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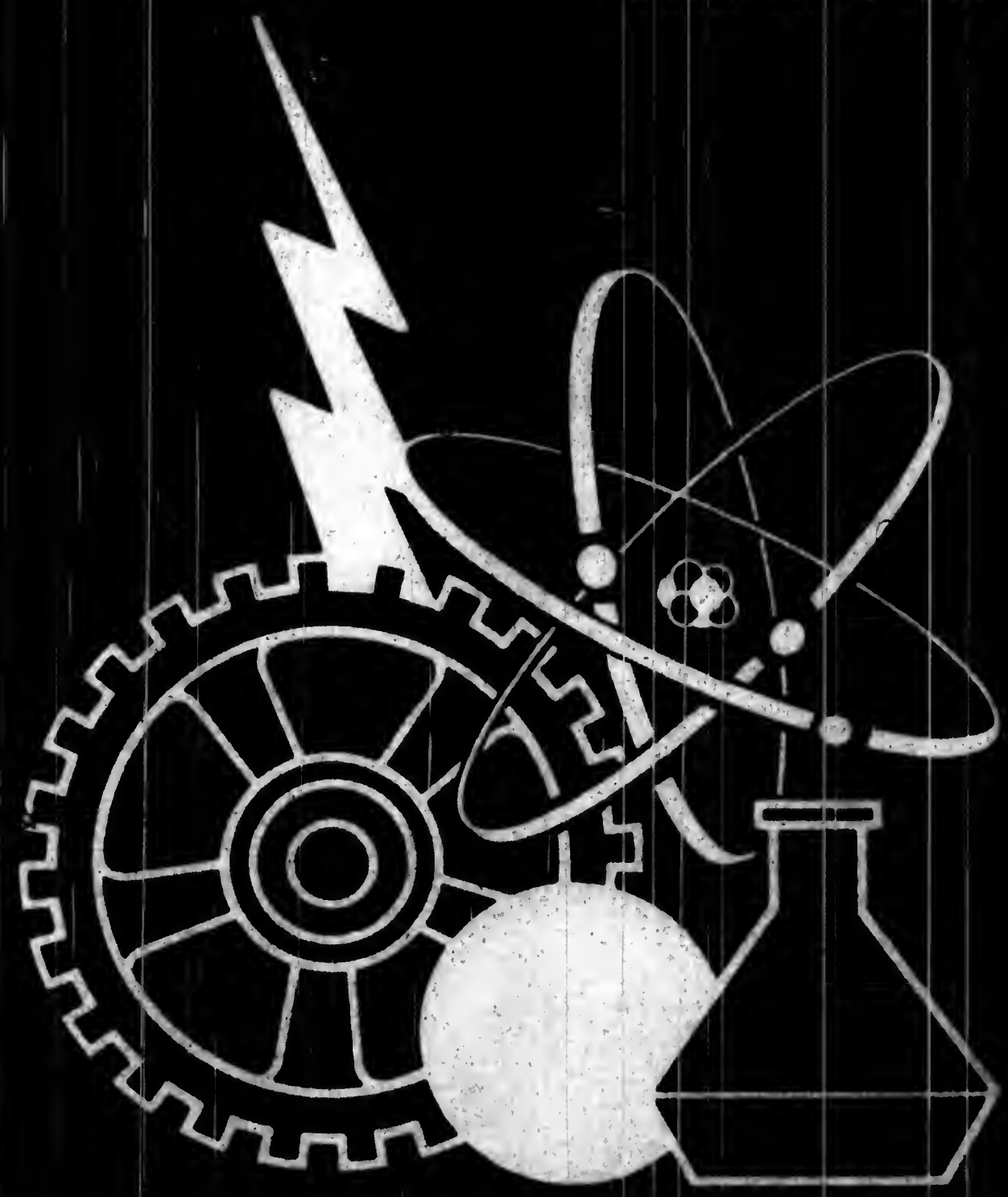
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

December 2, 1986



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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 2, 1986 Volume 1073 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic-Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 29, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,417,359 through 4,418,430
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 14, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,348,776	06/287,055	9/14/82
4,348,785	06/264,383	9/14/82
4,348,807	06/236,059	9/14/82
4,348,808	06/216,294	9/14/82
4,348,816	06/229,657	9/14/82
4,348,820	06/230,443	9/14/82
4,348,824	06/226,437	9/14/82
4,348,827	06/277,723	9/14/82
4,348,857	06/248,859	9/14/82
4,348,872	06/226,193	9/14/82
4,348,877	06/237,943	9/14/82
4,348,908	06/226,195	9/14/82
4,348,910	06/243,291	9/14/82
4,348,978	06/208,703	9/14/82
4,348,979	06/258,029	9/14/82
4,348,980	06/261,939	9/14/82
4,348,988	06/222,237	9/14/82
4,349,002	06/226,934	9/14/82
4,349,005	06/228,222	9/14/82
4,349,006	06/228,223	9/14/82
4,349,011	06/266,250	9/14/82
4,349,013	06/275,841	9/14/82
4,349,018	06/221,015	9/14/82
4,349,045	06/294,683	9/14/82
4,349,054	06/216,094	9/14/82
4,349,069	06/266,245	9/14/82
4,349,083	06/253,710	9/14/82
4,349,097	06/262,642	9/14/82
4,349,104	06/232,811	9/14/82
4,349,107	06/227,692	9/14/82
4,349,120	06/272,301	9/14/82
4,349,125	06/221,807	9/14/82
4,349,138	06/312,693	9/14/82
4,349,139	06/247,255	9/14/82
4,349,147	06/245,055	9/14/82
4,349,148	06/236,797	9/14/82
4,349,188	06/275,885	9/14/82
4,349,203	06/290,885	9/14/82
4,349,210	06/237,523	9/14/82
4,349,253	06/218,026	9/14/82
4,349,273	06/238,583	9/14/82
4,349,292	06/240,729	9/14/82
4,349,337	06/283,776	9/14/82
4,349,348	06/264,715	9/14/82
4,349,475	06/242,945	9/14/82
4,349,477	06/243,026	9/14/82
4,349,492	06/228,758	9/14/82
4,349,503	06/263,662	9/14/82
4,349,516	06/255,549	9/14/82
4,349,536	06/255,940	9/14/82
4,349,551	06/271,007	9/14/82
4,349,563	06/253,184	9/14/82
4,349,565	06/251,835	9/14/82
4,349,593	06/251,209	9/14/82
4,349,614	06/241,088	9/14/82
4,349,615	06/219,491	9/14/82
4,349,635	06/315,102	9/14/82
4,349,643	06/248,184	9/14/82
4,349,684	06/318,962	9/14/82
4,349,686	06/320,608	9/14/82
4,349,816	06/248,666	9/14/82
4,349,864	06/238,155	9/14/82
4,349,884	06/216,724	9/14/82
4,349,897	06/257,068	9/14/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,441,249, Re. S.N. 851,470, Filed Apr. 10, 1986, Cl. 29/577C, SEMICONDUCTOR INTEGRATED CIRCUIT CAPACITOR, Joshua Alspector, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: H. J. Wingegar, et al., Ex. Gp.: 114

4,449,792, Re. S.N. 866,245, Filed May 21, 1986, Cl. 350/432, LARGE-APERTURE SINGLE LENS WITH ASPHERICAL SURFACES, Norikazu Arai, et al., Owner of Record: *Konishiroku Photo Industry Co., Tokyo, Japan,* Attorney or Agent: Jordan B. Bierman, et al., Ex. Gp.: 257

4,539,059, Re. S.N. 845,709, Filed Mar. 27, 1986, Cl. 156/251, METHOD OF MANUFACTURING CORROSION-RESISTANT MEASURING PROBES, Kurt Burger, et al., Owner of Record: *Robert Bosch, GmbH., Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 131

4,553,732, Re. S.N. 914,769, Filed Oct. 3, 1986, Cl. 251/30.1, SOLENOID CONTROLLED FLOW VALVE, Robert W. Brundage, et al., Owner of Record: *Inventors,* Attorney or Agent: James T. Hoffmann, et al., Ex. Gp.: 347

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

De. 255,509, Reexam. No. 90/001,099, Requested: Sept. 26, 1986, Cl. D3/59, WRIST PURSE, Michael Nathan, et al., Owner of Record: *M. Nathan, Inc., New York, N.Y.,* Attorney or Agent: Henry R. Lerner, Ex. Gp.: 290, Requester: Sunburst Products, Inc., Canoga Park, Calif.

Re. 30,759, Reexam. No. 90/001,098, Requested: Sept. 24, 1986, Cl. 264/118, METHOD AND APPARATUS FOR PRODUCING AND TRANSPORTING SINGLE AND MULTI-LAYER CHIPBOARDS, Wolfgang Burkner, Owner of Record: *Carl Schenck AG., Darmstadt, Germany,* Attorney or Agent: Robert B. Russell, Ex. Gp.: 130, Requester: Willian, Brinks, et al., Chicago, Ill.

3,440,973, Reexam. No. 90/001,096, Requested: Sept. 24, 1986, Cl. 99/483, PROOFERS FOR BREAD PRODUCTS AND CONVEYOR SYSTEMS WHICH ARE ADAPTED TO USE THEREIN, William Lanham, et al., Owner of Record: *Lanham Machinery, Inc., Decatur, Ga.,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 240, Requester: Stewart Systems, Inc., Plano, Tex.

3,500,938, Reexam. No. 90/001,094, Requested: Sept. 24, 1986, Cl. 173/40, UNIVERSALLY MOUNTED DRILLING MAST, John V. Watson, Owner of Record: *Watson, Inc., Fort Worth, Tex.,* Attorney or Agent: M. A. O'Neil, Ex. Gp.: 320, Requester: Owner

3,680,493, Reexam. No. 90/001,095, Requested: Sept. 24, 1986, Cl. 34/147, CONVEYOR SYSTEM, William Lanham, et al., Owner of Record: *Lanham Machinery, Inc., Decatur, Ga.,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 340, Requester: Stewart Systems, Inc., Plano, Tex.

3,727,015, Reexam. No. 90/001,100, Requested: Sept. 29, 1986, Cl. 200/38, CAM OPERATED PROGRAM TIMER ASSEMBLY WITH REPLACEABLE LEAF SPRING CONTACT STRUCTURE, Elmo W. Voland, et al., Owner of Record: *PR Mallory Co., Inc., Indianapolis, Ind.*, Attorney or Agent: Robert F. Meyer, Ex. Gp.: 210, Requester: Sankyo Seiki Mftg. Co., Tokyo, Japan

3,903,369, Reexam. No. 90/001,087, Requested: Sept. 12, 1986, Cl. 179/6, TELEPHONE ANSWERING SYSTEM WITH REMOTE PLAY BACK, James R. Darwood, Owner of Record: *Fortel, Inc., Compton, Calif.*, Attorney or Agent: Jessup & Beecher, Ex. Gp.: 230, Requester: Phonemates, Inc., Torrance, Calif.

3,967,505, Reexam. No. 90/001,102, Requested: Oct. 1, 1986, Cl. 73/864.52, METHOD AND MEANS FOR DRAWING SAMPLES FROM MELTS, Heinrich Feichtinger, Owner of Record: *Leybold-Heraeus Technologies, Inc., Enfield, Conn.*, Attorney or Agent: Felfe & Lynch, Ex. Gp.: 260, Requester: Owner

4,165,075, Reexam. No. 90/001,092, Requested: Sept. 16, 1986, Cl. 273/140, FISHING GAME DEVICE, Mark Popovich, Owner of Record: *Fair Equipment, Inc., Arlington, Va.*, Attorney or Agent: Shlesinger, Arkwright, et al., Ex. Gp.: 330, Requester: Kalish & Gilster, St. Louis, Mo.

4,224,769, Reexam. No. 90/001,101, Requested: Sept. 29, 1986, Cl. 52/36, SPACE DIVIDER SYSTEM, Douglas C. Ball, et al., Owner of Record: *Hauserman, Inc., Cleveland, Ohio,* Attorney or Agent: Maky, Renner, et al., Ex. Gp.: 350, Requester: Herman Miller, Inc., Zeeland, Mich.

4,329,090, Reexam. No. 90/001,086, Requested: Sept. 12, 1986, Cl. 405/263, EMPLOYING QUICKLIME IN STABILIZING SURFACE LAYER OF THE EARTH, Joe D. Teague, et al., Owner of Record: *Porta Batch Co., Fort Worth, Tex.*, Attorney or Agent: None, Ex. Gp.: 240, Requester: Robert L. Thomas, Fort Worth, Tex.

4,389,074, Reexam. No. 90/001,089, Requested: Sept. 17, 1986, Cl. 299/79, MINE TOOLS UTILIZING COPPER MANGANESE NICKEL ALLOY, Mark S. Greenfield, Owner of Record: *GTE Products Corp., Stamford, Conn.*, Attorney or Agent: Donald R. Castle, Ex. Gp.: 320, Requester: Kennametal, Inc., Latrobe, Pa.

4,422,338, Reexam. No. 90/001,103, Requested: Oct. 1, 1986, Cl. 73/861, METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT, James E. Smith, Owner of Record: *Micro Motion, Inc., Boulder, Colo.*, Attorney or Agent: Mary Helen Sears, Ex. Gp.: 260, Requester: Owner

4,442,325, Reexam. No. 90/001,097, Requested: Sept. 30, 1986, Cl. 170/190, SWITCHABLE INCREMENTAL ATTENUATION FOR TELEPHONE LINE INTERFACE, Noel McDermott, Owner of Record: *Larus Corp., Santa Clara, Calif.*, Attorney or Agent: Jeffery J. Blatt, Ex. Gp.: 260, Requester: Keltronics Corp., Oklahoma City, Okla.

4,450,512, Reexam. No. 90/001,088, Requested: Sept. 16, 1986, Cl. 362/276, ARRANGEMENT FOR MOUNTING A THERMAL PROTECTIVE DEVICE IN A RECESS MOUNTED LIGHTING FIXTURE, Paul J. Kristofek, Owner of Record: *Cooper Ind., Inc., Houston, Tex.*, Attorney or Agent: None, Ex. Gp.: 340, Requester: Juno Lighting, Inc., Des Plaines, Ill.

4,482,565, Reexam. No. 90/001,093, Requested: Sept. 15, 1986, Cl. 514/192, B-LACTAMASE-CONTAINING ANTIBACTERIAL AGENTS AND B-LACTAMASE INHIBITORS, Maurizio Foglio, et al., Owner of Record: *Farmitalic Carlo Erba S.p.a., Milan, Italy,* Attorney or Agent: Wegner & Bretschnider, Ex. Gp.: 120, Requester: Owner

4,544,572, Reexam. No. 90/001,091, Requested: Sept. 18, 1986, Cl. 427/44, COATED OPHTHALMIC LENSES AND METHOD FOR COATING SAME, Timothy Sandvig, Owner of Record: *Armorlite, Inc., San Marcos, Calif.*, Attorney or Agent: Marshall, O'Toole, et al., Ex. Gp.: 150, Requester: Camelot Ind. Corp., St. Paul, Minn.

Erratum

In the notice of Certificates of Correction, appearing at 1064 O.G. 21 in the Official Gazette of Mar. 18, 1986, all references to Patent No. 4,294,879 should be deleted, as the Certificate Notice appeared in error in Official Gazette of Mar. 18, 1986.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Glynn A. Beard, Denver, Colo., Reg. No. 846,949, for the mark "NYLORAC", Canc. No. 15,093.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to registrants at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Mission Marine Associates, Inc., assignee, by change of name and assignment of Pacemaker Corp., Irvine, Calif., Reg. No. 704,203, for the mark "PACEMAKER", Canc. No. 15,600.

Telephone Technology, Inc., Irvine, Calif., Reg. No. 1,261,557 for the mark "TELEMATE", Canc. No. 15,739.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,007,195, Robert Garner and Jean Claude Petitpierre, HETEROCYCLIC SUBSTITUTED FLUORANS, Interference No. 101,590, decided Sept. 3, 1986, claims 1-6.

Patent No. 4,177,923, Robert C. Krump, BATTERY OPERATED THERMOSTAT TIMER WITH BATTERY CHARGING CIRCUITS, Interference No. 101,506, decided Aug. 19, 1986, claims 1-4.

Patent No. 4,215,815, Robert C. Krump, BATTERY OPERATED THERMOSTAT TIMER WITH BATTERY CHARGING CIRCUITS, Interference No. 101,507, decided Aug. 19, 1986, claim 1.

Patent No. 4,377,069, Hideyuki Kobayashi, BRAKE BOOSTER, Interference No. 101,430, decided Sept. 9, 1986, claims 1-5.

Patent No. 4,417,001, Glenn R. Svoboda, William L. Carlstrom and Richard T. Stoehr, LOW SMOKE ISOCYANURATE MODIFIED URETHANE FOAM AND METHOD OF MAKING SAME, Interference No. 101,456, decided Sept. 11, 1986, claims 1-12.

Patent No. 4,433,792, George Mandel, OPENING AND STOPPER DEVICE, Interference No. 101,479, decided Aug. 18, 1986, claims 1-7.

Patent No. 4,442,950, Thomas P. Wilson, OPENING AND CLOSING MEANS FOR A CONTAINER TOP, Interference No. 101,479, decided Aug. 18, 1986, claims 1-12.

Patent No. 4,464,056, Horst Schmitz and Wolfgang Krompass, MIXING HEAD FOR REACTIVE MATERIALS, Interference No. 101,472, decided June 17, 1986, claims 1-6 and 9.

Patent No. 4,497,579, Horst Schmitz and Wolfgang Krompass, MIXING HEAD FOR REACTIVE MATERIALS, Interference No. 101,473, decided June 17, 1986, claims 1-5.

Patent No. 4,507,853, James M. McDavid, METALLIZATION PROCESS FOR INTEGRATED CIRCUITS, Interference No. 101,570, decided Sept. 9, 1986, claims 1-10.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 2, 1986

4,294,879	4,573,535	4,594,227	4,607,496
4,443,362	4,574,216	4,594,825	4,607,640
4,477,030	4,574,270	4,594,964	4,608,007
4,500,342	4,574,594	4,595,131	4,608,077
4,505,822	4,574,880	4,595,569	4,609,017
4,507,323	4,575,313	4,597,858	4,609,193
4,514,465	4,576,522	4,598,245	4,609,463
4,515,584	4,578,158	4,598,774	4,609,808
4,517,862	4,579,213	4,599,462	4,610,559
4,540,781	4,580,103	4,599,489	4,611,108
4,544,922	4,580,151	4,600,458	4,611,578
4,547,295	4,581,055	4,601,017	4,611,797
4,547,448	4,581,242	4,601,083	4,611,887
4,548,098	4,582,731	4,602,515	4,611,933
4,551,715	4,583,057	4,602,572	4,612,060
4,553,296	4,585,005	4,602,930	4,612,197
4,555,465	4,587,038	4,604,318	4,612,245
4,558,564	4,588,770	4,604,738	4,612,459
4,559,050	4,590,128	4,604,849	4,612,466
4,567,274	4,590,144	4,605,019	4,612,517
4,567,919	4,591,474	4,605,050	4,613,375
4,568,957	4,591,768	4,605,637	4,613,650
4,569,768	4,592,543	4,605,767	4,613,733
4,572,105	4,592,561	4,605,911	4,614,596
4,572,625	4,592,893	4,605,949	4,614,647
4,572,801	4,592,900	4,606,883	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
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CONDITION OF PATENT APPLICATIONS AS OF September 30, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-04-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-03-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,464,063 to 3,470,563, inclusive
Plant Patents ..... Numbers 2,918 to 2,926 inclusive

STATUTORY INVENTION REGISTRATIONS

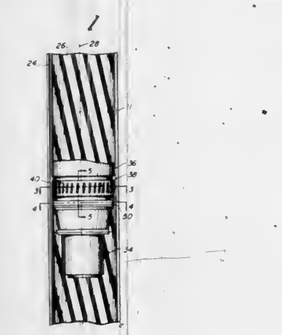
PUBLISHED DECEMBER 2, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H167
PROJECTILE OBTURATOR

James J. Forster, Socorro, N. Mex.; Chester J. Kobialka, Landing, and Sung Cho, Hackettstown, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1986, Ser. No. 854,212
Int. Cl.[4] F42B *31/00*
U.S. Cl. 102—524 **23 Claims**



1. An obturator of composite construction for use on a projectile launched from an upstanding tube, the interior surface of the tube between its ends having an alternate series of land and groove means, said obturator comprising:

circular-like band means mounted on peripheral surface means of a projectile adjacent the propellant end thereof, the band means having annular groove means in the outer periphery thereof,

annular shoulder means provided on the projectile and facing in a direction toward the propellant end of the projectile so as to positively retain the obturator on the projectile when it is inserted in the tube,

ring means mounted in the groove means,

a series of relatively spaced bristle-like means being arranged about the ring means such that one end of each bristle-like means is inserted in the outer peripheral surface of the ring means while at the same time the outer end of each bristle-like means being disposed above the outer peripheral surface of the ring means, and

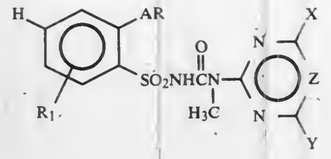
resin means for affixing the ring means to the band means while at the same time affixing the inserted end of each bristle-like means of the series thereof in order that the outer ends of certain bristle-like means of the series of bristle-like means wipingly engage the series of land means so as to cause cleaning of the series of land means of propellant residue from a prior projectile inserted in the tube and launched therefrom.

H168
HERBICIDAL SULFONAMIDES

Michael Conner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1982, Ser. No. 449,547
Int. Cl.[4] A01N *43/66, 43/54*; C07D *251/42, 239/42*
U.S. Cl. 71—93 **17 Claims**

1. A compound of the formula



wherein
A is O or $S(O)_n$;
R is CHF_2, CF_3, CH_2CF_3, CF_2CF_2H, CF_2CFHCl, CF_2CFHBr, or CF_2CHFCF_3;
R_1 is H, F, Cl, Br, CH_3, CF_3 or OCH_3;
n is 0, 1 or 2;
X is CH_3 or OCH_3;
Y is CH_3, OCH_3, OCH_2CH_3, CH_2CH_3, CH_2OCH_3 or $CH_2CH_2OCH_3$; and
Z is CH or N; and
their agriculturally suitable salts.

H169
IGNITION COMPOSITION

Gerald L. Mackenzie, Port Tobacco; Robert O. Petri, La Plata, and James E. Rose, Bryans Road, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

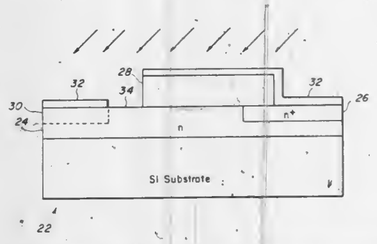
Filed May 22, 1986, Ser. No. 870,674
Int. Cl.[4] C06B *27/00, 45/10*
U.S. Cl. 149—19.3 **12 Claims**

1. An igniter composition for a gas generator comprises, on the basis of total composition weight, from about 97.5 to about 99.5 percent of a stoichiometric combination of a pyrotechnic metal selected from the group consisting of beryllium, lithium, sodium, titanium, magnesium, aluminum, boron and alloys and mixtures thereof and one or more halogenated polymers; and from about 0.5 to 2.5 percent of fumed colloidal silica.

H170
SELF ALIGNED NOTCH FOR INP PLANAR TRANSFERRED ELECTRON OSCILLATOR

Steven G. Binari, Camp Springs, Md., assignor to Government of the United States of America, Washington, D.C.

Filed Jan. 13, 1986, Ser. No. 818,512
Int. Cl.[4] H01L *21/00, 21/308, 21/467, 21/94*
U.S. Cl. 29—576 B **10 Claims**



1. A method of fabricating an indium phosphide transferred-electron oscillator device comprising the steps of:

selecting a semi-insulating indium phosphide substrate with an epitaxial n-type surface layer and an n^+-doped anode region in said surface layer;

applying a masking layer over said surface layer including a first void over said anode region and a second void over an adjacent cathode region;
evaporating a metallization layer at an angle from perpendicular to said masking layer, having a slant in a direction from said anode region to said cathode region, to create a narrow void in said metallization layer adjacent to said cathode region due to shadow effect of said masking layer;
implanting impurity ions into said surface layer through said metallization layer void to create a narrow high-resistivity region adjacent to said cathode region;
removing said masking layer with the portion of said metallization layer which contacts it, to create a cathode region metallization layer over said cathode region and an anode region metallization layer over said anode region; and
alloying said substrate to convert said cathode metallization layer to an ohmic cathode contact and said anode metallization layer to an anode ohmic contact.

H171
BRANCHED CHAIN GLYCOSIDES

Robert S. McDaniel, Decatur; Leonard F. Vander Burgh, Bethany, and Allen D. Urfer, Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jun. 24, 1985, Ser. No. 748,258
Int. Cl.[4] C11D *1/66*
U.S. Cl. 252—174.17 **10 Claims**

1. A glycoside composition comprising:
a. a branched chain monoglycoside of the formula:

$$R(OG);$$

b. a branched chain polyglycoside of the formula:

$$R(OG)_x;$$ and

c. a straight chain glycoside of the formula:

$$A(OG)_y$$

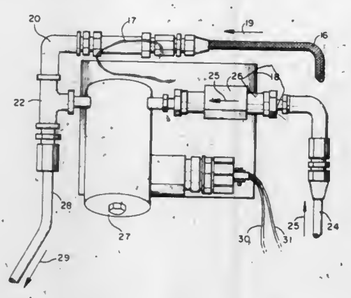
wherein R is an alkyl or alkenyl moiety containing from about 7 to about 30 carbon atoms and containing branching at the 2 or higher position on R wherein the branching is selected from the group consisting of methyl, ethyl, isopropyl, normal propyl, butyl, pentyl, hexyl, and mixtures thereof; G is a saccharide moiety selected from the group consisting of glucose, fructose, mannose, galactose, talose, gulose, allose, altrose, idose, arabinose, xylose, lyxose and ribose and mixtures thereof; x is a number equal to or greater than 2; A is a straight-chained alkyl, alkenyl or aromatic moiety containing from about 6 to about 30 carbon atoms; and y has an average value of from about 1.2 to about 10 and wherein the weight ratio of the branched chain monoglycoside to the branched chain polyglycoside is from about 20:1 to about 1:4 and the weight ratio of the branched chain monoglycoside to the straight chain glycoside is from about 50:1 to about 1:50.

H172
AIR PURGE SYSTEM FOR VEHICLE ENGINE EXHAUST SMOKE SYSTEMS

William J. Pribyl, Baltimore, and Donald L. Curtis, Edgewood, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1986, Ser. No. 845,668
Int. Cl.[4] C09K *3/30;* **C06D** *3/00;* **F41H** *9/06*
U.S. Cl. 252—305 **20 Claims**

1. An air purge system device for use with nozzle tubes carrying a fuel oil to an engine exhaust system for vaporization of the fuel oil, comprising:
at least one nozzle tube for carrying fuel oil to an engine exhaust system;
a supply valve for controlling flow of fuel to said nozzle tube;
an air purge line for forcing air into said tube when said air supply valve is closed;
a one-way check valve on said air purge line permitting air flow toward said tube and preventing fuel flow in said air purge line;
an air source having a positive air pressure and connected to supply air to said air purge line; and

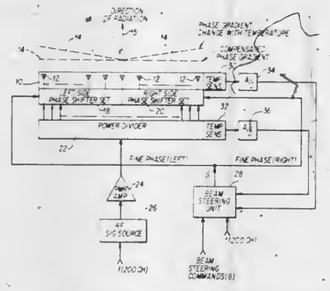


a fuel supply source connected to supply fuel to said supply valve.

H173
TEMPERATURE AND FREQUENCY COMPENSATED ARRAY BEAM STEERING UNIT

Kenneth D. Claborn, and William C. Bailey, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1986, Ser. No. 859,283
Int. Cl.[4] H01Q *3/26;* **G01S** *7/40*
U.S. Cl. 342—372 **21 Claims**



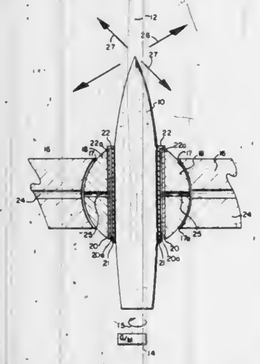
1. A method of electronically compensating for beam pointing errors and sidelobes resulting from temperature and frequency changes on a phased array antenna including a set of phase shifters for controlling the beam radiated from a plurality of radiating elements comprising the steps of:
sensing temperature at least of the antenna aperture;
selecting an operating frequency from a plurality of discrete operating frequencies for RF signals transmitted from the array;
converting the sensed temperature of the antenna aperture to an electrical signal;
generating an electrical signal indicative of said operating frequency;
combining both electrical signals and generating therefrom a memory address signal;
addressing a memory having a set of stored values of beam steering phase gradients compensated for both temperature and operating frequency;
reading out a predetermined phase gradient value from said memory in accordance with said memory address signal;
generating a beam steering angle command signal;
operating on the predetermined value of the phase gradient read out from the memory by a mathematical function of beam steering angle and generating therefrom a coarse phase gradient signal;

utilizing said phase gradient signal as a phase shifter drive signal; and
coupling said drive signal to said set of phase shifters for radiating a compensated beam from said array at said beam steering angle.

H174
HIGH SPIN COMPOUND AIR BEARING

William H. Mermagen, Havre de Grace, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 12, 1985, Ser. No. 797,065
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—108 **20 Claims**



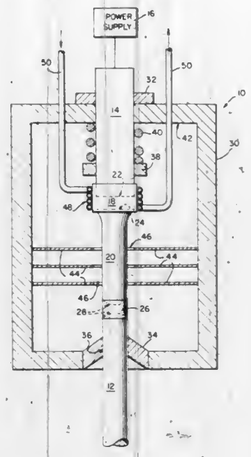
11. In an air bearing device for use with flight simulators to spin stabilized projectiles having a primary axis of rotation in which a projectile is rotated about its primary axis, said device having a frame and a drive means for rotating said projectile about its primary axis, the improvement comprising:
a hemispherical first stator mounted on said frame and defining an interior spherical space having a center on said primary axis;
a hemispherical first rotor positioned about said center in said spherical space, said first rotor being uniformly separated from said first stator by a first air gap;
a cylindrical second stator mounted on said first rotor and defining an interior cylindrical space having an axis coexistent with said primary axis;
a cylindrical second rotor positioned about said primary axis in said cylindrical space, said second rotor being uniformly separated from said second stator by a second air gap;
air supply means positioned to supply air to said first air gap in an amount sufficient to support said first rotor in said first stator said to supply air to said second air gap in an amount sufficient to support said second rotor in said second stator; and
sleeve means on said second rotor for mounting a projectile to said second rotor in positioning the rotational axis of said projectile on said primary axis.

H175
RESIDUAL STRESS REDUCTION OF PROCESSED DU ALLOY RODS

Sheldon J. Cytron, Mountain Lakes, and Kenneth Willison, Hamburg, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 27, 1985, Ser. No. 780,874
Int. Cl.[4] H02N *2/00*
U.S. Cl. 318—116 **20 Claims**

1. An assembly for processing depleted uranium (DU) rods, including:
a power supply which supplies electrical energy;
a converter connected to the power supply, which converts the electrical energy to mechanical energy;

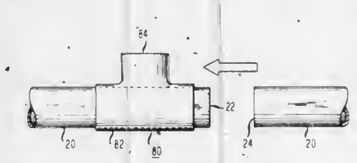


a housing which encloses a substantial portion of the converter; and
a connector located within the housing that connects the DU rod to the converter such that the DU rod is vibrated.

H176
SLIP TEE PIPE FITTING

Alexander Johnstone, Jr., Howell Township, Monmouth County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 16, 1985, Ser. No. 766,255
Int. Cl.[4] F16L *21/00, 41/00*
U.S. Cl. 285—31 **10 Claims**

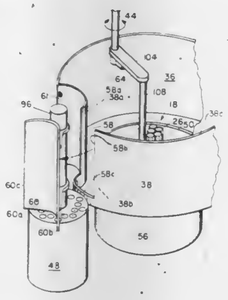


1. A female pipe fitting adapted to provide a branch for a pipe from which a section of said pipe has been removed leaving first and second free ends of said pipe, said female pipe fitting comprising
first, second and third openings, said first and second openings being opposite each other, smooth surfaced and coaxial, the axis of said third opening being at an angle to the axis of said first and second openings,
said first opening adapted to fit over said first free end of said pipe so that said first and second openings of said female pipe fitting slide over said first end of said pipe,
said second opening of said female pipe fitting adapted to slide over said second end of said pipe,
said female pipe fitting being positioned so that the space through said third opening of said female pipe fitting communicates with said first and second openings of said female pipe fitting and said first and second ends of said pipe,
said third opening adapted to receive a second pipe to effect said branch from said pipe, and
said section of pipe which has been removed being smaller by a predetermined length than the distance between said first and second openings of said female pipe fitting.

H177
FUEL HANDLING SYSTEM FOR A NUCLEAR REACTOR

James G. Saiveau, Hickory Hills; William J. Kann, Park Ridge, and James P. Burelbach, Glen Ellyn, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,606
Int. Cl.[4] G21C *19/20*
U.S. Cl. 376—261 3 Claims

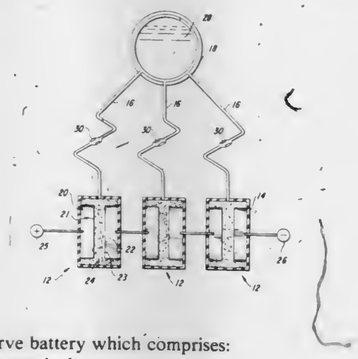


1. In a pool type nuclear fission reactor having a core, a plurality of fuel core elements and a redan structure in the form of a vessel for confining coolant in a hot pool area at a first end of said core separated from a cold pool area at a second end of said core, a fuel handling system comprising;
a core element storage basket located outside of said redan structure in said cold pool area;
an access passage in said redan structure:
a gate to close said passage;
means for opening and closing said gate; and
means for manipulating said fuel core elements through said access passage between said storage basket and said core when said gate is open.

H178
RESERVE BATTERY WITH IMPROVED WET-STAND CHARACTERISTICS

Allan M. Biggar, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 5, 1985, Ser. No. 795,135
Int. Cl.[4] H01M *6/36, 6/38*
U.S. Cl. 429—114 13 Claims

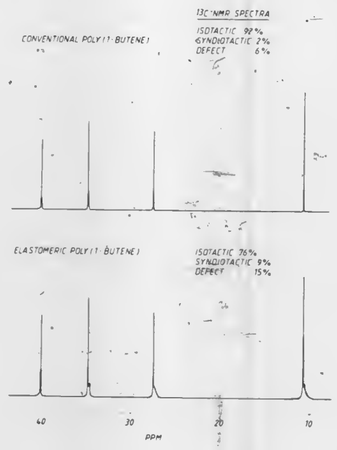


1. A reserve battery which comprises:
a positive terminal;
a negative terminal;
a plurality of battery cells electrically connected in series between the positive terminal and the negative terminal, each cell including a positive electrode having an active surface and a negative electrode having an active surface which is spaced from the positive electrode active surface;
a reservoir for receiving electrolyte;
electrolyte supply means for supplying electrolyte to the reservoir;
a like plurality of filling conduits formed of electrically insulating material and extending respectively between the cells and the reservoir to establish communication between each cell and the reservoir;
means for exerting a force on electrolyte within the reservoir to cause the flow of electrolyte through the filling conduits into the cells; and
a like plurality of gas generators disposed respectively within the filling conduits to contact electrolyte flowing therethrough, each gas generator comprising a material which generates a gas when brought into contact with the electrolyte.

H179
POLYBUTYLENE

George B. Klingensmith, 1828 Milford, Houston, Tex. 77098, and Thair L. Higgins, 1626 Elm St., El Cerrito, Calif. 94530

Continuation-in-part of Ser. No. 517,499, Jul. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 331,106, Dec. 16, 1981, abandoned. This application Nov. 28, 1984, Ser. No. 675,669
Int. Cl.[4] C08F *4/64, 4/44, 4/52*
U.S. Cl. 526—125 6 Claims

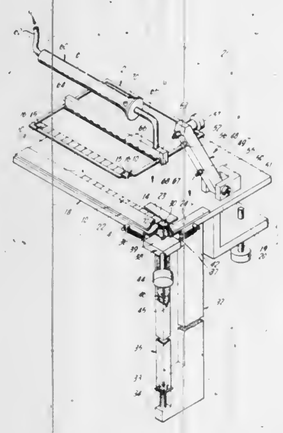


1. Process for the production of a 1-butene homopolymer characterized by having reduced crystallinity due to enchained tactic defect structures, and by the following properties:
Solubility in refluxing diethyl ether, % wt. <8
Crystallinity (by X-ray diffraction (Form I), % 25–40
Melting point of Form I, °C. about 100–118
Tensile Strength (ASTM Method D-638)
At yield psi: 400–1700
At break psi: 3000–4500
Elongation at break, %: 300–600
Hardness, Shore A, 10 sec.: 50–90
which process comprises contacting butene-1 with a polymerization catalyst consisting essentially of:
(1) a procatalyst support obtained by contacting a magnesium halide with an electron donor and a titanium halide;
(2) an aluminum alkyl cocatalyst; and
(3) a selectivity control agent;
the ratios of the catalyst components being within the following ranges:
(a) titanium content of procatalyst, from about 1 to about 5% wt.;
(b) aluminum:titanium atomic ratio, from about 50 to about 150;
(c) selectivity control agent:titanium atomic ratio, from about 4.5 to about 20;
(d) aluminum:selectivity control agent molar ratio, from about 5:1 to about 15:1.

H180
ASSEMBLING ARTICLES IN A TUBE

Jerry C. Hurst, Reading, and John S. Rizzo, Birdsboro, both of Pa., assignors to AT&T Bell Laboratories

Filed Dec. 18, 1984, Ser. No. 683,095
Int. Cl.[4] B65B *5/10, 35/00*
U.S. Cl. 53—435 8 Claims



1. Apparatus for assembling in a tube having opposing walls, a column of flat articles having first and second major surfaces and initially in the form of an interconnected row of such articles, comprising:
a base for supporting the interconnected row of the articles, each interconnected article having its second major surface on the base and its first major surface facing upward, said base also having an aperture of a size and shape to pass serially downward therethrough, ones of the articles, each having its second major surface facing downward;
means for removably supporting the tube under the base with an open end facing upward and registered to the aperture;
means associated with the base for guiding to and introducing a leading article of the interconnected row over the aperture;
means for breaking the leading article away from a trailing article in the row so that the leading article is introduced into the aperture and urged downward a distance sufficient to provide space for a sebsequent article; and
frictional means for yieldably supporting the articles as they are serially assembled into the tube such that an article introduced into the aperture is held at the open end of the tube and free fall of such article in the tube is substantially prevented.

H181
BIS(2-FLUORO-2,2-DINITROETHOXY)ACETONITRILE AND A METHOD OF PREPARATION

William M. Koppes, Adelphi, and Horst G. Adolph, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1986, Ser. No. 878,149
Int. Cl.[4] C06B *25/00*
U.S. Cl. 149—88 7 Claims

1. Bis(2-fluoro-2,2-dinitroethoxy)acetonitrile, $N{\equiv}CCH[OCH_2CF(NO_2)_2]_2$.

REISSUES

DECEMBER 2, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,297

APPLIANCE FOR DREDGING THE BOTTOM OF A BODY OF WATER

Jacques Oules, Paris, France, assignor to Hydroconsult, S.A., Paris, France

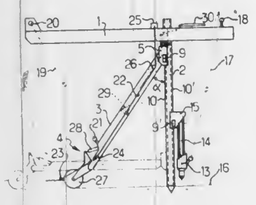
Original No. 4,445,290, dated May 1, 1984, Ser. No. 330,788, Dec. 14, 1981. Application for reissue Jun. 28, 1985, Ser. No. 749,638

Claims priority, application France, Dec. 16, 1980, 8026683

Int. Cl.[4] E02F *3/88*

U.S. Cl. 37—66

14 Claims



1. Dredging appliance, [particularly for dredging at great water depths of up to 100 meters and more,] comprising: a buoyant body adapted to float on the water surface; an anchoring device vertically movably mounted in said buoyant body between an anchoring position wherein its lower end is driven into the water bottom and a raised position withdrawn from said bottom; a first support carriage supporting a working head carrying arm, said first carriage being slidably mounted on said anchoring device for vertical movement on said anchoring device; a working head carrying arm hingedly mounted at one of its ends on said first support carriage so as to be rotatable about a substantially horizontal axis, said working head carrying arm having a constant length; a working head carried by the other free end of said arm, said working head being adapted to dredge said bottom by accomplishing successive parallel dredging movements, each movement being along [a path in the form of an arc of circle] *an arcuate path*; and [control cables] *for means* moving said working head along each said dredging path; said first support carriage being vertically slidable along said anchoring device between an upper dredging position wherein the length of said working head carrying arm is such that said working head is in contact with said bottom with said working head carrying arm forming a relatively small angle with the vertical axis of said anchoring device, and a lower dredging position where said arm extends substantially horizontally, with said anchoring device remaining in its anchoring position driven in the water bottom and said working head being in contact with said bottom, said working head being movable during dredging in a direction perpendicular to the dredging paths by the vertical movement of said first carriage on said anchoring device [from] *between* said [upper] dredging [position to said lower dredging position] *positions* corresponding [thereby] to a multitude of parallel dredging paths.

Re. 32,298

LIQUID-SEPARATING DEVICE

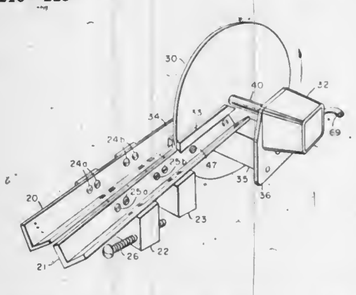
Harold J. Baer, 3022 Hall SE., Grand Rapids, Mich. 49506, and Glenn B. Morse, Grand Rapids, Mich., assignors to Harold J. Baer, Grand Rapids, Mich.; Harold J. Baer, Jr., Denver, Colo. and Lawrence J. Baer, Crotton, Md.

Original No. 4,220,533, dated Sep. 2, 1980, Ser. No. 551,161, Feb. 20, 1975. Application for reissue Aug. 13, 1984, Ser. No. 590,276

Int. Cl.[4] B01D *35/06*; E02B *15/04*

U.S. Cl. 210—223

1 Claim



1. A machine for elevating liquid material, said machine including frame means and plate means rotatably mounted on said frame means, and also including wiping means and collector means adapted to remove liquid from said plate means, and drive means adapted to rotate said plate means, wherein the improvement comprises:

at least two plates constituting said plate means mounted respectively on spaced axis of rotation and in overlapping relationship;

bracket means interposed between said plate, and mounted on said frame, said bracket means having a receptacle slot, and said wiping means is a flexible strip normally received in said slot and engaging said overlapping plates along the opposite edges of said strip, said bracket means constituting the sole supporting and retaining means for said strip, said drive means being operative to induce a common direction of rotation of said plates; and wherein

said slot is normally inclined to the horizontal, and has a serrated edge on the side thereof facing the direction of rotation of one of said plates, and said one plate is mounted below the other of said plates.

Re. 32,299

GLASS COMPOSITION AND ARTICLES

Ronald M. Randklev, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,350,532, dated Sep. 21, 1982, Ser. No. 288,290, Jul. 30, 1981. Continuation-in-part of Ser. No. 184,917, Sep. 8, 1980, abandoned. Application for reissue Sep. 21, 1984, Ser. No. 653,871

Int. Cl.[4] C03C *3/118, 3/085, 8/04, 8/06*

U.S. Cl. 501—59

7 Claims

5. A single phase composition consisting essentially of, in percent by weight:

Zinc oxide	20 to 35%
Silica	45 to 65%
Boric oxide	3 to 15%
Aluminum oxide	0 to 10%
Alkali metal oxide or	0 to 5%

-continued

alkaline earth metal oxide

and aluminum fluoride, wherein the combined weight of aluminum oxide and aluminum fluoride is at least about 5%, the weight of aluminum fluoride is sufficient to contribute to the melt fluidity of the glass and enable it to be poured in the form of thin filaments for rapid cooling thereof, and said composition exhibits an X-ray absorption characteristic of at least 1/16 inch.

Re. 32,300

BASIC AMINO OR AMMONIUM ANTIMICROBIAL AGENT-POLYETHYLENE GLYCOL ESTER SURFACTANT-BETAINE AND/OR AMINE OXIDE SURFACTANT COMPOSITIONS AND METHOD OF USE THEREOF

William G. Gorman, East Greenbush, and Karl F. Popp, Schodack Landing, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Original No. 4,420,484, dated Dec. 13, 1983, Ser. No. 320,754, Nov. 12, 1981. Continuation-in-part of Ser. No. 245,089, Mar. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 158,737, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 65,885, Aug. 13, 1979, abandoned. Application for reissue Jul. 3, 1985, Ser. No. 752,332

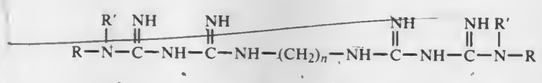
Int. Cl.[4] A61K *31/155*

U.S. Cl. 514—635 **31 Claims**

1. An antimicrobial skin cleansing composition consisting essentially of

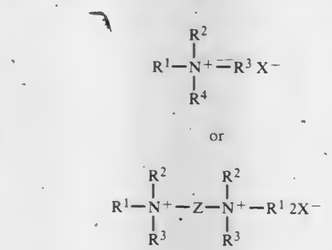
an antimicrobially effective amount of one or more antimicrobial agents selected from the group consisting of

(a) a compound having the structural formula



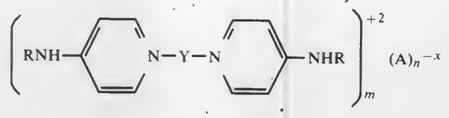
wherein R taken alone is phenyl substituted by alkyl, alkoxy, nitro or halo, p-(2,2-dichlorocyclopropyl)phenyl, alkyl having from 6 to 16 carbon atoms, cycloalkyl or polycyclic alkyl having more than 6 carbon atoms or lower-alkyl-cycloalkyl or cycloalkyl-lower-alkyl having from 1 to 4 carbons in lower alkyl; R′ taken alone is hydrogen; R and R′ taken together are 3-azabicyclo(3,2,2)nonyl; and n is an integer from 3 to 9; or a pharmaceutically acceptable salt thereof;

(b) a compound having the structural formula



wherein R^1 is long-chain alkyl or aralkyl; R^2 is short-chain alkyl, long-chain alkyl or aralkyl, benzyl or part of an aromatic system or non-aromatic system; R^3 and R^4 are short-chain alkyl or part of an aromatic ring system or non-aromatic ring system; Z is a carbon-hydrogen chain; and X is a pharmaceutically acceptable anion; and

(c) a compound having the structural formula



wherein

R is an alkyl group containing from 6 to 18 carbon atoms, a cycloalkyl group containing from 5 to 7 carbon atoms, benzyl, benzyl substituted by one or two substituents selected from the group consisting of halogen, hydroxy, lower-alkyl, lower-alkoxy, nitro, cyano and trifluoromethyl or phenyl substituted by methylenedioxy or one or two substituents selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, nitro, cyano and trifluoromethyl;

Y is an alkylene group containing from 4 to 18 carbon atoms and separating the two 4-(R-NH)-1-pyridinyl groups by from 4 to 18 carbon atoms;

A is a pharmaceutically acceptable anion;

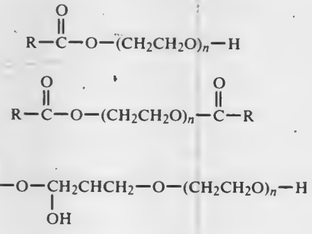
m is 1 or 3;

n is 1 or 2;

x is 1, 2 or 3; and

(m)(2)=(n)(x);

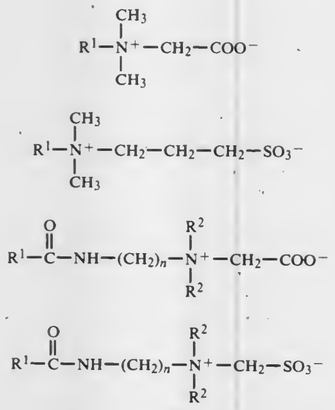
(B) from about 0.75% to about 30% by weight of one or more polyethylene glycol ester surfactants having the structural formulas



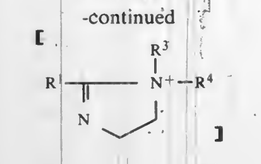
wherein R is alkyl or alkenyl having from about 8 to about 20 carbon atoms or lanolin and n is an integer from about 8 to about 200;

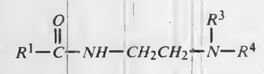
(C) from about 0.5% to about 30% by weight of one or more surfactants selected from the group consisting of

(a) betaines having the structural formulas



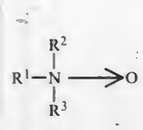
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wherein R^1 is alkyl or alkenyl having from about 8 to about 18 carbon atoms; R^2 is methyl, ethyl or 2-hydroxyethyl; R^3 is 2-hydroxyethyl [or CH_2COO^-]; R^4 is [CH_2COO^- or $CH_2CH_2—O—CH_2COO^-$; an] *CH_2CH_2COONa; and* n is 2 or 3; and

(b) amine oxides having the structural formula



wherein R^1 taken alone is methyl, ethyl or 2-hydroxyethyl; R^2 taken alone is methyl, ethyl or 2-hydroxyethyl; R^1 and R^2 taken together are morpholino; R^3 is alkyl having from about 8 to about 18 carbon atoms or $R^4CONH(CH_2)_3$ wherein R^4 is alkyl having from about 8 to about 18 carbon atoms; and wherein 2-hydroxyethyl can be condensed with from 1 to about 200 units of ethylene oxide; and

(D) water, aqueous ethyl alcohol, aqueous isopropyl alcohol or an aqueous ethyl alcohol-isopropyl alcohol mixture.

PLANT PATENTS

GRANTED DECEMBER 2, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,813
PLUM TREE (BLUE KNIGHT)

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Nov. 13, 1984, Ser. No. 671,334
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, as illustrated and described, characterized by its vigorous, upright growth and a heavy regular bearer of medium size, very firm, yellow flesh fruit with an attractive blackish blue skin color; characterized in comparison to Red Beaut, (U.S. Plant Pat. No. 2,539); by having fruit that matures 10 days later, is larger in size, colors 2 weeks before maturity and the tree is more productive and a regular bearer of fruit.

5,814
DISTINCT VARIETY OF STREPTOCARPUS NAMED NANCY

Gerhard Fleischle, Vaihingen/E.-Ensingen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Feb. 7, 1985, Ser. No. 699,456
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

5,815
CHRYSANTHEMUM PLANT NAMED DELTA

Leendert A. Hoek, and Jan Hoek, both of The Hague, Netherlands, assignors to Hoek Breeding B.V., Netherlands

Filed Dec. 4, 1984, Ser. No. 678,042
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum named Delta, as described and illustrated, and particularly characterized by its flat capitulum form and daisy capitulum type, pink ray floret color devoid of discoloration, diameter across face of capitulum ranging from 70 to 85 mm. at maturity, uniform nine weeks response, upright branching pattern and minimum pollen production.

5,816
CHRYSANTHEMUM PLANT NAMED HOPSCOTCH

Leonard H. Shoesmith, deceased, late of Woking Surrey, England by May Victoria Shoesmith, executrix, assignor to Ball Pan Am Plant Company, Parrish, Fla.

Filed Dec. 13, 1984, Ser. No. 681,422
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Hopscotch, as described and illustrated, having flat capitulum form and single capitulum type, yellow ray floret color, excellent flower substance, diameter of capitulum 9.5 to 11.5 cm., medium pot plant height and semi-upright branching pattern.

5,817
CHRYSANTHEMUM PLANT NAMED YELLOW DRAMATIC

Kjell-Ake Persson, Vaartoepets Handelstraegaard Kjoepingegatan 70, 23100 Trelleborg, Sweden

Filed Dec. 13, 1984, Ser. No. 681,481
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Yellow Dramatic, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; yellow tinged orange ray floret color; diameter across face of capitulum ranging from 6 to 9 cm. at maturity; uniform nine week flowering response; medium plant height when grown single stem; 8 to 12 cm. peduncles on open, normally terminal sprays; 13° C. minimum temperature tolerance for initiation and development of flowering buds; and significantly reduced development of the orange carotene as expressed by the parent cultivar Dramatic, in all stages of maturation and all environments tested to date.

5,818
CHRYSANTHEMUM PLANT NAMED WESTLAND SUN

Jacques C. M. van der Knaap, DeLier, Netherlands, assignor to Ball Pan Am Plant Company, Parrish, Fla.

Continuation of Ser. No. 494,561, May 13, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 661,054
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Westland Sun, as described and illustrated, and particularly characterized by its flat capitulum form and spider capitulum type, tubular yellow ray floret color which does not bronze under cooler temperatures, 70–90 mm. diameter across face of capitulum, long peduncles, uniform nine week response, and its semi-upright branching habit.

5,819
CHRYSANTHEMUM PLANT NAMED YELLOW FAVOR

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 28, 1984, Ser. No. 675,567
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Yellow Favor, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; yellow ray floret color; diameter across face of capitulum ranging from 8 to 12 cm. at maturity; uniform nine week flowering response; medium plant height, and spreading branching pattern that adapts to both disbud and spray pot mum programs.

PATENTS

GRANTED DEC. 2, 1986

ERRATA

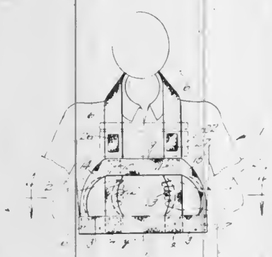
For CLASS	See PATENT NO.
005-446	4,624,487
222-131	4,625,884
424-146	4,626,189
250-506	4,626,380
540-306	4,626,384
540-451	4,626,385
427-143	4,626,463
564-355	4,626,522
379-099	4,626,622
379-095	4,626,623
379-137	4,626,624
379-137	4,626,625
379-394	4,626,626
379-214	4,626,627
379-283	4,626,628
379-386	4,626,629
379-199	4,626,630
379-165	4,626,631
379-029	4,626,632
379-027	4,626,633
379-028	4,626,634
361-219	4,626,917

PATENTS

GRANTED DECEMBER 2, 1986

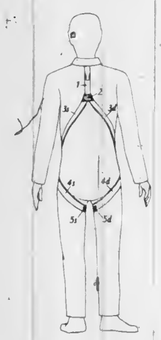
GENERAL AND MECHANICAL

4,625,334
TANDEM RIDER HARNESS
Stephen M. Proffer, 273 Kincaid, Eugene, Oreg. 97405
Filed Jul. 1, 1985, Ser. No. 750,023
Int. Cl.[4] A41D *1/04*
U.S. Cl. 2—1 **6 Claims**



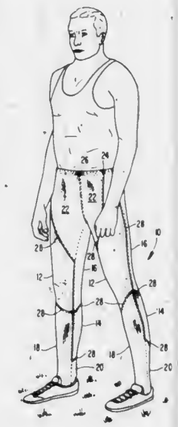
1. A safety harness for wear by the forward rider of tandem riders, said harness comprising,
a belt including means for adjustably applying same about the forward riders waist,
strap means for overlying the forward riders frontal torso area and terminating downwardly in attachment to said belt, and
said strap means having segments constituting first and second pairs of handholds proximate the frontal torso area for grasping by the rearwardmost rider of the tandem riders, said first pair of handholds being spaced a lesser distance apart than said second pair of handholds, said strap means additionally including a cross member which retains said first pair of handholds and said second pair of handholds against displacement during harness use.

4,625,335
RESCUE AND SECURING HARNESS INTEGRALLY AFFIXED TO A GARMENT
Mario Vinai, Via Montello 25, Brescia, Italy
Filed Jun. 5, 1985, Ser. No. 741,550
Claims priority, application Italy, Jun. 5, 1984, 21259 A/84; Apr. 15, 1985, 21449/85[U]
Int. Cl.[4] A41D *13/00*; **A62B** *35/00*
U.S. Cl. 2—69 **8 Claims**



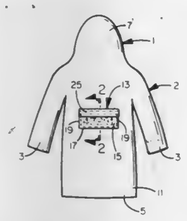
1. A rescue- and securing harness integrally affixed to a garment having a collar, said harness comprising a sustaining band positioned in a rear portion of said garment and comprising the following component parts:
(a) a vertical strap section for running along a user's backbone, projecting beyond the garment's collar and reaching a user's interscapular region, and having means for a lift line hook-up in an uppermost position;
(b) two first strap sections, symmetrically arranged relative to a user's backbone and diverging downwards from a point of conjunction with said vertical strap section, one towards the left and the other towards the right, each first strap section reaching the region of a respective iliac crest of a user and extending frontal and obliquely downwards to reach a user's waist line;
(c) two second strap sections starting, each, from a bottom end point of each of said first strap sections and running, each, obliquely downwards along the respective junction line between a user's thigh and the gluteus, to be terminated in the medial region of a user's thigh;
(d) an adjustable setting belt having two fixed branches which are fixedly attached, each, to a respective one of said bottom end points of said strap; and
(e) a pair of adjusting belts which are joined to an end point of the respective strap sections, said belts being generally oriented along a respective groin-line of a user.

4,625,336
ATHLETIC GARMENT
Thomas Derderian, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 30, 1985, Ser. No. 739,120
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—79 **12 Claims**



1. A form-fitting athletic garment to simultaneously warm preselected tendons and fragile muscles while allowing excess heat to escape preselected large, hard-working muscles, comprising:
first fabric panels having relatively open mesh to cover preselected large, hard-working muscles;
second fabric panels having relatively closed mesh to cover preselected tendons and fragile muscles; and
said first and second fabric panels being joined at their adjacent edges by seams so that the garment form-fits a wearer and said first fabric panels cover the preselected large, hard-working muscles and the second fabric panels cover the preselected tendons and fragile muscles.

4,625,337
SAFETY RAIN SUIT
Daniel P. Zahn, Rte. 1, Box 99, Lomira, Wis. 53048
Filed Aug. 5, 1985, Ser. No. 762,519
Int. Cl.[4] A41D *31/00*
U.S. Cl. 2—82 4 Claims



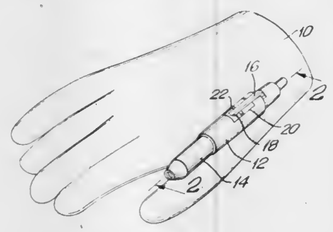
1. A hunting suit comprising:
a. a jacket adapted to be worn by a person and manufactured from an opaque material, the jacket having an imperforate back; and
b. a transparent hunting tag holder permanently bonded to the back of the jacket, the holder comprising an imperforate generally rectangular panel fabricated from a transparent material and permanently bonded at the side and bottom margins thereof to the jacket back to thereby cooperate with the jacket back to form an open top pocket integral with the jacket, and a generally rectangular imperforate flap fabricated from a flexible transparent material and permanently bonded along the upper margin thereof to the jacket back and overlapping the panel to cover the pocket open top, the flap being selectively foldable upwardly along the upper margin thereof to uncover the pocket open top,
so that a hunting tag inserted in the pocket is visible through the transparent panel and flap.

4,625,338
LADIES' RESILIENT GARMENT FOR SMOOTHING ARM FLABBINESS
LaFerne L. Starling, 4475 49th St. #101, San Diego, Calif. 92115
Filed May 6, 1985, Ser. No. 731,022
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—106 8 Claims



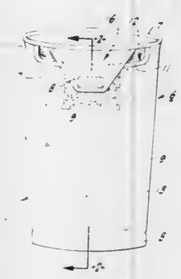
1. A ladies' garment for smoothing the wrinkles and flabbiness in the arms and waist of a wearer, said garment comprising;
a waist encircling section;
a pair of spaced arm sections connected to the waist section to form a U-shaped back opening to enable the wearing of a backless garment;
the material of said arms and waist sections being made of a two-way stretchable material;
said waist section having an opening sufficiently large to be stretchable over the body of the wearer to encircle the waist area; and
said arm sections extending over the shoulders of the user for applying a tension on said arm sections to maintain them in a snug position around the arms of the wearer.

4,625,339
ILLUMINATING GLOVE
Raymond A. Peters, 473 W. 158th St., New York, N.Y. 10032
Filed Oct. 7, 1985, Ser. No. 785,013
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—160 1 Claim



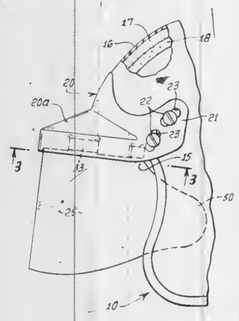
1. A glove having an elastic sleeve mounted on its upper side, at the junction of thumb and index finger, a penlight mounted in said sleeve, said light including a flexible mounting clip having an enlarged clamping tip, said sleeve having a panel in its wall to support said mounting clip, said panel including a raised abutment running transversely of the sleeve for retaining engagment with the enlarged end of the mounting clip.

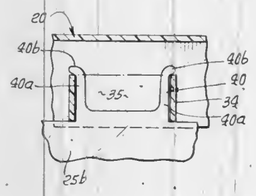
4,625,340
CARRIER POCKET
Robert D. Hernandez, Modesto, Calif., assignor to Komfort Karrier, Inc., Turlock, Calif.
Filed Mar. 10, 1986, Ser. No. 837,908
Int. Cl.[4] A41D *27/20*
U.S. Cl. 2—247 3 Claims



1. A carrier pocket for wear on the leg comprising a sleeve having a top margin and adapted to fit around the calf, a substantially quadrilateral sheet adapted to overlie a portion of said sleeve and having one upper edge part registering with said top margin and having another spaced edge part parallel to and located below said upper edge part to leave a gap therebetween, means for securing the edges of said sheet to said sleeve except along said spaced edge part, a flexible flap having top and bottom edges, means for securing said top edge of said flap to said upper edge part of said sleeve with said flap adapted to overlie said gap, a two-part Velcro fastener, means for securing one part of said Velcro fastener to said flap near the bottom edge of said flap, and means for securing the other part of said Velcro fastener to and along said spaced edge part of said sheet.

4,625,341
REMOVABLY ATTACHABLE SHIELD FOR HELMET VISOR
Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.
Filed Jul. 18, 1985, Ser. No. 755,931
Int. Cl.[4] A42B *1/08;* A61F *9/06*
U.S. Cl. 2—424 10 Claims

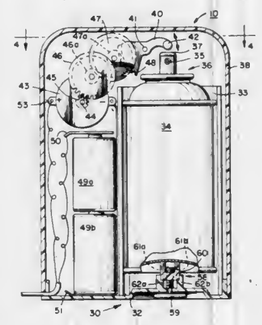




1. In combination with a helmet visor projecting generally forwardly,
(a) a transparent shield to be supported by the visor so as to extend downwardly from the visor in the helmet wearer's field of view,
(b) the visor and shield having thereon tongue and groove interconnection means that retain the shield to the visor along a curved path with said means extending along said path,
(c) the interconnection means on the shield located at an upper edge defined by the shield,
(d) said interconnection means defined by the shield projecting as a J-shaped deflectible tongue means at the upper edge of the shield, the visor having groove means along said curved path to freely accept said tongue means, the visor having a shoulder extending beneath the tongue means to block downward withdrawal of the tongue means from the groove means, the visor groove means located proximate a forward periphery of the visor and opening downwardly, the groove means located along said curved path which is C-shaped and forwardly convex, and the visor extending over and concealing said groove menas which opens upwardly.

4,625,342
DEVICE ACTUATED BY TOILET FLUSHING FOR DISPENSING DEODORANT
Robert B. Gangnath, Monroe, and Nicolae Tudor, Westport, both of Conn., assignors to Plus One, Inc., Norwalk, Conn.
Filed Jul. 30, 1984, Ser. No. 635,759
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—228 2 Claims

1. A device for dispensing a vapor into the air in response to the movement in a predetermined direction from a first position of an actuation element of a flush toilet, which actuation element moves in said predetermined direction when said toilet is flushed, comprising in combination with said actuation element:
support means for supporting a container that has a spring loaded valve which opens from a first position when moved in one direction against said spring loading to permit material in said container to disperse therefrom in vapor form,
a lever arm pivotally mounted for one end thereof to directly engage and move said spring loaded valve to its open, vapor dispensing position when said lever arm is pivoted in one direction,
electrically operable means operable when energized to pivot said lever arm in said one, valve opening, direction, and adapted when deenergized, immediately after being energized, to permit said lever arm to be pivoted in the opposite direction by said spring loading of said valve, which valve is thereby permitted to return to its said first position by said spring loading,
means for moving a said container on said support means selectively toward and away from the path of movement

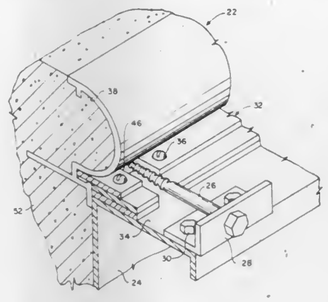


of the said lever arm end which engages said valve as means for adjusting the length of the path the valve travels while open, thereby to adjust the amount of vapor that is dispensed from said container, said means for moving a said container on said support means comprising a jack screw mechanism on said support means for engaging the end of said container that is opposite the end of said container that has said valve thereon,
a source of electric power for energizing said electrically operable means, and
switch means mounted and operable to be responsive to movement of said actuation element in said predetermined direction from its said first position for operably connecting said power source to energize said electrically operable means and thereby cause said valve to be opened when said actuation element moves in said predetermined direction from its said first position and then operable to disconnect said power source from said electrically operable means when said actuation element then moves in the opposite direction back to its said first position.

4,625,343
COPING ATTACHMENT SYSTEM
John C. Bumgarner, Sr., 414 S. Crain Hwy., Glen Burnie, Md. 21061
Filed Oct. 7, 1985, Ser. No. 785,254
Int. Cl.[4] E04B *1/16*
U.S. Cl. 4—506 8 Claims

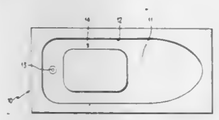
1. In a system for use in forming a poured-concrete swimming pool having: an integral, rounded metal coping located for being held in place by said poured concrete as a permanent part of said swimming pool and with a vinyl-liner-retaining longitudinal recess opening laterallly therein and an upright lip forming a constriction in said opening by projecting upward

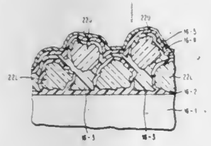
towards said coping, and having a temporary upright wall form with a substantially horizontal top for detachable securance to said coping, the improvement comprising: means for detachably securing said coping to the temporary wall form



including: a screw, means for rotatably mounting the screw to said top, and the screw having a tapering diameter thread engaging said constriction and drawing a portion of said coping against structure of the wall form when said screw is rotated.

4,625,344
PERMANENT SLIP-RESISTANT BATH MAT
Timothy J. Howard, P.O. Box 1337, Big Pine Key, Fla. 33043
Filed Jul. 18, 1985, Ser. No. 756,287
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—581 **5 Claims**



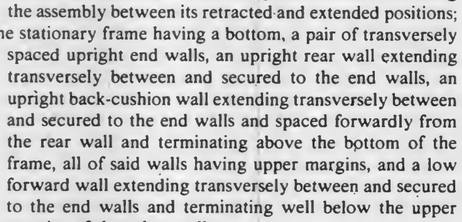


1. A durable bath mat adapted to be permanently secured to the floor of a bath tub or shower and providing a high degree of slip resistance under wet conditions, to a user standing on the mat, comprising:

a layered body having a continuous, unbroken upper surface, said body having a first vinyl layer of a thickness forming the bulk of said mat, at least one second layer on top of said first layer, said second layer comprising sand particles suspended in vinyl, said particles being relatively uniformly laterally spaced and completely surrounded by vinyl whereby said second layer has a relatively rough upper configuration, and at least one third vinyl layer covering said second layer and provided a substantially uniformly thick coating conforming to the configuration of said second layer, said third layer providing a slip resistant surface adapted to support a person standing thereon, said vinyl in all layers being clear, flexible and being blended together to form a solid mass, said first and third layers being free of said sand particles; and,

an adhesive layer covering the bottom of said body, said adhesive being clear, permanent and water resistant, and being adapted to adhesively secure said mat to said tub or shower.

4,625,345
AUTOMATED SOFA BED
Lorin A. Wood, 19422 Palo Verde Dr., Sun City, Ariz. 85372
Filed Mar. 26, 1985, Ser. No. 716,086
Int. Cl.[4] A47C *17/14*
U.S. Cl. 5—13 **23 Claims**



1. A convertible article of furniture comprising:

a stationary frame having a storage cavity therein, a bed frame configured and adapted for storage in folded condition within the cavity and for extension in unfolded condition into a body-supporting bed frame in substantially horizontal position, and actuating mechanism for moving the assembly between its retracted and extended positions;

the stationary frame having a bottom, a pair of transversely spaced upright end walls, an upright rear wall extending transversely between and secured to the end walls, an upright back-cushion wall extending transversely between and secured to the end walls and spaced forwardly from the rear wall and terminating above the bottom of the frame, all of said walls having upper margins, and a low forward wall extending transversely between and secured to the end walls and terminating well below the upper margins of the other walls;

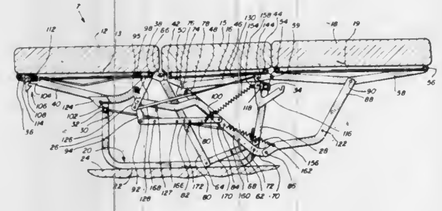
the bed frame assembly comprising a plurality of frame sections including at least a primary upper torso support section, a secondary lower torso support section, and a terminal leg support section, each section being generally rectangular in plan form and defined by two transversely spaced longitudinally extending frame members, having inner and outer ends, and pivotally connected to adjacent sections on transversely extending pivot axes;

the actuating mechanism comprising transversely spaced control and support linkages pivotally mounted at first ends to the stationary frame and pivotally connected at second ends to intermediate points on the frame members of the primary section, and transversely spaced floating power links having first and second ends and a midportion, each pivotally carried by a pair of control links pivotally connected at first ends to spaced locations on the stationary frame and pivotally connected at second ends to the first end and midportion of each floating power link to rotate and translate it in a vertical plane;

the second end of each floating power link being pivotally connected by a pivotal mount to the inner end of one of the frame members of the primary section, with the rotation and translation of the floating power link serving to translate the frame assembly out of and into the stationary frame about the control and support linkages;

and power means connected to the floating power links to drive them in their extension and retraction movements.

4,625,346
THREE PORTION SEAT-BED FOR RECREATIONAL VEHICLES
Howard M. Quackenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa
Filed Feb. 26, 1985, Ser. No. 705,542
Int. Cl.[4] A47C *17/17*
U.S. Cl. 5—37 R **24 Claims**



1. A convertible seat-bed assembly, comprising:

a base structure;

a seat support structure for supporting a seat cushion secured thereto and having a rearward edge portion;

an inner back support structure for supporting an inner back cushion secured thereto and having first and second edge portions;

an outer back support structure for supporting an outer back cushion secured thereto and having a forward edge portion;

connection means movably connecting the forward edge portion of the outer back support structure with the second edge portion of the inner back support structure;

linkage means for supporting the seat, inner back, and outer back support structures from the base structure for movement between a seat position and a bed position;

the seat support support structure, the inner back strucure, and the outer back support structure being adapted to occupy generally the same horizontal plane in the bed position, the rearward edge portion of the seat support structure being adjacent the first edge portion of the inner back support structure and the second edge portion of the inner back support structure being adjacent the forward edge portion of the outer back support structure,

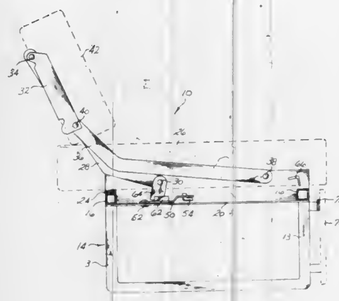
the seat support structure extending rearwardly in the seat position, the first edge portion of the inner back support structure being spaced above and to the rear of the rearward edge portion of the seat support structure, the inner back support structure extending generally upward from the first edge portion, the forward edge portion of the outer back support structure being spaced rearwardly from the second edge portion of the inner back support structure, and the outer back support structure extending downwardly therefrom,

the linkage means including

rear swing arm means having a main portion and an extension portion formed integral therewith, the main portion being pivotally supported on the base structure, and supporting the inner back support structure, and

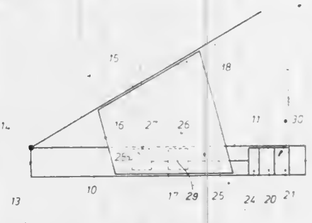
an outer back swing arm means being movably connected with the extension portion and with the outer back support structure for supporting the outer back support structure and articulating same between the seat and bed positions.

4,625,347
ROLLOVER BACK SOFA-BED
Terry J. McElmurry; H. Coleman Davis; William B. Leftwich, all of Elkhart, Ind., and David Markel, White Pigeon, Mich., assignors to Coachmen Industries, Inc., Middlebury, Ind.
Filed Aug. 21, 1984, Ser. No. 642,765
Int. Cl.[4] A47C *23/00*
U.S. Cl. 5—43 **4 Claims**



1. In a convertible sofa-bed having a base frame which includes a generally horizontal seat, a back rest, and a pair of arms, control link means connecting said back rest to said base frame for roll-over movement of said back rest between a sofa position wherein the back rest is generally upright and a bed position wherein the back rest is forward of said seat, the improvement wherein said arms are mounted for shiftable movement outwardly of said seat, means associated with said base frame and arms responsive to said roll-over movement of the back rest for accommodating said shiftable movement of the arms outwardly of said seat, said arms hingedly connected to said base frame, said means for accommodating said arm movement including pivot means connecting said arms to said base frame, and camming means associated with said link means for contacting said pivot means upon said roll-over movement of the back rest, said pivot means upon cam means contact for allowing outward hinged movement of said arms.

4,625,348
APPARATUS FOR ADJUSTING THE HEAD OR FOOT SECTION OF THE RESTING SURFACE OF A BED
Werner Renggli, Winterthur, and Daniel Kung, Kollbrunn, both of Switzerland, assignors to Urs Widmer, Switzerland
Filed Jan. 11, 1985, Ser. No. 690,691
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400804
Int. Cl.[4] A61G *7/06;* **A47C** *20/04*
U.S. Cl. 5—71 **12 Claims**



1. A self contained, portable, unitary apparatus for adjusting the head and foot sections of the resting surface of a bed by means of at least one bellows being expanded by compressed air and contracted by expelling the compressed air, characterized in that compressed air generator (**30**) is a unitary structure comprising an electric motor (**21**) and a pump (**20**) coupled to said motor; that an electric switch (**23**) has three switch posi-

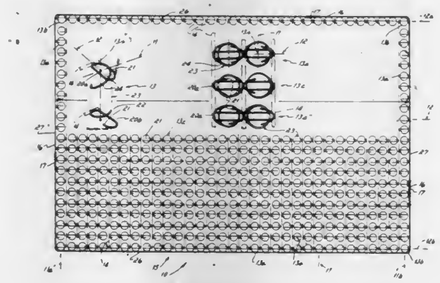
tions and operates in its first switch position to deactivate said electric motor (**21**) and to close a conduit (**29**) between said at least one bellows (**16**) and a compressed air outlet (**25**) of said pump (**20**), said electric switch (**23**) in its second switch position activates said electric motor (**21**) and opens said conduit (**29**) between said compressed air outlet (**25**) of said pump (**20**) and said at least one bellows (**16**), said electric switch (**23**) in its third switch position establishes communication between said at least one bellows (**16**) and a conduit to the atmosphere (**28**); that said compressed air generator (**30**) and the underside (**17**) of said at least one bellows (**16**) is secured to a base plate (**10**), said base plate (**10**) having side walls (**11, 12, 13, 19**) forming a box-shaped base, the height of said side walls being at least as large as the height of said compressed air generator (**30**); that the upper face (**18**) of said at least one bellows (**16**) is secured to an adjusting plate (**15**), said box-shaped base and said adjusting plate (**15**) being joined by hinges (**14**), said base (**10**) and said adjusting plate (**15**) combining in an initial position to enclose a space, the height of which is at least as large as the height of said compressed air generator (**30**); that said at least one bellows (**16**) as it expands, moves said adjusting plate (**15**) from a position substantially parallel to said base plate (**10**) as viewed with repect to a common edge of said base (**10**) and said adjusting plate (**15**), to a predetermined angular position within the range of 0° to 50° inclined from said common edge; and that said compressed air generator (**30**) is positioned in the area of a side wall (**12**) of said base which is opposite said hinges joining said box-shaped base and said adjusting plate (**15**).

4,625,349

BEDDING COIL SPRING UNIT AND ASSEMBLY METHOD

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 10, 1985, Ser. No. 721,575
Int. Cl.[4] A47C *23/02, 27/04*
U.S. Cl. 5—248 **10 Claims**



1. A bedding product comprising

a series of coil springs disposed in column and row matrix configuration, said rows being interconnected together one with the other in order to maintain said matrix configuration, and each of said coil springs having opposed end face loops connected by at least one intermediate loop,

a first section of said coil springs in which at least one of said coil springs within a given row is an individualized coil spring separate and apart from those coil springs adjacent thereto except as said rows are interconnected one with the other, said end face loops of each of said individualized coil springs including a free end not knotted to the coil spring wire from which said spring is formed so that, in effect, said end face loops of said individualized coil springs are defined by an open segmented loop configuration,

a second section of said coil springs in which at least two of said coil springs within a given row are directly connected one to the other, said two coil springs being formed from a single continuous length of spring wire that defines both said coil springs as well as a connector section that directly connects both said coil springs,

padding that overlies at least one end loop face of said coil spring matrix, and

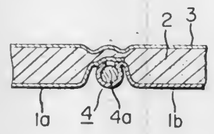
upholstery that overlies said padding to provide said finished bedding product.

4,625,350

SEAT CUSHION WITH WELT

Muneharu Urai, and Tadafumi Abe, both of Tokyo, Japan, assignors to Tachikawa Spring Co. Ltd., Japan

Division of Ser. No. 651,266, Sep. 17, 1984, which is a continuation of Ser. No. 327,239, Dec. 3, 1981, abandoned. This application Nov. 29, 1984, Ser. No. 676,488
Claims priority, application Japan, Feb. 10, 1981, 56-17402[U]; Mar. 5, 1981, 56-29600; Apr. 7, 1981, 56-51113
Int. Cl.[4] A47C *31/00*
U.S. Cl. 5—448 **2 Claims**



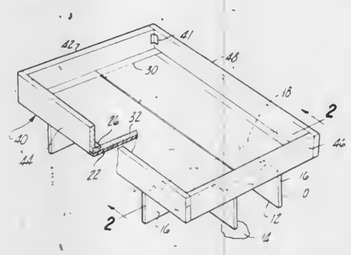
1. A welt formed on and welded to a surface layer of a seat cushion by heating means, said welt comprising a core of required length and an elongate covering of a circumferential length substantially the same as the circumference of said core, said covering being rounded to enclose said core and being welded to said seat-cushion surface layer, said seat-cushion surface layer including one surface layer and another surface layer, and an end portion of said one surface layer overlaps an associated end portion of said another surface layer, and said welt is formed on and welded to said end portion of said another surface layer, and wherein an end portion of said one surface layer defines said covering that encloses said core and is welded to the end portion of the other surface layer.

4,625,351

WATERBED FRAME

Jon R. Campian, 3572 Port Cove Dr., Pontiac, Mich. 48054

Filed Aug. 30, 1985, Ser. No. 771,418
Int. Cl.[4] E04D *15/00*
U.S. Cl. 5—450 **4 Claims**



1. A frame for a waterbed balloon having a standard predetermined thickness when inflated, said frame comprising:

a stand having a lower surface adapted to rest on a ground support,

a generally rectangular and planar support member positioned on top of said stand so that an upper surface of said support member is substantially horizontal,

a substantially planar adapter positioned on and in abutment with said upper surface of said support member, said adapter having an outer periphery which is substantially rectangular and flush with an outer periphery of said support member, said adapter having a substantially rectangular inner periphery spaced inwardly from its outer periphery, and said adapter having a height of a predetermined amount,

a sheet of insulation contained within and extending entirely across the inner periphery of said adapter, said sheet having a thickness equal to said predetermined amount so that an upper surface of said sheet is substantialy on a same plane with an upper surface of said adapter, and

a rail assembly secured to said upper surface of said adapter and extending around the entire periphery of said adapter, said rail assembly extending upwardly from said adapter by a height substantially equal to said standard predetermined thickness and having a substantially rectangular inner periphery,

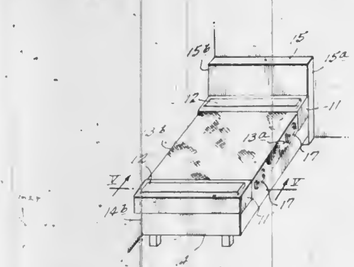
wherein, with said waterbed balloon positioned in said frame, a bottom surface of said balloon is supported by said upper surface of said sheet and said upper surface of said adapter, and said surfaces of said balloon are in abutment with said inner periphery of said rail assembly so that said rail assembly surrounds and contains said waterbed balloon.

4,625,352

IMPLEMENT FOR FASTENING SHEET TO MAT

Mikizo Kobayashi, 19, Nanpeidai 8-chome, Shibuya-ku, Tokyo 150, Japan

PCT No. PCT/JP83/00452, § 371 Date Aug. 24, 1984, § 102(e) Date Aug. 24, 1984
PCT Filed Dec. 24, 1983, Ser. No. 645,323
Claims priority, application Japan, Dec. 24, 1982, 57-201644[U]
Int. Cl.[4] A47C *21/02,* **A47D** *7/06*
U.S. Cl. 5—498 **1 Claim**



1. In combination:

a bed base having a top surface, head and foot surfaces and side surfaces;

a head plate fixed on said head surface and having a side surface which projects sideward beyond one of said bed base side surfaces;

a mattress slidably positioned on said top surface, said mattress having a top surface, head and foot surfaces and side surfaces and being less in length and greater in width than said bed base so that one of said plate side surfaces may project sideward beyond the corresponding side surface of said bed base, said mattress being provided with a pull-belt on the side surface thereof opposite to said plate one side surface;

two sheet fastening implements on said base top surface, one at each end portion of said mattress, each of said sheet fastening implements comprising a box-like hollow body having top and bottom walls, two side walls and an end wall, said body being open at the other end for receiving the corresponding end portion of said mattress therein; and

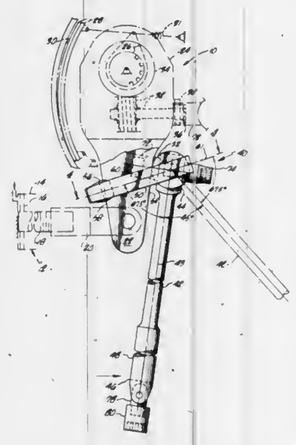
a strip-shaped sheet clamping member on said body top wall and extending over the entire length thereof, said sheet clamping member having a portion fixed on said body top wall and a free portion resiliently urged into close contact with said body top wall, whereby a sheet can be clamped between said clamping member and said body top wall.

4,625,353

BRAKE ADJUSTMENT TOOL

Carlos Tamez, and Miguel P. Castaneda, both of 3797 Mayland, Baldwin Park, Calif. 91706

Filed Jul. 15, 1985, Ser. No. 755,602
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—100 **12 Claims**



1. A tool for adjusting a brake mechanism the brake mechanism comprising a crank device for turning a brake operating shaft between a released position and an actuated position in response to movement of a piston under external power, the crank device having an arm and an adjustment screw for changing the phase of the shaft with respect to the piston, the tool comprising:

a. a lever having a first end and a second end;

b. a spanner attached to the first end of the lever, the spanner comprising a bar having first and second bearing members extending laterally from opposite ends thereof for engaging opposite sides of the arm for turning the shaft by means of the lever without applying the external power; and

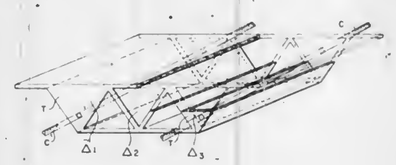
c. a head engagement member for turning the screw, the engagement member being fastened to the lever.

4,625,354

BRIDGE WITH PREFABRICATED SECTIONS AND WITH EXTERNAL PRESTRESSING BY CABLES

Pierre Richard, Neuilly S. Seine, France, assignor to Bouygues, France

Filed May 14, 1984, Ser. No. 609,734
Claims priority, application France, May 16, 1983, 83 08058
Int. Cl.[4] E01D *7/00*
U.S. Cl. 14—73 **10 Claims**



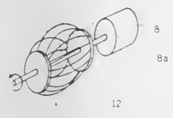
1. A section for a bridge comprising:

vertically spaced parallel upper and lower decks and longitudinally extending inclined webs which form longitudinally open isosceles dihedrons and constitute integral bracings between said decks, said dihedrons having their apex edge facing downwardly, at least one of said dihedrons being closed by a transverse panel provided with a longitudinal passage for a longitudinal prestressing cable.

4,625,355
COPPER BIT CLEANER

Kyoichi Miyashita, Osaka, Japan, assignor to Earthnics Corporation, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,827
Claims priority, application Japan, Dec. 21, 1983, 58-242539; Nov. 10, 1984, 59-236938
Int. Cl.⁴ B08B *1/04*
U.S. Cl. 15—93 R **5 Claims**



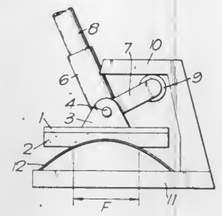
1. A copper bit cleaner comprising: a casing formed with a bit aperture for allowing the copper bit of a soldering tool to be inserted therethrough; a plurality of flexible solder residue scraping members each formed so as to intermittently contact a portion of a circumference of said copper bit when said scrapings members are rotated; solder residue scraping member holding means cased in said casing and holding said solder residue scraping members, said solder residue scraping member holding means including at least one drum, said drum further including a pair of disks fixed on a shaft of said drum and said plurality of solder residue scraping members each comprise an elongated member tensed at a predetermined spacing from one another between the circumferential edges of said disks, said elongated members being selected from the groups consisting of string, metal wires or chains; and drive means for rotationally driving said solder residue scraping member holding means at a high speed so that solder residue scraping members may slide on a circumference of the copper bit, which is inserted through said aperture, at a high speed to scrape off the solder residue thereby to split the scraped solder residue off from said solder residue scraping members by the centrifugal forces thereof.

4,625,356
MOP AND SQUEEZE COMBINATION

Hermann Meili, Münchwilen, Switzerland, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 601,199, Apr. 17, 1984, abandoned.
This application Jun. 10, 1985, Ser. No. 742,369
Claims priority, application United Kingdom, Apr. 18, 1983, 8310475
Int. Cl.⁴ A47L *13/14*
U.S. Cl. 15—119 A **9 Claims**

1. A mop comprising a backing plate, an absorbent body attached thereto, a handle pivotally connected to the backing plate by way of two perpendicularly acting hinge members, and one or more lever arms rigidly attached to the lower end of the handle, the combination of the handle and the arms forming a lever, the arms being co-operable with an auxiliary abutment located in suitable relation with a squeezing surface so that pivoting movement of the handle causes a downward

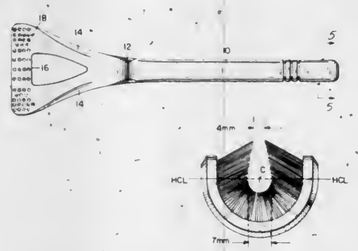


pressure onto the backing plate for squeezing the absorbent body against the squeezing surface.

4,625,357
TOOTHBRUSH

John D. DeMartino, 348 Green Hill Rd., Longmeadow, Mass. 01104

Filed Aug. 30, 1985, Ser. No. 771,353
Int. Cl.⁴ A46B *9/04*
U.S. Cl. 15—167 A **1 Claim**



1. In a toothbrush of a configuration for allowing a user easily to reach his buccal and lingual surfaces and the confined areas where the gingival crest meets the adjacent teeth, the combination of:

an elongated handle having a bifurcated forward end,

the bifurcation defining a pair of arms diverging from each other and with each arm bending downwardly in a slow curve at an obtuse angle to the general handle plane,

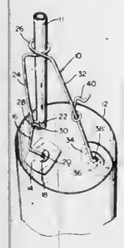
the spaced free outer ends of the arms being interconnected by a transversely extending arched head defining opposite lower side walls and an upper middle wall therebetween, the top of the head lying in a plane extended substantially along the top surface of the handle and the bottom of the head lying in a plane substantially below the bottom surface of the handle,

a gridlike arrangement of tufts of bristles projecting inwardly from the inner wall of the head with the tufts projecting from the opposite side walls at an angle approximately 30° to the horizontal center line of the head and with the tufts projecting from the middle wall toward the center point of the head, the tufts being arranged in spaced rows extending in the direction of the handle from one side of the head to the opposite side, the tufts of each row being evenly spaced as to each other, the spaces between the rows of tufts being greater at the middle portion of the head than at the spaced free outer ends of the arms, each row being comprised of 3 or 4 spaced tufts save for the second row from the spaced free outer ends of the arms on each side where 5 such spaced tufts are provided, the tufts of the fourth row from the spaced free outer ends of the arms being spaced and staggered as to tufts of adjacent rows, the fifth tuft in the second row on each side of the head being disposed rearwardly of the plane of the innermost row of tufts, with the outer ends of the tufts defining an open space of teardrop configuration.

4,625,358
CHIMNEY CLEANING TOOL

Frederick G. Barrett, 611 SW. Cheltenham, Portland, Oreg. 97201

Filed Aug. 5, 1985, Ser. No. 762,256
Int. Cl.⁴ F23J *3/02*
U.S. Cl. 15—242 **18 Claims**



1. A chimney tool for removing soot and creosote buildup from substantially round chimneys, stovepipes and the like, comprising:

(a) a pole for manipulation by a person;

(b) a resilient rod mounted on the pole and being bent to a configuration including:

(1) a lower shank mounted on the end of the pole and extending therefrom;

(2) an upper shank extending along the pole from the lower shank and also being mounted on the pole at the other end thereof;

(3) a spring arm extending from the upper shank and angling outwardly from the pole;

(4) a loop between the lower shank and the upper shank, and wherein the rod is attached to the pole by a bolt passing through the loop and through a hole in the pole; and

(5) a loop formed between the upper shank and the spring arm, the loop being about an axis substantially parallel to that of the pole, and mounting the rod by encircling the pole;

(c) a scraper blade mounted rotatably on the end of the lower shank and having a plurality of similar interchangable working surfaces to engage the inside of the chimney; and

(d) a roller wheel mounted rotatably on the end of the spring arm and being engagable with the side of the chimney opposite the scraper blade.

4,625,359
WINDSHIELD WIPER UNIT

Bruno Egner-Walter, Heilbronn; Eckhardt Schmid, Brackenheim; Wolfgang Scholl, Gemmrigheim; Anton Epple, Rottenburg; Hans Trube, Herrenberg; Martin Pfeiffer, Stuttgart; Josef Berger, Wolfschlugen, and Egon Frey, Sindelfingen, all of Fed. Rep. of Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Bietigheim-Bissingen and Daimler-Benz Aktiengesellschaft, Stuttgart, both of, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,809
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324634
Int. Cl.⁴ B60S *1/26*
U.S. Cl. 15—250.21 **34 Claims**

1. A windshield wiper unit with a wiper arm of telescopic construction comprising:

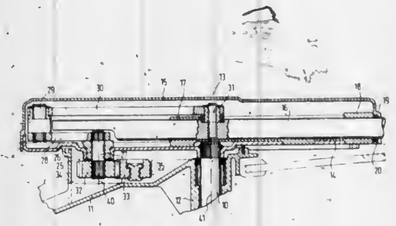
a housing adapted to be driven by a driving motor to and fro about an axis of rotation;

a slide having rear and front ends movable in a telescopic fashion through a stroke distance in relation to said housing;

front and rear bearings disposed in said housing for supporting said slide;

said slide having a length at least as long as the distance between said front and rear bearings plus the stroke distance of said slide;

a connecting rod coupled to said slide;



a crank coupled to said connecting rod, said crank having a fixed axis of rotation, said crank and said connecting rod being movable to displace said slide in said telescopic fashion;

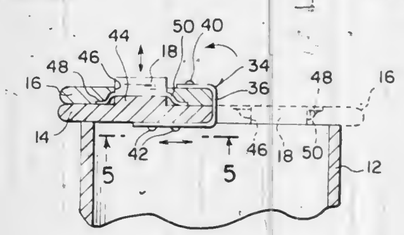
said connecting rod being positioned above or below said slide and coupled to said slide betweeen said front and rear bearings at a point spaced from the rear end of said slide; and

wherein said distance between said front and rear bearings is at least as great as said stroke distance.

4,625,360
SHOE SHINE BOX

Burdette Garrard, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Jul. 30, 1984, Ser. No. 636,122
Int. Cl.⁴ A47L *23/28*
U.S. Cl. 15—265 **2 Claims**



1. A shoe shine box which comprises a housing with a top opening having a hinged top for covering said opening to store shoeshining paraphernalia, said top comprising:

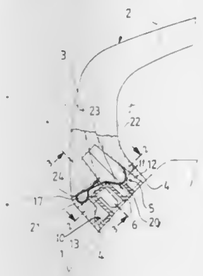
(a) a fixed plate affixed lengthwise to cover a portion of said opening;

(b) a pivotable cover for the remainder of said opening having a hinge affixed lengthwise at one side to an adjoining side of said plate moveable to open and closed positions; and

(c) a shoe rest provided on said top in both the open and closed positions wherein the cover is pivotal 180° to be superimposed on the plate, further comprising:

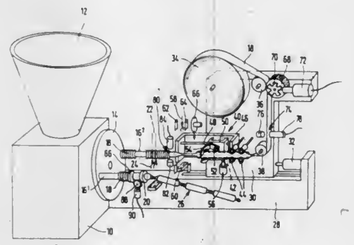
(a) said plate having a raised portion on its top surface comprising said shoe rest;
(b) said cover having an aperture therethrough adapted to receive said portion when pivoted 180° to the open position wherein said cover includes a shoe support mounted moveably in said aperture with flexible means whereby said aperture receives said shoe rest to engage said support whereby said shoe support is mounted above said cover when the cover is in said open position.

4,625,361
SPRING CLIP FASTENING STRUCTURE FOR SECURING HANDLE TO UTENSIL
Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile, Neunkirchen, Fed. Rep. of Germany
Filed Mar. 1, 1985, Ser. No. 707,317
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407503
Int. Cl.⁴ B25G *3/24*
U.S. Cl. 16—114 A **5 Claims**



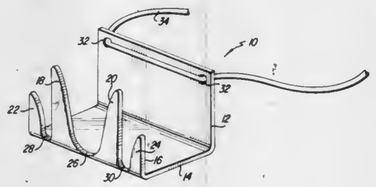
1. In a handle fastening structure for use on a utensil, said structure comprising:
(a) a support bracket fixedly secured to and projecting from a wall of said utensil, said support bracket having at least one leg fastened to said utensil and a crosswise extending portion;
(b) a handle member having a recess therein which opens toward and along an axis perpendicular to said wall of said utensil, said recess receiving therein said support bracket;
(c) an attachment means on said support bracket which extends at an angle with respect to said wall of said utensil,
(d) at least one shoulder in said recess of said handle member extending lengthwise in said recess and which, in the mounted condition of the handle, grips behind said attachment means on said support bracket;
(e) a spring forming an abutment and is arranged in said recess of said handle member, said spring cooperating with a contact surface on said support bracket and during assembly of said handle member onto said support bracket is tensioned to secure said handle and said utensil to one another,
the improvement comprising wherein said spring is an elongate leaf spring having a longitudinal axis extending substantially parallel with respect to said wall of said utensil and perpendicular to said axis of said recess in said handle member, wherein one end of said elongate leaf spring is fixedly held in said handle member and the other end of said spring is arranged freely flexibly movable in said recess, said crosswise extending portion on the support bracket having a length less than the length of said recess, said support bracket being initially received in said recess and oriented to one side of said recess, wherein said freely flexibly movable end of said spring is initially oriented in engagement with said crosswise extending portion and being flexed in a direction perpendicular to said longitudinal axis of said spring, wherein said recess in said handle member includes means for permitting said handle member to be movable in a first direction parallel with respect to said wall of said utensil a finite distance and wherein during said movement in said first direction, said freely flexibly movable end of said spring is permitted to move in a locking direction perpendicular to said longitudinal axis thereof and out of engagement with said crosswise extending portion to grip behind the contact surface at one end of said crosswise extending portion to prevent a movement of said handle member in a second direction parallel to said wall of said utensil and opposite said first direction and in this manner effect a securement of said handle and said utensil to one another.

4,625,362
METHOD AND A DEVICE FOR AUTOMATED MANUFACTURE OF STRINGS OF SAUSAGES
Günter Kollross, and Fritz K. Steinbis, both of Gross Gerau-Dornheim, Fed. Rep. of Germany, assignors to Teepak, Inc., Oak Brook, Ill.
PCT No. PCT/DE83/00098, § 371 Date Feb. 2, 1984, § 102(e) Date Feb. 2, 1984, PCT Pub. No. WO83/04162, PCT Pub. Date Dec. 8, 1983
PCT Filed Jun. 3, 1983, Ser. No. 584,252
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 3220640; Jun. 25, 1982, 32725
Int. Cl.⁴ A22C *11/02*
U.S. Cl. 17—33 **41 Claims**



1. In a method for the continuous automated manufacture of sausage wherein tubular material for sausage casings from a supply source, is axially shirred into sections and said sections are stuffed with force meat into divided off portions, the improvement comprising continually measuring the length of tubular material comprising each shirred section before stuffing, continually measuring the length of tubular material from each shirred section utilized during stuffing, continually comparing the length of tubular material utilized during stuffing with the length of shirred material measured before stuffing and dividing off said portions in response to that comparison.

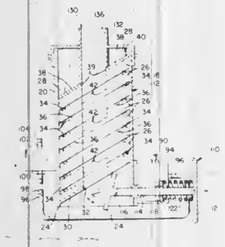
4,625,363
SQUIRREL SKINNING APPARATUS
Talmadge G. Watson, 302 Blake Dr., Vicksburg, Miss. 39180
Filed Dec. 27, 1985, Ser. No. 814,058
Int. Cl.⁴ A22B *1/00, 5/00*
U.S. Cl. 17—44.2 **7 Claims**



1. A squirrel skinning holder fabricated from a single sheet of material comprising:

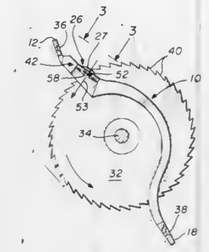
a back portion having means for fixing the holder to an upright;
a central portion laterally extending from said back portion;
a squirrel support portion extending vertically from said central portion in a plane substantially parallel to the back portion, said squirrel support portion having formed thereon a pair of upwardly extending inner tines and a pair of upwardly extending outer tines, said inner tines forming a central V-shaped slot therebetween, one of said inner tines and one of said outer tines forming a first outer slot therebetween and the other of said inner tines and the other of said outer tines forming a second outer slot, said first and second outer slots being disposed on respective opposite sides of said central slot, each of said outer slots being flared to provide a wedge shape and dimensioned so as to receive a respective hind leg of a squirrel just beneath the foot joint and said central slot being dimensioned so as to receive the body of a squirrel in the area of the chest just below the forelegs.

4,625,364
BAIT CUTTING DEVICE
Dean J. Adams, 3200 W. Commodore Way, #201, Seattle, Wash. 98199
Filed Dec. 23, 1985, Ser. No. 812,939
Int. Cl.⁴ A22C *25/08*
U.S. Cl. 17—55 **14 Claims**



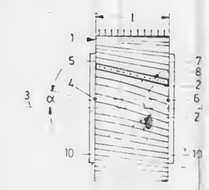
1. Bait cutting device comprising:
(a) Housing means
(b) a cutting head means within said housing including a series of spaced-apart, generally flat, rectangular and planar blade means having an actuator attachment end and a cutting edge end opposite said attachment end, individual blade means at their cutting edge end being disposed between adjacent spacer blocks, said spacer blocks being arranged in an aligned stack and separated to receive individual blade means therebetween and including openings therein such that a tunnel is defined extending through said stack of spacer blocks, said blade means and said spacer blocks being positioned at a predetermined angle to said tunnel, said blade means including a first retracted piston such that said blades as a unit are withdrawn out of said tunnel and a second operative position whereby out of said tunnel and second operative position whereby said blade means as a unit are moved through and across said tunnel to cut whole bait therein into a plurality of angled slices, and
(c) Actuator means to which the attachment end of said blades is detachable secured and whereby said plurality of blade means are moved between said first and second positions as a unitary, multi-bladed cutting head.

4,625,365
GINNING POINT ASSEMBLY
James E. Nayfa, 10310 Woodford, Dallas, Tex. 75229
Continuation-in-part of Ser. No. 586,544, Mar. 5, 1984, abandoned. This application Jan. 22, 1985, Ser. No. 693,389
Int. Cl.⁴ D01B *1/08*
U.S. Cl. 19—55 R **19 Claims**



1. A ginning point assembly for use in conjunction with a cotton gin rib for ginning cotton having seeds and associated debris comprising:
a. a rectangular mounting plate for removable attachment to said rib at the ginning point,
b. first and second opposed recesses formed in said plate,
c. rotating means mounted in each of said recesses for rotation at said ginning point in a direction transverse to the longitudinal axis of said rib to which said plate is attached, and
d. a shield attached to said mounting plate above said rotating means to prevent said debris or cotton from interfering with the rotation of said rotating means.

4,625,366
OPENING CYLINDER FOR OPEN-END SPINNING MACHINES OR THE LIKE
Josef Egerer, Schwabach, Fed. Rep. of Germany, assignor to Staedtler & Uhl., Schwabach, Fed. Rep. of Germany
Filed Oct. 16, 1985, Ser. No. 787,996
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438133
Int. Cl.⁴ D01B *19/00*
U.S. Cl. 19—97 **4 Claims**



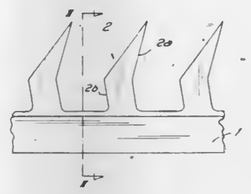
1. Opening cylider for open-end spinning machines or the like, comprising:
a cylindrical basic body;
undercut grooves disposed in the outer surface of said cylindrical body, said grooves running helically at an acute angle (α) to the longitudinal axis of said cylindrical body; and
needlebars having plastic roots with an intrinsic elasticity, said needlebars being inserted and retained in said grooves;
whereby the needlebars are held parallel to the longitudinal axis of said cylindrical body due to the helical twisting of their roots.

4,625,367

RIGID CLOTHING FOR CARD FLATS

Roger Sole-Leris, Provenza, 276, 08008 Barcelona, Spain

Filed Oct. 10, 1985, Ser. No. 786,304
Claims priority, application Spain, Oct. 11, 1984, 288.973[U]
Int. Cl.[4] D01G *15/84*
U.S. Cl. 10—113 6 Claims



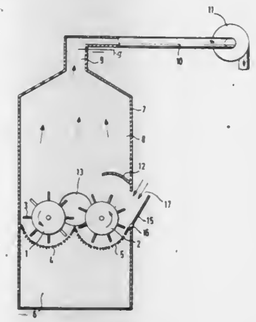
1. Rigid clothing for card flats comprising a plurality of juxtaposed metal strips positioned on a flat, each of said metal strips having a base which extends in a longitudinal direction and which is secured to the flat and each of said metal strips having a row of spikes separated by gullets, each of said spikes comprising a front leading edge and a rear trailing edge, said front leading edge having an active upper part terminating in a pointed tip for orientating and combing fibers and said rear trailing edge having an active lower part terminating at said base for retaining short fibers and impurities in a lower portion of a gullet between said active part of said rear trailing edge and a lower part of a front leading edge of a following spike.

4,625,368

METHOD AND APPARATUS FOR OPENING AND CLEANING FIBER MATERIAL

Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,933
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333750
Int. Cl.[4] D01G *9/04*
U.S. Cl. 19—200 10 Claims



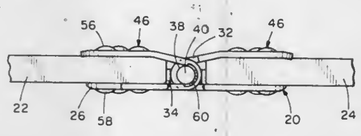
1. In an apparatus for opening and cleaning fiber material, including a casing, a beater cylinder having a longitudinal axis and being supported in said casing in a horizontal orientation; a grid situated underneath said cylinder; means defining a fiber inlet opening and a fiber outlet opening oriented for guiding a fiber carrying air stream parallel to said axis into, through and out of the apparatus; and a deflector plate situated within the casing above said cylinder; the improvement wherein said casing defines a free space above said cylinder, said free space having a height dimension being approximately at least twice the diameter of said cylinder and further comprising means defining an air outlet opening in an upper part of said casing above said cylinder and suction means in communication with said air outlet opening for withdrawing one part of the air from the fiber carrying air stream through said air outlet opening.

4,625,369

BELT FASTENER WITH ENLARGED LOOP FOR HINGE PIN

Edward C. Musil, Lyons, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed Jun. 1, 1984, Ser. No. 616,287
Int. Cl.[4] F16G *3/04*
U.S. Cl. 24—33 B 3 Claims



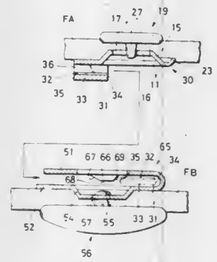
1. A belt fastener of one piece of metal having substantially uniform thickness, said fastener comprising:
a generally flat upper plate of substantially uniform and predetermined thickness,
a generally flat lower plate of substantially the same thickness as the upper plate,
strap means integrally joining said plates and forming a loop to receive a hinge pin therein,
an abutment finger integrally joined to and extending from one of said plates for limiting insertion of a belt segment moved between said plates, said finger being offset with respect to said strap means and having a thickness reduced to substantially less than that of said upper plate,
ends on said upper and lower plates spaced from said loop,
said abutment finger having a first side located at a predetermined first distance from said loop and having a second side located at a second predetermined reach back distance from said ends of the upper and lower plates,
said reduction in size of said abutment finger increasing substantially the area of the loop and of the hinge pin to be received therein.

4,625,370

HOOK-AND-EYE ASSEMBLY

Takeo Fukuroi; Kihei Takahashi, and Keichi Inazawa, all of Uozu, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 17, 1985, Ser. No. 809,723
Claims priority, application Japan, Dec. 17, 1984, 59-191114[U]; Jan. 22, 1985, 60-7097[U]
Int. Cl.[4] A44B *13/00, 1/42*
U.S. Cl. 24—599 10 Claims



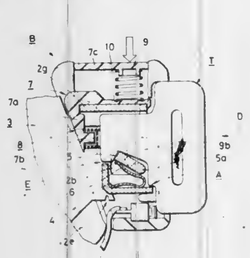
1. A hook-and-eye assembly comprising:
(a) an eye composed a base plate having a pair of arms projecting laterally from one surface of the base plate and defining an opening therewith, said arms having confronting ends, said base plate having a first embossed portion projecting away from said arms and having a center spaced from edges of said arms, said first embossed portion having a pair of first holes divided by a first bridge;
(b) a first fastener having a pair of first prongs inserted through said first holes, respectively, and bent around said first bridge with said first embossed portion directed toward said first fastener for positioning a first fabric (FA) therebetween;
(c) a hook composed of a face plate for insertion into said opening and a back plate spaced therefrom, said back plate having a second embossed portion projecting away from said face plate and having a pair of second holes divided by a second bridge; and
(d) a second fastener having a pair of second prongs inserted through said second holes, respectively, and bent around said second bridge with said second embossed portion directed toward said second fastener for positioning a second fabric (FB) therebetween.

4,625,371

SEAT BELT BUCKLE

Takeo Ueda, Kanagawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Sep. 27, 1985, Ser. No. 783,349
Claims priority, application Japan, Nov. 22, 1984, 59-176651[U]
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—641 9 Claims



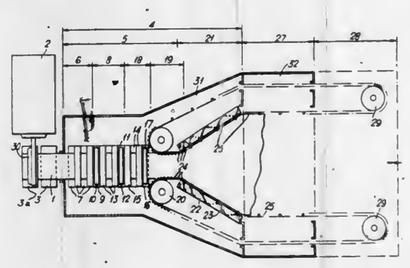
1. A buckle for releasably receiving a tongue which defines an engagement recess, comprising:
a latch member engageable with the engagement recess;
a base formed in a substantially U-like configuration so as to define an opening in the direction of insertion of the tongue and defining through both side walls thereof support slots for turnably supporting the latch member, said base being adapted to receive the tongue therein;
a bridge secured on the base and extending in the opening of the base, said bridge having engagement portions which when the tongue is in a state kept in engagement with the latch member, are kept in engagement with both first and second portions of the tongue so as to hold the tongue in a received position, said first portion extending from the engagement recess of the tongue toward the leading edge of the tongue and said second portion extending in the opposition direction from the engagement recess;
a biasing member for biasing the latch member so that the latch member assumes a latch position where the latch member is engageable with the engagement recess of the tongue;
release means for turning the latch member against the biasing force of the biasing member so as to release the latch member from the latch position;
wherein both side walls of the base define a pair of inwardly-widening recesses in adjacent to the opening and the bridge has been secured to the base by inserting the bridge in the inwardly-widening recesses and then clinching the side walls at locations adjacent to the mouths of the recesses.

4,625,372

APPARATUS FOR THE MANUFACTURE OF BIAXIALLY STRETCHED FLAT FILM

Walter Hufnagel, Forchheim; Volker Graap, deceased, late of Burk (by Erika Graap geborene Lang, executrix); Freidrich von und zu Aufsess, Forchheim/Reuth, and Rötger Armsen, Buckenhofen, all of Fed. Rep. of Germany, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 166,514, Jul. 7, 1980, abandoned, which is a division of Ser. No. 964,002, Nov. 27, 1978, Pat. No. 4,261,944, which is a continuation-in-part of Ser. No. 887,582, Mar. 17, 1978, abandoned, which is a continuation of Ser. No. 699,684, Jun. 25, 1976, abandoned. This application Mar. 22, 1985, Ser. No. 714,792
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528370
Int. Cl.[4] B29C *55/00*
U.S. Cl. 26—73 2 Claims



1. Apparatus for biaxially stretching a flat film of thermoplastic material, comprising:
(a) roller means for continually advancing and thereafter taking up said flat film in a longitudinal direction;
(b) means for adjusting and maintaining said flat film at the temperature at which it is to be stretched;
(c) roller means having infinitely variable speeds for partially pre-stretching said flat film only in said longitudinal direction while advancing it, the speed of said pre-stretching roller means being such that the flat film can be pre-stretched in the longitudinal direction to 20–50% of the total stretching capacity of the flat film in the longitudinal direction, said advancing and pre-stretching roller means including means for alternatively heating and cooling the cylindrical surfaces of said roller means wherein all of said roller means can be heated to the temperature at which said flat film is being subsequently stretched;
(d) roller means for guiding the flat film from the pre-stretching roller means;
(e) equalizing roller means, mounted behind the film guiding roller means, for maintaining tension on the flat film while said flat film is running, said equalizing roller means being capable of moving out of their normal position if necessary to maintain said tension;
(f) means, positioned to receive the longitudinally pre-stretched flat film from the equalizing roller means, for further stretching said flat film simultaneously biaxially both in the longitudinal direction and in a direction transverse to said longitudinal direction, while further advancing said flat film in said longitudinal direction;
(g) means for gripping said flat film at its edges;
(h) carrier means for moving said gripping means longitudinally while the flat film is being simultaneously biaxially stretched;
(i) divergently positioned rotatable spindle means having spiral grooves therein of increasing pitch corresponding to the longitudinal film-stretching desired in the simultaneous biaxial stretching of said flat film, said gripping means being operatively associated with said spindle

grooves so that, as said spindle means rotate, the gripping means are moved along by said spiral grooves, said gripping means being operable in diverging relation and with increasing speed so as to stretch successive regions of said flat film simultaneously in said longitudinal and said transverse direction, such that, at any given point in any region, said flat film is being biaxially stretched both in said longitudinal and transverse directions;

j a housing means for surrounding said pre-stretching roller means and said stretching means, said housing means having space inside heated to about the temperature at which said flat film is being stretched; and

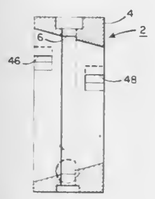
(k) means, arranged beyond the housing means, for cooling the flat film after it has been biaxially stretched.

4,625,373

METHOD OF MAKING A PRINTING HEAD FOR AN INK JET PRINTER

Peter Duffield, Wayland; David Hudson, Chelmsford, both of Mass., and Steven I. Zoltan, Brookfield, Conn., assignors to Advanced Color Technology, Inc., Chelmsford, Mass.

Filed Aug. 2, 1985, Ser. No. 761,857
Int. Cl.⁴ H01L *41/22*
U.S. Cl. 29—25.35 **27 Claims**



1. The method of fabricating an ink jet head comprising the steps of

forming a housing having a circular transverse opening with an annular groove in the internal surface thereof,

said internal surface being tapered to form a first conical surface,

providing a mandrel formed of a first metal having an exterior conical surface complimentary with said first conical surface and capable of being dissolved by chemical reaction with a predetermined compound,

coating said exterior surface of said mandrel with a film of a second metal resistant to chemical reaction with said compound,

coating each of said conical surfaces with a film of a third metal capable of being cold welded,

pressing said mandrel into said housing and forcing said conical surfaces into intimate contact thereby sealing said groove to form an annular ink chamber and welding said mandrel and said housing into an integral structure,

treating said mandrel with said compound thereby to dissolve said mandrel and cause the film of said second metal to remain in engagement with said first conical surface and provide a permanent seal and diaphragm wall for said chamber, and

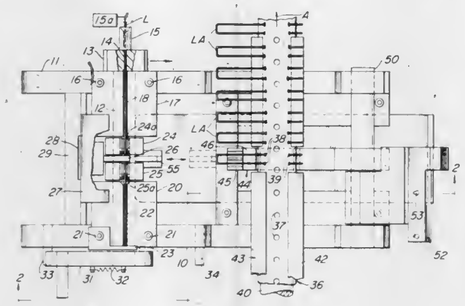
positioning a transducer to mechanically engage the inner wall of said chamber whereby when said transducer is energized by a voltage pulse, the ink in said chamber is subjected to a corresponding pressure pulse.

4,625,374

CAPACITOR LEAD WIRE MANUFACTURE

Ruslon J. Smith, Moscow, Pa., assignor to Equipment Technology Incorporated, Peckville, Pa.

Filed Nov. 9, 1984, Ser. No. 670,558
Int. Cl.⁴ H01G *4/00*
U.S. Cl. 29—25.42 **10 Claims**



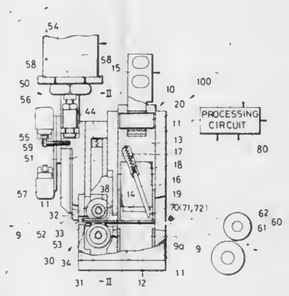
1. In a machine for the manufacture of electrical components having a body and substantially parallel lead wires extending therefrom, said machine comprising an elongated movable carrier strip for the components, said carrier strip having a plurality of sets of openings disposed in transversely-spaced pairs extending through the strip in aligned relationship with one another, carrier strip support means for guiding and flexing the carrier strip transversely into a position in which the openings of each pair are in straight-line paths, movable means for passing straight sections of lead wire stock along said straight-line paths and through each of said openings to a position in which each straight section is mounted on the strip with its ends extended through the openings.

4,625,375

APPARATUS FOR AUTOMATICALLY PROCESSING A SLIDE FASTENER CHAIN

Tatsuo Osaki, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,269
Claims priority, application Japan, Jan. 25, 1983, 58-10329
Int. Cl.⁴ A41H *37/06;* B21D *53/50;* B21F *45/18;* B29D *5/00*
U.S. Cl. 29—33.2 **1 Claim**



1. An apparatus for automatically processing a slide fastener chain to which a sucession of fly strips is attached, comprising:

(a) an intermittently operative feed unit for feeding the fastener chain longitudinally along a path;

(b) a first cutting unit, disposed on the path upstream of said feed unit, for forming an element-free portion in the fastener chain while said feed unit is inoperative;

(c) a second cutting unit, disposed on the path downstream of said feed unit, for severing the fastener chain transversely across the element-free portion while said feed unit is inoperative;

(d) a measuring unit, independent of said drive unit and disposed on the path upstream of said first cutting unit, for producing a number of electrical signals, depending on the amount of the fastener chain having been fed through said measuring unit, said measuring unit comprising a pair of idler rollers which are corotatable as the fastener chain is fed by said feed unit and which produces a number of the electrical signals depending on the number of revolutions of one of the idler rollers;

(e) a detector, disposed on the path between said first cutting unit and said measuring unit, for producing a signal pulse each time confronting ends of each adjacent pair of the successive fly strips arrive at said detector, said detector comprising a light source positioned on one side of the path of the fly strips, and a photoelectric transducer element positioned on the other side of the path of the fly strips for receiving the light passed through a space between confronting ends of an adjacent pair of the successive fly strips; and

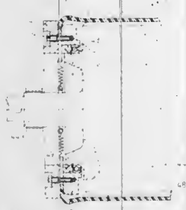
(f) a processing circuit having outputs for electrically controlling said cutting units separately, and having inputs electrically connected to said detector and said measuring unit for, upon receipt of one signal pulse from said detector, counting the electrical signals having been issued from said measuring unit, and for producing a first output signal, when the number of the counted electrical signals reaches a first predetermined value corresponding to the distance between said first cutting unit and said detector, to de-energize said feed unit and, at the same time, to energize said first cutting unit, and for thereafter counting additional electrical signals from said measuring unit, and for producing a second output signal, when the number of the counted electrical signals reaches a second predetermined value corresponding to the distance between said cutting units, to again de-energize said feed unit and to energize said second cutting unit.

4,625,376

PRESS ROLL FOR WEB MATERIAL WITH CLAMPED PRESS JACKET

Christian Schiel; Hans Flämig; Udo Grossman; Josef Müllner, all of Heidenheim, and Karl Steiner, Herbrechtingen, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,761
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501635
Int. Cl.⁴ A61F *13/20;* D04H *1/22*
U.S. Cl. 29—119 **25 Claims**



1. A press roll for forming a press nip with a counter roll, the press roll having lateral ends and comprising;

a main support member, which extends along the press roll between respective opposite lateral ends thereof; means for supporting the support member;

an endless, flexible, liquid-impervious press jacket comprising a fabric-reinforced, relatively hard plastic material, wrapped around the support member, the press jacket having opposite lateral ends; the jacket being rotatable on the support member and past the counter roll; means on the support member for urging the press jacket outwardly toward the counter roll;

a respective press jacket support element at each of the lateral ends of the roll and outside the lateral ends of the support member; each support element having a periphery and also having an outwardly facing outside end; the press jacket support element being rotatable with the press jacket;

at each lateral end thereof, the press jacket having an edge zone which extends past the periphery of the respective support element and then extends radially inwardly past the outside end of the support element, and the jacket there defining an annular end sealing surfae;

clamping means located outward of the outside end of at least one of the jacket support elements for being clamped against the annular end sealing surfce of the press jacket and for clamping that end sealing surface against the outside end of the one support element to form a liquid-tight seal; and

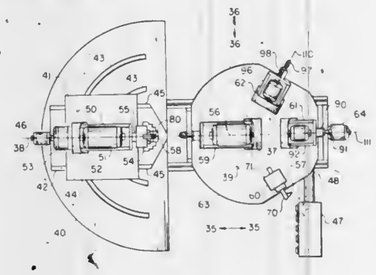
at least one longitudinal end thereof, the jacket edge zone being urged radially inwardly toward the axis of the press roll for forming the end sealing surface of the edge zone.

4,625,377

METHOD FOR MANUFACTURING UNIVERSAL JOINTS

Keshav S. Kavthekar, 43150 Leeds Ct., Canton, Mich. 48188

Division of Ser. No. 563,263, Dec. 20, 1983, which is a continuation of Ser. No. 288,320, Jul. 30, 1981, abandoned. This application Aug. 8, 1985, Ser. No. 763,558
Int. Cl.⁴ B21D *53/10;* B23P *13/00*
U.S. Cl. 29—149.5 B **11 Claims**



1. A method for manufacturing universal joints of the type employing conjugate members having close fitting conforming surfaces comprising mounting each of the conjugate members in a common workhead during the machining thereof, imparting the same relative motions between the conjugate members and cutting tools as exist during the actual service of the members, engaging the cutting tools with the members and generating the close fitting conforming surfaces of the members by the cutting actions of the tools.

4,625,378

METHOD OF MANUFACTURING FIN-TUBE HEAT EXCHANGERS

Satoshi Tanno; Hachiro Koma; Yukichi Aoki; Hironori Ito, all of Kusatsu; Hiroshi Yoneda, Daito, and Shigeo Aoyama, Higashiosaka, all of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

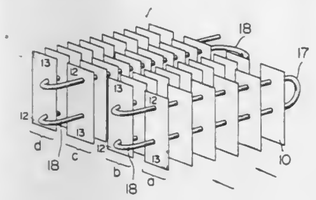
Continuation of Ser. No. 585,212, Mar. 1, 1984, abandoned. This application Dec. 31, 1985, Ser. No. 815,749
Claims priority, application Japan, May 9, 1983, 58-80344; May 30, 1983, 58-96348; May 30, 1983, 58-96349
Int. Cl.⁴ B23P *15/26*
U.S. Cl. 29—157.3 A **9 Claims**

1. A method of manufacturing a fin-tube heat exchanger

which includes a multiplicity of plate fins arranged in a plurality of rows disposed at a predetermined pitch in the direction of air flow, and a jointless refrigerant pipe extending through said plate fins in a zigzag manner, said method comprising the steps of:

firstly forming at least one pipe-receiving hole in each plate fin in an offset manner relative the center of said each plate fin;

secondly placing said plate fins in fin-receiving grooves formed in a straight fin-positioning fixture at predetermined spacings such that the same longitudinal ends of said plate fins of alternating rows appear on the same side of said fin positioning fixture and that said pipe-receiving holes are linearly aligned;



thirdly inserting said refrigerant pipe into said pipe-receiving holes and expanding said refrigerant pipe into tight and close contact with said plate fins;

fourthly bending said refrigerant pipe in such a zigzag manner that the straight portions of said refrigerant pipe are arranged along at least one straight line, as viewed in the direction of the rows, with each said at least one straight line passing through a straight portion in every row, and that a predetermined spacing is provided between the opposing edges of said plate fins in adjacent rows; and

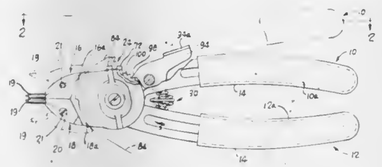
fifthly imparting a twist to said refrigerant pipe to line up said plate fins and arrange said refrigerant pipe such that the straight portions thereof are positioned in a staggered manner, as viewed in the direction of the rows, with each said at least one line becoming altered.

4,625,379

RETAINING RING TOOL

J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Filed Nov. 8, 1984, Ser. No. 669,672
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—229 **15 Claims**



1. A hand tool for removing and installing resilient retaining rings, comprising:

(a) a pair of operating handles defining a pivot;

(b) a pair of jaw members, each including an associated retaining ring engagement means;

(c) jaw latching means for selectively coupling one of said jaw members to one of said handles and the other of said jaw members to another of said handles;

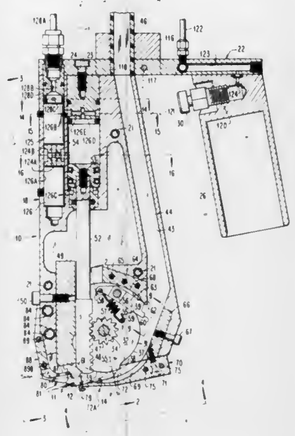
(d) said latching means including a prong coengageable with recesses formed on peripheral portions of said jaw members and said handles.

4,625,380

CLIP INSERT TOOL

Paul R. Everhard, 252 Southpoint Dr., and Roy K. Monroe, 100 Loch Lomond Dr., both of Lexington, Ky. 40503

Filed Mar. 12, 1985, Ser. No. 711,020
Int. Cl.⁴ B23P *19/00, 19/04, 19/08*
U.S. Cl. 29—243.56 **30 Claims**



1. A tool for inserting a clip at a predetermined position on a portion of an element with portions of the clip on opposite sides of the portion of the element including:

support means having orientation means for cooperating with a portion of an element that is to have portions of a clip disposed on opposite sides thereof at a predetermined position to orient said support means at a selected position relative to the portion of the element;

said orientation means including means for disposition in a hole in an element when a clip is to be inserted in the hole in the element and means for engaging only a surface of the element when a clip is to be inserted at an edge of the element;

said support means having passage means to receive a clip in a specific orientation;

stopping means to stop a clip received in said passage means in a specific orientation at a selected position in said passage means;

advancing means for advancing a stopped clip from its selected position in said passage means to its predetermined position on opposite sides of the portion of the element;

and control means to control the activation and inactivation of said advancing means.

4,625,381

FLOATING WEAR BUSHING RETRIEVER APPARATUS

Francis Gravouia, Jr., 406 Acorn St., Lafayette, La. 70507, and Henry Hebert, Rte. #3, Box 100, Carencro, La. 70520

Filed Apr. 24, 1981, Ser. No. 257,175
Int. Cl.⁴ E21B *17/12*
U.S. Cl. 29—283 **9 Claims**

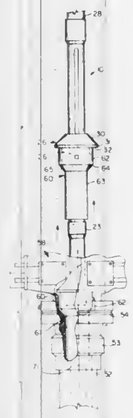
1. A floating wear bushing retreiver apparatus for retrieving wear bushing without imparting the weight of a drill string onto the wear bushing, said apparatus comprising:

a. a tool sub unit having a mandrel section with a longitudinal bore therethrough;

b. a retreiver section having an integral body and a bore therethrough for inserting onto said mandrel portion of said sub unit, the interior diameter of said bore of said retriever section being slightly larger than the exterior diameter of said mandrel portion of said sub unit and the exterior diameter of said retriever section being slightly

smaller than the interior diameter of a wear bushing to be retrieved;

c. means on said mandrel portion of said sub unit for disallowing rotation of said retriever section around said mandrel portion, said means comprising a grooved portion along substantially the entire length of said tool sub unit and means communicating with said rotation disallowing means disposed on the interior wall of said retriever body;



d. means on the first and second ends of said sub unit for maintaining said retriever section on said sub unit between said end means;

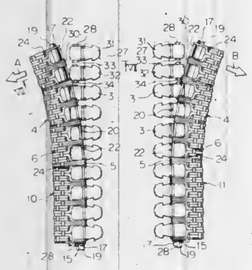
e. means on said retreiver section for engaging said retriever section to the wear bushing to be retreived, said means comprising protruding members disposed symmetrically on said retriever section.

4,625,382

SPACE FORMING METHOD FOR SLIDE FASTENER CHAIN

Hiroshi Shirakawa, and Shigeru Imai, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,615
Claims priority, application Japan, Dec. 12, 1983, 58-234818
Int. Cl.⁴ B21D *53/50*
U.S. Cl. 29—408 **3 Claims**



1. A space forming method for a slide fastener chain wherein fastener elements are partially removed from a slide fastener chain to form a so-called space, said slide fastener chain being constructed such that each of said fastener elements being of synthetic resin and having an engaging head and a pair of legs originally extending to both sides of the engaging head and then bent about the engaging head into a U-shaped configuration is originally secured to the edge of the fastener tape which consists of a woven structure of warps and wefts by means of weft thread loops located between each fastener element, said weft thread loops passing around binding warp threads which hold the fastener elements therebetween, a core string held between both legs of the fastener elements and connecting threads held in grooves inside the legs of the fastener elements, all of said binding warp threads, core string and connecting threads extending along the row of fastener elements to connect each fastener element, the improvement comprising:

right and left stringers are disengaged from each other;

each stringer is set on a working bed;

all fastener elements in the space forming area of each stringer are kept fixed on the working bed by respective press pieces at their engaging heads;

at least the connecting threads extending through the legs of each fastener element are cut at the front and rear end of the space forming area of each stringer;

then the fastener tapes are pulled away from the respective press pieces, thereby pulling out the binding warp threads, core string and connecting threads from the fastener elements;

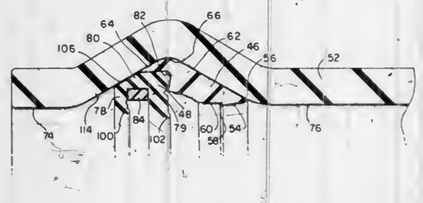
whereby the fastener elements are removed from each fastener tape, and the binding warp threads, core string and connecting threads extended along the space forming area are kept in the weft loops.

4,625,383

METHOD FOR SEATING A GASKET IN A PLASTIC PIPE BELL USING A HARD CONFIGURED RING

Efrain D. Vassallo, and Jose E. Valls, both of Ponce, P.R., assignors to Vassallo Research and Development Corporation, Ponce, P.R.

Filed Mar. 18, 1985, Ser. No. 712,718
Int. Cl.⁴ B29C *57/08*
U.S. Cl. 29—445 **6 Claims**



1. The method for seating a gasket in one end of a plastic pipe by using a shaped mandrel comprising

heating the end and softening the plastic sufficiently to make it pliable;

positioning a hard configured ring on a medial portion of the mandrel, defining an outer ring periphery of diameter that is larger than the diameter of the mandrel, and defining an annular, radially inwardly exposed angular junction in the ring;

applying the heated end of the pipe over the mandrel and over the outer periphery of the ring to form a shaped bell with an annular, radially outwardly extending pocket therein;

urging the heated pipe end into overall contact with portions of the mandrel and with the outer periphery of the ring;

cooling the heated pipe end and encapsulating the ring within the annular pocket of the shaped bell;

disassociating the mandrel from the shaped bell and from the hard ring; and

applying a resilient gasket interiorly of the bell in contact with both portions of the annular pocket and the annular angular junction of the ring.

4,625,384

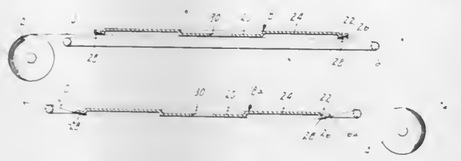
METHOD OF MAKING A RECORDING DISC

Sten R. Gerfast, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 369,905, Apr. 19, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 655,309

Int. Cl.[4] B23P *11/02*; G11B *5/82*

U.S. Cl. 29—448 **5 Claims**



1. Method of making a recording disc comprising the steps of:

(1) forming sheet metal into a disc-shaped support having

a substantially uniform cross-sectional thickness throughout and

axial projections at its hub and near its rim, the peaks of which define an unobstructed radial plane along one face of the support and

a flange connecting said projections,

(2) punching a central spindle opening into the disc-shaped support,

(3) stretching a recording sheet across the projections, and

(4) securing the recording sheet to the disc-shaped support radially beyond the peak of the rim-projection.

4,625,385

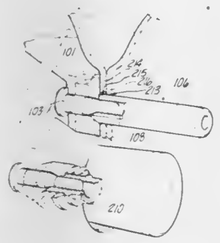
METHOD FOR MOUNTING A WHEEL FLANGE

Terry K. Kohler, St. Clair Shores, Mich.; William L. Grube, Lake Bluff, Ill., and Norbert G. Giczewski, Jr., Livonia, Mich., assignors to Metform Corporation, Savanna, Ill.

Filed Jul. 16, 1985, Ser. No. 755,671

Int. Cl.[4] B23Q *3/00*; B25B *27/00*

U.S. Cl. 29—467 **3 Claims**



3. A method for mounting one or more wheel flanges to the hub of an axle, the hub having attached thereto a plurality of lug bolts arranged in a fixed pattern, the wheel flanges each having a plurality of mounting holes therethrough arranged in said fixed pattern, comprising:

(a) threadably engaging two or more of said plurality of said lug bolts each with an elongated axial pin capable of passing through the respective mounting hole in said wheel flanges;

(b) for each said wheel flange, placing the mounting hole corresponding to said lug bolt about said lug bolt by passing said pin through said mounting hole to support each wheel flange in proper alignment with each of the plurality of lug bolts;

(c) threadably engaging some of the lug bolts which remain unengaged with lug nuts to clamp said wheel flanges toward said hub;

(d) detaching all said pin threadably engaged in step (a), above; and

(e) threadably engaging some of the lug bolts which remain unengaged with lug nuts to further clamp said wheel flanges toward said hub.

4,625,386

COMBINATION TOOL

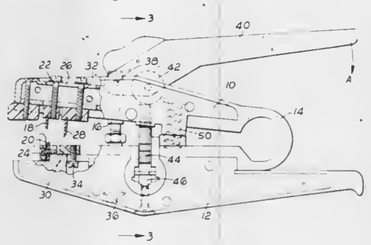
Zdzislaw Bieganski, Harpenden, England, assignor to Abeco Limited, Woburn, England

Filed Sep. 23, 1985, Ser. No. 778,988

Claims priority, application United Kingdom, Oct. 4, 1984, 8425043

Int. Cl.[4] H01R *43/05*

U.S. Cl. 29—566.4 **3 Claims**



1. A combination tool for stripping insulation from a cable and crimping a terminal to the cable, comprising a pair of substantially parallel parts connected together at one end by a member which is flexible to permit relative movement of said parts, a crimping anvil seated on a first one of said parts, a crimping punch which is guided relative to said anvil so as to cooperate with said anvil, a hand lever having a roller which is pivoted intermediate the ends of the lever and bears upon the crimping punch, a pin which has one end fixed in said first one of said parts and has its other end pivoted to one end of said hand lever, each of said parts having at its free end a cutting blade and a stripping blade, fixed in positions which are adjustable longitudinally of said parts, whereby sueezing together said hand lever and said first part actuates said punch and also actuates said cutting and stripping blades.

4,625,387

CUTTING MACHINE WITH AUTOMATIC CHANGING OF TOOLS AND TOOL MAGAZINES

Nikola D. Stoilov, Sofia, Bulgaria, assignor to Institute za Metalorejeshti Mashini, Sofia, Bulgaria

Filed Nov. 2, 1984, Ser. No. 667,910

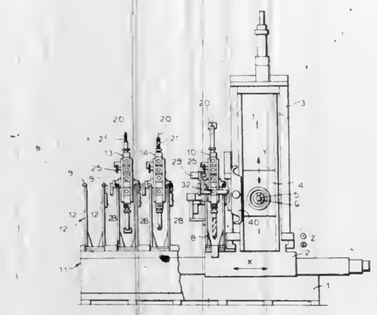
Claims priority, application Bulgaria, Nov. 3, 1983, 62913

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **10 Claims**

1. A cutting machine with automatic changing of tools and tool magazines, comprising a fixed body, a cross slide on the body, a column mounted on the cross slide for movement at right angles to the transverse movement of cross slide, a headstock having a tool supporting and driving spindle on said column, means for selectively moving the headstock along the length of the column transversely to the direction of movement of the cross slide and of the column on the cross slide, a workpiece supporting table position forwardly of the body, a tool magazine storing station spaced closely from the body, said tool magazine storing station having a plurality of similar cells each of which receives a respective tool carrying magazine, each magazine having a plurality of indexable tool receiving seats disposed in a plane parallel with the axis of the spindle of the machine, the machine having a tool magazine receiving station on the cross slide of the body thereof, said receiving station having a magazine receiving cell, means selectively to transfer a chosen one of said magazines from said magazine

storing station to the receiving cell of the receiving station, means to actuate the tool indexing means of the tool magazine positioned in the receiving cell so as to present a predetermined desired second tool thereon to a tool changing position



wherein said second tool lies in the same plane as and close to a first tool mounted on the spindle of the machine, and means to remove the first tool from the machine spindle and to transfer the second tool from the tool magazine in the receiving cell to the spindle of the machine.

4,625,388

METHOD OF FABRICATING MESA MOSFET USING OVERHANG MASK AND RESULTING STRUCTURE

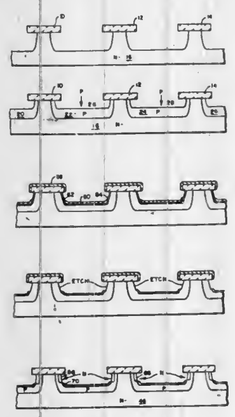
Edward J. Rice, Los Gatos, Calif., assignor to Acrian, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 371,599, Apr. 26, 1982, Pat. No. 4,419,811. This application Dec. 7, 1983, Ser. No. 558,923

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.[4] H01L *21/22*

U.S. Cl. 29—571 **13 Claims**



1. A method of fabricating a field effect transistor in a body of semiconductor material of first conductivity type comprising the steps of

(a) forming a plurality of spaced layers of insulating material on a major surface of said body,

(b) removing portions of said body by chemical etching thereby forming mesa structures defined by side walls, with said spaced layers of insulating material overhanging said mesa side walls,

(c) forming layers of opposite conductivity type in said major surface by introducing dopants into said etched portion of said major surface of said semiconductor body;

thereafter silicon oxide layers are formed on said etched portions,

(d) depositing masking material layers on said plurality of spaced layers and opposite conductivity layers on said etched surfaces, said spaced layers overhanging said mesas interrupting said masking material layer on said spaced layers from said masking material layers on said etched surface,

(e) removing the insulating material on the side walls of said mesa not covered by said masking material layer under said overhanging spaced layers to expose the surfaces of said side walls,

(f) removing said masking material layers,

(g) diffusing a first conductivity type dopant into the exposed surfaces of said mesa side wall,

(h) removing said insulating material layers from said etched regions.

4,625,389

INFRARED RADIATION DETECTORS

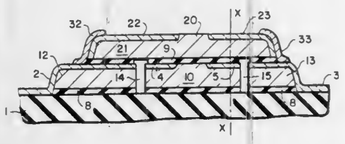
John B. Readhead, Lyndhurst, England, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 463,210, Feb. 2, 1983, Pat. No. 4,555,720. This application Jul. 1, 1985, Ser. No. 750,193

Claims priority, application United Kingdom, Mar. 3, 1982, 8206290

Int. Cl.[4] H01L *21/86, 21/90, 21/94, 31/00*

U.S. Cl. 29—572 **2 Claims**



1. A method of manufacturing an infrared radiation detector, said method comprising the steps of:

providing a substrate;

mounting a lower body of infrared-sensitive material on the substrate;

providing a metallization pattern on the lower body and on the substrate beyond said body, said metallization pattern defining at least one first detector element formed in the lower body;

dividing the lower body into at least first and second portions electrically insulated from each other and separated from each other by a gap, said first portion having the first detector element therein;

mounting an upper body of infrared-sensitive material on the lower body, said infrared-sensitive material having different characteristics from those of the infrared-sensitive material of the lower body, said upper body being mounted to bridge the gap between the first and second portions of the lower body;

forming a metallization on the upper body, said metallization defining at least one second detector element formed in the upper body directly above the first detector element; and

forming an electrical connection from the substrate to the second detector element, said electrical connection being provided on the second portion of the lower body.

4,625,390

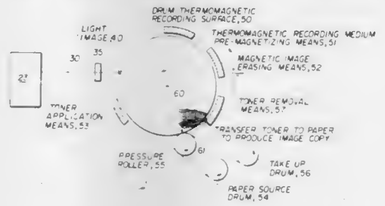
TWO-STEP METHOD OF MANUFACTURING COMPRESSED BISMUTH-CONTAINING GARNET FILMS OF REPLICABLE LOW ANISOTROPY FIELD VALUE

Michael F. Shone, Parsippany, and Roger F. Belt, Morristown, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Continuation of Ser. No. 475,937, Mar. 16, 1983, Pat. No. 4,544,239. This application Jun. 27, 1985, Ser. No. 749,356

Int. Cl.⁴ H01L *21/265;* **G11C** *19/08;* **C04B** *35/40*

U.S. Cl. 29—576 B **12 Claims**



1. A two-step method of manufacturing a magnetically switchable magneto-optic element comprising compressed bismuth-containing garnet film of low anisotropy field value on a monocrystalline gadolinium garnet substrate, which method comprises:

(a) first, growing a compressed bismuth-containing garnet film on a monocrystalline gadolinium garnet substrate, said garnet film having a growth and strain induced effective anisotropy of about 3000 gauss or less;

(b) and then, reducing the anisotropy field of the as-grown garnet film in step (a) to a preselected lower anisotropy field by ion implantation remote from the interface of said film and substrate.

4,625,391

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Yoshitaka Sasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 18, 1982, Ser. No. 389,939

Claims priority, application Japan, Jun. 23, 1981, 56-96908; Oct. 7, 1981, 56-159841

Int. Cl.⁴ H01L *21/304, 21/44*

U.S. Cl. 29—589 **4 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:

(a) forming a first conductive layer of polycrystalline silicon or amorphous silicon on a field insulating layer on a semiconductor substrate;

(b) forming a first indulating film of an antioxidant insulating material on said first conductive layer;

(c) selectively etching said first insulating film to form a plurlaity of first insulating patterns;

(d) selectively etching said first conductive layer to form a plurality of first conductive patterns by using said first insulating patterns as masks in such a manner that sides of said first conductive patterns are overhung by said first insulating patterns;

(e) oxidizing the sides of said first conductive patterns to form second insulating films on the sides of said first conductive patterns;

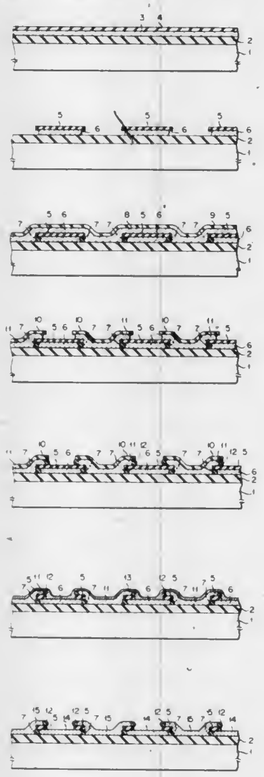
(f) forming a second conductive layer of polycrystalline silicon or amorphous silicon on surfaces of said field insulating layer, said first insulating patterns, and said second insulating films;

(g) forming a third insulating film of an antioxidant insulating material on said second conductive layer;

(h) selectively etching said third insulating film to form a plurality of third insulating patterns and to expose part of said second conductive layer, each of said third insulating patterns being formed between said first insulating patterns neighboring to said third insulating patterns;

(i) selectively etching said second conductive layer to form a plurality of second conductive patterns by using said third insulating patterns as masks in such a manner that the sides of said second conductive patterns are overhung by said third insulating patterns to expose surfaces of said first insulating patterns;

(j) oxidizing the exposed sides of said second conductive patterns to form fourth insulating films on the sides of said second conductive patterns;



(k) etching said exposed first insulating patterns and third insulating patterns by using said fourth insulating films as masks in a self-aligned manner to expose surfaces of said first conductive patterns and second conductive patterns;

(l) forming a high-melting point metal on the exposed surfaces of the first and second conductive patterns; and

(m) annealing said high-melting point metal, first and second conductive patterns to convert said first and second conductive patterns into metal silicide in a self-aligned manner.

4,625,392

METHOD OF MANUFACTURING A MOLDED ROTATABLE ASSEMBLY FOR DYNAMOELECTRIC MACHINES

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 5, 1985, Ser. No. 772,819

Int. Cl.⁴ H02K *15/02*

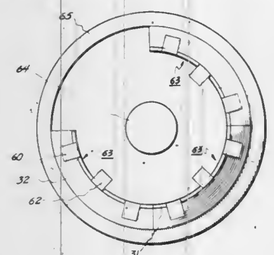
U.S. Cl. 29—598 **5 Claims**

1. A method of making a rotor for a dynamoelectric machine comprising the steps of:

forming a plurality of flux ring segmments of flux conducting material;

securing segments of magnetizable material to each of said flux ring segments to form a ring-segment magnetizable material subassembly;

situating a plurality of the subassemblies in a cylindrically shaped molding ring, with the magnetizable material adjacent the inside walls of the molding ring;



situating a shaft in the molding ring along the axis of the cylindrical molding ring; and

molding plastic material around the shaft and inside the ring-segment magnetizable material subassemblies whereby the outermost surfaces of the magnetizable material define a cylinder.

4,625,393

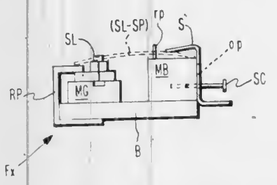
METHODS OF ATTACHING BACK-BAR TO SLIDER

Otto Fuchs, Westlake Village, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 299,096, Sep. 3, 1981, Pat. No. 4,518,940. This application Jun. 18, 1984, Ser. No. 621,828

Int. Cl.⁴ G11B *5/42*

U.S. Cl. 29—603 **23 Claims**



1. A method for attaching magnetic part means to a magnetic recording slider including a prescribed non-magnetic gap zone, the slider including first post means disposed on one side of said gap zone and second post means on the other side of said gap zone, the method comprising:

providing magnetic flux source means and disposing it to direct opposing flux along the respective post means;

providing holder means and arranging it to receive and hold said slider and said source means in prescribed relative disposition whereby the magnetic flux from the source means is directed in "opposed-pole fashion" with the flux entering the slider on one side of said gap zone and returning from the slider on the other side of the gap zone;

whereby when the magnetic part means is presented in magnetic contact with, and between, said post means, it is automatically, and magnetically held firmly in position by the flux from said source means; and

then bonding said part means to said post means.

4,625,394

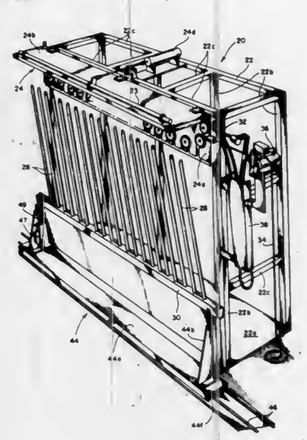
BLANKET WIRE INSERTION MACHINE

Glen Kemnitz, Laurel, and Richard H. Williams, Waynesboro, both of Miss., assignors to Sunbeam Corporation, Oak Brook, Ill.

Filed Oct. 3, 1985, Ser. No. 783,973

Int. Cl.⁴ H05B *3/54*

U.S. Cl. 29—611 **23 Claims**



1. An apparatus for inserting a heating element into a fabric shell of an electric blanket, the shell including two spaced fabric layers which are secured together to form open-ended parallel passageways across the entire shell, comprising a plurality of elongated tubes supported at one end in a common plane and spaced for insertion into said passageways in said shell, said tubes being formed with slots which extend throughout the length of each tube, said slots in adjacent pairs of tubes being in spaced facing relationship, a leader having a leading end and a trailing end and having means to secure its trailing end to a length of a heating wire, drive means positioned at both ends of said tubes to tubes, said drive means engaging said leader and driving said leader through each of said tubes successively to draw said length of heating wire through the passageways of said shell whereby said heating wire extends continuously through said passageway.

4,625,395

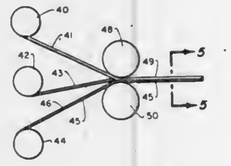
BATTERY PLATE CONTAINING FILLER WITH CONDUCTIVE COATING

John J. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 550,875, Nov. 14, 1983, Pat. No. 4,510,219. This application Nov. 21, 1984, Ser. No. 673,676

Int. Cl.⁴ H01M *6/00*

U.S. Cl. 29—623.4 **15 Claims**



1. A method of forming a through-conductive plate comprising the steps of:

dispersing conductive tin oxide coated glass in a softened resin; and

forming the resin into a sheet.

4,625,396

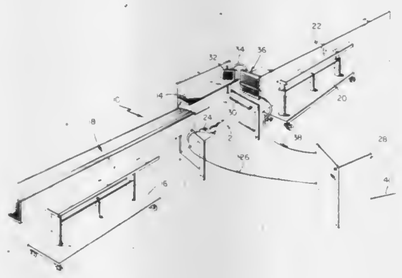
PATTERN FUEL ASSEMBLY LOADING SYSTEM

Hassan J. Ahmed, Columbia, S.C.; Kenneth S. Gerkey, Mt. Lebanon Twp., Allegheny County, Pa.; Thomas W. Miller, Butler, Pa., and Mark E. Wylie, Mt. Lebanon Twp., Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1984, Ser. No. 686,960

Int. Cl.[4] B23P *21/00;* B23Q *15/00, 17/00;* G21C *3/00*

U.S. Cl. 29—701 28 Claims



1. An interactive system for facilitating preloading of fuel rods into magazines, which comprises:

an operator work station adapted for positioning between a supply of fuel rods of predetermined types, and the magazine defining grid locations for a predetermined fuel assembly;

display means associated with said work station;

scanner means associated with said work station and adapted for reading predetermined information accompanying the fuel rods;

a rectangular frame adapted for attachment to one end of the fuel assembly loading magazine;

prompter/detector means associated with said frame for detecting insertion of a fuel rod into the magazine; and

processing means responsive to said scanner means and said sensing means for prompting the operator via said display means to pre-load the fuel rods into desired grid locations in the magazine.

18. Apparatus for facilitating pre-loading of fuel rods in predetermined grid locations of a fuel assembly loading magazine, comprising:

a rectangular frame adapted for attachment to one end of the fuel assembly loading magazine; and

means associated with said frame for detecting insertion of fuel rods into the magazine.

28. Apparatus for facilitating pre-loading of fuel rods in predetermined grid locations of a fuel assembly loading magazine, comprising:

a rectangular frame adapted for attachment to one end of the fuel assembly loading magazine;

a plurality of first photosensors associated with one side of said frame and corresponding to the rows of grid locations in the magazine; and

a plurality of second photosensors associated with an adjacent side of said frame and corresponding to columns of grid locations in the magazine, said first and second photosensors being offset for detecting movement of a fuel rod relative to the magazine.

4,625,397

PLUG-IN AND PULLING TOOL

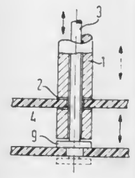
Ulrich Voigt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,567

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 8420924[U]

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—739 4 Claims



1. A plug-in and pulling tool for the purpose of plugging-in or pulling an uppermost printed circuit board in a printed circuit board stack, which is formed through a combination of printed circuit boards spaced a predetermined distance apart, provided on the upper and lower side with one half each of a two-part plug-in connector, whereby each printed circuit board has a common predetermined thickness and contains a keyhole-shaped recess comprising a circular opening with a short connecting slot on both lateral sides of the plug-in connector halves, comprising:

a hollow cylindrical exterior part with a surrounding groove having a width corresponding to one printed circuit board thickness and formed at a height from one end of said part less than said printed circuit board spacing, and

a push rod with a push rod bar guided in a mobile fashion in the interior of the hollow cylindrical exterior part in the direction of the longitudinal axis, and with a push rod plate corresponding in its diameter to the outer diameter of the exterior part, the diameter of said exterior part and psaid rod plate are slightly smaller than said circular opening of said keyhole-shaped recess, but larger than the width of said short connecting slot,

whereby, said push rod plate and said groove are insertable into said openings and positionable at said slots by lateral movement to be operable against adjacent circuit boards to squeeze said circuit boards together during a plugging-in operation and to push said adjacent circuit boards apart during a pulling operation.

4,625,398

APPARATUS FOR MANUFACTURING BIDIRECTIONALLY OPENABLE SLIDE FASTENERS

Akiyoshi Kando, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,177

Claims priority, application Japan, May 11, 1984, 59-94128; May 11, 1984, 59-94129

Int. Cl.[4] A41H *37/06*

U.S. Cl. 29—768 8 Claims

1. An apparatus for manufacturing a bidirectionally openable slide fastener, comprising:

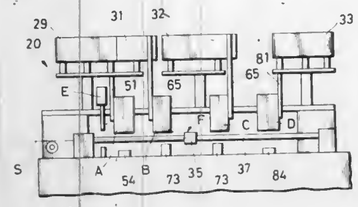
(a) a gripper mechanism for gripping and feeding a pair of slide fastener stringers along a feed path;

(b) a pin attachment unit disposed on said feed path for attaching a pin to an end of one of said slide fastener stringers;

(c) a first slider attachment unit disposed on said feed path for threading a first slider over said slide fastener stringers;

(d) a second slider attachment unit disposed on said feed path for threading a second slider over said slide fastener stringers;

(e) a box pin attachment unit disposed on said feed path for attaching a box pin to an end of the other slide fastener stringer; and



(f) a cutter unit disposed on said feed path for cutting off said slide fastener stringers across an element-free space to produce a completed bidirectionally openable slide fastener.

4,625,399

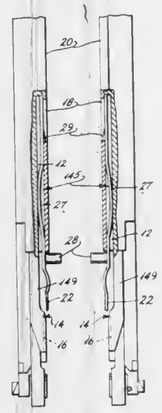
METHOD AND APPARATUS FOR INSERTING LEADS OF ELECTRICAL COMPONENTS INTO CORRESPONDING HOLES ACCORDING TO DIFFERENT SPACINGS OF SAID HOLES

Albert W. Zemek, Windsor; Frank J. Orzelek, Binghamton, and Charles Dunlap, Kirkwood, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,929

Int. Cl.[4] H05K *3/32;* B23P *19/00*

U.S. Cl. 29—845 12 Claims



1. A method of mounting components on circuit boards by use of at least two tool sections each on opposite sides of and being movable toward and away from a mid-plane, said components each comprising a body and leads extending in generally opposite directions from said body, said circuit boards having sets of spaced lead receiving holes with at least two sets of holes having different center-to-center hole spacings for receiving formed leads with corresponding formed lead spacings and one of said hole spacings being a smallest hole spacing, and said tool sections each comprising a lead former and a means for driving a formed lead into a corresponding hole of said spaced holes by engagement with said formed lead, the method comprising the step of:

spacing each of said driving means inwardly toward said mid-plane from an adjacent outside former a distance further than such spacing for said smallest hole spacing and sufficiently far from a radius of said formed lead, upon spreading a pair of outside formers apart from a setting for said smallest hole spacing, in order to avoid a lead misinsertion when inserting and driving formed leads into a set of holes having spacings greater than said smallest hole spacing, said misinsertion being causable by forcing a formed lead from driving engagement with a blade of said driving means during a subsequent operation of clinching inserted leads to an underside of said circuit board.

5. In an apparatus for mounting components on circuit boards and comprising tool sections on opposite sides of an each movable toward and away from a mid-plane, said components each comprising a body and leads extending in generally opposite directions from said body, said circuit boards having sets of spaced lead receiving holes with at least two sets of holes having different center-to-center hole spacings for receiving formed leads of components having corresponding formed lead spacings and one of said hole spacings being a smallest hole spacing, and said tool sections each comprising a lead former and a means for driving a formed lead into a corresponding hole of said spaced holes, each said driving means being operatively associated with a lead former, the improvement comprising:

means, operatively associated with said driving means, for spacing blades of said driving means

inwardly toward said mid-plane from adjacent outside formers a distance further than such spacing for said smallest hole spacing and sufficiently far from radii of said formed leads upon spreading a pair of outside formers apart from a setting for said smallest hole spacing in order to avoid a lead misinsertion when mounting a component by driving said formed leads into a set of holes having spacings greater than said smallest hole spacing, said misinsertion being causable by forcing a formed lead from driving engagement with a blade of said driving means during an operation of clinching inserted leads to an underside of said circuit board.

4,625,400

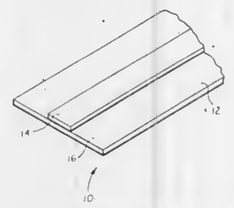
METHOD OF MAKING A STRIP FOR AN ELECTRICAL CONTACT TERMINAL

Julius C. Fister, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 6, 1983, Ser. No. 511,364

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—879 8 Claims



1. A method of producing a strip adapted for use as an electrical contact terminal, comprising the steps of:

providing a relatively flexible metal or metal alloy substrate;

providing a powdered metal or metal alloy;

adding a binder to the powdered metal or metal alloy to hold the powdered metal or metal alloy together;

depositing the powdered metal or metal alloy with added binder on a first surface of said metal or metal alloy substrate;

pressure bonding said metal or metal alloy powder with added binder to the first surface of said metal or metal alloy substrate; and

annealing said substrate with said pressure bonded metal or metal alloy powder at a temperature from about 150° C. up to but not including the melting temperature of said metal or metal alloy powder to further increase the adhesion between the powdered metal or metal alloy and said surface of said metal or metal alloy substrate.

4,625,401

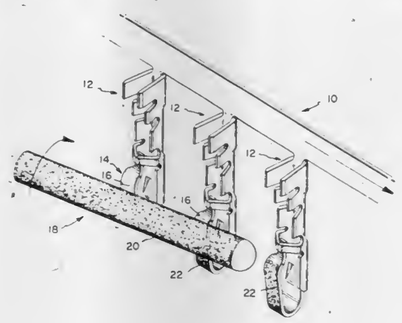
METHOD OF GOLD COATING AN ARTICLE

George B. Cvijanovich, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 623,639, Jun. 25, 1984, abandoned and a continuation-in-part of Ser. No. 364,168, Mar. 31, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 775,716

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—885 2 Claims



1. A process for coating gold on a continuous strip of electrical contact terminals extending side by side from a carrier strip, each terminal having a contact zone which is intended to engage and establish electrical contact with a complementary contact member, comprising the steps of:

electrolytically depositing gold on a cylinder,

rotating the gold coated cylinder,

feeding a strip of terminals past the rotating cylinder,

holding the contact zones of the terminals against the rotating cylinder with sufficient normal force to cause dynamic frictional welding of the gold to the contact zone.

4,625,402

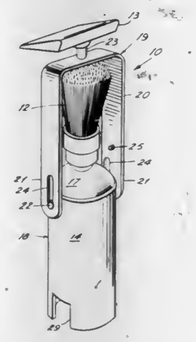
AEROSOL SHAVING CREAM AND RAZOR

James P. Kavoussi, 1401 80th St., Brooklyn, N.Y. 11228

Filed Apr. 22, 1985, Ser. No. 726,038

Int. Cl.[4] B26B *21/44*

U.S. Cl. 30—41 3 Claims



1. An aerosol shaving cream and razor implement, comprising, in combination, a safety razor, a brush, and a main body member receiving a replaceable container of shaving cream; said brush comprising a plurality of brush bristles set in a brush holder extending from the main body member, a hole through said brush holder providing communication between the shaving cream container and said brush bristles for passage of shaving cream therethrough; and a razor unit pivotally mounted on said main body member, said razor unit comprising a U-shaped yoke, opposite ends of said yoke being pivotally attached to diametrically opposite sides of main body member for extending the yoke over the brush bristles, means for locking the yoke in its extended position, and wherein said safety razor is supported from the mid portion of the yoke to project outwardly therefrom.

4,625,403

DEVICE FOR GRASPING AND HANDLING ARTICLES

Jörgen Jansson, Ulfsta Idenor, 824 00 Hudiksvall, and Lars Jansson, Ulfsta Idenor, 820 00 Hudiksvall, both of Sweden

Filed Aug. 30, 1985, Ser. No. 774,403

Claims priority, application Sweden, Sep. 7, 1984, 8404496

Int. Cl.[4] A21C *15/04*

U.S. Cl. 30—114 10 Claims



1. A device for grasping and handling articles, primarily generally cylinder sector shaped articles such as pieces of cake, comprising two blade parts (**1, 2**) and a grip (**3**) located at one end thereof, said blade parts (**1, 2**) being pivotally connected to each other by means of a hinge (**4**) located at that end of the blade parts which is opposite to the grip (**3**) to enable grasping of the article in question between each other, characterized in that the blade parts (**1, 2**) are pivotable in a direction towards each other without any obstruction by the grip or other components of the device to a position (FIG. **1**), where they lie in close vicinity to each other in a substantially parallel relation so as to thereby co-operate so that they operate as one single cutting blade.

4,625,404

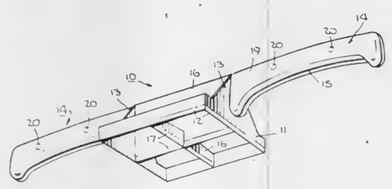
CHEESE SEGMENTER

Peter Valente; Matthew A. Rocco, and Barbara B. Rocco, all of Allendale, N.J., assignors to Matthew & Barbara Rocco, Allendale, N.J.

Filed Feb. 19, 1985, Ser. No. 702,605

Int. Cl.[4] A21C *5/08, 15/04*

U.S. Cl. 30—114 3 Claims



1. A knife for cutting an elongated cheese block comprising a rectangular frame having four sides, each side of one pair of parallel sides defining a blade with a cutting edge on a bottom thereof, and a pair of oppositely disposed vertically upstanding extensions of generally triangular shape extending upwardly from the other pair of parallel sides;

a pair of blades extending within and across said frame in perpendicular relation to each other, each of said pair of blades having a cutting edge on a bottom side thereof coplanar with said cutting edges of said frame, one of said pair of blades extending longitudinally between said extensions and being integral with said extensions while extending upwardly to the same height as said extensions, the other of said pair of blades extending upwardly to the same height as said one pair of parallel sides of said frame; and

a pair of handles, each handle extending from a respective extension of said frame with a bottom surface disposed above a plane of said cutting edges of said frame.

4,625,405

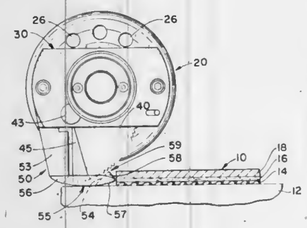
CAST CUTTER

H. Dean Hudnutt, Benton Harbor, Mich.; Edsell M. Eady, Bradfordwoods, and Mark V. Cromie, Pittsburgh, both of Pa., assignors to Deeco, Inc., Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 626,650

Int. Cl.[4] B23D *47/02*

U.S. Cl. 30—370 10 Claims



1. An apparatus for cutting a surgical or orthopedic cast overlying a human or animal body portion comprising:

a housing;

motor means mounted to the housing;

a pair of blade members, each having an arcuate, sawtoothed, edge portion, the edge portions being in juxtaposed relationship, the blades being pivotally mounted relative to the housing for concurrent movement on a common pivot axis;

transmission means located within the housing and connected between the motor means and the blades, the transmission means having an input connected to the motor and an output connected to the blades, the transmission means, in respnse to energization of the motor means, simultaneously driving the blades for oscillatory movement relative to each other, the juxtaposed edge portions being at least in part simultaneously engageable with the cast to cut the cast and provide a single kerf therein; and

a footlike blade guard supported in fixed relationship to the blades, a portion of the guard being positionable between blade portions engageable with the cast and the underlying body portion so as to shield the body portion from contact with the moving blades as the cast is cut, the blade guard having an upper surface engageable with the underside of the cast and a lower surface engageable with the body portion of the human or animal, the sawtoothed edge portions of the blades cooperating with the upper surface of the bladeward to provide a nip area for receiving the underside of the cast engageable with the blade guard upper surface, the sawtoothed, arcuate, edge portions of the blades moving in parallel planes generally perpendicular to the upper surface of the footlike blade guard, the blade guard including an aperture extending between the upper and lower blade guard surfaces, the moving sawtoothed edge portions located at said nip area extending from said upper surface into said aperture to a point between the upper and lower surfaces of the blade guard.

4,625,406

SAFETY DEVICE FOR A PORTABLE CHAIN SAW

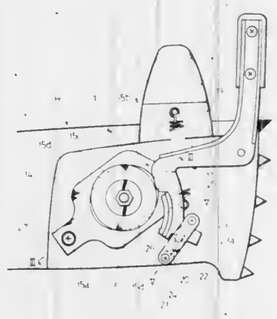
Fusao Fushiya, and Nobuhiro Inoue, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Mar. 15, 1985, Ser. No. 712,198

Claims priority, application Japan, Mar. 21, 1984, 59-41131[U]

Int. Cl.[4] B23D *57/02*

U.S. Cl. 30—381 5 Claims



1. In a hand portable chain saw having a housing with a hand grip, a cutting chain, a guide bar projecting forwardly of the housing for supporting the cutting chain for endless movement, an electric motor carried by the housing for driving the cutting chain, and a drive shaft rotatably carried by the housing and operatively connected with the electric motor, the improvement comprising:

an engaging member rotatable with and axially movably supported by said drive shaft and having a clutch surface formed on the forward end thereof;

an interlocking wheel idly but axially non-movably supported by said drive shaft in confronting relation to said engaging member, said interlocking wheel having a clutch surface engageable with said clutch surface of said engaging member for driving said cutting chain;

a flexible pushing plate disposed between the engaging member and interlocking wheel for pushing said engaging member out of driving engagement with said interlocking wheel, said pushing plate having one end secured to said housing and the other end movable in the axial direction of said drive shaft;

a brake lever mounted on said housing for swinging movement in response to engagement by an operator's hand;

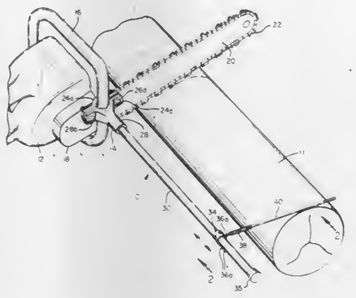
a spring engaged between said brake lever and said housing for urging said brake lever in one forward direction;

cam means provided on said brake lever and operable with said engaging member such that, upon swinging movement of said brake lever in said forward direction, said cam means presses said other end of said pushing plate to move said engaging member out of driving engagement with said interlocking wheel;

a braking member secured to said brake lever and operable in unison with the movement of said cam means such that swinging movement of said brake lever moves said braking member into and out of frictional braking engagement with said interlocking wheel between a braking position and an inoperative position in synchronism with the movement of said engaging member out of and into driving engagement with said interlocking wheel; and

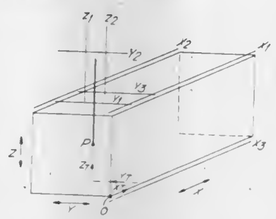
means for locking said brake lever in opposition to the force of said spring when said braking lever is in its inoperative position.

4,625,407
LENGTH-MEASURING ATTACHMENT FOR CHAIN SAW
F. Patrick Wallis, 17717 Scott La., Gladstone, Oreg. 97027
Filed Aug. 12, 1985, Ser. No. 764,589
Int. Cl.[4] B27B *17/00*
U.S. Cl. 30—383 3 Claims



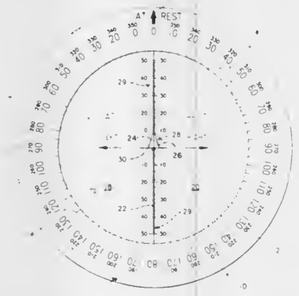
1. A length measuring attachment for a chain saw comprising detachable clamp means for clamping the attachment to a stationary portion of the chain saw, an elongate support arm connected to the clamping means and extending to the side of the chain saw in a direction transverse to a longitudinal-oriented chain saw bar, and an index pointer detachably coupled to the support arm and slideably amounted thereon, whereby the index pointer may be set at any location along the transverse length of the arm for indicating the length of an article to be cut by the chain saw, wherein the index pointer includes a longitudinally extending rod resilently mounted to the elongate support arm, and wherein the longitudinally extending rod is frictionally held within one end of a helical spring having a longitudinally extending axis, and a frictional manually operated clamp is connected to the other end of the spring for engaging the elongate support arm.

4,625,408
MEASURING APPARATUS
David A. Wright, Edinburgh, Scotland, assignor to Ferranti plc, Cheshire, England
Continuation-in-part of Ser. No. 104,850, Dec. 18, 1979, abandoned. This application Apr. 1, 1981, Ser. No. 249,953
Claims priority, application United Kingdom, Dec. 27, 1978, 7850002
Int. Cl.[4] G01B *11/03*
U.S. Cl. 33—1 M 9 Claims



1. Measuring apparatus for determining the position of a point in a measuring volume relative to a datum point and with respect to three mutually perpendicular axes, which includes a probe member supported for movement within said measuring volume, such movement being subject to errors caused by rotations about axes perpendicular to one or more of said axes, a measuring system which includes, for each axis, (n+1) linear position transducers when n is the number of rotations for which correction is required, the transducers being located outside the measuring volume and spaced from one another so as to detect said rotations, and circuit means operable, for each axis, to combine the outputs of the transducers in such a manner as to provide a single corrected output.

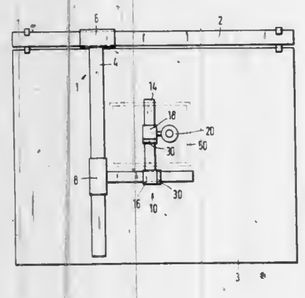
4,625,409
GRAPHICS PROTRACTOR
Jeanette S. Arakawa, 26889 Nina Pl., Los Altos Hills, Calif. 94022
Filed Oct. 11, 1985, Ser. No. 786,878
Int. Cl.[4] B43L *7/06*
U.S. Cl. 33—1 N 12 Claims



1. A device for placement on a computer display screen to determine direction changes for graphics commands, which comprises a circular ring bearing indicia representing degrees around the circumference of said ring relative to a point of origin on said ring, first and second members rotatable within said ring and through which at least a portion of the computer display is visible, each of said first and second members having a straight line movable into and out of registration with the straight line on the other of said first and second members by rotation of said first and second members within said ring, said first and second members bearing indicia along the straight line corresponding to a graphics symbol centrally located of said ring, said first and second members having contrasting colors and being configured so that each forms a semicircular area in one of the contrasting colors within said ring.

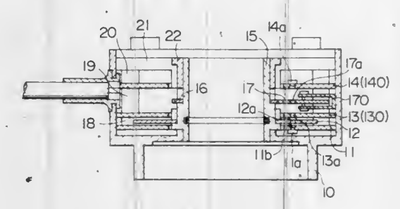
6. A device for placement on a computer display screen to determine direction changes for graphics commands, which comprises a circular ring bearing indicia representing degrees around the circumference of said ring relative to a point of origin on said ring, first and second members rotatable within said ring and through which at least a portion of the computer display is visible, each of said first and second members having a straight line movable into and out of registration with the straight line on the other of said first and second members by rotation of said first and second members within said ring, said first and second members bearing indicia along the straight line corresponding to a graphics symbol centrally located of said ring, said ring being formed from first and second outer layers separated by an inner spacer layer, each of said first and second outer layers having an annular ring extending from an inside edge of said ring and facing said inner spacer layer, the annular rings and said inner spacer layer forming a pair of slots, said first and second members being positioned in the pair of slots for rotation within said ring.

4,625,410
COMPUTER-AIDED DRAWING OR ENGRAVING DEVICE
Hans Eder, Schortens, Fed. Rep. of Germany, assignor to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. Kg, Wilhelmshaven, Fed. Rep. of Germany
PCT No. PCT/EP84/00350, § 371 Date Jul. 9, 1985, § 102(e) Date Jul. 9, 1985, PCT Pub. No. WO85/02150, PCT Pub. Date May 23, 1985
PCT Filed Nov. 5, 1984, Ser. No. 756,991
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340677
Int. Cl.[4] B43L *13/00;* G06K *15/22;* G05B *19/39*
U.S. Cl. 33—1 M 12 Claims



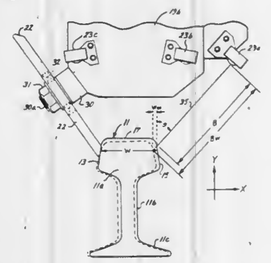
1. A drawing or engraving device or plotter comprising:
first and second travelling carriage systems, the first travelling carriage system comprising a first guide rail having a first travelling carriage movable along the first guide rail, and a second guide rail having a second travelling carriage movable along the second guide rail;
the second travelling carriage system comprising a third guide rail having a third travelling carriage movable along the third guide rail, and a fourth guide rail having a fourth travelling carriage movable along the fourth guide rail, the third guide rail being linked to the second travelling carriage;
a working head on the fourth travelling carriage;
means for measuring the distances covered by the travelling carriages in different distances in order to indicate the actual coordinates in a selected coordinate system which the working head executes during use;
drive means to drive the third and fourth travelling carriages, the drive means being locked when in a nonactivated state;
programming means having input means for selection of selected coordinates which the user would like the working head to pass through during use;
a memory for storage of the selected coordinates, the memory being operatively connected to the programming means;
a computer which is operatively connected to the measuring means as well as to the memory and which determines any deviation of the actual coordinates from the selected coordinates; and
control means operatively connected to the computer and to the drive means, the control means causing the drive means to drive the third and fourth travelling carriages to compensate for the deviation.

4,625,411
APPARATUS FOR DETECTING ROTATION OF STEERING WHEEL
Hideki Kashiwagi, Nishio; Shigeyuki Akita, Okazaki; Hiroaki Tanaka, Aichi, and Akira Kuno, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan
Filed May 30, 1985, Ser. No. 739,473
Claims priority, application Japan, Jun. 1, 1984, 59-113751
Int. Cl.[4] G08C *19/10;* G01B *11/26*
U.S. Cl. 33—1 PT 6 Claims



1. An apparatus for detecting a rotation of a steering wheel comprising:
a rotary plate mounted to a shaft without a relative rotation therebetween, said shaft being rotatable in accordance with a rotation of said steering wheel;
means for detecting a rotation of said rotary plate;
a rotary member rotatable in accordance with a rotation of said shaft;
a first means for detecting a reference position signal provided in said rotary plate;
a second means for detecting a reference position signal provided in said rotary member;
a reduction means for reducing the rotational speed of said rotary member such as to allow said first and second signal detecting means to be aligned with each other once in a plurality of rotations of said shaft; and
means for detecting a reference position disposed in a line passing through said first and second signal detecting means, said position detecting means outputting a reference position signal upon an alignment of said first and second signal detecting means with said line.

4,625,412
APPARATUS AND METHOD FOR MEASURING THE WEAR OF RAILROAD RAIL
Bruce W. Bradshaw, Ludington, Mich., assignor to Jackson Jordan, Inc., Ludington, Mich.
Filed Sep. 13, 1985, Ser. No. 775,587
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—1 Q 17 Claims



1. In a system for measuring the wear in the cross-sectional profile of a railhead of a railroad rail, an apparatus for measuring the width and height of said profile comprising:
a carriage for traveling along said railroad rail;
a first guide means for dynamically positioning said carriage transversely on said railroad rail with respect to the direc-

tion of travel for the carriage in response to changes in the width of said profile;

a second guide means for dynamically positioning said carriage transversely on said rail with respect to the direction of travel for the carriage in response to changes in the height of said profile; and

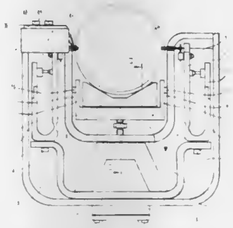
a plurality of distance sensors fixedly mounted to said carriage for determining wear in said profile by sensing changes in the transverse position of said carriage relative to at least one reference surface of the rail that is not worn during normal use.

4,625,413

HEAD FOR CHECKING DIMENSIONS OF MECHANICAL PARTS

Mario Possati, Bologna, and Carlo Dall'Aglio, Volta Reno D1 Argelato, both of Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Oct. 4, 1985, Ser. No. 784,310
Claims priority, application Italy, Oct. 15, 1984, 3603 A/84
Int. Cl.[4] G01B *7/12*
U.S. Cl. 33—143 L **17 Claims**



1. Head for checking dimensions of mechanical parts comprising:

an integral member including a support portion, a plurality of resiliently flexible portions defining relevant fulcrums aligned along a single axis of rotation, and movable arms connected to the support portion through the resiliently flexible portions, the movable arms being rotatable, independently from one another, about said axis of rotation;

feelers fixed to the movable arms for contacting the part to be checked, at least one of the feelers being adjustable for changing the mutual distance of the feelers and arranging all of the feelers substantially aligned along a geometrical axis parallel to said single axis of rotation; and

detecting devices for generating signals responsive to the displacements of the movable arms.

4,625,414

WELDING RING GAUGE

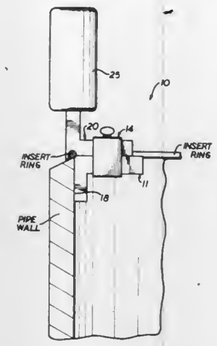
Johnny Van Howard, P.O. Box 333, 3149 Fairburn Rd., Douglasville, Ga. 30133

Filed Jan. 22, 1985, Ser. No. 696,500
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—180 R **4 Claims**

1. A gauge to locate and hold a pipe insert ring in place on the bevel on the end of a pipe so that the ring can be tack welded to the pipe comprising:

a first slide member defining a gauging surface thereon adapted to abut the inside of a pipe adjacent the end thereof and locate said gauge with respect to the pipe;

a second slide member slidably mounted on said first slide member for movement generally normal to said gauging surface, said second slide member having a holding portion thereof adapted to adjustably project past said gauging surface so as to overlie the bevel on the end of the pipe when said gauging surface abuts the inside of the pipe, said holding portion defining a holding recess therein adapted to engage the insert ring and locate the insert ring on the end of the pipe; and



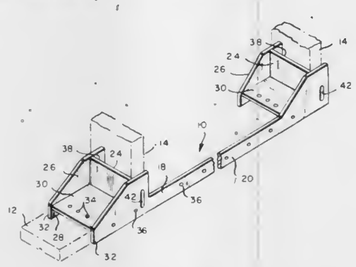
locking means for selectively fixing said second slide member with respect to said first slide member to locate said holding recess with respect to said gauging surface.

4,625,415

STUD SPACER

Damon Diamontis, 520 Mt. Auburn St., Watertown, Mass. 02172

Filed Feb. 26, 1985, Ser. No. 705,713
Int. Cl.[4] G01B *3/30*
U.S. Cl. 33—180 R **7 Claims**



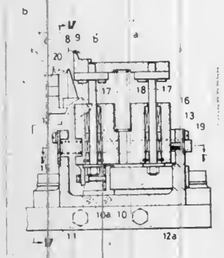
1. A stud spacer comprising a rigid, elongate first support, longitudinally-spaced dividers fixed at one end to one side of said first support at right angles thereto, the spaces between dividers corresponding to the distance between studs and means for anchoring the spacer to the structure to which the studs are to be secured, said elongate support containing sight openings adjacent the dividers, the distance between sight openings and longitudinally-spaced second supports fixed to the respective opposite ends of te dividers providing support for said ends corresponding to the on center spacing required by the building code and an anchor member adjacent each divider fixed to said elongate support and said second supports, containing holes for receiving fastening means to secure the spacer.

4,625,416

CLEARANCE MEASURING APPARATUS FOR AN ASSEMBLY DEVICE

Keizaburo Ohtaki, Hatoyama; Ryo Niikawa, and Masashi Sakata, both of Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,729
Claims priority, application Japan, May 16, 1984, 59-70405
Int. Cl.[4] G01B *7/02;* **B23P** *21/00*
U.S. Cl. 33—180 AT **4 Claims**



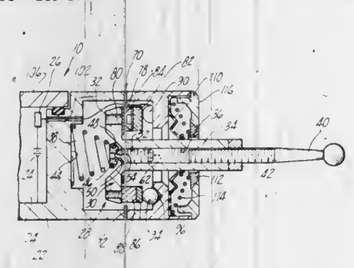
1. A clearance measuring apparatus to be used on a set jig for holding a component part which is to be assembled with a product main body, said apparatus being for measuring the amount of a clearance formed between circumferential edges of a component part assembling portion of the product main body and the component part, the apparatus comprising a stationary claw fixed to the set jig and arranged to be brought into engagement with the circumferential edge of the component part, a casing attached to the set jig, a pair of guide bars mounted in the casing aligned along the clearance measuring direction, a slidable frame movably mounted on the guide bars, a first spring urging the frame in the clearance measuring direction away from the stationary claw, a pair of rods slidably mounted on the slidable frame, a plate mounted on said rods, a second spring urging said plate in a direction towards the product main body, a movable claw mounted on said plate being thereby movable in the clearance measuring direction for engagement with the circumferential edge of the component part assembling portion, and detecting means for detecting a displacement amount of the movable claw in relation to the stationary claw.

4,625,417

PROBE WITH STYLUS PRESSURE ADJUSTMENT

Robert F. Cusack, Grosse Pointe, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Jun. 17, 1985, Ser. No. 745,863
Int. Cl.[4] G01B *3/22*
U.S. Cl. 33—169 R **16 Claims**



1. In a probe having a stylus projecting from one end of a housing for detecting contact with an object, said probe having a movable member connectable to the stylus and bias means for urging the movable member into a given rest position when the stylus is free from contact, the improvement wherein:

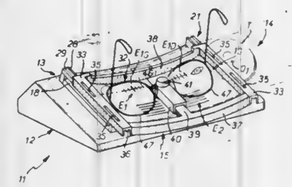
said movable member is provided with a bore to which the stylus is removably connected, with the bore extending through the movable member into the interior of the probe housing and providing access to means located within the housing and accessible through the bore for adjusting the bias pressure on the movable member when the stylus is removed.

4,625,418

APPARATUS FOR DETERMINING THE DIAMETER OF A LENS TO FIT AN EYEGLASS FRAME

Christian Joncour, Saint-Maurice, and Annick Leducq, Paris, both of France, assignors to Essilor International Cie Generale d'Optique, Creteil, France

Filed Feb. 28, 1986, Ser. No. 834,599
Claims priority, application France, Mar. 8, 1985, 85 03423
Int. Cl.[4] G01B *5/00;* **A61B** *3/10*
U.S. Cl. 33—200 **15 Claims**



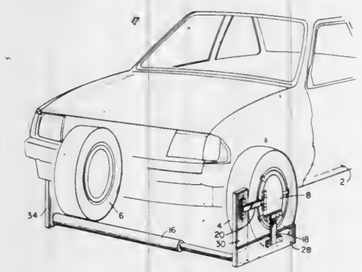
1. Apparatus for determining the diameter of an unprocessed ophthalmic lens to fit a particular eyeglass frame, comprising a base, a guide on said base adapted to receive a card carrying diagrams of available unprocessed ophthalmic lenses, and a support on said base adapted to receive the eyeglass frame to be fitted with lenses, wherein said card guide is fixed relative to said base and comprises an elongate slote adapted to allow said card to slide within it and said frame support is mobile relative to said card guide in the direction at right angles to said slot.

4,625,419

WHEEL ALIGNMENT MEASURING APPARATUS

Osmond Beissbarth, Sulzbacherstrasse 15, 8000 Munich 40, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 700,019
Claims priority, application European Pat. Off., Feb. 8, 1984, 84101304.8
Int. Cl.[4] G01B *5/255, 7/315*
U.S. Cl. 33—203.17 **11 Claims**



1. A wheel alignment measuring apparatus for use on a pair wheels of a motor vehicle comprising:

gage disks adapted to be applied to said vehicle adjacent to said wheels at right angles to the respective axes of rotation thereof,

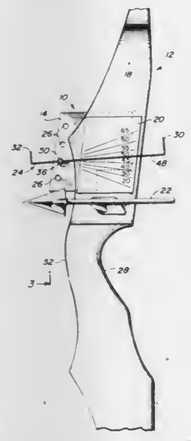
a support yoke adapted to be placed athwart said vehicle adjacent to said pair of wheels,

measuring plates mounted on said yoke at right angles thereto and extending horizontally as far as points under said respective gage disks when said yoke is located in an operational position athwart said vehicle,

at least one angle measuring device being made up of a housing, a head pivotally mounted on said housing for rocking motion about an axis of said housing, and an angle transducer joined to said head for sensing rocking motion thereof and providing an output signal representative of such rocking motion,

said angle measuring device being adapted to be removably mounted with said housing on said measuring plate and with said head on said gage disk with said housing axis being orientated essentially vertical to sense an angle related to toe-in.

4,625,420
BOW SIGHT FOR COMPOUND BOWS
Jack Figured, 446 - 15th St., Scranton, Pa. 18504
Filed Feb. 14, 1986, Ser. No. 829,174
Int. Cl.[4] F41G *1/46*
U.S. Cl. 33—265 **11 Claims**



1. A sighting device to be used with a compound bow having a belly, said sighting device comprising:

(a) a generally planar bow mounting plate sized to be mountable on a side of said bow belly so that a portion of said plate extends beyond the front of said bow to form a bracket, said bracket including a plurality of sight assembly apertures; and,

(b) a rotatable sight assembly including a sleeve, a sight support rod journalled through said sleeve and sight means connected by an intermediate shaft, said shaft mounted transversely through said sight support rod and sleeve, wherein said sight support rod is inserted into one of said plurality of sight assembly apertures to rotatably attach said sight assembly to said mounting plate,

so that said sight means are pivotably adjustable for varying target distances.

4,625,421
ARCHERY BOW SIGHTING DEVICE
Juergen M. Strauss, 29 Blairmore Dr., Trenton, N.J. 08690
Filed Nov. 6, 1985, Ser. No. 795,588
Int. Cl.[4] F41G *1/46*
U.S. Cl. 33—265 **4 Claims**

1. An archery bow sighting device comprising:

(a) a body member fixedly securable with respect to an archery bow to be immovable with respect thereto;

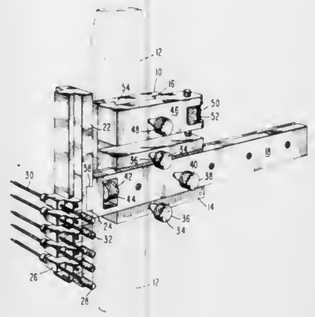
(b) a vertical coarse adjustment block positioned adjacent to said body member and being vertically movable connected thereto;

(c) a vertical interlocking means positioned connected to said body member and to said vertical coarse adjustment block to allow only vertical movement of said vertical coarse adjustment block with respect to said body member;

(d) a longitudinal adjustment arm positioned adjacent to said vertical coarse adjustment block and being longitudinally movably connected thereto;

(e) a longitudinal interlocking means positioned connected to said vertical coarse adjustment block and said longitudinal adjustment arm to allow only relative longitudinal movement therebetween;

(f) a lateral adjustment bar positioned adjacent to said longitudinal adjustment arm and being laterally movably connected thereto;



(g) a lateral interlocking means positioned connected to said longitudinal adjustment bar and said lateral adjustment bar to allow only relative lateral movement therebetween;

(h) a plurality of pin blocks movably secured with respect to said lateral adjustment bar, each pin block defining a pin mounting means therein;

(i) a plurality of sighting pins being mountable with respect to each of said pin mounting means of each of said pin blocks; and

(j) a vertical fine adjustment block positioned adjacent to said body member and being vertically movable with respect thereto, said vertical fine adjustment block further including a thumbscrew means extending therethrough into abutting engagement with respect to said body member to selectively secure said vertical fine adjustment block with respect to said body member to prevent relative movement therebetween.

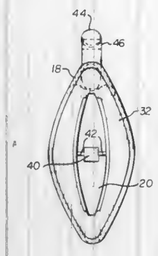
4,625,422
ARCHERY BOW SIGHT MOUNTED ON THE BOW STRING AND METHOD OF MAKING SAME
Charles W. Carlson, 2811 - 13 Mile Rd., Rockford, Mich. 49341
Filed Oct. 11, 1985, Ser. No. 786,665
Int. Cl.[4] F41B *5/00;* **F41G** *1/00*
U.S. Cl. 33—265 **19 Claims**

1. A bow sight for use with a bow to provide targeting accuracy, the bow sight adapted to be mounted to a bow string and comprising:

a frame portion having front and rear surfaces and inner and outer edge surfaces, said outer edge surfaces having channels formed therein adapted to engage strands of said bow string, and said inner edge surfaces forming a relatively large open central area extending through said frame portion;

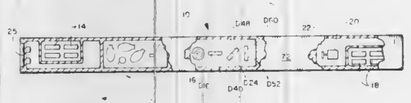
means imbedded within said frame portion for imparting rigidity and strength to said frame portion;

aiming means positioned within said open central area of said frame portion for locating a target within said open area; and



securing means comprising arms connected to said frame portion for securing said aiming means within said open area.

4,625,423
ELECTRONIC INCLINATION GAUGE
Robert R. Sackett, 2282 Caminito Pescado #43, San Diego, Calif. 92107
Filed Sep. 24, 1985, Ser. No. 779,470
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 **24 Claims**



1. An inclination gauge comprising:

a bar for measuring selected angles of inclination relative to a vertical or horizontal axis;

optic sensing means for optically sensing said selected angles of inclination of said bar from said vertical or horizontal axis;

a plurality of indicator means connected to said sensing means, one of said plurality of indicating means for indicating each selected angle of bar inclination from said vertical or horizontal axis;

a power circuit for energizing said sensing means and plurality of indicator means; and

a gravity operated switch means in series between said power circuit, said plurality of indicator means and said optic sensing means for connecting said power circuit to said optic sensing means and plurality of indicator means only when said bar is positioned for measuring one of said selected angles of inclination relative to said vertical or horizontal axis.

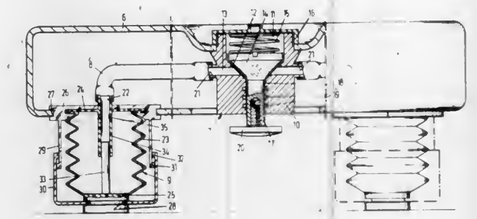
4,625,424
QUICK LEVELING APPARATUS
Cornelis F. de la Haye, Gevers Deynootweg 590, 2686 BS 'S-Gravenhage, Netherlands
Filed Dec. 28, 1984, Ser. No. 687,515
Int. Cl.[4] A47B *9/10*
U.S. Cl. 33—367 **10 Claims**

1. Apparatus for leveling a surface, comprising at least three bellows means for supporting said surface, each said bellow means containing a pressure medium;

a casing having a casing wall provided with an opening therein, and a diaphragm closing said opening;

a chamber inside said casing and having a chamber wall provided with an opening adjacent said casing wall opening, a valve member mounted in said chamber, spring means urging said valve member to a closed position in which said valve member engages said chamber wall, closes said chamber wall opening and extends into said casing wall opening;

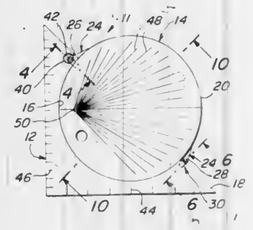
a conduit connected between each said bellows means and said casing, at least two of said conduits being in communication with one another when said valve member is urged against the bias of said spring means out of engagement with said chamber wall, said valve member being



operable to disconnect said conduits from one another when in the closed position; and

a reciprocable actuator for said valve member mounted on the outside of said casing adjacent said diaphragm and arranged to be pushed into engagement with said valve member via said diaphragm and to move said valve member against the bias of said spring means out of engagement with said chamber wall.

4,625,425
UNIVERSAL TRIANGLE
Ricardo G. Senno, 46-63 Parsons Blvd., Flushing, N.Y. 11355, and Pamela de Toledo, 382 State St., Brooklyn, N.Y. 11217
Filed Oct. 1, 1985, Ser. No. 782,480
Int. Cl.[4] B44D *3/30*
U.S. Cl. 33—477 **6 Claims**



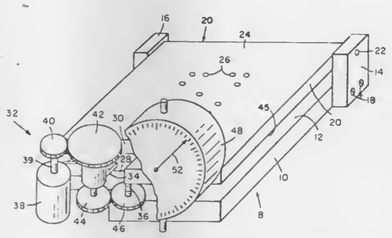
1. A universal triangle implement comprising in combination, a right triangle and a circular disk rotatably supported on said triangle, said triangle and said circular disk each including various measurement and drafting aid means, said triangle comprising a semi-circular notch forming a seat to rotatbly receive said disk, a groove formed in the periphery of said disk, a tongue projecting from the periphery of the notch and sidably engaging said groove, a removable wire extending around said groove whereby said disk is retained in said notch and can freely rotate with respect to the triangle, lock means extending from the triangle into the groove for locking the disk in a desired place with respect to the triangle, and means for adjusting the tension in said wire to control the ease of rotation of the disk with respect to the triangle.

4,625,426

DYNAMIC ALIGNMENT FIXTURE WITH FEEDBACK CONTROL

Joe S. Hunter, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 21, 1986, Ser. No. 820,035
Int. Cl.[4] G01B *3/56, 5/24*
U.S. Cl. 33—537 **4 Claims**



1. A dynamic alignment fixture for automatically measuring the input axis of a gyro comprising:

a. a base plate adapted to be mounted on a rate table said base plate having first and second ends;

b. an upper plate having first and second ends, said upper plate having said first end pivotally mounted at said first end of said base plate, said upper plate positioned above said base plate and disposed for having a gyro mounted thereon;

c. a resolution displacement gauge mounted on said pivot plate at said second end thereof, said gauge having an indicator for indicating the position of said pivot plate relative to said base plate;

d. adjusting means mounted adjacent a second end of said base plate for pivoted support of said upper plate; and,

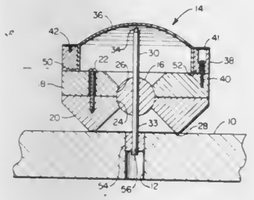
e. feedback control means for automatically controlling said adjusting means for pivotal movement of said upper plate, said feedback control means disposed for utilizing the output of said gyro as an error signal, responsive to energization of said gyro, to control said upper plate relative to said rate table until the gyro output is nulled.

4,625,427

APPARATUS FOR MEASURING THE ANGLE OF A HOLE IN A SURFACE

Paul A. Rine, 5071 Gunston Dr., Columbus, Ohio 43232

Filed Nov. 22, 1985, Ser. No. 800,690
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—534 **11 Claims**



1. Apparatus for measuring the angle of the centerline of a circular hole of uniform diameter with respect to the surface surrounding the hole, said apparatus comprising:

a spherical ball having a diameter and a center point,

said ball being supported between an upper and a lower plate, each plate having an opening therethrough, said plate openings being coaxial, said plates each having a surface in said opening conforming to the surface of the ball, the conforming surface in each opening having means having one diameter less than said ball diameter and another diameter at least as great as said ball diameter, said plates being in contact with each other and in contact with said ball for preventing all movement of said ball with respect to said plates except for rotation of said ball,

a linear pointer extending through the ball having a sharp point on its upper end, the pointer extending through the center point of the ball,

a ferrule mounted on the lower end of said pointer, said ferrule being cylindrical and of the same diameter as the hole, the pointer being inserted into an aperture in said ferrule, the aperture being coaxial with the axis of the cylindrical ferrule,

the lower plate having a contact surface for engaging the surface surrounding said hole,

a semi-spherical transparent dome mounted above said upper plate, the inner surface of said dome being in close proximity to the point on said pointer, the inner surface of said dome having a radius slightly greater than the distance from the center point of the ball to the tip of the point of the pointer, and

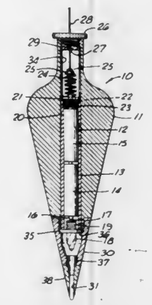
the dome including lines forming concentric circles about an axis whereby an observer may observe the point of the pointer through the transparent dome and its location with respect to the axis of the circles, the axis of the circles being perpendicular to the contact surface of the lower plate.

4,625,428

LIGHTED PLUMB BOB

Gerald E. Griffin, 1207 Deerfield Ct., Ontario, Calif. 91761

Filed Apr. 26, 1985, Ser. No. 727,732
Int. Cl.[4] G01C *15/10*
U.S. Cl. 33—348 **6 Claims**



1. An improved plumb bob of the type having a generally frusto-conical, weighted body and a line affixed to the wide end of the body, wherein the improvement comprises:

an axial bore in said body, said bore terminating at its lower end with a removable, generally conical member, said generally conical member having an axial opening, said member also having means for attachment to the weighted body;

a light bulb and battery assembly held within said axial bore, said assembly including a conductive cylindrical housing having an insulative cap on its upper end and said assembly being oriented so that the light bulb portion thereof is directed downwardly, said light bulb having two conventional terminals thereon and said assembly having at least one battery therein and a first pole of said battery touching one terminal of said light bulb;

cap means affixed to said weighted body at the upper end thereof, said cap means having an opening therethrough, said opening lying along the axis of said weighted body, the bottom end of said cap means being electrically conductive and being electrically connected to said weighted body and said line passing through said cap means;

electrically conductive spring means electrically connected at its lower end to a second pole of said battery within said weighted body by way of a conductive pin held by said insulative cap, which conductive pin passes therethrough and is affixed to the second pole of said battery and having an electrical contact point at the upper end of said spring means, said spring means having a relaxed length less than the distance between its point of attachment on said battery and the bottom end of said cap means and said spring having a flexibility so that when a force equal to the weight of said weighted body is exerted on said spring, said spring means will stretch an amount greater than said distance between its point of attachment on said battery and the bottom end of said cap means, the second end of said spring means being affixed to the lower end of said line whereby when said plumb bob is supported by its line, the spring means will stretch and touch the lower end of the cap means thereby completing the circuit and turning on said light bulb which will shine on axial beam of light directly downward by marking the point directly below said plumb bob; and

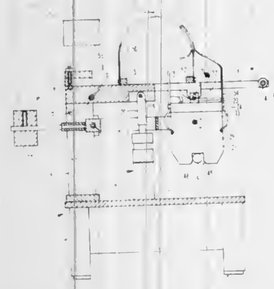
an electrically non-conductive shield positioned in said axial bore between said spring means and the axial bore, whereby electrical contact between said spring means and said axial bore is prevented.

4,625,429

APPARATUS FOR CHECKING THE ROUNDNESS OF ROTATING PARTS

Franco Danielli, Zola Predosa, Italy, assignor to Finike Italiana Marposs S.p.A, S. Marino di Bentivoglio, Italy

Filed May 23, 1985, Ser. No. 737,055
Claims priority, application Italy, May 28, 1984, 3475 A/84
Int. Cl.[4] G01B *7/12*
U.S. Cl. 33—504 **14 Claims**



1. An apparatus for checking the roundness of rotating parts, comprising:

support means;

control means mounted on the support means for supporting the part to be checked and rotating it about an axis;

measuring means including a support device, two measuring heads fixed to the support device and adapted to cooperate with diametrically opposed points of the part for providing relevant measurement signals, and two elements fixed to the support device, these elements being arranged on the same side with respect to the geometric plane defined by said axis and by the straight line passing through said diametrically opposed points and defining substantially a Vee rest adapted to remain into stable contact with the part, for positioning the support device and the measurement heads with respect to the rotating part; and

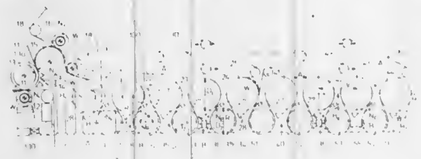
processing means receiving the signals of the measuring heads for calculating the out-of-roundness of the part depending on the difference between the maximum and minimum values of a linear combination of said signals.

4,625,430

DRYING SECTION AND METHOD IN PAPER MACHINE

Jouko Aula, and Raima Kerttula, both of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Filed Jun. 4, 1985, Ser. No. 741,227
Claims priority, application Finland, Jun. 6, 1984, 842285; Jun. 8, 1984, 843094
Int. Cl.[4] F26B *3/24*
U.S. Cl. 34—13 **44 Claims**



1. A method for drying a web in a multi-cylinder drying section of a paper machine, the drying section including at least one single-fabric draw drying cylinder group comprising two lines of cylinders which are spaced from each other and a drying fabric running between cylinders of the two lines, the web being supported by said drying fabric in the spaces between the cylinder lines and carried by said drying fabric into direct contact with a heated surface of a drying cylinder of one line, the fabric being in direct contact with surfaces of such cylinders of the other line with the web situated on an outer surface of said drying fabric, comprising the steps of:

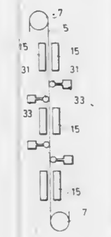
cooling the drying fabric as it runs between said cylinders with the surfaces of which the web is in direct contact, and wherein said cooling step is carried out by bringing said drying fabric into direct contact with a surface of at least one contact-cooling guide cylinder.

4,625,431

STRIP COOLING APPARATUS FOR CONTINUOUS ANNEALING FURNACE

Tadashige Nanba; Yasuo Tokita; Tetsuo Fukuzawa; Mitsushige Shiota; Toshinori Yoshida; Masato Yokata; Kozaburo Ichida; Norichika Nagira; Goki Yamamoto, and Masashi Mitsuzuka, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,430
Claims priority, application Japan, Nov. 14, 1984, 59-238506; Nov. 14, 1984, 59-238507; Nov. 14, 1984, 59-171681[U]
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—62 **3 Claims**



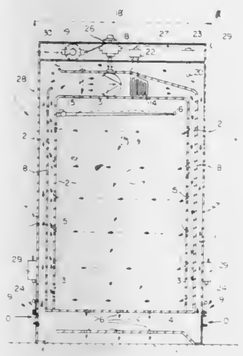
1. A strip cooling apparatus for a continuous annealing furnace to continuously treat elongated steel strip that is fed in the longitudinal direction thereof, which comprises:

a furnace chamber having walls which define a passage for the strip;

a pair of cooling gas chambers attached to the walls of the

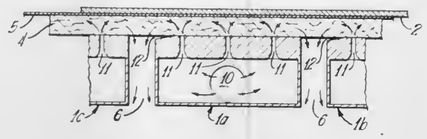
furnace so as to face each other across the strip, each chamber having a front facing a corresponding side of the strip;
nozzles provided to the front of each cooling gas chamber, each nozzle facing the strip, having a round outlet, shooting forth a stream of pressurized gas to the strip being fed, separated from the strip by a distance z of not more than 70 mm, and projecting from the front of the cooling gas chamber by a length of not less than (100−z) mm;
forced gas circulation means having an intake duct communicating with the furnace chamber and discharge ducts communicating with the cooling gas chamber;
gas cooling means provided in the intake duct;
a pair of rotatable holding rolls disposed on both sides of the strip in a staggered manner and reciprocatably attached to the furnace walls so as to press the strip at a right angle thereto; and
means for moving the holding rolls back and forth to the desired positions.

4,625,432
APPARATUS AND METHOD FOR DRYING AND STERILIZING FABRICS
Hans Baltes, Heideweg 27, D-4600 Dortmund 30, Fed. Rep. of Germany
Filed Nov. 30, 1984, Ser. No. 676,578
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343236
Int. Cl.[4] F26B *9/06*
U.S. Cl. 34—151 **10 Claims**



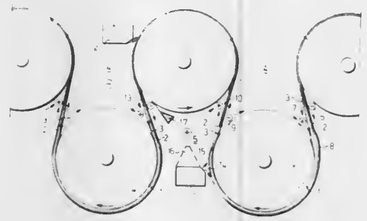
1. Apparatus for drying and sterilizing fabrics comprising:
a drier cabinet having walls;
means for suspending fabric parts in said cabinet; and
means for generating, distributing and circulating first warm air in said cabinet for drying purposes and thereafter hot air for the sterilization of the fabric parts;
means to cool said cabinet walls by causing fresh air to flow along at least a portion of the interior of said walls of said drier cabinet to cool same comprising distributing ducts in at least a portion of said walls and including at least one fresh air inlet port in at least one of said walls, said distributing ducts directing said fresh air to said means for generating, distributing and circulating first warm air, and at least one exhaust air outlet port in at least one of said walls.

4,625,433
FIBROUS PACK DRYING METHOD AND APPARATUS
Dean L. Giancola, Perrysburg; Craig D. Kowalski, and Frederic H. Paetz, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 18, 1985, Ser. No. 724,697
Int. Cl.[4] F26B *3/06*
U.S. Cl. 34—23 **7 Claims**



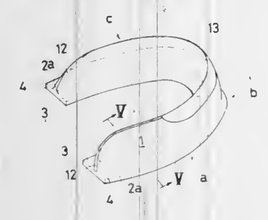
1. Apparatus for drying a porous pack of mineral fibers, said pack having a facing on one side thereof, comprising a porous conveyor belt supporting and transporting said pack, and a plurality of apertured members being in spaced apart relationship to each other for injecting gas through said conveyor belt and into the unfaced side of said pack for drying, said apertured members forming therebetween passageways for the exit from said pack of gas deflected by said facing.

4,625,434
ARRANGEMENT IN CYLINDER DRYER
Ingemar Karlsson; Karl-Hugo Andersson, both of Växjö , and Rolf Petersson, Eneryda, all of Sweden, assignors to Flakt Aktiebolag, Nacka, Sweden
Filed Mar. 9, 1983, Ser. No. 473,447
Claims priority, application Sweden, Mar. 25, 1982, 8201904
Int. Cl.[4] F26B *13/08*
U.S. Cl. 34—114 **7 Claims**



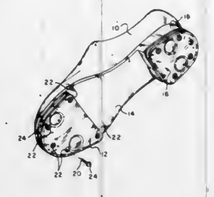
1. Arrangement in a cylinder drier intended for incorporation in a paper machine and including a plurality of cylinders arranged in two substantially parallel rows, the paper web being trained serpentine about said cylinders during drying, said web being carried by a single endless porous fourdrinier wire to provide a two-ply assembly with an exposed web face and an exposed wire face, said assembly pressing the exposed web face radially inward against the cylinder surfaces in one row of cylinders and positioning the wire between the web and the cylinder surfaces in the other row with the exposed wire face directed radially inward, a series of pockets being formed by the web and the cylinders lying consecutive in the travelling direction of the web, at least one first pocket having sides defined by the exposed web face and a bottom defined by a cylinder of said one row, and at least one second pocket having sides defined by the exposed wire face and a bottom defined by a cylinder of said other row, said cylinder rows being spaced so that said assembly passes in a run from contact with one of said consecutive cylinders to contact with the next of said consecutive cylinders, in said run the web face facing a first pocket and the wire face facing a second pocket;
to prevent the paper web from lifting from the wire when it travels in said run between the cylinders, means being provided for blowing air into said first pocket, such that excess pressure is generated in the first pocket to counteract the negative pressure produced by the assembly passing out of contact with said one of said cylinders, and means being provided in said second pocket for blowing air obliquely against the wire toward its direction of travel when the wire is moving into the second pocket to generate a sub-pressure in the pocket to counteract the excess pressure produced by the assembly passing into contact with said next of said cylinders, thereby substantially eliminating the pressure difference across the assembly in the nip where the web and the wire pass into contact with said next of said cylinders, said blowing means in said second pocket being aligned with and confronting a cylinder so that it blows against the wire at a point where the two-ply assembly is engaged on the cylinder.

4,625,435
SPORTS SHOE
Noboru Ueda, Chikushino, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Aug. 31, 1984, Ser. No. 646,120
Claims priority, application Japan, Sep. 1, 1983, 58-137005[U]; Mar. 6, 1984, 59-31317[U]
Int. Cl.[4] A43B *23/08*
U.S. Cl. 36—68 **6 Claims**



1. A heel counter for a sports shoe comprising:
a heel reinforcement wall shaped to include an inner surface in conformity with an outer surface of a heel portion of an upper of a sports shoe; and
an attaching portion formed to project inwards from a lower end portion of the heel reinforcement wall and a flange portion formed to project outwards from the lower end portion of the heel reinforcement wall are provided so that the inner surface of the heel reinforcement wall is adhered to the outer surface of the heel portion of the upper;
the attaching portion thereof is interposed between and adhered to an inwardly bent portion of the upper portion and a shoe sole, and the flange portion thereof is adhered to an upper surface of an outer peripheral edge portion of the shoe sole for preventing rolling of the heel portion;
said heel reinforcement wall of the heel counter comprises at least two layers including a main reinforcement wall made of a comparatively hard material and a subsidiary reinforcement wall made of a comparatively soft material and said main reinforcement wall and the subsidiary reinforcement wall are substantially equal in height one to another a medial portion of the heel counter, and the subsidiary reinforcement wall is larger in height than the main reinforcement wall at a rear side portion and a lateral portion of the heel counter.

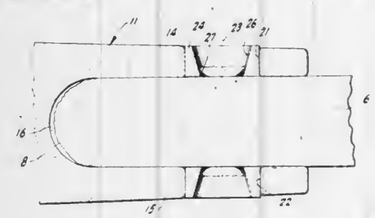
4,625,436
CLOGGING DANCE TAP DEVICE
Walter T. Stevens, Jr., 105 Fellowship Rd., Moorestown, N.J. 08057
Filed Jun. 24, 1985, Ser. No. 748,173
Int. Cl.[4] A43B *5/12*
U.S. Cl. 36—113 **18 Claims**





1. A tap device to be attached to the shoe bottom surface of at least one of the heel and toe comprising:
(a) a base plate member having a front end and a back end, the direction between the ends being common to the length of the shoe,
(b) a plurality of holes through the base plate each hole being of a size to allow the shank of a nail with a head to fit through but to prevent the head from passing through,
(c) a tapping plate member substantially the same size as said base plate,
(d) attachment means comprising at least two rivet means to attach the tapping plate to the base plate while allowing the tapping plate to move, canting back and forth toward the front end and toward the back end, and
(e) a plurality of holes through the tapping plate, one each aligned over every hole in the base plate, each hole being of a size to barely allow the head of the nail to pass through the hole in the tapping plate.

4,625,437
SHROUD FOR A DIGGING BUCKET LIP
Linden T. Curtis, Temecula, Calif.; William G. Franklin, Tucson, Ariz., and John R. Olds, Schererville, Ind., assignors to Engineered Equipment Company, Corona, Calif.
Filed Apr. 15, 1985, Ser. No. 723,206
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—141 R **6 Claims**



1. A shroud for a solid digging bucket lip having an outer lip surface and an inner lip surface parallel to each other and having a transversely extending leading edge between said lip

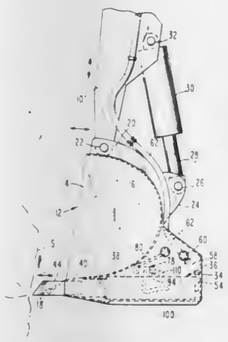
surfaces comprising a separate shroud body having a forward portion substantially symmetrical about a central plane, a pair of spaced legs integral with and extending rearwardly from said forward portion and parallel to each other, said legs having leg surfaces in positions substantially to abut said outer and said inner lip surfaces and to abut said leading edge, means including a wall defining an aperture through one of said legs between said leg surfaces and open to said lip, a ring having an inner ring surface and an outer ring surface, said ring being slidable in said aperture against said wall and in a direction normal to said plane and into abutment of the end of said ring with said solid bucket lip, and a welding bead on said bucket lip and on and extending around the inside of said inner ring surface and leaving a portion of said bucket lip exposed through said aperture.

4,625,438

EXCAVATING BUCKET HAVING POWER DRIVEN, INDIVIDUALLY CONTROLLED DIGGING TEETH

Daniel S. Mozer, 126 Grandview Ave., Yardville Heights, N.J. 08620

Filed Sep. 20, 1985, Ser. No. 777,996
Int. Cl.[4] E02F *5/00*
U.S. Cl. 37—141 T **15 Claims**



1. In a power-driven digging and loading bucket of the type mounted on a balance beam of a piece of heavy-duty construction equipment, said bucket having a leading edge, the improvement that comprises:

(a) a row of digging units mounted on said leading edge, each of which includes

(1) a digging tooth projecting beyond said leading edge in position to strike and break up a work surface,

(2) a hollow casing fixedly mounted in said bucket,

(3) pneumatic hammer means for imparting high-speed reciprocating movement to said tooth, said hammer means including an impact hammer housing slidably mounted in the casing for advancement bodily toward said work surface with the tooth during said reciprocating movement of the tooth, and

(4) means for advancing said tooth and the housing of its associated hammer means bodily toward said surface;

(b) means for directing air under pressure into the several hammer means from a source common to all of said units; and

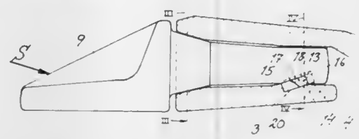
(c) means for shutting off the supply of air under pressure to each hammer means independently of the other hammer means responsive to bodily advancement of its housing through a predetermined distance.

4,625,439

EXCAVATING TOOTH RETAINING MEANS

Arne Johansson, Karlskoga, and Torsten Larsson, Nybro, both of Sweden, assignors to AB Bofors Wear Parts, Bofors, Sweden

Filed Jul. 18, 1984, Ser. No. 632,072
Claims priority, application Sweden, Jul. 26, 1983, 8304134
Int. Cl.[4] F02F *9/28*
U.S. Cl. 37—142 R **8 Claims**



1. A wear-parts system for tools in an earth moving machine having a holder member and a wear-part member, said members being releasably connected to each other by a protrusion on one of said members and a mating opening on the other of said members, said wear-part member being locked to said holder member by easily removable locking wedge means, wherein

said holder member comprises a first tapered contact surface and a second contact surface, and said wear-parts member comprises a third tapered contact surface for coacting with said first tapered contact surface, and a fourth contact surface for coacting with said second contact surface,

said first and third tapered contact surfaces being adapted to cooperate with each other in a first contact area and said second and said fourth contact surfaces being adapted to cooperate with each other in a second contact area,

said first contact area and said second contact area being separated from each other by a zone in which there is a clearance between said holder member and said wear-part member, and

said locking wedge means is located at said second contact area and comprises a wedge member having an angled chamfered flank for facing a cooperating angled flank, said locking wedge means being oriented to produce a wedging effect between said wear-part member and said holder member by forcing said wear-part member rearwardly in mating engagement with said holder member, and bringing said first and said third tapered surfaces into contact with each other in said first contact area, and forcing a portion of said second and fourth contact surfaces on the side opposite to said locking wedge sideways against each other in said second contact area to achieve contact which is free of play in both of said first and second contact areas.

4,625,440

TENTERING FRAME FOR SHEET-LIKE MEMBERS

Hiep D. Dang; Roy L. Hicks, and Joel F. M. Leathers, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 29, 1985, Ser. No. 759,769
Int. Cl.[4] D06C *3/08*
U.S. Cl. 38—102.5 **7 Claims**

1. A tentering apparatus for tensioning a sheet-like member comprising:

(a) at least four clamping assemblies adjacent to each other and arranged in a picture frame type configuration and adapted for clamping at least a portion of the periphery of the sheet-like member, the clamping assemblies comprising at least two elongated, generally planar members through which the said periphery of the sheet like material passes wherein the elongated portion of the members is adjacent and parallel to each other, and held together with a fastening means;

(b) at least four corner members interposed between the four clamping assemblies and adapted to be connected at the ends of the four clamping assemblies; and

(c) at least one threaded rod directly connecting at least one of the corner members to at least one of the clamping assemblies, at least one threaded rod containing a wing nut for tensioning the sheet-like member at least in the vertical direction, wherein the sheet-like member is tensioned by at least one of the threaded rods and wing nuts.

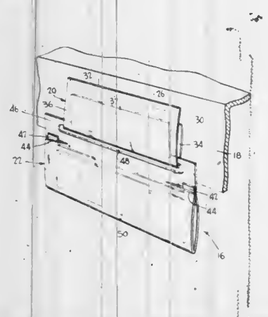


4,625,441

WAREHOUSE LABEL HOLDER ASSEMBLY

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Filed Jun. 26, 1985, Ser. No. 748,830
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—10 R **7 Claims**



1. A label holder assembly comprising primary and secondary label-holding pockets each formed of sheet material such as clear plastic, the primary pocket comprising front and back panels connected along a lower edge of the pocket, and adhesive means on an upper edge portion of the front panel for securing the pocket to a front surface of a product shelf and the like with the back panel being supported against the surface, the back panel having a free upper edge located below the level of said upper edge portion of the front panel, the secondary pocket having front and back panels connected along a lower edge of the pocket and a web portion at the upper edge of the pocket with an elongate transverse slot for hooking over the free upper edge of the primary pocket from behind in order releasably and selectively to suspend the secondary pocket from the primary pocket.

4,625,442

CATTLE STUNNING GUN

Richard C. Hill, 300 W. College, Independence, Mo. 64015, and Roger J. Hancox, 4 Blythe Close, Church Farm, Burntwood, Staffordshire, England

Filed May 22, 1984, Ser. No. 612,901
Int. Cl.[4] A22B *3/02*
U.S. Cl. 42—1.12 **6 Claims**

1. A stunning gun comprising:

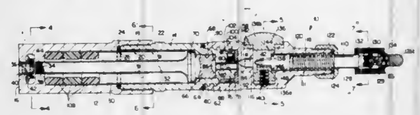
a gun body having a muzzle end and a breech end and a bore between the muzzle and breech ends, said body presenting at the breech end thereof a cartridge chamber for receiving an explosive cartridge;

a bolt mounted in said bore for axial movement between an extended position and a retracted position, said bolt having a leading end located beyond the muzzle end in the extended position and a trailing end located adjacent the cartridge chamber in the retracted position;

a breech cap on the breech end of said body;

a firing pin in said breech cap for exploding a cartridge upon impact therewith;

trigger means for effecting movement of said firing pin against a cartridge in the cartridge chamber to effect explosion of the cartridge and forceful propulsion of the bolt from the retracted position to the extended position;



a a rigid collar encircling said bolt for releaseably retaining said bolt in the retracted position, said collar being mounted in said body at the muzzle end thereof for limited movement and presenting an inside surface engageable with the leading end of said bolt to maintain the bolt in the retracted position; and

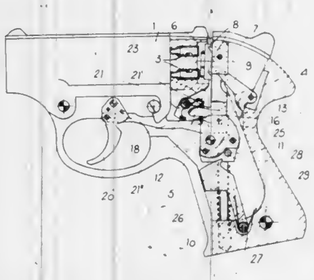
biasing means acting against said collar on one side thereof for biasing said collar toward a skewed position wherein said inside surface acts against the leading end of the bolt to retain the bolt in the retracted position, said biasing means being yieldable to permit said leading end of the bolt to release from said inside surface as the bolt is propelled toward the extended position.

4,625,443

SINGLE- OR DOUBLE-ACTION TRIPPING MECHANISM FOR FOUR-BARRELLED PISTOLS

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi P.Beretta S.p.A., Italy

Filed Sep. 7, 1984, Ser. No. 648,698
Claims priority, application Italy, Sep. 14, 1983, 5189 A/83
Int. Cl.[4] F41C *19/00*
U.S. Cl. 42—42.03 **5 Claims**



1. A tripping mechanism for a pistol having four barrels, a firing pin for each barrel, a hammer mounted for movement between a cocked position away from the firing pin and a firing position toward the firing pins, a rotating head rotatably mounted to the hammer and rotatable into successive positions to strike successive firing pins when the hammer is moved into its firing position, head rotating means engaged with the head to rotate the head with movement of the hammer toward its cocked position, and a trigger mounted for movement between a rest position and a control position, said tripping mechanism comprising:

a connecting rod connected to the trigger for movement with movement of the trigger, said connecting rod having

a disengaging tappet, an arming tappet and a portion spaced from the trigger and being adjacent to the hammer;

a trip lever having first and second extremities, said hammer having a cocking tooth, said trip lever being movable into a position with said first extremity thereof engaged with said cocking tooth when said hammer is in its cocked position, said second extremity being in a path of movement of said disengaging tappet, said connecting rod being movable to move said disengaging tappet against said second extremities to move said trip lever so as to disengage said first extremity from said cocking tooth, said connecting rod being moved by movement of the trigger from its rest position to its control position; and

the hammer having a frontal shoulder engageable by said arming tappet of said connecting rod with movement of the trigger from its rest position to its control position, said hammer having a step extending from said shoulder and overlying said portion of said connecting rod which is spaced from the trigger, said portion of said connecting rod engaging against said step with further movement of said connecting rod to disengage said arming tappet from said frontal shoulder when the hammer has been moved to its cocked position by movement of said connecting rod, the continued movement of said connecting rod causing said disengaging tappet of said connecting rod to engage said extremity of said trip lever to move said first extremity of said trip lever away from said cocking tooth of the hammer.

4,625,444

HAIR TRIGGER FOR A RIFLE

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi P.Beretta S.p.A., Italy

Filed Apr. 12, 1985, Ser. No. 722,780
Claims priority, application Italy, May 30, 1984, 5160 A/84
Int. Cl.[4] F41C *19/02*
U.S. Cl. 42—69.02 **4 Claims**



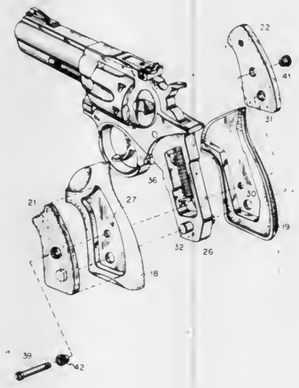
1. A hair trigger for a rifle provided with a principal or normal trigger mechanism and a hair or light trigger mechanism for the firing pin of the weapon, the said normal trigger mechanism comprising a trigger lever pivotally mounted on a pin and capable of angular displacement with a trigger and a trigger slide which is guided vertically and designed to act together with an overlying cam profile of a foot attached to the firing pin, the said trigger lever being displaced by a spring towards the trigger slide while the latter is displaced by a corresponding spring towards the said foot, the said trigger lever acting as a strut to hold the trigger slide in a condition immobilising the firing pin in the retracted cocked position, the said trigger lever being capable of being displaced by the trigger slide when the firing pin is released to fire a projectile, wherein the light trigger mechanism includes a small piston or hammer which is pressed down by a compressible spring and is designed to strike against a front arm of the trigger, an auxiliary trigger lever arresting the said small piston or hammer in a position in which the corresponding compressible spring is compressed, and an auxiliary trigger slide designed to engage the said arm of the trigger to immobilise the auxiliary trigger lever in the condition in which it arrests the small piston or hammer in the cocked position, the said small piston or hammer being capable of being displaced into this position by movement of the trigger towards the small piston or hammer and being capable of being released from the said position by a slight rearward movement of the trigger so that it is released from the said auxiliary trigger slide, the action of the said small piston or hammer on the arm of the trigger causing the trigger lever to move away from the trigger slide in order to release the firing pin when this is held in the cocked position.

4,625,445

GRIPS FOR HANDGUNS

William B. Ruger, Croydon, N.H., assignor to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Mar. 28, 1985, Ser. No. 716,920
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—71.02 **7 Claims**



1. In a handgun having a handle including a handle frame, the improvement comprising

(a) a deformable elastomer grip element positioned on each side of the handle frame, said element including an inside portion engageable with the handle frame and including an outside portion for engagement with the handgun user's hand;

(b) a recess in the outside portion of the grip element;

(c) a non-deformable externally inserted stiffening element in the recess, the size and shape of the recesses and stiffening elements being variable to accomplish the desired flexibility- to-stiffness of the handgun handle; and

(d) fastener and alignment means for fastening and aligning the grip elements, the frame and the stiffening elements.

4,625,446

DETECTOR FOR DETECTING A BIT OF A FISH

Shinichi Morimoto, Nishinomiya, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 21, 1986, Ser. No. 831,612
Claims priority, application Japan, Mar. 4, 1985, 60-30437[U]
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—17 **5 Claims**



1. A detector for detecting a bite of a fish, on a fishing line, said detector comprising:

a fish-bite detection sensor for sensing a pressure caused by a bite of said fish on at least one of a fish-hook connected to said fishing line and a bait rigged on said fish-hook to thereby detect a bite of said fish,

an oscillator electrically connected to said sensor for emitting an output signal responsive to said sensor sensing said pressure, said oscillator being disposed in the proximity of said fish-hook and including a power source,

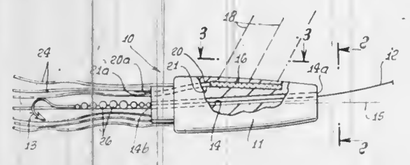
a receiver for receiving said output signal from said oscillator, said receiver being disposed away from said fish-hook.

4,625,447

SOLAR POWERED FISHING LURE

Beverly J. Buchanan, Lakewood, Calif., assignor to Sevenstrand Tackle Corporation, Huntington Beach, Calif.

Filed Mar. 21, 1985, Ser. No. 714,379
Int. Cl.[4] A01K *85/01, 79/02*
U.S. Cl. 43—17.1 **12 Claims**



1. A solar powered fishing lure, comprising

(a) a lure body carried on a fishing line proximate a hook, to be pulled in the water,

(b) a solar cell on the body and proximate one side thereof to receive sunlight transmitted in the water and develop electrical power, and means carried by the body and receiving power from said cell to provide an output which tends to attract fish to the lure,

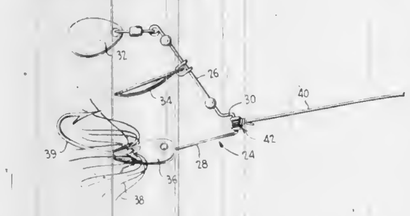
(c) and means on the lure to cause the lure to cooperate with water flowing relatively past the lure to cause the front of the line to be elevated relative to the rear of the lure, and the cell to face upwardly.

4,625,448

FISHING LURE WITH IMPROVED LINE ATTACHMENT

Fred C. Borders, 15801 Empire La., Westminster, Calif. 92683

Filed Jun. 6, 1985, Ser. No. 741,897
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.11 **5 Claims**



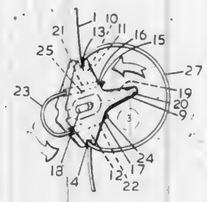
1. In a fishing lure comprising a wire-type shaft bent to form mutually angled arms for receiving a spinner or the like and a concealed hook respectively, the arms defining a line-attachment portion at the junction therebetween, the improvement comprising a bushing with a continuous cylindrical outer surface and a throughbore freely rotatably mounting the bushing on said portion of the shaft with said cylindrical outer surface surrounding and spaced from said shaft whereby the line may be tied around the cylindrical outer surface of the bushing coaxially with said portion of the shaft rather than directly around the shaft.

4,625,449

KNOTLESS PATERNOSTER BOOM

Duncan J. Swinbanks, and Brian J. Swinbanks, both of Isle of Mull, Scotland, assignors to Knotless Fishing Tackle Limited. Isle of Mull, Scotland

Filed Mar. 21, 1985, Ser. No. 714,277
Claims priority, application United Kingdom, Mar. 22, 1984, 8407445
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—42.74 **7 Claims**



1. A knotless paternoster boom for use in holding out a snood from a fishing line which boom comprises a body having an upper and a lower end and a laterally extending boom member adapted for supporting, in use, a snood extending from said boom member generally in the direction in which said boom member extends said boom having upper bore means extending from an inlet at said upper end to an outlet means remote from said inlet thereof and a lower bore means extending from an inlet at said lower end to an outlet means remote from said inlet thereof and prong means associated with said outlet means whereby in use of the boom upper and lower loops may be taken in a line and fed into the bore means, through the upper and lower boom inlets, respectively out of said outlet means and around said prong means, and the line then pulled taut around said boom thereby to secure said boom in a desired position along said line; said body being formed and arranged at said outlet means, and at said inlets and prong means so as to provide pathways for the line between said loops and at the ends of said loops which are substantially free of sharp edges and abrupt discontinuities whereby tightening of the line on the boom is facilitated and the risk of damage to the line when it is pulled taut is minimized;

said bore means comprising two passage means formed and arranged so as to define guided pathways, without any abrupt discontinuities, extending generally directly from said inlets to said outlet means, for said line loops, said outlets being disposed at the front of said boom substantially adjacent the boom member, whereby in use of the boom a loop of line can be simply pushed into each inlet and will upon further pushing automatically emerge out of said outlet means without the need for any manipulation thereof;

said body being provided with two generally parallel prong support bores; and

said prong means being formed separately from said body and being in the form of a prong member having a shape selected from generally 'U'-shaped and generally 'J'-shaped, and being mounted with its two generally parallel limbs disposed in respective ones of said prong support bores in said body wherein said prong member limbs and prong support bores are formed and arranged so that said prong member is slidable between an operating position in which the distal ends of said prong member limbs project from said prong support bores for engagement with a respective line loop in use of the boom, and a retracted position in which said prong member limb distal ends are retracted into said prong support bores for disengagement from said line loops.

4. A knotless paternoster boom for use in holding out a snood from a fishing line which boom comprises a body having an upper end and a lower end and a laterally extending boom

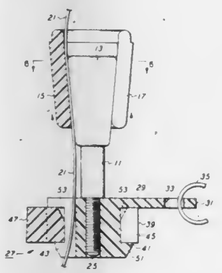
member adapted for supporting, in use, a snood extending from said boom member generally in the direction in which said boom member extends said boom having upper bore means extending from an inlet at said upper end to an outlet means remote from said inlet thereof and a lower bore means extending from an inlet at said lower end to an outlet means remote from said inlet thereof and prong means associated with said outlet means whereby in use of the boom the upper and lower loops may be taken in a line and fed into the bore means, through the upper and lower boom end inlets, respectively, out of said outlet means and around said prong means, and the line then pulled taut around said boom thereby to secure said boom in a desired position along said line; said body being formed and arranged at said outlet means, and at said inlets and prong means so as to provide pathways for the line between said loops and at the ends of said loops which are substantially free of sharp edges and abrupt discontinuities whereby tightening of the line on the boom is facilitated and the risk of damage to the line when it is pulled taut is minimized;

said bore means comprising two passage means formed and arranged so as to define guided pathways, without any abrupt discontinuities, extending generally directly from said inlets to said outlet means, for said line loops whereby in use of the boom a loop of line can be simply pushed into each inlet and will upon further pushing automatically emerge out of said outlet means without the need for any manipulation thereof;

said body being provided with two generally parallel prong support bores; and

said prong means being formed separately from said body and being in the form of a generally 'J'-shaped prong member mounted with its two generally parallel limbs disposed in respective ones of said prong support bores in said body; said prong member having a first, substantially extended, limb constituting said boom member of the boom and having a snood line support at its distal end for tying on of a snood line, said snood line support being provided with a retractable elongate knot guard which is slidable between a retracted position in which said snood line support is exposed for tying on of a snood line and an operating position in which it forms a sheath around said support and extends beyond it thereby to resist untying of the snood line and to support it in an outwardly extending disposition from the line on which the boom is mounted in use thereof.

4,625,450
QUICK RELEASABLE CONNECTOR FOR MULTIPLE BAIT FISHING
Leonhard J. Roemer, Jr., 27 Forgham Rd., Rochester, N.Y. 14616
Filed Jul. 8, 1985, Ser. No. 752,976
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—43.12 **13 Claims**



1. A connector for connecting a lateral fish line to a main line, said connector comprising:

(a) means for loosely encircling a main fish line to keep said connector connected to said main line without impeding movement of said connector along said line;

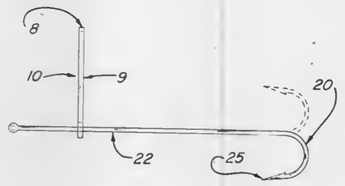
(b) means forming an inclined wedging surface;

(c) a clamping member movable relative to said wedging surface and cooperating therewith to clamp there between a portion of a main fish line which also passes through said encircling means;

(d) said clamping member having a portion adapted to strike a fixed object as said main fish line is reeled in, thereby to move said clamping member in an unclamping direction relative to said wedging surface; and

(e) means forming an attachment point for attaching a lateral fish line carrying a lure or the like.

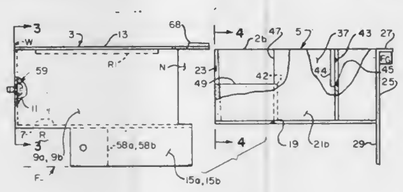
4,625,451
LIVE BAIT HOLDER FOR SURFACE FISHING
James S. Griffiths, 2947 NW. 8th Ave., Ontario, Oreg. 97914
Filed Sep. 9, 1985, Ser. No. 773,791
Int. Cl.[4] A01K *83/06*
U.S. Cl. 43—44.4 **3 Claims**



1. A live bait holder comprising:

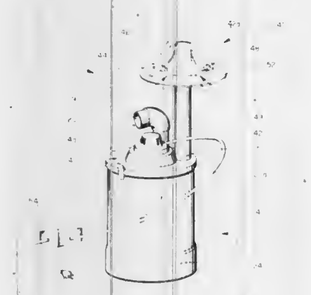
a ring defining an orifice for receiving live bait, said ring constructed of a resilient material and having a narrow slit therethrough for the separation of the ring for insertion of live bait into the orifice and the retraction thereof to substantially encircle the bait for confinement of the bait, said ring constructed of a material having a density less than water for flotation, and said ring provided with a permeable tab located diametrically opposite of said slit and having a hook attached to said ring by penetration of said permeable tab so that the shank of said hook is longitudinally parallel to said orifice.

4,625,452
BAIT STATION AND TRAP
Charles E. Knote, 2323 Brookwood Dr., Cape Girardeau, Mo. 63701
Continuation-in-part of Ser. No. 540,407, Oct. 11, 1983, Pat. No. 4,521,987. This application Apr. 3, 1985, Ser. No. 719,380
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **6 Claims**



1. A bait station or trap for rodents and comprising a housing structure incorporating side walls, two ends walls, a top wall, and a bottom wall, said housing having lower wall means for supporting it above the surface on which it rests thereby forming a housing tunnel enclosed by said lower wall means on three sides under said bottom wall and extending substantially the length of said housing, there being a substantially vertically arranged entrance into the formed housing tunnel proximate a first of said end walls, said bottom wall having an opening therein and defining an entrance chamber opening upwardly into the housing structure, said bottom wall opening being located proximate a second of said end walls opposite the location of the entrance into the housing tunnel the length of said housing tunnel being such as to provide a substantially darkened entrance for any rodent entering into the entrance chamber a bait chamber provided within the housing structure, a circuitous path between said entrance chamber and said bait chamber, at least one partition within the housing interior and within the circuitous path between the entrance chamber and the bait chamber, said partition having an opening therethrough so as to permit access of any rodent from said entrance chamber and to the bait chamber, and one of said end, side, and top walls being openable to attain access into the interior of the said housing structure.

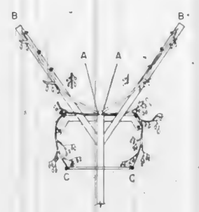
4,625,453
APPARATUS FOR CAPTURING INSECTS
Ulys Smith, Rte. 3, Box 576-A, Greenville, N.C. 27834
Filed Jun. 24, 1985, Ser. No. 748,217
Int. Cl.[4] A01M *1/06*
U.S. Cl. 43—139 **4 Claims**



4. An insect capturing device comprising: an insect induction head including upper and lower spaced apart plates defining an air passageway therebetween; said lower plate having a generally bell shaped configuration and including an insect alighting ledge extending around the perimeter thereof; said upper plate having a dome-like configuration and including a terminal edge that terminates inwardly of said insect alighting ledge so as to define an open area thereabove; a circumferential inlet into said air passageway formed by the terminal edge of said upper plate and the underlying portion of said lower plate; a suction opening formed in the central portion of said lower plate and communicatively connected with said air passageway; and vacuum means operatively connected with said suction opening for generating a system of moving air and directing the same across said insect alighting ledge and through said induction head thereby pulling insects alighting on said insect alighting ledge through said air passageway to a central portion thereof and into and through said suction opening.

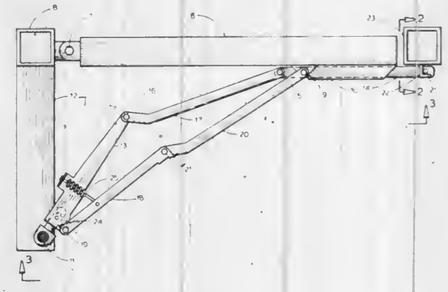
4,625,454
ESPALIER SYSTEM AND VINE MANAGEMENT PROGRAMME SUITABLE FOR KIWI FRUIT
Wynton M. Daniell, Matahui Rd. R.D.2, Aongatete Katikati, New Zealand
Filed Oct. 31, 1984, Ser. No. 666,650
Claims priority, application New Zealand, Nov. 21, 1983, 206343
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—44 **4 Claims**

1. A vine management method which comprises providing an espalier supported row of vines having a canopy of lower fruiting branches for each vine and two upwardly extending divergent framing elements for supporting younger branches above said canopy of branches, allowing the growth of at least two further branches from each vine between the two upwardly extending elements in a divergent upwardly extending manner substantially symmetrically about the row-wise direction and after harvest of the canopy of branches and before the



ensuing harvest, removing, at least to a substantial extent, the branches forming the canopy, moving the younger branches that were supported by the divergent framing elements down to define a canopy structure for the ensuing season and engaging said further branches that grew between the two upwardly extending elements to assume the position previously taken by said younger branches prior to their being moved.

4,625,455
GATE OPERATING MECHANISM
Robert W. Harris, 625 NE. 41st St., Seattle, Wash. 98107, and William R. Weber, 4200-50th Ave. NE., Seattle, Wash. 98105
Filed Aug. 19, 1985, Ser. No. 766,720
Int. Cl.[4] E05F *11/28*
U.S. Cl. 49—281 **2 Claims**



1. A gate operating mechanism comprising:

a. a crank arm attached to a drive means at one end with a drag link, pin connected, at the other end;

b. said drag link, pin connected to a sliding bolt operating in a guide attached to the gate;

c. a first index link pivotally mounted on the crank arm and pin connected to a second index link;

d. said second index link, pin connected to the gate;

e. said crank arm and drag link, when the drive means rotates to open the gate, pushes the sliding bolt free of a latch as a drag link common center passes over center alinging the said drag link common center with an index link common center and aligning the drag link pin connection at the sliding bolt with the index pin connection at the gate to allow the mechanism to open the gate fully without binding;

f. said drag and crank link, when the drive means rotates to close the gate, pushes the gate closed and pulls the sliding bolt into the latch as the drag link common center passes over center and as the index common center pases over center to restrain the gate from rebounding as the sliding bolt impacts a jam post.

4,625,456

POWER DOOR OPERATING DEVICE

Lucien Lafontaine, 755 Mont Pellier, Apt. No. 1105, Ville St-Laurent, Quebec, Canada (H4L 4H1)

Filed Feb. 20, 1986, Ser. No. 831,292

Int. Cl.[4] E05F *11/00*

U.S. Cl. 49—358 **5 Claims**



1. In a power door operating device for use with a vertical sliding door mounted on two guide tracks, one on each side of the door, the door having guide rollers at each side to rotate inside the guide tracks, the operating device including:

a housing having therein a reversible motor and gear reduction driving a drive shaft extending out of the housing;

a drive roller formed of resilient material connected to the drive shaft, the drive roller having a contoured surface to ride on an outside surface of one guide track;

pinch means to pinch the one guide track between one of the guide rollers of the door and the drive roller such that rotation of the drive roller frictionally drives the sliding door in the guide tracks; and

attachment means on the housing for connection to the sliding door;

the improvement comprising:

slidable connection between the drive roller and the drive shaft to take into account lateral displacement of the sliding door between open and closed position of the sliding door, and

slidably adjustable base for the attachment means for different thicknesses of sliding door and the guide tracks.

4,625,457

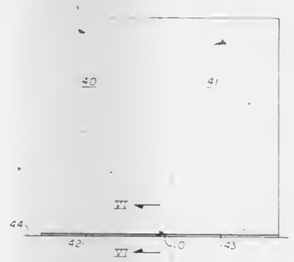
INSULATING MEMBER FOR DOUBLE DOORS

Phillip E. Avery, 1485 Gold Hill Rd., Newcastle, Calif. 95658

Filed May 30, 1985, Ser. No. 739,310

Int. Cl.[4] E06B *3/32*

U.S. Cl. 49—366 **5 Claims**



1. Improved insulating means for a pair of double doors mounted in a door opening having a floor wherein the bottom of said doors at the intersection thereof forms a space between the doors and the floor, the improvement comprising;

an insulating device having a flat planar portion secured to the side edge of one of said doors having an integral lower deformable portion extending downwardly from said planar portion into the space formed between the doors and the floor, said lower deformable portion being comprised of a deformable section having a plurality of outwardly extending spaced resilient fingers thereon.

4,625,458

VEHICLE DOOR STRUCTURE

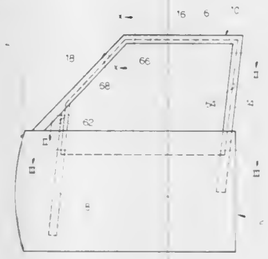
Yuzi Okamoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 14, 1985, Ser. No. 701,913

Claims priority, application Japan, Mar. 1, 1984, 59-29748[U]; Mar. 1, 1984, 59-29749[U]

Int. Cl.[4] E05F *11/38*

U.S. Cl. 49—374 **18 Claims**



1. A vehicle door structure, comprising:

a door frame having a front portion, an upper portion connected with the front portion, and a rear portion connected with the upper portion, each of said front, upper and rear portions having a channel at an inner peripheral portion;

a door glass mounted on a vehicle door so that the door glass is vertically displaceable by an operation of a passenger of a vehicle;

a door glass run fitted into at least one of the channels of said front, upper and rear portions of the door frame, the door glass run comprising a base portion secured to the door frame and extending laterally across the vehicle, an inner lip portion connected with the base portion and extending longitudinally along the vehicle to contact an interior surface of the door glass at its tip end, and an outer lip portion connected with the base portion and extending longitudinally along the vehicle, the outer lip portion having a tip end which is wedge-shaped in cross section, said door glass contacting the outer lip portion, whereby when a door glass is upwardly displaced and the vehicle is traveling at a high speed, which creates unequal pressures between an exterior and an interior of the vehicle, resulting in a force directed toward the exterior of the vehicle, said outer lip portion functions to smoothly displace the door glass.

4,625,459

WINDOW PANE FOR MOTOR VEHICLES

Hermann Warner, Trebur, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1985, Ser. No. 718,508

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413029

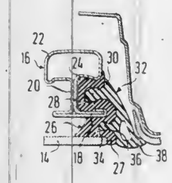
Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—488 **5 Claims**

1. In an automotive vehicle comprising vehicle body structure including exterior panel means, a window pane and a window frame means located interiorly of said window pane; and inwardly from its side edges,

said window frame means having a flange extending parallel with the window pane and which defines with other portions of said frame means a recess facing in the same direction as the adjacent side edge of the window pane,

a profiled retaining member for supporting said window pane on said frame means so that the window pane is substantially flush with the adjacent panel means of said vehicle, said retaining member having one end which is fixedly joined to said window pane on its interior side and which extends over said flange and has its other end received within said recess of said frame means, the improvement being that said profiled retaining member has a first recess at its other end defined by a bottom and a pair



of side surfaces which diverge from each other toward said bottom and has a second recess with diverging side surfaces between said window pane and said flange on said frame, and that said retaining member is clamped in place on said frame by a profiled elastomeric locking member having first and second spaced projections shaped complementary with said first and second recesses of said retaining member and which are snap fittingly received within said first and second recesses, and wherein said elastomeric locking member has a flexible end portion which extends between said side edge of the window pane and said panel means to provide a seal therebetween.

4,625,460

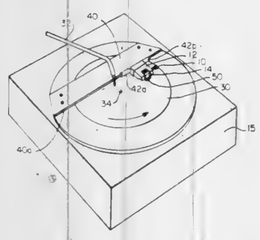
FIXTURE FOR USE IN NON-ENCAPSULATED CROSS-SECTIONING OF A COMPOSITE STRUCTURE

David L. Burgess, and Orlin D. Trapp, both of 51 Hillbrook Dr., Portola Valley, Calif. 94025

Filed Sep. 30, 1982, Ser. No. 430,849

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—125 **18 Claims**



1. A fixture for use in non-encapsulated cross-sectioning of a composite structure, comprising:

a base having a step-like section formed in its lower surface at one end thereof for resting on a grinding surface to support said base thereon;

a mounting member adapted to be removably secured to that end of said base opposite from said step-like section for maintaining the composite structure in position relative to said grinding surface, said mounting member removable from said base with the composite structure mounted thereon; and

said mounting member including a substantially U-shaped member having two parallel arms either of which is positionable in a slot formed in the upper surface of said base or in a recess formed in the lower surface of said base wherein said arms are spaced from said grinding surface when so positioned.

4,625,461

METHOD AND APPARATUS FOR POSITIONING WORK SUPPORTING UNITS IN GRINDING MACHINES

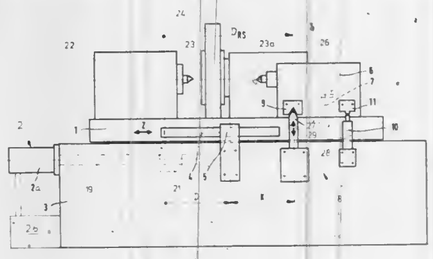
Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 10, 1985, Ser. No. 690,129

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401088

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165.77 **13 Claims**



5. A grinding machine, comprising work supporting table means; second supporting means; a drive for moving said table means relative to said second supporting means in the direction of one machine axis; automatic controls for operating said drive; at least one work supporting unit; a locking device engageable to affix said unit to said table means; and a coupling device operable to releasably connect said unit to said second supporting means so that said drive can place said unit and said table means into any one of a plurality of selected positions with reference to each other in response to disengagement of said locking device and on coupling of said unit to said second supporting means.

4,625,462

CORDLESS ELECTRIC FINISHING SANDER

Fusao Fushiya; Nobuo Hakamata, and Michio Okumura, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Aug. 29, 1985, Ser. No. 770,515

Claims priority, application Japan, Aug. 29, 1984, 59-181149

Int. Cl.[4] B24B *23/04*

U.S. Cl. 51—170 MT **4 Claims**

1. A portable cordless finishing sander comprising:

(a) a housing having a pair of mating housing portions detachably secured together along a common plane, said housing providing

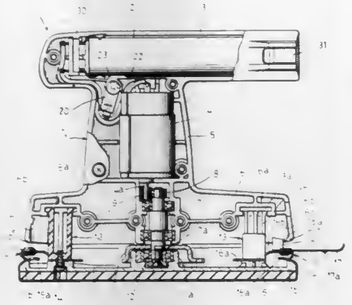
(1) a motor housing portion formed on the medial part thereof for storing an electric motor therein,

(2) an elongated handle portion horizontally extending above said motor housing portion and having formed therein a compartment for storing a battery to drive said electric motor, the forward end of said compartment being disposed generally forwardly of said motor housing and achieving balance of weight between the front and rear of said sander,

(3) a skirt portion extending below said motor housing portion;

(b) a sandling plate extending below and resiliently carried

by said skirt portion of said housing for orbital motion relative thereto; and



(c) a pair of clamping means mounted to said sanding plate for clamping a sheet of sandpaper to said sanding plate.

4,625,463

WAFER ATTRACTING AND FIXING DEVICE

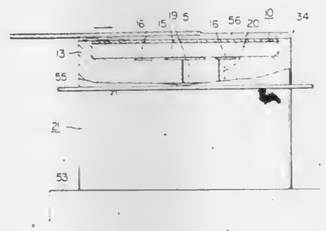
Shinji Sekiya, Tokyo, Japan, assignor to Disco Co., Ltd., Tokyo, Japan

Division of Ser. No. 265,318, May 20, 1981, Pat. No. 4,521,995. This application Mar. 6, 1985, Ser. No. 708,626

Claims priority, application Japan, May 23, 1980, 55-0684471; May 23, 1980, 55-071025[U]

Int. Cl.⁴ B24B *41/06*

U.S. Cl. 51—216 R **6 Claims**



1. A method for transferring a nearly circular wafer to the substantially center position of the surface of a nearly circular disc of similar diameter, said method comprising forming a water layer on said surface of said disc, laying the wafer on the water layer, and transferring the wafer to the center position of said disc by use of the surface tension of the water layer.

4,625,464

PIPE PROCESSING DEVICE

Tetsushi Kubo, 861, Hirata, Ichihara-shi, Chiba-ken, Japan

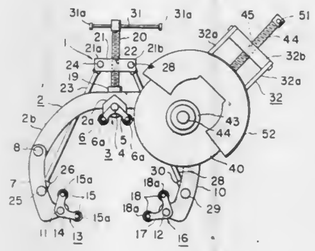
Filed Jun. 27, 1985, Ser. No. 749,403

Claims priority, application Japan, Aug. 13, 1984, 59-123904[U]; Feb. 16, 1985, 60-28921

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—241 B **8 Claims**

1. Pipe processing device provided with an attaching body which comprises a supporting member, an upper abutting member provided at the central portion of said supporting member and having a pair of parallel abutting rollers, a left arm member pivotally attached at its base portion to the left half portion of said supporting member, a right arm member pivotally attached at its base portion to the right half portion of said supporting member, a left abutting member provided at the free end portion of said left arm member and having a pair of parallel abutting rollers, a right abutting member provided at the free end portion of said right arm member and having a pair of parallel abutting rollers, a screw bar pivotally supported at its lower end portion on said supporting member, a mounting member screw-fitted to said screw bar, a left tension bar pivotally attached at its upper end portion to the left end portion of said mounting member and also pivotally attached at its lower end portion to the left arm member, and a right tension bar pivotally attached at its upper end portion to the right end



portion of said mounting member and also pivotally attached at its lower end portion to the right arm member; a guide member fixed to said supporting member; a movable member provided on said guide member, said movable member being capable of advancing and retracting along said guide member; a rotating shaft provided on said movable member; and a cutting wheel and a chamfering cutter provided on said rotating shaft.

4,625,465

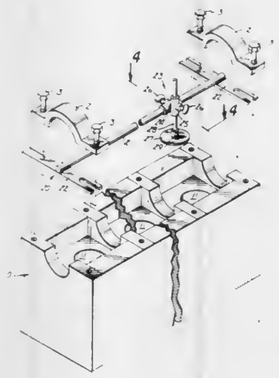
HONE STOP ASSEMBLY

Daryl L. Kirt, Rte. 4, Box 276A, Pierz, Minn. 56364

Filed Dec. 19, 1985, Ser. No. 811,156

Int. Cl.⁴ B24B *55/00*

U.S. Cl. 51—262 R **11 Claims**



1. A hone stop assembly for use with a honing tool in honing the cylinder bores of an internal combustion engine block, the engine block being of the type having a plurality of cylinder bores having first and second ends and including a projection adjacent the first end of a first of said bores, said assembly comprising a frame mountable to the engine block; a hone stop; and adjustment means for adjustably securing the hone stop to the frame and allowing the hone stop to be selectively positioned proximal to the first end of said first cylinder bore interposed generally between the end of said cylinder bore and said projection to serve as a stop for the honing tool.

4,625,466

POLISHING WHEEL

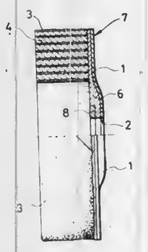
Kyuji Saigusa, Tokyo, Japan, assignor to Sankyorikagaku Kabushiki-Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,597

Claims priority, application Japan, Aug. 19, 1983, 58-127330[U]; Aug. 19, 1983, 58-127331[U]

Int. Cl.⁴ B24D *13/00*

U.S. Cl. 51—403 **2 Claims**



1. A polishing wheel for attachment to a disk mounted for rotation on a drive shaft of a power tool, said polishing wheel comprising: a plurality of spiral turns of a flexible, ribbon-like polishing cloth, said cloth provided with an outwardly facing abrasive surface, a plurality of spiral turns of a ribbon-like flexible band of a width corresponding to said cloth, said band interleaved between said turns of said polishing cloth and coextensive therewith, said polishing cloth defining the outermost of said interleaved layers, adhesive securing means securing said spiral turns of said cloth and said flexible band together along their substantial length; and means securing side edges of said cloth and said band to a surface of said disk whereby an opposite side edge of said cloth is exposed and movable into tangential edge contact with an object to be polished.

4,625,467

GEAR SHAPER HAVING REPLACEABLE TIP

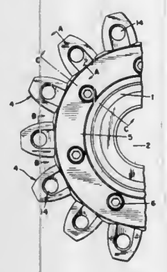
Hyakuro Nara, Osaka, Japan, assignor to Azumi Manufacturing Co., Ltd., Osaka, Japan

Continuation of Ser. No. 557,746, Dec. 5, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 758,857

Claims priority, application Japan, Dec. 28, 1982, 57-229418

Int. Cl.⁴ B24D *7/06;* **B23F** *21/03*

U.S. Cl. 51—209 R **1 Claim**



1. A gear shaping tool comprising

a circular body having a rotational axis, a plane front surface perpendicular to said axis, back surface substantially perpendicular to said axis, and an outer periphery surface, said body further having a stepped portion located toward said outer periphery surface and said stepped portion comprising a plane first surface portion in the same plane as the front surface of said body and a second portion stepped a predetermined distance from said front surface of said body axially toward said back surface of said body;

a plurality of tip seats, each having a front surface, a back surface, a bottom surface and a top surface;

means for attaching said bottom surface of said tip seats to and equally spaced along said outer periphery with said front surface of said tip seat facing in an axial direction in the same direction as said front surface of said body and with said back surface of said tip seat facing in an axial direction in the same direction as said back surface of said body, and wherein said front surfaces of said tip seats have substantially V-shaped grooves therein with said V-shaped grooves having a V-shaped bottom channel extending in a direction radially of said axis, said tip seats being disposed so that open top channel parts of said V-shaped grooves face in an axial direction in the same direction as faced by said front surfaces of said tip seats, and wherein said tip seats each further has a hole therein starting from said front surface at said V-shaped groove bottom channel and extending at an oblique angle downward toward said axis;

a circular ring having an axis, a plane front surface, a back surface and an outer circuclar periphery surface, said back surface having a stepped portion corresponding to and alignable with said stepped portion of said body with said outer periphery surface of the ring extending above said second stepped portion and adjacent said first stepped portion;

means for attaching said ring to said body with said axis of said body corresponding to and aligned with said axis of said ring, and with said stepped back surface of said ring corresponding to and aligned with said stepped portion of said body with said outer periphery surface of said ring extending in an axial direction from said front surface of said body and located below said tip seats;

a plurality of replaceable tips, each comprising a horseshoe shaped plane front work surface, a top surface, a bottom surface and a back surface, said back surface having a substantially triangular surface corresponding to and alignable with said V-shaped groove of said tip seats, said bottom surface corresponding to and alignable with said outer periphery surface of said ring, said top surface corresponding to said top surface of said tip seats and wherein said tips each further has a hole disposed therein extending from a front thereof toward said axis at an oblique angle corresponding to said oblique angle of said hole of said tip seat, and alignable therewith; and

means for replaceably attaching said tips to said tip seats with said triangular back surfaces of said tips aligned with said V-shaped grooves of said front surfaces of said tip seats, and with said bottom surface of said tips being positioned on said outer periphery surface of said ring, and with said holes of said tips being aligned with said bottom of said tip seats, and with said front work surface of said tips extending in an axial direction and outward from said front plane surface of said body, said means for replaceably attaching comprising pins fit into said aligned holes of said tips and said tip seats, thereby to attach said tips to said tip seats in a replaceable manner.

4,625,468

TEMPORARY/PORTABLE NUCLEAR FALLOUT SHELTER

Viktor E. Hampel, 2783 Curlew Ct., Pleasanton, Calif. 94566

Filed Jul. 5, 1983, Ser. No. 510,583

Int. Cl.⁴ E04H *9/10;* **E04G** *11/04;* **A45F** *1/16*

U.S. Cl. 52—2 **16 Claims**

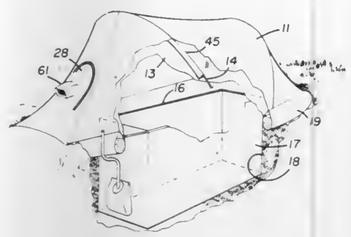
1. A portable shelter for placement over a hole in the ground comprising in combination,

a tent enclosure having a floor with a tubular section extendable downwardly therefrom,

means for supporting the tent enclosure to form an enclosed volume above the hole, the tubular section of the tub floor extending downwardly into and lining the hole,

a shield membrane approximately dimensioned and having

sufficient surface area to completely cover the tent enclosure when erected, with its circumferential edge extend-



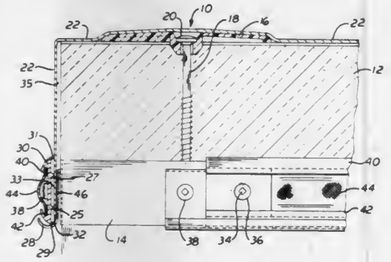
ing into and partially buried in a shallow trench excavated around the tent enclosure and hole.

4,625,469

REPLACEMENT FLAT ROOF INSULATION COVER

Thomas H. Gentry, 79 Bay Woods Dr., Clearwater, Fla. 33572, and Robert W. Mays, 2025 Roger St., Clearwater, Fla. 33546

Filed Nov. 12, 1985, Ser. No. 796,830
Int. Cl.⁴ E04D *13/16*
U.S. Cl. 52—3 **10 Claims**



1. A roof replacement structure for a building having a substantially flat roof at about right angles to the building sidewalls comprising:

(a) contiguous panels of rigid insulation applied over the flat roof and substantially covering the roof exposed flat surfaces;

(b) a flexible, water impervious membrane fastened over the panels of rigid insulation and the roof with a plurality of mechanical fasteners, the membrane having a plurality of extensions covering the mechanical fasteners, the extensions overlapping the mechanical fasteners and being heat sealed to the membrane;

(c) a periphery of the membrane overlapping the upper portion of the building sidewalls and mechanically fastened thereto with a termination insert bar having an inboard and outboard side; and

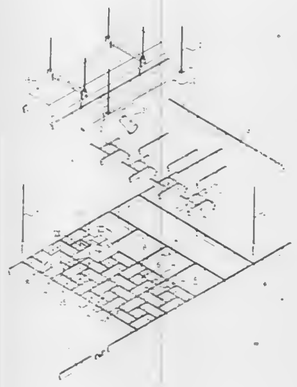
(d) the termination insert bar having a first and second leg on the outboard side holding a roofing member insert and a first and second nose on the inboard side, at least one nose in contact with the periphery of the membrane overlapping the sidewall.

4,625,470

OPENWORK SCREEN ASSEMBLY

Robert C. Heritage, London, England, assignor to Intalite International N.V., Netherlands Antilles

Filed Dec. 15, 1983, Ser. No. 562,191
Claims priority, application United Kingdom, Dec. 17, 1982, 8235957
Int. Cl.⁴ E04C *2/40*
U.S. Cl. 52—28 **11 Claims**



1. An open work screen assembly for use in a building construction, formed of interconnected elongate member with spaces therebetween, comprising:

an outer rectangle formed by two pairs of parallel, spaced, outer elongate members, and

an inner rectangle smaller than said outer rectangle inside and spaced from said outer rectangle, formed of four serially adjacent inner elongate members,

each of said four elongate members having opposite free ends including a first free end meeting the next inner elongate member at a position between its opposite free ends to form a T-shape,

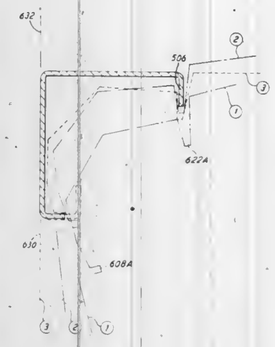
and a second free end opposite said first free end meeting a side of the outer rectangle between its ends, the inner rectangle being thereby surrounded by four intermediate rectangles, the first end of each inner elongate member making a hinged connection with the next inner elongate member, said inner elongate member including at last one projecting hinge tab on said first end thereof projecting generally longitudinally of said inner elongate member, the next inner elongate member having at least one slot extending generally transversely to the direction of elongation of said next inner elongate member, each slot being defined by edges on said next inner elongate member substantially surrounding the slot, said at least one hinge tab being retained in said at least one slot so as to define said hinge connection, said edges surrounding the tab, said four inner elongate members being formed so as to be serially hingedly connectable to each other at said hinged connections in a collapsed condition with all four inner elongate members generally parallel to each other such that the inner rectangle is openable by pivoting said inner elongate members relative to one another about the hinged connections.

4,625,471

APPARATUS AND METHOD FOR SUPPORTING CUPBOARDS AND THE LIKE

Eric K. Cheng, London, United Kingdom, assignor to Reyloc Limited, London, England

Filed Jun. 14, 1984, Ser. No. 620,476
Claims priority, application United Kingdom, Jun. 22, 1983, 8316907; Oct. 10, 1983, 8326708
Int. Cl.⁴ A47B *5/00*
U.S. Cl. 52—36 **10 Claims**



1. An apparatus for building, erecting or suspending structures comprising:

(i) an elongated linear support member formed by a vertical web and a horizontal web, said vertical web having a horizontally extending flange and said horizontal web having a downwardly extending vertical flange; and

(ii) a panel configured and dimensioned to cooperate with said linear support member so that said panel hangs substantially vertically from said linear support member with the plane of said panel substantially perpendicular to the length of said linear support,

(a) said panel having a top edge provided with a top edge notch configured and dimensioned to receive said vertical flange when said panel and said elongated linear support member are assembled, thereby preventing horizontal separation of said panel from said elongated linear support member,

(b) said panel also having an inner edge provided with an inner edge notch defined by a lower horizontal straight surface distal to said top edge of said panel and an upper, inclined surface nearer than said lower horizontal surface to said top edge, such that said inner edge notch is configured and dimensioned to receive said horizontal flange when said panel and said elongated support member are assembled, thereby providing vertical support for said panel.

4,625,472

GEODESIC DOME PREFABRICATED PANELS

Michael F. Busick, 401 N. Harbor City Blvd., Melbourne, Fla. 32935

Filed Oct. 24, 1983, Ser. No. 544,697
Int. Cl.³ E04B *1/32*; E04C *1/10*
U.S. Cl. 52—81 **15 Claims**

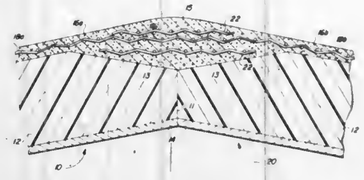
1. A lightweight structural building panel having a shape compatible for use in assembling a geodesic dome structure comprising:

a core portion formed from insulative material, said core portion having an exterior face, an interior face and a plurality of bordering portions;

a wall covering attached to said interior face;

an exterior coating of cementitious material over and attached to said exterior face except for each of said bordering portions along the edges of said exterior face; and

a wire mesh coextensive with said core portion, said wire mesh embedded in said exterior coating and extending into an area above said bordering portions thereof adja-



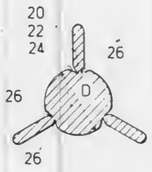
cent said exterior face, said insulative material having a thickness substantially greater than the combined thickness of said interior covering and said exterior coating.

4,625,473

ANTI-TWIST ROD SECTION AND METHOD OF USING THE SAME IN SURVEY MONUMENT PLACEMENT

Phillip R. Peterson, and William C. Rushing, both of Madison, Wis., assignors to Berntsen, Inc., Madison, Wis.

Filed Feb. 22, 1985, Ser. No. 704,328
Int. Cl.⁴ E02D *5/74*
U.S. Cl. 52—98 **29 Claims**



1. An anti-twist rod section adapted to be driven into the ground without rotation comprising:

(a) an elongated body with upper and lower ends; and

(b) at least one substantially straight fin joined to the body at a junction at the apex of a necked down portion of each fin to provide a line of weakness extending the length of the fin at the junction, the plane of each fin running parallel to the longitudinal body axis, and the junction of each fin to the body adapted to allow the anti-twist rod section to be driven into the ground with the fin in place and to allow the fin to be severed from the body at the junction as it is bent tangentially away from the body, the dimensions of the junction and of the fin and the material of the fin selected such that the fin will bend when torque is applied to the fin to bend it tangentially away from the body and cause a rupture of the junction of the fin and body which progresses downwardly from the top of the fin as the fin is bent.

4,625,474

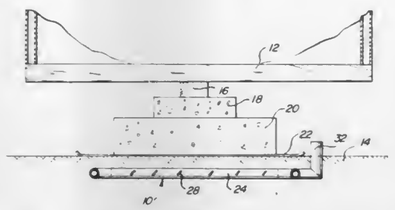
TUBE-TYPE TERMITE CONTROL SYSTEM

Richard C. Peacock, deceased, late of Honolulu, and Ruby L. Peacock, personal representative, 2726 Waiwai Loop, Honolulu, both of Hi. 96819

Filed Apr. 2, 1984, Ser. No. 595,965
Int. Cl.⁴ A01M *1/20*
U.S. Cl. 52—101 **2 Claims**

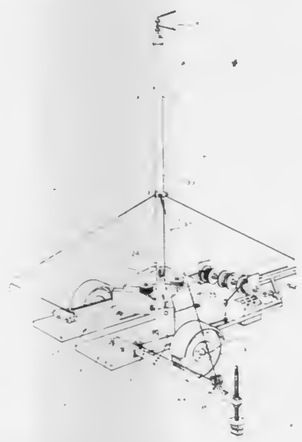
1. A termite control system for a pier-type support structure disposed inwardly of the perimeter of a building and supporting the building above ground surface to form a crawl space to protect wood floor and other wood components of the building from termite infestation, said system comprising a tube associated with the support structure for the building and extending along the surface of the support structure horizontally and vertically throughout the surface area of the support structure in contact with the ground for protecting the support

structure and forming a barrier to passage of termites throughout the vertical height and horizontal dimensions of the support structure for the building, said tube including a plurality of slits therein for discharging liquid chemicals into the ground, at least one end of the tube extending above ground for access thereto to enable termite killing insecticides to be



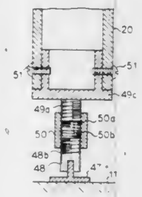
discharged into the tube for passage therethrough and discharge into the ground, said tube being in the form of a closed loop about the perimeter of and below the pier-type support structure, the upper end of the tube extending above ground surface and terminating in the crawl space outwardly of the pier-type support structure and inwardly of the building perimeter to provide access thereto.

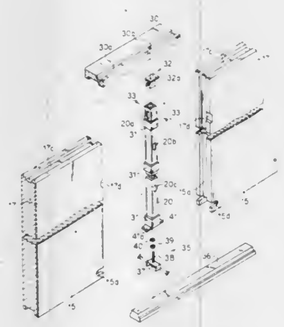
4,625,475
EXTENSIBLE MAST
Henry J. McGinnis, P.O. Box 7256, Fort Worth, Tex. 76111
Filed May 13, 1985, Ser. No. 733,069
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—108 **8 Claims**



1. An extensible mast, comprising:
a plurality of tape reels mounted upon a base and angularly oriented thereon with respect to a common, vertical axis, each of said tape reels, receiving a resilient metal tape having longitudinal edges, for winding and unwinding said tape;
guide means located on said base receiving the respective longitudinal edges of said metal tapes and for orienting said tapes whereby said tapes are fed upwardly in planes parallel to said vertical axis and at an angle to each other to form a rigid structure; and
winding means on said base dispensing a reinforcing winding simultaneously with the upwardly movement of said tapes for strengthening said rigid structure, said winding means including a bevel gear driven by a main drive, said bevel gear engaged with an annular plate having a ring gear mounted thereon which is driven by said bevel gear for rotation about said vertical axis, and wherein said ring gear carries a plurality of rotatable windings thereon, said rotatable windings having a planetary gear surface for contacting the mating surface of a stationary sun gear mounted on said base, whereby movement of said main drive and, in turn, said bevel gear causes said windings to rotate about said vertical axis as said rigid structure is being erected to wrap said structure with a reinforcing winding.

4,625,476
PARTITION WALL
Yoshikatsu Shimada, Kiyose, Japan, assignor to Nihon Shuno System Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1984, Ser. No. 684,074
Claims priority, application Japan, Dec. 27, 1983, 58-244837; Feb. 16, 1984, 59-26049; Apr. 25, 1984, 59-82075; Apr. 25, 1984, 59-82076; Apr. 25, 1984, 59-59966[U]; Apr. 26, 1984, 59-83007; Apr. 26, 1984, 59-83008; Apr. 26, 1984, 59-83009
Int. Cl.[4] E04B *2/82;* **E04H** *1/00*
U.S. Cl. 52—126.4 **8 Claims**

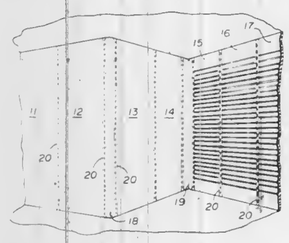




1. A prefabricated partition wall for use in a room having a floor and a ceiling, comprising:
an upper support for cooperation with the ceiling;
a lower support for cooperation with the floor;
a metallic joint tube extending vertically and having upper and lower open ends;
a fixture for fixing the upper open end of the joint tube to the upper support;
a plurality of panels each having at both sides thereof a vertical groove of a shape corresponding to that of the joint tube;
an adjustor placed between the lower support and the lower open end of the joint tube for supporting the joint tube and the panels at their bottom portion in such a manner that the adjustor can be actuated to adjust the joint tube and the panels together in a vertical direction so as to fix securely them in position between the floor and the ceiling;
a plurality resilient sleeve members attached to the joint tube in such a way that the resilient sleeve members are disposed between the joint tube and the panels in the vertical grooves;

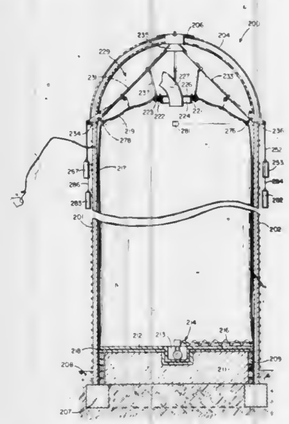
said adjustor comprising a first member set on the lower support and having a male screw, a second member fixed to the lower end of the joint tube and having a male screw and a third member having a pair of female screws threaded reversely to each other and engaging the male screws of the first and second members so that the third member can be turned so as to adjust the distance between the first member and the second member;
the lower support being formed in a T-shape with an upwardly extending projection;
the first member of the adjustor having a groove for cooperation with the projection of the lower support to prevent the first member from turning;
the second member having a flange portion for supporting the bottom corners of the panels and a joint portion fixed to the flange portion and joined to the lower open end of the joint tube;
at least one of the panels including a door unit having a door hinged thereto between the vertical grooves.

4,625,477
DISPLAY WALL FORMED OF READILY ATTACHABLE AND DETACHABLE PANELS
George S. Johnstonbaugh, New Philadelphia, Ohio, assignor to Masonite Corporation, Chicago, Ill.
Filed Dec. 13, 1985, Ser. No. 808,765
Int. Cl.[4] E02D *35/00*
U.S. Cl. 52—127.9 **18 Claims**



1. A modular wall panel construction including at least two vertically oriented structural members in edge-to-edge engagement, and means affixing said structural members together and permitting ready disassembly thereof, said means comprising a plurality of recesses provided in an edge of a first one of said structural members and a rotary bolt lock affixed within each recess, and a vertical standard affixed at an edge of the second one of said structural members,
A. each of said rotary bolt locks comprising:
(1) a housing having an opening at an edge thereof,
(2) a hub rotatably mounted in said housing and having an aperture provided therein adapted to receive a driving means,
(3) a radial arm affixed to said hub,
(4) an arcuate bolt extending from an end of said radial arm, and
(5) driving means adapted to be inserted in the aperture of said hub, and, upon rotation, to cause said radial arm to revolve, thereby causing said arcuate bolt to emerge from the aperture in said housing, and
B. said elongate standard comprising:
(1) means for affixing said standard to the second of said structural members comprising a mounting flange engaging a face of the second of said structural members and having apertures provided in said flange and affixing means extending through said apertures and engaged in said second structural member,
(2) said standard having a wall substantially perpendicular to said mounting flange and being provided with a plurality of pairs of slots, one pair of slots being juxtaposed opposite each of said rotary bolt locks of said first structural members,
whereby, when said two structural members at each joint are brought together edge-to-edge and said drive means is inserted in the aperture of said hub and rotated, the arcuate bolt of said rotary bolt lock emerges from the aperture of said housing, enters one slot of one of said pairs of slots in said standard and returns through the second slot of said pair of slots, thereby solidly affixing said two structural members together.

4,625,478
LINER FOR TOWER SILO AND METHOD OF INSTALLING SAME
John T. Goode, 308 Norfolk Ct., Bedford, Tex. 76021
Continuation-in-part of Ser. No. 331,535, Dec. 7, 1981, Pat. No. 4,479,334. This application Oct. 29, 1984, Ser. No. 665,784
Int. Cl.[4] E04H *7/00*
U.S. Cl. 52—197 **43 Claims**



1. An apparatus for converting a conventional tower silo to a bottom unloading sealed silo, said conventional tower silo including an upright side wall having an inside surface surrounding a chamber for storing material, an upper end, and a lower end anchored to the ground, a roof mounted on the upper end of the silo wall covering the upper end of the chamber comprising: air impervious liner means located in said chamber adjacent the inside surface of the side wall, means attaching the liner means to the side wall to hold the liner means in engagement with said inside surface, said linear means having an upper portion of the liner means to the support means, said means attaching the upper portion of the liner means to the support means including yieldable means for biasing the upper portion of the liner means in an upward direction, an inner wall located adjacent the inside of the lower end of the side walls, and floor means engageable with the inner wall at the lower end of the side wall, said floor means having means to accommodate a bottom material unloading machine.

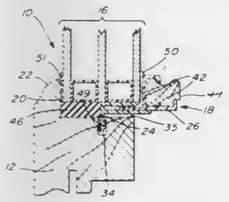
4,625,479
CASING WINDOW
Jean-Paul Giguere, Lotbiniere, Canada, assignor to Donat Flamand Inc., Lotbiniere, Canada
Filed Jul. 16, 1984, Ser. No. 631,101
Int. Cl.[4] E06B *7/12, 3/58*
U.S. Cl. 52—202 **6 Claims**

1. A device for holding a multiple glazed sealed unit in a wooded sash having a rabbet, said glazed unit having a given uniform thickness, said sash defining an L-shaped seat receiving said glazed unit therein, said seat having a given uniform

depth and being edged laterally by a shoulder portion which determines the depth of said seat and against which bears said glazed unit, the thickness of said glazed unit being greater or no less than the depth of said seat, said device comprising:

a peripheral base member adapted to be inserted between said glazed unit and said sash, said peripheral base member being retained on said sash;

a removable peripheral retaining moulding, adapted to be engaged in the peripheral base member and pressing the glazed unit against the shoulder of the seat to hold said glazed unit in said sash, said peripheral retaining moulding being adapted to be engaged in said peripheral base member by means of a ratchet-stop allowing a progressive notch engagement of said peripheral retaining moulding in said peripheral base member but prevent unwanted with-



drawal of said peripheral retaining moulding relatively to said peripheral base member;

said peripheral base member being constituted by a jaw having two branches, one of which comprises on its inner side a set of teeth, said peripheral retaining moulding comprising a tongue substantially perpendicular to the plane of said sash, said tongue penetrating said base member and comprising, at one end, a pawl engaging the backside of said teeth in order to form said ratchet-stop;

said peripheral base member being retained on said sash by means of a longitudinal flange extending substantially at right angles relative to said base member, said flange penetrating and being held in a peripheral groove formed in said rabbet of said sash, said peripheral groove being spaced from said shoulder portion of said sash a predetermined distance.

4,625,480

UNDERFLOOR ASSEMBLY AND CABLE DISTRIBUTION SYSTEM AND CABLE TRENCH THEREFOR

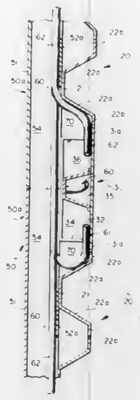
Arthur Nusbaum, Tenafly, N.J., assignor to Robert Nusbaum; Howard Nusbaum, both of New York, N.Y. and Barbara Selick, Teaneck, N.J.

Division of Ser. No. 459,599, Jan. 20, 1983, Pat. No. 4,558,546. This application Aug. 19, 1985, Ser. No. 766,593

Int. Cl.⁴ E04F *17/08*; H02G *3/18*

U.S. Cl. 52—221 **2 Claims**

1. A cable distribution duct for installation under the cable trenches of an underfloor assembly, which comprises a longitudinally extending bottom plate having opposed side edges and longitudinally extending wall means on said bottom plate and defining therewith a plurality of longitudinally extending closed cells having top, opposed side and bottom portions, a said closed cell being provided at each side edge of said bottom plate, said wall means comprising a plurality of elongated inverted U-shaped top members on said bottom plate having integral opposed side portions and a top portion, said inverted U-shaped top members being longitudinally spaced apart and extending longitudinally along said bottom plate such that a said closed cell at said side edge has its top portion and the side portion thereof adjacent said side edge omitted where said closed cell at said side edge runs under said trench, said wall means further comprising a longitudinally extending inverted U-shaped divider means on said bottom plate passing through and between said top members, said top members, said divider means and said bottom plate defining three said cells, whereby all three said cells are closed cells under said top members and a said cell at said side edge has its top portion and side portion



adjacent said side edge omitted in the space between adjacent spaced apart top members.

4,625,481

REPLACEMENT PANEL AND METHOD OF INSTALLING SAME IN A CURTAINWALL

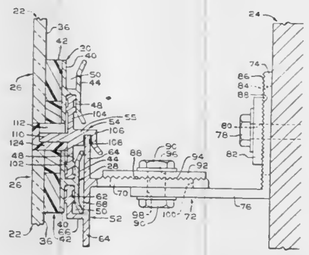
Stephen L. Crandell, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 311,822, Oct. 16, 1981, Pat. No. 4,483,122, which is a continuation-in-part of Ser. No. 65,318, Aug. 9, 1979, Pat. No. 4,307,551. This application Sep. 7, 1984, Ser. No. 648,855

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.⁴ E04B *2/88*

U.S. Cl. 52—235 **20 Claims**



13. A system for mounting a plurality of glass panels to a structure, comprising:

hanger means adhesively attached to a first major surface of selected ones of said glass panels;

a framing grid attached to the structure;

means engaging said hanger means for securing said glass panels to said framing grid;

wherein said selected ones of said glass panels each comprise a first glass sheet having said first major surface facing an interior of the structure, a second major surface, and peripheral edges extending between and interconnecting said first and said second major surfaces; and,

wherein said peripheral edges of said selected ones of said glass panels have a flat planar cross-section.

4,625,482

UNIT TYPE CURTAIN WALL

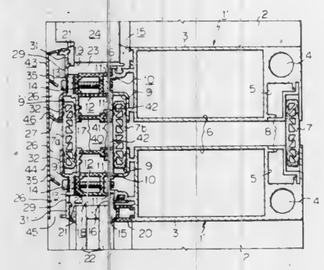
Hiromitsu Kaminaga, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,187

Claims priority, application Japan, Aug. 16, 1982, 57-123946[U]

Int. Cl.⁴ E04B *1/62*; E04H *1/06*

U.S. Cl. 52—235 **2 Claims**



1. A unit type curtain wall having a side defining a part of a room and comprising a plurality of mutually connected curtain wall units each of which consists of vertical and horizontal elongated members tied together to form a rectangular unit frame defining an opening encompassed by the elongated members and a heat insulative panel mounted to close the opening, further comprising:

said vertical and horizontal elongated members are constituted by shaped members each having recesses on a side facing away from said room so that the recesses open laterally of the frame and face each other, and said curtain wall comprises retainer members each respectively coupled to the associated shaped member at said side facing away from said room with heat insulating coupling members extending transversely therebetween to form a lateral groove for retaining a panel between the shaped member and the retainer member, the retainer members each having recesses which open laterally of the frame and face each other;

heat insulating inner sealing members each mounted in said recesses of the shaped members facing each other;

heat insulating outer sealing members each mounted in said recesses from in said retainer members and facing each other;

said inner and outer heat insulating seal members connecting adjacent frames and forming, in cooperation with said heat insulating coupling means, a space communicating with the external atmosphere; and

said heat insulating coupling means being in contact with said heat insulating inner sealing member to prevent said shaped members from being contacted by said in said space.

4,625,483

CONNECTOR SYSTEM FOR FURNITURE PANELS

Ralf G. Zacky, Los Angeles, and Gordon L. Alexander, Sylmar, both of Calif., assignors to Aspects, Inc., Sun Valley, Calif.

Filed Jun. 3, 1985, Ser. No. 740,221

Int. Cl.⁴ E04B *2/74*; E04C *2/38*

U.S. Cl. 52—239 **24 Claims**

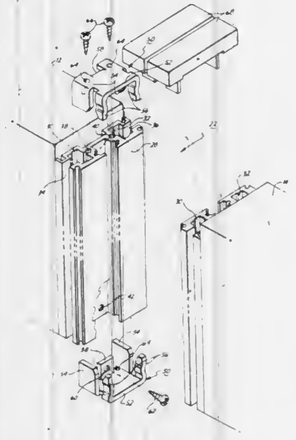
1. A panel system including a universal connector, including

a first panel member including at least one rail member attached vertically along one side edge of the first panel member and with the rail member including at least one cavity extending along the vertical axis of the first rail,

a second panel member including at least one rail member attached vertically along one side edge of the second panel member and with the rail member including at least one cavity extending along the vertical axis of the second rail and with the first and second panel members positioned adjacent each other to have the first and second rail members positioned adjacent each other,

at least two universal connectors for interconnecting the panels to each other and with one connector positioned at the bottom of the rail members and the other connector positioned at the top of the rail members, the connectors including

a horizontal body portion and at least two leg members extending perpendicularly from the body portion and with each of the leg members for insertion into the one



cavity of a rail member for interlocking the connector to either or both of the rail members,

a flange portion extending perpendicularly from the body portion and with the flange portion including locking means for locking to the rail member in a direction perpendicular to the vertical axis of the rail member, and

the body portion including locking means for locking to the rail member in a direction along the vertical axis of the rail member.

4,625,484

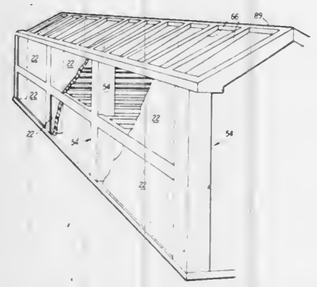
STRUCTURAL SYSTEMS AND COMPONENTS

Leonard Oboler, Key Biscayne, Fla., assignor to High Tech Homes, Inc., Miami, Fla.

Filed Jul. 5, 1985, Ser. No. 751,808

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—251 **16 Claims**



1. A complete building roof, wall and intermediate floor structure which comprises:

a. a plurality of building panels formed from synthetic mate-

rial and having opposed major surfaces to provide wall panel members and roof panel members,

(1) said building panels being prefabricated and assembled so as to form conduits between adjacent wall panel members and corresponding roof panel members to provide upon setting of pneumatically applied reinforced concrete structure,

b. a plurality of vertical, inclined or horizontal reinforced concrete members capable of being joined to said panel members,

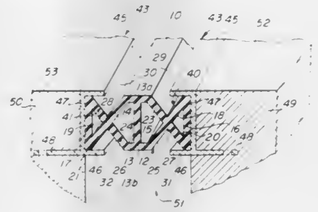
c. the erected synthetic material which originally form conduits and surfaces to receive the concrete and which together comprise the erected structure revert to insulation following the setting of said concrete and provide no structural support to the completed builiding.

4,625,485

ELASTOMERIC GLANDS

John D. Nicholas, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed Jan. 14, 1986, Ser. No. 818,704
Int. Cl.[4] E01C *11/10*
U.S. Cl. 52—396 **22 Claims**



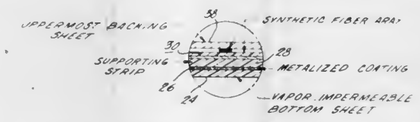
1. An elastomeric gland for use inside a movement tolerance space between relatively movable bodies, said gland comprising; a generally hexagonal wall member tubular longitudinally of said gland and an intermediate strut wall interconnecting a first pair of side walls of said hexagonal wall member medially of said first pair of side walls inside said hexagonal wall member, thereby producing an I-beam aspect with said first pair of side walls of said hexagonal wall member prior to said hexagonal wall member being compressed, and second and third pairs of side walls of said hexagonal wall member interconnecting opposite lateral ends of said first pair of side walls and forming a pair of apexes spaced oppositely of said intermediate strut wall about equidistantly from opposite sides of said intermediate strut wall, and said gland further including, opposite end means to be against said relatively movable bodies when said gland is inside said movement tolerance space, and two pairs of slanted connecting walls connected with said second and third pairs of side walls of said hexagonal wall member and with said opposite end means, having said connections with said second and third pairs of side walls of said hexagonal wall member contiguous to said pair of apexes and removed in one of said pairs of slanted connecting walls about equidistantly from said opposite lateral ends of one of said side walls in said first pair of side walls of said hexagonal wall member and removed in the other of said pair of slanted connecting walls about equidistantly from said opposite lateral ends of the other of said side walls in said first pair of side walls of said hexagonal wall member, and having said slanted connecting walls in said one of said two pairs diverge with reference to said slanted connecting walls in said other of said two pairs as said slanted connecting walls lead away from said hexagonal wall member, for said second and third pairs of side walls of said hexagonal wall member to be flexed about said opposite lateral ends of said first pair of side walls of said hexagonal wall member under thrust from said two pairs of slanted connecting walls and thereby carry said pair of apexes toward said opposite sides of said intermediate strut wall and ultimately, when said gland is fully compressed, have said second and third pairs of side walls of said hexagonal wall member be side facially against said opposite sides of said intermediate strut wall, with said first pair of side walls of said hexagonal wall member and said intermediate strut wall still appreciably preserving said I-beam aspect.

4,625,486

LAMINATED VAPOR BARRIER MATERIAL AND METHODS OF USE

Thomas C. Dickinson, 205 Fifth St., Hackettstown, N.J. 07840

Filed Jan. 22, 1985, Ser. No. 693,469
Int. Cl.[4] E04B *1/74*; A47H *1/14*; E04G *3/00*
U.S. Cl. 52—404 **12 Claims**



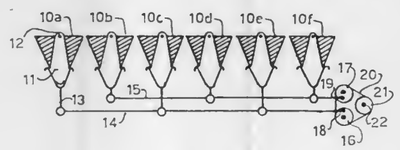
1. A reinforced laminated layer vapor barrier material for being supported by fasteners at a plurality of mounting points in a building interior comprising a bottom moisture resistant material facing sheet, an uppermost backing sheet, an intermediate strengthening fiber array layer being constituted by a plurality of layers of strips of synthetic fibers of generally the same cross section and arranged in a criss cross diamond array to provide multi-directional strength, a plurality of laterally disposed and longitudinally spaced fastener engaging support strips of greater cross section than said synthetic fibers and integrally formed in the laminated layer intermediate said fiber array layer and said bottom sheet, an adhesive interconnecting all layers into a cohesive selfsupportive, layered and laminated vapor barrier material.

4,625,487

BODY SUPPORT

Richard S. Blakeway, Queensland, Australia, assignor to Francis John Boundy, Victoria, Australia

Filed Feb. 20, 1985, Ser. No. 703,511
Claims priority, application Australia, Feb. 21, 1984, PG3731
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—446 **7 Claims**



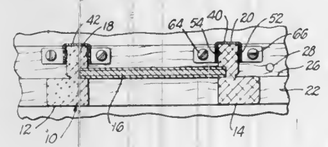
1. A body support comprising a flat topped support surface built up of a series of parallel, elongated, side by side, support means, each said support means being pivotally mounted for rotational movement about an axis transverse to one dimension of said body support, each said support means being provided with an upper support surface each generally in the same plane as its neighbours when said support means are disposed with their upper surfaces parallel to said support surface, each said support means being supported for tilting about its rotational axis by means of a tiltable support tray, each said support means being so shaped that in their horizontal situation each support means substantially abuts against its neighbour and can be tilted from the horizontal without fouling against its neighbours, drive means being provided, operatively linked to a pair of drive links moved thereby reciprocatively in a direction transverse to the support means axes said drive links being adapted to move in opposite directions relative to one another, and each drive link being connected to alternate support trays along the series of trays so as to move them as two interconnected groups, each group moving in opposed manner to the other.

4,625,488

WALL ATTACHMENT CLIP FOR SUSPENDED WOODBEAM CEILING

Gilbert G. Kern, 515 N. Victory Blvd., Burbank, Calif. 91502

Continuation-in-part of Ser. No. 598,410, Apr. 9, 1984, Pat. No. 4,525,971, which is a division of Ser. No. 407,652, Aug. 12, 1982, Pat. No. 4,464,876, which is a continuation-in-part of Ser. No. 259,858, May 4, 1981, Pat. No. 4,454,700, which is a continuation-in-part of Ser. No. 28,904, Apr. 10, 1979, Pat. No. 4,281,498. This application Apr. 22, 1985, Ser. No. 726,142
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—665 **4 Claims**



1. An attachment clip in combination with a suspended woodbeam ceiling wherein said woodbeam ceiling comprises:

a wood ceiling beam comprising first and second longitudinal woodbeam side members, each having an upstanding web, a beam center attached to and positioned between said woodbeam side members to maintain said side members in spaced relationship;

a wall rail, said wall rail being made of wood and being for securement against the wall of a room at the level of said suspended woodbeam ceiling, said wall rail lying at right angles to said beam so that both of the upstanding woodbeam side members on said beam lie against said wall rail, and wherein said attachment clip comprises:

a body having a web and first and second flanges attached to said web and extending substantially parallel to each other and forming an inverted U-shaped body lying on said upstanding web of one of said longitudinal woodbeam side member, inwardly directed points on both said flanges, said attachment clip being made of stamped metal and said inwardly directed points being stamped from said flanges to extend into the interior U-shaped channel between said flanges, said inverted U-shaped body being positioned down over the upstanding web of one of said first and second upstanding longitudinal woodbeam side members of said beam with said web of said body lying on said web of said side member with said points on both said flanges engaging in said web of said upstanding longitudinal woodbeam side member upon which it is engaged to retain said body of said attachment clip onto said beam;

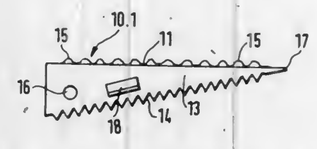
first and second tabs formed on said body respectively secured to said first and second flanges, said tabs being bent away from each other to lie substantially in a plane and lie against the face of said wall rail, said tabs each having an opening therein and a fastening member engaged through said opening into said wall rail to retain said beam adjacent said wall rail.

4,625,489

WEDGE FOR USE IN LATTICE SUBSTRUCTURES OF WALL PANELS

Ulrich Bögle, Reutlingen, Fed. Rep. of Germany, assignor to Wilhelm Bögle KG, Reutlingen, Fed. Rep. of Germany

Filed Jan. 3, 1986, Ser. No. 816,047
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502959
Int. Cl.[4] B66F *13/00*
U.S. Cl. 52—712 **18 Claims**



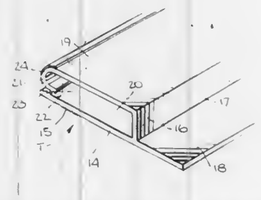
1. A wedge for use with lattice substructures of wall panels, comprising side walls and a back wall extending between said side walls, the wedge being bent from a sheet stamping, each side wall having a wedge surface formed at least partially by a bent edge region, each edge region having a toothed edge.

4,625,490

TRACKS FOR FABRIC WALL COVERINGS

Floyd M. Baslow, P.O. Box 778, Highland Lakes, N.J. 08422

Filed Oct. 1, 1985, Ser. No. 782,531
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—716 **6 Claims**



1. A panel frame formed by track pieces attachable to a wall for supporting a fabric panel whose margin has an excess tail that is anchored in the track pieces, each track piece comprising:

(A) A flat base that lies against the wall, said base having parallel upper and lower edges, the rear surface of said base adjacent its upper edge having a band of striations thereon to facilitate bonding thereof to said wall;

(B) a profiled strip that overlies the base and has an edge wall joined to the base at about a right angle thereto along a line intermediate the upper and lower edges of the base, the section of the base below said line functioning as a mounting flange for the track piece to secure it to the wall, a raised face parallel to the base to define therewith a storage channel, said face being adhesive-free and extending from the edge wall to a rounded cove terminating in a bent-in nose that normally abuts the upper border of the base to define a dilatable inlet leading into said storage channel; and

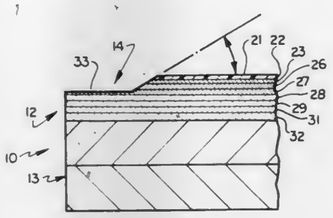
(C) a layer of pressure-sensitive adhesive provided on said cove to hold the margin of the fabric panel as the tail thereof is being stuffed into said channel through the inlet.

4,625,491

ELEVATED FLOOR PANEL WITH INTEGRAL TRIM

Franklin E. Gibson, Ellicott City, Md., assignor to Donn Incorporated, Westlake, Ohio

Filed Jan. 13, 1986, Ser. No. 817,893
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—794 13 Claims



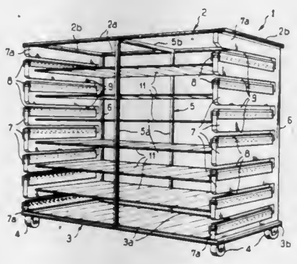
1. A floor panel for elevated floors comprising a rectangular base structure adapted to be supported at its corners and providing a load surface operable to support loads thereon, a floor covering mounted on said load surface providing a decorative exposed surface layer on the side thereof opposite said load surface, said floor covering providing an inner body portion having an appearance contrasting with the appearance of said decorative surface layer, said floor covering providing a border along the edges of said panels along which said decorative surface layer is removed to expose said inner body portion and thereby provide an integral contrasting border around said decorative surface layer.

4,625,492

DEVICE FOR PACKING AND IN VACUO PRESERVING, IN A PLASTIC WRAPPING, PRODUCTS STERILIZED IN AN AUTOCLAVE

Christian Colas, Neuilly sur Seine, France, assignor to MAJ, Pantin, France

Filed Apr. 18, 1985, Ser. No. 724,346
Claims priority, application France, Apr. 27, 1984, 84 06672
Int. Cl.[4] B65B *31/02*
U.S. Cl. 53—373 3 Claims



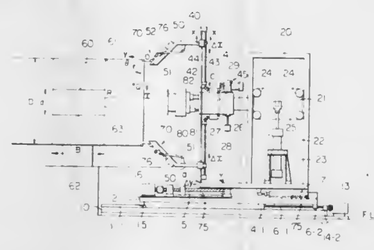
1. A device for packing and in vacuo preserving, in a plastic wrapping, products, particularly linen, sterilized in an autoclave, comprising a support rack at least one of the vertical faces of which has vertically spaced horizontal slits, means for supporting air-impermeable plastic material bags in a horizontal position inside said support rack, each bag having an open end which passes through one of the horizontal slits in said support rack, and compression and sealing means associated with the slits for sealing the open ends of the bags, each compression and sealing means comprising a pair of parallel horizontal bars, which define therebetween one of said slits and which are movable and fixed, respectively, and an actuating means for moving said movable bar between a first position in which the two bars of each pair are spaced apart from each other and a second position in which the two bars of each pair are pressed against each other, said actuating means comprising a linear actuator having a direction of movement which is parallel to the longitudinal direction of said horizontal slits, and a conversion mechanism arranged for converting the direction of movement of said linear actuator into a movement orientated perpendicularly to the longitudinal direction of said slits, and which acts at two longitudinally spaced points on said movable bar, the arrangement being such that the stroke of the movable bar between the first and second positions is at least 5 mm, said conversion mechanism comprising a horizontal control bar coupled to said linear actuator, a pair of ramp-shaped cams, which are situated respectively close to the ends of said movable bar, and a pair of rollers associated respectively with said cams, one of said pairs of cams and rollers being carried by said movable bar, whereas the other pair is carried by said horizontal control bar, said horizontal control bar extending between the movable bar of one of said pairs of parallel horizontal bars and the fixed bar of an adjacent pair of parallel horizontal bars, and one of the two bars, namely the control bar and the fixed bar of the adjacent pair of parallel horizontal bars, comprising at least two longitudinally spaced rollers which engage with a horizontal rolling surface of the other one of the two bars.

4,625,493

APPARATUS FOR WRAPPING THE END SURFACE OF CYLINDRICAL OBJECT

Yoshio Yagi; Toshihiko Kondo; Norio Matsubara; Shoichiro Miyazaki; Atsumi Seya, all of Kitakyushu; Akira Matsunami, and Keizo Fujiwara, both of Kimitsu, all of Japan, assignors to Yuwa Sangyo Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,274
Claims priority, application Japan, Dec. 25, 1984, 59-272089
Int. Cl.[4] B65B *7/14*
U.S. Cl. 53—378 3 Claims



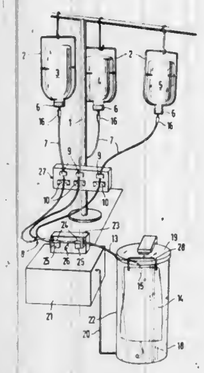
1. Apparatus for wrapping the end surface of a cylindrical object comprising, in combination, an immovable machine base, a mobile machine base on said immovable machine base, the position of said mobile machine base being adjustable in the horizontal direction, a fixing frame on said mobile machine base, an ultra low friction sliding mechanism supporting said fixing frame on said mobile machine base, a mechanism connected to said fixing frame for adjusting the position of said fixing frame in the horizontal direction, said frame being provided with a tubular member which is freely movable in the vertical direction, a lift device connected to said tubular member for moving it vertically, a rotatable tubular member fitted into said tubular member and provided with a drive source for rotation, said rotatable tubular member being further provided with a support arm fixing disc having a plurality of radial elongated openings formed at equal intervals therearound, a support arm base for each opening and shiftable on the disc in the direction of the corresponding opening, each said support arm base freely slidable in a corresponding opening, support arm drive means for driving said support arms radially on said fixing disc, and a support arm pivotally mounted on each said support arm base, said support arm being provided at its free end with a grip device consisting of a radially outer and a radially inner member for gripping the projecting portion of the wrapping paper, said outer member being provided with a pusher plate for being pressed against the end of the coil as said grip device is moved radially inwardly, and means for rotating said pusher plates, whereby a projecting portion of a wrapping paper on the outer surface of the cylindrical object is gripped on its circumference by the grip devices, pleats are formed therein as the support arms are moved inwardly and the free end of the projecting portion of the wrapping paper is constrained under tension, and the folded pleats of the wrapping paper are pressed against the coil upon rotation of said pusher plates.

4,625,494

METHOD AND APPARATUS FOR MAKING MIXTURES OF PHARMACEUTICAL LIQUIDS

Peter Iwatschenko, Neunkirchen, and Fritz Giebler, Meitingen-Ostendorf, both of Fed. Rep. of Germany, assignors to Pfrimmer & Co. Pharmazeutische Werke Erlangen, Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 489,645, Apr. 28, 1983, abandoned.
This application Dec. 13, 1985, Ser. No. 808,668
Int. Cl.[4] B65B *31/02*
U.S. Cl. 53—432 21 Claims



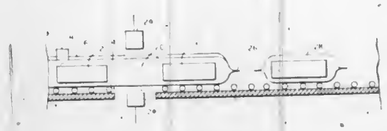
18. A method for automatically preparing and accurately mixing predetermined amounts of pharmaceutical liquids under sterile conditions, comprising the steps of passing the liquid to be mixed from separate closed supply containers along separate supply paths, combining said separate supply paths into a combined flow path leading to the receptacle to be filled with the pharmaceutical liquids, maintaining the outside of said receptacle under vacuum conditions, maintaining said separate supply paths and said combined flow path closed from the surrounding atmosphere, sensing the emptying of each of said supply containers by sensing means which sense the air in the respective separate supply path, closing off the respective supply path by closure means upon sensing said air to thereby prevent air from entering the supply path downstream of said closure means upon emptying of the respective supply container, and thereafter sealing off the contents of said receptacle, whereby the receptacle thereby receives a predetermined amount of pharmaceutical liquid from each of said supply containers along a flow path closed from the surrounding atmosphere and air is prevented from entering said receptacle upon emptying of the respective supply container, thereby providing for automatic and exact filling of the receptacle under sterile conditions.

4,625,495

METHOD OF PACKAGING AND SYSTEM THEREFOR

John M. Holovach, Denville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,229
Int. Cl.[4] B65B *51/20*
U.S. Cl. 53—450 5 Claims



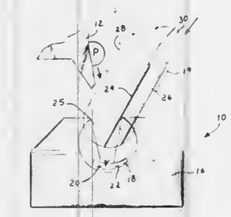
1. A method of packaging comprising:
(a) providing a series of spaced, in-line items to be packaged within a flexible heat-sealable film in tubular form;
(b) directing oppositely disposed heated streams of gas against the tubular film so as to effect heat-softened concave deformations in said tubular film between said spaced items;
(c) by application of a heated force, collapsing said tubular film between said spaced items from a direction at least about normal to the streams of gas, causing said concave deformations to form collapsed, oppositely disposed, spaced-apart gussets, said heated force being capable of heat-softening the film in a region transverse of said tubular film;
(d) cooling all heated film surfaces to cause heat-sealing of contacting surfaces;
(e) severing the tube along a line at least generally midway of the heat-seal between said items; and
(f) serially repeating the process steps to form individual heat-seal packaged items.

4,625,496

METHOD AND APPARATUS FOR FORMING A RECLOSABLE PACKAGE

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Jun. 11, 1985, Ser. No. 743,423
Int. Cl.[4] B65B *9/00*
U.S. Cl. 53—451 14 Claims



1. A method for forming reclosable plastic bags from plastic sheeting having longitudinally extending zipper profiles thereon, in situ, on a form and fill machine of the type having a collar disposed about a filling spout, said plastic sheet having a major portion and said profiles defining a minor portion formed substantially centrally on said major portion, said method comprising:
moving said sheeting longitudinally across said collar;
guiding said major portion about said pouring spout and joining the longitudinal edges of said sheeting to form a tube;
guiding said minor portion and said profiles away from said pouring spout;
flattening said major portion and said minor portion to form a transverse sealing zone;

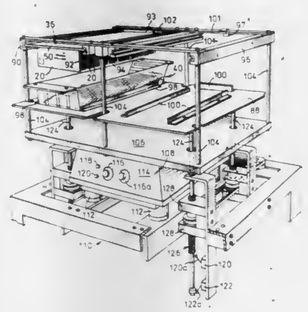
forming a first transverse seam across said major and minor portions at said traverse zone whereby to form a pocket;
introducing product into said pocket and, thereafter, forming a second transverse seam spaced across the product from the first transverse seam to thereby form a bag about said product.

4,625,497

METHOD AND APPARATUS FOR EXTRACTING THE CONTENTS OF ENVELOPES

Trevor W. Owen, Mississauga, Canada, assignor to Owen Tri-Cut Limited, Mississauga, Canada

Filed Sep. 17, 1985, Ser. No. 777,069
Int. Cl.[4] B65B *69/00*
U.S. Cl. 53—492 **15 Claims**



1. A method of extracting the contents of envelopes each of which has been opened along at least one longitudinal edge and has an opposite unopened longitudinal edge, the method comprising the steps of:
providing a support having a generally planar surface carrying an adhesive;
arranging a batch of said envelopes on said support with the envelopes generally parallel to one another and with their unopened longitudinal edges in contact with said adhesive, the adhesive being capable of causing the envelopes to adhere to the support by their said unopened longitudinal edges;
orienting the support with the envelopes suspended from the support, above a tray for receiving the contents of the envelopes; and,
vibrating the support to dislodge the contents from the envelopes and permit them to fall into the tray.

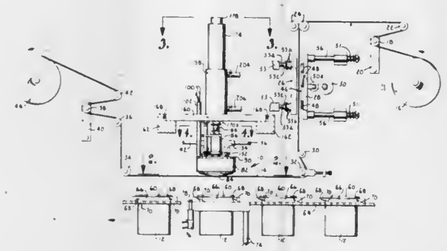
4,625,498

APPARATUS FOR APPLYING RECESSED MEMBRANE SEALS TO CONTAINERS

Jack D. Parsons, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.

Filed Mar. 25, 1985, Ser. No. 715,904
Int. Cl.[4] B65B *7/28;* **B67B** *5/00*
U.S. Cl. 53—526 **18 Claims**

1. Apparatus for applying a flat flexible membrane to a container having a rim, said apparatus comprising:
a frame;
an applicator head for applying the membrane to the container, said applicator head having a vacuum surface for applying suction to the membrane and a sealing surface for sealing a marginal portion of the membrane to the rim of the container, said vacuum surface and sealing surface being rigidly connected to one another in the applicator head;
means for mounting said applicator head on the frame for generally up and down movement between a raised position wherein the applicator head is located above the container and a lowered position wherein said vacuum surface is lowered into the container a predetermined distance below the rim and said sealing surface is on the rim of the container;
means for applying suction to said vacuum surface;
means for maintaining a flat web of material under tension with the membrane carried on the web and located between the container and applicator head in the raised position of the latter;
power means for effecting movement of said applicator head from the raised position to be lowered position to effect adherence of the membrane to said vacuum surface by



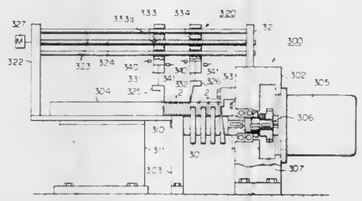
suction and detachment of the membrane from the web as said vacuum surface moves below the web and into the container, said vacuum surface projecting beyond said sealing surface to deform and recess the membrane said predetermined distance below the rim of the container before a marginal portion of the membrane is engaged against the rim of the container by said sealing surface; and
means for heating said sealing surface to heat seal the marginal portion of the membrane to the rim of the container with the membrane recessed below the rim.

4,625,499

DEVICE FOR LOADING PRODUCTS TO A PREDETERMINED LOCATION

Yoshimitsu Yamaguchi; Masanori Suzuki, both of Kariya, and Tadahiko Shibata, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 2, 1985, Ser. No. 751,237
Claims priority, application Japan, Jul. 6, 1984, 59-138970
Int. Cl.[4] B65B *35/30*
U.S. Cl. 53—542 **5 Claims**



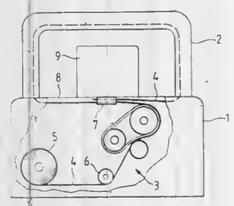
1. A device for loading products to a predetermined location comprising:
a frame,
a stopper provided along a path through which the products are fed to the predetermined location, the ends of the products being engagable with said stopper,
a threaded column supported in said frame and rotating in such a manner that the upper surfaces thereof move clockwise in a direction toward said stopper, said threaded column having external screw threads turning in a direction toward the predetermined location when side threaded column rotates, the portion between said screw threads receiving the product to urge the product along by frictional force from the rotation of said threaded column until the end of the product butts against said stopper, said portion feeding the product toward the predetermined location while urging the end of the product against said stopper,
means for rotating said threaded column,
means for supplying the product to said threaded column in such a manner that the product is engaged with the portion between said screw threads, said supply means being provided on the opposite side of said threaded column to said stopper, and
means for bundling a predetermined number of products, said bundling means including:
at least a front claw and a rear claw, and
means for moving said claws up and down relative to the predetermined location and to and fro relative to said stopper, in such a manner that such front claw moves forward to a lower position and said rear claw is at first stationary in an upper position, and then moves forward to a lower position to operate together with said front claw to engage the products,
said moving means including a pair of support members, a guide rod, a threaded rod, means for connecting said front and rear claws and means for rotating said threaded driving rod about the axis thereof, said guide rod and said threaded driving rod being supported at said support members in such a manner that said guide rod and said threaded driving rod are disposed in parallel to the surface of the predetermined location, said front claw being moved forward by said threaded driving rod, and said connecting means having delay means connecting said front and rear claws after only said front claw has moved forward a predetermined distance from said rear claw so that said front and rear claws move forward together after the connecting of said claws.

4,625,500

MACHINE FOR APPLYING A BAND AROUND A PACKAGE

Hans Huber, Buttikon, Switzerland, assignor to A. Konrad Feinmechanik Ag., Merenschwand, Switzerland

Filed Mar. 11, 1985, Ser. No. 710,034
Claims priority, application Switzerland, Mar. 13, 1984, 1247/84
Int. Cl.[4] B32B *35/00;* **B65B** *13/04*
U.S. Cl. 53—589 **7 Claims**



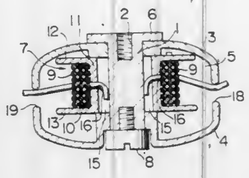
1. A machine having a drive for applying a band around a package wherein the package is held together after winding around the band, tensioning said band and joining the band ends, said machine drive comprising a drive motor and sliding means for feeding and tensioning the band, a clutch located between said drive motor and said sliding means, said clutch including means for adjusting the transmittable torque and for metering the band tension exerted on the package wherein said clutch is a controllable electromagnetic clutch having an armature which is under the action of a magnetic restoring force which assists the release of the clutch.

4,625,501

CUTTER BLADE DEVICE OF MOWING MACHINE

Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,241
Claims priority, application Japan, Feb. 14, 1984, 59-19583[U]
Int. Cl.[4] A01D *34/67*
U.S. Cl. 56—12.7 **3 Claims**



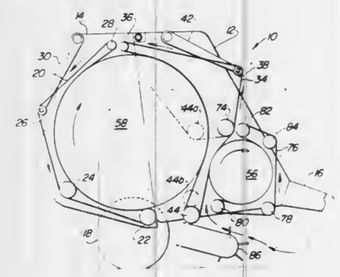
1. A cutter blade device for a mowing machine, comprising:
a spool of generally cylindrical configuration having a cylindrical outer wall portion and a non-cylindrical inner wall;
a flexible cord wound in coil form on said cylindrical outer wall portion of said spool;
a boss adapted to be mounted on a drive shaft for driving a casing of the mowing machine for rotation, said boss being received axially within the non-cylindrical inner wall of said spool so that said spool and said boss are rotatively fixed relative to one another, and so that said non-cylindrical inner wall of said spool and the exterior surface of said boss define therebetween at least one axially extending depression to receive an inner end portion of said cord;
a through hole formed in the cylindrical outer wall portion of the spool and opening into the non-cylindrical inner wall of said spool at the axially extending depression; and
wherein said inner end portion of the cord is led through said through hole into the axially extending depression and is bent and held in position therein.

4,625,502

PRESS FOR FORMING CYLINDRICAL BALES

Ralph A. Gerhardt, Bettendorf, Iowa, and Jean Viaud, Sarreguemines, France, assignors to Deere & Company, Moline, Ill.

Filed Jan. 18, 1985, Ser. No. 692,601
Claims priority, application European Pat. Off., Jan. 19, 1984, 84400111.5
Int. Cl.[4] A01F *15/18*
U.S. Cl. 56—341 **1 Claim**



1. A press for forming large cylindrical bales, comprising: a mobile frame including a fixed front part and a rear part forming a raisable door pivotally connected to the front part; a first set of transverse rollers supported by the rear part of the frame and including a lower front fixed roller; second and third sets fo transverse rollers supported by the front part of the frame; first, second and third sets of endless belts respectively being supported by the first, second and third sets of rollers with the

sets of rollers being arranged such that the first and second sets of belts cooperate to form a main bale-forming chamber and the second and third sets of belts cooperate to form a bale core-forming chamber forwardly of the main bale-forming chamber; said second set of rollers including a lower rear roller mounted between the bale-forming and bale core-forming chambers for vertical movement between lowered and raised positions; a pickup mounted to the frame and extending close to but beneath said lowered position to a location forwardly of said lower front fixed roller of the first roller set; said third set of rollers including a fixed lower rear roller spaced forwardly of said lowered position, a fixed lower front roller, a fixed upper rear roller and a movable upper front tensioning roller; said third set of rollers being so located that when a bale core is located in the bale core-forming chamber and the lower front roller of the second set of rollers is moved to its raised position, the tension in the third set of belts acts to force the bale core rearwardly past the lower rear roller of the third set of rollers into the main bale-forming chamber; and said pickup being located relative to the bale core and bale-forming chambers and to the lower front roller of the second set of rollers so that when the last-mentioned lower front roller is in its lowered position the pickup cooperates with the roller and loop to move crop material into the core-forming chamber and when the roller is raised to a position intermediate its lowered and raised position, the pickup moves crop material directly into the bale-forming chamber.

4,625,503

METHOD AND DEVICE FOR STRANDING MULTIFILAMENT SUPERCONDUCTOR STRANDS

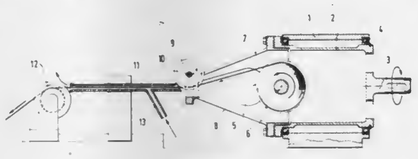
Patrick Dubots, Neauphle le Chateau; Jean-Claude Kermarrec, Velizy Villacoublay, and Jean-Pierre Tavergnier, Linas, all of France, assignors to Alsthom-Atlantique, S.A., Paris, France

Filed Jun. 24, 1985, Ser. No. 747,992

Claims priority, application France, Jun. 28, 1984, 84 10220

Int. Cl.[4] D02J *13/00*; D07B *3/00*

U.S. Cl. 57—6 **7 Claims**



1. A method of producing a twisted multifilament superconductor strand having a low stranding pitch without a substantial reduction in a critical current density of said strand, comprising:

twisting a multifilament superconductor strand to a pitch of between 3 and 7 diameters; and,

heating said multifilament superconductor strand to a temperature above 200° C.

4,625,504

PITCHED CABLES SHEATHED WITH A PLASTIC FILM AND METHOD OF SHEATHING

Franz Burghardt, Asslar, Fed. Rep. of Germany, assignor to Küster & Co. GmbH, Ehringshausen, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 748,319

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442494

Int. Cl.[4] D07B *1/16*

U.S. Cl. 57—223 **5 Claims**

1. A pitched cable partially sheathed with a plastic film and having an unsheathed portion defining a gear rack, comprising a plastic polyamide tube slipped over a given length of a pitched cable having a pitch helix and gaps between turns of said pitch helix, said plastic tube affixed to said pitched cable so that the outside diameter of said tube is decreased and parts of the inside wall of said plastic tube are entered into said gaps



between said turns of said pitch helix and thereby said tube is firmly fixed onto said cable.

4,625,505

FRICTION SPINNING DEVICE

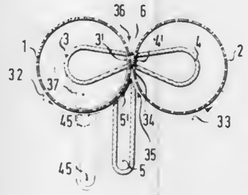
Hans Raasch, and Heinz-Georg Wassenhoven, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,513

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407339

Int. Cl.[4] D01H *7/882*

U.S. Cl. 57—401 **23 Claims**



1. A friction spinning machine for the production of spun yarn generated at least in part from spun fibers comprising

a first spinning member formed by a rotary body;

a second spinning member having a surface disposed adjacent to the first spinning member, where the surface is adapted to be moved in a direction about opposite to the surface motion direction of the first spinning member, and forming with the first spinning member an input triangular zone and an output triangular zone, where each triangular zone has one corner at about the location of closest spacing of the spinning members, where the input triangular zone and the output triangular zone are disposed on opposite sides of closest adjacency of two spinning members, and where at least one of the spinning members is provided with a perforated wall;

a suction means located close to one of the spinning members and disposed adjacent to the perforated wall such that a suction stream becomes effective pressing the spinning fibers against the surface of the spinning member;

a fiber feed provision;

a spun yarn discharge provision, where the fiber feed provision and the spun yarn discharge provision are disposed such that the fibers are fed into the input triangular zone and that a threaded spun yarn is withdrawn from the output triangular zone in a direction which is near a plane tangential to the outer surfaces of the spinning members at their closest spacing.

4,625,506

OPEN-END SPINNING PROCESS AND DEVICE

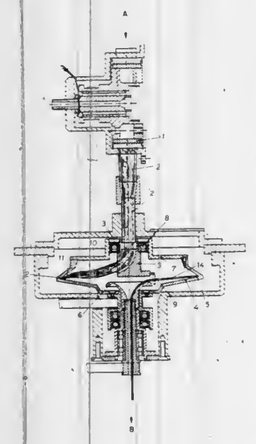
Michel Beckers, Verviers, Belgium, assignor to Societe Anonyme des Ateliers Houqet Duesberg Bosson, Verviers, Belgium

Filed Oct. 11, 1983, Ser. No. 540,765

Claims priority, application Belgium, Oct. 8, 1982, 0/209,204

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—413 **2 Claims**



1. In an open end spinning device in which a strand of fibers is fed to a disintegrator which separates the individual fibers and conveys them through a conveying channel to a rotor in which they are delivered to a fiber deposition zone fixed in space with respect to said rotor when in motion and in which said fibers are collected in a circular groove in the face of said rotor in the form of a ring of aligned and parallel fibers which are then converted by torsion into a continuous thread in a thread formation zone, said continuous thread being withdrawn from said rotor by thread delivery and thread winding means, the tension placed on said continuous thread by said delivery and thread winding means causing said thread formation zone to continuously move in space with respect to said rotor when in motion, the improvement for preventing the overlapping of said zones and the deposition of fibers on said continuous thread before they can become aligned with and parallel to each other in said ring of fibers, which comprises: a tubular component axially aligned with said fiber conveying channel and said rotor for receiving fibers from said conveying channel and directing them into the circular groove in the face of said rotor, said tubular component being mounted with respect to said rotor for separate rotation, and means associated with said tubular component and with said continuously moving thread whereby the motion of the latter is conveyed to said tubular element thereby providing thereto a speed of rotation equivalent to the difference between the speed of said thread formation zone and that of said rotor, whereby said fiber deposition zone and said thread formation zone are caused to move at corresponding speeds.

4,625,507

GUIDE CHAIN

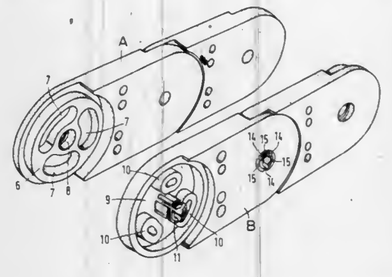
Werner Moritz, and Friedrich Haschek, both of Siegen, Fed. Rep. of Germany, assignors to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,706

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407169

Int. Cl.[4] F16G *13/00*

U.S. Cl. 59—78.1 **9 Claims**



1. An energy-conveying guide chain for feeding consumable material of all types, via lines, from a stationary connection to a movable consuming device; the lines being disposed in continuous inner spaces within said chain as link-supported therewith, which comprises:

a plurality of one-piece chain links, each of which has two ends, with a disk-shaped plate being disposed at one end, on one side of said link, and a cup with a floor being disposed at the other end, on the opposite side of said link; said plate having a central pivot axis, and slots disposed therearound in said plate at one end; said cup having a central pivot axis, and engaging studs disposed thereabout and formed in the floor of said cup; each of said plates being provided with a central pivot hole disposed on said pivot axis thereof, and each of said cups being provided with a central pivot journal disposed on said piovt axis thereof; a diameter of said plate being less than a diameter of said cup, so that the plate of one chain link can be placed in the cup of another chain link readily insertable in each other for a snap connection therewith, with the engaging studs of said cup extending into the slots of said plate to limit the angle of pivot of said links relative to one another.

4,625,508

HINGED BRACELET OF WATCH CHAIN TYPE

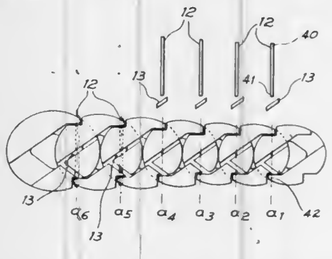
Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Bienne, Switzerland

Filed Mar. 12, 1985, Ser. No. 710,804

Claims priority, application Italy, Mar. 20, 1984, 20156 A/84

Int. Cl.[4] F16G *13/00*

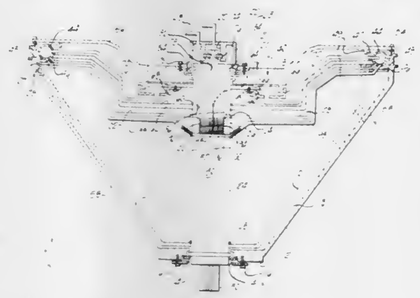
U.S. Cl. 59—80 **8 Claims**



1. A bracelet comprising a plurality of inter-engaging flat

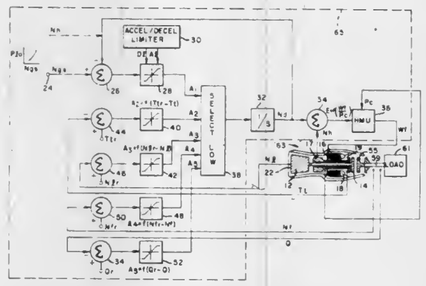
links (1) having an upper surface and an under surface, each of said links being of generally elliptical contour (5) with the major axis (3) of the ellipse extending longitudinally of the bracelet, a central diamond-shaped opening (2) in each link whose main diagonal coincides with the major axis of the ellipse, a first channel (30) extending obliquely to the said major axis diagonally from one edge (8) of the link to the other (8') in the upper surface of each link, the edges of said first channel extending along a first pair of parallel opposite sides (4,4') of said diamond-shaped opening, a second channel (31) extending obliquely to said major axis diagonally from one edge (7) of the link to the other (7') in the under surface of each link, the edges of said second channel extending along a second pair of parallel opposite edges (32,32') of said diamond-shaped opening, a slot (9) in each link extending along said first channel between one edge of the link and said opening (2), said slot permitting the passage of a second link when the bracelet is assembled, and means (10,11,12) for mutual pivotal connection between each pair of adjacent links in said chain about transverse axes lying in the plane of said links.

4,625,509
COMBUSTION ENGINE
Darrel J. Sheppard, Sr., 28751 Delton, Madison Heights, Mich. 48071
Continuation of Ser. No. 142,022, Apr. 21, 1980, abandoned. This application Jun. 28, 1983, Ser. No. 508,416
Int. Cl.⁴ F02C *3/14*; F26F *15/22*
U.S. Cl. 60—39.35 **28 Claims**



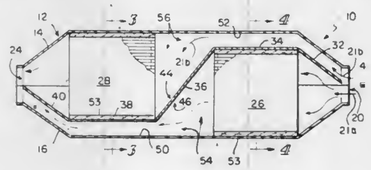
1. A combustion engine comprising:
a rotating drive shaft for power output at a first end of said shaft;
combustor means for burning fuel and for vaporizing liquid water to generate exhaust gases, said combustor means being attached to said drive shaft so as to drive said shaft by rotating thereabout;
first means for supplying fuel to said combustor means;
second means for supplying air to said combustor means, wherein said combustor means comprises a plurality of jets receiving fuel from said first means and air from said second means, each of said plurality of jets having exhaust means for directing exhaust gases in a plane perpendicular to said drive shaft so as to rotate said shaft;
ignition means for providing ignition in said combustor means; and
third means for supplying liquid water into said plurality of jets, wherein said shaft has a water passage coaxial therewith to receive water and said third means for supplying water comprises first duct means communicating water from said water passage to said plurality of jets in sufficient quantity to produce thrust in said plurality of jets by the vaporization of the liquid water supplied to said jets and exhausted therefrom.

4,625,510
STRESS LIMITER APPARATUS FOR A GAS TURBINE ENGINE
Rowland M. Evans, Terrasse-Vaudreuil, Canada, assignor to Bendix Avelex Inc., Montreal, Canada
Continuation of Ser. No. 257,027, Apr. 24, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 550,702
Int. Cl.⁴ F02C *9/28*
U.S. Cl. 60—39.161 **21 Claims**



1. A fuel control for gas turbine comprising:
(a) means for controlling the fuel flow to the gas turbine engine as a function of a demanded speed signal;
(b) means for generating said demanded speed signal as the time integral of a selected acceleration term;
(c) means for generating a demanded acceleration term as a function of at least one operating parameter of the engine;
(d) a plurality of summing means for generating difference signals between an actual parameter signal related to a stress limit and a predetermined limit value;
(e) a plurality of scheduling means for determining stress limit acceleration terms as functions of the difference signals generated by said summing means; and
(f) means for comparing said acceleration terms and for generating said elected acceleration term as the lowest of said acceleration terms, wherein said scheduling means provides:
(i) a difference signal determined as a function having a maximum acceleration value exceeding the maximum value of said demanded acceleration for operation of the engine in a normal range, (ii) decreasing acceleration values for operation of the engine within a predetermined range of a stress limit, (iii) a zero acceleration value for operation of the engine at the stress limit, (iv) increasing deceleration values for operation of the engine beyond the stress limit, and (v) a maximum deceleration value for operation of the engine in a dangerous range.

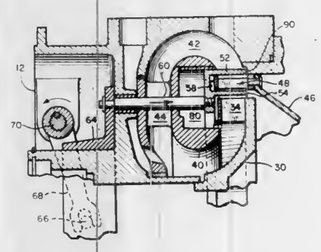
4,625,511
EXHAUST PROCESSOR
George E. Scheitlin; Mark A. Sickels, and Robert T. Usleman, all of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.
Filed Aug. 13, 1984, Ser. No. 639,803
Int. Cl.⁴ F01N *3/24, 3/02*
U.S. Cl. 60—299 **30 Claims**



1. An exhaust processor assembly comprising

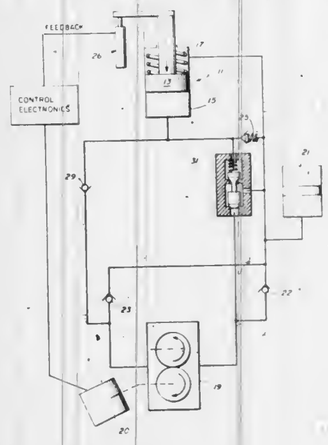
a housing including an interior wall, an inlet for introducing a combustion product into the housing and an outlet for exhausting combustion product from the housing,
first and second substrate means for treating combustion product introduced into the housing through the inlet, the first substrate means having an outer boundary, the interior wall of the housing and the outer boundary of the first substrate means cooperating to define a passageway therebetween, and
bypass means for distibuting a portion of the combustion product introduced into the housing through the inlet to the second substrate means for treatment therein through the passageway such that said distributed portion bypasses the first substrate means without flowing inside the outer boundary of the first substrate means to reach the second substrate means.

4,625,512
SINGLE STAGE, TWIN VALVE, VARIABLE TORQUE CONVERTER
James G. Morrow, Sr., Manitowoc, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.
Continuation of Ser. No. 694,893, Jan. 24, 1985, abandoned, which is a continuation of Ser. No. 392,565, Jun. 28, 1982, abandoned. This application Jan. 29, 1986, Ser. No. 823,829
Int. Cl.⁴ F16D *33/02*
U.S. Cl. 60—353 **3 Claims**



1. A torque converter comprising
a. a housing for containing a fluid medium and having a generally torroid-shaped chamber formed therein for providing a defined fluid flow path;
b. an input shaft mounted in the housing with a vaned impeller attached thereto for rotation therewith, the impeller having its vanes disposed within the fluid flow path of the torroid-shaped chamber,
c. an output shaft mounted in the housing with a vaned turbine attached thereto for rotation therewith, the turbine having a single set of vanes disposed within the fluid flow path of the torroid-shaped chamber so that the turbine and impeller are coupled by means of the fluid medium; and
d. means for regulating fluid flow from the impeller to the turbine within the torroid-shaped chamber and for completely sealing off the turbine from the fluid medium in the torroid-shaped chamber including a twin valve arrangement including a first cylindrical sleeve portion and a second cylindrical sleeve portion that are radially joined together in concentric relation and positioned for simultaneous axial movement into and out of the torroid-shaped chamber with the first sleeve portion movable axially into and out of a space between the vaned impeller and the vaned turbine and the second sleeve portion movable axially into and out of an area adjacent to and radially outward from the vaned turbine, the second sleeve portion in its outer axial position extending across the outside of the turbine vanes and abutting the housing whereby the turbine vanes are essentially sealed off from the oil flow in the torroid-shaped chamber so that for a constant input shaft speed a variable forward direction output torque is provided and a reduced reverse direction output torque is achieved depending on the axial position of the twin valve arrangement.

4,625,513
CONTROLLED FLOW HYDRAULIC SYSTEM
J. Robert Glomeau, Dover, Mass., assignor to REXA Corporation, Dover, Mass.
Filed Mar. 28, 1983, Ser. No. 479,673
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.⁴ F15B *13/04*
U.S. Cl. 60—431 **4 Claims**



1. A hydraulic system comprising:
a fluid reservoir;
a bidirectional pump;
a variable volume load having an inlet port, said load being moved in one direction by the introduction of fluid through said inlet port and being moved in the opposite direction by the withdrawal of fluid from said inlet port;
a flow matching control valve having a source port, a load port and a drain port, said control valve being characterized in that a hydraulic flow into the source port produces a matching controlled flow into the load port, both flows exiting the control valve together through said drain port;
means connecting said reservoir to both sides of said pump through respective check valves permitting flow from the reservoir toward the pump;
means connecting one side of said pump to the source port of said control valve;
means connecting the load port of said control valve to the inlet port of said load;
means connecting the drain port of said control valve to said reservoir; and
means connecting the other side of said pump to the inlet port of said load through a check valve permitting flow from said pump toward said load.

4,625,514

HEATER HEAD ASSEMBLY OF HEATED-GAS ENGINE

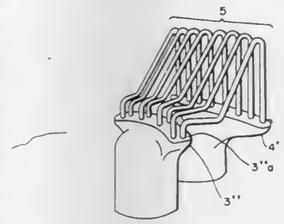
Tetsuya Tanaka, Toyota, and Kazuaki Yamaguchi, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

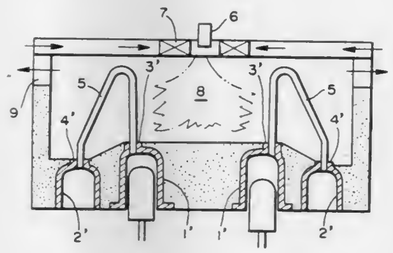
Filed Mar. 18, 1985, Ser. No. 712,740

Claims priority, application Japan, Mar. 26, 1984, 59-43584[U]

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—517 **2 Claims**





1. A heater head assembly of a heated-gas engine, comprising;

a plurality of cylinders arranged along a periphery of a combustion chamber;

a plurality of regenerator housings positioned radially outwardly of said plurality of cylinders;

a first manifold formed integrally with each of said cylinders;

a second manifold formed integrally with each of said regenerator housings; and

a bundle of heater tubes having first ends received in said first manifold and second ends received in said second manifold for connecting said cylinders and said regenerator housings through said first and second manifolds;

each of said first manifolds having an end face provided with insertion holes arranged in two rows for receiving the first ends of respective ones of said heater tubes, and an inner wall defining a working gas flow passage which is gradually and successively constricted from a width adjacent said end face greater than an inner diameter of the corresponding cylinder to a width substantially equivalent to said inner diameter, thereby substantially equalizing flow of the working gas from said corresponding cylinder into said heater tubes and from said heater tubes into said corresponding cylinder;

each of said second manifolds having an end face provided with insertion holes for receiving the second ends of respective ones of said heater tubes, and an inner wall defining a working gas flow passage which is gradually and successively constricted from a width adjacent said end face greater than an inner diameter of the corresponding regenerator housing to a width substantially equivalent to said inner diameter, thereby substantially equalizing flow of the working gas from said corresponding regenerator housing into said heater tubes and from said heater tubes into said corresponding regenerator housing.

4,625,515

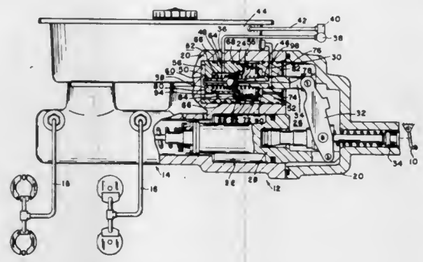
BRAKE BOOSTER

Lawrence R. Myers, and Lloyd G. Bach, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 20, 1984, Ser. No. 652,384

Int. Cl.⁴ B60T *13/20*

U.S. Cl. 60—551 **13 Claims**



1. A brake booster comprising a housing substantially defining a pressure chamber, an output piston exposed to the pressure chamber so that fluid pressure communicated to the pressure chamber acts against the output piston to move the latter to a brake applied position during braking, and a valve assembly operable during the brake application to communicate the fluid pressure to the pressure chamber, the valve assembly including an input member cooperating with a valve member to open communication between a pressure source and the pressure chamber during braking, the housing defining an intermediate chamber communicating with the pressure chamber and movably receiving the input member, a pressure cavity communicating with the pressure source and movably receiving the valve member and an auxiliary chamber normally isolated from the intermediate chamber upon termination of braking, and valve means controlling communication between said auxiliary chamber and said intermediate chamber, said input member operating said valve means for opening communication between said auxiliary chamber and said intermediate chamber before said input member opens communication between said pressure cavity and said intermediate chamber upon actuation of the valve assembly so that any fluid pressure leakage from said pressure cavity prior to actuation of the valve assembly to said auxiliary chamber will be initially communicated during actuation of the valve assembly to said pressure chamber via said intermediate chamber by said valve means and said fluid pressure leakage is trapped upon termination of braking in said auxiliary chamber.

4,625,516

BRAKE BOOSTER

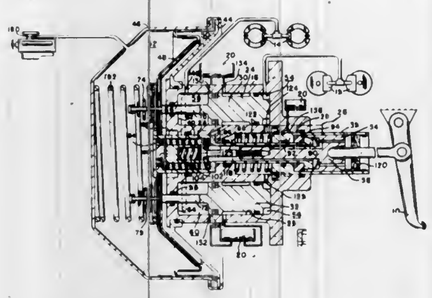
Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Aug. 2, 1984, Ser. No. 637,084

Int. Cl.⁴ B60T *13/20*

U.S. Cl. 60—554 **17 Claims**

1. A brake booster comprising a housing with at least three bores, a pair of pistons movably and separately carried in two of the bores, a valve assembly movably carried in one of the bores, diaphragm cooperating with the housing to define a pair of cavities, the valve assembly and the pair of pistons being engageable with the diaphragm, the valve assembly comprising a valve body coupled to the diaphragm, a valve member cooperating with the valve body in a rest position to open communication between the pair of cavities and a plunger cooperating with the valve member to impart movement thereto relative to the valve body and close communication between the pair of cavities so that a pressure differential is established across the diaphragm to impart movement thereto during braking, and a cylinder extending into the one bore and cooperating with the valve body and the housing to define a primary pressure chamber in the one bore, each of the pair of pistons separating a secondary pressure chamber in their respective bore from an auxiliary pressure chamber, the housing defining passages to communicate each auxiliary pressure chamber with the primary pressure chamber, the cylinder being movable in response to movement of the plunger to develop fluid pressure in the primary and the auxiliary pressure chambers, and the pair of pistons being movable in the same direction as the cylinder in response to movement of the diaphragm and also in response to fluid pressure communicated to the auxiliary pressure chambers in order to generate fluid pressure in each of the secondary pressure chambers during braking.



4,625,517

THERMOACOUSTIC DEVICE

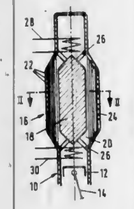
Ulrich A. Müller, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 10, 1986, Ser. No. 818,089

Claims priority, application Switzerland, Jan. 22, 1985, 269/85

Int. Cl.⁴ F03G *7/00*

U.S. Cl. 60—721 **19 Claims**



1. A thermoacoustic device having

a vibration chamber;

a heat source within said chamber;

a heat sink within said chamber; and

a plurality of rod-type elements within said chamber between said heat source and said heat sink.

4,625,518

ICE MUG

Saul E. Freedman, 1156 New Pear St., Vineland, N.J. 08360

Filed Jul. 9, 1985, Ser. No. 753,105

Int. Cl.⁴ F25C *5/08*; F25D *3/08*

U.S. Cl. 62—1 **5 Claims**

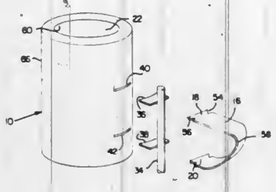
1. The method of forming an ice mug having a frozen container having a hollow interior and a handle means of non-freezable material comprising the steps of

fabricating a one-piece mold having an open top, sidewalls defining a bottomly closed annular area and a shaped interior baffle;

positioning the open mold top upwardly and filling the mold with a freezable, consumable liquid;

freezing the liquid within the mold to form the frozen container and conforming the hollow interior of the container to the shape of the interior baffle and sidewalls;

releasing the frozen container form the mold;



applying heat to at least one portion of the sidewalls and forming at least one melted area;

inserting a portion of the handle means into the melted area and refreezing the melted area;

whereby an ice mug comprising a frozen container with a partially embedded, non-frozen handle means is provided.

4,625,519

ROTARY MAGNETIC REFRIGERATOR

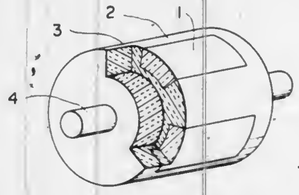
Yoshinori Hakuraku, and Hisanao Ogata, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,763

Claims priority, application Japan, Apr. 20, 1984, 59-78407

Int. Cl.⁴ F25B *21/02*

U.S. Cl. 62—3 **2 Claims**



1. In a rotary magnetic refrigerator comprising rotors which are packed with portions of a working substance at equal spacing along the outer circumference thereof, and which are made of a material having a low thermal conductivity, openings that are formed in the outer surfaces of said rotors so as to communicate with a high-temperature cooling medium, housings having cooling portions provided on sides thereof opposite to said openings, means which establishes an intense magnetic field near said openings and which establishes a weak magnetic field near said cooling portions, and means for driving said rotors, a rotary magnetic refrigerator characterized in comprising:

two of such rotors;

housings having openings which are formed in common for said two rotors, and cooling portions which are formed independently with respect to said rotors;

single electromagnet means for establishing an intense magnetic field near said openings;

means for establishing a weak magnetic field near said cooling portions; and

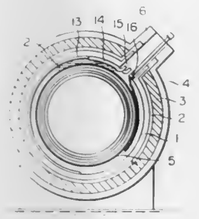
drive means for rotating said two rotors in synchronism with each other.

4,625,520

SUPERCONDUCTING DEVICE

Yasuomi Yagi, Hitachi; Ken Takahashi, and Takeo Nemoto, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,577
Claims priority, application Japan, Sep. 5, 1984, 59-184642
Int. Cl.[4] F17C *1/00*
U.S. Cl. 62—45 **10 Claims**



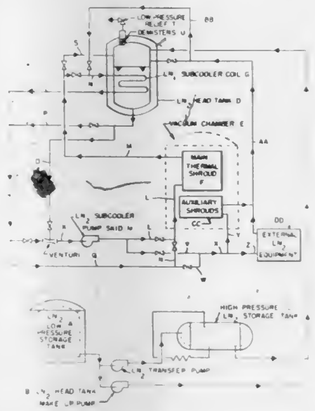
1. A superconducting device comprising a superconducting coil, a vessel structure having, in an installed position, a substantially cylindrical form with a longitudinal center axis extending substantially horizontally, said vessel structure inlcuding an inner vessel filled with a cryogenic coolant and mounting said superconducting coil therein, and a heat-insulating outer shield heat-insulatively covering said inner vessel, and a coolant inlet port fixed to said vessel structure and communicated with said inner vessel for supplying the coolant to said inner from outside of said vessel structure, said inlet port extending radially and outwardly of said vessel structure at an angle with a line vertical to the center axis of said vessel structure in the installed position.

4,625,521

LIQUID NITROGEN DISTRIBUTION SYSTEM

John C. Murphy, Pittsburgh, and Robert H. Swinderman, Mars, both of Pa., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.

Filed May 13, 1985, Ser. No. 733,055
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **13 Claims**



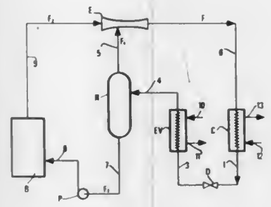
1. Apparatus for testing articles in a simulated space environment comprising:
a circulation system means for simulating low temperatures of a space environment including;
a vacuum chamber;
internal and external piping means cooperating therewith in both a subcooled pressurized closed loop forced feed system and in a gravity convection system;
heat exchanger means in said vacuum chamber connected to said piping means and cooperating with both of said systems; and
a head tank means for supplying liquid nitrogen (LN_2) to both of said systems.

4,625,522

PROCESS FOR PRODUCING COLD AND/OR HEAT BY USING A NON-AZEOTROPIC MIXTURE OF FLUIDS IN A CYCLE WITH EJECTOR

Jacques Cheron, Maisons Laffitte, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 9, 1986, Ser. No. 817,386
Claims priority, application France, Jan. 9, 1985, 85 00330
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—114 **9 Claims**



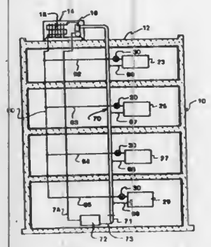
1. A process for producing cold and/or heat by using a working fluid (F), characterized by the steps of :
(a) subjecting a working fluid (F), in gaseous state, to condensation under a pressure (CP) by transferring the condensation heat of fluid (F) to an external fluid, said fluid (F) comprising a non-azeotropic mixture of 5–95 %, in molar proportion, of a first constituent and 95–5 %, in molar proportion, of a second constituent miscible in liquid phase with the first consituent the constituents of said mixture being chemically different and capable of evaporating but not to crystallizing under the operating conditions of the process,
(b) subjecting the resultant condensate to a pressure decrease and supplying heat thereto under said decreased pressure (EP) so as to partly evaporate it and separating the vaporized fraction (F1) from the liquid phase remaining fraction (F2),
(c) increasing the pressure of fraction (F2) up to a pressure (BP) higher than the pressure (CP) of step (a) and supplying heat to said fraction (F2), so as to obtain it (F2) in vapor phase, and
(d) subjecting the vapor phase fraction (F2) obtained in step (c) to expansion through ejection means and driving along with said expanded fraction the vapor phase fraction (F1) obtained from step (b), so as to admix said two fractions and to reconstitute the fluid (F) in gaseous state at the pressure (CP) of step (a).

4,625,523

OIL COLLECTION/RECIRCULATION FOR VAPOR-COMPRESSION REFRIGERATION SYSTEM

Samuel G. Toub, 14114 Dallas Pkwy./Suite 470, Dallas, Tex. 75240; James L. Gilliland, Jr., and Homer W. Holder, both of 3614 Security, Garland, Tex. 75042

Division of Ser. No. 375,721, May 7, 1982, Pat. No. 4,534,182.
This application Jan. 25, 1985, Ser. No. 700,705
Int. Cl.[4] F25B *31/00*
U.S. Cl. 62—193 **7 Claims**



1. In a vapor-compression refrigeration system:
an oil lubricated compressor, a condenser and an evaporator interconnected by conduit means to form a closed circuit for circulation of a refrigerant fluid;
at least part of said conduit means comprising a refrigerant vapor return conduit for conducting refrigerant vapor from said evaporator to said compressor, said compressor being disposed at a vertical elevation above said evaporator;
reservoir means in fl' ' flow communication with said refrigerant vapor return conduit for collecting oil separated from said refrigerant fluid;
means for pumping oil from said reservoir means to said compressor through a separate oil return conduit;
a fluid operated motor adapted to be driven by refrigerant fluid from said refrigeration system, said motor driving said pumping means; and
control means, including first liquid level sensing means, for sensing a predetermined accumulation of oil in said reservoir means and causing said pumping means to be energized to pump oil from said reservoir means to said compressor;
said first liquid level sensing means including switch means interposed in a control circuit and operable to cause said control circuit to energize said pumping means;
said control circuit adapted to open and close a refrigerant flow control valve for controlling the flow of refrigerant fluid through said fluid operated motor, said control circuit further being operable to energize and deenergize said motor to prevent more than a predetermined quantity of oil from accumulating in said reservoir means.

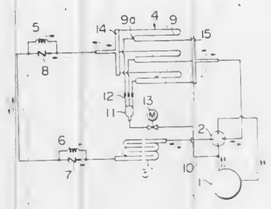
4,625,524

AIR-COOLED HEAT PUMP TYPE REFRIGERATING APPARATUS

Takashi Kimura; Hiromi Tanaka, and Masayoshi Omori, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1985, Ser. No. 804,939
Claims priority, application Japan, Dec. 7, 1984, 59-257536
Int. Cl.[4] F25B *47/00*
U.S. Cl. 62—278 **5 Claims**

1. An air-cooled heat pump type refrigerating apparatus having a refrigerant circuit reversible into heating and cooling operation modes, comprising a series of elements connected successively by piping means which include a compressor, a four-way valve, an indoor heat exchanger, a capillary tube for cooling having second check valve connected in parallel therewith, a capillary tube for heating having first check valve connected in parallel therewith and an outdoor heat exchanger, said circuit, by shifting the four-way valve, being capable of providing the heating operation mode in which a communication route is established in the order through the compressor, the four-way valve, the indoor heat exchanger, the first check valve, the second capillary tube, the outdoor heat exchanger, the four-way valve and the compressor, and the cooling operation mode in which a communication route is established in the order through the compressor, the four-way valve, the outdoor heat exchanger, the second check valve, the first capillary tube, the indoor heat exchanger, the four-way valve and the compressor as well as a defrosting operation mode in which a communication route is established through



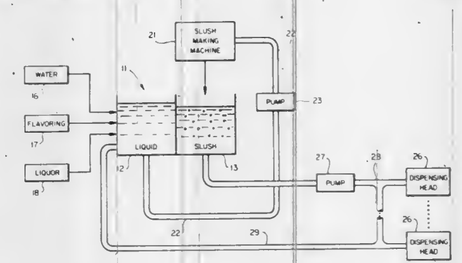
the same route as that in that cooling operation mode, characterized in that a branch tube branching off from a discharge tube of the compressor is provided, said branch tube being provided midway thereon with a solenoid valve and having a plurality of capillary tubes connected to the other end of the branch tube through a distributor, and said capillary tubes are connected respectively to heat transfer tubes of the outdoor heat exchanger at points midway thereon, and said solenoid valve is arranged to effect during the heating operation the opening and closing thereof by means of a control circuit which operates to sense outdoor air temperature and outdoor air relative humidity.

4,625,525

APPARATUS AND METHOD FOR PRODUCING FROSTED DRINKS

George Bradbury, 23921 Pinnacles Ct., Hayward, Calif. 94541, and David Bradbury, Hayward, Calif., assignors to Speciality Equipment Companies, Inc. Taylor Freezer Division, Rockton, Ill., by said David Bradbury

Filed Jun. 3, 1985, Ser. No. 740,282
Int. Cl.[4] F25D *13/00*
U.S. Cl. 62—330 **5 Claims**



1. In apparatus for producing frosted drinks: a first tank for holding a liquid, a second tank for holding a slush, slush making means which receives liquid from the first tank and freezes the liquid to form a slush which is delivered to the second tank, said second tank having a capacity substantially greater than the output of the slush making machine so that the slush can accumulate in the second tank, a dispensing head, and means for continuously circulating the slush from the second tank to the dispensing head and from the dispensing head to the first tank.

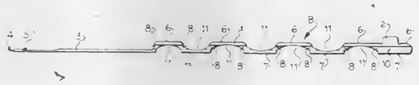
4,625,526
NIPPLE DECORATION DEVICE
Dale Milawski, 520 Spring Hill Dr., Roselle, Ill. 60172
Filed Dec. 18, 1984, Ser. No. 683,049
Int. Cl.[4] A44C *25/00*
U.S. Cl. 63—2 **13 Claims**





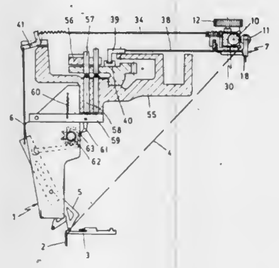
1. A decoration device for a nipple comprising:
a substantially C-shaped, hollow, tubular member;
means for applying a bias force contained within the hollow portion of said substantially C-shaped, hollow, tubular member;
two arcuate support arms connected to said C-shape, hollow, tubular member at the ends of said member, each of said support arms having one end slidably telescopically received within the hollow portion of said substantially C-shaped, hollow, tubular member and one end protruding from said substantially C-shaped, hollow, tubular member; and
two spaced apart arcuate pads, each of said two spaced apart arcuate pads being rigidly attached to the end of each arcuate support arm which protrude-from said substantially C-shaped, hollow tubular member, said spaced apart arcuate pads having concave surfaces confronting each other constructed and arranged for engagement with the sides of the nipple in generally conforming relation thereto;
whereby the decoration device will be held in place on the nipple by a bias force transmitted to said spaced apart arcuate pads by said support arms without causing undue discomfort to the wearer.

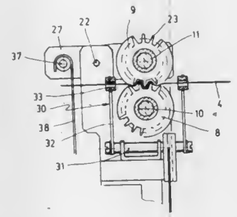
4,625,527
KNITTING PLATE NEEDLE AND ITS MANUFACTURING METHOD
Masao Fukuhara, Wakayama, Japan, assignor to Fukuhara Needle Company, Ltd., Wakayama, Japan
Filed Apr. 11, 1986, Ser. No. 850,603
Claims priority, application Japan, Apr. 12, 1985, 60-079116
Int. Cl.[4] D04B *35/02*
U.S. Cl. 66—123 **7 Claims**



1. In a knitting needle comprising an elongate shank including opposite sides, outer and inner edge portions of the same cross-sectional thickness and extending along corresponding front and back edges of said elongate shank, a hook on one end of said shank, and butt means integral with and extending outwardly from said front edge, the combination therewith of
a central section extending longitudinally of said shank and between said outer and inner edge portions,
said central section being of a predetermined cross-sectional thickness which is less than the cross-sectional thickness of said outer and inner edge portions and defining at least one elongate groove extending longitudinally along at least one of said opposite sides of said elongate shank and
said elongate groove extending substantially parallel with and spaced from said back edge of said elongate shank,
said groove providing improved shock absorbing characteristics to the needle to reduce the transmission of shock from said needle butt means to said hook, said groove also providing a passageway extending longitudinally along said needle shank to provide for improved retention and distribution of lubricant along said needle shank.

4,625,528
YARN FEED DEVICE FOR A CIRCULAR KNITTING MACHINE
José M. Dalmau Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain
Continuation of Ser. No. 656,855, Oct. 2, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,592
Claims priority, application Spain, Oct. 7, 1983, 526625
Int. Cl.[4] D04B *15/48, 15/58*
U.S. Cl. 66—132 T **7 Claims**

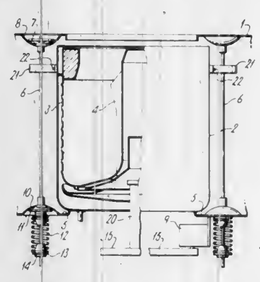




1. A yarn feed device for a circular knitting machine equipped with a striper, comprising:
(a) two parallel facing shafts which rotate in synchronism and are separated from one another, each of said shafts having mounted thereon a set of identical toothed rollers such that each of the drive rollers of one set is adapted to mesh with a mating driven roller of the other set, the teeth of the rollers of one set being shifted relative to those of the other so that, in rotation, the teeth of the one penetrate between the teeth of the other without making contact at any point;
(b) operating spaces between the toothed rollers of each set;
(c) a bevelled corner on the toothed rollers facing the corresponding operating space;
(d) a drive and a driven pinion mounted respectively on the parallel shafts, the drive pinion being adapted to cause the driven pinion to rotate;

(e) a yarnguide for each operating space, hingedly mounted on a shaft and including two eyelets defining a line capable of occupying an inoperative position extending through in an operating space or an operative position extending between a pair of rollers;
(f) an actuating lever for each yarnguide;
(g) a support head for hingedly mounting one of said parallel shafts; and
(h) activating means in the striper for receiving the yarn,
each of said yarnguide actuating levers being associated with the activating means of the striper at the same time as the support head of said one of said parallel shafts is associated with drive means synchronized with the rotation of the circular knitting machine and acting upon the striper.

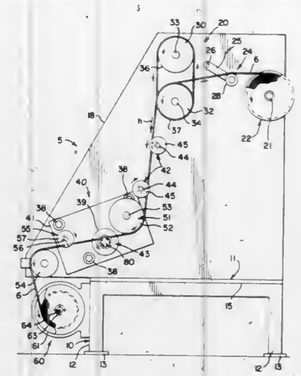
4,625,529
LAUNDRY MACHINES
Iain Anderson, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand
Filed Feb. 26, 1985, Ser. No. 706,028
Claims priority, application New Zealand, Feb. 29, 1984, 207317
Int. Cl.[4] D06F *37/24*
U.S. Cl. 68—23.3 **5 Claims**



1. A laundry machine comprising:
a frame having an upper part;
a water container, a rotatable wash element in the container and a motor in driving relation with the rotatable wash element, the container, the rotatable wash element and the motor being suspended as a unit from the upper part of the frame;
a plurality of suspension means suspending the unit from the frame so as to provide an upper part of the unit and a lower part of the unit, each suspension means comprising a rod, a first two part coupling for coupling the corresponding rod to the upper part of the frame and a second two part coupling for coupling the lower part of the unit to the corresponding rod, each two part coupling being adapted to permit free relative angular movement between the parts thereof; and
restraining means, for at least one of the suspension means, for coupling the upper part of said unit to the rod, in the corresponding restraining means, so as to restrain twisting of the unit relative to the frame beyond predetermined limits.

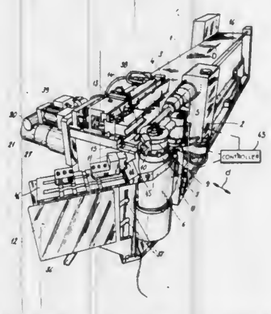
4,625,530
WIRE PREFORM APPARATUS
Gary L. Wood, Salisbury, N.C., assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Sep. 3, 1985, Ser. No. 772,279
Int. Cl.[4] B21C *47/00;* **B21F** *3/00*
U.S. Cl. 72—146 **7 Claims**

1. An apparatus for forming a helically shaped wire which is used in flexible wire reinforced hose, the apparatus comprising a frame, a wire supply means mounted on said frame for rotation about a first axis; a wire-shaping mechanism comprising a wire shaping support means mounted on said frame, a rotatable cylindrical preform roller mounted on said support means for rotation about an axis parallel to said first axis, said preform roller comprising at least one groove having a minor diameter, said preform roller is positioned for the engagement of the wire



in the groove about the minor diameter; and a windup reel mounted on said frame for rotation about an axis parallel to said first axis for tensioning said wire from said preform roller and for winding up the helically formed wire thereon.

4,625,531
BENDING MACHINE
Jean Lafrasse, Dardilly, and Jean-Paul Chastan, Ecully, both of France, assignors to Picot S.A., Tassin la Demi Lune, France
Filed Jul. 9, 1985, Ser. No. 753,314
Claims priority, application France, Jul. 10, 1984, 84 11321
Int. Cl.[4] B21D *7/04, 9/05*
U.S. Cl. 72—150 **2 Claims**



1. A machine for bending an elongated workpiece extending along a longitudinal axis, the machine comprising:
a housing;
holding means on the housing for retaining the workpiece with its axis nondisplaceable relative to the housing and for advancing the workpiece in a feed direction parallel to the axis;
a support defining a mandrel axis transverse to the longitudinal axis and spaced transversely therefrom, the support and the mandrel axis being displaceable on the housing transverse to the longitudinal workpiece axis;
a mandrel carried directly on the support and formed with an arcuate groove centered on the mandrel axis, the mandrel carrying an inner jaw forming a continuation of the groove and being rotatable therewith on the support about the mandrel axis;
an arm mounted directly on the support pivotal about the mandrel axis and carrying an outer jaw generally complementary to the inner jaw;

a guide carried directly on the housing mainly upstream of the mandrel and having a guide groove confronting the groove of the mandrel and centered on the longitudinal workpiece axis;

jaw actuator means for displacing the outer jaw on the arm radially of the mandrel axis;

guide actuator means for displacing the guide on the housing transversely of the feed direction and independently of the support;

support actuator means for displacing the support and the jaws and mandrel carried thereby transverse to the direction and independently of the guide; and

pivot actuator means for pivoting the support about the mandrel axis to bend the workpiece between the jaws and the guide, the support actuator means including

an electric motor carried on the housing,

a spindle rotationally coupled to the electric motor, extending perpendicular to the mandrel axis, and threaded into the support for displacing the support relative to the housing prior to pivoting of the support and bending of the workpiece,

a tubular piston fixed on and coaxially receiving the spindle, and

a cylinder fixed on the housing and forming a pair of oppositely effective hydraulic compartments flanking the piston for displacing the support relative to the housing after pivoting of the support and bending of the workpiece.

4,625,532

MANUFACTURING STEEL CONCRETE REINFORCEMENTS ON A HIGH SPEED ROD ROLLING MILL

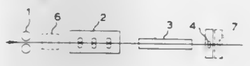
Marios Economopoulos, Liege, and Pierre Simon, Montegnee, both of Belgium, assignors to Centre de Recherches Metallurques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

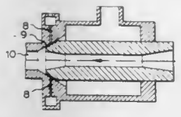
Filed Jul. 17, 1984, Ser. No. 631,787

Claims priority, application Luxembourg, Jul. 18, 1983, 84 922

Int. Cl.⁴ B21B *45/02*

U.S. Cl. 72—201 **5 Claims**





1. In a method of manufacturing a steel concrete-reinforcing rod wherein the rod is passed through finishing stands of a high speed rod mill and is subjected to preliminary cooling before the finishing stands and to surface quenching immediately after its exit from the finishing stand, the quenching step being carried out in a water flow whose speed is substantially lower than the speed of the rod and being followed by a self-tempering step, the improvement for reducing the braking force caused by the quenching step comprising:

cooling the rod during said preliminary cooling so that the temperature of the rod at the exit of the finishing stands is between 1050° C. and 950° C.;

forming an annular flow of water around the rod exiting from the finishing stands;

introducing air into said annular flow of water to increase the compressibility of the coolant flow of water; and

applying said annular flow of water containing air to the outer surface of the moving rod at an acute angle in the direction in which the rod is moving.

4,625,533

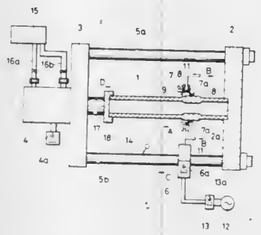
METHOD AND APPARATUS FOR INCREASING THICKNESS OF TUBULAR MEMBER

Kenichi Okada, Yokohama; Hiroshi Asao, Fujisawa, and Hideo Yonemura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,471

Int. Cl.⁴ B21K *21/08*

U.S. Cl. 72—302 **2 Claims**



1. A method of increasing a thickness of a tubular member, the method comprising the steps of:

disposing a tubular member into a support means;

heating the tubular member by a heating means;

applying a compressive force at a predetermined rate to the tubular member in an axial direction of the tubular member by a pressure means to increase the thickness of the tubular member;

moving the heating means in an axial direction of the tubular member at a predetermined spaced to locally and progressively heat the tubular member;

cooling the heated portion of the tubular member while the heating means is moved to control a heating width of said heating means, with the heating width being controled to be at most about twice a thickness of the tubular member; and

controlling a surface temperature of the tubular member so as to cause a thermal gradient between inner and outer diameter sides of the tubular member thereby reducing an increase in a thickness of the inner diameter side of the tubular member.

4,625,534

CRIMP CUTTER BLADE

Saburo Hemmi, Narashino, and Isao Sato, Ohmiya, both of Japan, assignors to 501 Sinano Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,988

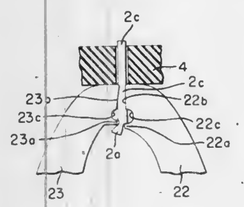
Claims priority, application Japan, Oct. 25, 1983, 58-199558

Int. Cl.⁴ B21D *28/00*

U.S. Cl. 72—326 **4 Claims**

1. A crimp cutter blade for crimping and cutting terminal wires of electronic components mounted on printed circuit boards and the like comprising, a pair of separate arms mounted on a crimping tool for movement toward and away from each other, each arm having a free end, a crimping portion terminating at a corresponding free end and having a flat clamping face, each face having a respective recess terminated by a traverse cutting edge thereon remote from the clamping face, the cutting edge terminating the crimping portion of the corresponding arm, the arms being movable to a position in

which the clamping faces are spaced for receiving a free end portion of a terminal wire on an electronic component extending through the printed circuit board and the like longitudinally between the clamping faces, longitudinally across the recesses and longitudinally across the trasverse cutting edges for crimping and severing thereof while the electronic component is mounted on the printed circuit or the like, the arms being movable toward each other to opposed positions in which the corresponding clamping faces, recesses and cutting edges are disposed opposed and the terminal wire is cut by the cutting edges while the terminal wire is clamped, crushed and crimped by the said clamping faces, the recesses being disposed to receive material of the terminal wire flowed by the clamping



faces thereinto when said arms are displaced toward each other to effectively clamp, crimp and cut the free end portion of the terminal wire, the recesses being dimensioned such tht flow of material of the terminal wire thereinto during the crimping and severing of the free end portion is of a volume flowed in a direction toward the terminal wire free end portion for effectively cancelling any tendency of longitudinal displacement of the remaining terminal wire in a direction away from the free end portion when severed, and said opposed clamping faces being oriented to crush the terminal wire forming an enlargement laterally thereon immediately adjacent the printed circuit board or the like thereby to retain the component in place.

4,625,535

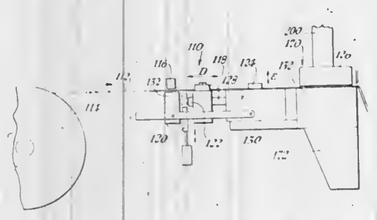
METHOD OF FORMING TRUSS PLATES

Robert W. Birckhead, P.O. Box 2225, Pompano Beach, Fla. 33061

Continuation of Ser. No. 463,063, Feb. 2, 1983, abandoned, which is a division of Ser. No. 206,866, Nov. 14, 1980, abandoned. This application Jan. 9, 1985, Ser. No. 690,365

Int. Cl.⁴ B21D *31/02, 28/26*

U.S. Cl. 72—326 **1 Claim**



1. A method of forming a teeth-like pattern in a rectangular truss plate for uniting two pieces of wood with a pattern that approximates an ideal teeth patten which maintains a maximum cross section of plate material and higher tension value of the plate per unit width of plate near a joinder line of the pieces of wood while providing transverse rows of teeth on either side of the joinder line in both directions wherein the number of teeth can be increased porportionally to a decrease in force on the plate due to forces taken up by and transferred to the wooden members by each row of teeth nearest the joinder line, comprising the steps of:

providing a die stamping apparatus;

providing said die stamping apparatus with a fixed pattern of teeth punch dies to punch the teeth pattern, the fixed pattern is provided with a plurality of transverse rows of teeth and a plurality of longitudinal columns of teeth, providing a pattern of at least two transverse rows of teeth in the fixed pattern teeth punch dies with the teeth in one transverse row being in a different longitudinal column than the teeth in the other transverse row;

providing a strip of truss plate material;

moving the strip plate material through the die stamping apparatus;

controlling the strip plate material movement in fixed single feed steps or double feed steps;

die stamping said fixed pattern of transverse rows and longitudinal columns of teeth;

die stamping the identical number of punched teeth in additional transverse rows by moving the plate material between die stampings a distance equal to the distance between a first and a last transverse row of teeth in the fixed pattern of teeth punch dies plus the distance between the first transverse row and the other transverse row; and

die stamping a greater number of punched teeth in a particular transverse row by moving the plate material between die stamping a distance at least equal to the distance between, on one hand the first transverse row and the next succeeding transverse row, and on the other hand a maximum distance equal to the distance between the first transverse row and the last transverse row of teeth, said number of teeth punched into any given transverse row being determined by the number of dies used while performing the stamping on that particular transverse row;

whereby a rectangular truss plate may be provided varying teeth patterns of approximately an ideal teeth pattern without changing dies.

4,625,536

METHOD OF CONTROLLING UNEQUAL CIRCUMFERENTIAL SPEED ROLLING

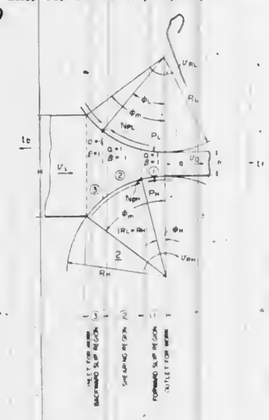
Yasuo Morooka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,941

Claims priority, application Japan, Jan. 11, 1984, 59-2008

Int. Cl.⁴ B21B *35/06, 37/12*

U.S. Cl. 72—249 **5 Claims**



1. A set-up method for control of unequal circumferential speed rolling in which a work to be rolled is made to pass between at least one pair of rolls each of which is driven at a different circumferential speed, said set-up method comprising the steps of:

calculating angles (ϕ_H, ϕ_L) of neutral points on a higher speed roll and a lower speed roll in accordance with at least diameters of the respective rolls of said pair of rolls, predetermined outlet thickness of said work and a ratio of

the circumferential speeds of said higher speed roll and said lower speed roll;

calculating forward slip rates (f_H, f_L) of said higher speed roll and said lower speed roll in accordance with said calculated angles of neutral points of said rolls, said diameters of said rolls and said outlet thickness of said work;

calculating a total rolling force in accordance with a load distribution curve when said calculated angles of neutral points of said rolls are not greater than a contact angle (ϕ_m) of said work and said rolls;

calculating a circumferential speed of said higher speed roll and a circumferential speed of said lower speed roll in accordance with said calculated forward slip rates of said higher speed roll and said lower speed roll and a target outlet speed of said work;

calculating roll positions for said rolls in accordance with said calculated total rolling force and said target speed of said work; and

setting up and controlling said rolls in accordance with said calculated circumferential speeds and roll positions of said rolls.

4,625,537

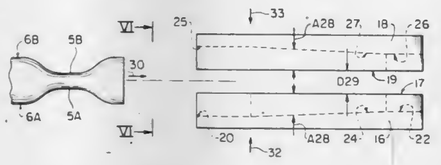
LOCALIZED BOSS THICKENING BY COLD SWAGING

Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 447,261, Dec. 6, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,531

Int. Cl.⁴ B21D *41/04*

U.S. Cl. 72—367 **16 Claims**



1. A method for localized boss thickening by cold swaging a hollow surface of revolution having an end which will bedome a boss and an end region, said method comprising the steps of

corrugating the area of said hollow surface of revolution, which after swaging is the transition, which is usually conical or ogival, from adjacent the boss to the end of the swaged area, to form a corrugated shape which is initially a figure eight in cross-section while the end region to be reduced in diameter and thickened is maintained circular in cross-section;

cold swaging the circular end of said hollow surface of revolution to a small diameter, thickened so that it may function as the boss end of a pressure vessel;

simultaneously swaging the corrugated region from said figure eight cross-section to a smaller envelope substantially kidney shape cross-section whereby it remains unthickened but bent to a smaller diameter; and

subsequently pressurizing to remove most of the corrugations and to cause the region of the deformed hollow surface of revolution having the corrugations removed to revert to its original diameter.

4,625,538

PLUG GRIP FOR FITTING EXPANSION PLUGS

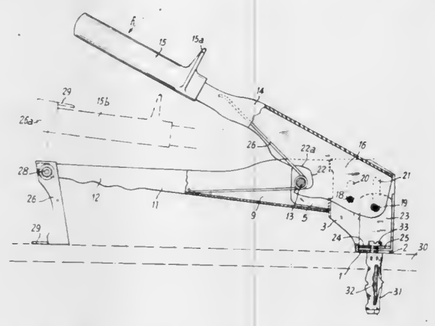
Roger Malagnoux, St Brice Sous Foret, France, assignor to Etablissements Pierre Grehal et Compagnie, St. Brice Sous Foret, France

Filed Mar. 15, 1985, Ser. No. 712,010

Claims priority, application France, Mar. 29, 1984, 84 04927

Int. Cl.⁴ B21D *9/05*

U.S. Cl. 72—391 **14 Claims**



1. A plug grip for fitting expansion plugs comprises a first and a second arms, said first and second arms being pivotally mounted together, with the first arm leading to a bearing show member and the second arm causing a raise of a screw of an expansion plug, said second arm comprising two successive bearing points, a first one of the bearing points providing a great lever arm ratio for causing a start of bending of the expansion plug while a second bearing point of the two bearing points proivdes a smaller lever arm ratio for increasing a distortion stroke of the expansion plug, and wherein the first arm comprises a first shoe member and a second shoe member which are in a same plane for preventing a pivoting movement of said first arm during a pivoting movement of said second arm.

4,625,539

AUTOMATIC CRIMPER AND CRIMPING DIE

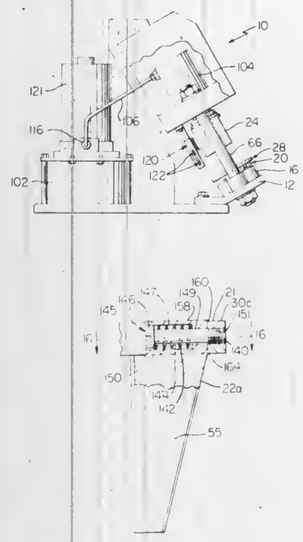
Thomas W. Brooks, Springfield, Mo.; David A. Masseth, Centerville; Joseph R. Malecka, Kettering, both of Ohio; C. Edward Stiver; Charles S. Pearson, both of Ocala, Fla., and James D. Fox, Westchester, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Jan. 28, 1985, Ser. No. 695,707

Int. Cl.⁴ B21D *41/04*

U.S. Cl. 72—402 **6 Claims**

1. In a crimping die assembly comprising a plurality of die fingers; each said die finger having a workpiece engaging surface, a top surface, a bottom surface an outside surface and side surfaces with the distance between the top surface and bottom surface defining its length; holding means for holding said die fingers in a working relationship, said holding means comprising a retaining ring having a plurality of substantially evenly spaced openings for receiving said die fingers therein for holding said die fingers at one end of said die assembly, said retaining ring having a top surface and a bottom surface and a central axis with the distance between the top surface and bottom surface defining its thickness, each said die finger having connecting means connecting said die finger to said retaining ring, each said connecting means permitting only radial movement of its respective said die finger with respect to said central axis of said retaining ring; and springing means integrally associated with said connecting means tending to force said die fingers radially outward with respect to said retaining ring, the length of said die fingers being greater than said retaining ring thickness so that an outside surface extends below the bottom surface of said retaining ring and is configured to contact a conical shaped bowl of a crimping machine the improvement wherein said top surfaces of said die fingers extend beyond said top surface of said retaining ring so as to



receive pressing forces directly from a ram through a pusher ring that engages said top surfaces of said die fingers when said crimping die is used to crimp a workpiece.

4,625,540

CONVEYOR IN PLASTIC WORKING MACHINE

Hiroyasu Yamada, Kawagoe; Motoatsu Shiraishi, Sakado; Ken Tazou, Hidaka; Mitsuki Nakamura, Niiza; Ryoichi Kageyama, Sayama; Akira Namiki, Tokorozawa, and Masaru Sasagawa, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,800

Claims priority, application Japan, Jan. 20, 1984, 59-8097; Nov. 6, 1984, 59-233968; Nov. 6, 1984, 59-233969; Nov. 12, 1984, 59-238101; Nov. 12, 1984, 59-238102

Int. Cl.⁴ B21J *13/08*

U.S. Cl. 72—405 **6 Claims**

1. In a working machine having pairs of lower dies and upper dies disposed at a plurality of working stations, respectively, for cooperatively working a workpiece at the respective stations, the stations being set at intervals in a direction of conveyance of the workpiece,

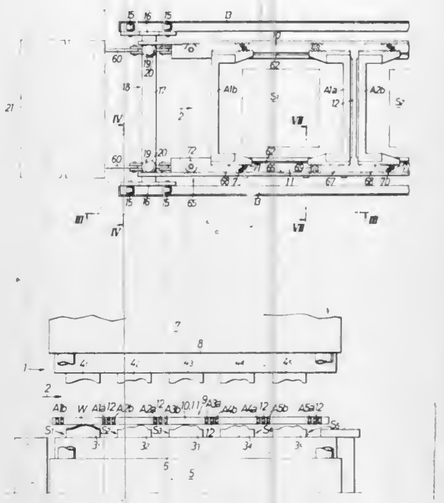
a conveyor comprising:

a pair of transfer bars disposed on opposite lateral sides of each working station of said plurality of working stations and extending parallel to each other in the conveying direction, said pair of transfer bars being fixed relatively to each other and spaced from one another a predetermined distance and being unitarily movable in a vertical direction as well as in said conveying direction by respective driving means;

a plurality of unitary arms disposed laterally bridging between the pair of transfer bars such that each unitary arm extends at least said predetermined distance, said arms being displaceable in the conveying direction relative to the transfer bars between an inoperative position and an operative position through operation of a driving means; and

a handling mechanism disposed on each arm for holding the workpiece;

whereby during operation of conveyor, the arms are moved from their inoperative positions to the operative positions for holding and releasing the workpiece, thereby allowing, in cooperation with the operation of the transfer bars,



the workpiece to be conveyed in sequence from working station to working station.

4,625,541

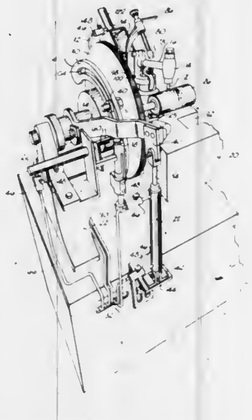
APPARATUS FOR PATTERNING A CYLINDRICAL SURFACE

Lloyd Jones, 501 Taylor Rd., Greer, S.C. 29651, and Larry Jones, Rte. 5, Box 31, Simpsonville, S.C. 29681

Filed Oct. 28, 1985, Ser. No. 791,939

Int. Cl.⁴ B21J *7/46*

U.S. Cl. 72—421 **19 Claims**



1. A die indexing apparatus for patterning a cylindrial surface by punching an indentation into the cylindrical surface, the apparatus comprising:

means for punching the surface;

first actuating means for actuating said punching means;

means for translating said punching means relative to the cylindrical surface;

second actuating means for actuating said translating means, said second actuating means being independent of said first actuating means;

means for rotating the cylindrical surface relative to said punching means;

third actuating means for actuating said rotating means, said third actuating means being independent of said first actuating means and said second actuating means; and

control means said control means for controlling the relative order of actuating each said first, second and third actuating means and for controlling the frequency of actuating each said first, second and third actuating means.

4,625,542

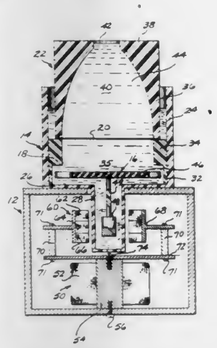
RADIATION POWER MEASURING APPARATUS

Craig E. Nelson, Seattle, Wash., assignor to TAB Leasing, Seattle, Wash.

Continuation-in-part of Ser. No. 650,819, Sep. 14, 1984. This application Sep. 13, 1985, Ser. No. 775,625

Int. Cl.⁴ G01H *3/10*

U.S. Cl. 73—1 R **26 Claims**



1. An apparatus for measuring the power of radiation, the apparatus comprising:

float means including a target for the radiation, the float means being constructed such that the net gravitational force, including buoyancy force, if any, acting on the float means tends to accelerate the float means in a first direction; and

force balancing means including drive means for providing a drive signal and means responsive to the drive signal for exerting an attractive balancing force on the float means in a second direction opposite to the first direction such that the magnitude of the balancing force corresponds to a characteristic of the drive signal, the drive means being adapted to vary said characteristic of the drive signal, to thereby vary the balancing force on the float means, such that when the drive signal is controlled so as to cause the float means to be suspended at a predetermined height, and characteristic of the drive signal provides a measure of the force exerted on the target as a result of the radiation striking the target, and therefore of the power of the radiation.

4,625,543

METHOD AND DEVICE FOR CALIBRATING AN ANALYZER FOR MEASURING LOW ION ACTIVITY VALUES IN A SAMPLE STREAM

Stefan Ertl, and Martin Jola, both of Hombrechtikon, Switzerland, assignors to Zellweger Uster Ltd., Uster, Switzerland

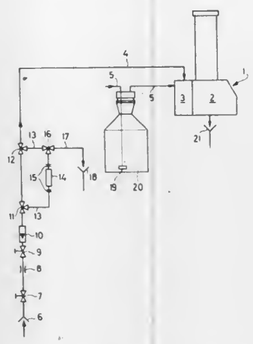
Filed Jul. 10, 1985, Ser. No. 753,460

Claims priority, application Switzerland, Jul. 18, 1984, 3486/84

Int. Cl.⁴ G01C *25/00*

U.S. Cl. 73—1 G **14 Claims**

1. A method for calibrating an analyzer for measuring low ion activity values in a sample stream, wherein in the analyzer the sample stream is conditioned by the addition of reagents and the ion concentration is measured by means of a measuring system, which comprises introducing ions to be measured in a given concentration into the sample stream by passing the



stream over an appropriate calibrating substance which releases the ions into said stream, said substance comprising a water soluble glass for the defined release of a known quantity of the ions to be measured, and establishing a reference concentration directly in the sample stream.

4,625,544

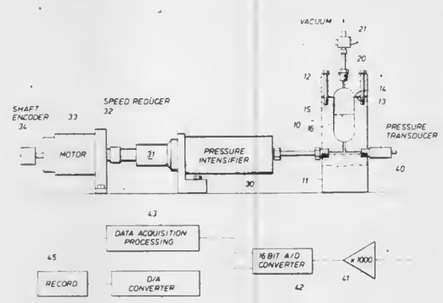
DETERMINING SATURATION AND PERMEABILITY USING MERCURY CAPILLARY PRESSURE CURVES

Herbert Hi-Hwa Yuan; Benjamin F. Swanson, and Robert G. Stapleton, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 727,462, Apr. 26, 1985, abandoned. This application Jan. 29, 1986, Ser. No. 823,548

Int. Cl.⁴ G01N *15/08*

U.S. Cl. 73—38 **14 Claims**



1. A method for determining a preselected characteristic of a porous body, comprising:

confining a portion of said body in a closed zone,

evacuating said zone and pore spaces of said body to a high vacuum,

admitting a fluid into said zone to a level above said body to completely immerse said body in said fluid and fill said zone with said fluid,

continuously injecting additional fluid into said zone at a preselected rate,

substantially continuously noting pressure changes of said fluid in said zone and the volume of fluid injected into said zone,

determining rheons, subisons and risons from said noted pressure changes and injected volumes, and

determining said preselected characteristic of said body from said noted pressure changes, said noted injected volumes, said determined rheons, said determined subisons, or said determined risons, or from combinations thereof.

4,625,545

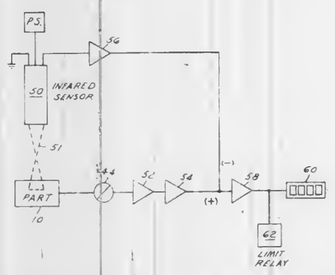
METHOD AND APPARATUS FOR DETECTING LEAKS

Albert E. Holm, Marine City, and Grant A. Holm, Richmond, both of Mich., assignors to Testrite, Inc., Marine City, Mich.

Filed Apr. 5, 1985, Ser. No. 720,037

Int. Cl.⁴ G01M *3/26*

U.S. Cl. 73—40 **10 Claims**



1. The method of quickly determining leakage of a test chamber in a production environment comprising the steps of:

applying gas pressure to the test chamber and generating a signal whose slope varies with the rate of change of the pressure;

sensing the infrared radiation from the test chamber and generating a signal whose slope varies with the rate of change of the radiation; and

comparing the slopes of the two signals and reading a divergence therebetween as a function of chamber leakage.

4,625,546

CYLINDER POWER BALANCE DIAGNOSTIC APPARATUS FOR INTERNAL COMBUSTION ENGINE

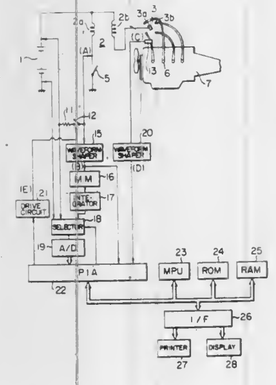
Hiroyuki Sugo, Katsuta, and Takashi Aoki, Kanuma, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,366

Claims priority, application Japan, Nov. 18, 1983, 58-218537

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—116 **4 Claims**



1. A cylinder power balance diagnostic apparatus for an internal combustion engine having a plurality of cylinders, comprising:

an ignition device for operating ignitors associated with the cylinders of said internal combustion engine, including an ignition coil having a primary winding;

first means for taking out an ignition signal which is generated in synchronism with a primary signal of said ignition coil primary winding;

generating means for generating a standard pulse on the basis of a firing signal applied from said ignition device to the ignitor associated with a predetermined one of said cylinders;

designating means for designating a cylinder of said internal combustion engine on the basis of an ignition signal from said first means and said standard pulse from said generating means;

misfiring means for selectively connecting a resistor across the ends of said ignition coil primary winding for a predetermined time to cause said cylinder designated by said designating means to misfire;

detecting means for detecting engine speed at least while said designated cylinder is being misfired by said misfiring means;

second means for setting said designating means to designate all cylinders of said internal combustion engine one after another every time the engine speed has been detected by said detecting means; and

means for determining whether or not each cylinder is out of order on the basis of the number of engine rotations of the cylinder detected by said detecting means during the time said cylinder is misfiring wherein said second means comprises means for automatically controlling the designating of each cylinder to be misfired on the basis of the number of occurrences of said ignition signal when counted from the occurrence of said standard pulse.

4,625,547

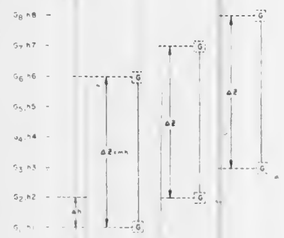
BOREHOLE GRAVIMETRY LOGGING

W. D. Lyle, Jr., Grapevine, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,025

Int. Cl.⁴ G01V *7/00*

U.S. Cl. 73—152 **5 Claims**



1. A method for conducting a borehole gravimetry survey, comprising the steps of:

(a) selecting an interval along the borehole over which gravity gradients are to be determined,

(b) selecting a plurality of gravity measurement stations at equally spaced, vertical points along said interval,

(c) carrying out gravity measurements at each of said gravity measurement stations, and

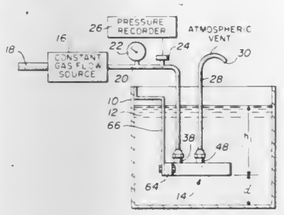
(d) determining a moving average gradient for gravity measurements from selected pairs of said gravity measurement stations over said interval.

4,625,548

HYDROSTATIC HEAD PRESSURE SENSORS FOR A SYSTEM TO DETERMINE FLUID LEVEL AND WEIGHT

Ian G. Charter, Seabrook, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1985, Ser. No. 722,554
Int. Cl.[4] G01F *23/16*; G01L *7/08*; G01N *9/26*
U.S. Cl. 73—299 **15 Claims**



1. A hydraulic liquid pressure sensor for use in a gas operated liquid pressure sensing system, comprising:

(a) a rigid sensor body having thereon a generally circular and substantially flat membrane resting surface, a gas inlet communicating to a peripheral portion of said resting surface and a gas outlet having an opening in said resting surface in a centrally disposed location on said generally circular resting surface,

(b) a flexible membrane member positioned adjacent to said resting surface and resting in flush contact therewith when in an undistorted collapsed state in the absence of gas flow between said inlet and said outlet, and

(c) means for securing and sealing said flexible membrane to said resting surface around the periphery of said generally circular membrane resting surface at a location radially outward of said gas inlet in order to render said membrane responsive to gas flow along a path from said inlet between said resting surface and said membrane to said outlet and influenced by hydraulic liquid pressure acting on the side of said membrane opposite said resting surface, and

(d) said inlet has a generally annular inlet groove in said body opening to said resting surface and spaced substantially outward of, and in a generally concentric relation to said outlet opening in order to form a fluid passageway from between said resting surface and said membrane, and said gas inlet additionally includes another groove in said sensor body opening to said resting surface, connected to said generally annular inlet groove and extend inward therefrom relative to the center portion of said resting surface on said circular resting surface and not connected to said outlet opening.

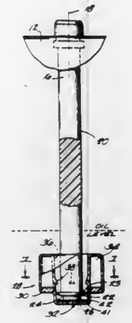
4,625,549

OPTICAL FLUID LEVEL INDICATOR INCLUDING FLOAT WITH REFLECTING MEANS

J. Michael Mahoney, Bristol, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 1, 1985, Ser. No. 761,542
Int. Cl.[4] G01F *23/02, 23/34*
U.S. Cl. 73—327 **15 Claims**

1. An optical fluid level indicator comprising a light transmitting member having a first end, and a second end adapted to extend into a fluid container, a float including light reflecting means, and means on said float and on said light transmitting member for guiding movement of said float relative to and along said member in response to the level of fluid in the container and for limiting movement of said float relative to said member between a first position wherein, when the fluid in the fluid container is at a predetermined level, said light reflecting means is adjacent said second end of said light transmitting member so as to thereby to reflect from said second end and toward said first end light traveling in said member from said first end toward said second end, and a second position wherein, when the fluid in the fluid container is at a level lower than said predetermined level, said light reflecting means is spaced from said second end of said light transmitting member



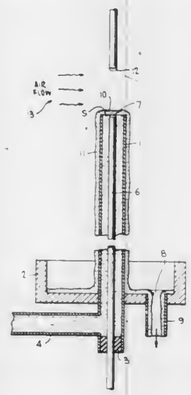
so as thereby to permit dispersion at said second end of light traveling in said member from said first end toward said second end.

4,625,550

METHOD AND APPARATUS FOR THE CONTINUOUS PSYCHROMETRIC MEASUREMENT OF THE CONCENTRATION OF A VAPOROUS COMPONENT IN A GAS

Ansgar C. H. Sorensen, Anemonevej 4, Allerod Dk-3450, Denmark

PCT No. PCT/DK84/00080, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01350, PCT Pub. Date Mar. 28, 1985
PCT Filed Aug. 27, 1984, Ser. No. 732,697
Claims priority, application Denmark, Sep. 13, 1983, 4151/83
Int. Cl.[4] G01N *25/62*
U.S. Cl. 73—338 **3 Claims**



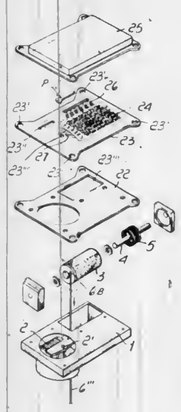
1. Method for the continuous psychometric measurement of the concentration of a vaporous component in a gas by causing the gas to flow past a "dry" thermosensor measuring the temperature of the gas flow, and a "wet" thermosensor, the surface of which is kept completely moistened with liquid of the same kind as the vaporous component, wherein liquid for moistening the "wet" thermosensor is caused to flow upwardly through a vertical tube, in the upper open end of which the "wet" thermosensor is arranged, in a flow of sufficient size for forming, on top of the tube, a body of liquid completely covering the thermosensor and the upper marginal edge of the tube, said body of liquid having a free surface swept by the gas flow, and for overflowing from the top of the tube down along the outer surface of the tube in the form of a continuous liquid film, the dimensions and material of the tube being so selected that the liquid flow, during its passage upwardly through the tube, by heat exchange with the liquid film on the outer surface of the tube, is brought to the same or practically the same temperature as that prevailing in the body of liquid on top of the tube.

4,625,551

DEVICE FOR DETECTING THE DEVELOPED POWER IN HOME PEDALLING APPARATUS FOR BICYCLES

Teodoro Carnielli, Via Dante, 61, Veneto (Treviso), Italy

Filed Dec. 24, 1984, Ser. No. 685,478
Claims priority, application Italy, Jun. 28, 1984, 22427/84[U]
Int. Cl.[4] A61B *5/22*
U.S. Cl. 73—379 **1 Claim**



1. A power detecting device to be applied to room pedalling apparatus, essentially comprising, in a common envelope, a tachometer and a revolving drum, provided with a colored pattern thereon and driven by a dynamometric braking caliper assembly associated to the flywheel of said pedalling apparatus, the pointer of said tachometer and said colored pattern on the drum being so designed as to indicate in cooperation a case of a table including a plurality of said cases therein there is written a respective number indicative of said power, said braking caliper assembly essentially comprising two brackets rigid with the bicycle frame and providing corresponding guides, concentrical with the axis of the flywheel, therealong said caliper assembly is able of sliding, said caliper assembly being provided with braking shoes arranged to friction contact the top grooved peripheral portion of said flywheel, said shoes causing, as they are clamped on said flywheel periphery, said braking caliper assembly to advance against the progressive biassing of two dinamometric springs, said revolving drum being coupled to said caliper assembly through the inner wire of a driving cable.

4,625,552

INSTRUMENT FOR SEPARATING FLUFF COMPONENTS

Carl W. Johnson, Neenah, Wis., assignor to Specialty Research, Inc., Neenah, Wis.

Filed Oct. 25, 1985, Ser. No. 791,307
Int. Cl.[4] G01D *21/00*
U.S. Cl. 73—865.5 **14 Claims**

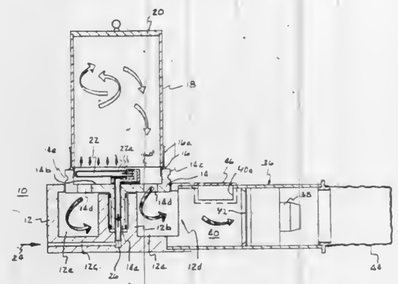
1. An apparatus for testing for the amount of fiberization of a particular sample of fluff, comprising:

a base for providing support and having an opening in its upper surface;

a spindle journaled to said base and having at least one opening for communicating with the opening in said base;

a testing sieve supported by said spindle and disposed on the opposite side of said spindle from said base, the openings of said sieve being sufficiently large to pass the great majority of fibers and sufficiently small to prevent the passage of the great majority of knots;

an enclosure placed over said sieve;



a compressed air bar communicating with a source of compressed air, disposed between said sieve and said spindle, for releasing compressed air through said sieve to impact on the sample;

a vacuum means for drawing the fibers through said sieve, said spindle and said base; and

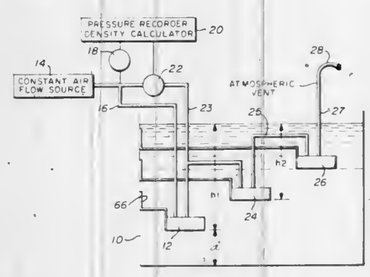
means for automatically and continually rotating said spindle and sieve with respect to said air bar, so that the sample is continually and automatically agitated.

4,625,553

SYSTEM TO DETERMINE THE LEVEL AND WEIGHT OF LIQUID IN A TANK OR THE LIKE

Ian G. Charter, Seabrook, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1985, Ser. No. 722,587
Int. Cl.[4] G01N *9/26*
U.S. Cl. 73—438 **13 Claims**



1. A system for measuring the density of liquid in a container, comprising

(a) a first liquid pressure sensor mounted in a container of liquid and located at a predetermined distance above the bottom of said container, said pressure sensor has a rigid sensor body with a membrane resting surface thereon, a gas inlet communicating to an inlet segment of said resting surface and a gas outlet communicating from an outlet segment on said resting surface, a flexible membrane member is positioned on said resting surface and lies in flush contact therewith in an undistorted state in the absence of gas flow between said inlet and said outlet, and means securing and sealing said flexible membrane to said resting surface to make said membrane responsive to gas flow from said inlet to said outlet in passing between said rest-

ing surface and said membrane as influenced by hydraulic liquid pressure acting on the side of said membrane opposite said resting surface,

(b) a second liquid pressure sensor similar to said first pressure sensor and also mounted in said container at a known elevation above that of said first pressure sensor,

(c) a constant flow rate gas source connected by a first conduit means to the inlet of said first pressure sensor,

(d) a second conduit means communicably connecting the outlet of said first pressure sensor to the inlet of said second pressure sensor,

(e) a third conduit means communicably connecting the outlet of said second pressure sensor to the atmosphere at substantially atmospheric pressure,

(f) a gas pressure measuring means operably connected to measure the gas pressure at the inlet of said first pressure sensor,

(g) a differential gas pressure measuring means operably connected to measure the differential gas pressure between the inlet of said first pressure sensor and the inlet of said second pressure sensor, and

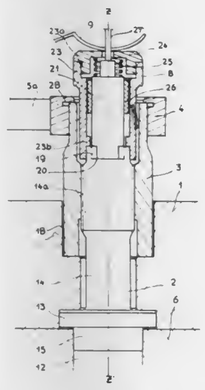
(h) a density calculator means operably connected to said gas pressure measuring means and said differential gas pressure measuring means to determine the depth and density of liquid in the container.

4,625,554

DEVICE FOR TIGHTENING A NUT ON A FASTENING PIN OF A NUCLEAR REACTOR GUIDING TUBE

Maurice Lanzoni, Cergy, France, assignor to Framatome & Cie., Courbevoie, France

Filed Mar. 25, 1985, Ser. No. 715,448
Claims priority, application France, Mar. 23, 1984, 84 04511
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—581 **3 Claims**



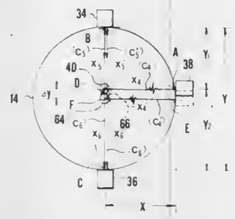
1. A device for tightening a nut on a fastening pin of a guiding tube of a nuclear reactor, comprising in combination a wrench having a hollow profiled part which has an axis constituting a tightening axis and a shape corresponding to the shape of the nut, and means for checking the pretension of the pin comprising a measuring cell disposed in the hollow part of the wrench, a detector transmitting and receiving ultrasounds placed inside the cell, the cell being freely mounted in said hollow part of the wrench and comprising a portion of small diameter whose diameter is less than an inside diameter of the nut, a lower portion of the small-diameter portion of the cell being provided for coming to bear against an end of the pin in an operating position of the device so that the detector is put into contact with said end of the pin for the measurement, the cell further comprising a portion which is of large diameter which exceeds an inside diameter of the hollow part of the wrench and is provided for bearing against the wrench for withdrawal and the transporting of the device from a working position to another position, the device further comprising resiliently yieldable means carried by the wrench for exerting a bearing force in a direction along said axis on the measuring cell, and means for preventing the wrench from driving the measuring cell in rotation during the tightening.

4,625,555

ULTRASONIC MEASUREMENT METHOD, AND APPARATUS THEREFOR

Tadashi Fujii, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,775
Claims priority, application Japan, Feb. 7, 1984, 59-19441
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—597 **11 Claims**



1. An ultrasonic measurement method in which first and second ultrasonic transducers constituting a set are arranged to directly oppose each other across an object interposed therebetween, a third ultrasonic transducer is provided at a predetermined position and directed toward the object, the first, second and third ultrasonic transducers being so arranged that a ray along a transmission direction of the third ultrasonic transducer intersects, internally of the object, a ray connecting the first and second ultrasonic transducers, said method comprising steps of:

(a) transmitting an ultrasonic wave into the object from the first ultrasonic transducer;

(b) measuring a first period of time required for the ultrasonic wave from the first ultrasonic transducer to be received by the second ultrasonic transducer by passing through the object;

(c) transmitting an ultrasonic wave into the object from the third ultrasonic transducer, said ultrasonic wave being scattered at a portion where the rays intersect;

(d) measuring second and third periods of time respectively required for the ultrasonic wave from the third ultrasonic transducer to be received by said first and second ultrasonic transducers following scattering of the ultrasonic wave; and

(e) measuring mean propagation velocity of sound, on the basis of the first, second and third periods of time, along three ray intervals which are located inside the object and which connect the portion at which the rays intersect and each of the three ultrasonic transducers.

4,625,556

METHOD OF LAYER THICKNESS MEASUREMENT

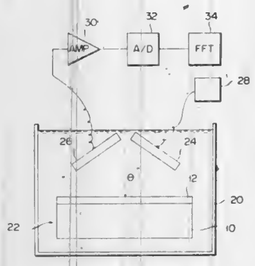
Yusuke Sukahara, Tokyo; Eiji Takeuchi, and Eisaku Hayashi, both of Urawa, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,299
Claims priority, application Japan, Jul. 10, 1984, 59-142573
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—602 **6 Claims**

1. A method for measuring the layer thickness of an object including a substrate and a layer formed thereon, comprising steps of:

obtaining the incident angle θ at which an ultrasonic wave is applied through an ultrasonic wave propagation medium to a reference layer made of the same material as the layer of the object and formed on a reference substrate made of the same material as the substrate of the object, and the product H of the frequency of the ultrasonic wave and the thickness of the reference layer, said incident angle θ and product H having such values as to minimize the intensity of the ultrasonic wave reflected from the reference layer;

bringing the layer of the object into contact with an ultrasonic wave propagation medium of the same material as said propagation medium;



applying an ultrasonic wave to the layer of the object through the propagation medium at the incident angle θ;

measuring the frequency of the ultrasonic wave reflected from the layer to detect the frequency of the incident ultrasonic wave for the minimum reflected wave intensity; and

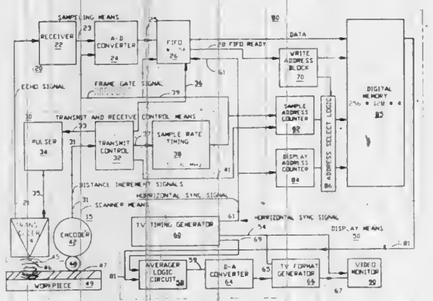
calculating the thickness of the layer of the object from the detected frequency and the value H.

4,625,557

ACOUSTICAL IMAGING SYSTEM

Jerry Rutherford, Anaheim, Calif., assignor to Rutherford Scientific, Anaheim, Calif.

Filed Feb. 20, 1985, Ser. No. 703,315
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—635 **19 Claims**



1. An imaging system for non-destructively imaging the cross-section of a workpiece, said cross-section being taken substantially orthogonal to the surface of said workpiece along an operator selected course on said surface, said image system comprising:

a scanner means for providing a series of acoustical pulses in response to a corresponding series of acoustical drive signals; for receiving reflected acoustical waves from said workpiece surface and providing an echo signal corresponding to the received acoustical waves for each acoustical pulse; and for providing a series of distance increment signals at substantially equal incremental distances in response to motion of said scanner means on said workpiece surface along said operator selected course;

a transmit and receive control means responsive to each distance increment signal for providing an acoustical drive signal and a column clock signal set comprising a predetermined number of consecutive spaced column clock signals, the duration of said column clock signal set characterizing an echo interval as the time required for said acoustical waves resulting from each acoustical pulse to move through said workpiece and return to said scanner means;

sampling means responsive to said column clock signal set for converting each said echo signal into a corresponding column series of digital values, each value characterizing the amplitude of said echo signal at time corresponding to a respective column clock signal within said echo interval;

storage means for storing each column series of digital values as successive column arrays to form an image array of digital values, each digital value having a corresponding column and row address, and for reading and outputting said image array of digital values as display data in display compatible format;

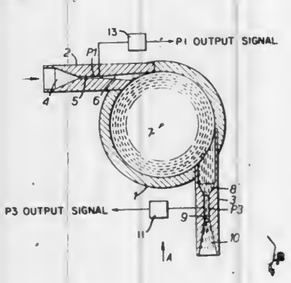
display means for forming an image from said display data formed from said image array of digital values, each digital value controlling the gray scale level of a pixel on said image, said image characterizing the cross-section of said workpiece.

4,625,558

FUEL MONITORING SYSTEMS

Peter J. Taylor, Fareham, England, assignor to Plessey Overseas Limited, Ilford, England

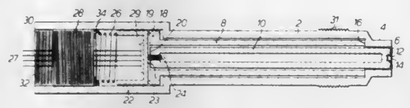
Filed Apr. 9, 1985, Ser. No. 721,417
Claims priority, application United Kingdom, Apr. 13, 1984, 8409650
Int. Cl.⁴ G01N *7/00*
U.S. Cl. 73—64.2 **3 Claims**



1. A fuel monitoring system for an aircraft, said system comprising:

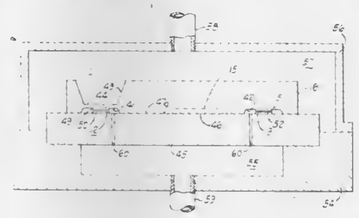
a cylindrical centrifugal air separtion chamber, input and output venturi devices positioned tangentially with respect to the separation chamber for tangentially conveying fuel into and out of said separation chamber, respectively, conveying means for conveying fuel from a fuel tank of an aircraft to the input venturi device which, due to the pressure drop of the fuel therein serves to release air from the fuel before it passes into the centrifugal air separation chamber where the air released from the fuel is separated out to provide substantially de-aerated fuel, air vent means for exhausting air from the separtion chamber, tangential passageway means for conducting de-aerated fuel from the separtion chamber into the output venturi device to produce a pressure drop in the de-aerated fuel, and pressure transducer means connected to the center of the output venturi device for measuring the pressure of the de-aerated fuel and for providing a pressure signal for use in determining the vapor pressure of the de-aerated fuel.

4,625,559
PRESSURE TRANSDUCER
Roy E. Carter, 83 Cherry Garden Lane, Newport, Essex, CBII 3QB, and Francis S. Baker, 23 Rochford Road, Bishops Stortford, Hertfordshire CM23 5ET, both of England
Filed Jan. 14, 1985, Ser. No. 691,070
Claims priority, application United Kingdom, Jan. 24, 1984, 8401848
Int. Cl.[4] G01L *7/08, 9/04*
U.S. Cl. 73—706 10 Claims



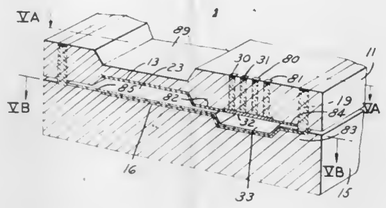
1. A pressure transducer comprising an elongate hollow outer housing having a pressure sensor diaphragm and externally positioned fixing means which facilitates pressure tight introduction of the diaphragm into a pressure sensing port provided in apparatus capable of generating pressures to be sensed, two elongate members positioned within the outer housing in operative association with the diaphragm so as to move differentially in a direction parallel with the longitudinal axis of the housing consequent upon movement of the diaphragm responsively to a pressure to be sensed, and transducer means responsive to differential movement between the elongate members for producing a signal in dependence upon the pressure sensed.

4,625,560
CAPACITIVE DIGITAL INTEGRATED CIRCUIT PRESSURE TRANSDUCER
Gary G. Sanders, Lakewood, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio
Filed May 13, 1985, Ser. No. 733,060
Int. Cl.[4] G01L *9/12*
U.S. Cl. 73—718 20 Claims



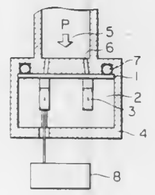
1. A pressure transducer comprising, in combination:
a semiconductor base;
first and second capacitors each with first and second conductive plates and with each said first conductive plate integrally formed on said semiconductor base;
said first capacitor at least partially formed on a deformable wall unitary with said semconductor base;
means to apply to said deformable wall a force or a pressure for measurement thereof by change of the distance and capacitance between said first and second plates of said first capacitor;
an Eccles-Jordan astable multivibrator including said first and second capacitors; and
an integrated circuit unitarily on said semiconductor base and including at least said multivibrator and said first and second capacitors.

4,625,561
SILICON CAPACITIVE PRESSURE SENSOR AND METHOD OF MAKING
Mati Mikkor, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 6, 1984, Ser. No. 678,902
Int. Cl.[4] G01L *9/12;* H01G *5/16*
U.S. Cl. 73—724 17 Claims



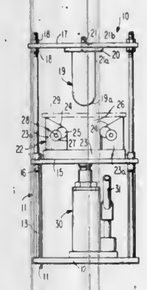
12. A capacitor pressure sensor including:
a first and second silicon wafer having therebetween a cavity with a surrounding hermetic seal and opposing cavity plates;
a first conductive aluminum doped p+ type path through said first wafer to said cavity;
a second conductive aluminum doped p+ type path through said first wafer to a boundary portion of said cavity;
said hermetic seal of said cavity between said first and second wafers being recrystallized silicon highly doped with p+ type impurities; and
said opposing cavity plates of said cavity in said first and second silicon wafers being doped regions with p+ type impurities to form electrodes of a capacitor.

4,625,562
AMORPHOUS MAGNETIC ALLOY SENSOR
Ichiro Yamashita, Yawata; Hiroyuki Hase, Katano, and Yukihiko Ise, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 1, 1984, Ser. No. 667,224
Claims priority, application Japan, Jun. 8, 1984, 59-118508; Jul. 18, 1984, 59-148802
Int. Cl.[4] G01L *9/16*
U.S. Cl. 73—728 1 Claim
MICROFICHE APPENDIX INCLUDED
(07181986 Microfiche, Pages)



1. An amorphous magnetic alloy sensor device comprising:
a magnetic circuit including an amorphous magnetic alloy exhibiting magnetostriction, a strain being produced in said amorphous magnetic alloy when pressure is applied thereto; and,
a coil for applying a magnetic field to said magnetic circuit, said magnetic field having an alternating magnetic field component on which is superimposed a direct current magnetic field component, the intensity of the magnetic field being greater than the field strength which results in maximum permeability of said amorphous magnetic alloy and less than the intensity inducing 95% of the saturation magnetization thereof, whereby a change in the inductance of said magnetic circuit corresponds to a change in the pressure applied to said amorphous magnetic alloy.

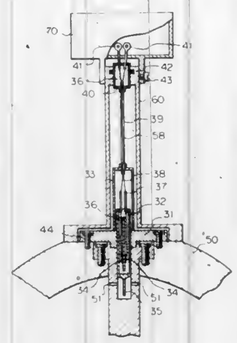
4,625,563
PORTABLE BEND TESTER
Richard S. Dawson, and Daniel S. Dawson, both of 1717 Solano Way, Bldg. 20, Concord, Calif. 94520
Filed Oct. 28, 1985, Ser. No. 792,027
Int. Cl.[4] G01N *3/20*
U.S. Cl. 73—850 2 Claims



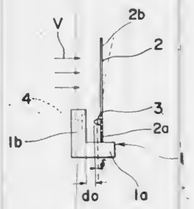
1. A portable bend tester, comprising, in combination, a frame including a horizontal base at a lower end thereof, a plurality of upwardly vertical rods fixedly mounted on said base, a horizontal platform vertically slidable along a longitudinally intermediate portion of said rods, and a horizontal top plate affixed upon an upper end of said rods; and an upright jack mounted upon said base bearing against an underside of said platform, a downwardly plunger mounted on an underside of said top plate, a lower end of said plunger being rounded, and a yoke being mounted upon an upper side of said platform; said yoke comprising a base block, a pair of spaced apart, upwardly extending posts mounted upon said base block, a top surface of each said post being at an inclined angle, said inclined surfaces of both said pair of posts being positioned to incline downwardly toward a common space formed between said posts, each said post having a vertical side surface adjacent said space, and a roller seated at a junctioning corner of said inclined top surface and said vertical side surface, said roller being rotatable about a horizontal axis and resting against a surface of a rounded fastener.

4,625,564
VORTEX FLOW METER
Hideo Murakami, and Naoki Matsubara, both of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan
Filed Nov. 30, 1984, Ser. No. 676,752
Claims priority, application Japan, Dec. 2, 1983, 58-228052; Jul. 27, 1984, 59-113403[U]
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 16 Claims

1. A vortex flow meter, comprising:
a thin-walled cylindrical tube extending throughout a center of a mounting flange and provided with a pressure receiving plate at a lower end thereof which is exposed to small pressure variations of a vortex train shed by a vortex shedder;
sensing elements integrally mounted in said thin-walled cylindrical tube for converting a small pressure variation acting on said pressure receiving plate to an electrical signal;
a flexible tubular member rigidly connected to the mounting flange coaxially with the thin-walled cylindrical tube in such a manner as to surround the thin-walled cylindrical tube;
a hermetically sealed elastic narrow tube connected at one end to the tubular member;
a hermetically sealed terminal block connected to the other end of the elastic narrow tube;
the electrical signal being outputted sequentially via said flexible tubular member, said elastic narrow tube and said terminal block; and
a protective tube slidably coupled on an outer periphery of the terminal block and fixed in place while surrounding the flexible tubular member, the elastic narrow tube and the mounding flange.



4,625,565
WIND VELOCITY SENSOR
Eiichi Wada, Takatsuki; Motohiro Gahara, Kobe, and Hiroaki Tsubakishita, Nishinomiya, all of Japan, assignors to Sinko Kogyo Co., Ltd., Osaka, Japan
Filed Apr. 5, 1985, Ser. No. 720,377
Claims priority, application Japan, Apr. 9, 1984, 59-71447
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.74 3 Claims



1. A wind velocity sensor comprising:
a stationary base;
a resilient plate presented in a windstream and receiving the force provided thereby, said resilient plate being mounted to said base with a fixed end thereof and flexing about said fixed end in response to the force of said windstream and returning to an initial rest position after removal of said windstream provided force;
a permanent magnet mounted on either one of said resilient plate or said base;
a Hall element for generating electromotive force under an influence of magnetic flux and fixed on either the other of said base or said resilient plate and facing the magnet with a gap provided therebetween, the dimension of said gap varying with the position of said resilient plate, said Hall element developing an output inversely proportional to the square of said gap dimension;
electric circuit means including an inversion amplifier connected to the output of said Hall element for developing an electric output signal therefrom, said inversion ampli-

fier varying said output signal in linear proportion to the wind velocity.

4,625,566

MASS AND FORCE METER

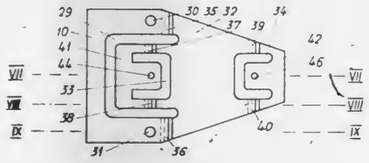
Mario Gallo, Krönleinstr. 1, CH-8044 Zurich, and Johannes Wirth, Sonnenbergstr. 55, CH-8032 Zurich, both of Switzerland

Filed Mar. 11, 1985, Ser. No. 710,096

Claims priority, application European Pat. Off., Mar. 31, 1984, 84103601.5

Int. Cl.[4] G01L *1/26, 1/10*

U.S. Cl. 73—862.38 **4 Claims**



1. A mass and force meter comprising, a body, a load support, guides guiding said load support parallely and vertically with respect to said body, a strokeless measuring system, a lever system transmitting the load to be measured to said measuring system, said lever system including a single lever, first flat band articulations linking said single lever to a flat part tightly fixed to said body, said single lever and said flat part forming a single, flat plate, a first slit in said flat plate separating said single lever from said flat part, a second slit in said single lever separating it from an input end part, second flat band articulations linking said input end part to said single lever, a third slit in said single lever separating it from an output end part, third flat band articulations linking said output end part to said single lever.

4,625,567

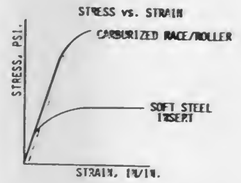
METHOD AND APPARATUS FOR THE MEASUREMENT OF BEARING LOADS USING A DUCTILE WIRE INSERT

Robert W. Frayer, Jr., Canton, and Douglas Glover, Ann Arbor, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Apr. 15, 1985, Ser. No. 723,420

Int. Cl.[4] G01L *1/06, 5/16*

U.S. Cl. 73—862.04 **14 Claims**



1. A test bearing for measuring bearing load, comprising:

a bearing member having at least one recess formed therein, and comprising a material having a predetermined yield strength; and

at least one insert member provided in said recess of said bearing member, said insert member comprising a material having a yield strength less than said predetermined yield strength of said material of said bearing member, such that loading of said test bearing elastically deforms said bearing member and plastically deforms said insert member, and such that plastic deformation of said insert member provides an indication of said bearing load.

9. A method for determining bearing loads in a bearing application system using a test bearing having an insert member which plastically deforms during testing, said method comprising:

installing said test bearing in said system;

operating said system so as to test load said test bearing and cause plastic deformation of said insert member;

measuring the amount of said plastic deformation; and

calculating said bearing test load based on the amount of plastic deformation of said insert member.

4,625,568

SYSTEM FOR MEASURING THE ENGAGEMENT PRESSURE BETWEEN CYLINDERS OF A PRINTING PRESS

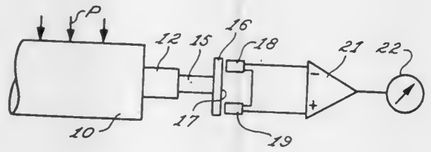
Winfried Hartung, Offenbach am Main, and Valentin Gensheimer, Mühlheim, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,052

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432701

Int. Cl.[4] G01L *5/00*

U.S. Cl. 73—862.55 **12 Claims**



1. A system for measuring the engagement pressure between first and second cylinders in a printing press frame along a common plane containing the axes of the two cylinders, the system being of the kind wherein the first cylinder has a pair of journals supported in respective bearings in the press frame, a planar measurement surface being mounted to one end of the journals perpendicular to and radially with respect to the axis of the first cylinder for rotation with the first cylinder, and the tilting of the measurement surface with respect to the press frame being sensed to measure the engagement presure, wherein the improvement comprises at least two electrical sensors responsive to the axial positions of the measurement surface with respect to the press frame at a substantial radius from the axis of the first cylinder and at diametric locations with respect to the axis of the first cylinder, and means for comparing the responses of the two sensors to obtain measured values of the engagement pressure so as to reduce the response of the measurement systems to axial play in the bearings supporting the first cylinder.

4,625,569

LIQUID INJECTION DEVICE

Jun-ichi Toei, Yamaguchi; Nobuyuki Baba; Keiichi Housako, both of Kanagawa, and Tetsuo Ikushige, Yamaguchi, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,948

Claims priority, application Japan, Jan. 17, 1984, 59-5942; Dec. 6, 1984, 59-258127

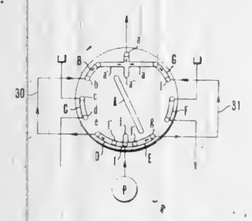
Int. Cl.[4] G01N *1/00*

U.S. Cl. 73—863.72 **12 Claims**

1. A liquid injection device, comprising a pair of a stator and a rotor arranged in such a manner so as to rotate in a mutually surface contacting relationship under an air-tight and light-tight states, a plurality of small openings for supplying liquid

communicating to n number (wherein n is an integer of 3 or larger) of liquid systems, provided on the contacting surface of the rotor or stator and a plurality of bridging grooves for communicating two or more of said small openings to form a plurality of liquid flowing paths thereby, one of said plurality of bridging grooves being a main groove, provided on the contacting surface of said stator or rot whereby said rotor can be rotated to a predetermined angle in relation to the stator from its neutral position which forms a liquid filling mode to two other positions; that is a normally rotated position and a reversely rotated position, said liquid supply paths being formed at each one of the respective three positions following the conditions (a) and (b) shown below:

(a) a first liquid system out of said n number of liquid systems has a pair of small openings which serve as an inlet and an outlet for the supply of liquid, provided on one of the



above-mentioned mutually contacting opposing surfaces, and said inlet and outlet are connected at the neutral position through the main groove, wherein said connection is shut off respectively at the above-mentioned normally rotated positions and reversely rotated positions; and

(b) each one of the (n−1) number of other liquid systems other than the first liquid system has a loop which spans over two small openings connected to an external liquid supply channel, and there are also another two small openings, wherein at the the normally rotated and reversely rotated positions at leas a portion of the plurality of loops are connected to the inlet and the outlet of the first liquid system, each in a different manner.

4,625,570

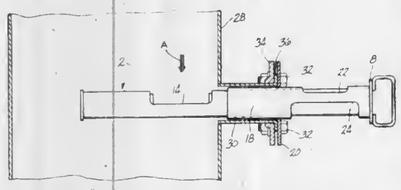
STOCK SAMPLING DEVICE

Kent Witherspoon; James P. Carroll; Bud Allen, all of Decatur; Terri Norton; James Odell, both of Town Creek; Doreen Pittman, Florence; Pat Phillips, Hillsboro; Phillip Everett, Muscle Shoals; Joe Hovater, Decatur; Hank Livingston, Decatur, and Lisa Williams-Terry, Decatur, all of Ala., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 18, 1985, Ser. No. 789,148

Int. Cl.[4] G01N *1/20*

U.S. Cl. 73—863.81 **2 Claims**



1. A manually operated material sampling apparatus for taking samples of a material from a pipeline equipped with a sample retrieval nozzle opening into said pipeline through the pipeline wall, and wherein the material falls downwardly through the pipeline, said sampling apparatus comprising:

(a) a radially outwardly extending flange formed at an outer end of said nozzle distal of said pipeline;

(b) a tubular open-ended track member telescopically engaging said nozzle, said track member having a radially outwardly extending flange thereon which is disposed in abutting contact with said nozzle flange, and said track member having an outward portion which extends from said track member flange away from said pipeline, said track member outward portion having formed therein a vertically upwardly open inspection opening, and an opposed aligned vertically downwardly open discharge opening;

(c) means removably clamping said track member flange to said nozzle flange; and

(d) a tubular scoop member telescopically mounted in said track member for axial and rotational reciprocal movement with respect to said track member, said scoop member having a first sealed end disposed in said track member, a second end opposite said first sealed end, said second end being disposed outside of said track member and having a stop part operable to engage said track member to limit the extent to which said scoop member can be telescoped into said track member, and said scoop member further including an open cradle portion disposed between said first and second ends of said scoop member, said scoop member being movable with respect to said track member between;

(i) an inner sample-catching position wherein said cradle portion is disposed within said pipeline to catch a sample of the material falling through said pipeline and wherein said stop part engages said track member, said scoop member being operable to close off said inspection and discharge openings in said track member when in said sample-catching position; and

(ii) an outer sample-delivering position wherein said inner sealed end of said scoop member is disposed in sealing relationship with said nozzle and track member to seal the interior of the pipeline from ambient surroundings, and wherein said cradle portion of said scoop member is aligned with said inspection opening in said track member so that a retrieved sample can be visually inspected and dumped from said cradle portion through said discharge opening by appropriate axial rotation of said scoop member.

4,625,571

GRAB SAMPLER

Brian G. Slater, Rochester, England, assignor to British Petroleum Company, London, England

Filed Oct. 20, 1982, Ser. No. 435,630

Claims priority, application United Kingdom, Oct. 31, 1981, 8132869

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—863.84 **17 Claims**

1. A device for sampling liquid flowing through a pipeline, said device being adapted to be inserted into the pipeline and comprising:

A. a set of concentric tubular members made up of

(1) an outer, hollow cylindrical body having a base closing one end thereof and having a radially oriented liquid inlet and liquid outlet adjacent to the base thereof,

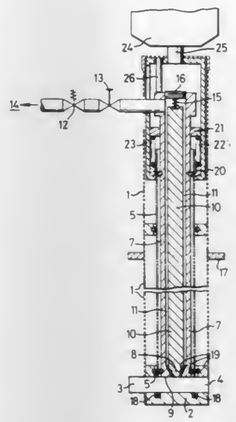
(2) a sleeve mounted within and axially slideable with respect to the outer cylindrical body, and

(3) a hollow piston mounted within and axially slideable with respect to the sleeve, wherein

(a) the sleeve is adapted to define a liquid-tight chamber between the walls thereof, the base portion of the body and the piston, and is capable of trapping a sample of liquid within said chamber,

(b) the piston is provided at the base thereof with an internal non-return valve and is adapted to apply pressure to the trapped sample thereby displacing the sample through the valve into the inside of the piston, and

(c) the inside of the piston is connected to sample removal means for removal of the sample therein, and



B. acuator means for seq-entially lowering first the sleeve and the the piston so as to isolate and remove a sample of liquid.

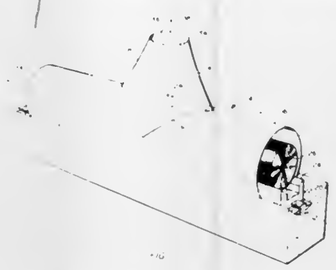
4,625,572
CYLINDER PUMP
Kiyoshi Yamashita, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Apr. 17, 1985, Ser. No. 724,153
Claims priority, application Japan, Apr. 18, 1984, 59-79039
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—864.16 **4 Claims**



1. A cylinder pump for an automatic chemical analyzer or the like, comprising:
a cylinder made of a ceramic material and having a mirror-like inner surface; and
a solid plunger made substantially of the same ceramic material as that of said cylinder and having a mirror-like outer surface, said plunger being movable within said cylinder and said outer surface of said plunger being in liquid-tight sliding contact with said inner surface of said cylinder for precisely withdrawing and discharging a predetermined volume of liquid into and out of said cylinder.

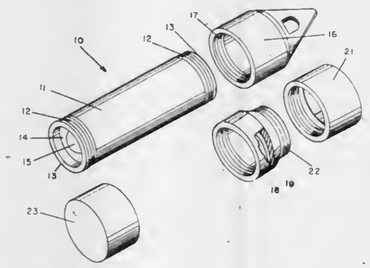
4,625,573
MAGNETIC SHIELDING AND MAGNETICALLY SHIELDED BOREHOLE CORE DRILLING
William E. Henry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 23, 1985, Ser. No. 737,372
Int. Cl.[4] G01N *1/08*
U.S. Cl. 73—864.44 **27 Claims**

1. A magnetic shielding member comprising:
a first hollow portion which includes a wall having a first opening therethrough, said wall having an exterior surface, wherein said first portion is composed of a ferromagnetic material characterized by an initial magnetic permeability of at least about 10,000 gauss/oersted; and
a second hollow portion, having an axis, of a ferromagnetic material also characterized by an initial permeability of at least about 10,000 gauss/oersted, wherein said second portion has a first end at which said second portion meets said first portion at said exterior surface, said second portion also having a second open end generally opposite said first end and a sidewall which extends between said ends and which extends outwardly from said exterior surface so as to generally surround said first opening and so as to generally taper toward said axis from said first end to said



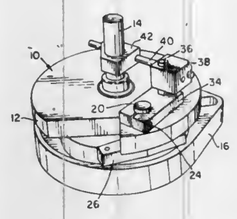
second open end, at least a portion of said second portion sidewall being flared such that a first acute angle defined between said axis and said sidewall near said first end is greater than a second acute angle defined between said axis and said sidewall near said second end, the difference between the first acute angle and the second acute angle being about 10°, and wherein said sidewall has an interior surface which defines an interior space therein which communicates with said first opening.

4,625,574
LIQUID SAMPLING METHOD AND MEANS
Robert J. Robbins, Rte. 2, Box 6, Lodi, Wis. 53555
Filed Aug. 26, 1985, Ser. No. 769,136
Int. Cl.[4] G01N *1/10*
U.S. Cl. 73—864.63 **5 Claims**



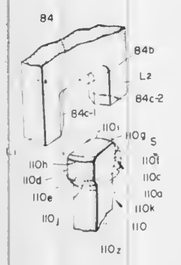
5. The method of obtaining a sample of contents of a body of liquid and preserving such sample from deterioration resulting from aeration, contamination, or loss of volatile components comprising the steps of providing a container for confining a sample of liquid, immersing said container in the body of liquid to be sampled, removing said container when filled from said body of liquid, applying to the top of said container a septum, securing a cap on said container to maintain said septum in interfacing disposition with liquid in said container and to provide a volume above said septum into which dissolved and entrapped gaseous components in said sample can escape, thereby to preserve said sample against loss of quality prior to analysis.

4,625,575
CAM ASSEMBLY FOR A FEEDER MECHANISM
Philippe A. Le Bras, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 13, 1985, Ser. No. 797,297
Claims priority, application United Kingdom, Nov. 13, 1984, 8428644
Int. Cl.[4] F16H *25/08*
U.S. Cl. 74—63 **6 Claims**



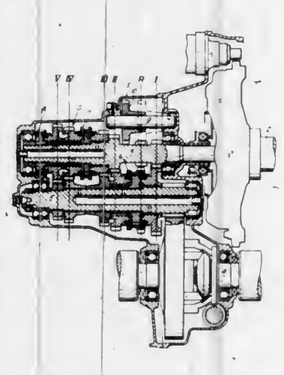
1. A cam assembly for incorporation in an article feeder mechanism which assembly comprises a cam plate having formed therein a first continuous cam track and a second relatively shallower cam track, cam track follower means including a first follower for relative movement within only said first continuous track and a second follower for relative movement within the first and second cam tracks, drive means for moving said cam track followers with respect to said cam tracks, said cam track follower means being connected to article pick up means and each of said first and second cam tracks including arcuate portions engaged sequentially by respective ones of said first and second followers so that said article pick-up means is caused to move to an outwardly extended position and to an inwardly retracted position, respectively, relative to a central axis of said cam plate.

4,625,576
SHIFT CONTROL MECHANISM OF AUTOMOTIVE MANUAL TRANSMISSION
Michihiro Okuda, Zama, and Kotei Takahashi, Sagamihara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Oct. 5, 1984, Ser. No. 658,216
Claims priority, application Japan, Oct. 7, 1983, 58-187788
Int. Cl.[4] G05G *9/12, 5/10*
U.S. Cl. 74—473 R **10 Claims**



1. In a shift control mechanism of a manual transmission having a control rod which is movable in response to both selecting and shifting operations of a manual shift lever, and at least one shift fork which is movable to achieve a gear coupling,
a direction changing mechanism comprising:
a drive member movable together with said control rod, said drive member having an enlarged head portion;
said head portion having two diametrically opposed portions;
a driven member movable together with said shift fork, said driven member being formed with a recess into which said head portion of the drive member is insertable to actuate said driven member,
wherein said enlarged head portion and said recess are so sized and constructed that upon said selecting operation, said head portion is brought into said recess maintaining said two diametrically opposed portions spaced from side walls of said recess, and upon completion of said shifting operation, said two diametrically opposed portions of said head portion are in intimate contact with said side walls of said recess.

4,625,577
MULTI-SPEED TRANSMISSION
Noboru Ashikawa; Hiroshi Nakayama, and Makoto Sumi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 5, 1984, Ser. No. 585,987
Claims priority, application Japan, Mar. 4, 1983, 58-35628; Mar. 4, 1983, 58-35629
Int. Cl.[4] G05G *9/10*
U.S. Cl. 74—475 **4 Claims**



1. A multi-speed transmission having a plurality of forward speed gear trains and at least one reverse speed gear train, comprising, a pair of parallel fork shafts, one said shaft being fixed, the other said shaft being slidable along its axial direction, means to selectively engage the gear trains and means to retain said selective engagement means in the selected position, and said means to selectively engage the gear trains including a first shift fork connected to said fixed fork shaft so as to slide to either side of its disengaged neutral position, a second shift fork connected to said slideable fork shaft so as to slide to either side of its disengaged neutral position, a third shift fork connected to said slidable fork shaft so as to slide in one direction by motion of said slideable fork shaft to only one side of its disengaged neutral position, a reverse shift fork connected to said slideable fork shaft and adapted to be actuated by motion of said slideable fork shaft in a direction opposite to the direction of the said motion which engages said third shift fork.

4,625,578
STEERING WHEEL ASSEMBLY
Kazuyoshi Nishijima, Fuji, Japan, assignor to Nihon Plast Co., Ltd., Shizuoka, Japan
Filed Jan. 14, 1985, Ser. No. 691,107
Claims priority, application Japan, Jan. 18, 1984, 59-6722
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—484 R **6 Claims**

1. In a steering wheel assembly of the type that includes:
a steering wheel body including a rim, at least one spoke having a radially outer end connected to said rim and a hub connected to the radially inner end of said spoke and adapted to be detachably secured to a steering shaft of a

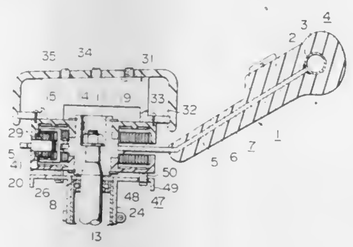
vehicle, said hub having a substantially cylindrical upper portion;

an upper member defining therein a central opening through which said upper cylindrical portion of said hub rotatably extends, said upper member having an outer peripheral portion formed thereon with internal gear teeth arranged on a circle substantially coaxial to the axis of said hub;

a pad mounted on said upper member to cover the top thereof;

a lower member substantially coaxial to but axially spaced from said upper member, said lower member defining therein a central opening substantially coaxial to the axis of said steering shaft and having an outer peripheral portion formed thereon with internal gear teeth arranged on a circle substantially coaxial to the axis of said steering shaft;

at least one planet gear disposed in meshing engagement with said internal gear teeth of said upper and lower members;



a carrier fixed to said hub for rotation therewith and supporting said planet gear for rotation about the axis thereof; and

means for mechanically connecting said lower member to a stationary member of the vehicle so that said lower member is kept stationary during rotation of said steering wheel body;

the rotation of said steering wheel body causing said planet gear to be revolved about the axis of said steering shaft while said planet gear is rotated about its own axis with the teeth thereof engaged with the internal gear teeth of said upper and lower members so that said upper member is rotated relative to said steering wheel body in a direction opposite to the direction of rotation thereof whereby said upper member is kept apparently stationary;

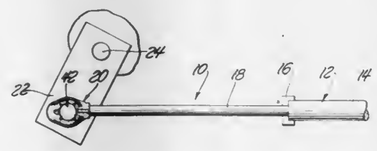
the improvement which comprises a flange fixed to said planet gear and extending radially outwardly therefrom into the axial space between said upper and lower members, said flange having opposite axial end faces in slidable engagement with said upper and lower members.

4,625,579

CAPPED CORE ELEMENT TERMINAL

Arthur L. Spease, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Nov. 28, 1984, Ser. No. 675,775
Int. Cl.⁴ F16C *1/14*
U.S. Cl. 74—501 R **12 Claims**



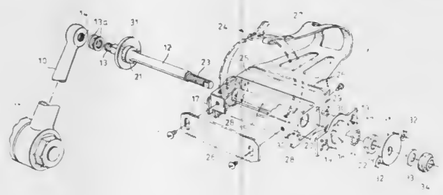
1. A motion transmitting remote control assembly (**10**) of the type for transmitting motion in a curved path, said assembly comprising: guide means (**12**); core means having a peripheral end and being movably supported by said guide means (**12**) and extending therefrom to provide a variably extending length of said core means between said guide means (**12**) and said peripheral end of said core means, said extending length defining a line of force; an integral terminal member (**20**) for operatively interconnecting said extending length of said core means and a control member (**22**) of the type having a body portion (**32**) and a ball pin (**36**) extending therefrom, said terminal member (**20**) including a passageway (**38**) defining an opening having a central longitudinal axis perpendicular relative to said line of force and including a plurality of flexible fingers (**40**) defining a portion of said passageway (**38**) and having an engage condition for engaging and retaining the ball pin (**36**) disposed within said passageway (**38**) and a disengage condition for releasing the ball pin (**36**); and characterized by finger spreading means (**42**) movably mounted within said passageway (**38**) for reciprocating movement along said central longitudinal axis between an inserted position for radially outwardly spreading said fingers (**40**) to said disengage condition during insertion and removal of the ball pin (**38**) and a withdrawn position wherein said fingers (**40**) are in said engaged position for engaging and retaining said ball pin (**36**) within said passageway (**38**).

4,625,580

BICYCLE PEDAL MECHANISM

Raymond R. Burt, R.R. #4, Orangeville, Ontario, Canada (L9W 2Z1)

Filed Dec. 13, 1984, Ser. No. 681,278
Int. Cl.⁴ G05G *1/14*
U.S. Cl. 74—594.4 **8 Claims**



1. A bicycle pedal mechanism comprising

a pedal axle,

means for attaching the pedal axle to one end of a pedal crank arm so as to extend laterally therefrom,

a tubular housing journalled on said axle, the axle projecting from the housing at each end,

a pedal frame,

support means mounted at the ends of said tubular housing for supporting the pedal frame thereon,

said support means including means constraining the pedal frame to move to and fro transversely with respect to the support means,

a cam rigidly mounted at each end of the pedal axle,

cam follower means carried by the pedal frame at each end thereof,

said cam follower means engaging the cams whereby to effect oscillatory longitudinal movement of the pedal frame in response to rotation of the cams,

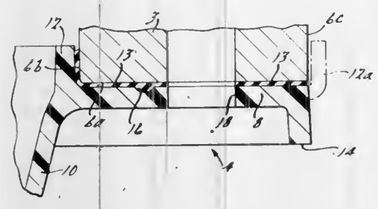
wherein the support means further comprises a longitudinally extending plate at each end of the tubular housing, each plate having a flanged aperture through which the axle projects, the flange of said aperture being fixedly attached to the respective end of the tubular housing.

4,625,581

AUTOMOTIVE COMPONENT COVER

Neil A. Hull, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 10, 1985, Ser. No. 690,278
Int. Cl.⁴ F16H *57/02*
U.S. Cl. 74—606 R **3 Claims**



1. A cover for an automotive component comprising:

a mounting section contoured to match a sealing surface of said component circumscribing the cavity to which said cover is to be applied;

a closure section attached to said mounting section; and

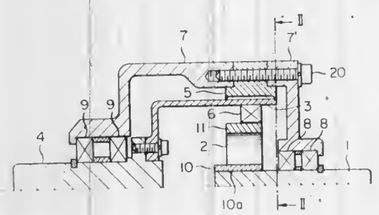
generally parallel inner and outer flanges fixed to the inner and outer contours of said mounting section with said inner flange adapted to extend into said cavity and said outer flange adapted to extend parallel to and in the same direction as said inner flange such that sealant placed between said mounting section and said sealing surface when said cover is applied to said component will be retained between said flanges and said sealing surface as well as between said mounting section and said sealing surface.

4,625,582

HARMONIC DRIVE APPARATUS

Yuichi Kiryu, Hyogo, Japan, assignor to S. Soga & Co., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,585
Claims priority, application Japan, Dec. 29, 1983, 58-250254
Int. Cl.⁴ F16H *37/04*
U.S. Cl. 74—640 **3 Claims**



2. A harmonic drive apparatus comprising:

a rigid, circular spline which has a number of internal spline teeth and which is rotatable about an axis of rotation;

a hollow cylindrical, radially deflectable flexspline having outer spline teeth engageable with said internal spline teeth of said circular spline, said flexspline being concentrically rotatable about said axis of rotation, and the number of said external spline teeth of said flexspline being less than the number of said internal spline teeth of said circular spline; and

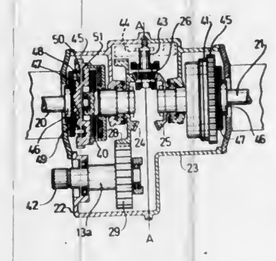
a wave generator disposed within said flexspline in engagement therewith and rotatable about said axis of rotation, said wave generator having a cam section which generates a circumferential wave of radial deflection of said flexspline for causing the external spline teeth of said flexspline to locally engage with the internal spline teeth of said circular spline, said cam section having an elasticity in its radial direction sufficient for biasing said flexspline against said circular spline to absorb any play between said flexspline and said circular spline, said wave generator including a ring member elliptical in cross section, flexible in its radial direction, and having rigidity in its circumferential direction, and an inner member, disposed within the ring member, which is flexible in the radial direction of the ring member so as to apply a compressive force on the ring member from the inside thereof, said inner member including concentric elastic spring portions inside said ring member, connected to each other in the direction of the minor axis of said ring member, and to said ring member in the direction of the major axis thereof, through bridge portions so as to transmit the torque from said spring portions to said ring member.

4,625,583

VEHICLE DRIVE PLANT

Sven-Olof Kronogard, Lomma, Sweden, assignor to AB Volvo, Goeteborgs, Sweden

Division of Ser. No. 148,217, May 9, 1980, which is a continuation-in-part of Ser. No. 844,079, Oct. 20, 1977, abandoned. This application May 14, 1980, Ser. No. 149,759
Claims priority, application Sweden, Oct. 20, 1976, 7611617
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—661 **1 Claim**



1. A vehicle drive plant comprising:

at least one pair of prime movers, each prime mover having an output end and an output shaft at said output end which rotates in a predetermined direction, said prime movers being operatively connected to a common drive shaft;

a base block;

oppositely disposed substantially parallel end walls in said base block;

each end wall having means for receiving at least one of said output shafts of each pair of said at least one pair of prime movers, the output shafts of each pair of said prime movers being aligned on a common axis of rotation and parallel to said common drive shaft;

individually operable clutch means disposed within said base block, said clutch means being operably connected to each one of said output shafts of each pair of prime movers and having a clutch output shaft;

a gear train within said base block operably connecting said clutch output shafts to said common drive shaft,

said gear train comprising a bevel gear wheel on each clutch output shaft,

at least one bevel pinion meshing with said bevel gear wheels having a diameter smaller than the diameter of said bevel gear wheels,

a first spur gear wheel integral with at least one of said bevel gear wheels, and

a second spur gear wheel on said common drive shaft in cooperative engagement with said first spur gear wheel;

said drive shaft comprising a stub shaft journalled at its inner end in bearings within said base block and extending through the wall of said base block and having means on the outer end thereof for connecting to a propulsion shaft;

said base block being divided into two parts along a plane parallel to said end walls, perpendicular to said common axis of rotation of said prime mover output shafts, and including the axis of rotation of said at least one bevel pinion; and

a flywheel mounted upon the shaft of said at least one bevel pinion within said base block.

4,625,584

SPLIT AXLE DRIVE MECHANISM FOR PART-TIME FOUR-WHEEL DRIVE VEHICLE

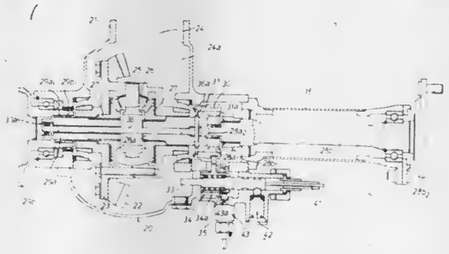
Takayoshi Onodera, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 5, 1985, Ser. No. 795,255

Claims priority, application Japan, Nov. 5, 1984, 59-232882; Nov. 9, 1984, 59-170667[U]; Nov. 13, 1984, 59-171886[U]; Nov. 13, 1984, 59-238796; Nov. 19, 1984, 59-175551[U]; Nov. 20, 1984, 59-175826[U]; Nov. 20, 1984, 59-175827[U]; Nov. 21, 1984, 59-177136[U]

Int. Cl.[4] B60K *23/04, 23/08;* **F16H** *1/40*

U.S. Cl. 74—713 **12 Claims**



1. A split axle drive mechanism for a part-time four-wheel drive vehicle equipped with a transfer device adapted to change the operating mode of the vehicle drive system to a two wheel drive mode and a four wheel drive mode, comprising:

a differential housing;

a differential case rotatably mounted within said housing, said differential case being provided thereon with a ring gear for rotation about a first axis and provided therein with a plurality of pinion gears for rotation about a second axis perpendicular to said first axis and a pair of side gears for rotation about said first axis and in meshing engagement with each of said pinion gears;

a first axle shaft disposed along said first axis and connected to one of said side gears for rotation therewith;

a second axle shaft disposed along said first axis and axially slidably connected to the other side gear for rotation therewith;

a first output member disposed along said first axis to be connected to said first axle shaft and having an outer end adapted for attachment to one split axle part for driving one of a pair of vehicle road wheels;

a second output member disposed along said first axis to be connected to said second axle shaft and having an outer end adapted for attachment to the other split axle part for driving the other road wheel;

a clutch mechanism disengageable for disconnecting said first axle shaft from said first output member when the two wheel drive mode is selected at said transfer device and engageable for connecting said first axle shaft to said first output member when the four wheel drive mode is selected at said transfer device;

a connecting rod axially slidably disposed in said first and second axle shafts and operatively connected at one end thereof with said clutch mechanism and at the other end thereof with one end of said second axle shaft to be maintained in a first position during disengagement of said clutch mechanism and to be moved to a second position in response to engagement of said clutch mechanism; and

coupling means for connecting said second axle shaft to said second output member in response to movement of said connecting rod from said first position to said second position and for disconnecting said second axle shaft from said second output member in response to movement of said connecting rod from said second position to said first position.

4,625,585

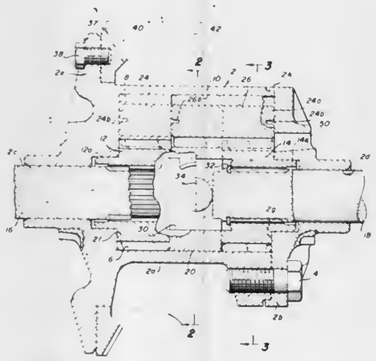
TORQUE-PROPORTIONING DIFFERENTIAL WITH SECTIONAL HOUSING

Walter L. Dissett, Southfield, Mich., assignor to Tractech, Inc., Warren, Mich.

Filed Jan. 9, 1985, Ser. No. 689,929

Int. Cl.[4] F16H *3/28, 57/02*

U.S. Cl. 74—715 **10 Claims**



1. A differential mechanism of the torque-proportioning helical pinion type having inherent friction torque bias, comprising

(a) a sectional housing adapted to be rotatably driven about its longitudinal axis, said housing consisting of

(1) a section (**2***a*) containing at one end:

(a) a longitudinal central bore (**6**) defining a central chamber; and

(b) a plurality of longitudinally extending pairs of pinion cavities arranged in circumferentially spaced relation about said central bore, the cavities of each pair being in communication with each other and with said central bore, one cavity of each pair having a greater depth than the other cavity of that pair; and

(2) an end cover section (**2***b*) connected with said one end of said body section for closing the ends of said central bore and said pinion cavities;

(3) said body and end section containing outlent shaft openings coaxially arranged relative to the longitudinal axis of said housing and in communication with said central chamber, respectively;

(b) a pair of longitudinally spaced helical side gears journalled at opposite ends of said central chamber coaxially with the longitudinal axis of said housing, said side gears being adapted to be splined to the adjacent ends of a pair of aligned axially spaced output shafts extending through said housing openings, respectively, said side gears having at their remote ends end thrust surfaces adapted for cooperation with corresponding thrust surfaces on said body and cover members, respectively;

(c) generally annular side gear spacer means (**20**) arranged coaxially between said side gears, said spacer means and said side gears having at their adjacent ends cooperating end thrust surfaces;

(d) pairs of helical pinions (**24**, **26**) journalled with an outside diameter running fit in longitudinally offset relation in said pairs of pinion cavities, respectively, the pinions of each pair being in enmeshing engagement with each other at their adjacent ends, the remote ends of said pinion pair being in enmeshing engagement with the associated side gears, respectively; and

(e) means supporting the pinions of each pair adjacent the remote ends of the associated pinion cavities, respectively, the remote ends of said pinions having thrust surfaces adapted for cooperation with corresponding thrust surfaces on said body and cover sections respectively, the supporting means for the pinion (**24**) mounted in the cavity of greater depth comprising an integral hub portion (**24***a*) which extends longitudinally from said pinion and terminates in an end extremity in engagement with said cover section.

4,625,586

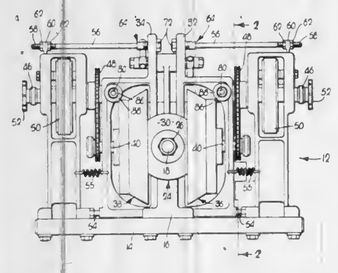
RESILIENT ROD COUPLING MEMBER AND ADJUSTING STRUCTURE FOR FRICTION DRIVE MECHANISM

Clair D. Splittstoesser, Coffeyville, Kans., assignor to Dixon Industries, Inc., Coffeyville, Kans.

Filed Oct. 22, 1984, Ser. No. 663,508

Int. Cl.[4] F16H *15/16, 15/08, 37/06*

U.S. Cl. 74—721 **2 Claims**



1. In a variable speed friction drive mechanism having a main frame, a pair of opposed, outwardly convergent driving cones rotatably connected about a common axis to the main frame, a subframe, a driven drum rotatably supported by the subframe and having an inner frustoconical surface, a universal joint mounting the subframe on the main frame, and an elongated resilient rod coupled to the main frame and the subframe and spaced from said universal joint, such that the drum and subframe are movable to shift said drum surface into and out of a disengaged position relative to both cones into and out of any one of a number of positions engaging either of the cones, whereby one of the cones drives the engaging drum at a speed ratio variably dependent upon the distance of the point of contact on said surface and the driving cone from its respective rotational axis, the improvement of which comprises:

a rod adjusting member connecting the rod to the subframe, the member having means for adjustably moving said drum in a direction generally parallel to the rotational axis of the cones, such that the distance between the drum surface and either of the cones when disengaged from each other is adjustable to any one of a number of preselected lengths, and such that said resilient rod is unstressed in its normal configuration as said distance is adjusted to any one of said preselected lengths,

said member being cylindrical, elongated, having two ends, surroundingly engaging a portion of the rod, and having an elongated bore extending from one end thereof and mating with said rod, the longitudinal axis of the bore being non-parallel to the longitudinal axis of the member, whereby as the member is axially rotated relative to the normal longitudinal axis of the rod, the distance between the drum surface and either of the cones when disengaged from each other is adjustable to any one of a number of preselected lengths.

4,625,587

SPEED CHANGE DEVICE FOR USE IN DRIVING AUXILIARY MACHINERY

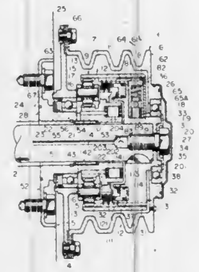
Chihiro Hosono, Aichi, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 371,269, Apr. 23, 1982, abandoned. This application Feb. 1, 1985, Ser. No. 697,265

Claims priority, application Japan, Apr. 24, 1981, 56-62721

Int. Cl.[4] F16H *3/74*

U.S. Cl. 74—752 C **5 Claims**



1. A speed change device for use in driving auxiliary machinery comprising:

an auxiliary machinery driving pulley as an output member;

an input member fixed to a driving shaft of an engine;

a planetary gear transmission changeably connected to said auxiliary machinery driving pulley and said input member, said planetary gear transmission comprising a planetary gear set, said planetary gear set comprising a planetary carrier connected to said auxiliary machinery driving pulley, a ring gear connected to said input member and a sun gear connected to support means fixed to an engine block through a one way clutch, said ring gear equipped with a tubular member having an axis identical to the axis of the driving shaft of said engine and said input member, said ring gear and sun gear being connected engageably and disengageably by clutch, said clutch being equipped with a hydraulic servo and arranged between said input member and said engine block, said hydraulic servo being parallel to said one way clutch in the axial direction and arranged between said input member and said planetary gear set; and

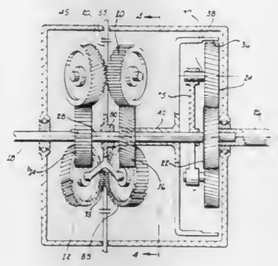
a hydraulic control unit for controlling said planetary gear transmission, said hydraulic control unit having a centrifugal type governor valve switchable between feed and release for supplying feed oil pressure to said hydraulic servo, and arranged inside said input member, wherein said governor valve is mounted in a radial direction with respect to the driving shaft and comprises a cylinder and a valve, said cylinder having a larger-diameter portion at a radial center side and a smaller-diameter portion at the radial outside, said valve being disposed within said cylinder in such a state that a spring is attached to the radial outside of said valve, said valve having two lands respectively fitted in said larger-diameter portion and said smaller-diameter portion of said cylinder, said larger-diameter portion having a side wall in which are formed an oil discharge port, a pressure-release port from said hydraulic servo, an input oil port of said governor valve and an output oil port to said hydraulic servo at predetermined intervals and in order successively from the radial center side, said governor valve having a hysteresis function in its operation caused by the difference in area between opposite end faces of each of said two lands.

4,625,588

CONTINUOUSLY VARYING PLANETARY MECHANICAL TRANSMISSION SYSTEM

Ray Brickley, 2007 Island Rd., Harvard, Ill. 60033

Filed Sep. 3, 1985, Ser. No. 771,614
Int. Cl.[4] F16H *3/44, 57/10, 37/06*
U.S. Cl. 74—793 **17 Claims**



1. A continuously varying mechanical transmission, comprising:

a first set of planetary gear means for operably connecting to a power shaft;

a secondary set of planetary gear means operably connected to said first set of planetary gear means by a bearing shaft for operably attaching to a load shaft; said first set of planetary gear means comprises: (a) a control sun operably coupled to a shaft means for integrally joining with said power shaft; (b) a driven sun operably coupled to a shaft means for operably joining with said power shaft, said driven sun is located proximate to said control sun, said driven sun and said control sun are equal in size; (c) a plurality of first planet gears suitable for rotating around said control and driven suns, said first planet gears are of equal sizes and are angularly skewed; and (d) a control carrier means for operably joining to said plurality of first planet gears and at least one brake means exerting towards said control carrier of said first set of planetary gears to permit continuous varying proportion in angular rotation between said power shaft and said load shaft.

4,625,589

CREEP PREVENTING DEVICE FOR VEHICLE EQUIPPED WITH AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo; Takashi Aoki, Fujimi; Yoichi Sato, Wako, and Yukihiro Fukuda, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,594
Claims priority, application Japan, Apr. 6, 1983, 58-60362
Int. Cl.[4] B60K *41/18, 41/16*
U.S. Cl. 74—856 **6 Claims**

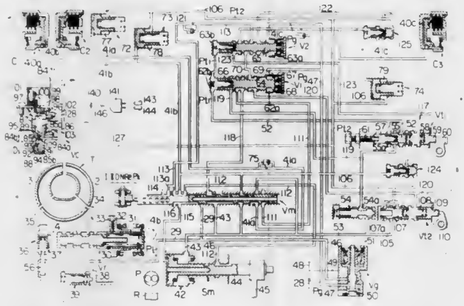
1. In a creep preventing device for vehicles equipped with an automatic transmission, comprising;

a fluid type torque converter;

an auxiliary transmission having a frictionally engaging element for starting and connected to said torque converter; and

a creep preventing valve disposed in an oil passage that is branched from an operating oil passage leading to said frictionally engaging element and that leads to an oil tank, said creep preventing valve being adapted to open said oil passage during the idle operation of the vehicle;

the improvement wherein said creep preventing valve is constructed such that it is operated in the opening and the closing directions by a common hydraulic pressure of a hydraulic pressure source acting on opposite surfaces thereof, said opposite surfaces consisting of a first pressure receiving surface of a larger area for receiving thereon the hydraulic pressure toward a closing side of the valve and a second pressure receiving surface of a smaller area for receiving thereon said hydraulic pressure toward an opening side of the valve, wherein during ordinary operating conditions, said hydraulic pressure is allowed to act upon both pressure receiving surfaces to keep the valve in closed state, and during the idling operation the pressure acting upon the first pressure receiving surface is released to allow the valve to move to an open position, said creep preventing valve having an oil chamber connected via an oil path to means for producing a signal pressure proportional to an engine output, said valve being moved to a



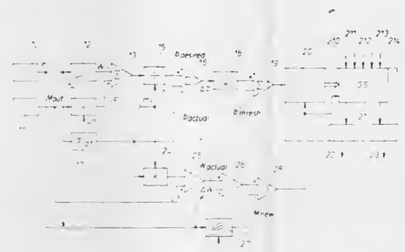
closed position when a signal pressure above a predetermined value is introduced into said oil chamber, said oil chamber being connected to said oil path via a check valve allowing the pressure to flow only in a direction toward said oil chamber from the oil path, said oil chamber being communicated with said operating oil passage through an orifice, a solenoid valve being provided and adapted to exhaust the hydraulic pressure acting on said first pressure receiving surface during the idling operation.

4,625,590

CONTROL APPARATUS FOR AN AUTOMATIC TRANSMISSION

Alfred Müller, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,547
Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018032
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—866 **4 Claims**



1. Control apparatus for an automatic transmission in a motor vehicle, comprising:

means for furnishing a desired acceleration signal, said means comprising a combination of

first means (**10**) for furnishing a speed signal signifying the then-present vehicle speed;

second means (**11**) for furnishing a torque signal signifying then-present transmission output torque;

third means (**12**) for furnishing a resistance signal signifying the resistance to travel of said vehicle at a predetermined load and on a level road, and

fourth means (**14, 13, 15**) for computing said desired acceleration signal from said resistance and torque signals in accordance with the equation

$$b_{desired}=(M_{out}u\eta-W)/m_F$$

where

m_F is the mass of the vehicle,

ü is the product of the transmission ratio of the differential and the main pinion radius, and

η is the efficiency of the drive train;

means (**17**) for furnishing an actual acceleration signal signifying the actual acceleration of said vehicle;

first comparator means (**16**) connected to said means for furnishing an actual acceleration signal and said means for furnishing a desired acceleration signal, for comparing said actual to said desired acceleration signal and furnishing a first difference signal corresponding to the difference therebetween;

second comparator means (**19**) for comparing said first difference signal to a predetermined acceleration threshold signal and furnishing a second difference signal only when said first difference signal exceeds said predetermined acceleration threshold signal; and

computing means (**20, 21**) connected to said second comparator means for furnishing a standard gear shift control signal from a gear of said transmission which is then in operation to another gear of said transmission into which other gear a shift is expectable on the basis of nominal shift characteristics, said standard gear shift control signal being derived from said nominal shift characteristics in the absence of said second difference signal and for also furnishing a modified shift control signal derived from an auxiliary shift characteristic in the presence of said second difference signal;

means (**27**) for furnishing a new torque signal signifying the torque to be expected in said other gear;

means (**24,25**) for furnishing an actual resistance signal signifying the then-present resistance to vehicle travel and obtained by subtracting the product of the mass of the vehicle and said actual acceleration signal from said torque signal signifying then-present transmission torque, and

third comparator means connected to said means for furnishing an actual resistance signal, said means for furnishing a new torque signal and said computing means for impeding the generation of said gear shift control signal when said new torque signal is less than said actual resistance signal.

4,625,591

CREEP PREVENTING DEVICE FOR VEHICLES EQUIPPED WITH AN AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 593,775
Claims priority, application Japan, Mar. 28, 1983, 58-52028; Mar. 28, 1983, 58-52029
Int. Cl.[4] B60K *41/18, 41/16*
U.S. Cl. 74—866 **6 Claims**

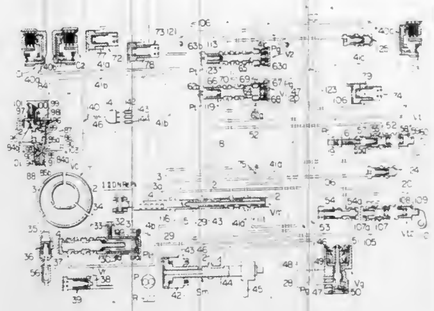
1. In a creep preventing device for vehicles equipped with an automatic transmission, comprising:

a fluid type torque converter;

an auxiliary transmission which has a frictionally engaging element for starting, and which is coupled to said torque converter; and

a creep preventing valve disposed in an oil path that is branched from an operation oil path leading to said frictionally engaging element and that leads to an oil tank, said creep preventing valve being adapted to open said oil path during the idle operation of the vehicle;

the improvement wherein said creep preventing valve is constructed such that it is operated in the opening direction and the closing direction by the pressure of a hydraulic pressure source on opposite surfaces thereof.

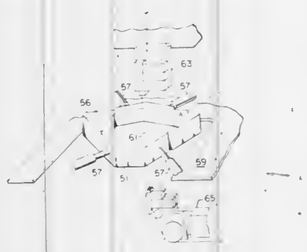


4,625,592

DIE FOR CUTTING PAPER, CLOTH AND THE LIKE AND METHOD OF MAKING SAME

Harold J. Bayens, 110 Meadowbrook Country Club, Ballwin, Mo. 63011

Filed Feb. 6, 1985, Ser. No. 698,763
Int. Cl.[4] C22B *3/02*
U.S. Cl. 76—107 C **12 Claims**



1. A method of making a die for repetitively cutting predetermined shapes out of paper, cloth and the like comprising the steps of:

(a) cutting a die blank out of a blank of metal, the outline of the die blank corresponding generally to the shape it is desired to cut;

(b) removing at least part of the interior of the die blank to form a modified die blank with a central opening having substantially the same shape as the shape it is desired to cut; and

(c) forming a cutting edge on one surface of the modified die blank adjacent the central opening.

4,625,593

WOOD DRILL AND METHOD OF CONSTRUCTION

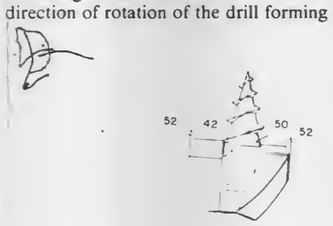
Norman H. Schmotzer, 637 Shore Rd., North Palm Beach, Fla. 33408

Filed Aug. 7, 1984, Ser. No. 638,836
Int. Cl.[4] B23B *27/18*
U.S. Cl. 76—108 T **7 Claims**

1. A method of making a drill having a direction of rotation for drilling,

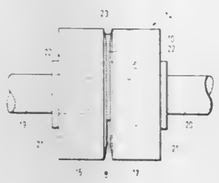
(1) forming a web having a first spiral land extending for at least the length of a hole to be drilled; and a second spiral land extending midway down the groove formed by the first spiral land, said first and second spiral land having an upper and lower spiral surface,

(2) forming the top of the web, first spiral land, and second spiral land as a flat portion with the top of the first spiral land and second spiral land each extending outwardly from the web to an outer end,
(3) forming a hole into the top end of the web,
(4) forming a first notch in the top of the first spiral land extending from the outer end to the hole in the web, said first notch having a first surface facing in the direction of rotation of the drill and a second surface extending from the bottom of said first surface in the direction of rotation of the drill forming a platform,
(5) forming a second notch in the top of the second spiral land extending from the outer end to the hole in the web, said second notch having a first surface facing in the direction of rotation of the drill and a second surface extending from the bottom of said first surface in the direction of rotation of the drill forming a platform,



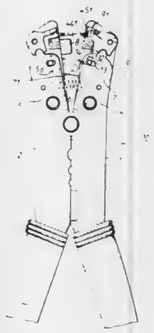
(6) forming a lead screw having a bottom axial projection for fitting into the hole in the top end of the web,
(7) forming a cutting insert for placement in each first and second notch against the first and second surfaces, respectively,
(8) placing the bottom axial projection of said lead screw into the hole,
(9) placing a cutting insert respectively in each first and second notch against the first and second surfaces, respectively, and adjacent the bottom axial projection of said lead screw,
(10) fixing said lead screw and inserts to each other and to said web and lands;
(11) contouring the inserts and adjacent spiral lands to provide a sharp forward edge for cutting, and
(12) forming a holding shank at the bottom of the web.

4,625,594
PROCESS AND APPARATUS FOR PRODUCING A SAW BLADE
Kurt Janke, Solingen, Fed. Rep. of Germany, assignor to Gebruder Honsberg GmbH Sonderwerkzeugmaschinen und Sagenfabrik, Remscheid-Hasten, Fed. Rep. of Germany
Filed Sep. 5, 1985, Ser. No. 773,441
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433279
Int. Cl.⁴ B23D *65/00*
U.S. Cl. 76—112 **7 Claims**



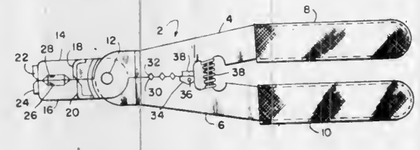
1. Process for producing a saw blade, comprising the steps of providing a metal strip;
forming teeth on one longitudinal edge of the metal strip;
passing the metal strip between two grinding wheels for grinding down more material from the untoothed area of the metal strip than from the toothed area, wherein each wheel includes opposing mutually parallel end faces for grinding both sides of the sheet metal strip and each grinding wheel further includes a conical edge region for grinding the lateral flanks of the teeth.

4,625,595
STRUCTURE FOR A WINE STRIPPER
Hui W. Hsiao, No. 502, Chung Shan Road, Chung Ho, Taipei, Taiwan
Filed Jun. 6, 1985, Ser. No. 741,663
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.42 **1 Claim**



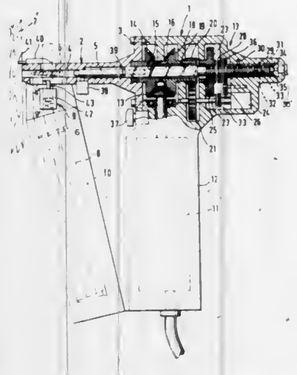
1. An improved structure for a wire stripper comprising a pair of first and second arms which are symmetric to each other and pivotally connected together, the first arm being provided at one end with a handle and at the other end with a ball member and a slot while the second arm being furnished at one end with a handle corresponding to the handle of the first arm and the other end with a ball member and a slot which are respectively symmetric to a ball member and the slot of the first arm; a pair of first and second pieces symmetric to each other wherein the first piece is provided at an upper side thereof with a pin corresponding to the slot of the first arm and a concave recess formed below said pin, said second piece is furnished at an upper side thereof with a pin corresponding to the slot of the second arm and a concave recess formed below said pin, which is associated with the concave recess of the first piece to form a long slot, a spring received in said long slot and secured at its both ends respectively to the first and second arms, the second piece further provided at an underside thereof with a flange, means for securing the first and the second pieces respectively to the first and the second arms with the pins thereof respectively inserted into the corresponding slots which are so arranged that when the first and second pieces are driven to an operating position by pressing the two arms inwardly, the pins will respectively move along the corresponding slots to central portions of the slots, and when the first and second pieces are driven back to an unused position by the spring, the pins will move along the corresponding slots to outer portions thereof; a stationary cutting member being secured to the upper side of the first piece, a pivotal cutting member pivotally connected to the upper side of the first piece cooperating with said stationary cutting member to be a stripping means, said pivotal cutting member being provided with a socket engaging with the ball member of the first arm such that the pivotal cutting member is driven by the first arm thereof; a stationary clamping member being secured to the upper side of the second piece, a pivotal clamping member pivotally connected to the upper side of the second piece cooperating with said stationary clamping member to be a clamping means, said pivotal clamping member being furnished with a socket engaging with the ball member of the second arm such that the pivotal clamping member is driven by the second arm thereof; a latching plate being provided with a protuberance corresponding to the concave recess of the first piece and an aperture corresponding to the flange of the second piece, the latching plate being secured to the underside of the first piece with its protuberance received in said concave recess and with its aperture engaged with the flange to keep the stripper in its unused position; the latching plate further provided at an end adjacent to the aperture with a bent portion extending outwardly from the underside of the second piece to a predetermined distance and then being bent to be parallel to said second piece so as to avoid the interference between the flange of the second piece and the end of the latching plate; an aligning piece being secured to the underside of the second piece adjacent to said latching plate to keep the first and the second pieces in alignment each other.

4,625,596
ELECTRICAL PLIERS
Adolph Makus, 5004 State Rd. 92, Lake Stevens, Wash. 98258
Filed Oct. 19, 1984, Ser. No. 663,687
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.44 **6 Claims**



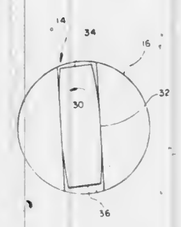
1. A tool for simultaneously cutting an electrical wire and stripping a predetermined length of insulation which comprises:
a pair of overlying, essentially planar arm members pivotally connected to be movable in scissors fashion, an elongated portion of said members on one side of the pivot point serving as handles for operating the tool;
a pair of upturned wire severing members mounted on the arms on the other side of and adjacent the pivot point, said severing members having opposed sharpened cutting portions oriented substantially normal to the longitudinal axis of the tool and normal to the plane of the arms;
a pair of upturned insulation stripping members located on the arms anterior to the severing members, said insulation stripping members oriented essentially parallel to the cutting portions of the severing members and having cooperating opposed notches for cutting through the wire insulation without cutting into the electrical conductor, said stripping members being located on the same side of said plane of the arms as said severing members whereby the space between the cutting portions of the severing members and the stripping members defines a fixed distance from which insulation will be stripped from a wire; and
an adjustable stop means mounted on one arm member in a location to cooperate with a fixed anvil mounted on the other arm member for controlling the depth of cut into the insulation in order to accommodate and strip various wire sizes, said upturned severing members and stripping members enabling the tool to function on a wire of any length without interference from the handles.

4,625,597
SCREW DRIVING APPARATUS
Adolf Cast, Lenningen, Fed. Rep. of Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany
Filed Sep. 13, 1984, Ser. No. 650,095
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333427
Int. Cl.⁴ B25B *23/02, 23/04, 23/06*
U.S. Cl. 81—57.37 **7 Claims**



1. A screw driving apparatus, comprising housing means, an electrical drive motor in said housing means, a hollow screw guide member, screw supply means operatively secured to said hollow screw guide member for feeding screws into said hollow screw guide member, a screw driver blade operatively movable in said hollow screw guide member, first mouting means (3) rigidly securing said hollow screw guide member to said housing means, second mouting means slidably mounting said screw driver blade in said housing means for displacement relative to said electrical drive motor, coupling means operatively interconnecting said electrical drive motor to said screw driver blade for driving said screw driver blade, said coupling means comprising first coupling members for rotating said screw driver blade and second coupling members for axially displacing said screw driver blade, and wherein said second coupling members for axially displacing said screw driver blade comprise a screw jack, connector means operatively securing said screw jack in a force transmitting manner to said screw driver blade, and feed advance drive means operatively interconnecting said electrical drive motor to said screw jack for axially displacing said screw jack and thus said screw driver blade.

4,625,598
POSITIVE ENGAGEMENT SCREW DRIVER TOOL
Frank Wolfram, 375 Alta Dr., Grayslake, Ill. 60030
Filed May 10, 1985, Ser. No. 732,688
Int. Cl.⁴ B25B *13/48*
U.S. Cl. 81—436 **3 Claims**



1. A tool for use with a fastening device having a head with a straight slot of predetermined width comprising:

a body;

a segment having a top end attached to said body and a bottom end, said segment tapering to a thickness less than a thickness of said bottom end between said top and bottom ends;

an end portion atteched to said bottom end of said segment having a midpoint which is wider than the width of its ends, said end portion having substantially arched line segments connecting said midpoint to said ends of said end portion; and

an engagement area between at least a side of said segment and a side of the slot in the head of the fastening device which initially occurs at approximately a point intermediate to said midpoint and said end of said end portion on said arched line segment and increases in area toward said midpoint and toward said top end of said segment as increasing torque is applied to the tool;

wherein said engagement area increases with increasing torque due to deformation of the material which forms the fastening device.

4,625,599

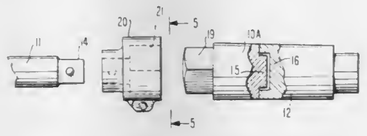
HALF-INCH LUG LOCK KEY

Charles R. Icard, 10345 Newport Dr., El Paso, Tex. 79924

Filed Jul. 22, 1985, Ser. No. 757,265

Int. Cl.[4] B25B *23/00*

U.S. Cl. 81—461 **1 Claim**



1. A one-half inch lug lock key assembly, comprising, in combination, a one piece key member positioned between an extension key adapter and a combination lug lock, and a second adapter being positioned between said key member and said extension key adapter for converting any drive size to a one-half inch drive; a plurality of parallel protrusions on a first end of said key member for engagement in slots on an end of said combination lug lock, said second adapter having a square socket on one end for engaging a square head on one end of said extension key adapter and a hexagonal socket on an opposite end for engaging a hexagonal head on an opposite end of said key member, said hexagonal socket being split longitudinally and forming a pair of jaws, and a clamping screw transversely through said jaws for forcibly tightening said split hexagonal socket around said key member hexagonal head.

4,625,600

LUG REMOVAL/INSTALLATION DEVICE

Robert W. Koren, 4855 Boston Ave., and James T. Koren, 4726 Cypress Ave., both of Trevose, Pa. 19047

Filed Sep. 3, 1985, Ser. No. 771,698

Int. Cl.[4] B25B *23/00*

U.S. Cl. 81—462 **12 Claims**

1. A device for use in conjunction with a lug wrench in the removal or installation of vehicle wheel lugs comprising:

a main vertical support member having a pair of pivoted end portions,

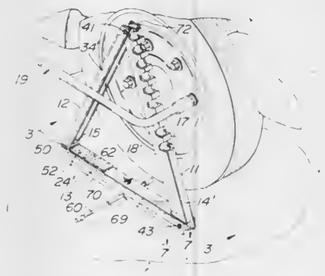
a secondary vertical support member having a pivoted end portion and a free end portion,

a base member having a pivoted end portion and a free end portion, said base member having a substantial base width to provide a ground contacting support portion of substantial width on a bottom side thereof,

a first pivot means pivotally connecting said main vertical support member and said secondary vertical support member together of said pivoted end portions thereof,

second pivot means for pivotally connecting said main vertical support member and said base member together at said pivoted end portions thereof,

means for releasably fastening the free end portion of said base member to the free end portion of said secondary support member for positioning said members in a ground supported standing triangular configuration with said base member supported on the ground at said ground contacting support portion of said bottom side to form the bottom leg of said triangular configuration and said vertical support members extending upwardly from said base member to form the other two legs of said triangular configuration with said first pivot means being located at the upper apex of said triangular configuration, said second pivot means being located at a lower apex of said triangular configuration adjacent ground level and adjacent said ground contacting support portion,



said main vertical support member having a plurality of slots therein spaced apart along the length thereof and providing bearing surfaces for holding a horizontally extending portion of the lug wrench during the removal or installation of a vehicle wheel lug.

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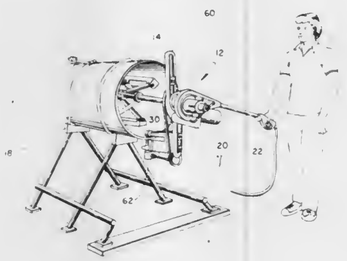
PIPE LATHE

William N. Brummet, Burbank, Calif., assignor to Pilot Manufacturing Company, Ashtabula, Ohio

Filed Aug. 15, 1984, Ser. No. 641,135

Int. Cl.[4] B23B *5/16*

U.S. Cl. 82—4 C **14 Claims**



1. A device for shaping the surface of a pipe, comprising:

mounting means for mounting said device to said pipe including a means for engaging and retaining said mounting means in a fixed position to said pipe and a means for actuating said engaging and retaining means to engage said pipe, said mounting means further including an arbor shaft substantially coaxially positioned within and extending outward from said pipe;

rotating means which is rotatable about said mounting means arbor shaft, said rotating means comprising a hub means rotatably mounted about said arbor shaft to which a frame means is coupled;

tool means for shaping the surface of said pipe, said tool means including a pivot base means coupled to said frame means, said tool means further including a pivot arm rotatably mounted to said pivot base means about an axis perpendicualr to said arbor shaft and having said first means for engaging a first pipe surface and a second means for engaging a second opposite pipe surface, said pivot arm means second engaging means including a cutting means having a surface which when brought into contact with said pipe surface will remove said pipe surface at said contacted area as said rotating means rotates about said arbor shaft;

radial progression means for moving said cutting means along a line perpendicular to said arbor shaft as said rotating means rotates about said arbor shaft; and

biasing means for biasing said tool means pivot arm first engaging means into contact with said pipe surface as said rotating means rotates about said arbor shaft.

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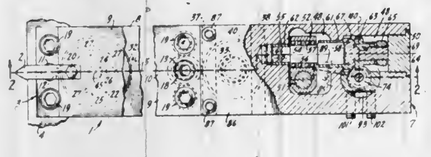
CUTTING TOOL HOLDER

John A. Korson, and Bruce W. Korson, both of Rte. 1, Box 21, Suttons Bay, Mich. 49682

Filed Jan. 2, 1986, Ser. No. 815,733

Int. Cl.[4] B23B *29/10*

U.S. Cl. 82—36 R **19 Claims**



1. A cutting tool holder for a machine tool, comprising:

(A) a mounting plate for attachment to said machine tool; a pivot pin having its central axis extending perpendicularly from said mounting plate adjacent one end thereof; and means for holding said mounting plate on said machine tool;

(B) a pivot plate having a hole adjacent one end thereof receiving said pivot pin; said pivot plate being adjacent said mounting plate; there being a cavity in said pivot plate at its other end; means in said cavity anchored to said mounting plate; a shaft having an eccentric portion rotatably journalled in the anchored means, said shaft having a bearing portion journalled for rotation in said pivot plate, said eccentric portion having a centerline that is a predetermined distance from the centerline of said bearing portion; and gear means on said shaft; said center line of said eccentric portion and said centerline of said bearing portion being in planes that are perpendicular to said central axis of said pivot pin;

(C) means for turning said gear means, so that turning of said gear means causes rotation of said shaft so as to move said eccentric portion of said shaft in said anchored means and to thereby cause said pivot plate to pivot around said pivot pin;

(D) means for attaching a cutting tool to said one end of said pivot plate;

(E) the distance between said cavity in said other end of said pivot plate and said pivot pin being several times greater than the distance between said one end of said pivot plate and said pivot pin, whereby the distance moved by said cutting tool when said pivot plate pivots around said pivot pin is only a small fraction of the distance moved by said other end; and

(F) means for holding said mounting plate and said pivot plate in the required position.

4,625,603

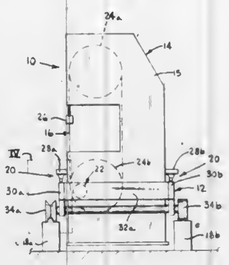
VERTICAL CUTOFF SAW WITH FEED RATE CONTROL

Donald J. Vanden Brink, Wyoming, Mich., assignor to Tannewitz, Inc., Grand Rapids, Mich.

Filed Jul. 25, 1985, Ser. No. 758,816

Int. Cl.[4] B23D *53/04;* **B27B** *13/00*

U.S. Cl. 83—74 **13 Claims**



1. A saw comprising:

a carriage;

motive means for driving at least one of said carriage and a material to be cut relative one another at a variable speed along a horizontal path;

a frame supported by said carriage and horizontally reciprocable with respect to said carrige generally parallel to the path;

saw means supported by said frame for cutting a material as said carriage and the material are driven relative one another;

sensor means for sensing the horizontal force between said carriage and said frame as said saw means cuts the material; and

control means responsive to said sensor means for controlling said motive means to vary the drive speed to attempt to effect a desired load on said saw means.

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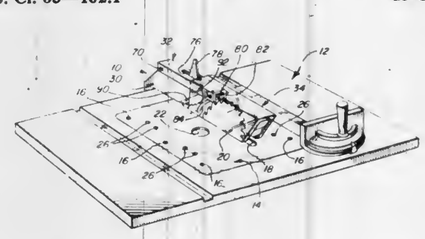
SPLITTER AND BLADE GUARD ASSEMBLY

Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jun. 10, 1985, Ser. No. 741,746

Int. Cl.[4] B27B *5/06*

U.S. Cl. 83—102.1 **13 Claims**



1. In a splitter and blade guard assembly for use with a table top for supporting a portable power circular saw, said assembly having (1) a mounting plate for mounting said saw on said table top and having a first slot for receiving the circular saw blade of said saw; (2) a splitter for entering into the workpiece kerf as the workpiece is fed past said splitter; (3) splitter mounting means for mounting said splitter to said table top in alignment with said mounting plate first slot; (4) an extension bracket pivotally mounted to said splitter; and (5) a guard hood pivotally mounted to said extension bracket to accommodate pivoting movement relative to said extension bracket and

having a distal end portion extending over said mounting plate first slot; the improvement comprising:

(A) said splitter including an upwardly projecting guide member; and

(B) said extension bracket defining a guide slot for receiving said guide member to prevent lateral movement of said extension bracket as said extension bracket pivots upwardly while permitting said guard hood to pivot relative to said extension bracket for accommodating the workpiece.

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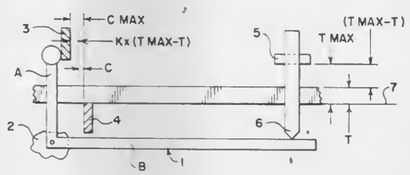
AUTOMATIC KNIFE ALIGNMENT FOR SHEAR

John Buta, Salem, Ohio, assignor to John R. Buta, Salem, Ohio

Filed Dec. 6, 1982, Ser. No. 447,296

Int. Cl.[3] B26D *7/26*

U.S. Cl. 83—368 **7 Claims**



1. In a metal shear device having a pair of vertically opposed knives, means for automatically adjusting the horizontal clearance between said knives comprising: a bellcrank pivotally mounted on said shear device having a substantially horizontal arm and a substantially vertical arm, the ratio of the length of said vertical arm to the length of said horizontal arm being a predetermined constant, means to arcuately pivot said horizontal arm downward a vertical distance equal to the maximum thickness of metal shearable by said shear device minus the thickness of metal to be sheared and said vertical arm horizontally against one of said pair of vertically opposed knives a distance equal to the said vertical shift of said horizontal arm times said predetermined constant, whereby the clearance between said pair of knives is properly adjusted for the thickness of the metal to be sheared.

4,625,606

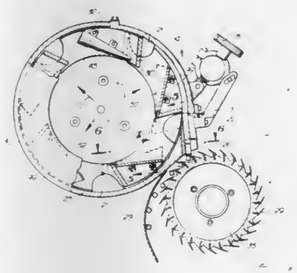
ROTARY CUTTING APPARATUS

Richard K. Pinegar, and Ronald B. Bates, both of Caldwell, Id., assignors to J. R. Simplot Company, Boise, Id.

Filed May 28, 1985, Ser. No. 738,453

Int. Cl.[4] B26D *3/24*

U.S. Cl. 83—403 **23 Claims**



1. A rotary cutting apparatus for cutting a product such as vegetables or the like, comprising:

a generally cylindrical housing having an axially extending slot formed therein;

a slicing knife mounted on said housing in a position lining one side of said slot;

a generally cylindrical impeller mounted for rotational movement within said housing, said impeller including a generally annular face ring separated axially from a generally circular backplate by a plurality of axially extending impeller blades extending therebetween in circumferentially spaced relation about the peripheries thereof; and

a generally annular divider ring mounted on said impeller blades in a position axially between said face ring and said backplate, said divider ring cooperating with said face ring and said backplate for respectively defining first and second annular chambers for radially outward passage of the product upon rotation of said impeller into cutting relation with said slicing knife, each of said chambers being subdivided by said impeller blades into arcuate segments.

4,625,607

FOOD SLICER

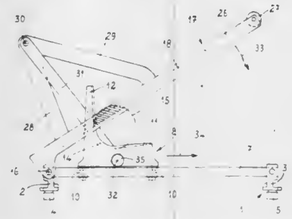
Paul Maillez, 301 cours Emile Zola, Villeurbanne (Rhone), France

Filed Sep. 26, 1985, Ser. No. 780,658

Claims priority, application France, Jan. 17, 1985, 85 01148

Int. Cl.[4] B26D *3/00*

U.S. Cl. 83—466.1 **7 Claims**



1. A machine for slicing a piece of a foodstuff, the apparatus comprising:

a base having front and rear ends and provided with at least one guide extending longitudinally therebetween;

a carriage longitudinally displaceable along the guide on the base and formed with a seat adapted to receive the foodstuff piece and with a plurality of longitudinally extending and upwardly open slots at the seat;

a blade frame pivotal about a horizontal transverse axis at the rear end of the base and provided with a plurality of blades extending radially of the axis, the frame being pivotal between an upper position with the blades extending upward clear of the carriage from the axis and a lower position with the blades extending horizontally longitudinally and received in the slots; and

means including at least one link between the carriage and the blade frame for displacing the carriage longitudinally from the rear base end to the front base end on displacement of the blade frame from the upper to the lower position and vice versa.

4,625,608

MICROTOMES

Werner Behme, Walldorf, and Manfred Berleth, Eppelheim, both of Fed. Rep. of Germany, assignors to Parke, Davis & Company, Morris Plains, N.J.

Filed Jan. 30, 1985, Ser. No. 696,363

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404097

Int. Cl.[4] G01N *1/06*

U.S. Cl. 83—713 **6 Claims**

1. A microtome comprising

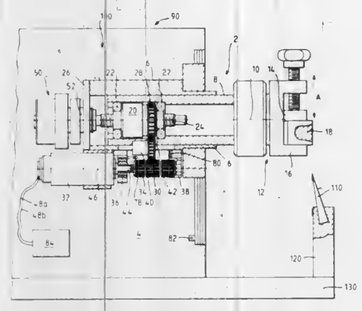
a base

a knife mounted on said base

a guide means mounted for vertical motion on said base

an elongated sleeve slidably mounted in said guide means, said sleeve being adapted to move along an axis extending horizontally and perpendicular to said knife, a specimen holder positioned at one end of said sleeve facing said knife, a bore extending into the distal end of said sleeve,

a threaded spindle rotatably mounted on said guide means, one end of said spindle extending into said bore,



first drive means for rotating said spindle,

a nut adapted to threadably engage said spindle, said nut being rotatably mounted on said sleeve, and

second drive means for rotating said nut, whereby, rapid feed or withdrawal of said sleeve is provided by rotation of the nut and fine feed of said sleeve is provided by rotation of said spindle.

4,625,609

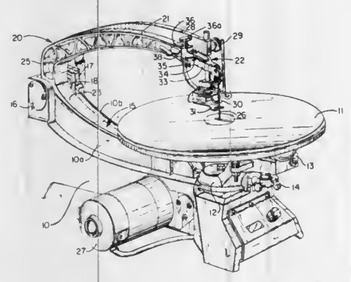
COUNTERBALANCING MECHANISM FOR SCROLL SAW

Steven W. Ashworth, Blawknox, Pa., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jul. 19, 1985, Ser. No. 757,027

Int. Cl.[4] B27B *19/06*

U.S. Cl. 83—743 **4 Claims**



1. A scroll saw, comprising:

(a) a base having a table and a horizontal pivot shaft spaced therefrom;

(b) a yoke having upper and lower arms and a curved bight connecting said arms, said arms terminating in upper and lower ends having a saw blade connected therebetween and extending through said table, said yoke having a center of percussion disposed at a predetermined point on said lower arm;

(c) mounting means for mounting said yoke on said pivot shaft at said curved bight; and

(d) reciprocating means for reciprocating said yoke about the axis of said pivot shaft to effect movement of said saw blade, said reciprocating means including a first shaft mounted for rotation about an axis, means for rotating said first shaft about said axis, a connecting rod having a first end and a second end, eccentric coupling means for eccentrically connecting said first end to said first shaft for said second end to reciprocate as said first shaft rotates, means for connecting said second end to said predetermined point, a first counterbalance on said first shaft having a center of mass offset radially from the axis of said first shaft in a direction directly opposite said shaft from said eccentric coupling means with said connecting rod, a second shaft rotatably mounted on said base extending parallel to said first shaft, intermeshing gears on said first and second shafts whereby rotation of said first shaft in one direction causes rotation of said second shaft in the opposite direction, and a second counterbalance on said second shaft having a center of mass offset radially from an axis of said second shaft in a direction to enhance the inertial effects of said counterbalances in a vertical direction and to cancel the inertial effects of said counterbalances in a horizontal direction.

4,625,610

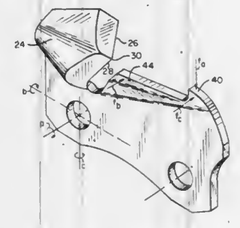
CUTTING CHAIN HAVING AUTOMATIC SHARPENING

Michael V. Petrovich, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Nov. 4, 1985, Ser. No. 794,706

Int. Cl.[4] B27B *33/14*

U.S. Cl. 83—834 **4 Claims**



1. A saw chain cutting link comprising; a body portion having top, bottom, front and back edges, a cutting head extending upwardly from the top edge rearward of a center line bisecting the body portion front to back, and a depth gauge extending upwardly from the top edge position forwardly of the cutting head;

said cutting head formed into a hooded cutting head having a side plate extending upwardly from the body portion along one side of the body portion and a top plate extended from the side plate over the body portion, a top plate cutting edge forming the leading edge of said top plate, and a side plate cutting edge forming the leading edge of said side plate, and a cutting point formed by the intersection of the top plate cutting edge and the side plate cutting edge, said cutting point being the outer most point of said hooded cutting head both upwardly and laterally of said one side, and said cutting point being the forward most point of said top and side plate cutting edges;

primary and secondary elements forming said depth gauge, said primary element projected upwardly from the top edge of the body portion to an upper most position forwardly of the center line a distance greater than the distance of the cutting point of said cutting head is rearward of said center line, said upward extension of the primary element terminating at an upper position just short of the upper position of the cutting point to provide thereby a depth gauge setting for the top plate cutting edge that is maintainable by an automatic sharpening function, and said secondary element projected upwardly from the top edge of the body portion and laterally from said one side to terminate at a position substantially adjacent the side plate cutting edge in a direction front to back, and just laterally short of the cutting point to provide thereby a depth gauge setting for the side plate cutting edge, said

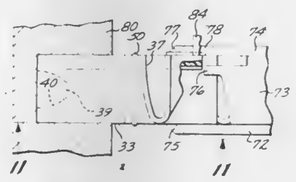
secondary element being recessed below the cutting point and upper extension of the primary element to avoid interference of the automatic sharpening function.

4,625,611

METHOD AND APPARATUS FOR REMOVING THE OUTERMOST LAYER OF A MULTILAYERED PRODUCT

Jack Bauman, Pacific Palisades, Calif., assignor to General Medical Products, Inc., Santa Monica, Calif.

Filed Apr. 10, 1985, Ser. No. 721,561
Int. Cl.⁴ B26D *3/00*
U.S. Cl. 83—861 **12 Claims**



1. A method of removing a plurality of strips from the outer layer of a multilayered product which has a substrate with at least one property substantially different than the same property of the outer layer, comprising:

a. holding the multilayered product in a first position with respect to an operative head having a plurality of surface removing means;

b. moving the operating head into engagement with the multilayered product in the first position to remove a plurality of strips of the outer layer of the multilayered product and thereby to expose strips of substrate having at least one property which is substantially different than the same property of the outer layer thereof;

c. disengaging the operative head from the multilayered product;

d. holding the multilayered product in a second position with respect to an operative head having a plurality of surface removing means; and

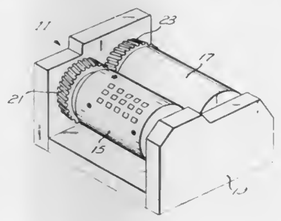
e. moving the operative head into engagement with the multilayered product in the second position to remove additional strips of the outer layer from the multilayered product to expose additional strips of said substrate.

4,625,612

ROTARY PORTAPUNCH ASSEMBLY

Robert J. L. Oliver, Huntington Beach, Calif., assignor to Riccobin & Martin, Santa Fe Springs, Calif.

Filed Sep. 23, 1985, Ser. No. 779,070
Int. Cl.⁴ A21C *11/00*; **B26D** *3/08*
U.S. Cl. 83—863 **14 Claims**



1. A rotary portapunch assembly for forming incomplete punches in tabulation cards comprising:

a housing;

an anvil roller rotatably mounted within said housing, said anvil roller comprising an annular outer surface portion;

a die roller rotatably mounted within said housing, said die roller comprising an annular outer surface portion and a cutting die, said cutting die being formed on said die roller annular outer surface portion and extending outwardly therebeyond, said cutting die comprising a plurality of substantially identical cutting die elements, said elements including cutting edge portions and relief portions, said cutting edge portions extending from said die roller annular outer surface portion a distance substantially equal to the distance between said die roller annular outer surface portion and said anvil roller annular outer surface portion, said relief portions extending from said die roller annular outer surface portion a distance less than the distance between said die roller annular outer surface portion and said anvil roller annular outer surface portion;

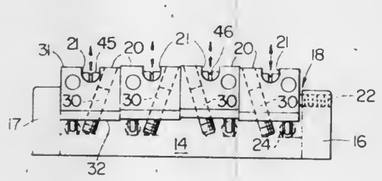
said die roller and said anvil roller cooperating to crease and substantially cut a pattern of substantially identical punches on tabulation cards passing therebetween, said punches being readily removable from said card upon the application of pressure to said punches.

4,625,613

ADJUSTABLE BRIDGE AND TUNING UNIT FOR A STRINGED MUSICAL INSTRUMENT

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,671
Int. Cl.⁴ G10D *3/04*
U.S. Cl. 84—298 **10 Claims**



1. An adjustable bridge and tuning unit for a stringed musical instrument, the instrument including a body, a neck portion extending from the body, a plurality of strings extending over a part of said body and said neck portion, and means for securing said strings at one end to said neck portion, the bridge and tuning unit comprising:

a base member fixedly mounted to said body, the base member including a pair of sidewalls defining a channel therebetween;

a plurality of individual bridge saddles, one of said bridge saddles corresponding to and aligned for supporting each of said strings, each saddle having a string supporting portion including a groove on one surface thereof for alignment with said string, said string passing entirely over said saddle;

said bridge saddles being positioned in abutting relation within said channel, one of said saddles being in frictional contact with one of said sidewalls;

first and second angled means for individual bidirectional adjustment of each said bridge saddle with respect to said corresponding string while said string is in place under tension on said instrument, said first angled means for individually adjusting the position of each said bridge saddle longitudinally in the direction of said string, and said second angled means including only a single screw for adjusting the position of each said bridge saddle generally vertically with respect to said base member, said screw having a top offset from the string supporting portion of said saddle for access to said screw and a bottom located substantially centrally of the width of said bridge saddle; and

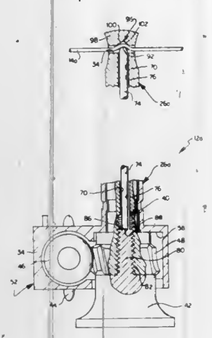
tuning means mounted on said base member for securing the other end of said string and for increasing or decreasing the tension in each said string.

4,625,614

TUNING DEVICE

Robert J. Spercel, 3214 E. 139th St., Cleveland, Ohio 44111

Filed Jul. 29, 1985, Ser. No. 759,951
Int. Cl.⁴ G10D *3/14*
U.S. Cl. 84—306 **2 Claims**



1. A device for tuning a string of a musical instrument, said device comprising a housing, a string post having a first end portion projecting from said housing and a second end portion disposed in said housing, a pinion connected to said second end portion of said string post and disposed in said housing, a worm disposed in said housing in meshing engagement with said pinion, first manually rotatable knob means connected with said worm and disposed at least partially outside of said housing for rotating said worm to thereby impart rotary motion to said pinion and string post, said string post including first surface means for defining a string passage which extends through the first end portion of said string post in a direction transverse to a central axis of the string post to receive a portion of the string, said string post including second surface means for defining a second passage which extends axially through said string post and pinion from an intersection with said first passage to an opening in the second end portion of said string post, said second passage including an internally threaded portion circumscribed by said pinion, a clamp pin disposed in said second passage and having a cylindrical outer side surface disposed in engagement with said second surface means, said clamp pin having a first end surface means for engaging the string at the intersection of said string passage and second passage and a second end surface means disposed in said second passage adjacent to said pinion, externally threaded means disposed in threaded engagement with said internally threaded portion of said second passage, said externally threaded means being disposed in abutting engagement with said second end surface means on said clamp pin, and second manually rotatable knob means connected with said externally threaded means and disposed at least partially outside of said housing for rotating said externally threaded means relative to said string post to clamp the string against said first surface means at the intersection of said string passage and said second passage under the influence of forces transmitted from said externally threaded means through said clamp pin to the string.

4,625,615

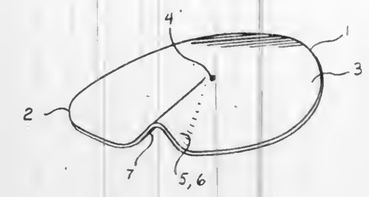
PICK FOR STRINGED INSTRUMENTS

Donald W. Lukehart, 8036 3rd St., Downey, Calif. 90241

Filed Sep. 3, 1985, Ser. No. 772,053
Int. Cl.⁴ G10D *3/12*
U.S. Cl. 84—322 **4 Claims**

1. A pick for a stringed musical instrument, said pick having a generally planar body consisting of a rigid, unitary material, being substantially tear-drop shaped having a top edge, two side edges, and a picking tip, the improvement comprising:

a single raised portion on one surface of said body and a complementary depression of the opposite surface, said raised portion and complementary depression originating



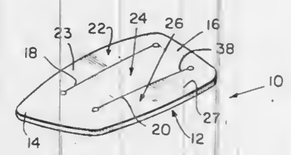
from the approximate central area of said body and extending outwardly to one side edge of said body intermediate said picking tip and said top edge.

4,625,616

THUMB PICK

Richard E. McVicker, 802 Northbend Rd., Beech Grove, Ind. 46107

Filed Aug. 26, 1985, Ser. No. 769,021
Int. Cl.⁴ G10D *3/16*
U.S. Cl. 84—322 **9 Claims**



1. A pick for stringed instruments, the pick comprising:

a string-engaging portion, and

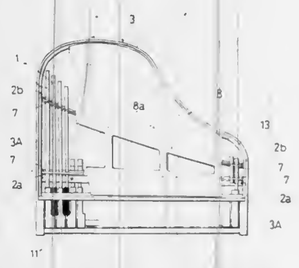
an integral main body portion including strap means for selectively defining a thumb-receiving passageway, the strap means being movable between a substantially flat dormant position and a bowed thumb-receiving position, said strap means including a top portion and at least three straps interconnecting the top portion and the string-engaging portion.

4,625,617

SUPPORT APPARATUS FOR SOUND MEMBERS OF MUSICAL INSTRUMENT

Kenichiro Hara, Hamamatsu, and Shizuo Nakamura, Kakegawa, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

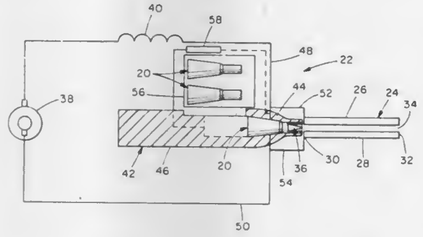
Filed Jul. 12, 1985, Ser. No. 754,625
Int. Cl.⁴ G10D *13/08*
U.S. Cl. 84—404 **3 Claims**



1. A supporting apparatus for the sound members of a musi-

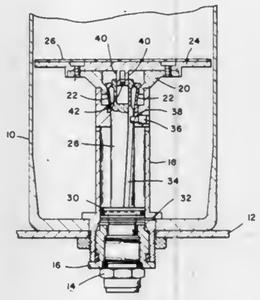
cal instrument of the type having a plurality of sound members and a corresponding plurality of striking members, each of said sound members being supported at two points corresponding to the respective fundamental vibration nodes of a two-free-end type vibration of said sound member such that the ends of said sound member are free to vibrate, and being arranged to vibrate in response to the impact of a corresponding one of said striking members for generating a musical sound of a predetermined frequency, said sound members being disposed side by side at predetermined intervals, wherein said support apparatus comprises first and second elongated elastic seat members, first and second supporting members, and first and second elongated elastic holding members, each of said sound members being mounted, at said two points of support, on said first and second seat members which are in turn respectively supported by said first and second supporting members, and said first and second holding members being arranged to oppose and overlie said first and second seat members respectively, each of said first and second seat members being attached to and below each of said sound members and each of said first and second holding members being attached to and above each of said sound members by means of an adhesive agent.

4,625,618
ELECTROMAGNETIC RAIL GUN SYSTEM AND CARTRIDGE THEREFOR
John J. Howanick, Fort Walton Beach, Fla., assignor to GA Technologies Inc., San Diego, Calif.
Filed Jan. 11, 1984, Ser. No. 569,795
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **18 Claims**



1. An electromagnetic rail gun system comprising:
an electromagnetic rail gun having a breech end and a muzzle end and a pair of substantially parallel rails partly defining a bore for receiving a projectile;
a power supply for providing substantially constant voltage direct current;
a cartridge including a releasably held projectile having a nose and a trailing end carrying an armature, said cartridge further including a casing comprising a pair of electrically conductive casing segments spaced from one another by insulating means;
breech means for holding said cartridge with said projectile aligned with said bore; and
interconnection means from said power supply connecting the breech end of said rails in parallel with the casing segments of said cartridge held in said breech means,
said cartridge further comprising shunt means interconnecting said casing segments for carrying current therebetween, said armature being in electrically conductive relationship with said casing segments, and said shunt means being changeable from a closed current carrying condition to an open condition in which current cannot pass through said shunt means,
whereby opening of said shunt means results in increased flow of current through said armature which current interacts with the magnetic field generated by current flowing through said casing segments to provide a force to move said projectile into said rail gun bore.

4,625,619
DEVICE FOR SEPARATION AND LAUNCH OF A BODY WITH LINEAR AND ROTATIONAL VELOCITY
Rogelio R. Ceniza, Milpitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 2, 1984, Ser. No. 627,330
Int. Cl.[4] F41F *5/02*
U.S. Cl. 89—1.57 **5 Claims**

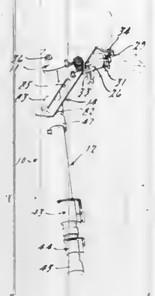


1. An apparatus for releasably holding and remotely launching an object with specific motion characteristics comprising:
(a) a generally cylindrical launch tube having a central bore in its base;
(b) means for generating a high pressure gas;
(c) means for forming an expansion chamber for said gas, said forming means located primarily in said tube;
(d) means for connecting said tube, said generating means and said forming means approximate said bore in said base;
(e) means for holding releasably said object to be launched, said holding means operably connecting said forming means and said object;
(f) means for receiving releasably said linear and rotational velocity transferred by said imparting means; and
(g) means for imparting predetermined linear and rotational velocity to an object, said imparting means positioned for linear and rotational movement within said forming means, said imparting means including a piston forming the base of said expansion chamber in said forming means, said piston slidably movable within said forming means; a generally cylindrical ram having a diameter less than said piston and said forming means and having its base joined to said piston, said ram also having a segment of its upper portion tapering to a neck portion, said neck portion having a bore coaxial with the longitudinal axis of said ram; a helical groove in the outer surface of said ram extending from the base of said neck portion to said piston; a cam pin extending from the interior of said forming means to slidably engage said groove, the tip of said cam pin encircled by a roller bearing to minimize friction; and a torque pin extending across said bore in said neck portion of said ram for releasable engagement of said receiving means upon actuation of said generating means.

4,625,620
BIPOD FOR A FIREARM
Gerald Harris, Harris Engineering, Barlow, Ky. 42024
Filed May 7, 1985, Ser. No. 732,174
Int. Cl.[4] F41C *29/00*
U.S. Cl. 89—37.04 **9 Claims**

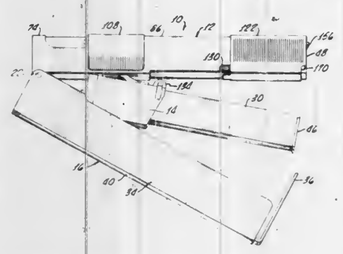
1. A bipod having a supporting base and a pair of legs pivotally attached thereto, means for attaching said base to a firearm and a pair of strut assemblies, each for selectively bracing one leg in a support position and a folded position with respect to said base, each said strut having a strut with an L-shaped slot

therein and said strut assembly being pivotally connected to an associated leg by a fastening element extending through said



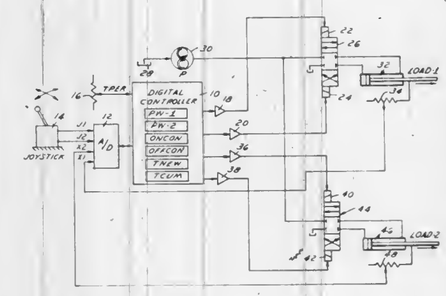
L-shaped slot, and each said strut assembly including means for biasing said strut assembly towards a folded position.

4,625,621
COMPACT FOLDABLE GUN
Francis J. Warin, Oak Harbor, Ohio, assignor to ARES, Inc., Port Clinton, Ohio
Filed Apr. 2, 1984, Ser. No. 596,048
Int. Cl.[4] F41C *9/02*
U.S. Cl. 89—197 **10 Claims**



1. A compact foldable gun comprising:
a receiver assembly;
magazine housing means pivotally mounted to the receiver assembly on an underside thereof for supporting a magazine with the receiver assembly for feeding ammunition into the receiver assembly when the foldable gun is unfolded to an open and operative configuration for firing the ammunition, and for supporting the magazine in a position generally parallel to and adjacent a receiver assembly under side when the foldable gun is in a folded configuration for storage and carrying;
stock means pivotally mounted to the receiver assembly for providing a shoulder support for the receiver assembly when the stock means is in an unfolded position and the foldable gun is in an operative configuration for firing ammunition, said stock means being further operative for containing the magazine housing and magazine when the foldable fun is in a folded configuration with the stock means pivoted to a position generally parallel with the receiver assembly and adjacent the receiver assembly underside;
said receiver assembly including pivotally mounted trigger means, a bolt and a sear, said sear and pivotally mounted trigger means being disposed in an operative relationship for locking and unlocking the bolt, said pivotally mounted trigger means being further operative for rotating inwardly toward the receiver assembly during folding of the foldable gun; and,
said receiver assembly including a barrel disposed within the bolt and the bolt, upon recoil, slides along an outside of the barrel with a rear portion of the bolt extending into the stock means upon recoil.

4,625,622
POWER TRANSMISSION
Rajamouli Gunda, Rochester, and Melvin A. Rode, West Bloomfield, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.
Filed Aug. 15, 1985, Ser. No. 765,796
Int. Cl.[4] F15B *21/02*
U.S. Cl. 91—36 **3 Claims**

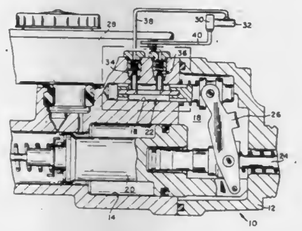


1. A fluid servo system comprising first and second solenoid valve actuators for variably actuating respective first and second loads, first and second sensing means respectively coupled to said actuators and loads to provide corresponding first and second sensor signals respectively indicative of actuation at said actuators and loads, means for receiving first and second input command signals, and digital control means for providing first and second pulse-width modulated signals to said first and second solenoid valve actuators as respective functions of differences between said first and second sensor signals and the corresponding said first and second command signals, said digital control means comprising
means for determining a continuously repeating modulation time period TPER common to both of said actuators,
first and second register means for respectively storing modulation time durations PW1 and PW2 equal to or less than said modulation period TPER for said first and second actuators respectively,
means for selectively energizing said first and second solenoid actuators at the onset of each said time period TPER,
means for determining the lesser of said time durations PW1 and PW2,
means for selectively de-energizing one of said solenoid actuators associated with the lesser of said time durations PW1 and PW2 following termination of said lesser duration,
means for determining a difference between said time durations PW1 and PW2, and
means for selectively de-energizing the other of said solenoid actuators following termination of said difference between said durations.

4,625,623
BRAKE BOOSTER
Larry G. Lohraff, Berrien Springs, Mich., assignor to Allied Corporation, Morristown, N.J.
Filed Jun. 29, 1984, Ser. No. 626,257
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—368 **4 Claims**

1. A brake booster comprising a housing, a pair of spaced-apart, substantially parallel bores defined within said housing, a piston slidably mounted in one of said bores and cooperating with the housing to define a pressure chamber between the end of the piston and the housing, said pressure chamber communicating with said other bore, said other bore having a circumfer-

entially extending wall, an inlet and an outlet extending generally radially through the circumferentially extending wall of said bore, a valve assembly slidably mounted in said other bore, said valve assembly including a plate-like member and a pair of bearings mounted on said plate-like member to support the latter in said other bore, and a pair of cylinders slidably mounted in said inlet and outlet respectively for movement generally radially with respect to the axis of said other bore, each of said cylinders defining a passage therethrough to communicate fluid between the inlet and outlet and the bore, and a recess in said plate-like member defined within a solid portion of the latter, said valve assembly being slidably mounted in said other bore and movable from a first position in which the solid



portion of the plate-like member is in registry with the cylinder in the inlet and the recess is in registry with the cylinder in the outlet to thereby vent the pressure chamber, said valve assembly being movable to a second position in which the solid portion of the plate-like member is in registry with the cylinder in the outlet and the recess is in registry with the cylinder in the inlet to thereby communicate fluid pressure from the inlet to the pressure chamber through said recess and said other bore, and resilient means yieldably maintaining each of said cylinders in sliding engagement with said plate-like member, said plate-like member including a pair of bearings slidably engaging said housing and said cylinder forms an interference with said pair of bearings to limit the movement of said plate-like member relative to said housing.

4,625,624

POWER ASSISTED STEERING SYSTEM AND A STEERING ASSEMBLY FOR SUCH A SYSTEM

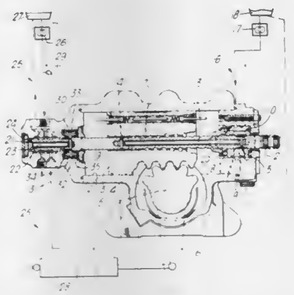
Frederick J. Adams, Clevedon, United Kingdom, assignor to TRW Cam Gears Limited, Hertfordshire, United Kingdom

Filed Nov. 30, 1984, Ser. No. 677,063

Claims priority, application United Kingdom, Dec. 9, 1983, 8332934

Int. Cl.⁴ F15B *13/06*

U.S. Cl. 91—375 A **14 Claims**



1. A power assisted steering system comprising:

a steering assembly for providing a steering output in response to a steering input torque;

servomotor means for providing power assistance to the steering output;

a first hydraulic system portion comprising a rotary valve for applying fluid pressure to the servomotor means in response to the steering input torque;

a second hydraulic system portion independent of the first hydraulic system portion and comprising an axially responsive valve for also applying fluid pressure to the servomotor means; and

means for coupling the axially responsive valve to the rotary valve, said coupling means comprising axially extending shaft means and spring means for biasing said shaft means to a neutral condition, said shaft means being axially displaceable against the bias of said spring means in response to a reaction imparted to said shaft means as a result of the steering input torque to actuate said axially responsive valve.

4,625,625

VEHICLE HYDRAULIC SYSTEMS

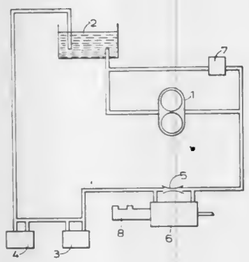
Desmond H. J. Reynolds, West Midlands, England, assignor to Lucas Industries Public Limited Company, England

Filed Apr. 23, 1984, Ser. No. 603,123

Claims priority, application United Kingdom, Apr. 30, 1983, 8311933

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—378 **6 Claims**



1. An open centre vehicle hydraulic system including vehicle services, a pump for circulating hydraulic fluid continuously to operate said vehicle services, a fixed restriction through which fluid is passed to generate a pressure differential, and a closed centre booster operated by said pressure differential generated by said fixed restriction, said booster comprising a housing having an inlet connected to the higher pressure side of said fixed restriction, an outlet connected to the lower pressure side of said fixed restriction and a bore in which a boost piston works, means defining a boost chamber in said bore behind said boost piston, and a control valve means controlling pressurisation of said boost chamber in response to an input load, said control valve means controlling communication between said boost chamber and said inlet, and between said boost chamber and said outlet, and having three operating positions, a first position in which said boost chamber is connected to said outlet and cut off from said inlet, a second position in which said boost chamber is connected to said inlet and cut off from said outlet, and a third position in which said boost chamber is isolated from said inlet and said outlet; and when said booster is inoperative said control valve means is in said first position so that there is no fluid flow to said booster, and on initial operation of said booster said control valve means moves to said second position so that fluid flow from the inlet pressurises said boost chamber to advance said boost piston in said bore.

4,625,626

CONTROL/FIRE DAMPER FOR DUCTS INVENTILATION INSTALLATIONS

Arvo Aalto; Erkki Aalto; Juhani Häsä; Markku Penttilä, all of Kausala; Harri Saukkonen, Kouvola, and Arvi Tolmunen, Kausala, all of Finland, assignors to Halton Oy, Finland

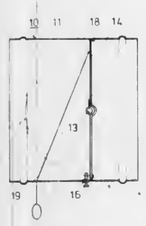
PCT No. PCT/FI83/00070, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/01907, PCT Pub. Date May 24, 1984

PCT Filed Nov. 11, 1983, Ser. No. 629,832

Claims priority, application Finland, Nov. 12, 1982, 823900

Int. Cl.⁴ F24F *11/00*

U.S. Cl. 98—1 **9 Claims**



1. A control/fire damper for a duct in a ventilation installation, said duct comprising a shell defining an outer envelope and having an interior constituting a flow duct, comprising:

a closing member mounted within said flow duct for movement between a first closed position wherein flow through said duct from an upstream side of said closing member to a downstream side thereof is prevented, and a second open position wherein said flow is permitted;

a clamping counterpart fixed to said closing member within said flow duct for movement therewith, said clamping counterpart comprising a member positioned so that said member remains in entirely within the envelope defined by said flow duct shell both upstream and downstream of said closing member when said closing member is in said first closed position, said second open position and in positions intermediate of said first and second positions; and

selectively actuatable clamping means for frictionally engaging said clamping counterpart upon actuation for fixing said clamping counterpart and closing member fixed thereto in a desired position, said clamping means passing through said shell of said flow duct, said clamping means including means for actuating the same which are operable from outside of said shell.

4,625,627

VENTILATED CABINET FOR CONTAINING GAS SUPPLY VESSELS

Vassilios J. Livanos, Fort Lee, and Eugene Y. Ngai, White House Station, both of N.J., assignors to Matheson Gas Products, Inc., Secaucus, N.J.

Filed May 20, 1985, Ser. No. 735,977

Int. Cl.⁴ F24F *3/16*

U.S. Cl. 98—32 **10 Claims**

1. A cabinet for enclosing a gas vessel and the associated gas flow regulating equipment during its use in an industrial gas dispensing system, said cabinet being adapted to be mounted on a support base and connected to ventilation means causing air to flow through the cabinet and around the gas vessel to carry away any gas leaking from the vessel and the regulating equipment in the cabinet,

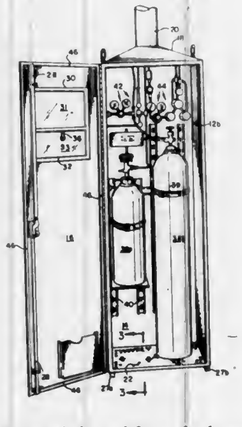
said cabinet having upright wall means forming an elongated upright housing for receiving the vessel and the associated equipment, a perforated floor member providing a relatively unobstructed inlet for air at the bottom of said cabinet and a tapered roof at the top of said cabinet,

said floor member extending across the full depth and width of the housing and being mounted above said support base to permit a free uniform airflow across the full depth and width of the cabinet bottom so that a uniform airflow is provided for sweeping the interior of said cabinet,

said tapered roof providing a gradually reduced cross-sectional flow area terminating in a conduit for exhausting air and any entrained gases from said housing by the ventilating means,

said upright wall means providing a flow passage of substantially uniform cross-sectional area from said floor plate to the roof,

said wall means including an access door extending substantially from the floor to the roof to allow placement and



removal of gas vessels in and from the housing, an observation port for viewing the associated equipment, and an access port to permit manual operation of said associated equipment,

said observation port having a transparent cover preventing the escape of air and any gas from the housing therethrough, and

said access port having a displaceable panel sealingly engaging the access port, said access port being dimensioned and positioned in the wall means to prevent egress of entrained gases through the port when said displaceable panel is displaced and the ventilation means is operating.

4,625,628

COMBINED WALL AND VENTILATOR MODULE FOR A BUILDING

Akio Ikemura, Kurobe, and Minoru Kajiki, Toyama, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 716,550, Mar. 27, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 842,061

Int. Cl.⁴ F24F *13/00*

U.S. Cl. 98—32 **1 Claim**

1. A combined wall and ventilation module for a building, comprising:

(a) a wall unit including a thermally insulated open rectangular window frame having a thermally insulated frame member, and further including a thermally insulated wall element mounted in said window frame on the exterior side thereof, said frame member including a pair of interconnected interior and exterior frame pieces made of extruded metallic sections, and thermally insulative connectors interposed between said interior and exterior frame pieces;

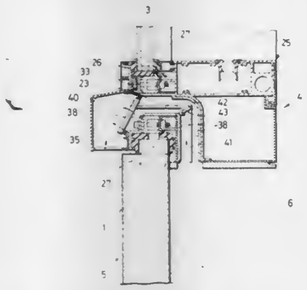
(b) a ventilator supported by said window frame on the interior side thereof and having a heat-exhcanging element disposed therein for effecting a heat exchange between fresh atmospheric air and consumed room air, an inlet port for the passage of the fresh atmospheric air, and

a discharge port for the passage of the consumed room air; and

(c) said frame member having within it

(1) at least one thermally insulated internal intake passage communicating at its one end with said inlet port and at the opposite end with the outside atmosphere for introducing therethrough the fresh atmospheric air into said ventilator, said intake passages being covered with a layer of thermally insulative material extending over the inner peripheral surface thereof,

(2) at least one thermally insulated internal discharge passage communicating at its one end with said discharge port and at the other end with the outside atmosphere for discharging therethrough the consumed room air into the outside atmosphere, said discharge passages being covered with a layer of thermally insulative material extending over the inner peripheral surface thereof;



(3) each of said thermally insulated intake and discharge passages being defined by at least a portion of said interior piece of extruded metal section; and

(d) a damper movably disposed in each of said intake and discharge passage for opening and closing said passage, said damper having one surface covered with a layer of thermally insulative material.

4,625,629

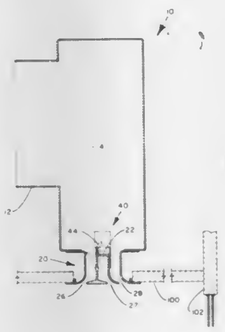
HEATING/COOLING DIFFUSER

David F. Bryans, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,416

Int. Cl.[4] F24F *13/06*

U.S. Cl. 98—40.17 **4 Claims**



1. A diffuser comprising:

first means defining a single horizontal discharge for discharging air in a fixed first direction;

second means defining a pair of horizontal discharges for discharging air in a fixed direction which is opposite from said first direction; and

valve means defining an integral value body for blocking either said single horizontal discharge or a predetermined one of said pair of horizontal discharges whereby two of said horizontal discharges are always opened.

4,625,630

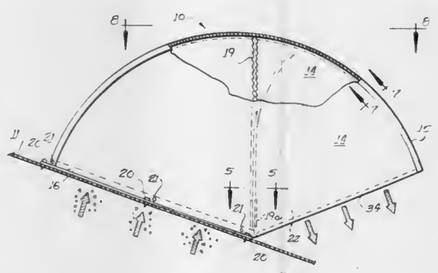
ROOF VENT AND METHOD OF MAKING SAME

Michael W. Carroll, Roselle, and Michael E. Harwood, Palatine, both of Ill., assignors to North American Agricultural, Inc., Schaumburg, Ill.

Filed Aug. 27, 1984, Ser. No. 645,039

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—42.22 **7 Claims**



1. A nestable vent for covering an opening in the roof of a grain storage bin, or the like, comprising, in combination, a housing with a pair of side members each having edges and a top member secured to the side members so as to be coextensive with the edges thereof and defining an interior with an air inlet and an air outlet;

a flange for locating and securing the housing over the roof opening, the flange including a baffle extending into the housing substantially across the width thereof between the housing side members; and

a flat sheet screen member located substantially inwardly from the housing inlet and outlets and sized to extend across the interior of the housing so as to prevent ingress or egress through the vent other than through the screen, the screen having a lower portion secured to the baffle and having upstanding side portions and a top portion substantially free from binding contact by the housing side or top members so that if the screen should become clogged, pressure inside the bin will cause the upper portion of the screen member to bend about the baffle, thus releasing the pressure, before the pressure can reach levels capable of causing structural damage to the bin.

4,625,631

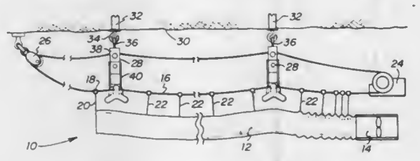
METHOD AND APPARATUS FOR EXTENDING VENTILATION DUCTWORK

Samuel I. Vera, Golden, Colo., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,966

Int. Cl.[4] E21F *17/02*

U.S. Cl. 98—50 **15 Claims**



1. An extendable ventilation ductwork system comprising:

an extendable ventilation ductwork adapted to connected at one end to a fresh air source;

a pulley fixed at the point of furthest desired extension of said extendable ductwork;

deployment means for paying out and taking in a cable fixed at the point of deployment of said extendable ductwork;

a cable extending between said pulley and said deployment means to thereby form a lower deployment line and an upper return line;

securing means for fixedly connecting the other end of said extendable ductwork to said lower line;

a clip means slidably mounted on said lower line between said securing means and said deployment means;

support means for connecting said clip means to a point on said extendable ductwork between said ends thereof whereby said support means will pull said clip means along said lower line when said deployment means is actuated to extend said ductwork to provide support for said ductwork from said lower line;

a hanger assembly affixed over said cable at a point between said pulley and said deployment means, said hanger assembly comprising:

a housing;

a swivel having a body and a plurality of stubs radially spaced around said body at equal angles to each other, each of said stubs extending outwardly from the body at an angle with respect to the centerline of said body;

pivot means for rotatably mounting said swivel on said housing, said pivot means passing through the centerline of said body whereby each stub is adapted to receive and support said lower line of said cable when said stub is in its uppermost position on said body until said stub is contacted by said clip means, said swivel being rotated by said clip means as it moves along said lower line to move the next of said stubs into said uppermost position to support said lower line while permitting said clip means to pass through said swivel.

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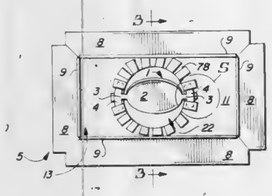
DAMPER AND REGISTER BOX

Robert Markman, Pampano Beach, Fla., and Larry N. Markman, Longview, Tex., assignors to Owl Flex, Inc., Kilgore, Tex.

Filed May 13, 1985, Ser. No. 733,068

Int. Cl.[4] F24F *13/00*

U.S. Cl. 98—102 **10 Claims**



1. In an air handling system having a conduit and a register box terminating the conduit for directing air flow, the improvement comprising a damper plate and a first tab connector projecting outwardly from a first segment of said damper plate, said first segment located on the periphery of said damper plate; a second tab connector projecting outwardly from a second segment of said damper plate, said second segment located on the periphery of said damper plate and substantially 180° disposed from said first segment and said first tab connector; a first mount tab terminating said first tab connector; and a second mount tab terminating said second tab connector said first mount tab and said second mount tab adapted for attachment to the register box, whereby said damper plate is adjustable in the conduit by bending said first tab connector and said second tab connector.

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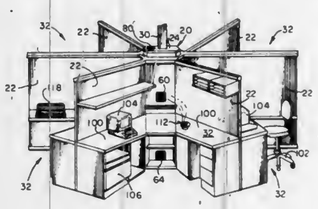
VENTILATED CORE UNIT FOR SERVICE CONNECTIONS

Michael G. Martin, Clinton, N.J., assignor to Center Core, Inc., South Plainfield, N.J.

Filed Aug. 20, 1985, Ser. No. 767,547

Int. Cl.[4] B05B *15/12*; F23J *11/00*

U.S. Cl. 98—115.3 **18 Claims**



1. An apparatus for ventilating and providing utility connections to a workspace, the workspace being defined between a floor and a ceiling and having at least one supply electrical terminal, the apparatus comprising:

a cabinet having walls at least partly enclosing the supply electrical terminal and partitions attached to the walls and subdividing the workspace into work areas, the cabinet and partitions extending only part way from the floor to the ceiling, a free space being defined above the cabinet and partitions for air flow in the workspace;

a work area fan mounted in a side wall of the cabinet, the work area fan being operable to draw air from

one of the separate work areas into a plenum defined by the walls of the cabinet;

an air filter mounted in one of the walls of the cabinet, the air filter cleaning air drawn in by the fan and discharging clean air back into the workspace at the free space above the cabinet, the air passing through the cabinet, free space and separate work areas in a circulating ventilation path; and,

at least one electrical outlet mounted in one of the walls of the cabinet, the outlet providing connection to the electrical terminal through the cabinet; whereby the apparatus filters air from the separate work areas and moderates local heat loads in the separate work areas, independent of direct connection to a building HVAC system.

4,625,634

GRILL BASKET

Burkhard Krüper, Menden, Fed. Rep. of Germany, assignor to Cramer GmbH & Co. KG, Menden, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,494

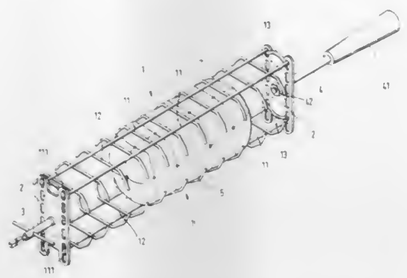
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524093

Int. Cl.[4] A47J *43/18*

U.S. Cl. 99—427 **3 Claims**

1. A grill basket, comprising two wire basket halves, said basket halves being mutually adjustable and each half being formed from a plurality of longitudinal rods having bent-over ends and transverse wires, said basket halves being interconnectable at their ends by connection members and each of said connection members being provided with a spindle to permit rotatable movement, in which said connection members are in the form of plates, each plate having two parallel rows of holes which are spaced from each other, said bent-over ends of said longitudinal rods of the wire basket halves being hookable in

said holes, and clamping members being provided which connect said longitudinal rods, said clamping members being in



engagement with an inner surface of the plates after the bent-over ends of the longitudinal rods have been hooked therein.

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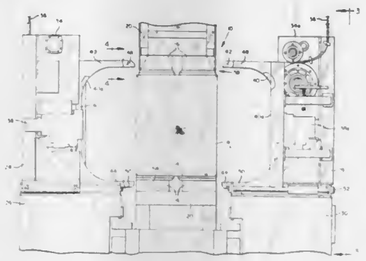
BANDING APPARATUS FOR PRESSES

Charles B. Lewis, 7451 SW. Coho Ct., Tualatin, Oreg. 97062

Filed Feb. 19, 1985, Ser. No. 702,928

Int. Cl.[4] B65B *13/14*

U.S. Cl. 100—26 **1 Claim**



1. A banding station comprising

a banding area for receiving articles to be bound,

a first carriage on one side of said banding area,

a second carriage on the other side of said banding area in lateral alignment with said first carriage,

banding drive means on at least one of said carriages arranged to drive banding lengthwise,

track means on said first carriage arranged to receive banding from said banding drive means and direct it partly around an article,

track means on said second carriage arranged to receive banding from the track means on said first carriage for directing a band around an article,

and drive means arranged to move at least one of said carriages toward and away from the other for disposition of the track means on the carriages from a retracted position to a closely adjacent position inside said banding area for direct advancement during a banding process of the end of the banding from one of said carriage track means into said other carriage track means,

and press means having upper and lower press platens in said banding area,

said press means having lateral openings for receiving said track means in their closely adjacent position.

4,625,636

VEHICLE COMPACTOR

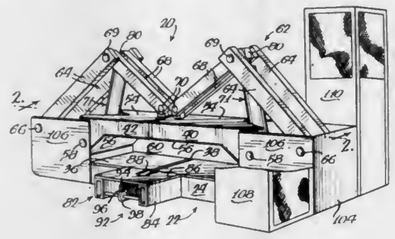
Richard E. Woods, and Marvin D. Bradburn, both of Markle, Ind., assignors to Car-Go, Corp., Muncie, Ind.

Continuation-in-part of Ser. No. 534,805, Sep. 22, 1983, Pat. No. 4,510,858, which is a division of Ser. No. 347,489, Feb. 10, 1982, Pat. No. 4,426,928. This application Mar. 27, 1985, Ser. No. 716,448

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] B30B *9/32*

U.S. Cl. 100—35 **15 Claims**



15. A method of compacting a vehicle having a length in a direction of movement of the vehicle during compaction comprising the steps of:

providing a compacting device with a frame having a bed with front and rear portions, a door movable toward and away from the bed and a winch mechanism entirely and integrally connected to said frame adjacent the front portion of said bed and having a line with a free end;

connecting the free end of said line to a front end of said vehicle;

actuating said winch to draw said line in a straight line and advance said vehicle from said rear portion toward said front portion of said bed; and

moving said door toward said bed to effect compaction of said vehicle;

whereby the entire vehicle can be drawn over said bed with said spaced from said front portion of said bed by a distance about equal to the length of said vehicle.

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ROLL ASSEMBLY FOR USE IN CALENDERS AND THE LIKE

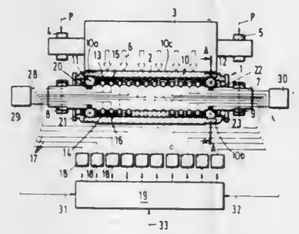
Josef Pav; Reinhard Wenzel; Rainer Schmidt, all of Krefeld; Peter Svenka, Grefrath, and Richard Rauf, Krefeld, all of Fed. Rep. of Germany, assignors to Kleimwefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,067

Claims priority, application Fed. Rep. of Germany, May 2, 1984, 3416210

Int. Cl.[4] B30B *15/26, 3/04*

U.S. Cl. 100—47 **25 Claims**



1. A roll assembly, particularly a calender, comprising a first roll rotatable about a first axis; a second roll rotatable about a second axis which is parallel to said first axis, said second roll comprising a flexible elongated cylindrical shell defining with the first roll an elongated nip and having an internal surface, an intermediate portion and first and second end portions, a rigid carrier surrounded by said shell, first and second bearings respectively interposed between said carrier and the first and second end portions of said shell, and signal generating first and second sensor means for monitoring the stresses which are applied to said first and second bearings in a plane including said axes and intersecting said nip, particularly when a web of material which is being treated by the roll assembly passes through said nip; and means for counteracting said stresses, includng at least one row of supporting elements installed in said shell between said first and second end portions and surrounded by the corresponding parts of said intermediate portion, at least one adjustable motor installed between each of said supporting elements and said carrier and arranged to urge the respective supporting element toward the internal surface of said shell to thereby select the force with which the corresponding part of said intermediate portion is urged toward the first roll, and control means responsive to the signals from said sensor means and operative to adjust said motors so as to minimize or eliminate the stresses to which said bearing means are subjected by the respective end portions of said shell.

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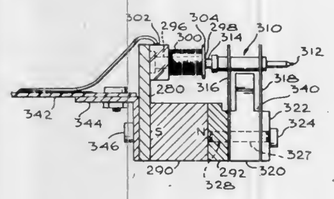
DOT MATRIX LINE PRINTER

William O. Fritz, 5409 Willowick Cir., Anaheim, Calif. 92807; John C. Chamberlain, 4112 Salacia Dr., Irvine, Calif. 92714, and Gary C. Chandler, 802 Quivera St., Laguna Beach, Calif. 92651

Division of Ser. No. 386,199, Jun. 7, 1982, Pat. No. 4,462,702. This application May 31, 1984, Ser. No. 616,536

Int. Cl.[4] B41J *3/12*

U.S. Cl. 101—93.04 **2 Claims**



1. A hammer bank for use in a dot matrix line printer comprising:

an elongate bar of magetic material;

a row of pole pins of magnetic material, said pole pins extending parallel to each other from one face of said bar;

an elongate permanent magnet extending along said face parallel to said row, said magnet being polarized in a direction parallel to the axes of said pins;

for each pole pin, an elongate hammer element of magnetic material, said hammer element being generally aligned with the respective pole pin;

for each hammer element, a resilient suspension including a parallel pair of leaf springs, each of which has a free end attached to a respective spaced point on said hammer element, said leaf springs being nominally parallel to said face of said bar thereby accommodating resilient movement of the hammer elements toward and away from the respective pole pins, the leaf springs being biased to urge the hammer elements away from the respective pole pins;

a block of magnetic material separating the other ends of each pair of said leaf spings, said block being magnetically coupled to said magnet and having a portion which extends between each pair of said springs toward the respective hammer element leaving a minimal gap therebetween thereby forming, for each hammer element, a magnetic circuit which includes the respective pole pin, said bar of magnetic material, said permanent magnet, said block, the hammer element, and the variable gap between the hammer element and the respective pole pin; and

around each pole pin, a respective coil energizable to substantially null the magnetic force exerted by the permanent magnet between the pole pin and the respective hammer element.

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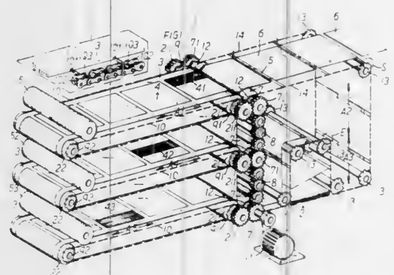
CONTINUOUS, MULTI-CHROMATIC AND MULTI-PRODUCTIVE PRESS

Chien F. Tsai, 39, Alley 15, An Tou Lane, Yen Ping Li, Changhua City, Taiwan

Filed May 6, 1985, Ser. No. 730,648

Int. Cl.[4] B41F *5/02, 21/04*

U.S. Cl. 101—181 **1 Claim**



1. A continuous multi-productive printer comprising:

a plurality of parallel, vertically layered coplanar conveyor systems disposed symmetrically along the same vertical plane, each conveyor system being essentially identical and comprising:

first and second spaced, parallel, horizontally coplanar cylinders;

an endless conveyor belt looped about said horizontally coplanar cylinders, said endless conveyor belt carrying a plurality of sheet plate holders positioned side-by-side, one side edge of a sheet plate holder and a corresponding side edge of an adjacent sheet plate holder being spaced a distance A apart, the vertical distance between the cylindrical axes of two vertically adjacent and corresponding cylinders being said distance A; and

a chromatized color drum abutting against an upper side of said looped endless conveyor belt;

a chain gear on each end of each horizontally coplaner cylinder;

a pair of parallel link chains connected to each side of said looped endless conveyor belt, each one of said pair of link chains being engaged with said chain gears on corresponding ends of said horizontally coplanar cylinders;

a paper feeding unit comprising;

a paper feeding means;

a plurality of press rollers, each press roller being disposed parallel to and horizontally coplanar with a corresponding adjacent first cylinder, each of said first cylinders having one of said press rollers corresponding therewith;

a continuous conveyor mat, having releasable means for clamping individual sheets of paper thereon, extending from said paper feeding means, between spaces existing between each of said press rollers and said corresponding first cylinders, the spaces between said press rollers and said corresponding first cylinders being sufficient to permit joint passage of said sheet plate holder with a sheet plate attached thereto, said endless loop conveyor belt, said conveyor mat and a sheet of paper therethrough and

to transfer an image on said sheet plate to said paper sheet, to a delivery means, and back to said paper feeding means, said delivery means comprising means for releasing paper held on said conveyor mat by said clamping means and means for collecting said released paper;

a motor for driving said conveyor belt and said conveyor mat;

a gear means interconnecting said each of press rollers and each of said first cylinders so that said conveyor mat and all of said conveyor belts move synchronously at the same speed,

means drivingly connecting said motor to said gear means.

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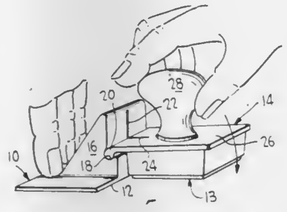
REGISTERED MULTIPLE STAMPING

Hilary Bunger, 40 Little Fox La., Weston, Conn. 06883

Filed Jan. 8, 1985, Ser. No. 689,773

Int. Cl.[4] B41K *1/38*

U.S. Cl. 101—327 **3 Claims**



1. Apparatus for imprinting successive images in registered relationship onto the surface of an imprintable medium to form a composite imprint, comprising:

a series of individual imprinting devices each comprising an imprinter including an imprintable surface for retaining an image mounted at a given fixed position thereon, said fixed position being registered with respect to each one of the series of imprinting devices, each of said imprinting devices having a lip extending from one edge thereof, and an index mark adjacent said lip; a registration device adapted to be held in fixed position with respect to said imprintable medium and including a groove to pivotally receive said lip and a registration mark above said groove for separately, removably retaining each of said imprinting devices successively in aligned registration with said imprintable medium by positioning said lip in said groove with said registration mark and said index mark aligned with each other;

the successive application of the lips of said series of individual imprintable devices with the groove of said registration device with the index and registration marks aligned enabling the production of a composite image on said imprintable medium;

each one of said series of imprinting devices further includes a pair of opposed sides, one said side including said imprintable surface and bearing said image, and the other opposed side including means for manipulating each imprinting device to form an imprint of said image on the surface of said imprintable medium.

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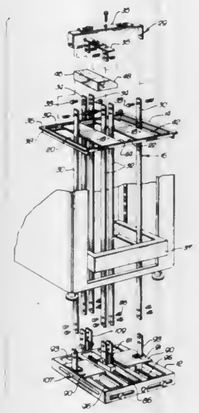
ENVELOPE PRINTING APPARATUS WITH SIDE ALIGNERS EXTENDING THROUGH A MOVEABLE ELEVATOR PLATFORM

Theodore T. Jagosz, 936 Second St., Hermosa Beach, Calif. 90254, and David J. Tepe, 1646 Stanford Ave., Redondo Beach, Calif. 90278

Filed Mar. 18, 1985, Ser. No. 712,733

Int. Cl.[4] B61F *13/64*

U.S. Cl. 101—240 **19 Claims**



1. An envelope printing system comprising:

offset duplicator means for receiving sheet media from an upwardly moving stack, impressing an inked image on the sheet media and delivering the sheet media to a stacker, the offset duplicating means defining a printing path and having a media receiving station for stripping the uppermost media from a media stack and presenting the media to the printing path;

feeding means for supplying multiple envelopes simultaneously to the media receiving station of the offset duplicator means, the feeding means having an elevator for progressively supplying sheet media to the media receiving station at a nominally fixed level in alignment with the receiving station for simultaneous presentation of plural envelopes to the printing path;

frame means for supporting envelopes for presentation to the receiving station, the frame means coupled to the elevator of the offset duplicator means, the frame means having

envelope bed means for vertically supporting plural envelope stacks in adjacent yet spaced apart relationship to define longitudinal window means between the envelope stacks, the bed means defining a lateral plane and the longitudinal window means for receiving upright guide members normal to the lateral plane of the bed means, the bed means disposed transversely across the frame means;

base means for supporting a plurality of longitudinal upright guide members; and

longitudinal upright guide means for entraining in a upright stack envelopes for presentation to the receiving station, the upright guide means extending from the base means for supporting plural stacks of envelopes in adjacent yet juxtaposed relationship, the longitudinal upright guide means extending through the window means, whereby plural uniform stacks of envelopes may be presented to the feeding station, without interference from the envelope bed as the upright guide means pass through the window means.

4,625,642

INKING UNIT OF A ROTARY OFFSET PRESS

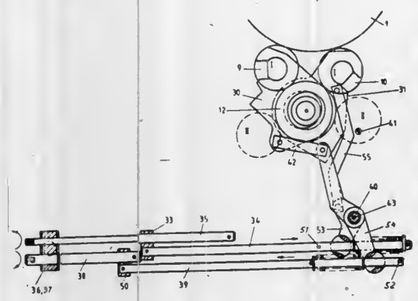
Janko Despot, Offenbach am Main, and Hans Kibler, Heusenstamm, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 796,078

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440895

Int. Cl.[4] B41F *31/34;* **B41L** *27/36*

U.S. Cl. 101—352 **3 Claims**



1. An inking unit for a rotary offset press having a plat cylinder comprising a plurality of externally accessible non-displaceable transfer rolls and a plurality of inner displaceable transfer and applicator rolls which are externally accessible only after pivoting around one of the non-displaceable transfer rolls, or after the removal of such rolls, at least two of the inner displaceable applicator rolls being mounted in pivoted levers and having provision for engaging and disengaging a respective one of the non-displaceable transfer rolls, the pivoted levers of the inner displaceable applicator rolls being mounted on eccentric bushings having provision for adjusting the pivoted levers relative to the respective non-displaceable transfer rolls, characterized by a first displaceable transfer roll engaging a pair of the inner displaceable applicator rolls and at least a pair of the displaceable transfer rolls being mounted for engagement with the non-displaceable transfer rolls, said first and said pair of the displaceable transfer rolls being journalled for rotation in a single mounting arm mounted on an eccentric collar disposed centrally on the axis of said one non-displaceable transfer roll, and said arm being pivotable through 180°, so that said mounting arm can be lowered together with the center of the eccentric, whereby said first displaceable transfer roll can be pivoted clockwise, together with said mounting arm, out of the inking unit with said pair of displaceable transfer rolls removed, and at least three of said displaceable applicator rolls being mounted in levers respectively pivotable around said non-displaceable transfer rolls for consecutive engagement with the plate cylinder.

4,625,643

INK DISPENSING MEANS

William F. Davis, Mtd. Rte. 13 & Voelbel Rd., Hightstown, N.J. 08520

Filed Aug. 9, 1984, Ser. No. 639,212

Int. Cl.[4] B41F *31/08*

U.S. Cl. 101—363 **4 Claims**

1. In a printing press having an ink taking means rotatably mounted and driven; and

an ink dispensing means comprising an anilox drum having ink cells recessed in the periphery of said drum, said drum rotatably mounted between end walls;

said ink taking means taking ink from said anilox drum; and

a doctoring means wiping ink from the periphery of the drum;

said doctoring means spaced apart from said ink taking means;

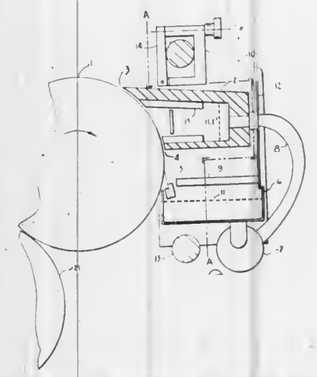
an improvement comprising, in combination,

an ink applicator disposed after the ink taking means and before the doctoring means with said doctoring means spaced apart from said applicator;

said applicator interfacing with the drum to form a plenum chamber having a first and a second orifice along the length of the drum;

said first orifice disposed further from said doctoring means than said second orifice;

said second orifice formed to minimize the flow of ink issuing therefrom;



means for flushing air and foreign material from the drum's periphery and from said cells prior to said cells entering said plenum chamber including an ink sump and an ink circulating means supplying ink to the plenum chamber in sufficient quantity to issue from both orifices at full press operating speed, whence the air in the cells is replaced with clean fresh ink under pressure as the cells pass thru the plenum chamber;

said chamber proportioned to equalize the flow of ink to said orifices;

collecting means directing the ink issuing from the two orifices and the ink wiped from the periphery of the drum to the sump.

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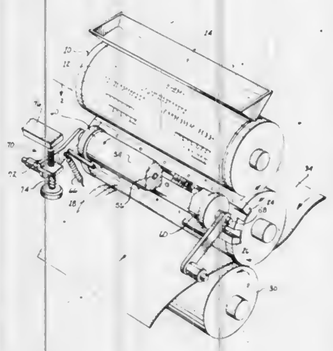
APPARATUS FOR AN OFFSET PRINTING PRESS

Mark H. Bouliane, P.O. Box 314, and John D. Rohsner, Victoria, both of Navasota, Tex. 77868

Filed Jul. 1, 1985, Ser. No. 750,933

Int. Cl.[4] B41L *47/46*

U.S. Cl. 101—426 **17 Claims**



1. In an offset printing press including

i. a blanket cylinder defining a first cylindrical surface having a radius r_1 and a recessed section;

ii. a blanket tightly stretched around said blanket cylinder and defining a second cylindrical surface having a radius r_2 greater than r_1;

iii. an impression cylinder aligned with said blanket cylinder to define a printing interface between said blanket cylinder and said impression cylinder for receiving paper sheets and transferring an inked image from said blanket to the paper sheets; and

iv. adjustable drive means for defining and maintaining a fixed phase angle between said blanket cylinder and said impression cylinder and for rotating said cylinders at an equal angular velocity and in complementary directions to transfer images to the paper sheets;

a number imprinting apparatus comprising:

a. a number head having a body and a number imprinting surface;

b. means for retaining the body of said number head within the recessed section of said blanket cylinder with the number imprinting surface aligned to contact the paper sheets as said number head is rotated through the printing interface;

c. synchronized inking means located at a first angular position around said blanket cylinder angularly spaced apart from the printing interface, said synchronized inking means including

i. ink transfer means;

ii. spacing means for maintaining a gap between said ink transfer means and said blanket as said blanket is rotated past said ink transfer means; and

iii. means for periodically displacing said ink transfer means toward and away from said blanket cylinder as said recessed section is rotated past said ink transfer means to cause said ink transfer means to contact said number head and transfer ink to the number imprinting surface of said number head;

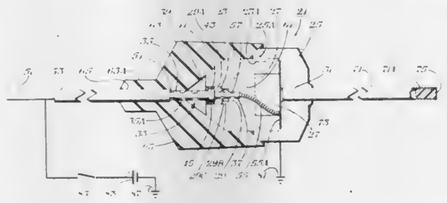
whereby the number imprinting surface of said number head is periodically reinked as the recessed section of said blanket cylinder is rotated past said synchronized inking means without transferring ink from said synchronized inking means to said blanket.

4,625,645

CORE GUN IGNITER

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Mar. 1, 1985, Ser. No. 707,406
Int. Cl.[4] F42C *19/12*
U.S. Cl. 102—202.14 **6 Claims**



1. An igniter for use in a high pressure and high temperature environment for igniting an explosive charge, comprising:

a metallic housing having wall structure defining a chamber,

first and second openings at opposite ends of said housing respectively extending through said wall structure to said chamber,

an electrical connector extending through said first opening to said chamber,

a sealing material surrounding said connector in said first opening and engaging said connector and the wall of said first opening forming a seal between said connector and said wall of said first opening,

said sealing material being capable of withstanding high temperature and high pressure,

a ring shaped sapphire member surrounding said connector in said first opening between said sealing material and said chamber,

said ring shaped sapphire member engaging said connector and said wall of said first opening forming a high temperature electrical insulating member,

explosive powder in said chamber,

a metallic igniting element in said chamber electrically connected to said connector and to said wall of said housing,

a tubular member having a first end coupled to said second opening and a second end adapted to be located next to an explosive charge, and

a plug of elastic material under compression located in said second end of said tubular member,

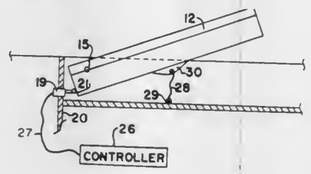
when electrical energy is applied to said connector, said metallic igniting element is heated causing said explosive powder in said chamber to explode and force said plug of elastic material out of said tubular member releasing the resulting heat and force from said chamber by way of said tubular member to said explosive charge causing said explosive charge to explode.

4,625,646

AERIAL MISSILE HAVING MULTIPLE SUBMISSILES WITH INDIVIDUAL CONTROL OF SUBMISSIBLE EJECTION

George T. Pinson, Huntsville, Ala., assignor to The Boeing Aerospace Company, Seattle, Wash.

Filed Oct. 6, 1980, Ser. No. 194,040
Int. Cl.[4] F42B *13/50, 25/16*
U.S. Cl. 102—489 **12 Claims**



1. In an aerial missile having multiple, rearward discharge launching tubes for submissiles, said launching tubes arranged in a cylindrical locus about the longitudinal axis of said aerial missile, improved activating means for each said launching tube comprising:

a mounting means for securing each launching tube to said aerial missile to permit pivotal movement from an inactive position generally parallel to the said longitudinal axis of the aerial missile to an activated position wherein the rear portion of the launching tube is displaced radially outwardly from the aerial missile;

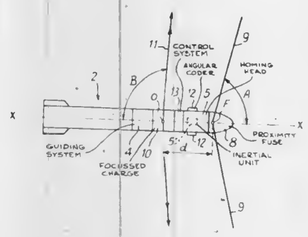
independent power operated means for pivoting each launching tube to the said activated position, said power operated means secured at one end to a structural component of said aerial missile and secured at the other end to said launching tube remote from said mounting means.

4,625,647

WEAPON SYSTEM AND MISSILE FOR THE STRUCTURAL DESTRUCTION OF AN AERIAL TARGET BY MEANS OF A FOCUSSED CHARGE

Pierre Laures, Chatenay-Malabry, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Mar. 15, 1985, Ser. No. 712,388
Claims priority, application France, Apr. 13, 1984, 84 05913
Int. Cl.[4] F42C *13/00*
U.S. Cl. 102—214 **8 Claims**



1. A weapon system intended for the structural destruction of a target by means of a controlled focussed charge having splinters and comprising a missile carrying said focussed charge and carrying first means for furnishing the value of the velocity Ve of said missile, second means for furnishing the value of the vectorial relative velocity V_R of the target with respect to said missile, third means for furnishing the angle D between the longitudinal axis of the missile and said relative velocity, and fourth means for detecting proximity, adapted to indicate the instant of detection of one end of said target,

wherein said system comprises computing means which are mounted on board said missile and which, from the values of the velocity of the missile and of the relative target-missile velocity, as well as from said angle between the longitudinal axis of the missile and said relative velocity, calculate at an instant close to said instant of detection furnished by said fourth means, a duration which is then counted down by said computer means from said instant of detection and at the end of which said computer means control said focussed charge.

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PROJECTILE PROPELLING CHARGE AND METHOD OF MANUFACTURE THEREOF

Georg Klein, Meersbusch, and Eckhard Rahnenfuehrer, Dormagen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 656,036
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335821
Int. Cl.[4] C06D *5/06*
U.S. Cl. 102—286 **8 Claims**

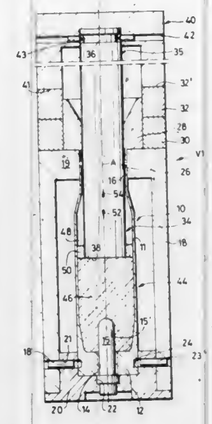
1. An improved cartridge casing holding a propellant charge and having a projectile operatively mounted thereon, the improvement comprising

(a) a first predetermined portion of said propellant charge is disposed in the bottommost portion of said casing, said first portion consisting of loose powder without binders or solvents which is thereafter compressed;

(b) said first portion forming 50–80% of the total mass of the propellant charge;

(c) a cylindrically shaped propellant charge ignitor having a predetermined exterior diameter, the bottom of said casing having an axial bore which extends at least partially into said first portion, the interior diameter of which corresponds to the outer diameter of said igniter; and

(d) a second predetermined portion of said propellant charge forms the rest of the entire propellant charge mass and



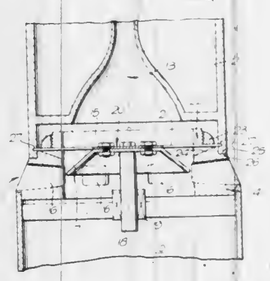
consists of loose powder which poured into said casing so as to confront the projectile mounted thereon.

4,625,649

PROJECTILES

James L. L. Russell, Stevenage, United Kingdom, assignor to British Aerospace PLC, Surrey, England

Filed Apr. 4, 1984, Ser. No. 596,493
Claims priority, application United Kingdom, Apr. 5, 1983, 8308960
Int. Cl.[4] F42B *15/10*
U.S. Cl. 102—377 **6 Claims**



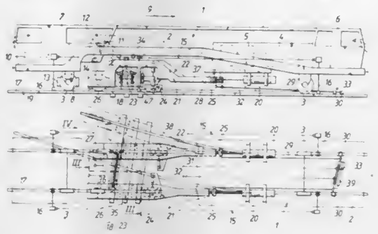
1. A projectile having a forward portion including propulsion means having outlet means for exhausting efflux rearwardly, a rearward portion arranged adjacent said forward portion; releasable connection means for connecting said rearward portion to said forward portion, said connection means comprising an impingement member attached to said rearward portion for axial sliding movement and having an impingement region facing said outlet means and strip means connected to said impingement member and having a plurality of locking portions for engaging abutment means on said forward portion to lock together said forward and rearward portions, and radial outlet means on said rearward portion disposed adjacent said impingement member so that the latter deflects said efflux through said outlet means, the connection means being arranged such that on operation of said propulsion means said impingement member is moved rearwardly relative to said rearward portion thus to withdraw said locking portions from engagement.

4,625,650

MULTIPLE EFFECT AMMUNITION

Stephen J. Bilsbury, Godfrey, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 666,050
Int. Cl.[4] F42B *13/12, 11/14*
U.S. Cl. 102—516 **5 Claims**



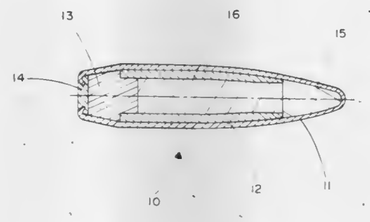
1. An explosive light armor penetrating projectile for launching through a rifled gun barrel, which round comprises;
a copper jacket for engaging the barrel rifling;
a tubular hard heavy metal projectile body having a front end and rear end, said body disposed immediately inside said jacket and having sufficient weight and hardness to penetrate light armor upon impact with a target at expected impact velocity;
a high explosive mixture disposed within said body for explosively fragmenting said body;
an igniting mixture located within the jacket forward of said high explosive mixture for igniting said explosive after a predetermined measurable delay so as to allow said projectile body to penetrate a target prior to detonation of said explosive;
a lightweight metal base plug located within the jacket behind the explosive and behind the body and consisting essentially of pyrophoric material which is adapted to burn over a relatively long period so as to increase the fire-starting ability of the rounds, and
a non-flammable sealant layer behind said base plug for preventing ignition of base plug or high explosive mixture by the burning propellant during projectile launch.

4,625,651

MOBILE TRACK SWITCH LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 24, 1984, Ser. No. 643,862
Claims priority, application Austria, Oct. 12, 1983, 3640/83
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] E01B *27/17*
U.S. Cl. 104—7.2 **14 Claims**



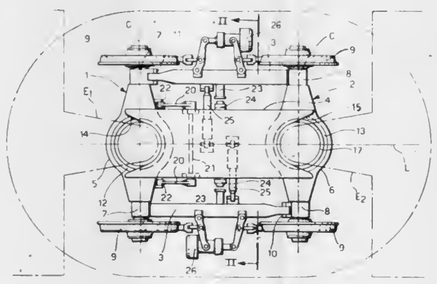
1. A mobile track switch leveling, lining and tamping machine for tamping ballast under respective ties of a track comprised of two rails fastened to successive ones of the ties, which comprises
(a) an elongated machine frame supporting drive means, means for supplying power to the drive means, and control means,
(b) two undercarriages spaced apart in the direction of elongation of the machine frame and supporting the machine frame for mobility on the track in an operating direction,
(c) a respective carrier frame associated with each one of the track rails between the two undercarriages, each carrier frame supporting
(1) a tamping tool unit comprising tamping tools capable of tamping the ballast in a track switch, and
(2) a track leveling and lining unit comprising tools for lifting and laterally moving the track, the tools being capable of engaging the associated track rail in the track switch, the track leveling and lining unit preceding the tamping tool unit in the operating direction, and the drive and control means being connected to the tamping tools and the tools for lifting and laterally moving the track for operating the tools,
(d) a longitudinally adjustable coupling device pivotally linking one end of each one of the carrier frames to the elongated machine frame, the drive and control means being connected to the coupling device for operating the same, and
(e) a free steering gear with a single guide wheel supporting an end of each carrier frame opposite to the one end on the associated track rail.

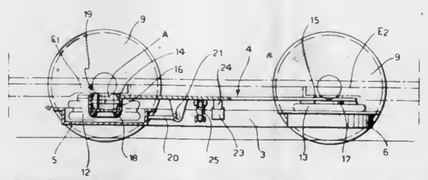
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TWO-AXLED CENTRAL SUPPORT BOGIE FOR RAILWAY AND TRAMWAY VEHICLES WITH TWO OR MORE ARTICULATED BODIES

PierAntonio Losa, Pianezza, and Augusto Tabbia, Settimo Torinese, both of Italy, assignors to Fiat Ferroviaria Savigliano S.p.A., Italy

Filed Mar. 5, 1985, Ser. No. 708,256
Claims priority, application Italy, Nov. 2, 1984, 68091 A/84
Int. Cl.[4] B61D *17/20*
U.S. Cl. 105—4.1 **7 Claims**





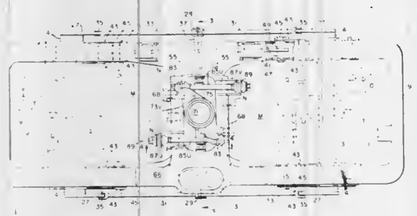
1. A wheeled bogie for interconnecting adjacent railway vehicles of the type having articulation pins provided on projections at the ends of the vehicles, said bogie comprising:
(a) a longitudinally extending central structure defining a longitudinal axis and having upwardly open articulation sockets adjacent its ends to receive the articulation pins,
(b) two cross members, each of which cross members has a central platform below and coaxial with said articulation sockets,
(c) annular air springs of the bellows type surrounding said sockets and provided on said central platforms to resiliently support said central structure and to accommodate limited vertical and lateral movement of said central structure relative said cross member platforms,
(d) each of said cross members having a shallow U-shape with said central platform defined by the base of the U and with upwardly projecting legs, said legs having upper ends defining supports for the wheels, said wheels provided on two axles in said bogie,
(e) longitudinally extending strut members, each of which strut members has one rigidly connected to a lower end of one of said U-shaped cross member legs, said strut members oriented in laterally spaced relationship to said central structure and being independent thereof, each of said strut members having opposite ends pivotably connected to the lower end of each of said U-shaped cross members,
(f) means connecting at least one cross member end to said central structure to prevent longitudinal movement of the central structure relative said cross member, said means comprising at least one torsion bar mounted transversely to said central structure and at least one connecting link having one end clamped to the torsion bar and the other end pivotally connected to the cross member, and
(g) means for snubbing lateral motion of said central structure relative to said cross members and said longitudinal strut member, said means comprising elastic snubbers provided in part on said central structure and in part on said strut members.

4,625,653

HIGH ADHESION RAILWAY POWER TRUCK WITH BODY SPRING-SUPPORTED ON THE TRUCK STRUCTURE

Keith L. Jackson, Creve Coeur, Mo., assignor to Lukens General Industries, Inc., Coatesville, Pa.

Filed Jul. 11, 1985, Ser. No. 753,934
Int. Cl.[4] B61F *5/24*
U.S. Cl. 105—168 **21 Claims**



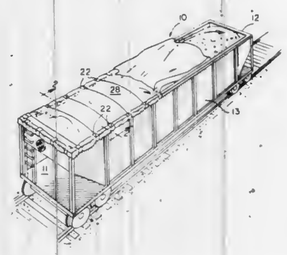
15. In a railway vehicle comprising a truck having a pair of wheeled axles, truck framing supported from said axles, framing-supported structure including a transverse bolster part and a body part supported on said bolster part, springs carried by said bolster part and directly supporting said body part thereon, a generally transverse lever fulcrumed on a fixed vertical axis to one of said structure parts, transversely spaced pairs of vertically spaced longitudinally extending parallel links pivotally connected to opposite ends of said lever and extending therefrom in opposite directions longitudinally of the truck, the ends of said links remote from said lever being pivotally secured to said other structure part, fulcrum means for said transverse lever having bearing surface portions spaced apart vertically from each other substantially as far as the vertical spacing of said parallel links whereby to prevent tipping of said lever longitudinally of the truck with respect to the structure part on which said lever is fulcrumed and by the vertical spacing of said links to maintain said bolster part against longitudinal tipping with respect to said body part.

4,625,654

COVER FOR COAL CAR

Thomas N. Kuss, P.O. Box 1750, and Donald L. Horne, 4 Circle Dr., both of Prestonsburg, Ky. 41653

Filed Jul. 5, 1985, Ser. No. 751,860
Int. Cl.[4] B61D *39/00*
U.S. Cl. 105—377 **4 Claims**



1. A pre-assembled hold-down combination of clamp and strap means adapted for retaining a flexible cover on a top-flanged, open-top, railway freight car or the like container body, wherein the flange is continuous and outwardly extending, comprising:
A. a first clip or hook type clamp element adapted to securely fit onto an end section of said flange of a first wall of the container body;
B. an opposed clip or hook type second clamp element adapted to securely fit onto an opposed end section of said flange of a second wall of the container body;
C. said clamp elements each having a top wall portion that is in generally opposed and planar relationship to the other;
D. each said top wall portion having at least a first row of three longitudinally spaced, peripherally closed slots extending therethrough and the rows of slots being in alignment;
E. at least one hook or clip type third clamp element adapted to securely fit onto a third flange section that is on a third wall of said container body and that is intermediate of and more closely associated with aforesaid flange end sections;
F. said third clamp element having a top wall portion that is (1) in generally planar relationship to aforesaid top wall portions, (2) extending in direction inwardly of said third flange section, and (3) formed at its free edge in a rolled-over, tubular configuration; and
G. strap means (1) threaded and slidable through the tubular formation and (2) at each end adjustably threaded and overlappingly reversely threaded through a respective one of said rows of slots;
H. whereby the assembly of (G) may, as a comprehensive unit, be fitted onto aforesaid flange sections at one end of a flexible sheet-covered said container body and the assembly secured thereon by tightening the strap at said slot means; and
I. whereby a second said assembly as in (G) may similarly be fitted to and secured at the other end of a said covered container body to thereby maintain a full covering of the container body.

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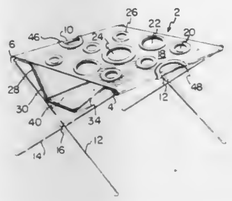
FOLDABLE TABLE HAVING STORAGE CAPABILITIES

Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625

Filed Aug. 9, 1984, Ser. No. 639,200
Int. Cl.[4] A47B *85/00*
U.S. Cl. 108—25 **2 Claims**

1. A foldable table comprising two pairs of legs pivotally

joined intermediate their lengths and having a cross bar connecting each of a pair, a table panel formed from a flexible material attached at opposite ends to said cross bar, said table panel having openings therein for receiving articles used in the consumption of beverages and the like, a lower panel extending beneath said table panel and attached at its opposite ends to said table panel, said lower panel having a relatively rigid center section comprising a section attached to said center section at its ends and forming a pocket and a relatively rigid



member inside of said pocket extending below at least some of said openings and having side panels inclined upwardly to the bottom of said table panel when said table is in an open position to provide support for articles extending through said openings and wherein said lower panel is dimensioned so that its center section is spaced below said table panel when the table is in an open position to provide space sufficient to permit articles placed in said openings above said center section to have portions extending below said table panel and supported on said center section.

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FOLDABLE TABLE WITH STORAGE CAPABILITY

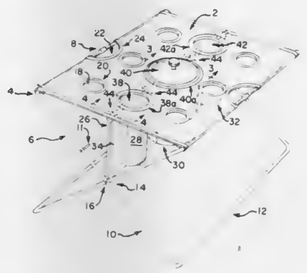
Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625

Filed Feb. 19, 1985, Ser. No. 703,105

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ A47B *85/00*

U.S. Cl. 108—25 **2 Claims**



1. In a foldable table comprising a flexible table top having a plurality of openings therein to accommodate articles for beverage consumption or storage, a pair of legs having portions engaging opposite ends of said table panel and pivoted at an intermediate location along their legs whereby they may be spread apart to open the table for use or brought together to permit storage and transporting the table for use, and a rigid receptacle panel having a plurality of receptacles below said table top, said receptacles aligned below said openings in said table top to house articles placed therein, said rigid panel having a horizontal flange along its top and having a plurality of openings provided in said horizontal flange, a plurality of straps secured to the underside of said table top, looped fasteners passing through said straps and said openings attaching said rigid panel to the underside of said table top.

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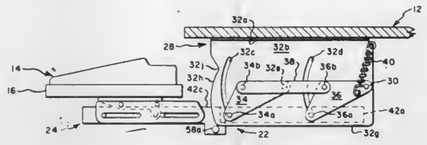
ADJUSTABLE KEYBOARD SUPPORTING MECHANISM

Carl H. Little, and Richard L. Watt, both of Jamestown, N.Y., assignors to Weber-Knapp Company, Jamestown, N.Y.

Filed May 15, 1984, Ser. No. 610,341

Int. Cl.⁴ A47B *57/00*

U.S. Cl. 108—93 **17 Claims**



1. A mechanism for mounting a keyboard for movement relative to a horizontal support, such as defined by a desk or table top, said mechanism comprising:

a pair of brackets having means for fixing said pair of brackets to depend from a lower surface of said support;

two pairs of links, wherein one of said pairs of links is pivotally supported on one of said brackets and an other of said pairs of links is pivotally supported on an other of said brackets;

means pivotally coupled to said pairs of links for mounting said keyboard for vertical movement relative to said support incident to pivotal movement of said pairs of links relative to said brackets;

spring means for at least partially counterbalancing the weight of said keyboard; and

clamping means supported by said means for mounting said keyboard for vertical movement with said keyboard, and said clamping means releasably clamping against said brackets for releasably retaining said keyboard in a desired vertical position relative to said support, said means for mounting said keyboard includes telescopic slide means for supporting said keyboard for horizontal movements relative to said support, said telescopic slide means including a pair of slide mechansims each having first parts pivotally coupled one to each said pair of links and other parts for carrying said keyboard, said telescopic slide means carries means cooperating with said brackets for retaining said keyboard in a lower storage position during extending and contracting movements of said telescopic slide means, and said means cooperating with said brackets is carried by said other parts, said brackets having horizontally disposed lower guide edges and vertically extending front guide edges, and said means cooperating with said brackets includes follower means arranged to engage with said lower and front guide edges.

4,625,658

SAFETY STORAGE APPARATUS

Robert M. Hodges, 3720 Hampton Rd., Pasadena, Calif. 91107

Filed Jun. 15, 1984, Ser. No. 621,158

Int. Cl.⁴ E05G *1/00*

U.S. Cl. 109—47 **18 Claims**

1. Safety storage apparatus adapted for combination with a concrete slab having a vertical access opening therethrough, comprising

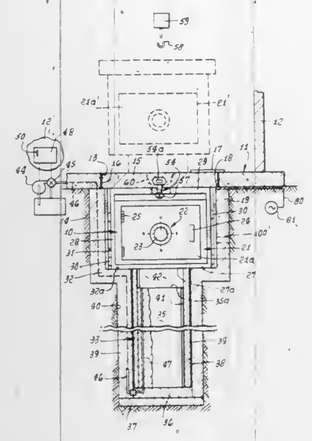
(a) a vertical actuator beneath said opening,

(b) a safe storage chamber mounted on said actuator for vertically actuated movement via said opening between a stored position below the level of said slab and an access position above the level of said slab,

(c) a closure overlying said storage chamber for vertical movement therewith between a down position closing said opening and an up position above said chamber in its said access position, and

(d) a lifting element above said chamber and concealed by said closure, said element being liftable to elevate said

chamber independently of operation of the acutator, said closure consisting of concrete sized for close reception in



said opening, said lifting element extending into said concrete closure to be accessible after destruction of that portion of the concrete closest to said element.

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SECURITY WINDOW OR DOOR

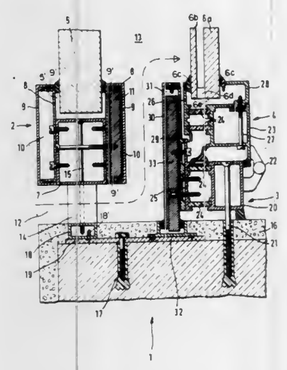
Heinrich Saelzer, Industriestrasse 4, 3550 Marburg-Wehrda, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,131

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432021

Int. Cl.⁴ E06B *1/04*

U.S. Cl. 109—49.5 **6 Claims**



1. A security structure for protecting an opening in a building, comprising at least a first plate-like panel on an attack susceptible or outer side of said window, and a second plate-like panel arranged parallel to and a distance away from said first panel on an inner side of said window away from said attack susceptible side to enclose a space between said first panel and second panel, a first frame comprising separate first frame sections for enclosing said first panel, a second frame comprising second frame sections for enclosing said second panel, whereby said first panel and said second panel are mounted with their respective frames within a soffit surrounding said opening, and at least one of said first frame sections is held a distance away from said soffit to form a gap which provides a venting flow connection between said space between said first panel and said second panel with the outside of said window, said structure further comprising a first security member of a bullet-proof material, and a similar second security member also of a bulletproof material, whereby said first security member is attached to said first frame on a side facing said second frame, and said second security member is attached to said second frame on a side facing said first frame, whereby at least one of said security members overlaps edge areas of one of said panels, and at least one other of said security members overlaps the area of said gap, and wherein said first and second security members partially overlap each other in the vertical direction.

4,625,660

AUXILIARY APPARATUS FOR DISCHARGING INCINERATION RESIDUES OF FURNACES, PARTICULARLY REFUSE INCINERATORS

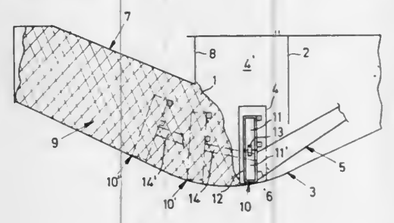
Walter Brüngger, Gross, and Peter A. Cerny, Bellikon, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Aug. 14, 1985, Ser. No. 765,550

Claims priority, application Switzerland, Sep. 12, 1984, 4358/84

Int. Cl.⁴ F23J *1/00*

U.S. Cl. 110—165 R **13 Claims**



1. An auxiliary apparatus for discharging incineration residue from furnaces, particularly refuse incinerators, which comprises: a trough or tank to which the incineration residues are supplied; a discharge chute communicating with said trough; means for supplying said residues to said trough comprising a drop shaft communicating with said trough; a movable piston in said trough for removing the combustion residues from the trough to said discharge chute having a front face; a trough mintenance and inspection opening arranged in a side wall of the trough; a plate arranged in front of the front face of the piston, wherein the plate is in two parts, each of the two parts approximately covers the front face of the piston and is approximately twice as high as the front face of the piston; and adjusting means for supporting the plate on the piston.

4,625,661

HAZARDOUS WASTE INCINERATOR

August S. Melchior, Wilson, N.C., assignor to Melchior-Moore Associates, Inc., Wilson, N.C.

Filed Jan. 2, 1986, Ser. No. 815,628

Int. Cl.⁴ F23D *3/00, 5/00, 7/00, 9/00*

U.S. Cl. 110—241 **18 Claims**

1. A portable incinerator for the disposal of small amounts of hazardous waste material with a minimum of exhaust combustion gases and comprising the combination of

a boiling chamber for receiving the hazardous waste material therein,

heating means cooperating with the boiling chamber for vaporizing the hazardous waste material therein to form waste gas thereof,

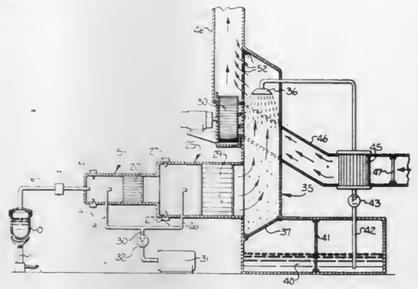
a combustion chamber spaced from said boiling chamber,

means for conducting the vaporized waste gas from said boiling chamber and into the entrance end of said combustion chamber,

oxygen supply means for injecting oxygen into said combustion chamber,

ignition means positioned in said combustion chamber for igniting the mixture of waste gas and oxygen,

a catalytic converter positioned at the exit end of said combustion chamber and through which the oxidized waste gas passes for obtaining total oxidation of the combustion gas, and



a wet scrubber chamber communicatively connected to the exit end of said combustion chamber and into which the combustion gases are directed to pass therethrough and to be exhausted at the opposite end thereof, said wet scrubber chamber preventing harmful combustion gases from escaping through the exhaust.

4,625,662

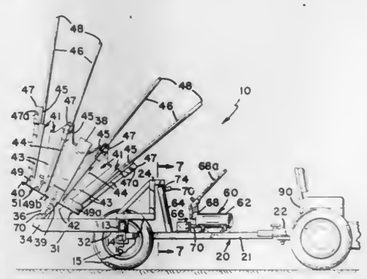
TOWABLE TRANSPLANTER

Ralph Heinzen, P.O. Box 728, Garrison, N. Dak. 58540

Filed Nov. 29, 1984, Ser. No. 675,980

Int. Cl.[4] A01C *11/00*

U.S. Cl. 111—2 **13 Claims**



1. A self-contained towable transplanter, said transplanter comprising a frame, an extractor head supported on said frame, a hydraulic system for driving said extractor head, and a plurality of wheels supporting said frame;

said frame comprising a first member and a second member, said second member including an axle positioned between and joining a pair of said wheels, said first member being mounted on said axle, said first member including means for attaching said transplanter to a towing vehicle, said second member being pivotally supported with respect to said first member at said axle, said second member carrying said extractor head;

said extractor head including a plurality of blades, said blades being reciprocally mounted in support means, said support means including a first support portion mounted on said second frame member, said support means further including a second portion hingedly mounted to said first portion, said second portion serving as a gate through which a tree trunk may pass;

said hydraulic system including means acting between said first frame member and said axle to pivotally drive said second frame member with respect to said first frame member, said hydraulic system further including means acting to raise and lower said extractor head with respect to said second frame member.

4,625,663

WORK CUTTING ATTACHMENT FOR ZIGZAG SEWING MACHINES

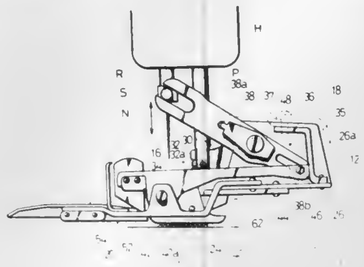
Mikio Mori, 12-2, Chidori-cho 3-chome, Ogaki-shi, Gifu-ken, Japan

Filed Feb. 5, 1986, Ser. No. 826,383

Claims priority, application Japan, Feb. 5, 1985, 60-21098; Aug. 28, 1985, 60-190275

Int. Cl.[4] D05B *37/06*

U.S. Cl. 112—128 **12 Claims**



1. A work cutting attachment for use with a zigzag sewing machine having an endwise reciprocatory needle bar, a presser bar and a feed dog, comprising:

a base plate;

mounting means for removably securing said base plate to said presser bar of said sewing machine;

interlocking means pivotally supported on said base plate and engageable with said needle bar for vertical swinging movement therewith;

a movable and a fixed knife disposed generally behind said needle bar relative to the direction of work advancement;

a guide member for guiding the fabric chip cut by said knives in a direction away from the work fabric to be sewn; and

a presser foot disposed generally below said needle bar and cooperating with said feed dog to hold and feed the work fabric to be sewn, said presser foot having a needle clearance aperture formed centrally therein.

4,625,664

CRAFT YARNS

Virginia B. Duell, 1801 Maple, Ellis, Kans. 67637

Filed Jul. 21, 1983, Ser. No. 515,689

Int. Cl.[4] D05B *97/00*

U.S. Cl. 112—262.1 **1 Claim**



1. A method for constructing a craft yarn having particular desired qualities comprising the steps of:

selecting a plurality of lengths of a first yarn having a first particular quality of size, color and texture;

selecting at least one additional yarn having at least one additional particular quality of size, color and texture;

forming said plurality of first yarn lengths and said at least one additional yarn into an elongated bundle of parallel-laid individual yarns;

selecting a particular stitch length and bite width on a sewing machine to obtain a desired size and resilience of a craft yarn; and

tightly encasing said parallel-laid yarns with a zig-zag stitch thread.

4,625,665

DUAL-CHAIN SEWING MACHINE

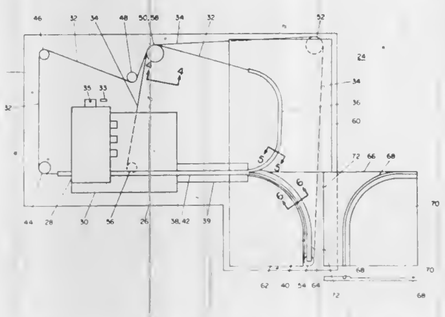
Elbert Engle, P.O. Box 235, Ashville, Ala. 35935

Division of Ser. No. 569,049, Jan. 9, 1984, Pat. No. 4,541,353.

This application Jun. 12, 1985, Ser. No. 744,108

Int. Cl.[4] D05B *97/00*

U.S. Cl. 112—262.3 **4 Claims**



1. A method for mating a first fabric ply to a second fabric play along corresponding first and second seam tracks on said plies, comprising the steps of:

engaging said first ply along said first seam track with transverse pins on a first elongated flexible carrier;

engaging said second ply along said second seam track with transverse pins on a second elongated flexible carrier;

flexing at least one of said carriers in the region of said seam tracks to have a shape conforming to the other of said carriers, and

bringing said carriers together with the pins of each carrier facing the pins of the other carrier and the pins of both carriers engaging both plies along said tracks, thereby mating said plies along said tracks.

4,625,666

OPTICAL THREAD BREAKAGE MONITORING APPARATUS FOR TUFTING MACHINES

Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

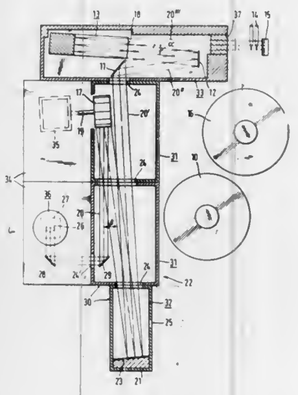
Filed Dec. 13, 1985, Ser. No. 808,961

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1984, 3447869

Int. Cl.[4] D05C *15/00*

U.S. Cl. 112—273 **8 Claims**

1. Optical thread breakage monitoring apparatus for tufting machines, in which a carrier web is passed from below to a feed roller and is deflected by the latter into a substantially horizontal direction to be passed beneath a row of needles which periodically introduce threads into the carrier web by upward and downward movement for the formation of tufted material, using a laser beam scanning device which has a narrow retroreflecting strip arranged immediately beneath and behind the needle tips when the needles are opened, immediately above and substantially perpendicular to the surface of the tufted material, and also parallel to the row of needles, wherein the scanning device generates, by means of a mirror wheel and a strip-like concave mirror, a scanning beam in the form of a laser beam which periodically scans the retroreflecting strip and extends substantially parallel to the part of the carrier web which extends between the feed roller and the row of needles and perpendicular to the retroreflecting strip, and contains a light receiver operating in autocollimation which is connected to an electronic fault evaluating circuit which, on the absence of a scanning beam interruption signal brought about by the needles and/or the threads extending between the needles and the carrier web, transmits a fault signal, wherein the laser beam scanning device is vertically arranged in front of the feed roller and substantially below the level of the row of needles, and wherein a strip-like deflecting mirror arranged substantially at the level of and parallel to the row of needles deflects the scanning beam which emerges substantially vertically out of the scanning device in the direction of the retroreflecting strip, characterised in that the deflecting mirror (**11**) deflects the incident laser beam somewhat obliquely upwardly



to a strip-like plane mirror (**12**) extending parallel to it which deflects the laser beam upwardly to the concave mirror (**13**) arranged on the opposite side of the deflecting mirror (**11**) from the needle row (**14**), with the concave mirror (**13**) being arranged parallel to and horizontally opposite to the needle row (**14**); and in that the mirror wheel (**17**) is arranged directly below the deflecting mirror (**11**) with its axis of rotation disposed somewhat tilted relative to the horizontal and receives the laser beam (**20**) vertically from below and also directs the laser beam essentially downwardly, however somewhat obliquely in the direction of the row of needles (**14**) to a strip-like deflecting mirror (**23**) arranged at the base (**21**) of the housing (**22**) near the wall (**25**) facing the tensioning roller (**10**), with the strip-like deflecting mirror (**23**) extending parallel to the deflecting mirror (**11**) and reflecting the laser beam upwardly past the mirror wheel (**17**) to the deflecting mirror (**11**).

4,625,667

SEWING MACHINE WITH A STEP MOTOR FOR FEED CONTROL

Joachim Hammermann, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed May 30, 1984, Ser. No. 615,458

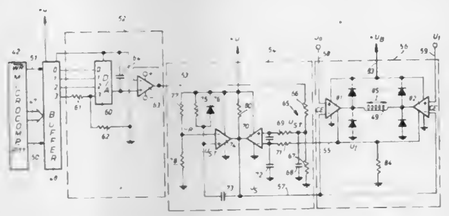
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321215

Int. Cl.[4] D05B *3/02*

U.S. Cl. 112—456 **5 Claims**

4. A sewing machine with a main shaft, a vertically guided needle bar in driving connection with the main shaft for a lifting motion of the needle bar, a step motor with a plurality of phase windings controlled by a microcomputer connected to setting means for the control of the size and direction of the feeding action of a cloth feeder, and a pulse generator connected to the main shaft and triggering the step motor motion,

comprising: the microcomputer (**42**) being connected, via a buffer memory (**48**) and D/A converter (**60**), to the non-inverting input of a first comparator (**70**) which controls the turning on and off as well as the intensity of a phase current (**1**) of each phase winding (**49**,**49'**) of the step motor (**31**) and whose inverting input is connected to a discriminating element (**84**) disposed in a phase circuit (**56**) of the step motor, said first comparator



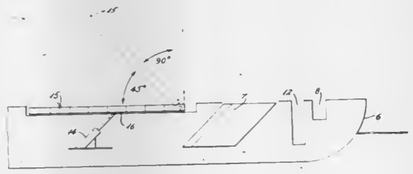
having an output connected to said phase circuit for controlling the turning on and off as well as the intensity of the phase current of each phase winding, a second comparator (**74**) having an output connected to said output of said first comparator, an inverting input connected to a reference voltage (U_R) and a non-inverting input connected via a resistor (**75**) to said reference voltage and via a condenser (**73**) to said outputs of said first and second comparators.

4,625,668

LAST DITCH DEFENCE PROCESS

William B. Fitch, Naval Chaplain School, NETC, Newport, R.I. 02841

Filed Nov. 14, 1983, Ser. No. 551,605
Int. Cl.⁴ B63G *9/04*
U.S. Cl. 114—14 **1 Claim**



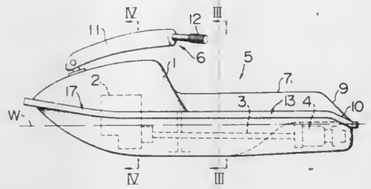
1. A mechanical projectile defence apparatus for a ship which comprises:
- a helicopter hangar;
- a helicopter deck;
- a secondary helicopter deck;
- a lower internal deck;
- a stage one shield in the form of two braced plates mounted at a right angle with respect to each other and being stored below the helicopter deck on the lower internal deck, the shield having a gear rack, the shield being deployed at a 45 degree angle with respect to the helicopter deck by a pinion gear mounted on a support on the lower internal deck;
- a stage two shield in the form of two steel nets and a fabric trap, the trap being three dimensional in shape and having air vents, the nets being located forward of the trap, the nets and trap extending to a level above the helo hangar when deployed, the nets and trap being stored in a locker with a lid and drains below the helicopter deck, and the nets and trap being deployed by two lift cylinders which cylinders are stored below the helicopter deck;
- a stage three shield in the form of a reinforced deck, the shield primarily functioning as the helicopter deck when stored and the shield being pivotally mounted to be deployed by a lift cylinder;
- and all three of said shields being deployed aft of the helicopter hangar with the stage two shield being the rearmost and the stage three shield being the foremost.

4,625,669

SMALL-SIZED MARINE CRAFT HAVING AN UPSTANDING PERIPHERAL FLANGE

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 28, 1985, Ser. No. 750,089
Claims priority, application Japan, Jul. 2, 1984, 59-136934
Int. Cl.⁴ B63H *11/02*
U.S. Cl. 114—56 **5 Claims**



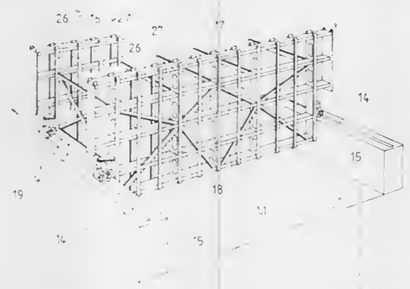
1. A small-sized marine craft comprising:
- a shell including a deck having a projecting seat portion protruding upright from a rear part of said deck, step portions on both sides of said seat portion, and stepped flange portions formed on outer extremities of said step portions, each of said stepped flange portions having an upright wall portion standing substantially upright from said outer extremity of said step portion and a horizontal wall portion extending laterally outwardly from a top of said upright wall portion, said stepped flange portions extending around and meeting at the stern of the craft to provide a continuous stepped flange at the stern;
- said seat portion and said step portions having downwardly sloping tail end portions at the stern of the craft meeting said continuous stepped flange;
- an engine mounted in a bow portion of said shell;
- a propulsion means provided on a stern portion of said shell and drivingly connected to said engine; and
- a steering handle device provided on a bow portion of said shell.

4,625,670

SHIP FOR CARRYING STANDARIZED CARGO UNITS

Jadwiga Igielska, Lerum, Sweden, assignor to Trans Consultants AB, Gothenburg, Sweden

Filed Dec. 19, 1984, Ser. No. 683,359
Int. Cl.⁴ B61D *3/16*
U.S. Cl. 114—78 **10 Claims**



1. In a ship having at least one deck for carrying standardized cargo units stacked vertically between spaced-apart, transverse guide members, the improvement comprising:
- a plurality of rails on the deck running in the longitudinal direction of the ship;
- at least one cargo unit support cassette supported on said rails, each cassette comprising a forward guide member, a rear guide member longitudinally spaced from said forward guide member, and longitudinal stays interconnecting said guide member having a length to space said guide members apart a distance to receive standardized cargo units therebetween, said guide members having front and rear sides; and
- anti-friction means on said cassette operatively engaging said rails to facilitate movement of said cassette along said longitudinal rails;
- each guide member comprising a frame structure of basically rectangular shape, and having transverse braces within each guide member extending from the lower corners of said basically rectangular frame structure diagonally inwards and upwards, and transversely acting releasable locking means mounted on said lower corners releasably engageable with bracket means on said deck for holding said cassette against unintentional movement transverse to and along said rails at any selected position.

4,625,671

SAILING SYSTEM

Thomas G. Nishimura, P.O. Box 90445, Honolulu, Hi. 96835

Filed Mar. 28, 1984, Ser. No. 594,464
Int. Cl.⁴ B63H *9/06*
U.S. Cl. 114—103 **12 Claims**



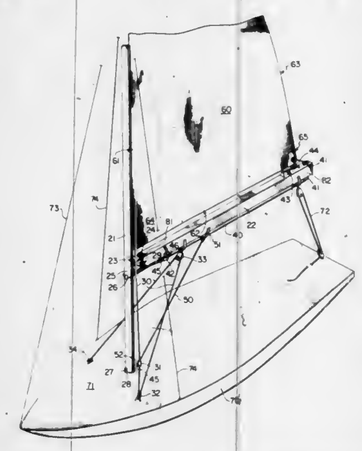
1. A sailing system for propelling body means having a mast mounted thereon, said sailing system comprising:
- A. a sail supportable on the mast and having a double paneled luff section;
- B. at least one socket comprising:
  - a forward portion in cooperative load transferring association with the mast to enable said socket to transfer loads to said mast and simultaneously swivel laterally relative to the mast; and
  - side flanges extending rearwardly from said forward portion and converging towards each other in the rearward direction to define a gap;
- C. a flexible batten extending along said sail and having a forward portion extending between the panels of the luff section, through the socket gap and into a corresponding socket, and having a rear end portion;
- D. wherein said socket further comprising forward restraining means bearing against the forward portion of said batten for restraining said batten against endwise movement in the forward direction while simultaneously enabling the forward end portion of said batten to shift laterally relative to said socket in response to the angle of attack of said sail;
- E. rear restraining means anchored to the sail leech for applying a selective load against the rear end portion of said batten to impart a compression load on said batten thereby loading the forward end portion of said batten against said socket and in turn loading said socket against the sail mast; and,
- F. wherein said forward restraining means of said socket comprise a hinge having a flexible loop extending forwardly from the gap of said socket into the interior of said socket, said loop receiving the forward end portion of said batten and restraining forward movement of said batten while being substantially free from lateral restraint of the forward end of said batten.

4,625,672

SAIL TENSION CONTROL MECHANISM

Gregg B. Jackson, 721 Upshur St. N.W., Washington, D.C. 20011

Filed Nov. 23, 1984, Ser. No. 674,032
Int. Cl.⁴ G63H *9/00*
U.S. Cl. 114—111 **21 Claims**



1. An automated sail tension control mechanism for a sailing vessel comprising:
- a mast;
- a boom with a forward end and a connection at said forward end to said mast;
- a vertical axis of pivot for said boom at said connection;
- at least one radial line restraining means on said boom substantially aft of said vertical axis of pivot;
- at least one eccentric line restraining means disposed substantially from said boom's vertical axis of pivot and within approximately 90 degree arcs from directly forward of said vertical axis of pivot; and
- at least one sail tension line led twice directly between said radial line restraining means and said eccentric line restraining means, once to each side of said mast, such that as said boom is sheeted in and out, on either side of the sailing vessel, said sail tension line is substantially tensioned and eased, respectively.

4,625,673

MOTION COMPENSATION MEANS FOR A FLOATING PRODUCTION SYSTEM

Frank R. Faller, Vancouver; Ross G. Clouston, Richmond, and Larry Bergholz, N. Delta, all of Canada, assignors to Novacorp International Consulting Ltd., Canada

Filed Jun. 12, 1984, Ser. No. 619,735
Claims priority, application Canada, Feb. 13, 1984, 447301
Int. Cl.⁴ B63B *21/50*
U.S. Cl. 114—230 **4 Claims**

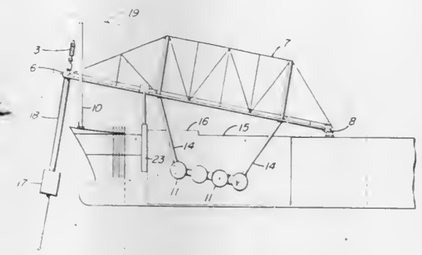
1. A self-contained system for providing passive motion compensation at a ship-riser interface of a riser-moored float-

ing production system or oil storage tanker, said system comprising:

a ship having a flooded foretank;

a trussed bridge structure mounted on the deck of said ship, said bridge structure being pivotally mounted to said deck at the aft end of the bridge structure and well inward of the bow end of said ship and having its fore end overhanging the bow of said ship;

said flooded foretank being located between the pivoted end of the bridge and the bow end of the ship;



a riser attached to the fore end of the bridge structure; stanchion means straddling the sides of the fore end of the bridge structure and being of sufficient height to include the vertical motion of the bridge structure;

float means rigidly secured to and suspended below said bridge structure and positioned within said flooded foretank of said ship for exerting an upward bouyant force on the bridge structure; and

a production line swivel in a gimbal mounted on the fore end of the bridge structure for connection to a production riser.

4,625,674

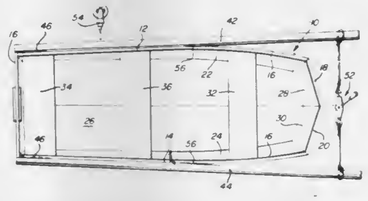
GUNNEL FLOTATION PIPE AND METHOD OF INSTALLATION

Jack B. Covington, 407 W. 1st North, Rexburg, Id. 83440

Filed Jul. 26, 1984, Ser. No. 634,608

Int. Cl.[4] B63B *43/14*

U.S. Cl. 114—360 **3 Claims**



1. The method of stiffening and providing flotation for an outwardly bowed aluminum gunnel of a boat, said method comprising:

A. placing a generally longitudinally straight aluminum tubular member along said gunnel with one end portion of said tubular member abutted against the outer side of one end portion of said gunnel and the other end portion of said tubular member tangent to the adjacent portion of the inwardly curving other end portion of said gunnel;

B. welding said one end portions to each other;

C. applying a moderate inward thrust on said tubular member other end portion sufficient to flex said tubular member into a configuration with a mid-portion thereof conforming to the curvature of at least the adjacent areas of the inwardly curving other end portion of said gunnel, but with less thrust than that which will flex said tubular member past the flexure limit thereof;

D. applying moderate heat along the flexed portion of said tubular member to allow the flexure stresses thereon to effect a permanent gradual bend or set in said tubular member to thereby allow a further length portion of said tubular member to abut and extend along said inwardly curving other end portion of said gunnel;

E. welding said flexed and heated further length portion of said tubular member to the opposing gunnel outer surfaces;

F. repeating steps C, D and E until substantially the full length of said gunnel has opposing portions of said tubular member welded thereto;

G. rendering said tubular member buoyant.

4,625,675

DIET MANAGEMENT DEVICE

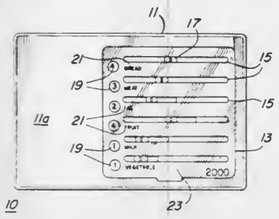
Harvey Rosenberg, 1552 Skyhawk Rd., Escondido, Calif. 92025

Continuation of Ser. No. 565,585, Dec. 27, 1983, abandoned.

This application Oct. 24, 1985, Ser. No. 790,795

Int. Cl.[4] G09F *9/45*

U.S. Cl. 116—324 **7 Claims**



1. A hand-held portable diet management device for use relative to a plurality of predetermined food groups for a predetermined diet, comprising:

a housing;

respective manually displaceable indicators for each of the predetermined food groups mounted on said housing and disposed for independent displacement along distinct paths from a common origin, the displacement of each of said indicators from said common origin being respectively indicative of food amounts; and

a removable card with respective encoded slots for each of the predetermined food groups for limiting the respective maximum displacements of each of said indicators from the common origin to correspond to the respective maximum amounts of foods allocated for the predetermined food groups of a selected daily calorie intake for the predetermined diet, said indicators being displaced to respective maximum displacements as defined by said encoded slots for indicating the daily maximum allowable amounts of food allocated for each predetermined food group without reference to dietary tables by the user and further monitoring pursuant to food intake the amounts of food not yet consumed, within the selected daily calorie intake, for each predetermined food group, said removable card being selectable from a plurality of removable cards, each having differing encoded slot lengths for any one good group and respectively corresponding to different predetermined daily calorie intakes, said removable card further being removed and replaced without disassembly of the remainder of the diet managment device.

4,625,676

DEVELOPING DEVICE

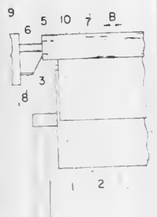
Koji Sakamoto; Toshio Kaneko, both of Tokyo; Fuchio Kanno, and Wataru Yasuda, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Feb. 16, 1983, Ser. No. 466,928

Claims priority, application Japan, Feb. 17, 1982, 57-19925[U]; Jun. 3, 1982, 57-94051; Jun. 4, 1982 57-94778; Jun. 16, 1982, 57-101965; Jun. 24, 1982, 57-93678[U]

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **9 Claims**



1. A developing device for developing an electrostatic latent image formed on an image bearing member using magnetic toner particle, comprising:

toner carrier means for carrying said magnetic toner particles along a predetermined path, a part of which defines a developing section where said electrostatic latent image is developed by said magnetic toner particles;

supplying means for supplying said magnetic toner particles to said toner carrier means;

means for generating a magnetic field to be applied to said toner carrier means for causing said magnetic toner particles to be attracted to said toner carrier means while transported along said predetermined path;

pressure means disposed between said supplying means and said developing means in pressure contact with said toner carrier means and directed in a direction counter to the movement of said magnetic toner particles at the contact between said pressure means and said toner carier means, for forming a thin film of magnetic toner particles which are charged to a predetermined polarity; and

moving means for moving said pressure means in the direction perpendicular to the relative moving direction between said toner carrier means and said pressure means while maintaining said pressure means in pressure contact with said toner carrier means.

4,625,677

APPARATUS FOR COATING AND POLISHING A MICROPIPETTE

Erwin Neher, Edaigehausen, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,192

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—713 **10 Claims**

1. An apparatus for coating and heat polishing a micropipette having a shank portion and a tip end, said apparatus comprising

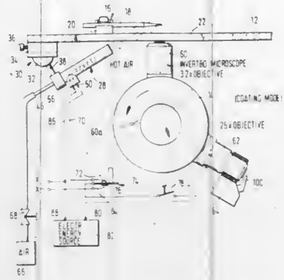
(a) a microscope having a stage and an optical system, said optical system comprising a relatively low power objective and a relatively high power objective which are adapted to be positioned selectively in an operative relationship with respect to said stage,

(b) first means for supporting and positioning a micropipette on said stage so that it can be coated and observed through either objective;

(c) an air gun adapted to apply selectively hot or cold air jets to said pipette on said stage;

(d) heat polishing means including an electrically heatable filament;

(e) second means for supporting said filament, said second means being operatively associated to said high power



objective to position said filament proximate to the tip end of said micropipette supported on said stage when said high power objective is moved in its operative position with respect to said stage.

4,625,678

APPARATUS FOR PLASMA CHEMICAL VAPOR DEPOSITION

Yoshimi Shioya, Yokohama; Mamoru Maeda, Tama; Yasushi Ohyama, Kodaira, and Mikio Takagi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

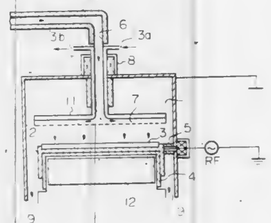
Continuation of Ser. No. 498,561, May 26, 1983, abandoned.

This application Jun. 3, 1985, Ser. No. 740,306

Claims priority, application Japan, May 28, 1982, 57-90678

Int. Cl.[4] H01L *21/20;* **C23C** *13/08*

U.S. Cl. 118—723 **6 Claims**



1. An apparatus for plasma chemical vapor deposition on a base body using a gas of a compound which is liquid or solid at room temperature, the compound gas being converted into a plasma state, comprising:

a plasma treating chamber having an evacuation opening to maintain the interior of said plasma treating chamber at a desired reduced pressure;

a gas feed pipe extending from the exterior of said plasma treating chamber to the interior of said plasma treating chamber, for introducing the compound gas into said plasma treating chamber, said gas feed pipe having a gas outlet member in the interior of said plasma treating chamber;

two electrodes, disposed substantially parallel to each other in said plasma treating chamber, for applying high frequency electric power to generate plasma, one of said two electrodes being a susceptor for supporting the base body and the other of said two electrodes being said gas outlet member;

a heating jacket in heat conductive contact with at least the portion of said gas feed pipe in the interior of said plasma treating chamber and in heat conductive contact with said

gas outlet member, said heating jacket for heating said gas feed pipe to prevent the compound gas from condensing or solidifying, said heating jacket including:

a bottom plate in heat conductive contact with said gas outlet member, and having a first cavity; and

a double cylindrical member having a second cavity connected to said first cavity, said double cylindrical member extending from said bottom plate and being in heat conductive contact with said gas feed pipe; and

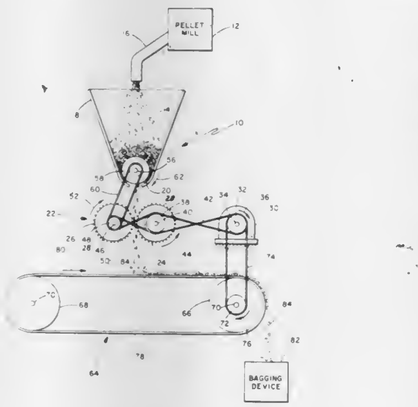
a heating cover in heat conductive contact with a portion of said gas feed pipe on the exterior of said plasma chamber.

4,625,679

BEDDING PRODUCT FOR ANIMALS AND METHOD OF MAKING SAME

Robert V. Hill, 2902 Park St., Middleton, Wis. 53562

Filed Aug. 14, 1984, Ser. No. 640,524
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—1 **17 Claims**



1. A method of making an animal bedding product comprising the step of partially rupturing or tearing apart cellulose pellets to provide fluffed particles having a lesser density than said pellets.

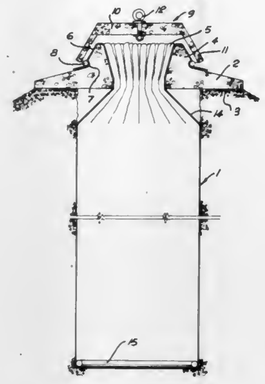
4,625,680

WATER CONSERVATION MEANS

Lawrence J. Hogan, 69 Berowra Waters Road, Berowra, New South Wales, Australia

Filed Jul. 20, 1984, Ser. No. 632,864
Claims priority, application Australia, Jul. 27, 1983, PG0507
Int. Cl.[4] B65G *5/00*
U.S. Cl. 119—74 **20 Claims**

1. A storage reservoir for fluent material comprising a bore-hole of circular cross-section extending into the ground from the surface thereof, the bore-hole mouth periphery being adjacent the ground surface, an annular collar structure disposed at the mouth of the bore-hole with a peripheral radially outermost portion of said collar structure surrounding and extending beyond the periphery of the mouth of the bore-hole, and disposed adjacent the ground surface, and a pre-formed tube made from plastic film with one closed end disposed in the



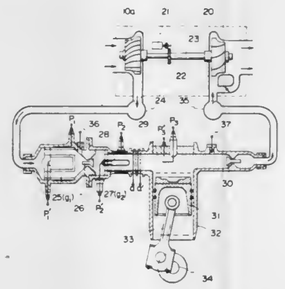
bore hole as a liner therefore and with its other open end secured to said collar structure.

4,625,681

METHOD OF OBTAINING MECHANICAL ENERGY UTILIZING H_2O PLASMA GENERATED IN MULTIPLE STEPS

Uozumi Sutekiyo, Hachiogi, Japan, assignor to Sutabiraiza Company, Limited, Saitama, Japan

Filed Feb. 7, 1985, Ser. No. 699,404
Claims priority, application Japan, Feb. 10, 1984, 59-21987
Int. Cl.[4] F02B *43/08*
U.S. Cl. 123—3 **6 Claims**



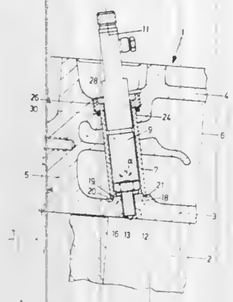
1. A method of obtaining mechanical energy utilizing H_2O - plasma generated in multiple steps, which comprises: a first step of generating H_2O gas using a gasifier, and transforming the H_2O gas to a plasma using an electric discharge, said plasma having a state of energy; a second step of intensifying the state of energy of the plasma of the first step, to a level such that the plasma with the intensified state of energy is ready to generate a plasma jet, by using high voltage to produce a more intensified electrical discharge than that in the first step and by high-frequency induction heating; and a third step of generating an ultra-high temperature plasma jet by exposing the plasma of the second step to periodic modulation of the high voltage for the second electrical discharge, and causing a high-pressure thermal explosion reaction by compression of the ultra-high temperature plasma jet in synchronization with the modulation, and thereby converting the energy produced by a plasma reaction at the ultra-high temperature in the plasma jet into mechanical energy.

4,625,682

CYLINDER HEAD

Werner Dietrich, Heppenheim, and Gernot Langeloth, Mannheim, both of Fed. Rep. of Germany, assignors to Motoren-Werke Mannheim Aktiengesellschaft vorm. Renz Abt. stationärer Motorenbau, Mannheim, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 710,151
Int. Cl.[4] F01P *3/16*
U.S. Cl. 123—41.31 **7 Claims**



1. In a cylinder head for an internal combustion engine, having at least one receptacle socket, penetrating a cooling chamber, for a spark plug or an injection valve, which socket rests tightly at one end thereof, with a frustoconical seating face, against a corresponding seating face of a seat on a lower cylinder head wall, and at its other end is retained in a cylinder head wall and pressed axially against the seat, the improvement wherein

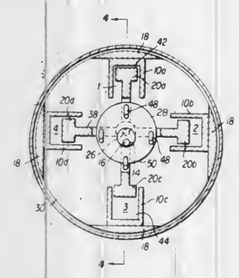
the seating face (**19**) on the receptacle socket (**7** or **8**) is a female cone and the corresponding seating face (**18**) on the seat (**16** or **17**) is embodied as a male cone, and the end (**21**) of the receptacle socket (**7** or **8**) is open towards the cooling chamber (**6**).

4,625,683

ROTATING CYLINDER INTERNAL COMBUSTION ENGINE

Roberto L. Bonfilio, 47-25 198 St., Auburndale, N.Y. 11358

Division of Ser. No. 483,602, Apr. 11, 1983. This application Apr. 16, 1985, Ser. No. 723,862
Int. Cl.[4] F02B *57/00*
U.S. Cl. 123—44 R **20 Claims**



1. In a rotary internal combustion engine, having:

a plurality of radially aligned cylinders collectively supported in a housing for common rotation about a first axis

a piston block including a piston for each said cylinder slidable within each said cylinder, said piston block being rotatable about a second axis displaced from and parallel to said first axis;

slide means coupled with said plurality of radially aligned cylinders;

means coupled with said slide means linking said cylinders with said piston block to rotate said cylinders and said pistons together while moving said cylinders transversely of said first axis for rotation of said cylinders and pistons together for producing reciprocal motion of said pistons in said cylinders;

an offset crank for each said cylinder;

a piston plate coupled for rotation with said piston block, one end of said offset crank being coupled with said piston plate; and

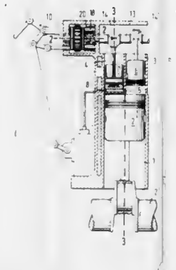
a cylinder plate coupled for rotation with said cylinders, the other end of said offset crank being coupled with said cylinder plate whereby rotation of said cylinders and said cylinder plate imparts rotation to said piston plate and said piston block.

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INTERNAL COMBUSTION ENGINE

Gilbert L. Ch. H. L. Van Avermaete, 2 Um Bourbierg, Hellange 3335, Luxembourg

PCT No. PCT/BE83/00024, § 371 Date Aug. 30, 1984, § 102(e) Date Aug. 30, 1984, PCT Pub. No. WO84/02745, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 28, 1983, Ser. No. 642,127
Claims priority, application Luxembourg, Jan. 4, 1983, 84574
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—48 A **4 Claims**



1. A controlled ignition, mixed combustion cycle engine, the engine having a cylinder and a piston therein, comprising

means forming two variable-volume chambers partitioned so as to be separated from each other, one of said chambers being a combustion chamber and the other of said chambers being an air reserve chamber, said chambers being associated with the cylinder and located adjacent an end of the cylinder corresponding to a top dead-center position of the piston in the cylinder,

means for operatively communicating said chambers with each other,

two pistons, one of said pistons respectively movably disposed in respective of said chambers,

a small crankshaft,

crank pins staggered by 180° from each other on said small crankshaft and operatively connected to said pistons of said chambers so as to transmit an alternating movement to said pistons of said chambers,

a cam shaft operatively connected to said cylinder,

said small crankshaft together with said cam shaft forms a kinematic chain, and

a clutch having a clutch casing in said kinematic chain, and

said clutch includes, in the clutch casing, a transmission input gearing driven by the cam shaft without being locked to said cam shaft but connected to said cam shaft by spiral shaft grooves, and disposed in a common plane with said transmission input gearing, an output gearing driven by said input gearing and being connected to said small crankshaft by spiral shaft grooves without being locked to said small crankshaft.

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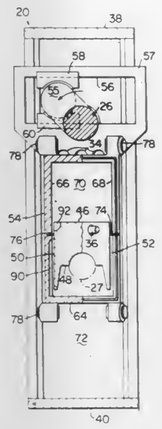
MACHINE WITH DOUBLE ACTING BOX PISTON

Craig S. Beshore, 753 Puma Canyon La., Glendora, Calif. 91740

Filed Nov. 1, 1984, Ser. No. 667,416

Int. Cl.[4] F02B *59/00*

U.S. Cl. 123—50 R **20 Claims**



1. A machine having at least a first working chamber formed by:

a machine case with:

first and second stationary sidewall surfaces facing each other, each surface of said first and second stationary sidewall including:

a pair of bearing surfaces thereon; and

a first head surface extending between said first and second stationary sidewall surfaces; and

a first generally box-shaped reciprocating piston having:

a first end interior surface facing said first head surface;

first and second reciprocating sidewall surfaces extending between said first and second stationary sidewall surfaces and between said first end interior surface and said first head surface to define a first working chamber;

eight corners, each corner having:

an adjustable, outwardly facing, bearing pad thereon positioned for engagement with one of said bearing surfaces; and

first and second opposite rectangular side edges, said first opposite rectangular side edge facing said first stationary sidewall surface and being slightly spaced therefrom, and second opposite rectangular side edge facing said second stationary sidewall surface and being slightly spaced therefrom, said first and second opposite rectangular side edges each including:

seal means which contact said first and second stationary sidewall surfaces respectively to prevent flow thereabout.

4,625,686

COMPACT FRESH-GAS INTAKE SYSTEM FOR ENGINES WITH COMBINATION SUPERCHARGING

Heribert Kubis, Nuremberg, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,220

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344950

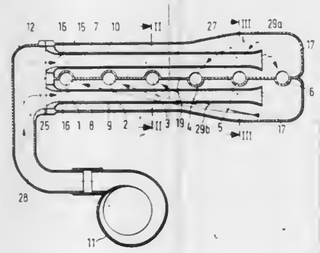
Int. Cl.[4] F02B *27/00*

U.S. Cl. 123—52 MB **12 Claims**

1. A fresh-gas intake system for turbocharged, in-line, six-cylinder bank of an internal combustion engine, with said system being disposed between and communicating with, a supercharging device and inlet ports of said cylinders; said system comprising:

two resonance tanks, each of which respectively communicates with said inlet ports of three different adjacent cylinders; each of said resonance tanks having a volume being in a range of between one half to ten times a total volume of the three cylinders with which it communicates; each of said resonance tanks having a length and a common partition wall that extends over all of said inlet ports, all of said inlet ports being disposed in-line of all of said cylinders of said given bank of cylinders;

two resonance pipes, a respective one of which is associated with and disposed within each of said resonance tanks; each of said resonance pipes having an outlet opening located along a common plane, which opens into its associated resonance tank, and an inlet opening located along a common plane, which communicates with the discharge



side of said supercharging device for receiving fresh gas therefrom; of each of said resonance pipes having an effective length corresponding to at least eight times a diameter of a circle having a circular which is equivalent to that of of said resonance pipe; said resonance tanks and said resonance pipes extending in a common direction along a longitudinal axis of said engine, with the inlet ports being open to their respective resonance tank along a plane extending between said resonance pipes which contains said common partition wall; and

supply means, in a form of at least one supply cover, to establish said communication with low-loss flow conditions between said supercharging device and said inlet openings of said resonance pipes, so that fresh gas can be delivered from said supercharging device to said resonance pipes with need for a plenum tank being eliminated and with introduction of the resonance pipes as well as the supply of the fresh gas being facilitated.

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INTAKE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Koichi Hatamura, and Koji Asanomi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 653,765, Sep. 24, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 815,287

Claims priority, application Japan, Sep. 24, 1983, 58-176777; Oct. 28, 1983, 58-202045; Oct. 28, 1983, 58-202046

Int. Cl.[4] F02B *31/00*

U.S. Cl. 123—52 M **16 Claims**

1. An intake arrangement for an internal combustion engine having a combustion chamber including a cylinder having an axial and a lateral direction and a cylinder head, comprising:

first and second intake ports for supplying intake gases into said combustion chamber, which open into said combustion chamber;

a plurality of intake valves for opening and closing said intake ports, respectively;

a main intake passage having a centerline constituting a main-axis;

a shutter valve for opening and closing said main intake passage, which is provided in said main intake passage;

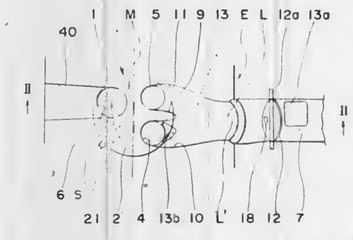
said shutter valve being adapted to be held in a closed state when the amount of intake gases is small and to be opened when the amount of intake gases is increased;

a throttle valve in said main intake passage upstream of said shutter valve with respect to a direction of flow of gases towards the combustion chamber;

said main intake passage being branched, at a branch point disposed downstream of said shutter valve, into first and second branch intake passages such that said first and second branch intake passages are, respectively, connected to said first and second intake ports;

said first and second branch intake passages being on opposite sides of said center line; and

means for causing a swirling flow of the gases in a circumferential direction of the combustion chamber comprising an auxiliary intake passage having an upstream end opening into the main intake passage at a location upstream of the shutter valve, and also having a downstream end opening immediately adjacent said first intake port only into said first branch intake passage, the cross-section of said downstream end of said auxiliary intake passage being short in the axial direction of said cylinder and long in the lateral direction, said auxiliary intake passage having a portion which extends from a side of said center line on which said second intake port is located and crosses said center line to end at the downstream end of said auxiliary intake passage, said upstream end of said auxiliary intake passage located downstream of said throttle valve in a lower wall of said main passage.



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FUEL SUPPLYING SYSTEM FOR INTERNAL COMBUSTION ENGINE

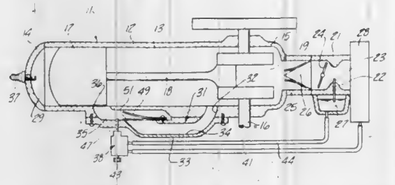
Hidekazu Takayasu, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 4, 1985, Ser. No. 741,005

Claims priority, application Japan, Jun. 5, 1984, 59-113823

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 B **20 Claims**



1. A charge forming arrangement for an internal combustion engine comprising an induction passage for delivering a charge to a combustion chamber of said engine, reed-type check valve for precluding flow through said induction passage until pressure thereacross exceeds a predetermined value, a fuel bowl adapted to contain a source of fuel at substantive atmospheric pressure, and a fuel discharge nozzle for delivering fuel into said induction passage between said combustion chamber and said check valve means, and conduit means for delivering fuel from said fuel bowl to said fuel discharge nozzle for discharge of fuel therefrom in response to a pressure difference between said fuel bowl and an outlet of said discharge nozzle wherein said fuel discharge nozzle is positioned contiguous to a periphery of a tip of said reed-type valve.

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INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS

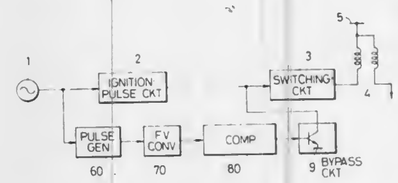
Satoshi Komurasaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 463,418, Feb. 3, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,384

Claims priority, application Japan, Feb. 3, 1982, 57-16709; Feb. 3, 1982, 57-16710

Int. Cl.[4] F02P *5/145*

U.S. Cl. 123—335 **7 Claims**



1. An internal combustion engine ignition system, of the type including an ignition coil, comprising; pulse generator means for generating pulses of a predetermined width in response to an ignition signal, ignition pulse circuit means for generating ignition pulses in response to said ignition signal, converter means for converting said pulses of said pulse generator means into waveforms of a variable level, comparator means for comparing said variable level with a reference value, and means responsive to an output of said comparator for reducing an output voltage of said ignition coil in a graduated manner, said comparator responsive means including means for increasingly inhibiting the supply of power to said ignition coil in response to increasing engine r.p.m. above a predetermined engine r.p.m. level, by increasingly shortening an effective period of said ignition pulses.

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SYSTEM FOR CONTROLLING AN ENGINE AND METHOD THEREFOR

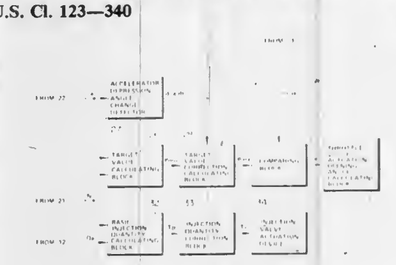
Tatsuo Morita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 2, 1985, Ser. No. 761,842

Claims priority, application Japan, Aug. 3, 1984, 59-163636; Aug. 6, 1984, 59-164589; Aug. 8, 1984, 59-121538[U]

Int. Cl.[4] F02D *41/14, 43/00*

U.S. Cl. 123—340 **20 Claims**



1. A system for controlling an engine, comprising:

(a) first means for adjusting an intake air quantity supplied to the engine according to an opening angle thereof;

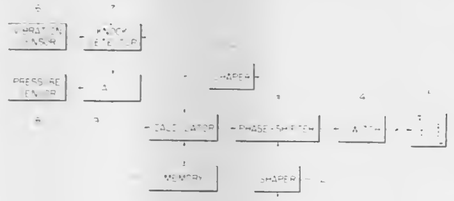
(b) second means for actuating said first means to adjust the opening angle according to an angular displacement thereof;
(c) third means for detecting a characteristic value corelative to an engine output;
(d) fourth means for detecting the angular displacement of said second means;
(e) fifth means for detecting an engine speed;
(f) sixth means for calculating a target value of the engine output corelative value from the angular displacement of said second means and engine speed detected by said fourth and fifth means;
(g) seventh means for comparing the calculated target value of the engine output corelative value by said sixth means with the detected value of engine output corelative value by said third means;
(h) eighth means for calculating the opening angle value of said first means on the basis of a comparison result of said seventh means; and
(i) ninth means for further actuating said first means to adjust the opening angle of said first means according to the calculated opening angle of said eighth means in addition to the adjustment of the opening angle of said first means by means of said second means so that the detected value of the engine output corelative value by said third means coincides with the calculated target value thereof by said sixth means.

4,625,691

KNOCK SUPPRESSION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Satoshi Komurasaki; Atsushi Ueda; Yoshinobu Morimoto, and Youichi Kadota, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1985, Ser. No. 711,061
Claims priority, application Japan, Mar. 15, 1984, 59-51627; Mar. 15, 1984, 59-51628; Mar. 15, 1984, 59-51629
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—425 **12 Claims**



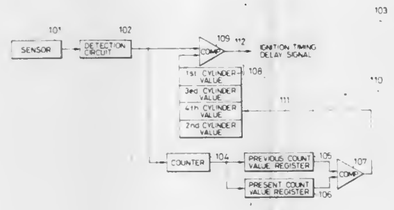
1. A knock suppression system for an internal combustion engine comprising:
means for detecting the load condition of said eninge;
means for detecting the rotating speed of said engine;
means for detecting a knock signal at a level corresponding to the knock intensity of said engine;
means for determining whether the operating condition of said engine is steady;
storage means for storing a reference-controlled variable for the suppression of knocks corresponding to the level of said knock signal when it is determined by said determining means that the operating condition of said engine determined from said rotating speed and said load condition is steady;
means for correcting said reference-controlled variable according to the magnitude of said knock signal including means for determining whether said knock signal is larger than a predetermined value; and
means for retarding an ignition signal to be applied to the ignition coil of said engine according to said corrected reference-controlled variable.

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APPARATUS FOR CONTROLLING IGNITION TIMING FOR INTERNAL COMBUSTION ENGINE

Yuichi Kashimura, Katsuta, and Noboru Sugiura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,770
Claims priority, application Japan, Mar. 23, 1984, 59-55710
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—425 **9 Claims**



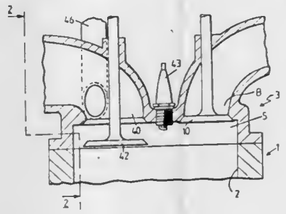
1. An apparatus for controlling ignition timing for an internal combustion engine comprising a knock sensor, a memory into which a knock evaluation reference value is written, an evaluation circuit which produces an ignition timing angle delay signal when the signal form said knock sensor exceeds said knock reference value written into said memory, means for gradually advancing the angle of ignition timing for a specific cylinder, and means for re-writing the knock evaluation reference value of said memory when a knock is generated by said advancing means, wherein said means for gradually advancing the angle of ignition timing for a specific cylinder is operated when the engine revolution number and engine load are within a preset area after a reference crank angle signal from a crank angle sensor is generated.

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INTERNAL COMBUSTION ENGINE

John M. Tribey, 89 Kalinda Road, Ringwood, Victoria, Australia

Continuation of Ser. No. 463,452, Jan. 21, 1983, Pat. No. 4,558,670, which is a continuation-in-part of Ser. No. 202,030, Oct. 29, 1980, abandoned, which is a division of Ser. No. 861,929, Dec. 19, 1977, Pat. No. 4,249,495. This application Jul. 26, 1985, Ser. No. 759,530
Claims priority, application Australia, May 29, 1981, 9111/81
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] F02B *17/00*
U.S. Cl. 123—432 **8 Claims**



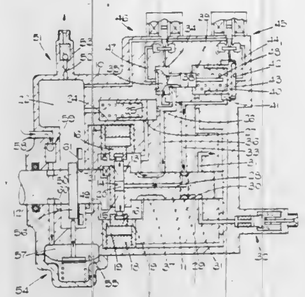
1. A method of operating an internal combustion engine having a cylinder and piston reciprocally mounted therein, said method including egressing combustion products from the cylinder during an exhaust stroke, admitting to the cylinder a tangential stream of air only during said exhaust stroke at a pressure and direction relative to the cylinder such that said stream of air circulates against the cylinder wall, introducing a combustible mixture of a working fluid and fuel into said cylinder during an induction stroke, maintaining said stream of air and said combustible mixture substantially stratified during a compression stroke, in which the engine includes an exhaust duct and an exhaust valve for opening and closing same to said cylinder and in which the step of admitting to the cylinder a tangential stream of air includes routing the air stream through an opening, as seen in plan, transversely into said exhaust duct adjacent to and generally tangentially of said cylinder wall, and avoiding exhaust flow into said opening when said exhaust valve is open by providing the opening with a shielding means upstream in the exhaust flow from said opening.

4,625,694

FUEL PUMPING APPARATUS

Anthony J. Adey, Sevenoaks, and Dorian F. Mowbray, Burnham, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,371
Claims priority, application United Kingdom, Jul. 13, 1984, 8417861
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—450 **7 Claims**



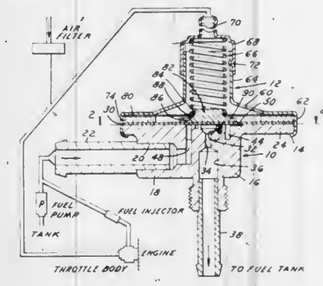
1. A fuel pumping apparatus for supplying fuel to a compression ignition engine comprising a housing, a rotary distributor member mounted in the housing, a drive shaft coupled to the distributor member, said drive shaft extending to the exterior of the housing and passing through a fuel inlet chamber defined in the housing, a plunger mounted within a bore formed in the distributor member, cam means for positively reciprocating the plunger in the bore in timed relationship with the associated engine in use, said plunger defining with said bore a first pump chamber, first passage means in the distributor member and housing for conveying fuel displaced from said first pump chamber to outlet ports in turn, said outlet ports in use being connected to the injection nozzles of the associated engine respectively, a second pump chamber in part defined by said plunger surrounding the distributor member, the volume of said second pump chamber increasing as the volume of the first pump chamber descreases and vice versa, second passage means in the distributor member and housing through which fuel displaced from said second pump chamber can flow to said first pump chamber, third valve means for connecting said fuel inlet chamber with said second pump chamber while the volume of the second chamber is increasing, said third valve means comprising channels in said drive shaft which establish communication between the lower portion of the inlet chamber in the vicinity of the drive shaft and the lower portion of the second pump chamber and between a higher position in the inlet chamber in the vicinity of the drive shaft and the upper portion of the second pump chamber, a diaphragm pump mounted on the housing, the diaphragm pump including a chamber in part defined by a diaphragm, a spring loading the diaphragm to reduce the volume of the chamber, a cam carried on said drive shaft for urging the diaphragm against the action of the spring, said cam being arranged to allow movement of the diaphragm by the spring during the time the volume of said second pump chamber is increasing, and fourth valve means operable to connect the chamber of the diaphragm pump with a fuel inlet during movement of the diaphragm by the cam and with said inlet chamber during movement of the diaphragm of the spring.

4,625,695

FUEL PRESSURE REGULATOR

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Mar. 28, 1985, Ser. No. 717,017
Int. Cl.[4] F02M *37/04*
U.S. Cl. 123—463 **3 Claims**



1. A pressure regulator for use in a fuel system for internal combustion engines utilizing a fuel pump and an air supply which comprises:
(a) a base housing having a fuel inlet to receive fuel under pressure from a fuel pump and having a fuel by-pass outlet,
(b) a valve seat formed in a central portion of a flat surface of said base housing between said inlet and said outlet,
(c) a first flexible diaphragm overlying said valve seat and said surface of said base housing exposed on one side to fuel pressure in said inlet,
(d) a rigid plate having a flat base surface centrally disposed on the other side of said first diaphragm surrounded by radially free space on said diaphragm and overlying said valve seat, said valve seat in said surface occupying a defined central area in said surface, and said plate having a circumference greater than said defined area wherein the edge of said plate will fulcrum on said surface outside said valve seat area to open said valve area, and
(e) a spring means bearing on said plate to urge said diaphragm and said plate toward said seat.

4,625,696

PRESSURE REGULATOR FOR A PETROL INJECTION SYSTEM

Dario Radaelli, Legnano, Italy, assignor to Alfa Romeo Auto S.p.A., Napoli, Italy

Filed Feb. 12, 1985, Ser. No. 700,953
Claims priority, application Italy, Feb. 23, 1984, 19779 A/84
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—463 **5 Claims**

1. A pressure regulator for the petrol circuit of an internal combustion engine injection system provided with intake ducts and injectors disposed in said intake ducts, said circuit comprising a petrol tank, a pump and a delivery duct connected to said injectors, the regulator comprising a casing provided with a first duct for petrol inlet and connected to said delivery duct, a second duct for petrol discharge and connected to said tank, and a third duct connected to at least one engine intake duct, the regulator also comprising a valving member engaged with a sized port disposed in said petrol discharge duct, said valving

member being connected to a diaphragm, one face of which is subjected to the inlet petrol pressure, its other face being subjected to a pressure which is a function of the engine intake pressure, the regulator being characterised in that said valving member is also operationally connected to an aneroid capsule also subjected to said pressure which is a function of the engine



intake pressure, said third duct having a sized port, and there is a fourth duct connected to atmosphere and having a manually adjustable variable port wherein pressure of petrol to said injectors is a controlled function of intake pressure and atmosphere pressure reacting on both said diaphragm and said aneroid capsule.

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AUTOMOTIVE ENGINE CONTROL SYSTEM CAPABLE OF DETECTING SPECIFIC ENGINE OPERATING CONDITIONS AND PROJECTING SUBSEQUENT ENGINE OPERATING PATTERNS

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 30, 1984, Ser. No. 666,367

Claims priority, application Japan, Nov. 4, 1983, 58-205927; Nov. 4, 1983, 58-205928; Nov. 4, 1983, 58-205929

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—478 **27 Claims**



1. An electronic engine control system for an internal combustion engine comprising:

monitoring means for monitoring a preselected engine operating parameter and for producing a first signal indicative thereof;

means for sampling said first signal and, based on said sampled first signal, recording engine operation pattern data indicative of an actual variation of said preselected engine operating parameter with time;

model means for presetting a model pattern corresponding to a preselected engine operating condition, said model pattern including a portion corresponding to a model variation of said preselected engine operating parameter with time;

comparing means, responsive to said sampling means and said model means, for comparing said engine operation pattern data and said portion of said model data, for determining whether said engine operation pattern data approximately matches said portion of said model pattern, and for producing a match indication if a match is determined; and

control means, responsive to said sampling means and said comparing means, for performing engine control and fail safe procedures on the basis of said first signal in the absence of said match indication, and on the basis of said first signal and said model pattern in the presence of said match indication.

4,625,698

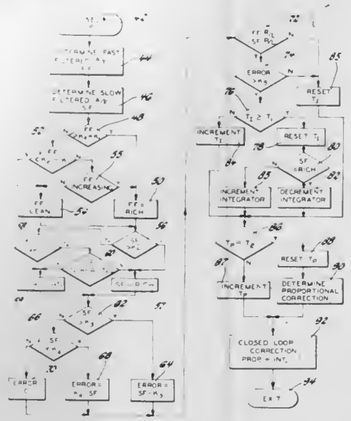
CLOSED LOOP AIR/FUEL RATIO CONTROLLER

Robert H. Jamrog, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1985, Ser. No. 768,638

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **4 Claims**



1. An air-fuel mixture control system for an internal combustion engine having combustion space into which an air-fuel mixture is drawn to undergo combustion and having an exhaust passage into which combustion gases from the combustion space are discharged, the system comprising in combination:

a mixture supply means for supplying a mixture of air and fuel to the combustion space;

a sensor responsive to the combustion gases in the exhaust passage for generating an air/fuel ratio signal related to the value of the air/fuel ratio of the mixture supplied by the mixture supply means;

filter means responsive to the air/fuel ratio signal for generating a fast filtered air/fuel ratio signal and a slow filtered air/fuel ratio signal;

means responsive to the fast filtered air/fuel ratio signal for providing a proportional adjustment to the ratio of the air-fuel mixture supplied by the mixture supply means in a direction tending to produce a predetermined air/fuel ratio; and

means responsive to the slow filtered air/fuel ratio signal for providing an integral adjustment to the ratio of the air-fuel mixture supplied by the mixture supply means in a direction tending to produce the predetermined air/fuel ratio, the combined proportional and integral adjustment providing for a stable ratio of the air-fuel mixture with minimum amplitude variation.

4,625,699

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

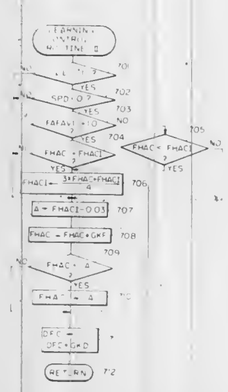
Nobuyuki Kobayashi, and Takashi Hattori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1985, Ser. No. 760,658

Claims priority, application Japan, Aug. 3, 1984, 59-163497

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **10 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of:

calculating a base fuel amount in accordance with predetermined parameters of said engine;

detecting an air-fuel ratio of said engine;

calculating an air-fuel ratio correction amount in accordance with the detected air-fuel ratio so that the air-fuel ratio of said engine is brought close to a predetermined air-fuel ratio;

calculating a mean value of said air-fuel ratio correction amount;

calculating a learning correction amount so that the mean value of said air-fuel correction amount is brought close to a predetermined value;

setting a lower limit upon said learning correction amount;

determining whether or not said engine is in an idling state;

determining whether or not the mean value of said air-fuel ratio correction amount is larger than the predetermined value, when said engine is in an idling state;

determining whether or not said learning correction amount is larger than a lower limit reference value for said lower limit, when said engine is in an idling state;

renewing said lower limit reference value in accordance with said learning correction amount, when the mean value of said air-fuel ratio correction amount is larger than the predetermined value and said learning correction amount is larger than said lower limit reference value; and

adjusting the actual air-fuel ratio in accordance with said base fuel amount, said air-fuel ratio correction amount, and said learning correction amount.

4,625,700

PLUNGER PUMP FOR DELIVERING LIQUIDS ESPECIALLY FUELS, FOR RECIPROCATING INTERNAL COMBUSTION ENGINES

Ludwig Elsbett, and Günter Elsbett, both of Industriestr. 14, D 8543 Hilpoltstein, Fed. Rep. of Germany

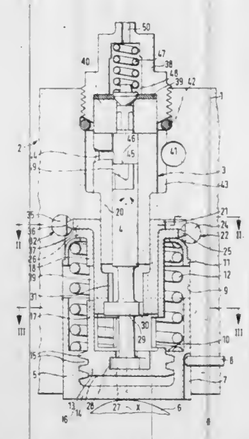
Filed Feb. 9, 1982, Ser. No. 347,172

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105205

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—500 **9 Claims**

1. A plunger pump for delivering liquids, particularly for delivering fuels to reciprocating internal combustion engines, comprising a casing having an outlet; a barrel in said casing; a plunger reciprocably and angularly displaceably installed in said barrel and arranged to expel liquid via said outlet while performing a delivery stroke in said barrel and to move relative to said barrel without expulsion of liquid while performing a lift stroke preceding the respective delivery stroke; a tappet reciprocably installed in said casing and indirectly coupled to said plunger to impart reciprocatory movements thereto; means for reciprocating said tappet including rotary cam means for moving the tappet axially in a direction to cause said plunger to perform forward strokes each of which includes a lift stroke followed by a delivery stroke, and spring means yieldably opposing the movement of said tappet under the action of said cam means, said casing and said barrel having means defining a path for the flow of liquid into said barrel while said plunger performs a return stroke under the action of said spring means and for the flow of liquid from said barrel into said outlet when the plunger performs a delivery stroke,



said plunger having a control edge arranged to alter the volume of liquid, which is expelled via said outlet during a delivery stroke of said plunger, in response to angular displacement of said plunger in said barrel; first drive means for changing the angular position of said plunger in said barrel including a first sleeve having at least one first jaw and axially movably guiding said plunger, at least one second jaw provided on said plunger and arranged to receive torque from said first jaw, and means for rotating said sleeve; and second drive means for changing the axial position of said plunger relative to said tappet to thereby vary the lift and return strokes of the plunger, including a second sleeve having at least one third jaw, a one-piece pressure member coupled with said plunger for axial movement therewith and having first threads mating with second threads provided on said tappet and at least one fourth jaw arranged to receive torque from said third jaw, and means for rotating said second sleeve to thereby move said pressure member and said plunger axially of said tappet by way of said third jaw and said threads.

4,625,701

FUEL SYSTEM

Peter J. Bartlett, Castle Hedingham, and Peter F. Bradford, Sudbury, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Feb. 13, 1985, Ser. No. 701,210

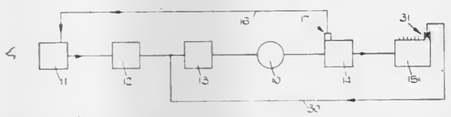
Claims priority, application United Kingdom, Mar. 9, 1984, 8406270

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—514 **11 Claims**

1. A fuel supply system for a compression ignition engine comprising a low pressure pump having an inlet connected to a fuel supply tank, a high pressure fuel pump including a hous-

ing, a fuel filter connected between an outlet of the low pressure pump and an inlet of the high pressure pump, a fuel heater for heating fuel flowing to the filter, a fuel return conduit extending from the housing of the high pressure pump to said supply tank, and temperature responsive means in said return conduit responsive to the temperature of fuel flowing in said fuel return conduit, said temperature responsive means acting to restrict the flow of fuel in said fuel return conduit when the



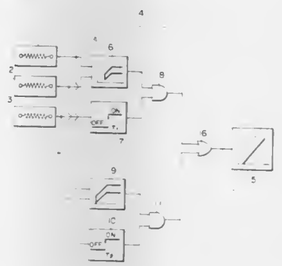
temperature of the fuel flowing in said fuel return conduit is below a predetermined value and comprising a valve housing defining a valve chamber, said valve chamber forming part of said conduit, a valve member movable in said chamber, a temperature responsive spring acting on said valve member, the valve member and spring being arranged so that when the fuel flowing in said chamber is cold, the valve member will be moved in said chamber to restrict the fuel flow through the chamber.

4,625,702

EXHAUST GAS RECIRCULATION CONTROL DEVICE FOR DIESEL ENGINE

Takanori Onishi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 24, 1985, Ser. No. 726,777
Claims priority, application Japan, Sep. 11, 1984, 59-188887
Int. Cl.⁴ F02M *25/06*
U.S. Cl. 123—571 **8 Claims**



1. An EGR control device for controlling an EGR valve in a diesel engine, said EGR control device comprising:

an electric control unit means for receiving input from an engine load sensor means for detecting engine load, an engine revolution sensor means for detecting an engine speed and a thermo-sensor means for detecting an engine temperature state, said electric control unit means having a first EGR MAP for preventing EGR under a low engine revolution idling speed during low engine temperature states, a second EGR MAP for permitting EGR under the low engine revolution idling speed during high engine temperature states, and a means for selecting either said first EGR MAP or said second EGR MAP in accordance with engine operating conditions, wherein said first EGR MAP issues an output signal for EGR in a stage of fuel injection and an engine speed greater than a first predetermined engine speed that is higher than the idling speed and said second EGR MAP issues an output signal for EGR in the stage of fuel injection and at an engine speed greater than a second predetermined engine speed that is lower than the idling speed; and

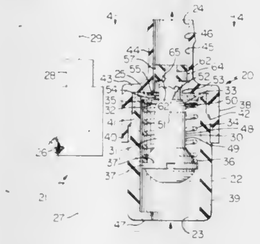
an electric vacuum regulating valve means connected to said electric control unit means and receiving an output signal therefrom, said electric vacuum regulating valve means regulating an opening degree of said EGR valve in accordance with said output signal from said electric control unit.

4,625,703

CRANKCASE VENTILATING SYSTEM, FLOW CONTROL DEVICE THEREFOR AND METHOD OF MAKING THE SAME

James A. Otto, and Marvin P. Weaver, both of Knox County, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 8, 1985, Ser. No. 720,876
Int. Cl.⁴ F02B *25/06*
U.S. Cl. 123—574 **16 Claims**



1. In a flow control device for a crankcase ventilating system of an internal combustion engine, said device comprising a valve housing means having an inlet and an outlet and an annular valve seat means therein intermediate said inlet and said outlet, a movable valve member disposed in said housing means and having a body portion disposed on the inlet side of said valve seat means and a generally frusto-conical flow metering portion for cooperating with said valve seat means to control fluid flow therethrough, and a spring means disposed in said housing means and being operatively associated with said housing means and said valve member to tend to urge said body portion of said valve member away from said valve seat means, the improvement wherein said valve member has fin means adjacent said metering portion and on the outlet side of said valve seat means that cooperates with said housing means to tend to prevent vibration of said valve member during said fluid flow through said valve seat means, said fin means extending outwardly from said valve member, said fin means comprising a plurality of spaced apart fins disposed in a circular array thereof and radiating outwardly from said valve member, said fin means comprising a separate part having an opening passing centrally therethrough, said valve member having a stem extending from said flow metering portion thereof and being disposed in said opening whereby said part is carried by said valve member.

4,625,704

ELECTRONIC IGNITION SYSTEM

James G. Wheelock, Montrose, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jun. 28, 1985, Ser. No. 750,417
Int. Cl.⁴ F02P *5/00*
U.S. Cl. 123—611 **6 Claims**

1. An ignition system for a spark ignition combustion engine having a rotatable driven output shaft comprising:

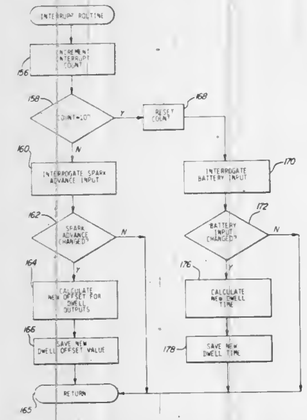
means for sensing the rotational position and speed of said shaft and for generating output signals, representative thereof,

at least one spark plug,

means for cyclically activating said spark plug in synchronism with the rotation of said shaft comprising:

a source of electrical energy, means for storing electrical energy, switch means responsive to said sensing means for electrically connecting said source of electrical energy to said storing means for a predetermined period of time regardless of the rotational speed of said shaft and for thereafter discharging the energy stored in said storing means to said spark plug at a preselected rotational position of said shaft,

means for manually varying said rotational position at which said spark plug is energized by a user selected value, said manual varying means generating a spark advance output signal representative of the user selected value,



wherein the voltage of said source of electrical energy varies between an upper limit and a lower limit, and comprising means responsive to the voltage of said source of electrical energy for varying the duration of said predetermined time period inversely with respect to the voltage of said electrical source and for generating a voltage output signal representative of the voltage of the electrical source,

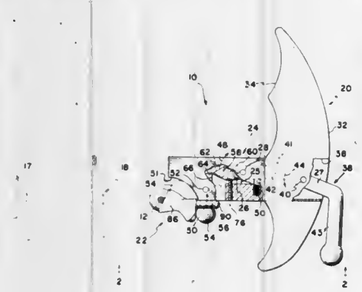
a computer having a data input and program means for periodically reading either of said voltage output signal or said spark advance output signal on said data input at predetermined time intervals.

4,625,705

BOWSTRING RELEASE APPARATUS

William P. Willits, 251 Lockwood St., Saginaw, Mich. 48602

Filed Mar. 28, 1983, Ser. No. 479,484
Int. Cl.⁴ F41B *5/00*
U.S. Cl. 124—35 A **31 Claims**



1. Apparatus for aiding the drawing and releasing of a bowstring for movement from a rest position in which the bowstring is substantially linear to a drawn position in which the bowstring is non-linear, to propel an arrow received by the bowstring, comprising:

an endless length of flexible material including a pair of lines coupled at their opposite ends by a pair of integral, bowstring-receiving loops;

each line including a central portion and a pair of intermediate portions integrally joining said end loops and the respective central portions;

one of said central portions being laterally movable relative to the other of said central portions to collectively define a closed draw loop, defining a draw loop opening which is normally of a predetermined size, for receiving a bowstring draw member;

said pair of intermediate portions of each line including first and second intermediate line portions disposed adjacent first and second line portions respectively of the other line;

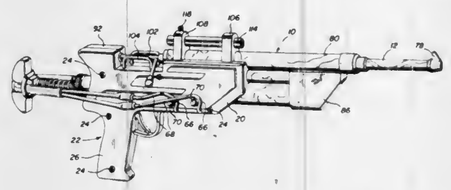
yieldable means normally maintaining said adjacent intermediate portions of said pair of lines in contiguous positions in contiguous relation but permitting relative lateral movement of said adjacent intermediate portions coupled to said one central portion relative to said intermediate portions coupled to the other of said central portions to operative positions when draw force is exerted on said one central draw portion, to provide said draw loop with a draw opening of greater predetermined size.

4,625,706

ELASTIC POWERED COMPRESSED AIR GUN

John E. Turner, Jr., 11900 Montana Ave., El Paso, Tex. 79936

Filed Aug. 19, 1985, Ser. No. 767,093
Int. Cl.⁴ F41B *7/08, 11/00*
U.S. Cl. 124—67 **15 Claims**



1. An air gun including a tubular barrel having muzzle and breech ends, said gun including an elongated cylinder and a piston slidable in said cylinder, resilient means connected between said cylinder and piston operative to yieldably bias said piston toward one end of said cylinder, latch means operative to releasably retain said piston in a "cocked" position displaced toward the other end of said cylinder from said one end, cocking means operative from the exterior of said cylinder for manually displacing said piston from said one end of said cylinder toward said "cocked" position, closing means removably closing said breech end of said barrel, said breech end of said barrel, when open, being operative to receive a projectile therein with said projectile enjoying a free sliding fit in said barrel for projection from said muzzle end responsive to fluid pressure admitted into said breech end behind said projectile when said breech end is closed, and communicating means communicating said one end of said cylinder with said breech end of said barrel forward of said breech end closing means, said resilient means including elongated elastic means including a pair of generally parallel arms and a bight portion extending between and connecting one pair of ends of said arms, the other pair of ends of said arms being anchored relative to said barrel forward of said breech end, said bight portion being anchored relative to said cocking means, an elongated stock from which said barrel and cylinder are supported, an intermediate length portion of said stock including a transverse notched underside and oppositely outwardly projecting opposite side abutment pins, anchor means in the form of a generally

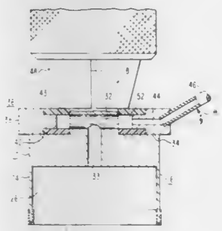
U-shaped anchor incorporating a pair of arms interconnected at one pair of ends by a connecting bight portion extending therebetween, said bight portion of said anchor means being removably seated in said notched underside and said arms of said anchor means extending rearwardly from said bight portion of said anchor means along opposite sides of said stock, the forward ends of said anchor means arms adjacent said anchor means bight portion including curved portions extending over and curving downwardly in front of said pins toward and joined to said anchor means bight portion, the curved portions of said anchor means arms being abutingly engaged with said pins, the other pair of ends of said elastic means arms being anchored to the rear ends of said anchor means arms.

4,625,707

CORE DRILL APPARATUS

Robert H. Whittaker, Derry Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1985, Ser. No. 790,697
Int. Cl.[4] B28D *1/02*
U.S. Cl. 125—20 **10 Claims**



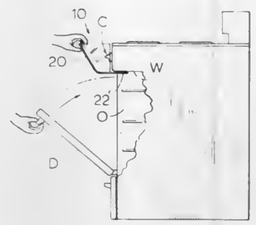
1. Apparatus for drilling cores in a workpiece comprising:
(A) a drill member having a cylindrical cutter head portion and a shank portion adapted to be inserted into a holder of a machine for rotating the drill member;
(B) said hollow cylindrical cutter head portion and said shank portion both being machined from the same single piece of stock so as to form a one-piece unitary body lying along a longitudinal axis;
(C) said cylindrical cutter head portion including a relatively thin wall portion having a smooth, continuous lower margin and defining a hollow interior;
(D) an abrasive cutting material deposited on said lower margin of said relatively thin wall portion;
(E) means defining a shoulder portion in the transition region between said cylindrical cutter head portion and said shank portion;
(F) said shank portion having at least a radial fluid passageway and an axial fluid passageway extending from said radial fluid passageway to the hollow interior of said cylindrical cutter portion;
(G) a short collar member in the form of a relatively thin disk having a central axial aperture adapted to fit over and surround said shank portion and including lower and upper sealing washers having central apertures substantially equal to the dimension of said shank portion so as to form a substantially fluid-tight seal therewith, the arrangement defining an internal cavity surrounding said shank portion;
(H) said disk being counterbored on the bottom and top surfaces thereof to thereby define a central internal ledge;
(I) said lower and upper sealing washers being press-fit into respective lower and upper portions of said collar member abutting opposite sides at said internal ledge and being held in place by said shoulder portion and said holder of said machine; and
(J) means for supplying a fluid to said internal cavity of said collar member.

4,625,708

STOVE GUARD

Alvan H. Beall, Apt. #2, 6037 Majors La., Columbia, Md. 21045

Filed Nov. 25, 1985, Ser. No. 801,285
Int. Cl.[4] F24C *3/12*
U.S. Cl. 126—42 **2 Claims**



1. A stove guard (**10**) for preventing access by small children to controls of a conventional stove, the conventional stove being of the type having an upwardly closing oven door (D), an oven (O) with a top wall (W) and front mounted controls (C) above the top wall of the oven (O), while preserving good access for operation of said front mounted controls (C) by adults, comprising: said stove guard comprising: a front panel portion (**20**) proportioned for covering the front of said front mounted controls (C), said front panel portion (**20**) sloping upwardly and outwardly toward the front and leaving access from above to said front mounted controls (C); said front panel portion (**20**) having a transverse lower portion (**28**), a horizontal panel portion (**22**) extending rearwardly from the transverse lower portion (**28**) at an open angle to the front panel portion (**20**); a rearward portion (**22'**) of the horizontal panel portion (**22**) in position permitting clamping the rearward portion (**22'**) between a said top wall (W) of an oven (O) and oven door (D) on closure of said oven door (D); the front panel portion (**20**) and the horizontal panel portion (**27**) having respective sides, first and second end panels (**24,26**) joining the respective sides of the front panel portion (**20**) and the horizontal panel portion (**22**), and closing off access at said sides.

4,625,709

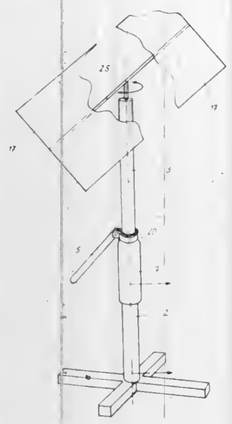
TRACKING SOLAR COLLECTOR INSTALLATION

Rolf Brandstätter, Spesshardter Weg 22, D-7260 Calw, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,732
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421411
Int. Cl.[4] F24J *2/38*
U.S. Cl. 126—424 **11 Claims**

1. In a tracking solar collector installation comprising
a mast having a lower end portion,
a solar collector plate mounted on said mast and rotatable about a vertical axis, and
tracking means for rotating said solar collector plate about said vertical axis,
the improvement residing in that said tracking means comprise
a vertical tube, surrounding said lower portion of said mast, which protrudes above said tube,
chamber defining means in the form of a bellows with a top member slidable in said tube to change the volume of said chamber a compression spring tending to expand said bellows along said axis,
means for admitting liquid to said chamber and for discharging liquid at a controlled rate from said chamber,
a reservoir is provided, which is adapted to receive liquid from and to supply liquid to said internal chamber,
a helical track centered on said axis and provided on one of the elements consisting of said mast and said tube on the side thereof facing the other of said elements, and

at least one track follower provided on the other of said elements and engageable with and adapted to ride along said track,
so that said mast is adapted to force down said top member and to displace liquid out of said chamber at a controlled rate,



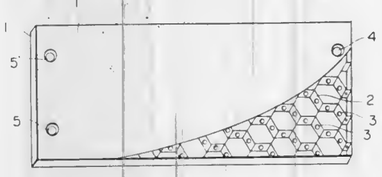
said track follower and said track are arranged to cooperate and to rotate said mast about said axis in response to an axial movement of said top member, and
said solar collector plate is non-rotatably connected to said mast.

4,625,710

HOLLOW STRUCTURE PANEL FOR HEAT STORAGE MATERIAL AND PROCESS FOR PRODUCING HEAT STORAGE MATERIAL PANEL USING THE SAME

Mithuhiro Harada, Tokyo, and Kenji Saita, Niihama, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 745,235
Claims priority, application Japan, Jun. 21, 1984, 59-128535
Int. Cl.[4] F24J *3/00, 2/00*
U.S. Cl. 126—430 **1 Claim**



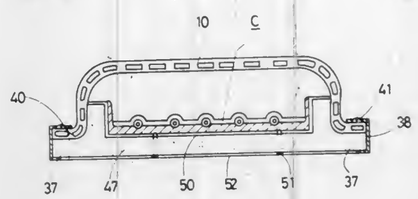
1. A method for producing a heat storage material panel, comprising a hollow plate-like structure having at least two face plates spaced apart at a given distance from each other, and a core member composed of an assemblage of a plurality of unit cells and sandwiched between said face plates, at least one hole being provided in at least one end plate, and each unit cell in said core member having at least two holes communicating with adjoining unit cells, which comprises evacuating air from the interior of the hollow plate-like structure through at least one hole provided in at least one face plate of said structure, and concurrently with or after the evacuation, supplying a solidifiable heat storage material to fill the structure through one or more other holes or through the hole used for the evacuation.

4,625,711

SOLAR HEAT COLLECTOR

Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 446,624, Dec. 3, 1982, abandoned. This application Aug. 5, 1985, Ser. No. 762,812
Claims priority, application Japan, Dec. 7, 1981, 56-182621[U]; Feb. 26, 1982, 57-27389[U]
Int. Cl.[4] F24J *2/56*
U.S. Cl. 126—450 **4 Claims**



1. A solar heat collector consisting of
a transparent upper casing in the form of an inverted U shape configuration for absorbing solar energy said upper casing having inner and outer parallel plates conforming to said inverted U-shape configuration which inner and outer plates define an insulating chamber disposed therebetween said chamber being subdivided by a plurality of partition means into a plurality of compartments throughout said entire chamber, said upper casing being fabricated from a plastic selected from the group consisting of an acrylic resin, a polyester resin and a polycarbonate resin;
a lower casing which is joined to said inverted U-shaped upper casing so as to define a sealed heat collecting chamber disposed therebetween;
a heat exchange means installed in said heat collecting chamber formed between said upper casing and said lower casing for conveying a heat exchange medium therethrough including means for introducing and removing said heat exchange medium into and out of said heat exchange means;
a heat collecting plate extending across said heat collecting chamber for transmitting absorbed heat to said heat exchange means for heating said heat exchange medium being conveyed therethrough;
said inverted U-shaped upper casing having an outwardly extending peripheral connecting flange edge portion and said lower casing having a corresponding outwardly extending peripheral connecting flange edge portion, said peripheral flange of said upper casing being fitted into the corresponding flange on said lower casing lateral to said heat collecting chamber.

4,625,712

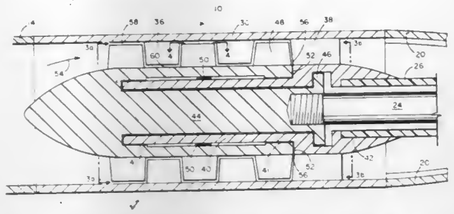
HIGH-CAPACITY INTRAVASCULAR BLOOD PUMP UTILIZING PERCUTANEOUS ACCESS

Richard K. Wampler, Rancho Cordova, Calif., assignor to Nimbus, Inc., Rancho Cordova, Calif.

Filed Sep. 28, 1983, Ser. No. 537,244
Int. Cl.[4] A61F *1/24*
U.S. Cl. 128—1 D **6 Claims**

2. An intravascular blood pump, comprising:
(a) an elongated housing open at each end, said housing having a shape and size allowing it to be passed through a human blood vessel;
(b) non-hemolytic rotary pumping means within said housing for pumping blood in a living patient longitudinally through said housing;
(c) conduit means extending from said housing and adapted to lie within said blood vessel without blocking it;

(d) power means located remotely from said pumping means for powering said pumping means; and



(e) drive means including a flexible cable extending from said power means to said pumping means through said conduit means for transferring drive power from said power means to said pumping means.

4,625,713

INSTRUMENT INCORPORATED IN A RESECTOSCOPE

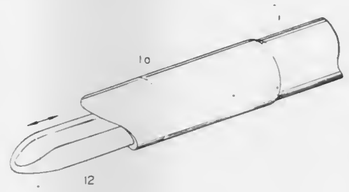
Yasunori Hiraoka, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,109

Claims priority, application Japan, Dec. 14, 1982, 57-188675[U]

Int. Cl.⁴ A61B *1/00*

U.S. Cl. 128—4 **8 Claims**



1. A combination of a resectoscope and an instrument for extracting a previous excised prostatic endogland; the resectoscope including an outer sheath to be inserted through the urinary tract, a slide member provided longitudinally slidably with respect to the sheath at a trailing end of the sheath, and a telescope inserted through the sheath to a tip end of the sheath for direct observation in front of the tip of the sheath; said instrument comprising an extractor having an extractor tip in the form of a tongue positioned adjacent said tip of said sheath for extracting the previous excised endogland from the exogland by inserting the tongue between the prostatic endogland and exogland.

4,625,714

ENDOSCOPE HAVING A CONTROL FOR IMAGE STAND STILL AND PHOTOGRAPHING THE IMAGE

Makoto Toyota; Fumitaka Takeshita, and Satoshi Arakawa, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Aug. 16, 1985, Ser. No. 766,411

Claims priority, application Japan, Aug. 20, 1984, 59-172795

Int. Cl.⁴ A61B *1/04*

U.S. Cl. 128—6 **3 Claims**

1. An endoscope comprising:

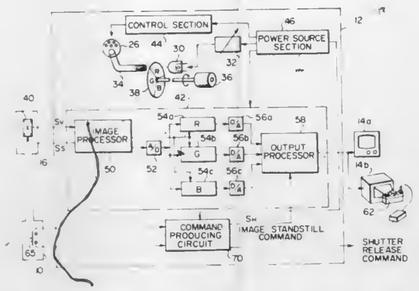
an insertion section provided in the forward end thereof with a solid state imaging device;

a manual control section connected to said insertion section, for performing various operations for observation;

a display unit for monitor-displaying an object to be observed in response to a video signal from said solid state imaging device in the forward end of said insertion section;

a single push button switch provided on said manual control section, being operated both at the time for making a displayed image stand still in said display unit and at the time for operating a shutter of a camera for photographing said displayed image; and

a command producing circuit for producing an image stand-



still command to make a displayed image stand still in response to a first operation of said push button switch and for producing a command to release said shutter of the camera in response to a subsequent operation of said switch in the state where the former command is produced.

4,625,715

WHIRLPOOL BATH MASSAGING APPARATUS

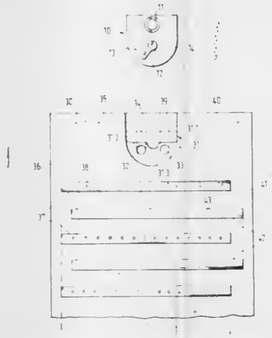
Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,043

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305576

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 128—66 **15 Claims**



1. Whirlpool bath massaging apparatus comprising a bubble mat having a plurality of separated air distribution channels and at least one air distribution system, a distributor control means having a control switch for regulating air supply to said at least one air distribution system, and an air supply means comprising a blower in communication with said bubble mat through an aerator tube and said distributor controls means, said distributor control means comprising a self-contained, removable structural unit separate from said bubble mat and insertable into a receptacle in said bubble mat, said distributor control means having a housing comprising a lower portion (**17**) and an upper portion (**19**), said upper housing portion (**19**) having formed thereon a sleeve connecting socket (**11**) for connection to said aerator tube, said lower housing portion (**17**) having outlet connecting means on its underside in the form of extending connector studs (**13, 14**) equal in number to said at least one air distribution system in said bubble mat, said connecting socket (**11**) projecting into spaces (**27, 28**) formed between said lower housing portion (**17**) and said upper housing portion (**19**) establishing an air passageway from said aerator tube to said connector studs (**13, 14**), said receptacle (**31**) of said bubble mat (**30**) conforming to the contours of said distributor control means (**10**) for positive installation of said distributor control means (**10**) in said bubble mat (**30**), said receptacle (**31**) having disposed therein inlet connecting means in the form of sockets (**32, 33**) associated with said at least one air distribution system, said connector studs (**13, 14**) of said distributor control means (**10**) being directly insertable into said sockets (**32, 33**) in communication with said at least one air distribution system and closely retained therein when said distributor control means (**10**) is retained in said receptacle (**31**) of said bubble mat (**30**), establishing an air passageway from said aerator tube to said at least one air distribution system.

4,625,716

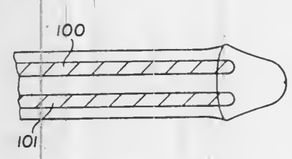
PENILE PROSTHESIS WITH RHEOPEXIC MATERIAL ENCLOSED IN A CHAMBER

Mark L. Pomeranz, 9760 Viceroy Dr. East, Jacksonville, Fla. 32217

Division of Ser. No. 634,442, Jul. 25, 1984, Pat. No. 4,564,006, which is a continuation of Ser. No. 490,450, May 2, 1983, Pat. No. 4,498,466, which is a continuation-in-part of Ser. No. 388,107, Jun. 15, 1982, Pat. No. 4,432,357. This application Oct. 4, 1985, Ser. No. 785,061

Int. Cl.⁴ A61F *5/00*

U.S. Cl. 128—79 **17 Claims**



1. A penile prosthesis comprising:

an elongated member of flexible material and defining at least one closed chamber therein; and

a rheopexic material in said at least one chamber and retained sealingly within said at least one chamber;

said elongated member with said rheopexic material therein being biologically safe to be implanted in a penis.

4,625,717

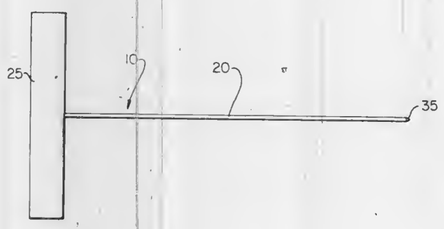
INTEROSSEOUS WIRING SYSTEM

William M. Covitz, 36 Rockledge Rd., Newton, Mass. 02161

Filed Jun. 17, 1985, Ser. No. 745,063

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 **5 Claims**



1. An interosseous wiring system comprising:

(a) a wire having an enlargement formed at one end thereof; and

(b) a threading tool for threading said wire through a hole, said threading tool comprising a shaft having a front end terminating in a tip, a side recess formed in said shaft adjacent said front end, and a canal extending axially from said side recess to said tip, said side recess being sized so as to accommodate said enlargement, and said canal being sized so as to accommodate the body of said wire but not said enlargement, whereby said wire may be attached to said threading tool by positioning said enlargement in said side recess and said wire in said canal.

4,625,718

AIMING APPARATUS

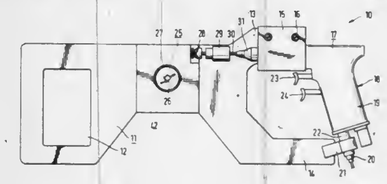
Sven E. Olerud, Laennholm, Sweden, and Karl M. Richter, Wendtorf, Fed. Rep. of Germany, assignors to Howmedica International, Inc., Kiel, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,676

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 8417428[U]

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 VD **8 Claims**



1. An aiming apparatus for use in making transverse bores in a patient's bone in register with the holes of an osteosynthesis aid in the bone, such as an interlocking nail, said aiming apparatus comprising a holding means for the accommodation of an aiming member adapted to be brought into the beam path of an X-ray device, a reception head made of a material transparent to X-ray radiation and adapted to receive a drill or wire drill, said reception head being rotatably supported in the holding means, and a power drive means supported by said holding means to drive the reception head for rotation.

4,625,719

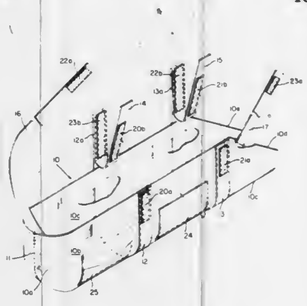
ADJUSTABLE ARM SLING

David H. Chambers, 2890 Griffin Rd., Ste. #4, Fort Lauderdale, Fla. 33004

Filed Jul. 16, 1985, Ser. No. 755,700

Int. Cl.⁴ A61F *5/40*

U.S. Cl. 128—94 **10 Claims**



1. An adjustable arm sling comprising:

a flexible sling body formed to provide a channel section closed at one end by an elbow portion and open at the other end, said channel section having opposed front and back portions merging with a bottom portion and together with the bottom portion merging with the elbow portion;

an underarm strap centrally of the sling body and an underwrist strap adjacent the open end of the sling body, said underarm and underwrist straps each passing beneath the

sling body, being secured to the channel section, and having a respective tag at the top of the back portion of the channel section;

an overarm strap and an overwrist strap fixed at a rear end to the tag of the underarm strap and the tag of the underwrist strap, respectively, and arranged to overlap at the front portion of the underarm strap and the underwrist strap, respectively;

a first shoulder strap fixed to said elbow portion and having a free end portion arranged to overlap the tag of the underwrist strap;

a second shoulder strap fixed to said channel section near the open end thereof and having a free end portion arranged to overlap the tag of the underarm strap; and

four mating sets of hook and loop type fastening strips mounted at (a) the underside of the overarm strap and the front side of the underarm strap, (b) the underside of the underwrist strap and the front side of the underwrist strap, (c) said free end portion of the first shoulder strap and the tag of the underwrist strap, and (d) said free end portion of the second shoulder strap and the tag of the underarm strap.

4,625,720

WOUND DRESSING MATERIAL

Peter M. Lock, Raniganj, Bowesden Lane, Shorne, Nr. Gravesend, Kent, England

Filed Jan. 20, 1984, Ser. No. 572,307
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **18 Claims**



1. A wound dressing material comprising a sheet of a synthetic plastics material which is permeable to water vapour and to air, having on one side a surface for application to a wound, and immediately behind the said surface a low density cellular region having a structure of collapsed, open cells which intercommunicate with one another, and a more dense region behind the cellular region, and an intermediate region in which there is a gradual transition from the cellular region to the more dense region, so that on contact with liquid exudate from a wound, the dressing material will absorb a limited amount of exudate into the cellular region but prevent it from passing right through the dressing material.

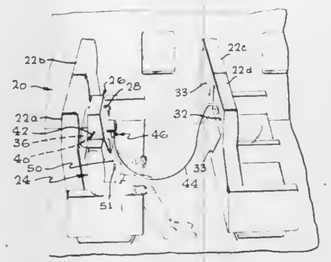
11. A sterile wound dressing material comprising a pliable sheet of a synthetic plastics material which is permeable to water vapor and to air and impermeable to liquids, having on one side a surface for application to a wound, and immediately behind the said surface a low density collapsed cellular region having a structure of collapsed, open cells which intercommunicate with one another, and a more dense region behind the ceullular region, and an intermediate region in which there is a gradual transition from the collapsed cellular region to the more dense region, so that on contact with liquid exudate from a wound, the collapsed cellular region of the dressing material will expand and absorb a limited amount of exudate but the dense region will prevent the exudate from passing right through the dressing material.

4,625,721

SMOKE MASK

Harold H. Levine, Northridge; Peter P. Kavaloski, Los Angeles, and Thomas K. Hale, Glendale, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Nov. 7, 1983, Ser. No. 549,136
Int. Cl.[4] A62B *7/04*
U.S. Cl. 128—201.28 **5 Claims**



1. An improvement to a windowed smoke mask assembly for use by passengers in an aircraft cabin, said aircraft having a source of pressurized fresh air, said improvement comprising:

a container of pressurized breatheable gas mounted to said smoke mask, said container having a flow control valve means;

first conduit means coupled to said flow control valve means and adapted to deliver said breatheable gas from said container to the interior of said smoke mask upon the opening of said control valve means;

a vent valve means mounted to said smoke mask for venting exhaled air from said interior of said smoke mask;

a second conduit means coupled to said aircraft source of pressurized fresh air;

a disconnect valve means comprising:

a first body portion coupled to said second conduit means, said first body portion having a probe mounted therein;

a second body portion attached to said smoke mask, said second body portion having a valve spring biased toward the closed position, said second body portion in detachable engagement with said first body portion in such a manner that said probe maintains said valve in said open position; and

latch means having an operating lever with an aperture therethrough releaseably holding said first and second body portions together;

a flange member mounted to the smoke mask having a second aperture therethrough;

a lanyard means comprising a flexible line having a first end coupled to said flow control valve means and a second end coupled to a pull ring, said flexible line passing through said first and second apertures, said lanyard having a stop member attached thereto between said first and second apertures with said stop member being larger than said first aperture;

such that when said ring is pulled said flow control valve is immediately open and said disconnect valve means is actuated upon said stop member reaching said lever.

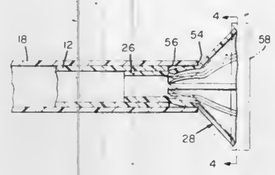
4,625,722

BONE CEMENT SYSTEM AND METHOD

William M. Murray, 145 Bryce Rd., Camp Hill, Pa. 17011

Filed May 3, 1985, Ser. No. 730,380
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—92 VQ **22 Claims**

1. A bone cement delivery device for flowing bone cement into a long bone medullary canal including a tubular nozzle, an umbrella-type bone cement shield at the distal end of the nozzle, and means at the proximal end of the nozzle for attaching the device to a source of bone cement so that cement may be flowed from the source through the nozzle, past the shield and into the canal, the shield comprising a plurality of ribs joined to, circumferentially spaced around and extending outwardly of the distal end of the nozzle and a plurality of flexible sheeting portions each extending between adjacent ribs from the



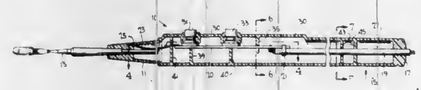
distal end of the nozzle to the shield lip, each sheeting portion including a first relatively more flexible part near one adjacent rib and a second relatively less flexible part near the other adjacent rib whereby upon collapse of the shield the first sheeting parts fold inwardly before the second sheeting parts fold inwardly.

4,625,723

PENCIL FOR ELECTROSURGICAL GENERATOR

Paul J. Altnether, Largo, and Frederick W. Rexroth, Dunedin, both of Fla., assignors to Medical Research Associates, Ltd. #1, Clearwater, Fla.

Filed Feb. 26, 1985, Ser. No. 705,966
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **16 Claims**



1. In an electrosurgical pencil of the type having an electrode blade energizable via an electrical signal, a switch structure for permitting selective application of said signal to said electrode blade, the improvement comprising:

an electrically insulative hollow housing from which said electrode blade projects and into which said electrical signal is delivered, said housing having at least one housing wall with an aperture defined therethrough to provide communication between outside and inside the housing;

circuit carrying means disposed inside said housing in substantially fixed spatial relation to said housing wall and including a circuit surface having first and second spaced electrical circuit contacts at least parts of which are disposed in substantial registration with said aperture;

a resilient dome-like member, disposed in said housing, tapering from an open first end having a relatively large peripheral dimension to a closed second end having a relatively small peripheral dimension, said dome-like member having an interior space, said closed second end being disposed in substantial registration with said aperture, said first end including a flange portion with a first sealing surface disposed substantially flush against said circuit surface entirely surrounding and forming a closed sealing path about said parts of said first and second contacts, said flange portion further including a second sealing surface facing in a direction opposite said first sealing surface, said dome-like member including a tapered peripherally continuous connecting wall extending between said first and second ends, said connecting wall being sufficiently flexible to permit said second end to be resiliently displaced axially at least a predetermined axial displacement toward said first end in response to an actuating force applied to said second end through said aperture;

electrically conductive means secured to said second end and disposed in said open interior space for electrically bridging said first and second contacts in response to said predetermined axial displacement of said second end; and

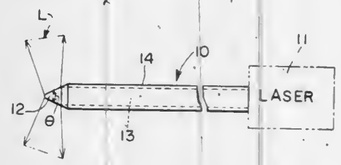
structural means extending from said housing wall into flush contact with said second sealing surface to provide a first peripherally continuous sealing engagement with said second sealing surface outside said interior space while compressively urging said first sealing surface into engagement with said circuit surface.

4,625,724

LASER VASCULAR ANASTOMOSIS APPARATUS

Masane Suzuki; Hiroshi Shibamoto, and Motonori Kanaya, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 16, 1985, Ser. No. 723,936
Claims priority, application Japan, Jul. 25, 1984, 59-153267
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **5 Claims**



1. Apparatus for vascular anastomosis by irradiation with laser rays, comprising:

laser guide means having a distal end insertable into a vascular duct for transmitting laser rays therethrough;

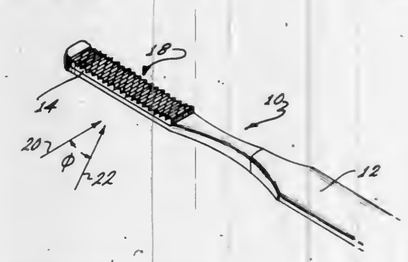
a laser-ray-transmissive conical tip on the distal end of said laser guide means, said conical tip having a conical surface adapted to reflect laser rays incident upon the inner side of said conical surface by internal reflection and then to allow said reflected laser rays to emanate by passing through an opposite portion of said conical surface so as to form an annular sheath of laser rays adapted to be applied to the inside of a vascular duct.

4,625,725

SURGICAL RASP AND METHOD OF MANUFACTURE

John A. Davison, and Robert J. Kellar, both of San Jose, Calif., assignors to Snowden-Pencer, Inc., Norcross, Ga.

Filed Aug. 30, 1983, Ser. No. 527,935
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—304 **22 Claims**



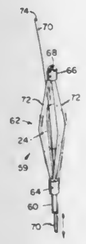
1. A surgical rasp comprising:

a handle; and

an insert rigidly attached to said handle having a surface formed with a plurality of generally v-shaped scrap-

ing grooves, each of said scraping grooves having a first side generally perpendicular to said surface and a second side transverse to said surface and spaced apart from each adjacent said scraping groove to form a sharp cutting edge therebetween, and a plurality of generally v-shaped diagonal grooves, cross-cut to said plurality of scraping grooves, each of said diagonal grooves having a first side generally perpendicular to said surface and a second side transverse to said surface and spaced apart from each adjacent said diagonal groove to provide for elongation of said sharp cutting edges.

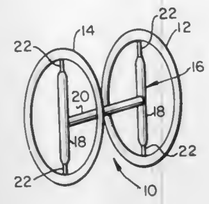
4,625,726
KIDNEY STONE RETRIEVER
Everette J. Duthoy, 1472 Cherry Hill Rd., St. Paul, Minn. 55118
Filed Aug. 7, 1984, Ser. No. 638,381
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 **3 Claims**



1. A device for removing a stone from a ureter, comprising:
a hollow tube having proximal and distal ends,
means having proximal and distal ends for retrieving said stone, said retrieving means having a ferrule with an opening therein at its distal end, said ferrule opening being in substantial alignment with said hollow tube and extending through the ferrule;
means for attaching said retrieving means to the proximal end of said tube and having an opening extending therethrough that opens to the retrieving means and to the hollow tube; and
a guide wire for slidably passing through said hollow tube, the attaching means opening and selectively through the opening in said ferrule of said retrieving means;
whereby said guide wire may be inserted in said ureter past stone and said ferrule, said retrieving means and said tube may slid over and along said guide wire until said retrieving means moves to the vicinity of said stone, and said guide wire being moveable from alignment between said tube and the opening in said ferrule thereby allowing said retrieving means to be moved in said ureter to capture said stone and remove said stone.

4,625,727
ANASTOMOSIS DEVICE WITH EXCISABLE FRAME
Arnold R. Leiboff, 20 Wendell St., Hempstead, N.Y. 11550
Filed Jan. 24, 1985, Ser. No. 694,614
Int. Cl.[4] A61B *17/11*
U.S. Cl. 128—334 C **16 Claims**

1. An anastomosis device for surgically joining the free ends of two tubular body tissue members, said device comprising a pair of rigid rings made of bio-degradable material for placement in the lumens of the free ends of the respective tubular members, a frangible rigid frame having an essentially non-yieldable bar integrally holding said two rings in fixed substantial parallel opposition to each other at a distance spaced apart permitting the placement of the free ends of the two tubular members about the respective spaced rings, said frame being excisable from said rings upon application of sutures in a series of running stitches extending from one ring to another across the space between the opposing rings and about the free ends of the tubular members and their respective rings, said sutures permitting said rings and respective tubular members to be



drawn together by pulling the ends of the stitches to retain said rings and tubular members in fixed apposition with the free ends of the tubular members clamped therebetween.

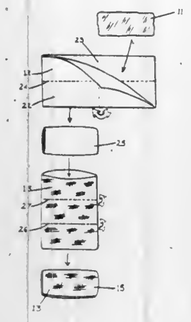
4,625,728
IMPROVING POULTRY EGG PRODUCTION
Michael Schonberg, 701 W. 177th St., New York, N.Y. 10033
Continuation-in-part of Ser. No. 406,604, Aug. 9, 1982. This application Feb. 6, 1984, Ser. No. 577,431
Int. Cl.[4] A61N *00/00*
U.S. Cl. 128—395 **8 Claims**

1. A method for improving egg production in poultry comprising:
irradiating said poultry with a first radiation comprising a green radiation within a wavelength band of 400 to 600 nanometers until said poultry have attained proper body weight for sexual development to proceed; said green radiation being delivered to said poultry at a rate of at least 10^{14} quanta/second/cm^2 or, if said green radiation is delivered at a rate of less than 10^{14} quanta/second/cm^2, said green radiation comprising at least 80% of said first radiation; and
subsequently irradiating said poultry with a second radiation comprising a near-red radiation within a wavelength band of 600 to 670 nanometers; said near-red radiation being delivered to said poultry at a rate of at least 10^{13} quanta/second/cm^2 or, if said near-red radiation is delivered at a rate of less than 10^{13} quanta/second/cm^2, said near-red radiation comprising at least 75% of said second radiation.

4,625,729
BODY COOLING CUFF
Lois Y. Roney, 604 Lookout Dr., Apt. 228, Richardson, Tex. 75080
Continuation-in-part of Ser. No. 357,169, Mar. 11, 1982, abandoned. This application Jan. 9, 1985, Ser. No. 689,942
Int. Cl.[4] A61F *7/10*
U.S. Cl. 128—402 **1 Claim**

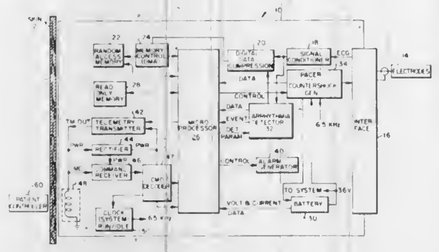
1. A body cooling device for attachment to the wrist comprising
a flexible, reusable, permanently sealed cold pack containing cooling material;
a reusable cloth case containing the cold pack, said cloth case of absorbent washable material with one end and one side being closed, said cloth case being larger in size than the cold pack so that the cloth case can be folded over the cold pack when the cold pack is placed within said cloth case thereby forming a plurality of layers of the absorbent washable material;
a reusble outer case containing the assembled cloth case and cold pack, said outer case being of material substantially impermeable to fluid, said outer case being foldable over the assembled cloth case and cold pack thereby forming a plurality of layers of the material substantially impermeable to fluid whereby air is entrapped between the layers;

a cuff holder having ends and made of sturdy, flexible material, said cuff holder being lined with insulation on one side; and



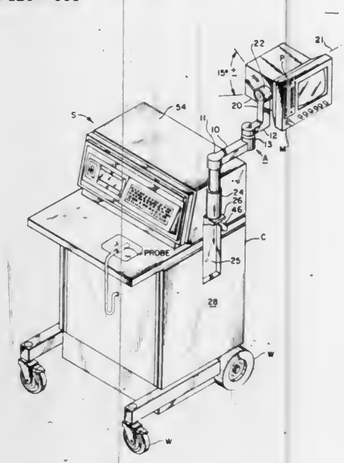
fastening means for fastening together the ends of the cuff holder when the cuff holder and the assembled outer case, cloth case and cold pack are placed around the wrist.

4,625,730
PATIENT ECG RECORDING CONTROL FOR AN AUTOMATIC IMPLANTABLE DEFIBRILLATOR
Glen H. Fountain, Silver Spring; David G. Lee, Jr., Columbia, and David A. Kitchin, Seabrook, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Apr. 9, 1985, Ser. No. 721,464
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—419 D **6 Claims**



1. An implantable automatic defibrillator capable of recording electric signals indicative of the physiology of a patient's heart upon detection of predetermined events and upon detection of an externally generated patient ECG recording command signal comprising:
an internal means for sensing said electrical signals indicative of the physiology of said patient's heart;
an implantable device receiving said electrical signals including:
means for converting said electrical signal into digital signals representative of said physiology of said patient's heart;
a memory means having a plurality of designated regions, a first region designated to continuously store a first group of digital signals representing the current heart physiology sensed over a recent time period, a second region designated to permanently store a second group of digital signals derived from said first group of digital signals previously stored in said first region;
a direct memory access controller having means for transferring said digital signals on a continuous basis from said means for converting to said first region of said memory means and for updating said first group of digital signals, and having means for copying and permanently storing said first group of digital signals concurrently in said second region of said memory means as said second group of digital signals upon receipt of a transfer command;
means for detecting a plurality of predetermined physiological heart events and for generating an event signal command, the detecting means monitoring said digital signals from said means for converting;
a transmitter means for converting and sending data representative of said second group of digital signals externally outbound from said implantable device;
a receiver means for sensing the presence of said externally generated patient ECG recording command signal and for generating a patient record command;
means for the controlled delivery of electrical pulses to stimulate said patient's heart, based upon said physiology of said patient's heart;
a microprocessor coupled to said memory means, said direct memory access controller, said detecting means, said transmitter means, said receiver means, and said means for delivering, said microprocessor controlling said means for delivering, said microprocessor having:
means for recognizing said patient record command and said event signal command and for generating said transfer command such that said direct memory access controller permanently stores said first group of digital signals in said second region of said memory means as said second group of digital signals; and
means for actuating said transmitter means to effect the outbound transmission of data representative of said second group of digital signals.

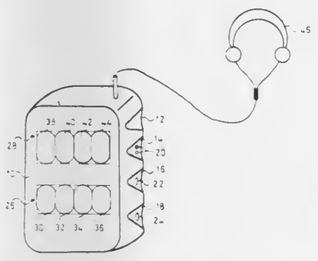
4,625,731
ULTRASONIC IMAGE DISPLAY MOUNTING
Phillip J. Quedens, Berlin; Peter J. Dutko, Jr., Durham; Raymond F. Larson, Middlefield, and Ralph A. Donarumo, Wallingford, all of Conn., assignors to Picker International, Inc., Highland Heights, Ohio
Filed Oct. 10, 1984, Ser. No. 659,402
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **35 Claims**



1. An ultrasonic examination system comprising:
(a) an ultrasonic transducer means responsive to electrical signals to propagate ultrasonic energy, and responsive to the receipt of ultrasonic echoes to generate electrical signals indicative of such echoes;
(b) imaging circuitry including transmission circuitry coupled to said transducer means for generating electrical signals to actuate the transducer to propagate ultrasonic energy, and receiving circuitry responsive to echo indicating signals generated by said transducer means in response

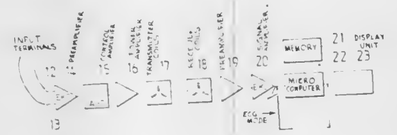
to ultrasonic echoes to produce imaging electrical signals representing an image corresponding to said echoes;
(c) a monitor electrically coupled to said receiving circuitry for producing a visual image corresponding to said received echoes in response to said imaging signals;
(d) base means;
(e) articulated support means comprising a plurality of pivotally serially interconnected arms for supportively coupling said monitor for movement with respect to said base means, and
(f) an array of controls electrically coupled to control at least part of the operation of said imaging circuitry, in addition to control of said monitor, said array being mechanically coupled to move with said monitor.

4,625,732
APPARATUS FOR MEASURING THE ACTUAL PSYCHOPHYSIOLOGICAL CONDITION
Zoltán Kása; Mihály Ágoston, both of Budapest; László Bognár, Kecskemét; János Hideg, Budapest; Péter Remes, Kecskemét, and László Hiros, Budapest, all of Hungary, assignors to Medicor Muvek, Budapest, Hungary
Filed Nov. 18, 1983, Ser. No. 553,382
Claims priority, application Hungary, Jun. 15, 1983, 2132/83
Int. Cl.[4] A61B *5/02, 5/05*
U.S. Cl. 128—670 **4 Claims**



1. Apparatus for measuring the actual psychophysiological condition of a subject, comprising:
a case to be held in hand;
sensors engaging fingers holding the case to detect skin conductance;
a pulse sensor engaging a finger holding the case;
a keyboard arranged in a surface of the case with identical keys;
a display arranged in said surface with display segments associated with respective ones of said keys;
a block for determining the actual emotional condition which comprises:
a skin conductance measuring block connected to said sensors,
a feedback unit for delivering an indication for said subject in response to actual skin conductance values
a block for determining the actual mental condition which comprises:
a pulse source for providing light pulses on said display segments in a random distribution,
an audio signal source providing audio signal together with selected ones of said light pulses according to a random selection,
a means for detecting the simultaneous activation of a pair of associated key and display segment,
a block for determining the actual physical condition which comprises:
a heart rate measuring means associated with said pulse sensor,
a means for determining the efficiency of repeated physical excercises made by said subject,
an arithmetical and logical unit associated with said condition determining blocks for determing respective weighted sums of measuring results provided by said blocks.

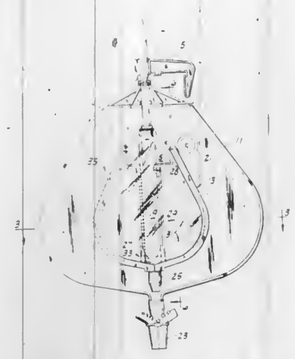
4,625,733
PROCEDURE AND MEANS FOR TELEMETRIC MEASURING OF HEARTBEAT AND ECG SIGNAL, USING A MAGNETIC PROXIMITY FIELD
Seppo Säynäjäkangas, Köykkyrintie 20, 90440 Kempele, Finland
Filed Jul. 18, 1984, Ser. No. 632,031
Claims priority, application Finland, Nov. 11, 1983, 834152
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—687 **7 Claims**



1. A method for telemetric measurement of heartbeat signals whereby a person's heartbeat signal is measured from a suitable part of the body and the signal generated is transmitted from a transmitter to a receiver by telemetric data transmission comprising the steps of:
(a) applying electrodes attached to the transmitter against a person's skin for detecting a heartbeat signal in said person's body:
(b) amplifying the detected heartbeat signal, through amplifier means and generating a periodic low frequency signal dependent upon the detected and amplified heartbeat signal:
(c) generating a periodic three-dimensional low frequency magnetic proximity field by feeding said low frequency periodic signal to three mutually perpendicular magnetic coils provided in the transmitter.
(d) detecting by means of an inductive coupling, said three dimensional magnetic field with a receiver having a magnetic coil structure similar to that of said transmitter;
(e) amplifying the signal received as induced in said receiver coils by a magnetic field generated by said transmitter coils;
(f) converting the received and amplified signal by known means to computer readable data;
(g) calculating the heartbeat value from said computer readable data by means of a computer interfaced with said receiving; and
(h) displaying the heartbeat value on means interfaced with said computer.

4,625,734
URINE METER AND DRAINAGE BAG COMBINATION
Paul Sherlock, San Francisco, Calif.; Benjamin Brausen, Cromwell, Conn., and Phillip P. Klein, Plano, Tex., assignors to Sherwood Medical Company, St. Louis, Mo.
Filed Aug. 6, 1984, Ser. No. 638,134
Int. Cl.[4] A61B *5/00;* **B65D** *33/00*
U.S. Cl. 128—762 **15 Claims**

1. A meter for collecting and measuring body fluids comprising a relatively rigid front panel forming the front of the meter, said meter having a longitudinal axis, a relatively rigid rear panel forming the back of the meter, the front and rear panels being secured together along their peripheries to form the meter, and a relatively flexible tube extending along said axis of the meter substantially from the top to the bottom thereof between the front and rear panels to form a burette to receive body fluid from a patient, said burette extending substantially from the front panel to the back panel throughout a substantial portion of its length, the burette being supported in place by the front and rear panels and having an outlet in fluid communication with the meter, one of said panels having a passage means formed therein within and at the bottom of the meter extending transversly of the burette and said axis and in fluid communication with portions of the meter



on both sides of the burette to permit body fluids to pass transversely by the burette to equalize the level of fluids in the portions of the meter on each side of the burette when the meter is in use.

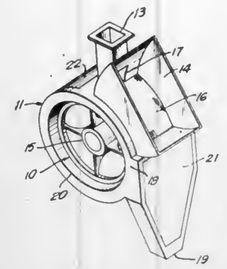
4,625,735
HUSKING ROLL ASSEMBLY WITH CUTTER ELEMENT
Ronald L. Anderson, 3641 Agate St., and Harry T. Kessler, Jr., 4460 Mill, both of Eugene, Oreg. 97405
Filed Jan. 7, 1985, Ser. No. 689,095
Int. Cl.[4] A01D *45/02*
U.S. Cl. 130—5 G **12 Claims**



1. A husking roll assembly for use in a husking machine and comprising in combination,
a shaft adapted at its ends for journalled support within the husking machine, said shaft defining a keyway, and
tubular roll segments on said shaft and having lands thereon, said lands jointly defining a recess, a cutter element inset within said recess and having an outer surface terminating laterally in edges located at or proximate the roll segment periphery, said cutter element having an inwardly projecting ear thereon for inserted engagement with said shaft defined keyway.

4,625,736
METHOD AND APPARATUS FOR EXPANDING TOBACCO WITH WATER
Ronald D. Rothchild, 106 Rynda Rd., South Orange, N.J. 07079
Continuation-in-part of Ser. No. 304,713, Sep. 23, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,428
Int. Cl.[4] A24B *3/18*
U.S. Cl. 131—296 **10 Claims**

1. A method for expanding moisture containing tobacco in which said tobacco is very rapidly heated by contact with a moving stream of heated gas, such that the relative velocity between said gas and said tobacco particles is greater than the substantially similar gas and tobacco particles in a transport gas velocity sufficient to transport said particles in said gas, with said tobacco being subject to said very rapid heating for at least



about 0.5 seconds following the introduction of said tobacco into contact with said gas stream.

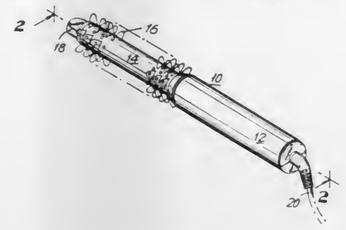
4,625,737
FOAMED, EXTRUDED, TOBACCO-CONTAINING SMOKING ARTICLE AND METHOD OF MAKING THE SAME
Gus D. Keritsis; Walter A. Nichols; George H. Burnett, all of Richmond; Richard A. Thesing, Glenn Allen, and Jose G. Nepomuceno, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 457,505, Dec. 30, 1982, Pat. No. 4,510,950. This application Apr. 16, 1985, Ser. No. 723,883
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—355 **26 Claims**

1. A method of making a foamed, extruded, tobacco-containing smoking article, comprising the steps of:
(a) mixing together from about 5 to about 98 wt. % of tobacco particles having a particle size of up to about 5 mesh and an OV value of from about 3 to about 20%, from 0 to about 60 wt. % of a filler having a particle size of up to about 350 μm, from about 2 to about 40 wt. % of a cellulosic binder selected from the group consisting of hydroxypropyl cellulose, carboxymethyl cellulose, and its sodium, potassium and ammonium salts, cross-linked carboxymethyl cellulose, and its sodium, potassium and ammonium salts, hydroxyethyl cellulose, ethyl hydroxyethyl cellulose, hydroxypropyl methyl cellulose, methyl cellulose, ethyl cellulose, and mixtures thereof; and an amount of water to form a wet blend containing from about 15 to about 50 wt. % of water; then
(b) extruding the wet blend from step (a) under extrusion conditions of temperature and pressure such that as the wet blend is extruded the moisture in said blend is converted to steam, thereby foaming the article.

4,625,738
HEATED BRISTLE CURLING BRUSH
Jorgen Skovdal, Trumbull, and Loretta D. Goeller, Rowayton, both of Conn., assignors to Clairol Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 597,950, Apr. 9, 1984. This application Oct. 5, 1984, Ser. No. 659,108
Int. Cl.[4] A45D *1/00*
U.S. Cl. 132—9 **9 Claims**

1. In an internally heated hair curling brush comprising a handle, a barrel extending from said handle, said barrel having a longitudinal axis and an outer surface radially spaced from said longitudinal axis, said surface provided with a plurality of grooves, the improvement comprising:
a plurality of bristle members in thermal contact with said barrel, each bristle member formed into a plurality of generally arch-shaped heat conducting bristles each of which, when said bristle members are in operative association with said barrel, extend radially from said axis along

a predetermined acruate length and are aligned in a plane substantially perpendicular to said axis, a portion of each bristle member near the base of each bristle being shaped to generally mate with a corresponding one of said



grooves, said aligned bristles having a predetermined arcuate gap between adjacent ones of said aligned bristles;
means for retaining said bristle members in thermal contact with said housing and for maintaining said radially extending orientation of said bristles.

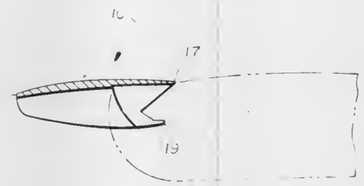
4,625,739
WIG ATTACHING MEMBER
Koji Hamazaki, 431-1, Manjojiki-cho, Fukakusa Oogamedani, Fushimi, Japan
Filed Jan. 2, 1985, Ser. No. 688,135
Int. Cl.[4] A41G *5/00*
U.S. Cl. 132—54 **8 Claims**



1. A wig attaching member to be fixed to an inner surface of a wig, comprising:
a substantially convexo-concave sheet-like member which includes a smooth continuous curved marginal edge, a substantially spherical external convex surface and a substantially spherical internal concave surface;
said marginal edge being formed to be in tight contact with a bald area of a wearer's scalp thereby to provide an airtight relationship between said marginal edge and said bald area;
said member being elastically deformable when pressing force is applied thereon and restorable when said pressing force is removed therefrom, so as to provide an internal space serving as a vacuum chamber which is formed between said internal concave surface and said bald area when said member is pressed against said bald area by said pressing force and then released from said pressing force;
negative pressure existing in said vacuum chamber keeping said member attached to said bald area; and
said member being detachable from said bald area when ambient air is introduced into said chamber to eliminate said negative pressure.

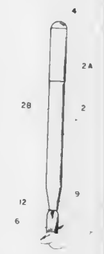
4,625,740
FINGERNAIL TIP DEVICE
Nancy L. Roth, Carmichael, Calif., assignor to Top of the Line Nail Tips, Inc., Carmichael, Calif.
Filed May 4, 1983, Ser. No. 491,375
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 **13 Claims**

1. An artificial fingernail tip to be worn in conjunction with a natural fingernail having a top surface, comprising in combination:
(a) a thin, elongated, upwardly convex body having a forward leading edge and further having a longitudinal central ridge portion of enhanced thickness for added strength, the longitudinal central ridge portion having a non-uniform cross-section and tapering towards the forward leading edge,
(b) a crescent-shaped vertical step portion along a rear underside surface of said body for abutting engagement with the forward lading edge of a natural fingernail, such that the body is supported only on the top surface of the natural fingernail,
(c) two extended cusp portions along rear peripheral edges of both sides of said body and extending rearwardly of the step portion for added lateral strength, and



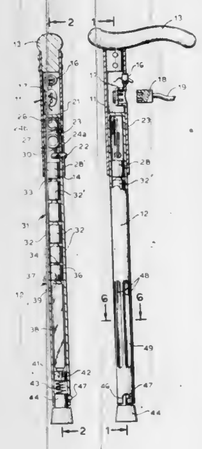
(d) a reduced thickness rearward medial portion of said body proximate said step and extending rearwardly therefrom to overlay a natural nail tip.
whereby said artificial nail can be adhesively affixed to a natural nail by applying adhesive means to a bottom surface of said rear medial portion and an inner surface of said cusp portions, abutting said step portion against the forward leading edge of a natural fingernail and manipulating said artificial fingernail tip into conformation engagement with a natural fingernail.

4,625,741
NAIL POLISHER
David Gardiner, 15140 Kittridge Ave., Van Nuys, Calif. 91405
Filed Aug. 23, 1984, Ser. No. 643,557
Int. Cl.[4] A45D *40/00*
U.S. Cl. 132—79 B **6 Claims**



1. An elongated polishing device substantially in the shape of a writing instrument comprising:
a first flexible housing, said first housing including a chamber containing a liquid substance, generally uniformly equidistant side walls, a first end portion and a second end portion, said second end portion comprising a valve assembly, including a second housing means, said second housing means including a top portion and a base portion, a coiled spring positioned within said second housing, a valve stem positioned adjacent to said coiled spring, a first hole through said second housing formed through said top portion and in spaced opposed relation with said valve stem and a second hole positioned vertically through said base portion of said second housing means;
a means fixedly secured to said first end portion for receiving and applying said liquid, said means for receiving and applying said liquid having a width that is substantially equal to that of the widest portion of said first flexible housing; and,
a breakable seal joining said first end portion and said means fixedly secured to said first end portion for receiving and applying said liquid when pressure is exerted on said side walls.

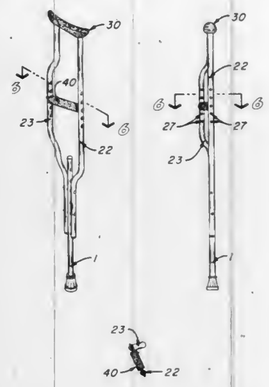
4,625,742
MULTI-FUNCTION LIGHTED WALKING CANE
Jerry G. Phillips, 4271 NW. 5th St., Apt. 47, Plantation, Fla. 33317
Continuation-in-part of Ser. No. 453,128, Dec. 27, 1983, abandoned. This application May 6, 1985, Ser. No. 730,725
Int. Cl.[4] A45B *3/04*
U.S. Cl. 135—66 **9 Claims**



1. A lighted walking cane which comprises:
an upper tubular part having a handle at its upper end and an open ended lower end;
a lower tubular part telescopingly received in said upper part;
a battery compartment in said lower part for containing a plurality of axially disposed, series connected batteries in the battery compartment; having an upper and a lower battery terminal for producing a battery voltage;
a voltage converter in said lower part having input terminals for receiving and converting the battery voltage to a high secondary A.C. voltage;
a fluorescent tube disposed axially in the lower end of said lower tubular part having end terminals connected to said high A.C. voltage for firing and maintaining said fluorescent tube in lighted condition, said lower tubular part having apertures in its wall for admitting light to the outside;
electrical circuit means for interconnecting said battery compartment, said converter and said fluorescent tube; and
locking means for adjustably locking together said upper and lower tubular parts.

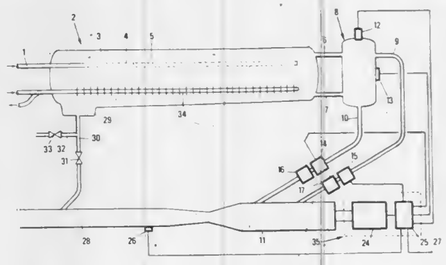
4,625,743
CRUTCH
Garth L. Harker, 3720 Vista Dr., Nampa, Id. 83651
Filed Aug. 12, 1985, Ser. No. 764,392
Int. Cl.[4] A61H *3/02*
U.S. Cl. 135—68 **2 Claims**

1. A crutch comprising:
a ground engaging support shaft;
a bifurcated main frame carried by said support shaft, said main frame including first and second vertically extending struts;
an armrest carried by and affixed to the uppermost terminal end of said struts; the longitudinal axis of said first strut being in a plane with the longitudinal axis of said armrest and said second strut defining two end portions and a



mid-portion, the longitudinal axis of said mid-portion being offset and parallel to the plane of said first strut and armrest; and
a substantially horizontal handgrip, said handgrip affixed to said first strut and the mid-portion of said second strut at an angle relative to the plane defined by said first strut and said armrest.

4,625,744
PROCESS AND DEVICE FOR PERFORMING A SERIES OF HYDRODYNAMIC FUNCTIONS ON A FLOW COMPRISED OF AT LEAST TWO PHASES
Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Oct. 11, 1983, Ser. No. 540,351
Claims priority, application France, Oct. 11, 1982, 82 17122
Int. Cl.[4] F17D *3/00*
U.S. Cl. 137—10 **16 Claims**



1. A process for performing a series of hydrodynamic functions on a flow of fluids comprised of at least two phases which comprises the following steps: effecting separation of the fluid phases that comprise the initial flow; effecting turbulence reduction of the flows of each of said fluid phases separated from each other; and effecting recombination of said fluid phases to form a new polyphasic flow with a predetermined structure; said fluid phases comprising a gas phase and a liquid phase; separation of the liquid and gas being effected in a vessel to provide a liquid level therein with a gas over the liquid; said turbulence reduction being effected in a separate vessel also having the same liquid level therein; said recombination of said gas and liquid phases being effected by controlled gravity flow

of the liquid to an ejector means as well as controlled flow of the gas to said ejector means whereby a desired gas-flow mixture is discharged from the ejector means to provide said predetermined polyphasic structure.

4,625,745

DRAG REDUCTION AGENTS FOR HYDROCARBON SOLUTIONS

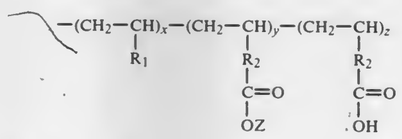
Ralph M. Kowalik, Bridgewater; Ilan Duvdevani, Leonia, both of N.J.; Kissho Kitano, Ohi, Japan, and Donald N. Schulz, Annandale, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 626,018, Jun. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 565,159, Dec. 23, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,362

Int. Cl.⁴ F17D *1/16*

U.S. Cl. 137—13 **4 Claims**

1. A method for reducing the frictional drag of a hydrocarbon liquid in flow through pipes or conduits having a continuous bore therethrough which comprises adding about 0.001 to about 0.5 grams of a polymeric complex to 100 ml. of said hydrocarbon liquid, wherein the polymeric complex is the reaction product of a copolymer containing an alpha-olefin and vinyl alkylenecarboxylic acid and a basic nitrogen-containing copolymer, wherein said acid copolymer of alpha-olefin and vinyl alkylenecarboxylic acid has the formula:



wherein R_1 is an alkyl group having 1 to 25 carbon atoms, Z is an alkyl group having about 1 to about 25 carbon atoms, R_2 is an alkylene group having about 3 to about 17 carbon atoms, x is about 95.0 to about 99.99 mole % and y is about 5.0 to about 0.01 mole % and z is about 0.01 to about 5.0 mole percent, said basic nitrogen containing polymer being a copolymer of vinyl pyridine with another monomer selected from the group consisting of styrene, t-butyl styrene, alkylacrylate, alkyl methacrylate, butadiene, isoprene, vinyl chloride and acrylonitrile.

4,625,746

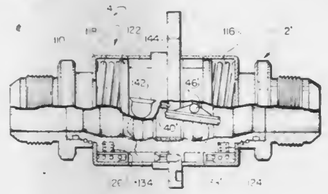
AUTOMATIC FLUID SEALING MECHANISM FOR A CONDUIT WITH A FRANGIBLE CONNECTOR

John H. Calvin, 251 Toro Canyon Rd., Carpinteria, Calif. 93013, and Jack Y. Wakasa, 4025 Michael Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 366,048, Apr. 6, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 717,529

Int. Cl.⁴ F16K *13/04*

U.S. Cl. 137—68.1 **13 Claims**



1. An automatic fluid sealing mechanism for a pair of conduits which are connected together by a frangible connector means, comprising:

a first butterfly valve comprising a first sealing disc mounted in the first conduit on a first pivot shaft in the vicinity of the frangible connector, a first plate carried on an end of the first pivot shaft and extending when the valve is open from the shaft pivot axis to a location laterally offset from the shaft pivot axis relative to the conduit axis and adapted to pivot with the shaft, a first rib member extending outward from the plate and laterally to opposite sides of the shaft axis, the rib member including a substantially flat bearing reception surface which faces away from the conduit connection along a plane substantially normal to the conduit axis when the valve disc is rotated closed, a first annular spring housing in the first conduit, a first coil spring positioned under compression in the first spring housing, and a first annular bearing member carried at an end of the first coil spring, the bearing member including a substantially flat bearing surface which is urged in a direction generally parallel to the conduit axis against the rib member by the coil spring to produce a turning moment that urges the first pivot shaft and disc to pivot to a closed position sealing the first conduit, the bearing surface lying substantially flat against the rib member's bearing reception surface under the spring force of the coil spring when the valve is closed and restraining the disc from rotating in either direction away from a closed position,

a second butterfly valve comprising a second sealing disc mounted in the second conduit on a second pivot shaft in the vicinity of the frangible connector, a second plate carried on an end of the second pivot shaft and extending when the second valve is open from the second shaft pivot axis to a location laterally offset from said axis relative to the second conduit axis and adapted to pivot with the second shaft, a second rib member extending outward from the plate and laterally to opposite sides of the second shaft axis, the second rib member including a substantially flat bearing reception surface which faces away from the conduit connection along a plane substantially normal to the conduit axis when the second valve disc is rotated closed, a second annular spring housing in the second conduit, a second coil spring positioned under compression in the second spring housing, and a second annular bearing member carried at an end of the second coil spring, the second bearing member including a substantially flat bearing surface which is urged in a direction generally parallel to the conduit axis against the second rib member by the second coil spring to produce a turning moment that urges the second pivot shaft and disc to pivot to a closed position sealing the second conduit, the bearing surface lying substantially flat against the second rib member's bearing reception surface under the force of the second coil spring when the second valve is closed and restraining the second disc from rotating in either direction away from a closed position,

said valve discs being positioned within their respective conduits to pivot on mutually intersecting arcs, each disc normally abutting against the other disc in an open position and preventing the other disc from closing, said discs being released and pivoted to closed sealing positions under the influence of their respective coil spring means when the frangible connector is broken and the two conduits are separated.

4,625,747

PRESSURE RESPONSIVE FLOW DIVIDER VALVE FOR SERVO-POWERED STEERING DEVICES

Norbert Mucheyer, Rechtenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

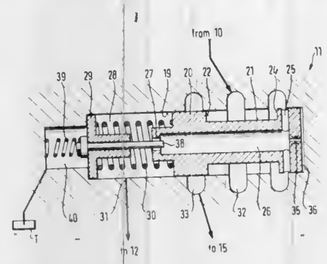
Filed Feb. 27, 1985, Ser. No. 705,977

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408864

Int. Cl.⁴ G05D *11/03*

U.S. Cl. 137—101 **5 Claims**

1. A pressure response flow divider valve for servo-powered steering devices, in particular for hydrostatic steering devices of agricultural tractors and machinery, which flow divider valve is placed between a pressure source and a steering valve, said flow divider valve comprising a control piston including spaced control lands to control respectively the fluid flow from said pressure source to a first port connected to said steering valve and to a second port connected to a further hydraulic load, further comprising a throttle located between said pressure source and said steering valve, said control piston being displaced in response to the pressure difference between the pressure of said pressure source and the pressure in said



steering valve, said pressure difference occurring across said throttle, so that the volume of fluid flowing to said further system is increased and the volume of fluid flowing to said steering valve is decreased when the steering device is not operated, whereas the volume of fluid flowing to the steering valve is increased and the fluid flowing to the further load is decreased, when the steering device is actuated, characterized in that a valve member is provided to change the cross sectional area of said throttle, said valve member being directly actuated by the pressure upstream of said throttle to increase the cross sectional area of the throttle upon the actuation of said steering device.

4,625,748

SAFETY ARRANGEMENT FOR POWER ASSISTED STEERINGS

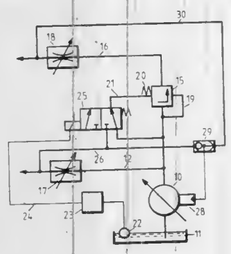
Ludwig Muncke, Lohr; Norbert Mucheyer, Rechtenbach, and Wolfgang Kauss, Lohr, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,520

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432159

Int. Cl.⁴ B62D *5/07*

U.S. Cl. 137—101 **8 Claims**



1. In a safety arrangement for fluid power-assisted steering and at least one additional hydraulic system comprising a priority valve connected to a pump for dividing the amount of fluid delivered by the pump from a reservoir between a steering valve of the power-assisted steering and the additional hydraulic system, said priority valve being responsive to steering demand for increasing the flow of fluid to the additional hydraulic system while throttling the amount flowing to the steering valve when the steering is not actuated and upon actuation of the steering increasing the amount flowing to the steering and throttling the amount flowing to the additional hydraulic system, the improvement characterized by a level sensor for detecting the level of fluid in the reservoir, a movable control piston disposed within the priority valve operable to move in response to a control pressure to a position causing the restriction of fluid flowing to the additional hydraulic system, and a switch valve communicating with the level sensor and the priority valve operable to provide the control pressure to the movable control piston when the level of the fluid in the reservoir falls below a predetermined value.

4,625,749

PRESSURE SUPPLY DEVICE FOR A HYDRAULIC SYSTEM

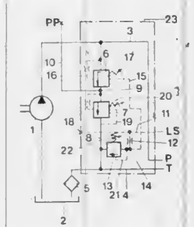
Christian Eskildsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 17, 1985, Ser. No. 735,269

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420674

Int. Cl.⁴ G05D *16/04*

U.S. Cl. 137—115 **4 Claims**



1. A pressure supply device for a hydraulic system, comprising, a pump and a pump conduit connected to an output port, a diverting path in parallel with said pump conduit and connected to inlet and tank ports, said diverting path being operable to divert fluid during normal operation when there is fluid flow in said pump conduit downstream for the connection of said diverting path to said pump conduit, first and second valves in series in said diverting path with said first valve being a pressure regulating valve and said second valve providing a constant pressure drop, said valves forming a pressure divider at a point between said valves, and a control pressure conduit branching off from said point between said valves for operating a plurality of proportional valves of consumer units.

4,625,750

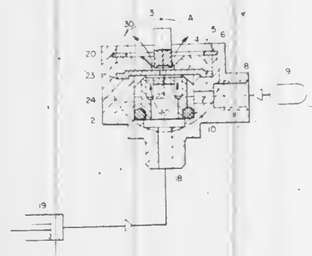
FORCE-CONTROLLED PRESSURE REGULATING VALVE

Joachim Scholz, An der Ziegelei 14, 7551 Bischweier, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,785

Int. Cl.⁴ G05D *16/06*

U.S. Cl. 137—116.5 **17 Claims**



1. A force-controlled pressure regulating valve, including a

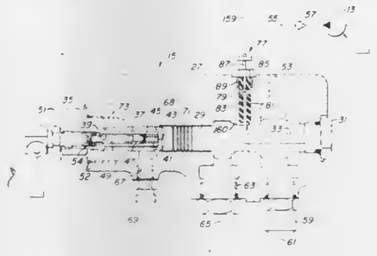
housing having a pressure medium inlet opening connected to a pressure medium source, a pressure medium output opening connected to a utilization device, and a venting opening, which leads to a low pressure medium, and a valve member, adjustable between two end positions, for connecting the pressure medium output opening either to the pressure medium inlet, when the venting opening is blocked, or to the venting opening, when the pressure medium inlet opening is blocked, characterized in that the housing includes a chamber which is permanently connected to the pressure medium inlet opening and blocked against the pressure medium output opening, said valve member being guided radially without play within said housing and being configured as a hollow cylinder, said housing including an opening connected to the pressure medium outlet opening and valve seat coaxial with the venting opening, and said valve member further comprising a cover which defines a second valve seat, one edge of said cylinder surrounding the opening connected with the pressure medium output opening, and the other edge of said cylinder cooperating with the first valve seat coaxial with the venting opening, and surrounding the second valve seat in the cover of said valve member, said valve further comprising a control member, arranged within the venting opening and including an annular edge, for applying a setting force on the valve member through the valve member cover by means of said annular edge to as to connect an inside space within the housing to the pressure medium inlet opening when the venting opening is closed, and means for producing a resetting force, during the setting of the valve member under the influence of the setting force, which acts in opposition to this setting force such that, when the seetting force is exceeded, said other edge of the valve member is reseated on said first valve seat.

4,625,751

VEHICLE STEERING AND AUXILIARY FUNCTION HYDRAULIC CIRCUIT

Douglas M. Gage, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 6, 1985, Ser. No. 708,915
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—118 **2 Claims**



1. A priority valve for inclusion in a hydraulic circuit, said priority valve for branching fluid delivered by said hydraulic circuit to said priority valve to priority users and non-priority users, said priority valve:

a valve body defining a valve bore, a valve spool slidably mounted in said valve bore, and a plurality of port intersecting to said valve bore being specifically an inlet port, a priority user outlet port, a non-priority user outlet port and a priority load sensing port, first means for restricting motion of said valve spool to a first position allowing fluid communication between said inlet port and said priority user outlet port and also said non-priority user outlet port, and second means for restricting motion of said valve spool to a second position allowing fluid communication between said inlet port and said priority user outlet port; and

a load sensing conduit fluidly communicates with said priority users and said priority user load sensing port to provide an additional source of fluid to said priority valve only when said valve spool occupies said second position, said additional fluid to act collectively with said first means, wherein the improvement comprises:

said valve body further having a switch port intersecting to said valve bore;

a switch having an insulating material generally cylindrically and radially mating sized to be longitudinally press mounted in said switch port a pin extending generally centrally through said insulating materia, to have one intrude into said valve bore at a right angle and to contact said valve spool at said angle when said spool occupies said second position, a plug fixably mounted to said valve body; a screw extending into said plug having one end in abutting contact with the other end of said pin, the other end of said screw extending beyond said valve body;

a second insulating material sandwiched between said plug and a portion off said screw to fixably maintain said screw insulated from said valve body; and,

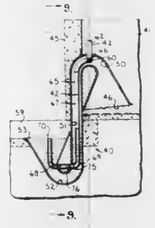
electric circuit means for providing an audible warning when said pin is in contact with said valve spool, said electrical circuit means being in electrical communication with said electrical switch.

4,625,752

FLUSHING SIPHON

John A. George, R.R. 1, Uniontown, Kans. 66779

Continuation-in-part of Ser. No. 43,692, May 30, 1979, Pat. No. 4,319,601, which is a continuation-in-part of Ser. No. 821,404, Aug. 3, 1977, Pat. No. 4,181,142. This application Mar. 2, 1981, Ser. No. 239,633
Int. Cl.[4] F04F *10/00*
U.S. Cl. 137—124 **5 Claims**



1. A siphon apparatus in combination with a fluid holding tank and a floor surface for flushing fluid from the fluid holding tank onto the floor surface comprising:

(a) an inlet;

(b) an air trap;

(c) a liquid trap having a cross-sectional area;

(d) a downcomer connecting said air trap and said liquid trap; and

(e) a divergent dishcarge; said inlet, air trap, downcomer, liquid trap and discharge in that order sequentially flow communicating with one another;

(f) said inlet being positioned within the fluid holding tank and flow communicating therewith; and

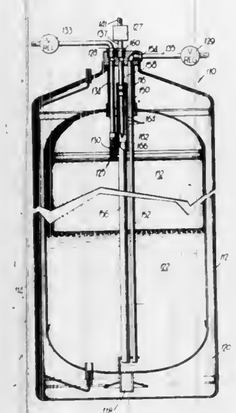
(g) said discharge having a cross-sectional area substantially larger than the cross-sectional area of said liquid trap such that a flow velocity associated with the liquid passing through said siphon in the region of said discharge will be a substantially lower velocity as compared to a flow velocity associated with fluid passing through said trap; said discharge opening upward onto the floor surface; and said liquid trap being positioned beneath the floor surface; such that fluid is urged to remain in said liquid trap at the end of a flushing cycle associated with the siphon and thereby ensuring that said liquid trap is filled with fluid for a subsequent flushing cycle.

4,625,753

CONTAINER FOR RECEIVING, STORING, AND DISPENSING CRYOGENIC FLUIDS

Keith W. Gustafson, Station 1101, Lake Arrowhead, Waleska, Ga. 30183

Filed Jul. 10, 1985, Ser. No. 753,483
Int. Cl.[4] F17C *7/02*
U.S. Cl. 137—202 **2 Claims**



1. A cryogenic tank for receiving, storing, and dispensing a cryogenic liquid with a vapor space adjacent the top of the tank above the liquid in the bottom of the tank, the tank comprising:

(a) an outer vessel;

(b) an inner vessel for containing the cryogenic liquid;

(c) an insulating space between the vessels;

(d) a sealable access port connected to the inner vessel to provide sealed access from outside the outer vessel to inside the inner vessel;

(e) an inlet tube extending from outside the outer vessel through the access port into the inner vessel and having an educator nozzle connected to its end within the inner vessel, wherein the eductor nozzle is enclosed within a concentric tube having apertures through which vapor is drawn from the vapor space into the concentric tube and condensed and entrained by action of the eductor and carried to the liquid and wherein the eductor nozzle is located within the vapor space adjacent the top of the tank, the concentric tube extends from the vapor space into the liquid in the bottom of the tank, and an outlet tube extends from outside the outer vessel through the access port into the cryogenic liquid; and

(f) vapor pressure relief means extending from outside the outer vessel through the access port into the vapor space and comprising a vent tube having a closable end outside of the tank and a float valve at the vent tube's end disposed within the vapor space wherein the float value comprises a buoyant ball enclosed within a perforated housing, the ball being disposed to float within the housing into engagement with a seat to close the vent tube.

4,625,754

VALVE BONNET CLOSURE

George L. Wilson, 16639 Ben Ledi, and John B. Goss, Sr, , 4790 Whispering Falls, both of Houston, Tex. 77084

Filed Aug. 26, 1985, Ser. No. 769,131
Int. Cl.[4] F16K *43/00, 51/00*
U.S. Cl. 137—315 **27 Claims**

15. A removable bonnet gate valve which allows access to the interior of the valve body wherein the improvement comprises:

a shoulder formed on the interior of the valve body adjacent the access opening to support a bonnet closure;

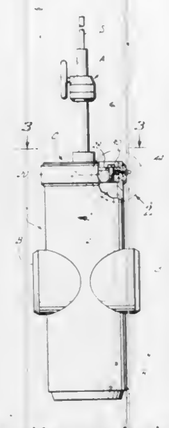
an annular groove in said valve body between said shoulder and the access opening;

a bonnet closure adapted to fit within the access opening and rest upon said shoulder leaving said groove exposed;

at least three lock elements adapted to contact said bonnet closure and fit within said groove; leaving radial spaces between the ends of adjacent lock elements;

retaining plates corresponding to the number of radial spaces adapted to fit within said radial spaces and be releasably secured therein to retain said lock elements in said groove thereby sealing said access opening; and

seal means between said body, said bonnet closure and said lock element segments.

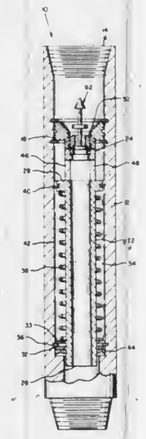


4,625,755

KELLY MUD SAVER VALVE SUB

Jeffery A. Reddoch, 106 Weeks Dr., Youngsville, La. 70505

Continuation-in-part of Ser. No. 386,711, Jun. 9, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,371
Int. Cl.[4] E21B *21/40*
U.S. Cl. 137—327 **2 Claims**



1. A mud saver valve for preventing drilling mud from escaping from a kelly when a drill string is broken below the kelly, said valve comprising:

a tubular valve body having first and second ends, said first end being provided with means for attachment in fluid

communicating relationship with the kelly, said second end being provided with means for attachment to said drill string;

an annular seat fixed in the interior of said valve body adjacent its first end;

a tubular closure member within said valve body, said closure member being provided with a selectively closed seating end for seating in valve closing engagement with said annular seat, an open non-seating end in fluid communicating relationship with said drill string, and an annular expansion in the outer diameter of said closure member adjacent said seating end;

a top and bottom spacer ring disposed in sliding relationship around said tubular closure member intermediate said annular expansion and said non-seating end of said closure member, said spacer ring and annular expansion cooperatively defining an annular chamber around said closure member;

a helical spring disposed around said closure member within said chamber for biasing said closure member towards said annular seat;

an annular retainer between said top and bottom rings, said retainer being carried by said valve body for preventing longitudinal displacement of said bottom spacer ring towards said annular expansion and preventing downhole pressure from being communicated to said helical spring;

a first, annular, unidirectional seal disposed in substantially sealing engagement between said annular expansion and the interior annular wall of said tubular valve body for permitting fluid to pass out of said chamber but not into said chamber, said first unidirectional seal being maintained in a stationary position relative to said closure member by means embedded in said valve body, and said annular expansion of said closure member extending a sufficient length of said closure member to maintain said first unidirectional seal and said annular expansion in substantially sealing relationship as said closure member moves between a seating position and a non-seating position with said annular seat;

a second, annular, unidirectional seal disposed around said closure member adjacent said non-seating end of said closure member between said bottom spacer ring and said non-seating end of said closure member and in substantially sealing engagement between the exterior of said closure member and the interior annular wall of said tubular valve body for permitting fluid to pass out of said chamber but not into said chamber, said second unidirectional seal being stationery relative to said closure member,

said inner diameter of said valve body being reduced between said second unidirectional seal and said second end of said valve body thereby forming a reduced diameter portion, said reduced diameter portion providing a shoulder on which said second unidirectional seal rests, said second unidirectional seal being disposed around said closure member adjacent said bottom spacer ring but outside said chamber, said helical spring resting on said top spacer ring;

an opening in said closure member between said annular expansion and said seating end through which fluid may pass to the interior of said closure member when said valve opens, against the bias of said helical spring; and

means for selectively opening said seating end of said closure member in response to downhole pressure to vent said downhole pressure past said valve, said means for selectively opening said sealing and comprising a substantially circular plate with an upwardly extending spear pointing in the direction of said first end of said valve body, said plate further having a plurality of depending, deformable legs for insertion into the seating end of said closure member, said deformable legs having enlarged ends for retaining said plate in axially sliding relationship with respect to said closure member, said plate being movable between a first position wherein said plate substantially sealingly closes said seating end of said closure member and a second position wherein said seating end is open, the area between said legs defining pressure release openings through which downhole pressure is vented to the surface,

an annular face of said annular seat against which said closure member seats being beveled, and an annular face of said seating end of said closure member which seats against said annular seat being cooperatively beveled so that said faces seat along an annular inclined surface, and wherein the annular bottom edge of the circular plate is inclined inwardly and downwardly, and the annular surface of the closure member against which the annular bottom edge of the closure plate seats is correspondingly inclined to provide an inclined sealing surface along which the circular plate and closure member seal.

4,625,756

PILOT OPERATED RELIEF VALVE

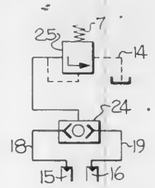
Hans-Peter Riedel, Steinhausen; Josef Zürcher, Edlibach, and Hubert Häussler, Neuheim, all of Switzerland, assignors to Beringer-Hydraulik GmbH, Neuheim, Switzerland

Filed Jan. 26, 1984, Ser. No. 573,965

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302434; May 17, 1983, 3317879; Aug. 11, 1983, 3328988

Int. Cl.[4] F16K *17/10*

U.S. Cl. 137—491 **3 Claims**



1. A pilot operated relief valve comprising

a housing having a bore therein, said bore having inner and outer ends and an outwardly facing annular shoulder intermediate its ends to define an inner cylindrical bore portion and an outer cylindrical bore portion which has a diameter greater than that of said inner bore portion,

a first fluid channel and a second fluid channel each communicating with said bore,

a piston slideably mounted in said bore and comprising a cylindrical first portion which is closely received in said outer bore portion, and a cylindrical inner end portion closely received in said inner bore portion, and an inwardly facing annular shoulder between said first and second cylindrical portions, said piston being slideably mounted in said bore between a closed position wherein said piston closes communication between said first and second channels and an open position wherein said piston permits such communication, and wherein the space between the inner end of said bore and the inner end of said second cylindrical portion of said piston comprises a first control space, and the space between the shoulder of said bore and the shoulder of said piston defines a second control space,

first fluid canal means for conducting a fluid from one of said fluid channels to said first control space,

second fluid canal means for conducting a fluid from the other of said fluid channels to said second control space, and

pressure release means operatively communicating with each of said first and second spaces for releasing the pressure in each of said spaces upon the pressure therein exceeding a predetermined absolute amount, said pressure release means comprising a pressure relief outlet maintained at essentially zero pressure, a first relief duct communicating with said first control space, a second relief duct communicating with said second control space, two-way valve means operatively connected to each of said first and second relief ducts for permittigg flow from only one of said first and second relief ducts to said pressure relief outlet, and pressure operated relief valve means disposed in said pressure relief outlet.

4,625,757

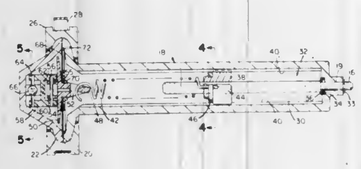
DIFFERENTIAL PRESSURE FLUID FLOW REGULATING DEVICE

Raymond C. Dykstra, Boulder, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 13, 1985, Ser. No. 744,373

Int. Cl.[4] F16K *17/34*

U.S. Cl. 137—504 **14 Claims**



1. A fluid flow regulating device comprising

a housing defining an inlet, an outlet orifice having an outlet axis along the direction of flow through it, and a fluid flow passage therein between said inlet and said outlet orifice,

a movable piston in said housing having an upstream surface and a downstream surface exposed to fluid flowing through said passage,

a spring biasing said piston in the upstream direction,

means for providing a drop in pressure between said upstream surface and said downstream surface as a function of fluid flow rate through said device, and

a closure member that is connected to said movable piston and has an externally curved surface that is movable along a closure member path perpendicular to said outlet axis between positions adjacent to and in front of said outlet orifice as said piston moves in response to changes in the magnitude of said drop in pressure,

said surface being curved about an axis that is perpendicular to both said outlet axis and said closure member path,

said closure member being movable so as to permit pivoting of said closure member about an edge of said housing defining said outlet orifice at a point of contact of said closure member with said edge.

4,625,758

VALVE ACTUATOR APPARATUS

Roy Murray, Brighton, Canada, assignor to ITT Corporation, New York, N.Y.

Filed Jun. 28, 1985, Ser. No. 750,725

Int. Cl.[4] F16K *31/50*

U.S. Cl. 137—554 **1 Claim**

1. A valve actuator apparatus, comprising:

a housing section having a closed bottom surrounded by extending sidewalls with an opened top and fabricated from a sheet metal material,

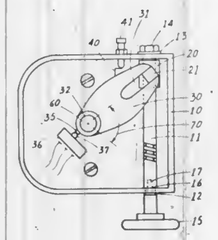
a cover member of a planar configuration stamped from a sheet metal material for covering said opened top of said housing section and means for coupling said cover member to said housing section,

a spindle member fabricated from bronze and positioned between opposite sidewalls and rotatably secured to said housing section, with one end extending from said housing, a handle coupled to said spindle member at said one end via shear means operative to rupture when excessive forces are applied to said spindle to thereby disconnect said handle from said spindle during the application of an excessive force,

a traveling nut member fabricated from steel coupled to said spindle member and adapted to move along said spindle member when said spindle member is rotated, with said bronze spindle member self-lubricating said steel travel nut member,

a steel pivot nut pivotally secured to said travel nut and adapted to move with said travel nut,

a pivot arm fabricated from powdered iron infiltrated with copper and having a first pivot end coupled to said housing and adapted to accommodate a valve shaft, and having a second slotted end with said slot positioned about said pivot nut to cause said arm to pivot as said pivot nut moves according to the rotation of said spindle member to



thereby rotate said valve shaft from a first to a second position, with said powdered iron pivot arm, self-lubricating pivot nut, said pivot arm having a projection extending from said first pivot end,

switching means located in said housing section and having a movable switch actuator plunger which when pushed inwardly places said switching means in a first non-operative state and which when released, places said switching means in a second operative state, with said switch actuator contacting said projection to push the same inwardly and to do so during rotation of said shaft from said first to said second position and to move out of contact and therefore release said actuator when said valve shaft is in said second position to thereby operate said switching means in said second position only when said projection releases said actuator.

4,625,759

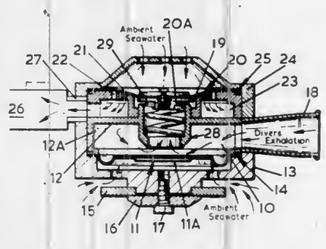
GAS RECLAIM BACK PRESSURE REGULATOR

David W. Craig, Arbroath, Scotland, assignor to Alan R. Krasberg, Aberdeen, Scotland

Filed Jun. 25, 1985, Ser. No. 748,540

Int. Cl.[4] A62B *7/04*

U.S. Cl. 137—613 **8 Claims**



1. A two-stage gas reclaim back pressure regulator comprising a composite housing having housing inlet means for connection to a diver's exhalation tube and housing outlet means for connection to a gas reclaim line, said composite housing having

(a) a first-stage chamber defined, in part, by a first fixed wall and a first movable wall, said first chamber being in gaseous communication with said housing inlet tube, a first portion of said housing overlying said first movable wall being provided with means defining an opening for permitting seawater access to an outside surface of said first movable wall;

(b) a second stage chamber defined, in part, by a second fixed wall and a second movable wall, said second stage chamber having a center and a periphery and said fixed and said movable walls being disposed between said center and said periphery, said fixed wall having a passageway therein for permitting exhaust gases to pass therethrough, said passageway having a narrower portion in proximity to said center and a wider portion disposed towards the periphery of said chamber, a second portion of said housing having means defining an opening for permitting seawater access to an outside surface of said second movable wall;

(c) a third chamber defined by said first and said second fixed walls and being disposed substantially between said first and second chambers, said third chamber being in gaseous communication with said housing outlet means and with said passageway;

(d) tubular means disposed between said first stage chamber and said second stage chamber for permitting gaseous communication therebetween, said tubular means having a first tube end disposed within said first stage chamber and a second tube end disposed in said second stage chamber;

(e) said first movable wall and said first tube end being cooperable to define a first stage valve, and said second movable wall and said passageway being cooperable to define a second stage valve, the arrangement being such that, in use, said housing is secured to a diver's helmet and the housing inlet means is connected to a diver's exhalation tube and the housing outlet means is connected to a gas reclaim line, and in the absence of exhalation the ambient pressure of seawater acts in said first and said second movable walls to close said first and said second stage valve isolating the diver from negative pressure in the gas reclaim line and said second movable member covers said passageway, and when the diver exhales, said first and said second movable walls are separated from the respective first tube end and said passageway against ambient seawater pressure to open said first and second stages and said second movable wall is removed from said passageway starting at said narrower portion whereby the flow rate of exhalation gases is proportional to the amount the second movable wall is lifted from said passageway, so that the exhalation gases are conducted in sequence, from said first chamber through said second chamber, said passageway, and said third chamber to said gas reclaim line.

4,625,760

MOBILE CONCRETE HANDLING APPARATUS

Heinz Mertens, Hamm, Fed. Rep. of Germany, assignor to Walter Scheele GmbH & Co. KG, Unna-Massen, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,974

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409474

Int. Cl.⁴ F16L *37/28, 25/00*

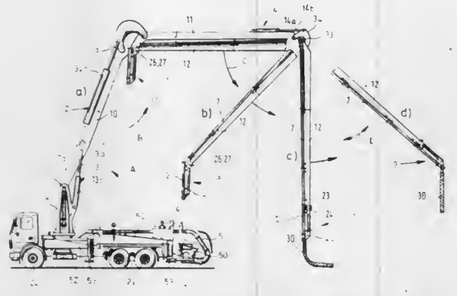
U.S. Cl. 137—615 **11 Claims**

1. A concrete distributing apparatus comprising:

a base;

a plurality of articulated support arms having respective duct sections in communication to deliver concrete to a location remote from said base upon unfolding of said support arms in an operating condition, said support arms including a terminal arm and being foldable to lie substantially parallel and horizontal in a rest condition;

an additional support arm articulated to said terminal arm and adapted to fold relative to said terminal arm to lie parallel therewith in said rest position but swingable away from said terminal arm into an operative position wherein said terminal arm and said additional arm are aligned when said terminal arm is disposed vertically, said additional arm being mounted to swing freely from a free end of said terminal arm but being provided with means for



arresting said additional arm in alignment with said terminal arm, said additional arm hanging vertically when it is not folded relative to said terminal arm and is not arrested therewith; and

an additional duct section carried by said additional arm and aligned and connected with a duct section on said terminal arm upon said additional arm being arrested in alignment with said terminal arm.

4,625,761

CORROSION-RESISTANT, QUICK DISCONNECTING COUPLING ASSEMBLY FOR PIPING USE

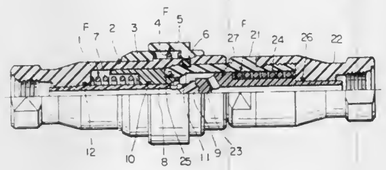
Tatsuro Uchida, Osaka; Hisayuki Matsumoto, Takatsuki, and Teiji Arita, Yokohama, all of Japan, assignors to Daikin Industries, Osaka and Yokohama Aeroquip Co. Ltd., Tokyo, both of, Japan

Filed Nov. 1, 1984, Ser. No. 667,260

Claims priority, application Japan, Nov. 2, 1983, 58-206650; Nov. 14, 1983, 58-214584

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 137—614.03 **16 Claims**



1. A corrosion-resistant, quick disconnecting coupling assembly for piping use consisting of a female coupling means and a male coupling means for causing or stopping the conduction of a fluid by connection or disconnection between both, in which assembly:

said female coupling means comprises an exterior female body and, first means defining a first fluid path therethrough, a cylindrical first valve means mounted in said female body for forming an enclosure by and between said female body and said first valve means thereby to define a first annular closed chamber on a first side of said first valve means and an open cavity on a second side of said first valve means and second means for isolating said first annular chamber from said first fluid path, said first valve means comprising a first hollow cylindrical portion defining a part of said first fluid path and having a first top closure end and a first separable partition means extending

radially outwardly from said first closure end for normally blocking fluid flow, and having, through said first cylindrical portion, a first transverse hole and a first longitudinal hole serving each as a path of fluid flow and communicating with each other, at least a portion of said first separable partition means of said first valve means being slidingly movable to separate from a remaining portion to allow fluid to flow, said first transverse hole being a part of said first fluid path and located adjacent said separable partition means of said first valve means between said open cavity and said first hollow cylindrical portion, and a first spring housed in said first annular closed chamber, axially extending between said movable portion of said first separable partition means and said female body so as to be compressible or extensible thereby to enable said first transverse hole to open or close upon compression or extension of said first spring, said second means thereby isolating said first spring from said fluid path; and

said male coupling means comprises an exterior male body having an elongted fit cylindrical portion thereon and third means defining a second fluid path therethrough, a cylindrical second valve member mounted in said male body so as to form an enclosure by and between the male body and said second valve means thereby to define a second annular closed chamber and fourth means for isolating said second annular chamber from said second fluid path, said second valve means consisting of a second hollow cylindrical portion having a second top closure end and a second separable partition means extending radially outwardly from said second closure end, and having, through said second cylindrical portion, a second transverse hole and a second longitudinal hole serving each as a path of fluid flow and communicating with each other, at least said second partition means of said second valve means being slidingly movable,

said second transverse hole being located adjacent said second partition means, and a second spring housed in said second annular chamber, extending axially between said second partition means and said male body so as to be compressible or extensible thereby to enable said second transverse hole to open or close upon compression or extension of said second spring, said fourth means thereby isolating said second spring from said fluid path,

whereby when said female coupling means and said male coupling means are connected to each other, said fit cylindrical portion of said male body is received and fitted in said open cavity of said female body in a telescopic manner, said movable portions of said first and second partition means being both moved in their respective bodies up to the compression limit positions of said first and second springs, said first and second top closure ends being in abutment with each other, and said first and second transverse and said first and second longitudinal holes are put in communication with one another.

4,625,762

AUTO-FILL FLOW VALVE

Hedayat H. Hassanzadeh, Houston, and Guy L. McClung, III, Spring, both of Tex., assignors to Weatherford U.S., Inc., Houston, Tex.

Filed Nov. 8, 1985, Ser. No. 796,665

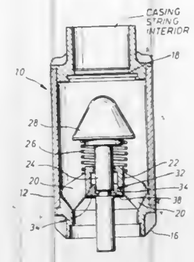
Int. Cl.⁴ F16K *31/12*

U.S. Cl. 137—624.27 **13 Claims**

1. A releasable locking mechanism for a valve, the valve having a body and a valve stem movably mounted in a guide means in the body, the valve having a seat towards which the stem is movable, the valve closing upon the stem sealingly contacting the seat, the releasable locking mechanism comprising

locking means disposable in coacting relationship with the stem for holding the stem to prevent the movement of the stem toward the seat,

the locking means disposable to abut the guide means and maintained in contact therewith,



the locking means formed so that upon the application of a sufficient force to the stem in a direction away from the seat the locking means is releasable and can fall away from the valve.

4,625,763

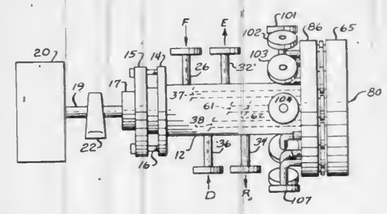
DISC-AXIAL MULTIPORT VALVE

David L. Schick, Mt. Prospect; Gary M. Schumann, and Charles A. Dolejs, both of Arlington Heights, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 10, 1985, Ser. No. 753,490

Int. Cl.⁴ F16K *11/06*

U.S. Cl. 137—625.15 **8 Claims**



1. A disc-axial multiport valve for accomplishing the simultaneous interconnection of a plurality of conduits in accordance with a previously determined cycle, where any conduit communicates, by means of the valve, with no more than one other conduit at any one valve index position, comprising:

(a) a stator assembly having a hollow interior and an open end, having means for attachment of said plurality of conduits and being comprised of a stator cylindrical element having a hollow interior and an open end and a stator discular element which has a central opening for insertion of a rotor cylindrical element and is joined to the open end of the stator cylindrical element in a flangelike manner, the stator discular element having a transverse surface which faces outward with respect to the stator cylindrical element and is perpendicular to an axis of rotation, which axis of rotation is the longitudinal axis of both the stator assembly and a rotor assembly, the stator discular element having a plurality of internal passages extending from the transverse surface to an exterior surface of the stator discular element, to which stator discular element exterior surface conduits are connected so that each passage communicates with one of said conduits, where the intersections of the passages with the transverse surface are arranged in a circle centered on the axis of rotation, and where there are a plurality of ports in the stator cylindrical element, each port in communication with one of said conduits;

(b) said rotor assembly comprised of said rotor cylindrical element and a rotor discular element which is joined to an end of the rotor cylindrical element, the rotor cylindrical

element being located substantially inside the hollow interior of said stator cylindrical element, the rotor discular element having a sealing surface which faces inward with respect to the rotor cylindrical element, which sealing surface is perpendicular to said axis of rotation, and which sealing surface is parallel to said stator discular element transverse surface, the rotor assembly having a plurality of interior channels, each channel extending from said rotor sealing surface to the exterior surface of the rotor cylindrical element, the number of said channels being equal to the number of said stator assembly ports, and which rotor assembly rotates about said axis of rotation to various valve index positions in accordance with said previously determined cycle;

(c) means for definition of non-intersecting fluid paths between said rotor channels and said stator ports; and,

(d) means for definition of non-intersecting fluid paths between said stator passages and said rotor channels.

4,625,764

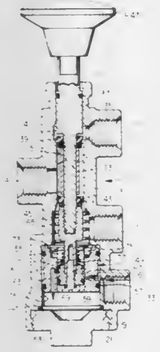
RELAY VALVE

David E. Snyder, Longview, and Norman L. Gundel, Dallas, both of Tex., assignors to Axelson, Inc., Longview, Tex.

Filed Apr. 3, 1986, Ser. No. 847,642

Int. Cl.[4] F15B *13/042*

U.S. Cl. 137—625.66 **18 Claims**



1. A relay valve, which comprises:

a valve body having a longitudinal bore having a first end and a second end, said valve body having an inlet, an outlet, and exhaust, and a pilot inlet extending into said valve bore;

a valve stem slidingly mounted in said valve bore and movable between a first position in which said inlet is in communication with said outlet and communication from said outlet to said exhaust is blocked, and a second position in which said outlet is in communication with said exhaust and communication from said inlet to said outlet is blocked;

a piston slidingly mounted in said valve bore and movable with respect to said stem, said piston having a longitudinal piston bore, said piston defining a chamber in said valve bore between said piston and said second end of said valve bore;

means for urging said piston toward said second end of said valve bore;

a spool connected to said stem and slidingly positioned in said piston bore and movable with respect to said piston between an open position in which said chamber is in communication with said exhaust and a closed position in which communication between said chamber and said exhaust is blocked and said said pilot inlet is in communication with said chamber, wherein when said spool is in said closed position pressure within said chamber acts on said spool and piston to move said stem to said first position and when said spool is in said open position pressure in said chamber vents to said exhaust allowing said piston to move toward said second end of said valve bore allowing said stem to move to said second position;

means for urging said spool toward said open position;

and means for manually moving said spool to its open and closed positions.

4,625,765

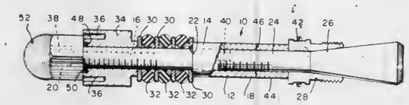
PLUG, FOR FLUID-SEALING OF TUBES

John W. O'Donnell, 1424 George St., Pt. Pleasant, N.J. 08742; Michael C. Catapano, 226 Clubhouse Dr., Middletown, N.J. 07748, and Renato R. Noe, 1609 West St., Union City, N.J. 07087

Filed Oct. 2, 1985, Ser. No. 783,184

Int. Cl.[4] F16L *55/10*

U.S. Cl. 138—89 **10 Claims**



1. A plug, for fluid-sealing of tubes, comprising:

a plug body having a central, longitudinal axis;

said plug body having means formed thereon defining an abutment;

said body having a threaded bore formed axially therein;

a nosepiece;

said nosepiece having a shank portion which is externally threaded;

said shank portion being threadedly and removably engaged with said bore;

said nosepiece having means manipulatable for causing said nosepiece to extend from, and to retract toward said body;

said body also having an externally-threaded portion at one end thereof;

a seal disposed in encircling engagement with said body intermediate said abutment and said one end of said body; and

annular, seal-compressing means disposed in encircling engagement with said one end of said body; wherein

said seal-compressing means comprises a nut threadedly engaged with said externally-threaded portion of said body; and

said body and said nut have means cooperatively manipulatable for causing said seal-compressing means to move along said body, toward said abutment, to cause said seal to be compressed and expanded into sealing engagement with an inner surface of a tube; and further including

gripping means encircling said nosepiece, and movable relative thereto, for effecting fast, gripping engagement with the aforesaid, same inner surface of a tube.

4,625,766

ISOLATION AND PROTECTION DEVICE FOR WORKING ON TUBING, AND IN PARTICULAR ON NUCLEAR POWER STATION TUBING

Gérard Dohlen, Ecuelle; Jean-Claude Le Marquis, Moret sur Loing, and Claude Oberlin, Avon, all of France, assignors to Electricite de France, France

Filed Mar. 20, 1984, Ser. No. 591,428

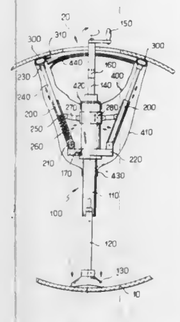
Claims priority, application France, Mar. 24, 1983, 83 04837

Int. Cl.[4] F16L *55/12*

U.S. Cl. 138—93 **8 Claims**

1. In an isolation and protection device for insertion through an opening in the side wall of tubing and deployment to a position inside the tubing such that the opening is sealed from the interior of the tubing, said device comprising a central shaft having an inner foot end adapted to abut the tubing side wall

generally opposite the opening, a base provided slidably on said shaft, a deformable sealing member of closed shape for surrounding the tubular side wall opening and adapted to assume the interior shape of the tubing around the opening, a plurality of arms distributed around the shaft means pivotably connecting ends of said arms to said base for movement between collapsed position against the shaft to enable the device to be inserted through the opening into the tubing and deployed positions wherein free ends of said arms are spaced from said shaft, said sealing member supported at the free ends



of said arms, mechanical means connected to said shaft and to said base for moving the base slidably on said shaft and said arms from collapsed to deployed positions, said mechanical means also thereby pressing the sealing member against the inside surface of the tubing whose shape it is to assume and pressing the foot of said shaft against the tubing side wall opposite the opening, two sheets each of which has a periphery supported by said sealing member, one of said sheets being sealed around said base and the other of said sheets being sealed around said shaft to provide a double walled isolation device for the opening in the tubing.

4,625,767

KEY COUPLING FOR A ROTATION DOBBY

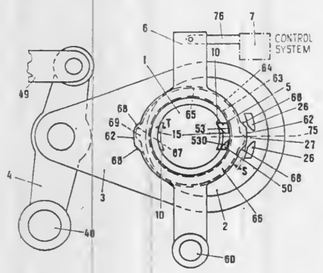
Rudolf Schwarz, Horgen-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Jan. 25, 1985, Ser. No. 694,878

Claims priority, application European Pat. Off., Jan. 28, 1984, 84100901.2

Int. Cl.[4] D03C *1/00*

U.S. Cl. 139—76 **8 Claims**



1. A key coupling cooperable with a drive shaft and an eccentric ring of a rotation dobby, the eccentric ring being freely rotatably supported on the drive shaft and a connecting rod being freely rotatably supported on the eccentric ring, comprising a controlling switching arm having an indexing ring which is movable to a center position approximately concentric with respect to the drive shaft and can be swung back and forth with respect to the drive shaft in a radial plane thereof, and two keys which can each engage a groove of the drive shaft and are each supported on the eccentric ring for movement approximately radially of the drive shaft, one said key being a driving key used to effect rotation of the eccentric ring with the drive shaft and the other key being a hold-back key adapted to hold back the eccentric ring and to keep the driving key engaged play-free in the groove of the drive shaft, wherein the indexing ring has two controlling cams which each cooperate with a respective one of said keys, the first controlling cam directly and positively effecting all movement of the driving key relative to the eccentric ring in each radial direction and the driving key in turn controlling coupling and releasing of the eccentric ring to and from the drive shaft, and the second controlling cam, through its shape and in dependence on the position of the indexing ring, permitting the hold-back key to be directly and positively moved radially outwardly by the drive shaft in response to rotation of the drive shaft relative to the eccentric ring, and directly and positively effecting radially inward movement of the hold-back key in response to rotational movement of the eccentric ring relative to the second controlling cam by the driving key.

4,625,768

BATTEN FOR WEAVING LOOM

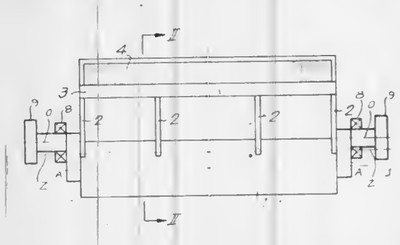
Bernard J. Pauwels, Roeselare; Paul J. Huyghe, Jabbeke, and Ignace F. Meyns, Ichtegem, all of Belgium, assignors to N.V. Weefautomaten Picanol, Ypres, Belgium

Filed Mar. 1, 1985, Ser. No. 707,377

Claims priority, application Belgium, Mar. 2, 1984, 2/60357; Feb. 19, 1985, 2/60618

Int. Cl.[4] D03D *49/60*

U.S. Cl. 139—188 R **9 Claims**



1. A batten assembly for a weaving loom comprising a batten shaft and a reed assembly supported by supports on one side of the batten shaft; the batten assembly having a swinging axis and the batten shaft having a central axis located to one side of and extending parallel to the swinging axis; the batten assembly center or axis of gravity and the batten assembly swinging axis being located away from the batten shaft central axis but within the transverse cross sectional periphery of the batten shaft.

4,625,769

GUIDE DEVICE FOR A WEFT PICKING ELEMENT AND A METHOD OF MAKING SAME

Peter Riesen, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 5, 1985, Ser. No. 772,638

Claims priority, application European Pat. Off., Sep. 13, 1984, 84110954.9

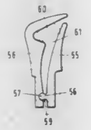
Int. Cl.[4] D03D *49/66*

U.S. Cl. 139—188 R **18 Claims**

1. A guide device for a weft picking element of a weaving machine, said device including a plurality of aligned guide teeth defining a guide channel for the picking element, each said tooth having a guide and support member, a guide hook,

a base and a zone in said base between guide and support member and said hook to permit positional adjustment of said





guide and support member and said hook relative to each other.

4,625,770

METHOD AND APPARATUS FOR MONITORING WEFT INSERTION IN A FLUID JET LOOM

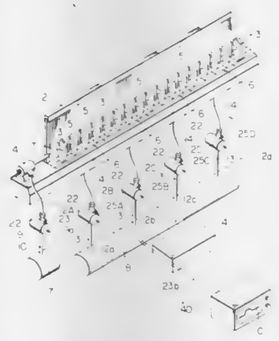
Mamoru Ishikawa, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed May 1, 1985, Ser. No. 729,405

Claims priority, application Japan, Jun. 29, 1984, 59-135686; Jun. 29, 1984, 59-135687

Int. Cl.[4] D03D *51/18*

U.S. Cl. 139—336 **10 Claims**



1. A method of monitoring the weft insertion in a fluid jet type loom in which the supply of the jet discharge fluid impelling the weft yarn into the open shed of the warp yarn is controlled by a valve unit, characterized in that the jet fluid pressure on the output side of the valve unit is sensed by a pressure detection element which generates electrical signals varying in magnitude proportionately with variations in said pressure, and alarm or cessation of the loom operation is caused when the signals are below a preset value.

4,625,771

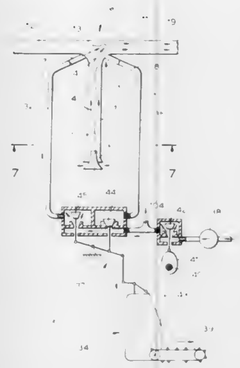
APPARATUS FOR INSERTING TWO WEFT THREADS INTO TWO WARP SHEDS IN A LOOM WITH CENTRAL JET INSERTION

Ladislav Sevcik, and Vladimir Svaty, both of Liberec, Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Continuation-in-part of Ser. No. 609,586, May 19, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 757,744

Int. Cl.[4] D03D *47/30*

U.S. Cl. 139—435 **5 Claims**



1. An apparatus for inserting two weft threads into warp sheds in a loom with central jet insertion, comprising a weft change motion device, nozzles associated with individual weft threads, the outlets of said nozzles being directed into two opposite warp sheds, which can supply air from alternate pressurized air means in accordance with a program, intermediate inlet ducts connected to the respective nozzles, and pairs of opposite outlet ducts in communication with the outlets of the respective nozzles, means for changing the directions of advance of the respective wefts, having tipping nozzles which can be alternately changed in their position in accordance with the program, the discharged directions of the respective tipping air jets being mutually cross-wise directed into said respective pairs of opposite outlet ducts.

4,625,772

COMPONENT LEG BENDING DEVICE

Geoffrey D. Maskens, Blandford, United Kingdom, assignor to Ambotech Limited, Dorchester, England

PCT No. PCT/GB84/00161, § 371 Date Jan. 22, 1985, § 102(e) Date Jan. 22, 1985, PCT Pub. No. WO84/04867, PCT Pub. Date Dec. 6, 1984

PCT Filed May 11, 1984, Ser. No. 695,860

Claims priority, application United Kingdom, May 26, 1983, 8314628

Int. Cl.[4] B21F *1/00*

U.S. Cl. 140—105 **11 Claims**

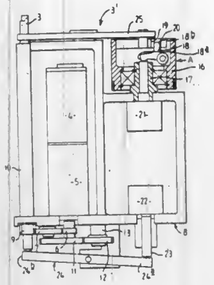
1. Apparatus for bending the legs of a component inserted into a printed circuit board, the apparatus comprising a plurality of bending devices, each bending device comprising:

a frame;

a member rotatably mounted to said frame for engaging a respective leg of a component;

means for rotating the engaging member to a selected one of a plurality of orientations; and

means for moving the engaging member in the selected orientation, the engaging member of each bending device being rotatable independently of the engaging member of the other bending device(s) so that the respective component leg associated with each bending device can be bent in a selected direction.



4,625,773

MACHINE FOR FABRICATING A REINFORCING BODY FOR A CONCRETE PIPE

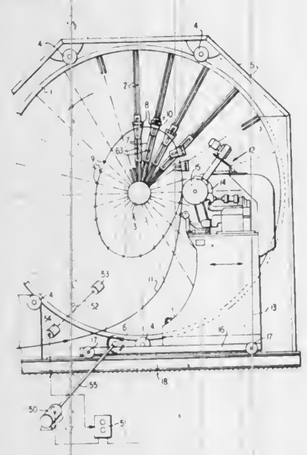
Georg Pfender, Kisslegg, Fed. Rep. of Germany, assignor to MBK Maschinenbau GmbH, Kisslegg, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,213

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422420

Int. Cl.[4] B21F *31/00*

U.S. Cl. 140—112 **9 Claims**



1. A machine for manufacturing a reinforcing body for a concrete part, wherein the reinforcing body includes longitudinal rods and wires wound over the rods and welded to the rods at the points of intersection with the rods, said machine having a longitudinal direction and comprising:

an axially stationary main wheel mounted for rotation, the axial direction of said main wheel being in the longitudinal direction of the machine;

an axially mobile support wheel mounted coaxially and drivable synchronously with said main wheel;

adjustable guide pieces carried by said main wheel for supporting the longitudinal rods to be welded;

first servo means connected to said guide pieces for producing a common uniform adjustment of said guide pieces;

a welding carriage movable transversely to the machine longitudinal direction;

second servo means connected to said welding carriage and synchronized with said first servo means for moving said welding carriage transversely to the machine longitudinal direction in synchronism with the adjustment of said guide pieces;

welding means mounted on said welding carriage for welding the intersections of the rods and wire consecutively during the rotary movement of said main wheel;

signal transducer means for generating a guide quantity signal as a function of the rotary angular position of said main wheel;

amplifier means having an adjustable amplification factor, an input connected to said signal transducer means for receiving said guide quantity signal and an output for producing the guide quantity signal amplified by a factor corresponding to the desired size of the reinforcing body; and

third servo means connected to said welding carriage and having an input for receiving the amplified guide quantity signal, said third servomotor means moving said welding carriage transversely to the machine longitudinal direction by an amount dictated by the amplified guide quantity signal, wherein said second and third servo means are connected in series for moving said welding carriage in accordance with the sum of their movements.

4,625,774

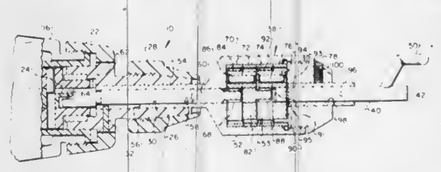
CONDUCTOR UNWRAPPING ATTACHMENT FOR MOTOR DRIVEN TOOL

Paul D. Stack, Jr., Cadillac, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 11, 1985, Ser. No. 786,905

Int. Cl.[4] B21F *15/04*

U.S. Cl. 140—123 **9 Claims**



1. A device for rotatably driving a conductor unwrapping bit and for connection to a motor driven tool to be driven thereby, said tool including a drive member and means for supporting a conductor wrapping bit and sleeve assembly, said device comprising;

a housing including an elongated cylindrical portion adapted to be supported by said means on said tool, said cylindrical portion including a bore for rotatably supporting an elongated drive shaft, said drive shaft including means engageable with said drive member to be rotatably driven thereby;

a conductor unwrapping bit rotatably supported on said housing; and

speed reduction gear means disposed in said housing and drivably interconnecting said unwrapping bit with said drive shaft for driving said unwrapping bit at a reduced speed with respect to the speed of rotation of said drive shaft.

4,625,775

HIGH SPEED CONTAINER PLACEMENT APPARATUS

Herbert E. Schaltegger, 10 Schaghticoke Trail, New Milford, Conn. 06776

Filed Mar. 27, 1985, Ser. No. 716,680

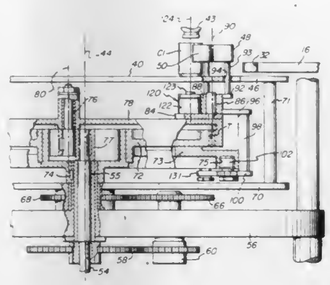
Int. Cl.[4] B65B *1/04*

U.S. Cl. 141—83 **27 Claims**

16. A high speed placement device for use with workpieces such as containers comprising:

(A) a plurality of workpiece receiving stations spaced equidistantly from a central axis;

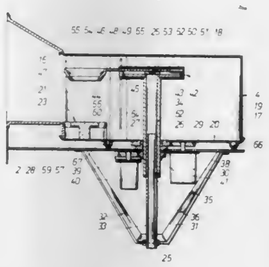
(B) an annular turntable rotatable about said central axis for transporting workpieces thereon;
(C) feeder guide means for transferring workpieces from said turntable to said workpiece receiving stations;
(D) discharge guide means for transferring workpieces from said workpiece receiving stations to said turntable; and



(E) means to oscillate said feeder and discharge guide means to transfer said workpieces between said turntable and said workpieee receiving stations.

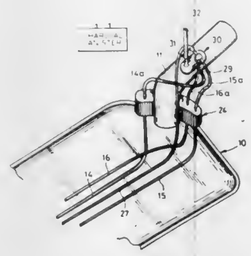
27. The high speed container placement apparatus in accordance with claim 16, wherein said workpieces are containers and said receiving stations are weigh stations with product dispensing devices for filling said containers by weight.

4,625,776
VENDING MACHINE DELIVERING CUPS CONTAINING FRESHLY MADE BEVERAGES
Per W. Mikkelsen, Odense, Denmark, assignor to Wittenborgs Automatfabriker, Odense, Denmark
Filed Jul. 10, 1985, Ser. No. 753,652
Claims priority, application Denmark, Aug. 3, 1984, 3778/84
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—83 8 Claims



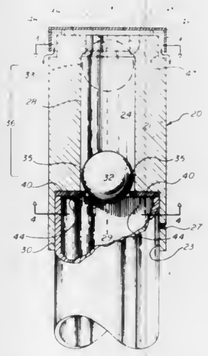
1. A vending machine for delivering cups containing freshly made beverages comprising a cup dispenser for dispensing empty cups; a filling device for receiving said empty cups during the process said beverages are made; a powder dispensing device, said powder dispensing device able to adjust to amount of powder dispensed to the cup in said filling device; a water feeding device, said water feeding device feeding water into said cups in said filling device, said filling device comprised of a cup holder supporting each cup during the filling in of each of the ingredients of the beverage, said cup holder mounted to a weighing unit for weighing the cup and at least one of the added ingredients of the beverage in sequence and regulating the delivery of the powder dispensing device and water feeding devices, said cup holder detecting when the ingredients thereof are about to be used up.

4,625,777
FUEL TANK VENTILATING SYSTEM
Wilfried Schmidt, Bingen, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 12, 1985, Ser. No. 796,796
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442149
Int. Cl.[4] B67C *3/02*
U.S. Cl. 141—286 10 Claims



1. Arrangement for limiting the filling of tanks and for aeration and ventilation of fuel tanks in which a portion of the tank volume acts as a pressure-compensation space with regard to temperature changes, with an aeration and ventilation arrangement opening into an aeratable and ventable filler neck, said arrangement having a filling vent which determines the maximum liquid level considered allowable and an operating vent which takes over aeration and ventilation of the pressure-compensation volume with a sealing system, such that the operating vent is sealed by means of a spring when the tank cap is removed, and opened when the tank cap is put on by action of the same against the spring force, characterized by the fact that a valve integrated into the aeration and ventilation line controls the operating vent, the valve body of said valve being operable against spring resistance by means of a plunger rod, and that the valve is placed in the filler neck in such a way that the piston rod is parallel to the sides of the filler neck, and that its free end projects out of the filler neck when the tank cap is removed.

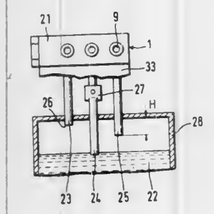
4,625,778
AUTOMATIC VENTING VALVE FOR GAS STORAGE TANK
Howard Johnson, West Valley City, Utah, assignor to HMH, Inc., West Valley City, Utah
Filed Apr. 26, 1985, Ser. No. 727,731
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—301 11 Claims



1. A control valve for blocking atmospheric venting of gas

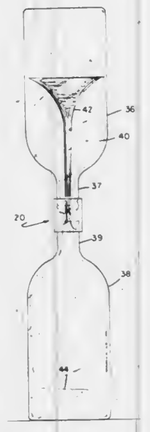
fumes contained within a gasoline storage tank during tanker refill operations wherein the gasoline tank includes a venting tube coupled to open space within the top of the tank to provide air intake for pressure equalization as gasoline is gradually removed from the tank, said control valve comprising:
a. a rigid, tubular valve casing having a top opening, a bottom opening and a flow channel therebetween;
b. means for attaching the bottom end of the casing to an upper end of the venting tube such that the valve flow channel forms a continuation venting path for the venting tube;
c. first and second valve seats and an intermediate seating member coupled to the casing and at least partially contained within the flow channel, said seating member being configured in shape and size to form restricted air space between the seating member and a surrounding wall of the flow channel to be reversibly displaceable in response to fume exhaust expelled during refill operations, being displaceable along the flow channel between (i) a rest position wherein the seating member nests under force of gravity on the second valve seat and (ii) a sealed position wherein the seating member is raised by fluid flow against the gravity force to a sealed position at the first valve seat;
d. said second valve seat including weap holes therethrough positioned along the flow channel such that communication between an exterior environment and an unblocked segment of the flow channel is maintained when the seating member is in the rest position to enable gradual venting of the strage tank; and
e. said first valve seat being configured to develop a full seal and blockage with the seating member in the sealed position wherein fluid flow through the weap holes of the second valve seat is blocked to thereby prevent forced evacuation of gas fumes during filling operations;
f. said first and second valve seats, seating member and flow channel be configured with minimal open space along and within the flow channel to enable rapidly moving gas fumes to build a sufficient pressure head to raise the seating member in sealing contact against the first valve seat.

4,625,779
RECEIVING ARRANGEMENT FOR FILLING AN ANAESTHETIC FLUID.
Martin Ryschka, Stockelsdorf; Helmut Mohr, Lübeck; Wolfgang Falb, Krummesse, and Carl-Friedrich Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany
Filed Sep. 23, 1985, Ser. No. 779,384
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434966
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—311 R 9 Claims



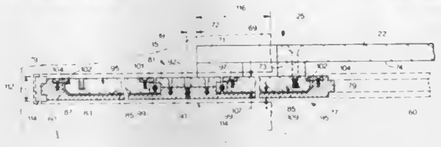
1. A receiving arrangement for filling an anaesthetic medium from a supply vessel into the charging chamber of an anaesthetic apparatus, the supply vessel being connectable to the arrangement by means of a coupling piece, the arrangement comprising:
a receiving structure having an input opening for receiving said coupling piece therein;
a connecting part disposed adjacent said receiving structure and including channel means communicating with said charging chamber for conducting the anaesthetic medium to the latter, said channel means terminating in port means facing said receiving structure;
said receiving structure further including a closure piece slidably mounted in said structure between a first position directly opposite said port means and a second position whereat said closure piece is displaced away from said port means thereby making the latter accessible to said coupling piece after the latter is inserted into said receiving structure through said opening; and, resilient biasing means for biasing said closure piece into said first position;
drive means for driving said receiving structure between a rest location whereat said closure piece seals said port means with respect to the ambient when in said first position to an actuating location whereat said receiving structure and said closure piece are displaced away from said port means and whereat said receiving structure can receive said coupling piece therein so as to cause said closure piece to be displaced to said second position against the force of said resilient biasing means so that said coupling piece occupies said first position;
said coupling piece and said connecting part conjointly defining a connecting interface whereat said anaesthetic medium flows from said coupling piece into said port means when said structure is returned to said rest location with said coupling piece inserted therein; and,
blocking means for blocking the entry of said coupling piece through said opening when said receiving structure is in said rest location and for blocking an unwanted slippage of said coupling piece out of said opening when said structure is at said rest location with said coupling piece inserted therein.

4,625,780
VORTEX CONNECTOR
Craig C. Burnham, 26 Dearborn St., Salem, Mass. 01970
Continuation-in-part of Ser. No. 466,607, Mar. 22, 1983, abandoned. This application Mar. 26, 1985, Ser. No. 716,172
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—319 8 Claims



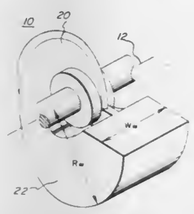
1. A vortex connector for at least one bottle having a male helically-threaded neck comprising a hollow tubular-threaded connector having female helical threads disposed internally within at least one end thereof and an axially elongated constriction venturi positioned internally between the ends of said connector such that liquid in said bottle can swirl about a vortex in flowing through said connector.

4,625,781
SAW CARRIER ASSEMBLY FOR TREE FALLING APPARATUS
Jerry L. Miller; Frank E. Jaenicke, both of Prince George, and Quentin C. Lodge, Fort St. James, all of Canada, assignors to Northern Manufacturing Limited, Prince George, Canada
Filed May 30, 1985, Ser. No. 739,175
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—34 R 18 Claims



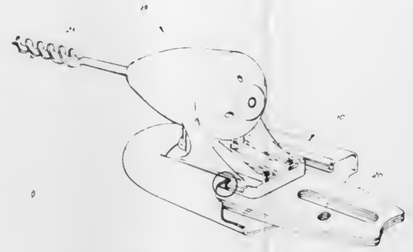
1. A saw carrier assembly for a loop of saw chain which is adapted to produce a kerf in a workpiece, the assembly having:
(a) a saw support means and a sprocket drive means, the support means mounting the sprocket drive means to drive the saw chain,
(b) a saw chain journalling means mounted for rotation on the saw support means, the journalling means having a rotatable circular outer plate with a circular periphery cooperating with the saw chain to mount the chain to rotate with the outer plate so as to reduce friction and to resist sawing forces, the outer plate being spaced from the sprocket drive means and disposed relative to the drive means so that the saw chain extends as a loop around the drive means and the outer plate, the outer plate having a thickness less than the kerf to permit a portion of the outer plate to pass into the kerf with negligible interference therewith.

4,625,782
LOG SPLITTER
Gary O. Jameson, RD #1, Box 200, Middle Grove, N.Y. 12850
Filed Aug. 5, 1985, Ser. No. 762,689
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 R 26 Claims



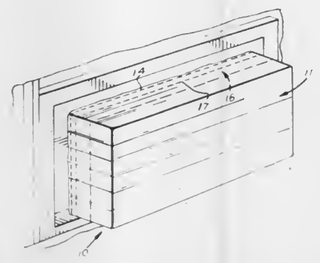
1. A blade, rotatable about an axis, for use in log splitting, said blade being positioned to engage an end of a log and being constructed so as to split the log in a single 360° rotation about said axis, comprising:
cutting means having a radius relative to said axis which increases with rotation of said blade such that upon rotation of said blade, said cutting means sufficiently penetrates the end of a log engaged by said blade to form a lengthwise crack in said log; and
separating means of width which increases with rotation of said blade for separating the log into two pieces along said lengthwise crack, said separating means being integral with and subsequent to said cutting means.

4,625,783
PROTECTIVE COVER
John A. Notaras, and Angelo L. Notaras, both of 15-21 Reynolds Street, Balmain, New South Wales, 2041, Australia
Filed Feb. 15, 1983, Ser. No. 466,509
Claims priority, application Australia, Feb. 17, 1982, PF2744
Int. Cl.[4] B67B *17/00*; F16P *1/02*
U.S. Cl. 150—52 R 6 Claims



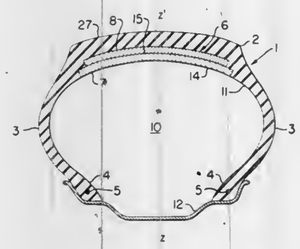
1. A protective safety cover for a power transmission chain of a chain saw power head to drive an attachment for the power head, said attachment having at least two fins for engagement by the cover, said cover being resilient and having two elongated grooves adapted to frictionally engage the fins to thereby secure the cover to the attachment, said grooves being curved until said fins are located therein so that upon location of said fins in said grooves, said cover is resiliently deformed to correspond to the shape of said fins, thereby to enhance the frictional engagement between the fins and grooves.

4,625,784
INDOOR AIR CONDITIONER COVER AND SYSTEM
Bernard A. Boroson, 101 Clark St., Brooklyn, N.Y. 11201
Filed Jun. 12, 1985, Ser. No. 744,105
Int. Cl.[4] A47B *81/00*
U.S. Cl. 150—52 R 7 Claims



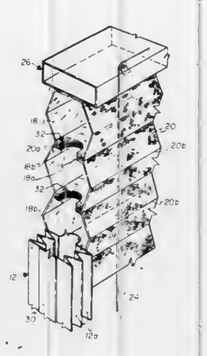
1. An indoor air conditioner cover set for the indoor portion of and air conditioner comprising means substantially impermeable to air, means to seal said impermeable means to said indoor portion of said air conditioner, a fabric cover, said cover including; a fabric outer layer; an inner ply of insulating fibre; open at one end; and said cover adapted to fit over the indoor portion of an air conditioner, means at said open end of said indoor air conditioner cover adapted to selectively reduce the periphery of said opening, said periphery adapted to grasp the periphery of said indoor portion of said air conditioner over said impermeable means and conform thereto, a peripheral fold in said cover, said peripheral fold including means to optionally release said fold to increase the depth of said cover.

4,625,785
REINFORCEMENT PLY FOR TIRE FORMED AT LEAST IN PART OF A FABRIC WITH A THREE-DIMENSIONAL BODY; TIRES COMPRISING AT LEAST ONE SUCH PLY; METHODS OF OBTAINING SUCH TIRES
Michel Merle, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Division of Ser. No. 579,213, Feb. 10, 1984, Pat. No. 4,580,611.
This application Nov. 27, 1985, Ser. No. 802,865
Claims priority, application France, Feb. 16, 1983, 83 02625
Int. Cl.[4] B60C *5/01*
U.S. Cl. 152—452 4 Claims



1. A tire having at least one, characterized by the fact that the reinforcement ply is formed, at least in part, by a fabric having the following properties, when the fabric is arranged in such a manner as to have a generally flat shape with two flat principal faces:
(a) the fabric comprises a three-dimensional body and reinforcement threads arranged in the body and held by the body;
(b) practically all the voids in the fabric are capable of being impregnated with at least one material which forms part of the structure of the tire;
(c) the body is capable of retaining a three-dimensional structure even if the reinforcement threads are removed from the fabric;
(d) the body comprises warp threads, each of these warp threads undulating practically in a plane perpendicular to the principal faces of the fabric and being alternately tangent to one of these faces and then to the other face;
(e) the body comprises woof threads arranged between the warp threads practically in at least four planes within the thickness of the fabric, these planes being parallel to the principal faces of the fabric;
(f) the reinforcement threads are arranged practically in one plane, the reinforcement threads having the same orientation, the plane of the reinforcement threads being parallel to the planes of the woof threads;
(g) the reinforcement threads are without contact with at least one of the principal faces of the fabric;
(h) the reinforcement threads are separated from each other by the threads of the body in such a manner that the reinforcement threads are without contact with each other;
(i) the threads of the body have a cross-section whose surface has an area at most equal to one-quarter of the area of the surface of the cross-section of the reinforcement threads;
(j) the ratio between the rigidity of the fabric measured according to the orientation of the reinforcement threads and the rigidity of the body by itself measured in this same orientation is at least equal to 10, these rigidity measurements being carried out for a relative elongation of 2%;
(k) the porosity of the fabric is at least equal to 50%;
(l) the permeability of the fabric is at least equal to $10^{-11} m^2 \cdot Pa^{-1} \cdot s^{-1}$ for a fluid whose viscosity is 1 Pa·s.

4,625,786
INSULATED WINDOW SHADE ASSEMBLY
Neil A. Carter, 510 Galisteo St., Santa Fe, N. Mex. 87501, and Armand G. Winfield, Santa Fe, N. Mex., assignors to Neil A. Carter, Santa Fe, N. Mex.
Filed Dec. 5, 1984, Ser. No. 678,473
Int. Cl.[4] A47H *5/00*
U.S. Cl. 160—84 R 7 Claims



1. An insulated window shade assembly comprising:
a window shade including first and second pleated plys, each of said plys having multiple horizontal pleats formed by alternating inside folds and outside folds formed in said plys, means connecting said plys so as to maintain a uniform spacing between said plys while also permitting free folding of said plys along said pleats, whereby said shade can be raised upwardly to a compact raised position in which said plys are fully folded and lowered downwardly to a lowered position in which said pleats are partially unfolded, each of said plys having side edges which define the side edges of said window shade and which are cut at an angle with respect to a vertical plane extending orthogonally with respect to the plane of the shade, and
a pair of guide rails for attachment to a window casing, each of said guide rails including angled surfaces which abut and conform with said side edges of said pleated plys when said shade is in said lowered position,
said side edges of said pleated plys being cut at an angle which is approximately one half the angle of said angled surfaces of said guide rails, said angle being taken with respect to a vertical plane oriented orthogonally with respect to the plane of the shade, and wherein said pleats of said plys extend at an angle of approximately 120° with respect to one another when said shade is in said lowered position, whereby said side edges of said plys flushly abut said surfaces of said guide rail in a sealing relationship when said shade is in said lowered position, and wherein said side edges of said pleated plys partially draw away from said guide rails to reduce friction as said shade is raised due to folding motion of said pleats.

4,625,787
METHOD AND APPARATUS FOR CONTROLLING THE LEVEL OF LIQUID METAL IN A CONTINUOUS CASTING MOLD
David L. Haveman, Carleton, Mich., and John C. Powell, Oakdale, Pa., assignors to National Steel Corporation, Pittsburgh, Pa.
Filed Jan. 22, 1985, Ser. No. 693,197
Int. Cl.[4] B22D *11/18*
U.S. Cl. 164—453 9 Claims

1. A method of controlling the pouring of molten metal into a mold of a continuous molten metal caster from a tundish having a variable outlet nozzle including a valve member

movable to vary the area of the outlet nozzle opening, the method comprising the steps of

monitoring the level of liquid metal in the mold and providing an electrical signal indicating both direction and magnitude of a detected deviation of said liquid metal level from a predetermined level,

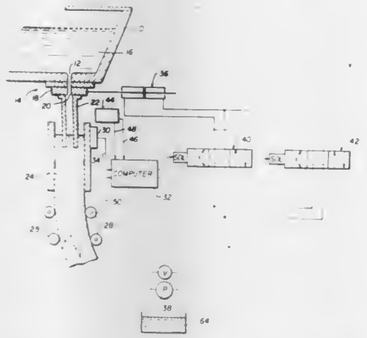
detecting the position of said valve member and providing an electrical signal representing said detected position,

determining any necessary change in outlet opening area required to correct the detected deviation in liquid metal level,

determining a valve position error representing the extent of movement of said valve member required to produce said necessary change in outlet opening area,

applying a force to said valve member to initially move said valve member at a maximum velocity for a predetermined distance less than said valve position error and thereafter applying a force to further move said valve member in increments and determining the valve position error remaining after each incremental movement until the valve position error substantially equals zero, and

monitoring the velocity of said valve member during each incremental movement and stopping the application of force to the valve member when the velocity of said valve member reaches a predetermined cutoff velocity less than said maximum velocity, the cutoff velocity after each successive incremental movement being less than the preceding cutoff velocity.



7. Apparatus for controlling the pouring of molten metal into a mold of a continuous molten metal caster from a tundish having a variable outlet nozzle including a valve member movable to vary the area of the outlet nozzle opening, comprising

sensor means monitoring the level of liquid metal in the mold and providing an electrical signal indicating both direction and magnitude of any deviation of said liquid metal level from a predetermined level,

means continuously detecting the position of said valve member and providing an electrical signal representing said detected position,

computer means operable to determine a valve position error representing the extent of movement of said valve member required to produce a metal flow rate to correct a detected deviation in liquid metal level from said predetermined level,

hydraulic actuator means operable to apply force to said valve member to initially move said valve member at a first velocity for a predetermined distance less than said valve position error and thereafter to apply force to further move said valve member at a velocity lower than said first velocity in increments,

means determining the valve position error remaining after each incremental movement until the valve position error substantially equals zero, and

means monitoring the velocity of said valve member during each incremental movement,

said computer means being operable to control operation of said hydraulic actuator means to control application of force to said valve member and to stop the application of force to said valve member during each incremental movement when the velocity of said valve member reaches a predetermined cutoff velocity less than said first velocity, the cutoff velocity after each successive incremental movement being less than the preceding cutoff velocity.

4,625,788

APPARATUS AND METHOD FOR THE CONTINUOUS CASTING OF METAL

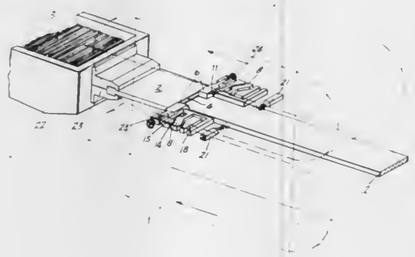
Kurt Buxmann, Sierre, and Martin Bolliger, Venthône, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 10, 1984, Ser. No. 639,334

Claims priority, application Switzerland, Aug. 24, 1983, 4606/83

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—481 **5 Claims**



1. An apparatus for the continuous casting of moletn metal wherein molten metal is fed to a mold defined by a pair of continuously advancing surfaces comprising a nozzle having a front face defining an opening of a width b for feeding molten metal to said mold, side-limiting means immediately downstream of said nozzle and in contact with said front face for prohibiting the flow of molten metal by said front face, said side-limiting means comprises at least a pair of baffles defining a width b_1 and at least a pair of cooling blocks immediately downstream of said pair of baffles defining a width b_2 and means associated with said side-limiting means for varying the width of at least one of said width b_1 and said width b_2.

5. In a method of controlling the width of a casting strip cast with an apparatus which includes a mold defined by a pair of continuously advancing surface, the method comprises the steps of providing a nozzle having a front face defining an opening of a width b for feeding molten metal to said mold, providing at least a pair of baffles defining a width b_1 immediately downstream of said nozzle and in contact with said front face for prohibiting the flow of molten metal by said front face, positioning at least a pair of cooling blocks defining a width b_2 downstream of said baffles, feeding molten metal to said nozzle, said baffles and said cooling blocks and varying the width of said width b_2.

4,625,789

DOUBLE BARRIER HEAT EXCHANGER

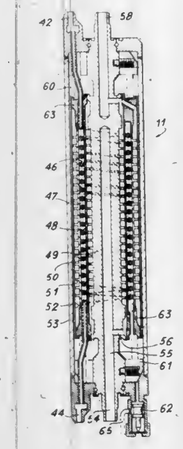
Jean E. Chaix, Manosque; Jean C. Chaix, Venelles, and Jean L. Chaix, Pertuis, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 30, 1982, Ser. No. 403,415

Claims priority, application France, Aug. 10, 1981, 81 15451

Int. Cl.⁴ F28D *7/02;* **G21C** *17/00, 19/28*

U.S. Cl. 165—11.1 **11 Claims**



1. A double barrier heat exchanger comprising a primary duct allowing passage of a radioactive primary fluid and a secondary duct allowing passage of a secondary fluid, a space being provided between said primary duct and said secondary duct, said heat exchanger further comprising a junction matrix positioned within said space and in contact both with the primary duct and the secondary duct, said matrix being in the form of a solid compact metallic mass and incorporating at least one element able to diffuse into the primary fluid when it is in contact with said primary fluid and able to become radioactive when it is submitted to the action of an activation source.

4,625,790

HEAT TRANSPORT APPARATUS

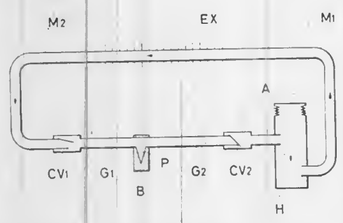
Kenji Okayasu, No. 20-15, Mukai-machi, Gyouda-shi, Saitama-ken, Japan

Filed Jul. 22, 1985, Ser. No. 757,605

Claims priority, application Japan, Jul. 24, 1984, 59-153442

Int. Cl.⁴ F28D *15/00*

U.S. Cl. 165—104.22 **2 Claims**



1. A heat transport apparatus comprising a heating block made of material having a high heat conductivity and having a recess means formed therein to produce a small bubble, pipe means made of material having a low heat conductivity and adapted to contain a working fluid, the heating block being positioned with its recess in fluid communication with the interior of the pipe means and arranged to be heated for growing a bubble in said working fluid, flapper-type check valves provided at the ends of the pipe means and arranged so that the growing bubble increases the pressure of the working fluid in the pipe means, the increased pressure causing one check valve to open and the other check valve to close, thereby displacing the working fluid through the opened check valve under the action of the grown bubble, further pipe means connected between an inlet of one of the check valves and an outlet of the other check valve for circulating the working fluid to pass it through the other check valve into the heating block when the bubble is constricted, and a radiator positioned in the further pipe means for radiating heat from the working fluid.

4,625,791

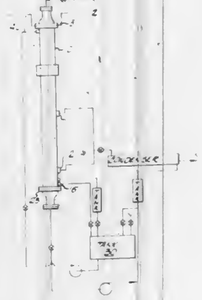
APPARATUS AND METHOD FOR OPERATING SOLUTION HEAT WITH VERTICAL HEAT EXCHANGERS

Michael L. Lane; Lowell T. Whitney, and Paul C. Beck, all of Arvada, Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed May 3, 1985, Ser. No. 729,914

Int. Cl.⁴ B64D *13/04, 13/08*

U.S. Cl. 165—115 **2 Claims**



1. A vertical heat exchanger apparatus for exchanging heat comprising:

vertical tube means for containing a heat source from which heat is to be extracted;

container means surrounding said vertical tube means for containing fluid to be heated by said vertical tube means;

means for introducing said fluid into said container means;

means for exhausting said fluid from said container means;

perforated baffle means contained horizontally in said container means and surrounding said vertical tube means for providing an open annulus between said baffle means and said vertical tube means to provide an opening through which said fluid must flow downward over the vertical tube means;

fluid control means associated with said baffle means and said annulus and adapted to provide a substantially uniform falling film of said fluid on the surfaces of said vertical tube means, and

said fluid control further including centering means comprising structural centering member means wherein the intersection defined by said structural member means receives, in contact relationship each vertical tube of said vertical tube means centrally of each opening in said perforated baffle means defining said open annulus.

4,625,792

RECUPERATIVE HEAT EXCHANGER

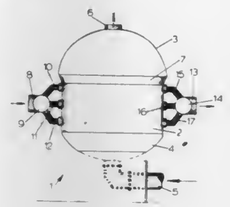
Henk Beenhakker, Haarlem; Dirk Van Der Giessen, Noord-Scharwoude, and Kees Verweij, Limmen, all of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

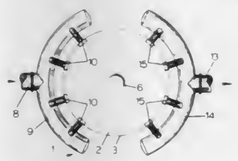
Filed Jan. 15, 1985, Ser. No. 691,586

Claims priority, application Netherlands, Jan. 17, 1984, 8400139

Int. Cl.⁴ F28F *7/00, 9/02*

U.S. Cl. 165—139 **7 Claims**





1. A recuperative heat exchanger for gas-gas heat exchange at a temperature above 700° C., comprising

(a) a refractory lined vessel having a vertically extending steel shell having an open top and bottom and respective ends of said vessel closing said top and bottom,

(b) top and bottom apertured refractory plates dividing the space within the vessel into respective top and bottom end chambers and a heat-exchange chamber therebetween,

(c) a plurality of substantially vertical tubes of refractory ceramic material extending between said plates and connecting the said end chambers,

(d) connections for respectively supply and discharge of a first heat-exchange media provided in said ends,

(e) on one side of said steel shell a plurality of connections for supply of a second heat-exchange media distributed over a region of said shell, said plurality of connections extending both vertically and circumferentially,

(f) and on the other side of the steel shell a plurality of connections for discharge of the second medium also distributed over a region of said shell extending both vertically and circumferentially, and

(g) manifolds connecting the said connections for supply and discharge of the second medium to main supply and discharge conduits respectively.

4,625,793

HEADER FOR A HEAT EXCHANGER

Patrick Cadars, Montigny le Bretonneux, France, assignor to Valeo - Societe Anonyme Francais, Paris, France

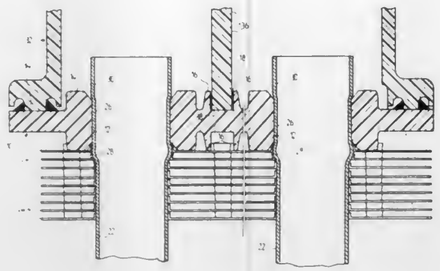
Filed Sep. 13, 1985, Ser. No. 775,673

Claims priority, application France, Sep. 14, 1984, 84 14154

Int. Cl.⁴ F28D *1/04*

U.S. Cl. 165—151 **4 Claims**

1. A header plate for a tube bank heat exchanger, said header plate including inner and outer faces and means defining a longitudinally and laterally spaced array of mounting holes extending therethrough, each hole dimensioned to sealingly receive one end of one of the tubes in said bank, a pair of parallel ribs formed on each of said inner and outer faces of said header plate in symmetry, groove means defined by and between each rib pair and a tubular collar encircling each mounting hole and projecting outwardly therefrom away from each face of said header plate substantially the same distance as



said rib pairs to define each face of the header plate as substantially identical and symmetrical.

4,625,794

PLASTIC HEAT EXCHANGER CONSTRUCTION

Felix Dürst, Zürich, Switzerland, assignor to Norbert Allenspach, Switzerland

Filed Sep. 21, 1984, Ser. No. 653,790

Claims priority, application Switzerland, Sep. 30, 1983, 5323/83

Int. Cl.⁴ F28F *3/12*

U.S. Cl. 165—170 **6 Claims**



1. A plastic heat exchanger, comprising a plate portion having two spaced apart walls with a plurality of substantially parallel cross webs interconnecting said walls and defining a plurality of longitudinally extending heat transfer medium flow channels, and a distribution and collecting element having spaced apart legs abutting the ends of the plate walls and being welded thereto, said distribution and collecting element having at least one of a heat transfer fluid plastic nipple inlet connection and a heat transfer fluid plastic nipple outlet connection, said distribution and collection element being of U-shaped cross section and closed at each end having a spacing of the legs forming the U-shaped cross section which is substantially equal to the spacing of the walls of said plate at least adjacent portions thereof abutting said plate walls, said distribution and collecting element having wall thickness which is slightly greater than the wall thickness of said heat exchange plate walls.

4,625,795

GEOMECHANICAL PROBE FOR A DRILLING WELL

Damien M. Despax, Paris; Jean-Pierre H. Martin, Colombes, and Francois Gueuret, Voisins le Bretonneux, all of France, assignors to Compagnie Francaise des Petroles, Paris Cedex, France

Filed Mar. 25, 1985, Ser. No. 715,844

Claims priority, application France, Apr. 3, 1984, 84 05210

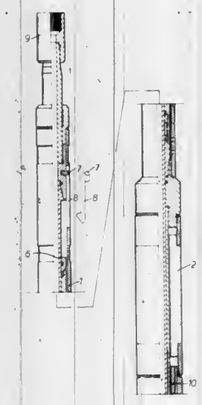
Int. Cl.⁴ E21B *47/00*

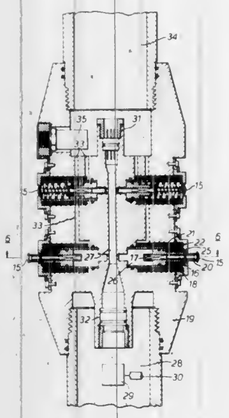
U.S. Cl. 166—66 **9 Claims**

1. A geomechanical probe for a drilling well, comprising an elongate body provided with an inner space adapted to receive pressurised fluid and including:

a pair of inflatable packers longitudinally spaced apart along the body and capable of sealing against the well wall when inflated and defining a closed well space from one packer to the other packer between said body and the well wall;

passage means, extending between said inner space and the inflatable packers and between said inner space and said closed well space, for conveying pressurised fluid successively to said inflatable packers for inflating the same and to said closed well space for acting against the well wall between the inflated packers; and





a logging box located between said packers and including a plurality of radially movable tracers distributed circumferentially around said box, said tracers being biased radially outwardly and being mounted on radially movable support members movable between a retracted position in which the tracers are maintained within said box and an extended working position in which the tracers are able to contact the well wall, and sensing means surrounding said tracers for providing signals representative of the radial positions of the respective tracers.

4,625,796

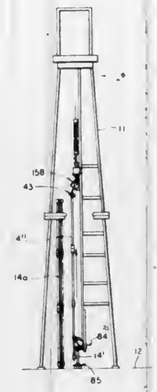
WELL PIPE STABBING AND BACK-UP APPARATUS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Apr. 1, 1985, Ser. No. 718,537

Int. Cl.⁴ E21B *19/20*

U.S. Cl. 166—77.5 **35 Claims**



1. Well apparatus comprising:

a back-up tool for holding the upper threaded end of a string of well pipe against rotation as an additional length of pipe is connected thereto;

means mounting said back-up tool for movement between an active position for engaging and holding said upper end of the pipe string and an inactive position offset laterally with respect to the string;

a stabbing unit for locating said additional length of pipe during connection to the string; and

means mounting said stabbing unit for movement with said back-up tool between said active and inactive positions thereof and for movement relative to said back-up tool, in said active position thereof, between a first position of the stabbing unit for engaging and holding said additional length of pipe at a location offset laterally with respect to the back-up tool and a second position locating the additional length of pipe in alignment with the back-up tool for connection to the string;

said means mounting the back-up tool being constructed to mount said tool for vertical movement in said active position of the back-up tool in addition to said movement of the back-up tool between said active and inactive positions, to thereby engage said upper threaded end of the pipe string and hold is against rotation at different levels;

said means mounting the stabbing unit connecting the stabbing unit to said back-up tool for vertical movement therewith in said active position of the back-up tool.

4,625,797

CHEMICAL INJECTION TUBE MOUNTING STRUCTURE FOR A GEOTHERMAL WELL

Jiro Tsutsumi, Iwate; Minolu Uchiyama, Morioka, and Kunio Katagiri, Funabashi, all of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,132

Claims priority, application Japan, Apr. 17, 1984, 59-76891

Int. Cl.⁴ E21B *37/06*

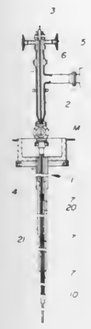
U.S. Cl. 166—90 **6 Claims**

1. A chemical injection tube mounting structure for a geothermal well having a fluid with a characteristic flashing point, comprising:

a vertical pipe mounted coaxially with a bore hole of a geothermal well;

a sealing flange mounted at the upper end of said vertical pipe;

a chemical injection tube having a lower end, an upper end, an inside wall and a peripheral wall, said tube secured at said upper end to said sealing flange and extending down into said vertical pipe, said tube extending at said lower end down to below the flashing point in the well, and further being enclosed at said lower end thereof;



a nozzle extending downward from said inside wall of said chemical injection tube at a position between said upper end and said lower end, said chemical injection tube pierced by several tiny holes through said peripheral wall, said tiny holes located below said nozzle for supplying scale preventing chemicals, provided from above ground, into the geothermal well.

4,625,798

SUBMERSIBLE PUMP INSTALLATION, METHODS AND SAFETY SYSTEM

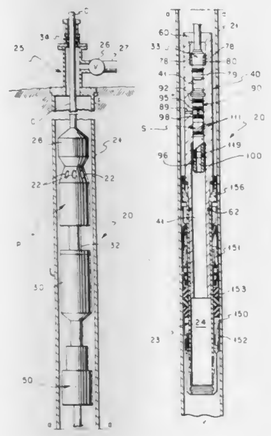
Russell I. Bayh, III, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 470,581, Feb. 28, 1983, Pat. No. 4,529,035. This application Jan. 31, 1985, Ser. No. 697,051

The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.

Int. Cl.[4] E21B *43/00, 34/06*

U.S. Cl. 166—106 **7 Claims**



1. A well completion having a hydraulically powered submersible pump with an intake and a discharge disposed within a first well flow conductor, comprising:

a. well packer means for forming a fluid seal with the interior of the first well flow conductor at a downhole location to direct formation fluid flow to the pump intake;

b. a landing nipple releasably secured to the upper portion of the well packer means;

c. a longitudinal passageway extending through the landing nipple;

d. a safety valve releasably secured within the longitudinal passageway for controlling fluid flow therethrough;

e. means for attaching the submersible pump to the landing nipple above the safety valve;

f. the longitudinal passageway providing a portion of the means for directing formation fluid flow to the pump intake;

g. the landing nipple further comprising a tubular housing means with the longitudinal passageway extending therethrough;

h. locking grooves formed on the interior of the longitudinal passageway intermediate the ends thereof;

i. the locking grooves providing means for releasably securing the safety valve within the longitudinal passageway;

j. a second flow conductor extending from the well surface and coaxially disposed within the first flow conductor to form an annulus therebetween; and

k. the second flow conductor and the annulus cooperating to provide separate flow paths for supplying input power fluid to the submersible pump and for returning fluid discharged from the pump to the well surface.

4,625,799

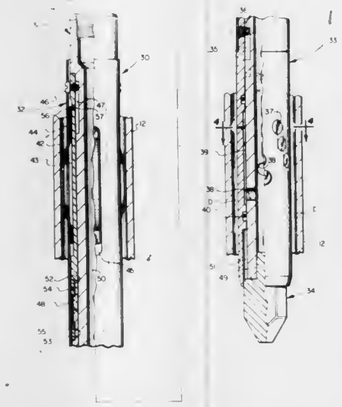
CLEANING TOOL

William H. McCormick, Plano, and Charles C. Cobb, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Jun. 19, 1985, Ser. No. 746,313

Int. Cl.[4] E21B *37/00*

U.S. Cl. 166—223 **15 Claims**



1. An apparatus for cleaning flow conductors comprising:

a. mandrel means having a longitudinal passageway extending therethrough;

b. means for connecting one end of the mandrel means to a source of cleaning fluid;

c. means for restricting fluid flow from the other end of the mandrel means;

d. port means extending laterally through the mandrel means to communicate fluid from the longitudinal passageway to a nozzle body means;

e. said nozzle body means slidably disposed on the exterior of the mandrel means;

f. chamber means formed in the interior of the nozzle body means and the exterior of the mandrel means to receive fluid from the port means;

g. sealing means to prevent undesired fluid flow from the chamber means;

h. a plurality of nozzles extending radially through the nozzle body means to communicate cleaning fluid from the chamber means to the exterior of the nozzle body means; and

i. means for selectively rotating the nozzle body means in response to longitudinal movement of the apparatus.

4,625,800

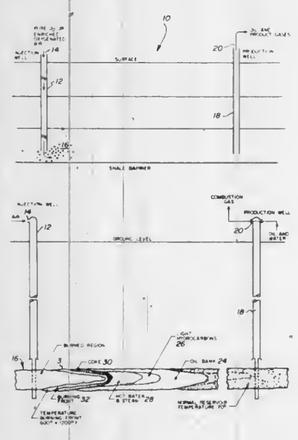
METHOD OF RECOVERING MEDIUM OR HIGH GRAVITY CRUDE OIL

Valadi N. Venkatesan, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1984, Ser. No. 673,632

Int. Cl.[4] E21B *43/243*

U.S. Cl. 166—256 **8 Claims**



4. A method to sustain an in-situ combustion process during the recovery of medium and high gravity crude oil from a subsurface reservoir containing said oil which reservoir has at least two communication paths to the surface comprising:

(a) injecting oxygen-enriched fluid into the subsurface hydrocarbon reservoir, through a first fluid communication path;

(b) permitting said oxygen-enriched fluid to react with the medium and high gravity crude oil in the subsurface hydrocarbon reservoir for a predetermined time, to form lower quality crude oil thereby creating coke or heavier fractions in said lower quality oil which is used to support combustion;

(c) injecting an oxygen-containing fluid into said reservoir; and

(d) combusting said oxygen-containing fluid in said reservoir whereupon a portion of said coke or heavier fractions sustains the in-situ combustion process while producing the remainder of said lower quality crude oil to the surface.

4,625,801

METHODS AND APPARATUS FOR RECOVERY OF HYDROCARBONS FROM UNDERGROUND WATER TABLES

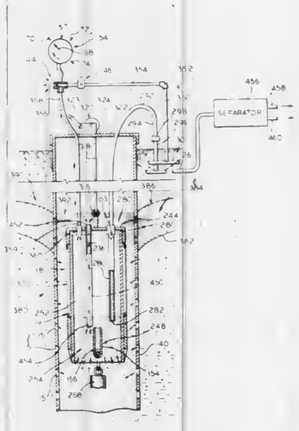
Wayne C. McLaughlin, St. Charles; William J. Recker, Bloomingdale; Phillip C. Modesitt, Chicago, and Paul K. Francescon, Coal Valley, all of Ill., assignors to Pump Engineer Associates, Inc., Addison, Ill.

Continuation-in-part of Ser. No. 513,264, Jul. 13, 1983, Pat. No. 4,527,633. This application Jan. 14, 1985, Ser. No. 691,166

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] E21B *43/12, 43/34, 44/16;* **F04F** *1/08*

U.S. Cl. 166—267 **6 Claims**



4. Apparatus for recovery of both underground liquid petroleum origin hydrocarbons lying on ground water of a ground water table, and the ground water that is elevationally adjacent to the liquid hydrocarbons, from a well extending below ground surface level into the ground water table and below the level of the liquid hydrocarbons within the well on the ground water therein, said apparatus comprising:

a vessel having a liquid receiving chamber,

said vessel including a liquid inflow port adjacent one of its ends and liquid inflow permitting static pressure responsive check valve means for said inflow port confining flow of the liquids through said inflow port to flow of same in an inflow direction into the vessel chamber,

said vessel including a liquid outflow port disposed adjacent the lower end of said chamber and liquids outflow permitting, static pressure responsive check valve means for confining flow of the liquids from said chamber through said outflow port to flow of same in an outflow direction out of said chamber and having an outlet adjacent the upper end of said vessel,

a source of gas under pressure,

piping for conveying the liquids from the well to and including separator means for specific gravity separation of the hydrocarbon liquids from the water,

said source of gas and said piping being located externally of the well and adjacent the ground surface level,

conduit means connecting said gas source to said vessel chamber and including fluid directional flow control valve means located exteriorly of the well including directional control means for venting said chamber to atmosphere therethrough and blocking off said gas source and forming the venting mode of said directional control valve means, and for communicating said gas source to said chamber free of venting of said chamber to the atmosphere and forming the chamber static pressurizing mode of said directional control valve means,

pipe means for connecting said liquid outflow check valve means outlet to said piping with a corresponding liquid head,

means for adjustably suspending said vessel in the well and holding same essentially stationary vertically at an elevation within the well wherein both the liquid hydrocarbons and the ground water are received in said chamber in said venting mode of said directional control valve means,

and means for switching said directional flow control valve means between said modes for establishing alternate vessel operation cycles of liquids inflow to said chamber with venting of said chamber to atmosphere, opening of said vessel inflow valve means under the static pressure of the liquids in the well, and closing of said vessel outflow check valve means under the head of said pipe means, and gas pressurization of said chamber to evacuate the liquids therefrom into said piping through said vessel outflow valve means against said head of said pipe means and free of venting of said chamber to atmosphere and mechanical pumping of the liquids so evacuated.

6. The method of removing both ground water and hydrocarbon liquids lying on same, of a ground water table, at a well extending below the ground surface level into the ground water table, said method comprising:

disposing within the well and within both the ground water and the hydrocarbon liquids in the well a vessel defining a chamber that is open to freely receive both the liquids in which the vessel is disposed,

admitting both the liquids of the well into the chamber and venting to atmosphere the air within the vessel displaced by the quantity of liquids admitted to the chamber, and thereby establishing a vessel chamber charging step and while holding the vessel essentially stationary vertically,

sealing the vessel chamber off from the atmosphere and the liquids that are external of the vessel, and exposing the vessel chamber to a source of compressed air and conducting the quantity to liquids solely under the static pressure of the compressed air applied directly thereto, and in an isolated flow that is free of mechanical pumping, to a ground level located site that is remote from said vessel, and thereby establishing a vessel chamber discharge step, and while holding the vessel essentially stationary vertically,

and alternately repeating said vessel chamber charging and discharging steps while holding the vessel essentially stationary vertically to effect step by step withdrawal of both the liquids from the well substantially free of emulsification, and to effect conductance of both of the liquids to said site,

and at said site specitfic gravity separating the hydrocarbon liquids from the water.

4,625,802

POTASSIUM SILICATE CLAY STABILIZATION PROCESS

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 627,993, Jul. 3, 1984, abandoned. This application Mar. 27, 1985, Ser. No. 716,735

Int. Cl.[4] E21B *43/12*

U.S. Cl. 166—292 **28 Claims**

28. A process for stabilizing clays present in a water-sensitive, subterranean sandstone formation having a matrix, the sandstone formation containing fine particles which interact with aqueous solutions having ionic makeup distinct from connate water to reduce permeability of the formation and fluid flow therethrough, the sandstone formation being penetrated by a well bore in fluid communication therewith, the process comprising:

injecting into the matrix of said subterranean sandstone formation via said well bore an aqueous solution consisting essentially of water, potassium silicate and potassium hydroxide and one or more potassium salts, said potassium silicate and potassium hydroxide existing in said aqueous solution as potassium ions, silicate ions and hydroxide ions, said silicate and hydroxide ions interacting with said sandstone formation in the presence of said potassium ions to effectively render said fine particles relatively insensitive to said aqueous solutions having a distinct ionic makeup, and said potassium silicate and potassium hydroxide being dissolved in said aqueous solution in a quantity sufficient to effectively render said fine particles relatively insensitive to said aqueous solutions having a distinct ionic makeup for a substantial period of time, thereby preventing substantial permeability reduction of the formation matrix.

4,625,803

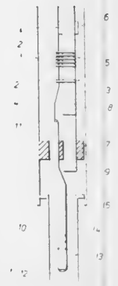
METHOD AND APPARATUS FOR INJECTING WELL TREATING LIQUID INTO THE BOTTOM OF A RESERVOIR INTERVAL

Warren W. Walhaug, and Boyd B. Moore, both of Houston, Tex., assignors to Shell Western E&P Inc., Houston, Tex.

Filed May 20, 1985, Ser. No. 736,160

Int. Cl.[4] E21B *37/06, 41/02, 43/27*

U.S. Cl. 166—310 **10 Claims**



1. A process for dispersing a well treating liquid at a selected depth within the borehole of the well, comprising:

equipping the well with a dual string packer which (a) is connected into a segmented first tubing string, (b) is connected into an upper portion of a relatively stiff tubing string providing a separate second string which extends to the selected depth, and (c) is connected to a lower portion of a spoolable tubing string that opens into the second tubing string, is strapped along the first tubing string and extends from a surface location to at least near to the packer; and

injecting through the spoolable tubing string and into the selected depth within the well a mixture of a well treating liquid and a gas, with said mixture being formed at substantially ambient surface temperature and down hole injection pressure and said gas being significantly soluble in the well treating liquid at the mixing temperature but being significantly less soluble in that liquid at the reservoir temperature, so that agitation of liquid within the borehole due to gas being inject along with and released from the solution disperses the treating liquid throughout the selected depth within the well.

6. An apparatus for dispersing a treating liquid at a selected depth within a well, comprising:

a cased well containing a dual string packer which (a) is connected into a segmented first tubing string, (b) is connected into an upper portion of a relatively stiff tubing string providing a separate second string that extends into the selected depth within the well, and (c) is connected to a lower portion of a spoolable tubing string which opens into the second tubing string, is connected along the exterior of the first tubing string and extends from a surface location to a location at least near the packer; and

means for injecting fluid into the spoolable tubing string.

4,625,804

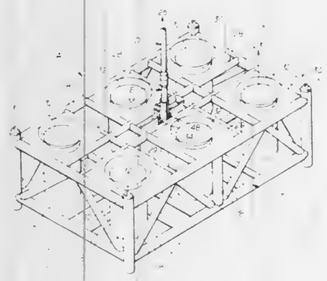
REMOTELY RELEASABLE TEMPLATE AND DOME

Grady G. Allen, Jr., Rosenberg, Tex., assignor to Grady Allen Survey Consultants, Inc., Rosenberg, Tex.

Filed Mar. 7, 1985, Ser. No. 709,604

Int. Cl.[4] E02D *5/54;* **E21B** *7/12*

U.S. Cl. 166—338 **14 Claims**



1. A remotely releasable template assembly for precision placement of a template of the type having at least one sleeve member for placing about a well casing stub extending from the sea floor, comprising:

mating means mounted with the template for demountably coupling the template to a complementary end of a drill string extending from a support structure located above the well casing stub; said mating means is positioned near the template assembly center of balance when the template assembly is demountably coupled to the drill string;

the vertical axis of said drill string being essentially parallel to the longitudinal axis of the sleeve member when the drill string is demountably coupled to the template assembly;

said end of the drill string includes a gyroscopic orientation means for detecting the deviation of the template from a desired bearing; and,

said mating means maintains the template semi-rigidly coupled to the drill string until the template is controllably released from the drill string;

whereby the rotation of the drill string about the vertical axis of the drill string rotates the template assembly into the desired orientation.

7. A method for precision placement of a template of the type having at least one sleeve member for placing about a well casing stub extending from the sea floor, comprising the steps of:

semi-rigidly coupling a mating means mounted with the template for demountably coupling the template to a complementary end of a drill string;

lowering the drill string with the template demountably coupled thereto until the template is in proximity to the sea floor;

determining the orientation of a selected axis of the template relative to a desired heading;

rotating the drill string about the vertical axis until the desired orientation of the template is achieved;

lowering the drill string until the template contacts the sea floor; and then,

remotely releasing the drill string from the template.

4,625,805

OIL PRODUCTION INSTALLATION FOR A SUBSEA STATION OF MODULAR DESIGN

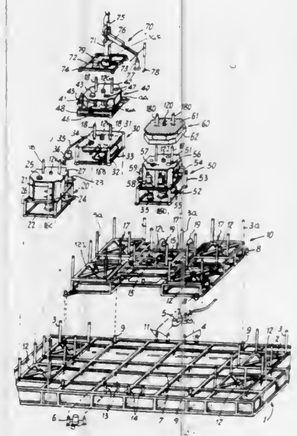
Vilhelme Ladecky, Port Gentil République du Gabon, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Nov. 19, 1984, Ser. No. 673,477

Claims priority, application France, Nov. 21, 1983, 83 18458

Int. Cl.[4] E21B *7/12*

U.S. Cl. 166—341 **19 Claims**



1. An oil production installation for a subsea station of modular design comprising a base frame (**1**) having in at least one zone one or more locations for modules, guide bases (**2**) having guide members (**3**) in said one zone fixed to the frame and intended to receive a modular production unit (**20**) including a christmas tree (**21**), comprising, in combination:

said base frame having at least a second zone;

a manifold frame (**10**) at said second zone,

said manifold frame having one or more guide bases (**17**), (**17'**) having guide members (**3***a*) adapted to receive one or more functional modular units;

one or more modular units (**30, 40, 50**) having guide sleeve members adapted to cooperate with said guide members (**3***a*);

each guide base (**17**) (**17'**) and each unit (**30, 40, 50**) having a mandril (**12**);

each modular unit having a mechanical connector (**16**) for mating with a mandril (**12**) to allow locking and unlocking of a modular unit with its associated guide base or with modular unit;

each modular unit having upstanding internal guide columns (**18**) at the top thereof;

each modular unit including guide sleeves for reception of said guide column (**18**) of a modular unit adapted to be vertically stacked thereon;

whereby production control units (**20**) are separate from units stacked thereon and whereby said manifold frame (**10**) may support modular units in said second zone in selected stacked relation in which units requiring more frequent service are located on top.

4,625,806

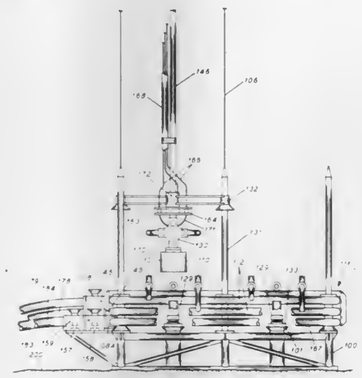
SUBSEA DRILLING AND PRODUCTION SYSTEM FOR USE AT A MULTIWELL SITE

William H. Silcox, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 78,992, Sep. 26, 1979, abandoned, which is a continuation of Ser. No. 903,327, May 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 754,391, Dec. 27, 1976, abandoned. This application Oct. 19, 1984, Ser. No. 663,006

Int. Cl.[4] **E21B** *43/013, 43/017, 7/128*

U.S. Cl. 166—358 **20 Claims**



1. A subsea drilling and production system having separate independent units for each wellhead capable of being remotely installed and removed independent of one another by hydraulic control lines operable at the surface of a body of water, comprising:

a drilling template positioned on the bottom of a body of water, said template having a plurality of apertures through which wells may be drilled;

a casing head established at each well drilled through said template;

a Christmas tree for each well removably connected to said casing heads;

remotely operable means for removably connecting said Christmas tree to said casing head;

a production unit for each well removably connected to said template, said production unit including manifold piping and control means, said manifold piping including piping involving production handling, annulus access, gas and fluid lift, gas and fluid injection, pressure maintenance, and said control means including electrical cables and hydraulic piping for signal and energy transmission;

flow line means for establishing a fluid path between said manifold piping and said Christmas tree;

a first remotely operable valve means, said first valve means located in said flow line means for controlling fluid flow therethrough;

remotely operable means for removably connecting each production unit to said template, said means including a production unit hydraulic connector and a production unit connector mandrel;

flow line connector means for removably connecting said manifold piping between each of said production units and each of said Christmas trees, said manifold piping operating so that said production unit and said Christmas tree may be removed and installed independently of one another by hydraulic control lines operated from the water surface, said flow line connnector means including a hollow cylindrical member having a piston driven, reciprocally slidable hollow inner sleeve coaxially positioned and slidably movable within an outer sleeve so as to complete the flow path between said manifold piping and said Christmas tree when the inner sleeve is extended, the orientation of said flow line means being horizontal to the plane of said template whereby said Christmas tree and said production unit will lie along a common plane and can be lifted from the template independently;

a first control line means for transmitting a signal for controlling fluid flow to each Christmas tree and each production unit;

control line connector means for disconnectably connecting said first control line means between each of said Christmas trees and each of said production units, said control line connecting means operating so that each of said production units and each of said Christmas trees may be removed and installed independently of one another, said control line connector means including a hollow cylindrical member having a piston driven reciprocally slidable inner sleeve coaxially positioned and slidably movable within an outer sleeve so as to complete a control circuit from the production unit to each Christmas tree, the orientation of said control line connector means being horizontal to the plane of said template whereby said control line connector means does not interfere with removal of the Christmas trees or production units when a Christmas tree or production unit is lifted from the template;

a second remotely operable valve means, said second valve means located between each of said production units and each of said Christmas trees being used for stopping the fluid flow between each of said production units and each of said Christmas trees when either is removed;

a second control line means, said second control line means extending from the surface of the body of water to said template mounted equipment;

control pods removably connected to said template and operatively connected to said first control line means in each of said production units, each of said control pods adapted to receive signals from said second control line means for controlling the operation of each of said Christmas trees, each of said production units, said control line means, and said remotely operable valve means;

means for removably connecting each of said control pods to each of said production units; and

means for removably connecting said control pod to said template.

4,625,807

METHOD AND APPARATUS FOR RECOVERY OF WATER-IMMISCIBLE LIQUIDS FROM WATER-BEARING FORMATIONS

Delmont E. Harlow, 100 Canada Via, Diablo, Calif. 94528

Filed Jun. 14, 1985, Ser. No. 744,830

Int. Cl.[4] **E21B** *34/08, 43/12, 44/00;* **F04F** *1/08*

U.S. Cl. 166—370 **8 Claims**

1. Apparatus for the extraction of a water-imiscible liquid of less density than water from a well in a water-bearing formation, comprising:

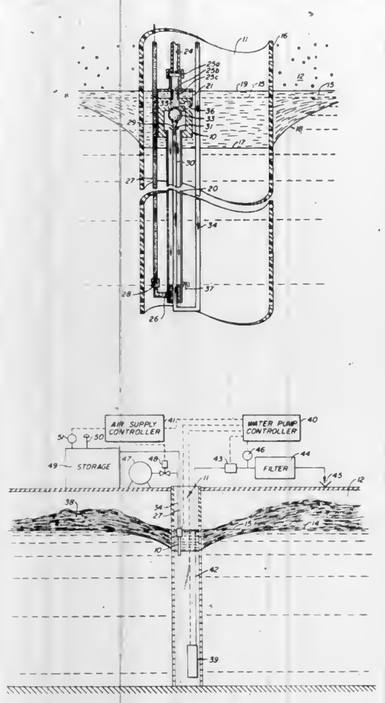
an elongate liquid-retaining vessel having a first end and a second end, and having a liquid entry port and a gas entry port toward said first end and an exit port toward said second end;

a first check valve positioned in said first end between said liquid entry port and said gas entry port, normally sealed against said gas entry port and movable by compressed gas flowing from said gas entry port to seal against said liquid entry port;

a second check valve positioned in said exit port, normally closed, operable by compressed fluid flow from said vessel;

means for feeding compressed gas to said vessel through said gas entry port for discrete time periods of preselected duration; and

an air vent in said vessel positioned to permit the escape of air therefrom during flow of liquid into said vessel through said liquid entry port, said air vent being sealable



from the interior of said vessel by said first check valve upon the flow of compressed gas from said gas entry port.

4,625,808

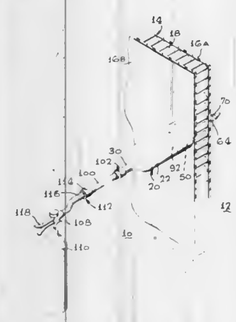
DEVICE FOR COUPLING FIRE EXTINGUISHERS TO CLOSED-OFF COMPARTMENTS

Paul F. Halfpenny, Van Nuys, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Nov. 21, 1984, Ser. No. 673,708

Int. Cl.[4] **A62C** *11/00*

U.S. Cl. 169—30 **7 Claims**



1. A device for coupling an outlet port of a fire extinguisher containing a source of pressurized fire suppression chemical to the interior of a closed off compartment having a pierceable wall, the device comprising:

a cylinder having first and second ends closed off by first and second walls, respectfully, said second wall having an aperture therethrough, said cylinder further having an inlet port in proximity to said first end;

a piston assembly comprising:

a piston movably mounted within said cylinder forming a closed off chamber within said cylinder, said piston movable from a first position in proximity to said first end to a second position in contact with said second wall;

a piston rod coupled at one end to said piston and at its opposite end terminating in a ram adapted to pierce the wall, said piston rod adapted to pass through said aperture as said piston moves from said first position to said second position;

passage means coupling said chamber to the exterior surface of said ram;

valve means comprising:

said piston having a plurality of holes extending therethrough; and

a sealing disk having a plurality of support rods movably mounted through said plurality of said holes, the length of said rods being greater than the thickness of said piston, said sealing disk adapted to seal said passage means when said piston is in said first position and said rods adapted to contact said second wall prior to said piston reaching said second position causing said sealing disk to uncover said passage means.

4,625,809

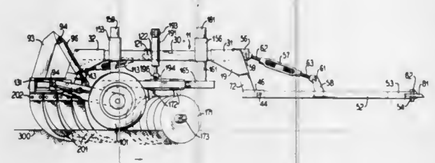
BRIDGE HITCH TYPE FRAME

Gary Moynihan, 8100 Moynihan Rd., R.R. 1, Fairfax, Iowa 52228

Filed Apr. 5, 1985, Ser. No. 720,418

Int. Cl.[4] **A01B** *35/18*

U.S. Cl. 172—178 **1 Claim**



1. A farm implement comprising, a bridge truss type frame comprising a pair of longitudinally extending frame members, four downwardly extending frame members attached to opposite ends of said pair of longitudinally extending frame members, a plurality of cross-frame member attached between said pair of longitudinally extending frame members, a draw-bar attached to the front two of said four downwardly extending frame members, a chisel plow supporting cross-frame with a plurality of plows attached to the rear two of said four downwardly extending frame members and mounted substantially under said rear two downwardly extending frame members, a pair of ground wheel supporting links pivotally attached to said plow supporting cross-frame, means for moving said ground wheel supporting links, a disc frame with a plurality of discs supported from said bridge truss frame for vertical movement, and means to raise and lower said disc frame, wherein said draw bar is pivotally attached to said front two of said four downwardly extending frame members, said first locking and adjusting means connected to said draw bar and to said bridge truss type frame, wherein said first locking and adjusting means is a turnbuckle and a pair of I-bolts, wherein said chisel plow supporting cross-frame is pivotally attached to the rear of said four downwardly extending frame members and second locking and adjusting means connected to said chisel plow supporting cross-frame and to said bridge truss type frame, wherein said second locking and adjusting means is a second turnbuckle and a second pair of I-bolts, wherein said means for moving said ground wheel supporting links comprise a first pair of hydraulic cylinders, and wherein said means to raise

and lower said disc frame comprise a second pair of hydraulic cylinders.

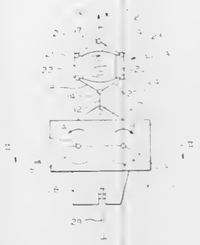
4,625,810
TILLAGE TOOL
Delmar D. Edmisson, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc.
Filed Feb. 27, 1985, Ser. No. 706,128
Int. Cl.[4] A01B *23/02*
U.S. Cl. 172—749 **7 Claims**



1. A tillage tool comprising:
an elongated shank having an upper end and a pointed lower end portion, said pointed lower end portion having an elongated, tapered undercut, dove-tailed slot extending from the point at the lower end of the shank upwardly in the shank and tapering by diminishing in width from a location adjacent the point at the lower end of the shank as such slot progresses upwardly and rearwardly in the shank; and
a hard metal wear insert mounted on the pointed lower end portion of the shank, said insert being substantially complementary in configuration to said pointed lower end portion and including an elongated locking key wedgingly engaged by said slot, said insert further comprising:
an overlay plate protectively covering the upper surface of the pointed lower end portion of said shank, and having said locking key carried on the lower side thereof, and having a point at the forward lower end thereof; and
a protuberant rib carried centrally on the upper side of said overlay plate and extending rearwardly and upwardly from the point at the forward lower end of said overlay plate, and disposed in substantially vertical alignment with said locking key, whereby the insert can be removed from engagement with said slot by impacting the upper rear end of said protuberant rib to transfer removing force to said locking rib and thereby disengage said locking rib from said tapered, undercut dove-tailed slot.

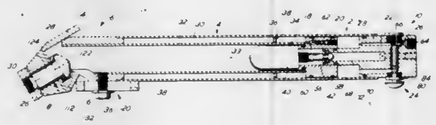
4,625,811
HYDRAULIC VIBRATORY PILE DRIVER
Josef-Gerhard Tuenkers, Bahnstrasse 46, Ratlingen 1, Fed. Rep. of Germany
Filed Feb. 3, 1984, Ser. No. 576,620
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303574
Int. Cl.[4] E02D *7/18*
U.S. Cl. 173—49 **7 Claims**

1. A vibratory pile driver comprising
a rigid vibratory housing;
a least two parallel and horizontally spaced shafts mounted in said housing for rotation independently of each other;
at least two massive weights eccentrically positioned on the respective shafts;
at least two hydraulic drive motors, each motor being connected to the respective shaft and weight so as to rotate said two shafts with the respective weights in opposite directions, said weights being arranged in said housing to be horizontally substantially oscillation-free and being positioned in a plane extending perpendicularly to a direction of piling; and



a common pressure fluid pump connectec to both of said motors so that said motors are hydraulically coupled to each other by a common pipe connecting said motors with said common pressure fluid pump but said hydraulic motors are not mechanically coupled to each other, whereby said hydraulic motors are self-synchronized only by said hydraulic coupling to each other to cause a self synchronization of a number of revolutions of said weights without requiring of an application thereto of a forced synchronization by mechanical coupling to each other for generating a vertically directed force.

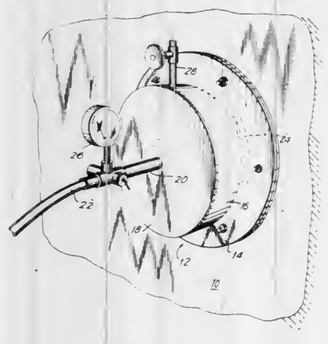
4,625,812
PNEUMATIC IMPACT HAMMER
James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa
Filed Apr. 1, 1985, Ser. No. 718,520
Int. Cl.[4] B21J *15/22*
U.S. Cl. 173—134 **10 Claims**



1. An impact hammer for use with a supply of compressed air comprising, in combination:
port means for interconnecting said hammer and supply of compressed air;
a first chamber, interconnected to said port means, for receiving said compressed air;
an elongate outer tube;
an elongate inner tube within said outer tube, said outer and inner tubes defining a second chamber therebetween, said outer and inner tubes also defining driving ends and control ends;
channel means between said first and second chambers for allowing said compressed air to flow from said first chamber to said second chamber;
a mallet slidably mounted within said inner tube, said mallet including a side wall substantially adjacent said inner tube, a driving end proximate said driving ends of said outer and inner tubes, and a pressure end proximate said control ends of said outer and inner tubes;
trigger means for releasing air from said first chamber;

driver means slideably extending from said driving end of said inner tube;
dump valve means for detecting a release of air from said first chamber and thereafter directing said compressed air from said second chamber against said pressure end of mallet, whereby said hammer may slide along said inner tube and impact said driver.

4,625,813
METHOD AND APPARATUS FOR CORING IN SUBAQUEOUS STRUCTURES
Arvind J. Trivedi, 3 Whitehall Way, Englishtown, N.J. 07726, and Vincent G. Miller, 235 Benson Pl., Westfield, N.J. 07090
Filed Jun. 17, 1985, Ser. No. 745,450
Int. Cl.[4] E21B *10/02*
U.S. Cl. 175—20 **21 Claims**



1. A method of coring in a subaqueous structure including a wall having a hydrostatic pressure head on an outer side thereof, comprising:
installing on an inner side of said wall a port valve assembly including a mounting plate, means anchoring the mounting plate to the inner side of said wall, and a valve having an open nosition in which a cylindrical bore extends through the valve and a closed position in which the cylindrical bore is blocked;
with said valve in its open position, inserting a coring device through said cylindrical bore, cutting a cylindrical core of said wall, and retrieving said core thus leaving a generally cylindrical cored hole;
placing the valve into its closed position;
installing a grouting device on said port valve assembly;
placing said valve into its open position;
installing grouting compound through said grouting device into said cored hole; and
removing said valve assembly.

18. A port valve assembly for extraction of core samples from a subaqueous structure and subsequent grouting of the resulting cored hole in said structure, comprising a flanged full port ball valve having a valve body with first and second flanges and a rotatable ball having an opening therein wherein in an open position a generally cylindrical bore extends through the valve from said first flange through the ball opening to said second flange, and in a closed position with said ball rotated substantially 90° said bore is blocked shut; a mounting plate having a circular hole aligned with said cylindrical bore, said second flange being mounted on said mounting plate; and sealing means carried by said valve body for introducing grouting material through said bore and into the cored hole in the subaqueous structure to thereby seal said hole.

4,625,814
PERCUSSIVE DRILL ROD SYSTEM
Kalevi Helasuo, and Antero Ala-Jokimäki, both of Vantaa, Finland, assignors to Oy Airam Ab Kometa, Finland
PCT No. PCT/FI83/00074, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02158, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 29, 1983, Ser. No. 637,222
Claims priority, application Finland, Nov. 30, 1982, 824126
Int. Cl.[4] E21B *7/00, 17/18*
U.S. Cl. 175—57 **11 Claims**



1. A percussive drill rod arrangement for long-hole rock drilling of a hole having a diameter of about 30 mm. to about 300 mm., said arrangement comprising
a full-hole drilling bit,
a drill rod connected to said drilling bit and through which percussive energy is transferred to said drilling bit, said rod being formed by at least one extension piece which is adapted to be threadingly connected to another extension piece,
said extension piece comprising
an internally threaded component,
a tubular component,
an externally threaded component,
weld joints connecting said internally threaded component with said tubular component, and said externally threaded component with said tubular component,
an outer surface of said drill rod being substantially continuous and stepless, and
an inner channel axially extending through said extension piece for supply of pressurized flushing medium such as water or air into the hole being drilled for conveying away drilled material through an annular space or side flushing channel formed between said drill rod and a wall of the hole being drilled,
a ratio of a diameter of said inner channel to an outer diameter of said tubular component being from about 0.7 to 0.9.

4,625,815
DRILLING EQUIPMENT, ESPECIALLY FOR USE IN UNDERGROUND MINING
Klaus Spies, Frennetstr. 49, 5100 Aachen-Schmithof, Fed. Rep. of Germany
Filed May 25, 1984, Ser. No. 614,433
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322427
Int. Cl.[4] E21C *1/00, 5/00*
U.S. Cl. 175—73 **10 Claims**

1. A drilling apparatus for use with a drilling machine having

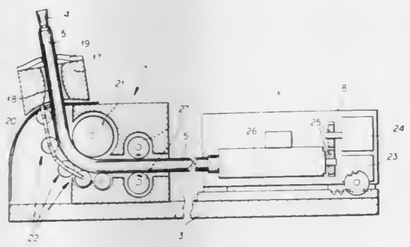
a guide and adapted to drill holes at an angle to said guide, said apparatus comprising in combination:

a rotatable annular bit adapted to cut a hole in a rock and provided with high-pressure water-jet nozzles;

a high-pressure pipe connected to said bit at one end thereof and connectable to a high-pressure pump, said pipe being constructed to be rigid under torsion;

a rotary drive displaceable along said guide and forming part of said machine, said drive being coupled to said pipe for rotating same whereby upon rotation of said pipe, torque is applied thereto to generate a torsion which renders said pipe rigid;

a nonrotatable jacket tube rotatably receiving said pipe, elastically deflectable into a bent condition from a straight condition and substantially rigid in radial direction;



a deflecting means including a deflection device located at an end of said guide and adapted to be positioned in the region of a mouth of a hole to be drilled for angularly deflecting said tube and said pipe to establish an angle at which a hole is to be drilled relative to said guide; and

means for axially displacing said tube and said pipe along said guide at a location remote from said bit whereby said tube and said pipe are displaced together through said deflection device in a longitudinal direction to advance drilling of said hole, said deflection devide comprising an element having an aperture through which said tube and said piep are passed and mounted to swing at an extremity of said guide, a main deflection roller disposed in said guide at said extremity, and a roller chain having a plurality of auxiliary rollers disposed opposite said main deflection roller and a coupled to said element.

4,625,816

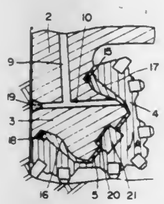
BORING DRILL BIT

Sho Takano, Norita, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,298

Int. Cl.[4] E21B *10/22*

U.S. Cl. 175—371 **10 Claims**



1. In a boring drill bit which comprises a shank which has a first end that can be attached to a drill pipe and second end, said shank defined an axial line therethrough; a plurality of elongated pin connected to the second end of said shank and around its circumference, said elongated pins extending radially outwardly with respect to said axial line and away from said first end of said shank so as to be inclined with respect to said axial line, each elongated pin having a root end connected to said shank and a free end and each elongated pin having a side surface and an end surface; and a plurality of roller cutters, each roller cutter having a generally cylindrical bore therein to enable it to be rotatably positioned over a respective elongated pin;

the improvement wherein the side surface of each of said elongated pins has an undulating shape such that successive cross sections through said elongated pin between said free end and said root end will be circular and will have gradually decreasing and then gradually increasing diameters; wherein a generally cup-shaped plain bearing is positioned between each elongated pin and each associated roller cutter, each generally cup-shaped plain bearing member having a side wall composed of a plurality of separate portions and a bottom portion which covers the end surface of said elongated pin, said side wall having an inner surface which is shaped to correspond with the undulating shape of the side surface of said elongated pin; and including holding means for connecting said generally cup-shaped plain bearing member to the associated roller cutter therearound so as to prevent axial movement therebetween.

4,625,817

METHOD OF ZERO ADJUSTMENT FOR COMBINATORIAL WEIGHING OR COUNTING SYSTEM

Kazuo Kawashima, and Kazuhiyo Minamida, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Japan

Continuation-in-part of Ser. No. 375,022, Apr. 16, 1982. This application May 31, 1984, Ser. No. 615,967

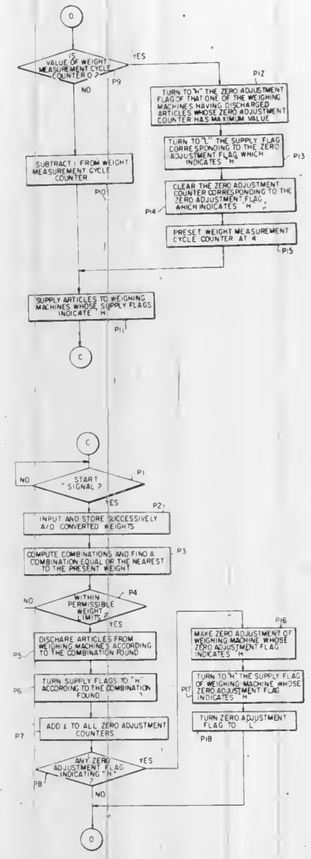
The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.[4] G01G *19/22, 13/14*

U.S. Cl. 177—1 **7 Claims**

1. A method of zero adjustment for use with a combinatorial weighing or counting system which operates by weighing batches of articles on a plurality of weighing machines, computing combinations of the respective weight values of the batches of articles or combinations of the respective numbers of articles, converted from the respective weight values, in the batches, selecting a combination which is equal to or nearest a set value, and discharging the articles from the weighing machines corresponding to the selected combination, said method

being characterized in that a selected one or more of said weighing machines will be zero adjusted after a predetermined



number of measurements of weight for the entire system have been made.

4,625,818

ELECTRIC BALANCE

Erich Knothe, Bovenden; Franz-Josef Melcher, Hardegsen, and Christoph Berg, Adelebsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

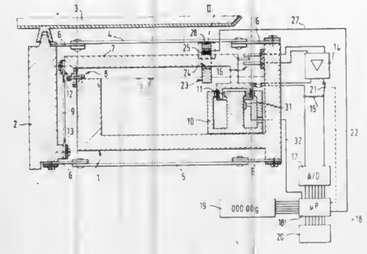
Filed Mar. 18, 1985, Ser. No. 712,763

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3409998

Int. Cl.[4] G01G *7/00*

U.S. Cl. 177—212 **8 Claims**

1. Balance based on the principle of the electro-magnetic compensation of force having a balance scale, and a scale carrier which can move vertically, by means of moveable parts and is connected to a support part integral with the housing, the balance is further provided with stops limiting the movement of the balance scale carrier in a vertical direction, a permanent magnet having a current-carrying coil which is located in the air gap of the permanent magnet generating a weight-proportional counterforce, a control circuit regulates the current through the coil by a digital signal processing unit, characterized in that switching means (**21**) are provided which can interrupt the current flow through the coil (**11**) so that when the current flow is interrupted, movable parts (**2–9**) of the balance move against one of the stops (**24** or **25**), the switching means (**21**) are controlled by the digital signal processing unit (**18**) and a storage means (**20**) is provided within the framework of the digital signal processing unit (**18**) which stores the last-determined weight value for the duration of the



interruption of the current flow through the coil (**11**), the pulse-duty factor, that is, the time of the current flow through the coil in relation to the time in which the current flow through the coil is interrupted, is less than one.

4,625,819

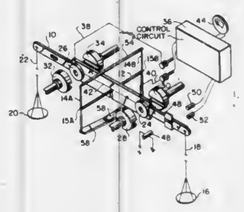
VERTICALLY STABLE FRICTION-FREE MICROBALANCE

Michael O'Neill, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 25, 1985, Ser. No. 780,067

Int. Cl.[4] G01G *7/00, 1/22, 21/28*

U.S. Cl. 177—212 **16 Claims**





1. A microbalance including a balance beam, means for attaching a weight to be measured to one end of said balance beam, electromagnetic torque generating means connected to said balance beam for overcoming the beam displacement caused by a weight to be measured, means for detecting when a beam displacement has occurred and operable to generate an electrical signal to control said torque generating means to thereby change the torque to balance said beam to a null position, means for measuring the current of said torque generating means as a measure of the weight to be measured, a mounting means for said balance beam comprising at least two vertically aligned elongated flexible metal tension members, the upper ends of said tension members being attached to a fixed support, a crossbeam fixedly attached to said balance beam at a point of attachment intermediate to the ends thereof to form a pivot beam for said balance beam, said point of attachment being intermediate to the ends of said crossbeam, the ends of said

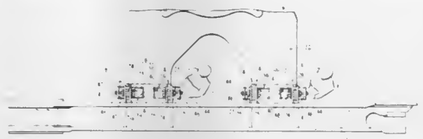
crossbeam being fixedly attached respectively to portions of said tension members below said fixed support attachment.

4,625,820

CRAWLER FRAME TO BASE FRAME CONNECTION

Damon N. Christian, Dothan, Ala., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Apr. 9, 1985, Ser. No. 721,430
Int. Cl.⁴ B62D *55/10*
U.S. Cl. 180—9.1 **18 Claims**



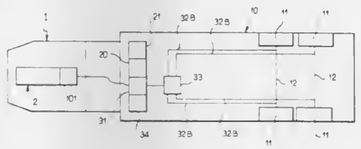
1. In a crawler frame to base frame connection, a plurality of connector plates fixed to a crawler frame and base frame and being disposed side-by-side in interfitting parallel relationship, the connector plates fixed to one frame having aligned polygonal through openings and at least a connector plate of the other frame having a notch formed therein including substantially right angularly spaced edges in substantial alignment with corresponding edges of the polygonal through openings, a tapered polygonal cross-section wedge adapted to be placed in said through openings and notch, said tapered polygonal cross-section wedge having opposite side pairs of convergent flat faces for engaging opposing corresponding edges of the through openings and notch, said angularly spaced edges of said notch being chamfered at an angle matching the taper of one of the opposite side pairs of convergent flat faces of said wedge, power means to force the wedge to a positive locking position of engagement with the through openings and notch, and means fixedly connecting said plates of one frame at another location thereon with said plate of the other frame being shiftably disposed relative to said means and plates of said one frame, whereby the wedge in said positive locking position forces said plate of said other frame into rigidly locked engagement with said means.

4,625,821

MOTORIZING DEVICE FOR A TRAILER DRAWN BY A TRACTOR

Gabriel Aumont, 1, rue des Landes, Z. I. Rennes Sud Est Cesson Sevigne 35510, and Alain Queguiner, 20, rue des Buttes de Coesmes, Rennes 35000, both of France

Filed May 27, 1983, Ser. No. 498,747
Claims priority, application France, Jun. 1, 1982, 82 09494
Int. Cl.⁴ B62D *59/04*
U.S. Cl. 180—14.2 **9 Claims**



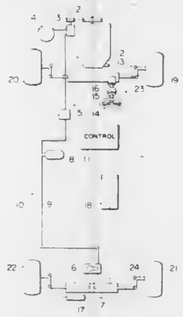
1. In a vehicle including a tractor and a trailer attached to the tractor wherein, the tractor comprises driving wheels and a main engine connected to said driving wheels and wherein the trailer comprises driven wheels, at least one auxiliary engine in the trailer and powering the trailer, a plurality of hydraulic motors in the trailer which are connected, respectively, to the driven wheels of the trailer by hydraulic circuits in the trailer, said hydraulic circuits including pumps, the pumps being powered by said at least one auxiliary, engine, and a regulating element coupled to and controlling said hydraulic circuits; the improvement wherein said at least one auxiliary engine operated independently of said regulating element, and said regulating element comprises a tachometric pick up provided on the main engine and generating an electrical signal proportional to the rotating speed of the main engine of the tractor, means for controlling the trailer pump output to the hydraulic motors in the trailer, and means coupling the said electrical signal to said means for controlling the trailer pump output so that the discharge in the hydraulic circuits is proportional to the rotating speed of said main engine.

4,625,822

REAR WHEEL STEERING CONTROL FOR VEHICLE

Kenji Nakamura; Yasuji Shibahata, both of Yokohama; Yukio Fukunaga, Zushi; Yasumasa Tsubota, Yokosuka; Namio Irie, and Junsuke Kuroki, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 20, 1985, Ser. No. 703,593
Claims priority, application Japan, Feb. 22, 1984, 59-30144
Int. Cl.⁴ B62D *15/00*
U.S. Cl. 180—140 **13 Claims**



1. A vehicle comprising:
a pair of front wheels and a pair of rear wheels,
front wheel steering means for altering a front wheel steering angle, and
rear wheel steering means including means for measuring distance travelled by the vehicle, means for sensing the front wheel steering angle, means for determining a target rear wheel steering angle equal to the product of the front wheel steering angle and a predetermined ratio, and means for controlling a rear wheel steering angle by steering the rear wheels so that the rear wheel steering angle is maintained equal to the target rear wheel steering angle when the distance measured by the distance measuring means is equal to or greater than a predetermined total distance, and so that the rear wheel sterring angle approaches the target rear wheel steering angle in accordance with distance travelled by the vehicle when the distance measured by the distance measuring means is smaller that the predetermined total distance.

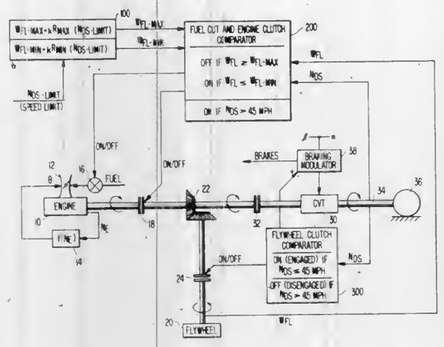
4,625,823

CONTROL SYSTEM AND METHOD FOR A FLYWHEEL TYPE POWER DELIVERY SYSTEM

Andrew A. Frank, Madison, Wis., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 17, 1984, Ser. No. 651,166
Int. Cl.⁴ B60K *9/04*
U.S. Cl. 180—165 **20 Claims**

11. In a flywheel type power delivery system having an energy-storing flywheel, a prime mover operatively coupled to the flywheel for delivering power to the flywheel, and a continuously variable ratio transmission operatively coupled to the flywheel for delivering power to an output shaft, the improvement comprising:
selector means for selecting a desired maximum output shaft speed limit;
speed range function means defining a desired flywheel operating speed range defined by a minimum flywheel speed and a maximum flywheel speed, each of said minimum and maximum flywheel speeds being defined as a function of the selected maximum output shaft speed limit;
speed measuring means for measuring the acutal speed of the flywheel; and
power control means for controlling the delivery of power from the prime mover to the flywheel as a function of measured flywheel speed to keep the speed of the flywheel within said predetermined range.

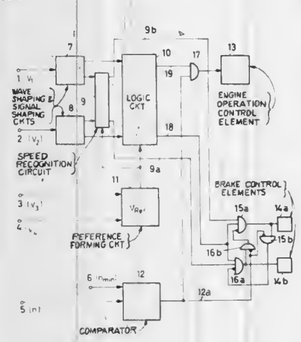


4,625,824

METHOD AND APPARATUS TO CONTROL SLIPPAGE OR SPINNING OF DRIVEN WHEELS OF A VEHICLE

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,412
Claims priority, application Fed. Rep. of Germany, May 3, 1984, 3416292
Int. Cl.⁴ B60T *8/04*
U.S. Cl. 180—197 **10 Claims**



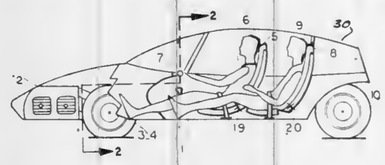
1. Method of controlling or spinning of driven wheels of a vehicle having a drive engine, to furnish tractive effort and provide drive torque to the driven wheels using the steps of
generating driven wheel speed signals (V_1, V_2) representative of rotary speed of the wheels of the vehicle;
generating a vehicle speed signal (V_{Ref}) representative of the speed of movement of the vehicle;
generating a wheel slip signal (*9a*, *9b*) if the rotary speed of any one of the driven wheels indicates that the wheel is slipping or spinning;
controlling the drive torque applied on the driven wheels in a direction to reduce drive torque, and hence wheel speed, in a dependence on presence of a wheel slip signal from at least one of the wheels;
and comprising, in accordance with the invention, the step of applying a braking effort only to that one of the driven wheels which, first provides a wheel slip signal, while leaving another driven wheel uncontrolled and permitting at least initially slippage thereof; and
controlling the output torque of the engine in a direction to reduce the output torque of the engine only after the braking effort applied to said one of the driven wheels has resulted in an essential termination of slippage of said one driven wheel.

4,625,825

FRONT-DRIVE THREE-WHEELS VEHICLE WITH TANDEM DRIVE AND PASSENGER

Pierre M. Ethier, 36 Des Castels, Lauzon, Quebec, Canada (G6V 2B7)

Continuation of Ser. No. 587,930, Mar. 9, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,312
Claims priority, application Canada, Mar. 21, 1983, 424020
Int. Cl.⁴ B62D *61/06*
U.S. Cl. 180—211 **11 Claims**



1. A motorized vehicle comprising:
a chassis,
a pair of front wheels located essentially symmetrically to the right and left of the chassis, and a single rear wheel, the chassis being supported on said front wheels and said rear wheel,
an engine power source mounted on said chassis at the front portion of the vehicle, said engine power source having its center of gravity located forward of the center of gravity of said two front wheels,
a transmission means for operatively connecting said engine power source to said front wheels to drive said front wheels,
steering means for steering the front wheels, said steering means including means positioned to be operated by a driver of the vehicle,
an occupant section extending rearwardly from said front portion and having a driver's seat located rearwardly of the engine and located essentially equidistantly from each of said front wheels, a passenger seat located behind the driver's seat, both seats being along the front to rear centerline of the vehicle,
each of said driver's seat and passenger seat having a bottom portion and a backrest, and including a space between the bottom portion of the driver's seat and adjacent sides of the occupant section, which space extends essentially along the length of the bottom portion of the driver's-seat to provide a space alongside the driver's seat for the legs of a passenger seated on the passenger seat.

4,625,826
VIBRATION ISOLATING MOUNTINGS FOR PUSH-PULL CABLES COUPLED TO VIBRATING CONTROL ARMS

Steven L. Schmid, Agency; J. Clark Fickle, and Keith E. Hill, both of Ottumwa, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 3, 1985, Ser. No. 740,785
Int. Cl.[4] B62D *11/04*
U.S. Cl. 180—315 **10 Claims**



1. In a control system including a controlled device which generates noise vibrations during operation and includes a swingable control arm, a pivotally mounted, manually operable control lever, and a push-pull cable including a bend located between and being coupled between an output end of the lever and the control arm for transmitting pivotal motion of the lever to the control arm, the improvement comprising: said cable having an elongate core having one end coupled to the lever and another end anchored at a location adjacent the control arm; a sheath slidably encasing said core; said sheath being shorter than said core; a first coupling means anchoring a first end of said sheath at a location adjacent the output end of the lever, and a second coupling means including a shock absorber means connecting another end of the sheath to the control arm so as to diminish the transmission of noise vibrations to the cable, and hence, to the control lever.

4,625,827
MICROPHONE WINDSCREEN

Bruce Bartlett, Elkhart, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Oct. 16, 1985, Ser. No. 788,037
Int. Cl.[4] G10K *13/00;* **F01N** *7/00*
U.S. Cl. 181—158 **3 Claims**

1. In a unidirectional microphone, said microphone including a unidirectional capsule having a sound receiving entry, a windscreen positioned adjacent to said microphone capsule, the improvement wherein said windscreen includes a first portion formed of uncompressed cellular material positioned in front of said capsule sound receiving entry and a second portion formed of compressed cellular material positioned to the rear of said capsule opposite its sound receiving entry, said windscreen second portion constituting means for blocking



and absorbing sound waves wherein the directivity of said microphone is enhanced.

4,625,828
ACOUSTIC REFLECTOR FOR GROUND PLANE MICROPHONE

Belur N. Shivashankara, Bellevue; Wendell R. Miller, Renton, and Gene W. Stubbs, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 9, 1985, Ser. No. 773,641
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—175 **19 Claims**



1. An acoustic reflector for a ground plane microphone useful for measuring the flyover noise produced by an aircraft, said acoustic reflector comprising an acoustically hard base member including a central portion having a cavity extending inwardly from a surface thereof suitable for receiving a microphone, and a plurality of tapered projections spaced along and extending outwardly from the periphery of said central portion, each of said tapered projections having curved peripheral edges for progressively matching the acoustic impedance at the boundary between said base member and the surface upon which said base member is deployed to effectively reduce edge diffraction contamination of the flyover noise signal sensed by a microphone mounted in said cavity.

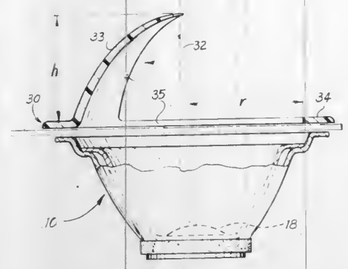
4,625,829
SPEAKER GRILL

Ronald A. Sirois, 1420 Raritan Rd., Scotch Plains, N.J. 07076

Filed Mar. 26, 1984, Ser. No. 593,667
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—175 **26 Claims**

1. A grill to be used in combination with an acoustic speaker comprising:

a frame for placement over the acoustic speaker having a passage therethrough, said passage having an area; and

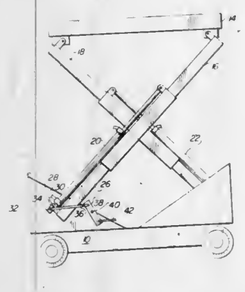


a first acoustic shell attached to said frame and extending over a portion of said passage, said portion being so limited that said first shell's projection onto said passage is less than approximately one half the area of said passage.

4,625,830
WORK PLATFORM CENTERING APPARATUS

Donald T. Wehmeyer, Roselle; Ronald W. Barnhart, Elmhurst, and Craig Beymer, Darien, all of Ill., assignors to Economy Engineering, Inc., Bensenville, Ill.

Filed Jan. 29, 1985, Ser. No. 696,081
Int. Cl.[4] E04G *1/22*
U.S. Cl. 182—19 **5 Claims**



1. In an elevating work platform apparatus having a base and having a platform supported by first and second extensible scissors members mounted on the base by respective supporting pivots and means for extending each scissors member, the improvement comprising:

(a) a linear cam arranged for reciprocal linear travel;

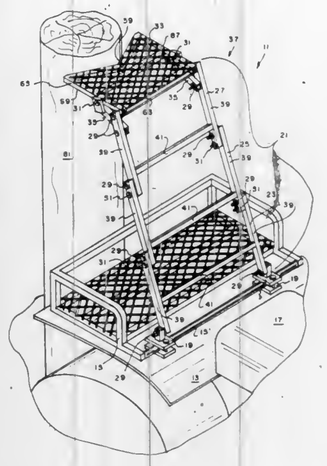
(b) sensing means positioned along said linear cam to detect predetermined limits of linear travel; and

(c) mechanical linkage connecting said linear cam to said first and second extensible scissors members for mechanically transposing the relative position of said scissors members to said linear travel of said linear cam, wherein said mechanical linkage comprises a control member pivotally mounted proximate its center to said linear cam and having pivotally mounted proximate its extremities first and second linking members connecting said control member to said first and second extensible scissors members respectively.

4,625,831
DEER STAND

Harvey B. Rodgers, Jr., 511 Catalpa, Clarksdale, Miss. 36614

Filed Feb. 7, 1986, Ser. No. 827,382
Int. Cl.[4] A01M *31/02*
U.S. Cl. 182—116 **7 Claims**



1. A hunting stand for use with an all-terrain vehicle, or the like, said stand comprising:

(a) mounting bracket means for mounting said stand to the rack of an all-terrain vehicle;

(b) a plurality of sections;

(c) pivot means attached to said sections for pivotally coupling said sections together in end-to-end relationship to establish ladder means movable into a collapsed overlapping position in said rack and an extended position out of said rack;

(d) a platform having a rear edge for engaging a tree trunk;

(e) means secured to said platform and said ladder means adjacent the upper end thereof for securing said platform to said ladder means;

(f) means for securing said ladder means in an extended position;

(g) means secured to said mounting bracket means and said ladder means adjacent the lower end thereof for pivotally coupling said ladder means to said mounting means to permit said ladder means to move into said collapsed overlapping position in said rack and to move into a use position against a tree when said ladder means is secured in said extended position.

4,625,832
LADDER SUPPORT MEMBER

D. Wayne Hartley, 1429 Mosstree Rd., N. Charleston, S.C. 29406

Filed Nov. 12, 1985, Ser. No. 796,751
Int. Cl.[4] E06C *1/20*
U.S. Cl. 182—172 **8 Claims**

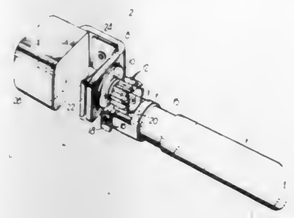
1. A ladder support member, comprising:

a. a U-shaped bracket into which a portion of a ladder is inserted, and which has a threaded void on one side thereof;

b. a threaded member having a means thereon, and engaging said threaded void and said ladder so as to hold said ladder within said U-shaped bracket; and

c. a leg member pivotally attached to said U-shaped bracket on said side having said threaded void therein, and having engaged means on an end near said point of pivotal attach-

ment cooperating with said means on the threaded member upon pivoting of said leg member, whereby upon said



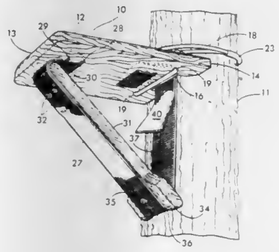
engagement, rotation of said leg member rotates said threaded member.

4,625,833

PORTABLE TREE SEAT

Kenneth D. Lewis, 10438 Young St., Wisconsin Rapids, Wis. 54494

Filed Feb. 10, 1986, Ser. No. 828,444
Int. Cl.[4] A01M *31/02;* **A45F** *3/26*
U.S. Cl. 182—187 **13 Claims**



1. A portable tree seat comprising:
(a) a platform having a front edge and a back edge;
(b) a rigid elongated brace having a front end and a back end;
(c) a front flexible strap portion attached to the brace and extending up and secured to the platform, and a back flexible strap portion attached to the brace and extending up to the platform and adjustably secured thereto;
(d) means on the platform attachable to a vertical post structure such as a tree for holding the back edge of the platform in position engaging the post structure, whereby with the platform back edge so engaged, the brace may be positioned by adjusting the strap such that the brace is held by the strap in position between the post structure and the platform to support the platform in a horizontal position.

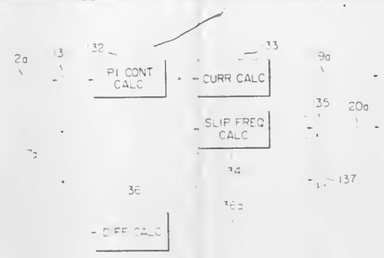
4,625,834

SPEED CONTROL APPARATUS FOR ELEVATOR

Tooru Tanahashi, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,698
Claims priority, application Japan, Feb. 29, 1984, 59-38213
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—29 R **5 Claims**

1. In an elevator speed control apparatus having a converter which converts alternating current into direct current, an inverter which inverts the D.C. output of the converter into alternating current to control a speed of a hoisting induction motor, a speed detector which detects the rotational speed of the induction motor, and processing means to control the A.C. output of the inverter, wherein an output signal of the speed detector is fed into the processing means at a predetermined interval, and an output signal produced by calculation of the processing means is applied to the inverter so as to perform a



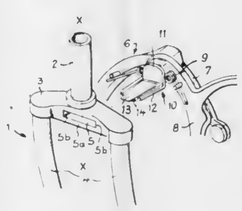
slip frequency control of the induction motor; a speed control apparatus for an elevator characterized by comprising means to correct a magnitude by which the rotational speed of the induction motor changes after the output signal of said speed detector has been fed into said processing means until the control signal is applied to said inverter.

4,625,835

DEVICE FOR MOUNTING AND FIXING A BRAKE ON A CYCLE

Maurice E. L. Coué, Feucherolles, France, assignor to Huret et ses Fils, Nanterre, France

Filed Jun. 22, 1984, Ser. No. 623,429
Claims priority, application France, Jul. 1, 1983, 83 11017
Int. Cl.[4] B62L *1/00;* **B62K** *19/38*
U.S. Cl. 188—24.11 **4 Claims**



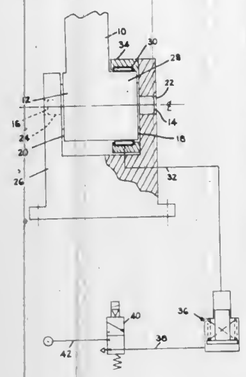
1. A device for mounting and fixing a caliper type brake on a part of a cycle, said device comprising an L-shaped support comprising a first upright flange portion having a pivot pin thereon and perpendicular thereto for mounting a caliper type brake and a second substantially horizontal portion defining a tab, said tab including a rigid portion including a base and a pair of spaced coplanar legs extending therefrom opposite to said pivot pin and defining an open space therebetween for locking engagement in a cavity of complementary shape in said cycle part, said tab further including a resiliently yieldable tongue portion anchored at oen end to said base and extending therefrom in said open space and having a latch portion thereon extending out of the plane of said legs and engageable with said part of the cycle for maintaining the support on said part of the cycle.

4,625,836

LOCKING DEVICE FOR MOVABLE ARM ASSEMBLY

Norman B. Pigott, Bishops Stortford, England, assignor to Robotic Systems Limited, Mildenhall, England

Filed Nov. 7, 1983, Ser. No. 549,318
Claims priority, application United Kingdom, Nov. 10, 1982, 8232077
Int. Cl.[4] B25J *9/14;* **F16D** *51/08*
U.S. Cl. 188—67 **5 Claims**



1. A locking device for locking up a movable arm assembly such as a robot arm assembly device comprising:
a longitudinal extending movable arm element having a first end,
a support extending around the first end of the movable arm element and pivotally connected to the arm element supporting the arm element whilst permitting it to pivot so as to alter the direction in which it extends, and
an expandable annular element located directly between radially separated opposed annular faces which respectively move with the movable arm element and form part of the support therefor, the expandable element having a fluid connection leading to means for supplying hydraulic oil under pressure to the interior of the expandable element to expand same and cause the movable arm element to lock relative to the support therefor until the hydraulic oil pressure is released, an air pressure-to-oil pressure intensifier for converting air line pressure to a higher oil pressure by providing a large diameter piston over which the air pressure acts and a small diameter piston movable in a cylinder containing the oil, and a control valve for supplying air under pressure from a source thereof to the air pressure-to-oil pressure intensifier and for venting the pressurized air therein when the pressure is to be released.

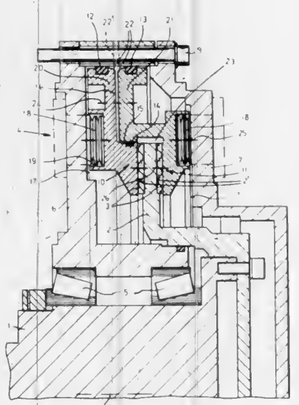
4,625,837

HOLDING BRAKE FOR MANIPULATOR

Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen + Roboter GmbH, Augsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 611,387, May 17, 1984, abandoned, which is a continuation of Ser. No. 326,891, Dec. 2, 1981, abandoned. This application Mar. 21, 1985, Ser. No. 714,698
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046156
Int. Cl.[4] F16D *65/24*
U.S. Cl. 188—170 **14 Claims**

1. A holding brake effective between a rotating part and a nonrotating part of a manipulator, said brake comprising:
a substantially nondeformable brake disk secured to one of said parts, centered on an axis corresponding to the axis about which the rotating part turns relative to the nonrotating part, and having a pair of axially oppositely directed and annular brake-disk faces centered on the axis;
a housing secured to the other of said parts, at least partially surrounding said brake disk, and having a pair of end walls having wall faces axially confronting the respective disk faces;
respective brake elements limitedly axially displaceable independently of each other between said wall faces and the respective disk faces and having annular brake-element faces centered on the axis and flatly axially engageable with the respective disk faces;
means including formations on said elements and housing for rotationally coupling said elements and said housing and preventing relative rotation between said elements and said housing;
biasing means including respective similar pluralities of springs angularly equispaced about the axis and axially compressed between each of said brake elements and the



respective wall face for normally urging said elements with a substantially constant force axially together into braking engagement with said disk and thereby normally locking the disk against rotation in the housing;
seal means between said brake elements and between said brake elements and said housing for defining an annular pressurizable chamber between said brake elements centered on the axis radially offset from said disk and said disk faces, the axial width of said chamber being substantially less than the thickness of said disk between said disk faces; and
means disposed along the periphery of said chamber and including at least two valves angularly equispaced about the axis for admitting a fluid under pressure radially at respective angularly equispaced locations into the chamber and thereby pressurizing said chamber and moving said elements axially apart and substantially instantaneously out of braking engagement with said disk.

4,625,838

VEHICLE ANTI-SKID/WHEELSPIN DEVICE

George D. Hopes, Reading, England, assignor to The Secretary of State for Transportation in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

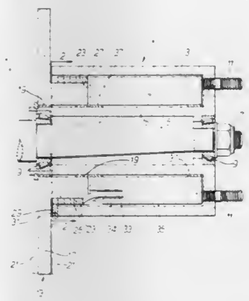
PCT No. PCT/GB84/00270, § 371 Date Mar. 29, 1985, § 102(e) Date Mar. 29, 1985, PCT Pub. No. WO85/00789, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 3, 1984, Ser. No. 718,016

Claims priority, application United Kingdom, Aug. 4, 1983, 8321040

Int. Cl.⁴ B60T *8/093*

U.S. Cl. 188—181 A **4 Claims**



1. A device for avoiding skidding or wheel spinning in a vehicle, said device comprising:
   a fixed hub to which a heel can be attached,
   force application means for applying force to the fixed hub,
   a rotatable flywheel arranged coaxially within the hub,
   a single wrap spring clutch having a first end secured directly to said hub,
   a plurality of coils resiliently engaged around the force application means below a pre-determined rate of change of velocity of the hub relative to the flywheel, the second end of said wrap spring clutch being secured directly to the flywheel so that the plurality of coils disengage the force application means at said pre-determined rate of change of velocity and so that fracture of the wrap spring clutch near the second end leaves the hub still engaged to the force application means.

4,625,839

OVERHEAD TROLLEY WIRE INSULATED SUPPORT POST

James Cockburn, Edinburgh, Scotland, and Arthur D. Suddards, Liverpool, England, assignors to BICC Public Limited Company, London, England

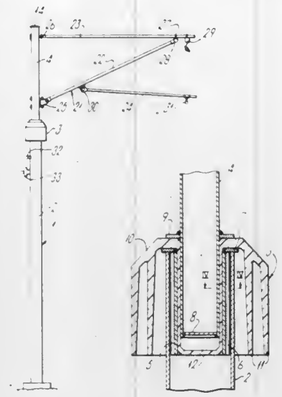
Filed Dec. 18, 1984, Ser. No. 683,011

Claims priority, application United Kingdom, Dec. 19, 1983, 8333744

Int. Cl.⁴ B60M *1/20;* **E04H** *12/22;* **H02G** *7/20*

U.S. Cl. 191—40 **12 Claims**

1. For use in supporting a contact wire of an overhead electric traction system for railways, a cantilever structural assembly comprising an upstanding support structure and, mounted on an upper part of the upstanding support structure, a cantilever structure, wherein the upstanding support structure comprises a lower part which over at least the upper end portion of its length is of tubular form, an upper part to which the cantilever structure is attached and which is separately formed with respect to and whose lower end portion extends within and along at least a part of the length of the upper tubular end portion of the lower part and, positioned between the upper end portion of the lower part and the lower end portion of the upper part, a tubular insulator of plastics insulating material having, at its upper end, an outwardly extending shed clamped between the uppermost end of the lower part of the upstanding support structure and an outwardly extending shoulder on the upper part of the upstanding support structure, the plastics insulating material of the insulator being such that



it will withstand any normal mechanical loading to which the upstanding support structure will be subjected whilst it is in service and which is of such a shape as to provide the necessary minimum creepage path between neighbouring ends of the lower and upper parts of the upstanding support structure.

4,625,840

HYDRAULIC CONTROL UNIT FOR AUTOMOTIVE TRANSMISSIONS

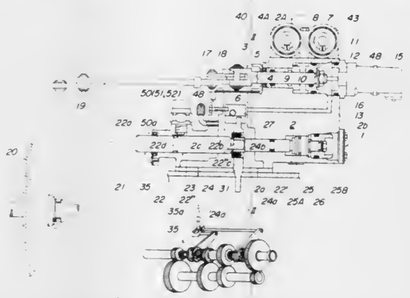
Yutaka Kojima, Higashimatsuyama, and Hisao Ishida, Tokyo, both of Japan, assignors to Diesel Kiki Co., Ltd. and Isuzu Motors Co., Ltd., both of Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,316

Claims priority, application Japan, Aug. 19, 1983, 58-128077[U]; Aug. 19, 1983, 58-128078[U]

Int. Cl.⁴ B60K *41/22*

U.S. Cl. 192—3.58 **8 Claims**



1. In a hydraulic control unit for use in an automotive transmission having a speed change gear and a clutch, said hydraulic control unit including a housing, a change gear operating mechanism means for hydraulically operating said speed change gear, and a clutch operating mechanism means for hydraulically operating said clutch, wherein said change gear operating mechanism means and said clutch operating mechanism means are both incorporated in said housing, the improvement wherein said change gear operating mechanism means comprises a first hydraulic actuator means for effecting gear shifting of said speed change gear and gear selection thereof, first solenoid valve means for controlling said first hydraulic actuator means, first and second position sensor means for sensing positions of said first hydraulic actuator means indicative of a selected gear position of said speed change gear and a shifted gear position thereof, respectively, and said clutch operating mechanism means comprises a second hydraulic actuator means for effecting engagement and disengagement of said clutch, second solenoid valve means for controlling said second hydraulic actuator means, and a third position sensor means for sensing a position of said second hydraulic actuator means indicative of engagement and disengagement of said clutch, said first and second hydraulic actuator means, said first and second solenoid valve means, and said first, second and third position sensor means being all incorporated in one body in said housing.

4,625,841

POWER-ASSISTED TRANSMISSION HAVING A GEAR SHIFT SUPPRESSING ARRANGEMENT

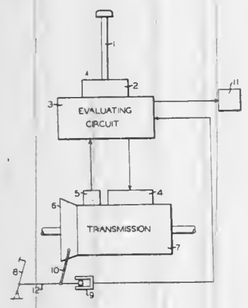
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 557,788

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245405

Int. Cl.⁴ B60K *41/22*

U.S. Cl. 192—3.63 **9 Claims**



1. In a power-assisted transmission for motor vehicles having a gear shift suppressing arrangement which controls the transmission so that a change of gears is possible only when a clutch is completely disengaged comprising, an electrical sensor means for sensing the position of the clutch, said sensor means being connected to an electronic evaluating circuit means which controls the selection and the engagement of the gears, said evaluating circuit means prevents the engagement of a newly selected gear when the clutch is still engaged, said evaluating circuit means causes the disengagement of the old gear at some point of clutch pedal movement which is less than the complete clutch pedal movement, and said evaluating circuit means causes the complete engagement of the newly selected gear only when the clutch pedal finishes the complete clutch pedal movement.

4,625,842

U-PATTERN HYDROSTATIC TRANSMISSION CONTROL LINKAGE

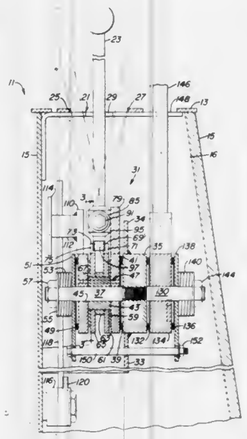
Michael J. King, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 3, 1985, Ser. No. 740,931

Int. Cl.⁴ B60K *41/26;* **G05G** *9/12*

U.S. Cl. 192—4 C **6 Claims**

1. In a vehicle having a hydrostatic transmission responsive to a transmission control lever to effect the speed and direction of the vehicle, said hydrostatic transmission having operative modes in forward, neutral and reverse, a console and a transmission control linkage mounted within said console and in communication with said transmission control lever, said transmission control linkage comprising:
   said console having a generally U-shaped slot formed therein including first and second spaced apart and generally parallel legs and a third leg intersecting the first and second legs;
   a shaft mounted in said console;
   a first control plate pivotally mounted on said shaft and having formed thereon a radially outward extending tab containing a slot and a radially outward extending nipple located generally at a right angle to said tab;
   a second control plate pivotally mounted on said shaft in axially spaced apart relationship to said first control plate and having formed thereon a radially outward extending tab containing a slot and a radially outward extending nipple located generally at a right angle to said tab and opposite to said nipple of said first control plate;
   a shift lever extending through said slot and having a tab form at one end;



   means for pivotally supporting said shift lever for movement about an axis spaced from and normal to the axis of said shaft such that said shift lever can experience lateral pivotal motion within said third leg of said console slot to bring said shift lever tab into residency in said slot of said first control plate tab or into residency in said slot of said second control plate tab, and for pivotally supporting said shift lever for movement about the axis of said shaft such that said shift lever can experience pivotal motion in either said first leg or said second leg of said console slot to cause respective pivotal motion of said first control plate or of said second control plate;
   a first linking arm pivotally mounted at one end to said nipple of said first control plate and pivotally mounted at the other end to said transmission control lever; and,
   a second linking arm pivotally mounted at one end to said nipple of said second control plate and pivotally mounted at the other end to said transmission control lever.

4,625,843

TORQUE LIMITER WITH DEVICE INDICATING OPERATION THEREOF

Peter J. Maltby, and Ray Parker, both of Wolverhampton, England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Mar. 11, 1985, Ser. No. 710,067

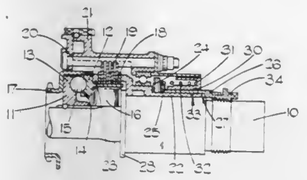
Claims priority, application United Kingdom, Mar. 17, 1984, 8407029

Int. Cl.⁴ F16D *43/20, 67/02*

U.S. Cl. 192—8 R **2 Claims**

1. A torque limiting device comprising an input shaft, an output shaft, a clutch having input and output elements cou-

pled to said input and output shafts respectively, one of said elements being rotationally and axially movable with respect to the other element in response to a torque in excess of a predetermined value on said output shaft, a first spring biasing said elements against relative axial movement, a brake device responsive to an initial amount of said relative axial movement for arresting rotation of said output shaft, said brake device comprising a plurality of first discs mounted on said clutch



output element for rotation therewith, a plurality of second discs intercalated with said first discs and secured against rotation, and an abutment towards which said discs are urged by said relative axial movement, said torque limiting device including a second spring urging said abutment towards said brake discs, an indicator device operable by movement of said abutment against said second spring, and means for retaining said indicator device in a position to which it has been operated by axial movement of said output element.

4,625,844

GEAR SYNCHRONIZER ASSEMBLY FOR POWER TRANSMISSION

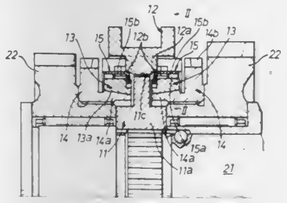
Kazuhito Ikemoto, and Yukio Terakura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 3, 1984, Ser. No. 677,748

Claims priority, application Japan, Dec. 5, 1983, 58-229587

Int. Cl.⁴ F16D *23/06, 21/04*

U.S. Cl. 192—53 F **4 Claims**



1. In a gear synchronizer assembly comprising a gear member rotatable on a transmission shaft, a spline piece formed at one side thereof with a conical portion and thereon with external splines and mounted on a hub portion of said gear member for rotation therewith, a synchronizer ring mounted on the conical portion of said spline piece for frictional engagement therewith, a hub member fixedly mounted on said shaft for rotation therewith and having a cylindrical hub portion encircling said synchronizer ring and formed thereon with external splines, a clutch sleeve encircling the cylindrical hub portion of said hub member and having internal splines in continual engagement with the external splines of said hub member, said clutch sleeve being axially shiftable toward and away from said gear member to be engaged at the internal splines thereof with the external splines of said spline piece, and thrust means for moving said synchronizer ring toward said spline piece in shifting operation of said clutch sleeve toward said gear member to effect the frictional engagement of said synchronizer ring with said spline piece,

the improvement wherein said clutch sleeve is formed at its inner periphery with an internal radial projection axially movable in a corresponding axial groove formed in the cylindrical hub portion of said hub member, and wherein said thrust means comprises a radially contractibe annular resilient member arranged in surrounding relationship with said synchronizer ring and axially slidably supported in place by engagement with the inner circumference of the cylindrical hub portion of said hub member, said resilient member having an axial leg extending therefrom toward the internal radial projection of said clutch sleeve and having a radial projection arranged between said hub member and said synchronizer ring to be brought into engagement with the internal radial projection of said clutch sleeve in shifting operation of said clutch sleeve toward said gear member and being arranged to abut against and urge said synchronizer ring toward said spline piece upon engagement with the internal radial projection of said clutch sleeve, the axial leg of said resilient member being further arranged to be compressed radially inwardly by engagement with the internal projection of said clutch sleeve.

4,625,845

OVERLOAD RELEASE LATCH

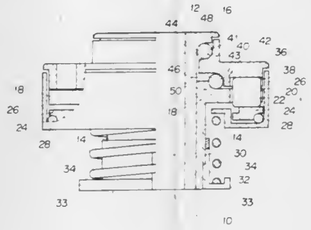
Heizaburo Kato, Ichikawa, Japan, assignor to Sankyo Manufacturing Company Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,217

Claims priority, application Japan, Jul. 20, 1984, 59-108930[U]

Int. Cl.⁴ F16D *43/20*

U.S. Cl. 192—56 R **6 Claims**



1. A torque limiter comprising:

a cylindrical boss connected to a drive shaft of the input side so as to be rotated integrally therewith, said boss including upper and lower edges each projecting radially outwardly therefrom;

a drive flange of the output side disposed between said upper and lower edges, said drive flange having a plurality of circumferentially separated recesses formed in the lower surface of said drive flange at the outer portion thereof;

roller bearings received in said lower edge of said boss, said roller bearings being engageable with said recesses and forced thereinto by the action of a torque spring; and

a bearing means for rotatably mounting said drive flange on said boss, said bearing means comprising a first row of ball bearings disposed between said upper edge and a first curved flange and a second row of ball bearings disposed between said lower edge and a second curved flange, said first curved flange being formed on the inner portion of said drive flange at a position facing said upper edge, and said second curved flange being formed on the portion of said drive flange at a position facing said lower edge.

4,625,846

DEVICE FOR DISCONNECTING THE WHEELS FROM A VEHICLE'S OPTIONAL DRIVE

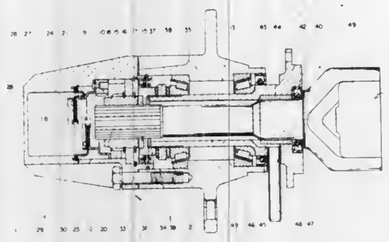
Miguel Gomez, Sao Paulo, Brazil, assignor to AVM-Auto Equipamentos Lida, Sao Paulo, Brazil

Filed Jun. 25, 1984, Ser. No. 624,537

Claims priority, application Brazil, Oct. 10, 1983, 8305573

Int. Cl.⁴ F16D *25/04, 25/061*

U.S. Cl. 192—67 R **26 Claims**



1. An automatic free wheeling hub assembly for a four wheel drive vehicle to drivingly connect a wheel to the associated vehicle's drive axle shaft which has a longitudinally extending axis and is provided with external splines on one end thereof;

said hub assembly comprising a housing hub having an axial bore through which the shaft extends;

a body having a cavity aligned with said bore, with one end of said body abutting an end face of said housing hub and the other end of said body being closed, said body having an internal section of slots;

means securing said body to said housing hub;

means in said housing hub for mounting said hub assembly on the spline end of the shaft, with said housing hub completely surrounding the shaft and with the spline end thereof extending into the cavity of said body;

a cylindrical axle hub provided with internal splines and mounted on and carried by the spline end of the shaft within said cavity;

said axle hub having an integral toothed section of teeth on the exterior thereof;

an axially movable clutch ring located in the cavity of said body and spaced from the spline end of the shaft, said clutch ring having an internal section of teeth for selective engagement with the teeth on said axle hub carried by the shaft;

said clutch ring having an external section of locking teeth located in and movable along the internal slots provided in said body;

fluid responsive actuating means including a movable member located in said cavity axially opposite the spline end of the shaft;

said movable member dividing said cavity into a pair of fluid chambers; and

means securing said movable member to said clutch ring;

said fluid responsive actuating means being responsive to a pressure differential in said chambers thereby moving said movable member and said clutch ring axially in said cavity to effect engagement or disengagement of the teeth of said clutch ring and said axle hub;

said body, hub housing, movable member and clutch ring when disengaged from said axle hub, being adapted to turn freely as a unit, independent from said axle hub and the shaft.

4,625,847

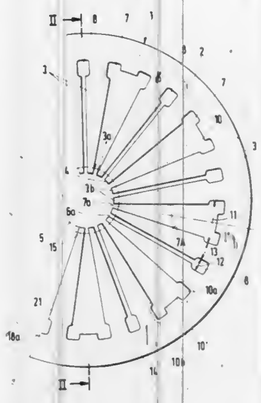
DIAPHRAGM SPRING FOR USE IN FRICTION CLUTCHES OR THE LIKE

Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 337,516, Jan. 6, 1982, Pat. No. 4,492,293. This application Nov. 7, 1984, Ser. No. 656,434

Int. Cl.⁴ F16D *13/44;* **F16F** *1/34*

U.S. Cl. 192—89 B **12 Claims**



1. A diaphragm spring, particularly for use in friction clutches, comprising an annular main section; and a plurality of elongated fingers extending from said section substantially radially inwardly and having inner end portions with end faces defining a substantially circular opening, said fingers defining between themselves alternating elongated first and second slots extending from said end faces to said section and respectively having enlarged first and second outermost portions of lesser and greater width, as considered in the circumferential direction of said section, the width of said first slots being at least substantially identical with the width of said second slots in the region of the inner end portions of said fingers.

4,625,848

LOCK DEVICE

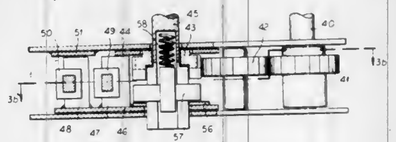
Pierre Meyers, Nimrodstrasse 7a, 8012 Ottobrunn, and Klaus Meister, am Fischerwinkel 3, 8022 Grünwald, both of Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,024

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310822; Oct. 24, 1983, 3338604

Int. Cl.⁴ F16D *23/12*

U.S. Cl. 192—93 A **7 Claims**



1. A drive for a lock arrangement comprising:

an input shaft mounted for rotation;

an output shaft mounted for rotation;

an output gear rotationally coupled to said input shaft and mounted for free rotation about said output shaft;

a pivotal plate;

electromagnetic coupling means including an electromagnet carried on said pivotal plate and an armature plate, said

armature plate being mounted for rotation with said output gear;

excitation means for energizing said electromagnet and coupling said pivotal plate to said input shaft via said armature plate and said output gear;

cam means on said pivotal plate;

said output shaft including a bore and a transverse slot through said bore;

said output gear including a groove;

dog means comprising a spring in said bore, a member slidable within said bore and biased by said spring and a dog carried on said member slidable in said slot and engaged and cammed by said cam means to move into said groove and couple said output shaft to said input shaft via said output gear.

4,625,849

CENTRIFUGAL CLUTCH

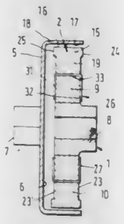
Reinhard Gommel, Backnang, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,958

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332766

Int. Cl.⁴ F16D *23/10, 43/24*

U.S. Cl. 192—105 BA **29 Claims**



1. A centrifugal clutch for small motors such as for hand-guided portable apparatus including chain saws, cut-off machines, mopeds or the like comprising:

a carrier adapted to be rotatably driven by the motor of the apparatus thereby defining an axis of rotation;

a clutch drum disposed in surrounding relationship to said carrier;

a plurality of centrifugal weights disposed within said clutch drum;

connecting means for slidably connecting and guiding said weights on said carrier for movement in a direction radial of said axis between a rest position whereat said weights are disengaged from said drum and an active position whereat said weights are in contact engagement with said drum for transmitting torque thereto from said carrier; and,

a plurality of holders corresponding to respective ones of said weights for securing said weights against movement parallel to said axis;

said connecting means including: a plurality of receiving means formed on said centrifugal weights, respectively; and, a plurality of engaging means formed on said carrier for engaging corresponding ones of said weights at said receiving means thereof; each of said weights and the receiving means corresponding thereto defining two end faces facing in respective opposite directions along said axis; and,

each one of said holders being a single unitary sheet metal piece including a mid portion extending between said end faces parallel to said axis and two legs extending at right angles from said mid portion for engaging corresponding ones of said end faces and at least one of said legs overlapping said engaging means thereby preventing a movement of said weights relative to said carrier in a direction parallel to said axis.

4,625,850

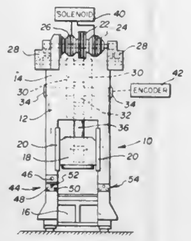
PRESS CLUTCH CONTROL SYSTEM

Eugene M. Marsh, Crestwood, Ill., assignor to Verson Allsteel Press Co., Chicago, Ill.

Filed Mar. 9, 1983, Ser. No. 473,570

Int. Cl.⁴ F16D *11/04;* **B21J** *9/20*

U.S. Cl. 192—143 **5 Claims**



1. In a press machine including a press having a slide, the slide cycling between a top position and a bottom position, said slide operable by a clutch controlled rotatative drive system, a clutch control system comprising:

sensing means interconnected to the drive system for sensing the rotation of the drive system;

timing means responsive to said sensing means for generating an elapsed time signal representing the amount of time for the drive system to rotate from a first angular position to a second angular position;

means for comparing said elapsed time signal with a predetermined magnitude to thereby generate a signal representing the speed of the press; and

means responsive to said speed signal for generating a control signal limiting rotation of said drive system to a number of degrees functionally related to said speed signal and effective for deactuating the clutch to enable stoppage of the press at a consistent predetermined position at the top of the slide's cycle.

4,625,851

COIN TESTING APPARATUS

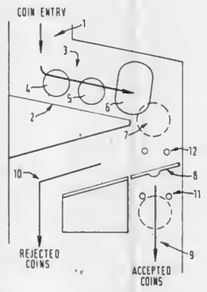
Peter R. Johnson, Reading; Derek Hutchinson, Hillingdon; Peter J. Reyner, Northwood, and Robert Dean, Farnham Common, all of England, assignors to Mars, Inc., McLean, Va.

Filed Jul. 30, 1984, Ser. No. 636,015

Claims priority, application United Kingdom, Jul. 28, 1983, 8320337

Int. Cl.⁴ G07D *5/00*

U.S. Cl. 194—200 **18 Claims**



1. A coin testing apparatus comprising a coin path, a testing station in said coin path, means responsive to the presence of an object in the testing station for generating a control signal, a gate mechanism in the coin path downstream of the testing station, the gate mechanism being operable in response to the testing of an acceptable coin to permit access for such coin to an accept path and otherwise preventing such access, a pre-gate detector located upstream of the gate mechanism and downstream of the testing station and downstream of the general location in the coin path whereat an object would be located at the time of generation of said control signal by at least such a distance that the largest coin to be accepted by the apparatus cannot concurrently be detected by the detector and be responsible for the generation of said control signal, the pre-gate detector being responsive to coins and other objects for signalling the presence of an object in the coin path close to the gate mechanism, and means for inhibiting such operation of the gate mechanism as would permit access to the accept path when said pre-gate detector signals the presence of an object close to the gate mechanism and said control signal is generated in response to the presence at the same time of another object in the testing station.

4,625,852

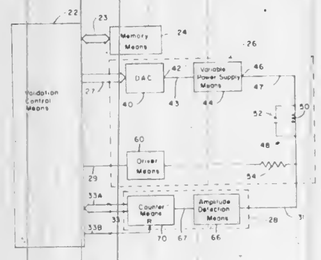
COIN DETECTION AND VALIDATION MEANS AND METHOD

Ronald A. Hoormann, St. Peters, Mo., assignor to Coil Acceptors, Inc., St. Louis, Mo.

Filed Sep. 5, 1985, Ser. No. 772,702

Int. Cl.⁴ G07D *5/08*

U.S. Cl. 194—317 **21 Claims**



1. A coin validation means for validating that a coin submitted to examination is a valid coin of an acceptable denomination, comprising a memory means including means for storing predetermined data entries, each acceptable denomination having a first data entry associated therewith, the corresponding first data entries for the respective acceptable denominations forming a first set of data entries, a validation control means operatively connected to said memory means and operable to permit the retrieval from said memory means of the predetermined data entries stored therein, ringing means operatively connected to said validation control means and controllable by said validation control means, said ringing means having a field associated therewith and including ring conditioning means and ring reaction means, said validation control means operable to produce respective conditioning signals corresponding to different predetermined data entries retrieved from said memory means, said ring conditioning means responsive to each conditioning signal to pre-condition said ringing means in accordance therewith, said validation control means operable to produce ring initiation signals, said ring reaction means responsive to each said ring initiation signal to produce during a ringing time interval a damped wave output signal the characteristics of which are dependent, in part, both upon the particular pre-condition of said ringing means and upon any coin in the field of said ringing means, and means operatively connected to said ringing means to monitor each said damped wave output signal and to respond to a first particular predetermined characteristic of said damped wave output signal applicable with respect to all of said first set of data entries, the particular damped wave output signal produced in response to any given ring initiation signal for any of said first set of data entries while a coin submitted for examination is in the field of the ringing means having associated therewith said first particular predetermined characteristic if such coin is a valid coin of the particular acceptable denomination whose associated first data entry was retrieved from said memory means and utilized to pre-condition said ringing means.

4,625,853

APPARATUS FOR THE TRANSPORT OF WORKPIECES TO AND FROM A MACHINE TOOL

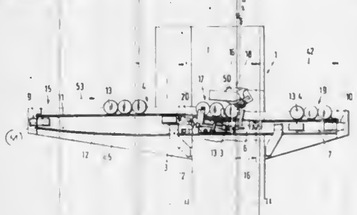
Hans Gregg, Woerthsee/Steinebach, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,767

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409302

Int. Cl.⁴ B65G *15/64*

U.S. Cl. 198—345 **6 Claims**



1. An apparatus for the transport of workpieces from a loading station through a working station to an unloading station, comprising at least one endless and movably supported conveyor chain guided before the loading station and after the unloading station over sprocket wheels with horizontal axes, said axes being supported in a frame and of which one of two return points for said chain is driven rotatinglys by a motor, wherein a conveying route is formed by an upper reach of said conveyor chain, viewed in the conveying direction, starting out from said one return point extends first horizontally, then downwardly inclined from a point before the working station to a point beyond the working station and thereafter horizontally again to the other return-point, so that the two return points have different elevational positions in the frame, and means for varying the inclination between the first horizontal section and the working station, said means including a rocker arm extending from adjacent the downstream end of the first horizontal section to at least the working station and supporting said conveyor chain, said rocker arm at its end which is adjacent the first horizontal section being pivotally adjustable about a horizonal axis which extends transversely with respect to the conveying direction, and further means for facilitating a resiliently downwardly swinging away of said rocker arm under the action of a force which is created during a clamping of the workpiece in the working station.

4,625,854

CONTAINER TRANSFER SYSTEM

Helmut Deichmann, Seven Hills, and Thomas J. Zeeff, Cleveland, both of Ohio, assignors to Feco Engineered Systems, Inc., Cleveland, Ohio

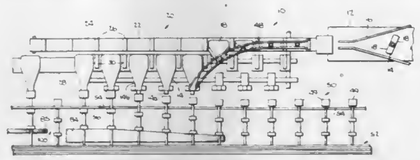
Filed Sep. 4, 1984, Ser. No. 647,297

Int. Cl.⁴ B65G *47/04, 47/24, 49/00*

U.S. Cl. 198—416 **10 Claims**

1. A container carrying mechanism for containers having neck and body portions and a longitudinal axis, comprising an endless transfer conveyor for receiving and holding the containers in a substantially horizontal position and moving the containers along a longitudinal path, the transfer conveyor having a plurality of container receiving segments for receiving and for supporting the containers with necks of the containers oriented in a common direction, the transfer conveyor having means for engaging and supporting the neck of each

container and for restraining the container against moving in an axial direction prior to removal of the container therefrom, an endless carrier conveyor for moving in spaced relation to the transfer conveyor, a plurality of support members extending laterally of the carrier conveyor with each support member having a carrier member, each of said carrier members having means for engaging and carrying containers by their necks, means for moving the support members and the carrier mem-



bers laterally toward the transfer conveyor to grip individual containers by the neck,

said carrier members move the containers along the same longitudinal path and means for moving the container receiving segments away from the containers and said longitudinal path whereby the containers are separated from the transfer conveyor and carried by the support members to one or more container operations.

4,625,855

APPARATUS FOR DISPLACING PROFILED STEEL RODS OF A ROLL CONVEYOR

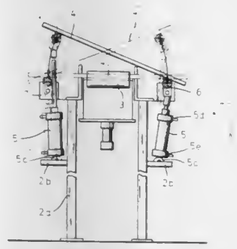
Siegfried Klaus, Ennepetal, Fed. Rep. of Germany, assignor to Carl-Ulrich Peddinghaus, Wuppertal-Barmen, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,536

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341109

Int. Cl.[4] B65G *47/94*

U.S. Cl. 198—367 **1 Claim**



1. A roller conveyor for rod and bar stock which comprises:

an elongated frame structure having a pair of horizontally spaced members;

a multiplicity of rollers disposed between said members and journaled thereon to form a conveyor track along which said stock can be displaced;

a plurality of cross pieces each disposed between two such rollers and having ends lying laterally outwardly of said track and having an inoperative position wherein said cross pieces are disposed below the surface of a plane tangent to said rollers;

a respective longitudinal beam disposed on each side of said track and rigidly connected to undersides of all of the ends of the plurality of cross pieces projecting at the respective side of said track, said beams extending parallel to said members;

respective supports on each side of said frame structure for receiving from above the respective beam in said inoperative position of said cross pieces and shaped to permit rotation of the respective beam relative to the respective support upon elevation of the beam on the opposite side of said frame structure; and

at least one fluid-operated cylinder pivotally connected to said structure on each of said opposite sides thereon and having a piston rod pivotally connected to the respective beam, the cylinder being selectively operable on opposite sides of said track for selectively raising one of said beams from a position in which it is held and from the respective support so as to pivot the beams and the cross pieces connected thereto about an axis defined by the beam on the opposite side of said structure and its said support.

4,625,856

DEVICE FOR DEFLECTING FILLED WAFER SLICES ARRANGED IN JUXTAPOSED ROWS AND ADVANCED IN THE DIRECTION OF SAID ROWS

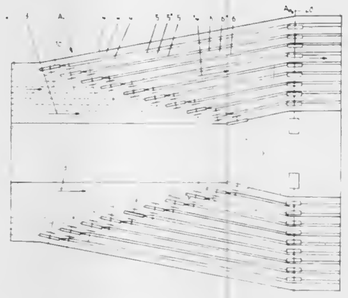
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Feb. 11, 1985, Ser. No. 700,535

Claims priority, application Austria, Feb. 20, 1984, 557/84

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—457 **10 Claims**



1. An apparatus for deflecting a plurality of laterally juxtaposed, substantially parallel, rectilinear rows of wafers filled with a sticky composition from a first direction to a second direction angularly diverging from the first direction, which comprises the combination of

(a) a planar surface supporting the rows of wafers for advancement in said directions,

(b) respective pairs of laterally spaced rectilinear side walls facing each other and defining substantially parallel guiding passages therebetween on the planar supporting surface for respective ones of the rows of wafers, the guiding passages extending in the second direction and the second direction angularly diverging from the first direction at a bend,

(1) each guiding passage having an entrance portion at the bend defined between an outside side wall portion and an inside side wall portion, and

(2) the entrance portions of the guide passages being staggered in the direction of advancement,

(c) a respective rotary disc associated with the entrance portion of each one of the guiding passages, each rotary disc having

(1) an upper portion protruding through a slot in the supporting surface and constituting a guiding face facing the guiding passage, the guiding face forming the outside side wall portion at the bend and deflecting successive ones of the wafers in each row at the entrance portion of each guiding passage from the first to the second direction as the rows of wafers are advanced in said directions,

(d) a respective shaft arranged below the supporting surface and rotatably supporting each rotary disc, each shaft extending perpendicularly to the second direction, and

(e) a cleaning device associated with each rotary disc and arranged below the supporting surface for removing any of the sticky composition adhering to the guiding face of the rotary disc.

4,625,857

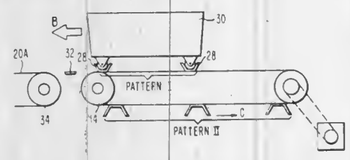
ENDLESS BELT CONVEYOR SYSTEM HAVING PATTERNED BELT TRANSPORT SURFACE

Guenther L. Kuehl, Greenwich, Conn., assignor to Z-Loda Corporation, New Canaan, Conn.

Filed Sep. 6, 1985, Ser. No. 773,049

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—465.1 **14 Claims**



1. A conveyor system for the transportation of loads from a first station to a second station, in which some of the loads have a first pattern of bottom protrusions and some of the loads have a different second pattern of bottom protrusions, with each load bottom having forward and rear protrusions, said conveyor system comprising:

(a) an endless belt having an outer transport surface, a drive roller and a driven roller, said belt being trained over said rollers;

(b) a plurality of spaced-apart nesting means affixed to said belt transport surface, said nesting means forming first and second patterns corresponding, respectively, to said first and second patterns of bottom protrusions of said loads, and

(c) control means for controlling said drive roller to advance said belt to a selected pattern so that, at a first station, forward nesting means of the selected pattern on said belt will engage and carry the forward protrusions of said load and, upon further advance of said belt, the rear nesting means of said selected pattern will engage and carry the rear protrusions of said load.

4,625,858

HARNESS ASSEMBLING APPARATUS

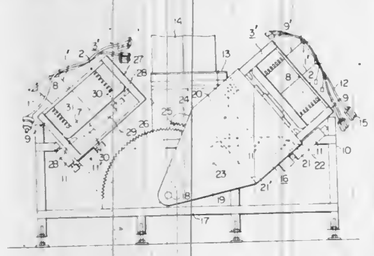
Takeshi Fukui, Kanazawa, Japan, assignor to Tokai Electric Wire Company Limited, Mie, Japan

Continuation-in-part of Ser. No. 432,841, Oct. 5, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,198

Claims priority, application Japan, Oct. 7, 1981, 56-160826

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—465.1 **15 Claims**



1. A harness assembling apparatus having a conveyor system including a forward conveyor line and a parallel backward conveyor line, and a plurality of pallets each having an upper deck carrying a plurality of jigs for supporting a harness thereon, said jigs including at least one fixed jig carried by said upper deck of the pallet in a fixed vertical position relative to said upper deck and at least one movable jig supported for vertical movement relative to said upper deck between a lowered position and a raised position, a lower deck supporting said movable jig, said movable jig supported by said lower deck being extended to the upper side of said upper deck through an aperture formed in said upper deck, said lower deck being movable up and down relatively to said upper deck for effecting vertical movement thereof, said pallets being supported in said conveyor lines with their decks inclined to the horizontal and driven successively along said conveyor lines between work stations for assembling and testing harnesses, characterized by comprising a turning a shifting device provided at least one of the downstream ends of said conveyor lines, said turning and shifting device being adapted to shift successive pallets from one conveyor line to the other conveyor line one by one and including a turning device for pivoting said decks in such a manner that the edge of said deck located at the lower side on said one conveyor line is located at the upper side on said other conveyor line.

4,625,859

SCREW FEEDER

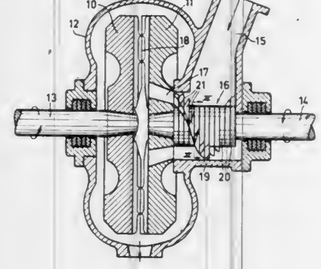
Axel H. Sjöbom, Bellevue, Wash., assignor to Sunds Defibrator Aktiebolag, Sundsvall, Sweden

Filed Nov. 27, 1984, Ser. No. 675,317

Claims priority, application Sweden, Dec. 20, 1983, 8307046

Int. Cl.[4] B65G *33/30*

U.S. Cl. 198—665 **8 Claims**



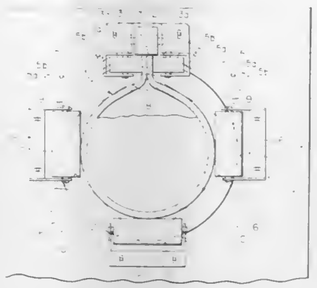
1. A screw feeder for conveying material in a longitudinal direction, comprising an axle which is reversibly rotatably driven about a longitudinal axis, and a plurality of feed elements mounted longitudinally successively on said axle; each said feed element comprising first and second feeding flanks facing in said longitudinal direction and converging in said longitudinal direction, each of said first and second flanks having longitudinally spaced leading and trailing ends and being curved from said leading end to said trailing end, said first and second flanks being joined at their leading ends to form a radially extending apex, said feed elements being rotatably adjustable relative to one another about said axis by a selected distance in a first direction to bring said apexes into general alignment with said trailing ends of said first flanks to form a right-hand screw flank, and by a selected distance in a second direction to bring said apexes into general alignment with said trailing ends of said second flanks to form a left-hand screw flank; at least one of said feed elements being operably coupled to said axle for rotation therewith.

4,625,860

TUBULAR BELT CONVEYOR

Mikio Kawasaki, Suita, and Kiyoshi Matsumoto, Takarazuka, both of Japan, assignors to Sumitomo Heavy Industries, Ltd, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,257
Int. Cl.[4] B65G *15/08, 15/40, 39/12*
U.S. Cl. 198—819 **5 Claims**



1. A tubular belt conveyor having a substantially flat endless belt for running between pulleys disposed at a material supplying end and a material discharging end, and a plurality of belt supporting and guiding means arranged in the direction of running of the endless belt for guiding the running belt while deforming the belt into a tubular form, wherein said endless belt has a substantially uniform thickness, without longitudinal grooves, indentations or projections, along its breadth and is deformable into a tubular form such that the longitudinal side edge portions of the surface thereof which is contacted by the material being conveyed abut each other thus forming a lug extending along the tube formed by said belt, said endless belt being provided between said tubular portion and said lug portion with an intermediate portion made of a flexible material different from the material of the other portions of the belt and having greater flexibility in said intermediate portion than the other portions of the belt, and wherein each of said belt guiding and supporting means includes a frame through which the deformed belt passes and on which are mounted a pair of guide rollers for clamping said lug from both sides thereof, a pressing roller having an axis orthogonal to the axes of said guide rollers and engageable with the radially outer end surface of said lug, and a plurality of tube-forming rollers arranged in angularly spaced relationship with each other around said tube for engaging the outer peripheral surface of said tube formed by said belt thus maintaining the tubular form of said belt wherein said pressing roller and a pair of said tube-forming rollers adjacent said pair of guide rollers are supported by respective roller supports which are secured to said frame through adjusting means for free adjustment of positions in the radial direction, and wherein the adjusting means of said tube-forming rollers adjacent said rollers are arranged such as to allow the axes of said rollers to be adjusted within a plane perpendicular to the tube formed by said belt.

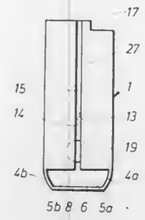
4,625,861

CASE PREFERABLY FOR A LIGHTER

Harald U. G. Krog, 29, Strandparken, Bandholm Maribo 4930, Denmark

PCT No. PCT/DK84/00076, § 371 Date Apr. 17, 1985, § 102(e) Date Apr. 17, 1985, PCT Pub. No. WO85/00872, PCT Pub. Date Feb. 28, 1985
PCT Filed Aug. 16, 1984, Ser. No. 726,905
Claims priority, application Denmark, Aug. 17, 1983, 3759/83
Int. Cl.[4] B65D *85/20, 67/02*
U.S. Cl. 206—234 **6 Claims**

1. A case for frictionally retaining a lighter,
said case being tubular and having an opening at its upper end and a lower rim at its lower end;
the lower rim having means to form an obliquely extending recess for receiving a portion of a bottle cap, the lower rim further having means to form an inwardly projecting gripping part for engaging the bottle cap from below and a counter-holding part opposing the gripping part for abutting and pressing on the bottle cap from above to cooperate with the gripping part in loosening the cap from a bottle;



the case being made of a single sheet metal member bent substantially symmetrically from a longitudinal central line to form first and second opposing side walls;
the first side wall being continuous;
the second side wall being broken by a slot defined by edge portions of said sheet metal member to provide resilience for retaining the lighter;
said recess receiving a portion of said lighter when said lighter is fully inserted into the case.

4,625,862

SUPPORT ASSEMBLY FOR GOLFING ACCESSORIES

Gene Clayton, 29 W. Walling, St. Louis, Mo. 63141

Filed Apr. 22, 1985, Ser. No. 725,938
Int. Cl.[4] A63B *55/00, 57/00*
U.S. Cl. 206—315.3 **2 Claims**



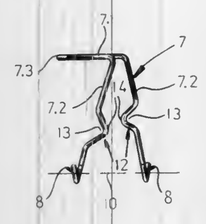
1. The combination with a golf bag having a loop-forming member provided on the exterior thereof and golf club head covers provided for selected clubs retained within said bag, of a temporary support assembly for said head covers comprising a first component of flat, plate-like character having opposite inner and outer faces, a first section of pile material being fixed on the outer face of said first component, an opening provided in said component, means passing through said opening and said bag loop-forming member for suspending said first component, a second component having a relatively rigid backing portion, a second section of pile material provided on one side of said backing portion, and an eyelet extending from the opposite side of said backing portion, said eyelet projecting through the related golf club cover, and retention means presented inwardly of said cover for acceptance within the eyelet for securing said second component on said cover, said first and second pile sections being designed for mutual engagement whereby during disuse said golf club cover may be retained against displacement upon said first component.

4,625,863

CONNECTING CLIP

Georg Knoblauch, Giengen, Fed. Rep. of Germany, assignor to Firma Georg Knoblauch, Giengen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,932
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406332
Int. Cl.[4] B65D *85/29*
U.S. Cl. 206—379 **3 Claims**



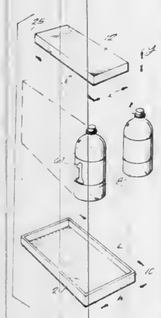
1. In a connecting clip having a clip arm and two clip legs extending from said clip arm, a pivot eye attached to the end of each of said clip legs opposite said arm with an axis of said pivot eye substantially parallel to said clip arm, a case for storage of objects, particularly slender work tools such as spiral drills, taps, or the like, said connecting clip attached to said case, said case comprising a case bottom having at least one pivotable holder insert therein for receiving said objects and a case cover connected to said holder insert by said connecting clip, by-means-of which said holder insert is swung up automatically when said case is opened by raising said cover, wherein said connecting clip is inserted in a clip pivot on the inner side of said case cover and is pushed so that said pivot eyes of said clip legs engage on and are held by said pivot pins of said holder insert, the improvement wherein said clip arm is substantially perpendicular to said clip legs and when said clip arm is inserted in said clip pivot said clip legs will both be on the same side of said clip pivot, and each of said clip legs has lying in the plane of said clip legs a bent portion having at least one bend, said bend having a crest, and said crests from each of said clip legs facing each other across both of said clip legs.

4,625,864

CONTAINER PACKAGE ASSEMBLY

Terry J. Nigrelli, 11117 Marken Rd., Kiel, Wis. 53042

Filed Aug. 23, 1985, Ser. No. 768,874
Int. Cl.[4] B65D *71/04*
U.S. Cl. 206—427 **2 Claims**



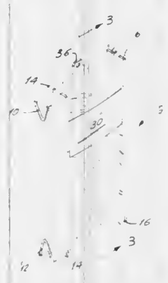
1. The combination of a plurality of containers having annular neck flanges and tops and upper and lower trays and means to secure the upper and lower trays in spaced position to secure said components in integrated assembly, the number of containers in a transverse row being defined by the letter n and wherein d is the diameter of the containers, r is the radius of the neck flange, and N is the number of containers in a longitudinal direction and h is the height from the neck flange to the container top, said upper tray having a width w substantially the same as $(n-1)\times D+2r$ and a length l substantially the same as $(N-1)\times D+2r$ and a tray depth y greater than or equal to the height h of the flange to container top;
and wherein the dimensions of the lower tray include a width W substantially the same as $n\times D$ and a length L substantially the same as $N\times D$.

4,625,865

DISPLAY PACKAGE FOR GARLAND OR THE LIKE

William F. Protz, Jr., 528 N. 7th St., Manitowoc, Wis. 54220

Filed May 6, 1985, Ser. No. 731,106
Int. Cl.[4] B65D *85/04;* **B65H** *55/02*
U.S. Cl. 206—388 **16 Claims**



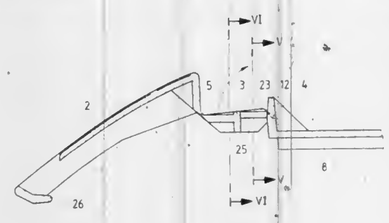
1. A package for a strand of crushable material or the like comprising first and second strand support members and means for retaining said members in spaced relation such that the strand can be wrapped therearound, said retaining means comprising first and second spaced, substantially parallel retaining elements, and means for mounting said members proximate the ends of said elements, said mounting means comprising an opening proximate each end of each of said elements, each of said members having portions adapted to be received within said openings.

4,625,866

RING FOR SEALING AND STORAGE OF A SPOOL OF RECORDING TAPE

Patrick P. P. Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed May 15, 1985, Ser. No. 734,475
Claims priority, application France, May 22, 1984, 84 07951
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—400 **5 Claims**



1. A ring for sealing and storage of a spool of recording tape said spool having a hub and a pair of parallel circular cheeks, defined by opposite sides the ring comprising: a band of flexi-

ble and extensible material, equipped with longitudinal ribs for engaging said opposite sides, said band having one end with a hook and a second end with a loop hingedly connected to said second end, said loop being provided to close and stretch the ring around the spool by engaging said hook, the loop being hinged onto the band by a link rotatable toward an open position restricted by stop means; the band, the loop and the link being in one piece; the link being hinged onto the band by a zone of reduced thickness; wherein the band is equipped in the zone with at least one column which intercepts the path of the link, one of the link and the column exhibiting an oblique flank provided to enable the link to pass beyond the column by elastic deformation when said link is rotated away from said open position and for preventing said link from returning to said open position.

4,625,867

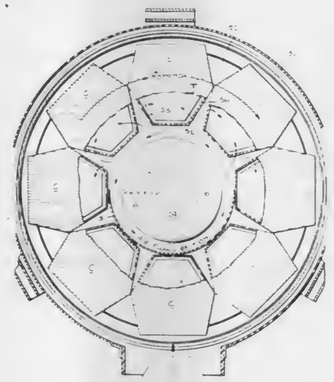
HOT AIR OVEN FOR FOOD-LOADED CARTRIDGES

Raul Guibert, Los Angeles, Calif., assignor to Sunset Ltd., Santa Monica, Calif.

Continuation of Ser. No. 803,756, Jun. 6, 1977, abandoned, Division of Ser. No. 776,772, Mar. 11, 1977, Pat. No. 4,112,916. This application Oct. 20, 1980, Ser. No. 198,630

Int. Cl.⁴ B65D *21/02;* **F25B** *13/00*

U.S. Cl. 206—499 **6 Claims**



1. An array of individual cartridges having a hexagonal form arranged in a circular array with their side apexes substantially in point contact to create a vertical column whose cross section has a crown-of-thorns configuration defined by a circular series of triangular alcoves joined by links, said column being adapted to receive a stream of heated air in a swirling pattern which serves to heat pre-cooked meals contained in said cartridges, each cartridge in the array comprising:

A an open carton having a rear wall and inclined side walls, the inclined side walls of the cartons in the array converging toward said point contacts to form the triangular alcoves and the rear walls thereof forming the links of the column; and

B a vertical stack of trays containing pre-cooked meals nested in said carton and having spaces therebetween to admit said heated air, said trays having a six-sided form whose rear three sides lie adjacent the respective walls of the carton and whose front three sides are exposed whereby said trays may be individually removed from the carton, each carton in the array having openings in the rear and inclined side walls thereof to admit said heated air from said column into the spaces between the trays.

4,625,868

COMPOSITE SLAT FOR USE IN VENETIAN BLINDS

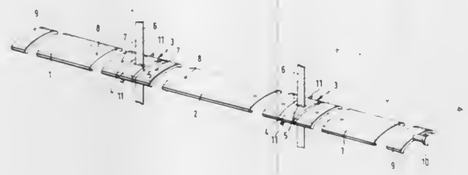
Richard Bischof, Hölstein, Switzerland, assignor to Emil Schenker AG, Schönenwerd, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,637

Claims priority, application Switzerland, Feb. 23, 1984, 890/84

Int. Cl.⁴ E06B *9/26, 9/264*

U.S. Cl. 206—577 **11 Claims**



1. A kit for the assembly of a composite slat for use in a venetian blind, comprising at least three elongated first slat sections and at least two connecting sections arranged to be placed between said first sections so that said connecting sectiona alternate with said first sections and each connecting section is flanked by two first sections, said first and connecting sections respectively having first and second end portions arranged to be slidably telescoped into each other, each of said connecting sections having an aperture for the passage of a flexible slat gathering element and each connecting section further having fastener means for attachment of a cord thereto and stop means for determining the extent to which such connecting section can be coupled with the respective first sections.

4,625,869

CARRIER FOR PACKAGING, SHIPPING AND TRANSPORTING COILED, HEAVY-WEIGHT PRODUCTS

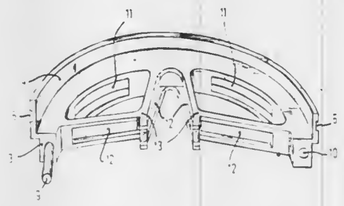
Sytze A. Kuipers, Terhorne, Netherlands, assignor to Lankhorst Touwfabrieken B.V., Sneek, Netherlands

Filed Jan. 31, 1986, Ser. No. 824,539

Claims priority, application Netherlands, Dec. 30, 1985, 8503583

Int. Cl.⁴ B65D *19/00*

U.S. Cl. 206—600 **4 Claims**



1. A carrier for packaging, shipping and transporting coiled, heavy-weight products, characterized in that the carrier is formed as a ring of a synthetic plastics material, comprising an upright rim, said ring being dividable into two ring halves, each having a pin and a hole for assembling the ring halves to form the carrier, thereby forming a double pin-and-hole joint; each of said ring halves is provided on the inside with one or more reinforcing ribs of synthetic plastics material connected integrally with the ring wall and stabilizing said wall, while the ring wall and the reinforcing ribs have openings therein which, when the ring halves are assembled to form the carrier, result in the formation of a plurality of pairs of channels extending parallel to the ring plane.

4,625,870

BILL HANDLING APPARATUS

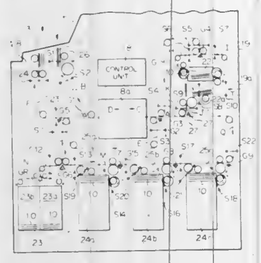
Manabu Nao, Ebina, and Hisao Hirota, Kodaira, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 29, 1983, Ser. No. 537,010

Claims priority, application Japan, Sep. 29, 1982, 57-170563

Int. Cl.⁴ B07C *5/38;* **G07D** *7/00*

U.S. Cl. 209—534 **15 Claims**



1. A bill handling apparatus, comprising:

(a) a bill-receiving means including:

(i) a bill insertion opening in which bills are inserted by users,

(ii) discriminating means for discriminating bills,

(iii) arranging and accumulating means, operatively connected to said discriminating means, having a bill arranging mechanism for arranging bills so that the front and back sides thereof face the same direction, according to a determination of the orientation of the bills made by said discriminating means, and having a bill accumulating mechanism for accumulating the arranged bills, said arranging and accumulating means comprising:

a pair of feed rollers in rolling contact, arranged on opposite sides of the path of the bills,

a tiltable gate element, operatively connected to said discriminating means, and disposed below said feed rollers,

a top plate arranged below said gate element, and having an upper and a lower position,

a supporting member,

an accumulating plate, arranged below said top plate, rotatably supported on said supporting member and having an upper and a lower position,

drive means for moving said top plate and said accumulating plate independently, in the vertical direction, from said upper position to said lower position,

a first pair of feed rollers in rolling contact, arranged on one side of said top plate and said accumulating plate, and

a second pair of feed rollers in rolling contact, arranged on the other side of said top plate and said accumulating plate and, wherein said tiltable gate element directs a bill to be selectively fed to one of said first and said second pairs of feed rollers according to the result of the determination of the orientation of the bill in said discriminating means, such that the bills are arranged on said accumulating plate with the front and back sides of successive bills facing the same direction,

(iv) a plurality of bill-receiving boxes for receiving bills according to denomination,

(v) first feeding means for feeding the bills inserted in said insertion opening to said bill arranging and accumulating means,

(vi) second feeding means, operatively connected to said discriminating means, for feeding genuine bills to said arranging and accumulating means and for returning non-genuine bills to the user, according to a determination of the authenticity of the bills made by said discriminating means, and

(vii) third feeding means for feeding the bills accumulated in said bill arranging and accumulating means, via said discriminating means, to said bill-receiving boxes;

(b) a bill-disbursing means including:

(i) a bill-disbursing opening from which bills are disbursed to users, and

(ii) a means for delivering out the bills received in said bill-receiving boxes, via said discriminating means, to said disbursing opening; and

(c) a reject box for recovering genuine bills for which no determination is made in said discriminating means, and other bills which are unsuited for disbursement.

4,625,871

AUTOMATIC BACKGROUND BRIGHTNESS CONTROL DEVICE FOR COLOR SORTING APPARATUS

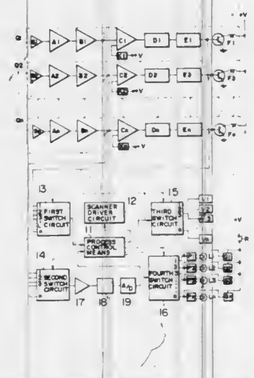
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,244

Claims priority, application Japan, Dec. 25, 1982, 57-226501

Int. Cl.⁴ B07C *5/342*

U.S. Cl. 209—549 **6 Claims**



1. An automatic background brightness control device for colour sorting apparatus having a plurality of sorting channels, each of said channels comprising a sensor, an ejector driver circuit and a feeder, said sensor being adapted to detect the amount of reflected and/or transmitted light from objects to be sorted and the amount of reflected and/or transmitted light from a background provided at the sorting channel, said device comprising:

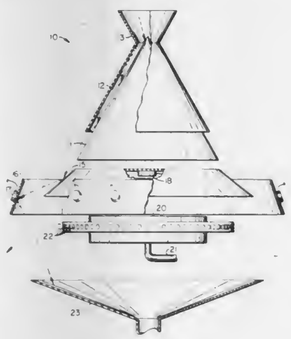
a process control means comprising a means for comparing the number of pulses sent from said ejector driver circuit within a predetermined period of time against predetermined reference numbers representative of a decreased grain flow and a normal grain flow and producing feeder control signals for decreasing and increasing the grain flow from said feeder as a result of said comparison to said predetermined reference numbers, respectively, means for comparing outputs from said sensor against predetermined reference voltages while the grain flow is decreased responsive to said feeder control signals and producing a background brightness control signal only when said output from said sensor deviates from said reference voltages, and means for producing a selection signal while the grain flow is normal;

a scanner circuit means for selecting, in response to the selection signal from said process control means, from said sorting channels the sorting channel of which the background brightness is to be controlled, said scanner circuit means selecting said sorting channels one after another so that the control of the background brightness of one sort-

ing channel begins upon the completeion of the control of the background brightness of the previous channel; and

a light control means for controlling the background brightness within said selected sorting channel according to said background brightness control signal.

4,625,872
METHOD AND APPARATUS FOR PARTICLE SORTING BY VIBRATION ANALYSIS
Thomas J. DeLacy, Los Altos; John R. Bingham, Stockton, and George F. Carroll, Manteca, all of Calif., assignors to Diamond Walnut Growers, Stockton, Calif.
Filed Sep. 10, 1984, Ser. No. 649,257
Int. Cl.[1] B07C *5/34*
U.S. Cl. 209—557 **46 Claims**



1. Apparatus for sorting particles, comprising:

means for propelling said particles along a preselected feed trajectory;

a first surface intersecting said feed trajectory and adapted to rebound all of said particles into a first rebound trajectory while preferentially reducing the kinetic energy in a portion of said particles by preferential absorption of said energy therefrom according to the composition thereof;

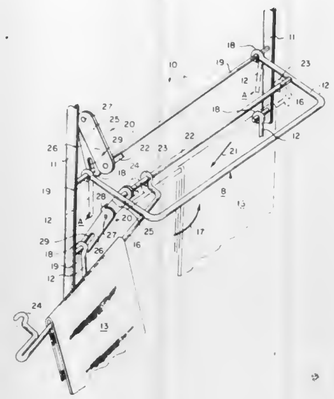
a second surface intersecting said first rebound trajectory and capable of rebounding said particles into a second rebound trajectory while absorbing residual kinetic energy therefrom;

means for sensing vibrations in said second surface arising from said absorbed energy and for generating a signal when the value of a distinguishing characteristic of said vibrations falls within a preselected range; and

means for converting said signal to an impulse directed toward said second rebound trajectory to deflect therefrom the particle giving rise to said signal.

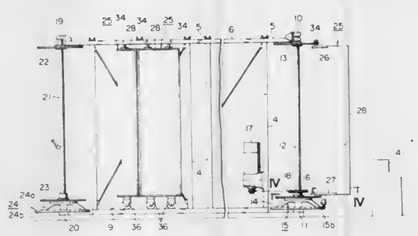
4,625,873
GARMENT RACK
Keiichiro Hayashi, 31 Carol Rd., Westfield, N.J. 07090
Filed Apr. 30, 1984, Ser. No. 605,193
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—119 **12 Claims**

1. A garment rack for the mounting and removal of apparel therefrom in a facile manner, comprising: a master frame for supproting said apparel, said master frame having a plurality of tiered sub-frame sections each supporting an individual apparel item, each of said sub-frame sections being movable from a generally flat, fold-down position to an open, access position wherein said apparel item can be easily accessed and separated from said sub-frame section, each of said sub-frame sections having a respective hanger rod member each being slidably movable substantially laterally across a corresponding sub-frame section from a generally secured apparel position at one



end of said sub-frame therefrom and the rack is of tubular construction.

4,625,874
ROTARY RACK STOCK
Masatoshi Abe, Yokohama, and Tatsuo Kaise, Yokosuka, both of Japan, assignors to Okamura Corporation, Japan
Filed Jul. 12, 1985, Ser. No. 754,391
Claims priority, application Japan, Jul. 16, 1984, 59-146114
Int. Cl.[4] A47F *5/02*
U.S. Cl. 211—122 **4 Claims**



1. A rotary stock rack, comprising:

a frame body comprised of an upper guide and a coextensive parallel lower roller guide disposed below the upper guide, the upper and the lower guides being shaped for defining two parallel linear portions, and two semicircular portions at the ends of said linear portions wherein said linear and said semicircular portions define an elliptical path;

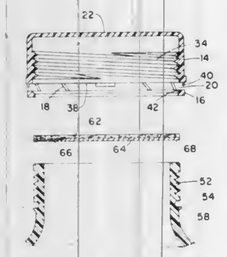
a plurality of racks extending between said upper guide and said lower guide, and arranged around said linear and said semicircular portions; connecting links connecting said racks to each other in an endless serial fashion;

a rotary cradle disposed adjacent each said semicircular portion for supporting said racks thereon at said semicircular portion and for enabling movement of said plurality of racks along said elliptical path;

each said rack having at least one roller which is disposed at said rotary cradle as said rack passes over said cradle for allowing said plurality of racks to travel along said semicircular portions of said elliptical path; and

means separate from said cradle for engaging said racks for moving them along said elliptical path.

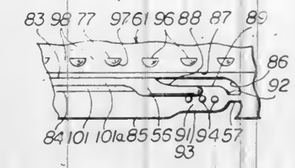
4,625,875
TAMPER-EVIDENT CLOSURE
Joseph J. Carr, 1503 Bel Aire Ct. West, Point Pleasant, N.J. 07842, and Thomas J. Angelini, 142 Imperial Ave., Pittsfield, Mass. 01201
Filed Feb. 4, 1985, Ser. No. 697,795
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—232 **18 Claims**



1. A tamper-evident closure for use in connection with a container including a threaded neck portion and an annular collar portion below said threaded neck portion which comprises:

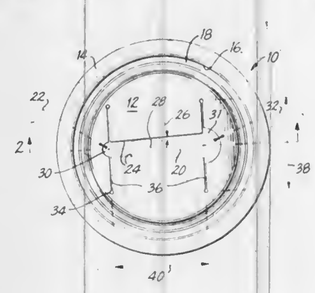
a one-piece closure body including an upper closure portion comprised of an end wall and a cylindrical side wall, said cylindrical side wall including an internally threaded upper portion, a depending lower skirt portion, and flexible arm members formed between said closure body and said lower skirt portion defining an opening therebetween, said internally threaded upper portion of said closure being formed of a triple thread type and cooperating with said threaded neck portion of said container, said threaded neck portion of said container being of a cooperating triple thread configuration to thereby permit axial positional alignment of said closure on said threaded neck portion of said container prior to positioning of said closure on said threaded neck portion of said container by a downward force on said closure, said upper closure portion being formed with intermediate wall portions depending downwardly into said opening in said spaced-apart relationship to said depending lower skirt portion, said depending lower skirt portion including an inwardly projecting bead adapted to engage said annular collar portion of said container when said closure is positioned in fluid tight relationship to said container, said intermediate wall portions contacting said depending lower skirt portion during downward movement and thus positioning said closure onto said threaded neck portion of said container to thereby cause said inwardly projecting bead of said depending lower skirt portion to engage said annular collar portion of said container, said flexible members permitting relative longitudinal contacting movement between said upper closure portion and said depending lower skirt portion during positioning of said closure on said container and being fracturable to thereby leave said depending lower skirt portion on said container after said upper closure portion of said closure is unthreaded from said container.

4,625,876
CAP AND NECK STRUCTURE FOR A WIDE MOUTH JAR
Joseph J. Bullock, III, Atherton, Calif., assignor to Cap Snap Co., Inc., San Jose, Calif.
Continuation of Ser. No. 515,275, Jul. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 397,550, Jul. 12, 1982, Pat. No. 4,438,857. This application Jan. 9, 1985, Ser. No. 689,859
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—256 **13 Claims**



1. A cap of the type having a central top disc, a thin-walled substantially cylindrical outer skirt of substantially uniform thickness depending from said disc, an upper internal circumferential bead on said outer skirt, a lower internal circumferantial bead on said outer skirt below said upper bead, a circumferential score line in said outer skirt above said lower bead, a portion of said outer skirt below said score line being cut away to form a pull tab extending in a direction parallel to said score line, whereby upon pulling said tab circumferentially, said outer skirt severs along said score line, said lower bead being removed as said tab is pulled, said portion of said outer skirt cut away comprising a straight section parallel to and immediately below said score line, the improvement which comprises a thickening along the upper edge of said tab, said thickening extending upward and merging with said lower bead.

4,625,877
BLOOD COLLECTION NEEDLE DISPOSAL SYSTEM
Louis Hoch, Nutley, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Nov. 7, 1985, Ser. No. 795,958
Int. Cl.[4] B65D *85/00*
U.S. Cl. 215—366 **8 Claims**



1. A closure device for closing the opening in a contaminated needle collection container and removing contaminated needle hubs from blood collection assemblies, characterized by

(a) a substantially flat thin closure body;

(b) attaching means along the edges of said body for the attachment to a contaminated needle collection container;

(c) an opening positioned substantially centrally of said body;

(d) said opening being elongated with a first end and a second end;

(e) said first end being of smaller width than said second end;

(f) the side walls of said elongated opening diverging from said first end to said second end; and

(g) a plurality of spaced-apart elongated slots extending from

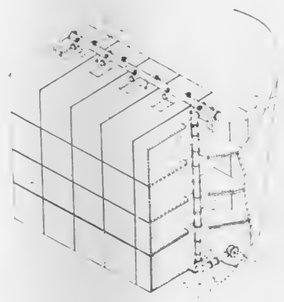
each side wall of said opening, said slots extending perpendicular to the longitudinal axis of said opening.

4,625,878

STRUCTURE OF CONTAINER POSSIBLE FOR BULK CARGO CARRIAGE IN ADDITION TO ORIGINAL UTILITY

Po-Chao Lee, 7F-2, No. 19, Alley 3, Lane 402, Yen-Shou St., Taipei, Taiwan

Filed Feb. 1, 1985, Ser. No. 697,102
Int. Cl.[4] B65D *88/00*
U.S. Cl. 220—1.5 **1 Claim**



1. An improved structure of a shipping container, the container having a top and a floor with structural supports therein, the improvement compriing a sliding door welded and connected to said top and a floor door connected to said floor at a position corresponding vertically to said sliding door, said sliding door including a joint seat formed as a frame of C-shaped members defining guiding rails at each side of said sliding door, said joint seat having a bottom surface open to an interior of said container and a top surface with an open portion and a covered portion, a sliding window member slidably mounted in said frame and movable between a first position completely closing said open portion and a second position opening said open portion, and means for fixing said window member in one of said first position and said second position; said floor door including a base frame having an open center and a check edge extending inwardly toward said open center with a rubber cushion thereon, and a door member hingedly connected to said base frame and sized to rest on said rubber cushion on said check edge when closed to completely seal said floor door, said door member having the same structural support as said structural support of said floor, a concave portion, and locking means in said concave portion; whereby with said sliding door and said floor door closed, said container is suitable for use as a general utility dry cargo container and with a plurality of containers stacked up one over another in layers and said sliding door and said floor door of each open, a through hole is provided from a top layer to a bottom layer for loading or discharging of bulk cargo.

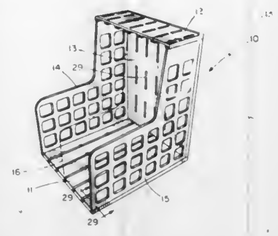
4,625,879

USER ASSEMBLED DESK TOP FILE

Clark W. Liu, 9 Deerpath Dr., Vernon Hills, Ill. 60061

Filed Oct. 31, 1985, Ser. No. 793,248
Int. Cl.[4] B65D *6/00, 6/12, 6/16*
U.S. Cl. 220—4 R **11 Claims**

1. A generally rectangular panel plastic container wherein the panels are molded separately and thereafter assembled together without the use of any tools, and wherein the container may be constructed to be positioned in a variety of orientations, comprising: first and second opposed parallel panels interconnected at one end by a third panel, first manually activated integral snap-locking devices interconnecting the first and third panels and the second and third panels, at least two integral parallel locking slots integrally formed in the first and second panels with the slots in the first panel being aligned with the slots in the second panel, fourth and fifth panels slidably positioned in the aligned slots in the first and



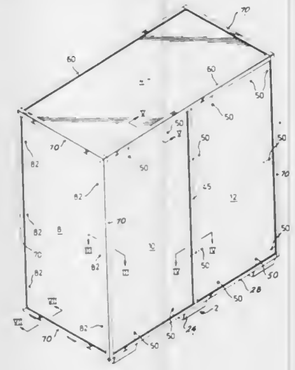
second panels and having locking slides slidable in the locking slots, and manually activated integral snap-locking devices interconnecting the fourth and third panels and the fifth and third panels.

4,625,880

CONTAINERS

Kenneth B. Pym, 1 Conway Avenue, Clitheroe, Lancashire, England

Filed Jul. 3, 1985, Ser. No. 751,381
Claims priority, application United Kingdom, Dec. 12, 1984, 8431372
Int. Cl.[4] B65D *7/24*
U.S. Cl. 220—4 F **11 Claims**



1. A strike down container having a width shorter than its length and consisting essentially of a base member, a top member, two opposing vertical end members, and two pairs of vertical side members, each pair of vertical side members comprising two sheets of material in a side-by-side, co-planar arrangement, said pair of vertical side members having an inner and outer surface forming, respectively, a portion of the interior wall and a portion of the exterior wall of the container, said container capable of being struck down whereby each vertical side member, vertical end member and top member may be stacked flat on top of the base member within and not extending outside the dimensions of the short and long sides of the base member, characterized by the provision of a coupling means for joining each of said pairs of vertical side members on each side of the container in said co-planar arrangement and in a weatherproof manner about the co-operating edges thereof, the long sides of each of said top and base members being provided with support members fastened thereto, said support members each providing vertically co-extending parallel first and second flanges set respectively adjacent the edges of the respective top or base member, said support members thereby

providing a vertical slot between said flanges along each of the long sides of said top and base members so as to receive therein a sealing strip and to receive and support therein the respective vertical side members, there being a plurality of latch means for providing releasable engagement between the support members and the co-operating vertical side members, said latch means, when engaged, exerting a joining force between said respective top or base member and the respective vertical side member, at least one corresponding short side of each of the top and base members being provided with support members fastened thereto, said support members each comprising an angle support strip having a horizontal flange which is fastened to the interior wall surface of the respective top or bottom member and a vertical flange positioned so as to have an outer face which is co-planar with the edge face of the respective top or bottom member on which the angle strip is mounted, the adjacent edges of the adjacent vertical side members being provided with similar angle strips fastened on their interior wall surface so as to have the outer face of a vertical flange co-planar with the edge face of the respective vertical side member on which said angle strip is mounted, and the co-operating end member being bounded on all four sides by angle support strips each having a first flange fastened to the exterior wall surface of said end member and a second flange perpendicular thereto having an interior surface which is adjacent to the respective edge faces of said end member and adjacent to the respective exterior wall surface of the top member, bottom member or vertical side members, there being sealing strips placed adjacent the edges of the last said end member so as to be between its interior wall surface and the edge face of the co-operating top member, bottom member and vertical side members and also the outer face of the flanges of the angle support strips mounted thereon, said end panel being provided along all its four sides with clamping means which are accessible for adjustment outside the container and which have adjustable abutment members which may be moved from non-interfering positions to permit removal of the end panel from the container to positions in which they engage with the angle support strips of said respective top member, bottom member and vertical side members by engagement with the inwardly facing surfaces of said flanges having vertical outwardly facing surfaces which are co-planar with the edge face of the respective top member, bottom member or vertical side member on which said angle support strips are respectively mounted, said adjustable abutment members, when engaged, providing a joining force between the end member and said flanges with which they engage.

4,625,881

PRESSURIZED TANK HAVING RESILIENT SUPPORT

Franklin J. Carlson, 1081 Wisconsin Ave., Okauchee, Wis. 53029

Filed Sep. 18, 1985, Ser. No. 777,190
Int. Cl.[4] F17C *13/08*
U.S. Cl. 220—69 **10 Claims**



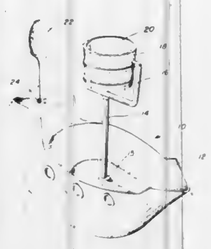
1. A tank construction, comprising a metal tank to contain a pressurized fluid and having a dome-shaped head, a first ring secured to the head, a second ring disposed radially outward of said first ring and disposed in engagement with said head, said second ring being connected directly to said first ring and being free of direct attachment to said head, the inner peripheral portion of the second ring overlapping said first ring, said second ring being secured to the outer surface of the first ring, and a resilient annular skirt secured to the second ring and projecting in an axial direction beyond said head.

4,625,882

TOY-LIKE CEREAL SERVING APPARATUS

Mark Sullivan, Box 182A, Rte. 1, East New Market, Md. 21631

Filed Jan. 15, 1985, Ser. No. 691,559
Int. Cl.[4] A47G *19/02, 19/06*
U.S. Cl. 220—23.83 **1 Claim**



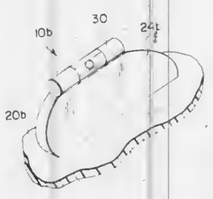
1. A toy-like apparatus for serving food comprising:
(a) a boat-shaped bowl resembling the shape of the hull of a sailing ship for containing said food;
(b) a support resembling a mast of the sailing ship extending upwardly from the bowl;
(c) a container for ingredients to be added to the food in the container pivotally mounted on the top of said support, said container resembling a crow's nest of the sailing ship; and
(d) a spoon removably mounted on a tail end of said bowl in such a position that it resembles the rudder of the sailing ship.

4,625,883

FLOATING LID FOR PAINT CANS

Joseph J. Burke, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jan. 22, 1985, Ser. No. 693,527
Int. Cl.[4] B65D *25/10*
U.S. Cl. 220—93 **1 Claim**



1. A floating cover for a can of paint, said can including a gutter and a lid, said cover comprising:
(a) a substantially flat circular disc of a thin, flexible, bouyant impervious to air material, said disc being of a diameter to fit closely inside said can on surface of said paint; and
(b) an upwardly extending handle affixed to center of said disc for removing said disc from said can and inserting said disc therein, further comprising a level vial affixed to said handle so that said disc can be positioned level on said surface of said paint eliminating dead air space therebetween.

4,625,884

JUG, MORE PARTICULARLY INSULATING JUG

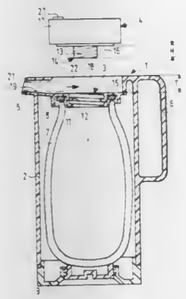
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niedelfaula, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,870

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 8400247[U]

Int. Cl.⁴ B67D *5/60;* **A47J** *41/00;* **B65D** *47/00, 5/72*

U.S. Cl. 222—131 **7 Claims**



1. An insulating jug comprising a protective housing having an injection molded construction of synthetic material and an insulating container inserted therein, said insulating container being held between a floor member and a shoulder in an upper region of said protective housing, an opening of the insulating jug being arranged in said shoulder, an open annular recessed area being formed above said opening and shoulder in said protective housing, said open annular recessed area being dimensioned larger than said opening and adapted to receive a lid for attachment by complementary threads provided on said lid and on said shoulder of the protective housing, and a laterally projecting spout commencing at said open annular recessed area, and characterized in that said spout is of pipe-shaped cross-section and is conically enlarged inwardly, said spout being integrally formed with said injection molded-construction, synthetic-material protective housing, and an annular flange is arranged at an inner edge of said shoulder and projecting into the opening of the insulating container and having one of said complementary threads formed as an internal thread thereon, and said lid has on a lower side a projection having the other of said complementary threads formed as an external thread thereon for engagement with the internal thread of said annular flange, said lid having a shoulder above said projection with a sealing surface that cooperates with an upper surface of said annular flange of said shoulder, so that in a first lid position said sealing surface of said lid and said upper surface form a seal and in a second lid position axially spaced apart from said first position and having said threads engaged, said sealing surface is spaced apart from said upper surface, whereby liquid can be poured from said container.

4,625,885

CONTROLLED-RELEASE SECURITY BAND FOR STERILIZATION CONTAINER

Robert L. Nichols, 808 Fort Worth, Jacksonville, Tex. 75766

Filed Mar. 20, 1986, Ser. No. 842,113

Int. Cl.⁴ B65D *53/00, 55/02*

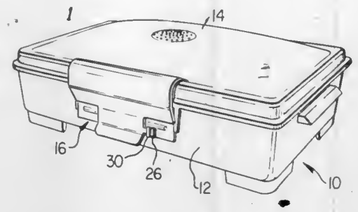
U.S. Cl. 220—214 **9 Claims**

1. A security system for a sterilization container, comprising:

a first member and a second member associated with the container, said first member positioned adjacent to said second member when said container is closed, said second member moved to a position spaced from said first member when said container is open;

a non-stick surface on said first member formed at least on an area remote from said second member when said first and second members are adjacent;

a band for being placed around portions of said first and second members while they are adjacent, said band



shrinking during a sterilization treatment of said container to bind said first member to said second member;

said band releasing from said first member when said second member is moved to said position spaced from said first member.

4,625,886

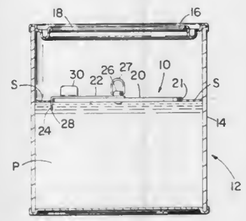
LIQUID SURFACE SEALING DEVICE

Nancy K. Eisenman, 34 Lincoln La., Simsbury, Conn. 06070

Filed Feb. 3, 1986, Ser. No. 825,217

Int. Cl.⁴ B65D *88/34*

U.S. Cl. 220—216 **11 Claims**



1. A device for sealing the surface of a liquid stored within container, the liquid having a tendency to surface hardened upon exposure to atmosphere to form a skin, said device comprising sealing means for floating on the surface of the liquid in closely spaced relation to the inner surface of the container sidewalls and including a substantially flat sealing member of relatively rigid sheet material having a peripheral shape substantially complimenting the peripheral shape of the associated inner surface of the container sidewalls, and means for cutting skin formed on a portion of the surface of the liquid between the peripheral edge of the sealing member and the associated inner surface of the container sidewalls and including a cutting element supported on the upper surface of the sealing member and having a blade portion including a cutting edge proximate the peripheral edge of the sealing member, and means for connecting the cutting element to the sealing member to move with its cutting edge travelling in a path generally defined by the peripheral edge of the sealing member and in cutting engagement with the skin.

4,625,887

WATER-SEALED TYPE POT COMPRISING STEAM ESCAPE VALVE MEMBER

Motohiko Ito, Chiba, Japan, assignor to Taiyo Altight Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 799,988

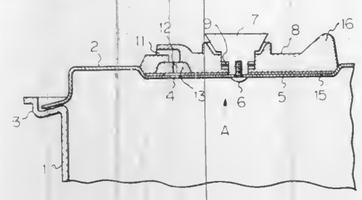
Int. Cl.⁴ B65D *51/16*

U.S. Cl. 220—231 **4 Claims**

1. A water-sealed type pot which is arranged such that water is retained between a flange portion at the upper portion of a pot body and a lid thereof, said lid being provided with a hole through which steam is jetted out, the pot comprising:

a valve seat formed at the periphery of said hole; and

a valve member slidably provided on said valve seat in such a manner that it may be changed over between a position wherein said hole is closed and a position wherein said hole is opened,



said valve member being pressed against said valve seat by the action of a spring;

and at least one of the slide surfaces of said valve member and of said valve seat being formed of polytetrafluoroethylene.

4,625,888

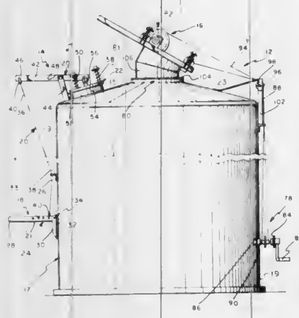
GROUND ACTUATED LID OPERATING SYSTEM

Andy L. Thompson, R.R. 1, Courtland, Kans. 66939

Filed Nov. 18, 1985, Ser. No. 799,139

Int. Cl.⁴ B65D *43/26*

U.S. Cl. 220—262 **11 Claims**



1. A ground actuated lid operating system connected to a upright silo structure operable to be connected to access openings thereto, comprising:

(a) a pressure release lid apparatus including a lid actuator assembly secured to a side wall of the silo structure; a pressure lid assembly secured to an upper portion of the silo structure; and a lid linkage assembly connected to the silo structure and operably connected to the pressure lid assembly;

(b) said lid actuator assembly includes a lock handle assembly connected to a cable connector assembly and to a cable member to open and close a portion of said pressure lid assembly; and

(c) said pressure lid assembly including a pressure lid member mounted about one of the access openings into the silo structure and having a lid biasing member to bias said pressure lid member to a closed condition;

whereby said lid actuator assembly is operable through said cable member to open and close said pressure lid member to allow pressure within the silo structure to escape therefrom and being biased into a closed condition by said lid biasing member.

4,625,889

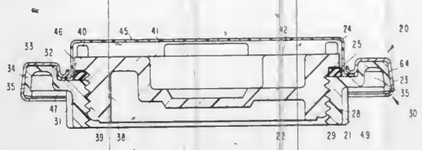
REPLACEABLE, CRIMP-ON, THREADED CLOSURE FOR PLASTIC CONTAINER

Gary M. Baughman, Auburn, Ind., assignor to Rieke Corporation, Auburn, Ind.

Filed Oct. 21, 1985, Ser. No. 789,510

Int. Cl.⁴ B65D *17/00*

U.S. Cl. 220—288 **11 Claims**



1. In combination:

a synthetic material drum having a drum end molded with at least one internally splined, raised annular boss; and

a pipe thread closure comprising:

an externally splined flange member of synthetic material and unitary construction and having internal threading and an outwardly-radiating lip defining a downwardly opening annular channel suitably designed and arranged to receive said raised annular boss;

an annular metal retaining ring defining a downwardly opening annular channel shaped to conform to the outer surface of said outwardly-radiating lip and overlying and engaging said lip above, inwardly and outwardly of said raised annular boss;

a unitary, synthetic material closure plug having a series of external threads which are designed and arranged for engagement with said internal threading.

4,625,890

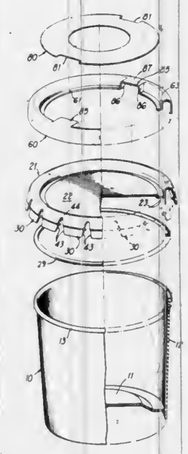
SAFETY CLOSURE FOR OPEN HEAD CONTAINERS

Herbert W. Galer, 24 Woodland Trail, Newnan, Ga. 30264

Filed Oct. 9, 1985, Ser. No. 785,783

Int. Cl.⁴ B65D *45/32*

U.S. Cl. 220—319 **10 Claims**



1. A closure assembly of the type having a container with a removable lid, said container having a sidewall and being substantially cylindrical and open at its top portion, said container having a chime carried by said wall and circumscribing said top portion, said chime protruding radially outwardly of the wall of said container and having a shoulder along its bottom portion, wherein the improvement comprises a remov-

able plastic cap assembly for closing said open top, said cap assembly including:

(a) a removable plastic cap having (i) a central web for extending over said open top portion of said container when said cap is placed on said container, said web having a substantially circular periphery, (ii) a sealing ring fixed to said periphery of said web, said sealing ring being downwardly opening and having an annular top portion for extending over the rim of said chime when said cap closes the top portion of said container, and (iii) a plurality of lugs carried by the outer portion of said top portion, said lugs being circumferentially spaced around the periphery of said top portion of said cap for extending around said chime, each of said lugs having an inwardly protruding flange for protruding beneath a portion of said chime when said cap closes said container and said lug is moved inwardly toward said container, said lugs normally extending downwardly and outwardly from said top portion of said cap; and

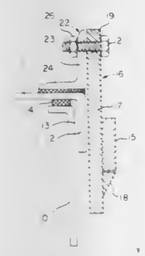
(b) locking ring for extending over said top portion of said sealing ring, said locking ring opening downwardly and having an inwardly extending lip for engaging beneath a portion of said sealing ring when said sealing ring is disposed beneath a portion of said locking ring, said lugs having portions which protrude downwardly between said lip of said locking ring and said wall of said container and terminating below said locking ring.

4,625,891

CONTAINER LID LOCK

Gerald C. Lilly, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Dec. 20, 1985, Ser. No. 811,353
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—327 **8 Claims**



1. An assembly for securing a lid upon a disposable waste container comprising;

(a) a retaining bracket mounted on the exposed wall surfaces of the waste container adjacent to the open top thereof,

(b) an elongated latch piece having a first depending portion insertable within said bracket and extending in facial abutment with the adjacent side wall of the container,

(c) said latch piece providing a second portion extending vertically above the open top edge of the container to a point above the lid when it is placed on the container,

(d) a latching brace attached to said second portion of said latch piece and in contact with the lid when the same is placed in a closing position upon the container for latching the lid in place, and

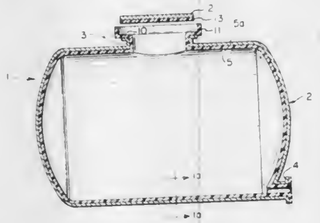
(e) means carried by said first portion of said latch piece providing an interlock between said latch piece and said retaining bracket for securing said latch piece within said retaining bracket when the lid is placed upon the open top of the waste container and held thereon by said brace.

4,625,892

POLYOLEFIN TANK WITHIN A METALLIC TANK

Hervin A. Carlin, Jr., Lake Charles, La., assignor to Poly Processing Company, Inc., Monroe and Industrial Equipment & Engineering, Inc., Lake Charles, both of, La.

Continuation-in-part of Ser. No. 532,010, Sep. 14, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,418
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—465 **2 Claims**



1. A heavy walled polyolefin tank within a metallic tank comprising, a metallic tank having continuous side and end walls, a flanged manway fitting and a flanged outlet fitting connected to said metallic tank, each fitting including a neck portion integrally connected to said metallic tank wall and a flange integrally connected to the free end of said neck portion, said flange having a planar outer surface, the walls of said polyolefin tank being continuous and in proximity to and spaced from the walls of said metallic tank, whereby the polyolefin tank and metallic tank are free to expand and contract independently of each other to thereby preclude damage to the tank through thermal expansion and contraction, said polyolefin tank having polyolefin flanged fittings corresponding to the metallic tank flanged fittings, said polyolefin extending through the necks of the metallic tank fittings and engaging and covering the entire planar outer flanged surfaces thereof, the engagement between the tanks being only in the region of the flanges, the polyolefin on the flange of the manway fitting extending outwardly therefrom to form a cup-shaped projection to prevent spillage of liquids on the outer surface of the outer tank when filling the inner tank, and polyolefin coated closures for said fittings, said closures adapted to engage the polyolefin flanges, whereby the inner tank flanges may be sealed between the flanges of the metallic tank fittings, thereby assuring the integrity of product containment entirely within the polyolefin tank.

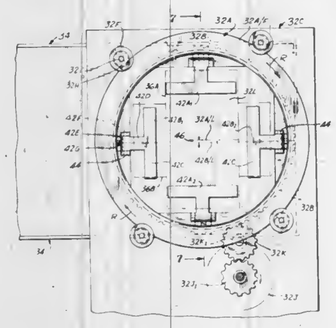
4,625,893

STAMP BOOKLET DISPENSER MECHANISM

Eli Reiter, Dix Hills; Joseph R. Robson, Smithtown, and Joseph W. Latinski, Commack, all of N.Y., assignors to General Aero Products Corp., Copiague, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,198
Int. Cl.[4] G07F *11/04*
U.S. Cl. 221—67 **10 Claims**

1. Apparatus for dispensing at least two articles of a predetermined configuration and arranged in a criss-cross stack, comprising a storage magazine for receiving said articles in the form of said stack, delivery means for furnishing selectively dispensed ones of said articles from said magazine on demand in response to an input command, receiving means for allowing said selectively dispensed articles to be removed from said apparatus, gate means for alternately blocking and opening access to said delivery means for said stack, dispensing control means for governing the operation of said gate means through at least opened and closed cycles, and locating means for effecting said opening of said gate means in response to said dispenser control means in a preferred sequence to cause one of said articles to be furnished to said delivery means in a predetermined orientation, wherein said gate means includes a plurality of pivotable members adapted for controlled movement relative to said delivery means, said pivotable members being operable in opposed pairs, said articles in said stack being supported by cooperating ones of said pivotable members in accordance with said predetermined configuration of said articles, said dispenser control means including means for positioning said pivotable members to support or release said articles in said closed or said opened cycles respectively, said articles in said stack including one group in a first position and another group in a second position, said one group being disposed in longitudinal alignment with said receiving means and said another group being disposed in transverse alignment with said receiving means, and said dispenser control means includes a control cam for governing the sequential movement of said pivotable members of said gate means, said locating means including portions of said gate means and of said dispenser



control means to effect said delivery of said one of said articles in said predetermined orientation, wherein said control cam has a central axis and said gate means has a central axis between each opposed pair of said pivotable members, said locating means including an offset gap between said central axes of said control cam and said gate means, said control cam being substantially circular in configuration and including a plurality of lobe and dwell segments corresponding to said opened and close cycles respectively, and said pivotable members of said gate means including at least a crossbar portion to support said articles during alternate ones of said opened cycles and during said closed cycles, and a projecting follower portion in contact with said lobe segments to cause said gate means to open for the dispensing of selected ones of said articles and in contact with said dwell segments to cause said gate means to close to prevent the dispensing of said articles.

4,625,894

NEWSPAPER VENDING MACHINE

Harold K. James, 510 N. Main St., Space 3, and Joseph L. McNeese, 555 Moffat Blvd., Space 53, both of Manteca, Calif. 95336

Filed Nov. 21, 1983, Ser. No. 553,680
Int. Cl.[4] B65H *3/28*
U.S. Cl. 221—193 **10 Claims**



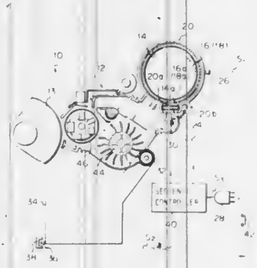
1. A newspaper vending machine comprising a frame including an enclosure; means defining a dispensing opening in one wall of said enclosure; a bottom plate on said frame inclined downwardly toward said opening for supporting a plurality of folded, rectangular newspapers disposed substantially upright adjacent to each other and with the folds thereof resting on said bottom plate; a transverse barrier upstanding from said bottom plate adjacent said opening; cam means adjacent said barrier on the side thereof opposite said opening for engaging and lifting that one of the plurality of newspapers as is nearest said barrier and for separating the one engaged newspaper from the remainder of the plurality of newspapers, said cam means having a circumferential, part toroidal groove for supporting and moving the one engaged newspaper and a fin portion adjacent said groove for intrusion between the one engaged newspaper and an adjacent newspaper; and means mounting said cam means for rotation about an axis accentric to said groove and said fin portion for engaging said cam means against the fold of the one newspaper to lift said newspaper above said barrier and to urge said lifted newspaper over said barrier and into said dispensing opening while blocking the adjacent newspaper from movement toward said barrier.

4,625,895

DRY-PROCESS DEVELOPER REPLACING AND SUPPLYING DEVICE FOR ELECTROPHOTOGRAPHIC RECORDING APPARATUS

Moriyoshi Tsukano, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,888
Claims priority, application Japan, Jan. 20, 1984, 59-6089[U]; Jan. 20, 1984, 59-6090[U]
Int. Cl.[4] G03G *15/08;* B65B *1/06*
U.S. Cl. 222—63 **11 Claims**



1. A developer replacing and supplying device for use with a developing unit of a type using a dual composition developer which is made up of toner and carrier, comprising:

developer discharge means for discharging a used developer from a developing unit and which includes a bottle placed in a predetermined position adjacent said developing unit and in communication with a developer output for collecting the discharged developer;

carrier supply means for supplying fresh carrier to the developing unit;

toner suppy means for supplying fresh toner to the developing unit;

support means for selectively and rotatably supporting said carrier supply means and toner supply means, said support means having a slot formed therein;

interceptor means for selectively intercepting the supply from one of the toner supply means and the carrier supply means which is supported by said support means; and

control means for controlling the developer discharge means, the support means and the interceptor means such that the developer discharge means discharges the used developer from the developing unit and such that the interceptor means subsequently discontinues interception of the supply of the toner or the carrier to the developing unit wherein the control means further comprises a shutter

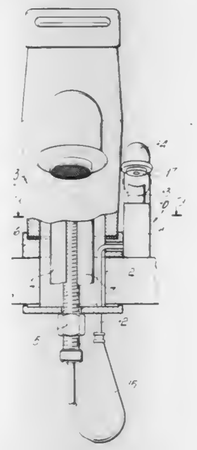
for opening and closing said slot of said support means so as to communicate and to discontinue communication of an interior of at least one of said supply means to and from an interior portion of the developing unit, a supply means sensor for identifying said carrier supply means or said toner supply means, and a bottle sensor in the developing unit and wherein said interceptor means discontinues interception of the supply from either of said supply means and said discharge means discontinues discharge of said used developer upon said sensors detecting the absence of either of said supply means and/or said bottle.

4,625,896

DEVICE FOR DISPENSING LIQUID SOAP

Gianpaolo Rocchelli, Via Leonardo da Vinci 38, Brescia, Italy

Filed Feb. 7, 1985, Ser. No. 699,371
Claims priority, application Italy, Feb. 17, 1984, 6925/84[U]
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—180 **9 Claims**



1. A device for dispensing liquid soap affixable to a water delivery unit such as a mixer tap, a tap outlet and similar tap which delivers water to wash basins or sinks, comprising at least one delivery conduit for liquid soap, said delivery conduit having affixed thereto a substantially part-annular collar which is insertable in a location between a water delivery unit body base and a water delivery unit support plane, the collar being held in said location by water delivery unit fixing means, wherein the device further comprises pumping means communicating with an inlet conduit connected to said delivery conduit and extending radially through said collar, said inlet conduit having a portion extending parallel to water delivery unit riser pipe, one end of said inlet conduit being locatable in a reservoir of liquid soap.

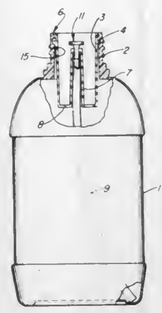
4,625,897

METERING DISPENSERS

Michael Wortley, Portsmouth, England, assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Sep. 21, 1984, Ser. No. 652,904
Int. Cl.[4] G01F *11/26*
U.S. Cl. 222—205 **7 Claims**

1. A metering dispensing container assembly comprising a hand-held squeezable container and an upwardly open cup mounted in and having its side wall sealed to the neck of the container, the cup having extending through its bottom wall a dip tube assembly extending substantially to the bottom of the interior of the container, the upper end of the dip tube assembly being open to atmosphere at a point above the bottom of the cup but below the level of the open top of the cup, and the cup having an air vent in its side wall below the seal to the



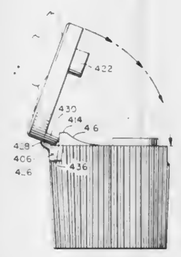
container neck providing communication, between the interior of the container and atmosphere.

4,625,898

DISPENSING CLOSURE EMPLOYING LIVING HINGE WITH CAMS TO MOMENTARILY DEFORM HINGE AND RECESSES TO ACCEPT CAMS

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Sep. 11, 1984, Ser. No. 649,290
Int. Cl.[4] B65D *47/00*
U.S. Cl. 222—517 **6 Claims**



1. An integrally molded, unitary, plastic dispensing closure comprising:
(a) a closure body of substantially cylindrical shape adapted to be secured to a container,
(I) said closure body comprising a top surface extending across one end of said closure body,
(II) said top surface having a dispensing opening extending therethrough,
(III) a wall segment sloping downwardly below said top surface and a wall extending parallel to said top surface,
(IV) said wall segment and said wall extending parallel to said top surface defining a cavity extending below said top surface,
(V) a first post and a second post projecting upwardly from said top surface at points remote from said dispensing opening,
(b) a lid,
(I) said lid comprising an unbroken, continuous planar top and a shallow annular skirt,
(II) a plug depending below said planar top,
(III) a first lug and a second lug depending from said planar top and extending below said annular skirt,
(IV) said lugs contacting said posts when said lid is in its opened position,

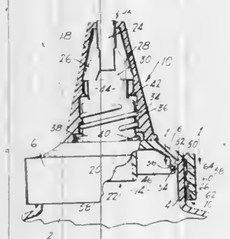
(V) a holder located below said planar top and between said first and second lugs,
(VI) said skirt having at least one recess defined at one side of said holder, said skirt also having at least one recess defined at the opposite side of said holder,
(c) a thin flexible hinge,
(I) said hinge being joined to said holder on the skirt of said lid along a first pivot line,
(II) said hinge being joined to said closure body along a second pivot line,
(III) said hinge urging said lid to a stable position,
(d) said lid being pivoted between opened and closed positions while the lugs function as cams to facilitate the temporary deformation of said hinge while passing between its opened and closed positions,
(e) said sealing plug being seated within said discharge opening when said lid is in its closed position,
(f) said lugs on said lid fitting into said cavity in said top surface, and
(g) said posts fitting into recesses on said annular skirt of said lid so that said skirt contacts the upper surface of said closure body.

4,625,899

HAND-HELD DISPENSER WITH AUTOMATIC VENTING

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed Feb. 7, 1985, Ser. No. 699,306
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—521 **8 Claims**



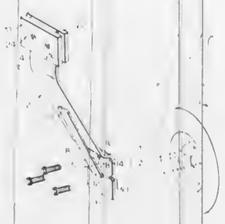
3. A hand-held dispenser for a flowable product, comprising in combination:
(a) a container for said product, having a neck portion at its top,
(b) a cap body having a discharge opening, and having a base portion cooperable with the neck portion of the container to mount the cap body thereon,
(c) said base portion and neck portion having cooperable, automatic pressure-relief valving means responsive to increased gas pressure in the container, for venting a quantity of said gas when the container is in its upright position, and
(d) cooperable means on the container neck portion and cap body base portion, for enabling limited axial movement of the latter on the neck portion, said means also effecting a permanent retention of the base portion against complete removal from the said neck portion and providing for free passage of vented gas therebetween,
(e) said valving means comprising an annular sealing surface on one of said portions, and a cooperable annular sealing surface on the other of said portions, engageable with the sealing surface on said one portion when the cap body is fully seated on the container neck portion, and
(f) means defining a recess disposed in one of said portions adjacent the sealing surface thereof, said recess underlying the cooperable sealing surface on the other of said portions when the cap body is raised axially from the said fully seated position on the container neck portion, such that the seal between the said portions is broken, thereby enabling said venting to occur.

4,625,900

OUTBOARD MOTOR MOUNTS FOR VEHICLES

Darryl Lawson, 185 Ferguson St., Fallon, Nev. 89406

Filed May 30, 1984, Ser. No. 615,462
Int. Cl.[4] B60R *9/08*
U.S. Cl. 224—42.07 **2 Claims**



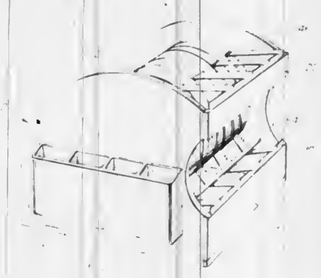
1. An outboard motor mount for attachment to a vehicle bumper and not otherwise supported by the vehicle body, comprising:
(a) a rectangular unitary metal plate having a first end, a second end, a front side facing away from said vehicle body and a rear side;
(b) means for supporting an outboard motor on said first end;
(c) means on said second end for attachment to said bumper;
(d) two bends in said metal plate facilitating said ends being spaced apart and substantially parallel to one another;
(e) a straight intermediate portion of said metal plate extending between said bends;
(f) a metal brace unitary with said metal plate on said front side extending from said intermediate portion to said second end without support of said vehicle body other than said brace;
(g) said brace welded at said intermediate portion and bolted at said second end; and
(h) said means on said second end comprising bolt holes in said second end, a rectangular back plate having corresponding bolt holes therein and bolts extending from said second end to said back plate.

4,625,901

MULTI-BLADE TAPE DISPENSER

Nicholas J. Adelizi, 12402 Patricia Dr., Cerritos, Calif. 90701

Filed Oct. 4, 1985, Ser. No. 784,039
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—1 **23 Claims**



22. A method of dispensing a plurality of pressure sensitive tapes from a tape core comprising:
providing a tape dispenser having a housing and a hollow base filled with a high density material, with two sides

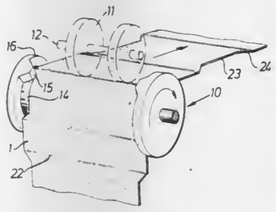
securely fastened to said base, said sides being perpendicular to said base;
providing a first and second member spaced apart and securely fastened to the edge of each of said sides, said support member being perpendicular to each of said sides and extending from the outer edge of one side to the outer edge of the other side, said first support member being on the upper portion of said housing and said second support member being on the lower portion of said housing;
providing a removable blade on the top edge of each support member with each of said blades in a verticle position with the cutting edge on top;
providing a rotating circular guide bar located within said housing opposite the lower support member, whereby the back of said pressure adhesive tape will bear against said circular guide bar;
providing a cylindrical core whose diameter is less than the internal diameter of the tape roll;
providing an instrument and tape holder on the back of said tape dispenser and a drawing instrument holder on the side of said tape dispenser;
sliding said pressure sensitive tapes on said cylindrical core;
providing a groove on the inside portion of said sides, said groove having a width slightly larger than the diameter of said core, said groove being formed in a downward and forward direction
starting at the upper-back portion of said sides and terminating approximately midway on the internal portion of said sides;
sliding said core containing said pressure sensitive tapes in said groove until said core reaches the bottom of said groove;
guiding said tapes alternately to the top of said blade on said first support member whereby said tape is cut to a desired length;
guiding the remaining tapes under said guide bar to the top of said second support member whereby said tape is cut to the desired length.

4,625,902

METHOD AND ARRANGEMENT FOR THE FEEDING OF A MATERIAL WEB

Alf Billberg, Oxie, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 575,765, Feb. 1, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,510
Claims priority, application Sweden, Feb. 10, 1983, 8300706
Int. Cl.[4] B65H *20/04, 20/22, 23/16*
U.S. Cl. 226—2 **3 Claims**



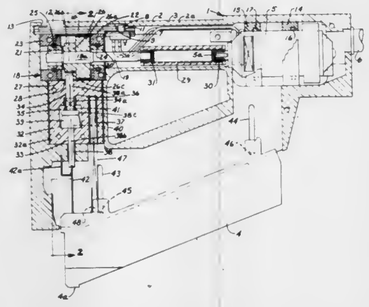
1. A system for severing packaging blanks of a predetermined length from a continuous web having longitudinal borders, a maximum width and recesses at uniform intervals along each longitudinal border, said uniform intervals corresponding with said predetermined length, said system comprising:
means for cyclically cutting the continuous web to separate packaging blanks from said continuous web;
tension roller means for applying tension in said continuous web;
a rotatable drive cylinder between said cutting means and said tension roller means, said drive cylinder being spaced from said cutting means and having a driving surface of a circumferential length greater than said predetermined length, a pair of radial flanges at opposite ends of said driving surface and longitudinally spaced apart according to said maximum width and a pair of longitudinally spaced lugs projecting radially outwardly from said driving surface at circumferentially fixed locations adjacent each flange, said lugs being shaped so as to be initially received with circumferential clearance by said recesses of continuous web guided onto said driving surface, said pair of lugs being positioned relative to said driving surface to define at a rotational position of said drive cylinder a feed length corresponding with said predetermined length;
means for rotating said drive cylinder continuously at a substantially constant speed;
means for guiding the continuous web onto said drive cylinder;
compression roller means for pressing the continuous web into engagement with said driving surface at said drive cylinder rotates so that said drive cylinder feeds to said cyclical cutting means an initial length of the continuous web greater than said predetermined length; and
means for cyclically disengaging said compression roller means as said drive cylinder rotates, said cyclically disengaging means including bevelled areas on said drive cylinder, said bevelled areas being adapted to periodically relieve the engagement of the continuous web with the driving surface so that said lugs are moved by the drive cylinder relative to the continuous web into registration with edges of a pair of said recesses as said drive cylinder moves into said rotational position, whereby the position at which the web is cut is accurately controlled relative to the web recess.

4,625,903

MULTIPLE IMPACT FASTENER DRIVING TOOL

Carl T. Becht, Cincinnati, Ohio, assignor to Sencorp, Cincinnati, Ohio

Filed Jul. 3, 1984, Ser. No. 627,428
Int. Cl.[4] B25C *1/06, 5/15*
U.S. Cl. 227—131 **19 Claims**



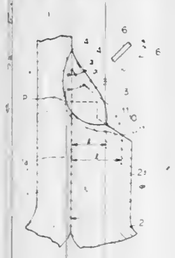
1. A fastener driving tool for driving a fastener into a workpiece, said tool comprising a shaft rotatable about its axis, a prime mover to impart rotary motion to said shaft, a fastener driver in association with said tool and means to translate said rotary motion of said shaft into reciprocating motion of said driver, constituting a series of short, high-velocity strokes in rapid succession, by imparting discrete blows to said driver in rapid succession, said translation means comprising an impact member non-rotatively mounted with respect to said shaft and having at least one impacting surface thereon, an energy transfer member having a first end adapted to cooperate with said at least one impacting surface of said impact member and a second end adapted to cooperate with said driver, said energy transfer member being shiftable between a first position wherein said first end is spaced from said at least one impacting surface of said impact member, and a second position wherein said first end is impacted by said at least one impacting surface of said impact member in raid succession, a means to normally bias said energy transfer member to said first position, and a resilient energy absorbing member disposed to arrest said energy transfer member at the termination of each of said short, high-velocity strokes.

4,625,904

STRUCTURE OF DISC WHEEL

Hitoshi Matsui, and Fumiaki Kawahata, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 541,251, Oct. 12, 1983, abandoned. This application Nov. 27, 1985, Ser. No. 802,087
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—168 **1 Claim**



1. A method for forming a disc wheel, comprising the steps of:
locating an inner surface of an annular rim against an outer surface of an angled portion of a disc, an edge surface of said angled portion being provided with a generally flat surface perpendicular to the inner surface of the rim for forming a corner therebetween, and an inclined surface located between the generally flat surface and an inner face of the angled portion, the inclined surface being inclined radially inward away from said rim;
focusing a welding electrode at the corner between the inner surface of the rim and the generally flat surface of the angled portion; and
securing the rim to the disc by welding in the area between the edge surface of the angled portion and the inner surface of the rim, the step of securing including locating a radially innermost contact point of the welding on the inclined surface of the edge surface.

4,625,905

HINGED COVER CARTON

Raj K. Mangla, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 630,164, Jul. 12, 1984, abandoned, and a continuation-in-part of Ser. No. 481,512, Apr. 1, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,088
Int. Cl.[4] B65D *1/24*
U.S. Cl. 229—2.5 EC **34 Claims**

1. A carton moulded from a sheet of plastic resin material by thermoforming and comprising:
(i) a bottom section having cells for receiving articles to be packaged,
(ii) a cover formed integrally with the bottom section and having a top, a front wall, side walls and back wall which is resiliently hinged at its lower edge to the rear edge of the bottom section,
(iii) the front wall of the cover having a plurality of inwardly extending locking flutes,
(iv) each locking flute having a locking aperture formed in it,
(v) the outermost wall of said cells extending upwardly and terminating at a top edge of said bottom section, the regions between at least some of said cells forming a recess with top of each recess being locking extensions corresponding to each locking aperture, each locking extension extending from the rear of a recess forwards to said top



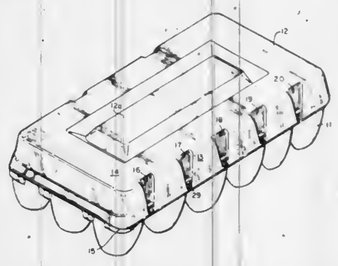
front edge, each locking extension engaging with the lower edge of the corresponding locking aperture when the cover is in the closed position.

4,625,906

EIGHTEEN CELL HINGED-COVER CARBON THERMOFORMED FROM PLASTIC SHEET

Raj K. Mangla, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 481,512, Apr. 1, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,715
Int. Cl.[4] B65D *85/32*
U.S. Cl. 229—45 EC **6 Claims**



1. A carton for the packaging of eggs and the like thermoformed by male and female dies from a polystyrene foam plastic sheet having a sheet line comprising:
a cell section formed from said plastic sheet to define a plurality of cells extending from the sheet line in one direction for reception of packaged articles and of a depth such that said articles are enclosed thereby for a portion less than their vertical dimension as packaged;
a fixed integral cell section extension located above the sheet line and stretched in an opposite direction from said one direction;
a dished cover resiliently hinged to the rear edge of said cell section, said cover being formed from said plastic sheet to define a front wall, a back wall, and end walls extending in said one direction from said sheet line and fixed to each other and to a top for said cover;
a plurality of flutes in said front wall of said cover each having an offset surface which is inwardly offset with respect to said front wall and a hole in said offset surface;
said extension being continuous along the front wall and having spaced horizontal latching elements located at a terminal end of said extension, each latching element being complementary to one of said flutes in said front wall, each latching element projecting outwardly through a complementary one of the holes in the inwardly offset surface of said cover and within the confines of said flute to latch said carton in the closed position.

4,625,907

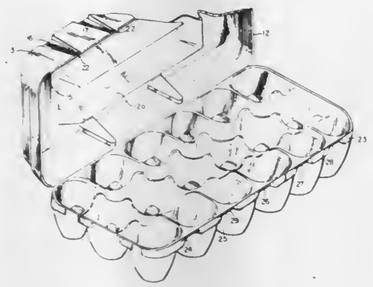
THERMOFORMING EIGHTEEN-CELL HINGED COVER CARTON FROM PLASTIC SHEET

Raj K. Mangla, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 481,512, Apr. 1, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,849

Int. Cl.[4] B65D *43/22;* **B29C** *51/08. 51/32. 55/02*

U.S. Cl. 229—45 EC **6 Claims**



1. A process for the production of a thermoformed thermoplastic carton comprising:

providing a relatively flat oriented sheet of polystyrene foam having a sheet line;

preheating said sheet to at least its forming temperature;

thermoforming said preheated sheet by bringing together a male mold member and a female mold member to form said carton by:

forming a cell section from said plastic sheet to define a plurality of cells extending from the sheet line in one direction;

forming a dished cover resiliently hinged to the rear edge of said cell section, said cover being formed from said plastic sheet to define a front wall, a back wall, and end walls extending in said one direction from said sheet line and fixed to each other and to a top for said cover;

stretching said plastic sheet in the opposite direction from said sheet line to form an extension from said cell section along the front edge of said cell section; and

forming complementary latching elements on said cover front wall and on said extension from said cell section.

4. The thermoplastic carton thermoformed by the process recited in claim 1.

4,625,908

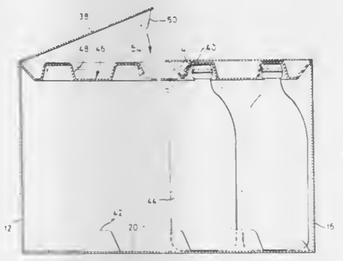
CONTAINER LOCK CONSTRUCTION

Roy W. Emery, 1 Donino Court, Toronto, Ontario, Canada (M4N 2H6)

Filed Oct. 31, 1983, Ser. No. 546,906

Int. Cl.[4] B65D *45/00*

U.S. Cl. 229—45 R **4 Claims**



1. A moulded container comprising bottom, side walls at right angles to the bottom; a top closure, said top closure comprising flaps hinged to the upper edges of opposed side walls; said bottom, side walls and top closure being made and formed by a moulding process, locating panel means adapted to overlie container contents in use and to be juxtaposed to the top closure of the container when the top closure is closed, said locating panel means being formed with blisters with their openings facing downwardly to embrace and locate the upper end of an article in the container in use, at least one of said flaps of said top closure having a second interlock means integrally moulded therein said second interlock means including a blister with its opening facing upwardly and having a surface adapted to cooperate with the first interlock means in manually releasable interlocking relation when the top closure is closed whereby the top closure is retained closed and the locking panel extends across the opposed free edges of said opposed flaps; said top closure interlock means and said locking panel interlock means being accessible from the upwardly facing opening of the blister of the first interlock means when in interlocked relation from the exterior of said top closure for manual release from interlocking relation; the second interlock means and the first interlock means being adapted to engage and to flex with respect to each other as the flaps are closed to permit the first and second interlock means to enter into cooperative interlocking relation and to permit manual release of the said interlocking relation on manual manipulation.

4,625,909

COMPUTERIZED CORRESPONDENCE FORM

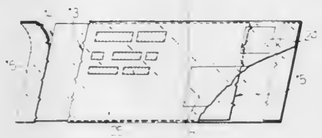
Franco Ferrando, via Repubblica, 39, 13051 Biella (Vercelli), Italy

Filed Dec. 22, 1983, Ser. No. 564,636

Claims priority, application Italy, Dec. 29, 1982, 68525 A/82

Int. Cl.[4] B65D *27/00. 27/10*

U.S. Cl. 229—92.1 **11 Claims**



1. A computerized correspondence form, at least one portion of which is designated to be folded so as to form an envelope containing at least one sheet, said portion of the form comprising a first sheet and at least one second sheet; said first sheet and each said second sheet including a first side edge, a second side edge parallel to said first side edge, a front face and a rear face, the front face of said first sheet and the rear face of one said second sheet constituting a front face and a rear face of said portion of the form, respectively, each said sheet including a first and second side strip extending close to, and parallel with, said first and said second side edges, respectively, of the respective one of each said sheet; said sheets being joined to each other at at least said first strips, each said strip having an outer edge facing the respective side edge, and an inner edge facing away from the respective side edge, a preset tear line weakening each said sheet along the inner side edge of the respective first strip, said preset tear line on said first sheet having a lower tear resistance than said preset tear line of each said second sheet, and a strip of adhesive material being provided on said rear face of said portion of the form along each said side strip of said one second sheet.

4,625,910

HEATER SYSTEM ASSOCIATED WITH ENGINE

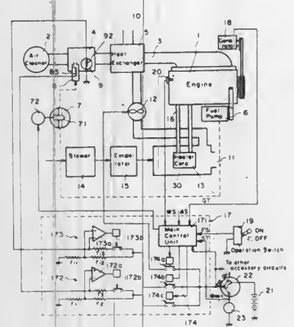
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,599

Claims priority, application Japan, May 26, 1984, 59-106869

Int. Cl.[4] G05D *23/00;* **B60H** *1/02;* **F02G** *5/00*

U.S. Cl. 237—2 A **5 Claims**



1. A heater system disposed on an air intake pipe and located upstream of a fuel supply device for supplying fuel to an engine, comprising:

(a) a fuel supply unit for supplying fuel to the heater system;

(b) a burner disposed on the air intake pipe for burning the vaporized fuel by ignition to create heat, including

(i) a heat for vaporizing the fuel supplied from the fuel supply unit;

(ii) an igniter for igniting the fuel vaporized by the heater;

(c) a heat exchanger disposed on the air intake pipe downsteam of the burner for recovering the heat generated by the burner; and

(d) means for controlling the amount of fuel being supplied to the heater system by the fuel supply unit.

4,625,911

AIR CONDITIONER SYSTEM FOR AUTOMOBILES

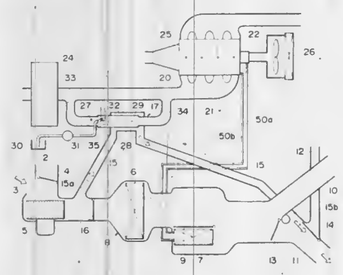
Itizo Tomita, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,178

Claims priority, application Japan, May 18, 1984, 59-100253; May 18, 1984, 59-100254; May 18, 1984, 59-100255; May 18, 1984, 59-100256

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 C **6 Claims**



1. An air conditioner system for an automotive vehicle including a passenger compartment and an engine with an air intake manifold connected thereto, said air conditioner system comprising:

conditioned air duct means having the downstream end opening into the passenger compartment;

a blower disposed in said duct means for forcing air through said duct means into the passenger compartment;

main heat exchanging means disposed in said duct means for subjecting the air to heat-exchange while the air passes through said duct means; and

an auxiliary heating means in said duct means for heating air to be supplied to the passenger compartment, said auxiliary heating means including a combustion device having a combustion chamber, a fuel pump for supplying fuel thereto, a burner in said combustion chamber and connected to said pump for injecting the fuel into said combustion chamber, and an air flow passage connected to said combustion chamber for supplying air thereinto, said air flow passage including an intake passage having one end connected to one end of said combustion chamber and an exhaust passage having one end connected to the other end of said combustion chamber, the other ends of said intake and exhaust passages being connected with the intake manifold for connecting said air flow passage and combustion chamber in parallel with said intake manifold.

4,625,912

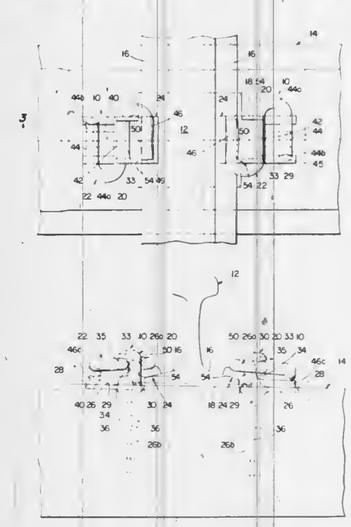
RAILWAY FASTENING ASSEMBLY

Graham M. Fee, Geneva, Ohio, assignor to True Temper Railway Appliances, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 240,411, Mar. 4, 1981, and Ser. No. 228,804, Jan. 27, 1981, Pat. No. 4,442,793, and a continuation of Ser. No. 57,823, Jul. 16, 1979, abandoned, said Ser. No. 240,411, is a continuation of Ser. No. 930,232, Aug. 2, 1978, abandoned, said Ser. No. 228,804, is a continuation of Ser. No. 933,630, Aug. 14, 1978, abandoned. This application May 11, 1981, Ser. No. 262,710

Int. Cl.[4] E01B *9/30*

U.S. Cl. 238—349 **30 Claims**



1. A drive-on rail fastening assembly for securing a railway rail having a laterally projecting base flange, to a support therefor, said assembly comprising a generally S-shaped, in plan as well as in perspective, torsional spring rail clip including a singular generally linear central leg, the latter adapted to be generally horizontally oriented and adapted to extend in the general lengthwise direction of extension of the rail, and a retaining chair bearing portion and a rail bearing portion spaced on opposite sides and extending from opposite ends of the central leg, said chair bearing and said rail bearing portions each comprising an arcuate loop section and a terminal leg section, said leg section of said rail bearing portion being a leading leg and said leg section of said chair bearing portion being a trailing leg, chair means adapted to be positioned adjacent said rail base flange, on said support and to coact with

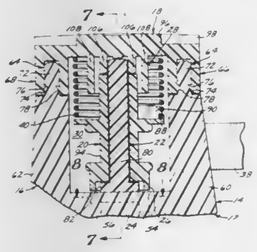
said clip for establishing a torsional spring force on said central leg for securing the railway rail, said chair means including a head having an inner side and an opposite outer side, recess means on said head for receiving said central leg in seating engagement therewith, said inner side of said head being adapted to face said rail, and having a generally smooth defining periphery in a vertical direction as viewed in elevation so as to prevent inadvertent snagging of the rail base on said chair means during installation of the rail on said support, said recess means opening onto said outer side of said head, and being disposed laterally outwardly of the rail base flange, ramp means on said chair means disposed laterally of said outer side of said head, an insulating member disposed intermediate said rail bearing portion of said rail clip and said base flange of the railway rail, electrically and mechanically insulating said chair means and said rail clip from said railway rail, said member including a recess on its underside adapted to conform to the confronting base flange of the railway rail, said member on its upperside including means adapted for coaction with said clip for establishing a locking engagement therewith, said member including a laterally extending head portion received in relatively close fitting relation in a pocket formed in the confronting inner side of said head, and generally vertically extending lateral shoulders on either end of said head portion outwardly of said pocket adapted to guide said member during vertical movement thereof relative to said chair means, said ramp means establishing a generally upwardly directed force on said chair bearing portion of said clip when said clip is driven onto said chair means in a direction generally lengthwise of said rail, thus establishing oppositely directed torsional forces on said central leg resulting in positive restraining force by said clip on the rail.

4,625,913

SPRINKLER HAVING TWO-PIECE DRIVE ARM BRIDGE

Hans D. Christen, La Verne, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Jun. 27, 1984, Ser. No. 624,981
Int. Cl.⁴ B05B *3/08, 3/14*
U.S. Cl. 239—1 **17 Claims**



1. An improved sprinkler, comprising:

a main body having a pair of upwardly extending legs which each terminate in a locking stud;

an impact drive mechanism having an impact drive arm and a spring, said drive arm pivoting about a vertical axis in response to a rotational biasing of said spring and interaction between said drive arm and a fluid stream exiting said main body;

means for pivotally mounting said impact drive mechanism on said body, said mounting means including a fulcrum pin independently positionable on said main body, and having a bearing surface which interfaces with an oppositely facing bearing surface of said drive arm;

a bridge-forming cap including a hood and a pair of downwardly descending clasps which each snap-fit over a corresponding one of said locking studs, said cap providing a guide for the upper portion of said mounting means; and

means for shielding the interfacing bearing surfaces of said mounting means and said drive arm against entry of abrasives.

11. A method of assembling an improved sprinkler, the steps comprising:

providing a main body having a pair of upwardly extending legs which each terminate in a first locking member, the main body providing a principle fluid conduit for the improved sprinkler;

assembling an impact drive mechanism having an impact drive arm and a spring for biasing the rotational movement of the drive arm, to means for pivotally mounting the impact drive mechanism, thereby creating a subassembly;

placing the subassembly on the main body; and

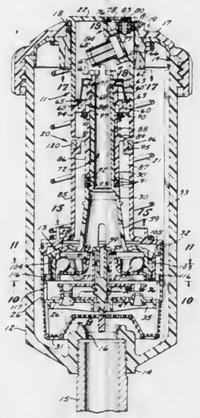
inescapably securing the subassembly to the main body by locking a bridge-forming cap having a pair of downwardly descending second locking members to the main body, the second locking members being engaged with the first locking members on the legs.

4,625,914

ROTARY DRIVE SPRINKLER

Timothy C. Sexton, Walnut, Calif.; George H. Lockwood, Wilton Manors, Fla.; David E. Robertson, Covina; Joseph D. Mason, Monteclair, both of Calif.; Mark J. Mattson, San Dimas, and Robert W. Patterson, LaVerne, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.

Filed May 16, 1985, Ser. No. 735,071
Int. Cl.⁴ B05B *3/16, 3/04*
U.S. Cl. 239—206 **60 Claims**



1. A rotary drive sprinkler, comprising:

a sprinkler housing adapted for connection to a supply of irrigation water;

a spray head for outward projection of an irrigation water stream and supported for rotation relative to said housing;

a rotary drive assembly for rotatably driving said spray head;

a reversing mechanism including means for reversing the direction of spray head rotation, within the end limits of a part-circle arcuate path, said reversing mechanism including resilient means permitting forced spray head rotation beyond either one of said end limits to a rotational position outside said part-circle path and upon subsequent spray head rotation for automatically returning to reversing rotation between said end limits within said part-circle path.

4,625,915

SPRINKLER HEAD APPARATUS

Haggie I. Cockman, Post Office Box 1600, Sanford, Fla. 32771

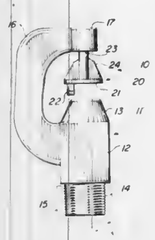
Filed Apr. 19, 1985, Ser. No. 725,363
Int. Cl.⁴ B05B *1/26*
U.S. Cl. 239—390 **6 Claims**

1. A sprinkler head comprising:

a sprinkler head body portion having attaching means for attaching the sprinkler head body portion to a water source and nozzle means for directing water from said sprinkler head body portion;

an arm attached to said sprinkler head body and extending over said nozzle means, said sprinkler arm having an opening having a tapered bore therethrough in general alignment with said nozzle;

a plurality of fixed deflection members, each deflection member being removably attachable to said opening in said arm and positioned to deflect water from said nozzle in predetermined patterns, and each said fixed deflection member having a deflection portion and an attaching



portion for attaching the fixed deflection member into the opening in said arm, said deflection member being positioned between the nozzle means and the opening in the arm; and

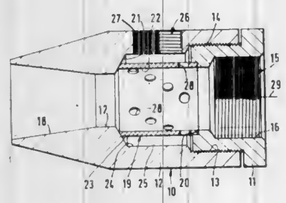
said attaching portion including a wedging portion thereon for locking one said deflection member to said arm and each said fixed deflection member attaching portion having a pair of angled wedging portions thereon for wedging said deflection member in said arm opening with the force of the water from the nozzle impinging thereagainst whereby deflecting members are held against loosening in said arm by the water from a sprinkler head nozzle.

4,625,916

CYLINDRICAL INSET FOR A BINARY ATOMIZING NOZZLE

Wolfgang Nieuwkamp, Käppishäusern; Martin Junger, Grafenberg, and Helmut Wenzel, Alstadt, all of Fed. Rep. of Germany, assignors to Lechler GmbH & Co., KG, Fellbach, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,269
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325741
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 239—431 **14 Claims**



1. A binary atomizing nozzle, comprising:

(a) a nozzle housing having a liquid inlet, a gas inlet and a mixture outlet;

(b) a multiply stepped and continuous axial bore in said housing between said liquid inlet and said mixture outlet, one of the steps defines an angularly disposed shoulder proximate said outlet and another of said steps defines an offset proximate said liquid inlet;

(c) a cylindrical inset coaxially mounted in said bore and extending between and clamped between said shoulder and said offset and said inset having an outer diameter less than the diameter of said bore between said shoulder and said offset for therewith defining an annular channel;

(d) said inset has a bore coaxial with said housing bore providing a mixing chamber;

(e) said gas inlet disposed transverse to the axis of said inset and communicating with said channel for providing atomizing gas thereto; and

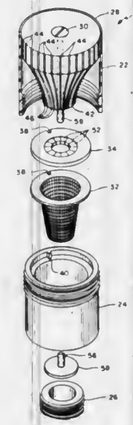
(f) a plurality of radially extending boreholes in said inset permitting flow of the atomizing gas from said channel into said mixing chamber, said boreholes disposed in a plurality of arrays extending between said offset and said shoulder and said arrays in successive uniformly spaced apart planes disposed transverse to the axes of said bores and the boreholes of each array are mutually angularly offset around the axis of said inset so that the boreholes of any one array are axially aligned in the direction of flow with the boreholes of only one other array for maximizing the number of boreholes in said inset and causing uniform gas speed around the circumference of said inset and therefore uniform inflow conditions at all boreholes.

4,625,917

VARIABLE SPRAY SPRINKLER

Gary D. Torney, 173 Solano Ave., San Rafael, Calif. 94901

Filed Jan. 21, 1986, Ser. No. 820,009
Int. Cl.⁴ A62C *31/00, 37/20*
U.S. Cl. 239—446 **8 Claims**



1. A sprinkler comprising:

a hollow base having means for its attachment to a supply line;

a head having means for water tight connection to said base and a multiplicity of channels for directing water to an elevated discharge outlet; and

an arc adjustment plate having a mutiplicity of removable slots positioned at the inlets of said channels;

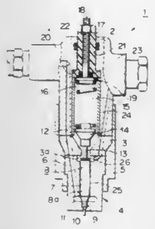
whereby the pattern of said removable slots which have been removed controls the sprinkler's spray pattern by controlling the channels through which water flows.

4,625,918

FUEL INJECTION VALVE

Takeo Funada; Nobuo Kawada, and Tatsuhiko Abe, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Sep. 7, 1984, Ser. No. 648,723
Claims priority, application Japan, Sep. 7, 1983, 58-137892[U]
Int. Cl.[4] F02M *61/10*
U.S. Cl. 239—533.3 **11 Claims**



1. In a fuel injection valve of the type having an ON-OFF switch formed by a nozzle body made of a conductive material and having a valve seat, said nozzle body being mounted through a conductive spacer on a nozzle holder, a needle valve made of a conductive material and slidably supported and guided by a guide hole defined in said nozzle body, said needle valve having a needle end, a rear end, a member extending between said ends having a peripheral surface, and an insulating layer on said peripheral surface so as to insulate said needle valve from said nozzle body, means including a pin mounting said needle valve on an end thereof for moving said needle valve supported in said guide hole so as to lift said needle end thereof onto and away from said valve seat, and electrical means for applying a potential between said nozzle body and said needle valve, whereby an electrically conductive state is established between said needle valve and said nozzle body when said needle end is seated on said valve seat and an electrically insulated state is established between said needle valve and said nozzle body when said needle end is moved away from said valve seat,

the improvement comprising an electrical insulation member between said rear end of said needle valve and a surface of said conductive spacer facing said rear end so as to insulate said needle valve from said conductive spacer, said surface of said conductive spacer defining an outer limit of movement of said needle valve when said needle valve is moved away from said valve seat.

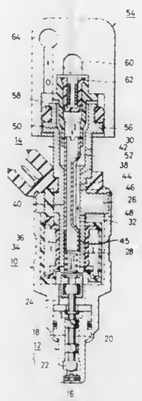
4,625,919

ELECTROMAGNETIC FUEL INJECTION VALVE

Masabiro Soma; Takeshi Atago, and Takayuki Kido, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Dec. 3, 1984, Ser. No. 677,240
Claims priority, application Japan, Dec. 2, 1983, 58-226904
Int. Cl.[4] F16K *31/06*
U.S. Cl. 239—585 **7 Claims**

1. An electromagnetic fuel injection valve comprising:
(a) a housing made of a magnetic material;
(b) a valve which opens and closes a fuel injection port that is hydraulically connected to the interior of said housing;
(c) a moving core which drives said valve;
(d) a fuel guide member which consists of a large diameter portion that is secured to said housing on the side opposite to said fuel injection port, a stationary core which extends from said large diameter portion to protrude into said housing, a connection portion which extends from said large diameter portion to protrude toward the outer side of said housing, and a penetration path which extends from the protruding end of said stationary core to the protruding end of said connection portion;
(e) an electromagnetic coil disposed in an annular space defined by the outer periphery of said stationary core and the inner periphery of said housing;
(f) a tubular member which is disposed in said penetration path and which has openings at its both ends;
(g) sealing means which hydraulically seals the area between the outer periphery of said tubular member and the inner periphery of said penetration path at an end portion on the side of said fuel injection port of said tubular member; and
(h) a connection hole which hydraulically connects said annular space to said penetration path on the side of said connection portion relative to said sealing means; wherein when the fuel is allowed to flow into said tubular member, the fuel flows in the path between said tubular member and said penetration path in a direction opposite to the flow of fuel in said tubular member, so that the fuel circulates.

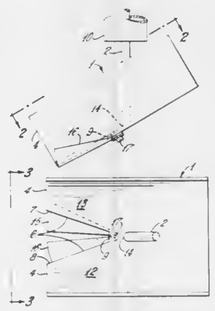


4,625,920

ROTARY DISTRIBUTOR

Stephen Seng, Bladensburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 3, 1981, Ser. No. 251,017
Int. Cl.[4] A01C *17/00*
U.S. Cl. 239—651 **4 Claims**



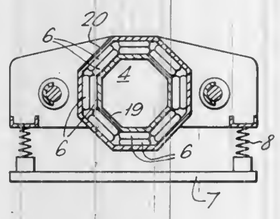
1. A distributor comprising:
(a) an inlet conduit;
(b) a vertical, rotatable shaft positioned centrally of said inlet conduit;
(c) a semi-circular trough adapted to receive material introduced through said conduit and angularly affixed to said shaft to incline said trough to form an upper and lower end of said trough, said trough having an opening positioned centrally of its lower end; and,
(d) closure means adapted to alter the size of said opening.

4,625,921

COMMINUTING

Brian F. Blundell, Ballinger, England, assignor to IMS Lycrete Limited, London, England

Filed Apr. 4, 1985, Ser. No. 719,670
Claims priority, application United Kingdom, Jun. 4, 1984, 8408936
Int. Cl.[4] B02L *17/14*
U.S. Cl. 241—14 **8 Claims**



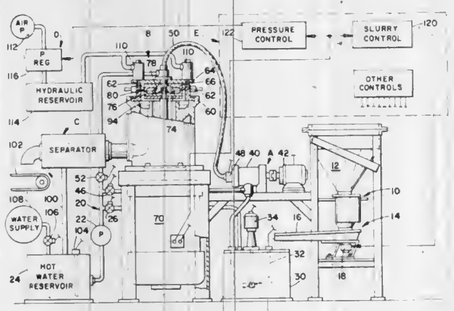
1. A method of comminuting material to a predetermined size, said method comprising using apparatus which includes a frame; first resilient means carried by said frame and adapted for mounting said apparatus on a substrate; a processing vessel carried by said frame and having an inlet and an outlet for said material to be processed; second resilient means comprising a plurality of spring members mounted about said vessel between said vessel and said frame, said second resilient means being independent of said vessel and said frame; and means to apply a controlled periodic force to said frame thereby to cause vibration of said frame and said vessel, wherein, material is placed in said processing vessel and said controlled periodic force is then applied to said frame to cause the material in said vessel to travel a substantially circular orbital path.

4,625,922

ELEVATED TEMPERATURE COMMINUTION OF VULCANIZED RUBBER AND OTHER ELASTOMERS

Ronald L. Brubaker, Hudson, and Robert Calevich, Richmond Heights, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 4, 1985, Ser. No. 688,959
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—17 **9 Claims**



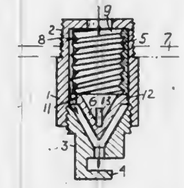
1. A method of comminuting pellets to micron range particles, the method comprising:
pumping a slurry of liquid and pellets to be comminuted to a comminuting zone defined between mating abrasive surfaces of a rotor and a stator;
concurrently, rotating the rotor relative to the stator and pressing the rotor and stator abrasive surfaces together with a high pressure such that the rotor and stator shear the liquid as well as the pellets, energy expended to rotate the rotor and stator is in part utilized to comminute the pellets to micron range particles, is in part wasted shearing the liquid, is in part utilized by the rotor and stator mating abrasive surfaces wearing each other away, and in part heats the liquid and micron range particles to at least 130° F.;
separating the micron range particles and the heated liquid;
mixing the separated, heated liquid with additional pellets to be comminuted to form additional, heated slurry which is pumped to the comminuting zone, the heated liquid having a lower viscosity than cooler liquid such that less energy is wasted shearing the liquid during the rotating and pressing step, whereby recirculating heated liquid improves energy efficiency of the comminuting method.

4,625,923

CONTAMINANTS FILTERING AND BREAKING

Semyon Fishgal, 1908-35 High Park Ave., Toronto, Canada (M6P 2R6)

Filed Jul. 1, 1985, Ser. No. 750,771
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—40 **8 Claims**



1. A device for breaking down contaminants existing within a liquid, including
a reservoir of the liquid;
a pressure line of the liquid;
a nozzle having an inlet and an outlet communicating respectively with said line and reservoir;
a stand-off obstacle facing the outlet;
a collar installed upstream of the nozzle, the collar containing an inner lateral surface and an outer lateral surface and a plurality of minor openings trough which the liquid is filtered before entering the nozzle.

4,625,924

HOLD DOWN MECHANISM FOR REDUCTION APPARATUS

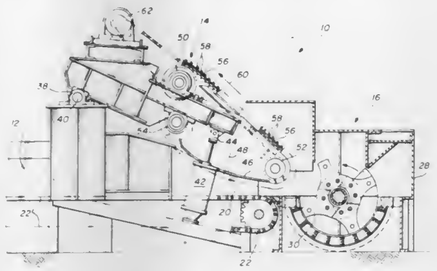
Glenn W. Killinger, Fountain Inn, S.C., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 27, 1985, Ser. No. 770,026
Int. Cl.[4] B02C *13/286, 23/02*
U.S. Cl. 241—186 R **7 Claims**

1. Feeding means for delivering a mass of materials into reduction apparatus, said feeding means comprising:
a generally horizontally disposed feeding table including material conveying means for moving material along said table toward said reduction apparatus, said table having a first end adjacent to said reduction apparatus and having a remote end;
hold down means located adjacent to the conveying means on said table, said hold down means including a frame carrying an endless traveling feed apparatus for moving said material toward said reduction apparatus and for engaging said material to hold said material to prevent

movement of said material away from said reduction apparatus, and having a curved belly pan on the side thereof adjacent to the conveying means, said belly pan extending across the width of said feed apparatus and having a convex portion curved toward said table for supporting said feed apparatus in an arcuate configuration and for preventing deflection of said feed apparatus across the width thereof; and,

pivot means supporting said hold down means for pivotal movement toward and away from said table, said pivot



means including a pivot axis located relative to tangents to the curve of said belly pan whereby reaction force vectors are generated when said endless traveling feed apparatus engages the material on the convex portion between the apex thereof and the end adjacent to the first end of the frame for increasing downwardly directed forces applied by said hold down means to said material and when said feed apparatus engages the material on the convex portion between the apex and said remote end for causing said hold down means to pivot relatively away from said table.

4,625,925

COMMINUTING APPARATUS FOR SHEET MATERIAL OR SHEET MATERIAL LAYERS

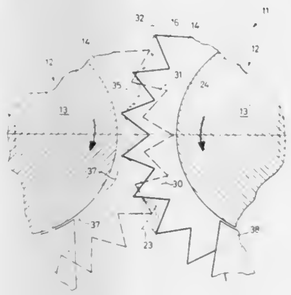
Albert Goldhammer, Ueberlingen, Fed. Rep. of Germany, assignor to Feinwerktechnik Schleicher & Co., Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,305

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313103

Int. Cl.⁴ B02C *18/16*

U.S. Cl. 241—236 **18 Claims**



1. A cutting arrangement for comminuting sheet material, comprising:

two cutting rolls rotatable around parallel axes in a common connecting plane, the rolls being drivable in opposite directions around said axes, each cutting roll having a plurality of cutting discs spaced from one another by a groove, the cutting rolls being spaced such that the cutting discs intersect one another, each disc between end discs of the rolls engaging in the groove between adjacent cutting discs on the other of said cutting rolls, each cutting disc having an outer periphery and two side faces, the outer periphery being provided with cut-outs, adjacent cut-outs on each of the discs defining teeth having apices and bottoms between the teeth, cutting edges on each cutting disc being defined by the teeth and the side faces;

means for driving said cutting rolls in rotational synchronism, and the cutting rolls being rotationally offset with respect to one another by an angular offset of about half a circumferential distance between cut-outs, whereby each tooth of each cutting disc on one cutting roll is substantially aligned with a cut-out of said adjacent cutting discs of the other cutting roll as the rolls are rotated around said axes, the bottoms betweens the teeth on each cutting disc travel during rotation in a circle which does not intersect the bottoms circle of travel of the other disc; and,

said teeth and the cutting edges defining an effective intersecting surface between adjacent side faces of each cutting disc in which area the cutting discs and the opposing teeth are very closely adjacent one another, said effective intersecting surface being a narrow zigzag-shaped band following an outer circumference of each cutting disc and continuous over at least two of said teeth, whereby at least two teeth on both cutting discs work exactly on gaps of the outer cutting disc.

4,625,926

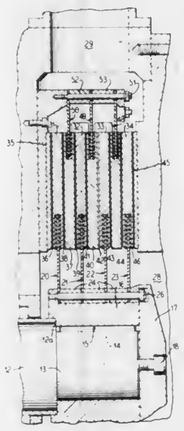
MULTIPLE DISK REFINER WITH ELASTOMERIC MOUNTING

Edward C. Kirchner, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Nov. 8, 1984, Ser. No. 669,539

Int. Cl.⁴ B02C *7/14*

U.S. Cl. 241—261.2 **6 Claims**



1. A multiple disk refiner comprising:

a housing,

a rotatable hub mounted for rotation within said housing,

a plurality of spaced refiner rotor disks concentric with said rotatable hub,

a plurality of spaced additional disks in interleaved relation with said rotor disks and defining passages therewith through which a suspension to be refined can be passed,

means for creating relative rotational movement between said rotor disks and said additional disks,

a plurality of flexible rotor elements mounted on said hub for rotation therewith, and

resilient coupling means connecting said flexible rotor elements with said rotor disks, said coupling means including a resiliently deformable elastomer providing a driving connection between said flexible rotor elements and said rotor disks and arranged to deform in a shearing mode thereby permitting increased axial deflection of said flexible rotor elements.

4,625,927

APPARATUS FOR WINDING ELECTRICAL COILS WITH CLOSED CORES

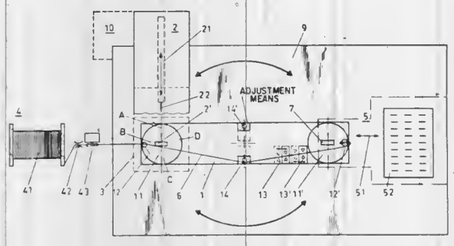
Ernst Arnold, Buchs, Switzerland, assignor to Meteor AG, Rueschlikon, Switzerland

Filed Aug. 27, 1984, Ser. No. 644,510

Claims priority, application PCT Int'l Appl., Jul. 23, 1984, PCT/CH84/00115

Int. Cl.⁴ H01F *41/08*

U.S. Cl. 242—4 R **3 Claims**



1. Apparatus for winding electrical coils with coil formers having core openings, comprising:

a turret;

a coil former receiver;

a wire supply device;

a wire mount provided on said coil former receiver for receiving wire supplied from said supply device;

a winding unit including four wire retainers disposed on a rotatable winding head and a wire drawing device having a catch hook, means for moving said catch hook so that it can pass through a wire retainer and the core opening in the coil former; and

two wire deflectors adjustably affixed to said turret so that they are laterally adjustable relative to said turret and a separating device for cutting wire to length.

4,625,928

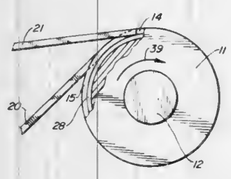
METHOD OF MAGNETIC CYLINDER ASSEMBLY

Andres Peekna, Hinsdale, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Division of Ser. No. 610,044, May 14, 1984, abandoned. This application May 20, 1985, Ser. No. 736,062

Int. Cl.⁴ B41F *27/02, 27/06;* **B65H** *81/00;* **H01F** *7/02*

U.S. Cl. 242—7.02 **2 Claims**



1. In the method of assembling a magnetic cylinder, comprising

providing a cylinder with two spaced apart helical pole pieces defining two magnet receiving slots on the cylinder surface;

winding two flexible magnets on said cylinder, one in one slot and the other in the adjacent slot, the magnets having like poles facing each other;

the improvement wherein:

the magnets are positioned to enter the slots with an angular displacement such that one magnet leads the other to minimize demagnetization of each magnet by proximity to the field of the other magnet.

4,625,929

METHOD AND DEVICE FOR AVOIDING IRREGULAR OR RIBBON WINDINGS DURING THE WINDING OF CHEESES OR CROSS-WOUND BOBBINS

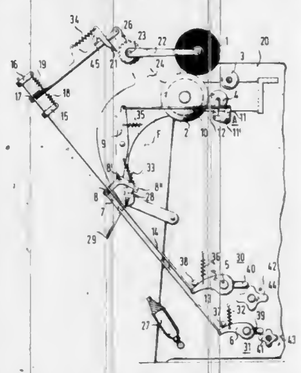
Hermann Slaghuis, and Heinz G. Bender, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,728

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324889

Int. Cl.⁴ B65H *54/38*

U.S. Cl. 242—18.1 **9 Claims**



1. Method for avoiding irregular or ribbon windings while winding cross-wound bobbins with scrambled windings, including a movable bobbin holder for supporting a bobbin and a frictionally-driven drive cylinder for contacting the bobbin, which comprises continuously lifting the bobbin holder to different heights and lowering the bobbin holder causing the duration of the contact between the bobbin and the drive cylinder to continuously change.

4,625,930

FILM WINDING AND REWINDING APPARATUS

Randall G. Urlik, Englewood, Colo., assignor to Goldberg Brothers, Inc., Denver, Colo.

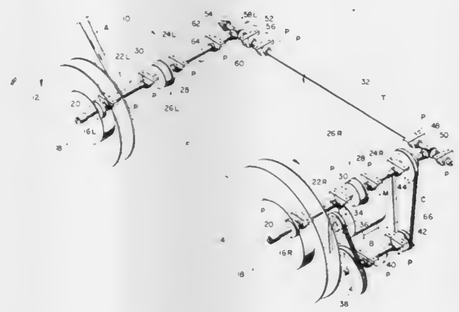
Filed Oct. 29, 1984, Ser. No. 666,187

Int. Cl.⁴ B65H *18/10*

U.S. Cl. 242—67.3 R **14 Claims**

1. An apparatus for winding and rewinding film which comprises: first and second film reels mounting spindles mounted for rotation in spaced substantially parallel relation; first and second film reels selectively mountable upon one of said first and second spindles for rotation therewith in side-by-side spaced relation, said reels being aligned to transfer a length of film wound upon one to the other; an electric motor having a motor shaft turning in one directions; first and second input shafts journalled for rotation in coaxial relation to said first and second spindles; a first electrically-actuated electromagnetic combination clutch/brake unit operatively interconnecting said first input shaft to said first spindle; a second electrically-actuated electromagnetic combination clutch/brake unit operatively interconnecting said second input shaft to said second spindle; power transfer means operatively interconnecting said motor shaft and said first and second input shafts for simulta-

neous synchronous rotation; said first and second clutch/brake units each having a first actuated position effective to frictionally link said input shafts and spindles together for conjoint rotation and said clutch/brake units having a second actuated position effective to frictionally inhibit relative rotational movement between said coaxially-aligned input shafts and spindles in opposite directions, said power transfer means being operative to rotate both of the input shafts in the same direction at the same speed when the film is wound onto the take-up and supply reels in opposite directions; and control means electrically connected to said first and second clutch/-brake units operative in a first position to actuate said first clutch/brake unit into its first actuated position and said sec-



ond clutch/brake unit into its second actuated position whereby the film: reel mounted on said first spindle becomes a driven take-up reel onto which the film is wound and the film reel mounted on said second spindle becomes a frictionally-braked supply reel effective to tension any film wound thereon as it passes to said take-up reel, and said control means having a second operative position effective to shift the first clutch/-brake unit into its second actuated position and said second clutch/brake unit into its first actuated position whereby said reel mounted on said second spindle becomes the driven take-up reel and the reel mounted on said first spindle becomes the frictionally-braked supply reel for tensioning the film passing onto the take-up reel.

4,625,931

WEB-MEANDERING PREVENTING DEVICE

Tadashi Tamura, and Reiji Kikuchi, both of Iwate, Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Aug. 16, 1983, Ser. No. 524,120

Claims priority, application Japan, Aug. 27, 1982, 57-128634; Feb. 28, 1983, 58-27101

Int. Cl.[4] B65H *16/04, 23/08*

U.S. Cl. 242—68.3 **13 Claims**



1. In a printing device operating in connection with a web upon a roll, means for controlling the web for preventing meandering or uncontrolled running of said web upon said roll, comprising:

a machine frame, a relatively stationary shaft fixed to the frame;

a core member rotatably mounted around the fixed shaft; a reel mounted around the core member, and the reel being adapted for having the web wound thereon in a rolled form for providing a roll of the web; the reel being rotatable on the shaft selectively to permit the web to wind off the roll and to take up the web onto the roll each time the reel is rotated;

idle rotation restraining means between the reel and the core member for preventing the reel from idly rotating separately from the core member;

axial positioning means for positioning the core member on the stationary shaft and with respect to the frame of the machine;

elastic means for elastically biasing the core member axially of the stationary shaft and toward the axial positioning means for causing such engagement between the positioning means and the core member as to prevent the core member and the reel therearound from freely rotating thereby to prevent the web from running free of the roll, or onto the roll, and hence for preventing meandering running of the web;

the idle rotation restraining means comprises friction means for frictionally connecting the reel around the core member for frictionally preventing the reel from idly rotating separately from the core member;

the reel having an inner circumference around the core member, and the friction means including an idle-stoping leaf spring secured to the core member and having a free end frictionally abutting the inner circumference of the reel; and

the free end of the leaf spring being bent in a direction with respect to the reel for allowing the reel to frictionally rotate together with the core member only in one direction.

4,625,932

REAR DRAG TYPE SPINNING REEL

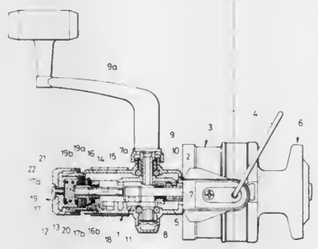
Hideo Murakami, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jan. 7, 1985, Ser. No. 689,275

Claims priority, application Japan, Jan. 16, 1984, 59-3915[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.51 A **2 Claims**



1. A spinning reel of the rear drag type, comprising; a reel body made of plastic, said reel body having a recess portion formed at a rear end thereof, a fitting through hole formed in a bottom wall of said recess portion, a spool shaft passing through said through hole in said bottom wall, a click receiver made of metal and having a washer engaging flange at one end thereof in contact with said reel body, said click receiver being fitted in said through hole and including a non-rotatable hub portion, a click member fitted on said spool shaft and rotatable with respect to said click receiver, a plurality of drag washers abutting said click member, said click member including a first rotatable sleeve portion received within said click receiver, a flange, and a second sleeve portion disposed on a side of said flange distant from said flange of said click receiver, for passing through and supporting said drag washers, said click member being mounted so as to be axially slidable on said spool shaft but rotatably fixed to said spool shaft and including an integral gear portion; spring means for biasing said drag washers against said flange of said click member; said click receiver including a tab portion provided at one end thereof, said bottom wall including a recess for receiving said tab portion to prevent rotation of said click receiver, and a further drag washer disposed between said flange of said click receiver and said flange of said click member in a manner such that said click member is slidable and rotatable with respect to said further drag washer, and a drag mechanism for applying an adjustable force to said drag washers.

4,625,933

PROCESS AND DEVICE FOR REGULATING THE MOVEMENT OF A MEMBER BY EMPLOYING A FLUID FLOW

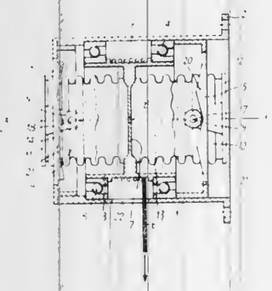
Gérard Luciano, St. Laurent-du-Var; Pierre Poveda, Le Cannet-Rocheville, and Pierre Croiset, Mandelieu, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Sep. 17, 1984, Ser. No. 651,089

Claims priority, application France, Oct. 13, 1983, 83 16292

Int. Cl.[4] B65H *77/00;* **B66D** *5/28*

U.S. Cl. 242—99 **6 Claims**



1. A device for regulating at any instant the speed of a mobile member moving in a stroke of determined uniform direction by employing a fluid passing under pressure through an orifice of restricted section, comprising:

(A) an aligned assembly of two bellows filled with an incompressible fluid, sadi bellows being coaxial and joined by a common partition having located thereon said orifice of restricted section, and said bellows being compressible parallel to their common axis;

(B) said mobile member comprising a pulley coaxial to said bellows having wound thereon a cable, whereby movement of said cable rotates said pulley;

(c) cams for alternately compressing ends of said bellows opposite said partition as said pulley rotates for causing said fluid to be passed through said orifice several times in alternate directions during rotation of said pulley.

4,625,934

AIRPLANE SEAT

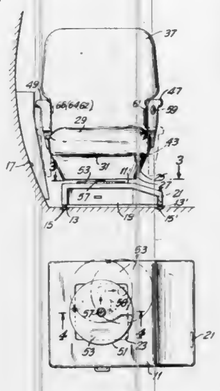
James M. Ryan, New York, and Enrique Alie, Brooklyn, both of N.Y., assignors to Falcon Jet Corporation, Teterboro, N.J.

Filed Sep. 28, 1984, Ser. No. 655,524

Int. Cl.[4] B64D *11/06*

U.S. Cl. 244—122 R **12 Claims**

1. An airplane seat comprising in combination, a base member having a pair of tracks located on the bottom thereof cooperating with a pair of tracks fixed to the floor of an airplane fuselage and adapted to move in a fore and aft direction, an opening in the top of said base member, clutch means located in said opening adapted to move universally in fore, aft and lateral directions therein, an adjustable, generally horizontally disposed seat base located above said base member, a vertically disposed shaft fixed to the bottom of said seat base and to said clutch means located in said opening and adapted to rotate said seat with respect to said base member and permit movement of said seat base universally in fore, aft and lateral directions independently of the movement of said base member on the tracks fixed to the floor of said fuselage, said clutch means including clutch plates disposed in opposite sides of the opening in said base member and which are keyed on said shaft for axial movement thereon and into and out of contact with the upper and lower surfaces of the top of said base member when in engaged and disengaged positions, respectively, an



adjustable, generally vertically disposed back member cooperatively and pivotally joined to said seat base, a pair of arm rests disposed along the sides of said seat base and forward of said back member, adjusting means located on said seat base adapted to lower and raise the leading edge thereof with respect to its generally horizontal disposition, adjusting means located in said back member adapted to adjust the curvature of the front surface thereof and means for adjusting the vertical position of said back member with respect to its disposition with said seat base located on said seat base.

4,625,935

ADJUSTABLE-HEIGHT SUPPORT FOR ROTARY EVAPORATORS

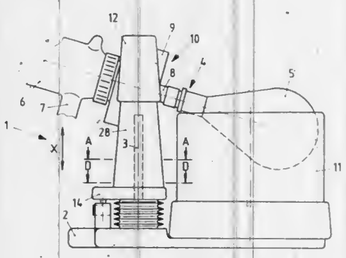
Adolf Zellweger, Gossau, Switzerland, assignor to Büchi Laboratoriums-Technik AG, Flawil, Switzerland

Filed Dec. 4, 1984, Ser. No. 677,853

Claims priority, application Switzerland, Dec. 9, 1983, 6597/83

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—297.1 **11 Claims**



1. An adjustable-height support for a weight, such as a combined glass unit and drive unit in an evaporator, the support comprising a base plate, a substantially vertical rod extending upwards from said base plate, a holder device for the weight displaceable along said rod, mechanical energy storage means for storing potential energy in an amount dependent on the

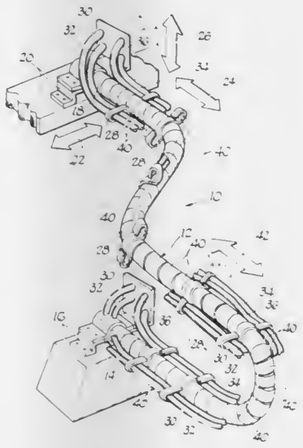
position of said holder device along said rod, means mechanically operable between said holder device and said energy storage means whereby movement of said holder device downwards along said rod stores energy in said energy storage means, and whereby said holder device can be raised with the assistance of force derived from said energy storage means, locking means for locking said holder device against movement along said rod when said holder device is in any one of a range of positions along said rod, and adjusting means for adjusting the potential energy that can be stored in said energy storage means.

4,625,936

FLEXIBLE SUPPORT AND CARRIER ASSEMBLY

Edward L. Hadden, Sr., Mechanicsburg, Pa., assignor to Sine Products Company, Mt. Clemens, Mich.

Filed Jun. 6, 1983, Ser. No. 501,202
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—544 **26 Claims**



1. A flexible support and carrier assembly for supporting associated accessory means, comprising a plurality of sequentially arranged body-like segments, said segemets being arranged with respect to each other for articulated motion as between adjacent segments, said plurality of sequentially arranged body-like segements defining an elongated articulated structure having first and second ends, spring means operatively connected to at least certain of said plurality of segments, said spring means resiliently resisting while permitting said articulated motion as between adjacent segments to occur in a first direction of aritculation, said spring means also resiliently urging said adjacent segments to experience said articulated motion in a second direction of articualation opposite to said first direction, and guard means carried at least by certain of said segments, said guard means functioning to prevent the unintentional incursion of unrelated objects into spaces between said adjacent segments when experiencing articulation.

4,625,937

LANTERN STAND

Gregory W. Haase, 14647 Greenwood Rd., #301, Dolton, Ill. 60419

Filed May 17, 1985, Ser. No. 735,111
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—545 **17 Claims**

1. A pole assembly useful for hanging an item by its handle comprising base means including a spike portion capable of being pounded into a solid mass to provide an anchor for said pole assembly; a plurality of elongated pole section means each having a first end and a second end, each of said pole section means being structured to be connectable end-to-end with at least one other of said pole section means to form a pole, provided that the first end of the lowermost of said pole section means is adapted to engage that portion of said base means extending out of said solid mass; arm means associated with the uppermost of said pole section means of said pole and extending away from said pole; and hook means associated with said arm means and being capable of holding said handle of said item, provided that the average cross-sectional area of the next higher of said pole section means of said pole is decreased relative to the next lower of said pole section means of said pole, and provided further that said assembly is structured so that said spike portion, said pole section means other than said lowermost pole section means, said arm means and said hook means are storable in said lowermost pole section means.

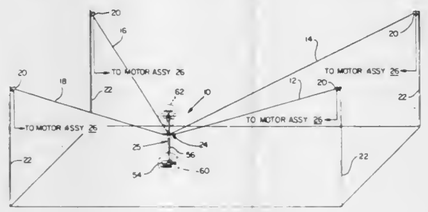


4,625,938

SUSPENSION SYSTEM FOR SUPPORTING AND CONVEYING EQUIPMENT, SUCH AS A CAMERA

Garrett W. Brown, 515 Addison Ct., Philadelphia, Pa. 19147

Filed Nov. 30, 1983, Ser. No. 544,456
Int. Cl.[4] F16M *13/00*; H04N *5/30*; G03B *1/00*
U.S. Cl. 248—550 **10 Claims**



1. A support system for equipment which is to be capable of being panned and tilted by remote control, said support system comprising:

first support means elongated in the direction of the panning axis of said equipment;

means for attaching said equipment tiltably adjacent one end of said support means;

second support means concentric with said axis, rotatable about said axis with respect to said first support means, and mounted along said first support means spaced from said equipment attaching means; and

drive means coupling said first and second elongated support means, said drive means being adapted to be energized to produce relative rotation between said support means

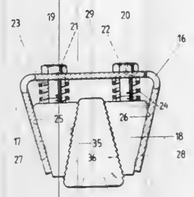
about said axis, and controllable to maintain a predetermined rate of such rotation.

4,625,939

ENGINE MOUNTING FOR MOTOR VEHICLES

Dieter Bergelt, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1985, Ser. No. 755,616
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426378
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—638 **12 Claims**



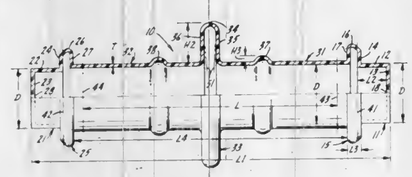
1. An engine mounting for motor vehicles having brackets attached to a vehicle body for connection to damping blocks attached to an engine, characterized by each bracket supporting two spaced apart slidable spring-loaded clamping pieces with teeth on inner surfaces thereof, and an intermediate piece attached to the respective damping blocks, the intermediate piece having teeth on two of its surfaces which cooperate with the teeth of the clamping pieces when the intermediate piece is inserted therebetween from below.

4,625,940

WALL SLEEVES

Bruce G. Barton, Livonia, Mich., assignor to Thunderline Corporation, Wayne, Mich.

Filed May 1, 1984, Ser. No. 605,800
Int. Cl.[4] E04G *15/00*
U.S. Cl. 249—83 **42 Claims**



1. A unitary, one-piece molded resin wall sleeve precursor convertible into a wall sleeve assembly for forming a continuous unimpeded passageway of given internal diameter D through a concrete wall by cutting off end sections, transition sections, and portions of sleeve sections from a central sleeve member portion of the precursor and inserting the end sections into the remaining sleeve member, comprising:

first and second end sections, at opposite ends of the wall sleeve precursor member, each and section including a cylindrical body portion having an external diameter D and a substantially flat mounting flange projecting radially outwardly of the axially inner end of the body portion;

first and second transition sections adjoining the first and second end sections, respectively, and joining the end sections to opposite ends of a central sleeve member portion, each transition section including an outer transition wall extending axially inwardly from the outer rim of the mounting flange of the associated end section and a transition boundary wall extending radially inwardly from the outer transition wall;

and the central sleeve member portion comprising:

N coaxial cylindrical sleeve sections of internal diameter D interposed in series between the two transition sections; and

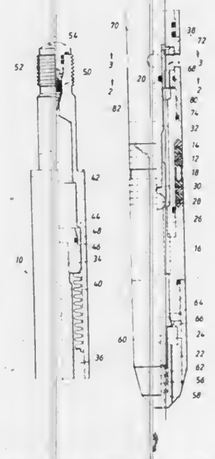
N−1 annular, hollow, axially compressible water stop sections each interconnecting two adjacent sleeve sections, each water stop section having two spaced walls extending radially outwardly of the ends of the adjacent sleeve sections and interconnected by a water stop rim wall, the internal diameter of the rim wall being much larger than D.

4,625,941

GAS LIFT VALVE

Joseph L. Johnson, Houston, Tex., assignor to Priess-Johnson Oil Tools International, Inc., Houston, Tex.

Filed Apr. 23, 1985, Ser. No. 726,113
Int. Cl.[4] F16K *31/12*
U.S. Cl. 251—12 **8 Claims**



1. Pressure responsive valve apparatus, comprising:

a. a housing including at least one inlet port and at least one outlet port separated from the inlet port, with all such ports communicating between the interior of the housing and the exterior of the housing;

b. a seat, positioned within the housing between the inlet and outlet ports, generally defining a flow port for flow of fluid between the inlet and outlet ports, and a valve member, with at least one of said seat and said valve member being movable, and whereby said flow port may be selectively closed by sealing engagement between said seat and said valve member, and said flow port may be opened a selected amount to allow selected fluid flow therethrough by relative separation between said seat and said valve member;

c. means for providing force to urge said seat and valve member together to close said flow port; and

d. choke means for providing at least one orifice means between said inlet port and said flow port to establish a constricted flow area for fluid flowing between said inlet port and said flow port, wherein said choke means is generally aligned with said inlet port so that fluid entering through said inlet port may impinge on said choke means, whereby a pressure drop may be effected across said orifice between said inlet port and said flow port, and wherein said choke means may be sealed to prevent fluid flow between said inlet port and said flow port other than through said orifice means.

4,625,942

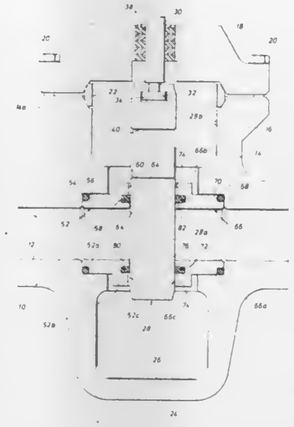
VALVE ASSEMBLY, SEAT AND SEAL

Norman A. Nelson, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 343,203, Jan. 27, 1982, Pat. No. 4,471,943. This application Apr. 27, 1983, Ser. No. 489,252

Int. Cl.⁴ F16K *3/16*

U.S. Cl. 251—327 **20 Claims**



1. An annular seat for a valve assembly comprising:

a seat body having a generally axially facing annular contact face for opposition to a valve element and having an annular groove located between the radially inner and outer extremities of said contact face and extending axially thereinto, said annular groove having inner and outer side walls, said contact face having an annular sealing area intermediate said annular groove and the inner extremity of said contact face; and

a face seal comprising an annular elastomeric seal body having a base portion disposed in said annular groove and a sealing portion which in a relaxed condition projects axially outwardly from said annular groove, said seal body further having an annular auxiliary sealing formation extending about its outer diameter, said auxiliary sealing formation in a relaxed condition projecting radially outwardly from said base portion, and when said base portion is installed in said annular groove, being resiliently deflected radially inwardly by said outer side wall to sealingly engage said outer side wall; and

vent means located in said seat body for communicating with said annular groove radially outwardly of said seal body and axially inwardly of said auxiliary sealing formation, said vent means extending outwardly from said annular groove through the radially outer periphery of said seat body.

4,625,943

PIVOTAL CLOSING MEMBER

Klaus Gröger, Hemmignen, Fed. Rep. of Germany, assignor to Dr. Ing. H.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,217

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340127[U]

Int. Cl.⁴ F16K *11/052*

U.S. Cl. 251—305 **2 Claims**

1. A return spring system for a throttle valve comprising:

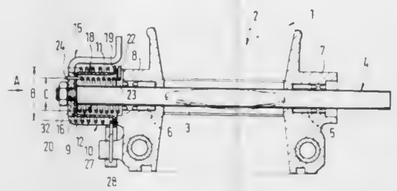
a housing;

a shaft rotatably mounted in said housing;

a valve attached to said shaft;

a lever attached to said shaft;

a multiplicity of spring members having coils of different diameters and being concentrically arranged, each of said spring members having a first end attached to said lever and a second end attached to said housing, said spring members include an outer spring member concentrically disposed around an inner spring member; wherein the lever includes an opening for receiving said first end of the inner spring member and the housing includes a recess for receiving said second end of the inner spring member, and the housing includes a stop member for engaging said second end of said outer spring; and said outer spring first end includes a bent portion engaging an edge of said lever, all of said spring members urging said shaft in a uniform direction;



a bushing attached to said shaft disposed intermediate said outer spring member and said inner spring member, said bushing having an opening for receiving said first end of said inner spring;

a loading means including said lever for loading said inner and outer spring members for urging said shaft in a uniform direction; and

a retaining means for retaining the lever in a first position, said retaining means including a screw member in threaded engagement with the stop member of the housing, the screw member being movable to engage the lever.

4,625,944

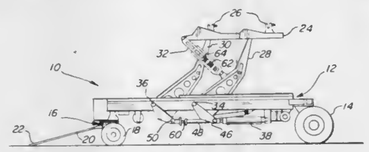
SAFETY DEVICE FOR LIFTING APPARATUS

Harry S. Mankey, and Charles C. Garner, both of Dallas, Tex., assignors to Standard Manufacturing Company, Inc., Dallas, Tex.

Continuation of Ser. No. 590,358, Mar. 16, 1984, abandoned, which is a continuation of Ser. No. 467,399, Feb. 17, 1983, abandoned, which is a continuation of Ser. No. 214,750, Dec. 9, 1980, abandoned. This application Jan. 2, 1986, Ser. No. 814,590

Int. Cl.⁴ B60P *1/48;* **B66F** *3/24*

U.S. Cl. 254—8 R **6 Claims**



1. In a lifting apparatus having a main lifting mechanism capable of independently lifting, lowering and supporting a predetermined maximum load between first and second positions, the improvement comprising:

a first safety means including a cylinder having a lifting chamber and a lowering chamber, operatively connected to said lifting apparatus and having sufficient capacity for lifting, lowering and supporting said predetermined maximum load between said first and second positions independently of said main lifting mechanism;

a source of hydraulic fluid;

a first hydraulic line, having a first portion and a second portion, connected between said source and said lifting chamber, and a second hydraulic line connected between said source and said lowering chamber; and

a second safety means including a counterbalance holding valve having an inlet connected to said first portion of said first hydraulic line and an outlet connected to said second portion of said first hydraulic line, said counterbalance holding valve also including a control terminal connected to said second hydraulic line, said holding valve for preventing the lowering of said predetermined maximum load except in response to the application of hydraulic pressure to said control terminal via said second hydraulic line.

4,625,945

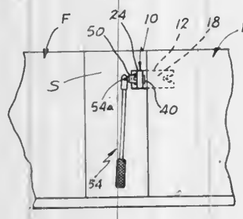
PRY BAR WEDGE MEMBER

Jay A. Hearn, and John E. Hearn, both of 100 Brandy Dr., Marietta, Ohio 45750

Filed Oct. 9, 1984, Ser. No. 658,677

Int. Cl.⁴ B25C *11/00;* **B66F** *15/00*

U.S. Cl. 254—25 **11 Claims**



1. A pry bar wedge member adapted for facilitating the removal of forms from poured concrete or the like comprising, an elongated wedge shaped body portion having means thereon for forcing the body portion between a form and poured hardened concrete, a head portion adjacent the rearward end of said wedge member projecting upwardly from said body portion, said means comprising a striking surface on the rearward end of said body portion adapted for hammering for causing forced entry of said body portion between a form and poured hardened concrete, and ratchet means in said head portion adapted for coaction with a lever, for applying leverage force to the body portion in the operation of prying the forms loose from the attached structure, said ratchet means in operation being rotatable about an axis extending generally parallel to the longitudinal axis of said body portion, said ratchet means including projecting means enabling the lever to be extended from the ratchet means generally perpendicular to the rotary axis of said ratchet means whereby said leverage force can be applied to said body portion from laterally of said rotary axis of said ratchet means to cause said wedge member to rotate about said longitudinal axis of said body portion in the operation of prying a form loose from the attached structure in restricted space environments, and said ratchet means including means on said head portion on the opposite side of said head portion as compared to the side of said head portion on which is located said striking surface on said body portion, for selectively reversing the permissible direction of rotation of said ratchet means.

4,625,946

HOIST HAVING WORM SAFETY DEVICE

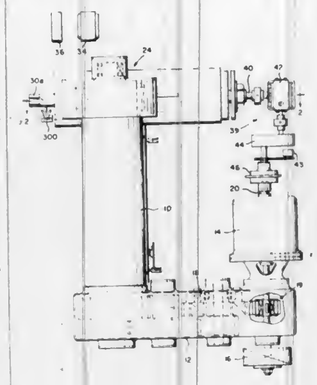
Charles W. Clark, Jr., and Harold H. West, both of King County, Wash., assignors to Ederer Incorporated, Seattle, Wash.

Filed Mar. 19, 1984, Ser. No. 590,630

Int. Cl.⁴ B66D *1/48, 1/14*

U.S. Cl. 254—274 **28 Claims**

4. A safety system in a load-carrying hoist in which there is defined a last low-speed, load-carrying component, a last high-speed, load-carrying component including a main drive motor, a power transmission main drive operatively coupled to the motor, a drum operatively coupled to the main drive and to the last low-speed, load carrying component, a secondary drive including substantially irreversible gearing having a first portion with gear teeth driven by one power source and a second portion with gear teeth in mesh with the gear teeth of the first portion driven by the drum at a speed slower than the gear teeth of said first portion and wherein the drum cannot substantially back drive the first portion, thus holding the drum in the event of a hazard condition, positioning means for automatically engaging the first portion power source for accelerating the gear teeth of the first portion of the irreversible gearing to said gear tooth speed faster than the gear teeth of the second portion and in a direction out of interference with the gear teeth of the second portion of the irreversible gearing during normal operations, but allowing interference to lock the gear teeth of the second portion when a hazard condition occurs.



4,625,947

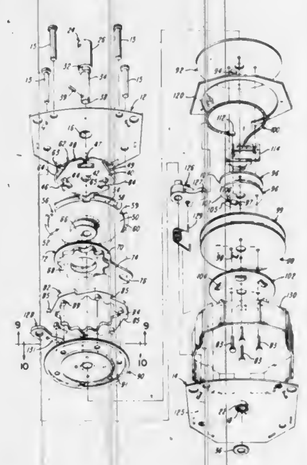
TIRE LIFT/CARRIER

Stephen A. Denman, Centerville, and Garthwood R. Taylor, Dayton, both of Ohio, assignors to Deuer Manufacturing, Inc., Dayton, Ohio

Filed Jul. 2, 1984, Ser. No. 627,029

Int. Cl.⁴ B66D *1/14, 1/34, 1/36, 1/58*

U.S. Cl. 254—323 **21 Claims**



1. A tire lift/carrier or the like including a spool, said spool

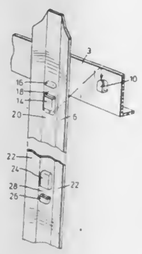
comprising a plurality of plate elements fixed in side by side face abutting relation, one portion of said plate elements intermediate others thereof having its outer peripheral surface recessed relative that of other plate elements by which it is bounded to define therewith a narrow track the base of which is provided by the outer periphery of said portion of said plate elements, said one portion of said plate elements being apertured to form therein a generally rectangular opening to provide a pocket in said spool which is laterally expanded by apertures in said bounding plate elements, one end of a cable having means providing an enlargement thereof anchored in said pocket, a restricted passage defined in said one portion of said plate elements, said passage being open at one end thereof to said pocket and having the other end thereof opening from said base of said track, the direction of said passage being laterally of and substantially at a right angle to a line radial to said spool, said passage providing a path through which said cable extends from said pocket, the configuration of said outer perpheral surface of said one portion of said plate elements, to one side of the opening of said restricted passage from said base, being formed in an essentially spiral arc, facilitating a natural, smooth wrap of said cable about said base and a smooth extension thereof from said spool.

4,625,948

PICKET FENCE

Kaljo Lustvee, 18 Finchley Road, Islington, Ontario, Canada (M9A 2X5)

Filed Feb. 20, 1985, Ser. No. 703,374
Claims priority, application Canada, Jun. 26, 1984, 457500
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—72 **22 Claims**



1. A fence construction comprising: a first transverse rail; a plurality of pickets mounted on the first, transverse rail; mounting means mounting the pickets to the transverse rail and comprising; for each picket, a first mounting location which comprises a first, transverse link and a first, supporting part around the first, transverse link, and a first tongue having a length greater than the width of the first transverse link so that a free end of the tongue abuts the supporting part in use, with the transverse rail including one of the first mounting location and the first tongue and the respective picket including the other of the first mounting location and the first tongue, the mounting means further comprising retaining means for retaining the pickets on the transverse rail.

4,625,949

OXYGEN-FUEL WELDING AND CUTTING CABINET ASSEMBLY

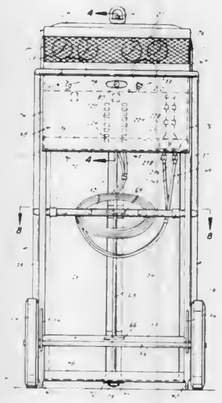
James A. Walker, 337 Westover, Clarksdale, Miss. 38614

Filed Jul. 22, 1985, Ser. No. 757,327
Int. Cl.[4] B23K *7/00*
U.S. Cl. 266—48 **23 Claims**

1. A structure for oxygen-fuel welding and cutting use and medical use, to be used with a cylinder with a valve, hoses, and regulator, comprising:

(a) a cabinet having walls forming an enclosure with an opening for a door, the said opening sized to permit the hands to extend within the cabinet, and to permit passage of a regulator therethrough;

(b) a door movably mounted to the cabinet with means for moving from an open position which allows the said opening to be exposed to permit a regulator and the hands to extend therethrough, and to a closed position which blocks the said opening to prevent the hands or fingers from extending into the opening and prevents removal of the regulator from the cabinet;



(c) means for rigidly mounting a regulator within the cabinet;

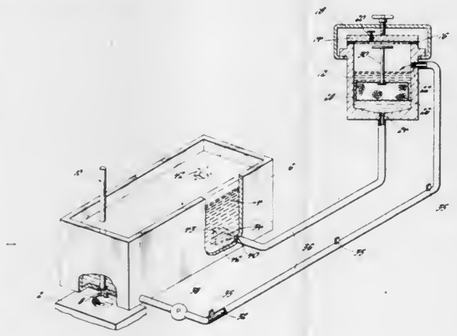
(d) the cabinet having means for allowing an input hose to extend from a cylinder valve to connection with a regulator mounted within the cabinet and for allowing an output hose to extend from the regulator to outside the cabinet, the said means being sized to permit the passage of the input and output hoses but to block the passage of the regulator therethrough.

4,625,950

LEAD ALLOYING APPARATUS

Jackie L. Tobias, Muncie; Larry R. Kline, and Ted O. Moser, both of Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1985, Ser. No. 754,237
Int. Cl.[4] F27B *17/00*
U.S. Cl. 266—200 **5 Claims**



1. Lead-alloying apparatus including a furnace for retaining melt at a first temperature and means associated with said furnace for introducing into said melt less than about 0.06% by weight of an alloyant having a melting point significantly higher than said melt temperature and an ambient temperature solid solubility in lead less than 0.06% by weight said means comprising:

a sealed vessel containing an alloyant-rich master alloy for dissolution into, and alloyant-enrichment of, a relatively small superheated portion of said melt withdrawn from said furnace, said vessel having an inlet for receiving said portion from said furnace, an outlet for returning said alloyant-enriched portion to said furnace, and porous means between said inlet and outlet for substantially containing undissolved master alloy within said vessel;

a heated conduit communicating said furnace with said inlet for conducting said portion from said furnace to said vessel while superheating said portion to at least about the melting temperature of said master alloy;

a return conduit communicating said outlet with said furnace for conducting said alloyant-enriched portion from said vessel to the furnace; and

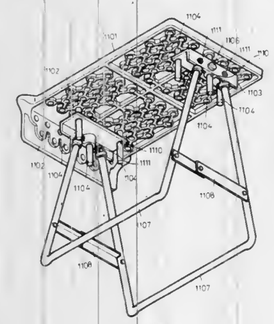
means for circulating said portion from said furnace through said conduits and vessel and back to said furnace to dissolve said master alloy into said portion as said portion circulates therethrough.

4,625,951

WORKBENCH AND CLAMP STRUCTURE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Feb. 8, 1985, Ser. No. 699,673
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—88 **7 Claims**



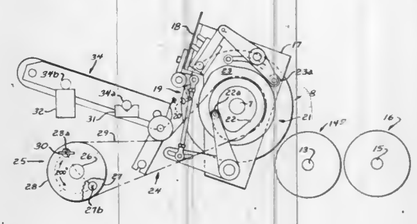
1. A work bench, comprising a pair of spaced blocks, a support post received in each of the blocks for slidable movement therein along a substantially vertical axis, a horizontal work table supported on top of the posts, means for clamping the support posts to the respective blocks, whereby the height of the work table may be adjusted, each of the blocks having a pair of sockets therein, the sockets in each block being arranged in juxtaposition to the respective support post and extending downwardly, a pair of substantially U-shaped legs, each of the legs including a substantially horizontal bight portion adapted to rest on the floor, each of the legs further including a pair of substantially parallel leg portions connected with the bight portion and having free end portions received in the respective sockets, and wherein the work table has a top surface and further has a bottom surface, a plurality of bosses formed integrally with the work table and depending from the bottom surface thereof, each of the bosses having a through aperture formed therein and extending from the top surface to the bottom surface of the work table, the apertures being distributed substantially throughout the work table, and respective ribs connecting adjacent bosses, thereby providing strength and rigidity to the work table during use of the work bench.

4,625,952

SIGNATURE INSERTER

Jorg Schniter, Glenview, Thomas Kazyra, Burbank and Ronald Hastie, Elk Grove Village, all of Ill., assignors to R. R. Donnelley & Sons, Chicago, Ill.

Continuation of Ser. No. 757,634, Jul. 22, 1985, abandoned. This application Mar. 11, 1986, Ser. No. 839,452
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—54 **20 Claims**



1. In a high speed signature inserter to gather books for a saddle stitcher at a cyclic rate exceeding 225 books per minute, said inserter including a driven gathering chain, a signature supply means, a driven rotary extracting drum on a first axis, a guide shoe concentric with a portion of the periphery of the extracting drum, a plurality of movable jaw means disposed about the periphery of the extracting drum to grasp signatures from said supply seriatim with their closed ends leading, an adjustable register stop adjacent the periphery of the extracting drum which controls when a trailing open end of a signature passes beyond an end of the guide shoe, a driven rotary transfer drum on a second axis, a plurality of gripper means disposed about the periphery of the transfer drum to grip the trailing end of each signature and strip the signature from the extracting drum, and an opener drum on a third axis, said opener drum cooperating with the transfer drum to open signatures and drop them successively straddling the gathering chain, the improvement comprising:

a signature form roller adjacent said end of the guide shoe and cooperating therewith to define a gap of predetermined width;

a recess in the periphery of the transfer drum in which each gripper means is positioned, each said recess confronting said gap as a trailing end portion of a signature traverses the gap;

and air nozzle means that directs an air stream through the gap to bend each signature about the form roller and deflect the trailing end portion of the signature into the recess to be gripped by the gripper means.

4,625,953

SHEET SEPARATING DEVICE

Tohru Hamatani, Chiba, Japan, assignor to Hi-Tec Seiko Company Ltd., Chiba, Japan

Filed May 15, 1985, Ser. No. 734,108
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—1 **5 Claims**

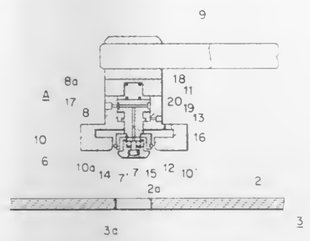
1. A sheet separating device for separating flexible disc-shaped sheet materials from the stack thereof, respective sheet materials having holes in the center thereof in register with each other to define a single hole in said stack, said sheet separating device comprising

an outer member having a contact surface extending in a plane, said outer member being driven to bring said contact surface into and out of contact with said stack, said outer member having a suction chamber therein, said suction chamber having an opening in said contact surface, said opening having a size large enough and adapted to surround said single hole in the stack;

vacuum source means connected to said suction chamber to drawn an inner edge of a sheet material in contact with the

contact surface of said outer member, said inner edge defining the hole of said sheet material;

an inner member housed in said suction chamber and shaped to define a narrow upwardly extending suction gap in cooperation with said outer member, said inner member having a size larger than said single hole to block said drawn inner edge of the top sheet material, and



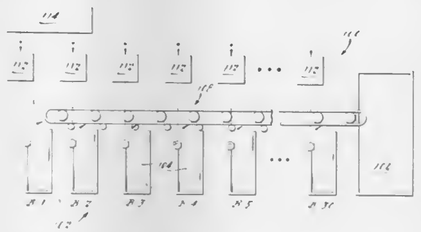
the inner member being relatively movable with respect to the outer member and away from the stack to thereby draw the peripheral section adjacent the hole in the uppermost flexible sheet upwardly and around the periphery of the circular opening in the contact surface of the outer member so as to separate the uppermost flexible sheet from the sheet immediately below it.

4,625,954

SHEET FEEDING APPARATUS

Jon C. Pusey, 25593 Rutledge Crossing, Farmington Hills, Mich. 48018

Filed Nov. 26, 1985, Ser. No. 787,496
Int. Cl.[4] B65H *39/055*
U.S. Cl. 271—9 **6 Claims**



1. A sheet feeder comprising:

a plurality of bins for holding sheets to be fed;

a plurality of extraction means, one of said plurality of extraction means being associated with each one of said bins for extracting at least one sheet therefrom upon actuation; and

control means for establishing a sheet feed cycle and for causing the extraction of said sheets from said bins during said sheet feed cycle, said control means including:

timing means for producing a predetermined sequence of timing signals during each sheet feed cycle, said timing means being configured to provide overlapping sheet feed cycles wherein the last sheet of a first occurring sheet feed cycle is extracted after the first sheet of a second occurring sheet feed cycle is extracted;

switching means responsive to said timing means for selectively actuating selected ones of said extraction means;

missing sheet detection means for providing a missing sheet warning signal upon activation, said detection means being activated upon the occurrence of a timing signal associated with the extraction of a first sheet and being deactivated upon the extraction of a second sheet sequentially after said first sheet; and

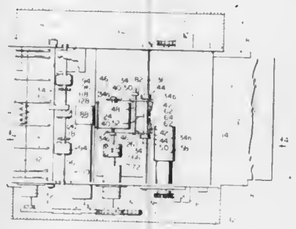
means for synchronizing said detection means with said overlapping sheet feed cycles including means for preventing the activation of said detection means in response to the next occurring timing signal associated with the extraction of said first sheet.

4,625,955

SHEET FEEDER

Donald L. Snellman, 2807 W. Galer St., Seattle, Wash. 98199; Bernard A. Pearson, and John W. Jacobs, both of King County, Wash., assignors to Donald L. Snellman, Seattle, Wash.

Filed Jan. 16, 1985, Ser. No. 692,055
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—10 **32 Claims**



12. A sheet feeder, comprising:

a receiving tray for holding a stack of sheets;

an incrementally driven engagement wheel positioned above said receiving tray for contact with the upper sheet of the stack and operable to separate ad convey the upper sheet from the stack by rotation of said wheel;

a generally horizontally extending first shaft on which said engagement wheel is mounted;

a generally horizontally extending second shaft positioned spaced apart from said first shaft, said second shaft being mountable in a substantially fixed position;

a pair of laterally spaced-apart first and second arms extending between said first and second shafts, each of said first and second arms having a first portion retaining said first shaft and a second portion longitudinally spaced from said first portion and pivotally connected to said second shaft, said first and second arms being pivotally movable about said second shaft within at least a limited range to permit free angular movement of said first shaft in a generally vertical direction during operation;

feed means for receiving the upper sheet conveyed by said engagement wheel and feeding the upper sheet along a feed path to the apparatus to which the sheet feeder is connected;

a connector positioned intermediate of said engagement wheel and said second shaft and extending between said first and second arms, said connector being pivotally attached to each of said first and second arms; and

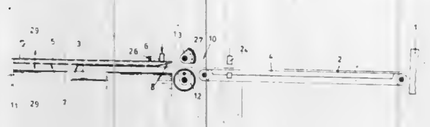
a link extending between said second shaft and said connector, said link being attached to said second shaft and said connector to rotate said second shaft in response to vertical movement of said first shaft and being axially rotatable relative to at least one of said second shaft or said connector to permit angular movement of said first shaft.

4,625,956

APPARATUS FOR FORMING A STACK OF SHEETS

Josef Marass, Seehausen b. Murnau; Rudolf Liepert, Augsburg, and Klaus Weyrich, Rosenheim, all of Fed. Rep. of Germany, assignors to Fa. Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 724,916
Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3418344
Int. Cl.[4] B65H *29/68*
U.S. Cl. 271—183 **19 Claims**



1. In a stacker for accepting sheets from a sheet processing machine and depositing such sheets on a support so as to build a stack with a leading edge, comprising a brake device adapted to slow down said sheets on their way over said leading stack edge to be deposited on said stack, said brake device having at least one brake roller and means for driving it at a surface speed less than a speed of supply of said sheets to said brake device and a sheet nip member adapted to bring each sheet into engagement with said brake roller, the improvement comprising:

said nip member being in the form of a segment drivingly connected with said brake roller for causing rotation of the segment about an axis to which said segment is concentric, and

said stacker further comprising tripping means for causing operation of said segment on the motion of such sheet towards said brake device, at least one suction belt for moving said sheets to said brake device and at least one blow tube placed over said stack and having at a lower side thereof at least one nozzle directed in the direction of transport of said sheets, said blow tube being pivotably supported at an upstream end thereof for turning about an axis normal to the direction of sheet transport, and a compressed air line for the supply of air to said at least one blow tube.

4,625,957

APPARATUS FOR STACKING AND DELIVERING PAPER NAPKINS, PAPER TOWELS, AND THE LIKE

Allen J. DuFresne, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 19, 1984, Ser. No. 622,097
Int. Cl.[4] B65H *31/00*
U.S. Cl. 271—214 **18 Claims**

1. An apparatus for stacking and delivering a stack consisting of a plurality of products comprising:

(a) a frame,

(b) a magazine on the frame for supporting a plurality of said products along a path of product mmovement,

(c) a conveyor on the frame adjacent the magazine, the conveyor having a run which extends intthe direction of said path,

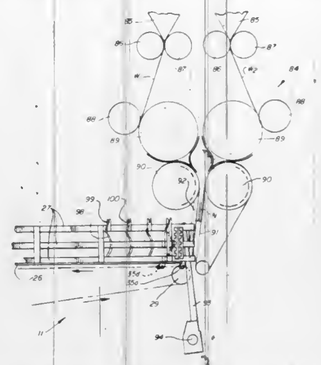
(d) a plurality of fingers mounted on the conveyor and engageable with stacks on the magazine for moving the stacks along said path,

(e) drive means for moving the conveyor at:

(i) a relatively slow velocity during an initial build-up period for a new stack whereby the new stack is built up behind one of said fingers during said initial build-up period;

(ii) a relatively fast velocity after the initial build-up period for the new stack whereby said one finger moves away from the new stack and moves a previously completed stack along said path at a faster speed than the speed at which the new stack is built up; and

(f) means for supporting the new stack on the magazine when said one finger moves away from the new stack after



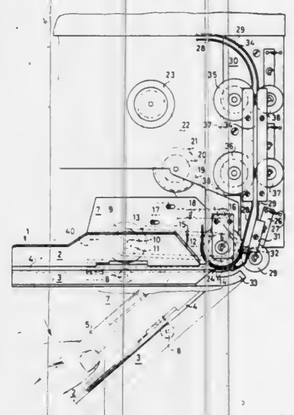
said initial build-up period whereby said new stack can be built up after said initial build-up period without being engaged by any of said fingers and while said one finger moves said previously completed stack away from the new stack.

4,625,958

DOCUMENT FEEDING MECHANISM WITH PIVOTABLE INPUT CHUTE

Horst Dyma, Villingen-Schwenningen; Hans Bommersheim, Brigachtal; Otto Becker, Trossingen, and Armin Heindke, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Fed. Rep. of Germany

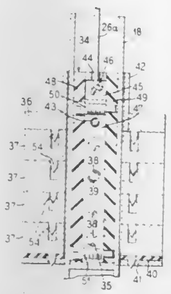
Filed Feb. 22, 1985, Ser. No. 704,373
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 8405504[U]
Int. Cl.[4] B65H *5/06*
U.S. Cl. 271—274 **5 Claims**



1. A document feeding mechanism for feeding documents in a document encoder comprising feed chute means including front and rear guide parts for guiding a document therebetween, document transport means adapted to be switched on and off, power transmission means for said document transport means, axle means pivotally supporting said front and rear guide parts so as to enable lateral pivotal movement thereof, said Power transmission means being also carried by said axle means, and additional document transport means supported on said axle means, said additional document transport means

operating to undertake further transportation of documents after they are transported out of said feed chute means.

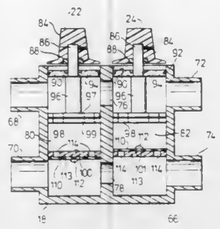
4,625,959
WEIGHT GUIDE FOR EXERCISING MACHINE
John J. Schleffendorf, 2312 Crescent Ave., Waukegan, Ill. 60085
Continuation-in-part of Ser. No. 356,635, Mar. 10, 1982, Pat. No. 4,515,363. This application May 16, 1984, Ser. No. 610,867
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **16 Claims**



1. A weight guide for an exercising machine, comprising:
(a) a base having a hollow vertical column;
(b) a cable having one end extending downwardly into said hollow vertical column, and adapted at its other end to be tensioned and released by the user of the exercising machine;
(c) an elongated plug disposed in said hollow column and connected to said one end of said cable, said plug having a plurality of horizontal apertures;
(d) a number of individual weights embracing said hollow column and each a horizontal aperture;
(e) a connector joining a selected one of said weights to said elongated plug extending through an aligned pair of their apertures and through an aligned pair of vertical slots in said column; and
(f) said elongated plug comprising:
(1) a metal central portion having the apertures receptive of said connector; and
(2) a pair of elongated rigid plastic portions disposed at opposite sides of and secured to said central portion for engaging the interior of said hollow vertical column while holding said central metal portion out of engagement therewith.

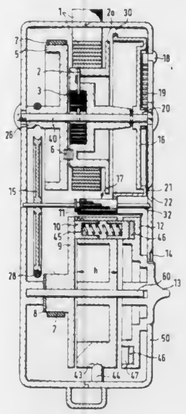
4,625,960
FLUID TYPE ABDUCTOR-ADDUCTOR EXERCISE DEVICE
William Gvoich, 281 Rainbow Dr., Hamilton, Ontario, Canada L8K 4G3, and John B. Rogers, R.R. #1, Hunts Point, Queens County, Nova Scotia, Canada B0T 1G0
Filed Mar. 14, 1985, Ser. No. 711,751
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 **14 Claims**

1. An abductor-adductor exercise device which comprises a pair of actuator means, a pair of connecting means, a pair of air cylinders, each air cylinder having a piston adjustably engageable therein, each connecting means connecting one of said actuator means to one of said pistons, a valve module for varying the resistance to the movement of air within the device and pneumatic connection means pneumatically connecting said valve module to said pair of air cylinders, said valve module comprising two pairs of valves, each pair of valves adapted to control the flow of air through said module, each pair of valves comprising a shut-off valve and a check valve, each of said shut-off valves adapted to be opened, partially opened or closed in response to the adjustment of an external control means, and each of said check valves comprising a closure member, a seat and a securing means securing said seat to said closure member, to allow passage of air therethrough in a first or a second direction, a valve casing, an upper channel extending through the upper portion of said casing, a lower channel extending through the lower portion of said casing, a first connecting channel connecting said upper channel and said



lower channel, a second connecting channel connecting said upper channel and said lower channel, one of said pairs of valves in said first connecting channel between said upper channel and said lower channel and the other of said pairs of valves in said second connecting channel between said upper channel and said lower channel.

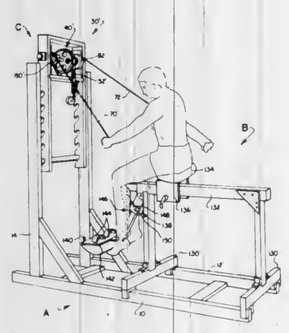
4,625,961
TRANSPORTABLE HOME ENERGY TRAINING DEVICE AND SPROCKET
Dieter C. H. Brand, Bergstrasse 4, D-8201 Hohenthann, Fed. Rep. of Germany
Filed Dec. 16, 1983, Ser. No. 561,961
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248665
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—132 **11 Claims**



1. A transportable home energy training device comprising
(a) housing;
(b) a rotatable supply drum and at least one tension element in said housing, said tension element being capable of being unwound from said supply drum and capable of being rewound again thereon;
(c) a braking member in said housing, coupled to said drum, and a plurality of frictional braking devices capable of being engaged against said braking member, and means for selectively engaging one or more of said braking devices against said braking member;
(d) a variable drive gear in said housing and rotatably coupled to said supply drum;

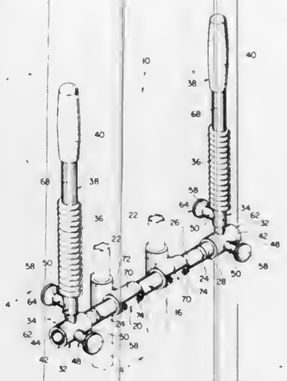
(f) positioning means for positioning said variable drive gear to a number of gear drive positions corresponding to the number of braking devices engaged against said braking disk, said positioning means being coupled between said variable drive gear and said means for selectively engaging one or more of said braking devices, whereby the geared engagement of said indicating wheel is selectively adjusted corresponding to the frictional braking devices engaged against said braking member.

4,625,962
UPPER BODY EXERCISE APPARATUS
Glenn M. Street, State College, Pa., assignor to The Cleveland Clinic Foundation, Cleveland, Ohio
Filed Oct. 22, 1984, Ser. No. 663,169
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—132 **15 Claims**



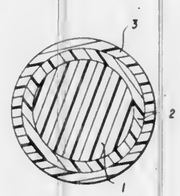
1. An exercise apparatus comprising:
(a) a lower support frame including an upstanding frame portion extending upward to at least about the height of an athlete's waist;
(b) a lower body support structure operatively connected with the lower support frame, the lower body support structure including:
(i) a lower support assembly supported on the lower support frame;
(ii) a longitudinally extending rail mounted horizontally on the lower support assembly and extending parallel to a floor on which the exercise apparatus is disposed;
(iii) an athlete supporting seat mounted to the support rail to be selectively and fixedly positioned therealong;
(iv) a telescopic member pivotally connected at one end with the longitudinally extending rail;
(v) a foot supporting structure connected with an other end of the telescopic member such that telescopic member adjusts a distance between the foot supporting structure and the longitudinally extending rail;
(vi) an angular adjustment mechanism for selectively fixing a relative angular relationship between the telescopic member and the longitudinally extending rail;
(c) an upper frame;
(d) a flywheel rotatably mounted adjacent a top of the upper frame;
(e) an adjustable drag means for selectively adjusting the effort required to maintain rotation of the flywheel;
(f) a drive means for selectively rotating the flywheel, the drive means being mounted contiguous to the flywheel;
(g) an adjustable mounting means for selectively mounting the upper frame to the lower support frame such that the flywheel and drive means are adjustably mounted above the athlete's head;
(h) flexible cables extending downward from the drive means to at least one handle such that pulling the cables downward and rearward with effort as determined by the adjustable drag means causes the drive means to rotate the flywheel.

4,625,963
EXERCISE APPARATUS
William E. Lancellotti, 100 Brookwood Dr., Johnston, R.I. 02919
Filed Jul. 2, 1985, Ser. No. 751,369
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—135 **6 Claims**



1. An exercise apparatus comprising:
a. an elongated cylindrical base member;
b. means for mounting said base member in nonrotatable relation on a supporting structure;
c. a pair of elongated resiliently flexible exercise elements each including longitudinal adjustment means for adjusting the outward extent of each said exercise element with respect to the base member; and
d. means independently and adjustably securing each of said exercise elements to said base member in a plurality of different positions at radially spaced locations around the circumference of said cylindrical base member.

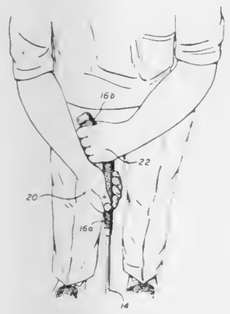
4,625,964
GOLF BALL
Mikio Yamada, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 5, 1984, Ser. No. 627,719
Claims priority, application Japan, Jul. 6, 1983, 58-123898
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—62 **4 Claims**



1. A solid golf ball consisting of a core, an intermediate layer and a cover, said core having a diameter of not more than 32 mm and a specific gravity of not less than 1.50 and being a composition comprising 100 parts by weight of a polybutadiene rubber, 10 to 50 parts by weight of zinc acrylate or methacrylate, 10 to 150 parts by weight of zinc oxide and 1 to 5 parts by weight of a crosslinking or curing agent; said intermediate layer having a thickness of 3.2 to 5.4 mm and being a composition comprising 100 parts by weight of a polybutadiene rubber,

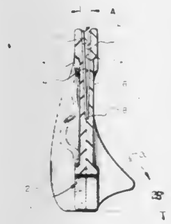
10 to 50 parts by weight of zinc acrylate or methacrylate, 0 to 30 parts by weight of zinc oxide and 1 to 5 parts by weight of a crosslinking or curing agent, the specific gravity of said intermediate layer being lower than that of said core; and said cover having a thickness of 1 to 3 mm and a Shore D hardness of not more than 64.

4,625,965
GOLF PUTTER
Fagan Mullins, 2813 W. Harris, San Angelo, Tex. 76901
Filed Jun. 28, 1985, Ser. No. 749,776
Int. Cl.[4] A63B *53/14*
U.S. Cl. 273—81.3 **1 Claim**



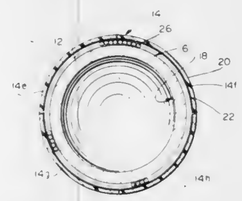
1. A putter having a putter head, a shaft, and grip means for permitting the execution of a putting stroke while gripping the putter with a golfer's one hand placed in position on the grip means with the thumb pointing substantially down the front of the shaft, and with the golfer's other hand placed in inverted position on the grip means above the one hand with the back of the other hand at the front of the grip means, with the thumb of the other hand at the top of the grip means around the back of the grip means, and with the knuckles of the other hand resting along the inner forearm of the golfer's one hand, the grip means comprising a lower portion of sufficient length for receiving the golfer's one hand, the lower portion being a linear extension of the shaft, and an upper portion of sufficient length for receiving only the golfer's other hand, wherein the upper portion of the grip means is bent rearwardly with respect to the putter face and said lower portion.

4,625,966
PLAYING CARD HOLDER WITH CURVATURE
Richard F. Sweet, 1454 Briarglen Ave., Westlake Village, Calif. 91361
Continuation-in-part of Ser. No. 795,933, Nov. 7, 1985. This application Feb. 10, 1986, Ser. No. 828,630
Int. Cl.[4] A63F *1/10*
U.S. Cl. 273—150 **16 Claims**



1. A holder for playing cards, comprising:
first and second plates formed in a three-dimensional space oriented according to x, y and z axes, the plates being defined by respective base portions generally in the x-direction and by upper card contacting portions, both portions being generally disposed in the x,y plane and generally symmetrical about a centerline in the y-direction, said plates being joined together at their base portions and disposed relative to each other with mutually opposed surfaces diverging from each other away from the area of joinder to form a card-receiving slot therebetween for releasably securing playing cards, said slot having an angular divergence which is substantially constant throughout the slot in the approximate range of 1°–8°,
the plate sections remote from the centerline and on either side thereof being generally arcuately curved in the z-direction about an axis which lies generally in the y-direction, thereby increasing the visual security of cards placed in the holder,
the width of the card receiving slot being small enough to releasably secure playing cards placed in the slot by the opposed lateral pressures of the plates adjacent the cards with no substantial plate movement, and
means for supporting the card holder in a generally upright position.

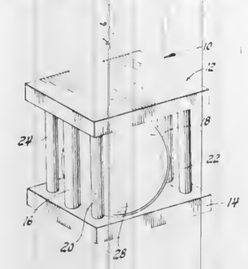
4,625,967
MOVABLE SURFACE GLOBAL PUZZLE
Chin-Lai Yu, 69-51 44th Ave., Woodside, N.Y. 11377
Filed Jun. 4, 1985, Ser. No. 740,993
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S **16 Claims**



1. A movable surface global puzzle comprising a hollow central core, said central core including an outer spherical surface and an inner spherical surface, a shell spaced from and surrounding said core, said shell having at least two component sections, permanent magnetic means for providing an attractive interaction between the core and the shell wherein the outer spherical surface defines a region of magnetic polarity and the inner spherical surface defines a region of opposite magnetic polarity, slide means interposed between the shell and the core, said slide means providing for slidable displacement of the shell with respect to the core and relative movement between respective shell sections.

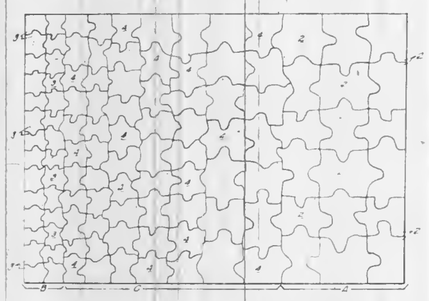
4,625,968
TRAPPED BALL AMUSEMENT DEVICE
Brian L. McDermott, 120 Pickford, Walled Lake, Mich. 48088
Filed Dec. 18, 1984, Ser. No. 682,846
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—156 **7 Claims**

1. An amusement device comprising:
a base;
a cap;
a ball disposed between the base and the cap;
structure means mounted between the base and the cap and connected thereto to prevent the cap from being moved away from the base and to prevent removal of the ball from its position between the cap and the base, said structure means including a pin, the base having an opening for one end of the pin, the cap having an opening for the opposite end of the pin;
the openings in the cap and the base being aligned one with the other such that the pin can be removed by moving one end of the pin toward the opening in the cap until the opposite end of the pin clears the base opening;
a latch member disposed in the cap opening and engageable with the pin to prevent its motion toward the cap, the



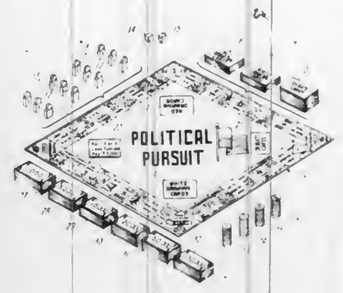
latch member being movable between a locking position in which it prevents motion of the pin toward the cap, and a release position in which the latch member is not disposed in the path of motion of the pin; and
magnet means disposed in the cap to engage the latch member in said locking position, the magnet means being movable to a position in which it releases the latch member for movement toward said release position.

4,625,969
JIGSAW PUZZLE
John L. Donnell, 2740 Kincaid, Eugene, Oreg. 97405
Filed Feb. 19, 1985, Ser. No. 702,789
Int. Cl.[4] A63F *9/10*
U.S. Cl. 273—157 R **2 Claims**



1. A jigsaw puzzle comprising,
a first set of relatively large contiguous puzzle pieces of substantially the same size and comprising one area of the puzzle,
a second set of relatively small contiguous puzzle pieces of substantially the same size and comprising a second area of the puzzle, said second set offset from said first set,
intermediate sized puzzle pieces graduated in size to provide a puzzle wherein piece size is indicative of proper piece location between the first set and the second set of pieces, and
said first set of contiguous puzzle pieces occuping a marginal area of a jigsaw puzzle of rectangular shape.

4,625,970
POLITICAL GAME
Charles F. Childs, and Linda M. O. Childs, both of 2936 Melbourne Ave., Dayton, Ohio 45417
Filed Jun. 3, 1985, Ser. No. 740,627
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—257 **5 Claims**

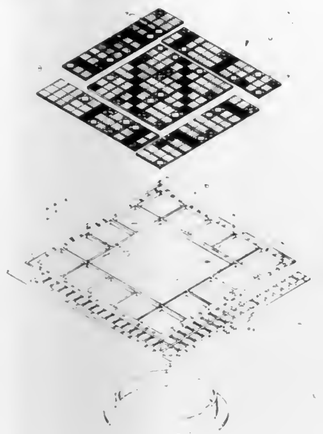


1. A political game comprising a square or rectangular game board which includes, along the other periphery thereof, a plurality of divided spaces or sections, each of which has an unfavorable, favorable, or neutral situation or direction for a player whose playing piece lands thereon; a set of different playing pieces for each player, each playing piece within the set for each player being of the same color; a plurality of drawing cards of a first color, each of which either assists or hinders each respective player's pursuit of higher political office potentially culminating in the Presidency of the United States of America; a plurality of drawing cards of a contrasting color containing only cards which hinder a player's pursuit of higher political office; a plurality of debate cards which challenge the debating players' knowledge of American political history including detailed and obscure knowledge; paper play money of a plurality of different denominations and worth; a pair of dice of generally cubical shape and containing size substantially flat surfaces, each surface containing a different number of dots ranging from one to six; a plurality of vote tokens, having a corresponding plurality of different denominations and worth different number of votes and a set of rules and regulations governing play whereby to win, a player either progresses from candidate to governor to senator to president by sequentially acquiring a combination of money and votes for each office, or is the only player to remain financially solvent whereas all opposing players have gone bankrupt.

4,625,971
CROSSWORD PUZZLE EDUCATIONAL GAME
Jack A. Ferguson, 5818 Glenndale Rd., Glenndale, Md. 20769
Filed Aug. 28, 1984, Ser. No. 644,967
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—272 **20 Claims**

1. An educational word game comprising of combination,
a game board having an upper surface which supports a plurality of removeable marginal game board segments and a removable, larger central game board segment,
all said segments defining a playing surface and provided with coding correlative of scoring opportunities by placing game tiles thereon, said segments are substantially square in shape and said coding is embodied as diverse colors and symmetrical geometrical designs such that reorientation of any or all said segments will afford players a different game since said coding is neutral to reorientation due to the symmetry and colors,
each said marginal segment defined by an N×N matrix with an equal member of rows and columns upon which said tiles are placed,
said central segment defined by a YN×YN matrix with an equal number of rows and columns upon which said tiles

are placed, where Y is a whole number integer greater than or equal to one,



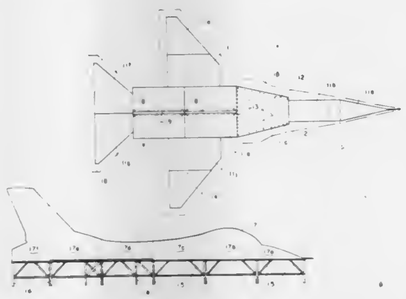
said marginal segments completely circumscribe said central segment such that any row or column of marginal segments has YN+2N marginal segments.

4,625,972

SEMI- TWO-DIMENSIONAL DECOYS

Harry L. Task; Michael B. Tutin, both of Dayton, and Gregory R. Bothe, West Carrollton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,713
Int. Cl.[4] F41J *1/00*; B64C *39/02*
U.S. Cl. 273—348 **2 Claims**



1. A decoy for providing the deceptive appearance of a genuine object comprising:

(a) a first plurality of modular table units, each of predetermind size and shape, and assembled in a predetermined abutting relationship to define a substantially flat surface having the peripheral shape and size approximating a full size plan view of said object;

(b) each of said table units comprising a frame defining a portion of said flat surface, and a plurality of legs independently supporting said frame in a spaced relationship to a surface supporting said table units, whereby the surfaces of all said table units are supported at the same level and a shadow of said plan view of said object is defined on said supporting surface;

(c) at least one of said table units having a surface thereon including means defining a slot; and

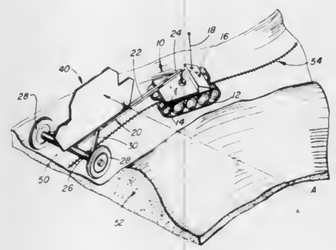
(d) a substantially flat, vertical element supported on said modular units in said slot, said vertical element defining a substantially full size silhouette of a side elevational view of said object.

4,625,973

TRAINING MOVING TARGET SYSTEM

Jean-Guy Dallaire, Loretteville, Canada, assignor to Minister of National Defence of her Majesty's Canadian Government, Ottawa, Canada

Filed Jun. 24, 1985, Ser. No. 748,214
Claims priority, application Canada, Aug. 21, 1984, 461481
Int. Cl.[4] F41J *9/02*
U.S. Cl. 273—366 **6 Claims**



1. A mobile target system comprising:

(a) a driverless, self-propelled tractor vehicle;

(b) a trailer vehicle including a long drawbar, means connecting a distal end thereof to the tractor vehicle for universal articulation thereon and widely spaced ground support wheels mounted on opposite sides of the drawbar, remote from the tractor vehicle;

(c) a projectile target comprising a panel shaped to simulate the silhouette of an armoured military vehicle;

(d) means mounting the projectile target on the trailer vehicle; and

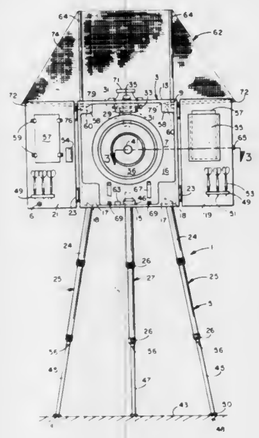
(e) control means for controlling the tractor vehicle to drive along a selected path.

4,625,974

OUTDOOR GAME CABINET

Frank Andrews, 536 Forest Blvd., Sheboygan Falls, Wis. 53085

Filed Dec. 31, 1984, Ser. No. 687,833
Int. Cl.[4] F41J *1/10*; A63B *69/36*
U.S. Cl. 273—407 **8 Claims**



1. An outdoor game cabinet for storing and transporting selected game components including a target board comprising:

a. case means for holding the game components;

b. door means for selectively enclosing the components within the case means and for exposing the target board; and

c. leg means convertible between an extended assembled condition for supporting the case means at a predetermined height above the ground and a collapsed disassembled condition for nesting within the case means for storage therein, the leg means being adjustable to permit proper alignment of the target board on uneven ground surfaces when in the extended assembled condition, the leg means comprising at least three legs, each leg having an upper end for securing to the case means and being adapted to telescope between a fully expanded condition and a fully collapsed condition, wherein at least one leg is pivotally connected at the upper end thereof to the case means at the junction of a back wall and a top wall of the case means, wherein a portion of the case means back and top walls is formed with an angular notch bounded by a pair of spaced vertical walls, and wherein a pin extends horizontally through the spaced walls and through the upper end of the pivotal leg,

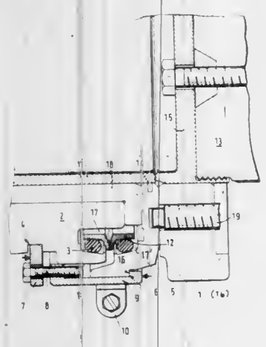
so that the pivotable leg is pivotally received within the case means notch.

4,625,975

INSTALLATION FOR SEALS

Wolfgang Beust, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,266
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 8402968[U]
Int. Cl.[4] F16J *15/18*; B23P *19/04*
U.S. Cl. 277—9.5 **5 Claims**



1. Device for installing sealing between two coaxially arrangement but rotatable parts comprising:

said two parts each being provided with annular abutment surfaces;

said parts being provided with groove means for receiving sealing elements;

two segmented ring means respectively abutting said abutment surfaces; and

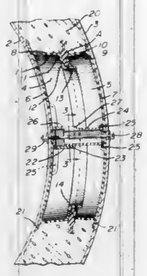
bolt means for temporarily bolting said segmented ring means together.

4,625,976

SHAPING ELEMENT FOR MANHOLE OPENING AND GASKET

Noël Gilbert, 238, 14e Avenue, La Guadeloupe Beauce-Sud Québec, Canada (G0M 1G0)

Filed Mar. 3, 1986, Ser. No. 835,874
Int. Cl.[4] F16J *15/06*
U.S. Cl. 277—12 **15 Claims**



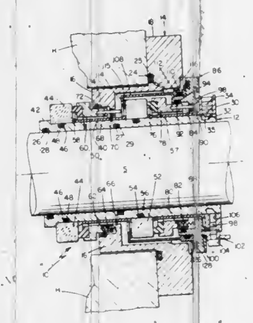
1. A shaping element to define the inner, surface of revolution of an opening through a wall of settable material as it is being formed between an exterior and an interior wall form, said shaping element comprising: exterior and interior mating parts, securing means to secure said mating parts in assembled position providing a peripheral wall configured to produce an inner surface of revolution of a desired size and shape, each of said parts having a longitudinal axis which is co-axial with said opening when the parts are assembled and each part having a peripheral flange with an outer end and an inner end, said outer end adapted to abut the respective wall forms, each flange extending inwardly from its outer end and each defining a part of said peripheral wall, the inner end of the flange of said exterior part being radially inwardly offset relative to the inner end of the flange of said interior part, the inner ends of said flanges being axially spaced in the assembled position of said parts and providing a peripheral channel to receive and retain the radially inward lip portion of an annular sealing gasket which has a radially outward anchoring portion adapted to radially protrude from said peripheral wall to be anchored in said settable material.

4,625,977

CONVERTIBLE, STAND-BY ROTARY SEAL ASSEMBLY

Henri V. Azibert, Stoneham, Mass., and Robert E. Rockwood, Windham, N.H., assignors to A. W. Chesterton Company, Stoneham, Mass.

Filed Apr. 30, 1985, Ser. No. 728,995
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—82 **13 Claims**



1. A seal assembly for sealing the space between relatively

fixed and relatively rotated members one of which extends into the other, including:

first and second relatively rotatable sub-assemblies adapted respectively to be attached and sealed to said respective members to confine the flow of fluid through said space to a restricted passage between them;

first and second seal rings having opposed sealing faces engageable in relatively rotated relation to seal said passage, a first of said seal rings forming part of said first sub-assembly; and

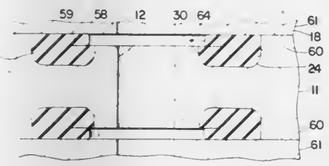
coupling means selectively operable to couple said second of said seal rings alternatively to said first sub-assembly in a seal-inoperative, stand-by state wherein said rings are not relatively rotated and to said second assembly in a seal operative, working state wherein said opposed faces of said seal rings are in relatively rotated engagement to seal said restricted passage.

4,625,978

LOW TEMPERATURE SEAL

Jerry G. Jelinek, La Habra, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed May 20, 1985, Ser. No. 736,152
Int. Cl.[4] F16J *15/10*
U.S. Cl. 277—180 **8 Claims**



1. An elastomeric seal assembly for low temperature, static sealing applications, comprising

a body member having a sealing surface and an annular groove therein, said sealing surface adapted for intimate faying contact with the conforming surface of a stationary mating member, said annular groove surrounding an opening in said body member, which said opening is exposed to fluid under pressure to be sealed,

annular elastomeric seal means in said groove adapted for fluid sealing engagement with said conforming surface of said mating member, said seal means projecting from said groove beyond said sealing surface and adapted for deformation by said mating member,

first and second annular walls in said body member defining the sides of said groove, said walls being spaced from one another in a direction from said opening so that one of said walls is closer to said opening, said first wall being disposed at a high pressure side and said second wall disposed at a low pressure side, said second wall being continuous and extending to said sealing surface, said first wall extending to a second surface recessed from said sealing surface thereby to provide a path to said groove for fluid communication and pressurization of said seal therein from the opening, said seal comprising a projecting seal portion and adjacent recessed seal portion, said projecting seal portion being positioned adjacent said second wall and adapted for deformation by said mating member toward said recessed seal portion, said recessed seal portion being adjacent said second surface.

4,625,979

SEAL ASSEMBLY HAVING A LOW EXTRUSION RESISTANT ELASTOMERIC SEALING BEAD

Josefino T. Inciong, Des Plaines, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Aug. 5, 1985, Ser. No. 762,682
Int. Cl.[4] F16J *15/10*
U.S. Cl. 277—180 **6 Claims**



1. A gasket assembly comprising a gasket member defining an opening therethrough, said gasket member comprising a substantially flat surface portion around said opening,

a low extrusion-resistant elastomeric first sealing bead formed in situ on said one flat surface portion of said gasket member and circumscribing said opening,

a high extrusion-resistant second bead of sealing material formed in situ on said one flat surface portion of said gasket member circumscribing said opening, and the edge of said second bead lying closely adjacent to the edge of said first sealing bead, and

a high extrusion-resistant third bead of sealing material formed in situ on said one flat surface portion of said gasket member circumscribing said opening, and the edge of said third bead lying closely adjacent to the edge of said first sealing bead, said second and third beads straddling said first sealing bead,

said first sealing bead having an overall height which is greater than the heights of said second and third beads, and wherein the volumes of the spaces between said first sealing bead and said second and third beads is less than the volume of the first sealing bead which lies above an imaginary line connecting the uppermost edges of the second and third sealing beads, whereby under compression by a compressing surface, the displacement of the first sealing bead is confined by said second and third beads and the first sealing bead material remains as the primary seal against a compressing surface overlapping adjacent surfaces of said second and third sealing beads and substantially eliminating said spaces,

whereby when said gasket member is placed under compression, said second and third beads restrict displacement of said first bead to prevent extrusion of said first sealing bead.

4,625,980

FUEL TANK

Walter A. Lyzohub, Redford Township, Wayne County, Mich., assignor to Chrysler Motors, Highland Park, Mich.

Filed Jul. 1, 1985, Ser. No. 749,974
Int. Cl.[4] B62K *15/02*
U.S. Cl. 280—5 A **1 Claim**

1. In a vehicle:

a substantially horizontally disposed and generally flat structural member such as a trunk floor;

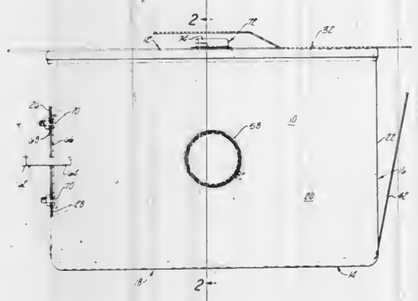
a composite type fuel tank with a two-layer structure including an inner enclosure means of elastomeric material having bottom, top and side walls and an outer enclosure means of rigid material including a member defining integral bottom and side walls and another member defining a top wall, the top wall extending in parallelism and touching engagement with the structural member;

the side walls of the outer enclosure means defining an upper edge portion extending in closely spaced relation to the top wall;

an integral strip of the elastomeric enclosure means extending between the upper edge and the top wall and then folded over in overlying relation to the exterior of the side walls adjacent the upper edge thereof;

a peripheral edge portion on the top wall of the outer enclosure means extending normally to its generally planar extent and over the integral elastomeric strip thereby pressing the strip tightly against the upper edge portion;

at least one opening means through the walls, the opening means being formed by an outwardly turned edge of the outer enclosure wall, a portion of the flexible elastomeric inner enclosure being extended over the turned edge and



folded back over the exterior surface of the outer enclosure wall;

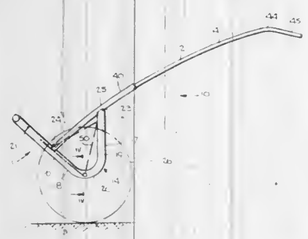
strap means connected at opposite ends to the vehicle structural member and with the midpoint engaging the bottom wall structure of the fuel tank thereby securing the fuel tank to the vehicle and pressing the upper edge portion of the side walls against the top portion in good sealing relation whereby the top wall is held securely against the structural member to produce a tank resistant to outward movement of the top due to internal tank pressure greater than the atmospheric pressure.

4,625,981

HARNESS RACING SULKY

Anthony Marchionne, 35 Linda La., Yonkers, N.Y. 10710

Filed Dec. 17, 1984, Ser. No. 682,245
Int. Cl.[4] B62C *1/08*
U.S. Cl. 280—63 **21 Claims**



1. In a harness racing sulky comprising a chassis, and a first and a second approximately parallel, spaced apart shaft wherein each shaft has a rear end joined to said chassis and each shaft extends forward from said chassis for attachment to a horse to be disposed therebetween, the improvement comprising:

said chassis being a continuous frame member formed by an elongated, horizontally disposed member having a first end and a second end oriented generally transverse to said shafts and a first and second vertically disposed, generally U-shaped member each located respectively below the first end and the second end of said horizontally disposed member, wherein each generally U-shaped member comprises;

a generally vertically disposed and rearwardly inclined back leg having a top end and a bottom end, a generally vertically disposed front leg located forward of said back leg and having a top end and a bottom end, a base member joining said bottom ends of said back leg and said front leg, a transition member joining the top end of said back leg to a respective end of said horizontally disposed member, said rear end of a respective shaft joined to said said back leg, said top end of said front leg joined to said respective shaft forward of said shaft rear end, whereby said back leg, said front leg and the portion of said respective shaft between said rear end of said shaft and said joining of said top end of said front leg to said shaft forms a generally closed triangular structure;

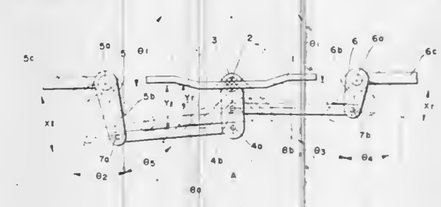
means for rotatably mounting a wheel to said base member of each U-shaped member located so that the axis of each wheel is coincident, whereby said horizontally disposed member is located to the rear of the coincident axes of said wheels.

4,625,982

HANDLE LEVER STEERING DEVICE OF THREE-WHEEL AND FOUR-WHEEL AUTOMOTIVE VEHICLES

Isamu Matsuo, Ono, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 27, 1985, Ser. No. 706,173
Claims priority, application Japan, Feb. 29, 1984, 59-39282
Int. Cl.[4] B62D *7/16*
U.S. Cl. 280—95 R **1 Claim**



1. A handle lever steering device of three-wheel and four-wheel automotive vehicles comprising:

a handle lever supported by a rotary shaft connected to a frame;

a left knuckle arm supported by a rotary shaft connected to the frame and disposed on the left side of said rotary shaft for supporting the handle lever and a right knuckle arm supported by a rotary shaft connected to the frame and disposed on the right side of said rotary shaft for supporting the handle lever, the aforesaid parts constituting an Ackermann mechanism;

a support shaft connected to a left arm of said left knuckle arm and another support shaft connected to a right arm of said right knuckle arm;

a rod end connected to said rotary shaft for supporting the handle lever and having a first support shaft and a second support shaft connected thereto; and

a first tie rod connecting the support shaft connected to said left arm to the first support shaft of the rod end and a second tie rod connecting the support shaft connected to said right arm to the second support shaft of the rod end; wherein the improvement resides in that:

said first support shaft and said second support shaft of said rod end are located on an imaginary straight line extending through the center of said rotary shaft for supporting the handle lever in a front-to-rear direction, and the ratio of the distance Y_1 between the center of the rotary shaft for supporting the handle lever and the center of the first support shaft of the rod end to the distance X_1 between the center of the rotary shaft for supporting the left knuckle arm and the center of the support shaft connected to the left arm is substantially equal to the ratio of the distance

Y_r between the center of the rotary shaft for supporting the handle lever and the center of the second support shaft of the rod end to the distance X_r between the center of the rotary shaft for supporting the right knuckle arm and the center of the support shaft connected to the right arm wherein the distance X_l between the center of the rotary shaft for supporting the left knuckle arm and the center of the support shaft connected to the left arm is substantially different than the distance X_r between the center of the rotary shaft for supporting the right knuckle arm and the center of the support shaft connected to the right arm.

4,625,983

DEVICE FOR REDUCING SPLASH AND SPRAY FROM VEHICLES

Ronald G. Tye, Bishops Stortford, England, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 22, 1982, Ser. No. 370,924

Claims priority, application United Kingdom, Apr. 28, 1981, 8113030

Int. Cl.⁴ B62B *9/16*

U.S. Cl. 280—154.5 R **5 Claims**

1. A vehicle which moves with wheels in contact with the ground having attached thereto a device for reducing splash, spray and bounce back of fluid thrown from the wheels of said vehicle, said device comprising a non-tufted, non-woven sketetal mass of bonded, resilient fibrous members containing 75 to 98 percent by volume of voids in a mat-like structure of thickness at least about 0.95 cm and in which the distribution of voids is so arranged that the ratio of void volume diminishes across the thickness of the structure, there being a greater volume of voids at the face at which fluid enters the structure.

4,625,984

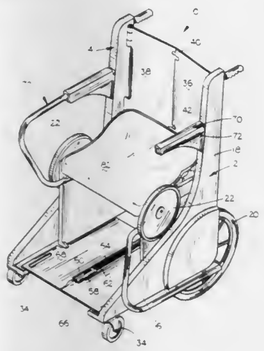
FOLDING WHEELCHAIR

John V. Kitrell, 4639 Holdrege, Lincoln, Nebr. 68503

Filed Aug. 12, 1985, Ser. No. 764,723

Int. Cl.⁴ B62B *11/00;* **B62M** *1/14*

U.S. Cl. 280—242 WC **9 Claims**



1. A folding wheelchair, comprising:

first and second generally L-shaped side frames, each of said side frames including a first frame portion with forward and rearward ends, and a second frame portion extending upwardly from the rearward end of said first frame portion,

a first back panel hingedly secured at one end to said second side frame portion of said first side frame,

a second back panel hingedly secured at one end of said second side frame portion of said second side frame,

said first and second panels being hingedly secured together at their other ends, the hinge connection adapted to stop hinged movement of said panels in one direction when said panels are in a generally coplanar orientation,

a first generally planar hinge plate hingedly secured at one end to said first frame portion of said first frame,

a second generally planar hinge plate hingedly secured at one end to said first frame portion of said second frame,

said first and second hinge plates being hingedly secured together at their other ends, the hinge connection adapted to stop hinged movement of said plates in one direction when said plates are in a generally coplanar orientation,

the hinge connection between said first and second frame, through said panels and plates, permitting the wheelchair to be moved between a folded inoperative position to an operative position,

a first drive wheel rotatably mounted on said first side frame at the lower rearward end thereof,

a second drive wheel rotatably mounted on said second side frame at the lower rearward end thereof,

a first caster wheel mounted at the forward end of said first side frame portion of said first side frame,

a second caster wheel mounted at the forward end of said first side frame portion of said second side frame,

first and second armrest assemblies mounted on said first and second side frames, respectively,

a seat means positioned between said first and second side frames,

and first and second footrest assemblies mounted on said first and second hinge plates, respectively, each of said first and second footrest assemblies being independently movable between a foot supporting position and a non-supporting position while the wheelchair is in an operative position.

4,625,985

ANTI DIVE DEVICES FOR MOTORCYCLES

Yasuo Nakano, and Toshiharu Yoshioka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Apr. 15, 1985, Ser. No. 723,173

Int. Cl.⁴ B62K *25/08*

U.S. Cl. 280—276 **5 Claims**



1. An antidive device for a motorcycle having a front wheel supported by forks, comprising:

(a) each of said forks having an inner pipe and an outer case axially slidably connected, said outer case having an inner chamber and an outer chamber filled with a working fluid;

(b) at least two working fluid passages of different sizes connecting said inner chamber and said outer chamber;

(c) a first brake means and a second brake means; ;

(d) a hydraulic pressure generator;

(e) said first brake means comprising a rotatable caliper bracket which actuates said hydraulic pressure generator, which in turn generates a hydraulic pressure;

(f) means for transmitting said hydraulic pressure to said second brake means, thereby actuating said second brake means;

(g) means, actuated by said hydraulic pressure, for selecting between the working fluid passages.

4,625,986

VELOCIPEDE

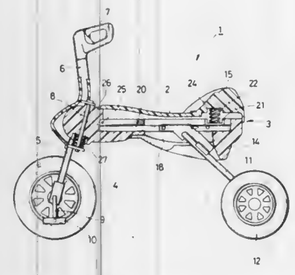
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jun. 10, 1985, Ser. No. 742,886

Claims priority, application Japan, Jul. 19, 1984, 59-150828

Int. Cl.⁴ B62J *1/00;* **B62K** *5/06*

U.S. Cl. 280—282 **4 Claims**



1. A velocipede, comprising frame means including on its upper surface a centrally disposed seat surface, front leg means having front wheel means attached to a lower end of said front leg means, means securing said front leg means to said frame means for a turning movement with respect to said frame means so as to change the direction of said front wheel means, a handle shaft fixedly connected to said front leg means, handle means at an upper end of said handle shaft, rear leg means extending rearwardly and downwardly from said frame means, two rear wheels secured to a lower end of said rear leg means, said frame means comprising separately prepared upper and lower halves, said upper half comprising a saddle providing said seat surface, pivot pin means turnably connecting said upper half at its front end to said lower half, said pivot pin extending widthwise of said velocipede, said upper half and said lower half being so constructed that a clearance is defined between said upper and lower halves, and compression spring means arranged in said clearance for supporting said upper half with respect to said lower half, whereby said upper half is turnable downwardly with respect to the lower half against the forces of said compression spring means for providing a cushioning effect when said upper half is pivoting downwardly about said pivot pin.

4,625,987

SOFT TERRAIN MOTORCYCLE SUPPORT FIXTURE

Barry I. Marsh, 2309 Wood Beach Landing, Virginia Beach, Va. 23455

Filed Aug. 27, 1985, Ser. No. 769,651

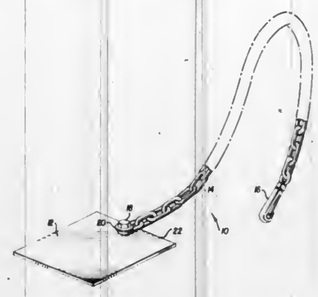
Int. Cl.⁴ B62H *1/02*

U.S. Cl. 280—293 **11 Claims**

1. a motorcycle accessory for enhancing the effectiveness of a motorcycle side stand by allowing an operator to leave a motorcycle supported by its side stand on a relatively soft terrain surface, said accessory comprising.

a thin, relatively flat, metallic plate having a side face surface area of sufficient size for preventing said plate from being pushed sideways into said soft terrain surface by the weight of said motorcycle acting through said side stand when said plate is between said side stand and said terrain surface;

a metallic tether having one end therof affixed to said plate and having a sufficient length extending away from said plate for removably fastening said metallic tether to a member of said motorcycle other than said side stand when said plate is between said side stand and said terrain surface to support said motorcycle, said metallic tether including a length adjusting means for allowing the reduction of slack in said tether extending between the plate and the motorcycle-member fastening point, so that said tether can be made to extend relatively tautly between said plate and said motorcycle fastening member;



whereby a motorcycle operator can park his motorcycle on a soft surface with a side stand by placing the metallic plate under the side stand and relatively tautly fastening the tether to a member of the motorcycle by extending the tether close to the side stand so that when the operator moves the side stand to a stored position he will feel the tether and be reminded that the accessory is present.

4,625,988

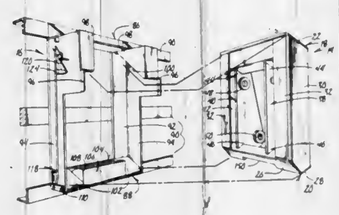
QUICK HITCH AND METHOD OF USING SAME

Reinhold D. Witchey, Waterloo, and James M. Green, Waverly, both of Iowa, assignors to Henke Manufacturing Corporation, Waverly, Iowa

Filed Dec. 19, 1983, Ser. No. 563,185

Int. Cl.⁴ B60D *7/00*

U.S. Cl. 280—461 A **14 Claims**



1. A quick hitch assembly for attaching an implement to a prime move, comprising:

a male portion secured to said prime mover and having spaced apart upper and lower members, and opposite sides, with a convave surface in said lower member, and

a female portion secured to said implement and having spaced apart upper and lower members, and opposite sides,

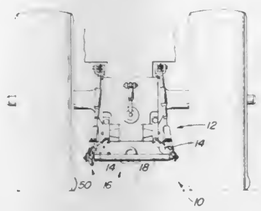
said upper and lower members of said male and female portions having complimentary shapes for mating engagement therebetween;

said female portion including a releasable locking means on said lower end thereof for selectively coupling said male and female portions together;

said locking means including a lock member pivotal between a first locked position and second unlocked position, said lock member comprising an elongated tubular member having a cross-sectional shape in the form of a sector of a circule having an outer convex surface and an opposite inner portion, said lock member being pivotally connected at said inner portion to said lower member of said female portion, said outer convex surface of said lock member matingly engaging said concave surface in said lower

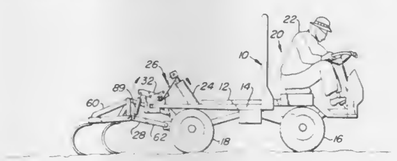
member of said male portion so as to couple said male and female portions together.

4,625,989
TRACTOR/IMPLEMENT HITCH
James R. Allen, Valley Mills, Tex.; William P. Wohlford, Bettendorf, Iowa, and Bernard B. Poore, East Moline, Ill., assignors to Deere & Company, Moline, Ill.
Filed Dec. 16, 1985, Ser. No. 809,592
Int. Cl.[4] B60D *1/04*
U.S. Cl. 280—479 A **10 Claims**



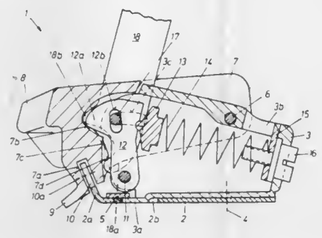
1. A hitch system for connecting an implement tongue to vehicle draft links, the hitch system comprising:
a hook opening toward the draft links, the hook having a base rigidly fixed to the tongue and an end connected to the base via a bight portion;
a drawbar comprising a shaft rotatably coupled to and extending between aft ends of the draft links; and
a latch member fixed with respect to the drawbar, the latch member and the drawbar cooperating to define a hook-receiving aperture, the drawbar and latch member being rotatable from a hook-receiving position wherein the end of the hook may be moved through said aperture and wherein the hook receives the drawbar to a coupled position wherein the aperture receives the bight portion of the hook and wherein the latch member is engaged with the bight portion of the hook to prevent the hook from being moved away from the drawbar.

4,625,990
IMPLEMENT COUPLER KIT FOR TRACTOR
David J. Orth, and George E. Love, both of 11506 E. Whitmore Ave., Hughson, Calif. 95326
Filed Oct. 30, 1985, Ser. No. 793,082
Int. Cl.[4] A01B *59/043*; B62D *53/00*
U.S. Cl. 280—415 R **18 Claims**



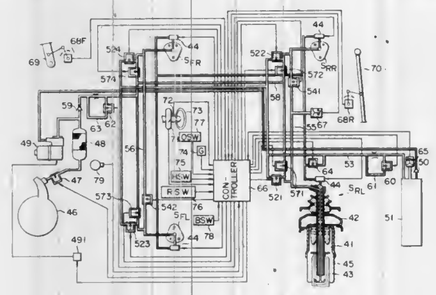
1. In a minitractor having a chassis frame for mounting a removable dump bed, a hydraulic pump bed ram connected to the chassis frame for operating the dump bed, an implement coupler kit adapted to couple the hydraulic ram of the minitractor to auxiliary implements when the dump bed is removed from the minitractor for lifting and lowering the auxiliary implements by actuation of the hydraulic ram comprising:
a. a crank shaft assembly coupled to the rear of the minitractor chassis frame with the dump bed removed and connecting linkage means connecting the crank shaft assembly to the auxiliary implements for raising and lowering the implements wherein said crank shaft assembly includes:
1. a bracket with means for rigidly mounting the bracket on the chassis frame proximate the hydraulic ram,
2. a crank shaft rotatably mounted on the bracket,
3. a drive lever having a first end rotatably mounted on the crank shaft and a second end connected to the hydraulic ram,
4. coupler means operably connecting the drive lever to the crank shaft for transmitting actuations of the hydraulic ram to rotations of the crank shaft,
5. at least one crank arm having a first end fixed to the crank shaft and a second distal end coupled to the connecting linkage means to transmit partial rotations of crank shaft to substantially linear motions in the connecting linkage means.

4,625,991
HEEL HOLDER
Leichtfried, Friedrich, Traiskirchen, Austria, assignor to TMC Corporation, Baar/Zug, Switzerland
Filed Apr. 26, 1985, Ser. No. 727,703
Claims priority, application Austria, May 4, 1984, 1480/84
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—632 **6 Claims**



1. In a heel holder having a base plate adapted to be secured to a ski, a bearing block and means for pivotally supporting said bearing block on said base plate, in an upper region of said bearing block there is arranged a first pivot axle for a binding housing having down-holding means thereon and a stepping spur and in the lower region of said bearing block there is arranged a second pivot axle for a control lever, said control level engaging a control element movably supported on said binding housing, a resilient means for urging said control element into engagement with said control lever, adjusting means for adjusting an initial force at which said resilient means urges said control element into engagement with said control lever, a two-arm release lever hingedly secured to said control lever, an arm on said release lever engaging a projection on said binding housing, the improvement comprising wherein a third pivot axle for said release lever is guided in a slotted hole in said control lever, said slotted hole extending approximately radially with respect to said second pivot axle of said control lever, said third pivot axle also being guided in two arc-shaped slotted holes provided in sidewalls on said bearing block, said arc-shaped slotted holes having as their centerpoint the centerpoint of said third pivot axle for said control lever.

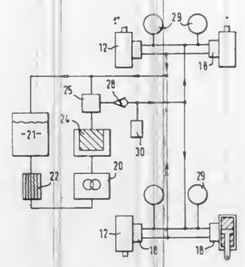
4,625,992
VEHICLE SUSPENSION APPARATUS
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara; Shinichi Takeuchi, both of Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi, and Hiroki Abe, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1985, Ser. No. 694,674
Claims priority, application Japan, Jan. 24, 1984, 59-7202[U]; Apr. 25, 1984, 59-60913[U]; Apr. 25, 1984, 59-60915[U], Apr. 28,1984, 59-63112
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—703 **10 Claims**



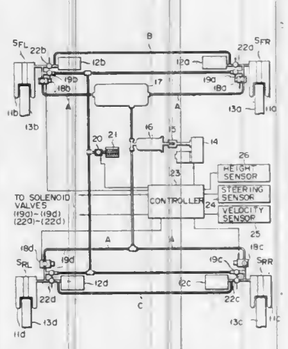
1. A suspension apparatus comprising:
suspension units mounted on respective wheels and having fluid spring chambers;
fluid supply means for supplying a fluid to said fluid spring chambers of said suspension units through control valves;
fluid exhaust means for exhausting the fluid from said fluid spring chambers through exhaust valves;
acceleration detecting means for detecting acceleration acting on a vehicle body in a longitudinal direction thereof; and
nose dive preventing means, for preventing a nose dive, in which front wheel fluid supply solenoid valves are opened for a control time T to supply the fluid to corresponding said fluid spring chambers and rear wheel fluid exhaust solenoid valves are opened for the control time T to exhaust the fluid from corresponding said fluid spring chambers when a negative acceleration detected by said acceleration detecting means exceeds a reference negative acceleration.

4,625,993
VEHICLE SUSPENSION SYSTEM
David A. Williams, Cranfield, and Peter G. Wright, Norwich, both of United Kingdom, assignors to Group Lotus Public Limited Company, Norwich, England
PCT No. PCT/GB84/00014, § 371 Date Sep. 20, 1984, § 102(e) Date Sep. 20, 1984, PCT Pub. No. WO84/02886, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 20, 1984, Ser. No. 653,216
Claims priority, application United Kingdom, Jan. 21, 1983, 8301741
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 **20 Claims**

1. A suspension system for a road vehicle, said road vehicle comprising a vehicle body and road wheels supporting said body by way of said suspension system, wherein:
said suspension system comprises a double acting hydraulic actuator extending between said vehicle body and each of said road wheels,
a pressure fluid circuit into which said hydraulic actuators are connected,
transducer means operatively associated with each of said hydraulic actuators, each transducer means being adapted to provide outputs representative of the load reacted by the associated hydraulic actuator and the displacement thereof,
electro-hydraulic servo valves, each servo valve being operative to adjust a respective one of said hydraulic actuators, and
circuit means responsive to said outputs of said transducer means to generate signals corresponding to a plurality of the heave pitch and roll modes of movement of said vehicle body, to generate further signals corresponding to predetermined generalized displacements in said plurality of modes of vehicle body movement, and to derive from said further signals control signals for said servo valves, whereby said hydraulic actuators are adjusted so as to maintain a predetermined attitude of said vehicle body.



4,625,994
VEHICLE SUSPENSION APPARATUS
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara; Shinichi Takeuchi, both of Okazaki; Masanaga Suzumura, Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi, and Hiroki Abe, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1985, Ser. No. 694,675
Claims priority, application Japan, Jan. 24, 1984, 59-7215[U]; Jan. 24, 1984, 59-7216[U]; Jan. 24, 1984, 59-7221[U]; Mar. 22, 1984, 59-39920[U]
Int. Cl.[4] B60G *17/00, 17/08*
U.S. Cl. 280—707 **10 Claims**



1. A suspension apparatus comprising: suspension units mounted on respective wheels, each unit having a fluid spring chamber; fluid supply means having fluid supply path selecting means for selecting one of large-and small-diameter fluid supply paths and supplying the fluid to said fluid spring chambers through a selected one of said large- and small-diameter fluid supply paths; and fluid exhaust means having fluid exhaust path selecting means for selecting one of large- and small-diameter fluid exhaust paths and exhausting the fluid from said fluid

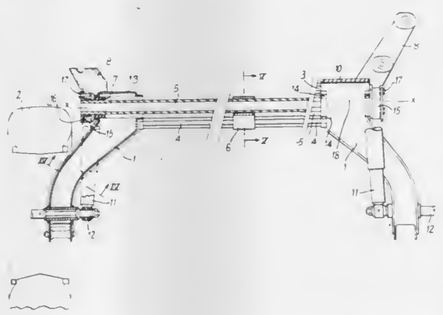
spring chambers through a selected one of said large- and small-diameter fluid exhaust paths, so that the fluid is supplied to said fluid spring chambers of contracted said suspension units, and the fluid is exhausted from said fluid spring chambers of elongated said suspension units when a vehicle changes a position thereof so as to control a change in the position of the vehicle.

4,625,995

SUSPENSION WITH PIVOTABLE ARMS

Jacques Aubry, Cabries; Michel Bonfils, St. Cannat, and Jean-Paul Merlet, Mimet, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 5, 1985, Ser. No. 708,528
Claims priority, application France, Mar. 8, 1984, 84 03603
Int. Cl.⁴ B60G *11/20*
U.S. Cl. 280—723 **10 Claims**



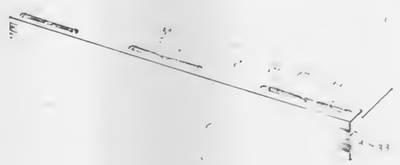
1. A suspension for two wheels of a vehicle, comprising:
(a) a first tube transversely attached at opposite ends to said vehicle's chassis, wherein said first tube is a composite of fiber and synthetic resin;
(b) a pair of arms rotatably mounted on opposite ends of said first tube, each of said arms carrying one of said wheels;
(c) at least two mutually spaced second tubes in parallel and mutually spaced alignment with said first tube being each attached at opposite ends to said arms, said first and second tubes being interconnected at middle portions thereof, wherein said second tubes are each a composite of fiber and synthetic resins.

4,625,996

BOOKBINDING STRIPS AND METHOD OF BINDING BOOKS EMPLOYING SERRATED STUDS

Karl Hymmen, Sparks, Nev., assignor to Velo-Bind, Inc., Sunnyvale, Calif.

Filed Jun. 6, 1985, Ser. No. 741,956
Int. Cl.⁴ B42D *1/00*; B42F *13/06, 3/00*
U.S. Cl. 281—21 A **13 Claims**



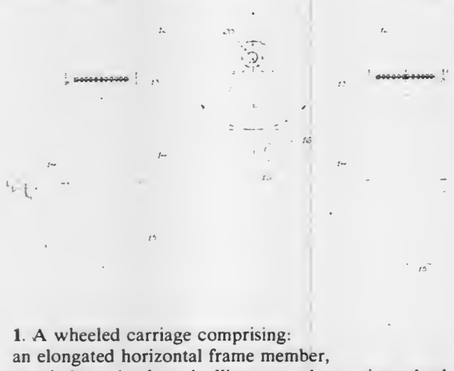
1. A book comprising a plurality of sheets each formed with at least four regularly spaced apart first holes spaced longitudinally of the spine edge of said sheet, a first strip, a second strip formed with a plurality of second holes at the same intervals as said first holes and a groove in the outer surface of said second strip for each said second hole communicating with one of said second holes, and a plurality of plastic studs integral with said first strip, each said stud extending outward from said first strip through a first said hole and a second said hole and being flexible and bendable at approximately a 90° angle, the ends of said studs beyond said second holes being bent at approximately right angles and received in said grooves, the lengths of said grooves being complementary to said studs, and retaining means retaining said ends of said studs within said grooves, said retaining means comprising overhangs along at least one longitudinal edge of each said groove adjacent only the outside of said groove, first teeth formed in said studs and for each said groove second teeth formed on at least one side of said groove complementary to said first teeth adjacent said second hole, said overhang extending from said second teeth to the end of said groove opposite said second hole and being smooth surfaced, said studs being snapped under said overhang.

4,625,997

WHEELED CARRIAGE FOR SUPPORTING AND TRANSPORTING PIPES

Hugh R. McLaughlin, Aberdour, Bray Rd., Foxrock, Dublin 18, Ireland

Filed Apr. 5, 1985, Ser. No. 720,324
Claims priority, application Ireland, Apr. 9, 1984, 871/84
Int. Cl.⁴ B05B *15/00*
U.S. Cl. 285—5 **3 Claims**



1. A wheeled carriage comprising:
an elongated horizontal frame member,
two independently swivelling ground-engaging wheels,
swivel mounting means for mounting said wheels below the frame member at longitudinally spaced positions along said frame member for wheel rotation about horizontal axes and independent swivelling about vertical swivel axes,
at least one pipe support member freely suspended from the frame member at a position between said wheels for pivotting about a substantially horizontal axis perpendicular to the swivel axes of the wheels,
the pipe support member being adapted to support a pipe below and substantially parallel to said pivot axis of said support member with said wheels being disposed laterally one on either side of said pipe, and
a link bar pivotally connected to the frame member for rotation about a substantially vertical axis to permit the carriage to be coupled to a like carriage to form a connected pair.

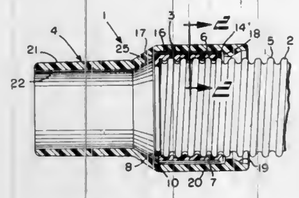
4,625,998

SWIVEL HOSE COUPLINGS

Donald A. Draudt, 31017 Lake Rd., Bay Village, Ohio 44140, and Dale A. Draudt, 26240 Hickory La., Olmsted Falls, Ohio 44138

Filed Apr. 2, 1984, Ser. No. 596,234
Int. Cl.⁴ A47L *9/24*; F16L *17/00*
U.S. Cl. 285—7 **21 Claims**

1. A swivel hose coupling comprising a swivel insert, means for attaching said swivel insert to an end of a hose, said swivel insert including a sleeve portion surrounding such hose end, and a swivel hose end piece surrounding said swivel insert said swivel hose end piece having an internal cylindrical groove therein in which an external cylindrical portion of said sleeve portion having an outer diamater less than the inner diameter of said internal groove is rotatably received, said internal groove having opposite axial inner and outer ends overlapping



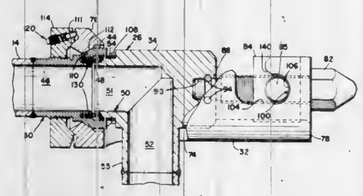
opposite axial inner and outer ends of said sleeve portion to retain said sleeve portion within said internal groove, said sleeve portin having a plurality of circumferentially spaced longitudinally extending grooves in said external cylindrical portion separated by relatively narrow ribs threbetween for reducing frictional contact between said swivel insert and swivel hose end piece during relative rotation therebetween.

4,625,999

REMOTELY-OPERABLE BALL JOINT CONNECTOR

Gordon A. Valentine, Denver, Colo., and Edwin J. Gale, Aurora, Calif., assignors to Stanley Aviation Corporation, Aurora, Colo.

Filed Nov. 19, 1981, Ser. No. 322,926
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—24 **14 Claims**



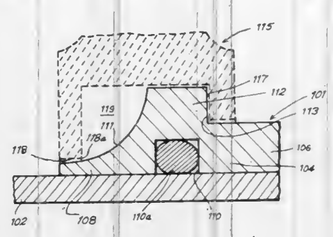
1. In a fluid-conveying connector, an assembly for coupling together a pair of fluid-conveying pipes and comprising a female end member adapted to be fixed to one of said pipes, a male end member adapted to be fixed to the other of said pipes and having an end portion adapted to be received in said female member, a seal ring positioned between and engaging said female member and said end portion of said male member for establishing at least a substantially fluid tight seal between said male and female members, a housing structure receiving said male and female members, means mounting said housing structure on said female member for universal articulation relative to said female member for enabling said housing structure to be angularly aligned with said end portion of said male member, and selectively operable means carried by said male member and engageable with said housing structure for confining said male member between surfaces on said housing structure and said female member with said end portion disposed in said female member and for articulating said housing structure into angular alignment with said end portion whenever said housing structure is initially angularly misaligned with said end portion during installation of said male member with said female member.

4,626,000

SPIGOT AND SOCKET CONNECTIONS

Michael O'Leary, 18, Willbrook, Whitechurch Road, Rathfarnam, Dublin 14, Ireland

Filed Sep. 8, 1983, Ser. No. 530,230
Claims priority, application Ireland, Sep. 8, 1982, 2180/82; Jun. 16, 1983, 1417/83
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—39 **8 Claims**



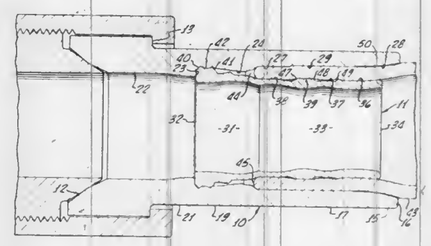
1. A fitting for a spigot and socket connection comprising a socket member having:
(a) a gripping portion which is deformable for engaging a spigot received within the socket member by the application of deforming force by a pressure face of a deforming tool,
(b) a region for accommodating an internal annulus of a deformable sealing material, said region being axially spaced from said gripping portion, so that substantially no deformation is experienced in the vicinity of said region during the application of said deforming force, and
(c) a portion defining a non-axially disposed abutment face for abutting engagement with an abutment face of said deforming tool, said abutment face of said tool being fixedly axially spaced from said pressure face thereof, so that abutment of the abutment face of the tool against that of said abutment-face-defining socket member portion results in said pressure face of the tool being aligned with said deformable gripping portion of the socket member.

4,626,001

FLUID FITTING WITH HIGH TEMPERATURE CAPABILITIES

Francis C. K. Lee, Westchester, Calif., assignor to The Deutsch Company Metal Components Division, Gardena, Calif.

Filed Apr. 16, 1984, Ser. No. 601,007
Int. Cl.⁴ F16L *13/14*
U.S. Cl. 285—94 **15 Claims**



1. A fluid fitting comprising
a first sleeve,
a second sleeve,
said first sleeve being more malleable than said second sleeve, said second sleeve being harder than said first sleeve, having a greater yield strength than that of said first sleeve, and having a greater coefficient of thermal expansion than that of said first sleeve,

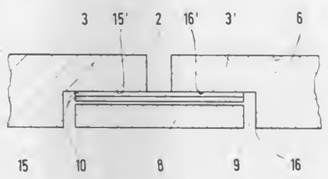
said first sleeve having a first end, a second end and an internal shoulder intermediate said ends thereof,
said second sleeve being received in said first sleeve and having a first end abutting said shoulder and a second end adjacent said second end of said first sleeve,
said first and second sleeves defining an annular space therebetween from said second end of said second sleeve to a location adjacent said shoulder adapted to receive a tube to be connected to said first and second sleeves,
said first and second sleeves including means for securing said first sleeve to said second sleeve and forming a fluid seal therebetween adjacent said shoulder of said first sleeve,
said means including an annular ridge on said second sleeve adjacent said first end thereof, said first sleeve being compressed inwardly so that the interior surface of said first sleeve is deflected around said annular ridge,
said second sleeve including a duality of annular grooves in its exterior surface inwardly of said second end thereof so as to define a land between said grooves having relatively sharp corners at the ends of said land,
said first sleeve being swageable inwardly toward said second sleeve for forcing such a tube into said grooves and causing said corners to dig into said tube,
said first sleeve including a counterbore in said second end thereof, and
a dry film lubricant on the surface of said counterbore for preventing metal-to-metal contact between said first sleeve and said tube at said counterbore so that said tube is not scuffed and caused to fail under vibration.

4,626,002

SELF-ACTING SEAL BETWEEN ADJACENT PIPE ENDS OF A PRESSURE VESSEL

Klaus Hagemeister, Munich, and Alfred Hueber, Merching, both of Fed. Rep. of Germany, assignors to MTU, Munich, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,662
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401569
Int. Cl.[4] F16L *17/00*; F16J *15/16*
U.S. Cl. 285—95 **20 Claims**



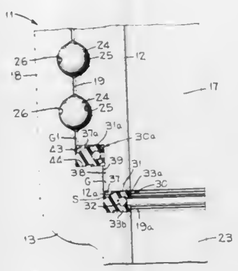
1. A self-acting seal assembly for a circumferential gap between adjacent pipe ends of a pressure vessel adapted for carrying a pressure medium at a pressure greater than ambient pressure, said seal assembly comprising a seal element closing said circumferential gap under the internal pressure in the vessel by the pressure medium, the adjacent pipe ends of the vessel at said gap having inner surfaces for guiding axial and radial movement of said seal element, said seal element including a flexible, relatively thin-walled element capable of flexing across its width, said adjacent pipe ends being constituted by the ends of pipe elements forming said vessel, said pipe elements having walls which collectively define the wall of the vessel, said adjacent pipe ends of the vessel being provided with recesses having bounding surfaces forming said surface which guide the radial and axial movement of the seal element, said seal element being accommodated in said recesses with clearance radially and axially and acting under the internal pressure to engage said bounding surfaces and close said circumferential gap, said seal element including a strip wound as an annular element with overlapping ends.

4,626,003

CONSTANT MOTION SWIVEL SEAL ASSEMBLY

Michael R. Williams, Houston, and Neil G. Weber, Austin, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 3, 1985, Ser. No. 740,710
Int. Cl.[4] F16L *17/06*
U.S. Cl. 285—98 **10 Claims**



1. A constant motion swivel seal assembly for use in a constant motion swivel joint, said seal assembly comprising:
a generally cylindrical inner member having a bore extending axially therethrough;
a generally cylindrical outer member having a bore extending axially through a first portion of said outer member, said outer member having an axially extending passage to receive said inner member, said passage extending through a second portion of said outer member;
an annular sealing ring mounted between an end of said inner member and an end of said axial passage to provide a fluid-tight seal between said inner member and said outer member, said sealing ring being made of material havng a low coefficient of friction, said sealing ring having a relatively large surface against an adjacent surface of said outer member and a relatively small surface against an adjacent surface of said inner member so said sealing ring slides over said surface of said inner member and rotates with said outer member; and
a wedge-shaped annular anti-extrusion ring mounted between said annular sealing ring and a junction between said axial passage of said outer member and an outer surface of said inner member, said anti-extrusion ring having a relatively large surface against an adjacent surface of said inner member and a relatively small surface against an adjacent surface of said outer member causing said anti-extrusion ring to slide over said surface of said outer member and to rotate with said inner member, said sealing ring having a relatively small surface against an adjacent surface of said anti-extrusion ring so said sealing ring slides over said surface of said anti-extrusion ring during rotation.

4,626,004

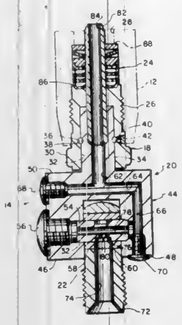
FLUID SWIVEL COUPLING

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Filed Apr. 5, 1983, Ser. No. 482,219
The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.
Int. Cl.[4] F16L *27/00*
U.S. Cl. 285—122 **17 Claims**

1. A fluid swivel coupling for interconnecting a first fluid conduit and a second fluid conduit comprising:
(a) a spindle member;
(b) a yoke extending from said spindle member having parallel spaced apart arms;

(c) a fluid conduit connector connected to said first fluid conduit;
(d) a pivot pin extending between the parallel arms of said yoke for pivotally mounting said fluid conduit connector for transverse rotational movement between said parallel arms defining a first range of movement of said fluid swivel;
(e) a spindle body connected to said second fluid conduit



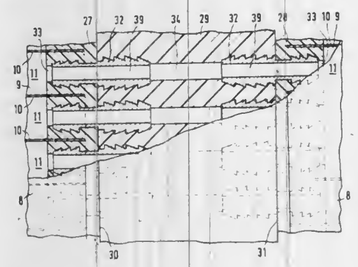
having an axial bore therethrough for accepting said spindle member and including means for attaching said spindle member so that said spindle body rotates on said spindle about their common axis defining a second range of movement of said fluid swivel; and
(f) a fluid passageway in said fluid swivel coupling interconnecting said first and second fluid conduits which is continuous and uninterrupted througnout the first and second ranges of movement of said fluid swivel.

4,626,005

FLUID-TIGHT FLEXIBLE CONNECTION BETWEEN HOLLOW SECTIONS

Gustav Stifter, Wanderhofstrasse 14, D-8922 Piting/Obb., Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,421
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324406
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—137.1 **12 Claims**



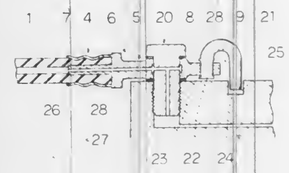
1. A fluid-tight flexible connection connecting matching cavities of adjoining hollow sections, said connection comprising at least two couplings each tightly inserted into a cavity of a different one of said hollow sections with at least one passage extending into the cavity in the respective hollow section, a flexible part extending between the couplings to permit a hinge action between said adjoining hollow sections upon bending of said flexible part, said flexible part having at least one transverse passage aligned with the respective passages of the couplings, each coupling being of a soft elastic material, with its external cross section being tightly fitted in the internal cross section of the cavity, the flexible part itself being of a soft elastic material, and tubular nipples of hard material and forced into the aligned matching passages of an associated coupling and the transverse passage of the flexible part.

4,626,006

HOSE COUPLING

Fujio Noguchi, Nagoya; Yasuo Oguni, Okasaki, and Masayuki Shimizu, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Nishikasugai and Toyoda Gosei Co., Ltd., Toyota, both of, Japan

Filed Apr. 19, 1985, Ser. No. 724,961
Claims priority, application Japan, Apr. 20, 1984, 59-58807[U]
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—158 **5 Claims**



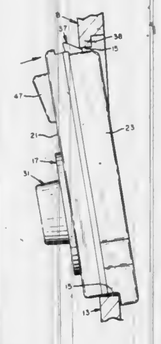
1. A hose coupling comprising;
(a) a coupling body constituted by a hose joint portion connected to a hose, and an eye-joint portion connected to a fixed-side element; and
(b) a pin having its distal and proximal end portions formed such that their respective axes are offset in parallel to each other, said distal end portion being engaged with a hole provided in said fixed-side element when said coupling body is secured to said fixed-side element, and said proximal end portion being connected to said coupling body in such a manner that said distal end portion is pivotal about said proximal end portion.

4,626,007

TILT BOLT LOCK

Wayne F. Larson, Salem, Oreg., assignor to Supra Products, Inc., Salem, Oreg.

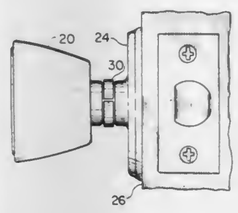
Filed Aug. 3, 1984, Ser. No. 637,521
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—65 **5 Claims**



1. In a lock structure:
a first member,
a second member,
a latch member carried by said first member and having a latching relationship with respect to said second member, said first member being movable from a piston where said

latch member is in its latching position to a second position where said latch member is in an unlatching position,
said latch member and said second member having a camming relationship such that relative approaching movement of the two would cause the latch member to move in an unlatching direction,
first stop means cooperable with said first member and having releasing and non-releasing positions and preventing movement of said first member relative to said second member except when said stop means is in its releasing position,
second stop means cooperable with said latch member and having releasing and non-releasing positions and preventing unlatching movement of said latch member relative to said first member except when said second stop means is in its releasing position.

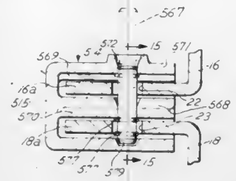
4,626,008
DOOR LOCK APPARATUS
Joseph M. Yadrick, One Biscayne Dr., Slovan, Pa. 15078
Filed Nov. 21, 1983, Ser. No. 553,794
Int. Cl.[4] E05C *1/14*
U.S. Cl. 292—169.17 **4 Claims**



1. In combination with a passage lock door knob assembly for an interior door having an exterior door knob abutting an exterior face plate and connected by a shaft extending through said door and through an interior face plate to an interior door knob, with said interior door knob connected by a locking shaft to said interior face plate, and normally unlocked lock means, lock operating means which can be activated to lock said lock means by advancing said interior door knob toward said interior face plate, the improvement comprising locking prevention apparatus consisting of a removable split ring of substantially rigid material adapted to engage circumferentially the external surface of said locking shaft between the interior door knob and the interior face plate of said door knob assembly, said split ring of substantially rigid material constructed and arranged to limit translational motion of said interior door knob toward said interior face plate, whereby locking of said lock means is prevented.

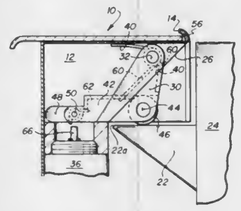
4,626,009
SHIPPING CONTAINER SEALS
Ralph G. Burnett, 7314 Ave., Kenosha, Wis. 53140, and Frank Mikic, 3329 99th St., Kenosha, Wis. 53142
Filed Nov. 30, 1983, Ser. No. 556,463
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—327 **7 Claims**

1. A seal mechanism for joining two bracket members having holes therein comprising a male member means and a female member means cooperating with said male member means to prevent retrograde motion once said male member means and female member means are assembled on said two bracket members, said female member means including locking means cooperating with said male member means to permit the male member means to move in one direction, but precluding retrograde motion, said female member means comprising a box-like hood formed with an inner horizontal shelf having a hole therein and having an open side for receiving said bracket members, said hood having aligned holes in the roof and the inner horizontal shelf, adapted to be aligned with the holes in the bracket members, said male member means comprising a pin having an expandable ring carried thereon, said pin being



adapted to extend through the holes in the bracket members and the aligned hole in the roof into the hole in said inner horizontal shelf to secure the bracket members within the box-like hood.

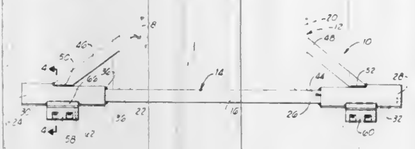
4,626,010
CONCEALED DOOR RELEASE MECHANISM
Leland J. Hanchett, Jr., Phoenix, and Mark A. Lawrence, Mesa, both of Ariz., assignors to Hanchett Entry Systems, Inc., Phoenix, Ariz.
Continuation of Ser. No. 578,886, Feb. 10, 1984, abandoned. This application Jan. 28, 1986, Ser. No. 823,825
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—341.16 **6 Claims**



1. A door release mechanism for a door having a latch bolt, comprising:
a strike block adapted to receive the latch bolt and having a ramped surface over which the latch bolt travels;
said ramped surface having first and second ends and top and bottom sides, such that the latch bolt travels over said top side;
the latch bolt extending into said strike block a maximum distance to said top side of said ramped surface at said first end thereof and extending into said strike block a minimum distance to said top side of said ramped surface at said second end thereof;
said ramped surface adapted for urging the latch bolt into the door, thereby allowing the opening of the door;
said ramped surface having a slotted aperture;
a keeper pivotally mounted within said strike block adjacent said bottom side and said second end of said ramped surface and extending through said aperture;
a dogging member pivotally attached to said keeper within said strike block adjacent said bottom side and said first end of said ramped surface and adapted to engage the latch bolt to maintain the door in a closed position by preventing the latch bolt from traveling over said ramped surface;
a lever member pivotally attached to the end of said dogging member distal said keeper; and
means attached to said strike block proximate said lever member for actuating said lever member, thereby allowing said dogging member and said keeper to pivot within said strike block and to withdraw from said aperture to

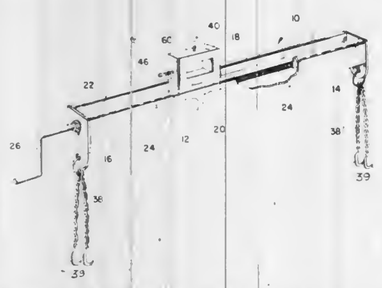
permit the latch bolt to travel over said ramped surface from said first end to said second end thereof.

4,626,011
BUMPER
Jeffry W. Gauthier, Oklahoma City, Okla., assignor to Central Oklahoma Ambulance Trust, Okla.
Filed Feb. 4, 1985, Ser. No. 697,945
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—120 **3 Claims**



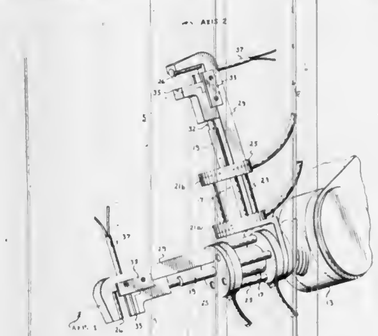
1. An improved bumper for mounting on the frame of a vehicle, comprising:
a cross bar having a first end portion, a second end portion, and a medial portion between the first end portion and the second end portion, whereby the bumper can be mounted on the vehicle by attachment of the medial portion to the vehicle frame so that the end portions of the crossbar extend laterally from opposite sides of the frame;
two tubular reinforcement sheaths, each sheath mounted on one of the end portions of the crossbar to extend circularly thereabout, wherein a slot is formed through the wall of each sheath to intersect the end of the sheath facing the medial portion of the crossbar, said slot extending a selected distance longitudinally toward the opposite end of the sheath;
two braces, each brace attached to one of the sheaths and extending therefrom at an angle to the longitudinal axis of the sheath for attachment to the vehicle frame, and where portions of each brace are extended through said slot and attached to the end portion of the crossbar positioned within the sheath; and
two elastomeric pads, each pad mounted on one of said sheaths on a side of the sheath diametrically opposed to the attachment of a brace to the sheath.

4,626,012
LOAD POSITIONER
Gary Weldele, 2024 Britian Dr., Long Beach, Calif. 90810
Filed Sep. 19, 1984, Ser. No. 651,930
Int. Cl.[4] B66C *1/10*
U.S. Cl. 294—81.3 **14 Claims**



1. A device for lifting and tilting an object in a first single plane and a second single plane orthogonal to the first single plane simultaneously comprising:
a first longitudinal rectangular member having two ends and an open top;
end blocks attached to each end of said first member with holes therethrough;
a movable carriage having threads therethrough positioned inside of said first member;
a threaded rod having two ends extending through said threaded carriage and through said holes in said end blocks to move said carriage in said first member;
a crank attached to one end of said rod to turn said threaded rod;
securing means on each end of said threaded rod to hold said threaded rod in said first member;
lifting means attached to said end blocks of first member;
a second longitudinal rectagular member having the two ends located orthogonal to said first longitudinal rectangular member, said second member slidable positioned through a hole in said carriage;
locking means to prevent said second member from sliding in said carriage after being positioned;
lifting means attached to the bottom of each end of said second member;
adjusting means attached to the top of each of said second member;
adjusting locking means to hold said second member firmly in place whereby said object is tilted in said first plane by moving said carriage inside of said first member by said crank and said second member in said hole in said carriage to move the center of gravity of said object away from being concentric with said hoisting means.

4,626,013
DUAL AXIS GRIPPER
Burton F. Barrows, Mount Dora, Fla., assignor to General Electric Company, Charlottesville, Va.
Filed Dec. 11, 1984, Ser. No. 680,414
Int. Cl.[4] B25J *15/00*
U.S. Cl. 294—88 **6 Claims**



1. A dual axis gripper for use with a robot arm for part manipulation, the arm having a first rotatable wrist arranged for rotation about a horizontal first axis passing perpendicularly through an end of the arm and a second rotatable wrist coupled to said first wrist and arranged for rotation about a second axis perpendicular to and passing through the horizontal first axis, the gripper comprising:
first and second gripper means; and
bracket means for coupling said first gripper means to the robot arm colinear with the second axis and for coupling said second gripper means to the robot arm perpendicular to the second axis said first and second gripper means being conjointly rotatable about the first axis, said first gripper means being rotatable about the second axis such that a part held by said first gripper means is rotated about an axis passing through the part, and said second gripper means being rotatable about the second axis such that a part held by said second gripper means is rotated in a

plane normal to the first axis and at a constant radial dimension from the first axis.

4,626,014

GRIPPER HAVING GRIPPER ARMS SUPPORTED IN A ROTATABLE SLIDING GUIDE

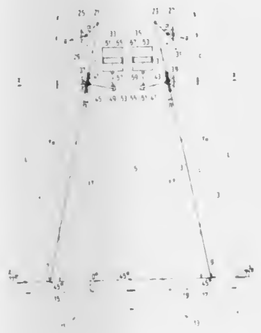
Jakob Vredenbregt; Johannes W. C. M. Van Gerwen; Petrus H. de Leeuw, and Franciscus T. Vleeskens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,859

Claims priority, application Netherlands, May 29, 1985, 8501524

Int. Cl.⁴ B25B *5/04*

U.S. Cl. 294—88 **4 Claims**



1. A gripper comprising at least two relatively displaceable first ends of two gripper arms arranged mirror-symmetrically around a centre line and at least two second ends of the said gripper arms displaceable along circles of equal diameters, characterized in that each of the gripper arms is supported between its first and its second end in a sliding guide which is rotatable about a point occupying a fixed position with respect to the centre of the circle along which the second end is displaceable, while for each gripper arm the connection line between the centre of the said circles and the point of rotation of the respective sliding guide is parallel to the said centre line and in a rectangular coordinate system with a Y axis parallel to the centre line and with the point of rotation of the sliding guide of each of the gripper arms as origin the relations are satisfied:

$$Y = L.\cos\beta - R.\cos\alpha - c \leqq Y_o$$

$$|Y - Y_o| = |L.(\cos\beta - 1) - R.(\cos\alpha - 1)| \leqq |W|,$$

where:

Y = the distance of the point of rotation of the sliding guide from the first end of the perspective gripper arm, with $Y = Y_o$ for $\alpha = 0$,

$|Y - Y_o|$ = the absolute value of $Y - Y_o$

L = the length of the gripper arm,

β = the angle between the gripper arm and the Y axis,

R = the radius of the circle along which the second end is displaceable,

c = the distance between the centre of a circle and the point of rotation of the respective sliding guide,

α = the angle between the Y axis and the radius vector of the second end,

|W| = the absolute value of the maximum tolerance in a direction parallel to the Y axis of the position of the gripper at a reference point P.

4,626,015

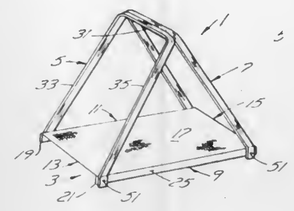
FIREWOOD CARRIER

Robert A. Kruyt, P.O. Box 673, Hudson, Que., Canada (J0P 1H0)

Filed Oct. 15, 1985, Ser. No. 787,441

Int. Cl.⁴ B65D *71/00*

U.S. Cl. 294—152 **1 Claim**



1. A firewood carrier comprising: a generally rectangular bottom having two rigid, parallel side supports and a flexible panel fixed to the side supports and extending between them along their length; a pair of U-shaped, resilient handles each having a pair of legs joined by a cross-bar; one of the handles connected at the end of one leg to one end of one of the side supports and at the end of the other leg to one end of the other side support to have the cross-bar overlie the panel; the other handle connected at the end of one leg to the other end of the one side support and at the end of the other leg to the other end of the other side support to have the cross-bar overlie the panel;

the handles, in their normal, relaxed position, holding the side supports spaced-apart to have the panel gently taut whereby when a pile of wood is loaded onto the panel of the carrier between the legs of each handle and the loaded carrier is then lifted via the handles, the panel will sag drawing the side supports, and thus the legs of each handle, toward each other to tightly hold the wood on the carrier between the legs of each handle during transport.

4,626,016

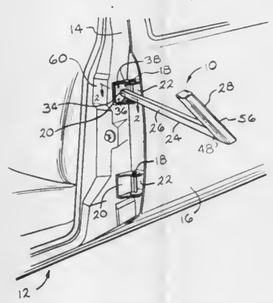
STRUCTURAL AID FOR FACILITATING EGRESS FROM A VEHICLE

Ralph A. Bergsten, 1014 Cellana, Shell Point Village, Ft. Myers, Fla. 33908

Filed Dec. 2, 1985, Ser. No. 803,590

Int. Cl.⁴ B60R *27/00*

U.S. Cl. 296—1 R **9 Claims**



1. In combination with a passenger vehicle, a structural aid comprising sleeve means mounted in a door frame and a handlebar having a first end and a second end, said handlebar comprising a sleeve-engaging portion proximate said first end and adapted to be inserted in and withdrawn from said sleeve means, a handle portion proximate said second end and adapted to be gripped by an occupant of the vehicle when said sleeve-engaging portion is inserted in said sleeve, said sleeve-engaging portion and said sleeve being configured so that, when the former is inserted in the latter, the handlebar extends generally outwardly from the vehicle and said handle portion is positioned so as to be graspable by the occupant.

4,626,017

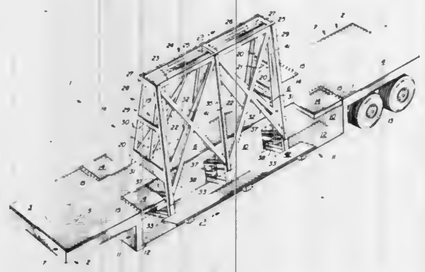
TRAILER STRUCTURE FOR TRANSPORTING SHEET GLASS AND FRANGIBLE MATERIAL

Paul E. Robertson, 1842 Hunter Cir., Shreveport, La. 71119

Filed Oct. 7, 1985, Ser. No. 785,214

Int. Cl.⁴ B60P *3/00, 7/10*

U.S. Cl. 296—3 **20 Claims**



1. An apparatus for supporting frangible sheet material on a trailer chassis and protecting the sheet material from torsional and other road stresses transmitted to the trailer chassis, said apparatus comprising a first A-frame fixedly carried by the trailer chassis; a second A-frame adapted to receive sheets of frangible sheet material and fitted over said first A-frame and pivotally carried by said first A-frame; and cushioning means provided in cooperation with said second A-frame for limiting the pivot of said second A-frame on said first A-frame, whereby said second A-frame is substantially prevented from flexing due to torsional and other road stresses in the trailer chassis and in said first A-frame.

4,626,018

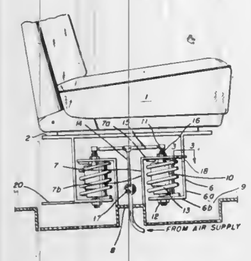
VEHICLE SEAT SUSPENSION APPARATUS

Ross Massey, 216 Harding Pl., Nashville, Tenn. 37205

Filed May 14, 1984, Ser. No. 609,899

Int. Cl.⁴ B60N *1/02*

U.S. Cl. 296—65 R **7 Claims**



1. Vehicle seat suspension apparatus comprising a vehicle seat, said vehicle seat being joined to a first bracket means, a second bracket means being joined to said vehicle, said first bracket means being vertically movable relative to said second bracket means, said first bracket means comprising a first vertical element extending downwardly from said vehicle seat and a first horizontal element joined to said first vertical element remote from said seat, said second bracket means comprising a second vertical element extending upwardly from the connection with said vehicle and a second horizontal element joined to said second vertical element remote from said connection, said second horizontal element being disposed intermediate said seat and said first horizontal element, said first and second horizontal elements being spatially separated and bearing upon each other by an intervening load bearing means, a slot formed in said first vertical element, and a portion of said second horizontal element remote from said second vertical element being disposed in said slot to limit lateral swaying of said seat.

4,626,019

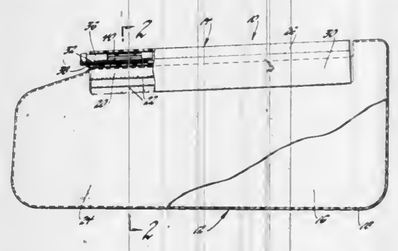
VEHICLE SUNSHADE STRUCTURAL ASSEMBLY

Randy W. Tung, Birmingham; Verner J. Fisher, Jr., Troy; William D. Wilstermann, Utica, all of Mich., and Brian K. Neale, Luton, England, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1985, Ser. No. 801,581

Int. Cl.⁴ B60J *3/00*

U.S. Cl. 296—97 H **3 Claims**



1. A two-piece structural assembly for a vehicle sunshade of the type that is adapted to be joined to a vehicle for movement between a stowed and an operative position, comprising,

a sunshade body including a relatively low density central portion and an integral outer skin of higher density and sufficient thickness to form in cooperation with said central portion a unitary lightweight laminate structure of just sufficient rigidity to allow said sunshade to be moved between said stowed and operative positions by grasping said sunshade body, but of insufficient rigidity to allow said sunshade body to be directly attached to said vehicle,

a sunshade body support having an attachment portion that is adapted to be movably joined to said vehicle so as to allow said sunshade to be so moved between said stowed and operative positions when said sunshade body has been secured to said support, said support also having a pair of spaced retention members that are clampingly engageable over the outer skin of a portion of said sunshade body with sufficient clamping force to so secure said sunshade body to said support to complete said structural assembly, said retention members conforming sufficiently closely to and covering sufficient area of said outer skin of said insufficiently rigid sunshade body portion to distribute said clamping force over said outer skin so as to maintain the structural integrity of said outer skin as said sunshade is so moved between said stowed and operative positions by grasping said sunshade body.

4,626,020

RETRACTABLE VEHICLE BACKLIGHT APPARATUS

Milton C. Kaltz, Allen Park, and Michael P. Alexander, Grosse Ile, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Feb. 8, 1985, Ser. No. 699,784

Int. Cl.⁴ B60J *7/08*

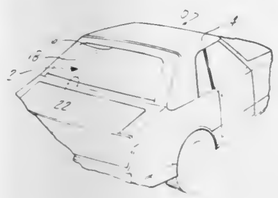
U.S. Cl. 296—107 **9 Claims**

1. A retractable backlight apparatus for a vehicle having a roof structure with a rear window opening comprising:

a rigid, movable, backlight panel for closing the rear window opening in the vehicle roof structure;

a first pair of links, each having first and second ends, the first ends of each of the first pair of links being pivotally connected to spaced upper portions of the backlight panel, the second ends of the first pair of links being pivotally connected to stationary portions of the vehicle, the first pair of links being pivotally movable about the second ends from a first raised position and a second lowered, substantially horizontal position,

a second pair of links, each having first and second ends, the first ends of each of the second pair of links being pivotally connected to spaced lower portions of the backlight



panel, the second ends of the second pair of links being pivotally connected to stationary portions of the vehicle, the second pair of links being pivotally movable about the second ends from a first raised position to a second lowered, substantially horizontal position, in corporation which the first pair of links, to dispose the backlight panel in a substantially vertical orientation within the interior of the vehicle in the lowered position; and

means for moving the backlight panel between the first raised position closing the window opening in the vehicle roof structure and the second storage position.

4,626,021

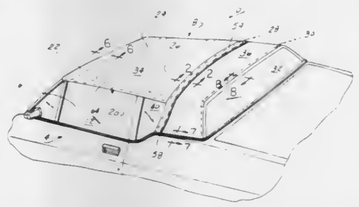
CONVERTIBLE TOP COVER

Peter P. Muscat, 14980 Waterfall Rd., Northville, Mich. 48167

Filed Apr. 8, 1985, Ser. No. 720,742

Int. Cl.⁴ B60J *7/12*

U.S. Cl. 296—107 **5 Claims**



1. A convertible top covering for a convertible automobile vehicle body having a foldable frame enclosing a passenger compartment of said vehicle body, said foldable frame comprised of a header frame member extending across the front of said top frame and a plurality of top frame bow members extending transversely across the passenger compartment of said vehicle, said top covering comprising:

a front panel comprising of a single piece of fabric extending completely over said foldable frame from one of said intermediate bow members forwardly and attached to said header frame;

attachment means securing the rear edge of said front panel along said one of intermediate bow members;

a rear panel comprising a single piece of fabric extending completely over said foldable frame from said one of said intermediate bow members rearwardly thereof, and secured to adjacent portions of said vehicle body; said attachment means also attaching said rear panel to said one of said intermediate bow member; said attachment means including a recess formed in said one intermediate bow frame member receiving the adjacent edges of each of said front and rear panels and further including an elongated retainer member fit into and secured in said recess to there by attach said front and rear panels; said retainer member extending substantially the entire length of intermediate bow frame member;

said retainer member including a hollow ridge portion extending into said recess and wherein said attachment means includes screw fasteners extending through said one of said intermediate bow member and into said ridge.

4,626,022

FLAT BED TRAILER WITH LIGHT REFLECTING STRUCTURE

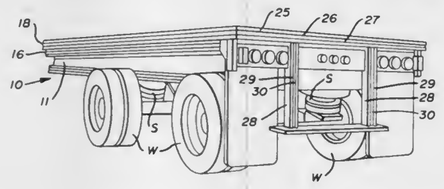
Howard Booher, P.O. Box 277, Randolph, Ohio 44265

Filed Sep. 20, 1984, Ser. No. 652,515

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.⁴ B62D *33/04*

U.S. Cl. 296—182 **4 Claims**



1. In a flat bed trailer structure consisting of a pair of horizontally spaced longitudinally extending, integral I-beams, each having vertically spaced upper and lower horizontally disposed portions and an intermediate vertically disposed web portion, a plurality of longitudinally spaced, transversely positioned cross frame members having spaced vertically disposed side walls positioned in transversely registering apertures in said web portion of said I-beams contiguous with said upper horizontally disposed portions of said I-beams, each of said registering apertures defined by spaced vertically positioned sides, longitudinally extending floor sections positioned on the transversely positioned cross frame members in side by side relatin with one another and with said upper horizontally disposed portions of said I-beams, edge rails positioned on the opposite ends of said transversely positioned cross frame members and mounted thereon, and tie rails mounted on said edge rails, said spaced vertically disposed side walls of said cross frame members welded to said web portions of said I-beams on opposite sides of said apertures therein to form spaced double welds between said cross frame members and said I-beams, said floor sections and the edge rails affixed to said cross frame members, and a rear cap extending across the rear of said flat bed trailer, the improvement in combination therewith comprising wide flat groove means in portions of said I-beams and in portions of said tie rails and in portions of said rear cap, and light reflecting material positioned in said groove means so as to edge light said flat bed trailer when light from a light source is directed thereagainst.

4,626,023

SLIDING ROOF HAVING A SLIDING INSIDE ROOF LINING

Alfons Lutz, Emmering, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,723

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323396

Int. Cl.⁴ B60J *7/04;* **B32B** *3/12, 7/10*

U.S. Cl. 296—216 **30 Claims**

1. A sliding roof for motor vehicles having a transparent rigid sliding cover by means of which an opening in the roof can be selectively closed or at least partially exposed, as well as having a frameless inside cover lining that is displaceable, at least in the sliding direction of the sliding cover, independently from the sliding cover, said cover lining having lateral guide edges guided in guide means, wherein the inside cover lining is formed as a multi-layer panel having at least a core layer of a



first thickness and density and a cover layer, said core and cover layer having essentially equal transverse dimensions, said cover layer being applied at least on one side of said core layer, and the core and cover layers, in an area of their lateral edges, being compressed together in a manner reducing said thickness and increasing said density of at least said core layer relative to the first thickness and density thereof and forming said guide edges as a result.

4,626,024

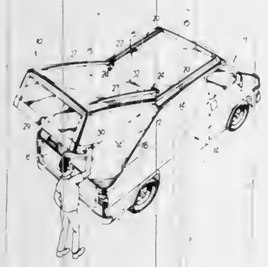
PICKUP VAN

Jack D. Swann, 3668 Cascade Palmetto Hwy., Atlanta, Ga. 30331

Filed Jul. 5, 1985, Ser. No. 752,123

Int. Cl.⁴ B60J *7/02*

U.S. Cl. 296—216 **7 Claims**



5. A truck convertible between the configuration of a panel truck and the configuration of a pickup truck, and with said truck comprising, in combination, a fixed body section having two sides joined by a top that shelters a forward portion of a cargo bay, a movable body section having two sides joined by a top, and guide means comprising a pair of rails mounted atop said fixed section top and a pair of runners pivotably mounted to a forward end of said movable section for movement along said rails for guiding said movable body section between a rear position with said movable body section top sheltering a rear portion of said cargo bay in sealing engagement with the fixed body section and a forward position with said movable body section top positioned above said fixed body section top exposing said cargo bay rear portion to ambience, whereby the forward end of the movable body section may be lifted from its sealing engagement with the fixed body section, placed upon the rails, and slid upon the rails to its forward position.

4,626,025

POWER OPERATED CLOSURE FOR VEHICLE ROOF OPENING

Walter Haecker, Hemmingen; Andreas-Uwe Nemenz, Rutesheim, and Hans Weiner, Muehlacker, all of Fed. Rep. of Germany, assignors to Dr. Ing. H.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 606,576

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316406

Int. Cl.⁴ B60J *7/11, 7/19*

U.S. Cl. 296—218 **7 Claims**



1. A power operated closure arrangement for an opening in a roof of a motor vehicle comprising:

a motor situated within the vehicle body;

a closure member for selectively covering the opening in the roof;

an element movable between a locked position and an unlocked position by the motor and which is engageable and disengageable by the motor with the closure member for locking the closure member to said vehicle and for moving said closure member between a closed position and a canted position;

a control system for controlling the motor and controlling the movement of said element, and

sensing means for permitting said element to move between the locked position and the unlocked position only when the closure member is situated in said opening, the closure member being completely removable from the vehicle and replaceable into the opening only when said element is in the unlocked position.

4,626,026

AUTOMOTIVE ROOF STRUCTURE WITH A DETACHABLE SET ROOF

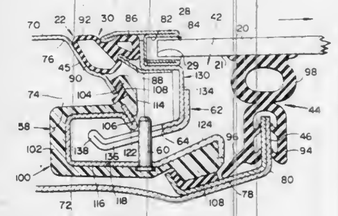
Masuo Hasegawa, Isehara, Japan, assignor to Nissan Shatai Company, Limited, Hiratsuka, Japan

Filed Mar. 15, 1984, Ser. No. 590,066

Claims priority, application Japan, Aug. 23, 1983, 58-153963

Int. Cl.⁴ B60J *7/11, 7/19;* **B62D** *25/07*

U.S. Cl. 296—218 **11 Claims**



1. A T-top for a vehicle, comprising:

a vehicle roof including a three-sided opening and a central pillar extending in the longitudinal direction of the vehicle body, said opening including an edge along said three sides, one of said edges defined along said center pillar;

a set roof receivable in said opening along said three sides and having an outer edge unbounded by said three sides; and

an inner latch mechanism for securement of said set roof in said opening, said inner latch mechanism including:

(a) a guide pin installed in said center pillar edge;

(b) a guide strip formed along an edge of said set roof and including a guide groove engageable with said guide pin, said guide strip including an upwardly bent edge; and

(c) a recess formed in said center pillar edge for receiving said guide strip, said recess including a downwardly extending lip engageable with said upwardly bent edge of said guide strip;

wherein upward tilting of said set roof from said outer edge disengages said inner latch mechanism, and wherein movement of said set roof is restricted in a direction transverse to said longitudinal direction of said vehicle body, when said set roof is received in said opening, by means of said engagement of said downwardly extending lip and said upwardly bent edge.

4,626,027

SLIDING ROOF FOR A VEHICLE

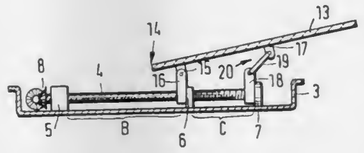
Rolf Farmont, Dusseldorf, Fed. Rep. of Germany, assignor to Farmont Produktion GmbH & Co. Kg, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,778

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404541

Int. Cl.⁴ B60J *7/057, 7/04*

U.S. Cl. 296—223 **8 Claims**



1. A sliding roof for a vehicle comprising:

a plate having a closed position in which it closes an opening in the vehicle roof and being movable lengthwise of the vehicle to a plurality of positions for varying the amount of opening in the vehicle roof;

front support means for supporting the front end of said plate, said front support means being movable lengthwise of the vehicle to move said plate to said plurality of different positions, said front support means including a horizontal transverse axle connected with the front end of said plate for joint movement therewith;

rear support means for supporting the rear end of said plate, said rear support means comprising a support member connected to the rear end of said plate at a predetermined distance from said horizontal transverse axle for joint movement with said plate and a rear support movable lengthwise of the vehicle relative to said support member to adjust the height of the rear end of said plate to thereby vary the amount of opening at said plurality of positions of said plate; and

actuator means for moving said front support means and said rear support in predetermined relative relationship to thereby provide for movement of said rear support relative to said support member, said actuator means comprising threaded spindle means extending lengthwise of the vehicle, said front support means and said rear support comprising socket means having internal threads for receiving said threaded spindle means therein, thread pitches of said threaded spindle means in a zone of movement of said front support means and in a zone of movement of said rear support being relatively different.

4,626,028

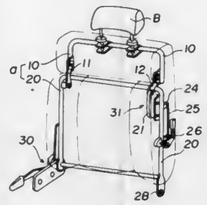
SEAT FOR VEHICLES

Susumu Hatsutta, and Yasuji Ikisu, both of Tokyo, Japan, assignors to Mitsubishi Motors Corp. and Tachikawa Spring Co., Ltd., both of, Japan

Filed Oct. 11, 1984, Ser. No. 659,626

Int. Cl.⁴ A47C *31/00*

U.S. Cl. 297—289 **6 Claims**



1. In a seat for vehicles wherein the seatback having two sides is divided into an upper part having an upper frame member and a lower part having a lower frame member, said upper frame member connected for inclination relative to said lower frame member, said lower frame member mounted for inclination on a seat frame, and seat further having a first reclining device fixed on one side thereof for adjusting the inclination of said lower seat frame forward and backward relative to said seat frame, the improvement comprising:

a hinge bracket connecting said upper frame member to said lower frame at said one side corresponding to said first reclining device for one-way inclination in the forward direction,

an arm fixed to the lower part of said upper frame member at the other side opposite said hinge bracket and extending therefrom for pivotal connection to an intermediate reclining device,

an intermediate reclining device mounted on the upper part of said lower frame member on said other side for controlled forward inclination of said upper frame member in relation to said lower frame member, said arm pivotally connected to said intermediate reclining device for forward pivoting with respect thereto, and

a manual operating mechanism fixed to the lower end of said lower frame for actuating said intermediate reclining device to permit free rotation of said upper frame in relation to said lower frame,

whereby the degree of inclination between said upper frame member and said lower frame member can be selectively established by a seat occupant.

4,626,029

WORK CHAIR

Egon Bräuning, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

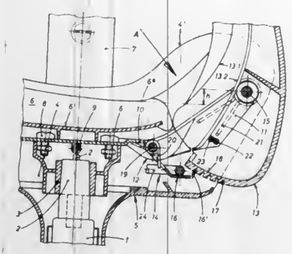
Continuation of Ser. No. 541,112, Oct. 12, 1983, abandoned. This application Jan. 3, 1986, Ser. No. 816,680

Claims priority, application Switzerland, Oct. 21, 1982, 6131/82

Int. Cl.⁴ A47C *1/024*

U.S. Cl. 297—367 **4 Claims**

1. A chair with an adjustable backrest support comprising a seat shell rotatably mounted on a chair column, said adjustable backrest support is connected to said seat shell by a fork-shaped bearing, a locking arrangement including an engagement claw for securing a portion of the backrest, the chair further comprising said seat shell having a base plate assembly containing said fork-shaped bearing in the form of symmetric girders projected from a rear part of the chair, said backrest support having an upper part and a lower part, said lower part having a shell shape formed by two side walls and an end wall an external surface of said endwall having a plurality of transverse recesses therein for engagement with said engagement claw of the locking arrangement providing releasable engagement coupling between the base plate and the end wall of said backrest support for adjusting the tilt of the backrest.



4,626,030

BABY CARRIAGE

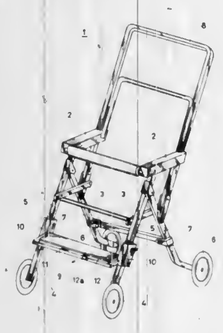
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Aug. 16, 1985, Ser. No. 766,897

Claims priority, application Japan, Sep. 10, 1984, 59-137744[U]

Int. Cl.⁴ A47C *7/50*

U.S. Cl. 297—429 **3 Claims**



1. A baby carriage, comprising leg means including a pair of front legs with front wheels attached to said legs, a footrest extending between and being attached to said pair of front legs, said footrest comprising first and second foot supporting surfaces adapted for selectively appearing in a foot supporting position, said first and second foot supporting surfaces comprising an upper plate and a lower plate superposed on each other, and two connecting members for connecting said upper and lower plates to each other, first journal means tiltably securing one end of said connecting members to a side of said lower plate and second journal means tiltably securing the other end of said connecting members to a lateral middle portion of said upper plate, whereby an upper surface of said lower plate forms said first foot supporting surface, and wherein a surface of said upper plate forms said second foot support surface.

4,626,031

APPARATUS FOR LOOSENING AND/OR BREAKING COAL DEPOSITS, ROCKS, GRANULAR OR LUMPY MATERIAL, OR SCRAP

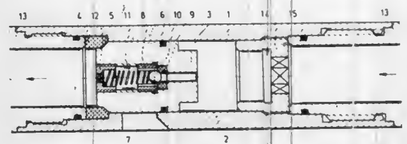
József Németh; László Belley, both of Budapest; György Gergo; Béla Sebestyén, both of Pécs, and Zoltán Vida, Komló, all of Hungary, assignors to Gepipari Technologiai Intezet and Mecseki Szenbanyak, both of Budapest, Hungary

Continuation of Ser. No. 476,521, Mar. 18, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 684,976

Claims priority, application Hungary, Aug. 4, 1982, 2511/82

Int. Cl.⁴ E21C *37/14*

U.S. Cl. 299—16 **1 Claim**



1. An apparatus for loosening mineral matter from a bed thereof and particularly along a steep front provided with a bore hole, said apparatus comprising:

a multiplicity of identical axially spaced-apart breaking units, each of said breaking units consisting of:

a housing defining an axial bore having an inlet end and an outlet end for compressed air,

a free-floating differential piston displaceable in said bore axially between a first limiting position wherein said piston is proximal to said inlet end and a second limiting position wherein said piston is proximal to said outlet end, said piston being configured such that oppositely effective surfaces thereof subjected to pneumatic pressure solely result in the displacement of said piston between said limiting positions, the larger effective surface upon pressurization biasing said piston into said second limiting position, and

a spring biased check valve wholly located in said piston and movable therewith and oriented to open upon flow of air under pressure from said inlet end to said outlet end by said flow of air when said piston is in said second limiting position and permitting flow of air under pressure through said piston when said piston is in said second position and blocking reverse flow of air through said piston, said housing being formed with a braking air slot opening laterally toward said mineral matter, blocked by said piston in said second limiting position and unblocked upon movement of said piston to said first limiting position;

respective identical connecting pipes between the housings of said units with each connecting pipe threadedly engaging the outlet end of each relatively more upstream unit adjacent the respective connecting pipe and threadedly engaging the inlet end of the adjacent relatively more downstream unit whereby said pipes and said units define a string substantially filling said bore hole and having an upstream end; and

means for connecting said upstream end of said string to a high pressure compressed air source, whereby said units are successively filled with compressed air under high pressure and the respective pistons are urged by the high pressure into the respective second limiting positions and upon relief of pressure at said inlet end of said string by differential piston action said pistons are successively and automatically displaced into the respective first limiting positions to discharge air under high pressure in succession from the slots of said units with delay between the successive pressure discharges, said slots being limited to sides of said housings turned toward said mineral matter to be loosened and away from said bed, each of said housings being provided with only a single such slot, a locking

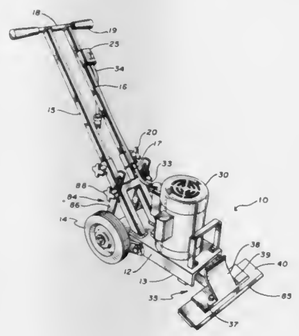
collar being secured in said outlet end of each housing for sealing engagement by the respective piston and is held in the respective outlet end by a portion of an adjoining one of said connecting pipes threaded into the respective outlet end.

4,626,032
ROCK DITCHER
Jesse W. Harris, 815 Afterglow, Apt. 21D, San Antonio, Tex. 78216, and Louis L. Lutich, 27039 Ramblewood, San Antonio, Tex. 78261
Filed Jun. 18, 1984, Ser. No. 621,781
Int. Cl.[4] F02F *3/08, 5/06*
U.S. Cl. 299—36 **26 Claims**



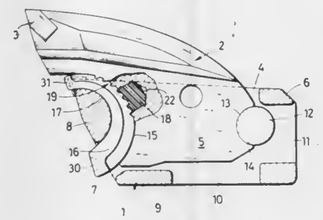
1. Apparatus for excavating hard soils comprising:
an elongate support means;
an endless chain having a cutting surface capable of movement relative to said support means;
drive means for moving said endless chain;
means for concentrating the cutting force on said cutting surface; and
means spaced along said support means for changing the point of the concentrating force along said cutting surface while said endless chain is being moved relative to said support means.

4,626,033
CARPET AND TILE STRIPPER WITH CONTROLLABLE VECTOR
Martin L. Anderson, 4417 Third St., NE., Minneapolis, Minn. 55421
Filed Nov. 19, 1984, Ser. No. 672,602
Int. Cl.[4] A47L *11/12*
U.S. Cl. 299—37 **2 Claims**



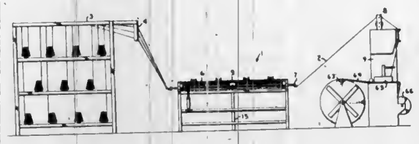
2. A carpet and tile stripping machine comprising a support frame;
motor means mounted on said frame;
said motor means including eccentric means driven by said motor means to produce orbital motion in a substantially horizontal plane; handle means connected to the rear portion of said frame for guiding and maneuvering said carpet stripping machine; a cutting blade mounting assembly positioned on said frame for orbital movement in a substantially horizontal plane; said assembly having an elongated drive bar portion and a transversely extending cutting blade mounting portion, said elongated drive bar portion being operatively connected to said eccentric means with said cutting blade mounting portions being positioned beyond the front of said frame whereby the cutting blade portion is driven in an orbital, substantially horizontal path by said eccentric means; the improvement comprising:
(a) motion retainer bar means connected at one end thereof to the drive bar portion and at the other end thereof to the front end of the frame, said ends being respectively connected to connection means wherein at least one of said means is adjustable to be capable of varying the distance between the connection means and the motor means; and
(b) said drive bar includes an elongated slot extending along its length thereof, said motion retainer bar means including a link pivotally mounted between the support frame and said drive bar slots such that said link may be positioned more rearwardly or forwardly in said slot so as to alter the angle between said drive bar portion and the support frame.

4,626,034
CUTTER-BIT ASSEMBLIES
Oswald Breuer, Dortmund; Bernd Steinkuhl, Lünen; Franz Roling, Nordkirchen; Norbert Hesse; Christoph Rassmann, both of Lünen; Gunther-Dietmar Schoop, Ottmarsbocholt, and Werner Höltken, Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany
Filed Feb. 5, 1985, Ser. No. 698,520
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404295; Nov. 6, 1984, 3440448
Int. Cl.[4] E21B *10/00*
U.S. Cl. 299—91 **20 Claims**



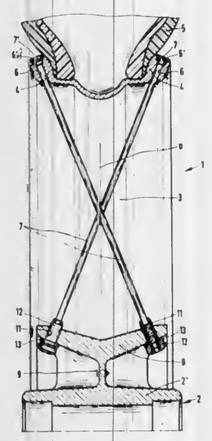
1. A cutter-bit assembly, comprising: a holder (**1**) defining an open pocket (**4**), a cutter-bit (**2**) having a shank (**5**) detachably mounted in the pocket, an arcuate tapered gap formed between the shank and an inner face (**17**) of the pocket, bearing means (**12, 13**) between the shank and the holder opposite the gap, a removable tapered wedge element (**16**) fitted in the gap, the wedge element and the shank forming first and second complementary components, an insert (**18**) made from deformable plastics material removably carried by one of the complementary components and having an exterior portion extending outwardly from a surface of said one component, and a serrated metallic portion (**19**) on the other of the components disposed in direct contact with said exterior portion of the insert, said exterior portion being deformed by the serrated metallic portion and lodging in gaps between adjacent serrations to frictionally shape lock the wedge element in the gap and thus lock the cutter-bit in the pocket.

4,626,035
APPARATUS FOR MAKING MOPS
J. Gary Gradinger, Shawnee Mission, Kans.; Robert W. Quearry, Kansas City, Mo.; Robert D. Chalfant, Atchison, Kans., and Charles G. Wilson, Kearney, Mo., assignors to Golden Star, Inc., North Kansas City, Mo.
Division of Ser. No. 619,335, Jun. 11, 1984. This application Aug. 30, 1985, Ser. No. 771,021
Int. Cl.[4] A46D *9/00;* **A47L** *13/20*
U.S. Cl. 300—16 **4 Claims**



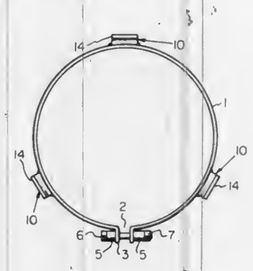
1. A mop making machine comprising:
(a) a yarn feeder means for pulling yarn from a spool thereof;
(b) a first guide means for directing said yarn from said feeder means;
(c) a heater means for heating said yarn to approximately 320° F. to 330° F.;
(d) a die means associated with said heater means for pressing upon said yarn and urging heated fibers of said yarn together;
(e) a second guide means for directing said yarn from said heater means and said die means; and
(f) a tufting apparatus receiving said yarn from said second guide means; said tufting apparatus having a backing reel therewith carrying backing material and sewing means for affixing said yarn to said backing material.

4,626,036
SPOKE WHEEL
René Hinsberg, Munich, and Markus Poschner, Schweitenkirchen, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany
Filed Nov. 23, 1984, Ser. No. 674,142
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342608
Int. Cl.[4] B60B *1/04*
U.S. Cl. 301—58 **12 Claims**



1. A spoke wheel for a tubeless tire comprising a wheel hub and a rim means comprising radially extending rim flanges on opposite sides of a rim base for securing a tire to the rim means, through-bore mounting means in the rim flanges and in the wheel hub with through bores in the rim flange being axially aligned with through bores in the hub, the wheel hub and rim means being connected with each other by a number of spokes having spoke heads and spoke nipples, at least one of the spoke heads and spoke nipples being inserted into the respective axially aligned mounting bore means provided in the hub and in the rim flanges of the rim means.

4,626,037
HUB CAP MOUNTING BRACKET
Andrew Kushner, 145 Baker Dr., Pittsburgh, Pa. 15237
Continuation of Ser. No. 558,329, Dec. 5, 1983, abandoned. This application Oct. 29, 1985, Ser. No. 792,511
Int. Cl.[4] B60B *7/02, 7/06*
U.S. Cl. 301—108 S **2 Claims**

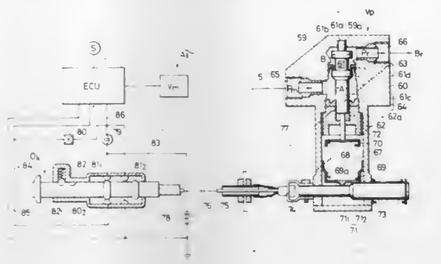


1. A bracket for mounting a decorative hub cap on the end of a vehicle axle, said bracket comprising a substantially cylindrical base portion having a longitudinal axis adapted to be substantially coaxial with the longitudinal axis of a vehicle axle when said cylindrical base portion is mounted on a vehicle axle, said cylindrical base portion having a split therein, each end of said cylindrical base portion at said split having an outwardly extending ear aligned holes in each of said outwardly extending ears, means extending through said aligned holes adapted to pull said ears toward one another, three resilient tabs located at spaced points around the circumference of said cylindrical base portion and extending outwardly from said cylindrical base portion in a direction substantially parallel to the longitudinal axis of said cylindrical base portion, each of said tabs having a flat inner end portion attached directly to said cylindrical base portion and a flat outer end portion substantially parallel to said flat inner end portion adapted to support a decorative hub cap and an intermediate portion angled outwardly away from the longitudinal axis of said cylindrical base portion integral with said inner and outer end portions, said outer end portion of each of said tabs lying in a circle coaxial with said cylindrical base portion and having a diameter slightly greater than the diameter of said cylindrical base portion, whereby the inner circumferential surface of said cylindrical base portion of said bracket is adapted to engage the circumferential surface of the end of a vehicle axle and said outer end portion of each of said tabs is adapted to tightly engage a decorative hub cap to hold said decorative cap onto a vehicle axle.

4,626,038
FLUID BRAKE SYSTEM FOR A MOTORCYCLE
Tsutomu Hayashi, Tokyo, and Hidehiko Inoue, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 23, 1983, Ser. No. 468,962
Claims priority, application Japan, Feb. 25, 1982, 57-29330; Feb. 25, 1982, 57-26233[U]
Int. Cl.[4] B60T *13/00*
U.S. Cl. 303—6 C **11 Claims**

1. A fluid brake system for a motorcycle having front and rear brakes, a brake actuating mechanism constructed and arranged to simultaneously actuate both front and rear brakes and an anti-locking mechanism for the front brake, the im-

provement comprising a proportional pressure reduction valve between the brake actuating mechanism and the rear brake, said valve having selectable first and second threshold set



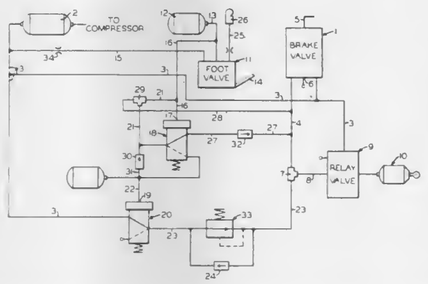
pressures and a means for selecting said first and second threshold set pressures and for disabling said anti-locking mechanism when said second threshold set pressure is selected.

4,626,039

RAILWAY VEHICLE PENALTY BRAKE CONTROL SYSTEM

Robert J. Worbois, N. Huntingdon, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Feb. 22, 1985, Ser. No. 705,940
Int. Cl.[4] B60T *7/14*
U.S. Cl. 303—19 **10 Claims**



1. A railway vehicle brake control system including braking means, an operator's brake valve device operative to provide service brake control pressure according to the selected position of an operating handle thereof in a brake application zone, and a source of fluid under pressure comprising:

(a) a reservoir;

(b) penalty control means for connecting said source of fluid under pressure to said reservoir in a first position and for venting said reservoir in a second position;

(c) a first double check valve device via which either said service brake control pressure or said penalty brake control pressure is connected to said braking means;

(d) a first pilot valve device including a control port subject to said reservoir fluid under pressure, an inlet connected to said source of fluid under pressure, an outlet connected to said first double check valve device, and an exhaust port, said first pilot valve device having an actuated position in which said inlet is connected to said outlet in response to said reservoir fluid under pressure being reduced below a first predetermined value to thereby provide penalty brake control pressure, and having a reset position in which said outlet is connected to said exhaust port in response to said reservoir fluid under pressure exceeding said first predetermined pressure to thereby exhaust said penalty brake control pressure;

(e) suppression means for preventing operation of said first pilot valve device to said actuated position when said service brake control pressure exceeds said first predetermined value; and

(f) interlock means for preventing operation of said first pilot valve device from said actuated position to said reset position when said penalty control means is in said second position comprising:

(i) a second pilot valve device having a control port, an inlet, a first outlet, and a second outlet, said second pilot valve device being operable to an actuated position in response to said reservoir fluid under pressure being less than a second predetermined value, wherein said inlet thereof is connected to said second outlet thereof, and being operable to a reset position in response to said reservoir fluid under pressure exceeding said second predetermined value, wherein said inlet thereof is connected to said first outlet thereof;

(ii) a first conduit between said reservoir and said control port of said second pilot valve device;

(iii) a second conduit between said first conduit and said inlet of said second pilot valve device; and

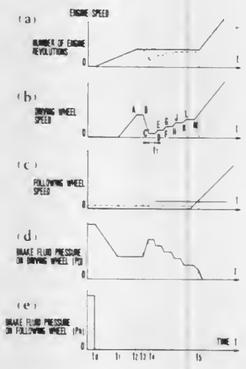
(iv) a third conduit between said brake valve device and said first double check valve device having said service brake control pressure, said reservoir fluid under pressure being exhausted via said brake valve device when said service brake control pressure is less than said reservoir fluid under pressure, whereby said second pilot valve is prevented from being operated to said reset position until said service brake control pressure exceeds said second predetermined value.

4,626,040

METHOD FOR CONTROLLING THE START OF VEHICLE

Kinzi Ogino, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed Aug. 1, 1985, Ser. No. 761,613
Claims priority, application Japan, Aug. 8, 1984, 59-165980
Int. Cl.[4] B60T *8/82*
U.S. Cl. 303—96 **8 Claims**



1. In a vehicle having a brake fluid pressure controller arranged to control brake fluid pressure on following and driving wheels, one independently of the other, a brake fluid pressure retaining device arranged to retain brake fluid pressure for parking by means of said fluid pressure controller and an engine revolution controller, a method for controlling the start of said vehicle comprising the steps of:

(a) completely releasing the brake fluid pressure on said following wheel and gradually reducing the brake fluid pressure on said driving wheel in response to a vehicle starting operation;

(b) holding said driving wheel brake fluid pressure at a value which is obtained at a point of time when the rotation of the driving wheel is detected;

(c) stopping the acceleration of engine revolution at a point of time when the rotating speed of said driving wheel comes to exceed a predetermined value and then lowering the rotating speed of said driving wheel at least either by increasing said brake fluid pressure on said driving wheel or by reducing the number of revolution of said engine;

(d) gradually raising the rotating speed of said driving wheel at least either by lowering the brake fluid pressure on said driving wheel or by accelerating the revolution of said engine; and

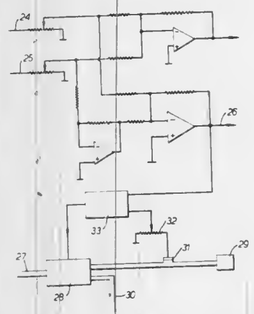
(e) completely releasing the brake fluid pressure on said driving wheel by cancelling an ensuing control operation when the rotation of said following wheel is detected at any of said steps (a), (b) and (c).

4,626,041

STRAIN GAUGE ASSEMBLIES

John Harbour, Chippenham, Great Britain, assignor to TRW Probe Electronics Co. Ltd., Gloucestershire, England

Filed Jun. 4, 1984, Ser. No. 616,956
Claims priority, application United Kingdom, Jun. 3, 1983, 8315346
Int. Cl.[4] B60T *8/00*
U.S. Cl. 303—100 **5 Claims**



1. An anti-skid brake apparatus for a vehicle having an axle for supporting vehicle load at support locations, each end of the axle rotatably carrying a wheel, each wheel having an associated hydraulically actuatable brake means, actuation of the brake means effecting torsional loads between its associated wheel and axle, said apparatus comprising:

a strain guage assembly including first strain guage bridge means mounted to said axle at a location between a selected wheel and a support location and second strain guage bridge means mounted to said axle at a location diametrically opposed to said first strain guage bridge means, said first strain guage bridge means and said second strain guage bridge means each outputting an electical signal indicative of shear strain in said axle;

processing circuit means for porcesing the output signals from said first strain guage bridge means and from said second strain guage bridge means and for putputting an electrical signal indicative of torsional load in said axle;

electically controllable fluid pressure regulator means operatively connected to a brake fluid line, to a fluid actuating device of the brake means associated with said selected wheel, and to a brake fluid reservior for controlling fluid pressure supplied to the fluid actuating device in response to an electrical control signal;

pressure sensing means for sensing fluid pressure outputted from said fluid pressure regulator means and for generating an electrical signal indicative of the sensed fluid pressure; and

regulator control circuit means operatively connected to said processing circuit means, said pressure sensing means, and said fluid pressure regulator means for determining an actual braking effect from the output signal from said processing circuit means, for determining a requested braking effect from the output signal from said pressure sensing means and for generating said electrical control signal to control said fluid pressure regulator means responsive to the determined actual braking effect and the requested braking effect to prevent said selected wheel from skidding.

4,626,042

ANTI-LOCKING SYSTEM FOR A TWO-WHEEL ROAD VEHICLE WITH HYDRAULIC DUAL CIRCUIT BRAKING INSTALLATION

Manfred Burckhardt, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 26, 1984, Ser. No. 574,083
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302642
Int. Cl.[4] B60T *8/02*
U.S. Cl. 303—106 **9 Claims**



1. An anti-locking system for a two-wheel road vehicle having a hydraulic dual circuit braking installation, a front wheel brake and a rear wheel brake, with a wheel rotational speed sensor means provided individually for the front and rear vehicle wheels, means for generating deceleration signals respectively therefor and with braking pressure control means, the braking pressure control means having braking pressure control valves for controlling the front wheel brake and rear wheel brake, the braking pressure control valves having at least a pressure maintaining position and a pressure reduction position,

first comparator means receiving said front wheel deceleration signal b_F and comprising

first means transmitting a signal when front wheel deceleration b_F exceeds a threshold value b_{F1} for driving the pressure control valve means into the pressure maintaining position and second means transmitting a signal when front wheel deceleration b_F exceeds a second threshold value b_{F2} which is greater than the threshold value b_{F1} for driving the pressure control valve means into the pressure reduction position,

second comparator means receiving said rear wheel deceleration signal b_R and comprising

third means transmitting a signal when rear wheel deceleration b_R is greater than a threshold value b_{R1} for driving the pressure control valve means into the pressure maintenance position, and fourth means transmitting a signal when rear wheel deceleration b_R is greater than a second threshold value b_{R2} which is greater than threshold value b_{R1} for driving the pressure control valve means into the pressure reduction position,

a processing means receiving front wheel rotation speed signals and rear wheel rotation speed signals for generating a front brake slip signal λ_F and a rear wheel brake slip signal λ_R, said signals λ_F and λ_R being referenced to a reference velocity v_r,

third comparator means receiving said front and rear brake slip signals λ_F and λ_R and comprising

fifth means transmitting a signal when front brake slip λ_F is greater than or equal to a value which is less than the rear wheel brake slip λ_R by an amount D_1 for driving the pressure control valve means into the pressure maintaining position,

sixth means generating a signal when front wheel brake slip λ_F differs from the rear wheel brake slip λ_R only by an amount d which is smaller than D_1 for driving the braking pressure control valves into the pressure reduction position,

seventh means transmitting a signal when front wheel braking slip λ_F equals or exceeds a first threshold value λ_{F1} for driving the braking pressure control valves into the pressure maintaining position, and

eigth means transmitting a signal when front wheel brake slip λ_F is greater than a second threshold value λ_{F2} which is greater than the threshold value λ_{F1} for driving the pressure control valve means into the pressure reduction position.

4,626,043

SLIP-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH A DRIVEN AXLE

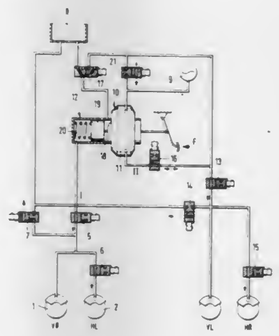
Juan Belart, Walldorf; Helmut Fennel, Frankfurt am Main; Wolfram Seibert, Darmstadt, and Ivica Batistic, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,099

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407538

Int. Cl.⁴ B60T *8/02*

U.S. Cl. 303—114 **3 Claims**



1. A slip-controlled brake system for automotive vehicles with a driven axle and a non-driven one, with a braking pressure generator connected to an auxiliary pressure source, to said braking pressure generator the wheel brakes of a front wheel and of a rear wheel are connected by way of two separate pressure medium circuits, with wheel sensors and electronic circuits for the detection of the rotational behavior of the wheels and the vehicle's velocity and for the generation of braking pressure control signals, with a normally open inlet valve each which is provided in the pressure medium line from the braking pressure generator to the two associated wheel brakes, and with a normally locking outlet valve which after switching-over into the open position connects the pressure medium line, which leads to the two wheel brakes, with a pressure compensation reservoir, wherein in each brake circuit (I, II) a normally open multi-directional valve (**6**, **15**) is inserted into the pressure medium line leading to the wheel brake of the non-driven wheel (HL, HR), after switching-over said normally open multi-directional valve (**6**, **15**) locking the pressure medium line;

wherein at least one multi-directional valve (**4**, **16**, **17**) are inserted in one of the two brake circuits (I, II) upstream of the inlet valve (**5**, **13**) into the pressure medium lines leading to the wheel brake of both one rear wheel and one front wheel, for the purpose of controlling the traction slip the auxiliary pressure source (**9**) being connectable to the pressure medium circuits (I, II) by means of said multi-directional valves (**4**, **16**, **17**), said valve (**17**) and the connection of a master cylinder prechamber (**18**) to said pressure source (**9**) and said reservoir; and,

wherein the braking pressure generator (**10**) includes a brake booster (**11**) fed by the auxiliary pressure source (**9**), one of the two pressure medium circuits (II) being directly connected to said brake booster (**11**) and said brake booster (**11**) acting on a master cylinder (**12**) whose working chamber (**20**) communicates with the other pressure medium circuit (I); wherein the braking pressure generator (**10**) has a pressure medium line leading from the brake booster (**11**) to said master cylinder prechamber (**18**), another multi-directional valve (**17**) is inserted into said pressure medium line which is switchable from a position to connect said pressure source to said prechamber to a position to connect said prechamber to said reservoir; said multi-directional valves (**4**, **16**, **21**) connected to the auxiliary pressure source (**9**) for traction slip control and further connected to one of the pressure medium circuits and to the pressure medium line leading from the brake booster (**11**) to the master cylinder (**12**).

4,626,044

HYDRAULIC BRAKE FOR VEHICLES

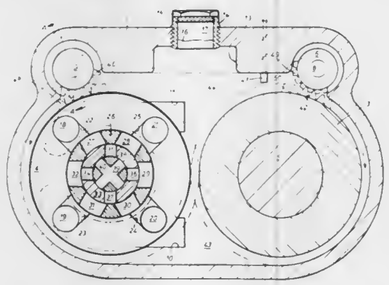
Günther Obstfelder, Weinheim-Lützelsachsen, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 639,817

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1983, 3331064

Int. Cl.⁴ B60T *8/087*

U.S. Cl. 303—116 **15 Claims**



1. Hydraulic brake for vehicles, especially a wheel brake for motor vehicles having a wheel shaft, with a housing and a pressure line with a valve which are filled with a hydraulic brake fluid and with an actuating line for the valve, whereby the mechanical or kinetic energy of the vehicle during braking is converted into thermal energy in the brake fluid and transmitted via the housing to the atmosphere, comprising:

(a) first and second gears which mesh with one another in a pressure-tight manner centrally located in the housing and forming a liquid-filled pressure chamber and a vacuum reservoir chamber according to the principle of a gear pump, whereby the first gear can be driven by the wheel shaft to be braked;

(b) a return line for returning the brake fluid to the vacuum reservoir chamber through the axis of rotation of the second gear; and

(c) a valve located in the return line, including an adjustable slide which can be actuated via the actuating line in order to regulate the amount of flowthrough through the brake,

wherein the return line includes conduits running through the second gear over the axis of rotation and a movable

piston is centrally located in the second gear serving as a valve which selectively regulates opening of the conduits.

4,626,045

CONTROL UNIT FOR ANTILOCK BRAKE SYSTEMS

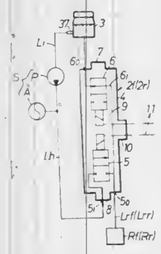
Akihiko Takei, Utsunomiya, and Etsuo Fujii, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,504

Claims priority, application Japan, Jun. 7, 1984, 59-117283; Jun. 8, 1984, 59-117929; Jun. 9, 1984, 59-118834; Jun. 9, 1984, 59-118835

Int. Cl.⁴ B60T *8/02*

U.S. Cl. 303—119 **17 Claims**



1. A control unit for antilock brake systems, comprising a support base provided with an oil channel, an oil tank, and an electro-magnetic valve having openings in communication with said oil channel and said oil tank, respectively, said valve being supported on said support base and in turn supporting said oil tank thereon,

wherein a support hole and a connecting wall covering said support hole are formed in a bottom wall of said oil tank,

said support hole being oil-tightly fitted around an upper end section of said electro-magnetic valve while said connecting wall being connected by screw means to a projecting shaft which is provided projectingly on an end face of the upper end section of said electro-magnetic valve, and

wherein said connecting wall is provided with a through-hole communicating an inside of said oil tank to said electro-magnetic valve.

4,626,046

TANK TREAD ASSEMBLIES WITH TRACK-LINKING MECHANISM

Earl R. Collins, Jr., LaCanada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 18, 1985, Ser. No. 692,802

Int. Cl.⁴ B62D *55/20, 55/28*

U.S. Cl. 305—36 **7 Claims**

1. Assembly apparatus for use with tread shells of a vehicle track comprising:

first and second sleeves in respective first and second tread shells of said track, each said sleeve being encapsulated in rubber;

a link member;

first and second pin means attached to said link member for insertion, respectively, into said first and second sleeves;

first and second taper means on said first and second pin means, respectively, for urging said shells together;

respective first and second locking grooves formed respectively on said first and second pin means;

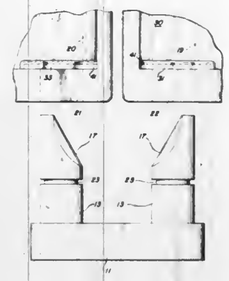
an opening in each of said first and second tread shells;

clip means insertable through said openings for interlockingly engaging said locking grooves;

highway pad means having first and second tabs therein;

an internal cavity in each of said track shells;

openings in said track shells to receive said first and second tabs, and



release rod means insertable into said cavity for interlocking with said highway pad means for retaining said highway pad means in position adjacent said track.

4,626,047

ECCENTRIC CAM FOR MODULE LATCHING MECHANISM

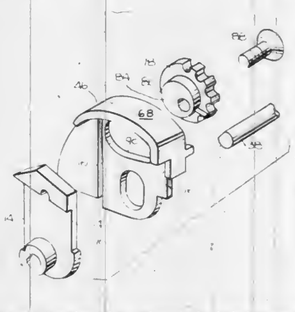
Joseph F. Miciukiewicz, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 11, 1985, Ser. No. 774,768

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.⁴ A47B *87/00*

U.S. Cl. 312—107.5 **5 Claims**



1. In a latching mechanism for releasably joining and locking together two separate modules located on a flat surface having

A. a first module having a pair of lower fingers projecting therefrom and a pair of angular, locking members projecting therefrom, said first module also having a shaft rotatably mounted in the lower portion of said first module and a pair of rotary front legs and a pair of stationary rear legs, said rotary front legs being fixedly secured to said shaft;

B. a second module having a pair of lower apertures for locking engagement with said pair of lower fingers and a pair of upper apertures for locking engagement with said pair of angular, locking members, said front legs being operative to abut said flat surface to thereby support the front of the module in a raised position and said first module having an overhanging portion extending along the front thereof that is adapted to extend above a recessed portion of the second module; and

C. a cam fixedly secured to said shaft at an angular displacement from said front legs, said second module having a cam follower surface, wherein rotation of said shaft effects rotation of said rotary, front legs from said supporting position to thereby lower said first module from said raised position onto said second module when the lower fingers engage the lower apertures, and wherein continued rotation of said shaft effects continued rotation of said

cam causing the cam to abut the cam follower surface to thereby urge the recessed portion of said second module upwardly against the overhanging portion of said first module, causing said two modules to be rigidly locked together, the improvement comprising

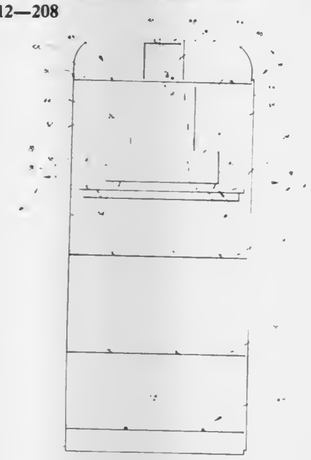
an adjustment device capable of raising or lowering the cam relative to said cam follower surface prior to the joining of said two modules, said device including said cam, a latch cam track having sides for vertical sliding engagement with said cam and an aperture, said cam including a surface sized to engage said latch cam track, a cam adjustment eccentric for translating said cam vertically, and a screw threadingly engaging said aperture in said latch cam track and securing said eccentric to said cam and said latch cam track, said track, eccentric and cam being positioned in a manner allowing them to be secured together.

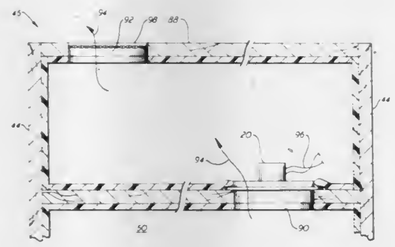
4,626,048

COMPUTER PRINTER HOUSING

Theodore J. Goodlander, Nashua, N.H., assignor to Cab-Tek, Inc., Nashua, N.H.

Filed Oct. 17, 1985, Ser. No. 788,387
Int. Cl.[4] A47B *21/00*
U.S. Cl. 312—208 **11 Claims**





1. A free-standing unitary structure of a height adequate to serve as a wall member and constituting a sound-proofing housing for use with computer output printer comprising:

(a) a pair of vertical spaced side walls;

(b) a top member interconnecting the tops of said side walls;

(c) a bottom member interconnecting the bottoms of said side walls to form an enclosure having opposed openings thereto on opposite sides thereof;

(d) first door means disposed for openably closing one of said openings;

(e) second door means disposed for openably closing the other of said openings;

(f) a slidable shelf separate from said two door means adapted to support a printer mounted between said side walls for slidable movement between said openings to provide working access to the printer from either of said openings;

(g) a sound-deadening material disposed on said side walls and top member within said chamber and

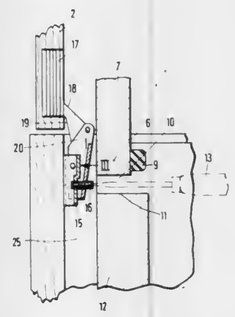
(h) a lower storage space for holding a paper supply for said computer printer and receiving printer paper from said computer, openings in said shelf for permitting passage of said paper to and from the computer printer.

4,626,049

CABINET UNIT WITH BUILT-IN REFRIGERATOR OR THE LIKE

Jürgen Gross, Enger, and Günter Sundermeier, Bünde, both of Fed. Rep. of Germany, assignors to Paul Hettich GmbH & Co., Kirchlengern, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 747,934
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 8419396[U]
Int. Cl.[4] A47B *97/00*
U.S. Cl. 312—291 **4 Claims**



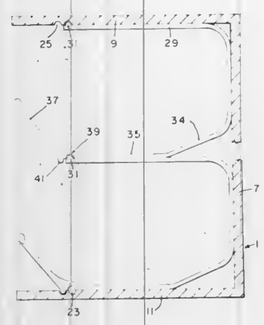
1. A cabinet unit, comprising an outer cabinet including an outer portion of a furniture piece; an outer door pivotally mounted on said outer portion for turning about a first axis, means for pivotally mounting said outer door on said outer portion and including a hinge having a mounting plate mounted on said outer portion and a hinge arm connected with said outer door and fixed on and adjustable relative to said mounting plate, screw means for mounting and adjusting said hinge and including mounting screws which mount said mounting plate on said outer portion and an adjusting screw which adjusts said hinge arm relative to said mounting plate; and an inner cabinet including an inner portion of a piece of furniture, an inner door mounted pivotally relative to said inner portion about a second axis which is located substantially close to said first axis, said inner door being movable between a closed position in which it closes an interior of said inner cabinet and an open position in which it opens the interior of said inner cabinet so that in said open position a gap is formed between said second portion of a furniture piece and said inner door to allow access to said mounting screws and said adjusting screw, while in said closed position said inner door blocks access to said mounting screws and said adjusting screw.

4,626,050

KIT BOX HAVING A HOUSING AND FLEXIBLE BINS

William H. Davis, 5705 Twineing, Dallas, Tex. 75227

Filed Sep. 4, 1985, Ser. No. 772,424
Int. Cl.[4] A47B *81/00*; B65D *21/02*
U.S. Cl. 312—293 **20 Claims**



1. A kit box which includes:

(a) an electrostatically protective housing,

(b) electrostatically protective flexible bin means removably secured in said housing, said bin means including:

(c) continuous flexible sheet means having a top portion, a rear portion, a front portion and a bottom portion, said top and front portions each having a free edge, said sheet means defining space extending entirely between the free edges of said top and front portions,

(d) said top portion including first locking means for removably securing said top portion in said housing, and

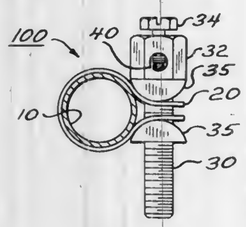
(e) said bottom portion including means for removably securing said bottom portion in said housing.

4,626,051

UNIVERSAL GROUND CLAMP

George J. Franks, Jr., 261 Whitehall, Palatine, Ill. 60072

Filed Jul. 18, 1985, Ser. No. 756,755
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **10 Claims**



1. A clamping device for coupling an electrical ground to an object such as a conduit, pipe or ground rod comprising

clamping strap means having at least a first and a second circular clearance hole formed therein and adapted to be placed about and in contact with at least a portion of the peripheral surface of an object to be grounded for forming an electrical and mechanical coupling thereto,

fastening means for tightening said clamping strap means about an object to be grounded including a threaded stud positionable through said first and second circular clearance holes formed in said clamping strap means after said clamping strap means has been positioned about at least a portion of the peripheral surface of the object to be grounded,

a first and a second securing plate supported on said threaded stud with said clamping strap means being positioned on said threaded stud between said securing plates, said first and second securing plates each being formed with a curved face having a substantially constant radius of curvature throughout the entire surface thereof which contacts said clamping strap means and supported on said threaded stud with said curved faces positioned adjacent each other with one of said curved faces on each side of said clamping strap means positioned therebetween,

said first and second securing plates carried upon said threaded stud for converging movement relative to each other upon rotation of said stud to thereby tighten said clamping strap about an object to be grounded, and

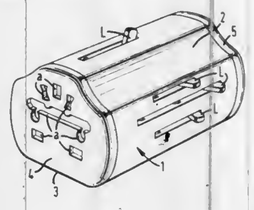
means for securing a terminated ground wire to said clamping device.

4,626,052

ELECTRICAL CONNECTORS

Clive S. Rumble, 51 Hays Mews, London, England (W1X 5DB)

Filed Feb. 6, 1985, Ser. No. 698,882
Claims priority, application United Kingdom, Feb. 8, 1984, 8403294
Int. Cl.[4] H01R *29/00*
U.S. Cl. 339—31 M **6 Claims**



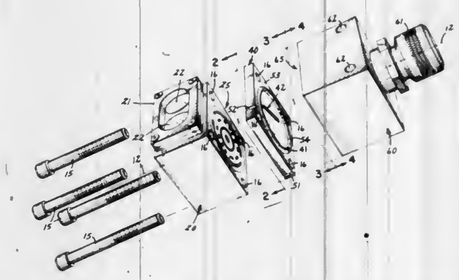
1. An adaptor comprising a casing, a plurality of sliding carriers each carrying an array of pins and slidable between a rear pins-retracted position and at least one forward pins-protruding position, the carriers being disposed in stacked relationship and means for moving a selected one of the said carriers between the forward and rear positions.

4,626,053

SENSING DEVICES WITH MODULAR INTERCONNECTION AND PROGRAMMING

Robert W. Fayfield, Excelsior, Minn., assignor to Banner Engineering Corp., Minneapolis, Minn.

Filed May 21, 1984, Ser. No. 612,663
Int. Cl.[4] H01R *27/00*
U.S. Cl. 339—32 M **12 Claims**



1. A sensing device for the detection or measurement of objects, comprising:

a direction dependent sense module having means for sensing objects within a sensitivity pattern along a predetermined sensing direction relative to said sense module, said sense module having a pattern of fixed electrical contacts

thereon which connect to circuitry within the sense module;

a second module having a pattern of fixed electrical contacts thereon which connect to circuitry within the second module;

at least one of said sense module and said second module capable of operating in a plurality of discrete modes in response to connections to be made to its pattern of electrical contacts;

said sense module and said second module configured to fit together in a plurality of predetermined discrete orientations with said sensing direction rotated relative to said second module and with selected ones of the contacts of said sense module and said second module making electrical contact in different orientations of the modules to effect selection of one of said discrete modes of operation of said sense module or second module; and

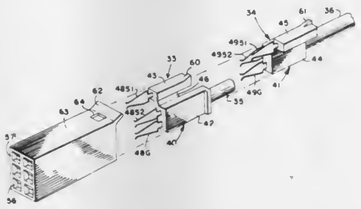
means for holding said sense module and second module together in assembly in each of said plurality of orientations to form a sensing device operative in the selected mode according to the relative orientation of the modules.

4,626,054

CABLE TERMINATION SYSTEM WITH DIAGONAL SIGNAL TERMINATOR

John N. Tengler, and James C. Pilny, both of Chico, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 18, 1984, Ser. No. 621,663
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—59 M **41 Claims**



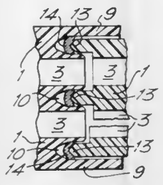
1. In combination, a pair of cables or conductor sets each including at least two conductors, and a terminator pair for terminating said conductors of respective ones of said cables or conductor sets, each terminator comprising a body of insulating material having a pair of contact anchor portions joined by a diagonal web portion at one axial end of the body and diagonally spaced at the other axial end of the body to receive the diagonal web portion of the other terminator for mating interengagement of the terminators, and at least one contact anchored in each contact anchor portion and electrically connected to a respective conductor of the corresponding cable or conductor set; and at least one of said cables or conductor sets being anchored in one contact anchor portion of the corresponding terminator body, and having one conductor thereof electrically connected to a contact anchored in said one contact anchor portion and another conductor thereof passing through the web portion of the corresponding terminator body for electrical connection to a contact anchored in the other contact anchor portion of the terminator body.

4,626,055

ELECTRICAL CONNECTOR ASSEMBLY

Robert W. Baker, Harrow, and Werner Lothmann, Ascot, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1983, Ser. No. 505,622
Claims priority, application United Kingdom, Jun. 22, 1982, 8218116
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—60 M **2 Claims**



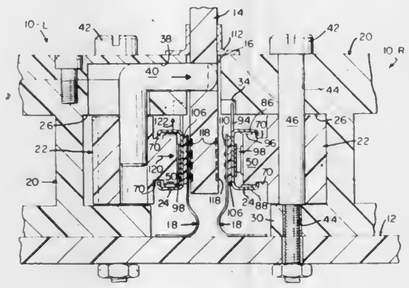
1. An electrical connector assembly comprising a pair of mated housings each having a plurality of through cavities therein receiving respectively electrical terminals mating with respective terminals in aligned cavities in the other housing, and a sealing member located between mating faces of the housings and sealing between the aligned cavities of the housings, the mating face of one housing being formed with grooves surrounding respective cavities, each groove tapering inwardly towards its bottom; the mating face of the other housing being formed with tapered ribs surrounding respective cavities, each rib being freely received in the respective groove surrounding the associated cavity in the one housing; and the sealing member being in the form of an apertured sheet of resilient material mounted to extend across the mating face of the one housing with walls defining the cavities in the one housing extending through respective individual apertures in the sheet, portions of the sheet havig been urged into each groove in the one housing by respective ribs on the other housing by the mating of the housings so that the portions of the sheet are in stretched condition over the tapered ends of the ribs and in compressed condition against the walls of the or each groove to provide the sealing, at locations spaced from the bottom of the or each groove.

4,626,056

CARD EDGE CONNECTOR

Howard W. Andrews, Jr., Hershey; Clifford F. Bobb, Carlisle, and Attalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 581,635, Feb. 21, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,109
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 339—75 MP **47 Claims**



1. A zero insertion force, card edge connector for interconnecting circuits on a circuit board and on a circuit card by means of circuits on a flexible film where some circuits thereon are attached to circuits on the circuit board and where a free edge of the flexible film extends away from the board, comprising:

a. a housing for mounting on a circuit board with a card receiving space adjacent thereto, and having cam support means thereon;

b. an elongated cam slidably mounted on the cam support means for longitudinal travel parallel to the housing and card receiving space;

c. cooperating means on the housing and on the cam for causing the cam to move laterally towards and away from the card receiving space as the cam moves parallel thereto;

d. a cam follower having one surface for receiving an edge of a flexible film, the cam follower being mounted on the cam in a sliding relation and with the one surface facing the card receiving space;

e. cooperating means on the cam and on the cam follower for moving the cam follower away from the circuit board on which the housing may be mounted as the cam moves along the cam support means; and

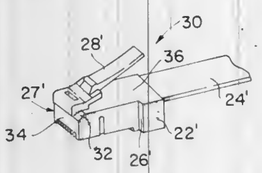
f. cooperating means on the housing and on the cam follower to prevent the cam follower from moving parallel to the card receiving space as the cam moves longitudinally but which permits the cam follower to move laterally as the cam moves laterally towards and away from the card receiving space so that circuits on an edge of a flexible film which may be attached to the one surface will engage and disengage with circuits on a circuit card which may be positioned in the card receiving space.

4,626,057

EIGHT CONDUCTOR MODULAR PLUG

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Oct. 21, 1985, Ser. No. 789,478
Int. Cl.⁴ H01R *13/627*
U.S. Cl. 339—91 R **3 Claims**



1. In an eight wire modular plug for telephonic and related equipment including an insulating housing having eight contacts, each contact connected to a wire lead, the housing having apertures to permit access between the eight contacts and a modular jack, and the housing having a locking means thereon, the improvements comprising:

a pair of oppositely disposed stepped-in portions along the sides of said housing wherein at least a portion of said housing is capable of insertion into either a six or, eight position modular jack of standard construction, wherein the six position modular jack of standard construction has a first sized opening for receiving said modular plug housing, and wherein the eight wire modular jack of standard construction has a second sized opening for receiving said modular plug housing, said second opening being larger than said first opening; and

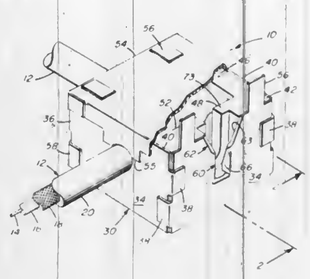
a pair of beveled edges, each of said beveled edges being oppositely disposed on either side of said locking means to allow the plug to bypass interior obstructions commonly found in six position jacks.

4,626,058

CONNECTOR BOX FOR COAXIAL CABLE

Thomas F. Prince, Milton, and Julian J. Bishop, Belmont, both of Mass., assignors to Ark-Les Corporation, Watertown, Mass.

Filed Sep. 30, 1985, Ser. No. 782,223
Int. Cl.⁴ H01R *4/24*
U.S. Cl. 339—97 P **21 Claims**



3. For interconnecting coaxial cable having an inner conductor, an inter-conductor dielectric, an outer conductor, and an outer protective sheath, a connector box comprising

a shell formed by progressive stamping from sheet metal stock and bent to the form of an open box with a floor and a side wall perpendicular thereto, said shell side wall having a free standing edge away from said floor,

a spacer structure made of dielectric material and fitted within said shell, said spacer including a wall adjacent said shell wall,

an inner connector element formed by progressive stamping from sheet metal stock, supported by said spacer structure within said shell without making electrical contact with said shell, and providing a wall perpendicular to said floor, said inner connector wall having a free standing edge away from said floor,

said shell having insulation displacing slots in said shell wall entering from the free standing edge thereof and sized to cut through the sheath of said cable and engage the outer conductor of said cable, said spacer structure having passages in its wall for receiving said cable, said passages being aligned with said shield insulation displacement slots, and said inner connector having insulation displacing slots in said inner connector wall entering from the free standing edge thereof and sized to cut through said inter-conductor dielectric and engage said inner conductor, said inner connector slots being aligned with said shell slots and said passages.

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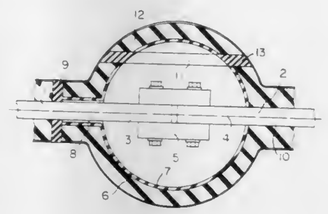
CONNECTING ARRANGEMENT FOR CURRENT CONDUCTORS HAVING FULL SOLID INSULATION

Klaus Böhme; Günter Seibt, and Klaus Sieber, all of Dresden, German Democratic Rep., assignors to VEB "Otto Buchwitz", Dresden, German Democratic Rep.

Continuation of Ser. No. 427,373, Sep. 29, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,238
Claims priority, application German Democratic Rep., Aug. 20, 1981, 232695
Int. Cl.⁴ H01R *13/46*
U.S. Cl. 339—143 C **8 Claims**

1. A coupling arrangement for fully solid material insulated current conductors in very high voltage or current applications wherein the danger of corona discharge is present; comprising a fully solid material insulated hollow body, a shield provided on the inside of said body, at least a pair of input means for said current conductors, said hollow body is constructed substantially rigid, at least one of said input means for said current conductors is constructed as a pass-through opening, the other of said input means being constructed as a solid

insulator embedding the associated current conductor, said current conductors being led-through or fixedly encased in respective ones of said openings of said input means, said hollow body comprises at least one service opening and a cover therefor, means for electrically sealing and shielding said cover to said opening in a selectively removable fashion, and for providing a shielding structure for said cover against corona formations between said conductors and said cover, said current conductors having end portions formed to provide for



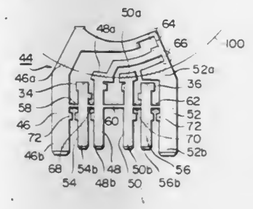
force, positive or material locking-type current conducting coupling between said pair of current conductors, said coupling being accessible from said service opening for supervising, servicing, assemblying or disassemblying operations, wherein on said input means and between said fully solid material insulated hollow body and the fully solid material insulated current conductor in said input means or a component joint, there is provided an elastic electrically sealing compensator means for allowing for heat compensation of said conductors.

4,626,060

CHANGE-OVER SWITCH

Kazumi Inayoshi, Toyota, Japan, assignor to Kojima Press Industry Co., Ltd., Aichi, Japan

Filed Jun. 25, 1985, Ser. No. 748,682
Claims priority, application Japan, Jun. 26, 1984, 59-96625[U]
Int. Cl.⁴ H01R *13/70*
U.S. Cl. 339—147 P **2 Claims**



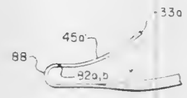
1. A change-over switch capable of coupling directly with a connector, comprising a boxy type base plate and a single terminal plate including a plurality of terminals formed therein which is made by a press-punching and folding process, said terminal plate forming at one end change-over contacts in the inside of said base plate with the other end of said terminal plate forming connector contacts which extend outwardly from said base plate, said change-over switch being characterized by illumination lamp terminals being provided parallel to said terminals, each of said lamp terminals being coupled with a corresponding lamp lead wire, the other end of each of said lamp terminals extending outwardly from said base plate parallel to the connector contacts of said terminals to form a lamp connector contact, a group of said connector contacts forming one group of terminals in the switch, said terminal plate is a one-piece terminal plate, said change-over contacts and said lamp terminals are preformed into said one-piece terminal plate which can rigidly be mounted on said base plate in such a state that the terminals are connected with one another through connections, said connections being cutaway to separate said terminals from one another after said terminal plate has been fixed to said base plate, and an operating rotary lever is swingably provided on the base plate with a movable contact which is adapted to move along an arcuate path to engage the change-over contacts of the terminal plate.

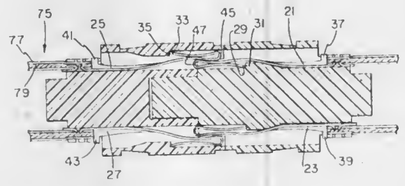
4,626,061

CRIMP CONNECT TERMINALS

Roy A. Patton, Visalia, Calif., assignor to Ronald A. Patton and Dennis D. Patton, both of Fort Wayne, Ind.

Division of Ser. No. 612,032, May 18, 1984, Pat. No. 4,565,001.
This application Oct. 30, 1985, Ser. No. 792,813
Int. Cl.⁴ H01R *13/28*
U.S. Cl. 339—217 S **6 Claims**





1. For use in an electrical connector, an elongated metallic contact member having length, width and thickness dimensions, said contact member including terminal and detent portions on the opposite ends thereof, an elongated shank portion interconnecting said terminal and detent portions, said detent portion including an elongated contact portion and an elongated tab portion disposed adjacent to each other and extending in longitudinal juxtaposition, adjacent ends of said contact and tab portions being joined in a substantially U-shaped reflex bend, the distal end of said tab portion having a straight edge substantially normal to the longitudinal axis of said tab portion, said contact and tab portions being resiliently flexible and movable toward and away from each other. said terminal portion being a longitudinal extension of said shank portion, said terminal portion having two side flanges extending transversely beyond the shank portion to thereby serve as an abutment, said contact portion and said U-shaped bend being wider than said tab portion and joining the extremity of said U-shaped bend in laterally opposite edges which extend substantially perpendicular to the longitudinal axis of said tab portion thereby providing locking edges at said adjacent end of said tab portion.

4,626,062

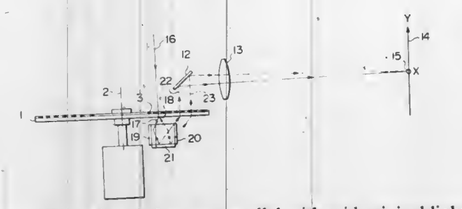
LIGHT BEAM SCANNING APPARATUS

Hiromi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1984, Ser. No. 574,431
Claims priority, application Japan, Feb. 1, 1983, 58-15137
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—3.71 **8 Claims**

1. A light beam scanning apparatus comprising a rotatable plate provided with at least one plane diffraction grating, a light, beam source for emitting a light beam incident on said plane diffraction grating so as to define a plane of incidence, an optical system for reflecting the first-order diffracted light component and the minus first-order diffracted light component of the light beam diffracted by said plane diffraction

grating by use of a plurality of plane reflection surfaces and for guiding the reflected light beam of said first-order diffracted light component and the reflected light beam of said minus first-order diffracted light component again to said plane diffraction grating so that, after said reflected light beams are diffracted again by said plane diffraction grating, said light



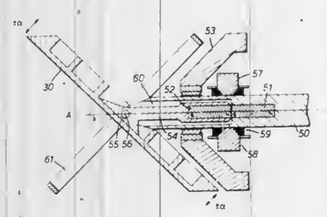
beams diffracted again become parallel with said original light beam incident on said plane diffraction grating, and a focusing lens for focusing said parallel light beams diffracted again by said plane diffraction grating to a light spot on a scanning surface, whereby said scanning surface is scanned with the focused light spot as said rotatable plate is rotated.

4,626,063

CONTROL OF ROTATING MIRRORS

Frank R. Honey, 149 Coode Street, Bayswater, Western Australia 6053, Australia

PCT No. PCT/AU84/00057, § 371 Date Dec. 12, 1984, § 102(e) Date Dec. 12, 1984, PCT Pub. No. WO84/04175, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 12, 1984, Ser. No. 686,265
Claims priority, application Australia, Apr. 15, 1983, PF8895
Int. Cl.⁴ G02B *7/18, 26/10*
U.S. Cl. 350—6.9 **13 Claims**



1. A rotating mirror arrangement for use in airborne scanning comprising:

a. A first shaft of circular cross section, adapted to rotate about its axis, said shaft being hollow at one end thereof to provide a cylindrical region of circular cross section with said shaft;

b. a second shaft which is longer than the cylindrical region of the first shaft, said second shaft being supported within the cyindrical region of the first shaft by pivot means at or near the open end of said cylindrical region, said second shaft being pivotable about the axis of said pivot means, said axis being orthogonal to and passing through the axis of said first shaft, said second shaft being a loose fit in said cylindrical region;

c. a planar mirror mounted on the end of said second shaft which is outside said cylindrical region, the plane of said mirror being at 45° relative to the axis of said second shaft;

d. a first elongate permanent magnet mounted within said first shaft along the axis thereof, a pole of said first permanent magnet being adjacent to the closed end of said hollow cylindrical region;

e. a second elongate permanent magnet mounted within said second shaft along the axis thereof, a pole of said second permanent magnet being adjacent to the end of said second shaft which is remote from said planar mirror so that said second permanent magnet is attracted by said first permanent magnet to bias the second shaft to a central position within the cylindrical region; and

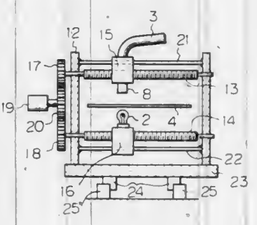
f. electromagnet means fixedly positioned external to said first shaft to generate a magnetic field in the region of said pole of said second permanent magnet.

4,626,064

OPTICAL RETRIEVING SYSTEM

Toshinobu Futagawa, 5-21-2-503, Higashigotanda, Shinagawa-ku, Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,683
Claims priority, application Japan, Feb. 10, 1983, 58-21156
Int. Cl.⁴ G02B *6/12*
U.S. Cl. 350—96.10 **3 Claims**



1. In an optical system for reading information recorded on a translucent film, where the system is of the kind having

(i) a source of light for illuminating information recorded on the film, and

(ii) optical means having a lens for reading information from the film,

the improvement wherein the light source is movable and wherein the optical means further includes

(a) a flexible optical fiber having one end situated to emit light onto the lens, and

(b) means holding said one end of the flexible optical fiber aligned with the optical axis of the lens, said means holding the lens and said aligned one end of the flexible optical fiber stationary relative to the movable light source,

and wherein the improvement further comprises

carriage means having the light source and the other end of the flexible optical fiber mounted thereon in a manner enabling the film to be interposed between the light source and said other end of the flexible optical fiber with the carriage means movable across the film, said other end of the flexible optical fiber being situated to intercept light passing through a localized area of the film illuminated by the light source and transmit that light along the flexible optical fiber to said one end whereby the film can be scanned to read out the recorded information through the stationery lens.

4,626,065

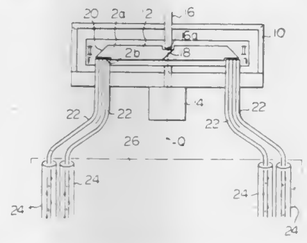
LIGHT CONDUCTION APPARATUS UTILIZING INTERMITTENT ILLUMINATION APPLIED TO OPTICAL FIBERS FOR PHOTOSYNTHETIC REACTION

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,088
Claims priority, application Japan, Feb. 5, 1982, 57-17238
Int. Cl.⁴ G02B *6/26;* **F21V** *7/04;* **A01G** *7/00*
U.S. Cl. 350—96.15 **16 Claims**

1. A light conduction apparatus for photosynthesis reaction comprising a first rod member for conducting light therethrough, said first rod member having an input end portion for light input and an output end portion for light output, a plurality of second rod members for conducting light therethrough, each of said second rod members having an input end portion for light input, said second rod members conducting said light input to a confinement in which a photosynthetic reaction

occurs, said input end portions of said second rod members being arranged along a circular array of concentric rows, rotatable light distributor means interposed between said outlet end portions of said first rod member and said input end portion of said second rod members, said light distributor means having a first portion disposed opposite said output end portion of said first rod member for receiving light from said first rod member, said light distributor means having a radiation surface spaced from said first portion and disposed opposite a portion of said circular array of said input end portions of said second rod members such that upon rotation of said light distribution means, said radiation surface successively passes over said input end portions of said second rod members to thereby sequentially route the light output from said outlet end portion of said first rod member successively to said circularly arrayed input end portions of said second rod members, and drive



means for continuously rotating said rotatable light distributor means such that said rotatable light distributor means sequentially and successively distributes the light from said first rod member to said second rod members as said rotatable light distributor means is rotated by said drive means to thereby provide an intermittent supply of light to said confinement to cause said photosynthetic reactions to occur, said light distributor means comprising a transparent rod having said radiation surface formed at at least one end portion thereof, said transparent rod having an axis of rotation, said output end portion of said first rod member facing said axis of rotation of said transparent rod, said radiation surface of said light distributor means having a substantially rectangular shape and being positioned to sequentially move past said concentric rows of said input end portions of said second rod members while the transparent rod is rotated.

4,626,066

OPTICAL COUPLING DEVICE UTILIZING A MIRROR AND CANTILEVERED ARM

Frank H. Levinson, Hanover Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,430

Int. Cl.⁴ G02B *6/32*

U.S. Cl. 350—96.18 **7 Claims**

1. An optical device for diverting incoming light among transmission elements comprising:

a graded-index-of-refraction lens including two opposite surfaces;

at least two transmission elements coupled to one surface of the lens, one transmission element being positioned to transmit incoming light into said one surface and the other transmission element being positioned to receive at least a portion of the incoming light which is reflected back to said one surface;

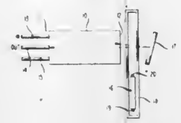
a first reflecting element at the other surface of the lens positioned to reflect the incoming light at a certain angle, the element being mounted so as to move in a direction parallel to the surface of the lens and out of the path of the incoming light; and

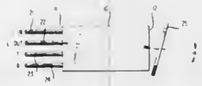
a second reflecting element at an angle to the first reflecting element and positioned so that the incident light will be reflected by said second element when the first element is moved out of the path of the incoming light and the angle of reflection thereby altered.

3. An optical device for diverting incoming light among transmission elements comprising:

a graded-index-of-refraction lens including two opposite surfaces;

at least two transmission elements coupled to one surface of the lens, one transmission element being positioned to transmit incoming light into said one surface and the other





transmission element being positioned to receive at least a portion of the incoming light which is reflected back to said one surface; and

a reflecting element at the other surface of the lens positioned to reflect the incoming light at a certain angle, the element comprising a cantilever beam formed from a semiconductor substrate so that bending of the beam controllably alters the said angle of reflection of the incoming light.

4,626,067

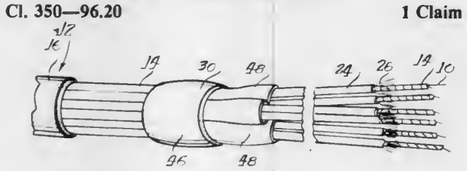
METHOD OF BREAKING OUT AND TERMINATING FIBER OPTIC ELEMENTS FROM A MULTIFIBER CABLE

David B. Watson, Batavia, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 29, 1982, Ser. No. 403,095

Int. Cl.⁴ G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **1 Claim**



1. A method of breaking out individual optical fibers from a multifiber optical cable and connecting each of the optical fibers to a connector, said method comprising the steps of:

removing more than one foot of the multifiber cable jacket from the end of the cable to expose the individual optical fibers,

cutting individual flexible tubing segments to sizes shorter than the exposed length of the individual optical fibers,

folding opposite ends of the strengthening members on the tubing segments back around the ends of the cut tubing segments,

securing the ends of the reinforcing members to opposite ends of the tubing segments,

telescoping each of the tubing segments with the folded back ends of the reinforcing members onto an optical fiber and about its buffer tube,

spacing the inner ends of the telescoped tubing segments from the cut end of the cable jacket to provide a junction region,

detaching the folded back inner ends of the strengthening members from the tubing segments and adhesively securing these inner ends to the buffer tubes of the optical cable at the junction region between the inner ends of the tubing

segments and the cut end of the jacket,

covering the adhesively secured ends of the strengthening members and the buffer tubes at the junction region, and

connecting each optical fiber to a connector and adhesively connecting each of the outer ends of the strengthening members, each providing the pull-out strength between the multifiber cable and the respective connectors for each of the optical fibers and with the individual optical fibers each covered by a flexible tubing segment between its connector and the cable.

4,626,068

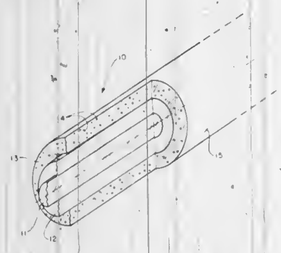
PHOTOACTIVE COATING FOR HARDENING OPTICAL FIBERS

Robert S. Caldwell, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,215

Int. Cl.⁴ G02B *6/00;* **B05B** *5/00;* **C09K** *11/54*

U.S. Cl. 350—96.34 **4 Claims**



1. An optical fiber structure which is hardened against the effects of ionizing nuclear radiation emanating from a source external of said fiber structure, which comprises:

(a) a light conducting core comprising a material having a first predetermined index of refraction;

(b) a transparent cladding on said core, said cladding comprising a material having a second predetermined index of refraction less than said first predetermined index of refraction;

(c) a substantially transparent coating on said cladding, said coating including a phosphorescent material substantially uniformly distributed throughout said coating for interacting with said ionizing radiation to emit light to irradiate that portion of said core near said light emitting phosphorescent material affected by said radiation; and

(d) a metallized layer on said coating, said metallized layer including an internally reflective surface for reflecting said light into said core.

4,626,069

OPTICAL POWER DIVIDER

Hans Dammann, Tangstedt, and Ulrich Killat, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 141,857

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916184

Int. Cl.⁴ G02B *5/18, 6/34*

U.S. Cl. 350—162.2 **11 Claims**

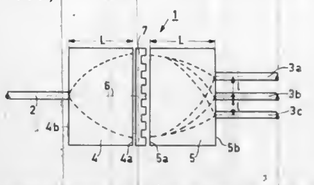
2. An optical power divider comprising:

first and second imaging devices, each of which can convert a point light source into parallel rays and can convert parallel rays into a point light source; and

first and second optical gratings situated between the imaging devices such that parallel rays, produced by the imaging devices from point light sources, will pass through the gratings, and gratings being plane, one-dimensional, binary phase gratings each having a rectangular groove profile and each having a duty factor of substantially 1:1;

characterized in that:

the optical path difference, $H=(N-1)h$, of the first grating is substantially given by $H=0.32\lambda+n\lambda$, where N is the refractive index of the grating material, h is the grating height, λ is the wavelength of the light being divided, and $n=0, 1, 2 \ldots$;



the optical path difference of the second grating is substantially $0.5\lambda+m\lambda$, where $m=0, 1, 2 \ldots$; and

the two gratings are rotated relative to each other.

4,626,070

CONSTRUCTION PANEL

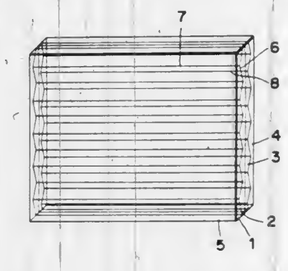
Jean-Jacques Rivier, 467 Frontière, Hemmingford, Québec, Canada J0L-1H0

Continuation of Ser. No. 508,653, Jun. 28, 1983, Pat. No. 4,540,241. This application Jun. 19, 1985, Ser. No. 746,309

Claims priority, application Switzerland, Jul. 12, 1982, 4231/82

Int. Cl.⁴ G02B *17/00, 27/00*

U.S. Cl. 350—260 **8 Claims**



1. A panel made of transparent material having a given critical angle, for selectively transmitting or reflecting radiations from a source of radiation located on a front side of the panel, comprising:

at least one rigid planar element of said transparent material having a planar face and a face having a series of adjacent protruding prism-shaped portions formed by facets inclined at a predetermined angle of about 45° with respect to said planar face, and meeting at parallel ridges;

said facets having all the same dimensions;

said prism-shaped portions being symmetrical, and identical to one another;

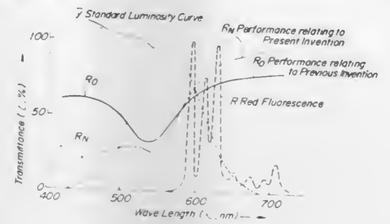
so that said panel has a reflecting property for all the radiations striking it, on the one hand, in any direction contained within a straight plane parallel to said ridges and perpendicular to said planar face, and on the other hand in any other direction contained within any oblique plane, parallel to said ridges and inclined through an azimuth angle with respect to said straight plane, provided said other direction is inclined according to an altitude angle greater than a given value with respect to a reference direction perpendicular to said ridges, said given value being a function depending on the azimuth angle and on the angle of inclination of the facets, and said function increasing in a continuous manner with the azimuth angle on both sides of said straight plane.

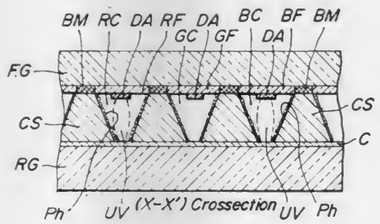
4,626,071

OPTICAL FILTER MADE OF INORGANIC MATERIAL FOR RED LIGHT

Masatoshi Wada; Shigekazu Matsubara; Yukikazu Moritsu, all of Osaka, and Tetsuo Sakai, Tokyo, all of Japan, assignors to Okuno Chemical Industries Co., Ltd. and Nippon Hoso Kyokai, both of, Japan

Filed Jun. 17, 1985, Ser. No. 744,999
Int. Cl.[4] G02B *5/20*
U.S. Cl. 350—311 **7 Claims**





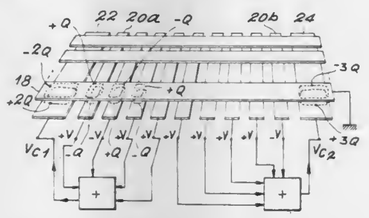
1. An optical filter made of inorganic material for red light, comprising,
a glass substrate, and
a layer sticked on said glass substrate and fired, which is made of inorganic materials including indispensable constituents consisting of copper sulfate 1 to 70 parts by weight, alkali metal sulfate 20 to 90 parts by weight and alkali earth metal sulfate 10 to 80 parts by weight.

4,626,072

MATRIX DISPLAY AND METHOD OF CAPACITANCE COMPENSATION VIA CHARGE DISTRIBUTION

Jean F. Clerc, Meylan, and Denis Sarrasin, Rives dui Fure, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 25, 1984, Ser. No. 573,711
Claims priority, application France, Feb. 16, 1983, 83 02494
Int. Cl.[4] G02F *1/133;* G09G *3/00*
U.S. Cl. 350—333 **3 Claims**



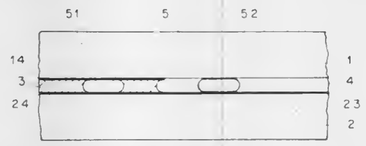
1. A method for compensating a coupling between rows and columns of an electrically controlled matrix display wherein said matrix display has a material having modifiable optical characteristics, said material being interposed between a first group of p rows of parallel electrodes and a second group of q columns of parallel electrodes, the rows and columns intersecting one another, wherein an area X_{ij} of the material being defined by the region of the material covered by row i, in which i is an integer such that $1 \leqq i \leqq p$ and by column j, in which j is an integer such that $1 \leqq j \leqq q$, said rows being selected and said columns being selected to carry electrical signals bringing about an excitation of the material suitable for modifying its optical characteristics comprising the steps of:
providing a device for compensating the coupling between the rows and columns, by providing at least one compensating electrode; and
each said compensation electrode intersecting all of the electrodes of the first group of electrodes and being separated therefrom by a dielectric, and being parallel to the electrodes of the second group of electrodes, supplying each said compensation electrode with a specific voltage signal which provides electrical charges on each unselected row of electrodes, the intensity of said voltage being such that the algebraic sum of the electrical charges on each unselected row of electrodes is zero at all times.

4,626,073

LIQUID CRYSTAL DISPLAY CELL WITH ELASTIC CELL SPACERS

Hermann Amstutz, Mellingen, and Meinolph Kaufmann, Rütihof-Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 6, 1984, Ser. No. 628,288
Claims priority, application Switzerland, Jul. 8, 1983, 3764/83
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—344 **13 Claims**



1. A liquid display cell comprising:
two lane-parallel support plates having mutually inward facing surfaces provided with respective electrode layers and a border surrounding said electrode layers;
a liquid crystal layer switchable between two optically distinguishable states contained in a space between said plates and said border; and
rubber-like elastic particles disposed between said plates and serving as spacers to maintain said plates separated within a predetermined separation range.

4,626,074

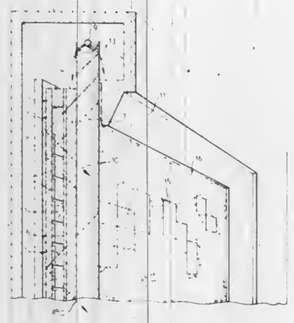
ILLUMINATED LIQUID/CRYSTAL DISPLAY DEVICE USING INTERNAL REFLECTION AND SCATTERING

William A. Crossland, Harlow; John R. Brocklehurst, Bishop's Stortford; Peter J. Ayliffe, Stansted, and Arthur Atkinson, Addingham, Nr. Ilkley, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,508
Claims priority, application United Kingdom, May 5, 1983, 8312277
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—345 **9 Claims**

1. A liquid crystal display device of the scattering mode type comprising:
a liquid crystal layer whose two major surfaces are bounded by two transparent sheets secured together with a perimeter seal to form an enclosure for the liquid crystal layer, and
display illumination means for directing light into said enclosure within an angular range such that, at least over a predetermined display area, substantially all the light is prevented from emerging from the externally facing

major surface of either sheet by internal reflection within said display area unless first scattered by a selected region of said liquid crystal layer,
wherein said display area is backed with a contrasting background surface behind and out of optical contact with said two sheets and having a matte black appearance.
9. A display device comprising:
an electronically addressable layer of a smectic liquid crystal material confined within a defined display area between front and rear transparent plates having respective trans-



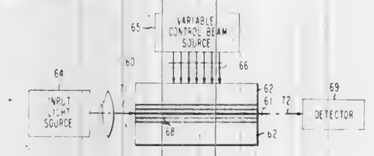
parent electroded inner surfaces in optical contact therewith and
means for directing light into said layer such that the light is prevented by internal reflection at respective outer surfaces of said front and rear plates from emerging from the display area of the device unless scattered by one or more scattering regions of the layer,
whereby said scattering regions may be rendered visible against a background of contrasting appearance behind and out of optical contact with said display device.

4,626,075

LIGHT BEAM APPLIED TO A LAYERED SEMICONDUCTOR STRUCTURE IS CONTROLLED BY ANOTHER LIGHT BEAM

Daniel S. Chemla, Rumson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 455,462, Jan. 3, 1983, abandoned. This application May 23, 1985, Ser. No. 737,571
Int. Cl.[4] G02F *1/015, 1/19, 1/35*
U.S. Cl. 350—354 **9 Claims**



1. An optical device comprising
a multiple quantum well structure having alternate layers of a large energy band gap semiconductor material and a small energy band gap semiconductor material, the small energy band gap material layers being arranged for containing trapped charge;
means for directing a first light beam having a constant intensity into the layers of the structure along an axis parallel to the layers, said first light beam having a wavelength that is in the transparency range of said multiple quantum well structure; and
means for variably photoexciting the small energy band gap material layers with a second light beam having a wavelength in an absorption band of the small energy band gap material layers for releasing in the small energy band gap material layers a variable quantity of charge from their valence band to control the first light beam.

4,626,076

ZOOM LENS

Sigeru Oshima, Tokyo, and Sadahiko Tsuji, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 464,998, Feb. 8, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,918
Claims priority, application Japan, Feb. 25, 1982, 57-29728
Int. Cl.[4] G02B *15/00*
U.S. Cl. 350—427 **3 Claims**



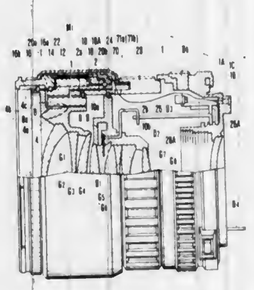
1. A zoom lens comprising:
from front to rear,
a first positive lens component;
a second negative lens component;
a third negative lens component consisting of a single negative lens; and
a fourth lens component, said first, second and third lens components moving in respective different loci from each other when zooming, wherein said first lens component takes a more front position when in the telephoto side than when in the wide angle side, said second lens component takes a more rear position when in the telephoto side than when in the wide angle side, and said third lens component moves forward when zooming from the wide angle to the telephoto side begins.

4,626,077

LENS MOUNT WITH BUILT-IN MOTOR

Hiroshi Yamamoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,387
Claims priority, application Japan, May 20, 1983, 58-89780
Int. Cl.[4] G02B *7/11*
U.S. Cl. 350—429 **5 Claims**



1. A lens mounting comprising:
(a) a body tube of magnetic material;
(b) a focusing lens and a first lens holder containing said focusing lens, said first lens holder being movably arranged in said body tube;
(c) a focusing actuator member for driving said focusing lens;

(d) a motor for driving said lens holder, said motor including a field coil of hollow cylindrical shape, a field magnet, a commutator for supplying current to said field coil, a brush and electric lines, said field coil being secured to one end of said focusing actuator member in parallelism to a direction parallel with an optical axis, a holder containing said commutator being secured to the opposite end of said field coil in series in a direction parallel with the optical axis, said field magnet being positioned between said field coil and said body tube and secured to said body tube; and

(e) means for transmitting one of the driving torque from said focusing actuator member and the rotation of said field coil to said first lens holder.

4,626,078

MULTIPLE PASS OPTICAL MATRIX SYSTEM

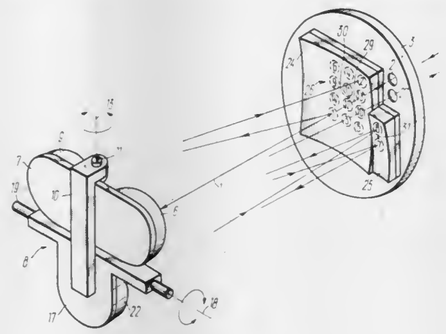
Semen M. Chernin, Moscow, and Evgenia G. Barskaya, Leningrad, both of U.S.S.R., assignors to Institut Khimicheskoi Fiziki, Moscow, U.S.S.R.

PCT No. PCT/SU83/00035, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01589, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 30, 1983, Ser. No. 761,587

Int. Cl.[4] G02B *17/06, 5/10*

U.S. Cl. 350—504 **4 Claims**



1. A multiple pass optical matrix system wherein a radiation flux from an illuminating source passes through an entrance opening of a housing to one of two rigidly secured together main objective mirrors having equal radii of curvature and mechanically connected to a mount, the mount being attached to a means for rotating the main objective mirrors about an axis perpendicular to the rows of an image matrix, the radiation flux then passes to a main field mirror having a radius of curvature equal to the radii of curvature of main objective mirrors and being arranged along the longitudinal axis of the system at a distance equal to the radius of curvature of the main objective mirrors, the main field mirror directs the radiation flux to another main objective mirror, and the radiation flux is reflected therefrom to the main field mirror, and from there to the first objective mirror, and, in the last pass, leaves the system through an exit opening of the housing, wherein the improvement comprises an additional objective mirror having the same radius of curvature and mechanically connected to the mount; a means for rotating said additional objective mirror about an axis parallel to the row of the image matrix, said rotating means connected with the mount; and an auxiliary field mirror having the same radius of curvature and placed next to the main field mirror.

4,626,079

DARK FIELD ILLUMINATION APPARATUS FOR EPI-ILLUMINATION SYSTEM

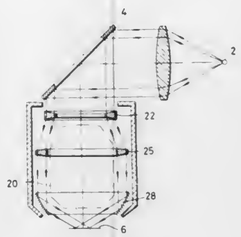
Eiji Nakamura, and Yutaka Suenaga, both of Yokohama, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,403

Claims priority, application Japan, Apr. 13, 1984, 59-74245; Apr. 24, 1984, 59-82455

Int. Cl.[4] G02B *21/10*

U.S. Cl. 350—525 **10 Claims**



1. Apparatus for illuminating an object to be observed through an objective lens, said apparatus comprising:

(a) a lens tube member for supporting the objective lens therein in such manner as to provide an annular space between the objective lens and the lens tube member;

(b) means for supplying an annular light beam toward the object through the space;

(c) an annular negative lens disposed within the space with an optical axis being common to the optical axis of the objective lens, said negative lens having an action to diverge the annular beam in a direction away from said optical axis;

(d) an annular condenser member having an optical axis common to the optical axis of the objective lens and provided in the vicinity of one end of the objective lens opposed to the object, said condenser member having an action to direct the divergent annular beam toward said object; and

(e) an annular positive lens having an optical axis common to the optical axis of the objective lens and disposed between the negative lens and the condenser member within the space;

said positive lens cooperating with the negative lens to form substantially an afocal system.

4,626,080

OPTICAL INSTRUMENT, IN PARTICULAR BINOCULARS

Daniel Swarovski, Wattens, and Kurt Schwab, Mils, both of Austria, assignors to D. Swarovski & Co., Austria

Filed Feb. 17, 1983, Ser. No. 467,340

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205583

Int. Cl.[4] G02B *23/02, 7/18, 23/18*

U.S. Cl. 350—569 **7 Claims**

1. An optical instrument comprising:

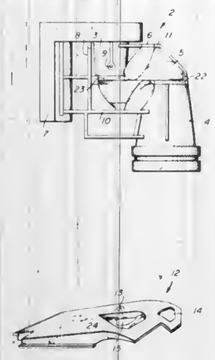
a plastic foam outer shaped member;

an objective tube within said outer shaped member,

an eyepiece tube within said outer shaped member, and

a prism system with said outer shaped member, providing an optical path through said optical instrument; and

positioning means for said prism system, wherein said positioning means is a two part construction comprising a housing portion and a means for lidding said housing portion exhibiting recesses for allowing said prism system to be elastically bound, and further includes a preformed



prism seat independent from said outer shaped member, said objective tube, and said eyepiece tube.

4,626,081

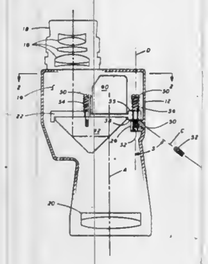
BINOCULAR ALIGNMENT

Tadao Nishizawa, Tokyo, Japan, assignor to Swift Instruments, Inc., Boston, Mass.

Filed May 3, 1985, Ser. No. 730,371

Int. Cl.[4] G02B *23/02, 7/18*

U.S. Cl. 350—569 **3 Claims**



1. In a binocular viewing device comprising a body defining an enclosed chamber, a prism seat disposed within said chamber and mounted to said body, and an optical system including prisms disposed upon said prism seat, and an ocular lens and an objective lens positioned at opposite ends of said chamber for viewing therethrough, via said prisms, the improvement wherein said device further comprises

means for resiliently mounting said prism seat to said body comprising at least three elongated fasteners spaced about the periphery of said prism seat, with means associated with each said fastener for resiliently engaging a first surface of said prism seat to urge said prism seat into fixed contact with said body, and

at least one adjusting member extending through said body into said chamber from the outside,

the inner end of said adjusting member adapted upon rotation for axial movement relative to said body for engagement upon a surface of said prism seat in a manner to displace said prism seat from contact with the body, thereby to change the relationship of the plane of the prism seat to the line of viewing from said ocular lens to said objective lens for changing alignment of the optical system.

4,626,082

PROJECTING DEVICE

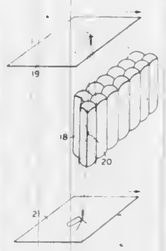
Noritaka Mochizuki, Yokohama; Setsuo Minami, Kawasaki; Yoshiya Matsui, Yokohama, and Tadasu Taniguchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 173,918, Jul. 31, 1980, abandoned. This application Sep. 4, 1984, Ser. No. 647,270

Claims priority, application Japan, Aug. 10, 1979, 54-102493; Nov. 29, 1979, 54-154730; Dec. 24, 1979, 54-168484; Dec. 27, 1979, 54-172404

Int. Cl.[4] G02B *13/26*

U.S. Cl. 350—573 **11 Claims**



4. A projecting device, comprising:

plural lenses arranged in parallel with respect to each other in the direction of the optical axis, each of said lenses being a single bar lens having a uniform index of refraction and an axial length larger than an effective aperture thereof, said single bar lens being adapted for projecting, after forming an inverted intermediate image perpendicular to the optical axis at the intermediate position of said lens, a pixel of an object plane as a pixel of an erect image having a magnification of unity, wherein each lens satisfies the following three inequality relations:

$$K_1 \times \frac{n-1}{\frac{1}{S_1}\left(\frac{\phi_0}{2}-\frac{\phi_1}{2}\right)\times\frac{1}{\frac{\phi_1}{2}}} < r_1 < K_2 \times \frac{n-1}{\frac{1}{S_1}\left(\frac{\phi_0}{2}-\frac{\phi_1}{2}\right)\times\frac{1}{\frac{\phi_1}{2}}} \quad (1)$$

$$-K_2 \times \frac{n-1}{\frac{1}{S_1}\left(\frac{\phi_0}{2}-\frac{\phi_1}{2}\right)\times\frac{1}{\frac{\phi_1}{2}}} < r_2 < -K_1 \times \frac{n-1}{\frac{1}{S_1}\left(\frac{\phi_0}{2}-\frac{\phi_1}{2}\right)\times\frac{1}{\frac{\phi_1}{2}}} \quad (2)$$

$$K_1 \times 2nS_1 \times \frac{\phi_1}{\phi_0} < d < K_2 \times 2nS_1 \times \frac{\phi_1}{\phi_0} \quad (3)$$

wherein:

r_1 and r_2: radii of curvature of the first and second faces, respectively, of the lens;

d: axial thickness of the lens;

n: refractive index of the lens;

ϕ_1: effective aperture of the lens;

ϕ_0: maximum diameter of the effective object field;

S_1: distance from the first face of the lens to the object plane; and

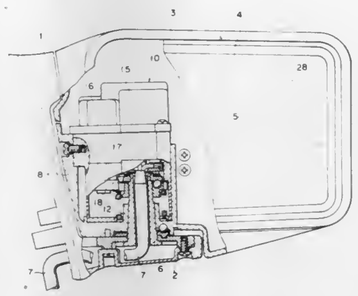
K_1: 0.9 and K_2=1.1.

4,626,083

ELECTRICALLY FOLDABLE DOOR MIRROR

Kiyoshi Nakayama; Yasutoshi Ito, and Toshiyuki Kumai, all of Shizuoka, Japan, assignors to Murakami Kaimeido Co., Ltd., Shizuoka, Japan

Filed Jun. 17, 1985, Ser. No. 745,663
Claims priority, application Japan, Feb. 19, 1985, 60-29472
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—604 **4 Claims**



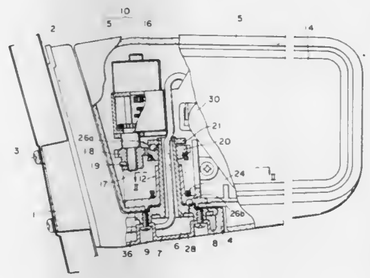
1. An electrically foldable door mirror comprising a base, a shaft erected on said base, a mirror body rotatably attached to said shaft, electric driving means for turning said mirror body, a pinion secured to the output shaft of said electric driving means, said pinion being engaged with a clutch gear attached to the upper portion of said shaft, means for automatically stopping said electric driving means, said stopping means being disposed between one surface of a fixed clutch fixed to the upper end of said shaft and a surface of said mirror body opposing said one surface of the fixed clutch, said stopping means comprising a printed circuit and contact pieces slidable thereon.

4,626,084

ELECTRICALLY FOLDABLE DOOR MIRROR

Toshiyuki Kumai, Shizuoka, Japan, assignor to Murakami Kaimeido Co., Ltd., Shizuoki, Japan

Filed Jun. 17, 1985, Ser. No. 745,664
Claims priority, application Japan, Jun. 28, 1984, 59-131995
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—604 **4 Claims**



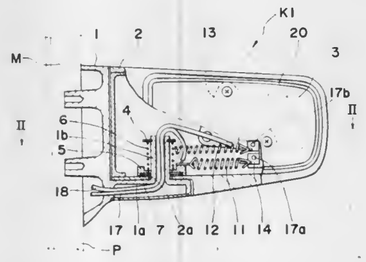
1. An electrically foldable door mirror comprising a base, a shaft erected on said base, a mirror body rotatably attached to said shaft, electric driving means supported by a frame within said mirror body, a pinion secured to the output shaft of said electric driving means, said pinion being engaged with a clutch gear attached to the upper portion of said shaft, an upper clutch disposed between the upper surface of said clutch gear and the upper end of said shaft, a lower clutch disposed between the lower surface of said frame at the position of insertion of said shaft and the opposing surface of said base, a coiled spring provided around said shaft so as to give a force of engagement to both of said clutches, said upper clutch being more strongly engaged than said lower clutch so that said lower clutch is disengaged earlier when said mirror body is turned.

4,626,085

ROTATABLE DOOR MIRROR FOR A MOTOR VEHICLE

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 6, 1985, Ser. No. 795,458
Claims priority, application Japan, Nov. 6, 1984, 59-168843[U]
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—604 **7 Claims**



1. An apparatus for retractably tilting a visor of a door mirror of a motor vehicle, said door mirror including a stay attached to an outer door panel of said motor vehicle and formed with a rotary shaft portion and a mirror member mounted on said visor, with said visor being formed with a hole and being pivotally mounted on said stay through fitting of said rotary shaft portion of said stay into said hole of said visor so as to be pivoted about said rotary shaft portion in forward and rearward directions of said motor vehicle between a normal position where said visor is projected outwardly from said outer door panel in a sidewise direction of said motor vehicle and a retracted position where said visor is retracted towards said outer door panel, said apparatus comprising:

a spring means having a first and second element which are made of shape-memory alloy;

a lever means for supporting said first element of said spring means at a minimum mounting length when said visor is disposed at the normal position and at a maximum mounting length when said visor is disposed at the retracted position and supporting said second element of said spring means at a maximum mounting length when said visor is disposed at the normal position and at a minimum mounting length when said visor is disposed at the retracted position, said lever means is provided peripherally outwardly from said rotary shaft portion;

said spring means being attached, at opposite ends thereof, to said lever means and an inner portion of said visor; and

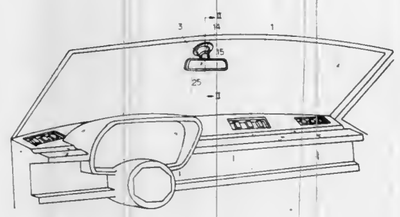
a battery acting as a power source of said apparatus, which is connected to the opposite ends of said spring means, whereby when said spring means is heated upon energization thereof, said spring means is contracted from the maximum mounting length to the minimum mounting length based on shape-memory effect of the shape-memory alloy such that said visor is rotated between the normal and retracted positions.

4,626,086

REAR VIEW MIRROR ASSEMBLY

Yasuo Ohyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 19, 1985, Ser. No. 756,950
Claims priority, application Japan, Jul. 23, 1984, 59-111270[U]
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—632 **21 Claims**



1. A rear view mirror assembly of a vehicle comprising:

a base member secured to a surface of the vehicle, the base member having a hook and a mounting portion thereon; and

a first unit of the rear view mirror assembly comprising,

a mounting member having a first end located on the mounting portion of said base member, the mounting member having a first aperture and a first socket portion disposed around the first aperture, the first socket portion disposed on a second end of said mounting member opposite from said first end,

a spring member mounted on the hook of said base member and having an engaging means thereon, the spring member being able to support a force on the hook of said base member,

a support arm having a first end with an outer surface and an inner surface, and an opposite second end which rotatably supports a rear view mirror,

the outer surface of said first end of said support arm mounted slidably on the first socket portion of said mounting member,

the inner surface of said support arm having a second socket portion,

a second aperture extending from the second socket portion of the inner surface to the outer surface of the support arm, a diameter of the second aperture of said support arm being greater than a diameter of the first aperture of said mounting member,

a second ball member mounted slidably on the second socket portion of said support arm, and

an engagement member inserted into the second aperture of said support arm and the first aperture of said mounting member, the engagement member having one end engaging the engagement means of said spring member, and an opposite end connected to said second ball member, the engagement member uniting said second ball member, said support arm and said mounting member on said base member through said spring member,

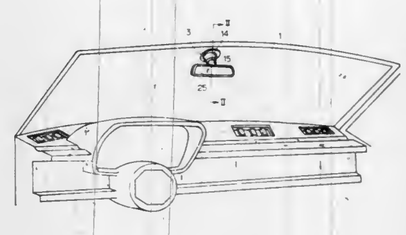
whereby said first unit of the rear view mirror assembly is universally mounted on said base member, and said first unit of the rear view mirror assembly may disengage from said hook of said base member, when more than the predetermined amount of force is applied thereto.

4,626,087

REAR VIEW MIRROR ASSEMBLY

Yasuo Ohyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 19, 1985, Ser. No. 756,953
Claims priority, application Japan, Jul. 23, 1984, 59-111268[U]
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—632 **20 Claims**



1. A rear view mirror assembly of a vehicle comprising:

a base member secured to a windshield of the vehicle, the base member having a hook and a mounting portion thereon;

a spring member mounted on the hook of said base member and having an engaging means thereon, the spring member supporting a predetermined amount of a force on the hook of said base member; and

a unit of rear view mirror assembly comprising;

a mounting member having a first end located on the mounting portion of said base member, the mounting member having a first aperture and a first socket portion on a second opposite end of the mounting member, the first socket portion disposed around the first aperture,

a support arm having a first end with an outer surface and an inner surface, and an opposite second end on which a rear view mirror is rotatably mounted,

the outer surface of said support arm mounted slidably on the first socket portion of said mounting member,

the inner surface of said support arm having a second socket portion,

a second aperture extending from the second socket portion of the inner surface to the outer surface of the support arm, an inner peripheral edge defining said second aperture, a diameter of the second aperture of said support arm being greater than a diameter of the first aperture of said mounting member,

a second ball member mounted slidably on the second socket portion of said support arm, the second ball member having a portrusion thereon disposed within the second aperture of said support arm, and

an engagement member inserted into the second aperture of said support arm and the first aperture of said mounting member, the engagement member having a first end engaging with the enagagement means of said spring member and an opposite end connected to said second ball member, the engagement member supporting said second ball member, said support arm and said mounting member on said base member through said spring member,

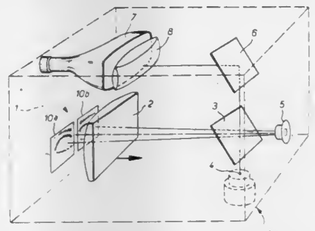
said unit of the rear view mirror assembly being united by said engagement with the protrusion of said second ball member inserted within said second aperture to restrain selectively said support arm from moving on said second ball member.

4,626,088

OCULAR PARAMETER MEASURING DEVICE WITH DIGITALLY CONTROLLED VIRTUAL GRATICULES

Christian Joncour, Villeneuve-Saint-Georges; Alain Pierre, Paris; Patrice Renan, Paris; Jean-Louis Roumegoux, Paris; Francoise Richard, deceased, late of Joisin-le-Bretonneux; by Jacques M. G. Richard, heir, Cugnaux; Alexandra A. C. Richard, heir, Cugnaux, and Anne-Lise P. M. Richard, heir, Cugnaux, all of France, assignors to Essilor International Cie Generale d'Optique, Creteil, France

Filed Dec. 19, 1984, Ser. No. 683,389
Claims priority, application France, Dec. 29, 1983, 83 21010
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—204 **8 Claims**



1. Device for measuring a subject's ocular parameters, in particular the interpupillary distance, for the purposes of fitting a pair of eyeglasses, said device comprising a generally plane front plate, means for marking the position of the subject relative to said front plate, windows in said front plate corresponding to the locations of the lenses of the eyeglasses, optical means having an optical axis normal to and centered on said front plate comprising a convergent lens, a point light source and a viewing eyepiece optically coincident with said source on said optical axis, said optical means being on the opposite side of said convergent lens and the focus thereof when said convergent lens is at an origin position to said front plate, high-resolution luminous display means having a screen adapted to display graticules, optical coupling means whereby an image of said graticules is formed in the plane of said front plate and within the boundaries of said windows, deflection means comprising respective deflection circuits whereby the positions of said graticules within said windows may be adjusted vertically and horizontally, and means for displaying the position of said graticules.

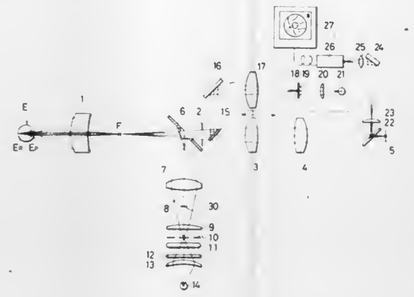
4,626,089

OPHTHALMIC INSTRUMENT HAVING A FOCUS DETECTING SYSTEM

Susumu Takahashi, and Kiwami Horiguchi, both of Tokyo, Japan, assignors to Tokyo Kagaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,675
Claims priority, application Japan, Apr. 2, 1983, 58-58497
Int. Cl.[4] A61B *3/14*
U.S. Cl. 351—208 **6 Claims**

1. A focusing signal detecting device for an ophtalmic instrument including mark projecting means for protecting a plurality of mark images to a fundus of a patient's eye, photoelectric means for photoelectrically scanning the mark images projected on the fundus of the patient's eye by a succession of parallel scanning lines to produce mark image signals, a synchronizing signal counting circuit for counting line synchronizing signals for the photoelectric means, a mark image counting circuit for counting the number of mark image signals produced by the photoelectric means in each line scan to determine that a predetermined number of mark image signals exist in a single scanning line, means responsive to outputs of said two circuits for determing that said mark image signals occur in a plurality of successive scanning lines, and means for



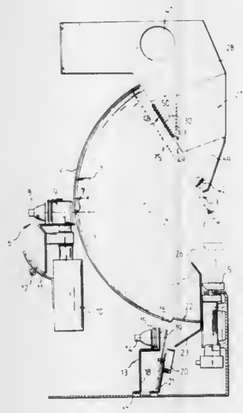
selecting one of said last named successive lines for judgment of focus condition.

4,626,090

CUPOLA-TYPE OPHTHALMOLOGICAL APPARATUS THE VISUAL FIELD AND THE ELECTROPHYSIOLOGICAL EXAMINATION OF THE HUMAN EYE

Jacques Charlier; Bruno Buys; Jean-Pierre Sozanski; Yves Moschetto; Jean-Claude Hache, and Pierre Francois, all of Lille, France, assignors to Institut National de la Sante et de la Recherche Medicale (Inserm), Lille, France

Continuation-in-part of Ser. No. 218,773, Dec. 22, 1980, abandoned. This application Apr. 16, 1984, Ser. No. 600,479
Claims priority, application France, Dec. 20, 1979, 79 31887
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—226 **14 Claims**



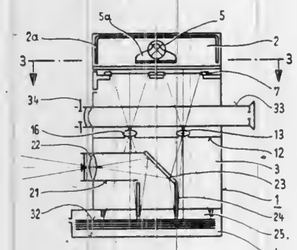
1. Apparatus for examining the field of vision of a patient, comprising a dome of hemispherical shape provided on its inner surface with a screen having a central fixation point, means for positioning the head of a patient with his eye just below the center of said dome and directed toward said fixation point, unitary means for illuminating said screen and projecting a movable stimulating image on said screen, said unitary illuminating and projecting means comprising a casing, a light source in said casing, a small mirror located below said light source and just above the center of said dome, optical means for transmitting a beam of light along an optical axis from said light source to said mirror, said optical means comprising a condensing lens, variable filter means, image producing means and a focusing lens for projecting an image on said mirror for reflection by said mirror onto said screen, means for mounting said mirror for rotation about first and second axes perpendicular to one another, first motor means for selectively rotating said mirror about said first axis and second motor means for selectively rotating said mirror about said second axis to produce movement of said image on said screen, a window aperture cut in a wall of said casing between said light source and said mirror, light-reflecting means hingedly mounted at a lower side of said window aperture for movement between a first position in which it closes said window aperture and a second position in which it intercepts the transmission of light from said light source to said mirror and directs light from said light source out through said window aperture to illuminate said screen, said entire unitary illuminating and projecting means including said casing, said light source, mirror, lens, filter means, image producing means, and mirror mounting and rotating means, being disposed within a space immediately above the patient's head and just beyond the upper limit of the patient's field of vision.

4,626,091

PHOTOGRAPHIC CAMERA

Heinrich Ostermeier, Cologne, Fed. Rep. of Germany, assignor to Happycard International Limited, Shannon, Ireland

Filed Sep. 19, 1985, Ser. No. 777,699
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434633
Int. Cl.[4] G03B *15/08*
U.S. Cl. 354—75 **9 Claims**



1. In a photographic camera for producing a composite picture, the camera comprising a casing including means for producing an image of an external object or scene on a first portion of an unexposed photographic medium disposed in an image plane within the casing and a plurality of projection systems for producing respective static thematic images on other respective portions of the medium, the improvement wherein the light from each projection system is transmitted freely within the casing to the vicinity of the image plane, and wherein a multi-aperture framing element is provided adjacent the image plane, the light from each projection system and the light from the external object or scene passing through respective apertures of the framing element to fall on respective areas of the medium which are delimited from each other by the apertures of the framing element.

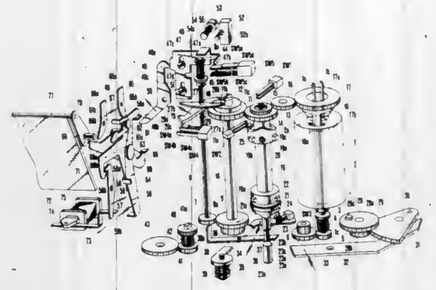
4,626,092

CLUTCH MECHANISM FOR CAMERA

Tatsuo Konno, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,805
Claims priority, application Japan, Jul. 30, 1983, 58-140230
Int. Cl.[4] G03B *1/40*
U.S. Cl. 354—212 **8 Claims**

1. A clutch mechanism for a camera, comprising:
(a) a sprocket arranged to feed one frame portion of film at a time by rotating a predetermined angle in response to one film winding operation;
(b) a take-up spool arranged to take up the film;
(c) a drive transmission system arranged to drive said take-up spool; and



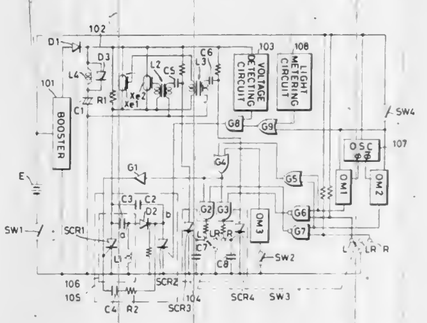
(d) a face clutch arranged within said drive transmission system to allow or cut off the transmission of a driving force, said face clutch having driving teeth arranged at a pitch different from the pitch of teeth to be driven.

4,626,093

FLASH CONTROL DEVICE FOR ELECTRONIC FLASH APPARATUS

Hideki Matsui, Yokohama, and Nobuyoshi Hagyuda, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,316
Claims priority, application Japan, Jun. 28, 1984, 59-133860
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—415 **14 Claims**



1. An electronic flash apparatus for flash photographing, comprising:
flash discharge means comprising first and second flash tubes;
means for supplying a voltage to said flash discharge means;
selector means provided for selecting at least one of said first and second flash tubes and adapted to be manipulated by the operator,
said selector means having a first selection mode selecting said first flash tube and a second selection mode selecting said second flash tube;
first light emission control means for triggering discharge in said first flash tube for said flash photographing when said first selection mode is selected and triggering discharge in said second flash tube for said flash photographing when said second selection mode is selected;
second light emission control means comprising oscillator means for generating periodic output signals and periodically triggering discharge in said first flash tube in re-

sponse to said periodic output signals when said first selection mode is selected and in said second flash tube in response to said periodic output signals when said second selection mode is selected, wherein said second light emission control means is adapted to control said voltage supplying means in such a manner that flash tube light emission repeats at a period related to said periodic output signals; and

means for driving said second light emission control means in a manner different from said flash photographing.

4,626,094

SHUTTER TIME SWITCHING DEVICE FOR ROTARY SHUTTER

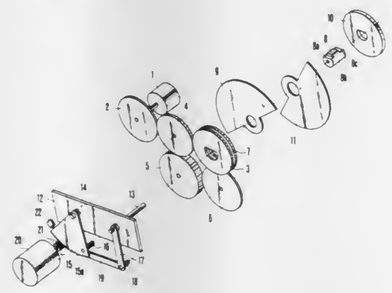
Syuichiro Saito, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,748

Claims priority, application Japan, Nov. 16, 1983, 58-215740; Nov. 16, 1983, 58-215741

Int. Cl.[4] G03B *7/00, 9/16;* **H04N** *5/225*

U.S. Cl. 354—456 **24 Claims**



1. An exposure control device, comprising:

(a) exposure control means for controlling a degree of exposure;

(b) a stepping motor arranged to drive said exposure control means; and

(c) motor control means for causing said stepping motor to be driven in a two-phase driving mode for a first exposure time by said exposure control means and in a single-phase driving mode for a second exposure time that is longer than said first exposure time.

4,626,095

BELT-HOLDER DRAWER FOR PHOTORECEPTOR BELT FOR COPIER APPARATUS

Jean-Claude Berger, Issoudun, France, assignor to Tetras, Paris, France

Filed May 16, 1985, Ser. No. 734,813

Claims priority, application France, May 16, 1984, 84 07566

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 BE **10 Claims**

1. Belt holder drawer for a copier apparatus comprising first and second spaced cylinders and an endless belt looped thereon,

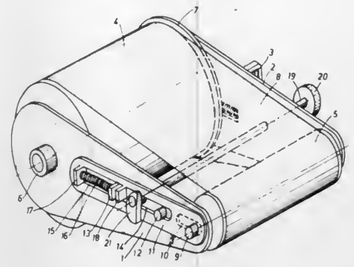
(a) said first cylinder having a slight conicity with one side having a smaller diameter than the other side,

(b) a bearing flange adjacent the side of the first cylinder having the smaller diameter,

(c) means for mounting said first cylinder for rotation about a fixed axis,

(d) means for mounting said second cylinder for rotation about the axis thereof,

(e) means for permitting movement of the second cylinder radially thereof towards and away from said first cylinder, and



(f) means for urging said second cylinder away from said first cylinder.

4,626,096

IMAGE FORMING APPARATUS FOR FORMING A VISUAL IMAGE IN ACCORDANCE WITH IMAGE SIGNALS

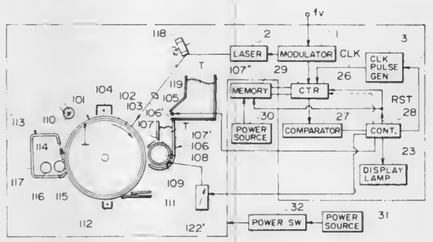
Yasumasa Ohtsuka, Yokohama; Jun Asai; Yoshihiro Murasawa, both of Kawasaki; Hiroshi Sasame, Tokyo, and Masaharu Ohkubo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,952

Claims priority, application Japan, Apr. 2, 1984, 59-63262; Nov. 28, 1984, 59-251181

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—14 D **28 Claims**



1. An image forming apparatus used in conjunction with means for producing an image signal representing an image to be recorded, said apparatus comprising:

means for forming a visivble image, as represented by the image signal, with visible material on an image bearing member;

means for generating a time signal;

means for measuring the time signal generated by said time signal generating means as a function of the production of the image signal by said producing means; and

means for generating a signal, indicating insufficiency of supply of the visible material for said forming means to properly form a visible image on the basis of measurement of the time signal by said measuring means.

4,626,097

PROCESS FOR PREPARING PRINTING PLATES

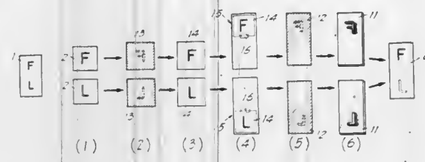
Seiichi Uchida, Moriguchi, Japan, assignor to Osaka Seihan Center Kyogyo Kumiai, Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,778

Claims priority, application Japan, Jun. 28, 1983, 58-117217

Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—77 **6 Claims**



1. In a process for preparing a printing plate the process characterized by the steps of:

forming individual positive images of printing plate images to be reproduced on an individual of a plurality of transparent film pieces selected by image and color, each of said film pieces respectively being of a dimensional size less than the dimensional size of the printing plate to be prepared;

detachably superposing the transparent film pieces bearing the positive images of like color unto a transparent film of size corresponding generally with the size of printing plate to be prepared individually for a respective color; and

optically utilizing the superposed transparent film pieces and transparent film for preparing a printing plate bearing said images.

4,626,098

COPYING FRAME FOR PRODUCING OFFSET PLATES

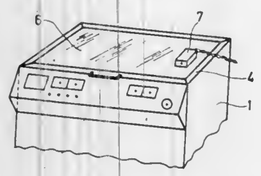
Franz Arendt, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,142

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434829

Int. Cl.[4] G03B *27/04*

U.S. Cl. 355—85 **2 Claims**



1. In a copying frame machine for producing offset plates, the improvement comprising a rubber cover, a copying frame having a glass plate superimposable on said rubber cover so as to sandwich and lock therebetween an offset printing plate, a film and a sheet of copying material, means for applying a vacuum between said rubber cover and said glass plate, and vibration-generating means for applying vibration to at least one of said glass plate and said rubber cover.

4,626,099

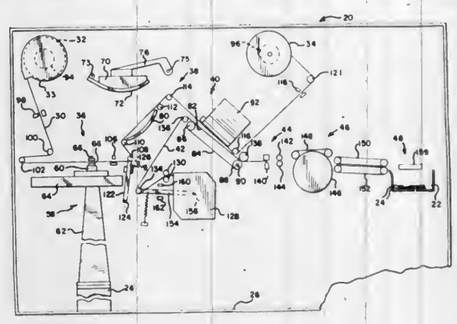
FILM DUPLICATION SYSTEM FOR MICROIMAGE RECORDERS

Robert D. Zuelke, Wheeling; Paul H. Friedrich, Glenview, and David G. Stites, Elgin, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 17, 1985, Ser. No. 788,283

Int. Cl.[4] G03B *27/04*

U.S. Cl. 355—99 **34 Claims**



1. In a microimage recording apparatus of the type utilizing an elongated master film strip movable along a master film processing path, a film duplication system for making a duplicate film strip from successive developed image areas on said master film strip, said duplication station comprising:

means for moving a developed image area on said master film strip into and out of a duplication position along said master film strip path for making a duplicate of said image area on said duplicate film strip;

means for moving a segment of said duplicate film strip along a duplicate film processing path and moving said segment into contact against said master film strip at said duplication position, said means for moving said duplicate film strip comprising vacuum belt means having a belt run in vacuum holding contact with said duplicate film strip at said duplication position and movable toward and away from said master film strip at said duplication position; and

means for exposing said duplicate film strip at said duplication position to light passed through said image area on said master film strip for creating a latent duplicate image area on said segmet of said duplicate film strip in contact with said master film strip at said duplication position.

4,626,100

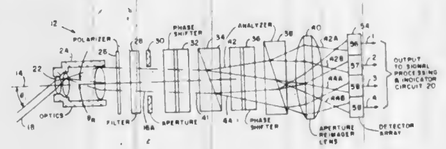
WIDE FIELD OF VIEW TWO-AXIS LASER LOCATOR

John L. Johnson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1983, Ser. No. 565,788

Int. Cl.[4] G01C *1/00;* **G01J** *4/00*

U.S. Cl. 356—152 **12 Claims**



1. A remote laser locator system for processing incoming directional optical energy comprising: an optical sensor disposed for detecting impinging optical energy; said sensor comprising a polarizer, optical wavelength filter means, an internal aperture, first and second phase shifters, first and second polar-

ization analyzers, an aperture reimaging lens system for imaging said internal aperture, and a detector array; said sensor being disposed for directing impinging optical energy sequentially through said polarizer, filter, internal aperture, first phase shifter, first analyzer, second phase shifter, second analyzer and lens system to said detector array; and the outputs of said detector array being electrical outputs defining the angle of incidence of said optical energy.

4,626,101

SURFACE DEFECT INSPECTING APPARATUS

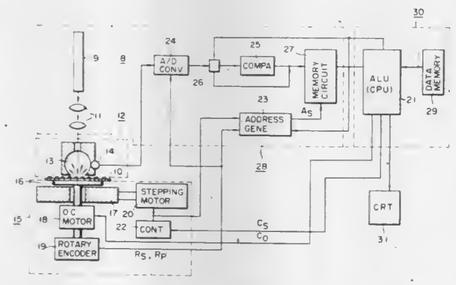
Shigeru Ogawa, Yokohama; Hiroshi Yamaji, Chigasaka, and Masaaki Kano, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 26, 1984, Ser. No. 675,008

Claims priority, application Japan, Nov. 26, 1983, 58-221394; Jul. 19, 1984, 59-148614

Int. Cl.⁴ G01N *21/89*

U.S. Cl. 356—237 **19 Claims**



1. An apparatus for inspecting an object under inspection for defects on the surface thereof, comprising:

means for holding the object under inspection in a manner that the substantially entire surface of the object may relatively be scanned by laser beam;

spherical integrating light collecting means provided at one end with an opening disposed close to the inspected surface of the object held by said holding means;

laser beam illustrating means coupled with another end of said spherical integrating light collecting means and for illuminating said inspected surface of the object with the laser beam through said opening;

photo-electric converting means for receiving the scattered light as is reflected by said inspected surface and collected by said spherical integrating light collecting means, and for converting the scattered light into an electrical signal representing an amount of light;

analog to digital converting means for analog to digital converting the electrical signal derived from said photo-electric converting means into a digital signal;

peak detecting means for receiving the digital signal derived from said analog to digital converting means to detect peak values at predetermined periods;

means for calculating a mean value based on a digital signal output from said analog to digital converting means;

means for storing at least one reference value which is for determining at least one threshold level to detect surface defect or defects present on said inspected surface;

means for calculating said threshold level based on said reference value and said mean value; and

surface defect detecting means for comparing peak values derived from said peak detecting means with said threshold level, and for detecting the surface defect or defects depending on the result of the comparison.

4,626,102

BRAGG CELL SPECTRAL ANALYZER WITH A PRISM EXPANSION SYSTEM

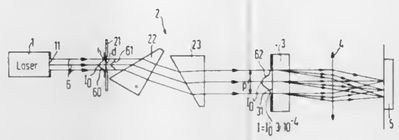
Eckhard Storck, and Ulrich Wolff, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,847

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404822

Int. Cl.⁴ G01J *3/06*; G01R *21/17*; G02F *1/33*

U.S. Cl. 356—328 **9 Claims**



1. In a Bragg cell spectral analyzer having a Bragg cell with an expansion system for the expansion of a laser beam conducted to the Bragg cell having an aperture, said laser beam emerging from an opening, which has a diameter lying in the order of magnitude of a millimeter, as a parallel bundle of light having a Gaussian cross-sectional distribution of the light intensity and passing through the expansion system in this form with superimposed stray light, the improvements comprising said expansion system being a prism expansion system and including an aperture diaphragm being disposed in the path of the laser beam in front of the prism expansion system, said aperture diaphragm being disposed a distance in front of the opening from which the laser beam emerges on the order of magnitude of a meter and having an aperture with a diameter of an order of magnitude of a millimeter which is greater than the half-width value of the Gaussian cross-sectional distribution and cuts off the Gaussian cross-sectional distribution at the edges, and said prism expansion system expanding the diffraction-limited laser beam emerging from the aperture diaphragm with a Gaussian cross-sectional distribution cut-off at its edges to such a degree into an expanded laser beam having a prescribable intensity value I of the expanded, cut-off Gaussian cross-sectional distribution at the edges of the aperture of the Bragg cell being lower than half of the maximum intensity value at the center of the cross-section distribution of the expanded laser beam.

4,626,103

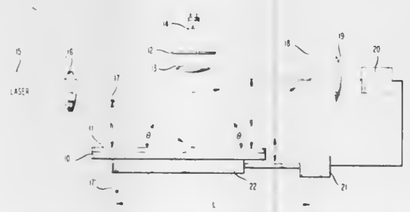
FOCUS TRACKING SYSTEM

Martin Feldman, Berkeley Heights; David N. Reece, Irvington, and John S. Wagner, Lebanon, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 29, 1984, Ser. No. 594,939

Int. Cl.⁴ G01B *11/14*

U.S. Cl. 356—363 **16 Claims**



1. A method of fabricating integrated circuits in a semiconductor wafer including tracking the position of a surface relative to a desired plane comprising:

directing a light beam at a small angle to the surface so as to specularly reflect a portion of the beam and form interference fringes between the reflected beam and the remaining portion of the beam passing over the surface;

detecting changes in the position of the fringes; and

adjusting the position of the surface relative to the plane in response to changes in the position of the fringes.

4,626,104

METHOD AND APPARATUS FOR MIXING PARTICULATE MATERIALS

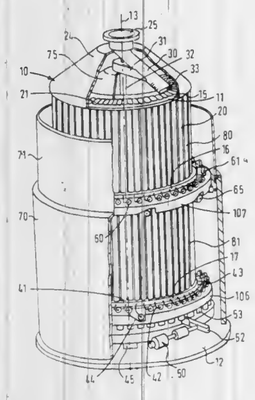
Ronald H. Pointon, Formby, and Allen F. Nightingale, Sutton Coldfield, both of England, assignors to W & A Bates Limited, England

Filed Nov. 14, 1984, Ser. No. 671,242

Claims priority, application United Kingdom, Nov. 24, 1983, 8331422

Int. Cl.⁴ G05D *11/00*; B01F *15/04*

U.S. Cl. 366—162 **11 Claims**



1. A method of blending particulate materials comprising mixing together predetermined proportions of ingredients to form a batch and transferring the mixed ingredients by a series of instalments into each of a plurality of blending chambers so that each blending chamber receives a plurality of instalments of the mixed ingredients and thereby contains an average sample, then fully discharging the blending chambers in sequence to provide an output in the form of a series of sub-batches each comprising said predetermined proportions of ingredients and the transfer of the batch to the blending chambers being completed before the sequential discharge of the blending chambers commences, whereby the output from the blending chambers is in the form of a series of sub-batches each comprising said predetermined portions of ingredients.

4,626,105

MEDICATION ORGANIZER

Larry D. Miller, Rte. 4, Box 494, Springhill Rd., Somerville, Ala. 35670

Filed Mar. 4, 1986, Ser. No. 835,892

Int. Cl.⁴ G04B *47/00*

U.S. Cl. 368—10 **12 Claims**

1. An improved medication organizer comprising a plurality of compartments having a minimum of simple, easily understood controls operable by elderly people for dispensing a plurality of different classes of pills to be taken at different time intervals measured from selectable reference times and including easily understood controls for correcting the reference times for pills taken too early or too late and comprising:

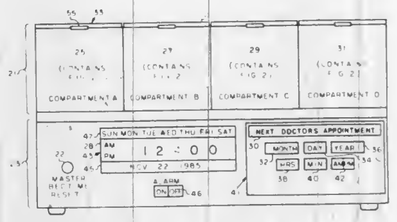
first indicator means for setting a readable morning time and indicatable, when it occurs, by an audible alarm when the day's first pills should be taken;

second indicator means for indicating the different intervals of time which should elapse between the taking of different kinds of pills;

third means comprising a plurality of compartments, each dedicated to the storage of pills, which can be of different types, but all of which have the same morning starting time and the same time interval between the taking of the pills;

a real time clock with means for producing coded signals indicating hours and minutes;

a plurality of time readout means, one for reading out the time for taking the next pills of each individual compartment;



fourth means for transferring the contents of said first indicator means to said readout means in response to a signal originated by the patient at bedtime;

fifth means for incrementing the time indicated by each readout means by the amount stored in said second indicator means by the patient when he takes a pill on time; and

sixth means for transferring the contents of said RTC to said time readout means in response to a signal originated by the patient when the patient believes he has taken his pill too early or too late and then incrementing said time readout means by the amount stored in said second indicator means.

4,626,106

VCR TIMED CONTROLLER

Gerald L. Hooper, Pinehurst, Id., assignor to James Ratliff, Hayden Lake, Id.

Filed Oct. 23, 1985, Ser. No. 790,345

Int. Cl.⁴ G04F *8/00*

U.S. Cl. 368—107 **22 Claims**



1. A timed controller operable with a VCR for partially inhibiting operation thereof after a preselected time period has elapsed, comprising:

a clock generating clock pulses at a preselected rate;

a counter receiving and counting said clock pulses and generating an inhibit signal upon counting a predetermined number of said clock pulses corresponding to the preselected time period;

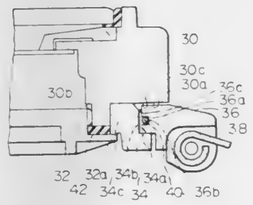
an inhibit switch connected to the VCR and applying a control signal thereto in response to said inhibit signal to cause the VCR to automatically rewind and allow ejec-

tion of a cassette therein while disabling other playing functions of the VCR upon elapse of the preselected time period;
a keyed switch activated by a key removable from the VCR; and
a reset responsive to said keyed switch to reset said counter.

4,626,107
STRUCTURE OF ROTATING MECHANISM FOR WATCH CASE

Junichi Nishikawa, and Yutaka Shoji, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 781,250
Claims priority, application Japan, Oct. 1, 1984, 59-206090; Oct. 1, 1984, 59-148766[U]; Oct. 26, 1984, 59-162062[U]
Int. Cl.⁴ G04B *37/00*
U.S. Cl. 368—276 **7 Claims**

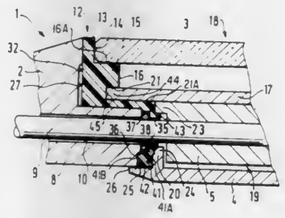


1. A structure of a rotating mechanism for a watch case having a time display section, comprising:
a case body internally accommodating said time display section and having a lower opening;
a back cover fitted into said lower opening of said case body;
a retaining ring secured to a lower portion of said case body; and
a band attaching base engaging with said case body by being clamped between said retaining ring and said case body, said case body being adapted to rotate with respect to said band attaching base.

4,626,108
WRISTWATCH WITH SEAL

Wolfgang Ganter, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 741,948
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421168
Int. Cl.⁴ G04B *37/00*
U.S. Cl. 368—291 **2 Claims**

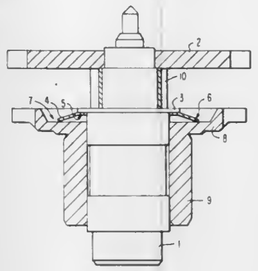


1. A wristwatch comprising:
an outer case including a longitudinal retaining bore,
a hollow, generally cylindrical seal disposed in said retaining bore, said seal comprising a tube of hard synthetic plastic material including an inner wall, said inner wall including an upper portion and a lower portion of reduced diameter, said upper portion including a radial notch and an upper longitudinal recess disposed above said notch, said notch including upper and lower radial faces, said upper recess including a longitudinally extending wall and a shoulder extending radially inwardly from a lower end of said longitudinally extending wall,
said lower portion including a radially inwardly projecting flange, and a lower longitudinal recess disposed below said flange, said tube including a longitudinally extending inner surface defining a portion of said lower recess, and a longitudinally extending outer wall disposed radially outside of said inner surface, said outer wall engaging a portion of said retaining bore,
a water movement having a collar seated on said flange and radially engaging a portion of said inner wall to be radially and longitudinally positioned within said tube, said portion of said inner wall pressing radially against said collar in a fluidresistant manner,
a watch face disposed above said movement and including a planar outer periphery received in said notch and making area contact with said lower face of said notch, said watch face engaging an upper end of said watch movement and urging said collar longitudinally against said flange,
a crystal disposed in said upper recess such that an outer peripheral portion of said crystal sits upon said shoulder and said longitudinally extending wall presses radially inwardly against said outer peripheral portion, and
a bottom cover received in said lower recess, said bottom cover including an upwardly extending wall disposed internally of said lower recess so as to extend longitudinally alongside said movement in radially spaced relationship therewith, a radially outer surface of said upwardly extending wall engaging said inner surface of said lower recess in a fluid-resistant manner.

4,626,109
WATCH HAND DRIVE SHAFT STRUCTURE

Wolfgang Kroener, Pforzheim, Fed. Rep. of Germany, assignor to Pforzheimer Uhren Rohwerke Porta GmbH, Pforzheim, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,456
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 8436089[U]
Int. Cl.⁴ G04B *29/00*
U.S. Cl. 368—322 **2 Claims**

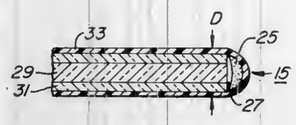


1. A drive shaft arrangement for a timepiece, comprising a minute shaft adapted to carry a minute hand at one end thereof, said minute shaft having a collar formed thereon and carrying a minute gear at its other end, a pinion gear disposed on said minute shaft between said collar and said minute gear for rotation therewith, an hour gear provided with a sleeve rotatably disposed on said minute shaft at the side of said collar opposite said pinion gear, said hour gear having a cavity formed in its face adjacent said collar and a Belleville spring disposed in said cavity and having its radially inner end disposed adjacent said collar and its radially outer end abutting the cavity wall.

4,626,110
TECHNIQUE FOR OPTICALLY MEASURING THE TEMPERATURE OF AN ULTRASONICALLY HEATED OBJECT

Kenneth A. Wickersheim, Menlo Park, and Mei H. Sun, Los Altos, both of Calif., assignors to Luxtron Corporation, Mountain View, Calif.

Filed May 3, 1985, Ser. No. 730,299
Int. Cl.⁴ G01J *5/08*; G01K *11/20, 13/00*
U.S. Cl. 374—131 **15 Claims**

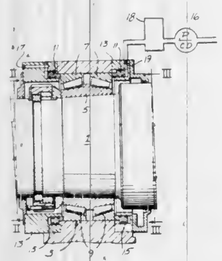


1. A method of monitoring the temperature of a volume of material that is being heated by absorption of ultrasonic energy being directed into said volume of material from its outside, comprising the steps of:
implanting within said material one end of an optical fiber transmission medium which carries an optical temperature sensor, said sensor and optical transmission medium adjacent said sensor being characterized by being made substantially entirely of non-compressible material and having an outer diameter that is substantially equal to or less than a wavelength of said ultrasonic energy in said material divided by the mathematical constant pi, and
monitoring the temperature of said sensor through connection with another end of said optical fiber transmission medium;
whereby temperature artifacts that tend to be caused by ultrasonic energy interaction with the temperature sensor are minimized.

4,626,111
SELF-COMPENSATING ANTI-FRICTION BEARING CLEARANCE DEVICE

Archie N. Swasey, Oxford, and William J. Winter, Trumbull, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Jul. 25, 1985, Ser. No. 758,733
Int. Cl.⁴ F16C *27/00*
U.S. Cl. 384—99 **2 Claims**

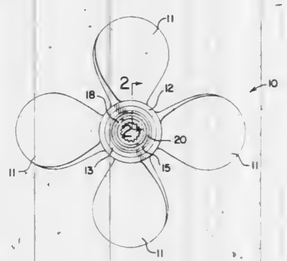


1. An automatically adjusting roller bearing assembly for supporting a rotating shaft, said roller bearing assembly comprising:
(a) a unitary dual track oppositely tapered inner bearing race;
(b) a pair of sets of roller elements, disposed around the circumference of each track of said inner bearing race;
(c) a split pair of tapered outer bearing races, each arranged so as to capture one set of roller elements between said inner bearing race and said respective outer bearing race, said outer bearing races being supported against axial movement one toward the other solely by said roller elements; and
(d) axially traversable means for applying and maintaining a preselectable force applied axially to each race of said pair of outer races in the direction toward the other of said outer races.

4,626,112
PROPELLER BEARING

James H. Kramer, Akron, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Jan. 27, 1984, Ser. No. 574,314
Int. Cl.⁴ F01D *5/00*; F16C *33/20*; F16D *7/02, 3/64*
U.S. Cl. 384—300 **11 Claims**

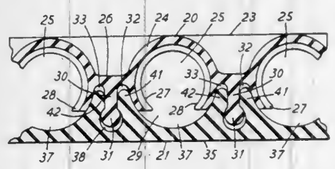


1. A bearing assembly for a rotating marine propeller comprising:
a rigid bushing having a splined inner bore for connection to a drive shaft, an annular elastomeric member having its inner bore surface bonded to the exterior surface of said rigid bushing for rotation therewith, said annular elastomeric member being in radial compression, said annular elastomeric member being in a flat elongated configuration in cross section, said annular elastomeric member having an exterior circumferentially extending surface in frictional engagement with the interior circumferentially extending surface of a cylindrical rigid member, said cylindrical rigid member is made of an antifrictional material, the outer surface of said cylindrical rigid member is bonded to the interior surface of a sleeve, and said sleeve being securely connected to a circular hub member which has a plurality of blades extending radially therefrom to form said propeller.

4,626,113
CAGE FOR A RADIAL BALL BEARING

John P. Forknall, Dunstable, and Keith W. Woodbridge, Luton, both of England, assignors to SKF (U.K.) Limited, Luton, England

Filed Mar. 18, 1985, Ser. No. 713,575
Claims priority, application United Kingdom, Apr. 4, 1984, 8408678
Int. Cl.⁴ F16C *33/38, 33/44*
U.S. Cl. 384—530 **14 Claims**



1. A cage for separating the balls of a radial ball bearing, comprising an annular body of resilient plastics material having pockets for reception of the balls, the annular body being formed on one side thereof with a plurality of flanges arranged

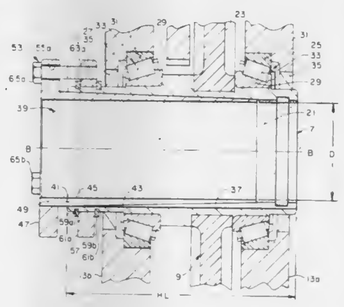
in pairs spaced around the body and with guide prongs arranged one between adjacent pairs of the flanges, each pair of flanges defining the mouth of a separate one of said pockets in the annular body, and the guide prongs being arranged to guide the balls into the mouths of the pockets upon fitting of the annular body into the bearing from a side thereof, the mouths of the pockets having a width less than the diameter of the balls, and the annular body being deformable by the force between the balls and the flanges upon fitting the annular body into the bearing so as to enlarge said mouths for introduction of the balls into the pockets as a snap fit, wherein the cage includes a retainer ring adapted to be mounted on said guide prongs to maintain substantially the same chord distance between the guide prongs and thereby restrict deformation of the annular body and prevent disengagement of the annular body from the balls due to the contact forces between the balls and the annular body during operation of the bearing.

4,626,114

SINGLE TAPERED BUSHING FOR SHAFT MOUNT

Allyn E. Phillips, Mason County, Ky., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 23, 1985, Ser. No. 778,896
Int. Cl.[4] F16C *43/04*; F16B *2/14*
U.S. Cl. 384—584 **6 Claims**



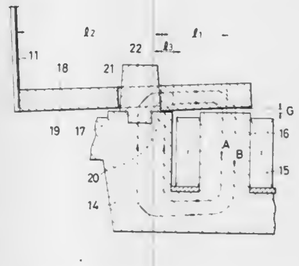
1. A single tapered bushing system for receiving and mounting a shaft within a bearing assembly, said bearing assembly being supported within a housing and comprising a pair of spaced anti-friction bearings, each said bearing having an outer race fixed with respect to said housing, and an inner race rotatable with respect to said outer race, a plurality of rolling elements disposed between said inner and outer races, a rotatable member having a hollow hub open at both ends thereof, said hub being received by the inner races of said bearings with said inner races of said bearings and said hub being generally coaxial and with the inner races and with said hub being rotatable relative to said outer races and said housing, said hub having a tapered inner bore extending substantially through said hub and converging inwardly from one open end of the hub to the other, a single sleeve having a flange at one end thereof, said sleeve having an outer tapered surface converging inwardly from said flange at said one end thereof and further having a cylindrical inner bore, said sleeve being received within said hub bore from said one open end of said hub with the outer tapered surface of said sleeve contacting said tapered hub bore substantially along the full length thereof, a longitudinal slot in said sleeve for permitting circumferential contraction and/or expansion of said sleeve within said hub bore, said inner sleeve bore receiving a shaft in such manner as to accommodate variations in axial alignment, concentricity, and/or parallelism, within a limited range, between the axis of said shaft and the axis of said hub, means for rotatably coupling said shaft and said hub such that said hub and said shaft rotate as a unit, and means for forceably drawing said sleeve with said shaft received in the bore thereof into said tapered bore of said hub thereby to effect contraction or expansion of said sleeve on said shaft so as to accommodate said variations between said shaft and said hub, and for positively coupling said shaft and said hub.

4,626,115

DOT PRINTER HEAD

Takashi Norigoe, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,716
Claims priority, application Japan, Mar. 8, 1984, 59-44489
Int. Cl.[4] B41J *1/60, 1/56*
U.S. Cl. 400—124 **12 Claims**



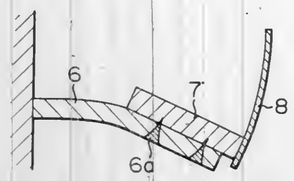
1. A dot printer head comprising:
(a) a yoke having a central axis;
(b) a plurality of cores disposed on said yoke around said central axis and magnetically connected to said yoke, each one of said plurality of cores extending from said yoke in a first direction;
(c) a plurality of coils, each one of said plurality of coils surrounding an associated one of said plurality of cores;
(d) a plurality of projections disposed on said yoke around said central axis and magnetically connected to said yoke, each one of said plurality of projections extending from said yoke in said first direction and each one of said plurality of projections being located on the same radial line relative to said central axis as an associated one of said pluraity of cores;
(e) a plurality of armatures, each one of said plurality of armatures:
(i) being mounted on one of said plurality of projections extending from said yoke for pivotable movement about a pivot on said yoke between the associated one of said cores and the associated one of said projections;
(ii) facing an associated one of said cores; and
(iii) having a hole therethrough to receive one of said plurality of projections, said hole being larger than said projections by an amount sufficient to permit said armature to pivot between a rest position and an actuated position
thereby providing a magnetic path through each one of said plurality of cores, said yoke, the associated one of said plurality of projections, the associated one of said plurality of armatures, and back to said each one of said plurality of cores; and
(f) a plurality of needles, each one of said plurality of needles being operatively connected to one end of an associated one of said plurality of armatures for movement therewith to and from a printing position as said armature moves between said actuated and rest positions.

4,626,116

HEAD FOR WIRE DOT PRINTER

Takehiko Sagara, Fukaya; Hiroya Suzuki, Kumagaya, and Iwao Ohtsuka, Matsue, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,524
Claims priority, application Japan, Mar. 6, 1984, 59-42279
Int. Cl.[4] B41J *3/12*; C22C *38/18*
U.S. Cl. 400—124 **9 Claims**



1. A head for a spring charge type wire dot printer comprising:
a leaf spring welded to an armature and biased by a permanent magnet; and
a magnetic coil adapted to erase the magnetic field of said permanent magnet so as to release said leaf spring and to drive a print wire;
said leaf spring being made of an alloy consisting essentially of 13–14 wt % Cr, 0.37–0.43 wt % C, 0.25–0.5 wt % Si, 0.3–0.5 wt %, Mn, 1.15–1.35 wt % Mo and the balance Fe.

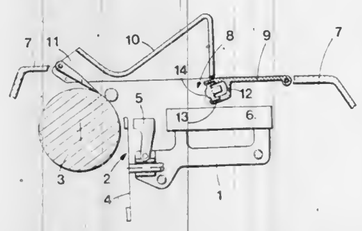
4. A weldable, iron-based spring material consisting essentially of 13–14 wt % Cr, 0.37–0.43 wt % C, 0.25–0.5 wt % Si, 0.3–0.5 wt % Mn, 1.15–1.35 wt % Mo and the balance Fe.

4,626,117

TYPEWRITER

Pierre Dumusc, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed May 5, 1981, Ser. No. 260,803
Claims priority, application Switzerland, May 20, 1980, 3916/80
Int. Cl.[4] B41J *29/18*
U.S. Cl. 400—716 **3 Claims**



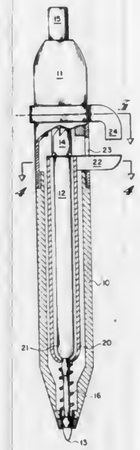
1. A typewriter comprising a casing having an opening in the upper part thereof, a platen to receive the paper to be written on, a carriage movable along said platen and a writing device on said carriage, a guard pivotally mounted at its rear edge on said casing and covering a first portion of said opening when in a lowered position, said guard including a front edge facing said platen, stationary lighting means for illuminating the area where the writing is to be performed and also to illuminate the entire length of said platen, said lighting menas including at least one substantially linear light source, a transparent slide removably secured to the front edge of said guard opposite said platen, said at least one light source mounted in said transparent slide, said stationary lighting means including an optical system integral with said transparent slide and adapted to pick up the rays from said light source and direct them toward said platen in the form of a flat beam, said slide including electrical connections for said light sources, electrical connection means mounted on said casing, whereby electrical contact is made between said electrical connections on said slide and said electrical connection means on said casing when said hinged guard is in a lowered position and broken when the guard is in a raised position.

4,626,118

WRITING INSTRUMENT WITH FASTENING MEANS

Roger T. Bellavance, Sterling Hill Rd., Moosup, Conn. 06354

Filed Mar. 18, 1985, Ser. No. 712,536
Int. Cl.[4] B43K *24/00, 7/12, 29/00, 25/00*
U.S. Cl. 401—104 **8 Claims**



1. A writing instrument having an outer case which contains an elongated cartridge having an axis, said cartridge bearing a writing point at one end and engaging, at the other end, a mechanism for alternately moving said cartridge axially to position said writing point to alternately a retracted position within said outer case and a protracted position protruding outside said outer case, said writing instrument further comprising:
a rigid shackle arm, fixed to said outer case;
a bushing, enveloping said cartridge within said outer case and adapted to be moved axially by said cartridge; and
a pawl, borne by said bushing and movable substantially solely axially thereby, said pawl protruding through a slot in said outer case to define, with said shackle arm, a shackle which is open when said writing point is in a protracted position and which is closed when said writing point is in a retracted position.

4,626,119

COSMETIC POWDER DISPENSER AND APPLICATOR

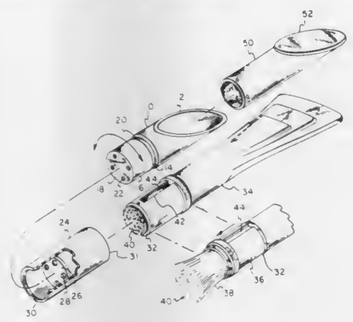
James E. Ladd, Jr., Rowayton, Conn., assignor to Laura Lupton, Inc., Rowayton, Conn.

Filed Jul. 5, 1985, Ser. No. 752,133
Int. Cl.[4] A46B *11/00, 11/04*
U.S. Cl. 401—123 **8 Claims**

1. A cosmetic powder dispenser and applicator comprising:
a first elongated hollow member having first and second opposite ends, the first end being open, the second end being closed and having a plurality of small spaced apart openings therein;
a hollow elongated capsule adapted to be filled with cosmetic powder, said capsule being closed at one end and open at the other, said capsule being removably slidable into and out of said first member, said capsule, when inserted in the first member, having its open end adjacent

the second end of the first member and its closed end closing the first end of the first member;

a second elongated hollow member having a first end with a like plurality of like openings and a second open end, the second member rotatably engaging the first member with the first end of the second member adjacent the second end of the first member, the first and second members having a first position of relative rotation at which the openings in the two members are aligned and a second position of relative rotation at which the openings in the two members are out of alignment;



a third elongated hollow member having an open end detachably engaging the second end of the second member and having an opposite closed end; and

a brush having a plurality of essentially parallel bristles with powder applying tips, said brush being disposed in the third member with said tips adjacent said second member, said brush and said third member having manually operated cooperating means for establishing a first forward position at which said bristles will extend almost entirely out of the third member and a second withdrawn position at which said brush is disposed within the third member.

4,626,120

RESILIENT WRITING NIB WITH OFFSET FLATTENED PORTION

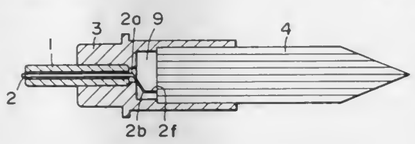
Hishao Fukui, Tokyo; Yutaka Shinohara, Konosu, and Takashi Tamura, Yashio, all of Japan, assignors to Pentel Kabushiki Kaisha, Nihonbashi, Japan

Filed Sep. 24, 1984, Ser. No. 653,785

Claims priority, application Japan, Sep. 30, 1983, 58-152554[U]; Sep. 30, 1983, 58-152555[U]

Int. Cl.⁴ B43K *1/10, 1/06, 8/00*

U.S. Cl. 401—260 **4 Claims**



1. A writing instrument comprising:

a cylindrical casing having an ink reservoir therein;

a tubular holder extending from one end of said casing;

ink feed means disposed between said tubular holder and said ink reservoir, said ink feed means having an ink feed core which consists essentially of a bundle of synthetic fibers;

a nib holder pipe positioned within said tubular holder and extending in a longitudinal direction; and

a needle-like writing nib slidably positioned in said nib holder pipe, said writing nib having a rear end which is laterally offset to a front end thereof, said rear end being inserted in said ink feed core and not fixed with respect thereto, said writing nib having at least one flex portion thereon at a position between said nib holder pipe and said ink feed core and said writing nib having a flexible flattened linear portion thereon only at a position between said flex portion and said ink feed core, said flattened linear portion extending at an angle to said longitudinal direction, thereby providing a small resilience at the initial stage of nib displacement and preventing said writing nib from dropping out of said nib holder pipe.

4,626,121

PIVOT JOINT ASSEMBLY CAPABLE OF AMPLIFIED WEAR INDICATION

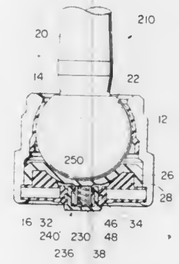
Takashi Tajima, Toyohashi, and Tatsuyoshi Tsuji, Aichi, both of Japan, assignors to Musashi Seimitsu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 16, 1985, Ser. No. 755,611

Claims priority, application Japan, Jul. 19, 1984, 59-150087

Int. Cl.⁴ F16C *11/06;* **G01D** *21/00*

U.S. Cl. 403—27 **13 Claims**



1. A pivot joint assembly capable of amplified wear indication, comprising:

(a) a housing open at one end and closed at another end, the closed end of the housing having an aperture defined therein;

(b) a stud member having a shank extending into the housing through the open end thereof and terminating in a head supported within the housing in a manner subject to wear in use;

(c) wear takeup means mounted within the housing adjacent the closed end thereof and held against the head of the stud member for displacement therewith toward the open end of the housing with the progress of wear;

(d) a protuberance on the wear takeup means extending through the aperture in the closed end of the housing, the protuberance receding into the housing with the development of wear;

(e) a wear indicator cap mounted on the protuberance on the wear takeup means and preloaded with respect to the protuberance in a direction away from the housing:

(f) first engagement means on the protuberance for normally holding the wear indicator cap in a first position on the protuberance, where the wear indicator cap is arranged for abutment against of the housing, the first engagement means allowing the wear indicator cap to travel under the preload to a second position on the protuberance, farther away from the housing than the first position, when the wear developes beyond an acceptable limit; and

(g) second engagement means on the protuberance for engaging the wear indicator cap in the second position.

4,626,122

CONNECTOR

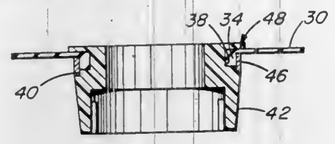
Brian Harrison, Nepean, and Ronald E. Davis, Kanata, both of Canada, assignors to Her Majesty the Queen in Right of Canada represented by Minister of National Defence, Ottawa, Canada

Filed Jun. 20, 1985, Ser. No. 746,861

Claims priority, application Canada, Oct. 29, 1984, 466550

Int. Cl.⁴ F16B *7/10;* **F16C** *11/00*

U.S. Cl. 403—51 **5 Claims**



1. A system for connecting an annular, rigid component to an opening in a flexible sheet material, comprising:

(a) a boss molded around the opening in the sheet material;

(b) means defining an external groove around the component of substantially the same dimensions as the boss, to accommodate the boss with a snug fit;

(c) an annular keeper with an internal diameter less than the external diameter of the boss to engage the boss circumferentially under hoop stress and to compress the boss radially against the component; and

(d) a ledge on the component for engaging the annular keeper to retain the keeper in compressing relation on the boss.

4,626,123

CONNECTOR FOR TUBULAR BARS AND ATTACHMENT MEMBERS IN A SPACE FRAMEWORK

Angus J. D. Brown, 10 Travers Road, London N. 7, England

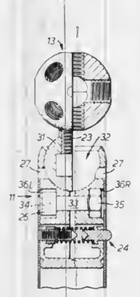
PCT No. PCT/GB83/00021, § 371 Date Sep. 30, 1983, § 102(e) Date Sep. 30, 1983, PCT Pub. No. WO83/02633, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 31, 1983, Ser. No. 551,996

Claims priority, application United Kingdom, Feb. 1, 1982, 8202847

Int, Cl.⁴ F16D *1/12*

U.S. Cl. 403—141 **8 Claims**



1. In a space framework comprising a plurality of tubular bars and attachment members, a plurality of connectors interconnecting said bars and said attachment members, each said connector comprising: a cylindrical body portion located within one end of one of said bars; said body portion and one end of said bar defining corresponding holes, a snap-fit assembly including bolt means, locatable in said corresponding holes, spring means urging said bolt means into said corresponding holes, and a grub screw which can selectively be brought into abutment with said bolt means to lock said bolt means in position in said corresponding holes, releasably interengaging said body portion and said one bar; an engagement member engaging one of said attachment members; adjustable swivel-joint means interconnecting said body portion and said engagement member; and releasable locking means operatively associated with said swivel-joint means, whereby said engagement member can be adjusted to a desired orientation with respect to said body portion by virtue of said swivel-joint and locked in said desired orientation by means of said locking means.

4,626,124

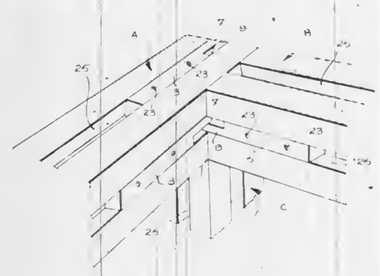
STRUCTURAL CORNER JOINTS

Francois X. Laroche, P.O. Box 1024, Waterloo (Quebec), Canada (J0E 2N0)

Filed Dec. 20, 1985, Ser. No. 811,277

Int. Cl.⁴ F16B *7/00*

U.S. Cl. 403—295 **9 Claims**



1. A structural joint comprising:

(a) a pair of elongated members, each member being rectangular in cross-section and having four sides each provided with an elongated groove extending lengthwise thereof, said members being arranged so that the grooves of one member communicate with the grooves of the other member;

(b) each of said grooves defining, in cross-section, a housing having a top opening, a bottom wall and opposed side walls spaced apart a distance greater than said top opening;

(c) a connecting key comprising:

a pair of elongated legs, each leg having, in cross-section, a top face, a bottom face and opposed side faces spaced apart a distance greater than said top face; said legs being slidably fitted into a pair of communicating housings with the side faces thereof engaging the side walls of the grooves defining said housings; and

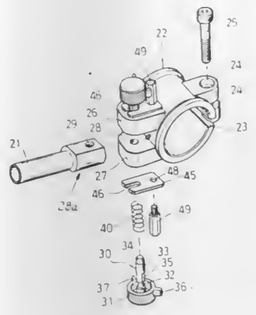
means interconnecting said legs end to end for pivotal movement about an axis transverse to said legs,

(d) locking means through the legs of said connecting key, including screws pressed against the bottom walls of said grooves for forcing said side faces of said legs against said side walls of said grooves thereby to lock said legs into said grooves,

(e) at least one additional connector having the same structure as described in paragraph (c), the legs of said additional connector key being slidably fitted into another pair of communicating housings, and

(f) additional locking means having the same structure as described in paragraph (d), said additional locking means cooperating with said additional connector key for locking said additional connector key into the two further grooves defined by said other pair of housings communicating with one another.

4,626,125
LOCK PIN MECHANISM
Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan
Filed Dec. 17, 1985, Ser. No. 809,944
Int. Cl.[4] B25G *3/18;* **F16B** *21/00*
U.S. Cl. 403—324 **8 Claims**



1. A lock pin assembly, comprising a stationary member, a member to be fixed, and a lock pin for releasably coupling said member to be fixed to said stationary member,

said stationary member having at least one flange with an aperture therethrough; a plate having a cut-out portion positioned at said flange adjacent said aperture, said cut-out portion being defined between margins which define its width and serve as guides for said lock pin;

said lock pin having a cross section sized to fit into and rotate inside said aperture and being greater than the width of said cut-out portion, having at least one excision for reducing the cross section of the pin at the excision, having a neck portion adjacent said excision of a cross section less than or equal to said reduced cross section, the boundary between said neck portion and said excision forming a shoulder, and having a tip portion at the opposite end of the lock pin from said neck portion,

said lock pin being positioned in said circular aperture and being longitudinally movable through said aperture between a forward position, wherein said tip portion of said lock pin engages said member to be fixed, and a rearward portion wherein said tip portion of said lock pin releases said member to be fixed;

said lock pin being freed for movement between said forward and rearward positions by rotation thereof such that said excision is aligned with the margin of said cut-out portion, said lock pin being locked in said forward position by rotation thereof such that said excision is not aligned with said cutout portion, said shoulder of said lock pin cooperating with said plate to thereby prevent longitudinal movement of said lock pin.

4,626,126
CONNECTOR MEMBER
Jagan N. Suchdev, Woodridge, and Mark Dailey, Chicago, both of Ill., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 21, 1984, Ser. No. 652,720
Int. Cl.[4] B25G *3/38*
U.S. Cl. 403—353 **8 Claims**

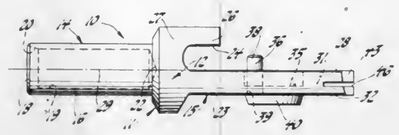
5. A method of making a connector member, said method comprising the steps of

providing a slug of work hardenable conductive material in relatively soft extrudable condition,

extruding a thinwall tubular socket from one end of the slug to form a first end portion of said connector,

annealing the first end portion to soften the formed socket to a hardness suitable for crimping, and

extruding a long tongue from an opposite end of the slug to form a second end portion while maintaining the socket of the first end portion in said soft crimpable condition, the



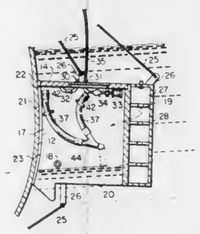
extrusion of said second end portion causing work hardening of the material thereof to provide wear resisting greater hardness of the tongue.

4,626,127
ELASTOMERIC PAVEMENT MARKER
David C. May, St. Paul, Minn.
Continuation of Ser. No. 483,603, Apr. 11, 1983, Pat. No. 4,534,673. This application May 6, 1985, Ser. No. 731,087
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—14 **8 Claims**



1. A roadway marker comprising a body having a base which can be attached to the surface of a roadway without requiring a recess or hole in the roadway, and which has a raised surface adapted to face oncoming traffic when the marker is mounted on a roadway, and a reflective material attached to said raised surface on the side adapted to face oncoming traffic, said body being made of an elastomer and having a hollow cross section and a compressive strength at 25 percent compression of less than about 100 kPa.

4,626,128
UNDERWATER GAS POCKET WORK UNIT AND REMOVAL OF DANGEROUS FUMES AND GASES THEREFROM
Thomas H. Devine, 147 Jefferson Ave., Chula Vista, Calif. 92010
Filed Apr. 11, 1985, Ser. No. 722,285
Int. Cl.[4] B63C *11/52*
U.S. Cl. 405—12 **8 Claims**



1. An underwater gas pocket work unit for attachment to an underwater work surface to define a work chamber that may be entered from beneath through the water, for use with an irregular work surface, whereby a plurality of recesses are defined in the upper portion of the work chamber, comprising

a structure consisting of a top end wall and side walls defining a side opening, which, when positioned with the side opening at the work surface, defines a work chamber that is accessible only from beneath;

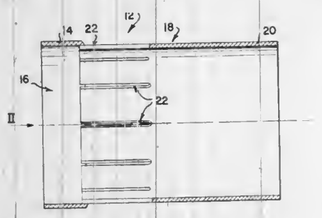
means for sealing the structure at the side opening to the work surface to define said work chamber, wherein the work chamber is defined solely by the structure and the work surface;

valve means in the structure for enabling a gas to enter the work chamber to provide a gaseous pocket in the upper portion of the work chamber when the structure is sealed to the underwater work surface;

venting means for exhausing gases from the work chamber through a port located at the uppermost portion of the work chamber, wherein the venting means comprise

a pluraltiy of said ports, with at least one port being positionable in the uppermost portion of each recess.

4,626,129
SUB-SOIL DRAINAGE PIPING
Antonius B. Kothmann, No. 4 Haarhoff Street, Somerset West, and Keith Brinch, Durbanville, both of South Africa, assignors to Antonius B. Kothman, Somerset West, South Africa
Filed Jul. 26, 1984, Ser. No. 634,485
Claims priority, application South Africa, Jul. 27, 1983, 83/5499; Dec. 29, 1983, 83/9708
Int. Cl.[4] E02B *11/00, 13/00*
U.S. Cl. 405—43 **3 Claims**



1. A sub-soil drainage pipe segment which has connecting formations at opposite ends thereof, whereby a number of such segments can be interconnected end-to-end to form a sub-soil drainage line, the segment further having a plurality of circumferentially spaced, longitudinally extending slots therein which render the segment water-pervious, wherein the connecting formations are complementary spigot and socket formations, whereby the spigot formation of one such pipe segment is receivable in a socket formed by the socket formation of another such pipe segment, wherein each slot, across its entire width and depth, opens into the socket at one end of the slot and wherein the pipe segment comprises a first round cylindrical portion extending to one end of the pipe segment and forming the socket, and a second round cylindrical portion integral with and extending from the first cylindrical portion to the other end of the segment, the inside diameter of the first cylindrical portion being equal to or slightly greater that the outside diameter of the second cylindrical portion.

4,626,130
DRIP IRRIGATION SYSTEM
Richard D. Chapin, 368 N. Colorado Ave., Watertown, N.Y. 13601
Continuation of Ser. No. 559,853, Dec. 12, 1983, abandoned, which is a continuation of Ser. No. 261,699, May 8, 1981, abandoned. This application Apr. 30, 1985, Ser. No. 727,622
Int. Cl.[4] B05B *15/00;* **E02B** *13/00*
U.S. Cl. 405—44 **42 Claims**

1. For use in a fluid distributing system for plants and the like, an elongated fluid distribution hose, said hose comprising:

first, second, and third fluid passages extending longitudinally thereof, said first fluid passage being adapted for communication with a source of pressurized fluid, said third fluid passage forming a continuous fluid path extending substantially the length of said hose;

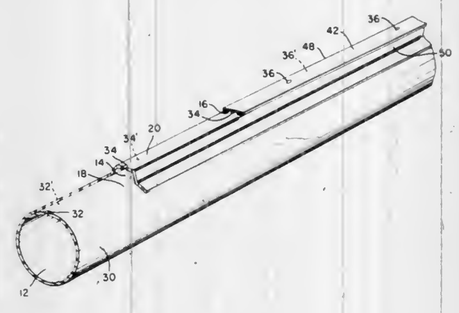
a wall member separating said first and second fluid passage;

a second wall member separating said second and third passages;

first fluid-passing openings from said first fluid passage through said first wall member into said second fluid passage, said first openings providing fluid communication between said first and second fluid passages, each of said first fluid-passing openings being of predetermined size and spacing to create a first pressure drop between said first and second passages;

second fluid-passing openings from said second fluid passage through said second wall member into said third fluid passage, said second fluid-passing openings being of predetermined size and spacing for providing fluid communication between said second and third fluid passages, said first fluid-passing openings being more widely spaced than said second fluid-passing openings so that each first fluid-passing opening feeds a plurality of second fluid-passing openings;

discharge fluid-passing openings from said third fluid passage to the exterior of the hose wherein two adjacent said discharge fluid-passing openings are located substantially



an equal distance from each said second fluid-passing opening;

said second fluid passage being of predetermined size to define water conveying means for conveying fluid from said first fluid-passing openings to said second fluid-passing openings with substantially no pressure loss taking place within said second fluid passage as fluid is conveyed from said first openings to their corresponding said second openings, and

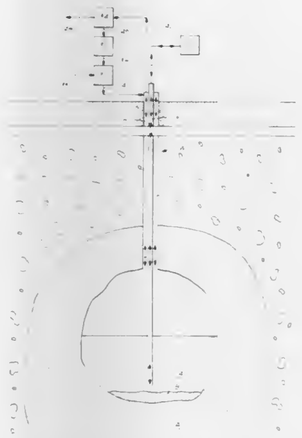
a plurality of elongated discharge fluid passageways defined by said third passage, each of said discharge passageways being defined between one of said second fluid-passing openings and its nearest discharge opening, each of said discharge passageways having a predetermined length and cross-sectional area for creating by friction between said fluid and the interior of said discharge passageways a second pressure loss between said second openings and said discharge openings so that a back pressure is created to raise the pressure in said second fluid passage to enable the hose to function properly over varying elevations of a terrain and so that said fluid exits said discharge openings under substantially quiescent conditions, said first and second pressure losses constituting a substantial portion of the pressure loss taking place between said first passage and said discharge fluid-passing openings.

4,626,131

UNDERGROUND LIQUID STORAGE SYSTEM AND METHOD

David N. Glew; John S. McIntyre, both of Sarnia, and Jeffrey F. Gilbert, deceased, late of Sarnia, all of Canada (by Enid R. Gilbert, executrix), assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1985, Ser. No. 808,903
Int. Cl.[4] B65G *5/00, 65/30*
U.S. Cl. 405—59 **20 Claims**



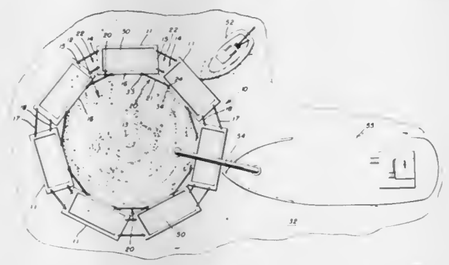
1. A liquid storage system, comprising:
(a) a subterranean cavity;
(b) a dense liquid displacing phase disposed in the lower portion of said cavity; and
(c) a light liquid phase disposed above said dense phase in said cavity, said light liquid phase including a stored liquid which normally has a density above or about that of said displacing phase, and dissolved in said stored liquid, a light fluid in a sufficient amount to maintain the density of said light liquid phase at least about 1 kg/m^3 below that of said displacing phase to prevent phase inversion and dispersion therewith.

4,626,132

OIL CONTAINMENT BARGE ASSEMBLY

Sebree J. Allen, Rte. 2, Kevil, Ky. 42053

Filed Mar. 7, 1985, Ser. No. 709,385
Int. Cl.[4] E02B *15/04*
U.S. Cl. 405—71 **8 Claims**



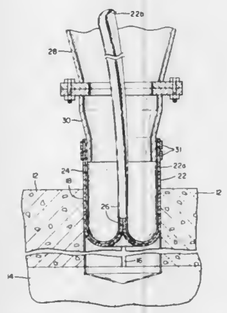
1. An apparatus for containing oil floating on a body of water, comprising:
(a) a plurality of elongated ocean-going barges, each barge having opposite end portions and inner sidewall surface, said barges adapted to be arranged end-to-end in an endless configuration surrounding an oil spill on a body of water, in which said inner sidewall surfaces of adjacent pairs of barges are disposed at an angle to each other, other than a straight angle,
(b) means detachably connecting the adjacent end portions of said barges in said configuration,
(c) a plurality of elongated oil-impervious curtains, each curtain having a top portion, a bottom portion, opposite end portions, and a major portion between said opposite end portions,
(d) the dimensions of each curtain being great enough to span any free space between adjacent end portions of said barges in said configuration,
(e) an elongated, straight rigid spar member for each curtain having opposite end portions and adapted to span the adjacent end portions of a pair of said adjacent barges in said configuration,
(f) means securing said top portion of each curtain to a corresponding spar member,
(g) means securing the opposite end portions of said spar member to corresponding end portions of adjacent pairs of said barges to permit each of said curtains to hand in a substantially vertical plane from said corresponding spar member as an oil barrier spanning the free space between adjacent end portions of said adjacent barges and inside the inner sidewall surfaces of said barges in said configuration,
(h) weight means in the bottom portions of said curtains, and
(i) clamp means detachably securing both opposite end portions of each of said curtains substantially flush against the corresponding inner sidewall surfaces of said adjacent barges in said configuration, whereby said major portions of each of said curtains is suspended in a different vertical plane from and spaced inward from, said inner sidewall surfaces.

4,626,133

WATERSTOP FOR MONOLITH JOINTS

Stephen T. Waring, Salem, Oreg., assignor to Gelco Grouting Service, Salem, Oreg.

Filed Sep. 13, 1984, Ser. No. 650,233
Int. Cl.[4] E02B *7/10, 3/10*
U.S. Cl. 405—107 **12 Claims**



1. A waterstop for sealing a vertical joint between monoliths comprising
a tubular member arranged to be inserted in a hole provided in adjacent monoliths astraddle a joint therebetween,
said tubular member comprising an outer layer of material saturated with a resin capable of bonding to defining walls in the hole,
an inner layer of fluid impermeable material bonded to said outer layer,
and a permanent core portion filling the interior of said tube to maintain the tubular member in tight bonded engagement with the defining walls of the hole against head pressure of water behind said monoliths.

4,626,134

APPARATUS AND METHOD FOR EXTRACTING HORIZONTAL UNDERGROUND PIPE

Martin Coumont, 314 Sutton Avenue, Winnipeg, Manitoba, Canada (R2G 0T2)

Filed Aug. 26, 1985, Ser. No. 769,391
Claims priority, application Canada, Aug. 29, 1984, 462053
Int. Cl.[4] E02F *5/10*
U.S. Cl. 405—184 **8 Claims**



1. Apparatus for extracting underground pipe of the type comprising a plurality of sections each having a radial end face for abutting an end face of an adjacent section, the apparatus comprising a frame for positioning in a hole in the ground with one end of the frame adjacent to one end of the pipe, ram means mounted on the frame for providing substantially horizontal reciprocating movement for feeding a rod into and withdrawing the rod from the end of the pipe, a head member for attachment to the rod for insertion thereby into the end of the pipe including a body, means for attaching the body to the rod by which the member is inserted into the pipe, a plurality of rigid pipe engagement members each having an apex and arranged in spaced relation around the body such that the apexes thereof extend radially outwardly from the body with the apexes thereof lying in a single radial plane for engaging a radial end surface at an end of a pipe section, means pivotally mounting each of said engagement members on said body for substantially radial movement of said apex and spring means for biasing each of said engagement members outwardly for contact of said apex with an inner face of the pipe whereby the head member can be inserted into and along the pipe with the apexes in engagement with the inner surface until the apexes move outwardly under said spring bias into contact with said radial face for withdrawal of said pipe section with said head member, said body including first and second centering means for engaging the inner surface of the pipe forwardly and rearwardly respectively of said pipe engagement members so as to maintain said body central of said pipe while moving longitudinally of said pipe, each of said centering means comprising a plurality of leaf springs arranged in angularly spaced relation around the body, the leaf springs being biased into contact with the inner surface of the pipe, and clamping jaw means mounted on the frame at a position spaced from said ram means and adjacent said one end of the frame exteriorly of the pipe so as to engage and fracture the portion of the withdrawn pipe section at a position along its length.

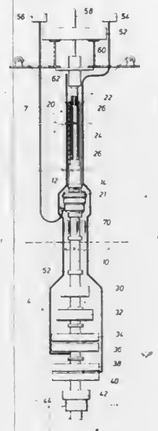
4,626,135

MARINE RISER WELL CONTROL METHOD AND APPARATUS

Joseph R. Roche, Humble, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Oct. 22, 1984, Ser. No. 663,235
Int. Cl.[4] E21B *33/06*
U.S. Cl. 405—195 **6 Claims**

1. An improved flow diverter having an outer dimension adapted for riser pressure control, the flow diverter having
a housing having a bore therethrough and at least one outlet passage having an axis provided in its wall,
a packing element disposed within the housing,
an annular piston disposed within the housing beneath the packing element and adapted for moving from a lower position to an upper position within the housing,
the wall of said annular piston in said lower position covering said outlet passage in the housing wall and preventing fluid communication from the bore of the housing to the outlet passage, and
in the upper position, the wall of the annular piston at least partially uncovering said outlet passage and allowing fluid communication from the bore of the housing to the outlet passage as the piston urges said packing element to close about an object extending through the bore of the housing,
wherein the improvement comprises,



a connector having a passage defining a ninety-degree turn, one end of said connector attached to said housing about said outlet passage in the wall of said diverter housing so that said connector is disposed within the outer dimension of the flow diverter,
said ninety-degree turn passage having a target means disposed therein substantially perpendicularly to the axis of said outlet passage for resisting erosion of pressurized well fluid out of said housing passage, and means for connecting an auxiliary choke line to the other end of said connector.

4,626,136

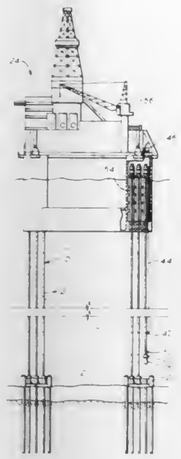
PRESSURE BALANCED BUOYANT TETHER FOR SUBSEA USE

Richard H. Gunderson, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Sep. 13, 1985, Ser. No. 775,915
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 **22 Claims**

1. A buoyant tether for a tension leg offshore platform, comprising:
a tubular, load bearing wall portion adapted to extend from a foundation at the bottom of the water body in which said platform is situated to a buoyant main body of said platform proximate the surface of the water body, said wall portion defining an enclosed volume isolated from the water body by said wall portion;
a plurality of bulkheads secured to said wall portion and extending laterally across said enclosed volume, said bulkheads being spaced one from the other along the length of said tubular wall portion and serving to divide said enclosed volume into a series of buoyancy cells adapted to contain gas, said bulkheads defining fluid flow passages extending therethrough;
a plurality of valves, each of said valves corresponding to and being in sealed fluid communication with one of said

bulkhead fluid flow passages, each of said valves being adapted to open to permit fluid flow through said fluid



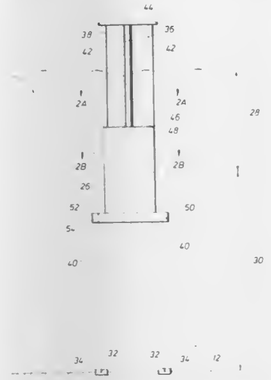
flow passage in response to the pressure differential across said bulkhead exceeding a preselected value.

4,626,137

SUBMERGED MULTI-PURPOSE FACILITY

John R. Willemsz, Walnut, Calif., assignor to Zainuddin M. Banatwala and Fred E. Dorst, both of Houston, Tex., part interest to each

Filed Apr. 16, 1985, Ser. No. 723,735
Int. Cl.[4] E02D *21/00*; B63B *35/44*
U.S. Cl. 405—224 **7 Claims**



1. A method for establishing the location of a Submerged Multi-Purpose Facility beneath the surface of a body of water for affording a support structure capable of withstanding high lateral forces at and near the water surface, which comprises:

determining at the geographical location where the facility is to be located the magnitude of existing lateral forces at a representive plurality of depth locations,

plotting said magnitudes and determining a substantially exponential curve wherein the lateral forces at or near the surface define a relatively linear high-force range and the lateral forces near the bottom of the water define a relatively linear low-force range, the generally curvilinear part of the curve between said high-force range and said low-force range defining the knee range of the curve,

positioning said facility using buoyancy means and ballasting means at a depth location within or below the knee range of the curve, and

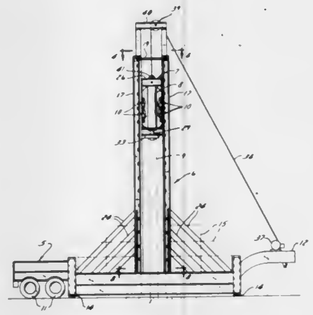
anchoring the facility to the bottom in such a manner so as to permit a small amount of lateral movement by the small lateral forces prevailing at the positioned depth location for the facility.

4,626,138

NON-IMPACTING PILE DRIVER

G. Mitchell Boyes, Green Bay, Wis., assignor to Atlas Hydropiling Ltd., Green Bay, Wis.

Filed May 10, 1985, Ser. No. 732,676
Int. Cl.[4] E02D *7/20*
U.S. Cl. 405—232 **6 Claims**



1. A non-impacting pile driver comprising a chassis having ground engaging means for resting on the ground, a mast secured to said chassis and defining a pair of laterally spaced opposite and upright guide rails, a carriage having opposite side portions slidingly engaged with said guide rails to be confined by them to vertical movement along said mast, a hydraulic ram comprising a cylinder fixed to said carriage with its axis upright and between said guide rails and a piston rod projecting downward from said cylinder that is axially extendable and retractable relative to the cylinder and the carriage through a stroke of predetermined length for exerting downward force upon a pile to be driven, and latch means for releasably locking the carriage to the mast at each of a plurality of locations that are spaced apart along the mast by a distances not greater than said predetermined length, said pile driver being characterized by:

A. the cylinder of said hydraulic ram having

(1) at its upper end an upper connection to the carriage that confines the upper end of the cylinder against lateral motion relative to the carriage and carries upward reaction force upon the cylinder into the carriage for transfer to the mast through said latch means, and

(2) at its lower end a lower connection with the carriage which cooperates with said upper connection to confine the cylinder against all lateral motion relative to the carriage;

B. the piston rod of said hydraulic ram having guide means fixed on its lower end, said guide means having

(1) opposite end portions slidingly engaged with said guide rails to confine the piston rod against lateral deflection and

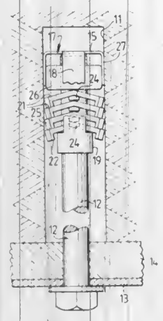
(2) a pile engaging element on its underside engageable with the top end of a pile to be driven and arranged to confine the same against lateral displacement relative to the piston rod.

4,626,139

ROOF BOLT ANCHOR

Russell Blackwell, 2109 Arcadia Rd., Birmingham, Ala. 35214

Filed Feb. 19, 1985, Ser. No. 702,794
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—259 **11 Claims**



1. An anchor for a mine roof bolt for use in a preformed bore hole comprising, in combination:

(a) a plurality of elongated leaves each having a central aperture for receiving said bolt therethrough with said leaves being transversely bent proximal said central aperture such that said leaves extend less than said bore hole diameter and being stacked vertically on said bolt;

(b) means for compressing said leaves proximal and parallel to said bolt in response to rotation of said bolt such that said leaves are moved toward a flattened position such that said leaves are urged into engagement with said bore hole's walls; and

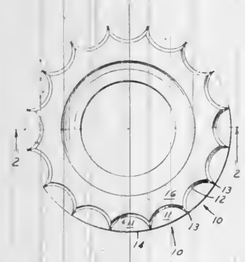
(c) means intermediate said leaves proximal said central apertures for distributing the compressive forces generated by said compressing means evenly among the bent leaves to cause equal and simultaneous engagement of the leaves with said bore hole walls.

4,626,140

CHIP CONTROL INSERT

Raymond Zweekly, and Tony M. Lowe, both of Royal Oak, Mich., assignors to GTE Valeron Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 725,639, Apr. 22, 1985. This application Oct. 7, 1985, Ser. No. 785,211
Int. Cl.[4] B23B *27/22*; B26D *1/00*
U.S. Cl. 407—114 **18 Claims**



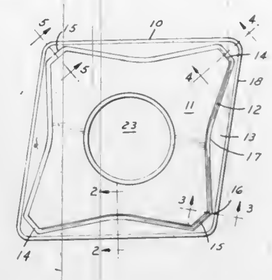
1. A chip breaking insert characterized by a circular cutting face with a circular peripheral cutting edge, a plurality of chip breaking scallop depressions around the cutting face periphery adjacent the cutting edge forming adjacent ridges on said face which intersect each other in wedge points substantially at the cutting edge, each scallop comprising a bottm positive rake planar surface terminating in a conical segment backwall.

4,626,141

CHIP CONTROL INSERT

John Malaker, Warren, and Thomas J. Bernadic, Ferndale, both of Mich., assignors to GTE Valeron Corporation, Danvers, Mass.

Filed Jan. 23, 1985, Ser. No. 694,034
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—114 **6 Claims**



1. Chip control insert comprising polygon side cutting edge periphery, planar island face bounded by ramp chip breaking wall, said wall extending across each cutting corner, said wall extending adjacent said edge away from each corner with progressively increasing spacing from said edge, narrow uniform rake land around said periphery followed by groove leading to base of said chip breaking wall, said groove being formed with an arcuate concave surface formed with a uniform radius descending from said land to a maximum depth tangent to a flat bottom, said flat bottom leading to an obtuse angular juncture with said chip breaking wall.

4,626,142

CLUTCH FOR DRILLING MACHINE

Edward Brin, Rolling Meadows, and James Mette, Streamwood, both of Ill., assignors to Quali-Tech Machine & Engineering Co., Inc., Elk Grove Village, Ill.

Filed Mar. 18, 1985, Ser. No. 712,668
Int. Cl.[4] B23B *41/08*
U.S. Cl. 408—81 **11 Claims**



1. In a drilling machine for tapping a pipeline of the type including a boring bar for holding a tapping tool, a body tube over said boring bar and secured to said boring bar to allow rotation of said boring bar relative to said body tube, a feed tube over said body tube, means for allowing said feed tube to advance relative to said body tube, means for rotating said boring bar, the improvement comprising:

a clutch including a clutch disc secured to said boring bar to rotate therewith, a feed adjustment nut threadably mounted on said feed tube, a clutch member secured to

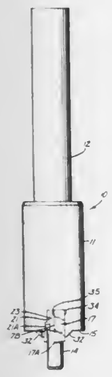
said feed tube allowing axial movement of said clutch member relative to said feed tube, a biasing member positioned between said feed adjustment nut and said clutch member, a friction disc positioned between said clutch disc and said clutch member, said clutch disc including a first face abutting said friction disc, said clutch member including a first face abutting said friction disc, said first face of said clutch disc and said first face of clutch member each including means for providing a high friction surface.

4,626,143

SPOT FACER AND BORING HEAD HAVING REPLACEABLE CARBIDE CUTTERS

David C. Rembold, Bloomington, Minn., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Jun. 6, 1984, Ser. No. 617,672
Int. Cl.[4] B23C *1/20*
U.S. Cl. 408—82 **13 Claims**



1. A rotatable boring tool comprising a head member and means to mount the head member to permit rotation thereof about a longitudinal axis, said head member having an outer peripheral surface and an end face surface generally perpendicular to said longitudinal axis comprising at least one groove defined in said head member having spaced parallel side walls and opening to the end face surface and to the peripheral surface, said groove having one side wall thereof lying in a radial plane, a slit in the head member adjacent to one side of said groove to form a relatively narrow and somewhat resilient wall between the groove and the slit, a longitudinally extending threaded bore formed in the head at a location intersecting the slit at an intermediate location, a cutter blade adapted to be inserted in said groove, and a screw-like member having a threaded portion for cooperating with the threaded bore and a tapered head portion, said tapered head portion being formed so that when the threaded member is turned into the threaded bore it exerts sideward pressure on the narrow resilient wall in a direction to clamp against the cutter blade in said groove.

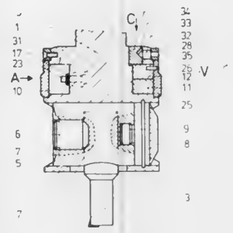
4,626,144

BORING TOOL WITH BALANCING MEANS FOR NON-VIBRATING BORING

Willy Berner, Rupperswil, Switzerland, assignor to Urma Aktiengesellschaft, Rupperswil, Switzerland

Filed Mar. 6, 1985, Ser. No. 708,950
Claims priority, application Switzerland, Mar. 21, 1984, 1434/84
Int. Cl.[4] B23B *47/00*
U.S. Cl. 408—143 **6 Claims**

1. A boring tool comprising:
a boring head having an axis of rotation and means for attachment of said head to a rotatable member of a machine tool;
means on said head for adjustably holding a cutting tool so that the cutting edge thereof can be radially adjusted relative to said axis of rotation to define a selected cutting circle;
balancing means on said head for establishing an eccentric mass to balance the unbalancing effect of eccentric positioning of said cutting tool, said balancing means including first and second movable weight segments mounted for circular movement about said axis of rotation,



elongated, flexible cord means for interconnecting said weights so that movement of said first weight in one direction causes movement of said second weight in the other direction,
an adjusting ring rotatably mounted on said head and coupled to said first weight so that manual rotation of said ring moves both of said weights, and
clamping means on said head for clamping said weights in any position selected by rotation of said adjusting ring.

4,626,145

GOLDSMITH'S WAX RING PRE-FORM SIZING TOOL

Eduardo C. Vasquez, 117 NE. 1st Ave., #1522, Miami, Fla. 33132

Filed Jun. 14, 1985, Ser. No. 744,524
Int. Cl.[4] B23B *41/00, 45/06*
U.S. Cl. 408—196 **3 Claims**



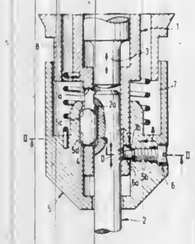
1. A wax ring pre-form sizing tool comprising:
a pilot member for slideably engaging the bore of a wax ring pre-form; a body member attached to said pilot member, said body member having a radial slot therein for receiving a scraping blade; a scraping blade having a scraping surface developed by relieving one half of the thickness of a portion of said blade and creating a scraping surface having a flat forward scraping edge and a rounded trailing edge; a screw extending from the end of the body member to secure said scraping blade in a desired radial position and a handle attached to the opposite end of said screw for operating the tool, so that when the tool is inserted in a wax ring preform and rotated by means of the handle the scraping edge removes a shaving of wax therefrom, creating a bore of the desired ring size.

4,626,146

TOOL HOLDER FOR A DRILLING OR A CHISELING DEVICE

Anton Neumaier, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Apr. 16, 1985, Ser. No. 723,666
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414300
Int. Cl.[4] B23B *31/10*
U.S. Cl. 408—239 R **6 Claims**



1. A tool holder for drilling and chiseling devices comprising an axially elongated guide tube arranged to receive a tool with a cylindrically shaped shank end with axially extending depressions in the cylindrical shank end, said guide tube having openings extending therethrough from the radially outer surface to the radially inner surface, said guide tube having a first end arranged to receive the shank end of the tool, locking elements positioned within said openings and being radially displaceable therein for engaging within the depressions in the tool shank, an adjusting sleeve laterally enclosing said guide tube and said sleeve being rotatable relative to said guide tube, and recesses formed in the inside surface of said sleeve arranged to register with said openings in said guide tube, wherein the improvement comprises that said adjusting sleeve has a first end and a second end spaced apart in the axial direction of said guide tube and the first end of said adjusting sleeve being spaced axially from the first end of said guide tube, said adjusting sleeve is manually axially displaceable relative to said guide tube, and means for rotating said adjusting sleeve relative to said guide tube when said adjusting sleeve is manually axially displaced relative to said guide tube for effecting registration of said recesses in said adjusting sleeve with said openings in said guide tube, said means comprising a cam surface on one of said adjusting sleeve and guide tube with the cam surface extending generally in the axial direction of said guide tube and inclined at an oblique angle relative to the axis of said guide tube and a projecting cam in the other one of said adjusting sleeve and guide tube and extending therefrom into surface contact with said surface, and said means comprising a cam surface being spaced axially from the first end of said guide tube and between the first and second ends of said adjusting sleeve.

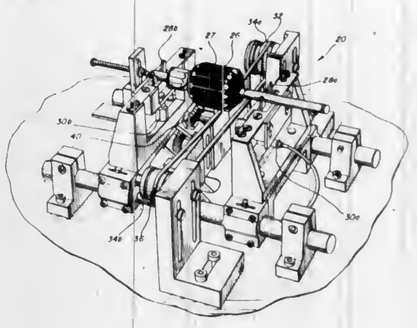
4,626,147

METHOD OF AND APPARATUS FOR BALANCING A ROTARY BODY

Arne M. Nystuen, Lincoln Township, Berrien County, and John M. Kuss, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 3, 1984, Ser. No. 657,255
Int. Cl.[4] B23C *3/00;* G01M *1/22*
U.S. Cl. 409—133 **29 Claims**

1. A method of balancing a rotary body
wherein the body includes spaces therein at various locations, comprising the steps of:
rotating the body in first and second spaced bearings, the location of the first and second bearings defining first and second bearing planes, respectively;
sensing the forces in the first and second bearing planes caused by rotation of the body;
determining from the sensed forces the magnitude and angular location of a mass compensation to the rotary body which if effected at such location, would substantially statically balance the body;
choosing an axial location for the mass compensation which would reduce to a minimum the dynamic unbalance of the body;



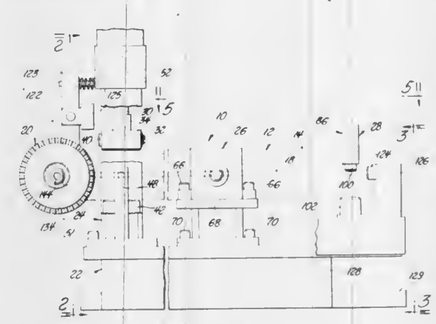
comparing the minimum dynamic unbalance against a specified limit to determine whether such unbalance is acceptable; and
effecting the mass compensation if the minimum dynamic unbalance is acceptable including the steps of removing material of a particular weight from the rotary body using a cutter by in turn determining from the particular weight and the angular and axial locations the amount by which the total volume of the rotary body is to be reduced by the cutter.

4,626,148

MOUNT MACHINING ASSEMBLY

William L. Pringle, 999 Lakeshore Rd., Grosse Pointe Shores, Mich. 48236

Filed May 9, 1983, Ser. No. 493,047
Int. Cl.[4] B23D *1/06*
U.S. Cl. 409—157 **19 Claims**



1. A milling assembly (**10**) for machining an I-beam (**12**) including two flanged portions (**14,16**) and a web portion (**18**) therebetween, said assembly (**10**) comprising; milling means (**20**) for end milling of the two flanged portions (**14,16**) of the I-beam (**12**), said milling means (**20**) including a pair of laterally opposed motors (**136**) and a rotary milling head (**134**) supported and driven by each of said motors (**136**); support means (**22**) for supporting the I-beam (**12**) thereon and for reciprocating movement relative to said milling means (**20**) to bring the ends of the I-beam (**12**) in contact with said milling means (**20**), said motors being disposed above said support means (**22**);

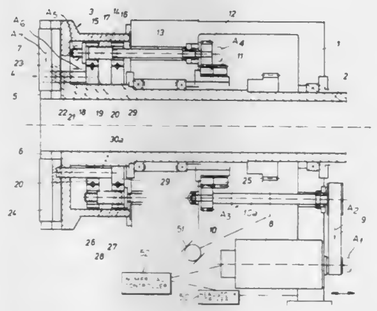
alignment means for aligning the I-beam (12) upon said support means (22) in a predetermined position; and clamping means including a plurality of clamping stations (24,26,28) for fixedly clamping the I-beam along the length upon said support means (12), each of said clamping stations (24,26,28) including a hydraulically actuated clamping member and stop means for engaging the I-beam (12) therebetween, said clamping means including a first clamping station (24) for engaging the edges of the flanged portions (14,16) from a vertical direction and a second clamping station (26) for engaging the flanged portions (14,16) of the I-beam (12) in the horizontal direction and a third clamping station (28) for engaging the web (18) of the I-beam (12) in the vertical direction, said first clamping station (24) being supported on said support means (22) proximate to said milling means (20) and said third clamping station (28) being supported on the opposite end of said support means (22), said second clamping station (26) being disposed therebetween, said alignment means including a spring biased clamp (127) supported by said first clamping station and disposed on said support means (22) and extending downwardly between said milling heads (134) proximate to said milling means (20) and a stop member (124) and a third mount member (126), said stop member (124) being mounted on said third mount member (126) at the opposite end of said support means (22) for engaging the end of the web portion (18) of the I-beam (12) between the two flanged portions (14,16).

4,626,149

ROTATING TOOLHEAD, ESPECIALLY FOR TURNING STATIONARY WORKPIECES

Franz Holy, and Johann Eigner, both of Stockerau, Austria, assignors to Machinefabrik Heid Aktiengesellschaft, Vienna, Austria

Filed Dec. 11, 1984, Ser. No. 680,388
Claims priority, application Austria, Dec. 13, 1983, 4330/83
Int. Cl.⁴ B23B *3/26*
U.S. Cl. 409—191 **7 Claims**



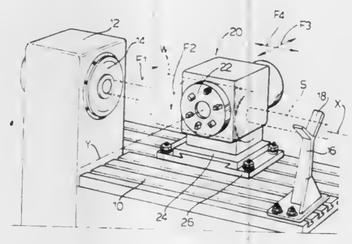
1. A machine tool for the turning of a fixed workpiece, comprising:
a headstock;
means for axially shifting said headstock relative to said workpiece in an axial direction thereof;
a hollow main spindle rotatably journaled in said headstock;
a toolhead mounted on said main spindle and formed with at least two groups of annularly equispaced guides;
respective tool slides received in said guides and radially displaceable on said toolhead in corresponding groups, said slides being adapted to receive respective toolholders and respective cutting tools for turning said workpiece;
respective motors assigned to each of said groups;
respective transmissions connected to said motors and each including a plurality of angularly equispaced circulating ball threaded drives disposed at fixed locations in said headstock and having respective members axially displaced upon rotation of the respective motors;
respective rings rotatable with said spindle and axially displaceable thereon and operatively connected with said members of the drives for each of said groups of slides; and
respective angle motion translating machanisms connecting each of said rings with the slides of the corresponding group so that all of the slides of each group are synchronously displaced upon axial movement of the ring.

4,626,150

MACHINE TOOL FOR MACHINING WORKPIECES BY CHIP REMOVAL ACCORDING TO A QUADRIC SURFACE OF REVOLUTION, PARTICULARLY FOR SUPER FINISHING OF CYLINDRICAL SURFACES

Alirio Dapiran, Montalto d'Ivrea, and Gurioli Giovanni, Ivrea, both of Italy, assignors to Istituto per le Richerche di Tecnologia Meccanica Rtm, Vico Canavese, Italy

Continuation-in-part of Ser. No. 393,400, Jun. 29, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 683,632
Int. Cl.⁴ B23C *3/04*
U.S. Cl. 409—199 **12 Claims**



1. A machine tool for machining workpieces by chip removal machining operations according to a ruled quadric surface, said machine being of a type essentially comprising a workpiece holder unit for rotation of a workpiece about an axis of the quadric surface to be obtained, and a rotary composite tool having a series of at least three elementary tools located at angularly spaced apart positions about a rotation axis for the composite tool, each said elementary tool having a respective front cutting edge, said rotation axis for the composite tool being orthogonal to a plane tangent to said quadric surface and said composite tool being movable relative to the workpiece and parallel to said plane, wherein the front cutting edges lie in a plane at right angles to the axis of rotation of the composite tool; the front cutting edges for consecutive machining operations are arranged consecutively on the composite tool on angularly spaced apart radiuses and at decreasing spacings from its axis of rotation and at decreasing spacing from said tangent plane, a farthest front cutting edge from the axis of rotation being also farthest from the tangent plane, and wherein the front cutting edges are of such a length and arrangement that a portion of a circular path for each successive cutting edge, referring to the direction of rotation, partially overlies the path of the immediately preceding front cutting edge, for a gradual machining.

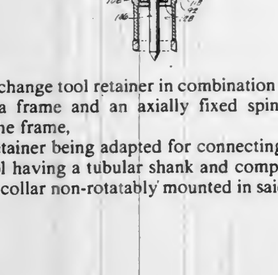
4,626,151

TOOL ALIGNMENT GAUGE

Robert F. Dietrich, R.D. #2 Box 367, Johnstown, Pa. 15904

Filed Nov. 14, 1984, Ser. No. 671,362
Int. Cl.⁴ B23C *1/12*
U.S. Cl. 409—210 **2 Claims**

1. In a milling machine having a work support with means for defining a work plane and a cutter with means for defining a cutter plane moveable relative to said work support, said work and cutter planes being generally parallel to and spaced from each other when misaligned, the improvement comprising:
means for indicating alignment and misalignment of said tool and work planes in order to facilitate aligning of said planes substantially coplanarly, and comprising:
a base mountable on said work support so as to position a fixed indicator relative to said work plane;
a pivotal angle-arm having means for reversibly mounting said angle arm on said base in order to position, alternately, opposite sides of said angle-arm immediately adjacent said base, said angle-arm having a short leg having a threaded rod engageable with said cutter and a long leg defining a moveable indicator alignable with said fixed indicator, said short leg being engageable with said cutter via said threaded rod during checking of said alignment and misalignment;



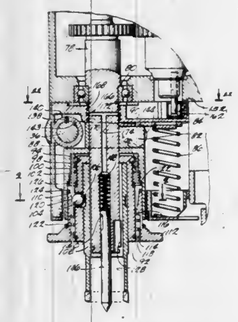
whereby, with said work and cutter planes nonaligned and said angle-arm pivotally mounted on said base with said fixed indicator aligned with said work plane, said short arm of said angle-arm is engageable with said cutter so that nonalignment of said fixed and moveable indicators is indicative of misalignment of said work and cutter planes and so that, by turning said threaded rod, said angle-arm is pivotally adjustable to align said indicators while said threaded rod still engages said cutter, such that an arcuate distance of movement of a tip of said moveable indicator to effect said alignment of indicators is proportional to a distance of movement required of said cutter and cutter plane relative to said work plane in order to align said work and cutter planes.

4,626,152

QUICK CHANGE TOOL RETAINER

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Apr. 8, 1985, Ser. No. 720,859
Int. Cl.⁴ B23B *31/22, 45/14*
U.S. Cl. 409—232 **5 Claims**



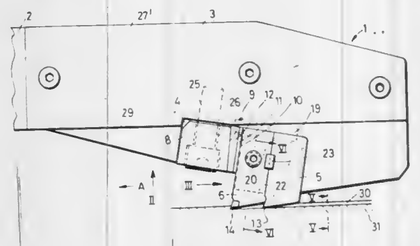
1. A quick change tool retainer in combination with a power tool having a frame and an axially fixed spindle rotatably mounted in the frame,
said tool retainer being adapted for connecting to said spindle a tool having a tubular shank and comprising,
a tool feed collar non-rotatably mounted in said frame coaxial with and outside of said spindle, said collar being movable axially with respect to said spindle,
a cage inside said collar,
bearing means supporting said cage inside said collar for rotation relative to said collar,
said cage being radially spaced from said spindle,
a tubular tool shank in the space between said spindle and said cage, said shank having a peripheral groove,
a drive key connecting said spindle and said tool shank,
a plurality of radial holes in said cage,
a ball in each of said holes and having a diameter greater than said space between said cage and said spindle,
a release collar mounted on said cage and having a cam surface bearing on said balls to move said balls radially inwardly of said cage to engage said peripheral groove in said tool shank,
a spring biasing said release collar to move said balls inwardly,
said release collar being movable against the bias of said spring to release said balls for raidal movement outwardly to disengage said tool.

4,626,153

DRAW-KNIFE

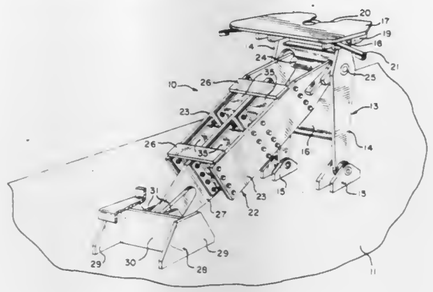
Karl Ergert, and Ernst M. Balzat, both of Frechen, Fed. Rep. of Germany, assignors to Balzat Werkzeugmaschinenfabrik GmbH, Kerpen-Sindorf, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,120
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335503
Int. Cl.⁴ B23D *13/04*
U.S. Cl. 409—304 **12 Claims**



1. Draw-knife for producing keyways and for profiling a workpiece comprising:
a knife bar having a longitudinal axis;
a head portion mounted on said knife bar;
a throat aperture located in said head portion;
an immobile knife having a cutting edge which extends transversely to the longitudinal axis of said knife bar and located in said throat aperture;
a pair of coaxially adjustable knife plates located along a transverse axis relative to said longitudinal axis, each having a cutting edge with both adjustable knife plates located in said throat aperture;
said immobile knife abutting said pair of coaxially adjustable knife plates and located at a different position along said longitudinal axis relative said pair of coaxially adjustable knife plates;
a clamping means for removably attaching said immobile knife and said pair of coaxially adjustable knife plates located in said throat aperture.

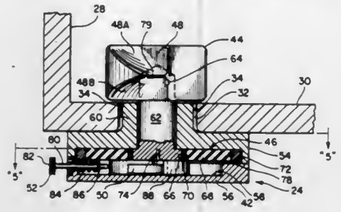
4,626,154
TRAILER HITCH WITH ELASTOMER IN SHEAR CUSHIONING
Harold E. Hesch, St. John, Ind., and Michael W. Diluigi, Burnham, Ill., assignors to Pullman Standard Inc., Chicago, Ill.
Filed Feb. 18, 1983, Ser. No. 467,966
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—56 **10 Claims**

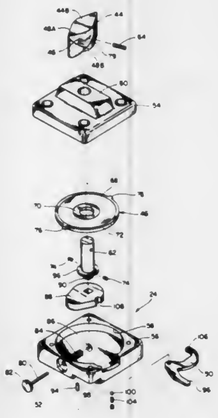


1. A trailer hitch for securing trailers to a platform, said hitch including;
a vertical support member;
a fifth wheel plate supported at the upper portion of said support member, said fifth wheel plate including a kingpin receiving slot;
pivotal means connecting a lower portion of said support member to said platform to permit swinging movement of said vertical support member; and
the fifth wheel plate supported thereon,
a fixed anchoring bracket on said platform,
a diagonal frame member including a pair of laterally spaced first thrust plates,
said vertical support member including a pair of spaced upright legs,
first pivot means pivotally connecting said upright legs to an upper end portion of said laterally spaced thrust plates,
anchoring thrust plate means having opposing sides and being disposed between said first thrust plates,
second pivot means pivotally connecting said anchoring thrust plate means to said fixed anchoring bracket, and
first and second sets of resilient cushioning elements connected to respective sides of said anchoring thrust plate means and to respective first thrust plates,
each of said sets of resilient cushioning elements comprising a plurality of individual separated cushioning elements being positioned in an arrangement having two rows of cushioning element in a lengthwise direction with respect to the diagonal frame member and two rows of cushioning elements in a transverse direction with respect to the diagonal frame member,
each of said cushioning elements being connected to the thrust plate means and to the respective thrust plate whereby the diagonal frame member is shorter in length and capable of absorbing substantially the same forces, and whereby the hitch is compact to provide clearance for securing said trailer to said platform.

4,626,155
AUTOMATIC CONTAINER SECUREMENT DEVICE WITH A SPRING BIASED, CAM SURFACED HEAD
Emil J. Hlinsky, Oak Brook, and Stephen W. Simek, Buffalo Grove, both of Ill., assignors to MacLean-Fogg Company, Mundelein, Ill.
Filed Jan. 13, 1986, Ser. No. 818,500
Int. Cl.[4] B60P *1/64;* **B63B** *25/00;* **F16B** *21/08;* **B65G** *57/03*
U.S. Cl. 410—82 **22 Claims**

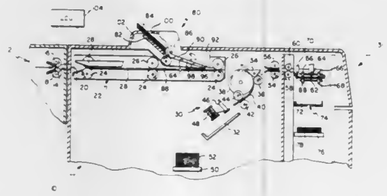
13. A container securement device of the type including a base, a shear block projecting from said base adapted to engage a locking opening in a container placed against the base, a rotatable head movable between a container loading position generally aligned with said shear block in which the head and shear block can enter the locking opening and a container locked position offset from the shear block in which the container is secured against the base, and the improvement comprising:





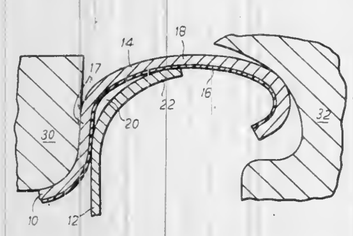
a spring connected between said base and said head biasing said head to said container locked position;
and a cam surface on said head for rotating said head in opposition to the force of said spring in response to engagement of said cam surface with the perimeter of said locking opening.

4,626,156
FINISHING APPARATUS WITH COVER INSERTER
Richard C. Baughman; Stephen J. Flamini, and William C. Wilson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 13, 1985, Ser. No. 733,341
Int. Cl.[4] B42B *9/00;* **B42C** *11/02*
U.S. Cl. 412—33 **1 Claim**



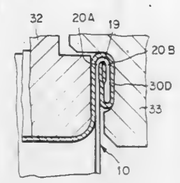
1. In a finishing apparatus having an assembly station at which booklets are assembled, and the finishing apparatus having a sheet transport defining a first path leading to the assembly station, the sheet transport being adapted to deliver sets of sheets seriatim to the assembly station, the improvement comprising:
a support in the finishing apparatus for holding a stack of booklet covers, the support being located above the sheet transport and inclined at an angle relative to the sheet transport, means for feeding booklet covers from the support and along a second sheet path extending from the support to the first path so that booklet covers can be delivered from the support to the assembly station, and the finishing apparatus having a cover enclosing the sheet transport and the feeding means, the cover having an opening directly above the support and of sufficient size to allow an operator to place a stack of booklet covers onto the support without opening the cover.

4,626,157
METHODS OF MAKING CONTAINERS
Josef T. Franek, Chorleywood; Paul Porucznik, Kennington; Peter H. Serby, Newbury, and Christopher J. N. Tod, Steyning, all of United Kingdom, assignors to Metal Box Public Limited Company, United Kingdom
Continuation-in-part of Ser. No. 293,634, Aug. 10, 1981, Pat. No. 4,423,823. This application Nov. 14, 1983, Ser. No. 551,205
Claims priority, application United Kingdom, Dec. 8, 1979, 7942425
Int. Cl.[4] B21D *51/26*
U.S. Cl. 413—1 **1 Claim**



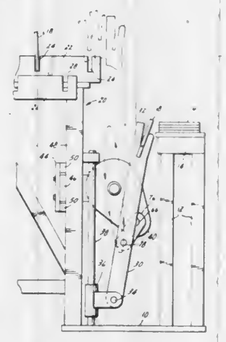
1. A method of making an aerosol container comprising the steps of
(i) providing a tubular container body having an opening set-off by a curl,
(ii) providing a laminated component for the container from a pre-laminated sheet comprising a metal substrate layer having a layer of polymeric material bonded over the whole of at least one side of the substrate layer,
(iii) forming the laminated component into an aerosol valve cup having a central portion and an annular channel,
(iv) positioning the annular channel of the aerosol valve cup upon the curl of the aerosol container with the polymeric material sandwiched therebetween, and
(v) urging the annular channel and curl by mechanical deformation into a crimped mechanical connection, while compressing the polymeric material to form an air/gas-tight seal,
steps (ii) through (v) being performed without any sealing material (other than said polymeric material) present by virtue of step (ii) being or having been introduced, without adding heat, and without any bonding between the annular channel and curl.

4,626,158
CONTAINER SEAM AND A PROCESS FOR FORMING A CONTAINER SEAM
Lucien F. Le Bret, Saint Gratien, France, assignor to Gallay S.A., Paris, France
Filed Jul. 5, 1984, Ser. No. 627,931
Claims priority, application France, Jul. 5, 1983, 83 11188; Sep. 30, 1983, 83 15596
Int. Cl.[4] B21D *51/30*
U.S. Cl. 413—6 **16 Claims**



1. A process for assembling a container body and a bottom therefor by forming a triple seam between the body and the bottom of the container comprising the steps of:
(a) forming a hook-shaped profile in the edge of the body of the container;
(b) superposing a bottom edge of the bottom of the container over the hooked edge of the body of the container;
(c) flanging a terminal part of said body subsequent to the step of forming the hook-shaped profile in the body edge; said body edge having:
(i) the hook-shaped profile with a generally axially extending terminal part; and
(d) rolling the bottom and body edges around each other to form a triple seam having more than five layers of adjoining material.

4,626,159
MACHINE LOADER
James D. Scannell, Grosse Pointe Farms, Mich., assignor to Lamb Technicon Corp., Warren, Mich.
Filed Nov. 21, 1984, Ser. No. 674,027
Int. Cl.[4] B65G *47/06*
U.S. Cl. 414—112 **16 Claims**



1. A machine for loading long flexible strips of sheet stock onto a machine comprising a base, a support fixed relative to said base and on which a stack of said strips is adapted to be arranged such that the uppermost strip can be slid off the top of the stack, a slide carried by said base and constructed and arranged for movement generally vertically with respect to said base, a pair of laterally spaced apart and parallel loader arms each pivotally mounted on said slide, extending generally vertically and constructed and arranged for movement in a

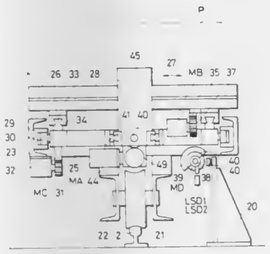
generally vertical plane, each of said arms having a generally vertically extending slot therein, a strip receiving device adjacent said arms having a pair of laterally spaced, generally vertically extending slots therein, the slots in said arms and said receiving device having open upper ends for receiving and supporting said strips edgewise in a generally vertically oriented position, a drive carried by said base for moving said arms such that the slotted portions thereof remain in a generally vertically oriented position while moving throughout a generally elliptical path lying in a generally vertical plane and adjacent said stack and said receiving device, said elliptical path extending from above to below both said support and the slots in said strip receiving device and having its major axis extending generally vertically, said arms at one location in said path being oriented such that the vertical slots therein are positioned to receive in edgewise position a strip slid off the top of the stack, said path having a portion wherein the slots in said arm move generally vertically downwardly into alignment with the slots in the strip receiving device so that, when the slotted portions of the arms move downwardly past the receiving device, the strip supported in the slots of said arms is deposited in the slots of the receiving device, and said drive having a rotatable input member, an output member pivotally connected to said arms, means interconnecting said input and output members, and said drive being constructed and arranged to cause said pivotal connection of said output member to orbit around the axis of rotation of said input member in an elliptical path with its major axis extending generally vertically.

4,626,160

UNMANNED TRANSFER SYSTEM FOR TRANSFERRING WORKS TO MACHINING TOOLS

Tadataka Shiomi; Kouichi Nabika, both of Gifu, and Takashi Kawagoe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 380,813, May 21, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 725,367
Claims priority, application Japan, May 24, 1981, 56-79005
Int. Cl.[4] B65G *1/04*
U.S. Cl. 414—222 **1 Claim**



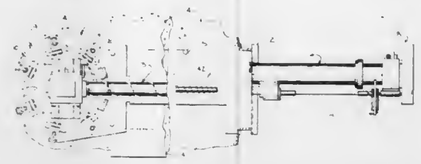
1. An apparatus for positioning a carriage-supported pallet with respect to a pallet station comprising:
positioning means for establishing the relative positions of said pallet and said carriage;
first alignment means associated with said carriage;
second alignment means associated with said pallet station;
said first and second alignment means being mechanically engageable to thereby establish the relative positions of said carriage and said pallet station, wherein;
said first alignment means comprises a rotatable semicircular cam having a tapered surface;
said second alignment means comprises a pair of rollers between which said cam may be introduced;
whereby rotation of said cam through said rollers causes said tapered surface to become wedged between said rollers, thereby fixing the position of said carriage with respect to said pallet.

4,626,161

PRE-ASSEMBLED TURNTABLE MOUNTING UNIT FOR A STORAGE STRUCTURE

George E. Olson, Arlington Heights, and Jerry F. Nobiling, McHenry, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 360,799, Mar. 22, 1982, abandoned. This application Oct. 23, 1984, Ser. No. 663,771
Int. Cl.[4] B65G *65/46*
U.S. Cl. 414—308 **5 Claims**



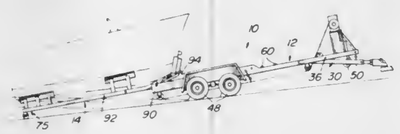
1. In a storage structure, a vessel to contain a stored material, a foundation to support the vessel, said foundation having a trough extending from the center of the vessel to the exterior, a pre-assembled unit disposed in the trough adjacent the center of the vessel, said unit comprising a fixed ring supported on the upper surface of the foundation and having a central opening communicating with the inner end portion of the trough, an annular turnable having a central aperture, support means carried by said ring for supporting said turntable for rotation, a material dislodging member operably connected to the turntable, drive means operably connected to said turntable for rotating said turntable and thereby rotating said dislodging member around said vessel, drive transmission means operably connected to said dislodging member for rotating the dislodging member about its axis, said drive transmission means extending downwardly through said opening in said ring and through said aperture in said turntable, a platform suspended from said ring and spaced above the bottom of the trough, said drive transmission means being mounted in an established position on said platform, a plurality of legs interconnecting the platform with said ring for suspending said platform from said ring, and adjusting means operably connected to at least one of said legs for adjusting the length of said leg to align said drive transmission means with said turntable and said ring.

4,626,162

EXTENDABLE TRAILER FOR MARINE VEHICLES

Vincent Parisi, 3464 Germantown Pike, Collegeville, Pa. 19426

Filed Aug. 20, 1985, Ser. No. 767,560
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—479 **6 Claims**



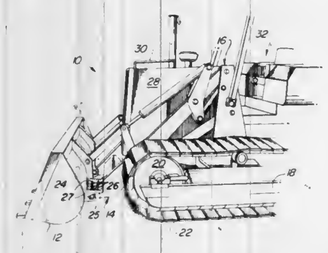
1. An extendable boat trailer including:
(a) a wheeled chassis adapted to be secured to a towing vehicle and having elongate, laterally spaced-apart side members;
(b) a boat supporting cradle on said chassis and movable rearwardly and forwardly thereon;
(c) said cradle including a rear section and a forward section, said forward section extending upwardly and forwardly relative to said rear section, and said rear section being movably supported on low friction conveyor means associated with said elongate side members of said chassis;
(d) said low friction conveyor means including two sets of rollers, one of said sets being associated with one of said elongate side members of the chassis and the other set being associated with the other of said elongate side members of said chassis, a rear roller in each set being adjacent the rearward end of the chassis and constituting cradle-retaining means;
(e) said forward section of the cradle including laterally spced-apart, downwardly directed retaining means thereon for engaging with the cradle-retaining means on said chassis when said cradle has been fully extended rearwardly on said chassis;
(f) whereby rearward movement of said cradle results in a corresponding downward movement thereof as said forward section moves along a rear section of the chassis until the laterally spaced-apart retaining means on the forward section of the cradle engages the rear rollers on the chassis which constitute the retaining means adjacent the rearward end of the chassis.

4,626,163

MOUNTING STEP FOR CRAWLER LOADER

Joseph E. Link, Farley, and James F. Oeth, Dubuque, both of Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 553,612, Nov. 21, 1983, abandoned. This application Sep. 24, 1985, Ser. No. 780,229
Int. Cl.[4] E02F *3/04*
U.S. Cl. 414—685 **2 Claims**



1. In a crawler loader having a bucket coupled to the forward end of a support arm structure and being selectively positionable in a lowered position, a fore-and-aft extending drive track located entirely outwardly of the support arm structure and having a forward end spaced rearwardly from an end portion of the bucket and an engine enclosure and operator's station located inwardly of the drive track, the improvement comprising: an open step structure fixed to a rear surface of said end portion of the bucket in alignment with and projecting toward a forward end of said drive track when the bucket is in said lowered position so as to be useable by an operator mounting or dismounting the crawler loader.

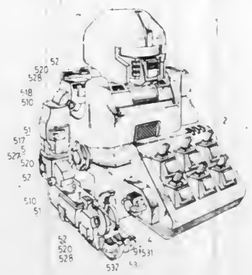
4,626,164

ROBOT WITH IMPROVED TRANSMISSION SYSTEM

Chin-Der Chang, Taipei, Taiwan, assignor to Timestrong Enterprise Co., Ltd., Taipei, Taiwan

Filed May 22, 1985, Ser. No. 736,946
Int. Cl.[4] B25J *11/00*
U.S. Cl. 414—735 **9 Claims**

1. A robot toy including a body incorporating a movable arm operated by a motor through a transmission system, and the improvements wherein the movable arm is constituted of alternatingly interconnected first members and second members, each said first member having a first end, a second end and a first rotating unit, each said second member having a third end for connection with said first end and said first rotating unit which rotates said second member about the longitudinal axis of said first member, a fourth end for connection with said second end of the next first member, and a second rotating unit for rotating said next first member about an axis perpendicular to said longitudinal axis, and said transmission system includes first gear members separately mounted in said robot body and driven by said motor simultaneously, second gear members for meshing with said first gear members respectively, clutch members for engaging and disengaging said first and second gear members, and a plurality of transmitting cords



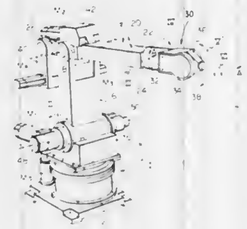
which are made of metal wires twisted together each of said cords is interconnected to a different one of said second gear members and one of said first and second rotating units for transmitting the movements of its respective second gear member to its respective one of said first and second roating units.

4,626,165

INDUSTRIAL ROBOT WRIST MECHANISM

Seiichiro Nakashima, Hino; Shigemi Inagaki, Kokubunji, and Susumu Ito, Hino, all of Japan, assignors to Fanuc Ltd, Hino, Japan

PCT No. PCT/JP83/00367, § 371 Date Jun. 19, 1984, § 102(e) Date Jun. 19, 1984, PCT Pub. No. WO84/01538, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 20, 1983, Ser. No. 624,509
Claims priority, application Japan, Oct. 20, 1982, 57-182929
Int. Cl.[4] B66C *1/00*
U.S. Cl. 414—735 **2 Claims**



1. A wrist mechanism of an industrial robot, comprising:
an outer wrist joined to a free end of a robot arm;
an inner wrist pivotally supported by bearings within said outer wrist and adapted to be turned about an axis by a first rotative input force transmitted thereto through said robot arm;
a robot hand holding part journaled within said inner wrist and adapted to be turned by a second rotative input force transmitted thereto from outside of said inner wrist;
a gear mechanism set having a driving gear and a driven gear for transmitting said second rotative input force to said robot hand holding part;
said driving gear of said gear mechanism being a first bevel gear to which said second rotative input force is transmitted, coaxially with said first rotative input force transmitted to said inner wrist, at a reduced revolving rate through a first reduction gear of high reduction ratio, and said driven gear of said gear mechanism being a second bevel gear meshing with said first bevel gear to transmit said

second rotative input force to said robot hand holding part; and

a second reduction gear of a high reduction ratio provided between said outer wrist and said inner wrist having an input wheel supported on said outer wrist and an output wheel attached to aid inner wrist for reduction of said first rotative input force transmitted to said inner wrist;

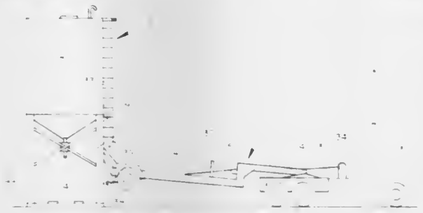
said first and second reduction gears being coaxially arranged about said axis of said inner wrist pivotal support.

4,626,166

METHOD FOR THE PLACEMENT OF A TRAILER-MOUNTED SAND HOPPER

Arthur E. Jolly, P.O. Box 1146, Victoria, Tex. 77902

Filed Nov. 6, 1985, Ser. No. 795,631
Int. Cl.[4] B60P *1/64*
U.S. Cl. 414—786 **1 Claim**



1. A method for placing a bulk sand hopper at a specified location comprising:

transporting said hopper horizontally to said specified location on a trailer pivotally mounted at a front end to a motor-driven truck;

attaching a winch and cable system, cooperative with said trailer, to a tilting hinge member on a lower portion of said hopper, said hopper being tiltably attached to a rear portion of said trailer;

engaging said winch and cable system in a first direction to tilt said hopper to a generally vertical position whereby front legs of said hopper contact the ground at said specified location, said hopper rotating about pivot points on said trailer to which said hopper is tiltably attached;

backing said truck while said hopper comes to a full upright position at said location, said rear portion of said trailer simultaneously being lifted above said ground at said location while rotating about said pivot points;

detaching said winch and cable system from said hinge member and subsequently attaching said system to a tongue member connected to said hopper above said pivots points;

removing connection members from said pivot points to disengage said trailer from said hopper;

engaging said winch and cable system in a second and opposite direction to lower said trailer to said ground at said specified location;

disconnecting said system from said tongue member after said trailer is fully upon said ground.

4,626,167

MANIPULATION AND HANDLING OF INTEGRATED CIRCUIT DICE

Robert H. Bond, Carrollton; Steven Swendrowski, The Colony; Michael A. Olla, Flower Mound, and Barry L. Morrison, Bedford, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

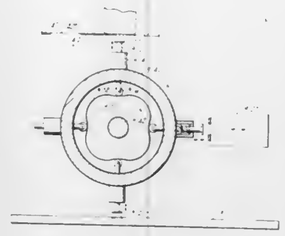
Filed Mar. 22, 1984, Ser. No. 592,151
Int. Cl.[4] B32B *31/04*
U.S. Cl. 414—786 **5 Claims**

1. A method of manipulating integrated circuit dice having a contact side and a substrate side comprising the steps of:

a. depositing at least one integrated circuit die contact side down in at least one of a first linear array of receptacles positioned initially at predetermined intervals along a first axis in a first substantially horizontal plane;

b. rotating said array of receptacles 180 degrees about a first rotation axis parallel to said first plane, whereby said at least one integrated circuit die is contact side up;

c. dropping said at least one die into a second, corresponding array of receptacles spaced at said predetermined intervals



along a second axis parallel to said first axis and aligned vertically with said initially positioned first linear array of receptacles, whereby said dice rest in said second corresponding array contact side up; and

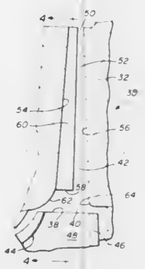
d. precising said die prior to dropping said die into said second array of receptacles and after said step of rotating by slidably aligning said die from an initial position to an aligned position.

4,626,168

DIFFUSER FOR CENTRIFUGAL COMPRESSORS AND THE LIKE

Colin Osborne, Allegany, and Peter N. Chow, Olean, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 15, 1985, Ser. No. 734,571
Int. Cl.[4] F04D *29/30*
U.S. Cl. 415—211 **9 Claims**



1. In a centrifugal compressor including a bladed impeller journaled for rotation about a rotational axis of a housing having improved diffuser means located adjacent to the outlet of the impeller, said improved diffuser means having an inner diameter sized to receive said impeller and including:

an annular diffuser passageway in general radial alignment with the outlet of said impeller, said passageway having an inlet, outlet, and an intermediate portion, said intermediate portion being of less axial width than said impeller outlet; and,

a plurality of circumferentially spaced ribs located in said diffuser passageway, said ribs having leading edges located in said intermediate portion and remote from the outlet of said impeller and from the inlet of said diffuser passageway and closer to the inlet of said diffuser passageway than to said outlet;

said impeller including a hub and a shroud with blades disposed therebetween;

said diffuser means including a shroud surface in said diffuser passageway located adjacent to said impeller shroud and a hub surface in

said diffuser passageway located adjacent to said impeller hub;

said hub surface being generally aligned with said hub;

said shroud surface being disposed at an angle relative to said hub surface; and,

said ribs projecting from said shroud surface toward said hub surface in circumferential spaced relationship.

7. A method for increasing the efficiency of a centrifugal compressor having a rotor that generates low angle gas flow over a portion of the rotor outlet area, the method comprising the steps of:

locating ribs in a diffuser passageway of the compressor with said ribs projecting axially into but not substantially past the low angle flow portion, with the leading edges of the ribs located away from said rotor outlet, said ribs increasing the low flow gas angle therebetween within said diffuser passageway; and

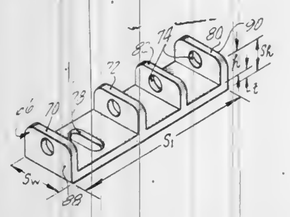
pinching the inlet portion of said diffuser passageway adjacent to the low angle flow portion and upstream of said ribs to increase the low angle of gas flow uniformly around the entire circumference of said rotor upstream of said leading edges.

4,626,169

SEAL MEANS FOR A BLADE ATTACHMENT SLOT OF A ROTOR ASSEMBLY

Frederick F. Hsing, Windsor, and John A. Leogrande, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 561,016, Dec. 13, 1983, Pat. No. 4,505,640.
This application Oct. 23, 1984, Ser. No. 663,927
Int. Cl.[4] F01D *5/18*
U.S. Cl. 416—95 **3 Claims**



1. A seal means adapted for use in a blade attachment slot of a gas turbine engine which comprises:

a seal plate having rectangular shape, a width Sw, a first end, a second end, an axial length S_l between the ends, a cross-sectional thickness t and an orifice extending therethrough;

a plurality of baffles integral with the seal plate which extend across the width Sw of the plate a distance equal to the width of the seal plate and from the seal plate a distance h, the distance h being

measured perpendicular to the seal plate and being at

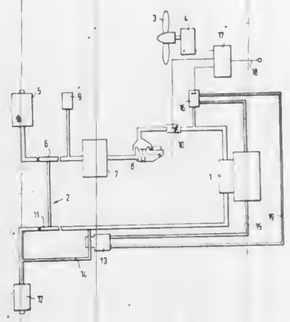
least twice the cross-sectional thickness t ($h \leqq 2t$), wherein at least one baffle extends from the seal plate between the first end and the orifice, wherein at least one baffle extends from the seal plate between the second end and the orifice and wherein at least one additional baffle extends from the seal plate between said baffles and said orifice.

4,626,170

PROPULSION AGGREGATE FOR AN AIRCRAFT

Heinz Dorsch, Weissach-Flacht, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,255
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306612
Int. Cl.[4] B64C *11/34*
U.S. Cl. 416—29 **20 Claims**



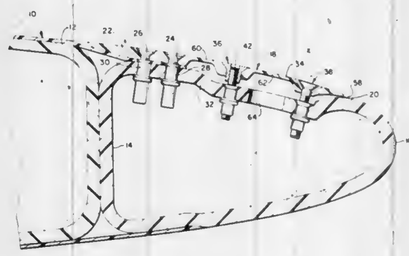
1. A propulsion aggregate for an aircraft utilizing a multicylinder-injection-internal combustion engine having a crankshaft and inlet suction line means for each cylinder, throttle valve means in said inlet suction line means to control the flow of inlet air to the engine, a propeller with an adjustable blade pitch drivingly connected to said crankshaft, a blade pitch control for said propeller, a fully automatic continuously operating fuel injection means for determining a fuel-air mixture for the engine including an air quantity measuring means operable to meter a fuel quantity to the engine in response to air mass flow to the individual suction line means of the cylinders by way of a control piston of a fuel quantity distributor means, and common adjusting means for adjusting both the throttle valve means and the blade pitch control of the propeller in unison.

4,626,171

ROTOR BLADE CONSTRUCTION FOR CIRCULATION CONTROL AIRCRAFT

Donald R. Carter, Sr., Derby; Timothy A. Krauss, Harwinton, and Matthew Sedlak, Wallingford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1984, Ser. No. 664,738
Int. Cl.[4] B64C *21/08*
U.S. Cl. 416—90 A **2 Claims**



1. A rotor blade for a circulation control aircraft having along a portion of its span an edge section consisting of a Coanda surface, a duct located within said edge section for providing compressed air to be discharged adjacent the top of

the Coanda surface to flow around the outside of the Coanda surface, and flexible panel means for controlling compressed air discharge, said panel having a first edge fixedly connected to the upper outside surface of said edge section and a second edge defining with an upper portion of the Coanda surface a spanwise extending slot through which compressed air is discharged, said panel also having first flexure means associated with first means for establishing a preload on said panel second edge so that said slot is closed until a minium duct air pressure is reached, and second flexure means associated with second means for limiting the movement of said panel second edge in response to duct air pressure so as to establish a maximum slot opening, said first flexure means including a composite panel length area of specific thickness and layup to provide desired flexing characteristics and said second flexure means including a composite panel length area of different specific thickness and layup to provide different flexing characteristics than said first flexure means.

4,626,172

VARIABLE-PITCH MULTI-BLADE PROPELLER INCORPORATING INDIVIDUALLY DISMOUNTABLE BLADES MADE OF COMPOSITE MATERIALS, PROCESS FOR MANUFACTURING SUCH BLADES AND BLADES THUS PRODUCED

René L. Mouille, Aix-en-Provence; Marc Declerco, Pelissane; Jean-Pierre Jalaguier, Vitrolles, and Bernard Jaugey, Marseilles, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Division of Ser. No. 587,649, Mar. 8, 1984. This application Apr. 24, 1985, Ser. No. 726,640

Claims priority, application France, Mar. 18, 1983, 83 04448

Int. Cl.[4] B64C *11/06*

U.S. Cl. 416—134 A **6 Claims**



1. A blade for equipping a multi-blade propeller and in particular a propeller for being used as a tail rotor or a rotorcraft, comprising:

a shell with aerodynamic profile, constituted by at least one layer of fiber fabrics with high mechanical resistance agglomerated by a polymerized synthetic resin for impregnation,

a preformed filling body made of a cellular or foam synthetic material and disposed in said shell,

a spar having a longitudinal axis substantially parallel to a longitudinal axis of the blade and constituted by a single elongated leaf of rovings of fibers with high mechanical resistance agglomerated by a polymerized synthetic resin, and of which a major part is fixed in said shell whereas an end part of said spar is emerging from said shell and forms a twistable and bendable spar root part from connecting said spar to a hub, and

a metal leading edge cover integrated in said shell, wherein said elongated leaf forming said spar is constituted by a single bundle of rovings which is folded on itself in a zone of fold to define two equal halves having inner parts adjacent said zone of fold and outer parts remote from said zone of fold, said inner parts constituting said spar root part having an inner end arranged as a loop surrounding a tubular connecting element for connecting the blade to said hub, and said outer parts being coupled to each other and constituting said spar major part received in said shell and bonded, on one hand, in a cut-out provided in one face of said preformed filling body and whose cross-section corresponds substantially to that of said spar major part, and, on the other hand, directly on an inner face part of said shell opposite said cut-out of said filling body, and said shell comprises an inner end turned towards said spar root part and arranged as a blade root which is traversed by said spar root part and made with extensions of each layer of fiber fabrics constituting said shell and covering a stack of reinforcing fiber fabric layers.

4,626,173

VARIABLE-PITCH MULTI-BLADE PROPELLER INCORPORATING INDIVIDUALLY DISMOUNTABLE BLADES MADE OF COMPOSITE MATERIALS, PROCESS FOR MANUFACTURING SUCH BLADES AND BLADES THUS PRODUCED

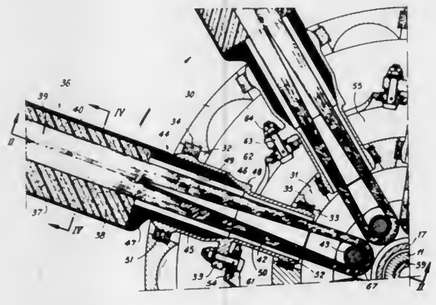
René L. Mouille; Marc Declerco; Jean-Pierre Jalaguier, and Bernard Jaugey, all of Bouches-du-Rhône, France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Mar. 8, 1984, Ser. No. 587,649

Claims priority, application France, Mar. 18, 1983, 83 04448

Int. Cl.[4] B64C *27/45, 11/00*

U.S. Cl. 416—134 A **16 Claims**



1. In a variable-pitch multi-blade propeller intended in particular to be used as tail rotor of a rotorcraft, and comprising:

a central shaft driven in rotation about a central axis,

a hub rotating with said central shaft about said axis,

blades, preferably in an odd number, each comprising

a shell with aerodynamic profile constituted by at least one layer of fiber fabrics with high mechanical resistance rigidified by a polymerized synthetic resin for impregnation, and having an inner end which extends by a blade root,

a filling body made of cellular or foam synthetic material disposed in said shell,

a spar having a longitudinal axis substantially parallel to that of said blade and constituted by a single elongated leaf of fibers with high mechanical resistance agglomerated by a polymerized synthetic resin, of which the major part is fixed in said shell and of which one inner end part, emerging from said shell on passing through said blade root, forms a twistable and flexible root part by which said spar is connected to said hub, said blade root being fast with a pitch control member which is adapted to exert on said shell a torsional moment, substantially centred on said spar longitudinal axis, when said pitch control member is actuated by an assembly for collectively controlling the pitch of said blades, and which is mounted to rotate in said hub about said blade longitudinal axis and wherein

(a) each blade is individually connected to said hub by said spar root part which is arranged in the form of a loop having an inner end surrounding a single connection element bolted on said hub,

(b) said hub has, for each said blade, two axially extending parts which are radially spaced apart from each other, and in each of which there is an opening which is coaxial with the opening of the other hub part, and

(c) said blade pitch control member is rotatably mounted in said two coaxial openings.

4,626,174

TURBINE BLADE

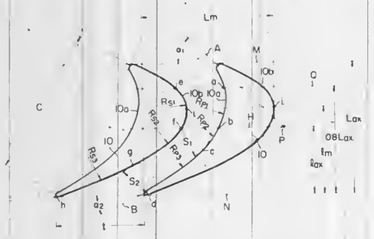
Takeshi Sato, Hitachi; Akira Uenishi, Mito; Norio Yasugahira, and Katsukuni Hisano, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 544,727, Oct. 24, 1983, abandoned, which is a continuation of Ser. No. 129,200, Mar. 11, 1980, abandoned. This application Apr. 9, 1985, Ser. No. 721,469

Claims priority, application Japan, Mar. 16, 1979, 54-29920

Int. Cl.[4] F01D *5/14*

U.S. Cl. 416—223 A **3 Claims**



1. A turbine blade of a low blade profile loss wherein a crossing point of an inlet angle α_1 and an outlet angle α_2 of the blade is located in a position in which the distance between the crossing point of an outlet end of the blade is greater than one-half of a blade width L_{ax}, the inlet angle α_1 is in a range of between 35°-40°, the outlet angle α_2 is in a range of 25°-28°, and a ratio of a narrowest width S_2 of the flow channel at the blade outlet end to a narrowest width S_1 of a flow channel defined between a backside of the turbine blade in a vicinity of the crossing point and a front side of an adjacent blade is $0.81 \leqq S_2/S_1 < 0.96$, a ratio of a distance l_{ax} between a line connecting the outlet ends of adjacent blades and a line passing through the crossing point to the blade width L_{ax} is in a range of 0.5–0.54, a ratio of a distance L_m from the outlet end of a blade to a maximum projecting point of a backside of the blade in a direction of rotation of the blade to the width L_{ax} is in a range of 0.75–0.89, and wherein a ratio of the distance from the maximum projecting point to the line connecting the outlet ends of adjacent blades is in the range of 0.6–0.66.

4,626,175

FLOAT SWITCH CABLE CLAMP

Richard Riback, Highland Park, and Francois Geneve, Chicago, both of Ill., assignors to Expert Corporation, Chicago, Ill.

Filed Aug. 22, 1985, Ser. No. 768,454

Int. Cl.[4] F04B *49/04*

U.S. Cl. 417—40 **17 Claims**

1. A fluid pump adapted to control the level of a fluid medium, including

a housing encasing said fluid pump;

drive means in said housing for driving said fluid pump;

switch means associated with said drive means for turning said drive means and said fluid pump on and off;

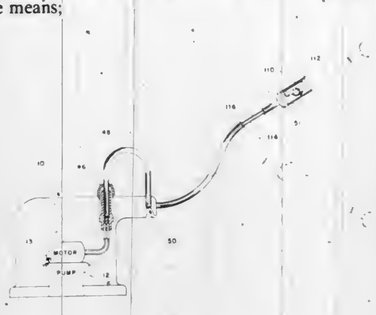
said switch means housed in a float element adapted to float on the upper level of said fluid medium;

cable means extending between said float element and said drive means in said housing, said cable means exerting a force on said float element when the level of said fluid medium reaches a predetermined maximum level, whereby the attitude of said float element changes responsive to said force exerted by said cable means;

said switch means adapted to turn said drive means on and off responsive to the change in attitude of said float element;

the improvement comprising: clamp means associated with said housing;

said clamp means adapted to removably hold said cable means in a predetermined stationary position whereby the distance between said clamp means and said float element remains constant while said clamp means engages said cable means;



said clamp means adapted to provide manual release of said cable means from said clamp means and subsequent manual re-insertion of said cable means in said clamp means at a different position along the length of said cable means whereby the distance of said cable means extending between said clamp means and said float element is changed.

4,626,176

PUMP EMPLOYING THE SUCTION EFFECT OF A ROTATING LIQUID RING

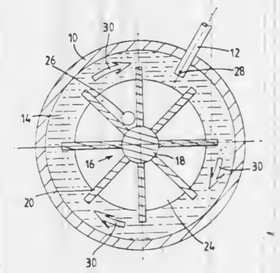
Michael Cole, Ipswich, England, assignor to Genevac Limited, England

Filed Apr. 26, 1985, Ser. No. 727,541

Claims priority, application United Kingdom, May 3, 1984, 8411364; Sep. 12, 1984, 8422995; Dec. 6, 1984, 8430889

Int. Cl.[4] F04C *19/00*

U.S. Cl. 417—54 **22 Claims**



1. A pump comprising:

(1) a pump housing having a generally cylindrical interior and enclosing a quantity of working liquid,

(2) at least one probe having at least one aperture on its external surface and positioned in the housing,

(3) internal passage means in the probe for communicating said at least one aperture with a first external space,

(4) means for causing the liquid to move in a circular path inside the housing and relative to the probe, the liquid passing over the external surface of the probe and past the aperture in the probe, and

(5) outlet means for communicating between a second external space and a central region of the housing which in use is free of liquid,

whereby fluid to be pumped is drawn through the probe to pass out of said aperture into the liquid, by virture of the suction effect of the liquid passing over the aperture, to move as fluid bubbles toward the central region of the

housing as a result of centrifugal forces acting on the more dense liquid, the bubbles migrating through the circulating liquid into the central region to pass out of the housing through the outlet means.

22. A method of pumping a fluid from one region to another by employing a suction effect produced when a liquid flows over a surface containing an orifice which communicates with the said one region, comprising the steps of:

(1) causing a liquid having a density greater than that of the fluid, to flow over an external surface of a member having at least one orifice in said external surface, to create a suction effect at the orifice by virtue of the movement of liquid over the orifice, to draw fluid from the said one region out of the orifice into the liquid moving past the orifice;

(2) constraining the liquid to follow a curved path so as to introduce centrifugal forces therein and thereby produce radial separation of the liquid and the less dense fluid entrained therein, and

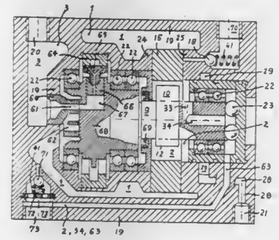
(3) conveying the displaced fluid to the said other region.

4,626,177

HYDRAULIC ARRANGEMENT

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 429,746, Sep. 30, 1982, abandoned, which is a division of Ser. No. 179,420, Aug. 19, 1980, Pat. No. 4,475,870.
This application Dec. 3, 1984, Ser. No. 677,774
Int. Cl.[4] F04B *17/00, 35/00*
U.S. Cl. 417—271 **1 Claim**



1. A hydraulic arrangement, comprising, in combination, a housing, a rotary shaft revolvably borne in said housing, at least one eccenctric cam ring revolving in unison with said shaft when said shaft revolves, surrounding a portion of said shaft and forming a cylindrical outer face of equal radii around an axis which is parallel to the axis of said shaft but distanced therefrom by a first eccentricity; at least one cylinder block provided in said housing and facilitating at least one cylinder, at least one piston, at least one entrance port and at least one exit port to pass fluid into and out of said at least one cylinder when said at least one piston reciprocates in said at least one cylinder; while said housing also includes at least one first space and at least one second space, at least one inlet and at least one outlet; said second space is sealed and separated from said first space; said first space engages said at least one entrance port, said outlet communicates to said at least one exit port; said second space surrounds said at least one cam ring; said at least one piston is capable of partially entering said second space and engaging at least indirectly said outer face of said cam ring, and said outer face of said cam ring at least indirectly engages to guide at least partially the reciprocation - stroke of said at least one piston when said at least one piston reciprocates in said at least one cylinder,

wherein said housing includes at least one hydraulic motor, said inlet is communicated to the entrance means of said hydraulic motor,

wherein said hydraulic motor rotates said shaft and said eccentric cam ring when fluid is supplied to said motor,

wherein said motor has an exit and said exit is provided with an overflow and pressure setting valve whereby the outlet flow of said motor flows under the set pressure of said setting valve into said first space to flow through said entrance port and to drive said piston(s) outward in said cylinder(s),

wherein said second space is communicated to a space under substantial low pressure which might be the outlet of said motor after said setting valve, and,

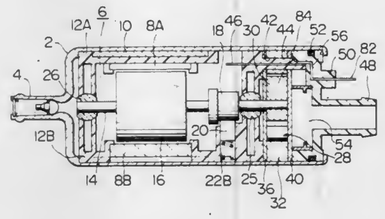
wherein said motor drives over said eccentric cam said piston(s) to an inward stroke in said cylinder(s) to supply a flow of fluid of a fourth pressure out of said cylinder(s) and through said outlet out of said arrangement.

4,626,178

FUEL SUPPLY PUMP

Susumu Terumoto, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,565
Claims priority, application Japan, Oct. 21, 1983, 58-197281
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—366 **7 Claims**



1. A fuel pump comprising an electric motor section and a pump section driven by said electric motor section, a tubular casing means for housing the motor section and the pump section, said tubular casing means includes an opening at a first end thereof and a first pipe means for connection with a first external hose at a second end of the tubular casing means, end cover means for enclosing said opening, said end cover means being integrally provided with a second pipe means for connection with a second external hose and a terminal, said electric motor section comprising an insulating holder having an outer circumferential portion with depressed surfaces and being divided along a longitudinal axis thereof into two parts, an armature supported at both ends of said insulating holder through bearings, field magnets mounted on the parts of said insulating holder, yoke means fitted to said depressed surfaces so as to be held by said insulating holder for covering gaps between the two parts of said insulating holder, and brush means insertable in respective parts of the insulating holder, said pump section comprising a rotor mounted to one end of the shaft of said armature, and a pump-housing fixedly arranged to cover said rotor, both said electric motor section and pump section being covered with said tubular casing means and the opening of said casing means is covered with said end cover means so that both said electric motor section and said pump section are assembled together.

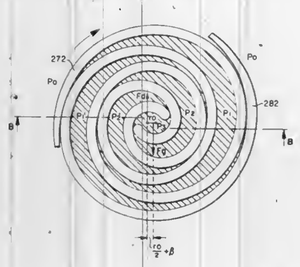
4,626,179

AXIAL THRUST LOAD MECHANISM FOR A SCROLL TYPE FLUID DISPLACEMENT APPARATUS

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Iseaki, Japan

Filed Nov. 14, 1984, Ser. No. 671,306
Claims priority, application Japan, Nov. 14, 1983, 58-212526
Int. Cl.[4] F01C *1/04*
U.S. Cl. 418—55 **4 Claims**

1. In a scroll type fluid displacement apparatus including a pair of scrolls each having a circular end plate from which a spiral wrap extends, said spiral wraps interfitting at an angular and radial offset to form a pluraity of line contacts to define at least one pair of sealed off fluid pockets, driving means operatively connected to one of said scrolls for driving said one scroll to effect orbital motion of said one scroll during orbital motion to thereby change the volume of the fluid pockets, the improvement comprising a linear length of an inner side surface of said spiral wrap of said one scroll formed longer than the linear length of an inner surface of said spiral wrap of the other scroll to shift the sealed off time of said fluid pockets to generate an assymmetrical gap pressure distribution within said spiral wraps to thereby increase the moment of rotation of said one scroll.

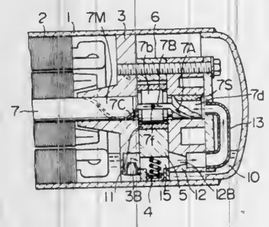


4,626,180

ROTARY COMPRESSOR WITH SPIRAL OIL GROOVES FOR CRANKSHAFT

Shigetaro Tagawa; Mitsuru Murata; Kazuo Sekigami; Masahiko Sugiyama, and Gen Konno, all of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,557
Claims priority, application Japan, Jul. 29, 1983, 58-137520
Int. Cl.[4] F04C *29/02;* **F01M** *1/06*
U.S. Cl. 418—63 **2 Claims**



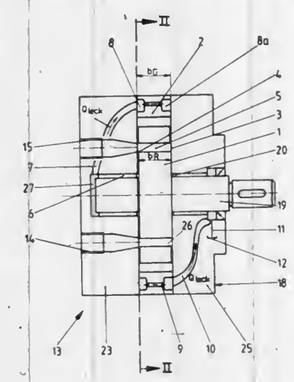
1. A rotary compressor comprising a cylinder, a main bearing and a sub-bearing located on respective sides of said cylinder, a crankshaft extending through said cylinder, a crankshaft extending through said cylinder, said crankshaft having a crank pin positioned within said cylinder for rotation, a main journal and a sub-journal rotatably supported in said main bearing and said sub-bearing, respectively, means in the cylinder operatively associated with the crankshaft for compressing a fluid in the cylinder during operation of said compressor, portions of said main journal and sub-journal being heavily subjected to a load from reaction forces by the main bearing and sub-bearing, respectively to a force applied to the crankshaft as a result the fluid pressure in said cylinder during operation said compressor, electrically operated means for rotating said crankshaft in a predetermined direction, a first spiral oil groove provided in the outer periphery of the main journal of the crankshaft and a second spiral oil groove provided in the outer periphery of the sub-journal of the crankshaft, means for supplying oil to said oil grooves during operation of said compressor, wherein the first oil groove is formed so as to spiral in a direction opposite to the rotational direction of the crankshaft and the second oil groove is formed so as to spiral in the same direction as the rotational direction of the crankshaft, and wherein both the first and second oil grooves are not provided in said portions of the corresponding journals which are heavily subjected to said load.

4,626,181

ROTARY HYDROSTATIC MACHINE WITH HEATED CENTER HOUSING PORT

Jörg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 654,932, Sep. 27, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 828,891
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335879
Int. Cl.[4] F03C *2/00;* **F04C** *2/00, 15/00*
U.S. Cl. 418—83 **5 Claims**



1. A hydrostatic machine comprising:

a housing including a center part, a flange part and a cover forming a sandwich-like structure;

a rotor rotatably mounted in said housing by means of bearings, said rotor carrying at its outer periphery a plurality of vanes adapted to define pressure and suction chambers for hydraulic oil;

space means defined in said housing and being adapted to receive leakage oil originating from said pressure chambers;

first passage means provided in said cover;

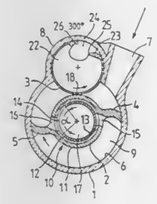
annular second passage means defined in said center part; and

third passage means defined in said flange part;

said first passage means being adapted to provide a leakage oil connection from said space means to said annular second passage means, and said annular second passage means being in leakage oil connection with said third passage means via said center part;

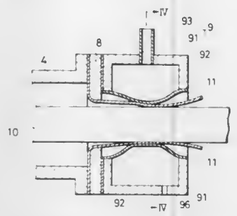
said space means, first passage means, annular second passage means and third passage means being provided so that said leakage oil flowing therethrough causes thermal expansion of said center part which substantially matches thermal expansion of said rotor.

4,626,182
EXTERNAL SHAFT ROTARY PISTON MACHINE
Felix Wankel, Lindau, Fed. Rep. of Germany, assignor to Felix Wankel, Lindau, Fed. Rep. of Germany and Aisin Seiki Co., Ltd., Kariya, Japan
Filed Oct. 9, 1984, Ser. No. 658,482
Claims priority, application Switzerland, Oct. 10, 1983, 5516/83
Int. Cl.[4] F01C *1/24*
U.S. Cl. 418—191 9 Claims



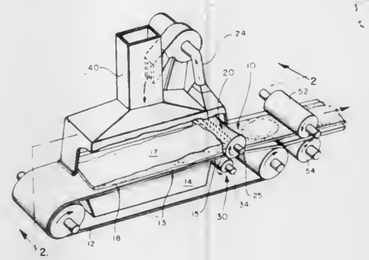
1. An external shaft rotary piston machine comprising:
a piston rotor having a shaft with an outer periphery which carries at least one piston, said at least one piston having a generally radially extending curved configuration with a concave surface on one side thereof and a convex surface on an opposite side thereof;
a sealing rotor having a circular cylindrical peripheral surface, said sealing rotor being structured to define an enclosed cavity comprising a receiving opening having a leading and a trailing boundary edge adapted to receive therein said piston of said piston rotor, said cavity being formed to consist essentially of a volume portion kinematically necessary for movement of said piston through said cavity and of an additional volume portion in excess of said kinematically necessary portion adjacent to said leading and trailing boundary edges, said additional volume and said kinematically necessary volume portion being contiguous and forming the entire volume of said cavity, said cavity thereby being larger than kinematically necessary for movement of said piston through said cavity by said additional volume portion so as to avoid the occurrence of compressed effects upon fluid squeezed between surfaces moving rapidly toward each other; and
a common housing enclosing both said sealing rotor and said piston rotor;
said sealing rotor and said piston rotor being structured so that a sealing point is formed between said circular peripheral surface of said sealing rotor and said periphery of said piston rotor shaft;
said piston being so shaped that one of said boundary edges of said receiving opening moves in sealed engagement along said concave surface of said piston with the other of said boundary edges being displaced radially inwardly from said peripheral surface of said sealing rotor and being formed between said volume portion kinematically necessary for movement of said piston through said cavity and said additional volume portion, said other boundary edge moving in sealing engagement along said convex surface of said piston.

4,626,183
APPARATUS FOR PRODUCING THERMOPLASTIC RESIN FOAM
Hideharu Shirai, and Yoshifumi Nakahara, both of Nara, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan
Filed Feb. 28, 1984, Ser. No. 584,355
Int. Cl.[4] B29C *47/00, 47/92*
U.S. Cl. 425—68 6 Claims



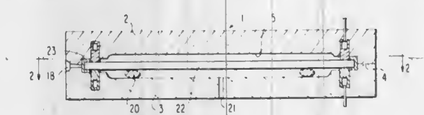
1. An apparatus for producing a thermoplastic resin foam comprising
(a) an extruder;
(b) a die member on said extruder;
(c) a vacuum chamber airtightly connected to said die, said vacuum chamber member having a discharge end; and
(d) an inflatable air-shielding means attached to at least the discharge end of said vacuum chamber, said air-shielding means comprising an annular, U-shaped cross-section frame attached to at least the discharge end of said vacuum chamber, said U-shaped cross-section frame having a base portion and two inwardly-directed portions defining an annular opening, a flexible sheet covering said opening and being air-tightly attached to said frame, a flexible protective means provided on and along a radial inner surface of said flexible sheet, and means for introducing pressurized fluid into said frame.

4,626,184
SCARFING APPARATUS
Philip G. Hammond, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Mar. 14, 1985, Ser. No. 711,789
Int. Cl.[4] B29D *7/00;* A61F *13/16*
U.S. Cl. 425—83.1 7 Claims



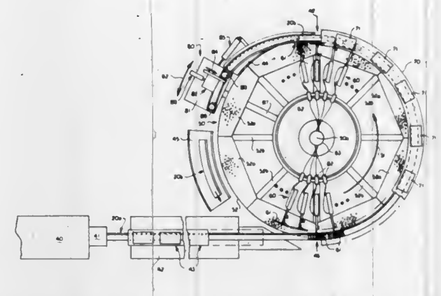
1. An apparatus for making a batt portion of a disposable absorbent structure from a continuously moving fibrous web having first and second opposing surfaces, said apparatus comprising:
a movable belt for carrying the web;
a toothed scarfing roll, rotatably mounted adjacent the first surface of the web and contoured along the length thereof in a direction transverse to the direction of movement of the fibrous web, for forming a transverse contour in the web by scarfing the first surface thereof;
a contouring roll opposite said scarfing roll, said contouring roll having a nonuniform circumferential surface, disposed about a longitudinal axis thereof, in communication with the second opposing surface of the web and operatively synchronized with said scarfing roll for moving the second opposing surface relative to the axis of said scarfing roll during at least a partial revolution of said nonuniform circumferential surface and a full rotation of said scarfing roll to contour each batt formed thereby both transversely and longitudinally in the direction of movement of the web;
and cutting means for cutting the fibrous web into a plurality of discrete batts at selected intervals.

4,626,185
METHOD AND APPARATUS FOR MOLDING A FRAME AROUND THE PERIPHERY OF A FLAT OR CURVED OBJECT
Bernard Monnet, Bellignat, France, assignor to Billion S.A., Bellignat, France
Filed Sep. 13, 1985, Ser. No. 775,862
Claims priority, application France, Sep. 21, 1984, 84 14649
Int. Cl.[4] B29D *27/00*
U.S. Cl. 425—110 6 Claims



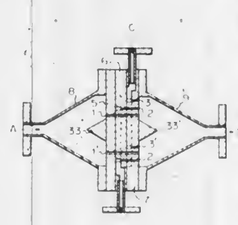
1. An apparatus for the injection molding of a precisely dimensioned frame (**23**) onto and around the circumference of a generally planar object (**22**) having a substantially fixed area but being subject to variations in circumferential dimensions, comprising:
(a) a pair of mold halves (**2, 3**), each having an exterior and an interior surface, the interior surface of each mold half being contoured and comprising a central recessed portion (**5**) having an area less than said object area, a shoulder portion (**19**) surrounding said recessed portion and an interface portion (**4**) surrounding said shoulder portin, said interface portion and said shoulder portion defining a precisely dimensioned cavity portion (**17**), said mold halves being adapted to be secured together in contact at said interface portion with said object disposed therebetween, whereby said shoulder portions on each mold half are opposite one another, and said cavity portions define the precisely dimensioned outer surfaces of an edge frame mold surrounding the outer circumference of said object;
(b) first sealing means (**20**) disposed in the recess portion of one of the mold halves and adapted to contact said object for defining, together with the object and said one mold half, a suction chamber for retaining the object in a predetermined position;
(c) second sealing means (**8, 9**) disposed in said shoulder portion of each mold half and being individually and cooperably operable, when said mold halves are secured with said object therebetween, to engage the opposite surfaces of the object proximate and inwardly from an outer edge thereof to complete and seal the edge frame mold, and
(d) means (**18**) for injecting a plastic or elastomeric material into the edge frame mold cavity under pressure.

4,626,186
APPARATUS FOR FORMING DRUM HANDLING RINGS
Don R. Hofstetter, Montville, and Louis F. Fow, Jr., Chagrin Falls, both of Ohio, assignors to Mont-Pac, Inc., Parkman, Ohio
Filed Aug. 6, 1984, Ser. No. 638,285
Int. Cl.[4] B29C *53/00*
U.S. Cl. 425—115 12 Claims



1. An apparatus for use in forming a plurality of curved strips from an extruded strip of heated, deformable thermoplastic material advancing along its longitudinal extent toward said apparatus, said curved strips being subsequently used to form rings of a preferred geometry, said apparatus comprising:
a rotatable turntable;
retaining means located on one side of the turntable for retaining an advancing end portion of said moving strip in a predetermined curved position on said one side of the turntable as it rotates, said retained portion of predetermined curvature being radially spaced from the axis of rotation of the turntable;
means for cooling the retained curved portion of the strip so that it will maintain, for at least a predetermined time period, its curved condition when no longer retained in position on said turntable; and
means for cutting predetermined lengths from said cooled curved portion as it is released from its retained position on said turntable.

4,626,187
APPARATUS FOR PREPARING A SYNTHETIC RESIN PLATE OF DIFFERENT COLORS
Isao Kamada, Otake, Japan, assignor to Mitsubishi Rayon Company Ltd., Tokyo, Japan
Filed Jun. 13, 1984, Ser. No. 620,032
Claims priority, application Japan, Jun. 29, 1983, 58-116048
Int. Cl.[4] B29C *47/04*
U.S. Cl. 425—131.1 3 Claims



1. An apparatus for preparing a synthetic resin plate having different colors, said apparatus comprising:
a body;
a first set of passages extending from an upstream end to a downstream end of said body in a flow direction;

at least one further set of passages extending into said body in said flow direction from said downstream end thereof, wherein said passages of said first and further set of passages are alternately arranged in a direction transverse to said flow direction;

means for supplying a first polymerizable liquid material under pressure to said upstream end;

means for supplying a different further polymerizable liquid material under pressure to each said at least one further set of passages, whereby said first and further liquid materials are extruded from said body as a product having alternating layers of said first and further liquid materials;

means for forming said extruded product into a layered plate shape;

means for delivering said extruded product from said body to means for polymerization; and

means for polymerizing said polymerizable liquid to form a plate-shaped product;

wherein said body comprises:

(a) at least two plates forming an array in said flow direction, said at least two plates including an upstream plate and a further plate for each said further set of passages, each said at least one further set of passages extending into said body from said downstream end only so far as one said further plate corresponding to said at least one further set of passages, and

(b) passage means in each said further plate for connecting a corresponding one said means for supplying a different further polymerizable material to a corresponding one of said further sets of passages, wherein each said passage means comprise a first circumferential passage means communicating with a corresponding one of said means for supplying and a plurality of spiral passage means communicating said first passage means with a corresponding one of said further passages.

4,626,188

DOUGH-ROLLING MACHINE

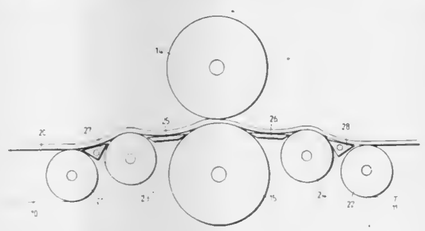
Eugen Morgenthaler, and Jacques Rolli, both of Kirchberg, Switzerland, assignors to Seewer AG, Burgdorf, Switzerland

Filed May 22, 1984, Ser. No. 613,057

Claims priority, application Switzerland, May 27, 1983, 2918/83

Int. Cl.⁴ B29C *47/92*

U.S. Cl. 425—145 **13 Claims**



1. A dough-rolling machine comprising a pair of spaced dough rollers, reversible first and second transport means positioned on opposite sides of said dough rollers for transporting dough to and from said dough rollers in both forward and reverse directions, and first and second measuring rollers mounted on opposite sides of said dough rollers for engagement with the underside of said dough before it passes between said dough rollers in forward and reverse directions, respectively, for determining the actual rate of speed of said dough before it passes between said dough rollers in forward and reverse directions, respectively.

4,626,189

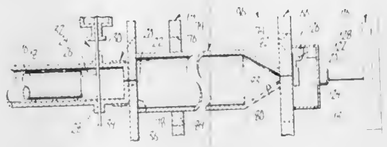
METHOD AND MACHINE FOR FORMING ARTICLES FROM A PLASTIC MATERIAL

Floyd V. Hammer, R.R. 1, Union, Iowa 50258, and Brian Harper, Havant, United Kingdom, assignors to Floyd V. Hammer, Union, Iowa

Filed Nov. 18, 1985, Ser. No. 798,886

Int. Cl.⁴ B29B *11/06*

U.S. Cl. 425—146 **4 Claims**



1. A molding machine for forming articles from a plastic material comprising:

a support frame,

a screw extruder on said frame and having an inlet and an outlet;

means for introducing into said screw extruder a quantity of plastic material to be extruded, said screw extruder being operable to heat and mix said plastic material and to force said plastic material outwardly through said outlet in a fluid condition;

a plurality of molds, each of said molds having a first open end and a second end, a closure plate being secured in covering relation over said second end so as to substantially close said second end, said closure plate having a fill sensing aperture therein;

a mold holding frame adapted to retentively hold said plurality of molds,

mold mounting means movably mounting said mold holding frame to said support frame for movement of each of said molds one at a time to a fill station wherein said first end of said model is in a position to receive said fluid plastic material exiting from said outlet of said screw extruder;

power means for causing movement of said mold mounting means;

fill sensing means mounted on said support frame for covering said fill sensing apertures of said closure plates of said molds when said molds are in said fill position, said fill sensing means being adapted to sense when said fluid plastic material commences issuing from said fill sensing aperture;

switch means connected to said fill sensing means, and said extruder for causing deactuation of said extruder in response to said fill sensing means sensing said fluid plastic material issuing from said fill sensing aperture.

4,626,190

RETENTION MECHANISM FOR A SPLIT MOLD CARRIER AND CAM FOR ACTUATING THE SAME

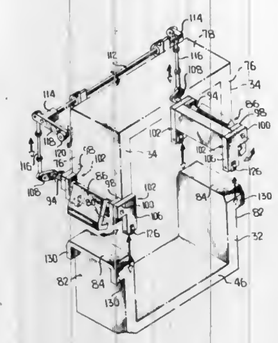
Ernest W. Hellmer, Chicago, Ill., assignor to Continental Plastic Containers, Stamford, Conn.

Filed Jun. 27, 1985, Ser. No. 749,213

Int. Cl.⁴ B29C *49/56*

U.S. Cl. 425—539 **16 Claims**

1. A mold mounting unit for a split mold of a molding apparatus, said mold mounting unit comprising first and second mold half carriers disposed in opposed aligned relation, means carried by each of said mold half carriers for mounting a mold half, said mold half carriers having a pair of opposed locking flanges along two sides thereof, retainer means for selectively restricting separation of locking flanges of each pair, said retainer means being in the form of a C-shaped cross sectional



member having spaced retaining flanges for receiving therebetween locking flanges of an associated pair of locking flanges.

4,626,191

METHOD OF CONTROLLING A COMBUSTION FLAME AND A MICROPHONIC PROBE ALLOWING THE APPLICATION OF THE METHOD

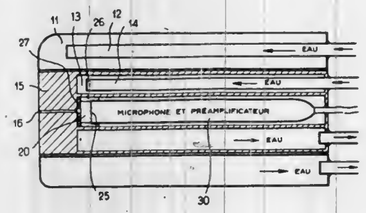
Claude Bertrand, Orleans, France, assignor to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation of Ser. No. 587,880, Mar. 15, 1984, Pat. No. 4,538,979, which is a continuation of Ser. No. 304,639, Sep. 22, 1981, abandoned. This application Jun. 19, 1985, Ser. No. 746,574

Claims priority, application France, Sep. 25, 1980, 80 20591

Int. Cl.⁴ F23N *1/00*

U.S. Cl. 431—12 **11 Claims**



1. A method of optimally controlling the combustion of a mixture of pressurized components which provides a turbulent flame substantially exclusively by the acoustic noise level of the flame, comprising the steps of detecting the noise level across a frequency band of from zero to below approximately 3000 Hertz, converting said noise level to an acoustic pressure signal, generating a control signal representing the flow rate of one of said components, taking the ratio of said acoustic pressure signal to said control signal, using said ratio as a pilot signal, and adjusting the flow rate of one of said components to a level that adjusts the pilot signal to its maximum amplitude.

4,626,192

PRIMARY GAS FURNACE CONTROL

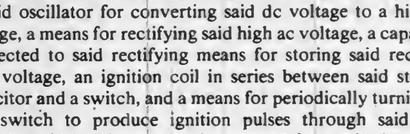
Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 2, 1984, Ser. No. 627,038

Int. Cl.⁴ F23Q *9/08*

U.S. Cl. 431—46 **5 Claims**

1. In a primary control for gas furnaces, and comprising a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit having a thermostatic switch therein, an electrically operable pilot gas valve therein, an electrically operable main gas valve therein, relay means therein for controlling the energization of said main gas valve when a coil of said relay means is energized by a main valve control circuit portion of said low voltage circuit, and flame sensing means therein and disposed so as to be in the path of gas emanating from said pilot gas valve and being subjected to the heat of the gas flame thereof when said gas has been ignited, said flame sensing means having means for controlling



said main gas valve by effecting the energization of said coil of said relay means when said flame sensing means is sensing the presence of said gas flame, the improvement wherein said main valve control circuit portion has discharge capacitor means controlling the energization of said coil and has sustaining capacitor means connected in parallel with said coil and effective to maintain energization of said coil during recharging of said discharge capacitor means.

4,626,193

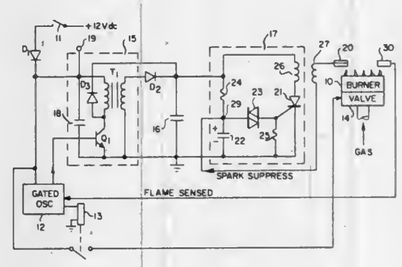
DIRECT SPARK IGNITION SYSTEM

Ronald A. Gann, La Crescenta, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,644

Int. Cl.⁴ F23N *5/00*

U.S. Cl. 431—71 **2 Claims**



2. In a direct spark ignition system having a gas burner, an electrically operable valve connected to said burner to admit fuel thereto, a gated oscillator having a timing circuit for timing a trial ignition, a spark generator responsive to said oscillator for igniting fuel emanating from said burner, and a flame sensor for sustaining oscillations of said oscillator while a flame exists at said burner, said spark generator having an inverter connected to a low voltage dc source and responsive to said oscillator for converting said dc voltage to a high ac voltage, a means for rectifying said high ac voltage, a capacitor connected to said rectifying means for storing said rectified high voltage, an ignition coil in series between said storage capacitor and a switch, and a means for periodically turning on said switch to produce ignition pulses through said coil, whereby said ignition system is powered from said dc source but controlled by said oscillator, an improvement wherein said inverter is comprised of a step-up transformer having its primary winding connected in series with said dc source and a common emitter transistor having its collector connected to said primary winding, said transistor having its base connected to be controlled by said oscillator to chop the dc into ac in the primary winding, and a diode connected between said storage capacitor and said collector of said transistor, said diode being poled to couple into said capacitor back EMF energy when said transistor is turned off.

4,626,194

FLOW REGULATING DEVICE

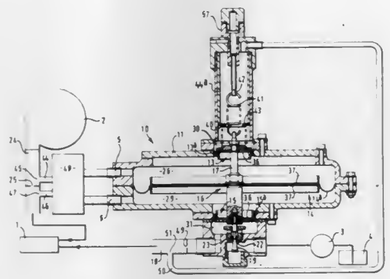
Paul Mills, Penn, England, assignor to Stordy Combustion Engineering Limited, Wolverhampton, England

Filed Oct. 19, 1983, Ser. No. 543,637

Claims priority, application United Kingdom, Oct. 19, 1982, 8229806

Int. Cl.⁴ F23N *1/00*

U.S. Cl. 431—90 **8 Claims**



1. An apparatus for controlling the flow of fuels of varying viscosity at various pressures in order to maintain a predetermined fuel to air ratio to a burner comprising:

(a) a first conduit means for directing air to the burner having a flow restrictive means therein to separate the first conduit means into high and low pressure sections;

(b) a second conduit means for directing fuel to the burner having flow restrictive means therein to separate the second conduit means into high and low pressure sections;

(c) fuel flow regulating means comprising

(i) a hollow body,

(ii) a valve member disposed within the body and reciprocally moveable therein, having a valve stem with a valve head on the end thereof, and

(iii) three annular, coaxial diaphragm assemblies disposed within the hollow body including a pair of outer diaphragm assemblies and an intermediate diaphragm assembly disposed therebetween, the diaphragm assemblies sealingly mounted about the outer periphery thereof to the hollow body and by the inner peripheries thereof to the valve member, the intermediate and each of the outer diaphragm assemblies in conjunction with the hollow body forming first and second isolated intermediate chambers, respectively above and below the intermediate diaphragm assembly and each of the outer diaphragm assemblies forming in conjunction with the hollow body first and second isolated outer chambers;

(d) a third conduit means in fluid communication with a fuel source and the first outer chamber and having a valve orifice and a valve seat therein adapted to receive the valve head of the valve member to control the flow of fuel from the source thereof to the first outer chamber;

(e) a fourth conduit means in fluid pressure transmitting relationship between the first isolated intermediate chamber and the high pressure section of the first conduit means without fluid flow therethrough;

(f) a fifth conduit means in fluid pressure transmitting relationship with the second isolated intermediate chamber and the low pressure section of the first conduit means without fluid flow therethrough; and

(g) a sixth conduit means in fluid communication between the second outer chamber and the low pressure section of the second conduit means.

4,626,195

LOW LOAD BURNING BURNER

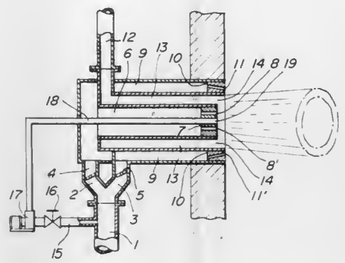
Kuniaki Sato; Shinichiro Muto, both of Chiba, and Noriaki Wako, Yokohama, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Nippon Furnace Kogyo Kaisha, Ltd., Tokyo, both of, Japan

Filed May 8, 1985, Ser. No. 732,244

Claims priority, application Japan, May 9, 1984, 59-91074

Int. Cl.⁴ F23M *9/00*

U.S. Cl. 431—188 **1 Claim**



1. In a low load burning burner comprising inner and outer air flow passages, inner and outer air supply pipes, several number of inner air flow nozzles, and several number of outer air flow nozzles, being connected to said inner and outer air flow passages through the inner and outer air supply pipes, respectively, a fuel gas supply passage, a fuel gas supply pipe, and a fuel gas nozzle being connected to said fuel gas supply passage through the fuel gas supply pipe, said inner air flow nozzles being arranged in the peripheral portion of an inner air flow baffle arranged at the end of the center axis portion of the burner and having a relatively large area center portion, said outer air flow nozzles being arranged in an annular outer air flow baffle arranged at the end of the peripheral portion of the burner, and said fuel gas nozzle being constituted by an annular region, which is formed between the inner air flow baffle and the outer air flow baffle, such that the fuel gas can be jetted straightforwardly into the furnace through the nozzle, the improvement comprising a motive air supply means, which comprises a branched passage, a flow rate control valve and a pressurizing fan, and is operated at the low load burning of the burner so as to supply a proper amount of a motive air under a proper pressure and to jet the motive air straightforwardly through a motive air nozzle arranged in the inner air flow baffle, in the outer air flow baffle or in the fuel gas nozzle region.

4,626,196

SPARK IGNITED GAS BURNER

Charles E. Stohrer, Jr., Hickory Hills, Ill., assignor to Harper-Wyman Company, Hinsdale, Ill.

Filed Sep. 23, 1985, Ser. No. 779,646

Int. Cl.⁴ F23Q *3/00*

U.S. Cl. 431—264 **9 Claims**

1. A spark ignited gas burner assembly comprising in combination:

an electrically conductive sheet metal burner body including a sidewall;

an internal fuel chamber contained within said body;

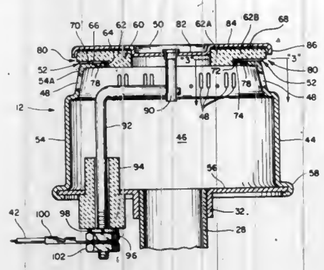
means for supplying fuel to said chamber;

an array of main burner ports in said sidewall;

an electrically conductive burner top member overlying said burner body and said chamber;

spacer means sandwiched between said burner body and said top member for spacing apart said burner body and top member and for electrically isolating said top member from said burner body;

an ignition gas pathway defined between said burner body and top member extending independent of said main burner ports from said internal chamber to an ignition region above said main burner ports; and



a spark ignition circuit including a spark gap in series circuit relationship between said burner body and said top member for providing ignition sparks in the ignition region.

4,626,197

SPACE HEATER

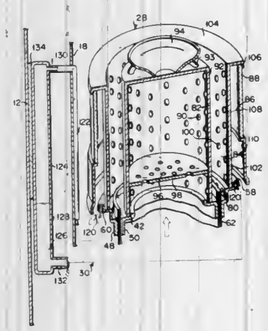
Katsuyoshi Kumazawa, Yamato; Toshio Ohtsuki, Yokohama, and Minoru Komori, Ebina, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1985, Ser. No. 716,457

Claims priority, application Japan, Mar. 31, 1984, 59-63688

Int. Cl.⁴ F23D *3/02*

U.S. Cl. 431—302 **29 Claims**



1. A space heater comprising:

a fuel tank for storing liquid fuel;

a combustion chamber formed above said fuel tank;

means defining a narrow path; for communicating said combustion chamber with said fuel tank;

a wick, a lower end portion of which is dipped in the liquid fuel in said fuel tank and an upper end portion of which is inserted in said narrow path to soak up the liquid fuel by capillary action, said wick being adapted to evaporate the soaked up liquid fuel;

a wick posiiton control mechanism for moving said upper end portion upward in said combustion chamber in a combustion state and moving said upper end portion downward in said narrow path in an extinguished state; and

wick temperature control means including a heat-absorbing pipe for absorbing heat from said wick, a heat radiator connected in tandem with said heat-absorbing pipe and working fluid sealed in a space defined by said heat-absorbing pipe and said heat radiator, wherein said heat-absorbing pipe is located in contact with the surface of the wick inside said upper end portion of said narrow path.

4,626,198

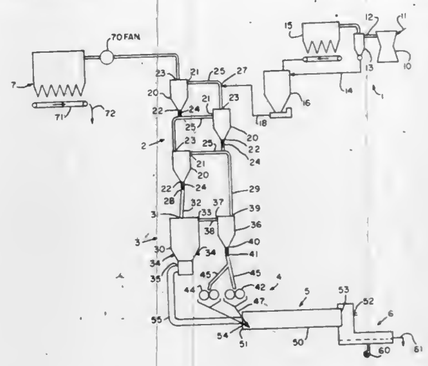
METHOD AND APPARATUS FOR PRODUCING DEAD BURNT MATERIALS

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Sep. 20, 1985, Ser. No. 778,466

Int. Cl.⁴ F27B *14/00, 7/02;* C04B *35/00, 35/02*

U.S. Cl. 432—13 **14 Claims**



14. An improved process for producing sintered material comprising the steps of calcining raw materials to be sintered in a calcining furnace; immediately forming the hot calcined materials into nodules; immediately supplying the thus formed nodules to a sintering furnace; and sintering the nodules.

4,626,199

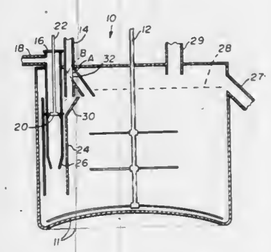
SUBMERGED COMBUSTION CALCINATION

Larbi Bounini, Libertyville, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 25, 1985, Ser. No. 727,078

Int. Cl.⁴ F27B *15/00;* C04B *11/00, 11/02*

U.S. Cl. 432—58 **8 Claims**



1. A calcination apparatus comprising:

a kettle having a top wall, a sidewall, a bottom wall, a duct extending through the top wall for the introduction of uncalcined material into the kettle, an exhaust vent, and a port for the discharge of calcined material;

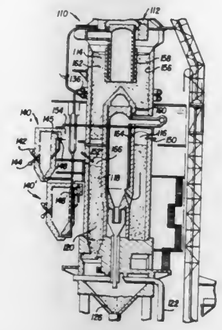
a burner;

a first tube extending through the top wall into the kettle, said tube communicating with the burner and having an outlet for injecting hot combustion gases from the burner into the material to be calcined;

a second tube surrounding the first tube and extending beyond the outlet of the first tube, the second tube having an inlet for the material to be calcined and an outlet which is co-axial with the first tube;

said first and second tubes defining a passageway between them which empties into the second tube.

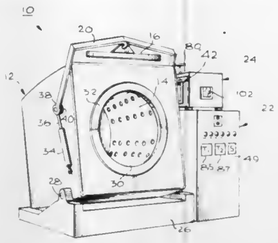
4,626,200
SHAFT KILNS HAVING FLUID-BED AIR HEATER
Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.
Filed Jul. 15, 1985, Ser. No. 755,124
Int. Cl.[4] F27D *1/08*
U.S. Cl. 432—101 **5 Claims**



1. In an annular shaft kiln for the burning of limestone or the like, comprising:
- a generally vertical hollow structure having an inlet at an upper end thereof and a discharge site at the lower end thereof;
- an enclosed shaft connecting said inlet and said discharge site;
- an inner cylinder disposed within said generally vertical shaft so as to define a generally annular zone between said inlet and said discharge site, and further comprising at least one chamber in said annular zone for the introduction of hot gases to said zone;
- a heat recuperator for recovering excess heat from said shaft kiln;
- the improvement comprising a fluidized bed air heater for supplying said hot gases to be injected into each of said chambers;
- said fluized bed comprising an inert bed of fluidized material;
- means for supplying solid fuel to said fluidized bed for combustion therein to produce hot gases;
- an outlet for hot gases;
- conduits connecting said outlet for hot gases to said at least one chamber; and
- means to introduce excess heat received by said heat recuperator to said fluid bed air heater.

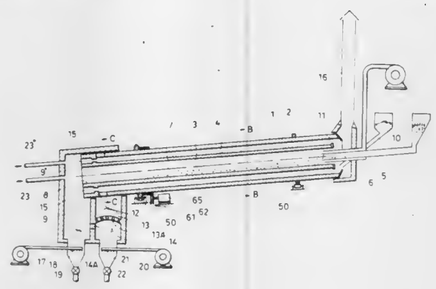
4,626,201
COMBUSTION CHAMBER FOR A COMMERCIAL LAUNDRY DRYER
Charles R. Grantham, 1720 Pacific Ave., Venice, Calif. 90291
Filed Jun. 11, 1985, Ser. No. 743,371
Int. Cl.[4] F27B *7/36, 7/06;* F24H *1/00*
U.S. Cl. 432—105 **48 Claims**

18. A combustion for a laundry article-drying device or the like, comprising:
- a front wall;
- a back wall having a flame source mounted thereon;
- a burner cylinder mounted at one end to said back wall around said flame source, said burner cylinder having an open end facing said front wall; and
- a heating cylinder coaxial with and slightly overlapping said burner cylinder, said heating cylinder having a larger diameter than said burner cylinder to provide a clearance



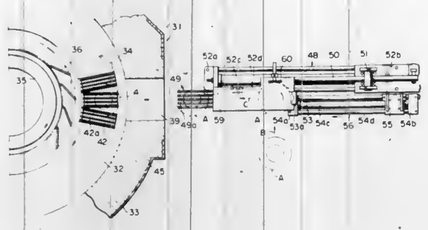
for fresh air entering between said heating and burner cylinders into said heating cylinder.

4,626,202
ROTARY KILN
Tatsu Chisaki, Tokyo; Toshio Ikenaga, Yokohama, and Akira Iwabuchi, Tokoro, all of Japan, assignors to Chisaki Co., Ltd., Tokyo; Kunneppu Sekkai Kogyo Incorporated, Hokkaido and Daizo Kunii, Tokyo, Japan
Filed Dec. 20, 1985, Ser. No. 811,533
Claims priority, application Japan, Dec. 24, 1984, 59-270927
Int. Cl.[4] F27B *7/08, 7/10*.
U.S. Cl. 432—107 **7 Claims**



1. A rotary kiln comprising:
- a cylindrical kiln body supported for rotation about a central axis inclined with respect to a horizontal plane;
- a generally cylindrical combustion chamber formed inside said kiln body and extending along the central axis, said combustion chamber having an inlet at an elevated end thereof for receiving a supply of fuel and an outlet at a lower end thereof for discharging residue produced by combustion of the fuel inside said combustion chamber, the residue dropping from said outlet; and
- a plurality of generally cylindrical calcination chambers formed inside said kiln body so as to lie parallel with and surround said combustion chamber, each one of said calcination chambers having an inlet at an elevated end thereof for receiving a supply of raw material to be calcined inside said calcination chamber, an opening at a lowermost end thereof, and an outlet adjacent the lowermost end thereof for discharging the raw material calcined inside said calcination chamber, said raw material dropping from said outlet;
- the outlet of said combustion chamber communicating with the opening at the lowermost end of each of said calcination chambers.

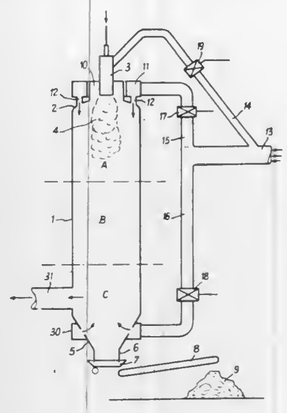
4,626,203
FURNACE
Hidesato Sakamoto, Nagareyama, Japan, assignor to Furnace Juko Kabushiki Kaisha, Saitama, Japan
Filed Oct. 2, 1985, Ser. No. 782,857
Claims priority, application Japan, Oct. 11, 1984, 59-212993
Int. Cl.[4] F27B *9/16, 9/00;* B65G *25/00;* F27D *3/00*
U.S. Cl. 432—138 **4 Claims**



1. In a furnace comprising a furnace chamber surrounded by fireproof walls formed with a work inlet and a work outlet and having heating means such as a burner provided toward the inside of the furnace chamber, a work mounting turntable rotatably provided within said furnace chamber, and a circulating fan provided coaxially with said turntable, said turntable having a plurality of work mount portions formed at the outer circumferential positions thereof separately at regular angular intervals and a plurality of diffusing blades formed at inner circumferential positions inside said work mount portions coaxially with said turntable so as to face said circulating fan, whereby a gas within said furnace chamber heated by said heating means is uniformly circulated toward said work mount portions from said circulating fan through said diffusing blades; the improvement comprising:
- work carry-in means for carrying a work into said furnace chamber through said work inlet while mounting said work on said work carry-in work means so as to to transfer said work onto a selected one of said work mount portions; and
- work carry-out means for carrying out a work mounted on a specific one of said work mount portions through said work outlet while mounting said work on said work carry-out means,
- each of said work mount portions being provided with a plurality of strip members with their respective one ends supported at the outer circumferential positions of said turntable, said strip members being separated at regular intervals, each of said work carry-in means and said work carry-out means being arranged to have its forward end constituted by a plurality of strip members separated at regular intervals so that said strip members of any one of said work mount portions can enter the respective intervals of any one of said work carry-in and work carry-out means.

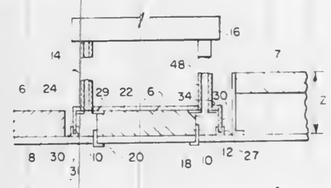
4,626,204
HIGH-TEMPERATURE HOT-AIR GENERATOR
Raymond M. Saint Julian, Couvrut; Philippe M. Gehant, Le Chesnay; Ivan G. Bertrand, Paris, and Michel H. Folliet, Gargenville, all of France, assignors to Societe des Ciments Francais, France
Filed Jul. 10, 1985, Ser. No. 753,392
Claims priority, application France, Jul. 10, 1984, 84 10953
Int. Cl.[4] F24H *1/00*
U.S. Cl. 432—222 **10 Claims**

1. A hot-air generator comprising a cylindrical enclosure with vertical axis, whose walls are covered on the inside with refractory bricks, tranversed by a flux of air to be heated, at the top of which a burner is placed, which can operate with a liquid, gaseous or powdered solid fuel, characterized by the fact that the flux of air to be heated arrives at the said enclosure (**1**) through three distinct ducts (**14**, **15**, **16**); the first (**14**) feeding the burner with combustion air; the second (**15**) supplying a first current of dilution insufflated at the top of the enclosure (**1**), surrounding the flame (**4**) and circulating from top to bottom; the third (**16**) supplying a second dilution current insufflated at the base of the enclosure and circulating from bottom to top; so that the said enclosure (1) comprises three temperature zones: a first zone A surrounding the flame whose



temperature is comprised between 1,300° and 2,000°; a second, intermediate zone B, in which the temperature is comprised between 800° and 900°; a third zone Z in which the temperature is comprised between 300° and 800°; said burner (**3**) both being situated inside a cylindrical chamber (**10**) coaxial to the enclosure (**1**), and including means for displacing it along its longitudinal axis so as to determine as desired the length by which it projects into the chamber (**10**).

4,626,205
NOZZLE STRUCTURE FOR AIR FLOW SOLDERING/DESOLDERING
Vincent P. Barkley, Arlington, Va., and William J. Siegel, Silver Spring, Md., assignors to Pace, Incorporated, Laurel, Md.
Filed Aug. 8, 1985, Ser. No. 763,705
Int. Cl.[4] F24J *3/00;* B23K *1/00*
U.S. Cl. 432—225 **19 Claims**



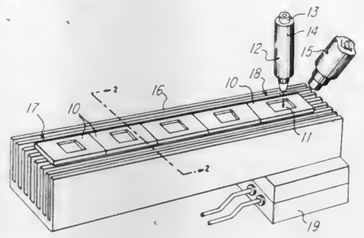
1. A nozzle structure suitable for bringing heated fluid into contact with a plurality of terminals of a modular electronic component to facilitate attachment of said component to a substrate or removal therefrom, said nozzle structure comprising:
- conduit forming means adapted to contact a component and the substrate to form a heated fluid conduit extending around said component; and
- heated fluid delivery means coupled to said conduit forming means for delivering heated fluid to said conduit to effect melting of solder or the like at terminals of said component.

4,626,206

APPARATUS FOR INTEGRATED CIRCUIT ASSEMBLY OPERATIONS

Ricky A. McIntosh, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 14, 1984, Ser. No. 681,463
Int. Cl.[4] F24J *3/00*; F28F *7/00*; H05B *1/00*; F27D *11/00*
U.S. Cl. 432—230 **5 Claims**



1. Apparatus for performing a manufacturing operation on a plurality of workpieces in sequence, comprising:

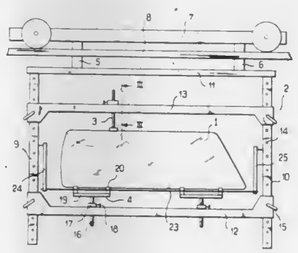
an elongated heat-conducting fixture having a heater engaging the fixture at a work position, the work position being laterally spaced from one end of the fixture by a transit distance selected for preheating said workpieces, a loading position at said one end for initially loading said workpieces into said fixture, a plurality of slots extending into said fixture a substantial part of the thickness thereof and extending along said fixture from said loading position to said work position to radiate heat and define a temperature gradient along the length of the fixture to thereby preheat the workpieces, the slots being spaced from one another along the width of the fixture to receive pins depending from the workpiece for a pluarlity of standard spacings of such pins.

4,626,207

APPARATUS FOR HOLDING A GLASS SHEET IN A SUBSTANTIALLY VERTICAL POSITION DURING HEAT TREATMENT OF THE GLASS SHEET

Claude Aubry; Jacques Chaumette; Bernard Letemps, all of Thourotte; Jean-Marc Petitcollin, Le Plessis-Brion, all of France; Werner Gatzweiler, Heineberg; Heinz-Bernd Rissmann, Aachen, both of Fed. Rep. of Germany; Luc Vanaschen, Eupen, Belgium, and Jürgen Zeitzen, Herzogenrath, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 610,787, May 16, 1984, abandoned.
This application Sep. 16, 1985, Ser. No. 775,717
Claims priority, application France, May 16, 1983, 83 08044
Int. Cl.[4] F27D *5/00*; C03B *23/02, 27/00*
U.S. Cl. 432—253 **6 Claims**



1. In an apparatus for holding a glass sheet in a substantially vertical position having two upright members, a lower crosspiece member and an upper crosspiece member, said crosspiece members joining said upright members, and lower support means on said lower crosspiece member adapted to receive a lower edge of said glass sheet, the improvement comprising upper support means located on said upper crosspiece member which comprises:

piston means capable of reciprocating movement in a substantially vertical direction for contacting an upper edge of said glass sheet;

guide means extending in a substantially vertical direction through an aperture defined by said upper crosspiece member for allowing rotational or substantially vertical movement of said piston means; and

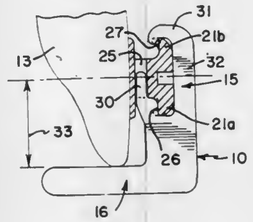
means for contacting the sides of said glass sheet operatively associated with said piston means and said guide means, and constructed in a manner such that said contacting means normally remains in an open position, removed from said glass sheet, said open position of said contacting mens corresponding to a raised position of said piston means, and said contacting means assuming a closed position in contact with the sides of said sheet when said piston means moves to a lower position due to a corresponding movement of the upper edge of said glass sheet from bending or sliding of said glass sheet.

4,626,208

POSITIONING JIG FOR EDGEWISE BRACKET

Arthur B. Hall, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Filed Aug. 16, 1985, Ser. No. 766,873
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—3 **8 Claims**



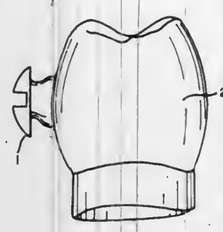
1. A disposable positioning jig in combination with a single tie-wing edgewise bracket having a lingually disposed vertical slot or opening to position the bracket on a tooth for bonding, wherein the bracket includes a base having a lingual bonding surface and a centrally disposed lingual vertical slot or opening, and a tie wing extending buccolabially from the base, said tie wing including gingival and incisal tie wing ears and having a horizontal labiobuccally opening archwire slot, said jig including a vertical bracket engaging portion having a first finger frictionally fitting within the vertical slot or opening from the occlusal end, a second finger interconnected with the first finger and frictionally engaging over and around the gingival edge of the bracket tie wing, and a gauge arm extending substantially at right angles to said bracket engaging portion for contacting the occlusal of the tooth on which the bracket is mounted to space the archwire slot a predetermined distance from the occlusal, the thickness of said jig being substantially less than the mesiodistal dimension of said tie wing.

4,626,209

ORTHODONTIC BRACKET WITH METALLIC COATED BONDING BASE

Min H. Tsai, Van Nuys, and John E. Sargeant, Los Alamitos, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Continuation of Ser. No. 483,459, Apr. 11, 1983, abandoned.
This application Apr. 17, 1984, Ser. No. 600,603
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—9 **1 Claim**



1. An orthodontic device comprising a stainless steel bracket having an integral bonding base with a thin coating having asperities, said coating being formed onto said bonding base by thermally sprayed molten corrosion resistant titanium carbide powder.

4,626,210

DENTAL HANDPIECE

Peter Malata, Bürmoos, and Otto Rosenstatter, Seeham, both of Austria, assignors to Dentalwerk Bürmoos Gesellschaft m.b.H., Bürmoos, Austria

PCT No. PCT/AT84/00027, § 371 Date Mar. 14, 1985, § 102(e) Date Mar. 14, 1985, PCT Pub. No. WO85/00281, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 12, 1984, Ser. No. 717,180
Claims priority, application Austria, Jul. 14, 1983, 2583/83
Int. Cl.[4] A61C *1/08, 3/00*
U.S. Cl. 433—29 **6 Claims**



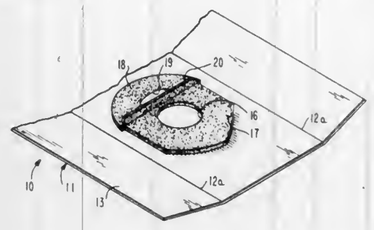
1. Dental handpiece comprising a grip sleeve having at least one cordlike light guide in the area of the handpiece head part which passes out of the latter in the direction of the tooth treatment tool and accordingly extends in its entirety within said grip sleeve and is connected at the rear end to a light source and comprising a detachable connecting piece provided for the connection at the end member of a supply tube for the supply media of said handpiece, said connecting piece being arranged so as to be freely rotatable relative to said grip sleeve, wherein said connecting piece is provided with media through-pass ducts which open into it and pass through it and which are connectable with media lines of said grip sleeve leading to the use positions of said handpiece, characterized in that said light source **(14)** is arranged in a recess **(11)** located preferably eccentrically in said grip sleeve **(2)** and is electrically connected with at least one current conductor **(15)** which is connectable by means of a contact arrangement **(16, 17, 34, 35)** which permits a reciprocal rotation of said grip sleeve and said connecting piece **(10)**, with a current conductor **(42)** which penetrates said connecting piece and has a contact **(36)** at the end of said connecting piece remote of said tool for connecting to an opposite contact in said supply tube end member **(29)**, wherein said contact arrangement consists of two slip rings **(34, 35)** and two slide contacts **(16, 17)**.

4,626,211

DENTAL SHIELD

Cindy Coston, 11614 Veradero, San Antonio, Tex. 78216

Filed Sep. 20, 1985, Ser. No. 778,400
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—137 **1 Claim**



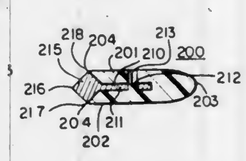
1. A dental shield, comprising, in combination, a panel, a mouth gaurd secured to said panel, a nose guard secured to said panel and a filtering rib secured to said panel; an opening being formed through said panel and aligned with a similar opening through said mouth guard, said mouth guard being fabricated of cotton, and both the opening through said panel and the opening through said mouth guard enabling the entry of a tooth cleaning and polishing instrument therethrough; one face of said mouth guard being fixedly adhered to a rear face of said panel and the opening through said mouth guard encompasing a patient's mouth; said nose guard being fabricated of cotton and having a recess in its bottom for fitting therein a nose of said patient, and one face of said nose guard being fixedly adhered to said rear face of said panel; and said filtering rib being fabricated of cotton and being horizontally disposed and fixedly adhered to a bottom of said nose guard and projecting under the nostrils of said patient and filtering the air being threatened by said patient.

4,626,212

DENTAL INSTRUMENT

Harris Mann, 3518 Dows Rd., Philadelphia, Pa. 19154, and Jeffrey M. Cohen, 1311 Huntingdon Pike, Huntingdon Valley, Pa. 19006

Filed Jan. 31, 1985, Ser. No. 696,765
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—144 **2 Claims**



1. A hand held dental instrument of molded synthetic plastic for the removal of material from or about the teeth of a person which comprises

a shaft,

at least one angularly related shank extending from said shaft,

said shank including a tip having spaced parallel walls,

blade means having a central portion carried in said tip,

said central portion having at least two openings,

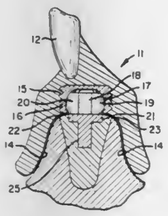
studs from said tip extending through said openings for blade retention in said tip,

said central portion having a front portion of square cross section extending along its length, and

said square front portion providing one exposed sharpened

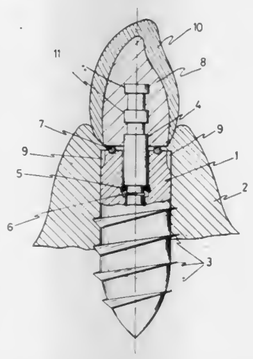
cutting edge, and providing two abutment surfaces opposite said edge.

4,626,213
DENTAL APPLIANCE
James R. Shiner, 3415 Lark St., San Diego, Calif. 92103, and Wilbur E. Rule, San Diego, Calif., assignors to James R. Shiner, San Diego, Calif.
Filed Jul. 5, 1985, Ser. No. 752,308
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—173 **8 Claims**



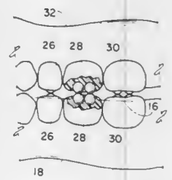
1. A denture retaining unit comprising a first sub-unit in the form of a ball and socket structure wherein said structure comprises a socket ring which is adapted to receive and house said ball and to be incorporated into a denture, and said ball is in the form of a truncated sphere comprised of a permanent magnet positioned between two segments of said sphere, the poles of said magnet extending at least substantially to opposite surface portions of said sphere, the said segments being of a magnetizable metal, and the flat face-portion of said truncated sphere being adapted for magnetic engagement with a flat face of a magnetizable keeper: and a second sub-unit in the form of a flat-faced magnetizable keeper adapted to be secured to a support member extending from the jaw inside the mouth.

4,626,214
FIXED DENTAL IMPLANT
Alberto A. Artal, Avda. San José, 115-1°F., Zaragoza, Spain
Filed May 11, 1984, Ser. No. 609,471
Claims priority, application Spain, May 17, 1983, 272,292; May 3, 1984, 279,140
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—174 **11 Claims**



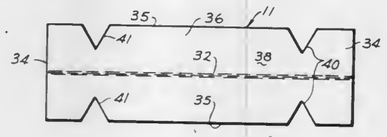
1. Improved fixed dental implant of the type fixed to the maxilla, comprising a first elongated body having external thread means for securing said first body to the maxilla with one end of said first body extending into the maxilla, said first body having an axial internal bore extending out of the other end thereof, a second elongated body bearing a dental prosthesis at one end and having a shaft portion at the other end dimensioned to be removably received within said bore with a pressure fit, but to be moveable under normal chewing action, a free face on said first body through which said bore extends, an opposing face on said second body positioned to be opposed to said free face when said shaft portion is received in said bore, and sealing means interposed between said free face and said opposing face, said sealing means being made of a sufficiently resilient material so as to serve as a force absorber between said first and second bodies, while also serving as a seal.

4,626,215
MASTICATION-ENHANCING PROTRUSION
Clifford R. Clarke, 1600 Atkins, Apt. 12, Eugene, Oreg. 97401
Filed Aug. 12, 1985, Ser. No. 764,388
Int. Cl.[4] A61C *13/08*
U.S. Cl. 433—198 **2 Claims**



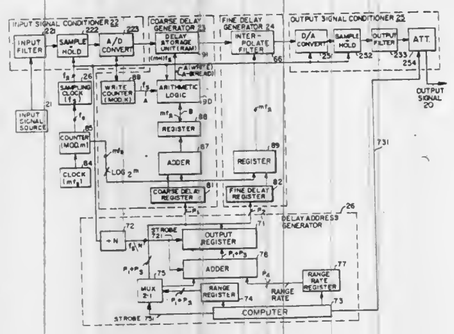
1. In combination with upper and lower dentures where the upper denture has an upper multi-cusp posterior tooth body simulating an actual tooth and made of hardened denture-forming material and the lower denture has a lower multi-cusp posterior tooth body simulating a natural tooth mating with the tooth body of the upper denture and made of denture material, the improvement comprising:
an upper occlusal surface element anchored in the posterior tooth body of the upper denture;
a lower occlusal surface element anchored in the posterior tooth body of the lower denture;
the upper and the lower occlusal surface elements each having a composition of greater wear resistance than the denture material and each having hemispherical protrusions limited to paired protrusions that protrude from the tooth body in which the element is anchored, the protrusions of a pair of protrusions being aligned in a direction extending from the buccal to the opposite side of a tooth body; and
the protrusions of said upper and lower occlusal surface elements being arranged to simulate naturally occurring cusps in the respective tooth bodies and providing point-contact mastication surfaces.

4,626,216
INTRAORAL DENTAL RADIOGRAPHIC FILM PACKET PAD
Vonda Strong-Grainger, N. 6014 Ruby - #32, Spokane, Wash. 99207-1151
Filed Apr. 22, 1985, Ser. No. 725,765
Int. Cl.[4] A61B *19/04*
U.S. Cl. 433—229 **8 Claims**



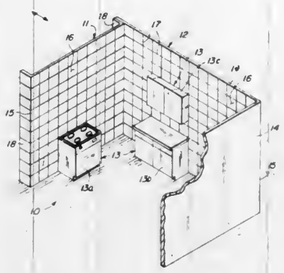
1. A resilient pad for attachment to a dental radiographic film packet having a thickness dimension defined by opposed lingual and labial surfaces, said surfaces being joined together along longitudinal side edges and along transverse end edges, the pad comprising:
an elongated foldable pad body formed of a resilient non-toxic material, biocompatible with oral tissues and including a length dimension between ends, a width dimension between pad side edges, and a thickness dimension between inner and outer pad surfaces;
wherein the length dimension of the pad body is at least equal to the length of the end edge of the film packet and the width dimension is greater than the thickness dimension of the film packet;
an adhesive along the inner surface for attaching the foldable pad body to the film packet along an edge thereof and with the inner surface overlapping adjacent portions of the lingual and labial film packet surfaces.

4,626,217
BROADBAND DOPPLER SIMULATOR
Arthur J. Tardif, Amherst, N.H., and Samuel D. Anthony, Tiverton, R.I., assignors to Raytheon Company, Lexington, Mass.
Filed May 2, 1983, Ser. No. 490,929
Int. Cl.[4] G09B *9/06*
U.S. Cl. 434—8 **4 Claims**



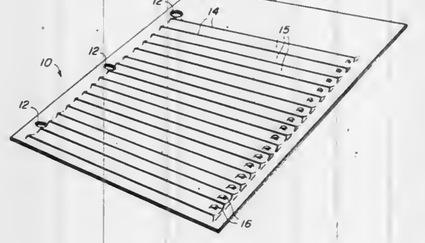
4. A doppler shift simultor circuit comprising:
a source of a signal;
means sampling at a sampling frequency said signal to provide a sequence of sampled signals;
a delay medium;
means for sequentially storing said sampled signals in a sequence of locations in a delay medium;
means sequentially reading out a group "m", "m" being greater than one, of sampled signals in adjacent locations in said delay medium;
means modifying the amplitude of each of said read-out sampled signals in a predetermined manner each modified amplitude being provided at a rate "m" times the sampling frequency;
means summing at the sampling frequency the modified amplitude of the read-out "m" locations in memory to provide a sequence of sum signals at the sampling frequency;
said modifying means producing a different amplitude at a data sampling frequency rate of each one of said "m" sampled signals to thereby cause the sum signal to be different on each summation;
means filtering said sequence of sum signals to cause the filtered succession of sum signals to have a doppler shift and delay with respect to said source signal.

4,626,218
MODULAR FURNITURE DESIGN AID
Charles W. Wright, 3725 Blackstone Ave., Riverdale, N.Y. 10463
Filed Jul. 1, 1985, Ser. No. 750,742
Int. Cl.[4] G09B *25/04*
U.S. Cl. 434—73 **3 Claims**



1. A modular furniture design aid , comprising, in combination, a kit including a plurality of miniature wall pieces and a plurality of modular furniture pieces for selective assembly together, a permanent magnet in each said furniture piece, and a steel face on each said wall piece for detachable attachment together; and printing means by each of said furniture pieces.

4,626,219
SCRIBE GUIDE
Ned Goldreyer, 56-15 201st St., Bayside, N.Y. 11364
Filed Jun. 17, 1985, Ser. No. 745,842
Int. Cl.[4] G09B *11/04, 21/00*
U.S. Cl. 434—162 **2 Claims**

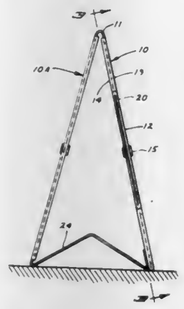


1. A scribe guide, comprising, in combination, a sheet of writing paper and a plurality of parallel, equally spaced apart, raised ridges formed upon an upper side of said paper defining arcuate smooth grooves therebetween which form writing spaces, said ridges extend horizontally on said paper, and an upwardly raised protrusion is formed on the writing paper near a right side end of each said writing space midway between adjacent raised ridges.

4,626,220
PSYCHOLOGICAL TEST DEVICE
Alan S. Kaufman; Nadeen L. Kaufman, both of San Diego, Calif., and Jack A. Naglieri, Powell, Ohio, assignors to American Guidance Service, Inc., Circle Pines, Minn.
Filed Mar. 27, 1984, Ser. No. 593,820
Int. Cl.[4] G09B *1/22*
U.S. Cl. 434—236 **13 Claims**

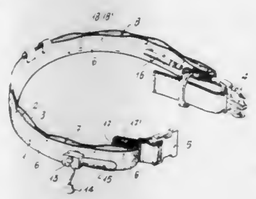
1. A psychological test device for measuring the intellectural ability of children which comprises:
(A) a circular disk interposed between front and back face plates and mounted for rotation relative thereto,

(B) said face plates being generally rectangular, fixed together along at least one edge, and of a size larger than the disk,
(C) a plurality of elements of pictorial information on the front face of the disk uniformly arrayed spaced inwardly from the periphery of the disk,
(D) a corresponding plurality of elements of descriptive identifying information on the back face of the disk uniformly arrayed around the periphery of the disk,
(E) a window in the front face plate overlying the path of



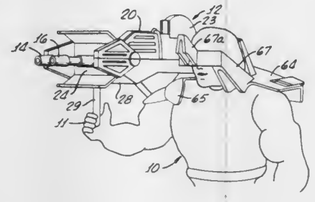
rotary movement of the pictorial information, the area of the window being small relative to the element of pictorial information such that only small increments of pictorial information are exposed through the window at any one time, and
(F) a common cut-out in one edge of said face plates, the depth of said cut-out being sufficient to expose a narrow marginal edge of the front face of the disk without exposing the pictorial information, the width of said cut-out being correlated to the number of elements of pictorial information on the disk.

4,626,221
SELFINFLATING LIFE PRESERVER
Ajello Rocco, Via XX Giugno 87, 06100 Perugia, Italy
Filed Apr. 17, 1985, Ser. No. 724,253
Claims priority, application Italy, May 22, 1984, 32819/84[U]
Int. Cl.[4] B63C *9/16*
U.S. Cl. 441—108 **10 Claims**



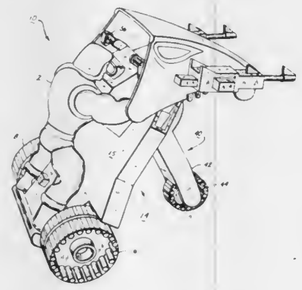
1. A life preserver comprising:
a belt having a front side and a rear side, each side having upper, lower and side edges, the sides being fixed together near the lower edges thereof to define a pocket therebetween which is open at the upper edges, the belt further comprising a buckle at its side edge to permit fastening thereof;
a bladder member located in the pocket and comprising a pair of humped portions;
inflating means for inflating the bladder member, the bladder member being substantially contained in the pocket when in a deflated condition and extending from the pocket when inflated so as to support a wearer thereof; and
fastening means for maintaining the belt in a shortened position when the bladder is deflated, the inflation of the bladder causing the fastening means to unfasten to extend the length of the belt.

4,626,222
TOY WEAPON PACK FOR FIGURE TOY
Roger H. Sweet, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 27, 1985, Ser. No. 781,297
Int. Cl.[4] A63H *3/00*
U.S. Cl. 446—268 **14 Claims**



1. In an accessory device for use with a figure toy, the combination comprising:
a housing in the form of a simulated weapon;
first and second generally bar-shaped members slidably mounted within said housing, each of said members having a portion thereof extending through an opening in said housing to the exterior thereof with said portion configured to simulate the barrel of a weapon;
a motor means within the housing, said motor means including crank means;
means responsive to operation of said motor means for enabling alternating relative reciprocation between said members for simulating the firing of the weapon, said means responsive to operation of said motor means including crank coacting means on said first member for reciprocating said first member in response to operation of said motor means and rocker means within said housing for interconnecting said first and second members; and
means for enabling attachment of said device to the upper torso of said figure toy.

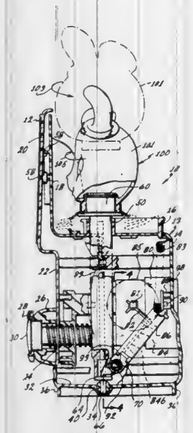
4,626,223
TOY VEHICLE ASSEMBLY
Roger H. Sweet, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 13, 1985, Ser. No. 775,552
Int. Cl.[4] A63H *13/00*
U.S. Cl. 446—279 **7 Claims**



1. A toy vehicle for use with a toy figure in which the vehicle is transformed into different configurations by a young child for a variety of play comprising:

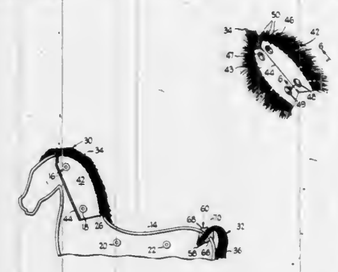
a first frame member including at least one wheel member and a deck member upon which a toy figure is positioned in a parallel relationship therewith;
a second frame member pivotally connected to the first frame member on a horizontal axis, said second frame member having at least a single wheel connected to one end thereof;
said first and second frame members having a first position in which said first and second frame members are positioned in a planar position with the frame members extended longitudinally and with the toy figure positioned in a prone position, and a second position in which said first and the second frame members are pivoted relative to one another to provide an elevated structure with the wheel members closer together and toy figure in a standing position; and actuating means housed below the deck member in said first frame member for releasing engagement of the first end and second frame members and causing pivotal relative movement of the frame members on said horizontal axis parallel to axes of the wheel members to move the frame members from their first position to their second position.

4,626,224
SLOWLY APPEARING, RAPIDLY DISAPPEARING FIGURE TOY
John T. Benson, Canoga Park; William Hart, Palos Verdes Estates, and Jerome F. Stratman, Cypress, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jun. 6, 1985, Ser. No. 742,160
Int. Cl.[4] A63H *3/28, 13/00*
U.S. Cl. 446—297 **6 Claims**



1. An action figure toy comprising:
a figure;
a housing including means to conceal the figure;
means connecting said figure to said housing for relative movement from a position of concealment of said figure to one of visibility of said figure;
means to move said figure slowly from said position of concealment to said position of visibility and to return it rapidly to said position of concealment;
wherein the connecting means includes a post supporting said figure in said housing, a pin fixed to said post, an actuating arm mounted on said housing having a first end connected loosely to said pin, and means mounted on said housing to move said actuating arm about a pivot fixed to said housing and located adjacent a second end of said arm;
wherein the means to move said arm includes a crank, one end of which crank engages said arm and the other end of which engages a motor-driven music box;
wherein said arm includes a slot and said crank includes a finger which engages said slot whereby upon actuation of said music box said crank will drive said arm to thereby move said figure.

4,626,225
TOY FIGURES WITH FLEXIBLE HAIR INSERTS
Allison W. Katzman, Chicago; Donald A. Rosenwinkel, Oak Park, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 8, 1985, Ser. No. 699,833
Int. Cl.[4] A63H *3/00, 3/44*
U.S. Cl. 446—394 **15 Claims**

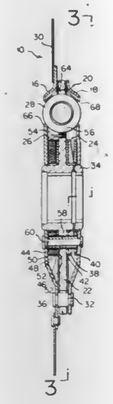


1. A toy figure comprising:
a generally hollow body formed of mating shells of a relatively rigid material;
at least one of the mating shells having an inwardly extending post;
an opening extending through the body;
flexible strands of material secured to a compressible member;
decorations formed in relief adjacent the outside edge of the member obscuring the attachment of the flexible strands;
the member being insertable into the opening in the body with the decorative edge obscuring the opening;
the member having an aperture; and
the post fitting through the aperture to secure the member against removal.

4,626,226
TORQUE FLUCTUATION DAMPER
Masauemon Kajikawa; Hiroyuki Kitajima, and Tatsuo Kato, all of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jul. 16, 1980, Ser. No. 169,319
The portion of the term of this patent subsequent to Mar. 2, 2001, has been disclaimed.
Int. Cl.[4] F16D *3/14*
U.S. Cl. 464—64 **8 Claims**

1. A damper to be interposed between an internal combustion engine and a power train for controlling the torque fluctuations of the engine, comprising:
(a) a drive plate to be connected to and driven by the engine;
(b) a retaining plate coaxially connected to the drive plate for simultaneous rotation therewith;
(c) a driven plate to be connected to the power train for imparting torque thereto, the driven plate being coaxially mounted between the drive plate and the retaining plate for angular displacement within limits;
(d) means between the drive plate and the driven plate for frictionally transmitting the rotation of the drive plate to the driven plate;
(e) a friction plate mounted between the retaining plate and the driven plate, the friction plate having a conical contact surface held against the driven plate such that the conical surface becomes flat;
(f) a disc spring between the retaining plate and the friction

plate biasing the conical contact surface of the friction plate to lie flatly against the driven plate under even pressure at all times; and



(g) spring means operatively connected between the drive and retaining plates and the driven plate for absorbing the torque fluctuations when a slip occurs therebetween.

4,626,227

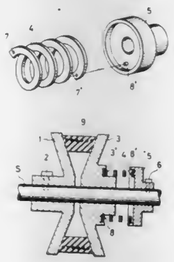
SPRING-LOCKED VARIABLE SPEED PULLEY

Hiroshi Takano, Hyogo, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Nov. 4, 1985, Ser. No. 794,877

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—8 **3 Claims**



1. A spring-locked variable speed pulley comprising: a stationary pulley piece fixedly mounted on a shaft; a movable pulley piece mounted on said shaft in such a manner that said movable pulley piece is movable in and axial direction of said shaft and is rotatable around said shaft; a stopper mounted on said shaft; a coil spring interposed between said movable pulley piece and said stopper with said stopper being on a side of said movable pulley piece opposite to the side of said movable pulley where said stationary pulley piece is provided; and a pin protruding from confronting sides of each of said movable pulley piece and said stopper, holes in both ends of said coil spring engaging with respective ones of said pins, wherein, in operation, when a load caused by a belt laid around said pulley rotates said coil spring in a direction in which it is wound or the direction opposite thereto, loads in respect torque directions are borne.

4,626,228

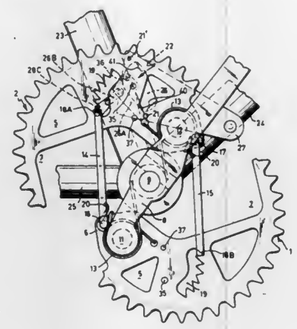
ADJUSTABLE SPROCKET WHEEL AND TRANSMISSION MECHANISM

Hendrikus P. Kooijman, Brederodestraat 26B, 2042 BB Zandvoort, Netherlands

Filed Mar. 28, 1984, Ser. No. 594,259

Int. Cl.[4] F16H *9/02*

U.S. Cl. 474—49 **5 Claims**



1. An adjustable sprocket wheel and transmission mechanism for optimizing the energy of a bicyclist as he turns the pedal crank of a bicycle, comprising two toothed wheel segments each having a sector angle substantially 180°, the wheel segments being interconnected by means of a lever system provided with springs arranged to incrementally increase the diameter of the sprocket wheel defined by the wheel segments, characterized in that one of the pedal cranks is connected to each of the toothed wheel segments by crank pivots mounted on projections lying adjacent the periphery of the wheel segments, each of the wheel segments having a recess positioned to receive the projection of the other wheel segment when the wheel segments are in a retracted position in which they define a circular sprocket wheel, the lever system comprising a pair of levers each having an inside end and an outside end, each lever being connected at its outside end to one of the wheel segments by fixed pivot points, each of the said levers having a transmission pin at its opposite end movable to various positions in an adjustable groove in the other of the wheel segments, first spring means loading the wheel segments toward one another about their crank pivots, and second spring means spring loading said levers about their fixed pivots.

4,626,229

DERAILLEUR FOR A BICYCLE

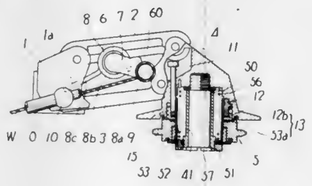
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 30, 1984, Ser. No. 605,697

Claims priority, application Japan, May 9, 1983, 58-81430; Sep. 12, 1983, 58-141195[U]

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **7 Claims**



1. A derailleur for a bicycle for shifting a driving chain from one sprocket to another at a multistage sprocket assembly, said derailleur comprising a base member, a movable member movable axially with respect to said multistage sprocket assembly, shifting means having a linkage member operated from an exterior of said derailleur to move said movable member axially of said multistage sprocket assembly, a guide mechanism supported to said movable member for guiding said driving chain from one sprocket to another at said multistage sprocket assembly, and a return spring supported by said linkage member, said linkage member having a support shaft for said spring positioned at an intermediate portion of said linkage member between said base member and said movable member, said return spring having a coiled portion supported to said support shaft and having first and second end portions, said first end portion being retained to said linkage member and said second end portion engaging movably with said base member, said linkage member being movable relative to said base member.

4,626,230

DEVICE FOR SENSING DAMAGE TO A COGGED BELT

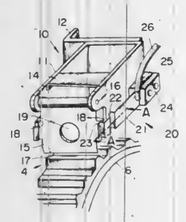
Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 20, 1984, Ser. No. 622,443

Claims priority, application Japan, Jun. 30, 1983, 58-118579; Sep. 12, 1983, 58-168075; Jan. 10, 1984, 59-2514; Mar. 22, 1984, 59-55072

Int. Cl.[4] F16G *1/28*

U.S. Cl. 474—106 **7 Claims**



1. In combination:

(a) a pulley having evenly spaced grooves;

(b) a belt formed with evenly spaced teeth which mesh with the grooves on the pulley; and

(c) means, located near the belt, for sensing deformation of the belt resulting from damage to at least one of the teeth of the belt,

wherein said sensing means comprises:

a switch including a movable contact strip, a first contact section on the strip, a fixed body, and a second contact section on the body; and

a sensing probe positioned to contact the moving belt when the belt deforms such that the sensing probe is moved from a normal position by the moving belt when the belt deforms, wherein when the sensing probe is in its normal position, the sensing probe directly engages the strip and holds the strip in a position in which the first contact section separates from the second contact section, and wherein when the sensing probe is moved from its normal position, the sensing probe disengages from the strip and thus the strip moves to a position in which the first contact section contacts the second contact section.

4,626,231

MOUNTING SHAFT TO PULLEY FORMED OF SHEET METAL

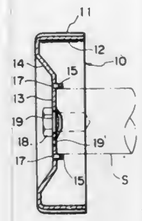
Satoshi Nagano, Osaka, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Oct. 1, 1985, Ser. No. 782,372

Claims priority, application Japan, Apr. 30, 1985, 60-63172[U]

Int. Cl.[4] F16H *55/30*

U.S. Cl. 474—152 **7 Claims**



1. A pulley to be rigidly affixed to an end of a rotary shaft defining an axis, the pulley comprising:

a peripheral surface, a web, and a hub integrally formed of a single metal sheet, the hub having a central bolt hole for inserting an axial bolt through the hub and into the shaft;

a plurality of protrusions on the hub, each having a portion defined between two slits in said hub, said portion being contiguous with the hub at opposite ends of the slits and raised axially from the hub intermediate said opposite ends, the protrusions bearing radially against the shaft adjacent said end; and,

a rotation preventing means for preventing relative rotation of said shaft and said pulley, having an eccentric attachment means on said pulley.

4,626,232

BELT CONSTRUCTION AND METHOD OF MAKING THE SAME

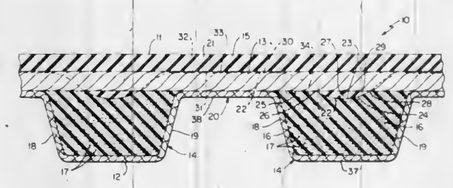
Richard J. Witt, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Oct. 9, 1984, Ser. No. 659,159

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] B29H *7/22*; **F16G** *1/00*

U.S. Cl. 474—205 **20 Claims**



1. In a method of making a belt construction having opposed sides and comprising a tensile means intermediate said opposed sides, a plurality of teeth defining one of said opposed sides of said belt construction and being mainly formed of a first polymeric material that has reinforcing fibers therein, each tooth having opposed sides that are disposed in spaced relation to adjacent sides of adjacent teeth, said belt construction having a land area between adjacent teeth, and a backing member defining the other of said opposed sides of said belt construction, said backing member being mainly formed from a second polymeric material that is initially separate from said material of said teeth, said method comprising the steps of providing a grooved drum, disposing said tensile means about said drum, then disposing said first polymeric material in a non-cured

form thereof about said tensile means, and then subjecting said drum with said first material and said tensile means thereon to heat and pressure to cause said first material to be forced toward said drum and exude through said tensile means adjacent said grooves and into said grooves to at least partially form said teeth, the improvement comprising the steps of then substantially immediately force cooling said first material and said drum to a certain temperature to stop the curing of said first material so that said first material is generally in a less cured condition thereof than a cured condition thereof if said drum with said first material and said tensile means thereon had been permitted to cool to said certain temperature at a normal rate by being disposed in substantially static air of substantially normal room temperature, then disposing said second material in a non-cured form thereof about said tensile means on said drum, and then subjecting said drum with said first and second materials and said tensile means thereon to heat and pressure to cause said first and second materials to be forced toward said drum to complete any remaining unfinished portion of said teeth and be cured together to form said belt construction.

7. A belt construction made by the method of claim 1.

4,626,233

GUIDE CHAIN FOR FEED LINES

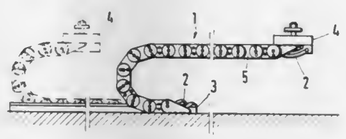
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,090

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414412

Int. Cl.⁴ F16G *13/02*

U.S. Cl. 474—206 **13 Claims**



1. A guide chain for guiding feed lines sectionally having individually different measurements extending from a stationary connection to a movable consuming device; to connect the links of respective link chains of said guide chain, separable crosspieces being provided which form through passages for said feed lines; each of said crosspieces comprising at least two crossbars having a substantially flat cross-section with wide sides and rounded-off narrow sides; the improvement wherein:

each of said crosspieces further comprises at least one, of at least one type of, element disposed between said crossbars to interconnect the latter; said connecting elements being usable in any desired combination of the types thereof collectively to form said through passages via said connecting elements per se having measurements adaptable individually to different measurements of guiding feed lines; and

that wide side of each of said crossbars which is directed inwardly, in a location toward another one of said crossbars, being provided with a mounting channel having a C-shaped cross-section; said connecting elements being respectively connected with said crossbars by being placed on said narrow sides thereof, respectively by being placed in said mounting channels thereof.

4,626,234

TRAY-TYPE CARTONS ERECTING METHOD AND APPARATUS

Bernard H. Oxborrow, Swindon, England, assignor to Metal Box Public Limited Company, Reading, United Kingdom

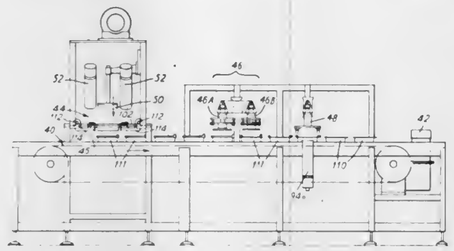
PCT No. PCT/GB83/00130, § 371 Date Jan. 4, 1984, § 102(e) Date Jan. 4, 1984, PCT Pub. No. WO83/04000, PCT Pub. Date Nov. 24, 1983

PCT Filed May 4, 1983, Ser. No. 589,084

Claims priority, application United Kingdom, May 10, 1982, 8213491

Int. Cl.⁴ B31B *1/44*

U.S. Cl. 493—167 **12 Claims**



1. A method of erecting from a blank of foldable sheet material a rectangular tray-type carton having a base formed from a base panel of the blank, a side wall upstanding from the base and formed from four side wall panels, gusset folds secured against the side wall at the corners of the carton and formed from gusset panels by which the side wall panels are joined integrally together, and a continuous peripheral flange outturned from the side wall around the mouth of the carton, the flange being formed from elongate panels carried by the side wall panels and formed at their ends with tabs which are secured together in overlapping relation at the corners of the carton, wherein the method is characterised by the steps of:

(a) prior to folding up the side wall panels, folding up from the plane of the blank those of the tabs which are to be uppermost in the erected carton,

(b) at a first station, forming the side wall by folding up the side wall panels in relation to the base panel whilst folding the gusset panels to form the gusset folds, such folding being accompanied by movement of the elongate panels wth the side wall panels as coplanar extensions thereof with the exception of the said uppermost ones of the tabs,

(c) moving the partially erected carton from the first station to a second station;

(d) at the second station, folding the elongate panels outwardly in relation to the side wall and into generally coplanar relation with one another, with the said uppermost tabs overlying other ones of the tabs at the corners of the carton, and

(e) securing the overlapping tabs together at the corners of the carton to form the continuous peripheral flange.

4,626,235

APPARATUS FOR ASSEMBLING EXPANDABLE PRODUCT BAGS WITHIN ENERGY SLEEVES

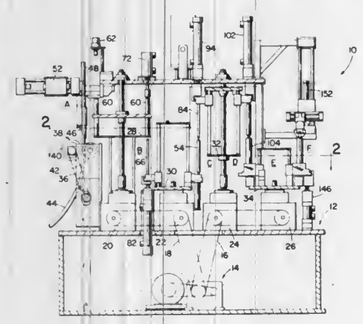
Wolfgang Kesselring, Goshen, Conn., assignor to Jamieson Manufacturing Company, Torrington, Conn.

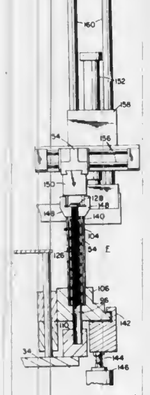
Filed Mar. 6, 1985, Ser. No. 708,745

Int. Cl.⁴ B31B *1/60*

U.S. Cl. 493—210 **10 Claims**

1. Apparatus for assembling an axially elongated, diametrically expandable and contractible product bag axially within a similarly axially elongated diametrically expandable and contractible open ended energy sleeve of elastomeric material, the sleeve being at least partially diametrically expanded at assembly; said apparatus comprising at least one energy sleeve expansion station, a support for holding an energy sleeve at said station with at least one open end portion exposed axially, a hollow expansion tube at said station axially insertable into the sleeve at its said expcsed open end portion whereby to progressively expand the sleeve substantially throughout its length, an energy sleeve and product bag assembly station, means located between said expansion station and said assembly station for transporting an expanded energy sleeve with the hollow expansion tube therewithin from said sleeve expansion station to said assembly station, means located adjacent said assembly station for transporting a product bag to said assembly station and into a position of axial alignment with said energy sleeve and expansion tube, means adjacent said assembly station for effecting relative axial movement between said product bag and both said sleeve and the expansion tube therewithin





whereby to insert the bag in the tube within the sleeve with one end portion thereof protruding from the tube and the sleeve an energy sleeve and product bag withdrawal station, means at said withdrawal station for effecting relative axial movement between said sleeve and both said expansion tube and product bag whereby to position said sleeve with one end portion extending beyond said expansion tube and surrounding said bag along at least a part of its protruding end portion, said sleeve thus frictionally gripping said bag at its said protruding end portion due to its compressive tendency in its expanded condition, and a withdrawal means at said withdrawal station for engaging said protruding end portion of said product bag at a remaining part thereof and simultaneously and in assembly axially withdrawing both said bag from within said expansion tube and said sleeve from its position about the tube.

4,626,236

APPARATUS FOR SEPARATING BAG ENDS DURING MANUFACTURE

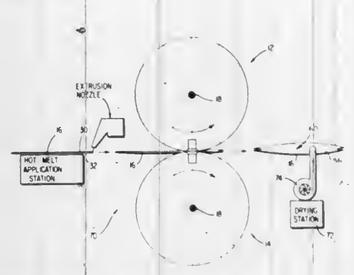
Horst Maurer, Cumberland, R.I., assignor to Windmoeller & Hoelscher Corporation, Lincoln, R.I.

PCT No. PCT/US82/00069, § 371 Date Sep. 20, 1983, § 102(e) Date Sep. 20, 1983

Continuation of Ser. No. 530,915, Sep. 20, 1983, abandoned. This PCT application Jan. 20, 1982, Ser. No. 788,706

Int. Cl.⁴ B31B *1/80*

U.S. Cl. 493—257 **4 Claims**



1. A bag making machine, comprising:

means for applying a hot melt sealing material to at least one of the edges of the top and bottom layers of a flat, tubular bag preform having at least one open end;

conveyor means for guiding the tubular bag preform horizontally through the machine;

a first stationary support shaft on one side of said conveyor means after said sealing material applying means, said first support shaft carrying a first bearing means and having first internal conduit means in communication with an external source of vacuum;

a first wheel rotatably supported on said first bearing means of said first support shaft;

a second stationary support shaft on an opposite side of said conveyor means after said sealing material applying means, said second support shaft carrying a second bearing means and having second internal conduit means in communication with the external source of vacuum;

a second wheel rotatably supported on said second bearing means of said second support shaft;

each of said first and second wheels including a control hub, a peripheral portion carrying a plurality of circumferentially disposed, bag-contacting suction cups, and conduit means providing communication between said control hub and each of said suction cups, said hub communicating with said conduit means of said shaft to provide bag gripping vacuum at said suction cups during only a part of a revolution of said wheel;

said first and second support shafts being positioned on the opposite sides of said conveyor belt with the respective axes thereof essentially parallel to and spaced from each other so that respective pairs of suction cups of said first and second wheels are positioned opposite to each other as said first and second wheels rotate to define a plurality of circumferentially spaced bag contacts therebetween;

said first and second wheels being arranged in line to receive the end of a bag preform between said pairs of oppositely positioned suction cups, said suction cups moving with and in the same direction as the bag preform for overcoming a tendency for the hot melt sealing material to cause the edges of said top and bottom layers to stick together, and thereby separating the edges to open the end of the bag preform; and

air blower means for keeping the end of the bag preform open after the bag preform emerges in the open condition from between said rotating first and second wheels, to permit drying of the hot melt sealing material and thereby preclude the edges of the bag preform from subsequently

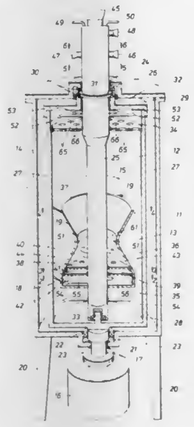
becoming unintentionally stuck together by the hot melt sealing material.

4,626,237

METHOD AND APPARATUS FOR SEPARATING THE COMPONENTS OF A WELLSTREAM

Jimmie G. Galloway, Jr., Missouri City, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Dec. 10, 1984, Ser. No. 680,101
Int. Cl.⁴ B01D *21/26*
U.S. Cl. 494—37 **18 Claims**



1. A method for separating the components of a stream which is comprised of a first liquid, a second liquid and gas, said first liquid being lighter than said second liquid, said method comprising the steps of:

(a) introducing said stream into a centrifuge rotor having a rotor wall and opposed first and second end portions;

(b) rotating said rotor at a speed which creates a centrifugal force sufficient to cause a radial separation of said gas from said liquids, said liquids thereby being forced outward to form a liquid layer adjacent to said rotor wall, said liquid layer being separated from said gas by a liquid/gas interface;

(c) inducing countercurrent flow in said liquid layer such that the direction of flow adjacent to said interface is toward said first end portion and such that the direction of flow adjacent to said rotor wall is toward said second end portion, said countercurrent flow and said centrifugal force acting together to axially separate said first liquid and said second liquid by forcing said first liquid to flow toward said first end portion and by forcing said second liquid to flow toward said second end portion; and

(d) extracting said separated first liquid, second liquid and gas from said rotor.

4,626,238

INSERTION APPLICATOR

Scarlet Sustmann, Viersen, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 729,597
Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417519
Int. Cl.⁴ A61F *13/20*
U.S. Cl. 604—15 **7 Claims**

1. A tampon or suppository insertion applicator comprising:

an open ended cylindrical insertion sleeve adapted to receive a tampon or suppository removably placed within it and biasing against its inner wall; and

an ejection slide for insertion into said sleeve comprising an extended insertion member whose inserting diameter is less than that of the inner diameter of said sleeve, whose front end is adapted to bias against said tampon or suppository, and whose rear end comprises means for preventing the further insertion of said slide into said sleeve, the insertable length of said slide being not substantially greater than that of said sleeve, said ejection slide comprising a single strip of flat material which is substantially rectangular, having a short dimension less than twice the inner diameter of said sleeve and a long dimension at least equal to the length of said sleeve, said stip having a first fold line along the central axis of its long dimension, a



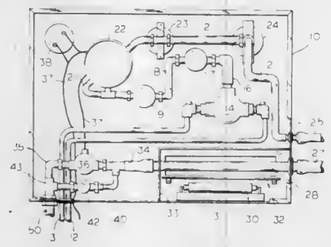
second fold line transversing said first fold line at about a 90° angle and at a distance from the rear end of said strip approximately equal to the length of its short dimension, the portion of said first fold line between said second fold line and said rear end being at least partially cut; said further insertion preventing means being afforded when said strip is folded inward along the first fold line, folded outward along the second fold line, and said partially cut portion is completely separated, forming a butterfly whose wingspan is greater than the inner diameter of said sleeve.

4,626,239

COLONIC LAVAGING MACHINE

Nicholas Ardizzone, 102 E. Eight St., Vidalia, Ga. 30474

Filed Sep. 30, 1985, Ser. No. 782,043
Int. Cl.⁴ A61M *7/00;* **A61B** *10/00*
U.S. Cl. 604—31 **6 Claims**



1. Apparatus for lavaging the colon comprising:

a speculum for insertion into the anal canal of a patient for lavaging the colon and extracting matter lodged therein;

a water supply line connected with said speculum;

sensing means for detecting a preselected high level of water pressure in said water supply line and for detecting a preselected low level of water pressure in said water supply line;

a drain line connected with said speculum; and

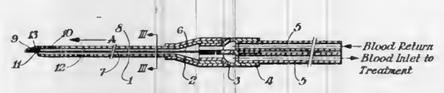
valve means coupled with said sensing means for controlling the flow of water through said drain line by increasing drain flow rate upon said sensing means detecting said high level and by decreasing drain flow rate upon said sensing means detecting said low level.

4,626,240

DUAL LUMEN SUBCLAVIAN CANNULA

William Edelman, Long Beach, and Michael Baranowski, Corona Del Mar, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Continuation of Ser. No. 318,715, Nov. 6, 1981, Pat. No. 4,403,983. This application Sep. 8, 1983, Ser. No. 530,332
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.⁴ A61M *25/00*
U.S. Cl. 604—43 **4 Claims**



1. A dual lumen subclavian cannula suitable for semi-permanent use during hemodialysis, comprising:

a flexible tube divided into first and second flow lumens by a flexible longitudinal septum, centrally located within said tube;

the proximal end of said tube fitted to a manifold for separately collecting fluid from one of said first and second lumens and distributing fluid into the other of said lumens;

the distal end of the tube wall enclosing said second lumen tapered to a closed smoothly rounded blunt edge against said septum, and provided with a distal opening by at least one aperture proximal to the tapered section of the tube wall, with the interior of said lumen being filled with inert plastic immediately distal of its distal opening thereby substantially eliminating stagnation in the distal end of the second lumen and thus substantially reducing the tendency of blood to clot therein;

the distal end of the tube wall enclosing said first lumen not being closed, to provide a first distal opening for said first lumen, said first distal opening being spaced proximally from said closed distal end of said second lumen; and

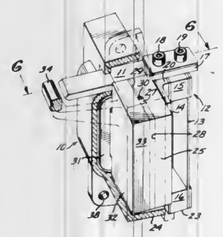
a second distal opening for said first lumen provided by at least one aperture in the tube wall proximal to said tapered section in said second lumen.

4,626,241

APPARATUS AND METHOD FOR CONTROLLING THE PARENTERAL ADMINISTRATION OF FLUIDS

Peter Campbell, Lawrenceville; Izrail Tsals, Princeton Junction, both of N.J., and David Matsuura, La Jolla, Calif., assignors to Ivac Corporation, San Diego, Calif.

Filed Mar. 6, 1985, Ser. No. 708,829
Int. Cl.⁴ A61M *31/00, 5/005*
U.S. Cl. 604—49 **19 Claims**



1. A method of controlling the flow of fluid through a flexible tube comprising:

a. applying a first force to a pincher element by means of a permanent magnet to urge the pincher element against the tube;

b. applying a second force to the pincher element which is essentially opposite in direction and which is smaller in magnitude than the first force so that the resultant force urging the pincher element against the tube is sufficient to constrict the tube and to thereby essentially stop fluid flow through the tube; and

c. reducing the first force to a magnitude less than the sum of the magnitude of the second force and any force applied to the pincher element by the tube so that the resultant force on the pincher element will cause the pincher element to move away from its position constructing the tube, thereby opening up the tube and allowing fluid flow through the tube.

5. In an apparatus to control the flow of fluid through a flexible tube wherein a pincher element is urged against the tube to constrict the tube and thereby essentially stop fluid flow therethrough and wherein the pincher element is moved away from its position against the tube to allow fluid flow therethrough, the improvement comprising:

a. a permanent magnet means to apply a first force to the pincher element to thereby urge the pincher element against the tube,

b. a second means to apply a second force to the pincher element which is opposite in direction but smaller in magnitude than the first force applied thereto; and

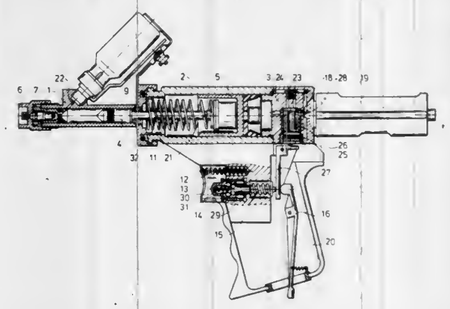
c. means to reduce the first force applied to the pincher element to a magnitude less than the sum of the force applied to the pincher element by the second means and any force applied to the pincher element by the tube to thereby move the pincher element away from its position constricting the tube.

4,626,242

SIPHON-CARTRIDGE ACTIVATED AUTOMATIC INOCULATING DEVICE WIHTOUT NEEDLE FOR INDIVIDUAL ACCULATION, E.G. FOR INSULINIZATION

Kálmán Fejes, and Lajos Nagy, both of Budapest, Hungary, assignors to Radelkis Elektrokémiai Müszergyártó Ipari Szövetkezet, Budapest, Hungary

Filed Aug. 23, 1984, Ser. No. 624,584
Int. Cl.⁴ A61M *5/30*
U.S. Cl. 604—68 **2 Claims**



1. Siphon-cartridge actuated automatic inoculating device without needle for individual inoculation, comprising an inoculating cylinder and an actuating unit, a quick coupling means (**32**) releasably interconnecting the inoculating cylinder (**1**) and the actuating unit (**2**), said actuating unit comprising a working piston (**5**), carbonic acid gas contained in a cartridge support for actuation of said unit is allowed to flow to a rear-side of the working piston (**5**) by a valve (**18**) performing a triple function and after actuation, said valve enabling a discharge of said gas into the atmosphere through a bore (**26**) of the piston, wherein after completing the phase of inoculation, further outstream of carbonic acid gas from the cartridge is prevented by a sealing body (**23**), wherein a spring (**24**) of the valve (**18**) performing triple function permits the discharge of the remaining carbonic acid gas from the cartridge for preventing a pressure drop,

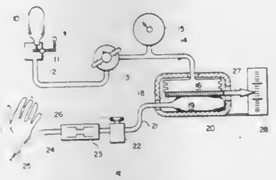
further comprising a starter spring connected to a trigger pin and a hoisting arm, said starter spring being placed into a state of readiness by said hoisting arm (**16**).

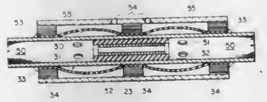
4,626,243

GRAVITY-INDEPENDENT INFUSION SYSTEM

Param I. Singh, Lexington, and David C. de Sieyes, Wenham, both of Mass., assignors to Applied Biomedical Corporation, Danvers, Mass.

Filed Jun. 21, 1985, Ser. No. 749,470
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—141 **19 Claims**





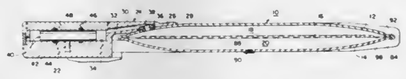
1. An infusion system comprising a source of liquid infusate contained in an infusate bag and pressurized by means external to said bag to a substantially constant known driving pressure , of at least 200 Torr, said pressure driving a flow rate of said liquid infusate through a cutoff valve in series with a flow restrictor of selectable, substantially constant, known hydraulic resistance, said flow restrictor consisting of at least one small-bore flow passage having a length and a diameter, the ratio of said length to said diameter being at least 10, and said length being at least 3 millimeters, and said restrictor providing substantially all of the resistance to flow of said liquid infusate when said cutoff valve is open and said infusate is flowing, whereby said flow rate is then substantially constant.

4,626,244

IMPLANTABLE MEDICATION INFUSION DEVICE

Robert H. Reinicke, Mission Viejo, Calif., assignor to Consolidated Controls Corporation, El Segundo, Calif.

Filed Feb. 1, 1985, Ser. No. 697,514
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—141 **32 Claims**



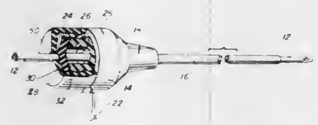
1. An implantable medication infusion device, comprising a pair of circular concave members positioned in opposed relation with the outer edges thereof connected together, a flexible circular diaphragm positioned between said concave members and having the edge thereof sealed to said concave members thereby to form a pressure stabilizing chamber with one of said concave members on one side of said diaphragm and a medication reservoir with the other one of said concave members on the other side of said diaphragm, a two phase fluid in said pressure stabilizing chamber for maintaining a constant pressure on said diaphragm which is greater than the body pressure of the body in which said infusion device is implanted, body means secured to at least one of said concave members and having a recess therein, a penetrable septum mounted in said body means and communicating with said recess a passageway in said body means between said recess and said reservoir, whereby said reservoir can be filled through said septum, said recess and said passageway, and a capillary unit positioned in said body means and having an inlet connected to said reservoir and an outlet communicating with the exterior of said device, said capillary unit having a flow restrictive passageway between said inlet and outlet of sufficiently small cross section to limit the flow of medication from said reservoir in response to the pressure on said diaphragm to a desired rate.

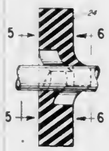
4,626,245

HEMOSTATIS VALVE COMPRISING AN ELASTOMERIC PARTITION HAVING OPPOSED INTERSECTING SLITS

Lawrence A. Weinstein, Miami Lakes, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 30, 1985, Ser. No. 771,299
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—167 **7 Claims**





1. In a hemostatic catheter including a housing mounted on the catheter, said housing including a self-sealing penetrable barrier, the improvement comprising
an elastomeric partition valve made of one-piece construction;
said partition valve including first slit means defined by a first side of said valve;
second slit means defined by the opposite side of said partition valve;
each slit means having a location which creates two spaced apart points of intersection with the other slit means;
each slit means having a depth that is insufficient to extend through the entire thickness of said partition valve,
whereby sealing is provided to an implement inserted through said partition valve.

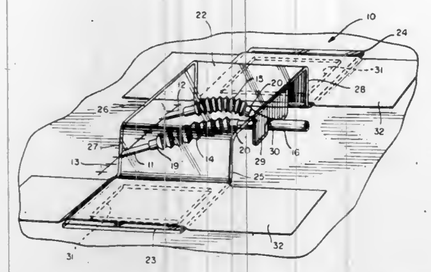
4,626,246

MEDICAL DRAINAGE APPARATUS

John G. Verkade, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

Filed Oct. 17, 1983, Ser. No. 542,703
Int. Cl.[4] A61M *25/02*
U.S. Cl. 604—174 **12 Claims**

1. A medical drainage apparatus for draining fluid from the body comprising:
a tube having a first portion which is adapted to be connected to an area of the body which is to be drained, an intermediate, pleated flexible portion, and a third portion, the pleated flexible portion being able to accommodate relative movement between the first and third portions by flexing, elongation, and compression; and
a relatively rigid bridge adapted to be secured to the body for holding the third portion of the tube relative to the body, the bridge having a pair of base portions adapted to be attached to the body and an intermediate portion between the base portion which extends over the tube, the intermediate portion of the bridge including a tabe which extend toward the third portion of the tube and holds the third portion.

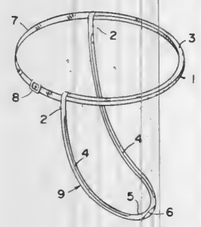


4,626,247

SWEAT COLLECTING HEADBAND

Alfred R. Frankel, 403 Gulf Way - Apt. 701, Pass-A-Grille Beach, Fla. 33706

Continuation-in-part of Ser. No. 343,411, Jan. 28, 1982, abandoned. This application Jan. 19, 1984, Ser. No. 572,121
Int. Cl.[4] A61J *7/00;* **A42B** *1/22*
U.S. Cl. 604—312 **5 Claims**



2. A headband assembly comprising (a) a continuous unbroken headband adapted to be fitted directly snugly against the head of the wearer, said headband having at least one passageway therein of fixed shape extending along a substantial portion of the length of said headband, said passageway being disposed in said headband so as to intercept and collect sweat running down the head of the wearer and (b) a receiving means coupled to said passageway for receiving the sweat collected in said passageway and adapted to transmit the collected sweat to the wearer's mouth, said receiving means comprising a tube leading into a grooved faceband slanting downward and forward, said faceband being adapted to collect sweat from the wearer's face and being connected at the lower end thereof with a hollow mouthpiece adapted to be fitted into the wearer's mouth, said mouthpiece having an opening therein through which sweat delivered to the interior of said hollow mouthpiece may be admitted into the wearer's mouth.

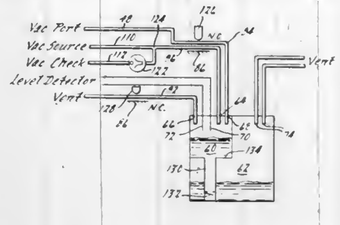
4,626,248

OPHTHALMIC CASSETTE

Gregg D. Scheller, St. Peters, Mo., assignor to Storz Instrument Company

Filed Dec. 16, 1985, Ser. No. 809,118
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—319 **20 Claims**

1. A microsurgical apparatus for collecting substances removed from a surgical situs by suction comprising:
a primary container having means for selectively applying a vacuum thereto and having inlet means for communicating with said surgical situs;
a secondary container of a capacity greater than said primary container;
first passage means communicating between said primary and secondary containers for conducting substances from said primary container to said secondary container by gravity; and
first valve means responsive to the vacuum within said primary container for opening and closing said first passage means.

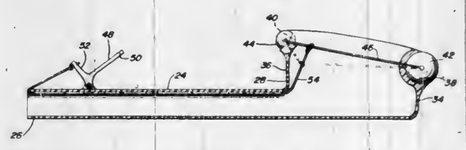


4,626,249

FEMALE STANDING URINATION AID

Oliver R. Hamey, 725 N. Grant, Liberal, Kans. 67901

Filed Apr. 10, 1985, Ser. No. 721,676
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—329 **8 Claims**

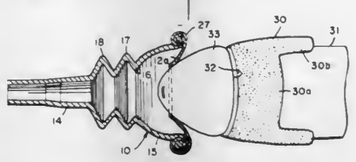


1. A female standing urination aid including an elongated generally horizontal conduit having opposite ends, one end of said conduit being open and comprising a discharge end and the other end of said conduit comprising an inlet end and including means defining an upwardly projecting receiver opening downwardly into said other end, said receiver including closely opposing generally parallel opposite side walls extending longitudinally of said conduit and end wall portions extending between and connecting corresponding ends of said side walls, said side walls and end wall portions projecting at least slightly upwardly from said inlet end and being integrally formed of resilient and shape retentive material, manually operable receiver opening means operative from a point spaced along said conduit from said receiver toward said discharge end and connected to at least the end wall portion of said receiver furthest from said discharge end to relatively displace said end wall portions toward each other and thus reduce the spacing therebetween, said receiver being constructed in a manner such that at least the mid-portions of said side walls will bow so as to be outwardly convex and thus spread apart responsive to said end wall portions being relatively displaced toward each other, thereby opening said receiver for receiving liquid thereinto from above.

4,626,250
MALE URINARY COLLECTION SYSTEM AND EXTERNAL CATHETER THEREFOR

Barry L. Schneider, Deerfield, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation of Ser. No. 613,279, May 24, 1984, Pat. No. 4,581,026, which is a continuation-in-part of Ser. No. 521,224, Aug. 9, 1983, abandoned, which is a continuation of Ser. No. 271,086, Jun. 5, 1981, abandoned. This application Feb. 14, 1986, Ser. No. 829,318
Int. Cl.[4] A61F *5/458*
U.S. Cl. 604—352 4 Claims



1. A method of securing an external male catheter upon a wearer to protect surfaces of the glans against injury from direct urine contact while at the same time avoiding objectionable adhesive engagement between the catheter and the glans, comprising the steps of providing an external catheter having a tubular sheath formed of soft elastic material and including a thin-walled cylindrical body section, a reduced drainage tube section, a tapered neck section disposed between said body and drainge tube sections, and an inner sleeve of soft elastic disposed within said sheath and having a proximal end portion merging and permanently integrated with said cylindrical section and an elongated distal end portion extending and tapering distally into said neck section; said elongated distal end portion of said sleeve terminating distally in a reduced opening spaced axially from the distal end of said neck section and having an outer surface unsecured and normally spaced inwardly from said neck section along substantially the full length and circumferential extent of said distal end portion; fitting said catheter upon a wearer's penis with said cylindrical section extending along the shaft of the penis behind the glans thereof and with said inner sleve stretched about the glans and in protective but substantially non-adhesive engagement therewith; and maintaining said inner sleeve in protective substantially non-adhesive engagement with said glans by adhesively securing said cylindrical body section to the shaft of the penis behind the corona of the glans.

4,626,251
SURGICAL SPONGE

Albert Shen, 7 Annabelle La., Florham Park, N.J. 07932

Filed Feb. 22, 1985, Ser. No. 704,616
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—362 6 Claims



1. A surgical sponge having a plurality of plies of absorbent material, each edge of the sponge being sealed either by a fold in said material which thereby defines two plies or by stitching joining the edge of each ply to the corresponding edge of each contiguous ply,

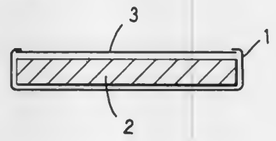
at least one continuous stitch through said plies being disposed inwardly from and roughly paralllel to a first of said sealed edges so as to define, together with second and third adjoining transverse sealed edges, a roughly quadrangular area, and

at least one radiopaque thread disposed within said quadrangular area between two plies of said sponge, said radiopaque thread being embedded at first and second points in the stitching defining at least one side of said quadrangular area but with the portion of said radiopaque thread between said points being otherwise freely disposed within and unbound to said sponge.

4,626,252
DISPOSABLE DIAPER

Kazunori Nishizawa, Funabashi, and Hiroshi Mizutani, Yachiyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 465,693, Feb. 10, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,923
Claims priority, application Japan, Mar. 2, 1982, 57-32830
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 10 Claims



1. In a disposable diaper comprising an integral assembly of a liquid-impermeable back sheet, an absorbent medium placed thereon and a liquid-permeable sheet overlying said absorbent medium, the improvement which comprises: said back sheet is a porous, vapor-permeable, liquid-impermeable film made by mixing 100 parts by weight of a polyolefin resin, 28, to 200 parts by weight of filler particles and 10 to 70 parts by weight of a liquid or wax-like hydrocarbon polymer said polymer being a saturated hydroxy-substituted hydrocarbon polymer obtained by hydrogenating hydroxy-substituted liquid polybutadiene having from 1.5 to 5 hydroxyl groups per molecule, said hydroxy-substituted hydrocarbon polymer having a number average molecular weight of from 400 to 48,000, molding the mixture to form a film and then stretching said film more than 1.2 times its original dimension in at least one surface direction to form fine pores in the film.

4,626,253
SURGICAL HEMOSTAT COMPRISING OXIDIZED CELLULOSE

Cecil H. Broadnax, Jr., Somerset, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

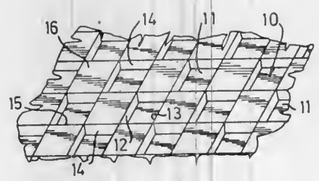
Filed Oct. 5, 1984, Ser. No. 657,997
Int. Cl.[4] A61L *15/00*
U.S. Cl. 604—374 9 Claims

1. A surgical hemostat comprising a warp knit tricot fabric constructed of yarns of oxidized cellulose, said yarns being derived from bright rayon yarns of about 40 to 80 total denier, said fabric having a density of at least 0.03 g/cm^2, air porosity of less than 150 cm^3/sec/cm^2, and liquid absorption of at least 3 times the dry weight of the fabric and at least 0.1 g water per cm^2 of fabric.

4,626,254
ABSORBENT ARTICLE

Leif U. R. Widlund, Mölnlycke, and Carl-Daniel W. Norenberg, Gothenburg, both of Sweden, assignors to Molnycke AB, Gothenburg, Sweden

Filed May 14, 1985, Ser. No. 733,778
Claims priority, application Sweden, May 15, 1984, 8402614
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—383 9 Claims

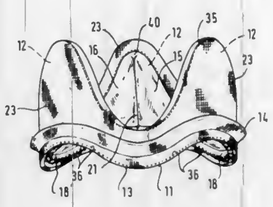


1. An absorbent article, such as a sanitary towel, a diaper or bandage, comprising a liquid-impermeable topsheet which is provided with openings over at least part of its area and which is intended to lie against the body of the wearer, and an absorbent body located beneath said topsheet, the openings being arranged in depressions in the topsheet and in such wall portions of said depressions which, when seen from the mouth of the depressions, form at least a right angle to the plane of said topsheet; the bottoms of said depressions, when projected perpendicularly onto the plane of the topsheet, substantially covering the mouths of the depressions in said plane.

4,626,255
HEART VALVE BIOPROTHESIS

Bruno Reichart, München, Fed. Rep. of Germany, and Christian Weinhold, Hatzfelderweg 13b, 8000 München 71, Fed. Rep. of Germany, assignors to Christian Weinhold, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,774
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334512
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 11 Claims



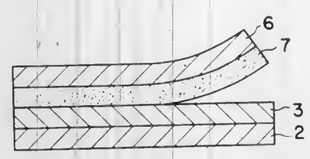
1. Heart valve prosthesis with a fixed, integral aortic valve of an adult kangaroo which is positioned in a resiliently flexible, fabric-covered supporting frame having substantially the shape of a cylinder with a substantially circular cross-section and consisting of an axially slightly undulatory annulus comprising three complete waves and of three rounded posts which are positioned at equidistant angles and extend axially from the wave apices and furthermore having a number of perforations, the fabric being shaped as a suture ring near the end face opposite to the posts, the annulus fibrosus, from which the three aortic leaflets originate and in the area of which muscular tissue of the ventricular septum is to be found, extending along the end face of the supporting frame opposite to the posts and being sutured there to the fabric, and the aortic wall or stump, which is cut according to the shape of the supporting frame, being mounted within the annulus and said posts and being sutured to the fabric along the end face of the supporting frame on the side of the posts, in which each of the three leaflets protrude substantially unimpeded from the annulus fibrosus into the aortic lumen, without being coalesced with muscular tissue of the vertricular septum.

4,626,256

IMAGE-RECEIVING SHEET

Sadanobu Kawasaki, Tokorozawa; Mineo Yamauchi, Ichikawa, and Masanori Akada, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,252
Claims priority, application Japan, Jul. 25, 1983, 58-135627
Int. Cl.[4] D06P *3/00*; B41M *5/26*
U.S. Cl. 8—471 5 Claims



1. An image-receiving sheet for use in combination with a heat transfer sheet, comprising a substrate and an image-receiving layer provided on the substrate for receiving dye transferred from a heat transfer sheet when heated, said image-receiving layer containing a dye-permeable releasing agent comprising a reaction-hardened product of an amino-modified silicone and an epoxy-modified silicone.

4,626,257

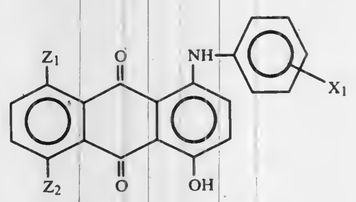
METHOD FOR DYEING POLYESTER FIBER MATERIALS: DISPERSE DYE COMBINATIONS WITH COMPENSATED COLOR FADING

Yoshikazu Matsuo; Toshio Nakamatsu, both of Osaka; Toshikazu Moriwaki, Hyogo; Sadaharu Abeta, and Kunihiko Imada, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

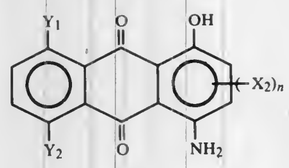
Filed May 10, 1985, Ser. No. 732,768
Claims priority, application Japan, May 10, 1984, 59-94372
Int. Cl.[4] D06P *3/54, 1/16*
U.S. Cl. 8—638 6 Claims

1. A method for dyeing polyester fiber materials comprising conducting combination dyeing by a combination of disperse dyes wherein at least one of said dyes is capable of compensating for the color fading of at least one other of said disperse dyes produced upon a degree of exposure of said material to sunlight, by the color change in hue caused in said at least one disperse dye under the same degree of exposure to sunlight, said combination of disperse dyes including as a blue disperse dye combination from 20 to 95% by weight of an anthraquinone dye of the general formula (I) and 80 to 5% by weight of an anthraquinone dye of the general formula (II):

(1)



(2)



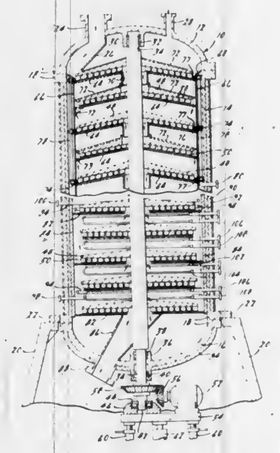
wherein X_1 is a halogen atom or a hydrogen atom; one of Z_1 and Z_2 is a nitro group and the other is a hydroxy group; one of Y_1 and Y_2 is an amino group and the other is a hydroxy group; X_2 is a halogen atom; and n is an integer of from 0 to 3.

4,626,258

MULTIPLE HEARTH APPARATUS AND PROCESS FOR THERMAL TREATMENT OF CARBONACEOUS MATERIALS

Edward Koppelman, 4424 Bergamo Dr., Encino, Calif. 91316

Filed Dec. 19, 1984, Ser. No. 683,591
Int. Cl.[4] C10L *9/08*; F26B *5/04, 17/12*
U.S. Cl. 44—2 14 Claims



14. A process for the thermal treatment of moist organic carbonaceous materials under pressure which comprises the steps of:

(a) introducing a supply of moist carbonaceous feed material to be processed under pressure into a preheating chamber and preheating the feed material to a temperature of from about 200° to about 500° by countercurrent heat transfer contact with reaction gases,

(b) extracting any liquid formed in the preheating chamber from said chamber under pressure,

(c) introducing the preheated feed material under pressure into a multiple hearth apparatus comprising a pressure vessel containing a plurality of superimposed annular hearths,

(d) distributing the preheated feed material on the uppermost hearth and transferring the feed material radially along each hearth in an alternating inward and outward direction to effect a downward cascading of the feed material from one hearth to the next hearth therebelow,

(e) independently heating the feed material in said vessel to a controlled elevated temperature for a period of time sufficient to vaporize at least a portion of the volatile substances therein to form volatile gases and a solid thermally restructured product,

(f) transferring the volatile gases in a countercurrent direction to the feed material through the pressure vessel and into said preheating chamber, and

(g) discharging the solid product under pressure from said vessel.

4,626,259

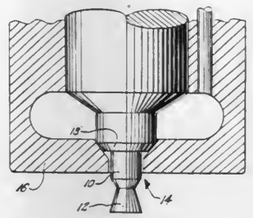
FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

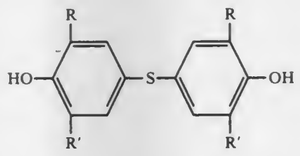
Filed Oct. 31, 1985, Ser. No. 793,585

Int. Cl.[4] C10L *1/26*

U.S. Cl. 44—57 **11 Claims**



1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) a sterically hindered 4,4'-thiobis phenol having the formula:



wherein R and R' are the same or different and are alkyl groups containing from 1 to 16 carbon atoms each, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,626,260

METHOD OF CONTROLLING THE PULSE FREQUENCY OF A PULSE OPERATED ELECTROSTATIC PRECIPITATOR

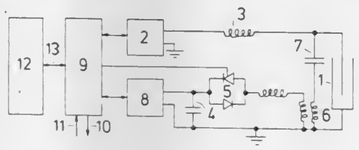
Hans J. Jorgensen, Lyngby, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

Filed Dec. 12, 1985, Ser. No. 808,041

Claims priority, application United Kingdom, Dec. 12, 1984, 8431293

Int. Cl.[4] B03C *3/68*

U.S. Cl. 55—2 **13 Claims**



1. A method of controlling the pulse frequency of an electrostatic precipitator energized by a pulse superimposed direct voltage, in which

(a) a search procedure is carried out at selected intervals and, during which procedure

(b) the pulse repetition frequency is lowered and then increased stepwise according to a selected scale;

(c) the DC-voltage (V_{DC}), the pulse voltage (V_p) and the average current through the precipitator are measured for each value of the pulse repetition frequency;

(d) the charge (q_p) transmitted per pulse is calculated as the average current divided by the pulse repetition frequency;

(e) one of the two parameters $|V_{DC}|+|V_p|$ and q_p is maintained constant while the other is varied, said stepwise increase of the pulse frequency being stopped when the value of the expression:

$$(|V_{DC}|+V_p|)/q_p$$

remains constant or drops in the second of two successive frequency steps; and,

(f) the limit of said pulse repetition frequency being determined by the frequency in the step where said stepwise frequency increase is stopped.

4,626,261

METHOD OF CONTROLLING INTERMITTENT VOLTAGE SUPPLY TO AN ELECTROSTATIC PRECIPITATOR

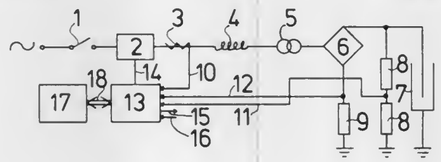
Hans J. Jorgensen, Lyngby, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

Filed Dec. 12, 1985, Ser. No. 808,045

Claims priority, application United Kingdom, Dec. 12, 1984, 3431294

Int. Cl.[4] B03C *3/68*

U.S. Cl. 55—2 **17 Claims**



1. A method of controlling the period length of an intermittent voltage supply from a power supply to an electrostatic precipitator, in which

(a) a search procedure is carried out at predetermined time intervals, and during which procedure:

(b) a series of increasing values is given to the ratio of n_c/n_p between the number of conduction half periods n_c during which said power supply supplies current to said precipitator and the number of non-conduction half periods n_p during which said power supply to said precipitator is cut off, said increasing values being obtained through stepwise altering of at least one of the numbers n_c or n_p according to a selected scale;

(c) the charge transmitted per system half-period is calculated at each scale step, said charge being defined as the average current of said precipitator divided by the total number n_c of said conduction system half-periods per second;

(d) said search procedure being stopped when the ratio between the maximum voltage and the charge transmitted per system half-period remains constant or decreases at transition from one scale step to the succeeding one; and,

(e) the number of conduction system half-periods n_c and of non-conduction system half-periods n_p so obtained determining the numbers of conduction system half-periods and non-conduction system half-periods to be maintained in said precipitator until the next search procedure.

4,626,262

EXHAUST AIR SYSTEM FOR ELECTROSTATIC AIR CLEANER

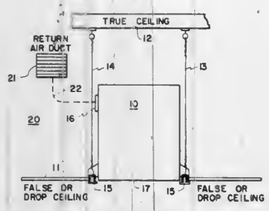
John A. Forss, Excelsior, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 24, 1986, Ser. No. 836,265

Int. Cl.[4] B03C *3/36*

U.S. Cl. 55—128 **7 Claims**

1. An electrostatic air cleaner means for control of the air quality in a room and adapted to be mounted in a drop or false ceiling of said room, including: electrostatic air cleaner means having intake air means and discharge air means mounted in a plane that generally coincides with the plane of said false ceiling for said room in which said electrostatic air cleaner means is installed; said electrostatic air cleaner means creating an air flow into said intake air means where said air flow is treated; said treated air flow being subsequently discharged from said electrostatic air cleaner means; exhaust air means opening above said false ceiling and adapted to vent part of



said treated air flow above said false ceiling; said exhaust air means having moveable vent closure means; said vent closure means including a sealing portion and air diverting portion with said air diverting portion being adjustably positioned in said treated air flow to deflect a portion of said air flow through said exhaust air means; and said sealing portion of said vent closure means being moved to a position to regulate the amount of said treated air flow that is vented through said exhaust air means and away from said room in which said electrostatic air cleaner means is installed.

4,626,263

HIGH-PERFORMANCE ELECTRET AND AIR FILTER

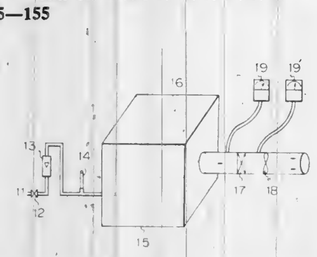
Naofumi Inoue, Iwakuni, and Satoshi Matsuura, Otake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,367

Claims priority, application Japan, Apr. 24, 1984, 59-81033

Int. Cl.[4] B03C *3/45, 3/64, 3/28*

U.S. Cl. 55—155 **6 Claims**



1. A high-performance electret comprising 60 to 99% by weight of a non-polar polymer, 0.5 to 39.5% by weight of a polar polymer and 0.5 to 20% by weight of at least one component selected from the group consisting of (A) a non-polar polymer modified with an unsaturated carboxylic acid or a derivative thereof, (B) a non-polar polymer modified with an unsaturated epoxy monomer and (C) a non-polar polymer modified with a silane monomer having an olefinically unsaturated bond.

6. An air filter composed substantially of a fibrous polymeric electret, said electret comprising 60 to 99% by weight of a non-polar polymer, 0.5 to 39.5% by weight of a polar polymer and 0.5 to 20% by weight of at least one component selected from the group consisting of (A) a non-polar polymer modified with an unsaturated carboxylic acid or a derivative thereof, (B) a non-polar polymer modified with an unsaturated epoxy monomer and (C) a non-polar polymer modified with a silane monomer having an olefinically unsaturated bond.

4,626,264

SCRUBBER FOR AN APPARATUS FOR THE DESULFURIZATION OF FLUE GAS

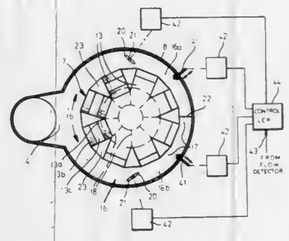
Werner Stehning, Dorsten, Fed. Rep. of Germany, assignor to Gottfried Bischopp Bau Kompl. Gasreinigungs- und Wasseruckkuhlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,455

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410110

Int. Cl.[4] B01D *45/08*

U.S. Cl. 55—213 **10 Claims**



1. A scrubber for the desulfurization of a flue gas comprising:

a column formed at a lower portion with a flue gas inlet, at an upper portion with a head having a radial outlet for discharging scrubbed flue gas, a sump for collecting scrubbing liquid below said inlet, and means between said inlet and said outlet for scrubbing rising flue gas with a scrubbing liquid containing an additive capable of absorbing sulfur oxide, said flue gas entraining scrubbing liquid into said head;

an array of impingement baffle liquid separators forming sectors disposed around a central space in said head whereby flue gas entering said central space passes radially through said sectors for removal of entrained scrubbing liquid therefrom;

means forming an annular collecting passage around said array for collecting flue gas from which liquid has been separated, said passage communicating radially with said outlet; and

at least two closure elements disposed along said passage and adapted to close off from said outlet at least one segment thereof to inactivate a corresponding group of said separators for partial load operation of the scrubber, said closure elements being provided with respective drives for shifting said elements between passage-blocking and passage-opening positions.

4,626,265

PURIFICATION SYSTEM

Joseph G. Adiletta, Thompson, Conn., assignor to Pall Corporation, Glen Cove, N.Y.

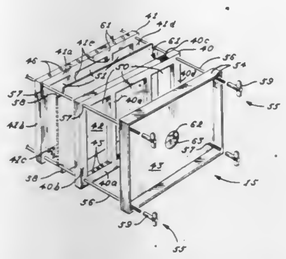
Filed Jun. 17, 1985, Ser. No. 745,508

Int. Cl.[4] B01D *53/02*

U.S. Cl. 55—316 **10 Claims**

1. An electrical purification system for purifying gas comprising a housing having an inlet and an outlet and defining a gas flow path between the inlet and the outlet; electric blower means mounted to the housing for effecting a flow of gas along the gas flow path, said blower means including a stator and a rotor magnetically coupled to each other and further including a blade means connected to the rotor and disposed within the housing in the gas flow path for forcing the gas along the gas flow path; and a selfcontained filtering means operatively associated with the housing to communicate with the flow of gas, said filtering means including a plurality of inlet cells, each having a surface with at least one inlet aperture and an internal space communicating with the inlet aperture, a plurality of

outlet cells, each having a surface with at least one outlet aperture and an internal space communicating with the outlet aperture, and a plurality of generally planar, microporous filter elements for removing particulate contaminants from the gas, said inlet and outlet cells being alternately arranged with at least one filter element disposed between each inlet cell and



outlet cell, said filtering means further including first and second impervious end means and means for sealingly compressing the filter elements, the inlet cells and the outlet cells between the impervious end means whereby the gas flows from the inlet aperture to the outlet aperture through the filter element.

4,626,266

CARBURETOR CHAMBER COVER DEVICE

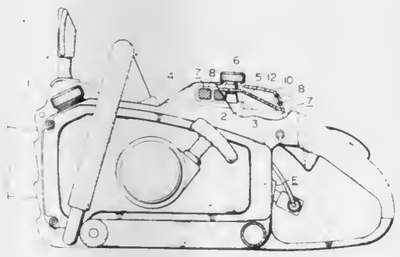
Fujio Sasaki, Mitaka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,814

Claims priority, application Japan, Nov. 22, 1983, 58-179572[U]

Int. Cl.⁴ B01D *46/00*

U.S. Cl. 55—385 R **5 Claims**



1. A carburetor chamber cover kit including a device for covering a carburetor chamber of a portable power-driven machine, said carburetor chamber accommodating an air cleaner and a carburetor for supplying air-fuel mixture to an internal combustion engine, said cover kit comprising:

a cover adapted to cover the opening of said carburetor chamber and having a plurality of air-inlet apertures; and a plurality of filter plates and a plurality of blind plates adapted to be alternatively selectively attached to said cover so as to fit said plurality of apertures.

4,626,267

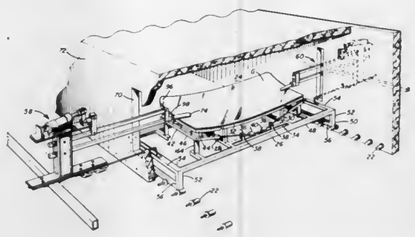
METHOD AND APPARATUS TO REDUCE TIP CURL OF A GLASS SHEET ON A BENDING MOLD

Thomas J. Reese, Sarver; David B. Rayburn, Vandergrift, and William P. Cathers, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 16, 1985, Ser. No. 776,279

Int. Cl.⁴ C03B *23/023*

U.S. Cl. 65—106 **20 Claims**



1. An apparatus for reducing the movement of an edge of a glass sheet away from a shaping rail of a bending mold while said glass sheet is conveyed along a path through a heating lehr on the bending mold comprising:

an edge roller means; and

means for biasing said roller means against said edge to urge said edge against said shaping rail as said glass sheet moves relative to said roller means through said lehr.

13. A method of reducing tip curl of glass sheets supported on a shaping rail of a bending mold, said rail being positioned slightly inboard of the perimeter of said sheets and conveyed along a path through a heating lehr to heat said sheets to their deformation temperature wherein said sheets sag and the perimeter of said glass sheets substantially conforms to the shape of said shaping rail, comprising:

contacting selected edge portions of said hot glass sheets with a roller means as said sheet moves along said path relative to said roller means; while

biasing said roller means against said selected edge portions to force said edge portion against said shaping rail of said mold as said sheet moves along said path relative to said roller means.

4,626,268

PROCESS FOR MANUFACTURING A PRODUCT SUITABLE FOR PRODUCING PURE QUARTZ GLASS AS WELL AS A PROCESS FOR PRODUCING PURE QUARTZ GLASS FROM THIS PRODUCT

Gerhard Lindemann, Clausiusstr. 40, D-6450 Hanau 1, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 713,788

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410200

Int. Cl.⁴ C03C *15/00*

U.S. Cl. 65—134 **11 Claims**

1. A process for manufacturing a product from natural non-transparent quartz (milky-quartz), the product being suitable for producing pure quartz glass, characterized by the steps of:

(a) reducing the natural non-transparent quartz into pieces which are homogeneous in themselves;

(b) washing said homogeneous pieces in a strong acid bath for a time sufficient to remove their excess sodium and potassium content;

(c) rinsing said homogeneous pieces in a purified water solution;

(d) measuring the translucency of said homogeneous pieces in said purified water solution to identify contaminated and intergrown pieces and groups of pieces having the same degree of translucency;

(e) separating said groups of pieces identified as having said same degree of translucency, one from the other, and from said contaminated and intergrown pieces to form at least one group of pieces in which all of the individual pieces within said group have the same degree of translucency; and

(f) granulating said at least one group of pieces to form said product.

4,626,269

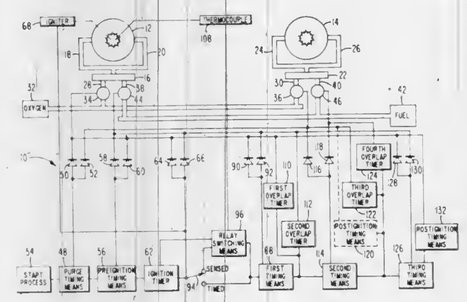
AUTOMATED SYSTEM FOR SEALING A MOUNT IN A CATHODE-RAY TUBE

Chester J. Halgas, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 20, 1985, Ser. No. 799,924

Int. Cl.⁴ C03B *23/217*

U.S. Cl. 65—162 **14 Claims**



1. An automated system for sealing a mount in a cathode-ray tube using first and second tiers of burner tips comprising:

first and second oxygen supply lines connected, respectively, to said first and said second tiers, and having first and second valves disposed therein, respectively, for controlling the flow of oxygen therethrough;

first and second fuel supply lines connected, respectively, to said first and said second tiers, and having third and fourth valves disposed therein, respectively, for controlling the flow of fuel therethrough;

preignition timing means responsive to a start signal and coupled to both said first and said third valves for effecting a preignition gas flow period;

an ignition timer responsive to said preignition timing means and coupled to both said first and said third valves and to an igniter for effecting an ignition latchup interval at the end of said preignition gas flow period;

a first timing means responsive to said ignition timer and coupled to both said first and said third valves for effecting a first-tier gas flow period following said preignition gas flow period;

a first overlap timer responsive to said first timing means and coupled to said first valve for continuing the flow of oxygen to said first tier for a first preselected time interval following said first-tier gas flow period; and

a second timing means responsive to said first timing means and coupled to both said second and said fourth valves for effecting a second-tier gas flow period at the end of said first-tier gas flow period.

4,626,270

NITRIFICATION-INHIBITING AGENT AND PROCESS FOR THE PRODUCTION THEREOF

Horst Michaud, Trostberg; Hermann Raveling, Altenmarkt, and Joachim von Seyerl, Seeon, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 420,770, Sep. 21, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 653,474

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140817

Int. Cl.⁴ C05C *9/00*

U.S. Cl. 71—28 **8 Claims**

1. An agent based on dicyandiamide for use with nitrogen-containing fertilizers to inhibit nitrification of the fertilizers consisting essentially of

60 to 99% by weight dicyandiamide and

40 to 1% by weight of a fertilizer which is readily soluble in water and/or ammonia.

4,626,271

CYANOBACTERIN HERBICIDE

Florence K. Gleason, Chaska, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 17, 1985, Ser. No. 776,842

Int. Cl.⁴ A01N *43/08*

U.S. Cl. 71—66 **6 Claims**

1. A method for inhibiting the growth of plants comprising the step of exposing the plant to a composition comprising cyanobacterin and a surfactant in a growth inhibiting effective amount.

4,626,272

CERTAIN PYRIDYLACETYLENE COMPOUNDS, COMPOSITIONS CONTAINING SAME AND HERBICIDAL METHODS OF USE

Hans-Georg Brunner, Lausen; Rolf Schurter, Binningen, and Henry Szczepanski, Wallbach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

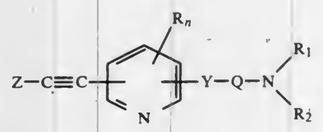
Division of Ser. No. 439,456, Nov. 5, 1982, Pat. No. 4,508,560. This application Dec. 14, 1984, Ser. No. 681,988

Claims priority, application Switzerland, Nov. 11, 1981, 7257/81

Int. Cl.⁴ A01N *43/84*; C07D *213/64*

U.S. Cl. 71—92 **18 Claims**

1. A compound of the formula



wherein

Z is phenyl which is unsubstituted or mono- or di-substituted by halogen, nitro, cyano, trifluoromethyl, C_1-C_4 alkoxy or C_1-C_4 alkyl; naphthyl; or furyl;

R is cyano, C_1-C_4 alkoxy, di(C_1-C_6-alkyl)-amino, halogen or C_1-C_4 alkyl;

n is 0, 1 or 2;

Y is oxygen or sulfur;

Q is straight-chain or branched-chain C_2-C_6-alkylene;

each of R_1 and R_2 is C_1-C_6 alkyl, C_3-C_6-alkenyl, C_3-C_6-alkynyl or C_3-C_8-cycloalkyl; or

R_1 and R_2 together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, piperazine and morpholine.

16. A method of controlling weeds, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**.

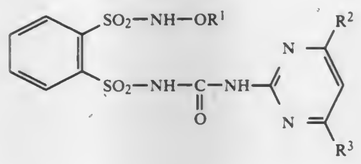
4,626,273

HERBICIDAL NOVEL 2-ALKOXYAMINOSULFONYL-BENZENE-SULFONYLUREAS

Kozo Shiokawa, Kawasaki; Toshio Goto, Sagamihara; Atsumi Kamochi, Hino; Koichi Moriya, and Shigeo Kohama, both of Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 696,837
Claims priority, application Japan, Feb. 10, 1984, 59-21839
Int. Cl.[4] A01N *9/22;* **C07D** *239/42*
U.S. Cl. 71—92 **8 Claims**

1. A 2-alkoxyaminosulfonylbenzene-sulfonylurea of the formula



in which R^1, R^2 and R^3 each independently is a lower alkyl group with 1–4 carbon atoms.

6. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compund according to claim 1.

4,626,274

HERBICIDAL AGENTS

Heinz Hausmann, Leichlingen; Robert R. Schmidt, Bergisch-Gladbach, and Herbert Voege, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,685
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247050
Int. Cl.[4] A01N *25/30*
U.S. Cl. 71—93 **8 Claims**

1. A herbicidal composition comprising a herbicidally effective amount of a triazine, traizinone or triazinedione herbicide and a synergizing amount of isopropyl myristate as a synthetic spreading agent.

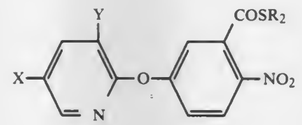
4,626,275

CERTAIN 5-(PYRIDYL-2'-OXY)-2-NITROBENZOIC ACID ESTER DERIVATIVES HERBICIDAL COMPOSITIONS CONTAINING SAME AND THEIR HERBICIDAL USE

Hermann Rempfler, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 342,879, Jan. 26, 1982, Pat. No. 4,420,328, which is a division of Ser. No. 174,985, Aug. 4, 1980, Pat. No. 4,326,880. This application Sep. 9, 1983, Ser. No. 530,802
Claims priority, application Switzerland, Aug. 14, 1979, 7430/79
Int. Cl.[4] C07D *213/64;* **A01N** *43/40*
U.S. Cl. 71—94 **16 Claims**

1. A 5-(pyridyl-2'-oxy)-2-nitrobenzoic acid derivative of the formula



wherein

X is halogen or halomethyl selected from amongst $—CF_3$, CCl_2F and $—CClF_2$,

Y is hydrogen, halogen or halomethyl selected from amongst $—CF_3$, $—CCl_2F$ and $CClF_2$, and

R_2 is C_1–C_8 alkyl substituted by C_2–C_8 alkoxy-carbonyl.

13. A method of selectively controlling weeds in a crop of useful plants, which comprises applying to said crop a herbicidally effective amount of a 5-(pyridyl-2'-oxy)-2-nitrobenzoic acid derivative according to claim 1.

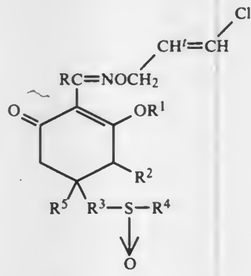
4,626,276

HERBICIDAL TRANS-2-[(3-CHLOROALLYLOXYIMINO)ALKYL]-5-(SUBSTITUTEDSULFINYLALKYL)-CYCLOHEXANE-1,3-DIONES AND DERIVATIVES THEREOF

Tatao Luo, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 618,979, Jun. 11, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,707
Int. Cl.[4] C07C *147/14;* **A01N** *31/04*
U.S. Cl. 71—103 **26 Claims**

1. A compound having the formula:



(I)

wherein R is lower alkyl;

R^1 is hydrogen, a compatible cation, or the group



wherein R^6 is lower alkyl, phenyl, indenyl, naphthyl or benzyl;

R^2 is hydrogen carboxy or alkoxycarbonyl having 2 through 6 carbon atoms;

R^3 is lower alkylene;

R^4 is lower alkyl, phenyl or substituted phenyl having 1 through 3 substituents independently selected from the group of lower alkyl, lower alkoxy, halo and haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo substituents independently selected from the group of fluoro, chloro, bromo or iodo;

R^5 is hydrogen or lower alkyl; and the designation = indicates trans-orientation with the double bond.

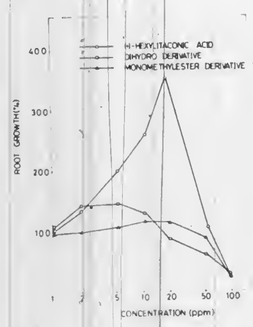
23. A herbicidal composition comprising a herbicidally effective amount of a compound according to claim 1, or mixtures of such compounds, and a compatible carrier.

4,626,277

PLANT GROWTH REGULATOR

Akinori Suzuki; Akira Isogai, both of Chiba; Suong B. Hyeon, Urawa; Takashi Kikkawa, Houya, and Shinzo Someya, Tokorozawa, all of Japan, assignors to Agro-Kanesho Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,807
Claims priority, application Japan, Dec. 6, 1984, 59-120550
Int. Cl.[4] A01N *37/06*
U.S. Cl. 71—113 **1 Claim**



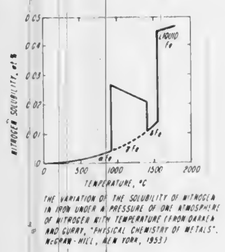
1. The method of accelerating rooting in plants which consists of treating said plants with an effective amount of [+]-hexylitaconic acid.

4,626,278

TANDEM ATOMIZATION METHOD FOR ULTRA-FINE METAL POWDER

George B. Kenney, 131 Green St., Medfield, Mass. 02052, and Charles P. Ashdown, 85 Wachusett Ave., Arlington, Mass. 02174

Filed Jul. 26, 1984, Ser. No. 634,785
Int. Cl.[4] B22D *23/08*
U.S. Cl. 75—0.5 C **12 Claims**



1. A method of producing an ultra-fine powder from a melt material, such method comprising:

dissolving in the melt a gas having a great difference in solubility between the liquid and the solid phases of the material;

atomizing the melt by means independent of the gas dissolved in the melt to produce atomized material; and

cooling the atomized material so that the dissolved gas is abruptly and voluminously released from solution, further disintegrating the atomized material to an ultra-fine powder.

4,626,279

METHOD FOR PROCESSING COPPER SMELTING MATERIALS AND THE LIKE CONTAINING HIGH PERCENTAGES OF ARSENIC AND/OR ANTIMONY

Arne Björnberg, Skelleftehamn; S. Ake Holmström, Ursviken, and Göran Lindkvist, Skelleftehamn, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed May 14, 1984, Ser. No. 609,989
Claims priority, application Sweden, Jun. 6, 1983, 8303184
Int. Cl.[4] C22B *1/02*
U.S. Cl. 75—2 **13 Claims**



1. A method for treating a sulphidic concentrate having an average particle size below 1 millimeter which concentrate is intended for further processing to recover at least one of copper and precious metals and which contains at least one mineral complex containing a contaminant selected from the group of arsenic, antimony, bismuth and mixtures thereof in quantities adversely affecting subsequent processing stages comprising:

(a) introducing the concentrate and fluidizing gas into a fluidized bed reactor;

(b) heating the concentrate to the lowest temperature exceeding the splitting or decomposition temperatures of at least one mineral complex present in the concentrate;

(c) regulating the oxygen potential in the reactor to a level within the range of 10^{-14} to 10^{-16} atmosphere by adjusting the composition of the gas introduced into the reactor so as to prevent the formation of non-volatile compounds of said contaminant;

(d) controlling the concentrate residence time in the reactor by adjusting the solids-to-gas ratio in the reactor so as to ensure substantial elimination of contaminant;

(e) removing the gas and solids from the reactor;

(f) passing said gas and solids to a separating means in which solids substantially free from contaminant are separated from the gas;

(g) maintaining the aforesaid lowest temperature and said regulated oxygen potential through-out the period over which the solids are in contact with said gas;

(h) returning at least a part of the separated solids to the reactor in order to control the residence time thereof; and

(i) removing a partially roasted final product from at least one of the fluidized bed and the separating means which has an arsenic content no greater than 0.64%, an antimony content no greater than 0.15% and a bismuth content no greater than 0.1%.

4,626,280

RECOVERY OF TUNGSTEN, SCANDIUM, IRON, AND MANGANESE FROM TUNGSTEN BEARING MATERIAL

Clarence D. Vanderpool; Martin B. MacInnis, both of Towanda, and Judith A. Ladd, Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 24, 1986, Ser. No. 838,482
Int. Cl.[4] C22B *3/00*
U.S. Cl. 75—101 R **7 Claims**

1. A process for recovering tungsten, scandium, iron, and

manganese from tungsten bearing material, said process comprising:

(a) digesting said material in a sulfur dioxide solution at a sufficient temperature for a sufficient time to form a digestion solution containing the major portion of the scandium, iron and manganese and a digestion residue containing the major portion of the tungsten;

(b) separating said digestion solution from said digestion residue;

(c) extracting the major portion of the scandium from said digestion solution with an organic solution consisting essentially of an extracting agent which is essentially a mixture of tertiary alkyl primary amines which are present in an amount sufficient to extract the major portion of the scandium without extracting iron and manganese, and the balance an essentially aromatic solvent;

(d) separating the resulting scandium containing organic from the resulting raffinate;

(e) stripping essentially all of the scandium from the scandium-containing organic solution by contacting said scandium-containing organic solution with hydrochloric acid to form a scandium containing hydrochloric acid solution;

(f) separating said scandium containing hydrochloric acid solution from the resulting stripped organic solution;

(g) adjusting the pH of the raffinate to at least about 3.5 with a base to form a precipitate containing the major portion of the iron and manganesee which was in said aqueous phase;

(h) separating said precipitate from the resulting liquor;

(i) contacting chlorine gas with an aqueous slurry of said precipitate at a sufficient temperature for a sufficient time to form a manganese containing solution containing the major portion of the manganese which was in said precipitate and an iron solid containing the major portion of the iron which was in said precipitate.

4,626,281

HARD METAL COMPOSITION

Haskell Sheinberg, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 517,536, Jul. 26, 1983, abandoned. This application May 7, 1985, Ser. No. 731,616

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ C22C *29/00*

U.S. Cl. 75—238 **6 Claims**

1. A hard composition of matter having a Rockwell A hardness value of at least approximately 85, comprising the compressed and densified reaction product of:

a minor amount of a boron carbide component selected from the group consisting of (a) boron carbide and (b) boron and carbon, the boron and carbon being present in amounts sufficient to form boron carbide in situ, wherein said boron carbide component consists essentially of B_4C;

a major amount of a metal mixture consisting essentially of:

(a) a first metal component selected from the group consisting of tungsten and molybdenum and mixtures thereof, and

(b) a second metal component selected from the group consisting of nickel and iron and mixtures thereof;

wherein said minor amount of said boron carbide component is between 3% and 6% by weight of said composition of matter when said first metal component is tungsten, said minor amount of said boron carbide component is between 6% and 10% by weight of said composition when said first metal component is molybdenum, and said boron carbide component is between 3% and 10% when said first metal component is a mixture of tungsten and molybdenum, with the remainder of the composition being formed of said metal mixture; and

wherein said first metal component is from 70% to less than about 90% by weight of said metal mixture when said first metal component is tungsten, and wherein said first metal component is from 72% to less than about 90% by weight of said metal mixture when said first metal component is molybdenum; with the remainder of said metal mixture in each case being formed of said second metal component, and wherein for hard compositions of matter with similar Rockwell A hardness properties when one unmixed said first metal component is totally substituted for the other unmixed said first metal component, the ratio of the moles of the unmixed first metal component to moles of boron carbide is held constant; and wherein for hard compositions of matter with similar Rockwell A hardness properties when said first metal component is a mixture of tungsten and molybdenum, the sum of the number of moles of tungsten and molybdenum is held constant with respect to the number of moles of boron carbide.

4,626,282

CONTACT MATERIAL FOR VACUUM CIRCUIT BREAKER

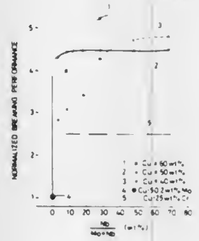
Eizo Naya, and Mitsuhiro Okumura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,983

Claims priority, application Japan, Oct. 30, 1984, 59-230619; Nov. 20, 1984, 59-247517

Int. Cl.⁴ B22F *1/00*

U.S. Cl. 75—247 **7 Claims**



1. Contact material for vacuum circuit breaker which contains elements of: (1) copper; (2) molybdenum; and (3) niobium or tantalum.

4,626,283

CORROSION AND MARINE GROWTH INHIBITING COMPOSITIONS

Evon Martins, Somerville, and Richard A. Slepetys, Bricktown, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Mar. 21, 1985, Ser. No. 714,709

Int. Cl.⁴ C04B *9/02*

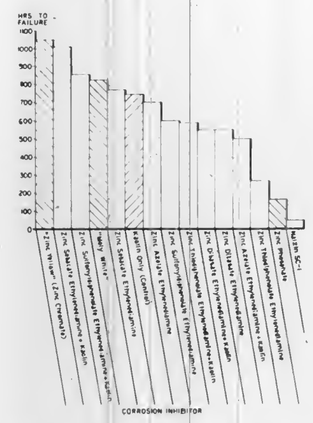
U.S. Cl. 106—14.24 **42 Claims**

1. In a coating composition for protecting metallic substrates against corrosion comprising

a film-forming vehicle and a corrosion inhibitor; the improvement comprising, as said inhibitor, an effective amount of an amine-complexed zinc salt of an organic diacid selected from the group consisting of (i) dicarboxylic acids and (ii) diphenols;

wherein said amine-complexed zinc salt of said organic diacid has the structural formula:

$$ZnA_x.B_y$$



wherein A is the organic diacid residue, B is the amine, x is between 0.6 and 1.0, and y is between 0.03 and 0.87.

4,626,284

RECORDING LIQUID

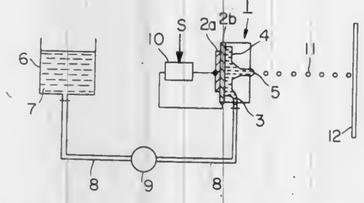
Tokuya Ohta; Masatsune Kobayashi, both of Tokyo; Konoe Miura, and Hiroshi Takimoto, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Canon Inc., both of Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,730

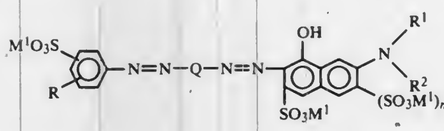
Claims priority, application Japan, Oct. 8, 1983, 58-188653; Nov. 17, 1983, 58-216664

Int. Cl.⁴ C09D *11/02*

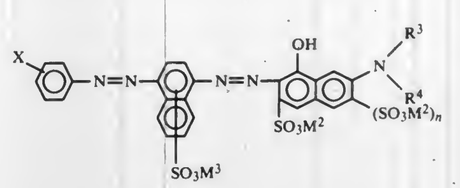
U.S. Cl. 106—22 **18 Claims**



1. A recording liquid for ink jet recording or for writing comprising at least one of naphthalenedisazoic dyes represented by general formula (I) or (II) and a liquid medium for dissolving and dispersing the dye;


(I)

wherein Q represents a phenylene or naphthalene group substituted by a group shown by $—SO_3M^1$; R represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a lower acylamino group, a nitro group or a halogen atom; R^1 represents a phenyl group substituted by a group shown by $—SO_2M^1$ or a group shown by $—COOM^1$, a lower alkyl group substituted by a group shown by $—COOM^1$, or a lower alkylaminocarbonyl lower alkyl group; R^2 represents a hydrogen atom, a lower alkyl group substituted by a group shown by $—COOM^1$, or a lower alkylaminocarbonyl lower alkyl group; M^1 represents an alkali metal atom, an ammonium cation, or H.A. (wherein A represents an amine); and n represents 0 or 1;


(II)

wherein X represents an alkylcarbonylamino group having 2 to 5 carbon atoms, an arylcarbonylamino group, an alkylsulfonylamino group having 1 to 4 carbon atoms, an arylsulfonylamino group, an unsubstituted carbonamido group or a carbonamido group substituted by an alkyl group having 1 to 4 carbon atoms, an unsubstituted sulfonamido group, a sulfonamido group substituted by an alkyl group having 1 to 4 carbon atoms, or a group shown by $—SO_3M^2$; R^3 represents a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, or a group shown by $—CH_2SO_3M^2$; R^4 represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms; said R^3 and R^4 do not represent, however, a hydrogen atom at the same time when X is a group shown by $—SO_3M^2$; M^2 represents an alkali metal atom an ammonium cation, or H.A. (wherein A represents an amine); and n represents 0 or 1.

4,626,285

FLUID LOSS CONTROL IN OIL FIELD CEMENTS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J.; Lawrence Sedillo, Houston, and John C. Newlove, Kingwood, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 19, 1984, Ser. No. 651,897

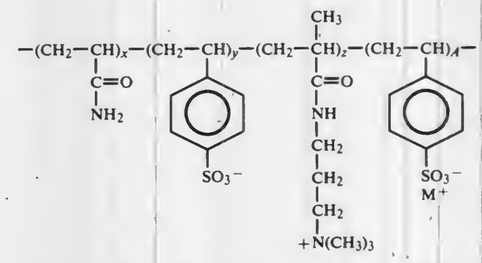
Int. Cl.⁴ C04B *7/35*

U.S. Cl. 106—90 **4 Claims**

1. A cement fluid loss composition which comprises an aqueous slurry of:

(a) about 35 to about 90 weight percent of water based on weight percent of dry cement; and

(b) about 0.1 to about 2 weight percent of a terpolymer based on weight percent of dry cement, said terpolymer having the formula:



wherein x is about 40 to about 98 mole %, y is about 2 to about 20 mole %, z is about 2 to about 20 mole %, y is equal to z, A is about 1 to about 50 mole %, wherein the sum of A, y and z is less than 60 mole % and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IVA, VIA, VIIA, VIIIA, IB and IIB of the Periodic Table of Elements.

4,626,286

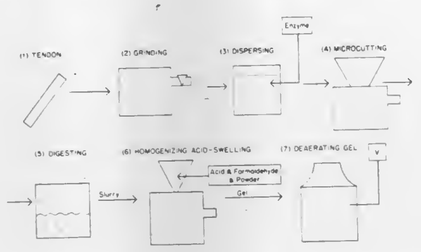
COLLAGEN GEL AND THE PROCESS OF MAKING SAID GEL

Eugene K. Lubbs, Milford, N.J., assignor to Schmid Laboratories, Inc., Little Falls, N.J.

Continuation of Ser. No. 546,963, Oct. 31, 1983, abandoned. This application Mar. 27, 1985, Ser. No. 716,521

Int. Cl.[4] C08L *89/00*

U.S. Cl. 106—157 **32 Claims**



1. A method of making collagen gel for use in the manufacture of thin collagen film article shaving superior mechanical properties comprising:

comminuting clean animal tendon containing at least 30% collagen essentially free of ligamentous tissue in the presence of about 65% water by weight to form a collagen slurry;

treating said slurry with about 0.1–0.5% by weight of proteolytic enzyme derived from *Aspergillus oryzae* which effectively digests elastin and other non-collagenous matter contained in said tendon while leaving the collagen structure of said tendon substantially intact, said percentage being based on the collagen solids content of said slurry:

swelling the slurry with an acid selected from the group consisting of lactic acid, maleic acid, succinic acid, malic acid, oxalic acid, and tartaric acid to form a swollen collagen suspension;

homogenizing and deaerating said suspension to form a collagen gel.

4,626,287

PROCESS FOR PREPARING SUCROSE ENCRUSTED METHYLCELLULOSE PARTICLES FOR USE IN BULK LAXATIVE COMPOSITIONS

Dhiren N. Shah, Loveland; Jack Domet, and Gregory V. Hammer, both of Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 29, 1985, Ser. No. 695,984

Int. Cl.[4] C08L *1/28*

U.S. Cl. 106—197.1 **8 Claims**

1. In a process for preparing a sucrose encrusted methylcellulose particle suitable for use in a bulk laxative composition wherein sucrose and methylcellulose are mixed in the presence of water the improvement which comprises mixing hot sucrose syrup with powdered methylcellulose.

4,626,288

STARCH DERIVATIVES FORMING REVERSIBLE GELS

Peter T. Trzasko, Plainsboro; Martin M. Tessler, Edison, and Teresa A. Dirscherl, North Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 690,423, Jan. 10, 1985, abandoned. This application Dec. 12, 1985, Ser. No. 808,408

Int. Cl.[4] C08L *3/06, 3/08, 3/10*

U.S. Cl. 106—210 **20 Claims**

1. A gelling agent, which comprises a starch derivative containing an ether or ester substituent group with an at least C_{12} linear hydrocarbon chain, wherein the starch derivative is prepared by reacting an unmodified or modified starch base with an effective amount of an etherifying or esterifying reagent containing the hydrocarbon chain, the starch base having an amylose content of at least 17% by weight and the modified starch being a lightly derivatized, lightly converted, and/or lightly crosslinked starch; characterized in that a reversible gel is formed by an aqueous solution or dispersion of the starch derivative obtained by thermal-gelatinization at a pH of about 3–8 upon cooling or obtained by room temperature alkali-gelatinization at pH 13 or above upon pH adjustment to below pH 13.

4,626,289

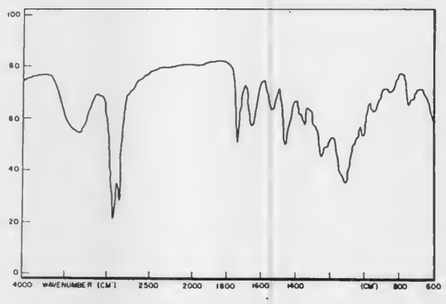
TREATED GLASS FIBERS AND AQUEOUS DISPERSION AND NONWOVEN MAT OF GLASS FIBERS

Ed C. Hsu, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 422,771, Sep. 24, 1982, Pat. No. 4,536,447. This application Mar. 28, 1985, Ser. No. 717,278

Int. Cl.[4] C08L *91/00*; D02G *3/00*

U.S. Cl. 106—287.34 **5 Claims**



1. Aqueous dispersion of chopped glass fiber strands, comprising: water and chopped glass fibers having a coating of an aqueous chemical treating composition, consisting of;

a. nonionic surfactant,

b. cationic quaternay anmonium salt surfactant, where the ratio of the nonionic to cationic surfactants is about 1 to about 99 to about 99 to 1,

c. polar functional coupling agent selected from the group consisting of organo metallic and organo-silane coupling agents having polar organic functionalities, and

d. water in an amount to give a total solids content that is effective for applying the composition to glass fibers,

where the chopped glass fibers have a length of about 1/16 of an inch to about 3 inches and are present in an amount of about 0.001 to about 5 weight percent of the dispersion.

4,626,290

INORGANIC FILLER AND PROCESS FOR PRODUCTION THEREOF

Tadahisa Nakazawa, Tokyo; Masahide Ogawa, Shibata; Kiyoshi Abe, Shibata, and Kazuhiko Suzuki, Shibata, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

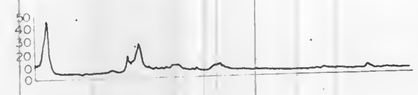
Filed Mar. 26, 1985, Ser. No. 716,095

Claims priority, application Japan, Mar. 26, 1984, 59-56264

Int. Cl.[4] C04B *14/00*

U.S. Cl. 106—288 B **21 Claims**

1. An inorganic filler composed of a modified clay mineral obtained by reacting a clay mineral of the montmorillonite group with an alkaline earth metal hydroxide and thereafter substituting a metallic component of Group IIb, III or IV of the periodic table for the alkaline earth metal component, said modified clay mineral having an X-ray diffraction pattern



inherent to montmorillonite, an oil absorption of at least 100 ml/100 g and a Hunter whiteness of at least 80%.

4,626,291

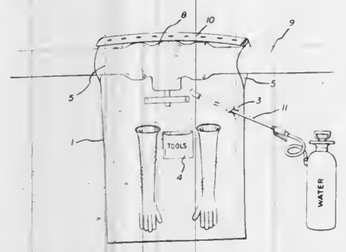
PORTABLE CONTAINMENT DEVICE FOR TREATMENT OF HAZARDOUS MATERIALS

Thomas Natale, 99 Ivy Ave., Moorestown, N.J. 08057

Continuation of Ser. No. 543,850, Oct. 20, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 777,560

Int. Cl.[4] B08B *5/04*

U.S. Cl. 134—21 **10 Claims**



1. A disposable device adapted for receiving asbestos insulation and like hazarous materials, said disposable device comprising:

a length of lay-flat tubing forming a bag, said bag being flexible and collapsible and including

two sides,

two side edges formed by opposed folds of said bag, said two side edges joining said two sides together,

a top edge of said bag and a bottom edge of said bag, said two side edges extending substantially parallel to each other from said top edge of said bag to said bottom edge of said bag,

said top edge and said bottom edge extending substantially parallel to each other and extending substantially perpendicular to said two side edges,

said bottom edge being sealed to close off a bottom of said bag and said top edge having an opening for entry of said asbestos insulation and like hazardous materials into the interior of said bag, and

glove means sealed to one of said two sides of said bag for protected access to the interior of said bag from the exterior of said bag.

4,626,292

SOFT CONTACT LENS WETTING AND PRESERVATION METHOD

Guy J. Sherman, Mandeville, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Division of Ser. No. 537,245, Sep. 28, 1983, Pat. No. 4,528,535, which is a continuation-in-part of Ser. No. 384,110, Jun. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 53,758, Jul. 2, 1979, abandoned. This application Nov. 1, 1984, Ser. No. 667,120

The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.

Int. Cl.[4] C11D *3/48, 1/72*

U.S. Cl. 134—26 **1 Claim**

1. A method of wetting a silicone copolymer contact lens having a surface charge, said method comprising:

neutralizing said surface charge and contacting the lens with a wetting composition, said wetting composition includes a wetting system and a preservative system, said wetting system comprising a wetting agent selected from the group consisting of polyvinyl alcohol, polyvinylpyrrolidone, and mixtures thereof, and said preservative system comprising from about 0.05% to about 2.0% trimethoprim by weight of the total composition, a first adjuvant bactericide comprising from about 0.025% to about 0.5% ethylenediaminetetraacetic acid or a water soluble salt thereof by weight of the total composition and a second adjuvant bactericide comprising from about 0.001% to about 0.20% sorbic acid by weight of the total composition.

4,626,293

METHOD OF MAKING A HIGH VOLTAGE DMOS TRANSISTOR

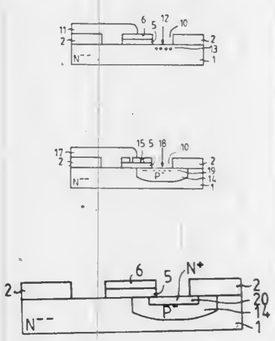
Gustaaf Schols, Brugge, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 27, 1984, Ser. No. 625,723

Claims priority, application Belgium, Jun. 27, 1983, 2/60137

Int. Cl.[4] H01L *27/02, 21/265*

U.S. Cl. 148—1.5 **7 Claims**



1. A process for making a semiconductor device comprising the steps of:

providing a substrate of a first conductivity type;

covering said substrate with an oxide layer;

forming a polysilicon gate on said oxide layer;

forming an opening in said oxide layer;

subjecting said substrate to a first predeposition of impurity material of a second conductivity type through said opening;

subjecting said substrate to a first diffusion drive-in operation to form a well of said second conductivity type therein through said opening;

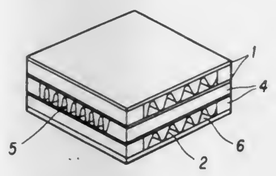
subjecting said substrate to a second predeposition and second diffusion drive-in steps of impurity material to form a region in said well through said opening separated from

the boundary of said well by a channel zone, said channel zone being formed under said polysilicon gate;
covering said polysilicon gate by a silicon nitride layer during at least said first drive-in step; and
wherein said region forms the source of said device and said substrate forms the drain of said device.

4,626,294
LIGHTWEIGHT ARMOR PLATE AND METHOD
Robert E. Sanders, Jr., New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed May 28, 1985, Ser. No. 738,613
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—11.5 A **32 Claims**

1. In the method of producing improved aluminum-magnesium alloy armor plate, wherein aluminum-magnesiums alloy is cold rolled to a reduction of at least 10% to produce cold-rolled plate, the imrpovement comprising:
(a) providing an aluminum alloy consisting essentially of about 6 to 10% magnesium, about 0.1 to 1% manganese, 0.05 to 0.23% chromium, balance aluminum and incidental elements and impurities;
(b) heating said alloy to a temperature of at least 600° F.;
(c) cooling said alloy at a controlled cooling rate of at least 10° F. per minute down to a temperature of 200° F. or less; and
(d) cold rolling said alloy.

4,626,295
METHOD OF PRODUCING ALUMINUM ALLOY STRUCTURES
Kantaro Sasaki, Ashiya; Shosuke Iwasaki, Kobe; Tetsuo Abiko, Osaka; Yoshio Baba, Nagoya; Michiki Hagiwara, Nagoya, and Keizo Nanba, Nagoya, all of Japan, assignors to Sumitomo Precision Products Co., Ltd., Hyogo, Japan
Filed Apr. 26, 1985, Ser. No. 727,775
Int. Cl.[4] C21D *1/00*
U.S. Cl. 148—127 **5 Claims**



1. A method of producing brazed aluminum alloy structures of high brazing joint strength, comprising:
forming said joint by brazing using brazing sheets formed by cladding both surfaces of a core member with a brazing material and joining it to a second member comprised of an aluminum alloy which has not been subjected to a heat treatment prior to brazing;
treating the resulting brazed structure at a temperature of 500°–570° C. for at least one hour.

4,626,296
SYNTHESIS OF NEW AMORPHOUS METALLIC SPIN GLASSES
Robert C. Haushalter, Clinton, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Feb. 11, 1985, Ser. No. 700,845
Int. Cl.[4] C22C *38/00, 19/07*
U.S. Cl. 148—403 **2 Claims**

1. An amorphous metallic precipitate consisting essentially of the formula $(M_1)_a(M_2)_b$ wherein M_1 is Fe and M_2 is $SnTe_4$ and the integers a and b which provide stoichiometric balance are respectively 2 and 1, said precipitate has been formed from a solution of chemical compounds M_1X and YM_2 in a chemical solvent wherein YX are soluble in said solvent.

4,626,297
SINGLE-CRYSTAL ALLOY
Geoffrey W. Meetham, Allestree; Michael J. Goulette, Mickleover, and Roger P. Arthey, Melbourne, all of England, assignors to Rolls-Royce plc, London, England
Continuation of Ser. No. 242,827, Mar. 12, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 538,844
Claims priority, application United Kingdom, Mar. 13, 1980, 8008579
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—404 **5 Claims**

1. A single crystal alloy suitable for use in the form of a single-crystal casting consisting essentially of the following constituents by weight percent:

Chromium	11–12%
Cobalt	4–12%
Molybdenum	2.0–2.5%
Tungsten	0.5–1.0%
Tantalum	5–6%

The sum of

$$\text{Molybdenum \%} + \frac{\text{Tungsten \%}}{2} + \frac{\text{Tantalum \%}}{3}$$

lying between 4 and 6

Aluminium	4–5.5%
Titanium	1.5–3.5%

The sum of

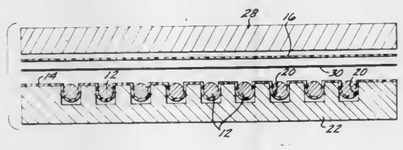
$$\text{Aluminium \%} + \frac{\text{Titanium \%}}{2}$$

lying between 5 and 7

Carbon	0.015–0.05%
Boron	0–0.01%
Zirconium	0–0.01%

balance essentially Nickel plus incidental impurities.

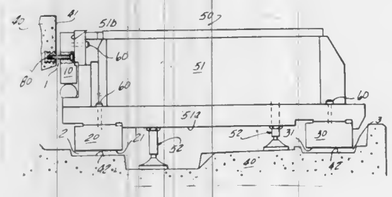
4,626,298
METHOD OF MAKING FLAT MULTIPLE CONDUCTOR CABLE
Ira L. Allard, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Mar. 25, 1985, Ser. No. 715,697
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—55 **10 Claims**



1. A method of forming a flat conductor cable having a plurality of elongated generally round wire conductors, comprising the steps of:

preforming a plurality of elongated and generally parallel spaced channels into a lower ply of a relatively thin and lightweight polyimide sheet material;
placing the round wire conductors into the spaced channels of the lower ply of polyimide sheet material; and
bonding the lower ply of polyimide sheet material together with an upper ply of a relatively thin and lightweight polyimide sheet material with the round wire conductors supported within the spaced channels.

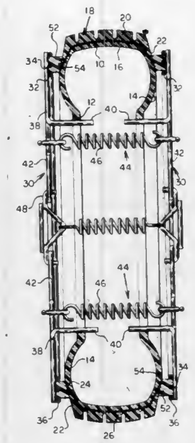
4,626,299
METHOD OF ATTACHING GUIDEWAYS TO A MACHINE TOOL BED
Edwin L. Knight, Ware, and William S. Shea, Clinton, both of Mass., assignors to The Warner & Swasey Company, Cleveland, Ohio
Filed Jun. 24, 1985, Ser. No. 748,091
Int. Cl.[4] E04B *2/00*; E04F *13/00*
U.S. Cl. 156—71 **6 Claims**



1. A method of attaching guideways (**10, 20, 30**) to a machine tool bed (**40**), comprising the steps of:
attaching a plurality of guideways (**10, 20, 30**) to a fixture (**50**) to hold said guideways in a predetermined spaced relationship;
locating the fixture (**50**) in a predetermined relationship to said bed (**40**) so that there is a respective space (**1, 2, 3**) between each of said guideways (**10, 20, 30**) and said bed (**40**);
filling the space (**1, 2, 3**) between said guideways (**10, 20, 30**) and said bed with a bonding material (**70**);
allowing the bonding material (**70**) to harden to bond each of said guideways (**10, 20, 30**) to said bed (**40**) and;
removing the fixture (**50**) from the guideways (**10, 20, 30**).

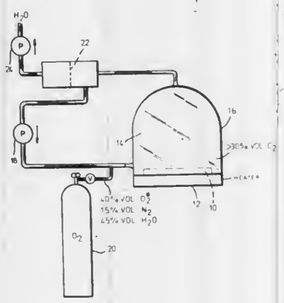
4,626,300
METHOD AND APPARATUS FOR VULCANIZING RETREADED TIRES
Carlton K. Barefoot, Muncie, Ind., assignor to Tred-X Corporation, Muncie, Ind.
Filed Oct. 1, 1984, Ser. No. 656,332
Int. Cl.[4] B29D *30/56*; B29C *33/40*
U.S. Cl. 156—96 **6 Claims**

1. The method of retreading a tire with a pre-cured, pre-molded annular full circle tread wherein an uncured layer of bonding material having marginal edges is located between a tire having sides and a pre-cured, pre-molded annular full circle tread mounted upon the tire having marginal edges overlying portions of the tire sides in an autoclave comprising the steps of:
(a) confining only the marginal edges of the tread and bonding material and the tire sides adjacent the tread and bonding material marginal edges with an elastomeric material having an ironing surface of a configuration blending with the tire sides on both sides of the tire such that the ironing surface wil be uniformly and closely held against the entire configuration of the tread marginal edges,
(b) placing the tire and tread assembly in an autoclave,
(c) heating the assembly in the autoclave in a pressurized environment to vulcanize the tread to the tire and confining and shaping the tread and bonding material at the tread and bonding material marginal edges to produce a blended transition at the tread marginal edges and tire sides,
(d) removing the tire and tread assembly from the autoclave, and



(e) releasing the confinement of the marginal edges of the tread and bonding material.

4,626,301
METHOD OF MAKING A FIRE-RESISTANT TRANSLUCENT LAYER
Hans-Henning Nolte, Gelsenkirchen, Fed. Rep. of Germany, assignor to Flachglas Aktiengesellschaft, Furth, Fed. Rep. of Germany
Continuation of Ser. No. 515,923, Jul. 20, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,367
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227057
Int. Cl.[4] B32B *17/00*
U.S. Cl. 156—99 **6 Claims**



1. A method of making a flame-resistant layer which comprises the steps of:
depositing an aqueous composition of an alkali metal silicate upon a substrate; and
drying said composition on said substrate in a drying atmosphere consisting essentially of oxygen with an oxygen content maintained at at least 30% by volume free oxygen, a maximum of 15% by volume of gases selected from the group which consists of argon, nitrogen and sulfur hexafluoride, and the balance a gas selected from the group which consists of water vapor and helium.
6. The method defined in claim 1 wherein said substrate is a

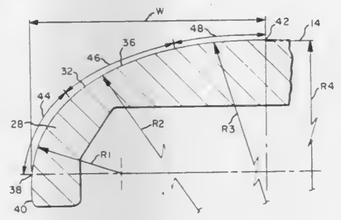
glass pane, further comprising the step of covering said layer after the drying thereof with a second glass pane.

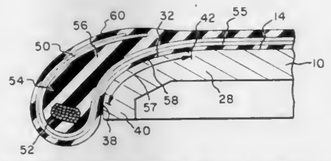
4,626,302

TIRE BUILDING APPARATUS AND METHOD

William R. Casey; Robert P. Loser, both of Akron; Michael W. Smith, Brimfield, and Terry J. Waibel, Seville, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 24, 1984, Ser. No. 653,215
Int. Cl.[4] B29D *30/26*
U.S. Cl. 156—133 **9 Claims**





1. A tire building drum rotatable about a drum axis comprising a generally cylindrical surface having shoulders at axially spaced-apart edges thereof, each of said shoulders having a curved shoulder surface for supporting a lower sidewall of a tire carcass built on said drum, said shoulder surface being curved and defining a curved line of intersection of said shoulder surface and a radial plane containing said drum axis which has a curvature that can be generated as a segment of a conic section disposed at an angle other than a right angle to the axis of said cone for increasing the radius of curvature of said line of intersection from a first position adjacent an axially outer edge of said drum to a second position adjacent said cylindrical surface of said drum whereby during shaping of said tire carcass built on said drum and bending of said lower sidewall the compressive forces are dispersed in the outer portions of said lower sidewall between said first position and said second position.

7. A method of making a tire carcass comprising:

(a) rotating a generally cylindrical tire building drum about a drum axis;

(b) applying green tire components to said tire building drum;

(c) forming a generally cylindrical radially inner surface of said components on a cylindrical central part of said drum;

(d) forming curved radially inner surfaces of said lower sidwalls on curved shoulder surfaces of said drum with each of said radially inner surfaces of said lower sidewalls having a curved line of intersection of each of said shoulder surfaces with a radial plane containing said drum axis and said line of intersection having a curvature that can be generated as a segment of a conic section disposed at an angle other than a right angle to the axis of said cone for increasing the radius of curvature of each of said inner surfaces of said lower sidewalls from a first position at the axially outer edge of said tire carcass to a second position on said cylindrical inner surface;

(e) removing said tire carcass from said tire building drum; and

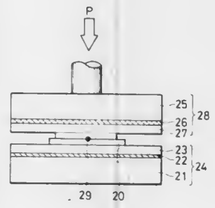
(f) shaping said tire carcass to a generally toroidal form by bending said lower sidewalls so that compressive forces resulting from said bending are dispersed in outer portions of said lower sidewalls between said first and second positions providing a generally flat contour.

4,626,303

PROCESS FOR MAKING ELECTRO-OPTIC ELEMENT

Makoto Ogura, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,448, Oct. 19, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 779,296
Claims priority, application Japan, Oct. 27, 1982, 57-189692
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—145 **24 Claims**



1. A process for making electro-optic elements, which comprises the steps of:

a. setting up an enclosure by sealing peripheral areas of a pair of electrode plates spaced at a given distance,

b. filling the enclosure with a liquid material capable of producing an electro-optical change through a filling hole thereof, and

c. sealing the filling hole while applying positive pressure by a pressing means to the external surface of the electrode plates forming the enclosure.

4,626,304

METHOD OF MAKING A LIGHT-POLARIZING PLATE

Takuzo Okumura, Osaka; Masataka Yanase, Tokyo, and Hitoshi Kikui, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 584,908, Feb. 29, 1984, Pat. No. 4,564,545. This application Sep. 17, 1985, Ser. No. 776,834
Claims priority, application Japan, Mar. 1, 1983, 58-034236
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—163 **6 Claims**

1. A process for producing a light-polarizing plate comprising a hydrophilic light-producing film covered with high polymer film protector comprising reducing the moisture content of said hydrophilic light-polarizing film to 5% or less then covering the hydrophilic film with a hydrophobic high polymer film protector having a water vapor transmission of not more than 10 g/m^2 day and an average light transmission in the visible region of not less than 30%.

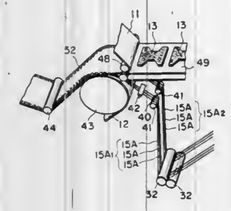
2. A process according to claim 1 wherein the hydrophobic high polymer film protector is uniaxially stretched.

4,626,305

DISPOSABLE DIAPER AND METHOD FOR INCORPORATION OF ELASTIC MEMBER INTO SUCH DIAPER

Migaku Suzuki; Satoshi Sasaki; Takashi Mitsuno, and Hiroyuki Inagaki, all of Ehime, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 460,909, Jan. 23, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,369
Claims priority, application Japan, Apr. 14, 1982, 57-61946
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—164 **7 Claims**



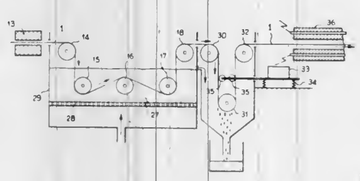
1. A method for incorporation of elastic members into a disposable diaper including a topsheet, a backsheet, an absorbent body fixedly interposed between said both sheets, and elastic members arranged in respective side flaps formed by portions of said both sheets extending beyond opposite outer edges of said absorbent body so as to be closely laid upon one another so that longitudinal elastic lines are formed in said side flaps to fit said side flaps around infant's thighs, said method comprising steps of feeding an elastic member in the form of a tape consisting of six (6) to ninety (90) rubber strings joined together in parallel, said rubber strings each having a substantially equal cross-sectional area of 0.03 mm^2 to 0.45 mm^2 and a totally cross-sectional area of 0.18 mm^2 to 2.7 mm^2, separating these rubber strings along joints thereof into individual rubber strings while stretched at a stretching ratio of 100% to 400%, supplying respective three (3) to forty-five (45) rubber strings of said six (6) to ninety (90) rubber strings onto regions of the diaper to be formed into said side flaps at appropriate intervals while these rubber strings are applied with adhesive agent, and adhesively securing these rubber strings in said regions.

4,626,306

PROCESS FOR MANUFACTURING PROFILED STRIPS IN FIBER-LOADED THERMOPLASTIC RESIN, INSTALLATION FOR THE IMPLEMENTATION THEREOF AND PROFILED STRIPS OBTAINED

Gilbert Chabrier, Montmorency; Guy Moine, Domont; Roger Maurion, Montigny les Cormeilles, and René Szabo, Le Peco, all of France, assignors to Spie-Batignolles, Puteaux and Coflexip, Paris, both of, France

PCT No. PCT/FR82/00192, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01755, PCT Pub. Date May 26, 1983
Continuation of Ser. No. 522,379, Jun. 20, 1983, abandoned. This PCT application Nov. 17, 1982, Ser. No. 819,481
Claims priority, application France, Nov. 18, 1981, 81 21545
Int. Cl.[4] B05D *1/24*
U.S. Cl. 156—180 **9 Claims**



1. A process for manufacturing thin profiled strips composed of continuous unidirectional fibers embedded in a thermoplastic resin, comprising the following successive steps:

(a) dipping a lap (1) of parallel and equally-taut fibers in a bath (26, 27) of resin particles,

(b) feeding the lap over rollers (15, 16, 17) immersed in said bath of resin particles,

(c) exerting on the lap of fibers running over said rollers (15, 16, 17) immersed in the resin, a tension such that the resin particles trapped between the rollers and the lap can penetrate into the lap, by pushing the fibers apart from each other and be caught in the lap once the lap has passed around the rollers, while leaving in the lap resin particles in excess of a desired resin-to-fiber content ratio,

(d) continuously vibrating the lap to remove said excess resin particles in the lap thereby to achieve said desired resin-to-fiber content ratio,

(e) heating the lap loaded with particles to melt said resin particles, and

(f) forming and cooling the obtained profiled strip.

5. An installation for manufacturing thin profiled strips composed of continuous unidirectional fibers embedded in a thermoplastic resin, comprising:

means for dipping a lap (1) of parallel and equally-taut fibers in a bath (26, 27) of resin particles,

means for feeding the lap over rollers (15, 16, 17) immersed in said bath of resin particles,

means for exerting on the lap of fibers running over said rollers (15, 16, 17) immersed in the resin, a tension such that the resin particles trapped between the rollers and the lap can penetrate into the lap, by pushing the fibers apart from each other and be caught in the lap once the lap has passed around the rollers, while leaving in the lap resin particles in excess of a desired resin-to-fiber content ratio,

an agitator (33) adapted to vibrate continuously said lap at adjustable frequency and amplitude for removing said excess resin particles in the lap thereby to achieve said desired resin-to-fiber content ratio,

means for heating the lap loaded with particles to melt said resin particles, and

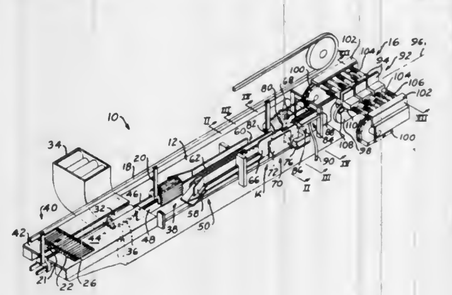
means for forming and cooling the obtained profiled strip.

4,626,307

MACHINE AND METHOD FOR ASSEMBLING PLEATED FILTER MATERIAL AND A HOLLOW CORE MEMBER

Paul Cherkas, Saratoga; Joel L. Fritsche, Sunnyvale, both of Calif.; John J. Groezinger, Dunlap, Ill.; Paul D. LaGorce, Oakland, Calif., and Ronald W. Streitmatter, Toulon, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1985, Ser. No. 812,679
Int. Cl.[4] B31F *1/00*
U.S. Cl. 156—218 **15 Claims**



9. A method for assembling a pleated filter material and a perforate-hollow core member, including the steps of:

conveying a rectangularly-shaped pack of longitudinally pleated filter material having a predetermined number of

pleats uniformly spaced between opposed end pleats each having a free end;

conveying a perforate hollow core member and bringing said core member into contact with said pleated filter pack;

supporting a selected one of said filter pack and said core member on the other, and simultaneously conveying said pack of filter material and said core member through a wrapping station and an adhesive application station;

forming said pack of filter material about the core member and bringing the free ends of the end pleats into juxtaposition;

applying an adhesive material to an apposed surface of at least one of the juxtaposed free ends;

clamping together the apposite end surface of each of the end pleats; and,

simultaneously conveying the assembled pack of filter material and core member, and maintaining the clamping force on the joined end surfaces for a period of time sufficient to permit curing of the adhesively bonded joint therebetween.

4,626,308

METHOD OF MAKING WELDED PIPE JOINTS

Donald J. Ansell, Wymond Ham, England, assignor to The Victaulic Company PLC, Hertfordshire, England

Filed Feb. 9, 1984, Ser. No. 578,690

Claims priority application, United Kingdom, Feb. 18, 1983; Mar. 1, 1983; Oct. 24, 1983

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—257 **8 Claims**



1. A method of forming a welded joint between an end of a thermoplastic pipe and a surrounding pipe fitting including a thermoplastic sleeve having a bore and an internal wall defining said bore, comprising the steps of forming around the internal wall of the sleeve a helical cut by means of a cutting tool, said cut being inclined to the surface of the wall along the line of cut, and the cutting tool and its angular relationship to the bore being chosen such that during incision an internally extending flap of the thermoplastic material produced by the incision is caused to open out and deform transverse to the direction of incision whereby a helical cavity is formed within the sleeve wall; feeding into said cavity an electrically conducting wire; working the internal wall of the sleeve so as to lay, at least partially, the flap against that wall and enclose the wire within the cavity between the flap and the sleeve wall; fitting the sleeve about the end of the pipe and passing an electrical current through the electrical wire so as to fuse the sleeve to the pipe.

4,626,309

SELECTIVE BONDING INTERCONNECTION MASK

William B. Mullen, III, Boca Raton, Fla.; James H. Groteluesch-hen, Westchester, and Robert Henschel, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,127

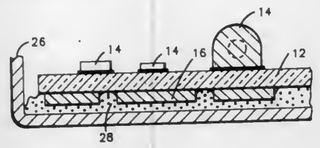
Int. Cl.⁴ B32B *31/04, 31/12*

U.S. Cl. 156—289 **7 Claims**

1. A method of bonding first and second members of an apparatus together to minimize the occurences of structural failures in said first and second members comprising the steps of:

determining the highest probable structural failure initiation locations of at least said first member,

preparing a mask of preselected insulating material having at least one aperture therein, said at least one aperture positioned, sized and shaped to define at least one common bonding area between said first and second members, with said at least one aperture being located in an area removed from said highest probably structural failure initiation locations, whereby structural failures induced by the bonding and loading characteristics of the first and second members are minimized;



placing a layer of bonding material on a surface of said second member;

placing said mask over said layer of bonding material;

placing said first member over and directly against said mask;

bonding said first member to second member at said at least one bonding area.

4,626,310

SURGICAL ADHESIVE SYSTEMS FOR HARD BODY TISSUES

Wolfgang Ritter, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 460,901, Jan. 25, 1983, abandoned. This application May 10, 1985, Ser. No. 732,801

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204504; Aug. 9, 1982, 3229635

Int. Cl.⁴ C09J *5/02*

U.S. Cl. 156—307.3 **25 Claims**

1. A method of bonding hard body tissues to each other or to a metal or to a synthetic material comprising the steps of:

(A) applying to one or both surfaces to be joined together a surgical bonding system comprising:

(a) a polymerization initiating starter component which contains at least one organoboron compound; and

(b) a polymerizable adhesive component which contains at least one resorbable (meth)-acrylate compound which is a (meth)-acrylic acid ester having more than one (meth)-acrylate group on a polyester oligomer chain that contains hydroxy-carboxylic acid segments; and

(B) joining together said surfaces.

4,626,311

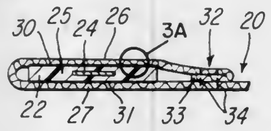
CLOTH PRODUCT HAVING AN ANTITHEFT DEVICE AND METHOD OF MAKING SAME

Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Co., Inc., Cincinnati, Ohio

Filed Feb. 23, 1984, Ser. No. 582,788

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—308.2 **9 Claims**



1. In a method of making a cloth product having an antitheft device attached thereto, said method comprising the steps of, providing means attaching said device to a cloth product, providing means in said device capable of interrupting a magnetic sensing field upon passing said product with its attached device through said field, said step of providing means capable of interrupting said sensing field comprises providing an inner member made of a magnetically detectable material, the improvement in said method in which said step of providing means attaching said device to said cloth product comprises the steps of encapsulating said inner member with a dual-purpose cover member made of a thermoplastic material, said cover member having a surface portion, and permanently attaching said device to said product by fusion of substantially the entire area of said surface portion to a particular part of said product which has interstices therein, said fusion resulting in the thermoplastic material of said cover member being partially moved within said interstices to provide a tenacious bond between said part and said surface portion and thereby require substantial damage to said part in order to remove said device from said product.

4,626,312

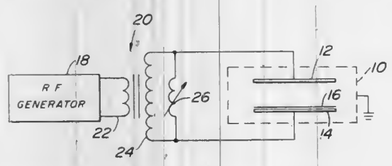
PLASMA ETCHING SYSTEM FOR MINIMIZING STRAY ELECTRICAL DISCHARGES

David H. Tracy, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 24, 1985, Ser. No. 748,291

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—345 **6 Claims**



1. A plasma etching system comprising:

(a) a grounded reactor chamber for performing an etching operation;

(b) a counter electrode and a chuck electrode for receiving a wafer having a film thereon to be etched;

(c) said electrodes being isolated from the walls of said chamber: and

(d) an ungrounded source of low frequency radio frequency power connected across said counter and chuck electrodes to perform an etching operation while minimizing electrical discharges from said electrodes to said reactor chamber.

4,626,313

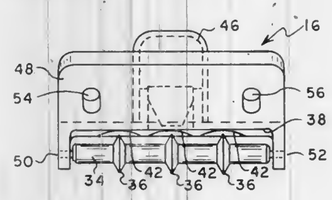
MANUAL LABEL APPLICATOR

Edward C. Karp, Belvidere, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.

Filed Jan. 2, 1985, Ser. No. 688,179

Int. Cl.⁴ B65C *9/18, 9/42*

U.S. Cl. 156—362 **15 Claims**



1. A label applicator for receiving a preprinted label, having a printed side and an adhesive side and presenting said label with said adhesive side at least partially exposed for applying said label to a commodity comprising:

a frame member;

a roll member rotatably mounted to said frame and having a plurality of ridges extending circumferentially around said roll member, said ridges being adapted to contact said adhesive side of said label as it is received; and

a first surface defined in said frame having a corresponding plurality of generally longitudinal flutes defined therein, each said flute being in approximate vertical alignment with and arranged for partially receiving one of said plurality of ridges on said roll member to provide a plurality of partial creases in said label as it is advanced beyond said roll member to impart increased stiffness to said label along its length with said adhesive side at least partially exposed for applying said label to a commodity.

4,626,314

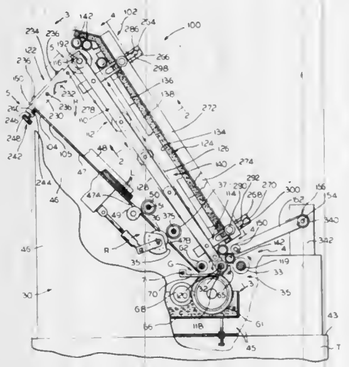
LABELING MACHINE ATTACHMENT FOR STACK EXITING OF ROUND LABELED OBJECTS

James G. Wesley, Cicero, Ill., assignor to Labelette Company, Forest Park, Ill.

Filed Oct. 5, 1984, Ser. No. 657,980

Int. Cl.⁴ B65C *9/04;* **B32B** *31/00*

U.S. Cl. 156—449 **6 Claims**



1. In a semi-automatic labeling machine for consecutively applying discrete labels of the same predetermined size to each container of a run of round containers each of which is of the same predetermined size including external diameter, with the labeling machine including a label supply station hopper having a downwardly sloping floor plate, a glue applying station, a labeling station including a pair of rotatable support rollers each having its longitudinal axis disposed normally of the path of movement of the individual labels from the supply hopper therefor through the stations, upon which machine support rollers round containers of a container run to be consecutively labeled may be manually consecutively applied on the side thereof to be supported and rotated about the longitudinal axis thereof by the machine support rollers when the latter are rotating, with the glue applying station including means for applying glue to the underside of the respective labels when received from the label supply station, and means for consecutively feeding the discrete labels longitudinally thereof along a feed path including one of said support rollers being in overlying relation to said feed path and a label feed guide mounted below the one support roller and including guide surfacing concentric with the periphery of the one support roller and disposed to direct the leading end of a label to be applied to the run container external side wall surfacing at a predetermined outfeed angle, with the one support roller being rotatable about a stationary axis and the other support roller being mounted for adjustment toward and away from the one support roller, to support and rotate containers for runs of such containers of variant diameters for label application run purposes and accommodate labeling containers of container runs made up of containers of all the same but variant container run sizes, and with the means for feeding the discrete labels for a

run of such containers including means for individually feeding the labels from the hopper through the glue applying station along the path of movement for application of glue thereto and then to label applying relation at the labeling station, and after one of the labels has been applied to consecutive of the run containers, the labeled container is manually removed from the support rollers to be manually replaced by the next run container to be labeled,

the improvement for adapting the labeling machine to consecutively supply discrete labels from the supply hopper through the stations and consecutively apply such labels to cylindric objects of a run of such cylindric objects each of which is of the same predetermined size including diameter, and each of which is consecutively manually applied to the support rollers to dispose same in labeling position, and to effect automatic removal of the consecutively labelled cylindric objects from their labeling position on the support rollers by the manually placing of the next cylindric object to be labelled on the support rollers in the labeling position thereof, with the labels to be so applied to the cylindric objects of such run being each of the same predetermined size,

said improvement comprising:

an attachment for the labeling machine comprising:

a conveyor frame having intake and discharge ends, with the intake end of same being articulated to the machine in alignment with the axis of the machine one support roller, and with the discharge end of same having a prop frame articulated to same,

means for securing said prop frame to the machine floor plate for disposing said conveyor frame in overlying relation to the machine floor plate,

said conveyor frame including endless conveyor means extending between and defining on the operation thereof said intake and discharge ends of same,

said conveyor means comprising an upper conveying run and a lower return run,

said attachment further comprising a panel structure mounted on said conveyor frame in overlying relation to said upper conveying run,

said panel structure including a planar frictional resistant rolling surface opposing and spaced from said upper conveying run,

means for adjustably setting said panel structure with respect to said conveyor frame to space said panel structure roller surface from said conveyor means upper conveying run along the length of the latter for defining a roller way of uniform depth therealong for rollably and consecutively receiving the cylindric objects in rolling friction engagement relation of the objects with both said upper conveying run and said rolling surface from the roller way intake end adjacent the machine support rollers through the roller way and its discharge end adjacent the conveyor frame discharge end,

and means for driving said conveyor means to move said upper conveying run away from the axis of the one machine support roller and said return run toward the axis of the one machine support roller for rolling the consecutive objects through the roller way and its said discharge end,

said improvement further including:

a pressure roller disposed above the pair of machine support rollers and in vertical alignment with the said other support roller of the machine support rollers,

said pressure roller being journalled on a swing arm mounted for swinging movement toward and away from the machine other support roller in an arc about an axis paralleling the machine support roller axes,

means for biasing said pressure roller toward the machine other support roller,

said swing arm being proportioned for locating said arc to pass through said labeling position that the individual labeling run objects are to have when individually supported for labeling on the machine support rollers.

said setting means includes means for adjusting said panel structure toward and away from the machine labeling station for positioning said roller way intake end to rollably and consecutively receive from the labeling station the respective cylindric objects of such run disposed at said position for labeling when the respective objects are displaced from such position toward said roller way intake end,

whereby, for a particular run of the cylindric objects of all the same size including diameter, when the machine is operated to rotate the machine support rollers and label the run objects one by one with consecutive labels of the same predetermined size, and said pressure roller rides on the machine other support roller, and when an object of the run to be labelled is manually inserted in said labeling position by manually pressing same against said pressure roller and the machine other support roller and into the labeling station for labelling at said labelling position, and such labelling of same is effected,

and consecutively thereafter the following objects of the run to be labelled are similarly manually inserted into the labelling station at said position to consecutively displace the immediately proceeding object of the run into said roller way intake end, as the cylindric objects of the labelling run are consecutively labeled by the labelling machine, such objects are consecutively entered into said roller way for automatically exiting same from the labeling station lengthwise of said roller way and to and through the roller way discharge end for discharge over said prop frame, and the pressure roller when resting on one of the objects to be labeled at the labeling station biases same against the machine support rollers for maintaining same at the labeling station for labeling purposes.

4,626,315

PROCESS OF FORMING ULTRAFINE PATTERN

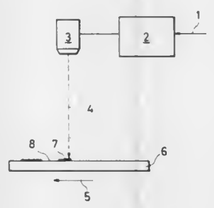
Tatsuji Kitamoto, Kanagawa; Hiroshi Amari, Tokyo; Akira Nahara, Kanagawa; Ryuji Shirahata, Kanagawa, and Yoshihiro Arai, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 8, 1985, Ser. No. 796,124

Claims priority, application Japan, Nov. 9, 1984, 59-236393; Dec. 12, 1984, 59-261400

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*

U.S. Cl. 156—628 **10 Claims**



1. A process for forming an ultrafine pattern on a surface of a substrate, comprising the steps of: irradiating the surface of the substrate with radiation modulated according to an information to be patterned, subjecting the substrate surface to deposition to form deposited areas and non-deposited areas in correspondence with the non-irradiated areas and the irradiated areas, respectively, and subjecting the substrate surface to etching.

4,626,316

METHOD OF CHEMICALLY POLISHING QUARTZ CRYSTAL BLANKS

Ronald J. Brandmayr, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1985, Ser. No. 781,166

Int. Cl.[4] C03C *15/00*

U.S. Cl. 156—637 **13 Claims**

1. Method of chemically polishing quartz crystal blanks selected from the groups consisting of AT-cut quartz crystal blanks and SC-cut quartz crystal blanks so the quartz crystal blanks will be suitable for use in resonators and oscillators, said method including the steps of:

(a) thoroughly cleaning the quartz crystal blanks,

(b) treating the quartz crystal blanks with an etching solution selected from the group consisting of $NH_4F.HF$ solution and NaOH solution at pressures of about 750 psi to about 1450 psi in a high pressure vessel while agitating to circulate the etchant and maintaining a temperature of about 85° C. throughout the etching solution for a time effective to polish said blanks,

(c) cooling the vessel to about 50° C.,

(d) removing the quartz crystal blanks and then thoroughly rinsing the quartz crystal blank with water, and

(e) spinning dry the quartz crystal blanks.

4,626,317

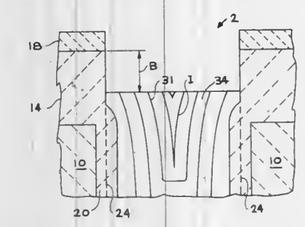
METHOD FOR PLANARIZING AN ISOLATION SLOT IN AN INTEGRATED CIRCUIT STRUCTURE

Matthew A. Bonn, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 3, 1985, Ser. No. 719,185

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **11 Claims**



1. An improved method for forming an isolation slot wherein the penetration of subsequently formed oxide into microcracks or voids formed in the filler material is inhibited which comprises:

(a) forming an isolation slot in an oxidizable substrate;

(b) oxidizing the walls of the slot to form an oxide layer capable of functioning as an isolation oxide;

(c) filling the slot by depositing polysilicon therein;

(d) etching the polysilicon in the slot to remove a predetermined amount of polysilicon from both the bottom and the sides of said slot to leave a first layer of polysilicon in said slot;

(e) depositing a second layer of polysilicon in said slot over said etched first layer of polysilicon;

(f) etching said second layer of polysilicon; and

(g) oxidizing the surface of said second layer of polysilicon.

4,626,318

METHOD OF CONTROLLING A PULP REFINER BY MEASURING FREENESS AND REMOVING THE LATENCY FROM THE PULP

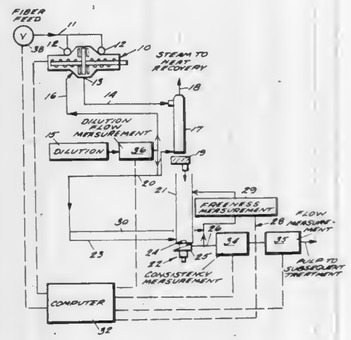
James R. Prough, and James E. Morin, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jul. 15, 1985, Ser. No. 754,739

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.[4] D21D *1/20, 5/20*

U.S. Cl. 162—49 **9 Claims**



1. A method of controlling a refiner which refines comminuted cellulosic fibrous material to produce mechanical pulp having latent properties, comprising the steps of:

(a) fluidizing mechanical pulp having a consistency of about 8–25 percent shortly after discharge from the refiner so as to effect substantially complete removal of the latency thereof, by, and during, centrifugal pumping of the pulp while it has a consistency of about 8–25 percent in a generally non-return path;

(b) continuously measuring freeness of a sample of the latency-removed pulp, and wherein the only portion of the pulp not passing in the non-return path is the sample, the sample being recirculated after freeness measurement; and

(c) in response to the measurement obtained in step (b), automatically controlling refiner parameters to ensure the mechanical pulp produced has desired freeness properties.

4,626,319

PROCESS FOR THE DELIGNIFICATION AND ACID BLEACHING OF CELLULOSE WITH OXYGEN AND HYDROGEN PEROXIDE

Horst Krüger, Darmstadt; Hans-Ulrich Süss, Hasselroth, both of Fed. Rep. of Germany; Gerhard Arnold, Mobile, Ala.; Sigrid Anspach, Grosskarlbach, Fed. Rep. of Germany; Ursula Schwartzkopff, Kleinostheim, Fed. Rep. of Germany, and Hans Jelitto, Lampertheim, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,242

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428352

Int. Cl.[4] D21C *9/16*

U.S. Cl. 162—65 **22 Claims**

1. A process for the delignification and bleaching of cellulose comprising the step treating lignin containing cellulose simultaneously with oxygen and hydrogen peroxide, wherein there is employed and oxygen pressure of 0.03 to 0.5 MPa, an oxygen concentration of 0.1 to 5.0 wt.%, a hydrogen peroxide concentration of 0.1 to 3.0 wt.%, in each case based on the bone dry weight of the cellulose, a pulp density of 2 to 30% in the pH range of 1 to 4 and a temperature of 60° to 120° C.

4,626,320

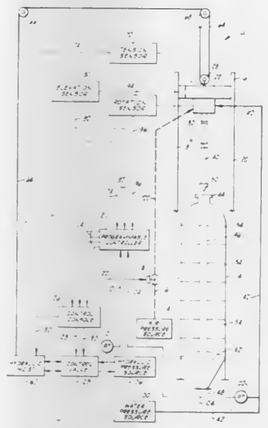
METHOD FOR AUTOMATED DE-COKING

Charles W. Alworth, Ponca City, Okla.; Ward B. Davis, Katy, Tex., and John C. Thomas, deceased, late of Ponca City, Okla. (by Betty O'Grady Thomas, executor), assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 22, 1984, Ser. No. 582,619

Int. Cl.[4] C10B *33/00; 41/04*

U.S. Cl. 201—2 **5 Claims**



1. A method of controlling de-coking of a petroleum coke drum with a hydro-blasting drill supported by a vertical hoist comprising the steps of:

entering predetermined operational control parameters comprising drill rotation speed, vertical elevation drill speed, vertical drill elevation position and drill tension into a programmable logic controller,

sensing the vertical position of the hydro-blasting drill in the coke drum and generating an electrical drill elevation signal,

sensing the tension being imposed by the vertical hoist on the hydro-blasting drill in the coke drum and generating an electrical drill tension signal,

sensing the rotation speed of the hydro-blasting drill in the coke drum and generating an electrical drill rotation speed signal,

coupling the electrical drill elevation signal, drill tension signal and drill rotation speed signal to said programmable logic controller,

coupling the programmable logic controller to a power source for the vertical hoist and to a rotation drive source for the hydro-blasting drill,

controlling the drill rotation speed, vertical elevation position and the tension imposed on the hydro-blasting drill during de-coking of the petroleum coke drum with electrical signal outputs from the controller.

4,626,321

DISTILLATION SYSTEMS AND METHODS

Hans E. Grethlein, Hanover, and Lee H. Lynd, Meriden, both of N.H., assignors to Trustees of Dartmouth College, Hanover, N.H.

Continuation of Ser. No. 525,102, Aug. 22, 1983, abandoned. This application Feb. 13, 1986, Ser. No. 829,549

Int. Cl.[4] B01D *3/00*

U.S. Cl. 203—26 **23 Claims**

1. A method for performing a distillative separation in distillation apparatus, comprising:

(a) introducing feed containing a more volatile component and a less volatile component to said distillation apparatus;

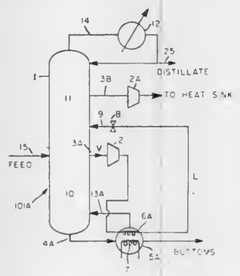
(b) supplying sufficient heat to said distillation apparatus to provide a bottoms liquid enriched in the less volatile component compared to the feed, an internal vapor stream in said apparatus and an overhead vapor enriched in the more volatile component compared to the feed;

(c) providing a reflux liquid in contact with the vapor stream in said distillation apparatus;

(d) removing an overhead product from said apparatus, said overhead product being enriched in the more volatile component compared to the feed;

(e) removing a bottoms product from said apparatus, said bottoms product being enriched in the less volatile component compared to the feed;

(f) withdrawing from a point in said distillation apparatus having a temperature intermediate between the highest and lowest temperatures in said apparatus a vapor stream for use as a heat source for transferring heat to a heat-sink liquid having a temperature at the system pressure higher than the temperature of said withdrawn vapor stream at the system pressure, the flow rate of the withdrawn vapor stream having an upper limit which causes the distillation



apparatus to be pinched at the return point and a lower limit which provides significant changes in the internal reflux ratio at the point of return for the withdrawn vapor stream;

(g) performing work on vapor resulting from said withdrawn vapor stream to raise the condensation temperature of said vapor above the evaporation temperature of said heat-sink liquid;

(h) condensing at least a portion of said vapor resulting from the withdrawn vapor stream and employing heat from said condensation to vaporize at least a portion of the heat-sink liquid under conditions whereby the condensing vapor resulting from the withdrawn vapor stream acts as a heat-source of a heat pump and the vaporizing heat-sink liquid acts as a heat-sink of a heat pump to thereby transfer heat from said withdrawn vapor stream to said heat-sink liquid; and

(i) returning said withdrawn vapor stream to the distillation apparatus at a point having a lower temperature than its point of withdrawal.

4,626,322

PHOTOELECTROCHEMICAL PREPARATION OF A SOLID-STATE SEMICONDUCTOR PHOTONIC DEVICE

Jay A. Switzer, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 653,353, Sep. 24, 1984, which is a division of Ser. No. 518,814, Aug. 1, 1983, Pat. No. 4,492,811. This application May 31, 1985, Ser. No. 740,182

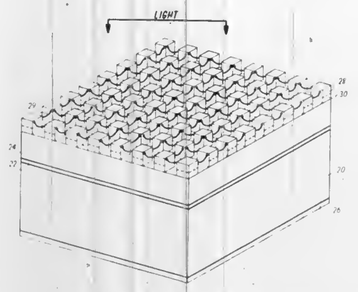
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.[4] C25D *9/04;* **H01L** *31/18*

U.S. Cl. 204—2.1 **25 Claims**

1. A method for the preparation of a solid-state semiconductor photonic device comprising photoelectrochemically depositing a conductive coating material which forms a junction

with a substrate consisting essentially of a semiconductor selected from the group consisting of n-type, p-type, and intrinsic



semiconductors, said conductive coating material selected from the group consisting of metals and semiconductors.

4,626,323

METHOD FOR THE MANUFACTURE OF A PRINTING ELEMENT FOR AN INK DROPLET PRINTING UNIT

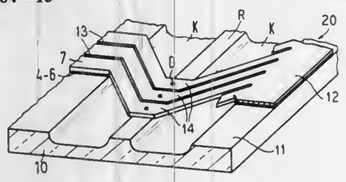
Guenter E. Trausch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 14, 1986, Ser. No. 839,548

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512837

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **13 Claims**



1. A method for producing a printing head having a glass substrate with a common ink chamber with two channels separated by a ridge extending along the length of the chamber and having conductor loops extending across the chamber, which loops have a middle portion provided with an ink orifice overlying the ridge, said method comprising the steps of providing a glass substrate with a substrate surface; forming a strip of a double layer on a part of the glass surface corresponding to an area in which the ridge is to be formed by depositing a first metal layer on a surface of the substrate, depositing a second metal layer on the first metal layer to form the first double layer and shaping the first double layer into the strip by removing the double layer except in the area of the ridge; then depositing a second double layer on the strip and substrate surface by depositing a third layer of metal on the strip and the exposed portions of the substrate surface, and depositing a fourth metal layer on the third layer with the steps of depositing the first, second, third and fourth layers being selected from a group consisting of vapor-depositing and sputtering; providing an electroplating mask on an exposed metal surface of the last-applied layer by photolithographically forming a positive dry-resist structure on the metal surface of the last-applied layer, said mask defining a position for each nozzle and leaving portions of the metal surface exposed in a pattern corresponding to the comb having the conductor loops; exposing to UV light portions of the resist structure which overlie a region for each of the two ink channels which are to be subsequently formed; electrodepositing a comb having leads and conductor loops separated by gaps on the portions exposed by the electroplating mask; removing the UV-exposed portions of the resist structure to form spaces between adjacent conductor loops in each of the regions; forming an etching mask for etching the channels by etching the exposed metal layer beneath the spaces and beneath the adjacent conductor loops to expose portions of the substrate surface; removing material from the substrate surface of the glass substrate by utilizing the etching mask and an etching process with ultrasonic to form two ink channels separated by said ridge; subsequently removing the remaining resist structure; and then loosening the middle portion of each of the conductor loops from the glass ridge extending between the ink channels by selectively etching away the second layer and then etching away the first and third layers positioned between the ridge and the middle portions of each of the conductor loops so that each middle portion may move relative to the ridge thus ejecting an ink droplet through its nozzle.

4,626,324

BATHS FOR THE ELECTROLYTIC DEPOSITION OF NICKEL-INDIUM ALLOYS ON PRINTED CIRCUIT BOARDS

George J. Samuels, Syracuse, and Joseph M. Garman, Williamsville, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 605,352, Apr. 30, 1984, abandoned. This application Mar. 26, 1985, Ser. No. 714,849

Int. Cl.[4] C25D *3/56*

U.S. Cl. 204—43.1 **24 Claims**

1. A novel aqueous bath having a pH equal to or less than about 5 for electrodeposition of a nickel/indium alloy, said bath comprising:

(a) at least about 0.5M nickel cations and at least about 0.001M indium cations;

(b) up to about 2.6M chloride ions;

(c) from about 0.25M to about 1.6M of boric acid; and (d) water, wherein said nickel cations, indium cations or a combination thereof are derived totally or in part from a salt selected from the group consisting of nickel carbonate, indium carbonate, indium chloride, nickel chloride, indium sulfamate, nickel sulfamate, with the proviso that at least a portion of said indium cations are derived from indium sulfamate and at least a portion of said nickel cations are derived from nickel sulfamate.

4,626,325

PROCESS FOR THE PREPARATION OF 4-HYDROXY-1,2-BENZISOTHIAZOL-3(2H)-ONE-1,1-DIOXIDE

Gunter Trummlitz, Warthausen; Wolfgang Eberlein, Biberach; Wolfhard Engel, Biberach, and Gerhard Mihm, Biberach, all of Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

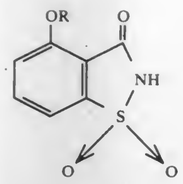
Filed Mar. 19, 1986, Ser. No. 841,392

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509819

Int. Cl.[4] C25C *3/00*

U.S. Cl. 204—59 R **8 Claims**

1. Process for preparing 4-hydroxy-1,2-benzisothiazol-3(2H)-one-1,1-dioxide which comprises the steps of anodically oxidizing 1,2-benzoisothiazol-3(2H)-one-1,1-dioxide in the presence of trifluoroacetic acid or trifluoromethanesulfonic acid and a conducting salt in order to yield an intermediate of the formula



wherein R is CF_3CO— or CF_3SO_2—, and then hydrolyzing the resulting intermediate to yield the product.

4,626,326

ELECTROLYTIC PROCESS FOR MANUFACTURING PURE POTASSIUM PEROXYDIPHOSPHATE

John S. C. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jun. 6, 1985, Ser. No. 741,785
Int. Cl.[4] C25B *1/28*
U.S. Cl. 204—82 **12 Claims**

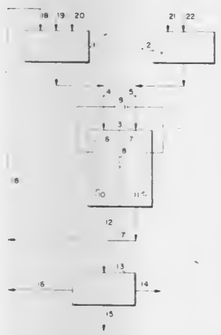
1. A process for producing potassium peroxydiphosphate in an electrolytic cell or plurality of cells, wherein each cell comprises an anode compartment containing an anode, a cathode compartment containing a cathode, and separating means which prevents a substantial flow of an aqueous liquid between the anode compartment and the cathode compartment and which is substantially permeable to an aqueous ion, said process comprising introducing into the anode compartment an aqueous anolyte substantially free from fluoride or other halide ions, said anolyte comprising potassium cations, phosphate anions, hydroxyl anions, and at least 0.015 mols per liter of nitrate anions, the hydroxyl anions being present in sufficient quantity to maintain the anolyte between pH 9.5 and pH 14.5; introducing into the cathode compartment an aqueous catholyte solution substantially free from fluoride or other halide anions, said catholyte containing at least one of the ions present in the anolyte, and applying sufficient electric potential between the anode and the cathode to cause an electric current to flow through said catholyte and anolyte whereby phosphate anions are oxidized at the anode to form peroxydiphosphate anions.

4,626,327

ELECTROLYTIC PROCESS FOR MANUFACTURING POTASSIUM PEROXYDIPHOSPHATE

Michael J. McCarthy, Lawrenceville, and John S. C. Chiang, Mercerville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 6, 1985, Ser. No. 741,933
Int. Cl.[4] C25B *1/28*
U.S. Cl. 204—82 **15 Claims**



1. A process for producing potassium peroxydiphosphate in an electrolytic cell or plurality of cells, each cell comprising at least one anode compartment containing an anode and at least one cathode compartment containing a cathode, said compartments being separated by a separating means which prevents a substantial flow of an aqueous liquid between the anode compartment and the cathode compartment, such separating means being substantially permeable to an aqueous anion, comprising: introducing into the anode compartment an aqueous anolyte comprising phosphate and hydroxyl anions and potassium cations, the hydroxyl anions being present in sufficient quantity to provide an anolyte pH between 9.5 and 14.5; concomitantly providing in the cathode compartment an aqueous catholyte comprising an alkali metal hydroxide in a sufficient amount such that when a sufficient electrical potential is applied between the anode and the cathode hydroxyl anions will transfer through the separating means to maintain the anolyte between pH 9.5 and pH 14.5; and applying said sufficient electrical potential to cause phosphate anions to be oxidized at the anode to form peroxydiphosphate anions and to cause hydroxyl anions to transfer from the catholyte through the separating means to maintain the anolyte at said pH.

4,626,328

PROCESS FOR THE ELECTROCHEMICAL ROUGHENING OF ALUMINUM FOR USE AS PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Dieter Mohr, Schlangenbad, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,245
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415363
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.95 **15 Claims**

1. A process for the electrochemical roughening of a material selected from aluminum and aluminum alloys, comprising the steps of:

placing the material in an aqueous mixed electrolyte solution containing HCl and at least one organic acid, said organic acid selected from di- and polyphosphonic acids and gallic acids;

subjecting said material to the action of alternating current to produce a roughened surface;

wherein the mixed electrolyte contains from about 0.5 to about 10% by weight of HCl and from 0.05 to 5.0% by weight of the organic acid; and

wherein the temperature of the mixed electrolyte is from about 20° C. to about 60° C., and the current density of the alternating current is from about 3 to about 200 A/dm^2.

4,626,329

CORROSION PROTECTION WITH SACRIFICIAL ANODES

John W. Jost, Santa Ana, and Mohammad H. Ghandehari, Brea, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 22, 1985, Ser. No. 693,279
Int. Cl.[4] C23F *13/00*; C22C *21/00*
U.S. Cl. 204—148 **13 Claims**

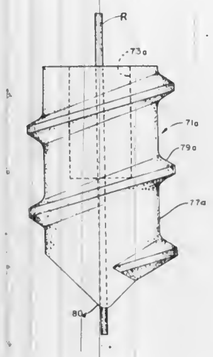
1. A method for inhibiting corrosion of a metal structure in an electrolytic environment comprising electrically interconnecting the structure with an anode consisting essentially of aluminum, alloyed with about 0.01 to about 10 percent by weight of a rare earth metal or mixture of rare earth metals and placing the anode into the environment,

4,626,330

TORSIONALLY INSTALLED ANODE AND EARTH ANCHOR/PENETRATOR

Marion R. Farmer, Shelby County, Tenn., assignor to Dixie Electrical Manufacturing Company, Memphis, Tenn.

Continuation of Ser. No. 573,845, Jan. 25, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,675
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 **10 Claims**



1. A torsionally installed galvanic anode for corrosion protection of a metal structure located within an environment, comprising an elongate shaft having means on its bottom end forming screwing means for screwing said shaft into the ground upon rotation of said shaft, an anode body carried by said shaft securely fastened concentrically onto the exterior surface of said shaft for exposure to the surrounding environment in which the anode locates, said shaft having substantial length and being capable of withstanding significant torsional forces exerted through said shaft during embedding of said galvanic anode into the ground, the lower end of said anode body comprising at least one helix and being contoured into an earth penetrating shape to form said screwing means said concentrially arranged anode body and its contoured lower end being formed of at least one of an aluminum, zinc, magnesium, and an alloy thereof, and means on said shaft cooperable with a rotatable drive means for rotating said shaft and for torsionally installing at least in part said anode into the ground and for providing surface contact of at least a part of said anode with the same.

4,626,331

ELECTROLYTIC CELL EMPLOYING FLUIDIZED BED

Nobutaka Goto, Kashiwa, and Nobuyasu Ezawa, Tokyo, both of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Division of Ser. No. 674,063, Nov. 19, 1984, Pat. No. 4,569,729. This application Nov. 21, 1985, Ser. No. 800,528
Claims priority, application Japan, Jul. 16, 1984, 59-146105; Aug. 27, 1984, 59-128607[U]
Int. Cl.[4] C25D *17/00*; C25B *9/00*; C25C *7/00*
U.S. Cl. 204—222 **6 Claims**

1. In an electrolytic cell including a cylindrical electrolytic cell main body divided into a main electrode chamber and an auxiliary electrode chamber by a diaphragm, and having main electrode particles in the main electrode chamber, which are maintained in the fluidized state by an electrolyte supplied to the main electrode chamber; the improvement comprising:

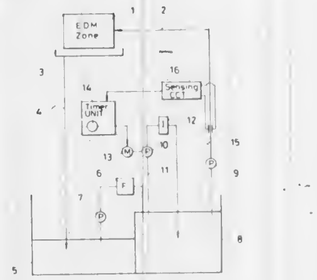
an electrolyte supply port and an electrolyte discharge port provided to enable flow of electrolyte through said cell to maintain the fluidized state of said particles, and a porous auxiliary electrode in contact with the diaphragm on the side thereof facing said auxiliary electrode chamber, to facilitate flow of gas generated on the auxiliary electrode in the direction of said auxiliary chamber, said main electrode chamber being provided with an upper dispersion-preventing tower comprising said electrolyte discharge port and having a tapered expanding portion for decelerating and separating said main electrode particles from said electrolyte before said electrolyte reaches said electrolyte discharge port.

4,626,332

FLUSHING FLUID RECYCLING SYSTEM FOR ELECTROEROSION

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research, Incorporated, Kanagawa, Japan

Filed Jul. 10, 1985, Ser. No. 753,562
Claims priority, application Japan, Jul. 10, 1984, 59-141432
Int. Cl.[4] C25F *7/02*; B23H *7/36*
U.S. Cl. 204—237 **6 Claims**



1. An electroerosion machine, comprising:

means for collecting a flushing liquid medium from an electroerosion zone; and

fluid treating means for processing the collected liquid medium and then recycling it into said electroerosion zone, the fluid treating means comprising:

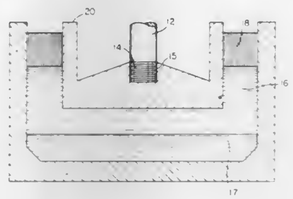
fluid regenerating means for said liquid medium,

operating means for rendering said regenerating means cyclically active for said medium with a predetermined active to inactive time ratio in each cyclic period,

sensing means for sensing the resistivity of said liquid medium, and

means responsive to said sensing means for acting on said operating means to modify said active to inactive time ratio to a reduced value in each cyclic period while said sensed resistivity lies above a predetermined level.

4,626,333
ANODE ASSEMBLY FOR MOLTEN SALT ELECTROLYSIS
Duane R. Secrist, Elizabethton; James M. Clark, Johnson City, and Henry E. Grindstaff, Memphis, all of Tenn., assignors to Great Lakes Carbon Corporation, Briarcliff Manor, N.Y.
Filed Jan. 28, 1986, Ser. No. 823,438
Int. Cl.[4] C25C *3/12*
U.S. Cl. 204—286 **14 Claims**



1. An anode assembly for an electrolytic cell for molten salt electrolysis comprising a cermet connector and a cermet or ceramic anode, the connector having a lower electrical resistivity than the anode at the operating temperature of the cell, wherein the connector and anode are mated together in the green or calcined state and then sintered to produce said assembly having a low resistance joint.

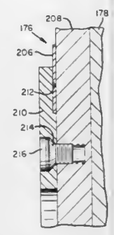
4,626,334
ELECTRODE FOR ELECTROLYSIS
Kazuhide Ohe, and Yukio Kawashima, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Feb. 1, 1985, Ser. No. 697,164
Int. Cl.[4] C25B *11/00*
U.S. Cl. 204—290 R **9 Claims**

1. An electrode for use in electrolysis comprising an electroconductive substrate provided over at least a portion of its outer surface with a coating of a platinum group metal oxide catalyst, characterized in that said coating consisting essentially of
(i) 3 to 45 mol% of ruthenium oxide,
(ii) 0.1 to 30 mol % of at least one member selected from metallic platinum, platinum oxide, metallic platinum plus iridium oxide, and platinum oxide plus iridium oxide, and
(iii) 50 to 96.9 mol % of tin oxide.

4,626,335
LITHIUM ALLOY ANODE FOR THERMAL CELLS
Earl B. Cupp, and D. Robert Cottingham, both of Joplin, Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio
Filed Aug. 26, 1985, Ser. No. 769,025
Int. Cl.[4] C25C *11/06*; H01M *4/36*
U.S. Cl. 204—293 **12 Claims**

12. As an article of manufacture, an anode wafer for a thermal cell,
said anode wafer comprising particles of a lithium anode alloy bonded with particles of a metal binder,
said lithium anode alloy being of the class consisting of lithium-aluminum alloys; lithium-silicon alloys; and lithium-boron alloys,
said metal binder being of the class consisting of unalloyed iron, copper, nickel, manganese; and mixtures thereof, and
wherein substantially all said metal binder in said wafer remains present as a discrete phase, unalloyed with said lithium alloy.

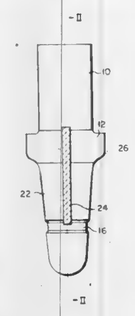
4,626,336
TARGET FOR SPUTTER DEPOSITING THIN FILMS
Darrel R. Bloomquist, Boise, Id.; Bangalore R. Natarajan, San Jose, and James E. Opfer, Palo Alto, both of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.
Filed May 2, 1985, Ser. No. 730,700
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—298 **2 Claims**



1. A target for sputter-depositing a magnetic layer having a radial coercivity gradient on a substrate which is moved relative to the target, said magnetic layer having at least two constituent materials, said target comprising:
a circular base member of a first diameter which is formed of a first constituent material;
a ring member having an inside diameter and an outside diameter smaller than the first diameter, the ring member being formed of a second constituent material and being disposed on the base member concentrically therewith; and
a clamping ring member having an outside diameter which is less than the outside diameter of the ring member and greater than the inside diameter of the ring member, the clamping ring member also having an inside diameter which is less than the inside diameter of the ring member, the clamping ring member being formed of the first constituent material and being mounted to the base member concentrically therewith and overlying a portion of the inner perimeter margin of the ring member so as to clamp the ring member to the base member whereby the sputtering surface of the target comprises only the first and second constituent materials in a predetermined ratio of exposed areas thereof.

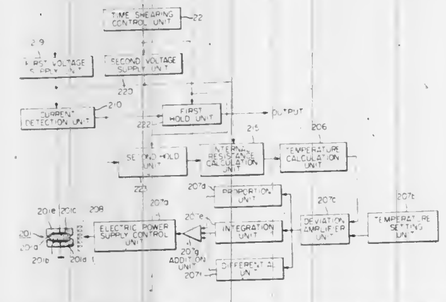
4,626,337
OXYGEN SENSOR
Yasumichi Hotta, Mie; Takao Akatsuka, Aichi; Masao Kawaguchi, Toyota; Jiro Nakano, Okazaki, and Takao Ishibashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed May 2, 1985, Ser. No. 729,854
Claims priority, application Japan, May 7, 1984, 59-66875[U]
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—429 **5 Claims**

1. An oxygen sensor for detecting the concentration of oxygen contained in a subject gas comprising:
a solid electrolytic element made of an oxygen ion-conducting metal oxide having a first surface adapted to be exposed to the subject gas and a second surface adapted to be exposed to a reference gas;
a porous first electrode fixed on said first surface of said element;
a porous second electrode fixed on said second surface of said element;
an electrically-insulating layer made of a heat-resisting ceramic material formed on said first surface of said element except where said first electrode is fixed on said first surface;
a metal lead formed on said insulating layer, this metal lead being made of film material and being electrically connected to said first electrode;
an electrically-conductive retaining element formed on said metal lead, this retaining element being electrically connected to said first electrode and constituted by a densely sintered mixture of a conducting metal material and a binding material; and
a gas diffusion-resisting layer made of a porous, electrically-insulating ceramic material, this layer covering said first electrode, said metal lead and said retaining element, this oxygen sensor thereby being adapted such that at least



within a predetermined range of oxygen concentration, if said first electrode is electrically connected via said metal lead to an anode of a source of electrical power, and said second electrode is electrically connected to a cathode of said source of electrical power and a voltage applied across said electrodes thereby while said first surface is exposed to said subject gas and said second surface is exposed to said reference gas, a current will flow between said electrodes, which current is proportional to the difference between the concentration of oxygen in said subject gas and said reference gas.

4,626,338
EQUIPMENT FOR DETECTING OXYGEN CONCENTRATION
Haruyoshi Kondo; Keiichi Saji, and Takashi Takeuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichen, Japan
Filed Apr. 29, 1982, Ser. No. 373,257
Claims priority, application Japan, May 1, 1981, 56-65180; May 25, 1981, 56-78029; May 25, 1981, 56-78030; May 25, 1981, 56-78031; May 25, 1981, 56-78033
Int. Cl.[4] G01N *27/46, 27/58*
U.S. Cl. 204—406 **30 Claims**



11. A limiting electric current oxygen concentration detector comprising:
(a) means including a limiting electric current oxygen concentration sensor, said sensor including an oxygen ionic conductor having major surfaces, a cathode on one of said surfaces, an anode on the other of said surfaces, means for controlling the rate of oxygen permeation into said oxygen ionic conductor, and means for heating said sensor,
(b) a first voltage source for generating a voltage to be applied to said sensor during a first period so as to measure a limiting electric current flowing thereto,
(c) a second voltage source for generating a voltage to be applied to said sensor during a second period so as to measure internal resistance thereof,
(d) means for performing control in a time-sharing manner such that the voltage from said first voltage source is supplied to said sensor during a first period and the voltage from said second voltage source is supplied to said sensor during a second period,
(e) current detection means for detecting the current flowing when the voltage from said first voltage source is applied to said sensor and the current flowing when the voltage from said second voltage source is applied to said sensor,
(f) means for determining the internal resistance of said sensor in accordance with the detected current from said current detection means,
(g) means for calculating the internal resistance of said sensor according to the following formula,

$$T = 1/\{(K/E)\log_e(R/Ro) + 1/To\}$$

wherein,
e represents the base of natural logarithms,
E represents activation energy
K represents Boltzmann constant,
T represents absolute temperature
To represents reference temperature
R represents internal resistance,
Ro represents internal resistance at the temperature To,
(h) means for determining the temperature T according to the output of said means for calculating the internal resistance,
(i) means for setting a temperature, and
(j) means for controlling current from a power source to said means for heating of said sensor according to the difference between said calculated value of temperature of said sensor and the set temperature.

4,626,339
SUPPORTED CHROMIUM-MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS
Russell R. Chianelli, Somerville; Teh C. Ho, Bridgewater; Allan J. Jacobson, Princeton, and Archie R. Young, Montclair, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Sep. 28, 1984, Ser. No. 656,090
Int. Cl.[4] C10G *71/00, 45/04*
U.S. Cl. 208—18 **27 Claims**

9. A process for hydrotreating a hydrocarbon feed which comprises contacting said feed at a temperature of at least about 150° C. and in the presence of hydrogen with a catalyst obtained by compositing a quantity of inorganic refractory oxide support material with one or more precursor salts and heating said composite at elevated temperature of at least about 150° C., in the presence of excess sulfur in the form of one or more sulfur-bearing compounds and under oxygen-free conditions for a time sufficient to form said catalyst, wherein said precursor salt contains a tetrathiometallate anion of Mo, W or mixture thereof and a cation comprising trivalent chromium or a mixture of trivalent chromium with one or more divalent promoter metals selected from the group consisting of Fe, Ni, Co, Mn, Zn, and Cu wherein said trivalent chromium and divalent promoter metals are chelated by at least one neutral, nitrogen-containing polydentate ligand, L, said contacting occurring for a time sufficient to hydrotreat at least a portion of said feed.

4,626,340

PROCESS FOR THE CONVERSION OF HEAVY HYDROCARBON FEEDSTOCKS CHARACTERIZED BY HIGH MOLECULAR WEIGHT, LOW REACTIVITY AND HIGH METAL CONTENTS

Roberto E. Galiasso, San Antonio de Los Altos; Beatriz R. Arias; Lino Caprioli, both of Caracas; Juan Garcia, San Antonio de Los Altos, and Humberto Kum, Los Teques, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Sep. 26, 1985, Ser. No. 780,589
Int. Cl.[4] C10G *69/06, 69/10*
U.S. Cl. 208—89 7 Claims

1. A process for the conversion of a heavy hydrocarbon feedstock characterized by high molecular weight, low reactivity and high metal contents comprising:

(a) feeding said heavy hydrocarbon feedstock characterized by the following composition and properties:

Gravity, °API	0–15
KV at 210° F., cst	5000–70,000
Vanadium, wt. ppm	400–800
Nickel, wt. ppm	50–150
Asphaltenes, % wt.	10–25
Conradson Carbon, % wt.	10
500° C. + Residue Content, % wt.	50%

to a hydrodemetallization zone wherein said feedstock is contacted with hydrogen and a catalyst capable of demetallizing organometallic complexes of high molecular weight and cracking resistance, said catalyst having the following composition and properties: a molybdenum surface concentration of from 4.0 to 8.0% by weight, a titanium surface concentration of from 0.15 to 1.2% by weight, a nickel surface concentration of from 2.0 to 5.0% by weight, an aluminum surface concentration of from 50.0 to 80.0% by weight and a sulfur surface concentration of from 2 to 10%, as measured by photo-electron spectroscopy (XPS) and a pore volume of from 0.2 to 0.5 cm^3/gr, a specific surface of from 50 to 180 m^2/gr, a bimodal pore distribution such that 20% of pores is between 10 and 100 Å, and 60% between 100 and 1000 Å, with a particle size of from 0.5 to 3 mm so as to produce an effluent;

(b) removing the effluent from said demetallization zone and feeding said effluent to a thermal cracking zone wherein said effluent is contacted with hydrogen so as to produce a cracked product; and

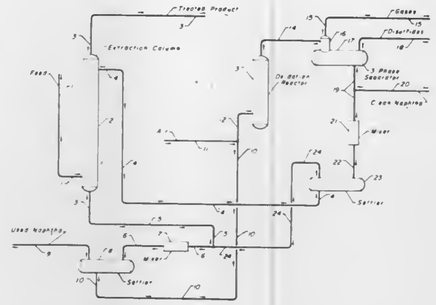
(c) feeding the cracked product of said cracking zone to a hydrocarbon conversion zone wherein said product is contacted with hydrogen and a catalyst capable of cracking molecules of high cracking resistance, said catalyst having the following composition and properties: a molybdenum surface concentration of from 1.0 to 3.7% by weight, a titanium surface concentration of from 0.15 to 5.0% by weight, an iron surface concentration of from 6.0 to 20.0% by weight, a nickel surface concentration of from 0.3 to 8.0% by weight, an aluminum surface concentration of from 1 to 20% by weight, a magnesium surface concentration of from 2.0 to 25.0% by weight, and a sulfur surface concentration of from 7.0 to 28.0% by weight, as measured by photo-electron spectroscopy (XPS) and a pore volume of from 0.2 to 0.6 cm^3/gr, a specific surface of from 30 to 150 m^2/gr, a bimodal pore distribution such that 40% of pores is between 10 and 100 Å, and 40% between 100 and 1000 Å, with a particle size of from 0.5 to 3 mm.

4,626,341

PROCESS FOR MERCAPTAN EXTRACTION FROM OLEFINIC HYDROCARBONS

Thomas A. Verachtert, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 23, 1985, Ser. No. 812,160
Int. Cl.[4] C10G *19/02, 19/08*
U.S. Cl. 208—235 24 Claims



1. A process for treating hydrocarbon feed streams by removing mercaptans which comprises the steps of:

(a) contacting a feed stream which comprises a saturated feed hydrocarbon having a boiling point below about 230 degrees Celsius and which also comprises at least 5 mole percent olefinic hydrocarbons and at least 1 mole percent total diolefinic and acetylene hydrocarbons with a hereinafter characterized regenerated aqueous alkaline solution in a first extraction zone and thereby forming a product hydrocarbon stream and a mercaptan-rich aqueous alkaline solution which comprises diolefinic hydrocarbons and acetylene hydrocarbons;

(b) removing diolefinic and acetylene hydrocarbons from the mercaptan-rich aqueous alkaline solution by contacting the mercaptan-rich aqueous alkaline solution with a treating hydrocarbon stream in a second extraction zone and thereby forming a treated mercaptan-rich aqueous alkaline solution;

(c) passing the treated mercaptan-rich aqueous alkaline solution into a mercaptan conversion zone in which mercaptans are converted to hydrocarbon soluble sulfur-containing chemical compounds, and producing a conversion zone effluent stream which comprises said sulfur-containing chemical compounds and an aqueous alkaline solution; and

(d) separating a majority of said sulfur-containing chemical compounds from the conversion zone effluent stream in a separation zone and thereby forming said regenerated aqueous alkaline solution.

4,626,342

CATALYTIC COAL LIQUEFACTION PROCESS

Diwakar Garg, Macungie, and Swaminathan Sunder, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 29, 1985, Ser. No. 792,393
Int. Cl.[4] C10G *1/00, 1/06*
U.S. Cl. 208—419 23 Claims

1. In a process for catalytic solvent refining of coal at an elevated temperature and pressure in the presence of hydrogen and a hydrocarbon solvent to produce liquid hydrocarbons and normally solid solvent-refined coal, the improvement comprising using as catalyst a mixture of:

(a) from 0.01 to about 5% by weight of a mono- or polycyclic, substituted or unsubstituted 1,4- or 1,2-quinone with respect to coal feed and

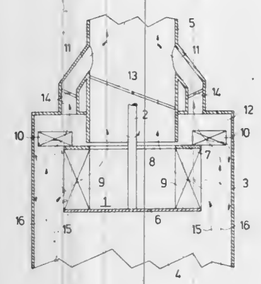
(b) from 0.01 to about 5% by weight of an ammonium, alkali metal, or alkaline earth metal compound selected from an oxide, hydroxide or salt of a weak acid, with respect to coal feed.

4,626,343

SEPARATOR FOR SORTING PARTICULATE MATERIAL

Jan Folsberg, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

Filed Jul. 31, 1985, Ser. No. 760,820
Claims priority, application United Kingdom, Aug. 13, 1984, 8420566
Int. Cl.[4] B07B *7/083, 13/16*
U.S. Cl. 209—138 4 Claims



1. In a separator for sorting particulate material suspended in a conveying gas into a fine fraction and a coarse fraction, the separator being of the kind comprising a rotor with two end plates and vanes, means to rotate the rotor, and a housing encasing said rotor and having an inlet duct leading to one end of said rotor for the supply of unsorted material and an outlet duct leading from an opposite end of said rotor for discharging said separated fine fraction, the improvement wherein said rotor comprises two sets of vanes with different sorting characteristics, and in that control means are provided for regulating the relative proportions of said conveying gas through different ones of said two vanes sets, said control means comprising separate outlet passages connected to said separator outlet duct with means mounted in each outlet passage to control the conveying gas through its respective passage.

4,626,344

OIL FILTER RESTRICTION SENSOR

Virginia L. Fick, and Kenton W. Fick, both of 3007 S. Xenia Ct., Denver, Colo. 80231

Filed Jan. 23, 1986, Ser. No. 821,841
Int. Cl.[4] B01D *35/14*
U.S. Cl. 210—90 12 Claims

1. An oil filter sensor device for insertion between the oil filter mounting bracket mounted on an internal combustion engine and an oil filter cartridge having a filter element therein, said sensor device providing a warning to an operator of said engine if a restricted oil filter condition occurs, said sensor device includes:

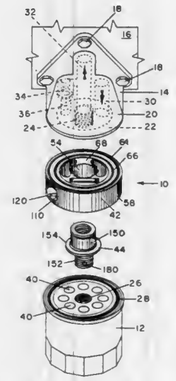
a. a disk-shaped body means having a first generally flat surface and an opposite second generally flat surface;

b. said body means having a first longitudinal passageway centrally positioned through said body means to carry filtered oil between the oil filter element and said engine bracket interconnecting through said first and second surfaces and a second longitudinal passageway separately formed in said body means to carry incoming unfiltered oil between said engine bracket and said oil filter cartridge and arranged to interconnect through said first and second surfaces;

c. a closed internal cylindrical bore formed in said body means having a first end opening through the outer surface of said body means, a slidable piston mounted within said cylindrical bore and sized to closely fit the diameter of said bore, a removable plug suitably mounted within the open end of said bore to close and seal the bore and to restrict the movement of said piston;

d. a biasing means positioned within said bore between said plug and said piston to bias the piston in a first position away from said plug, said plug having an insulated electrical connector mounted therein which extends into said bore so that the piston when it moves to a second position against said biasing means makes electrical contact with said connector;

e. a first internal passageway provided within said body means to interconnect said first longitudinal passageway with the bore nearest the plug and a second internal passageway within said body means interconnecting said



second longitudinal passageway with the opposite end of said bore whereby the differential pressure across the oil filter will also be applied across said slidable piston so that when the differential pressure across the filter exceeds a predetermined amount indicating a restricted filter element the piston will be caused to slide to the second position in contact with said electrical connector;

f. said electrical connector being connected to a suitable alarm circuit means for alerting the operator to the restricted oil filter condition; and

g. a threaded mounting adapter arranged to be inserted through said first longitudinal passageway in said body means and threaded to said oil filter mounting bracket and the oil filter cartridge mounted on the opposite side of said body means.

4,626,345

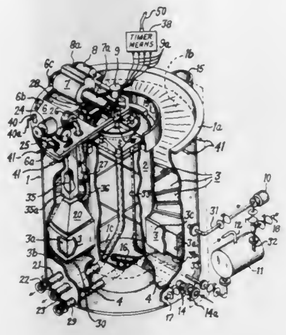
APPARATUS FOR CLARIFICATION OF WATER

Milos Krofta, Lenox, Mass., assignor to Lenox Institute for Research, Inc., Lenox, Mass.

Filed Sep. 4, 1984, Ser. No. 646,789
Int. Cl.[4] B01D *21/01*
U.S. Cl. 210—104 13 Claims

1. Apparatus for treatment of unclarified water comprising, in combination, an outer tank, an inner tank arranged within said outer tank, a carriage arranged on top of said outer tank and movable about the vertical axis thereof, conduit means opening into said inner tank for introducing unclarified water into said inner tank, supply means connected to said conduit means for adding flocculating material to the unclarified water, whereby the flocculating material is mixed with the unclarified water in said inner tank, the top of said inner tank being below the top of said outer tank, whereby the unclarified water with contaminant-attached flocculating material therein overflows from said inner tank into said outer tank, first pipe means extending upwardly in said inner tank and having gas diffuser

means connected thereto at its upper end for introducing into the upper portion of said inner tank gaseous material dissolved in water for attaching to the flocculated contaminant particles in the mixture and floating the same in said outer tank, means on said carriage for removing the sludge formed by the flocculated particles on the surface of the water in said outer tank, second pipe means extending upwardly in said inner tank and having funnel means at its upper end for receiving sludge from said sludge removing means and discharging the same, filter



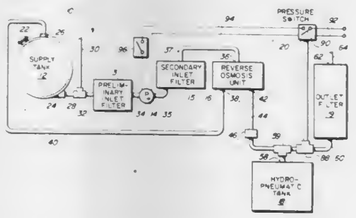
means at the bottom portion of said outer tank for removing downwardly flowing flocculated material, the walls of said inner and outer tanks defining an annular space therebetween, said filter means comprising a plurality of filter beds arranged in said annular space, said filter beds comprising porous material having surfaces on which said downwardly flowing flocculated material is deposited, means for removing the thus deposited material, and discharge means for removing the thus clarified water.

4,626,346

REVERSE OSMOSIS WATER PURIFICATION SYSTEM FOR USE IN LIMITED WATER SUPPLY INSTALLATIONS

Belton E. Hall, 819 College Ave., Tempe, Ariz. 85282

Filed Feb. 10, 1986, Ser. No. 827,867
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—110 **13 Claims**



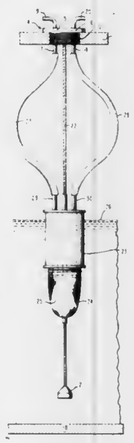
1. A reverse osmosis water purification system for use with a limited and exhaustible water supply comprising:
(a) a water supply tank for containment of a limited and exhaustible water supply and having an outlet port and a return port;
(b) a reverse osmosis unit for producing purified water and having an inlet port, a pure water outlet port and a waste water outlet port;
(c) pump means coupled between the outlet port of said supply tank and the inlet port of said reverse osmosis unit for extracting water from said supply tank and directing it under pressure to said reverse osmosis unit;
(d) pipeline means coupled between the waste water outlet port of said reverse osmosis unit and the return port of said supply tank for returning the waste water produced by said reverse osmosis unit to said supply tank;
(e) a hydro-pneumatic storage tank defining a pure water storage compartment which is coupled to the pure water outlet port of said reverse osmosis unit to receive pure water therefrom; and
(f) means associated with said storage tank and said pump means for sensing the pressure in the pure water storage compartment of said storage tank and controlling the operation of said pump means to maintain the differential pressure across said reverse osmosis unit in a predetermined pressure range.

4,626,347

SELF-CLEANING FILTER ADAPTED FOR RAPID, INEXPENSIVE INSTALLATION

Thomas P. Neglio, Kings Village Apts. G-98, Budd Lake, N.J. 07828

Filed Nov. 8, 1984, Ser. No. 669,673
Int. Cl.⁴ B01D *35/04*
U.S. Cl. 210—232 **8 Claims**



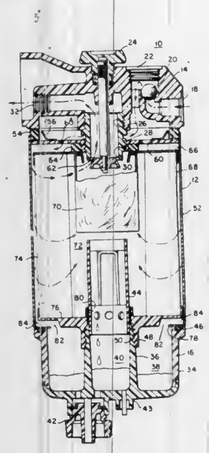
1. A filter for filtering liquid contained in a tank having a top opening comprising:
(a) means for attaching to the top opening,
(b) two conduits passing through said attachment means such that, when said attachment means is attached to the opening, each of said conduits has an end inside of the tank and an end outside of the tank,
(c) a weight hanging from said attachment means by a cable, said weight being on or near the bottom of the tank when said attachment means are attached to the opening,
(d) a float adapted to float on the surface of the liquid and slide along said cable,
(e) filtration media attached to said float forming an enclosed space, said filtration media being submerged in the liquid when the float is floating, and
(f) two at least partially flexible conduits connecting said enclosed space with the inside ends of said conduits passing through said attachment means,
said weight, cable, float, at least partially flexible conduits, and filtration media being capable of passing through the opening in the top of the tank.

4,626,348

END CAP WHICH WILL ACCOMMODATE FLOW REVERSAL

Walter H. Stone, Modesto, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 29, 1984, Ser. No. 626,031
Int. Cl.⁴ B01D *36/02*
U.S. Cl. 210—248 **23 Claims**



11. An invention comprising a fuel filter unit including:
(a) a casing having first and second fuel ports to define a radially inward fuel flow path through said filter unit;
(b) a first filter media disposed in a closed loop within said casing and separating a central fuel chamber from a peripheral fuel chamber, said peripheral fuel chamber disposed directly between said first filter media and said casing, said first filter media disposed intermediate said first and said second fuel ports in said fuel flow path, said fuel flow path includes radially inward flow of fuel through said first filter media;
(c) a plurality of peripheral contaminant outlets operable to allow prefiltering removal of contaminants directly from said peripheral fuel chamber; and
(d) a central contaminant outlet operable to allow contaminants to directly pass from said central fuel chamber, and wherein said filter unit further includes an end cap having a plurality of contaminant channels extending radially inwardly therethrough towards said central contaminant outlet, each of said inwardly extending contaminant channels connecting said peripheral fuel chamber to an associated peripheral contaminant outlet.

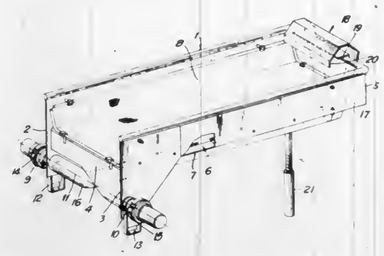
4,626,349

DEVICE FOR SEPARATING SOLIDS FROM LIQUIDS

Arnold Uphus, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,320
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410307
Int. Cl.⁴ B01D *39/10*
U.S. Cl. 210—250 **6 Claims**

1. In a device for separating solids from liquids including a feed pipe, an outlet, a screen mounted in a housing, a receiving chamber below the screen and in communication with the outlet, and product-delivery means receptive of product from the feed pipe for feeding same on to the screen at one side, the improvement comprising: means mounting the screen housing and product delivery means for pivotal movement around a horizontal axis at the opposite side of the screen parallel to said one side of the screen to vary the angle of inclination of the screen with respect to the horizontal, comprising a first rotatable connection to the feed pipe and a second rotatable connection to the outlet positioned on opposite sides of the screen housing with their axes of rotation coinciding with the horizontal pivot axis of the screen housing, whereby a change in



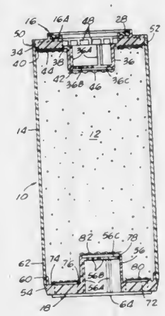
the angle of inclination of the screen can be obtained without affecting the relative position of the product delivery means and the screen.

4,626,350

FILTER CARTRIDGE

Roger P. Reid, 1920 Alder St., Caldwell, Id. 83605

Filed Apr. 1, 1985, Ser. No. 718,499
Int. Cl.⁴ B01D *27/02, 35/00*
U.S. Cl. 210—282 **30 Claims**



1. A cartridge adapted for containing a generally compacted particulate medium through which a fluid is passed to perform a filtering operation, comprising:
a tubular outer wall element,
a first closure element secured to one end of said tubular element,
fluid permeable means for restraining the particulate medium, and
a unitary end closure integrally including annular ring means having means for attachment to the other end of said tubular element, an axially central portion and flexible spring means forming at interconnection between said central portion and said annular ring means,
said fluid permeable means being operatively coupled with said central portion for acting against the particulate medium,
said flexible spring means being adapted for flexure from a non-stressed condition into a stressed condition for urging said central portion against the filter medium and toward the one end of said tubular element for producing and maintaining a compacting force on the filter medium sufficient to inhibit channeling or cavitation of the filter medium.

4,626,351

FILTER, ESPECIALLY FOR DRY-CLEANING MACHINES

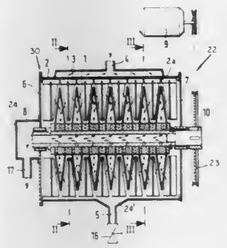
Heinrich Führing, Augsburg, Fed. Rep. of Germany, assignor to Bowe Reinigungstechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,745

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413467

Int. Cl.[4] B01D *29/34*

U.S. Cl. 210—331 **6 Claims**



1. A filter, particularly for a dry-cleaning machine, comprising:

a casing defining an axis;

a hollow rotatable shaft traversing said casing in direction of said axis and defining an interior;

a plurality of filtering elements accommodated within said casing and communicating with the interior of said shaft, each of said filtering elements having a filtering surface extending transversely to said shaft; and

turbulence-inducing means juxtaposed with each of said filtering surfaces of each filtering element for allowing removal of deposits from said filtering surfaces, said filtering elements being provided with elongated projections extending outwardly along said filtering surfaces from inner locations to outer peripheries thereof and cooperating with the said turbulence-inducing means to increase turbulence upon a relative rotation of said filtering elements and said turbulence-inducing means, said turbulence-inducing means including respective disks respectively lying between pairs of said filtering elements, said disks being provided at each side thereof with at least one rib arranged parallel to a respective filtering surface, said projections having an outer edge extending in close proximity to edges of said ribs so as to define a narrow gap therebetween.

4,626,352

VESSEL STRAINER

Simon C. Massey, and Rowland W. Massey, both of 21 Church St., Beaumaris, Victoria 3193, Australia

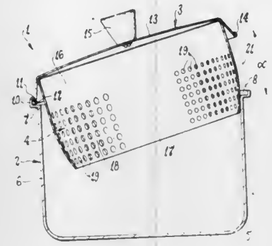
Filed Feb. 25, 1985, Ser. No. 705,136

Claims priority, application Australia, Feb. 28, 1984, PG3812

Int. Cl.[4] B01D *35/02, 35/28*

U.S. Cl. 210—469 **10 Claims**

1. A combination for a vessel having at least one side wall and a rim extending about the side wall defining a top opening of the vessel, the combination including: a lid for covering the top opening to close the vessel, the lid having a peripheral edge region bearing on the rim when closing the vessel; and, a straining element extending at least partially about the lid adjacent the peripheral edge region and depending from the lid to a terminal edge, the straining element having an outer face providing at least one perforated straining zone through which vessel contents can be strained from the vessel, a peripheral region of the outer face at the terminal edge at least adjacent the straining zone being curved inwardly of the straining zone, the straining element being spaced substantially inwardly and clear of the vessel side wall when the lid closes the vessel whereby the lid can be lifted clear of the vessel without interfering engagement between the straining element and vessel to completely open the vessel, and whereby the lid can also be pivoted away from the vessel to partially open the vessel, the lid being pivotable about a portion of the peripheral edge region located across the lid from the straining zone with the rim acting as a fulcrum for the peripheral edge region, pivoting



of the lid causing the straining zone to arcuately swing out of the vessel until the inwardly curved outer face region of the straining element adjacent the straining zone interferingly engages the vessel side wall in face-to-face relationship so that the straining zone generally extends between the pivoted lid and parially open vessel, whereupon the vessel together with the lid and straining element can be tilted to strain vessel contents through the straining zone.

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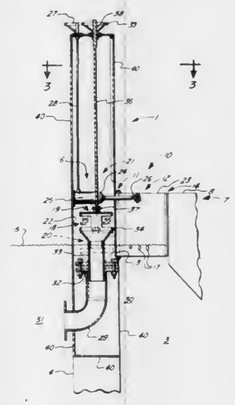
SIDE SKIMMER FOR USE IN A CHANNEL

Harold J. Beard, and Raleigh L. Cox, both of P.O. Box 3838, Baton Rouge, La. 70821

Filed Oct. 4, 1985, Ser. No. 784,153

Int. Cl.[4] B01D *17/00;* **C02F** *1/40*

U.S. Cl. 210—519 **5 Claims**



1. A side skimmer in combination with a channel containing flowing liquid, said channel having at least two sides, a bottom and containing an obstruction partially across the width of said channel and extending above and below the surface of said flowing liquid, comprising:

a. a skimming means, for skimming said surface of said flowing liquid, having a fixed portion extending above and below said surface of said flowing liquid, fixedly connected to one side of said channel and aligned with said obstruction, and having a movable portion extending above and below said surface of said flowing liquid, selectively movable between a closed position so as to allow free flow between said skimming means and said obstruction, and an open position between said fixed portion and said obstruction; and

b. a skimmer drain, connected through one said wall of said channel just upstream of said skimming means and movable between an open position just below said surface of said flowing liquid and a closed position.

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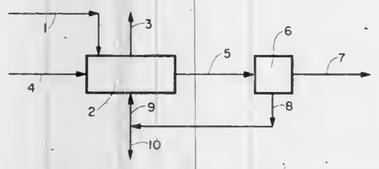
METHOD FOR ANAEROBIC TREATMENT OF HIGH STRENGTH LIQUORS

Clarence A. Hoffman, Rothschild; William M. Copa, and Michael R. Mayer, both of Wausau, all of Wis., assignors to Zimpro Inc., Rothschild, Wis.

Filed Sep. 30, 1985, Ser. No. 782,256

Int. Cl.[4] C02F *3/28;* **C12P** *5/02*

U.S. Cl. 210—603 **58 Claims**



1. A process for treatment of high strength BOD containing liquors, comprising the steps of:

(a) mixing and contacting said liquors with biomass comprising viable facultative acid-forming bacteria and methanogenic bacteria, together with a powdered adsorbent support medium, for a period of 4–72 hours in a mildly mixed anaerobic digestion environment to remove a substantial portion of the BOD and generate a methane fuel gas and additional facultative acid-forming bacteria and methanogenic bacteria;

(b) separating and recovering said methane fuel gas from said mixture of digested liquors, biomass and adsorbent support medium;

(c) separating said biomass and adsorbent support medium from said digested liquors by gravitational force to form a clarified digested liquor and a sludge of said biomass and adsorbent support medium;

(d) discharging said clarified digested liquor to the natural environment or to a further step of reuse or treatment;

(e) continuously or intermittently recycling a portion or all of said sludge to said mixing and contact step (a) to treat additional quantities of high strength BOD containing liquor; and

(f) intermittently or continuously adding fresh powdered adsorbent support medium to said mixture of liquors, biomass and support medium in step (a) to compensate for losses of said support medium in the process.

4,626,355

METHOD OF DETERMINING ALCOHOL CONSUMPTION

Marius K. Joustra, Upsala, and Claes G. Blanche, Sollentuna, both of Sweden, assignors to Pharmacia AB, Upsala, Sweden

PCT No. PCT/SE85/00061, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO85/03578, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 6, 1985, Ser. No. 796,026

Claims priority, application Sweden, Feb. 6, 1984, 8400587

Int. Cl.[4] B01H *15/08*

U.S. Cl. 210—635 **4 Claims**

1. In a method for determining the alcohol consumption of an individual by means of quantifying isotransferrin in a body fluid sample obtained from said individual and in subjecting the said body fluid sample to an isocratic chromatography procedure on an ion-exchanger conditioned to a pH within a range having a lower pH limit no lower than the pH equal to the pI of an isotransferrin of pI 5.5 and having an upper pH limit no higher than the pH equal to the pI of an isotransferrin of pI 6.1 so that the total amount of the isotransferrins is separated into

(i) a fraction (I) which contains at least one isotransferrin having a pI higher than 5.6 and

(ii) one or more fractions which contain(s) the bulk of the remaining isotransferrins having pI values lower than those of the isotransferrins which have a pI higher than 5.6 and have been transferred to fraction (I),

whereupon the total amount of isotransferrin(s) in fraction (I) (=the total amount of transferrin in fraction (I)) is determined in a manner known per se and is correlated in a manner known per se with the total concentration of those isotransferrins in said sample which have a pI higher than 5.6 and have been transferred to fraction (I).

4,626,356

SLUDGE CONCENTRATION METHOD

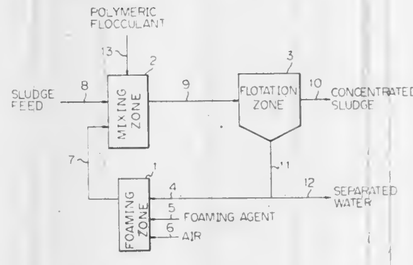
Akira Suzuki, Saitama; Yasumi Shioya, Tokyo, and Norio Watanabe, Kanagawa, all of Japan, assignors to Shinryo Air Conditioning Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 636,585, Aug. 1, 1984, abandoned. This application Dec. 24, 1985, Ser. No. 813,245

Claims priority, application Japan, Aug. 22, 1983, 58-152939

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—705 **15 Claims**



1. A method of sludge concentration comprising the steps of

(a) forming a froth in a foaming zone by mixing a surfactant foaming agent, air and water,

(b) mixing the sludge feed with said froth and a cationic polymeric flocculant in a mixing zone, and

(c) introducing the resultant mixture of sludge and flocculant into a flotation zone for separatting the mixture into a concentrated sludge and water.

4,626,357

WASTE WATER CONTROL METHOD AND MEANS

Frank J. Finger, Highland Park, N.J., and Dominick P. DiChiria, Minneapolis, Minn., assignors to American Pollution Controls, Inc., Highland Park, N.J.

Filed Jan. 10, 1985, Ser. No. 690,310

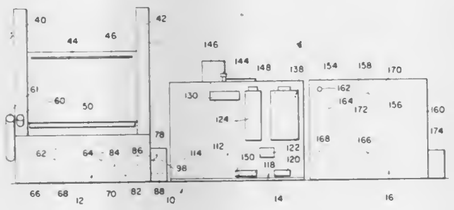
Int. Cl.[4] C02F *1/76*

U.S. Cl. 210—721 **14 Claims**

1. Apparatus for the reduction of undesirable pollutants from waste fluid utilized in radiator treatment operations, and comprising a first unit having a flush booth including means for exteriorly spraying and interiorly flushing a radiator with a caustic fluid thus producing a caustic waste fluid containing organic material and toxic metals selected from the group consisting of lead, copper and zinc, sump means disposed in communication with the flush booth for receiving fluid therefrom by gravity for an initial separation of heavy particles from the fluid; a second unit having a first settling compartment provided therein for receiving the fluid from the sump means to provide a first settling of the heavy components of the fluid received from the sump means, a first holding compartment in communication with the first settling compartment for receiv-

ing the lighter components of the fluid therefrom, wherein the second unit includes a reactor task means disposed in the first holding compartment, calcium hypochlorite chemical bath means disposed exteriorly of the first holding compartment for treating the fluid, ultraviolet light means disposed exteriorly of the chemical bath means and in communication therewith, for treating the hypochlorite treated fluid, ferric chloride chemical bath means for treating the fluid leaving said ultraviolet light means and for passing the fluid to said reactor tank means, and pump means operable for moving the fluid from the holding compartment through the chemical bath means and ultraviolet light means and to the reactor tank means for effecting reduction of the organic material and toxic metal content of said fluid; and a third unit having a second settling compartment provided therein for receiving the fluid from the first holding compartment and providing a second settling of the heavy component of the fluid including said toxic metals and a second holding compartment in communication with the second settling compartment for receiving substantially clear fluid therefrom for ultimate discharge thereof from the apparatus.

11. A method for the reduction of undesirable pollutants



from waste fluid produced in a radiator treatment operation, including exteriorly spraying and interiorly flushing a radiatior with a caustic fluid thus producing a waste fluid containing organic material and toxic metals selected from the group consisting of lead, copper and zinc, and comprising the steps of initially capturing the waste fluid in a sump, cascading the fluid through the sump for an initial separation of heavier particles from the fluid, directing the fluid into a first settling compartment of separation of the heavier components of the fluid from the lighter components thereof, directing the fluid into a first holding compartment, passing the fluid through a calcium hypochlorite chemical bath, subjecting the chemically treated fluid to an ultra violet light the combination of calcium hypochorite and ultraviolet light effecting a reduction of said organic material in said fluid, treating said fluid with an effective amount of ferric chloride and directing the fluid into a reactor tank to reduce the toxic metal content of said fluid, moving the fluid from the reactor tank to a second settling compartment for a further separation of the heavier components of the fluid including said toxic metals from the lighter components thereof, and directing substantially clean fluid into a second holding tank for ultimate disposal of the processed fluid.

4,626,358

LIQUID SWEEPING ASSEMBLY AND METHOD

Francis E. Fetsko, 1408 SE. 27th St., Cape Coral, Fla. 33904

Filed Oct. 18, 1984, Ser. No. 662,087

Int. Cl.[4] C02F *1/40;* **E02B** *15/00*

U.S. Cl. 210—776 **22 Claims**

19. A method of removing impurities from liquid contained in a reservoir, said method comprising the steps of:

(a) causing impurities to be maintained in suspension within the liquid,

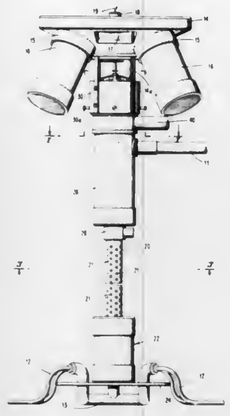
(b) removing impurity-laden liquid from a location in at least a middle half section between the top surface and bottom of the liquid in the reservoir,

(c) extracting the impurities from the liquid, and

(d) returning the liquid to the reservoir after said extracting step.

21. An assembly for removing impurities from liquid contained in a reservoir, said assembly comprising:

(a) means for causing impurities to be maintained in suspension within the liquid, and



(b) means for removing impurity-laden liquid from a location in at least a middle half section between the top surface and bottom of the liquid reservoir,

(c) extracting the impurities from the liquid, and

(d) returning the liquid to the reservoir after said extracting step.

4,626,359

FILTER

Michael C. Bennett, Chart; Nicholas Coote, Ide Hill, Near Sevenoaks, and Andrew Byers, Bromley, all of England, assignors to Tate & Lyle Public Limited Company, England

Filed Jun. 3, 1985, Ser. No. 740,208

Claims priority, application United Kingdom, Jun. 1, 1984, 8413982

Int. Cl.[4] B01D *23/14*

U.S. Cl. 210—793 **17 Claims**

10. In a method of filtering an aqueous stream comprising passing said stream through a deep bed filter comprising an upright vessel of filter medium, inlet means at the top of the vessel for introduction of an aqueous stream to be filtered, outlet means at the bottom of the vessel for removal of filtered liquid and means for fluidizing and backwashing the medium by an upward flow of liquid, the improvement which comprises the filter medium comprising bone char having a specific gravity substantially in the range of 2.2 to 2.5 and a particulate mineral filter material, the bone char being located substantially above the mineral filter material.

4,626,360

APPARATUS FOR SEPARATING SAND AND OIL FROM A WASTE WATER STREAM

Corley P. Senyard, Sr.; Corley P. Senyard, Jr., and Thomas J. Senyard, all of P.O. Box 14387, Baton Rouge, La. 70898-4387

Filed Sep. 10, 1984, Ser. No. 648,497

Int. Cl.[4] B01D *45/02, 45/08*

U.S. Cl. 210—799 **49 Claims**

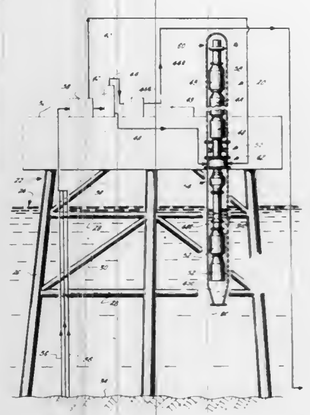
1. An apparatus for separating oil, gas, and sand from a waste water stream and for separating oil from oily sand in said waste water stream comprising:

a. upper oil manager means for removing low pressure gas and at the same time collecting and conveying any oil separated from said waste water stream;

b. sand helix means connected to said upper oil manager means for separating sand particles and oil particles from said waste water stream;

c. sand manager means connected to said sand helix means for collecting sand separated from said stream of waste water and removing oil from said sand;

d. flow control means connected to said sand manager means and the lower oil manager for controlling the flow of oil, water and sand through said apparatus;



e. lower oil manager means connected to said flow control means for receiving oil and transferring said oil to a storage tank outside of said apparatus;

f. oil reservoir means located beneath said lower oil manager means for receiving and containing oil, and

g. oil helix means connected to said lower oil manager means for separating trace oil from said waste water stream.

4,626,361

BINDER-MIXTURES FOR OPTICAL RECORDING LAYERS AND ELEMENTS

Michel F. Molaire, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 473,825, Mar. 9, 1983, Pat. No. 4,499,165. This application Oct. 19, 1984, Ser. No. 662,920

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—1 **7 Claims**

1. A composition comprising a mixture of non-polymeric compounds exhibiting a single thermal transition free of phase separation characterized in that said mixture (a) is amorphous (b) is solid at about 20° C. and (c) comprises at least two different compounds each having at least two linking components joining one multi-valent organic nucleus with at least two organic nuclei wherein at least one of the multivalent organic nucleus and the organic nuclei is a multicyclic aromatic nucleus.

4,626,362

ADDITIVE SYSTEMS FOR CONTROL OF FLUID LOSS IN AQUEOUS DRILLING FLUIDS AT HIGH TEMPERATURES

Joseph J. Dickert, Jr., Yardley, Pa., and Israel J. Heilweil, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 11, 1985, Ser. No. 722,027

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.51 **4 Claims**

1. A water-based clay drilling fluid containing from 0.25 lbs./bbl. to 6 lbs./bbl. of

(A) sulfonate amide polymer 2, a water-soluble sulfonate amide copolymer, having a molecular weight of about 200,000 to 2 million and consisting of a random distribution of units of the formulae

(a) $-CH_2-CH-$ with $C{=}O$ and $HN-C(CH_3)_2-CH_2-SO_3^-X^+$

in a proportion of 60 wt.% to 80 wt.% of the weight of the copolymer, and

(b) $-CH_2-CH-$ with $N-R_1$ and $C(=O)-R_2$

in a proportion of 20 wt.% to 40 wt.% of the weight of the copolymer,

wherein R_1 and R_2 are the same or different and each is hydrogen, methyl, or ethyl, and X^+ is a cation, and

(B) 0.25 lbs./bbl. to 6 lbs./bbl. of an acrylate polymer of the formula

$$\left[-CH_2-CH(C{=}O{-}O{-}Na)-CH_2-CH(C{=}O{-}O{-}Na)-CH_2-\right]_n$$

wherein said acrylate polymer has a molecular weight less than 50,000, and wherein the weight ratio of said sulfonate amide copolymer to said acrylate polymer is about 3:1.

4,626,363

CATIONIC ACRYLAMIDE EMULSION POLYMER BRINE THICKENERS

Patricia A. Gleason, Westfield, and Marie A. Piccoline, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 29, 1984, Ser. No. 645,379

Int. Cl.[4] C09K *7/02;* **E21B** *43/00*

U.S. Cl. 252—8.514 **17 Claims**

1. A thickened, solids free, aqueous drilling and servicing brine having a density of at least 14.4 ppg. comprising (a) an aqueous solution of at least one water-soluble salt of a multivalent metal, and (b) a cationic water-in-oil emulsion polymer of acrylamide or methacrylamide and a cationic monomer selected from the group consisting of a dialkylaminoalkyl acrylamide or methacrylamide, a trialkylaminoalkyl acrylamide or methacrylamide, a trialkylaminoalkyl acrylate or methacrylate, and a dialkyldiallyl ammonium halide, wherein the acrylamide or methacrylamide to cationic monomer molar ratio of the polymer is about 70:30 to 95:5, the polymer having an I.V. in 1.0N KCl of about 1.0 to 7.0 dl/g and being present in a compatible and viscosifying amount; the thickened brine characterized by being substantially non-dilatent.

4,626,364

PARTICULATE FABRIC SOFTENING AND ANTISTATIC BUILT DETERGENT COMPOSITION AND PARTICULATE AGGLOMERATE FOR USE IN MANUFACTURE THEREOF

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,157

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.8 **18 Claims**

1. A particulate fabric softening antistatic product for addition to detergent compositions to impart fabric softening and antistatic properties to them, which comprises agglomerated particles of fabric softening bentonite and higher aliphatic isostearamide antistat.

4,626,365

POLYTETRAFLUORETHYLENE-CONTAINING COATING COMPOSITION FOR SLIDING PARTS

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed May 24, 1985, Ser. No. 737,431

Claims priority, application Japan, Jun. 5, 1984, 59-113949

Int. Cl.[4] C10M *131/04*

U.S. Cl. 252—12 **9 Claims**

1. A composition for sliding parts, selected from the group consisting of:

(a) a composition for sliding parts consisting of:

0.1 to 50 vol % in total of at least one selected from the group (A) consisting of tetrafluoroethylenehexafluoropropylene copolymer resin (FEP), tetrafluoroethyleneperfluoroalkylvinyl ether copolymer resin (PFA), tetrafluoroethylene-ethylene copolymer resin (ETFE), fluoroethylene propylene ether resin (EPE);

0.1 to 35 vol % of a compound metal oxide; and

the balance substantially polytetrafluoroethylene (PTFE), the total content of components other than PTFE ranging between 0.2 and 70 vol %;

(b) a composition for sliding parts consisting of:

0.1 to 50 vol % in total of at least one selected from the group (A) consisting of FEP, PFA, ETFE, and EPE;

a compound metal oxide;

a metal oxide;

the total content of both the compound metal oxide and the metal oxide ranging between 0.1 to 35 vol %; and

the balance substantially PTFE, the total content of components other than PTFE ranging between 0.2 and 70 vol %;

(c) a composition for sliding parts consisting of:

0.1 to 50 vol % in total of at least one selected from the group (A) consisting of FEP, PFA, ETFE, and EPE;

a compound metal oxide;

at least one selected from a group (B) consisting of: a metallic lubricant; a metal sulfide; a metal fluoride; a carbonic solid; a fibrous material such as carbon fiber; and ceramics

the total content of the compound metal oxide and at least the one selected from the group (B) ranging between 0.1 to 35 vol %; and

the balance substantially PTFE, the total content of components other than PTFE ranging between 0.2 and 70 vol %; and

(d) a composition for sliding parts consisting of:

0.1 to 50 vol % in total of at least one selected from the group (A) consisting of FEP, PFA, ETFE, and EPE;

a compound metal oxide;

a metal oxide;

at least one selected from a group (B) consisting of: a metallic lubricant; metal sulfide; a metal fluoride; a carbonic solid lubricant; a fibrous material; and ceramics

the total content of the compound metal oxide, the metal oxide and the at least one selected from the group B ranging between 0.1 to 35 vol %; and

the balance substantially PTFE, the total content of components other than PTFE ranging between 0.2 and 70 vol %.

4,626,366

FUNCTIONAL FLUIDS AND CONCENTRATES CONTAINING ASSOCIATIVE POLYETHER THICKENERS AND CERTAIN METAL DIALKYLDITHIOPHOSPHATES

Mark A. Frentrup, Dearborn; Stanley T. Hirozawa, Birmingham; James E. Carson, Lincoln Park, and Daniel E. Coker, Woodhaven, all of Mich., assignors to BASF Corporation, Wyandotte, Mich.

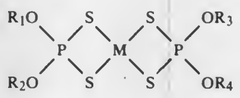
Filed Jan. 6, 1984, Ser. No. 568,865

Int. Cl.[3] C10M *3/42*

U.S. Cl. 252—32.7 E **44 Claims**

1. A functional fluid concentrate which comprises

(a) a cloud point raising additive having the following structural formula:



wherein R_1, R_2, R_3, and R_4 are individually linear or branched alkyl, alkenyl, aryl, arylakyl, or alkylaryl groups having from 1 to 24 carbon atoms; and M is selected from the group consisting of Zn, Sb, Sn, Mg and Mn:

(b) from 0.5 part to 10.0 parts by weight of a polyether nonionic surfactant; and

(c) from 0.01 part to 50.0 parts by weight of an associative polyether thickener, said weights based upon 1.0 part by weight of the cloud point raising additive.

4,626,367

WATER-SOLUBLE METAL-WORKING LUBRICANT COMPOSITION

Hiroshi Kuwamoto, Fukuyama; Hiroyuki Nagamori; Takashi Mukai, both of Wakayama, and Shuichi Iwado, Fukuyama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 615,760, May 31, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,358

Claims priority, application Japan, Oct. 6, 1983, 58-103631

Int. Cl.[4] C16M *173/02*

U.S. Cl. 252—49.5 **6 Claims**

1. A non-oil based water-soluble metal-working lubricant composition comprising as essential components thereof:

(a) one or more polyetherpolyols having molecular weights of 200 to 100,000 and obtained by adding alkylene oxides to one or more compounds selected from the group consisting of:

(1) polyalkylenepolyamines selected from the group consisting of ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine, pentaethylenehexamine, propylenediamine, and butylenediamine, (C_4–C_{22}) N-alkylated derivatives thereof and derivatives thereof which may further contain up to 3 hydroxyl groups in place of the NH_2 groups; and

(2) alkyl- and alkylaryl-amines selected from the group consisting of (C_4–C_{36}) mono- or dialkylamines, (C_3–C_6) cycloalkylamines, and (C_4–C_{36}) alkylarylamines having at least one phenyl group; and

(b) one or more compounds selected from the group consisting of boric acid and phosphoric acid compounds selected from the group consisting of:

(i) phosphoric acid, phosphorous acid, thio compounds thereof and mono- or di- (C_1–C_8) alkyl ester compounds thereof;

(ii) mono- and di-phosphoric acid esters containing alkyl group containing at least one hydroxyl group, and thio compounds thereof;

(iii) mono- and di-phosphoric acids which contain (C_1–C_8) alkyl groups and thio compounds thereof;

(iv) mono- and di-phosphinic acids which contain (C_1–C_8) alkyl groups and thio compounds thereof; and

(v) mono-, di- and tri-phosphonic acids containing one or more nitrogen atoms.

4,626,368

BENZOTRIAZOLE DERIVATIVES AND ORGANIC COMPOSITIONS CONTAINING SAME

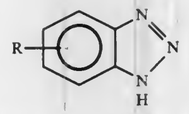
Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 10, 1985, Ser. No. 807,425

Int. Cl.[4] C10M *1/10*

U.S. Cl. 252—49.9 **15 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and a minor load-carrying/antiwear amount of a product of reaction obtained by reacting a C_1–C_8 hydrocarbyl aldehyde and a dihydrocarbyl phosphite having from 1 to about 30 carbon atoms in each hydrocarbyl moiety with a benzotriazole having the following generalized structural formula:



where R is H or hydrocarbyl having from 1 to about 12 carbon atoms, the reaction being carried out under ambient pressure at from about 70° to about 120° C. in substantially molar ratios of reactants.

4,626,369

LEAD ZIRCONATE TITANATE CERAMICS

Basil E. Walker, Jr., Waldorf, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1985, Ser. No. 749,022

Int. Cl.[4] C04B *35/49*

U.S. Cl. 252—62.9 **11 Claims**

1. A lead zirconate titanate (PZT) piezoelectric ceramic composition which, based on total composition weight, consists essentially of

a solid solution of lead zirconate and lead titanate in a $PbZrO_3$:$PbTiO_3$ ratio from about 0.505:0.495 to about 0.54:0.46;

a halide salt selected from the group consisting of fluorides and chlorides of alkali metal and alkaline earth elements and mixtures thereof except for francium and radium in an amount from about 0.5 to 2 weight percent; and

an oxide selected from the group consisting of magnesium, barium, scandium, aluminum, lanthanum, praesodymium, neodymium, samarium, and mixtures thereof in an amount from about 0.5 to about 6 weight percent, the relative amount of oxide being from about 1 to about 4 times that of said halide.

4,626,370

MAGNETIC FLUID

Katsuhiko Wakayama, and Hiraku Harada, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,356

Claims priority, application Japan, Sep. 17, 1984, 59-194322; Sep. 18, 1984, 59-194985

Int. Cl.[4] H01F *10/10*

U.S. Cl. 252—62.52 **11 Claims**

1. A magnetic fluid comprising metal fine particles of iron, a phospholipid surface-active agent, and a medium,

the improvement wherein said medium is at least one member selected from the group consisting of diesters of dicarboxylic acids.

4,626,371

MAGNETIC COMPOSITE

Yukio Ikenaga; Katsuhiko Takahashi, both of Fuji; Tsuneyoshi Okada, Kawasaki; Kenji Hijikata, and Toshio Kanoe, both of Fuji, all of Japan, assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,683

Claims priority, application Japan, Sep. 12, 1984, 59-191368

Int. Cl.[4] H01F *1/00, 1/26*

U.S. Cl. 252—62.54 **19 Claims**

1. A magnetic composite which comprises a magnetic powder and a binder resin of a melt-processable polymer which is capable of forming an anisotropic melt phase, with said magnetic composite having been formed by molding a blend comprising said magnetic powder and said molten polymer which exhibits an anisotropic melt phase.

4,626,372

BORATE SOLUTION SOLUBLE POLYVINYL ALCOHOL FILMS

Edward J. Kaufmann, San Ramon, and Barry A. Sudbury, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 319,966, Nov. 10, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 577,727

Int. Cl.[4] C11D *17/04*

U.S. Cl. 252—90 **6 Claims**

1. A method of introducing a laundry additive to an aqueous laundry solution containing borate at levels as high as 3.4×10^{-3}M, comprising:

enclosing said additive in a sealed water soluble envelope, said envelope being formed of a plasticized film of a polymer consisting essentially of polyvinyl alcohol, the solubility rate of said plasticized film in a laundry solution having a borate concentration of about 1.7×10^{-3}M and a pH of about 10.7 being increased by the presence therein, in addition to a plasticizing amount of plasticizer, of a solubility rate increasing amount of a polyhydroxy compound, PHC, which has a binding constant, K_2, with borate, in aqueous solution at 25° C., that is greater than about $800M^{-2}$, K_2 being defined as equal to

$$\frac{\text{(Complex)}}{\text{(borate) (PHC}^2\text{)}}$$

wherein (Complex), (borate) and (PHC) are the molar concentrations of the respective constituents; and

contacting said envelope with an aqueous laundry solution containing borate at levels as high as 3.4×10^{-3}M for a sufficient time for said envelope to dissolve sufficiently to allow said additive to contact said aqueous laundry solution.

4,626,373

MANGANESE ADJUNCTS, THEIR PREPARATION AND USE

Timothy D. Finch, Bromborough, and Raymond J. Wilde, Higher Bebington, both of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,536

Claims priority, application United Kingdom, Nov. 8, 1983, 8329762

Int. Cl.⁴ C11D *9/42;* **D06L** *3/00*

U.S. Cl. 252—96 **16 Claims**

1. Manganese adjunct for use as a bleach catalyst comprising a manganese (II) cation bound to a ligand forming a compound selected from the group consisting of a true complex compound, a water-insoluble salt compound, an ion-binding compound by adsorption and mixtures thereof, said manganese (II)-ligand compound being present at least in an amount effective to catalyze bleaching, which compound is protectively embedded in a matrix of a water-soluble or water-dispersible material selected from the group of organic homopolymers or heteropolymers, organic nonionic compounds, long-chain C_{10}–C_{22} fatty acids, long-chain C_{10}–C_{22} fatty acid soaps, glassy sodium phosphates and mixtures thereof, said matrix present in an amount from 5 to 50% by weight of the manganese adjunct.

10. A detergent bleach composition comprising from 2 to 99.95% by weight of a peroxide bleaching agent and 0.005 to 5% by weight of a manganese adjunct as a bleach catalyst comprising a manganese (II) cation bound to a ligand forming a compound selected from the group consisting of a true complex compound, a water-insoluble salt compound, an ion-binding compound by adsorption and mixtures thereof, said manganese (II)-ligand compound being present at least in an amount effective to catalyze bleaching, which compound is protectively embedded in a matrix of a water-soluble or water-dispersible material selected from the group consisting of organic homopolymers or heteropolymers, organic nonionic compounds, long-chain C_{10}–C_{22} fatty acids, long-chain C_{10}–C_{22} fatty acid soaps, glassy sodium phosphates and mixtures thereof, said matrix present in an amount from 5 to 50% by weight of the manganese adjunct.

4,626,374

HEAVY METAL ADJUNCTS, THEIR PREPARATION AND USE

Timothy D. Finch, Bromborough, and Raymond J. Wilde, Higher Bebington, both of United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

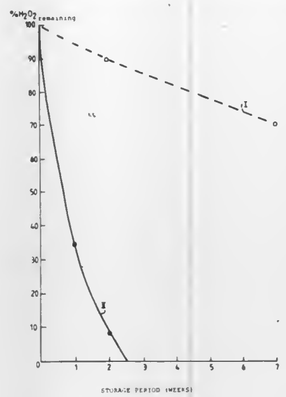
Filed Nov. 5, 1984, Ser. No. 668,451

Claims priority, application United Kingdom, Nov. 8, 1983, 8329761

Int. Cl.⁴ C11D *17/00, 17/04, 17/06*

U.S. Cl. 252—174.13 **16 Claims**

1. A stable heavy metal adjunct for use as a bleach catalyst comprising a matrix of a heavy metal salt having atomic numbers of from 24 to 29 provided with a surface powder coating of desiccant microsized inert powdered material with a mean



particle size of less than 25 μm in an amount of from 0.5 to 20% by weight of the heavy metal salt.

4,626,375

LIQUID CRYSTALLINE SUBSTANCES

Dietrich Demus; Roger Frach; Hans-Joachim Deutscher, and Horst Zaschke, all of Halle, German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik, Berlin-Oberschoeneweide, German Democratic Rep.

Filed Oct. 10, 1984, Ser. No. 659,388

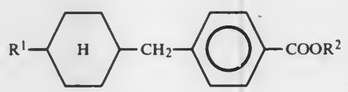
Claims priority, application German Democratic Rep., Oct. 28, 1983, 256067

Int. Cl.⁴ C09K *3/34;* **G02F** *1/13;* **C07C** *69/76, 69/74, 121/00*

U.S. Cl. 252—299.63 **20 Claims**

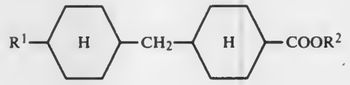
1. Liquid-crystalline esters of 4-[(4'-alkyl-cyclohexyl)-methyl]-benzoic acids or -cyclohexanecarboxylic acids having the general formula

I



or

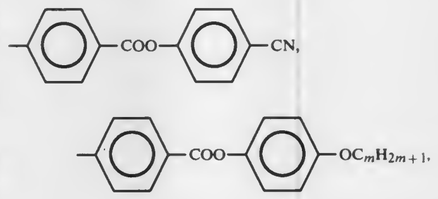
II



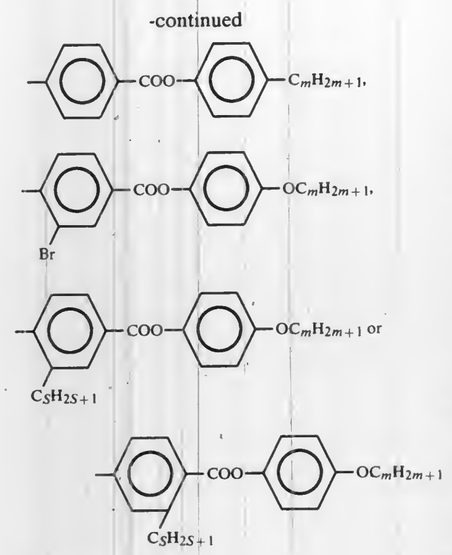
wherein

R^1 in formulas I and II = C_nH_{2n+1},

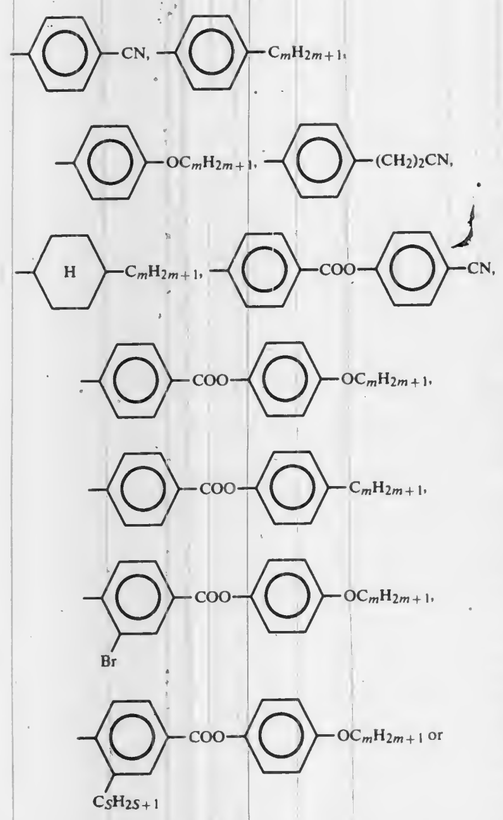
R^2 in formula I =



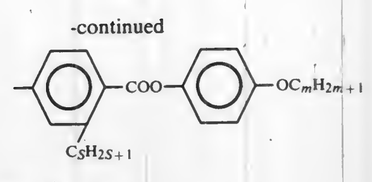
-continued



R^2 in formula II =



-continued



wherein in formulas I and II

n = an integer from 1 to 10

m = an integer from 1 to 10

S = an integer from 1 to 10.

4,626,376

PROCESS FOR OBTAINING SOLUTIONS HAVING A HIGH CONTENT OF DISSOLVED GAS

Jean-Louis Pean, 4, Allée des Maraichers, 91310 Montlhery, France

Filed Feb. 21, 1985, Ser. No. 703,752

Claims priority, application France, Feb. 29, 1984, 84 03130

Int. Cl.⁴ C09K *3/30*

U.S. Cl. 252—305 **10 Claims**

1. A process for obtaining a solution of a chlorofluorohydrocarbon having 25–30% by weight of dissolved gas, comprising producing solution-saturation in a countercurrent manner under subcritical pressure of the gas in a chlorofluorohydrocarbon previously compressed under pressure and supercooled to a temperature of at least as low as a temperature in the neighbourhood of a chosen temperature, said chosen temperature being the temperature of the dissolved gas-chlorofluorohydrocarbon mixture at the exit, the chlorofluorohydrocarbon being sprayed in a dissolving zone which is maintained under the pressure of the gas, a first contact of the gas with the liquid chlorofluorohydrocarbon being achieved by a bubbling under subcritical pressure of the gas in the chlorofluorohydrocarbon under conditions of temperature and pressure lower than the critical conditions with a strict thermal regulation throughout the dissolving-saturating stage so that it is effected below the critical conditions.

4,626,377

DEFOAMING COMPOSITION

Ronald W. Kavchok, Belle Mead, N.J., and Francis J. Boylan, deceased, late of Newton, N.J. (by Katherine C. Boylan, executor), assignors to Drew Chemical Corporation, Boonton, N.J.

Continuation-in-part of Ser. No. 485,215, Apr. 15, 1983, Pat. No. 4,477,370. This application Sep. 10, 1984, Ser. No. 648,590

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.⁴ B01D *19/04*

U.S. Cl. 252—321 **3 Claims**

1. An aqueous defoaming composition comprising as the primary component a 5–30% aqueous hydrophobic dispersion of a solid alcohol of 14–28 carbon atoms, a solid fatty acid of 14–28 carbon atoms, a soap of a solid fatty acid of 14–28 carbon atoms and a nonionic or anionic surfactant, the ratio by weight of acid and soap to alcohol being 0.2–0.4:1.0 and 0.1–0.5:1.0, respectively, and the ratio by weight of surfactant to combined alcohol, acid and soap being 0.1–0.4:1.0; and as the secondary component a dispersion of finely divided hydrophobic silica or ethylene-bis-stearamide in a water insoluble organic liquid, said primary and secondary components being present in a ratio by weight of the composition of 50–99.5% and 50–0.5%, respectively.

4,626,378

USE OF FLUORINATED NORBORNYLSILOXANES FOR DEFOAMING FRESHLY EXTRACTED DEGASSING CRUDE OIL

Roland Berger, Bochum; Hans-Ferdi Fink, Essen; Götz Koerner, Essen; Jaroslav Langner, Essen, and Christian Weitemeyer, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

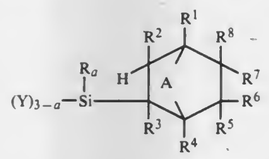
Filed Jun. 25, 1985, Ser. No. 748,727

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423609

Int. Cl.[4] C07F *7/04;* B01D *19/04, 17/05*

U.S. Cl. 252—321 19 Claims

1. In a method for defoaming crude oil containing volatile hydrocarbons under pressure wherein a defoaming effective amount of a defoaming agent is added to the crude oil, the improvement which comprises using as the defoaming agent, a fluorinated norbornylsiloxane having the general formula



in which

R is a hydrocarbon radical with 1 to 6 carbon atoms or a phenyl radical;

R^1, R^2, R^3, R^4 are the same or different and represent hydrogen or methyl radicals;

R^5, R^6, R^7, R^8 are the same or different and represent hydrogen, fluorine radicals, hydrocarbon radicals with 1 to 8 carbon atoms, or fluorinated hydrocarbon radicals with 1 to 20 carbon atoms, in which at least one of the R^5, R^6, R^7, R^8 radicals must be a fluorine or a fluorinated hydrocarbon radical;

Y is an organosiloxanyl radical,

A is a divalent hydrocarbon radical or an oxygen radical, and

a is 0, 1 or 2.

4,626,379

DEMULSIFIER COMPOSITION AND METHOD OF USE THEREOF

Rudolf S. Buriks, St. Louis, Mo., and James G. Dolan, Granite City, Ill., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 490,742, May 2, 1983, Pat. No. 4,502,977. This application Dec. 24, 1984, Ser. No. 686,105

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[4] B01D *17/04*

U.S. Cl. 252—340 51 Claims

1. Composition comprising the reaction product of (a) a blend of at least two polyoxyalkylene oxide copolymers wherein at least one of said copolymers is a polyoxyalkylene oxide block copolymer and at least one of said copolymers is a polyoxyalkylene oxide random copolymer, at least one of said copolymers being derived from a polyoxyalkylene glycol and a diglycidyl ether, and (b) a vinyl monomer, said product being partially crosslinked.

4,626,380

TRANSPORT AND STORAGE CONTAINER FOR RADIOACTIVE WASTE

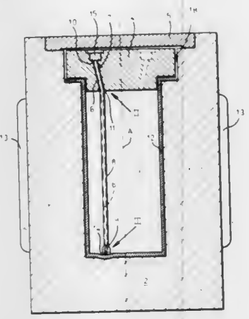
Henning Baatz, and Dieter Rittscher, both of Essen, Fed. Rep. of Germany, assignors to GNS-Gesellschaft fur Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,228

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222749

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 5 Claims



1. A storage and transport container for radioactive waste, the container comprising:

an upwardly open vessel having a closed bottom, solid walls, and an open upper mouth;

a lid sealingly engaged over and completely blocking the mouth, the lid being formed with at least one vertically throughgoing passage having a lower end and a threaded upper end, the vessel and lid being centered on an axis and the upper and lower passage ends being axially out of line with each other, the passage extending between these ends at an angle to the axis;

a rigid guide tube fixed to the lid and extending down in the vessel from the lower passage end to a location immediately adjacent the bottom of the vessel, whereby the interior of the tube forms a downward continuation of the passage to the location;

a feed tube extending along the passage and the continuation thereof and having an upper end provided with a rigid fitting sealingly but releasably screwed to the lid at the threaded upper passage end and a lower end at the location, whereby the vessel can be filled and emptied through this feed tube; and

a foot valve at the lower end of the feed tube, the tubes and valve being so dimensioned and the feed tube being sufficiently flexible that the feed tube and valve can be pushed down through the rigid guide tube, the valve engaging the bottom of the vessel when the upper feed-tube end is threaded into the upper passage end.

4,626,381

PROCESS FOR THE PREPARATION OF AN ISOMERIC MIXTURE OF 1-(2,6,6-TRIMETHYLCYCLOHEXYL)-HEXANE-3-OL

Karl-Heinrich Schulte-Elte, Onex, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 584,500, Feb. 28, 1984. This application Dec. 17, 1985, Ser. No. 809,806

Claims priority, application Switzerland, Mar. 11, 1983, 1340/83

Int. Cl.[4] C11B *9/00;* A61K *7/46*

U.S. Cl. 252—522 R 3 Claims

1. A method to enhance, modify or improve the odor properties of perfumes and perfumed articles which comprises adding thereto a fragrance effective amount of a composition containing not less than about 60% by weight of trans-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol and not more than about 40% by weight of cis-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol.

4,626,382

METHOD OF PRODUCING A GLASS BLOCK CONTAINING RADIOACTIVE FISSION PRODUCTS AND APPARATUS THEREFOR

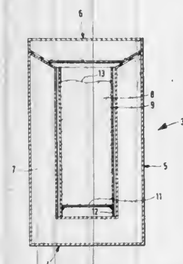
Detlef Stritzke, Mol; Eckhart Ewest, Balen, and Wilfried Heimerl, Mol, all of Belgium, assignors to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,474

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324291

Int. Cl.[4] C03B *25/04, 40/02;* G21F *9/30*

U.S. Cl. 252—629 12 Claims



1. Method of producing a glass block containing radioactive fission products in a metal vessel, the method comprising the steps of:

applying a layer of carbon material on substantially the entire inner wall surfaces of said metal vessel to facilitate movement between said vessel and the glass block to be formed therein;

placing said metal vessel in a thermally-insulated receptacle having a thermally-insulated cover;

then filling said metal vessel with a melt of glass containing radioactive fission products emanating from a glass-melt furnace;

covering said receptacle with said cover thereby closing off the melt of glass with respect to the ambient; and,

allowing said metal vessel filled with the glass melt to cool in said receptacle for a predetermined period of time during which said movement occurs thereby inhibiting the formation of fissures in said block.

4,626,383

CHEMILUMINESCENT SYSTEM CATALYSTS

Herbert P. Richter, and Joseph H. Johnson, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1985, Ser. No. 719,786

Int. Cl.[4] C09K *11/00*

U.S. Cl. 252—700 1 Claim

1. In a method for producing light in short duration, high intensity systems and low temperature systems having the steps of bringing a hydrogen peroxide component containing a catalyst and a solvent and an oxalate ester-fluorescent component together and allowing said components to react to produce said light, the improvement comprising in utilizing as said catalyst a lithium carboxylic acid salt selected from the group consisting of lithium salicylate, lithium 5-t-butyl salicylate and lithium 2-chlorobenzoate.

4,626,384

PENAM DERIVATIVES

Motoaki Tanaka; Makoto Kajitani, and Tomio Yamazaki, all of Tokushima, Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

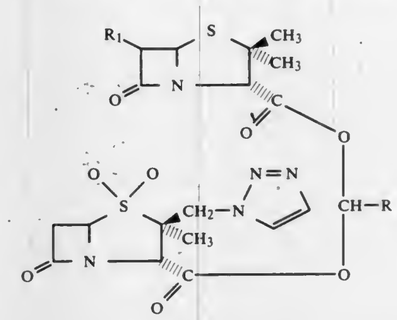
Filed Mar. 28, 1985, Ser. No. 716,948

Claims priority, application Japan, Apr. 6, 1984, 59-69843

Int. Cl.[4] C07D *499/32;* A61K *31/43*

U.S. Cl. 540—306 8 Claims

1. A penam derivative represented by the formula



(I)

wherein R is hydrogen or methyl and R_1 is (hexahydro-1H-azepin-1-yl)methyleneamino, 2-phenylacetamido, 2-phenoxyacetamido, 2-amino-2-phenylacetamido, 2-amino-2-(p-hydroxyphenyl)acetamido or 2-(4-ethyl-2,3-dioxo-1-piperazine)carboxamido-2-phenylacetamido, or a pharmaceutically acceptable salt thereof.

4,626,385

N-SUBSTITUTED CARBAMOYL-LACTAM

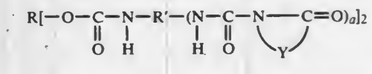
Kaneyoshi Ashida, 23560 E. Newell Cir., Farmington Hills, Mich. 48024, and Jozef L. M. van der Loos, Rijksweg Zuid 146, 6134 AE Sittard, Netherlands

Continuation-in-part of Ser. No. 592,082, Mar. 22, 1984, abandoned. This application May 21, 1985, Ser. No. 736,257

Int. Cl.[4] C07D *223/10, 207/38, 211/40*

U.S. Cl. 540—451 9 Claims

1. An N-substituted carbamoyl-lactam compound of the formula:



wherein R is a di-valent hydrocarbon radical derived from polytetramethyleneglycol and represents the radical remaining from the polytetramethylene oxide starting material used in preparing polytetramethylene-glycol, said polytetramethylene glycol having a hydroxyl equivalent weight of 300 to 3000,

wherein R′ is a di-valent hydrocarbon radical derived from a diisocyanate selected from the group consisting of 1,5 hexane diisocyanate, 1,6 hexane diisocyanate, isophorone diisocyanate, xylylene diisocyanate, 2,2′-diphenylmethane diisocyanate, 2,4′-diphenylmethane diisocyanate, 4,4′-diphenylmethane diisocyanate, hydrogenated 2,2′-diphenylmethane diisocyanate, hydrogenated 2,4′-diphenylmethane diisocyanate, hydrogenated 4,4′-diphenylmethane diisocyanate, hydrogenated xylylene diisocyanate, hydrogenated 2,4-toluene diisocyanate, hydrogenated 2,6-toluene diisocyanate and mixtures thereof,

Y is a C_3–C_{14} alkylene group, and

a is a value corresponding to the mean functionality of said polyisocyanate minus 1.

4,626,386

PROCESS FOR THE PREPARATION OF ALKALI METAL AND ALKALINE EARTH METAL SALTS OF DIARYLPHOSPHINIC ACIDS

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,131

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415070

Int. Cl.[4] C07F *9/30*

U.S. Cl. 260—502.4 R 8 Claims

1. A process for the preparation of alkali metal and alkaline earth metal salts of diarylphosphinic acids by reacting triarylphosphane oxides with alkali metal or alkaline earth metal hydroxides at elevated temperature, wherein the reaction is carried out using a molar ratio of a triarylphosphane oxide to an alkali metal hydroxide of about 1:1 or a molar ratio of a triarylphosphane oxide to an alkaline earth metal hydroxide of about 1:0.5, wherein the reaction is carried out in the presence of water in an amount of about 10% or more by weight, relative to the weight of the starting triarylphosphane oxide, under elevated pressure.

4,626,387

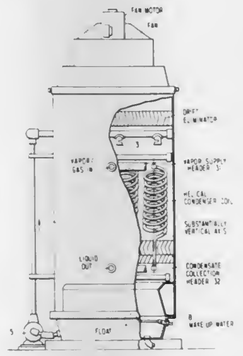
EVAPORATIVE CONDENSER WITH HELICAL COILS AND METHOD

Diego E. F. Dodds, Buenos Aires, Argentina, assignor to Leonard Oboler, Key Biscayne, Fla., a part interest

Filed May 29, 1985, Ser. No. 738,704

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—153 31 Claims



1. Evaporative condensing apparatus including a bank of heat exchange pipes and means for spraying cooling liquid droplets onto the external surfaces of said pipes, comprising in combination,

a pair of vertically spaced elongated headers,

strut means secured to said headers for maintaining a fixed distance between said headers,

said heat exchange pipes being constituted by a plurality of hollow helical pipes connected between said headers and having a substantially vertically oriented axis to avoid pooling of liquid and defining a plurality of helical flow paths between said headers, said cooling liquid droplets impinging on said hollow helical pipes to generate vibration and effect scale removal.

4,626,388

METHOD FOR PRODUCING CONTACT LENSES BY CENTRIFUGAL CASTING

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademi Ved, Prague, Czechoslovakia

Continuation of Ser. No. 715,436, Mar. 25, 1985, abandoned. This application Jan. 23, 1986, Ser. No. 822,677

Claims priority, application Czechoslovakia, Mar. 31, 1984, 2434-84

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.1 20 Claims

1. Method for producing contact lenses by centrifugal casting in molds inserted as a vertical row into a rotating polymerization column, wherein objects of a cylindric shape, which correspond by the diameter and height to the casting molds, are inserted between casting molds, whereas the ratio of weight to volume of these objects is larger than 3.

4,626,389

INSTALLATION FOR THE CONTINUOUS PRODUCTION OF MATERIALS USING EXOTHERMICALLY HARDENING BINDERS AND METHOD

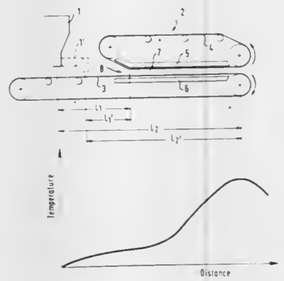
Karsten Lempfer, Grunbergstr. 18; Gert Kossatz, Im Gettelhagen 156, and Heinz Sattler, Warnowstr. 6, all of D-3300 Braunschweig, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,220

Claims priority, application Fed. Rep. of Germany, May 9, 1983, 3316946

Int. Cl.[4] B29C *39/16*

U.S. Cl. 264—40.7 13 Claims



1. A method for the continuous production of a product using an exothermically hardening binder material selected from the group consisting of gypsum and hydraulic cement comprising the steps of:

mixing the materials with water in a mixing and feeding station having an output in such a way as to define a first time period from the beginning of mixing to the beginning of stiffening and a second time period from the beginning of mixing to the end of hydration, where the end of hydration corresponds to the maximum temperature of the product being produced;

advancing the materials at a rate of advance from the mixing and feeding station to and through a calibrating or pressing unit having an entrance and an exit;

setting the ratio of the distance between the output of the feeding station and the entrance to the calibrating or pressing unit and the distance between the output of the feeding and the exit of the calibrating or pressing unit to correspond to the ratio between the first time period from the beginning of mixing to the beginning of stiffening and the second time period from the beginning of mixing to the end of hydration;

sensing the temperature of the advancing materials at points spaced proximate the exit of the calibrating or pressing unit; and

controlling the rate of advance of the materials so that the exothermically hardening binder materials reach the maximum temperature shortly before leaving the calibrating or pressing unit.

4,626,390

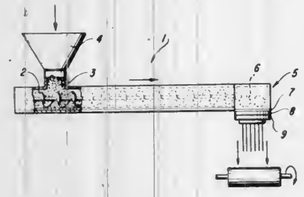
SELF-CRIMPED FOAMED FIBERS

Hsin L. Li, Parsippany; Theodore Largman, and Hendrikus J. Oswald, both of Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 3, 1985, Ser. No. 688,494

Int. Cl.[4] B29C *47/06, 67/20*

U.S. Cl. 264—46.1 11 Claims



11. A method of forming a self-crimped foamed fibers comprising the steps of:

(a) melt spinning a foamed fiber of an effective cross-sectional area having a plurality of randomly-arranged cells distributed asymmetrically over the effective cross-section of the foamed fiber taken substantially normal to the longitudinal axis of the foamed fiber, the minimum cross-sectional area occupied by the cells is at least about 0.1A, where A is the effective cross-sectional area of the foamed fiber, the asymmetrical distribution of the randomly-arranged cells being such that the foamed fiber is capable of crimping under a no load condition; and

(b) heating the foamed fiber under conditions sufficient to produced a crimped foam fiber having at least one crimp/inch, the cross sectional area of the crimped foamed fiber being not more than about 10% greater than of the effective area of the foamed fiber prior to the heating step.

4,626,391

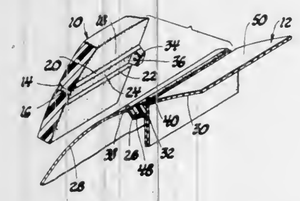
METHOD OF FINISHING A BODY PANEL JOINT

Edward F. Taylor, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,386

Int. Cl.[4] B29C *33/40, 67/20*

U.S. Cl. 264—46.6 2 Claims



1. A method of finishing joints in a body where two or more adjacent body panels are joined together forming a trough-like joint in between the panels by molding a plastic bead in said joint, said bead having a finished surface without any extraneous material to be removed while effecting an aesthetic quality and watertight seal, said method comprising the steps of:

pressing a mold against said body overlaying the joint, said mold comprising a feed hole and an interior cavity-defining surface having a contour of the bead surface to be formed, said mold being made of a pliable material effecting a tight seal between surfaces of the mold and of the body;

injecting a bead-forming material through said feed hole into a mold cavity defined by said interior cavity-defining surface and said trough-like joint surface;

curing said bead material in said mold until such time that the bead material has adhered to the body; and

removing said mold from said body, whereby an aesthetic quality bead is formed in said trough-like joint between the panels achieving a watertight seal.

2. A method of finishing joints in an automobile body where two or more adjacent flanged body panels are joined together at the flanges in a joint that has a trough between said adjacent panels running the length of the joint, said method being characterized by molding a polyurethane bead in said trough so that said bead has a finished surface without any extraneous material to be removed while effecting an aesthetic quality and watertight seal, said method comprising the steps of:

pressing a mold overlaying the length of the joint against said vehicle body with sufficient force, said mold comprising two ridge portions spaced apart to sealingly engage the shoulder section of the trough, a feed hole, an interior cavity-defining surface having a contour of the bead surface to be formed, and two end blocks spaced apart sealing the ends of the mold at least one of said blocks having a small vent hole, said mold being made of a pliable silicone rubber material effecting a tight seal between surfaces of the mold and of the vehicle body;

injecting a bead-forming polyurethane material through said feed hole under sufficient pressure to completely fill the cavity defined by said interior cavity-defining surface and said end blocks in the mold and said trough surface in the vehicle body;

curing said urethane material in said mold until such time that the urethane material has adhered to the body; and

removing said mold from said body, whereby an aesthetic quality bead is formed in said trough between the panels achieving a watertight seal.

4,626,392

PROCESS FOR PRODUCING CERAMIC BODY FOR SURGICAL IMPLANTATION

Kazuo Kondo; Masahiko Okuyama; Masakazu Watanabe, and Satoshi Iio, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Mar. 27, 1985, Ser. No. 716,437

Claims priority, application Japan, Mar. 28, 1984, 59-60046; Mar. 28, 1984, 59-60047

Int. Cl.[4] C04B *37/00, 35/00, 35/48*

U.S. Cl. 264—62 4 Claims

1. A process for producing a ceramic body for surgical implantation, comprising the steps of: providing a porous material by semi-sintering a ceramic compact of a ceramic material having a sintering temperature higher than the sintering temperature of apatite; filling pores in the surface of said porous material with a powder selected from the group consisting of a fine powder of at least one of tricalcium phosphate and apatite, and a mixture of said fine powder and a powder of said ceramic material; firing said porous material at the sintering temperature of said ceramic compact; coating the surface of said fired porous material with a material selected from the group consisting of (1) a fine apatite powder and (2) a finely pulverized mixture of apatite and a calcium phosphate base frit; and sintering the ceramic body at a temperature up to 1,350° C.

4,626,393

METHOD OF MANUFACTURING LOW TEMPERATURE SINTERED CERAMIC MATERIALS FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE

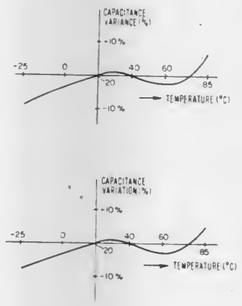
Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 676,652, Nov. 30, 1984. This application Jul. 9, 1985, Ser. No. 753,169

Claims priority, application Japan, Nov. 30, 1983, 58-225564; Nov. 30, 1983, 58-225565

Int. Cl.[4] C04B *35/46, 40/00;* **H01G** *4/10, 4/12*

U.S. Cl. 264—65 **4 Claims**



1. A process for the fabrication of coherently bonded bodies of a low temperature sintered ceramic material, for particular use as the dielectric bodies of capacitors, which comprises:

forming green bodies of desired shape and size from a mixture of 100 parts by weight of $Ba_{k-x-y}M_xL_yO_kTiO_2$ in finely divided form, where M is at least either of magnesium and zinc, where L is at least either of strontium and calcium, where k is a numeral in the range of 1.00 to 1.04 and x a numeral in the range of 0.002 to 0.049, where y is a numeral in the range of 0.001 to 0.048, and x+y is a value in the range of 0.02 to 0.05, and 0.2 to 10.0 parts by weight of an additive mixture consisting essentially fo 25 to 50 mole percent lithium oxide and 50 to 75 mole percent silicon dioxide in finely divided form for providing upon firing coherently bonded dielectric bodies with a specific dielectric constant in excess of 2000, dielectric losses of less than 2.5 percent, resistivity of over 1×10^6 megohm-centimeters and capacitance temperature dependence of + or −10% in a temperature range of −25° to +85° C.;

sintering the green bodies to maturity in a nonoxidative atmosphere at a temperature not to exceed 1300° C.; and

reheating the sintered bodies in an oxidative atmosphere at a temperature lower than said preceding sintering temperature.

4,626,394

METHOD OF MANUFACTURING LOW TEMPERATURE SINTERED CERAMIC MATERIALS FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE

Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 676,796, Nov. 30, 1984. This application Jul. 9, 1985, Ser. No. 753,240

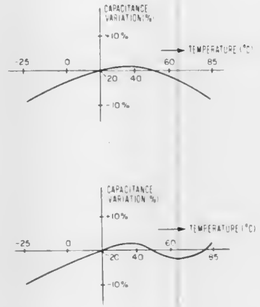
Claims priority, application Japan, Nov. 30, 1983, 58-225562; Nov. 30, 1983, 58-225563

Int. Cl.[4] C04B *35/46, 40/00;* **H01G** *4/10, 4/12*

U.S. Cl. 264—65 **4 Claims**

1. A process for the fabrication of coherently bonded bodies of a low temperature sintered ceramic material, for particular use as the dielectric bodies of capacitors, which comprises:

forming green bodies of desired shape and size from a mixture of 100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$ in finely divided form, where M is at least either of magnesium, zinc, strontium and calcium, where k is a numeral in the range of 1.00 to 1.04 and where x is a numeral in the range of 0.02 to 0.05, and 0.2 to 10.0 parts by weight of an additive in finely divided form composed of 30 to 90 mole percent boron oxide and 10 to 70 mole percent of at least one metal oxide selected from the group consisting of barium oxide, magnesium oxide, zinc oxide, strontium oxide, and calcium oxide for providing upon firing coherently bonded dielectric bodies with a specific dielectric constant in excess of 2000, dielectric losses of less than 2.5 percent, resistivity of over 1×10^6 megohm-centimeters and capacitance temperature dependence of + or −10% in a temperature range of −25° to +85° C.;



sintering the green bodies to maturity in a nonoxidative atmosphere at a temperature not to exceed 1300° C.; and

reheating the sintered bodies in an oxidative atmosphere at a temperature lower than said preceding sintering temperature.

4,626,395

METHOD OF MANUFACTURING LOW TEMPERATURE SINTERED CERAMIC MATERIALS FOR USE IN SOLID DIELECTRIC CAPACITORS OR THE LIKE

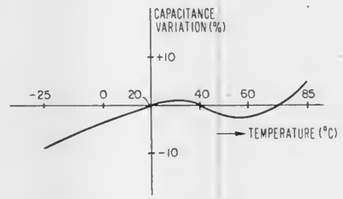
Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 676,780, Nov. 30, 1984. This application Jul. 9, 1985, Ser. No. 753,241

Claims priority, application Japan, Nov. 30, 1983, 58-225567

Int. Cl.[4] C04B *35/46, 40/00;* **H01G** *4/10, 4/12*

U.S. Cl. 264—65 **3 Claims**



1. A process for the fabrication of coherently bonded bodies of a low temperature sintered ceramic material, for particular use as the dielectric bodies of capacitors, which comprises:

forming green bodies of desired shape and size from a mixture of 100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$ in finely divided form, where M is at least either of magnesium, zinc, strontium and calcium, where k is a numeral in the range of 1.00 to 1.04 and where x is a numeral in the range of 0.02 to 0.05, and 0.2 to 10.0 parts by weight of an additive in finely divided form composed of 30 to 90 mole percent boron oxide and 10 to 70 mole percent of at least one metal oxide selected from the group consisting of barium oxide, magnesium oxide, zinc oxide, strontium oxide, and calcium oxide for providing upon firing coherently bonded dielectric bodies with a specific dielectric constant in excess of 2000, dielectric losses of less than 2.5 percent, resistivity of over 1×10^6 megohm-centimeters and capacitance temperature dependence of + or −10% in a temperature range of −25° to +85° C.;

sintering the green bodies to maturity in a nonoxidative atmosphere at a temperature not to exceed 1300° C.; and

re-heating the sintered bodies in an oxidative atmosphere at a temperature lower than the preceding sintering temperature.

4,626,396

METHOD OF MANUFACTURING LOW TEMPERATURE SINTERED CERAMIC MATERIALS FOR USE IN SOLID DIELECTRIC CAPACITORS OF THE LIKE

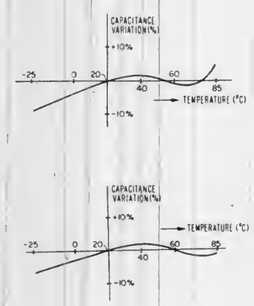
Takeshi Wada, Harunamachi; Hiroshi Nakamura, Fujioka; Masami Fukui, and Nobutatsu Yamaoka, both of Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 676,635, Nov. 30, 1984. This application Jul. 9, 1985, Ser. No. 753,242

Claims priority, application Japan, Nov. 30, 1983, 58-225566; Nov. 30, 1983, 58-225568

Int. Cl.[4] C04B *35/46, 40/00;* **H01G** *4/10, 4/12*

U.S. Cl. 264—65 **4 Claims**



1. A process for the fabrication of coherently bonded bodies of a low temperature sintered ceramic material, for particular use as the dielectric bodies of capacitors, which comprises:

forming green bodies of desired shape and size from a mixture of 100 parts by weight of $Ba_{k-x}M_xO_kTiO_2$ in finely divided form, where M is at least either of magnesium, zinc, strontium and calcium, where k is a numeral in the range of 1.00 to 1.04 and where x is a numeral in the range of 0.02 to 0.05, and 0.2 to 10.0 parts by weight of an additive mixture consisting essentially of 25 to 90 mole percent boron oxide and 10 to 75 mole percent silicon dioxide in finely divided form for providing upon firing coherently bonded dielectric bodies with a specific dielectric constant in excess of 2000, dielectric losses of less than 2.5 percent, resistivity of over 1×10^6 megohm-centimeters and capacitance temperature dependence of + or −10% in a temperature range of −25° to +85° C;

sintering the green bodies to maturity in a nonoxidative atmosphere at a temperature not to exceed 1300° C.; and

reheating the sintered bodies in an oxidative atmosphere at a temperature lower than said preceding sintering temperature.

4,626,397

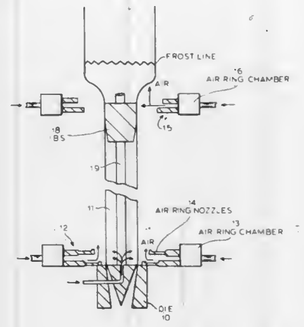
METHOD FOR CONTROLLED ORIENTATION OF EXTRUDED RESINS

Ajit K. Bose, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 29, 1984, Ser. No. 666,116

Int. Cl.[4] B29C *55/28*

U.S. Cl. 264—565 **7 Claims**



1. A process for the extrusion-blowing of a biaxially oriented, high density polyethylene tubular article, which comprises;

providing apparatus for thermally plasticizing and shaping said polyethylene, which comprises an extruder having a feed zone, heating zones, shaping zones and means for passing the polyethylene in successive stages through each of said zones, said zones being interconnected;

feeding the polyethylene to said feed zone;

continuously passing the fed polyethylene to the heat zones, said heat zones being maintained at a temperature above the first order phase transition temperature of the fed polyethylene, whereby said fed polyethylene is thermally plasticized;

continuously passing plasticized polyethylene to a shaping zone wherein said polyethylene is shaped in the form of a hollow tube;

continuously passing the hollow tube through an air quench, in the form of a primary air zone, inducing machine direction orientation in the tube of plasticized polyethylene;

drawing the air quenched tube over a bubble stabilizer to add strain to the tube;

drawing the formed and air quenched hollow tube at an increased speed though a secondary adjustable air zone;

cooling the drawn tube in the secondary adjustable air zone by directing a flow of chilled air on the tube, said adjustable air zone being positioned along the drawn tube at the flex point where transverse direction orientation takes over and freezes into the drawn tube,

whereby the ratio of machine direction properties to cross direction properties in the fully shaped hollow tube can be varied; and

blowing the cooled and drawn tube.

4,626,398

PROCESS FOR THE PRODUCTION OF EXTRUDED WEB MULTIPLE PANEL WITH UNDULATED WEBS

Eng H. Vetter, Rossdorf, and Karl-Heinrich Schanz, Muehltal, both of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 719,240

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414832; Jul. 14, 1984, 3426060

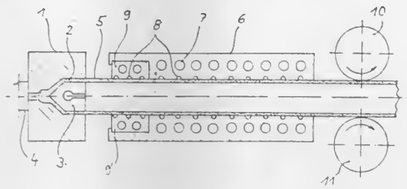
Int. Cl.[4] B29C *47/90*

U.S. Cl. 264—566 **9 Claims**

1. A process for the production of extruded web multiple

panels comprising two planar outside walls and a plurality of at least generally parallel webs that connect the two planar outside walls to one another and that undulate in the extrusion direction, said process comprising the steps of:

(a) extruding a thermoplastic material through a slotted die which has a slot containing longitudinally spaced core pieces, the spaces between said longitudinally spaced core



pieces forming non-undulated webs between the outside walls of a hollow extrudate, and then

(b) applying friction forces to the planar exterior surface of at least one of the outside walls of the hollow extrudate in rhythmically alternating directions crosswise to the direction of extrusion of the hollow extrudate in an area in which the hollow extrudate is still above its softening temperature.

4,626,399

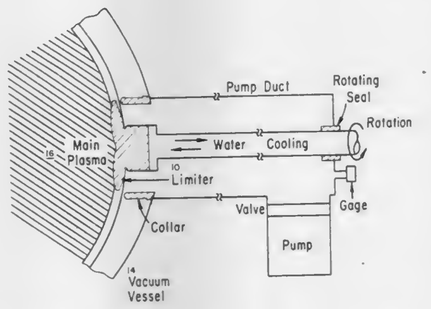
LIMITER

Samuel A. Cohen, Hopewell; Joel C. Hosea, Princeton, and John R. Timberlake, Allentown, all of N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,645

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—136 **10 Claims**



1. In a nuclear fusion vacuum vessel having an inner wall; a scrape-off region which includes a bulk plasma, energetic ions, and slide away electrons; an improved limiter, cylindrically symetrical about an axis and rotatable about said axis, said limiter having a front face and a back face, said front face having an annular flat portion covering a major portion of said front face, an indented portion and a vertex therebetween, said vertex forming a leading edge for said slide away electrons, whereby the heat load absorbed by said limiter is distributed thereon upon rotation thereof.

4,626,400

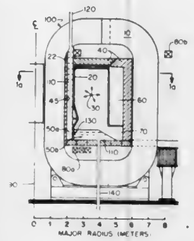
VARIABLE CONTROL OF NEUTRON ALBEDO IN TOROIDAL FUSION DEVICES

Daniel L. Jassby, and Bradley J. Micklich, both of Princeton, N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,199

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—146 **20 Claims**



1. In a toroidal fusion plasma device, including a vacuum vessel for confining a plasma which contains fusion neutrons, said vacuum vessel having inboard and outboard walls, an arrangement for varying, between steady state operating modes, one of said flux and said energy spectrum of said fusion neutrons which are incident on said outboard wall, said arrangement comprising:

neutron reflective material exclusively disposed immediately adjacent said inboard wall so as to reflect ones of said fusion neutrons having a predetermined flux and energy spectrum onto a predetermined portion of said outboard wall; and

means for positioning said neutron reflective material into and out of communication with said fusion neutrons, whereby at least one of said flux and said energy spectrum of said fusion neutrons which are incident on said outboard wall is varied when said albedo material is in communication with said fusion neutrons.

4,626,401

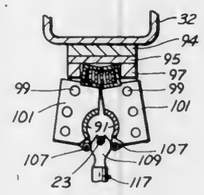
APPARATUS FOR INSPECTING FUEL ELEMENTS

David J. Oakley, Richland; Oliver J. Groves, Seattle, both of Wash., and Bruce J. Kaiser, Wilmington, N.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 21, 1984, Ser. No. 685,081

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—245 **16 Claims**



15. An alpha monitor for inspecting nuclear fuel pins for contamination by detecting emission of alpha particles from contaminants present upon exterior surfaces of a fuel pin casing after the casing has been sealed; comprising:

a structural framework having an upper beam and lower beam which are spaced apart and approximately parallel, with the length of the beams defining a longitudinal direction; the structural framework further having front and rear end pieces connecting the upper and lower beams in fixed relationship;

means for singularly accepting fuel pins positioned laterally adjacent to the alpha monitor; the means for singularly accepting fuel pins having a plurality of singulator cylinders mounted for rotation, the singulator cylinders each having a fuel pin recess on an exterior surface thereof which aligns with associated fuel pin recesses on other singulator cylinders; the means for singularly accepting fuel pins further having means for rotating the singulator cylinders to thereby transfer fuel pins into the alpha monitor one at a time;

a first roller assembly connected to the lower beam for receiving fuel pins accepted by the means for singularly accepting fuel pins, the first roller assembly being arranged to roll fuel pins longitudinally to and from the alpha monitor for processing outside the alpha monitor; the first roller asembly including a plurality of first rollers and means for rotating the rollers to thereby convey the fuel pins longitudinally to and from the alpha monitor;

first transfer means connected to the lower beam and comprising a plurality of first lifting arm assemblies and a plurality of first transfer ramps; the lifting arm assemblies acting to lift fuel pins from the first roller assembly causing the fuel pins to roll laterally onto and over the first transfer ramps;

an electrode assembly mounted beneath the upper beam, the electrode assembly having two tubular semicylindrical electrode casings each pivotally mounted for clamshell movement between a closed position and open positions wherein the electrode casings open downwardly toward the lower beam; the electrode assembly further having a plurality of electrodes mounted within the electrode casings;

a combined pin lifting and electrode operating means connected to the lower beam and comprising a plurality of lifter units having pin lifters slidably mounted therein for extension into the electrode assembly, the pin lifters having a distal end with a recess for receiving and holding fuel pins therein; the pin lifters also having an external camming profile which is narrow at the distal end and then enlarges downwardly to form an enlarged midsection for engaging and opening the pivotally mounted electrode casings in clamshell motion, the external camming profile further defined by tapering inwardly downward from the enlarged midsection to form a waist which allows the electrode casings to close about a fuel pin which is inserted therein;

a second roller assembly connected to the lower beam and approximately aligned with the pin lifters of the combined pin lifting and electrode operating means, the second roller assembly receiving fuel pins when the pin lifters lower to thereby rest the fuel pins in the second roller assembly; the second roller assembly including a plurality of rollers and means for rotating the rollers to thereby convey fuel pins from the alpha monitor longitudinally; and

second transfer means connected to the lower beam and comprising a plurality of second lifting arm assemblies, and a plurality of second transfer ramps; the lifting arm assemblies acting to lift fuel pins from the second roller assembly thereby causing the fuel pins to roll laterally therefrom and onto and over the second transfer ramps to thereby exit from the alpha monitor.

4,626,402

APPARATUS FOR THE STORAGE AND TRANSPORT OF RADIOACTIVE MATERIALS

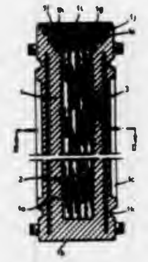
Henning Baatz, and Dieter Rittscher, both of Essen, Fed. Rep. of Germany, assignors to GNS Gesellschaft fur Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,467

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342641

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—272 **8 Claims**



1. In a system for the transport and storage of the radioactive material contained in the form of fuel rods of nuclear fuel elements irradiated in the core of a nuclear reactor, wherein said elements can be accommodated in an upwardly open chamber of a container composed of a cast iron or steel and receiving at least one sliding cover, the improvement wherein:

said chamber is provided with a grid-shaped metal lattice defining vertically extending compartments, and

said fuel rods after removal from said elements are disposed in said compartments in a closest-packed configuration wherein said fuel rods have line contact along their length with adjacent fuel rods with the closest possible packing that minimizes free-space.

4,626,403

RECOVERY SHROUD FOR DAMAGED NUCLEAR FUEL ELEMENTS

Mirko Fabris, Nivelles, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Brussels, Belgium

Filed Dec. 22, 1982, Ser. No. 452,124

Claims priority, application European Pat. Off., Dec. 29, 1981, 81201402.5

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—272 **8 Claims**

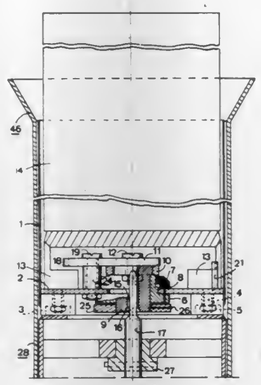
1. A recovery shroud for a damaged fuel element of a nuclear power facility, which fuel element includes at least one support foot, said shroud comprising:

a body surrounding at least a portion of said fuel element and having a base for receiving and supporting said at least one foot; and

retaining means movable between a retaining position holding said at least one foot on said base, and a release position wherein said at least one foot is free to move from said base, said retaining means comprising at least one gripper finger mounted for movement toward and away from said at least one foot, said finger having a first end disposed adjacent said foot and a spring connected to bias said at least one finger toward said at least one foot;

actuation means for moving said finger toward and away from said foot, said actuation means comprising a rotatable element having a radially extending portion pivotally connected to a second end of said finger, said actuation means further comprising a shaft unattached to and con-

tacting said rotatable element, and means for rotating said shaft; and



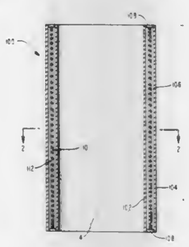
guide means slidably connected to said finger to constrain said finger to move in an at least partially linear path along said guide means toward and away from said foot.

4,626,404

ANNULAR BURNABLE ABSORBER ROD

Walston Chubb, Franklin Township, Venango County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 563,895
Int. Cl.[4] G21C *7/04*
U.S. Cl. 376—447 **7 Claims**



1. In a neutron irradiation environment of a water cooled and moderated reactor core a fuel assembly having a discrete annular burnable absorber rod, said rod being free of nuclear fuel material said rod comprising a first elongated hollow tube having opposed ends, a second elongated hollow tube having opposed ends, said first and second tubes constructed of a zirconium material, said first and second tubes concentrically arranged about a common axis to provide a coextensive annular space therebetween and a path for said water through said first tube along said common axis, sealing means for sealing said annular space at common opposed ends of said first and second tube, a hollow niobium tubular support arranged within said annular space, said tubular support having an inner and outer surface, a layer of burnable neutron absorber material provided on at least a portion of one of said surfaces of said support said layer of said burnable neutron absorber material selected from the group of boron compounds consisting of boron carbide, boron nitride and zirconium diboride;

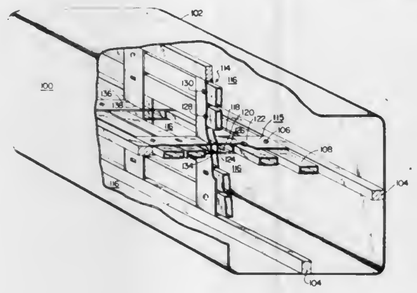
and said layer of said burnable neutron absorber material having a thickness between 0.002 to 0.010 inches.

4,626,405

CRUCIFORM SKELETON AND WATER CROSS FOR A BWR FUEL ASSEMBLY

David H. Field; William E. Kirby, and Theodore W. Nylund, all of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1984, Ser. No. 584,424
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—448 **41 Claims**



1. A moderator flow assembly for delivering nonboiling water to a nuclear fuel assembly comprising:

(a) a plurality of axially spaced, cruciform-shaped grid assemblies, each of said grid assemblies being formed by orthogonal pairs of spaced, parallel elongate grid straps, which define said cruciform shape;

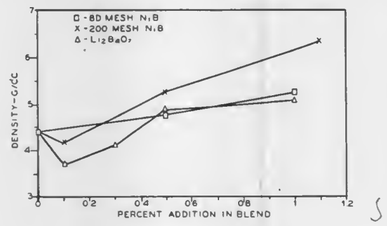
(b) and a plurality of moderator tubes held in a cruciform array in said fuel assembly by said cruciform-shaped grid assemblies.

4,626,406

ACTIVATED SINTERING OF METALLIC POWDERS

Jon M. Poole, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Oct. 28, 1985, Ser. No. 792,033
Int. Cl.[4] C22C *32/00*
U.S. Cl. 419—12 **20 Claims**



1. A method for consolidating a product from metallic powder, the method comprising:

(a) blending the powder with a binder and a boron containing activator to form a slurry,

(b) introducing the slurry into an active forming apparatus to cause the formation of an object of predetermined shape,

(c) removing the binder from the object, and

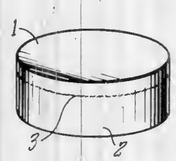
(d) sintering the object.

4,626,407

METHOD OF MAKING AMORPHOUS BORON CARBON ALLOY CUTTING TOOL BITS

Richard D. Veltri, East Hartford, and Francis S. Galasso, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 12,930, Feb. 16, 1979. This application Jan. 22, 1981, Ser. No. 227,315
Int. Cl.[4] C22C *32/00*; B22F *7/06*
U.S. Cl. 419—18 **9 Claims**



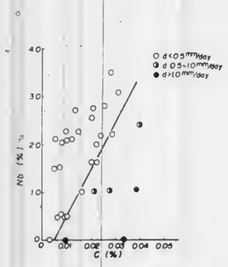
1. A process of forming an amorphous boron-carbon alloy containing cutting tool bit comprising filling a tool bit die with an amorphous boron-carbon alloy and binder and subjecting the mixture to heat and pressure sufficient to form the cutting tool bit.

4,626,408

NI-BASED ALLOY EXCELLENT IN INTERGRANULAR CORROSION RESISTANCE, STRESS CORROSION CRACKING RESISTANCE AND HOT WORKABILITY

Koichiro Osozawa, Yokohama; Rikio Nemoto, Kawasaki; Yoshito Fujiwara, Chigasaki; Tomoaki Okazaki, Hiroshima; Yasuhiro Miura, and Kiyoshi Yamauchi, both of Kure, all of Japan, assignors to Nippon Yakin Kogyo Kabushiki Kaisha and Babock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,824
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—442 **4 Claims**



1. A Ni-based alloy excellent in intergranular corrosion resistance, stress corrosion cracking resistance and hot workability, consisting essentially of 25% or less of Fe, 14 to 26% of Cr, 0.045% or less of C, 1.0% or less of Si, 1.0% or less of Mn, 0.030% or less of P, 0.0010% or less of S, 0,005 to 0.2% of N, 0.05 to 4.0% of Nb, said Nb being present in an amount satisfying the relationships: % Nb≧100 (% C−0.005) % in case where % C is more than 0.0055% and % Nb=[3.0−75 (% C+% N)] % in case where (% C+% N) is less than 0.04%, sum of all said elements exclusive of Ni being not more than 40%, and the balance consisting of Ni.

4,626,409

ALUMINIUM ALLOYS

William S. Miller, Gerrards Cross, England, assignor to Alcan International Limited, Montreal, Canada

Filed Mar. 30, 1984, Ser. No. 595,446
Claims priority, application United Kingdom, Mar. 31, 1983, 8308907; Mar. 31, 1983, 8308908
Int. Cl.[4] C22C *21/16*
U.S. Cl. 420—533 **20 Claims**

1. An aluminium base alloy consisting of a composition within the following ranges in weight percent:

Lithium	2.3 to 2.9
Magnesium	0.5 to 1.0
Copper	1.6 to 2.4
Zirconium	0.05 to 0.25
Titanium	0 to 0.5
Manganese	0 to 0.5
Nickel	0 to 0.5
Chromium	0 to 0.5
Zinc	0 to 0.5
Aluminium	Remainder (apart from incidental impurities),

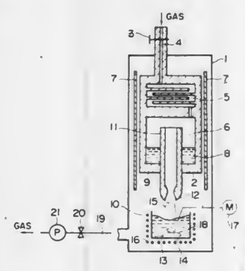
and in which the ratio of copper to magnesium is between 1.6:1 and 4.8:1.

4,626,410

METHOD OF MAKING COMPOSITE MATERIAL OF MATRIX METAL AND FINE METALLIC PARTICLES DISPERSED THEREIN

Hirohisa Miura; Hiroshi Satou; Toshio Natsume; Hidenori Katagiri; Yoshiro Hayashi, and Masahiro Taguchi, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 13, 1984, Ser. No. 620,176
Claims priority, application Japan, Jul. 13, 1983, 58-127439
The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.
Int. Cl.[4] B22F *9/00*; C22C *23/00*
U.S. Cl. 420—590 **5 Claims**



1. A method of making a composite material comprising a first metallic material as a matrix material and fine particles of a second metal dispersed therein, which comprises the steps of:

rapidly cooling a vapor of said second metal by adiabatic expansion through a nozzle, thereby obtaining a jet flow of fine metal particles; and

directing said jet flow of fine metal particles against the mass of said first metal in the molten state.

4,626,411

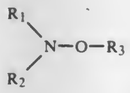
COMPOSITION AND METHOD FOR DEOXYGENATION

John J. Nemes; Harvey W. Thompson, and John E. Waller, all of Mississauga, Canada, assignors to Dearborn Chemical Company, Limited, Mississauga, Canada

Filed Apr. 17, 1985, Ser. No. 724,230
Claims priority, application Canada, Apr. 18, 1984, 452270
Int. Cl.[4] C23F *11/06;* C02F *1/70;* C09K *3/00*
U.S. Cl. 422—13 **20 Claims**

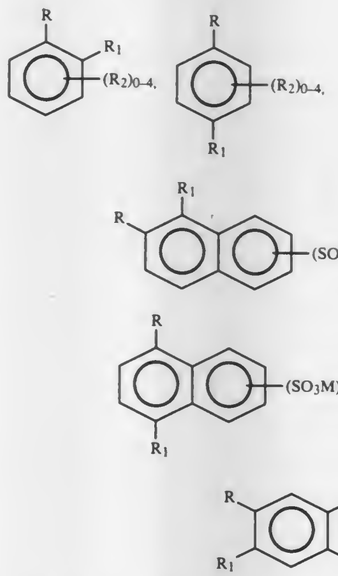
1. A composition which is useful for inhibiting corrosion due to the presence of oxygen in aqueous systems comprising:

(a) at least one hydroxylamine compound having the general formula



in which R_1, R_2 and R_3 are either the same or different and are selected from the group consisting of hydrogen, lower alkyl and aryl, or a water soluble salt of said hydroxylamine compound;

(b) at least one compound having the general formula:



in which R and R_1 are independently selected from the group consisting of —OH, —NH_2; R_2 is lower alkyl containing 1 to 8 carbon atoms; and M is selected from the group consisting of H, Na, K and combinations thereof; and

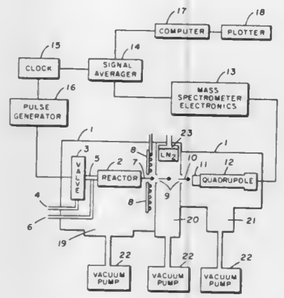
(c) at least one neutralizing amine; the weight ratio of the hydroxylamine compound component to the neutralizing amine component being between about 10:1 to about 1:10, and the weight ratio of the quinone or benzene compound component to the neutralizing amine component being between about 10:1 to about 1:100.

4,626,412

METHOD AND APPARATUS FOR CARRYING OUT CATALYZED CHEMICAL REACTIONS AND FOR STUDYING CATALYSTS

Jerry R. Ebner, and John T. Gleaves, both of St. Charles, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 14, 1984, Ser. No. 682,028
Int. Cl.[4] G01N *31/10*
U.S. Cl. 422—50 **1 Claim**



1. An apparatus comprising:

(a) an enclosed housing and means for producing a vacuum within the housing;

(b) within said housing, a reactor having a zone defined in the reactor containing a packed particulate reaction catalyst, said reactor being structured to allow a reactant gas to pass through the packed particles of the catalyst to produce a product gas by a slow reaction;

(c) means for introducing a rapid pulse of said reactant gas to said reactor and means for controling conditions such that a given molecule of said gas will collide with the surfaces of said catalyst from about 100 to 10^6 times and with other gas molecules about 10^3 or less;

(d) means for withdrawing from said reactor a pulse of product gas;

(e) within said housing, means for resolving said pulse of product gas to produce a resolved pulse of product gas in which molecules of product gas move in substantially parallel paths;

(f) means for providing real time analysis of said resolve pulse of product gas; and

(g) means for coordinating the actions of said rapid pulse introducing means and said analysis means so that scanning by said analysis means coincides with the arrival of a resolved pulse of product gas.

4,626,413

INSTRUMENT FOR MEASUREMENT OF THE ORGANIC CARBON CONTENT OF WATER

Frederick K. Blades, Boulder, and Richard D. Godec, Erie, both of Colo., assignors to Anatel Instrument Corporation, Boulder, Colo.

Filed Jan. 10, 1984, Ser. No. 569,678
Int. Cl.[4] G01N *27/07*
U.S. Cl. 422—78 **19 Claims**

1. Apparatus for measurement of the total organic carbon content of a sample of water, comprising:

a sample cell having a window;

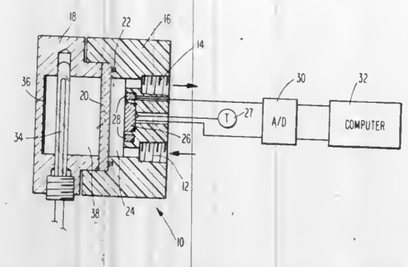
a source of ultraviolet radiaton of a frequency which causes oxidation of organic carbon compounds disposed in juxtaposition to said window, the material of said window being substantially transparent to said radiation;

a pair of electrodes disposed in said sample cell;

means for monitoring the conductance between said electrodes as a function of time during which a sample is exposed to ultraviolet radiation from said source;

means for continuously calculating values for first and second time derivatives of said conductance;

means for monitoring said values for the first and second time derivatives of the conductance; and



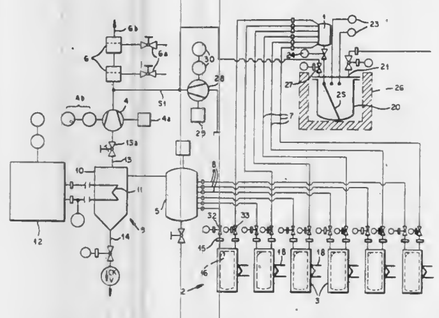
means responsive to said calculated values of said second derivative for determining when said oxidation has been substantially completed.

4,626,414

APPARATUS FOR THE PACKAGING OF RADIOACTIVE WASTES IN STORAGE CONTAINERS

Henning Baatz, and Dieter Rittscher, both of Essen, Fed. Rep. of Germany, assignors to GNS Gesellschaft fur Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,489
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1982, 3200331
Int. Cl.[4] G21F *9/16*
U.S. Cl. 422—159 **1 Claim**



1. An apparatus for the packaging of radioactive waste in storage containers, comprising:

a plurality of storage containers, each being fitted with an internal baffle for preventing incoming radioactive waste from spattering into fluid suctioned from said containers;

a suction source attached to each of said containers for evacuating each of said containers and imparting a vacuum therein;

a source of radioactive waste;

means for introducing said radioactive waste into said containers, said introducing means at least in part caused by the vacuum present within said containers wherein said introduction means comprises,

a metering unit connected to and located between said radioactive waste source and each of said containers, a sequentially operable valve means for tranferring slugs of radioactive waste to said containers, said valve means located between said containers and said metering unit, wherein more than one storage container can be simultaneously filled utilizing the single suction source;

a heating unit attached to each of said containers for drying said radioactive waste therein while the suction on said containers is maintained by said suction source;

a condenser connected between said suction source and said containers for condensing vapors arising from said containers after the filling thereof, whereby the radioactive waste in said containers is dried during the maintenance of suction by said source, said condenser comprising a cyclone which is provided internally with a cooling coil and which has an upper outlet connected to said source and a condensate outlet at the bottom of said cyclone;

a filter connected to said suction source for filtering gas from which condensate has been separated;

a refrigerating unit connected to said cooling coil;

a tank connected between said containers and said cyclone; and

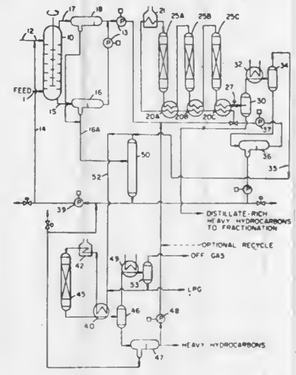
means for connecting each of said containers to said tank.

4,626,415

OLEFIN UPGRADING SYSTEM FOR EXTRACTED FEED

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 600,699, Apr. 16, 1984, Pat. No. 4,513,156. This application Mar. 27, 1985, Ser. No. 716,317
Int. Cl.[4] B01J *8/04;* C07C *2/02*
U.S. Cl. 422—190 **8 Claims**



1. A continuous system for converting olefins to heavier liquid hydrocarbons comprising

(a) an extraction unit having a means for contacting an olefinic liquid hydrocarbon feedstream containing oxygenated hydrocarbons with a polar solvent under continuous countercurrent liquid extraction conditions, and means for recovering a polar extract phase containing the oxygenated hydrocarbons and an olefinic liquid raffinate stream substantially free of oxygenated hydrocarbons;

(b) a first reactor including means for contacting the olefinic liquid raffinate stream in a first catalyst reactor zone with oligomerization catalyst at elevated pressure and moderate temperature under conditions favorable for conversion of olefins to a first reactor effluent stream rich in distillate range hydrocarbons;

(c) means for separating the first reactor effluent stream into a liquid product stream rich in distillate and a vapor stream containing lower hydrocarbons;

(d) distillation means for separating oxygenated hydrocarbons from the polar extract phase; and

(e) a second reactor having means for contacting at least a portion of the vapor stream containing lower hydrocarbons and recovered oxygenated hydrocarbons in a second catalyst reaction zone with oligomerization catalyst at moderate pressure and elevated temperature under conditions favorable for conversion of lower olefins and oxy-

genates to a second reactor effluent stream rich in heavier hydrocarbons.

4,626,416

INSOLUBLE CHELATING COMPOSITIONS

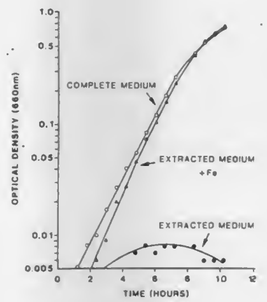
Irving W. DeVoe, Baie D'Urfe, and Bruce E. Holbein, Pointe-Claire, both of Canada, assignors to Devoe-Holbein International, N.V., Curacao, Netherlands Antilles

Division of Ser. No. 469,431, Feb. 24, 1983, Pat. No. 4,530,963. This application Jun. 22, 1984, Ser. No. 623,397

Claims priority, application Canada, Aug. 20, 1982, 409869; Jan. 31, 1983, 420567

Int. Cl.[4] B07C *5/36;* B07B *13/05*

U.S. Cl. 423—12 **60 Claims**



1. A method for treating an insoluble composition loaded with Th^{4+} and UO_2^{2+} to separate Th^{4+} therefrom characterized in that said composition is contacted with an aqueous solution containing a suitable Th^{4+} chelating agent and an organic acid, said organic acid being a carboxylic acid, said solution having a pH greater than 2, said composition comprising a member selected from the class consisting of:

(A) an insoluble composition comprising:

(1) one or more organic chelating compounds, covalently fixed to the surface of

(2) a suitable insoluble carrier, said organic chelating compounds possessing one or more coordinating sites, said organic chelating compounds being selected from the class consisting of microbial siderophores and

(B) an insoluble composition comprising:

(1) one or more catechol compounds covalently fixed to the surface of

(2) a suitable insoluble carrier, said catechol compounds being covalently fixed to the surface of said carrier at the benzene ring thereof, said catechol compounds being selected from the group consisting of unsubstituted catechol and catechol substituted on the benzene ring by one or two electrophilic substituents.

4,626,417

METHODS FOR CHEMICALLY REDUCING NITROGEN OXIDES

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 537,087, Sep. 29, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,359

Int. Cl.[4] C01B *21/00;* B01J *8/00*

U.S. Cl. 423—235 **56 Claims**

1. A method for reducing an oxide of nitrogen which comprises contacting said oxide of nitrogen with a composition comprising urea and sulfuric acid in which the urea/sulfuric acid molar ratio is below 2 and wherein at least a portion of said urea and sulfuric acid is present as the monourea adduct of sulfuric acid.

4,626,418

REMOVAL OF SO_2 FROM SO_2-CONTAINING GASES

John W. College, Oakdale, Pa., and Joseph Vlnaty, Ruskin, Fla., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 26, 1985, Ser. No. 780,416

Int. Cl.[4] B01J *8/00;* C01B *17/00*

U.S. Cl. 423—243 **22 Claims**

1. A dry process for the removal of SO_2 from a gaseous mixture containing SO_2 which comprises contacting said gaseous mixture containing SO_2 with a mixture containing at least one alkaline earth compound selected from the group consisting of calcium and magnesium carbonates, oxides and hydroxides and from about 0.01 to about 12 weight percent sugar at a temperature in the range of about 100° to about 2400° F., with the mols of said alkaline earth compound relative to the mols of SO_2 in said gaseous mixture being in the range of about 0.5:1 to about 3:1.

4,626,419

CONTROL OF SO_x EMISSION

Paul H. Lewis, Groves; Eugene P. Dai, Port Arthur, and Edward H. Holst, Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,213

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] B01J *8/00;* C01B *17/00;* C10G *11/00, 11/02*

U.S. Cl. 423—244 **23 Claims**

1. A process for removing a gaseous sulfur component from a mixture of gases containing sulfur oxides which comprises contacting said mixture of gases containing sulfur oxides at 800° F.–1500° F. with a composite containing a porous refractory support bearing as a first component (i) at least the compound containing 0.5–10 w% bismuth, chromium, or a rare earth metal, said first component being in one form of crystals of oxide of crystal size less than about 90 Angstrom units and as a second component (ii) at least one compound containing 0.4–5 wt% alkali metal.

4,626,420

SYNTHETIC FRAIPONTITE AND PROCESS FOR PREPARATION THEREOF

Koichi Usui, Hoya; Teiji Sato; Masanori Tanaka, both of Shibata; Yasuo Mizoguchi, Osaka, and Noriyuki Takahashi, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,273

Claims priority, application Japan, Jun. 22, 1984, 59-127569

Int. Cl.[4] C01B *33/20*

U.S. Cl. 423—326 **18 Claims**

1. A process for the preparation of a synthetic fraipontite type mineral having a chemical structure represented by the formula $(Zn_{3-x}Al_x)(Si_{2-x}Al_x)$-$O_5(OH)_4$, wherein x is a number of from 0 to 1.75, which comprises heating an oxide or hydroxide mixture or coprecipitate having a three-component oxide composition comprising 5 to 45 mole % of SiO_2, 35 to 65 mole % of ZnO and 0 to 60 mole % of Al_2O_3 in the presence of water to form a crystal of the fraipontite type by crystallization.

4,626,421

PREPARATION OF MAGADIITE

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

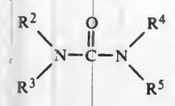
Filed Jun. 28, 1985, Ser. No. 750,373

Int. Cl.[4] C01B *33/28*

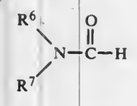
U.S. Cl. 423—326 **5 Claims**

1. In the method for preparing magadiite or an alkali metal form of magadiite from an aqueous reaction mixture containing an alkali metal hydroxide and a source of silica oxide, the improvement which comprises adding to said aqueous reaction mixture a promoter selected from the group consisting of a hydrocarbon substituted urea and hydrocarbon substituted

amide or mixtures thereof wherein the hydrocarbon substituted urea has the formula:



wherein R^2 and R^3 are the same or different and each is H, lower alkyl of 1 to 5 carbon atoms or R^2 and R^3 together with the nitrogen to which they are attached form an alkylene group containing 4 to 7 carbon atoms which may be interrupted by an O, S or N atom; R^4 and R^5 are the same or different and each is H, lower alkyl of 1 to 5 carbon atoms or R^4 and R^5 together with the nitrogen to which they are attached form an alkylene group containing 4 to 7 carbon atoms which may be interrupted by an O, S or N atom, with the proviso that R^2, R^3 R^4 and R^5 cannot all be hydrogen at the same time, the hydrocarbon substituted amide has the formula:



wherein R^6 and R^7 are H or lower alkyl containing 1 to 5 carbon atoms or R^6 or R^7 together with the nitrogen to which they are attached form an alkylene group containing 4 to 7 carbon atoms which may be interrupted by an O, S or N atom, with the proviso that both R^6 and R^7 cannot be hydrogen at the same time.

4,626,422

HIGH PURITY HIGH SURFACE AREA SILICON NITRIDE

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,080

Int. Cl.[4] C01B *21/068, 33/06*

U.S. Cl. 423—344 **7 Claims**

1. A process for producing high purity and high surface area silicon nitride, said process comprising:

(a) contacting silicon tetrachloride with water to hydrolyze said silicon tetrachloride and form a two phase system consisting essentially of a solid phase which is essentially silica gel and a liquid phase;

(b) heating said two phase system at a temperature of at least about 80° C. to partially dehydrate said silica gel;

(c) removing said solid phase from said liquid phase;

(d) forming a slurry of said solid phase in an aqueous solution of a water soluble organic source of carbon;

(e) adding a dispersing agent to said slurry to disperse the silica gel;

(f) adjusting the pH of the resulting dispersing agent-treated slurry to greater than about 7;

(g) heating the resulting pH adjusted slurry at a temperature from about 200° C. to about 400° C. to remove essentially all of the water therefrom and and to decompose the water soluble organic source of carbon to elemental carbon and produce a powder mixture of silicon dioxide and carbon;

(h) deagglomerating said powder mixture;

(i) heating the resulting deagglomerated powder mixture in a nitrogen atmosphere at a temperature from about 1450° C. to about 1500° C. to form a reaction product the major portion of which is silicon nitride; and

(j) heating said reaction product in an air atmosphere at a temperature from about 600° C. to about 650° C. to remove essentially all of the carbon from said reaction product and form a high purity high surface area silicon nitride.

4,626,423

PROCESS FOR THE PRODUCTION OF ALKALITHIOCYANATE

Edgar Bilger, Langenselbold, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 8, 1986, Ser. No. 849,588

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514408

Int. Cl.[4] C01C *3/20*

U.S. Cl. 423—366 **12 Claims**

1. Process for the production of alkalithiocyanate comprising mixing an aqueous alkalicyanide solution at temperature of up to a maximum of 50° C. with a suspension of sulphur in a water miscible alcohol having a boiling point of below 90° C., wherein the sulphur is present in excess of at most 3%, with reference to the stoichiometrically required quantity, carrying out the reaction at the boiling temperature of the alcohol, distilling off the alcohol as an azeotrope, and separating the sulphur that has not reacted.

4,626,424

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim, Towanda, and Robert P. McClintic, Montroeton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,996

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423– 593 **3 Claims**

1. A process for producing relatively pure solid ammonium metatungstate said process comprising:

(a) forming a slurry of ammonium paratungstate in water,

(b) heating said slurry to a pH of about 5.8 to about 6.0 to stabilize said slurry,

(c) adjusting the pH of said slurry to about 3.5,

(d) heating the resulting pH adjusted slurry for a sufficient time to form ammonium metatungstate,

(e) removing insolubles from the resulting digested solution,

(f) forming an admixture of said digested solution and a lower alcohol having the formula $C_nH_{2n+1}OH$ wherein n is from 1 to 4 to form a relatively pure solid ammonium metatungstate; and

(g) separating said solid ammonium metatungstate from the resulting mother liquor.

4,626,425

RECOVERY OF TUNGSTEN FROM AMMONIACAL SOLUTIONS

Richard A. Scheithauer; Clarence D. Vanderpool; Martin B. MacInnis, and Michael J. Miller, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,840

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **4 Claims**

1. A method for recovering tungsten from a relatively dilute ammoniacal tungsten solution, said method comprising:

(a) adding hexamethylenetetramine to said tungsten solution in an amount sufficient to form a hexamethylenetetramine complex;

(b) adjusting the pH of the resulting hexamethylenetetramine treated solution with a mineral acid to from about 1.0 to about 2.0 to form a precipitate of said complex containing at least about 99% of the tungsten and a mother liquor;

(c) separating said precipitate from said mother liquor.

genates to a second reactor effluent stream rich in heavier hydrocarbons.

4,626,416

INSOLUBLE CHELATING COMPOSITIONS

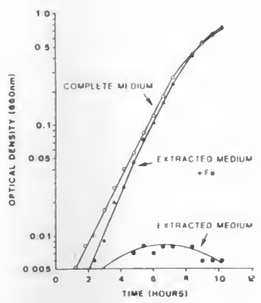
Irving W. DeVoe, Baie D'Urfe, and Bruce E. Holbein, Pointe-Claire, both of Canada, assignors to Devoe-Holbein International, N.V., Curacao, Netherlands Antilles

Division of Ser. No. 469,431, Feb. 24, 1983, Pat. No. 4,530,963. This application Jun. 22, 1984, Ser. No. 623,397

Claims priority, application Canada, Aug. 20, 1982, 409869; Jan. 31, 1983, 420567

Int. Cl.[4] B07C *5/36;* **B07B** *13/05*

U.S. Cl. 423—12 **60 Claims**



1. A method for treating an insoluble composition loaded with Th^{4+} and UO_2^{2+} to separate Th^{4+} therefrom characterized in that said composition is contacted with an aqueous solution containing a suitable Th^{4+} chelating agent and an organic acid, said organic acid being a carboxylic acid, said solution having a pH greater than 2, said composition comprising a member selected from the class consisting of:

(A) an insoluble composition comprising:

(1) one or more organic chelating compounds, covalently fixed to the surface of

(2) a suitable insoluble carrier, said organic chelating compounds possessing one or more coordinating sites, said organic chelating compounds being selected from the class consisting of microbial siderophores and

(B) an insoluble composition comprising:

(1) one or more catechol compounds covalently fixed to the surface of

(2) a suitable insoluble carrier, said catechol compounds being covalently fixed to the surface of said carrier at the benzene ring thereof, said catechol compounds being selected from the group consisting of unsubstituted catechol and catechol substituted on the benzene ring by one or two electrophilic substituents.

4,626,417

METHODS FOR CHEMICALLY REDUCING NITROGEN OXIDES

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 537,087, Sep. 29, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,359

Int. Cl.[4] C01B *21/00;* **B01J** *8/00*

U.S. Cl. 423—235 **56 Claims**

1. A method for reducing an oxide of nitrogen which comprises contacting said oxide of nitrogen with a composition comprising urea and sulfuric acid in which the urea/sulfuric acid molar ratio is below 2 and wherein at least a portion of said urea and sulfuric acid is present as the monourea adduct of sulfuric acid.

4,626,418

REMOVAL OF SO_2 FROM SO_2-CONTAINING GASES

John W. College, Oakdale, Pa., and Joseph Vlnaty, Ruskin, Fla., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 26, 1985, Ser. No. 780,416

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—243 **22 Claims**

1. A dry process for the removal of SO_2 from a gaseous mixture containing SO_2 which comprises contacting said gaseous mixture containing SO_2 with a mixture containing at least one alkaline earth compound selected from the group consisting of calcium and magnesium carbonates, oxides and hydroxides and from about 0.01 to about 12 weight percent sugar at a temperature in the range of about 100° to about 2400° F., with the mols of said alkaline earth compound relative to the mols of SO_2 in said gaseous mixture being in the range of about 0.5:1 to about 3:1.

4,626,419

CONTROL OF SO_x EMISSION

Paul H. Lewis, Groves; Eugene P. Dai, Port Arthur, and Edward H. Holst, Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,213

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] B01J *8/00;* **C01B** *17/00;* **C10G** *11/00, 11/02*

U.S. Cl. 423—244 **23 Claims**

1. A process for removing a gaseous sulfur component from a mixture of gases containing sulfur oxides which comprises contacting said mixture of gases containing sulfur oxides at 800° F.–1500° F. with a composite containing a porous refractory support bearing as a first component (i) at least the compound containing 0.5–10 w% bismuth, chromium, or a rare earth metal, said first component being in one form of crystals of oxide of crystal size less than about 90 Angstrom units and as a second component (ii) at least one compound containing 0.4–5 wt% alkali metal.

4,626,420

SYNTHETIC FRAIPONTITE AND PROCESS FOR PREPARATION THEREOF

Koichi Usui, Hoya; Teiji Sato; Masanori Tanaka, both of Shibata; Yasuo Mizoguchi, Osaka, and Noriyuki Takahashi, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,273

Claims priority, application Japan, Jun. 22, 1984, 59-127569

Int. Cl.[4] C01B *33/20*

U.S. Cl. 423—326 **18 Claims**

1. A process for the preparation of a synthetic fraipontite type mineral having a chemical structure represented by the formula $(Zn_{3-x}Al_x)(Si_{2-x}Al_x)$-$O_5(OH)_4$, wherein x is a number of from 0 to 1.75, which comprises heating an oxide or hydroxide mixture or coprecipitate having a three-component oxide composition comprising 5 to 45 mole % of SiO_2, 35 to 65 mole % of ZnO and 0 to 60 mole % of Al_2O_3 in the presence of water to form a crystal of the fraipontite type by crystallization.

4,626,421

PREPARATION OF MAGADIITE

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

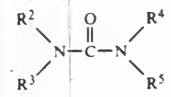
Filed Jun. 28, 1985, Ser. No. 750,373

Int. Cl.[4] C01B *33/28*

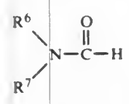
U.S. Cl. 423—326 **5 Claims**

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4,626,422

HIGH PURITY HIGH SURFACE AREA SILICON NITRIDE

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Filed Jun. 24, 1985, Ser. No. 748,080

Int. Cl.[4] C01B *21/068, 33/06*

U.S. Cl. 423—344 **7 Claims**

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(b) heating said two phase system at a temperature of at least about 80° C. to partially dehydrate said silica gel;

(c) removing said solid phase from said liquid phase;

(d) forming a slurry of said solid phase in an aqueous solution of a water soluble organic source of carbon;

(e) adding a dispersing agent to said slurry to disperse the silica gel;

(f) adjusting the pH of the resulting dispersing agent-treated slurry to greater than about 7;

(g) heating the resulting pH adjusted slurry at a temperature from about 200° C. to about 400° C. to remove essentially all of the water therefrom and and to decompose the water soluble organic source of carbon to elemental carbon and produce a powder mixture of silicon dioxide and carbon;

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(i) heating the resulting deagglomerated powder mixture in a nitrogen atmosphere at a temperature from about 1450° C. to about 1500° C. to form a reaction product the major portion of which is silicon nitride; and

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4,626,423

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Filed Apr. 8, 1986, Ser. No. 849,588

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514408

Int. Cl.[4] C01C *3/20*

U.S. Cl. 423—366 **12 Claims**

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4,626,424

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim, Towanda, and Robert P. McClintic, Montroeton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,996

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **3 Claims**

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(b) heating said slurry to a pH of about 5.8 to about 6.0 to stabilize said slurry,

(c) adjusting the pH of said slurry to about 3.5,

(d) heating the resulting pH adjusted slurry for a sufficient time to form ammonium metatungstate,

(e) removing insolubles from the resulting digested solution,

(f) forming an admixture of said digested solution and a lower alcohol having the formula $C_nH_{2n+1}OH$ wherein n is from 1 to 4 to form a relatively pure solid ammonium metatungstate; and

(g) separating said solid ammonium metatungstate from the resulting mother liquor.

4,626,425

RECOVERY OF TUNGSTEN FROM AMMONIACAL SOLUTIONS

Richard A. Scheithauer; Clarence D. Vanderpool; Martin B. MacInnis, and Michael J. Miller, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1985, Ser. No. 704,840

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **4 Claims**

1. A method for recovering tungsten from a relatively dilute ammoniacal tungsten solution, said method comprising:

(a) adding hexamethylenetetramine to said tungsten solution in an amount sufficient to form a hexamethylenetetramine complex;

(b) adjusting the pH of the resulting hexamethylenetetramine treated solution with a mineral acid to from about 1.0 to about 2.0 to form a precipitate of said complex containing at least about 99% of the tungsten and a mother liquor;

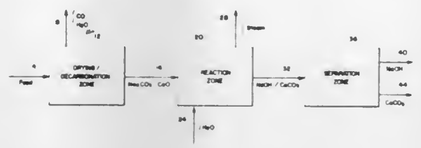
(c) separating said precipitate from said mother liquor.

4,626,426

PROCESS FOR THE MANUFACTURE OF CAUSTIC SODA

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Aug. 9, 1986, Ser. No. 764,110
Int. Cl.⁴ C01F *5/24*
U.S. Cl. 423—641 **7 Claims**



1. A process for the manufacture of caustic soda comprising the steps of:

providing a particulated, solid alkaline mineral comprised of a hydrated double salt of sodium carbonate and calcium carbonate said sodium and calcium carbonates being present therein in a molar ratio of about 1:1;

heating said particulated, solid alkaline mineral to a temperature sufficient to remove water of hydrations therefrom and to partially decarbonate said particulated, solid alkaline mineral by removal of one mole of carbon dioxide per mole of said particulated, solid alkaline mineral and thereby provide a hot, friable, solid intermediate product comprised of sodium carbonate and calcium oxide;

combining said hot, friable, solid intermediate product with water to effect hydration of the calcium oxide and causticization of the sodium carbonate, comprising said hot, friable, solid intermediate product, to provide an aqueous mixture of particulated calcium carbonate suspended in caustic soda solution; and

separating and recovering the caustic soda solution from the aqueous mixture.

4,626,427

CARDAMOM SEED PREPARATION BEING EFFECTIVE AGAINST BAD BREATH

Horst G. P. Wienecke, Gross-Gerau, and Karl-Wilhelm Stock, Buettelborn, both of Fed. Rep. of Germany, assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Sep. 16, 1985, Ser. No. 776,678
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1984, 3437679
Int. Cl.⁴ A61K *9/36*
U.S. Cl. 424—35 **5 Claims**

1. Preparation being effective, when chewed and swallowed, against bad breath originating from the consumption of smelling substances, including onions, garlic, alcohol and smoking tobacco, characterized in that it comprises a chewing bonbon containing uncoated seeds of the cardamom plant, or cardomom seeds coated by a dragee shell mass, said chewing bonbon and said drageee shell mass consisting essentially of sugar or sugar substitutes including sorbit, xylite, and mixtures thereof.

4,626,428

COMPOSITIONS AND PROCESS FOR APPLYING PROTECTIVE COVERING AND EXTENSIONS TO FINGERNAILS

Renee Weisberg, 1137 Village Cir., S. Phoenix, Ariz. 85022, and Lawrence J. Krebaum, Glen Ellyn, Ill., assignors to Renee Weisberg, Phoenix, Ariz.

Filed Aug. 2, 1984, Ser. No. 636,987
Int. Cl.⁴ A61K *7/04, 7/043*
U.S. Cl. 424—61 **8 Claims**

1. A protective acrylic coating composition for strong protective and extension of the human fingernail comprising parts A, B and C, wherein part A comprises:

30–90 vol % of Ethyl methacrylate,
1–50 vol % of Isobutyl methacrylate,
2–20 vol % of Trimethylolpropane trimethacrylate,
1–10 vol % of Polyethylene glycol dimethacrylate,
0.001–1.0 vol % of Hydroxyethylmethacrylate,
0.1–6.0 vol % of N,N-dimethyl-toluidine,
0.0001–0.1 g/ml of A of D and C Violet #2,
0.0001–0.1 g/ml of A an ultraviolet light absorbing absorber;

part B comprises one or more non-reactive polymers selected from the group consisting of cellulose esters, toluenesulfonamide-formaldehyde condensation polymers, polyesters of the diol of terephthalate, polyvinyl acetals, nylons, polycarbonates, terminated polymethacrylates and polyurethane, wherein part B is provided in the range of 2–40 g per 100 ml of part A, and

part C comprises at least one selected from the group consisting of talc, kaolin, gypsum Fuller's earth, dolomite, and wollastonite provided in an amount of 0.5–20 g of C per 100 ml of part A.

4,626,429

CONDITIONING OF HAIR WITH AMIDES OF TRIALKYLACETIC ACIDS

Clarence R. Robbins, Piscataway, and Robert J. Steltenkamp, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,697
Int. Cl.⁴ A61K *7/06, 7/09, 7/11*
U.S. Cl. 424—70 **18 Claims**

1. A process for conditioning hair which comprises applying a hair conditioning amount of an amide of trialkylacetic acid to such hair, which amide is selected from the group consisting of monoamides of trialkylacetic acid of 5 to 16 carbon atoms and mono-N-higher alk(en)yl amine, polyamides of trialkylacetic acid and polyamine, and mixtures thereof, wherein the alkyls of the trialkylacetic acid moieties are of 1 to 10 carbon atoms each, and in which each of the polyamine moieties contains from 2 to 5 amino groups.

4,626,430

PROCESSES FOR GROWTH OF MODIFIED *PASTEURELLA HAEMOLYTICA* BACTERIA AND PREPARATION OF A VACCINE THEREFROM

Carrell J. Kucera, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 255,145, Apr. 17, 1981, Pat. No. 4,388,299. This application Jan. 19, 1983, Ser. No. 511,418
Int. Cl.³ A61K *39/102;* **C12P** *21/00;* **C12N** *1/20*
U.S. Cl. 424—92 **9 Claims**

1. A process for preparing a modified live *Pasteurella haemolytica* vaccine capable of inducing immunity in bovine, porcine and ovine animal species without serious side effects which comprises chemically modifying virulent *Pasteurella haemolytica* strain ATTC No. 31611 by passaging it in the presence of an acridinium salt and combining the modified bacteria with a carrier.

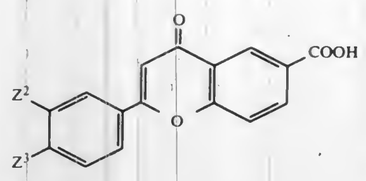
4,626,431

STORAGE OF RED BLOOD CELLS

John F. Batchelor, Beckenham; Richard M. Hyde, Croydon, and David J. Livingstone, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 19, 1984, Ser. No: 662,709
Claims priority, application United Kingdom, Oct. 25, 1983, 8328495
Int. Cl.⁴ A61K *35/18;* **A01N** *1/02*
U.S. Cl. 424—101 **14 Claims**

1. A method for maintaining the oxygen-delivery capacity of stored mammalian red blood cells comprising admixing said cells, prior to their transfusion into a recipient mammal, with a non-toxic, maintenance-effective amount of a compound of formula (I)



(I)

wherein

one of Z^2 and Z^3 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ *where*

X is selected from hydrogen and hydroxyl and

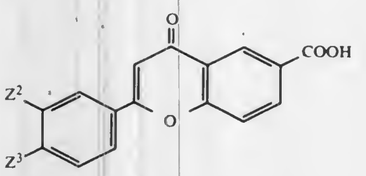
n is an integer from 1 to 3,

provided that when X is hydroxyl *then* n is always greater than 1 *and* no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms and

the other of Z^2 and Z^3 is hydrogen

or a pharmacologically acceptable salt thereof.

5. A method for prolonging the useful storage life of stored mammalian red blood cells comprising admixing said cells, prior to their transfusion into a recipient mammal, with a non-toxic, prolongation-effective amount of a compound of formula (I)



(I)

wherein

one of Z^2 and Z^3 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ *where*

X is selected from hydrogen and hydroxyl and

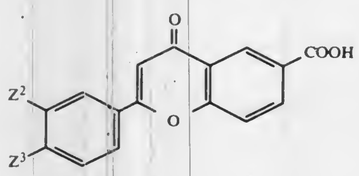
n is an integer from 1 to 3,

provided that when X is hydroxyl *then* n is always greater than 1 *and* no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms and

the other of Z^2 and Z^3 is hydrogen

or a pharmaceutically acceptable salt thereof.

9. A sterile, sealed vessel containing an anticoagulant and a non-toxic amount of a compound of formula (I)



(I)

wherein

one of Z^2 and Z^3 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ *where*

X is selected from hydrogen and hydroxyl and

n is an integer from 1 to 3,

provided that when X is hydroxyl *then* n is always greater than 1 *and* no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms and

the other of Z^2 and Z^3 is hydrogen

or a pharmaceutically acceptable salt thereof.

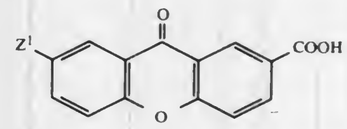
4,626,432

STORAGE OF RED BLOOD CELLS

Richard M. Hyde, Croydon, and David J. Livingstone, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Oct. 19, 1984, Ser. No. 662,784
Claims priority, application United Kingdom, Oct. 25, 1983, 8328495
Int. Cl.⁴ A61K *35/18;* **A01N** *1/02*
U.S. Cl. 424—101 **14 Claims**

1. A method for maintaining the oxygen-delivery capacity of stored mammalian red bloods cells comprising admixing said cells, prior to their transfusion into a recipient mammal, with a non-toxic, maintenance-effective amount of a compound of formula (I)



(I)

wherein Z^1 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ where

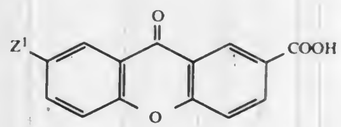
X is selected from hydrogen and hydroxyl and

n is an integer from 1 to 3,

provided that when X is hydroxyl then n is always greater than 1 and no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms

or a pharmacologically acceptable salt thereof.

5. A method for prolonging the useful storage life of stored mammalian red blood cells comprising admixing said cells, prior to their transfusion into a recipient mammal, with a non-toxic, prolongation-effective amount of a compound of formula (I)



(I)

wherein Z^1 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ where

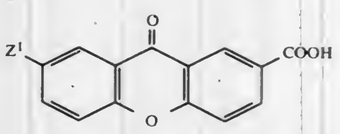
X is selected from hydrogen and hydroxyl and

n is an integer from 1 to 3,

provided that when X is hydroxyl then n is always greater than 1 and no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms

or a pharmacologically acceptable salt thereof.

9. A sterile, sealed vessel containing an anticoagulant and a non-toxic amount of a compound of formula (I)



(I)

wherein Z^1 is selected from hydroxyl and a group $-O(C_nH_{2n})X$ where

X is selected from hydrogen and hydroxyl and

n is an integer from 1 to 3,

provided that when X is hydroxyl then n is always greater than 1 and no single carbon atom in the radical $-(C_nH_{2n})-$ is attached to both oxygen atoms

or a pharmaceutically acceptable salt thereof.

4,626,433

REMEDY FOR HEMORRHOIDS

Chester P. Gros, New Orleans, La., assignor to Preparation Gold, Inc., New Orleans, La.

Filed May 20, 1985, Ser. No. 735,599
Int. Cl.[4] A61K *33/06*
U.S. Cl. 424—154 4 Claims

1. A composition for topically treating hemorrhoids, which comprises:

a. a lubricating base containing a mixture of; aluminum potassium sulfate, linseed oil, menthol, and camphor.

4,626,434

FRUIT INFUSION USING A SYRUP WHICH HAS BEEN SUBJECTED TO ENZYME TREATMENT AND CONCENTRATED

John S. O'Mahony, Amherst; Marvin L. Kahn, Williamsville, and Satya N. Adapa, Derby, all of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Division of Ser. No. 466,411, Feb. 15, 1983, Pat. No. 4,551,348.
This application Sep. 12, 1985, Ser. No. 775,503
Int. Cl.[4] A23L *1/00*
U.S. Cl. 426—50 13 Claims

1. A process for infusing fruit with sugar solutes comprising:

(a) suspending the fruit in a rapidly circulating heated aqueous bath initially incorporating about 30–84 percent dissolved sugar solutes, said sugar solutes being comprised of about 35 to about 100 percent fructose;

(b) inhibiting dilution of the bath caused by exfusing fruit water by introducing concentrated sugar solution into the bath and withdrawing substantially equal amounts of diluted syrup so as to stabilize the bath solutes concentration;

(c) enzymatically treating the withdrawn, diluted syrup so as to reduce its pectin viscosity;

(d) concentrating the diluted syrup evaporation;

(e) returning the concentrated syrup to the infusion bath; and

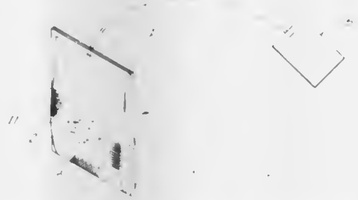
(f) withdrawing the fruit from the bath when the concentration of sugar solutes has been raised to the desired level before detrimental shrinkage occurs.

4,626,435

INDIVIDUAL COFFEE BREWING

Mark E. Zimmerman, P.O. Box 2315, Pasadena, Calif. 91102

Filed Nov. 18, 1985, Ser. No. 798,816
Int. Cl.[4] A23F *5/24*; B65B *29/02*
U.S. Cl. 426—78 4 Claims



1. A coffee brewing solid composition disposed and secured in a water permeable, preselected size, and closed bag comprising:

a preselected weight of sized ground and flaked coffee beans, and,

a preselected minor weight percentage based on the coffee brewing solid composition of a dry, solid, powdered composition which foams and forms carbon dioxide gas on wetting with boiling hot water, said foamer composition having a selected ratio of chemical equivalents of powdered sodium bicarbonate and a powdered fruit acid,

said chemical equivalent weight of fruit acid at least equal to the equivalent weight of sodium bicarbonate, aforesaid powdered foamer composition intimately mixed with said preselected weight of coffee beans and being in an amount sufficient to produce sufficient carbon dioxide gas to agitate said coffee beans when wetted with boiling hot water.

4,626,436

FROZEN BLOCK PROCESS FOR VEGETABLE OR FRUIT CONVENIENCE FOODS

Alan B. Bradley, Vermilion, Ohio; James H. Geary, South Hamilton, Mass.; James W. Hutchison, Bellevue, Ohio; Thomas S. Jones, Huron, Ohio; Donald A. Mather, Sandusky, Ohio; Scott D. Mather, Sandusky, Ohio, and Thomas M. Surmiak, Sandusky, Ohio, assignors to Stein Associates, Inc., Sandusky, Ohio

Filed Jul. 12, 1984, Ser. No. 630,231
Int. Cl.[4] A23B *7/04*; A23L *1/212*
U.S. Cl. 426—289 14 Claims

1. A method for producing edible foods in a natural state from raw or partially cooked vegetable or fruit food units comprising the steps of freezing a plurality of irregularly shaped said food units to a temperature in the range of about −10° F. to +10° F., placing the frozen food units in the absence of extraneous binding material into block forming means and exerting pressure thereon within a range of about 100–1500 lbs/in^2 sufficient to form said units into a compact unified frozen block.

4,626,437

METHOD FOR THE PREPARATION OF ALCOHOL-FREE WINE

Ulrich Schobinger, Zug; Robert Waldvogel, and Peter Dürr, both of Wädenswil, all of Switzerland, assignors to Schweizerische Eidgenossenschaft, Wadenswil, Switzerland

PCT No. PCT/CH82/00013, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/02723, PCT Pub. Date Aug. 19, 1982
Continuation of Ser. No. 432,935, Sep. 29, 1982, abandoned. This PCT application Feb. 1, 1982, Ser. No. 701,664
Claims priority, application Switzerland, Feb. 6, 1981, 889/81
Int. Cl.[4] A23L *2/02*, *2/38*
U.S. Cl. 426—387 7 Claims

1. A method for the manufacture of alcohol-free wine product having a remaining alcohol content of less than 5 g/Kg using a concentrating plant and a separate counter-current distillation column having a head and at least forty theoretical plates including the steps of

first evaporating between 30–60% of a completely fermented wine in said concentrating plant to produce a de-alcoholized wine concentrate and a vapor condensate containing alcohol and aromatic substances,

then feeding said condensate to a supply location in the middle third of said column to separate said condensate into a fraction comprising alcohol and aromatic substances within the boiling range of 77° to 97° C.

withdrawing said fraction comprising alcohol from said column at a location above said supply location,

withdrawing said aromatic substances at a location below said supply location,

mixing together said aromatic substances, said dealcoholized wine or fruit juice concentrate, dearomatized grape juice or fruit juice and mineral-free or distilled water,

impregnating the resultant mixture with carbon dioxide,

stabilizing said alcohol-free wine product against microbiological spoilage, and

adding anti-oxidants so as to yield said alcohol-free wine product ready for consumption.

4,626,438

PROCESS FOR MAKING SKIN-ON POTATO BOATS

Jerome J. Glantz, Tualatin, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 558,835, Dec. 7, 1983, abandoned, which is a division of Ser. No. 409,870, Aug. 20, 1982, Pat. No. 4,420,494, which is a continuation-in-part of Ser. No. 830,066, May 20, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,269
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—438 12 Claims



1. A method of preparing, from a raw, skin-on potato, a potato boat having (1) an outer potato layer of predetermined thickness adjacent the skin, and (2) a hollowed-out center, the method comprising the steps of:

slicing a whole, skin-on potato to form a plurality of potato sections, each having a portion of the outer potato skin thereon; thereafter

removing a center portion of a section, leaving an outer potato layer of predetermined thickness adjacent the skin; thereafter

parfying said potato section; and

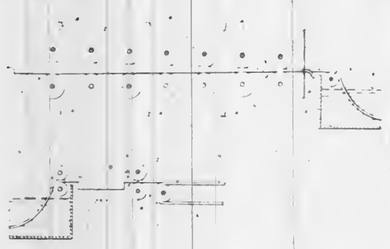
at some stage in the processing of said potato or potato section prior to parfying, blanching the outer potato layer thereof to gelatinize the same and thereafter maintaining the outer potato layer in a blanched gelatinized condition until parfying is commenced.

4,626,439

METHOD FOR PRODUCING THIN PORTIONS OF PASTA FILATA CHEESE

Marco M. Meyer, 2038 Green Tree Rd., Junction City, Wis. 54443

Continuation of Ser. No. 621,451, Jun. 18, 1984, abandoned. This application Jun. 27, 1985, Ser. No. 750,311
Int. Cl.[4] A23P *1/00*; A23C *19/00*
U.S. Cl. 426—517 21 Claims



1. A method for producing thin portions of cheese of the pasta filata type, said portions having a desired thickness and a predetermined quantity of cheese, said method comprising the steps of:

placing the cheese in a heated, deformable state;

forming an extended ribbon of the cheese moving in a direction away from the point of formation;

successively applying pressure to the moving heated, deformable ribbon of cheese in a single direction normal to the direction of movement, thereby reducing the size of the ribbon in a dimension parallel to the direction of pressure application to a desired thickness while simultaneously increasing the dimension of the ribbon through free and unrestrained expansion in a dimension that is normal to the direction of pressure application and to the direction of movement, whereby said pressure application forms a flattened ribbon of cheese; and

severing the flattened ribbon into portions having the predetermined quantity of cheese.

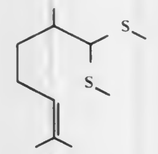
4,626,440

FLAVORING WITH DIALKYLTHIOALKENES, DIALKYLTHIOALKYLCYCLOALKENES AND MONOALKENYLCYCLOALKENS

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Kevin P. Miller, Middletown; Domenick Luccarelli, Jr., Neptune, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 731,919, May 8, 1985, Pat. No. 4,565,707.
This application Nov. 21, 1985, Ser. No. 800,605
Int. Cl.[4] A23L *1/226*
U.S. Cl. 426—535 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with said foodstuff from about 0.001 up to about 250 ppm of the dialkylthio derivative having the structure:



4,626,441

DIETETIC FROZEN DESSERTS CONTAINING ASPARTAME

Melvin Wolkstein, 24 Mayhew Dr., South Orange, N.J. 07079

Filed Oct. 6, 1983, Ser. No. 539,661
Int. Cl.[4] A23G *9/02*; A23L *1/236*, *1/307*, *1/308*
U.S. Cl. 426—548 27 Claims

1. A sweetener-bulking agent composition suitable for use in dietetic frozen desserts comprising:

(a) as the sweetener, mixtures of aspartame with a synergistic sweetener selected from the group consisting of thaumatin, acesulfame K, saccharin, chalcone, stevioside, cyclamate, glycyrrhizin and mixtures thereof or aspartame alone, and

(b) as the bulking agent,

(i) a material selected from the group consisting of polydextrose, microcrystalline cellulose, fermented whey, a mixed culture of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*, soy bean protein, sucrose polyester and mixtures thereof; or

(ii) a material selected from the group consisting of polydextrose, microcrystalline cellulose, fermented whey, soy bean protein, sucrose polyester and mixtures thereof, in combination with a minor amount of a material selected from the group consisting of sugar alcohols, sugars, whey, rennet, lactase and mixtures thereof;

with the proviso that when aspartame alone is the sweetener, the bulking agent is not polydextrose alone or a mixture of polydextrose and microcrystalline cellulose, and when polydextrose alone is the bulking agent, the sugar alcohol, if present, is not sorbitol.

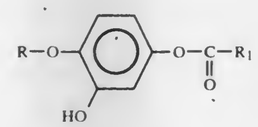
4,626,442

3-HYDROXY-4-ALKYLOXYPHENYL HETEROCYCLIC AROMATIC CARBOXYLATES

Paul R. Zanno, Port Chester; Ronald E. Barnett, Suffern, and Jed A. Riemer, Scarsdale, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 566,633, Dec. 29, 1983. This application Mar. 21, 1986, Ser. No. 842,345
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—548 **4 Claims**

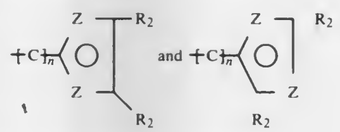
1. A foodstuff comprising a sweetening compound of the formula:



wherein

R is selected from the group consisting of methyl and ethyl;

R_1 is selected from the group consisting of



wherein n is an integer from 0 to 1;

each Z is selected from the group consisting of S, O, NR_2, N and CR_2 with the provisio that at least one Z is a hetero atom and a further provisio that NR_2 is not a NH group; and

each R_2 is selected from the group consisting of H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $CH(CH_3)_2$, OH, OCH_3, OCH_2CH_3, $OCH(CH_3)_2$, CH_2OH, CH_2CH_2OH, $CH_2CHOHCH_3$, CH_2OCH_3, CHO, $COCH_3$, $COCH_2CH_3$, CH_2COCH_3, COOH and $COOCH_3$ with R_1 containing no more than 12 carbon atoms; and salts thereof.

4,626,443

PROCESS FOR PREPARING DRESSINGS COMPRISING W/O/W TYPE MULTIPLE EMULSIONS

Yasuyuki Takahashi; Shigeru Aizawa; Shigeru Tamai; Toshiro Yoshida, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 610,853, May 16, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,180
Int. Cl.[4] A23L *1/24*
U.S. Cl. 426—602 **2 Claims**

1. A process for preparation of dressings comprising W/O/W type multiple emulsions which comprises adding an emulsifier selected from the group consisting of monoerucin, dierucin, and polyglycerol polycondensed recinoleic acid ester to an oil in an amount of 0.1 to 15% based on said oil, adding said oil, containing said emulsifier, to an inner aqueous phase in a ratio of 3/1 to 1/3 to obtain an O/W type emulsion, phase-inverting the emulsion by additional agitating to obtain a W/O type emulsion, adding vinegar to water in an amount effective to season a dressing to form an outer aqueous phase, adding the W/O type emulsion to an amount of said outer aqueous phase effective to obtain a dressing, and agitating the mixture to obtain said dressing.

4,626,444

PROCESS FOR PREPARATION OF DRESSINGS COMPRISING W/O/W TYPE MULTIPLE EMULSIONS

Yasuyuki Takahashi; Shigeru Aizawa; Shigeru Tamai; Toshiro Yoshida, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 610,853, May 16, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,182
Claims priority, application Japan, Mar. 2, 1984, 59-038668
Int. Cl.[4] A23L *1/24*
U.S. Cl. 426—602 **2 Claims**

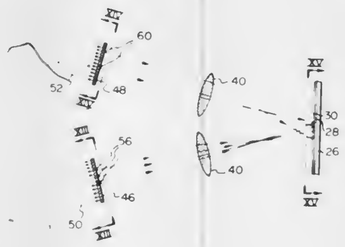
1. A process for preparation of dressings comprising W/O/W type multiple emulsions which comprises adding an emulsifier selected from the group consisting of monoerucin, dierucin and polyglycerol polycondensed recinoleic acid ester to an oil phase, adding an inner aqueous phase to said oil phase, agitating the mixture to obtain a W/O emulsion, adding vinegar to water in an amount effective to season a dressing to form an outer aqueous phase, adding said W/O emulsion to an amount of said outer aqueous phase effective to obtain said dressing and agitating the resulting mixture to obtain said dressing.

4,626,445

METHOD OF MANUFACTURING AN OPTICAL INTERFERENCE AUTHENTICATING DEVICE

Jerzy A. Dobrowolski, Ottawa, and Allan J. Waldorf, Kemptville, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 12, 1985, Ser. No. 797,167
Claims priority, application Canada, Nov. 9, 1984, 467550
Int. Cl.[4] B41M *3/14*
U.S. Cl. 427—7 **11 Claims**



1. A method of manufacturing an optical interference authenticating device comprising:

(a) depositing two coatings on a substrate, each of the said coatings comprising at least one optical interference layer, the materials of the layers being selected so that the two coatings together and separately have different, known spectral reflectance and spectral transmittance characteristics, at different angles of incidence of light thereon,

(i) a first one of the said coatings being sufficiently radiation-absorbing for electromagnetic radiation of a particular wavelength to be excavatable by a beam thereof of sufficient intensity and duration,

(ii) a second one of the said coatings being insufficiently radiation-absorbing for the said electromagnetic radiation of a particular wavelength to be substantially resistant to excavation solely by absorbing radiation of a beam thereof of sufficient intensity and duration to excavate the said first one of the coatings, and

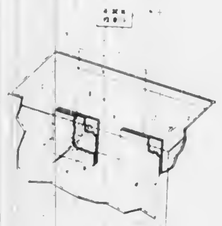
(b) excavating, by a beam of the said electromagnetic radiation, at least one identifiable configuration in the said first coating, to form at least one excavated area therein having a sufficiently different reflectance or transmittance than the remainder of the said first coating to be distinguishable therefrom at a particular angle of incidence of light on the substrate.

4,626,446

ELECTROLESS PLATING BATH MONITOR

Robert J. Capwell, Vestal, and Robert G. Rickert, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,922
Int. Cl.[4] C23C *18/16*
U.S. Cl. 427—8 **6 Claims**



1. A method of determining plating characteristics of an electroless metal plating bath comprising the steps of:

placing in said bath a first body having a surface of metal the same as the metal to be plated by said bath;

placing in said bath with said first body a second body having a surface seeded to initiate autocatalytic deposition of metal from said bath thereon; and

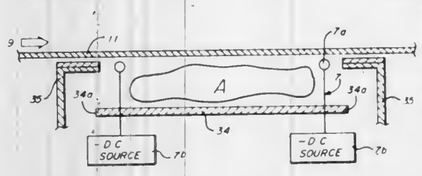
measuring the difference in electrical potential between said surface of metal of said first body and said seeded surface of said second body as a function of immersion time during plating of said bath.

4,626,447

PLASMA CONFINING APPARATUS

Joachim Doehler, Union Lake, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 18, 1985, Ser. No. 713,354
Int. Cl.[4] C23C *13/08*
U.S. Cl. 427—39 **11 Claims**



1. In plasma glow discharge deposition apparatus wherein layers of semiconductor alloy material are deposited onto a substrate, the deposition apparatus comprising at least one dedicated deposition chamber which includes: means for supporting a substrate; cathode means spaced from the substrate; means for introducing process gases in a plasma region formed between the substrate and the cathode means; and a power source for energizing the cathode means to develop an activated plasma from the process gases introduced into the plasma region for facilitating the reaction thereof, the improvement comprising, in combination:

electrically biased means adapted to repel plasma electrons so as to substantially confine the plasma to at least one preselected portion of the plasma region, whereby only semiconductor alloy material deposited from said at least one preselected portion of the plasma region is deposited onto the substrate.

8. A method of confining a highly energetic plasma within the plasma region formed in the space between a substrate and a cathode means in a glow discharge deposition chamber; the method including the steps of:

providing a source of process gases including at least one precursor semiconductor gas;

introducing the process gases into the plasma region;

energizing the cathode means to form an activated plasma from the process gases flowing through the plasma region for facilitating the reaction thereof; and,

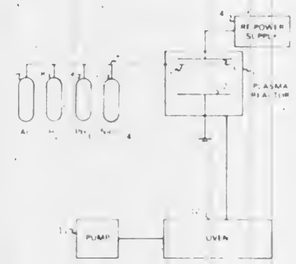
providing electrically biased means adapted to repel plasma electrons so as to confine the activated plasma to a preselected portion of the plasma region, whereby only semiconductor alloy material from said preselected portion of the plasma region is deposited onto the substrate.

4,626,448

PLASMA DEPOSITION OF AMORPHOUS METAL ALLOYS

Auda K. Hays, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1985, Ser. No. 756,126
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **6 Claims**



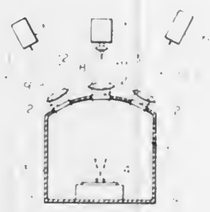
1. A method of plasma-depositing amorphous metal alloy coatings on a substrate, consisting of dissociating vapors of organometallic compounds and metalloid hydrides in a reducing gas in a glow discharge environment, wherein the ratio of the partial pressures of the organometallic and the hydride vapors is maintained at a level such that the metalloid content of the resulting coating is within the range of about 20 to 40 atomic percent, and wherein the plasma in the glow discharge is characterized by an average electron energy of 1 to 10 eV and electron densities of about 10^9 to 10^{12} cm^{-3}, said energy being supplied at frequencies within the range of about 0 to 10^{10} Hz.

4,626,449

METHOD FOR FORMING DEPOSITION FILM

Yutaka Hirai; Hiroshi Echizen, both of Tokyo; Masafumi Sano, Kawasaki; Hisanori Tsuda, Atsugi, and Katsuji Takasu, Asaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,258
Int. Cl.[4] C23C *11/00*
U.S. Cl. 427—53.1 **12 Claims**



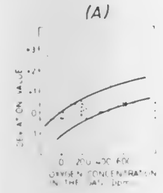
1. A method for forming a deposition film by introducing a

starting gas for formation of a deposition film into a reaction chamber housing a substrate therein and forming a deposition film on the substrate by irradiation with light, which comprises performing deposition by using a monochromatic light and a continuous polychromatic light in combination and projecting the lights on the substrate on which the deposition film is to be formed.

4,626,450
PROCESS FOR PRODUCING SEMICONDUCTOR DEVICES

Akihiko Tani, Tachikawa; Takashi Aoyagi, Musashino; Shuji Ikeda, Koganei, and Kouichi Nagasawa, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,195
Claims priority, application Japan, Jun. 25, 1984, 59-129323
Int. Cl.⁴ H01L *21/324*
U.S. Cl. 427—93 **21 Claims**



1. In a process for producing semiconductor devices by treating a semiconductor substrate having a silicon dioxide film on the surface thereof in an inert gas atmosphere at a high temperature, the improvement wherein oxygen is contained in an amount of 100 ppm to 500 ppm in said inert gas, said amount of oxygen being such that thermal etching of the semiconductor substrate during the high temperature treatment is prevented without formation of a thick oxide film on the semiconductor substrate.

4,626,451
METHOD OF MANUFACTURING SINTERED CERAMIC BODY

Shun-ichiro Tanaka; Kazuo Ikeda, and Akio Sayano, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 26, 1984, Ser. No. 593,304
Claims priority, application Japan, Mar. 29, 1983, 58-53420
Int. Cl.⁴ B05D *1/18, 3/02, 5/12*
U.S. Cl. 427—123 **9 Claims**

1. A method of manufacturing a sintered ceramic body comprising the steps of:

(a) coating at least part of a surface of an unsintered ceramic powder compact containing a non-oxide series ceramic material as a major constituent with a coating material which has a melting point or decomposition point higher than a sintering temperature of said compact, said coating material being a nonconductive inorganic material which becomes conductive after sintering; and

(b) sintering the coated ceramic powder compact thus forming the sintered ceramic body having a conductive layer on said at least part of said surface thereof, wherein

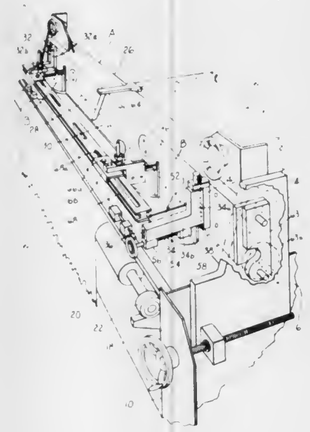
said nonconductive inorganic material which becomes conductive after sintering comprises one of titanium oxide and zirconium oxide and wherein,

said non-oxide series ceramic material contains silicon ceramics as a major constituent.

4,626,452
ADJUSTABLE SEALING DAMS FOR A COATING MACHINE AND METHOD

Robert J. Poterala, Rte. 15, Rocky Pointe Way, Greenville, S.C. 29607

Filed Mar. 20, 1985, Ser. No. 714,158
Int. Cl.⁴ B05C *5/02*; B05D *1/26*
U.S. Cl. 427—356 **27 Claims**



1. Apparatus for controlling the width of coating compound applied from a trough to a traveling web and for automatically adjusting to changes in the width of a metering gap between the trough and a coating blade, wherein said trough has an interior contour for containing a level of coating compound, said apparatus comprising:

a pair of adjustable end dams carried within said interior contour of said trough spaced apart from one another;

each said end dam including an end dam frame means which includes a first leg stationarily braced against said coating blade, and a second leg integral with said first leg adapted for bracing against said interior contour of said trough;

a dam plate carried by said first and second legs being impervious to fluid for damming the lateral flow of coating compound in said trough;

said dam plate and frame means being movable relative to each other;

first bracing means acting on said first leg for maintaining said first leg braced and sealed against said coating blade while permitting relative vertical movement between said first leg and said coating blade;

second bracing means acting on said second leg to urge said second leg against interior contour of said trough;

said second leg being movable relative to said first leg so that said second leg acted on by said second bracing means follows said interior contour of said trough as said metering gap is changed in its width by movement of said trough; and

dam plate retaining means interconnecting said dam plate and said first and second legs for retaining said dam plate and said first and second legs together during said relative movement maintaining a lateral fluid dam as said trough and second leg move in response to adjustment of said metering gap.

4,626,453
COATING COMPOSITIONS AND METHOD FOR IMPROVING THE PROPERTIES OF COATED SUBSTRATES

Brian L. Klotz, and James M. Klotz, both of Quakertown, Pa., assignors to Coatings for Industry, Inc., Souderton, Pa.

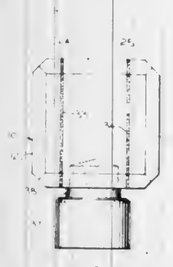
Filed Sep. 20, 1985, Ser. No. 778,373
Int. Cl.⁴ B05D *3/02*; C09D *5/10*
U.S. Cl. 427—397.7 **16 Claims**

1. In an acidic aqueous coating composition useful for glazing and sealing phosphate-bonded coatings and containing dissolved phosphate, dissolved dichromate, dissolved aluminum, and inorganic colloidal particles, the improvement comprising including in said composition a water miscible organic component containing a polypropylene glycol monoalkyl ether in an amount sufficient to impart substantially blister-free and uniformly adherent properties to a coating prepared from said composition.

4,626,454
DECORATIVE FITTING

Robert B. Sandman, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Aug. 5, 1985, Ser. No. 762,261
Int. Cl.⁴ B44F *1/12*; B29C *1/02*; B29F *1/08*
U.S. Cl. 428—13 **15 Claims**



1. A method of forming a decorative fitting so that it has an internal color layer, comprising:

forming a frame on a first substantially transparent panel such that the frame projects out from a side surface of the first panel;

abutting a second substantially transparent panel against the frame so as to form a color-insert cavity, said cavity being defined by the edges of the frame and the space between adjacent walls of the transparent panels;

placing a flowable color material and adhesive in the cavity and permitting the color material and adhesive to harden in the cavity and bind to the panels so as to form a sandwich structure; and

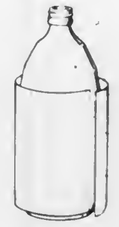
cutting the sandwich structure into at least two fitting components, both of which comprise a sandwich of a portion of both of the panels with a segment of the color layer in between.

4,626,455
COEXTRUDED MULTILAYER SHEET AND SLEEVE LABEL FOR BOTTLES

James A. Karabedian, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 14, 1985, Ser. No. 691,250
Int. Cl.⁴ B65D *23/08*; B32B *27/08*
U.S. Cl. 428—35 **28 Claims**

1. A coextruded multilayer sheet adapted for use as a solvent seal label sleeve on containers, the sleeve also being sealable by ultrasonic, hot air and heat sealing, the sheet label comprising a foam polystyrene layer for use on the inside of the sleeve next to the container and an outer skin layer formed by extruding a blend of a polyolefin, polystyrene and a compatibility agent, the compatibility agent being used in an effective amount to provide limited compatibility and limited adhesion between the skin layer and the foam layer at the interface, thereof, to enhance the toughness of the label, the amount of polyolefin being an effective amount to provide the skin layer with a shrinkage rate that matches the shrinkage rate of the foam



layer when external heat is applied to skin layer of the label to prevent undesirable wrinkles in the outer surface of the skin layer, the amount of polyolefin also being effective to provide a shrinkage force of the skin layer when its outer surface is heated that is not sufficient to form wrinkles on the underside of the foam.

4,626,456
LAMINATE STRUCTURE FOR COLLAPSIBLE DISPENSING CONTAINER

Christopher J. Farrell, and Mark A. Williams, both of Arlington Heights, Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 565,522, Dec. 28, 1983, Pat. No. 4,526,823, which is a continuation of Ser. No. 341,610, Jan. 22, 1982, abandoned. This application Apr. 30, 1985, Ser. No. 728,789
Int. Cl.⁴ B32B *27/08*
U.S. Cl. 428—35 **18 Claims**



1. A crease-retaining plastic laminate sheet useful for making collapsible dispensing container, said laminate sheet comprising an outer layer of a filled plastic material coextensively bonded to an inner plastic layer, wherein said filled plastic material comprises a polymer selected from the group consisting of polypropylene, high impact grade polypropylene and a blend of polypropylene or high impact grade polypropylene with high density polyethylene, and from about 5 to about 80 percent by weight, based on said filled plastic material, of a filler selected from the group consisting of calcium carbonate, talc, mica, glass powder, metal powder and mixtures thereof, and wherein said inner plastic layer is made essentially of high density polyethylene.

4,626,457
VERSATILE MINIPURSE

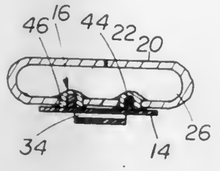
Kenneth W. Willie, 7536-26th Ave., Kenosha, Wis. 53240

Filed Oct. 24, 1985, Ser. No. 790,940
Int. Cl.⁴ A45C *1/02*
U.S. Cl. 428—35 **20 Claims**

1. A versatile minipurse for carrying pocket money comprising:

a flat hollow one-piece enclosure having a substantially closed peripheral edge and substantially parallel upper and lower surfaces, the upper surface having a slit there-

across, said enclosure being integrally formed of resilient plastic material such that squeezing the peripheral edge at opposite ends of the slit spreads the slit to open the enclosure;



a one-piece clip along the lower outside surface substantially within the bounds of the peripheral edge and including upper and lower portions biased together; and

means at at least one point along a line transverse to the slit to connect the upper portion of the clip to the lower surface of the enclosure.

4,626,458

RECOVERABLE ARTICLE FOR ENCAPSULATION

Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Limited, London, England

Filed Dec. 30, 1983, Ser. No. 567,130

Claims priority, application United Kingdom, Jan. 6, 1983, 8300221; Aug. 16, 1983, 8322004

Int. Cl.⁴ B29C *27/00*; H01R *4/00*

U.S. Cl. 428—36 **26 Claims**



1. An assembly for enclosing a junction between elongate substrates, which comprises:

(A) a sleeve comprising a recoverable fabric;

(B) means for rendering the fabric substantially impervious when the fabric is recovered; and

(C) a liner for the sleeve, the liner having a central region of larger cross-section, and end regions of smaller cross-section which provide transitions from the central region to the substrate and which locate the liner with respect to the substrate.

4,626,459

MOUNTING STRUCTURE FOR SECURITY STRIP

Nicholas Warhol, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1986, Ser. No. 773,996

Int. Cl.⁴ B32B *15/12, 3/02*

U.S. Cl. 428—40 **3 Claims**

1. A mounting structure for use in mounting a flat, narrow, metallic strip on a sheet of paper including:

a flat, narrow, metallic strip;

a piece of paper having length and width dimensions that are greater than those of said metallic strip; and

an adhesive carried on one side of said piece of paper with said narrow, metallic strip held by said adhesive and positioned centrally of said piece of paper whereby an adhesive covered border is provided by said piece of paper about the periphery of said metallic strip for use in securing said piece of paper with said metallic strip to a selected surface.



4,626,460

COEXTRUDED PRESSURE SENSITIVE LABEL STOCK MATERIAL WITH INTEGRAL PEELABLE BACKING

Gary L. Duncan, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 753,850, Jul. 11, 1985, Pat. No. 4,582,736. This application Dec. 30, 1985, Ser. No. 814,693

Int. Cl.⁴ A61F *3/02*; B32B *3/26*

U.S. Cl. 428—40 **20 Claims**

1. A biaxially oriented label stock product of which comprises:

(a) a facing layer in the form of a polyolefin film having an upper surface and a lower surface, a pressure sensitive adhesive component incorporated within said facing layer or applied as a coating to the lower surface thereof; and,

(b) a release layer in the form of a polyolefin film having an upper surface and a lower surface and having a release agent component for the pressure sensitive adhesive component of facing layer (a) incorporated therein or applied as a coating to the upper surface thereof, the lower surface of facing layer (a) being peelably affixed to the upper surface of said release layer (b).

4,626,461

GAS TURBINE ENGINE AND COMPOSITE PARTS

Karl M. Prewo, Vernon, and John J. Brennan, Portland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 18, 1983, Ser. No. 459,029

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.⁴ B32B *5/02, 5/08, 15/08*

U.S. Cl. 428—113 **9 Claims**



1. A gas turbine engine core engine component selected from blades, vanes, discs, side plates, seals, combustor liners, flaps, burner case structures or turbine case structures; comprising a plurality of substantially titanium-free ceramic layers selected from (a) aluminosilicate, (b) lithium aluminosilicate, (c) magnesium aluminosilicate, or (d) mixtures thereof, each layer reinforced with a plurality of unidirectional, continuous length silicon carbide fibers, each layer having an axial flexural strength exemplified by a critical stress intensity factor greater than 10×10^3 psi (inch)$^{\frac{1}{2}}$, high temperature strength, high temperature oxidation stability, and good insulating properties.

4,626,462

PROCESS FOR THE MANUFACTURE OF THROUGH-HOLE CONTACTED FLEXIBLE CIRCUIT BOARDS FOR HIGH BENDING STRESSES AND THE CIRCUIT BOARDS MADE THEREFROM

Horst Kober, Marburg, and Gunter Trogisch, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freundenberg, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,916

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434672

Int. Cl.⁴ B32B *3/10*

U.S. Cl. 428—137 **20 Claims**



11. A flexible circuit element formed in a method of manufacturing comprising the steps of:

forming a first flexible non-conductive carrier film;

forming a first conductive layer;

providing a first adhesive layer between said first carrier film and said first conductive layer;

laminating said first carrier film, first adhesive layer and first conductive layer to form a flexible base laminate;

selectively providing a second adhesive layer to portions of said first carrier film of said flexible base laminate whereby at least one area on said first carrier film has no adhesive and defines a bending region; and

providing a second conductive layer on said second adhesive layer whereby said bending region is covered by said second conductive layer and defines a space; and

laminating said flexible base laminate, second adhesive layer and second conductive layer to define a flexible laminate unit.

12. The circuit element of claim 11 including the steps of:

forming at least one conductive through-hole in said flexible laminate unit in a location outside of said bending region; and

forming a circuit pattern in said second conductive layer, a portion of said circuit pattern being formed over said space.

4,626,463

DISKETTE HAVING WEAR-RESISTANT MAGNETIZABLE LAYER

Chiaki Fujishiro, Hino, and Mitsuhiro Kominami, Sagamihara, both of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 26, 1984, Ser. No. 654,378

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—143 **8 Claims**

1. Diskette including a magnetic recording disk which has reliable overwrite capability and has a flexible backing and a magnetizable layer of inorganic particles uniformly dispersed in a nonmagnetizable binder, which particles comprise acicular magnetizable particles, alpha-Fe_2O_3 particles, and head-cleaning agent particles having a Mohs hardness of at least 7, which layer has surface smoothness better than 0.1 micrometers peak-to-valley and topical liquid lubricant, characterized in that:

(a) the head-cleaning agent particles comprise from 1 to 4 percent by weight of the layer,

(b) the alpha-Fe_2O_3 particles are acicular, of approximately the same length and thickness as the magnetizable particles, and comprise from 2 to 7 weight percent of the layer, and

(c) the topical lubricant is contained in pores of the layer in an amount of at least 2 percent by weight of the layer, and

(d) the acicular magnetizable particles, the head-cleaning agent particles, and the alpha-Fe_2O_3 particles together comprise from 69 to 73 percent by weight of said layer.

4,626,464

WEAR RESISTANT COMPOUND BODY

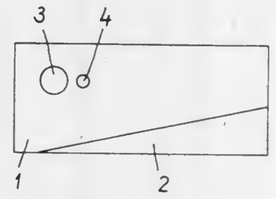
Johannes Jachowski, Duisburg; Helmut Klasing, Essen; Josef Blum, Essen, and Paul Pant, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,916

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315125

Int. Cl.⁴ B32B *15/04*; B22C *9/02*

U.S. Cl. 428—212 **8 Claims**



1. A wear resistant compound body comprising a metal alloy basic material and a wear resistant zone containing hard substance and/or hard metal particles in addition to the basic material, wherein said basic material comprises

0.001 to 1.5 weight percent carbon,

0.5 to 8 weight percent boron,

1 to 8 weight percent niobium,

0.2 to 6 weight percent chromium,

0 to 30 weight percent nickel,

0 to 10 weight percent manganese,

0 to 6 weight percent vanadium,

0 to 5 weight percent molybdenum,

0 to 5 weight percent silicon, the remainder being iron; wherein

the hard substance and hard metal particles have a diameter of from 0.1 to 20 mm and the percentage of hard substance and hard metal particles in the wear resistant zone lies between 25 and 95 volume percent; and wherein said hard substance particles are firmly embedded within said metal alloy basic material and said hard metal particles are fused with said metal alloy basic material.

4,626,465

CURTAIN FABRICS FOR GREENHOUSES AND SHADE HALLS

Göran Henningsson, Kinna, Sweden, assignor to Ludwig Svensson International B.V., Zuidland, Netherlands

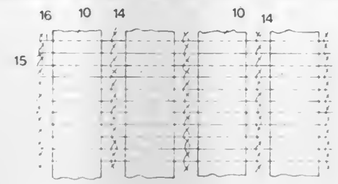
Continuation-in-part of Ser. No. 629,822, Jul. 3, 1984. This application Dec. 17, 1985, Ser. No. 809,790

Int. Cl.⁴ D03D *3/00*

U.S. Cl. 428—225 **16 Claims**

1. A curtain fabric comprising spaced strips of a flexible sheet material running in one direction, a longitudinal direction, of the fabric and which are interconnected by means of textile threads in a yarn framework, the strips being selected from a group consisting of heat radiation reflecting and heat radiation absorbing materials, wherein the yarn framework includes transverse connection threads, and longitudinal connection threads, the transverse connection threads being located on opposite sides of a plane containing the strips so as to

extend respectively across opposite surfaces of the strips, and the transverse threads on one side of said plane extending



through the spaces between adjacent strips for connection to the longitudinal threads.

4,626,466

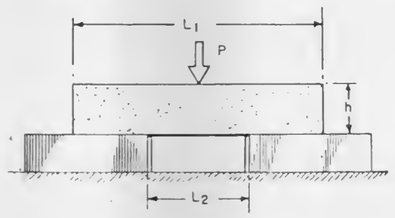
AQUEOUS SUSPENSION OF BENTONITE AND ITS USE FOR COATING THERMAL INSULATING PLATES

Sabine Schmidt, Bruckobol; Peter Kleihschmit, Hanau, and Rudolf Schwarz, Alzenau-Wasser, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 481,231, Apr. 1, 1983, Pat. No. 4,529,630. This application Oct. 28, 1983, Ser. No. 546,365

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—247 **18 Claims**



1. A combination consisting essentially of a thermal insulating molded article consisting of about 40 to 70% of a finely divided insulating component, 20 to 50% of an opacifier and 1 to 10% of high temperature resistant inorganic fibers and a coating for the thermal insulating article, said coating consisting essentially of bentonite and inorganic fibers.

4,626,467

BRANCHED POLYOLEFIN AS A QUENCH CONTROL AGENT FOR SPIN MELT COMPOSITIONS

Barry J. Hostetter, Decatur, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 16, 1985, Ser. No. 809,369

Int. Cl.⁴ D04H *1/58, 1/04;* **D02G** *3/00*

U.S. Cl. 428—288 **23 Claims**

1. A method for increasing efficiency and flexibility of an air-quench-dependent spin melt compositions, comprising incorporating within said spin melt compositions an active amount of at least one branched polyolefin additive having a Branching Index within the range of about 0.20–0.90.

4,626,468

MICROPOROUS SUPPORT LAYER WITH INTERFACIALLY POLYMERIZED COPOLYAMIDE THEREON

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1986, Ser. No. 854,928

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—315.5 **3 Claims**

1. A composite reverse osmosis membrane having good salt rejection with high flux comprising a microporous support layer and superposed thereon a layer of an interfacially polymerized copolyamide consisting essentially of repeating units derived from meta-phenylene diamine and, based on polymerized acid chloride present, from 10 to 80 weight percent of the repeating units derived from trimesoyl chloride, 90 to 15 weight percent repeating units derived from cyclohexane-1,3,5-tricarbonyl chloride and, up to 40 weight percent of the repeating units are derived from isophthaloyl chloride, terephthaloyl chloride or mixtures thereof.

4,626,469

MAGNETIC RECORDING MATERIAL

Nobutaka Yamaguchi; Kenichi Masuyama; Shinobu Iida, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1983, Ser. No. 505,505

Claims priority, application Japan, Jun. 18, 1982, 57-105162

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—323 **7 Claims**



1. A magnetic recording material comprising a non-magnetic support base having coated thereon a magnetic layer, the magnetic layer comprising:

a binder having dispersed therein;

a ferromagnetic powder;

a carbon black fine powder having a mean primary grain size ranging from 5 to 9 mμ; and

a carbon black coarse powder having a mean primary grain size in the range of 50 mμ to 120 mμ, wherein the carbon black fine powder and the carbon black coarse powder are present in a mixing ratio ranging from 95/5 to 5/95 by weight.

4,626,470

IMPREGNATED CATHODE

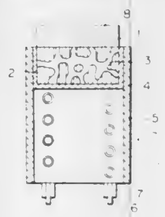
Shigehiko Yamamoto, Tokorozawa; Sadanori Taguchi, Tokyo, and Toshiyuki Aida, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,777

Claims priority, application Japan, Jun. 29, 1984, 59-133149

Int. Cl.⁴ H01J *1/14*

U.S. Cl. 428—336 **11 Claims**



1. An impregnated cathode comprising: a refractory porous body impregnated with an electron emissive material, free of Sc or scandium oxide, and having an electron emissive surface;

and a thin film disposed on said electron emissive surface said film consisting essentially of a refractory metal and at least one of Sc and a scandium oxide.

9. An impregnated cathode comprising: a refractory porous body that is impregnated with an electron emissive material, is free of Sc or scandium oxide, and has an electron emissive surface; and a thin film disposed on said electron emissive surface; said film having a thickness between 10 nm and 1 μm and consisting essentially of 80% to 99% by weight of a refractory metal and 1% to 20% by weight of at least one of Sc and a scandium oxide; and said refractory metal consisting of at least one metal selected from the group consisting of W, Mo, Ir, Os, Re and Pt.

4,626,471

MICROENCAPSULATION BY IN-SITU POLYMERIZATION OF MULTIFUNCTIONAL EPOXY RESINS

Hung-Ya Chao, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,078

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.⁴ B01J *13/02;* **B32B** *27/38*

U.S. Cl. 428—402.21 **13 Claims**

1. A method of forming microcapsules by in-situ polymerization comprising the following steps in combination:

a. forming a solution comprising a polyfunctional amine, an epoxy resin selected from the group consisting of 4-glycidyloxy-N,N-di-glycidyl aniline and methylolated bisphenol A based epoxy resins, and an organic solvent capable of dissolving said amine and said resin; and

b. dispersing said solution in the form of minute droplets within a substantially aqueous continuous phase such that microcapsular walls form at the periphery of said droplets through the reaction of said amine with said resin.

13. A microcapsule formed according to the method of claim 1.

4,626,472

FREE-FLOWING FLAKES OF HYDROPHILIC/WATER-SOLUBLE POLYMER GEL

Jean Boutin, Mions, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevole, France

Division of Ser. No. 515,643, Jul. 20, 1983, Pat. No. 4,550,033. This application Aug. 12, 1985, Ser. No. 764,642

Claims priority, application France, Jul. 20, 1982, 82 12611

Int. Cl.⁴ C08K *3/34*

U.S. Cl. 428—407 **5 Claims**

1. Storage-stable, discrete, non-adherent and free-flowing burst grains or flakes of a hydrophilic or water-soluble polymer gel, said burst grains or flakes comprising a complete thin adherent film coating of a processing aid powder, and said powder being inert with respect to the polymer and either water absorbent or adapted to prevent dehydration of the polymer gel.

4,626,473

THERMAL ENERGY STORAGE POWDERED MATERIAL

Ih-Houng Loh, Cambridge; Robert E. Cohen, Jamaica Plain, and Raymond F. Baddour, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 22, 1985, Ser. No. 725,618

Int. Cl.⁴ C08J *3/04*

U.S. Cl. 428—409 **6 Claims**

1. A thermal energy storage material comprising a powder consisting essentially of particles of a polyolefin, said powder having substantially the entire surface portions of substantially all of said particles crosslinked at a depth of less than 1000 Angstroms to prevent fusing of said particles to each other at relatively high temperatures utilized for thermal energy storage wherein the heat of fusion of said particles is substantially identical to said particles of said polyolefin prior to surface crosslinking.

4. A process for preparing a thermal energy storage material comprising contacting particles consisting essentially of a polyolefin with an inert gaseous medium present as a cold plasma in a fluidized bed for crosslinking substantially the entire surface portion of substantially all of said particles and forming surface crosslinked particles at a depth less than 1000 Angstroms for thermal energy storage, said crosslinking being sufficient to prevent fusing of said particles to each other at relatively high temperatures utilized for thermal energy storage and said surface crosslinked particles having a heat of fusion substantially identical to said particles of said polyolefin prior to surface crosslinking.

4,626,474

POLYIMIDE FILM/METAL FOIL LAMINATION

Ki-Soo Kim, Katonah, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 21, 1985, Ser. No. 747,541

Int. Cl.⁴ B32B *15/08, 27/06, 27/00*

U.S. Cl. 428—416 **10 Claims**

1. A laminate intermediate adapted to be cured to form a laminate, said laminate intermediate comprising:

(a) a polyimide film;

(b) a metal foil; and

(c) a curable adhesive layer which lies between (a) and (b), the curable adhesive layer consisting essentially of a predominant amount of a curable epoxy resin, substantially no flexibilizer, and an epoxy curing agent for the epoxy resin.

4,626,475

POLYURETHANE PRESSURE SENSITIVE ADHESIVES FOR BONDING LAYERED STRUCTURES

Anil Goel, Worthington; Joseph Holehouse, Columbus, and Kenneth Barnett, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 18, 1985, Ser. No. 777,111

Int. Cl.⁴ B32B *27/00;* **C08L** *23/00;* **C08G** *18/28, 18/77*

U.S. Cl. 428—423.1 **4 Claims**

1. The structure composed of at least two surfaces of at least two materials bonded together by the intercalation of a pressure sensitive adhesive produced by the reaction of a polyisocyanate and a polyol having a molecular weight of 400 or greater in the presence of from 1 to 10% by weight of a bicyclic amide acetal based on the weight of polyol.

4,626,476

WEAR AND CORROSION RESISTANT COATINGS APPLIED AT HIGH DEPOSITION RATES

Calvin H. Londry, and Thomas A. Adler, both of Indianapolis, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

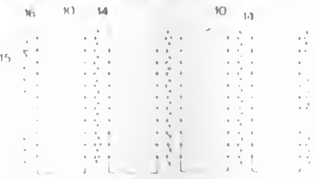
Continuation-in-part of Ser. No. 546,541, Oct. 28, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,327

Int. Cl.⁴ B32B *15/04;* **B05D** *1/00, 1/02, 1/10*

U.S. Cl. 428—457 **35 Claims**

1. A coating composition applied to a substrate by a thermal spray process which consists essentially of from about 4.0 to about 10.5 weight percent cobalt, from about 5.0 to about 11.5 weight percent chromium, from about 3.0 to about 5.0 weight percent carbon and the balance tungsten.

extend respectively across opposite surfaces of the strips, and the transverse threads on one side of said plane extending



through the spaces between adjacent strips for connection to the longitudinal threads.

4,626,466

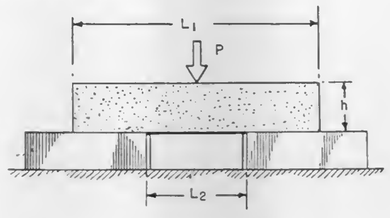
AQUEOUS SUSPENSION OF BENTONITE AND ITS USE FOR COATING THERMAL INSULATING PLATES

Sabine Schmidt, Bruckobol; Peter Kleihschmit, Hanau, and Rudolf Schwarz, Alzenau-Wasser, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 481,231, Apr. 1, 1983, Pat. No. 4,529,630. This application Oct. 28, 1983, Ser. No. 546,365

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—247 **18 Claims**



1. A combination consisting essentially of a thermal insulating molded article consisting of about 40 to 70% of a finely divided insulating component, 20 to 50% of an opacifier and 1 to 10% of high temperature resistant inorganic fibers and a coating for the thermal insulating article, said coating consisting essentially of bentonite and inorganic fibers.

4,626,467

BRANCHED POLYOLEFIN AS A QUENCH CONTROL AGENT FOR SPIN MELT COMPOSITIONS

Barry J. Hostetter, Decatur, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 16, 1985, Ser. No. 809,369

Int. Cl.[4] D04H *1/58, 1/04;* **D02G** *3/00*

U.S. Cl. 428—288 **23 Claims**

1. A method for increasing efficiency and flexibility of an air-quench-dependent spin melt compositions, comprising incorporating within said spin melt compositions an active amount of at least one branched polyolefin additive having a Branching Index within the range of about 0.20–0.90.

4,626,468

MICROPOROUS SUPPORT LAYER WITH INTERFACIALLY POLYMERIZED COPOLYAMIDE THEREON

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1986, Ser. No. 854,928

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—315.5 **3 Claims**

1. A composite reverse osmosis membrane having good salt rejection with high flux comprising a microporous support layer and superposed thereon a layer of an interfacially polymerized copolyamide consisting essentially of repeating units derived from meta-phenylene diamine and, based on polymerized acid chloride present, from 10 to 80 weight percent of the repeating units derived from trimesoyl chloride, 90 to 15 weight percent repeating units derived from cyclohexane-1,3,5-tricarbonyl chloride and, up to 40 weight percent of the repeating units are derived from isophthaloyl chloride, terephthaloyl chloride or mixtures thereof.

4,626,469

MAGNETIC RECORDING MATERIAL

Nobutaka Yamaguchi; Kenichi Masuyama; Shinobu Iida, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1983, Ser. No. 505,505

Claims priority, application Japan, Jun. 18, 1982, 57-105162

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—323 **7 Claims**



1. A magnetic recording material comprising a non-magnetic support base having coated thereon a magnetic layer, the magnetic layer comprising:

a binder having dispersed therein;

a ferromagnetic powder;

a carbon black fine powder having a mean primary grain size ranging from 5 to 9 mμ; and

a carbon black coarse powder having a mean primary grain size in the range of 50 mμ to 120 mμ, wherein the carbon black fine powder and the carbon black coarse powder are present in a mixing ratio ranging from 95/5 to 5/95 by weight.

4,626,470

IMPREGNATED CATHODE

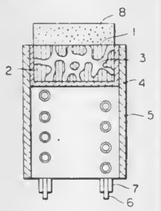
Shigehiko Yamamoto, Tokorozawa; Sadanori Taguchi, Tokyo, and Toshiyuki Aida, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,777

Claims priority, application Japan, Jun. 29, 1984, 59-133149

Int. Cl.[4] H01J *1/14*

U.S. Cl. 428—336 **11 Claims**



1. An impregnated cathode comprising: a refractory porous body impregnated with an electron emissive material, free of Sc or scandium oxide, and having an electron emissive surface;

and a thin film disposed on said electron emissive surface said film consisting essentially of a refractory metal and at least one of Sc and a scandium oxide.

9. An impregnated cathode comprising: a refractory porous body that is impregnated with an electron emissive material, is free of Sc or scandium oxide, and has an electron emissive surface; and a thin film disposed on said electron emissive surface; said film having a thickness between 10 nm and 1 μm and consisting essentially of 80% to 99% by weight of a refractory metal and 1% to 20% by weight of at least one of Sc and a scandium oxide; and said refractory metal consisting of at least one metal selected from the group consisting of W, Mo, Ir, Os, Re and Pt.

4,626,471

MICROENCAPSULATION BY IN-SITU POLYMERIZATION OF MULTIFUNCTIONAL EPOXY RESINS

Hung-Ya Chao, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,078

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] B01J *13/02;* **B32B** *27/38*

U.S. Cl. 428—402.21 **13 Claims**

1. A method of forming microcapsules by in-situ polymerization comprising the following steps in combination:

a. forming a solution comprising a polyfunctional amine, an epoxy resin selected from the group consisting of 4-glycidyloxy-N,N-di-glycidyl aniline and methylolated bisphenol A based epoxy resins, and an organic solvent capable of dissolving said amine and said resin; and

b. dispersing said solution in the form of minute droplets within a substantially aqueous continuous phase such that microcapsular walls form at the periphery of said droplets through the reaction of said amine with said resin.

13. A microcapsule formed according to the method of claim 1.

4,626,472

FREE-FLOWING FLAKES OF HYDROPHILIC/WATER-SOLUBLE POLYMER GEL

Jean Boutin, Mions, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Division of Ser. No. 515,643, Jul. 20, 1983, Pat. No. 4,550,033. This application Aug. 12, 1985, Ser. No. 764,642

Claims priority, application France, Jul. 20, 1982, 82 12611

Int. Cl.[4] C08K *3/34*

U.S. Cl. 428—407 **5 Claims**

1. Storage-stable, discrete, non-adherent and free-flowing burst grains or flakes of a hydrophilic or water-soluble polymer gel, said burst grains or flakes comprising a complete thin adherent film coating of a processing aid powder, and said powder being inert with respect to the polymer and either water absorbent or adapted to prevent dehydration of the polymer gel.

4,626,473

THERMAL ENERGY STORAGE POWDERED MATERIAL

Ih-Houng Loh, Cambridge; Robert E. Cohen, Jamaica Plain, and Raymond F. Baddour, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 22, 1985, Ser. No. 725,618

Int. Cl.[4] C08J *3/04*

U.S. Cl. 428—409 **6 Claims**

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4. A process for preparing a thermal energy storage material comprising contacting particles consisting essentially of a polyolefin with an inert gaseous medium present as a cold plasma in a fluidized bed for crosslinking substantially the entire surface portion of substantially all of said particles and forming surface crosslinked particles at a depth less than 1000 Angstroms for thermal energy storage, said crosslinking being sufficient to prevent fusing of said particles to each other at relatively high temperatures utilized for thermal energy storage and said surface crosslinked particles having a heat of fusion substantially identical to said particles of said polyolefin prior to surface crosslinking.

4,626,474

POLYIMIDE FILM/METAL FOIL LAMINATION

Ki-Soo Kim, Katonah, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 21, 1985, Ser. No. 747,541

Int. Cl.[4] B32B *15/08, 27/06, 27/00*

U.S. Cl. 428—416 **10 Claims**

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(a) a polyimide film;

(b) a metal foil; and

(c) a curable adhesive layer which lies between (a) and (b), the curable adhesive layer consisting essentially of a predominant amount of a curable epoxy resin, substantially no flexibilizer, and an epoxy curing agent for the epoxy resin.

4,626,475

POLYURETHANE PRESSURE SENSITIVE ADHESIVES FOR BONDING LAYERED STRUCTURES

Anil Goel, Worthington; Joseph Holehouse, Columbus, and Kenneth Barnett, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 18, 1985, Ser. No. 777,111

Int. Cl.[4] B32B *27/00;* **C08L** *23/00;* **C08G** *18/28, 18/77*

U.S. Cl. 428—423.1 **4 Claims**

1. The structure composed of at least two surfaces of at least two materials bonded together by the intercalation of a pressure sensitive adhesive produced by the reaction of a polyisocyanate and a polyol having a molecular weight of 400 or greater in the presence of from 1 to 10% by weight of a bicyclic amide acetal based on the weight of polyol.

4,626,476

WEAR AND CORROSION RESISTANT COATINGS APPLIED AT HIGH DEPOSITION RATES

Calvin H. Londry, and Thomas A. Adler, both of Indianapolis, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 546,541, Oct. 28, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,327

Int. Cl.[4] B32B *15/04;* **B05D** *1/00, 1/02, 1/10*

U.S. Cl. 428—457 **35 Claims**

1. A coating composition applied to a substrate by a thermal spray process which consists essentially of from about 4.0 to about 10.5 weight percent cobalt, from about 5.0 to about 11.5 weight percent chromium, from about 3.0 to about 5.0 weight percent carbon and the balance tungsten.

4,626,477

WEAR AND CORROSION RESISTANT COATINGS AND METHOD FOR PRODUCING THE SAME

John E. Jackson, Brownsburg; Thomas A. Adler, and Jean M. Quets, both of Indianapolis, all of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 546,542, Oct. 28, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,325

Int. Cl.[4] B32B *15/04, 27/06;* B05D *1/12*

U.S. Cl. 428—457 30 Claims

1. A coating composition which has been applied to a substrate by a thermal spray process which consists essentially of from about 6.5 to about 9.0 weight percent cobalt, from about 2.0 to about 4.0 weight percent chromium, from about 3.0 to about 4.0 weight percent carbon and the balance tungsten.

4,626,478

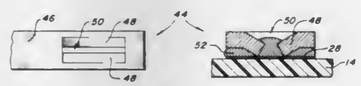
ELECTRONIC CIRCUIT DEVICE COMPONENTS HAVING INTEGRAL SPACERS PROVIDING UNIFORM THICKNESS BONDING FILM

Herman F. van Dyk Soerewyn, Peabody, Mass., assignor to Unitrode Corporation, Lexington, Mass.

Filed Mar. 22, 1984, Ser. No. 592,220

Int. Cl.[4] H01L *23/48*

U.S. Cl. 428—596 11 Claims



1. A composite article providing a uniform thickness conductive bond in a conductive interface defined by first and second generally planar constituent surfaces of an electrical lead and the contact pad of an electronic circuit device component, comprising:

an electrically conductive bonding material disposed in said conductive interface;

a spacer integrally formed with said substantially planar electrical lead that projects towards said contact pad for uniformly spacing said constituent surfaces of said conductive interface a preselected non-zero distance apart defining a uniform thickness interspace therebetween; and

means integrally formed with said lead for providing an opening therethrough through-which gases produced by the conductive bonding material disposed in the interface may exit.

4,626,479

COVERING METAL STRUCTURE FOR METALLIZED METAL LAYER IN ELECTRONIC PART

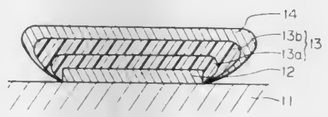
Yoshihiro Hosoi, and Takaaki Fujioka, both of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Oct. 23, 1985, Ser. No. 790,332

Claims priority, application Japan, Oct. 26, 1984, 59-226228

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—663 6 Claims



1. A covering structure for a metallized metal layer of an electronic part, wherein the surface of a metallized layer on an insulating substrate is covered with an intermediate metal layer comprising at least a first intermediate metal layer composed mainly of a nickel/boron alloy, which is located on the side of the metallized metal layer, and a second intermediate metal layer composed mainly of a nickel/phosphorus alloy, which is located on the first intermediate metal layer, and the surface of the intermediate metal layer is covered with a surface metal layer composed mainly of gold.

4,626,480

MAGNETIC RECORDING MEDIUM COMPRISING A VACUUM-DEPOSITED MAGNETIC FILM OF A MAGNETIC MATERIAL AND A TUNGSTEN OXIDE AND METHOD FOR MAKING THE SAME

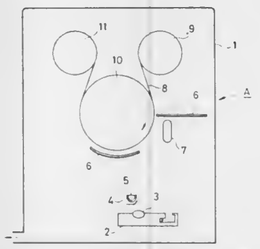
Masanobu Shigeta, Isehara; Makoto Mizukami, Yokohama, and Toshikazu Nishihara, Zama, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Jan. 30, 1985, Ser. No. 696,581

Claims priority, application Japan, Feb. 2, 1984, 59-16002

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—694 6 Claims



1. A magnetic recording medium for high density recording comprising a non-magnetic substrate and a magnetic thin film formed on at least one side of the non-magnetic substrate by vacuum deposition, said magnetic thin film consisting essentially of a magnetic material and a tungsten oxide used in an amount of from 10 to about 50 wt %, calculated as W, of the magnetic thin film.

4,626,481

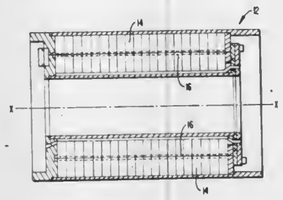
COMMON ELECTROLYTE MANIFOLD BATTERY

J. Pierre Wilson, San Jose, Calif., assignor to Altus Corporation, San Jose, Calif.

Filed Nov. 1, 1985, Ser. No. 793,795

Int. Cl.[4] H01M *2/38, 6/14*

U.S. Cl. 429—18 23 Claims



1. A common electrolyte manifold battery, said battery including at least one module having a plurality of cells, at least one common electrolyte manifold traversing said cells for transporting an electrolyte, an anode and a cathode, said one cell comprising

an anode plate having an end proximal to said manifold and an end distal to said manifold, said distal end being connected to said anode;

a cathode plate, positioned parallel with said anode plate, having an end proximal to said manifold and an end distal to said manifold, said distal end being connected to said cathode; and

a layer of insulator enveloping each of said proximal end of said anode plate and said cathode plate, said insulator layers being contiguous with said common electrolyte manifold, whereby

short circuiting of said one cell is minimized.

4,626,482

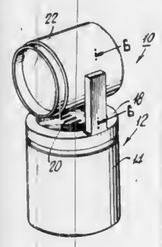
METAL/AIR BATTERIES

Robert P. Hamlen, Bernardsville, and Peter F. Connolly, Parsippany, both of N.J., assignors to Alupower, Inc., Bernardsville, N.J.

Filed Nov. 18, 1985, Ser. No. 798,988

Int. Cl.[4] H01M *12/06*

U.S. Cl. 429—27 14 Claims



1. A metal air battery comprising

(a) a tank defining a single continuous reservoir for liquid electrolyte;

(b) a plurality of air cathodes each having first and second opposed surfaces;

(c) an electrically nonconductive frame carrying the cathodes in electrically isolated relation to each other and defining with the cathode first surfaces a liquid-tight air chamber open to ambient atmosphere, the frame being removably insertable in the reservoir to expose the cathode second surfaces to electrolyte therein;

(d) a plurality of metal anode, one for each cathode, disposed for immersion in electrolyte in the reservoir in spaced juxtaposed relation to the cathode second surfaces to constitute therewith a plurality of anode-cathode pairs each electrically coupled by electrolyte;

(e) circuit means for connecting said anode-cathode pairs in series to each other and to an external load; and

(f) means for engaging the frame with the tank, when the frame is inserted in the reservoir, to divide the reservoir into a plurality of separate and substantially electrically isolated electrolyte-holding zones each containing one anode and the cathode second surface juxtaposed thereto, so as to inhibit anode-to-anode current flow through the electrolyte.

4,626,483

ELECTROCHEMICAL CELL

Roger J. Bones, Abingdon; David A. Teagle; Steven D. Brooker, both of Swindon, and Roy C. Galloway, Park Nook Quarndon, all of England, assignors to Lilliwyte Societe Anonyme, Luxembourg

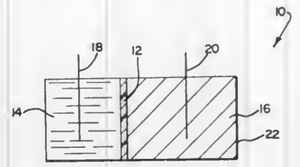
Filed Sep. 23, 1985, Ser. No. 778,668

Claims priority, application United Kingdom, Sep. 21, 1984, 8423961

Int. Cl.[4] H01M *4/52, 10/39*

U.S. Cl. 429—50 19 Claims

1. A cathode for an electrochemical cell, which cathode comprises an electronically conductive electrolyte-permeable macroscopically porous matrix impregnated with a sodium aluminium halide molten salt liquid electrolyte which contains chloride ions and is molten at the operating temperature of the cell, the matrix having a chlorinated nickel-containing substance dispersed therein as the active cathode substance a minor proportion of a suitable chalcogen being dispersed in at least one member of the group comprising said electrolyte and said active cathode substance, for resisting a progressive drop



in the capacity of the cathode with repeated charge/discharge cycling thereof.

4,626,484

LIGHT-SENSITIVE PRINTING PLATE PRECURSOR

Akira Nishioka; Takao Nakayama, and Tomoaki Takekoshi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 6, 1981, Ser. No. 290,451

Claims priority, application Japan, Aug. 11, 1980, 55-109984

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—273 11 Claims

1. A process for producing a light-sensitive printing plate presursor, which comprises spray-coating an aqueous liquid containing a resin in a dissolved or dispersed state on a light-sensitive layer provided on a support and drying the aqueous liquid, thereby depositing the resin strongly adhered to and as particles on the surface of the light-sensitive layer, wherein said resin particles deposited are from 1 to 20μ in height, from 20 to 200∞ in width, and are present in a coverage from 1 to 1,000 particles per mm^2, and wherein the deposited resiin is a particulate layer of particles of resin.

4,626,485

SUBSTITUTED SQUARIUM COMPOUNDS, PROCESS FOR PREPARING THE SAME AND ELECTROPHOTOGRAPHIC PHOTORECEPTORS CONTAINING THE SAME

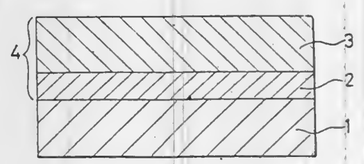
Seki Kin; Hiroyuki Tanaka; Satoshi Saeki; Kaoru Torikoshi, and Lyong S. Pu, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,165

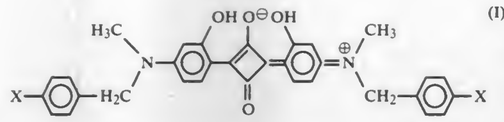
Claims priority, application Japan, May 11, 1984, 59-92764; May 25, 1984, 59-104776

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 13 Claims



1. An electrophotographic photoreceptor comprising an electroconductive support and a photosensitive layer comprising a squarium compound represented by formula (I):



(I)

wherein X is a nitro group or a cyano group.

2. An electrophotographic photoreceptor as claimed in claim 1, wherein said photosensitive layer comprises a charge transport layer and a charge generation layer containing said squarium compound.

4. An electrophotographic photoreceptor as claimed in claim 2, wherein said charge transport layer comprises a compound selected from the group consisting of triarylpyrazoline, triphenylmethane, oxadiazole, tetraphenylbenzidine or trinitrofluororenone and a binder resin.

4,626,486

ELECTROPHOTOGRAPHIC ELEMENT COMPRISING ALLOY OF SELENIUM AND TELLURIUM DOPED WITH CHLORINE AND OXYGEN

Hideyo Nishizima, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,017

Claims priority, application Japan, Apr. 8, 1983, 58-60968

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—86 **2 Claims**

1. An electrophotographic element comprising an electrically conductive substrate and a Se-Te-Cl alloy system photoconductive layer mounted on said substrate, wherein the amount of Te contained in said alloy is in the range of 6 to 12 wt.% of Se, the Cl content is in the range of 10 to 30 ppm of the total amount of Se and Te, and the content of O_2 as impurity is 10 ppm or less of the whole alloy.

4,626,487

PARTICULATE DEVELOPER CONTAINING INORGANIC SCRAPER PARTICLES AND IMAGE FORMING METHOD USING THE SAME

Yasuo Mitsuhashi, Yokohama; Masaki Uchiyama; Kazunori Murakawa, both of Tokyo, and Kenji Okado, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,060

Claims priority, application Japan, Aug. 3, 1983, 58-142061; Dec. 26, 1983, 58-249087

Int. Cl.[4] G03G *9/00, 9/14, 13/06*

U.S. Cl. 430—109 **15 Claims**



1. A particulate developer, which comprises

(i) 85 to 99.77% by weight of colored resinous particles,

(ii) 0.2 to 10% by weight of inorganic fine particles (A) having a BET specific surface area of 0.2 to 30.0 m^2/g as measured by nitrogen absorption, and

(iii) 0.03 to 5% by weight of inorganic fine particles (B) having a BET specific surface area of 40 to 400 m^2/g as measured by nitrogen absorption, in which each weight of said particles is based on the total weight of said colored resinous particles, said inorganic fine particles (A), and said inorganic fine particles (B).

4,626,488

POLYMERIC BINDER FOR TONER HAVING SPECIFIC WEIGHT DISTRIBUTION

Sukejiro Inoue, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,520

Claims priority, application Japan, Apr. 28, 1984, 59-86767

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **34 Claims**

1. A binder resin for a toner comprising a polymer having at least three peaks or shoulders in its chromatogram obtained by gel permeation chromatography, wherein said at least three peaks or shoulders include a peak or shoulder A having the smallest molecular weight Ma of 2,000 to 80,000, a peak or shoulder C having the largest molecular weight Mc of 3×10^6 or larger satisfying the relationship of $Mc/Ma \geqq 150$, and a peak or shoulder B having an intermediate molecular weight Mb between said Ma and Mc of 3×10^5 to 1×10^6, wherein said peaks or shoulders A, B and C have heights Ha, Hb and Hc, respectively, which satisfy the proportion Ha:Hb:Hc of 1:0.2–1.0:0.1–0.6.

4,626,489

PROCESS FOR PRODUCING TONER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES BY STEPWISE SUSPENSION POLYMERIZATION

Yoshihiko Hyosu, Sagamihara, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 536,333, Sep. 27, 1983, Pat. No. 4,601,968. This application Apr. 8, 1985, Ser. No. 720,607

Claims priority, application Japan, Oct. 4, 1982, 57-174218; Oct. 4, 1982, 57-174219

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—137 **12 Claims**

1. A process for producing a toner for developing electrographic images, comprising:

a. dispersing a polymerizable mixture comprising a polymerizable monomer, a polymerization initiator and a colorant in a dispersion in which the polymerizable monomer is substantially insoluble;

b. polymerizing the dispersion of the polymerizable mixture in the dispersion medium forming a disperse system having polymeric particles;

c. adding an additional polymerizable monomer and an oil-soluble polymerization initiator to adsorb the additional monomer on the polymeric particles; and

d. polymerizing the additional monomer to form a polymer, wherein the additional monomer and conditions for step d are selected so that the polymer obtained in said step has a glass transition temperature higher than that of the polymer obtained in step b.

4,626,490

ENCAPSULATED TONER

Masuo Yamazaki, Kawasaki; Katsutoshi Wakamiya, Yokohama; Toru Matsumoto, Tokyo; Ichiro Ohsaki; Toshiaki Nakahara, both of Kawasaki, and Hisayuki Ushiyama, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,467

Claims priority, application Japan, Jan. 27, 1984, 59-13102

Int. Cl.[4] G03G *9/16*

U.S. Cl. 430—138 **19 Claims**

1. An encapsulated toner comprising a core material and a shell material encapsulating said core material, said core material including binder resin containing a long chain organic compound having a hydrocarbon chain and an ester compound of R^1COOR^2 wherein R^1 is an alkyl group or alkenyl group of 15 to 80 carbon atoms and R^2 is an alkyl group or alkenyl group of 10 to 40 carbon atoms, said binder resin having an acid value of 0 to 2.

4,626,491

DEEP ULTRA-VIOLET LITHOGRAPHIC RESIST COMPOSITION AND PROCESS OF USING

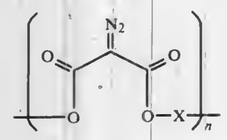
Gary M. Gray, Pelham, Ala., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 539,818, Oct. 7, 1983, abandoned. This application Sep. 12, 1985, Ser. No. 775,322

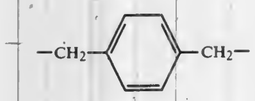
Int. Cl.[4] G03C *1/54, 1/60;* **G03F** *7/26*

U.S. Cl. 430—190 **16 Claims**

1. A lithographic resist composition for use with deep UV light of less than 300 nm wavelength comprising a base soluble film-forming polymer and in admixture therewith as a deep UV photosensitive solubilizing agent, a sufficient quantity of an oligomeric compound of the formula



wherein X is



and n is a whole positive integer such that the molecular weight of the oligomeric compound is from about 300 to about 3000 daltons, whereby upon exposure to deep UV radiation the exposed composition becomes more soluble in basic developer.

7. A castable resist composition comprising the lithographic resist composition of claim 1 in a film-forming solvent having a boiling point of from about 120° to 210° C.

12. A process for forming a lithographic resist image comprising image-wise exposing to deep UV light of less than about 300 nm a film cast on a substrate and dissolving the exposed portion of said film with a basic solution, wherein the film cast on the substrate comprises a film cast from the castable composition of claim 7.

4,626,492

POSITIVE-WORKING O-QUINONE DIAZIDE PHOTORESIST COMPOSITION CONTAINING A DYE AND A TRIHYDROXYBENZOPHENONE COMPOUND

James N. Eilbeck, Ringwood, N.J., assignor to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Filed Jun. 4, 1985, Ser. No. 741,070

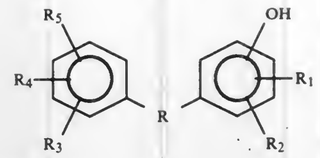
Int. Cl.[4] G03C *1/60, 1/54*

U.S. Cl. 430—191 **6 Claims**

1. A positive-working photoresist composition which comprises a solvent and solid ingredients dissolved therein; said solids, whose proportions are based by weight on the total solids in said composition, comprise:

(a) from about 63 to about 68 percent of a novolak resin;

(b) from about 15 to about 22 percent of a naphthoquinone diazide sensitizer prepared by mono-, di- or tri-esterifying a low molecular weight phenol compound with 1,2-naphthoquinone-2-diazide-5-chloride, said phenol compound having the formula



wherein:

R is a single bond or one of the groups CO, S, O, SO_2 or CR_6R_7;

R_1, R_2, R_3, R_4 and R_5 are each independently H, X (where X is a halogen atom), OH, a lower alkyl group having 1 to 4 carbon atoms or a lower alkoxy group having 1 to 4 carbon atoms; and

R_6 and R_7 are each independently H or a lower alkyl group having 1 to 4 carbon atoms;

or wherein:

two of the radicals R_3, R_4 and R_5 or the two radicals R_1 and R_2 independently jointly form an aromatic ring, whereby at least one of the radicals R_1, R_2, R_3, R_4 or R_5 is OH;

(c) from about 0.1 to about 3 percent of a dye which absorbs light at a maximum wavelength of from about 330 to about 460 nm; and

(d) an effective proportion of an additive compound to increase the photospeed and rate of development of said composition, said additive compound being a trihydroxybenzophenone compound and said proportion ranging from about 10 to about 20 percent.

4,626,493

LASER-IMAGEABLE ASSEMBLY WITH HETEROGENEOUS RESIN LAYER AND PROCESS FOR PRODUCTION THEREOF

Alan Butters, Suffolk; Roger N. Barker, Essex, and Stuart C. Rennison, Suffolk, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 8, 1985, Ser. No. 721,184

Int. Cl.[4] G03C *1/72;* **G03F** *1/00, 7/10*

U.S. Cl. 430—201 **14 Claims**

13. A method of making an imaged printing plate by placing the coated surface of an assembly including a transparent substrate having on a surface thereof an energy absorbent transfer layer wherein the transfer layer comprises particles which absorb laser energy dispersed in a heterogeneous resin layer, in intimate contact with a surface of a printing plate former and directing a laser beam image pattern through the transparent substrate of the assembly to transfer a portion of the coated surface corresponding to the image pattern from the substrate to the surface of the printing plate former, then, optionally, effecting cross-linking of the transferred portion.

4,626,494

HARDENED COLOR DIFFUSION TRANSFER PHOTOGRAPHIC MATERIALS

Kokichi Waki, and Yukio Karino, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1985, Ser. No. 765,787

Claims priority, application Japan, Aug. 15, 1984, 59-170134

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—213 **16 Claims**

1. A color diffusion transfer photographic material comprising (A) a light-sensitive element comprising a first support having thereon at least a silver halide photographic emulsion layer, a color forming compound and a hardening agent for controlling the swollen film thickness thereof, (B) an image receiving element comprising a second support having thereon at least an image receiving layer and a hardening agent for controlling the swollen film thickness thereof and (C) means

for providing an alkaline treating solution between element (A) and (B), wherein:

(i) the swollen film thickness of said light-sensitive element (A) is from about 10 μm to 45 μm after being contacted with water at 25° C. for 5 minutes;

(ii) the swollen film thickness of said image receiving element (B) is from about 10 μm to 45 μm after being contacted with a 0.1N KOH aqueous solution at 25° C. for 3 minutes; and

(iii) said means for providing an alkaline treating solution provides an average thickness of said treatment of from about 40 μm to 80 μm.

4,626,495

PHOTOGRAPHIC IMAGE RECEIVING ELEMENTS FOR SILVER SALT DIFFUSION TRANSFER PROCESSES

Shinji Sakaguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

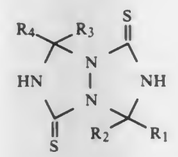
Filed Aug. 20, 1984, Ser. No. 642,324

Claims priority, application Japan, Aug. 19, 1983, 58-151355

Int. Cl.⁴ G03C *5/54*

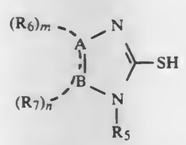
U.S. Cl. 430—232 **15 Claims**

1. In a photographic image receiving element for a silver salt diffusion-transfer process which comprises a hydrolyzable first alkali impermeable polymer layer applied on a base and an image receiving layer thereon comprising a hydrolyzable second alkali impermeable polymer layer containing silver precipitation nuclei which is prepared by hydrolyzing at least a part of the hydrolyzable second alkali impermeable polymer layer so as to be alkali permeable, the improvement wherein at least one hydrophilic polymer layer containing at least one of gum arabic and arabic acid is coated between said first alkali impermeable polymer layer and said image receiving layer, and said first alkali impermeable polymer layer contains at least one compound represented by formula (I) or formula (II)



(I)

wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, or an aryl group having from 6 to 12 carbon atoms,



(II)

wherein A and B each represents a nitrogen atom or a carbon atom, provided that A and B are not both nitrogen atoms, m is 0 and A is a nitrogen atom, n is 0 when B is a nitrogen atom, and m and n are 1 when A and B are each a carbon atom, R_5, R_6 and R_7 each represents a hydrogen atom, an alkyl group having from 1 to 10 carbon atoms or a substituted or nonsubstituted aryl group having from 6 to 20 carbon atoms, and R_6 and R_7 together can additionally represent a substituted or unsubstituted aromatic carbocyclic ring together with A and B.

4. A photographic image receiving element for a silver salt diffusion transfer process according to claim **1**, wherein the hydrolyzable first and second alkali impermeable polymer layers comprise acetyl cellulose.

4,626,496

OPTICAL INFORMATION RECORDING MEDIUM

Tsutomu Sato, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 745,344

Claims priority, application Japan, Jun. 19, 1984, 59-124470; Jun. 19, 1984, 59-124471

Int. Cl.⁴ G03C *5/24*

U.S. Cl. 430—270 **31 Claims**

1. An optical information recording medium capable of recording information and regenerating the information with light comprising, on a substrate, a recording layer consisting essentially of a double salt of an organic dye cation and a metal complex anion, said recording layer having a thickness 100 Å to 5 microns.

17. An optical information recording medium capable of recording information and regenerating the information with light comprising, on a substrate, a recording layer consisting essentially of a double salt of an organic dye cation and a metal complex anion and an organic dye, said recording layer having a thickness 100 Å to 5 microns.

4,626,497

PROCESS FOR THE PRODUCTION OF COLORED PHOTOGRAPHIC POLYMER IMAGES

Martin Roth; Beat Müller; Joseph Berger, all of Marly, and Peter Loew, Münchenstein, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 628,890, Jul. 9, 1984, abandoned, which is a division of Ser. No. 297,604, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 147,783, May 8, 1980, abandoned. This application May 24, 1985, Ser. No. 738,156

Claims priority, application Switzerland, May 18, 1979, 4673/79

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—293 **5 Claims**

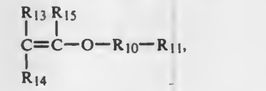
1. A process for the production of a photographic image colored with a cationic dye made by exposing imagewise a light-sensitive recording material having, on a base, one layer consisting of a photocrosslinkable polymer, the side chains, of which have photoactive maleimide groupings, wherein the layer consists of at least one copolymer which has an average molecular weight of 10^3 to 10^6 and is obtained by free radical polymerisation of a composition consisting of from 10 to 82% by weight of a comonomer (1) selected from the group consisting of those of the formula



(7)

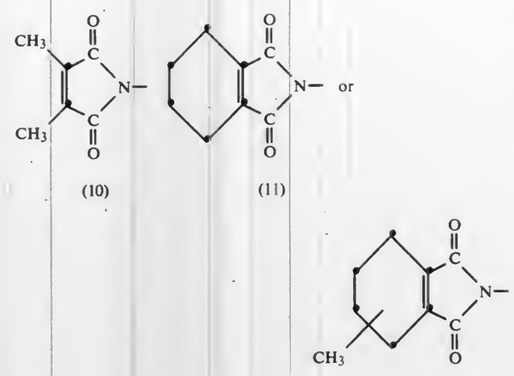


(8)



(9)

in which R_9 is hydrogen or methyl, R_{10} is straight-chain or branched alkylene having 1 to 12 carbon atoms or cycloalkylene having 5 or 6 carbon atoms, R_{11} is a maleimide grouping of the formula



(10) (11) (12)

and R_{12} is hydrogen or alkyl having 1 to 6 carbon atoms and R_{13}, R_{14} and R_{15} are each hydrogen, halogen, cyano or alkyl having 1 to 6 carbon atoms, from 18 to 90% by weight of a comonomer (2) which is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, maleic acid, fumaric acid, itaconic acid, vinylsulfonic acid, styrenesulfonic acid and phthalic acid/(meth)acrylate half ester, and from 0 to 72% by weight of at least one further ethylenically unsaturated comonomer (3) which differs from the comonomers (1) and (2), the amount of (1), (2) and (3) being 100% by weight, characterized that the comonomer (2) is present in the photocrosslinkable polymer in an amount of at least 18% by weight, based on the total amount of the comonomers, and that the complete development and complete coloring of the exposed recording materials is carried out together in one step in an alkaline, aqueous or aqueous-organic developer-solution having diluted therein a cationic dye in an amount of 0.01 to 10% by weight relating to said solution, and then washing and drying the developed and colored image.

4,626,498

COLOR REVERSAL PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Sadanobu Shuto; Yasuhiro Hayashi; Munehisa Fujita, and Kazunori Hasebe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed May 21, 1984, Ser. No. 612,217

Claims priority, application Japan, May 20, 1983, 58-88939

Int. Cl.⁴ G03C *5/50*

U.S. Cl. 430—379 **13 Claims**

1. A color reversal photographic light-sensitive material having at least one negative working type light-sensitive silver halide emulsion layer, wherein at least one of said emulsion layer and a layer adjacent thereto contains a light-insensitive silver halide emulsion of silver halide grains containing internal fog centers is, wherein said light-insensitive silver halide emulsion comprises core-shell type silver halide grains having a structure such that the surface-fogged silver halide inner core is covered with a silver halide outer shell and wherein the thickness of the outer shell is between 50 and 1,000 Å, and wherein said silver halide emulsion of silver halide grains containing fog centers is an emulsion capable of providing (1) almost no increase in density when subjected to 2-minute processing (normal processing), and (2) when subjected to 10-minute processing (push processing), an increase in density as high as at least five times that obtained by the 2-minute processing is obtained, in which the 2-minute processing and the 10-minute processing are carried out by coating the emulsion on a film support in a silver amount coated of 0.5 $g.m^2$, processing the resulting sample without exposure at 38° C. for 2 minutes (normal processing) and at 38° C. for 10 minutes (push processing) using a developer of the following formulation,

Formulation of Developer:	
Water	700 ml
Sodium Tetrapolyphosphate	20 g
Sodium Sulfite	2 g
Hydroquinone Monosulfonate	30 g
Sodium Carbonate (monohydrate)	30 g
1-Phenyl-4-methyl-4-hydroxymethyl-3-Pyrazolidone	2 g
Potassium Bromide	2.5 g
Potassium Thiocyanate	1.2 g
Potassium Iodide (0.1% aq. soln.)	2 ml
Water to make	1 liter

4,626,499

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Masatoshi Kato, and Hiroshi Kitaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

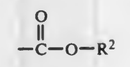
Filed Apr. 26, 1985, Ser. No. 727,978

Claims priority, application Japan, Apr. 27, 1984, 59-85836

Int. Cl.⁴ G03C *1/02*

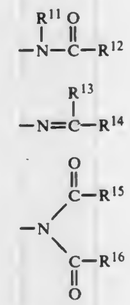
U.S. Cl. 430—559 **14 Claims**

1. A heat developable light-sensitive material comprising a support having thereon a light-sensitive silver halide emulsion, a base or a base precursor, a reducing agent and a compound in an amount capable of effectively stopping heat development of said heat developable light-sensitive material by reacting with a base generated by said base or said base precursor, said compound contains a group bonded to a carbon atom which is represented by formula (I)



(I)

wherein R^2 represents an aryl group, a substituted aryl group, a heterocyclic group or a group represented by formula (A), (B), or (C)



(A) (B) (C)

wherein R^{11} through R^{16} each represents an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group, wherein said carbon atom is included in an alkyl group, a substituted alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, and aralkyl group, and aryl group, a substituted aryl group, or a heterocyclic group.

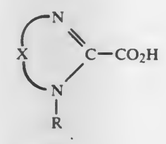
4,626,500

HEAT-DEVELOPABLE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

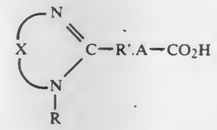
Kozo Sato; Hiroshi Kitaguchi, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 13, 1985, Ser. No. 776,177
Claims priority, application Japan, Sep. 14, 1984, 59-193467
Int. Cl.⁴ G03C *1/06, 1/40, 5/54*
U.S. Cl. 430—617 **13 Claims**

1. A heat-developable silver-halide photographic light-sensitive material comprising a support having thereon, at least one layer containing a compound represented by formula (I) or (II)



(I)



(II)

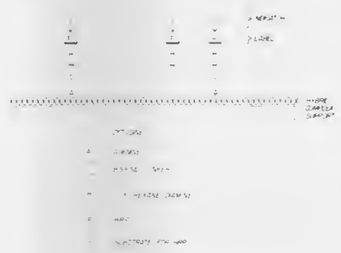
wherein R and R' each represents a group selected from a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, an amino group, an acylamino group, an alkoxy group, an alkylthio group, a sulfonylamino group, a heterocyclic ring group and a substituted group of them; X represents atoms forming a 5-membered or 6-membered ring; and A represents a group causing a decarboxylation reaction.

4,626,501

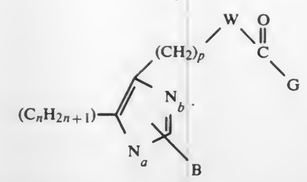
LABELED DNA

Greg M. Landes, Northboro, Mass., assignor to Integrated Genetics, Inc., Framingham, Mass.

Filed Sep. 2, 1983, Ser. No. 529,044
Int. Cl.⁴ C12Q *1/68;* **C07H** *17/00, 19/00;* **C07D** *473/00*
U.S. Cl. 435—6 **24 Claims**



1. A polymeric DNA molecule wherein at least some of the adenine and cytosine bases of said DNA molecule are derivatized to their respective etheno analogs, said analogs having the formula



wherein n is between 0 and 10, inclusive; each p is between 1 and 10, inclusive; n_a is N-1 of adenine or N-3 of cytosine; N_b is N-6 of adenine or N-4 of cytosine; B is the remainder of the adenine or cytosine base; W is SO_2—$(CH_2)_q$, q being between 1 and 10, inclusive; and G is X, X being NH—$(CH_2)_r$—Z wherein $1 \leqq r \leqq 10$, Z being a detectable entity.

4,626,502

METHOD FOR EXPOSING BACTERIAL ANTIGEN IN BACTERIAL CELLS ASSAY USING SAME

Laurel Krause-Hooyman, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 27, 1984, Ser. No. 574,779
Int. Cl.⁴ G01N *33/53;* **C12Q** *1/38, 1/14*
U.S. Cl. 435—7 **1 Claim**

1. A diagnostic immunoassay for Strep Group A bacteria the improvement comprising:

treating a test sample of antigen-containing bacterial cells with achromopeptidase thereby exposing Strep Group A antigen and, then detecting said antigen by using Strep Group A antibody in an immunoassay format.

4,626,503

ANTITUMOR AGENTS LL-D49194α_1, LL-D49194β_1, LL-D49194β_2, LL-D49194β_3, LL-D49194γ, LL-D49194δ, LL-D49194ϵ, LL-D49194ξ, LL-D49194η, LL-D49194ω_1, LL-D49194ω_2, AND LL-D49194ω_3

May D. Lee, Monsey; Amedeo A. Fantini, New City, both of N.Y.; David P. Labeda, Peoria, Ill.; William M. Maiese, Bridgewater; Raymond T. Testa, Cedar Grove, both of N.J., and Donald B. Borders, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 596,499, Apr. 4, 1984, abandoned. This application Feb. 14, 1985, Ser. No. 701,831
Int. Cl.⁴ C12P *19/60;* **C12N** *1/20;* **C07G** *11/00;* **A01N** *25/26*
U.S. Cl. 435—75 **19 Claims**

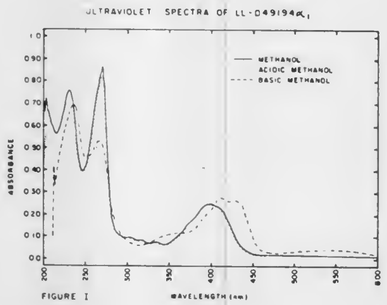


FIGURE 1

17. A biologically pure culture of the microorganism *Streptomyces vinaceus-drappus* having the identifying characteristics of NRRL 15735, said culture being capable of producing antibiotics LL-D49194α_1; LL-D49194β_1; LL-D49194β_2; LL-D49194β_3; LL-D49194γ; LL-D49194δ; LL-D49194ϵ; LL-D49194ζ; LL-D49194η; LL-D49194ω_1; LL-D49194ω_2 and LL-D49194ω_3 in recoverable quantities upon fermentation in

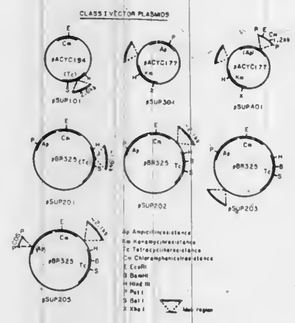
an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

4,626,504

DNA TRANSFER VECTOR FOR GRAM-NEGATIVE BACTERIA

Alfred Puhler, and Reinhard Simon, both of Bielefeld, Fed. Rep. of Germany, assignors to Lubrizol Genetics, Inc., Boulder, Colo.

Filed Jul. 1, 1983, Ser. No. 510,370
Int. Cl.⁴ C12N *15/00, 1/20, 1/00*
U.S. Cl. 435—172.3 **22 Claims**



1. A suicide plasmid that is mobilizable, but not self-transmissible, comprising:

(a) a first DNA segment containing a replicon functional in *E. coli;* and

(b) a second DNA segment containing a Mob-site and oriT of a plasmid transferrable by conjugation in the presence of a tra function encoded by a gene that acts in trans and capable of transferring the plasmid to an organism in which said replicon does not function;

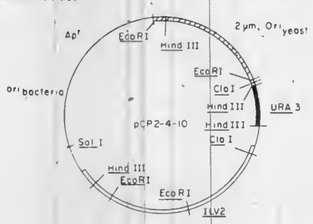
said suicide plasmid not containing a gene providing said tra function.

4,626,505

SELECTABLE MARKERS FOR YEAST TRANSFORMATION

Saverio C. Falco, Arden, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1984, Ser. No. 583,337
Int. Cl.⁴ C12N *15/00, 1/18, 1/00;* **C12R** *1/865*
U.S. Cl. 435—172.3 **30 Claims**



1. A plasmid vector adapted for transformation of a host strain of qenus Saccharomyces, said vector comprising a first DNA segment capable of transforminq sensitive cells to a phenotype characterized by resistance to selective concentrations of sulfometuron methyl.

4,626,506

PROCESS AND DEVICE FOR THE DETERMINATION OF CELLS SECRETING CELLULAR CONTENTS

William M. Arnold, Aachen, and Ulrich Zimmermann, Hürtgenwald-Gey, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Julich, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,523
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323415
Int. Cl.⁴ C12N *13/00*
U.S. Cl. 435—173 **5 Claims**

1. Process for the determination of cells secreting cellular contents such as proteins and/or glycoproteins, hormones, or growth factors, from a medium containing said secreting cells and other cells of the same species or genus, comprising the steps of:

exposing the cells to rotating electrical field forces of variable rotational speeds;

differentiating the first group of cells secreting cellular contents from said other cells by means of the rotational behavior of said secreting cells which differs from that of said other cells.

4,626,507

HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES SPECIFIC FOR A HUMAN CELL SURFACE GLYCOPROTEIN

Ian S. Trowbridge, San Diego, and M. Bishr Omary, Del Mar, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Sep. 25, 1980, Ser. No. 190,725
Int. Cl.⁴ C12N *15/00, 5/00*
U.S. Cl. 435—240 **11 Claims**

1. A cell line, produced by the fusion of an antibody-producing animal cell obtained from a rodent inoculated with human cellular material and a neoplastic cell, which produces a monoclonal antibody which reacts specifically with an acidic glycoprotein characterized by its presence on human proliferating and immature hematopoietic cells and its absence from normal human peripheral blood cells, said glycoprotein having a monomer molecular weight of about 110,000, naturally occurring as a desulfide bonded dimer, binding to concanavalin A and wheat germ agglutinin, being expressed in Hela cells and other nonhematopoietic tumor cells, and not appearing in detectable amounts in normal adult human brain, liver or kidney tissue, said glycoprotein reacting with the antibody produced by the cell line deposited at the ATCC and assigned Accession No. CRL-8034 or the antibody produced by the cell line deposited at the ATCC and assigned Accession No. CRL-8035.

4,626,508

METHOD FOR EXTENDING THE VIABILITY OF VIRULENT *BACILLUS POPILLIAE*

Keith H. Steinkraus, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,562
Int. Cl.⁴ C12N *1/04*
U.S. Cl. 435—242 **10 Claims**

1. In a method for extending the viability of an in vitro culture of *Bacillus popilliae* in a growth supporting medium the improvement comprising adding to the growth supporting medium a culture viability extending amount of C_{16}-C_{20} ethylenically unsaturated fatty acid.

4,626,509

CULTURE MEDIA TRANSFER ASSEMBLY

George F. Lyman, Rocky Point, Me., assignor to Data Packaging Corp., Cambridge, Mass.

Filed Jul. 11, 1983, Ser. No. 512,722
Int. Cl.⁴ C12M *1/00, 1/32;* **B01L** *3/02;* **B67D** *5/00*
U.S. Cl. 435—287 **7 Claims**

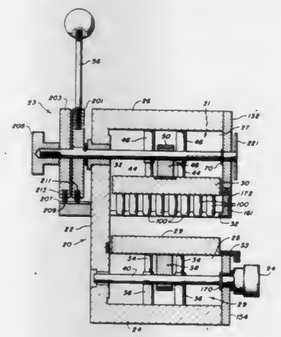
1. In a machine for transferring liquid to a multi-well culture

plate having a frame, a support on the frame for a multi-chamber transfer plate which receives the liquid from a source and deposits it in the culture plate, a piston plate having an array of pistons for entering the chambers to draw liquid into and discharge liquid from the chambers, said piston plate and transfer plate being movable with respect to the culture plate, and guide means on the frame for establishing the path of travel of the piston plate; wherein the improvement comprises said guide means for controlling the movement of the piston plate comprising:

a rotatable shaft on the frame,

a cam on the shaft operatively connected to the piston plate causing the piston plate to follow the cam surface as the cam rotates with the shaft,

a handle operatively secured to the shaft for rotating the shaft on the frame to in turn rotate the cam,



first detent means on the frame adjacent the shaft,

second detent means on the shaft for engaging the first detent means to establish a first reference position for the shaft which represents a starting position for the piston plate with respect to the transfer plate wherein the pistons enter the chambers a limited extent,

third detent means movable on the shaft for engaging the first detent means, for establishing a second reference position for the shaft which represents a volume measurement position for the piston plate with respect to the transfer plate wherein the pistons enter the chambers a greater extent than the first position,

and means for varying the postion of the third detent means with respect to the shaft for changing the volume measurement postion for the piston plate.

4,626,510

PLASMIDIC VECTORS FOR EXPRESSING IN *BACILLUS SUBTILIS* AND A METHOD OF PREPARING THEM

Guido Grandi, Segrate, Italy, assignor to Eni-Ente Nazionale Idrocarburi, Roma, Italy

Filed Aug. 31, 1983, Ser. No. 528,098

Claims priority, application Italy, Sep. 8, 1982, 23166 A/82

Int. Cl.⁴ C12N *1/00, 15/00;* C12P *21/00*

U.S. Cl. 435—317 **11 Claims**

1. A hybrid plasmid that is useful for synthesizing heterologous proteins in *B. subtilis*, said hybrid plasmid being formed by coupling the plasmid pUB110 with the small PstI fragment of the plasmid pSM4, pSM5 or pSM6 at their XbaI sites, said hybrid plasmid having a marker of resistance to kanamycin and a EcoRI site located from 0 to 4 bases from the last G of the ribosome recognition sequence GAGGG, said hybrid plasmid being capable of producing the heterologous proteins coded by cloned DNA wherein said production is induced by subinhibiting doses of erythromycin.

4,626,511

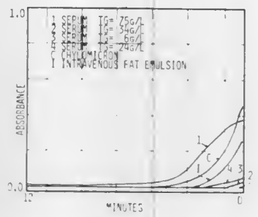
COMPOSITION FOR REDUCING TURBIDITY IN SAMPLES OF BIOLOGICAL FLUIDS

Joseph D. Artiss, Windsor, Canada, and Bennie Zak, Southfield, Mich., assignors to Wayne State University, Detroit, Mich.

Filed May 13, 1985, Ser. No. 733,267

Int. Cl.⁴ G01N *31/00*

U.S. Cl. 436—8 **21 Claims**



1. A composition for reducing turbidity in biological fluid samples consisting essentially of:

a buffering agent;

a lipase-activating nonionic surfactant;

cyclodextrin;

a lipase; and

water.

4,626,512

STANDARD SOLUTION FOR SIMULTANEOUSLY CALIBRATING A PLURALITY OF ION ELECTRODES

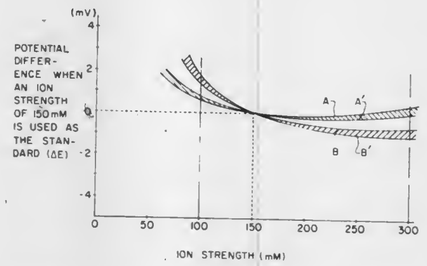
Narihiro Oku; Seiji Usui; Hiroaki Uematsu, and Takeshi Kohno, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed May 22, 1985, Ser. No. 737,036

Claims priority, application Japan, Jul. 14, 1984, 59-146239

Int. Cl.⁴ G01N *31/00*

U.S. Cl. 436—8 **4 Claims**



1. A standard solution for simultaneously calibrating a plurality of ion electrodes for determining a plurality of ions, which includes at least potassium ions and calcium ions in blood, said standard solution consisting essentially of an aqueous solution of sodium chloride, potassium chloride, calcium carbonate, Tris(hydroxy)aminomethane and hydrochloric acid, wherein the concentration of the standard solution for the potassium ion electrode and the calcium ion electrode is adjusted in accordance with the following equations:

$$\Delta E = A\,(\sqrt{\mu} - \sqrt{150})$$

potassium ions:

$$C = C_o \cdot 10^{-\Delta E/60}$$

calcium ions:

$$C = C_o \cdot 10^{-\Delta E/30}$$

potassium ions:

$$A = -0.130 \text{ to } -0.065$$

calcium ions:

$$A = -0.240 \text{ to } -0.172$$

wherein

ΔE: is the potential difference when an ionic strength of 150 mM is used as the standard;

μ: is the ionic strength;

C_o: is the calibrated concentration;

C: is the concentration of reagent added; and

A: is the correction factor.

4,626,513

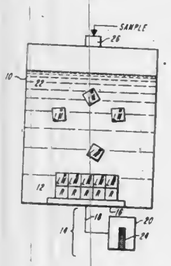
METHOD AND APPARATUS FOR LIGAND DETECTION

James A. Burton, Amesbury, and Bernard Hoop, Jr., Wakefield, both of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Nov. 10, 1983, Ser. No. 550,400

Int. Cl.⁴ G01N *33/543, 33/544, 33/542*

U.S. Cl. 436—518 **38 Claims**



1. A radioassay process for detecting the presence of a ligand in a sample, said process comprising the steps of:

A. providing a chamber and an associated sensor means for generating a signal representative of the number of beta particles emitted by radioactive atoms incident thereon, said chamber containing:

(i) a plurality of receptor molecules capable of coupling with said ligand;

(ii) a plurality of ligand molecules capable of coupling with said receptor molecules, at least one of said pluralities of receptor molecules and ligand molecules being a species immobilized on a solid support within said chamber, the other of said pluralities of receptor molecules and ligand molecules comprising free species labeled with radioactive atoms which emit beta particles;

(iii) a chamber medium; and

(iv) means for fixing the position of said sensor means with respect to said support;

B. introducing a solution containing said sample within said chamber, said solution and said chamber medium comprising a quenching solution adapted to quench substantially all beta particles emitted by said radioactive atoms before said particles travel a predetermined quenching distance D;

C. allowing ligand in said sample and ligand molecules to compete for sites of attachment on said receptor molecules and allowing said free species within said chamber to diffuse about said solution;

D. detecting said signal generated by said sensor means while said solution and said free species remain within said chamber, said signal being representative of the number of said radioactive atoms located within said quenching distance D of said sensor means; and

E. comparing said signal with a base value to detect the presence of ligand in said sample.

4,626,514

GOOD AESTHETIC ARTIFICIAL DENTAL MATERIALS BY CALCIUM PHOSPHATE GLASS-CERAMIC

Akira Watanabe, Okayama; Yoshimitsu Takeuchi, Bizen; Hiroyasu Tokuda, Bizen; Seiji Kihara, Bizen; Yasuhiro Makino, Bizen, and Keiji Kamegawa, Bizen, all of Japan, assignors to Kyushu Refractories Co., Ltd., Okayama, Japan

Continuation-in-part of Ser. No. 628,747, Jul. 9, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 844,893

Claims priority, application Japan, Jul. 8, 1983, 58-125164

Int. Cl.⁴ A61C *13/08;* C03C *10/02*

U.S. Cl. 501—10 **2 Claims**

1. Dental materials with calcium phosphate glass-ceramic consisting of:

calcium phosphate composite with the atomic ratio of calcium to phosphorus Ca/P being 0.35–1.7; and

a coloring component contained in said calcium phosphate composite, said coloring component being a mixture of nickel oxide and compounds selected from the group consisting of oxides of Fe, Mn, Ce, W, and Ti, the content of said coloring component is 0.3–5 wt. pt. against 100 wt. pt. of the calcium phosphate composite and the content of nickel oxide is 0.01–3.5 wt. pt. of said coloring component.

4,626,515

REINFORCED ALKALINE EARTH ALUMINOSILICATE GLASSES

Kenneth Chyung; Kishor P. Gadkaree, and Mark P. Taylor, all of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,634

Int. Cl.⁴ C03C *14/00*

U.S. Cl. 501—32 **3 Claims**

1. A SiC whisker and continuous ceramic fiber reinforced glass matrix hybrid composite body consisting essentially of about 5–60% by weight deagglomerated SiC whiskers having a thickness less than 100 microns with a length-to-diameter ratio of at least 10 and about 15–70% by volume ceramic fibers substantially uniformly distributed in an essentially alkali-free, alkaline earth aluminosilicate glass matrix, the total content of whiskers + fibers not exceeding about 70% by weight.

4,626,516

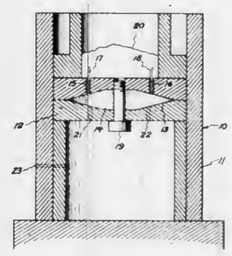
INFILTRATION OF MO-CONTAINING MATERIAL WITH SILICON

Charles R. Morelock, Saratoga Springs, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 31, 1985, Ser. No. 760,844

Int. Cl.⁴ C04B *35/58, 35/56, 35/52*

U.S. Cl. 501—92 **21 Claims**



1. An integral polycrystalline composite having a contact angle of less than 90 degrees and a phase composition consisting essentially of a silicide of molybdenum in an amount of at least about 5% by volume of the composite, elemental silicon

in an amount of at least about 1% by volume of the composite and silicon carbide in an amount of at least about 90% by volume of said composite, said silicide of molybdenum being formed in situ, said composite being bonded by at least said silicide of molybdenum, said composite having a substantially uniform porosity of less than about 5% by volume of the composite.

4,626,517

HIGH TOUGHNESS SINTERED BODIES

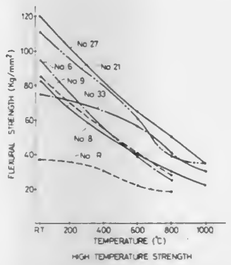
Masakazu Watanabe; Satoshi Iio, and Yasushi Matsuo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 408,086, Aug. 13, 1985, abandoned. This application Feb. 14, 1985, Ser. No. 701,646

Claims priority, application Japan, Aug. 13, 1981, 56-127004; Aug. 13, 1981, 56-127005; Aug. 25, 1981, 56-132934

Int. Cl.⁴ C04B *35/58, 35/48*

U.S. Cl. 501—96 **4 Claims**



1. A high toughness sintered body consisting essentially of from 40 to 99.5% by weight Component A and from 0.5 to 60% by weight Component B, wherein the mean grain size of the sintered body is 3 microns or less, wherein:

Component A is partially stabilized ZrO_2 which contains 1 to 6 mol% of Y_2O_3, 7 mol% of MgO or 6 mol% of CaO as a stabilizer in which tetragonal and cubic ZrO_2 constitute at least 90% by weight thereof and the ratio of the tetragonal ZrO_2 to the cubic ZrO_2 is at least ½; and

Component B is TiN, with impurities being 3% by weight or less of SiO_2, 0.5% by weight or less of Fe_2O_3, and 0.5% by weight or less of TiO_2, provided that the total amount is 3% by weight or less.

4,626,518

METHOD FOR MANUFACTURING HIGH TOUGHNESS SINTERED BODIES

Masakazu Watanabe; Satoshi Iio, and Yasushi Matsuo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 408,086, Aug. 13, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 610,459

Claims priority, application Japan, Aug. 13, 1981, 56-127004; Aug. 13, 1981, 56-127005; Aug. 25, 1981, 56-132934

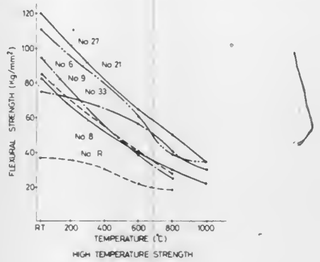
Int. Cl.⁴ C04B *35/48, 35/10*

U.S. Cl. 501—104 **2 Claims**

1. A method for manufacture of a high toughness sintered body, comprising:

(a) preparing a powder mixture containing 40–99.5 wt% of Component A consisting essentially of ZrO_2 powder having an average particle diameter of no longer than 1 μm and 1–6 mol% of Y_2O_3, 7 mol% of MgO or 6 mol% of CaO as a stabilizer and 0.5–60 wt% of Component B consisting essentially of α-Al_2O_3 powder having an average particle diameter of not longer than 1 μm by uniformally mixing water soluble salts of ZrO_2, stabilizer and Al_2O_3 in the form of an aqueous solution and coprecipitating the powder mixture; and

(b) sintering the powder resulting from step (a) at temperature in the range of from 1400° C. to 1600° C. at atmospheric pressure to obtain a sintered body wherein at least 90% by weight of ZrO_2 particles present therein are accounted for by tetragonal and cubic crystals, the ratios of said tetragonal crystals to said cubic crystals is at least 1:3,



and the average crystal particle diameter of the entire sintered body is 3μ or less; wherein the mixed powder contains not more than 3 wt% of SiO_2, not more than 0.5 wt% of Fe_2O_3, not more than 0.5 wt% of TiO_2 and not more than 3 wt% total of the SiO_2, the Fe_2O_3 and the TiO_2 based on the total weight of the mixed powder.

4,626,519

SUPPORTED POLYOLEFIN CATALYST COMPONENTS AND METHODS OF MAKING AND USING SAME

Nemesio D. Miro, North Brunswick, N.J.; Floyd E. Farha, Bartlesville, Okla., and Charles E. Capshew, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 6, 1985, Ser. No. 773,164

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—105 **26 Claims**

1. A process for preparing a catalyst suitable for use in the polymerization of olefins comprising

(1) co-comminuting an aluminum halide; at least one electron donor; a Group IVB-VIB transition metal compound; and a support base selected from the group consisting of the Group IIA and IIIA salts and the salts of the multivalent metals of the first transition series with the exception of copper to produce a coground solid;

(2) extracting said coground solid with an organic liquid; and

(3) separating the solid from the liquid under such conditions that at least 5 weight percent of the aluminum in the coground solid is removed, characterized in that the extraction and the separation are conducted at a temperature below the boiling point of the lowest boiling portion of the organic liquid used in the extraction but in the range of about 70° C. to about 100° C.

4,626,520

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 638,190, Aug. 9, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,359

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 502—115 **16 Claims**

1. A transition metal containing catalyst component comprising the solid reaction product obtained by sequentially treating an inert solid support material in an inert solvent with (A) an organometallic compound represented by the formula R^1MgR^2 wherein R^1 and R^2, which can be the same or different, are selected from alkyl groups, aryl groups, cycloalkyl groups, aralkyl groups, alkadienyl groups, or alkenyl groups having from 1–10 carbon atoms, (B) BCl_3 or ethyl aluminum dichloride, (C) a halogenide or alkoxide titanium compound, and (D) Cl_2, Br_2, an interhalogen or mixtures thereof wherein the treating is performed in an order selected from the orders (a) D, B, A, C, (b) D, A, B, C, (c) D, A, C, B, (d) A, D, B, C, and (e) A, D, C, B.

4,626,521

SELECTIVE CATALYTIC OXIDATION OF CARBON MONOXIDE IN HYDROCARBON STREAM TO CARBON DIOXIDE

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,321, Oct. 17, 1983, abandoned, which is a division of Ser. No. 200,242, Oct. 24, 1980, abandoned, which is a continuation of Ser. No. 929,067, Jul. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 799,812, May 23, 1977, abandoned. This application Jul. 27, 1984, Ser. No. 635,337

Int. Cl.⁴ B01J *23/58*

U.S. Cl. 502—328 **9 Claims**

1. A method of preparing, from an alkaline compound and a cobalt compound, an alumina supported cobalt oxide catalyst useful for the selective oxidation of CO in a gaseous reaction medium containing a hydrocarbon which consists essentially of:

(a) impregnating an alumina support with an aqueous solution of a first water soluble alkaline compound whose anion is capable of forming a water insoluble cobalt compound when said first water soluble alkaline compound is reacted with a water soluble cobalt compound, said water insoluble cobalt compound capable of providing a water insoluble cobalt oxide upon calcination,

(b) drying the alkaline compound impregnated alumina support,

(c) impregnating the dried alkaline compound impregnated alumina support with an aqueous solution of a water soluble cobalt compound whose anion is capable of forming a second water soluble alkaline compound upon reaction of said first water soluble alkaline compound with said water soluble cobalt compound, whereby an insoluble cobalt compound forms on the support,

(d) calcining the cobalt compound impregnated, alkaline compound containing, alumina support to form an insoluble cobalt oxide on the cobalt compound impregnated, alkaline compound containing, alumina support,

(e) washing the calcined support with water to remove soluble compounds and activate the cobalt oxide catalyst.

4,626,522

BENZOXAZOCINES INTERMEDIATES

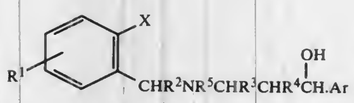
Alan C. White, Windsor, and Robin G. Shepherd, Burnham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 214,078, Dec. 8, 1980, Pat. No. 4,318,909. This application Sep. 18, 1981, Ser. No. 303,436

Int. Cl.⁴ C07C *93/08*

U.S. Cl. 564—355 **5 Claims**

1. A compound of formula (II)



(II)

wherein R^1 represents hydrogen, or one or more halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, $—NH_2$, mono- or di-(lower)alkyl-amino or cyano substituents, R^2, R^3 and R^4, which may be the same or different, each represent hydrogen or lower alkyl or R^3 and R^4 together represent $—(CH_2)_3—$ or $—(CH_2)_4—$, R^5 represents hydrogen, lower alkyl, phenyl(lower)alkyl, cyclobutyl(lower)alkyl or cyclopropyl(lower)alkyl, Ar is a phenyl radical optionally substituted by one or more halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or $—NH_2$ groups and X is fluorine, chlorine or bromine.

4,626,523

GRF ANALOGS II

Wylie W. Vale, Jr., and Jean E. F. Rivier, both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 532,170, Sep. 13, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,736

Int. Cl.⁴ C07K *7/10;* **A61K** *37/24*

U.S. Cl. 514—12 **20 Claims**

1. A synthetic peptide having the formula: R_1-Ala -R_3-Ala-Ile-Phe-Thr-R_8-Ser-R_{10}-Arg-R_{12}-R_{13}-Leu -R_{15}-Gln-Leu-R_{18}-Ala-Arg-Lys-Leu-Leu-R_{24}-R_{25}-Ile-R_{27}-R_{28}-Arg-Gln-Gln-Gly-Glu-R_{34}-Asn-Gln-Glu-R_{38}-R_{39}-R_{40}-Arg-R_{42}-R_{43}-R_{44}-Y wherein R_1 is Tyr, D-Tyr, Met, Phe, D-Phe, pCl-Phe, Leu, His or D-His, which residue has either a $C^{\alpha}Me$ or $N^{\alpha}Me$ substitution; R_3 is Asp or D-Asp; R_8 is Ser, Asn D-Ser or D-Asn; R_{10} is Tyr or D-Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{15} is Gly or D-Ala; R_{18} is Tyr or Ser; R_{24} is His or Gln; R_{25} is Glu or Asp; R_{27} is Met, Ala, Nle, Ile, Leu, Nva or Val; R_{28} is Asn or Ser; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe or Ala; R_{43} is Asn or Arg; R_{44} is Leu or Val; and Y is the carboxyl moiety of the amino acid residue at the C-terminus, which is the radical —COOR,—CRO,—CONHNHR, —CON(R)(R′) or —CH_2OR, with R and R′ being lower alkyl, fluoro lower alkyl or hydrogen; or a biologically active fragment thereof extending from the N-terminus to a residue in any of positions 27 through 43 as its C-terminus; or a nontoxic acid addition salt thereof.

4,626,524

ANTIVIRAL PEPTIDES

Alfred Server, Boston, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Aug. 30, 1984, Ser. No. 645,554

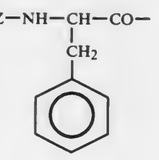
Int. Cl.⁴ A61K *37/02;* **C07K** *7/10, 7/08, 7/06, 5/10*

U.S. Cl. 514—13 **13 Claims**

1. A peptide comprising the following sequence:

X—NH—Ala—Gly—Y

wherein X is D— or



where Z is hydrogen, C_1-C_6 acyl, aroyl or an amino-protecting group; and

Y is selected from the group consisting of

Ile,
Ile—Ala,
Ile—Ala—Ile,
Ile—Ala—Ile—Gly,
Ile—Ala—Ile—Gly—Ile,
Ile—Ala—Ile—Gly—Ile—Ala,
Ile—Ala—Ile—Gly—Ile—Ala—Ala,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—-
Gly—Val—Ala—Thr,

Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala—Thr—Ala,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala—Thr—Ala—Ala,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala—Thr—Ala—Ala—Glu,
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala—Thr—Ala—Ala—Glu—Val,
and
Ile—Ala—Ile—Gly—Ile—Ala—Ala—Leu—Gly—Val—Ala—Thr—Ala—Ala—Glu—Val—Thr.

4,626,525

ANTIBIOTICS, PREPARATION AND USE OF AND INTERMEDIATES THEREFOR

Günter Benz, Madison, Wis.; Karl G. Metzger, Wuppertal, Fed. Rep. of Germany; Jörg Pfitzner, Wuppertal, Fed. Rep. of Germany; Delf Schmidt, Wuppertal, Fed. Rep. of Germany, and Hans-Joachim Zeiler, Velbert, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

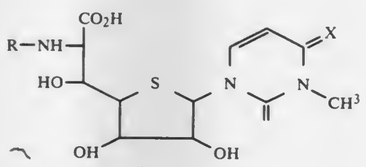
Filed Nov. 7, 1984, Ser. No. 669,176

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341571

Int. Cl.[4] A61K *37/02;* **C07K** *5/06, 5/08, 5/10*

U.S. Cl. 514—18 **12 Claims**

1. A compound of the formula



in which

X is O or N—CO—NH_2,

R is the radical of an aminoacid other than serine selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, proline, hydroxyproline, threonine, cysteine, cystine, methionine, tryptophan, asparaginic acid, asparagine, glutamic acid, glutamine, hydroxyglutamic acid, arginine, lysine or histidine, or a radical from the group comprising ThrSer, HisSer, AlaSer, HyoSer, HyoHyoSer, HyoHyoHyoAla, HyoHyoHyoThr, Hyo, HyoHyo or HyoHyoHyo, and Hyo is N^5-acetyl-N^5-hydroxy-L-ornithine.

4,626,526

(S)-N^6-2-HYDROXYPROPYLADENOSINES

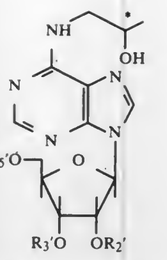
James A. Bristol, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 26, 1984, Ser. No. 665,230

Int. Cl.[4] A61K *31/70;* **C07H** *19/06*

U.S. Cl. 514—46 **5 Claims**

1. A diastereomer having the pure S configuration at the symmetric carbon of the 2-hydroxypropylamino side chain of the formula



wherein R_2', R_3', and R_5' are each independently H, lower alkanoyl, benzoyl or benzoyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, or when R_2' and R_3' are taken together are lower alkylidene, or a pharmaceutically acceptable acid addition salt thereof.

4. A pharmaceutical composition for treating hypertension comprising an antihypertensive effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

5. A method for treating hypertension in a mammal suffering therefrom, which comprises administering to such mammals antihypertensive amount of a compound as claimed in claim 1 in unit dosage form.

4,626,527

PROCESS FOR UTILIZING CHOLINE TO SUSTAIN MUSCULAR PERFORMANCE

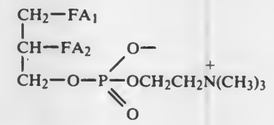
Richard J. Wurtman, Boston; Lydia Conlay, Nahant, and Krzysztof Blusztajn, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 28, 1985, Ser. No. 780,053

Int. Cl.[4] A61K *31/685*

U.S. Cl. 514—78 **4 Claims**

1. The process of reducing fatigue caused by major exercise in a patient about to participate in major exercise or in a patient having completed major exercise which comprises administering to said patient an amount of a compound effective to raise the bloodstream choline level of the patient to between about 10 and 50 nanomoles/ml and to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocholine, having the formula:



wherein FA_1 and FA_2 can be the same or different and are fatty acid residues having from 6–26 carbon atoms, glycerophosphocholine and mixtures thereof.

4,626,528

O,O-DIALKYL O[P-(N-ALKYLCARBAMOYL)PHENYL]PHOSPHOROTHIONATES AND INSECTICIDAL COMPOSITIONS INCLUDING THE SAME

William E. McHenry, Oktibbeha County, Miss., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

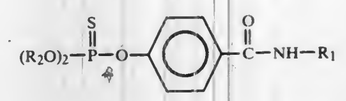
Filed Oct. 20, 1983, Ser. No. 543,715

Int. Cl.[4] A01N *57/14;* **C07F** *9/18*

U.S. Cl. 514—119 **27 Claims**

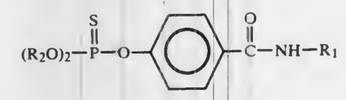
1. A method of controlling fire ants and termites comprising placing an effective amount of a bait comprising an effective

amount of an attractant and from 0.05 to 5% of a compound having the formula:



wherein R_1 is a primary or secondary alkyl having from 3 to 6 carbon atoms and R_2 is selected from methyl or ethyl.

12. A phosphorothionate having the formula:



wherein R_1 is selected from primary and secondary alkyls having from to 3 to 6 carbon atoms and R_2 is selected from methyl or ethyl.

4,626,529

OILY COMPOSITIONS COMPRISING A DERMATOLOGICAL ACTIVE PRINCIPLE, INTENDED FOR THE TREATMENT OF THE SCALP OR SKIN

Jean F. Grollier, Paris, France, assignor to L'oreal, Paris, France

Continuation of Ser. No. 436,171, Oct. 22, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,219

Claims priority, application Luxembourg, Oct. 23, 1981, 83711

Int. Cl.[4] A61K *31/60*

U.S. Cl. 514—159 **15 Claims**

1. A homogeneous oily composition which is substantially free of water and suitable for the treatment of the scalp and/or skin, which consists essentially of 0.01 to 15% by weight of a dermatological active principle which is substantially insoluble in water or unstable in the presence of water, 5 to 85% by weight of an oily compound and 15 to 95% by weight of an oil-soluble surface-active component comprising an anionic surface-active agent, the acid group of which has been neutralised by an amine.

4,626,530

TREATMENT OF EYE INFLAMMATION WITH BIPHENAMINE

Thomas L. Schulte, 218 Family Farm Dr., Woodside, Calif. 94062

Continuation-in-part of Ser. No. 517,417, Jan. 17, 1984, Pat. No. 4,497,824, and a continuation-in-part of Ser. No. 456,896, Jan. 10, 1983, Pat. No. 4,469,702, each is a continuation-in-part of Ser. No. 276,566, Jun. 23, 1981, Pat. No. 4,369,190. This application Feb. 1, 1985, Ser. No. 697,101

Int. Cl.[4] A61K *31/615*

U.S. Cl. 514—166 **10 Claims**

1. A method for preventing or ameliorating an inflammatory response in an eye exposed to a chemical irritant or a contact lense, which comprises applying topically to the affected eye of the patient an anti-inflammatorily effective amount of biphenamine, as an opthomologically acceptable aqueous mixture comprising a pharmaceutically acceptable carrier.

4,626,531

PROSTAGLANDINS AND ANTIGESTAGENS FOR INDUCTION OF LABOR AND FOR ABORTION

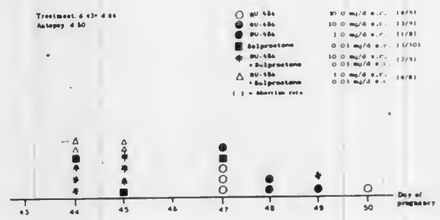
Walter Elger, and Sybille Beier, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,358

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337450

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **31 Claims**



1. A pharmaceutical composition comprising a labor or abortion inducing prostaglandin and a labor or abortion inducing antigestagen, the total amount of the combination of the prostaglandin and the antigestagen being effective to induce labor or an abortion.

9. A pharmaceutical composition of claim 1, wherein the prostaglandin is prostaglandin E_2, prostaglandin $F_{2\alpha}$16-phenoxy-ω-17,18,19,20-tetranor-PGE_2-methylsulfonylamide, 16,16-dimethyl-trans-Δ^2-PGE_1-methyl ester, 9-deoxo-16,16-dimethyl-9-methylene-PGE_2, a prostaglandin F derivative, 15-methyl-$PGF_{2\alpha}$-methyl ester, (5Z,13E)-(9R,11R,15R)-9-chloro-11,15-dihydroxy-16,16-dimethyl-5,13-prostadienoic acid, (5Z,13E)-(9R,11R,15R)-11,15dihydroxy-9-fluoro-16-phenoxy-17,18,19,20-tetranor-5,13-prostadienoic acid, (5Z,13E)-(9R,11R,15R)-11,15-dihydroxy-16,16-dimethyl-9-fluoro-5,13-prostadienoic acid (DE-OS 31 26 924), (5Z,13E)-(9R,11R,15R)-9-bromo-11,15-dihydroxy-16-phenoxy-17,18,19,20-tetranor-5,13-prostadienoic acid, or (5Z,13E)-(9R,11R,15R)-9-bromo-11,15-dihydroxy-16,16-dimethyl-5,13-prostadienoic acid.

14. A method of inducing an abortion in a pregnant patient comprising administering to the patient an effective amount of a composition of claim 1.

4,626,532

PROCESS FOR STABILIZATION OF BACAMPICILLIN HYDROCHLORIDE

Ulf A. Kjellberg, Rönninge; Per G. H. Nyqvist, Tullinge; Jan U. Stenhede, Södertälje, and Lars B. Stenmark, Karlskoga, all of Sweden, assignors to Astra Lakemedel Aktieboag, Sodertalje, Sweden

Filed Oct. 29, 1985, Ser. No. 792,507

Claims priority, application Sweden, Nov. 9, 1984, 8405611

Int. Cl.[4] A61K *31/43;* **C07D** *499/32*

U.S. Cl. 514—195 **12 Claims**

1. Bacampicillin hydrochloride protected from degradation by storage in the presence of water vapour by a protecting substance selected from the classes consisting of alkanes, alkenes, esters of aliphatic alcohols with aliphatic carboxylic acids, aliphatic alcohols, and aliphatic carboxylic acids, characterized in that said protecting substance has a straight chain which may be interrupted or terminated by oxygen, and has a molecular weight between 144 and 350 Dalton, and is present in bacampicillin hydrochloride in 3 to 9% by weight, calculated on dry bacampicillin hydrochloride.

8. A process for the manufacture of bacampicillin hydrochloride protected from degradation by storage in the presence of water vapour characterized in that wetmassing of bacampicillin hydrochloride for the purpose of granulation is carried

out in the presence of 3 to 9% by weight, calculated on dry bacampicillin hydrochloride, of at least one straight-chain protecting substance with a molecular weight between 144 and 350 Dalton which may be interrupted or terminated by oxygen and is selected from the classes consisting of alkanes, alkenes, esters of aliphatic alcohols with aliphatic carboxylic acids, aliphatic alcohols, and aliphatic carboxylic acids.

9. A process according to claim 8, characterized in that the bacampicillin hydrochloride is brought into contact with a solution of the protecting substance dissolved in a solvent therefor and the solvent is removed by filtration or centrifugation.

12. Pharmaceutical compositions containing bacampicillin hydrochloride, characterized in that said bacampicillin hydrochloride has been granulated and protected by a process according to claim 8 or 9.

4,626,533

7-(2-THIENYLACETAMIDO)-3-ACYLAMINOMETHYL-CEPHALOSPORINS

Sándor Elek; Ildikó Mihók née Borbély, and Miklós Mihók, all of Debrecen, Hungary, assignors to Biogal Gyogyszergyar, Debrecen, Hungary

PCT No. PCT/HU84/00026, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/04096, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 19, 1984, Ser. No. 689,056

Claims priority, application Hungary, Apr. 19, 1983, 1351/83

Int. Cl.[4] A61K *31/545;* **C07D** *501/46*

U.S. Cl. 514—202 **2 Claims**

1. 7-(2-thienyl)acetylamino-3-(4-chlorophenyl-acetylamino)-methyl-ceph-3-ene-4-carboxylic acid or an alkali metal carboxylate salt thereof.

4,626,534

PHARMACEUTICAL FORMULATION

Alan L. Fites, and Michael J. Pikal, both of Greenwood, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 633,739, Jul. 23, 1984, abandoned. This application Jul. 29, 1985, Ser. No. 759,725

Int. Cl.[4] A61K *31/545*

U.S. Cl. 514—203 **6 Claims**

1. A pharmaceutical formulation comprising ceftazidime pentahydrate, between about 10% and about 15% by weight of ceftazidime activity of dry powdered sodium carbonate, and between about 10% and about 50% by weight of ceftazidime activity of amorphous lactose.

4,626,535

CEPHALOSPORINS

Rolf Angerbauer; Michael Boberg; Günther Kinast; Karl G. Metzger; Wilfried Schröck, all of Wuppertal, and Hans-Joachim Zeiler, Neviges, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

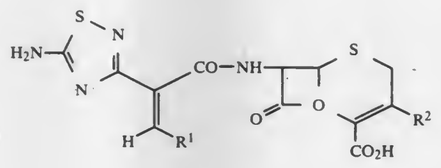
Filed Dec. 30, 1983, Ser. No. 566,975

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300593

Int. Cl.[4] C07D *501/38;* **A61K** *31/545*

U.S. Cl. 514—203 **12 Claims**

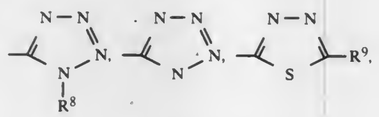
1. A compound of the formula

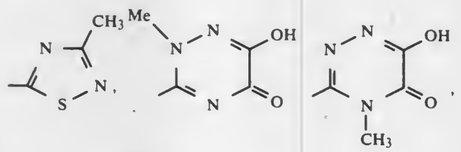


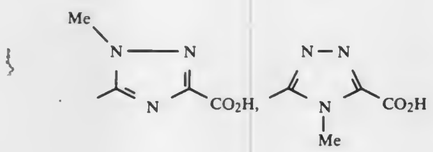
in which

R^1 denotes hydrogen, C_1-C_{12}-alkyl, phenyl or a halogen substituted phenyl ring,

R^2 represents hydrogen, C_1-C_4-alkyl, C_1-C_4-alkenyl, halogen, C_1-C_4-alkoxy, C_1-C_4-alkylthio, hydroxymethyl, formyloxymethyl, C_1-C_4-alkylcarbonyloxymethyl, aminocarbonyloxymethyl, pyridiniummethyl, 4-carbamoylpyridiniummethyl, 4-sulphonylethylpyridiniummethyl, 4-carboxylmethylpyridiniummethyl or heterocyclylthiomethyl, heterocyclyl repesenting a radical of the formula







wherein

R^8 denotes hydrogen, methyl, 2-dimethylaminoethyl, carboxymethyl, sulphomethyl, carboxyethyl or sulphoethyl and

R^9 denotes hydrogen or methyl,

or a pharmaceutically tolerated salt or ester thereof.

4,626,536

COMPOSITIONS FOR COMBATTING TOXAEMIA

Rolf W. Pfirrmann, Lucerne, Switzerland, assignor to Ed Geistlich Sohne Ag fur Chemische/Industrie, Lucerne, Switzerland

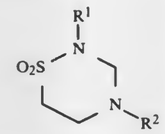
Filed Oct. 19, 1984, Ser. No. 662,887

Claims priority, application United Kingdom, Oct. 20, 1983, 8328111

Int. Cl.[4] A61K *31/54*

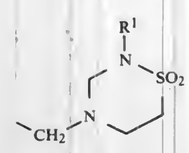
U.S. Cl. 514—222 **4 Claims**

1. A method of treatment of the human or warm-blooded animal body to combat toxic proteins or peptides in the bloodstream, said proteins or peptides being selected from the group consisting of fungal toxins, venoms and bacterial exotoxins, said method comprising administering to said infected body an effective amount for inactivating the toxic proteins or peptides of a compound of formula (I)



(I)

wherein R^1 represents a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms and R^2 represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or a group of formula II



(II)

in which R^1 is as defined above.

4,626,537

GUANIDINES, PHARMACEUTICAL COMPOSITIONS AND USE

Krishna G. Dave, and Thomas George, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

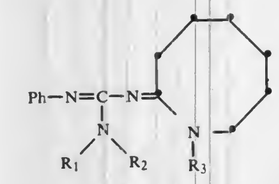
Continuation of Ser. No. 660,769, Oct. 19, 1984, abandoned, which is a continuation of Ser. No. 509,556, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 319,534, Nov. 9, 1981, abandoned, which is a continuation of Ser. No. 151,035, May 19, 1980, abandoned. This application Feb. 28, 1986, Ser. No. 834,506

Claims priority, application Switzerland, May 29, 1979, 4993/79

Int. Cl.[4] A61K *31/535;* **C07D** *413/12*

U.S. Cl. 514—237 **5 Claims**

1. A guanidine derivative of the formula



(I)

wherein Ph is phenyl, the group $—NR_1R_2$ is morpholino, and R_3 is hydrogen, or methyl, or a tautomeric compound or therapeutically useful salt thereof.

3. A therapeutic composition for the treatment of hyperglycaemia comprising an effective amount of an hypoglycaemic active compound of formula I as claimed in claim 1 togehter with a pharmaceutically acceptable excipient.

4,626,538

[7-(3-DISUBSTITUTED AMINO)PHENYL]PYRAZOLO[1,5-A]PYRIMIDINES

John P. Dusza, Nanuet, N.Y.; Andrew S. Tomcufcik, Old Tappan, N.J., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

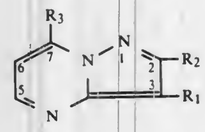
Continuation-in-part of Ser. No. 612,812, May 24, 1984, Pat. No. 4,521,422, which is a continuation-in-part of Ser. No. 506,966, Jun. 23, 1983, abandoned. This application May 13, 1985, Ser. No. 732,986

The portion of the term of this patent subsequent to Jun. 3, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/505;* **C07D** *471/04*

U.S. Cl. 514—258 **15 Claims**

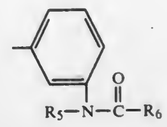
1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, halogen, cyano and



R_2 is selected from the group consisting of hydrogen and alkyl (C_1-C_3); R_3 is



R_4 is selected from the group consisting of hydrogen, alkyl(C_1-C_6) and alkoxy(C_1-C_6); R_5 is selected from the group consisting of hydrogen, alkyl(C_1-C_6), alkenyl(C_2-C_6), $—CH_2C{\equiv}CH$, cycloalkyl(C_3-C_6)methyl, $—CH_2OCH_3$ and $—CH_2CH_2OCH_3$, and R_6 is selected from the group consisting of alkyl(C_1-C_6), cycloalkyl(C_3-C_6), —O-alkyl(C_1-C_6), —NH-alkyl(C_1-C_3), —N-dialkyl(C_1-C_3), $—(CH_2)_n—$O-alkyl(C_1-C_3), $—(CH_2)_n—$NH-alkyl(C_1-C_3) and $—(CH_2)_n—$N-dialkyl(C_1-C_3), where n is an integer 1 to 3 inclusive.

14. A method of ameliorating anxiety in a mammal which comprises administering to said mammal an amount of a compound of claim 1 sufficient to reduce anxiety.

4,626,539

TRANDERMAL DELIVERY OF OPIOIDS

Bruce Aungst, and Robert C. DiLuccio, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 639,385, Aug. 10, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 741,762

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **27 Claims**

1. A method of administering a therapeutic dose of an opioid to the systemic circulation of a mammal which comprises topically administering to the mammal an opioid-containing pharmaceutical composition, wherein the composition consists essentially of a therapeutically effective amount of an opioid or a pharmaceutically acceptable salt thereof; an effective penetration enhancing amount of at least one of a saturated fatty acid of 8–15 carbon atoms or of an unsaturated fatty acid of 8–18 carbon atoms; and propylene glycol as a suitable pharmaceutical carrier.

4,626,540

SUBSTITUTED 1-AMINO-4-NITRO-ACRIDINONES AND METHODS OF TREATING BACTERIAL INFECTIONS AND LEUKEMIA WITH THEM

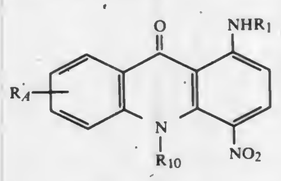
David B. Capps, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 549,709, Nov. 8, 1983, abandoned. This application Oct. 10, 1984, Ser. No. 658,100

Int. Cl.[4] A61K *31/47;* **C07D** *219/08*

U.S. Cl. 514—297 **16 Claims**

1. A compound of the formula



where R_1 is alkylene-NR_xR_y where alkylene is a 2 to 4 carbon straight or branched hydrocarbon chain, which may be substi-

tuted by hydroxyl, and R_x is hydrogen or R_x and R_y are each independently 1 to 4 carbon straight or branched chain alkyl, or 2 to 4 carbon straight or branched chain hydroxyalkyl, or alkylene-NR_xR_y N-oxide where alkylene is a 2 to 4 carbon straight or branched hydrocarbon chain, and R_x and R_y are each independently 1 to 4 carbon straight or branched alkyl; R_{10} is H or 1 to 4 carbon straight or branched chain alkyl; R_A is H or one or two groups selected from hydroxy, chloro, 1 to 4 carbon alkoxy, benzyloxy, 2 to 8 carbon straight or branched alkanoyloxy, 1-4 carbon straight or branched, alkoxycarbonyloxy, amino and 1 to 4 carbon monoalkyl- or dialkylamino, or a pharmaceutically acceptable acid addition salt or a mixture thereof.

14. A pharmaceutical composition comprising a therapeutically effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

15. A method for treating bacterial infections in a mammal comprising administering an effective amount of a pharmaceutical composition as claimed in claim **14** to such mammal in need thereof.

16. A method for treating leukemia in a mammal comprising administering an effective amount of a pharmaceutical composition as claimed in claim **14** to such mammal in need thereof.

4,626,541

WATER SOLUBLE SALT COMPOSITION OF M-AMSA

Murray A. Kaplan, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,478
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—297 **13 Claims**

1. The lactate salt of m-AMSA in admixture with pyroglutamic acid, prepared from at least 2 moles of acid, the molar ratio of pyroglutamic acid to lactic acid used to prepare the salt being from about 0.1 to 1 mole lactic acid to 2 to 1 mole of pyroglutamic acid.

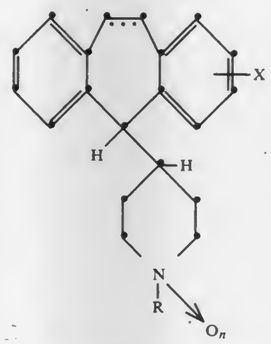
4,626,542

4-(5H-DIBENZO[A,D]CYCLOHEPTEN-5-YL)PIPERIDINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS

Stella W. King, Lansdale, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 5, 1984, Ser. No. 596,955
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—325 **1 Claim**

1. A method for treating cardiovascular disorders caused by high cellular concentration of Ca^{++} comprising administering to a patient in need of such treatment a therapeutically effective amount for treatment of cardiovascular disorders caused by high cellular concentrations of Ca^{++} of a compound having the formula:



wherein the . . . bond denotes a saturated single bond or an unsaturated double bond, X is hydrogen, halogen, trifluoromethyl or lower alkoxy and R is hydrogen, lower alkyl containing from 1 to 6 carbon atoms or cycloalkyl containing from 3 to 6 carbon atoms and n is 0 or 1, or a pharmaceutically acceptable acid addition salt thereof.

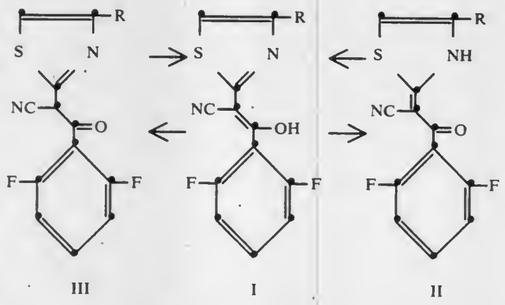
4,626,543

INSECTICIDAL 2,6-DIFLUOROBENZOYL DERIVATIVES OF 4-SUBSTITUTED-1,3-THIAZOLE-2-ACETONITRILES

Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 1, 1985, Ser. No. 697,546
Int. Cl.[4] C07D *277/30;* **A01N** *43/78*
U.S. Cl. 514—365 **9 Claims**

1. A compound of the formula I, II, or III



wherein R is an alkyl group containing 2 to 6 carbon atoms optionally substituted by one or more halogen atoms, a cycloalkyl group containing 3 to 6 ring carbon atoms optionally substituted by one or more alkyl groups containing 1 or 2 carbon atoms, an aryl or aralkyl group containing 6 to 10 carbon atoms optionally ring-substituted by one or more halogen atoms or alkyl groups containing 1 or 2 carbon atoms or an alkoxycarbonylalkyl group in which the alkyl portions contain from 1 to 6 carbon atoms.

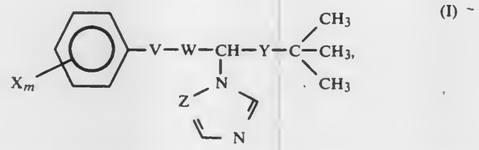
4,626,544

AZOLE COMPOUNDS AND FUNGICIDES CONTAINING THESE COMPOUNDS

Guenter Schulz, Ludwigshafen; Hubert Sauter, Mannheim; Gernot Reissenweber, Boehl-Iggelheim, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

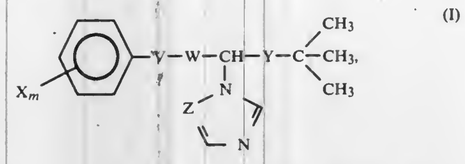
Filed Apr. 25, 1985, Ser. No. 727,136
Int. Cl.[4] A01N *43/50, 43/653;* **C07D** *233/60, 249/08*
U.S. Cl. 514—383 **4 Claims**

1. An azole compound of the formula



where V is oxygen or sulfur, X is hydrogen, fluorine, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, phenyl or phenoxy, m is an integer from 1 to 5, the individual atoms or groups being identical or different when m is greater than 1, W is a group of the formula $(CH_2)_v$—CR^1=CR^2—$(CH_2)_t$, where R^1 and R^2 are identical or different and are each hydrogen, methyl, ethyl, chlorine or fluorine, or is a group of the formula $(CH_2)_v$—C≡C—$(CH_2)_t$, and v and t are identical or different and are each 1, 2 or 3, Z is CH or N, and Y is C=O or CR^3OR^4, where R^3 is hydrogen, methyl, vinyl, allyl, ethynyl or propynyl, and R^4 is hydrogen, C_1-C_4-alkyl, C_2-C_4-alkenyl, C_2-C_4-alkynyl or C_2-C_4-alkanoyl, and its plant-tolerated addition salts with acids and metal complexes.

3. A process for combatting fungi, wherein the fungi or the materials, areas, plants or seed threatened by fungus attack are treated with a fungicidally effective amount of an azole compound of the formula



where V is oxygen or sulfur, X is hydrogen, fluorine, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, phenyl or phenoxy, m is an integer from 1 to 5, the individual atoms or groups being identical or different when m is greater than 1, W is a group of the formula $(CH_2)_v$—CR^1=CR^2—$(CH_2)_t$, where R^1 and R^2 are identical or different and are each hydrogen, methyl, ethyl, chlorine or fluorine, or is a group of the formula $(CH_2)_v$—C≡C—$(CH_2)_t$, and v and t are identical or different and are each 1, 2 or 3, Z is CH or N, and Y is C=O or CR^3OR^4, where R^3 is hydrogen, methyl, vinyl, allyl, ethynyl or propynyl, and R^4 is hydrogen, C_1-C_4-alkyl, C_2-C_4-alkenyl, C_2-C_4-alkynyl or C_2-C_4-alkanoyl, or a plant-tolerated addition salt or metal complex thereof.

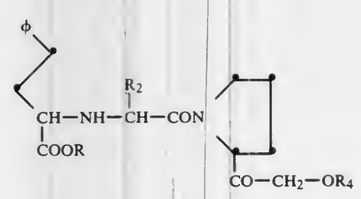
4,626,545

AMINO ACID DERIVATIVES AS ENZYME INHIBITORS

David Taub, Metuchen, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

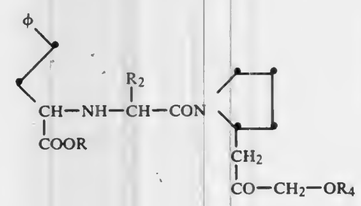
Filed Aug. 27, 1984, Ser. No. 644,188
Int. Cl.[4] A61K *31/40;* **C07D** *207/08, 207/12*
U.S. Cl. 514—423 **4 Claims**

1. A compound having the formula:



wherein:
R is hydrogen, ethyl, benzyl;
R_2 is methyl, $(CH_2)_4NH_2$;
R_4 is hydrogen, $COCH_3$; and, the pharmaceutically acceptable salts thereof.

2. A compound having the formula:



wherein:
R is hydrogen, ethyl, benzyl;
R_2 is methyl, $(CH_2)_4NH_2$;
R_4 is hydrogen, $COCH_3$; and
the pharmaceutically acceptable salts thereof.

3. A pharmaceutical composition for treating hypertension comprising a pharmaceutically acceptable carrier and an antihypertensively effective amount of a compound of claim **1** or claim **2**.

4. A method of treating hypertension in humans which comprises administering to a person in need of such treatment an antihypertensively effective amount of a compound of claim **1** or claim **2**.

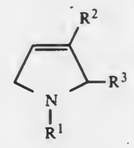
4,626,546

3-ARYL-3-PYRROLINE DERIVATIVES

Gerhard Satzinger, Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Manfred Herrmann; Edgar Fritschi, both of St. Peter, and Wolfgang Steinbrecher, Gundelfingen, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

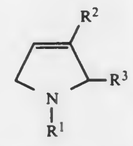
Filed Aug. 3, 1984, Ser. No. 637,351
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328643
Int. Cl.[4] A61K *31/40;* **C07D** *207/20*
U.S. Cl. 514—429 **8 Claims**

1. A compound of the formula



wherein R^1 is a hydrogen atom or a straight chained or branched alkyl group with up to four carbon atoms or a benzyl radical, R^2 is a phenyl radical, mono- or disubstituted by hydroxy or hydroxymethyl, and R^3 is a hydrogen atom or a straight chained or branched alkyl group, or a pharmacologically acceptable acid addition salt thereof.

4. A method for treating heart and vascular diseased comprising administering to a host suffering therefrom a heart and vascular disease treatment effective amount of a compound of the formula



wherein R^1 is a hydrogen atom or a straight chained or branched alkyl group with up to four carbon atoms or a benzyl radical, R^2 is a phenyl radical unsubstituted or mono- or disubstituted by alkyl or akloxy with up to four carbon atoms, hydroxymethyl, hydroxy, or trifluoromethyl, and R^3 is a hydrogen atom or a straight chained or branched alkyl group, or a pharmacologically acciptable acid addition salt thereof said compound being in admixture with a pharmaceutically acceptable carrier or adjuvent.

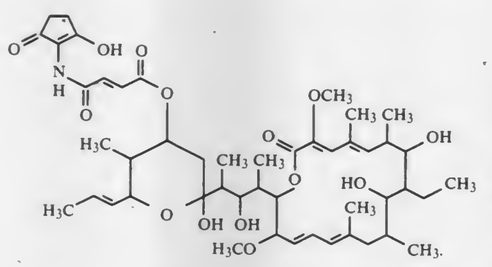
4,626,547

ANTIBIOTIC AM-2604-A, AN ANTI-TRICHOMONAS AGENT, ANTI-CACCIDIUM AGENT, ANTI-VIRAL AGENT AND ANTI-FUNGAL AGENT CONTAINING THE SAME AND METHODS OF USE OF THE SAME

Satoshi Omura, and Hideki Shimizu, both of Tokyo, Japan, assignors to The Kitasato Institute, Tokyo, Japan

Division of Ser. No. 459,912, Jan. 21, 1983, Pat. No. 4,503,152. This application Nov. 15, 1984, Ser. No. 671,398
Claims priority, application Japan, Jan. 21, 1982, 57-6756
Int. Cl.[4] C07D *407/06;* **A61K** *31/365*
U.S. Cl. 514—450 **18 Claims**

1. An antibiotic AM-2604-A substance having the following properties:
(a) Molecular formula: $C_{48}H_{71}NO_{14}$;
(b) Optical rotation: $[\alpha]_D^{27.5} = +240°$ (C=0.02, methanol);
(c) Melting point: 204° to 205° C.;
(d) Ultraviolet absorption spectrum: as shown in FIG. 1;
(e) Infrared absorption spectrum as shown in FIG. 2;
(f) Proton nuclear magnetic resonance spectrum as shown in FIG. 3;
(g) ^{13}C Nuclear magnetic resonance spectrum as shown in FIG. 4; and
(h) Soluble in chloroform, acetone, and ethyl acetate, sparingly soluble in lower alcohols, and insoluble in n-hexane and water



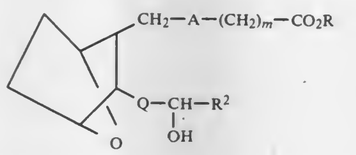
4,626,548

7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN COMPOUNDS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

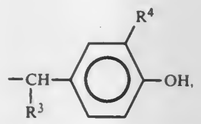
Steven E. Hall, Ewing Township, Morris County, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 19, 1985, Ser. No. 767,312
Int. Cl.[4] A61K *31/34;* **C07D** *307/00*
U.S. Cl. 514—469 **15 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof, wherein A is —CH=CH— or $(CH_2)_2$; m is 1 to 5; Q is —CH=CH— or $(CH_2)_2$; R is H, alkali metal or alkyl; and and R^2 is



R^3 is H or lower alkyl and R^4 is H or I, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;
aryl alone or as part of another group is phenyl or naphthyl which is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxy groups and/or 1 or 2 lower alkoxy groups;
cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups;
$(CH_2)_m$ or $(CH_2)_2$ may contain 1 or 2 lower alkyl substituents.

11. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

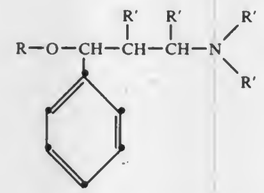
4,626,549

TREATMENT OF OBESITY WITH ARYLOXYPHENYLPROPYLAMINES

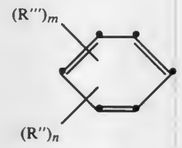
Bryan B. Molloy, North Salem, and Klaus K. Schmiegel, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 544,654, Oct. 24, 1983, Pat. No. 4,584,404, which is a continuation of Ser. No. 872,147, Jan. 25, 1978, abandoned, which is a division of Ser. No. 432,379, Jan. 10, 1974, Pat. No. 4,314,081. This application Mar. 31, 1986, Ser. No. 846,448
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—651 **9 Claims**

1. A method of treating animals suffering from an appetite disorder comprising administering to said animal an effective amount of a compound of the formula

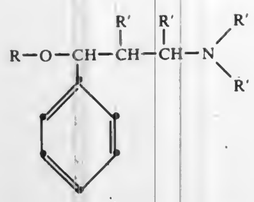


wherein each R′ is independently hydrogen or methyl; wherein R is naphthyl or

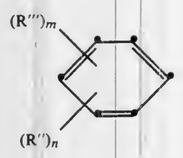


wherein R″ and R‴ are halo, trifluoromethyl, C_1-C_4 alkyl, C_1-C_3 alkyloxy or C_3-C_4 alkenyl; and
wherein n and m are 0, 1 or 2; and acid addition salts thereof formed with pharmaceutically-acceptable acids.

4. A method of blocking the uptake of monoamines by brain neurons in animals comprising administering to said animal a monoamine blocking amount of a compound of the formula



wherein each R′ is independently hydrogen or methyl; wherein R is naphthyl or



wherein R″ and R‴ are halo, trifluoromethyl, C_1-C_4 alkyl, C_1-C_3 alkyloxy or C_3-C_4 alkenyl; and
wherein n and m are 0, 1 or 2; and acid addition salts thereof formed with pharmaceutically-acceptable acids.

4,626,550

ZEOLITE FOR PERSONAL CARE PRODUCTS

Elliot P. Hertzenberg, Wilmington, Del., assignor to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 691,093, Jan. 14, 1985, abandoned. This application Oct. 7, 1985, Ser. No. 785,373
Int. Cl.[4] A61K *7/16*
U.S. Cl. 514—770 **6 Claims**

1. A self-warming personal care product in the form of a lotion, ointment, paste or cream comprising 1 to 6 parts by weight (pbw) of activated Zeolite A and 4 to 9 pbw of an anhydrous liquid vehicle, said zeolite being defined by the notation:

$$Zeolite(K_xNa_{12-x})A$$

wherein x is about 3.0 to 7.2.

4,626,551

HOMOGENEOUS LIQUID PHASE PROCESS FOR MAKING ALKANE POLYOLS

Leonard Kaplan, and Wellington E. Walker, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 223,648, Jan. 9, 1981, abandoned, which is a continuation of Ser. No. 138,973, Apr. 10, 1980, abandoned, which is a continuation of Ser. No. 618,021, Sep. 30, 1975, abandoned. This application Apr. 1, 1982, Ser. No. 364,221
Int. Cl.[4] C07C *27/06*
U.S. Cl. 518—701 **1 Claim**

1. In the homogeneous liquid phase process of producing alkane polyols by the reaction of oxides of carbon and hydrogen in the presence of a rhodium catalyst in which rhodium is complexed with carbon monoxide to provide a rhodium carbonyl complex at a temperature between about 100° C. to about 375° C. and at a pressure between about 1000 psia to about 50,000 psia, the improvement which comprises effecting said reaction in a solvent mixture of tetraglyme and sulfolane under conditions whereby such solvent mixture is essentially inert and the rate of formation of such alkane polyol is greater than would be obtained by effecting said reaction under equal conditions using tetraglyme or sulfolane as the solvent.

4,626,552

PROCESS FOR THE START-UP OF A FISCHER-TROPSCH REACTOR

Kym B. Arcuri, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 6, 1986, Ser. No. 816,235
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—712 **14 Claims**

1. In a process for the start-up of a reactor wherein a feed comprised of hydrogen and carbon monoxide is contacted with a bed of hydrocarbon synthesis catalyst in which perturbations of the temperature profile across the bed can develop, and which, at line-out conditions defined by feed flow rate, pressure, temperature, and the molar ratio of hydrogen:carbon monoxide of the feed is sufficient to synthesize hydrocarbons from the hydrogen and carbon monoxide, the improvement which comprises: elevating, while maintaining the molar feed ratio of hydroge:carbon monoxide at below about 90 percent of its line-out value, the feed flow rate, pressure, and temperature to values approaching line-out feed flow rate, line-out pressure, and line-out temperature, and then gradually increasing the molar feed ratio of hydrogen:carbon monoxide to essentially that employed at line-out.

4,626,553

CATION EXCHANGE MEMBRANE OF A FLUOROCARBON POLYMER AND A PROCESS FOR PREPARING THE SAME

Toshioki Hane, Kawasaki, and Jukichi Ohmura, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 322,635, Nov. 18, 1981, abandoned. This application Apr. 29, 1985, Ser. No. 726,964
Claims priority, application Japan, Nov. 29, 1980, 55-168554
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.
Int. Cl.[4] C08J *5/22*
U.S. Cl. 521—27 **6 Claims**

1. A process for preparing a double-layer cation exchange membrane of fluorocarbon polymer having an improved interlayer adhesion, comprising the steps of:
subjecting to chemical treatment at a temperature of from 0° to 150° C. for a period of from 1 to 200 hr with a reducing agent, said agent being at least one member selected from the group consisting of HI, HBr, KI, NaI, $Na_2SO_2O_3$ and hydrazine, a starting fluorocarbon polymer containing pendant groups of the formula:

$$—O(CF_2)_mSO_2X$$

wherein X is a fluorine atom, a cholorine atom, a hydrogen atom, M or OM in which M represents a hydrogen atom, a metal atom or an ammonium group and m is an integer of 3 to 5 to convert a portion of said $—O(CF_2)_mSO_2X$ groups to carboxylic acid groups of the formula:

$$—O(CF_2)_{m-1}COOM'$$

wherein N′ represents a hydroen atom, a metal atom or an ammonium group and m is as defined above, thereby to obtain a first fluorocarbon polymer having an equivalent weight of 800 to 2,00;
transforming the first fluorocarbon polymer into a film to obtain a first layer; and
laminating the first layer on a seoond layer of a second fluorocarbon polymer containing pendant groups of the formula:

$$—O(CF_2)_mSO_2X$$

wherein X and m are as defined above, and having an equivalent weight of 800 to 1,5000, said first fluorocarbon polymer having an equivalent weight of at least 150 greater than that of said second fluorocarbon polymer, to

obtain a double-layer cation exchange membrane comprising the first layer of the first fluorocarbon polymer containing said carboxylic acid groups, which are uniformly distributed in the layer, with said $-O(CF_2)_mSO_2X$ groups and, laminated on the first layer, the second layer of the second fluorocarbon polymer containing said $-O(CF_2)_mSO_2X$ groups, said first layer having an equivalent weight of at least 150 greater than that of said second layer.

4,626,554

PROCESS FOR PRODUCING MODIFIED STYRENIC POLYMER BEADS FOR HIGH STRENGTH FOAMED ARTICLES

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 29, 1985, Ser. No. 802,906
Int. Cl.[4] C08J *9/22*
U.S. Cl. 521—57 **3 Claims**

1. A process for forming styrenic polymer beads modified with styrenic monomer/divinylbenzene copolymer for use in producing foamed cups with improved strength and thermal properties comprising:

(a) forming an aqueous suspension of initial polystyrene beads having a weight average molecular weight of 230,000 to 350,000 with a polydispersity (Mw/Mn) of 2 to 3.1, with the aid of a suitable suspending agent system;

(b) forming a comonomer solution of a styrene monomer and divinylbenzene;

(c) forming an emulsion comprising a suitable emulsifier and said comonomer solution with free-radical-producing catalysts dissolved therein;

(d) adding the emulsion to the styrene polymer bead suspension at 25°–75° C. to allow the comonomers and catalyst to be absorbed therein/thereon during the addition and shortly after the addition is complete, heating the resulting bead suspension to a polymerization temperature of about 80°–95° C., and maintaining said temperature for 0.10 to 6 hours to copolymerize said comonomers; and

(e) heating said suspension to a temperature of 115° to about 135° C. to substantially complete the polymerization of said styrene monomer and divinylbenzene to form beads having copolymer diffused throughout but distributed primarily at or near the surface of the bead;

(f) cooling the suspension to 105° C. or less;

(g) adding a non-ionic surfactant and 3–12% by weight based on polymer of a blowing agent selected from the group consisting of aliphatic hydrocarbons containing 4 to 6 carbon atoms, halogenated hydrocarbons which boil at a temperature below the softening point of the polymer, and mixtures of these;

(h) heating the suspension at a temperature of from 80°–150° C. to impregnate the polymer beads with blowing agent; and

(i) cooling the suspension to room temperature, acidifying the suspension, and separating the impregnated beads from the aqueous system.

4,626,555

POLYPROPYLENE FOAMED PARTICLES

Hiroshi Endo, and Toshio Yagi, both of Mie, Japan, assignors to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Oct. 22, 1985, Ser. No. 790,194
Claims priority, application Japan, Nov. 9, 1984, 59-236168
Int. Cl.[4] C08J *9/22*
U.S. Cl. 521—59 **4 Claims**

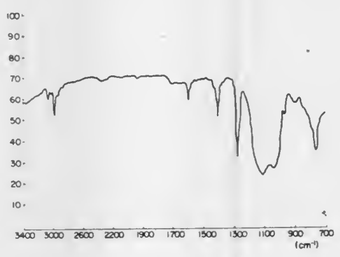
1. Substantially non-crosslinked polypropylene foamed particles having a bulk density of from 8 to 100 g/l and a particle diameter of from 1 to 5 mm, said polypropylene resin comprising from 5 to 30% by weight of a room-temperature xylene soluble matter having an ethylene content of from 20 to 80% by weight and from 70 to 95% by weight of a room-temperature xylene insoluble matter having a main melting peak temperature of from 130° to 158° C., wherein said polypropylene resin is an ethylene-propylene block copolymer, a mixture of an ethylene-propylene random copolymer and an ethylene-propylene rubber, or a mixture of an ethylene-propylene-butene-1 random copolymer and an ethylene-propylene rubber.

4,626,556

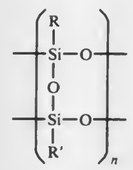
SOLVENT-SOLUBLE ORGANOPOLYSILSESQUIOXANE, PROCESS FOR PRODUCING THE SAME, AND SEMI-CONDUCTOR USING THE SAME

Ikuo Nozue; Osahiko Tomomitsu; Yoshiji Yumoto, all of Yokohama, and Yoshio Matsumura, Yokkaichi, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 422,196, Sep. 23, 1982, abandoned. This application Sep. 25, 1985, Ser. No. 779,617
Claims priority, application Japan, Oct. 3, 1981, 56-157885; Oct. 22, 1981, 56-169178; Nov. 30, 1981, 56-190667
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—99 **15 Claims**



1. A composition comprising a solvent-soluble organopolysilsesquioxane represented by the formula (I):



(I)

wherein R and R', which may be the same or different, represent hydrogen, lower alkyl, alkenyl, or aryl groups, wherein at least lower alkyl and alkenyl groups are present in the organopolysilsesquioxane, and n is degree of polymerization, and a compound which generates crosslinking-reaction-active species upon irradiation with light or an ionizing radiation.

4,626,557

PLASTIC OVENWARE CONTAINING TALC

Joseph J. Duska, Manasquan; Arnold B. Finestone, Woodcliff Lake, and John B. Maher, Rockaway, all of N.J., assignors to Dart Industries, Inc., Northbrook, Ill.

Continuation of Ser. No. 401,765, Jul. 26, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 726,882
Int. Cl.[4] A47J *27/08, 36/04;* C08K *3/34;* C08L *67/00*
U.S. Cl. 523—100 **28 Claims**

1. A molded article of permanent ovenware, comprising at least about 35% by weight of a wholly aromatic polyester and about 1 to 60% by weight of a talc containing a minimum amount of materials decomposable at elevated temperatures characterized by a weight loss on ignition of not more than about 6% by weight at 950° C. and 2% by weight at 800° C. and having an iron content of not more than about 1.0% by weight analyzed as iron oxide, such that the ovenware is not blistered or bubbled or cracked during molding or oven use.

4,626,558

DENTAL IMPRESSION COMPOSITION CONTAINING FINELY SIZED POLYACRYLAMIDE

Michael A. Pellico, Los Angeles, Calif., assignor to Laclede Professional Products, Inc., Gardena, Calif.

Filed Oct. 10, 1985, Ser. No. 785,985
Int. Cl.[4] A61K *6/10*
U.S. Cl. 523—109 **11 Claims**

1. In a powdered alginate, dental impression composition that is adapted to be mixed with water and is orally settable, said powdered alginate composition containing:

from about 6 to about 10 wt. % of an alkali metal alginate selected from the group consisting of sodium alginate, potassium alginate and mixtures thereof,

from about 6 to about 12 wt. % of a calcium sulfate reactant,

from about 0.6 to about 1.6 wt. % of a reaction rate retarder selected from the group consisting of phosphate, pyrophosphate and tripolyphosphate salts of sodium, potassium and mixtures thereof, and

filler,

the improvement which comprises polyacrylamide in said powdered alginate composition in an amount from about 0.01 to about 0.25 wt. %, said polyacrylamide having a particle size less than about 300 mesh, to thereby effect a smooth admixture of the powdered alginate composition with water.

4,626,559

NON-PERMANENT ORNAMENTAL PAINT MIXTURE

Wanda H. Sadler, Smith County; John Milligan, Bexar County, and Jerry W. Parks, Dallas County, all of Tex., assignors to Pep Rally Paint, Inc., Dallas, Tex.

Filed Apr. 22, 1985, Ser. No. 725,766
Int. Cl.[4] C09D *5/02, 5/14, 5/20, 5/28*
U.S. Cl. 523—122 **20 Claims**

1. A non-permanent ornamental paint mixture being water soluble after drying, comprising: a first solution consisting essentially of approximately 50 parts by weight water, of up to 1.0 parts by weight defoamer, of approximately 0.25 dispersing agent, of approximately 56 parts by weight filler and of approximately 0.02 parts by weight antimicrobial agent; a second solution consisting essentially of approximately 110 parts by weight water, of approximately 20 parts by weight an acid containing, cross-linked acrylic emulsion copolymer, of approximately up to 1.0 parts by weight defoamer, of approximately 3.0 parts by weight release agent and of approximately 0.625 parts by weight alkali; and an aqueous pigment dispersion of from about 6 to about 16 parts by weight.

4,626,560

NOVEL BINDING AGENT COMPOSITIONS, FOUNDRY SAND COMPOSITIONS AND UREIDO FUNCTIONAL ORGANOSILICON COMPOUNDS

James G. Marsden, and Enrico J. Pepe, both of Amawalk, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 309,657, Oct. 8, 1981, abandoned. This application Sep. 21, 1983, Ser. No. 534,165
Int. Cl.[4] C08K *9/06, 3/34;* B22C *11/22*
U.S. Cl. 523—145 **9 Claims**

1. In a binding agent composition for inorganic oxides comprising a curable binder and an organosilicon coupling agent, the improvement wherein said organosilicon coupling agent is a siloxane having, per molecule, two silicon-bonded hydroxyl groups or two silicon-bonded hydrolyzable or condensible groups selected from the group consisting of alkoxy, acyloxy, amino and haloalkoxy and at least one silicon-bonded group of the formula $[R'HNC(O)]_n—R—$ wherein R is an aliphatic radical containing at least one nitrogen atom, hydrogen and at least five carbon atoms wherein at least one nitrogen atom therein is bonded to each (R'HNCO— to form

(R'HNCON<)

at least one free valence of

(R'HNCON<)

is bonded to an alkylene carbon atom of R, any other free valence of

(R'HNCON<)

is bonded to a member selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl and aralkyl, any nitrogen atom in R is separated from silicon by at least three sequentially joined carbon atoms; R' is hydrogen, alkyl having 1 to 8 carbon atoms or methylol; and n is at least one; and any remaining free valence of silicon is bonded to oxygen which in turn is bonded to another silicon atom to form therewith the siloxane.

4,626,561

METHOD OF MAKING TWO PHASE MATERIAL OF HIGH MOLECULAR WEIGHT POLYMER AND FINE PARTICLES DISPERSED THEREIN

Hirohisa Miura; Hiroshi Satou; Toshio Natsume, and Hidenori Katagiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 17, 1984, Ser. No. 611,547
Claims priority, application Japan, Jul. 13, 1983, 58-127442
Int. Cl.[4] C08K *3/08*
U.S. Cl. 523—318 **7 Claims**

1. A method of making a composite material comprising a high molecular weight polymer material as matrix material and fine particles containing a metal dispersed therein, wherein vapor of said metal is rapidly cooled by being expanded through a nozzle, and a jet flow from said nozzle is directed into a mass of said high molecular weight polymer material in molten state.

4,626,562

EPOXY RESIN COMPOSITION AND CONSTRUCTION MATERIAL CONTAINING THE SAME FOR USE IN NEW CONSTRUCTION OR FOR REPAIRS

Masatoshi Motomura; Niichi Toyama, both of Ichihara; Noboru Okoshi, Chiba; Yoshitami Araki, Kisai; Kenichiro Nomura, Satte, and Takehisa Kozai, Kodaira, all of Japan, assignors to Dainippon Ink & Chemicals, Inc. and Taisei Road Construction Co., Ltd., both of Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,456
Claims priority, application Japan, Jan. 28, 1985, 60-12492
Int. Cl.[4] C08L *63/00;* C08G *59/66*
U.S. Cl. 523—466 **16 Claims**

1. A construction material for use in new constructions or for repairs comprising

[A] an epoxy resin composition consisting essentially of (a) an epoxy compound having on an average at least two epoxy groups in each of its molecules, (b) an ester of a mercaptoalkylcarboxylic acid having on an average more than two thiol groups in each of its molecules and in which the number of carbon atoms of the alkylene group between the ester groups and the thiol groups is on an average in excess of one, and (c) a tertiary amine-type curing accelerator;

[B] at least one aggregate selected from the group consisting of (d) natural and artificial coarse aggregates having a particle diameter of 2.5 to 50 millimeters, and (e) natural and artificial fine aggregates having a particle diameter of less than 2.5 millimeters, and, as required,

[C] an additive that reduces the viscosity as well as functions as an extender.

4,626,563
FIRE RETARDANT CARBONATE POLYMER COMPOSITION
Samuel A. Ogoe, Angleton, and Kevin F. Dick, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 550,677, Nov. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 651,139, Sep. 17, 1984, abandoned. This application Apr. 24, 1985, Ser. No. 726,853
Int. Cl.[4] C08K *5/43*
U.S. Cl. 524—168 9 Claims

1. A flame retardant polymer composition comprising an aromatic carbonate polymer having dispersed therein
(A) from 0.001 to 2% by weight of a metal salt of an aromatic sulfimide,
(B) from 0.01 to 10% by weight of a monomeric or polymeric bromo and/or chloro halogenated aromatic compound,
(C) from 0.001 to 2% by weight of a metal salt of an inorganic acid having a pka from 1 to 5, and
(D) from 0.01 to 10% by weight of fibril forming polytetrafluoroethylene.

4,626,564
AROMATIC POLYSULFONE RESIN COMPOSITION
Teruo Saito, Shiga, and Kazuo Hieda, Hyogo, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
Filed Dec. 9, 1985, Ser. No. 806,865
Claims priority, application Japan, Dec. 11, 1984, 59-261199; Mar. 4, 1985, 60-42465
Int. Cl.[4] C08K *7/04*
U.S. Cl. 524—413 5 Claims

1. An aromatic polysulfone resin composition comprising from 30% to 95% by weight of an aromatic polysulfone and from 5% to 70% by weight of a potassium titanate fiber having not more than 0.25% by weight of a free potassium content.

4,626,565
PREPARATION PROCESS FOR POLYPROPYLENE-BASE RESIN COMPOSITIONS
Yoichi Kawai; Masaru Abe; Katsumi Sekiguchi; Akio Yoshihara, and Shigeru Hayashi, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
PCT No. PCT/JP 8400403, § 371 Date Mar. 29, 1985, § 102(e) date Mar. 29, 1985
PCT Filed Aug. 17, 1984, Ser. No. 722,013
Filed Mar. 29, 1985, Ser. No. 722,013
Claims priority, application Japan, Aug. 18, 1983, 58-149609
Int. Cl.[4] C08L *53/00, 23/16;* C08K *3/00, 5/14*
U.S. Cl. 524—423 7 Claims

1. A process for preparing polypropylene-base resin compositions exhibiting a melt flow index value of at least 8.5 g/10 min., a modulus of flexural elasticity of at least 8500 kg/cm^2 and an Izod value, notched at −40° C., of at least 19.1 Kg.cm/cm, which process comprises heating at a temperature of 170° C.-280° C. a mixture containing:
(a) a crystalline ethylene-propylene block copolymer having an ethylene content of 7–30 wt. % and having a portion of 65 wt. % or more insoluble in boiling n-heptane;
(b) an ethylene-propylene copolymer rubber having a propylene content of 40–65 wt. % and a Mooney viscosity of 15–80 at 100° C.;
(c) and inorganic filler having a particle size of 6 μm or smaller; and
(d) an organic peroxide, said components (a), (b), (c) and (d) being contained in amounts of 65–95 wt. %, 35–5 wt. %, 2–25 wt. % and 0.001–0.5 wt. %, respectively, all based on the total amount of components (a) and (b).

4,626,566
COMPOSITION
Kenneth F. Miller, and Omar M. Boutni, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.
Filed Dec. 26, 1985, Ser. No. 813,381
Int. Cl.[4] C08K *5/01;* C08L *69/00*
U.S. Cl. 524—490 10 Claims

1. A composition comprising an aromatic carbonate polymer in admixture with a mold release effective amount of a hydrogenated alpha-olefin oligomer fluid.
9. The composition in accordance with claim 1 wherein the hydrogenated alpha-olefin oligomer fluid has at least about 30 carbon atoms.

4,626,567
WATER-RESISTANT CLEAR AND COLORED ACRYLIC LATEX SEALANT
Wei T. Chang, Dayton, Ohio, assignor to Beecham Home Improvement Products Inc., Dayton, Ohio
Filed Oct. 25, 1985, Ser. No. 791,330
Int. Cl.[4] C08K *3/34, 5/24, 9/06*
U.S. Cl. 524—493 21 Claims

1. An acrylic copolymer latex sealant composition, which comprises an acrylic copolymer having a glass transition temperature not exceeding about 0° C., an organoaminosilane, at least about 0.5% silica, based on the total weight of the composition, an anionic, non-ionic or amphoteric surfactant, and water.

4,626,568
VIBRATION AND NOISE INSULATING RUBBER COMPOSITIONS
Kyosaku Sato; Richard W. Liu, and Seung-Tong Cheung, all of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada
Filed Aug. 8, 1985, Ser. No. 763,694
Int. Cl.[4] C08K *3/20, 3/10, 5/01;* C08L *33/02*
U.S. Cl. 524—526 5 Claims

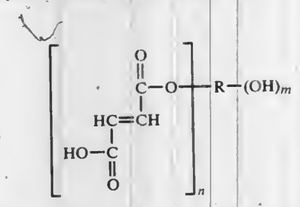
1. A vibration damping and noise insulating rubber composition having a relatively high and uniform damping coefficient between the temperatures of 25° C. and 80° C., said composition comprising:
about 65 to about 97 parts by weight of at least one rubber selected from the first group consisting of natural rubber, isoprene rubber, butadiene rubber and styrene-butadiene rubbery polymers,
about 3 to about 35 parts by weight of at least one carboxylated rubber selected from the second group consisting of carboxylated styrene-butadiene rubber, carboxylated butadiene rubber, carboxylated isoprene rubber and carboxylated natural rubber, for a total of 100 parts by weight of said rubbers,
about 20 to about 60 parts by weight of carbon black based on 100 parts by weight of the total of the above rubbers,
about 3 to about 25 parts by weight per 100 parts by weight of the total of the above rubbers of extender oil,
about 1 to about 10 parts by weight per 100 parts by weight of the total of the above rubbers of at least one metal oxide selected from the group consisting of zinc oxide, zinc peroxide, magnesium oxide and calcium oxide, and
vulcanization agents.

4,626,569
PROCESS FOR PRODUCING A MOLDED PRODUCT AND THE MOLDED PRODUCT PRODUCED THEREBY
Phillip A. Waitkus, and Louis L. Korb, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.
Continuation-in-part of Ser. No. 668,396, Nov. 5, 1984, abandoned, which is a continuation of Ser. No. 502,181, Jun. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 356,893, Mar. 10, 1982, abandoned, which is a continuation of Ser. No. 182,755, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,531, Jun. 21, 1979, abandoned. This application Oct. 1, 1985, Ser. No. 782,315
Int. Cl.[4] B29C *43/00;* C08K *3/04;* C08L *61/08, 61/10*
U.S. Cl. 524—541 32 Claims

1. The process for producing from a moldable composition a moldable product substantially free of pits and holes and much less subject to cracking and failure during formation and use comprising the step of molding the said composition at a temperature of 100°–180° C. and at a pressure between 500 pounds per square inch and 20 tons per square inch, said moldable composition being prepared by the addition of a phenolic-aldehyde Novolac resin in which at least 50 molar percent of said aldehyde is furfuraldehyde to an aqueous solution or suspension of a phenolic-aldehyde resol resin prior to the removal of 90 percent of the removable water from said resol resin solution or suspension, the proportions of said resins comprising 20–80 parts by weight of said Novolac resin and 20–80 parts by weight of said resol resin with the combined weight of said two resins comprising 100 parts by weight, thereafter effecting co-reaction of said resins together with an amine selected from the group consisting of hexamethylenetetramine and amines in which there is at least one hydrogen connected to a nitrogen atom, the amount of said amine being equivalent to 1–15 percent by weight of hexamethylenetetramine based on the total weight of phenolic component, and removal of water from the resulting reaction mass while maintaining the resin in a moldable condition, the Novolac resin having been prepared with the removal of at least 25 percent by weight of the water removable during the Novolac preparation.

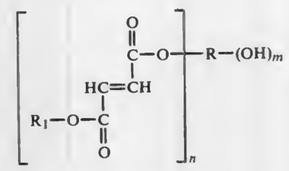
4,626,570
LOW SHRINKING THERMOSETTING POLYESTER RESIN COMPOSITIONS AND A PROCESS FOR THE PREPARATION THEREOF
Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Jun. 29, 1984, Ser. No. 625,913
Int. Cl.[4] C08L *67/06*
U.S. Cl. 525—12 17 Claims

1. A process for preparing a resin composition comprising the steps of:
(a) contacting a molar excess of an alpha, beta unsaturated dicarboxylic acid or derivative thereof with an organic polyol for a time and at a temperature sufficient to form a composition comprising a carboxylic acid terminated polyester having the formula:



(I)

wherein n is a number having an average value of about 2 to less than about 4, m is a number equal to the free valence of R less the average value of n, the ratio of n to m is greater than about 2.0, and R is the residuum of a polyester which contained from 2 to 4 inclusive hydroxyl groups;
(b) contacting a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof with the carboxylic acid terminated polyester of (a) in the presence of a non-oxidizing acid catalyst having a non-nucleophilic anion selected from the group consisting of fluoroboric acid, hexafluorophosphoric acid, hexafluoroantimonic acid and trifluoromethanesulfonic acid (triflic acid) for a time and at a temperature of from about 80° to about 140° C. sufficient to form a composition comprising an unsaturated ester having the formula:



(II)

wherein n, m and R are as defined above, and R_1 is the residuum of a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof having from 2 to about 20 carbon atoms;
(c) admixing a copolymerizable ethylenically unsaturated monomer with the unsaturated ester of (b); and
(d) admixing a thermoplastic polymer low profile additive with the mixture of (c).

4,626,571
DIHYDROXYACRYL
Paul H. Weigel, Dickinson, Tex., assignor to Board of Regents, University of Texas, Austin, Tex.
Division of Ser. No. 665,804, Oct. 29, 1984, Pat. No. 4,584,402. This application Nov. 14, 1985, Ser. No. 797,853
Int. Cl.[4] C08L *89/00*
U.S. Cl. 525—54.1 4 Claims

1. A process for covalently binding molecules bearing at least one primary amino group to a polyacrylyl terpolymer, the process comprising:
providing a quantity of acrylyl-type terpolymer bearing pendant vicinal dihydroxyalkyl substituents bound to said terpolymer
oxidizing said terpolymer with alkali-metal metaperiodate or metaperiodic acid to convert at least a portion of the pendant vicinal dihydroxyalkyl substituents to pendant aldehyde substituents, and
incubating the oxidized terpolymer with molecules bearing at least one primary amino group to form Schiff base linkages between the amino group and the pendant aldehyde substituents; and
treating the Schiff base linkages with alkali metal cyanoborohydride to produce secondary amine linkages binding the molecules to the terpolymer.

4,626,572
RESINOUS COMPOSITION
Omar M. Boutni, Mt. Vernon, Ind., and Ping Y. Liu, Naperville, Ill., assignors to General Electric Company, Mt. Vernon, Ind.
Filed Dec. 23, 1985, Ser. No. 812,289
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 30 Claims

1. A resin composition exhibiting improved thick section impact strength and improved resistance to organic solvents consisting essentially of, in admixture:
(i) a blend consisting essentially of (a) at least one aromatic polycarbonate resin or at least one aromatic copolyester-carbonate resin and (b) at least one grafted derivative of an ethylene-propylene-diene terpolymer; and
(ii) an amount effective to at least improve the thick section impact strength and resistance to organic solvents of said blend of at least one ethylene-propylene-diene terpolymer.

4,626,573

FLAME-RETARDANT MOLDED COMPOSITION INCORPORATING A POLY(N-(BROMOPHENYL)MALEIMIDE-CO-STYRENE-CO-MALEIC ANHYDRIDE) COPOLYMER

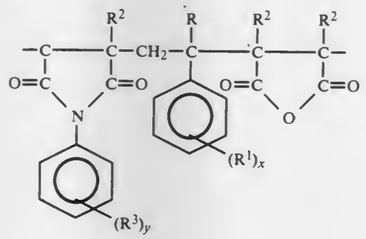
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 685,361, Dec. 24, 1984, Pat. No. 4,604,422. This application Apr. 9, 1986, Ser. No. 849,640

Int. Cl.[4] C08F *212/06, 212/08, 226/06;* **C08L** *45/00*

U.S. Cl. 525—148 **7 Claims**

1. A method for producing a molded article which comprises (1) blending a random copolymer comprised of the following recurring units:



wherein R represents —H, —CH_3, or —CH_2CH_3; R^1 represents —CH_3, —CH_2CH_3, —$CH(CH_3)_2$, —$C(CH_3)_3$, —OH, —OCH_3, —CO_2H, —$CONH_2$, or —$CON(CH_3)_2$; each R^2 separately represents —H or —CH_3; R^3 represents a —Cl or —Br; x represents an integer from 0 to 3 and wherein y represents an integer of from 1 to 3; a flame-retardant synergist and a thermoplastic resin with the proviso that the random copolymer and the thermoplastic resin cannot be the same; and, (2) molding the resulting blend.

4,626,574

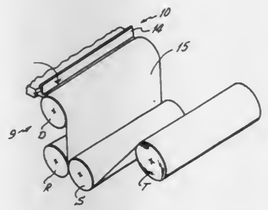
LINEAR LOW DENSITY POLYETHYLENE FILM AND METHOD OF MAKING

Leopoldo V. Cancio; James N. Fitzsimmons, both of Cincinnati; Robert M. Mortellite, Hamilton, and Pai-Chuan Wu, Cincinnati, all of Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Division of Ser. No. 400,416, Jul. 21, 1982. This application Feb. 8, 1985, Ser. No. 699,745

Int. Cl.[4] C08L *23/04*

U.S. Cl. 525—240 **6 Claims**



1. A length of thermoplastic film produced by the steps of:
continuously extruding an extrudate comprising linear low density polyethylene having a propensity for draw resonance at high draw speeds when passed through a slot-die in the form of a web, with the extrudate at a temperature above its crystallization temperature,
locating a draw roller for the web adjacent the slot of the die to thereby produce a short draw-gap of not more than about six inches,
drawing the web into a film having commercially uniform gauge thickness with the draw roller at take-up speeds of at least about several hundred f.p.m., and
maintaining the short draw-gap at said speeds whereby said film is continuously formed and draw resonance is substantially eliminated in the web.

4,626,575

PRESSURE SENSITIVE ADHESIVES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 22, 1985, Ser. No. 725,599

Int. Cl.[4] C08F *8/30*

U.S. Cl. 525—329.5 **6 Claims**

1. A pressure sensitive adhesive composition comprising the reaction product of: (1) a normally tacky interpolymer derived by the addition polymerization of 100 parts by weight of a monomer mixture consisting essentially of (a) at least 40 parts of a C_4–C_{18} alkyl acrylate or methacrylate; (b) from 0.5–10 parts of an ethylenically unsaturated monomer having at least one carboxyllic acid group; (c) the balance including (i) a C_3–C_{10} vinyl ester of an alkanoic acid, and/or (ii) a methyl or ethyl ester of acrylic acid or methacrylic acid;
(2) from 0.1–10% by weight based on (1) of a 2-oxazoline.

4,626,576

ELASTOMER HAVING RANDOM PEROXIDE FUNCTIONALITY AND METHOD

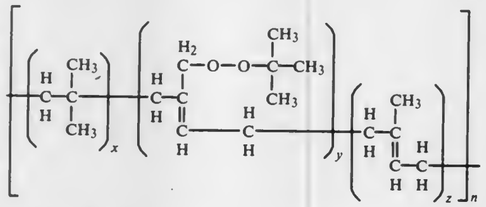
Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 589,368, Mar. 14, 1984. This application Jul. 29, 1985, Ser. No. 759,772

Int. Cl.[4] C08F *8/00*

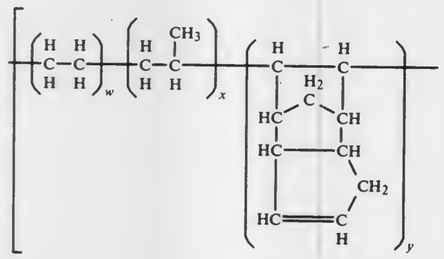
U.S. Cl. 525—332.8 **6 Claims**

1. A random polymer having the general formula:

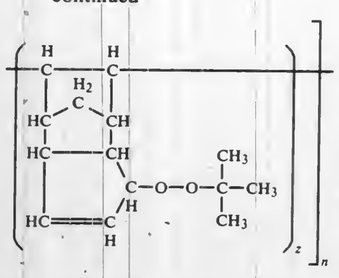


wherein said polymer is comprised of 1 to 15% by weight of the non-conjugated diene hydrocarbon monomers subscribed by the letters y and z, and 85 to 99% by weight of the mono olefin monomer subscribed by the letter x and n is an integer greater than 100.

3. A random polymer having the general formula:

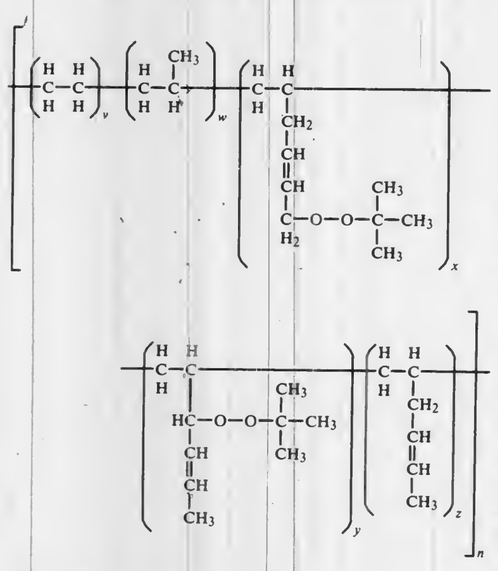


-continued



wherein said polymer is comprised of 1 to 15% by weight of the non-conjugated diene hydrocarbon monomers subscripted by the letters y and z, and 85 to 99% by weight of the monoolefin monomers subscripted by the letters w and x and n is an integer greater than 100.

5. A random polymer having the general formula:



wherein said polymer is comprised of 1 to 15% by weight of the non-conjugated diene hydrocarbon monomers subscripted by the letters x, y, and z, and 85 to 99% by weight of the monoolefin monomers subscripted by the letters v and w and n is an integer greater than 100.

4,626,577

PROCESS FOR PREPARING A SOLUTION OF POLY(ALLYLAMINE)

Susumu Harada, Koriyama, Japan, assignor to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 670,534, Nov. 13, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 817,760

Claims priority, application Japan, Nov. 14, 1983, 58-213698

Int. Cl.[4] C08C *19/00*

U.S. Cl. 525—369 **3 Claims**

1. A process for the preparation of a methanolic solution of poly(allylamine) which comprises treating a powdered hydrochloride, phosphate or sulfate salt of poly(allylamine) with a methanolic solution of caustic alkali or ammonia.

4,626,578

THERMOSETTING HIGH SOLIDS PRIMER COMPOSITION COMPRISING EPOXY ESTER RESIN AND HYDROXY-REACTIVE CROSSLINKING AGENT

Panagiotis I. Kordomenos, Mt. Clemens; David L. Maker, Rochester; Gordon R. Mros, Utica, and John D. Nordstrom, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,637

Int. Cl.[4] C08G *18/80*

U.S. Cl. 525—484 **20 Claims**

1. An organic solvent based thermosetting composition comprising:
(A) cross-linkable hydroxy functional epoxy ester resin having a number average molecular weight (Mn) between about 1,000 and about 5,000, said resin comprising the reaction product of diepoxide chain extended with aliphatic diol and subsequently chain terminated with monobasic fatty acid; and
(B) polyfunctional, hydroxy-reactive cross-linking agent selected from aminoplast cross-linking agent, blocked polyisocyanate cross-linking agent comprising at least two isocyanate groups blocked by reaction with an active hydrogen bearing blocking agent, and a compatible mixture of any of them, said cross-linking agent being included in an amount such that at the cure temperature of the composition said cross-linking agent will provide between about 0.5 and about 1.6 hydroxy reactive groups per hydroxy group contributed by said epoxy ester resin.

4,626,579

PROCESS FOR THE QUASI-IONIC POLYMERIZATION OF ACRYLIC ACID DERIVATIVES

Manfred T. Reetz, Marburg; Ralph Ostarek, Ebsdorfergrund, and Karl-Erwin Piejko, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 825,822

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504168

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—194 **8 Claims**

1. In the process for the quasi-ionic polymerization of acrylic acid derivatives, in which the polymerization is initiated using organosilicon compounds as the initiators in the presence of nucleophilic or electrophilic catalysts and the polymerization is carried out at temperatures from −100° to +100° C., if appropriate in the presence of an aprotic solvent, the improvement which comprises to use as the initiator a mercaptosilane of the formula

$$(R)_3Si—SR^1 \qquad (I)$$

in which
R is the radical of an optionally substituted aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon and
R^1 is the $Si(R)_3$ radical or a C_1–C_{10}-alkyl radical which is monosubstituted or polysubstituted by trialkylsiloxy and-/or trialkylsilylmercapto groups.

4,626,580

NOVEL POLYMERS AND COPOLYMERS AND PRODUCTION OF POLY(ACETYLENE)

William J. Feast, Durham, and Jeremy N. Winter, South Croydon, both of England, assignors to The British Petroleum Company PLC, London, England

Filed Jul. 30, 1985, Ser. No. 760,486

Claims priority, application United Kingdom, Aug. 4, 1984, 8419949; Aug. 25, 1984, 8421643; Sep. 8, 1984, 8422743

Int. Cl.[4] C08F *14/18, 114/18, 214/18*

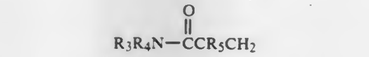
U.S. Cl. 526—253 **11 Claims**

1. A metathesis polymer comprised of multiple units of

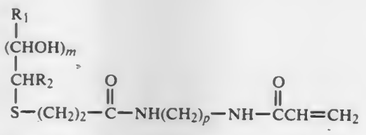
3,6-bis(trifluoromethyl)pentacyclo [6.2.0.0^{2,4}.0^{3,6}.0^{5,7}]dec-9-ene (IV).

4,626,581
DIHYDROXYACRYL
Paul H. Weigel, Dickinson, Tex., assignor to Board of Regents, University of Texas, Austin, Tex.
Division of Ser. No. 665,804, Oct. 29, 1984, Pat. No. 4,584,402. This application Nov. 14, 1985, Ser. No. 797,854
Int. Cl.^{4} C08F *12/30*
U.S. Cl. 526—288 **15 Claims**

1. A terpolymer prepared by the copolymerization of:
in major amount, an acrylyl unit of the formula



Where R_3 is H, R_5 is H or Ch_3, and R_4 is benzyl, n-butyl, p-chlorophenyl, cyclohexyl, dodecyl, ethyl, methyl, n-hexadecyl, napthyl, p-nitrophenyl, n-octadecyl or 2-phenethyl, or where R_3 and R_4 are identical and are H, n-butyl, ethyl or methyl, alone or in combination; and
in minor amount, a crosslinking agent selected from the group consisting of N,N′ methylenebisacrylamide, bisacryloyl cystamine, N,N′ hexamethylenebisacrylamide, N,N′ (bisethylsulfone) bisacrylamide, N,N′ ethylenebisacrylamide, N,N′ dodecanomethylene-bisacrylamide, N,N′ tetramethylenebisacrylamide, and N,N′ trimethylenebisacrylamide, alone or in combination; and
in lesser amount to supply a level of pendant vicinal dihydroxyalkyl substituents, a compound of the formula:



where p is a whole integer from 1 to 12, R_1 is CH_2OH, CHO or CH_2SH, m is a whole integer from 1 to 3 and R_2 is CH_2OH or H, to produce a polyacrylyl-type terpolymer bearing pendant vicinal dihydroxyalkyl substituents.

4,626,582
ACRYLOXYMETHYL SUBSTITUTED FATTY COMPOUNDS
Michael J. Virnig, Fridley; James P. Clark, St. Anthony, and Edward D. DiDomenico, Anoka, all of Minn., assignors to Henkel Corporation, Minneapolis, Minn.
Filed Feb. 28, 1985, Ser. No. 706,549
Int. Cl.^{4} C08F *20/36*
U.S. Cl. 526—298 **24 Claims**

1. A compound having the structural formula:

wherein:
m and n are integers, provided that n is greater than 3 and the sum of m and n ranges from 7 to 19;
Y is a hydrogen, methylol or acryloxymethyl group; and one of X and Z is acryloxymethyl and the other is selected from the group of:
(a) —CN,
(b) —C(O)—NR^1R^2,
(c) —C(O)—OR^3, or
(d) —CH_2—NR^4R^5
wherein: R^1 R^2 and R^3 are independently lower alkyl provided that R^1 and R^2 may together constitute a divalent hydrocarbon group having 4, 5, or 6 aliphatic carbon atoms or 3,4, or 5 aliphatic carbon atoms and one hetero atom or group; R^4 is lower acyl; and R^5 is hydrogen or lower alkyl; provided that when X is acryloxymethyl, Y is hydrogen.

4,626,583
POLYSILANE-SILOXANE OLIGOMERS AND COPOLYMERS AND METHODS OF MAKING THE SAME
Barry C. Arkles, Ambler, Pa., assignor to Petrarch Systems Inc., Bristol, Pa.
Filed Jul. 11, 1985, Ser. No. 754,093
Int. Cl.^{4} C08G *77/04*
U.S. Cl. 528—34 **18 Claims**

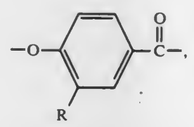
1. A linear polysilane-siloxane copolymer of the general formula:



wherein Me is a methyl group, R is lower aklyl or aryl, m=4 to about 30 inclusive, n=1 to about 100 inclusive, a and b are each 1 to about 10 inclusive , and a units alternate with b units.

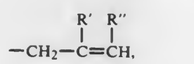
4,626,584
CROSSLINKABLE THERMOTROPIC POLYESTERS DERIVED FROM ALLYLICALLY SUBSTITUTED HYDROXYBENZOIC ACID AND A PROCESS FOR PREPARING A SHAPED ARTICLE OF THE POLYESTERS
Robert W. Stackman, and Husam A. A. Rasoul, both of Racine, Wis., assignors to Celanese Corporation, New York, N.Y.
Filed Sep. 11, 1985, Ser. No. 775,278
Int. Cl.^{4} C08G *63/02, 63/54*
U.S. Cl. 528—192 **27 Claims**

1. A thermotropic crosslinkable polyester capable of forming an anisotropic melt consisting essentially of
(a) approximately 1 to 40 mole percent of the recurring moiety

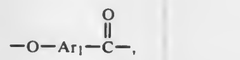


I.

wherein R is an allylic group of the formula



wherein R′ and R″ are independently selected from the group consisting of hydrogen, methyl, ethyl, propyl, phenyl, phenylmethyl, phenylethyl and mixtures thereof, and
(b) approximately 60 to 99 mole percent of recurring moieties selected from the group consisting of



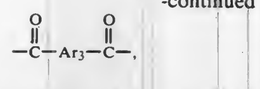
II.

are substantially free of allylic ring substitution, and substantially stoichiometrically balanced amounts of the recurring moieties

III.

and

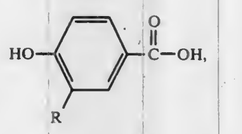
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IV.

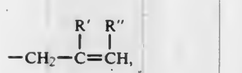
and mixtures thereof, wherein Ar_1, Ar_2 and Ar_3 are independently selected and each represent one or more divalent radicals comprising at least one aromatic ring.

18. A process for preparing a crosslinked shaped polyester article comprising:
(a) heating a monomer mixture consisting essentially of
(i) approximately 1 to 40 mole percent of the monomer:

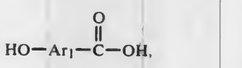


A.

and/or the ester-forming derivatives thereof, wherein R is an allylic group of the formula:

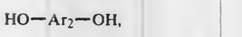


wherein R′ and R″ are independently selected from the group consisting of hydrogen, methyl, ethyl, propyl, phenyl, phenylmethyl, phenylethyl, and mixtures thereof, and
(ii) approximately 60 to 99 mole percent of monomers selected from the group consisting of:



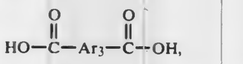
B.

and/or the ester-forming derivatives thereof, which monomer B is substantially free of allylic ring substitution, and substantially stoichiometrically balanced amounts of monomers of the formulae



C.

and



D.

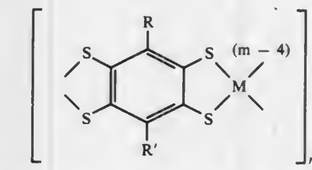
and/or the ester-forming derivatives thereof, and mixtures thereof, wherein Ar_1, Ar_2 and Ar_3 are independently selected and each represent one or more divalent radicals comprising at least one aromatic group, to a temperature sufficient to polyesterify said monomers to form a polyester;
(b) melt processing the resulting polyester to form a solid shaped article; and
(c) heating the resulting solid shaped article of (b) at a temperature sufficient to substantially crosslink allylic groups derived from monomer A of the polyester while substantially retaining the configuration of the solid shaped article imparted in step (b).

4,626,585
METHOD OF PRODUCING A POLYPHENYLENE ETHER PROTECTED AGAINST MOLECULAR WEIGHT DEGRADATION, WHERE THE COPPER SALT EMPLOYED IN THE COUPLING REACTION CAN BE REUSED
Martin Bartmann, Recklinghausen, and Klaus Burzin, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany
Filed May 10, 1985, Ser. No. 732,737
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419604; Nov. 17, 1984, 3442141
Int. Cl.^{4} C08G *65/38*
U.S. Cl. 528—212 **21 Claims**

1. A method for producing a polyphenylene ether which comprises:
(1) oxidatively coupling a di-ortho-substituted phenol in the presence of a copper catalyst in a medium which comprises:
(a) a C_1 to C_4 chlorinated hydrocarbon;
(b) a C_6 to C_8 aromatic solvent; or
(c) a mixture of (a) or (b) and a C_1 to C_6 alcohol, a C_3 to C_6 ketone or a mixture thereof, in a volumetric ratio of from 92.5:7.5 to 50:50, wherein during the oxidative coupling reaction the polyphenylene ether substantially remains in solution;
(2) removing the oxygen required for the coupling reaction;
(3) terminating the reaction by adding hydrazine to the reaction mixture; and,
(4) separating out the resulting precipitate.

4,626,586
TRANSITION METAL POLY(BENZODITHIOLENE)
Fred Wudl; Alan J. Heeger, both of Santa Barbara, Calif., and Carl W. Dirk, Piscataway, N.J., assignors to Regents of the University of California, Berkeley, Calif.
Filed Aug. 13, 1985, Ser. No. 765,303
Int. Cl.^{4} C08G *75/14*
U.S. Cl. 528—374 **24 Claims**

1. A polymer of the formula:



where R and R′ are H or alkyl and are the same or different, M is at least one transition metal, m is the valence of M, (m-4) is the charge upon M, and n is 2–1,000.

4,626,587
EXTRUSION FINISHING OF PERFLUORINATED COPOLYMERS
Richard A. Morgan, and William H. Sloan, both of Vienna, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 571,198, Jan. 16, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 752,174
Int. Cl.^{4} C08F *6/00*
U.S. Cl. 528—481 **5 Claims**

1. A process for reducing the backbone instability in a raw melt-processible copolymer of 80–99% by weight units of tetrafluorethylene and complementally 20–1% by weight units of hexafluorpropylene which comprises:
(a) subjecting said raw melt-processible copolymer, which copolymer has a backbone volatiles index greater than 15 and a melt viscosity between 10^2 and 10^6 Pa.s, to a vacuum of less than 10^5 Pa and to a temperature of between 220° C.

and 450° C. while moving the copolymer through a twin screw extruder having intermeshing corotating screws that are self-wiping and which have tight clearance,

and subjecting the copolymer to a shear rate between 500 and 7000 reciprocal seconds for a time sufficient to result in the copolymer having a backbone voltailes index less than 10; and

(b) removing the copolymer from the extruder.

4,626,588

CONJUGATED POLYMER FILM AND PYROLYZED PRODUCT THEREOF

Ichiki Murase, Ootsu; Toshihiro Ohnishi, Takatsuki, and Takanobu Noguchi, Ootsu, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,221

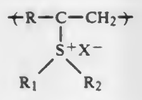
Claims priority, application Japan, Jun. 26, 1984, 59-130032; Jan. 9, 1985, 60-869

Int. Cl.[4] C08F *6/00*

U.S. Cl. 528—481 **9 Claims**

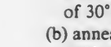
1. A highly electroconductive carbonaceous material obtained by a method which comprises:

(a) biaxially stretching a film of polyelectrolyte of a sulfonium salt having a recurring unit:



and a molecular weight greater than 3500, wherein R_1 and R_2 each represent a hydrocarbon radical having 1 to 20 carbon atoms, R is an aromatic hydrocarbon group having 6 to 20 carbon atoms, and X is an anion, at a temperature of 30°–150° C. in an inert atmosphere;

(b) annealing the biaxially stretched film at a temperature of 150°–450° C. in an inert atmosphere, thereby forming a biaxially stretch-oriented film of a conjugated polymer of the formula:



wherein R, defined as above, forms a conjugated system with the vinylene group, and n is an integer of up to 50,000; and

(c) pyrolyzing said annealed film at a temperature of 400°–3500° C. in an inert atmosphere.

4,626,589

ORGANIC DYE COMPOUND HAVING BOTH PYRIDINIOTRIAZINYL AND VINYLSULFONE TYPE FIBER-REACTIVE GROUPS

Takashi Omura, Ashiya; Yutaka Kayane, Ibaraki; Mikoto Takahashi, Oita; Tetsuya Miyamoto, Takatsuki; Akira Takeshita, Toyonaka; Naoki Harada, Suita, and Katsumasa Otake, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

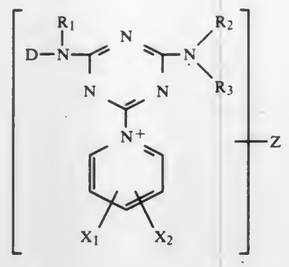
Filed Feb. 7, 1985, Ser. No. 699,182

Claims priority, application Japan, Feb. 20, 1984, 59-31133

Int. Cl.[4] C09B *44/02, 44/08, 62/523, 62/527*

U.S. Cl. 534—605 **6 Claims**

1. A compound, or a salt thereof, of the following formula,



wherein D is an organic dye moiety, R_1 and R_2 are independently hydrogen or a, lower alkyl unsubstituted or substituted with hydroxy, carboxy, sulfo, carbamoyl, cyano or methoxycarbonyl, R_3 is hydrogen, or a lower alkyl unsubstituted or substituted with hydroxy, cyano, methoxy, ethoxy, chloro, bromo, carboxy, carbamoyl, methoxycarbonyl, ethoxycarbonyl, sulfo and sulfamoyl, phenyl unsubstituted or substituted with chloro, bromo, methyl, ethyl, methoxy, ethoxy and sulfo or napthyl unsubstituted or substituted with sulfo, X_1 and X_2 are independently hydrogen, halogen or a lower alkyl, cyano, carbamoyl, vinyl, β-hydroxyethyl, β-sulfoethyl, β-sulfatoethyl, carboxyl, alkoxycarbonyl or sulfo, Z is appended to the above-defined D or R_2 and stands for $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Y$ in which Y is a group capable of being split by the action of an alkali.

4,626,590

REACTIVE MONOAZO AND DISAZO PYRIDONE DYESTUFFS CONTAINING A HALO-SUBSTITUTED 6-MEMBER NITROGEN-CONTAINING HETEROCYCLIC RING

Toshio Niwa, Yokohama; Kiyoshi Himeno, Kitakyushu; Toshio Hihara, and Yukiharu Shimizu, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

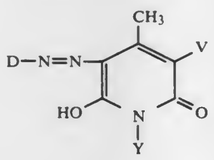
Filed Nov. 6, 1984, Ser. No. 668,739

Claims priority, application Japan, Nov. 22, 1983, 58-220301; May 29, 1984, 59-108949; Jul. 27, 1984, 59-157043; Jul. 27, 1984, 59-157044; Aug. 13, 1984, 59-169000

Int. Cl.[4] C09B *62/085, 62/09, 62/245, 62/25*

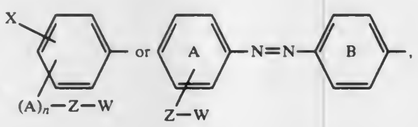
U.S. Cl. 534—635 **8 Claims**

1. A reactive pyridone azo dyestuff of the formula:



wherein

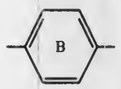
D represents



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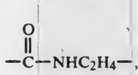


represents phenylene which is unsubstituted or substituted by lower alkyl, lower alkoxy, trifluoromethyl or halogen,



represents phenylene which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen or acetylamino,

—A— represents $—CH_2—$, $—C_2H_4—$, $—OC_2H_4—$,



$—SO_2NHC_2H_4—$ or $—SO_2C_2H_4—$,

—X represents hydrogen, lower alkyl, lower alkoxy, nitro, trifluoromethyl or halogen,

—Y represents alkyl, aryl or aralkyl which are unsubstituted or substituted by lower alkoxy or phenoxy,

—Z— represents a connecting group of —O— or —S—,

—V represents —CN or $—CONH_2$,

—W represents a 6-membered nitrogen-containing heterocyclic ring having at least one active halogen atom, and

n represents 0 or 1.

4,626,591

TRANS-DL-1-ALKYL-6-ALKOXY-1,2,3,4,4A,5,8,8A OCTA-HYDROQUINOLINES

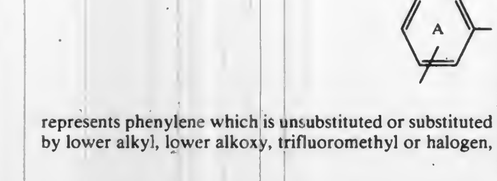
John M. Schaus, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 521,863, Aug. 10, 1983, Pat. No. 4,450,787, which is a continuation-in-part of Ser. No. 384,817, Jun. 3, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 725,032

Int. Cl.[4] C07D *215/20*

U.S. Cl. 546—165 **2 Claims**

1. A compound of the formula



wherein R and R^2 are separately C_{1-3} alkyl.

4,626,592

GEM CYCLODIALKYLATION OF AMINES AND AMIDES

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 618,005, Jun. 6, 1984. This application Dec. 24, 1984, Ser. No. 685,854

Int. Cl.[4] C07D *295/02*

U.S. Cl. 546—192 **23 Claims**

1. The process of converting an N,N-dialkylatable amino or amido group into an N,N-cyclodialkylated amino or amido group which comprises reacting a compound containing at least one N,N-dialkylatable amino or amido group with an unstrained cyclic ether co-reactive therewith in the presence of a viable B-subgroup metal oxide alkylation catalyst other than a Group I-B metal oxide so that at least one such N,N-dialkylatable amino or amido group is transformed into an N,N-cyclodialkylated amino or amido group, respectively.

4,626,593

VINYL STILBAZOLES

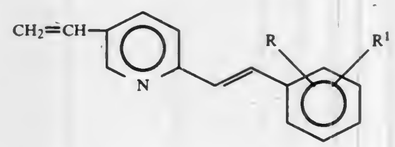
John A. Parker, Los Altos; Alvin H. Heimbuch, El Cerrito; Ming-Ta S. Hsu, and Timothy S. Chen, both of San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 553,339, Nov. 18, 1983, Pat. No. 4,526,925. This application Apr. 22, 1985, Ser. No. 725,725

Int. Cl.[4] C07D *211/70, 211/72*

U.S. Cl. 546—339 **16 Claims**

1. A 5-vinyl-2-stilbazole of the structure



wherein R and R′ are independently selected from hydrogen, lower alkyls, lower alkoxy, phenyl, alkyl phenyls of 7 to 9 carbons, chloro, bromo or iodo.

4,626,594

PROCESS FOR THE PREPARATION OF BETA-HYDROXYETHYL-(1,2,4-TRIAZOLE) DERIVATIVES

Reinhard Lantzsch, Leverkusen, and Karl-Julius Reubke, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

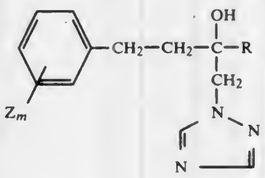
Filed Nov. 19, 1984, Ser. No. 672,767

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342692

Int. Cl.[4] C07D *249/08*

U.S. Cl. 548—262 **9 Claims**

1. A process for the preparation of a β-hydroxyethyl-(1,2,4-triazole derivative of the formula



R represents straight-chain or branched alkyl with 1 to 4 carbon atoms, straight-chain or branched halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 halogen atoms, cycloalkyl which has 3 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms, or phenyl which is optionally substituted by halogen, alkyl with 1 to 4 carbon atoms and/or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms,

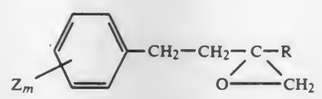
Z represents halogen, alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 halogen atoms, phenyl which is optionally substituted by halogen and/or alkyl with 1 to 4 carbon atoms, phenoxy which is optionally

substituted by halogen and/or alkyl with 1 to 4 carbon atoms, and

m represents the number 0, 1, 2 or 3,

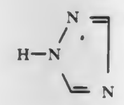
it being possible for the radicals Z to be identical or different

which process comprises reacting an oxirane of the formula

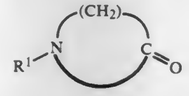


in which

R, Z and m have the abovementioned meaning, with 1,2,4-triazole of the formula



in the presence of a cyclic amide of the formula



in which

R^1 represents alkyl with 1 to 4 carbon atoms and

n represents the number 3, 4 or 5,

as diluent, and in the presence of a base.

4,626,595

OXIRANE INTERMEDIATES OF 1-HYDROXYETHYL AZOLE COMPOUNDS

Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Berg-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlinger, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

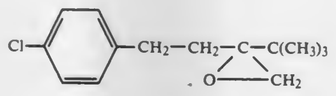
Division of Ser. No. 499,679, Jun. 6, 1983, Pat. No. 4,532,341, which is a continuation of Ser. No. 405,657, Aug. 5, 1982, abandoned, which is a division of Ser. No. 260,479, May 4, 1981, abandoned. This application Jan. 28, 1985, Ser. No. 695,610

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018866; Feb. 19, 1981, 3106076

Int. Cl.[4] C07D *303/08*

U.S. Cl. 549—559 **1 Claim**

1. An oxirane compound of the formula



4,626,596

SYNTHESIS OF MOLYBDENUM/ALKYLENE GLYCOL COMPLEXES USEFUL AS EPOXIDATION CATALYSTS

Edward T. Marquis, Austin; Kenneth P. Keating, Georgetown; John R. Sanderson, and William A. Smith, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,701

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—57 **5 Claims**

1. A method for preparing a catalytically active molybdenum complex which comprises:

a. reacting at an elevated temperature between about 80° and 130° C. a reaction mixture consisting essentially of an undiluted ammonium-containing molybdenum compound with an undiluted alkylene glycol such that the ratio of moles of alkylene glycol to gram atoms of molybdenum ranges from about 7:1 to 20:1, in the presence of a minor amount of water, and

b. subsequently mildly stripping the product from step a. to give said catalytically active molybdenum complex, said molybdenum complex having a final water content of about 0.5 to 6 wt.%.

said alkylene glycol having a molecular weight of less than about 200 and containing only primary or secondary hydroxyl groups, said hydroxyl groups being separated from each other by an even number of carbon atoms.

4,626,597

16-FLUORO-16,17-DIDEHYDRO PROSTANOIDS AND PROCESS FOR THEIR PREPARATION

Franco Faustini, Milan; Roberto d'Alessio, Cinisello Balsamo; Achille Panzeri, Merate, and Enrico di Salle, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

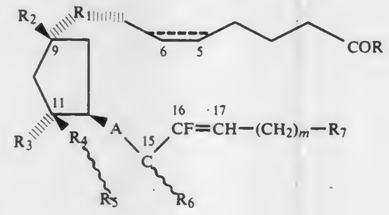
Filed Aug. 22, 1984, Ser. No. 643,014

Claims priority, application United Kingdom, Sep. 7, 1983, 8324004

Int. Cl.[4] C07C *177/00*

U.S. Cl. 560—53 **17 Claims**

1. A compound of the following formula (I)



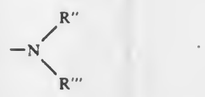
(I)

wherein

R is

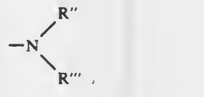
(1) —OH or —OR', wherein R' is C_1-C_6 alkyl optionally substituted by phenyl cyclopentyl, cyclohexyl, furyl, tetrahydrofuryl, or pyridyl;

(2)



wherein each of R'' and R''' is, independently, hydrogen; C_1-C_6 alkyl; phenyl; furyl, tetrahydrofuryl, pyridyl; or R'' and R''', together with the nitrogen atom to which they are linked, are morpholino, thiomorpholino, piperidino or piperazino;

(3) —W—$(CH_2)_n$—X wherein W is —O— or —NH—, n is an integer of 1 to 4 and X represents a group —OR' or a group



wherein R', R'' and R''' are as defined above; or

(4) —$NHSO_2$—R^{IV}, wherein R^{IV} is C_1-C_4 alkyl, phenyl or phenyl substituted by C_1-C_4 alkyl;

one of R_1 and R_2 is hydrogen and the other is hydroxy or R_1 and R_2, taken together, form an oxo group;

one of R_3 and R_4 is hydrogen and the other is hydroxy or R_3 and R_4 are both hydrogen or, taken together, form an oxo group;

one of R_5 and R_6 is hydroxy and the other is hydrogen, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, or phenyl;

m is zero or an integer of 1 to 3;

R_7 is unsubstituted phenyl or phenyl substituted by one or more substituents chosen from C_1-C_4 alkyl, C_1-C_4-alkoxy, tri-halo-C_1-C_4-alkyl, halogen,

wherein each of R^V and R^{VI} is, independently, hydrogen, C_1-C_4-alkyl or phenyl;

A is trans —CH=CH—, —CH_2—CH_2— or —C≡C—, and the symbol represents a single bond or a cis double bond, with the condition that R_3 and R_4 do not form an oxo group when R_1 and R_2 form an oxo group,

and the pharmaceutically or veterinarily acceptable salts thereof.

4,626,598

PURIFICATION OF TEREPHTHALIC ACID

Lawrence G. Packer, Lisle, and David E. James, Batavia, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 17, 1985, Ser. No. 745,620

Int. Cl.[4] C07C *51/42*

U.S. Cl. 562—487 **14 Claims**

1. In a method for producing purified terephthalic acid by catalytic hydrogenation of a relatively impure terephthalic acid solution in a polar solvent, the improvement which comprises the step of modulating solution hydrogen concentration during said hydrogenation so as to maintain a predetermined color scale b*-value in the purified terephthalic acid.

4,626,599

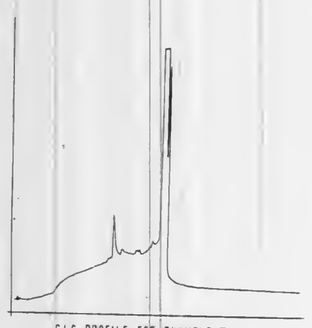
DITHIOETHERS OF 2-PHENYL-2-ALKENALS AND ORGANOLEPTIC USES THEREOF

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 726,352, Apr. 23, 1985, Pat. No. 4,571,344. This application Oct. 25, 1985, Ser. No. 791,394

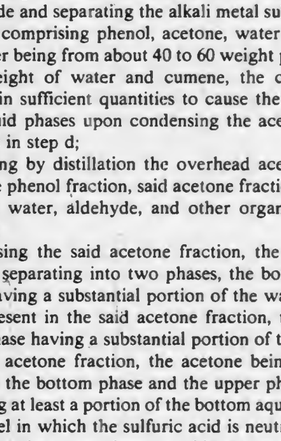
Int. Cl.[4] C07C *149/267*

U.S. Cl. 568—57 **8 Claims**



GLC PROFILE FOR EXAMPLE I CRUDE

3. A mixture of dithioethers of 2-phenyl-2-alkenals defined according to the structure:



and

wherein N represents 0 or 1 and each of R_4 and R_5 represents hydrogen or methyl.

4,626,600

PROCESS FOR PURIFYING ACETONE

John W. Fulmer, Mt. Vernon, and William D. Kight, Poseyville, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 609,322, May 11, 1984, abandoned. This application Feb. 21, 1985, Ser. No. 703,990

Int. Cl.[4] C07C *45/80*

U.S. Cl. 568—411 **3 Claims**

1. A process for reducing the water content of acetone prepared from cumene which includes the comprises

a. adding cleaving-effective catalytic quantities of sulfuric acid to a mixture comprising cumene hydroperoxide and cumene, the cumene hydroperoxide making up about 81 to 83 weight percent of the said mixture and the cumene at least 10 parts by weight as measured by 100 parts by weight cumene hydroperoxide, thereby producing a mixture comprising phenol, acetone, cumene and suifuric acid;

b. neutralizing the said sulfuric acid with an aqueous alkali hydroxide and separating the alkali metal sulfate from the mixture comprising phenol, acetone, water and cumene, the water being from about 40 to 60 weight percent of the total weight of water and cumene, the cumene being present in sufficient quantities to cause the formation of two liquid phases upon condensing the acetone fraction distillate in step d;

c. separating by distillation the overhead acetone fraction from the phenol fraction, said acetone fraction containing acetone, water, aldehyde, and other organics including cumene;

d. condensing the said acetone fraction, the said acetone fraction separating into two phases, the bottom aqueous phase having a substantial portion of the water and aldehyde present in the said acetone fraction, the upper organic phase having a substantial portion of the cumene of the said acetone fraction, the acetone being partitioned between the bottom phase and the upper phase;

e. recycling at least a portion of the bottom aqueous phase to the vessel in which the sulfuric acid is neutralized and

f. processing the upper phase to achieve a separation of the acetone and water.

4,626,601

PREPARATION OF 4-FLUORO-3-PHENOXY-BENZAL-DEHYDE ACETALS AND INTERMEDIATES THEREFOR

Rainer Fuchs; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen; Hans-Jochem Riebel, Wuppertal, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

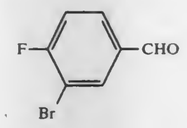
Continuation of Ser. No. 174,762, Aug. 4, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,657

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933979

Int. Cl.⁴ C07C *47/52*

U.S. Cl. 568—425 **1 Claim**

1. 3-Bromo-4-fluoro-benzaldehyde of the formula



4,626,602

ALIPHATIC ALCOHOLS, THEIR PREPARATION AND USE OF SAME AS PERFUMING INGREDIENTS

Karl-Heinrich Schulte-Elte, Onex, and Hervé Pamingle, Geneva, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

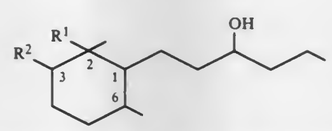
Continuation of Ser. No. 594,192, Mar. 28, 1984. This application Dec. 4, 1985, Ser. No. 804,249

Claims priority, application Switzerland, Apr. 12, 1983, 1963/83; Aug. 30, 1983, 4743/83

Int. Cl.⁴ C07C *35/08;* **C11B** *9/00*

U.S. Cl. 568—822 **14 Claims**

1. Cycloaliphatic alcohols of formula



(I)

wherein each of symbols R^1 and R^2 designates a methyl radical or wherein R^1 designates an ethyl radical and R^2 stands for a methyl radical or a hydrogen atom.

4,626,603

PROCESS FOR THE CONTINUOUS PRODUCTION OF VICINAL DIOLS

Rainer Siegmeier, Frankfurt; Günter Prescher, Hanau, and Helmut Maurer, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

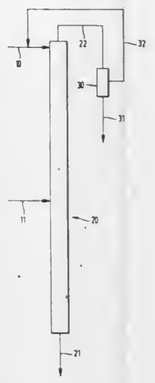
Filed Nov. 15, 1985, Ser. No. 798,797

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3442938

Int. Cl.⁴ C07C *29/00, 31/20, 35/14*

U.S. Cl. 568—833 **19 Claims**

1. A continuous process for the production of a low molecular weight vicinal diol by acid catalyzed saponification in a column in the presence of an organic solvent at low pressure and moderate temperature comprising continuously (1) supplying a solution of an aliphatic or cycloaliphatic epoxide having 3 to 8 carbon atoms in an aromatic hydrocarbon or a halohydrocarbon solvent which is not miscible with water to the middle of the column, (2) adding a mixture of fresh water and recycled water containing acid catalyst at the top of the column, saponifying the epoxide in the column at 30° to 150° C. at atmospheric pressure or a pressure up to 5 bar, (3) drawing off an azeotrope of solvent and water at the head of the column, (4) separating the azeotrope into (a) water and (b) solvent, (5) removing the solvent from the system, (6) returning the water



to the top of the column and (7) drawing off an acid aqueous solution of vicinal diol from the sump of the column.

4,626,604

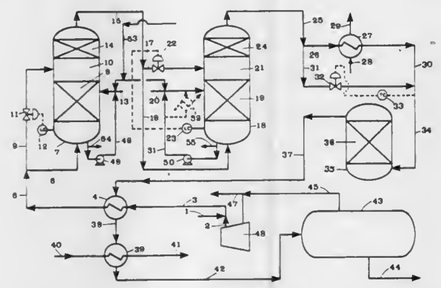
HYDROGENATION PROCESS

Andrew G. Hiles, Pinner, England, and John E. Logsdon, Houston, Tex., assignors to Davy McKee (London) Limited, London, England

Filed Sep. 11, 1985, Ser. No. 774,958

Int. Cl.⁴ C07C *29/14, 29/17, 29/132;* **C11C** *3/12*

U.S. Cl. 568—881 **30 Claims**



1. A continuous process for the catalytic hydrogenation of an unsaturated organic compound to a hydrogenation product thereof which comprises:

providing a catalytic hydrogenation zone comprising (i) a first catalytic stage, (ii) at least one intermediate stage, including a penultimate stage, and (iii) a final catalytic stage, each stage containing a charge of a hydrogenation catalyst and the stages being connected in series so that material from one stage is fed to the next stage in the series;

supplying to the first catalytic stage, at a first preselected rate and at a temperature at least as high as the threshold temperature for the hydrogenation reaction, a first vaporous feed mixture comprising excess hydrogen and the unsaturated organic compound;

allowing catalytic hydrogenation to occur substantially adiabatically in the first catalytic stage;

recovering from the, or from each, catalytic stage preceding the penultimate catalyst stage in the series a corresponding vaporous product mixture containing hydrogenation product and excess hydrogen;

vaporising in the, or in each, resulting vaporous product mixture a preselected amount of further unsaturated organic compound to form a corresponding vaporous feed stream for supply to the next catalytic stage in the series;

supplying to the, or to each, intermediate catalytic stage, at a corresponding preselected rate and at a temperature at least as high as the threshold temperature for the hydrogenation reaction, a corresponding intermediate vaporous feed stream comprising a mixture of further vaporous unsaturated organic compound and product mixture from the preceding catalytic stage of the series;

allowing hydrogenation to occur substantially adiabatically in the, or in each, intermediate catalytic stage;

controlling the rate of supply of, and the composition of, the corresponding intermediate vaporous feed stream fed to the penultimate catalytic stage in relation to the volume of catalyst therein so that, under the substantially adiabatic conditions prevailing in the penultimate catalytic stage, the product mixture recovered therefrom still contains a minor amount of chemically unsaturated material;

recovering from the penultimate catalytic stage a vaporous penultimate product mixture containing hydrogenation product, a minor amount of chemically unsaturated material and excess hydrogen;

cooling the vaporous penultimate product mixture;

supplying resulting cooled penultimate product mixture containing hydrogenation product, a minor amount of chemically unsaturated material and hydrogen to the final catalytic stage at a temperature at least as high as the threshold temperature for the hydrogenation reaction;

allowing hydrogenation of the minor amount of chemically unsaturated material in the penultimate product mixture to occur substantially to completion in the final catalytic stage; and

recovering from the final catalytic stage a final product mixture that contains hydrogenation product and excess hydrogen and is substantially free from chemically unsaturated material.

4,626,605

PROCESS FOR EXTRACTING PHENOLS FROM AQUEOUS SOLUTIONS

Bernhard Wojtech, Bad Soden am Taunus; Manfred Mayer, Niedernhausen, and Karl-Erich Ott, Hamburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,341

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436349

Int. Cl.⁴ C07C *37/82, 37/70*

U.S. Cl. 568—757 **7 Claims**

1. A process for reducing the phenol concentration of an aqueous solution, which comprises extracting the phenol from the aqueous solution with an extractant containing a salt of an aliphatic amine, having a total carbon number of at least 10, and a strong acid.

4,626,606

PRODUCTION OF HEXANITROSTILBENE (HNS)

Henry C. Duffin, Surbiton; Peter Golding, Epping, and Asoka M. Jaweera-Bandara, Surbiton, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 19, 1984, Ser. No. 632,294

Claims priority, application United Kingdom, Jul. 22, 1983, 8319850

Int. Cl.⁴ C07C *79/10*

U.S. Cl. 568—931 **32 Claims**

1. A method of preparing 2,2',4,4',6,6'-hexanitrostilbene (HNS) which comprises the steps of

(a) oxidizing to a nitrated organic reactant, selected from 1,2-dipicrylethane (DPE) and 2,4,6-trinitrotoluene (TNT), to HNS with an oxidizing agent, said oxidation being performed in an aprotic solvent having dissolved therein a soluble base selected from the group consisting of salts of monocarboxylic acids, salts of dicarboxylic acids, and salts of polycarboxylic acids, and

(b) recovering the HNS from the aprotic solvent, provided that when DPE is oxidized and the base is a salt of a monocarboxylic acid, the molar ratio of DPE to base in the aprotic solvent is between 1:1 and 1:6.

17. A method of preparing 2,2',4,4',6,6'-hexanitrostilbene (HNS) which comprises the step of:

(a) oxidizing 2,4,6-trinitrotoluene (TNT) to HNS with an oxidizing agent, said oxidation being performed in an aprotic solvent having dissolved therein a soluble base selected from the group consisting of salts of monocarboxylic acids, salts of dicarboxylic acids and salts of polycarboxylic acids, and

(b) recovering HNS from the aprotic solvent.

4,626,607

PROCESS AND INSTALLATION FOR MANUFACTURING NITROMETHANE

Bernard Jacquinot, Douai; Jacques Quibel, Maisons Laffitte, and Roger Mari, Villers-les-Nancy, all of France, assignors to Societe Chimique de la Grande Pariosse, Azote et Produits Chimiques, Paris, France

Filed Jan. 25, 1985, Ser. No. 695,047

Claims priority, application France, Jan. 27, 1984, 84 01248

Int. Cl.⁴ C07C *79/04*

U.S. Cl. 568—948 **17 Claims**

1. A process for preparing nitromethane by nitration in a homogeneous gaseous phase reaction medium of methane or a mixture of hydrocarbons containing a substantial quantity of methane, the nitrating agent being selected from the group consisting of nitric acid, nitrogen peroxide and mixtures thereof, the molar ratio methane/nitrating agent being between 0.1 and 5, the reaction contact time being between 0.1 and 120 seconds, the reaction pressure being between 1 and 35 bars absolute, the reaction temperature being between 270° and 600° C. and wherein the nitration reaction is carried out in the presence of an active agent introduced in a molar ratio of active agent/methane at the most equal to 3 and a molar ratio of active agent/nitrating agent at the least equal to about 1, the active agent being selected from the group consisting of a halogen, a hydracid, and an organic halide vaporizable or soluble in the reaction medium.

11. A process for preparing nitromethane by nitration of methane, comprising:

preheating methane containing at least one constituent which is inert with respect to the reaction and the reaction products;

independently preheating a nitrating agent selected from the group consisting of nitric acid, nitrogen peroxide and mixtures thereof;

incorporating in the methane or the nitrating agent prior to said preheating thereof an active agent selected from the group consisting of a halogen, a hydracid and an organic halide vaporizable or soluble in a subsequently formed reaction medium;

forming a homogeneous gaseous phase reaction medium of said methane, said inert constituent, said active agent and said nitrating agent as quickly as possible after said preheating, the molar ratio of methane to nitrating agent being 0.1 and 5, the reaction pressure being between 1 and 35 bars absolute, the reaction temperature being between 270° and 600° C., and the molar ratio of said active agent to methane being at most equal 3, and effecting nitration of said methane in said homogeneous gaseous phase reaction medium for a time of 0.1 to 120 seconds;

cooling reaction effluents to obtain a gaseous phase and a liquid phase, and separating said liquid phase from said gaseous phase;

recompressing methane which has not reacted and inert constituents produced during the nitration reaction, add-

ing thereto a fresh supply of methane, and recycling the resultant mixture to the reaction zone;
recovering the nitrating agent by absorption of nitrogen oxides from said gaseous phase;
denitrating the liquid phase by treatment with an oxygenated gas, concentrating and recovering the nitrating agent;
uniting fractions of nitrating agent recovered from the gaseous and liquid effluent phases; and
recovering a mixture of nitroparaffins having a high content of nitromethane from the denitrated liquid phase, and washing and purifying the mixture of nitroparaffins.

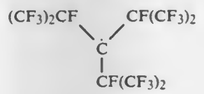
4,626,608

PERSISTENT PERFLUOROALKYL FREE RADICALS USEFUL AS POLYMERIZATION CATALYST

Kirby V. Scherer, Jr., Santa Monica; Taizo Ono, San Gabriel, both of Calif., and Kouichi Yamanouchi, Sakai, Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Apr. 5, 1983, Ser. No. 482,359
Int. Cl.⁴ C07C *19/08*
U.S. Cl. 570—134 **2 Claims**

1. A free radical having the formula



4,626,609

AROMATIC COMPOUND CONVERSION

David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 573,776, Jan. 23, 1984, Pat. No. 4,559,314, which is a continuation-in-part of Ser. No. 360,749, Mar. 22, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 791,279
Int. Cl.⁴ C07C *2/68*
U.S. Cl. 585—467 **26 Claims**

1. A process for converting feedstock comprising xylene isomers to isomerization conversion product which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition prepared by a method which comprises forming a composite of a crystalline zeolite having a silica:alumina mole ratio of at least 100:1 and a Constraint Index from 1 to 12, a binder comprising alumina, and water, and contacting the composite with steam to enhance the activity of the catalyst.

15. A process for converting feedstock comprising aromatic compounds selected from the group consisting of benzene, monocyclic alkyl-substituted benzene of from 7 to 10 carbon atoms and mixtures thereof, alkyl being methyl, ethyl or a combination thereof, to alkylation conversion product comprising aromatic compounds which differs from said feedstock, which comprises contacting said feedstock and an alkylating agent at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition preapred by a method which comprises mixing a high-silica zeolite having a Constraint Index of 1 to 12 with binder comprising alumina, and treating the mixture of zeolite and binder at elevated temperature under conditions effective to increase catalytic activity of said mixture.

19. A process for converting feedstock comprising toluene to disproportionation conversion product which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition prepared by a method which comprises mixing a high-silica zeolite having a Contraint Index of 1 to 12 with binder comprising alumina, and treating the mixture of zeolite and binder at elevated temperature under conditions effective to increase catalytic activity of said mixture.

4,626,610

IRON DEFICIENCY CHLOROSIS RESISTANT SOYBEAN VARIETY

Paul Sun, Roscoe, Ill., assignor to DeKalb-Pfizer Genetics, DeKalb, Ill.

Filed Jan. 11, 1985, Ser. No. 690,706
Int. Cl.⁴ A01H *1/06*
U.S. Cl. 800—1 **7 Claims**

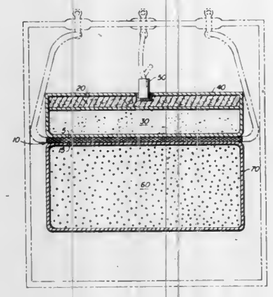
1. A novel process to produce the seeds of a soybean variety resistant to iron deficiency chlorosis comprising the steps of:
(a) crossing plants grown from seeds of Beeson and Corsoy;
(b) developing a pure plant line from the seeds produced in (a) and crossing plants grown from said line with plants grown from seeds of Hodgson;
(c) developing a pure plant variety from the seeds produced in (b), said variety being selected for those resistant to iron deficiency chlorosis; and
(d) harvesting the seeds of said pure resistant plant variety.

4,626,611

SHORT DURATION THERMOELECTRIC GENERATOR

George E. McManis, III; John O. Bratcher, and Ronald F. Dettling, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1985, Ser. No. 750,965
Int. Cl.⁴ H01L *35/28*
U.S. Cl. 136—212 **10 Claims**



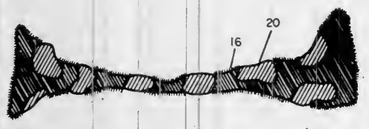
1. A thermoelectric generator capable of fast rise times and stable output voltage for short durations, having a SiGe thermoelectric array and a hot side and cold side; the improvement comprising:
a hot side heat sink adjacent said hot side of said array, containing a material having a melting point within the range of 700° C. to 800° C. selected from the group consisting of: low melting borate glasses, alkali metal halides, borosilicate glasses, low melting phosphate glasses and carbonates;
a cold side heat sink adjacent said cold side of said array, containing a material having a melting point within the range of 50° C. to 100° C. selected from the group consisting of: aliphatic glycyl esters, fatty acids, organic waxes, silicone waxes and low melting organic salts.

4,626,612

FOAMED MULTIPLE THERMOCOUPLE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed May 21, 1984, Ser. No. 612,718
Int. Cl.⁴ H01L *35/28*
U.S. Cl. 136—224 **14 Claims**



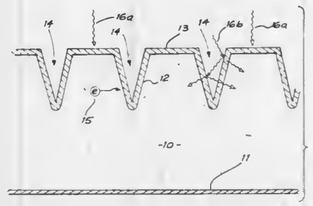
1. A thermocouple structure having a multiplicity of individual thermocouple elements forming the structure and contributing to the effect and function of the thermocouple structure, comprising:
a conductive foam matrix defining a multiplicity of open cells, at least a portion of the foam matrix forming a first pole member;
a plurality of discrete conductors formed of a different material from said foam matrix, the discrete conductors being embedded in said foam matrix and having a portion thereof exposed on wall portions of said cells of said foam matrix;
a second pole member; and,
means for making electrical contact between the second pole member and said discrete conductors and for conveying current to the second pole member, whereby each of the discrete conductors form individual thermocouple elements.

4,626,613

LASER GROOVED SOLAR CELL

Stuart R. Wenham, and Martin A. Green, both of Sydney, Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Dec. 19, 1984, Ser. No. 683,505
Claims priority, application Australia, Dec. 23, 1983, PG3004
Int. Cl.⁴ H01L *31/06, 31/18*
U.S. Cl. 136—255 **7 Claims**



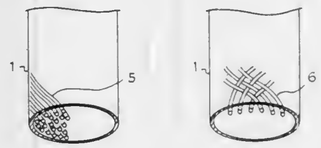
1. A solar cell comprising a substrate, a front surface of which has a plurality of grooves or hollows formed therein, and a rectifying junction formed on said surface and extending into said grooves, a top layer of said junction having a sheet resistivity which is greater in the region between the grooves than in the region within the grooves.

4,626,614

GAS COOLED CURRENT LEAD FOR SUPERCONDUCTING MACHINE

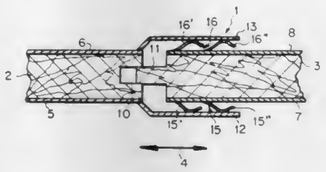
Susumu Shimamoto, Tokai; Toshinari Andoh, Katuta; Eisuke Tada, Katsuta; Yoshikazu Takahashi, Tokai; Akira Ishihara, Yokosuka; Yoshihiko Shindoh, Fujisawa, and Ikuo Itoh, Mobara, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Fuji Electric Co., Ltd., Kawasaki, both of, Japan

Filed Apr. 25, 1985, Ser. No. 726,983
Claims priority, application Japan, Jun. 15, 1984, 59-122000
Int. Cl.⁴ H01B *7/34*
U.S. Cl. 174—15 S **4 Claims**



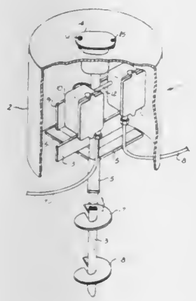
1. A gas cooled current lead for carrying an electric current from room temperature to a superconducting machine at a cryogenic temperature, said lead comprising:
(a) an outer tube containing a passageway and
(b) a plurality of electric conductor wires disposed within said passageway, each one of said plurality of electric conductor wires having a cross-sectional area that is less than 1/20,000 of the cross-sectional area of said passageway, said plurality of electric conductor wires occupying between 50% and 85% of the cross-sectional area of said passageway and being uniformly distributed over the cross-sectional area of said passageway,
whereby, in use, liquid helium at a cryogenic temperature can be passed among said plurality of electric conductor wires, efficiently cooling them.

4,626,615
RF EXPANSION JOINT FOR AN ELECTRICALLY SEALED ENCLOSURE
Garritt C. Van Dyk, Jr., Bethel, Conn., assignor to Keene Corporation, Norwalk, Conn.
Filed Apr. 8, 1985, Ser. No. 721,256
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 MS **4 Claims**



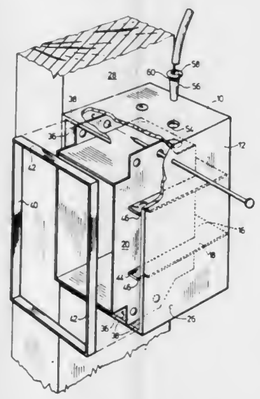
1. An RF expansion joint for an electrically sealed enclosure comprising first and second adajcent relatively movable wall members movable along a predetermined linear path, shielding material on at least one outer face of each said wall member, a first guide means on an end face of said first wall member extending along said linear path and parallel thereto, a second guide means on an end face of said second wall member extending along said linear path and parallel thereto and adapted to engage with the first guide means to align said wall members for linear movement throughout a range of movement relative to each other along said linear path, an extension to the shielding on said first wall member adjacent the end face having said first guide means, extending along said linear path and overlying the end face of the second wall member having said second guide means, and electrical sealing means, separate from said guide means, extending between said extension and the shielding on the second wall member.

4,626,616
ANTI-TAPPING DEVICE TO PREVENT UNAUTHORIZED CONNECTIONS TO ELECTRICAL UTILITY SERVICE CABLES
Larry C. Masters, P.O. Box 116, Travelers Rest, S.C. 29690
Filed Dec. 12, 1984, Ser. No. 680,901
Int. Cl.[4] H02G *9/00*
U.S. Cl. 174—37 **11 Claims**



4. An anti-tapping device to prevent unauthorized connections to utility service cable comprising:
(a) a support member;
(b) anchoring means attached to said support member and including means for securing and for removing said support member into and from a base support;
(c) means for mounting utility service cable junction connectors, said mounting means being carried by said support member;
(d) a housing member for enclosing cable junction connectors and enclosing said means for removing said support member from the base support; and
(e) lock means carried by said support member for rotatably mounting said housing whereby said housing rotates freely when an unauthorized attempt is made to remove same, thereby preventing access to cable junction connectors.

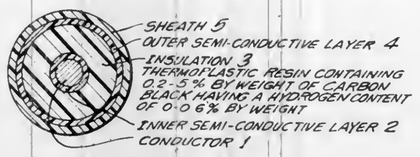
4,626,617
CONTAINER FOR ELECTRICAL OUTLETS
Glen Rye, R.R. #2, Keswick, Ontario, Canada (L4P 3E9)
Filed Jan. 9, 1985, Ser. No. 690,031
Claims priority, application Canada, Jan. 26, 1984, 446,053
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—53 **14 Claims**



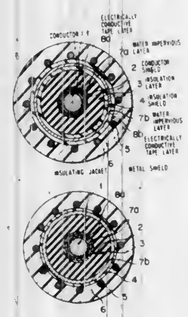
1. Container for electrical outlet box for use in combination with a vapor barrier of flexible material, comprising:
a unitary molded container having side and rear walls and a front opening, said container being designed and dimensioned to receive at least the rearward portion of an electric outlet box therein,
the side walls adjacent their forward edges defining generally forward-rearward extending surfaces which together substantially surround the front opening,
a ring member, having surfaces designed to be complementary to and to slide upon said side wall surfaces,
a flexible vapor barrier retained in place between said ring surfaces and said container surfaces.

4,626,618
DC ELECTRIC POWER CABLE
Michio Takaoka, Chiba; Tsuneaki Motai, Yachiyo; Motoyuki Ono, Sakura; Shotaro Yoshida, Tokyo; Toshio Niwa, Yachiyo; Toru Takahashi, Tokyo; Keiichiro Kataoka, Ichikawa, and Hiroshi Yamanouchi, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan
Filed May 3, 1985, Ser. No. 730,224
Claims priority, application Japan, May 8, 1984, 59-91520
Int. Cl.[4] H01B *9/02*
U.S. Cl. 174—105 SC **9 Claims**

1. A DC power cable comprising a conductor and an insulation of a thermoplastic resin formed around said conductor, said insulation containing about 0.2 to about 5% by weight of carbon black, the ratio of mineral oil absorption (cc/100 g) to specific surface (m^2/g) in said carbon black being not less than 0.7, and said carbon black having the hydrogen content of not more than 0.6% by weight.

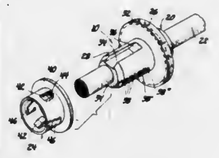


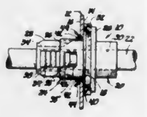
4,626,619
WATER IMPERVIOUS RUBBER OR PLASTIC INSULATED POWER CABLE
Tadayuki Uematsu, Chiba, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 651,644, Sep. 17, 1984, which is a continuation of Ser. No. 468,402, Feb. 22, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 799,189
Claims priority, application Japan, Feb. 7, 1983, 58-15372[U]
Int. Cl.[4] H01B *7/18*
U.S. Cl. 174—106 SC **14 Claims**



1. In an insulated power cable having a cable core comprising a conductor; an extruded conductor shield; an insulation layer selected from the group consisting of cross-linked polyethylene composition, polyethylene composition and ethylene-propylene rubber composition; and an extruded insulation shield; the last three members being sequentially formed around the conductor; and a metal shield layer formed around the cable core;
the improvement comprising:
a supporting layer of an electrically conductive tape layer wound directly around the conductor of the cable core; and
inner and outer water impervious layers, each comprising a laminated tape;
the inner water impervious layer comprising a lead foil layer and an electrically conductive plastic layer formed on at least one surface of the lead foil layer, the inner water impervious layer being longitudinally applied to a region around the conductor of the cable core and over said supporting layer, and said inner water impervious layer being arranged underneath and bonded to the conductor shield of the cable core; and
the outer water impervious layer comprising a lead foil layer and additional layers laminated on both surfaces of the lead foil layer, at least one of said additional layers of the outer water impervious layer being an electrically conductive plastic layer, the outer water impervious layer being positioned between the insulation layer of the cable core and the metal shield layer, and the outer water impervious layer being longitudinally applied to a region directly above the cable core and being bonded to the cable core.

4,626,620
WIRE BUNDLE AND GROMMET ASSEMBLY
Robert G. Plyler, Vienna, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 5, 1985, Ser. No. 804,618
Int. Cl.[4] H02G *3/22*; **H01B** *17/30*
U.S. Cl. 174—153 G **3 Claims**





1. A combined wire bundle and grommet assembly attachable to a panel having opposed surfaces so as to pass said wire bundle through an aperture in said panel, comprising,
a grommet body having a passage through which a wire bundle extends and within which said wire bundle is held fast with respect to said grommet body, said grommet body further including a stop portion that is sized larger than said aperture and an extension that is sized smaller than said aperture,
a cam member on said grommet body extension,
a retention sleeve slideably fitted over said grommet body extension and cam member, said retention sleeve being sized smaller than said aperture but for a stop portion sized larger than said aperture and spaced from said grommet body stop portion,
a retention member on said retention sleeve that normally lies substantially inboard of said retention sleeve so as to fit through said aperture, but which is movable outboard of said retention sleeve by said cam member when said grommet body extension slides relative to said retention sleeve in an operative direction so as to move said retention sleeve and grommet body stop portions toward one another, whereby, said wire bundle may be pulled through said aperture, thereby pulling said grommet body extension and retention sleeve through said aperture until said retention sleeve stop portion engages one of said opposed panel surfaces, thereby anchoring said retention sleeve with respect to said panel, continued pulling on said wire bundle then serving to slide said grommet body extension relative to said anchored retention sleeve in said operative direction with said relative sliding serving to engage said cam member with said retention member to thereby move said retention member sufficiently outboard of said retention sleeve to move past the perimeter of said aperture and into engagement with the other of said panel surfaces, said relative sliding continuing until said grommet body stop portion also engages said one panel surface, whereby, the engagement of said retention member and said grommet body stop flange with their respective opposed panel surfaces attaches said assembly to said panel.

4,626,621

CIRCUIT FOR GENERATING A POSITION IN DIGITAL FORM

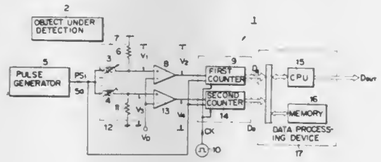
Yasuhiro Hiyama, and Kyoichi Fujimori, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Aug. 10, 1984, Ser. No. 640,168

Claims priority, application Japan, Aug. 10, 1983, 58-145059; Sep. 2, 1983, 58-160250

Int. Cl.[4] G01B *7/00;* **G08C** *19/08*

U.S. Cl. 178—18 **6 Claims**



1. A circuit for generating a position signal in digital form showing the position of an object under detection, comprising:

a pulse generator for generating a pulse signal;

a first detecting means which includes a first coil whose inductance value varies in accordance with the position of the object and generates a first pulse response signal relating to the inductance value of the first coil in response to the pulse signal;

a second detecting means which includes a second coil with a constant inductance value and generates a second pulse response signal relating to the inductance value of the second coil in response to the pulse signal; and

output means for producing a digital signal corresponding to a ratio between the inductance value of the first coil and that of the second coil as a digital position signal in response to at least the first and second pulse response signals, said output means including:

switching means for alternately taking out the first pulse response signal and the second pulse response signal,

a pulse signal generating means responsive to the output signal from the switching means for alternately generating a first pulse signal with a period corresponding to the inductance value of the first coil and a second pulse signal with a period corresponding to the inductance value of the second coil,

means for applying the output pulse signal from the pulse signal generating means as a synchronizing signal to said pulse generator,

means for generating a switching control signal for operating the switching means in response to the output signal from the pulse signal generating means, and

a computing means for computing a ratio between the inductance value of the first coil and that of the second coil in response to the first and second pulse signals, and

wherein said pulse generator generates the pulse signal synchronized with the output pulse signal from the pulse signal generating means, whereby the output digital data from said computing means can be used as digital position data.

4,626,622

TELEPHASING METHOD AND SYSTEM FOR REMOTELY IDENTIFYING UNKNOWN PHASES OF TRANSMISSION OR DISTRIBUTION LINES WITHIN AN ELECTRICAL NETWORK

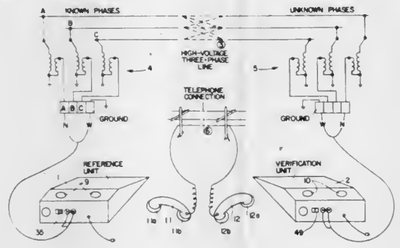
Michel Bouvrette, Ste-Sophié, Canada, assignor to Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 607,404, May 7, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,300

Claims priority, application Canada, Nov. 15, 1983, 441171

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—99 **44 Claims**



1. A telephasing system for identifying an unknown phase within a polyphase network used for transmission or distribution of electrical energy, by comparison of said unknown phase with a known reference phase, of said polyphase network, the reference phase and the unknown phase operating at alternating voltages of the same frequency, the reference phase being located at a point of said polyphase network far from a point of the polyphase network where the unknown phase is located, said telephasing system comprising:

a first device connected to the reference phase and a second device connected to the unknown phase, said first and second devices each comprising means for establishing a bidirectional communication interconnection between said first and second devices;

one of said first and second devices constituting a transmitting device and comprising means for producing a first signal representative of the alternating voltage of the phase connected to said transmitting device;

said means for establishing said communication interconnection comprising means for transmitting said first representative signal from the transmitting device to the other of said first and second devices through said communication interconnection;

said other device comprising means for producing a second signal representative of the alternating voltage of the phase connected to said other device, and means for identifying, from said first representative signal received from said transmitting device and from said second representative signal, the unknown phase by a detection of a phase angle between the alternating voltage of the unknown phase and the alternating voltage of the reference phase;

said telephasing system also comprising:

means for generating at least one short duration test signal and for bringing about a round trip of said test signal between said first and second devices through said bidirectional communication interconnection and the interconnection establishing means;

means for measuring a transmission delay of said round trip of the test signal between the first and second devices, and for determining, from said measured round trip transmission delay, a transmission delay of said first representative signal transmitted through the communication interconnection from the transmitting device to said other device; and

means for compensating for said transmission delay of the first representative signal determined by said measuring and determining means, in order to prevent any error introduced by said first representative signal transmission delay in said detection of the phase angle.

4,626,623

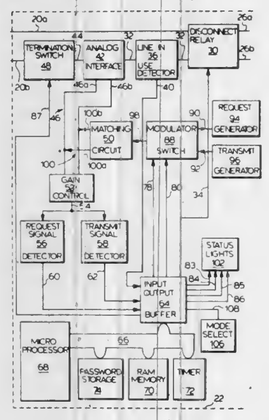
METHOD AND APPARATUS FOR TELEPHONE ACCESS SECURITY

Joseph G. LaHaye, 614 Colby Drive, Waterloo, Ontario, Canada

Filed Sep. 7, 1984, Ser. No. 648,067

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—95 **23 Claims**



8. An access security apparatus for use in association with a telephone system, and a telephoning device and an answering device, said answering device being operable to answer a telephone call from said telephoning device said access security apparatus comprising;

a receiving security unit connectable between said answering device and said telephone system;

disconnect relay means operable to temporarily interrupt said telephone call between said answering device and said telephone system, and more or less simultaneously, to establish a connection between said receiving security unit and said telephone system;

request signal generating means in said receiving unit being operable in response to a telephone call from said telephoning device to automatically generate a request signal requiring a coded response;

a transmitting security unit connectable between said telephoning device and said telephone system;

password transmit signal generating means in said transmitting unit being responsive to said request signal from said receiving unit and operable to automatically generated a digital password transmit signal, said digital password transmit signal being modulated onto an analogue carrier signal and deliver same to said receiving security unit, and,

a circuit means in said receiving security unit, said switch circuit means being responsive to said password transmit signal to automatically operate said disconnect relay to reestablish connection between said telephoning device and said answering device across said telephone system.

4,626,624

TELECOMMUNICATIONS SYSTEM, PARTICULARLY A TELEPHONE EXCHANGE SYSTEM, HAVING OVERLOAD PROTECTED SEQUENTIAL LOGIC SYSTEMS

Georg Daisenberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

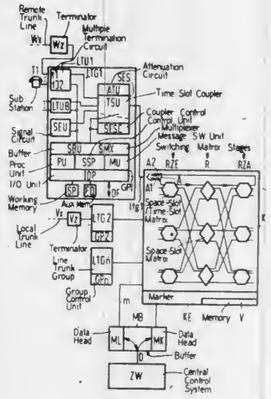
Filed Feb. 27, 1984, Ser. No. 583,893

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311866

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.[4] H04M *15/26*

U.S. Cl. 379—137 **2 Claims**



1. A telecommunication system comprising:

a plurality of lines and trunks, arranged in groups, for connection to subscriber stations and for carrying call information including initial switching identifiers and subsequent selection characters to be processed and which are announced by said initial switching identifiers;

a central information-processing system having a limited call-handling capability with respect to its information-processing capacity;

a switching network connected to said central information processing system;

a plurality of partially-centralized switching devices each connected to a respective line/trunk group and to said central information-processing system via said switching network, and each operable to receive, intermediately store and transit call information to said central information-processing system for processing to set up calls between calling and called subscriber stations;

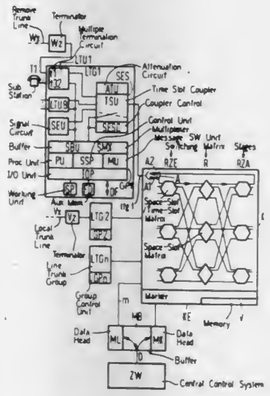
traffic load measuring means connected to each of said partially-centralized switching devices and responsive to said initial switching identifiers to produce control signals representing the information-processing traffic load; and

a plurality of cyclically-deincremented counting means each connected to a respective partially-centralized switching device and to said traffic load measuring means, each of said counting means incremented by said control signals and operable to produce and transmit an overload signal to the respective partially-centralized switching device upon reaching a predetermined count representing a traffic load limiting value to cause the respective partially-centralized switching device to reject further initial switching identifiers until the respective counting means has been deincremented below said predetermined count so that said central information-processing system does not reach an overload condition.

4,626,625
TELECOMMUNICATIONS SYSTEM, PARTICULARLY A TELEPHONE EXCHANGE SYSTEM, HAVING OVERLOAD PROTECTED SEQUENTIAL LOGIC SYSTEMS

Georg Daisenberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 584,120
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311875
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] H04M *15/26*
U.S. Cl. 379—137 3 Claims

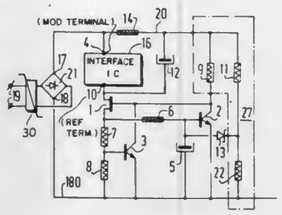


1. A telecommunications system comprising:
a plurality of lines and trunks, arranged in groups, for connection to subscriber stations and for carrying call information including initial switching identifiers as control signals followed by characters;
a central information-processing system having a limited call-handling capability with respect to its information-processing capacity;
a switching network connected to said central information processing system;
a plurality of partially-centralized switching devices each connected to a respective line/trunk group and to said central information-processing system via said switching network, and each operable to receive, intermediately store and transmit call information to said central information-processing system for processing to set up calls between calling and called subscriber stations;
traffic load measuring means connected to each of said partially-centralized switching devices and responsive to said initial switching identifiers to produce control signals representing said switching identifiers and therefore representing the information-processing traffic load;
a plurality of cyclically-decremented counting means each connected to a respective partially-centralized switching device, each of said counting means incremented only by said control signals representing switching indentifiers and operable to produce and transmit an overload signal to the respective partially-centralized switching device upon reaching a predetermined count representing a traffic load limiting value to prevent acceptance of following characters when such characters have not yet been received and prevent the acceptance of further initial switching identifiers when such characters have already been received; and
means connected to and operable to cyclically deincrement said counting means at uniform time intervals.

4,626,626
INTERFACE FOR A TELEPHONE SET

Jean-Pierre Coulmance, Osny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,608
Int. Cl.[4] H04M *3/00*
U.S. Cl. 379—394 11 Claims



1. An apparatus comprising an electronic interface circuit for a telephone set connected to a telephone line over which modulated signals are transmitted, said telephone set having a rectifier bridge circuit connected to said telephone line and an integrated circuit connected to said rectifier bridge circuit, said integrated circuit having a modulation terminal to which the modulated signals are applied and a reference terminal, said interface circuit comprising: first controlled impedance means having a control electrode and first and second output electrodes, said first output electrode being connected to said reference terminal; current-measuring resistor means connected between said bridge circuit and said second output electrode; and current regulating means connected to said current-measuring resistor means and to said control electrode for controlling the impedance of said first controlled impedance means; the improvement consisting of negative feedback means for limiting current in said telephone line, said negative feedback means comprising:
first and second load resistance means connected at a common junction and connected in series between said control electrode of said first controlled impedance means and said modulation terminal; and
capacitor means connecting said common junction to said reference terminal;
said first load resistance means and said capacitor means providing negative feedback from said first output terminal of said first controlled impedance means to said control electrode thereof, thereby reducing the impedance of said first controlled impedance means for modulated signals transmitted over the telephone line.

4,626,627
TELEPHONE LINE SELECTOR FOR USE WITH A PBX

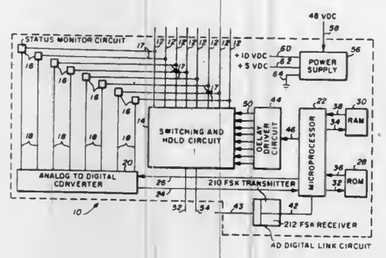
Frank L. Van Gilluwe, Sunnyvale; Samuel B. Dunham, Santa Clara, and Douglas A. Cross, San Mateo, all of Calif., assignors to Teledex, Santa Clara, Calif.

Filed Oct. 7, 1983, Ser. No. 540,135
Int. Cl.[4] H04M *3/50;* H04Q *3/64*
U.S. Cl. 379—214 8 Claims

MICROFICHE APPENDIX INCLUDED
(76 Microfiche, 2 Pages)

1. A telephone line selector comprising:
a plurality of telephone lines from a PBX;
a plurality of means for individually monitoring the status of each of said telephone lines and generating a signal corresponding to said status;
a plurality of means for selectively connecting said telephone lines, one at a time, to a first or second secretarial telephone unit;
a plurality of means for selectively placing said telephone lines on hold;
a programmable microprocessor;
a means for transmitting each status signal to said microprocessor;

a means for transmitting digital signals between said microprocessor and executive telephone units and secretarial telephone units associated in a work group; and
a means for transmitting control signals from said microprocessor to said plurality of means for selectively connecting said telephone lines and for selectively placing said telephone lines on hold such that the telephone lines

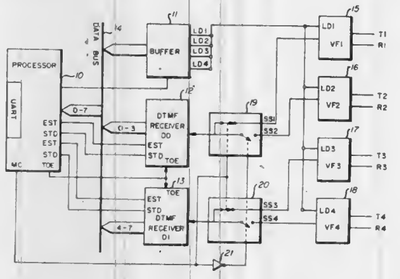


are connected to the first or second secretarial telephone unit or placed on hold in response to digital signals received by said microprocessor over said means for transmitting digital signals;
whereby the telephone line selector provides selective connection of said telephone lines to said secretarial units of said work group.

4,626,628
TELEPHONE LINE CIRCUIT HAVING TIME-SHARED DTMF RECEIVERS

Johann D. Ramsaran, Carleton Place; Bora Biray, Nepean; Nadir Nizamuddin, and Anthony Yung, both of Calgary, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 27, 1984, Ser. No. 655,128
Int. Cl.[4] H04M *3/00*
U.S. Cl. 379—283 16 Claims

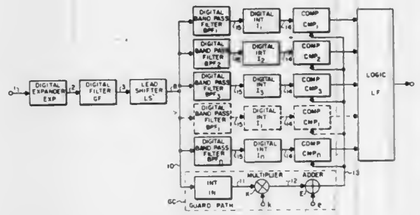


1. A circuit for time-sharing a DTMF tone receiver comprising:
a DTMF receiver having an input terminal for receiving a sequence of tone signals and an output terminal for providing output signals representative of the identity of the sequence of tone input signals,
a pair of transmission gates having their output terminals connected together to the input terminal of the receiver and their input terminals respectively connected to the first and second terminals;
a control circuit including means for generating timing signals, the control circuit providing switching signals to the transmission gates to cause each of the first and second terminals to be connected alternately to the input terminal of the receiver at a predetermined rate until the receiver detects an individual tone signal of the sequence of tone signals on at least one of the first and second terminals, the control circuit including means responsive to said initial detection for inhibiting the further generation of switching signals until the individual tone detection by the receiver has been completed.

4,626,629
DIGITAL MULTIFREQUENCY SIGNAL RECEIVER

Giacomo Premoli, and Giacomo Cannalire, both of Milan, Italy, assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed Dec. 14, 1984, Ser. No. 681,755
Int. Cl.[4] H04M *1/50*
U.S. Cl. 379—386 12 Claims

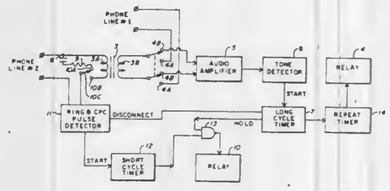


1. A digital detector device for telephone band multifrequency signalling comprising:
a digital filter having an input to which the signal source is connected and an output,
a level shifter amplifier having an input connected to the output of said digital filter and an output,
a plurality of individual frequency detectors each having a first and a second input and an output,
said frequency detectors each comprising;
a band pass filter connected to the output of said level shifter,
a digital integrator and,
a comparator connected in series,
a guard path circuit comprising an integrator, a digital multiplier and an adder circuit, in series, an input to said integrator connected to the output of said level shifter, and an output connected to the second input of each of said comparator circuits,
said output comprising a variable reference level for said signal comparison in said comparator circuits.

4,626,630
TELEPHONE CALL FORWARDING DEVICE

Herbert H. Waldman, Brooklyn, N.Y., assignor to Louis Orenbuch, Boston, Mass.

Filed Dec. 20, 1984, Ser. No. 684,021
Int. Cl.[4] H04M *3/54*
U.S. Cl. 379—199 6 Claims



1. Telephone call forwarding apparatus for enabling call

forwarding instructions to be given over a subscriber's procured service telephone line from a second telephone line, the apparatus comprising,

(a) line seizure means for seizing the second telephone line,

(b) ring signal detector means responsive to ring signals on the second telephone line for causing the line seizure means to seize the second telephone line,

(c) switch means responsive to the ring signal detector means for coupling audio signals between the second telephone line and the subscriber's procured service phone line,

(d) a long cycle timer for continuously maintaining seizure of the second telephone line for the period of the long cycle, and

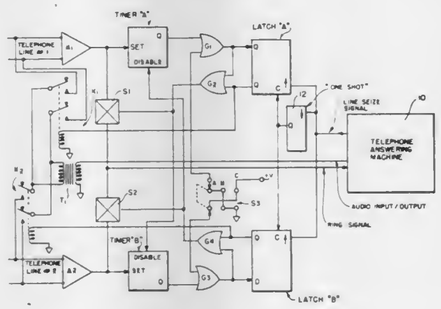
(e) repeat timer means for automatically and repetitively, during the long cycle period, causing the switch means alternatingly to seize the procured service phone line for an interval in which call forwarding instructions can be given and to release the procured service phone line for a second interval whose duration enables a new dial tone to be subsequently obtained on the procured service phone line.

4,626,631

DUAL LINE ADAPTER FOR TELEPHONE ANSWERING MACHINE

Bradford E. Hanscom, Downey, Calif., assignor to Fortel, Inc., Compton, Calif.

Filed May 28, 1985, Ser. No. 738,289
Int. Cl.[4] H04M *1/64, 11/10*
U.S. Cl. 379—165 **3 Claims**



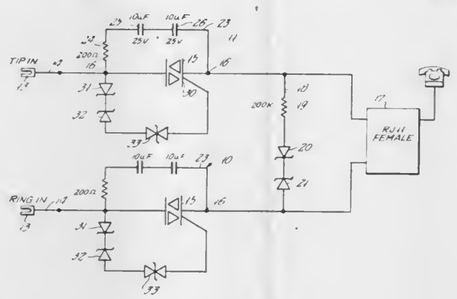
1. An adapter circuit and system for coupling a telephone answering machine to first and second telephone lines, said telephone answering machine including a coupling circuit for transmitting audio signals between the first and second telephone lines and the telephone answering machine, and a line seizure relay circuit included in said coupling circuit responsive to a line seize signal from the telephone answering machine for connecting the coupling circuit to the first and second telephone lines, said adapter circuit and system including: a first input circuit adapted to be connected to the first telephone line for producing a first output signal in response to a first ring signal received thereby over the first telephone line; a second input circuit adapted to be connected to the second telephone line for producing a second output signal in response to a second ring signal received thereby over the second telephone line; first switching means connected to the first input circuit and responsive to said first output signal for enabling said first input circuit to introduce the first ring signal received thereby to the telephone answering machine; second switching means connected to the second input circuit and responsive to said second output signal for enabling said second input circuit to introduce the second ring signal received thereby to the telephone answering machine; first latching circuit responsive to said line seizure signal from the telephone answering machine to latch said first switching means closed following the occurrence of the first output signal; a second latching circuit responsive to said line seizure signal from the telephone answering machine to latch said second switching means closed following the occurrence of the second output signal; and disabling circuitry interconnecting said first and second input circuits to prevent the closure of either one of said switching means when the other has been latched closed.

4,626,632

MAINTENANCE TERMINATION UNIT

Thomas Mazz, Huntington Station, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jul. 25, 1985, Ser. No. 760,055
Int. Cl.[4] H04B *3/46;* **H03K** *17/72*
U.S. Cl. 379—29 **3 Claims**



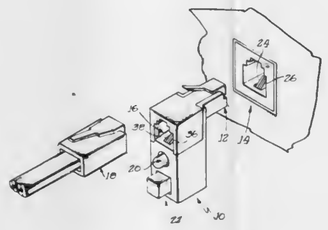
1. In a telephone maintenance termination unit for forming a closed circuit loop in a subscriber pair at a subscriber demarcation point, the unit including at least one triac, the opening of which permits conductivity only of alternating currents, improved means for placing said triac in a non-conductive mode including a series connection from one of said pair to a control element of said triac, said connection including a first Zener diode of first polarity, a second Zener diode of opposed polarity, and an SBS switch.

4,626,633

IN-LINE SWITCHED TELEPHONE LINE TESTER

William E. Ruehl, Wheeling, and E. Grant Swick, Bartlett, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Feb. 4, 1985, Ser. No. 698,068
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—27 **13 Claims**



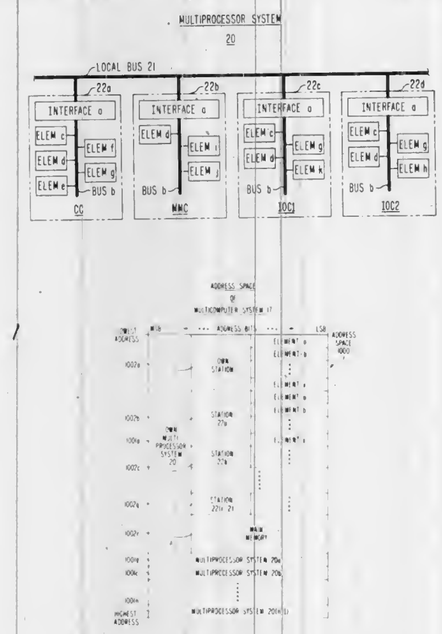
1. An in-line switched telephone tester apparatus comprising: a tester body defining a male connector portion of complementary configuration for insertion into a jack and a female connector portion of complementary configuration for receiving a plug; electrical contact means aligned with said male and female connector portions for engaging tip and ring contacts of said jack and said plug respectively; light emitting means having a light body and a pair of elongate leads; pushbutton means comprising a pushbutton body; mounting means for mounting said light body; and guide means for guiding said elongate leads into a predetermined alignment relative to said electrical contact means; said pushbutton body being movably mountable to said tester body for movement between a first position wherein said elongate leads are in electrically conductive contact with said electrical contact means and a second position wherein said elongate leads are out of electrically conductive contact with said electrical contact means.

4,626,634

MULTIPROCESSOR COMPUTING SYSTEM FEATURING SHARED GLOBAL CONTROL

David J. Brahm, Naperville; James M. Grinn, Warrenville; Edward L. Hepler, and Edward P. Schan, Jr., both of Woodridge, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1982, Ser. No. 430,681
Int. Cl.[4] H04M *3/28*
U.S. Cl. 379—28 **23 Claims**



1. In a data processing communication or telephone system, a multiprocessor comprising:

a plurality of stations, each having a first plurality and a second plurality of addresses associated therewith, the addresses of the first plurality of addresses of each station being exclusive to that station and the addresses of the second plurality of addresses being common to the stations;

each station including a plurality of addressable elements, each element having a first address from the first plurality of addresses and a second address from the second plurality of addresses associated therewith;

the plurality of elements of each station including a plurality of common elements each having a functional counterpart common element in at least one other station, each common element and it counterpart common elements having the same second address associated with them;

a system communication medium interconnecting the plurality of stations;

each station including a station communication medium interconnecting the plurality of elements of the associated station;

at least two of the plurality of stations each including element accessing means for selectively generating the first address of an element of another station on the system medium to access the element of the other station, and for selectively generating the second address of an element of the associated station on the station medium of the associated station to access the element of the associated station; and

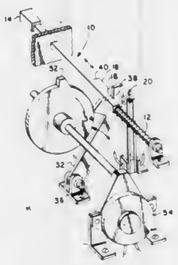
each station including first interface means for connecting the system medium with the station medium of the associated station in response to detecting an address from the first plurality of addresses of the associated station on the system medium.

4,626,635

LATCHING PUSH BUTTON SWITCH

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 490,269, May 2, 1983, Pat. No. 4,523,062. This application Jan. 31, 1985, Ser. No. 696,766
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 A **11 Claims**



1. A switch comprising:

a push button member which is movably mounted for movement at least between first and second positions for selectively moving a control device at least between first and second states;

a biasing means for biasing the push button member toward the first position, the biasing means being operatively connected with the push button member;

a hold means for selectively holding the push button member in the second position, the hold means being operatively connected with the push button member;

a follower member mounted for movement at least in and out of a release position, in the release position the follower member selectively causing the hold means to release the push button member from being held in the second position;

a timing means for intermittently moving the follower member to the release position to release the push button member after a selected duration; and,

said hold means including selectively engaging hold surfaces on the push button member and the follower member, movement of the follower member to the release position moving the hold surfaces out of engagement.

4,626,636

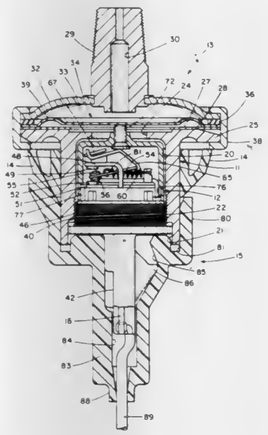
PRESSURE OPERATED SWITCH ASSEMBLY WITH EXTERNAL PRESSURE CONTROL

Ronald J. Hickman, Rochester, and John M. Gerula, Chatham, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 25, 1985, Ser. No. 715,837
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—83 P **7 Claims**

1. A pressure operated electric switch assembly, comprising; housing means having a flexible diaphragm therein communi-

cating with a pressure chamber, said housing means having an inlet fitting communicating with said chamber, a self-contained switch unit axially adjustable in the housing means having an actuator in engagement with the diaphragm, said switch unit having a portion thereof projecting from the housing means with an indicator thereon, indicia representing pressure mounted on the outside of the housing means adjacent the indicator, and interengaging means on the housing means and the switch unit to produce incremental axial movement of the switch unit in the housing means to vary the diaphragm travel



required for switch unit actuation and to move the indicator with respect to the indicia and provide the operator with a visual representation of switch actuation pressure, said interengaging means between the housing means and the switch unit including interengaging threads whereby upon rotation of the switch unit relative to the housing means the switch unit moves axially in the housing means to vary switch actuation pressure, said indicator being carried by an elastomeric boot covering and sealing the projecting portion of the switch unit to the housing means.

4,626,637

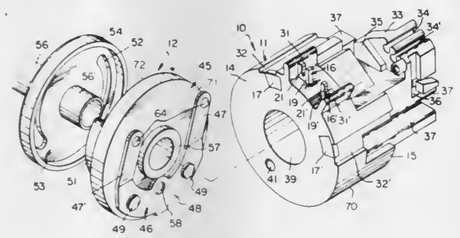
CONTACT ASSEMBLY

Billy E. Olsson, New Cumberland, and David W. Rupnik, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 535,505, Sep. 26, 1983. This application Jun. 13, 1985, Ser. No. 744,350

Int. Cl.[4] H01H *1/40*

U.S. Cl. 200—284 **18 Claims**



2. A contact assembly for a rotary switching unit capable of being incorporated into a vehicle suspension unit and of the type comprising a stator and a rotor securable in a datum position within a cylinder of said vehicle suspension unit, wherein:

said stator comprises a cylindrical stator block having a front contact face, a peripheral side and a rear face and being moulded in one piece from insulating plastics material and having secured therein a plurality of metal terminals each having a contact portion, a wire-connecting portion and a body portion therebetween;

said terminals have been moulded in the stator block with said contact portions located in circumferentially spaced relation flush with the surface of said front contact face forming a planar contact surface, and said wire-connecting portions protrude from said peripheral side of the stator block at a location spaced axially rearwardly of said planar contact surface to receive a wire for electrical connection thereto;

said stator block has mounting means for being coaxially mounted onto cooperating mounting means of said cylinder extending diametrically inwardly therefrom, said stator block having a substantial axial dimension such that said mounting means is securable to said cooperating mounting means at at least two axially spaced locations for stabilized mounting of said stator block within said cylinder, and said stator block has a bore extending axially therethrough to receive an operating shaft means of said switching unit freely rotatable therewithin;

said rotor comprises an insulating plastics disc having a front face spaced from said planar contact surface of said stator and carrying secured on said front face a circumferentially extending brush conductor having resilient contact arms extending forwardly from said front rotor face toward said planar contact surface, and contact arms having on free ends thereof brush contact portions arranged to wipe around said planar contact surface into and out from registration with the contact portions of the terminals with minimal contact wear; and

said rotor has mounting means for being mounted securely onto said operating shaft means of said switching unit extending axially therethrough.

4,626,638

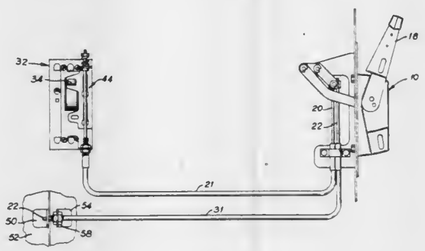
OPERATING SYSTEM FOR REMOTE ELECTRICAL EQUIPMENT

Billy G. Samples; Ralph L. Newton, both of Tucker, and Steven A. Kaufman, Decatur, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Dec. 6, 1984, Ser. No. 678,719

Int. Cl.[4] H01H *3/02, 9/22*

U.S. Cl. 200—331 **5 Claims**



1. Apparatus for operating an electrical control device having a generally reciprocating toggle and disposed within an enclosure, comprising:

a slave operator including a fixed member adapted to be attached to the device adjacent the toggle and a movable member slidably attached to said fixed member and having an opening for receiving the toggle therein;

a master operator disposed remotely with respect to the device and having at least a handle portion extending outside the enclosure, including a movable linkage coupled to the handle portion, and a stationary portion adjacent said linkage; an

a cable assembly including a sheath and an operating member, said sheath being coupled at a first end to one of said linkage and said stationary portion of said master operator and having a second end coupled to one of said fixed member and said movable member of said slave operator, said operating member having a first end coupled to the other of said linkage and stationary portion, and a second end coupled to the other of said fixed member and said movable member.

4,626,639

APPARATUS FOR STABILIZING A KEYBOARD SWITCH ASSEMBLY AGAINST CANTILEVER MOVEMENT

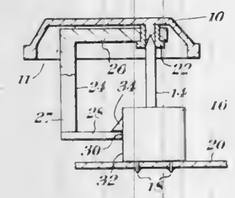
Robert G. Bradford, Falkirk, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 295,969, Aug. 25, 1981, abandoned. This application Jul. 11, 1984, Ser. No. 630,331

Claims priority, application United Kingdom, Dec. 5, 1980, 8039047

Int. Cl.[4] H01H *3/12*

U.S. Cl. 200—340 **17 Claims**



1. A stabilizing apparatus for reducing cantilever movement of a button operating a switch assembly on a baseboard in an electrical keyboard, said switch assembly including a shaft and a housing, said shaft being depressibly insertable into said housing to operate said switch assembly, said button being affixed at the distal end of said shaft for the depression thereof, said switch housing including a first bearing surface parallel to the direction of depression of said shaft, said shaft and said button being subject to the receipt of depressive forces in a preferred direction off-center from the axis of said shaft to cause said cantilever movement of said button, said apparatus comprising:

stabilizing arm means for reducing said cantilever movement of said button, said stabilizing arm means being rigid, said stabilizing arm means coupled in rigid relationship to said shaft, said stabilizing arm means having a first surface rigidly coupled to said shaft and a second surface in free sliding cooperation with said first bearing surface to thereby permit depression of said button.

4,626,640

MICROWAVE ARRANGEMENT FOR HEATING MATERIAL

Bernardus F. van der Heijden, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

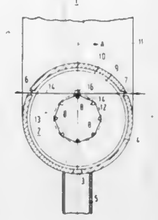
Filed Sep. 25, 1985, Ser. No. 779,770

Claims priority, application Netherlands, Oct. 2, 1984, 8402999

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 A **20 Claims**

1. A microwave arrangement for heating material in a continuous process comprising a cylindrical resonator having an axis and connectable to a microwave energy source, transport means for conveying the material through the resonator via apertures provided in a wall of the resonator, the transport means conveying the material through the resonator in a direction substantially perpendicular to the axis of the resonator over a curved path in a cylindrical mantle surface located concentrically relative to an inner wall of the resonator, the resonator being dimensioned so that, on excitation thereof,



high field concentrations are generated in the region of the curved path whereby the material is automatically conveyed through said regions of high field concentrations.

4,626,641

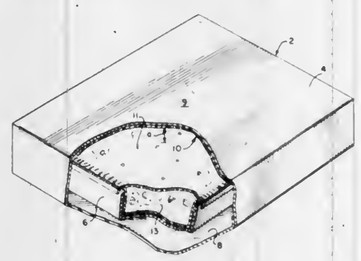
FRUIT AND MEAT PIE MICROWAVE CONTAINER AND METHOD

Richard K. Brown, Appleton, Wis., assignor to James River Corporation, Norwalk, Conn.

Filed Dec. 4, 1984, Ser. No. 678,216

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 E **19 Claims**



1. A container for protection of a food product during shipment and for use in heating, crisping and browning the food product having a top surface in a microwave oven, comprising:

(a) an insert means for containing the food product, said insert means having a predetermined height; and

(b) a microwave transmissive outer carton means for containing and supporting said insert means, said outer carton means having a cooking means for browning and crisping the top surface of the food product through radiated heat energy that includes a layer of microwave interactive material affixed to an underside of a top wall of said outer carton, and said outer carton means defining a receiving space for the insert means of a second predetermined height that is greater than the height of said insert means, in a manner coordinated to the food product intended for use therein, for causing said layer of microwave interactive material to be vertically spaced above the top surface of the food product by a vertical distance which maximizes the browning and crisping effect of said cooking means without overcooking or scorching the top surface of the food product, said vertical distance being no greater than approximately 2.7 cm.

4,626,642

MICROWAVE METHOD OF CURING A THERMOSET POLYMER

Chen-Shih Wang, Troy, and Darrel S. Nelson, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1985, Ser. No. 785,511
Int. Cl.[4] H05B 6/80
U.S. Cl. 219—10.55 M 2 Claims

1. A method of rapid curing a thermoset polymer used as an adhesive in the bonding of automotive plastic components comprising the steps of:

blending and dispersing into said thermoset polymer less than sixty weight percent of total weight electrically conductive metal fibers selected from the group consisting of steel and aluminum, said fibers having a minimum average aspect ratio of 5 and a maximum average diameter of 500 microns,

bonding said automotive plastic components together with said fiber containing thermoset polymer adhesive and clamping under sufficient pressure such that said automotive plastic components are in intimate contact with said fiber containing thermoset polymer adhesive,

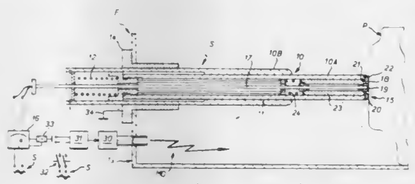
establishing a field of microwave energy for a time period of at least 10 seconds across the thermoset polymer for inducing sufficient electrical energy in said fibers such that heat is generated to rapidly cure said thermoset polymer and bond said automotive plastic components together.

4,626,643

HEAT SENSOR FOR MEASURING THE TEMPERATURE OF A PRODUCT HEATED IN A MICROWAVE OVEN

Michel Minet, Ezanville, France, assignor to Valeo, Paris, France

Filed Apr. 3, 1985, Ser. No. 719,485
Claims priority, application France, Apr. 4, 1984, 84 05292
Int. Cl.[4] H05B 6/68
U.S. Cl. 219—10.55 B 14 Claims



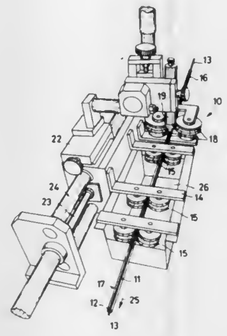
1. Heat sensor of the type adapted to be brought into contact with a product being heated in a microwave oven the temperature of which product is to be measured, said heat sensor comprising an elongate tubular body defining a protective armor and being open at a forawrd end, the forward end of said tubular body carrying a separately formed product engageable ring, said ring protruding radially inwardly of said body to reduce the size of the opening of said body forward end, a thermally conductive product engageable pad disposed in said body at said open forward end and facing axially outwardly at the open end of said body, a clearance being formed between said pad and ring, a heat-sensitve electrical component incorporated in said pad, and a cable extending along the inside of said body for connecting said component to a temperature measurement electrical circuit.

4,626,644

METHOD AND APPARATUS FOR AUTOMATICALLY PRODUCING THIN-WALLED TUBES

Aldo Parmeggiani, Milan, Italy, assignor to CISE-Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed May 11, 1984, Ser. No. 609,133
Claims priority, application Italy, May 13, 1983, 21095 A/83
Int. Cl.[4] B23K 9/02, 9/225
U.S. Cl. 219—61 6 Claims



1. A method of starting, stopping and restarting welding to form a longitudinal welded seam during the production of thin-walled tubes from shaped metal tape comprising the steps of:

(a) providing means for shaping, welding and cooling a metallic tube;

(b) during a "CYCLE START" stage simultaneously shifting the shaping, welding and cooling means from a first inoperative position to a second operative position in a first direction and moving the shaped tube in a second direction opposite the first direction to the second operative position while gradually raising the welding current amperage from a zero value to a steady state value between said first and second positions thereby effecting welding at the second position;

(c) during a "STEADY STATE" stage maintaining the shaping, welding and cooling means at the second position while continuously moving the shaped tube in the second direction to form a continuous longitudinally welded seam;

(d) during a "CYCLE STOP" stage simultaneously shifting the shaping, welding and cooling means from the second operative position to the first inoperative position in the second direction and gradually decreasing the welding current amperage from the steady state value thereof to a nearly zero value, thus forming an end of the longitudinally welded seam while maintaining the shaped tube stationary; and

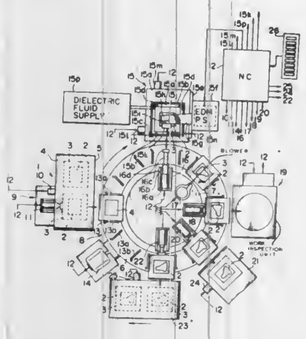
(e) during a "CYCLE RESTART" stage simultaneously shifting the shaping, welding and cooling means from the first inoperative position toward the second operative position in the first direction while raising the welding current amperage from the nearly zero value of step (d) to and reaching the steady state value thereof at a point along the previously formed longitudinally welded seam spaced from the welded seam end and again continuously moving the shaped tube in the second direction creating an overwelded seam and a continuation of the longitudinally welded seam.

4,626,645

AUTOMATIC TW ELECTROEROSION MACHINING SYSTEM

Kiyoshi Inoue, Tokyo, and Akihiko Shimizu, Kanagawa, both of Japan, assignors to Inoue-Japax Research Incorporated, Kanawaken, Japan

Filed Sep. 12, 1984, Ser. No. 650,293
Claims priority, application Japan, Sep. 12, 1983, 58-166599
Int. Cl.[4] B23H 7/00
U.S. Cl. 219—69 W 1 Claim



1. A TW (traveling-wire) electroerosion system for machining a plurality of workpieces of different types required to acquire different contours, comprising:

a store adjacent a predetermined path and having a plurality of separate seats for storing unmachined workpieces of different types;

work dispensing means associated with said store and having a first set of operating units operable under control commands to successively dispense the different workpieces from the respective seats in a prescribed order onto said path having respective seats;

a TW machine located adjacent said path and having a second set of operating units operable under control commands for electroerosively machining each of the dispensed workpieces from said path by means of a traveling wire-type electrode, said TW machine having a tank defined by four walls angularly adjoining one another at right angles and including a frontal wall facing said path, and front wall moving means for moving said frontal wall out of a normal position thereof to allow a workpiece to be displaced from a respective seat of said path opposite said tank into said tank, and for moving said frontal wall back into said normal position;

electrode setting means associated with said machine and having a third set of operating units operable under control commands for machining a start hole and automatically threading the wire-type electrode therethrough in the workpiece to initiate the TW-electroerosion thereof;

work handling and transfer means having a fourth set of operating units operable under control commands for transferring the workpiece along said path, and loading the workpiece from the path onto said machine and unloading the workpiece from the machine onto said path when said frontal wall is out of said normal position; and

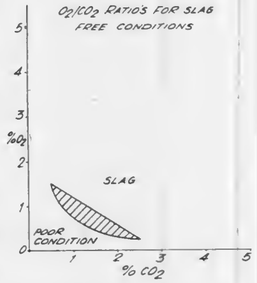
control means connected with said first, second, third and fourth sets of operating units for operating said work dispensing means, said TW machine, said electrode setting means and said work handling and transfer means and connected to said front wall moving means for moving said frontal wall to sequentially execute the plurality of work processing operations which are equal in number to the number of the workpieces and, in each of the processing operations, for selecting a particular one of the workpieces from the corresponding seat in said store according to said prescribed order to dispense it onto said path, transferring the dispensed workpiece along said path, opening said tank by moving said frontal wall, loading said workpiece on said machine in said tank, closing said tank, positioning the loaded workpiece to establish therein relative to the axis of the wire-type electrode a particular position of the starting hole from which to start the TW-electroerosion, forming said start hole in the workpiece at said particular position and threading the wire-type electrode through said hole, axially advancing the threaded electrode, effecting relative displacement, while effecting stock removal, between the workpiece and the advancing electrode along a particular path programmed to generate the prescribed contour in said particular workpiece, and unloading the machined workpiece from said machine onto said path.

4,626,646

SHIELDING GAS FOR ELECTRIC ARC WELDING

Derrick E. Hilton, Manchester, England, assignor to BOC Limited, London, England

Filed Nov. 30, 1983, Ser. No. 556,501
Claims priority, application United Kingdom, Sep. 12, 1983, 8235074
Int. Cl.[4] B23K 9/00, 35/38
U.S. Cl. 219—74 16 Claims



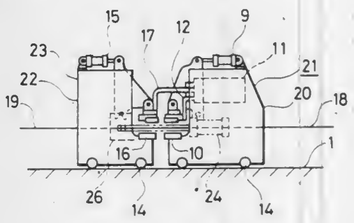
1. A shielding gas mixture for welding, comprising by volume carbon dioxide within the range 1.75% to 2.25% together with oxygen within the range 0.25% to 1.0% with the remainder being helium and argon except for incidental impurities.

4,626,647

FLASH WELDING MACHINE

Akimichi Takeda, and Akiyoshi Uomori, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

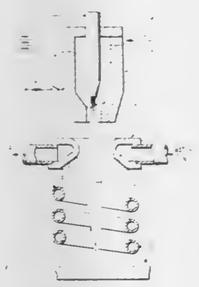
Filed Jul. 18, 1985, Ser. No. 756,422
Claims priority, application Japan, Jul. 19, 1984, 59-151507
Int. Cl.[4] B23K 11/04
U.S. Cl. 219—97 1 Claim



1. An apparatus for butt welding a trailing edge of a preceding metal strip (18) to a leading edge of a following metal strip (19) during the continuous conveyance of the strips in a common direction, comprising:

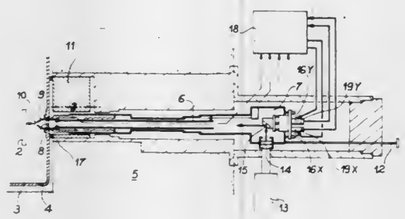
(a) a stationary set of rails (**1**) disposed parallel to the direction of conveyance,
(b) a first, preceding carriage (**21**) directly and movably mounted on the rails,
(c) a second, following carriage (**23**) directly and movably mounted on the rails,
(d) each of the carriages including respective clamping electrode pairs (**10, 16**) and actuating means (**9, 15**) operatively coupled thereto,
(e) means (**11, 12, 17**) mounted on one of the carriages for electrically energizing the electrode pairs,
(f) fluid piston and cylinder means (**24–26**) directly intercoupling the first and second carriages for controlling a separation therebetween, and
(g) first and second strip edge detectors (**27, 28**) respectively mounted on the second and first carriages and spaced apart in the direction of conveyance, an output of the first detector:
(1) initiating the movement of both carriages in the direction of conveyance upon detecting the trailing edge of the preceding strip, and
(2) increasing the feed velocity of the following strip upon detecting the leading edge thereof, and
an output of the second detector:
(1) energizing the actuating means on the first carriage upon detecting the trailing edge of the preceding strip to clamp said preceding strip between the electrode pairs on the first carriage,
(2) energizing the actuating means on the second carriage upon detecting the leading edge of the following strip to clamp said following strip between the electrode pairs on the second carriage, and concurrently,
(3) reducing the feed velocity of the following strip, and
(4) actuating the piston and cylinder means to reduce the separation between the first and second carriages to abut the strip edges pursuant to a flash welding thereof.

4,626,648
HYBRID NON-TRANSFERRED-ARC PLASMA TORCH SYSTEM AND METHOD OF OPERATING SAME
James A. Browning, P.O. Box 6, Hanover, N.H. 03755
Filed Jul. 3, 1985, Ser. No. 751,648
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121 PY **4 Claims**



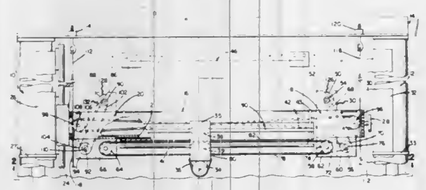
1. A hybrid non-transferred-arc plasma torch system comprising:
a plasma torch,
said torch including a plasma torch body,
said body being hollow and having a chamber therein opening to the body exterior through a relatively small diameter nozzle,
passage means for supplying a plasma gas to said chamber,
a cathode carried by said plasma torch body coaxial with said nozzle and functioning under a created arc to issue an arc flame through the nozzle,
an exterior anode electrically isolated from said cathode and the plasma torch body coaxial of said nozzle and spaced downstream therefrom,
said exterior anode having a passage therethrough axially aligned with said nozzle and an active anode surface surrounding said passage of relatively large area radially remote from the axis of the arc flame issuing from said torch.
means for initially subjecting said cathode and said anode of said plasma torch body to a potential difference sufficient to create an arc therebetween, and for subsequently subjecting said cathode and said exterior anode to a potential difference to cause said arc to extend through said exterior anode passage,
and wherein said torch and said anode are positioned such that said arc flame extends to and freely beyond the active anode surface such that a reverse flow of electrons completes the circuit from the arc flame beyond the anode surface back to said active anode surface, wherein said exterior anode comprises a cup-shaped member fixed to said torch body and extending axially beyond the body at said end bearing said nozzle to define a secondary gas chamber about the arc-flame exiting from the torch body nozzle and passing through said exterior anode passage, and means for supplying a secondary gas to said secondary gas chamber such that the secondary gas forms a sheath of non-ionized gas between the arc column and the wall of the exterior anode defining said passage therethrough, axially aligned with said torch body nozzle which functions to constrict the arc of said hybrid non-transferred-arc plasma torch system through said exterior anode passage and the portion of the arc which extends freely beyond the active anode surface.

4,626,649
CONTROL DEVICE FOR THE AUTOMATIC ALIGNMENT OF A LASER BEAM
Benoit Dupeyrat, Chilly-Mazarin; Nathalie Mardon, Asnieres, and Jean-Paul Noel, Chatenay-Malabry, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Oct. 23, 1984, Ser. No. 663,774
Claims priority, application France, Oct. 24, 1983, 83 16912
Int. Cl.⁴ B23K *26/02*
U.S. Cl. 219—121 LU **4 Claims**



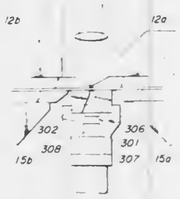
1. A control device for the automatic alignment on a target of a laser beam whose transverse energy distribution essentially has a central symmetry comprising:
means for deflecting the laser beam in the direction of the target;
two motors for modifying the deflection of the beam respectively in accordance with two axes perpendicular to one another and to the line joining the target at their intersection, by modifying the orientation of the reflection means;
two incremental coders respectively associated with the motors, each incremental coder being able to produce electrical pulses which are a function of the angle and the rotation direction of the motor with which it is associated;
a thermoelectric detector positioned between the target and the deflection means and able to supply, as a function of the misalignment of the beam along at least one of the axes, a voltage difference substantially proportional to the deflection of the beam along the axis in question; and
an electronic processing system for controlling the motors, as a function of the voltage differences and pulses produced by the incremental coders, so as to keep the beam aligned with the target;
wherein the thermoelectric detector comprises two pairs of thermocouples, whereof the hot junctions are in the laser beam and on a circle, whose plane is perpendicular to the path of the beam, wherein the hot junctions corresponding to one of the pairs belong to one diameter of the circle and wherein the hot junctions corresponding to the other pair belong to another diameter of the circle perpendicular to the said diameter, said diameter and said other diameter being respectively parallel to the axes and meet one another on the said line, the two hot junctions of each pair being at the same temperature when the beam is aligned with the target and coming from the deflection means, so as to obtain the voltage difference relative to an axis between the two hot junctions of the pair of thermocouples corresponding to said axis, and wherein the electronic processing system comprises:
an input-output electronic interface, connected to motors and to the thermocouples and provided with two pulses counters respectively connected to the incremental coders; and
electronic processing means connected to the interface and which, following misalignment of the laser beam, serve to determine on the one hand the state which each counter has to reach for realigning the beam, as a function of the voltage differences, and the state of each counter prior to the misalignment, and on the other hand the voltages to be successively applied to each motor until the realignment is obtained, as a function of the state to be reached by the corresponding counter and the successive states of said counter.

4,626,650
TWO-AXIS CUTTING MACHINE USING A PLASMA ARC TORCH OR THE LIKE
Edward C. Woodman, Newburyport, Mass., assignor to Cybermation, Inc., Cambridge, Mass.
Filed Jun. 15, 1984, Ser. No. 621,110
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121 PX **14 Claims**



1. A two-axis cutting machine for cutting a workpiece along a desired cutting path comprising:
a frame for holding the workpiece,
a rail fixed to the frame,
a beam arranged to move along the rail and having a pair of driving points spaced apart along an axis of the beam,
a cutting tool arranged to move along an axis of the beam,
an elongated flexible drive means having portions engaged respectively at the two driving points,
a carrier mechanism for carrying a drive section of the drive means, and having a pair of force translating elements at the two driving points for translating a force applied on the drive section into a pair of resulting forces directed parallel to the rail and in the same direction and applied respectively at the two driving points, and
a beam drive motor mounted on the beam for driving via means other than said flexible driving means, one of said force translating elements to cause it to exert a force on the drive section at one of said driving points, whereby the resulting forces at the two driving points move the beam along the rail while maintaining a constant angle between the beam axis and the rail.

4,626,651
APPARATUS FOR BUTT WELDING STEEL STRIPS BY USING A LASER BEAM IN A STEEL STRIP-PROCESSING LINE
Shigeki Taniguchi, Chiba; Kusuo Furukawa, Tokyo; Fumiya Yanagishima, and Hiroaki Sasaki, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan
Filed Feb. 27, 1984, Ser. No. 584,086
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LC **11 Claims**



1. A laser butt welding apparatus comprising a pair of clamp means of an inlet clamp means and an outlet clamp means, at least one of which is movable forward and rearward along the steel strip-feed line direction and which are adapted to clamp the edge portions of a preceding steel strip and a trailing steel strip, each of said inlet and outlet clamp means having an upper clamp beam and a lower clamp beam, the upper clamp beams of the inlet and outlet clamp means extending nearer to each other than the lower clamp beams of the inlet and outlet clamp means, a shearing means consisting of a preceding steel strip shear, and a trailing steel strip shear each having a lower shearing blade and an upper shearing blade which are independently movable up or down, said shearing means being adapted to be advanceable and retractable between the pair of the clamp means in a perpendicular direction to the line, and adapted to cut the edge portions of the preceding and trailing steel strips by lowering the upper blades while in said shearing, the edge portions of the preceding and trailing steel strips being firmly sandwiched between the lower shearing blades and the upper clamp beams of the preceding steel strip and trailing steel strip sides, means for butting the cut faces of the preceding and trailing steel strips while being clamped by means of the clamp means, said butting means being adapted to advance the preceding and/or the trailing steel strip so as to bring the cut faces of the preceding and trailing steel strips into butting contact with each other and to finely adjust the preceding and trailing steel strips through pivotal movement in a horizontal plane, so that the butting is more closely done to meet with actual sheared shapes of the cut ends of the preceding and trailing steel strips, a center clamp arranged under the butting portion of the preceding and trailing steel strips and is accessible thereto, for cooperation with said butting means, the center clamp comprising a backing bar adapted to be elevated before welding to clamp the butted ends of the preceding and trailing steel strips in cooperation with the upper clamp beams, thereby correcting the butted portion of the preceding and trailing steel strips, and laser torch means for cooperating with said butting means and the center clamp in butt welding a joint of the cut faces of the preceding and trailing steel strips, the laser torch means comprising a laser oscillator for irradiating a laser beam, which oscillator is placed on an off-line, a bender mirror adapted to bend the laser beam irradiated by said oscillator, and a condensor adapted to condense the laser beam reflected

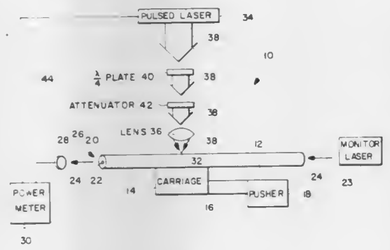
by the bender mirror at a weld zone, which is movable in a transverse direction of the steel strips to be joined.

4,626,652

METHOD AND MEANS OF REMOVING CLADDINGS FROM OPTICAL FIBERS

Paul E. Bjork, Minneapolis, Minn.; Gordon L. Mitchell, Woodinville, Wash., and Hans W. Mocker, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 21, 1985, Ser. No. 714,428
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LH **20 Claims**



1. A method of removing a portion of the exterior layer of an optical fiber to nearly expose the core region, wherein said optical fiber is capable of transmitting at least one mode of electromagnetic energy along said core, comprising:

transmitting a first beam of electromagnetic energy along said core;

directing a second beam of electromagnetic energy onto said portion of said exterior layer, said second beam having sufficient intensity to ablate at least some of said exterior layer;

monitoring the intensity of said first beam at a location on said fiber, wherein said portion of said exterior layer is between said location and the source of said first beam; and

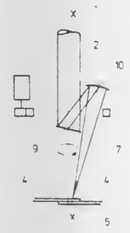
removing said second beam from said portion of said exterior layer when a sufficient variation occurs in the intesity of said first beam at said location to indicate that said core is nearly exposed.

4,626,653

METHOD OF AND INSTALLATION FOR SPOT-WELDING BY LASER BEAM

Mario Sciaky, Paris, Roland Cazes, St. Maur, and Georges Sayegh, Paris, all of France, assignors to Sciaky, S.A., Vitry sur Seine, France and Mario Sciaky, Paris

Filed Jun. 18, 1984, Ser. No. 621,354
Claims priority, application France, Jun. 24, 1983, 83 10531
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **2 Claims**



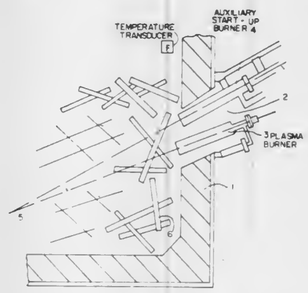
1. A method of spot welding by laser beam comprising: emanating a laser beam from a generator; focusing the laser beam on a work piece; displacing the focused beam in a desired path on the work piece; modulating the power of the emanating laser beam at a first power level prior to displacement, at a second power level less than the first power level during a first portion of the displacement and at a third power level less than the second power level during a second portion of the displacement.

4,626,654

METALLURGICAL PLASMA MELTING PROCESS

Fred Esser; Detlev Klöpper, both of Leipzig; Walter Lachner, and Gerhard Scharf, both of Dresden, all of German Democratic Rep., assignors to VEB Edelstahlwerk "8 Mai 1945" Freital, Freital, German Democratic Rep.

Division of Ser. No. 231,606, Feb. 5, 1981, Pat. No. 4,390,773.
This application Sep. 29, 1982, Ser. No. 427,376
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PR **2 Claims**



1. A method of melting metals and alloys in a plasma melting furnace, comprising the steps of:

providing one plasma burner having a longitudinally extending axis and at least one separate start-up burner having a longitudinally extending axis alongside same said plasma burner in the same port in the furnace side-wall, wherein the axes of the plasma burner and start-up burner intersect in the furnace at an acute angle;

initially operating only the start-up burner to form a crater in material in the furnace by the melting action of the start-up burner arc;

igniting the plasma burner; and

turning off the start-up burner when the plasma burner is operating at full capacity.

4,626,655

METHOD AND APPARATUS FOR WELDING ROLLED BANDS OF FINITE LENGTHS TO FORM CONTINUOUS BANDS DURING A MANUFACTURING OPERATION

Klaus Angerer, Roettenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

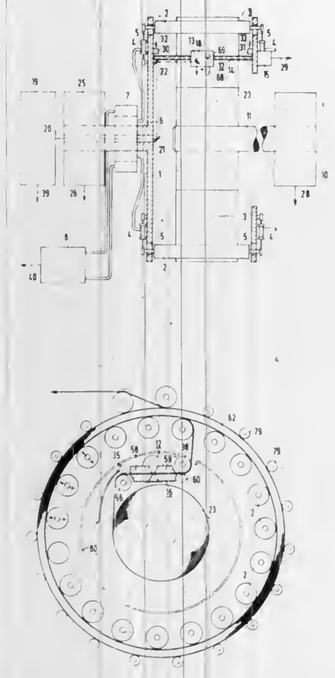
Filed Aug. 15, 1985, Ser. No. 766,167
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430209
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **17 Claims**

1. A method for welding rolled bands of finite length supply coils into a continuous band during a manufacturing operation, utilizing electrical sensing and control devices, comprising the steps of:

winding a first band of finite length from a smaller diameter supply coil into a larger diameter, concentrically located storage coil having sufficient length to uncoil and supply the manufacturing operation during a welding of a trailing band end of the first band;

clamping the trailing band end in a discharge side of a clamping and welding device located between an internal diameter of the storage coil and an external diameter of the supply coil;

inserting a second band of finite length as a subsequent supply coil and uncoiling a leading end thereof into a feed side of the clamping and welding device; and



clamping and welding the leading end of the second band supply coil to the clamped trailing end of the first band storage coil during the uncoiling of the storage coil into the manufacturing operation, the welding is accomplished in the clamping and welding device in a fixed position relative to the storage coil.

4,626,656

METHOD AND APPARATUS FOR INDICATING THE CONTACT STRUCTURE OF ELECTROMAGNETIC CONTACTOR ON THE HOUSING THEREOF USING LASER LIGHT

Shigeharu Ootsuka, Kagamihara; Yuji Mizuno, Nagoya; Junichi Kajimura, Kani, and Takaaki Mori, Mie, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,320
Claims priority, application Japan, Jul. 19, 1984, 59-148530
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LH **5 Claims**

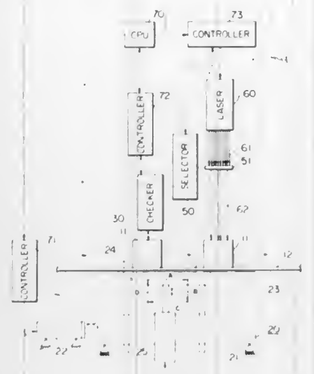
1. An apparatus for indicating the contact structure of an electromagnetic contactor on the housing thereof, the electromagnetic contactor having a pair of fixed contacts which can be electrically connected to one another by a moving contact operated by an electromagnet housed within said contactor, comprising:

checking means for determining the contact structure of an electromagnetic contactor and producing a corresponding output signal;

a laser;

a plurality of masks corresponding to the various possible contact structures of said electromagnetic contactor;

mask selector means responsive to said checking means for selecting a mask from said plurality of masks and positioning the selected mask in the optical path of said laser, the selected mask containing information corresponding to the contactor structure of said electromagnetic contactor as determined by said checking means; and



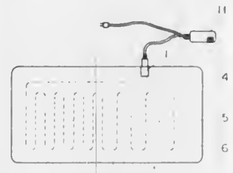
means for positioning said electromagnetic contactor in the optical path of laser light from said laser such that laser light passing through the selected mask illuminates appropriate portions of said contactor.

4,626,657

ELECTRIC HEATING APPLIANCE

Shinichi Endo, and Isao Matsuda, both of Yamatokooriyama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00219, § 371 Date Jan. 3, 1985, § 102(e) Date Jan. 3, 1985, PCT Pub. No. WO84/04631, PCT Pub. Date Nov. 22, 1984
PCT Filed Apr. 27, 1984, Ser. No. 694,560
Claims priority, application Japan, May 6, 1983, 58-79556
Int. Cl.[4] H05B *1/00, 3/00*
U.S. Cl. 219—212 **3 Claims**



1. An electric heating appliance comprising a body, a heater provided in said body, and a safety means on said body which is dissoluble in a dry-cleaning solution for substantially preventing the circulation of electricity to said heater.

4,626,658

ELECTRICALLY HEATED TOOL FOR SOLDERING PIPE CONNECTOR SLEEVES

Kenneth Gray, Beaulieu, England, and Albert Tucker, Cornwall, United Kingdom, assignors to Antex (Electronics) Limited, London, England

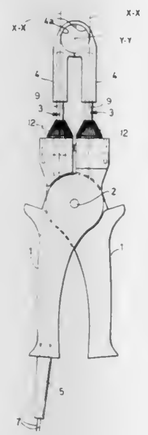
Filed Oct. 23, 1984, Ser. No. 663,887
Claims priority, application United Kingdom, Oct. 24, 1983, 8328338
Int. Cl.[4] B23K *3/04*; H05B *1/00*
U.S. Cl. 219—230 **4 Claims**

1. A tool for heating a pipe connector sleeve in order to melt solder provided therein or applied thereto to secure said pipe connector sleeve to a pipe, said tool comprising:

a pair of arms, each of said arms of said pair of arms having a first end and a second end, each of said pair of arms further being hingedly connected to one another between said first end and said second end of each said pair of arms, the first end of the first of said pair of arms being disposed adjacent the first end of the second of said pair of arms, the second end of the first of said pair of arms being disposed adjacent the second end of the second of said pair of arms;

first electric heating element means having a first shaft portion, said first shaft portion enclosing an electric heating element and having a first end and a second end, the first end of said first shaft portion being secured to said first end of one of said pair of arms with said first shaft portion extending therefrom, a first metallic head part, said first metallic head part having a part-circular recess that is adapted to contact said pipe connector sleeve to apply heat thereto, said first metallic head part having a tubular shank by which it is detachably and slidably attached to said second end of said first shaft portion to permit the rapid changing of said first metallic head part; and

second electric heating element means having a second shaft



portion, said second shaft portion enclosing an electric heating element and having a first end and a second end, the first end of said second shaft portion being secured to said first end of the other of said pair of arms with said second shaft portion extending therefrom, a second metallic head part having a part-circular recess that is adapted to contact said pipe connector sleeve to apply heat thereto, said second metallic head part having a tubular shank by which it is detachably and slidably attached to said second end of said second shaft portion to permit the rapid changing of said second metallic head part;

said first electric heating element means and said second electric heating element means, respectively, being adapted to heat said first metallic head part and said second metallic head part to a soldering temperature;

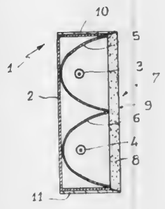
the arms of said pair of arms being pivotable with respect to one another about said hinged connection therebetween so that the part-circular recess of said first metallic head part and the part-circular recess of said second metallic head part can be closed together in juxtaposed relationship around said pipe connector sleeve to apply heat to the pipe connector sleeve.

4,626,659

ELECTRIC INFRA-RED RAY GENERATOR CONSTITUTING ATMOSPHERE PURIFIER

Michel Charmes, and Yves Trambouze, both of Lyons, France, assignors to Ateliers Deconstruction Industrielles du Rhone (A.C.I.R.), Sathonay Camp, France

Filed Dec. 7, 1984, Ser. No. 679,334
Claims priority, application France, Dec. 12, 1983, 83 20081
Int. Cl.[4] H05B *3/44*
U.S. Cl. 219—343 **3 Claims**



1. An electric infra-red ray generator for safely heating an object in an explosive atmosphere while at the same time oxidizing combustible gases coming in contact with it to purify the atmosphere, comprising:

a supporting housing having an opening and having reflector means in the housing directed toward said opening;

electrical emitter means in the housing between the reflector means and the opening and operative to emit shorter wave-length infra-red rays toward said opening;

a screen of refractory material covering the opening of the housing and receiving said shorter wave-length infra-red rays and being heated thereby, the screen being sufficiently transparent to said shorter infra-red rays to pass a part thereof through the screen toward an object disposed outside the housing, the refractory material of the screen being elevated by the part of the infra-red rays not passed by the screen to a temperature at which the refractory material emits longer wave-length infra-red rays toward said object; and

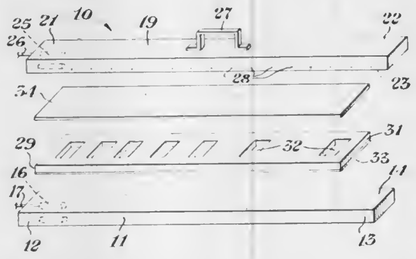
catalytic material impregnating the screen which serves as a support therefor, and the catalytic material being operative when heated with the screen to oxidize combustible gases coming into contact with the screen before they are heated by the emitter means to a temperature of auto-combustion.

4,626,660

OVEN HAVING CAVITIES OF VARYING TEMPERATURE

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1985, Ser. No. 725,890
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—385 **7 Claims**



1. An oven assembly capable of providing zones of different

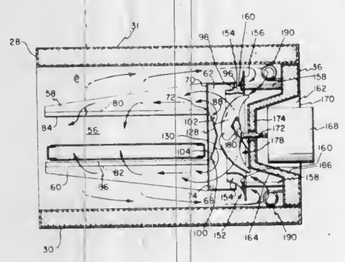
temperature, the assembly comprising first and second elongate members of generally like dimension, each of the members having at least one planar face of generally like dimension, each of the elongate members having a first end and a second end, each elongated member having a heat source only at its first end; the heat source being capable of supplying like amounts of heat to the first ends of the elongate members and creating zones of diminishing temperatures from its first to its second end; a thermally insulating member of elongate generally rectangular configuration having opposed generally parallel faces, the elongate thermally insulating member having disposed thereon a plurality of openings in spaced apart relationship extending between the generally parallel faces of the insulating member, the openings being adapted to receive samples of material to be evaluated at varying temperatures; the insulating member being positioned between the planar faces of the elongate members, the first ends of the elongate members being adjacent and the second ends of the elongate members being adjacent.

4,626,661

AIR DELIVERY SYSTEM FOR AN IMPINGEMENT FOOD PREPARATION OVEN

Mitchell C. Henke, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Apr. 16, 1984, Ser. No. 601,642
Int. Cl.[4] F27B *9/10*
U.S. Cl. 219—400 **14 Claims**



1. An impingement food preparation onve, comprising:

an enclosure ncluding a cooking chamber adapted for cooking a food product therein,

means in said cooking chamber adapted for supporting a food product,

a plurality of duct members mounted in said cooking chamber and spaced apart from said supporting means, said duct members including a plurality of nozzles positioned to direct a plurality of streams of air toward said supporting means, at least one said duct member being spaced above said supporting means with its respective said nozzles directed downwardly toward said supporting means, and at least one other said duct member being spaced belc v said supporting means with its respective said nozzles ; rected upwardly toward said supporting means,

a pleunum in said enclosure and connected to said duct members to provide a flow of air thereto, said plenum having a front wall with a plurality of openings connected to respective said duct members and a back wall with an opening therein,

means in said enclosure for heating the flow of air before it enters said plenum,

a ring-like member having a peripheral side wall and being closingly fitted in said back wall opening,

a rotatable scoop-type axial flow fan for causing a substantially axial flow of heated air toward said plenum front wall, said fan having a plurality of generally tear-drop shaped blades and positioned in said peripheral side wall of said ring-like member for drawing a flow of heated air from said enclosure into said plenum, each said blade having a leading edge portion that tapers to a point in the direction of rotation of said fan and a trailing row portion disposed at a given pitch angle, whereby upon rotation of said fan, each said blade leading edge portion scoops a portion of air and its respective said blade trailing row portion forcibly moves said portion of air forwardly in a substantially axial direction toward said plenum front wall,

said plenum front wall having a surface thereof tapering from said front wall openings inwardly of said plneum and toward said fan, whereby said tapering surface smoothly and uniformly directs the flow of heated air from said fan into said duct members and out of said nozzles, thereby providing a uniform cooking temperature for a food product on said supporting means,

said tapering surface of said front wall having a flat top portion leading at a first angle from said one duct member and a flat bottom portion leading at said first angle from said one duct member, said flat top portion and said flat bottom portion tapering together, whereby the flow of heated air is smoothly and uniformly directed to said one duct member and said one other duct member,

said one duct member and said one other duct member extending substantially the width of said plenum, said tapering surface further having a pair of oppositely disposed flat side portions of said front wall and tapering together with said flat top portion and said flat bottom portion inwardly of said plenum, whereby the flow of heated air is smoothly and uniformly directed to and along the width of said duct members,

said flat top portion and said flat bottom portion having respective end portions leading from respective said duct members at a third angle greater than said first angle, and wherein said flat side portions have respective end portions leading from respective said sides of said front wall at a fourth angle greater than said second angle to form a multi-tapering surface, whereby the flow of heated air is directed into said duct members substantially along their longitudinal axes.

4,626,662

PROGRAMMABLE MULTI-FUNCTION FEEDBACK COOKING APPARATUS

Stephen R. Woolf, 6173 Coldbrook, Lakewood, Calif. 90713

Filed Jan. 23, 1984, Ser. No. 572,880
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—501 **8 Claims**



1. Programmable feedback cooking apparatus for controlling the temperature of foodstuff in at least one vessel adapted for being heated by a selected heat generating means and comprising:

temperature transducing means mounted in the vessel to be removably disposed in direct heat exchange relationships with said foodstuff or fluid in said vessel for generating a first electrical input signal proportional to the temperature of the foodstuff;

analog-to-digital converter means coupled with saud transducer for receiving said first electrical input signal and

translating it into a digital input signal corresponding with the magnitude of said first electrical signal;

actuating means including a plurality of switching means selectively actuatable to generate selected temperature signals corresponding to a predetermined food temperature;

central processing means, including programming means, coupled to said converter means and responsive to the difference between said digital input signals and said selected temperature signals, said programming means generating corresponding digital output signals in accordance with a selected mathematical relationship between said difference between said digital input signal and said selected temperature signals, and said digital output signal;

digital-to-analog converter means coupled with said processing means and responsive to said digital output signal to generate a corresponding analog signal; and

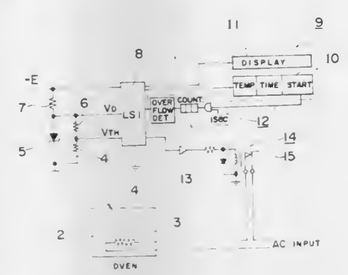
proportional control means coupled with said converter means, the heat generating means and said central processing means and responsive to the magnitude of said analog signal to proportionally vary the magnitude of energy introduced by said heat generating means to thereby control the heat applied to said vessel in accordance with said mathematical relationship based on the difference between the temperature selected on said actuating means and the actual temperature of said foodstuff or fluid as sensed by said transducer.

4,626,663

METHOD AND APPARATUS FOR DETECTING PROBLEMS OF TEMPERATURE CONTROL DEVICE

Koichi Tateda, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 421,510, Sep. 22, 1982, abandoned. This application Jul. 11, 1985, Ser. No. 754,207
Claims priority, application Japan, Sep. 29, 1981, 56-155953
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—504 **8 Claims**



1. A heating apparatus comprising:

a heating chamber;

a heater disposed in said chamber;

temperature control means for controlling temperature within said heating chamber to a desired temperature by driving said heater, said temperature control means including a thermo-sensitive element responsive to the temperature of said heater and producing an output related thereto, said temerature control means including;

problem detection means for detecting a problem in said temperature control means, said problem detection means including,

delay means, initiated by the energization of said heater by said temperature control means, for developing a detect signal a predetermined time after said heater is energized, said predetermined time being sufficient to vary the output of said thermo-sensitive element but less than the period necessary to raise the temperature within said chamber to the desired temperature, and

means, responsive to development of said detect signal by said delay means, for comparing the output of said thermo-sensitive element to a reference value to determine if said output has varied, said means for comparing developing defect signal when no variation of said output is detected; and

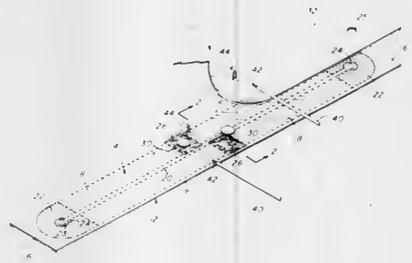
means for disconnecting the drive of said heater by said temperature control means in response to development of said defect signal.

4,626,664

ELECTRICAL HEATING DEVICE

Frederick G. J. Grise, Osterville, Mass., assignor to Flexwatt Corporation, Canton, Mass.

Continuation-in-part of Ser. No. 580,472, Feb. 15, 1984. This application Sep. 26, 1984, Ser. No. 654,772
Int. Cl.[4] H05B *3/06, 3/54*
U.S. Cl. 219—525 **16 Claims**



1. In an electrical heating device comprising

a generally flat substrate having an upper insulating surface,

a semi-conductor pattern carried by said upper surface of said substrate, and

a pair of generally flat metallic conductors mounted in a face-to-face engagement with said semi-conductor pattern,

that improvement wherein:

said semi-conductor pattern includes a pair of spaced connector portions and at least one heating portion extending between and electrically connected to each of said connector portions;

said connector portions have an electrical conductivity greater than that of said said heating portion; and,

each of said metallic conductors is in face-to-face engagement with a respective one of said connector portions, and the surface thereof in such engagement has an area that is less than the area of the upper surface of said respective one of said connector portions, the area:perimeter ratio of said surface of said conductor being about D/4 wherein D is the major dimension of said area of said conductor.

4,626,665

METAL OVERSHEATHED ELECTRICAL RESISTANCE HEATER

William C. Fort, III, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1985, Ser. No. 747,592
Int. Cl.[4] H05B *3/40, 3/06*
U.S. Cl. 219—534 **5 Claims**

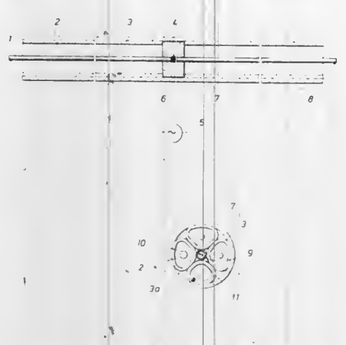
1. A well heater comprising:

a tubular metal oversheath encasing both a plurality of metal surfaced heating strands and at least one other metal surfaced strand;

said metal surfaced strands being at least substantially parallel to each other and the oversheath;

said oversheath being compressed radially inward to establish metal-to-metal contact between it and the strands within an assembly which is spoolable and is substantally impermeable throughout its length;

said heating strands including a plurality of electrically conductive cores which cores are capable of resistive heating, are surrounded by solid insulation contained



within a metal sheath and are positioned and interconnected in an arrangement providing a combination of electrical resistance per unit length of the well heater such that the heater is capable of generating heat at different rates along different portions of its length; and

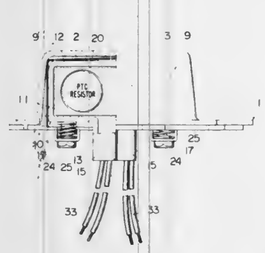
means for supplying electric current to said heating strands.

4,626,666

SELF-REGULATING ELECTRIC HEATER

Masatoshi Maeda; Toshio Kusunoki, and Yoji Iguchi, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 18, 1984, Ser. No. 662,143
Claims priority, application Japan, Nov. 18, 1983, 58-218351
Int. Cl.[4] H05B *3/02, 1/02;* H01C *7/02*
U.S. Cl. 219—537 **7 Claims**



1. A self-regulating electric heater comprising:

a radiator formed of a dimensionally stable material, said radiator having a cavity;

a pair of electrode plates;

at least one PTC resistor arranged in electric and heat transfer contact with said electrode plates; and

a support frame of electrically insulative material, said frame being formed with receiving portions respectively for said at least one PTC resistor and the electrode plates for holding the same in said electric and thermal contact, said frame being received in said cavity with both of said electrode plates in heat transfer contact with an inner wall of the cavity:

spring means, having two ends, one end of which is connected to said radiator; and

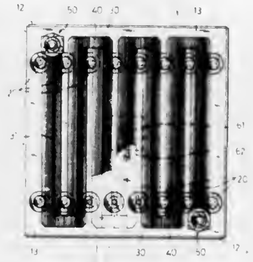
spring seat means on said support frame for receiving the other end of said spring means, said spring means urging the support frame into the cavity in the direction of biasing the electrode plates into intimate heat transfer contact with the inner wall of the cavity.

4,626,667

RADIANT HEATER OF SHORT RESPONSE TIME

Kazuo Asano, Nagoya, Japan, assignor to Kabushiki Kaisha Asano Kenkyusho, Nagoya, Japan

Filed Feb. 5, 1986, Ser. No. 827,032
Claims priority, application Japan, Mar. 29, 1985, 50-47519[U]
Int. Cl.[4] H05B *3/06;* H01C *3/10*
U.S. Cl. 219—542 **4 Claims**



1. A radiant heater comprising a table plate; an electrically insulating plate extending over the surface of one side of said table plate; a plurality of elongated thin plates made of a material generating Joule's heat, each of which is longitudinally bent so that the transverse section thereof is substantially V-shaped and longitudinally extended above said insulating plate, being transversely arranged with leaving a space between every adjacent two, which are electrically connected by a transversely extending thin plate of the same material at the free ends thereof so as to form a heater element extended in zig-zag; and a plurality of cup insulators, each of which has a body portion, leg portion protruding to pass through said insulating plate and table plate to be fixed thereto and a head portion forming an annular grooved between the same and said body portion, being transversely arranged in two rows providing suich a space between adjacent two that said longitudinally extended thin plate may be held at the side edges thereof with said annular groove of each of adjacent cup insulators respectively of the two rows.

4,626,668

KEYBOARD CONSTRUCTION

Martin Perches, 1801 Greenwich St., #102, San Francisco, Calif. 94123

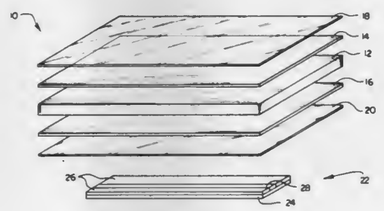
Filed May 28, 1985, Ser. No. 738,271
Int. Cl.[4] G06C *7/02*
U.S. Cl. 235—145 R **7 Claims**



1. A device comprising a frame, having a top surface, at least one opening in said frame, at least one key reciprocable in said opening in said frame and having a first position with the upper ends of said key above said top surface and a depressed second position, said key being shaped to substantially fill said opening, and having a top surface substantially the same size as said opening, said frame being formed with a slot immediately adjacent said key, the depth of said slot being sufficient to receive a long fingernail so that the pad of the finger may

touch said upper end to depress said key with the long fingernail thereof in said slot.

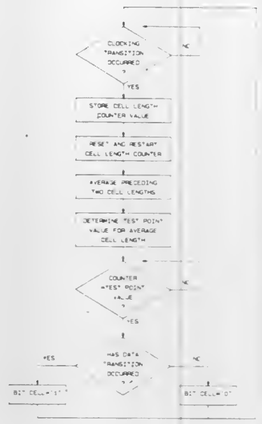
4,626,669
INTERCEPT SYSTEM FOR INTERCEPTING STOLEN, LOST AND FRAUDULENT CARDS
William H. Davis, Fairview Park, Ohio; John J. Goba, Elizabeth, N.J.; Dean D. Riggs, Avon Lake, Ohio; Abraham Zeewy, Cleveland, Ohio, and Howard M. Flint, Chagrin Falls, Ohio, assignors to Fairview Partners, Fairview Park, Ohio
Filed Dec. 28, 1983, Ser. No. 566,180
Int. Cl.[4] G06K *9/00*
U.S. Cl. 235—380 **20 Claims**



1. A method of intercepting fraudulent credit cards comprising:
laminating a layer of relatively high coercivity magnetizable material into a plastic card;
selectively marking the card with a man-readable code;
magnetically encoding at least selected portions of the high coercivity layer to encode the card with a magnetically readable code, the man-readable code and the magnetically readable code having a preselected correspondence, the magnetically readable code further including a check designation which is related to one of the man-readable and machine readable codes by a preselected relationship which is unpredictable from the man-readable code alone;
during each of a plurality of financial transactions:
magnetically decoding the magnetically readable code;
comparing the man-readable and magnetically readable code for the preselected correspondence; and,
recording a representation of the check designation to show that the magnetically readable code was decoded and compared with the man-readable code.

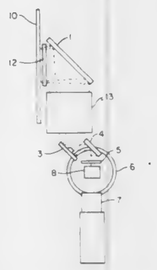
4,626,670
METHOD AND SYSTEM FOR DECODING TIME-VARYING, TWO-FREQUENCY, COHERENT-PHASE DATA
Kenneth L. Miller, Torrance, Calif., assignor to Xico, Inc., Santa Monica, Calif.
Filed Jun. 16, 1983, Ser. No. 504,809
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—436 **21 Claims**

1. A system for decoding two-frequency, coherent-phase data encoded as a plurality of bit cells with each bit cell comprising the time between two consecutive clocking transitions and one or no datum transition between said two clocking transitions, said system comprising: means for detecting transitions; means for measuring the time periods corresponding to the lengths of said bit cells; means for determining the optimum time to test whether a datum transition, if any exists, has occurred within the currently-measured bit cell; and means for determining the probable time length of said currently-measured bit cell and means for determining the optimum testing time for the prior occurence of a datum transition in said currently-measured bit cell from the average time length of at least the next two preceding bit cells; means for detecting



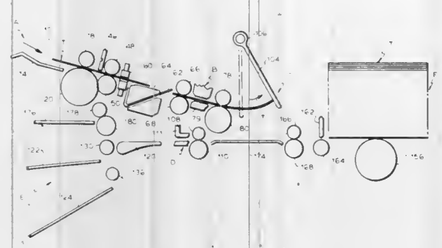
the occurrence of a datum transition, if any exists, within said currently-measured bit cell.

4,626,671
LENS SYSTEM FOR OPTICALLY RECORDED STORAGE CARD READER
J. Nathaniel Marshall, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.
Filed Jul. 6, 1984, Ser. No. 628,353
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—470 **2 Claims**



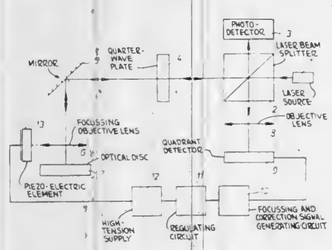
1. An optical storage card reader system comprising:
a. a first cylindrical lens close to the surface of an optical storage card to be read, said first cylindrical lens focusing a beam in a plane parallel to the direction of scan of data recorded on the optical storage card; and
b. a second cylindrical lens which focuses said beam in a plane perpendicular to the direction of said first cylindrical lens and said second cylindrical lens cooperating to focus said beam into a small spot and then collecting and focusing said beam reflected from the optical storage card into a receiver, thereby avoiding the consequences of defects on the surface.

4,626,672
DOCUMENT PROCESSING APPARATUS
Thomas P. Sapitowicz, Bel Air, and Mark T. MacLean-Blevins, Forest Hill, both of Md., assignors to General Instrument Corporation, New York, N.Y.
Filed Feb. 3, 1984, Ser. No. 576,536
Int. Cl.[4] G06K *13/08*
U.S. Cl. 235—480 **42 Claims**



1. Document processing apparatus comprising input means, reader means, and retaining means arranged along a first path, first means for transporting a document along said first path between said input means and said retaining means, printer means and output means arranged along a second path, second means for transporting a document along said second path between said retaining means and said output means, first and second frame sections, and first means for operably connecting said first frame section and said second frame section for relative movement therebetween to provide access to said first path.

4,626,673
DEVICE FOR ACCURATELY FOCUSSING A LASER BEAM
Luc A. Struye, Poperinge, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium
Filed Apr. 4, 1985, Ser. No. 719,822
Claims priority, application European Pat. Off., Apr. 5, 1984, 84200476.4
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **2 Claims**



1. Device for focussing a laser beam onto an object, provided with a laser source, optical components for directing the laser beam to the object, mechanical and electronic means for controlling and correcting adjusting organs for the optical components, which electronic means comprise a quadrant detector which receives part of the reflected laser beam and detects form changes as a result of faulty focussing and also comprise a regulating circuit controlled by a focussing signal formed by the difference of the sums of the output signals of quadrants of the quadrant detector facing one another diagonally, assuming $(A+C)-(B+D)$; A, B, C and D being the output signals of each of the quadrants of the quadrant detector, when said quadrants are passed through clock-wise starting at the first top left quadrant, characterized thereby that electronic means are provided which by means of the four output signals of the quadrant detector generate a correction signal for the fault arising on focussing as a result of the faulty centering of the quadrant diode and the laser beam proportional to the value "$-V_cH_c/\Sigma$" wherein

$$V_c=(A+B)-(C+D),$$

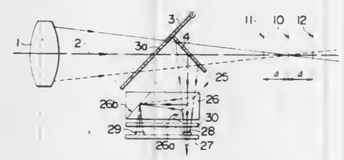
$$H_c=(A+D)-(B+C)$$

and

$$\Sigma=A+B+C+D;$$

which correction signal is added to the focussing signal for controlling the regulating circuit.

4,626,674
FOCUS DETECTING METHOD AND APPARATUS
Ken'ichi Oinoue, Suginami, Japan, assignor to Olympus Optical Company, Ltd, Tokyo, Japan
Filed Feb. 8, 1984, Ser. No. 578,228
Claims priority, application Japan, Feb. 10, 1983, 58-19592; Feb. 10, 1983, 58-19593; Nov. 18, 1983, 58-218117
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **20 Claims**



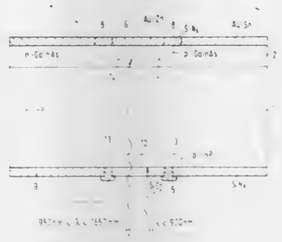
1. A focus detecting method comprising:
arranging light receiving planes of a first and a second photoelectric transducer element row in positions optically equivalent to plane positions which are located before and behind a presumed focal plane of an image forming optical system, respectively;
separating a light beam passing through an exit pupil of said image forming optical system into a first light beam passing primarily through a first half portion of the exit pupil and a second light beam passing primarily through a second half portion of the exit pupil, which portions are divided by a plane including an optical axis of said image forming optical system, by an image shift or displacement generating optical system which is disposed in front of said first and second transducer element rows;
directing one of said first and second light beams to the light receiving plane of at least one of said first and second transducer element rows and directing the other of said first and second light beams to the light receiving plane of at least the other of said first and second transducer element rows;
comparing a series of outputs of transducer elements of at least said one of said first and second transducer element rows and a series of output of transducer elements of at least said other of said first and second transducer element rows; and
performing a focus detection applying calculation based on shifts or displacements of images by said first and second light beams.

4,626,675

DEMULTIPLEXING PHOTODIODE SENSITIVE TO PLURAL WAVELENGTH BANDS

Hans M. Gündner, Benningen, and Kurt Hess, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 16, 1983, Ser. No. 467,122
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206312
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J 9 Claims



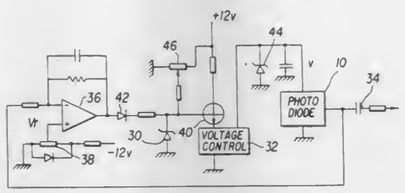
1. Light-sensitive device for separately detecting light of two different wavelength bands, comprising:
a substrate that is transparent to one of the two wavelength bands, and opaque to the other; and
two pn junctions located on opposite sides of the substrate and optically in series having different cutoff wavelengths for the photovoltaic effect, said substrate forming at least a portion of one of said pn junctions.

4,626,676

LIGHT DETECTOR HAVING A PHOTODIODE WITH BIAS CONTROL

Jean-Pierre Gerardin, Nanterre, France, assignor to Electricite de France (Service National), Paris, France

Filed Sep. 25, 1985, Ser. No. 779,985
Claims priority, application France, Sep. 28, 1984, 84 14980
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 R 6 Claims



1. A light detector for delivering an electrical measurement signal having signal components at a frequency representative of a frequency present in a light beam, having: an avalanche photodiode for receiving the light beam; source means for applying an adjustable bias voltage to said photodiode, whereby a variable measurement current is delivered by said photodiode; a circuit for measuring a mean value of said measurement current and delivering an output signal representative of said mean value; and means responsive to said output signal and controlling said source means for maintaining said mean value at a predetermined set value lower than that for which the current-voltage characteristic of said avalanche photodiode exhibits a bend.

4,626,677

CONTINUOUS NORMALIZER FOR AN ELECTRONIC CIRCUIT THAT COMPENSATES FOR EXTERNAL AND INTERNAL DRIFTS FACTORS

Edward M. Browne, Houston, Tex., assignor to ESM International, Inc., Houston, Tex.

Filed Sep. 27, 1984, Ser. No. 655,343
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A 8 Claims



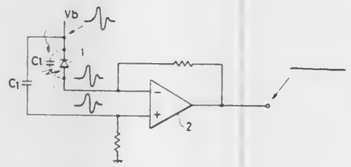
1. A normalizer, comprising:
a high gain amplifier connected for receiving an input voltage having a predetermined duration limit,
an operational amplifier having a first input dc coupled to the output of said high gain amplifier and a reference voltage as a second input, said operational amplifier producing a zero output voltage with an input voltage of said reference voltage value and producing an output deviating from zero as the input voltage deviates from said reference voltage value, and
a feedback network, including:
a limiter connected to said operational amplifier for removing high peaks from the output of said operational amplifier, and
an integrator having its input connected to said limiter and its output connected as a reference voltage to the second input of said operational amplifier for subtracting dc offset voltage from the input applied to the first input of said operational amplifier, thereby providing normalizing for a gradually changing input voltage and circuit operation conditions.

4,626,678

LIGHT DETECTING CIRCUIT

Tetsuo Morita, and Mitsuaki Nishie, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 4, 1984, Ser. No. 596,751
Claims priority, application Japan, Apr. 5, 1983, 58-59816
Int. Cl.[4] H01J *40/14*; H03F *17/00*
U.S. Cl. 250—214 A 7 Claims



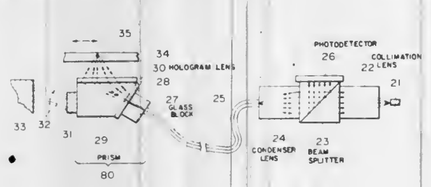
1. A light detecting circuit comprising:
a first photodiode receiving an optical signal and converting said optical signal into an electrical signal, said first photodiode being coupled to a bias voltage source;
a main amplifier receiving said electrical signal upon one of two input terminals thereof for amplifying said electrical signal; and
capacitance means connected to the other input terminal of said main amplifier and to said bias voltage source for canceling noise mixed in said circuit through a parasitic capacitance of said first photodiode from said bias voltage source.

4,626,679

OPTICAL HEAD AND METHOD OF DETECTING THE FOCUS THEREOF

Tetsuro Kuwayama, and Kazuya Matsumoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,440
Claims priority, application Japan, Sep. 22, 1982, 57-165258; Sep. 22, 1982, 57-165259; Sep. 22, 1982, 57-165260
Int. Cl.[4] G11B *7/135*
U.S. Cl. 250—227 32 Claims



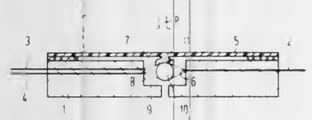
1. An optical head comprising:
a light source unit for supplying a light beam;
a detecting unit for carrying out a detection;
a condensing unit for condensing the light beam from said light source unit on an object surface and directing the light beam from said object surface to said detecting unit in which the light beam from said condensing unit is detected, said condensing unit being movable relative to said light source unit and said detecting unit, and including a transparent block; and
a flexible optical transmitter for forming an optical path leading from said light source unit to said condensing unit and an optical path leading from said condensing unit to said detecting unit, said flexible optical transmitter having an end and said end being connected to said transparent block.

4,626,680

PRESSURE SENSOR WHOSE OPTICAL SYSTEM MOVES IN RESPONSE TO MOVEMENT OF DIAPHRAGM

Gerhard Martens, Ellerau, and Manfred R. Liehr, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1984, Ser. No. 586,932
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1983, 3307964
Int. Cl.[4] G01L *1/00*
U.S. Cl. 250—231 P 10 Claims



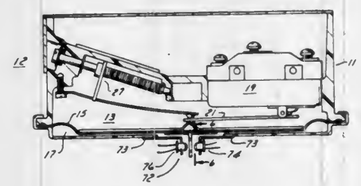
1. A pressure sensor comprising a diaphragm movable in response to pressure applied thereto, an optical system coupled to said diaphragm, said optical system being movable in response to movement of said diaphragm, a light guide for transmitting light into light guides arranged for receiving light transmitted by said transmitting light guide, wherein the transmitting and receiving light guides are arranged parallel to the diaphragm and the optical system is a focusing system which can change the amount of light receivable by the receiving light guides in response to movement of said diaphragm.

4,626,681

DIFFERENTIAL PRESSURE CONTROL APPARATUS

Thomas E. Hayes; J. Scott Jamieson, and Scott L. Spence, all of Goshen, Ind., assignors to Johnson Service Company

Filed Sep. 14, 1984, Ser. No. 650,454
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 P 9 Claims



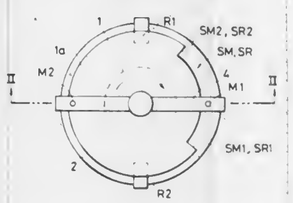
1. A differential pressure control apparatus including:
a switch responsive to a pneumatic differential pressure for signaling the actuation of a blower;
a signal generating section for controlling the speed of said blower, said section including a source for projecting a continuous beam of light, first means for sensing said projected light beam and second means for modulating said light beam, said first means and said second means being positionably displaceable one to the other in response to the magnitude of said differential pressure;
said second means including a blade devoid of a light-transmitting aperture therethrough and attached to and movable with a diaphragm in response to changes in said differential pressure, said signal generating section providing an analog output signal for controlling the speed of said blower.

4,626,682

ANGLE MEASURING DEVICE

Masato Hara; Masaaki Niiho; Eiji Takasugi, and Ryouji Honda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,582
Claims priority, application Japan, Jun. 29, 1983, 58-99487[U]
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE 6 Claims



1. In an angle measuring device in which a period of time T_1 required for a part formed in the periphery of a rotor rotated at a constant speed by a motor to make one revolution starting from a stationary reference point, and a period of time T_2 required for said part to move between said reference point and an angle measuring point are obtained to evaluate $360° \times (T_2/T_1)$ thereby to obtain an angle under measurement,

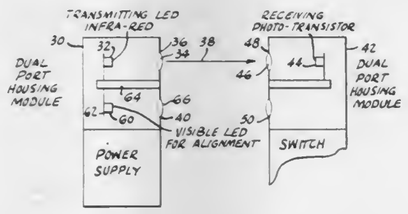
the improvement wherein said part to be measured is a cutout having an angular width determined according to a rotational irregularity of said motor, means for determining a first elapsed time required for a leading edge of said cutout to move between said reference point and said angle measuring point, means for determining a second elapsed time required for a trailing edge of said cutout to move between said reference point and said angle measuring point, and means for determining said angle under measurement in accordance with said first and second elapsed times.

4,626,683

THROUGH-BEAM OPTICAL DETECTOR SYSTEM WITH ALIGNMENT AID

Donald L. Van Zeeland, Franklin, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 12, 1982, Ser. No. 441,194
Int. Cl.[4] G01B *11/27*
U.S. Cl. 250—239 **1 Claim**



1. In optical detector systems having a universal type dual port transmitter housing module usable in both retro-reflective and through-beam optical detector systems,

the retro-reflective system using both ports of the transmitter housing module, one port for transmitting, and the other port for receiving,

the through-beam system using one port of the transmitter housing module for transmitting, and using a separate remotely spaced receiver for receiving,

the improvement in a through-beam system comprising:

an auxiliary light source in the available but unused port of the transmitter housing module to aid alignment of transmitter and receiver, wherein the receiver is housed in a universal type dual port module, and said auxiliary light source of the available but unused port of the transmitter shines on the available but unused port of the receiver for alignment purposes.

4,626,684

RAPID AND AUTOMATIC FLUORESCENCE IMMUNOASSAY ANALYZER FOR MULTIPLE MICRO-SAMPLES

Isaac J. Landa, 12109 Greenleaf Ave., Potomac, Md. 20854

Filed Jul. 13, 1983, Ser. No. 513,307
Int. Cl.[4] G01T *1/00*
U.S. Cl. 250—328 **22 Claims**

1. A fluorescence measuring apparatus for identifying a substance including:

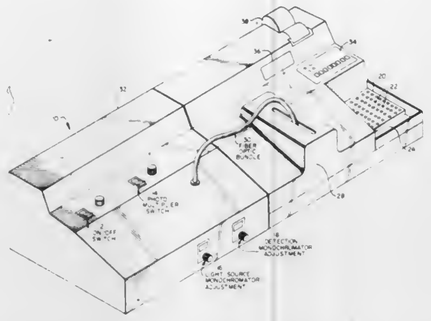
excitation means for producing light energy;

carrier means for holding a plurality of samples which include said substance during excitation scanning of said samples;

front-end fluorescent optics for directing said excitation light energy on a path orthogonal to the surface of said substance and for receiving fluorescent emission spectra back along substantially the same path from said substance;

means for scanning said front-end fluorescent optics from sample to sample of said plurality of said samples which include said substance; and

spectra emission analyzing means for receiving fluorescent emission spectra from said excited samples which include said substance through said front-end fluorescent optics,



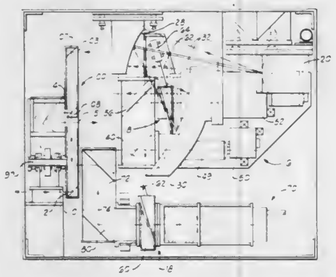
said emission analyzing means having means for detecting light intensity at the measured wavelength of said fluorescent emission spectra.

4,626,685

MULTISPECTRAL COLLIMATOR WITH BUILT-IN-TEST

Stephen K. Pitalo; Clarence J. Russnak, and Wallace M. Anderson, all of Huntsville, Ala., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,854
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—341 **18 Claims**



1. A multispectral collimator for testing and verifying electro-optical and opto-mechanical parameters of a unit under test, the collimator comprising:

a thermal image source for outputting a collimated infrared radiation image to the unit under test, the source including;

a thermal black body with infrared target and boresight aperture therein; and

a two-mirror aplanatized optic for receiving the image of the target and collimating the image to the unit under test;

a laser measurement tester for receiving a laser beam from the unit under test, the tester including;

a cube beam splitter for dividing the beam into a first portion and a second portion, the first portion received through the splitter, the second portion reflected from the splitter;

a fast detector and calorimeter for receiving the first portion of the beam, the fast detector measuring the width of the laser beam pulse, the collimator measuring the power input of the laser beam; and

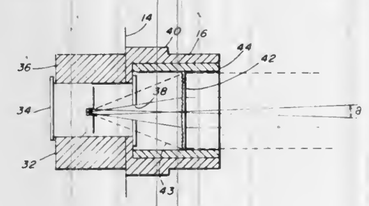
a laser measuring instrument for receiving the reflected second portion of the beam, the laser measuring instrument having a matrix camera and computer therein where the beam is focused onto the matrix of the camera and stored in the memory of the computer.

4,626,686

VARIABLE FIELD OF VIEW HEAT SCANNER

Francesco Pompei, Wayland; Shiraz Daya, Franklin, and Domenico A. Pompei, Wayland, all of Mass., assignors to Exergen Corporation, Natick, Mass.

Filed Apr. 9, 1984, Ser. No. 598,222
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—342 **14 Claims**



1. A radiation detector for providing an indication of the radiation from a surface area, the detector comprising:

a housing adapted to be hand held;

a radiation sensor positioned in the housing behind a main aperture for sensing radiation from the surface area;

an electronically controlled display in the housing to provide an indication of sensed radiation flux;

a lens support for retaining a removable lens assembly in front of the radiation sensor and aperture; and

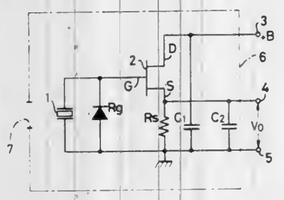
a plurality of removable and interchangeable lens assemblies of different focal lengths to be retained by the lens support and to provide different fields of view for the detector, each lens assembly comprising a Fresnel lens positioned in the barrel with the lens positioned at about its focal length from the radiation sensor, the main aperture being the limiting aperture of the detector such that the density of radiation from a given uniform surface area sensed by the radiation sensor is independent of which of said plurality of lens assemblies is retained by the lens support.

4,626,687

INFRARED SENSOR

Motohisa Nara, and Yasushi Endo, both of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,360
Claims priority, application Japan, Dec. 9, 1983, 58-232593
Int. Cl.[4] G01J *5/06, 5/04*
U.S. Cl. 250—338 **5 Claims**



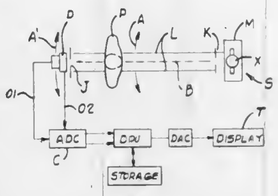
1. An infrared sensor comprising a pyroelectric element and a field effect transistor having drain, source and gate electrodes in a high frequency electric field and infrared radiation shielding case, the gate electrode being coupled with the pyroelectric element, wherein a capacitor is located in the case and connected between at least one of said drain and source electrodes of said field effect transistor and a ground potential.

4,626,688

SPLIT ENERGY LEVEL RADIATION DETECTION

Gary T. Barnes, 5068 Julata Dr., Birmingham, Ala. 35210

Filed Nov. 26, 1982, Ser. No. 444,605
Int. Cl.[1] G01T *1/20;* **G01J** *1/58*
U.S. Cl. 250—361 R **42 Claims**



1. An energy discriminating radiation detector comprising:

(a) a first element comprising a first material of a kind which is preferentially responsive to penetrative radiation of a first energy range;

(b) a second element comprising a second material different in kind from said first material and of a kind which is preferentially responsive to penetrative radiation of a second energy range extending higher than said first energy range and which is positioned to receive radiation which has penetrated through a portion of said first element; and

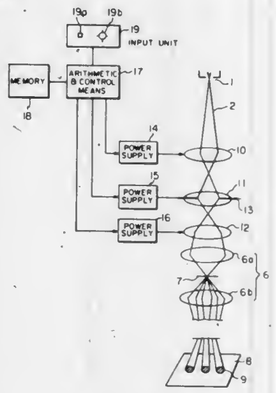
(c) a filter of penetrative radiation interposed between said first and second elements.

4,626,689

ELECTRON BEAM FOCUSING SYSTEM FOR ELECTRON MICROSCOPE

Takeshi Tomita, and Yu Ishibashi, both of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 743,014
Claims priority, application Japan, Jun. 16, 1984, 59-123993
Int. Cl.[4] H01J *29/46*
U.S. Cl. 250—396 R **7 Claims**



1. An electron beam emission and focusing system in an electron microscope comprising an electron gun; first, second, and third stages of focusing lenses for focusing the electron beam from the electron gun; first, second, and third power supplies for respectively exciting the first, second, and third stages of lenses; and an objective lens for focusing the electron

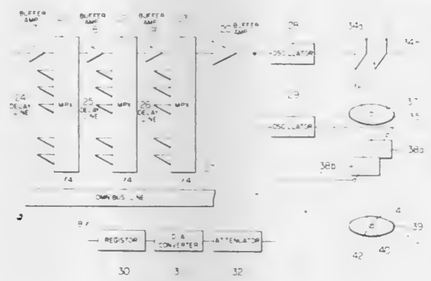
beam passed through the three lenses onto a specimen means for interrelatedly controlling the excitation currents supplied to the lenses from the three power supplies to change the divergence angle of the electron beam falling upon the specimen while maintaining the spot diameter of the beam falling upon the specimen constant.

4,626,690

APPARATUS FOR CHOPPING A CHARGED PARTICLE BEAM

Hideo Todokoro, and Tsutomu Komoda, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,203
Claims priority, application Japan, Nov. 21, 1983, 58-217724
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—396 R **4 Claims**



1. An apparatus for chopping a charged particle beam comprising:

first deflecting means for deflecting a charged particle beam in a predetermined direction by a high frequency voltage;

second deflecting means for deflecting said charged particle beam by a DC voltage or low frequency saw-tooth voltage in the same deflecting direction as said predetermined direction; and

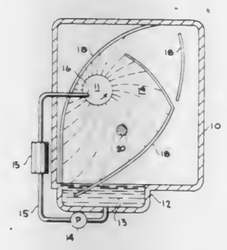
aperture means for taking out only a part of the charged particle beam which was deflected by said first and second deflecting means.

4,626,691

LIQUID-FILM ELECTRON STRIPPER

Basil F. Gavin, Albion, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 1, 1984, Ser. No. 667,255
Int. Cl.[4] H01J *3/04*
U.S. Cl. 250—423 R **15 Claims**



13. An improved liquid-film electron stripper for high intensity heavy ion beams comprising:

at least one rotatable disc mounted in a housing,

means for rotating said disc,

a liquid reservoir operatively connected to said housing,

means for directing liquid from said reservoir onto said rotatable disc for forming a film of liquid as liquid is spun from said disc,

said disc being configured to define a sharp edge located at one side of the periphery of said disc, and configured to include a flat, smooth radially outer section located adjacent said sharp edge, said liquid being directed onto said flat, smooth section of said disc,

said means for directing liquid onto said disc including a nozzle positioned with respect to said disc so that liquid from said nozzle impinges at about a 90° angle with respect to said flat, smooth surface of said disc, and

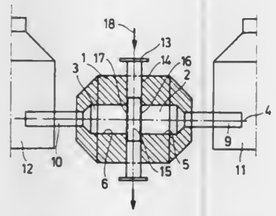
liquid film terminator means located in spaced relation to said disc and approximately perpendicular to a formed liquid film, said terminator means comprising at least one ribbon of material secured to said housing.

4,626,692

APPARATUS FOR DETECTING IODINE ISOTOPES

Jürgen Furrer, Karlsruhe, and Hans-Georg Dillman, Eggenstein, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe G.m.b.H, Karlsruhe, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 606,883
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324523
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—432 R **7 Claims**



1. An apparatus for detecting iodine isotopes in the exhaust gas of a nuclear installation, said apparatus being adapted to be connected in a bypass line for said exhaust gas which carries a partial exhaust gas flow and comprising a duct for said exhaust gas, an absorption chamber including absorption material disposed across said duct such that said partial exhaust gas flow is forced to pass through the absorption material in said absorption chamber, an arrangement of detectors supported at opposite sides of said absorption chamber and said exhaust gas duct in the area of said absorption chamber for measuring radioactive iodine collected in said absorption chamber, said absorption chamber being supported so as to be movable relative to said detectors for optimizing the sensing position of said detectors relative to said absorption chamber.

4,626,693

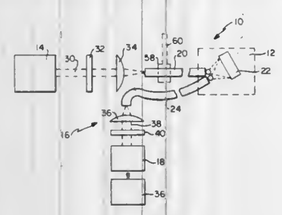
REMOTE MULTI-POSITION INFORMATION GATHERING SYSTEM AND METHOD

Tomas B. Hirschfeld, Livermore, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 194,684, Oct. 6, 1980. This application Mar. 31, 1983, Ser. No. 480,844
Int. Cl.[4] F21V *9/16*; G01N *21/64*
U.S. Cl. 250—458.1 **37 Claims**

1. A system for obtaining specific information from different information bearing locations comprising: means positioned in a location remote from said different locations for providing a source of light displaying a given wavelength characteristic; optical means including an arrangement of optical fibers cooperating with said light source for directing individual light beams into said different locations, said arrangement of fibers including single fibers at said different locations, respectively,

for directing said individual beams therein; individual means positioned at each of said different locations and responsive to an incoming one of said individual light beams from an associated one of said single fibers for providing a display of light containing the information to be obtained at that location, said display of light displaying a wavelength characteristic different than said given wavelength characteristic; said optical means cooperating with the light displays at said different locations for directing outgoing beams of light from said different locations to a single location remote from said different locations at least initially along said single fibers, each of said



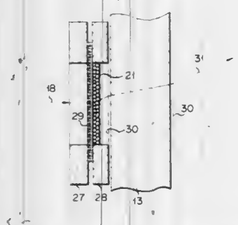
outgoing beams containing the same information as its cooperating light display at the wavelength characteristic of the latter; and means positioned at said single location for detecting said outgoing beams whereby to retrieve said information contained therein; each of said single fibers including one end which is located at its information bearing location in close proximity to said material, said fiber serving to carry both said incoming and outgoing beams, and wherein said optical means includes a spherical lens cooperating with each of the one ends of said single fibers for focusing said incoming beam onto its material and for collecting light from said light display for producing said outgoing beams.

4,626,694

IMAGE INTENSIFIER

Tetsu Sano; Hidero Anno, both of Tokyo, and Yuichiro Kume, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 565,005
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—483.1 **17 Claims**



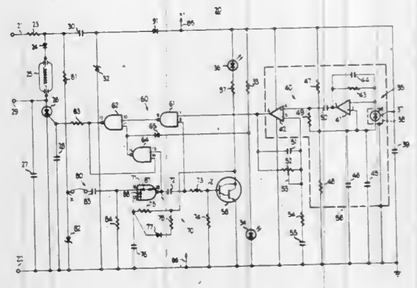
1. A screen arrangement means for an image intensifier comprising: an output screen constituted by a mesh-like substrate having an electron ray incident side and a light emitting side, and a phosphor layer supported by said light emitting side of said mesh-like substrate and susceptible to excitation by electron rays.

4,626,695

PHOTOELECTRIC COMBUSTION PRODUCTS DETECTOR WITH LOW POWER CONSUMPTION AND IMPROVED NOISE IMMUNITY

Manley S. Keeler, Naperville, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Jul. 16, 1984, Ser. No. 631,534
Int. Cl.[4] G08B *17/10*
U.S. Cl. 250—574 **20 Claims**



1. In an AC-powered combustion products detector including sampling means for periodically producing a test signal for testing the ambient air for combustion products, the improvement comprising: capacitive means for coupling the sampling means to an assoicated source of AC voltage and providing a supply current which is substantially 90° out of phase with the AC source voltage, rectifying means coupled to said capacitive means for providing a source voltage, first control means coupled to the sampling means and responsive to said supply voltage for establishing a predetermined enabling period during which the sampling period between test signals will terminate, and second control means coupled to the sampling means and to the AC source voltage for terminating the sampling period and actuating the sampling means to produce the test signal only at a time during said enabling period when the AC source voltage is substantially at zero.

4,626,696

FLYWHEEL PROPULSION SYSTEM FOR AUTOMOTIVE VEHICLES OR THE LIKE

Paul Maucher, Sasbach; Oswald Friedmann, Lichtenau, and Siegfried Sonntag, Vaihingen, all of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

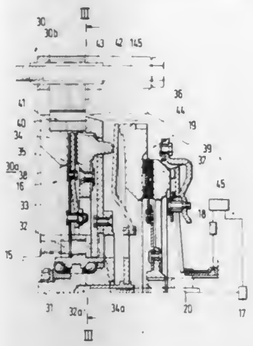
Continuation of Ser. No. 333,468, Dec. 22, 1981, Pat. No. 4,458,156. This application Jul. 2, 1984, Ser. No. 626,747
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048972
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.[4] B60K *9/04*
U.S. Cl. 290—38 R **26 Claims**

1. A propulsion system, particularly for the wheels of automotive vehicles, comprising

a power plant including a housing having a stationary component, a supporting surface on said stationary component and rotary output means;

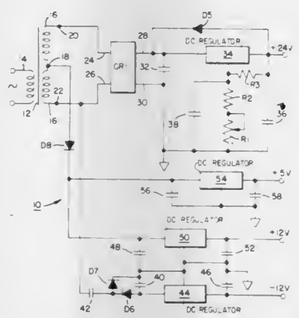
a starter-generator unit including a flywheel coaxial with said output means, first clutch means actuatable to connect said output means with said flywheel so that the latter can drive said output means or vice versa, rotor means affixed to said flywheel, stator means, and means for securing said stator means directly to the supporting surface of said stationary component of said housing so that the

stator means concentrically surrounds said rotor means and defines therewith a narrow gap;
transmission means having rotary input means; and



second clutch means actuatable to connect said output means with said input means.

4,626,697
POWER SUPPLY FOR PROVIDING PLURAL DC VOLTAGES
David C. Nelson, Santa Ana, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 22, 1984, Ser. No. 663,673
Int. Cl.[4] H02J *1/10*
U.S. Cl. 307—18 **7 Claims**



1. A DC power supply arrangement comprising:
a transformer including primary winding means for connection to an AC voltage source, and secondary winding means in electromagnetic coupling relation with said primary winding means;
first and second secondary winding terminal means connected across at least a portion of said secondary winding means for providing an AC secondary voltage when said primary winding means is connected to the AC voltage source;
center tap terminal means connected to a winding center point of said secondary winding means relative to the connection points of said first and said second terminal means;
first rectifier means having a pair of input terminals connected to said first and said second secondary winding terminal means, and a pair of output terminals one of which is coupled to a common potential point, for producing at the other one of said output terminals a first DC voltage of one polarity with respect to said common potential point in response to the AC voltage provided by said secondary winding terminal means, said first rectifier means including a first diode circuit arranged so that one of said secondary winding terminal means is coupled through a part of said first diode circuit to said common potential point during a half cycle period;
second rectifier means including DC blocking means connected to a selected one of said secondary winding terminal means, for producing a second DC voltage of polarity opposite to that produced by the first rectifier means with respect to said common potential point; and
third rectifier means including a diode one terminal of which is connected to said center tap terminal means of said secondary winding means, for producing a third DC voltage of polarity opposite to that produced by said second rectifier means.

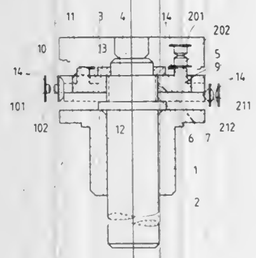
4,626,698
ZERO CROSSING SYNCHRONOUS AC SWITCHING CIRCUITS EMPLOYING PIEZOCERAMIC BENDER-TYPE SWITCHING DEVICES
John D. Harnden, Jr., Schenectady; William P. Kornrumpf, Albany, and George A. Farrall, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 21, 1984, Ser. No. 685,107
Int. Cl.[4] H02J *3/00*
U.S. Cl. 307—38 **41 Claims**



1. A zero crossing synchronous AC switching circuit for alternating current systems employing at least one piezoelectric ceramic bender-type switching device having load current carrying electric switch contacts and at least one prepolarized piezoelectric ceramic bender number for selectively closing or opening the electric switch contacts to control load current flow therethrough, said prepolarized piezoelectric ceramic bender member comprising a pair of planar prepoled piezoelectric ceramic plate elements secured in opposed parallel relationship sandwich fashion on opposite sides of a central conductive surface and having respective outer conductive surfaces that are insulted from each other and the central conductive surface by the respective intervening piezoelectric ceramic plate element thickness, said piezoelectric ceramic bender member further carrying at least one movable contact which coacts with a fixed contact to open and close the electric switch contact means of said switching device, zero crossing sensing circuit means for sensing the passage through zero value of a supply source of alternating current applied across the circuit and for deriving a zero crossing timing signal representative of the occurrence of the zero crossings, bender energization potential control circuit means responsive to the zero crossing timing signals for selectively controlling application and removal of a bender energizing potential across a piezoelectric ceramic bender member of the bender-type switching device to selectively apply said bender energization potential to each piezoelectric ceramic plate element and having the same polarity as the polarity of the prepole electric field previously permanently induced in said prepoled piezoelectric ceramic plate elements so that no depolarization of said piezoelectric ceramic plate elements occurs during successive operations of the switching device, and phase shift circuit means effectively responsive to the applied alternating current for shifting the timing of the application and removal of the bender

energizing potential to the piezoelectric ceramic bender member by a preselected phase shift interval relative to the naturally occurring zero crossings of the applied alternating circuit.

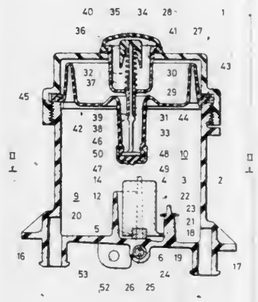
4,626,699
PULSE GENERATOR
Hermann F. Oesterle, Lauf; Wolfgang Rosl, Eckental, and Jochen Rose, Rothenbach, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Nov. 8, 1984, Ser. No. 669,691
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340843
Int. Cl.[4] H03K *3/00*
U.S. Cl. 307—106 **20 Claims**



1. A pulse generator driven by a rotary shaft, said pulse generator generating pulses indicative of rotation of said shaft and providing signals indicative of the direction of rotation of said shaft, said pulse generator comprising:
inclined plane means carried on said shaft;
a toothed disk;
supporting elements connected to said toothed disk for coupling said toothed disk to said inclined plane means;
said disk being rotatable with said shaft and being displaceable in a first axial direction to a first axial position by said inclined plane means when said shaft rotates in a first direction and being displaceable in a second axial direction to a second axial position by said inclined plane means when said shaft rotates in a second direction;
a first pair of contacts for detecting the direction of rotation of said shaft, said first pair of contacts being actuatable by said toothed disk such that when said disk is in said first position said first pair of contacts are closed and when said disk is in said second position said first pair of contacts are open;
a second pair of contacts actuated by the toothing on said toothed disk independently of the axial position of said disk but in dependence on the angle of rotation of said shaft.

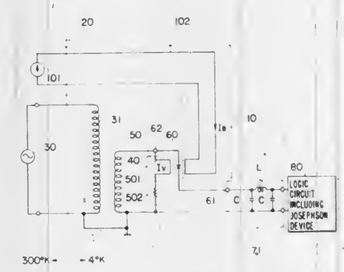
4,626,700
HYDRAULIC RESERVOIR WITH FLUID LEVEL DETECTOR
Ryuichi Tanaka, and Akira Tanaka, both of Kanagawa, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan
Filed Jul. 1, 1985, Ser. No. 750,907
Claims priority, application Japan, Jul. 5, 1984, 59-101841[U]
Int. Cl.[4] H01H *35/18*
U.S. Cl. 307—118 **22 Claims**

1. A hydraulic reservoir with fluid level detector comprising:
(A) a main body having an internal space for containing
(B) a cap attached to said main body for covering a top opening of said main body;
(C) a diaphragm arranged across said top opening of the main body, the outer circumference of said diaphragm being held between said main body and said cap, and the space between said cap and said diaphragm communicating with the atmosphere;
(D) a reed switch fixed to said main body;
(E) a float provided with permanent magnet, so arranged as to be vertically movable in said internal space of the main body, said reed switch and said float with permanent magnet constituting a fluid level detector, and when said float with permanent magnet is positioned under a predetermined level, said reed switch being closed by magnetic force of said permanent magnet;



(F) operating means for pushing down said float, being vertically movable and able to be pushed down from the external against buoyancy of said float; and
(G) a cylindrical portion integrally formed with said diaphragm, being closed at the lower end, said operating means being inserted into said cylindrical portion and said float being pushed down through the closed end of said cylindrical portion by said operating means.

4,626,701
RECTIFYING CIRCUIT COMPRISING A SUPERCONDUCTIVE DEVICE
Yutaka Harada, Kodaira; Kunio Yamashita, Hachiouji; Nobuo Kotera, Kokubunji, and Ushio Kawabe, Hamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 515,030, Jul. 18, 1983, abandoned, which is a continuation of Ser. No. 221,403, Dec. 30, 1980, abandoned. This application Feb. 1, 1985, Ser. No. 697,469
Claims priority, application Japan, Jan. 28, 1980, 55-7821
Int. Cl.[4] H03K *17/92*; H02M *7/02*
U.S. Cl. 307—245 **7 Claims**



1. A superconductive logic system comprising:
a Josephson junction connected to a pair of terminals,
a logic circuit including at least one Josephson device which operates in response to the application thereto of a low level D.C. voltage at a low temperature;
means for applying an A.C. signal to one of said pair of terminals connected to said Josephson junction;
means for applying a bias magnetic field of predetermined magnitude to said Josephson junction;

means for applying an alternating magnetic field in synchronism with said A.C. signal to said Josephson junction so that the state of said Josephson junction changes over between a superconductive state and a non-superconductive state alternately and repeatedly in response to the phase of said A.C. signal; and

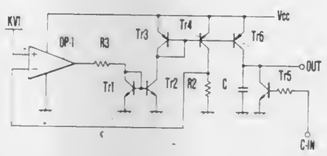
a filter circuit connected between the other terminal of said pair of terminals and said logic circuit for supplying said D.C. voltage thereto.

4,626,702

SAW-TOOTH WAVE GENERATING CIRCUIT

Yasuo Chito, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,335
Claims priority, application Japan, Nov. 30, 1983, 58-224391
Int. Cl.⁴ H03K *4/50*
U.S. Cl. 307—228 **17 Claims**



1. A saw-tooth wave generating circuit, comprising:

(a) an operational amplifier having first and second input terminals and generating an output;

(b) current control means for producing a current controlled by the output of said operational amplifier, said current control means being adapted for producing an output arranged to be fed back to the first input terminal of said operational amplifier, said current control means including at least two transistors having commonly controlled base voltages and through which the same current flows in correspondence to the output of said operational amplifier, and the output of one of said transistors being arranged to be fed back to the first input terminal of said operational amplifier, said current control means having another transistor;

(c) a reference voltage source for supplying a reference voltage to the second input terminal of said operational amplifier;

(d) integrating means for integrating a current produced by said other transistor; and

(e) reset means for resetting said integrating means.

4,626,703

THYRISTOR WITH CONNECTIBLE CURRENT SOURCES AND METHOD FOR OPERATING SAME

Hubert Patalong, Munich, and Eberhard Spenke, Pretzfeld, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,112
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230721
Int. Cl.⁴ H03K *17/72*
U.S. Cl. 307—252 G **3 Claims**

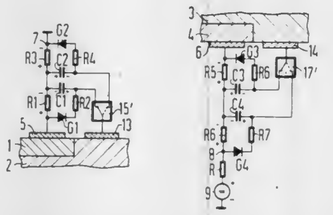
1. A thyristor comprising:

a semiconductor body having an n-emitter with a first electrode, a p-base layer adjacent to and contacting said n-emitter, a p-emitter having a second electrode, and an n-base layer adjacent to and contacting same p-emitter, said p-base layer and said n-base layers being separated by a pn-junction, and said p-base layer having a third electrode and said n-base layer having a fourth electrode;

two current sources comprising a first current source pair connected to said first electrode and a first switching means for connecting one of said current sources in said first current source pair at a time to said third electrode with a first polarity;

two further current sources comprising a second current source pair connected to said second electrode and a second switching means for connecting said fourth electrode to one of said current sources in said second current source pair at a time with a second polarity opposite to said first polarity;

each of said current sources in the first current source pair being opposite polarity and having a resistor, a capacitor interconnected in series between said resistor and said third electrode, and a rectifier connected in parallel with the series connection of said capacitor and said resistor,



said resistors in the respective current sources in said first current source pair being connected in series between said first electrode and an external terminal; and

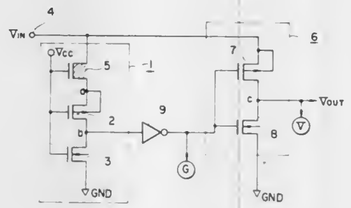
each of said further current sources in the second current source pair being of opposite polarity and having a further resistor, a further capacitor interconnected in series between said further resistor and said fourth electrode, and a further rectifier connected in parallel with the series connection of said further capacitor and said further resistor, said further resistors in the respective further current sources in said second current source pair being connected in series between said second electrode and another external terminal.

4,626,704

VOLTAGE LEVEL CONVERTING CIRCUIT

Akira Takata, Toyonaka, and Toyofumi Takahashi, Ikeda, both of Japan, assignors to Ricoh Company, Ltd., Japan

Continuation-in-part of Ser. No. 471,859, Mar. 3, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 724,793
Claims priority, application Japan, Mar. 4, 1982, 57-34769
Int. Cl.⁴ H03K *5/00*
U.S. Cl. 307—264 **12 Claims**



1. A voltage level converting circuit for converting the voltage level of an input signal to a desired level, comprising:

an input terminal to which an input signal may be applied;

voltage level detecting means connected to said input terminal for detecting the voltage level of said input signal and supplying a high level output signal when said input signal has been detected to be equal to or higher than a predetermined voltage level or a low level output signal when said input signal has been detected to be lower than said predetermined voltage level, said voltage level detecting means including a first P-channel MOSFET and a first N-channel MOSFET which are connected in series between said input terminal and a first reference voltage and which have their gates connected to a second reference voltage, said voltage level detecting means further including a depletion type N-channel MOSFET which is connected in series between said input terminal and said series connected first P-channel and N-channel MOSFETs and which has its gate connected to said second reference voltage;

inverting means having an input and an output, said input of said inverting means being connected to the junction between said first P-channel and first N-channel MOSFETs of said voltage level detecting means for inverting the output signal supplied from said voltage level detecting means; and

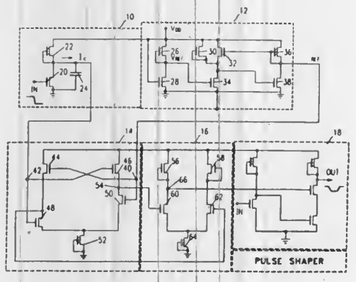
a CMOS device including a pair of second P-channel and second N-channel MOSFETs which are connected in series between said input terminal and said first reference voltage, the gate of each of said second P-channel and second N-channel MOSFETs being connected to said output of said inverting means and the junction between said second P-channel and second N-channel MOSFETs being connected to an output terminal of said circuit.

4,626,705

FIELD EFFECT TRANSISTOR TIMING SIGNAL GENERATOR CIRCUIT

Norman Raver, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,765
Int. Cl.⁴ H03K *17/14*
U.S. Cl. 307—269 **3 Claims**



1. A clock signal generator for providing an output clock signal adjusted for variations in circuit current comprising:

timer circuit means responsive to an input signal for producing a timing voltage signal having a voltage slope which varies faster or slower than a desired nominal slope due to circuit variations,

said timer circuit means including an FET constant current device for producing a varying current i_c in response to said input signal, and a capacitor responsive to said current i_c to produce said timing voltage signal,

reference voltage generating means connected to said timer circuit for generating a reference voltage having a magnitude proportional to the difference between said timing voltage slope and said nominal desired slope,

wherein said reference voltage generating means includes a voltage source V_{DD} and a pair of transistors connected to Vhd DD for providing a voltage between said pair of tansistors proportional to current i_c, and a feedback amplifier to amplify said voltage between said pair of transistors to a suitable value and provide stable gain to produce said reference voltage signal,

detecting means connected to said timer circuit means and said reference voltage generating means for producing a pulse signal representative of the crossover time when said magnitude of said timing voltage signal is equal to the magnitude of said reference voltage,

wherein said reference voltage is set higher for timing voltage pulse slopes which vary faster than said nominal slope, and is set lower for timing voltage pulse slopes which vary slower than said nominal slope such that said crossover time when said magnitudes are equal always occurs at the same given time period after the beginning of said timing voltage pulse, and

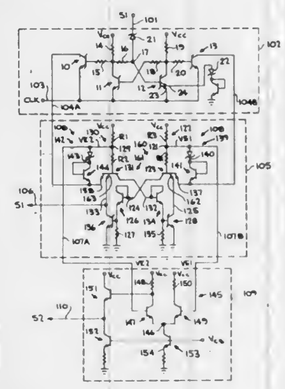
a waveform shaping means connected to said input signal and to said timing voltage signal for producing an output clock pulse having an occurrence time determined by said timing voltage signal and said crossover time.

4,626,706

DIGITAL SIGNAL LEVEL TRANSLATION/MASTER-SLAVE FLIP FLOP WITH LOOK-AHEAD

Michael Allen, San Francisco, and Tsen-Shau Yang, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 24, 1984, Ser. No. 614,403
Int. Cl.⁴ H03K *3/289*
U.S. Cl. 307—272 A **16 Claims**



1. An apparatus for translating a first type signal to a second type signal, the apparatus being responsive to a clock signal, comprising:

(a) master latch means for receiving and latching the first type signal during a portion of the clock signal and for generating a master latch signal corresponding to the level of the first type signal;

(b) slave latch means for receiving and latching the master latch signal and for generating a slave latch signal;

(c) lookahead means, receiving and responding to the master latch signal, for switching the slave latch signal to a state corresponding to the state of the master latch signal before said slave latch means completes a latch of the master latch signal; and

(d) output driver means, receiving and responding to the slave latch signal, for supplying the second type signal.

4,626,707

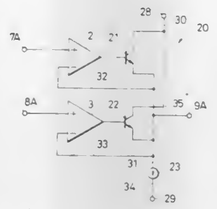
SIGNAL SELECTION CIRCUIT

Setsuo Arita, and Fumiyasu Ohkido, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 617,097
Claims priority, application Japan, Jun. 3, 1983, 58-97854
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—355 **8 Claims**

1. A signal selection circuit having a plurality of unit circuit elements each of which is comprised of an amplifier having an

inverted input terminal and a non-inverted input terminal, and a transistor of which the base is connected to the output terminal of said amplifier and of which the emitter is connected to the inverted input terminal of said amplifier, wherein a constant-current circuit connected to a first power-source terminal



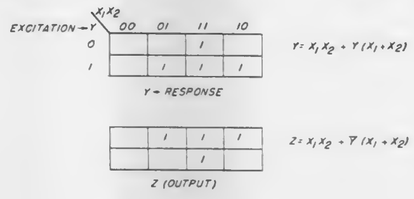
is connected to the emitter of said transistor in each of said unit circuit elements, these emitters are connected to an output terminal, and the collector of said transistor in each of said unit circuit elements is connected to a second power-source terminal.

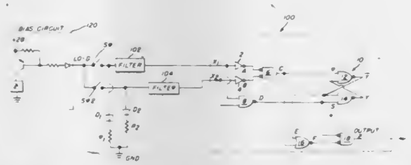
4,626,708

ELECTRONIC LOGIC TO ENHANCE SWITCH RELIABILITY IN DETECTING OPENINGS AND CLOSURES OF REDUNDANT SWITCHES

James A. Cooper, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,338
Int. Cl.[4] H03K *19/003;* **H04L** *1/00;* **G06F** *7/02, 11/16*
U.S. Cl. 307—441 **14 Claims**





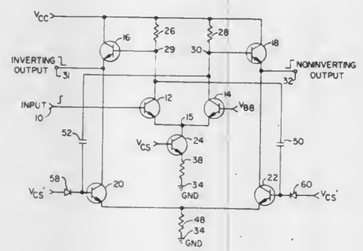
1. A system for enhancing switch reliability comprising:
first and second switches, each having open and closed output states;
memory means operatively connected to first and second switches for storing the last common output state simultaneously held by both said switches; and
logic means responsive to said memory means and said first and second switches for generating a first system output when both said switches are closed or when one of said switches closes when said last common output was open and for generating a second system output when both said switches are open or when one of said switches opens when said last common output was closed.

4,626,709

DYNAMIC PUSH-PULL FOR ECL

Nikhil C. Mazumder, San Jose, and Frederick N. Lancia, II, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 28, 1984, Ser. No. 656,101
Int. Cl.[4] H03K *19/013, 19/086*
U.S. Cl. 307—455 **6 Claims**



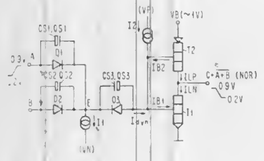
1. An emitter coupled logic (ECL) circuit comprising:
at least two switching transistors formed of a reference switching transistor and an input switching transistor and having their emitter terminals coupled to a first current source, said reference switching transistor having a base terminal coupled to a reference voltage terminal, said input switching transistor having a base terminal coupled to an input terminal;
a pair of emitter follower transistors, a first emitter follower transistor coupled to the reference switching transistor, a second emitter follower transistor coupled to the input switching transistor;
a second current source connected to each transistor of the emitter follower pair;
means connected to each switching transistor for exclusively coupling the second current source to one of the first and second emitter follower transistors dependent upon which switching transistor is conductive;
said coupling means including a pair of coupling transistors having their emitter terminals connected to said second current source, a first coupling transistor having its collector terminal connected to an emitter terminal of the first emitter follower transistor and its base terminal coupled to a collector terminal of the input switching transistor, a second coupling transistor having its collector terminal connected to an emitter terminal of the second emitter follower transistor and its base terminal coupled to a collector terminal of the reference switching transistor;
each base terminal of the coupling transistor pair being connected to the collector terminals of the switching transistors by capacitance means;
said second current source being formed of a resistance means connected between the emitter terminals of the coupling transistors and a voltage supply terminal; and
a diode being connected between each of the base terminals of the coupling transistors and a current source voltage terminal to prevent any current from flowing between the base terminals and the current source voltage terminal during switching;
whereby the delay in switching speeds caused by load capacitance on the emitter follower transistors is reduced.

4,626,710

LOW POWER LOGIC CIRCUIT WITH STORAGE CHARGE CONTROL FOR FAST SWITCHING

Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,943
Claims priority, application European Pat. Off., Jun. 8, 1984, 84106534.5
Int. Cl.[4] H03K *19/013, 19/084*
U.S. Cl. 307—457 **14 Claims**



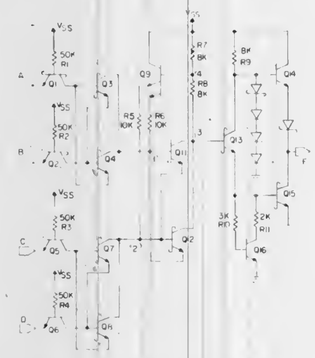
1. A logic circuit with input diodes each connecting an input with a common circuit node, a transistor output stage and one or more level shift diodes connecting said common circuit node and the input of said transistor output stage, each said level shift diode being poled oppositely with respect to said input diodes, characterized in that the input diodes as well as each level shift diode are designed as large τ_s diodes, τ_s being the minority carrier charge storage time constant, so that they are adapted to effect a dynamic exchange of minority carrier charges therebetween during input level transitions, providing a dynamic switching current which is substantially increased over an underlying small static dc current.

4,626,711

EXCLUSIVE OR GATE CIRCUIT

Gabriel M. Li, San Francisco, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 11, 1984, Ser. No. 609,368
Int. Cl.[4] H03K *19/21, 19/092, 19/013*
U.S. Cl. 307—471 **4 Claims**



1. An exclusive-or gate circuit comprising:
an exclusive-nor gate logic circuit having at least first and second input terminals and an output node; and
an inverter gate circuit having an input terminal coupled to said output node of said exclusive-nor logic circuit, whereby said inverter gate produces an output that represents the exclusive-nor function of said first and second input terminals, wherein said exclusive-nor logic circuit comprises:
first, second, third, and fourth transistors, each having emitter, base, and collector electrodes;
means coupling the emitter of said first transistor to said first input terminal;
means coupling said base of said first transistor to a first voltage source;
means coupling said collector of said first transistor to said base of said third transistor and to said emitter of said fourth transistor;
means coupling said emitter of said second transistor to said second input terminal;
means coupling said base of said second transistor to said first voltage source;
means coupling said collector of said second transistor to said base of said fourth transistor and to said emitter of said third transistor; and
means coupling said collectors of said third and fourth transistors together to comprise said exclusive-nor logic circuit output and to load means for coupling said output to said first voltage source;
said load means comprise fifth and sixth transistors, each one having emitter, base and collector electrodes;
means coupling said emitter of said fifth transistor, through a series resistor, to said exclusive-nor logic circuit output node;
means coupling said collector of said fifth transistor to said first voltage source;
means coupling said base of said sixth transistor to said exclusive-nor logic circuit output node;
means including a resistor voltage divider having a tap, coupled between said collector of said sixth transistor and said first voltage source; and
means coupling said base of said fifth transistor to said tap on said resistor voltage divider whereby said exclusive-or gate circuit includes a speed up feedback circuit.

4,626,712

HIGH SPEED MOS INPUT CIRCUIT WITH PRECISION INPUT-OUTPUT CHARACTERISTICS

Takashi Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,619
Claims priority, application Japan, Mar. 18, 1983, 58-45474
Int. Cl.[4] H03K *19/003*
U.S. Cl. 307—475 **11 Claims**



1. An input circuit for receiving input signals and to be connected to a power supply comprising:
a first stage series circuit for receiving said input signals, said first stage series circuit including a first driver transistor of

insulated-gate field effect type for receiving said input signal and a first load means connected in series across said power supply, said first driver transistor having a channel region defined by a first channel length, said first stage series circuit generating an internal signal from the intermediate junction of said first driver transistor and said first load transistor;

a second stage series circuit for receiving said internal signal, said second stage series circuit including a second driver transistor of insulated-gate field effect type for receiving said internal signal and a second load means connected in series across said power supply, an output signal being generated from the intermediate junction of said second driver transistors and said second load means;

said second driver transistor having a channel length shorter than said first channel length wherein said first channel length is 1.2 to 4 microns and said second channel length is 1 to 2 microns, the difference between said first and second channel lengths being 0.2 to 2 microns.

4,626,713

TRIP-POINT CLAMPING CIRCUIT FOR A SEMICONDUCTOR DEVICE

Robert D. Lee, Denton, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Sep. 6, 1984, Ser. No. 648,093
Int. Cl.[4] H03K *17/14*
U.S. Cl. 307—548 **1 Claim**



1. A trip-point clamping circuit for a semiconductor device including an output node connected to a sensing device comprising

inverter means for establishing a reference voltage level;

current means for maintaining the same current level on each of a first and a second element output in the absence of a signal at said output node,

first transistor means including a control gate coupled to the inverter means, a first current-carrying terminal coupled to the first current output and a second current carrying terminal,

second transistor means for responding to the voltage level at said output node including a control gate coupled to the output node, a first current carrying terminal coupled to the output node and to the second current output and a second current-carrying terminal, and

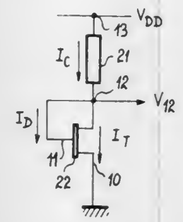
switch means supplied with current from the second current-carrying terminals of the first and second transistor means whereby the current to said switch means is varied by signals on said output node.

4,626,714

CIRCUIT FOR LIMITING THE DEVIATION OF LOGIC VOLTAGES

Ngu T. Pham, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 2, 1985, Ser. No. 803,166
Claims priority, application France, Dec. 4, 1984, 84 18467
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—550 **5 Claims**



1. A circuit for limiting the deviation of logic voltages in direct coupled logic circuits, called DCFL, comprising, connected in series between a supply source and ground, a load impedance and a field effect transistor whose source is grounded and whose gate is connected to the drain, which forms the output of the limiter circuit, the voltage of the common point between said load impedance and the drain of said field effect transistor being limited if said load impedance is matched to the transconductance and to the threshold voltage of said field effect transistor, so that the current which flows through the load resistor (I_{C21}) is less than or equal to twice the product of the transconductance (g_{m22}) multiplied by the threshold voltage (V_T):

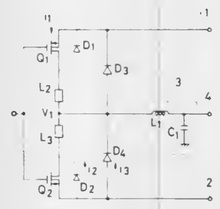
$$I_{C21} \leq 2_{gm22} \cdot V_T$$

4,626,715

MOS FET AMPLIFIER OUTPUT STAGE

Satoshi Ishii, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,290
Claims priority, application Japan, Feb. 28, 1983, 58-33497
Int. Cl.[4] H03K *17/687, 5/00, 3/01*
U.S. Cl. 307—585 **5 Claims**



1. An output circuit comprising:

first and second switching elements, said first switching element having a first signal channel terminal coupled to a positive power source terminal and a second signal channel terminal coupled to an intermediate terminal, said second switching element having a first signal channel terminal coupled to a negative power source terminal and a second signal channel terminal coupled to said intermediate terminal, and said first and second switching elements having respective control terminals receiving control signals, said intermediate terminal providing an output signal;

a first inductor coupled in series with the signal channel of said first switching element between said positive power source terminal and said intermediate terminal;

a second inductor coupled in series with the signal channel of said second switching element between said intermediate terminal and said negative power source terminal;

a first diode connected in parallel with the series coupling of said first transistor and said first inductor and having its anode coupled to said intermediate terminal and its cathode coupled to said positive power source terminal; and

a second diode connected in parallel with the series coupling of said second transistor and said second inductor and having its cathode coupled to said intermediate terminal and its anode coupled to said negative power source terminal;

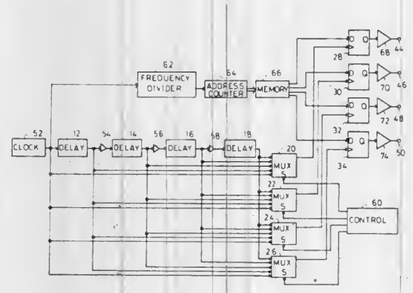
whereby power loss occurring at switching times of said control signals is reduced.

4,626,716

DIGITAL SIGNAL DELAY CIRCUIT

Yasuhiko Miki, Tokyo, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,600
Claims priority, application Japan, Apr. 27, 1984, 59-85659
Int. Cl.[4] H03K *5/13, 5/159*
U.S. Cl. 307—590 **6 Claims**



1. A digital delay circuit, comprising:

first and second delay devices each having an input terminal and an output terminal, the input terminal of said second delay device being connected to the output terminal of said first delay device;

first and second selection means each having first, second and third input terminals connected to the input and output terminals of said first delay device and the output terminal of said second delay device respectively and also having an output terminal, each selection means being operable to connect one of its input terminals to its output terminal; and

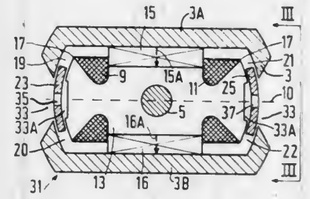
first and second latch means having respective clock input terminals connected to the output terminals of the first and second selection means respectively and also having respective output terminals, and each latch means having a data input terminal for receiving a digital input signal that is to be latched in response to a signal received at the clock input terminal.

4,626,717

PIVOTABLY OSCILLATING MOTOR HAVING SIMPLE ARMATURE POLE ELEMENTS

Johannes M. M. Hensing, Eindhoven, and Robert H. Munnig Schmidt, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,324
Claims priority, application Netherlands, Mar. 13, 1984, 8400791
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—36 **6 Claims**



1. A pivotally oscillating motor comprising a magnetizable stator and a reciprocable armature,

said stator including two coils arranged opposite each other, and a magnetizable core extending between said coils; a stator section arranged to define a plurality of air gaps formed between the stator section and the core at end faces of the coils which are remote from each other, said air gaps being concentric about an axis; and at least one permanent magnet disposed between said stator section and said core with a magnet pole facing the core,

said motor further comprising a motor shaft concentric with said axis, and an armature arranged to be pivotable about said shaft, said armature including a plurality of pole elements associated with respective air gaps, arranged such that pivoting of the armature causes one pole element to move into the respective air gap, and another pole element to move out of its respective air gap,

said coils and core being arranged such that passage of an alternating current through the coils causes flux alternately to increase in a first of said air gaps and decrease in the second of said air gaps, and then to decrease in the first gap and increase in the second.

4,626,718

ROTARY SOLENOID FOR INTERMITTENT INK RIBBON FEEDING

Nobuyuki Moriyama, Saga, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 19, 1982, Ser. No. 442,897
Claims priority, application Japan, Nov. 20, 1981, 56-186594
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—37 **30 Claims**

1. A rotary solenoid for producing an oscillatory rotary motion at its output, comprising:

a rotating shaft which is supported rotatably and which defines the output of said rotary solenoid at one end;

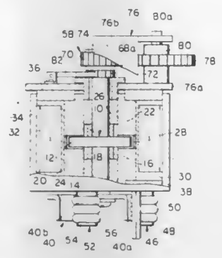
a rotor fixedly mounted on said rotating shaft, said rotor including a plurality of vanes extending radially;

a first stator including a plurality of first magnetic pole sections arranged around said rotating shaft at one side of said rotor;

a second stator including a plurality of second magnetic pole sections arranged around said rotating shaft at the other side of said rotor in an axially opposed relation with respect to said first magnetic pole sections of said first stator;

means for applying a magnetic field, when activated, to said first and second stators to produce a magnetic interaction between said vanes and said first and second magnetic pole sections thereby causing said rotor and thus said

rotating shaft to rotate in accordance with said magnetic interaction; and



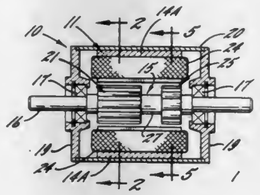
means for urging said rotating shaft to rotate in a predetermined direction, whereby said rotating shaft is rotated in said predetermined direction by said means for urging when said means for applying is deactivated.

4,626,719

STEPPING MOTOR HAVING ROTOR WITH AXIALLY SPACED SECTIONS

Ronald K. Foster, Rockford, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Jul. 22, 1980, Ser. No. 171,096
Int. Cl.⁴ H02K *37/00*
U.S. Cl. 310—49 R **6 Claims**



1. A rotary stepping motor comprising a stator member, a rotor member telescoped with and rotatable relative to said stator member, each of said members having angularly spaced pole pieces projecting radially toward the pole pieces of the other member, the pole pieces of one of said members being defined by two axially spaced sets of pole pieces, the pole pieces of one of said sets each having an angular width which is less than the angular width of the pole pieces of the other set, and windings on the pole pieces of said stator member and selectively energizable in a predetermined sequence to produce a rotating magnetic field having flux which threads through the axially spaced sets of pole pieces of said one member and through the pole pieces of the other member.

4,626,720

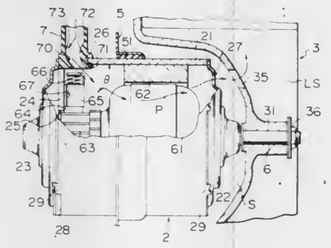
COOLING APPARATUS FOR MOTOR MEANS TO PROTECT COMMUTATOR FROM DUST AND MOISTURE IN COOLING AIR

Yoshinori Fukasaku, Hitachi; Kunihiro Noto, and Reijiro Takahashi, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 354,612, Mar. 4, 1982. This application Nov. 30, 1984, Ser. No. 676,925
Claims priority, application Japan, Mar. 6, 1981, 31345/81
Int. Cl.⁴ H02K *9/06*
U.S. Cl. 310—62 **9 Claims**

1. In a motor means for use in a blower apparatus having said motor means, a fan means adapted to be driven by said motor means and a casing encasing said fan means, said motor means including a housing, a permanent magnet means formed substantially in an annular form on an inner surface of said housing, a shaft projected outwardly from one end surface of said housing and rotatably supported at both ends of said housing, said fan means being fixed to the projected end portion of said shaft, an armature mounted on a portion of said shaft disposed in opposition to said permanent magnet means, a commutator mounted on the portion of said shaft opposite to said projected end portion of said shaft and located adjacent to said armature, and a brush means electrically engaging with said commutator, a cooling apparatus for cooling said motor means comprising:

an air introduction opening formed in a wall portion of said housing radially opposing said commutator; means for



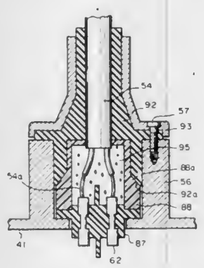
guiding a cooling air flow from said air introduction opening such that the cooling air flows along said armature into a low-pressure space in said blower apparatus, the pressure in said low-pressure space being lowered as a result of a rotation of said fan means to a level of the pressure around said air introduction opening, and deflecting means provided on a stationary part of the motor means at an upstream side of said armature as viewed in the direction of flow of said cooling air, for deflecting the cooling air from the guiding means away from the commutator and toward said armature so as to prevent a direct contact of dust and moisture in the cooling air with the commutator.

4,626,721

ELECTRICAL CONNECTOR FOR SUBMERGIBLE MOTOR PUMP ASSEMBLY

Kiyoshi Ouchi, Fujisawa, Japan, assignor to Ebara Corporation, Tokyo, Japan

Division of Ser. No. 472,833, Mar. 7, 1983. This application Mar. 4, 1985, Ser. No. 707,832
Claims priority, application Japan, Dec. 15, 1982, 57-21949
Int. Cl.⁴ H02K *5/132, 5/22;* H01R *13/40*
U.S. Cl. 310—71 **1 Claim**



1. A connector construction for connecting an electric cable to a motor section of a submergible pump comprising:

a terminal plate having terminals and adapted to be placed on an end cover of a motor section of said pump;

a hollow cylindrical cap having an open end a partly closed end at axially opposite ends thereof, respectively, said open end having means for sealingly engaging with said terminal plate so as to form a space into which a curable fixing agent may be introduced, said partly closed end having means for permitting an end portion of said cable to pass therethrough and for laterally supporting said end portion, said means for permitting and laterally supporting including means for introducing a fixing agent into said space, said cap having a tapered annular shoulder on an outer cylindrial surface thereof;

a boot made of elastic material and having an axial through hole through which said cable passes under intimate contact with said boot, said boot including a cylindrical portion having a bore for encasing therein a part of said cap, a cylindrical wall of said cylindrical portion terminating in an annular tapered end shaped to mate with said annular shoulder when the boot is placed over said part of said cap, said boot also including an annular tapering portion and a flange;

a cable seat portion formed on said end cover for the motor section, said seat portion including a cylindrical wall which forms a second space in which said terminal plate, said cover and the cylindrical portion of said boot may be disposed, the axial end of said cylindrical wall of said cable seat portion being adapted to closely engage with said flange of said boot when said boot is placed over said cap;

a metallic covering case having an internal configuration compatible with the outer configuration of said boot except for said cylindrical portion of said boot; and

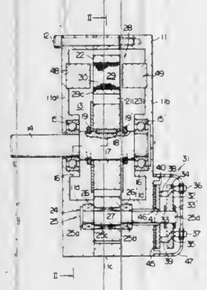
mechanical fastening means for fastening said metallic covering case to case cylindrical wall of said seat portion via said flange so that said terminals are completely sealed against water by firm engagement of said annular shoulder and said annular tapered end.

4,626,722

GEARED MOTOR

Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Sep. 12, 1984, Ser. No. 649,719
Claims priority, application Japan, Sep. 16, 1983, 58-171877
Int. Cl.⁴ H02K *7/06*
U.S. Cl. 310—82 **2 Claims**



1. A geared motor comprising:

a housing;

an output shaft rotatably received in said housing and having an axis of rotation passing therethrough;

a sun gear securely supported on said output shaft in said housing and having an axis of rotation in coaxial relationship to said axis of rotation of said output shaft, the sun gear having an outer peripheral portion formed with a plurality of external teeth having semi-circular cross sections;

a ring gear housed in said housing and having a center axis, the ring gear having an inner peripheral portion formed with a plurality of internal teeth held in meshing engagement with said external teeth of said sun gear, and the internal teeth of the ring gear having a pitch circle larger than that of said external teeth of said sun gear and being larger in number than said external teeth of said sun gear and being constituted by a plurality of axial grooves equiangularly formed in said peripherally inner portion of said ring gear and extending in parallel with the axis of rotation of said sun gear to have semi-circular cross sections, respectively, and a plurality of cylindrical bar members each rotatably received in said axial grooves;

supporting means for supporting said ring gear in such manner that said center axis of said ring gear is eccentrically revolvable with respect to said axis of rotation of said output shaft and said ring gear is prevented from being rotated about its center axis;

said supporting means comprising a plurality of crank shafts circumferentially equally spaced apart from one another and each having axial end portions rotatably received in said housing and axially aligned with each other and an axial intermediate portion rotatably received in the ring gear, the axial intermediate portion having a center axis which is revolvable with respect to the axes of rotation of the axial end portions; and

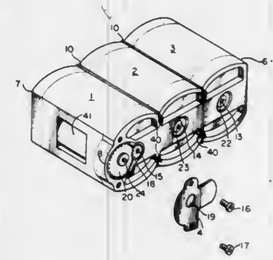
drive means for generating electromagnetic force to drive said ring gear to radially move with respect to said sun gear so that said output shaft is driven to rotate about its axis of rotation.

4,626,723

ACTUATOR SYSTEM FOR AUTOMOTIVE SEAT MOVER MECHANISMS AND THE LIKE

Bobby E. McMillen, Columbus, Miss., assignor to AMBAC Industries, Incorporated, Columbus, Miss.

Filed Mar. 15, 1982, Ser. No. 358,390
Int. Cl.⁴ H02K *23/00*
U.S. Cl. 310—83 **7 Claims**



1. An electric motor assembly comprising:

a plurality of similar armatures, each of which is supported on a shaft for rotation;

a separate housing, providing a field for each armature so that the housings and armatures constitute separate individual motors each without at least one end closure;

a common one piece end cap for at least one end of each housing to which an open end of each motor housing is affixed, which supports each motor housing relative to each other in a side by side relationship and which provides bearings for each armature shaft;

a first coupling means on at least one end of a first armature shaft to receive and drive a first external member; and

a second coupling means rotatably supported on said common housing closure means which second coupling means is driven by gears intermediate to a second armature shaft including a gear on the shaft, which gears provide an altered speed/torque output from that provided to the first coupling means, which second coupling means has provisions to receive and drive a second external member.

4,626,724

WATERPROOF DEVICE FOR ELECTRIC MOTOR

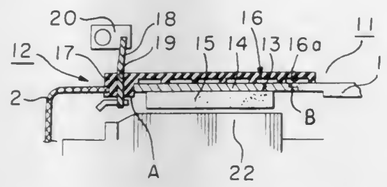
Akira Morishita, Himeji; Taiichi Nakagawa, Takasago, and Akinori Hasegawa, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,223

Claims priority, application Japan, May 17, 1984, 59-73451[U]

Int. Cl.[4] H02K *5/10*

U.S. Cl. 310—88 6 Claims



1. A waterproof device for an electric motor having a cylindrical motor frame body and a power supply lead wire extending from the interior of said motor frame body to the exterior thereof, said motor frame body being formed from at least three discrete portions disposed along the axial direction of the motor and meeting one another at respective split portions of said motor frame body,

said waterproof device comprising an annular elastic member attached onto an outer surface of said motor frame body and sealingly covering said split portions,

said elastic member comprising a lead-out portion positioned between two of said discrete portions and having therein an insertion port receiving said lead wire.

4,626,725

SYNCHRONOUS ROTARY MACHINE

Shigeki Kawada; Yoichi Amemiya; Masatoyo Sogabe, all of Hachioji, and Noboru Iwamatsu, Hino, all of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

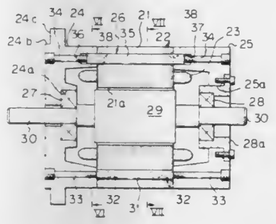
PCT No. PCT/JP85/00092, § 371 Date Oct. 25, 1985, § 102(e) Date Oct. 25, 1985, PCT Pub. No. WO85/04057, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 27, 1985, Ser. No. 796,480

Claims priority, application Japan, Feb. 27, 1984, 59-34370

Int. Cl.[4] H02K *5/00*

U.S. Cl. 310—89 5 Claims



1. A synchronous rotary machine comprising:

a stator iron core forming a part of the outer shell of the rotary machine and made of a number of thin plates stacked in the axial direction;

a winding wound around said stator iron core;

a pair of brackets attached to opposite ends of said stator iron core, respectively;

a rotor assembly rotatably supported on said brackets through bearing members mounted on said brackets, respectively;

a plurality of tightening members for tightening said brackets and said stator iron core in the axial direction thereof so that said stator iron core and said brackets are firmly tightened to each other; and

at least two rods extending in the axial direction through said stator iron core and limiting the distance between said brackets in such a manner that each of the rods abuts at the opposite ends thereof to said brackets when said stator iron core is contracted to a predetermined length.

4,626,726

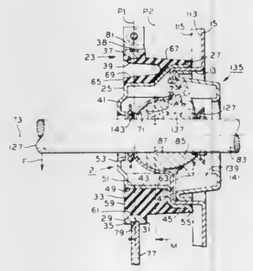
DYNAMOELECTRIC MACHINE WITH CUSHIONING DEVICE

James L. King, and Kerry B. Shelton, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 14, 1984, Ser. No. 681,685

Int. Cl.[4] F16C *27/06;* H02K *5/167*

U.S. Cl. 310—91 16 Claims



12. A cushioning device adapted for mounting engagement between a hub on an end frame of a dynamoelectric machine and a means for supporting the dynamoelectric machine, the cushioning device comprising:

a pair of generally annular mounts, one of said mounts having an axial length predeterminately greater than that of the other of said mounts and said other mount having an outer circumferential configuration arranged to receive at least a part of the supporting means for the dynamoelectric machine upon the mounting engagement of the cushioning device with the supporting means;

a pair of opposite end portions on said one mount generally defining the axial length thereof, one of said opposite end portions having an inner circumferential configuration arranged to receive therewithin at least a part of the hub on the end frame of the dynamoelectric machine upon the mounting engagement of the cushioning device with the hub and the other of said opposite end portions being arranged generally concentrically with at least a part of said other mount; and

a resilient material disposed in bonded engagement between said mounts.

4,626,727

FLAT, PERMANENT MAGNET ELECTRIC MOTOR

Jan Janson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,775

Claims priority, application Netherlands, May 11, 1984, 8401519

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 7 Claims

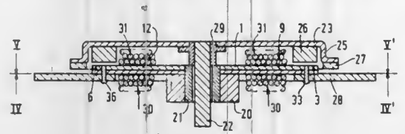
1. An electric motor, comprising

a rotor with a permanent magnet,

a stator comprising an iron body which is coaxial with said rotor, said body being at least partly bounded on a first axial side by a substantially plane surface; and said body comprising radial limbs which terminate in tooth surfaces, said tooth surfaces and rotor being separated by an air gap across which the teeth and rotor cooperate via air gap flux, and

a plurality of stator windings each arranged around a respective radially extending limb whereby each winding has a radially extending coil axis, each winding having a coil end portion which projects from the iron body in an axial direction on said first axial side,

characterized in that said tooth surfaces which cooperate with the rotor are situated in a plane transverse to the



rotor shaft on said first axial side and are disposed radially from the coil, and

said permanent magnet is an axially magnetized permanent magnet ring arranged axially opposite said tooth surfaces and radially from said coil end portions,

whereby the air gap flux is generally perpendicular to the radial limbs around which the windings are disposed.

4,626,728

POWER GENERATOR FOR A PIEZOELECTRIC ULTRA-SONIC TRANSDUCER

Gerhard Flachenecker, Ottobrunn; Karl Fastenmeier, Munich, and Heinz Lindenmeier, Planegg, all of Fed. Rep. of Germany, assignors to MED-Inventio AG, Zurich, Switzerland

Continuation of Ser. No. 640,075, Aug. 10, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 840,463

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331896

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—316 6 Claims



1. A power generator for an ultrasonic transducer comprising

variable-controlled oscillator means;

power amplifier means receiving the output of said variable-controlled oscillator means;

a transformer having three windings, said transformer having a first winding connected to said ultrasonic transducer;

coupling means coupling the output of said power amplifier means and said variable controlled oscillator means to said ultrasonic transducer through said first winding of said transformer;

phase measuring means having first and second inputs and an output, said first input being derived from the output of said coupling means, said second input being derived from the load current flowing through said ultrasonic transducer and said first winding by connecting said second input to a third winding of said three windings transformer, said second input being a current porportional to a reactive current component of said load current flowing in a second winding of said three winding transformer caused by the lead capacitance and rest capacitance of said ultra-sonic transducer, said second winding being connected to the output of said coupling means, said first and second windings being poled so that their magnetic effects are subtracted from each other;

said phase measuring device producing an output to said variable controlled oscillator proportional to the phase difference of said first and second inputs to adjust the frequency of said variable controlled oscillator means to a resonant frequency of said ultrasonic transducer determined by the load applied to said transducer.

4,626,729

ELECTROACOUSTIC PIEZOELECTRIC TRANSDUCERS

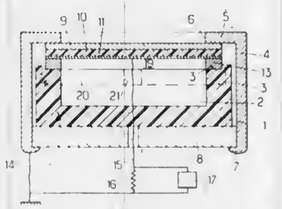
Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint-Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Filed Apr. 30, 1985, Ser. No. 728,768

Claims priority, application France, May 4, 1984, 84 06987

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—324 2 Claims



1. An electroacoustic piezoelectric transducer including a mechanically stretched vibrating membrane composed of a piezoelectric polymer sheet interposed between two metallic electrodes, one of said electrodes being constituted by metallization of one of the faces of the polymer sheet, and the other said electrode being constituted by an autonomous metallic sheet of high resistance to mechanical tension applied in a direction in or parallel to the plane of the metallic sheet, and in intimate adherence to the other face of said polymer sheet, the mechanical tension applied to the composite membrane being essentially withstood by said autonomous metallic sheet.

4,626,730

METHOD AND APPARATUS FOR ACTIVE CONTROL OF VIBRATIONS

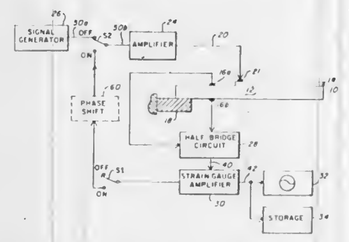
James E. Hubbard, Jr., Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 640,759, Aug. 14, 1984, Pat. No. 4,565,940. This application Sep. 24, 1985, Ser. No. 779,528

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—326 18 Claims



1. An apparatus for damping vibrations in a member, comprising:

a. transducer means for sensing mechanical vibrations in said member and producing a first electrical signal proportional thereto;

b. a piezoelectric film material constituting a distributed parameter controller mechanically cooperating with the member;

c. means responsive to said first electrical signal for applying a second electrical signal to the film material of the proper phase and amplitude to induce a mechanical strain in the film material to dampen vibrations in said member.

4,626,731

PIEZOELECTRIC GAS-LIGHTER

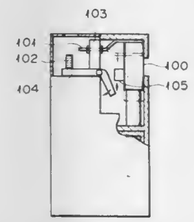
Hisayoshi Sadoya, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,110

Claims priority, application Japan, Nov. 16, 1984, 59-243053; Nov. 16, 1984, 59-174481[U]; Nov. 16, 1984, 59-174482[U]; Nov. 16, 1984, 59-174483[U]; May 28, 1985, 60-80683[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **8 Claims**



1. In a piezoelectric gas-lighter comprising a high-tension generator (**100, 110, 130, 150, 160**) having an inner and outer cases (**112, 116, 132, 136, 151, 158, 163, 162**) which are moved up and down reciprocally by a return spring (**115, 135, 152, 161**), in which cases are received: a piezoelectric element (**113, 133, 167**); and an impact hammer (**118, 138, 165**) supported by an action spring, said gas-lighter being operated in that: when said high-tension generator is depressed to cause said impact hammer to hit said piezoelectric element strongly, said piezoelectric element produces a high voltage which is discharged from a sparking nozzle (**101, 119, 139, 153, 171**) in a sparking manner, while a valve lever (**104, 121, 141, 156, 172**) lifts a gas nozzle (**102, 120, 140, 154, 173**) to cause said gas nozzle to eject a fuel gas to be ignited,

the improvement resides in that:

said sparking nozzle (**101, 119, 139, 153, 171**) is made of a resilient material and is mounted on said high-tension generator (**100, 110, 130, 150, 160**), a nozzle tip of which sparking nozzle is fixed to an insulating holder frame portion (**103**) in the vicinity of said gas nozzle (**102, 120, 140, 154, 173**), whereby at a time when said high-tension generator (**100, 110, 130, 150, 160**) is moved reciprocally said sparking nozzle (**101, 119, 139, 153, 171**) can follow said high-tension generator while being resiliently deformed to make it possible to discharge an electrical energy from a front end of said sparking nozzle toward said gas nozzle.

4,626,732

PIEZOELECTRIC RESONATOR

Andrë Debaisieux, Maison Laffitte, and Jean P. Aubry, Asnieres, both of France, assignors to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E., Argenteuil, France

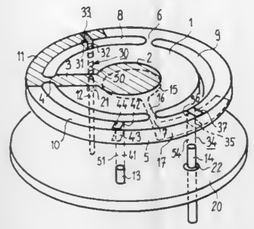
Filed Mar. 27, 1985, Ser. No. 716,403

Claims priority, application France, Mar. 30, 1984, 84 05036

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—348 **5 Claims**

1. A piezoelectric resonator comprising a base through which pass two conducting posts insulated therefrom and a piezoelectric plate comprising a central active zone surrounded by a peripheral ring connected to said central zone by at least two bridges defining slits separating the central zone from said peripheral zone, each face of the central zone being covered with an adherent electrode extending through at least one of said bridges over a part of said peripheral ring, each electrode of said plate being connected to one of the conducting posts through conducting fixing means, wherein said conducting fixing means are formed by a metal ribbon bearing on



the inner part of said peripheral zone so that said ribbon is disposed substantially in the extension of the corresponding post.

4,626,733

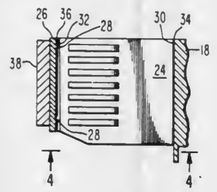
RADIATOR BAND FOR AN AIR-COOLED ELECTRON TUBE

William A. Novajovsky, Manheim Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 26, 1984, Ser. No. 654,482

Int. Cl.⁴ H01J *7/24, 19/36*

U.S. Cl. 313—40 **3 Claims**



1. In an air-cooled electron tube comprising an envelope including an anode forming a section of said envelope, a plurality of discrete radiator fins each having a proximal end and a distal end, said radiator fins having said proximal ends disposed adjacent to said anode and said distal ends circumscribed by a radiator band having an interior surface adjacent to said distal ends, the improvement wherein

said radiator band includes abutment means provided around said interior surface and extending inwardly therefrom for contacting said distal ends of said radiator fins, wherein said abutment means includes at least one circumferential projection which terminates in a sharp edge which pierces said distal ends of selected ones of said radiator fins, thereby contacting each of said radiator fins to urge said proximal ends thereof against said anode.

4,626,734

SINGLE-BASED, HIGH-PRESSURE DISCHARGE LAMP AND SOCKET COMBINATION

Wolfgang Greiler, Unterhaching, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,185

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412489

Int. Cl.⁴ H01J *5/50, 61/30;* **H01R** *33/74*

U.S. Cl. 313—51 **18 Claims**

1. A single-based, high-pressure discharge lamp comprising an elongated discharge vessel (**2**) including two essentially aligned oppositely located current supply shafts (**3, 4**);

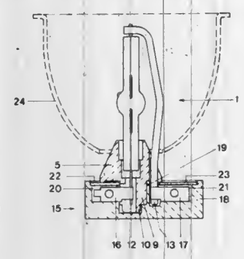
a base (**5**) for the vessel, of high-temperature-resistant insulating material;

a first electrical connection extending through a first one of the supply shafts, and a first (**12**) contact terminal means;

a second electrical connection (**14**) extending through the second supply shaft and a second contact terminal means (**13**),

wherein

the base (**5**) has a portion (**8**) of generally conical shape in the region adjacent the discharge vessel, and is formed with a centering stub (**9**) extending from the conical portion in a direction away from the discharge vessel,



the centering stub (**9**) being formed with a lateral slot (**11**), the first contact terminal means (**12**) being located within said slot (**11**), with clearance;

the conical portion (**8**) being formed with a reception recess in which an end portion of one of the supply shafts (**3**) of the discharge vessel is secured;

the second electrical connection (**14**) extending through the cone surface of the conical portion,

and the second contact terminal means (**13**) being located adjacent the centering stub (**9**) at a side thereof opposite said slot and hence opposite said first contact terminal means (**12**), and separated from said first contact terminal means by said centering stub (**9**).

4,626,735

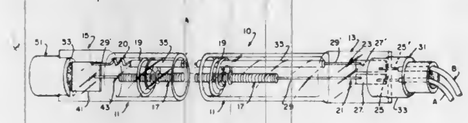
INCANDESCENT LAMP HAVING TWO LEAD-IN CONDUCTORS SEALED WITHIN ONE END AND INCLUDING EXPANSION MEANS

Merle E. Morris, and Stephen P. Senft, both of Lexington, Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 23, 1985, Ser. No. 768,582

Int. Cl.⁴ H01J *5/48, 5/50*

U.S. Cl. 313—275 **5 Claims**



1. In an incandescent lamp including a long, small diameter, tubular envelope having first and second press-sealed end portion, a coiled filament extending longitudinally through the interior of said envelope, at least one filament support member located within said envelope for supporting said filament within said envelope at a location between the ends of said filament and first and second lead-in conductors each of said lead-in conductors extending within said envelope and electrically connected to a respective one of the ends of said coiled filament, both of said lead-in conductors being positioned within said first press-sealed end portion of said envelope in a spaced-apart relationship to thereby enable electrical connections for providing electrical energy sufficient to activate said filament to be attached to said incandescent lamp at only said first press-sealed end portion, said first lead-in conductor electrically connected to said end of said filament nearest said first press-sealed end portion of said envelope and said second lead-in conductor connected to said end of said filament nearest said second press-sealed end portion of said envelope, said second lead-in conductor including a conductive wire inner portion extending longitudinally through said interior of said envelope substantially parallel to said filament and extending within said second press-sealed end portion of said envelope, a singular foil element hermetically sealed within said second press-sealed end portion, and a conducting wire member electrically connected to said foil element within said second press-sealed end portion and extending within said envelope for being electrically connected to said end of said filament nearest said second press-sealed end portion, said lamp further including a tubular, electrically insulative member located within said interior of said envelope and extending substantially the entire length thereof, said insulative member passing through and engaged by said filament support member while being spaced from and substantially parallel to said coil filament, said conductive wire inner portion of said second lead-in conductor being positioned within said tubular insulative member, the improvement wherein said inner portion of said second lead-in conductor includes therein an expandable section of curvilinear configuration for substantially preventing bowing of said second lead-in conductor and said tubular insulative member when said lamp is operated at high temperatures.

4,626,736

CATHODE RAY TUBE AND AN ELECTRON MULTIPLYING STRUCTURE THEREFOR

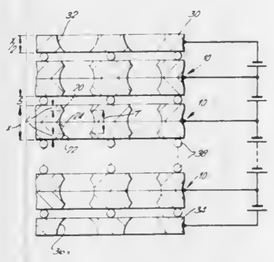
John R. Mansell, West Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1985, Ser. No. 695,998

Claims priority, application United Kingdom, Feb. 8, 1984, 8403298

Int. Cl.⁴ H01J *31/48*

U.S. Cl. 313—399 **19 Claims**



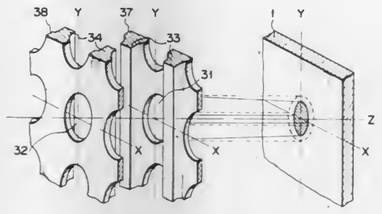
1. A cathode ray tube comprising an envelope having a faceplate and within the envelope an electron producing means, an output device, and a channel plate electron multiplying structure disposed between said electron producing means and said output device, said electron multiplying structure including a stack of n apertured substantially planar high resolution dynodes, and spacing means for separating the dynodes from each other, said dynodes being arranged in cascade with the apertures in adjacent dynodes being aligned to form channels, wherein the apertures in at least the second to the $(n-1)$th dynodes each have a multiplying re-entrant portion within the thickness of the dynode, the axially spaced ends of the re-entrant portion being spaced from the respective opposite surfaces of the dynode by an input portion and an output portion, the cross-sections of the axially spaced ends of the re-entrant portion which communicate with the input and output portions, respectively, being smaller than a cross-section between said axially spaced ends.

4,626,737

MASK FOCUSING COLOR PICTURE TUBE

Shigeo Takenaka, Fukaya; Eizaburo Hamano, Kumagaya, and Eiji Kamohara, Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 351,882, Feb. 24, 1982, abandoned.
This application Dec. 27, 1984, Ser. No. 685,230
Claims priority, application Japan, Feb. 25, 1981, 56-25448
Int. Cl.[4] H01J *29/81*
U.S. Cl. 313—402 11 Claims



1. A mask-focusing color picture tube comprising:
means for generating a plurality of electron beams;
a substantially planar display screen comprising a plurality of phosphor stripes aligned parallel to one another with select ones of said stripes luminscing in a different color than others of said stripes upon being struck by one of said electron beams;
electrostatic lens means for focusing said beams onto said screen comprising first and second substantially planar masks, each mask having a plurality of apertures therein with each aperture being bounded on one pair of opposite edges by row portions of said mask and on another pair of opposite edges by column portions of said mask, each mask positioned parallel to the other and to the plane of said screen with said masks located between said screen and said means for generating, with said apertures of said masks aligned to permit said beams each to strike a respective stripe which luminesces in a different color, and each mask being at a different electrical potential than the other; and
means for enhancing said focusing of said electrostatic lens means comprising a plurality of projections arranged on one side of at least one of said masks, said projections being arranged adjacent said apertures of said one side of said mask adjacent only one of said pairs of opposite edges of each aperture to arrange lines of electrical force through said apertures, upon application of said different electrical potential to said masks, in a manner which tends to diverge a beam through said apertures of said masks in a direction within the plane of said screen parallel to said stripes.

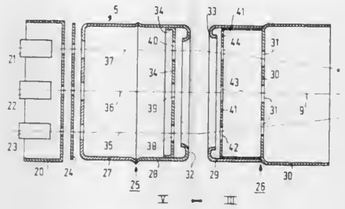
4,626,738

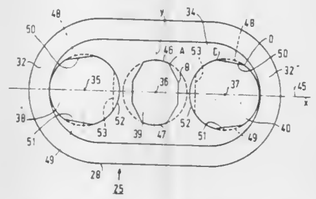
COLOR DISPLAY TUBE WITH ELECTROSTATIC FOCUSING LENS

Hans G Gerlach, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,776
Claims priority, application Netherlands, Aug. 5, 1983, 8302752
Int. Cl.[4] H01J *29/62*
U.S. Cl. 313—414 6 Claims

1. A color display tube comprising an evacuated envelope containing a luminescent screen and an electron gun system for producing a central electron beam and first and second outer electron beams along respective axes lying in a single plane, said electron gun system including first and second spaced-apart electrodes for producing therebetween a focusing lens field to focus the electron beams at the luminescent screen, said electrodes having facing rims extending from respective first and second recessed parts, each of said recessed parts extending transversely with respect to the axes and having central and first and second outer apertures for passing the respective electron beams; characterized in that:
(a) the central aperture in at least one of the recessed parts is elongate, is symmetrically disposed with respect to said plane, and is shaped to effect production in the region of the focusing lens field traversed by the central electron beam of a quadrupole component and a compensating eight-pole component; and





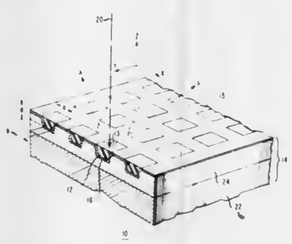
(b) each of the outer apertures in at least one of the recessed parts is non-circular, has a width which changes with distance from the central beam axis, is symmetrically disposed with respect to said plane, and is shaped to effect production in the region of the focusing lens field traversed by the respective outer electron beam of a quadrupole component and a compensating six-pole component.

4,626,739

ELECTRON BEAM PUMPED MOSAIC ARRAY OF LIGHT EMITTERS

Joseph Shmulovich, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 10, 1984, Ser. No. 609,000
Int. Cl.[4] H01J *29/10*
U.S. Cl. 313—469 8 Claims



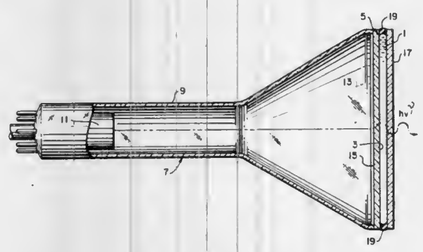
1. Optical apparatus comprising
means for generating a scannable electron beam, and
a luminescent screen including a transparent phosphor layer on which said electron beam is made incident to generate a scannable spot of light,
Characterized in that
said screen includes a substrate,
said phosphor layer comprises an array of discrete elements partially embedded in said substrate which is thick enough to dissipate heat generated in said elements, each of said elements having an output face from which said light escapes, the area of each output face being a relatively large fraction of the total surface area of each element,
a reflective coating covers all surfaces of each of said elements except said output face, and
said generating means makes said electron beam incident on the output face of selected ones of said elements.

4,626,740

RED LUMINESCENT CATHODE RAY DEVICE WITH IMPROVED COLOR FILTERING SYSTEM

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,103
Int. Cl.[4] H01J *31/00, 29/10, 5/16*
U.S. Cl. 313—478 12 Claims



1. A cathode ray tube device, particularly for projection television, for generating a bright red light spot comprising:
a cathode ray tube including an evacuated envelope, a europium-activated phosphor, capable of emitting red radiation when excited by electrons, positioned within said envelope and in a path of said electron beam and a transparent faceplate forming part of said envelope and positioned in the path of said red radiation, and outside of the outer surface of said faceplate, a light beam filtering means comprising a container, which at least in the path of said red radiation is transparent to said radiation, containing a concentrated solution of a soluble holmium salt and a soluble neodymium salt.

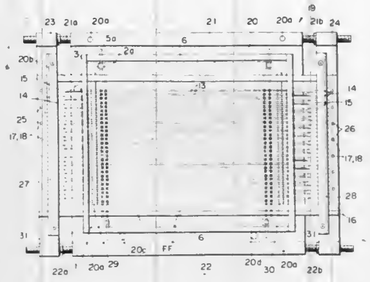
4,626,741

LINEAR ELECTRODE CONSTRUCTION FOR FLUORESCENT DISPLAY DEVICE AND PROCESS FOR PREPARING SAME

Kiyoshi Morimoto; Hiroshi Watanabe, and Yoshihisa Tsuruoka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Apr. 4, 1984, Ser. No. 596,683
Claims priority, application Japan, Apr. 8, 1983, 58-60959; Apr. 8, 1983, 58-51457[U]
Int. Cl.[4] H01J *1/62*
U.S. Cl. 313—497 10 Claims

1. A linear electrode construction for a fluorescent display device comprising:
an anode means having a phosphor layer deposited thereon, control electrodes and a cathode means arranged in a vacuum casing of said fluorescent display device which is formed by hermetically sealing a substrate and a front cover through side plates;
said control electrodes each having an electrode portion formed into a fine wire-like shape and a connecting terminal portion formed integral with said electrode portion at one end of said electrode portion, said connecting terminal portion being formed to have a width larger than said electrode portion;
said connecting terminal portions being securely interposed between said side plates and said substrate and arranged side by side at the exterior of said vacuum casing;
said fine wire-like electrode portions being fixed between said substrate and the side plates opposite to said side plates on which the corresponding connecting terminal portions are fixed;



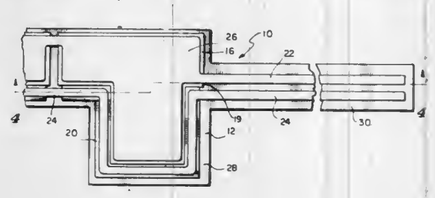
wherein said electrode portion formed into said fine wire-like shape comprises a portion mounted under tension opposite and above said anode means so as to avoid sagging and vibration of said fine wire-like shaped portion during operation and thereby to avoid short-circuiting of said control electrodes.

4,626,742

PLUG-COMPATIBLE ELECTROLUMINESCENT LAMP

Richard W. Mental, Indianapolis, Ind., assignor to Microlite, Inc., Westfield, Ind.

Filed Mar. 26, 1984, Ser. No. 593,578
Int. Cl.[4] H05B *33/06, 33/26*
U.S. Cl. 313—503 15 Claims



1. An electroluminescent apparatus comprising:
a substrate composed of a polymeric resin,
a first conductor fixed to the substrate and spaced inwardly from the edges of the substrate in a preselected pattern to form a first electrode,
a luminescent coating covering a first portion of the first conductor leaving at least one edge of the first conductor uncovered, the luminescent coating extending across a second edge of the first conductor onto the substrate; and
a pair of second conductors situated adjacent to, but separated from, each other on the substrate, one of the pair of second conductors covering substantially the whole of the luminescent coating and extending across the second edge onto the substrate, the other of the pair of second conductors extending along the at least one edge of the first conductor and onto the substrate.

4,626,743

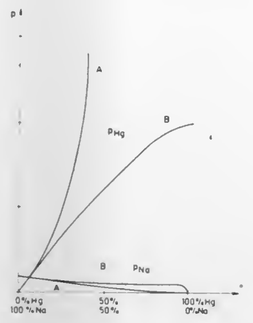
HIGH-PRESSURE SODIUM LAMP

Dénes Vida, Budapest, Hungary, assignor to Egyesült Izzólámpa és Villamossági Rt., Budapest, Hungary

Filed Feb. 23, 1983, Ser. No. 469,065
Int. Cl.[4] H01J *17/20, 61/20*
U.S. Cl. 313—571 1 Claim

1. A high pressure sodium vapor lamp comprising a hermeti-

cally closed tube made of translucent ceramic material of high thermal resistivity, at least two electrodes arranged in said tube for initiating a discharge arc, and a filling in said tube, wherein



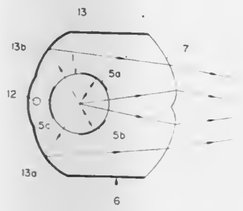
said filling comprises xenon, sodium in a quantity as to ensure pressure of saturated vapor at operating temperature, and mercury in a quantity of 0.5 to 2.5 micromol for each centimeter of length of the discharge arc.

4,626,744

ELECTRONIC DISCHARGE TUBE AND ELECTRONIC LIGHT EMITTER USING IT

Numata Saburo, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Continuation of Ser. No. 360,818, Mar. 22, 1982, Pat. No. 4,499,406. This application Nov. 29, 1984, Ser. No. 676,239
Claims priority, application Japan, Mar. 30, 1981, 56-46744
Int. Cl.[4] H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—57 **6 Claims**



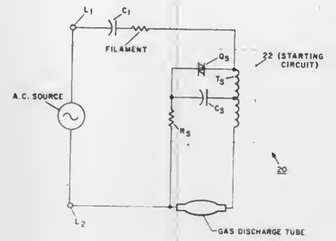
1. An electronic light emitter, which comprises:
an elongated transparent electric-discharge tube having a cathode and an anode extending along the interior of said tube, and at least one trigger electrode;
a transparent body having an elongated recess for receiving said tube, comprising front, rear and first and second side portions, and having a transparent lens means on said front portion thereof for permitting light to leave said body, and having first reflecting surface means formed on said rear portion thereof for reflecting light impinging thereon toward said transparent lens; and
second and third reflecting surface means on the surfaces of said tube juxtaposed to said first and second side portions of the body, for blocking a portion of light emitted from said tube from reaching said side portions of said body and for reflecting the blocked portion of light toward said first reflecting surface means formed on said rear portion of said body, whereby the width of said light emitter is substantially reduced over what would be necessary without said second and third reflecting means.

4,626,745

BALLAST CIRCUIT FOR LAMPS WITH LOW VOLTAGE GAS DISCHARGE TUBES

John M. Davenport, Lyndhurst, and Pieter J. von Herrmann, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 488,833, Aug. 26, 1983, abandoned. This application Aug. 8, 1985, Ser. No. 763,765
Int. Cl.[4] H05B *35/00, 37/00, 39/00, 41/00*
U.S. Cl. 315—179 **3 Claims**



1. In a lighting unit having a gas discharge tube as the light source, a resistive element in serial arrangement with said gas discharge tube, and a starting circuit for said gas discharge tube, said starting circuit having means for generating voltages so as to transition said gas discharge tube from its (1) intitial state requiring a high voltage to cause an initial arcing of the gas discharge tube, (2) to its glow-to-arc mode, and then (3) its final steady state run condition, and
a resistive-capacitive ballast circuit formed in part by said resistive element and adapted by the appropriate selection of the values of a capacitive component of said resistive-capacitive ballast circuit to accept various applied alternating current (A.C.) voltages across its terminals and developing an A.C. operating voltage for said gas discharge tube, said applied A.C. voltages having values in the range of 115 to 280 volts at frequencies in the range of 50 to 60 Hz, wherein said capacitive components of said resistive-component ballast circuit consists of:
a capacitor serially connected between one of the terminals having said applied A.C. voltages and said serial arrangement of said resistive element and said gas discharge tube;
said value of said capacitor being in the range of about 4 μf to about 65 μf so as to reduce said A.C. voltage in the development of said A.C. operating voltage of said gas discharge tube having reduced restrike voltage requirements and resistive element combination by a factor in the range of about 3 to about 1.

4,626,746

POWER CONTROL CIRCUIT

Andrew Zaderej, 4016 N. Home St., Mishawaka, Ind. 46544

Continuation of Ser. No. 401,706, Jul. 26, 1982, abandoned. This application Jun. 20, 1985, Ser. No. 747,168
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—208 **13 Claims**

1. An electrical power control comprising rectifier means for receiving an AC power supply input and producing a rectified signal, zero crossing circuit means for receiving said rectified signal and producing a square synchronous pulsed signal therefrom, ramp generator circuit means for receiving said square synchronous pulsed signal and producing a synchronous sawtooth output wave form signal, comparator circuit means for receiving said sawtooth output wave form signal along with a second signal and producing a pulsed width modulated signal in which the width of said modulated signal is varied in response to the value of said second signal, means for selectively varying said second signal into said comparator circuit means, bridge circuit means responsive to said modulated signal for receiving said AC power supply input and

regulating the duty cycle of said AC power supply input to produce a reduced power AC output in response to said width of said modulated signal, said bridge circuit means including two SCRs, the cathode of one of said SCRs being connected by a first conductor to the cathode of the other of said SCRs, two diodes, the anode of one of said diodes connected by a second conductor to the anode of the other of said diodes, the cathode of each of said diodes connected to the anode of a said SCR, a jumper extending between said first and second conductors, a third conductor connected at the junction of the



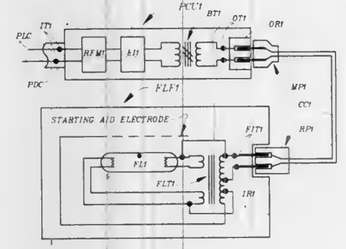
cathode of said one diode and the anode of the diode connected SCR, a fourth conductor connected at the junction of the cathode of said other diode and the anode of the diode connected SCR, said third and fourth conductors adapted for connection in series with an AC power source for producing said AC power supply input and a load, said SCRs including gate means responsive to said modulated signal for reducing the duty cycle of said AC power supply input and reducing the duty cycle of said AC power supply input and thereby the power to said load.

4,626,747

CLASS-3 LIGHTING SYSTEM

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed Jan. 9, 1984, Ser. No. 569,240
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **19 Claims**



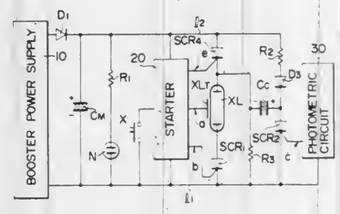
1. A lighting system adapted to be powered from the relatively low frequency voltage on an ordinary electric utility power line, said system comprising:
a plurality of lighting fixtures non-permanently mounted at different locations at or near a mounting surface, each lighting fixture having: (a) a set of input terminals; (b) lamp means and (c) matching means connected between the input terminals and the lamp means, the matching means requiring for its proper operation that a relatively high frequency voltage be provided at the input terminals of the lighting fixtures; and
for each lighting fixture:
(i) a power conditioning unit that is non-disconnectably connected with the power line and mounted at or near said mounting surface in a location within a relatively short distance from the lighting fixture, said power conditioning unit being operable to provide at a set of output terminals the relatively high frequency voltage required at the input terminals of said lighting fixture, and
(ii) flexible cord means operable to provide disconnectable electrical connection between the input terminals of said lighting fixture and the output terminals of said power conditioning unit;
thereby permitting the lighting fixture to be moved and re-located relative to, as well as to be removed and/or disconnected from, its power conditioning unit.

4,626,748

ELECTRONIC FLASH OF SERIES CONTROLLED TYPE

Hiroaki Nakamura, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,492
Claims priority, application Japan, Jan. 6, 1984, 59-695
Int. Cl.[4] H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—241 P **14 Claims**



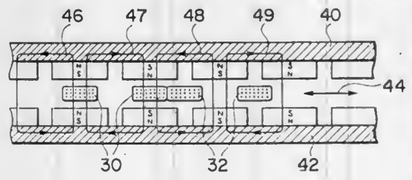
1. An electronic flash of series controlled type comprising:
a series connection of a flash discharge tube and a first switching element;
a second switching element connected in series with said series connection, the combination of the second switching element and the series connection being connected in parallel with a main capacitor;
a starter circuit for rendering the first and the second switching element on concurrently and for triggering the flash discharge tube at the same time therewith;
a commutating capacitor having its one end connected to the junction between the series connection and the second switching element;
a third switching element connected to the other end of the commutating capacitor, with the combination of the third switching element and the commutating capacitor being connected in parallel with said series connection;
and an emission terminate circuit for rendering the third switching element conductive.

4,626,749

TWO-DIMENSIONAL POSITIONING DEVICE

Teruo Asakawa, Tokyo, Japan, assignor to Tokyo Electron Limited, Japan

Filed Oct. 10, 1984, Ser. No. 659,351
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **12 Claims**



1. A two-dimensional positioning device comprising:
a first magnetic field group which includes a plurality of first magnetic fields, said first magnetic fields being arranged in

a first two-dimensional array, each of said first magnetic fields pointing in one direction perpendicular to a first plane including said first two-dimensional array;

a second magnetic field group which includes a plurality of second magnetic fields, said second magnetic fields being arranged in a second two-dimensional array in said first plane, each of said second magnetic fields pointing in the direction opposite to the direction of said first magnetic fields, said first and second magnetic fields being positioned such that each magnetic field of one of said first and second magnetic field groups is equidistantly surrounded by four magnetic fields which belong to the other magnetic field group;

a first coil set which includes at least two coils and which is positioned in said first and second magnetic fields, said first coil set being allowed to freely move in a first direction in a second plane parallel to said first plane;

a second coil set which includes at least two coils and which is positioned in said first and second magnetic fields, said second coil set being allowed to freely move in a second direction in said second plane, said second direction being normal to said first direction; and

means for controlling currents flowing through said first and second coil sets thereby controlling displacement thereof in first and second perpendicular directions in said second plane;

said first and second magnetic fields being each regularly spaced by a common distance from one another in said first and second arrays, each coil of said first and second coil sets being substantially rectangular, one pair of opposing sides of the coil being spaced by integer multiples of the common distance between adjacent like magnetic fields, the other pair of opposing sides of the coil being spaced by an odd integer multiple of one half of the common distance between adjacent like magnetic fields, and the coils of each of said first and second coil sets being separated by an odd integer multiple of one fourth of the common distance between adjacent like magnetic fields.

4,626,750

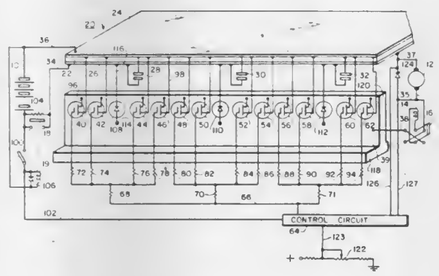
SOLID STATE D.C. MOTOR CONTROL

Stephen F. Post, Pleasant Hill, Calif., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,265

Int. Cl.[4] H02P *5/17*

U.S. Cl. 318—139 **18 Claims**



1. An electronic circuit chopper control system for a d.c. traction motor comprising a plurality of parallel-connected power field effect transistors arranged for connection in series with the traction motor, a common control circuit connected to the gate electrodes of said field effect transistors to control an on-off cycle of conduction through said field effect transistors, a plurality of parallel connected power diodes arranged for reverse connection in parallel with the traction motor to serve as freewheeling diodes, said diodes being physically positioned apart from one another and distributed in position among said field effect transistors and each diode being positioned in a similar manner with a group of associated field effect transistors for ease of transfer of current flow between the diode and the associated field effect transistors.

4,626,751

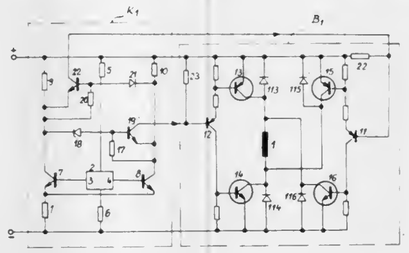
DIRECT-CURRENT MOTOR WITHOUT COMMUTATOR

Benno Doemen, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 499,670, Jun. 1, 1983, Pat. No. 4,542,323, which is a continuation of Ser. No. 287,061, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 40,276, May 18, 1979, abandoned. This application Jun. 24, 1985, Ser. No. 748,010

Int. Cl.[4] H02K *29/00*

U.S. Cl. 318—254 **18 Claims**



1. A one-phase collectorless d.c. motor incapable of producing a rotating stator field and instead producing a stator field which merely alternates between predetermined first and second stator-field orientations which are angularly offset from each other by **180** electrical degrees, the motor comprising

(a) a permanent-magnet rotor,

(b) a stator provided with a stator winding,

(c) stationarily positioned rotor-position-detecting means operative for generating information concerning the angular position of the permanent-magnet rotor, this information including distinguishable first information when the rotor is in a predetermined first range or rotor angular positions, distinguishable second information when the rotor is in a predetermined second range of rotor angular positions, and distinguishable further information when the rotor is in a predetermined range of rotor angular positions that is intermediate said first and second ranges of rotor angular positions,

(d) energizing circuit means operative, alternately, for effecting a first energization of the stator winding causing the latter to produce a stator field exhibiting said predetermined first stator-field orientation and for effecting a second energization of the stator winding causing the latter to produce a stator field exhibiting said predetermined second stator-field orientation,

(e) the energizing circuit means including

(e1) first winding-current-carrying semiconductor means having a conductive state and a non-conductive state and operative when in the conductive state for carrying stator winding current in a predetermined direction which establishes said first stator-field orientation,

(e2) second winding-current-carrying semiconductor means having a conductive state and a non-conductive state and operative when in the conductive state for carrying stator winding current in a predetermined direction which establishes said second stator-field orientation,

(e3) said first and second winding-current-carrying semiconductor means having respective state-control inputs,

(e4) state-determining means connected between the rotor-position-detecting means and the state-control inputs of said first and second winding-current-carrying semiconductor means, said state-determining means being able to distinguish among said first, second and further information generated by said rotor-position-detecting means and determining the conductive and non-conductive states of said first and said second winding-current-carrying semiconductor means in dependence upon the information generated by the rotor-position-detecting means, said state-determining means being operative

i. for causing said first and second winding-current-carrying semiconductor means to be, respectively, in the conductive and in the non-conductive state thereof in response to said rotor-position-detecting means furnishing said distinguishable first information that is generated when the rotor is in said predetermined first range of rotor angular positions, and

ii. for causing said first and second winding-current-carrying semiconductor means to be, respectively, in the non-conductive and in the conductive state thereof in response to said rotor-position-detecting means furnishing said distinguishable second information that is generated when the rotor is in said predetermined second range of rotor angular positions, and

iii. for causing both said first and said second winding-current-carrying semiconductor means to be in the non-conductive states thereof, by means of signals applied to said state-control inputs thereof, in response to said rotor-position-detecting means furnishing said distinguishable further information that is generated when the rotor is in said predetermined intermediate range of angular positions.

4,626,752

ELECTRIC MOTOR HAVING HALL GENERATORS AND CONTROL CIRCUIT

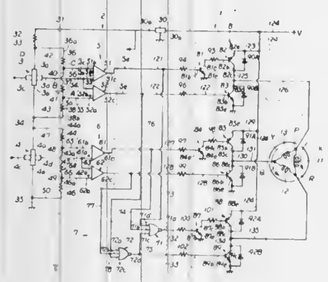
Kiyonori Fujisaki, 195-4 Ooyaguchi, Matsudo-shi, Chiba-ken; Toshio Kobayashi, 6-1-13 Kitakarasuyama, Setagaya-ku, Tokyo, and Heihachi Kato, 232 Terao, Kawagoe-shi, Saitama-ken, all of Japan

Filed Jul. 2, 1985, Ser. No. 751,281

Claims priority, application Japan, Mar. 4, 1985, 60-42965; Mar. 4, 1985, 60-42966

Int. Cl.[4] H02K *29/08*

U.S. Cl. 318—254 **10 Claims**



1. An electric motor having Hall generators and a control circuit comprising:

rotor means including a rotor having an inner periphery, a pair of permanent magents of different polarities secured to said inner periphery of said rotor, said pair of permanent magents being opposite to each other and angularly extending in a limited arc along said inner periphery of said rotor to produce mangetic fluxes of different polarities, said rotor having a pair of unmagnetized portions producing no magnetic flux angularly extending over a limited arc along said inner periphery between said pair of permanent magnets and being opposite to each other;

armature means including an armature having three poles and a coil wound around each of said poles, said coils being connected to each other;

Hall generator means including a pair of Hall generators angularly spaced from each other with respect to the axis of rotation of said rotor, said Hall generators being responsive to a first one of said permanent magnets to produce a first electric signal and being responsive to a second one of said permanent magnets to produce a second electric signal, said Hall generators being responsive to said unmagnetized portions of said rotor to produce no electric signal; and

control circuit means including a control circuit having two pairs of comparator devices, a first pair of comparator devices being electrically connected to one of said Hall generators, a first one of said first pair of comparator devices being responsive to said first electric signal produced by said one of said Hall generators to produce a first electric output, and a second one of said first pair of comparator devices being responsive to said second electric signal produced by said one of said Hall generators to produce a second electric output, said first and second ones of said first pair of comparator devices being responsive to an absence of an electric signal from said one of said Hall generators to produce no electric output, a second pair of comparator devices being electrically connected to the other of said Hall generators, a first one of said second pair of comparator devices being responsive to said first electric signal produced by said other of said Hall generators to produce a first electric output, and a second one of said second pair of comparator devices being responsive to said second electric signal produced by said other of said Hall generators to produce a second electric output, said first and second ones of said second pair of comparator devices being responsive to an absence of an electric signal from said other of said Hall generators to produce no electric output, said control circuit means further including a logic circuit having a pair of gates each having three inputs selectively connected to said outputs of said first and second pairs of comparator devices, each of said gates producing an electric output when said three inputs receive no electric output from said first and second pairs of comparator devices to which said three inputs are selectively connected, each of said gates producing no electric signal when one of said three inputs receives an electric output from said first and second pairs of comparator devices to which said three inputs are selectively connected, said electric outputs of said first and second pairs of comparator devices and of said pair of gates being connected to said coils of said three-pole armature and cooperating to control an electric current flowing through said coils in order to continuously rotate said rotor means.

4,626,753

MOTOR SPEED CONTROL BY MEASUREMENT OF MOTOR TEMPERATURE

Donald E. Letterman, Warrick County, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 546,696, Oct. 28, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,591

Int. Cl.[4] H02P *5/00;* **H02H** *5/04*

U.S. Cl. 318—334 **3 Claims**

1. A method of controlling the speed of an electric motor for maximum productive effort, comprising the steps of:

calculating a low end point for a range of allowable motor current values based on the temperature of the motor when the motor is stopped,

providing a reference value of motor temperature when the motor is running and directing the same to a summing location,

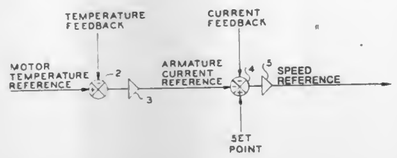
sensing the actual temperature of the motor and directing the same to said summing location,

summing the reference and actual temperature values at said

summing location to provide a summation of the two values,

calculating the position that said summation occupies in a range of motor temperatures,

using said summation to calculate a corresponding current reference from said range of allowable motor current values,



directing said current reference to a second summing location,

sensing the actual current down by the motor and directing the value thereof to the second summing location, and

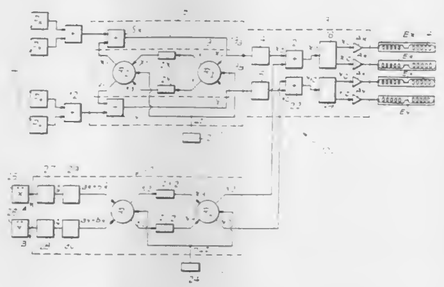
summing the two current values and using the summation to change the amount of current drawn by the motor by providing an adjustment of motor speed.

4,626,754

METHOD AND DEVICE FOR REDUCING THE VIBRATIONS OF ROTATING MACHINES EQUIPPED WITH AN ACTIVE MAGNETIC SUSPENSION

Helmut Habermann, Vernon; Maurice Brunet, Saint Marcel, and André Tassel, Gasny, all of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed Mar. 20, 1985, Ser. No. 713,814
Claims priority, application France, Mar. 26, 1984, 84 04649
Int. Cl.⁴ G05B *5/01*
U.S. Cl. 318—460 **22 Claims**



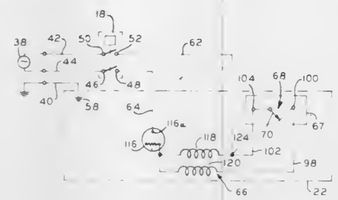
1. Method for reducing the vibrations of a rotating machine having a rotor mounted on a frame by way of an active magnetic suspension comprising at least one radial magnetic bearing equipped with electromagnetic coils, at least one radial detector for detecting the position of the rotor and a servo-control circuit connected to said detector and said coils, wherein said method consists in placing on the frame of the rotary machine, at least two vibration detectors having non-parallel axes which are perpendicular to the rotor axis, in recording by means of a spectrum analyzer, from the signals issued from the vibration detectors, the vibration frequencies corresponding to repetitive and stable in time disturbances, in identifying the recorded vibration frequencies corresponding to a multiple of the rotation speed of the rotor, the vibration frequencies corresponding to a multiple of a known characteristic frequency such as the power supply frequency of an asynchronous motor and the vibration frequencies which are stable in time, but non synchronous to a known characteristic frequency of a machine member, in introducing in the servo-control circuit, in order to compensate for the repetitive vibrations corresponding to the identified vibration frequencies, additional selective feedback loops with narrow band a high gain, the central frequencies of which are synchronized with the identified vibration frequencies respectively, in applying the signals produced by said vibration detectors, after integration, to the different additional feedback loops, and in filtering, inside each additional feedback loop, the transient signals whose frequencies are not related to the identified vibration frequency to be compensated by said loop.

4,626,755

SUMP PUMP MOTOR SWITCH CIRCUIT

James A. Butcher, Worthington, and Harold A. Padgett, Lyons, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 14, 1984, Ser. No. 681,535
Int. Cl.⁴ H02P *5/08*
U.S. Cl. 318—473 **14 Claims**



1. In an electric motor comprising a housing, run and start windings, an electric circuit connecting said motor to a line cord comprising two leads, said circuit comprising:

a switch housing mounted on said motor housing;

a double pole single throw switch in said switch housing having a first pair of electrical terminals mounted on switch housing and connected to said line cord leads;

said switch including a second pair of electrical terminals mounted on said switch housing and connectable respectively to said first pair of electrical terminals by said switch to energize the windings;

start switch means for controlling said start winding being operably mounted on a terminal board located on said motor and having first and second electrical terminals mounted thereon;

a first continuous electrical conductor having one end connected to a first terminal of said second pair of terminals and having its other end connected to a first end of both the start and run windings and bypassing the terminal board;

a second continuous electrical conductor having one end connected to a second terminal of said second pair of terminals and its other end bypassing said terminal board and directly connected to a second end of said run winding;

a third continuous electrical conductor connecting a second end of said start winding to the first of said start winding switch terminals; and

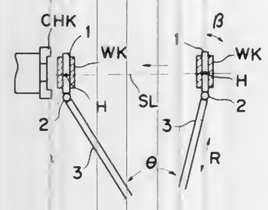
a fourth continuous electrical conductor connecting the second of said start switch terminals to the second end of said run winding.

4,626,756

NUMERICAL CONTROL SYSTEM

Hajimu Inaba, Hino, and Shinsuke Sakakibara, Kunitachi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP81/00273, § 371 Date May 28, 1982, § 102(e) Date May 28, 1982, PCT Pub. No. WO82/01426, PCT Pub. Date Apr. 29, 1982
Continuation of Ser. No. 387,849, May 28, 1982. This PCT application Oct. 8, 1981, Ser. No. 755,548
Claims priority, application Japan, Oct. 13, 1980, 55-142605
Int. Cl.⁴ G05B *19/18*
U.S. Cl. 318—573 **5 Claims**



1. A numerical control system for a robot employing a cylindrical coordinate system and having a movable element and a plurality of operational axes inclusive of an axis of rotation, said movable element being rotated about said axis of rotation such that said movable element is transported from a starting point to an end point and a predetermined point on said movable element is moved in linear fashion along a straight line connecting the starting and end points, said numerical control system comprising:

dividing means for dividing the straight line which interconnects the starting point and the end point into a pluraltiy of intervals at a series of division points Qi where i=1, 2, 3 . . . ;

generating means for generating positional data for each of said operational axes at each of the division points while said movable element is moving from the current position; and

executing means for executing linear interpolation for each of said intervals by using said positional data for each axis to move the predetermined point on said movable element between each of said division points such that said element moves approximately along said straight line.

4,626,757

BOAT CONTROLLER

Ralph S. Granchelli, 79 Joseph Rd., Framingham, Mass. 01701

Filed Mar. 13, 1984, Ser. No. 588,975
Int. Cl.⁴ G05D *1/00*
U.S. Cl. 318—588 **7 Claims**

1. A boat controller in combination with two spacially separated twin screw electric motor-propellers comprising,

a battery for storage of power to said motors,

means for accelerating each propeller independently interposed between said motors and said battery,

command means having a first and second channel for controlling said accelerating means separately and remote from said accelerating means,

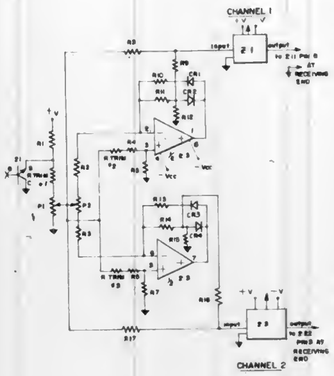
first control means for signaling said first and second channels of said command means uniformly,

second control means for signaling one channel at a time of said command means,

lever means movable about a mid-point forward and backward and rotable, clockwise and counterclockwise a preselected number of degrees, about a central point,

means responsive to said forward movement of said lever for controlling said first control means uniformly,

means responsive to the turning of said lever means clockwise reducing the second control means signal to the first channel of said command means and responsive to the turning of said lever means counter-clockwise reducing the second control means' signal to the second channel of



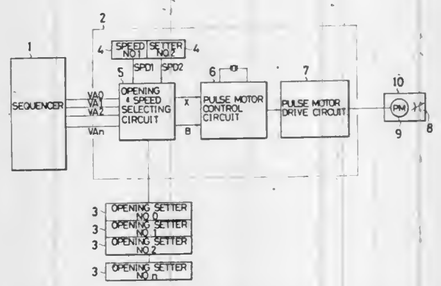
said command means whereby one of said motors is reduced in acceleration with respect to the other motor.

4,626,758

DIGITAL VALVE CONTROL APPARATUS

Kunihiko Takeuchi, Kanagawa; Fujio Baba, Tokyo; Kiyoshi Hayashi, Tokyo; Yasuo Shimomura, Tokyo, and Yuji Morishige, Chiba, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 667,371, Nov. 1, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 820,928
Claims priority, application Japan, Nov. 4, 1983, 58-207207
Int. Cl.⁴ G05B *19/28*
U.S. Cl. 318—603 **3 Claims**



1. A digital valve control apparatus for regulating opening of a digital valve with a pulse motor, comprising:

a signal generating means for generating instruction signals to control said digital valve;

at least one position setter for setting the absolute position of said pulse motor;

a least one speed setter for setting the displacement speed of said pulse motor;

a selecting means for selecting a set position signal or signals from said at least position setter and a set speed signal or signals from said at least one speed setter in response to the instruction signals from said signal generating means;

a frequency divider for producing pulses having a period corresponding to the set speed by changing the ratio of frequency division in response to the set speed signal selected by said selecting means;

a comparator for determining the difference between a present position of said pulse motor and the set position selected by said selecting means;

a counter for counting up or counting down synchronously with the frequency divided pulses from said frequency divider until said comparator produces a coincidence output; and

a drive means for driving said pulse motor in response to an output of said counter.

4,626,759

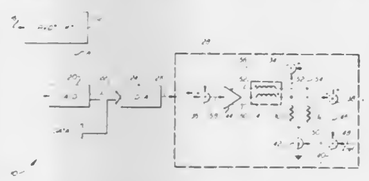
LOW NOISE DIFFERENTIAL TORQUER SERVO LOOP AND CIRCUITRY

Gregory J. McBrien, Portland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 15, 1985, Ser. No. 692,072

Int. Cl.[4] G05B *17/00*

U.S. Cl. 318—689 **4 Claims**



1. Apparatus (**28**) responsive to a signal (**26**) related to the position of a dual winding differential torquer (**14**) with respect to a balance position and also responsive to a DC source for unidirectionally controlling direct electric current in the dual windings of the differential torquer at a constant total power level, comprising:

sensing means (**30, 32, 34, 38, 40**), responsive to the electric current flowing in each of the torquer windings for providing a total current signal (**50**) indicative of the total electric current present in the torquer windings and for providing a difference signal (**56**) indicative of the present electric current difference between the windings;

regulator means (**42**), responsive to said total electric current signal (**50**) and to a reference electric current (**48**) for regulating said total electric current at a constant value; and

balancing means (**36, 44**), responsive to said difference signal (**56**) and to the position signal (**26**) for varying the magnitudes of said currents flowing in the torquer windings with respect to one another for rebalancing the position of the torquer in response to a position signal indicative of a position imbalance.

4,626,760

CONTROL CIRCUIT FOR A STEPPING MOTOR

Ngoc C. Bui, Fontaines; Henry Gête, Les Hauts-Geneveys, and Jean-Claude Robert-Grandpierre, Neuchâtel, all of Switzerland, assignors to Asulab SA, Neuchatel, Switzerland

Filed Mar. 14, 1985, Ser. No. 711,846

Claims priority, application Switzerland, Mar. 23, 1984, 1482

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **4 Claims**

1. A control circuit for a stepping motor having a rotor and a winding magnetically coupled to said rotor for causing said rotor to turn by one step in response to a driving pulse, comprising:

driving control pulse providing means for providing a driving control pulse;

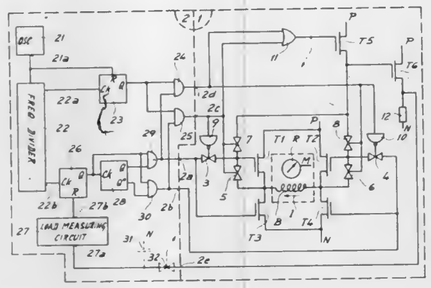
driving pulse applying means, including a first transistor connected to said winding and to said driving control pulse providing means, for applying said driving pulse to said winding in response to said driving control pulse;

measurement signal providing means for providing a measurement signal representative of current flowing in said winding, and including a second transistor;

measurement control pulse providing means for supplying a measurement control pulse;

disconnecting means responsive to said measurement control pulse for disconnecting said first transistor from said driving control pulse providing means; and

connecting means responsive to said measurement control pulse for connecting said first and second transistors to



form a current mirror in which said first transistor constitutes an input transistor of said current mirror and said second transistor constitutes an output transistor of said current mirror, such that current supplied by said second transistor when connected to said first transistor is representative of current flowing in said winding just before the beginning of said measurement control pulse.

4,626,761

METHOD AND APPARATUS FOR DETERMINING THE FLUX VECTOR OF A ROTATING FIELD MACHINE

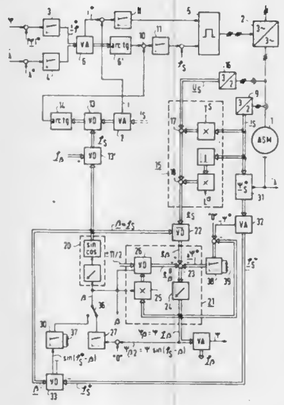
Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,484

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418640

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—803 **11 Claims**



1. A method for determining the flux vector of a rotating field machine, comprising the steps of:

(a) forming, from the current ($\underline{i}_s$) and the voltage ($\underline{u}_s$) of the stator of the machine, the EMF-vector ($\underline{e}_s$) of the machine;

(b) modifying the EMF vector by a feedback signal ($\beta=\phi s$) derived from the flux vector to form a modified EMF vector ($\underline{e}\beta$);

(c) integrating the modified EMF vector ($\underline{e}\beta$) to form the flux vector;

(d) said step of modifying comprising forming the modified EMF-vector ($\underline{e}\beta$) in a coordinate system derived from the feedback signal (β), one axis of which rotates relative to the stator reference system;

(e) said step of integrating comprising integrating the modified EMF vector in the rotating coordinate system, taking a rotary EMF component ($\underline{e}\beta^R$) into consideration; and

(f) forming the feedback signal (β) from the flux vector such that the frequency of the coordinate system is slaved to the motion of the flux vector ($\psi\beta$).

4,626,762

AC MOTOR CONTROL SYSTEM

Yoshiki Fujioka, Higashiyamato, and Mitsuhiko Hirota, Tokyo, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

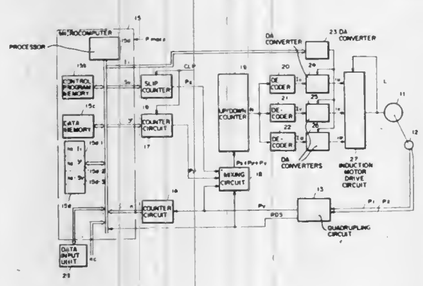
Division of Ser. No. 438,692, Nov. 2, 1982, Pat. No. 4,499,414.

This application Aug. 20, 1984, Ser. No. 641,995

Claims priority, application Japan, Nov. 4, 1981, 56-176748

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—809 **1 Claim**



1. An induction motor control system, comprising:

first pulse means, coupled to the motor, for producing an actual speed of the motor;

computing means, operatively connected to said first pulse means and to receive a speed command, for computing a difference speed from the actual speed and the speed command;

correspondence table means, operatively connected to said computing means, for outputting a current amplitude and a phase difference in dependence upon the difference speed and a slip value in dependence upon the actual speed and the speed command said slip value is divided into first through third ranges where the slip value is constant in the first range, increases proportionately with speed in the second range and decreases inverse proportionately with speed in the third range;

second pulse means, operatively connected to said correspondence table means and said second pulse means, for producing compensation pulses in dependence upon the phase difference and the slip value output by said correspondence table means and the speed pulses output by said first pulse means; and

converting means, operatively connected to said second pulse means, said correspondence table means and the motor, for converting the current amplitude and the compensation pulses into motor drive currents.

4,626,763

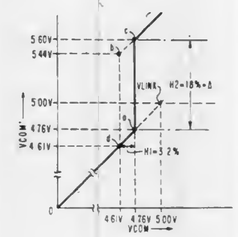
INVERTER SYSTEM WITH HYSTERESIS TRANSITION BETWEEN PULSE WIDTH MODULATION MODE AND PURE SQUARE WAVE MODE OF OPERATION

Charles W. Edwards, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 14, 1985, Ser. No. 690,918

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—811 **4 Claims**



1. Apparatus for controlling the speed of a motor, comprising:

a source of direct electrical current (PWB) having a nominal DC source voltage (VS) which may vary within limits;

inverter means (INV) interconnected with said source and the motor (M) for providing controlled power to the motor in the form of controlled variable frequency square waves (VAB), said square waves being chopped in accordance with controlled width-modulated chopping pulses in a predetermined square wave frequency range (CONSTANT TORQUE) for providing speed control and complementary motor winding voltage control in said frequency range, said inverter means being unreliable for producing width-modulated chopping pulses which are narrower than a predetermined minimum pulse width;

control means (PWM) interconnected with said source and said inverter means for providing controlled signals to said inverter means indicative of the frequency of said square waves and for providing said chopping pulses to said inverter means in accordance with a speed signal (VCOM) and a DC source voltage feed forward signal (VLINK), said control means, comprising:

pulse generator means (PG) interconnected to receive VCOM and VLINK as inputs for producing said chopping pulses the width of which is proportional to (VLINK-VCOM) for only those values of VCOM less than VLINK, for values of VCOM equal to or greater than VLINK no pulses being produced;

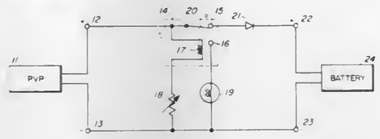
hysteresis switching means (HS) interconnected to receive VCOM and VLINK as inputs and interconnected with said pulse generator means to selectively provide as an additional input for said pulse generator means a bias signal (Δ) which signal when applied changes the signal VCOM within said pulse generator means to VCOM+Δ said signal (Δ) being applied when VCOM is increasing and VCOM=K(VLINK), where K is a scaling factor indicative of said predetermined minimum pulse width, the value of Δ being equal to or greater than (1-K)VLINK plus X, where X is the amount VLINK will increase as a result of motor winding voltage increase due to the sudden cessation of chopping pulse production so that VCOM nevertheless remains higher than VLINK as VLINK increases due to the increase in motor winding voltage.

4,626,764

PHOTOVOLTAIC BATTERY CHARGE CONTROLLER

Robert A. Weinhardt, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1983, Ser. No. 529,184
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—9 **1 Claim**



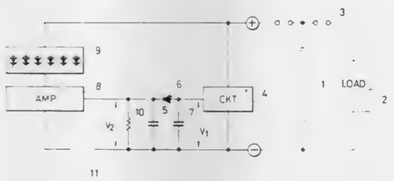
1. A photo voltaic panel (PVP) battery charging device, comprising:
- a PVP having positive and negative terminals; a relay coil coupled across said positive and negative terminals of said PVP;
- a variable resistor coupled across said positive and negative terminals of said PVP in series with said relay coil;
- a positive and a negative battery connecting terminals, said positive battery terminal being coupled to said positive PVP terminal, and said negative battery terminal being coupled to said negative PVP terminal;
- a normally closed relay switch operated upon by said relay coil and coupled between said positive PVP terminal and said positive battery terminal; and
- a forward biased diode coupled between said positive PVP terminal and said positive battery terminal in series with said relay switch between said relay switch and said positive battery terminal.

4,626,765

APPARATUS FOR INDICATING REMAINING BATTERY CAPACITY

Masafumi Tanaka, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed May 25, 1984, Ser. No. 614,092
Claims priority, application Japan, May 25, 1983, 58-92967; May 25, 1983, 58-92968; May 30, 1983, 58-95445; Jun. 24, 1983, 58-114475
Int. Cl.[4] H02J *7/00*; G08B *21/00*
U.S. Cl. 320—48 **6 Claims**



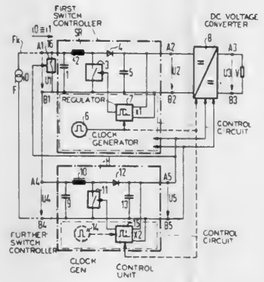
1. A device for displaying a remaining capacity of a battery, which comprises:
- means for detecting an open-circuit voltage of a battery or a voltage corresponding to said open-circuit voltage;
- means for setting a first imaginary voltage curve whose start point is determined by said voltage detected immediately before the discharging of said battery with respect to the open-circuit voltage of said battery which decreases as said battery is discharged and increases after a predetermined period during which discharge is suspended;
- means, responsive to a battery no-load condition existing for a predetermined time, for correcting said start point, whereby a corrected imaginary voltage curve is produced; and
- means for displaying a remaining capacity of said battery according to a voltage obtained from one of said first and corrected imaginary voltage curves, wherein said display means comprises:
- amplifier means;
- a plurality of LEDs connected in series to one after another in such a manner that one end of said series circuit of LEDs is connected through a current limiting resistor (**13**) to a power source and the other end is connected to the output terminals of the last stage of said amplifier means (**8**) which is activated lastly as the level of an input to said amplifier means increases; and
- NPN transistors connected between connecting points of said LEDs and the output terminals of said amplifier means, except for the last of said LEDs, in such a manner that the collectors of said NPN transistors are connected to said connecting points and the emitters of said NPN transistors are connected to said output terminals, the base of each transistor being connected to the output terminal of the rear stage of said amplifier means which is activated by an input level higher than that which activates the output terminal to which the emitter of said transistor is connected;
- said plurality of LEDs being successively turned off by said amplifier means to display a remaining capacity of said battery in response to a voltage drop of said capacitor.

4,626,766

CIRCUIT ARRANGEMENT FOR FEEDING ELECTRICAL USERS

Gerhard Musil, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,108
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425905
Int. Cl.[4] G05F *1/10*
U.S. Cl. 323—222 **14 Claims**



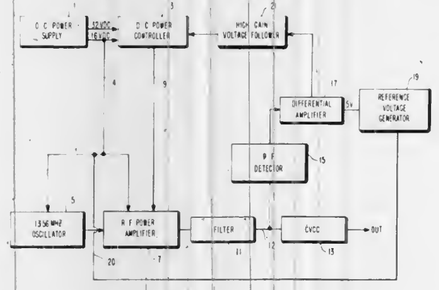
12. A circuit arrangement, comprising:
- remote feed means for feeding electrical users by DC series feed in a remote feed circuit from at least one constant current source;
- DC-DC converter means for connecting at least one user to the remote feed means at a location in the remote feed circuit;
- the DC-DC converter means containing a first switch controller means for generating a DC voltage from constant current and which has a switch element connected parallel to an input thereof;
- control circuit means for controlling the switch element dependent on a DC voltage fed to the user to be held at least approximately constant;
- a diode between the switch element and a capacitor connected parallel to an output of the first switch controller means, said diode being poled such that the diode is inhibited given a conductive switch element; and
- the control circuit means emitting a pulse sequence during start-up operation, the pulse sequence having a pulse-duty factor set which differs from a pulse-duty factor during normal operation such that a voltage at the input of the first switch controller means does not exceed a maximum possible value of the input voltage after a conclusion of the start-up operation.

4,626,767

CONSTANT CURRENT R.F. GENERATOR

Robert R. Clappier, Los Altos, and Steven J. Smith, Redwood City, both of Calif., assignors to Metcal, Inc., Menlo Park, Calif.

Filed Dec. 21, 1984, Ser. No. 684,730
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—280 **12 Claims**



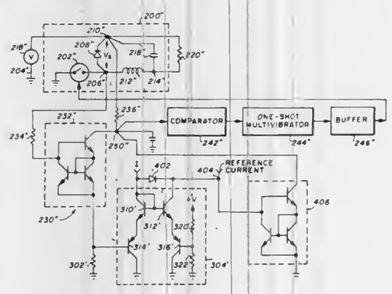
1. A voltage source for producing a constant output voltage at radio frequencies in the presence of large voltage standing wave ratios comprising,
- a field effect transistor having at least a gate and a drain,
- means for applying a radio frequency signal to said gate,
- means for applying a voltage to said drain including a transformer having a first winding in series with said drain,
- said field effect transistor having an output circuit including a second winding of said transformer, and
- means for applying a first d.c. voltage to said first winding remote from said drain to produce operation of said field effect transistor in its saturated region for Class C operation, and
- means for varying the voltage applied to the said first winding remote from said drain to provide a constant amplitude output voltage at the output of said second winding.

4,626,768

HIGH-SPEED FEEDBACK CIRCUIT WITH UNGROUNDED LOAD

Steve Smith, 5100 Channel Ave., Richmond, Calif. 94804

Continuation-in-part of Ser. No. 571,740, Jan. 18, 1984, Pat. No. 4,578,631. This application Dec. 6, 1985, Ser. No. 806,108
Int. Cl.[4] H02M *1/15*
U.S. Cl. 323—282 **2 Claims**



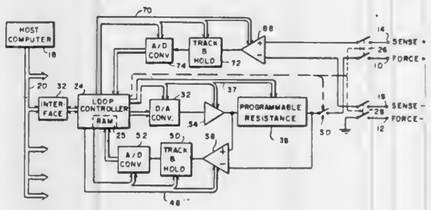
1. A circuit for use with a capacitor and a regulator, the regulator being of the type which includes a switch for developing a switched voltage the level of which varies as a train of pulses, the circuit for stabilizing the average level of the switched voltage at a level designated by the level of a reference voltage, the circuit comprising in combination:
- first current developing means for connection to receive the switched voltage, said first current developing means for developing a first current at least a portion of the instantaneous level of which is equal to a predetermined constant times the instantaneous level of said switched voltage;
- second current developing means for developing a second current at least a portion of the level of which is equal to a predetermined constant times the reference voltage level, said first and said second current developing means for connection to the capacitor so that said capacitor develops a voltage the magnitude of the level of which is equal to the integral of the level of a current the level of which is equal to the difference between said first and said second currents, said second current developing means including means for switching off said second current between pulses of said switched voltage;
- comparator means for connection to said capacitor, said comparator means for developing a voltage the level of which designates when the level of said capacitor developed voltage is at a predetermined voltage level; and
- switched driving means for connection to the switch and connected to said comparator means, said switch driving means being responsive to said comparator means developed voltage and operative to drive said switch so as to stabilize the average level of said switched voltage at the level designated by the level of said reference voltage.

4,626,769

VOLTAGE/CURRENT SOURCE

David P. Valley, Tyngsboro, and Allan Ryan, Billerica, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 711,192, Mar. 13, 1985, abandoned. This application Mar. 18, 1986, Ser. No. 844,212
Int. Cl.[4] G05F *1/10*
U.S. Cl. 323—283 **18 Claims**



1. A method of employing an electronic amplifier to drive a load with a desired load current comprising the steps of:
- A. sensing the load voltage with the amplifier disconnected from the load;
- B. setting the output voltage of the amplifier substantially equal to the sensed load voltage;
- C. when the amplifier output voltage has reached the load voltage, connecting the amplifier to the load;
- D. thereafter sensing the resultant load current; and
- E. controlling the amplifier output voltage to cause the sensed load current substantially to equal the desired load current.

4,626,770

NPN BAND GAP VOLTAGE REFERENCE

John J. Price, Jr., Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1985, Ser. No. 761,211
Int. Cl.[4] G05F *3/30*
U.S. Cl. 323—313 **12 Claims**



1. A voltage reference circuit including circuit means comprising first and second transistors operated at different current densities for developing first and second voltages having complementary temperature coefficients, means for sourcing currents to the transistors, means for combining the first and second voltages to establish a temperature compensated voltage at an output and feedback circuitry responsive to the voltages appearing at the collectors of the first and second transistors for adjusting the potential at the bases thereof to maintain the transistors operating at different current densities, the improvement comprising the feedback circuitry including:

current source means for providing first and second substantially equal currents at first and second outputs;

amplifier means including a differential amplifier input stage, said amplifier means having an output and first and second inputs coupled respectively to the collectors of the first and second transistors, said amplifier means acting as a current sink for said first current and being responsive to the voltages appearing at the collectors of the first and second transistors for providing a feedback signal at said output thereof that is used to adjust the base potential of the first and second transistors; and

bias circuit means receiving said second current at said second output of said current source means and being coupled with said amplifier means and which operates in conjunction therewith for biasing said amplifier means at a quiescent balanced operating condition wherein the currents through the first and second transistors tend to be made equal to one another.

4,626,771

ECL SLAVE REFERENCE GENERATOR

Bertrand J. Williams, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

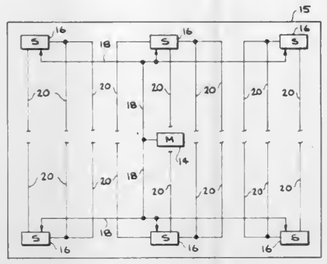
Filed Sep. 19, 1985, Ser. No. 777,888
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—349 **20 Claims**

16. A plurality of locally-distributed ECL slave reference generators positioned throughout a large monolithic integrated circuit device for tracking closely a central master reference generator to provide stable slave reference voltage, each of said slave reference generator comprising:

differential comparator means having first and second inputs coupled to a master reference voltage and a slave reference voltage respectively for comparing said master reference voltage and said slave reference voltage and for generating a difference voltage output;

current source means coupled to said differential comparator means for establishing a constant current flowing through said differential comparator means; and

negative feedback means responsive to said differential voltage output for supplying a feedback current to said second input of said differential comparator means so that said



slave reference voltage tracks closely said master reference voltage.

4,626,772

PROCESS AND DEVICE FOR DETERMINING A PARAMETER ASSOCIATED WITH A FAULTY ELECTRIC CONDUCTOR, USING A COMPOSITE MONITORING SIGNAL

Souillard Michel, Fontenay aux Roses, France, assignor to Enertec, Montrouge, France

Filed Jun. 7, 1984, Ser. No. 618,290
Claims priority, application France, Jun. 9, 1983, 83 09559
Int. Cl.[4] G01R *31/08*
U.S. Cl. 324—52 **5 Claims**



1. A method for determining at a measuring point in a faulty conductor of a three-phase electrical network a fault parameter consisting of the distance between the point of measurement and such fault or the direction of such fault comprising the steps of: measuring the instantaneous voltage and current of each of the conductors of the network at the measurement point and producing measurement signals representative of the measured voltage and current for such conductors, wherein the linear resistance and inductance of the conductors are known; applying Ohm's law to the conductors to form combinations of such signals with at least one magnitude of one of said signals linked to an impedance, each combination including a monitoring signal formed from the measurement signals representative of the current associated with a fault in said faulty conductor; and assigning a value to said parameter for which a group of at least one of said combinations satisfies Ohm's law, wherein said monitoring signal representative of the fault current consists of a linear combination of a signal representative of the homopolar current in said faulty conductor and a signal representative of an inverse current in said faulty conductor.

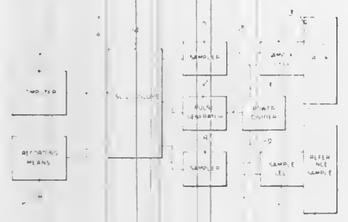
4,626,773

METHOD AND MEANS FOR DETERMINING ROCK PROPERTIES USING TIME-DOMAIN DIELECTRIC SPECTROSCOPY

Michael K. Kroeger, and John M. Longo, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Oct. 26, 1984, Ser. No. 665,249
Int. Cl.[4] G01R *27/04;* **E21B** *47/00*
U.S. Cl. 324—58.5 B **34 Claims**

1. A method for detecting a voltage signal reflected from a rock, employing an electrical line having a first conductor with a first end and a second end, and a second conductor with a first end and a second end, and a sample cell having a substantially flat face including a first conductive region electrically coupled to the first end of the first conductor and a second conductive region electrically coupled to the first end of the second conductor, wherein neither the first end of the first conductor nor the first end of the second conductor extends beyond the substantially flat face, including the steps of:



(a) positioning the substantially flat face of the sample cell in contact with the rock;

(b) generating a voltage pulse which initially propagates in a first direction in the electrical line toward the rock;

(c) detecting the voltage pulse as it propagates in the first direction in the electrical line; and

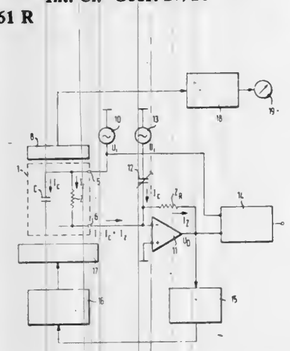
(d) detecting a return voltage signal reflected from the rock into the electrical line as said return voltage signal propagates in a second direction opposite the first direction in the electrical line.

4,626,774

METHOD AND ARRANGEMENT FOR MEASURING THE CONTAMINATION OF A CAPACITIVE DEW-POINT SENSOR

Paulus P. L. Regtien, Delft, Netherlands, assignor to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,464
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231995
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R **6 Claims**



4. Apparatus for measuring dew-point temperature and contamination of a capacitive dew-point sensor comprising:

a capacitive dew-point sensor including a substrate and capacitive electrodes disposed on said substrate;

means for measuring the impedance between said electrodes, said impedance varying in response to the formation of said dew on the substrate;

means reponsive to the amplitude of said impedance for measuring the temperature at which said dew forms on the substrate and thus measure said dew-point temperature; and

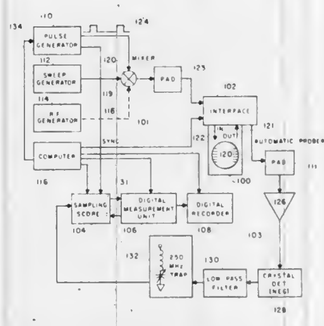
means responsive to the phase angle of said impedance for measuring said contamination of the dew-point sensor.

4,626,775

RADIO FREQUENCY PROBING APPARATUS FOR SURFACE ACOUSTIC WAVE DEVICES

Frederick Y. Cho, Scottsdale, Ariz.; Michael D. Adamo, Wilbraham, Mass., and David E. Leeson, Tempe, Ariz., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 4, 1984, Ser. No. 607,087
Int. Cl.[4] G01R *31/02, 31/28*
U.S. Cl. 324—73 R **20 Claims**



1. Radio frequency wafer probe card apparatus for surface acoustic wave device die having a plurality of radio frequency input and output port pads of differing time delay value comprising:

electrode means, including a plurality of spring loaded die contact fingers suspended on individual mounting arms around an aperture in said probe card and having coplanar contact ends located in coincidence with the distribution of said pads on said die, said contact fingers including ground connected fingers for each of said radio frequency ports and ground connected intermediate members located between adjacent radio frequency port fingers, for conducting radio frequency signals into and away from said surface acoustic wave device die with minimal stray radio frequency coupling;

radio freqeuncy switching means, including a plurality of semiconductor elements located adjacent said mounting arms and responsive to a plurality of external control signals, said semiconductor element being connected between each of said radio frequency output port mounting arms and an adjacent output bus, for selectively connecting one of said surface acoustic wave device output ports of selected time delay value with said output bus;

radio frequency conductor means, including transmission lines connecting said output bus and said input port with external signal apparatus and also including transmission line terminating and impedance matching elements located adjacent said mounting arms, for conveying radio frequency signals to and away from probed surface acoustic wave die.

4,626,776

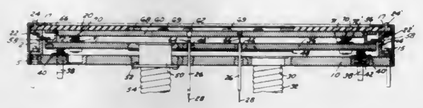
PROGRAMMABLE TEST FIXTURE

Alan M. Wilkinson, Cranston, R.I., assignor to O. B. Test Group, Inc., Warwick, R.I.

Filed Jun. 7, 1984, Ser. No. 618,043
Int. Cl.[4] G01R *15/12, 31/22, 31/26*
U.S. Cl. 324—73 PC **5 Claims**

1. A circuit board testing apparatus having a moveable top wall with an array of apertures therein, said top wall supporting a circuit board in sealing engagement therewith, a bottom wall spaced from the top wall by side walls, a flexible sealing

means extending inwardly from the side walls to the top wall, an intermediate plate mounted for reciprocation between the bottom wall and the top wall, said intermediate plate having an upwardly extending perimeter wall portion engaging said sealing means to allow a vacuum to be created between the intermediate plate and the top wall, a plurality of conductive test probe receptacles fixedly mounted on the bottom wall to extend upwardly through the intermediate plate toward the top wall, long and short length probe tips mounted in said



receptacles to extend through said apertures in the top wall, means sealing the receptacles to the intermediate plate yet permitting sliding movement therethrough, a first vacuum means connected between the top wall and the intermediate plate, second vacuum means connected between the intermediate plate and the bottom wall, said first vacuum means moving the top wall a first distance to contact the longer length probe tips and second vacuum means moving the top wall and intermediate plate toward the bottom wall to contact the short length probe tips and the longer length probe tips.

4,626,777

D.C. CURRENT TRANSFORMER CIRCUITS

John D. Ainsworth, Stafford, England, assignor to Associated Electrical Industries Limited, England

Filed Mar. 19, 1984, Ser. No. 590,908

Claims priority, application United Kingdom, Apr. 8, 1983, 8309559

Int. Cl.⁴ G01R *33/00, 1/22, 19/14*

U.S. Cl. 324—117 R **9 Claims**



1. A measuring circuit arrangement comprising:

(a) a D.C. current transformer provided with a current-carrying primary winding and a pair of inter-connected secondary windings magnetically coupled in opposite senses to said primary winding by respective saturable cores,

(b) signal means for applying an alternating e.m.f. across the ends of said secondary windings,

(c) means responsive to the resulting alternating current in said windings, and

(d) phase sensitive means for integrating the voltage across at least one of said secondary windings and determining the phase with respect to said alternating e.m.f. of the voltage across said at least one secondary winding and for thereby providing an indication of the sense of the primary current.

4,626,778

ACTIVE CURRENT SENSOR WITH PRIMARY REDUCING WINDING

Richard Friedl, Brunswick, Fed. Rep. of Germany, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

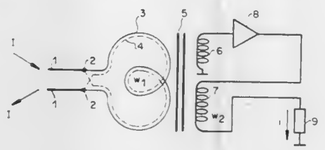
PCT No. PCT/EP82/00225, § 371 Date Jun. 9, 1983, § 102(e) Date Jun. 9, 1983, PCT Pub. No. WO83/01535, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 12, 1982, Ser. No. 509,447

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140544

Int. Cl.⁴ H01F *40/06;* **G01R** *15/02*

U.S. Cl. 324—127 **11 Claims**



1. A current sensor comprising a primary winding and at least one secondary winding magnetically coupled by a core, wherein the primary winding comprises first and second generally strip-shaped flat electrical conductors of the same material having different resistances, which conductors are electrically connected together at their ends and which are elsewhere electrically insulated from each other, and each of which passes through the core with a single turn and in the opposite winding direction to the other, so that the magnetomotive force through the core is determined by the difference between the partial currents flowing in the first and second flat conductors, and wherein the first and second flat conductors are disposed so that their flat sides are in thermal contact with each other over substantially their entire length.

4,626,779

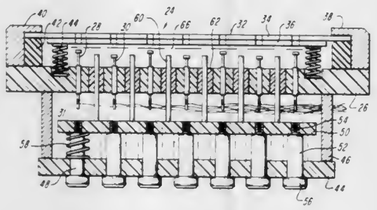
SPRING-STOPS FOR A BI-LEVEL TEST FIXTURE

Michael C. Boyle, Norton, Mass., assignor to Pylon Company, Inc., Attleboro Falls, Mass.

Filed Mar. 19, 1985, Ser. No. 713,476

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 F **9 Claims**



1. A test fixture for providing in-circuit and functional testing of electronic circuit devices by automatic testing equipment, comprising:

a probe support plate;

a first plurality of spring-loaded contacts fastened to the probe support plate with their contact ends constrained to lie on a first plane defining a functional testing array pattern;

a second plurality of upstanding spring-loaded contacts fastened to the probe plate with their contact ends constrained to lie in a second plane different from the first plane defining an in-circuit contact array pattern;

an electronic circuit device receiving face;

means for mounting the electronic circuit device receiving face for reciprocating motion relative to the probe plate in a direction defined by the normal to its plane;

a spring-loaded plate spaced from and generally parallel to the probe plate;

means for mounting the spring-loaded plate to the probe plate for reciprocating motion along a direction defined by the normal to its plane;

a plurality of elongated rods having ends; and

means for mounting the plurality of rods for sliding motion relative to the probe plate with one of the ends of each of the rods confronting the electronic circuit device receiving face and with the other end of each of the rods confronting the spring-loaded plate.

4,626,780

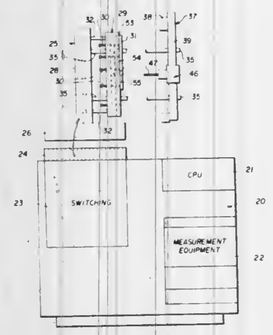
TRI-AXIS AUTOMATED TEST SYSTEM FOR PRINTED CIRCUIT BOARDS

Grady M. Powers, Mt. Sidney; Henri T. Burgers, Grottoes, and Jeffery P. Stowers, Mt. Sidney, all of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.

Filed Feb. 1, 1985, Ser. No. 697,518

Int. Cl.⁴ G01R *31/02, 31/28*

U.S. Cl. 324—158 F **10 Claims**



10. Apparatus for testing printed circuit boards in conjunction with a primary computerized test apparatus comprising a fixture holding the printed circuit board under test, a limited bed of nails assembly held closely adjacent to one side of said fixture in opposing relationship to the solder side of the printed circuit board under test being held by the fixture, the limited bed of nails assembly having an array of through passages each adapted to receive a test probe element, and an automated tri-axis test probe assembly held closely adjacent to one side of the limited bed of nails assembly with the latter disposed between said fixture and said test probe assembly and including a test probe element adapted to travel through selected ones of the through passages in the limited bed of nails assembly to reach and contact the solder side of the printed circuit board under test.

4,626,781

DEVICE FOR DETECTING THE SPEED OF ROTATION AND/OR AN ANGLE OF ROTATION OF A SHAFT

Werner Forkel, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 716,931

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411773

Int. Cl.⁴ G01P *3/48*

U.S. Cl. 324—174 **15 Claims**

1. A device for detecting one of a speed of rotation and an angle of rotation of a shaft, having

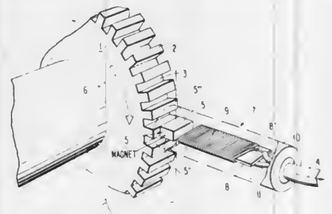
a ferro-magnetic motion transmitter which rotates with the shaft and which has on a periphery thereof areas of high magnetic permeability and areas of low magnetic permeability and configured as one of a toothed wheel and a perforated disc,

a magnetic-field-dependent sensor means for sensing motion of the motion transmitter and arranged at a distance from the motion transmitter and comprising a soft-magnetic planar strip core of high permeability and low hysteresis and eddy-current losses,

an evaluating circuit having a coil wound onto the said strip core transversely to a longitudinal direction of the strip core,

a permanent magnet arranged at a distance from the motion transmitter and sensor,

the sensor, permanent magnet and motion transmitter being



substantially linearly disposed with respect to each other with the sensor remote with respect to the motion transmitter with lines of magnetic force of the permanent magnet passing substantially perpendicularly through a flat side of the strip core and through said evaluating circuit and wherein

said permanent magnet having poles disposed substantially equidistant from the periphery of the motion transmitter and disposed between the motion transmitter and the sensor and lying substantially in the plane of the strip core,

the strip core of the sensor being aligned in a longitudinal direction substantially perpendicular to a magnetic axis of the permanent magnet and to the motion transmitter, and

means for driving the strip core into saturation in response to a high frequency current.

4,626,782

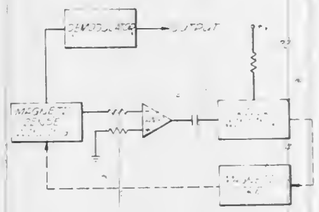
MAGNETOMETER OPERATED AT A SELF-RESONANT FREQUENCY BY A SENSE WINDING

Richard W. Lewis, Derby, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 26, 1983, Ser. No. 535,408

Int. Cl.⁴ G01R *33/04*

U.S. Cl. 324—253 **2 Claims**



1. A self resonant magnetometer for effectively measuring an external magnetic field and eliminating ringing noise normally associated with a magnetometer when an external signal is received, the magnetometer comprising:

a ferrite core;

a driver winding wound on the ferrite core for magnetizing the core in its non-linear region near its saturation level;

a voltage source connected to a resistor, the resistor connected to and biasing the driver winding and providing a current which will bring the permeability of the ferrite core near its saturation level;

a sense winding wound over the core and the driver winding, through interwire capacitance inherent in the sense winding the sense winding is designed to operate at a self-resonant frequency, this frequency is the same as the operating frequency of the magnetometer for eliminating noise related therewith;

an operational amplifier having its input connected to the sense winding and its output coupled to a dc blocking capacitor, the capacitor connected to the driver winding; and

an output signal detector via a lead connected to the sense winding for receiving a signal therefrom, the signal proportioned to the external magnetic field sensed by the sense winding;

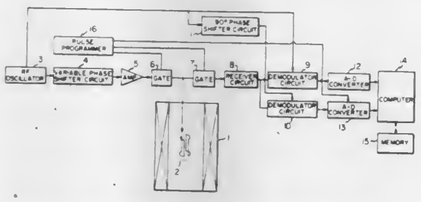
the sense winding indirectly connected to the driver winding via the amplifer and capacitor, any additional current, as sensed by the sense winding due to the external field, is amplified by the amplifier to the capacitor to the driver winding for driving the core into its non-linear region near saturation thereby changing the permeability rapidly and at the same time the sense winding providing the output signal during the permeability change.

4,626,783

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY FOR SELECTIVE DETECTION OF MULTIPLE QUANTUM TRANSITIONS

Muneki Ohuchi, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,378
Claims priority, application Japan, Apr. 5, 1984, 59-68216
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **4 Claims**



1. A nuclear magnetic resonance spectroscopy method for detecting multiple quantum transitions of a selected order, the transitions occurring in a sample containing rotating magnetic resonators, comprising the steps of:

(a) applying a pulse train to the resonators, the pulse train consisting of RF pulses in which at least one pulse is ϕ degrees out of phase with the last pulse;

(b) detecting the free induction decay signal emanating from the resonators for a period of time t2 after the application of the pulse train, using two channels of detecting system which are 90° out of phase with each other, and storing it in a memory;

(c) repeating these steps (a) and (b) while changing the value of evolution time t1 in one increment, the evolution time being the pulse spacing between certain pulses in the pulse train;

(d) repeating the steps (a)–(c) while successively resetting the value of ϕ to a set of predetermined values;

(e) forming a set of linear combinations of the free induction decay signals stored corresponding to the values of the evolution time t1 and the values of ϕ;

(f) forming three additional sets of linear combinations of the free induction decay signals by repeating the steps (a)–(e) after adding 90°, 180°, and 270°, respectively, to all the values of ϕ;

(g) forming sets of linear combinations of the free induction decay signals from the four sets of linear combinations of the free induction decay signals by addition or subtraction; and

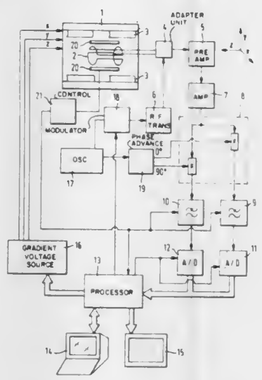
(h) converting the sets of the linear combinations of the free induction decay signals obtained in step (g) into the frequency domain by double Fourier transformation with respect to t1 and t2.

4,626,784

NMR IMAGING DEVICE

Raimo Sepponen, Helsinki, Finland, assignor to Instrumentarium Oy, Finland

Continuation of Ser. No. 539,322, Oct. 5, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 801,492
Claims priority, application Finland, Nov. 10, 1982, 823444
Int. Cl.[4] G01V *29/3*
U.S. Cl. 324—309 **20 Claims**



1. A device for nuclear magnetic resonance imaging of an object and having an improved signal/noise ratio in the NMR signal, said device comprising:

means (**1**) for generating a generally homogeneous magnetic field in the imaging region;

sets (**3**) of gradient coils for producing magnetic field gradients in the magnetic field,

signal coil means (**2**) at least substantially surrounding the imaging region for exciting the object and receiving NMR signals from the object;

amplifier means (**5, 7**) and filter means (**9, 10**) coupled to said signal coil means for detecting NMR signals from the object, said filter means having an alterable bandwidth;

sensor means (**20**) for determining at least one of the dimension and position of the portion of the object to be imaged in the direction of the gradient field used in the imaging; and

control means (**21**) coupled to said sensor means for altering the bandwidth of said filter means (**9, 10**) to a value determined, at least in part, by the position and dimension information obtained from said sensor means (**20**).

4,626,785

FOCUSED VERY HIGH FREQUENCY INDUCTION LOGGING

Teruhiko Hagiwara, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 24, 1984, Ser. No. 583,541
Int. Cl.[4] G01V *3/28*
U.S. Cl. 324—339 **7 Claims**



1. A method for performing a very high frequency induction log of the formation surrounding a borehole comprising:

inducing at a first location a very high frequency current flow in the formation, the frequency being substantially between 100–500 MHz;

simultaneously inducing at a second location spaced from said first location a very high frequency current flow in the formation, the current flow induced at the second location being the same frequency as the current flow at said first location but of opposite direction;

measuring both the in-phase and quadrature components of the induced voltage with respect to the induced current at third and fourth locations positioned between said first and second locations, said induced voltages being responsive to the high frequency current flow simultaneously induced in the formation at said first and second locations; and

determining from said measured components the phase shift and relative attenuation between said induced voltages.

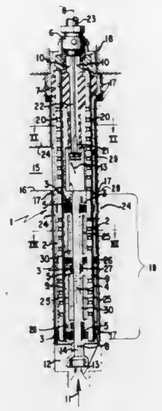
4,626,786

LIQUID CONDUCTIVITY PROBE

Kay Bödecker, Chieming; Walter Goth, Reichenhall; Robert Scheurl, Inzell, and Hans-Erwin Strasser, Siegsdorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,034
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245426
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—449 **5 Claims**

1. An electrical measuring probe for determining the electrical conductivity of a liquid comprising a measuring zone extended longitudinally through the probe, through which the liquid to be measured flows, sets of electrodes in contact with said liquid and spaced along said measuring zone to which an electrical current is applied between each set of electrodes, the electrodes having electrode leads remote from the liquid to be measured, said electrode leads being electrically in contact with four individual conductors symmetrically distributed at equal intervals around the longitudinal axis of the probe, said electrode leads electrically in contact with said four individual conductors, said four individual conductors forming a mechanically stabilizing and electrically conductive conductor frame covered with an electrically insulating sleeve, and wherein the sleeve consists of a chemically stable thermoplastic in intimate contact with said conductor frame, said measuring zone leading to a liquid outlet, said conductor frame being connected to an insulating receiving element in turn connected to an adjoining cable guide, wherein said insulating receiving element connected to the conductor frame, said adjoining cable guide, and said electrodes, are arranged symmetrically in relation to the axis of symmetry.

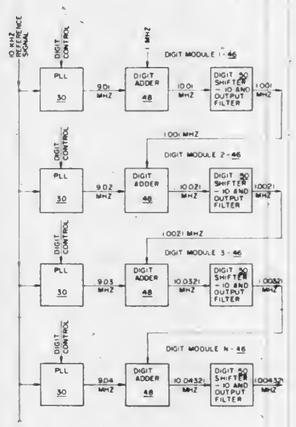


4,626,787

APPLICATION OF THE PHASELOCK LOOP TO FREQUENCY SYNTHESIS

Joseph P. Mefford, Glen Cove, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 6, 1985, Ser. No. 708,660
Int. Cl.[4] H03L *7/18, 7/22*
U.S. Cl. 328—14 **6 Claims**



1. A frequency synthesizer for generating a synthesized frequency output signal, said frequency synthesizer having n substantially identical digital module, stages, each of which stages generates one digit of the final frequency number of the synthesized frequency output signal, wherein each digital module stage comprises:

a. a phase lock loop receiving only a single input reference frequency signal from a reference signal generator, said phase lock loop comprising:
   i. a phase comparator receiving said single input reference signal as an input thereto, and generating a phase error signal,
   ii. a variable frequency oscillator coupled to receive the phase error signal as an input, and generating an output frequency signal for that digital module stage,
   iii. a digit control circuit means coupled to receive the output frequency signal as an input, said digit control circuit means also receiving a digit control input signal which determines the digit contribution of that digit module stage to the final frequency number of the synthesized frequency output signal, and the output of the digit control circuit means being directed as a second input signal to said phase comparator, which compares it with said reference frequency signal to generate the phase error signal, whereby the digit control input signal determines the output frequency signal for that module stage;
b. a digit adder, except the one associated with the first module stage, coupled to receive the output frequency signal from said phase lock loop output and the previous digit module stage as inputs thereto, the digit adder associated with said first stage receiving said phase lock loop output and a reference frequency signal input and producing a digit adder output signal; and
c. a digit shifter coupled to receive the digit adder output signal as an input thereto, and producing a shifted digit output signal as an output signal for that digit module stage, which is directed as an input signal to the digit adder of the subsequent digit module stage, or for the last digit module stage forms the synthesized frequency output signal for the frequency synthesizer.

4,626,788

CIRCUIT FOR RECONSTRUCTING NOISE-AFFECTED SIGNALS

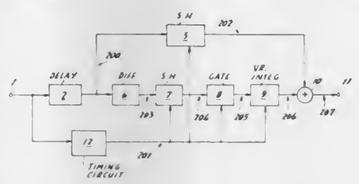
Yukinobu Ishigaki, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jul. 21, 1983, Ser. No. 516,242

Claims priority, application Japan, Jul. 21, 1982, 57-127204; Jul. 21, 1982, 57-127205; Jul. 30, 1982, 57-133296; Jul. 30, 1982, 57-133297

Int. Cl.⁴ H03B *1/00, 1/04;* H03K *5/00*

U.S. Cl. 328—165 **7 Claims**



1. A circuit for suppressing impulse noise imposed on an analog signal, the circuit having an input terminal to which the analog signal is applied and an output terminal, comprising:
means connected to said input terminal for generating a sampling pulse in response to the impulse noise in said analog signal;
delay means coupled to said input terminal for delaying said analog signal so that the impulse noise is time-coincident with said sampling pulse;
a differentiator responsive to an output signal from said delay means;
first sample-and-hold means connected to be responsive to said analog signal, as derived by said delay means, for generating a waveform which is a replica of the analog signal, as derived by said delay means, when said sampling pulse is absent and for holding said waveform in response to derivation of said sampling pulse;
second sample-and-hold means connected to said differentiator for generating a rectangular pulse in response to said sampling pulse;
a resettable integrator connected to said second sample-and-hold means for generating a ramp voltage in response to said sampling pulse, said ramp voltage having a slope variable as a function of the amplitude of said rectangular pulse; and
a summing circuit for summing said ramp voltage with an output signal from the first sample-and-hold means and applying a summed output signal to said output terminal.

4,626,789

DEMODULATING CIRCUIT FOR DATA SIGNAL

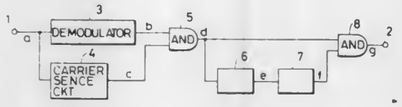
Yukio Nakata, Kawasaki; Osamu Shiotsu, Asaka; Motoyoshi Morito, Iruma, and Kaoru Suda, Ohmiyashi, all of Japan, assignors to Hitachi, Ltd. and Yagi Antenna Co., both of Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,412

Claims priority, application Japan, Aug. 19, 1983, 58-150258; Aug. 19, 1983, 58-150257

Int. Cl.⁴ H03D *3/18.*

U.S. Cl. 329—50 **5 Claims**



1. A data signal demodulating circuit for demodulating modulated signal bursts provided with periods during which only a carrier signal is present, before and after a data signal period, said circuit comprising:
a demodulator for demodulating data from said modulated signal;
a carrier sense circuit for detecting the period during which said carrier is present, from said modulated signal;
a first AND circuit for receiving an output from said demodulator and an output from said carrier sense circuit;
a data sense circuit for detecting the presence of said data signal from an output from said first AND circuit;
a timer driven by said output from said data sense circuit; and
a second AND circuit for receiving an output from said timer and said output from said first AND circuit.

4,626,790

DEMODULATOR FOR AMPLITUDE-MODULATED CARRIER FREQUENCY OSCILLATIONS

Waldemar Frühauf, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

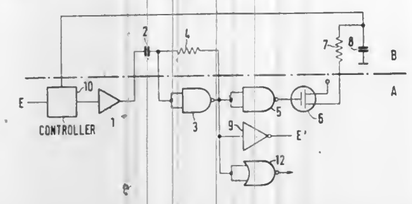
Filed Apr. 10, 1985, Ser. No. 721,976

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3418049

Int. Cl.⁴ H03D *1/00*

U.S. Cl. 329—101 **7 Claims**

1. A demodulator for amplitude-modulated carrier frequency oscillations whose peak value is maintained at a constant value at its receiving side by a controller, wherein the carrier frequency oscillations are supplied via a first capacitor to two inputs of a NOR gate, both inputs of the NOR gate being connected via a first resistor with the output thereof, and the output of the NOR gate being connected to an inverter,



such that, at the output of the inverter, the evaluated carrier frequency oscillations are collected.

4,626,791

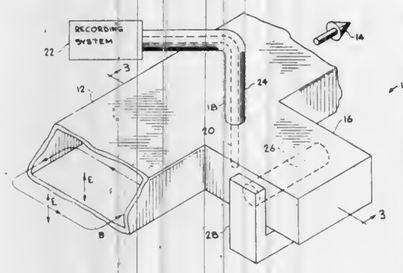
MICROWAVE DETECTOR

Heiner W. Meldner, Moss Beach, Calif.; Ronald Y. Cusson, Chapel Hill, N.C., and Ray M. Johnson, San Ramon, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1985, Ser. No. 699,879

Int. Cl.⁴ H03K *9/02*

U.S. Cl. 329—109 **7 Claims**



1. A detector for measuring the envelope shape of a microwave pulse comprised of high-frequency oscillations, said detector comprising:
a B-dot loop linking the magnetic field of said microwave pulse;
a biased ferrite, that produces a magnetization field flux that links said B-dot loop, and that is positioned within said B-dot loop so that the magnetic field of said microwave pulse interacts with said ferrite and thereby participates in the formation of said magnetization field flux; and
high-frequency insensitive means for measuring electric voltage or current induced in said B-dot loop.

4,626,792

PURE CRYSTAL EXCITON LASER AMPLIFIER AND METHOD OF OPERATION

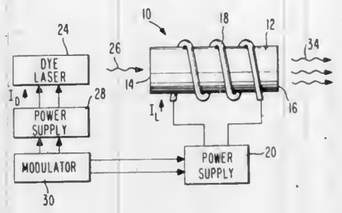
Richard L. Liboff, Ithaca, and Kung C. Liu, Rochester, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,637

Int. Cl.⁴ H01S *3/00;* H01L *33/00*

U.S. Cl. 330—4.3 **12 Claims**

1. A laser amplifier comprising:
a source of intense, monochromatic, coherent radiation to be amplified, said radiation have a selected wavelength;
a laser rod having an axial first and second ends, and being axially aligned with said source of radiation, said first end being adapted to receive said radiation to be amplified, said laser rod comprising a pure, undoped crystal in which the recombination of excitons produces a characteristic output radiation having said selected wavelength;
pumping means for producing electron population inversion within said laser rod and to a recombination energy level for the production of excitons within said laser rod the pure crystal laser rod providing a sufficiently high exciton density to assure a nonboson quality in said excitons; and
means for alternately activating said pumping means and said source of radiation to first produce said high density of excitons in said laser rod and then to cause said radiation to be amplified to impinge on said first end of said laser rod to stimulate decay of said high density, nonboson quality excitons, such decay producing photons of said characteristic wavelength and resulting in intense monochromatic, coherent output radiation at said characteristic wavelength at said second end of said laser rod, said output radiation being at a greater intensity than, and at the same wavelength as, said source radiation, whereby said source radiation is amplified.



4,626,793

RECEIVER AMPLIFIER FOR AMPLIFICATION OF A PHOTOELECTRIC CURRENT

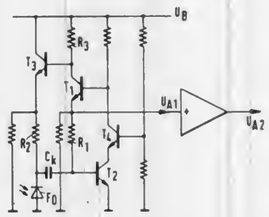
Helmut Moser, and Karl Militzer, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Continuation of Ser. No. 628,652, Jul. 6, 1984. This application Jan. 10, 1986, Ser. No. 817,781

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325926

Int. Cl.⁴ H03F *17/00;* H01J *40/14*

U.S. Cl. 330—59 **7 Claims**



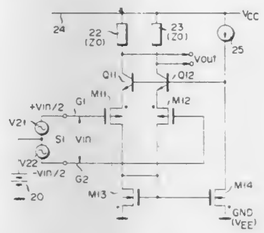
1. A receiver amplifier for amplification of a photoelectric current, said amplifier comprising: a light-sensitive semiconductor component; an amplifier transistor; a capacitor connected between the light-sensitive semiconductor component and the amplifier transistor for isolating signals with a frequency below a certain threshold delivered by the light-sensitive semiconductor component from the amplifier transistor; and a second transistor connected to said amplifier transistor for producing a current which compensates for changes in the current produced by the light-sensitive semicondutor component in response to light pulses.

4,626,794

AMPLIFIER CIRCUIT USING A P CHANNEL MOS TRANSISTOR

Yasuhiro Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 23, 1985, Ser. No. 726,349
Claims priority, application Japan, Apr. 26, 1984, 59-85020
Int. Cl.[4] H03F *3/16, 3/45*
U.S. Cl. 330—253 **2 Claims**



1. A circuit for amplifying a differential input signal, comprising:

a high potential power source terminal;

a low potential power source terminal;

a pair of P channel MOS transistors each having a source, a drain, and a gate, said drains being connected to said low potential power source terminal and said gates being connected to receive said differential input signal;

a pair of NPN bipolar transistors each having a base, a collector, and an emitter, said emitters being connected to said sources;

a base bias power source connected to said bases, said base bias power source comprising a current source having an input and an output arranged such that said input is connected to said high potential power source terminal, and a current mirror circuit having first and second inputs and first and second outputs arranged such that said first input is connected between said output of said current source and said bases, such that said second input is connected to said drains, and such that said first and second outputs are connected to said low potential power source terminal; and

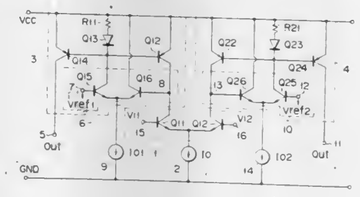
a pair of loads connected between said collectors and said high potential power source terminal, said collectors providing connection points for obtaining an amplified output signal representing said differential input signal.

4,626,795

DIFFERENTIAL AMPLIFIER

Tatsuo Tanaka; Nana Shigematsu, and Kazushige Koshika, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tosbac Computer System Co., Ltd., Tokyo, both of, Japan

Filed Sep. 6, 1985, Ser. No. 773,188
Claims priority, application Japan, Sep. 11, 1984, 59-190012
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 **4 Claims**



1. A differential amplifier comprising:

a pair of first and second input terminals receiving a pair of signal voltages to be amplified, respectively;

a first amplifying circuit comprising first and second transistors of a first conductivity type, the bases of which are connected to said first and second input terminals, respectively;

a second amplifying circuit comprising third and fourth transistors of said first conductivity type, said third transistor being at the non-inverting input side of said second amplifying circuit and said fourth transistor being at the inverting input side of said second amplifying circuit, the base of said fourth transistor being connected to the collector of said first transistor in said first amplifying circuit, and the base of said third transistor being connected to a first bias potential;

a first current mirror circuit comprising fifth and sixth transistors of a second conductivity type, the collector of said fifth transistor being connected to the base of said fourth transistor and the collector of said first transistor, and a collector current of said sixth transistor being taken out through a first output terminal as a first output current;

a third amplifying circuit comprising seventh and eighth transistors of said first conductivity type, said seventh transistor being at the non-inverting input side of said third amplifying circuit and said eighth transistor being at the inverting input side of said third amplifying circuit, the base of said eighth transistor being connected to the collector of said second transistor in said first amplifying circuit, and the base of said seventh transistor being connected to a second bias potential; and

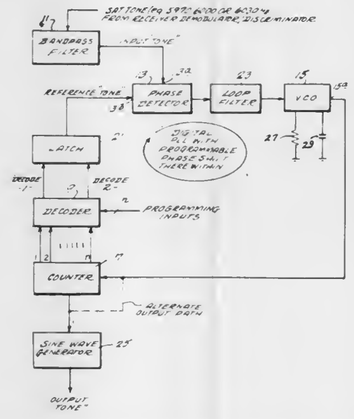
a second current mirror circuit comprising ninth and tenth transistors of second conductivity type, the collector of said ninth transistor being connected to the base of said eighth transistor and the collector of said second transistor, and a collector current of said tenth transistor being taken out through a second output terminal as a second output current.

4,626,796

DIGITAL APPARATUS AND METHOD FOR PROGRAMMABLY PHASE SHIFTING AN AUDIO TONE

James H. Elder, Bedford, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Mar. 1, 1985, Ser. No. 707,375
Int. Cl.[4] H03K *5/135;* **H03L** *7/08*
U.S. Cl. 331—1 A **25 Claims**



1. A digital programmable electrical phase shift circuit capable of providing a predetermined frequency f_1 output signal having a programmable phase shift with respect to a supplied frequency f_1 input signal, said circuit comprising:

phase detector means having first and second inputs for comparing the relative phase of said input electrical signal of frequency f_1 on said first input with a reference electrical signal of frequency f_1 at said second input and for providing a control signal which is representative of the thus detected phase difference;

a controllable oscillator connected to said phase detector means for providing an output signal having a frequency of Nf_1 controlled only by the control signal provided by the phase detector means;

frequency dividing means connected to receive the output of said oscillator and to derive a frequency divided reference signal of frequency f_1 therefom which reference signal is input to the second input of said phase detector means;

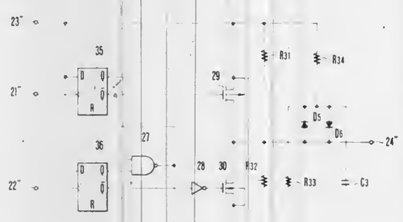
said frequency dividing means also producing a multi-bit digital signal recurring at frequency f_1 and including a digitally programmable circuit for effecting a controlled phase shift in said reference signal in accordance with a digital programming input by decoding said multi-bit digital signal so as to provide a digitally programmable electrical phase shift between said reference input signal and the output of said oscillator.

4,626,797

PHASE LOCKED LOOP PROVIDING THREE-LEVEL CONTROL SIGNAL TO VCO

Tsuguhide Sakata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,717
Claims priority, application Japan, Oct. 14, 1983, 58-193136; Oct. 14, 1983, 58-193137
Int. Cl.[4] H03L *7/08*
U.S. Cl. 331—1 A **17 Claims**



1. A phase-locked loop circuit, comprising:

(a) a controllable oscillator having an oscillation frequency;

(b) a phase detecting means arranged to generate a control signal for controlling the oscillation frequency of said oscillator according to a phase different between an output of said oscillator and an incoming signal; and

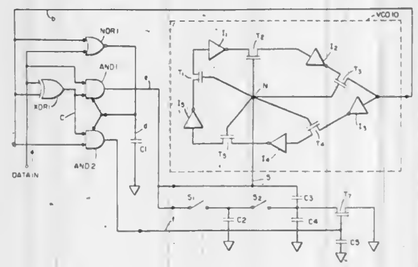
(c) designating means connected with said phase detecting means for designating a specific period of time during which said oscillator is substantially controlled by the control signal at every repeating period of said incoming signal.

4,626,798

PHASE-LOCK LOOP INCLUDING INTEGRATED-CIRCUIT VOLTAGE CONTROLLED OSCILLATOR

Jeffrey A. Fried, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 11, 1985, Ser. No. 807,496
Int. Cl.[4] H03L *7/06;* **H03B** *28/00*
U.S. Cl. 331—1 A **11 Claims**



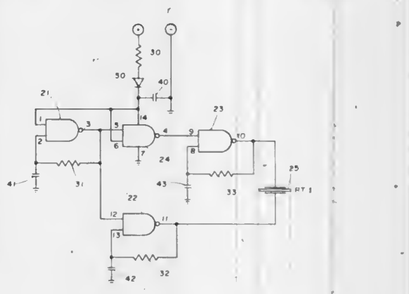
1. A voltage controlled oscillator comprising an odd number of inverter stages connected in a ring for producing an oscillating voltage; the output of each stage being connected to the input of the next stage via a voltage controllable impedance.

4,626,799

WARBLE SIGNALING DEVICE

Miroslav Matievic, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 23, 1985, Ser. No. 779,263
Int. Cl.[4] G08B *3/10;* **H03B** *5/24;* **H03K** *3/03*
U.S. Cl. 331—47 **2 Claims**



1. A warble signaling device comprising:

a first oscillator means for oscillating at a first frequency, said first oscillator means including a first gate having at least one active input and an output;

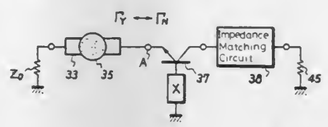
a second oscillator means for oscillating at a second frequency different from said first frequency, said second oscillator means including a second gate having at least two active, inputs and an output;

a third oscillator means for oscillating at a third frequency different from said first and second frequencies, said third oscillator means including a third gate having at least two active inputs and an output;

an inverter having an input and an output;

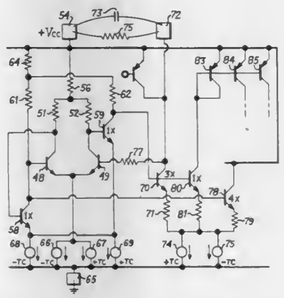
a piezoelectric transducer;
said output of said first gate connected to the input of said inverter and to one input of said second gate;
said output of said inverter connected to one input of said third gate; and
the outputs of said second and third gates connected across said piezoelectric transducer.

4,626,800
YIG THIN FILM TUNED MIC OSCILLATOR
Yoshikazu Murakami, Kanagawa; Seigo Ito, Tokyo, and Toshiro Yamada, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jun. 3, 1985, Ser. No. 740,813
Claims priority, application Japan, Jun. 5, 1984, 59-114793
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **8 Claims**



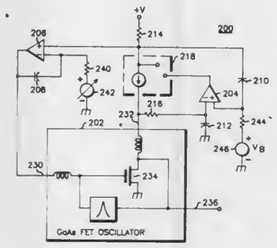
1. A tuned oscillator comprising: an active element; and
a ferromagnetic resonator connected to said active element;
said ferromagnetic resonator being formed of a ferrimagnetic crystal, a microstrip line electromagnetically coupled to said ferrimagnetic crystal and D.C. (direct current), bias magnetic field means applying D.C. (direct current) bias magnetic field to said ferrimagnetic crystal, said ferrimagnetic crystal being formed of an YIG (yttrium, iron, garnet) thin film formed by a thin film forming technique and being processed to suppress magnetostatic modes of ferromagnetic resonance other than the uniform mode.

4,626,801
RELAXATION INTEGRATED CIRCUIT OSCILLATOR
Thomas L. Field, Rutland, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed Oct. 25, 1985, Ser. No. 791,480
Int. Cl.[4] H03B *5/24;* **H03K** *3/023*
U.S. Cl. 331—111 **11 Claims**



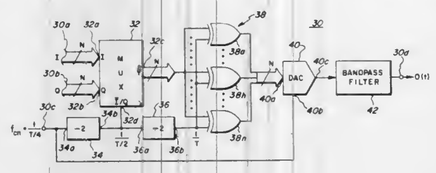
1. An integrated circuit relaxation oscillator comprising:
(a) three terminal pads to which the positive supply voltage, a ground reference voltage and a control voltage are intended to be applied, respectively;
(b) first and second differentially connected transistors, first and second collector resistors connected between the collectors of said first and second transistors, respectively, and said positive-voltage pad;
(c) third and fourth differentially connected transistors, the bases of said third and fourth transistors being connected, respectively, to said collectors of said first and second transistors;
(d) third and fourth collector resistors being connected to the collectors, respectively, of said third and fourth transistors which resistors at their other ends are connected together;
(e) a fifth resistor connected between said positive pad and said other resistor ends;
(f) a first current source means for supplying the emitter current in said first and second transistors;
(g) a second current source means for supplying the emitter current in said third and fourth transistors;
(h) the base of said first transistor being connected to said collector of said third transistor;
(i) a fifth and sixth transistor having collectors connected, respectively, to said control terminal pad and said positive terminal pad, said fifth transistor collector also being connected to the base of said second transistor, said bases of said fifth and sixth transistors connected, respectively, to said fourth and third transistor collectors; and
(j) a third current source means for supplying the emitter current in said fifth and sixth transistors, the other ends of said first, second and third current sources being connected to said ground terminal.

4,626,802
GAAS FET OSCILLATOR NOISE REDUCTION CIRCUIT
Paul H. Gailus, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 24, 1984, Ser. No. 685,710
Int. Cl.[4] H03B *5/00*
U.S. Cl. 331—117 FE **7 Claims**



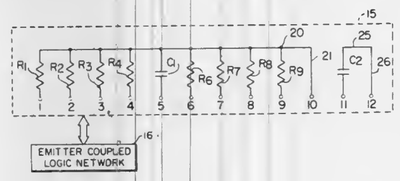
1. An improved low-noise FET oscillator comprising:
(a) oscillator means having a FET device with gate and drain terminals, wherein an output signal may be derived from the drain terminal of said FET device;
(b) means for driving the gate terminal of the FET oscillator circuit with a source of voltage which exhibits a low impedance at baseband frequencies.
(c) means for driving the drain input of the FET oscillator circuit with a source of current which exhibits a high impedance at baseband frequencies.
(d) means for maintaining the average D.C. voltage present on the drain terminal of the FET device at a relatively constant value, regardless of the average D.C. drain current, and
(e) means for maintaining constant D.C. drain current at a predetermined value which corresponds to low noise oscillator operation.

4,626,803
APPARATUS FOR PROVIDING A CARRIER SIGNAL WITH TWO DIGITAL DATA STREAMS I-Q MODULATED THEREON
John R. Holm, Seattle, Wash., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 30, 1985, Ser. No. 814,359
Int. Cl.[4] H03C *3/02;* **H03K** *7/06*
U.S. Cl. 332—9 R **16 Claims**



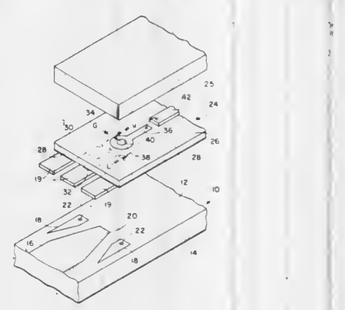
1. A digital I-Q modulator for providing an analog signal at a desired carrier signal frequency ω_1 and having in-phase I and quadrature-phase Q modulation sidebands thereof respectively provided responsive to respective different ones of in-phase I and quadrature-phase Q baseband digital data stream signals, comprising:
means for alternatingly selecting a different one of the pair of data stream signals to provide a first data signal during each of a successive multiplicity of time intervals of duration T essentially equal to the reciprocal of the carrier signal frequency ω_1;
means for inverting each bit of the first data signal during every other one of a multiplicity of successive inversion time intervals of duration T/2, each commencing at successive ones of the beginning and midpoint of each time interval T, to provide a second data signal;
a single digital-to-analog converter (DAC) means for converting said second data signal to an analog signal portion having an amplitude substantially established by the digital value of the second data signal during each of another multiplicity of successive conversion time intervals of duration T/4, each commencing at successive ones of the beginning and midpoint of each inversion time interval T/2; and
a bandpass filter having a center frequency substantially equal to the carrier signal frequency ω_1 and a passband of at least twice the bandwidth of the baseband digital data stream signals.

4,626,804
ECL TERMINATOR COMPRISED OF A PLURAL RESISTOR NETWORK
Ted H. Risher, Pompano Beach, and Glenn F. Wolfe, Plantation, both of Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Jan. 7, 1985, Ser. No. 689,472
Int. Cl.[4] H01P *1/24*
U.S. Cl. 333—22 R **9 Claims**



1. A device for terminating an electrical signal network comprising:
a single-in-line package having a plurality of terminal pins disposed along one side thereof;
a first conductor supported by said package and extending apart from but substantially parallel to the disposition of said plurality of terminal pins along said one side of said package;
means for coupling one of said plurality of terminal pins to said conductor; and
a plurality of resistor elements supported by said package and disposed parallel to one another such that one end of each of said resistor elements is connected to said first conductor and a second end of each of said resistor elements is connected to a respective terminal pin of said plurality of terminal pins other than said one terminal pin; and
a frequency responsive impedance element one end of which is connected to said first conductor and a second end of which is connected to another of said plurality of terminal pins, said frequency responsive impedance element being disposed among said resistor elements at a position which effectively minimizes the inductance associated with said first conductor between the respective one end of each of said resistor elements and said one end of said frequency responsive impedance element.

4,626,805
SURFACE MOUNTABLE MICROWAVE IC PACKAGE
Keith E. Jones, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Apr. 26, 1985, Ser. No. 727,946
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—33 **9 Claims**



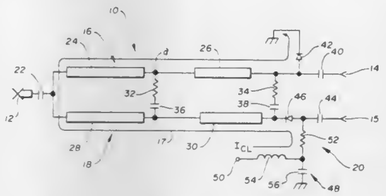
1. A surface mountable microwave package comprising:
a printed circuit board having a first microwave transmission line thereon with ground pads adjacent the end of said microwave transmission line;
a carrier substrate;
a co-planar transmission line on the bottom of said substrate situated so as to make electrical contact with said first microwave transmission line on said printed circuit board;
a second microwave transmission line on the top of said carrier substrate connected to said co-planar transmission line via a metallized through-hole, an integrated circuit being connected to said second microwave transmission line;
said package, during operation, having said carrier substrate placed on and connected to said printed circuit board.

4,626,806

RF ISOLATION SWITCH

George C. Rosar, Owatonna, and James R. Wilson, Waseca, both of Minn., assignors to E. F. Johnson Company, Waseca, Minn.

Filed Oct. 10, 1985, Ser. No. 786,204
Int. Cl.[4] H01P *1/15*
U.S. Cl. 333—104 6 Claims



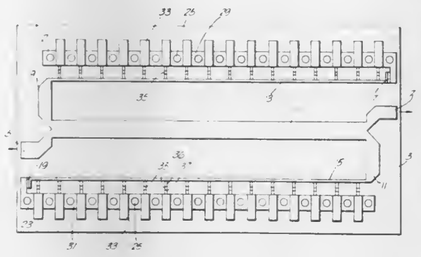
1. A multiple throw switch, comprising:
first, second, and third signal ports;
a first signal transmission line operably coupling said first and second signal ports;
a second signal transmission line operably coupling said first and third signal ports, said first and second signal transmission lines being operably coupled to define a DC current path therealong;
a voltage balancing network comprising a first resistive element and a first capacitive element in series, said network connected in shunt across said first and second signal transmission lines;
first and second asymmetrical conducting elements respectively operably coupled to said first and second signal transmission lines, each of said asymmetrical conducting elements selectively biasable between a transmission line enabling operating condition and a transmission line disabling operating condition; and
control means for selectively biasing said asymmetrical conducting elements,
said DC current path comprising means for operably coupling said control means to at least one of said asymmetrical conducting elements.

4,626,807

PHASE SHIFTING DEVICE

Kenneth Wilson, Middlesex, England, assignor to The General Electric Company, plc, England

Filed Jun. 12, 1985, Ser. No. 744,040
Claims priority, application United Kingdom, Jun. 25, 1984, 8416143
Int. Cl.[4] H01P *1/185, 3/08*
U.S. Cl. 333—164 8 Claims



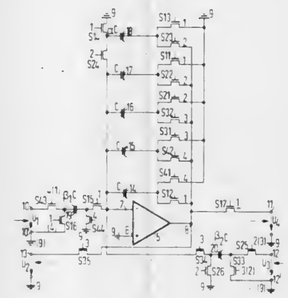
1. A phase shifting device comprising: a coupling device having an input port to which an input signal is applied, an output port from which an output signal is derived and at least one further port to which is connected a transmission line terminated in a discontinuity effective to reflect signals from the input port passing along the line back along the line to produce said output signal, said transmission line being constituted by a series of inductances formed by successive portions of a conductive track carried on one main face of a substrate whose other main face carries a ground plane, and a plurality of capacitive impedances each connected between the end of a respective portion of said track and the ground plane, the values of said impedances being controllable by control signals so as to vary the phase of said output signal respective to the phase of said input signal.

4,626,808

ELECTRICAL FILTER CIRCUIT FOR PROCESSING ANALOG SAMPLING SIGNALS

Josef Nossek, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,782
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022252
Int. Cl.[4] H03H *11/00*; G11C *27/02*
U.S. Cl. 333—173 7 Claims



1. An electrical filter circuit for functioning as a switched capacitor circuit for processing analog sampling signals, comprising a plurality of switches adapted to be controlled at prescribed clock phases, a plurality of capacitors connected to said switches, an operational amplifier having its non-inverting input connected to a reference potential, means connecting the inverting input and the output of said operational amplifier with said plurality of capacitors through individual ones of said switches to form a closed loop having N+1 capacitors, each of said N+1 capacitors being controlled by one of said switches to emit its charge during a first clock phase and controlled by another one of said switches to accept the charge in the immediately following clock phase, such that N signal charges repetitively circulate through said loop, said filter including input means including at least one capacitor connected to said inverting input of said operational amplifier, and output means including at least one output switch connected between said output of said operational amplifier and an output terminal of said filter.

4,626,809

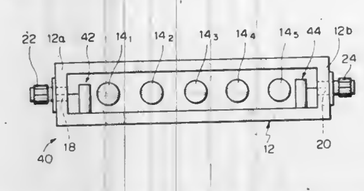
BANDPASS FILTER WITH DIELECTRIC RESONATORS

Motoo Mizumura, and Hisasuke Sei, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,104
Claims priority, application Japan, Sep. 27, 1984, 59-202337
Int. Cl.[4] H01P *1/20, 1/219, 7/10*
U.S. Cl. 333—202 6 Claims

1. A bandpass filter comprising:
a metal housing;
a plurality of dielectric resonators arranged in an array in said housing;

a signal input connector and a signal output connector each being mounted in the housing; and
an elongate metallic input post and an elongate metallic output post each being disposed in the housing to be connected to the housing at one end and open at the other end and respectively being connected to the signal input and signal output connectors,



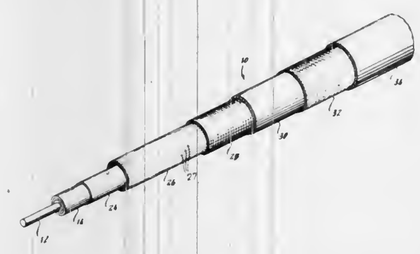
wherein each of the signal input and signal output posts having a length which is substantially equal to a quarter of a wavelength of a center frequency of the bandpass filter is adapted for removing a spurious mode having a frequency that is twice said center frequency.

4,626,810

LOW ATTENUATION HIGH FREQUENCY COAXIAL CABLE FOR MICROWAVE ENERGY IN THE GIGAHERTZ FREQUENCY RANGE

Arthur C. Nixon, 2065 Smithtown Ave., Ronkonkoma, Long Island, N.Y. 11779

Filed Oct. 2, 1984, Ser. No. 657,005
Int. Cl.[4] H01P *3/06*
U.S. Cl. 333—243 17 Claims



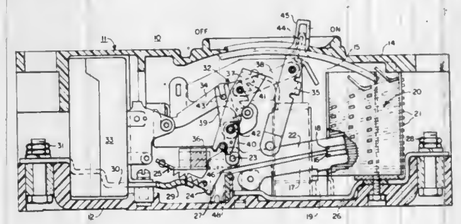
1. A low attenuation high frequency coaxial cable for carrying microwave energy in the gigaHertz range and having a center conductor extending along the axis of the cable comprising:
dielectric surrounding said center conductor including a plurality of layers of low density PTFE dielectric tape material,
at least one layer of high density PTFE dielectric material of a different dielectric constant than the layers of low density PTFE surrounding and holding said plurality of layers of low density PTFE dielectric material around said center conductor,
each of said layers of low density dielectric material comprising a tape extending longitudinally of the cable with its edges abutting in edge-to-edge relationship,
the abutting edges of each layer of low density material being located away from the abutting edges of an adjoining layer, and
said layer of high density dielectric material comprising a tape of unsintered PTFE material, extending longitudinally of the cable and encircling the underlying low density dielectric layers, and which is sintered in place after being applied over the underlying low density dielectric layers;
a plurality of longitudinally extending, parallel, adjacent conductive wire strands which are in electrical contact with each other forming an outer conductor encircling said high density PTFE dielectric material,
said conductive wire strands having a slight helical lay along the axis of said cable,
means surrounding and holding said strands in place, and
a protective outer jacket surrounding said holding means.

4,626,811

CIRCUIT INTERRUPTER WITH INTEGRAL RESILIENT STOP MEANS FOR CONTACT ARM

Jere L. McKee, Scott Township, Lawrence County; William I. Stephenson, Brighton Township, Beaver County, and Donald E. Schlosser, Beaver Falls, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1985, Ser. No. 786,987
Int. Cl.[4] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—46 8 Claims



1. A circuit interrupter comprising;
a housing comprising a base component and a cover component of insulating material, said base component having a wall portion with rigid shoulder means that protrudes into the interior of said housing,
a pair of separable contacts disposed within said housing, one of said contacts being secured to the end portion of an elongated contact arm that is pivoted at a medial part thereof and is swingable toward and away from the other contact along an arcuate path such that the contacts engage and then separate from one another,
an operating mechanism supported within said housing and adapted to move the swingable contact arm and thus open and close said contacts when the operating mechanism is sequentially actuated, and
means for arresting the movement of said swingable contact arm at a predetermined time during the contact-opening stroke of the circuit interrupter comprising a cushioning component of resilient material that is secured to the shoulder means of said wall portion and together therewith constitutes a resilient stop for said contact arm, the end portion of said contact arm which is remote from the contact on said arm being located proximate said resilient stop and being so oriented that it swings toward the cushioning component of the stop as the contacts are being separated and then strikes said resilient stop when the contacts are spaced a predetermined distance apart.

4,626,812

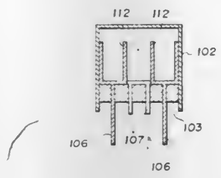
ELECTROMAGNETIC RELAY FOR SWITCHING HIGH FREQUENCY SIGNALS

Youichi Nakanishi, Kyoto, and Kozo Maenishi, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 13, 1984, Ser. No. 639,830
Claims priority, application Japan, Aug. 12, 1983, 58-126061[U]; Oct. 8, 1983, 58-188925
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—132 13 Claims

1. An electromagnetic relay, comprising: a non-metallic base formed with an insertion socket and provided with an electroconductive coating; a terminal platform having terminals

mounted therein and fitted in said insertion socket; and a ground base board fixed against said base so as to pressingly



hold said terminal platform in said socket and so as to contact said electroconductive coating.

4,626,813

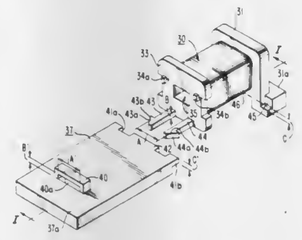
ELECTROMAGNETIC DRIVE AND POLARIZED RELAY

Hirofumi Koga, Kyoto; Kozo Maenishi, Nagaokakyo; Shuichi Kashimoto, Kyoto; Sueaki Honda, Uji; Kenichi Tsuruyoshi, Kusatsu, and Takezo Sano, Shiga, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 596,717, Apr. 4, 1984. This application Aug. 6, 1985, Ser. No. 762,860

Int. Cl.⁴ H01F *7/00, 3/00*

U.S. Cl. 335—278 **2 Claims**



1. A polarized electromagnetic relay apparatus for assembling a coil spool with a terminal carrying base plate comprising:

a coil spool having first and second end collars;

a flexible projecting piece formed in said first collar and having a stopper;

a holder portion having supporting offset portions formed in said second collar;

terminal members enchored in said second collar for receiving leads from a coil; and

a base plate comprising:

a latch projection formed in a top surface at a first end of said base plate having a latch hole adapted to receive said flexible projecting piece;

jaw-like offset portions formed in a second end of said base plate for engaging with said supporting offset portions;

whereby said coil spool is mounted on said base plate through engagement of said flexible projecting piece with said latch hole and engagement of said jaw-like offset portions with said supporting offset portions.

4,626,814

RAPID ACTING ELECTROMAGNETIC ACTUATOR

Mario Montuschi, Turin, and Mario Palazzetti, Avigliana, both of Italy, assignors to Iveco Fiat, S.p.A., Turin, Italy

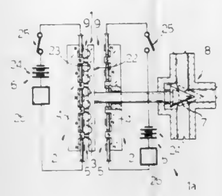
Filed Sep. 13, 1984, Ser. No. 650,198

Claims priority, application Italy, Sep. 19, 1983, 67963 A/83

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—281 **12 Claims**

1. A rapid acting electromagnetic actuator comprising an electromagnet and a movable armature which can be attracted towards said electromagnet when the electromagnet is excited, characterized by the fact that said electromagnet includes a ferromagnetic flat core in a shape of a substantially flat plate having a flat front surface facing said armature, and a winding



comprising a plurality of substantially rectilinear conductor elements electrically connected to each other and disposed within respective substantially rectilinear grooves formed on the front surface of said plate.

4,626,815

POLYPHASE ASSEMBLY

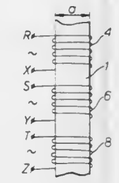
Mendel Krichevsky; Raul Rabinovici, both of Beer Sheva, and Benjamin Sharir, Ramat Gan, all of Israel, assignors to Ben-Gurion University of the Negev Research and Development Authority, Beer Sheva, Israel

Filed Aug. 27, 1984, Ser. No. 644,508

Claims priority, application Israel, Sep. 7, 1983, 69676

Int. Cl.⁴ H01F *33/00*

U.S. Cl. 336—5 **10 Claims**



1. A polyphase assembly for controlling A.C. devices and capable of producing an electrical impedance of a substantial resistive component, comprising a pluralit- of windings, separate for each phase, wound on and along a single, axially directed core, said core being constituted by at least one ferromagnetic body the air boundary to air boundary thickness of at least the portions of said core covered by said windings being greater than 1.6 mm.

4,626,816

MULTILAYER SERIES-CONNECTED COIL ASSEMBLY ON A WAFER AND METHOD OF MANUFACTURE

Rubin Blumkin, Great Neck, N.Y., and Robert Pereira, Jr., Jacksonville, Fla., assignors to American Technical Ceramics Corp., Huntington Station, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,634

Int. Cl.⁴ H01F *27/28, 41/04*

U.S. Cl. 336—192 **16 Claims**

1. A coil assembly, comprising:

a flat, electrically insulative slab having free edges;

a conductive pad on said slab adjacent one of said edges of said slab;

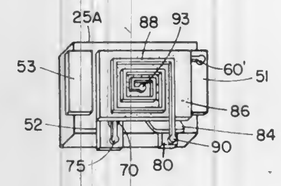
a first, flat, spiral, conductive coil on said slab; said coil having inner and outer ends, said outer end of said coil being connected to said pad;

a first, thin, flat insulative layer on said slab covering said coil, said layer having an open area exposing said inner end of said coil;

a first, flat, conductive jumper on said slab and said layer, said jumper being connected at one end thereof to said inner end of said coil, said jumper having an outer end disposed near another edge of said slab;

an insulative pad on said jumper;

a second, flat, spiral, conductive coil on said first insulative layer having inner and outer ends, said outer end of said second coil being connected to said outer end of said jumper;



a second, thin, flat insulative layer on said first insulative layer and said insulative pad, covering said second coil and said outer end of said jumper, said second insulative layer having another open area exposing said inner end of said second coil; and

a second flat conductive jumper on said second insulative layer connected at one end thereof to said inner end of said second coil, so that said first and second coils are electrically connected together in series between said conductive pad and said second jumper.

4,626,817

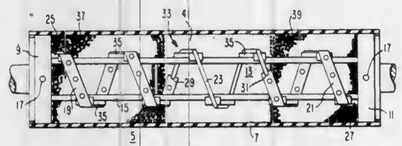
CURRENT LIMITING FUSE WITH LESS INVERSE TIME-CURRENT CHARACTERISTIC

Frank L. Cameron, N. Huntingdon Township, Huntingdon County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 17, 1985, Ser. No. 724,367

Int. Cl.⁴ H01H *85/04*

U.S. Cl. 337—162 **8 Claims**



1. A current-limiting fuse with less inverse time-current characteristic, comprising:

a tubular casing;

an electrical terminal at each end of the casing;

a fusible structure within the casing and having one end connected to one of the terminals and the other end connected to the other of the terminals;

the fusible structure including first fusible elements of high current clearing characteristics and including a second fusible element of low current clearing characteristics;

the second fusible element being disposed intermediate the first fusible elements and being connected thereto to form a series circuit;

a granular arc-extinguishing filler occupying the casing and surrounding the fusible structure;

a plurality of spaced support members extending longitudinally of the tubular casing and within the granular arc-extinguishing filler;

the fusible structure being disposed helically over and around the support members;

the arc-extinguishing filler embedding the second fusible element and being selected from the group consisting of calcium carbonate, gypsum, and boric acid;

the first and second fusible elements forming interfaces between the members and the fusible elements; and

a body of temperature-responsive, gas-evolving material at each interface to sever the elements when fusion occurs.

4,626,818

DEVICE FOR PROGRAMMABLE THICK FILM NETWORKS

John L. Hilgers, Milwaukee, Wis., assignor to Centralab, Inc., Milwaukee, Wis.

Filed Nov. 28, 1983, Ser. No. 555,847

Int. Cl.⁴ H01H *85/04*

U.S. Cl. 337—166 **1 Claim**



1. A thick film fusible device for use in a programmable thick film network comprising:

an alumina substrate;

a layer of an inorganic dielectric glaze screened on said substrate;

a thick film conductor in the form of a pattern of a fusible link having a narrow segment deposited on and straddling said glazed substrate; and

a second layer of inorganic glaze deposited over said first layer of glaze and the narrow segment of said fusible link, said second layer confining said conductor pattern so that high current released to said fusible link will cause said second layer of glaze to rupture thus releasing the conductive material and resulting in a high post fusing resistance.

4,626,819

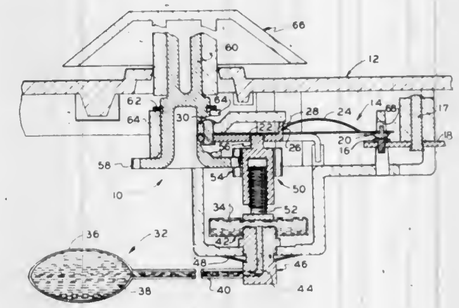
SWITCH ADJUSTING MECHANISM

Donald F. Drapeau, Windsor, Conn., assignor to Safeway Products, Inc., Middletown, Conn.

Filed Apr. 17, 1985, Ser. No. 724,190

Int. Cl.⁴ H01H *37/36*

U.S. Cl. 337—323 **10 Claims**



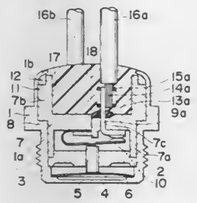
1. A condition responsive switch adjusting mechanism comprising switch contact means including a snap action movable contact, condition sensing means including an output portion movable in response to a sensed condition, an adjustable length actuator for the switch contact means disposed between the movable contact and the output portion of the sensing means, the actuator having a first member fixed against rotation and a second pinion member in coaxial alignment and threaded engagement with said first member for rotary and axial movement relative to said first member to adjust the length of said actuator, and an adjustment gear drivingly connected to said second pinion member for selectively adjusting the angular and axial position of the second pinion member relative to the first member.

4,626,820

THERMOSWITCH

Tadahiro Takahashi; Shinichi Ohi, and Kashiwa Kobayashi, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 714,083
Claims priority, application Japan, Apr. 11, 1984, 59-52930
Int. Cl.[4] H01H *37/52*
U.S. Cl. 337—354 **1 Claim**



1. A thermoswitch, comprising:
a bottomed housing;
a base disposed in said housing, said housing and said base defining a recess therein;
a first terminal and a second terminal, fixed in said base, said first and second terminals having basal portions projecting from said base into said recess;
means in said housing for alternatively electrically connecting and disconnecting said first terminal to and from said second terminal, said electrically connecting means including a movable contact and a thermosensitive member movable in response to temperature change to move said movable contact between a first position in which said first and second terminals are electrically connected through said movable contact and a second position in which said first and second terminals are electrically disconnected;
means, including an O-ring between said housing and said base, for sealing said thermoswitch against water flow between said housing and said base, said housing having a portion crimped over said O-ring,
a cold setting resin in said housing solidifying said basal portions;
lead wires connected to said basal portions of said first and second terminals in said recess;
heat-shrinkable tubes sheathing said lead wires in said recess; and
a thermosetting resin filling said recess so as to embed said heat-shrinkable tubes therein.

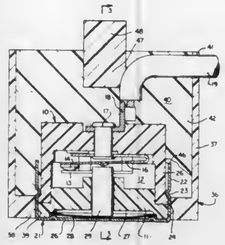
4,626,821

SEALED THERMOSTAT FOR USE IN DEFROST CONTROL SYSTEMS

Douglas P. Versaw, Mansfield, Ohio, assignor to Thermo-O-Disc, Incorporated, Mansfield, Ohio

Filed Nov. 4, 1985, Ser. No. 794,440
Int. Cl.[4] H01H *37/04*
U.S. Cl. 337—380 **11 Claims**

1. A sealed thermostat comprising a body assembly including a metallic cup having an imperforate end wall in thermal communication with a temperature-responsive member, enclosure means enclosing said body assembly while leaving said end wall exposed and cooperating with said body assembly to define a sealing cavity, and a sealing compound filling said sealing cavity, said cup providing side walls extending a substantial distance into said sealing cavity and providing an interface of substantial area with said sealing compound to prevent foreign material from entering said body assembly, said enclosure means being generally cup-shaped and providing an aper-



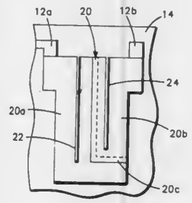
tured wall through which said metallic cup extends to expose said end wall.

4,626,822

THICK FILM RESISTOR ELEMENT WITH COARSE AND FINE ADJUSTMENT PROVISION

Torleiv O. Melkeraaen, Park Ridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1985, Ser. No. 729,776
Int. Cl.[4] H01C *10/00, 1/012, 1/01, 17/06*
U.S. Cl. 338—195 **6 Claims**



1. A flat ribbon-like thick film resistance elements especially suited for use in hybrid circuit assemblies between associated terminals on the substrate base, said resistance element having coarse and fine tuning adjustment capabilities, including in combination:
a flat rectilinear sheet of resistance material formed and positioned between the associated terminals on a hybrid circuit substrate and exhibiting a given resistance lower than the desired resistance values,
said resistance element providing a coarse laser beam trim adjustment by a first portion or segment formed by a resistance material of a given area effecting a given resistance value per unit area, said resistance element further providing fine laser beam trim by a second portion or segment formed by a resistance material of a given area effecting a lower resistance value per unit area than exhibited by said first portion.

4,626,823

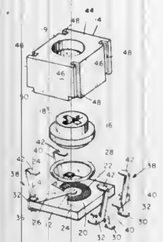
MINIATURE ELECTRONIC DEVICE WITH IMPROVED HOUSING ATTACHMENT

Ronald E. Smith, Sunnymead, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Nov. 9, 1984, Ser. No. 670,439
Int. Cl.[4] H01C *10/00*
U.S. Cl. 338—199 **15 Claims**

6. An electronic device, comprising:
a substrate carrying an electronic component on a major surface thereof;
a housing having top and side surfaces enclosing said major surface of said substrate on which said component is carried;
a terminal lead attached to each of at least two opposed sides

of said substrate, each of said leads having a first portion engageable with said substrate, and a second portion extending perpendicularly to said major surface carrying said component;
retention means, on said second portion of each of said terminal leads, and engageable with said housing, for



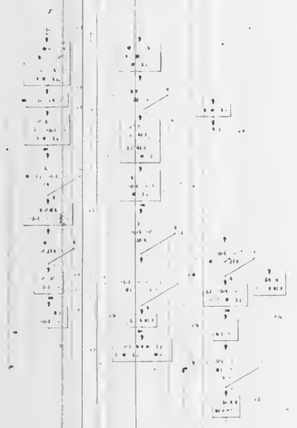
lockably retaining said housing in engagement with said substrate; and
slot means in said top and side surfaces of said housing, for receiving said second portion and said retention means of each of said terminal leads, said second portions being thereby recessed inwardly from said side surfaces substantially without protruding from said side surfaces.

4,626,824

APPARATUS AND ALGORITHM FOR COMPRESSING AND DECOMPRESSING DATA

Lawrence E. Larson, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1985, Ser. No. 743,443
Int. Cl.[4] H03K *13/00*
U.S. Cl. 340—347 DD **8 Claims**



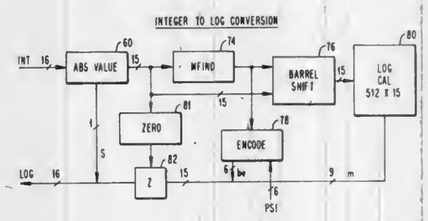
1. A data processing system, comprising:
a memory for storing instructions;
input/output means for transmitting data to another data processing system; and
processing means connected to said memory and to said input/output means for processing said instructions stored in said memory and developing a set of data, said processing means repeatedly compressing said set of data, thereby producing a compressed set of data, utilizing a compression algorithm stored in said memory and transmitting said compressed set of data to said another data processing system,
said compression algorithm compressing said set of data thereby forming a further set of data and repeatedly recompressing said further set of data until a previously compressed set of data and a subsequently compressed set of data is formed, a length of the subsequently compressed set of data being greater than a length of the previously compressed set of data, said previously compressed set of data being said compressed set of data transmitted to said another data processing system.

4,626,825

LOGARITHMIC CONVERSION APPARATUS

Wayne P. Burleson, Palo Alto; Lawrence F. Wagner, Berkeley, and Korbin S. Van Dyke, Fremont, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 2, 1985, Ser. No. 751,305
Int. Cl.[4] H03M *7/50*
U.S. Cl. 340—347 DD **1 Claim**



1. A digital apparatus for converting a digital binary integer having a plurality of bits into logarithmic representation comprising:
means for determining the bit position of the leading non-zero bit of said integer;
means for shifting said integer such that the leading non-zero bit is the left most bit;
table means for receiving said shifted integer and for providing a number representative of the mantissa portion of the logarithm of said shifted number, said table means having a plurality of interconnected comparators, arranged in an array and for storing a plurality of digital values in a monotonically increasing or decreasing order; each comparator having means for receiving said shifted integer, means for comparing said shifted integer to the digital value stored in said comparator, means for generating a comparison signal in response to said comparison; means for receiving the comparison signal from an immediately adjacent comparator, means responsive to the comparison signal from each comparator and the comparison signal from the adjacent comparator for generating an output signal; means for receiving the plurality of output signals and for generating said number representative of the mantissa portion of the logarithm of said shifted number; and
encoding means for receiving a point-set input value and the number of binary positions shifted by said shifting means and for generating the exponent portion of the logarithm of said integer, wherein said point-set input value is the scale value for said integer, whereby said mantissa portion and said exponent portion from the logarithmic representation of said integer.

4,626,826

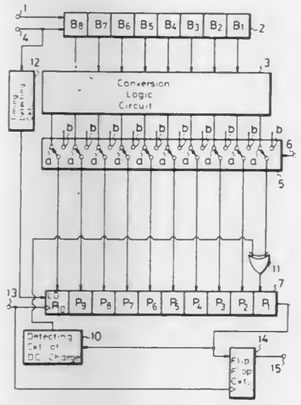
METHOD AND APPARATUS FOR ENCODING AND DECODING AN NRZI DIGITAL SIGNAL WITH LOW DC COMPONENT AND MINIMUM LOW FREQUENCY COMPONENTS

Shinichi Fukuda, and Yuichi Kojima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,148
Claims priority, application Japan, Oct. 27, 1983, 58-201587
Int. Cl.[4] H04L *3/00*
U.S. Cl. 340—347 DD **12 Claims**

1. A method for providing a digital signal having at least two

signal levels, a DC component substantially equal to zero and a predetermined maximum time between level transitions, said method comprising the steps of: dividing a base digital signal into a series of base words, each word having m bits of data; converting said base digital signal into a converted digital signal by matching said base words with corresponding converted words, each of said converted words having n bits of data, wherein n is greater than m and said converted digital signal has a predetermined maximum number of consecutive digital zeroes, said converted words including a plurality of paired primary combinations of n bits having a DC component substantially equal to zero when NRZI (non-return to zero, inverted)-coded and a plurality of secondary combinations of n bits having a DC component with an absolute value of two when NRZI-coded, each pair of said primary combinations being comprised of two complementary combinations which differ in variance of DSV when NRZI-coded and which both correspond to a respective one of said base words, and, in each instance when the base word being converted corresponds to a pair of said primary combinations, selecting the one of said primary combinations of said corresponding pair which decreases said DSV of the converted digital signal when NRZI-coded; and generating said converted signal as an NRZI-coded digital signal.



4,626,827

METHOD AND SYSTEM FOR DATA COMPRESSION BY VARIABLE FREQUENCY SAMPLING

Masatsugu Kitamura, Atsugi; Mitsuaki Tanaka, Fujisawa, and Hiroyuki Takekura, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 15, 1983, Ser. No. 475,405

Claims priority, application Japan, Mar. 16, 1982, 57-41550; Mar. 18, 1982, 57-43649; Mar. 24, 1982, 58-46575; Mar. 26, 1982, 57-48254

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 SH **23 Claims**

1. A system for translating an analog signal into a digital signal comprising series of digital data sets, comprising:

means for sampling the analog signal at a first clocked sampling frequency and generating therefrom a series of digital samples;

memory means for storing said digital samples; and

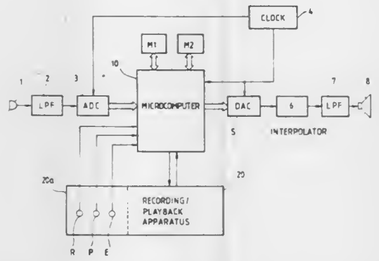
control means for generating a sampling datum indicating a variable sampling frequency at a submultiple of said first sampling frequency as a function of an instantaneous frequency of said analog signal for selecting digital samples out of said memory means in response to said sampling datum, and forming said sampling datum and said selected digital samples into a data set;

said control means comprising a microcomputer programmed to execute the following steps:

(a) periodically reading each of the digital samples out of said memory means and counting the samples until a predetermined count value is reached;

(b) detecting zero crossovers of said analog signal which occur during the interval between successive points at which said predetermined count is reached;

(c) dividing said predetermined count value by the number



of said detected zero crossovers to derive said sampling datum;

(d) dividing said predetermined count value by said sampling datum to obtain a datum indicating the number of digital samples to be selected from said memory means;

(e) reading said selected digital samples out of said memory means in response to said sampling datum;

(f) forming said selected digital samples and said sampling datum into said data set; and

(g) repeating the steps (a) to (f).

4,626,828

ADAPTIVE PREDICTIVE CODE CONVERSION METHOD OF INTERRUPTING PREDICTION AND AN ENCODER AND A DECODER FOR THE METHOD

Takao Nishitani, Tokyo, Japan, assignor to NEC, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,991

Claims priority, application Japan, Jul. 29, 1983, 58-139019

Int. Cl.[4] H03K *13/22*

U.S. Cl. 340—347 DD **26 Claims**



1. A code conversion method comprising the steps of:

carrying-out conversion between a succession of first signals and a succession of second signals;

producing a succession of prediction signals predictive of said first signal succession by the use of adaptive prediction means for successively carrying-out adaptive prediction of said first signal succession;

calculating the electric power of an electric signal succession related to a preselected one of said first and said second signal successions to produce a power signal representative of said electric signal; and

interrupting said adaptive prediction when the level of said electric power is not greater than a preselected electric power level.

4,626,829

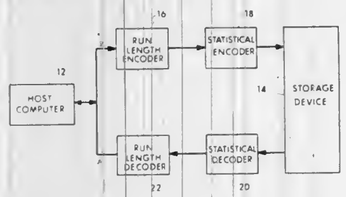
DATA COMPRESSION USING RUN LENGTH ENCODING AND STATISTICAL ENCODING

Edward L. Hauck, Lafayette, Colo., assignor to Intelligent Storage Inc., Longmont, Colo.

Filed Aug. 19, 1985, Ser. No. 767,186

Int. Cl.[4] H03K *13/00*

U.S. Cl. 340—347 DD **17 Claims**



17. A method of compressing and decompressing information symbols comprising the steps of:

run length encoding said information symbols to produce a data stream of run length encoded symbols having a character symbol identifying a repeated symbol of said information symbols, a flag symbol byte indicating the existence of a run, and a run length symbol indicating a number of repeated symbols of said run length encoded data;

statistically encoding a current run length encoded symbol in said data stream of said run length encoded symbols with a specified compression table which is one of a plurality of compression tables having statistical encoding data stored therein for statistically encoding said run length encoded symbols in accordance with a predetermined classification of said run length encoded symbols to produce compressed data comprising the steps of:

reading said current run length encoded data symbol as an address code in a lookup table having said statistical encoding data stored at an address location corresponding to said address code;

generating a statistical translation output from said statistical encoding data stored at said address location;

generating a pointer signal from pointer signal data stored at said address location;

determining if said current run length encoded data symbol is a first symbol of said data stream;

selecting a predetermined compression table for said first symbol;

selecting said specified compression table in accordance with said pointer signal generated for said previous run length encoded symbol for data other than said first symbol;

selecting said specified compression table based upon said predetermined classification of a previous run length encoded symbol which is chronologically previous to said current run length encoded symbol in said data stream of said run length encoded symbol;

statistically decoding said compressed data to produce statistically decoded data using one of a plurality of statistical decoding tables selected in accordance with a selection process dependent upon the order of said compressed data such that selection data of said selection process is inherent in said order of said compressed data; and,

run length decoding said statistically decoded data to produce decompressed information symbols.

4,626,830

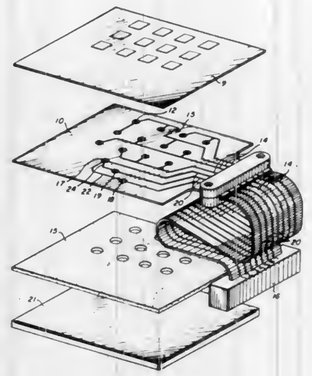
MEMBRANE KEYBOARD WITH IDENTIFYING CONNECTORS

Richard H. Noens, Arlington Heights, and Leonard E. Russell, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 18, 1984, Ser. No. 622,028

Int. Cl.[4] G06F *3/02;* **H04M** *1/26*

U.S. Cl. 340—365 VL **6 Claims**



1. In a membrane keyboard for use with a microprocessor, which microprocessor can be used with a plurality of different membrane keyboards provided that said microprocessor can identify which membrane keyboard is being used, and wherein the membrane keyboard includes:

a film having a plurality of contact switches formed thereon;

an indicia bearing layer disposed over said film;

a plurality of conductors formed on said film, each of said conductors having one end connected to at least one of said contact switches and a second end terminating in a contact lead;

a pin connector that can be operably connected to electrically interface with said microprocessor; and

a connector that electrically connects said contact leads of said plurality of conductors to said pin connector to thereby allow data input through said plurality of contact switches to be transmitted to said microprocessor;

an improvement comprising:

at least a first and second additional conductor formed on said film, which first and second additional conductors connect to said pin connector through said connector, wherein said first additional conductor connects to receive a reference voltage, such that said microprocessor can identify said membrane keyboard by determining whether said first and second additional conductors are electrically connected together by monitoring whether said reference voltage appears on said second additional conductor.

4,626,831

ANALOG SIGNAL PROCESSING CIRCUIT

Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1985, Ser. No. 725,179

Int. Cl.[4] G08B *23/00;* **H03L** *5/00*

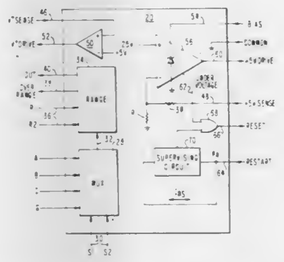
U.S. Cl. 340—500 **14 Claims**

1. An analog signal processing circuit adapted for use in an integrated circuit, said processing circuit comprising:

an analog signal multiplexing circuit including a plurality of input current paths, an output current path, a channel select circuit responsive to a first set of coded selection signals for selecting an input current path in accordance with the code of said first set of selection signals and for

coupling said selected input current path to said output current path to permit current therebetween, and first circuit means for maintaining the selected input current path at a first predetermined potential; and

a ranging circuit including an input and an output current path, said input current path of said ranging circuit being coupled to said output current path of said multiplexing circuit, a plurality of current splitters coupled in a cascaded chain having one end of said chain coupled to said input current path, each of said current splitters coupled



to one and another current paths, a range select circuit responsive to a second set of coded selection signals for splitting the current of the input current path between said one and another current paths of said current splitters in a proportion as governed by the code of said second set of selection signals, and means for providing current at the output current path representative of the current through the other current paths of said current splitter, whereby the current of the input current path is ranged at the output current path in accordance with the code of the second set of selection signals.

4,626,832

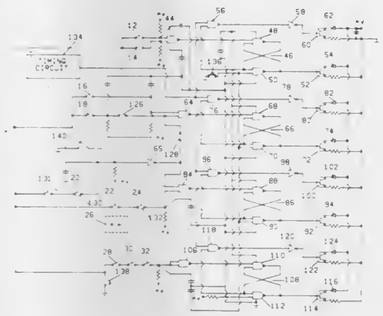
SOLAR SYSTEM FAULT DETECTION

Robert B. Farrington, Wheatridge, and James C. Pruett, Jr., Lakewood, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 14, 1984, Ser. No. 609,686

Int. Cl.[4] G08B *19/00*

U.S. Cl. 340—522 **31 Claims**



1. An apparatus for detecting predetermined faults in a variety of active, different solar systems, each of said different solar systems using a heat transfer fluid and having a tank for receiving fluid or a heat exchanger to transfer heat from the heat transfer fluid to a tank, and at least one collector and one pipe through which fluid flows, said different solar systems each having different predetermined operating conditions associated with a given type of fault, comprising:

a. a plurality of sensing means for sensing the presence of different predetermined operating conditions associated with each of the solar systems, each of said sensing means including a switch that changes in state in response to a change in a predetermined operating condition in at least one of said fluid, tank or heat exchanger, collector, and pipe;

b. means in communication with each of said sensing means for determining whether one or more predetermined faults have occurred in one of said solar systems, said means for determining including combining means, said combining means including logic gates at least one of which is actuated by logic gate actuating voltages via the associated states of at least two of said switches to produce an output signal indicative of whether a predetermined fault is present in the one solar system; and

c. indicating means responsive to said output signal for indicating the presence and identity of said one predetermined fault in said one solar system.

4,626,833

CIRCUIT ARRANGEMENT FOR CHECKING LIQUID FOOD FOR CONTAMINANTS

Robert Schlaich, Robert Bosch Str. 103, 7000 Stuttgart 1, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 678,058

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400129

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—540 **7 Claims**



1. A circuit arrangement for checking liquid food for contaminants which comprises

(a) a conductivity measuring probe (**1**) which is adapted to be placed in the liquid food to be checked,

(b) a transducer (**2**) which generates from the output signal from said measuring probe a voltage (V_T) which is a measure of the conductivity detected,

(c) a substraction stage (**3**) in which an individual reference voltage (V_{R0}) adapted to the type of food to be checked is subtracted from the transducer voltage (V_T) in such a way that the output signal (V_S) from the subtraction stage (**3**) has a constant value which is independent of the food batch,

(d) a measuring amplifier (**5**) which amplifies the output signal (V_S) from the subtraction stage (**3**) to an extent that is independent of the food batch,

(e) a first comparator (**8**) which compares the output signal (V_M) from the measuring amplifier (**5**) with a first comparison voltage ($+V_{R1}$) which represents an upper allowable conductivity nominal value (L_S) deviation which is independent of the food batch, said first comparator (**8**) triggering an alarm (**15**) if the first comparison voltage ($+V_{R1}$) is exceeded, and

(f) a second comparator (**9**) which compares the output signal (V_M) from the measuring amplifier (**5**) with a second comparison voltage ($-V_{R2}$) which represents a lower allowable conductivity nominal value (L_S) deviation which is independent of the food batch, the second comparator (**9**) triggering an alarm (**15**) if the second comparison voltage ($-V_{R2}$) is not attained.

4,626,834

GROUND CONTINUITY MONITOR FOR TOOL STOP CONTROLLERS

Roy E. Caruthers, Bay City, Tex., assignor to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Oct. 3, 1984, Ser. No. 657,333

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—649 **6 Claims**



1. A ground continuity monitor for a tool stop controller for tools subject to operator contact, for indicating proper ground continuity through a power line having hot, neutral, and ground leads without presenting excessive voltages to the tool and its ground lead when the ground path is open circuited, and for distinguishing between a proper low impedance path in the ground lead and a false high impedance path to ground through the body of an operator in contact with the tool, comprising:

(a) controllable shunt means connected for conduction between the power line hot and neutral leads,

(b) first and second resistive conductors connected in series between the power line hot and neutral leads, and connected at the junction therebetween to a control input of said controllable shunt means for controlling said shunt means,

(c) said first and second resistive conductors having predetermined values such that the voltage at said junction therebetween maintains said controllable shunt means in a first predetermined state of conduction when said junction is electrically connected through a low impedance to the power line ground, and a second predetermined state of conduction when said junction is not connected to the power line ground, said first and second resistive conductor predetermined values also being such that a sufficient current flows therethrough to support an operator safe voltage at said junction which maintains said controllable shunt means in said second state of conduction when said junction is electrically connected through a high impedance to ground, and

(d) indicator means for providing an indication of the state of conduction of said shunt means, for independently monitoring and providing a true indication of the electrical continuity of the ground path from the tool ground lead back to the power line ground, and for distinguishing between a proper low impedance ground path therethrough and a false, high impedance path such as through the body of an operator in contact with the tool, and

(e) a blocking diode connected in the line connecting the neutral lead to said controllable shunt means, a blocking diode connected in the line connecting the hot lead to said controllable shunt means, and a blocking diode connected in the line connecting the power line ground lead to said junction, for holding said controllable shunt means in said second state of conduction in response to miswiring of the power line leads, and, in the event that the equipment ground path is substantially open, imposing only a low voltage, high impedance signal on the tool, to protect the tool operator in case of contact therewith.

4,626,835

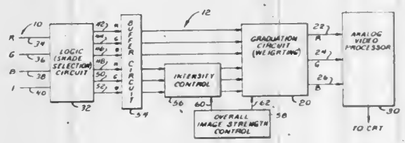
RGBI DIGITAL VIDEO CONTROL SYSTEM HAVING INTENSITY LEVEL CONTROL AND OVERALL IMAGE STRENGTH CONTROL

David K. Nienaber, Des Plaines, and Amir Sheikholeslami, Mt. Prospect, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 6, 1984, Ser. No. 668,768

Int. Cl.[4] G09G *1/28*

U.S. Cl. 340—703 **9 Claims**



8. An RGBI digital video control system for a color video monitor comprising:

variable intensity control means adapted to rereceive R',G' and B' signals to vary said R',G' and B' signals and to output said varied R',G' and B' signals;

graduation means adapted to receive R,G and B signals and said varied R',G' and B signals to combine said R,G and B signals with said R',G' and B' signals to generate RGB analog output signals; and

variable image strength control means coupled to said intensity control means to limit said R',G' and B' signals and coupled to said generation means to vary the level of said RGB analog output signals.

4,626,836

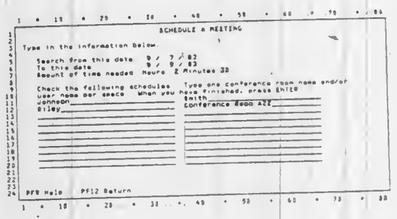
METHOD OF SCHEDULING MEETINGS

Donald E. Curtis, Garland; James P. Vincent, Arlington, and Mary E. Weidmann, Irving, all of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,609

Int. Cl.[4] G04S *47/00*

U.S. Cl. 340—706 **6 Claims**



1. A method of scheduling a meeting using attendee calendars stored in a computer system, said method comprising:

(a) presenting a scheduler with a prompting screen for keying in prospective attendees and desired date range and time span for a meeting;

(b) comparing in said computer system said date range and time span with said attendee calendars; and

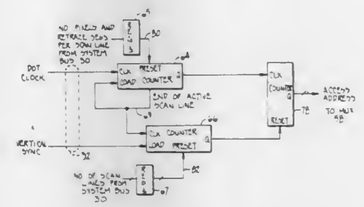
(c) presenting an option screen to said scheduler, displaying available times for selection of a meeting time.

4,626,837

DISPLAY INTERFACE APPARATUS

Ernest A. Priestly, Santa Clara, Calif., assignor to Wyse Technology, San Jose, Calif.

Filed Nov. 17, 1983, Ser. No. 552,755
Int. Cl.[4] G09G *1/06, 1/14*
U.S. Cl. 340—723 **2 Claims**



2. An apparatus for interfacing a first source of visual display data to a terminal, wherein the first source provides first visual display data, wherein the terminal includes visual display means for displaying second visual display data in synchronism with display control signals generated by the terminal and including a vertical sync signal, a horizontal sync signal, and a dot clock signal, and wherein the image of the visual display means is collectively formed from a selectable number of parallel scan lines each comprising a selectable number of pixels and retrace segments, said apparatus comprising:

generating means coupled to the terminal for generating access signals as a function of the display control signals, wherein the access signals include access addresses and access control signals, wherein said generating means includes counting means responsive to the dot clock signal and the vertical sync signal for maintaining a count that is incremented in accordance with the dot clock signal and is reset in accordance with the vertical sync signal, wherein said counting means includes a first counter clocked by the dot clock signal for providing a clocking output signal when the count reaches a selected number of dot clock pulses and for providing an end of scan line signal when the count reaches said selectable number of pixels and retrace segments, includes a second counter clocked by said end of scan line signal for counting said end of scan line signals and for providing a reset signal whenever the count of said second counter reaches said selectable number of parallel scan lines, and includes a third counter coupled to said first and second counters for maintaining a count that is incremented upon each clocking output signal from said first counter and is reset upon each reset signal from said second counter, and wherein the count of said third counter provides the access address;

storage means coupled to said generating means for storing the first visual display data from the first source and for supplying the first visual display data in accordance with the access signals and in synchronism with the display control signals, wherein said storage means is responsive to the access signals for supplying the first visual display data stored at the access address when the access control signals indicate that an access is permitted; and

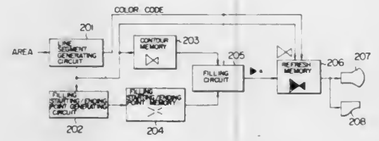
combining means coupled to said storage means and to the terminal for combining and displaying in synchronism on the visual display means the first and second visual display data.

4,626,838

FILLED SHAPED GENERATING APPARATUS

Shigeo Tsujioka, Higashiyamato; Seiichi Kanema, Tokyo; Eiji Okamura, Owariasahi; Kiyoshi Umezawa, Nagoya; Mitsuo Ooyama, Hachioji; Toshihisa Aoshima, Tokyo, and Mitsugu Yoneyama, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,444
Claims priority, application Japan, Oct. 18, 1982, 57-181311
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—744 **8 Claims**



1. An apparatus for generating a filled shape comprising:

(a) a refresh memory for storing a color code of each of dots constituting a two dimensional picture image;

(b) means for displaying the image by reading out the refresh memory sequentially by scanning said refresh memory in a first scanning direction;

(c) a line segment generating circuit for sequentially generating a coordinates position of each of dots on a closed contour of a shape to be displayed and a color code of the contour;

(d) a contour memory for storing first information at its memory locations corresponding to the dots on the contour of the shape;

(e) means for writing the contour color code in the refresh memory at its memory locations addressed by the dot coordinates positions generated by said line segment generating circuit;

(f) a filling starting/ending point memory for storing second information at its memory locations corresponding to dots being a starting point or ending point for filling in a second scanning direction;

(g) means for detecting the dots being the starting point or ending point for filling by the coordinates positions of the dots generated by said line segment generating circuit and writing the second information in the filling starting/ending point memory at the memory locations of the detected dots;

(h) means for sequentially reading out signals stored at memory locations of said filling starting/ending point memory corresponding to dots being starting or ending points, said dots arranged in the second scanning direction, and for generating a filling signal when a first one of said dots is read out and ending said filling signal when the next dot is readout, said filling signal being alternately generated and ended upon the reading of subsequent dots; and

(i) means for scanning the contour memory in synchronism with the scanning of the filling starting/ending point memory in said second scanning direction and selectively invalidating the filling signal so as to write a filling color code in the refresh memory only at its memory locations corresponding to said filling signal excepting said first information.

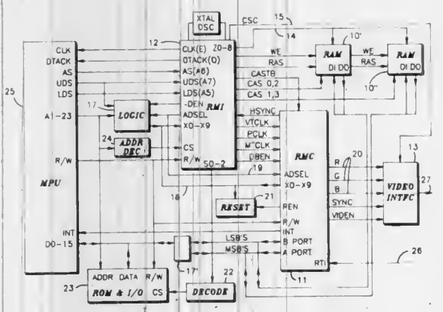
4,626,839

PROGRAMMABLE VIDEO DISPLAY GENERATOR

Patrick J. O'Malley, Chandler, Ariz., assignor to Motorola Inc., Schuamburg, Ill.

Filed Nov. 15, 1983, Ser. No. 551,812
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—750 **6 Claims**

1. A video control section and interface section for use in various video display systems having differing microprocessors and memories wherein the interface section comprises: clock circuitry for providing clocking signals for the video display system; memory timing circuitry receiving an input from the clock circuitry and providing memory control signals; control registers for receiving inputs from the microprocessor and the memory for providing a control input to the memory timing circuitry and to the clock circuitry; a microprocessor select circuitry, for providing an output indicating to which circuitry the microprocessor is sending commands, receiving inputs from the microprocessor and the clock circuitry; and a multiplexer for receiving addresses from the microprocessor and converting the addresses into row and column addresses; and wherein the control section comprises a data handler coupled to the microprocessor and the memory for latching and routing data within the video display system; a plurality of registers coupled to the data handler for temporarily storing data from the data handler; a decoder coupled to the plurality of registers for decoding character and attribute data; a character generator coupled to the decoder for storing character pattern information; a byte reducer coupled to the plurality of registers and receiving bytes of data and reducing the bytes to picture element size; logic circuitry, for implementing attributes to video to be displayed, coupled to receive inputs from the byte reducer, the decoder, and the character generator; a first shift register coupled to receive data from the logic circuitry for controllably shifting out data from any location within the first shift register to achieve scrolling of the video in one direction; object circuitry coupled to the data handler for receiving object data from said data handler to generate a display for the object; a second shift register coupled to the object circuitry and to the plurality of registers for shifting data out; a priority circuit coupled for receiving data from the second shift register and the first shift register to determine priority of the data from said first shift register and said second shift register on a picture element by picture element basis; a color mapping RAM coupled for receiving data from the priority circuit and the data handler and providing color data; a video out circuit for receiving said color data and for providing video color signals to a display unit; a display address generator receiving inputs from the decoder and the microprocessor and providing memory addresses; and a memory map and controller, for decoding addresses, coupled for receiving inputs from the microprocessor and the display address generator.

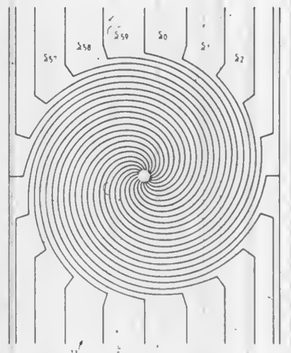


4,626,840

ELECTRONIC DISPLAY SUITABLE FOR POLAR COORDINATE REPRESENTATIONS

John L. Glasper, Ledbury, and Ian A. Shanks, Pavenham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 11, 1983, Ser. No. 540,999
Claims priority, application United Kingdom, Oct. 14, 1982, 8229450
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—752 **8 Claims**



1. An electronic display including:

an electrically responsive medium disposed between first and second substrates, each substrate bearing electrodes adjacent to the electrically responsive medium, and

means for energizing said electrodes to produce a response from the medium,

wherein the first substrate bears concentric non-intersecting spiral first electrodes each extending from a central region of the display and covering 360° of arc, each first electrode being connected to a respective connecting means arranged to relay address signals thereto without overlapping other first electrodes, and the second substrate bears a pattern of second electrodes arranged to cooperate with the first electrodes such that designation of any pair of first and second electrodes addresses a respective region of the electrically responsive medium lying between that pair of first and second electrodes.

4,626,841

METHOD OF DRIVING MATRIX DISPLAY DEVICE

Seigo Togashi, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

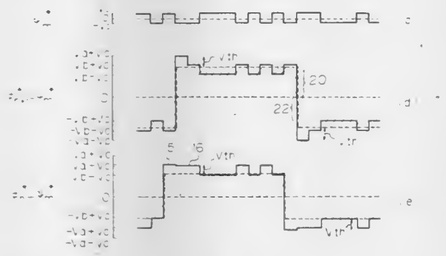
Filed Sep. 26, 1983, Ser. No. 536,106
Claims priority, application Japan, Sep. 27, 1982, 57-167943
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—805 **6 Claims**

1. A method of driving a matrix display device formed of a plurality of row electrodes, a plurality of column electrodes and a plurality of matrix elements disposed at intersections of said row electrodes and column electrodes, each of said matrix elements comprising an electro-optical display element and a non-linear resistance element connected in series between one of said row electrodes and one of said column electrodes, said non-linear resistance element having a threshold voltage above which a significant increase in the resistance thereof occurs, said method comprising:

applying row scanning signals successively to said row electrodes such that each of said row scanning signals is applied periodically to a corresponding one of said row electrodes during successive scanning frame intervals, while setting each of said row scanning signals to a first

potential during a selection interval of fixed duration occurring once during each of said frame intervals and setting each of said row scanning signals to a second potential during a non-selection interval which begins upon termination of each of said selection intervals and continues until the start of the succeeding one of said selection intervals, and setting the absolute value of said first potential to be higher than that of said second potential and setting the polarity of said second potential during each of said non-selection intervals to be identical to the polarity of said first potential during the immediately preceding selection interval; and

applying data signals which vary in potential over a fixed range to said column electrodes, said data signals repre-



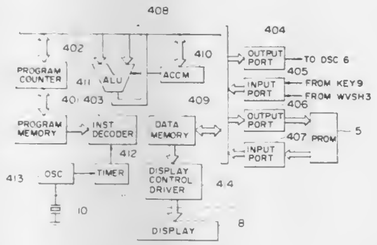
senting data values, while establishing a synchronized relationship between said row scanning signals and said data signals such that a drive potential corresponding to one of said data values is applied to each of said matrix elements during a corresponding one of said selection intervals, wherein the values of said first and second potentials of said row scanning signals and said fixed range of potential variation of said data signals are selected such that the absolute value of the difference between said drive potential established across a matrix element during each of said selection intervals and a potential established across said display element of that matrix element during the immediately preceding non-selection interval is always equal to or less than said threshold voltage of said non-linear resistance elements.

4,626,842

DISPLAY RADIO PAGING RECEIVER FOR VARIABLE LENGTH MESSAGES

Yoshio Ichikawa, and Takashi Ohyagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,587
Claims priority, application Japan, Aug. 27, 1982, 57-148985
Int. Cl.[4] H04Q *9/00*; G08B *5/22*
U.S. Cl. 340—825.44 **5 Claims**



1. A radio paging receiver adapted to receive a radio-frequency paging signal bearing a subscribers address word and a message comprising at least one message word of a predetermined number of digits, comprising:

display means having a first memory cell and an array of second memory cells, said second array being adapted to display at least one message word;

a memory having first and second groups of storage cells for storing the message therein, said first group storing one message word and said second group storing the remaining of said at least one message word;

a manually operated reset key; and

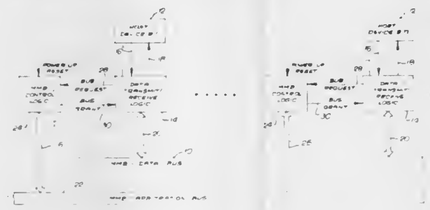
data processing means for detecting a match between a received address word and the subscriber's address word, and if a match occurs, detecting whether the total number of digits contained in said message is smaller or greater than the number of said second memory cells, storing the received at least one message word into said storage cells of said first group if said digit total is smaller than said number of cells, storing the received at least one message word into said storage cells of said first and second groups if said digit total is greater than said number of cells, generating a character corresponding to the degree of freshness of the received message, where said degree is based upon the chronological sequence in which the message was received, providing in response to the operation of said reset key a display of said character on said first memory cell and a display of the message word stored in the storage cells of said first group on said second memory cells, generating an indication of the presence of a message word to be subsequentially displayed if said digit total is greater than said number of cells, providing a display of a symbol on said first memory cell indicating that the message word being displayed is a continuation from the previously displayed message word and providing a display of the message words stored in the storage cells of the second group of said second memory cells if said digit total is greater than said number of cells, said display of message words, characters and indications being adapted for simultaneous display.

4,626,843

MULTI-MASTER COMMUNICATION BUS SYSTEM WITH PARALLEL BUS REQUEST ARBITRATION

Kenneth H. Szeto, Lawndale, and Frank A. Hill, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 27, 1983, Ser. No. 536,414
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.5 **17 Claims**



1. A multi-master communication bus system having a plurality of communication nodes, said system comprising:

a data bus for the transmission of information from node to node;

an arbitration bus for the transmission of synchronization signals and signals for the resolution of conflicts between multiple requests for bus access;

means located at each node for detection and generation of synchronization signals on said arbitration bus;

means located at each node for registering a unique node number associated with each node;

means located at each node and responsive to a locally generated request for bus access, for determining and asserting onto said arbitration bus a relative node priority;

means associated with said arbitration bus for generating a composite node number from all relative node priorities asserted onto said bus;

bus request resolution means located at each node for detecting the composite node number and determining therefrom whether the request for bus access is successful;

means located at each node for asserting onto said arbitration bus the number of the node that has been granted bus access;

means located at each node for registering the number of the last node to be granted bus access; and

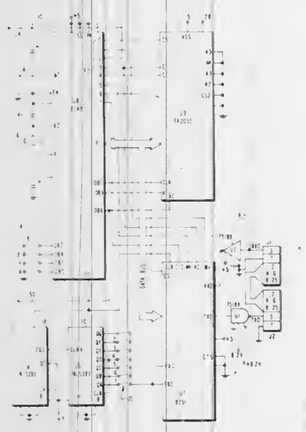
timing means located at each node, to regulate operations in relation to the synchronization signals.

4,626,844

ADDRESSABLE ELECTRONIC SWITCH

Bruce L. Mann, Flat Rock, and Steve A. Batti, Martinsville, both of Ind., assignors to Indiana Cash Drawer Company, Shelbyville, Ind.

Filed Nov. 23, 1983, Ser. No. 554,917
Int. Cl.[4] G06F *3/04*; G08B *13/06*
U.S. Cl. 340—825.31 **10 Claims**



1. An addressable electromechanical-device control switch with serial data input and output ports for series connection between a host computer and a separate peripheral device, comprising:

(a) a serial data input port for receiving a serial data stream from a sending device:

(b) a serial data output port for transmitting serial data out of said control switch to a separate peripheral device serially connected thereto;

(c) a semiconductor memory programmed with an individual access code:

(d) access code detection means for detecting an access code in a received data stream which matches said individual access code stored in said memory, said detection means being coupled to said data input port and data output port, said detection means including

(1) gating means for selectively sending data to said data output port, said gating means including means for suppressing an access code matching said stored access code; and

(2) means for generating an enable signal in response to detection of an access code matching said stored access code: and

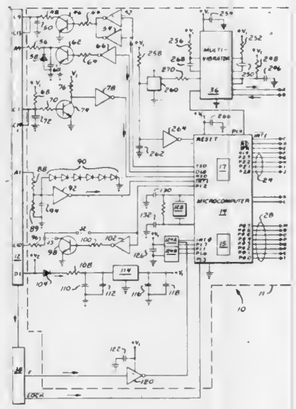
(e) means coupled to said detection means for switching an electromechanical load in response to an enable signal.

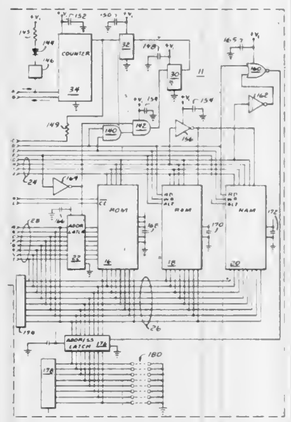
4,626,845

SUBSCRIBER VALIDATION SYSTEM

John F. Ley, Countryside, Ill., assignor to Epic Systems, Inc., Westchester, Ill.

Continuation of Ser. No. 470,498, Feb. 28, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,599
Int. Cl.[4] G08B *7/00*
U.S. Cl. 340—825.48 **5 Claims**
MICROFICHE APPENDIX INCLUDED
(25 Microfiche, 1 Pages)





1. In a restricted access trunked RF communication network including a central controller and a repeater module for exercising control over said network in re-transmitting a signal received from an authorized user transmitter wherein said received signal includes identifier tones for uniquely identifying a transmitter as a valid network user and wherein said identifier tones are at the beginning of said received signal, a system for validating network users comprising:

audio signal processor means coupled to the central controller and responsive to the identifier tones in the received signal for acquiring and locking onto the received signal, wherein said audio signal processor means provides a first output signal representing the period of a received identifier tone and a second output signal indicating that said audio signal processor means has received and locked onto a receiver identifier tone;

timing means coupled to said audio signal processor means and responsive to said second output signal for generating a timing signal of predetermined length in response to the receipt of said received signal;

measuring means coupled to said audio signal processor means and responsive to said first output signal for measuring the period of each of said identifier tones and providing a third output signal representing the period of each of said identifier tones;

processing means coupled to said timing means and to said measuring means and responsive to said timing signal and third output signal respectively output therefrom for averaging the measured periods of said identifier tones over the duration of said timing signal and generating an average period value for each of said identifier tones;

conversion means coupled to said processing means for converting the averge period values of a first measured period and a last measured period to a tone number representing a memory address and for providing said tone number to said processing means; and

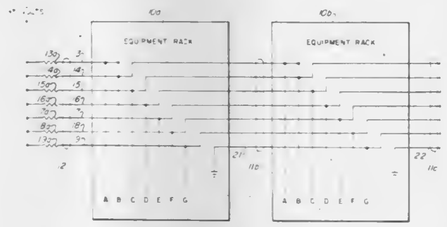
memory means coupled to said processing means for storing valid user information in a plurality of memory locations therein, wherein said processing means accesses a memory location in said memory means in naccordance with the tone number provided to said processing means by said conversion means and wherein said processing means enables said repeater module if said tone number corresponds with said valid user information and disables said repeater module if said tone number does not correspond with said valid user information.

4,626,846

BUS ARRANGEMENT FOR ADDRESSING EQUIPMENT UNITS AND A METHOD THEREFOR

Jay S. Parker, Ann Arbor, and Leo B. Koziol, Canton, both of Mich., assignors to Northern Telecom Limited, Montreal, Canada

Filed May 22, 1984, Ser. No. 613,062
Int. Cl.[4] H04Q *1/00, 3/00*
U.S. Cl. 340—825.52 **15 Claims**



1. A bus arrangement for interconnecting a plurality of equipment units in such a fashion that each unit is given a unique address, dependent solely upon its relative position to other equipment units in said interconnection, said bus arrangement in each unit comprising:

an entry port having N terminals, N being a positive integer equal to or greater than two;

an exit port having N terminals, wherein the 2nd to N^{th} terminals of said entry port are connected to the 1st to $(N-1)^{th}$ terminals, respectively, of said exit port, and an originating connection is made to the Nth terminal of said exit port so as to apply a signal having a fixed predetermined logical value to said N^{th} terminal of said exit port.

4,626,847

REMOTE CONTROL TRANSMITTER SYSTEM

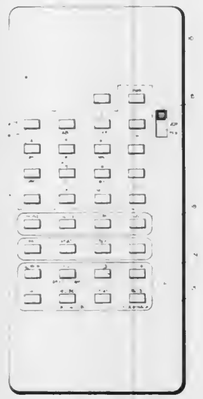
Thomas J. Zato, Palatine, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 27, 1983, Ser. No. 566,087
Int. Cl.[4] H04Q *1/00, 7/00;* **G08C** *19/00*
U.S. Cl. 340—825.56 **1 Claim**

1. A transmitter, including an integrated circuit, for transmitting coded digital control signals by operation of individual keys on a keyboard having an X-Y matrix of contacts scanned for closures by scan signals from the integrated circuit for supplying X-Y contact closure information to an integrated circuit code signal generator including a memory having different pages devoted to different devices comprising:

first membrane switch means connected to contacts in said X-Y matrix of contacts for conveying memory page selection information to said integrated circuit, said first membrane switch means each including one contact directly connected to said integrated circuit;

second membrane switch means underlying corresponding ones of said first membrane switch means and operated



therewith by corresponding key closures for providing functional information to said integrated circuit such that a single key closure results in both memory page and functional information being conveyed to said integrated circuit;

a multi-position device switch, having a switchable terminal which is coupled to said integrated circuit, for selecting among different memory pages in said memory; and

means for coupling the other of the contacts of certain of said first membrane switch means, corresponding to a select group of redefinable keys, to said switchable terminal of said multi-position switch.

4,626,848

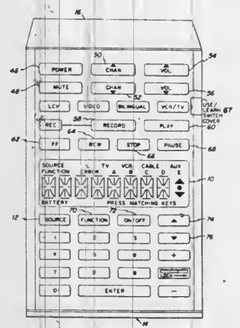
PROGRAMMABLE FUNCTIONS FOR RECONFIGURABLE REMOTE CONTROL

Raymond G. Ehlers, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed May 15, 1984, Ser. No. 610,549
Int. Cl.[4] G08C *19/00;* **H04B** *9/00*
U.S. Cl. 340—825.69 **6 Claims**

1. In a reconfigurable remote control transmitter for use with a plurality of remotely controlled products or appliances each of which is controllable with one or more signals transmitted from an associated remote control transmitter, said reconfigurable remote control transmitter emulating the remote control transmitters of said plurality of remotely controlled products or appliances and comprising receiver means operable in a learning mode for receiving signals transmitted from a remote control transmitter to be emulated, said signals being comprised of bursts of pulses separated by pauses, prompting means, microprocessor means connected to receive the output of said receiver means during said learning mode and coupled to said prompting means for prompting a user to initiate transmission of a signal from the remote control transmitter to be emulated and counting the number of pulses in each burst of pulses and the time duration of each pause of a transmission, said microprocessor means being programmed to

categorize the pulse bursts and pauses and generate a compressed code for each signal provided by the remote control transmitter to be emulated, memory means addressed by said microprocessor means for storing said compressed codes, and transmitter means controlled by said microprocessor means in an emulation mode for transmitting a coded signal for controlling a selected remotely controlled product or appliance, said microprocessor means being further programmed to recall from said memory means a desired compressed code, expand



said code and cause said transmitter means to transmit the coded signal in an emulation mode, the improvement comprising:

said prompting means includes display means controlled by said microprocessor means for identifying a selected source corresponding to one of said remotely controlled products or appliances; and

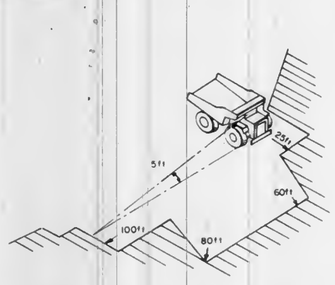
source means connected to said microprocessor means which when actuated causes said display means to successively identify a plurality of sources.

4,626,849

PROXIMITY DETECTION SYSTEM

John C. Sims, 54 Bowditch Rd., Sudbury, Mass. 01776

Continuation of Ser. No. 518,451, Jul. 29, 1983, abandoned. This application Jun. 25, 1985, Ser. No. 748,694
Int. Cl.[4] G08G *1/00*
U.S. Cl. 340—902 **7 Claims**



1. A detection system for use in a movable large haulage ground vehicle operating in a controlled ground environment to prevent damage to at least one other object, said system comprising

means mounted on said at least one other object present in said environment for omnidirectionally radiating an optical pulsed signal having a selected pulse repetition rate which lies within a frequency range from about 500 Hz to about 3 KHz, the selected pulse repetition rate being used to identify the type of said other object;

optically responsive detection means having a selected field of view mounted at one or more selected locations on said movable vehicle and responsive to said radiated optical pulsed signal when said other object is in the proximity of said movable vehicle within the field of view of said one or more detection means for detecting the presence of said radiated optical pulsed signal so as to provide one or more detected signals; and

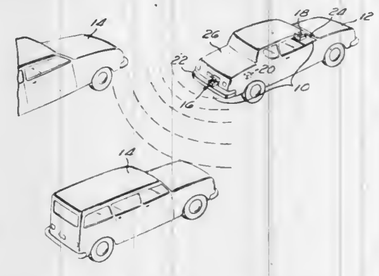
means responsive to said one or more detected signals for providing an indication to a driver of said movable large haulage vehicle as to the presence of said object in the proximity of the vehicle, as to the general direction of the location of said object relative to the movable vehicle, and as to the type of said object.

4,626,850

VEHICLE DETECTION AND COLLISION AVOIDANCE APPARATUS

Young H. Chey, Irvine, Calif., assignor to David Chey, Irvine, Calif., a part interest

Filed May 16, 1983, Ser. No. 494,948
Int. Cl.[4] G08G *1/16, 1/00*
U.S. Cl. 340—903 **2 Claims**



1. A vehicle collision avoidance and detection apparatus comprising:

a single transmitter/receiver transducer mounted within the trunk of a vehicle for acoustically detecting an object relative said vehicle and generating a first electrical signal;

means for positioning said single transmitter/receiver transducer in multiple azimuth directional positions;

an angle encoder for generating a second electrical signal at each of said multiple azimuth directional positions;

means for processing said first and second electrical signals to determine the distance and direction of said detected object from said vehicle in said multiple azimuth directional positions;

means for displaying the determined distance and direction of said detected object in said multiple azimuth directional positions, said positioning means comprising means for sequentially positioning said single transmitter/receiver transducer in a left, center and right azimuth directional position relative said vehicle and means for selectively positioning said single transmitter/receiver transducer in a left, center and right azimuth directional position relative said vehicle;

means for switching between said sequentially positioning means and said selectively positioning means;

said displaying means comprising a numeric display adapted to visually display the determined distance of said detected object and a first, second and third light source, each adapted to illuminate in response to said single transmitter/receiver transducer being disposed in the left, center and right azimuth directional positions, respectively; and

an elongate aperture formed in a portion of the trunk of a vehicle;

a cover plate sized to selectively cover and uncover said elongate aperture formed in the portion of the trunk of the vehicle; and

means for positioning said single transmitter/receiver trans-

ducer within the trunk of the vehicle in registered alignment with said elongate aperture.

4,626,851

AIRCRAFT DISPLAY DEVICES

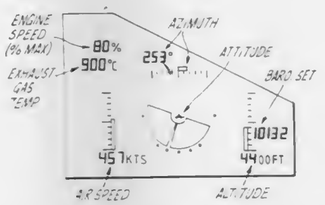
Michael J. Tooze, Kent, England, assignor to GEC Avionics Limited, England

Filed Nov. 7, 1984, Ser. No. 669,318

Claims priority, application United Kingdom, Nov. 9, 1983, 8329887

Int. Cl.[4] G01C *21/00, 23/00*

U.S. Cl. 340—975 **8 Claims**



1. A display device for an aircraft comprising: a circular array of radially extending selectively activatable display elements, the radially inner ends of which elements define a central space; within the said central space, a symbol fixed with respect to the aircraft in use; and means for selectively activating said display elements in accordance with aircraft attitude whereby the selected display elements form a visible pattern whose geometrical relationship with respect to said symbol is indicative of the aircraft attitude; and wherein said means for selectively activating said display elements activates a group of said elements which together form a sector of said circular array whose angular position in the array relative to said symbol is indicative of the roll angle of the aircraft; and said sector becomes progressively a larger angle sector as the aircraft pitch angle increases from zero in one direction and a smaller angle sector as the aircraft pitch angle increases from zero in the opposite direction.

4,626,852

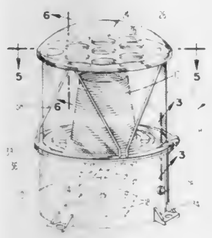
BUOY LANTERN SYSTEM

Robert J. Dodge, Houston, Tex., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 1, 1984, Ser. No. 576,062

Int. Cl.[4] G08G *3/00*

U.S. Cl. 340—985 **1 Claim**



1. Integrated and unitary lantern apparatus for mounting on a marine buoy and readily removable therefrom as a unit, said apparatus comprising, in combination,

a lantern housing at a lower portion of said lantern apparatus.

components including a clear lens cover, a solar panel, and a clear dome, each of said components disposed above said housing in sequential order abovementioned and supported by said component immediately therebelow,

a gimbal having an outer frame, and an inner frame supported therein by first pivot shafts communicating therebetween, said outer frame pivotally mounted to and supported by support means secured diametrically to said housing, said outer frame pivotally mounted to said support means on second pivot shafts,

damping means associated with one each of said first and second pivot shafts,

said inner frame and said outer frame pivotable substantially independently to each other and sustained tilting of said buoy, said outer frame pivotable in a direction normal to the direction of pivot of said inner frame,

drum lens mounted on said inner frame thereabove,

means for supplying light to said lens for transmission thereby,

a bank of batteries suspended from said inner frame for providing a righting moment to said gimbal when said buoy is tilted or inclined for a sustained period by currents and/or wind, said lantern being devoid of counterweight means, said batteries providing electric power to said means for supplying light,

transparent shielding means for protecting said lens and gimbal from a marine environment,

said solar panel providing power to recharge said batteries, said solar panel having a circular tray for receiving said lens cover for support thereon, said tray containing solar cells for receiving radiation from the sun,

said lens cover having a plurality of vent holes adjacent an upper portion thereof to permit escape of hydrogen gas therethrough when said batteries are charged by power generated by said solar cells of said solar panel,

said support means for supporting said gimbal outer frame to said housing comprising support members mounted therebetween carrying a pair of mating annuli thereon hingedly separable from each other by hinge means articulating therebetween, said lens cover supported on upper of said mating annuli and pivotable on said hinge means to provide ready access to interior of said lantern apparatus while permitting said drum lens supported on said inner gimbal frame thereabove and said batteries suspended from said inner gimbal frame therebelow to remain substantially vertically disposed independently of such pivoting on said hinge means,

said batteries suspended from said inner frame of said gimbal providing vertically to said lantern apparatus when said marine buoy is heeling up to above 11° from vertical due to wind and/or current, and

bolt-down means articulating between said lantern housing and marine buoy permitting said lantern apparatus to be readily removed therefrom.

4,626,853

PULSE COMPRESSION RADAR SIGNAL PROCESSOR

Henry E. Lee, Columbia, and Michael B. Seldes, Rockville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,979

Int. Cl.[4] G01S *7/28, 13/28*

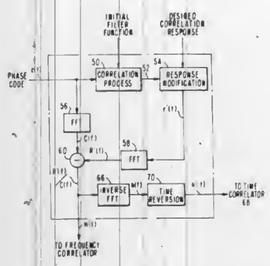
U.S. Cl. 342—132 **10 Claims**

1. In a phase-coded, pulse compression radar including first means for transmitting phase-coded RF pulses, and second means for receiving and conditioning the phase-coded radar return pulses rendered from said transmission, a pulse compression signal processor for decoding said phase-coded radar return pulses from said second means to enhance the resolvability of objects in range, said pulse compression signal processor comprising:

first filter means responsive to a first signal representative of the phase-code of said transmittal RF pulse to effect a second signal representative of the range correlation response of said first signal;

means for modifying said second signal into a third signal representative of a desired range correlation response;

means governed by said first signal and said third signal to generate a fourth signal representative of a desired filter function; and



second filter means for phase decoding said phase-coded radar return pulse from said second means as a function of said fourth signal to effect substantially said desired range correlation response thereof.

4,626,854

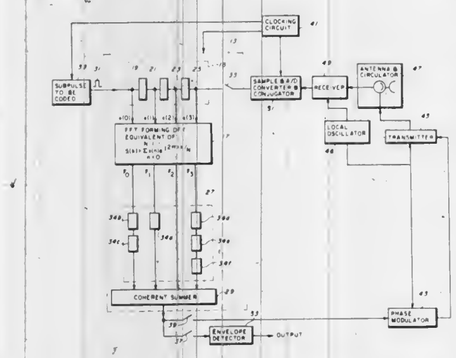
METHOD AND APPARATUS FOR GENERATING A MODIFIED P_1 CODE

Frank F. Kretschmer, Jr., Laurel, and Bernard L. Lewis, Fort Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1983, Ser. No. 532,114

Int. Cl.[4] G01S *13/28*

U.S. Cl. 342—196 **9 Claims**



1. An efficient, pre-compression, bandwidth-tolerant, digital pulse expander-compressor comprising:

transform means having N output terminals and responsive to an applied subpulse for successively generating N replicas x(n) of the subpulse, where n=0, 1, 2, . . . , N−1, and for weighting the replicas x(n) in accordance with the formula

$$F_k = \sum_{n=0}^{N-1} x(e)\exp[-j2\pi nk/N].$$

where k=0, 1, 2, . . . , N−1, to provide N weighted subpulses F_k, each at a respective one of the N output teminals, whenever one of the N replicas x(n) is generated; and

delay-summation means connected to the transform means for delaying each of the N weighted subpulses F_k corresponding to any replica of the applied subpulse by a time which is nN the length of the applied subpulse where k and n are interrelated by the formulae

$$k = \frac{N}{2} - n. \text{ for } n = 0, 1, \ldots \frac{N}{2}, \text{ and } k = \frac{3N}{2} - n,$$

$$\text{for } n = \frac{N}{2} + 1, \frac{N}{2} + 2 \ldots N - 1,$$

and for separately summing the real and imaginary parts of the delayed subpulses.

4,626,855

RADAR, SONAR AND SIMILAR SYSTEMS

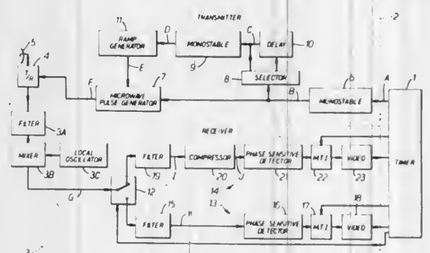
David G. Rouse, Halstead, England, assignor to The Marconi Company Limited, Chelmsford, England

Continuation of Ser. No. 305,344, Sep. 24, 1981. This application Oct. 25, 1984, Ser. No. 664,935

Claims priority, application United Kingdom, Sep. 27, 1980, 8031288; Jul. 23, 1981, 8122718

Int. Cl.[4] G01S *13/28, 13/66*

U.S. Cl. 342—201 **22 Claims**



1. A pulse radar system comprising:

a transmitter including:

means for transmitting a train of pulses which are timed to form groups of pulses, each group containing long and short pulses;

means for modulating at least the last pulse of one group and the first pulse of the next group, the modulation being of the type that will permit pulse compression upon reception of each modulated pulse; and

a receiver for receiving the transmitted pulses after reflection from a target, said receiver including: means for compressing the received modulated pulses; first means for distinguishing between pulses received from long and short ranges; second means for distinguishing between said long and short pulses; and third means responsive to said first and second means for using said long pulses when received from said long ranges and said short pulses when received from said short ranges to distinguish between targets in long and short ranges, respectively.

4,626,856

RADAR SIGNAL CORRECTION SYSTEM

Willis A. Pierson, Weatherford; James D. Hill, Dallas, and Vedon W. Otto, Burleson, all of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Oct. 14, 1983, Ser. No. 542,115

Int. Cl.[4] G01S *7/40*

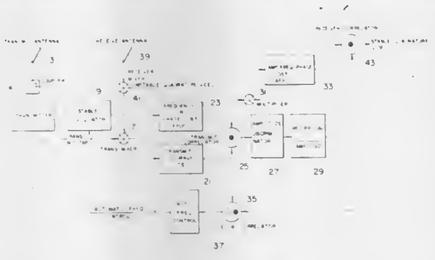
U.S. Cl. 342—174 **8 Claims**

3. A method of conditioning radio frequency pulses received by a radar antenna, reflected from transmit pulses generated by a radar transmitter, to account for vagaries in the transmit pulse, comprising in combination:

providing a variable frequency stable signal close to a transmit frequency of the transmit pulse;

determining the difference in phase and frequency between

the stable signal and the transmit frequency, and providing an in phase real output and a 90 degree out of phase imaginary output containing the phase and frequency difference and the amplitude of the transmit pulse;
converting the real and imaginary outputs to digital data;
storing the digital data representing the real and imaginary outputs; also
storing the digital data representing the real and imaginary outputs in a time reverse order; then
multiplying the digital data representing the real and imaginary outputs times the digital data stored in time reverse order on a point by point basis to define a number of products, and accumulating the products to define an amplitude variable;
taking the reciprocal of the amplitude variable;
multiplying the reciprocal of the amplitude variable times the data stored in time reverse order to provide an amplitude, frequency and phase operator coefficient; then
multiplying on a point for point basis the data representing the real and imaginary outputs times the data representing the amplitude, frequency, and phase operator coefficient



to define a number of products, and separately accumulating the first half of these products and the second half of these products, then subtracting the accumulation of the one half from the accumulation of the other half to produce a frequency error variable;
averaging the frequency error variable over a number of prior transmit pulses and tuning the stable signal toward zero frequency difference with the average determined;
determining the phase difference between the stable signal and reflections arriving at the receiver antenna, and providing an in phase real receiver output and a 90 degree out of phase imaginary receiver output;
converting the receiver outputs to digital data representing the difference in phase and frequency between the stable signal and the received reflection, and the amplitude of the received reflection; and
multiplying on a point by point basis the amplitude, frequency, phase operator coefficient times an equal number of sequential points from the real and imaginary receiver digital outputs, and accumulating the products for processing by a radar processor.

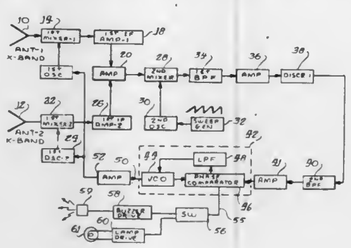
4,626,857

DUAL FREQUENCY BAND RADAR DETECTOR

Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,587
Int. Cl.[4] H04B *17/00, 1/26;* **G01S** *7/40*
U.S. Cl. 342—20 **18 Claims**

1. Apparatus for detecting the presence of radar signals occurring within either of a first or a second range of frequencies comprising: antenna means for receiving radar signals including radar signals occurring within said first and second range of frequencies; signal generating means for producing at least one pilot signal at a predetermined non-varying audio frequency; means for frequency modulating said received radar signals with said at least one pilot signal; means for isolating ones of the modulated signals produced in response to received signals in said first range of frequencies or in said second range of frequencies; frequency demodulating means coupled with said isolating means for detecting said at least one pilot signal; and control means responsive to said detected pilot signal for producing a control output signal; whereby the presence of said control output signal indicates the reception of said radar signals occurring within at least one of said first and second range of frequencies; wherein said control means com-



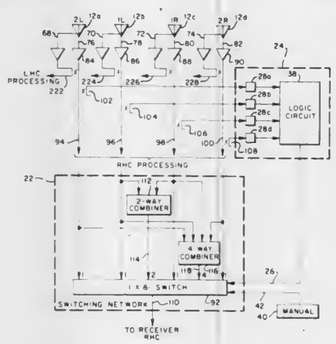
prises: band-pass filter means coupled to said demodulating for passing signals in a predetermined frequency band including the predetermined frequency of said at least one pilot signal; and phase comparator means coupled to said band-pass filter means and to said pilot signal producing means for producing said control output signal when the detected pilot signal is substantially the same frequency as and substantially in phase with at least one produced pilot signal.

4,626,858

ANTENNA SYSTEM

William O. Copeland, Huntsville, Ala., assignor to Kentron International, Inc., Huntsville, Ala.

Filed Apr. 1, 1983, Ser. No. 481,361
Int. Cl.[4] H01Q *3/02, 3/12*
U.S. Cl. 342—374 **39 Claims**



1. A system for receiving signals from spatial objects comprising:
a. an array fed aperture antenna for producing multiple beam patterns covering a predetermined spatial volume,
b. a corresponding feed port for each beam pattern coupled to said array for producing an output when a signal is generated by an object within a corresponding beam pattern,
c. a receiver for receiving said antenna array feed port outputs, and
d. means coupled between said antenna array feed ports and said receiver for simultaneously monitoring all feed port outputs and automatically coupled only the output of the feed port producing the greatest power to said receiver whereby automatic and continuous reception of signals

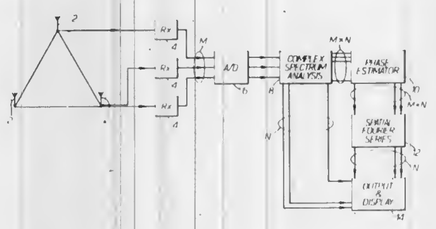
from an object within said multiple beam pattern is accomplished.

4,626,859

DIRECTION FINDING SYSTEMS

Edward V. Stansfield, Reading, England, assignor to Racal Research Limited, Berkshire, England

Filed Sep. 28, 1984, Ser. No. 655,637
Claims priority, application United Kingdom, Oct. 7, 1983, 8326912
Int. Cl.[4] G01S *5/04*
U.S. Cl. 342—442 **5 Claims**



1. A direction finding system responsive to a band of frequencies including
at least three antennas disposed so as to define an array of antennas equally spaced about the periphery of a circle having a diameter less than a proportion of half the wavelength of the highest frequency of said band,
a respective wideband receiver connected to each said antenna and adapted to produce a digital output representative of the signal received by said antenna,
means for deriving from said digital output a signal in digital form representing the spectrum of said received signal,
means for deriving from said signal spectrum of each said received signal the phase ($\phi(m,\omega)$) of any signal received by the antennas at each of a plurality of sample frequencies (ω) relative to a virtual reference, and
means for calculating for each said sample frequency (ω) a spatial Fourier series ($\rho(\omega)$) of said phases, where

$$\rho(\omega) = \sum_{m=0}^{M-1} \phi(m,\omega)\exp(j2\pi m/M)$$

in which M is the number of antennas in said array, and m is an index which takes the values 0 to M-1 to represent each said antenna in turn, and deriving from said spatial Fourier series the bearing of any source transmitting at each said sample frequency.

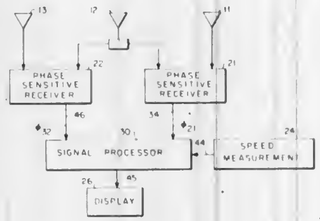
4,626,860

PASSIVE SYNTHETIC APERTURE SYSTEM FOR IMAGING A SOURCE OF ELECTROMAGNETIC RADIATION

Gus P. Tricoles, San Diego, and Eugene L. Rope, El Cajon, both of Calif., assignors to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Continuation-in-part of Ser. No. 171,979, Jul. 24, 1980, Pat. No. 4,422,076. This application Jun. 10, 1983, Ser. No. 503,175
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.
Int. Cl.[4] G01S *3/48, 13/90*
U.S. Cl. 342—442 **10 Claims**

1. A vehicle-mounted system for locating a source of electromagnetic radiation having a given wavelength, comprising first and second receiving antennas mounted to a vehicle and spaced apart from each other by a predetermined distance in the principal direction of motion associated with said vehicle for respectively providing first and second received signals in response to a wavefront of electromagnetic radiation having said given wavelength received by the first and second antennas;
a first phase sensitive receiver coupled to the first and second antennas for responding to the first and second received signals by providing a first phase difference signal that indicates a phase difference ϕ_{21} between the wavefronts of the radiation of the given wavelength received by the respective first and second antennas when said received radiation is radiated spherically from said source, whereby the value of the first phase difference signal varies as the vehicle moves in a straight line;



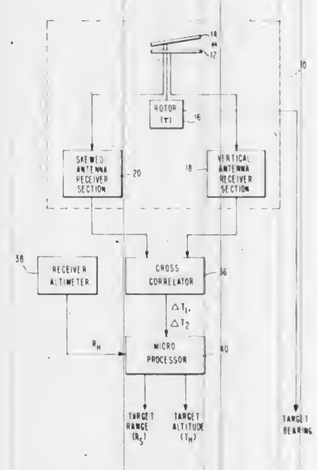
means operable when said vehicle is moving for measuring the speed of said vehicle; and
a signal processor for processing the values of the first phase difference signal provided as the vehicle moves in a straight line past its point of closest approach to said radiation source in combination with said vehicle speed measurement to provide imaging signals for visible display of an image of said source in relation to the location of said vehicle.

4,626,861

TWO ANGLE RANGE AND ALTITUDE MEASUREMENT SYSTEM AND METHODS

Edward R. Wiley, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1984, Ser. No. 655,705
Int. Cl.[4] G01S *3/02, 5/02*
U.S. Cl. 342—458 **10 Claims**



1. A system for detecting the range and elevation of a target comprising:
a. an antenna system having first and second planes of receipt which are inclined a fixed angle (θ) from one another, said antenna system being located along the line of

intersection of said planes and said antenna system including means for sweeping said line of interesection at a known rate of sweep (τ);

b. means for measuring the delay (T_1) between receipt of signals in said first and then in said second planes which are emitted from a target and received directly by said antenna system;

c. means for measuring the delay (T_2) between receipt of signals in said first and then in said second planes which are emitted by said target and received by said antenna system after being reflected from a remote surface;

d. means for measuring the height (R_H) of said receiver; and

e. means for calculating the range and/or elevation of said target in response to θ, τ, T_1, T_2 and R_H.

4,626,862

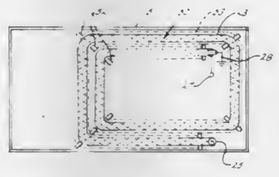
ANTENNA HAVING COAXIAL DRIVEN ELEMENT WITH GROUNDED CENTER CONDUCTOR

John Ma, 499 Dundee Ave., Milpitas, Calif. 95035

Filed Aug. 8, 1984, Ser. No. 639,667

Int. Cl.[4] H01Q *1/24*

U.S. Cl. 343—702 **5 Claims**



1. An antenna for conversion of electromagnetic radiation having a predefined wavelength, said antenna including a segment of coaxial cable, said segment of coaxial cable having a total length of approximately one quarter of a wavelength, said segment of coaxial cable being coiled to form a coil having at least one complete turn, said coaxial cable having outer and inner conductors being electrically connected together at a first end of the segment of coaxial cable, and having a signal connection to the outer conductor at a second end of the segment of coaxial cable, and the inner conductor being approximately at signal ground at the second end, so that the outside portion of said outer conductor in cooperation with the signal ground provides conversion between said electromagnetic radiation and an electrical signal at said signal connection, and said inner conductor in cooperation with said dielectric and the inner portion of said outer conductor provides a high quality matching impedance in parallel connection with said signal connection and said signal ground.

4,626,863

LOW SIDE LOBE GREGORIAN ANTENNA

Charles M. Knop, Lockport; Edward L. Ostertag, New Lenox, and Yuk-Bun Cheng, Lockport, all of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Sep. 12, 1983, Ser. No. 531,069

Int. Cl.[4] H01Q *19/19*

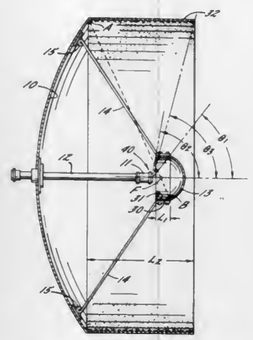
U.S. Cl. 343—781 P **5 Claims**

1. A microwave antenna comprising the combination of:

a paraboloidal main reflector having an axis and a focal point F;

a subreflector forming a surface of revolution about the axis of said main reflector and having a focal point between said main reflector and said subreflector and substantially coincident with the focal point of said main reflector; a feed horn extending along the axis of said main reflector for transmitting microwave radiation to, and receiving microwave radiation from, said subreflector along a feed horn beam; and

a first shield extending from the periphery of said subreflector toward said main reflector, parallel to the axis of the main reflector, for reducing side lobe levels, said first shield terminating outside of the beam passing between the subreflector and the main reflector, a second shield



extending from the periphery of said main reflector and parallel to the axis of the main reflector, said first shield intercepting that portion of the feed horn beam which is not intercepted by either said subreflector or said second shield.

4,626,864

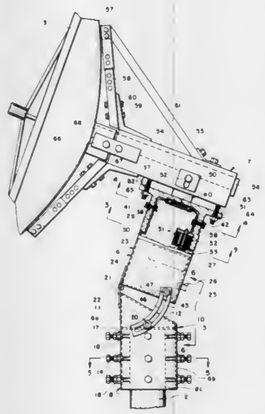
MOTORIZED ANTENNA MOUNT FOR SATELLITE DISH

Ian W. Micklethwaite, Terra Cotta, Canada, assignor to Polarmax Corporation, Akron, Ohio

Filed Mar. 12, 1984, Ser. No. 588,669

Int. Cl.[4] H01Q *3/04*

U.S. Cl. 343—766 **8 Claims**



1. An improved antenna mount for mounting a satellite dish on a vertical support pole, said mount including:

a base adapted to be mounted on an upper end of the support pole;

a plurality of bolts adjustably mounted on the base for engagement with the pole about the periphery thereof;

arm means for supporting a satellite dish;

motorized control means mounted on the base for rotating the arm means and supported satellite dish; including a housing containing an electric motor and a turret mount, a turret rotatably mounted on the turret mount and driven by the motor, and arm mounting means comprising a pivot bracket pivotally mounting the arm means on the turret and declination angle control bolts interposed between said arm means and said pivot bracket for maintaining the arm means in a pivotally adjusted position; and

wherein said motor housing is pivotally mounted on the top of said base by a hinge and a pair of slotted adjustment arms adapted to be fixedly secured at one end to said base, and at another end to said motor housing, enabling the motor housing to be pivoted to a desired satellite tracking position.

4,626,865

ANTENNA ELEMENT FOR ORTHOGONALLY-POLARIZED HIGH FREQUENCY SIGNALS

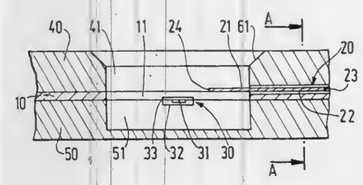
Emmanuel Rammos, Creteil, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,263

Claims priority, application France, Nov. 8, 1982, 82 18700; Apr. 29, 1983, 83 07109

Int. Cl.[4] H01Q *13/02*

U.S. Cl. 343—786 **6 Claims**



1. A high-frequency antenna comprising a first dielectric layer having a hole extending therethrough defining a first cavity, second and third dielectric layers on opposite sides of said first layer, said second layer having a hole therethrough aligned with said first cavity and defining a second cavity, said third layer having a planar closed bottom recess facing and aligned with said first cavity and defining a third cavity, the sides of said holes and recess and the bottom of said recess having a conductive coating, a first groove between said first and second layers extending to said cavities, a second groove between said first and third layers extending to said cavities in a direction perpendicular to said first groove, and first and second conductors disposed in said first and second grooves, respectively, extending different distances into said cavities, and defining first and second transmission lines with said first and second grooves, respectively, portions of the conductors extending into the cavities comprising probes for the reception or radiation of high-frequency signals.

4,626,866

COLLAPSIBLE FOLDABLE AERIAL

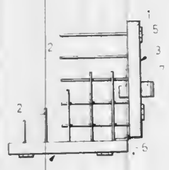
Torsten G. Lindberg, öckerö , Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 10, 1985, Ser. No. 733,143

Claims priority, application Sweden, May 30, 1984, 8402951

Int. Cl.[4] H01Q *1/08*

U.S. Cl. 343—880 **5 Claims**



1. A collapsible aerial including a bar-like base structure with rigidly attached aerial rods, said base structure including a plurality of bars arranged in plural pairs side by side, the bars in each pair being connected to each other by a longitudinal hinge having a longitudinal pivotal axis, the bars associated with adjacent pairs being connected to each other by transverse hinges at adjoining ends of the bars, the longitudinal pivotal axes of the longitudinal hinges in an operational position of the aerial being coincident and the transverse hinges between the bars of adjacent bar pairs being on opposite sides of the base structure so that the bars with said associated aerial rods may be pivoted about said longitudinal hinges from the operational position to a partially collapsed position in which said aerial rods are on one side of the base structure and the rod pairs with said associated aerial rods can be pivoted about the transverse pivotal axes of the transverse hinges into an entirely collapsed position.

4,626,867

METHOD OF PREVENTING UNREGISTERED PRINTING IN MULTI-NOZZLE INK JET PRINTING

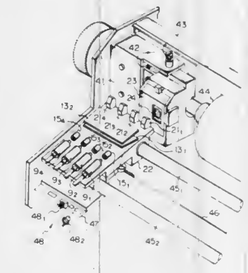
Tatsuya Furukawa, Yokohama, and Masanori Horike, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,059

Claims priority, application Japan, Oct. 22, 1983, 58-197911

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **8 Claims**



1. A method of preventing unregistered printing from occurring in an intended direction of movement of a carriage in multi-nozzle ink jet printing which uses a plurality of ink ejection nozzles arranged on the carriage with ejection positions thereof shifted from each other in the direction of carriage movement so as to print out information on a paper with ink issuing from the nozzles, said method comprising the steps of:

(a) detecting with a detecting element arrival of ink drops ejected from the respective nozzles while driving the carriage at a predetermined constant velocity, the detection being accomplished when there is a relative movement between said nozzle and said detection element;

(b) computing a difference between timings of the arrival of the ink drops from the respective nozzles; and

(c) setting timings at which printing with the ink from the respective nozzles is to be started in response to the computed difference.

4,626,868

METHOD AND APPARATUS FOR NON-IMPACT PRINTING

Irving R. Tsai, 435 E. 70th St., Apt. 16-K, New York, N.Y. 10021

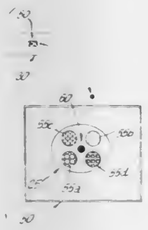
Filed Feb. 11, 1985, Ser. No. 700,127

Int. Cl.[4] G01D *15/14*; G03B *27/32*; G03G *13/01*

U.S. Cl. 346—1.1 **20 Claims**

1. Apparatus for non-impact printing on an untreated substrate containing a plurality of pixels of a toner mixture comprising:

(a) first means for providing electrical signals representative of the image to be printed;
(b) at least one controllable source of an agent having at least one preselected characteristic;
(c) a multi-component mixture of toner particles, each component toner particles in the mixture having a tendency to impart its printing feature in response to exposure only to an agent having a particular preselected characteristic different from the preselected characteristic of each other component toner particle, the mixture also including neutral particles that serve other than to impart a printing feature;



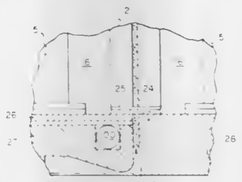
(d) a substrate having a substantially continuous surface, all portions of any given region of which are simultaneously visible to the controllable source;
(e) the mixture being substantially uniformly applied over the substrate so that each pixel on the substrate contains at least one particle of each toner component and at least one neutral particle;
(f) means associated with the first means and the controllable source means for directing an agent having the preselected characteristic from the controllable source to selected pixels on the substrate corresponding to the image to be printed.

4,626,869

INK JET WET-STORAGE SYSTEM

Michael J. Piatt, Enon, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,551
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **22 Claims**



1. In continuous ink jet printing apparatus of the type having a print head with an ink cavity, a multi-orifice plate in fluid communication with said cavity, means for supplying ink to said cavity to produce streams of ink droplets from said orifice plate and a charge plate including an array of charge electrodes located along one side of the nominal path of such droplet streams respectively adjacent individual ones of such droplet streams, the improvement comprising:
(a) wall means, located on the opposite side of said nominal path from said charge plate, for forming, with said orifice and charge plates, a capillary region that is contiguous the operative surfaces of said orifice and charge plates wherein ink liquid is supportable against gravitational force by capillary forces; and
(b) means for sealing said region from the surrounding atmosphere.

4,626,870

DUAL DENSITY TWO-SIDED THERMAL HEAD

Yoichi Yamamoto, Nara, and Yuichirou Mori, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 6, 1984, Ser. No. 638,065
Claims priority, application Japan, Aug. 25, 1983, 58-156722; Aug. 25, 1983, 58-156723
Int. Cl.[4] G01D *15/10;* **H05B** *1/02;* **B41J** *3/20;* **H01S** *4/00*
U.S. Cl. 346—76 PH **5 Claims**





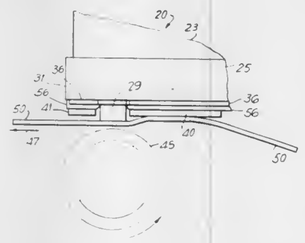
1. A thermal head for a recording apparatus comprising:
a substrate having first and second sides;
a first vertical thermal resistor line formed on said first side of said substrate, said first thermal resistor line including a plurality of thermal resistors vertically aligned in a first density;
a second vertical thermal resistor line formed on said second side of said substrate, said second thermal resistor line including a plurality of thermal resistors vertically aligned in a second density different from that of said first density of said first thermal resistor line; and
wiring means for said first and said second vertical thermal resistor lines;
said substrate being folded between said first and second sides to form a dihedral angle.

4,626,871

THERMAL PRINT HEAD WEAR BAR

Richard C. Schuessler, Levittown, Pa., assignor to Gulton Industries, Inc., East Greenwich, R.I.

Filed Feb. 8, 1985, Ser. No. 699,901
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**



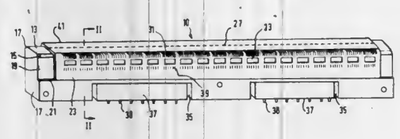
1. A thermal print head for use in thermal printing apparatus, said print head comprising:
a substrate;
a pattern of conductive lines on said substrate;
a resistive member overlying a portion of said lines, said lines adapted to generate discrete heated spots on said resistive member in response to excitation of said conductive lines; and
a screen-printed protective coating over a portion of said pattern and adapted to reduce the abrasive effect of grit particles carried on a medium to be printed which is passed over said protective coating and resistive member, said coating comprising a layer of dried and fired material formed of a ceramic/glass overglaze composition mixed with fine metallic oxide particles, wherein said particles comprise zirconium oxide, said zirconium oxide constituting approximately 5 to 15 percent, by weight, of said overglaze composition/particle mixture.

4,626,872

THERMAL PRINT HEAD

Shozo Takeno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1985, Ser. No. 770,562
Claims priority, application Japan, Oct. 5, 1984, 59-208087
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **11 Claims**



1. A thermal print head comprising:
a heat sink substrate having a flat surface with corners extending along both sides thereof;
a heat resisting organic resin film sheet formed on the flat surface and folded at the corners;
resistive heating layers comprising a plurality of resistive heating elements deposited on an area of the film sheet on the flat surface;
metal circuit layers extending on the film sheet electrically connected to the resistive heating layers respectively; and
integrated circuits mounted on the substrate at a position spaced from said flat surface and electrically connected to the metal circuit layers,
wherein the resistive heating layers are kept flat supported without bending.

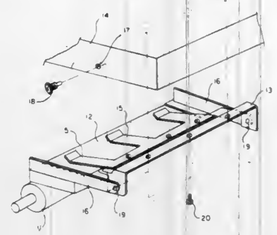
4,626,873

RECORDING HEAD SUPPORT

Matahira Kotani; Masafumi Matsumoto, and Hiroshi Shirakoshi, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1985, Ser. No. 787,512
Claims priority, application Japan, Nov. 13, 1984, 59-172510[U]
Int. Cl.[4] G01D *15/16;* **B41J** *3/20*
U.S. Cl. 346—139 R **2 Claims**

1. A recording head device comprising
a roller,
a recording head disposed opposite said roller,
a securing member,
a frame with a hole,
a pin passing through said hole in said frame in contact with said securing member, and
a supporting member for supporting said recording head, having an elongate hole and being engaged by said pin between said securing member and said frame, whereby a



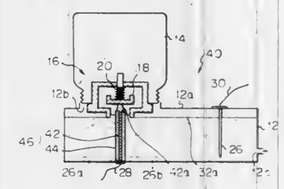
small relative motion is allowed between said securing member and said recording head.

4,626,874

LIQUID LEVEL DETECTOR FOR INK JET PRINTER

Toshiharu Murai, Yokohama; Koichiro Jinnai, Kawasaki; Minoru Ameyama, Yokohama, and Michio Umezawa, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,527
Claims priority, application Japan, Jul. 6, 1984, 59-141153
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—140 R **10 Claims**



1. A liquid level detector for detecting a level of stored liquid, comprising:
a housing for storing the liquid;
a supplementary liquid cartridge mounted in an opening formed through an upper wall of said housing for supplying supplementary liquid to said housing; and
two electrodes dipped in the liquid for detecting the level of the liquid;
at least one of said electrodes being positioned at the location where the supplementary liquid cartridge is mounted on the upper wall of the housing.

4,626,875

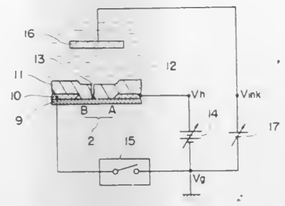
APPARATUS FOR LIQUID-JET RECORDING WHEREIN A POTENTIAL IS APPLIED TO THE LIQUID

Toshitami Hara, Tokyo; Hisanori Tsuda, Atsugi, and Shinichi Hirasawa, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 652,888
Claims priority, application Japan, Sep. 26, 1983, 58-177281; Sep. 26, 1983, 58-177282; Sep. 26, 1983, 58-177283
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **16 Claims**

1. A liquid-jet recording head comprising:
heat-generating means for generating heat energy to jet liquid, said heat-generating means including a heat-generating resistor and at least one pair of electrodes electrically connected to said heat-generating resistor for applying a predetermined voltage to said heat-generating resistor;

a protective film provided on said heat-generating means; and



a third electrode provided in contact with the liquid for applying a voltage to the liquid lower than the predetermined voltage applied to said heat-generating resistor.

4,626,876

SOLID STATE CORONA DISCHARGER

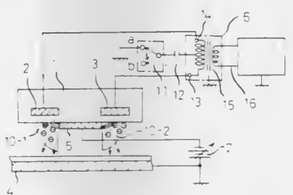
Seiichi Miyagawa, Nagareyama; Itsuo Ikeda, Sagamihara, and Shigeru Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 25, 1985, Ser. No. 695,461

Claims priority, application Japan, Jan. 25, 1984, 59-010288; Mar. 14, 1984, 59-047104; Mar. 14, 1984, 59-047105; Mar. 14, 1984, 59-047107; Mar. 14, 1984, 59-047106

Int. Cl.⁴ G01D *9/00, 15/06, 15/14;* **H04N** *1/23*

U.S. Cl. 346—160 **16 Claims**



1. A solid state corona discharger for charging a substance on one side thereof comprising:

(a) a pair of thin strip-shaped ac electrodes which are arranged side by side substantially in parallel and spaced apart from each other so as to preclude discharge between them, said ac electrodes being enveloped in and covered by, at least on one side thereof facing a substance to be charged, by a dielectric layer;

(b) an ac power supply for applying an ac potential across said ac electrodes;

(c) a thin dc electrode which is located on said one side of said ac electrodes and in contact with an external surface of said dielectric layer so as to form a closed circuit loop of capacitances with said ac electrodes but not connected therewith in terms of direct current, said dc electrode being placed to face opposite a substance to be charged;

(d) a dc power supply for applying a dc potential between said dc electrode and the substance so as to generate a dc electric field between the solid state corona discharger and the substance, and

(e) wherein a corona discharge is also initiated between said ac electrodes and said dc electrode by application of an ac potential across said ac electrodes.

4,626,877

HEAT-SENSITIVE RECORDING MATERIAL

Naoto Arai, Ikeda; Tohru Yamamoto, Anan, both of Japan, assignors to Kanzaki Paper Manufacturing Company, Limited, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,992

Claims priority, application Japan, Oct. 25, 1984, 59-224457

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—200 **8 Claims**

1. A heat-sensitive recording material comprising a base sheet and a heat-sensitive record layer formed over the base sheet and containing a color forming material and a color developing material which undergoes a color forming reaction on contact with the color forming material, the heat-sensitive recording material being characterized in that a resin layer containing a cationic-modified starch is formed over the heat-sensitive record layer.

4,626,878

SEMICONDUCTOR OPTICAL LOGICAL DEVICE

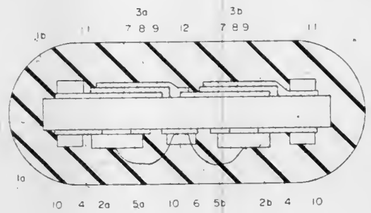
Yukinori Kuwano; Shoichi Nakano, both of Osaka, and Masaru Takeuchi, Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Dec. 6, 1982, Ser. No. 447,195

Claims priority, application Japan, Dec. 18, 1981, 56-205953; Dec. 11, 1981, 56-200469; Dec. 17, 1981, 56-204596

Int. Cl.⁴ H01L *31/12;* **A01L** *31/16*

U.S. Cl. 357—19 **12 Claims**



1. A semiconductor optical logical device, comprising:

a transparent substrate having first and second main surfaces;

a plurality of light emitting elements each independently responsive to an input signal, for emitting light, said light emitting elements being disposed on said first main surface; and

a plurality of light sensitive elements each of non-single crystalline semiconductor for receiving said light from each said light-emitting elements for converting same into an electrical signal, said light sensitive elements being disposed on said second main surface facing said plurality of said light emitting elements;

said plurality of light emitting elements being spaced apart from each other on said first main surface and leaving a boundary between each of said light emitting elements, and each of said light sensitive elements being spaced apart from each other on said second main surface opposite said boundary, an input electrode being provided at said boundary for supplying an input signal to said light emitting elements;

a conductive adhesive layer formed between said transparent substrate and said plurality of light emitting elements onto said transparent substrate and for external electrical connection, said conductive adhesive layer having portions for defining light emitting regions for allowing for light emission through said portions, whereby a mutual interface between adjacent full coupling pairs of said light emission and said light sensitive elements is prevented;

wherein at least two of said plurality of light sensitive elements are electrically coupled for providing a logical output signal from said at least two of said light sensitive elements.

4,626,879

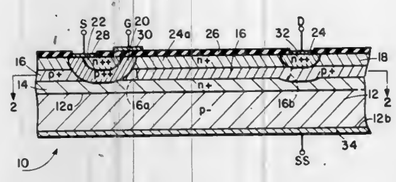
LATERAL DOUBLE-DIFFUSED MOS TRANSISTOR DEVICES SUITABLE FOR SOURCE-FOLLOWER APPLICATIONS

Sel Colak, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 451,993, Dec. 21, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 766,665

Int. Cl.⁴ H01L *29/94*

U.S. Cl. 357—23.4 **12 Claims**



1. A lateral double-diffused MOS transistor, which comprises:

a semiconductor substrate of a first conductivity type;

a first semiconductor layer of a second conductivity type opposite to that of the first on a first major surface of said substrate;

a second semiconductor layer of said first conductvity type on said first layer;

a third semiconductor surface layer of said second conductivity type on said second layer, the product of the net doping concentration and the thickness of said first, second and third semiconductor layers each being selected to accordance with the RESURF principle such that the product of doping concentration and layer thickness is typically approximately 10^{12} atoms/cm^2;

a first surface-adjoining channel region of said first conductivity type in said third layer and connected to said second semiconductor layer;

a surface-adjoining source region of said second conductivity type in said channel region;

a first surface-adjoining drain contact region of said second conductivity type in said third layer and spaced apart from said first channel region;

an extended drain region formed from a portion of said third layer between said first drain contact region and said first channel region;

an insulating layer on the surface of said transistor and covering at least that portion of the first surface-adjoining channel region located between said source and said extended drain regions;

a first gate electrode on said insulating layer, over said portion of the first channel region and electrically isolated from said third layer; and

source and first drain electrodes connected respectively to the source and first drain contact regions of the transistor.

4,626,880

VERTICAL MOS-FET DEVICES HAVING A PLANAR MULTICELL STRUCTURE

Chau Nguyen Minh, and Bernard Vertongen, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,234

Claims priority, application France, Dec. 8, 1982, 82 20554

Int. Cl.⁴ H01L *29/10*

U.S. Cl. 357—23.4 **4 Claims**

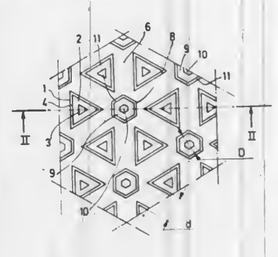
1. A vertical MOS-FET semiconductor device having a planar multicell structure, which comprises:

a semiconductor body;

a layer of a first conductivity type at the surface of said body which comprises the drain zone of said MOS-FET device;

a plurality of identical elementary cells, each in triangular form, each cell comprising a first highly-doped island of the second conductivity type in said layer which defines the form of said cell and a second highly-doped island of the first conductivity type in said first island, said second island being in the shape of a loop and having said triangular form, and said second island comprising the source zone of said MOS FET device;

a shortcircuit region in the center of the loop of said second island adjacent the surface of said device, at which region said first and second islands are connected together;



a channel zone formed adjacent said surface between the outer perimeter of said second island and the perimeter of said first island;

a gate region extending over said channel region; and

means for optimizing the overall length of said channel zone per unit of surface area (filling factor), which comprises a plurality of identical complementary cell elements, each having a construction similar to that of said elementary cells and having an hexagonal form, said complementary cell elements being located between adjoining apices of adjacent elementary cells.

4,626,881

CAPACITOR PRODUCED OF A LAYER COMBINATION OF METAL, INSULATOR AND SEMICONDUCTOR

Hiroyasu Kishi; Yuji Kimoto, and Keizo Mori, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Oct. 5, 1984, Ser. No. 658,418

Claims priority, application Japan, Oct. 17, 1983, 58-160760[U]

Int. Cl.⁴ H01L *29/78, 27/02;* **H03F** *3/45, 3/14*

U.S. Cl. 357—23.6 **6 Claims**

1. A capacitor comprising a layer combination of metal, insulator and semiconductor comprising:

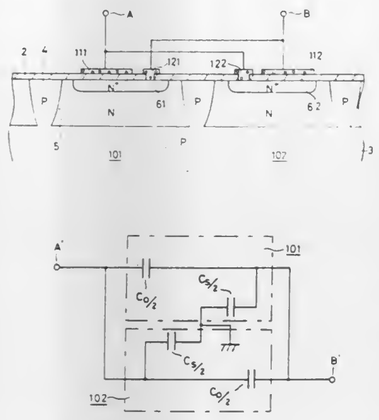
a first capacitor element comprising a semiconductor layer, an insulator film placed on said semiconductor layer, a first metal plate placed on said insulator layer and a second metal plate placed on said semiconductor layer,

a second capacitor element having a capacitance equal to that of said first capacitor element and comprising a semiconductor layer, an insulator film placed on said semiconductor layer, a first metal plate placed on said insulator layer and a second metal plate placed on said semiconductor layer,

a first wiring terminal connecting with said first metal plate of said first capacitor element and with said second metal plate of said second capacitor element, and

a second wiring terminal connecting with said second metal plate of said first capacitor element and with said first metal plate of said second capacitor element whereby a parasitic capacitance accompanying said first capacitor element is connected with said second wiring terminal and

a parasitic capacitance accompanying said second capacitor element is connected with said first wiring terminal



resultantly balancing the parasitic capacitances on both of said first and second wiring terminals.

4,626,882

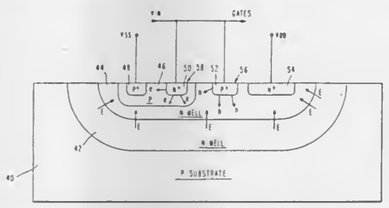
TWIN DIODE OVERVOLTAGE PROTECTION STRUCTURE

Peter E. Cottrell, Essex Junction; William J. Craig, South Burlington, and Ronald R. Troutman, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1984, Ser. No. 632,098

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.13 **9 Claims**



7. A semiconductor structure comprising:

a semiconductor body of a first conductivity type;

a first well region of a second conductivity type formed in a portion of said body and having in it a second conductivity type dopant of a predetermined concentration;

a second well region of a second conductivity type formed in a portion of said body within said first well region wherein the second conductivity type dopant concentration in said second well region is lower than that of said first well region;

an isolated region having a first type of conductivity formed within said second well region, said isolated region being isolated from remaining portions of said body by said second well region;

a second conductivity type region formed within said isolated region so that it forms a first PN junction diode;

a first conductivity type region formed within said second well region so as to form a second PN junction diode;

means for connecting said second conductivity type portion of said first PN junction diode and said second conductivity portion of said second PN junction diode to a signal line to receive a varying voltage signal;

means for applying a high bias potential on said second well region, said second PN junction diode being placed into a conductive state when said varying voltage signal rises above said high bias potential, said first conductivity type region generating minority carriers that are prevented from penetrating into said body by said first well region and said second well region; and

means for applying a low bias potential on said isolated region, said first PN junction diode being placed into a conductive state when said varying voltage signal falls below said low bias potential, said second conductivity type region generating minority carriers that are prevent from penetrating into said body by said first well region and said second well region.

4,626,883

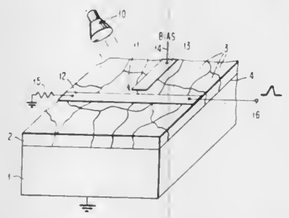
TEXTURED CRYSTAL PICOSECOND PHOTORESPONSIVE ELEMENT

Jeffrey A. Kash, Pleasantville, and Thomas F. Kuech, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1985, Ser. No. 749,609

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **10 Claims**



1. In a semiconductor element exhibiting the properties of optical sensitivity, high carrier mobility and short lifetime comprising in combination

a monocrystalline atomic arrangement substrate member having first and second essentially parallel planar major surfaces,

said substrate having a first spacing dimension between atoms in said monocrystalline atomic arrangement,

said substrate further having an insulating type conductivity and

a layer of an optically sensitive semiconductor material in domain produced textured crystalline relationship with said first surface of said substrate, the atomic arrangement of the atoms of said semiconductor having a second spacing different from said first spacing in said substrate member,

said semiconductor material layer maintaining the crystalline orientation of said substrate,

said semiconductor layer further having crystalline domains having boundaries perpendicular with said first surface and a crystalline orientation essentially that of said substrate,

said domain size being smaller than the diffusion length of the carriers in bulk monocrystalline material of said semiconductor.

4,626,884

OPTICALLY-SENSITIVE SEMICONDUCTOR DEVICES

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,027

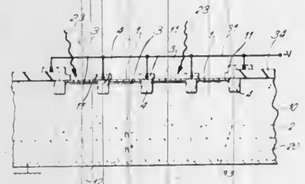
Claims priority, application United Kingdom, Dec. 20, 1983, 8333817

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **9 Claims**

1. A semiconductor device comprising a semiconductor

body having first and second regions of a first conductivity type, electrode connection to said first and second region,and an optically-sensitive barrier region located between the first and second regions at a given depth in said body to control current flow along a current path between said electrode connections to the first and second regions, which barrier region contains a net impurity concentration of the second, opposite conductivity type and is at least substantially fully depleted of free charge carriers by depletion layers formed with the first and second regions at zero bias and in the absence of incident light, optically transmissive means for permitting incident light to generate charge carriers in the vicinity of the barrier region to reduce the barrier height of the barrier region, and closely-



spaced field-relief regions, the barrier region being divided laterally into plural areas located between said closely-spaced field-relief regions, which field-relief regions protrude to a greater depth in the body than that of the barrier region, and, in the absence of incident light and with reverse bias of the barrier region, the device having a high voltage blocking characteristic due to the field-relief regions being spaced such that depletion layers extending in the second region from neighboring field-relief regions merge together under reverse-bias of the barrier region to reduce the electrostatic field below the barrier region, the device being switchable between the high voltage blocking state and a current conducting state by means of incident light.

4,626,885

PHOTOSENSOR HAVING IMPURITY CONCENTRATION GRADIENT

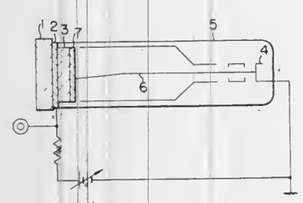
Sachio Ishioka, Tokyo; Yoshinori Imamura, Hachioji; Tsuyoshi Uda, Kodaira; Yukio Takasaki, Hachioji; Chushirou Kusano, Tokorozawa; Hirofumi Ogawa; Tatsuo Makishima, both of Hachioji, and Tadaaki Hirai, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,658

Claims priority, application Japan, Aug. 23, 1982, 57-144647

Int. Cl.[4] H01J *31/00;* **H01L** *27/14, 31/00*

U.S. Cl. 357—31 **15 Claims**



1. A photosensor comprising:

a transparent electrode disposed on a light receiving side of said photosensor and formed of a transparent conductive film; and

a photoconductive layer disposed on said transparent electrode, said photoconductive layer consisting of at least 5 to 30 atomic percent of hydrogen, at least one doped impurity selected from the group consisting of elements belonging to Groups II and III of the Periodic Table and the balance of amorphous silicon, a voltage being applied across said photoconductive layer so that a surface of said photoconductive layer facing said transparent electrode is at a positive potential with respect to another surface of said photoconductive layer opposite to said surface facing said transparent electrode; said at least one impurity having a concentration profile which is in a range of 0 to 5 ppm at the interface between said transparent electrode and said photoconductive layer, which does not decrease with the distance from the interface, and which is in a range of 1 to 100 ppm at said another surface of the photoconductive layer.

4,626,886

POWER TRANSISTOR

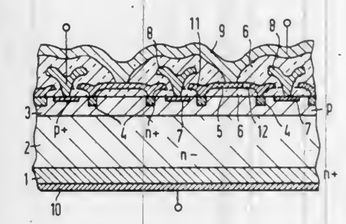
Jenö Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,288

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329241

Int. Cl.[4] H01L *29/72, 27/02, 23/48*

U.S. Cl. 357—34 **7 Claims**



1. A power transistor having a semiconductor body, including at least one base zone, at least one collector zone and a plurality of emitter zones connected to an emitter electrode via a resistor each, the power transistor comprising each emitter zone being in the shape of a strip, each resistor comprising at least a portion of a first layer, the first layer being disposed on an insulating layer located on top of the semiconductor body and contacting each coordinated emitter zone through at least one aperture provided in the insulating layer wherein the first layer disposed on the insulating layer comprises doped semiconductor material of polycrystalline silicon, each of the at least one base zone including a base contact zone doped higher than the doping of the base zone and embedded in the base zone, each base contact zone being disposed between two of the emitter zones, the layer disposed on the insulating layer projecting outwardly beyond the emitter zone and being an implantation mask for the base contact zones, and the semiconductor layer disposed on the insulating layer being doped higher than the emitter zone in contact with it and being a source of doping material for the emitter zone.

4,626,887

STATIC STORAGE CELL

Doris Schmitt-Landsiedel, and Gerhard Dorda, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 637,026

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3330013

Int. Cl.[4] H01L *27/02, 29/80, 49/02;* **G11C** *11/34*

U.S. Cl. 357—43 **17 Claims**

1. A static storage cell, comprising:

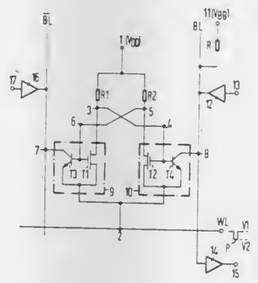
first and second cross-coupled inverters respectively formed of first and second field effect transistors and first and second resistor elements connected in series thereto;

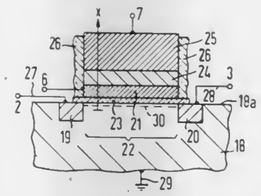
a first circuit node between the first field effect transistor and

the first resistor element being connected to a gate terminal of the second field effect transistor;

a second circuit node between the second field effect transistor and the second resistor element being connected to a gate terminal of the first field effect transistor;

said first and second circuit nodes being respectively connected to base terminals of respective second and first hot electron transistors (HETs), collector terminals of which being connected to respective second and first bit lines and emitter terminals of which being connected to an addressing word line; the first and second hot electron transistors being of a tunnel emission type and each having an emitter layer, an insulator layer, a base layer, and a collector layer;





said first and second field effect transistors respectively having source and drain regions which are inserted in a body of doped semiconductor material, a channel region lying between them at which an inversion layer forms, and a gate electrode covering said channel region;

the first and second hot electron transistors being combined with te respective first and second field effect transistors such that the HET transistor emitter layer is the inversion layer in the channel region of the field effect transistor, the HET base layer is the gate electrode of the field effect transistor, the insulator layer is disposed between the base layer and the channel region, collector layer has a terminal connected to the respective bit and a source terminal connected to the source region of the field effect transistor forming a terminal of said emitter of the respective hot electron transistor connected to said addressing word line.

4,626,888

GATE TURN-OFF THYRISTOR

Takahiro Nagano; Tsutomu Yatsuo; Saburo Oikawa, all of Hitachi, and Akira Horie, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

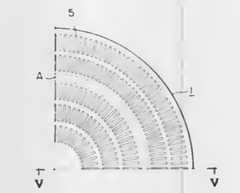
Filed Nov. 10, 1983, Ser. No. 550,586

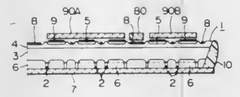
Claims priority, application Japan, Nov. 10, 1982, 57-195921

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.[4] H01L *29/74, 23/48*

U.S. Cl. 357—38 **8 Claims**





1. A gate turn-off thyristor comprising:

a circular semiconductor substrate having an emitter layer on the anode side, a first base layer, a second base layer, and an emitter layer on the cathode side, which has alternating conductivity types so as to form p-n junctions between adjacent layers, said emitter layer on the cathode side being composed of a plurality of separate individual emitter layers taking the shape of a long and narrow strip, said individual emitter layers on the cathode side being exposed onto one main surface of said semiconductor substrate together with said base layer and being arranged in the radial direction extending from the center of said semiconductor substrate toward the periphery thereof, while forming a plurality of rings on said one main surface;

cathode electrodes which respectively are in ohmic contact with respective strip-shaped individual emitter layers on the cathode side;

a gate electrode which is in ohmic contact with said second base layer exposed onto said one main surface of said semiconductor substrate and which surrounds said strip-shaped individual emitter layers on the cathode side;

an anode electrode which is at least in ohmic contact with said emitter layer on the anode side exposed to the other main surface of said semiconductor substrate;

cathode buffer electrode plates which are connected to said cathode electrodes; and

a gate collecting electrode which is connected to said gate electrode and is so provided in a ring form between emitter layer rings that the potential differences produced within said gate electrode by gate currents which are collected respectively from the center side of said semiconductor substrate and the periphery side thereof in view of said gate collecting electrode approximately balance each other.

4,626,889

STACKED DIFFERENTIALLY DRIVEN TRANSMISSION LINE ON INTEGRATED CIRCUIT

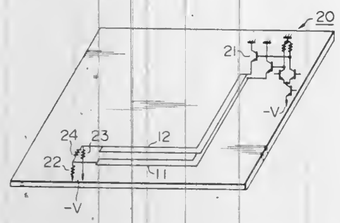
Masakazu Yamamoto, Kodaira; Akira Masaki, and Ryotaro Kamikawai, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,938

Claims priority, application Japan, Dec. 23, 1983, 58-242009

Int. Cl.[4] H01L *23/52;* **H01P** *3/08, 3/18*

U.S. Cl. 357—71 **6 Claims**



1. A semiconductor integrated circuit structure comprising:

a semiconductor substrate having such a large area as being adapted for a large scale integration;

circuit means formed in said semiconductor substrate for generating a pair of complementary signals in a phase-inverted relation with each other;

a first common potential level layer formed above said substrate and electrically insulated from said substrate;

a second common potential level layer formed above said first common potential level layer with an electrically insulating layer interposed therebetween; and

at least one pair of electric conductor pattern layers formed in a spaced relation with each other in said insulating layer, said pair of conductor pattern layers being in electrical connection with said circuit means for conducting said pair of complementary signals to a desired point in said insulating layer and being arranged so as to be overlapped with each other in a direction substantially perpendicular to said substrate and so as to be substantially parallel with said substrate.

4,626,890

METHOD AND APPARATUS FOR REMOVING PHASE MODULATION FROM THE COLOR BURST

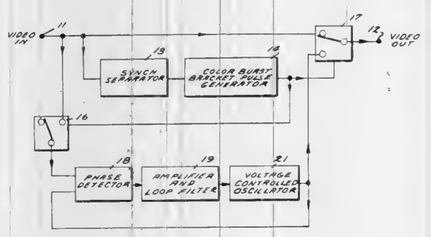
John O. Ryan, Cupertino, Calif., assignor to Macrovision, San Jose, Calif.

Filed Jul. 3, 1984, Ser. No. 627,619

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] H04N *9/45, 9/455, 9/80, 7/167*

U.S. Cl. 358—19 **6 Claims**



1. A method of removing phase modulation induced in the color burst of a video signal for inhibiting the making of acceptable video recordings of the video signal comprising the steps of:

switching the phase modulated color burst component through a phase lock loop to regenerate a color burst subcarrier free of modulation and having a phase equal to the mean phase of the modulated color burst component; and

inserting the regenerated color burst subcarrier component in the video signal, whereby acceptable video recordings of the video signal can then be made.

4,626,891

MOTION DETECTING CIRCUIT UTILIZING INTER-FRAME DIFFERENCE SIGNALS OF SUCCESSIVE FIELDS

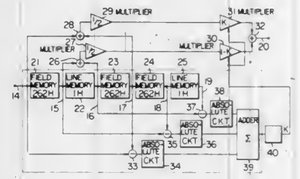
Masahiko Achiha, Iruma, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

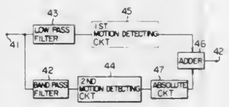
Filed Jul. 23, 1984, Ser. No. 633,273

Claims priority, application Japan, Jul. 25, 1983, 58-134326; Sep. 9, 1983, 58-164988

Int. Cl.[4] H04N *9/00*

U.S. Cl. 358—21 R **10 Claims**





1. A motion detecting circuit for detecting the motion of an object in an interlaced television signal comprising:

an input terminal to which the interlaced television signal is applied;

a plurality of memories connected in series to said input terminal, the sum of capacities of said plurality of memories corresponding to at least three fields;

a first circuit for calculating at least two inter-frame difference signals of successive fields from said plurality of memories; and

a second circuit for determining the motion of said object by utilizing the output of said first circuit.

4,626,892

TELEVISION SYSTEM WITH MENU LIKE FUNCTION CONTROL SELECTION

Kevin E. Nortrup, Indianapolis; Billy W. Beyers, Jr., Greenfield, and Jack S. Fuhrer, Carmel, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 5, 1984, Ser. No. 586,271

Int. Cl.[4] H04N *5/44*

U.S. Cl. 358—21 R **22 Claims**

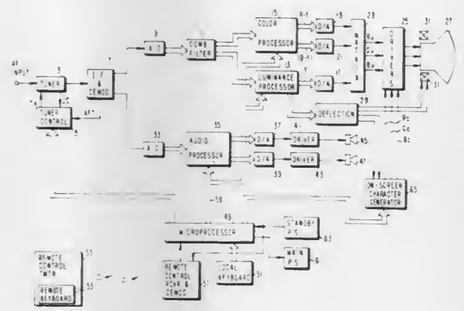
1. In a television system, apparatus comprising:

input means receiving a plurality of television signals for selecting one of said television signals;

signal processing means responsive to said selected television signal for adjusting, when enabled, various signal properties of said selected television signal to produce at least one of a video signal and an audio signal with desired properties;

coupling means for coupling said video signal to an image reproducing device in order to display an image and for coupling said audio signal to a sound reproducing device in order to produce an audio response;

a plurality of user operable numbered switches;
control means coupled to said input means and being normally responsive to the operation of said numbered switches for controlling the selection of one of said television signals;
character generation means coupled to said coupling means for forming alpha-numeric characters on said display device;
a user operable program switch;



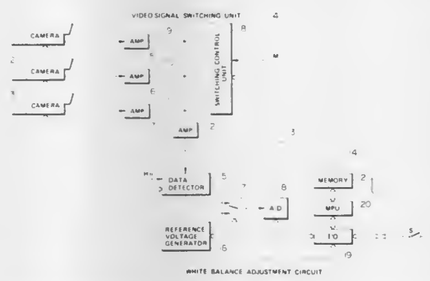
said control means also being coupled to said character generation means and to said signal processing means and being responsive to the operation of said program switch for causing the display of a numbered list of functions to be controlled by said signal processing means and thereafter being responsive to the operation of ones of said numbered switches for enabling said signal processing means to adjust respective signal properties.

4,626,893

WHITE BALANCE ADJUSTING SYSTEM FOR PLURAL COLOR TELEVISION CAMERAS

Junichi Yamanaka, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1984, Ser. No. 601,591
Claims priority, application Japan, Apr. 22, 1983, 58-069988
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—29 **10 Claims**



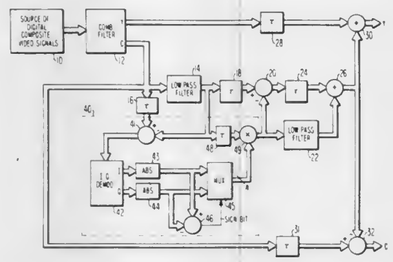
1. A system for adjusting the white balance of a plurality of color television cameras, comprising:
an output terminal;
a video switching unit, coupled to the outputs of said plurality of cameras, for selectively switching a selected one video signal sent from a selected one of said cameras to said output terminal;
a white balance adjustment circuit, coupled to said output terminal, for detecting the white balance condition of said selected one video signal from said video switching unit and generating an adjustment output in response thereto; and
means for supplying said adjustment output of said adjustment circuit to said selected one of the cameras selected by said video switching unit to adjust the white balance of said selected one camera.

4,626,894

SIGNAL FILTERING SYSTEM HAVING ADAPTIVELY CASCADED FILTER STAGES FOR DEVELOPING A VARIABLE BANDWIDTH FREQUENCY CHARACTERISTIC

Leopold A. Harwood, Bridgewater, and Robert A. Wargo, Ringoes, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 4, 1984, Ser. No. 657,592
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **14 Claims**



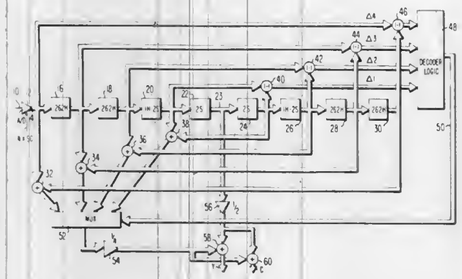
1. Apparatus for processing a composite signal having a first signal component, occupying a first band of frequencies, and a second signal component, occupying a second band of frequencies, including a filtering system comprising:
a first filter responsive to said composite signal and having a predetermined frequency response characteristic for passing signals occupying said first band of frequencies to the relative exclusion of signals occupying said second band of frequencies;
control means coupled to receive said composite signal and responsive to a predetermined band of frequencies of at least one of said first and second signal components, for developing a variable control signal that is proportional to the magnitude of at least one of said signal components;
signal splitting means coupled to said first filter and having first and second output terminals for providing respective signals at said first and second output terminals which are mutually supplementary scaled replicas of the signals provided by said first filter, the amplitudes of said respective scaled replica signals being in a ratio porportional to the instantaneous value of said control signal;
a second filter coupled to the first output terminal of said signal splitting means and having a frequency response characteristic substantially equal to said predetermined frequency response characteristic for passing signals occupying said first band of frequencies to the relative exclusion of signals occupying said second band of frequencies; and
signal combining means coupled to said second filter and to the second output terminal of said signal splitting means for combining the respective signals provided thereby to produce a filtered output signal.

4,626,895

SAMPLED DATA VIDEO SIGNAL CHROMINANCE/LUMINANCE SEPARATION SYSTEM

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 639,094, Aug. 9, 1984, abandoned. This application May 22, 1985, Ser. No. 736,970
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—31 **15 Claims**



1. A system for separating chrominance and luminance components from composite video signal, said system comprising:
a signal input port for applying said composite video signal;
a plurality of cascade connected delay elements serially connected to said signal input port, having a central output tap and pairs of further output taps, the pairs of taps being symmetrically disposed about said center tap;
means coupled to said pairs of taps and responsive to a control signal for selectively producing the sum of delayed signals from a particular pair of taps to an output port thereof;
signal differencing means coupled to each of said pairs of taps for producing respective signals corresponding to the magnitude of the differences of signals occurring between each pair of taps;
decoder circuitry coupled to said signal differencing means and responsive to said magnitude difference signals for generating said control signal, said control signal selectively producing said sum of delayed signals from the pair of taps tending to produce the smallest magnitude difference signal; and
signal combining means coupled to the output port of said means for producing the sum of delayed signals, and to said central tap, for combining signals to produce at least one of said separated luminance and chrominance components.

Patent Not Issued For This Number

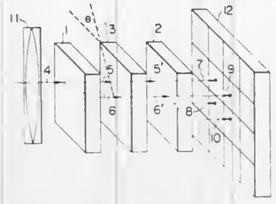
4,626,896

OPTICAL FILTER FOR COLOR IMAGING DEVICE

Masanori Sato, Katsuta; Shusaku Nagahara, Hachioji, and Kenji Takahashi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,449
Claims priority, application Japan, May 17, 1982, 57-81412
Int. Cl.[4] H04N *9/077, 9/07;* **G02B** *5/30, 27/28*
U.S. Cl. 358—44 **11 Claims**

10. An optical system for a color imaging device for introducing a plurality of rays of natural light transmitted through a lens system to a mosaic color-encoding filter, comprising: a first double refraction plate for splitting each ray of said natural light into two polarized light rays vibrating in orthogonal directions with respect to each other, an optical plate having a property to alter the state of polarization of the light rays produced by said first double refraction plate, a second double refraction plate for splitting each of the light rays altered by said optical plate into two polarized light rays vibrating in orthogonal directions with respect to each other so that quadruple light images arranged in a rectangular array are produced for each ray of said natural light, and a mosaic color-



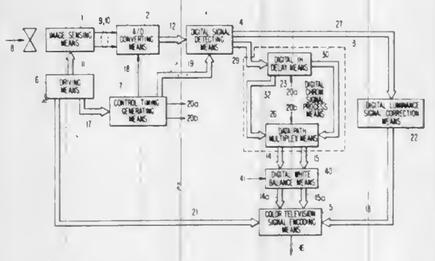
encoding filter positioned to receive the light rays from said second double refraction plate.

4,626,898

COLOR CAMERA USING DIGITAL SIGNAL PROCESSING TECHNIQUES

Takaaki Baba, Kounan, Japan, and Gerald T. O'Keefe, Cupertino, Calif., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 30, 1984, Ser. No. 595,379
Claims priority, application Japan, Mar. 31, 1983, 58-53913
Int. Cl.[4] H04N *9/077, 9/07*
U.S. Cl. 358—48 **21 Claims**



1. A digital color camera comprising:
an image sensing means for receiving optical signals to produce two alternately different pixel signals composed of a first pixel signal and a second pixel signal, said first pixel signal being composed of two different α and β color pixel signals which are shifted out at a frequency of f_c in one of two consecutive synchronous intervals of a television signal, and said second pixel signal being composed of two other different γ and δ color pixel signals which are different from said two different α and β color pixel signals in said first pixel signal and which are shifted out at a frequency of f_c in the other of said two consecutive horizontal synchronous intervals of said television signal;
an analog to digital converting means coupled to said image sensing means for converting said two alternately different pixel signals to a multiplexed digital pixel signal which is alternately different from one horizontal synchronous interval to a next horizontal synchronous interval;
a digital signal detecting means coupled to said analog to digital converting means for receiving said multiplexed digital pixel signal to produce a digital luminance signal and a digital chrominance difference signal which are alternately different from one horizontal synchronous interval to a next horizontal synchronous interval;
a digital chrominance signal processing means for receiving said digital chrominance different signal and for producing two independent digital chrominance difference signals;
a digital luminance signal correction means for receiving

said digital luminance signal and for producing a gamma corrected digital luminance signal;

a color television signal encoding means for receiving said two independent digital chrominance difference signals and said gamma corrected digital luminance signal to produce a color television signal;

a control timing generating means for generating first, second and third sets of timing pulses, said sets of timing pulses respectively controlling said analog to digital converting means, said digital signal detecting means and said digital chrominance signal processing means; and

a driving means for driving said image sensing means, said color television signal encoding means and said control timing generating means.

4,626,899

BEAM SCANNING DEVICE PRODUCING A HORIZONTALLY UNIFORM ELECTRON BEAM

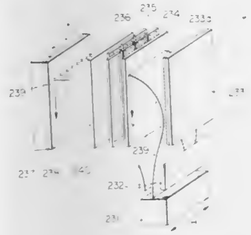
Kaoru Tomii; Hiroshi Miyama; Yoshikazu Kawauchi, all of Kanagawa, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 13, 1984, Ser. No. 570,536

Claims priority, application Japan, Jan. 14, 1983, 58-4489; Jan. 14, 1983, 58-4490; Jan. 20, 1983, 58-8455; Jan. 20, 1983, 58-8456; Mar. 16, 1983, 58-43549; Mar. 29, 1983, 58-54401; Mar. 29, 1983, 58-54402; Mar. 29, 1983, 58-54409; Nov. 25, 1983, 58-222432

Int. Cl.⁴ H04N *9/20, 5/66, 9/12;* **H01J** *29/70*

U.S. Cl. 358—65 **18 Claims**



17. A beam scanning device comprising electron beam generating means for generating a horizontally uniform electron beam; electron beam modulating means; and a phosphor screen,

said electron beam modulating means comprising p (p is an integer of not less than 2) electrode groups each of which has a plurality of vertically elongated electrodes, each of which has n (n is an integer of not less than 2) openings along a horizontal direction and which are arranged such that all of said openings thereof are equidistantly formed along the horizontal direction, said p electrode groups each having a plurality of vertically elongated electrodes which are aligned at predetermined intervals along an electron beam propagation direction and are offset by a predetermined distance along the horizontal direction, and

each of said p electrode groups comprising a plurality of subgroups, beam modulation signals and beam ON/OFF signals being selectively supplied to said plurality of subgroups so as to cause electron beams to be incident on predetermined positions on the phosphor screen.

4,626,900

COLOR VIDEO SIGNAL REPRODUCING CIRCUIT FOR INDEX TYPE TELEVISION UTILIZING VERTICAL CORRELATION OF INDEX SIGNALS AND 360° PHASE DETECTION AND ADJUSTMENT CIRCUITS

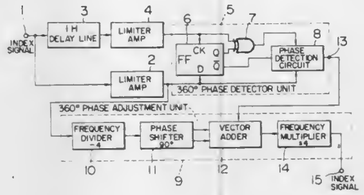
Fumio Inoue, and Hiroshi Jitsukata, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,035

Claims priority, application Japan, Feb. 25, 1983, 58-29301

Int. Cl.⁴ H04N *9/24;* **H01J** *29/41*

U.S. Cl. 358—67 **3 Claims**



1. An index type color picture reproducing circuit comprising:

index signal detecting means for simultaneously generating as its output signals, a first index signal received at the present time and a second index signal received at the time earlier substantially by one standard horizontal scanning period than the former;

phase detecting means for detecting the phase difference between the first and second index signals simultaneously applied thereto over a phase angle range of 360°, thereby generating an output signal indicative of the phase difference between said index signals; and

phase adjusting means receiving one of the index signal, a chrominance subcarrier signal and a chrominance signal as its input signal for changing the phase of said input signal over a phase angle range of 360° depending on the output signal of said phase detecting means, thereby generating a signal for enabling a color picture with normal hue to be reproduced on an index type picture tube even when a picture signal received has a horizontal scanning frequency different from a standard horizontal scanning frequency.

4,626,901

IMAGE PROCESSING APPARATUS USING MULTIPLE DITHER MATRICES

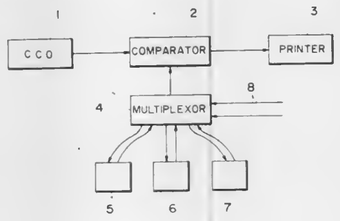
Hiroshi Tanioka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,447, Oct. 19, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,826

Claims priority, application Japan, Oct. 27, 1982, 57-187363

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—75 **8 Claims**



1. An image processing apparatus comprising:

means for generating image data; and

means for binary coding the image date from said generating means,

wherein said binary coding means includes first dither conversion means adapted to store data for first dither conversion and second dither conversion means adapted to store data for second dither conversion,

said respective data for first and second dither conversions in said first and second dither conversion means corresponding to first and second threshold dither matrices,

said first and second threshold dither matrices corresponding to first and second colors, respectively, being different from each another in repetitive array angle, and

said first and second dither conversion means being selected in response to signals associated respectively with said first and second colors.

4,626,902

METHOD AND SYSTEM FOR PROCESSING A BORDER PIXEL

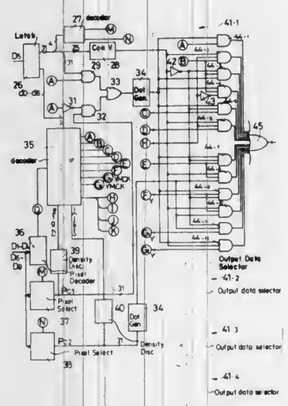
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Japan

Filed Apr. 20, 1984, Ser. No. 602,468

Claims priority, application Japan, Aug. 11, 1983, 58-147710

Int. Cl.⁴ H04N *1/46, 1/40*

U.S. Cl. 358—75 **20 Claims**



10. In an electronic image reproduction system using color separation films to reproduce multiple color images, apparatus for processing a border pixel between two pictorial components of an image or between a pictorial component and a line component of an image, the apparatus comprising:

(a) means for scanning an original to generate pixels, each pixel comprising a number of small pixels to provide improved resolution, and for detecting a border pixel;

(b) selection means for selecting at least one pixel from pixels surrounding the border pixel;

(c) means for obtaining image information associated with the selected pixels; and

(d) means for recording said border pixel on said color separation films based on using at least in part said image information.

4,626,903

METHOD FOR POINT-BY-POINT AND LINE-BY-LINE EXPOSING OF COLOR IMAGES USING TWO CORRECTION STAGES

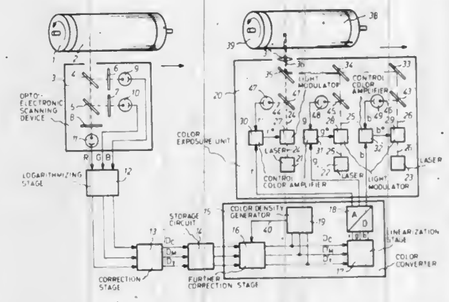
Ernst Giesche, Lilienthal; Eggert Jung, Schoenberg; Helma Meintz, Schoenkirchen, and Christian Roes, Kiel, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Apr. 5, 1984, Ser. No. 597,110

Claims priority, application European Pat. Off., Apr. 27, 1983, 83104101

Int. Cl.⁴ G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **16 Claims**



8. Apparatus for exposing a color image corresponding to a color original on chromatic photosensitive material point-by-point and line-by-line with a chromatic light recording beam, comprising:

(a) an optoelectronic scanning device (**3**) for obtaining color signal values (R, G, B) by point-by-point and line-by-line scanning of said color original,

(b) a correction device (**13,16**) connected to said scanning device (**3**) for calculating nominal color density values (D'_Y, D'_M, D'_C) from color signal values (R, G, B) by color and/or tone correction,

(c) a linearization stage (**17**) connected to the correction device (**13,16**) for converting the nominal color density values into modulating signal values (r, g, b) in such a manner so as to linearize the gradation characteristics of said chromatic photosensitive material, and

(d) an exposure unit (**20**) connected to said linearization stage (**17**) comprising:

(d_1) at least one light source (**21, 22, 23**) for generating individual chromatic light beams having different spectral components,

(d_2) light modulators (**27, 28, 29**) which are mounted in the light paths of said light beams for modulating the light intensities of the individual light beams with said modulating signal values (r, g, b), and

(d_3) optical means (**33, 34, 35, 37**) for combining said modulated light beams into said recording beam and for focusing said recording beam onto said chromatic photosensitive material.

4,626,904

METER FOR PASSIVELY LOGGING THE PRESENCE AND IDENTITY OF TV VIEWERS

Oscar M. Lurie, Bethesda, Md., assignor to Control Data Corporation, Minneapolis, Minn.

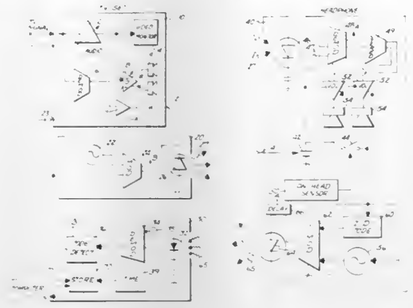
Filed Nov. 12, 1985, Ser. No. 797,344

Int. Cl.⁴ H04H *9/00*

U.S. Cl. 358—84 **16 Claims**

1. Apparatus for recording the presence and identity of the audience of a television set comprising transmitter means associated with said television set for transmitting a signal containing the audio portion of a program to which the television set is tuned; individual receiver means for each person comprising said audience, said individual receiver means including sensor means for sensing the positioning of said individual receiver means on a respective person, audio receiver means for receiv-

ing the transmitted signal from said transmitter means and for providing the audio portion of the program to the respective



person, and identification means responsive to said sensor means for transmitting an identification signal representative of the individual receiver means; and monitor means for receiving and recording identification signals from all of said individual receiver means.

4,626,905

PANORAMIC VIEW APPARATUS

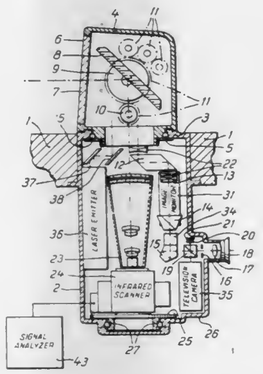
Horst Schmidt, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,600

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326904

Int. Cl.[4] H04N *7/18, 5/225, 5/33*

U.S. Cl. 358—87 **9 Claims**



1. A panoramic view apparatus comprising a tube, a lookout mirror located in said tube and movable in elevation and azimuth, a bi-spectrally transparent closure window, at least three different measuring and observation devices arranged adjacent each other in said tube, and means for directing the output and input radiation for the measuring and observation devices parallelly through said closure window wherein at least one of the observation devices operates in an opto-electronic manner and further comprising means for assuring that upright and laterally correct images of the object to be observed are projected on a receiving part of said observation means independently of the azimuthal position of the closure window.

4,626,906

INVERTED MICROSCOPE

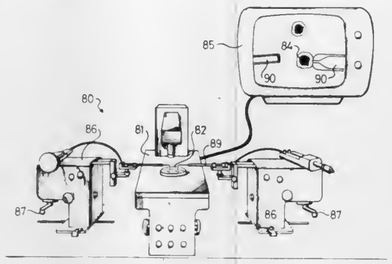
Donald R. Ensor, 111 Western Springs Road, Auckland, New Zealand

Filed Mar. 23, 1984, Ser. No. 592,822

Claims priority, application New Zealand, Apr. 8, 1983, 203838

Int. Cl.[4] H06N *7/18*

U.S. Cl. 358—93 **11 Claims**



1. An inverted microscope having a substantially rigid stage below which is mounted an objective lens, and means for transmitting an image via said lens to a video camera so that, in use, the path of the light from the lens to the camera being free from any means diverting any portion of said light to a path other than said path to the camera, thereby to establish only one said path of light from the lens, whereby substantially all of the light from the lens is directed to the camera.

4,626,907

METHOD AND APPARATUS FOR MUTUALLY ALIGNING OBJECTS

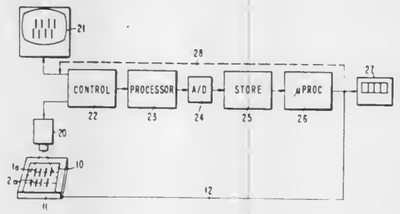
Franz Schedewie, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1984, Ser. No. 653,988

Claims priority, application European Pat. Off., Sep. 23, 1983, 83109475.0

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—101 **8 Claims**



1. A method for mutually aligning two objects each of which are provided with a periodically structured alignment pattern, characterized in including the steps of scanning the alignment patterns on both objects, converting said scanned alignment patterns into two periodic electrical signals, determining the relative phase difference of both said two periodic electric signals as a measure of alignment and digitizing and computing the Fourier components of said two periodic electrical signals.

4,626,908

TRACKING INPUT DEVICE

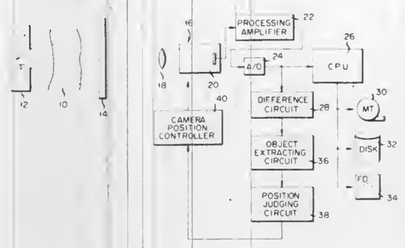
Yuichiro Tani, Yaita, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 22, 1983, Ser. No. 554,236

Claims priority, application Japan, Nov. 22, 1982, 57-203592

Int. Cl.[4] H05G *1/64;* **H04N** *5/32*

U.S. Cl. 358—111 **5 Claims**



1. An image input device comprising:

imaging means for imaging a picture including an object image which is to undergo diagnosis, which object varies in position and configuration over time to define a variational portion in which the object image varies over time;

object extracting means for extracting the variational portion within the object image by determining the difference in brightness between two pictures obtained by said imaging means;

position judging means for judging whether or not the object image variational portion extracted is located within a picture screen; and

control means for controlling the imaging conditions of said imaging means, in accordance with the results of the judgment made by said position judging means such that the control means moves said imaging means in a direction parallel to the plane on which the object image is imaged, where the object image variational portion is partly or wholly lost from the picture screen.

4,626,909

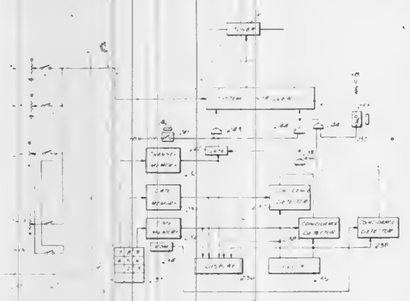
VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM WITH AUTOMATIC CHANNEL AND TIME SELECTION

Saburo Oniki, Mamaroneck, N.Y.; Takashi Okada, Yokohama, and Takao Mogi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,095

Int. Cl.[4] H04N *7/16;* **H04B** *11/16;* **G11B** *5/02*

U.S. Cl. 358—114 **21 Claims**



1. A video recorder for automatically recording information being broadcast on at least one predetermined channel at a predetermined time for at least two predetermined days, comprising:

tuning means for tuning to any one of a plurality of channels received thereby and including channel selecting means for selecting one of said channels;

recorder means for recording information broadcast on the channel to which said tuning means is tuned;

timing means actuable for causing operation of said recorder means at least one selected time in accordance with channel and timing information input to said timing means for said at least one selected time;

override means for controlling said tuning means and said recorder means in preference to said channel selecting means and said timing means and including memory means for storing said predetermined time for said predetermined days and said one predetermined channel; and

a single manually operable actuating member for actuating said override means without causing actuation of said timing means to override said channel selecting means and said timing means so that said recorder means records information on said one predetermined channel at said predetermined time on the next occurring predetermined day following actuation of said member;

said timing means being actuable without causing actuation of said override means.

4,626,910

CIRCUIT FOR PREVENTING FLICKER ATTRIBUTABLE TO FIELD SIGNAL-FRAME SIGNAL CONVERSION

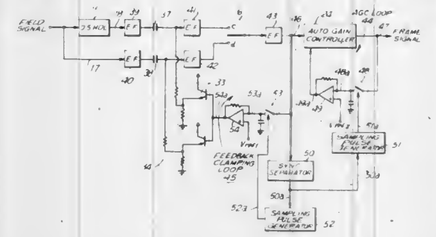
Keiichi Kawamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 11, 1984, Ser. No. 680,654

Claims priority, application Japan, Dec. 13, 1983, 58-233481; Dec. 13, 1983, 58-233482; Dec. 13, 1983, 58-233483

Int. Cl.[4] H04N *7/01, 5/53*

U.S. Cl. 358—140 **9 Claims**



1. In a field signal-frame signal conversion system including means for applying a delayed field signal delayed by ½ of one horizontal scanning period and a thru field signal, which is the same as the above field signal but not delayed, and switching means for alternately selecting the field signals at a time interval of one vertical scanning period to provide a frame signal, a circuit for preventing appearance of flicker attributable to the field signal—frame signal conversion, said circuit comprising a synchronizing signal separating circuit separating a synchronizing signal from the frame signal appearing at the output of said switching means, a sampling pulse generating circuit generating, in response to the application of the separated synchronizing signal, a sampling pulse signal synchronous with the change points from the sync tip level to the pedestal level and having a pulse width equal to or smaller than that of the serrating pulses, a sample and hold circuit operating in response to the sampling pulse signal for sampling the frame signal appearing at the output of said switching means, a clamping voltage generating circuit comparing the output signal of said sample and hold circuit with a reference value thereby generating a voltage signal proportional to the difference therebetween, and two clamping circuits connected to the thru and delayed field signal lines respectively and controlled by the output signal of said clamping voltage generating circuit for maintaining constant the pedestal level of the thru and delayed field signals.

4,626,911

DIGITAL DATA RECOVERY CIRCUIT

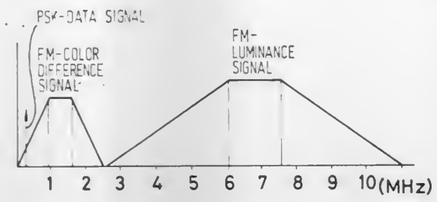
Takayuki Sasaki, Kanagawa, and Eiichi Ichimura, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,675

Claims priority, application Japan, Apr. 21, 1983, 58-59564[U]

Int. Cl.⁴ H04N *7/04, 5/04*

U.S. Cl. 358—141 **18 Claims**



1. Apparatus for recovering digital data from a reproduced frequency-multiplexed signal in which a carrier signal modulated with digital data is in frequency-multiplexed relationship with a video signal, comprising:

signal separating means receiving said reproduced frequency-multiplexed signal for separating therefrom said carrier signal modulated with digital data and a video horizontal synchronization signal;

phase-control loop means cooperating with said signal separating means and receiving said carrier signal modulated with digital data for generating a continuous carrier signal in phase-locked relationship with the carrier signal modulated with said digital data, said phase-control loop means including detector means receiving said carrier signal modulated with digital data and said continuous carrier signal for deriving said digital data from said carrier signal modulated with digital data; and

phase-compensation means receiving said video horizontal synchronization signal and responsive to said phase-control loop means for compensating said continuous carrier signal for phase shifts in said carrier signal modulated with digital data by sensing corresponding phase shifts of said video horizontal synchronization signal, whereby said detector means derives said digital data independently of said phase shifts in said carrier signal modulated with the digital data.

4,626,912

SEQUENTIAL DATA BLOCK ADDRESS PROCESSING CIRCUITS

James H. Wilkinson, Tadley, Near Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,088

Claims priority, application United Kingdom, Apr. 26, 1982, 8211975

Int. Cl.⁴ H04N *5/14, 7/04*

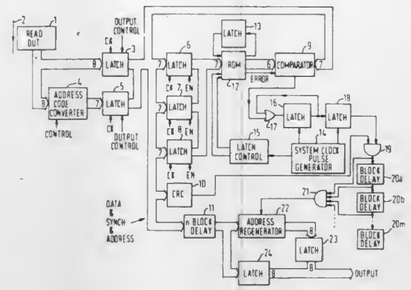
U.S. Cl. 358—141 **6 Claims**

1. A sequential data block address processing circuit for deriving address signals in dependence on incoming data, said circuit comprising;

means for generating said address signals;

means for receiving incoming sequential blocks of said incoming data, each of said blocks including a first block address which changes cyclically from block to block and which is defined by a plurality of ordered first address words, each of said first address words representing a respective present number which also changes cyclically, said present numbers being ordered in correspondence with the order of the respective first address words from a least significant present number to a most significant present number;

means for selectively incrementing each of said present numbers to form respective incremented numbers by incrementing said least significant present number and, if said incrementing causes said least significant present number to complete its cycle, effecting a carry to the next more significant present number, and similarly effecting a carry to each next more significant present number if the respective next less significant present number incremented by the carry completes its cycle and further for generating a predicted block address which is defined by a plurality of second address words ordered in correspondence with said first address words and representing said respective present number if said respective present number was not incremented and said respective incremented number otherwise; and



means for comparing each predicted block address with a next incoming first block address, by comparing the number represented by each second address word of the former with the present number represented by the correspondingly ordered first address word of the latter, to define pairs of compared address words and for producing a correct address indication only if there is identity between compared address words of at least one of said pairs, and means for producing a locking signal which is supplied to said means for generating said address signals for controlling the operation thereof.

4,626,913

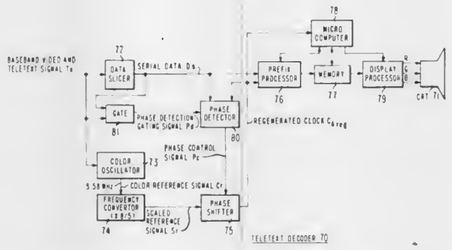
CHROMA BURST DERIVED CLOCK REGENERATOR FOR TELETEXT DECODER

Kadagattor V. Gurumurthy, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 26, 1984, Ser. No. 624,822

Int. Cl.⁴ H04N *7/087, 9/45*

U.S. Cl. 358—147 **10 Claims**



1. A clock regeneration apparatus, in a teletext decoder, for producing from an incoming teletext-like television signal a regenerated clock, wherein a line of said teletext-like television signal includes a burst signal and a data line signal that includes data line information bits containing a clock synchronization sequence and wherein said regenerated clock provides timing reference information to recover the data line information bits of said data line signal, said apparatus comprising:

a source of said teletext-like television signal;

means responsive to said burst signal within said teletext-like television signal for generating in accordance therewith a first clock having a frequency and a phase that are related to the frequency and phase of said burst signal, respectively;

a phase shifter responsive to a control signal for generating said regenerated clock signal by varying the phase of said first clock, in accordance with said control signal; and

a phase detector responsive to said teletext-like television signal and to said regenerated clock for detecting a phase difference to generate said control signal in accordance with said phase difference.

4,626,914

CARRIER SYNCHRONIZING SYSTEM FOR LOCKING A REMOTELY LOCATED CARRIER GENERATOR TO A REFERENCE CARRIER GENERATOR AT A BASE STATION

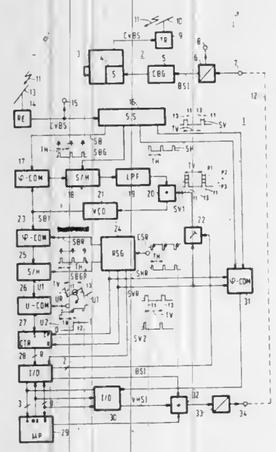
Hendrik Breimer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1985, Ser. No. 719,177

Claims priority, application Netherlands, Apr. 6, 1984, 8401101

Int. Cl.⁴ H04N *5/04, 9/44*

U.S. Cl. 358—148 **9 Claims**



1. A carrier synchronizing system, in which a reference carrier generator is present in a base station and a synchronized carrier generator in at least one remote station, carrier synchronizing information being transmitted from the base station to the remote station and a synchronized carrier and information to be transmitted therewith being transmitted from the remote station to the base station, the base station comprising a phase comparator means for generating carrier synchronizing information, characterized in that the base station comprises a periodically variable phase shifter to an input of which the synchronized carrier is applied, an output being coupled to an input of the phase comparator, the base station comprising a reference carrier generator for generating first and second periodic information components which occur with respective first and second periods, the first period comprising a plurality of second periods which each comprise a plurality of carrier periods, the periodically variable phase shifter receiving the first periodic information for providing a continuing phase shift during the first period, the phase comparator being followed by a resettable counter which is resettable under the control of the first periodic information components and to which the second periodic information components are applied as counting information, the counter being stopped by the phase comparator when the continuously shifted phase has become substantially equal to a reference phase, the counting result at counter outputs determining the carrier synchronizing information.

4,626,915

MOS SOLID-STATE IMAGE PICKUP DEVICE HAVING VERTICAL OVERFLOW DRAINS

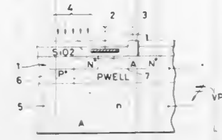
Norihiko Takatsu, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

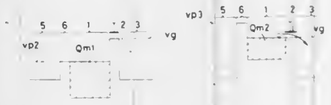
Filed Jul. 10, 1984, Ser. No. 629,321

Claims priority, application Japan, Jul. 15, 1983, 58-127577

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213 **7 Claims**





2. A camera for focusing an image of a scene to be picked up on a given surface and generating a picture signal corresponding to the image of the scene, said camera comprising:

(a) a MOS solid-state image pickup device for detecting a distribution of light intensities on said given surface, said solid-state image pickup device including:

a first region of n-type semiconductor extending in a direction along said given surface to generate charges corresponding to the light intensities,

a second region of p-type semiconductor arranged along said given surface to adjoin said first region,

a third region of n-type semiconductor arranged along said given surface to adjoin said second region,

a fourth region of p-type semiconductor arranged in a direction substantially perpendicular to a direction in which said given surface extends to adjoin said first region, and

a fifth region of n-type semiconductor arranged in a direction substantially perpendicular to the direction of extension of said given surface to adjoin said fourth region,

said first region having a first level of potential for said charges,

said second region having a second level of potential higher than said first level,

said third region having a third level of potential lower than said second level,

said fourth region having a fourth level of potential higher than said first level and lower than said second level prior to the start of the exposure of said given surface,

said fifth region having a fifth level of potential lower than said fourth level;

(b) means for controlling an exposure time of said given surface to said image of the scene; and

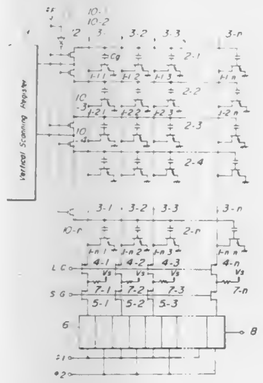
(c) means for shifting the potentials of said first and fourth regions in such a manner that the potential level of said first region is maintained lower than the potential level of said fourth region during a time that said given surface is exposed by said control means, said shift means including means for adjusting the potential difference between said fourth and fifth regions in such a manner that the potential level of said fourth region becomes higher than the potential level of said second region.

4,626,916

SOLID STATE IMAGE PICKUP DEVICE

Toyokazu Mizoguchi, Nagano, Japan; Jun-ichi Nishizawa, No. 6-16, 1-chome, Komegafukuro, Sendai City, Miyagi Pref., Japan; Sohbe Suzuki, Sendai, Japan, and Takashige Tamamushi, Sendai, Japan, assignors to Olympus Optical Co., Ltd., Tokyo and Jun-ichi Nishizawa, Miyagi, both of, Japan

Filed Nov. 29, 1983, Ser. No. 556,050
Claims priority, application Japan, Dec. 14, 1982, 57-217758
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.12 7 Claims



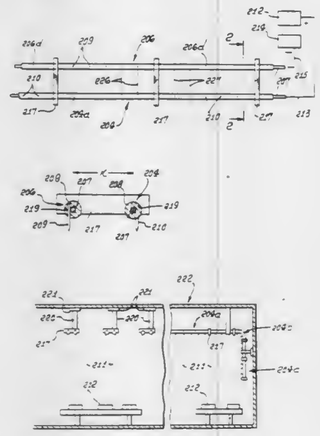
1. A solid state image pickup device comprising:
a plurality of picture cells each having a static induction transistor and arranged in a matrix having rows and columns,
means including a plurality of gate signal lines for supplying reset signal pulses and readout signal pulses to said picture cells placed on the same rows of said matrix with different timing, each reset signal pulse occurring earlier in time than a respective readout signal pulse,
means for generating said reset signal pulses and readout signal pulses and for scanning said gate signal supplying means said with said different timing,
means for reading out light signals stored in said picture cells placed on the same column of said matrix,
means for supplying said reset signal pulses having a positive potential enough to bias a PN junction between gate and drain regions of a respective SIT in the forward direction so as to successively reset charges stored in all of said SIT's of every said gate signal line, thereby changing said exposure time from reset instant to readout instant by changing the reset timing,
means for simultaneously and temporarily storing light signals stored in said cells on the same row and for converting said light signals into time series signals, and
switching means connected between said signal readout means and said temporary storage means for controlling the connection therebetween.

4,626,917

STATIC NEUTRALIZATION EMPLOYING NON-CORRODING ION DISPENSING TIPS

Donald G. Saurenman, Whittier, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation-in-part of Ser. No. 570,926, Jan. 16, 1984, Pat. No. 4,498,116, which is a continuation-in-part of Ser. No. 420,904, Sep. 21, 1982, Pat. No. 4,502,093, which is a continuation-in-part of Ser. No. 369,925, Apr. 19, 1982, Pat. No. 4,484,249, which is a continuation-in-part of Ser. No. 290,423, Aug. 6, 1981, Pat. No. 4,390,923, which is a continuation-in-part of Ser. No. 259,503, May 1, 1981, Pat. No. 4,388,667, which is a continuation-in-part of Ser. No. 241,684, Mar. 9, 1981, Pat. No. 4,493,289, which is a continuation-in-part of Ser. No. 124,242, Feb. 25, 1980, Pat. No. 4,282,830. This application Dec. 10, 1984, Ser. No. 680,143
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—216 20 Claims



1. In apparatus for reducing static electricity in a work zone, the combination that includes
(a) electrically conductive cable means having tips spaced therealong to dispense ions in response to voltage application to the cable means,
(b) the cable means defining cable extents each of which is flexible and includes elongated metallic core extent to which voltage is applicable, protective sleeve extent on and extending about the core extent, the sleeve defining a wall,
(c) and needles having shanks extending through said wall extents and extending adjacent the core extents to make sideward electrical contact therewith so as to receive voltage application, the needles defining the tips openly exposed outwardly of the cable extents to dispense ions into the atmosphere near the cable means,
(d) at least certain of the needles having surfaces at said tips consisting of tungsten or tungsten alloy for dispensing positive ions without corroding.

4,626,918

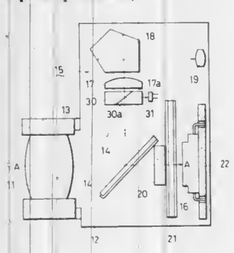
PHOTOMETRIC OPTICAL SYSTEM FOR SINGLE-LENS REFLEX ELECTRONIC PHOTOGRAPHIC CAMERA

Tahei Morisawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,124
Claims priority, application Japan, Dec. 21, 1983, 58-195450[U]
Int. Cl.[4] H04N *5/225*
U.S. Cl. 358—225 6 Claims

6. A single-lens reflex electronic photographic camera comprising:

an objective defining an optical axis;
a self-scanning photoconductive pickup device along the optical axis, the pickup device comprising a plurality of photoconductive elements arranged in an array and adapted to store individual electronic charges representative of picture elements;
a viewfinder mirror movable between a first position in which the mirror is out of the light path between the objective and the pickup device and a second position in which the mirror blocks the light path between the objective and the pickup device;
a low-pass optical filter disposed along the optical axis between the mirror and the pickup device;
a shutter disposed along the optical axis between the low-pass filter and the pickup device;



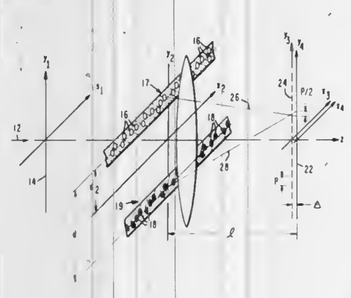
a viewfinder optical system disposed along the path of the light reflected by the mirror in the second position;
a compensation filter disposed along the light path of the viewfinder optical system, the compensation filter having an equivalent optical length with the optical low-pass filter;
a single photometric element laterally disposed relative to the path of light through the viewfinder optical system; and
means for diverting a portion of the light passing through the compensation filter to the photometric element to permit the photometric element to generate an electrical signal representative of the intensity of the light passing through the objective.

4,626,919

APPARATUS FOR DE-EMPHASIZING LOW SPATIAL FREQUENCIES IN OPTICAL IMAGING SYSTEMS

Emanuel Marom, Beverly Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 24, 1985, Ser. No. 747,602
Int. Cl.[4] H04N *9/06*
U.S. Cl. 358—225 12 Claims



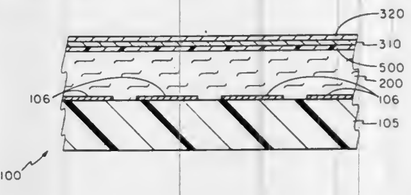
1. Apparatus for de-emphasizing low spatial frequencies in a two-dimensional optical imaging system, comprising:
first and second pluralities of pupils each randomly distributed in first and second parallel, coplanar strips, respectively, where the plane of the strips is positioned parallel to and between a source of optical information and an output image plane, the pupils of the first strip being circular in shape, and the pupils of the second strip being ring-shaped;
imaging means positioned between the plane of the pupils and the output image plane for imaging the light passing through the pupils from the source of optical information onto the output image plane; and
a Ronchi grating positioned between the imaging means and the output plane and parallel thereto at a distance from the output plane such as to provide interlacing of the image transmitted through the first and second pluarlities of pupils, the grid lines of the grating being parallel to the strips of pupils.

4,626,920

SOLID STATE LIGHT MODULATOR STRUCTURE

William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Jan. 30, 1984, Ser. No. 574,929
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] H04N *5/74*
U.S. Cl. 358—234 26 Claims



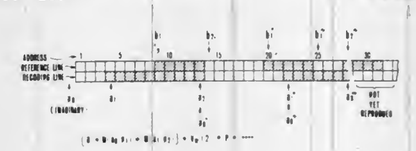
1. Apparatus for generating an image from an input video signal, comprising:
a semiconductor device having an array of spaced charge storage electrodes thereon;
an elastomer layer disposed on said semiconductor device over said array of electrodes, and having a thickness in the range between one-tenth and one times the average spacing between charge storage electrodes;
at least one conductive layer disposed over said elastomer layer;
said semiconductor device being responsive to said input video signal to selectively apply voltages between said charge storage electrodes and said at least one conductive layer to cause deformations of the metal layer and the elastomer layer; and
an optical subsystem for converting deformations of said at least one conductive layer into an image.

4,626,921

METHOD AND CIRCUIT FOR DEMODULATING ENCODED DATA OF FACSIMILE APPARATUS

Nobuhiro Ohtani, and Hidekazu Sakurai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,160
Claims priority, application Japan, Jul. 12, 1983, 58-127166
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—260 3 Claims



1. A method of decoding two-dimensionally encoded facsimile data,
wherein the decoding is implemented by using the interrationship between a decoding line and a reference line immediately preceding the decoding line,

wherein said two-dimensionally encoded facsimile data are grouped into a horizontal mode, a vertical mode and a pass mode,

wherein a changing pixel is defined as an element whose color is different from that of the previous element along the same line, and wherein

a_0 is a reference element;

a_1 is the next changing element to the right of a_0 on the coding line;

a_2 is the next changing element to the right of a_1 on the coding line;

b_1 is the first changing element on the reference line to the right of a_0 and of opposite color to a_0;

said method comprising the steps of:

receiving the encoded facsimile data;

detecting b_1;

detecting a_1 and a_2;

storing the address of b_1 into a reference line address memory, the changing pixels on the reference line being detected by continuously increasing the address of said reference line address memory;

comparing the addresses of b_1 and a_1 during said vertical mode, and if $a_1 > b_1$, the address of a_1 is stored into said reference line address memory;

comparing the addresses of b_1 and a_2 during said horizontal mode, and if $a_2 > b_1$, the address of a_2 is stored into said reference line address memory.

4,626,922

PICTURE SIGNAL DISCRIMINATING CIRCUIT

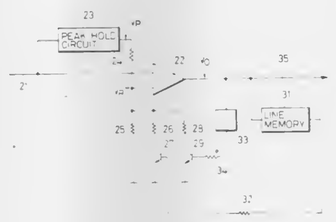
Hiroyuki Saitoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,201

Claims priority, application Japan, Oct. 7, 1983, 58-187093

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—282 **3 Claims**



1. A picture signal discriminating circuit for encoding an analog picture signal which is obtained by raster-scanning picture element targets (S_{ij}) in an original picture, said circuit comprising:

a. a comparator for binary-encoding said analog picture signal by comparing said picture signal to a threshold level, and

b. threshold level setting means for changing the threshold level of said comparator into one of a plurality of values according to previously binary-encoded values of said analog picture signal,

said previously binary-encoded values corresponding to the picture elements of said original picture in the same raster immediately adjacent the target being scanned (S_{ij-1}) and in the prior raster immediately adjacent the target being scanned (S_{i-1j}), and

said threshold level having a maximum value determined according to a peak value of said previously binary-coded values.

4,626,923

IMAGE PROCESSING APPARATUS

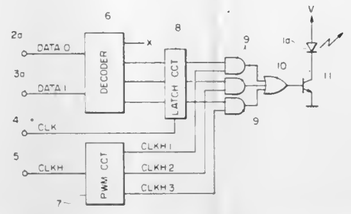
Tadashi Yoshida, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,740

Claims priority, application Japan, Mar. 8, 1983, 58-37725

Int. Cl.[4] H04M *1/40*

U.S. Cl. 353—283 **10 Claims**



1. An image processing apparatus for processing image data to produce dots of various sizes to be recorded to reproduce an image, said apparatus comprising:

means for inputting image data; and

means for forming a pulse-width modulated signal determining the size of a dot to be recorded in accordance with the value of image data input by said input means,

said signal forming means including means for producing a plurality of different pulse-width modulated signals with the center of any dot to be recorded at any one location and determined by any one of said pulse-width modulated signals being the same, and means for selecting one of said plurality of pulse-width modulated signals in accordance with the value of the image data input by said input means.

4,626,924

IMAGE FORMING APPARATUS

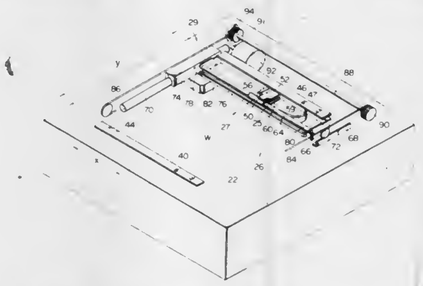
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 12, 1984, Ser. No. 660,071

Claims priority, application Japan, Oct. 14, 1983, 58-191921

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 **15 Claims**



1. An image forming apparatus for forming images on recording materials in response to image information of originals set on an original table, comprising:

a reading means having an initial position and being two-dimensionally moved along the original table, on which the original is set, to read image information of the original and generate an image information signal;

detecting means for detecting the initial position of the reading means and outputting an initial position detection signal;

a first means for moving the reading means in a direction;

a second means for moving the reading means in another direction intersecting with the direction in which the reading means is moved by the first moving means, said second moving means cooperating with the first one to two-dimensionally move the reading means along the original;

a means for forming an image on the recording material in response to the image information signal applied from the reading means;

a means for detecting the size of the recording material on which the image is to be formed and generating a size detection signal; and

a means for displaying on the original table the area which the reading means can read, in response to the size detection signal and the initial position detection signal, said display means being arranged at the first and second moving means, respectively.

4,626,925

PHOTOELECTRIC READER/PRINTER WITH VARIABLE READING AREA

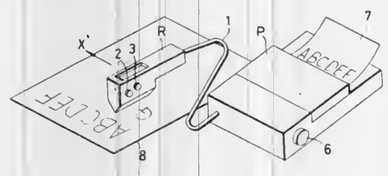
Kenji Toyoda, Chigasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,810

Claims priority, application Japan, Jun. 13, 1983, 58-105547

Int. Cl.[4] H04N *1/04, 1/024*

U.S. Cl. 358—285 **11 Claims**



1. Apparatus for optically reading an object comprising:

(a) an optical system for forming an image of the object on a determined plane;

(b) photo-electric conversion means having a light reception surface extending in one direction in a strip form, said light reception surface being disposed approximately coincident with said determined image plane and said photo-electric conversion means being able to produce photo-electric signals corresponding to the distribution of light intensity on said light reception surface in series,

(c) displacing means for producing a relative displacement between said object and a detection area of said object, said detection area being an area conjugate with said light reception surface through said optical system and extending in one direction of said object, and said relative displacement being produced in a direction nearly orthogonal to the direction in which said detection area extends;

(d) reading means for reading said photo-electric signals in response to the relative displacement between said detection area and said object;

(e) setting means for setting a continuous, optionally selected sectional area within said detection area; and

(f) means for transmitting said photo-electric signals of said photo-electric conversion means to said reading means, said transmitting means including gate means for inhibiting those photo-electric signals from being read in said reading means which correspond to an area other than said optionally set sectional area and control means for controlling said gate means in such manner that during the period corresponding to said optionally set sectional area said photo-electric signals are allowed to be transmitted to said reading means, said control means including means responsive to said setting means to generate a pulse having a pulse width corresponding to said optionally set sectional area.

4,626,926

PRINTER USED FOR A TELEVISION RECEIVER

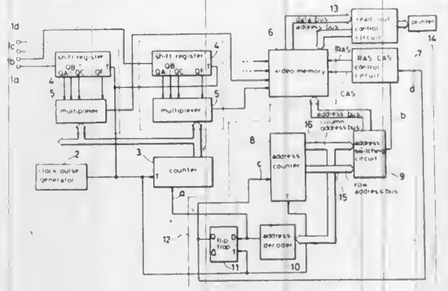
Shunichi Nakamura, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,601

Claims priority, application Japan, Jun. 8, 1983, 58-103596; Nov. 2, 1983, 58-206975; Nov. 28, 1983, 58-225281; Nov. 28, 1983, 58-225282

Int. Cl.[4] H04N *1/21, 1/23;* **G01D** *15/06*

U.S. Cl. 358—296 **5 Claims**



1. A printer used for a TV receiver, the printer comprising:

a writing address control circuit for generating row address signals, and column address signals except when generating the row address signals;

a shift register to which digital signals corresponding to video signals of TV signals are input, and which outputs the input digital signals as non-delayed output signals and delayed signals which are delayed by a strobe signal time which is required for delivering the row address;

a multiplexer to which the outputs of the shift register are input, and which generates output signals delayed relative to any previous outputs therefrom by a strobe signal time which is required for delivering the row address when and after each row address signal is generated;

a video memory to which the output signals of the multiplexer are input, and which stores the signals input in accordance with the row and column address signals from the writing address control circuit;

a read-out control circuit for reading out the signals stored in the video memory; and

a printer for printing out the signals read out by the read-out control circuit.

4,626,927

RECORDING AND REPRODUCING APPARATUS FOR RECORDING AND REPRODUCING A CARRIER CHROMINANCE SIGNAL WITH PRE-EMPHASIS AND DE-EMPHASIS

Akira Hirota, Chigasaki; Takuya Tsushima, Ayase, and Nobuyoshi Suzuki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 25, 1984, Ser. No. 634,407

Claims priority, application Japan, Jul. 29, 1983, 58-138872

Int. Cl.[4] H04N *5/76, 9/493*

U.S. Cl. 358—310 **10 Claims**

1. A recording and reproducing apparatus for recording a carrier chrominance signal, said apparatus comprising:

separating means for separating a carrier chrominance signal from a color video signal;

recording carrier chrominance signal processing means for converting the carrier chrominance signal into a carrier chrominance signal having a signal format suited for recording and reproduction;

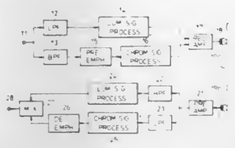
recording means for recording an output signal of said recording carrier chrominance signal processing means on a recording medium;

reproducing means for reproducing the recorded signal from

said recording medium;

reproduced carrier chrominance signal processing means for converting the reproduced signal from said reproducing means into a reproduced carrier chrominance signal having an original signal format; and

de-emphasis circuit means responsive to the reproduced carrier chrominance signal from said reproduced carrier chrominance signal processing means, for subjecting the reproduced carrier chrominance signal to a de-emphasis so that a high-frequency component in a vertical spatial frequency of the reproduced carrier chrominance signal is relatively attenuated compared to a low-frequency component of the reproduced carrier chrominance signal.



4,626,928

ORTHOGONAL PHASE MODULATION AND DEMODULATION METHODS

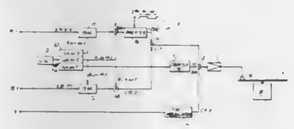
Masahiko Nagano, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 2, 1983, Ser. No. 519,730

Claims priority, application Japan, Aug. 9, 1982, 57-137375; Sep. 20, 1982, 57-162183; Jun. 13, 1983, 58-104104; Jun. 13, 1983, 58-104106

Int. Cl.[4] H04N *9/493*

U.S. Cl. 358—310 **74 Claims**



1. An orthogonal phase modulation method comprising the steps of: phase modulating first and second carrier signals by two modulation signals respectively, wherein said two modulation signals being two color signals or two luminance signals, said first and second carrier signals having the same frequency of $(n/2)f_H$ (where n is an integer, and f_H is a horizontal scanning frequency), said first and second carrier signals being orthogonal in phase to each other, and each having a phase modulation index equal to or less that 1.5 radian; inverting on of the two phase modulated signals every one horizontal scanning period (1H); combining said phase modulated signal alternately inverted with the other phase modulated signal not inverted; and supplying the combined phase modulated signals to an input means for receiving said combined signals.

4,626,929

COLOR VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Yutaka Ichinoi, Yokohama, and Naomichi Nishimoto, Tachikawa, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 12, 1984, Ser. No. 588,380

Claims priority, application Japan, Mar. 15, 1983, 58-42660; Mar. 15, 1983, 58-42661; Mar. 18, 1983, 58-45747

Int. Cl.[4] H04N *9/493, 5/76*

U.S. Cl. 358—310 **10 Claims**

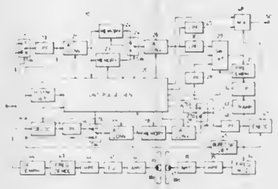
1, A color video signal recording and reproducing apparatus for recording an analog time-division-multiplexed signal on a recording medium, said time-division-multiplexed signal having a time base compressed luminance signal and a time base compressed line-sequential color difference signal within each horizontal scanning period so that said time base compressed line-sequential color difference signal is time-division-multiplexed with the time base compressed luminance signal, and for reproducing said time-division-multiplexed signal from the recording medium, said reproduced time-division-multiplexed signal being subjected to a time base expansion so as to obtain a reproduced luminance signal and a reproduced line-sequential color difference signal which have been returned to an original time base, said recording and reproducing apparatus comprising:

a first switching circuit for selectively passing, at the time of the recording, a color video signal which is to be recorded and for selectively passing the reproduced time-division-multiplexed signal at the time of the reproduction;

a filter circuit supplied with the output signal of said first switching circuit and having such a passband that a luminance signal within the color video signal which is to be recorded is separated and filtered at the time of the recording and the reproduced time-division-multiplexed signal is passed at the time of the reproduction;

a decoder supplied with the color video signal which is to be recorded for separating and filtering a chrominance signal from the color video signal and for obtaining a line-sequential color difference signal;

a second switching circuit for selectively passing the output line-sequential color difference signal of said decoder at the time of the recording and for selectively passing the output reproduced time-division-multiplexed signal of said filter circuit at the time of the reproduction;



first time base compressing means for subjecting the output luminance signal of said filter circuit to an analog-to-digital conversion and for perfoming a time base compression with respect to the digitally converted luminance signal by use of a first random access memory and a first control pulse generating means so as to produce a first digital time base compressed luminance signal, said first control pulse generating means generating a first control pulse and a second control pulse which has a frequency higher than a frequency of said first control pulse, said digitally converted luminance signal being written into said first random access memory depending on said first control pulse and read out from said first random access memory depending on said second control pulse so as to produce said first digital time base compressed luminance signal;

second time base compressing means for subjecting the output line-sequential color difference signal of said second switching circuit to an analog-to-digital conversion and for performing a time base compression with respect to the digitally converted line-sequential color difference signal by use of a second random access memory and a second control pulse generating means so as to produce a first digital time base compressed line-sequential color difference signal, said second control pulse generating means generating a third control pulse and a fourth control pulse which has a frequency higher than a frequency of said third control pulse, said digitally converted line-sequential color difference signal being written into said second random access memory depending on said third control pulse and read out from said second random access memory depending on said fourth control pulse so as to produce said first digital time base compressed line-sequential color difference signal;

discriminating signal producing means for producing a discriminating signal which is used to discriminate said time base compressed line-sequential color difference signal;

time-division-multiplexed signal producing means for producing said time-division-multiplexed signal by time-division-multiplexing a time base compressed luminance signal and a time base compressed line-sequential color difference signal which are obtained by subjecting the output digital signals of said first and second time base compressing means to a digital-to-analog conversion and said discriminating signal;

recording means for frequency-modulating said time-division-multiplexed signal and for recording the frequency modulated time-division-multiplexed signal on the recording medium;

reproducing means for reproducing the recorded signal from the recording medium and for demodulating the reproduced signal so as to obtain and supply the reproduced time-division-multiplexed signal to said first swtiching circuit;

first time base expanding means for performing a time base expansion which compensates the time base compression in said first time base compressing means, with respect to a second digital time base compressed luminance signal which has been obtained by subjecting said reproduced time-division-multiplexed signal from said filter circuit to an analog-to-digital conversion, by use of said first random access memory and said first control pulse generating means so as to obtain the reproduced digital luminance signal, said second digital time base compressed luminance signal being written into said fist random access memory depending on said second control pulse and read out from said first random access memory depending on said first control pulse so as to obtain said reproduced digital luminance signal;

second time base expanding means for performing a time base expansion which compensates the time base compression in said second time base compressing means, with respect to a second digital time base compressed line-sequential color difference signal which has been obtained by subjecting the output reproduced time-division-multiplexed signal of said second switching circuit to an analog-to-digital conversion, by use of said second random access memory and said second control pulse generating means so as to obtain the reproduced digital line-sequential color difference signal, said second digital time base compressed line-sequential color difference signal being written into said second random access memory depending on said fourth control pulse and read out from said second random access memory depending on said third control pulse so as to obtain said reproduced digital line-sequential color difference signal; and

digital-to-analog conversion circuit means for digital-to-analog converting said reproduced digital luminance signal and said reproduced digital line-sequential color difference signal to obtain a reproduced analog luminance signal and a reproduced analog line-sequential color difference signal.

4,626,930

ROTARY RECORDING MEDIUM HAVING DIFFERENT VIDEO SIGNALS RECORDED ON MUTUALLY ADJACENT TRACKS AND REPRODUCING APPARATUS THEREFOR

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 520,138, Aug. 4, 1983, abandoned, which is a division of Ser. No. 420,856, Sep. 21, 1982, abandoned. This application Mar. 15, 1985, Ser. No. 712,908

Claims priority, application Japan, Sep. 26, 1981, 56-152352

Int. Cl.[4] H04N *5/76, 5/78;* **G11B** *7/00*

U.S. Cl. 358—342 **6 Claims**

1. A rotary recording medium which is playable on a reproducing apparatus having a reproducing element for reproducing signal from the rotary recording medium, said rotary recording medium comprising:

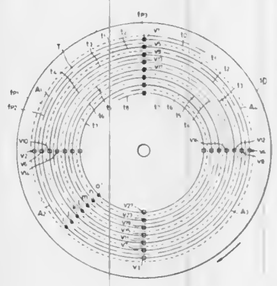
a spiral track (T) made up of a plurality of consecutive track turns;

first and second video signals alternately recorded on said plurality of track turns so that two mutually adjacent track turns have different video signals recorded thereon, said first video signal relating to a first program, said second video signal relating to a second program which is different from said first program; and

first and second audio signals recorded on said plurality of track turns, said first audio signal being related to said first program, said second audio signal being related to said second program;

said first program being reproduced responsive to said reproducing element scanning over (2n+1)-th track turns with a kick at each of kicking position (**V3**, **V11**, **V19**, . . .) where said reproducing element is kicked between (2n+1)-th and (2n+3)-th track turns, where n+0, 1,2, . . . ;

said second program being reproduced responsive to said reproducing element scanning over (2n+2)-th track turns with a kick at each of a plurality of kicking positions (**V7**, **V15**, **V23**, . . .) where said reproducing element is kicked between (2n+2)-th and (2n+4)-th track turns;



said kicking positions (**V3**, **V7**, **V11**, . . .) being arranged along a radial line extending across at least a part of said rotary recording medium;

a first continuous track portion including a kicking position which is constituted by portions of the (2n+1)-th and (2n+2)-th track turns which are consecutive track turns;

a second continuous track portion including a kicking position which is constituted by portions of the (2n+2)-th and (2n+3)-th track turns, which are consecutive track turns;

a third continuous track portion including a kicking position which is constituted by portions of the (2n+3)-th and (2n+4)-th track turns, which are consecutive track turns;

said first and second continuous track portions containing said first audio signal having identical audio information so that a continuity of audio information related to said first program is maintained as said reproducing element is being kicked between said first and second continuous track portions;

said second and third continuous track portions containing said second audio signal having identical audio information so that a continuity of audio information related to said second program is maintained as said reproducing elemnt is being kicked between said second and third continuous track portions.

4,626,931

CONTACT PRINTING APPARATUS WITH PRESETTABLE MEANS INDICATING NUMBER OF COPY AND MASTER TAPE LIFE EXPECTANCY

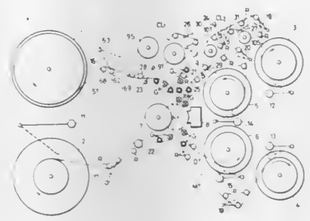
Takeshi Hori, Kanagawa; Yoshiharu Higano, Tokyo; Toshio Shirai, Kanagawa, and Toru Naganuma, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,766

Claims priority, application Japan, May 29, 1984, 59-109173

Int. Cl.[4] G11B *5/86*

U.S. Cl. 360—16 **10 Claims**



1. Contact printing apparatus for a magnetic tape; comprising:

means defining a printing station; and

means for driving a master tape and a slave tape so that successive portions of each are brought into substantial contract with successive portions of the other at said printing station;

said printing station means including means for applying a printing magnetic field to said successive portions while they are in substantial contact with each other at said printing station, so that data on said master tape is copied onto said slave tape and said slave tape becomes a copy of said master tape, whereby a single master tape can be employed to produce a plurality of copies;

further comprising means for counting the number of copies thus produced; and

indicating means for providing an indication corresponding to the remaining life expectancy of said master tape and including first preset means for presetting a value corresponding to the initial life expectancy of said master tape and second preset means for presetting a value corresponding to a desired number of said copies to be produced.

4,626,932

ROTATING VIDEO HEAD SWITCHING CONTROL SYSTEM

Jürgen Müller, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,832

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306791

Int. Cl.[4] H04N *5/78;* **G11B** *15/14*

U.S. Cl. 360—33.1 **4 Claims**



1. Rotating video head switching control system having a rotating head wheel (**4**) carrying at least two transducer heads (**6, 7**) for transducing video signals from a tape (**1**) into electrical signal words including video image signals and synchronizing signals;

an output circuit (**12, 13; 28, 29**) for transmitting the transduced signal words for further processing;

synchronizing signal recognition circuit means (**10, 21, 22**), for recognizing the presence of synchronizing signals in the siganl words, coupled to the transducer heads;

controlled switching means (**11, 26, 27**) for selectively switching one of the transducer heads (**6, 7**) to the output circuit and for steering the signal derived from one of the transducer heads for further processing,

and wherein, in accordance with the invention,

the synchronizing signal recognition circuit means (**10, 21, 22**) are connected to control, upon first recognizing a synchronizing signal, the controlled switching means (**11, 26, 27**) for switching, into connection with the output circuit, that one of the magnetic-transducer heads, from which the first synchronizing signal was derived, and for steering the signal words to the output circuit, and

disconnecting at least one other transducer head from the output circuit, to prevent transmission of noise signals from the other transducer head to the output circuit.

4,626,933

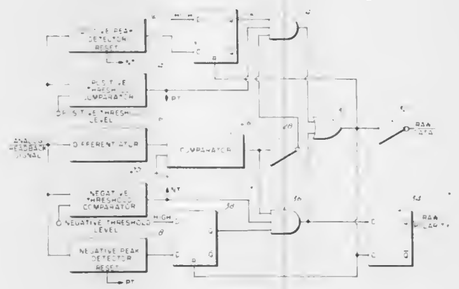
METHOD AND APPARATUS FOR QUALIFYING DATA

Nicholas J. Bucska, and James F. Hopper, both of Louisville, Colo., assignors to Amcodyne Incorporated, Longmont, Colo.

Filed Aug. 18, 1983, Ser. No. 524,426

Int. Cl.[4] G11B *5/02, 5/09*

U.S. Cl. 360—51 **6 Claims**



1. A method for use in removing invalid read data, comprising:

reading data from a storage medium, said data being represented by an analog signal having peaks, said data including both valid and invalid information;

providing a first predetermined threshold level relating to a first polarity;

providing a second predetermined threshold level relating to a second polarity;

determining that the analog signal has exceeded said first predetermined threshold level;

determining that the analog signal has exceeded said second predetermined threshold level, the period between the determination of the exceeding of the first predetermined threshold level and the second predetermined threshold level defining an interval;

updating substantially instantaneously in said interval a threshold value upon detection of the analog signal being greater than a current value of said threshold value;

continuing the updating of said threshold value in said interval to a value corresponding to a peak having a maximum signal value;

accepting as valid said peak having said first polarity and having said maximum signal value; and

rejecting as invalid any peak occurring in said interval having said first polarity and having an amplitude which is not substantially equal to said maximum signal value.

4,626,934

CUE SIGNAL RECORDING CIRCUIT FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

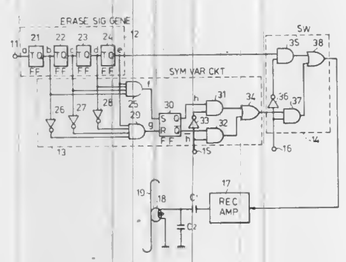
Masajhi Yoshida, Yokohama; Akira Hirota, Chigasaki; Yoshihiko Ota; Masahiko Tsuruta, both of Yokohama, and Hidetoshi Ozaki, Chofu, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jan. 16, 1985, Ser. No. 692,644

Claims priority, application Japan, Jan. 19, 1984, 59-7834

Int. Cl.[4] G11B *5/03, 5/09*

U.S. Cl. 360—66 **7 Claims**



1. A cue signal recording circuit for a magnetic recording and reproducing apparatus, said cue signal recording circuit comprising:

erase signal generating means for generating an erase signal having a relatively high frequency, said erase signal generating means comprising a first digital circuit for generating as said erase signal a first pulse signal having a repetition frequency equal to said relatively high frequency and having a duty factor of approximately 50%;

symmetry varying means responsive to a first external signal having a relatively low frequency for varying the symmetry of the waveform of the output erase signal of said erase signal generating means at said relatively low frequency, said symmetry varying means comprising a second digital circuit for forming second and third pulse signals and for alternately producing said second and third pulse signals at the frequency of said first external signal, said second pulse having a repetition frequency approximately equal to the repetition frequency of said first pulse signal and having a duty factor different from the duty factor of said first pulse signal, said third pulse signal having a repetition frequency approximately equal to the repetition frequency approximately of said first pulse signal and having a duty factor different from said first and second pulse signals;

switching means having a first input terminal applied with the output erase signal of said erase signal generating means and a second input terminal applied with an output signal of said symmetry varying means, said switching means being connected to said second input terminal so as to pass the output signal of said symmetry varying means for a predetermined short time period and being thereafter connected to said first input terminal so as to pass the output erase signal of said erase signal generating means responsive to a second external signal, said switching means comprising a digital switch responsive to said second external signal for selectively passing the output signals of said first and second digital circuits; and

erase head means supplied with the output signal of said switching means for recording on a magnetic tape a signal having said relatively low frequency as a cue signal for said predetermined short time period and thereafter erasing pre-recorded signals on said magnetic tape.

4,626,935

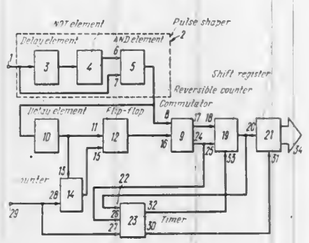
DEVICE FOR COUPLING CASSETTE TAPE RECORDER TO MICROCOMPUTER

Oleg S. Gorbachev, Zagrebsky bulvar, 5, korpus 3, kv. 272, Leningrad; Anatoly F. Ioffe, ulitsa 26 Bakinskikh komissarov, 7, korpus 4, kv. 59; Mikhail V. Kulagin, 5 Parkovaya ulitsa 39, korpus 2, kv. 10, both of Moscow; Boris I. Ruvinsky, ulitsa O.Dundicha 10, kv. 123; Vladimir S. Khorin, prospekt Raevskogo 6, kv. 17, both of Leningrad, and Jury V. Chugunov, ulitsa Miklukho-Maklaya, 65, korpus 3, kv. 4, Moscow, all of U.S.S.R.

Filed Jan. 14, 1985, Ser. No. 691,214

Int. Cl.[4] G11B *31/00*

U.S. Cl. 360—67 **2 Claims**



1. A device for coupling a cassette tape recorder and a microcomputer, comprising:

a pulse shaper having an input and an output;

said input of said pulse shaper, which is an information input of the device;

a delay element having an input and an output, said input being connected to said output of said pulse shaper;

a flip-flop having a first input, a second input and an output, said first input being connected to said output of said delay element;

a commutator having a first input, a second input, a first output, and a second output, said first input being connected to said output of said pulse shaper, and said second input being connected to said output of said flip-flop;

a reversible counter having a first input and a second input being connected, respectively, to said first and second outputs of said commutator, and a third input, and an output;

a shift register having a first input connected to said output of said reversible counter, a second input, and an output which is an output of said device;

a counter having a first reset input connected to said output of said delay element, a second counting input which is a clock input of said device, and an output connected to said second input of said flip-flop;

a timer having a first input connected to said output of said reversible counter, a second input connected to said second output of said commutator, a third input joined with said clock input of said device, a first output connected to said third setting input of said reversible counter, and a second output connected to said second shift input of said shift register.

4,626,936

RELATIVE VELOCITY CONTROL DEVICE FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

Kazuo Yoshino, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,372

Claims priority, application Japan, Apr. 30, 1984, 59-87366; Sep. 5, 1984, 59-184376

Int. Cl.[4] G11B *5/52*

U.S. Cl. 360—70 **7 Claims**

7. A relative velocity control device for use with the magnetic recording and reproducing apparatus comprising a means

for inputting tape running conditions to drive a tape, a means for detecting the running conditions of said tape which is actually being driven, an operational means for obtaining a rotation number of a drum motor using the tape driver and detector means, and said rotation number satisfying a conditional equation which makes the relative velocity between a head and a tape constant, a means for detecting a rotation number of a drum which is actually being driven, and a means for controlling the rotation number of said drum to drive the drum motor, wherein the relative velocity can be controlled constant.



4,626,937

MAGNETIC-TAPE APPARATUS HAVING A DISC WITH TWO CONTROL SURFACES

Heribert Hutterer, and Johann Veigl, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 656,102

Claims priority, application Austria, Sep. 29, 1983, 3464/83

Int. Cl.[4] G11B *5/008, 15/00, 15/44*

U.S. Cl. 360—90 **3 Claims**



1. A magnetic-tape apparatus comprising:

at least two manually-operable push-butons for selecting modes of operation of the apparatus,

a respective stop associated with each button for defining the mode of operation selected by actuation of the respective button,

at least one apparatus part arranged to be positioned in conformity with the selected mode, and

a servo mechanism which operates responsive to actuation of a button for positioning the apparatus part, said servo mechanism comprising

a motor,

a servo disc arranged to be driven by the motor for rotation upon actuation of a button, and having a first eccentric means arranged on the disc, a drive member arranged to be movable by said eccentric means,

an actuating member arranged to position the apparatus part, said actuating member being movable by the drive member to different positions defined by said stops, and

a control device comprising a second eccentric means arranged to be driven by said motor; at least one scanning element for scanning said stops, said scanning element arranged to cooperate with the second eccentric means and the actuating member, and to be released by said second eccentric means to scan the stops; and a spring arranged to bias said scanning element against a stop corresponding to the selected mode so as to scan said stop,

said servo mechanism being so arranged that actuation of a button first causes the second eccentric means to release the scanning element in order to scan the stops, said spring moving the actuating member to the position defined by the stop corresponding to the selected mode, and urging the scanning element against that stop; and said first eccentric means then moves said drive member so as to cause said drive member to move the actuating member, and the actuating member to position the apparatus part,

characterized in that said servo disc has a radial surface carrying a disc-shaped axially projecting portion having an endless groove formed in one side of said disc, and having a circumferential cam; and in that said endless groove constitutes the first eccentric means, and the circumferential cam constitutes the second eccentric means.

4,626,938

TAPE LOADING DEVICE IN A RECORDING AND/OR REPRODUCING APPARATUS

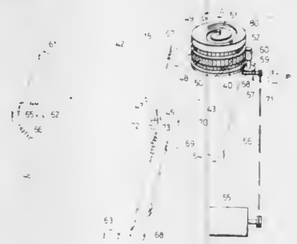
Hiroyuki Umeda, and Kazutaka Ashida, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 28, 1983, Ser. No. 470,715

Claims priority, application Japan, Mar. 8, 1982, 57-36176; Mar. 8, 1982, 57-36177; Mar. 10, 1982, 57-37369; Mar. 10, 1982, 57-33357[U]; Mar. 11, 1982, 57-34157[U]; Mar. 11, 1982, 57-34158[U]

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—95 **11 Claims**



1. A tape loading device in a recording and/or reproducing apparatus comprising a guide drum having heads for recording and/or reproducing signals onto a tape, said tape loading device comprising:

a first belt arranged along a first belt path which has a first section extending between said guide drum and a cassette accommodating said tape;

a second belt arranged along a second belt path which has a second section extending between said guide drum and said cassette;

driving means for driving said first and second belts so that each of said first and second belts in the respective first and second sections travels toward said guide drum during a tape loading mode and travels toward said cassette during a tape unloading mode;

a reflecting plate which rotates unitarily with said driving means so as to represent a rotary angle of said driving means;

a detector means comprising a light emitting element and a light receiving element arranged adjacent to each other for emitting a light to said reflecting plate and receiving the light which is reflected by said reflecting plate so as to detect the rotary angle of said driving means;

a pair of tape guide means movable in response to the travel of said first and second belts for intercepting the tape within said cassette and moving to predetermined positions in the vicinity of said guide drum during the tape loading mode, to guide the tape at said predetermined positions so that the tape travels along a predetermined tape path with respect to said guide drum for a predetermined range; and

guide path means for guiding said pair of tape guide means so that said tape guide means move along predetermined moving paths,

said driving means comprising a first rotary body having said first belt fit around its outer periphery to cause said first belt to travel, a second rotary body having said second belt fit around its outer periphery to cause said second belt to travel, said first and second rotary bodies being provided coaxially, a driving rotary body provided coaxially between said first and second rotary bodies for rotating substantially unitarily said first and second rotary bodies, a driving force generating means for rotating said driving rotary body so that said first, second and driving rotary bodies rotate in one rotational direction during said tape loading mode and in an opposite rotational direction during said tape unloading mode, a first spring member connected between said first rotary body and said driving rotary body, and a second spring member connected between said second rotary body and said driving rotary body,

said driving rotary body over-rotating after said pair of tape guide means reach said predetermined positions during said tape loading mode so that said first and second spring members are deformed and urge said first and second rotary bodies in said one rotational direction, the rotation of said driving rotary body being stopped when said detector detects a specific rotary angle of said driving means.

4,626,939

EJECTION MECHANISM FOR TAPE PLAYER

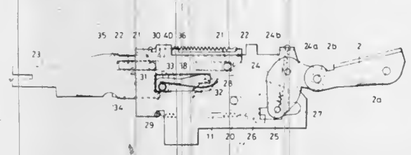
Kazuki Takai; Toshihiro Ikahata, and Wataru Watanabe, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,575

Claims priority, application Japan, Dec. 31, 1982, 57-228293; Dec. 31, 1982, 57-228294

Int. Cl.[4] G11B *17/04*

U.S. Cl. 360—96.5 **2 Claims**



1. In an ejection mechanism for a tape cassette player having vertically disposed drive shafts for engaging the spool bores of a cassette when said cassette is moved in a downward direction thereonto, said player including a frame positively fixed with respect to movable elements of said ejection mechanism, said ejection mechanism being operable to accept a cassette partially inserted into a forward or front portion of said mechanism onto a pack guide and urged to the rear thereof by the operator, said ejection mechanism including a guide arm pivotally mounted on said frame and coupled to raise said pack guide to an ejecting position responsively to a rotation of said guide arm, a pack stopper mounted for front-to-rear motion along said guide arm, a first or ejection link pivotally mounted on said guide arm, an inversion spring coupling said ejection link to said pack stopper and disposed to withdraw a partially inserted cassette engaging said pack stopper further into said pack guide or to urge said pack stopper to eject said cassette according to the angular position of said ejection link, and an ejection member mounted for reciprocating front-to-rear motion and having associated therewith first biasing means for biasing said ejection member forward, the improvement comprising:

an operation member disposed proximate to said ejection member and mounted for reciprocating front-to-rear motion and having associated therewith second biasing means for biasing said operation member forward; a connection member coupled between said operation member and said ejection link to rotate said ejection link in opposite directions by reciprocating motion of said operation member; releasable latch means configured to lockingly couple said ejection member and operation member together as a coupled pair in the forward positions thereof; latch release means for actuating said latch means to a releasing condition at a terminal portion of the rearward stroke of said coupled pair to release said operation member to be urged to said forward position by said second biasing means to rotate said ejection link by said connection member to assist in the ejection of said cassette; and coupling means for coupling said ejection member to said guide arm so that during an initial portion of the rearward motion of said ejection member said guide arm is pivoted to raise said pack guide to said ejecting position.

4,626,940

TAPE RECORDER WITH RECIPROCATING MAGNETIC HEADS

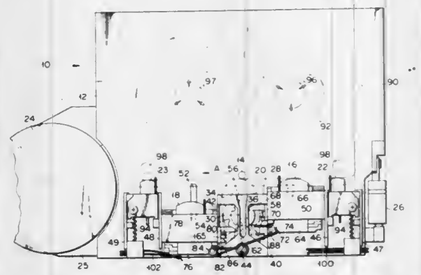
Minoru Kobayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,265

Claims priority, application Japan, Jun. 7, 1982, 57-97391; Jun. 10, 1982, 57-99524; Jun. 10, 1982, 57-99525; Jun. 10, 1982, 57-99526

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—96.3 **40 Claims**



1. A tape recorder which includes a capstan rotatably supported by a base, a flywheel attached to the capstan, and a pair of reel shafts rotatably supported by the base, comprising:

drive means for rotating the capstan;

magnetic reproducing means for reproducing data from a magnetic tape, said reproducing means being arranged on the base to reciprocate along a predetermined direction between an advanced position where the reproducing means is in contact with a magnetic tape and a retreated position where the reproducing means is spaced from the magnetic tape;

rotating means rotatably supported by the base for moving the reproducing means in the predetermined direction when the rotating means is rotated;

transmission means for engaging with the drive means and the rotating means to transmit the driving force of the drive means to the rotating means to rotate the rotating means;

control means for controlling the engagement of the transmission means with the rotating means and the drive means thereby controlling the movement of the magnetic reproducing means, said control means including: locking means normally engaged with the transmission means to disengage the latter from at least one of the rotating means and drive means and operable to disengage the locking means from the transmission means to engage the transmission means with the rocking means and the drive means; and

operating means for selectively urging the locking means to a position where the locking means is disengaged from the transmission means, and means to normally hold the locking means in a position where the locking means is engaged with the transmission means; and

mode setting means to establish a desired operation mode of the tape recorder.

4,626,941

METHOD AND APPARATUS FOR SUPPRESSING THE EVAPORATION OF LUBRICANT FILM COATED ON MAGNETIC DISKS OF A DISK STORAGE

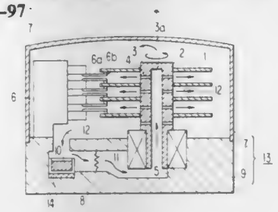
Shigetomo Sawada, Yokohama, and Takeo Hinobayashi, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 22, 1984, Ser. No. 618,078

Claims priority, application Japan, May 26, 1983, 58-93557; May 26, 1983, 58-93558; May 30, 1983, 58-96688; Jun. 30, 1983, 58-120097; Jun. 30, 1983, 58-120098

Int. Cl.⁴ G11B *5/012, 17/32, 5/82*

U.S. Cl. 360—97 **15 Claims**



1. A magnetic disk storage apparatus comprising:

an air-tight enclosure having a base and a container;

a magnetic storage disk coated with a lubricant layer;

drive means for rotating said disk;

a flying head assembly; and

a lubricant evaporating source containing a lubricant material positioned selectively inside said enclosure so that the evaporating surface of said lubricant evaporating source is exposed to the hot air flow created by the rotation of said disk such that the evaporation of said lubricant material contained in said lubricant evaporating source is accelerated;

said lubricant evaporating source during operation of said magnetic disk storage apparatus providing a lubricant vapor inside of said enclosure which suppresses the consumption of said lubricant layer coated on said magnetic disk by substantially balancing the rate of evaporation of the lubricant material of said lubricant layer on said disk with the rate of absorption of said lubricant vapor onto said lubricant layer.

4,626,942

POWER-SAVING DATA TRANSFER APPARATUS WITH A FLEXIBLE MAGNETIC DISK OR THE LIKE

Makoto Shoji, Fussa; Hiroshi Tsuyuguchi, Tokyo; Shozo Toma, Kokubunji; Kazuhiro Hiraki, Mitaka, and Tsutomu Morita, Musashino, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,674

Claims priority, application Japan, Mar. 2, 1984, 59-40128; Mar. 2, 1984, 59-40129

Int. Cl.⁴ G11B *5/012, 21/04, 15/48*

U.S. Cl. 360—97 **15 Claims**

1. A data transfer apparatus for use with a disklike record medium such as a flexible magnetic disk having data storage tracks thereon, the apparatus comprising:

(a) a disk drive motor for imparting rotation to the loaded record medium;

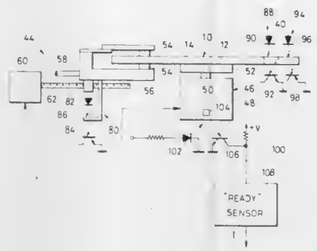
(b) a transducer head for data transfer with the record medium;

(c) a head transport motor for moving the transducer head radially of the record medium so as to enable the transducer head to access the individual data storage tracks on the record medium;

(d) a sensor including a light source for sensing whether the transducer head is in a preassigned track position on the record medium;

(e) power supply means;

(f) a power saving switch connected between the light source of the sensor and the power supply means for



allowing the latter to energize the former only when the operation of the sensor is required; and

(g) a switch control circuit connected to the power saving switch for the on/off control thereof, the switch control circuit being actuated at least when the data transfer apparatus is electrically turned on, for holding the power saving switch closed for a preassigned length of time thereafter.

4,626,943

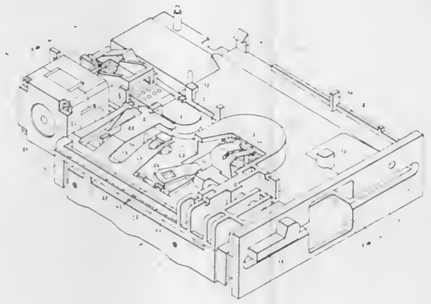
TORSIONAL ACTUATOR FOR LOADING AND UNLOADING FLEXIBLE DISK DRIVE

Donovan M. Janssen; Alan J. Kirton, both of Boulder; Robert M. Murphy, Longmont, and Leroy Rose, Boulder, all of Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 3, 1984, Ser. No. 627,651

Int. Cl.⁴ G11B *5/016, 17/02, 21/12*

U.S. Cl. 360—99 **7 Claims**



1. In a flexible disk drive having a frame, a drive spindle, and a collet to clamp a flexible disk to the drive spindle, apparatus for moving the collet toward and away from the spindle to thereby load and unload the disk drive, said apparatus comprising:

a torsion beam;

a preload arm attached to said torsion beam and engaging said frame to preload said torsion beam with a predetermined amount of torsion;

an actuating arm attached to said torsion beam and engageable with said collet for causing movement of said collet toward and away from said spindle;

a loading cam moveable between a load position and an unload position with said loading cam applying a force to said actuating arm when in said load position;

said actuating arm moving said collet away from said spindle in response to said torsion force in said torsion beam due to said preload arm when said loading cam is in said unload position; and

said actuating arm moving said collet onto said spindle with a predetermined load force in response to the load force from said loading cam when said loading cam is in said load position.

4,626,944

POSITIONING DEVICE FOR SCANNING MEANS IN A DISK DRIVE UNIT

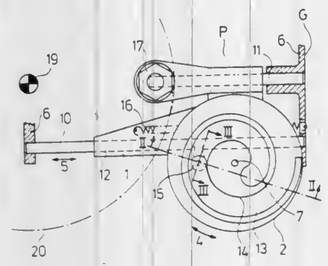
Joachim Hack, Ludwigshafen; Klaus Schulze-Berge, Mutterstadt, and Klaus Birkenmeier, Appenweier, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,291

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 8216961[U]

Int. Cl.⁴ G11B *21/08*

U.S. Cl. 360—106 **10 Claims**



1. A positioning device for at least one scanning means in a disk drive unit, said positioning device comprising a support mounting said at least one scanning means, and two cooperating guide means for imparting a longitudinal movement to said support, said guide means including a guide surface and a cooperating rotatable guide element in contact with said guide surface, one of said guide means being part of said support, and said guide element being, axially nondisplaceably, mounted for rotation about an axis disposed at an acute angle (α) to an axis which is perpendicular to the direction of movement of said support, both said axes, and hence said angle therebetween, lying in a plane which bisects said guide element and is parallel to the tangential plane as between said guide surface and said guide element, and the angular mounting of said rotatable guide element resulting in an automatic cleaning action between the guide element and the guide surface.

4,626,945

MAGNETIC HEAD

Toshinobu Futagawa, 3-3-23, Nishishinjunku,, Shinjuku-ku, Tokyo, Japan

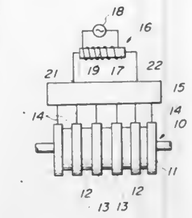
Filed Jun. 13, 1984, Ser. No. 620,184

Claims priority, application Japan, Jun. 18, 1983, 58-109909; Aug. 25, 1983, 58-155645

Int. Cl.⁴ G11B *5/127*

U.S. Cl. 360—110 **7 Claims**

1. A rotary magnetic head, characterized by comprising a head body of magnetic material rotatable around the axis thereof which head body is provided on its peripheral surface with a plurality of complete annular grooves, a plurality of magnetic elements which touch corresponding continuous peripheral surface portions positioned between two adjacent grooves, one or more magnetic exciting means, and means for selectively and magnetically connecting any pair of the two adjacent magnetic elements to said magnetic exciting means, whereby each of said two adjacent peripheral surface portions connected to said magnetic exciting means provides opposed



magnetic poles respectively at the opposite portions of said two peripheral surface portions.

4,626,946

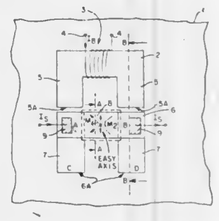
TWIN TRACK VERTICAL READ-WRITE HEAD STRUCTURE

Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1984, Ser. No. 584,364

Int. Cl.⁴ G11B *5/30;* **H01L** *43/00*

U.S. Cl. 360—113 **19 Claims**



1. An improved, twin track magnetic read-write head comprising a first magnetically permeable member having two legs and a connecting portion joining said two legs;

an electromagnetic coil wrapped about a section of said first magnetically permeable member and wherein:

the ends of said legs are arranged facing a magnetic medium for reading or writing magnetic signal records in two separate tracks to or from said magnetic medium and said first magnetically permeable member is configured such that the projections of said legs upon the plane of said magnetic medium have maximum dimensions that each lie in separate tracks and in a common plane perpendicular to the plane of said medium.

4,626,947

THIN FILM MAGNETIC HEAD

Shinji Narishige, Mito; Tsuneo Yoshinari, Hitachi; Mituo Sato, Takahagi; Masayuki Takagi; Sadanori Nagaike, both of Odawara; Toshihiro Yoshida, Fujisawa, and Katsuya Mitsuoka, Hitachi, all of Japan, assignors to Computer Basic Technology Research Association, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,658

Claims priority, application Japan, Oct. 15, 1982, 57-179711

Int. Cl.⁴ G11B *5/147, 5/127, 5/187*

U.S. Cl. 360—126 **2 Claims**

1. A thin film magnetic head, comprising:

a lower magnetic member having one end portion within the head and another end portion at an end of the head;

a non-magnetic member formed of aluminum oxide and disposed over the other end portion of the lower magnetic member;

an upper magnetic film laminated over said non-magnetic member and said lower magnetic member, said upper

magnetic film being a sputtered film formed of a Ni-Fe alloy and having one end portion in contact with the one end portion of said lower magnetic member, another end portion of said upper magnetic film being disposed in opposition to the other end portion of said lower magnetic member with a predetermined magnetic gap being formed therebetween by said non-magnetic member, whereby said upper magnetic film cooperates with said lower magnetic member to constitute a magnetic circuit having said magnetic gap at a predetermined location;

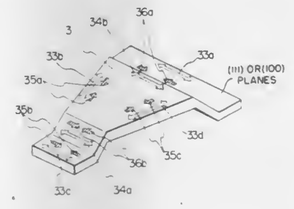
a conductor film for forming a coil having a predetermined number of turns, a portion of said coil extending between said lower magnetic member and said upper magnetic film so as to intersect said magnetic circuit; and

insulation means for electrically mutually insulating the individual turns of said conductor film and for electrically insulating said conductor film said lower magnetic member and said upper magnetic film from one another;

said upper magnetic film having a magnetostriction constant which is not greater than 6×10^{-7} in the absolute value; and said Ni-Fe alloy having a composition lying in a range of from 80.7% by weight to 81.5% by weight of Ni, and a principal surface spaced from the lower magnetic member that is mainly formed of (111) planes.

2. A thin film magnetic head, comprising:

a lower magnetic member having one end portion within the head and another end portion at an end of the head;



a non-magnetic member formed of aluminum oxide and disposed over the other end portion of the lower magnetic member;

an upper magnetic film laminated over said non-magnetic member and said lower magnetic member, said upper magnetic film being a sputtered film formed of a Ni-Fe alloy and having one end portion in contact with the one end portion of said lower magnetic member, another end portion of said upper magnetic film being disposed in opposition to the other end portion of said lower magnetic member with a predetermined magnetic gap being formed therebetween by said non-magnetic member, whereby said upper magnetic film cooperates with said lower magnetic member to constitute a magnetic circuit having said magnetic gap at a predetermined location;

a conductor film for forming a coil having a predetermined number of turns, a portion of said coil extending between said lower magnetic member and said upper magnetic film so as to intersect said magnetic circuit; and

insulation means for electrically mutually insulating the individual turns of said conductor film and for electrically insulating said conductor film, said lower magnetic member and said upper magnetic film from one another;

said upper magnetic film having a magnetostriction constant which is not greater than 6×10^{-7} in the absolute value; and said Ni-Fe alloy having a composition lying in a range of from 82.2% by weight to 83.0% by weight of Ni, and a principal surface spaced from the lower magnetic member that is mainly formed of (100) planes.

4,626,948

MAGNETIC TAPE CARTRIDGE PIVOT PIN AND SUPPORTING MEMBER

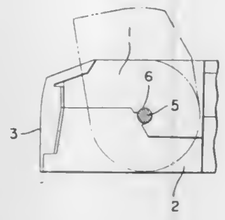
Kimio Tanaka; Haruo Shiba, and Yoshiya Sakata, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,255

Claims priority, application Japan, Sep. 8, 1983, 58-138408[U]

Int. Cl.⁴ G11B *23/04*

U.S. Cl. 360—132 **1 Claim**



1. A magnetic tape cartridge comprising:

a first half casing having a first edge;

a second half casing having a second edge which mates with said first edge to form a complete magnetic tape cartridge;

first arcuate recesses in said first half casing at opposite sides thereof, each said first arcuate recess forming the major part of the circumference of a circle having a first diameter and intersecting said first edge to define an entrance of said first recess, said entrance extending along a chord of said circle and having a width dimension smaller than said first diameter; and

a lid having pivot pins inserted in said first recesses, said pivot pins each having a diameter smaller than said first diameter and larger than said width dimension, whereby said pins are held in said first recesses by portions of each said first recess adjacent said entrance thereof;

wherein portions of said second edge which traverse said entrances of said first recesses in said complete cartridge are shaped to mate with said entrances and each said portion of said second edge defines a second arcuate recess forming the minor part of said circle having said first diameter,

whereby facing ones of said first and second receses cooperate to define continuous circular recesses, whereby said pins may be retained by said first recesses during assembly of said cartridge and whereby said second recesses help hold said pins in said continuous circular recesses of said complete cartridges and help center said casing halves.

4,626,949

MAGNETIC RECORD DISK CLEANING AND STABILIZING ASSEMBLY

George W. Brock, Los Altos Hills; Edward Mroz, Menlo Park; Robert J. Janning, Jr., Cupertino, and Robert S. Rogers, San Jose, all of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed May 19, 1983, Ser. No. 495,980

Int. Cl.⁴ G11B *5/74, 23/02*

U.S. Cl. 360—133 **11 Claims**

1. A magnetic record disk cleaning and stabilizing assembly comprising:

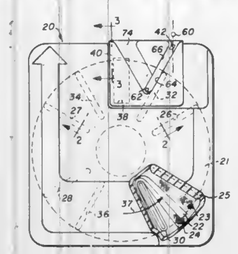
a magnetic record disk made of flexible material, said disk having at least one record surface;

a rigid case for containing said disk, said case having opposed inner surfaces;

a wiper made of cleaning material located between one of said inner surfaces of said case and said adjacent record surface of said disk;

said disk being rotatable while said case is maintained stationary; and

disk and wiper flexing means comprising opposed radially extending projections on each of said inner surfaces of said case spaced from one-another in the direction of rotation of said disk for flexing portions of said disk and said wiper



extending between said projections for creating frictional force between said record surface of said disk and said wiper, whereby said wiper cleans contaminants from said disk during rotation thereof.

4,626,950

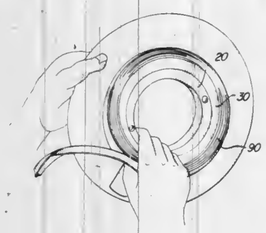
REMOVAL OF REEL STORED MAGNETIC TAPE

Anthony W. Livermore, Woburn, and Francis J. Ford, Melrose, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Sep. 13, 1984, Ser. No. 650,752

Int. Cl.⁴ G11B *5/78*

U.S. Cl. 360—134 **11 Claims**



1. Magnetic tape stripping apparatus, comprising:

a hard, reel core of essentially cylindrical form;

a resilient annular tape core mounted around said reel core and made of elastomeric material with a hardness of between 10 and 30 durameter; and said reel and tape cores being adapted to rotate to collect tape about said tape core wherein collected tape can be more easily stripped from the cores by the compressibility of said tape core.

7. A tape stripping device, comprising:

a hard inner member having a circular cylindrical shape;

a resilient outer member of hollow circular cylindrical form, coaxially fitted around said inner member, and made of a natural or synthetic elastomer from the class consisting of silicone elastomers, urethanes, and fluorocarbons; and said inner and outer members being adapted to rotate to collect tape about said outer member wherein collected tape can be more easily stripped from the inner and outer members by the compressibility of said outer member.

4,626,951

SINGULAR HOUSING OF SWITCH AND PROTECTIVE SEMICONDUCTOR

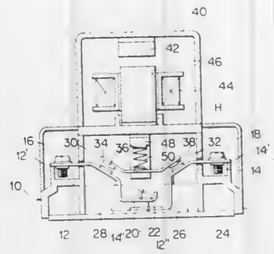
Yoshiaki Nagao, Owariasahi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,123

Claims priority, application Japan, May 23, 1983, 58-90275

Int. Cl.⁴ H01H *9/30*

U.S. Cl. 361—8 **7 Claims**



1. A switch comprising:

a housing having a mounting base;

a pair of spaced terminal means each including a terminal plate extending inside and outside said housing and secured to said mounting base, each of said terminal plates having affixed thereto a switch contact;

a moving contact plate provided within said housing, said moving contact plate having affixed thereto a pair switch contacts, each adapted to come into and go out of contact with one of said contacts on said pair of terminal plates; and

a semiconductor switching element electrically connected to at least one of said pair of terminal plates, said semiconductor switching element and the connection thereof to the terminal plate being positioned within said housing, said moving contact plate and said semiconductor switching element being arranged between said pair of terminal means.

4,626,952

PROTECTION APPARATUS FOR A TRANSISTOR INVERTER

Tetsuo Morikawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,278

Int. Cl.⁴ H02H *3/42*

U.S. Cl. 361—55 **3 Claims**



1. In an inverter circuit having a pair of transistors connected in series across a power source and drive circuits alternately turning said transistors on and off, said transistors having collector-emitter voltages and base currents corresponding

to the on and off states of said transistors, a protection apparatus comprising:

means for detecting the on and off states of said transistors and for producing combinations of binary signals representing said on and off states;

means including a logic circuit connected to said detecting means for performing logical operations on said binary signals and for providing a first output signal representing normal operation of said inverter circuit as a result of a logical operation based on a first combination of binary signals or a second output signal representing a short circuit in either of said transistors as a result of a logical operation based on a second combination of binary signals; and

means for electrically disconnecting said pair of transistors from said power source operated responsive to said second output signal, the normal operation of said inverter circuit being maintained when said first output signal is provided.

4,626,953

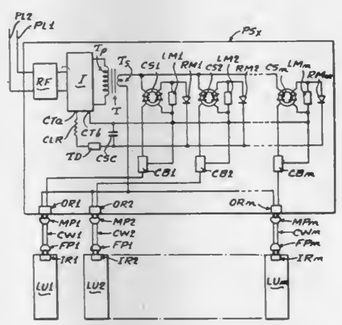
DOUBLY OVERLOAD-PROTECTED POWER DISTRIBUTION SYSTEM

Ole K. Nilssen, Caesar Dr., R.R. 5, Barrington, Ill. 60010

Filed Apr. 30, 1984, Ser. No. 605,479

Int. Cl.[4] H02H *7/12*

U.S. Cl. 361—63 **14 Claims**



1. A power conditioner adapted to be connected with and to be powered from the voltage on an ordinary electric utility power line, comprising:

an input circuit connected with said power line and operative to provide an AC voltage at a pair of AC input terminals, said input circuit having a set of control terminals and being operative upon the receipt of a disable signal at said control terminals to substantially diminish the magnitude of said AC voltage; and

a plurality of pairs of AC output terminals, each one of these pairs of AC output terminals having a current sensor and being individually and separately connected with said pair of AC input terminals by way of said current sensor and operable to provide an AC output, said current sensor being: (i) operative to sense the magnitude of the current associated with said AC output, (ii) connected in circuit with said control terminals, and (iii) operable to provide a disable signal to said control terminals in case the magnitude of the current associated with said AC output exceeds a pre-determined level for more than a certain length of time;

whereby, if the magnitude of the current flowing from at least one of said pairs of AC output terminals exceeds said pre-determined level for more than said certain length of time, said AC voltage will substantially diminish in magnitude, thereby reducing the magnitude of the current associated with said AC output.

4,626,954

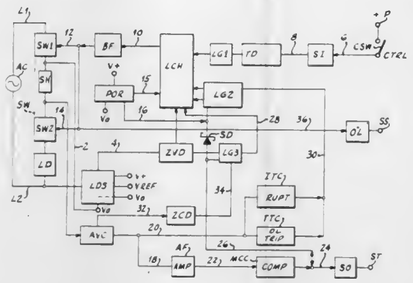
SOLID STATE POWER CONTROLLER WITH OVERLOAD PROTECTION

Michael A. Damiano, Germantown; Dale L. Gass, Brown Deer; Dennis M. Kramer, Brookfield, and Richard F. Schmerda, Oak Creek, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 6, 1984, Ser. No. 647,763

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—96 **16 Claims**



1. A solid state power controller with overload protection for use in a power circuit having an A.C. power supply source and power line connected to a load, said controller having a pair of series-reverse connected controlled power switching devices and a current sensor connected in series in said power circuit, said controlled power switching devices being of a type having two main power terminals and a control terminal for controlling said power switching device by a voltage thereon referenced to a first one of said power terminals and having a high forward blocking voltage and a low reverse blocking voltage, and the improvement comprising:

a control circuit selectively operable for controlling said power switching devices to energize or deenergize said load;

a line-derived rectified control power supply for said control circuit connected to said first power terminal and through the associated one of said controlled power switching devices and through its other power terminal directly across said power supply source so that the rectified control power supply current does not flow through said current sensor or said load thereby to prevent such control power supply current from interfering with the load current sensed by said current sensor as well as to prevent said control power supply current entering as leakage current to the load and so that the control power supply voltage will float with the voltage at said first power terminal thereby to maintain the control terminal to first power terminal voltage high enough to maintain said power switching device conducting despite variation in the voltage at said one power terminal; said control circuit comprising: an overload means responsive to said current sensor detecting an overload condition for rendering said power switching devices non-conducting.

4,626,955

THREE ELECTRODE GAS TUBE PROTECTOR

Casimir Z. Cwirzen, Arlington Heights, Ill., assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 21, 1985, Ser. No. 714,501

Int. Cl.[4] H02H *3/22*

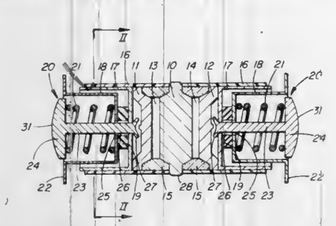
U.S. Cl. 361—119 **10 Claims**

1. A three electrode gas tube protector comprising;

a central electrode and a line electrode positioned on each side of the central electrode and spaced from the central electrode to define two gaps having a predetermined voltage breakdown, the electrodes forming a sealed assembly with said gaps at a sub-atmospheric pressure;

a conductive outer cup extending axially from each line electrode and a conductive inner cup within each outer cup, the bottom of the outer cup in contact with the line electrtode, the inner end of the inner cup spaced from the bottom end of the outer cup, the inner cup having a radially extending member at its outer end, the member spaced axially from the outer cup, and a fusible member positioned between and in contact with the inner end of the inner cup and the bottom end of the outer cup;

a compression spring positioned within said inner cup and a



contact member having a head portion and a stem portion, the stem portion extending axially through said spring and said inner end of said inner cup and said bottom of said outer cup, the stem portion having an inner end extending over the outer surface of the bottom of the outer cup, the spring contained in compression between said head portion and said inner end of the inner cup, said head portion extending axially beyond said radially extending member;

the arrangement such that on melting of the fusible element, said inner cup is moved axially by the spring for said flange to contact a ground member.

4,626,956

ELECTROMAGNETIC FEEDER DRIVE CONTROL APPARATUS

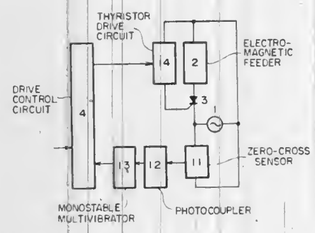
Kazufumi Naito, Ohtsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 11, 1984, Ser. No. 649,316

Claims priority, application Japan, Sep. 12, 1983, 58-168058

Int. Cl.[4] H01H *47/32*

U.S. Cl. 361—152 **11 Claims**



1. An electromagnetic feeder drive control apparatus for regulating the amplitude of an electromagnetic feed which is driven by an AC power supply, comprising:

an electromagnetic feeder connected to the AC power supply;

a switching element connected to the AC power supply and connected in series with said electromagnetic feeder;

a sensor, connected to the AC power supply, for producing a detection signal upon sensing that the voltage of the AC power supply has crossed a voltage of zero;

a drive control circuit coupled to said sensor, said drive control circuit comprising a microcomputer for producing a timing signal which sets on/off timing for said switching element based on the detection signal;

a first photocoupler, connected to said sensor, for transmitting the detection signal from said sensor;

a waveshaping circuit, connected to said first photocoupler and said drive control circuit, for receiving the detection signal and for providing a waveshaped detection signal to said drive control circuit; and

a thyristor drive circuit connected to said drive control circuit and said switching element, said thyristor control circuit having a second photocoupler at an input section thereof for receiving the timing signal, for producing a trigger pulse based on the timing signal, and for applying the trigger pulse to said switching element.

4,626,957

CAPACITOR WITH DISCHARGE GAP

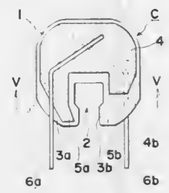
Toshimi Kaneko, Sabae, and Kazumi Kido, Fukui, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 14, 1985, Ser. No. 701,412

Claims priority, application Japan, Feb. 22, 1984, 59-25084[U]

Int. Cl.[4] H01G *1/11*

U.S. Cl. 361—275 **2 Claims**



1. A capacitor having a discharge gap, which comprises:

a generally plate-like substrate having a pair of opposite major surfaces and having a portion cut away to define an opening;

first and second capacitive electrodes formed on the respective major surfaces of the substrate; and

first and second discharge electrodes electrically connected with the first and second capacitive electrodes, respectively, said first and second discharge electrodes being positioned on respective sides of the opening in the substrate so as to confront each other across a discharge gap including the opening, and further comprising

a pair of leads each having one end portion rigidly connected to a respective capacitive electrode and another end portion adapted for external electric connection, said discharge electrodes being formed integrally with the respective leads at a substantially intermediate portion thereof.

4,626,958

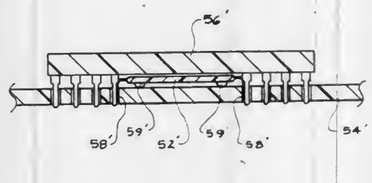
DECOUPLING CAPACITOR FOR PIN GRID ARRAY PACKAGE

Steven C. Lockard; Michael S. Hyslop, both of Tempe, and Jorge M. Hernandez, Mesa, all of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 693,189, Jan. 22, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,673

Int. Cl.[4] H01G *1/14;* **H02G** *13/08;* **H01L** *23/02*

U.S. Cl. 361—306 **34 Claims**



23. An electronic subassembly comprising:

a pin grid array package, said pin grid array package having an array of pins extending from one side thereof and

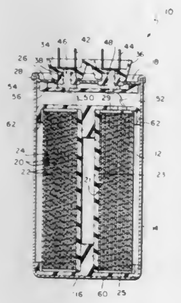
surrounding a central pin free area of predetermined size, at least some of the pins surrounding the central pin free area being first and second voltage level pins;
a circuit board, said circuit board having first spaced holes receiving said pin grid array package pins; and
decoupling capacitor means, said decoupling capacitor means being alinged with said central pin free area of said pin grid array package and electrically communicating with said circuit board, said capacitor means comprising;
a flat dielectric body having a pair of opposed surfaces;
a first conductor on one of said opposed surfaces of said dielectric body defining a first voltage level conductor;
a second conductor on the other of the said opposed surfaces of said dielectric body defining a second voltage level conductor;
a plurality of first leads in a predetermined configuration in electrical contact with said first conductor and extending outwardly therefrom;
a plurality of second leads in a predetermined configuration in electrical contact with said second conductor and extending outwardly therefrom;
the configurations of said first and second leads corresponding to configurations of first and second voltage levels of pins of the pin grid array package;
an insulating material surrounding said dielectric body and conductors, said first and second leads extending through said insulating material; and
said dielectric body, first conductor, second conductor and insulating material defining an insulated assembly, the size of said insulated assembly being less than the size of the central pin free area.

4,626,959

DIELECTRIC FLUID FOR METALLIZED CAPACITORS

Vandos Shedigian, and Gerald A. Voyles, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 4, 1984, Ser. No. 646,760
Int. Cl.⁴ H01G *3/04, 4/22*
U.S. Cl. 361—315 **6 Claims**



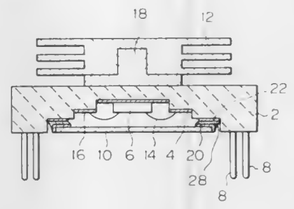
1. In a metallized polypropylene film capacitor including a casing containing a capacitor roll section having a pair of spaced apart electrodes, a polypropylene sheet for separating the electrodes, and a dielectric fluid adjacent said electrodes, in said casing, the dielectric fluid comprising about 90% to about 100% by volume of glyceryl tri(epoxy acetoxystearate).

4,626,960

SEMICONDUCTOR DEVICE HAVING SOLDERED BOND BETWEEN BASE AND CAP THEREOF

Toshio Hamano; Kaoru Tachibana, both of Yokohama, and Hideji Aoki, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 28, 1984, Ser. No. 675,795
Claims priority, application Japan, Nov. 28, 1983, 58-222191
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—388 **11 Claims**



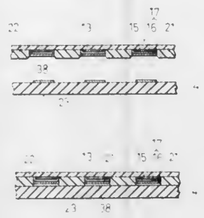
1. A semiconductor device comprising a semiconductor chip, an insulating base having a cavity therein carrying the semiconductor chip therewithin, and an insulating cap covering and sealing the cavity of the insulating base, wherein the insulating base and the insulating cap have respective patterns of metallization on areas of contact therebetween, the pattern of metallization of the insulating cap extending from the area of contact between the insulating base and insulating cap outwardly at least onto side surfaces of the insulating cap, the insulating base and the insulating cap being soldered to each other at the areas of the patterns of metallization.

4,626,961

CONNECTING STRUCTURE OF TERMINAL AREA OF PRINTED CIRCUIT BOARD

Yasuichi Ono; Yoshitada Amagishi, and Moritoshi Nakamura, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 6, 1984, Ser. No. 678,982
Claims priority, application Japan, Dec. 10, 1983, 58-189857[U]
Int. Cl.⁴ H05K *1/11*
U.S. Cl. 361—398 **12 Claims**



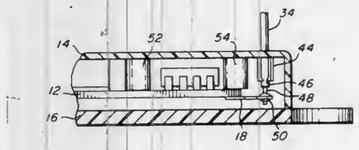
1. A printed circuit board assembly comprising a printed circuit board having a first terminal area which is electrically connected to a sheet member having a second terminal area;
said first terminal area of said printed circuit board comprising a substrate having a plurality of spaced-apart first terminals formed thereon;
said second terminal area comprising a plurality of spaced-apart second terminals corresponding to said first terminals formed on said sheet member, said second terminals each including a first layer of an electrically conductive material and a second layer of an electrically conductive hot-melt adhesive, and the spaces around said second terminals having a layer of electrically insulating hot-melt adhesive formed to a thickness greater than the thickness of said second terminals such that the surface of said insulating layer protrudes above the surface of said second terminals; and
said first and second terminal areas being electrically connected and bonded together by said hot-melt adhesives, wherein said electrically conductive adhesive layer of said second terminals are bonded in registration with said first terminals, and said electrically insulating adhesive layer in the spaces around said second terminals being bonded to said substrate of said printed circuit board in the spaces around said first terminals.

4,626,962

CIRCUIT BOARD ASSEMBLY WITH BUILT IN WIRE GRIPPER

Youngkee Ahn, Buffalo Grove, and Morris Tarshis, Lincolnwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1985, Ser. No. 739,394
Int. Cl.⁴ H05K *5/03*
U.S. Cl. 361—399 **4 Claims**



1. A circuit board assembly with built-in strain relief, comprising:
a housing for a circuit board, the housing including a top cover below which the circuit board may be positioned;
a circuit board carrying a plurality of terminals for connecting various points on the circuit board to a corresponding plurality of external wires, said terminals being positioned below the top cover;
a plurality of apertures formed in the top cover, each of said apertures being in substantial vertical alignment with a corresponding one of the terminals and being adapted to receive a wire which is to be bonded to the corresponding terminal;
a plurality of wire grippers formed in the top cover of the housing, each of said grippers being associated with one of said apertures and each comprising:
three fingers integrally formed with the top cover, the fingers extending downwardly from the front cover and spaced apart from each other substantially equally around the perimeter of the associated aperture, the fingers being formed so as to flex outwardly to permit a wire to be inserted through the associated aperture and between the fingers, but holding the inserted wire against removal in the opposite direction and holding the wire in substantial registration with an underlying terminal.

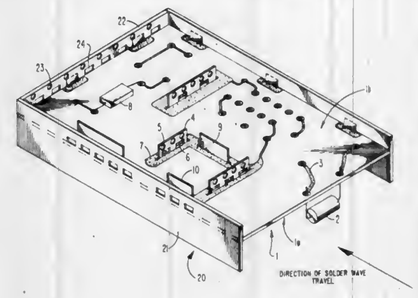
4,626,963

WAVE SOLDERABLE RF SHIELD MEMBER FOR A PRINTED CIRCUIT BOARD

Walter F. Speer, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 705,498
Int. Cl.⁴ H05K *5/04*
U.S. Cl. 361—424 **9 Claims**

1. Apparatus, comprising:
a printed circuit board having a component side and an electrical conductor side;
a first RF shield partition mounted on said component side of said printed circuit board substantially perpendicular to the plane of said printed circuit board for shielding circuitry on one side of said first RF shield partition from RF signals generated on the other side of said first RF shield partition; and
a second RF shield partition mounted on said electrical conductor side of said printed circuit board for shielding circuitry on one side of said second RF shield partition from RF signals generated on the other side of said second RF shield partition,
wherein said second RF shield partition comprises a tab of said first RF shield partition extending beyond said electrical conductor side of said printed circuit board, said second RF shield partition having an array of holes allowing solder of a solder wave to pass through said second RF shield partition without being substantially impeded thereby, said array of holes being at least partially filled by solder of said solder wave to form a substantially solid RF shield structure, and said second RF shield partition being soldered to one of said electrical conductors by said solder wave.

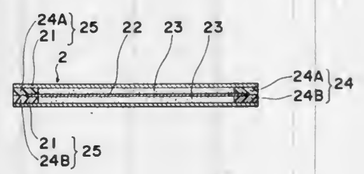


4,626,964

ELECTRICAL DOUBLE LAYER CAPACITOR AND PRODUCTION OF THE SAME

Siro Azuma; Kenichi Yokoyama, and Tatsuya Kitai, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 18, 1985, Ser. No. 712,758
Claims priority, application Japan, Mar. 19, 1984, 59-52769; Dec. 4, 1984, 59-257164
Int. Cl.⁴ H01G *9/00*
U.S. Cl. 361—433 **8 Claims**



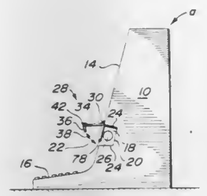
1. An electrical double layer capacitor containing at least one electrical double layer unit comprising:
a pair of electrodes separated by a separator and positioned between a pair of collecting plates with an insulting ring being provided around the periphery of said electrodes, said electrodes including an active carbon fiber fabric carrying an active carbon powder thereon wherein the active carbon fiber fabric is present on said separator side and a lyaer of the active carbon powder is present on said collecting plate side.

4,626,965

ILLUMINATION SYSTEM FOR A VISUAL DISPLAY TERMINAL

Vijai P. Gupta, and Jyoti Gupta, both of P.O. Box 516, Berwyn, Pa. 19312

Filed Nov. 21, 1985, Ser. No. 800,226
Int. Cl.[4] A61G *13/00*
U.S. Cl. 362—33 **5 Claims**



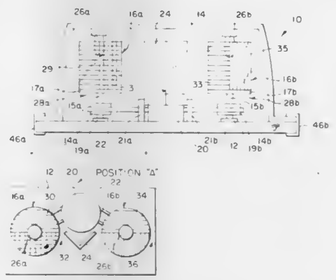
1. A combination illumination and visual display terminal comprising:
(a) a housing including
(i) a visual display terminal including a generally vertical screen juxtaposed above a generally horizontal keyboard extending forward and therebelow;
(ii) a channel located longitudinally in said housing between said screen and said keyboard, said channel having a perimeter forming part of said housing, said channel including a longitudinal opening running generally its entire length, both of said opening's horizontal rims forming a plane with said terminal screen; and,
(b) light means mounted longitudinally in said channel so that light emitted from said means is thereby directed generally only on said keyboard while avoiding illuminating said screen.

4,626,966

FLASHING STROBE BEACON

Martin Bleiwas, 1 Fox Ave, Baldwin, N.Y. 11510, and Edmund Goldstein, 42 West Blvd., East Rockaway, N.Y. 11518

Filed Sep. 19, 1985, Ser. No. 777,690
Int. Cl.[4] F21V *21/30;* **B61L** *29/24;* **B60Q** *1/26*
U.S. Cl. 362—35 **4 Claims**



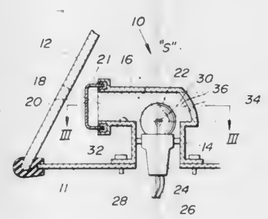
1. An improved flashing strobe beacon, as the type in which a fixed mounted high intensity light source emits light through a circumferential rotating lens, wherein the improvement comprises:
(a) a base made of a rigid material;
(b) at least one gaseous discharge high intensity strobe lamp connected to said base;
(c) two cylindrical lens through which coaxially mounted said gaseous discharge high intensity strobe lamp is mounted; whereby light emitted by said gaseous discharge high intensity strobe lamp must exit; and, wherein the outer cylindrical surface and the top circular surface of said cylindrical lens are comprised of at least two sections of variously colored fresnel light dispersing materials wherein said circular top surface is defined by two radii and said outer cylindrical surface is defined by downward projections of said radii, said two cylindrical lenses each containing one of said coaxially mounted gaseous discharge high intensity strobe lamps separated by a V-mirror such that light radiated along an axis connecting said cylinders is reflected perpendicularly to said axis, thereby further dispersing said light and preventing mixing of light from both of said cylindrical lenses.

4,626,967

AUXILIARY LAMP ARRANGEMENT FOR AUTOMOTIVE VEHICLE OR THE LIKE

Touru Segoshi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1985, Ser. No. 711,323
Claims priority, application Japan, Mar. 15, 1984, 59-49777
Int. Cl.[4] B60G *1/00*
U.S. Cl. 362—61 **16 Claims**



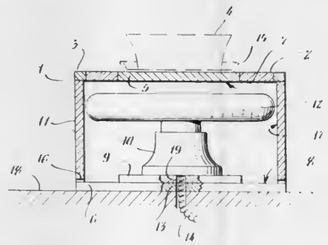
1. In a vehicle
a lamp arrangement comprising:
a housing which is arranged to be mounted on a portion of said vehicle and which is formed with an opening, said opening having a shadow which is cast into said housing; and
a light source disposed within said housing so that the light generating portion of said light source is located in the lower peripheral portion of said shadow.

4,626,968

DEVICE FOR ILLUMINATING CENTRIPETALLY VIEWED THREE-DIMENSIONAL OBJECTS IN WET LOCATIONS

Henry Von Kohorn, 22 Perkins Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 660,905, Oct. 15, 1984, Pat. No. 4,594,646. This application Feb. 1, 1985, Ser. No. 697,168
Int. Cl.[4] F21P *1/02*
U.S. Cl. 362—122 **5 Claims**



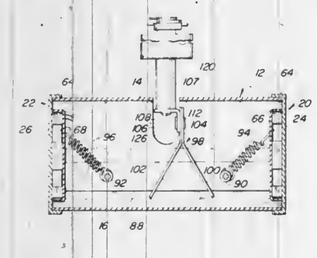
1. A plant illuminating apparatus for electrically lighting plants exposed to rain, comprising:
a watertight housing having water-impermeable walls including an upper wall having horizontal portions, adapted to have plants to be illuminated positioned directly above and proximate to said housing,
said horizontal portions of said upper wall horizontally extending under the outer reaches of said plants and having transparent portions near its periphery, and
a side wall extending downwardly from the periphery of said upper wall,
planter means disposed centrally with respect to said transparent portions of said upper wall having an upper opening adapted to contain at least one plant,
an artificial light source disposed in said housing in close proximity to said plant,
light reflective means on at least one inside surface of said housing, and
watertight means for conducting electrical power to said light source wherein light from said light source escapes upwardly from said housing through said transparent portions in said upper wall and is directed towards the outer reaches of the plant to be illuminated in an enveloping manner, and whereby water falling on said housing is conducted along the outer surfaces of said water-impermeable walls to a level below that of said light source.

4,626,969

WALL WASH TRACK LIGHTING FIXTURE

Paul Kristofek, Hickory Hills, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 4, 1985, Ser. No. 710,283
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 **23 Claims**



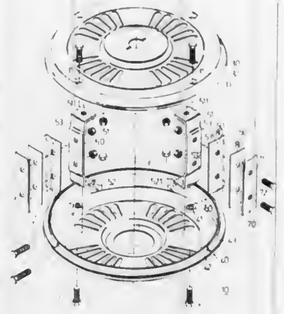
1. A lighting fixture for use in an electric track lighting system comprising:
a substantially channel shaped housing, said housing having a top wall, a back wall and a bottom wall;
at least two pair of aligned grooves formed on the top wall and the bottom wall of said housing;
a removable light reflector having a predetermined configuration mounted within one of said pairs of aligned grooves in the interior of said housing;
means for mounting and providing electrical current to a light source within said housing at a predetermined location relative to said light reflector;
at least one removable end cap constructed and arranged to enclose one end of said substantially channel shaped housing;
means for mounting said removable end cap to one end of said housing, said end cap mounting means adapted to provide retention of said end cap to said housing in a closed position and retention of said end cap to said housing in an open position which permits access to the interior of said housing; and
means for mounting said housing and electrically coupling said means for mounting a light source to said electrical track;
wherein when said end cap is in its open position said light reflector may be easily removed from said housing for service by sliding it along the prir of aligned grooves in which it is maintained.

4,626,970

ORNAMENTAL CASING ASSEMBLY FOR CEILING FAN

Ming C. Huang, 788, Chung Shan Rd., Tai Chung Hsien, Taiwan

Filed Jul. 24, 1985, Ser. No. 758,277
Int. Cl.[4] F21S *1/02;* **F04D** *29/64*
U.S. Cl. 362—147 **5 Claims**



1. An ornamental casing assembly for a ceiling fan comprising:
an upper shell,
a lower shell,
said upper and lower shells each having a flat periphery extending inwardly;
a plurality of connecting members fastened between said upper shell and said lower shell, and separating said upper shell and said lower shell;
a plurality of light-pervious plates mounted between said upper shell and said lower shell, and between said connecting members respectively, the upper and lower portions of said light-pervious plates abutting closely against said flat peripheries of the upper and lower shells, respectively;
a plurality of retaining members secured to said connecting members respectively for retaining said light-pervious plates firmly on said connecting members; and
a light member on the inner surface of the said lower shell within the space enveloped by said upper and lower shells and said light-pervious plates, the light member having a power line adapted to be coupled to an electrical power source, the power line being disposed along the inner surfaces of one of said connecting members and said upper shell, therefrom.

4,626,971

ILLUMINATED SURGICAL TRAY APPARATUS

Pamela J. Schultz, 2332 S. 10th Ave., Broadview, Ill. 60153

Filed May 17, 1985, Ser. No. 735,272
Int. Cl.[4] F21V *33/00;* **G02B** *27/02*
U.S. Cl. 362—154 **16 Claims**

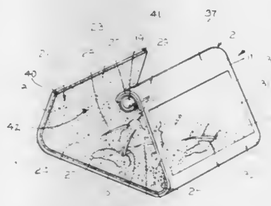
9. An illuminated surgical tray apparatus for the facilitated viewing and selection of thin fibrous surgical materials such as suture material and surgical instruments associated therewith, in a sterile operating room environment, said apparatus comprising:
substantially flat tray support means capable of accommodating said suture material and said surgical instruments thereon;
said flat tray support means having a front side and a rear side;
front plate means operably attached along a front plate attachment region to the front side of said flat tray support means and emanating substantially upwardly therefrom;

said front plate means having a top portion and a bottom portion;

viewing means operably contained within said front plate means so as to facilitate viewing of said suture material and said surgical instruments positioned thereon;

optical disclosure field means operably associated with said flat tray support means and said viewing means to provide a visually contrasting background with respect to said suture material and surgical instruments so as to facilitate viewing of said suture material and surgical instruments positioned upon said support means and differentiate said suture material and surgical instruments therefrom in said operating room environment;

lighting means operably associated with said support means



so as to illuminate said suture material and surgical instruments positioned upon said optical disclosure field means and said visually contrasting background;

said lighting means being operably affixed to said front plate means;

said top of said front plate means and said rear side of said support means describing an insertion region for alternative placement of said suture material and surgical instruments on said disclosure field and removal therefrom; and

said lighting means, viewing means, support means and optical disclosure field means cooperating so as to provide facilitated viewing of, by positioning a visually contrasting background with, access to and selection of said suture material and surgical instruments positioned within said apparatus.

4,626,972

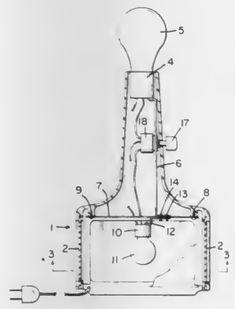
COMBINATION LAMP

Tobin Wolf, 1610 Harmon Cove Towers, Secaucus, N.J. 07094

Filed Jul. 30, 1985, Ser. No. 760,618

Int. Cl.[4] F21V *23/04*

U.S. Cl. 362—251 **8 Claims**



1. A combination lamp, which comprises:

(a) a lamp base,

(b) switch means secured to said lamp base,

(c) a first lamp socket securing a lamp therein disposed external of said lamp base, said first lamp socket being controlled by said switch means,

(d) a second lamp socket securing a lamp therein disposed internal of said lamp base, said second lamp socket being controlled by said switch means; and

(e) a light transmitting region in said lamp base for transmitting, external of said lamp base, light resulting from said lamp secured in said second lamp socket,

(f) said light transmitting region comprising a first groove extending to an exterior surface of said base and disposed in said lamp base and extending in a plane substantially parallel to the axis of said lamp, a first translucent sheet removably secured in said first groove, said second lamp being disposed in said lamp base to project light through said translucent sheet.

4,626,973

LAMP JUNCTION, METHOD OF ASSEMBLY THEREOF AND LAMP

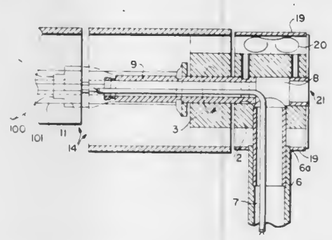
Philippe Ulmann, Wollerau, and Jürg Schmidt, Wald, both of Switzerland, assignors to Ulmann Holding AG, Wollerau, Switzerland

Filed May 28, 1985, Ser. No. 738,393

Claims priority, application Switzerland, Jun. 4, 1984, 2711/84

Int. Cl.[4] F21V *19/00*

U.S. Cl. 362—277 **8 Claims**



1. A lamp junction for electrically and mechanically connecting at least one lamp socket and at least one lamp shade member to a lamp support member, comprising:

a central support junction;

said central support junction being provided with a bore for accommodating the lamp support member;

at least one substantially tubular connection member for the at least one lamp socket;

said at least one substantially tubular connection member being fixedly mounted in said central support junction;

at least one anchorage member for each at least one lamp shade member;

said at least one anchorage member being constructed to slide onto said at least one substantially tubular connection member and being axially fixed but freely rotatably mounted thereon;

said central support junction comprising a first profile section;

each said at least one anchorage member comprising a second profile section;

said first profile section and said second profile section each having a substantially identical circumferential profile;

said first and second profile sections being coaxially arranged;

at least one cover sleeve for said central support junction;

said at least one cover sleeve being constructed to slide onto said first profile section for shielding said first profile section from the exterior;

the at least one lamp shade member being constructed to at least partially slide onto said second profile section for supporting the at least one lamp shade member and for shielding said second profile section from the exterior;

said circumferential profile of each said first and second profile sections comprising longitudinal ribs and longitudinal channels disposed between said longitudinal ribs;

said longitudinal ribs each comprising an outer peripheral portion;

said longitudinal ribs being configured at said outer peripheral portions thereof such that said circumferential profile of each of said first and second profile sections is essentially circumscribed by a circle; and

said longitudinal channels enabling air circulation along said longitudinal ribs.

4,626,974

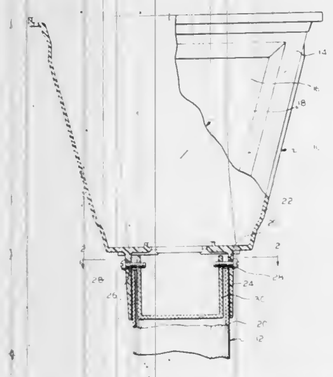
POST TOP LUMINAIRE CLAMP

John R. Dean, Memphis, Tenn., assignor to FL Industries, Inc., Livingston, N.J.

Filed Dec. 12, 1985, Ser. No. 808,455

Int. Cl.[4] F21V *21/08*

U.S. Cl. 362—396 **3 Claims**



1. A device for securing a luminaire to a tubular support post including:

a luminaire housing including a base portion having a slightly larger inner diameter relative to said support post, said base portion including first aperture means extending therethrough;

fitter clamp means of smaller width relative to the inner dimension of said support post and adapted to be disposed partially inside said support post;

said fitter clamp means including second aperture means extending therethrough;

fastening element means extending through said first aperture means and bearing on an outside surface of said base portion, said fastening element means extending through said second aperture means and forcefully engaging said fitter clamp means, whereby actuation of said fastening element means compresses said support post between said fitter clamp and said base portion of said luminaire when said base portion is placed over said support post, whereby said luminaire is rigidly attached to said support post.

4,626,975

FLOOD LIGHT FIXTURE CONSTRUCTION

Don Miletich, Greenfield, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 25, 1985, Ser. No. 715,426

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—418 **22 Claims**

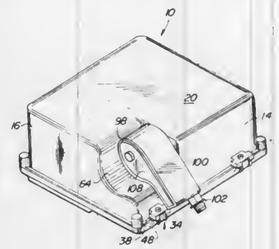
1. A lighting fixture comprising:

a generally rectilinear housing having an open front end in a relieved portion in a clearance opening in a side wall;

electrical component means including a lamp socket mounted within said housing for energizing an electric lamp;

light reflector means mounted within said housing for reflecting light from said lamp from the front of said housing;

a mounting arm operatively associated with said relieved portion, said mounting arm including means for attachment to an external mounting member and having means



for mounting said mounting arm to said housing, said means for mounting said mounting arm to said housing received in said clearance opening and providing for relative pivotal movement between said housing and said mounting arm; and

means for releasably locking said housing at selected angular positions relative to said mounting arm, said locking means being associated with said means for mounting said arm to said housing.

4,626,976

SWITCH MODE POWER SUPPLY HAVING MAGNETICALLY CONTROLLED OUTPUT

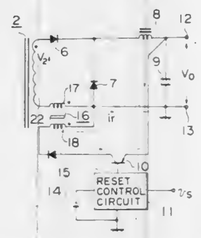
Kozin Abe; Kenichi Onda, both of Hitachi; Kohei Yabuno, Mito; Shin Nakajima, Kumagaya, and Noboru Ogawa, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,060

Claims priority, application Japan, Jan. 23, 1984, 59-8577; Jan. 23, 1984, 59-8578

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—19 **25 Claims**



1. A magnetically controlled switching regulator comprising:

a transformer having a primary winding to be connected to an unregulated DC power supply and a secondary winding;

switching means, connected in series with said primary winding, for alternately and repeatedly connecting and disconnected said primary winding to supply a pulse voltage train to said primary winding;

means, connected to one end of said secondary winding, for rectifying an output pulse voltage of said transformer;

an L-C filter including a choke coil and a capacitor, con-

nected to an output of said rectifying means, for smoothing said rectified output pulse voltage;

a first output terminal connected to an output of said L-C filter and a second output terminal connected to both the other end of said secondary winding and said L-C filter, an output voltage of said switching regulator being generated across said first and second output terminals;

a saturable reactor whose winding is connected in series with said secondary winding, said saturable reactor controlling the pulse width of said output pulse voltage to be supplied to said rectifying means, and said L-C filter and said reactor being constituted so as to reset said reactor by a high voltage using only the energy stored in said L-C filter; and

control means, connected to said L-C filter and said reactor, for controlling the resetting of said reactor to regulate said output voltage;

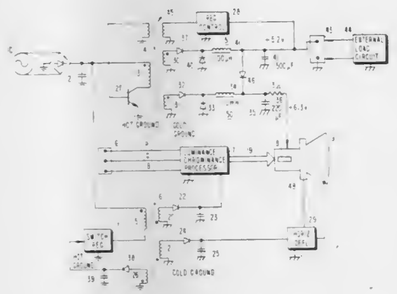
wherein said L-C filter and said reactor are constituted so as to reset said reactor by the energy stored in said capacitor; said transformer is constituted such that the polarity of the voltage which is induced in said secondary winding when said pulse voltage is supplied becomes positive at said one end of said secondary winding and becomes negative at said other end thereof; said capacitor is connected in parallel to said first and second output terminals; and said reactor includes a first winding connected between said other end of said secondary winding and said second output terminal for passing an output current of said switching regulator therethrough and a second winding magnetically coupled to said first winding, said second winding being connected across said capacitor through said reset control means.

4,626,977

REGULATED POWER SUPPLY FOR VIDEO DISPLAY APPARATUS

Mark T. Carnes, and Lawrence E. Smith, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 27, 1985, Ser. No. 813,757
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



4. A power supply comprising:

a source of unregulated voltage;

a transformer including a first transformer winding; means for periodically energizing said first transformer winding from said source of unregulated voltage;

first circuit means including a second transformer winding energized by said first transformer winding, said first circuit means developing a first voltage regulated with respect to said source of unregulated voltage, said first circuit means selectively supplying power to a first load circuit;

second circuit means including a third transformer winding energized by said first transformer winding;

a second load circuit coupled to said second circuit means and drawing power therefrom, said power provided by said second circuit means being insufficient to operate said second load circuit when said first load circuit does not draw power from said first circuit means; and

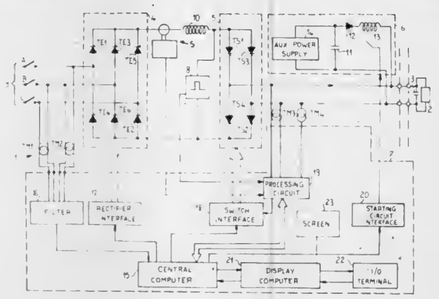
switching means coupled to said first circuit means and to said second load circuit, said switching means responsive to the level of said power provided by said second circuit means for causing said switching means to enter a first switching state when said level of said power provided is below a predetermined level for applying power from said first circuit means to said second load circuit and for causing said switching means to enter a second switching state when said level of said power provided is above said predetermined level for preventing said first circuit means from applying power to said second load circuit.

4,626,978

STATIC POWER FREQUENCY CONVERTER

Jean-Marie Thouvenin, Seyssinet Pariset, France, assignor to Saphymo-Stel, Massy, France

Filed Jul. 15, 1985, Ser. No. 755,277
Claims priority, application France, Jul. 13, 1984, 84 11182
Int. Cl.[4] H02M *5/45;* **H05B** *6/06*
U.S. Cl. 363—37 **17 Claims**



1. A static power frequency converter, comprising

a rectifier (**4**) having an input and an output and including controlled semiconductors (**TE1–TE6**) with control electrodes;

a switch (**5**) having an input and an output and including controlled semiconductors (**TS1–TS4**) with control electrodes;

and inductor (**10**) connecting the output of the rectifier to the input of the switch;

means for measuring (**TM3, TM4, S, 8**) a voltage output and a current output of the switch (**5**), and a current supplied by the rectifier (**4**) to the switch (**5**), and a reverse bias time of the controlled semiconductors of the switch (**5**);

means for detecting (**TM1, TM2**) a zero crossover of a voltage supplied to the input of the rectifier;

a processing circuit (**19**) connected to an output from the measuring means and from the detecting means;

a digital computer central processor (**15**) connected to an output of said processing circuit, and having at least two outputs; and

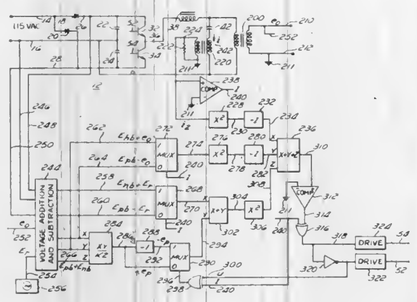
at least two interface circuits (**17, 18**) connecting one of said computer outputs to the control electrodes of the controlled semiconductors of said rectifier, and another of said computer outputs to the controlled electrodes of the controlled semiconductors of said switch (**5**).

4,626,979

ANTICIPATORY FEEDBACK TECHNIQUE FOR PULSE WIDTH MODULATED POWER SUPPLY

John W. JaQuay, San Diego, Calif., assignor to Diego Power, San Diego, Calif.

Filed Feb. 22, 1985, Ser. No. 704,336
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—41 **24 Claims**



1. A power supply, powered by a power source, for generating an output signal to a load, which output signal includes a desired signal waveform on which is superimposed a ripple waveform, comprising:

a switch for alternately connecting and disconnecting said load to and from said power source;

a filtering element for smoothing the application of said output signal to said load, to provide said desired signal waveform on which is superimposed a ripple waveform; and

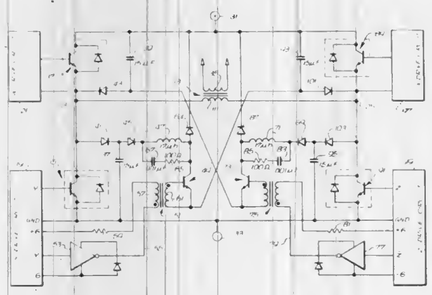
a control circuit responsive to a current in said filtering element for operating said switch at times to generate a varying instantaneous ripple waveform as a function of said desired signal waveform to provide a substantially constant selected frequency for said ripple waveform.

4,626,980

POWER BRIDGE HAVING A NON-DISSIPATIVE SNUBBER CIRCUIT

Thomas B. McGuire, San Diego, Calif., assignor to Square D Company, Palatine, Ill.

Filed May 17, 1984, Ser. No. 611,242
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—56 **14 Claims**



1. In a power bridge circuit of the kind including first, second, third and fourth switching power transistors connected to an inductive load, the first and third transistors being connected to opposite sides of the load and arranged to couple an electrical current through the load in a first direction, and the second and fourth transistors likewise being connected to opposite sides of the load and arranged to couple an electrical current through the load in a second, opposite direction, the circuit further including driver means for controllably biasing on the first and third transistors at substantially the same times and the second and fourth transistors at substantially the same times not coincident with the times the first and third transistors are biased on, and first, second, third and fourth capacitors shunting the respective first, second, third and fourth transistors, such that when the driver means biases off each corresponding pair of transistors, electrical current flowing through the inductive load is diverted through the associated pair of capacitors, to charge the capacitors to predetermined voltages, an improvement comprising:

first non-dissipative discharge means interconnecting the first and third capacitors, and second non-dissipative discharge means interconnecting the second and fourth capacitors, each of the first and second discharge means discharging its two associated capacitors simultaneously to their original states when the driver means again biases on the associated transistors, each of the first and second discharge means including

an inductor, switch means connected in series with the inductor, and

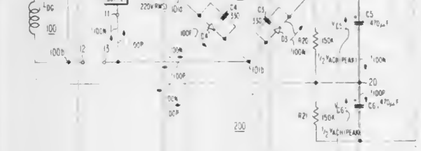
actuation means for controllably actuating the switch means when the associated transistors are biased on, to simultaneously discharge the two associated capacitors through the inductor.

4,626,981

DUAL VOLTAGE CONVERTER CIRCUIT

Robert Su, Taoyuan, and Fang-Nung Leu, Tu-Chen Taipei, both of Taiwan, assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 2, 1985, Ser. No. 761,847
Int. Cl.[4] H02M *3/06*
U.S. Cl. 363—62 **19 Claims**



1. A power supply for producng, from an AC input voltage, an AC output voltage, comprising;

a source of said AC input voltage;

first and second capacitors;

a rectifier arrangement coupled to said source and to said first and second capacitors for rectifying said AC input voltage to develop DC voltages in said first and second capacitors, respectively; and

a AC utilization circuit having a pair of terminals that requires, for proper operation, said AC output voltage having a predetermined amplitude to be developed between said pair of terminals, said AC utilization circuit being coupled to said AC input voltage through said rectifier arrangement such that said AC input voltage is alternately combined with said DC voltages in said first and second capacitors, in accordance with first and opposite polarities of said AC input voltage, respectively, for producing said AC output voltage at said predetermined amplitude that is developed between said pair of terminals of said AC utilization circuit.

4,626,982

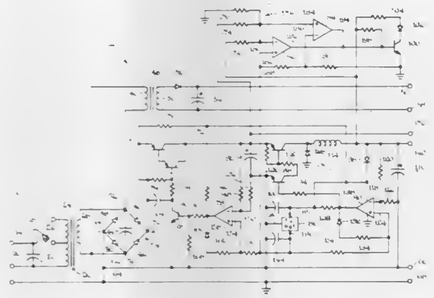
SERIES CONNECTED SWITCHING POWER SUPPLY CIRCUIT

Paul G. Huber, West Warwick, R.I., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 548,120, Nov. 2, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 831,105

Int. Cl.[4] H02M *7/25*

U.S. Cl. 363—80 **16 Claims**



1. A power supply circuit for providing a plurality of d.c. operating potentials of selected polarity and magnitude from an a.c. energy source comprising:

input transformer means for receiving an a.c. voltage input and for converting said a.c. voltage input to an a.c. output voltage of lower value and for limiting output current level;

first rectifier means for converting said lower a.c. voltage output to a unidirectional voltage waveform;

first charge storage means for storing an electrical charge;

first power switching means for receiving said unidirectional voltage waveform and providing a first controlled charging current to said first charge storage means;

first load voltage output means connected to said first charge storage means for providing a first load output voltage from said first charge storage means to a first load;

first load voltage sensing means for sensing the voltage level of said first load output voltage and providing a first proportional voltage signal proportional to said first load output voltage;

reference voltage level means for providing a reference voltage level;

first power switch control means for controlling the on-off state of said first power switching means dependent upon the relative values of said first proportional voltage signal and said reference voltage for controlling the ripple voltage of said first load output voltage;

second charge storage means for storing an electrical charge;

second power switching means connected electrically in series with said first load voltage output means for providing a second controlled charging current to said second charge storage means;

impedance means connected in series between the output of said second power switching means and said second charge storage means for limiting the current level of said second charging current when said second power switching means is in the current conducting state;

rectifier means having one terminal thereof connected to the junction between said second power switching means and said impedance means for providing a current conducting path through said impedance means when said second power switching means is in the non-conducting state;

second load voltage output means connected to said second charge storage means for providing a second load output voltage to a second load;

second load voltage sensing means for sensing the voltage level of said second load output voltage and providing a second proportional voltage signal proportional to said second load output voltage; and

second power switch control means for controlling the on-off state of said second power switching means dependent upon the relative values of said second proportional voltage signal and said reference voltage for controlling the ripple voltage of said second load output voltage.

4,626,983

POWER CONVERSION DEVICE FOR SOLAR CELL

Kosuke Harada, Fukuoka; Katsuaki Murata, Kumamoto, and Takazi Nakamizo, Fukuoka, all of Japan, assignors to Nishimu Electronics Industries Co., Ltd., Fukuoka, Japan

Filed Sep. 26, 1984, Ser. No. 654,858

Claims priority, application Japan, Oct. 6, 1983, 58-186011

Int. Cl.[4] H02M *7/515*

U.S. Cl. 363—132 **6 Claims**



1. A power conversion device for a solar cell having a pair of output terminals between which a dc output voltage is produced, comprising a voltage controlled oscillator (VCO) connected to the output terminals for generating an output oscillation with a frequency which is the function of the dc output voltage of said solar cell, an inverter having a chopping frequency which is controlled based on the output frequency of said voltage controlled oscillator, the inverter connected to the output terminals in parallel with the VCO to receive a dc output current of said solar cell and convert said dc output current into an alternating current (ac) output, the output frequency of the VCO and a frequency of the ac output tending to increase in the dc output voltage so that the ac output frequency is synchronized with a frequency of a commercial power source, and an inductor to couple therethrough the ac output from said inverter to the commercial power source.

4,626,984

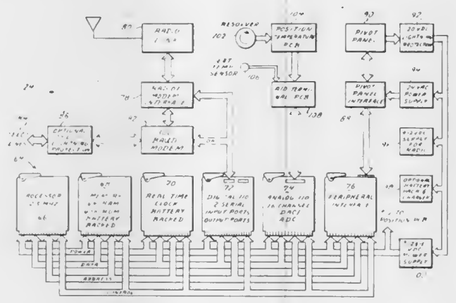
REMOTE COMPUTER CONTROL FOR IRRIGATION SYSTEMS

Rudy R. Unruh; James A. Lamb, and Richard A. Tejral, all of Omaha, Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Filed Aug. 29, 1984, Ser. No. 645,481

Int. Cl.[4] G06F *15/46, 15/16*

U.S. Cl. 364—132 **40 Claims**



1. A system for remotely monitoring and controlling at least one stored program controlled device comprising:

a base computer,

a remote electromechanical device, said device having at lease one parameter to be controlled and monitored,

a remote stored program controller, said controller having a stored program and means to independently monitor said at least one parameter and independently control said device in response to the monitoring of said at least one parameter in accordance with said stored program by monitoring and controlling said at least one parameter,

a communications link between the base computer and the stored program controller,

said base computer having means to request the controller to communicate information associated with said at least one parameter through said communications link to thereby monitor same, and

said base computer having means to generate instructions and communicate same through said communications link to the controller for execution by its stored program to thereby alter the operation of the remote electromechanical device.

4,626,985

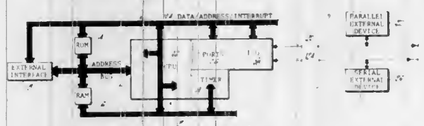
SINGLE-CHIP MICROCOMPUTER WITH INTERNAL TIME-MULTIPLEXED ADDRESS/DATA/INTERRUPT BUS

Willard S. Briggs, Carrollton, Tex., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 454,800, Dec. 30, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 783,261

Int. Cl.[4] G06F *13/24, 13/40*

U.S. Cl. 364—200 **6 Claims**



1. A single-chip microcomputer having on-chip memory and a number of logical units on an integrated circuit chip, including:

a first processing unit;

at least one on-chip input/output unit;

at least one port register unit external to said first processing unit;

at least one memory unit;

means for passing interrupt flag signals from at least one interrupt source to said first processing unit; and

means for passing signals to and from said logical units and said processing unit along at least one time-multiplexed internal address/data bus;

in which microcomputer said input/output unit, port register unit and memory unit are all mapped in a memory space, each having at least one memory address in said memory space;

characterized in that:

said means for passing signals includes means for time-multiplexing, within an instruction cycle, said internal address/data bus between an interrupt-sensing period and at least one other period, whereby said internal address/data bus becomes an address/data/interrupt bus;

said first processing unit includes means for sensing interrupt flag signals indicating the presence of interrupt on said internal address/data bus during said interrupt-sensing period; and

said internal address/data bus is the only signal path for address data, non-address data and interrupt flag signals between said first processing unit and any of said at least one on-chip input/output unit and said at least one port register.

4,626,986

PROCESSOR HAVING PLURAL INITIAL LOADING PROGRAMS FOR LOADING DIFFERENT OPERATING SYSTEMS

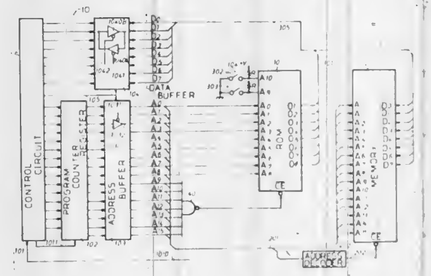
Shosuke Mori, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 752,008, Jul. 5, 1985, abandoned, which is a continuation of Ser. No. 664,090, Oct. 24, 1984, abandoned, which is a continuation of Ser. No. 333,808, Dec. 23, 1981, abandoned. This application Feb. 10, 1986, Ser. No. 827,678

Claims priority, application Japan, Dec. 29, 1980, 55-187950

Int. Cl.[4] G06F *9/40, 13/00*

U.S. Cl. 364—200 **6 Claims**



1. An information processor connected to a peripheral storage unit including execution programs, said information processor, comprising:

a central processing unit capable of executing a plurality of initial program loader programs after the operation of said central processing unit is initiated to load one of the execution programs;

an address bus operatively connected to said central processing unit and having upper and lower address terminals;

a data bus operatively connected to said central processing unit;

a first memory operatively connected to said data bus and said address bus, said central processing unit loading the one of the execution programs into said first memory in dependence upon one of the initial program loader programs;

a second memory, having upper and lower address terminals and operatively connected to said data bus, which stores said plurality of initial program loader programs therein, the lower address terminals of said second memory being connected to said central processing unit through said address bus, said central processing unit setting address bits of said second memory corresponding to the lower address terminals; and

an initial program loader setting part, operatively connected to said second memory at said upper address terminals, which selects one of said plurality of initial program loader programs, the upper address terminals of said second memory being connected to said initial program loader setting part, said initial program loader setting part setting the address bits of said second memory corresponding to the upper address terminals, thereby selecting the one of the plurality of initial program loader programs, the selection being independent from the address on the upper address terminals of said address bus.

4,626,987

METHOD OF AND CIRCUIT ARRANGEMENT FOR SUPPLYING INTERRUPT REQUEST SIGNALS

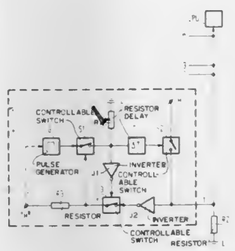
Siegfried Renninger, Nuremberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,619

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233542

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—200 **7 Claims**



1. A peripheral apparatus for a computer system, which apparatus has an output for an interrupt request signal and comprises an interrupt request pulse generator, a delay element, to an input of which the output of the generator is coupled, and an output of which is coupled to the said output for an interrupt request signal, sensing means for sensing the presence of an interrupt request pulse at the generator output, blocking means for blocking the operation of the sensing means and the transmission of an interrupt request pulse from the generator output to the delay element input if an interrupt request signal should be present on the said output for an interrupt request signal, and inhibiting means for inhibiting the blocking action of the blocking means in response to the sensing by said sensing means of the presence of an interrupt request pulse at the generator output.

4,626,988

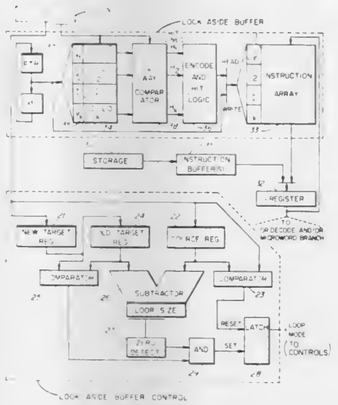
INSTRUCTION FETCH LOOK-ASIDE BUFFER WITH LOOP MODE CONTROL

Steven L. George, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,467

Int. Cl.[4] G06F *9/30*

U.S. Cl. 364—200 **19 Claims**



1. An instruction fetch apparatus for a data processing system, said instruction fetch apparatus having the capability of operating in either normal mode, where instructions are fetched from a storage means, or loop mode, where instructions are fetched from a look-aside buffer means, and having the capability of reducing fetch operations from said storage means when in said loop mode, comprising:

said look-aside buffer means for storing instructions prior to their execution;

control means coupled to said look-aside buffer means for placing said instruction fetch apparatus in said loop mode;

said control means further comprising:

comparing means for comparing a new instruction address with a previous instruction address; said comparing means providing a first control signal when said new instruction address and said previous instruction address are equal and

latch means coupled to said comparing means for enabling the extraction of instructions from said look-aside buffer means upon the presence of said first control signal.

4,626,989

DATA PROCESSOR WITH PARALLEL-OPERATING OPERATION UNITS

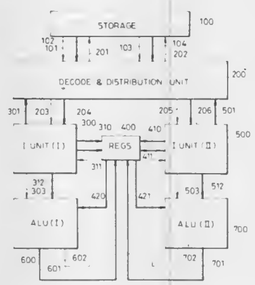
Shunichi Torii, Musashino, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,769

Claims priority, application Japan, Aug. 16, 1982, 57-141120

Int. Cl.[4] G06F *9/30*

U.S. Cl. 364—200 **7 Claims**



1. An information processor for processing a sequence of instructions comprising:

decode means for sequentially decoding the instructions of said sequence;

a plurality of control means for controlling execution of the decoded instructions received from said decode means;

a plurality of operation means, each connected to a respective one of said control means, for executing an instruction under control of the control means connected thereto; and

distribution means connected to said decode means and said plurality of control means for distributing a currently decoded instruction to one of said control means selected on the basis of comparison of said currently decoded instruction delivered from said decode means and at least one preceding decoded instruction whose execution is presently under the control of one of said plurality of control means.

4,626,990

ELECTRONIC CASH REGISTER

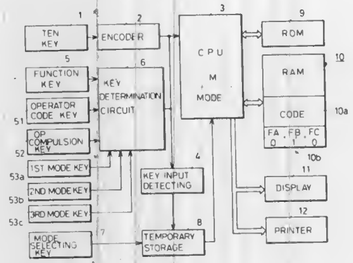
Kensaku Komai, Yamatokooriyama, and Fusahiro Shiono, Habikino, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1983, Ser. No. 514,038

Claims priority, application Japan, Jul. 27, 1982, 57-131804

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—405 **2 Claims**



1. An electronic cash register, comprising:

mode selecting means for selecting one of first, second and third modes, each said mode designating a different manner of printing a multidigit operator code;

commodity associated information inputting means for introducing information associated with a commodity;

operator code inputting means for inputting a said multidigit operator code, said multidigit operator code identifying a specific operator who enters said commodity associated information, each said operator code being predetermined for a different operator;

means for registering commodity associated information introduced by said commodity associated information inputting means;

registration inhibiting instruction providing means for providing an instruction to inhibit registration of said commodity associated information unless a said operator code is inputted by said operator code inputting means;

mode storing means, responsive to said mode selecting means, for storing the said mode selected by said mode selecting means;

registration inhibiting means, responsive to said registration inhibiting instruction providing means for inhibiting registration by said means for registering of said commodity associated information introduced by said commodity associated information inputting means when no said operator code is input from said operator inputting means;

displaying means responsive to operation of said means for registering for displaying at least said commodity associated information;

printing means responsive to operation of said means for registering for printing at least said commodity associated information;

mode determining means operatively connected to said mode storing means for determining the mode stored therein when said commodity associated information is to be registered by said means for registering; and

controlling means, responsive to said mode determining means for controlling said displaying means and said printing means such that the multidigit operator code entered by said operator code inputting means is displayed by said displaying means and printed by said printing means when said first mode is stored in said mode storage means, display of said operator code by said display means being inhibited and the printing of only a partial digit or digits of the multidigit operator code by said printing means being enabled when said second mode is stored in said mode storage means, and display and printing of said operator code being inhibited when said third mode is stored in said mode storage means.

4,626,991

SYSTEM FOR REPROJECTING IMAGES ACQUIRED BY BACKPROJECTION

Carl R. Crawford, Haifa, and Asher Reuveni, Natanya, both of Israel, assignors to Elscint Incorporated, Boston, Mass.

Filed Apr. 21, 1983, Ser. No. 487,310

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—414 **9 Claims**



1. A post-reconstruction artifact correction system for computerized tomography (CT) images reconstructed by backprojection, said system comprising:

(a) detector means for converting radiation obtained from source means at different angular positions relative to a subject to electrical signals, said radiation passing through said subject in straight line rays from said source means to said detector means, said different angular positions defining an object circle;

(b) means for preprocessing said electrical signals to provide projections indicative of absorption of the radiation in each of said rays;

(c) means for filtering said projections;

(d) back-projector means for converting said filtered projections to digitized original image data;

(e) memory matrix means for storing said digitized image data in elemental matrix areas;

(f) means for reading out said digitized original image data from said elemental matrix areas;

(g) means for processing the read-out data to obtain spectral components of said read-out data;

(h) means comprising said back-projector means for converting the spectral components of the digitized original image data into reprojections;

(i) said means for converting the spectral components comprising means for transmitting the spectral components to the input of said back-projector means and receiving said reprojections at the output of said back-projector means;

(j) means for combining said reprojections with said projections to obtain error projections;

(k) means including said back-projector means for converting said error projections to digitized error image error data; and

(l) means for combining the error image data and the original data to obtain error free data for providing an image substantially free of spectral artifacts.

4,626,992

WATER QUALITY EARLY WARNING SYSTEM

John Greaves, Sebastopol; Robert S. Wilson, Santa Rosa, and Edmund H. Smith, Sebastopol, all of Calif., assignors to Motion Analysis Systems, Inc., Santa Rosa, Calif.

Filed May 21, 1984, Ser. No. 612,378

Int. Cl.[4] G06F *14/38*; G01V *1/00*; A01K *61/00*

U.S. Cl. 364—418 **18 Claims**

1. In a system for monitoring water quality in a selected water system:

(a) tank means for exposing a plurality of living organisms to water from said selected water system;

(b) video means for simultaneously visually monitoring the

movements of a plurality of said organisms in said tank means;

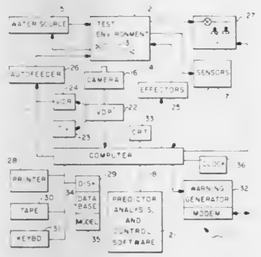
(c) sensor means for measuring selected characteristics of said organisms' environment including the temperature of said water;

(d) warning means for generating a warning message; and

(e) computer means, coupled to said video means, sensor means and warning means, for automatically, periodically evaluating the quality of the water in said water system, including

video analysis means for generating a set of observed statistical distributions for a multiplicity of preselected movement parameters based on said movements of said plurality of organisms monitored by said video means;

predictor means, responsive to measurements by said sensor means, for generating a set of prediction parameters, including



behavioral model means for defining a set of expected statistical distributions for said multiplicity of preselected movement parameters,

wherein each of a plurality of said expected statistical distributions defined by said behavioral model means is a function of one or more measurements by said sensor means, and said set of prediction parameters corresponds to said set of expected statistical distributions; and

analysis means for analyzing said movements of said organisms monitored by said video means, including means for comparing said set of observed statistical distributions with said set of prediction parameters and for activating said warning means when said movements do not correspond to said prediction parameters.

4,626,993

TEACHING-PLAYBACK TYPE AUTOMATICALLY RUNNING VEHICLE

Shigeaki Okuyama, Kawachinagano, and Osami Fuziwara, Kishiwada, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 1, 1982, Ser. No. 445,755
Claims priority, application Japan, Feb. 19, 1982, 57-26569
Int. Cl.[4] G05D *1/02, 3/12;* **G06F** *15/50*
U.S. Cl. 364—424 **4 Claims**

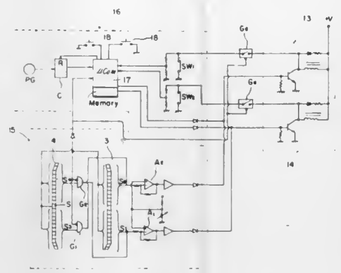
4. A method for controlling the travel of an automatically running vehicle over a predetermined course which has at least one guideline therein, said vehicle having a front and a rear, comprising:

storing vehicle commands which control said vehicle over said predetermined course;

detecting the presence and location of said guideline with first and second groups of sensors transversely mounted on said vehicle front and rear respectively;

controlling said vehicle in accordance with said stored vehicle commands when said guideline is not detected; and

controlling said vehicle in accordance with said guideline location when said guideline is detected by one of said sensors, vehicle control switching from said guideline location to said stored commands so that said vehicle is



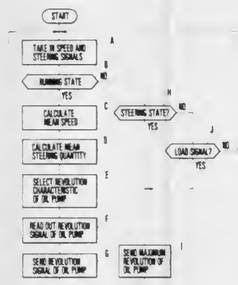
controlled by stored commands corresponding to actual vehicle position on said course.

4,626,994

METHOD AND APPARATUS FOR CONTROLLING POWER STEERING

Hideo Yabe, Hiki, and Ichiro Koike, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,400
Claims priority, application Japan, Jul. 9, 1983, 58-124965
Int. Cl.[4] B62D *5/06*
U.S. Cl. 364—424 **9 Claims**



3. Power steering control apparatus comprising:

a steering sensor for producing a steering signal representing a steering parameter of a steering wheel of a car;

a car speed sensor for producing a car speed signal representing a car speed of the car;

a mean car speed calculating circuit for calculating a mean car speed based on said car speed signal;

a mean steering parameter calculating means for calculating a mean steering parameter based on said steering signal;

a car speed calculating means for calculating an actual car speed in accordance with said car speed signal;

pattern memory means for storing a plurality of types of characteristics each representing a relationship between the car speed and a parameter representative of a current to be supplied to an electric actuator for driving a power steering device;

a selection circuit for selecting one of said plurality of types of characteristics in accordance with said mean steering parameter and said mean car speed; and

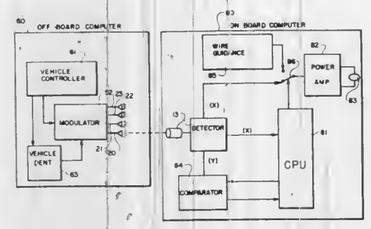
control means for controlling said electric actuator in accordance with a selected one of said plurality of types of characteristics so as to optimize the power steering device, said control means including means for specifying the value of said current representative parameter in accordance with the actual car speed.

4,626,995

APPARATUS AND METHOD FOR OPTICAL GUIDANCE SYSTEM FOR AUTOMATIC GUIDED VEHICLE

Gunnar K. Lofgren, Charlotte, N.C., and Göran P. R. Netzler, Frillesås, Sweden, assignors to NDC Technologies, Inc., Charlotte, N.C.

Filed Mar. 26, 1984, Ser. No. 593,477
Int. Cl.[4] G06F *15/20;* **B62D** *15/00*
U.S. Cl. 364—424 **2 Claims**



1. In a guided vehicle system which includes a vehicle freely maneuverable along a variable, pre-determined path by navigation means and computing the position of said vehicle relative to a plurality of fixed points collectively defining a path, said navigation means comprising:

(a) an off-board computer having:

(i) a vehicle controller containing predetermined vehicle and traffic protocol information regarding vehicle speed, direction, priority, routing or scheduling and means for generating an information containing signal;

(ii) a light source positioned respectively at each of said plurality of fixed points defining said path for receiving the information containing signal from the vehicle controller and emitting a light signal containing such information;

(b) a computer on-board said vehicle having:

(i) a light receiving lens for receiving said optical signal from one of said light sources said lens defining a field of view wherein any particular point within the field of view is represented by a X,Y coordinate wherein X,Y represents the displacement of the light source in respect to the axis of the light receiving lens;

(ii) a central processing unit for receiving and processing all vehicle information and outputting vehicle control instruction signals;

(iii) a power amplifier for outputting a vehicle control signal to vehicle maneuvering apparatus; and,

(iv) a detector for segregating X-data and Y-data, outputting Y-data to said central processing unit for azimuth computation and outputting X-data to said central processing unit for vehicle direction computation and to said power amplifier.

4,626,996

AIRCRAFT DATA INSTRUMENTATION AND ACQUISITION SYSTEM

Raymond D. J. Arlott, Surrey, England, assignor to British Aerospace PLC, Surrey, England

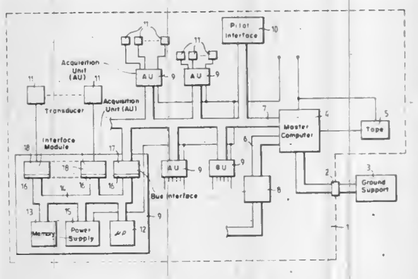
Filed Feb. 17, 1983, Ser. No. 467,367
Claims priority, application United Kingdom, Feb. 17, 1982, 8204675
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—424 **8 Claims**

1. A data acquisition system for an aircraft, the system comprising:

a central control and data acquisition computer connected to a digital signal bus and to data recorder means;

a plurality of data acquisition sub-units for being mounted at respective positions distributed about said aircraft and each comprising a local computer, bus interface means connected to said digital signal bus in parallel with the bus interface means of each other sub-units, power supply means, and a plurality of disengageable electrical connector devices each connected to an output of said power supply means, to said local computer and to said bus interface means;

for each data acquisition sub-unit, a plurality of analog signal transducers for sensing respective aircraft operating parameters and, for each transducer, an adaptive transducer interface module, each interface module comprising transducer drive signal supply means connected to the power supply means of the associated data acquisition sub-unit via a respective one of the connector devices of that sub-unit, analog-to-digital conversion and signal holding means connected to the local computer and bus interface means of said associated data acquisition sub-unit via said respective one of the connector devices of that sub-unit, transducer connector terminal means connected to the associated transducer to said transducer drive signal supply means and to said analog-to-digital conversion and signal holding means, first, second, third and fourth pairs of electrically conductive elements, and circuit support means for mounting said pairs with the elements of each pair positioned adjacent one another for having a resistor connected therebetween, said transducer connector terminal means including a first terminal which is connected to



one electrically conductive element of each of the first and third pairs thereof, a second terminal which is connected to one electrically conductive element of each of the second and fourth pairs thereof, a third terminal which is connected to the other electrically conductive element of each of the first and second pairs thereof, and a fourth terminal which is connected to the other electrically conductive element of each of the third and fourth pairs thereof;

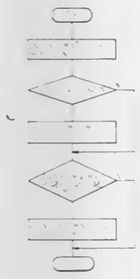
said drive signal supply means of each interface module being operable for deriving, from the output of the power supply means of said associated data acquisition sub-unit, drive signals for driving the transducer connected to the interface module; said analog-to-digital conversion and holding means of each interface module being operable, under the control of the local computer of said associated data-acquisition sub-unit, to form and hold digital signals representing samples of the analog signal supplied by the transducer connected to that interface module and to make said held digital signals available to the local computer of said associated data acquisition sub-unit; each said local computer being operable, under the control of said central control and data acquisition computer, to cause the digital signals made available to it to be transferred in sequence to said central computer via said digital signal bus; and said central computer being operable to cause said digital signals to be recorded by the data recorder means.

4,626,997

METHOD OF AND SYSTEM FOR CONTROLLING IGNITION TIMING RETARD LIMIT IN INTERNAL COMBUSTION ENGINE

Yuuji Takeda; Toshio Suematsu; Katsushi Anzai, and Yoshiyasu Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 17, 1984, Ser. No. 581,042
Claims priority, application Japan, Feb. 18, 1983, 58-26015
Int. Cl.⁴ F02P *5/04*
U.S. Cl. 364—431.05 **10 Claims**



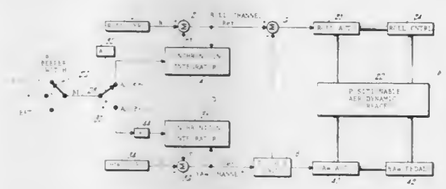
1. Method of controlling an ignition timing retard limit in an internal combustion engine ignition control apparatus of the type wherein ignition timing is determined from an intake air flowrate measurement and an engine speed measurement, and wherein the ignition retard limit prevents the determined ignition timing from exceeding the value of the limit in the retard direction, the method comprising:
- a step of detecting the onset of engine acceleration above a predetermined value denoting rapid acceleration;
- a step of moving the retard limit in the advance direction at the time of detecting said rapid acceleration; and
- a step of comparing the ignition timing with the moved retard limit prevent said ignition timing from exceeding the moved retard limit in the retard direction.

4,626,998

HEADING REFERENCE TRIM SYSTEM

Don L. Adams, Fairfield; Stuart C. Wright, Milford; William C. Fischer, Monroe, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,646
Int. Cl.⁴ B64C *13/08*
U.S. Cl. 364—434 **3 Claims**



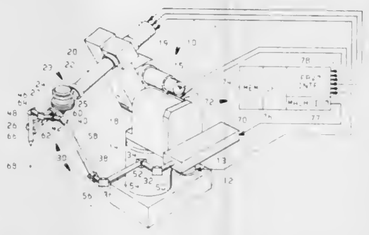
1. A heading reference trim system for an aircraft automatic flight control system having a roll channel for automatically controlling roll attitude and a yaw channel for automatically controlling yaw attitude, comprising:
- a beeper switch for providing a heading change signal indicative of a desired change in heading;
- airspeed sensing means for providing a cruise speed signal indicative of at least a threshold airspeed;
- switch means for providing the heading change signal in the roll channel to effect a change in roll attitude when the cruise speed signal is not present, and for providing the heading change signal in the yaw channel to effect a change in yaw attitude when the cruise speed signal is present so that a roll attitude reference in the roll channel remains unaffected by heading changes which are made by the beeper switch at cruise speeds.

4,626,999

APPARATUS FOR CONTROLLED MANIPULATION OF LASER FOCUS POINT

Robert D. Bannister, Loveland, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 18, 1984, Ser. No. 601,784
Int. Cl.⁴ B23K *27/00;* **G06F** *15/46*
U.S. Cl. 364—474 **6 Claims**



1. Apparatus for program controlled working of a material by manipulation of a focus point of a laser light beam, the focus point manipulation being effected in response to a stored program defining the motion of the focus point and the direction of the laser light beam through the focus point, the apparatus comprising:
- a. a laser generator for producing a laser light beam;
- b. a focusing element for focusing the laser light beam to a focus point;
- c. a program controlled machine having a plurality of first members relatively movable for three dimensionally moving the focus point of the focusing element to programmed locations and having a plurality of second members relatively movable for controlling the direction of the focusing element to direct the laser light beam through the focus point at the programmed location; and
- d. an articulated light pathway having an inlet end connected to the laser generator and an outlet end connected to the focusing element.

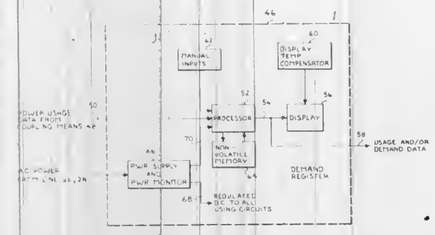
4,627,000

APPARATUS AND METHOD FOR COPYING DATA FROM ONE ELECTRONIC DEMAND REGISTER TO ANOTHER

Warren R. Germer, Dover, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,685
Int. Cl.⁴ G01R *11/64;* **G06F** *11/00, 15/46*
U.S. Cl. 364—483 **3 Claims**

1. Apparatus for copying data from a first electronic demand register to a second electronic demand register, said first and second electronic demand registers each containing a processor having a volatile memory and a non-volatile memory comprising:
- means responsive to a loss of power in said demand register for writing said data from said volatile memory to said non-volatile memory;
- a non-volatile memory copy programmer;
- first means in said non-volatile memory copy programmer for temporarily storing said data read out of said non-volatile memory in said first electronic demand register;
- second means in said non-volatile memory programmer for writing temporarily stored data from said first means for temporarily storing into said non-volatile memory in said second electronic demand register;
- said second means including means for producing control signals for controlling at least a read and a write operation of said non-volatile memory in said first electronic demand register and said non-volatile memory in said second electronic demand register; and



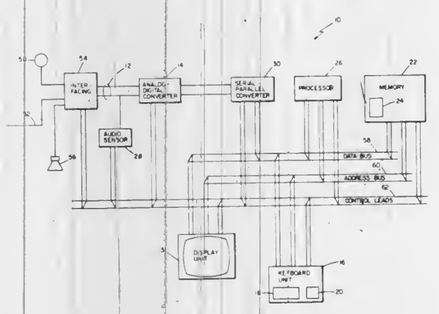
means in said non-volatile memory copy programmer for holding said processor in a one of said first and second demand register being read from and written to in a reset condition while said data is being read from and written to said non-volatile memory.

4,627,001

EDITING VOICE DATA

Gary N. Stapleford, Londonderry, and Deane C. Osborne, Brookline, both of N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Nov. 3, 1982, Ser. No. 439,210
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 364—513.5 **6 Claims**
MICROFICHE APPENDIX INCLUDED
(16 Microfiche, 750 Pages)



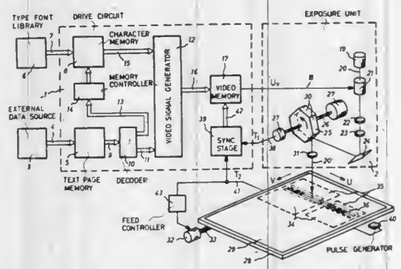
1. A system for processing information having
- continuous signal acquiring means for acquiring a continuously varying electrical signal corresponding to voice message,
- digitizing means for digitizing said continuously varying electrical signal, to produce discrete voice data corresponding to the audible quality of said voice message,
- discrete data acquiring means for acquiring discrete data corresponding to alphanumeric characters,
- discrete signal acquiring means for acquiring discrete signals including editing and control commands,
- memory for storing data in discrete form,
- display means for creating visible display, and a processor, said continuous signal acquiring means, said digitizing means, said discrete data acquiring means, said discrete signal acquiring means, said memory, said display means, and said processor being operatively interconected by control leads and data transfer channels,
- an operating program for said processor being stored in said memory such that said processor controls the operation of said system so as to:
- store said discrete voice data in said memory concurrently with acquiring voice message,
- store said character data in said memory concurrently with entry of characters,
- establish a sequence record in said memory indicating a unified order of voice message and character data,
- display visibly a sequence of voice token marks and character marks, each token mark representing a predetermined increment of acquired voice message and each character mark corresponding to one of said entered characters, said displayed sequence corresponding to the sequence in said record, and
- revise, responsive to entered editing commands, said sequence record to reflect editing changes in the order of voice and character data.

4,627,002

METHOD AND APPARATUS FOR RECORDING CHARACTERS

Dietrich Blum, Raisdorf, and Joerg Broening, Heikendorf, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 704,042
Claims priority, application European Pat. Off., Jan. 24, 1985, 85100702.1
Int. Cl.⁴ G09G *1/06*
U.S. Cl. 364—519 **30 Claims**



1. A method of recording characters from stored character data on a recording medium in electronic typesetting of a page, the character data required for recording being called up by text data representing set instructions and the character data being converted into a control signal for a recording element moving relative to said recording medium, and wherein said recording element records the characters picture-element-by-picture-element and image-line-by-image-line in a recording raster, said control signal defining a respective on-time of said recording element, comprising the steps of:
(a) before the recording
- (i) describing every closed contour of a character proceeding from a starting point on every contour by contour segments following one another in one circumferential direction around the contour, and defining coordinate values x, y of the contour segments in a coding raster of a first XY coordinate system referenced to an em-quad associated with the character, and storing the values as coded character data; and

(b) during recording
- (i) calling up the coded character data of every character to be recorded by the text data and modifying the coordinate values x_0, y_0 of starting points on every contour, and the coordinate values x, y of the contour segments by a dimensional or scaling factor derived from a recording size of the characters and from a relationship of the recording raster to the coding raster;
- (ii) determining picture element coordinates x^*, y^* of those

picture elements of the recording raster which optimally approximate a corresponding contour segment for every successive contour segment of the character by respective interpolation steps x_i, y_i between intersections of the recording raster executed from a starting point to an end point of a contour segment;

(iii) checking successive interpolation steps x_i, y_i for a change in direction;

(iv) respectively marking every identified picture element between two successive interpolation steps x_i, y_i by a marker signal as a switch point for the recording element when a fixed directional change of the corresponding interpolation steps x_i, y_i has taken place;

(v) providing a switch point memory oriented in picture element and image line fashion for the switch point marker signals of a character or character segment, a second XY coordinate system being allocated to this memory, and every memory line and every picture element therein being addressable by coordinate values $\bar{x}$, $\bar{y}$;

(vi) calculating write addresses $\bar{x}_S$, $\bar{y}_S$ for the switch point memory from the picture element coordinates x^*, y^* of the picture elements of a character or character segment marked as switch points and from the position of the character or character segment to be recorded on the recording medium, and intermediately storing the switch point marker signals under the calculated write addresses $\bar{x}_S$, $\bar{y}_S$;

(vii) providing a video memory oriented in picture element and image line fashion for video data of the character for at least one image line of the recording raster, a third UV coordinate system being allocated to said video memory, and every memory line and every picture element therein being addressable by coordinate values $\bar{u}$, $\bar{v}$;

(viii) over-writing the switch point marker signals of a character or character segment stored in the switch point memory line-wise and character-by-character as video data onto those memory locations of the video memory which correspond to a position of the character or character segment to be recorded on the recording medium;

(ix) given line-by-line overwriting of the switch point marker signals onto the corresponding memory locations of the video memory, occupying the memory locations lying between the addressed memory locations in the line direction with video data at the same time;

(x) forming read addresses $\bar{u}_L$, $\bar{v}_L$ for the video memory from the coordinate values u, v of the picture elements currently to be recorded referenced to a fourth UV coordinate system allocated to the recording medium; and

(xi) reading out the video data stored under the read addresses $\bar{u}_L$, $\bar{v}_L$ for recording the characters or character segments and employing the video data as the control signal for the recording element, so that the recording element is switched on or off for a respective duration of the control signal.

4,627,003

METHOD AND APPARATUS FOR CREATING NUMERICAL CONTROL DATA

Hajimu Kishi, Hino; Masaki Seki, Takaidonishi, and Kunio Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Feb. 28, 1983, Ser. No. 470,483
Claims priority, application Japan, Feb. 27, 1982, 57-031615
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—520 **2 Claims**

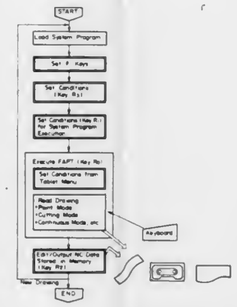
1. An apparatus for creating numerical control data by entering coordinate values of points plotted on a drawing, comprising:

coordinate generating means including coordinate designating means for designating a position on the drawing and means for generating first and second coordinate values corresponding to the position of said coordinate designating means on the drawing, said coordinate designating means having selection switches capable of selecting an output of rapid-traverse data or linear cutting data when said coordinate designating means is moved to the present position from the immediately preceding position;

a first processor, coupled to said coordinate generating means, for receiving, an inputs thereto, the first and second coordinate values of a present position designated by said coordinate designating means and the first and second coordinate values of an immediately preceding position designated by said coordinate designating means, and for computing the change in the first and second coordinate values from the immediately preceding position to the present position;

a register for storing a minimum reading distance for each of the first and second coordinates;

a comparator, coupled to said first processor and said register, for receiving the computed values from said first



processor and for comparing the magnitude of the computer values with the minimum reading distance stored in said register, said comparator producing a gate signal which is applied to said first processor when the computed values are larger than the minimum reading distance for each of the first and second coordinates;

a gate circuit, coupled to said comparator and said first processor, for providing, as an output, the first and second coordinate values of the present position when the gate signal is received from said comparator; and

a second processor, coupled to said gate circuit and said selection switches, for creating numerical control data when the first and second coordinate values of the present position are provided by said gate circuit, and said selection switches on said coordinate designating means are in the mode for producing linear cutting data.

4,627,004

COLOR IMAGE RECORDING SYSTEM AND METHOD FOR COMPUTER-GENERATED DISPLAYS

John K. Cool, Thousand Oaks; Edmund G. Newbert, Jr., Newbury Park, and Charles A. Glorioso, Thousand Oaks, all of Calif., assignors to Image Resource Corporation, Westlake Village, Calif.

Filed Oct. 12, 1982, Ser. No. 433,842
Int. Cl.[4] H04N *9/81;* **G06F** *15/62*
U.S. Cl. 364—521 **15 Claims**

14. The method of recording an image upon a recording medium using a display having a resolution less than the resolution of the recorded image comprising the steps of:

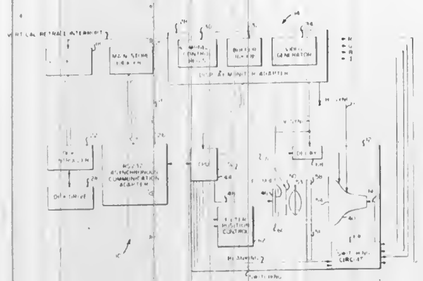
storing an image to be recorded;

for a first color, scanning the stored image to assemble and output for a plurality of repetitions display data defining a step image corresponding to a first type of spatially distinct field, and in sequence scanning the stored image to assemble and output for a plurality of repetitions display data corresponding to at least a second type of spatially distinct field;

in sequence repeating for a second color the substeps executed for the first color;

in sequence repeating for a third color the substeps executed for the first color;

displaying in sequence to a recording to a recording medium



the at least one consecutive repetition of each step image at a spatial location determined by a field to which the step image corresponds; and

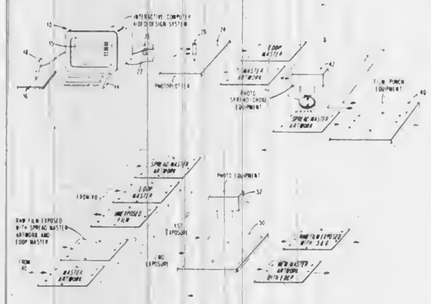
interposing between the display and the recording medium a filter of a color corresponding to a field of display data being displayed.

4,627,005

EQUAL DENSITY DISTRIBUTION PROCESS

John P. Doherty, Haverhill; David L. Dufour, Wakefield, both of Mass.; Russell E. Gebo, Windham, N.H., and Michael J. Sullivan, Arlington, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 24, 1984, Ser. No. 654,335
Int. Cl.[4] G03B *27/02*
U.S. Cl. 364—525 **23 Claims**



1. A method of modifying an original master artwork for eliminating non-uniform plating on a multilayer printed circuit board, said master artwork containing an image of a printed wiring pattern of at least one layer of said multilayer printed circuit board, said method comprising the steps of:

generating a first artwork containing an exact line image of said original master artwork circuit wiring pattern;

generating a second artwork containing a predetermined equal density distribution pattern covering the entire usable area of said board;

generating a third master artwork from said first artwork containing said exact image of said original master artwork wiring pattern which is larger than said exact image by a predetermined amount; and,

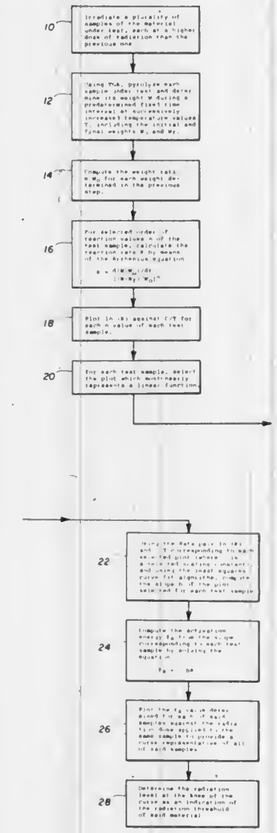
photographically combining different ones of said first, said second and third artworks in succession for producing a new master artwork which contains said image of said printed wiring pattern and said equal density distribution pattern.

4,627,006

METHOD FOR DETERMINING THE RADIATION THRESHOLD OF NON-METALLIC MATERIALS

Catherine P. Dulka, West Chester, and Evan H. Komito, King of Prussia, both of Pa., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 18, 1984, Ser. No. 682,952
Int. Cl.[4] G06F *15/52;* **G01T** *1/167*
U.S. Cl. 364—527 **4 Claims**



1. A method of determining the radiation threshold of a non-metallic material with the aid of a computer, comprising the steps of:

subjecting each of a plurality of samples of said material to a different dose of radiation;

pyrolyzing each sample;

computing the activation energy E_A for each of said samples;

plotting a graph of said calculated E_A values for all of said samples against the corresponding radiation doses applied to said samples; and

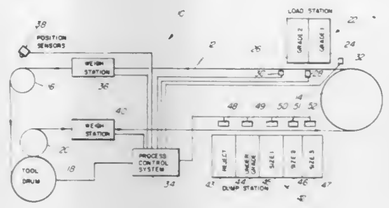
determining the radiation level at the knee of said curve as representative of the radiation threshold of said material.

4,627,007

SYSTEM FOR PROCESSING POULTRY CARCASSES

Theodore R. Muschany, Hoffman Estates, Ill., assignor to Swift & Company, Oak Brook, Ill.

Filed Feb. 29, 1984, Ser. No. 584,808
Int. Cl.[4] G06F *15/46;* **A22C** *21/00*
U.S. Cl. 364—550 **16 Claims**



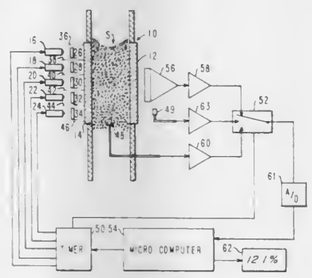
1. A system for processing poultry carcasses comprising:
data processing means for receiving and storing data, manipulating said data in a predetermined manner and providing output control signals in accordance with the manipulation of said data;
means to convey said carcasses from a loading point to a discharge point;
means to sense the position of at least one preselected part of the anatomy of said carcass relative to said means to convey as said carcass is being conveyed and provide data to said data processing means indicative of the position of said preselected part;
tool means for performing a desired function on said carcass; said tool means adapted to move with said carcass as it is being conveyed by said means to convey so that the desired function may be performed as the carcass is being conveyed;
means to move said tool means relative to said means to convey to a desired position relative to the position of said preselected part of said carcass on said means to convey in response to signals from said data processing means so that said tool means can perform the desired function at a predetermined position on said carcass as said carcass is being conveyed by said means to convey.

4,627,008

OPTICAL QUANTITATIVE ANALYSIS USING CURVILINEAR INTERPOLATION

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed Apr. 25, 1984, Ser. No. 603,821
Int. Cl.[4] G06F *15/20;* **G01N** *21/00;* **G01J** *3/48*
U.S. Cl. 364—550 **18 Claims**



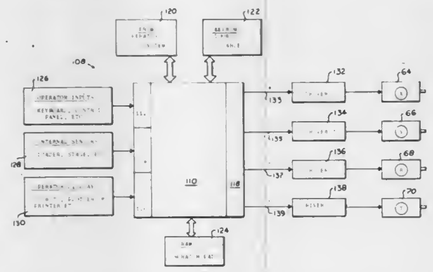
1. An apparatus for optically obtaining a quantitative value of a constituent having a wavelength variable optical absorptivity in a sample, comprising:
means for measuring optical absorptivity of a sample at a plurality of predetermined different wavelengths to obtain a corresponding plurality of measured optical absorptivity values,
means for computing a plurality of computed optical absorptivity values by a curvilinear interpolation technique from the measured optical absorptivity values, and
means for computing the constituent quantitative value from optical absorptivity values including one or more of the computed optical absorptivity values.

4,627,009

MICROSCOPE STAGE ASSEMBLY AND CONTROL SYSTEM

Duane C. Holmes, San Jose, and Guillermo L. Toro-Lira, Mountain View, both of Calif., assignors to Nanometrics Inc., Sunnyvale, Calif.

Filed May 24, 1983, Ser. No. 497,517
Int. Cl.[4] G06F *15/46;* **G05B** *19/19*
U.S. Cl. 364—559 **7 Claims**



1. A stage assembly and controller comprising:
a support frame having a substantially horizontal base member and a pair of spaced legs substantially perpendicular to said base member;
a tilt frame pivotally coupled between the spaced legs of said support frame for rotational movement around a tilt axis, said tilt frame supporting a first linear guide means parallel with said tilt axis;
a first carriage engaged with said first linear guide means for bidirectional linear movement parallel with said tilt axis, said first carriage supporting a second linear guide means substantially perpendicular to said first linear guide means;
a second carriage engaged with said second guide means for bidirectional linear movement, the combined movements of said first carriage and said second carriage permitting said second carriage to make Cartesian movements in a tilt plane determined by said tilt frame;
a pedestal coupled to said second carriage for concurrent Cartesian movements in said tilt plane, said pedestal having a specimen support surface parallel with said tilt plane and rotatable on an axis substantially normal to said tilt plane; and
control means for controlling the rotation of said tilt frame, said linear movement of said first carriage, said linear movement of said second carriage, and said rotation of said pedestal.

4,627,010

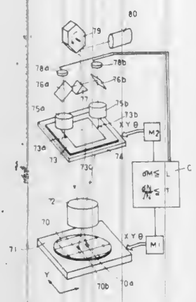
METHOD AND DEVICE FOR DISCRIMINATING STILLNESS OF A STEP EXPOSURE APPARATUS

Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,034
Claims priority, application Japan, Nov. 19, 1982, 57-203964
Int. Cl.[4] G01B *9/00*
U.S. Cl. 364—559 **8 Claims**

1. A method comprising the steps of:

providing relative movement between a mask and wafer in an alignment system;
repetitively detecting a displacement between said mask and wafer to provide a plurality of displacement data representing the displacement;
processing to compute a deviation value representing a variation in the detected data;
comparing said deviation value with a first critical value related to the degree of stillness in said system;



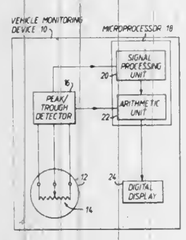
computing the amount of relative movement between said mask and wafer to cause alignment one with the other if said deviation value is smaller than said first critical value as determination in said preceding comparing step; and
repeating said processing step for re-computation of said deviation value if said measurement is larger than said first critical value as determined in said preceding comparing step.

4,627,011

VEHICLE MONITORING DEVICE

Henry B. Spencer, Peebles, and Gwilym M. Owen, Penicuik, both of Scotland, assignors to National Research Development Corp., London, England

Filed Jun. 1, 1983, Ser. No. 500,153
Claims priority, application United Kingdom, Jun. 2, 1982, 8216057; Jul. 26, 1982, 8221585
Int. Cl.[4] G06F *15/20;* **G01P** *3/42*
U.S. Cl. 364—566 **10 Claims**



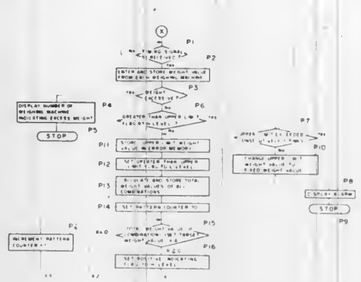
1. A vehicle monitoring device comprising:
an accelerometer; and
processing means, responsive to said accelerometer, for: (1) averaging out decelerating peaks and troughs occurring during a time interval of predetermined length, (2) repeating said averaging function (1) in a series of overlapping time intervals a predetermined number of times, (3) identifying the maximum average achieved over any of said time intervals and (4) outputting a derived value representing said maximum average.

4,627,012

COMBINATORIAL WEIGHING METHOD

Seiji Yamada, Kyoto, Japan, assignor to Ishida Scales Mfg. Co, Ltd., Kyoto, Japan

Filed Apr. 23, 1985, Ser. No. 726,600
Claims priority, application Japan, Apr. 25, 1984, 59-083485; Apr. 25, 1984, 59-083486
Int. Cl.[4] G01G *19/22, 19/52*
U.S. Cl. 364—567 **18 Claims**



1. A combinatorial weighing method implemented by a combinatorial weighing apparatus having a plurality of weighing machines for sensing the weight of articles supplied thereto and for producing weight data indicative of the sensed weights, a calculation control unit for performing a combinatorial calculation based on the weight data produced by the weighing machines, and setting units for setting a target weight value and allowable limits for a combinatorial weighing operation, the method comprising steps of:
(a) subjecting the weight data to a combinatorial calculation performed by the calculation control unit on the basis of predetermined combination patterns;
(b) calculating, using the calculation control unit, a total weight for all of the weight data from weighing machines that have participated in combinatorial weighing, said step (b) being executed when the combinatorial calculation performed in said step (a) fails to yield an optimum combination; and
(c) supplementing a predetermined number of weighing machines which have comparatively low weight values, based on the weight data, with articles after comparing, by using the calculation control unit, the total weight calculated in said step (b) with a predetermined percentage of the set target weight value.

4,627,013

LOAD WEIGHT INDICATING SYSTEM FOR LOAD MOVING MACHINE

Shuichi Ichiyama, Tsuchiura; Yukio Aoyagi, Ibaraki, and Tomohiko Yasuda, Kashiwa, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,403
Claims priority, application Japan, Dec. 1, 1982, 57-209245; Mar. 23, 1983, 58-47299; May 9, 1983, 58-79274
Int. Cl.[4] G06F *15/32;* **G06G** *7/68;* **E02F** *9/26*
U.S. Cl. 364—567 **14 Claims**

6. A load weight indicating system for a load moving machine including a support, and a front attachment supported by said support for pivotal movement about a first pivot, said front attachment having a first linkage element supported by said support for pivotal movement about said first pivot, a second linkage element supported by said first linkage element for pivotal movement about a second pivot, a loading section supported by said second linkage element, and first and second hydraulic actuator means mounted for pivotally moving the first linkage element and the second linkage element, respectively;
said load weight indicating system comprising:

first and second displacement detector means for detecting displacement α_1 and β_1 of at least the first linkage element and the second linkage element, respectively, of said front attachment;

pressing force sensor means for obtaining values P_b, P_r associated with a pressing force K_1 exerted by at least one of the first and second hydraulic actuator means of said front attachment;

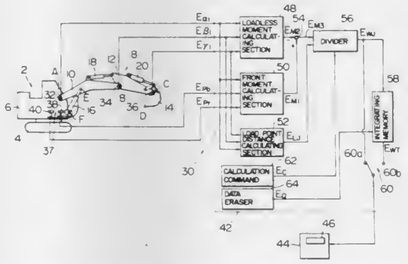
weight calculating means for calculating the weight of a load carried by the loading section based on the values α_1, β_1, P_b and P_r obtained at least by the first and second displacement detector means and the pressing force sensor means, respectively;

weight indicating means for indicating a value associated with the load weight obtained by said weight calculating means; and

position setting means for setting an arbitrarily selected position of said front attachment;

said weight calculating means including;

(a) a first means for calculating a moment of rotation M_{20} of the front attachment about the first pivot when the loading section carries no load, based on the values α_1, P_b and



P_r obtained at least by said first displacement detector means and said pressing force sensor means when the front attachment is moved and passes through a first set position set by said position setting means with the loading section carrying no load,

(b) a second means for calculating a moment of rotation M_1 of the front attachment about the first pivot when the loading section carries a load, based on the values α_1, P_b and P_r obtained by said first displacement detector means and said pressing force sensor means when the front attachment is moved and passes through a second set position set by said position setting means with the loading section carrying the load,

(c) a third means for calculating a horizontal distance L_J between a postion of the center of gravity of the load in the loading section and the first pivot, based on the values α_1 and β_1 obtained at least by said first and second displacement detector means when the front attachment is moved and passes through the second set position with the loading section carrying the load, and

(d) a fourth means operative to calculate $(M_1-M_0)/L_J$ based on the results of the calculation performed by said first, second and third means.

4,627,014

METHOD AND APPARATUS FOR DETERMINATION OF AN ANALYTE AND METHOD OF CALIBRATING SUCH APPARATUS

Donald H. Lo; Tai-Wing Wu, and Mark W. Bailey, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,878
Int. Cl.[4] G01J *3/28;* **G01N** *15/06;* **G01F** *25/00*
U.S. Cl. 364—571 **18 Claims**

15. A chemical analyzer for the determination of an analyte in an aqueous liquid in contact with an interactive composition for said analyte;

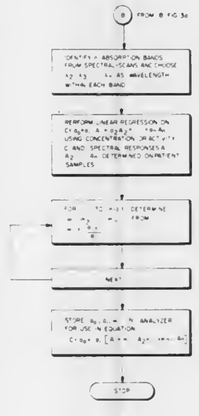
said analyzer comprising

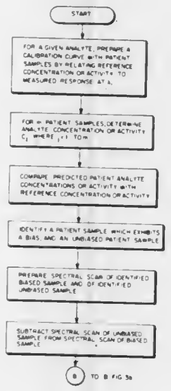
means for measuring the spectrophotometric responses A_1, A_2, . . . A_n at, respectively, a primary wavelength λ_1 and at n secondary wavelengths selected from the secondary wavelengths λ_2, λ_3, . . . λ_n; and

means for determining the concentration or activity C of said analyte using the equation (I):

$$C=a_0+a_1(A_1+\alpha_1A_2+\ldots+\alpha_{n-1}A_n)$$

wherein the constants a_0, a_1 and α_1, α_2, . . . α_{n-1} and said secondary wavelengths λ_2, λ_3, . . . λ_n are determined according to a calibration method for as many n secondary wavelengths as are used,





said calibration method comprising the steps:

(A) from a multiplicity of patient test samples of unknown analyte concentration or activity, identifying first and second patient test samples having substantially the same analyte concentration or activity, said first sample exhibiting a significant bias in analyte concentration or activity and said second sample exhibiting no significant bias in analyte concentration or activity measured at a primary wavelength λ_1;

(B) making a spectral absorption scan of each of said samples identified in step A;

(C) identifying absorption bands from said spectral scans where differences in absorbance between said scans can be observed, and selecting at least one secondary wavelength from the group of secondary wavelengths λ_2, λ_3, . . . λ_n representative of said absorption bands of both said first and second patient samples, respectively, wherein n represents the number of absorption bands;

(D) using a multiplicity of patient test samples of known analyte concentration or activity, determining a linear regression line and its intercept and slopes using the equation (II):

$$C=a_0+a_1A_1+a_2A_2+\ldots+a_nA_n$$

wherein C is analyte concentration or activity; a_0 is the intercept of said line; A_1, A_2, . . . A_n are the spectrophotometric responses measured at λ_1, λ_2, . . . λ_n respectively; and a_1, a_2, . . . a_n are the slopes of said line relating said spectrophotometric responses at λ_1, λ_2, . . . λ_n, respectively, to said analyte concentration or activity;

(E) using the results of step D to determine constants α_1, α_2, . . . α_{n-1} for said equation (I) above using the equation (III):

$$\alpha_i=(a_{i+1})/a_1$$

wherein

i=1 to (n−1); and

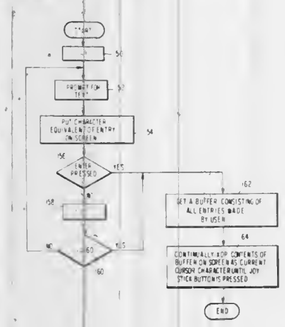
(F) recording in said analyzer the values of said constants a_0, a_1, and α_1, α_2, . . . α_{n-1} for use in equation I above.

4,627,015

TEXT PLACEMENT ON GRAPHICS SCREEN

Lawrence K. Stephens, Dallas, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 31, 1983, Ser. No. 499,451
Int. Cl.[4] G06F *3/00, 15/626;* **G09G** *1/06*
U.S. Cl. 364—900 **4 Claims**



1. A method of text placement on a graphics screen of a computer system, said graphics screen being an all points addressable screen for displaying graphics data from a display buffer, said method comprising the steps of:

interactively inputting an alphanumeric string to said computer using a keyboard;

storing said alphanumeric character string in a text buffer in said computer system;

displaying on said graphics screen said alphanumeric character string stored in said text buffer as a cursor symbol;

inputting cursor position data to said computer system using a cursor positioning device;

moving said cursor symbol to a desired position on said graphics screen by exclusive ORing the alphanumeric character string in said text buffer with all points addressable graphics data in said display buffer at the location of said cursor position data thereby placing said text comprising said alphanumeric character string on said graphics screen;

providing an input to said computer system indicating that said alphanumeric character string is to be fixed at a current location of said cursor; and

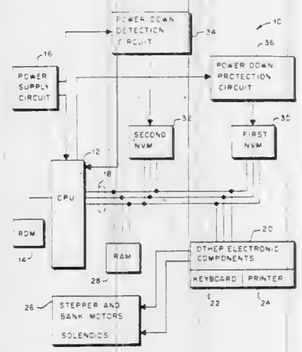
writing said alphanumeric character string into said display buffer data at the current location of said cursor.

4,627,016

MEMORY ADDRESS LOCATION SYSTEM FOR AN ELECTRONIC POSTAGE METER HAVING MULTIPLE NON-VOLATILE MEMORIES

Wallace Kirschner, Trumbull, Conn.; Easwaran C. N. Nambudiri, East Meadow, N.Y., and Douglas H. Patterson, Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 22, 1984, Ser. No. 643,112
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **8 Claims**



4. A system for using data stored in one non-volatile memory to locate the next memory address in which to write data in another non-volatile memory of an electronic postage meter, comprising:

first non-volatile memory for storing data reflecting postage transactions, including cumulative piece count data corresponding to the number of completed postage transactions;

second non-volatile memory having a plurality of individually addressable trip cycle memory locations for storing accounting data therein for each one of a predetermined number of trip cycles of the meter which number corresponds to the number of said individually addressable trip cycle memory locations in said second non-volatile memory and defines a modulus of said second non-volatile memory;

microprocessor means for retrieving the cumulative piece count data from said first non-volatile memory during a power up cycle;

dividing means for dividing the cumulative piece data by the modulus of said second non-volatile memory;

said microprocessor means using the remainder resulting from said dividing means to locate the next individually addressable trip cycle memory location in the sequence of memory locations in said second non-volatile memory for writing the accounting data for the first trip cycle of the meter after completion of the power up cycle.

4,627,017

ADDRESS RANGE DETERMINATION

Frederick T. Blount, Hopewell Junction, and Arnold Weinberger, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 199,143, Oct. 22, 1980, abandoned. This application May 2, 1983, Ser. No. 490,764
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **4 Claims**

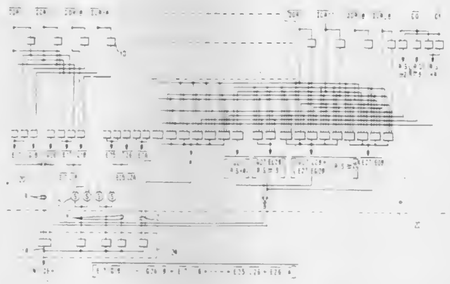
1. A circuit for checking to see if a memory address made up of a group of M high order digits plus a group of K low order

digits can fall within a range of contiguous memory addresses comprising:

first means for receiving the low order K-digits of an address at one end of said range of contiguous addresses,

second means for receiving c-digits that indicate the number of addresses in said range of contiguous addresses,

first logic means responsive both to the K-g high order digits of said K low order digits received in said fi.' means where g is a number of digits less than K digits and equal to or greater than c digits and to the correspondingly ordered K-g high order digits of said lower order digits in the memory address being checked to test for the existence of conditions of the K-g digits which would indicate the memory address can fall within said range and in response to the test provide a first set of signals indicative of the results of the test,



second logic means responsive both to said low-order g digits of said K low order digits received in said first means, and to the correspondingly ordered g low order digits of the memory address being checked and also responsive to said c digits received by said second means for testing the occurrence of a particular one of a plurality of further conditions of the g digits which would indicate that the memory address can fall within the range and provide a second set of signals indicative to the results of the testing, and

third logic means responsive to the first and second set of signals from said first and second logic means respectively to determine concurrence of one of the plurality of further conditions with one of the first mentioned conditions and thereby indicate whether said memory address does fall in said range.

4,627,018

PRIORITY REQUESTOR ACCELERATOR

John R. Trost, Anoka, and Daniel K. Zenk, Stillwater, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,285

Int. Cl.⁴ G06F *13/18*

U.S. Cl. 364—900 **6 Claims**

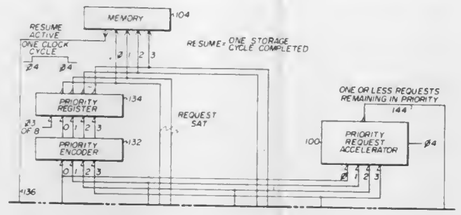
2. A priority requestor accelerator for increasing the request rate of priority logic circuits, such as are normally used to determine the sequential order in which memory requests are granted from various requestors in a data processing system comprising:

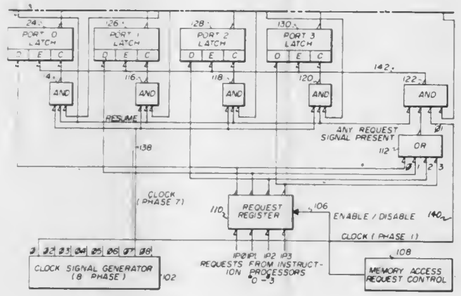
(a) request latching means with enabling/disabling means connected to the various requestors of said data processing system to simultaneously receive and store a plurality of memory requests upon activation of said enabling means and to prevent such reception and storage of said memory requests upon activation of said disabling means;

(b) priority encoder/decoder means coupled to said request latching means to sequentially satisfy the plurality of memory requests in a prioritized manner;

(c) priority request acceleration means coupled to said request latching means for detecting when one memory request remains in said request latching means and of providing an enabling output signal upon such detection; and

(d) coupling means connected between said priority request acceleration means and the enabling means of said request latching means to enable said request latching means, upon the detection of one memory request remaining in said request latching means, and by such enabling cause





the request latching means to simultaneously receive and store another plurality of memory requests whereby a priority requestor accelerator is provided which increases the request rate in which memory requests are granted by eliminating the delay which occurs between the granting of the last memory request of a previous plurality of such requests and the simultaneous reception of the next plurality of memory requests.

4,627,019

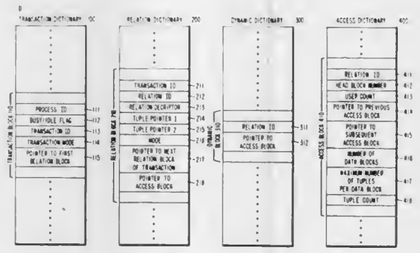
DATABASE MANAGEMENT SYSTEM FOR CONTROLLING CONCURRENT ACCESS TO A DATABASE

Fred K. Ng, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1982, Ser. No. 396,425

Int. Cl.⁴ G06F *15/40, 7/00*

U.S. Cl. 364—900 **34 Claims**



1. A method of controlling access by each of a plurality of contemporaneously active database transactions to a relation in a database, said method comprising the steps of

storing a plurality of versions of said relation representing modifications of said relation resulting from previously executed database transactions and at most one of said plurality of active database transactions,

storing in a relation dictionary a plurality of relation blocks each associated with one of said plurality of active database transactions and defining one of said plurality of relation versions and

permitting access by each of said plurality of active database transactions only to the one of said plurality of relation versions by the relation block associated with that database transaction.

4,627,020

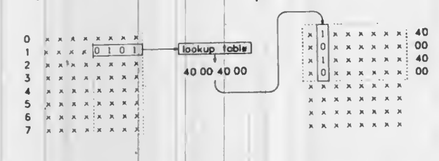
METHOD FOR ROTATING A BINARY IMAGE

Karen L. Anderson, Peekskill; Frederick C. Mintzer, Shrub Oak; Gerald Goertzel, White Plains, and Joan L. Mitchell, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,214

Int. Cl.⁴ G06F *7/00, 15/62;* **G06K** *9/36*

U.S. Cl. 364—900 **18 Claims**



1. A method for rotating a binary image in place by 90 degrees comprising the steps of:

storing said image in raster form as a sequence of bytes in an image buffer, said bytes representing said image in the form of r rows by c columns and each byte having b bits;

dividing said image vertically into a series of blocks, each block having r rows;

copying one block of said image bytes into a temporary storage buffer;

rearranging the uncopied bytes in the image buffer to make available a region having an area equal to that of the copied block and at the location in the image buffer where said copied block will fit after rotation, by overwriting a portion of the copied image bytes with uncopied image bytes;

separating said copied bytes in said temporary storage buffer into groups of m×m bits for rotation;

transferring each group to the available region of the image buffer, such that said groups are stored in rotated raster form; repeating said steps of copying, rearranging, separating, and transferring on the successive blocks of said uncopied image bytes to store said image in said image buffer in rotated form.

4,627,021

INTEGRATED PROCESSOR FOR THE PROCESSING OF WORD-WISE RECEIVABLE DATA

Eric H. J. Persoon; Christian J. B. O. E. Vandenbulcke; Eddy A. M. Odijk, and Eduard F. Stikvoort, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,243

Claims priority, application Netherlands, Dec. 6, 1983, 8304186

Int. Cl.⁴ G06F *7/52*

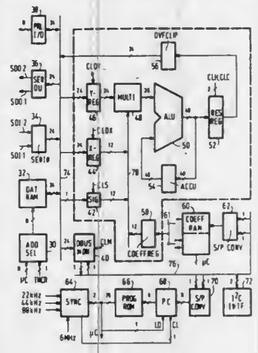
U.S. Cl. 364—900 **13 Claims**

1. A single-chip integrated circuit data processor for the processing of wordwise receivable data, comprising:

a. multiplier element (**48**) featuring a first input of n bits wide for receiving a first operand, a second input having a width of at least 2n bits but smaller than 2½n bits for receiving a second operand to be multiplied with said first operand, and a first output having a bit width that is at least equal to the sum of the bit widths of the first and the second inputs combined for presenting a product;

b. an arithmetic and logic unit (**50**) featuring a third input fed by said first output, a fourth input for receiving a further operand, and a second output having a bit width that is at least equal to the bit width of said first output for presenting a result operand;

c. retrocoupling means interconnected between said second output and said fourth input, said retrocoupling means comprising an accumulator register (**54**) and shift means for selectively presenting said result operand to said arithmetic and logic unit either without change of its respective bit significance levels, or with a uniform shift of its



respective bit significance levels to corresponding lower significance levels, said uniform shift having a maximum that equals a plurality of successive bit steps;

d. a multiplexed result register (**52**) fed by said second output in parallel to said retrocoupling means;

e. a read/write memory (**32**) for storing data;

f. bus means (**74**) having a bit width which is at least equal to the bit width of the second input, said bus means being connected to an output of said result register, to said first and second inputs, and bidirectionally to said read-write memory,

g. and control memory means (**60,66**) for storing control information for selectively controlling operations of said first and second inputs, said arithmetic and logic unit, said retrocoupling means, said result register, and said read-write memory.

4,627,022

PACEMAKER UTILIZING MICROPROCESSOR DMA FOR GENERATING OUTPUT PULSE SEQUENCES

Kornelis A. Mensink, Brummen, and Henk L. Brouwer, Dieren, both of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Filed Sep. 13, 1982, Ser. No. 417,167

Claims priority, application European Pat. Off., Oct. 26, 1981, 81108939.0

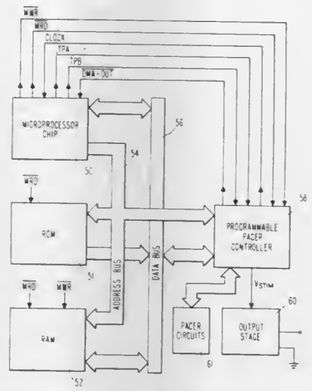
Int. Cl.⁴ A61N *1/36;* **G06F** *1/04*

U.S. Cl. 364—900 **12 Claims**

1. Pacemaker apparatus utilizing microprocessor DMA for generating timing signals for control of a pacemaker function, comprising a microprocessor having including a DMA controller for carrying out DMA data tranfer operations when microprocessor is in a DMA mode, memory interconnected with said microprocessor and containing a stored program and a plurality of data words stored at predetermined addresses for selection by said microporcessor when in said DMA mode, plurality of circuits including at least one pacing circuit which is controllable by a pacer timing signal, characterized by

a pacemaker controller interconnected with said microprocessor and said memory,

said pacemaker controller having first means for receiving signals from said microprocessor and for setting said microprocessor in said DMA mode upon receipt of a predetermined signal generated by said program; second means for receiving transferred data words directly from said



memory under control of said microprocessor when said microprocessor is in said DMA mode; third means connected to said second means for generating a two state pacer timing signal corresponding to the data content of one or more such received data; and gate means for connecting said pacer signal to said pacing circuit for control of same.

4,627,023

WORD INFORMATION RETRIEVAL SYSTEM USING VIDEO STORAGE MEDIUM

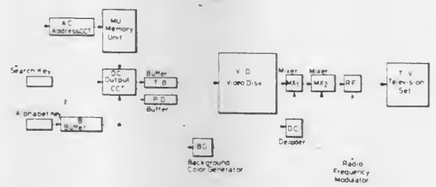
Shintaro Hashimoto, Ikoma, and Mitsuhiro Saiji, Soraku, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1982, Ser. No. 418,014

Claims priority, application Japan, Sep. 22, 1981, 56-150301; Sep. 24, 1981, 56-151837; Oct. 12, 1981, 56-163220

Int. Cl.⁴ G06F *15/02, 15/40*

U.S. Cl. 364—900 **9 Claims**



1. An information retrieval system for an electronic dictionary comprising:

input means for entering an entry world into a buffer memory of the system;

word list memory means for storing a list of words arranged in alphabetical order in a plurality of alphabetically-ordered batches, the entry word being contained in one of said batches, said word list memory means also storing address information with respect to locations of each batch of words on an associated video recording medium;

video means including said video recording medium for storing said alphabetically-ordered batches of words at respective locations designated by the address information in the word list memory means, and definitions of each word of each batch;

access means responsive to the entry word entered into the buffer memory and said address information stored in the word list memory means for retrieving a batch of words from the video recording medium which contains the entry word;

display means for simultaneously displaying, on a display screen, the batch of words containing the entry word retrieved by the access means, and

means for highlighting a region of the display screen containing the entry word and the definition thereof.

4,627,024

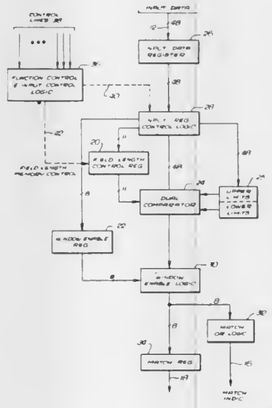
WINDOW-ADDRESSABLE MEMORY CIRCUIT

Barry H. Whalen, Rancho Palos Verdes, and James G. Peterson, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jul. 21, 1983, Ser. No. 517,083

Int. Cl.⁴ G06F *7/02*

U.S. Cl. 364—900 **13 Claims**



1. A window-addressable memory circuit, comprising:

input circuit means, including an input register, for inputting into the input register successive data words having a plurality of data fields;

memory means, for storing a plurality of sets of upper and lower limits;

dual comparator means, for simultaneously comparing the stored plurality of sets of upper and lower limits with each input data word; and

output circuit means, for indicating whether any of the comparisons made in said dual comparator means resulted in a match, and wherein said output circuit means includes

a multi-bit match register having one bit corresponding to each of the plurality of sets of upper and lower limits, and

a single output line derived as a logical combination of the multiple bits of said multi-bit register.

4,627,025

MEMORY PROGRAMMABLE CONTROLLER WITH WORD AND BIT PROCESSORS

Peter Ninnemann, Rottenbach, and Dieter Wollscheid, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 568,105

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302940

Int. Cl.⁴ G06F *15/16, 15/46*

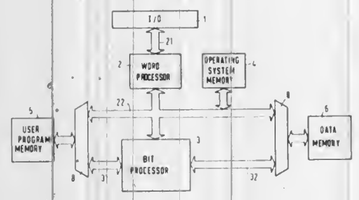
U.S. Cl. 364—900 **5 Claims**

1. In a memory-programmable controller of the type having a cyclically traversed user control program for controlling a peripheral process including a word processor for processing operating system and word commands, a bit processor coupled

to the word processor for processing binary interlinking commands, a user program memory coupled to said word processor and said bit processor and wherein the control program including the word and interlinking commands is stored, an operating system memory coupled to said word processor and said bit processor and wherein an operating system program comprising a plurality of subroutine including the operating system commands is stored, some of the operating system commands comprising subroutines for executing the word commands, each of the subroutines having an entry address, and a data memory coupled to said word processor and said bit processor and wherein binary process image signals comprising input and output signals of the process are stored, the improvement comprising:

said bit processor comprising means for sequentially accessing the user program memory and for recognizing word commands and interlinking commands in the user program memory, the operation of said bit processor being stopped in response to a word command recognized by the bit processor; and further comprising

means responsive to a word command recognized by the bit processor for generating digital information corresponding to an entry address into a subroutine of said operating system program for executing the recognized word command, said digital information being supplied to the word



processor whereby the word processor can enter the subroutine at the entry address corresponding to the digital information and execute the subroutine corresponding to the recognized word command

said means for generating comprising mapping memory means for generating the entry addresses corresponding to the respective word commands from the digital information, said bit processor comprising means for producing an addressing signal when the bit processor is processing a binary interlinking command, the addressing signal being coupled to the mapping memory means, the mapping memory means being responsive to the addressing signal and generating an entry address for a subroutine in the operating system memory which continuously interrogates said mapping memory means, the means for producing further producing, when a word command in the user program memory is recognized, the digital information, the mapping memory means being responsive to the digital information and generating the entry address of a subroutine in said operating system program corresponding to the recognized word command, the word processor being responsive to the entry address and entering into the operating system program at the entry address and executing the subroutine corresponding to the recognized word command, all processing operations of the bit processor being halted until the subroutine is executed.

4,627,026

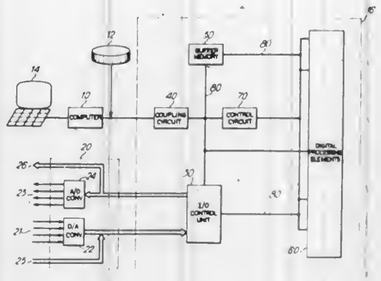
DIGITAL REAL-TIME SIGNAL PROCESSOR

Giuseppe Di Giugno, Bourg la Reine, France, assignor to I.R.C.A.M. (Institut de Recherche et de Coordination Accoustique/Misique, Paris, France

Filed Oct. 21, 1982, Ser. No. 435,698

Int. Cl.⁴ G06F *13/00, 15/00*

U.S. Cl. 364—900 **1 Claim**



1. A digital real-time signal processor, designed to be coupled to a computer (**10**), comprising:

a computer coupling circuit (**40**) connected to said computer (**10**);

an input-output control circuit (**30**);

a buffer memory (**50**); and

a digital processing circuit (**60**), said input-output control circuit, said buffer memory and said digital processing circuit being interconnected by an interconnection bus (**81**) and by a system bus (**85**), said interconnection bus (**81**) comprising a receive bus (**82**), a transmit bus (**83**) and a first data bus (**84**), said system bus (**85**) comprising a select bus (**86**), an address bus (**87**), a waveform address bus (**88**) and a second data bus (**89**), said digital processing circuit (**60**) comprising a plurality of processing modules (**101**, **102** . . . **110**), each of said modules being controlled by said select bus (**86**), said transmit bus (**83**) and said receive bus (**82**), data being exchanged between modules by said first data bus (**84**), each of said modules comprising:

(a) a first bus A

(b) a second bus B

(c) an arithmetic circuit (**115**) with at least a first input connected to said first bus A, a second input and an output connected to said second bus B,

(d) a high-speed multiplier (**120**) having at least a first input connected to said first bus A and a second input connected to said second bus B and an output connected to said second input of arithmetic circuit (**115**),

(e) a shift register connected to said second bus B,

(f) a waveform memory (**140**) containing samplings of determined waveforms, said waveform memory being addressed by said address bus (**88**), and having an output connected to said first bus A,

(g) a data memory (**150**) having an input connected to said second bus B and an output connected to said first bus A, and an addressing input,

(h) an address memory (**160**),

(i) a first address multiplexer (**162**) having a first input connected to said system bus (**85**), a second input, and an output connected to said address memory (**160**),

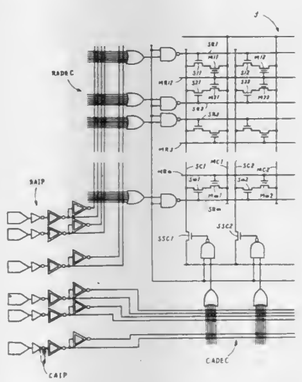
(j) a counter (**161**) connected to said second input of said first address multiplexer,

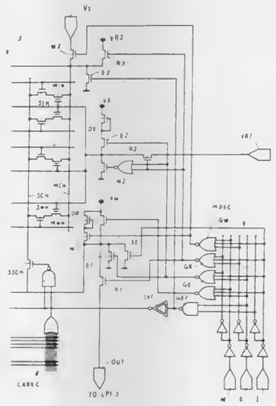
(k) a second address multiplexer (**170**) having a first input connected to said address bus (**87**) and a second input connected to said address memory, and an output connected to said addressing input of said data memory (**150**),

(l) a microprogram memory (**180**) having an output connected to said system bus (**85**), said microprogram memory being addressed by said counter (**161**),

(m) a first buffer memory (**181**) connected between said first bus A and said interconnection bus (**81**), and
(n) a second buffer memory (**185**) connected between said second bus B and said system bus (**85**).

4,627,027
ANALOG STORING AND REPRODUCING APPARATUS UTILIZING NON-VOLATILE MEMORY ELEMENTS
Yasuki Rai, Ogaki; Yuji Kitamura, Gifu, and Minoru Hamada, Ogaki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 23, 1983, Ser. No. 525,814
Claims priority, application Japan, Sep. 1, 1982, 57-153235; Sep. 9, 1982, 57-157885
Int. Cl.⁴ G11C *27/00, 7/00*
U.S. Cl. 365—45 **7 Claims**

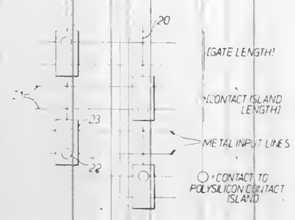




1. An analog signal storing apparatus, comprising: a memory array including an array of a plurality of semiconductor field-effect devices arranged in rows and columns, each field-effect device including a semiconductor substrate of one conductivity type, first and second regions of the opposite conductivity type formed on said semiconductor substrate spaced apart from each other for defining a channel region therebetween, a first insulating layer formed on said channel region, an electric charge storing layer formed on said first insulating layer above said channel region, a second insulating film formed on said electric charge storing layer, and a control gate formed on said second insulating layer above said electric charge storing layer, said semiconductor field-effect device exhibiting a first resistance value between said first and second regions across said channel region as a function of the quantity of an electric charge stored in said electric charge storing layer, addressing means coupled to said memory array for sequentially addressing said plurality of semiconductor field-effect devices, a single write voltage supply commonly coupled to one of said first and second regions of all of said plurality of semiconductor field-effect devices forming said rows and columns and responsive to said sequential addressing by said addressing means for supplying a write voltage to said semiconductor field-effect devices for sequentially charging said electric charge storing layer of said semiconductor field-effect devices in accordance with said sequential addressing, a single write resistor (DR) connected with one resistor end to said write voltage supply and with the other resistor end connected to said one of said first and second regions of all of said plurality of semiconductor field-effect devices so that said single write voltage supply supplies said write voltage to all field-effect devices in all rows and in all columns, said single write resistor (DR) having a relatively high second resistance value selected to be, at least, high enough to sufficiently decrease the rate of changing per unit of time of said electric charge storing layer due to a voltage drop of said write voltage determined by the ratio of said relative high second resistance value of said single resistor and said first resistance value of each of said semiconductor field-effect devices at the time when a channel is formed on said channel region of each of said semiconductor field-effect devices, said second resistance value of said single resistor being further selected to be, at most, small enough to decrease the transfer delay of said write voltage caused as a function of the product of said second resistance value and a parasitic capacitance value with respect to the sampling time of an analog signal determined by said sequential addressing, and analog signal supply means commonly coupled to one of said control gates and the other of said first and second regions of each of said plurality of semiconductor field-effect devices for commonly supplying an analog signal to said plurality of semiconductor field-effect devices, whereby said electric charge storing layer of each said semiconductor field-effect devices, as sequentially addressed, starts being charged as a function of said write voltage and the analog value voltage of said analog signal at the time of addressing, and stops being charged as a function of the voltage of said one of said first and second regions of each said semiconductor field-effect devices, as sequentially addressed, determined as a voltage division of said write voltage and said analog value voltage of said analog signal at the time of addressing by means of said relatively high second resistance value of said resistor means and said first resistance value of each said semiconductor field-effect devices, as sequentially addressed, whereby the quantity of electric charge stored in said electric charge storing layer of each said semiconductor field-effect devices, as sequentially addressed, is determined as a function of said analog value voltage and of said analog signal at the time of addressing, and whereby said analog value voltages of said analog signal at a plurality of time points of addressing are stored in said plurality of semiconductor field-effect devices.

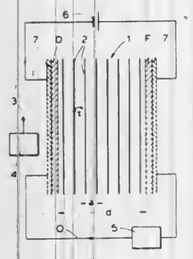
4,627,028
MEMORY DECODER CIRCUIT
Trevor K. Monk, Bexley, England, assignor to Standard Telephones and Cables, Public Limited Company, London, England
Filed Feb. 10, 1984, Ser. No. 578,946
Claims priority, application United Kingdom, Feb. 11, 1983, 8303886
Int. Cl.⁴ G11C *5/06*
U.S. Cl. 365—72 **3 Claims**

2. In a random access memory a NOR decoder circuit including a plurality of field effect transistor circuits each coupled between a circuit ground and a decoding node, each of said transistors having a gate divided into first and second portions disposed on diametrically opposite sides of a contact



island whereby that transistor gate is coupled to a conductor track.

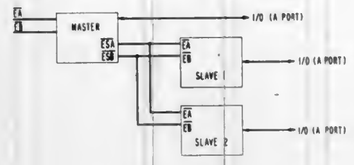
4,627,029
INFORMATION HOLDING DEVICE
Edward G. Wilson, and David Bloor, both of London, England, assignors to QMC Industrial Research Limited, London, England
Continuation-in-part of Ser. No. 420,000, Sep. 20, 1982, Pat. No. 4,534,015. This application Mar. 21, 1984, Ser. No. 591,939
Claims priority, application United Kingdom, Mar. 25, 1983, 8308309
Int. Cl.⁴ G11C *13/02, 13/04*
U.S. Cl. 365—107 **19 Claims**



1. A memory for carrying information comprising a multilayer film built up by successive deposition of a plurality of monomolecuiar layers, at least one of which has been deposited by a process of chemisorption and in which each layer is capable of carrying a charge; means for introducing charges into one side of the film in a time sequence which corresponds to the information to be carried; means for applying a voltage between the faces of the film to cause the charge carried by any layer to be transferred to the adjacent layer; and means for reading out the sequence of charges carried by the film.

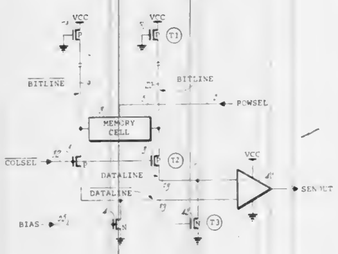
4,627,030
DUAL PORT MEMORY WORD SIZE EXPANSION TECHNIQUE
Frank E. Barber, Center Valley, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Feb. 4, 1985, Ser. No. 698,076
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—189 **5 Claims**

1. An integrated circuit dual port memory comprising a memory array, a first port and a second port for communicating with said array, a first enable input means for requesting access to said memory array for said first port, a second enable input means for requesting access to said memory array for said second port, and conflict resolution means to select one of said first and second ports for said communicating characterized in that
said integrated circuit further comprises control output means adapted to connect to enable input means of a slave



dual port memory and to ensure that the same port of said slave dual port memory is selected as the selected port of said dual port memory.

4,627,031
CMOS MEMORY ARRANGEMENT
Hiep van Tran, Carrollton, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.
Filed Jan. 7, 1985, Ser. No. 689,256
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—190 **3 Claims**



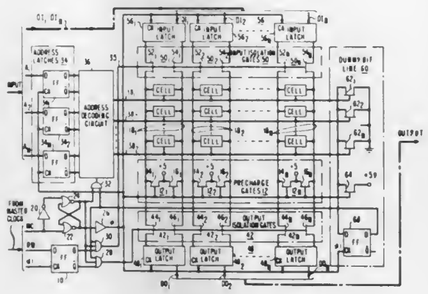
1. A CMOS memory arrangement comprising (FIG. 4)
at least one memory cell (**13**), a bitline (**20**) for determining the state of each memory cell,
pull-up means (**30**) for raising said bitline (**20**) to a power supply potential, VCC,
a dataline (**33,33'**) for transmitting the determined state of said memory cell (**13**) to a sense amplifier (**40**),
pass means (**31, 31'**) for controllably permitting current to flow between said bitline (**20**) and dataline (**33, 33'**), and
a bias means (**58, 59, 60, 13'**) for adjusting said dataline to a selected bias voltage level (**55**), including first (**58**), second (**59**), third (**60**), and fourth (**13'**) MOS transistor means for passing current,
said first (**58**), second (**59**) and third (**60**), and said first (**58**) and fourth (**13'**) transistor means being connected in respective series from said power supply potential, VCC, to ground, the gates of said first (**58**) and second (**59**) transistors being connected to ground,
said bias voltage level being established between (**55**) said second (**59**) and third (**60**) transistors, with the gate of said third transistor (**60**) being connected to a node therebetween.

4,627,032

GLITCH LOCKOUT CIRCUIT FOR MEMORY ARRAY

Kevin D. Kolwicz, and Gilbert L. Mowery, Jr., both of Allentown, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 25, 1983, Ser. No. 554,914
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **3 Claims**



1. A memory arrangement comprising

an array of memory cells arranged to occupy rows and columns;

a plurality of bit lines, each bit line associated with a separate one of the rows of said array of memory cells;

a clock source responsive to an external master clock signal for generating as separate output signals a first clock phase and a second clock phase, said plurality of bit lines responsive to said first clock phase for precharging said plurality of bit lines to a predetermined value when said first clock phase is of a first binary value;

a dummy bit line responsive to said first clock phase for precharging said dummy bit line wherein said dummy bit line precharges at a rate slower than said plurality of bit lines;

latching means responsive to both said first clock phase and said dummy bit line for producing an output signal of a first binary value if and only if said first clock phase is in transition between said first binary value and the other binary value, and said dummy bit line is sufficiently precharged such that said bit lines are precharged to said predetermined value; and

clock lockout means responsive to both said second clock phase and said latching means output signal allowing the propagation of said second clock phase to said memory array if and only if said latching means output signal is of said first binary value.

4,627,033

SENSE AMPLIFIER WITH REDUCED INSTANTANEOUS POWER

Adin E. Hyslop, Houston, and Charvaka Duvvury, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1984, Ser. No. 636,940
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—205 **13 Claims**

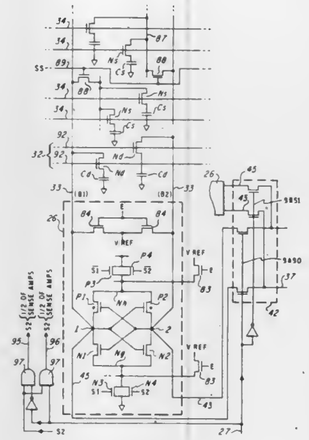
1. A sense amplifier circuit for a memory device, comprising:

a pair of bit lines, and a plurality of memory cells connected to each of said bit lines,

a cross-coupled latch circuit, having a grounding node and a positive voltage supply node, and having a pair of sense nodes,

grounding means including first transistor means and voltage supply means including second transistor means, said first transistor means being a pair of N-channel transistors and said second transistor means being at least one P-channel transistor, each transistor of said transistor means having a source-to-drain path and a gate, the source-to-drain paths of the first transistor means connected between said grounding node and grounding means, the source-to-drain paths of the second transistor means connected between said voltage supply node an voltage supply means,

means a coupling said pair of sense nodes to said pair of bit lines,



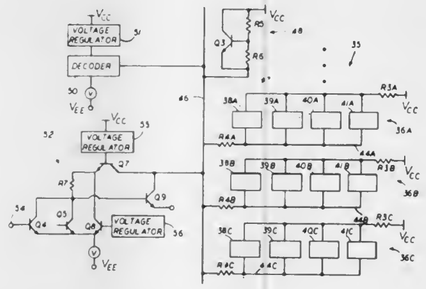
and control means selectively activating said gates of one of said transistors of said first transistor means at a first time in an active cycle after said memory cells are activated, then activating the gate of the other of said transistors of said first transistor means and the gate of said at least one transistor of said second transistor means at a second time after said first time in said operating cycle.

4,627,034

MEMORY CELL POWER SCAVENGING APPARATUS AND METHOD

William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Nov. 9, 1984, Ser. No. 669,929
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—226 **22 Claims**



1. A system for efficiently using standby current in a system, comprising:

a single power supply having first and second voltage level outputs;

a memory circuit coupled to one of said voltage level outputs to receive standby power in a deaddressed state;

a common bias supply bus connected to receive standby current from said memory circuit, said common bias supply bus having a voltage level between said first and second voltage level outputs; and

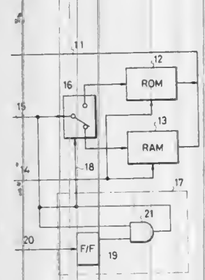
at least one second circuit connected to said common bias supply bus such that at least some of the standby current of said memory circuit may flow through said second circuit to provide a portion of the current required to operate said second circuit.

4,627,035

SWITCHING CIRCUIT FOR MEMORY DEVICES

Kenji Yashiro, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,167
Claims priority, application Japan, Jun. 8, 1983, 58-102263
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **2 Claims**



1. A memory system comprising:

a read-only memory;

a random-access memory, said read-only memory and said random-access memory having address ports commonly coupled to an address signal bus, data ports commonly coupled to an input/output bus and individual read/write control ports;

changeover switch means having an input receiving a memory read/write control signal and first and second outputs coupled to said read/write control ports of said read-only memory and said random-access memory, respectively,

a flip-flop means receiving a read-only memory/random-access memory switching control signal; and

an AND gate having a first input coupled to an output of said flip-flop, a second input receiving said read/write control signal, and an output applied with said read/write control signal to a control input of said changeover switch means.

4,627,036

VERTICAL SEISMIC PROFILING

Kay D. Wyatt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

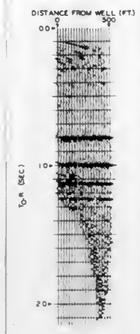
Filed Oct. 8, 1982, Ser. No. 433,752
Int. Cl.[4] G01V *1/32*
U.S. Cl. 367—57 **6 Claims**

1. A method for converting vertical seismic profiling (VSP) seismic data to surface seismic data, wherein the seismic source used to obtain said VSP seismic data was offset a desired distance from a borehole, said method comprising the steps of:

(a) selecting a first VSP data trace from said VSP seismic data;

(b) mapping segments of said first VSP data trace at respective VSP times into locations on a plot of surface seismic time as a function of distance from said borehole;

(c) repeating steps (a) and (b) for at least a portion of the VSP data traces, other than said first VSP data trace, in said VSP seismic data; and



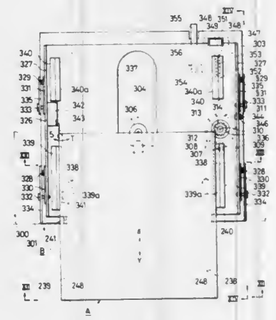
(d) summing sections of each VSP data trace which are mapped into the same location in said plot to produce said surface seismic data.

4,627,037

DISC REPRODUCING APPARATUS

Takuya Tamaru, Hamakita, and Mikio Ogusu, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 10, 1985, Ser. No. 721,666
Claims priority, application Japan, Apr. 12, 1984, 59-73583; May 15, 1984, 59-70478[U]; Jun. 1, 1984, 59-81525[U]
Int. Cl.[4] G11B *23/02*
U.S. Cl. 369—77.2 **11 Claims**



1. A disc reproducing apparatus for reproducing a disc on which optical information data are recorded and which is received in a disc case, said reproducing apparatus being able to receive said disc case with said disc received in said disc case, wherein when said reproducing apparatus receives said disc case with the disc, while said reproducing apparatus holds said disc case in a fixed position to the reproducing apparatus within said reproducing apparatus, said reproducing apparatus drives said disc in rotation and reproduces said optical information data,

said reproducing apparatus comprising a turntable which is engageable with said disc through an insert opening of said disc case to drive said disc in rotation, a pick-up head which accesses said disc through an aperture of said disc case, said optical information data recorded on said disc being optically reproduced by said pick-up head, and a disc case carrying mechanism which carries said disc case in cooperation with said disc case so that said reproducing apparatus is loadable and unloadable with said disc case,

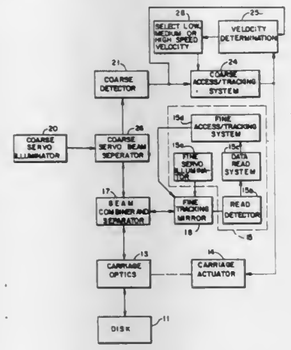
said disc case carrying mechanism comprising a pinion and said disc case including a rack formed on the surface of said disc case and engageable by said pinion to effect movement of said disc case.

4,627,038

OPTICAL DISK STORAGE UNIT HAVING A SERVO SYSTEM WITH DIFFERENT VELOCITY INPUTS

Majeed Abed, Lafayette, and Robert P. McIntosh, Longmont, both of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Jul. 5, 1984, Ser. No. 627,774
Int. Cl.[4] G11B *7/085*
U.S. Cl. 369—44 **9 Claims**



1. In an optical disk storage unit for reading data from or writing data to a disk surface having a rotational axis and a plurality of data bands having data tracks concentrically spaced about said rotational axis comprising;

means for rotating said disk surface about said rotational axis;

an optical head positioned adjacent to the disk surface for reading or writing;

means for positioning said head with respect to said disk surface in a radial direction;

means for projecting read/write light beams through said head onto said disk surface relative to one of said tracks;

a plurality of optically readable servo tracks concentrically spaced about the rotational axis of said disk between said data bands;

an improved access and tracking system including a light source for continuously illuminating a portion of said disk surface that spans the width of at least one data band, including at least one servo track, and a detector for detecitng light returned from said portion including light returned from said illuminated servo track, the output of said system being a position error signal having a saw-tooth waveform including ramps as said head crosses each data band a steep slope as said head crosses between data bands;

a differentiator, said position error signal being applied to said differentiator;

a sample and hold circuit, the output of said differentiator being applied to said sample and hold circuit, a blanking circuit having a switch connected between said differentiator and said sample and hold circuit to disconnect the output of said differentiator during said steep slope of said position error signal so that the output of said sample and hold circuit is a velocity signal; and

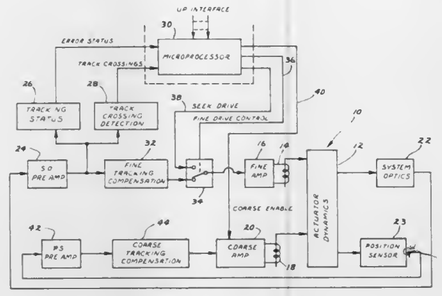
a servo loop responsive to said velocity signal and to said position error signal to produce a drive signal for said means for positioning said head.

4,627,039

HEAD POSITIONING SERVO SYSTEM FOR OPTICAL RECORDING WITH COARSE AND FINE CONTROL

Russell A. Meyer, Colorado Springs, Colo., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 23, 1983, Ser. No. 564,656
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **17 Claims**



1. In an optical disk recording system having a radially movable optical system mounted on a fine tracking linear actuator carriage which is mounted on a primary coarse positioning linear actuator, which is in turn radially movable with respect to an optical recording media disk, the improvement comprising;

A servo control positioning system coupled to receive;

(a) Optical system position signals derived from optically sensed tracking information on the optical media,

(b) Position information derived from data information received from the optical recording media, and,

(c) Further receiving information from a position sensing system, said position sensing system sensing the relative position of the fine tracking actuator vis-a-vis the coarse positioning actuator, said servo control positioning system controlling the movement of the fine tracking actuator through a first servo control loop and coarse positioning actuator through a second servo loop to position the optical system at a desired position, the servo control positioning system being operable to simultaneously position both the fine and coarse tracking position actuators by operating said first and second servo control loops in response to a difference between actual and desired optical system positions,

wherein said position sensing system provides as an output, a signal indicating direction and magnitude of displacement between the relative positions of the fine tracking actuator and the coarse positioning actuator, and wherein said coarse positioning actuator is controlled by said position sensing system operating said second servo control loop to follow movements of said fine tracking system.

4,627,040

OPTICAL DISK TRACKING APPARATUS

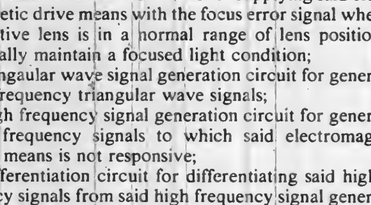
Shigeru Arai, Zushi; Itaru Shibata, Tokyo; Akira Minami, and Koichi Ogawa, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1983, Ser. No. 476,261
Claims priority, application Japan, Mar. 17, 1982, 57-42231
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **8 Claims**

1. An apparatus for controlling a position of a light beam to follow an information track on an information storage device in dependence upon a drive signal, comprising:

light-deflection means, receiving the drive signal, for deflecting and splitting the light beam in half and for moving the split light beam projected onto the information storage device transversely with respect to the information track in response to the drive signal;

photodetector means, positioned in the path of the split light beam, for detecting the difference in intensity between each half of the light beam reflected from said information storage device, and for producing an error signal indicative of a radial error of the light beam with respect to the information track; and



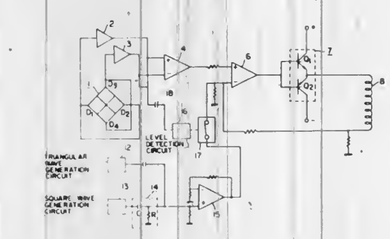
error correcting means, operatively connected to said light-deflection means and said photodetector means, for receiving said error signal and generating the drive signal to be applied to said light-deflection means in accordance with said error signal, and for correcting the error signal, said error correcting means including a circuit, operatively connected to receive the drive signal, for feeding back the drive signal to said error correcting means.

4,627,041

AUTOMATIC FOCUSING SYSTEM FOR READING INFORMATION FROM A RECORDING MEDIUM

Masaru Uemura, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00403, § 371 Date Mar. 15, 1983, § 102(e) Date Mar. 15, 1983
PCT Filed Oct. 8, 1982, Ser. No. 476,872
Claims priority, application Japan, Oct. 8, 1981, 56-161492
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 **4 Claims**



1. An automatic focusing system comprising:

(a) an objective lens for condensing light incident on and reflected from the surface of a recording medium;

(b) electromagnetic drive means responsive to a focus error signal being positive or negative for driving said objective lens in respective opposite directions along an optical axis;

(c) automatic focus control means for supplying said electromagnetic drive means with the focus error signal when the objective lens is in a normal range of lens positions to normally maintain a focused light condition;

(d) a tringaular wave signal generation circuit for generating low frequency triangular wave signals;

(e) a high frequency signal generation circuit for generating high frequency signals to which said electromagnetic drive means is not responsive;

(f) a differentiation circuit for differentiating said high frequency signals from said high frequency signal generation circuit;

(g) an adder circuit for adding said low frequency triangular wave signals from said triangular wave signal generation circuit and the output signals from said differentiation circuit to form a summation drive signal;

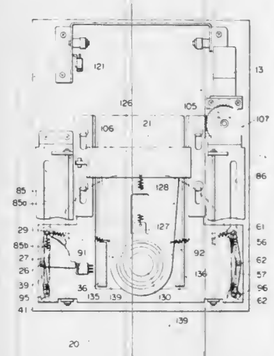
(h) means for supplying said electromagnetic drive means with said summation drive signal from said adder circuit while said objective lens is outside of said normal range of lens positions.

4,627,042

LOADING APPARATUS FOR A DISC

Nobuyuki Hara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 558,509, Dec. 6, 1983, abandoned. This application Sep. 11, 1985, Ser. No. 774,869
Claims priority, application Japan, Dec. 28, 1982, 57-229898; Dec. 28, 1982, 57-229899; Dec. 28, 1982, 57-229900; Dec. 28, 1982, 57-229901
Int. Cl.[4] G11B *1/00, 25/04, 17/04*
U.S. Cl. 369—77.1 **9 Claims**



1. In a disk player including a housing having an elongated opening extending laterally across a front wall thereof, and a rotary turntable laterally centered within said housing and spaced rearwardly from said front wall at a level below that of said elongated opening; a disk loading device for loading onto said turntable a record disk inserted into said opening, said device comprising

a slide base mounted within said housing for sliding movement between a forward position and a rearward position;

first and second disk guiding means mounted on said slide base so as to be disposed adjacent opposite sides, respectively, of said opening in said forward position of the slide base, each of said first and second disk guiding means including forward and rearward guide elements spaced apart in the direction of said sliding movement of the slide base, means mounting said guide elements at said level of the elongated opening for individual movements in directions generally transverse to said direction of the sliding movement, and means biasing said forward guide elements substantially transversely toward each other and said rearward guide elements substantially transversely toward each other to initial positions in which transverse distances between said forward guide elements and between said rearward guide elements, respectively, are smaller than the record disk diameter, whereby, with said slide base in said forward position, insertion of a record disk through said opening to a stabilized position in respect to said slide base causes the edge of said record disk to spread apart said forward guide elements and said rearward guide elements, respectively, until said forward and rearward guide elements of said first disk guiding means and of said second disk guiding means, respectively, are engaged with said edge of the record disk at

locations spaced forwardly and rearwardly in respect to a transversely extending diameter of the disk for stabilizing the position of said record disk relative to said slide base;

drive means operative when the inserted record disk has attained said stabilized position relative to the slide base for driving the latter to said rearward position in which the record disk in said stabilized position relative to the slide base is centered relative to said turntable;

disk support means mounted on said slide base and being movable relative thereto between a raised position engageable from below with the undersurface of the record disk inserted through said elongated opening and a lowered position below said level of the turntable; and

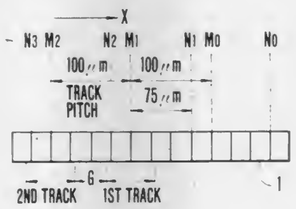
means normally maintaining said disk support means in said raised position and displacing said disk support means to said lowered position during a final increment of movement of said slide base to said rearward position.

4,627,043

HEAD SHIFTING APPARATUS

Tsukasa Uehara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Jan. 3, 1984, Ser. No. 567,547
Claims priority, application Japan, Jan. 7, 1983, 58-975
Int. Cl.⁴ G11B *5/47, 21/02*
U.S. Cl. 369—215 **25 Claims**



1. An apparatus for shifting a head, comprising:

(A) shifting means for shifting the head in a stepwise manner;

(B) detection means for detecting that the head has reached a predetermined position; and

(C) control means responsive to said detection means for controlling said shifting means, said control means causing said shifting means to operate in such a manner that, in order to set said head at said predetermined position, shifting of said head is performed in a first shifting mode with a predetermined first shift amount as one step until said detection means detects that said head reaches the predetermined position, and after the detection means detects that said head has reached the predetermined position, shifting of said head is performed in a second shifting mode with a predetermined second shift amount as one step larger than said first shift amount.

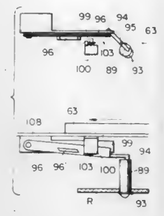
4,627,044

AUTOMATIC RECORD LOADING PLAYER

Hideyuki Takahashi; Isami Kenmotsu, and Takahiro Okajima, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 345,846, Feb. 4, 1982, Pat. No. 4,497,051.
This application Oct. 4, 1984, Ser. No. 657,551
Claims priority, application Japan, Feb. 5, 1981, 56-16096
Int. Cl.⁴ G11B *27/00*
U.S. Cl. 369—292 **3 Claims**

1. An automatic record loading player for loading a record with a first and second side and a center hole between said sides comprising a center spindle assembly (**80**) having a spindle (**89**) movable up-and-down within said center spindle assembly and detecting means (**SW-9, SW**) for detecting a state



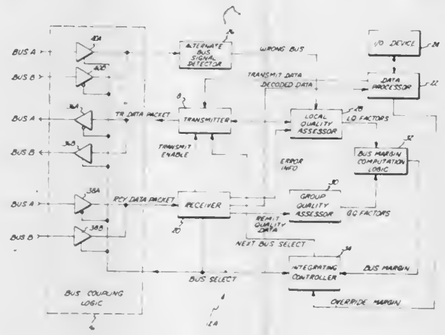
that said spindle has correctly penetrated said center hole from said first side to said second side.

4,627,045

ALTERNATING COMMUNICATION CHANNEL SWITCHOVER SYSTEM

Gene H. Olson, Minneapolis, and Dennis A. Quy, Apple Valley, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Feb. 14, 1984, Ser. No. 580,112
Int. Cl.⁴ H04J *1/16;* **G06F** *11/00;* **H04B** *11/16*
U.S. Cl. 370—16 **19 Claims**



1. A common communication system having a plurality of stations, each of which is coupled to at least two active communication channels for communicating packets between the stations, each of the stations comprising:

transmitter means selectively coupled to each channel for transmitting packets;

receiver means selectively coupled to each channel for receiving packets;

channel quality assessment means coupled to the receiver means for assessing the quality of each of the channels based on previous use of the channels and providing a quality factor for each channel; and

channel selection means coupled to the channel quality assessment means, the transmitter means and the receiver means for selecting the channel from among the active channels on which at least one subsequent packet is to be transmitted and received as a function of the quality factors, such that use of the active channels alternates.

4,627,046

PROGRAMMABLE FEATURE CARD

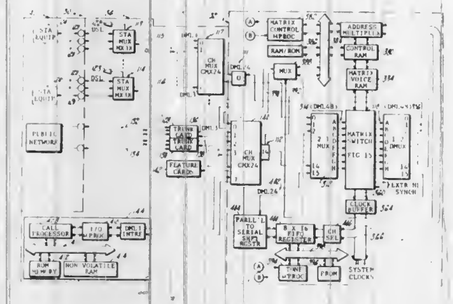
John C. Bellamy, Coppell, Tex., assignor to Data General Corp., Westborough, Mass.

Filed Apr. 26, 1984, Ser. No. 604,094
Int. Cl.⁴ H04Q *11/04;* **H04M** *3/00*
U.S. Cl. 370—58 **3 Claims**

1. Signal apparatus, for use in a series, digital private branch exchange (PBX) having call processor control, for providing alternate user selectable PBX application functions, comprising:

signal processing means having parallel input/output (I/O) data and address buses, and responsive to command signals from the PBX call processor, to clock signals from the PBX time base, and to a program algorithm definitive of the steps to be performed by said processor means in execution of the user programmed application function;

signal memory, responsive to the processor I/O data and



address buses, and including program memory for storing said processing means program algorithm and data memory for storing data signals from the PBX; and

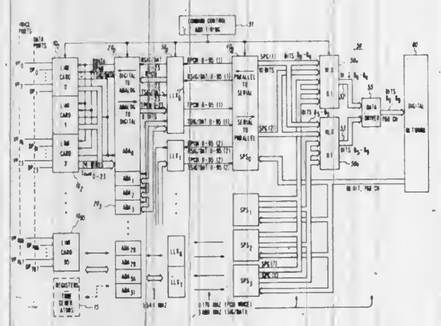
signal interface means connected to a data path of said PBX and responsive to said data path of said PBX and to said processing means for interfacing the PBX signal communications format to the signal communications format of said processing means, whereby said processing means performs the program algorithm stored in said program memory in response to command signals from the PBX call processor.

4,627,047

INTEGRATED VOICE AND DATA TELECOMMUNICATION SWITCHING SYSTEM

Satyan G. Pitroda, Downers Grove; Bakulesh A. Mehta, Bolingbrook, and William A. Fechalos, Naperville, all of Ill., assignors to Rockwell International Corp., El Segundo, Calif.

Filed Jan. 7, 1982, Ser. No. 337,643
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 370—58 **13 Claims**



1. In a time division multiplex switching system of the type having a plurality of voice access ports each having a voice path and a signalling path, transmit and receive voice buses each having a cyclic sequence of time channels, for carrying voice information to and from the voice ports, a plurality of registers, transmit and receive signalling buses each having a cyclic sequence of time channels for carrying signalling information from said voice ports and to said registers, respectively, a common control, a switching network having a voice section for switching voice information between said transmit and receive voice buses, and a network signalling section for switching signalling information between said transmit and receive signalling buses, an improvement for switching data between a data transmit line and a data receive line, comprising:

a transmit data port means for coupling data information from said data transmit line into a predetermined time channel of said transmit signalling bus, and includes:

multiple transmit data ports, each associated with a difference one of the signalling paths in said set of access ports,

logic means for combining information from each of said signalling paths with information from the associated transmit data port, and

means for multiplexing the said combined information from each of the said signalling paths and associated data ports into predetermined channels of said transmit signalling bus;

receive data bus means, including said receive signalling bus and having a cyclic sequence of time channels, for carrying data information switched by said network signalling section,

a receive data port means for coupling data information from a selected time channel of said receive data bus means to said data receive line, and includes:

multiple receive data ports, each associated with a different one of the voice access ports in said set, and

means for demultiplexing switched data information from said receive data bus means time channels to corresponding ones of said receive data ports,

wherein each said voice bus time channel corresponds to a different voice access port, and wherein each said signalling bus time channel corresponds to a different data port, and further the information on each voice port time channel and on each time channel of the associated data port are synchronized to appear in time coincidence throughout the switching system,

whereby each said voice access port having a data port is capable of transmit and receive voice information communication and simultaneous transmit and receive data information, and

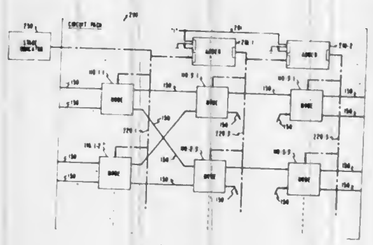
whereby the signalling portion of said system is utilized in switching data information from said data transmit line to said data receive line.

4,627,048

ROUTING ADDRESS BIT SELECTION IN A PACKET SWITCHING NETWORK

Mikiel L. Larson, St. Charles, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

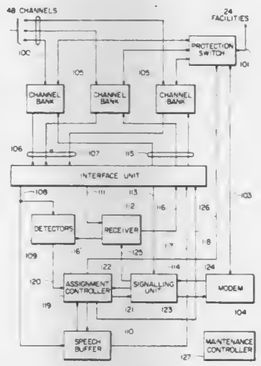
Filed Oct. 9, 1984, Ser. No. 658,594
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 370—60 **23 Claims**



1. A multi-stage packet switching network for switching packets each including a plurality of address elements corresponding with the plurality of network stages, comprising:

a plurality of switching nodes, each node included in one stage;
means for indicating to each node which stage includes the node; and
means responsive to the indicating means for selecting from the address elements of a packet the element that corresponds with the node's stage as the element on the basis of which the packet is routed at the node.

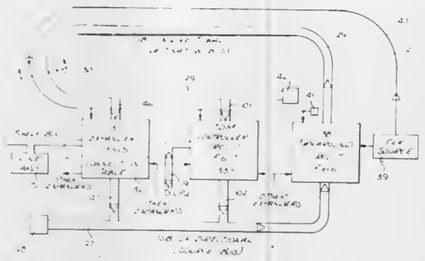
4,627,049
TASI SYSTEM INCLUDING AN ORDER WIRE
David H. A. Black, Chelsea, Canada, assignor to Northern Telecom, Ltd., Ottawa, Canada
Filed Dec. 22, 1980, Ser. No. 218,683
Claims priority, application Canada, Oct. 3, 1980, 361499
Int. Cl.[4] H04J *3/00*
U.S. Cl. 370—81 **13 Claims**



1. A method of transmitting channel-to-facility assignment and channel signalling information in a TASI system in which signals from a plurality of channels are interpolated for transmission via a lesser plurality of transmission facilities, comprising the steps of:
providing one of said facilities for the transmission of said information;
defining time division multiplex frames, each frame comprising a plurality of time slots forming a first part of the frame and a plurality of time slots forming a second part of the frame;
transmitting channel signalling information via said one facility during said first part of the frames; and
transmitting channel-to-facility assignment information, relating to the assignment of said channels to the other facilities for said interpolated transmission, via said one facility during said second part of the frames.

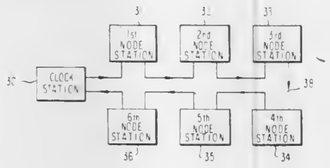
4,627,050
TIME DIVISION MULTIPLEXED COMPUTERIZED BRANCH EXCHANGE
Howard W. Johnson, Santa Clara; Michael G. Duncan, Fremont; Rod G. Sinks, Mountain View; John D. Edwards, Campbell; Martin H. Graham, Berkeley; James M. Kasson, Menlo Park, and Charles M. Corbalis, San Jose, all of Calif., assignors to Rolm Corporation, Santa Clara, Calif.
Filed May 22, 1984, Ser. No. 613,026
Int. Cl.[4] H04J *3/02, 3/16*
U.S. Cl. 370—85 **16 Claims**

1. A computerized branch exchange comprising:
a first unidirectional bus;
a second unidirectional bus;
a turnaround circuit means for coupling said first bus to said second bus;
a plurality of interface means each comprising:
a plurality of interface means coupled to communication lines for transmitting and receiving parallel data;
expander means coupled to said first and second buses;
a third bus coupled to said interface means and said expander means;
said expander means for providing coupling between said third bus and said first and second buses, said expander means coupled to transmit signals onto said first bus and coupled to receive signals from said second bus;



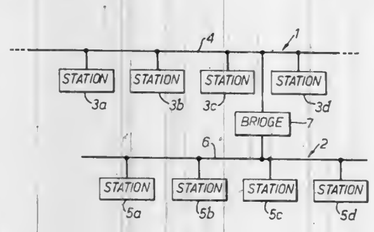
said expander means further including a memory to store a connection table to provide addresses of selected communication lines;
a computer for controlling said branch exchange;
a time division multiplexed (TDM) controller for controlling communications on said first and second buses, said controller coupled to said computer to transmit signals onto said first bus and receive signals from said second bus;
whereby an improved branch exchange is realized.

4,627,051
LOOP NETWORK SYSTEM CONTROLLED BY A SIMPLE CLOCK STATION
Hiroshi Shimizu, Tokyo, Japan, assignor to NEC, Tokyo, Japan
Continuation of Ser. No. 558,393, Dec. 5, 1983, abandoned. This application Jan. 30, 1986, Ser. No. 824,035
Claims priority, application Japan, Dec. 3, 1982, 57-212364; Dec. 3, 1982, 57-212365; Mar. 30, 1983, 58-54117; Mar. 31, 1983, 58-55437; Mar. 31, 1983, 58-55438; Mar. 31, 1983, 58-55439; Mar. 31, 1983, 58-55440; Mar. 31, 1983, 58-55441; Jul. 8, 1983, 58-124481
Int. Cl.[4] H04J *3/00*
U.S. Cl. 370—86 **20 Claims**



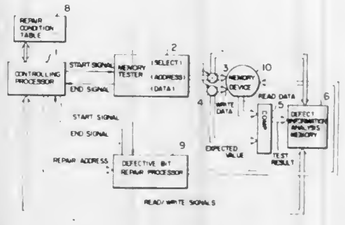
1. In a loop network system comprising a plurality of stations which are connected by a loop-shaped transmission path, said system being for carrying out unidirectional communication through said transmission path when each of said stations seizes a transmission right, the improvement wherein:
said stations are divided into a clock station and node stations;
said clock station comprising:
synchronization signal producing means for producing a succession of synchronization signal blocks to specify a predetermined period and a first kind of priority;
trigger signal producing means for producing a trigger signal block within a duration defined by said predetermined period when said clock station seizes the transmission right, said trigger signal block serving to trigger each of said node stations and to specify a second kind of priority different from said first kind of priority; and
selective sending means for selectively sending said synchronization and said trigger signal blocks to said transmission path to select either one of said first and second kinds of priority and to indicate said predetermined period;
each of said node stations comprising:
transmission signal producing means for producing a transmission signal block;
storage means for storing said transmission signal block as a stored signal block assigned with a degree of transmission priority; and
control means operatively coupled to said storage means and responsive to each of the synchronization and the trigger signal blocks received through said transmission path for controlling said storage means to supply said transmission path with said stored signal block by seizing the transmission right in consideration of said degree of transmission priority and said first and said second kinds of priority.

4,627,052
INTERCONNECTION OF COMMUNICATIONS NETWORKS
David P. Hoare, Hitchin, and David J. Warner, Baldock, both of England, assignors to International Computers Limited, London, England
Filed Mar. 11, 1985, Ser. No. 710,547
Claims priority, application United Kingdom, Mar. 19, 1984, 8407102
Int. Cl.[4] H04J *3/00, 3/24*
U.S. Cl. 370—88 **9 Claims**



1. A method of transferring data from a first network to a second network, each network comprising a plurality of stations interconnected by transmission means, each station having an identifying address unique in the two networks, and data being transmitted in packets each defining a source address and a destination address, the method comprising:
(a) maintaining an address table holding addresses exclusively of stations in the first network,
(b) comparing the destination addresses of packets transmitted over the first network with the contents of said table and, if it is detected that the destination address of a packet is not held in said table, transmitting the packet on to the second network, and
(c) comparing the source addresses of packets transmitted over the first network with the contents of said table and if it is detected that the source address of a packet is not held in said table, entering that source address into said table.

4,627,053
METHOD OF REPAIRING SEMICONDUCTOR MEMORY
Yooji Yamaki, Yokohama, and Shigenori Sakai, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 30, 1984, Ser. No. 595,411
Claims priority, application Japan, Mar. 31, 1983, 58-53972
Int. Cl.[4] G01R *31/28;* **G11C** *29/00*
U.S. Cl. 371—10 **7 Claims**



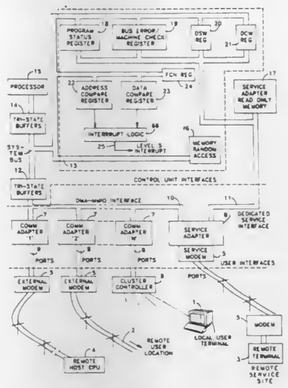
1. A system for repairing a semiconductor memory device wherein a memory device having spare lines arranged in row and column directions of memory array is tested for defective bits and the test result is stored in defect information analysis memory, said system comprising:
controlling processor means for obtaining the best solution for repair based on the test result stored in said defect information analysis memory, including means for executing a first process for repair in which a repairing line is assigned to any row or column that has a number of defective bits larger than a predetermined number of repairing lines, means for forming a compressed matrix of the rows and columns which have defective bits and which remain after execution of said first process without assignment of a repairing line, means for decomposing said compressed matrix into submatrices, means for executing a second process of extracting possible solutions of repair for each of said submatrices, and means for executing a third process of selecting under one or more conditions one of said possible solutions obtained in said second process; and
a repair condition table for storing a plurality of conditions used by said controlling processor in executing said third process.

4,627,054
MULTIPROCESSOR ARRAY ERROR DETECTION AND RECOVERY APPARATUS
Ronald J. Cooper, Raleigh; Mario A. Marsico, Cary, and John C. Pescatore, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 27, 1984, Ser. No. 644,888
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—11 **5 Claims**

1. Error detection, isolation and recover apparatus for a multiprocessor array, comprising:
a controlling microprocessor having a memory mapped I/O control interface, a memory containing a stored recovery routine invoked by an interrupt signal and interconnecting data and address system busses;
a plurality of I/O microprocessors interfaced to said data and address system busses for communicating to said control microprocessor and/or said memory;
a system memory mapped I/O control interface logic means also connected to said system data bus and address bus for receipt and exchange of signals and data;
a plurality of individually controllable selectively actuable isolation means and a plurality of individual control signal lines connected thereto and to said system memory mapped I/O control interface logic means, said selective

isolation means being interfaced between each said microprocessor and said data and address system busses;

an error detection and control logic means connected to said individual control signal lines and means connected thereto for activating a multipoint error signal to all said microprocessors over a said individual control signal line upon detection of an error occurring while any of said



microprocessors is controlling said data and address system busses;

said error signal serving at said microprocessor which is then in control of said data and address system busses to deactivate said microprocessor and to invoke an interrupt signal to said controlling microprocessor for analyzing the cause of said error in accordance with said stored recovery routine contained in said memory.

4,627,055

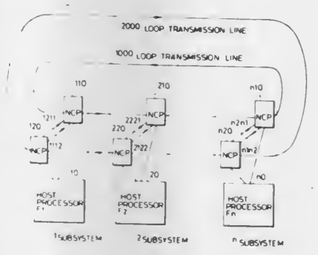
DECENTRALIZED PROCESSING METHOD AND SYSTEM

Kinji Mori, Yokohama; Makoto Nohmi; Shoji Miyamoto, both of Kawasaki, and Hirokazu Ihara, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1984, Ser. No. 570,502

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **14 Claims**



1. A decentralized processing method in a system having a plurality of subsystems, each subsystem being coupled to the other subsystems by at least one transmission means and performing processing of an assigned function comprising the steps:

each subsystem checking whether all of one or more informations required for execution of the assigned function of that subsystem are available from other subsystems over said at least one transmission means; and

each subsystem executing its assigned function only when all of the one or more informations required to perform its assigned function are available.

4,627,056

CHECK SYSTEM FOR A CONTROL BOARD

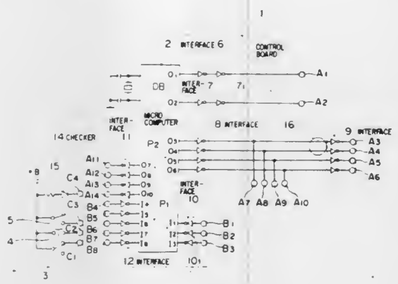
Misao Awane, Kitaadachi; Yorishige Suda, Kumagaya; Seiji Hara, and Satoshi Kobayashi, both of Kitaadachi, all of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Oct. 11, 1984, Ser. No. 659,710

Claims priority, application Japan, Oct. 17, 1983, 58-194853

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **7 Claims**



1. A check system comprising a control board having a plurality of input/output connectors to be connected to an apparatus, and a microcomputer provided on the control board and having a plurality of input/output terminals each connected to the corresponding input/output connector of the control board through the respective interface and a control program for controlling the actual operation of the apparatus in series, said microcomputer including a line check program for checking an abnormal state to be disposed between the input/output terminals and input/output connectors, said line check program including a first function for appointing a check mode when a check signal is introduced into said input connector which is not used during the operation of the control program, a second function for appointing either an input line check or an output line check in said check mode, a third function in said check mode for selecting either said input connector in said input line check or said output connector in said output line check, a fourth function for detecting the signal level of said input terminal connected to said input connector which is selected in said input line check, a fifth function for outputting, in the check operation wherein one of the output connectors is employed as a test output connector, a signal corresponding to the level of said input terminal to be detected by the fourth function to said output terminal connected with said test output connector, and a sixth function for outputting a signal of a certain level from said output terminal connected with said output connector which is selected in the output line check.

4,627,057

METHOD AND ARRANGEMENT FOR THE FUNCTIONAL TESTING OF COMPUTERS

Alfred Schmidt, and Wolfram Pöttig, both of Munich, Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 512,033

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—25 **3 Claims**

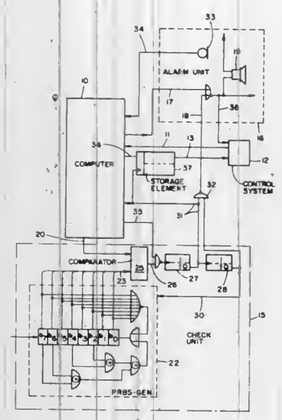
1. A method for testing computers used in the control or monitoring of processes, including a check unit for testing the computer, comprising:

a. generating check signal by the computer in the form of data words;

b. generating test signals by the check unit in the form of digital test words of the same length as that of the data work;

c. implementing a predetermined fixed shaping law by software such that during processing of the software the safety functions and functional groups of the computer are utilized;

d. dynamically modifying the digital test words pursuant to the shaping law;



e. comparing the check signals with the dynamically modified digital test works; and

f. the check unit having an output for generating a comparator signal to act upon the computer to prevent the computer from affecting the process, to emit an alarm signal, and to transfer or switch the process to a safe condition when the check signals and the test signals do not coincide or are not generated within a given time frame.

4,627,058

CODE ERROR CORRECTION METHOD

Yoshiaki Moriyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,067

Claims priority, application Japan, Jan. 27, 1984, 59-014039; Jan. 27, 1984, 59-014040

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37 **6 Claims**



1. A code error correction method for correction of errors in a data block subsequent to reception of said data block after transmission thereof or reproduction of said data block after recording thereof, said data block comprising first, second and third sets of sub-blocks, each of said sub-block sets comprising the entirety of said data block divided into a plurality of sub-blocks along a common array direction, with the division directions of said first, second and third sets of sub-blocks being mutually different, each of said sub-blocks comprising at least first and second check-words and a plurality of data words, each of said data words and check-words being linked to a corresponding error flag constituted by a plurality of binary code bits, said error flag being settable to first, second and third logic states for respectively indicating a high, low and intermediate level of probability of error within the corresponding word, the method comprising the steps of:

(a) setting all of said error flags to said third logic state;

(b) performing an integral number of repetitions of a sequence of processing stages, said sequence comprising:

at least one error detection processing stage in which an error detection computation is performed for each sub-block of said first set thereof, utilizing the contents of all data words and check-words of said sub-block, and if any error is detected, setting all of the error flags of said sub-block which are in said third logic state to said first logic state while leaving the states of all other error flags of said sub-block unchanged, while if no error is detected then setting all of said error flags which are in said third logic state to said second logic state and leaving all other error flags of said sub-block unchanged, said processing sequence further comprising:

at least a first error correction processing stage applied to said second set of sub-blocks and a second error correction processing stage applied to said third set of sub-blocks, with at least one of said first and second error correction processing stages being immediately succeeded in said sequence or at the commencement of each repetition of said sequence by one of said error detection processing stages applied to said first set of sub-blocks.

4,627,059

CIRCUIT ARRANGEMENT FOR TELECOMMUNICATIONS SYSTEMS, PARTICULARLY TELEPHONE SWITCHING SYSTEMS, HAVING DATA PROTECTION BY WAY OF PARITY BITS

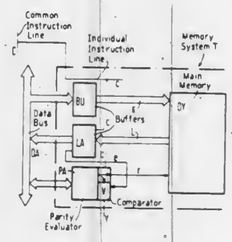
Josef Bronold, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,475

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328893

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—51 **4 Claims**



1. In a circuit arrangement of the type in which a dynamic memory for storing a plurality of informations is connected to a data bus via a first buffer which receives and stores a multibit information and stores the same in the dynamic memory upon receipt of a write instruction and is connected to the data bus via a second buffer and emits information thereto in a chronologically limited manner upon receipt of and only for the duration of a read instruction, the improvement wherein:

said second buffer includes a parity bit output; and a parity evaluator is provided and forms a first parity bit and stores

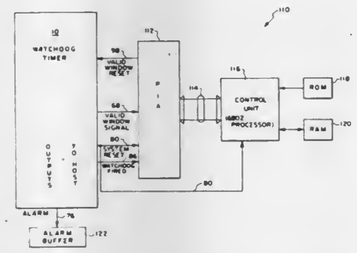
the same with the information in the dynamic memory for each incoming information in the first buffer, said parity evaluator derives a second parity bit upon reading of an information from the dynamic memory and comprises comparison means for comparing the first and second parity bits for equality, said parity evaluator connected to the data bus in parallel with the first and second buffers to receive both incoming and outgoing information at the respective times of receipt and transmission and is connected to said parity bit output of the second buffer for receiving the second parity bit upon intermediate storage in the second buffer, whereby, upon each emission of an information, the comparison means of said parity evaluator receives, on the one hand, the second parity bit derived by the parity evaluator and, on the other hand, the first parity bit correspondingly stored in the dynamic memory and output therefrom to the second buffer with the information, and extracted at said parity bit output of the second buffer.

4,627,060

WATCHDOG TIMER

Leon Huang, Hoffman Estates, and John J. Selman, Vernon Hills, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 29, 1984, Ser. No. 676,130
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—62 **7 Claims**



1. An apparatus for generating a controlled system reset signal comprising:
- first means for sensing an initial application of electrical power and for generating said reset signal;
- second means for generating a plurality of clock pulses of a selected frequency;
- third means for selectively counting said clock pulses in a selected, predetermined counting sequence; and
- fourth means for sensing said predetermined counting sequence including means for setting a selected indicia in response thereto and for inhibiting generation of said reset signal in response thereto.

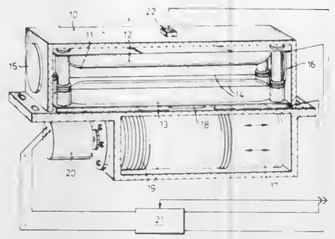
4,627,061

GAS LASER APPARATUS HAVING CONSTANT POWER OUTPUT

John McLeod, Irvine, Calif.; John A. Smith, Linlithgow, and Russell A. Leather, Perth, both of Scotland, assignors to Ferranti, plc, Gatley, England

Filed Aug. 4, 1983, Ser. No. 520,309
Claims priority, application United Kingdom, Aug. 6, 1982, 8222782
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—29 **8 Claims**

1. Gas laser apparatus which includes a cavity containing a gaseous active medium, discharge electrodes between which a potential difference may be applied to produce an electric pumping discharge in said active medium, a reservoir communicating with said cavity to form a sealed enclosure therewith and containing said active medium, and volume control apparatus responsive to the temperature of the gaseous active medium to control the volume of said reservoir containing said



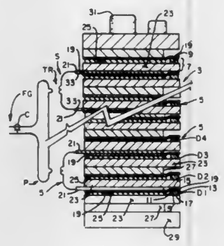
active medium and hence the pressure of said gaseous active medium within said cavity in such a manner as to maintain the output power of the apparatus at a constant value.

4,627,062

AC DRIVEN LASER DIODE ARRAY, POWER SUPPLY, TRANSFORMER, AND METHOD THEREFOR

Gerald M. Bender, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 26, 1983, Ser. No. 545,478
Int. Cl.[4] H01S *3/04*
U.S. Cl. 372—36 **15 Claims**



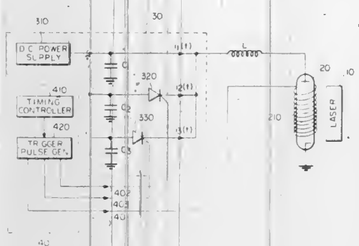
1. A laser diode array comprising a plurality of laser diodes each having a junction, a light emitting facet, and having a pair of opposed contact faces, said diodes each being assembled in a diode sandwich, each said diode sandwich including an electrode in face-to-face electrical and thermal conductive contact with one of said contact faces of said diode and a heat sink in face-to-face electrical and thermal conductive contact with the other of said contact faces of said diode, said diode sandwich further comprising a layer of electrical insulation between said electrode and said heat sink, said diode sandwiches being stacked one on the other such that the electrode of one diode sandwich is in conductive heat transfer relation with the heat sink of a next adjacent diode sandwich whereby heat from both contact faces of said diode is conductively transferred away therefrom via said electrode and said heat sink, said heat sink
- comprising a heat sink electrode in electrical and thermal contact with said other contact face of said diode and a heat sink plate in face-to-face contact with said heat sink electrode, each said heat sink being electrically connected to a power supply and to one another so as to be of substantially the same electrical potential, and said power supply comprising an alternating current power supply for exciting said diodes and for generating a coherent light emitted from said diodes.

4,627,063

LASER OSCILLATOR

Tetsuo Hosokawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,747
Claims priority, application Japan, Aug. 15, 1983, 58-139003
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 **4 Claims**



1. A laser oscillator comprising:
- a laser diode;
- a xenon gas discharge tube having an electrode and a trigger wire surrounding said discharge tube for optically pumping said laser diode in response to a current flowing in said trigger wire and voltage suppled to said electrode;
- a DC power supply unit;
- a first capacitor and at least one second capacitor connected to said DC power supply unit;
- a switching device connected to said second capacitor;
- a choke coil having first and second ends, said first end being connected to said first capacitor and said switching device, said second end being connected to said electrode of said discharge tube;
- a trigger pulse generator for generating a first trigger pulse and at least one second trigger pulse, said first trigger pulse being supplied to said trigger wire, said second trigger pulse being supplied to said switching device to activate said switching device; and
- a timing controller for controlling an interval of said trigger pulses such that the level of a trailing discharge current produced in said discharge tube by a supply of power is raised above a predetermined level before the level of a leading discharge current produced by a preceding supply of power is lowered below said predetermined level.

4,627,064

MIXED OXIDES FOR TUNABLE LASERS

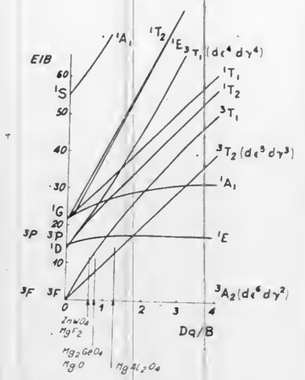
Francois Auzel, Le Mesnil St. Denis; Richard Moncorge, Trévoux, and Denise Morin, Nogent sur Marne, all of France, assignors to L'Etat Francais representé par le Ministre des P.T.T. (C.N.E.T.), France

Filed Nov. 20, 1984, Ser. No. 673,439
Claims priority, application France, Nov. 22, 1983, 83 18575
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—41 **15 Claims**

1. A tunable laser, including a monocrystal of a mixed oxide in accordance with the formula:

$$(A_{1-x}X_x)_n(B_{1-y}Y_y)_mO_4$$

in which:
- A represents one or more elements chosen from the group Mg, Mn and Zn;
- X represents one or more optically active divalent cations chosen from among V, Ni and Co;
- B represents one or more elements of the same valence chosen in the group comprising Si, Ge, P, Te, W, Al, In, Ga and Mo;
- Y represents one or more optically active trivalent cations chosen from among Cr, V and Ni;
- x is such that $0 \leqq x \leqq 0.15$;
- y is such that $0 \leqq y \leqq 0.15$; and



m and n are integers such that $2n+vm=8$ with v representing the valence of B, provided that $y=0$ when B represents one or more elements chosen from among Si, Ge, P, Te, W and Mo and x and y are not both equal to 0.

4,627,065

DOUBLE ACTIVE LAYER SEMICONDUCTOR LASER

Ralph A. Logan, Morristown, and Won-Tien Tsang, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 10, 1983, Ser. No. 502,978
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **13 Claims**



1. In a semiconductor laser comprising a substrate having a first conductivity type and sequentially disposed thereon a plurality of layers comprising a first cladding layer, said first cladding layer having a first conductivity type, a first active layer, a barrier layer, a second active layer, a second cladding layer, said second cladding layer having a second conductivity type, electrical contacts to said first and second cladding layers, said first and second active layers comprising essentially the same composition and having different Fabry-Perot mode spacings and being optically coupled to each other.

4,627,066

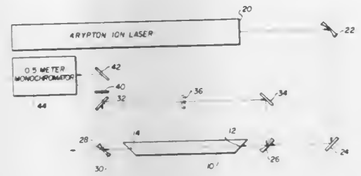
EXCIMER LASER PUMPED BY DISSOCIATIVE RECOMBINATION

William C. Stwalley, Iowa City, Iowa, and Mark E. Koch, Dallas, Tex., assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed May 8, 1984, Ser. No. 608,285
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—57 **22 Claims**

1. A method of producing coherent electromagnetic radiation comprising

providing a lasing medium having present at least one of species ARX, AR, R, X or A; R, X and A each being an atom or a molecular fragment said fragment consisting of one or more elements; ARX being ionizable to form ARX^+; ARX^+ having the property that upon recombination with an energetic electron it dissociates to form X, and AR in an excited state, such that AR in the excited state may emit electromagnetic radiation of a selected wavelength when stimulated by electromagnetic radiation



at a wavelength in the range being emitted by AR in an electronically excited state and dissociate into A and R,

ionizing at least a portion of ARX species in the lasing medium to form ARX^+ and free electrons,

recombining ARX^+ with said free electrons to form AR in the excited state and X, and

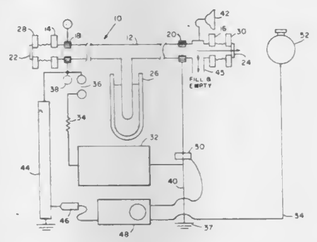
stimulating AR in the excited state with said similar electromagnetic radiation to thereby produce coherent electromagnetic radiation and at least two fragments.

4,627,067

MID-INFRARED LASER IN MOLECULAR HYDROGEN

Thomas A. Barr, Jr., Huntsville; William E. McCracken, Elkmont, and William B. McKnight, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 3, 1982, Ser. No. 446,743
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—81 **4 Claims**



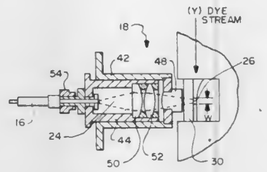
1. A mid-infrared laser in hydrogen which is produced by applying a high voltage pulse electric discharge means along a low loss cavity containing a gas consisting of hydrogen under pressure between 1 and 10 Torr and reflective cavity mirror assembly means at opposite ends of the cavity and with an ouput at one of said mirror assembly means to cause the gas to lase when a high voltage electric discharge pulse from said high voltage pulse electric discharge means is applied through said hydrogen gas and to produce a laser output at said one of said mirror assembly means along a multiplicity of lines producing output pulses with lengths varying from less than 1 microsecond to over 6 microseconds and with wavelengths in the 3 μm band.

4,627,068

FIBER OPTICS INTERFACE FOR A DYE LASER OSCILLATOR AND METHOD

Steve A. Johnson, Tracy, and Lynn G. Seppala, Pleasanton, both of Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 13, 1984, Ser. No. 620,305
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—101 **7 Claims**



1. In a lasing arrangement including a dye chamber defining a given zone having a cross sectional configuration which displays fixed lengthwise and widthwise dimensions and through which a continuous stream of dye flows in one direction while said zone is being illuminated by light from a first pumping beam which is directed into the zone along a second direction and which causes said dye to lase within said zone, said arrangement also including means to produce or amplify a dye beam extending in a third direction, the improvement comprising:

(a) means for producing a plurality of pump beams of lower power and different frequencies than said first pumping beam;

(b) a light multiplexing assembly including optical fiber means having an output end for combining said lower power beams into a single beam which exits the optical fiber means at its output end and which serves as said first pumping beam; and

(c) light coupling means connected with with the output end of said optical fiber means for optically directing said first pumping beam into said dye chamber zone to illuminate said zone with light from said first pumping beam, said light coupling means including optical means for causing substantially all of the light from said first pumping beam to be directed substantially uniformly into said cross sectional configuration, said optical means including means for optically imaging one dimension of said first pumping beam, as said one dimension appears at the output end of said optical fiber means, into the widthwise dimension of said zone.

4,627,069

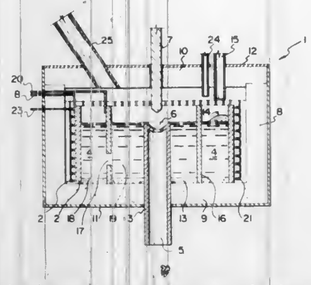
JOULE MELTER FOR THE PROCESSING OF RADIOACTIVE WASTES

Keith B. Harvey; Cynthia D. Litke, both of Pinawa, and Robert J. Porth, Seven Sisters Falls, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 23, 1984, Ser. No. 613,335
Claims priority, application Canada, Jun. 17, 1983, 431769
Int. Cl.[4] C03B *5/027*
U.S. Cl. 373—29 **8 Claims**

1. A joule melter for glass related products comprising:

inner and outer concentric electrodes adapted to be connected to a power supply, the outer electrode forming an outer wall of the melt chamber having a predetermined depth to contain the melt, the inner electrode being hollow to form an outlet for the melt;



non-conducting seal means between the inner and outer electrodes to form a base plug for the melt chamber; and

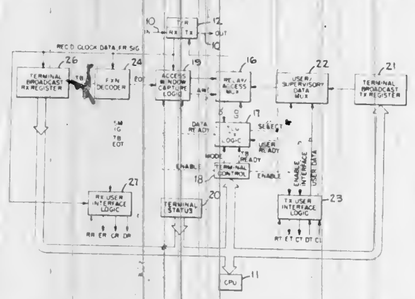
insulating refractory material enclosing the melt chamber.

4,627,070

ASYNCHRONOUS DATA BUS SYSTEM

Keith S. Champlin, Minneapolis; Ernest C. Preimesberger, Coon Rapids, and George W. Miller, Anoka, all of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 16, 1981, Ser. No. 302,939
Int. Cl.[4] H04Q *3/00*; H04J *3/06*
U.S. Cl. 375—3 **50 Claims**



1. An asynchronous data communications system wherein a plurality of system user data sources provide asynchronous data at random intervals and of random length for system user data sinks and wherein system dead time is minimized, comprising

a plurality of substantially similar multiplex terminals in communication with ones of the system user data sources and sinks,

a transmitter and a receiver in each of said terminals,

a message conveying path communicating said transmitter in one of said terminals with said receiver in another of said terminals so that said path describes a continuous loop extending from and returning to each of said terminals,

means in each of said multiplex terminals for accepting data from said receiver and for providing said data to one of the system user data sinks in communication therewith,

means in each of said multiplex terminals for transferring data to said transmitter from one of the system user data sources in communication therewith,

means in each of said multiplex terminals for detecting asynchronous transmission initiation and termination by a user data source,

means in each of said multiplex terminals for generating an access window signal in response to an asynchronous transmission termination, said last named means being coupled to said transmitter, and

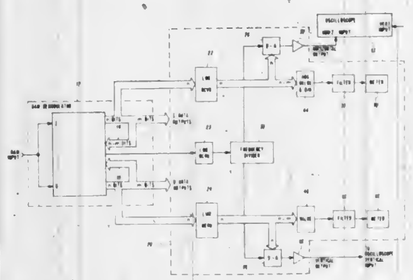
means including an access window capture circuit in each one of said multiplex terminals for directing said one of said terminals to assume a transmit access configuration when said access window signal is captured so that asynchronous data locally generated by ones of the user data sources is transmitted thereby from a user data source in communication therewith and for directing said one of said terminals to operate in a relay configuration when said access window is not captured so that asynchronous data is relayed from said receiver to said transmitter for retransmittal along said path to a user data sink in communication with another of said multiplex terminals.

4,627,071

DISTORTION ANALYZER FOR QUADRATURE DEMODULATED DATA

Manley J. Head, Wylie; William C. Smith, and Paul E. Pepmiller, both of Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 9, 1984, Ser. No. 670,432
Int. Cl.[4] H04B *3/46*
U.S. Cl. 375—10 **5 Claims**



5. A method of displaying a measure of distortion present in the outputs of a QAM demodulator having n parallel bits for each of in-phase and quadrature channels, the m most significant of said bits for each channel being the data output thereof and the remaining (n−m) bits representing error bits, said method comprising the steps of:

acquiring an error bit word from said demodulator for each of said channels, each said word including a plurality of the most significant of the (n−m) bits for the associated channel;

generating an absolute value of said error bit word, for each of said channels;

filtering the absolute value for each of said channels; and

displaying the filtered absolute value for each of said channels.

4,627,072

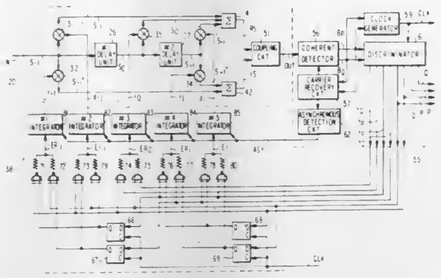
EQUALIZER MODIFYING A PHASE OF A GAIN CONTROL SIGNAL TO CARRY OUT EQUALIZATION

Toshihiko Ryu, and Shoichi Mizoguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,426
Claims priority, application Japan, Jun. 10, 1983, 58-103810
Int. Cl.[4] H03H *7/30*
U.S. Cl. 375—14 **16 Claims**

1. An equalizer responsive to an input signal subjected to modulation at a modulation rate for producing an output signal, said input signal being accompanied by a carrier wave of a carrier frequency, said equalizer including delay means responsive to said input signal for successively delaying said input signal in relation to said modulation rate to produce a central tap signal and additional tap signals, control signal generating means for generating a central control signal and complex control signals which are in one-to-one correspondence to said central and said additional tap signals, respectively, and output signal producing means responsive to said central and said additional tap signals and to said central con-

trol signal for producing said output signal, said complex control signals having difference phases relative to said central control signal, wherein the improvement comprises:



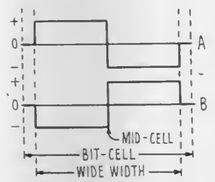
phase modifying means for modifying a specific phase of one of said complex control signals into a modified phase by shifting said specific phase by a step determined in relation to said modulation rate and said carrier frequency.

4,627,073

BINARY DATA TRANSMISSION METHOD

Michael B. Shepperd, Livermore, and Allan L. Blevins, San Jose, both of Calif., assignors to Myriad Concepts, Inc., Milpitas, Calif.

Filed Sep. 28, 1984, Ser. No. 655,720
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—20 **11 Claims**



1. A process for sending a stream of digital data over a high impedance metallic pair transmission line under high loss conditions comprising the steps of

a. converting the digital data into a stream of binary code, the first element of said code being characterized by having a bit cell voltage-time wave shape that begins at 0 volts, moves sharply to an initial voltage A different than zero, at mid cell traverses 0 volts to a second voltage B of similar magnitude but opposite sign to the initial voltage A and that returns to zero at the end of the bit cell, said wave shape being further characterized by a duty cycle of 80% or greater but such as to present a clear return to zero state at the start and end of the bit cell and the second element of said code being a mirror image of said first element, moving first to voltage B and second to voltage A.

b. with a transmitter, applying said stream of binary code to one end of the transmission line;

c. with a detector, detecting said stream of binary code at the other end of the transmission line; and

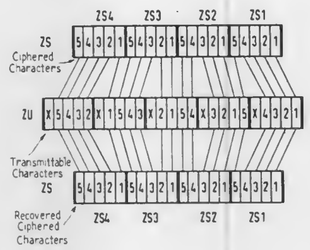
d. reformatting the detected stream of binary code to digital data.

4,627,074

METHOD AND ARRANGEMENT FOR TRANSMITTING CHARACTERS

Wernhard Markwitz, Munich, and Edward Kaeser, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,146
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207040
Int. Cl.[4] H04L *9/02*
U.S. Cl. 375—2.1 **12 Claims**



1. In a method of transmitting characters from a transmitting station to a receiving station, in which the characters emitted by a data source are ciphered in the transmitting station to comprise a plurality m of binary characters, and in which the ciphered characters are deciphered in the receiving station and fed to a data sink, the improvement therein comprising the steps of:

in the transmitting station, combining a plurality n of the binary characters of ciphered characters and a plurality x of fill characters whose binary values are respectively selected such that no control characters appear given a sequence of transmittable characters which represent letters, each control character being represented by a plurality of transmittable characters, to form transmittable characters, where the number n is less than the number m;

in the receiving station, removing the inserted fill characters; and

combining the respective plurality m of binary from the remaining characters to form characters representing the original ciphered characters for deciphering.

4,627,075

METHOD OF IDENTIFYING POSSIBLE VALID DATA PULSES IN A POSITION CODED PULSE TRAIN

Robert F. Fleming, III, and Raymond F. Irby, both of Vienna, Va., assignors to Vega Precision Laboratories, Inc., Vienna, Va.

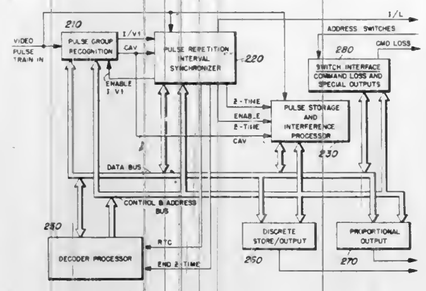
Filed Oct. 19, 1983, Ser. No. 543,404
Int. Cl.[4] H03K *7/04*
U.S. Cl. 375—23 **2 Claims**

1. A method of identifying possible data pulses in a position-coded pulse train in the presence of synchronous interference, said method comprising the steps of:

establishing a data pulse window;

dividing the data pulse window into a first set of contiguous interference windows and a second set of contiguous interference windows, the second set overlapping the first set;

storing a first interference count for each pulse occurring within a window of the first set of interference windows and a second interference count for said pulse occurring within a window of the second set of interference windows, said interference counts representing the frequency of occurrence of pulses in each interference window of said sets;



eliminating all pulses for which at least one of the two interference counts exceeds a predetermined maximum; and identifying the remaining pulses as possible data pulses.

4,627,076

LOW POWER DIGITAL BUS

Philip R. Staal; Richard C. Hughes, and John H. Olsen, all of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Continuation of Ser. No. 463,759, Feb. 4, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 776,186
Claims priority, application Canada, Feb. 24, 1982, 396950
Int. Cl.[4] H04B *3/00;* **H04L** *25/00*
U.S. Cl. 375—36 **8 Claims**

1. A system for transmitting signals with low crosstalk through multi-conductor cable comprising:

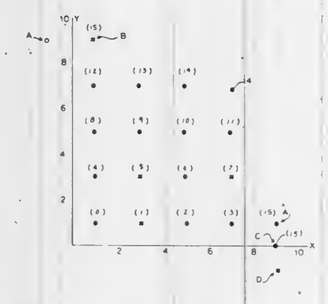
a plurality of coaxial lays of insulated conductor lines including at least one inner lay and one outer lay, each lay including a plurality of separate conductor lines, each separate conductor line of each lay being individually insulated from each other conductor line of the respective lay, an electrically conductive coaxial shield surrounding said plurality of lays and providing a common shield and ground for said plurality of lays and conductor lines, all conductor lines within said shield being insulated from said shield and ground, one conductor line in one of said lays providing a signal reference line for said one lay separate from said common ground, first and second like sources of direct voltage connected at respective opposite ends of said conductor lines of said one lay, each said voltage source being connected between ground and respective conductor lines in said one lay and including a voltage divider connected across each said voltage source, each said divider having a tap providing a reference voltage connected to the respective end of said reference line, means for transmitting signals over other conductor lines in said one lay including switching means connected between respective other signal transmitting conductor lines and ground for varying the voltage on said other conductor lines with respect to said reference line voltage, and means for terminating said signal transmitting lines at each end of said cable with the characteristic impedance of the respective line with respect to said shield.

4,627,077

MODIFIED QAM DATA POINT CONSTELLATION FOR SECONDARY CHANNEL SIGNALLING

Thomas R. Armstrong, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Continuation-in-part of Ser. No. 533,886, Sep. 20, 1983, abandoned, which is a continuation of Ser. No. 299,664, Sep. 8, 1981, abandoned. This application Dec. 3, 1984, Ser. No. 677,509
Int. Cl.[4] H03C *5/00;* **H04L** *27/00*
U.S. Cl. 375—39 **5 Claims**



1. A method of adding a secondary channel to a QAM signal mapped in the complex plane with data points assuming normal positions on concentric rings comprising the steps of:

(a) locating a pair of positions in the mapped complex plane (A and B) which are equi-distant from the origin and no farther from the origin than the distance from the origin to a selected data point;

(b) assigning a binary "1" to the existence of a data point at one of said pair of positions and a binary "0" to the existence of a data point at the other of said pair of positions;

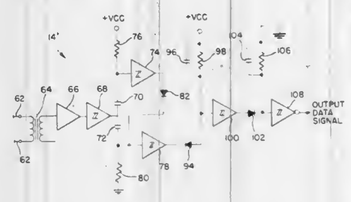
(c) shifting said selected data point from a mapped normal positions to define said secondary channel, the other data points being kept at their normal positions.

4,627,078

DATA COMMUNICATION SYSTEM

Donald L. Stoner, King County, Wash., assignor to The Microperipheral Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 526,335, Aug. 25, 1983. This application May 4, 1984, Ser. No. 606,916
Int. Cl.[4] H04L *27/10*
U.S. Cl. 375—45 **10 Claims**



1. A system for communicating digital data over a transmission link, comprising:

transition detector means for detecting transitions in the binary logic state of an input digital signal and generating a transition indicator signal in response thereto;

frequency-shift keying means responsive to said transition

indicator signal for generating a frequency-shift keyed signal to be transmitted over the link corresponding to the logic states of said input digital signal, said frequency-shift keyed signal comprised of a high-frequency signal for a bit at one logic state and a low-frequency signal for a bit at the other logic state;

zero-crossing detector means for detecting zero-crossings of said frequency-shift keyed signal received over the link and generating a zero-crossing indicator signal;

frequency detector means responsive to said zero-crossing signal for detecting said high-frequency and low-frequency signals of said frequency-shift keyed signal, and generating a frequency indicator signal, said frequency detector means detecting said high-frequency and low-frequency signals by measuring the time interval between successive signals of said zero-crossing signal against a first predetermined time constant to determine if the measured time interval between zero-crossings corresponds to said high-frequency or low-frequency signal; and

pulse generator means responsive to said frequency indicator signal for generating an output digital signal corresponding to said input digital signal, said pulse generator means measuring the time interval between successive signals of said frequency indicator signal against a second predetermined time constant to generate said output digital signal, said second predetermined time constant having a value selected to produce said output digital signal with a pulse duration matching the corresponding pulse duration of said input digital signal.

4,627,079

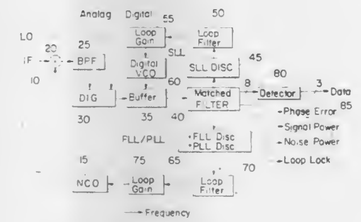
METHOD AND APPARATUS FOR ACQUIRING AND TRACKING A COMMUNICATIONS SIGNAL

Urban A. von der Embse, Westchester, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 7, 1983, Ser. No. 549,536

Int. Cl.[4] H04B *1/16*; H04L *27/00*

U.S. Cl. 375—96 **37 Claims**



28. A communications receiver employing a feedback loop to acquire or track a signal modulated with data symbols, comprising:

a filter means including a filter which has an output having the frequency within a bandwidth B Hz and means for converting signals at the filter output to converted output signals;

digitizer means for converting signals from said filter means into a digital bit stream;

a digital processor coupled to said digitizer means and said frequency converting means including a digital frequency lock loop (FLL), said digital processor processing said digital bit stream in accordance with a predetermined sequence of program steps and further including;

matched filter means for adaptively filtering said digital bit stream to provide matched filter means output signals;

FLL discriminant means responsive to the matched filter means for calculating an FLL discriminant signal;

FLL digital loop filter means for filtering said discriminant signal to provide an FLL filter signal coupled to said frequency converting means;

said digital processor simultaneously and independently time controlling the loop noise bandwidth B_L and the damping factor ξ.

4,627,080

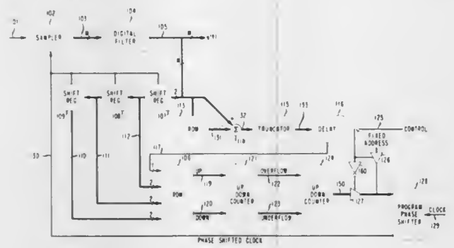
ADAPTIVE TIMING CIRCUIT

Walter Debus, Jr., Nottingham, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 23, 1984, Ser. No. 674,312

Int. Cl.[4] H04L *7/02*

U.S. Cl. 375—110 **12 Claims**



1. An adaptive timing circuit comprising

means for periodically sampling a received signal at sampling times so as to form a sample sequence, said sequence comprising a plurality of samples with each sample having an amplitude,

means for selecting one threshold value from a plurality of threshold values, said selected threshold value being the threshold value closest to the amplitude of one sample in said sequence,

means for comparing the amplitude of said one sample and said selected threshold value, and

means responsive to said comparison and said sample sequence for driving future sampling times toward optimum sampling times only when said samples in said sequence have successively increasing amplitudes or when said samples in said sequence have successively decreasing amplitudes.

4,627,081

SHIFT REGISTER STAGE

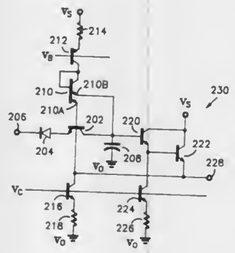
Michael J. Gay, Vaud, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1984, Ser. No. 682,410

Claims priority, application United Kingdom, Dec. 16, 1983, 8333662

Int. Cl.[4] G11C *27/00*

U.S. Cl. 377—58 **6 Claims**



1. A shift register stage responsive to a clock signal having

first and second phases, the stage having an input and an output node and comprising:

capacitive storage means;

switch means connected between the capacitive storage means and the input node of the stage and having a control electrode; and

amplifier means connected between the capacitive storage means and the output node of the stage,

the switch means being conductive and non-conductive respectively during the first and second phases of the clock signal so that the capacitive storage means is charged during the first phase of the clock signal to a voltage representative of the voltage at the input node of the stage, and the amplifier means being operative during at least the second phase of the clock signal so that the amplifier means produces at the output node of the stage a voltage representative of the voltage on the capacitive storage means,

wherein

means providing the voltage applied to the control electrode of the switch means to be offset during the first phase of the clock signal by a first offset value from the voltage on the capacitive storage means and to be offset during the second phase of the clock signal by a second offset value from the voltage on the capacitive storage means such that any charge removed from the capacitive storage means due to capacitive coupling effects between the capacitive storage means and the control electrode is independent of the voltage on the capacitive storage means.

4,627,082

SEMICONDUCTOR DEVICE FOR OBTAINING AN ACCURATE THRESHOLD VOLTAGE ADJUSTMENT

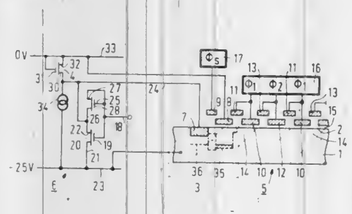
Marcellinus J. M. Pelgrom; Hendrik A. Harwig, and Jan W. Slothoom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,923

Claims priority, application Netherlands, Aug. 2, 1983, 8302731

Int. Cl.[4] G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 **2 Claims**



1. A semiconductor device comprising a semiconductor body having a major surface, a charge coupled device provided at said major surface and comprising an input stage having a source region, a surface-adjoining channel region, and a second gate electrode above the channel region and insulated therefrom for defining a storage site for collecting charge carriers supplied by the source region, said source region and said storage site being switchably connected, said input stage further comprising a first gate electrode above the channel region, insulated therefrom and situated between the source region and said second gate electrode for opening and closing the connection between the source region and said storage site underneath said second gate electrode, the semiconductor body further comprising a field effect transistor having a source region, a drain region, an intermediate channel region, and a gate electrode insulated from the channel region of said field effect transistor, the gate electrode and the drain electrode of said field effect transistor both being connected to said second gate electrode of the input stage of the charge coupled device, a current source, the source region of said input stage and the source region of the field-effect transistor both being connected to said current source, channel widths of the field effect-transistor and the input stage both being so small that threshold voltages in both channels are determined by narrow channel effects, lengths of the channel region of said field-effect transistor and of the channel region below said second gate electrode being equal, and said channel widths being different from each other so that the threshold voltages of said field effect transistor and said second gate electrode are different.

4,627,083

CHARGE TRANSFER DEVICE OUTPUT

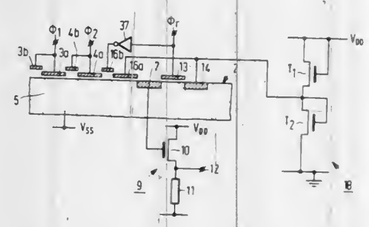
Marcellinus J. M. Pelgrom, and Jan W. Slotboom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1986, Ser. No. 841,907

Claims priority, application Netherlands, Mar. 25, 1985, 8500863

Int. Cl.[4] G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 **5 Claims**



1. A charge transfer device comprising a semiconductor body, at a surface of which is defined a charge transport channel for storing and transporting information in the form of discrete charge packets to an output stage, which has a zone for temporarily storing and reading the charge packets and an insulated gate field effect transistor which forms a reset transistor draining a read charge packet and preparing the said zone for storing and reading a next charge packet, this transistor comprising a source region coupled to the said zone, an insulated gate connected to a clock voltage source for rendering the transistor intermittently conducting and non-conducting, and a drain region connected to means for applying a suitable drain voltage, characterized in that the said means comprise a second insulated gate field effect transistor, which is designated hereinafter as auxiliary transistor, whose gate and drain can be applied to a fixed voltage V_1, more particularly the supply voltage, and whose source is connected to the drain region of the reset transistor and to current supply means for passing a current through the auxiliary transistor, and in that the gate of the reset transistor is connected to a clock voltage source, by means of which in the conductive state of the reset transistor, the voltage V_1 is also applied to the gate of the reset transistor.

4,627,084

DIFFERENTIATION AND INTEGRATION UTILIZING CHARGE-COUPLED DEVICES

George W. McIver, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 94,612, Nov. 15, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 315,099

Int. Cl.[4] G11C *19/28*; H01L *29/78*

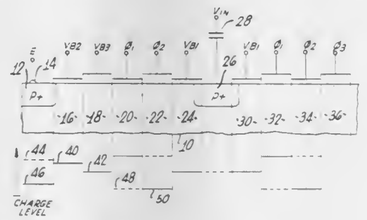
U.S. Cl. 377—60 **9 Claims**

1. A differentiating input circuit for a charge-coupled device (CCD), said circuit comprising:

a semiconductor substrate;

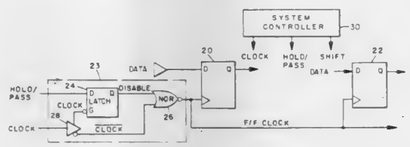
bias input circuit means integrated into said substrate, for generating a succession of packets of electrical charge,

each with the same charge level, proportional to a bias voltage;
means for propagating the charge packets along a channel of the CCD in a periodic manner;
a capacitive signal input circuit;
analog signal input means also integrated into said substrate, for modulating the charge level of the charge packets in accordance with the time differential of a periodically sampled analog input signal, to provide a succession of charge packets of which the charge level is proportional to the sum of the bias voltage and the difference between the currently sampled value of the analog input signal voltage and the previously sampled value of the input signal voltage;
said analog signal input means including a charge exchange region to which the input signal is connected through said capacitive input circuit, CCD gate means biased to a



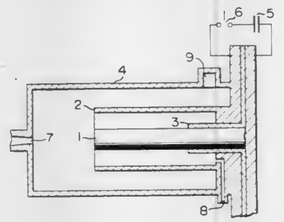
desired reference charge level, for cooperating with said charge exchange region in such a manner that the desired reference charge is increased by the amount of charge in one of the bais charge packets, is further modulated by an increment of charge proportional to the difference between the currently sampled and previously sampled values of the analog input signal, and is returned to the reference charge level when the modulated charge packet is removed from said CCD gate means;
at least one additional analog input signal means integrated into said substrate; and
at least one sequence of clocked CCD gates integrated into said substrate separating said analog input signal means, whereby multiple analog input signals are introduced at points spaced along the CCD channel, and only a single bias input circuit means is needed, thereby reducing input noise substantially.

4,627,085
FLIP-FLOP CONTROL CIRCUIT
Raymond C. Yuen, San Diego, Calif., assignor to Applied Micro Circuits Corporation, San Diego, Calif.
Filed Jun. 29, 1984, Ser. No. 626,401
Int. Cl.[4] G11C *7/00*; H03K *17/26*
U.S. Cl. 377—81 **5 Claims**



1. A circuit for transferring data in response to a CLOCK signal in which a HOLD signal selectively prevents data transfer, comprising:
data storage means responsive to an oscillating binary CLOCK signal for receiving and storing a data signal in response to a CLOCK signal transition in a first direction, transferring a stored data signal in response to a CLOCK signal transition in a second direction, and holding a stored data signal until the occurrence of a CLOCK signal transition in said second direction;
latch means responsive to said CLOCK signal and to a binary HOLD signal for providing one state of a binary DISABLE signal in response to a hold state of said HOLD signal and for providing a second state of said DISABLE signal in response to a pass state of said HOLD signal, said latch means transitioning between said first and second DISABLE signal states in synchronism with said CLOCK signal; and
a single gate responsive to said CLOCK signal and said DISABLE signal for blocking the provision of said CLOCK signal to said data storage means when said DISABLE signal has said first state and for providing said CLOCK signal to said data storage means when said DISABLE signal has said second state.

4,627,086
PLASMA X-RAY SOURCE
Yasuo Kato, Zama; Yoshio Watanabe, Tokyo, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 5, 1985, Ser. No. 772,692
Claims priority, application Japan, Sep. 7, 1984, 59-186538; Sep. 21, 1984, 59-196624
Int. Cl.[4] G21B *1/00*; H01J *35/00*
U.S. Cl. 378—119 **3 Claims**

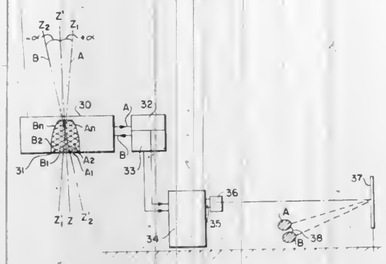


1. A plasma X-ray source comprising:
a cylindrical anode electrode;
a cathode electrode spaced apart from said anode electrode and disposed concentrically with said anode electrode to surround it;
insulating means interposed between said anode electrode and said cathode electrode to electrically insulate said anode electrode from said cathode electrode;
a discharge chamber housing said anode and cathode electrodes to define a discharge space;
means for applying an impulse voltage across said anode and cathode electrodes so as to create a plasma within said discharge space; and
means for maintaining the pressure in said discharge space to be constant by regulating continuous supply and evacuation of a discharge working gas to and from said discharge space.

4,627,087
3-DIMENSIONAL DISPLAY OF X-RAY, CAT SCAN AND NMR IMAGES
Alvin M. Marks, c/o ARDI, 359 R Main St., Athol, Mass. 01331
Filed Feb. 28, 1983, Ser. No. 470,432
Int. Cl.[4] G03B *41/16*
U.S. Cl. 378—4 **5 Claims**

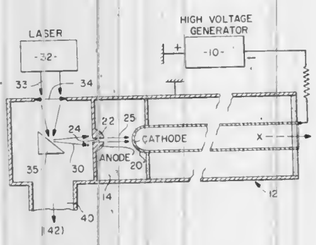
1. A method for the display of X-ray CAT scan images of a body volume as a three dimensional spatial image comprising imaging said body volume as a plurality of incremental sections as A and B stereo image pairs, storing said image pairs in a storage device, retrieving said A and B stereo image pairs from

said storage device in rapid succession, projecting, overlapping and orthogonally polarizing said stereo image pairs onto a



screen, and viewing said images through orthogonally polarized viewers.

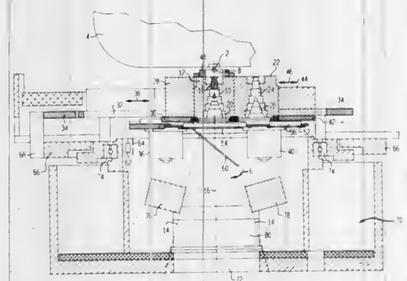
4,627,088
INTENSE X-RAY SOURCE USING A PLASMA MICROCHANNEL
Henri T. Doucet, Les Molieres; Michel Gazaix, Antony; Henri Lamain, Clamart; Claude Rouillé, Magny-les-Hameaux, and Jean-Pierre Furtlehner, Jouy-en-Josas, all of France, assignors to Centre National de la Recherche Scientifique and Commissariat à l'Energie Atomique, both of Paris, France
Filed Aug. 23, 1984, Ser. No. 643,458
Claims priority, application France, Sep. 2, 1983, 83 14086
Int. Cl.[4] H01J *35/00, 35/22*
U.S. Cl. 378—122 **5 Claims**



1. An intense soft X-ray source comprising:
an enclosure filled with gas and having two electrodes connected to a high voltage source by a transmission line, one of the electrodes having an opening;
means for producing a photoionizing radiation directed through said opening;
said radiation traversing the gas in the direction of the other electrode and during its passage producing a plasma microchannel;
an electrical discharge supplied by the source then occurring in the microchannel;
wherein the means for producing the photoionizing radiation is an auxiliary soft X-ray source.

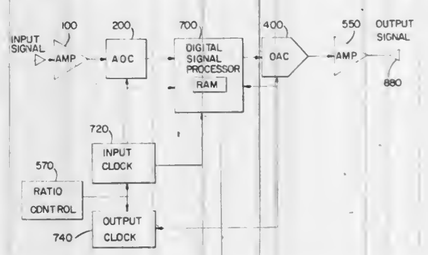
4,627,089
DEVICE FOR POSITIONING A FLATTENING FILTER IN THE CENTER OF AN X-RAY RADIATION
George Menor, Martinez; Rolando Tayag, Benecia, and Duc Tran, Saratoga, all of Calif., assignors to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.
Filed Aug. 30, 1984, Ser. No. 645,943
Int. Cl.[4] G21K *3/00*
U.S. Cl. 378—157 **15 Claims**

1. An electron accelerator comprising:
(a) means for producing an electron beam;
(b) a target removably inserted into the electron beam for producing x-ray deceleration radiation;
(c) means for switching between a first and a second x-ray energy mode and an electron mode;
(d) a first collimator surrounding a first flattening filter and a second collimator surrounding a second flattening filter;
(e) a device for positioning the first and second flattening filters in the center of the x-ray deceleration radiation when the accelerator is operating in the first and second x-ray energy mode, respectively, said device comprising:
(e1) a stop means including a stop carrier and a stop carrier motor for driving the stop carrier between a first and a second stop position relative to the x-ray deceleration radiation;



(e2) a drive means including a filter carrier carrying the collimators and flattening filters, and a filter carriage motor for driving the filter carriage between a first and a second position relative to the stop carrier,
whereby when both the stop carrier and the filter carrier are in their first positions, the first flattening filter is in the center of the x-ray deceleration radiation and when the stop carrier is in its second position and the filter carrier in its first position, the second flattening filter is in the center of the x-ray deceleration radiation and when both the stop carrier and the filter are in their second position, the stop means and the second collimator define an electron window for the electron mode.

4,627,090
AUDIO FREQUENCY MULTIPLICATION DEVICE
Jay Smith, III, Pacific Palisades, and Gerald S. Karr, Venice, both of Calif., assignors to Smith Engineering, Culver City, Calif.
Continuation of Ser. No. 399,690, Jul. 19, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,734.
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—34 **6 Claims**



1. An audio frequency signal processing circuit, adapted for frequency multiplication of analog audio signals, comprising:
integrator circuit means having an input for integrating a signal supplied to said input to provide a reference signal;
comparator means having first and second inputs and having an output for receiving said analog audio signal at said first

input and said reference signal at said second input and for comparing said analog audio signal to said reference signal and generating a binary output in response to said comparison;

means responsive to an input clock signal for sampling said binary output to produce a plurality of successive binary sample outputs and for storing and shifting said plurality of successive binary sample outputs;

logic means for receiving said successive binary sample output from said sampling, storing and shifting means and responsive thereto to generate a logic output signal;

filter means supplied with said logic output signal for providing a filtered output signal;

first variable pulse width generator means receiving said filtered output signal as an input for generating an output pulse having a width proportional to the level of said filtered output signal;

first switch means for providing a connection between one of said binary sample outputs and the input of said integrator circuit means during the duration of the output pulse generated by said first variable pulse width generator means;

means for storing said successive binary sample outputs at a first rate determined by said input clock signal to form stored binary data and for outputting said stored binary data at a second rate determined by an output clock signal;

register means having a data input, a clock input and a Q output, for receiving at said data input the stored binary data outputted by said storing means, for receiving said output clock signal at said clock input, and for providing output binary data at said Q output;

integrator means having an input for integrating a signal presented to said input to provide a signal comprising the output of said audio frequency signal processing circuit;

second variable pulse width generator means receiving said filtered output signal of said filter means as an input a[illegible] for generating an output pulse having a width proportional to the level of said filtered output signal;

second switch means for providing a connection between said Q output and the input of said integrator means during the duration of the output pulse generated by said second variable pulse width generator means; and

clock means for generating said input clock signal and output clock signal and supplying said input clock signal to said means for sampling and to said storing means and for supplying said output clock signal to said storing means and to said register means.

4,627,091
LOW-ENERGY-CONTENT VOICE DETECTION APPARATUS
Nicola J. Fedele, Kingston, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Apr. 1, 1983, Ser. No. 481,383
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—46 **18 Claims**

1. In a speech recognition system, an apparatus for storing speech parameters, said apparatus comprising:

transducer means responsive to acoustic energy for transforming said acoustic energy into analog electrical signals, wherein said acoustic energy comprises voiced speech, unvoiced speech and background noise;

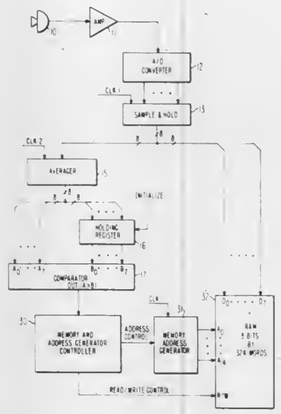
signal processing means for converting said analog signals to substantially equivalent forms of speech parameters and for sampling said speech parameters at a predetermined sampling rate;

first storage means coupled to said signal processing means for temporarily storing a plurality of samples of said speech parameters from said signal processing means;

a binary adder coupled to said signal processing means for computing the average signal level of samples of said speech parameters from said signal processing means during predetermined periods of time;

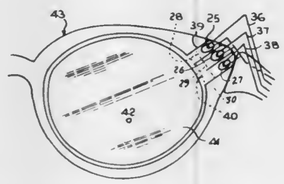
a digital magnitude comparator coupled to said binary adder, said comparator generating a control signal when the computed average signal level exceeds a predetermined signal level; said predetermined signal level representative of said background noise;

second storage means coupled to said first storage means for storing speech parameters transferred from said first storage means; and



means responsive to said control signal for conveying information stored in said first storage means to said second storage means, wherein said conveyed information includes speech parameters stored in said first storage means prior to the generation of said control signal.

4,627,092
SOUND DISPLAY SYSTEMS
Deborah M. New, 111 Greenbriar Drive, Waterloo, N2L 4B3, Canada
Filed Feb. 11, 1983, Ser. No. 465,872
Claims priority, application United Kingdom, Feb. 16, 1982, 8204506
Int. Cl.[4] G10L *7/10*
U.S. Cl. 381—48 **11 Claims**



1. A method of displaying sounds visually comprising the steps of:

(a) converting sound to an audio electrical signal;

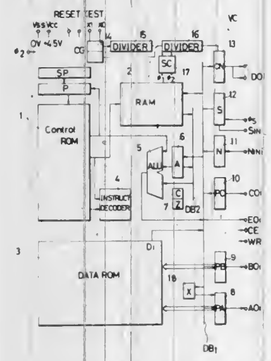
(b) processing the audio signal in M frequency bands so as to produce M separate signals each varying with the frequency band to which the signal relates;

(c) generating colour control signals from the separate channel signals to control the colour blend and brilliance in a color display device;

(d) supplying the colour control signals to a colour display device which incorporates means for displaying a substantially uniform colour resulting from the controlled blend and brilliance of the colour control signal; and

(e) adjusting the audio signal and colour control signals so that one particular uniform colour is obtained in the absence of sound, which changes at any given instant to a different unique uniform colour in the presence of sound, the particular colour change depending on the relative magnitude of the colour control signals which in turn depend on the frequency and amplitude of the components making up the sound.

4,627,093
ONE-CHIP LSI SPEECH SYNTHESIZER
Shintaro Hashimoto, Ikoma, and Hideo Yoshida, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 29, 1980, Ser. No. 220,918
Claims priority, application Japan, Dec. 27, 1979, 54-170857
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **3 Claims**



1. A speech synthesizer comprising a one-chip semiconductor integrated circuit which includes:

first memory means for storing information for speech synthesizing;

second memory means for storing control instructions and for addressing said first memory means for speech synthesis using said information stored in said first memory means;

an external connection port for connecting said chip to means for producing audible synthesized speech output; and

an external connection port for expansion of the memory capacity of said first memory means;

wherein said second memory means has a one-word length longer than that of said first memory means.

4,627,094
ELECTRONIC AUDIO SIGNAL PROCESSOR
Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01778
Continuation of Ser. No. 637,073, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 457,124, Jan. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 420,280, Sep. 20, 1982, Pat. No. 4,584,700. This application Jun. 17, 1985, Ser. No. 745,856
Int. Cl.[4] H03G *3/00, 7/00*
U.S. Cl. 38—61 **15 Claims**

1. An electronic audio signal processor for processing signals in the audio frequency range, comprising:

a high pass audio filtering circuit for receiving an electrical audio input signal;

an audio signal compressor circuit for receiving the output of said high pass audio filter and for producing an output signal,

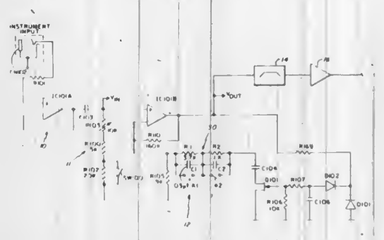
said compressor circuit comprising an amplifier having first and second inputs with the first input of the amplifier for receiving the output of said high pass audio filter,

and a feedback circuit comprising a semiconductor control transistor connected in series with impedance means,

said feedback circuit connecting from the output of said amplifier to said second input thereof,

said feedback circuit adapted to control the compression of the amplitude range of the signal appearing at the first input of said amplifier,

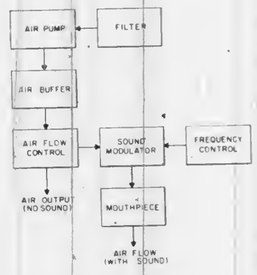
said semiconductor control transistor having an output electrode coupled to said impedance means,



said impedance means comprising an R-C circuit for providing both noise suppression and high end boost at low volume,

said R-C circuit comprising at least one resistor, at least one capacitor and conductor means connecting the resistor and capacitor in parallel between the transistor output electrode and said amplifier second input.

4,627,095
ARTIFICIAL VOICE APPARATUS
Larry Thompson, 3505 W. Rochelle Rd., Irving, Tex. 75062
Filed Apr. 13, 1984, Ser. No. 600,127
Int. Cl.[4] A61F *1/20*
U.S. Cl. 381—70 **12 Claims**



1. An artificial voice apparatus comprising:

electronic pump means for producing a continuous airflow within an airflow transmission means from ambient air;

sounding means connected to said transmission means for combining audible sound with the airflow, including modulation means for modulating the airflow to produce the combination of airflow with the audible sound at a selected frequency;

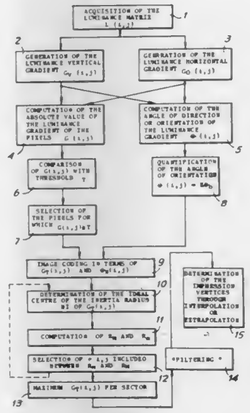
mouthpiece means connected to said sounding means for transporting the combined sound and airflow to within a persons mouth wherein said mouthpiece means includes a mouthpiece shaped to permit the person to articulate the combined sound and airflow to produce speech, said mouthpiece depositing the combined airflow and sound by a coupler tube to an area located above and behind the person's tongue but yet below the roof of the mouth, permitting free movement of the person's lips, jaw, and tongue to ease in the articulation of speech.

4,627,096

PROCEDURE AND APPARATUS FOR THE SURVEY OF THE IMPRESSION MADE ON A SPECIMEN IN MEASURING THE HARDNESS AT PENETRATION

Paolo Grattoni, Collegno, and Giulio Barbato, Turin, both of Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed Feb. 22, 1985, Ser. No. 704,536
Claims priority, application Italy, Feb. 24, 1984, 67181 A/84
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **27 Claims**



1. A procedure for the detection of the impression (I) made on a specimen (P) in measuring the hardness at penetration, and in particular for the determination of the position of the characteristic points of said impression, for example, the vertices in the Vickers impression, in which the specimen is illuminated so that it creates, in the vicinity of the impression, a variation of the luminance with respect to a neighbouring zone, and in which the image (R) of the impression is then magnified by an optical system (OS), said procedure further including the following operations:

exploring, by optical/electrical converter means (VC; C) the region (R) of the magnified image of the specimen (P) carrying the impression (I) in order to generate image electrical signals carrying information (L) indicative of the luminance of the explored region (R),

drawing from said image signals, by means of a technique of image processing, position data indicative of a group of image points taken, on the basis of predetermined selection criteria, as belonging to the impression contour (I), and

extrapolating or interpolating, from the position data of at least some of said image points, the position of the characteristic points of said impression.

4,627,097

METHOD AND APPARATUS FOR IMPROVED PRINTING IN A SELECTED ORIENTATION

David E. Finlay, Boulder; Jesus C. Lopez, Longmont, and Thomas S. Mereness, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,210
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—46 **21 Claims**

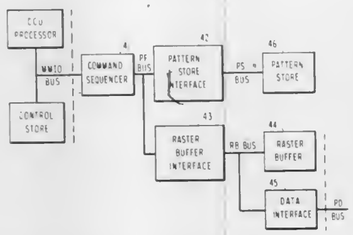
1. A method of transferring a data set, representing a portion of an image, from a first storage device to a second storage device to provide for production of an image with a selected rotation as said second storage device is read, said method comprising the steps of:

(a) arranging the data set in a predetermined order at said first storage device,

(b) providing a representation of a desired rotation and a representation of a desired home location in said second storage device at which location said data set is to be retrieved from,

(c) providing a pair of counters for addressing said second storage device,

(d) initializing said counters in dependence on said home location and rotation representations,



(e) reading said data set in multi-bit groups from said first storage device,

(f) writing said data in said multi-bit groups to said second storage device and reordering said multi-bit groups in a fashion dependent on said rotation,

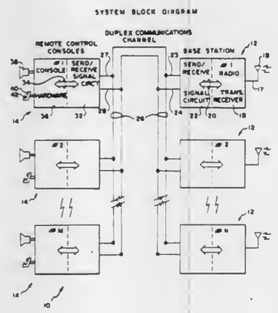
(g) as said data set is being written, modifying said counters in content, in an order and direction dependent on said rotation representation.

4,627,098

AUTOMATIC GAIN CONTROL FOR A REMOTE CONTROL SYSTEM HAVING SYMMETRICAL SEND/RECEIVE SIGNALING CIRCUITS

Arman V. Dolikian, Palatine; Michael D. Kotzin, Buffalo Grove, and Brian J. Budnik, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 568,170, Jan. 4, 1984. This application Nov. 13, 1985, Ser. No. 797,722
Int. Cl.[4] H04B *1/00, 7/00;* **H03G** *3/20*
U.S. Cl. 455—70 **26 Claims**



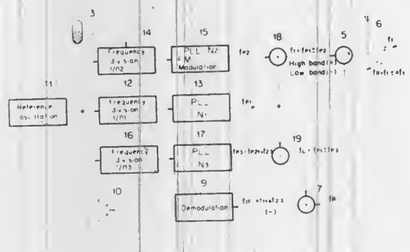
1. For use in a remote control system for radio communications, a voice shared, tone coded send/receive signaling circuit comprising audio channel coupling means for sending first voice signals and tone coded signals to and for receiving second voice signals and tone coded signals from an audio channel coupled thereto; gain control and signal coupling means for coupling said second voice signals of said audio channel coupling means to an audio output line and said second tone coded signals to a control means, said gain control and signal coupling means further comprising an operational amplifier, a voltage controlled resistor coupled between a first input and an output of said operational amplifier, a fixed resistor coupled between said audio channel coupling means and said first input of said amplifier, and a second input of said amplifier being coupled to a reference voltage whereby the ratio of said two resistors controls the gain of said gain control means; and audio signal transmission means having an input coupled to an audio input line for said first voice signals, an input coupled to said control means for said first tone coded signals, a combiner for said first voice and tone coded signals, and an output coupled to said audio channel coupling means.

4,627,099

COMMUNICATION APPARATUS FOR TRANSMITTING AND RECEIVING SIGNALS ON DIFFERENT FREQUENCY BANDS

Masashi Shimakata, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Dec. 26, 1984, Ser. No. 686,581
Claims priority, application Japan, Dec. 28, 1983, 58-245344
Int. Cl.[4] H04B *1/40*
U.S. Cl. 455—76 **23 Claims**



1. A communication apparatus for receiving and transmitting signals at different frequencies comprising

(a) a first oscillator means for generating a frequency fp_1 at each of a plurality of channels;

(b) a second oscillator means for generating a modulated frequency fp_2;

(c) a first mixer means for creating a transmission frequency which is a sum fp_1+fp_2 of the frequencies of the first and second oscillator means and a difference fp_1-fp_2 therebetween on high and low band transmissions respectively;

(d) a third oscillator means for generating a frequency fp_3 which is higher or lower than the frequency fp_2 of the second oscillator means by a given frequency Δf; and

(e) a second mixer means for creating a local oscillator frequency f_L which is a sum fp_1+fp_3 of the frequencies of the first and third oscillation means at high band transmission and low band receiving modes and a difference fp_1-fp_3 at low band transmission and high band receiving modes, and

(f) third mixer means for mixing a received signal with the local oscillator frequency f_L to provide an intermediate frequency signal f_{IF}.

4,627,100

WIDE BAND RADIO RECEIVER

Shigeru Takano, Tokyo, Japan, assignor to Regency Electronics, Inc., Indianapolis, Ind.

Filed Dec. 28, 1984, Ser. No. 687,191
Int. Cl.[4] H03J *7/18;* **H04B** *1/26*
U.S. Cl. 455—160 **6 Claims**

2. A circuit arrangement for a wide band superheterodyne radio receiver for receiving incoming radio signals between about 25 MHz and 550 MHz, comprising:

a variable first local oscillator for producing an output signal having a variable frequency higher than the upper frequency limit of said incoming radio signals;

a first mixer resonsive to said incoming radio signals and to the output signal of said first local oscillator for converting said incoming radio signals to a first intermediate frequency which is higher than the upper frequency limit of said incoming radio signals and which is higher than about 550 MHz;

a first intermediate frequency bandpass filter circuit selectively responsive to said first intermediate frequency;

a second local oscillator;

a second mixer responsive to the output signal of said first intermediate frequency filter circuit and to the output signal of said second local oscillator for converting the output signal of said first intermediate frequency filter circuit to a second intermediate frequency signal which is lower in frequency than said first intermediate frequency signal;

a second intermediate frequency band pass filter circuit selectively responsive to said second intermediate frequency signal;

a third local oscillator;

a third mixer responsive to the output signal of said second intermediate frequency filter circuit and to the output signal of said third local oscillator for converting the output signal of said second intermediate frequency filter circuit to a third intermediate frequency signal which is lower in frequency than said second intermediate frequency signal;

a third intermediate frequency band pass filter circuit selectively responsive to said third intermediate frequency signal;

first FM demodulator means for receiving the output signal of said third intermediate frequency filter circuit and demodulating FM audio modulation thereof, and outputting the demodulated signal as an audio frequency signal;

a fourth intermediate frequency band pass filter circuit selectively responsive to said second intermediate frequency signal and having a bandwidth narrower than the bandwidth of said second intermediate band pass filter circuit;

a fourth local oscillator;

a fourth mixer responsive to the output signal of said fourth intermediate frequency filter circuit and to the output signal of said local oscillator for converting the output signal of said fourth intermediate frequency filter circuit to a fourth intermediate frequency signal which is lower in frequency than said second intermediate frequency signal;

a fifth intermediate frequency band pass filter circuit selectively responsive to said fourth intermediate frequency signal;

second FM demodulator means for receiving the output signal of said fifth intermediate frequency filter circuit and demodulating FM audio modulation thereof, and output-

ing the demodulated signal as an audio frequency signal; and

phase locked loop circuitry means for controlling the frequency of said first local oscillator; and

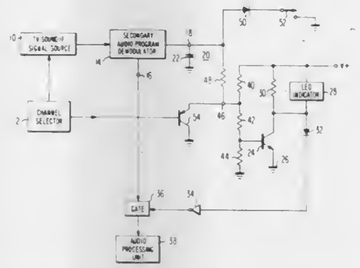
controller means responsive to externally manipulable switches for controlling said phase locked loop circuitry means to provide manual frequency tuning and automatic frequency scanning of said incoming radio signals.

4,627,101

MUTING CIRCUIT

Mark R. Anderson; David L. Albean, and Max W. Muterspaugh, all of Marion County, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1985, Ser. No. 705,373
Int. Cl.[4] H04B *1/16*; H04N *5/50*
U.S. Cl. 455—194 **9 Claims**



1. In a receiver including carrier selection means for tuning to a selected signal and further including an information signal demodulator coupled to said carrier selection means and having a baseband output for supplying a demodulated signal to load means and a logic output for providing a logic output signal, said logic output signal being of a first type when said information signal is present and being of a second type when said information signal is absent, a signal processing arrangement comprising:

low-pass filter means coupled to said logic output for providing a low-pass filtered logic signal corresponding to said logic output signal, said low-pass filter means including filter capacitance means for storing charge, wherein first and second levels of stored charge correspond to said filtered logic signal being of said first and second types, respectively;

signal gate means having a control point coupled to said low-pass filter means, and being coupled between said baseband output and said load means for coupling said baseband signal to said load means when said filtered logic signal is of said first type and not coupling said baseband signal therebetween when said low-pass filtered logic signal is of said second type; and

control means coupled to said filter capacitance means for selectively setting said stored charge to said second level.

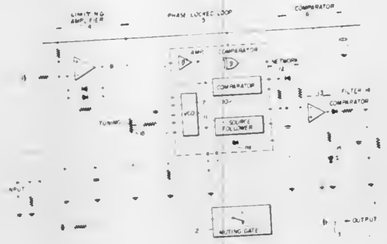
4,627,102

SQUELCH CIRCUIT

Henry A. Nott, Maribrynong, Australia, assignor to The Commonwealth of Australia, Australia

PCT No. PCT/AU84/00112, § 371 Date Feb. 15, 1985, § 102(e) Date Feb. 15, 1985, PCT Pub. No. WO85/00256, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 21, 1984, Ser. No. 713,387
Claims priority, application Australia, Jun. 27, 1983, PG0003
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—221 **2 Claims**

1. A squelch circuit for muting audio output of a receiver except when a desired audio signal is received, comprising: an input terminal connected to a limiting amplifier and a muting gate; a phase locked loop which receives the limiting amplifier output and which contains an oscillator and a phase comparator for comparing the frequency of said oscillator and said limiting amplifier output to produce an error voltage which is fed back to control said oscillator through a network to enable the oscillator to match its frequency to that of the limiting



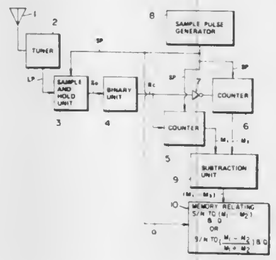
amplifier output, the match occurring faster when the limiting amplifier output frequency drops than when the limiting amplifier output frequency rises; said muting gate being coupled to an output of said network to mute the output of the receiver when the limiting amplifier output frequency is higher than that desired.

4,627,103

S/N RATIO DETERMINING METHOD AND APPARATUS FOR A RECEIVER

Hiroshige Fukuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 6, 1984, Ser. No. 617,938
Claims priority, application Japan, Jun. 13, 1983, 58-105540
Int. Cl.[4] H04B *17/00*
U.S. Cl. 455—226 **16 Claims**



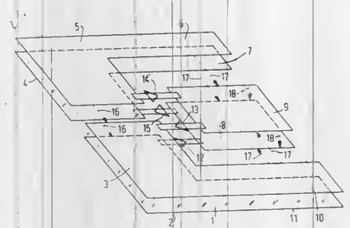
15. Apparatus for determining the signal-to-noise ratio of a signal comprising means for periodically sampling values of the signal to determine the number of sampled values relative to a reference level and for accumulating the numbers of the sampled values relative to said level, means responsive to the accumulated values for deriving a quantitative measure of the relative accumulated numbers of the sampled values above said reference level to the number of sampled values less than said reference level, and memory means for correlating a stored function of signal-to-noise ratio as a function of the quantitative measure and the number of samples with the derived quantitative measure.

4,627,104

MIXER

Reinhard Knöchel, Kölln Reisiek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1984, Ser. No. 603,053
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315860
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—327 **21 Claims**



1. A mixer comprising a plurality of bipolar mixing elements disposed at a junction of a plurality of waveguides, characterized in that said mixer includes:

(a) a dielectric substrate having oppositely-disposed first and second sides;

(b) a first waveguide comprising first and second spaced-apart conductive layers on the first side of the dielectric substrate, and corresponding substantially congruous conductive layers on the second side of said dielectric substrate;

(c) a second waveguide comprising third and fourth spaced-apart conductive layers and a central conductive layer disposed therebetween, on the first side of the dielectric substrate, and corresponding substantially congruous conductive layers on the second side of said dielectric substrate; and

(d) a third waveguide comprising an extended portion of the central conductive layer extending toward a slot defined by the first and second spaced-apart conductive layers, on the first side of the dielectric substrate, and a corresponding substantially congruous extended conductive layer portion on the second side of the dielectric substrate;

said bipolar mixing elements including two mixing elements on the first side of the dielectric substrate electrically connecting the extended portion of the central conductive layer to the first and second spaced apart conductive layers, respectively, and two mixing elements on the second side of the dielectric substate correspondingly electrically connecting the corresponding conductive layers on said second side.

4,627,105

SIGNAL TRANSMISSION SYSTEM AND METHOD

Kazuo Ohashi, and Takuya Yamakawa, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

Filed Jun. 10, 1985, Ser. No. 742,860
Claims priority, application Japan, Jun. 11, 1984, 59-119633
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—612 **21 Claims**

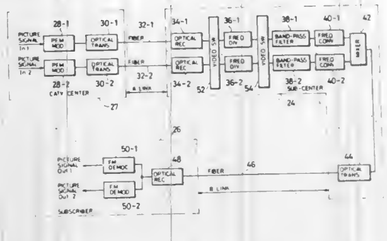
1. A optical transmission system comprising:

a central source of a plurality of transmission signals, said source including first means for converting each of said transmission signals into a pulse frequency modulation (PFM) signal;

a plurality of first means for optically transmitting a plurality of said PFM signals;

a plurality of sub-centers each connected to one of said plurality of first transmitting means, respectively, each said sub-center including second means for converting each of said PFM signals into a frequency modulated (FM) signal, respectively, and means for frequency multiplexing said FM signals to produce a multiplexed signal;

a plurality of second means for optically transmitting said multiplexed signal from each said sub-center; and



a plurality of subscriber means, each connected to one of said second transmitting means, respectively, each for converting said multiplexed signal back into said plurality of transmission signals.

4,627,106

COMMUNICATIONS SYSTEM

Hugh H. Drake, P.O. Box 727, Fort Collins, Colo. 80522

Filed Sep. 17, 1984, Ser. No. 651,258
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—617 **6 Claims**



1. A communication system for transmitting intelligence from a transmitter site through non-confined free space to an intermediate site remote from said transmitter site and receiving said intelligence from said intermediate site at a receiver site further remote and physically separate from said transmitter site and separated from said intermediate site by non-confined free space, said system comprising:

means at said transmitter site for producing a beam of spatially-coherent monochromatic, aperture-limited electromagnetic optical energy;

means for modulating said beam with intelligence-bearing information to develop wavefronts of mutually-aligned orientation;

means for directing said beam from said transmitter site through said space to impinge upon a surface at said intermediate site, said surface being reflective of said energy and exposed in said space to the impingement of said beam;

means also at said transmitter site for focusing said beam upon said surface, the impingement of said beam being within the depth of focus and substantially at the waist of the region of said focus of beam;

means at said receiver site for detecting said information in said beam as reflected by said surface and at an angle thereto and with the mutually-aligned orientation of said wavefronts maintained; and

means for deriving said information demodulated from said detecting means.

4,627,107

RADIO COMMUNICATIONS SYSTEM INCLUDING VEHICLE MOUNTED AND HAND-HELD RADIO DEVICES

Rainer Hohlfeld; Ralph Schwerin, both of Berlin; Hans Kader, Hennef, and Andreas Heymann, Essen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 195,086, Oct. 8, 1980, abandoned, which is a continuation of Ser. No. 11,164, Feb. 8, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 281,496

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805420

Int. Cl.[4] **H04B** *7/15, 1/40*

U.S. Cl. 455—11 **11 Claims**

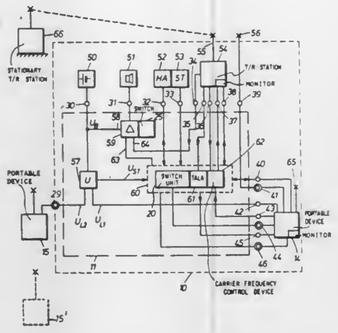
1. In a radio system including a first hand-held two-way communications device operating in a first frequency range, and a radio broadcasting device disposed in a motor vehicle for establishing two-way radio communication between the first hand-held device and a stationary radio transmitting and receiving station operating in a second frequency range, the radio broadcasting device including a vehicle mounted radio transmitting and receiving station operating in the second frequency range, a mount disposed in the vehicle and configured for holding the first hand-held device, and a power supply circuit connected to receive power from a source in the vehicle, the improvement wherein:

said system further comprises a second hand-held, two-way communications device operating in the first frequency range;

said mount is further configured for holding said second hand-held device;

each said hand-held device is provided with external contacts; and

said radio broadcasting device further comprises: electrical connection means associated with said mount and connected to said power supply circuit for establishing readily-disconnectable connections with said external contacts of, and for supplying power from said power supply circuit to, each said hand-held device when that hand-held device is held in said mount; and function transfer means disposed in said mount and connecting said electrical connection means to said vehicle mounted station.



DESIGNS

DECEMBER 2, 1986

286,940

COMBINED EDIBLE CONE AND ICE CREAM THEREFOR

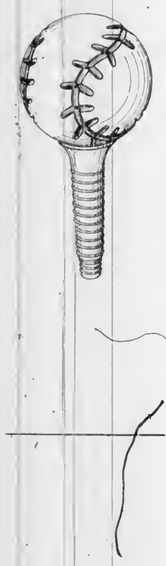
Salvatore Saladino, Weston, and Vicki M. Samson, Brampton, both of Canada, assignors to Neworld Ice Cream Corporation, Weston, Canada

Filed Oct. 18, 1984, Ser. No. 663,335

Claims priority, application Canada, Sep. 21, 1984, 21-09-84-16

Term of patent 14 years

U.S. Cl. D1—101



286,941

COMBINED EDIBLE CONE AND ICE CREAM THEREFOR

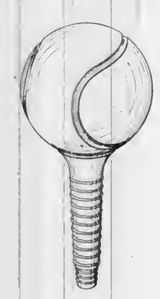
Salvatore Saladino, Weston, and Vicki M. Samson, Brampton, both of Canada, assignors to Neworld Ice Cream Corporation, Weston, Canada

Filed Oct. 18, 1984, Ser. No. 663,336

Claims priority, application Canada, Sep. 21, 1984, 21-09-84-20

Term of patent 14 years

U.S. Cl. D1—101



286,942

COMBINED EDIBLE CONE AND ICE CREAM THEREFOR

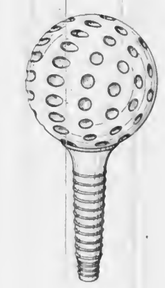
Salvatore Saladino, Weston, and Vicki M. Samson, Brampton, both of Canada, assignors to Neworld Ice Cream Corporation, Weston, Canada

Filed Oct. 18, 1984, Ser. No. 663,337

Claims priority, application Canada, Sep. 21, 1984, 21-09-84-19

Term of patent 14 years

U.S. Cl. D1—101



286,943

COMBINED EDIBLE CONE AND ICE CREAM THEREFOR

Salvatore Saladino, Weston, and Vicki M. Samson, Brampton, both of Canada, assignors to Neworld Ice Cream Corporation, Weston, Canada

Filed Oct. 18, 1984, Ser. No. 663,338

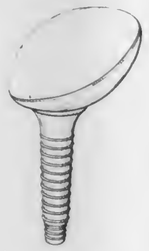
Claims priority, application Canada, Sep. 21, 1984, 21-09-84-18

Term of patent 14 years

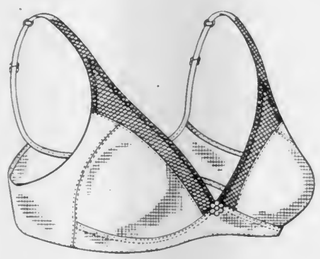
U.S. Cl. D1—101



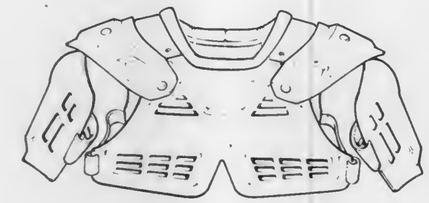
286,944
COMBINED EDIBLE CONE AND ICE CREAM THEREFOR
Salvatore Saladino, Weston, and Vicki M. Samson, Brampton, both of Canada, assignors to Neworld Ice Cream Corporation, Weston, Canada
Filed Oct. 18, 1984, Ser. No. 663,339
Claims priority, application Canada, Sep. 21, 1984, 21-09-84-17
Term of patent 14 years
U.S. Cl. D1—101

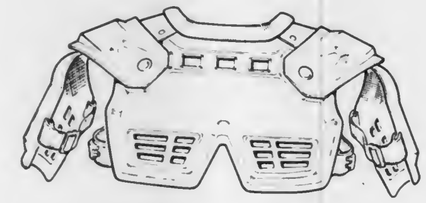


286,945
BRASSIERE
Phyllis Shonk, Glen Rock, N.J., assignor to International Playtex, Inc., Stamford, Conn.
Filed Mar. 19, 1984, Ser. No. 591,286
Term of patent 14 years
U.S. Cl. D2—24



286,946
SHORT CHEST PROTECTOR WITH BACK PROTECTION
Gerald R. Parks, Chula Vista, Calif., and John Dondero, Sun Valley, Id., assignors to John Gregory, San Diego, Calif.
Filed Jun. 18, 1984, Ser. No. 621,710
Term of patent 14 years
U.S. Cl. D29—10





286,947
DISPOSABLE DECONTAMINATION APRON
Alfred P. Wootton, Glendale, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Aug. 29, 1984, Ser. No. 645,571
Term of patent 14 years
U.S. Cl. D2—226



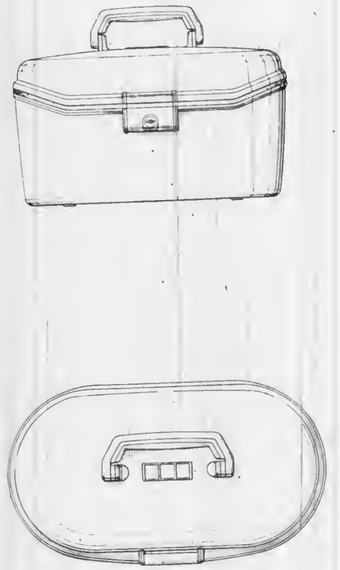
286,948
HEEL CUSHION
Charles E. Graham, 8345 Walnut Hill La., Ste. 105, Dallas, Tex. 75231
Filed Feb. 17, 1984, Ser. No. 581,375
Term of patent 14 years
U.S. Cl. D2—314



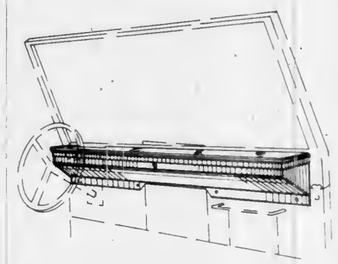
286,949
CARRIER FOR A PAINT CAN OR THE LIKE
Kenneth A. Hardman, 18283 Auten Rd., South Bend, Ind. 46637
Filed Apr. 25, 1984, Ser. No. 603,753
Term of patent 14 years
U.S. Cl. D3—106



286,950
TRAIN CASE
Richard Miles, Crowborough, and Stephen T. Green, Clanfield, both of England, assignors to Samsonite Corporation, Denver, Colo.
Filed Nov. 13, 1984, Ser. No. 670,442
Claims priority, application United Kingdom, Sep. 6, 1984, 1021940
Term of patent 14 years
U.S. Cl. D3—39



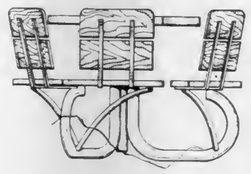
286,951
ADD-ON VEHICULAR STORAGE COMPARTMENT
Patrice C. Gant, 33150 Trinity Way, Lake Elsinore, Calif. 92330
Filed Apr. 12, 1984, Ser. No. 599,520
Term of patent 14 years
U.S. Cl. D3—40



286,952
HAIR BRUSH WITH RETRACTABLE COVER
Joseph Leroux, 6785 Molson, Montreal, Quebec, da H1Y 3C6
Filed Mar. 8, 1984, Ser. No. 587,695
Claims priority, application Canada, Mar. 5, 1984, 05-03-84-12
Term of patent 14 years
U.S. Cl. D4—136



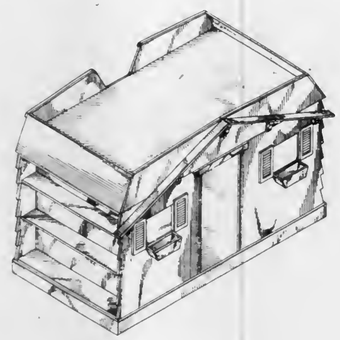
286,953
PICNIC TABLE
Jon Mayo, 1 Mowat Ave., Unit 502, Kingston, Ontario, Canada K7M 2J8
Filed Jan. 30, 1984, Ser. No. 575,391
Claims priority, application Canada, Aug. 5, 1983, 52283
Term of patent 14 years
U.S. Cl. D6—337



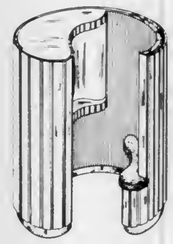
286,954
CHAIR
Roger Rougier, 105 de Louvain St., Montreal, Quebec, Canada H2N 1A3
Filed Apr. 16, 1984, Ser. No. 600,512
Term of patent 14 years
U.S. Cl. D6—374



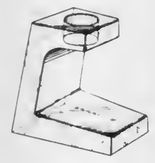
286,955
COMBINED CHILDREN'S BED, STORAGE UNIT AND AMUSEMENT CENTER
Richard E. Fisher, 194 Tudor Blvd., West Seneca, Buffalo, N.Y. 14220
Continuation of Ser. No. 867,828, Jan. 9, 1978, abandoned. This application Mar. 18, 1983, Ser. No. 476,801
Term of patent 14 years
U.S. Cl. D6—384



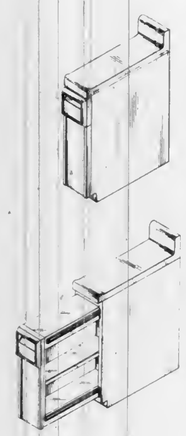
286,956
COMBINED AUTOMATIC INFORMATION TERMINAL AND VENDING MACHINE BOOTH
Lawrence B. Lockwood, 5935 Folsom, La Jolla, Calif. 92037
Filed Sep. 26, 1982, Ser. No. 426,422
Term of patent 14 years
U.S. Cl. D6—396



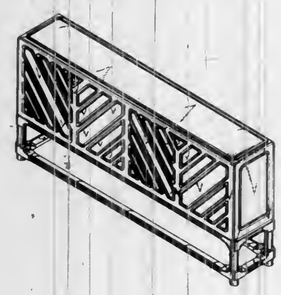
286,957
BUD VASE HOLDER
Joseph Johnson, 13 Lymon St., New Britain, Conn. 06053
Filed Nov. 4, 1983, Ser. No. 548,617
Term of patent 14 years
U.S. Cl. D6—403



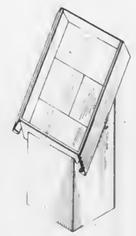
286,958
BASE CABINET
Peter J. Gualtieri, 117 Calumet Dr., Syracuse, N.Y. 13219
Filed Feb. 22, 1984, Ser. No. 583,147
Term of patent 14 years
U.S. Cl. D6—432



286,959
BUFFET OR THE LIKE
William Doezema, Grand Rapids, Mich., assignor to Baker, Knapp & Tubbs Inc., Chicago, Ill.
Filed Dec. 24, 1984, Ser. No. 685,365
Term of patent 14 years
U.S. Cl. D6—446



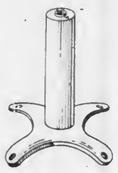
286,960
MERCHANDISE DISPLAY STAND
Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust, Chicago, Ill.
Filed Jun. 21, 1982, Ser. No. 390,268
Term of patent 14 years
U.S. Cl. D6—475



286,961
RETRACTABLE PLANT HANGER OR SIMILAR ARTICLE
G. Lawrence Abrams, Helene Rd., Valley Cottage, N.Y. 10989
Filed Apr. 16, 1984, Ser. No. 600,821
Term of patent 14 years
U.S. Cl. D6—513



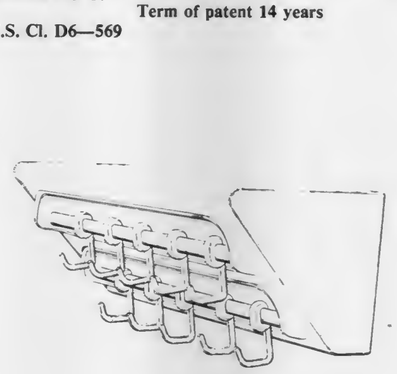
286,962
TOILET TISSUE HOLDER
Audias G. Ruiz, Paso Robles, Calif., assignor to William Kenney, San Miguel, Calif., a part interest
Continuation of Ser. No. 514,976, Jul. 18, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,861
Term of patent 14 years
U.S. Cl. D6—521



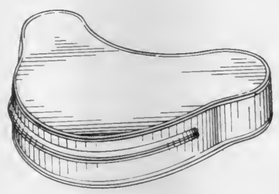
286,963
TOWEL RACK
Clifford D. Waghorn, Worthing, England, assignor to Quick Release Terminals Limited, England
Filed Mar. 12, 1984, Ser. No. 588,885
Term of patent 14 years
U.S. Cl. D6—549



286,964
COMBINED WALL MOUNTED SHELF AND HOOKS
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jun. 26, 1984, Ser. No. 624,769
Claims priority, application Italy, Dec. 29, 1983, 24058B/83[U]
Term of patent 14 years
U.S. Cl. D6—569



286,965
CUSHION OR SIMILAR ARTICLE
Kim E. Eisler, Rockton, Ill., assignor to Bottom Booster, Inc., Rockford, Ill.
Filed Jun. 4, 1984, Ser. No. 617,120
Term of patent 14 years
U.S. Cl. D6—596



286,966
BEVERAGE CUP
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Oct. 5, 1983, Ser. No. 539,374
Term of patent 14 years
U.S. Cl. D7—9





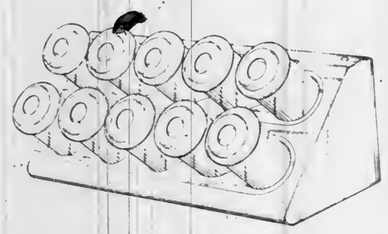


286,967
COVERED MUG
Mel Appel, Livingston, N.J., assignor to The Mel Appel Company, Short Hills, N.J.
Filed Oct. 14, 1983, Ser. No. 541,901
Term of patent 14 years
U.S. Cl. D7—9

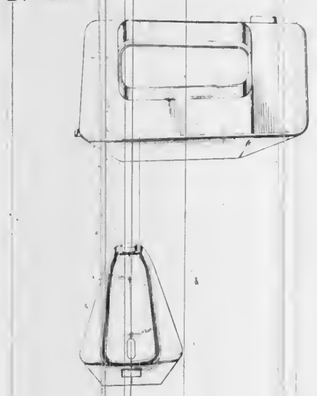


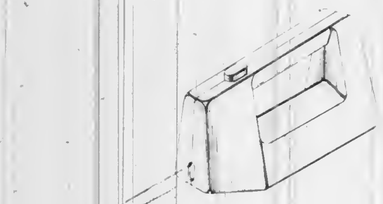


286,968
COMBINED SET OF JARS AND WALL MOUNTED HOLDER
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jun. 26, 1984, Ser. No. 624,767
Claims priority, application Italy, Dec. 29, 1983, 24058B/83[U]
Term of patent 14 years
U.S. Cl. D7—81



286,969
CORDLESS ELECTRIC KNIFE HOUSING
Don R. McCloskey, Trappe, Md., assignor to The Black & Decker Company, Newark, Del.
Filed Dec. 13, 1984, Ser. No. 681,425
Term of patent 14 years
U.S. Cl. D7—139





286,970
COOKING POT
Felix E. Bates, 131 Walker Ave., Huntsville, Ala. 35801
Filed Aug. 23, 1982, Ser. No. 410,535
Term of patent 14 years
U.S. Cl. D7—360



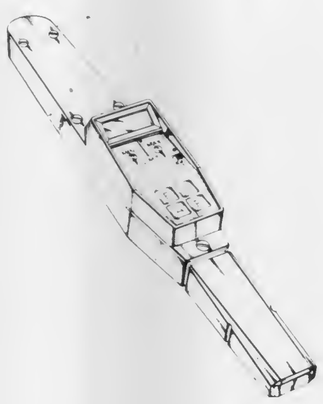
286,971
OFFSET CLAMP
John G. Lund, Tahoe City, Calif., assignor to In-Mech Industries, Tahoe City, Calif.
Filed Mar. 9, 1984, Ser. No. 588,114
Term of patent 14 years
U.S. Cl. D8—394



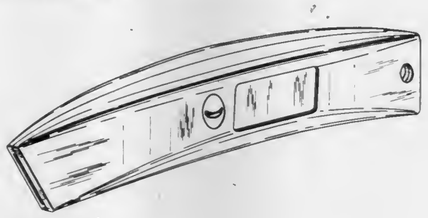
286,972
CARRIER
Jay A. Crews, 721 Johnson Ave., San Luis Obispo, Calif. 93401
Filed May 24, 1984, Ser. No. 613,434
Term of patent 14 years
U.S. Cl. D8—14



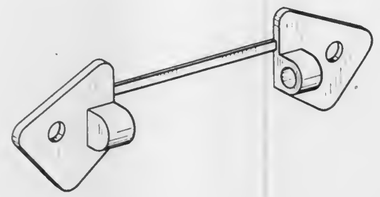
286,973
ELECTRONIC TORQUE WRENCH
Bosko Grabovac, Arcadia, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.
Filed Nov. 21, 1983, Ser. No. 554,045
Term of patent 14 years
U.S. Cl. D8—24



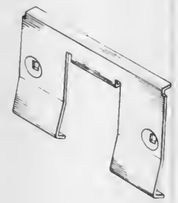
286,974
UTILITY KNIFE HANDLE
Kenneth A. Veverka, Charleston, S.C., assignor to Masco Corporation, Taylor, Mich.
Filed Nov. 25, 1983, Ser. No. 555,138
Term of patent 14 years
U.S. Cl. D8—107



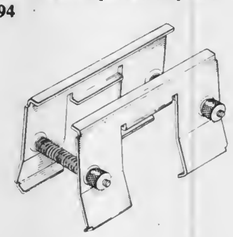
286,975
HINGE ELEMENT FOR CHAIRS OR THE LIKE
Frank Doerner, 138 Aberdeen Road., Kitchener, Ontario, Canada N2M 2Y7
Filed Aug. 20, 1984, Ser. No. 642,394
Claims priority, application Canada, Aug. 15, 1984, 15-08-84-12
Term of patent 14 years
U.S. Cl. D8—323



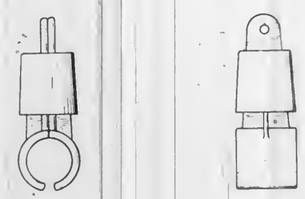
286,976
CLAMP PLATE
George L. Steck, Dayton; Raymond E. Steck, Miamisburg, and Laurence D. Steck, Dayton, all of Ohio, assignors to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed Dec. 19, 1983, Ser. No. 563,107
Term of patent 14 years
U.S. Cl. D8—394



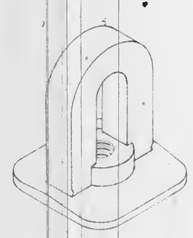
286,977
CLAMP
George L. Steck, Dayton; Raymond E. Steck, Miamisburg, and Laurence D. Steck, Dayton, all of Ohio, assignors to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed Dec. 19, 1983, Ser. No. 563,108
Term of patent 14 years
U.S. Cl. D8—394



286,978
CURTAIN ROD CLAMP
Denver L. Cogburn, Rte. 1, Box 185, Wister, Okla. 74966
Filed Jan. 10, 1984, Ser. No. 569,728
Term of patent 14 years
U.S. Cl. D8—396



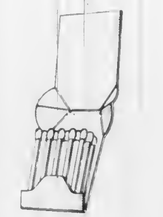
286,979
COMBINED EYE NUT AND WASHER
Malcolm S. Bethea, 232 Poinciana Dr., Birmingham, Ala. 35209
Filed Aug. 3, 1984, Ser. No. 637,619
Term of patent 14 years
U.S. Cl. D8—397



286,980
STUD FOR CHAIN LINKS
Jan-Olof Jönsson, Heby, Sweden, assignor to Ljusne Katting, AB, Ljusne, Sweden
Filed Dec. 12, 1984, Ser. No. 680,963
Claims priority, application Sweden, Jun. 14, 1984, 84-1798
Term of patent 14 years
U.S. Cl. D8—499



286,981
FOLDING MATCHBOOK
Meyer Gold, 3425 Calle Del Torre, Las Vegas, Nev. 89102
Filed May 24, 1984, Ser. No. 613,440
Term of patent 14 years
U.S. Cl. D9—304



286,982
PERFUME BOTTLE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Sep. 11, 1984, Ser. No. 649,415
Term of patent 14 years
U.S. Cl. D9—377



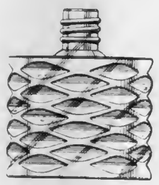
286,983
PERFUME BOTTLE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Sep. 11, 1984, Ser. No. 649,476
Term of patent 14 years
U.S. Cl. D9—385



286,984
PERFUME BOTTLE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Sep. 11, 1984, Ser. No. 649,422
Term of patent 14 years
U.S. Cl. D9—395



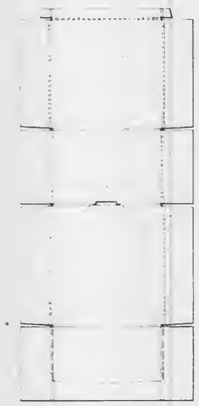
286,985
PERFUME BOTTLE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Sep. 11, 1984, Ser. No. 649,421
Term of patent 14 years
U.S. Cl. D9—407



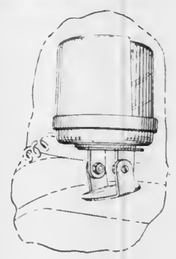
286,986
BOTTLE
Vernon C. Rader, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 23, 1983, Ser. No. 564,945
Term of patent 14 years
U.S. Cl. D9—413



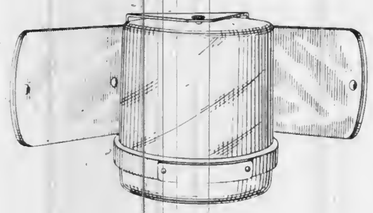
286,987
CONTAINER BLANK
James R. Golan; Kevin G. Wilson, and Sidney Gordon, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 21, 1984, Ser. No. 622,903
Term of patent 14 years
U.S. Cl. D9—433



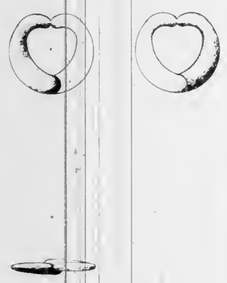
286,988
COMBINED VEHICLE WARNING LIGHT AND ADJUSTABLE MOUNTING BRACKET THEREFOR
Steven R. Akiyama, Park Forest, and Edward S. Stanuch, Oak Forest, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.
Division of Ser. No. 318,125, Nov. 4, 1981, abandoned. This application Dec. 4, 1984, Ser. No. 678,110
Term df patent 14 years
U.S. Cl. D10—114



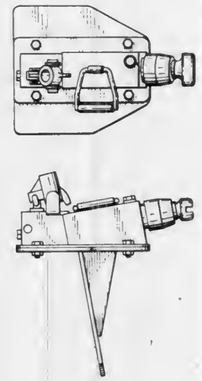
286,989
COMBINED VEHICLE WARNING LIGHT AND REFLECTOR THEREFORE
Steven R. Akiyama, Park Forest, and Edward S. Stanuch, Oak Forest, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.
Division of Ser. No. 318,125, Nov. 4, 1981, abandoned. This application Dec. 4, 1984, Ser. No. 678,111
Term of patent 14 years
U.S. Cl. D10—114



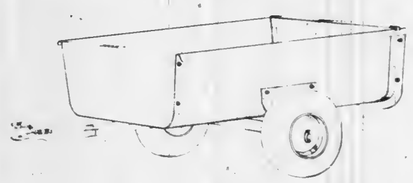
286,990
JEWELRY FINDING
Stephen Burlingham, 28 Scott La., Princeton, N.J. 08540
Filed Sep. 21, 1984, Ser. No. 652,913
Term of patent 14 years
U.S. Cl. D11—1



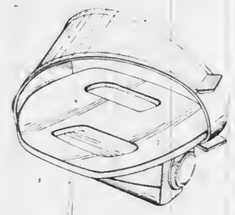
286,991
TRACK ALIGNMENT DEVICE
Thomas W. Tutt, Reading, England, assignor to Zwicky Engineering Limited, Berkshire, England
Filed Dec. 30, 1983, Ser. No. 567,114
Claims priority, application United Kingdom, Jul. 6, 1983, 1013952
Term of patent 14 years
U.S. Cl. D12—42



286,992
PULLED CART
Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.
Filed Dec. 29, 1983, Ser. No. 566,507
Term of patent 14 years
U.S. Cl. D12—105

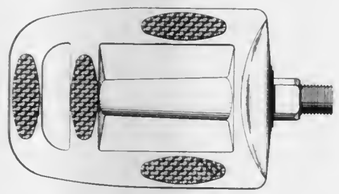


286,993
PEDAL
Esko Kotamäki, Turku, Finland, assignor to Tunturipyora Oy, Turku, Finland
Filed Dec. 18, 1984, Ser. No. 683,213
Claims priority, application Finland, Jun. 25, 1984, 634/84
Term of patent 14 years
U.S. Cl. D12—125



286,994
BICYCLE PEDAL
Luigi Colani, Sassenberg, Fed. Rep. of Germany, assignor to Union Sils, Van De Loo & Co., GmbH, Froendenberg, Fed. Rep. of Germany
Filed Mar. 16, 1984, Ser. No. 590,354
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, MR 145
Term of patent 14 years
U.S. Cl. D12—125

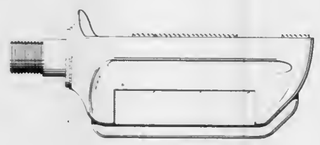


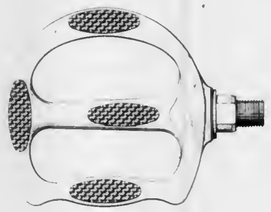


286,995
PEDAL FOR RACING BICYCLE
Chen-Jong Pai, No. 422-2, Sec. 1, Jong-Shan Rd., Ta-Jea Chen, Taichung Shen, Taiwan
Filed Apr. 12, 1984, Ser. No. 599,487
Term of patent 14 years
U.S. Cl. D12—125

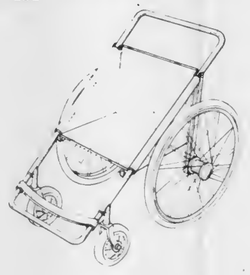


286,996
BICYCLE PEDAL
Jan D. Hartmann, Menden; Bernd Voegler, Herdecke, and Hubert Konzorr, Froendenberg, all of Fed. Rep. of Germany, assignors to Union Sils, Van De Loo & Co., GmbH, Froendenberg, Fed. Rep. of Germany
Filed Apr. 18, 1984, Ser. No. 601,604
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, MR151
Term of patent 14 years
U.S. Cl. D12—125

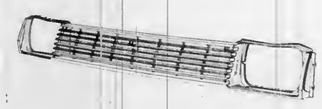




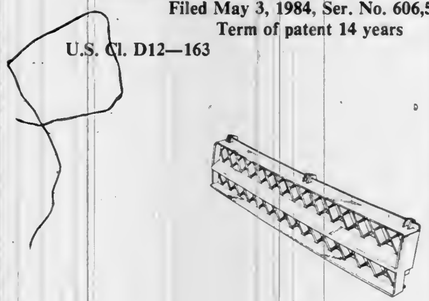
286,997
WHEELCHAIR
Robert L. Stephenson, Thousand Oaks, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.
Filed Jul. 6, 1984, Ser. No. 629,311
Term of patent 14 years
U.S. Cl. D12—131



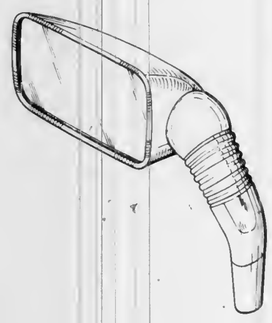
286,998
RADIATOR GRILLE FOR AN AUTOMOBILE
Tadao Okumura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 3, 1984, Ser. No. 606,593
Term of patent 14 years
U.S. Cl. D12—163



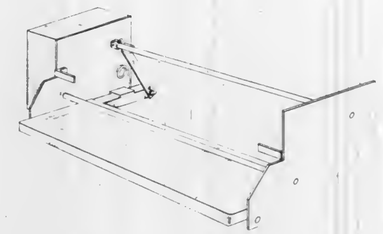
286,999
RADIATOR GRILLE FOR AN AUTOMOBILE
Shinichi Hiranaka, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 3, 1984, Ser. No. 606,596
Term of patent 14 years
U.S. Cl. D12—163



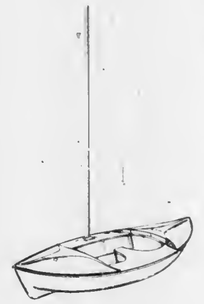
287,000
REAR VIEW MIRROR
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Beinasco, Italy
Filed Feb. 23, 1984, Ser. No. 582,780
Term of patent 14 years
U.S. Cl. D12—187



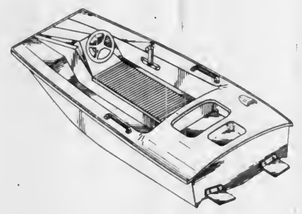
287,001
ELECTRO-MECHANICAL STEP UNIT FOR VEHICLES
William G. Jarvie, Placentia, and Allen L. Roller, Anaheim, both of Calif., assignors to Hideaway Step, Inc., Placentia, Calif.
Filed Apr. 10, 1984, Ser. No. 598,814
Term of patent 14 years
U.S. Cl. D12—203



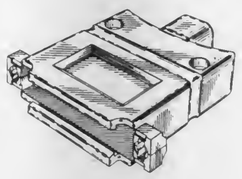
287,002
BOAT
Frank R. Goodman, 72 Whittingham Road, Mapperley, Nottingham, England
Filed Oct. 25, 1984, Ser. No. 664,558
Claims priority, application United Kingdom, May 18, 1984, 1019751
Term of patent 14 years
U.S. Cl. D12—303



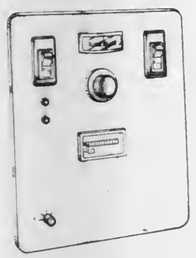
287,003
BOAT
Edwin Axel, 8707 Carlisle Rd., Wyndmoor, Pa. 19118
Filed Oct. 3, 1984, Ser. No. 657,365
Term of patent 14 years
U.S. Cl. D12—314



287,004
ELECTRICAL CONNECTOR COVER
Robert G. Dickie, Keswick, Canada, assignor to Northern Technologies Ltd., Markham, Canada
Filed Jan. 30, 1984, Ser. No. 575,213
Term of patent 14 years
U.S. Cl. D13—24



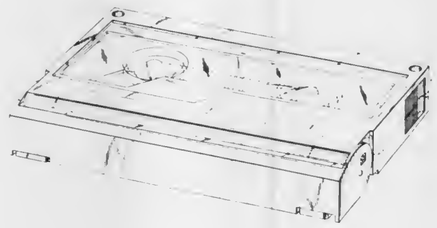
287,005
CONTROL PANEL
Charles L. Newton, Clearwater, Fla., assignor to Shipley Company Inc., Newton, Mass.
Filed Mar. 7, 1984, Ser. No. 586,978
Term of patent 14 years
U.S. Cl. D13—35



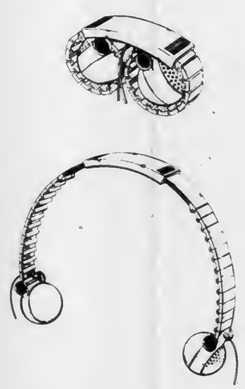
287,006
HOUSING FOR ELECTRICAL COMPONENTS AND THE LIKE
William E. Fletcher, Nashua, N.H.; Charles M. Ault, Winchester, and Dennis O. Sawyer, Tyngsboro, both of Mass., assignors to Termiflex Corporation, N.H.
Filed Jul. 29, 1983, Ser. No. 518,396
Term of patent 14 years
U.S. Cl. D13—40



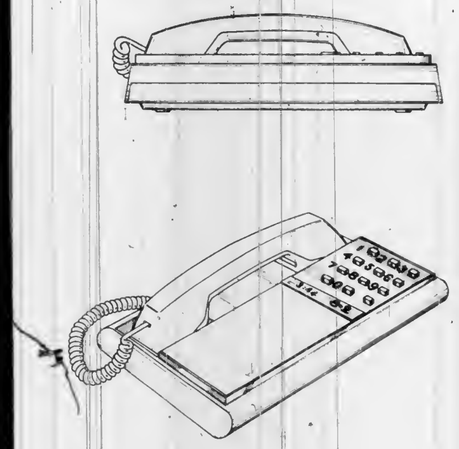
287,007
MAGNETIC TAPE CASSETTE OR THE LIKE
Yuko Wada, and Toshio Ohya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 29, 1983, Ser. No. 566,900
Claims priority, application Japan, Jul. 4, 1983, 58-28940
Term of patent 14 years
U.S. Cl. D14—11



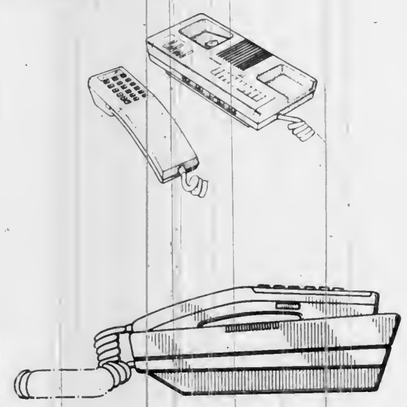
287,008
HEADPHONE
Joerg Tragatschnig, Zell am See, Austria, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Apr. 3, 1984, Ser. No. 596,435
Claims priority, application Japan, Oct. 7, 1983, 58-43826
Term of patent 14 years
U.S. Cl. D14—36



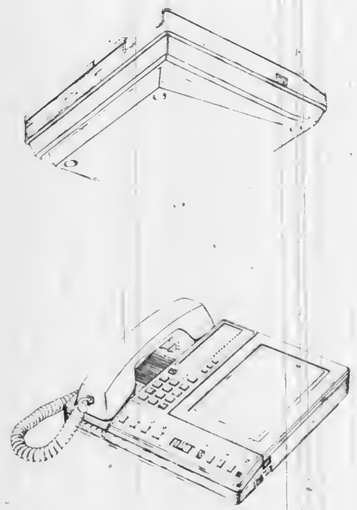
287,009
TELEPHONE SET
James T. Asaki, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.
Filed Sep. 28, 1984, Ser. No. 656,066
Term of patent 14 years
U.S. Cl. D14—53



287,010
MOBILE TELEPHONE UNIT
Akira Sekiguchi, Tokyo; Hideo Shimakage, Hachioji, and Kenji Tamogami, Mitaka, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1984, Ser. No. 631,895
Term of patent 14 years
U.S. Cl. D14—53



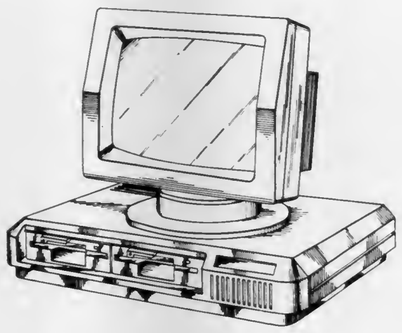
287,011
TELEPHONE SET
Noriaki Kaku, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 16, 1984, Ser. No. 672,314
Claims priority, application Japan, May 18, 1984, 59-20194
Term of patent 14 years
U.S. Cl. D14—57



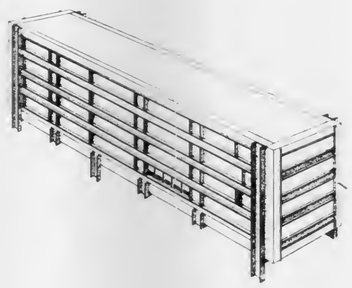
287,012
TELEPHONE INSTRUMENT
Koji Yanagida, and Tadanori Fujiwara, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Nov. 19, 1984, Ser. No. 673,137
Claims priority, application Japan, May 23, 1984, 59-21093
Term of patent 14 years
U.S. Cl. D14—58



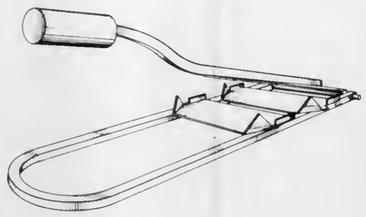
287,013
VIDEO DISPLAY TERMINAL
Richard Satherley, London, England, assignor to Future Computers Limited, Surrey, England
Filed Jan. 16, 1984, Ser. No. 571,276
Claims priority, application United Kingdom, Jul. 14, 1983, 1014093
Term of patent 14 years
U.S. Cl. D14—106



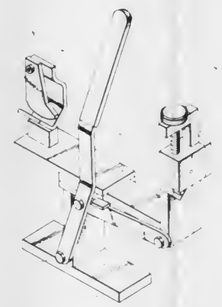
287,014
SPIN COOLER SUPPORT FRAME OR THE LIKE
Donald L. Butler, 1300-H Steinbeck Dr., Raleigh, N.C. 27609, and Thomas E. Martin, 1011 Manchester Dr., Cary, N.C. 27511
Filed Jul. 19, 1983, Ser. No. 515,143
Term of patent 14 years
U.S. Cl. D15—79



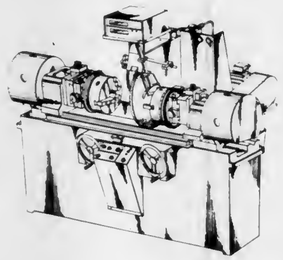
287,015
CAN CRUSHER
Kevin J. Berry, 89 Iris St., Beacon Hill, New South Wales 2100, Australia
Filed Nov. 2, 1984, Ser. No. 667,590
Term of patent 14 years
U.S. Cl. D15—123



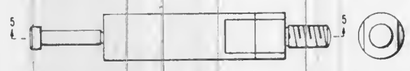
287,016
HOSE AND FERRULE ASSEMBLING APPARATUS
Robert H. Proctor, and Robert G. Cooper, both of Cockeysville, Md., assignors to Murray Corporation, Cockeysville, Md.
Filed Dec. 14, 1984, Ser. No. 681,796
Term of patent 14 years
U.S. Cl. D15—123



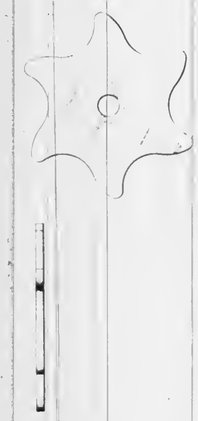
287,017
CRANKSHAFT GRINDING MACHINE
Rufus W. Aldridge, Jr., Huntsville, Ala., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Filed Aug. 2, 1984, Ser. No. 637,115
Term of patent 14 years
U.S. Cl. D15—124



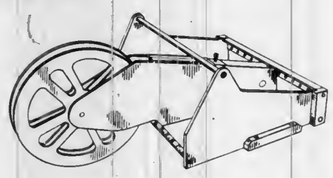
287,018
GRINDING WHEEL MOUNT
Melvin E. Shaffer, 603 W. Monroe, Kokomo, Ind. 46901, and David L. Tishner, Box 3, Michigantown, Ind. 46057
Filed Sep. 27, 1984, Ser. No. 654,973
Term of patent 14 years
U.S. Cl. D15—126



287,019
PACKAGING CONTROL WHEEL
Andrew W. Anderson, deceased, late of West Caldwell, by Miriam Anderson, executrix, Whiting, N.J., assignor to Scandia Packaging Machinery Company, Clifton, N.J.
Filed Jul. 22, 1983, Ser. No. 516,397
Term of patent 14 years
U.S. Cl. D15—138



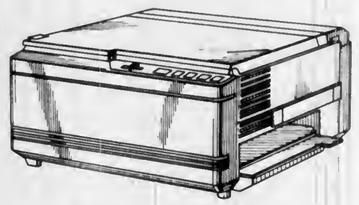
287,020
COMBINED REEL FEEDER MOUNTING RACK AND DETACHABLE FEEDER FOR USE IN PRINTED CIRCUIT ASSEMBLY MACHINES
Ronald J. Falk, Shoreview, Minn., assignor to Micro Component Technology, Inc., St. Paul, Minn.
Filed Jan. 24, 1984, Ser. No. 573,385
Term of patent 14 years
U.S. Cl. D15—199



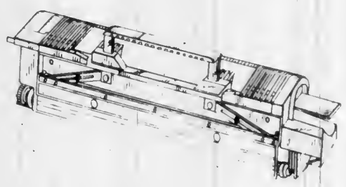
287,021
COMBINED CAMERA AND EYEGLASSES
Carlos J. Johnson, 219 33rd St., NE., Washington, D.C. 20019
Filed Dec. 26, 1984, Ser. No. 686,400
Term of patent 14 years
U.S. Cl. D16—1



287,022
ELECTRONIC COPYING MACHINE
Katsumi Kojima, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Nov. 16, 1984, Ser. No. 672,375
Claims priority, application Japan, May 21, 1984, 59-20482
Term of patent 14 years
U.S. Cl. D16—31



287,023
DEVELOPING UNIT FOR AN ELECTROGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 2, 1984, Ser. No. 595,989
Claims priority, application Japan, Oct. 5, 1983, 58-43302
Term of patent 14 years
U.S. Cl. D16—32

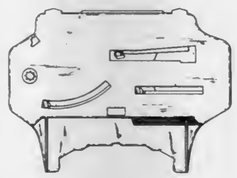


287,024
ELECTRONIC CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 15, 1984, Ser. No. 620,897
Claims priority, application Japan, Dec. 15, 1983, 58-54501
Term of patent 14 years
U.S. Cl. D18—7

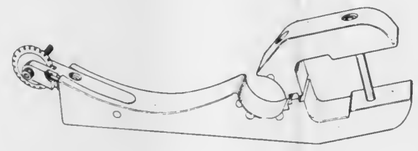


287,025
RIBBON CARTRIDGE FOR TYPEWRITER OR THE LIKE
Manfred Link, and Robert Schwarz, both of Nuremberg, Fed. Rep. of Germany, assignors to Triumph Adler AG, Nuremberg, Fed. Rep. of Germany
Filed Sep. 26, 1984, Ser. No. 654,402
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, MR VII 121
Term of patent 14 years
U.S. Cl. D18—12





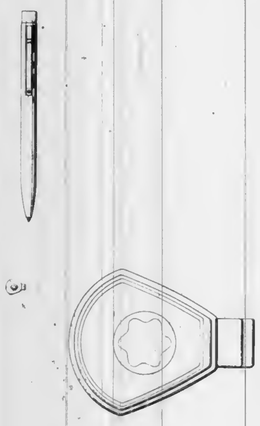
287,026
PERFORATING ATTACHMENT FOR A PRINTING PRESS
William J. Herben, 4/18A Bessemer St., Blacktown, New South Wales 2148, Australia, assignor to William Jerard Herben, Blacktown, Australia
Filed Aug. 10, 1984, Ser. No. 639,958
Term of patent 14 years
U.S. Cl. D18—22



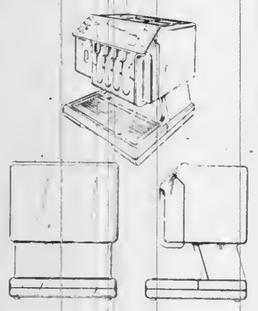
287,027
CARD-KEY FOR ELECTRONIC CARD-READING RECEPTACLE
Bruno V. Stiler, 2840 Telegraph Rd., Bannockburn, Ill. 60015
Filed Mar. 19, 1984, Ser. No. 590,970
Term of patent 14 years
U.S. Cl. D19—10



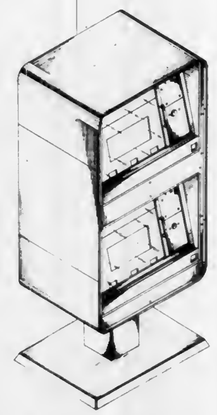
287,028
BALL POINT PEN
Gilles Thevenot, Baden-Baden, Fed. Rep. of Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Fed. Rep. of Germany
Filed Jan. 11, 1985, Ser. No. 690,955
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 66MR11900
Term of patent 14 years
U.S. Cl. D19—51



287,029
COMBINED PACKAGED COFFEE VENDING MACHINE AND ACCESSORIES STORAGE CABINET
Peter H. Oakley, Marlow, Michael B. Woodhall, Maidenhead, and Terence W. Gander, Bracknell, all of United Kingdom, assignors to Mars G.B. Limited, London, England
Filed May 15, 1984, Ser. No. 610,384
Claims priority, application United Kingdom, Nov. 23, 1983, 1016455
Term of patent 14 years
U.S. Cl. D20—4



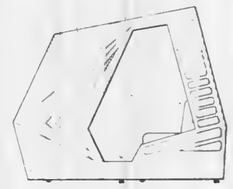
287,030
NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Co., Inc., Gardena, Calif.
Filed Dec. 19, 1983, Ser. No. 563,053
Term of patent 14 years
U.S. Cl. D20—6



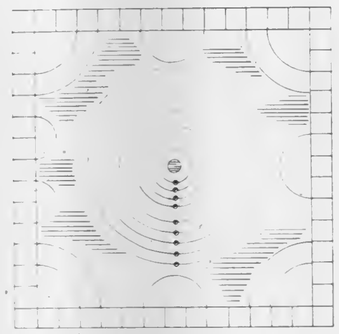
287,031
NO DIVING SIGN
Robert J. Cunitz, 1688 E. Gude Dr., Rockville, Md. 20850
Filed Dec. 3, 1984, Ser. No. 677,747
Term of patent 14 years
U.S. Cl. D20—31



287,032
COCKPIT TYPE GAME MACHINE
Tetsuro Funai, Daito, Japan, assignor to Funai Electric Company Limited, Daito, Japan
Filed Dec. 12, 1983, Ser. No. 560,379
Claims priority, application Japan, Sep. 29, 1983, 58-42518
Term of patent 14 years
U.S. Cl. D21—13



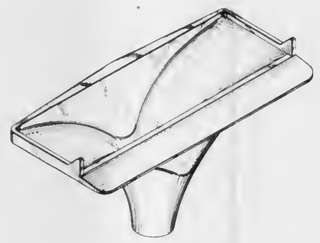
287,033
GAME BOARD
David A. Tourville, 282 E. Wyoming, St. Paul, Minn. 55107, and Charles D. Borden, 1891 Grand Ave., St. Paul, Minn. 55104
Filed Dec. 23, 1983, Ser. No. 565,148
Term of patent 14 years
U.S. Cl. D21—35



287,034
BINGO CHIP DISPENSER
Ronald A. Emmerling, New City, N.Y., assignor to American Tack & Hardware Company, Inc., Monsey, N.Y.
Filed Apr. 16, 1984, Ser. No. 600,983
Term of patent 14 years
U.S. Cl. D21—56



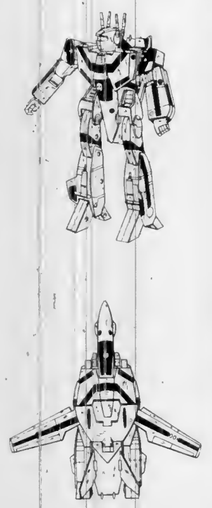
287,035
BINGO CHIP LOADER
Joseph J. Lewis, Haverstraw, N.Y., assignor to American Tack & Hardware Company, Inc., Monsey, N.Y.
Filed Apr. 16, 1984, Ser. No. 600,984
Term of patent 14 years
U.S. Cl. D21—56



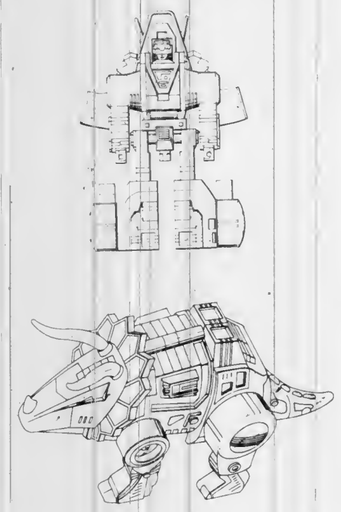
287,036
MODEL AIRPLANE
Yasuaki Ninomiya, Suite 5-101 Tamaplaza 20 Utsukushigaoka, 1-chome, Midoriku, Yokohama, Kanagawa, Japan
Filed Mar. 19, 1984, Ser. No. 590,762
Claims priority, application Japan, Nov. 22, 1983, 58-50990
Term of patent 14 years
U.S. Cl. D21—89



287,037
CHANGEABLE ROBOT TOY
Yukimitsu Matsushiro, Tokyo, Japan, assignor to Kabushiki Kaisha Matsushiro, Japan
Filed Apr. 13, 1984, Ser. No. 603,764
Term of patent 14 years
U.S. Cl. D21—150



287,038
RECONFIGURABLE DINOSAURIAN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,597
Claims priority, application Japan, Mar. 3, 1984, 59-8152
Term of patent 14 years
U.S. Cl. D21—150



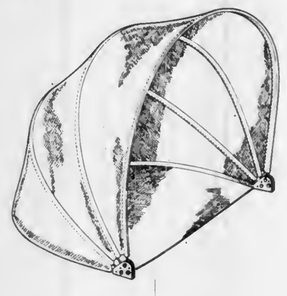
287,039
DOLL
Cathy S. Belue, 5157 N. Umberland Rd., Birmingham, Ala. 35210, and Sandra J. Tucker, 4500 Swallow Pl., Birmingham, Ala. 35213
Filed Jun. 7, 1984, Ser. No. 618,259
Term of patent 14 years
U.S. Cl. D21—166



287,040
TOY FOOTBALL
Emil S. Masura, 49959 M-51 West, Decatur, Mich. 49045
Filed Apr. 19, 1984, Ser. No. 602,211
Term of patent 14 years
U.S. Cl. D21—204



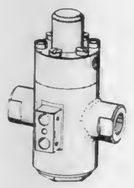
287,041
INFANT SHELTER OR SIMILAR ARTICLE
Clinton L. Gitchel, and Joan M. Gitchel, both of 0-9815 Kenowa SW., Grand Rapids, Mich. 49509
Filed Mar. 9, 1984, Ser. No. 587,979
Term of patent 14 years
U.S. Cl. D21—253



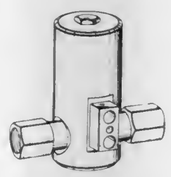
287,042
KNIFE HANDLE
Phillip W. Hoffman, Agoura, Calif., assignor to Hoffman Design, Inc., Los Angeles, Calif.
Filed Apr. 4, 1984, Ser. No. 596,527
Term of patent 14 years
U.S. Cl. D22—118



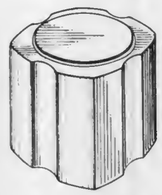
287,043
AUTOMATIC FLUID SHUTOFF VALVE
Richard E. Hughes, 821 Loma Dr., Hermosa Beach, Calif. 90254
Filed Jul. 6, 1984, Ser. No. 628,636
Term of patent 14 years
U.S. Cl. D23—19



287,044
FLUID CONTROL VALVE
Richard E. Hughes, 821 Loma Dr., Hermosa Beach, Calif. 90254
Filed Jul. 6, 1984, Ser. No. 628,637
Term of patent 14 years
U.S. Cl. D23—19



287,045
FAUCET HANDLE
Holly K. Yost, Van Nuys, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Division of Ser. No. 507,524, Jun. 24, 1983. This application Jul. 22, 1985, Ser. No. 757,486
Term of patent 14 years
U.S. Cl. D23—28

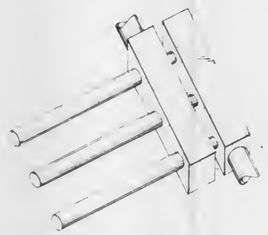


287,046
LOUVERED GRATING OR SIMILAR ARTICLE
Franco Berg, Brunswick, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany
Filed Oct. 12, 1983, Ser. No. 541,090
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, MR 344
Term of patent 14 years
U.S. Cl. D23—115



287,047
HEAT TRANSFER SYSTEM
Kenneth V. Nygren, Rte. 2, Box 161, Eagle, Wis. 53119
Filed May 30, 1984, Ser. No. 615,213
Term of patent 14 years
U.S. Cl. D23—136





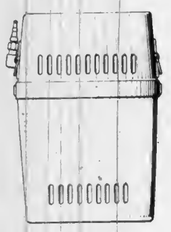
287,048
AIR DEFLECTOR FOR ATTACHMENT TO AN AIR CONDITIONING UNIT OR THE LIKE
Rickey B. Bratton, 201 Bratton Dr., Hot Springs, Ark. 71901
Filed Jun. 26, 1984, Ser. No. 624,907
Term of patent 14 years
U.S. Cl. D23—137



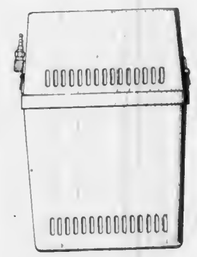
287,049
AIR FRESHENER
David F. Torres, Almeria, Spain, assignor to L & D, S.A., Almeria, Spain
Filed Dec. 10, 1984, Ser. No. 679,950
Claims priority, application Spain, Jun. 11, 1984, 106.273-E
Term of patent 14 years
U.S. Cl. D23—150



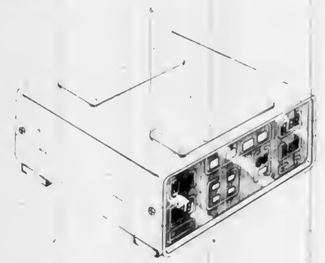
287,050
PORTABLE OXYGEN THERAPY UNIT
Warren E. Perkins, Port St. Lucie, and Mark T. Novak, Jensen Beach, both of Fla., assignors to $CRYO_2$ Corporation, Fort Pierce, Fla.
Filed Oct. 6, 1983, Ser. No. 539,543
The portion of the term of this patent subsequent to Dec. 2, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—8



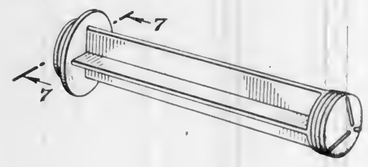
287,051
PORTABLE OXYGEN THERAPY UNIT
Warren E. Perkins, Port St. Lucie, and Mark T. Novak, Jensen Beach, both of Fla., assignors to $CRYO_2$ Corporation, Fort Pierce, Fla.
Filed Oct. 6, 1983, Ser. No. 539,544
The portion of the term of this patent subsequent to Dec. 2, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—8



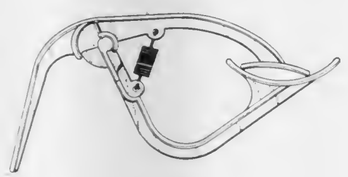
287,052
BLOOD PRESSURE MONITOR
Richard Avoy, Dunedin; Burton L. Cheatham, II, and Christopher Sheridan, both of Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.
Filed Mar. 16, 1984, Ser. No. 590,099
Term of patent 14 years
U.S. Cl. D24—21



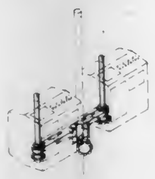
287,053
SYRINGE PLUNGER FOR AN IV INFUSION PUMP
Richard M. Bucchianeri, Escondido, and John J. Sevcik, San Diego, both of Calif., assignors to Ivac Corporation, San Diego, Calif.
Filed Mar. 17, 1983, Ser. No. 476,253
Term of patent 14 years
U.S. Cl. D24—25



287,054
PRESSURE DRESSING CLAMP
Cecil W. Heaton, Edmond, Okla., assignor to Medco Medical Corporation, Edmond, Okla.
Filed Jan. 24, 1983, Ser. No. 460,397
Term of patent 14 years
U.S. Cl. D24—27

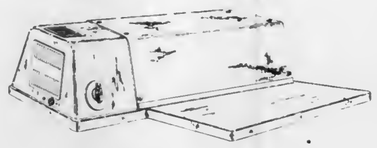


287,055
UNIVERSAL IV EQUIPMENT HOLDER
Thoedore J. Fick, Fox Island; David J. Fick, and James E. Reder, both of Tacoma, all of Wash., assignors to Washington Marine Products, Inc., Tacoma, Wash.
Filed Feb. 15, 1984, Ser. No. 580,560
Term of patent 14 years
U.S. Cl. D24—29

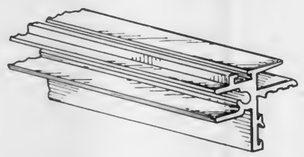




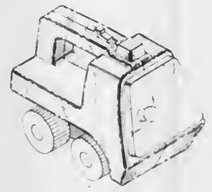
287,056
MASSAGER
William F. Curran, 85 Dobson Rd., P.O. Box 85, Mars, Pa. 16046
Filed Mar. 13, 1984, Ser. No. 589,123
Term of patent 14 years
U.S. Cl. D24—40



287,057
VENT JAMB
Joseph C. Bancroft, 812 Sweetwater Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,770
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



287,058
COMBINATION FLASHLIGHT AND TOY TRUCK
Gary S. Silverman, Novi, Mich., assignor to Robert H. Beck, Plymouth, Minn.
Filed May 3, 1984, Ser. No. 606,625
Term of patent 14 years
U.S. Cl. D26—47



287,059
EYEBROW SHAVER
Mary C. Gille, P.O. Box 325, Waretown, N.J. 08758
Filed Aug. 17, 1984, Ser. No. 641,698
Term of patent 14 years
U.S. Cl. D28—46



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Konrad Feinmechanik Ag.: *See*—
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Aalto, Arvo; Aalto, Erkki; Hasa , Juhani; Penttila , Markku; Saukkonen, Harri; and Tolmunen, Arvi, to Halton Oy. Control/fire damper for ducts inventilation installations. 4,625,626, Cl. 98-1.000.
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Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Switch mode power supply having magnetically controlled output. 4,626,976, Cl. 363-19.000.
Abe, Masaru: *See*—
Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, 4,626,565, Cl. 524-423.000.
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Abed, Majeed; and McIntosh, Robert P., to Storage Technology Partners II. Optical disk storage unit having a servo system with different velocity inputs. 4,627,038, Cl. 369-44.000.
Abeta, Sadaharu: *See*—
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Achiha, Masahiko, to Hitachi, Ltd. Motion detecting circuit utilizing inter-frame difference signals of successive fields. 4,626,891, Cl. 358-21.00R.
Acla, Howard L.: *See*—
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Acrian, Inc.: *See*—
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Adamo, Michael D.: *See*—
Cho, Frederick Y.; Adamo, Michael D.; and Leeson, David E., 4,626,775, Cl. 324-73.00R.
Adams, Dean J. Bait cutting device. 4,625,364, Cl. 17-55.000.
Adams, Don L.; Wright, Stuart C.; Fischer, William C.; and Verzella, David J., to United Technologies Corporation. Heading reference trim system. 4,626,998, Cl. 364-434.000.
Adams, Frederick J., to TRW Cam Gears Limited. Power assisted steering system and a steering assembly for such a system. 4,625,624, Cl. 91-375.00A.
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O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,626,434, Cl. 426-50.000.
Adelizi, Nicholas J. Multi-blade tape dispenser. 4,625,901, Cl. 225-1.000.
Adey, Anthony J.; and Mowbray, Dorian F., to Lucas Industries public limited company. Fuel pumping apparatus. 4,625,694, Cl. 123-450.000.
Adiletta, Joseph G., to Pall Corporation. Purification system. 4,626,265, Cl. 55-316.000.
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Ahmed, Hassan J.; Gerkey, Kenneth S.; Miller, Thomas W.; and Wylie, Mark E., to Westinghouse Electric Corp. Pattern fuel assembly loading system. 4,625,396, Cl. 29-701.000.
Ahn, Youngkee; and Tarshis, Morris, to Motorola, Inc. Circuit board assembly with built in wire gripper. 4,626,962, Cl. 361-399.000.
Aida, Toshiyuki: *See*—
Yamamoto, Shigehiko; Taguchi, Sadanori; and Aida, Toshiyuki, 4,626,470, Cl. 428-336.000.
Ainsworth, John D., to Associated Electrical Industries Limited. D.C. current transformer circuits. 4,626,777, Cl. 324-117.00R.
Air Products and Chemicals, Inc.: *See*—
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Akada, Masanori: *See*—
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Ala-Jokimaki, Antero: *See*—
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Alcan International Limited: *See*—
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Aleck, Benjamin J., to Grumman Aerospace Corporation. Localized boss thickening by cold swaging. 4,625,537, Cl. 72-367.000.

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Andrew Corporation: *See—*
Knop, Charles M.; Ostertag, Edward L.; and Cheng, Yuk-Bun, 4,626,863, Cl. 343-781.00P.
Andrews, Frank. Outdoor game cabinet. 4,625,974, Cl. 273-407.000.
Andrews, Howard W., Jr.; Bobb, Clifford F.; and Taylor, Attalee S., to AMP Incorporated. Card edge connector. 4,626,056, Cl. 339-75.0MP.
Angelini, Thomas J.: *See—*
Carr, Joseph J.; and Angelini, Thomas J., 4,625,875, Cl. 215-232.000.
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Cephalosporins. 4,626,535, Cl. 514-203.000.
Angerer, Klaus, to Siemens Aktiengesellschaft. Method and apparatus for welding rolled bands of finite lengths to form continuous bands during a manufacturing operation. 4,626,655, Cl. 219-121.0LC.
Anno, Hidero: *See—*
Sano, Tetsu; Anno, Hidero; and Kume, Yuichiro, 4,626,694, Cl. 250-483.100.
Ansell, Donald J., to Victaulic Company PLC, The. Method of making welded pipe joints. 4,626,308, Cl. 156-257.000.
Anspach, Sigrid: *See—*
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.
Antex (Electronics) Limited: *See—*
Gray, Kenneth; and Tucker, Albert, 4,626,658, Cl. 219-230.000.
Anthony, Samuel D.: *See—*
Tardif, Arthur J.; and Anthony, Samuel D., 4,626,217, Cl. 434-8.000.
Anzai, Katsushi: *See—*
Takeda, Yuuji; Suematsu, Toshio; Anzai, Katsushi; and Ito, Yoshiyasu, 4,626,997, Cl. 364-431.050.
Aoki, Hideji: *See—*
Hamano, Toshio; Tachibana, Kaoru; and Aoki, Hideji, 4,626,960, Cl. 361-388.000.
Aoki, Takashi: *See—*
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,625,589, Cl. 74-856.000.
Sugo, Hiroyuki; and Aoki, Takashi, 4,625,546, Cl. 73-116.000.
Aoki, Yukichi: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.

Aoshima, Toshihisa: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.
Aoyagi, Takashi: *See—*
Tani, Akihiko; Aoyagi, Takashi; Ikeda, Shuji; and Nagasawa, Kouichi, 4,626,450, Cl. 427-93.000.
Aoyagi, Yukio: *See—*
Ichiyama, Shuichi; Aoyagi, Yukio; and Yasuda, Tomohiko, 4,627,013, Cl. 364-567.000.
Aoyama, Shigeo: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.
Applied Biomedical Corporation: *See—*
Singh, Param I.; and de Sieyes, David C., 4,626,243, Cl. 604-141.000.
Applied Micro Circuits Corporation: *See—*
Yuen, Raymond C., 4,627,085, Cl. 377-81.000.
Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,625,986, Cl. 280-282.000.
Kassai, Kenzou, 4,626,030, Cl. 297-429.000.
Arai, Naoto, to Kanzaki Paper Manufacturing Company, Limited. Heat-sensitive recording material. 4,626,877, Cl. 346-200.000.
Arai, Nobushige, to Sharp Kabushiki Kaisha. Solar heat collector. 4,625,711, Cl. 126-450.000.
Arai, Shigeru; Shibata, Itaru; Minami, Akira; and Ogawa, Koichi, to Fujitsu Limited. Optical disk tracking apparatus. 4,627,040, Cl. 369-44.000.
Arai, Yoshihiro: *See—*
Kitamoto, Tatsuji; Amari, Hiroshi; Nahara, Akira; Shirahata, Ryuji; and Arai, Yoshihiro, 4,626,315, Cl. 156-628.000.
Arakawa, Jeanette S. Graphics protractor. 4,625,409, Cl. 33-1.00N.
Arakawa, Satoshi: *See—*
Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, 4,625,714, Cl. 128-6.000.
Araki, Yoshitami: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.
Arcuri, Kym B., to Exxon Research and Engineering Company. Process for the start-up of a Fischer-Tropsch reactor. 4,626,552, Cl. 518-712.000.
Ardizzone, Nicholas. Colonic lavaging machine. 4,626,239, Cl. 604-31.000.
Arendt, Franz, to Heidelberger Druckmaschinen AG. Copying frame for producing offset plates. 4,626,098, Cl. 355-85.000.
ARES, Inc.: *See—*
Warin, Francis J., 4,625,621, Cl. 89-197.000.
Arias, Beatriz R.: *See—*
Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, 4,626,340, Cl. 208-89.000.
Arita, Setsuo; and Ohkido, Fumiyasu, to Hitachi, Ltd. Signal selection circuit. 4,626,707, Cl. 307-355.000.
Arita, Teiji: *See—*
Uchida, Tatsuro; Matsumoto, Hisayuki; and Arita, Teiji, 4,625,761, Cl. 137-614.030.
Ark-Les Corporation: *See—*
Prince, Thomas F.; and Bishop, Julian J., 4,626,058, Cl. 339-97.00P.
Arkles, Barry C., to Petrarch Systems Inc. Polysilane-siloxane oligomers and copolymers and methods of making the same. 4,626,583, Cl. 528-34.000.
Arlott, Raymond D. J., to British Aerospace PLC. Aircraft data instrumentation and acquisition system. 4,626,996, Cl. 364-424.000.
Armsen, Rotger: *See—*
Hufnagel, Walter; Graap, Volker, deceased; von und zu Aufsess, Freidrich; and Armsen, Rotger, 4,625,372, Cl. 26-73.000.
Armstrong, Thomas R., to Paradyne Corporation. Modified QAM data point constellation for secondary channel signalling. 4,627,077, Cl. 375-39.000.
Arnaudeau, Marcel, to Institut Francais du Petrole. Process and device for performing a series of hydrodynamic functions on a flow comprised of at least two phases. 4,625,744, Cl. 137-10.000.
Arnold, Ernst, to Meteor AG. Apparatus for winding electrical coils with closed cores. 4,625,927, Cl. 242-4.00R.
Arnold, Gerhard: *See—*
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.
Arnold, William M.; and Zimmermann, Ulrich, to Kernforschungsanlage Julich. Process and device for the determination of cells secreting cellular contents. 4,626,506, Cl. 435-173.000.
Artal, Alberto A. Fixed dental implant. 4,626,214, Cl. 433-174.000.
Arthey, Roger P.: *See—*
Meetham, Geoffrey W.; Goulette, Michael J.; and Arthey, Roger P., 4,626,297, Cl. 148-404.000.
Artiss, Joseph D.; and Zak, Bennie, to Wayne State University. Composition for reducing turbidity in samples of biological fluids. 4,626,511, Cl. 436-8.000.
Arvin Industries, Inc.: *See—*
Scheitlin, George E.; Sickels, Mark A.; and Usleman, Robert T., 4,625,511, Cl. 60-299.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hane, Toshioki; and Ohmura, Jukichi, 4,626,553, Cl. 521-27.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hara, Masato; Niiho, Masaaki; Takasugi, Eiji; and Honda, Ryouji, 4,626,682, Cl. 250-231.0SE.
Morisawa, Tahei, 4,626,918, Cl. 358-225.000.
Asai, Jun: *See—*
Ohtsuka, Yasumasa; Asai, Jun; Murasawa, Yoshihiro; Sasame, Hiroshi; and Ohkubo, Masaharu, 4,626,096, Cl. 355-14.00D.
Asakawa, Teruo, to Tokyo Electron Limited. Two-dimensional positioning device. 4,626,749, Cl. 318-135.000.
Asano, Kazuo, to Kabushiki Kaisha Asana Kenkyusho. Radiant heater of short response time. 4,626,667, Cl. 219-542.000.
Asanomi, Koji: *See—*
Hatamura, Koichi; and Asanomi, Koji, 4,625,687, Cl. 123-52.00M.
Asao, Hiroshi: *See—*
Okada, Kenichi; Asao, Hiroshi; and Yonemura, Hideo, 4,625,533, Cl. 72-302.000.
ASC Incorporated: *See—*
Kaltz, Milton C.; and Alexander, Michael P., 4,626,020, Cl. 296-107.000.
Ashdown, Charles P.: *See—*
Kenney, George B.; and Ashdown, Charles P., 4,626,278, Cl. 75-0.50C.
Ashida, Kaneyoshi; and van der Loos, Jozef L. M. N-substituted carbamoyl-lactam. 4,626,385, Cl. 540-451.000.
Ashida, Kazutaka: *See—*
Umeda, Hiroyuki; and Ashida, Kazutaka, 4,626,938, Cl. 360-95.000.
Ashikawa, Noboru; Nakayama, Hiroshi; and Sumi, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Multi-speed transmission. 4,625,577, Cl. 74-475.000.
Ashland Oil, Inc.: *See—*
Goel, Anil; Holehouse, Joseph; and Barnett, Kenneth, 4,626,475, Cl. 428-423.100.
Goel, Anil B., 4,626,575, Cl. 525-329.500.
Ashworth, Steven W., to Delta International Machinery Corp. Counterbalancing mechanism for scroll saw. 4,625,609, Cl. 83-748.000.
Aspects, Inc.: *See—*
Zacky, Ralf G.; and Alexander, Gordon L., 4,625,483, Cl. 52-239.000.
Associated Electrical Industries Limited: *See—*
Ainsworth, John D., 4,626,777, Cl. 324-117.00R.
Astra Lakemedel Aktieboag: *See—*
Kjellberg, Ulf A.; Nyqvist, Per G. H.; Stenhede, Jan U.; and Stenmark, Lars B., 4,626,532, Cl. 514-195.000.
Asulab SA: *See—*
Bui, Ngoc C.; Gete, Henry; and Robert-Grandpierre, Jean-Claude, 4,626,760, Cl. 318-696.000.
AT&T Bell Laboratories: *See—*
Barber, Frank E., 4,627,030, Cl. 365-189.000.
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,626,634, Cl. 379-28.000.
Chemla, Daniel S., 4,626,075, Cl. 350-354.000.
Debus, Walter, Jr., 4,627,080, Cl. 375-110.000.
Feldman, Martin; Reece, David N.; and Wagner, John S., 4,626,103, Cl. 356-363.000.
Kolwicz, Kevin D.; and Mowery, Gilbert L., Jr., 4,627,032, Cl. 365-203.000.
Larson, Mikiel L., 4,627,048, Cl. 370-60.000.
Levinson, Frank H., 4,626,066, Cl. 350-96.180.
Logan, Ralph A.; and Tsang, Won-Tien, 4,627,065, Cl. 372-50.000.
Ng, Fred K., 4,627,019, Cl. 364-900.000.
Shmulovich, Joseph, 4,626,739, Cl. 313-469.000.
Atago, Takeshi: *See—*
Soma, Masahiro; Atago, Takeshi; and Kido, Takayuki, 4,625,919, Cl. 239-585.000.
Ateliers de Constructions Electriques de Charleroi (ACEC): *See—*
Fabris, Mirko, 4,626,403, Cl. 376-272.000.
Ateliers Deconstruction Industrielles du Rhone (A.C.I.R.): *See—*
Charmes, Michel; and Trambouze, Yves, 4,626,659, Cl. 219-343.000.
Atkinson, Arthur: *See—*
Crossland, William A.; Brocklehurst, John R.; Ayliffe, Peter J.; and Atkinson, Arthur, 4,626,074, Cl. 350-345.000.
Atlantic Richfield Company: *See—*
Dean, Barry D., 4,626,576, Cl. 525-332.800.
DiGiulio, Adolph V., 4,626,554, Cl. 521-57.000.
Younes, Usama E., 4,626,573, Cl. 525-148.000.
Atlas Hydropiling Ltd.: *See—*
Boyes, G. Mitchell, 4,626,138, Cl. 405-232.000.
Atomic Energy of Canada Limited: *See—*
Harvey, Keith B.; Litke, Cynthia D.; and Porth, Robert J., 4,627,069, Cl. 373-29.000.
Aubry, Claude; Chaumette, Jacques; Letemps, Bernard; Petitcollin, Jean-Marc; Gatzweiler, Werner; Rissmann, Heinz-Bernd; Vanaschen, Luc; and Zeitzen, Jurgen, to Saint Gobain Vitrage. Apparatus for holding a glass sheet in a substantially vertical position during heat treatment of the glass sheet. 4,626,207, Cl. 432-253.000.
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, to Societe Nationale Industrielle Aerospatiale. Suspension with pivotable arms. 4,625,995, Cl. 280-723.000.
Aubry, Jean P.: *See—*
Debaisieux, Andre ; and Aubry, Jean P., 4,626,732, Cl. 310-348.000.
Aula, Jouko; and Kerttula, Raima, to Valmet Oy. Drying section and method in paper machine. 4,625,430, Cl. 34-13.000.
Aumont, Gabriel; and Queguiner, Alain. Motorizing device for a trailer drawn by a tractor. 4,625,821, Cl. 180-14.200.

Aungst, Bruce; and DiLuccio, Robert C., to Du Pont de Nemours, E. I., and Company. Trandermal delivery of opioids. 4,626,539, Cl. 514-282.000.

Ausnit, Steven, to Minigrip, Inc. Method and apparatus for forming a reclosable package. 4,625,496, Cl. 53-451.000.

Auzel, Francois; Moncorge, Richard; and Morin, Denise, to L'Etat Francais represente par le Ministre des P.T.T. (C.N.E.T.). Mixed oxides for tunable lasers. 4,627,064, Cl. 372-41.000.

Avery, Phillip E. Insulating member for double doors. 4,625,457, Cl. 49-366.000.

AVM-Auto Equipamentos Lida: *See—*
Gomez, Miguel, 4,625,846, Cl. 192-67.00R.

Awane, Misao; Suda, Yorishige; Hara, Seiji; and Kobayashi, Satoshi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Check system for a control board. 4,627,056, Cl. 371-16.000.

Axelson, Inc.: *See—*
Snyder, David E.; and Gundel, Norman L., 4,625,764, Cl. 137-625.660.

Ayliffe, Peter J.: *See—*
Crossland, William A.; Brocklehurst, John R.; Ayliffe, Peter J.; and Atkinson, Arthur, 4,626,074, Cl. 350-345.000.

Azibert, Henri V.; and Rockwood, Robert E., to A. W. Chesterton Company. Convertible, stand-by rotary seal assembly. 4,625,977, Cl. 277-82.000.

Azuma, Siro; Yokoyama, Kenichi; and Kitai, Tatsuya, to Hitachi Maxell, Ltd. Electrical double layer capacitor and production of the same. 4,626,964, Cl. 361-433.000.

Azumi Manufacturing Co., Ltd.: *See—*
Nara, Hyakuro, 4,625,467, Cl. 51-209.00R.

B.F. Goodrich Company, The: *See—*
Kramer, James H., 4,626,112, Cl. 384-300.000.
Wood, Gary L., 4,625,530, Cl. 72-146.000.

Baatz, Henning; and Rittscher, Dieter, to GNS-Gesellschaft fur Nuklear-Service mbH. Transport and storage container for radioactive waste. 4,626,380, Cl. 250-506.100.

Baatz, Henning; and Rittscher, Dieter, to GNS Gesellschaft fur Nuklear-Service mbH. Apparatus for the storage and transport of radioactive materials. 4,626,402, Cl. 376-272.000.

Baatz, Henning; and Rittscher, Dieter, to GNS Gesellschaft fur Nuklear-Service mbH. Apparatus for the packaging of radioactive wastes in storage containers. 4,626,414, Cl. 422-159.000.

Baba, Fujio: *See—*
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, 4,626,758, Cl. 318-603.000.

Baba, Nobuyuki: *See—*
Toei, Jun-ichi; Baba, Nobuyuki; Housako, Keiichi; and Ikushige, Tetsuo, 4,625,569, Cl. 73-863.720.

Baba, Takaaki; and O'Keefe, Gerald T., to Matsushita Electric Industrial Co., Ltd. Color camera using digital signal processing techniques. 4,626,898, Cl. 358-48.000.

Baba, Toru, to Kioritz Corporation. Cutter blade device of mowing machine. 4,625,501, Cl. 56-12.700.

Baba, Yoshio: *See—*
Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, 4,626,295, Cl. 148-127.000.

Babock-Hitachi Kabushiki Kaisha: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

Bach, Lloyd G.: *See—*
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Baddour, Raymond F.: *See—*
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Bailey, Mark W.: *See—*
Lo, Donald H.; Wu, Tai-Wing; and Bailey, Mark W., 4,627,014, Cl. 364-571.000.

Baisch, Herbert: *See—*
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,625,604, Cl. 83-102.100.

Baker, Francis S.: *See—*
Carter, Roy E.; and Baker, Francis S., 4,625,559, Cl. 73-706.000.

Baker, Robert W.; and Lothmann, Werner, to AMP Incorporated. Electrical connector assembly. 4,626,055, Cl. 339-60.00M.

Baltes, Hans. Apparatus and method for drying and sterilizing fabrics. 4,625,432, Cl. 34-151.000.

Balzat, Ernst M.: *See—*
Ergert, Karl; and Balzat, Ernst M., 4,626,153, Cl. 409-304.000.

Balzat Werkzeugmaschinenfabrik GmbH: *See—*
Ergert, Karl; and Balzat, Ernst M., 4,626,153, Cl. 409-304.000.

Banatwala, Zainuddin M.: *See—*
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Banner Engineering Corp.: *See—*
Fayfield, Robert W., 4,626,053, Cl. 339-32.00M.

Bannister, Robert D., to Cincinnati Milacron Inc. Apparatus for controlled manipulation of laser focus point. 4,626,999, Cl. 364-474.000.

Baranowski, Michael: *See—*
Edelman, William; and Baranowski, Michael, 4,626,240, Cl. 604-43.000.

Barbato, Giulio: *See—*
Grattoni, Paolo; and Barbato, Giulio, 4,627,096, Cl. 382-8.000.

Barber, Frank E., to AT&T Bell Laboratories. Dual port memory word size expansion technique. 4,627,030, Cl. 365-189.000.

Barefoot, Carlton K., to Tred-X Corporation. Method and apparatus for vulcanizing retreaded tires. 4,626,300, Cl. 156-96.000.

Barker, Roger N.: *See—*
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,626,493, Cl. 430-201.000.

Barkley, Vincent P.; and Siegel, William J., to Pace, Incorporated. Nozzle structure for air flow soldering/desoldering. 4,626,205, Cl. 432-225.000.

Barnes, Gary T. Split energy level radiation detection. 4,626,688, Cl. 250-361.00R.

Barnett, Kenneth: *See—*
Goel, Anil; Holehouse, Joseph; and Barnett, Kenneth, 4,626,475, Cl. 428-423.100.

Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,626,442, Cl. 426-548.000.

Barnhart, Ronald W.: *See—*
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Barr, Thomas A., Jr.; McCracken, William E.; and McKnight, William B., to United States of America, Army. Mid-infrared laser in molecular hydrogen. 4,627,067, Cl. 372-81.000.

Barrett, Frederick G. Chimney cleaning tool. 4,625,358, Cl. 15-242.000.

Barrows, Burton F., to General Electric Company. Dual axis gripper. 4,626,013, Cl. 294-88.000.

Barskaya, Evgenia G.: *See—*
Chernin, Semen M.; and Barskaya, Evgenia G., 4,626,078, Cl. 350-504.000.

Bartlett, Bruce, to Crown International, Inc. Microphone windscreen. 4,625,827, Cl. 181-158.000.

Bartlett, Peter J.; and Bradford, Peter F., to Lucas Industries public limited company. Fuel system. 4,625,701, Cl. 123-514.000.

Bartmann, Martin; and Burzin, Klaus, to Chemische Werke Huls AG. Method of producing a polyphenylene ether protected against molecular weight degradation, where the copper salt employed in the coupling reaction can be reused. 4,626,585, Cl. 528-212.000.

Barton, Bruce G., to Thunderline Corporation. Wall sleeves. 4,625,940, Cl. 249-83.000.

BASF Aktiengesellschaft: *See—*
Hack, Joachim; Schulze-Berge, Klaus; and Birkenmeier, Klaus, 4,626,944, Cl. 360-106.000.
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BASF Corporation: *See—*
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,626,366, Cl. 252-32.70E.

Baslow, Floyd M. Tracks for fabric wall coverings. 4,625,490, Cl. 52-716.000.

Batchelor, John F.; Hyde, Richard M.; and Livingstone, David J., to Burroughs Wellcome Co. Storage of red blood cells. 4,626,431, Cl. 424-101.000.

Bates, Ronald B.: *See—*
Pinegar, Richard K.; and Bates, Ronald B., 4,625,606, Cl. 83-403.000.

Batistic, Ivica: *See—*
Belart, Juan; Fennel, Helmut; Seibert, Wolfram; and Batistic, Ivica, 4,626,043, Cl. 303-114.000.

Batti, Steve A.: *See—*
Mann, Bruce L.; and Batti, Steve A., 4,626,844, Cl. 340-825.310.

Baughman, Gary M., to Rieke Corporation. Replaceable, crimp-on, threaded closure for plastic container. 4,625,889, Cl. 220-288.000.

Baughman, Richard C.; Flamini, Stephen J.; and Wilson, William C., to Eastman Kodak Company. Finishing apparatus with cover inserter. 4,626,156, Cl. 412-33.000.

Bauman, Jack, to General Medical Products, Inc. Method and apparatus for removing the outermost layer of a multilayered product. 4,625,611, Cl. 83-861.000.

Bauman, Robert A.; and Ramachandran, Pallassana N., to Colgate-Palmolive Company. Particulate fabric softening and antistatic built detergent composition and particulate agglomerate for use in manufacture thereof. 4,626,364, Cl. 252-8.800.

Baxter Travenol Laboratories, Inc.: *See—*
Huang, Leon; and Selman, John J., 4,627,060, Cl. 371-62.000.

Bayens, Harold J. Die for cutting paper, cloth and the like and method of making same. 4,625,592, Cl. 76-107.00C.

Bayer Aktiengesellschaft: *See—*
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.
Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, 4,626,525, Cl. 514-18.000.
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; and Klauke, Erich, 4,626,601, Cl. 568-425.000.
Hausmann, Heinz; Schmidt, Robert R.; and Voege, Herbert, 4,626,274, Cl. 71-93.000.
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,626,595, Cl. 549-559.000.
Lantzsch, Reinhard; and Reubke, Karl-Julius, 4,626,594, Cl. 548-262.000.
Reetz, Manfred T.; Ostarek, Ralph; and Piejko, Karl-Erwin, 4,626,579, Cl. 526-194.000.

Bayerische Motoren Werke AG: *See—*
Hinsberg, Rene ; and Poschner, Markus, 4,626,036, Cl. 301-58.000.

Bayh, Russell I., III, to Otis Engineering Corporation. Submersible pump installation, methods and safety system. 4,625,798, Cl. 166-106.000.

BBC Brown, Boveri & Company, Limited: *See—*
Amstutz, Hermann; and Kaufmann, Meinolph, 4,626,073, Cl. 350-344.000.

Beall, Alvan H. Stove guard. 4,625,708, Cl. 126-42.000.

Beard, Harold J.; and Cox, Raleigh L. Side skimmer for use in a channel. 4,626,353, Cl. 210-519.000.

Becht, Carl T., to Sencorp. Multiple impact fastener driving tool. 4,625,903, Cl. 227-131.000.

Beck, Paul C.: *See—*
Lane, Michael L.; Whitney, Lowell T.; and Beck, Paul C., 4,625,791, Cl. 165-115.000.

Becker, Otto: *See—*
Dyma, Horst; Bommersheim, Hans; Becker, Otto; and Heindke, Armin, 4,625,958, Cl. 271-274.000.

Beckers, Michel, to Societe Anonyme des Ateliers Houqet Duesberg Bosson. Open-end spinning process and device. 4,625,506, Cl. 57-413.000.

Becton, Dickinson and Company: *See—*
Hoch, Louis, 4,625,877, Cl. 215-366.000.

Beecham Home Improvement Products Inc.: *See—*
Chang, Wei T., 4,626,567, Cl. 524-493.000.

Beenhakker, Henk; Van Der Giessen, Dirk; and Verweij, Kees, to Hoogovens Groep B.V. Recuperative heat exchanger. 4,625,792, Cl. 165-139.000.

Behme, Werner; and Berleth, Manfred, to Parke, Davis & Company. Microtomes. 4,625,608, Cl. 83-713.000.

Beier, Sybille: *See—*
Elger, Walter; and Beier, Sybille, 4,626,531, Cl. 514-171.000.

Beissbarth, Osmond. Wheel alignment measuring apparatus. 4,625,419, Cl. 33-203.170.

Belart, Juan; Fennel, Helmut; Seibert, Wolfram; and Batistic, Ivica, to Alfred Teves GmbH. Slip-controlled brake system for automotive vehicles with a driven axle. 4,626,043, Cl. 303-114.000.

Bell Helmets Inc.: *See—*
Broersma, Lester V., 4,625,341, Cl. 2-424.000.

Bell & Howell Company: *See—*
Zuelke, Robert D.; Friedrich, Paul H.; and Stites, David G., 4,626,099, Cl. 355-99.000.

Bellamy, John C., to Data General Corp. Programmable feature card. 4,627,046, Cl. 370-58.000.

Bellavance, Roger T. Writing instrument with fastening means. 4,626,118, Cl. 401-104.000.

Belley, Laszlo : *See—*
Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl. 299-16.000.

Beloit Corporation: *See—*
Kirchner, Edward C., 4,625,926, Cl. 241-261.200.

Belt, Roger F.: *See—*
Shone, Michael F.; and Belt, Roger F., 4,625,390, Cl. 29-576.00B.

Ben-Gurion University of the Negev Research and Development Authority: *See—*
Krichevsky, Mendel; Rabinovici, Raul; and Sharir, Benjamin, 4,626,815, Cl. 336-5.000.

Bender, Gerald M., to McDonnell Douglas Corporation. AC driven laser diode array, power supply, transformer, and method therefor. 4,627,062, Cl. 372-36.000.

Bender, Heinz G.: *See—*
Slaghuis, Hermann; and Bender, Heinz G., 4,625,929, Cl. 242-18.100.

Bendix Avelex Inc.: *See—*
Evans, Rowland M., 4,625,510, Cl. 60-39.161.

Bennett, Michael C.; Coote, Nicholas; and Byers, Andrew, to Tate & Lyle Public Limited Company. Filter. 4,626,359, Cl. 210-793.000.

Benson, John T.; Hart, William; and Stratman, Jerome F., to Mattel, Inc. Slowly appearing, rapidly disappearing figure toy. 4,626,224, Cl. 446-297.000.

Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Antibiotics, preparation and use of and intermediates therefor. 4,626,525, Cl. 514-18.000.

Beretta, Pier G., to Fabrica D'Armi P.Beretta S.p.A. Single- or double-action tripping mechanism for four-barrelled pistols. 4,625,443, Cl. 42-42.030.

Beretta, Pier G., to Fabrica D'Armi P.Beretta S.p.A. Hair trigger for a rifle. 4,625,444, Cl. 42-69.020.

Berg, Christoph: *See—*
Knothe, Erich; Melcher, Franz-Josef; and Berg, Christoph, 4,625,818, Cl. 177-212.000.

Bergelt, Dieter, to General Motors Corporation. Engine mounting for motor vehicles. 4,625,939, Cl. 248-638.000.

Berger, Jean-Claude, to Tetras. Belt-holder drawer for photoreceptor belt for copier apparatus. 4,626,095, Cl. 355-3.0BE.

Berger, Josef: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.

Berger, Joseph: *See—*
Roth, Martin; Muller, Beat; Berger, Joseph; and Loew, Peter, 4,626,497, Cl. 430-293.000.

Berger, Roland; Fink, Hans-Ferdi; Koerner, Gotz; Langner, Jaroslav; and Weitemeyer, Christian, to Th. Goldschmidt AG. Use of fluorinated norbornylsiloxanes for defoaming freshly extracted degassing crude oil. 4,626,378, Cl. 252-321.000.

Bergholz, Larry: *See—*
Faller, Frank R.; Clouston, Ross G.; and Bergholz, Larry, 4,625,673, Cl. 114-230.000.

Bergsten, Ralph A. Structural aid for facilitating egress from a vehicle. 4,626,016, Cl. 296-1.00R.

Beringer-Hydraulik GmbH: *See—*
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,625,756, Cl. 137-491.000.

Berleth, Manfred: *See—*
Behme, Werner; and Berleth, Manfred, 4,625,608, Cl. 83-713.000.

Bernadic, Thomas J.: *See—*
Malaker, John; and Bernadic, Thomas J., 4,626,141, Cl. 407-114.000.

Berner, Willy, to Urma Aktiengesellschaft. Boring tool with balancing means for non-vibrating boring. 4,626,144, Cl. 408-143.000.

Berntsen, Inc.: *See—*
Peterson, Phillip R.; and Rushing, William C., 4,625,473, Cl. 52-98.000.

Bertrand, Claude, to Centre National de la Recherche Scientifique (CNRS). Method of controlling a combustion flame and a microphonic probe allowing the application of the method. 4,626,191, Cl. 431-12.000.

Bertrand, Ivan G.: *See—*
Saint Julian, Raymond M.; Gehant, Philippe M.; Bertrand, Ivan G.; and Folliet, Michel H., 4,626,204, Cl. 432-222.000.

Beshore, Craig S. Machine with double acting box piston. 4,625,685, Cl. 123-50.00R.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,626,520, Cl. 502-115.000.

Beust, Wolfgang, to Mannesmann Aktiengesellschaft. Installation for seals. 4,625,975, Cl. 277-9.500.

Beyers, Billy W., Jr.: *See—*
Nortrup, Kevin E.; Beyers, Billy W., Jr.; and Fuhrer, Jack S., 4,626,892, Cl. 358-21.00R.

Beymer, Craig: *See—*
Wehmeyer, Donald T.; Barnhart, Ronald W.; and Beymer, Craig, 4,625,830, Cl. 182-19.000.

BICC Public Limited Company: *See—*
Cockburn, James; and Suddards, Arthur D., 4,625,839, Cl. 191-40.000.

Bieganski, Zdzislaw, to Abeco Limited. Combination tool. 4,625,386, Cl. 29-566.400.

Bilger, Edgar, to Degussa Aktiengesellschaft. Process for the production of alkalithiocyanate. 4,626,423, Cl. 423-366.000.

Billberg, Alf, to Tetra Pak International AB. Method and arrangement for the feeding of a material web. 4,625,902, Cl. 226-2.000.

Billion S.A.: *See—*
Monnet, Bernard, 4,626,185, Cl. 425-110.000.

Bilsbury, Stephen J., to Olin Corporation. Multiple effect ammunition. 4,625,650, Cl. 102-516.000.

Bingham, John R.: *See—*
DeLacy, Thomas J.; Bingham, John R.; and Carroll, George F., 4,625,872, Cl. 209-557.000.

Biogal Gyogyszergyar: *See—*
Elek, Sandor; Mihok nee Borbely, Ildiko ; and Mihok, Miklos, 4,626,533, Cl. 514-202.000.

Biray, Bora: *See—*
Ramsaran, Johann D.; Biray, Bora; Nizamuddin, Nadir; and Yung, Anthony, 4,626,628, Cl. 379-283.000.

Birckhead, Robert W. Method of forming truss plates. 4,625,535, Cl. 72-326.000.

Birkenmeier, Klaus: *See—*
Hack, Joachim; Schulze-Berge, Klaus; and Birkenmeier, Klaus, 4,626,944, Cl. 360-106.000.

Bischof, Richard, to Emil Schenker AG. Composite slat for use in venetian blinds. 4,625,868, Cl. 206-577.000.

Bishop, Julian J.: *See—*
Prince, Thomas F.; and Bishop, Julian J., 4,626,058, Cl. 339-97.00P.

Bjork, Paul E.; Mitchell, Gordon L.; and Mocker, Hans W., to Honeywell Inc. Method and means of removing claddings from optical fibers. 4,626,652, Cl. 219-121.0LH.

Bjornberg, Arne; Holmstrom, S. Ake; and Lindkvist, Goran, to Boliden Aktiebolag. Method for processing copper smelting materials and the like containing high percentages of arsenic and/or antimony. 4,626,279, Cl. 75-2.000.

Black, David H. A., to Northern Telecom, Ltd. TASI system including an order wire. 4,627,049, Cl. 370-81.000.

Blackwell, Russell. Roof bolt anchor. 4,626,139, Cl. 405-259.000.

Blades, Frederick K.; and Godec, Richard D., to Anatel Instrument Corporation. Instrument for measurement of the organic carbon content of water. 4,626,413, Cl. 422-78.000.

Blakeway, Richard S., to Boundy, Francis John. Body support. 4,625,487, Cl. 5-446.000.

Blanche, Claes G.: *See—*
Joustra, Marius K.; and Blanche, Claes G., 4,626,355, Cl. 210-635.000.

Blaschke, Felix, to Siemens Aktiengesellschaft. Method and apparatus for determining the flux vector of a rotating field machine. 4,626,761, Cl. 318-803.000.

Bleiwas, Martin; and Goldstein, Edmund. Flashing strobe beacon. 4,626,966, Cl. 362-35.000.

Blevins, Allan L.: *See—*
Shepperd, Michael B.; and Blevins, Allan L., 4,627,073, Cl. 375-20.000.

Bloomquist, Darrel R.; Natarajan, Bangalore R.; and Opfer, James E., to Hewlett Packard Company. Target for sputter depositing thin films. 4,626,336, Cl. 204-298.000.

Bloor, David: *See—*
Wilson, Edward G.; and Bloor, David, 4,627,029, Cl. 365-107.000.

Blount, Frederick T.; and Weinberger, Arnold, to International Business Machines Corporation. Address range determination. 4,627,017, Cl. 364-900.000.

Blum, Dietrich; and Broening, Joerg, to Dr. -Ing. Rudolf Hell GmbH. Method and apparatus for recording characters. 4,627,002, Cl. 364-519.000.

Blum, Josef: *See—*
Jachowski, Johannes; Klasing, Helmut; Blum, Josef; and Pant, Paul, 4,626,464, Cl. 428-212.000.

Blumkin, Rubin; and Pereira, Robert, Jr., to American Technical Ceramics Corp. Multilayer series-connected coil assembly on a wafer and method of manufacture. 4,626,816, Cl. 336-192.000.

Blundell, Brian F., to IMS Lycrete Limited. Comminuting. 4,625,921, Cl. 241-14.000.

Blusztajn, Krzysztof: *See—*
Wurtman, Richard J.; Conlay, Lydia; and Blusztajn, Krzysztof, 4,626,527, Cl. 514-78.000.

Board of Regents, University of Texas: *See—*
Weigel, Paul H., 4,626,571, Cl. 525-54.100.
Weigel, Paul H., 4,626,581, Cl. 526-288.000.

Bobb, Clifford F.: *See—*
Andrews, Howard W., Jr.; Bobb, Clifford F.; and Taylor, Attalee S., 4,626,056, Cl. 339-75.0MP.

Boberg, Michael: *See—*
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.

BOC Limited: *See—*
Hilton, Derrick E., 4,626,646, Cl. 219-74.000.

Bodecker, Kay; Goth, Walter; Scheurl, Robert; and Strasser, Hans-Erwin, to Henkel Kommanditgesellschaft auf Aktien. Liquid conductivity probe. 4,626,786, Cl. 324-449.000.

Boeing Aerospace Company, The: *See—*
Pinson, George T., 4,625,646, Cl. 102-489.000.

Boeing Company, The: *See—*
Lewis, Richard W., 4,626,782, Cl. 324-253.000.
Pitalo, Stephen K.; Russnak, Clarence J.; and Anderson, Wallace M., 4,626,685, Cl. 250-341.000.
Shivashankara, Belur N.; Miller, Wendell R.; and Stubbs, Gene W., 4,625,828, Cl. 181-175.000.
Wiley, Edward R., 4,626,861, Cl. 342-458.000.

Bogle, Ulrich, to Wilhelm Bogle KG. Wedge for use in lattice substructures of wall panels. 4,625,489, Cl. 52-712.000.

Bognar, Laszlo : *See—*
Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , 4,625,732, Cl. 128-670.000.

Bohme, Klaus; Seibt, Gunter; and Sieber, Klaus, to VEB "Otto Buchwitz". Connecting arrangement for current conductors having full solid insulation. 4,626,059, Cl. 339-143.00C.

Boliden Aktiebolag: *See—*
Bjornberg, Arne; Holmstrom, S. Ake; and Lindkvist, Goran, 4,626,279, Cl. 75-2.000.

Bolliger, Martin: *See—*
Buxmann, Kurt; and Bolliger, Martin, 4,625,788, Cl. 164-481.000.

Bommersheim, Hans: *See—*
Dyma, Horst; Bommersheim, Hans; Becker, Otto; and Heindke, Armin, 4,625,958, Cl. 271-274.000.

Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; and Morrison, Barry L., to Thomson Components-Mostek Corporation. Manipulation and handling of integrated circuit dice. 4,626,167, Cl. 414-786.000.

Bones, Roger J.; Teagle, David A.; Brooker, Steven D.; and Galloway, Roy C., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,626,483, Cl. 429-50.000.

Bonfilio, Roberto L. Rotating cylinder internal combustion engine. 4,625,683, Cl. 123-44.00R.

Bonfils, Michel: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,625,995, Cl. 280-723.000.

Bonn, Matthew A., to Advanced Micro Devices, Inc. Method for planarizing an isolation slot in an integrated circuit structure. 4,626,317, Cl. 156-643.000.

Booher, Howard. Flat bed trailer with light reflecting structure. 4,626,022, Cl. 296-182.000.

Borders, Donald B.: *See—*
Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., 4,626,503, Cl. 435-75.000.

Borders, Fred C. Fishing lure with improved line attachment. 4,625,448, Cl. 43-42.110.

Boroson, Bernard A. Indoor air conditioner cover and system. 4,625,784, Cl. 150-52.00R.

Bose, Ajit K., to Union Camp Corporation. Method for controlled orientation of extruded resins. 4,626,397, Cl. 264-565.000.

Bothe, Gregory R.: *See—*
Task, Harry L.; Tutin, Michael B.; and Bothe, Gregory R., 4,625,972, Cl. 273-348.000.

Bouliane, Mark H.; and Rohsner, John D. Apparatus for an offset printing press. 4,625,644, Cl. 101-426.000.

Boundy, Francis John: *See—*
Blakeway, Richard S., 4,625,487, Cl. 5-446.000.

Bounini, Larbi, to United States Gypsum Company. Submerged combustion calcination. 4,626,199, Cl. 432-58.000.

Bourns, Inc.: *See—*
Smith, Ronald E., 4,626,823, Cl. 338-199.000.

Boutin, Jean, to Rhone-Poulenc Specialities Chimiques. Free-flowing flakes of hydrophilic/water-soluble polymer gel. 4,626,472, Cl. 428-407.000.

Boutni, Omar M.; and Liu, Ping Y., to General Electric Company. Resinous composition. 4,626,572, Cl. 525-67.000.

Boutni, Omar M.: *See—*
Miller, Kenneth F.; and Boutni, Omar M., 4,626,566, Cl. 524-490.000.

Bouvrette, Michel, to Hydro-Quebec. Telephasing method and system for remotely identifying unknown phases of transmission or distribution lines within an electrical network. 4,626,622, Cl. 379-99.000.

Bouygues: *See—*
Richard, Pierre, 4,625,354, Cl. 14-73.000.

Bowe Reinigungstechnik GmbH: *See—*
Fuhring, Heinrich, 4,626,351, Cl. 210-331.000.

Boyadjieff, George I., to Varco International, Inc. Well pipe stabbing and back-up apparatus. 4,625,796, Cl. 166-77.500.

Boyes, G. Mitchell, to Atlas Hydropiling Ltd. Non-impacting pile driver. 4,626,138, Cl. 405-232.000.

Boylan, Francis J., deceased: *See—*
Kavchok, Ronald W.; and Boylan, Francis J., deceased, 4,626,377, Cl. 252-321.000.

Boylan, Katherine C., executor: *See—*
Kavchok, Ronald W.; and Boylan, Francis J., deceased, 4,626,377, Cl. 252-321.000.

Boyle, Michael C., to Pylon Company, Inc. Spring-stops for a bi-level test fixture. 4,626,779, Cl. 324-158.00F.

Bradburn, Marvin D.: *See—*
Woods, Richard E.; and Bradburn, Marvin D., 4,625,636, Cl. 100-35.000.

Bradbury, David: *See—*
Bradbury, George; and Bradbury, David, 4,625,525, Cl. 62-330.000.

Bradbury, George; and Bradbury, David, to Speciality Equipment Companies, Inc. Taylor Freezer Division, by said David Bradbury. Apparatus and method for producing frosted drinks. 4,625,525, Cl. 62-330.000.

Bradford, Peter F.: *See—*
Bartlett, Peter J.; and Bradford, Peter F., 4,625,701, Cl. 123-514.000.

Bradford, Robert G., to Burroughs Corporation. Apparatus for stabilizing a keyboard switch assembly against cantilever movement. 4,626,639, Cl. 200-340.000.

Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., to Stein Associates, Inc. Frozen block process for vegetable or fruit convenience foods. 4,626,436, Cl. 426-289.000.

Bradshaw, Bruce W., to Jackson Jordan, Inc. Apparatus and method for measuring the wear of railroad rail. 4,625,412, Cl. 33-1.00Q.

Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., to AT&T Bell Laboratories. Multiprocessor computing system featuring shared global control. 4,626,634, Cl. 379-28.000.

Brand, Dieter C. H. Transportable home energy training device and sprocket. 4,625,961, Cl. 272-132.000.

Brandes, Wilhelm: *See—*
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,626,595, Cl. 549-559.000.

Brandmayr, Ronald J., to United States of America, Army. Method of chemically polishing quartz crystal blanks. 4,626,316, Cl. 156-637.000.

Brandstatter, Rolf. Tracking solar collector installation. 4,625,709, Cl. 126-424.000.

Bratcher, John O.: *See—*
McManis, George E., III; Bratcher, John O.; and Dettling, Ronald F., 4,626,611, Cl. 136-212.000.

Brauning, Egon, to Protoned B.V. Work chair. 4,626,029, Cl. 297-367.000.

Brausen, Benjamin: *See—*
Sherlock, Paul; Brausen, Benjamin; and Klein, Phillip P., 4,625,734, Cl. 128-762.000.

Breimer, Hendrik, to U.S. Philips Corporation. Carrier synchronizing system for locking a remotely located carrier generator to a reference carrier generator at a base station. 4,626,914, Cl. 358-148.000.

Brennan, John J.: *See—*
Prewo, Karl M.; and Brennan, John J., 4,626,461, Cl. 428-113.000.

Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, to Gewerkschaft Eisenhutte Westfalia. Cutter-bit assemblies. 4,626,034, Cl. 299-91.000.

Brickley, Ray. Continuously varying planetary mechanical transmission system. 4,625,588, Cl. 74-793.000.

Brickman, Harold. Foldable table having storage capabilities. 4,625,655, Cl. 108-25.000.

Brickman, Harold. Foldable table with storage capability. 4,625,656, Cl. 108-25.000.

Briggs, Willard S., to Thomson Components - Mostek Corporation. Single-chip microcomputer with internal time-multiplexed address-/data/interrupt bus. 4,626,985, Cl. 364-200.000.

Brin, Edward; and Mette, James, to Quali-Tech Machine & Engineering Co., Inc. Clutch for drilling machine. 4,626,142, Cl. 408-81.000.

Brinch, Keith: *See—*
Kothmann, Antonius B.; and Brinch, Keith, 4,626,129, Cl. 405-43.000.

Bristol, James A., to Warner-Lambert Company. (S)-N^6-2-hydroxypropyladenosines. 4,626,526, Cl. 514-46.000.

Bristol-Myers Company: *See—*
Kaplan, Murray A., 4,626,541, Cl. 514-297.000.

British Aerospace PLC: *See—*
Arlott, Raymond D. J., 4,626,996, Cl. 364-424.000.
Russell, James L. L., 4,625,649, Cl. 102-377.000.

British Petroleum Company: *See—*
Slater, Brian G., 4,625,571, Cl. 73-863.840.

British Petroleum Company PLC, The: *See—*
Feast, William J.; and Winter, Jeremy N., 4,626,580, Cl. 526-253.000.

Broadnax, Cecil H., Jr., to Johnson & Johnson Products, Inc. Surgical hemostat comprising oxidized cellulose. 4,626,253, Cl. 604-374.000.

Brock, George W.; Mroz, Edward; Janning, Robert J., Jr.; and Rogers, Robert S., to Verbatim Corporation. Magnetic record disk cleaning and stabilizing assembly. 4,626,949, Cl. 360-133.000.

Brocklehurst, John R.: *See—*
Crossland, William A.; Brocklehurst, John R.; Ayliffe, Peter J.; and Atkinson, Arthur, 4,626,074, Cl. 350-345.000.

Broening, Joerg: *See—*
Blum, Dietrich; and Broening, Joerg, 4,627,002, Cl. 364-519.000.

Broersma, Lester V., to Bell Helmets Inc. Removably attachable shield for helmet visor. 4,625,341, Cl. 2-424.000.

Bronold, Josef, to Siemens Aktiengesellschaft. Circuit arrangement for telecommunications systems, particularly telephone switching systems, having data protection by way of parity bits. 4,627,059, Cl. 371-51.000.

Brooker, Steven D.: *See—*
Bones, Roger J.; Teagle, David A.; Brooker, Steven D.; and Galloway, Roy C., 4,626,483, Cl. 429-50.000.

Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., to Dayco Corporation. Automatic crimper and crimping die..4,625,539, Cl. 72-402.000.

Brotz, Gregory R. Foamed multiple thermocouple. 4,626,612, Cl. 136-224.000.

Brouwer, Henk L.: *See—*
Mensink, Kornelis A.; and Brouwer, Henk L., 4,627,022, Cl. 364-900.000.

Brown, Angus J. D. Connector for tubular bars and attachment members in a space framework. 4,626,123, Cl. 403-141.000.

Brown, Garrett W. Suspension system for supporting and conveying equipment, such as a camera. 4,625,938, Cl. 248-550.000.

Brown, Richard K., to James River Corporation. Fruit and meat pie microwave container and method. 4,626,641, Cl. 219-10.55E.

Browne, Edward M., to ESM International, Inc. Continuous normalizer for an electronic circuit that compensates for external and internal drifts factors. 4,626,677, Cl. 250-214.00A.

Browning, James A. Hybrid non-transferred-arc plasma torch system and method of operating same. 4,626,648, Cl. 219-121.0PY.

Brubaker, Ronald L.; and Calevich, Robert, to Goodyear Tire & Rubber Company, The. Elevated temperature comminution of vulcanized rubber and other elastomers. 4,625,922, Cl. 241-17.000.

Brummet, William N., to Pilot Manufacturing Company. Pipe lathe. 4,625,601, Cl. 82-4.00C.

Brunet, Maurice: *See—*
Habermann, Helmut; Brunet, Maurice; and Tassel, Andre , 4,626,754, Cl. 318-460.000.

Brungger, Walter; and Cerny, Peter A., to Von Roll AG. Auxiliary apparatus for discharging incineration residues of furnaces, particularly refuse incinerators. 4,625,660, Cl. 110-165.00R.

Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, to Ciba-Geigy Corporation. Certain pyridylacetylene compounds, compositions containing same and herbicidal methods of use. 4,626,272, Cl. 71-92.000.

Bryans, David F., to Carrier Corporation. Heating/cooling diffuser. 4,625,629, Cl. 98-40.170.

Buchanan, Beverly J., to Sevenstrand Tackle Corporation. Solar powered fishing lure. 4,625,447, Cl. 43-17.100.

Buchel, Karl H.: *See—*
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,626,595, Cl. 549-559.000.

Bucher, Heinz, to Metronic Electronic GmbH. Whirlpool bath massaging apparatus. 4,625,715, Cl. 128-66.000.

Buchi Laboratoriums-Technik AG: *See—*
Zellweger, Adolf, 4,625,935, Cl. 248-297.100.

Bucska, Nicholas J.; and Hopper, James F., to Amcodyne Incorporated. Method and apparatus for qualifying data. 4,626,933, Cl. 360-51.000.

Budnik, Brian J.: *See—*
Dolikian, Arman V.; Kotzin, Michael D.; and Budnik, Brian J., 4,627,098, Cl. 455-70.000.

Bui, Ngoc C.; Gete, Henry; and Robert-Grandpierre, Jean-Claude, to Asulab SA. Control circuit for a stepping motor. 4,626,760, Cl. 318-696.000.

Bullock, Joseph J., III, to Cap Snap Co., Inc. Cap and neck structure for a wide mouth jar. 4,625,876, Cl. 215-256.000.

Bumgarner, John C., Sr. Coping attachment system. 4,625,343, Cl. 4-506.000.

Bunger, Hilary. Registered multiple stamping. 4,625,640, Cl. 101-327.000.

Burckhardt, Manfred, to Daimler-Benz Aktiengesellschaft. Anti-locking system for a two-wheel road vehicle with hydraulic dual circuit braking installation. 4,626,042, Cl. 303-106.000.

Burgers, Henri T.: *See—*
Powers, G ady M.; Burgers, Henri T.; and Stowers, Jeffery P., 4,626,780, Cl. 324-158.00F.

Burgess, David L.; and Trapp, Orlin D. Fixture for use in non-encapsulated cross-sectioning of a composite structure. 4,625,460, Cl. 51-125.000.

Burghardt, Franz, to Kuster & Co. GmbH. Pitched cables sheathed with a plastic film and method of sheathing. 4,625,504, Cl. 57-223.000.

Buriks, Rudolf S.; and Dolan, James G., to Petrolite Corporation. Demulsifier composition and method of use thereof. 4,626,379, Cl. 252-340.000.

Burke, Joseph J.; and Spector, George. Floating lid for paint cans. 4,625,883, Cl. 220-93.000.

Burleson, Wayne P.; Wagner, Lawrence F.; and Van Dyke, Korbin S., to VLSI Technology, Inc. Logarithmic conversion apparatus. 4,626,825, Cl. 340-347.0DD.

Burnett, George H.: *See—*
Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., 4,625,737, Cl. 131-355.000.

Burnett, Ralph G.; and Mikic, Frank. Shipping container seals. 4,626,009, Cl. 292-327.000.

Burnham, Craig C. Vortex connector. 4,625,780, Cl. 141-319.000.

Burroughs Corporation: *See—*
Bradford, Robert G., 4,626,639, Cl. 200-340.000.
Fuchs, Otto, 4,625,393, Cl. 29-603.000.

Burroughs Wellcome Co.: *See—*
Batchelor, John F.; Hyde, Richard M.; and Livingstone, David J., 4,626,431, Cl. 424-101.000.
Hyde, Richard M.; and Livingstone, David J., 4,626,432, Cl. 424-101.000.

Burt, Raymond R. Bicycle pedal mechanism. 4,625,580, Cl. 74-594.400.

Burton, James A.; and Hoop, Bernard, Jr., to Massachusetts General Hospital. Method and apparatus for ligand detection. 4,626,513, Cl. 436-518.000.

Burzin, Klaus: *See—*
Bartmann, Martin; and Burzin, Klaus, 4,626,585, Cl. 528-212.000.

Busick, Michael F. Geodesic dome prefabricated panels. 4,625,472, Cl. 52-81.000.

Buta, John, to Buta, John R. Automatic knife alignment for shear. 4,625,605, Cl. 83-368.000.

Buta, John R.: *See—*
Buta, John, 4,625,605, Cl. 83-368.000.

Butcher, James A.; and Padgett, Harold A., to General Electric Company. Sump pump motor switch circuit. 4,626,755, Cl. 318-473.000.

Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., to Imperial Chemical Industries PLC. Laser-imageable assembly with heterogeneous resin layer and process for production thereof. 4,626,493, Cl. 430-201.000.

Buxmann, Kurt; and Bolliger, Martin, to Swiss Aluminium Ltd. Apparatus and method for the continuous casting of metal. 4,625,788, Cl. 164-481.000.

Buys, Bruno: *See—*
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.

Byers, Andrew: *See—*
Bennett, Michael C.; Coote, Nicholas; and Byers, Andrew, 4,626,359, Cl. 210-793.000.

Cab-Tek, Inc.: *See—*
Goodlander, Theodore J., 4,626,048, Cl. 312-208.000.

Cadars, Patrick, to Valeo - Societe Anonyme Francais. Header for a heat exchanger. 4,625,793, Cl. 165-151.000.

Caldwell, Robert S., to United States of America, Air Force. Photoactive coating for hardening optical fibers. 4,626,068, Cl. 350-96.340.

Calevich, Robert: *See—*
Brubaker, Ronald L.; and Calevich, Robert, 4,625,922, Cl. 241-17.000.

California Institute of Technology: *See—*
Rowlette, John J., 4,625,395, Cl. 29-623.400.

Calvin, John H.; and Wakasa, Jack Y. Automatic fluid sealing mechanism for a conduit with a frangible connector. 4,625,746, Cl. 137-68.100.

Cameron, Frank L., to Westinghouse Electric Corp. Current limiting fuse with less inverse time-current characteristic. 4,626,817, Cl. 337-162.000.

Campbell, Peter; Tsals, Izrail; and Matsuura, David, to Ivac Corporation. Apparatus and method for controlling the parenteral administration of fluids. 4,626,241, Cl. 604-49.000.

Campian, Jon R. Waterbed frame. 4,625,351, Cl. 5-450.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
Staal, Philip R.; Hughes, Richard C.; and Olsen, John H., 4,627,076, Cl. 375-36.000.

Canada, Her Majesty the Queen in Right of, represented by Minister of National Defence: *See—*
Harrison, Brian; and Davis, Ronald E., 4,626,122, Cl. 403-51.000.

Canadian Patents and Development Limited: *See—*
Dobrowolski, Jerzy A.; and Waldorf, Allan J., 4,626,445, Cl. 427-7.000.

Cancio, Leopoldo V.; Fitzsimmons, James N.; Mortellite, Robert M.; and Wu, Pai-Chuan, to Clopay Corporation. Linear low density polyethylene film and method of making. 4,626,574, Cl. 525-240.000.

Cannalire, Giacomo: *See—*
Premoli, Giacomo; and Cannalire, Giacomo, 4,626,629, Cl. 379-386.000.

Canon Inc.: *See—*
Ohta, Tokuya; Kobayashi, Masatsune; Miura, Konoe; and Takimoto, Hiroshi, 4,626,284, Cl. 106-22.000.

Canon Kabushiki Kaisha: *See—*
Chito, Yasuo, 4,626,702, Cl. 307-228.000.

Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, 4,626,875, Cl. 346-140.00R.
Hirai, Yutaka; Echizen, Hiroshi; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,626,449, Cl. 427-53.100.
Hyosu, Yoshihiko, 4,626,489, Cl. 430-137.000.
Inoue, Sukejiro, 4,626,488, Cl. 430-109.000.
Konno, Tatsuo, 4,626,092, Cl. 354-212.000.
Kosugi, Masao, 4,627,010, Cl. 364-559.000.
Kuwayama, Tetsuro; and Matsumoto, Kazuya, 4,626,679, Cl. 250-227.000.
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,626,487, Cl. 430-109.000.
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; and Taniguchi, Tadasu, 4,626,082, Cl. 350-573.000.
Ogura, Makoto, 4,626,303, Cl. 156-145.000.
Ohtsuka, Yasumasa; Asai, Jun; Murasawa, Yoshihiro; Sasame, Hiroshi; and Ohkubo, Masaharu, 4,626,096, Cl. 355-14.00D.
Oshima, Sigeru; and Tsuji, Sadahiko, 4,626,076, Cl. 350-427.000.
Saito, Syuichiro, 4,626,094, Cl. 354-456.000.
Sakata, Tsuguhide, 4,626,797, Cl. 331-1.00A.
Tanioka, Hiroshi, 4,626,901, Cl. 358-75.000.
Uehara, Tsukasa, 4,627,043, Cl. 369-215.000.
Yamamoto, Hiroshi, 4,626,077, Cl. 350-429.000.
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.
Yoshida, Tadashi, 4,626,923, Cl. 353-283.000.

Cap Snap Co., Inc.: *See—*
Bullock, Joseph J., III, 4,625,876, Cl. 215-256.000.

Capps, David B., to Warner-Lambert Company. Substituted 1-amino-4-nitro-acridinones and methods of treating bacterial infections and leukemia with them. 4,626,540, Cl. 514-297.000.

Caprioli, Lino: *See—*
Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, 4,626,340, Cl. 208-89.000.

Capshew, Charles E.: *See—*
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,626,519, Cl. 502-105.000.

Capwell, Robert J.; and Rickert, Robert G., to International Business Machines Corporation. Electroless plating bath monitor. 4,626,446, Cl. 427-8.000.

Car-Go, Corp.: *See—*
Woods, Richard E.; and Bradburn, Marvin D., 4,625,636, Cl. 100-35.000.

Cardis, Angeline B., to Mobil Oil Corporation. Benzotriazole derivatives and organic compositions containing same. 4,626,368, Cl. 252-49.900.

Carl Freundenberg, Firma: *See—*
Kober, Horst; and Trogisch, Gunter, 4,626,462, Cl. 428-137.000.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See—*
Gregg, Hans, 4,625,853, Cl. 198-345.000.

Carlin, Hervin A., Jr., to Poly Processing Company, Inc.; and Industrial Equipment & Engineering, Inc. Polyolefin tank within a metallic tank. 4,625,892, Cl. 220-465.000.

Carlson, Charles W. Archery bow sight mounted on the bow string and method of making same. 4,625,422, Cl. 33-265.000.

Carlson, Franklin J. Pressurized tank having resilient support. 4,625,881, Cl. 220-69.000.

Carnes, Mark T.; and Smith, Lawrence E., to RCA Corporation. Regulated power supply for video display apparatus. 4,626,977, Cl. 363-21.000.

Carnielli, Teodoro. Device for detecting the developed power in home pedalling apparatus for bicycles. 4,625,551, Cl. 73-379.000.

Carr, Joseph J.; and Angelini, Thomas J. Tamper-evident closure. 4,625,875, Cl. 215-232.000.

Carrier Corporation: *See—*
Bryans, David F., 4,625,629, Cl. 98-40.170.

Carroll, George F.: *See—*
DeLacy, Thomas J.; Bingham, John R.; and Carroll, George F., 4,625,872, Cl. 209-557.000.

Carroll, James P.: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Carroll, Michael W.; and Harwood, Michael E., to North American Agricultural, Inc. Roof vent and method of making same. 4,625,630, Cl. 98-42.220.

Carson, James E.: *See—*
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,626,366, Cl. 252-32.70E.

Carter, Donald R., Sr.; Krauss, Timothy A.; and Sedlak, Matthew, to United Technologies Corporation. Rotor blade construction for circulation control aircraft. 4,626,171, Cl. 416-90.00A.

Carter, Neil A.; and Winfield, Armand G., to Carter, Neil A. Insulated window shade assembly. 4,625,786, Cl. 160-84.00R.

Carter, Roy E.; and Baker, Francis S. Pressure transducer. 4,625,559, Cl. 73-706.000.

Caruthers, Roy E., to Daniel Woodhead, Inc. Ground continuity monitor for tool stop controllers. 4,626,834, Cl. 340-649.000.

Casey, William R.; Loser, Robert P.; Smith, Michael W.; and Waibel, Terry J., to Goodyear Tire & Rubber Company, The. Tire building apparatus and method. 4,626,302, Cl. 156-133.000.

Cast, Adolf, to Karl M. Reich Maschinenfabrik GmbH. Screw driving apparatus. 4,625,597, Cl. 81-57.370.

Castaneda, Miguel P.: *See—*
Tamez, Carlos; and Castaneda, Miguel P., 4,625,353, Cl. 7-100.000.

Catapano, Michael C.: *See—*
O'Donnell, John W.; Catapano, Michael C.; and Noe, Renato R., 4,625,765, Cl. 138-89.000.

Caterpillar Inc.: *See—*
Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., 4,626,307, Cl. 156-218.000.

Cathers, William P.: *See—*
Reese, Thomas J.; Rayburn, David B.; and Cathers, William P., 4,626,267, Cl. 65-106.000.

Cazes, Roland; and Sayegh, Georges, to Sciaky, S.A.; and Sciaky, Mario. Method of and installation for spot-welding by laser beam. 4,626,653, Cl. 219-121.0LC.

Celanese Corporation: *See—*
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,626,371, Cl. 252-62.540.
Stackman, Robert W.; and Rasoul, Husam A. A., 4,626,584, Cl. 528-192.000.

Ceniza, Rogelio R., to United States of America, Navy. Device for separation and launch of a body with linear and rotational velocity. 4,625,619, Cl. 89-1.570.

Center Core, Inc.: *See—*
Martin, Michael G., 4,625,633, Cl. 98-115.300.

Central Oklahoma Ambulance Trust: *See—*
Gauthier, Jeffry W., 4,626,011, Cl. 293-120.000.

Centralab, Inc.: *See—*
Hilgers, John L., 4,626,818, Cl. 337-166.000.

Centre de Recherches Metallurques-Centrum Voor Research in de Metallurgie: *See—*
Economopoulos, Marios; and Simon, Pierre, 4,625,532, Cl. 72-201.000.

Centre National de la Recherche Scientifique: *See—*
Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,627,088, Cl. 378-122.000.

Centre National de la Recherche Scientifique (CNRS): *See—*
Bertrand, Claude, 4,626,191, Cl. 431-12.000.

Cerny, Peter A.: *See—*
Brungger, Walter; and Cerny, Peter A., 4,625,660, Cl. 110-165.00R.

Ceskoslovenska Akademi Ved: *See—*
Wichterle, Otto, 4,626,388, Cl. 264-2.100.

Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , to Spie-Batignolles; and Coflexip. Process for manufacturing profiled strips in fiber-loaded thermoplastic resin, installation for the implementation thereof and profiled strips obtained. 4,626,306, Cl. 156-180.000.

Chaix, Jean C.: *See—*
Chaix, Jean E.; Chaix, Jean C.; and Chaix, Jean L., 4,625,789, Cl. 165-11.100.

Chaix, Jean E.; Chaix, Jean C.; and Chaix, Jean L., to Commissariat a l'Energie Atomique. Double barrier heat exchanger. 4,625,789, Cl. 165-11.100.

Chaix, Jean L.: *See—*
Chaix, Jean E.; Chaix, Jean C.; and Chaix, Jean L., 4,625,789, Cl. 165-11.100.

Chalfant, Robert D.: *See—*
Gradinger, J. Gary; Quearry, Robert W.; Chalfant, Robert D.; and Wilson, Charles G., 4,626,035, Cl. 300-16.000.

Chamberlain, John C.: *See—*
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., 4,625,638, Cl. 101-93.040.

Chambers, David H. Adjustable arm sling. 4,625,719, Cl. 128-94.000.

Champion International Corporation: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Champlin, Keith S.; Preimesberger, Ernest C.; and Miller, George W., to FMC Corporation. Asynchronous data bus system. 4,627,070, Cl. 375-3.000.

Chandler, Gary C.: *See—*
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., 4,625,638, Cl. 101-93.040.

Chang, Chin-Der, to Timestrong Enterprise Co., Ltd. Robot with improved transmission system. 4,626,164, Cl. 414-735.000.

Chang, Wei T., to Beecham Home Improvement Products Inc. Water-resistant clear and colored acrylic latex sealant. 4,626,567, Cl. 524-493.000.

Chao, Hung-Ya, to Moore Business Forms, Inc. Microencapsulation by in-situ polymerization of multifunctional epoxy resins. 4,626,471, Cl. 428-402.210.

Chapin, Richard D. Drip irrigation system. 4,626,130, Cl. 405-44.000.

Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, to Institut National de la Sante et de la Recherche Medicale (Inserm). Cupola-type ophthalmological apparatus the visual field and the electrophysiological examination of the human eye. 4,626,090, Cl. 351-226.000.

Charmes, Michel; and Trambouze, Yves, to Ateliers Deconstruction Industrielles du Rhone (A.C.I.R.). Electric infra-red ray generator constituting atmosphere purifier. 4,626,659, Cl. 219-343.000.

Charter, Ian G., to Dresser Industries, Inc. Hydrostatic head pressure sensors for a system to determine fluid level and weight. 4,625,548, Cl. 73-299.000.

Charter, Ian G., to Dresser Industries, Inc. System to determine the level and weight of liquid in a tank or the like. 4,625,553, Cl. 73-438.000.

Chastan, Jean-Paul: *See—*
Lafrasse, Jean; and Chastan, Jean-Paul, 4,625,531, Cl. 72-150.000.

Chaumette, Jacques: *See—*
Aubry, Claude; Chaumette, Jacques; Letemps, Bernard; Petitcollin, Jean-Marc; Gatzweiler, Werner; Rissmann, Heinz-Bernd; Vanaschen, Luc; and Zeitzen, Jurgen, 4,626,207, Cl. 432-253.000.

Chemische Werke Huls AG: *See—*
Bartmann, Martin; and Burzin, Klaus, 4,626,585, Cl. 528-212.000.

Chemla, Daniel S., to AT&T Bell Laboratories. Light beam applied to a layered semiconductor structure is controlled by another light beam. 4,626,075, Cl. 350-354.000.

Chen, Timothy S.: *See—*
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,626,593, Cl. 546-339.000.

Cheng, Eric K., to Reyloc Limited. Apparatus and method for supporting cupboards and the like. 4,625,471, Cl. 52-36.000.

Cheng, Yuk-Bun: *See—*
Knop, Charles M.; Ostertag, Edward L.; and Cheng, Yuk-Bun, 4,626,863, Cl. 343-781.00P.

Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., to Caterpillar Inc. Machine and method for assembling pleated filter material and a hollow core member. 4,626,307, Cl. 156-218.000.

Chernin, Semen M.; and Barskaya, Evgenia G., to Institut Khimicheskoi Fiziki. Multiple pass optical matrix system. 4,626,078, Cl. 350-504.000.

Cheron, Jacques; and Rojey, Alexandre, to Institut Francais du Petrole. Process for producing cold and/or heat by using a non-azeotropic mixture of fluids in a cycle with ejector. 4,625,522, Cl. 62-114.000.

Cheung, Seung-Tong: *See—*
Sato, Kyosaku; Liu, Richard W.; and Cheung, Seung-Tong, 4,626,568, Cl. 524-526.000.

Chevron Research Company: *See—*
Luo, Tatao, 4,626,276, Cl. 71-103.000.
Silcox, William H., 4,625,806, Cl. 166-358.000.
Zones, Stacey I., 4,626,421, Cl. 423-326.000.

Chey, David: *See—*
Chey, Young H., 4,626,850, Cl. 340-903.000.

Chey, Young H., to Chey, David, a part interest. Vehicle detection and collision avoidance apparatus. 4,626,850, Cl. 340-903.000.

Chianelli, Russell R.; Ho, Teh C.; Jacobson, Allan J.; and Young, Archie R., to Exxon Research and Engineering Company. Supported chromium-molybdenum and tungsten sulfide catalysts. 4,626,339, Cl. 208-18.000.

Chiang, John S. C., to FMC Corporation. Electrolytic process for manufacturing pure potassium peroxydiphosphate. 4,626,326, Cl. 204-82.000.

Chiang, John S. C.: *See—*
McCarthy, Michael J.; and Chiang, John S. C., 4,626,327, Cl. 204-82.000.

Chikamori, Sunao: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.

Childs, Charles F.; and Childs, Linda M. O. Political game. 4,625,970, Cl. 273-257.000.

Childs, Linda M. O.: *See—*
Childs, Charles F.; and Childs, Linda M. O., 4,625,970, Cl. 273-257.000.

Chisaki Co., Ltd.: *See—*
Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, 4,626,202, Cl. 432-107.000.

Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, to Chisaki Co., Ltd.; Kunneppu Sekkai Kogyo Incorporated; and Kunii, Daizo. Rotary kiln. 4,626,202, Cl. 432-107.000.

Chito, Yasuo, to Canon Kabushiki Kaisha. Saw-tooth wave generating circuit. 4,626,702, Cl. 307-228.000.

Chlorine Engineers Corp., Ltd.: *See—*
Goto, Nobutaka; and Ezawa, Nobuyasu, 4,626,331, Cl. 204-222.000.

Cho, Frederick Y.; Adamo, Michael D.; and Leeson, David E., to United States of America, Air Force. Radio frequency probing apparatus for surface acoustic wave devices. 4,626,775, Cl. 324-73.00R.

Chow, Peter N.: *See—*
Osborne, Colin; and Chow, Peter N., 4,626,168, Cl. 415-211.000.

Christen, Hans D., to Rain Bird Sprinkler Mfg. Corp. Sprinkler having two-piece drive arm bridge. 4,625,913, Cl. 239-1.000.

Christian, Damon N., to Kidde, Inc. Crawler frame to base frame connection. 4,625,820, Cl. 180-9.100.

Chrysler Motors: *See—*
Lyzohub, Walter A., 4,625,980, Cl. 280-5.00A.

Chubb, Walston, to Westinghouse Electric Corp. Annular burnable absorber rod. 4,626,404, Cl. 376-447.000.

Chugunov, Jury V.: *See—*
Gorbachev, Oleg S.; Ioffe, Anatoly F.; Kulagin, Mikhail V.; Ruvinsky, Boris I.; Khorin, Vladimir S.; and Chugunov, Jury V., 4,626,935, Cl. 360-67.000.

Chyung, Kenneth; Gadkaree, Kishor P.; and Taylor, Mark P., to Corning Glass Works. Reinforced alkaline earth aluminosilicate glasses. 4,626,515, Cl. 501-32.000.

Ciba-Geigy AG: *See—*
Roth, Martin; Muller, Beat; Berger, Joseph; and Loew, Peter, 4,626,497, Cl. 430-293.000.

Ciba-Geigy Corporation: *See—*
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,626,272, Cl. 71-92.000.
Dave, Krishna G.; and George, Thomas, 4,626,537, Cl. 514-237.000.
Rempfler, Hermann, 4,626,275, Cl. 71-94.000.

Cincinnati Milacron Inc.: *See—*
Bannister, Robert D., 4,626,999, Cl. 364-474.000.

CISE-Centro Informazioni Studi Esperienze S.p.A.: *See—*
Parmeggiani, Aldo, 4,626,644, Cl. 219-61.000.

Citizen Watch Co., Ltd.: *See—*
Nishikawa, Junichi; and Shoji, Yutaka, 4,626,107, Cl. 368-276.000.
Togashi, Seigo, 4,626,841, Cl. 340-805.000.

Clairol Incorporated: *See—*
Skovdal, Jorgen; and Goeller, Loretta D., 4,625,738, Cl. 132-9.000.

Clappier, Robert R.; and Smith, Steven J., to Metcal, Inc. Constant current r.f. generator. 4,626,767, Cl. 323-280.000.

Clarion Co., Ltd.: *See—*
Takai, Kazuki; Ikahata, Toshihiro; and Watanabe, Wataru, 4,626,939, Cl. 360-96.500.

Clark, Charles W., Jr.; and West, Harold H., to Ederer Incorporated. Hoist having worm safety device. 4,625,946, Cl. 254-274.000.

Clark, James M.: *See—*
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,626,333, Cl. 204-286.000.

Clark, James P.: *See—*
Virnig, Michael J.; Clark, James P.; and DiDomenico, Edward D., 4,626,582, Cl. 526-298.000.

Clarke, Clifford R. Mastication-enhancing protrusion. 4,626,215, Cl. 433-198.000.

Clayton, Gene. Support assembly for golfing accessories. 4,625,862, Cl. 206-315.300.

Clerc, Jean F.; and Sarrasin, Denis, to Commissariat a l'Energie Atomique. Matrix display and method of capacitance compensation via charge distribution. 4,626,072, Cl. 350-333.000.

Cleveland Clinic Foundation, The: *See—*
Street, Glenn M., 4,625,962, Cl. 272-132.000.

Clopay Corporation: *See—*
Cancio, Leopoldo V.; Fitzsimmons, James N.; Mortellite, Robert M.; and Wu, Pai-Chuan, 4,626,574, Cl. 525-240.000.

Clorox Company, The: *See—*
Kaufmann, Edward J.; and Sudbury, Barry A., 4,626,372, Cl. 252-90.000.

Clouston, Ross G.: *See—*
Faller, Frank R.; Clouston, Ross G.; and Bergholz, Larry, 4,625,673, Cl. 114-230.000.

Coachmen Industries, Inc.: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,625,347, Cl. 5-43.000.

Coatings for Industry, Inc.: *See—*
Klotz, Brian L.; and Klotz, James M., 4,626,453, Cl. 427-397.700.

Cobb, Charles C.: *See—*
McCormick, William H.; and Cobb, Charles C., 4,625,799, Cl. 166-223.000.

Cobe Laboratories, Inc.: *See—*
Dykstra, Raymond C., 4,625,757, Cl. 137-504.000.

Cockburn, James; and Suddards, Arthur D., to BICC Public Limited Company. Overhead trolley wire insulated support post. 4,625,839, Cl. 191-40.000.

Cockman, Haggie I. Sprinkler head apparatus. 4,625,915, Cl. 239-390.000.

Coflexip: *See—*
Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , 4,626,306, Cl. 156-180.000.

Cohen, Jeffrey M.: *See—*
Mann, Harris; and Cohen, Jeffrey M., 4,626,212, Cl. 433-144.000.

Cohen, Robert E.: *See—*
Loh, Ih-Houng; Cohen, Robert E.; and Baddour, Raymond F., 4,626,473, Cl. 428-409.000.

Cohen, Samuel A.; Hosea, Joel C.; and Timberlake, John R., to United States of America, Energy. Limiter. 4,626,399, Cl. 376-136.000.

Cohen, Sidney M., to Fuller Company. Method and apparatus for producing dead burnt materials. 4,626,198, Cl. 432-13.000.

Cohen, Sidney M., to Fuller Company. Shaft kilns having fluid-bed air heater. 4,626,200, Cl. 432-101.000.

Coil Acceptors, Inc.: *See—*
Hoormann, Ronald A., 4,625,852, Cl. 194-317.000.

Coker, Daniel E.: *See—*
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,626,366, Cl. 252-32.70E.

Colak, Sel, to North American Philips Corporation. Lateral double-diffused MOS transistor devices suitable for source-follower applications. 4,626,879, Cl. 357-23.400.

Colas, Christian, to MAJ. Device for packing and in vacuo preserving, in a plastic wrapping, products sterilized in an autoclave. 4,625,492, Cl. 53-373.000.

Cole, Michael, to Genevac Limited. Pump employing the suction effect of a rotating liquid ring. 4,626,176, Cl. 417-54.000.

Colgate-Palmolive Company: *See—*
Bauman, Robert A.; and Ramachandran, Pallassana N., 4,626,364, Cl. 252-8.800.
Robbins, Clarence R.; and Steltenkamp, Robert J., 4,626,429, Cl. 424-70.000.

College, John W.; and Vlnaty, Joseph, to Dravo Corporation. Removal of SO_2 from SO_2-containing gases. 4,626,418, Cl. 423-243.000.
Collins, Earl R., Jr., to United States of America, National Aeronautics and Space Administration. Tank tread assemblies with track-linking mechanism. 4,626,046, Cl. 305-36.000.
Commissariat a l'Energie Atomique: *See—*
Chaix, Jean E.; Chaix, Jean C.; and Chaix, Jean L., 4,625,789, Cl. 165-11.100.
Clerc, Jean F.; and Sarrasin, Denis, 4,626,072, Cl. 350-333.000.
Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,627,088, Cl. 378-122.000.
Dupeyrat, Benoit; Mardon, Nathalie; and Noel, Jean-Paul, 4,626,649, Cl. 219-121.0LU.
Commonwealth of Australia, The: *See—*
Nott, Henry A., 4,627,102, Cl. 455-221.000.
Compagnie d'Electronique et de Piezo-Electricite C.E.P.E.: *See—*
Debaisieux, Andre ; and Aubry, Jean P., 4,626,732, Cl. 310-348.000.
Compagnie Francaise des Petroles: *See—*
Despax, Damien M.; Martin, Jean-Pierre H.; and Gueuret, Francois, 4,625,795, Cl. 166-66.000.
Compagnie Generale des Etablissements Michelin: *See—*
Merle, Michel, 4,625,785, Cl. 152-452.000.
Computer Basic Technology Research Association: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.
Conlay, Lydia: *See—*
Wurtman, Richard J.; Conlay, Lydia; and Blusztajn, Krzysztof, 4,626,527, Cl. 514-78.000.
Connolly, Peter F.: *See—*
Hamlen, Robert P.; and Connolly, Peter F., 4,626,482, Cl. 429-27.000.
Conoco Inc.: *See—*
Alworth, Charles W.; Davis, Ward B.; and Thomas, John C., deceased, 4,626,320, Cl. 201-2.000.
Consan Pacific Incorporated: *See—*
Saurenman, Donald G., 4,626,917, Cl. 361-216.000.
Consiglio Nazionale Delle Ricerche: *See—*
Grattoni, Paolo; and Barbato, Giulio, 4,627,096, Cl. 382-8.000.
Consolidated Controls Corporation: *See—*
Reinicke, Robert H., 4,626,244, Cl. 604-141.000.
Container Products Corp.: *See—*
Lilly, Gerald C., 4,625,891, Cl. 220-327.000.
Continental Plastic Containers: *See—*
Hellmer, Ernest W., 4,626,190, Cl. 425-539.000.
Control Data Corporation: *See—*
Lurie, Oscar M., 4,626,904, Cl. 358-84.000.
Cool, John K.; Newbert, Edmund G., Jr.; and Glorioso, Charles A., to Image Resource Corporation. Color image recording system and method for computer-generated displays. 4,627,004, Cl. 364-521.000.
Cooper Industries, Inc.: *See—*
Kristofek, Paul, 4,626,969, Cl. 362-147.000.
Miletich, Don, 4,626,975, Cl. 362-418.000.
Stack, Paul D., Jr., 4,625,774, Cl. 140-123.000.
Watson, David B., 4,626,067, Cl. 350-96.200.
Cooper, James A., to United States of America, Energy. Electronic logic to enhance switch reliability in detecting openings and closures of redundant switches. 4,626,708, Cl. 307-441.000.
Cooper, Ronald J.; Marsico, Mario A.; and Pescatore, John C., to International Business Machines Corporation. Multiprocessor array error detection and recovery apparatus. 4,627,054, Cl. 371-11.000.
Coote, Nicholas: *See—*
Bennett, Michael C.; Coote, Nicholas; and Byers, Andrew, 4,626,359, Cl. 210-793.000.
Copa, William M.: *See—*
Hoffman, Clarence A.; Copa, William M.; and Mayer, Michael R., 4,626,354, Cl. 210-603.000.
Copeland, William O., to Kentron International, Inc. Antenna system. 4,626,858, Cl. 342-374.000.
Corbalis, Charles M.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.
Cordis Corporation: *See—*
Weinstein, Lawrence A., 4,626,245, Cl. 604-167.000.
Cornell Research Foundation, Inc.: *See—*
Liboff, Richard L.; and Liu, Kung C., 4,626,792, Cl. 330-4.300.
Steinkraus, Keith H., 4,626,508, Cl. 435-242.000.
Corning Glass Works: *See—*
Chyung, Kenneth; Gadkaree, Kishor P.; and Taylor, Mark P., 4,626,515, Cl. 501-32.000.
Coston, Cindy. Dental shield. 4,626,211, Cl. 433-137.000.
Cottingham, D. Robert: *See—*
Cupp, Earl B.; and Cottingham, D. Robert, 4,626,335, Cl. 204-293.000.
Cottrell, Peter E.; Craig, William J.; and Troutman, Ronald R., to International Business Machines Corporation. Twin diode overvoltage protection structure. 4,626,882, Cl. 357-23.130.
Coue, Maurice E. L., to Huret et ses Fils. Device for mounting and fixing a brake on a cycle. 4,625,835, Cl. 188-24.110.
Coulmance, Jean-Pierre, to U.S. Philips Corporation. Interface for a telephone set. 4,626,626, Cl. 379-394.000.
Coumont, Martin. Apparatus and method for extracting horizontal underground pipe. 4,626,134, Cl. 405-184.000.
Covington, Jack B. Gunnel flotation pipe and method of installation. 4,625,674, Cl. 114-360.000.
Covitz, William M. Interosseous wiring system. 4,625,717, Cl. 128-92.000.
Cox, Raleigh L.: *See—*
Beard, Harold J.; and Cox, Raleigh L., 4,626,353, Cl. 210-519.000.
Craig, David W., to Krasberg, Alan R. Gas reclaim back pressure regulator. 4,625,759, Cl. 137-613.000.
Craig, William J.: *See—*
Cottrell, Peter E.; Craig, William J.; and Troutman, Ronald R., 4,626,882, Cl. 357-23.130.
Cramer GmbH & Co. KG: *See—*
Kruper, Burkhard, 4,625,634, Cl. 99-427.000.
Crandell, Stephen L., to PPG Industries, Inc. Replacement panel and method of installing same in a curtainwall. 4,625,481, Cl. 52-235.000.
Crawford, Carl R.; and Reuveni, Asher, to Elscint Incorporated. System for reprojecting images acquired by backprojection. 4,626,991, Cl. 364-414.000.
Croiset, Pierre: *See—*
Luciano, Gerard; Poveda, Pierre; and Croiset, Pierre, 4,625,933, Cl. 242-99.000.
Cromie, Mark V.: *See—*
Hudnutt, H. Dean; Eady, Edsell M.; and Cromie, Mark V., 4,625,405, Cl. 30-370.000.
Cross, Douglas A.: *See—*
Van Gilluwe, Frank L.; Dunham, Samuel B.; and Cross, Douglas A., 4,626,627, Cl. 379-214.000.
Crossland, William A.; Brocklehurst, John R.; Ayliffe, Peter J.; and Atkinson, Arthur, to International Standard Electric Corporation. Illuminated liquid/crystal display device using internal reflection and scattering. 4,626,074, Cl. 350-345.000.
Crown International, Inc.: *See—*
Bartlett, Bruce, 4,625,827, Cl. 181-158.000.
Cupp, Earl B.; and Cottingham, D. Robert, to Eagle-Picher Industries, Inc. Lithium alloy anode for thermal cells. 4,626,335, Cl. 204-293.000.
Curtis, Donald E.; Vincent, James P.; and Weidmann, Mary E., to International Business Machines Corp. Method of scheduling meetings. 4,626,836, Cl. 340-706.000.
Curtis Instruments, Inc.: *See—*
Post, Stephen F., 4,626,750, Cl. 318-139.000.
Curtis, Linden T.; Franklin, William G.; and Olds, John R., to Engineered Equipment Company. Shroud for a digging bucket lip. 4,625,437, Cl. 37-141.00R.
Cusack, Robert F., to GTE Valeron Corporation. Probe with stylus pressure adjustment. 4,625,417, Cl. 33-169.00R.
Cusson, Ronald Y.: *See—*
Meldner, Heiner W.; Cusson, Ronald Y.; and Johnson, Ray M., 4,626,791, Cl. 329-109.000.
Cvijanovich, George B., to AMP Incorporated. Method of gold coating an article. 4,625,401, Cl. 29-885.000.
Cwirzen, Casimir Z., to Northern Telecom Limited. Three electrode gas tube protector. 4,626,955, Cl. 361-119.000.
Cybermation, Inc.: *See—*
Woodman, Edward C., 4,626,650, Cl. 219-121.0PX.
D. Swarovski & Co.: *See—*
Swarovski, Daniel; and Schwab, Kurt, 4,626,080, Cl. 350-569.000.
Dai, Eugene P.: *See—*
Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., 4,626,419, Cl. 423-244.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,626,256, Cl. 8-471.000.
Daido Metal Company Ltd.: *See—*
Mori, Sanae, 4,626,365, Cl. 252-12.000.
Daikin Industries: *See—*
Uchida, Tatsuro; Matsumoto, Hisayuki; and Arita, Teiji, 4,625,761, Cl. 137-614.030.
Dailey, Mark: *See—*
Suchdev, Jagan N.; and Dailey, Mark, 4,626,126, Cl. 403-353.000.
Daimler-Benz Aktiengesellschaft: *See—*
Burckhardt, Manfred, 4,626,042, Cl. 303-106.000.
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.
Forkel, Werner, 4,626,781, Cl. 324-174.000.
Dainippon Ink & Chemicals, Inc.: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.
Dainippon Screen Manufacturing Co., Ltd.: *See—*
Yamada, Mitsuhiko, 4,626,902, Cl. 358-75.000.
Daisenberger, Georg, to Siemens Aktiengesellschaft. Telecommunications system, particularly a telephone exchange system, having overload protected sequential logic systems. 4,626,624, Cl. 379-137.000.
Daisenberger, Georg, to Siemens Aktiengesellschaft. Telecommunications system, particularly a telephone exchange system, having overload protected sequential logic systems. 4,626,625, Cl. 379-137.000.
d'Alessio, Roberto: *See—*
Faustini, Franco; d'Alessio, Roberto; Panzeri, Achille; and di Salle, Enrico, 4,626,597, Cl. 560-53.000.
Dall'Aglio, Carlo: *See—*
Possati, Mario; and Dall'Aglio, Carlo, 4,625,413, Cl. 33-143.00L.
Dallaire, Jean-Guy, to Minister of National Defence of her Majesty's Canadian Government. Training moving target system. 4,625,973, Cl. 273-366.000.
Dalmau Guell, Jose M., to Jumberca, S.A. Yarn feed device for a circular knitting machine. 4,625,528, Cl. 66-132.00T.

Damiano, Michael A.; Gass, Dale L.; Kramer, Dennis M.; and Schmerda, Richard F., to Eaton Corporation. Solid state power controller with overload protection. 4,626,954, Cl. 361-96.000.
Dammann, Hans; and Killat, Ulrich, to U.S. Philips Corporation. Optical power divider. 4,626,069, Cl. 350-162.200.
Danfoss A/S: *See—*
Eskildsen, Christian, 4,625,749, Cl. 137-115.000.
Dang, Hiep D.; Hicks, Roy L.; and Leathers, Joel F. M., to Dow Chemical Company, The. Tentering frame for sheet-like members. 4,625,440, Cl. 38-102.500.
Daniel Woodhead, Inc.: *See—*
Caruthers, Roy E., 4,626,834, Cl. 340-649.000.
Daniell, Wynton M. Espalier system and vine management programme suitable for kiwi fruit. 4,625,454, Cl. 47-44.000.
Danielli, Franco, to Finike Italiana Marposs S.p.A. Apparatus for checking the roundness of rotating parts. 4,625,429, Cl. 33-504.000.
Dantlgraber, Jorg, to Mannesmann Rexroth GmbH. Rotary hydrostatic machine with heated center housing port. 4,626,181, Cl. 418-83.000.
Dapiran, Alirio; and Giovanni, Gurioli, to Istituto per le Richerche di Tecnologia Meccanica Rtm. Machine tool for machining workpieces by chip removal according to a quadric surface of revolution, particularly for super finishing of cylindrical surfaces. 4,626,150, Cl. 409-199.000.
Dart Industries, Inc.: *See—*
Duska, Joseph J.; Finestone, Arnold B.; and Maher, John B., 4,626,557, Cl. 523-100.000.
Dartmouth College, Trustees of: *See—*
Grethlein, Hans E.; and Lynd, Lee H., 4,626,321, Cl. 203-26.000.
Data General Corp.: *See—*
Bellamy, John C., 4,627,046, Cl. 370-58.000.
Data Packaging Corp.: *See—*
Lyman, George F., 4,626,509, Cl. 435-287.000.
Dave, Krishna G.; and George, Thomas, to Ciba-Geigy Corporation. Guanidines, pharmaceutical compositions and use. 4,626,537, Cl. 514-237.000.
Davenport, John M.; and von Herrmann, Pieter J., to General Electric Company. Ballast circuit for lamps with low voltage gas discharge tubes. 4,626,745, Cl. 315-179.000.
Davis, H. Coleman: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,625,347, Cl. 5-43.000.
Davis, Ronald E.: *See—*
Harrison, Brian; and Davis, Ronald E., 4,626,122, Cl. 403-51.000.
Davis, Ward B.: *See—*
Alworth, Charles W.; Davis, Ward B.; and Thomas, John C., deceased, 4,626,320, Cl. 201-2.000.
Davis, William F. Ink dispensing means. 4,625,643, Cl. 101-363.000.
Davis, William H. Kit box having a housing and flexible bins. 4,626,050, Cl. 312-293.000.
Davis, William H.; Goba, John J.; Riggs, Dean D.; Zeewy, Abraham; and Flint, Howard M., to Fairview Partners. Intercept system for intercepting stolen, lost and fraudulent cards. 4,626,669, Cl. 235-380.000.
Davison, John A.; and Kellar, Robert J., to Showden-Pencer, Inc. Surgical rasp and method of manufacture. 4,625,725, Cl. 128-304.000.
Davy McKee (London) Limited: *See—*
Hiles, Andrew G.; and Logsdon, John E., 4,626,604, Cl. 568-881.000.
Dawson, Daniel S.: *See—*
Dawson, Richard S.; and Dawson, Daniel S., 4,625,563, Cl. 73-850.000.
Dawson, Richard S.; and Dawson, Daniel S. Portable bend tester. 4,625,563, Cl. 73-850.000.
Daya, Shiraz: *See—*
Pompei, Francesco; Daya, Shiraz; and Pompei, Domenico A., 4,626,686, Cl. 250-342.000.
Dayco Corporation: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.
Witt, Richard J., 4,626,232, Cl. 474-205.000.
de la Haye, Cornelis F. Quick leveling apparatus. 4,625,424, Cl. 33-367.000.
Dean, Barry D., to Atlantic Richfield Company. Elastomer having random peroxide functionality and method. 4,626,576, Cl. 525-332.800.
Dean, John R., to FL Industries, Inc. Post top luminaire clamp. 4,626,974, Cl. 362-396.000.
Dean, Robert: *See—*
Johnson, Peter R.; Hutchinson, Derek; Reyner, Peter J.; and Dean, Robert, 4,625,851, Cl. 194-200.000.
Dearborn Chemical Company, Limited: *See—*
Nemes, John J.; Thompson, Harvey W.; and Waller, John E., 4,626,411, Cl. 422-13.000.
Debaisieux, Andre ; and Aubry, Jean P., to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E. Piezoelectric resonator. 4,626,732, Cl. 310-348.000.
Debus, Walter, Jr., to AT&T Bell Laboratories. Adaptive timing circuit. 4,627,080, Cl. 375-110.000.
Declerco, Marc: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,172, Cl. 416-134.00A.
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,173, Cl. 416-134.00A.
Deeco, Inc.: *See—*
Hudnutt, H. Dean; Eady, Edsell M.; and Cromie, Mark V., 4,625,405, Cl. 30-370.000.
Deere & Company: *See—*
Allen, James R.; Wohlford, William P.; and Poore, Bernard B., 4,625,989, Cl. 280-479.00A.
Gage, Douglas M., 4,625,751, Cl. 137-118.000.
Gerhardt, Ralph A.; and Viaud, Jean, 4,625,502, Cl. 56-341.000.
King, Michael J., 4,625,842, Cl. 192-4.00C.
Link, Joseph E.; and Oeth, James F., 4,626,163, Cl. 414-685.000.
Schmid, Steven L.; Fickle, J. Clark; and Hill, Keith E., 4,625,826, Cl. 180-315.000.
Degussa Aktiengesellschaft: *See—*
Bilger, Edgar, 4,626,423, Cl. 423-366.000.
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.
Schmidt, Sabine; Kleihschmit, Peter; and Schwarz, Rudolf, 4,626,466, Cl. 428-247.000.
Siegmeier, Rainer; Prescher, Gunter; and Maurer, Helmut, 4,626,603, Cl. 568-833.000.
Deichmann, Helmut; and Zeeff, Thomas J., to Feco Engineered Systems, Inc. Container transfer system. 4,625,854, Cl. 198-416.000.
DeKalb-Pfizer Genetics: *See—*
Sun, Paul, 4,626,610, Cl. 800-1.000.
DeLacy, Thomas J.; Bingham, John R.; and Carroll, George F., to Diamond Walnut Growers. Method and apparatus for particle sorting by vibration analysis. 4,625,872, Cl. 209-557.000.
de Leeuw, Petrus H.: *See—*
Vredenbregt, Jakob; Van Gerwen, Johannes W. C. M.; de Leeuw, Petrus H.; and Vleeskens, Franciscus T., 4,626,014, Cl. 294-88.000.
Delta International Machinery Corp.: *See—*
Ashworth, Steven W., 4,625,609, Cl. 83-748.000.
DeMartino, John D. Toothbrush. 4,625,357, Cl. 15-167.00A.
Demus, Dietrich; Frach, Roger; Deutscher, Hans-Joachim; and Zaschke, Horst, to VEB Werk fuer Fernsehelektronik. Liquid crystalline substances. 4,626,375, Cl. 252-299.630.
Denman, Stephen A.; and Taylor, Garthwood R., to Deuer Manufacturing, Inc. Tire lift/carrier. 4,625,947, Cl. 254-323.000.
Dennison Manufacturing Company: *See—*
Livermore, Anthony W.; and Ford, Francis J., 4,626,950, Cl. 360-134.000.
Dentalwerk Burmoos Gesellschaft m.b.H.: *See—*
Malata, Peter; and Rosenstatter, Otto, 4,626,210, Cl. 433-29.000.
Derderian, Thomas, to Nike, Inc. Athletic garment. 4,625,336, Cl. 2-79.000.
de Sieyes, David C.: *See—*
Singh, Param I.; and de Sieyes, David C., 4,626,243, Cl. 604-141.000.
Despax, Damien M.; Martin, Jean-Pierre H.; and Gueuret, Francois, to Compagnie Francaise des Petroles. Geomechanical probe for a drilling well. 4,625,795, Cl. 166-66.000.
Despot, Janko; and Kibler, Hans, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Inking unit of a rotary offset press. 4,625,642, Cl. 101-352.000.
de Toledo, Pamela: *See—*
Senno, Ricardo G.; and de Toledo, Pamela, 4,625,425, Cl. 33-477.000.
Dettling, Ronald F.: *See—*
McManis, George E., III; Bratcher, John O.; and Dettling, Ronald F., 4,626,611, Cl. 136-212.000.
Deuer Manufacturing, Inc.: *See—*
Denman, Stephen A.; and Taylor, Garthwood R., 4,625,947, Cl. 254-323.000.
Deutsch Company Metal Components Division, The: *See—*
Lee, Francis C. K., 4,626,001, Cl. 285-94.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Stritzke, Detlef; Ewest, Eckhart; and Heimerl, Wilfried, 4,626,382, Cl. 252-629.000.
Deutscher, Hans-Joachim: *See—*
Demus, Dietrich; Frach, Roger; Deutscher, Hans-Joachim; and Zaschke, Horst, 4,626,375, Cl. 252-299.630.
Devine, Thomas H. Underwater gas pocket work unit and removal of dangerous fumes and gases therefrom. 4,626,128, Cl. 405-12.000.
Devoe-Holbein International, N.V.: *See—*
DeVoe, Irving W.; and Holbein, Bruce E., 4,626,416, Cl. 423-12.000.
DeVoe, Irving W.; and Holbein, Bruce E., to Devoe-Holbein International, N.V. Insoluble chelating compositions. 4,626,416, Cl. 423-12.000.
Diamond Walnut Growers: *See—*
DeLacy, Thomas J.; Bingham, John R.; and Carroll, George F., 4,625,872, Cl. 209-557.000.
Diamontis, Damon. Stud spacer. 4,625,415, Cl. 33-180.00R.
DiChiria, Dominick P.: *See—*
Finger, Frank J.; and DiChiria, Dominick P., 4,626,357, Cl. 210-721.000.
Dick, Kevin F.: *See—*
Ogoe, Samuel A.; and Dick, Kevin F., 4,626,563, Cl. 524-168.000.
Dickert, Joseph J., Jr.; and Heilweil, Israel J., to Mobil Oil Corporation. Additive systems for control of fluid loss in aqueous drilling fluids at high temperatures. 4,626,362, Cl. 252-8.510.
Dickinson, Thomas C. Laminated vapor barrier material and methods of use. 4,625,486, Cl. 52-404.000.

DiDomenico, Edward D.: *See—*
Virnig, Michael J.; Clark, James P.; and DiDomenico, Edward D., 4,626,582, Cl. 526-298.000.
Diego Power: *See—*
JaQuay, John W., 4,626,979, Cl. 363-41.000.
Diesel Kiki Co., Ltd.: *See—*
Funada, Takeo; Kawada, Nobuo; and Abe, Tatsuhiko, 4,625,918, Cl. 239-533.300.
Hiyama, Yasuhiro; and Fujimori, Kyoichi, 4,626,621, Cl. 178-18.000.
Kojima, Yutaka; and Ishida, Hisao, 4,625,840, Cl. 192-3.580.
Takahashi, Tadahiro; Ohi, Shinichi; and Kobayashi, Kashiwa, 4,626,820, Cl. 337-354.000.
Tomita, Itizo, 4,625,911, Cl. 237-12.30C.
Dietrich, Robert F. Tool alignment gauge. 4,626,151, Cl. 409-210.000.
Dietrich, Werner; and Langeloth, Gernot, to Motoren-Werke Mannheim Aktiengesellschaft vorm. Renz Abt. stationarer Motorenbau. Cylinder head. 4,625,682, Cl. 123-41.310.
Di Giugno, Giuseppe, to I.R.C.A.M. (Institut de Recherche et de Coordination Accoustique/Misique. Digital real-time signal processor. 4,627,026, Cl. 364-900.000.
DiGiulio, Adolph V., to Atlantic Richfield Company. Process for producing modified styrenic polymer beads for high strength foamed articles. 4,626,554, Cl. 521-57.000.
Dillman, Hans-Georg: *See—*
Furrer, Jurgen; and Dillman, Hans-Georg, 4,626,692, Cl. 250-432.00R.
DiLuccio, Robert C.: *See—*
Aungst, Bruce; and DiLuccio, Robert C., 4,626,539, Cl. 514-282.000.
Diluigi, Michael W.: *See—*
Hesch, Harold E.; and Diluigi, Michael W., 4,626,154, Cl. 410-56.000.
Director-General of the Agency of Industrial Science and Technology: *See—*
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,626,588, Cl. 528-481.000.
Dirk, Carl W.: *See—*
Wudl, Fred; Heeger, Alan J.; and Dirk, Carl W., 4,626,586, Cl. 528-374.000.
Dirscherl, Teresa A.: *See—*
Trzasko, Peter T.; Tessler, Martin M.; and Dirscherl, Teresa A., 4,626,288, Cl. 106-210.000.
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Faustini, Franco; d'Alessio, Roberto; Panzeri, Achille; and di Salle, Enrico, 4,626,597, Cl. 560-53.000.
Disco Co., Ltd.: *See—*
Sekiya, Shinji, 4,625,463, Cl. 51-216.00R.
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Katzman, Allison W.; Rosenwinkel, Donald A.; and Disko, Harry, 4,626,225, Cl. 446-394.000.
Dissett, Walter L., to Tractech, Inc. Torque-proportioning differential with sectional housing. 4,625,585, Cl. 74-715.000.
Dixie Electrical Manufacturing Company: *See—*
Farmer, Marion R., 4,626,330, Cl. 204-197.000.
Dixon Industries, Inc.: *See—*
Splittstoesser, Clair D., 4,625,586, Cl. 74-721.000.
Dobrowolski, Jerzy A.; and Waldorf, Allan J., to Canadian Patents and Development Limited. Method of manufacturing an optical interference authenticating device. 4,626,445, Cl. 427-7.000.
Dr. Ing. h.c.F. Porsche AG: *See—*
Dorsch, Heinz, 4,626,170, Cl. 416-29.000.
Dr. Ing. H.c.F. Porsche Aktiengesellschaft: *See—*
Groger, Klaus, 4,625,943, Cl. 251-305.000.
Haecker, Walter; Nemenz, Andreas-Uwe; and Weiner, Hans, 4,626,025, Cl. 296-218.000.
Dr. -Ing. Rudolf Hell GmbH: *See—*
Blum, Dietrich; and Broening, Joerg, 4,627,002, Cl. 364-519.000.
Giesche, Ernst; Jung, Eggert; Meintz, Helma; and Roes, Christian, 4,626,903, Cl. 358-80.000.
Dodds, Diego E. F., to Leonard Oboler, a part interest. Evaporative condenser with helical coils and method. 4,626,387, Cl. 261-153.000.
Dodge, Robert J., to Pennwalt Corporation. Buoy lantern system. 4,626,852, Cl. 340-985.000.
Doehler, Joachim; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Plasma confining apparatus. 4,626,447, Cl. 427-39.000.
Doemen, Benno, to Papst-Motoren GmbH & Co KG. Direct-current motor without commutator. 4,626,751, Cl. 318-254.000.
Doherty, John P.; Dufour, David L.; Gebo, Russell E.; and Sullivan, Michael J., to Honeywell Information Systems Inc. Equal density distribution process. 4,627,005, Cl. 364-525.000.
Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, to Electricite de France. Isolation and protection device for working on tubing, and in particular on nuclear power station tubing. 4,625,766, Cl. 138-93.000.
Dolan, James G.: *See—*
Buriks, Rudolf S.; and Dolan, James G., 4,626,379, Cl. 252-340.000.
Dolejs, Charles A.: *See—*
Schick, David L.; Schumann, Gary M.; and Dolejs, Charles A., 4,625,763, Cl. 137-625.150.
Dolikian, Arman V.; Kotzin, Michael D.; and Budnik, Brian J., to Motorola, Inc. Automatic gain control for a remote control system having symmetrical send/receive signaling circuits. 4,627,098, Cl. 455-70.000.
Domet, Jack: *See—*
Shah, Dhiren N.; Domet, Jack; and Hammer, Gregory V., 4,626,287, Cl. 106-197.100.
Donarumo, Ralph A.: *See—*
Quedens, Phillip J.; Dutko, Peter J., Jr.; Larson, Raymond F.; and Donarumo, Ralph A., 4,625,731, Cl. 128-660.000.
Donat Flamand Inc.: *See—*
Giguere, Jean-Paul, 4,625,479, Cl. 52-202.000.
Donn Incorporated: *See—*
Gibson, Franklin E., 4,625,491, Cl. 52-794.000.
Donnell, John L. Jigsaw puzzle. 4,625,969, Cl. 273-157.00R.
Dorda, Gerhard: *See—*
Schmitt-Landsiedel, Doris; and Dorda, Gerhard, 4,626,887, Cl. 357-43.000.
Dorsch, Heinz, to Dr. Ing. h.c.F. Porsche AG. Propulsion aggregate for an aircraft. 4,626,170, Cl. 416-29.000.
Dorst, Fred E.: *See—*
Willemsz, John R., 4,626,137, Cl. 405-224.000.
Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, to Centre National de la Recherche Scientifique; and Commissariat a l'Energie Atomique. Intense X-ray source using a plasma microchannel. 4,627,088, Cl. 378-122.000.
Dow Chemical Company, The: *See—*
Dang, Hiep D.; Hicks, Roy L.; and Leathers, Joel F. M., 4,625,440, Cl. 38-102.500.
Glew, David N.; McIntyre, John S.; and Gilbert, Jeffrey F., deceased, 4,626,131, Cl. 405-59.000.
Ogoe, Samuel A.; and Dick, Kevin F., 4,626,563, Cl. 524-168.000.
Rubens, Louis C., 4,626,660, Cl. 219-385.000.
Dragerwerk Aktiengesellschaft: *See—*
Ryschka, Martin; Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl-Friedrich, 4,625,779, Cl. 141-311.00R.
Drake, Hugh H. Communications system. 4,627,106, Cl. 455-617.000.
Drapeau, Donald F., to Safeway Products, Inc. Switch adjusting mechanism. 4,626,819, Cl. 337-323.000.
Draudt, Dale A.: *See—*
Draudt, Donald A.; and Draudt, Dale A., 4,625,998, Cl. 285-7.000.
Draudt, Donald A.; and Draudt, Dale A. Swivel hose couplings. 4,625,998, Cl. 285-7.000.
Dravo Corporation: *See—*
College, John W.; and Vlnaty, Joseph, 4,626,418, Cl. 423-243.000.
Dresser Industries, Inc.: *See—*
Charter, Ian G., 4,625,548, Cl. 73-299.000.
Charter, Ian G., 4,625,553, Cl. 73-438.000.
Killinger, Glenn W., 4,625,924, Cl. 241-186.00R.
Osborne, Colin; and Chow, Peter N., 4,626,168, Cl. 415-211.000.
Drew Chemical Corporation: *See—*
Kavchok, Ronald W.; and Boylan, Francis J., deceased, 4,626,377, Cl. 252-321.000.
Dubots, Patrick; Kermarrec, Jean-Claude; and Tavergnier, Jean-Pierre, to Alsthom-Atlantique, S.A. Method and device for stranding multifilament superconductor strands. 4,625,503, Cl. 57-6.000.
Duell, Virginia B. Craft yarns. 4,625,664, Cl. 112-262.100.
Duffield, Peter; Hudson, David; and Zoltan, Steven I., to Advanced Color Technology, Inc. Method of making a printing head for an ink jet printer. 4,625,373, Cl. 29-25.350.
Duffin, Henry C.; Golding, Peter; and Jaweera-Bandara, Asoka M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Production of hexanitrostilbene (HNS). 4,626,606, Cl. 568-931.000.
Dufour, David L.: *See—*
Doherty, John P.; Dufour, David L.; Gebo, Russell E.; and Sullivan, Michael J., 4,627,005, Cl. 364-525.000.
DuFresne, Allen J., to Paper Converting Machine Company. Apparatus for stacking and delivering paper napkins, paper towels, and the like. 4,625,957, Cl. 271-214.000.
Dulka, Catherine P.; and Komito, Evan H., to General Electric Company. Method for determining the radiation threshold of non-metallic materials. 4,627,006, Cl. 364-527.000.
Dumusc, Pierre, to Hermes Precisa International S.A. Typewriter. 4,626,117, Cl. 400-716.000.
Duncan, Gary L., to Mobil Oil Corporation. Coextruded pressure sensitive label stock material with integral peelable backing. 4,626,460, Cl. 428-40.000.
Duncan, Michael G.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.
Dunham, Samuel B.: *See—*
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Dunlap, Charles: *See—*
Zemek, Albert W.; Orzelek, Frank J.; and Dunlap, Charles, 4,625,399, Cl. 29-845.000.
Dupeyrat, Benoit; Mardon, Nathalie; and Noel, Jean-Paul, to Commissariat a l'Energie Atomique. Control device for the automatic alignment of a laser beam. 4,626,649, Cl. 219-121.0LU.
Du Pont de Nemours, E. I., and Company: *See—*
Aungst, Bruce; and DiLuccio, Robert C., 4,626,539, Cl. 514-282.000.
Falco, Saverio C., 4,626,505, Cl. 435-172.300.
Morgan, Richard A.; and Sloan, William H., 4,626,587, Cl. 528-481.000.
Sundet, Sherman A., 4,626,468, Cl. 428-315.500.

Durr, Peter: *See—*
Schobinger, Ulrich; Waldvogel, Robert; and Durr, Peter, 4,626,437, Cl. 426-387.000.
Durst, Felix, to Allenspach, Norbert. Plastic heat exchanger construction. 4,625,794, Cl. 165-170.000.
Duska, Joseph J.; Finestone, Arnold B.; and Maher, John B., to Dart Industries, Inc. Plastic ovenware containing talc. 4,626,557, Cl. 523-100.000.
Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., to American Cyanamid Company. [7-(3-disubstituted amino)phenyl]-pyrazolo[1,5-a]pyrimidines. 4,626,538, Cl. 514-258.000.
Duthoy, Everette J. Kidney stone retriever. 4,625,726, Cl. 128-328.000.
Dutko, Peter J., Jr.: *See—*
Quedens, Phillip J.; Dutko, Peter J., Jr.; Larson, Raymond F.; and Donarumo, Ralph A., 4,625,731, Cl. 128-660.000.
Duvdevani, Ilan: *See—*
Kowalik, Ralph M.; Duvdevani, Ilan; Kitano, Kissho; and Schulz, Donald N., 4,625,745, Cl. 137-13.000.
Duvvury, Charvaka: *See—*
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Dykstra, Raymond C., to Cobe Laboratories, Inc. Differential pressure fluid flow regulating device. 4,625,757, Cl. 137-504.000.
Dyma, Horst; Bommersheim, Hans; Becker, Otto; and Heindke, Armin, to Kienzle Apparate GmbH. Document feeding mechanism with pivotable input chute. 4,625,958, Cl. 271-274.000.
E. F. Johnson Company: *See—*
Rosar, George C.; and Wilson, James R., 4,626,806, Cl. 333-104.000.
E. R. Squibb & Sons, Inc.: *See—*
Hall, Steven E., 4,626,548, Cl. 514-469.000.
Eady, Edsell M.: *See—*
Hudnutt, H. Dean; Eady, Edsell M.; and Cromie, Mark V., 4,625,405, Cl. 30-370.000.
Eagle-Picher Industries, Inc.: *See—*
Cupp, Earl B.; and Cottingham, D. Robert, 4,626,335, Cl. 204-293.000.
Earthnics Corporation: *See—*
Miyashita, Kyoichi, 4,625,355, Cl. 15-93.00R.
Eastman Kodak Company: *See—*
Baughman, Richard C.; Flamini, Stephen J.; and Wilson, William C., 4,626,156, Cl. 412-33.000.
Lo, Donald H.; Wu, Tai-Wing; and Bailey, Mark W., 4,627,014, Cl. 364-571.000.
Molaire, Michel F., 4,626,361, Cl. 252-1.000.
Piatt, Michael J., 4,626,869, Cl. 346-75.000.
Eaton Corporation: *See—*
Damiano, Michael A.; Gass, Dale L.; Kramer, Dennis M.; and Schmerda, Richard F., 4,626,954, Cl. 361-96.000.
Mahon, Joseph J., 4,626,635, Cl. 200-38.00A.
Van Zeeland, Donald L., 4,626,683, Cl. 250-239.000.
Ebara Corporation: *See—*
Ouchi, Kiyoshi, 4,626,721, Cl. 310-71.000.
Eberlein, Wolfgang: *See—*
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Mihm, Gerhard, 4,626,325, Cl. 204-59.00R.
Ebner, Jerry R.; and Gleaves, John T., to Monsanto Company. Method and apparatus for carrying out catalyzed chemical reactions and for studying catalysts. 4,626,412, Cl. 422-50.000.
Echizen, Hiroshi: *See—*
Hirai, Yutaka; Echizen, Hiroshi; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,626,449, Cl. 427-53.100.
Economopoulos, Marios; and Simon, Pierre, to Centre de Recherches Metallurques-Centrum Voor Research in de Metallurgie. Manufacturing steel concrete reinforcements on a high speed rod rolling mill. 4,625,532, Cl. 72-201.000.
Economy Engineering, Inc.: *See—*
Wehmeyer, Donald T.; Barnhart, Ronald W.; and Beymer, Craig, 4,625,830, Cl. 182-19.000.
Ed Geistlich Sohne Ag fur Chemische/Industrie: *See—*
Pfirrmann, Rolf W., 4,626,536, Cl. 514-222.000.
Edelman, William; and Baranowski, Michael, to Shiley Incorporated. Dual lumen subclavian cannula. 4,626,240, Cl. 604-43.000.
Eder, Hans, to Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. Kg. Computer-aided drawing or engraving device. 4,625,410, Cl. 33-1.00M.
Ederer Incorporated: *See—*
Clark, Charles W., Jr.; and West, Harold H., 4,625,946, Cl. 254-274.000.
Edmisson, Delmar D., to Adams Hard-Facing Company, Inc. Tillage tool. 4,625,810, Cl. 172-749.000.
Edwards, Charles W., to Westinghouse Electric Corp. Inverter system with hysteresis transition between pulse width modulation mode and pure square wave mode of operation. 4,626,763, Cl. 318-811.000.
Edwards, John D.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.
Egerer, Josef, to Staedtler & Uhl. Opening cylinder for open-end spinning machines or the like. 4,625,366, Cl. 19-97.000.
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH; and Daimler-Benz Aktiengesellschaft. Windshield wiper unit. 4,625,359, Cl. 15-250.210.
Egyesult Izzolempa os Villamossagi Rt.: *See—*
Vida, Denes, 4,626,743, Cl. 313-571.000.
Ehlers, Raymond G., to General Electric Company. Programmable functions for reconfigurable remote control. 4,626,848, Cl. 340-825.690.
Eickmann, Karl. Hydraulic arrangement. 4,626,177, Cl. 417-271.000.
Eigner, Johann: *See—*
Holy, Franz; and Eigner, Johann, 4,626,149, Cl. 409-191.000.
Eilbeck, James N., to Olin Hunt Specialty Products, Inc. Positive-working o-quinone diazide photoresist composition containing a dye and a trihydroxybenzophenone compound. 4,626,492, Cl. 430-191.000.
Eisenman, Nancy K. Liquid surface sealing device. 4,625,886, Cl. 220-216.000.
Elder, James H., to General Electric Company. Digital apparatus and method for programmably phase shifting an audio tone. 4,626,796, Cl. 331-1.00A.
Electricite de France: *See—*
Dohlen, Gerard; Le Marquis, Jean-Claude; and Qberlin, Claude, 4,625,766, Cl. 138-93.000.
Electricite de France (Service National): *See—*
Gerardin, Jean-Pierre, 4,626,676, Cl. 250-214.00R.
Elek, Sandor; Mihok nee Borbely, Ildiko ; and Mihok, Miklos, to Biogal Gyogyszergyar. 7-(2-thienylacetamido)-3-acylaminomethyl-cephalosporins. 4,626,533, Cl. 514-202.000.
Elger, Walter; and Beier, Sybille, to Schering Aktiengesellschaft. Prostaglandins and antigestagens for induction of labor and for abortion. 4,626,531, Cl. 514-171.000.
Eli Lilly and Company: *See—*
Fites, Alan L.; and Pikal, Michael J., 4,626,534, Cl. 514-203.000.
Molloy, Bryan B.; and Schmiegel, Klaus K., 4,626,549, Cl. 514-651.000.
Schaus, John M., 4,626,591, Cl. 546-165.000.
Elitex, koncern textilniho strojirenstvi: *See—*
Sevcik, Ladislav; and Svaty, Vladimir, 4,625,771, Cl. 139-435.000.
Elsbett, Gunter: *See—*
Elsbett, Ludwig; and Elsbett, Gunter, 4,625,700, Cl. 123-500.000.
Elsbett, Ludwig; and Elsbett, Gunter. Plunger pump for delivering liquids especially fuels, for reciprocating internal combustion engines. 4,625,700, Cl. 123-500.000.
Elscint Incorporated: *See—*
Crawford, Carl R.; and Reuveni, Asher, 4,626,991, Cl. 364-414.000.
Emerson Electric Co.: *See—*
Phillips, Allyn E., 4,626,114, Cl. 384-584.000.
Emery, Roy W. Container lock construction. 4,625,908, Cl. 229-45.00R.
Emhart Industries, Inc.: *See—*
Matievic, Miroslav, 4,626,799, Cl. 331-47.000.
Shedigian, Vandos; and Voyles, Gerald A., 4,626,959, Cl. 361-315.000.
Emil Schenker AG: *See—*
Bischof, Richard, 4,625,868, Cl. 206-577.000.
Endo, Hiroshi; and Yagi, Toshio, to Mitsubishi Yuka Badische Co., Ltd. Polypropylene foamed particles. 4,626,555, Cl. 521-59.000.
Endo, Shinichi; and Matsuda, Isao, to Matsushita Electric Industrial Co., Ltd. Electric heating appliance. 4,626,657, Cl. 219-212.000.
Endo, Yasushi: *See—*
Nara, Motohisa; and Endo, Yasushi, 4,626,687, Cl. 250-338.000.
Endress u. Hauser GmbH u. Co.: *See—*
Regtien, Paulus P. L., 4,626,774, Cl. 324-61.00R.
Energy Conversion Devices, Inc.: *See—*
Doehler, Joachim; and Izu, Masatsugu, 4,626,447, Cl. 427-39.000.
Enertec: *See—*
Michel, Souillard, 4,626,772, Cl. 324-52.000.
Engel, Joseph C., to Westinghouse Electric Corp. Analog signal processing circuit. 4,626,831, Cl. 340-500.000.
Engel, Wolfhard: *See—*
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Mihm, Gerhard, 4,626,325, Cl. 204-59.00R.
Engelhard Corporation: *See—*
Martins, Evon; and Slepetys, Richard A., 4,626,283, Cl. 106-14.240.
Engineered Equipment Company: *See—*
Curtis, Linden T.; Franklin, William G.; and Olds, John R., 4,625,437, Cl. 37-141.00R.
Engle, Elbert. Dual-chain sewing machine. 4,625,665, Cl. 112-262.300.
Eni-Ente Nazionale Idrocarburi: *See—*
Grandi, Guido, 4,626,510, Cl. 435-317.000.
Ensor, Donald R. Inverted microscope. 4,626,906, Cl. 358-93.000.
Epic Systems, Inc.: *See—*
Ley, John F., 4,626,845, Cl. 340-825.480.
Epple, Anton: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.
Equipment Technology Incorporated: *See—*
Smith, Ruslon J., 4,625,374, Cl. 29-25.420.
Ergert, Karl; and Balzat, Ernst M., to Balzat Werkzeugmaschinenfabrik GmbH. Draw-knife. 4,626,153, Cl. 409-304.000.
Ernst Leitz Wetzlar GmbH: *See—*
Schmidt, Horst, 4,626,905, Cl. 358-87.000.
Ertl, Stefan; and Jola, Martin, to Zellweger Uster Ltd. Method and device for calibrating an analyzer for measuring low ion activity values in a sample stream. 4,625,543, Cl. 73-1.00G.
Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin, 4,625,666, Cl. 112-273.000.
Eskildsen, Christian, to Danfoss A/S. Pressure supply device for a hydraulic system. 4,625,749, Cl. 137-115.000.

ESM International, Inc.: *See—*
Browne, Edward M., 4,626,677, Cl. 250-214.00A.

Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, to VEB Edelstahlwerk "8 Mai 1945" Freital. Metallurgical plasma melting process. 4,626,654, Cl. 219-121.0PR.

Essilor International Cie Generale d'Optique: *See—*
Joncour, Christian; and Leducq, Annick, 4,625,418, Cl. 33-200.000.
Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, 4,626,088, Cl. 351-204.000.

Etablissements Pierre Grehal et Compagnie: *See—*
Malagnoux, Roger, 4,625,538, Cl. 72-391.000.

Ethier, Pierre M. Front-drive three-wheels vehicle with tandem drive and passenger. 4,625,825, Cl. 180-211.000.

Ethyl Corporation: *See—*
Hargis, Duane C., 4,626,592, Cl. 546-192.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,626,259, Cl. 44-57.000.

Evans, Rowland M., to Bendix Avelex Inc. Stress limiter apparatus for a gas turbine engine. 4,625,510, Cl. 60-39.161.

Everett, Phillip: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Everhard, Paul R.; and Monroe, Roy K. Clip insert tool. 4,625,380, Cl. 29-243.560.

Ewest, Eckhart: *See—*
Stritzke, Detlef; Ewest, Eckhart; and Heimerl, Wilfried, 4,626,382, Cl. 252-629.000.

Exergen Corporation: *See—*
Pompei, Francesco; Daya, Shiraz; and Pompei, Domenico A., 4,626,686, Cl. 250-342.000.

Expert Corporation: *See—*
Riback, Richard; and Geneve, Francois, 4,626,175, Cl. 417-40.000.

Exxon Production Research Co.: *See—*
Galloway, Jimmie G., Jr., 4,626,237, Cl. 494-37.000.
Gunderson, Richard H., 4,626,136, Cl. 405-224.000.
Kroeger, Michael K.; and Longo, John M., 4,626,773, Cl. 324-58.50B.

Exxon Research and Engineering Company: *See—*
Arcuri, Kym B., 4,626,552, Cl. 518-712 000.
Best, Steven A., 4,626,520, Cl. 502-115.000.
Chianelli, Russell R.; Ho, Teh C.; Jacobson, Allan J.; and Young, Archie R., 4,626,339, Cl. 208-18.000.
Kowalik, Ralph M.; Duvdevani, Ilan; Kitano, Kissho; and Schulz, Donald N., 4,625,745, Cl. 137-13.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence; and Newlove, John C., 4,626,285, Cl. 106-90.000.

Ezawa, Nobuyasu: *See—*
Goto, Nobutaka; and Ezawa, Nobuyasu, 4,626,331, Cl. 204-222.000.

F. L. Smidth & Co. A/S: *See—*
Folsberg, Jan, 4,626,343, Cl. 209-138.000.
Jorgensen, Hans J., 4,626,260, Cl. 55-2.000.
Jorgensen, Hans J., 4,626,261, Cl. 55-2.000.

Fa. Georg Spiess GmbH: *See—*
Marass, Josef; Liepert, Rudolf; and Weyrich, Klaus, 4,625,956, Cl. 271-183.000.

Fabrica D'Armi P.Beretta S.p.A.: *See—*
Beretta, Pier G., 4,625,443, Cl. 42-42.030.
Beretta, Pier G., 4,625,444, Cl. 42-69.020.

Fabris, Mirko, to Ateliers de Constructions Electriques de Charleroi (ACEC). Recovery shroud for damaged nuclear fuel elements. 4,626,403, Cl. 376-272.000.

Fairchild Camera and Instrument Corporation: *See—*
Herndon, William H., 4,627,034, Cl. 365-226.000.

Fairview Partners: *See—*
Davis, William H.; Goba, John J.; Riggs, Dean D.; Zeewy, Abraham; and Flint, Howard M., 4,626,669, Cl. 235-380.000.

Falb, Wolfgang: *See—*
Ryschka, Martin; Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl-Friedrich, 4,625,779, Cl. 141-311.00R.

Falco, Saverio C., to Du Pont de Nemours, E. I., and Company. Selectable markers for yeast transformation. 4,626,505, Cl. 435-172.300.

Falcon Jet Corporation: *See—*
Ryan, James M.; and Alie, Enrique, 4,625,934, Cl. 244-122.00R.

Faller, Frank R.; Clouston, Ross G.; and Bergholz, Larry, to Novacorp International Consulting Ltd. Motion compensation means for a floating production system. 4,625,673, Cl. 114-230.000.

Fantini, Amedeo A.: *See—*
Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., 4,626,503, Cl. 435-75.000.

Fanuc Ltd.: *See—*
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,626,762, Cl. 318-809.000.

Fanuc Ltd: *See—*
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,626,756, Cl. 318-573.000.
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,626,725, Cl. 310-89.000.
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,627,003, Cl. 364-520.000.
Nakashima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, 4,626,165, Cl. 414-735.000.

Farha, Floyd E.: *See—*
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,626,519, Cl. 502-105.000.

Farmer, Marion R., to Dixie Electrical Manufacturing Company. Torsionally installed anode and earth anchor/penetrator. 4,626,330, Cl. 204-197.000.

Farmitalia Carlo Erba, S.p.A.: *See—*
Faustini, Franco; d'Alessio, Roberto; Panzeri, Achille; and di Salle, Enrico, 4,626,597, Cl. 560-53.000.

Farmont Produktion GmbH & Co. Kg: *See—*
Farmont, Rolf, 4,626,027, Cl. 296-223.000.

Farmont, Rolf, to Farmont Produktion GmbH & Co. Kg. Sliding roof for a vehicle. 4,626,027, Cl. 296-223.000.

Farrall, George A.: *See—*
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,626,698, Cl. 307-38.000.

Farrel Corporation: *See—*
Swasey, Archie N.; and Winter, William J., 4,626,111, Cl. 384-99.000.

Farrell, Christopher J.; and Williams, Mark A., to American Can Company. Laminate structure for collapsible dispensing container. 4,626,456, Cl. 428-35.000.

Farrington, Robert B.; and Pruett, James C., Jr., to United States of America, Energy. Solar system fault detection. 4,626,832, Cl. 340-522.000.

Fast, Jacob. Warehouse label holder assembly. 4,625,441, Cl. 40-10.00R.

Fastenmeier, Karl: *See—*
Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, 4,626,728, Cl. 310-316.000.

Faustini, Franco; d'Alessio, Roberto; Panzeri, Achille; and di Salle, Enrico, to Farmitalia Carlo Erba, S.p.A. 16-fluoro-16,17-didehydro prostanoids and process for their preparation. 4,626,597, Cl. 560-53.000.

Fayfield, Robert W., to Banner Engineering Corp. Sensing devices with modular interconnection and programming. 4,626,053, Cl. 339-32.00M.

Feast, William J.; and Winter, Jeremy N., to British Petroleum Company PLC, The. Novel polymers and copolymers and production of poly(acetylene). 4,626,580, Cl. 526-253.000.

Fechalos, William A.: *See—*
Pitroda, Satyan G.; Mehta, Bakulesh A.; and Fechalos, William A., 4,627,047, Cl. 370-58.000.

Feco Engineered Systems, Inc.: *See—*
Deichmann, Helmut; and Zeeff, Thomas J., 4,625,854, Cl. 198-416.000.

Fedele, Nicola J., to RCA Corporation. Low-energy-content voice detection apparatus. 4,627,091, Cl. 381-46.000.

Federal-Mogul Corporation: *See—*
Frayer, Robert W., Jr.; and Glover, Douglas, 4,625,567, Cl. 73-862.040.

Fee, Graham M., to True Temper Railway Appliances, Inc. Railway fastening assembly. 4,625,912, Cl. 238-349.000.

Feinwerktechnik Schleicher & Co.: *See—*
Goldhammer, Albert, 4,625,925, Cl. 241-236.000.

Fejes, Kalman; and Nagy, Lajos, to Radelkis Elektrokemiai Muszergyarto Ipari Szovetkezet. Siphon-cartridge activated automatic inoculating device wihtout needle for individual acculation, e.g. for insulinization. 4,626,242, Cl. 604-68.000.

Feldman, Martin; Reece, David N.; and Wagner, John S., to AT&T Bell Laboratories. Focus tracking system. 4,626,103, Cl. 356-363.000.

Felt Products Mfg. Co.: *See—*
Inciong, Josefino T., 4,625,979, Cl. 277-180.000.

Fennel, Helmut: *See—*
Belart, Juan; Fennel, Helmut; Seibert, Wolfram; and Batistic, Ivica, 4,626,043, Cl. 303-114.000.

Ferguson, Jack A. Crossword puzzle educational game. 4,625,971, Cl. 273-272.000.

Ferrando, Franco. Computerized correspondence form. 4,625,909, Cl. 229-92.100.

Ferranti, plc: *See—*
McLeod, John; Smith, John A.; and Leather, Russell A., 4,627,061, Cl. 372-29.000.
Wright, David A., 4,625,408, Cl. 33-1.00M.

Fetsko, Francis E. Liquid sweeping assembly and method. 4,626,358, Cl. 210-776.000.

Fiat Ferroviaria Savigliano S.p.A.: *See—*
Losa, PierAntonio; and Tabbia, Augusto, 4,625,652, Cl. 105-4.100.

Fick, Kenton W.: *See—*
Fick, Virginia L.; and Fick, Kenton W., 4,626,344, Cl. 210-90.000.

Fick, Virginia L.; and Fick, Kenton W. Oil filter restriction sensor. 4,626,344, Cl. 210-90.000.

Fickle, J. Clark: *See—*
Schmid, Steven L.; Fickle, J. Clark; and Hill, Keith E., 4,625,826, Cl. 180-315.000.

Field, David H.; Kirby, William E.; and Nylund, Theodore W., to Westinghouse Electric Corp. Cruciform skeleton and water cross for a BWR fuel assembly. 4,626,405, Cl. 376-448.000.

Field, Thomas L., to Sprague Electric Company. Relaxation integrated circuit oscillator. 4,626,801, Cl. 331-111.000.

Figured, Jack. Bow sight for compound bows. 4,625,420, Cl. 33-265.000.

Finch, Timothy D.; and Wilde, Raymond J., to Lever Brothers Company. Manganese adjuncts, their preparation and use. 4,626,373, Cl. 252-96.000.

Finch, Timothy D.; and Wilde, Raymond J., to Lever Brothers Company. Heavy metal adjuncts, their preparation and use. 4,626,374, Cl. 252-174.130.

Finestone, Arnold B.: *See—*
Duska, Joseph J.; Finestone, Arnold B.; and Maher, John B., 4,626,557, Cl. 523-100.000.

Finger, Frank J.; and DiChiria, Dominick P., to American Pollution Controls, Inc. Waste water control method and means. 4,626,357, Cl. 210-721.000.

Finike Italiana Marposs S.p.A: *See—*
Danielli, Franco, 4,625,429, Cl. 33-504.000.

Finike Italiana Marposs S.p.A.: *See—*
Possati, Mario; and Dall'Aglio, Carlo, 4,625,413, Cl. 33-143.00L.

Fink, Hans-Ferdi: *See—*
Berger, Roland; Fink, Hans-Ferdi; Koerner, Gotz; Langner, Jaroslav; and Weitemeyer, Christian, 4,626,378, Cl. 252-321.000.

Finlay, David E.; Lopez, Jesus C.; and Mereness, Thomas S., to International Business Machines Corporation. Method and apparatus for improved printing in a selected orientation. 4,627,097, Cl. 382-46.000.

Firmenich SA: *See—*
Schulte-Elte, Karl-Heinrich, 4,626,381, Cl. 252-522.00R.
Schulte-Elte, Karl-Heinrich; and Pamingle, Herve , 4,626,602, Cl. 568-822.000.

Fischbach, Wolfgang, to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile. Spring clip fastening structure for securing handle to utensil. 4,625,361, Cl. 16-114.00A.

Fischer, William C.: *See—*
Adams, Don L.; Wright, Stuart C.; Fischer, William C.; and Verzella, David J., 4,626,998, Cl. 364-434.000.

Fisher & Paykel Limited: *See—*
Anderson, Iain, 4,625,529, Cl. 68-23.300.

Fisher, Verner J., Jr.: *See—*
Tung, Randy W.; Fisher, Verner J., Jr.; Wilstermann, William D.; and Neale, Brian K., 4,626,019, Cl. 296-97.00H.

Fishgal, Semyon. Contaminants filtering and breaking. 4,625,923, Cl. 241-40.000.

Fister, Julius C., to Olin Corporation. Method of making a strip for an electrical contact terminal. 4,625,400, Cl. 29-879.000.

Fitch, William B. Last ditch defence process. 4,625,668, Cl. 114-14.000.

Fites, Alan L.; and Pikal, Michael J., to Eli Lilly and Company. Pharmaceutical formulation. 4,626,534, Cl. 514-203.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Red luminescent cathode ray device with improved color filtering system. 4,626,740, Cl. 313-478.000.

Fitzsimmons, James N.: *See—*
Cancio, Leopoldo V.; Fitzsimmons, James N.; Mortellite, Robert M.; and Wu, Pai-Chuan, 4,626,574, Cl. 525-240.000.

FL Industries, Inc.: *See—*
Dean, John R., 4,626,974, Cl. 362-396.000.

Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, to MED-Inventio AG. Power generator for a piezoelectric ultra-sonic transducer. 4,626,728, Cl. 310-316.000.

Flachglas Aktiengesellschaft: *See—*
Nolte, Hans-Henning, 4,626,301, Cl. 156-99.000.

Flakt Aktiebolag: *See—*
Karlsson, Ingemar; Andersson, Karl-Hugo; and Petersson, Rolf, 4,625,434, Cl. 34-114.000.

Flamini, Stephen J.: *See—*
Baughman, Richard C.; Flamini, Stephen J.; and Wilson, William C., 4,626,156, Cl. 412-33.000.

Fleming, Robert F., III; and Irby, Raymond F., to Vega Precision Laboratories, Inc. Method of identifying possible valid data pulses in a position coded pulse train. 4,627,075, Cl. 375-23.000.

Flexible Steel Lacing Company: *See—*
Musil, Edward C., 4,625,369, Cl. 24-33.00B.

Flexsteel Industries, Inc.: *See—*
Quackenbush, Howard M., 4,625,346, Cl. 5-37.00R.

Flexwatt Corporation: *See—*
Grise, Frederick G. J., 4,626,664, Cl. 219-525.000..

Flint, Howard M.: *See—*
Davis, William H.; Goba, John J.; Riggs, Dean D.; Zeewy, Abraham; and Flint, Howard M., 4,626,669, Cl. 235-380.000.

Flumig, Hans: *See—*
Schiel, Christian; Flumig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, 4,625,376, Cl. 29-119.000.

FMC Corporation: *See—*
Champlin, Keith S.; Preimesberger, Ernest C.; and Miller, George W., 4,627,070, Cl. 375-3.000.
Chiang, John S. C., 4,626,326, Cl. 204-82.000.
McCarthy, Michael J.; and Chiang, John S. C., 4,626,327, Cl. 204-82.000.
Williams, Michael R.; and Weber, Neil G., 4,626,003, Cl. 285-98.000.

Folliet, Michel H.: *See—*
Saint Julian, Raymond M.; Gehant, Philippe M.; Bertrand, Ivan G.; and Folliet, Michel H., 4,626,204, Cl. 432-222.000.

Folsberg, Jan, to F. L. Smidth & Co. A/S. Separator for sorting particulate material. 4,626,343, Cl. 209-138.000.

Fontana, Fernando, to Omega SA. Hinged bracelet of watch chain type. 4,625,508, Cl. 59-80.000.

Ford, Francis J.: *See—*
Livermore, Anthony W.; and Ford, Francis J., 4,626,950, Cl. 360-134.000.

Ford Motor Company: *See—*
Hull, Neil A., 4,625,581, Cl. 74-606.00R.
Kordomenos, Panagiotis I.; Maker, David L.; Mros, Gordon R.; and Nordstrom, John D., 4,626,578, Cl. 525-484.000.
Mikkor, Mati, 4,625,561, Cl. 73-724.000.

Forkel, Werner, to Daimler-Benz Aktiengesellschaft. Device for detecting the speed of rotation and/or an angle of rotation of a shaft. 4,626,781, Cl. 324-174.000.

Forknall, John P.; and Woodbridge, Keith W., to SKF (U.K.) Limited. Cage for a radial ball bearing. 4,626,113, Cl. 384-530.000.

Forss, John A., to Honeywell Inc. Exhaust air system for electrostatic air cleaner. 4,626,262, Cl. 55-128.000.

Fort, William C., III, to Shell Oil Company. Metal oversheathed electrical resistance heater. 4,626,665, Cl. 219-534.000.

Fortel, Inc.: *See—*
Hanscom, Bradford E., 4,626,631, Cl. 379-165.000.

Foster, Ronald K., to Warner Electric Brake & Clutch Company. Stepping motor having rotor with axially spaced sections. 4,626,719, Cl. 310-49.00R.

Fountain, Glen H.; Lee, David G., Jr.; and Kitchin, David A., to Johns Hopkins University, The. Patient ECG recording control for an automatic implantable defibrillator. 4,625,730, Cl. 128-419.00D.

Fow, Louis F., Jr.: *See—*
Hofstetter, Don R.; and Fow, Louis F., Jr., 4,626,186, Cl. 425-115.000.

Fox, James D.: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.

Frach, Roger: *See—*
Demus, Dietrich; Frach, Roger; Deutscher, Hans-Joachim; and Zaschke, Horst, 4,626,375, Cl. 252-299.630.

Framatome & Cie.: *See—*
Lanzoni, Maurice, 4,625,554, Cl. 73-581.000.

Francescon, Paul K.: *See—*
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,625,801, Cl. 166-267.000.

Francois, Pierre: *See—*
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.

Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., to Metal Box Public Limited Company. Methods of making containers. 4,626,157, Cl. 413-1.000.

Frank, Andrew A., to Aisin Seiki Kabushiki Kaisha. Control system and method for a flywheel type power delivery system. 4,625,823, Cl. 180-165.000.

Frankel, Alfred R. Sweat collecting headband. 4,626,247, Cl. 604-312.000.

Franklin, William G.: *See—*
Curtis, Linden T.; Franklin, William G.; and Olds, John R., 4,625,437, Cl. 37-141.00R.

Franks, George J., Jr. Universal ground clamp. 4,626,051, Cl. 339-14.00R.

Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,625,856, Cl. 198-457.000.

Franz Kuhlmann Prazisionsmechanik und Maschinenbau GmbH & Co. Kg: *See—*
Eder, Hans, 4,625,410, Cl. 33-1.00M.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,625,651, Cl. 104-7.200.

Frayer, Robert W., Jr.; and Glover, Douglas, to Federal-Mogul Corporation. Method and apparatus for the measurement of bearing loads using a ductile wire insert. 4,625,567, Cl. 73-862.040.

Freedman, Saul E. Ice mug. 4,625,518, Cl. 62-1.000.

Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., to BASF Corporation. Functional fluids and concentrates containing associative polyether thickeners and certain metal dialkyldithiophosphates. 4,626,366, Cl. 252-32.70E.

Frey, Egon: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.

Fried, Jeffrey A., to GTE Laboratories Incorporated. Phase-lock loop including integrated circuit voltage controlled oscillator. 4,626,798, Cl. 331-1.00A.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Jachowski, Johannes; Klasing, Helmut; Blum, Josef; and Pant, Paul, 4,626,464, Cl. 428-212.000.

Friedl, Richard, to LGZ Landis & Gyr Zug AG. Active current sensor with primary reducing winding. 4,626,778, Cl. 324-127.000.

Friedmann, Oswald: *See—*
Maucher, Paul; Friedmann, Oswald; and Sonntag, Siegfried, 4,626,696, Cl. 290-38.00R.

Friedrich, Paul H.: *See—*
Zuelke, Robert D.; Friedrich, Paul H.; and Stites, David G., 4,626,099, Cl. 355-99.000.

Fritsche, Joel L.: *See—*
Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., 4,626,307, Cl. 156-218.000.

Fritschi, Edgar: *See—*
Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.

Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C. Dot matrix line printer. 4,625,638, Cl. 101-93.040.

Frohberger, Paul-Ernst: *See—*
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,626,595, Cl. 549-559.000.
Fruhauf, Waldemar, to Siemens Aktiengesellschaft. Demodulator for amplitude-modulated carrier frequency oscillations. 4,626,790, Cl. 329-101.000.
Fuchs, Otto, to Burroughs Corporation. Methods of attaching back-bar to slider. 4,625,393, Cl. 29-603.000.
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; and Klauke, Erich, to Bayer Aktiengesellschaft. Preparation of 4-fluoro-3-phenoxy-benzal-dehyde acetals and intermediates therefor. 4,626,601, Cl. 568-425.000.
Fuhrer, Jack S.: *See—*
Nortrup, Kevin E.; Beyers, Billy W., Jr.; and Fuhrer, Jack S., 4,626,892, Cl. 358-21.00R.
Fuhring, Heinrich, to Bowe Reinigungstechnik GmbH. Filter, especially for dry-cleaning machines. 4,626,351, Cl. 210-331.000.
Fuji Electric Co., Ltd.: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
Fuji Photo Film Co., Ltd.: *See—*
Ishikawa, Hiromi, 4,626,062, Cl. 350-3.710.
Kato, Masatoshi; and Kitaguchi, Hiroshi, 4,626,499, Cl. 430-559.000.
Kawamura, Keiichi, 4,626,910, Cl. 358-140.000.
Kitamoto, Tatsuji; Amari, Hiroshi; Nahara, Akira; Shirahata, Ryuji; and Arai, Yoshihiro, 4,626,315, Cl. 156-628.000.
Nagano, Masahiko, 4,626,928, Cl. 358-310.000.
Nishioka, Akira; Nakayama, Takao; and Takekoshi, Tomoaki, 4,626,484, Cl. 430-273.000.
Sakaguchi, Shinji, 4,626,495, Cl. 430-232.000.
Sato, Kozo; Kitaguchi, Hiroshi; and Hirai, Hiroyuki, 4,626,500, Cl. 430-617.000.
Shuto, Sadanobu; Hayashi, Yasuhiro; Fujita, Munehisa; and Hasebe, Kazunori, 4,626,498, Cl. 430-379.000.
Waki, Kokichi; and Karino, Yukio, 4,626,494, Cl. 430-213.000.
Yamaguchi, Nobutaka; Masuyama, Kenichi; Iida, Shinobu; and Fujiyama, Masaaki, 4,626,469, Cl. 428-323.000.
Fuji Photo Optical Co., Ltd.: *See—*
Saburo, Numata, 4,626,744, Cl. 315-57.000.
Suzuki, Masane; Shibamoto, Hiroshi; and Kanaya, Motonori, 4,625,724, Cl. 128-303.100.
Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, 4,625,714, Cl. 128-6.000.
Fuji Xerox Co., Ltd.: *See—*
Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., 4,626,485, Cl. 430-59.000.
Saitoh, Hiroyuki, 4,626,922, Cl. 358-282.000.
Fujii, Etsuo: *See—*
Takei, Akihiko; and Fujii, Etsuo, 4,626,045, Cl. 303-119.000.
Fujii, Tadashi, to Terumo Kabushiki Kaisha. Ultrasonic measurement method, and apparatus therefor. 4,625,555, Cl. 73-597.000.
Fujikura Ltd.: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.
Fujimori, Kyoichi: *See—*
Hiyama, Yasuhiro; and Fujimori, Kyoichi, 4,626,621, Cl. 178-18.000.
Fujioka, Takaaki: *See—*
Hosoi, Yoshihiro; and Fujioka, Takaaki, 4,626,479, Cl. 428-663.000.
Fujioka, Yoshiki; and Hirota, Mitsuhiko, to Fanuc Ltd. AC motor control system. 4,626,762, Cl. 318-809.000.
Fujisaki, Kiyonori; Kobayashi, Toshio; and Kato, Heihachi. Electric motor having Hall generators and control circuit. 4,626,752, Cl. 318-254.000.
Fujishiro, Chiaki; and Kominami, Mitsuhiro, to Minnesota Mining and Manufacturing Company. Diskette having wear-resistant magnetizable layer. 4,626,463, Cl. 428-143.000.
Fujita, Munehisa: *See—*
Shuto, Sadanobu; Hayashi, Yasuhiro; Fujita, Munehisa; and Hasebe, Kazunori, 4,626,498, Cl. 430-379.000.
Fujitsu Limited: *See—*
Arai, Shigeru; Shibata, Itaru; Minami, Akira; and Ogawa, Koichi, 4,627,040, Cl. 369-44.000.
Hamano, Toshio; Tachibana, Kaoru; and Aoki, Hideji, 4,626,960, Cl. 361-388.000.
Mori, Shosuke, 4,626,986, Cl. 364-200.000.
Nao, Manabu; and Hirota, Hisao, 4,625,870, Cl. 209-534.000.
Sawada, Shigetomo; and Hinobayashi, Takeo, 4,626,941, Cl. 360-97.000.
Shioya, Yoshimi; Maeda, Mamoru; Ohyama, Yasushi; and Takagi, Mikio, 4,625,678, Cl. 118-723.000.
Fujiwara, Keizo: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.
Fujiwara, Yoshito: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.
Fujiyama, Masaaki: *See—*
Yamaguchi, Nobutaka; Masuyama, Kenichi; Iida, Shinobu; and Fujiyama, Masaaki, 4,626,469, Cl. 428-323.000.
Fukasaku, Yoshinori; Noto, Kunihiro; and Takahashi, Reijiro, to Hitachi, Ltd. Cooling apparatus for motor means to protect commutator from dust and moisture in cooling air. 4,626,720, Cl. 310-62.000.
Fukuda, Shinichi; and Kojima, Yuichi, to Sony Corporation. Method and apparatus for encoding and decoding an NRZI digital signal with low DC component and minimum low frequency components. 4,626,826, Cl. 340-347.0DD.
Fukuda, Yukihiro: *See—*
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,625,589, Cl. 74-856.000.
Fukuhara, Hiroshige, to Nissan Motor Company, Limited. S/N ratio determining method and apparatus for a receiver. 4,627,103, Cl. 455-226.000.
Fukuhara, Masao, to Fukuhara Needle Company, Ltd. Knitting plate needle and its manufacturing method. 4,625,527, Cl. 66-123.000.
Fukuhara Needle Company, Ltd.: *See—*
Fukuhara, Masao, 4,625,527, Cl. 66-123.000.
Fukui, Hishao; Shinohara, Yutaka; and Tamura, Takashi, to Pentel Kabushiki Kaisha. Resilient writing nib with offset flattened portion. 4,626,120, Cl. 401-260.000.
Fukui, Kiyozumi, to Teijin Seiki Company Limited. Geared motor. 4,626,722, Cl. 310-82.000.
Fukui, Masami: *See—*
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,393, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,394, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,395, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,396, Cl. 264-65.000.
Fukui, Takeshi, to Tokai Electric Wire Company Limited. Harness assembling apparatus. 4,625,858, Cl. 198-465.100.
Fukunaga, Yukio: *See—*
Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,625,822, Cl. 180-140.000.
Fukuroi, Takeo; Takahashi, Kihei; and Inazawa, Keichi, to Yoshida Kogyo K. K. Hook-and-eye assembly. 4,625,370, Cl. 24-599.000.
Fukuzawa, Tetsuo: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.
Fuller Company: *See—*
Cohen, Sidney M., 4,626,198, Cl. 432-13.000.
Cohen, Sidney M., 4,626,200, Cl. 432-101.000.
Fulmer, John W.; and Kight, William D., to General Electric Company. Process for purifying acetone. 4,626,600, Cl. 568-411.000.
Funada, Takeo; Kawada, Nobuo; and Abe, Tatsuhiko, to Diesel Kiki Co., Ltd. Fuel injection valve. 4,625,918, Cl. 239-533.300.
Furnace Juko Kabushiki Kaisha: *See—*
Sakamoto, Hidesato, 4,626,203, Cl. 432-138.000.
Furrer, Jurgen; and Dillman, Hans-Georg, to Kernforschungszentrum Karlsruhe G.m.b.H. Apparatus for detecting iodine isotopes. 4,626,692, Cl. 250-432.00R.
Furtlehner, Jean-Pierre: *See—*
Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,627,088, Cl. 378-122.000.
Furukawa Electric Co., Ltd., The: *See—*
Uematsu, Tadayuki, 4,626,619, Cl. 174-106.0SC.
Furukawa, Kusuo: *See—*
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Furukawa, Tatsuya; and Horike, Masanori, to Ricoh Company, Ltd. Method of preventing unregistered printing in multi-nozzle ink jet printing. 4,626,867, Cl. 346-1.100.
Fushiya, Fusao; and Inoue, Nobuhiro, to Makita Electric Works, Ltd. Safety device for a portable chain saw. 4,625,406, Cl. 30-381.000.
Fushiya, Fusao; Hakamata, Nobuo; and Okumura, Michio, to Makita Electric Works, Ltd. Cordless electric finishing sander. 4,625,462, Cl. 51-170.0MT.
Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; and Tsuruoka, Yoshihisa, 4,626,741, Cl. 313-497.000.
Futagawa, Toshinobu. Optical retrieving system. 4,626,064, Cl. 350-96.100.
Futagawa, Toshinobu. Magnetic head. 4,626,945, Cl. 360-110.000.
Fuziwara, Osami: *See—*
Okuyama, Shigeaki; and Fuziwara, Osami, 4,626,993, Cl. 364-424.000.
GA Technologies Inc.: *See—*
Howanick, John J., 4,625,618, Cl. 89-8.000.
Gadkaree, Kishor P.: *See—*
Chyung, Kenneth; Gadkaree, Kishor P.; and Taylor, Mark P., 4,626,515, Cl. 501-32.000.
Gage, Douglas M., to Deere & Company. Vehicle steering and auxiliary function hydraulic circuit. 4,625,751, Cl. 137-118.000.
Gahara, Motohiro: *See—*
Wada, Eiichi; Gahara, Motohiro; and Tsubakishita, Hiroaki, 4,625,565, Cl. 73-861.740.
Gailus, Paul H., to Motorola, Inc. GaAs FET oscillator noise reduction circuit. 4,626,802, Cl. 331-117.0FE.
Gaiser, Robert F., to Allied Corporation. Brake booster. 4,625,516, Cl. 60-554.000.

Galasso, Francis S.: *See—*
Veltri, Richard D.; and Galasso, Francis S., 4,626,407, Cl. 419-18.000.
Gale, Edwin J.: *See—*
Valentine, Gordon A.; and Gale, Edwin J., 4,625,999, Cl. 285-24.000.
Galer, Herbert W. Safety closure for open head containers. 4,625,890, Cl. 220-319.000.
Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, to Intevep, S.A. Process for the conversion of heavy hydrocarbon feedstocks characterized by high molecular weight, low reactivity and high metal contents. 4,626,340, Cl. 208-89.000.
Gallay S.A.: *See—*
Le Bret, Lucien F., 4,626,158, Cl. 413-6.000.
Gallo, Mario; and Wirth, Johannes. Mass and force meter. 4,625,566, Cl. 73-862.380.
Galloway, Jimmie G., Jr., to Exxon Production Research Co. Method and apparatus for separating the components of a wellstream. 4,626,237, Cl. 494-37.000.
Galloway, Roy C.: *See—*
Bones, Roger J.; Teagle, David A.; Brooker, Steven D.; and Galloway, Roy C., 4,626,483, Cl. 429-50.000.
Gangnath, Robert B.; and Tudor, Nicolae, to Plus One, Inc. Device actuated by toilet flushing for dispensing deodorant. 4,625,342, Cl. 4-228.000.
Gann, Ronald A., to ITT Corporation. Direct spark ignition system. 4,626,193, Cl. 431-71.000.
Ganter, Wolfgang, to Gebruder Junghans GmbH. Wristwatch with seal. 4,626,108, Cl. 368-291.000.
Garcia, Juan: *See—*
Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, 4,626,340, Cl. 208-89.000.
Gardiner, David. Nail polisher. 4,625,741, Cl. 132-79.00B.
Gardner, Hugh C., to Union Carbide Corporation. Low shrinking thermosetting polyester resin compositions and a process for the preparation thereof. 4,626,570, Cl. 525-12.000.
Garg, Diwakar; and Sunder, Swaminathan, to Air Products and Chemicals, Inc. Catalytic coal liquefaction process. 4,626,342, Cl. 208-419.000.
Garman, Joseph M.: *See—*
Samuels, George J.; and Garman, Joseph M., 4,626,324, Cl. 204-43.100.
Garner, Charles C.: *See—*
Mankey, Harry S.; and Garner, Charles C., 4,625,944, Cl. 254-8.00R.
Garrard, Burdette; and Spector, George. Shoe shine box. 4,625,360, Cl. 15-265.000.
Gass, Dale L.: *See—*
Damiano, Michael A.; Gass, Dale L.; Kramer, Dennis M.; and Schmerda, Richard F., 4,626,954, Cl. 361-96.000.
Gatzweiler, Werner: *See—*
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Gauthier, Jeffry W., to Central Oklahoma Ambulance Trust. Bumper. 4,626,011, Cl. 293-120.000.
Gavin, Basil F., to United States of America, Energy. Liquid-film electron stripper. 4,626,691, Cl. 250-423.00R.
Gay, Michael J., to Motorola, Inc. Shift register stage. 4,627,081, Cl. 377-58.000.
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Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,627,088, Cl. 378-122.000.
Geary, Frederick J., to Robertshaw Controls Company. Primary gas furnace control. 4,626,192, Cl. 431-46.000.
Geary, James H.: *See—*
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Geberth, John D., Jr. Fluid swivel coupling. 4,626,004, Cl. 285-122.000.
Gebo, Russell E.: *See—*
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Gebruder Honsberg GmbH Sonderwerkzeugmaschinen und Sagenfabrik: *See—*
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GEC Avionics Limited: *See—*
Tooze, Michael J., 4,626,851, Cl. 340-975.000.
Gefitec S.A.: *See—*
Posso, Patrick P. P., 4,625,866, Cl. 206-400.000.
Gehant, Philippe M.: *See—*
Saint Julian, Raymond M.; Gehant, Philippe M.; Bertrand, Ivan G.; and Folliet, Michel H., 4,626,204, Cl. 432-222.000.
Gelco Grouting Service: *See—*
Waring, Stephen T., 4,626,133, Cl. 405-107.000.
General Aero Products Corp.: *See—*
Reiter, Eli; Robson, Joseph R.; and Latinski, Joseph W., 4,625,893, Cl. 221-67.000.
General Dynamics Corporation: *See—*
Pierson, Willis A.; Hill, James D.; and Otto, Vedon W., 4,626,856, Cl. 342-174.000.
General Dynamics Corporation, Electronics Division: *See—*
Tricoles, Gus P.; and Rope, Eugene L., 4,626,860, Cl. 342-442.000.
General Electric Company: *See—*
Barrows, Burton F., 4,626,013, Cl. 294-88.000.
Boutni, Omar M.; and Liu, Ping Y., 4,626,572, Cl. 525-67.000.
Butcher, James A.; and Padgett, Harold A., 4,626,755, Cl. 318-473.000.
Davenport, John M.; and von Herrmann, Pieter J., 4,626,745, Cl. 315-179.000.
Dulka, Catherine P.; and Komito, Evan H., 4,627,006, Cl. 364-527.000.
Ehlers, Raymond G., 4,626,848, Cl. 340-825.690.
Elder, James H., 4,626,796, Cl. 331-1.00A.
Fulmer, John W.; and Kight, William D., 4,626,600, Cl. 568-411.000.
Germer, Warren R., 4,627,000, Cl. 364-483.000.
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,626,698, Cl. 307-38.000.
Holm, John R., 4,626,803, Cl. 332-9.00R.
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King, James L.; and Shelton, Kerry B., 4,626,726, Cl. 310-91.000.
Miller, Kenneth F.; and Boutni, Omar M., 4,626,566, Cl. 524-490.000.
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General Foods Corporation: *See—*
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General Hospital Corporation, The: *See—*
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General Instrument Corporation: *See—*
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General Medical Products, Inc.: *See—*
Bauman, Jack, 4,625,611, Cl. 83-861.000.
General Motors Corporation: *See—*
Bergelt, Dieter, 4,625,939, Cl. 248-638.000.
Jamrog, Robert H., 4,625,698, Cl. 123-489.000.
Plyler, Robert G., 4,626,620, Cl. 174-153.00G.
Schmidt, Wilfried, 4,625,777, Cl. 141-286.000.
Suchdev, Jagan N.; and Dailey, Mark, 4,626,126, Cl. 403-353.000.
Taylor, Edward F., 4,626,391, Cl. 264-46.600.
Tobias, Jackie L.; Kline, Larry R.; and Moser, Ted O., 4,625,950, Cl. 266-200.000.
Tung, Randy W.; Fisher, Verner J., Jr.; Wilstermann, William D.; and Neale, Brian K., 4,626,019, Cl. 296-97.00H.
Wang, Chen-Shih; and Nelson, Darrel S., 4,626,642, Cl. 219-10.55M.
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Imazeki, Kazuyoshi, 4,626,857, Cl. 342-20.000.
Genevac Limited: *See—*
Cole, Michael, 4,626,176, Cl. 417-54.000.
Geneve, Francois: *See—*
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Gensheimer, Valentin: *See—*
Hartung, Winfried; and Gensheimer, Valentin, 4,625,568, Cl. 73-862.550.
Gentry, Thomas H.; and Mays, Robert W. Replacement flat roof insulation cover. 4,625,469, Cl. 52-3.000.
Georg Knoblauch, Firma: *See—*
Knoblauch, Georg, 4,625,863, Cl. 206-379.000.
George, John A. Flushing siphon. 4,625,752, Cl. 137-124.000.
George, Steven L., to International Business Machines Corporation. Instruction fetch look-aside buffer with loop mode control. 4,626,988, Cl. 364-200.000.
George, Thomas: *See—*
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Gepipari Technologiai Intezet: *See—*
Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl 299-16.000.
Gerardin, Jean-Pierre, to Electricite de France (Service National). Light detector having a photodiode with bias control. 4,626,676, Cl. 250-214.00R.
Gerfast, Sten R., to Minnesota Mining and Manufacturing Company. Method of making a recording disc. 4,625,384, Cl. 29-448.000.
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Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl. 299-16.000.
Gerhardt, Ralph A.; and Viaud, Jean, to Deere & Company. Press for forming cylindrical bales. 4,625,502, Cl. 56-341.000.
Gerkey, Kenneth S.: *See—*
Ahmed, Hassan J.; Gerkey, Kenneth S.; Miller, Thomas W.; and Wylie, Mark E., 4,625,396, Cl. 29-701.000.
Gerlach, Hans G., to U.S. Philips Corporation. Color display tube with electrostatic focusing lens. 4,626,738, Cl. 313-414.000.
Germer, Warren R., to General Electric Company. Apparatus and method for copying data from one electronic demand register to another. 4,627,000, Cl. 364-483.000.
Gerula, John M.: *See—*
Hickman, Ronald J.; and Gerula, John M., 4,626,636, Cl. 200-83.00P.
Gete, Henry: *See—*
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Gewerkschaft Eisenhutte Westfalia: *See—*
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.

Ghandehari, Mohammad H.: *See—*
Jost, John W.; and Ghandehari, Mohammad H., 4,626,329, Cl. 204-148.000.

Giancola, Dean L.; Kowalski, Craig D.; and Paetz, Frederic H., to Owens-Corning Fiberglas Corporation. Fibrous pack drying method and apparatus. 4,625,433, Cl. 34-23.000.

Gibson, Franklin E., to Donn Incorporated. Elevated floor panel with integral trim. 4,625,491, Cl. 52-794.000.

Giczewski, Norbert G., Jr.: *See—*
Kohler, Terry K.; Grube, William L.; and Giczewski, Norbert G., Jr., 4,625,385, Cl. 29-467.000.

Giebler, Fritz: *See—*
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Giesche, Ernst; Jung, Eggert; Meintz, Helma; and Roes, Christian, to Dr. Ing. Rudolf Hell GmbH. Method for point-by-point and line-by-line exposing of color images using two correction stages. 4,626,903, Cl. 358-80.000.

Giguere, Jean-Paul, to Donat Flamand Inc. Casing window. 4,625,479, Cl. 52-202.000.

Gilbert, Enid R., executrix: *See—*
Glew, David N.; McIntyre, John S.; and Gilbert, Jeffrey F., deceased, 4,626,131, Cl. 405-59.000.

Gilbert, Jeffrey F., deceased: *See—*
Glew, David N.; McIntyre, John S.; and Gilbert, Jeffrey F., deceased, 4,626,131, Cl. 405-59.000.

Gilbert, Noel. Shaping element for manhole opening and gasket. 4,625,976, Cl. 277-12.000.

Gilliland, James L., Jr.: *See—*
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W., 4,625,523, Cl. 62-193.000.

Giovanni, Gurioli: *See—*
Dapiran, Alirio; and Giovanni, Gurioli, 4,626,150, Cl. 409-199.000.

Glantz, Jerome J., to Lamb-Weston, Inc. Process for making skin-on potato boats. 4,626,438, Cl. 426-438.000.

Glasper, John L.; and Shanks, Ian A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Electronic display suitable for polar coordinate representations. 4,626,840, Cl. 340-752.000.

Gleason, Florence K., to University of Minnesota, The Regents of the. Cyanobacterin herbicide. 4,626,271, Cl. 71-66.000.

Gleason, Patricia A.; and Piccoline, Marie A., to National Starch and Chemical Corporation. Cationic acrylamide emulsion polymer brine thickeners. 4,626,363, Cl. 252-8.514.

Gleaves, John T.: *See—*
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Glenn, William E., to New York Institute of Technology. Solid state light modulator structure. 4,626,920, Cl. 358-234.000.

Glew, David N.; McIntyre, John S.; and Gilbert, Jeffrey F., deceased (by Gilbert, Enid R., executrix), to Dow Chemical Company, The. Underground liquid storage system and method. 4,626,131, Cl. 405-59.000.

Glomeau, J. Robert, to REXA Corporation. Controlled flow hydraulic system. 4,625,513, Cl. 60-431.000.

Glorioso, Charles A.: *See—*
Cool, John K.; Newbert, Edmund G., Jr.; and Glorioso, Charles A., 4,627,004, Cl. 364-521.000.

Glover, Douglas: *See—*
Frayer, Robert W., Jr.; and Glover, Douglas, 4,625,567, Cl. 73-862.040.

GNS-Gesellschaft fur Nuklear-Service mbH: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,626,380, Cl. 250-506.100.
Baatz, Henning; and Rittscher, Dieter, 4,626,402, Cl. 376-272.000.
Baatz, Henning; and Rittscher, Dieter, 4,626,414, Cl. 422-159.000.

Goba, John J.: *See—*
Davis, William H.; Goba, John J.; Riggs, Dean D.; Zeewy, Abraham; and Flint, Howard M., 4,626,669, Cl. 235-380.000.

Godec, Richard D.: *See—*
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Goel, Anil; Holehouse, Joseph; and Barnett, Kenneth, to Ashland Oil, Inc. Polyurethane pressure sensitive adhesives for bonding layered structures. 4,626,475, Cl. 428-423.100.

Goel, Anil B., to Ashland Oil, Inc. Pressure sensitive adhesives. 4,626,575, Cl. 525-329.500.

Goeller, Loretta D.: *See—*
Skovdal, Jorgen; and Goeller, Loretta D., 4,625,738, Cl. 132-9.000.

Goertzel, Gerald: *See—*
Anderson, Karen L.; Mintzer, Frederick C.; Goertzel, Gerald; and Mitchell, Joan L., 4,627,020, Cl. 364-900.000.

Goldberg Brothers, Inc.: *See—*
Urlik, Randall G., 4,625,930, Cl. 242-67.30R.

Golden Star, Inc.: *See—*
Gradinger, J. Gary; Quearry, Robert W.; Chalfant, Robert D.; and Wilson, Charles G., 4,626,035, Cl. 300-16.000.

Goldhammer, Albert, to Feinwerktechnik Schleicher & Co. Comminuting apparatus for sheet material or sheet material layers. 4,625,925, Cl. 241-236.000.

Golding, Peter: *See—*
Duffin, Henry C.; Golding, Peter; and Jaweera-Bandara, Asoka M., 4,626,606, Cl. 568-931.000.

Goldreyer, Ned. Scribe guide. 4,626,219, Cl. 434-162.000.

Goldstein, Edmund: *See—*
Bleiwas, Martin; and Goldstein, Edmund, 4,626,966, Cl. 362-35.000.

Gomez, Miguel, to AVM-Auto Equipamentos Lida. Device for disconnecting the wheels from a vehicle's optional drive. 4,625,846, Cl. 192-67.00R.

Gommel, Reinhard, to Andreas Stihl. Centrifugal clutch. 4,625,849, Cl. 192-105.0BA.

Goode, John T. Liner for tower silo and method of installing same. 4,625,478, Cl. 52-197.000.

Goodlander, Theodore J., to Cab-Tek, Inc. Computer printer housing. 4,626,048, Cl. 312-208.000.

Goodyear Tire & Rubber Company, The: *See—*
Brubaker, Ronald L.; and Calevich, Robert, 4,625,922, Cl. 241-17.000.
Casey, William R.; Loser, Robert P.; Smith, Michael W.; and Waibel, Terry J., 4,626,302, Cl. 156-133.000.

Gorbachev, Oleg S.; Ioffe, Anatoly F.; Kulagin, Mikhail V.; Ruvinsky, Boris I.; Khorin, Vladimir S.; and Chugunov, Jury V. Device for coupling cassette tape recorder to microcomputer. 4,626,935, Cl. 360-67.000.

Goss, John B., Sr, : *See—*
Wilson, George L.; and Goss, John B., Sr, , 4,625,754, Cl. 137-315.000.

Goth, Walter: *See—*
Bodecker, Kay; Goth, Walter; Scheurl, Robert; and Strasser, Hans-Erwin, 4,626,786, Cl. 324-449.000.

Goto, Nobutaka; and Ezawa, Nobuyasu, to Chlorine Engineers Corp., Ltd. Electrolytic cell employing fluidized bed. 4,626,331, Cl. 204-222.000.

Goto, Toshio: *See—*
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, 4,626,273, Cl. 71-92.000.

Gottfried Bischopp Bau Kompl. Gasreinigungs- und Wasseruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See—*
Stehning, Werner, 4,626,264, Cl. 55-213.000.

Goulette, Michael J.: *See—*
Meetham, Geoffrey W.; Goulette, Michael J.; and Arthey, Roger P., 4,626,297, Cl. 148-404.000.

Graap, Volker, deceased: *See—*
Hufnagel, Walter; Graap, Volker, deceased; von und zu Aufsess, Freidrich; and Armsen, Rotger, 4,625,372, Cl. 26-73.000.

Gradinger, J. Gary; Quearry, Robert W.; Chalfant, Robert D.; and Wilson, Charles G., to Golden Star, Inc. Apparatus for making mops. 4,626,035, Cl. 300-16.000.

Grady Allen Survey Consultants, Inc.: *See—*
Allen, Grady G., Jr., 4,625,804, Cl. 166-338.000.

Graham, Martin H.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.

Granchelli, Ralph S. Boat controller. 4,626,757, Cl. 318-588.000.

Grandi, Guido, to Eni-Ente Nazionale Idrocarburi. Plasmidic vectors for expressing in *bacillus subtilis* and a method of preparing them. 4,626,510, Cl. 435-317.000.

Grantham, Charles R. Combustion chamber for a commercial laundry dryer. 4,626,201, Cl. 432-105.000.

Grattoni, Paolo; and Barbato, Giulio, to Consiglio Nazionale Delle Ricerche. Procedure and apparatus for the survey of the impression made on a specimen in measuring the hardness at penetration. 4,627,096, Cl. 382-8.000.

Gravouia, Francis, Jr.; and Hebert, Henry. Floating wear bushing retriever apparatus. 4,625,381, Cl. 29-283.000.

Gray, Gary M., to J. T. Baker Chemical Company. Deep ultra-violet lithographic resist composition and process of using. 4,626,491, Cl. 430-190.000.

Gray, Kenneth; and Tucker, Albert, to Antex (Electronics) Limited. Electrically heated tool for soldering pipe connector sleeves. 4,626,658, Cl. 219-230.000.

Great Lakes Carbon Corporation: *See—*
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,626,333, Cl. 204-286.000.

Greaves, John; Wilson, Robert S.; and Smith, Edmund H., to Motion Analysis Systems, Inc. Water quality early warning system. 4,626,992, Cl. 364-418.000.

Green Cross Corporation: *See—*
Scherer, Kirby V., Jr.; Ono, Taizo; and Yamanouchi, Kouichi, 4,626,608, Cl. 570-134.000.

Green, James M.: *See—*
Witchey, Reinhold D.; and Green, James M., 4,625,988, Cl. 280-461.00A.

Green, Martin A.: *See—*
Wenham, Stuart R.; and Green, Martin A., 4,626,613, Cl. 136-255.000.

Gregg, Hans, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Apparatus for the transport of workpieces to and from a machine tool. 4,625,853, Cl. 198-345.000.

Greiler, Wolfgang, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Single-based, high-pressure discharge lamp and socket combination. 4,626,734, Cl. 313-51.000.

Grethlein, Hans E.; and Lynd, Lee H., to Dartmouth College, Trustees of. Distillation systems and methods. 4,626,321, Cl. 203-26.000.

Griffin, Gerald E. Lighted plumb bob. 4,625,428, Cl. 33-348.000.

Griffiths, James S. Live bait holder for surface fishing. 4,625,451, Cl. 43-44.400.

Grindstaff, Henry E.: *See—*
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,626,333, Cl. 204-286.000.

Grinn, James M.: *See—*
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,626,634, Cl. 379-28.000.

Grise, Frederick G. J., to Flexwatt Corporation. Electrical heating device. 4,626,664, Cl. 219-525.000.

Groezinger, John J.: *See—*
Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., 4,626,307, Cl. 156-218.000.

Groger, Klaus, to Dr. Ing. H.c.F. Porsche Aktiengesellschaft. Pivotal closing member. 4,625,943, Cl. 251-305.000.

Grollier, Jean F., to L'oreal. Oily compositions comprising a dermatological active principle, intended for the treatment of the scalp or skin. 4,626,529, Cl. 514-159.000.

Gros, Chester P., to Preparation Gold, Inc. Remedy for hemorrhoids. 4,626,433, Cl. 424-154.000.

Grososman, Udo: *See—*
Schiel, Christian; Flumig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, 4,625,376, Cl. 29-119.000.

Gross, Jurgen; and Sundermeier, Gunter, to Paul Hettich GmbH & Co. Cabinet unit with built-in refrigerator or the like. 4,626,049, Cl. 312-291.000.

Grotelueschen, James H.: *See—*
Mullen, William B., III; Grotelueschen, James H.; and Henschel, Robert, 4,626,309, Cl. 156-289.000.

Group Lotus Public Limited Company: *See—*
Williams, David A.; and Wright, Peter G., 4,625,993, Cl. 280-707.000.

Groves, Oliver J.: *See—*
Oakley, David J.; Groves, Oliver J.; and Kaiser, Bruce J., 4,626,401, Cl. 376-245.000.

Grube, William L.: *See—*
Kohler, Terry K.; Grube, William L.; and Giczewski, Norbert G., Jr., 4,625,385, Cl. 29-467.000.

Grumman Aerospace Corporation: *See—*
Aleck, Benjamin J., 4,625,537, Cl. 72-367.000.

GTE Communication Systems Corporation: *See—*
Premoli, Giacomo; and Cannalire, Giacomo, 4,626,629, Cl. 379-386.000.

GTE Laboratories Incorporated: *See—*
Fried, Jeffrey A., 4,626,798, Cl. 331-1.00A.

GTE Products Corporation: *See—*
Kim, Tai K.; and McClintic, Robert P., 4,626,424, Cl. 423-593.000.
Morris, Merle E.; and Senft, Stephen P., 4,626,735, Cl. 313-275.000.
Ritsko, Joseph E.; and Acla, Howard L., 4,626,422, Cl. 423-344.000.
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, [illegible]el J., 4,626,425, Cl. 423-593.000.
Vanderpool, Clarence D.; [illegible]Innis, Martin B.; and Ladd, Judith A., 4,626,280, Cl. 75-101.00R.

GTE Valeron Corporation: *See—*
Cusack, Robert F., 4,625,417, Cl. 33-169.00R.
Malaker, John; and Bernadic, Thomas J., 4,626,141, Cl. 407-114.000.
Zweekly, Raymond; and Lowe, Tony M., 4,626,140, Cl. 407-114.000.

Gueuret, Francois: *See—*
Despax, Damien M.; Martin, Jean-Pierre H.; and Gueuret, Francois, 4,625,795, Cl. 166-66.000.

Guibert, Raul, to Sunset Ltd. Hot air oven for food-loaded cartridges. 4,625,867, Cl. 206-499.000.

Gulton Industries, Inc.: *See—*
Schuessler, Richard C., 4,626,871, Cl. 346-76.0PH.

Gunda, Rajamouli; and Rode, Melvin A., to Vickers, Incorporated. Power transmission. 4,625,622, Cl. 91-36.000.

Gundel, Norman L.: *See—*
Snyder, David E.; and Gundel, Norman L., 4,625,764, Cl. 137-625.660.

Gunderson, Richard H., to Exxon Production Research Co. Pressure balanced buoyant tether for subsea use. 4,626,136, Cl. 405-224.000.

Gundner, Hans M.; and Hess, Kurt, to International Standard Electric Corporation. Demultiplexing photodiode sensitive to plural wavelength bands. 4,626,675, Cl. 250-211.00J.

Gupta, Jyoti: *See—*
Gupta, Vijai P.; and Gupta, Jyoti, 4,626,965, Cl. 362-33.000.

Gupta, Vijai P.; and Gupta, Jyoti. Illumination system for a visual display terminal. 4,626,955, Cl. 362-33.000.

Gurumurthy, Kadagattor V., to RCA Corporation. Chroma burst derived clock regenerator for teletext decoder. 4,626,913, Cl. 358-147.000.

Gustafson, Keith W. Container for receiving, storing, and dispensing cryogenic fluids. 4,625,753, Cl. 137-202.000.

Gvoich, William; and Rogers, John B. Fluid type abductor-adductor exercise device. 4,625,960, Cl. 272-130.000.

Haas, Franz, Jr.: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,625,856, Cl. 198-457.000.

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Device for deflecting filled wafer slices arranged in juxtaposed rows and advanced in the direction of said rows. 4,625,856, Cl. 198-457.000.

Haas, Johann: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,625,856, Cl. 198-457.000.

Hasse, Gregory W. Lantern stand. 4,625,937, Cl. 248-545.000.

Habermann, Helmut; Brunet, Maurice; and Tassel, Andre , to Societe Europeenne de Propulsion. Method and device for reducing the vibrations of rotating machines equipped with an active magnetic suspension. 4,626,754, Cl. 318-460.000.

Hache, Jean-Claude: *See—*
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.

Hack, Joachim; Schulze-Berge, Klaus; and Birkenmeier, Klaus, to BASF Aktiengesellschaft. Positioning device for scanning means in a disk drive unit. 4,626,944, Cl. 360-106.000.

Hadden, Edward L., Sr., to Sine Products Company. Flexible support and carrier assembly. 4,625,936, Cl. 248-544.000.

Haecker, Walter; Nemenz, Andreas-Uwe; and Weiner, Hans, to Dr. Ing. H.c.F. Porsche Aktiengesellschaft. Power operated closure for vehicle roof opening. 4,626,025, Cl. 296-218.000.

Hagemeister, Klaus; and Hueber, Alfred, to MTU. Self-acting seal between adjacent pipe ends of a pressure vessel. 4,626,002, Cl. 285-95.000.

Hagiwara, Michiki: *See—*
Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, 4,626,295, Cl. 148-127.000.

Hagiwara, Teruhiko, to Shell Oil Company. Focused very high frequency induction logging. 4,626,785, Cl. 324-339.000.

Hagyuda, Nobuyoshi: *See—*
Matsui, Hideki; and Hagyuda, Nobuyoshi, 4,626,093, Cl. 354-415.000.

Hakamata, Nobuo: *See—*
Fushiya, Fusao; Hakamata, Nobuo; and Okumura, Michio, 4,625,462, Cl. 51-170.0MT.

Hakuraku, Yoshinori; and Ogata, Hisanao, to Hitachi, Ltd. Rotary magnetic refrigerator. 4,625,519, Cl. 62-3.000.

Hale, Thomas K.: *See—*
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., 4,625,721, Cl. 128-201.280.

Halfpenny, Paul F., to Lockheed Corporation. Device for coupling fire extinguishers to closed-off compartments. 4,625,808, Cl. 169-30.000.

Halgas, Chester J., to RCA Corporation. Automated system for sealing a mount in a cathode-ray tube. 4,626,269, Cl. 65-162.000.

Hall, Arthur B., to TP Orthodontics, Inc. Positioning jig for edgewise bracket. 4,626,208, Cl. 433-3.000.

Hall, Belton E. Reverse osmosis water purification system for use in limited water supply installations. 4,626,346, Cl. 210-110.000.

Hall, Steven E., to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane substituted prostaglandin compounds useful in the treatment of thrombotic disease. 4,626,548, Cl. 514-469.000.

Halton Oy: *See—*
Aalto, Arvo; Aalto, Erkki; Hasa , Juhani; Penttila , Markku; Saukkonen, Harri; and Tolmunen, Arvi, 4,625,626, Cl. 98-1.000.

Hamada, Minoru: *See—*
Rai, Yasuki; Kitamura, Yuji; and Hamada, Minoru, 4,627,027, Cl. 365-45.000.

Hamano, Eizaburo: *See—*
Takenaka, Shigeo; Hamano, Eizaburo; and Kamohara, Eiji, 4,626,737, Cl. 313-402.000.

Hamano, Toshio; Tachibana, Kaoru; and Aoki, Hideji, to Fujitsu Limited. Semiconductor device having soldered bond between base and cap thereof. 4,626,960, Cl. 361-388.000.

Hamatani, Tohru, to Hi-Tec Seiko Company Ltd. Sheet separating device. 4,625,953, Cl. 271-1.000.

Hamazaki, Koji. Wig attaching member. 4,625,739, Cl. 132-54.000.

Hamey, Oliver R. Female standing urination aid. 4,626,249, Cl. 604-329.000.

Hamlen, Robert P.; and Connolly, Peter F., to Alupower, Inc. Metal-/air batteries. 4,626,482, Cl. 429-27.000.

Hammer, Floyd V.; and Harper, Brian, to Hammer, Floyd V. Method and machine for forming articles from a plastic material. 4,626,189, Cl. 425-146.000.

Hammer, Gregory V.: *See—*
Shah, Dhiren N.; Domet, Jack; and Hammer, Gregory V., 4,626,287, Cl. 106-197.100.

Hammermann, Joachim, to Pfaff Haushaltmaschinen GmbH. Sewing machine with a step motor for feed control. 4,625,667, Cl. 112-456.000.

Hammond, Philip G., to Kimberly-Clark Corporation. Scarfing apparatus. 4,626,184, Cl. 425-83.100.

Hampel, Viktor E. Temporary/portable nuclear fallout shelter. 4,625,468, Cl. 52-2.000.

Hanchett Entry Systems, Inc.: *See—*
Hanchett, Leland J., Jr.; and Lawrence, Mark A., 4,626,010, Cl. 292-341.160.

Hanchett, Leland J., Jr.; and Lawrence, Mark A., to Hanchett Entry Systems, Inc. Concealed door release mechanism. 4,626,010, Cl. 292-341.160.

Hancox, Roger J.: *See—*
Hill, Richard C.; and Hancox, Roger J., 4,625,442, Cl. 42-1.120.

Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Splitter and blade guard assembly. 4,625,604, Cl. 83-102.100.

Hane, Toshioki; and Ohmura, Jukichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane of a fluorocarbon polymer and a process for preparing the same. 4,626,553, Cl. 521-27.000.

Hanscom, Bradford E., to Fortel, Inc. Dual line adapter for telephone answering machine. 4,626,631, Cl. 379-165.000.

Happycard International Limited: *See*—
Ostermeier, Heinrich, 4,626,091, Cl. 354-75.000.

Hara, Kenichiro; and Nakamura, Shizuo, to Kabushiki Kaisha Kawai Gakki Seisakusho. Support apparatus for sound members of musical instrument. 4,625,617, Cl. 84-404.000.

Hara, Masato; Niiho, Masaaki; Takasugi, Eiji; and Honda, Ryouji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Angle measuring device. 4,626,682, Cl. 250-231.0SE.

Hara, Nobuyuki, to Sony Corporation. Loading apparatus for a disc. 4,627,042, Cl. 369-77.100.

Hara, Seiji: *See*—
Awane, Misao; Suda, Yorishige; Hara, Seiji; and Kobayashi, Satoshi, 4,627,056, Cl. 371-16.000.

Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, to Canon Kabushiki Kaisha. Apparatus for liquid-jet recording wherein a potential is applied to the liquid. 4,626,875, Cl. 346-140.00R.

Harada, Hiraku: *See*—
Wakayama, Katsuhiko; and Harada, Hiraku, 4,626,370, Cl. 252-62.520.

Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, to Nishimu Electronics Industries Co., Ltd. Power conversion device for solar cell. 4,626,983, Cl. 363-132.000.

Harada, Mithuhiro; and Saita, Kenji, to Sumitomo Chemical Company, Limited. Hollow structure panel for heat storage material and process for producing heat storage material panel using the same. 4,625,710, Cl. 126-430.000.

Harada, Naoki: *See*—
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.

Harada, Susumu, to Nitto Boseki Co., Ltd. Process for preparing a solution of poly(allylamine). 4,626,577, Cl. 525-369.000.

Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Kawabe, Ushio, to Hitachi, Ltd. Rectifying circuit comprising a superconductive device. 4,626,701, Cl. 307-245.000.

Harara, Mitsuhiko: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.

Harbour, John, to TRW Probe Electronics Co. Ltd. Strain gauge assemblies. 4,626,041, Cl. 303-100.000.

Hargis, Duane C., to Ethyl Corporation. Gem cyclodialkylation of amines and amides. 4,626,592, Cl. 546-192.000.

Harker, Garth L. Crutch. 4,625,743, Cl. 135-68.000.

Harlow, Delmont E. Method and apparatus for recovery of water-immiscible liquids from water-bearing formations. 4,625,807, Cl. 166-370.000.

Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., to General Electric Company. Zero crossing synchronous AC switching circuits employing piezoceramic bender-type switching devices. 4,626,698, Cl. 307-38.000.

Harper, Brian: *See*—
Hammer, Floyd V.; and Harper, Brian, 4,626,189, Cl. 425-146.000.

Harper-Wyman Company: *See*—
Stohrer, Charles E., Jr., 4,626,196, Cl. 431-264.000.

Harris Corporation: *See*—
Mefford, Joseph P., 4,626,787, Cl. 328-14.000.
Risher, Ted H.; and Wolfe, Glenn F., 4,626,804, Cl. 333-22.00R.

Harris, Gerald. Bipod for a firearm. 4,625,620, Cl. 89-37.040.

Harris, Jesse W.; and Lutich, Louis L. Rock ditcher. 4,626,032, Cl. 299-36.000.

Harris, Robert W.; and Weber, William R. Gate operating mechanism. 4,625,455, Cl. 49-281.000.

Harrison, Brian; and Davis, Ronald E., to Canada, Her Majesty the Queen in Right of, represented by Minister of National Defence. Connector. 4,626,122, Cl. 403-51.000.

Hart, William: *See*—
Benson, John T.; Hart, William; and Stratman, Jerome F., 4,626,224, Cl. 446-297.000.

Hartenstein, Johannes: *See*—
Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.

Hartley, D. Wayne. Ladder support member. 4,625,832, Cl. 182-172.000.

Hartung, Winfried; and Gensheimer, Valentin, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. System for measuring the engagement pressure between cylinders of a printing press. 4,625,568, Cl. 73-862.550.

Harvey, Keith B.; Litke, Cynthia D.; and Porth, Robert J., to Atomic Energy of Canada Limited. Joule melter for the processing of radioactive wastes. 4,627,069, Cl. 373-29.000.

Harwig, Hendrik A.: *See*—
Pelgrom, Marcellinus J. M.; Harwig, Hendrik A.; and Slotboom, Jan W., 4,627,082, Cl. 377-60.000.

Harwood, Leopold A.; and Wargo, Robert A., to RCA Corporation. Signal filtering system having adaptively cascaded filter stages for developing a variable bandwidth frequency characteristic. 4,626,894, Cl. 358-31.000.

Harwood, Michael E.: *See*—
Carroll, Michael W.; and Harwood, Michael E., 4,625,630, Cl. 98-42.220.

Hasa , Juhani: *See*—
Aalto, Arvo; Aalto, Erkki; Hasa , Juhani; Penttila , Markku; Saukkonen, Harri; and Tolmunen, Arvi, 4,625,626, Cl. 98-1.000.

Haschek, Friedrich: *See*—
Moritz, Werner; and Haschek, Friedrich, 4,625,507, Cl. 59-78.100.

Hase, Hiroyuki: *See*—
Yamashita, Ichiro; Hase, Hiroyuki; and Ise, Yukihiko, 4,625,562, Cl. 73-728.000.

Hasebe, Kazunori: *See*—
Shuto, Sadanobu; Hayashi, Yasuhiro; Fujita, Munehisa; and Hasebe, Kazunori, 4,626,498, Cl. 430-379.000.

Hasegawa, Akinori: *See*—
Morishita, Akira; Nakagawa, Taiichi; and Hasegawa, Akinori, 4,626,724, Cl. 310-88.000.

Hasegawa, Masuo, to Nissan Shatai Company, Limited. Automotive roof structure with a detachable set roof. 4,626,026, Cl. 296-218.000.

Hashimoto, Shintaro; and Saiji, Mitsuhiro, to Sharp Kabushiki Kaisha. Word information retrieval system using video storage medium. 4,627,023, Cl. 364-900.000.

Hashimoto, Shintaro; and Yoshida, Hideo, to Sharp Kabushiki Kaisha. One-chip LSI speech synthesizer. 4,627,093, Cl. 381-51.000.

Hassanzadeh, Hedayat H.; and McClung, Guy L., III, to Weatherford U.S., Inc. Auto-fill flow valve. 4,625,762, Cl. 137-624.270.

Hatamura, Koichi; and Asanomi, Koji, to Mazda Motor Corporation. Intake arrangement for internal combustion engine. 4,625,687, Cl. 123-52.00M.

Hatsutta, Susumu; and Ikisu, Yasuji, to Mitsubishi Motors Corp.; and Tachikawa Spring Co., Ltd. Seat for vehicles. 4,626,028, Cl. 297-289.000.

Hattori, Takashi: *See*—
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,625,699, Cl. 123-489.000.

Hauck, Edward L., to Intelligent Storage Inc. Data compression using run length encoding and statistical encoding. 4,626,829, Cl. 340-347.0DD.

Hauni-Werke Korber & Co. KG.: *See*—
Obstfelder, Gunther, 4,626,044, Cl. 303-116.000.

Haushalter, Robert C., to United States of America, Energy. Synthesis of new amorphous metallic spin glasses. 4,626,296, Cl. 148-403.000.

Hausmann, Heinz; Schmidt, Robert R.; and Voege, Herbert, to Bayer Aktiengesellschaft. Herbicidal agents. 4,626,274, Cl. 71-93.000.

Haussler, Hubert: *See*—
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,625,756, Cl. 137-491.000.

Haveman, David L.; and Powell, John C., to National Steel Corporation. Method and apparatus for controlling the level of liquid metal in a continuous casting mold. 4,625,787, Cl. 164-453.000.

Hayashi, Eisaku: *See*—
Sukahara, Yusuke; Takeuchi, Eiji; and Hayashi, Eisaku, 4,625,556, Cl. 73-602.000.

Hayashi, Keiichiro. Garment rack. 4,625,873, Cl. 211-119.000.

Hayashi, Kiyoshi: *See*—
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, 4,626,758, Cl. 318-603.000.

Hayashi, Shigeru: *See*—
Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, 4,626,565, Cl. 524-423.000.

Hayashi, Tsutomu; and Inoue, Hidehiko, to Honda Giken Kogyo Kabushiki Kaisha. Fluid brake system for a motorcycle. 4,626,038, Cl. 303-6.00C.

Hayashi, Yasuhiro: *See*—
Shuto, Sadanobu; Hayashi, Yasuhiro; Fujita, Munehisa; and Hasebe, Kazunori, 4,626,498, Cl. 430-379.000.

Hayashi, Yoshiro: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, 4,626,410, Cl. 420-590.000.

Hayes, Thomas E.; Jamieson, J. Scott; and Spense, Scott L., to Johnson Service Company. Differential pressure control apparatus. 4,626,681, Cl. 250-231.00P.

Hays, Auda K., to United States of America, Energy. Plasma deposition of amorphous metal alloys. 4,626,448, Cl. 427-39.000.

Hazard, Robert E., to Polytop Corporation. Dispensing closure employing living hinge with cams to momentarily deform hinge and recesses to accept cams. 4,625,898, Cl. 222-517.000.

Head, Manley J.; Smith, William C.; and Pepmiller, Paul E., to Rockwell International Corporation. Distortion analyzer for quadrature demodulated data. 4,627,071, Cl. 375-10.000.

Hearn, Jay A.; and Hearn, John E. Pry bar wedge member. 4,625,945, Cl. 254-25.000.

Hearn, John E.: *See*—
Hearn, Jay A.; and Hearn, John E., 4,625,945, Cl. 254-25.000.

Hebert, Henry: *See*—
Gravouia, Francis, Jr.; and Hebert, Henry, 4,625,381, Cl. 29-283.000.

Heeger, Alan J.: *See*—
Wudl, Fred; Heeger, Alan J.; and Dirk, Carl W., 4,626,586, Cl. 528-374.000.

Heidelberger Druckmaschinen AG: *See*—
Arendt, Franz, 4,626,098, Cl. 355-85.000.

Heilweil, Israel J.: *See*—
Dickert, Joseph J., Jr.; and Heilweil, Israel J., 4,626,362, Cl. 252-8.510.

Heimbuch, Alvin H.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,626,593, Cl. 546-339.000.

Heimerl, Wilfried: *See*—
Stritzke, Detlef; Ewest, Eckhart; and Heimerl, Wilfried, 4,626,382, Cl. 252-629.000.

Heindke, Armin: *See*—
Dyma, Horst; Bommersheim, Hans; Becker, Otto; and Heindke, Armin, 4,625,958, Cl. 271-274.000.

Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile: *See*—
Fischbach, Wolfgang, 4,625,361, Cl. 16-114.00A.

Heinzen, Ralph. Towable transplanter. 4,625,662, Cl. 111-2.000.

Helasuo, Kalevi; and Ala-Jokimaki, Antero, to Oy Airam Ab Kometa. Percussive drill rod system. 4,625,814, Cl. 175-57.000.

Hellmer, Ernest W., to Continental Plastic Containers. Retention mechanism for a split mold carrier and cam for actuating the same. 4,626,190, Cl. 425-539.000.

Hemmi, Saburo; and Sato, Isao, to 501 Sinano Electric Co., Ltd. Crimp cutter blade. 4,625,534, Cl. 72-326.000.

Henke Manufacturing Corporation: *See*—
Witchey, Reinhold D.; and Green, James M., 4,625,988, Cl. 280-461.00A.

Henke, Mitchell C., to Lincoln Manufacturing Company, Inc. Air delivery system for an impingement food preparation oven. 4,626,661, Cl. 219-400.000.

Henkel Corporation: *See*—
Virnig, Michael J.; Clark, James P.; and DiDomenico, Edward D., 4,626,582, Cl. 526-298.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Bodecker, Kay; Goth, Walter; Scheurl, Robert; and Strasser, Hans-Erwin, 4,626,786, Cl. 324-449.000.
Ritter, Wolfgang, 4,626,310, Cl. 156-307.300.
Sustmann, Scarlet, 4,626,238, Cl. 604-15.000.

Henningsson, Goran, to Ludwig Svensson International B.V. Curtain fabrics for greenhouses and shade halls. 4,626,465, Cl. 428-225.000.

Hennion, Claude: *See*—
Lewiner, Jacques; and Hennion, Claude, 4,626,729, Cl. 310-324.000.

Henry, William E., to Phillips Petroleum Company. Magnetic shielding and magnetically shielded borehole core drilling. 4,625,573, Cl. 73-864.440.

Henschel, Robert: *See*—
Mullen, William B., III; Grotelueschen, James H.; and Henschel, Robert, 4,626,309, Cl. 156-289.000.

Hensing, Johannes M. M.; and Munnig Schmidt, Robert H., to U.S. Philips Corporation. Pivotably oscillating motor having simple armature pole elements. 4,626,717, Cl. 310-36.000.

Hepler, Edward L.: *See*—
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Schan, Edward P., Jr., 4,626,634, Cl. 379-28.000.

Hercules Incorporated: *See*—
Hostetter, Barry J., 4,626,467, Cl. 428-288.000.

Heritage, Robert C., to Intalite International N.V. Openwork screen assembly. 4,625,470, Cl. 52-28.000.

Hermes Precisa International S.A.: *See*—
Dumusc, Pierre, 4,626,117, Cl. 400-716.000.

Hernandez, Jorge M.: *See*—
Lockard, Steven C.; Hyslop, Michael S.; and Hernandez, Jorge M., 4,626,958, Cl. 361-306.000.

Hernandez, Robert D., to Komfort Karrier, Inc. Carrier pocket. 4,625,340, Cl. 2-247.000.

Herndon, William H., to Fairchild Camera and Instrument Corporation. Memory cell power scavenging apparatus and method. 4,627,034, Cl. 365-226.000.

Herrmann, Manfred: *See*—
Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.

Hertzenberg, Elliot P., to PQ Corporation. Zeolite for personal care products. 4,626,550, Cl. 514-770.000.

Hesch, Harold E.; and Diluigi, Michael W., to Pullman Standard Inc. Trailer hitch with elastomer in shear cushioning. 4,626,154, Cl. 410-56.000.

Hess, Kurt: *See*—
Gundner, Hans M.; and Hess, Kurt, 4,626,675, Cl. 250-211.00J.

Hesse, Norbert: *See*—
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.

Hewlett Packard Company: *See*—
Bloomquist, Darrel R.; Natarajan, Bangalore R.; and Opfer, James E., 4,626,336, Cl. 204-298.000.

Heymann, Andreas: *See*—
Hohlfeld, Rainer; Schwerin, Ralph; Kader, Hans; and Heymann, Andreas, 4,627,107, Cl. 455-11.000.

Hi-Hwa Yuan, Herbert; Swanson, Benjamin F.; and Stapleton, Robert G., to Shell Oil Company. Determining saturation and permeability using mercury capillary pressure curves. 4,625,544, Cl. 73-38.000.

Hi-Tec Seiko Company Ltd.: *See*—
Hamatani, Tohru, 4,625,953, Cl. 271-1.000.

Hickman, Ronald J.; and Gerula, John M., to Stewart-Warner Corporation. Pressure operated switch assembly with external pressure control. 4,626,636, Cl. 200-83.00P.

Hicks, Roy L.: *See*—
Dang, Hiep D.; Hicks, Roy L.; and Leathers, Joel F. M., 4,625,440, Cl. 38-102.500.

Hideg, Janos: *See*—
Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , 4,625,732, Cl. 128-670.000.

Hieda, Kazuo: *See*—
Saito, Teruo; and Hieda, Kazuo, 4,626,564, Cl. 524-413.000.

Higano, Yoshiharu: *See*—
Hori, Takeshi; Higano, Yoshiharu; Shirai, Toshio; and Naganuma, Toru, 4,626,931, Cl. 360-16.000.

Higgins, Larry, to Leggett & Platt, Incorporated. Bedding coil spring unit and assembly method. 4,625,349, Cl. 5-248.000.

High Tech Homes, Inc.: *See*—
Oboler, Leonard, 4,625,484, Cl. 52-251.000.

Hihara, Toshio: *See*—
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; and Shimizu, Yukiharu, 4,626,590, Cl. 534-635.000.

Hijikata, Kenji: *See*—
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,626,371, Cl. 252-62.540.

Hiles, Andrew G.; and Logsdon, John E., to Davy McKee (London) Limited. Hydrogenation process. 4,626,604, Cl. 568-881.000.

Hilgers, John L., to Centralab, Inc. Device for programmable thick film networks. 4,626,818, Cl. 337-166.000.

Hill, Frank A.: *See*—
Szeto, Kenneth H.; and Hill, Frank A., 4,626,843, Cl. 340-825.500.

Hill, James D.: *See*—
Pierson, Willis A.; Hill, James D.; and Otto, Vedon W., 4,626,856, Cl. 342-174.000.

Hill, Keith E.: *See*—
Schmid, Steven L.; Fickle, J. Clark; and Hill, Keith E., 4,625,826, Cl. 180-315.000.

Hill, Richard C.; and Hancox, Roger J. Cattle stunning gun. 4,625,642, Cl. 42-1.120.

Hill, Robert V. Bedding product for animals and method of making same. 4,625,679, Cl. 119-1.000.

Hilti Aktiengesellschaft: *See*—
Neumaier, Anton, 4,626,146, Cl. 408-239.00R.

Hilton, Derrick E., to BOC Limited. Shielding gas for electric arc welding. 4,626,646, Cl. 219-74.000.

Himeno, Kiyoshi: *See*—
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; and Shimizu, Yukiharu, 4,626,590, Cl. 534-635.000.

Hinobayashi, Takeo: *See*—
Sawada, Shigetomo; and Hinobayashi, Takeo, 4,626,941, Cl. 360-97.000.

Hinsberg, Rene ; and Poschner, Markus, to Bayerische Motoren Werke AG. Spoke wheel. 4,626,036, Cl. 301-58.000.

Hirai, Hiroyuki: *See*—
Sato, Kozo; Kitaguchi, Hiroshi; and Hirai, Hiroyuki, 4,626,500, Cl. 430-617.000.

Hirai, Tadaaki: *See*—
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.

Hirai, Yutaka; Echizen, Hiroshi; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, to Canon Kabushiki Kaisha. Method for forming deposition film. 4,626,449, Cl. 427-53.100.

Hiraki, Kazuhiro: *See*—
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, 4,626,942, Cl. 360-97.000.

Hiraoka, Yasunori, to Olympus Optical Co. Ltd. Instrument incorporated in a resectoscope. 4,625,713, Cl. 128-4.000.

Hirasawa, Shinichi: *See*—
Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, 4,626,875, Cl. 346-140.00R.

Hiros, Laszlo : *See*—
Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , 4,625,732, Cl. 128-670.000.

Hirota, Akira; Tsushima, Takuya; and Suzuki, Nobuyoshi, to Victor Company of Japan, Ltd. Recording and reproducing apparatus for recording and reproducing a carrier chrominance signal with pre-emphasis and de-emphasis. 4,626,927, Cl. 358-310.000.

Hirota, Akira: *See*—
Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, 4,626,934, Cl. 360-66.000.

Hirota, Hisao: *See*—
Nao, Manabu; and Hirota, Hisao, 4,625,870, Cl. 209-534.000.

Hirota, Mitsuhiko: *See*—
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,626,762, Cl. 318-809.000.

Hirozawa, Stanley T.: *See*—
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,626,366, Cl. 252-32.70E.

Hirschfeld, Tomas B., to University of California, The Regents of the. Remote multi-position information gathering system and method. 4,626,693, Cl. 250-458.100.

Hirsh Company: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,625,604, Cl. 83-102.100.

Hisano, Katsukuni: *See*—
Sato, Takeshi; Uenishi, Akira; Yasugahira, Norio; and Hisano, Katsukuni, 4,626,174, Cl. 416-223.00A.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Soma, Masahiro; Atago, Takeshi; and Kido, Takayuki, 4,625,919, Cl. 239-585.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Ichiyama, Shuichi; Aoyagi, Yukio; and Yasuda, Tomohiko, 4,627,013, Cl. 364-567.000.

Hitachi, Ltd.: *See*—
Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, 4,626,976, Cl. 363-19.000.

Achiha, Masahiko, 4,626,891, Cl. 358-21.00R.
Arita, Setsuo; and Ohkido, Fumiyasu, 4,626,707, Cl. 307-355.000.
Fukasaku, Yoshinori; Noto, Kunihiro; and Takahashi, Reijiro, 4,626,720, Cl. 310-62.000.
Hakuraku, Yoshinori; and Ogata, Hisanao, 4,625,519, Cl. 62-3.000.
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Kawabe, Ushio, 4,626,701, Cl. 307-245.000.
Inoue, Fumio; and Jitsukata, Hiroshi, 4,626,900, Cl. 358-67.000.
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.
Kashimura, Yuichi; and Sugiura, Noboru, 4,625,692, Cl. 123-425.000.
Kato, Yasuo; Watanabe, Yoshio; and Murayama, Seiichi, 4,627,086, Cl. 378-119.000.
Kimura, Takashi; Tanaka, Hiromi; and Omori, Masayoshi, 4,625,524, Cl. 62-278.000.
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; and Ihara, Hirokazu, 4,627,055, Cl. 371-16.000.
Morooka, Yasuo, 4,625,536, Cl. 72-249.000.
Nagano, Takahiro; Yatsuo, Tsutomu; Oikawa, Saburo; and Horie, Akira, 4,626,888, Cl. 357-38.000.
Nakata, Yukio; Shiotsu, Osamu; Morito, Motoyoshi; and Suda, Kaoru, 4,626,789, Cl. 329-50.000.
Okada, Kenichi; Asao, Hiroshi; and Yonemura, Hideo, 4,625,533, Cl. 72-302.000.
Sato, Masanori; Nagahara, Shusaku; and Takahashi, Kenji, 4,626,897, Cl. 358-44.000.
Sato, Takeshi; Uenishi, Akira; Yasugahira, Norio; and Hisano, Katsukuni, 4,626,174, Cl. 416-223.00A.
Soma, Masahiro; Atago, Takeshi; and Kido, Takayuki, 4,625,919, Cl. 239-585.000.
Sugo, Hiroyuki; and Aoki, Takashi, 4,625,546, Cl. 73-116.000.
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, 4,626,180, Cl. 418-63.000.
Tani, Akihiko; Aoyagi, Takashi; Ikeda, Shuji; and Nagasawa, Kouichi, 4,626,450, Cl. 427-93.000.
Terumoto, Susumu, 4,626,178, Cl. 417-366.000.
Todokoro, Hideo; and Komoda, Tsutomu, 4,626,690, Cl. 250-396.00R.
Torii, Shunichi, 4,626,989, Cl. 364-200.000.
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.
Yagi, Yasuomi; Takahashi, Ken; and Nemoto, Takeo, 4,625,520, Cl. 62-45.000.
Yamaki, Yooji; and Sakai, Shigenori, 4,627,053, Cl. 371-10.000.
Yamamoto, Masakazu; Masaki, Akira; and Kamikawai, Ryotaro, 4,626,889, Cl. 357-71.000.
Yamamoto, Shigehiko; Taguchi, Sadanori; and Aida, Toshiyuki, 4,626,470, Cl. 428-336.000.

Hitachi Maxell, Ltd.: *See*—
Azuma, Siro; Yokoyama, Kenichi; and Kitai, Tatsuya, 4,626,964, Cl. 361-433.000.

Hitachi Metals, Ltd.: *See*—
Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, 4,626,976, Cl. 363-19.000.
Sagara, Takehiko; Suzuki, Hiroya; and Ohtsuka, Iwao, 4,626,116, Cl. 400-124.000.

Hiyama, Yasuhiro; and Fujimori, Kyoichi, to Diesel Kiki Co., Ltd. Circuit for generating a position in digital form. 4,626,621, Cl. 178-18.000.

Hlinsky, Emil J.; and Simek, Stephen W., to MacLean-Fogg Company. Automatic container securement device with a spring biased, cam surfaced head. 4,626,155, Cl. 410-82.000.

HMH, Inc.: *See*—
Johnson, Howard, 4,625,778, Cl. 141-301.000.

Ho, Teh C.: *See*—
Chianelli, Russell R.; Ho, Teh C.; Jacobson, Allan J.; and Young, Archie R., 4,626,339, Cl. 208-18.000.

Hoare, David P.; and Warner, David J., to International Computers Limited. Interconnection of communications networks. 4,627,052, Cl. 370-88.000.

Hoch, Louis, to Becton, Dickinson and Company. Blood collection needle disposal system. 4,625,877, Cl. 215-366.000.

Hodges, Robert M. Safety storage apparatus. 4,625,658, Cl. 109-47.000.

Hoechst Aktiengesellschaft: *See*—
Kleiner, Hans-Jerg, 4,626,386, Cl. 260-502.40R.
Mohr, Dieter, 4,626,328, Cl. 204-129.950.
Wojtech, Bernhard; Mayer, Manfred; and Ott, Karl-Erich, 4,626,605, Cl. 568-757.000.

Hoffman, Clarence A.; Copa, William M.; and Mayer, Michael R., to Zimpro Inc. Method for anaerobic treatment of high strength liquors. 4,626,354, Cl. 210-603.000.

Hofstetter, Don R.; and Fow, Louis F., Jr., to Mont-Pac, Inc. Apparatus for forming drum handling rings. 4,626,186, Cl. 425-115.000.

Hogan, Lawrence J. Water conservation means. 4,625,680, Cl. 119-74.000.

Hohlfeld, Rainer; Schwerin, Ralph; Kader, Hans; and Heymann, Andreas, to Robert Bosch GmbH. Radio communications system including vehicle mounted and hand-held radio devices. 4,627,107, Cl. 455-11.000.

Holbein, Bruce E.: *See*—
DeVoe, Irving W.; and Holbein, Bruce E., 4,626,416, Cl. 423-12.000.

Holder, Homer W.: *See*—
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W., 4,625,523, Cl. 62-193.000.

Holehouse, Joseph: *See*—
Goel, Anil; Holehouse, Joseph; and Barnett, Kenneth, 4,626,475, Cl. 428-423.100.

Hollister Incorporated: *See*—
Schneider, Barry L., 4,626,250, Cl. 604-352.000.

Holm, Albert E.; and Holm, Grant A., to Testrite, Inc. Method and apparatus for detecting leaks. 4,625,545, Cl. 73-40.000.

Holm, Grant A.: *See*—
Holm, Albert E.; and Holm, Grant A., 4,625,545, Cl. 73-40.000.

Holm, John R., to General Electric Company. Apparatus for providing a carrier signal with two digital data streams I-Q modulated thereon. 4,626,803, Cl. 332-9.00R.

Holmes, Duane C.; and Toro-Lira, Guillermo L., to Nanometrics Inc. Microscope stage assembly and control system. 4,627,009, Cl. 364-559.000.

Holmstrom, S. Ake: *See*—
Bjornberg, Arne; Holmstrom, S. Ake; and Lindkvist, Goran, 4,626,279, Cl. 75-2.000.

Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Oxirane intermediates of 1-hydroxyethyl azole compounds. 4,626,595, Cl. 549-559.000.

Holovach, John M., to Mobil Oil Corporation. Method of packaging and system therefor. 4,625,495, Cl. 53-450.000.

Holst, Edward H.: *See*—
Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., 4,626,419, Cl. 423-244.000.

Holtken, Werner: *See*—
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.

Holy, Franz; and Eigner, Johann, to Machinefabrik Heid Aktiengesellschaft. Rotating toolhead, especially for turning stationary workpieces. 4,626,149, Cl. 409-191.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ashikawa, Noboru; Nakayama, Hiroshi; and Sumi, Makoto, 4,625,577, Cl. 74-475.000.
Hayashi, Tsutomu; and Inoue, Hidehiko, 4,626,038, Cl. 303-6.00C.
Nakano, Yasuo; and Yoshioka, Toshiharu, 4,625,985, Cl. 280-276.000.
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,625,589, Cl. 74-856.000.
Nishikawa, Masao, 4,625,591, Cl. 74-866.000.
Ohtaki, Keizaburo; Niikawa, Ryo; and Sakata, Masashi, 4,625,416, Cl. 33-180.0AT.
Takei, Akihiko; and Fujii, Etsuo, 4,626,045, Cl. 303-119.000.
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.

Honda, Ryouji: *See*—
Hara, Masato; Niiho, Masaaki; Takasugi, Eiji; and Honda, Ryouji, 4,626,682, Cl. 250-231.0SE.

Honda, Sueaki: *See*—
Koga, Hirofumi; Maenishi, Kozo; Kashimoto, Shuichi; Honda, Sueaki; Tsuruyoshi, Kenichi; and Sano, Takezo, 4,626,813, Cl. 335-278.000.

Honey, Frank R. Control of rotating mirrors. 4,626,063, Cl. 350-6.900.

Honeywell Inc.: *See*—
Bjork, Paul E.; Mitchell, Gordon L.; and Mocker, Hans W., 4,626,652, Cl. 219-121.0LH.
Forss, John A., 4,626,262, Cl. 55-128.000.

Honeywell Information Systems Inc.: *See*—
Doherty, John P.; Dufour, David L.; Gebo, Russell E.; and Sullivan, Michael J., 4,627,005, Cl. 364-525.000.
Marshall, J. Nathaniel, 4,626,671, Cl. 235-470.000.

Hoogovens Groep B.V.: *See*—
Beenhakker, Henk; Van Der Giessen, Dirk; and Verweij, Kees, 4,625,792, Cl. 165-139.000.

Hoop, Bernard, Jr.: *See*—
Burton, James A.; and Hoop, Bernard, Jr., 4,626,513, Cl. 436-518.000.

Hooper, Gerald L., to Ratliff, James. VCR timed controller. 4,626,106, Cl. 368-107.000.

Hoormann, Ronald A., to Coil Acceptors, Inc. Coin detection and validation means and method. 4,625,852, Cl. 194-317.000.

Hopes, George D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Transportation in Her Britannic Majesty's Government of the. Vehicle anti-skid/wheelspin device. 4,625,838, Cl. 188-181.00A.

Hopper, James F.: *See*—
Bucska, Nicholas J.; and Hopper, James F., 4,626,933, Cl. 360-51.000.

Hori, Takeshi; Higano, Yoshiharu; Shirai, Toshio; and Naganuma, Toru, to Sony Corporation. Contact printing apparatus with presettable means indicating number of copy and master tape life expectancy. 4,626,931, Cl. 360-16.000.

Horiba, Ltd.: *See*—
Oku, Narihiro; Usui, Seiji; Uematsu, Hiroaki; and Kohno, Takeshi, 4,626,512, Cl. 436-8.000.

Horie, Akira: *See*—
Nagano, Takahiro; Yatsuo, Tsutomu; Oikawa, Saburo; and Horie, Akira, 4,626,888, Cl. 357-38.000.

Horiguchi, Kiwami: *See*—
Takahashi, Susumu; and Horiguchi, Kiwami, 4,626,089, Cl. 351-208.000.

Horike, Masanori: *See*—
Furukawa, Tatsuya; and Horike, Masanori, 4,626,867, Cl. 346-1.100.

Horne, Donald L.: *See*—
Kuss, Thomas N.; and Horne, Donald L., 4,625,654, Cl. 105-377.000.

Hosaka, Akio, to Nissan Motor Company, Limited. Automotive engine control system capable of detecting specific engine operating conditions and projecting subsequent engine operating patterns. 4,625,697, Cl. 123-478.000.

Hosea, Joel C.: *See*—
Cohen, Samuel A.; Hosea, Joel C.; and Timberlake, John R., 4,626,399, Cl. 376-136.000.

Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 4,626,125, Cl. 403-324.000.

Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Lock pin mechanism. 4,626,125, Cl. 403-324.000.

Hosoi, Yoshihiro; and Fujioka, Takaaki, to Kyocera Corporation. Covering metal structure for metallized metal layer in electronic part. 4,626,479, Cl. 428-663.000.

Hosokawa, Tetsuo, to NEC Corporation. Laser oscillator. 4,627,063, Cl. 372-38.000.

Hosono, Chihiro, to Aisin-Warner Kabushiki Kaisha. Speed change device for use in driving auxiliary machinery. 4,625,587, Cl. 74-752.00C.

Hostetter, Barry J., to Hercules Incorporated. Branched polyolefin as a quench control agent for spin melt compositions. 4,626,467, Cl. 428-288.000.

Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Oxygen sensor. 4,626,337, Cl. 204-429.000.

Housako, Keiichi: *See*—
Toei, Jun-ichi; Baba, Nobuyuki; Housako, Keiichi; and Ikushige, Tetsuo, 4,625,569, Cl. 73-863.720.

Hovater, Joe: *See*—
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Howanick, John J., to GA Technologies Inc. Electromagnetic rail gun system and cartridge therefor. 4,625,618, Cl. 89-8.000.

Howard, Timothy J. Permanent slip-resistant bath mat. 4,625,344, Cl. 4-581.000.

Howmedica International, Inc.: *See*—
Olerud, Sven E.; and Richter, Karl M., 4,625,718, Cl. 128-92.0VD.

Hsiao, Hui W. Structure for a wine stripper. 4,625,595, Cl. 81-9.420.

Hsing, Frederick F.; and Leogrande, John A., to United Technologies Corporation. Seal means for a blade attachment slot of a rotor assembly. 4,626,169, Cl. 416-95.000.

Hsu, Ed C., to PPG Industries, Inc. Treated glass fibers and aqueous dispersion and nonwoven mat of glass fibers. 4,626,289, Cl. 106-287.340.

Hsu, Ming-Ta S.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,626,593, Cl. 546-339.000.

Huang, Leon; and Selman, John J., to Baxter Travenol Laboratories, Inc. Watchdog timer. 4,627,060, Cl. 371-62.000.

Huang, Ming C. Ornamental casing assembly for ceiling fan. 4,626,970, Cl. 362-147.000.

Hubbard, James E., Jr., to Massachusetts Institute of Technology. Method and apparatus for active control of vibrations. 4,626,730, Cl. 310-326.000.

Huber, Hans, to A. Konrad Feinmechanik Ag. Machine for applying a band around a package. 4,625,500, Cl. 53-589.000.

Huber, Paul G., to General Electric Company. Series connected switching power supply circuit. 4,626,982, Cl. 363-80.000.

Hudnutt, H. Dean; Eady, Edsell M.; and Cromie, Mark V., to Deeco, Inc. Cast cutter. 4,625,405, Cl. 30-370.000.

Hudson, David: *See*—
Duffield, Peter; Hudson, David; and Zoltan, Steven I., 4,625,373, Cl. 29-25.350.

Hueber, Alfred: *See*—
Hagemeister, Klaus; and Hueber, Alfred, 4,626,002, Cl. 285-95.000.

Hufnagel, Walter; Graap, Volker, deceased (by Lang, Erika Graap geborene, executrix); von und zu Aufsess, Freidrich; and Armsen, Rotger, to Internationale Octrooi Maatschappij "Octropa" B.V. Apparatus for the manufacture of biaxially stretched flat film. 4,625,372, Cl. 26-73.000.

Hughes Aircraft Company: *See*—
Marom, Emanuel, 4,626,919, Cl. 358-225.000.
von der Embse, Urban A., 4,627,079, Cl. 375-96.000.

Hughes, Richard C.: *See*—
Staal, Philip R.; Hughes, Richard C.; and Olsen, John H., 4,627,076, Cl. 375-36.000.

Hull, Neil A., to Ford Motor Company. Automotive component cover. 4,625,581, Cl. 74-606.00R.

Hunter, Joe S., to United States of America, Army. Dynamic alignment fixture with feedback control. 4,625,426, Cl. 33-537.000.

Huret et ses Fils: *See*—
Coue, Maurice E. L., 4,625,835, Cl. 188-24.110.

Hutchinson, Derek: *See*—
Johnson, Peter R.; Hutchinson, Derek; Reyner, Peter J.; and Dean, Robert, 4,625,851, Cl. 194-200.000.

Hutchison, James W.: *See*—
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.

Hutterer, Heribert; and Veigl, Johann, to U.S. Philips Corporation. Magnetic-tape apparatus having a disc with two control surfaces. 4,626,937, Cl. 360-90.000.

Huyghe, Paul J.: *See*—
Pauwels, Bernard J.; Huyghe, Paul J.; and Meyns, Ignace F., 4,625,768, Cl. 139-188.00R.

Hyde, Richard M.; and Livingstone, David J., to Burroughs Wellcome Co. Storage of red blood cells. 4,626,432, Cl. 424-101.000.

Hyde, Richard M.: *See*—
Batchelor, John F.; Hyde, Richard M.; and Livingstone, David J., 4,626,431, Cl. 424-101.000.

Hydril Company: *See*—
Roche, Joseph R., 4,626,135, Cl. 405-195.000.

Hydro-Quebec: *See*—
Bouvrette, Michel, 4,626,622, Cl. 379-99.000.

Hyeon, Suong B.: *See*—
Suzuki, Akinori; Isogai, Akira; Hyeon, Suong B.; Kikkawa, Takashi; and Someya, Shinzo, 4,626,277, Cl. 71-113.000.

Hymmen, Karl, to Velo-Bind, Inc. Bookbinding strips and method of binding books employing serrated studs. 4,625,996, Cl. 281-21.00A.

Hyosu, Yoshihiko, to Canon Kabushiki Kaisha. Process for producing toner for development of electrostatic images by stepwise suspension polymerization. 4,626,489, Cl. 430-137.000.

Hyslop, Adin E.; and Duvvury, Charvaka, to Texas Instruments Incorporated. Sense amplifier with reduced instantaneous power. 4,627,033, Cl. 365-205.000.

Hyslop, Michael S.: *See*—
Lockard, Steven C.; Hyslop, Michael S.; and Hernandez, Jorge M., 4,626,958, Cl. 361-306.000.

I.R.C.A.M. (Institut de Recherche et de Coordination Accoustique/-Misique: *See*—
Di Giugno, Giuseppe, 4,627,026, Cl. 364-900.000.

Icard, Charles R. Half-inch lug lock key. 4,625,599, Cl. 81-461.000.

Ichida, Kozaburo: *See*—
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Ichikawa, Yoshio; and Ohyagi, Takashi, to NEC Corporation. Display radio paging receiver for variable length messages. 4,626,842, Cl. 340-825.440.

Ichimura, Eiichi: *See*—
Sasaki, Takayuki; and Ichimura, Eiichi, 4,626,911, Cl. 358-141.000.

Ichinoi, Yutaka; and Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Color video signal recording and reproducing apparatus. 4,626,929, Cl. 358-310.000.

Ichiyama, Shuichi; Aoyagi, Yukio; and Yasuda, Tomohiko, to Hitachi Construction Machinery Co., Ltd. Load weight indicating system for load moving machine. 4,627,013, Cl. 364-567.000.

Igielska, Jadwiga, to Trans Consultants AB. Ship for carrying standarized cargo units. 4,625,670, Cl. 114-78.000.

Iguchi, Yoji: *See*—
Maeda, Masatoshi; Kusunoki, Toshio; and Iguchi, Yoji, 4,626,666, Cl. 219-537.000.

Ihara, Hirokazu: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; and Ihara, Hirokazu, 4,627,055, Cl. 371-16.000.

Iida, Shinobu: *See*—
Yamaguchi, Nobutaka; Masuyama, Kenichi; Iida, Shinobu; and Fujiyama, Masaaki, 4,626,469, Cl. 428-323.000.

Iio, Satoshi: *See*—
Kondo, Kazuo; Okuyama, Masahiko; Watanabe, Masakazu; and Iio, Satoshi, 4,626,392, Cl. 264-62.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,517, Cl. 501-96.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,518, Cl. 501-104.000.

Ikahata, Toshihiro: *See*—
Takai, Kazuki; Ikahata, Toshihiro; and Watanabe, Wataru, 4,626,939, Cl. 360-96.500.

Ikeda, Itsuo: *See*—
Miyagawa, Seiichi; Ikeda, Itsuo; and Suzuki, Shigeru, 4,626,876, Cl. 346-160.000.

Ikeda, Kazuo: *See*—
Tanaka, Shun-ichiro; Ikeda, Kazuo; and Sayano, Akio, 4,626,451, Cl. 427-123.000.

Ikeda, Shuji: *See*—
Tani, Akihiko; Aoyagi, Takashi; Ikeda, Shuji; and Nagasawa, Kouichi, 4,626,450, Cl. 427-93.000.

Ikemoto, Kazuhito; and Terakura, Yukio, to Toyota Jidosha Kabushiki Kaisha. Gear synchronizer assembly for power transmission. 4,625,844, Cl. 192-53.00F.

Ikemura, Akio; and Kajiki, Minoru, to Yoshida Kogyo K.K. Combined wall and ventilator module for a building. 4,625,628, Cl. 98-32.000.

Ikenaga, Toshio: *See*—
Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, 4,626,202, Cl. 432-107.000.

Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, to Celanese Corporation. Magnetic composite. 4,626,371, Cl. 252-62.540.

Ikisu, Yasuji: *See*—
Hatsutta, Susumu; and Ikisu, Yasuji, 4,626,028, Cl. 297-289.000.

Ikushige, Tetsuo: *See—*
Toei, Jun-ichi; Baba, Nobuyuki; Housako, Keiichi; and Ikushige, Tetsuo, 4,625,569, Cl. 73-863.720.
Illinois Tool Works, Inc.: *See—*
Ruehl, William E.; and Swick, E. Grant, 4,626,633, Cl. 379-27.000.
Imada, Kunihiko: *See—*
Matsuo, Yoshikazu; Nakamatsu, Toshio; Moriwaki, Toshikazu; Abeta, Sadaharu; and Imada, Kunihiko, 4,626,257, Cl. 8-638.000.
Image Resource Corporation: *See—*
Cool, John K.; Newbert, Edmund G., Jr.; and Glorioso, Charles A., 4,627,004, Cl. 364-521.000.
Imai, Shigeru: *See—*
Shirakawa, Hiroshi; and Imai, Shigeru, 4,625,382, Cl. 29-408.000.
Imamura, Yoshinori: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.
Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Dual frequency band radar detector. 4,626,857, Cl. 342-20.000.
Imperial Chemical Industries PLC: *See—*
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,626,493, Cl. 430-201.000.
IMS Lycrete Limited: *See—*
Blundell, Brian F., 4,625,921, Cl. 241-14.000.
Inaba, Hajimu; and Sakakibara, Shinsuke, to Fanuc Ltd. Numerical control system. 4,626,756, Cl. 318-573.000.
Inagaki, Hiroyuki: *See—*
Suzuki, Migaku; Sasaki, Satoshi; Mitsuno, Takashi; and Inagaki, Hiroyuki, 4,626,305, Cl. 156-164.000.
Inagaki, Shigemi: *See—*
Nakashima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, 4,626,165, Cl. 414-735.000.
Inayoshi, Kazumi, to Kojima Press Industry Co., Ltd. Change-over switch. 4,626,060, Cl. 339-147.00P.
Inazawa, Keichi: *See—*
Fukuroi, Takeo; Takahashi, Kihei; and Inazawa, Keichi, 4,625,370, Cl. 24-599.000.
Inciong, Josefino T., to Felt Products Mfg. Co. Seal assembly having a low extrusion resistant elastomeric sealing bead. 4,625,979, Cl. 277-180.000.
Inco Alloys International, Inc.: *See—*
Poole, Jon M., 4,626,406, Cl. 419-12.000.
Indiana Cash Drawer Company: *See—*
Mann, Bruce L.; and Batti, Steve A., 4,626,844, Cl. 340-825.310.
Industrial Equipment & Engineering, Inc.: *See—*
Carlin, Hervin A., Jr., 4,625,892, Cl. 220-465.000.
Inoue, Fumio; and Jitsukata, Hiroshi, to Hitachi, Ltd. Color video signal reproducing circuit for index type television utilizing vertical correlation of index signals and 360° phase detection and adjustment circuits. 4,626,900, Cl. 358-67.000.
Inoue, Hidehiko: *See—*
Hayashi, Tsutomu; and Inoue, Hidehiko, 4,626,038, Cl. 303-6.00C.
Inoue-Japax Research, Incorporated: *See—*
Inoue, Kiyoshi, 4,626,332, Cl. 204-237.000.
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,626,645, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research, Incorporated. Flushing fluid recycling system for electroerosion. 4,626,332, Cl. 204-237.000.
Inoue, Kiyoshi; and Shimizu, Akihiko, to Inoue-Japax Research Incorporated. Automatic TW electroerosion machining system. 4,626,645, Cl. 219-69.00W.
Inoue, Naofumi; and Matsuura, Satoshi, to Mitsui Petrochemical Industries, Ltd. High-performance electret and air filter. 4,626,263, Cl. 55-155.000.
Inoue, Nobuhiro: *See—*
Fushiya, Fusao; and Inoue, Nobuhiro, 4,625,406, Cl. 30-381.000.
Inoue, Sukejiro, to Canon Kabushiki Kaisha. Polymeric binder for toner having specific weight distribution. 4,626,488, Cl. 430-109.000.
Institut Francais du Petrole: *See—*
Arnaudeau, Marcel, 4,625,744, Cl. 137-10.000.
Cheron, Jacques; and Rojey, Alexandre, 4,625,522, Cl. 62-114.000.
Institut Khimicheskoi Fiziki: *See—*
Chernin, Semen M.; and Barskaya, Evgenia G., 4,626,078, Cl. 350-504.000.
Institut National de la Sante et de la Recherche Medicale (Inserm): *See—*
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.
Institute za Metalorejeshti Mashini: *See—*
Stoilov, Nikola D., 4,625,387, Cl. 29-568.000.
Instrumentarium Oy: *See—*
Sepponen, Raimo, 4,626,784, Cl. 324-309.000.
Intalite International N.V.: *See—*
Heritage, Robert C., 4,625,470, Cl. 52-28.000.
Integrated Genetics, Inc.: *See—*
Landes, Greg M., 4,626,501, Cl. 435-6.000.
Intelligent Storage Inc.: *See—*
Hauck, Edward L., 4,626,829, Cl. 340-347.0DD.
International Business Machines Corporation: *See—*
Anderson, Karen L.; Mintzer, Frederick C.; Goertzel, Gerald; and Mitchell, Joan L., 4,627,020, Cl. 364-900.000.
Blount, Frederick T.; and Weinberger, Arnold, 4,627,017, Cl. 364-900.000.
Capwell, Robert J.; and Rickert, Robert G., 4,626,446, Cl. 427-8.000.
Cooper, Ronald J.; Marsico, Mario A.; and Pescatore, John C., 4,627,054, Cl. 371-11.000.
Cottrell, Peter E.; Craig, William J.; and Troutman, Ronald R., 4,626,882, Cl. 357-23.130.
Curtis, Donald E.; Vincent, James P.; and Weidmann, Mary E., 4,626,836, Cl. 340-706.000.
Finlay, David E.; Lopez, Jesus C.; and Mereness, Thomas S., 4,627,097, Cl. 382-46.000.
George, Steven L., 4,626,988, Cl. 364-200.000.
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,626,943, Cl. 360-99.000.
Kash, Jeffrey A.; and Kuech, Thomas F., 4,626,883, Cl. 357-30.000.
Larson, Lawrence E., 4,626,824, Cl. 340-347.0DD.
Raver, Norman, 4,626,705, Cl. 307-269.000.
Schedewie, Franz, 4,626,907, Cl. 358-101.000.
Stephens, Lawrence K., 4,627,015, Cl. 364-900.000.
Vinal, Albert W., 4,626,946, Cl. 360-113.000.
Wiedmann, Siegfried K., 4,626,710, Cl. 307-457.000.
International Computers Limited: *See—*
Hoare, David P.; and Warner, David J., 4,627,052, Cl. 370-88.000.
International Flavors & Fragrances Inc.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,626,440, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,626,599, Cl. 568-57.000.
International Standard Electric Corporation: *See—*
Crossland, William A.; Brocklehurst, John R.; Ayliffe, Peter J.; and Atkinson, Arthur, 4,626,074, Cl. 350-345.000.
Gundner, Hans M.; and Hess, Kurt, 4,626,675, Cl. 250-211.00J.
Oesterle, Hermann F.; Rosl, Wolfgang; and Rose, Jochen, 4,626,699, Cl. 307-106.000.
Schols, Gustaaf, 4,626,293, Cl. 148-1.500.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
Hufnagel, Walter; Graap, Volker, deceased; von und zu Aufsess, Freidrich; and Armsen, Rotger, 4,625,372, Cl. 26-73.000.
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Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, 4,626,340, Cl. 208-89.000.
Ioffe, Anatoly F.: *See—*
Gorbachev, Oleg S.; Ioffe, Anatoly F.; Kulagin, Mikhail V.; Ruvinsky, Boris I.; Khorin, Vladimir S.; and Chugunov, Jury V., 4,626,935, Cl. 360-67.000.
Iowa State University Research Foundation: *See—*
Verkade, John G., 4,626,246, Cl. 604-174.000.
Irby, Raymond F.: *See—*
Fleming, Robert F., III; and Irby, Raymond F., 4,627,075, Cl. 375-23.000.
Irie, Namio: *See—*
Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,625,822, Cl. 180-140.000.
Ise, Yukihiko: *See—*
Yamashita, Ichiro; Hase, Hiroyuki; and Ise, Yukihiko, 4,625,562, Cl. 73-728.000.
Ishibashi, Takao: *See—*
Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, 4,626,337, Cl. 204-429.000.
Ishibashi, Yu: *See—*
Tomita, Takeshi; and Ishibashi, Yu, 4,626,689, Cl. 250-396.00R.
Ishida, Hisao: *See—*
Kojima, Yutaka; and Ishida, Hisao, 4,625,840, Cl. 192-3.580.
Ishida Scales Mfg. Co, Ltd.: *See—*
Yamada, Seiji, 4,627,012, Cl. 364-567.000.
Ishigaki, Yukinobu, to Victor Company of Japan, Limited. Circuit for reconstructing noise-affected signals. 4,626,788, Cl. 328-165.000.
Ishihara, Akira: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
Ishii, Satoshi, to Pioneer Electronic Corporation. MOS FET amplifier output stage. 4,626,715, Cl. 307-585.000.
Ishikawa, Hiromi, to Fuji Photo Film Co., Ltd. Light beam scanning apparatus. 4,626,062, Cl. 350-3.710.
Ishikawa, Mamoru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for monitoring weft insertion in a fluid jet loom. 4,625,770, Cl. 139-336.000.
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, to Hitachi, Ltd. Photosensor having impurity concentration gradient. 4,626,885, Cl. 357-31.000.
Isogai, Akira: *See—*
Suzuki, Akinori; Isogai, Akira; Hyeon, Suong B.; Kikkawa, Takashi; and Someya, Shinzo, 4,626,277, Cl. 71-113.000.
Istituto per le Richerche di Tecnologia Meccanica Rtm: *See—*
Dapiran, Alirio; and Giovanni, Gurioli, 4,626,150, Cl. 409-199.000.
Isuzu Motors Co., Ltd.: *See—*
Kojima, Yutaka; and Ishida, Hisao, 4,625,840, Cl. 192-3.580.
Isuzu Motors Limited: *See—*
Kawamura, Hideo, 4,625,910, Cl. 237-2.00A.
Ito, Hironori: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.
Ito, Motohiko, to Taiyo Altight Kogyo Co., Ltd. Water-sealed type pot comprising steam escape valve member. 4,625,887, Cl. 220-231.000.

Ito, Seigo: *See—*
Murakami, Yoshikazu; Ito, Seigo; and Yamada, Toshiro, 4,626,800, Cl. 331-96.000.
Ito, Susumu: *See—*
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Ito, Yasutoshi: *See—*
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Ito, Yoshiyasu: *See—*
Takeda, Yuuji; Suematsu, Toshio; Anzai, Katsushi; and Ito, Yoshiyasu, 4,626,997, Cl. 364-431.050.
Itoh, Ikuo: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
ITT Corporation: *See—*
Gann, Ronald A., 4,626,193, Cl. 431-71.000.
Murray, Roy, 4,625,758, Cl. 137-554.000.
Ivac Corporation: *See—*
Campbell, Peter; Tsals, Izrail; and Matsuura, David, 4,626,241, Cl. 604-49.000.
Iveco Fiat, S.p.A.: *See—*
Montuschi, Mario; and Palazzetti, Mario, 4,626,814, Cl. 335-281.000.
Iwabuchi, Akira: *See—*
Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, 4,626,202, Cl. 432-107.000.
Iwado, Shuichi: *See—*
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,626,367, Cl. 252-49.500.
Iwamatsu, Noboru: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,626,725, Cl. 310-89.000.
Iwasaki, Shosuke: *See—*
Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, 4,626,295, Cl. 148-127.000.
Iwatschenko, Peter; and Giebler, Fritz, to Pfrimmer & Co. Pharmazeutische Werke Erlangen. Method and apparatus for making mixtures of pharmaceutical liquids. 4,625,494, Cl. 53-432.000.
Izu, Masatsugu: *See—*
Doehler, Joachim; and Izu, Masatsugu, 4,626,447, Cl. 427-39.000.
J. M. Voith GmbH: *See—*
Schiel, Christian; Flurnig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, 4,625,376, Cl. 29-119.000.
J. R. Simplot Company: *See—*
Pinegar, Richard K.; and Bates, Ronald B., 4,625,606, Cl. 83-403.000.
J. T. Baker Chemical Company: *See—*
Gray, Gary M., 4,626,491, Cl. 430-190.000.
Jachowski, Johannes; Klasing, Helmut; Blum, Josef; and Pant, Paul, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Wear resistant compound body. 4,626,464, Cl. 428-212.000.
Jackson, Gregg B. Sail tension control mechanism. 4,625,672, Cl. 114-111.000.
Jackson, John E.; Adler, Thomas A.; and Quets, Jean M., to Union Carbide Corporation. Wear and corrosion resistant coatings and method for producing the same. 4,626,477, Cl. 428-457.000.
Jackson Jordan, Inc.: *See—*
Bradshaw, Bruce W., 4,625,412, Cl. 33-1.00Q.
Jackson, Keith L., to Lukens General Industries, Inc. High adhesion railway power truck with body spring-supported on the truck structure. 4,625,653, Cl. 105-168.000.
Jacobs, John W.: *See—*
Snellman, Donald L.; Pearson, Bernard A.; and Jacobs, John W., 4,625,955, Cl. 271-10.000.
Jacobson, Allan J.: *See—*
Chianelli, Russell R.; Ho, Teh C.; Jacobson, Allan J.; and Young, Archie R., 4,626,339, Cl. 208-18.000.
Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, to Societe Chimique de la Grande Pariosse, Azote et Produits Chimiques. Process and installation for manufacturing nitromethane. 4,626,607, Cl. 568-948.000.
Jaenicke, Frank E.: *See—*
Miller, Jerry L.; Jaenicke, Frank E.; and Lodge, Quentin C., 4,625,781, Cl. 144-34.00R.
Jagosz, Theodore T.; and Tepe, David J. Envelope printing apparatus with side aligners extending through a moveable elevator platform. 4,625,641, Cl. 101-240.000.
Jalaguier, Jean-Pierre: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,172, Cl. 416-134.00A.
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,173, Cl. 416-134.00A.
James, David E.: *See—*
Packer, Lawrence G.; and James, David E., 4,626,598, Cl. 562-487.000.
James, Harold K.; and McNeese, Joseph L. Newspaper vending machine. 4,625,894, Cl. 221-193.000.
James River Corporation: *See—*
Brown, Richard K., 4,626,641, Cl. 219-10.55E.
Jameson, Gary O. Log splitter. 4,625,782, Cl. 144-193.00R.
Jamieson, J. Scott: *See—*
Hayes, Thomas E.; Jamieson, J. Scott; and Spence, Scott L., 4,626,681, Cl. 250-231.00P.
Jamieson Manufacturing Company: *See—*
Kesselring, Wolfgang, 4,626,235, Cl. 493-210.000.
Jamrog, Robert H., to General Motors Corporation. Closed loop air/fuel ratio controller. 4,625,698, Cl. 123-489.000.
Janke, Kurt, to Gebruder Honsberg GmbH Sonderwerkzeugmaschinen und Sagenfabrik. Process and apparatus for producing a saw blade. 4,625,594, Cl. 76-112.000.
Janning, Robert J., Jr.: *See—*
Brock, George W.; Mroz, Edward; Janning, Robert J., Jr.; and Rogers, Robert S., 4,626,949, Cl. 360-133.000.
Janson, Jan, to U.S. Philips Corporation. Flat, permanent magnet electric motor. 4,626,727, Cl. 310-156.000.
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, to International Business Machines Corp. Torsional actuator for loading and unloading flexible disk drive. 4,626,943, Cl. 360-99.000.
Jansson, Jorgen; and Jansson, Lars. Device for grasping and handling articles. 4,625,403, Cl. 30-114.000.
Jansson, Lars: *See—*
Jansson, Jorgen; and Jansson, Lars, 4,625,403, Cl. 30-114.000.
Japan Atomic Energy Research Institute: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
Japan Metals and Chemicals Co., Ltd.: *See—*
Tsutsumi, Jiro; Uchiyama, Minolu; and Katagiri, Kunio, 4,625,797, Cl. 166-90.000.
Japan Storage Battery Company Limited: *See—*
Tanaka, Masafumi, 4,626,765, Cl. 320-48.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Nozue, Ikuo; Tomomitsu, Osahiko; Yumoto, Yoshiji; and Matsumura, Yoshio, 4,626,556, Cl. 522-99.000.
JaQuay, John W., to Diego Power. Anticipatory feedback technique for pulse width modulated power supply. 4,626,979, Cl. 363-41.000.
Jassby, Daniel L.; and Micklich, Bradley J., to United States of America, Energy. Variable control of neutron albedo in toroidal fusion devices. 4,626,400, Cl. 376-146.000.
Jaugey, Bernard: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,172, Cl. 416-134.00A.
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,173, Cl. 416-134.00A.
Jaweera-Bandara, Asoka M.: *See—*
Duffin, Henry C.; Golding, Peter; and Jaweera-Bandara, Asoka M., 4,626,606, Cl. 568-931.000.
Jelinek, Jerry G., to Parker Hannifin Corporation. Low temperature seal. 4,625,978, Cl. 277-180.000.
Jelitto, Hans: *See—*
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.
JEOL Ltd.: *See—*
Ohuchi, Muneki, 4,626,783, Cl. 324-307.000.
Tomita, Takeshi; and Ishibashi, Yu, 4,626,689, Cl. 250-396.00R.
Jidosha Kiki Co., Ltd.: *See—*
Yabe, Hideo; and Koike, Ichiro, 4,626,994, Cl. 364-424.000.
Jinnai, Koichiro: *See—*
Murai, Toshiharu; Jinnai, Koichiro; Ameyama, Minoru; and Umezawa, Michio, 4,626,874, Cl. 346-140.00R.
Jitsukata, Hiroshi: *See—*
Inoue, Fumio; and Jitsukata, Hiroshi, 4,626,900, Cl. 358-67.000.
Johansson, Arne; and Larsson, Torsten, to AB Bofors Wear Parts. Excavating tooth retaining means. 4,625,439, Cl. 37-142.00R.
John Wyeth & Brother Limited: *See—*
White, Alan C.; and Shepherd, Robin G., 4,626,522, Cl. 564-355.000.
Johns Hopkins University, The: *See—*
Fountain, Glen H.; Lee, David G., Jr.; and Kitchin, David A., 4,625,730, Cl. 128-419.00D.
Johnson, Carl W., to Specialty Research, Inc. Instrument for separating fluff components. 4,625,552, Cl. 73-865.500.
Johnson, Howard, to HMH, Inc. Automatic venting valve for gas storage tank. 4,625,778, Cl. 141-301.000.
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., to Rolm Corporation. Time division multiplexed computerized branch exchange. 4,627,050, Cl. 370-85.000.
Johnson, John L., to United States of America, Army. Wide field of view two-axis laser locator. 4,626,100, Cl. 356-152.000.
Johnson & Johnson Products, Inc.: *See—*
Broadnax, Cecil H., Jr., 4,626,253, Cl. 604-374.000.
Johnson, Joseph H.: *See—*
Richter, Herbert P.; and Johnson, Joseph H., 4,626,383, Cl. 252-700.000.
Johnson, Joseph L., to Priess-Johnson Oil Tools International, Inc. Gas lift valve. 4,625,941, Cl. 251-12.000.
Johnson, Peter R.; Hutchinson, Derek; Reyner, Peter J.; and Dean, Robert, to Mars, Inc. Coin testing apparatus. 4,625,851, Cl. 194-200.000.
Johnson, Ray M.: *See—*
Meldner, Heiner W.; Cusson, Ronald Y.; and Johnson, Ray M., 4,626,791, Cl. 329-109.000.
Johnson Service Company: *See—*
Hayes, Thomas E.; Jamieson, J. Scott; and Spence, Scott L., 4,626,681, Cl. 250-231.00P.

Johnson, Steve A.; and Seppala, Lynn G., to United States of America, Energy. Fiber optics interface for a dye laser oscillator and method. 4,627,068, Cl. 372-101.000.

Johnstonbaugh, George S., to Masonite Corporation. Display wall formed of readily attachable and detachable panels. 4,625,477, Cl. 52-127.900.

Jola, Martin: *See—*
Ertl, Stefan; and Jola, Martin, 4,625,543, Cl. 73-1.00G.

Jolly, Arthur E. Method for the placement of a trailer-mounted sand hopper. 4,626,166, Cl. 414-786.000.

Joncour, Christian; and Leducq, Annick, to Essilor International Cie Generale d'Optique. Apparatus for determining the diameter of a lens to fit an eyeglass frame. 4,625,418, Cl. 33-200.000.

Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; by Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, to Essilor International Cie Generale d'Optique. Ocular parameter measuring device with digitally controlled virtual graticules. 4,626,088, Cl. 351-204.000.

Jones, Keith E., to Tektronix, Inc. Surface mountable microwave IC package. 4,626,805, Cl. 333-33.000.

Jones, Larry: *See—*
Jones, Lloyd; and Jones, Larry, 4,625,541, Cl. 72-421.000.

Jones, Lloyd; and Jones, Larry. Apparatus for patterning a cylindrical surface. 4,625,541, Cl. 72-421.000.

Jones, Thomas S.: *See—*
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.

Jorgensen, Hans J., to F. L. Smidth & Co. A/S. Method of controlling the pulse frequency of a pulse operated electrostatic precipitator. 4,626,260, Cl. 55-2.000.

Jorgensen, Hans J., to F. L. Smidth & Co. A/S. Method of controlling intermittent voltage supply to an electrostatic precipitator. 4,626,261, Cl. 55-2.000.

Jost, John W.; and Ghandehari, Mohammad H., to Union Oil Company of California. Corrosion protection with sacrificial anodes. 4,626,329, Cl. 204-148.000.

Joustra, Marius K.; and Blanche, Claes G., to Pharmacia AB. Method of determining alcohol consumption. 4,626,355, Cl. 210-635.000.

Jumberca, S.A.: *See—*
Dalmau Guell, Jose M., 4,625,528, Cl. 66-132.00T.

Jung, Eggert: *See—*
Giesche, Ernst; Jung, Eggert; Meintz, Helma; and Roes, Christian, 4,626,903, Cl. 358-80.000.

Junger, Martin: *See—*
Nieuwkamp, Wolfgang; Junger, Martin; and Wenzel, Helmut, 4,625,916, Cl. 239-431.000.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Moritz, Werner; and Haschek, Friedrich, 4,625,507, Cl. 59-78.100.
Moritz, Werner, 4,626,233, Cl. 474-206.000.

Kabushiki Kaisha Asana Kenkyusho: *See—*
Asano, Kazuo, 4,626,667, Cl. 219-542.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Kawashima, Kazuo; and Minamida, Kazuhiyo, 4,625,817, Cl. 177-1.000.
Naito, Kazufumi, 4,626,956, Cl. 361-152.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Hara, Kenichiro; and Nakamura, Shizuo, 4,625,617, Cl. 84-404.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kajikawa, Masauemon; Kitajima, Hiroyuki; and Kato, Tatsuo, 4,626,226, Cl. 464-64.000.

Kabushiki Kaisha Sato: *See—*
Tamura, Tadashi; and Kikuchi, Reiji, 4,625,931, Cl. 242-68.300.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Suzuki, Masaru, 4,626,085, Cl. 350-604.000.

Kabushiki Kaisha Toshiba: *See—*
Kumazawa, Katsuyoshi; Ohtsuki, Toshio; and Komori, Minoru, 4,626,197, Cl. 431-302.000.
Ogawa, Shigeru; Yamaji, Hiroshi; and Kano, Masaaki, 4,626,101, Cl. 356-237.000.
Sugimoto, Yasuhiro, 4,626,794, Cl. 330-253.000.
Takeno, Shozo, 4,626,872, Cl. 346-76.0PH.
Tanaka, Tatsuo; Shigematsu, Nana; and Koshika, Kazushige, 4,626,795, Cl. 330-257.000.
Watanabe, Junji, 4,626,924, Cl. 358-285.000.
Yamanaka, Junichi, 4,626,893, Cl. 358-29.000.
Yamashita, Kiyoshi, 4,625,572, Cl. 73-864.160.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Ishikawa, Mamoru, 4,625,770, Cl. 139-336.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kondo, Haruyoshi; Saji, Keiichi; and Takeuchi, Takashi, 4,626,338, Cl. 204-406.000.

Kader, Hans: *See—*
Hohlfeld, Rainer; Schwerin, Ralph; Kader, Hans; and Heymann, Andreas, 4,627,107, Cl. 455-11.000.

Kadota, Youichi: *See—*
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,625,691, Cl. 123-425.000.

Kaeser, Edward: *See—*
Markwitz, Wernhard; and Kaeser, Edward, 4,627,074, Cl. 375-2.100.

Kageyama, Ryoichi: *See—*
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.

Kahn, Marvin L.: *See—*
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,626,434, Cl. 426-50.000.

Kaise, Tatsuo: *See—*
Abe, Masatoshi; and Kaise, Tatsuo, 4,625,874, Cl. 211-122.000.

Kaiser, Bruce J.: *See—*
Oakley, David J.; Groves, Oliver J.; and Kaiser, Bruce J., 4,626,401, Cl. 376-245.000.

Kajikawa, Masauemon; Kitajima, Hiroyuki; and Kato, Tatsuo, to Kabushiki Kaisha Komatsu Seisakusho. Torque fluctuation damper. 4,626,226, Cl. 464-64.000.

Kajiki, Minoru: *See—*
Ikemura, Akio; and Kajiki, Minoru, 4,625,628, Cl. 98-32.000.

Kajimura, Junichi: *See—*
Ootsuka, Shigeharu; Mizuno, Yuji; Kajimura, Junichi; and Mori, Takaaki, 4,626,656, Cl. 219-121.0LH.

Kajitani, Makoto: *See—*
Tanaka, Motoaki; Kajitani, Makoto; and Yamazaki, Tomio, 4,626,384, Cl. 540-306.000.

Kaltz, Milton C.; and Alexander, Michael P., to ASC Incorporated. Retractable vehicle backlight apparatus. 4,626,020, Cl. 296-107.000.

Kamada, Isao, to Mitsubishi Rayon Company Ltd. Apparatus for preparing a synthetic resin plate of different colors. 4,626,187, Cl. 425-131.100.

Kamegawa, Keiji: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.

Kamikawai, Ryotaro: *See—*
Yamamoto, Masakazu; Masaki, Akira; and Kamikawai, Ryotaro, 4,626,889, Cl. 357-71.000.

Kaminaga, Hiromitsu, to Yoshida Kogyo K.K. Unit type curtain wall. 4,625,482, Cl. 52-235.000.

Kamochi, Atsumi: *See—*
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, 4,626,273, Cl. 71-92.000.

Kamohara, Eiji: *See—*
Takenaka, Shigeo; Hamano, Eizaburo; and Kamohara, Eiji, 4,626,737, Cl. 313-402.000.

Kamyr, Inc.: *See—*
Prough, James R.; and Morin, James E., 4,626,318, Cl. 162-49.000.

Kanaya, Motonori: *See—*
Suzuki, Masane; Shibamoto, Hiroshi; and Kanaya, Motonori, 4,625,724, Cl. 128-303.100.

Kando, Akiyoshi, to Yoshida Kogyo K. K. Apparatus for manufacturing bidirectionally openable slide fasteners. 4,625,398, Cl. 29-768.000.

Kaneko, Toshimi; and Kido, Kazumi, to Murata Manufacturing Co., Ltd. Capacitor with discharge gap. 4,626,957, Cl. 361-275.000.

Kaneko, Toshio: *See—*
Sakamoto, Koji; Kaneko, Toshio; Kanno, Fuchio; and Yasuda, Wataru, 4,625,676, Cl. 118-657.000.

Kanema, Seiichi: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.

Kanno, Fuchio: *See—*
Sakamoto, Koji; Kaneko, Toshio; Kanno, Fuchio; and Yasuda, Wataru, 4,625,676, Cl. 118-657.000.

Kano, Masaaki: *See—*
Ogawa, Shigeru; Yamaji, Hiroshi; and Kano, Masaaki, 4,626,101, Cl. 356-237.000.

Kanoe, Toshio: *See—*
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,626,371, Cl. 252-62.540.

Kanzaki Paper Manufacturing Company, Limited: *See—*
Arai, Naoto, 4,626,877, Cl. 346-200.000.

Kao Corporation: *See—*
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,626,367, Cl. 252-49.500.
Nishizawa, Kazunori; and Mizutani, Hiroshi, 4,626,252, Cl. 604-370.000.

Kaplan, Leonard; and Walker, Wellington E., to Union Carbide Corporation. Homogeneous liquid phase process for making alkane polyols. 4,626,551, Cl. 518-701.000.

Kaplan, Murray A., to Bristol-Myers Company. Water soluble salt composition of m-AMSA. 4,626,541, Cl. 514-297.000.

Karabedian, James A., to Owens-Illinois, Inc. Coextruded multilayer sheet and sleeve label for bottles. 4,626,455, Cl. 428-35.000.

Karino, Yukio: *See—*
Waki, Kokichi; and Karino, Yukio, 4,626,494, Cl. 430-213.000.

Karl M. Reich Maschinenfabrik GmbH: *See—*
Cast, Adolf, 4,625,597, Cl. 81-57.370.

Karl Thomae GmbH: *See—*
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Mihm, Gerhard, 4,626,325, Cl. 204-59.00R.

Karlsson, Ingemar; Andersson, Karl-Hugo; and Petersson, Rolf, to Flakt Aktiebolag. Arrangement in cylinder dryer. 4,625,434, Cl. 34-114.000.

Karp, Edward C., to Sanitary Scale Company. Manual label applicator. 4,626,313, Cl. 156-362.000.

Karr, Gerald S.: *See—*
Smith, Jay, III; and Karr, Gerald S., 4,627,090, Cl. 381-34.000.

Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , to Medicor Muvek. Apparatus for measuring the actual psychophysiological condition. 4,625,732, Cl. 128-670.000.

Kash, Jeffrey A.; and Kuech, Thomas F., to International Business Machines Corporation. Textured crystal picosecond photoresponsive element. 4,626,883, Cl. 357-30.000.

Kashimoto, Shuichi: *See—*
Koga, Hirofumi; Maenishi, Kozo; Kashimoto, Shuichi; Honda, Sueaki; Tsuruyoshi, Kenichi; and Sano, Takezo, 4,626,813, Cl. 335-278.000.

Kashimura, Yuichi; and Sugiura, Noboru, to Hitachi, Ltd. Apparatus for controlling ignition timing for internal combustion engine. 4,625,692, Cl. 123-425.000.

Kashiwagi, Hideki; Akita, Shigeyuki; Tanaka, Hiroaki; and Kuno, Akira, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Apparatus for detecting rotation of steering wheel. 4,625,411, Cl. 33-1.0PT.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Velocipede. 4,625,986, Cl. 280-282.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Baby carriage. 4,626,030, Cl. 297-429.000.

Kasson, James M.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.

Katagiri, Hidenori: *See—*
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, 4,626,410, Cl. 420-590.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,626,561, Cl. 523-318.000.

Katagiri, Kunio: *See—*
Tsutsumi, Jiro; Uchiyama, Minolu; and Katagiri, Kunio, 4,625,797, Cl. 166-90.000.

Kataoka, Keiichiro: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Kato, Heihachi: *See—*
Fujisaki, Kiyonori; Kobayashi, Toshio; and Kato, Heihachi, 4,626,752, Cl. 318-254.000.

Kato, Heizaburo, to Sankyo Manufacturing Company Ltd. Overload release latch. 4,625,845, Cl. 192-56.00R.

Kato, Masatoshi; and Kitaguchi, Hiroshi, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,626,499, Cl. 430-559.000.

Kato, Tatsuo: *See—*
Kajikawa, Masauemon; Kitajima, Hiroyuki; and Kato, Tatsuo, 4,626,226, Cl. 464-64.000.

Kato, Yasuo; Watanabe, Yoshio; and Murayama, Seiichi, to Hitachi, Ltd. Plasma X-ray source. 4,627,086, Cl. 378-119.000.

Katzman, Allison W.; Rosenwinkel, Donald A.; and Disko, Harry, to Marvin Glass & Associates. Toy figures with flexible hair inserts. 4,626,225, Cl. 446-394.000.

Kaufman, Alan S.; Kaufman, Nadeen L.; and Naglieri, Jack A., to American Guidance Service, Inc. Psychological test device. 4,626,220, Cl. 434-236.000.

Kaufman, Nadeen L.: *See—*
Kaufman, Alan S.; Kaufman, Nadeen L.; and Naglieri, Jack A., 4,626,220, Cl. 434-236.000.

Kaufman, Steven A.: *See—*
Samples, Billy G.; Newton, Ralph L.; and Kaufman, Steven A., 4,626,638, Cl. 200-331.000.

Kaufmann, Edward J.; and Sudbury, Barry A., to Clorox Company, The. Borate solution soluble polyvinyl alcohol films. 4,626,372, Cl. 252-90.000.

Kaufmann, Meinolph: *See—*
Amstutz, Hermann; and Kaufmann, Meinolph, 4,626,073, Cl. 350-344.000.

Kauss, Wolfgang: *See—*
Muncke, Ludwig; Mucheyer, Norbert; and Kauss, Wolfgang, 4,625,748, Cl. 137-101.000.

Kavaloski, Peter P.: *See—*
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., 4,625,721, Cl. 128-201.280.

Kavchok, Ronald W.; and Boylan, Francis J., deceased (by Boylan, Katherine C., executor), to Drew Chemical Corporation. Defoaming composition. 4,626,377, Cl. 252-321.000.

Kavoussi, James P. Aerosol shaving cream and razor. 4,625,402, Cl. 30-41.000.

Kavthekar, Keshav S. Method for manufacturing universal joints. 4,625,377, Cl. 29-149.50B.

Kawabe, Ushio: *See—*
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Kawabe, Ushio, 4,626,701, Cl. 307-245.000.

Kawada, Nobuo: *See—*
Funada, Takeo; Kawada, Nobuo; and Abe, Tatsuhiko, 4,625,918, Cl. 239-533.300.

Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, to Fanuc Ltd. Synchronous rotary machine. 4,626,725, Cl. 310-89.000.

Kawagoe, Takashi: *See—*
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,626,160, Cl. 414-222.000.

Kawaguchi, Masao: *See—*
Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, 4,626,337, Cl. 204-429.000.

Kawahata, Fumiaki: *See—*
Matsui, Hitoshi; and Kawahata, Fumiaki, 4,625,904, Cl. 228-168.000.

Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, to Mitsui Toatsu Chemicals, Incorporated. Preparation process for polypropylene-base resin compositions. 4,626,565, Cl. 524-423.000.

Kawamura, Hideo, to Isuzu Motors Limited. Heater system associated with engine. 4,625,910, Cl. 237-2.00A.

Kawamura, Keiichi, to Fuji Photo Film Co., Ltd. Circuit for preventing flicker attributable to field signal-frame signal conversion. 4,626,910, Cl. 358-140.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Matsuo, Isamu, 4,625,982, Cl. 280-95.00R.
Nishida, Hiroshi, 4,625,669, Cl. 114-56.000.

Kawasaki, Mikio; and Matsumoto, Kiyoshi, to Sumitomo Heavy Industries, Ltd. Tubular belt conveyor. 4,625,860, Cl. 198-819.000.

Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, to Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet. 4,626,256, Cl. 8-471.000.

Kawasaki Steel Corporation: *See—*
Sato, Kuniaki; Muto, Shinichiro; and Wako, Noriaki, 4,626,195, Cl. 431-188.000.
Taniguchi, Shigeki; Furukawa, Kusuo; Yanagishima, Fumiya; and Sasaki, Hiroaki, 4,626,651, Cl. 219-121.0LC.

Kawashima, Kazuo; and Minamida, Kazuhiyo, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of zero adjustment for combinatorial weighing or counting system. 4,625,817, Cl. 177-1.000.

Kawashima, Yukio: *See—*
Ohe, Kazuhide; and Kawashima, Yukio, 4,626,334, Cl. 204-290.00R.

Kawauchi, Yoshikazu: *See—*
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,626,899, Cl. 358-65.000.

Kayane, Yutaka: *See—*
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.

Keating, Kenneth P.: *See—*
Marquis, Edward T.; Keating, Kenneth P.; Sanderson, John R.; and Smith, William A., 4,626,596, Cl. 556-57.000.

Keeler, Manley S., to Pittway Corporation. Photoelectric combustion products detector with low power consumption and improved noise immunity. 4,626,695, Cl. 250-574.000.

Keene Corporation: *See—*
Van Dyk, Garritt C., Jr., 4,626,615, Cl. 174-35.0MS.

Kellar, Robert J.: *See—*
Davison, John A.; and Kellar, Robert J., 4,625,725, Cl. 128-304.000.

Kemnitz, Glen; and Williams, Richard H., to Sunbeam Corporation. Blanket wire insertion machine. 4,625,394, Cl. 29-611.000.

Kenmotsu, Isami: *See—*
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, 4,627,044, Cl. 369-292.000.

Kenney, George B.; and Ashdown, Charles P. Tandem atomization method for ultra-fine metal powder. 4,626,278, Cl. 75-0.50C.

Kentron International, Inc.: *See—*
Copeland, William O., 4,626,858, Cl. 342-374.000.

Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., to Philip Morris Incorporated. Foamed, extruded, tobacco-containing smoking article and method of making the same. 4,625,737, Cl. 131-355.000.

Kermarrec, Jean-Claude: *See—*
Dubots, Patrick; Kermarrec, Jean-Claude; and Tavergnier, Jean-Pierre, 4,625,503, Cl. 57-6.000.

Kern, Gilbert G. Wall attachment clip for suspended woodbeam ceiling. 4,625,488, Cl. 52-665.000.

Kernforschungsanlage Julich: *See—*
Arnold, William M.; and Zimmermann, Ulrich, 4,626,506, Cl. 435-173.000.

Kernforschungszentrum Karlsruhe G.m.b.H: *See—*
Furrer, Jurgen; and Dillman, Hans-Georg, 4,626,692, Cl. 250-432.00R.

Kerr-McGee Chemical Corporation: *See—*
Rado, Theodore A., 4,626,426, Cl. 423-641.000.

Kerttula, Raima: *See—*
Aula, Jouko; and Kerttula, Raima, 4,625,430, Cl. 34-13.000.

Kesselring, Wolfgang, to Jamieson Manufacturing Company. Apparatus for assembling expandable product bags within energy sleeves. 4,626,235, Cl. 493-210.000.

Kessler, Harry T., Jr.: *See—*
Anderson, Ronald L.; and Kessler, Harry T., Jr., 4,625,735, Cl. 130-5.00G.

Khorin, Vladimir S.: *See—*
Gorbachev, Oleg S.; Ioffe, Anatoly F.; Kulagin, Mikhail V.; Ruvinsky, Boris I.; Khorin, Vladimir S.; and Chugunov, Jury V., 4,626,935, Cl. 360-67.000.

Kibler, Hans: *See—*
Despot, Janko; and Kibler, Hans, 4,625,642, Cl. 101-352.000.

Kidde, Inc.: *See—*
Christian, Damon N., 4,625,820, Cl. 180-9.100.

Kido, Kazumi: *See—*
Kaneko, Toshimi; and Kido, Kazumi, 4,626,957, Cl. 361-275.000.

Kido, Takayuki: *See—*
Soma, Masahiro; Atago, Takeshi; and Kido, Takayuki, 4,625,919, Cl. 239-585.000.

Kienzle Apparate GmbH: *See—*
Dyma, Horst; Bommersheim, Hans; Becker, Otto; and Heindke, Armin, 4,625,958, Cl. 271-274.000.

Kight, William D.: *See—*
Fulmer, John W.; and Kight, William D., 4,626,600, Cl. 568-411.000.

Kihara, Seiji: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.

Kikkawa, Takashi: *See—*
Suzuki, Akinori; Isogai, Akira; Hyeon, Suong B.; Kikkawa, Takashi; and Someya, Shinzo, 4,626,277, Cl. 71-113.000.

Kikuchi, Reiji: *See—*
Tamura, Tadashi; and Kikuchi, Reiji, 4,625,931, Cl. 242-68.300.

Kikui, Hitoshi: *See—*
Okumura, Takuzo; Yanase, Masataka; and Kikui, Hitoshi, 4,626,304, Cl. 156-163.000.

Killat, Ulrich: *See—*
Dammann, Hans; and Killat, Ulrich, 4,626,069, Cl. 350-162.200.

Killinger, Glenn W., to Dresser Industries, Inc. Hold down mechanism for reduction apparatus. 4,625,924, Cl. 241-186.00R.

Kim, Ki-Soo, to Stauffer Chemical Company. Polyimide film/metal foil lamination. 4,626,474, Cl. 428-416.000.

Kim, Tai K.; and McClintic, Robert P., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,626,424, Cl. 423-593.000.

Kimberly-Clark Corporation: *See—*
Hammond, Philip G., 4,626,184, Cl. 425-83.100.

Kimoto, Yuji: *See—*
Kishi, Hiroyasu; Kimoto, Yuji; and Mori, Keizo, 4,626,881, Cl. 357-23.600.

Kimura, Takashi; Tanaka, Hiromi; and Omori, Masayoshi, to Hitachi, Ltd. Air-cooled heat pump type refrigerating apparatus. 4,625,524, Cl. 62-278.000.

Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., to Fuji Xerox Co., Ltd. Substituted squarium compounds, process for preparing the same and electrophotographic photoreceptors containing the same. 4,626,485, Cl. 430-59.000.

Kinast, Gunther: *See—*
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.

King, James L.; and Shelton, Kerry B., to General Electric Company. Dynamoelectric machine with cushioning device. 4,626,726, Cl. 310-91.000.

King, Michael J., to Deere & Company. U-pattern hydrostatic transmission control linkage. 4,625,842, Cl. 192-4.00C.

King, Stella W.; and Remy, David C., to Merck & Co., Inc. 4-(5H-dibenzo[a,d]cyclohepten-5-yl)piperidine compounds, pharmaceutical compositions and methods. 4,626,542, Cl. 514-325.000.

Kioritz Corporation: *See—*
Baba, Toru, 4,625,501, Cl. 56-12.700.
Sasaki, Fujio, 4,626,266, Cl. 55-385.00R.

Kirby, William E.: *See—*
Field, David H.; Kirby, William E.; and Nylund, Theodore W., 4,626,405, Cl. 376-448.000.

Kirchner, Edward C., to Beloit Corporation. Multiple disk refiner with elastomeric mounting. 4,625,926, Cl. 241-261.200.

Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., to Pitney Bowes Inc. Memory address location system for an electronic postage meter having multiple non-volatile memories. 4,627,016, Cl. 364-900.000.

Kirt, Daryl L. Hone stop assembly. 4,625,465, Cl. 51-262.00R.

Kirton, Alan J.: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,626,943, Cl. 360-99.000.

Kiryu, Yuichi, to S. Soga & Co. Harmonic drive apparatus. 4,625,582, Cl. 74-640.000.

Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, to Fanuc Ltd. Method and apparatus for creating numerical control data. 4,627,003, Cl. 364-520.000.

Kishi, Hiroyasu; Kimoto, Yuji; and Mori, Keizo, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Capacitor produced of a layer combination of metal, insulator and semiconductor. 4,626,881, Cl. 357-23.600.

Kitaguchi, Hiroshi: *See—*
Kato, Masatoshi; and Kitaguchi, Hiroshi, 4,626,499, Cl. 430-559.000.
Sato, Kozo; Kitaguchi, Hiroshi; and Hirai, Hiroyuki, 4,626,500, Cl. 430-617.000.

Kitai, Tatsuya: *See—*
Azuma, Siro; Yokoyama, Kenichi; and Kitai, Tatsuya, 4,626,964, Cl. 361-433.000.

Kitajima, Hiroyuki: *See—*
Kajikawa, Masauemon; Kitajima, Hiroyuki; and Kato, Tatsuo, 4,626,226, Cl. 464-64.000.

Kitamoto, Tatsuji; Amari, Hiroshi; Nahara, Akira; Shirahata, Ryuji; and Arai, Yoshihiro, to Fuji Photo Film Co., Ltd. Process of forming ultrafine pattern. 4,626,315, Cl. 156-628.000.

Kitamura, Masatsugu; Tanaka, Mitsuaki; and Takekura, Hiroyuki, to Victor Company of Japan, Limited. Method and system for data compression by variable frequency sampling. 4,626,827, Cl. 340-347.0SH.

Kitamura, Yuji: *See—*
Rai, Yasuki; Kitamura, Yuji; and Hamada, Minoru, 4,627,027, Cl. 365-45.000.

Kitano, Kissho: *See—*
Kowalik, Ralph M.; Duvdevani, Ilan; Kitano, Kissho; and Schulz, Donald N., 4,625,745, Cl. 137-13.000.

Kitasato Institute, The: *See—*
Omura, Satoshi; and Shimizu, Hideki, 4,626,547, Cl. 514-450.000.

Kitchin, David A.: *See—*
Fountain, Glen H.; Lee, David G., Jr.; and Kitchin, David A., 4,625,730, Cl. 128-419.00D.

Kitrell, John V. Folding wheelchair. 4,625,984, Cl. 280-242.0WC.

Kjellberg, Ulf A.; Nyqvist, Per G. H.; Stenhede, Jan U.; and Stenmark, Lars B., to Astra Lakemedel Aktieboag. Process for stabilization of bacampicillin hydrochloride. 4,626,532, Cl. 514-195.000.

Klasing, Helmut: *See—*
Jachowski, Johannes; Klasing, Helmut; Blum, Josef; and Pant, Paul, 4,626,464, Cl. 428-212.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Power-assisted transmission having a gear shift suppressing arrangement. 4,625,841, Cl. 192-3.630.

Klauke, Erich: *See—*
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; and Klauke, Erich, 4,626,601, Cl. 568-425.000.

Klaus, Siegfried, to Peddinghaus, Carl-Ulrich. Apparatus for displacing profiled steel rods of a roll conveyor. 4,625,855, Cl. 198-367.000.

Kleihschmit, Peter: *See—*
Schmidt, Sabine; Kleihschmit, Peter; and Schwarz, Rudolf, 4,626,466, Cl. 428-247.000.

Kleimwefers GmbH: *See—*
Pav, Josef; Wenzel, Reinhard; Schmidt, Rainer; Svenka, Peter; and Rauf, Richard, 4,625,637, Cl. 100-47.000.

Klein, Georg; and Rahnenfuehrer, Eckhard, to Rheinmetall GmbH. Projectile propelling charge and method of manufacture thereof. 4,625,648, Cl. 102-286.000.

Klein, Phillip P.: *See—*
Sherlock, Paul; Brausen, Benjamin; and Klein, Phillip P., 4,625,734, Cl. 128-762.000.

Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of alkali metal and alkaline earth metal salts of diarylphosphinic acids. 4,626,386, Cl. 260-502.40R.

Kline, Larry R.: *See—*
Tobias, Jackie L.; Kline, Larry R.; and Moser, Ted O., 4,625,950, Cl. 266-200.000.

Klopper, Detlev: *See—*
Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, 4,626,654, Cl. 219-121.0PR.

Klotz, Brian L.; and Klotz, James M., to Coatings for Industry, Inc. Coating compositions and method for improving the properties of coated substrates. 4,626,453, Cl. 427-397.700.

Klotz, James M.: *See—*
Klotz, Brian L.; and Klotz, James M., 4,626,453, Cl. 427-397.700.

Knickerbocker, Robert H., to Siemon Company, The. Eight conductor modular plug. 4,626,057, Cl. 339-91.00R.

Knight, Edwin L.; and Shea, William S., to Warner & Swasey Company, The. Method of attaching guideways to a machine tool bed. 4,626,299, Cl. 156-71.000.

Knoblauch, Georg, to Georg Knoblauch, Firma. Connecting clip. 4,625,863, Cl. 206-379.000.

Knochel, Reinhard, to U.S. Philips Corporation. Mixer. 4,627,104, Cl. 455-327.000.

Knop, Charles M.; Ostertag, Edward L.; and Cheng, Yuk-Bun, to Andrew Corporation. Low side lobe Gregorian antenna. 4,626,863, Cl. 343-781.00P.

Knote, Charles E. Bait station and trap. 4,625,452, Cl. 43-131.000.

Knothe, Erich; Melcher, Franz-Josef; and Berg, Christoph, to Sartorius GmbH. Electric balance. 4,625,818, Cl. 177-212.000.

Knotless Fishing Tackle Limited: *See—*
Swinbanks, Duncan J.; and Swinbanks, Brian J., 4,625,449, Cl. 43-42.740.

Kobayashi, Kashiwa: *See—*
Takahashi, Tadahiro; Ohi, Shinichi; and Kobayashi, Kashiwa, 4,626,820, Cl. 337-354.000.

Kobayashi, Masatsune: *See—*
Ohta, Tokuya; Kobayashi, Masatsune; Miura, Konoe; and Takimoto, Hiroshi, 4,626,284, Cl. 106-22.000.

Kobayashi, Mikizo. Implement for fastening sheet to mat. 4,625,352, Cl. 5-498.000.

Kobayashi, Minoru, to Olympus Optical Co., Ltd. Tape recorder with reciprocating magnetic heads. 4,626,940, Cl. 360-96.300.

Kobayashi, Nobuyuki; and Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,625,699, Cl. 123-489.000.

Kobayashi, Satoshi: *See—*
Awane, Misao; Suda, Yorishige; Hara, Seiji; and Kobayashi, Satoshi, 4,627,056, Cl. 371-16.000.

Kobayashi, Toshio: *See—*
Fujisaki, Kiyonori; Kobayashi, Toshio; and Kato, Heihachi, 4,626,752, Cl. 318-254.000.

Kober, Horst; and Trogisch, Gunter, to Carl Freundenberg, Firma. Process for the manufacture of through-hole contacted flexible circuit boards for high bending stresses and the circuit boards made therefrom. 4,626,462, Cl. 428-137.000.

Koch, Mark E.: *See—*
Stwalley, William C.; and Koch, Mark E., 4,627,066, Cl. 372-57.000.

Koerner, Gotz: *See—*
Berger, Roland; Fink, Hans-Ferdi; Koerner, Gotz; Langner, Jaroslav; and Weitemeyer, Christian, 4,626,378, Cl. 252-321.000.

Koga, Hirofumi; Maenishi, Kozo; Kashimoto, Shuichi; Honda, Sueaki; Tsuruyoshi, Kenichi; and Sano, Takezo, to Omron Tateisi Electronics Co. Electromagnetic drive and polarized relay. 4,626,813, Cl. 335-278.000.

Kohama, Shigeo: *See—*
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, 4,626,273, Cl. 71-92.000.

Kohler Co.: *See—*
Sandman, Robert B., 4,626,454, Cl. 428-13.000.

Kohler, Terry K.; Grube, William L.; and Giczewski, Norbert G., Jr., to Metform Corporation. Method for mounting a wheel flange. 4,625,385, Cl. 29-467.000.

Kohno, Takeshi: *See—*
Oku, Narihiro; Usui, Seiji; Uematsu, Hiroaki; and Kohno, Takeshi, 4,626,512, Cl. 436-8.000.

Koike, Ichiro: *See—*
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Kojima Press Industry Co., Ltd.: *See—*
Inayoshi, Kazumi, 4,626,060, Cl. 339-147.00P.

Kojima, Yuichi: *See—*
Fukuda, Shinichi; and Kojima, Yuichi, 4,626,826, Cl. 340-347.0DD.

Kojima, Yutaka; and Ishida, Hisao, to Diesel Kiki Co., Ltd.; and Isuzu Motors Co., Ltd. Hydraulic control unit for automotive transmissions. 4,625,840, Cl. 192-3.580.

Kollmeyer, Willy D., to Shell Oil Company. Insecticidal 2,6-difluorobenzoyl derivatives of 4-substituted-1,3-thiazole-2-acetonitriles. 4,626,543, Cl. 514-365.000.

Kollross, Gunter; and Steinbis, Fritz K., to Teepak, Inc. Method and a device for automated manufacture of strings of sausages. 4,625,362, Cl. 17-33.000.

Kolwicz, Kevin D.; and Mowery, Gilbert L., Jr., to AT&T Bell Laboratories. Glitch lockout circuit for memory array. 4,627,032, Cl. 365-203.000.

Koma, Hachiro: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.

Komai, Kensaku; and Shiono, Fusahiro, to Sharp Kabushiki Kaisha. Electronic cash register. 4,626,990, Cl. 364-405.000.

Komfort Karrier, Inc.: *See—*
Hernandez, Robert D., 4,625,340, Cl. 2-247.000.

Kominami, Mitsuhiro: *See—*
Fujishiro, Chiaki; and Kominami, Mitsuhiro, 4,626,463, Cl. 428-143.000.

Komito, Evan H.: *See—*
Dulka, Catherine P.; and Komito, Evan H., 4,627,006, Cl. 364-527.000.

Komoda, Tsutomu: *See—*
Todokoro, Hideo; and Komoda, Tsutomu, 4,626,690, Cl. 250-396.00R.

Komori, Minoru: *See—*
Kumazawa, Katsuyoshi; Ohtsuki, Toshio; and Komori, Minoru, 4,626,197, Cl. 431-302.000.

Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Internal combustion engine ignition systems. 4,625,689, Cl. 123-335.000.

Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Knock suppression system for internal combustion engine. 4,625,691, Cl. 123-425.000.

Kondo, Haruyoshi; Saji, Keiichi; and Takeuchi, Takashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Equipment for detecting oxygen concentration. 4,626,338, Cl. 204-406.000.

Kondo, Kazuo; Okuyama, Masahiko; Watanabe, Masakazu; and Iio, Satoshi, to NGK Spark Plug Co., Ltd. Process for producing ceramic body for surgical implantation. 4,626,392, Cl. 264-62.000.

Kondo, Toshihiko: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Konno, Gen: *See—*
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, 4,626,180, Cl. 418-63.000.

Konno, Tatsuo, to Canon Kabushiki Kaisha. Clutch mechanism for camera. 4,626,092, Cl. 354-212.000.

Kooijman, Hendrikus P. Adjustable sprocket wheel and transmission mechanism. 4,626,228, Cl. 474-49.000.

Koppelman, Edward, to Koppelman, Edward. Multiple hearth apparatus and process for thermal treatment of carbonaceous materials. 4,626,258, Cl. 44-2.000.

Korb, Louis L.: *See—*
Waitkus, Phillip A.; and Korb, Louis L., 4,626,569, Cl. 524-541.000.

Kordomenos, Panagiotis I.; Maker, David L.; Mros, Gordon R.; and Nordstrom, John D., to Ford Motor Company. Thermosetting high solids primer composition comprising epoxy ester resin and hydroxy-reactive crosslinking agent. 4,626,578, Cl. 525-484.000.

Koren, James T.: *See—*
Koren, Robert W.; and Koren, James T., 4,625,600, Cl. 81-462.000.

Koren, Robert W.; and Koren, James T. Lug removal/installation device. 4,625,600, Cl. 81-462.000.

Kornrumpf, William P.: *See—*
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,626,698, Cl. 307-38.000.

Korson, Bruce W.: *See—*
Korson, John A.; and Korson, Bruce W., 4,625,602, Cl. 82-36.00R.

Korson, John A.; and Korson, Bruce W. Cutting tool holder. 4,625,602, Cl. 82-36.00R.

Koshika, Kazushige: *See—*
Tanaka, Tatsuo; Shigematsu, Nana; and Koshika, Kazushige, 4,626,795, Cl. 330-257.000.

Kossatz, Gert: *See—*
Lempfer, Karsten; Kossatz, Gert; and Sattler, Heinz, 4,626,389, Cl. 264-40.700.

Kosugi, Masao, to Canon Kabushiki Kaisha. Method and device for discriminating stillness of a step exposure apparatus. 4,627,010, Cl. 364-559.000.

Kotani, Matahira; Matsumoto, Masafumi; and Shirakoshi, Hiroshi, to Sharp Kabushiki Kaisha. Recording head support. 4,626,873, Cl. 346-139.00R.

Kotera, Nobuo: *See—*
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Kawabe, Ushio, 4,626,701, Cl. 307-245.000.

Kothman, Antonius B.: *See—*
Kothmann, Antonius B.; and Brinch, Keith, 4,626,129, Cl. 405-43.000.

Kothmann, Antonius B.; and Brinch, Keith, to Kothman, Antonius B. Sub-soil drainage piping. 4,626,129, Cl. 405-43.000.

Kotzin, Michael D.: *See—*
Dolikian, Arman V.; Kotzin, Michael D.; and Budnik, Brian J., 4,627,098, Cl. 455-70.000.

Kowalik, Ralph M.; Duvdevani, Ilan; Kitano, Kissho; and Schulz, Donald N., to Exxon Research and Engineering Company. Drag reduction agents for hydrocarbon solutions. 4,625,745, Cl. 137-13.000.

Kowalski, Craig D.: *See—*
Giancola, Dean L.; Kowalski, Craig D.; and Paetz, Frederic H., 4,625,433, Cl. 34-23.000.

Kozai, Takehisa: *See—*
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Koziol, Leo B.: *See—*
Parker, Jay S.; and Koziol, Leo B., 4,626,846, Cl. 340-825.520.

Kramer, Dennis M.: *See—*
Damiano, Michael A.; Gass, Dale L.; Kramer, Dennis M.; and Schmerda, Richard F., 4,626,954, Cl. 361-96.000.

Kramer, James H., to B.F. Goodrich Company, The. Propeller bearing. 4,626,112, Cl. 384-300.000.

Krasberg, Alan R.: *See—*
Craig, David W., 4,625,759, Cl. 137-613.000.

Krause-Hooyman, Laurel, to Abbott Laboratories. Method for exposing bacterial antigen in bacterial cells assay using same. 4,626,502, Cl. 435-7.000.

Krauss, Timothy A.: *See—*
Carter, Donald R., Sr.; Krauss, Timothy A.; and Sedlak, Matthew, 4,626,171, Cl. 416-90.00A.

Krebaum, Lawrence J.: *See—*
Weisberg, Renee; and Krebaum, Lawrence J., 4,626,428, Cl. 424-61.000.

Kretschmer, Frank F., Jr.; and Lewis, Bernard L., to United States of America, Navy. Method and apparatus for generating a modified P code. 4,626,854, Cl. 342-196.000.

Krichevsky, Mendel; Rabinovici, Raul; and Sharir, Benjamin, to Ben-Gurion University of the Negev Research and Development Authority. Polyphase assembly. 4,626,815, Cl. 336-5.000.

Kridl, Thomas A.: *See—*
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,626,458, Cl. 428-36.000.

Kristofek, Paul, to Cooper Industries, Inc. Wall wash track lighting fixture. 4,626,969, Cl. 362-147.000.

Kroeger, Michael K.; and Longo, John M., to Exxon Production Research Co. Method and means for determining rock properties using time-domain dielectric spectroscopy. 4,626,773, Cl. 324-58.50B.

Kroener, Wolfgang, to Pforzheimer Uhren Rohwerke Porta GmbH. Watch hand drive shaft structure. 4,626,109, Cl. 368-322.000.

Krofta, Milos, to Lenox Institute for Research, Inc. Apparatus for clarification of water. 4,626,345, Cl. 210-104.000.

Krog, Harald U. G. Case preferably for a lighter. 4,625,861, Cl. 206-234.000.

Kronogard, Sven-Olof, to AB Volvo. Vehicle drive plant. 4,625,583, Cl. 74-661.000.

Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, to Degussa Aktiengesellschaft. Process for the delignification and acid bleaching of cellulose with oxygen and hydrogen peroxide. 4,626,319, Cl. 162-65.000.

Kruper, Burkhard, to Cramer GmbH & Co. KG. Grill basket. 4,625,634, Cl. 99-427.000.

Kruyt, Robert A. Firewood carrier. 4,626,015, Cl. 294-152.000.

Kubis, Heribert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Compact fresh-gas intake system for engines with combination supercharging. 4,625,686, Cl. 123-52.0MB.

Kubo, Tetsushi. Pipe processing device. 4,625,464, Cl. 51-241.00B.

Kubota, Ltd.: *See—*
Okuyama, Shigeaki; and Fuziwara, Osami, 4,626,993, Cl. 364-424.000.

Kucera, Carrell J., to Norden Laboratories, Inc. Processes for growth of modified *Pasteurella haemolytica* bacteria and preparation of a vaccine therefrom. 4,626,430, Cl. 424-92.000.

Kuech, Thomas F.: *See—*
Kash, Jeffrey A.; and Kuech, Thomas F., 4,626,883, Cl. 357-30.000.

Kuehl, Guenther L., to Z-Loda Corporation. Endless belt conveyor system having patterned belt transport surface. 4,625,857, Cl. 198-465.100.

Kuipers, Sytze A., to Lankhorst Touwfabrieken B.V. Carrier for packaging, shipping and transporting coiled, heavy-weight products. 4,625,869, Cl. 206-600.000.

Kuka Schweissanlagen + Roboter GmbH: *See—*
Zimmer, Ernst, 4,625,837, Cl. 188-170.000.

Kulagin, Mikhail V.: *See—*
Gorbachev, Oleg S.; Ioffe, Anatoly F.; Kulagin, Mikhail V.; Ruvinsky, Boris I.; Khorin, Vladimir S.; and Chugunov, Jury V., 4,626,935, Cl. 360-67.000.

Kum, Humberto: *See—*
Galiasso, Roberto E.; Arias, Beatriz R.; Caprioli, Lino; Garcia, Juan; and Kum, Humberto, 4,626,340, Cl. 208-89.000.

Kumagai, Naotake: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.

Kumai, Toshiyuki, to Murakami Kaimeido Co., Ltd. Electrically foldable door mirror. 4,626,084, Cl. 350-604.000.

Kumai, Toshiyuki: *See—*
Nakayama, Kiyoshi; Ito, Yasutoshi; and Kumai, Toshiyuki, 4,626,083, Cl. 350-604.000.

Kumazawa, Katsuyoshi; Ohtsuki, Toshio; and Komori, Minoru, to Kabushiki Kaisha Toshiba. Space heater. 4,626,197, Cl. 431-302.000.

Kume, Yuichiro: *See—*
Sano, Tetsu; Anno, Hidero; and Kume, Yuichiro, 4,626,694, Cl. 250-483.100.

Kung, Daniel: *See—*
Renggli, Werner; and Kung, Daniel, 4,625,348, Cl. 5-71.000.

Kunii, Daizo: *See—*
Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, 4,626,202, Cl. 432-107.000.

Kunneppu Sekkai Kogyo Incorporated: *See—*
Chisaki, Tatsu; Ikenaga, Toshio; and Iwabuchi, Akira, 4,626,202, Cl. 432-107.000.

Kuno, Akira: *See—*
Kashiwagi, Hideki; Akita, Shigeyuki; Tanaka, Hiroaki; and Kuno, Akira, 4,625,411, Cl. 33-1.0PT.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Nara, Motohisa; and Endo, Yasushi, 4,626,687, Cl. 250-338.000.

Kuroki, Junsuke: *See—*
Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,625,822, Cl. 180-140.000.

Kusano, Chushirou: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.

Kushner, Andrew. Hub cap mounting bracket. 4,626,037, Cl. 301-108.00S.

Kuss, John M.: *See—*
Nystuen, Arne M.; and Kuss, John M., 4,626,147, Cl. 409-133.000.

Kuss, Thomas N.; and Horne, Donald L. Cover for coal car. 4,625,654, Cl. 105-377.000.

Kuster & Co. GmbH: *See—*
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Kusunoki, Toshio: *See—*
Maeda, Masatoshi; Kusunoki, Toshio; and Iguchi, Yoji, 4,626,666, Cl. 219-537.000.

Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, to Kao Corporation; and Nippon Kokan Kabushiki Kaisha. Water-soluble metal-working lubricant composition. 4,626,367, Cl. 252-49.500.

Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, to Sanyo Electric Co., Ltd. Semiconductor optical logical device. 4,626,878, Cl. 357-19.000.

Kuwayama, Tetsuro; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Optical head and method of detecting the focus thereof. 4,626,679, Cl. 250-227.000.

Kyocera Corporation: *See—*
Hosoi, Yoshihiro; and Fujioka, Takaaki, 4,626,479, Cl. 428-663.000.

Kyushu Refractories Co., Ltd.: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.

Labeda, David P.: *See—*
Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., 4,626,503, Cl. 435-75.000.

Labelette Company: *See—*
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Lachner, Walter: *See—*
Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, 4,626,654, Cl. 219-121.0PR.

Laclede Professional Products, Inc.: *See—*
Pellico, Michael A., 4,626,558, Cl. 523-109.000.

Ladd, James E., Jr., to Laura Lupton, Inc. Cosmetic powder dispenser and applicator. 4,626,119, Cl. 401-123.000.

Ladd, Judith A.: *See—*
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,626,280, Cl. 75-101.00R.

Ladecky, Vilhelme, to Societe Nationale Elf Aquitaine (Production). Oil production installation for a subsea station of modular design. 4,625,805, Cl. 166-341.000.

Lafontaine, Lucien. Power door operating device. 4,625,456, Cl. 49-358.000.

Lafrasse, Jean; and Chastan, Jean-Paul, to Picot S.A. Bending machine. 4,625,531, Cl. 72-150.000.

LaGorce, Paul D.: *See—*
Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., 4,626,307, Cl. 156-218.000.

LaHaye, Joseph G. Method and apparatus for telephone access security. 4,626,623, Cl. 379-95.000.

Lamain, Henri: *See—*
Doucet, Henri T.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,627,088, Cl. 378-122.000.

Lamb, James A.: *See—*
Unruh, Rudy R.; Lamb, James A.; and Tejral, Richard A., 4,626,984, Cl. 364-132.000.

Lamb Technicon Corp.: *See—*
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Lamb-Weston, Inc.: *See—*
Glantz, Jerome J., 4,626,438, Cl. 426-438.000.

Lancellotti, William E. Exercise apparatus. 4,625,963, Cl. 272-135.000.

Lancia, Frederick N., II: *See—*
Mazumder, Nikhil C.; and Lancia, Frederick N., II, 4,626,709, Cl. 307-455.000.

Landa, Isaac J. Rapid and automatic fluorescence immunoassay analyzer for multiple micro-samples. 4,626,684, Cl. 250-328.000.

Landes, Greg M., to Integrated Genetics, Inc. Labeled DNA. 4,626,501, Cl. 435-6.000.

Lane, Michael L.; Whitney, Lowell T.; and Beck, Paul C., to Adolph Coors Company. Apparatus and method for operating solution heat with vertical heat exchangers. 4,625,791, Cl. 165-115.000.

Lang, Erika Graap geborene, executrix: *See—*
Hufnagel, Walter; Graap, Volker, deceased; von und zu Aufsess, Freidrich; and Armsen, Rotger, 4,625,372, Cl. 26-73.000.

Langeloth, Gernot: *See—*
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Langner, Jaroslav: *See—*
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Lankhorst Touwfabrieken B.V.: *See—*
Kuipers, Sytze A., 4,625,869, Cl. 206-600.000.

Lantzsch, Reinhard; and Reubke, Karl-Julius, to Bayer Aktiengesellschaft. Process for the preparation of beta-hydroxyethyl-(1,2,4-triazole) derivatives. 4,626,594, Cl. 548-262.000.

Lanzoni, Maurice, to Framatome & Cie. Device for tightening a nut on a fastening pin of a nuclear reactor guiding tube. 4,625,554, Cl. 73-581.000.

Largman, Theodore: *See—*
Li, Hsin L.; Largman, Theodore; and Oswald, Hendrikus J., 4,626,390, Cl. 264-46.100.

Laroche, Francois X. Structural corner joints. 4,626,124, Cl. 403-295.000.

Larson, Lawrence E., to International Business Machines Corporation. Apparatus and algorithm for compressing and decompressing data. 4,626,824, Cl. 340-347.0DD.

Larson, Mikiel L., to AT&T Bell Laboratories. Routing address bit selection in a packet switching network. 4,627,048, Cl. 370-60.000.

Larson, Raymond F.: *See—*
Quedens, Phillip J.; Dutko, Peter J., Jr.; Larson, Raymond F.; and Donarumo, Ralph A., 4,625,731, Cl. 128-660.000.

Larson, Wayne F., to Supra Products, Inc. Tilt bolt lock. 4,626,007, Cl. 292-65.000.

Larsson, Torsten: *See—*
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Latinski, Joseph W.: *See—*
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Laura Lupton, Inc.: *See—*
Ladd, James E., Jr., 4,626,119, Cl. 401-123.000.

Laures, Pierre, to Societe Nationale Industrielle et Aerospatiale. Weapon system and missile for the structural destruction of an aerial target by means of a focussed charge. 4,625,647, Cl. 102-214.000.

Lawrence, Mark A.: *See—*
Hanchett, Leland J., Jr.; and Lawrence, Mark A., 4,626,010, Cl. 292-341.160.

Lawson, Darryl. Outboard motor mounts for vehicles. 4,625,900, Cl. 224-42.070.

Leather, Russell A.: *See—*
McLeod, John; Smith, John A.; and Leather, Russell A., 4,627,061, Cl. 372-29.000.

Leathers, Joel F. M.: *See—*
Dang, Hiep D.; Hicks, Roy L.; and Leathers, Joel F. M., 4,625,440, Cl. 38-102.500.

Le Bras, Philippe A., to Mead Corporation, The. Cam assembly for a feeder mechanism. 4,625,575, Cl. 74-63.000.

Le Bret, Lucien F., to Gallay S.A. Container seam and a process for forming a container seam. 4,626,158, Cl. 413-6.000.

Lechler GmbH & Co., KG: *See—*
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Leducq, Annick: *See—*
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Lee, David G., Jr.: *See—*
Fountain, Glen H.; Lee, David G., Jr.; and Kitchin, David A., 4,625,730, Cl. 128-419.00D.

Lee, Francis C. K., to Deutsch Company Metal Components Division, The. Fluid fitting with high temperature capabilities. 4,626,001, Cl. 285-94.000.

Lee, Henry E.; and Seldes, Michael B., to Westinghouse Electric Corp. Pulse compression radar signal processor. 4,626,853, Cl. 342-132.000.

Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., to American Cyanamid Company. Antitumor agents LL-D49194α_1, LL-D49194β_1, LL-D49194β_2, LL-D49194β_3, LL-D49194γ, LL-D49194δ, LL-D49194ϵ, LL-D49194ξ, LL-D49194η, LL-D49194ω_1, LL-D49194ω_2, and LL-D49194ω_3. 4,626,503, Cl. 435-75.000.

Lee, Po-Chao. Structure of container possible for bulk cargo carriage in addition to original utility. 4,625,878, Cl. 220-1.500.

Lee, Robert D., to Thomson Components-Mostek Corporation. Trip-point clamping circuit for a semiconductor device. 4,626,713, Cl. 307-548.000.

Leeson, David E.: *See—*
Cho, Frederick Y.; Adamo, Michael D.; and Leeson, David E., 4,626,775, Cl. 324-73.00R.

Leftwich, William B.: *See—*
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Leggett & Platt, Incorporated: *See—*
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Leiber, Heinz, to Robert Bosch GmbH. Method and apparatus to control slippage or spinning of driven wheels of a vehicle. 4,625,824, Cl. 180-197.000.

Leiboff, Arnold R. Anastomosis device with excisable frame. 4,625,727, Cl. 128-334.00C.

Leichtfried, Friedrich, to TMC Corporation. Heel holder. 4,625,991, Cl. 280-632.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Method and apparatus for opening and cleaning fiber material. 4,625,368, Cl. 19-200.000.

Le Marquis, Jean-Claude: *See—*
Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, 4,625,766, Cl. 138-93.000.

Lempfer, Karsten; Kossatz, Gert; and Sattler, Heinz. Installation for the continuous production of materials using exothermically hardening binders and method. 4,626,389, Cl. 264-40.700.

Lenox Institute for Research, Inc.: *See—*
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Leogrande, John A.: *See—*
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Leonard Oboler: *See—*
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L'Etat Francais represente par le Ministre des P.T.T. (C.N.E.T.): *See—*
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Letemps, Bernard: *See—*
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Letterman, Donald E., to Aluminum Company of America. Motor speed control by measurement of motor temperature. 4,626,753, Cl. 318-334.000.

Leu, Fang-Nung: *See—*
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Lever Brothers Company: *See—*
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Finch, Timothy D.; and Wilde, Raymond J., 4,626,374, Cl. 252-174.130.
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Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., to Lockheed Corporation. Smoke mask. 4,625,721, Cl. 128-201.280.

Levinson, Frank H., to AT&T Bell Laboratories. Optical coupling device utilizing a mirror and cantilevered arm. 4,626,066, Cl. 350-96.180.

Lewiner, Jacques; and Hennion, Claude. Electroacoustic piezoelectric transducers. 4,626,729, Cl. 310-324.000.

Lewis, Bernard L.: *See—*
Kretschmer, Frank F., Jr.; and Lewis, Bernard L., 4,626,854, Cl. 342-196.000.

Lewis, Charles B. Banding apparatus for presses. 4,625,635, Cl. 100-26.000.

Lewis, Kenneth D. Portable tree seat. 4,625,833, Cl. 182-187.000.

Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., to Texaco Inc. Control of SO_x emission. 4,626,419, Cl. 423-244.000.

Lewis, Richard W., to Boeing Company, The. Magnetometer operated at a self-resonant frequency by a sense winding. 4,626,782, Cl. 324-253.000.

Ley, John F., to Epic Systems, Inc. Subscriber validation system. 4,626,845, Cl. 340-825.480.

LGZ Landis & Gyr Zug AG: *See—*
Friedl, Richard, 4,625,778, Cl. 324-127.000.

Li, Gabriel M., to National Semiconductor Corporation. Exclusive or gate circuit. 4,626,711, Cl. 307-471.000.

Li, Hsin L.; Largman, Theodore; and Oswald, Hendrikus J., to Allied Corporation. Self-crimped foamed fibers. 4,626,390, Cl. 264-46.100.

Liboff, Richard L.; and Liu, Kung C., to Cornell Research Foundation, Inc. Pure crystal exciton laser amplifier and method of operation. 4,626,792, Cl. 330-4.300.

Liehr, Manfred R.: *See—*
Martens, Gerhard; and Liehr, Manfred R., 4,626,680, Cl. 250-231.00P.

Liepert, Rudolf: *See—*
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Lilliwyte Societe Anonyme: *See—*
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Lilly, Gerald C., to Container Products Corp. Container lid lock. 4,625,891, Cl. 220-327.000.

Lincoln Manufacturing Company, Inc.: *See—*
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Lindberg, Torsten G., to Telefonaktiebolaget LM Ericsson. Collapsible foldable aerial. 4,626,866, Cl. 343-880.000.

Lindemann, Gerhard. Process for manufacturing a product suitable for producing pure quartz glass as well as a process for producing pure quartz glass from this product. 4,626,268, Cl. 65-134.000.

Lindenmeier, Heinz: *See—*
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Lindkvist, Goran: *See—*
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Link, Joseph E.; and Oeth, James F., to Deere & Company. Mounting step for crawler loader. 4,626,163, Cl. 414-685.000.

Lisle Corporation: *See—*
Pool, James L., 4,625,812, Cl. 173-134.000.

Litke, Cynthia D.: *See—*
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Little, Carl H.; and Watt, Richard L., to Weber-Knapp Company. Adjustable keyboard supporting mechanism. 4,625,657, Cl. 108-93.000.

Litton Systems, Inc.: *See—*
Shone, Michael F.; and Belt, Roger F., 4,625,390, Cl. 29-576.00B.

Liu, Clark W. User assembled desk top file. 4,625,879, Cl. 220-4.00R.

Liu, Kung C.: *See—*
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Liu, Ping Y.: *See—*
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Liu, Richard W.: *See—*
Sato, Kyosaku; Liu, Richard W.; and Cheung, Seung-Tong, 4,626,568, Cl. 524-526.000.

Livanos, Vassilios J.; and Ngai, Eugene Y., to Matheson Gas Products, Inc. Ventilated cabinet for containing gas supply vessels. 4,625,627, Cl. 98-32.000.

Livermore, Anthony W.; and Ford, Francis J., to Dennison Manufacturing Company. Removal of reel stored magnetic tape. 4,626,950, Cl. 360-134.000.

Livingston, Hank: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Livingstone, David J.: *See—*
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Hyde; Richard M.; and Livingstone, David J., 4,626,432, Cl. 424-101.000.

Lo, Donald H.; Wu, Tai-Wing; and Bailey, Mark W., to Eastman Kodak Company. Method and apparatus for determination of an analyte and method of calibrating such apparatus. 4,627,014, Cl. 364-571.000.

Lock, Peter M. Wound dressing material. 4,625,720, Cl. 128-156.000.

Lockard, Steven C.; Hyslop, Michael S.; and Hernandez, Jorge M., to Rogers Corporation. Decoupling capacitor for Pin Grid Array package. 4,626,958, Cl. 361-306.000.

Lockheed Corporation: *See—*
Halfpenny, Paul F., 4,625,808, Cl. 169-30.000.
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Lockwood, George H.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.

Lodge, Quentin C.: *See—*
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Loew, Peter: *See—*
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Lofgren, Gunnar K.; and Netzler, Goran P. R., to NDC Technologies, Inc. Apparatus and method for optical guidance system for automatic guided vehicle. 4,626,995, Cl. 364-424.000.

Logan, Ralph A.; and Tsang, Won-Tien, to AT&T Bell Laboratories. Double active layer semiconductor laser. 4,627,065, Cl. 372-50.000.

Logsdon, John E.: *See—*
Hiles, Andrew G.; and Logsdon, John E., 4,626,604, Cl. 568-881.000.

Loh, Ih-Houng; Cohen, Robert E.; and Baddour, Raymond F., to Massachusetts Institute of Technology. Thermal energy storage powdered material. 4,626,473, Cl. 428-409.000.

Lohraff, Larry G., to Allied Corporation. Brake booster. 4,625,623, Cl. 91-368.000.

Londry, Calvin H.; and Adler, Thomas A., to Union Carbide Corporation. Wear and corrosion resistant coatings applied at high deposition rates. 4,626,476, Cl. 428-457.000.

Longo, John M.: *See—*
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Lopez, Jesus C.: *See—*
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L'oreal: *See—*
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Losa, PierAntonio; and Tabbia, Augusto, to Fiat Ferroviaria Savigliano S.p.A. Two-axled central support bogie for railway and tramway vehicles with two or more articulated bodies. 4,625,652, Cl. 105-4.100.

Loser, Robert P.: *See—*
Casey, William R.; Loser, Robert P.; Smith, Michael W.; and Waibel, Terry J., 4,626,302, Cl. 156-133.000.

Lothmann, Werner: *See—*
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Love, George E.: *See—*
Orth, David J.; and Love, George E., 4,625,990, Cl. 280-415.00R.

Lowe, Tony M.: *See—*
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Lubbs, Eugene K., to Schmid Laboratories, Inc. Collagen gel and the process of making said gel. 4,626,286, Cl. 106-157.000.

Lubrizol Genetics, Inc.: *See—*
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Lucas Industries public limited company: *See—*
Adey, Anthony J.; and Mowbray, Dorian F., 4,625,694, Cl. 123-450.000.
Bartlett, Peter J.; and Bradford, Peter F., 4,625,701, Cl. 123-514.000.
Maltby, Peter J.; and Parker, Ray, 4,625,843, Cl. 192-8.00R.
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Luccarelli, Domenick, Jr.: *See—*
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Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,626,599, Cl. 568-57.000.

Luciano, Gerard; Poveda, Pierre; and Croiset, Pierre, to Societe Nationale Industrielle Aerospatiale. Process and device for regulating the movement of a member by employing a fluid flow. 4,625,933, Cl. 242-99.000.

Ludwig Svensson International B.V.: *See—*
Henningsson, Goran, 4,626,465, Cl. 428-225.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 4,625,847, Cl. 192-89.00B.
Maucher, Paul; Friedmann, Oswald; and Sonntag, Siegfried, 4,626,696, Cl. 290-38.00R.

Lukehart, Donald W. Pick for stringed instruments. 4,625,615, Cl. 84-322.000.

Lukens General Industries, Inc.: *See—*
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Lundberg, Robert D.: *See—*
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Luo, Tatao, to Chevron Research Company. Herbicidal trans-2-[(3-chloroallyloxyimino)alkyl]-5-(substitutedsulfinylalkyl)-cyclohexane-1,3-diones and derivatives thereof. 4,626,276, Cl. 71-103.000.

Lurie, Oscar M., to Control Data Corporation. Meter for passively logging the presence and identity of TV viewers. 4,626,904, Cl. 358-84.000.

Lurssen, Klaus: *See—*
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Lustvee, Kaljo. Picket fence. 4,625,948, Cl. 256-72.000.

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Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Sliding roof having a sliding inside roof lining. 4,626,023, Cl. 296-216.000.

Luxtron Corporation: *See—*
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Lyle, W. D., Jr., to Mobil Oil Corporation. Borehole gravimetry logging. 4,625,547, Cl. 73-152.000.

Lyman, George F., to Data Packaging Corp. Culture media transfer assembly. 4,626,509, Cl. 435-287.000.

Lynd, Lee H.: *See—*
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Lyzohub, Walter A., to Chrysler Motors. Fuel tank. 4,625,980, Cl. 280-5.00A.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
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Schmidt, Alfred; and Pottig, Wolfram, 4,627,057, Cl. 371-25.000.

M.A.N. Roland Druckmaschinen Aktiengesellschaft: *See—*
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Hartung, Winfried; and Gensheimer, Valentin, 4,625,568, Cl. 73-862.550.

Ma, John. Antenna having coaxial driven element with grounded center conductor. 4,626,862, Cl. 343-702.000.

Machinefabrik Heid Aktiengesellschaft: *See—*
Holy, Franz; and Eigner, Johann, 4,626,149, Cl. 409-191.000.

MacInnis, Martin B.: *See—*
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Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,626,280, Cl. 75-101.00R.

MacLean-Blevins, Mark T.: *See—*
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MacLean-Fogg Company: *See—*
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Macrovision: *See—*
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Maeda, Mamoru: *See—*
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Maeda, Masatoshi; Kusunoki, Toshio; and Iguchi, Yoji, to Matsushita Electric Works, Ltd. Self-regulating electric heater. 4,626,666, Cl. 219-537.000.

Maenishi, Kozo: *See—*
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Magnetic Peripherals Inc.: *See—*
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Maher, John B.: *See—*
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Mahon, Joseph J., to Eaton Corporation. Latching push button switch. 4,626,635, Cl. 200-38.00A.

Mahoney, J. Michael, to Outboard Marine Corporation. Optical fluid level indicator including float with reflecting means. 4,625,549, Cl. 73-327.000.

Maiese, William M.: *See—*
Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., 4,626,503, Cl. 435-75.000.

Maillez, Paul. Food slicer. 4,625,607, Cl. 83-466.100.

MAJ: *See—*
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Maker, David L.: *See—*
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Makino, Yasuhiro: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.

Makishima, Tatsuo: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.

Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; and Inoue, Nobuhiro, 4,625,406, Cl. 30-381.000.
Fushiya, Fusao; Hakamata, Nobuo; and Okumura, Michio, 4,625,462, Cl. 51-170.0MT.

Makus, Adolph. Electrical pliers. 4,625,596, Cl. 81-9.440.

Malagnoux, Roger, to Etablissements Pierre Grehal et Compagnie. Plug grip for fitting expansion plugs. 4,625,538, Cl. 72-391.000.

Malaker, John; and Bernadic, Thomas J., to GTE Valeron Corporation. Chip control insert. 4,626,141, Cl. 407-114.000.

Malata, Peter; and Rosenstatter, Otto, to Dentalwerk Burmoos Gesellschaft m.b.H. Dental handpiece. 4,626,210, Cl. 433-29.000.

Malecka, Joseph R.: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.

Maltby, Peter J.; and Parker, Ray, to Lucas Industries public limited company. Torque limiter with device indicating operation thereof. 4,625,843, Cl. 192-8.00R.

Mangla, Raj K., to Mobil Oil Corporation. Hinged cover carton. 4,625,905, Cl. 229-2.5EC.

Mangla, Raj K., to Mobil Oil Corporation. Eighteen cell hinged-cover carbon thermoformed from plastic sheet. 4,625,906, Cl. 229-45.0EC.

Mangla, Raj K., to Mobil Oil Corporation. Thermoforming eighteen-cell hinged cover carton from plastic sheet. 4,625,907, Cl. 229-45.0EC.

Manitowoc Company, Inc., The: *See—*
Morrow, James G., Sr., 4,625,512, Cl. 60-353.000.

Mankey, Harry S.; and Garner, Charles C., to Standard Manufacturing Company, Inc. Safety device for lifting apparatus. 4,625,944, Cl. 254-8.00R.

Mann, Bruce L.; and Batti, Steve A., to Indiana Cash Drawer Company. Addressable electronic switch. 4,626,844, Cl. 340-825.310.

Mann, Harris; and Cohen, Jeffrey M. Dental instrument. 4,626,212, Cl. 433-144.000.

Mannesmann Aktiengesellschaft: *See—*
Beust, Wolfgang, 4,625,975, Cl. 277-9.500.

Mannesmann Rexroth GmbH: *See—*
Dantlgraber, Jorg, 4,626,181, Cl. 418-83.000.
Mucheyer, Norbert, 4,625,747, Cl. 137-101.000.
Muncke, Ludwig; Mucheyer, Norbert; and Kauss, Wolfgang, 4,625,748, Cl. 137-101.000.

Mannhardt, Karl: *See—*
Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.

Mansell, John R., to U.S. Philips Corporation. Cathode ray tube and an electron multiplying structure therefor. 4,626,736, Cl. 313-399.000.

Marass, Josef; Liepert, Rudolf; and Weyrich, Klaus, to Fa. Georg Spiess GmbH. Apparatus for forming a stack of sheets. 4,625,956, Cl. 271-183.000.

Marathon Oil Company: *See—*
Sydansk, Robert D., 4,625,802, Cl. 166-292.000.

Marchionne, Anthony. Harness racing sulky. 4,625,981, Cl. 280-63.000.

Marconi Company Limited, The: *See—*
Rouse, David G., 4,626,855, Cl. 342-201.000.

Mardon, Nathalie: *See—*
Dupeyrat, Benoit; Mardon, Nathalie; and Noel, Jean-Paul, 4,626,649, Cl. 219-121.0LU.

Mari, Roger: *See—*
Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, 4,626,607, Cl. 568-948.000.

Markel, David: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,625,347, Cl. 5-43.000.

Markman, Larry N.: *See—*
Markman, Robert; and Markman, Larry N., 4,625,632, Cl. 98-102.000.

Markman, Robert; and Markman, Larry N., to Owl Flex, Inc. Damper and register box. 4,625,632, Cl. 98-102.000.

Marks, Alvin M. 3-dimensional display of X-ray, CAT scan and NMR images. 4,627,087, Cl. 378-4.000.

Markwitz, Wernhard; and Kaeser, Edward, to Siemens Aktiengesellschaft. Method and arrangement for transmitting characters. 4,627,074, Cl. 375-2.100.

Marom, Emanuel, to Hughes Aircraft Company. Apparatus for de-emphasizing low spatial frequencies in optical imaging systems. 4,626,919, Cl. 358-225.000.

Marquis, Edward T.; Keating, Kenneth P.; Sanderson, John R.; and Smith, William A., to Texaco Inc. Synthesis of molybdenum/alkylene glycol complexes useful as epoxidation catalysts. 4,626,596, Cl. 556-57.000.

Mars, Inc.: *See—*
Johnson, Peter R.; Hutchinson, Derek; Reyner, Peter J.; and Dean, Robert, 4,625,851, Cl. 194-200.000.

Marsden, James G.; and Pepe, Enrico J., to Union Carbide Corporation. Novel binding agent compositions, foundry sand compositions and ureido functional organosilicon compounds. 4,626,560, Cl. 523-145.000.

Marsh, Barry I. Soft terrain motorcycle support fixture. 4,625,987, Cl. 280-293.000.

Marsh, Eugene M., to Verson Allsteel Press Co. Press clutch control system. 4,625,850, Cl. 192-143.000.

Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Lens system for optically recorded storage card reader. 4,626,671, Cl. 235-470.000.

Marsico, Mario A.: *See—*
Cooper, Ronald J.; Marsico, Mario A.; and Pescatore, John C., 4,627,054, Cl. 371-11.000.

Martens, Gerhard; and Liehr, Manfred R., to U.S. Philips Corporation. Pressure sensor whose optical system moves in response to movement of diaphragm. 4,626,680, Cl. 250-231.00P.

Martin, Jean-Pierre H.: *See—*
Despax, Damien M.; Martin, Jean-Pierre H.; and Gueuret, Francois, 4,625,795, Cl. 166-66.000.

Martin, Michael G., to Center Core, Inc. Ventilated core unit for service connections. 4,625,633, Cl. 98-115.300.

Martins, Evon; and Slepetys, Richard A., to Engelhard Corporation. Corrosion and marine growth inhibiting compositions. 4,626,283, Cl. 106-14.240.

Marvin Glass & Associates: *See—*
Katzman, Allison W.; Rosenwinkel, Donald A.; and Disko, Harry, 4,626,225, Cl. 446-394.000.

Masaki, Akira: *See—*
Yamamoto, Masakazu; Masaki, Akira; and Kamikawai, Ryotaro, 4,626,889, Cl. 357-71.000.

Maskens, Geoffrey D., to Ambotech Limited. Component leg bending device. 4,625,772, Cl. 140-105.000.

Mason, Joseph D.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.

Masonite Corporation: *See—*
Johnstonbaugh, George S., 4,625,477, Cl. 52-127.900.

Massachusetts General Hospital: *See—*
Burton, James A.; and Hoop, Bernard, Jr., 4,626,513, Cl. 436-518.000.

Massachusetts Institute of Technology: *See—*
Hubbard, James E., Jr., 4,626,730, Cl. 310-326.000.
Loh, Ih-Houng; Cohen, Robert E.; and Baddour, Raymond F., 4,626,473, Cl. 428-409.000.
Wurtman, Richard J.; Conlay, Lydia; and Blusztajn, Krzysztof, 4,626,527, Cl. 514-78.000.

Masseth, David A.: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.

Massey, Ross. Vehicle seat suspension apparatus. 4,626,018, Cl. 296-65.00R.

Massey, Rowland W.: *See—*
Massey, Simon C.; and Massey, Rowland W., 4,626,352, Cl. 210-469.000.

Massey, Simon C.; and Massey, Rowland W. Vessel strainer. 4,626,352, Cl. 210-469.000.

Masters, Larry C. Anti-tapping device to prevent unauthorized connections to electrical utility service cables. 4,626,616, Cl. 174-37.000.

Masuyama, Kenichi: *See—*
Yamaguchi, Nobutaka; Masuyama, Kenichi; Iida, Shinobu; and Fujiyama, Masaaki, 4,626,469, Cl. 428-323.000.

Mather, Donald A.: *See—*
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.

Mather, Scott D.: *See—*
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.

Matheson Gas Products, Inc.: *See—*
Livanos, Vassilios J.; and Ngai, Eugene Y., 4,625,627, Cl. 98-32.000.

Matievic, Miroslav, to Emhart Industries, Inc. Warble signaling device. 4,626,799, Cl. 331-47.000.

Matsubara, Naoki: *See—*
Murakami, Hideo; and Matsubara, Naoki, 4,625,564, Cl. 73-861.240.

Matsubara, Norio: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Matsubara, Shigekazu: *See—*
Wada, Masatoshi; Matsubara, Shigekazu; Moritsu, Yukikazu; and Sakai, Tetsuo, 4,626,071, Cl. 350-311.000.

Matsuda, Isao: *See—*
Endo, Shinichi; and Matsuda, Isao, 4,626,657, Cl. 219-212.000.

Matsui, Hideki; and Hagyuda, Nobuyoshi, to Nippon Kogaku K.K. Flash control device for electronic flash apparatus. 4,626,093, Cl. 354-415.000.

Matsui, Hitoshi; and Kawahata, Fumiaki, to Toyota Jidosha Kabushiki Kaisha. Structure of disc wheel. 4,625,904, Cl. 228-168.000.

Matsui, Yoshiya: *See—*
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; and Taniguchi, Tadasu, 4,626,082, Cl. 350-573.000.

Matsumoto, Hisayuki: *See—*
Uchida, Tatsuro; Matsumoto, Hisayuki; and Arita, Teiji, 4,625,761, Cl. 137-614.030.

Matsumoto, Kazuya: *See—*
Kuwayama, Tetsuro; and Matsumoto, Kazuya, 4,626,679, Cl. 250-227.000.

Matsumoto, Kiyoshi: *See—*
Kawasaki, Mikio; and Matsumoto, Kiyoshi, 4,625,860, Cl. 198-819.000.

Matsumoto, Masafumi: *See—*
Kotani, Matahira; Matsumoto, Masafumi; and Shirakoshi, Hiroshi, 4,626,873, Cl. 346-139.00R.

Matsumoto, Toru: *See—*
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.

Matsumura, Yoshio: *See—*
Nozue, Ikuo; Tomomitsu, Osahiko; Yumoto, Yoshiji; and Matsumura, Yoshio, 4,626,556, Cl. 522-99.000.

Matsunami, Akira: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Matsuo, Isamu, to Kawasaki Jukogyo Kabushiki Kaisha. Handle lever steering device of three-wheel and four-wheel automotive vehicles. 4,625,982, Cl. 280-95.00R.

Matsuo, Yasushi: *See—*
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,517, Cl. 501-96.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,518, Cl. 501-104.000.

Matsuo, Yoshikazu; Nakamatsu, Toshio; Moriwaki, Toshikazu; Abeta, Sadaharu; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Method for dyeing polyester fiber materials: disperse dye combinations with compensated color fading. 4,626,257, Cl. 8-638.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Baba, Takaaki; and O'Keefe, Gerald T., 4,626,898, Cl. 358-48.000.
Endo, Shinichi; and Matsuda, Isao, 4,626,657, Cl. 219-212.000.
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,626,899, Cl. 358-65.000.
Yamashita, Ichiro; Hase, Hiroyuki; and Ise, Yukihiko, 4,625,562, Cl. 73-728.000.

Matsushita Electric Works, Ltd.: *See—*
Maeda, Masatoshi; Kusunoki, Toshio; and Iguchi, Yoji, 4,626,666, Cl. 219-537.000.

Matsushita Refrigeration Company: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.

Matsuura, David: *See—*
Campbell, Peter; Tsals, Izrail; and Matsuura, David, 4,626,241, Cl. 604-49.000.

Matsuura, Satoshi: *See—*
Inoue, Naofumi; and Matsuura, Satoshi, 4,626,263, Cl. 55-155.000.

Mattel, Inc.: *See—*
Benson, John T.; Hart, William; and Stratman, Jerome F., 4,626,224, Cl. 446-297.000.
Sweet, Roger H., 4,626,222, Cl. 446-268.000.
Sweet, Roger H., 4,626,223, Cl. 446-279.000.

Matthew & Barbara Rocco: *See—*
Valente, Peter; Rocco, Matthew A.; and Rocco, Barbara B., 4,625,404, Cl. 30-114.000.

Mattson, Mark J.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.

Maucher, Paul, to Luk Lamellen und Kupplungsbau GmbH. Diaphragm spring for use in friction clutches or the like. 4,625,847, Cl. 192-89.00B.

Maucher, Paul; Friedmann, Oswald; and Sonntag, Siegfried, to Luk Lamellen und Kupplungsbau GmbH. Flywheel propulsion system for automotive vehicles or the like. 4,626,696, Cl. 290-38.00R.

Maurer, Fritz: *See—*
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; and Klauke, Erich, 4,626,601, Cl. 568-425.000.

Maurer, Helmut: *See—*
Siegmeier, Rainer; Prescher, Gunter; and Maurer, Helmut, 4,626,603, Cl. 568-833.000.

Maurer, Horst, to Windmoeller & Hoelscher Corporation. Apparatus for separating bag ends during manufacture. 4,626,236, Cl. 493-257.000.

Maurion, Roger: *See—*
Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , 4,626,306, Cl. 156-180.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See—*
Neher, Erwin, 4,625,677, Cl. 118-713.000.

May, David C. Elastomeric pavement marker. 4,626,127, Cl. 404-14.000.

Mayer, Manfred: *See—*
Wojtech, Bernhard; Mayer, Manfred; and Ott, Karl-Erich, 4,626,605, Cl. 568-757.000.

Mayer, Michael R.: *See—*
Hoffman, Clarence A.; Copa, William M.; and Mayer, Michael R., 4,626,354, Cl. 210-603.000.

Mays, Robert W.: *See—*
Gentry, Thomas H.; and Mays, Robert W., 4,625,469, Cl. 52-3.000.

Mazda Motor Corporation: *See—*
Hatamura, Koichi; and Asanomi, Koji, 4,625,687, Cl. 123-52.00M.

Mazumder, Nikhil C.; and Lancia, Frederick N., II, to Advanced Micro Devices, Inc. Dynamic push-pull for ECL. 4,626,709, Cl. 307-455.000.

Mazz, Thomas, to Porta Systems Corp. Maintenance termination unit. 4,626,632, Cl. 379-29.000.

MBK Maschinenbau GmbH: *See—*
Pfender, Georg, 4,625,773, Cl. 140-112.000.

McBrien, Gregory J., to United Technologies Corporation. Low noise differential torquer servo loop and circuitry. 4,626,759, Cl. 318-689.000.

McCarthy, Michael J.; and Chiang, John S. C., to FMC Corporation. Electrolytic process for manufacturing potassium peroxydiphosphate. 4,626,327, Cl. 204-82.000.

McClintic, Robert P.: *See—*
Kim, Tai K.; and McClintic, Robert P., 4,626,424, Cl. 423-593.000.

McClung, Guy L., III: *See—*
Hassanzadeh, Hedayat H.; and McClung, Guy L., III, 4,625,762, Cl. 137-624.270.

McCormick, William H.; and Cobb, Charles C., to Otis Engineering Corporation. Cleaning tool. 4,625,799, Cl. 166-223.000.

McCracken, William E.: *See—*
Barr, Thomas A., Jr.; McCracken, William E.; and McKnight, William B., 4,627,067, Cl. 372-81.000.

McDermott, Brian L. Trapped ball amusement device. 4,625,968, Cl. 273-156.000.

McDonnell Douglas Corporation: *See—*
Bender, Gerald M., 4,627,062, Cl. 372-36.000.

McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, to Coachmen Industries, Inc. Rollover back sofa-bed. 4,625,347, Cl. 5-43.000.

McGinnis, Henry J. Extensible mast. 4,625,475, Cl. 52-108.000.

McGuire, Thomas B., to Square D Company. Power bridge having a non-dissipative snubber circuit. 4,626,980, Cl. 363-56.000.

McHenry, William E., to S. C. Johnson & Son, Inc. O,O-dialkyl O[p-(N-alkylcarbamoyl)phenyl]phosphorothionates and insecticidal compositions including the same. 4,626,528, Cl. 514-119.000.

McIntosh, Ricky A., to Texas Instruments Incorporated. Apparatus for integrated circuit assembly operations. 4,626,206, Cl. 432-230.000.

McIntosh, Robert P.: *See—*
Abed, Majeed; and McIntosh, Robert P., 4,627,038, Cl. 369-44.000.

McIntyre, John S.: *See—*
Glew, David N.; McIntyre, John S.; and Gilbert, Jeffrey F., deceased, 4,626,131, Cl. 405-59.000.

McIver, George W., to TRW Inc. Differentiation and integration utilizing charge-coupled devices. 4,627,084, Cl. 377-60.000.

McKee, Jere L.; Stephenson, William I.; and Schlosser, Donald E., to Westinghouse Electric Corp. Circuit interrupter with integral resilient stop means for contact arm. 4,626,811, Cl. 335-46.000.

McKnight, William B.: *See—*
Barr, Thomas A., Jr.; McCracken, William E.; and McKnight, William B., 4,627,067, Cl. 372-81.000.

McLaughlin, Hugh R. Wheeled carriage for supporting and transporting pipes. 4,625,997, Cl. 285-5.000.

McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., to Pump Engineer Associates, Inc. Methods and apparatus for recovery of hydrocarbons from underground water tables. 4,625,801, Cl. 166-267.000.

McLeod, John; Smith, John A.; and Leather, Russell A., to Ferranti, plc. Gas laser apparatus having constant power output. 4,627,061, Cl. 372-29.000.

McManis, George E., III; Bratcher, John O.; and Dettling, Ronald F., to United States of America, Navy. Short duration thermoelectric generator. 4,626,611, Cl. 136-212.000.

McMillen, Bobby E., to AMBAC Industries, Incorporated. Actuator system for automotive seat mover mechanisms and the like. 4,626,723, Cl. 310-83.000.

McNeese, Joseph L.: *See—*
James, Harold K.; and McNeese, Joseph L., 4,625,894, Cl. 221-193.000.

McVicker, Richard E. Thumb pick. 4,625,616, Cl. 84-322.000.

Mead Corporation, The: *See—*
Le Bras, Philippe A., 4,625,575, Cl. 74-63.000.

MED-Inventio AG: *See—*
Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, 4,626,728, Cl. 310-316.000.

Medical Research Associates, Ltd. #1: *See—*
Altnether, Paul J.; and Rexroth, Frederick W., 4,625,723, Cl. 128-303.100.

Medicor Muvek: *See—*
Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , 4,625,732, Cl. 128-670.000.

Meetham, Geoffrey W.; Goulette, Michael J.; and Arthey, Roger P., to Rolls-Royce plc. Single-crystal alloy. 4,626,297, Cl. 148-404.000.

Mefford, Joseph P., to Harris Corporation. Application of the phase-lock loop to frequency synthesis. 4,626,787, Cl. 328-14.000.

Mehta, Bakulesh A.: *See—*
Pitroda, Satyan G.; Mehta, Bakulesh A.; and Fechalos, William A., 4,627,047, Cl. 370-58.000.

Meiji Milk Products Company Limited: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,443, Cl. 426-602.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,444, Cl. 426-602.000.

Meili, Hermann, to Lever Brothers Company. Mop and squeeze combination. 4,625,356, Cl. 15-119.00A.

Meintz, Helma: *See—*
Giesche, Ernst; Jung, Eggert; Meintz, Helma; and Roes, Christian, 4,626,903, Cl. 358-80.000.

Meister, Klaus: *See—*
Meyers, Pierre; and Meister, Klaus, 4,625,848, Cl. 192-93.00A.

Melcher, Franz-Josef: *See—*
Knothe, Erich; Melcher, Franz-Josef; and Berg, Christoph, 4,625,818, Cl. 177-212.000.

Melchior, August S., to Melchior-Moore Associates, Inc. Hazardous waste incinerator. 4,625,661, Cl. 110-241.000.

Melchior-Moore Associates, Inc.: *See—*
Melchior, August S., 4,625,661, Cl. 110-241.000.

Meldner, Heiner W.; Cusson, Ronald Y.; and Johnson, Ray M., to United States of America, Energy. Microwave detector. 4,626,791, Cl. 329-109.000.

Melkeraaen, Torleiv O., to Motorola, Inc. Thick film resistor element with coarse and fine adjustment provision. 4,626,822, Cl. 338-195.000.

Menor, George; Tayag, Rolando; and Tran, Duc, to Siemens Medical Laboratories, Inc. Device for positioning a flattening filter in the center of an X-ray radiation. 4,627,089, Cl. 378-157.000.

Mensink, Kornelis A.; and Brouwer, Henk L., to Vitafin N.V. Pacemaker utilizing microprocessor DMA for generating output pulse sequences. 4,627,022, Cl. 364-900.000.

Mental, Richard W., to Microlite, Inc. Plug-compatible electroluminescent lamp. 4,626,742, Cl. 313-503.000.

Merck & Co., Inc.: *See—*
King, Stella W.; and Remy, David C., 4,626,542, Cl. 514-325.000.
Taub, David, 4,626,545, Cl. 514-423.000.

Mereness, Thomas S.: *See—*
Finlay, David E.; Lopez, Jesus C.; and Mereness, Thomas S., 4,627,097, Cl. 382-46.000.

Merle, Michel, to Compagnie Generale des Etablissements Michelin. Reinforcement ply for tire formed at least in part of a fabric with a three-dimensional body; tires comprising at least one such ply; methods of obtaining such tires. 4,625,785, Cl. 152-452.000.

Merlet, Jean-Paul: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,625,995, Cl. 280-723.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Shah, Dhiren N.; Domet, Jack; and Hammer, Gregory V., 4,626,287, Cl. 106-197.100.

Mertens, Heinz, to Walter Scheele GmbH & Co. KG. Mobile concrete handling apparatus. 4,625,760, Cl. 137-615.000.

Metal Box Public Limited Company: *See—*
Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., 4,626,157, Cl. 413-1.000.
Oxborrow, Bernard H., 4,626,234, Cl. 493-167.000.

Metcal, Inc.: *See—*
Clappier, Robert R.; and Smith, Steven J., 4,626,767, Cl. 323-280.000.

Meteor AG: *See—*
Arnold, Ernst, 4,625,927, Cl. 242-4.00R.

Metform Corporation: *See—*
Kohler, Terry K.; Grube, William L.; and Giczewski, Norbert G., Jr., 4,625,385, Cl. 29-467.000.

Metronic Electronic GmbH: *See—*
Bucher, Heinz, 4,625,715, Cl. 128-66.000.

Mette, James: *See—*
Brin, Edward; and Mette, James, 4,626,142, Cl. 408-81.000.

Metzger, Karl G.: *See—*
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.
Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, 4,626,525, Cl. 514-18.000.

Meyer, Marco M. Method for producing thin portions of pasta filata cheese. 4,626,439, Cl. 426-517.000.

Meyer, Russell A., to Magnetic Peripherals Inc. Head positioning servo system for optical recording with coarse and fine control. 4,627,039, Cl. 369-44.000.

Meyers, Pierre; and Meister, Klaus. Lock device. 4,625,848, Cl. 192-93.00A.

Meyns, Ignace F.: *See—*
Pauwels, Bernard J.; Huyghe, Paul J.; and Meyns, Ignace F., 4,625,768, Cl. 139-188.00R.

Michaud, Horst; Raveling, Hermann; and von Seyerl, Joachim, to SKW Trostberg Aktiengesellschaft. Nitrification-inhibiting agent and process for the production thereof. 4,626,270, Cl. 71-28.000.

Michel, Souillard, to Enertec. Process and device for determining a parameter associated with a faulty electric conductor, using a composite monitoring signal. 4,626,772, Cl. 324-52.000.

Miciukiewicz, Joseph F., to Pitney Bowes Inc. Eccentric cam for module latching mechanism. 4,626,047, Cl. 312-107.500.

Micklethwaite, Ian W., to Polarmax Corporation. Motorized antenna mount for satellite dish. 4,626,864, Cl. 343-766.000.

Micklich, Bradley J.: *See—*
Jassby, Daniel L.; and Micklich, Bradley J., 4,626,400, Cl. 376-146.000.

Microlite, Inc.: *See—*
Mental, Richard W., 4,626,742, Cl. 313-503.000.

Microperipheral Corporation, The: *See—*
Stoner, Donald L., 4,627,078, Cl. 375-45.000.

Mihm, Gerhard: *See—*
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Mihm, Gerhard, 4,626,325, Cl. 204-59.00R.

Mihok, Miklos: *See—*
Elek, Sandor; Mihok nee Borbely, Ildiko ; and Mihok, Miklos, 4,626,533, Cl. 514-202.000.

Mihok nee Borbely, Ildiko : *See—*
Elek, Sandor; Mihok nee Borbely, Ildiko ; and Mihok, Miklos, 4,626,533, Cl. 514-202.000.

Miki, Yasuhiko, to Sony/Tektronix Corporation. Digital signal delay circuit. 4,626,716, Cl. 307-590.000.

Mikic, Frank: *See—*
Burnett, Ralph G.; and Mikic, Frank, 4,626,009, Cl. 292-327.000.

Mikkelsen, Per W., to Wittenborgs Automatfabriker. Vending machine delivering cups containing freshly made beverages. 4,625,776, Cl. 141-83.000.

Mikkor, Mati, to Ford Motor Company. Silicon capacitive pressure sensor and method of making. 4,625,561, Cl. 73-724.000.

Milawski, Dale. Nipple decoration device. 4,625,526, Cl. 63-2.000.

Milbar Corporation: *See—*
Anderson, J. Edward C., 4,625,379, Cl. 29-229.000.

Miletich, Don, to Cooper Industries, Inc. Flood light fixture construction. 4,626,975, Cl. 362-418.000.

Militzer, Karl: *See—*
Moser, Helmut; and Militzer, Karl, 4,626,793, Cl. 330-59.000.

Miller, George W.: *See—*
Champlin, Keith S.; Preimesberger, Ernest C.; and Miller, George W., 4,627,070, Cl. 375-3.000.

Miller, Jerry L.; Jaenicke, Frank E.; and Lodge, Quentin C., to Northern Manufacturing Limited. Saw carrier assembly for tree falling apparatus. 4,625,781, Cl. 144-34.00R.

Miller, Kenneth F.; and Boutni, Omar M., to General Electric Company. Composition. 4,626,566, Cl. 524-490.000.

Miller, Kenneth L., to Xico, Inc. Method and system for decoding time-varying, two-frequency, coherent-phase data. 4,626,670, Cl. 235-436.000.

Miller, Kevin P.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,626,440, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,626,599, Cl. 568-57.000.

Miller, Larry D. Medication organizer. 4,626,105, Cl. 368-10.000.

Miller, Michael J.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,626,425, Cl. 423-593.000.

Miller, Thomas W.: *See—*
Ahmed, Hassan J.; Gerkey, Kenneth S.; Miller, Thomas W.; and Wylie, Mark E., 4,625,396, Cl. 29-701.000.

Miller, Vincent G.: *See—*
Trivedi, Arvind J.; and Miller, Vincent G., 4,625,813, Cl. 175-20.000.

Miller, Wendell R.: *See—*
Shivashankara, Belur N.; Miller, Wendell R.; and Stubbs, Gene W., 4,625,828, Cl. 181-175.000.

Miller, William S., to Alcan International Limited. Aluminium alloys. 4,626,409, Cl. 420-533.000.

Milligan, John: *See—*
Sadler, Wanda H.; Milligan, John; and Parks, Jerry W., 4,626,559, Cl. 523-122.000.

Mills, Paul, to Stordy Combustion Engineering Limited. Flow regulating device. 4,626,194, Cl. 431-90.000.

Milwaukee Electric Tool Corporation: *See—*
Palm, Bernhard, 4,626,152, Cl. 409-232.000.

Minami, Akira: *See—*
Arai, Shigeru; Shibata, Itaru; Minami, Akira; and Ogawa, Koichi, 4,627,040, Cl. 369-44.000.

Minami, Setsuo: *See—*
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; and Taniguchi, Tadasu, 4,626,082, Cl. 350-573.000.

Minamida, Kazuhiyo: *See—*
Kawashima, Kazuo; and Minamida, Kazuhiyo, 4,625,817, Cl. 177-1.000.

Minet, Michel, to Valeo. Heat sensor for measuring the temperature of a product heated in a microwave oven. 4,626,643, Cl. 219-10.55B.

Minigrip, Inc.: *See—*
Ausnit, Steven, 4,625,496, Cl. 53-451.000.

Minister of National Defence of her Majesty's Canadian Government: *See—*
Dallaire, Jean-Guy, 4,625,973, Cl. 273-366.000.

Minnesota Mining and Manufacturing Company: *See—*
Fujishiro, Chiaki; and Kominami, Mitsuhiro, 4,626,463, Cl. 428-143.000.
Gerfast, Sten R., 4,625,384, Cl. 29-448.000.
Tengler, John N.; and Pilny, James C., 4,626,054, Cl. 339-59.00M.
Tye, Ronald G., 4,625,983, Cl. 280-154.50R.
Warhol, Nicholas, 4,626,459, Cl. 428-40.000.

Mintzer, Frederick C.: *See—*
Anderson, Karen L.; Mintzer, Frederick C.; Goertzel, Gerald; and Mitchell, Joan L., 4,627,020, Cl. 364-900.000.

Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., to Phillips Petroleum Company. Supported polyolefin catalyst components and methods of making and using same. 4,626,519, Cl. 502-105.000.

Mitchell, Gordon L.: *See—*
Bjork, Paul E.; Mitchell, Gordon L.; and Mocker, Hans W., 4,626,652, Cl. 219-121.0LH.

Mitchell, Joan L.: *See—*
Anderson, Karen L.; Mintzer, Frederick C.; Goertzel, Gerald; and Mitchell, Joan L., 4,627,020, Cl. 364-900.000.

Mitsubishi Chemical Industries Limited: *See—*
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; and Shimizu, Yukiharu, 4,626,590, Cl. 534-635.000.
Ohta, Tokuya; Kobayashi, Masatsune; Miura, Konoe; and Takimoto, Hiroshi, 4,626,284, Cl. 106-22.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Komurasaki, Satoshi, 4,625,689, Cl. 123-335.000.
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,625,691, Cl. 123-425.000.
Morikawa, Tetsuo, 4,626,952, Cl. 361-55.000.
Morishita, Akira; Nakagawa, Taiichi; and Hasegawa, Akinori, 4,626,724, Cl. 310-88.000.
Nagao, Yoshiaki, 4,626,951, Cl. 361-8.000.
Nakamura, Shunichi, 4,626,926, Cl. 358-296.000.
Naya, Eizo; and Okumura, Mitsuhiro, 4,626,282, Cl. 75-247.000.
Ootsuka, Shigeharu; Mizuno, Yuji; Kajimura, Junichi; and Mori, Takaaki, 4,626,656, Cl. 219-121.0LH.
Takeda, Akimichi; and Uomori, Akiyoshi, 4,626,647, Cl. 219-97.000.
Tanahashi, Tooru, 4,625,834, Cl. 187-29.00R.
Uemura, Masaru, 4,627,041, Cl. 369-45.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.

Mitsubishi Motors Corp.: *See—*
Hatsutta, Susumu; and Ikisu, Yasuji, 4,626,028, Cl. 297-289.000.

Mitsubishi Rayon Company Ltd.: *See—*
Kamada, Isao, 4,626,187, Cl. 425-131.100.

Mitsubishi Yuka Badische Co., Ltd.: *See—*
Endo, Hiroshi; and Yagi, Toshio, 4,626,555, Cl. 521-59.000.

Mitsuboshi Belting Ltd.: *See—*
Takano, Hiroshi, 4,626,227, Cl. 474-8.000.

Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, to Canon Kabushiki Kaisha. Particulate developer containing inorganic scraper particles and image forming method using the same. 4,626,487, Cl. 430-109.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Inoue, Naofumi; and Matsuura, Satoshi, 4,626,263, Cl. 55-155.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, 4,626,565, Cl. 524-423.000.

Mitsuno, Takashi: *See*—
Suzuki, Migaku; Sasaki, Satoshi; Mitsuno, Takashi; and Inagaki, Hiroyuki, 4,626,305, Cl. 156-164.000.

Mitsuoka, Katsuya: *See*—
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.

Mitsuzuka, Masashi: *See*—
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Method of making composite material of matrix metal and fine metallic particles dispersed therein. 4,626,410, Cl. 420-590.000.

Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, to Toyota Jidosha Kabushiki Kaisha. Method of making two phase material of high molecular weight polymer and fine particles dispersed therein. 4,626,561, Cl. 523-318.000.

Miura, Konoe: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Miura, Konoe; and Takimoto, Hiroshi, 4,626,284, Cl. 106-22.000.

Miura, Yasuhiro: *See*—
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

Miyagawa, Seiichi; Ikeda, Itsuo; and Suzuki, Shigeru, to Ricoh Company, Ltd. Solid state corona discharger. 4,626,876, Cl. 346-160.000.

Miyama, Hiroshi: *See*—
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,626,899, Cl. 358-65.000.

Miyamoto, Shoji: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; and Ihara, Hirokazu, 4,627,055, Cl. 371-16.000.

Miyamoto, Tetsuya: *See*—
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.

Miyashita, Kyoichi, to Earthnics Corporation. Copper bit cleaner. 4,625,355, Cl. 15-93.00R.

Miyazaki, Shoichiro: *See*—
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Mizoguchi, Shoichi: *See*—
Ryu, Toshihiko; and Mizoguchi, Shoichi, 4,627,072, Cl. 375-14.000.

Mizoguchi, Toyokazu; Nishizawa, Jun-ichi; Suzuki, Sohbe; and Tamamushi, Takashige, to Olympus Optical Co., Ltd.; and Nishizawa, Jun-ichi. Solid state image pickup device. 4,626,916, Cl. 358-213.120.

Mizoguchi, Yasuo: *See*—
Usui, Koichi; Sato, Teiji; Tanaka, Masanori; Mizoguchi, Yasuo; and Takahashi, Noriyuki, 4,626,420, Cl. 423-326.000.

Mizukami, Makoto: *See*—
Shigeta, Masanobu; Mizukami, Makoto; and Nishihara, Toshikazu, 4,626,480, Cl. 428-694.000.

Mizumura, Motoo; and Sei, Hisasuke, to NEC Corporation. Bandpass filter with dielectric resonators. 4,626,809, Cl. 333-202.000.

Mizuno, Yuji: *See*—
Ootsuka, Shigeharu; Mizuno, Yuji; Kajimura, Junichi; and Mori, Takaaki, 4,626,656, Cl. 219-121.0LH.

Mizusawa Industrial Chemicals, Ltd.: *See*—
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; and Suzuki, Kazuhiko, 4,626,290, Cl. 106-288.00B.
Usui, Koichi; Sato, Teiji; Tanaka, Masanori; Mizoguchi, Yasuo; and Takahashi, Noriyuki, 4,626,420, Cl. 423-326.000.

Mizutani, Hiroshi: *See*—
Nishizawa, Kazunori; and Mizutani, Hiroshi, 4,626,252, Cl. 604-370.000.

MM Systems Corporation: *See*—
Nicholas, John D., 4,625,485, Cl. 52-396.000.

Mobil Oil Corporation: *See*—
Cardis, Angeline B., 4,626,368, Cl. 252-49.900.
Dickert, Joseph J., Jr.; and Heilweil, Israel J., 4,626,362, Cl. 252-8.510.
Duncan, Gary L., 4,626,460, Cl. 428-40.000.
Holovach, John M., 4,625,495, Cl. 53-450.000.
Lyle, W. D., Jr., 4,625,547, Cl. 73-152.000.
Mangla, Raj K., 4,625,905, Cl. 229-2.5EC.
Mangla, Raj K., 4,625,906, Cl. 229-45.0EC.
Mangla, Raj K., 4,625,907, Cl. 229-45.0EC.
Shihabi, David S., 4,626,609, Cl. 585-467.000.
Tabak, Samuel A., 4,626,415, Cl. 422-190.000.
Venkatesan, Valadi N., 4,625,800, Cl. 166-256.000.
Vera, Samuel I., 4,625,631, Cl. 98-50.000.

Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; and Taniguchi, Tadasu, to Canon Kabushiki Kaisha. Projecting device. 4,626,082, Cl. 350-573.000.

Mocker, Hans W.: *See*—
Bjork, Paul E.; Mitchell, Gordon L.; and Mocker, Hans W., 4,626,652, Cl. 219-121.0LH.

Modesitt, Phillip C.: *See*—
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,625,801, Cl. 166-267.000.

Mogi, Takao: *See*—
Oniki, Saburo; Okada, Takashi; and Mogi, Takao, 4,626,909, Cl. 358-114.000.

Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum for use as printing plate supports, in an aqueous mixed electrolyte. 4,626,328, Cl. 204-129.950.

Mohr, Helmut: *See*—
Ryschka, Martin; Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl-Friedrich, 4,625,779, Cl. 141-311.00R.

Moine, Guy: *See*—
Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , 4,626,306, Cl. 156-180.000.

Molaire, Michel F., to Eastman Kodak Company. Binder-mixtures for optical recording layers and elements. 4,626,361, Cl. 252-1.000.

Molloy, Bryan B.; and Schmiegel, Klaus K., to Eli Lilly and Company. Treatment of obesity with aryloxyphenylpropylamines. 4,626,549, Cl. 514-651.000.

Molnycke AB: *See*—
Widlund, Leif U. R.; and Norenberg, Carl-Daniel W., 4,626,254, Cl. 604-383.000.

Moncorge, Richard: *See*—
Auzel, Francois; Moncorge, Richard; and Morin, Denise, 4,627,064, Cl. 372-41.000.

Monk, Trevor K., to Standard Telephones and Cables, Public Limited Company. Memory decoder circuit. 4,627,028, Cl. 365-72.000.

Monnet, Bernard, to Billion S.A. Method and apparatus for molding a frame around the periphery of a flat or curved object. 4,626,185, Cl. 425-110.000.

Monroe, Roy K.: *See*—
Everhard, Paul R.; and Monroe, Roy K., 4,625,380, Cl. 29-243.560.

Monsanto Company: *See*—
Ebner, Jerry R.; and Gleaves, John T., 4,626,412, Cl. 422-50.000.

Mont-Pac, Inc.: *See*—
Hofstetter, Don R.; and Fow, Louis F., Jr., 4,626,186, Cl. 425-115.000.

Montuschi, Mario; and Palazzetti, Mario, to Iveco Fiat, S.p.A. Rapid acting electromagnetic actuator. 4,626,814, Cl. 335-281.000.

Moore, Boyd B.: *See*—
Walhaug, Warren W.; and Moore, Boyd B., 4,625,803, Cl. 166-310.000.

Moore Business Forms, Inc.: *See*—
Chao, Hung-Ya, 4,626,471, Cl. 428-402.210.

Morelock, Charles R., to General Electric Company. Infiltration of Mo-containing material with silicon. 4,626,516, Cl. 501-92.000.

Morgan, Richard A.; and Sloan, William H., to Du Pont de Nemours, E. I., and Company. Extrusion finishing of perfluorinated copolymers. 4,626,587, Cl. 528-481.000.

Morgenthaler, Eugen; and Rolli, Jacques, to Seewer AG. Dough-rolling machine. 4,626,188, Cl. 425-145.000.

Mori, Kei. Light conduction apparatus utilizing intermittent illumination applied to optical fibers for photosynthetic reaction. 4,626,065, Cl. 350-96.150.

Mori, Keizo: *See*—
Kishi, Hiroyasu; Kimoto, Yuji; and Mori, Keizo, 4,626,881, Cl. 357-23.600.

Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; and Ihara, Hirokazu, to Hitachi, Ltd. Decentralized processing method and system. 4,627,055, Cl. 371-16.000.

Mori, Mikio. Work cutting attachment for zigzag sewing machines. 4,625,663, Cl. 112-128.000.

Mori, Sanae, to Daido Metal Company Ltd. Polytetrafluorethylene-containing coating composition for sliding parts. 4,626,365, Cl. 252-12.000.

Mori, Shosuke, to Fujitsu Limited. Processor having plural initial loading programs for loading different operating systems. 4,626,986, Cl. 364-200.000.

Mori, Takaaki: *See*—
Ootsuka, Shigeharu; Mizuno, Yuji; Kajimura, Junichi; and Mori, Takaaki, 4,626,656, Cl. 219-121.0LH.

Mori, Yuichirou: *See*—
Yamamoto, Yoichi; and Mori, Yuichirou, 4,626,870, Cl. 346-76.0PH.

Morikawa, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Protection apparatus for a transistor inverter. 4,626,952, Cl. 361-55.000.

Morimoto, Kiyoshi; Watanabe, Hiroshi; and Tsuruoka, Yoshihisa, to Futaba Denshi Kogyo Kabushiki Kaisha. Linear electrode construction for fluorescent display device and process for preparing same. 4,626,741, Cl. 313-497.000.

Morimoto, Shinichi, to Shimano Industrial Company Limited. Detector for detecting a bit of a fish. 4,625,446, Cl. 43-17.000.

Morimoto, Yoshinobu: *See*—
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,625,691, Cl. 123-425.000.

Morin, Denise: *See*—
Auzel, Francois; Moncorge, Richard; and Morin, Denise, 4,627,064, Cl. 372-41.000.

Morin, James E.: *See*—
Prough, James R.; and Morin, James E., 4,626,318, Cl. 162-49.000.

Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric optical system for single-lens reflex electronic photographic camera. 4,626,918, Cl. 358-225.000.

Morishige, Yuji: *See*—
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, 4,626,758, Cl. 318-603.000.

Morishita, Akira; Nakagawa, Taiichi; and Hasegawa, Akinori, to Mitsubishi Denki Kabushiki Kaisha. Waterproof device for electric motor. 4,626,724, Cl. 310-88.000.

Morita, Tatsuo, to Nissan Motor Company, Limited. System for controlling an engine and method therefor. 4,625,690, Cl. 123-340.000.

Morita, Tetsuo; and Nishie, Mitsuaki, to Sumitomo Electric Industries, Ltd. Light detecting circuit. 4,626,678, Cl. 250-214.00A.

Morita, Tsutomu: *See*—
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, 4,626,942, Cl. 360-97.000.

Morito, Motoyoshi: *See*—
Nakata, Yukio; Shiotsu, Osamu; Morito, Motoyoshi; and Suda, Kaoru, 4,626,789, Cl. 329-50.000.

Moritsu, Yukikazu: *See*—
Wada, Masatoshi; Matsubara, Shigekazu; Moritsu, Yukikazu; and Sakai, Tetsuo, 4,626,071, Cl. 350-311.000.

Moritz, Werner; and Haschek, Friedrich, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Guide chain. 4,625,507, Cl. 59-78.100.

Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Guide chain for feed lines. 4,626,233, Cl. 474-206.000.

Moriwaki, Toshikazu: *See*—
Matsuo, Yoshikazu; Nakamatsu, Toshio; Moriwaki, Toshikazu; Abeta, Sadaharu; and Imada, Kunihiko, 4,626,257, Cl. 8-638.000.

Moriya, Koichi: *See*—
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, 4,626,273, Cl. 71-92.000.

Moriyama, Nobuyuki, to Ricoh Company, Ltd. Rotary solenoid for intermittent ink ribbon feeding. 4,626,718, Cl. 310-37.000.

Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Code error correction method. 4,627,058, Cl. 371-37.000.

Morooka, Yasuo, to Hitachi, Ltd. Method of controlling unequal circumferential speed rolling. 4,625,536, Cl. 72-249.000.

Morris, Merle E.; and Senft, Stephen P., to GTE Products Corporation. Incandescent lamp having two lead-in conductors sealed within one end and including expansion means. 4,626,735, Cl. 313-275.000.

Morrison, Barry L.: *See*—
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; and Morrison, Barry L., 4,626,167, Cl. 414-786.000.

Morrow, James G., Sr., to Manitowoc Company, Inc., The. Single stage, twin valve, variable torque converter. 4,625,512, Cl. 60-353.000.

Mortellite, Robert M.: *See*—
Cancio, Leopoldo V.; Fitzsimmons, James N.; Mortellite, Robert M.; and Wu, Pai-Chuan, 4,626,574, Cl. 525-240.000.

Moschetto, Yves: *See*—
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.

Moser, Helmut; and Militzer, Karl, to Telefunken Electronic GmbH. Receiver amplifier for amplification of a photoelectric current. 4,626,793, Cl. 330-59.000.

Moser, Ted O.: *See*—
Tobias, Jackie L.; Kline, Larry R.; and Moser, Ted O., 4,625,950, Cl. 266-200.000.

Motai, Tsuneaki: *See*—
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Motion Analysis Systems, Inc.: *See*—
Greaves, John; Wilson, Robert S.; and Smith, Edmund H., 4,626,992, Cl. 364-418.000.

Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, to Dainippon Ink & Chemicals, Inc.; and Taisei Road Construction Co., Ltd. Epoxy resin composition and construction material containing the same for use in new construction or for repairs. 4,626,562, Cl. 523-466.000.

Motoren-Werke Mannheim Aktiengesellschaft vorm. Renz Abt. stationarer Motorenbau: *See*—
Dietrich, Werner; and Langeloth, Gernot, 4,625,682, Cl. 123-41.310.

Motorola, Inc.: *See*—
Ahn, Youngkee; and Tarshis, Morris, 4,626,962, Cl. 361-399.000.
Dolikian, Arman V.; Kotzin, Michael D.; and Budnik, Brian J., 4,627,098, Cl. 455-70.000.
Gailus, Paul H., 4,626,802, Cl. 331-117.0FE.
Gay, Michael J., 4,627,081, Cl. 377-58.000.
Melkeraaen, Torleiv O., 4,626,822, Cl. 338-195.000.
Mullen, William B., III; Grotelueschen, James H.; and Henschel, Robert, 4,626,309, Cl. 156-289.000.
Noens, Richard H.; and Russell, Leonard E., 4,626,830, Cl. 340-365.0VL.
O'Malley, Patrick J., 4,626,839, Cl. 340-750.000.
Price, John J., Jr., 4,626,770, Cl. 323-313.000.

Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, to Societe Nationale Industrielle Aerospatiale. Variable-pitch multi-blade propeller incorporating individually dismountable blades made of composite materials, process for manufacturing such blades and blades thus produced. 4,626,172, Cl. 416-134.00A.

Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, to Societe Nationale Industrielle et Aerospatiale. Variable-pitch multi-blade propeller incorporating individually dismountable blades made of composite materials, process for manufacturing such blades and blades thus produced. 4,626,173, Cl. 416-134.00A.

Mowbray, Dorian F.: *See*—
Adey, Anthony J.; and Mowbray, Dorian F., 4,625,694, Cl. 123-450.000.

Mowery, Gilbert L., Jr.: *See*—
Kolwicz, Kevin D.; and Mowery, Gilbert L., Jr., 4,627,032, Cl. 365-203.000.

Moynihan, Gary. Bridge hitch type frame. 4,625,809, Cl. 172-178.000.

Mozer, Daniel S. Excavating bucket having power driven, individually controlled digging teeth. 4,625,438, Cl. 37-141.00T.

Mros, Gordon R.: *See*—
Kordomenos, Panagiotis I.; Maker, David L.; Mros, Gordon R.; and Nordstrom, John D., 4,626,578, Cl. 525-484.000.

Mroz, Edward: *See*—
Brock, George W.; Mroz, Edward; Janning, Robert J., Jr.; and Rogers, Robert S., 4,626,949, Cl. 360-133.000.

MTU: *See*—
Hagemeister, Klaus; and Hueber, Alfred, 4,626,002, Cl. 285-95.000.

Mucheyer, Norbert, to Mannesmann Rexroth GmbH. Pressure responsive flow divider valve for servo-powered steering devices. 4,625,747, Cl. 137-101.000.

Mucheyer, Norbert: *See*—
Muncke, Ludwig; Mucheyer, Norbert; and Kauss, Wolfgang, 4,625,748, Cl. 137-101.000.

Mukai, Takashi: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,626,367, Cl. 252-49.500.

Mullen, William B., III; Grotelueschen, James H.; and Henschel, Robert, to Motorola, Inc. Selective bonding interconnection mask. 4,626,309, Cl. 156-289.000.

Muller, Alfred, to Robert Bosch GmbH. Control apparatus for an automatic transmission. 4,625,590, Cl. 74-866.000.

Muller, Beat: *See*—
Roth, Martin; Muller, Beat; Berger, Joseph; and Loew, Peter, 4,626,497, Cl. 430-293.000.

Muller, Jurgen, to Robert Bosch GmbH. Rotating video head switching control system. 4,626,932, Cl. 360-33.100.

Muller, Ulrich A., to Sulzer Brothers Limited. Thermoacoustic device. 4,625,517, Cl. 60-721.000.

Mullins, Fagan. Golf putter. 4,625,965, Cl. 273-81.300.

Mullner, Josef: *See*—
Schiel, Christian; Flumig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, 4,625,376, Cl. 29-119.000.

Muncke, Ludwig; Mucheyer, Norbert; and Kauss, Wolfgang, to Mannesmann Rexroth GmbH. Safety arrangement for power assisted steerings. 4,625,748, Cl. 137-101.000.

Munnig Schmidt, Robert H.: *See*—
Hensing, Johannes M. M.; and Munnig Schmidt, Robert H., 4,626,717, Cl. 310-36.000.

Murai, Toshiharu; Jinnai, Koichiro; Ameyama, Minoru; and Umezawa, Michio, to Ricoh Company, Ltd. Liquid level detector for ink jet printer. 4,626,874, Cl. 346-140.00R.

Murakami, Hideo; and Matsubara, Naoki, to Oval Engineering Co., Ltd. Vortex flow meter. 4,625,564, Cl. 73-861.240.

Murakami, Hideo, to Ryobi Ltd. Rear drag type spinning reel. 4,625,932, Cl. 242-84.51A.

Murakami Kaimeido Co., Ltd.: *See*—
Kumai, Toshiyuki, 4,626,084, Cl. 350-604.000.
Nakayama, Kiyoshi; Ito, Yasutoshi; and Kumai, Toshiyuki, 4,626,083, Cl. 350-604.000.

Murakami, Yoshikazu; Ito, Seigo; and Yamada, Toshiro, to Sony Corporation. YIG thin film tuned MIC oscillator. 4,626,800, Cl. 331-96.000.

Murakawa, Kazunori: *See*—
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,626,487, Cl. 430-109.000.

Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., 4,626,440, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,626,599, Cl. 568-57.000.

Murasawa, Yoshihiro: *See*—
Ohtsuka, Yasumasa; Asai, Jun; Murasawa, Yoshihiro; Sasame, Hiroshi; and Ohkubo, Masaharu, 4,626,096, Cl. 355-14.00D.

Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, to Director-General of the Agency of Industrial Science and Technology. Conjugated polymer film and pyrolyzed product thereof. 4,626,588, Cl. 528-481.000.

Murata, Katsuaki: *See*—
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,626,983, Cl. 363-132.000.

Murata Kikai Kabushiki Kaisha: *See*—
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,626,160, Cl. 414-222.000.

Murata Manufacturing Co., Ltd.: *See*—
Kaneko, Toshimi; and Kido, Kazumi, 4,626,957, Cl. 361-275.000.

Murata, Mitsuru: *See*—
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, 4,626,180, Cl. 418-63.000.

Murayama, Seiichi: *See*—
Kato, Yasuo; Watanabe, Yoshio; and Murayama, Seiichi, 4,627,086, Cl. 378-119.000.

Murib, Jawad H., to National Distillers and Chemical Corporation. Selective catalytic oxidation of carbon monoxide in hydrocarbon stream to carbon dioxide. 4,626,521, Cl. 502-328.000.

Murphy, John C.; and Swinderman, Robert H., to Pittsburgh-Des Moines Corporation. Liquid nitrogen distribution system. 4,625,521, Cl. 62-55.500.

Murphy, Robert M.: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,626,943, Cl. 360-99.000.

Murray, Roy, to ITT Corporation. Valve actuator apparatus. 4,625,758, Cl. 137-554.000.

Murray, William M. Bone cement system and method. 4,625,722, Cl. 128-92.0VQ.

Musashi Seimitsu Kogyo Kabushiki Kaisha: *See—*
Tajima, Takashi; and Tsuji, Tatsuyoshi, 4,626,121, Cl. 403-27.000.

Muscat, Peter P. Convertible top cover. 4,626,021, Cl. 296-107.000.

Muschany, Theodore R., to Swift & Company. System for processing poultry carcasses. 4,627,007, Cl. 364-550.000.

Musil, Edward C., to Flexible Steel Lacing Company. Belt fastener with enlarged loop for hinge pin. 4,625,369, Cl. 24-33.00B.

Musil, Gerhard, to Siemens Aktiengesellschaft. Circuit arrangement for feeding electrical users. 4,626,766, Cl. 323-222.000.

Muterspaugh, Max W.: *See—*
Anderson, Mark R.; Albean, David L.; and Muterspaugh, Max W., 4,627,101, Cl. 455-194.000.

Muto, Shinichiro: *See—*
Sato, Kuniaki; Muto, Shinichiro; and Wako, Noriaki, 4,626,195, Cl. 431-188.000.

Myers, Lawrence R.; and Bach, Lloyd G., to Allied Corporation. Brake booster. 4,625,515, Cl. 60-551.000.

Myriad Concepts, Inc.: *See—*
Shepperd, Michael B.; and Blevins, Allan L., 4,627,073, Cl. 375-20.000.

Nabika, Kouichi: *See—*
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,626,160, Cl. 414-222.000.

Nagahara, Shusaku: *See—*
Sato, Masanori; Nagahara, Shusaku; and Takahashi, Kenji, 4,626,897, Cl. 358-44.000.

Nagaike, Sadanori: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.

Nagamori, Hiroyuki: *See—*
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,626,367, Cl. 252-49.500.

Nagano, Masahiko, to Fuji Photo Film Co., Ltd. Orthogonal phase modulation and demodulation methods. 4,626,928, Cl. 358-310.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,626,229, Cl. 474-80.000.

Nagano, Satoshi, to Tsubakimoto Chain Co. Mounting shaft to pulley formed of sheet metal. 4,626,231, Cl. 474-152.000.

Nagano, Takahiro; Yatsuo, Tsutomu; Oikawa, Saburo; and Horie, Akira, to Hitachi, Ltd. Gate turn-off thyristor. 4,626,888, Cl. 357-38.000.

Naganuma, Toru: *See—*
Hori, Takeshi; Higano, Yoshiharu; Shirai, Toshio; and Naganuma, Toru, 4,626,931, Cl. 360-16.000.

Nagao, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Singular housing of switch and protective semiconductor. 4,626,951, Cl. 361-8.000.

Nagasawa, Kouichi: *See—*
Tani, Akihiko; Aoyagi, Takashi; Ikeda, Shuji; and Nagasawa, Kouichi, 4,626,450, Cl. 427-93.000.

Nagira, Norichika: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Naglieri, Jack A.: *See—*
Kaufman, Alan S.; Kaufman, Nadeen L.; and Naglieri, Jack A., 4,626,220, Cl. 434-236.000.

Nagy, Lajos: *See—*
Fejes, Kalman; and Nagy, Lajos, 4,626,242, Cl. 604-68.000.

Nahara, Akira: *See—*
Kitamoto, Tatsuji; Amari, Hiroshi; Nahara, Akira; Shirahata, Ryuji; and Arai, Yoshihiro, 4,626,315, Cl. 156-628.000.

Naito, Kazufumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Electromagnetic feeder drive control apparatus. 4,626,956, Cl. 361-152.000.

Nakagawa, Taiichi: *See—*
Morishita, Akira; Nakagawa, Taiichi; and Hasegawa, Akinori, 4,626,724, Cl. 310-88.000.

Nakahara, Toshiaki: *See—*
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.

Nakahara, Yoshifumi: *See—*
Shirai, Hideharu; and Nakahara, Yoshifumi, 4,626,183, Cl. 425-68.000.

Nakajima, Shin: *See—*
Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, 4,626,976, Cl. 363-19.000.

Nakamatsu, Toshio: *See—*
Matsuo, Yoshikazu; Nakamatsu, Toshio; Moriwaki, Toshikazu; Abeta, Sadaharu; and Imada, Kunihiko, 4,626,257, Cl. 8-638.000.

Nakamizo, Takazi: *See—*
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,626,983, Cl. 363-132.000.

Nakamura, Eiji; and Suenaga, Yutaka, to Nippon Kogaku K.K. Dark field illumination apparatus for epi-illumination system. 4,626,079, Cl. 350-525.000.

Nakamura, Hiroaki, to Olympus Optical Company, Ltd. Electronic flash of series controlled type. 4,626,748, Cl. 315-241.00P.

Nakamura, Hiroshi: *See—*
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,393, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,394, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,395, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,396, Cl. 264-65.000.

Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, to Nissan Motor Co., Ltd. Rear wheel steering control for vehicle. 4,625,822, Cl. 180-140.000.

Nakamura, Mitsuki: *See—*
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.

Nakamura, Moritoshi: *See—*
Ono, Yasuichi; Amagishi, Yoshitada; and Nakamura, Moritoshi, 4,626,961, Cl. 361-398.000.

Nakamura, Shizuo: *See—*
Hara, Kenichiro; and Nakamura, Shizuo, 4,625,617, Cl. 84-404.000.

Nakamura, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Printer used for a television receiver. 4,626,926, Cl. 358-296.000.

Nakanishi, Youichi; and Maenishi, Kozo, to Omron Tateisi Electronics Co. Electromagnetic relay for switching high frequency signals. 4,626,812, Cl. 335-132.000.

Nakano, Jiro: *See—*
Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, 4,626,337, Cl. 204-429.000.

Nakano, Shoichi: *See—*
Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, 4,626,878, Cl. 357-19.000.

Nakano, Yasuo; and Yoshioka, Toshiharu, to Honda Giken Kogyo Kabushiki Kaisha. Anti dive devices for motorcycles. 4,625,985, Cl. 280-276.000.

Nakashima, Seiichiro; Inagaki, Shigemi; and Ito, Susumu, to Fanuc Ltd. Industrial robot wrist mechanism. 4,626,165, Cl. 414-735.000.

Nakata, Yukio; Shiotsu, Osamu; Morito, Motoyoshi; and Suda, Kaoru, to Hitachi, Ltd.; and Yagi Antenna Co. Demodulating circuit for data signal. 4,626,789, Cl. 329-50.000.

Nakayama, Hiroshi: *See—*
Ashikawa, Noboru; Nakayama, Hiroshi; and Sumi, Makoto, 4,625,577, Cl. 74-475.000.

Nakayama, Kiyoshi; Ito, Yasutoshi; and Kumai, Toshiyuki, to Murakami Kaimeido Co., Ltd. Electrically foldable door mirror. 4,626,083, Cl. 350-604.000.

Nakayama, Takao: *See—*
Nishioka, Akira; Nakayama, Takao; and Takekoshi, Tomoaki, 4,626,484, Cl. 430-273.000.

Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; and Suzuki, Kazuhiko, to Mizusawa Industrial Chemicals, Ltd. Inorganic filler and process for production thereof. 4,626,290, Cl. 106-288.00B.

Nambudiri, Easwaran C. N.: *See—*
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,627,016, Cl. 364-900.000.

Namiki, Akira: *See—*
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.

Nanba, Keizo: *See—*
Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, 4,626,295, Cl. 148-127.000.

Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, to Nippon Steel Corporation. Strip cooling apparatus for continuous annealing furnace. 4,625,431, Cl. 34-62.000.

Nanometrics Inc.: *See—*
Holmes, Duane C.; and Toro-Lira, Guillermo L., 4,627,009, Cl. 364-559.000.

Nao, Manabu; and Hirota, Hisao, to Fujitsu Limited. Bill handling apparatus. 4,625,870, Cl. 209-534.000.

Nara, Hyakuro, to Azumi Manufacturing Co., Ltd. Gear shaper having replaceable tip. 4,625,467, Cl. 51-209.00R.

Nara, Motohisa; and Endo, Yasushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Infrared sensor. 4,626,687, Cl. 250-338.000.

Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, to Computer Basic Technology Research Association. Thin film magnetic head. 4,626,947, Cl. 360-126.000.

Natale, Thomas. Portable containment device for treatment of hazardous materials. 4,626,291, Cl. 134-21.000.

Natarajan, Bangalore R.: *See—*
Bloomquist, Darrel R.; Natarajan, Bangalore R.; and Opfer, James E., 4,626,336, Cl. 204-298.000.

National Distillers and Chemical Corporation: *See—*
Murib, Jawad H., 4,626,521, Cl. 502-328.000.

National Research Development Corp.: *See—*
Spencer, Henry B.; and Owen, Gwilym M., 4,627,011, Cl. 364-566.000.

National Semiconductor Corporation: *See—*
Li, Gabriel M., 4,626,711, Cl. 307-471.000.

National Starch and Chemical Corporation: *See—*
Gleason, Patricia A.; and Piccoline, Marie A., 4,626,363, Cl. 252-8.514.
Trzasko, Peter T.; Tessler, Martin M.; and Dirscherl, Teresa A., 4,626,288, Cl. 106-210.000.

National Steel Corporation: *See—*
Haveman, David L.; and Powell, John C., 4,625,787, Cl. 164-453.000.

Natsume, Toshio: *See—*
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, 4,626,410, Cl. 420-590.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,626,561, Cl. 523-318.000.

Naya, Eizo; and Okumura, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Contact material for vacuum circuit breaker. 4,626,282, Cl. 75-247.000.

Nayfa, James E. Ginning point assembly. 4,625,365, Cl. 19-55.00R.

NDC Technologies, Inc.: *See—*
Lofgren, Gunnar K.; and Netzler, Goran P. R., 4,626,995, Cl. 364-424.000.

Neale, Brian K.: *See—*
Tung, Randy W.; Fisher, Verner J., Jr.; Wilstermann, William D.; and Neale, Brian K., 4,626,019, Cl. 296-97.00H.

NEC: *See—*
Nishitani, Takao, 4,626,828, Cl. 340-347.0DD.
Shimizu, Hiroshi, 4,627,051, Cl. 370-86.000.

NEC Corporation: *See—*
Hosokawa, Tetsuo, 4,627,063, Cl. 372-38.000.
Ichikawa, Yoshio; and Ohyagi, Takashi, 4,626,842, Cl. 340-825.440.
Mizumura, Motoo; and Sei, Hisasuke, 4,626,809, Cl. 333-202.000.
Ohtani, Nobuhiro; and Sakurai, Hidekazu, 4,626,921, Cl. 358-260.000.
Ozawa, Takashi, 4,626,712, Cl. 307-475.000.
Ryu, Toshihiko; and Mizoguchi, Shoichi, 4,627,072, Cl. 375-14.000.

Neglio, Thomas P. Self-cleaning filter adapted for rapid, inexpensive installation. 4,626,347, Cl. 210-232.000.

Neher, Erwin, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Apparatus for coating and polishing a micropipette. 4,625,677, Cl. 118-713.000.

Nelson, Craig E., to TAB Leasing. Radiation power measuring apparatus. 4,625,542, Cl. 73-1.00R.

Nelson, Darrel S.: *See—*
Wang, Chen-Shih; and Nelson, Darrel S., 4,626,642, Cl. 219-10.55M.

Nelson, David C., to American Hospital Supply Corporation. Power supply for providing plural DC voltages. 4,626,697, Cl. 307-18.000.

Nelson, Norman A., to NL Industries, Inc. Valve assembly, seat and seal. 4,625,942, Cl. 251-327.000.

Nemenz, Andreas-Uwe: *See—*
Haecker, Walter; Nemenz, Andreas-Uwe; and Weiner, Hans, 4,626,025, Cl. 296-218.000.

Nemes, John J.; Thompson, Harvey W.; and Waller, John E., to Dearborn Chemical Company, Limited. Composition and method for deoxygenation. 4,626,411, Cl. 422-13.000.

Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, to Gepipari Technologiai Intezet; and Szenbanyak, Mecseki. Apparatus for loosening and/or breaking coal deposits, rocks, granular or lumpy material, or scrap. 4,626,031, Cl. 299-16.000.

Nemoto, Rikio: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

Nemoto, Takeo: *See—*
Yagi, Yasuomi; Takahashi, Ken; and Nemoto, Takeo, 4,625,520, Cl. 62-45.000.

Nepomuceno, Jose G.: *See—*
Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., 4,625,737, Cl. 131-355.000.

Netzler, Goran P. R.: *See—*
Lofgren, Gunnar K.; and Netzler, Goran P. R., 4,626,995, Cl. 364-424.000.

Neumaier, Anton, to Hilti Aktiengesellschaft. Tool holder for a drilling or a chiseling device. 4,626,146, Cl. 408-239.00R.

New, Deborah M. Sound display systems. 4,627,092, Cl. 381-48.000.

New York Institute of Technology: *See—*
Glenn, William E., 4,626,920, Cl. 358-234.000.

Newbert, Edmund G., Jr.: *See—*
Cool, John K.; Newbert, Edmund G., Jr.; and Glorioso, Charles A., 4,627,004, Cl. 364-521.000.

Newlove, John C.: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence; and Newlove, John C., 4,626,285, Cl. 106-90.000.

Newton, Ralph L.: *See—*
Samples, Billy G.; Newton, Ralph L.; and Kaufman, Steven A., 4,626,638, Cl. 200-331.000.

Ng, Fred K., to AT&T Bell Laboratories. Database management system for controlling concurrent access to a database. 4,627,019, Cl. 364-900.000.

Ngai, Eugene Y.: *See—*
Livanos, Vassilios J.; and Ngai, Eugene Y., 4,625,627, Cl. 98-32.000.

NGK Spark Plug Co., Ltd.: *See—*
Kondo, Kazuo; Okuyama, Masahiko; Watanabe, Masakazu; and Iio, Satoshi, 4,626,392, Cl. 264-62.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,517, Cl. 501-96.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, 4,626,518, Cl. 501-104.000.

Nguyen Minh, Chau; and Vertongen, Bernard, to U.S. Philips Corporation. Vertical MOS-FET devices having a planar multicell structure. 4,626,880, Cl. 357-23.400.

Nicholas, John D., to MM Systems Corporation. Elastomeric glands. 4,625,485, Cl. 52-396.000.

Nichols, Robert L. Controlled-release security band for sterilization container. 4,625,885, Cl. 220-214.000.

Nichols, Walter A.: *See—*
Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., 4,625,737, Cl. 131-355.000.

Niebylski, Leonard M.: *See—*
Zaweski, Edward F.; and Niebylski, Leonard M., 4,626,259, Cl. 44-57.000.

Nienaber, David K.; and Sheikholeslami, Amir, to Zenith Electronics Corporation. RGBI digital video control system having intensity level control and overall image strength control. 4,626,835, Cl. 340-703.000.

Nieuwkamp, Wolfgang; Junger, Martin; and Wenzel, Helmut, to Lechler GmbH & Co., KG. Cylindrical inset for a binary atomizing nozzle. 4,625,916, Cl. 239-431.000.

Nightingale, Allen F.: *See—*
Pointon, Ronald H.; and Nightingale, Allen F., 4,626,104, Cl. 366-162.000.

Nigrelli, Terry J. Container package assembly. 4,625,864, Cl. 206-427.000.

Nihon Plast Co., Ltd.: *See—*
Nishijima, Kazuyoshi, 4,625,578, Cl. 74-484.00R.

Nihon Shuno System Kabushiki Kaisha: *See—*
Shimada, Yoshikatsu, 4,625,476, Cl. 52-126.400.

Nihon Tokushu Noyaku Seizo K.K.: *See—*
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, 4,626,273, Cl. 71-92.000.

Niiho, Masaaki: *See—*
Hara, Masato; Niiho, Masaaki; Takasugi, Eiji; and Honda, Ryouji, 4,626,682, Cl. 250-231.0SE.

Niikawa, Ryo: *See—*
Ohtaki, Keizaburo; Niikawa, Ryo; and Sakata, Masashi, 4,625,416, Cl. 33-180.0AT.

Nike, Inc.: *See—*
Derderian, Thomas, 4,625,336, Cl. 2-79.000.

Nilssen, Ole K. Class-3 lighting system. 4,626,747, Cl. 315-209.00R.

Nilssen, Ole K. Doubly overload-protected power distribution system. 4,626,953, Cl. 361-63.000.

Nimbus, Inc.: *See—*
Wampler, Richard K., 4,625,712, Cl. 128-1.00D.

Ninnemann, Peter; and Wollscheid, Dieter, to Siemens Aktiengesellschaft. Memory programmable controller with word and bit processors. 4,627,025, Cl. 364-900.000.

Nippon Air Brake Co., Ltd.: *See—*
Tanaka, Ryuichi; and Tanaka, Akira, 4,626,700, Cl. 307-118.000.

Nippon Furnace Kogyo Kaisha, Ltd.: *See—*
Sato, Kuniaki; Muto, Shinichiro; and Wako, Noriaki, 4,626,195, Cl. 431-188.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Tamaru, Takuya; and Ogusu, Mikio, 4,627,037, Cl. 369-77.200.

Nippon Hoso Kyokai: *See—*
Wada, Masatoshi; Matsubara, Shigekazu; Moritsu, Yukikazu; and Sakai, Tetsuo, 4,626,071, Cl. 350-311.000.

Nippon Kogaku K. K.: *See—*
Toyoda, Kenji, 4,626,925, Cl. 358-285.000.

Nippon Kogaku K.K.: *See—*
Matsui, Hideki; and Hagyuda, Nobuyoshi, 4,626,093, Cl. 354-415.000.
Nakamura, Eiji; and Suenaga, Yutaka, 4,626,079, Cl. 350-525.000.
Takatsu, Norihiko, 4,626,915, Cl. 358-213.190.

Nippon Kokan Kabushiki Kaisha: *See—*
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,626,367, Cl. 252-49.500.

Nippon Rubber Co., Ltd.: *See—*
Ueda, Noboru, 4,625,435, Cl. 36-68.000.

Nippon Soken, Inc.: *See—*
Kashiwagi, Hideki; Akita, Shigeyuki; Tanaka, Hiroaki; and Kuno, Akira, 4,625,411, Cl. 33-1.0PT.

Nippon Steel Corporation: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Nippon Yakin Kogyo Kabushiki Kaisha: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

Nippondenso Co., Ltd.: *See—*
Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, 4,626,337, Cl. 204-429.000.
Kashiwagi, Hideki; Akita, Shigeyuki; Tanaka, Hiroaki; and Kuno, Akira, 4,625,411, Cl. 33-1.0PT.
Yamaguchi, Yoshimitsu; Suzuki, Masanori; and Shibata, Tadahiko, 4,625,499, Cl. 53-542.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Small-sized marine craft having an upstanding peripheral flange. 4,625,669, Cl. 114-56.000.

Nishida, Jun: *See—*
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 4,626,899, Cl. 358-65.000.

Nishie, Mitsuaki: *See—*
Morita, Tetsuo; and Nishie, Mitsuaki, 4,626,678, Cl. 250-214.00A.

Nishihara, Toshikazu: *See—*
Shigeta, Masanobu; Mizukami, Makoto; and Nishihara, Toshikazu, 4,626,480, Cl. 428-694.000.

Nishijima, Kazuyoshi, to Nihon Plast Co., Ltd. Steering wheel assembly. 4,625,578, Cl. 74-484.00R.

Nishikawa, Junichi; and Shoji, Yutaka, to Citizen Watch Co., Ltd. Structure of rotating mechanism for watch case. 4,626,107, Cl. 368-276.000.

Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, to Honda Giken Kogyo Kabushiki Kaisha. Creep preventing device for vehicle equipped with automatic transmission. 4,625,589, Cl. 74-856.000.

Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Creep preventing device for vehicles equipped with an automatic transmission. 4,625,591, Cl. 74-866.000.

Nishimoto, Naomichi: *See—*
Ichinoi, Yutaka; and Nishimoto, Naomichi, 4,626,929, Cl. 358-310.000.

Nishimu Electronics Industries Co., Ltd.: *See—*
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,626,983, Cl. 363-132.000.

Nishimura, Thomas G. Sailing system. 4,625,671, Cl. 114-103.000.

Nishioka, Akira; Nakayama, Takao; and Takekoshi, Tomoaki, to Fuji Photo Film Co., Ltd. Light-sensitive printing plate precursor. 4,626,484, Cl. 430-273.000.

Nishitani, Takao, to NEC. Adaptive predictive code conversion method of interrupting prediction and an encoder and a decoder for the method. 4,626,828, Cl. 340-347.0DD.

Nishizawa, Jun-ichi: *See—*
Mizoguchi, Toyokazu; Nishizawa, Jun-ichi; Suzuki, Sohbe; and Tamamushi, Takashige, 4,626,916, Cl. 358-213.120.

Nishizawa, Kazunori; and Mizutani, Hiroshi, to Kao Corporation. Disposable diaper. 4,626,252, Cl. 604-370.000.

Nishizawa, Tadao, to Swift Instruments, Inc. Binocular alignment. 4,626,081, Cl. 350-569.000.

Nishizima, Hideyo, to Ricoh Co., Ltd. Electrophotographic element comprising alloy of selenium and tellurium doped with chlorine and oxygen. 4,626,486, Cl. 430-86.000.

Nissan Motor Company, Limited: *See—*
Fukuhara, Hiroshige, 4,627,103, Cl. 455-226.000.
Hosaka, Akio, 4,625,697, Cl. 123-478.000.
Morita, Tatsuo, 4,625,690, Cl. 123-340.000.
Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,625,822, Cl. 180-140.000.
Okuda, Michihiro; and Takahashi, Kotei, 4,625,576, Cl. 74-473.00R.
Segoshi, Touru, 4,626,967, Cl. 362-61.000.
Yasuhara, Seishi, 4,626,230, Cl. 474-106.000.

Nissan Shatai Company, Limited: *See—*
Hasegawa, Masuo, 4,626,026, Cl. 296-218.000.

Nitto Boseki Co., Ltd.: *See—*
Harada, Susumu, 4,626,577, Cl. 525-369.000.

Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; and Shimizu, Yukiharu, to Mitsubishi Chemical Industries Limited. Reactive monoazo and disazo pyridone dyestuffs containing a halo-substituted 6-member mitrogen-containing heterocyclic ring. 4,626,590, Cl. 534-635.000.

Niwa, Toshio: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Nixon, Arthur C. Low attenuation high frequency coaxial cable for microwave energy in the gigaHertz frequency range. 4,626,810, Cl. 333-243.000.

Nizamuddin, Nadir: *See—*
Ramsaran, Johann D.; Biray, Bora; Nizamuddin, Nadir; and Yung, Anthony, 4,626,628, Cl. 379-283.000.

NL Industries, Inc.: *See—*
Nelson, Norman A., 4,625,942, Cl. 251-327.000.

Nobiling, Jerry F.: *See—*
Olson, George E.; and Nobiling, Jerry F., 4,626,161, Cl. 414-308.000.

Noe, Renato R.: *See—*
O'Donnell, John W.; Catapano, Michael C.; and Noe, Renato R., 4,625,765, Cl. 138-89.000.

Noel, Jean-Paul: *See—*
Dupeyrat, Benoit; Mardon, Nathalie; and Noel, Jean-Paul, 4,626,649, Cl. 219-121.0LU.

Noens, Richard H.; and Russell, Leonard E., to Motorola, Inc. Membrane keyboard with identifying connectors. 4,626,830, Cl. 340-365.0VL.

Noguchi, Fujio; Oguni, Yasuo; and Shimizu, Masayuki, to Toyota Jidosha Kabushiki Kaisha; and Toyoda Gosei Co., Ltd. Hose coupling. 4,626,006, Cl. 285-158.000.

Noguchi, Takanobu: *See—*
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,626,588, Cl. 528-481.000.

Nohmi, Makoto: *See—*
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; and Ihara, Hirokazu, 4,627,055, Cl. 371-16.000.

Nolte, Hans-Henning, to Flachglas Aktiengesellschaft. Method of making a fire-resistant translucent layer. 4,626,301, Cl. 156-99.000.

Nomura, Kenichiro: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.

Norden Laboratories, Inc.: *See—*
Kucera, Carrell J., 4,626,430, Cl. 424-92.000.

Nordstrom, John D.: *See—*
Kordomenos, Panagiotis I.; Maker, David L.; Mros, Gordon R.; and Nordstrom, John D., 4,626,578, Cl. 525-484.000.

Norenberg, Carl-Daniel W.: *See—*
Widlund, Leif U. R.; and Norenberg, Carl-Daniel W., 4,626,254, Cl. 604-383.000.

Norigoe, Takashi, to Tokyo Electric Co., Ltd. Dot printer head. 4,626,115, Cl. 400-124.000.

North American Agricultural, Inc.: *See—*
Carroll, Michael W.; and Harwood, Michael E., 4,625,630, Cl. 98-42.220.

North American Philips Corporation: *See—*
Colak, Sel, 4,626,879, Cl. 357-23.400.
Fitzpatrick, Brian J., 4,626,740, Cl. 313-478.000.

Northern Manufacturing Limited: *See—*
Miller, Jerry L.; Jaenicke, Frank E.; and Lodge, Quentin C., 4,625,781, Cl. 144-34.00R.

Northern Telecom, Ltd.: *See—*
Black, David H. A., 4,627,049, Cl. 370-81.000.
Cwirzen, Casimir Z., 4,626,955, Cl. 361-119.000.
Parker, Jay S.; and Koziol, Leo B., 4,626,846, Cl. 340-825.520.
Ramsaran, Johann D.; Biray, Bora; Nizamuddin, Nadir; and Yung, Anthony, 4,626,628, Cl. 379-283.000.

Norton, Terri: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Nortrup, Kevin E.; Beyers, Billy W., Jr.; and Fuhrer, Jack S., to RCA Corporation. Television system with menu like function control selection. 4,626,892, Cl. 358-21.00R.

Nossek, Josef, to Siemens Aktiengesellschaft. Electrical filter circuit for processing analog sampling signals. 4,626,808, Cl. 333-173.000.

Notaras, Angelo L.: *See—*
Notaras, John A.; and Notaras, Angelo L., 4,625,783, Cl. 150-52.00R.

Notaras, John A.; and Notaras, Angelo L. Protective cover. 4,625,783, Cl. 150-52.00R.

Noto, Kunihiro: *See—*
Fukasaku, Yoshinori; Noto, Kunihiro; and Takahashi, Reijiro, 4,626,720, Cl. 310-62.000.

Nott, Henry A., to Commonwealth of Australia, The. Squelch circuit. 4,627,102, Cl. 455-221.000.

Novacorp International Consulting Ltd.: *See—*
Faller, Frank R.; Clouston, Ross G.; and Bergholz, Larry, 4,625,673, Cl. 114-230.000.

Novajovsky, William A., to RCA Corporation. Radiator band for an air-cooled electron tube. 4,626,733, Cl. 313-40.000.

Nozue, Ikuo; Tomomitsu, Osahiko; Yumoto, Yoshiji; and Matsumura, Yoshio, to Japan Synthetic Rubber Co., Ltd. Solvent-soluble organopolysilsesquioxane, process for producing the same, and semiconductor using the same. 4,626,556, Cl. 522-99.000.

NSK-Warner K.K.: *See—*
Ueda, Takeo, 4,625,371, Cl. 24-641.000.

Nusbaum, Arthur, to Nusbaum, Robert; Nusbaum, Howard; and Selick, Barbara. Underfloor assembly and cable distribution system and cable trench therefor. 4,625,480, Cl. 52-221.000.

Nusbaum, Howard: *See—*
Nusbaum, Arthur, 4,625,480, Cl. 52-221.000.

Nusbaum, Robert: *See—*
Nusbaum, Arthur, 4,625,480, Cl. 52-221.000.

N.V. Weefautomaten Picanol: *See—*
Pauwels, Bernard J.; Huyghe, Paul J.; and Meyns, Ignace F., 4,625,768, Cl. 139-188.00R.

Nylund, Theodore W.: *See—*
Field, David H.; Kirby, William E., and Nylund, Theodore W., 4,626,405, Cl. 376-448.000.

Nyqvist, Per G. H.: *See—*
Kjellberg, Ulf A.; Nyqvist, Per G. H.; Stenhede, Jan U.; and Stenmark, Lars B., 4,626,532, Cl. 514-195.000.

Nystuen, Arne M.; and Kuss, John M., to Whirlpool Corporation. Method of and apparatus for balancing a rotary body. 4,626,147, Cl. 409-133.000.

O. B. Test Group, Inc.: *See—*
Wilkinson, Alan M., 4,626,776, Cl. 324-73.0PC.

Oakley, David J.; Groves, Oliver J.; and Kaiser, Bruce J., to United States of America, Energy. Apparatus for inspecting fuel elements. 4,626,401, Cl. 376-245.000.

Oberlin, Claude: *See—*
Dohlen, Gerard; Le Marquis, Jean-Claude; and Oberlin, Claude, 4,625,766, Cl. 138-93.000.

Obsler, Leonard, to High Tech Homes, Inc. Structural systems and components. 4,625,484, Cl. 52-251.000.

Obstfelder, Gunther, to Hauni-Werke Korber & Co. KG. Hydraulic brake for vehicles. 4,626,044, Cl. 303-116.000.

Odell, James: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Odijk, Eddy A. M.: *See—*
Persoon, Eric H. J.; Vandenbulcke, Christian J. B. O. E.; Odijk, Eddy A. M.; and Stikvoort, Eduard F., 4,627,021, Cl. 364-900.000.

O'Donnell, John W.; Catapano, Michael C.; and Noe, Renato R. Plug, for fluid-sealing of tubes. 4,625,765, Cl. 138-89.000.

Oesterle, Hermann F.; Rosl, Wolfgang; and Rose, Jochen, to International Standard Electric Corporation. Pulse generator. 4,626,699, Cl. 307-106.000.

Oeth, James F.: *See—*
Link, Joseph E.; and Oeth, James F., 4,626,163, Cl. 414-685.000.

Ogata, Hisanao: *See—*
Hakuraku, Yoshinori; and Ogata, Hisanao, 4,625,519, Cl. 62-3.000.

Ogawa, Hirofumi: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.

Ogawa, Koichi: *See—*
Arai, Shigeru; Shibata, Itaru; Minami, Akira; and Ogawa, Koichi, 4,627,040, Cl. 369-44.000.

Ogawa, Masahide: *See—*
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; and Suzuki, Kazuhiko, 4,626,290, Cl. 106-288.00B.

Ogawa, Noboru: *See—*
Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, 4,626,976, Cl. 363-19.000.

Ogawa, Shigeru; Yamaji, Hiroshi; and Kano, Masaaki, to Kabushiki Kaisha Toshiba. Surface defect inspecting apparatus. 4,626,101, Cl. 356-237.000.

Ogino, Kinzi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Method for controlling the start of vehicle. 4,626,040, Cl. 303-96.000.

Ogoe, Samuel A.; and Dick, Kevin F., to Dow Chemical Company, The. Fire retardant carbonate polymer composition. 4,626,563, Cl. 524-168.000.

Oguni, Yasuo: *See—*
Noguchi, Fujio; Oguni, Yasuo; and Shimizu, Masayuki, 4,626,006, Cl. 285-158.000.

Ogura, Makoto, to Canon Kabushiki Kaisha. Process for making electro-optic element. 4,626,303, Cl. 156-145.000.

Ogusu, Mikio: *See—*
Tamaru, Takuya; and Ogusu, Mikio, 4,627,037, Cl. 369-77.200.

Ohashi, Kazuo; and Yamakawa, Takuya, to Sumitomo Electric Industries, Inc. Signal transmission system and method. 4,627,105, Cl. 455-612.000.

Ohe, Kazuhide; and Kawashima, Yukio, to TDK Corporation. Electrode for electrolysis. 4,626,334, Cl. 204-290.00R.

Ohi, Shinichi: *See—*
Takahashi, Tadahiro; Ohi, Shinichi; and Kobayashi, Kashiwa, 4,626,820, Cl. 337-354.000.

Ohkido, Fumiyasu: *See—*
Arita, Setsuo; and Ohkido, Fumiyasu, 4,626,707, Cl. 307-355.000.

Ohkubo, Masaharu: *See—*
Ohtsuka, Yasumasa; Asai, Jun; Murasawa, Yoshihiro; Sasame, Hiroshi; and Ohkubo, Masaharu, 4,626,096, Cl. 355-14.00D.

Ohmura, Jukichi: *See—*
Hane, Toshioki; and Ohmura, Jukichi, 4,626,553, Cl. 521-27.000.

Ohnishi, Toshihiro: *See—*
Murase, Ichiki; Ohnishi, Toshihiro; and Noguchi, Takanobu, 4,626,588, Cl. 528-481.000.

Ohsaki, Ichiro: *See—*
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.

Ohta, Tokuya; Kobayashi, Masatsune; Miura, Konoe; and Takimoto, Hiroshi, to Mitsubishi Chemical Industries Ltd.; and Canon Inc. Recording liquid. 4,626,284, Cl. 106-22.000.

Ohtaki, Keizaburo; Niikawa, Ryo; and Sakata, Masashi, to Honda Giken Kogyo Kabushiki Kaisha. Clearance measuring apparatus for an assembly device. 4,625,416, Cl. 33-180.0AT.

Ohtani, Nobuhiro; and Sakurai, Hidekazu, to NEC Corporation. Method and circuit for demodulating encoded data of facsimile apparatus. 4,626,921, Cl. 358-260.000.

Ohtsuka, Iwao: *See—*
Sagara, Takehiko; Suzuki, Hiroya; and Ohtsuka, Iwao, 4,626,116, Cl. 400-124.000.

Ohtsuka, Yasumasa; Asai, Jun; Murasawa, Yoshihiro; Sasame, Hiroshi; and Ohkubo, Masaharu, to Canon Kabushiki Kaisha. Image forming apparatus for forming a visual image in accordance with image signals. 4,626,096, Cl. 355-14.00D.

Ohtsuki, Toshio: *See—*
Kumazawa, Katsuyoshi; Ohtsuki, Toshio; and Komori, Minoru, 4,626,197, Cl. 431-302.000.

Ohuchi, Muneki, to JEOL Ltd. Nuclear magnetic resonance spectroscopy for selective detection of multiple quantum transitions. 4,626,783, Cl. 324-307.000.

Ohyagi, Takashi: *See—*
Ichikawa, Yoshio; and Ohyagi, Takashi, 4,626,842, Cl. 340-825.440.

Ohyama, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Rear view mirror assembly. 4,626,086, Cl. 350-632.000.

Ohyama, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Rear view mirror assembly. 4,626,087, Cl. 350-632.000.

Ohyama, Yasushi: *See—*
Shioya, Yoshimi; Maeda, Mamoru; Ohyama, Yasushi; and Takagi, Mikio, 4,625,678, Cl. 118-723.000.

Oikawa, Saburo: *See—*
Nagano, Takahiro; Yatsuo, Tsutomu; Oikawa, Saburo; and Horie, Akira, 4,626,888, Cl. 357-38.000.

Oinoue, Ken'ichi, to Olympus Optical Ltd, Company. Focus detecting method and apparatus. 4,626,674, Cl. 250-201.000.

Okada, Kenichi; Asao, Hiroshi; and Yonemura, Hideo, to Hitachi, Ltd. Method and apparatus for increasing thickness of tubular member. 4,625,533, Cl. 72-302.000.

Okada, Takashi: *See—*
Oniki, Saburo; Okada, Takashi; and Mogi, Takao, 4,626,909, Cl. 358-114.000.

Okada, Tsuneyoshi: *See—*
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,626,371, Cl. 252-62.540.

Okado, Kenji: *See—*
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,626,487, Cl. 430-109.000.

Okajima, Takahiro: *See—*
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, 4,627,044, Cl. 369-292.000.

Okamoto, Yuzi, to Toyota Jidosha Kabushiki Kaisha. Vehicle door structure. 4,625,458, Cl. 49-374.000.

Okamura Corporation: *See—*
Abe, Masatoshi; and Kaise, Tatsuo, 4,625,874, Cl. 211-122.000.

Okamura, Eiji: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.

Okayasu, Kenji. Heat transport apparatus. 4,625,790, Cl. 165-104.220.

Okazaki, Tomoaki: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

O'Keefe, Gerald T.: *See—*
Baba, Takaaki; and O'Keefe, Gerald T., 4,626,898, Cl. 358-48.000.

Okoshi, Noboru: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.

Oku, Narihiro; Usui, Seiji; Uematsu, Hiroaki; and Kohno, Takeshi, to Horiba, Ltd. Standard solution for simultaneously calibrating a plurality of ion electrodes. 4,626,512, Cl. 436-8.000.

Okuda, Michihiro; and Takahashi, Kotei, to Nissan Motor Co., Ltd. Shift control mechanism of automotive manual transmission. 4,625,576, Cl. 74-473.00R.

Okumura, Michio: *See—*
Fushiya, Fusao; Hakamata, Nobuo; and Okumura, Michio, 4,625,462, Cl. 51-170.0MT.

Okumura, Mitsuhiro: *See—*
Naya, Eizo; and Okumura, Mitsuhiro, 4,626,282, Cl. 75-247.000.

Okumura, Takuzo; Yanase, Masataka; and Kikui, Hitoshi, to Sumitomo Chemical Company, Limited. Method of making a light-polarizing plate. 4,626,304, Cl. 156-163.000.

Okuno Chemical Industries Co., Ltd.: *See—*
Wada, Masatoshi; Matsubara, Shigekazu; Moritsu, Yukikazu; and Sakai, Tetsuo, 4,626,071, Cl. 350-311.000.

Okuyama, Masahiko: *See—*
Kondo, Kazuo; Okuyama, Masahiko; Watanabe, Masakazu; and Iio, Satoshi, 4,626,392, Cl. 264-62.000.

Okuyama, Shigeaki; and Fuziwara, Osami, to Kubota, Ltd. Teaching-playback type automatically running vehicle. 4,626,993, Cl. 364-424.000.

Olds, John R.: *See—*
Curtis, Linden T.; Franklin, William G.; and Olds, John R., 4,625,437, Cl. 37-141.00R.

O'Leary, Michael. Spigot and socket connections. 4,626,000, Cl. 285-39.000.

Olerud, Sven E.; and Richter, Karl M., to Howmedica International, Inc. Aiming apparatus. 4,625,718, Cl. 128-92.0VD.

Olin Corporation: *See—*
Bilsbury, Stephen J., 4,625,650, Cl. 102-516.000.
Fister, Julius C., 4,625,400, Cl. 29-879.000.

Olin Hunt Specialty Products, Inc.: *See—*
Eilbeck, James N., 4,626,492, Cl. 430-191.000.

Oliver, Robert J. L., to Riccobin & Martin. Rotary portapunch assembly. 4,625,612, Cl. 83-863.000.

Olla, Michael A.: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; and Morrison, Barry L., 4,626,167, Cl. 414-786.000.

Olsen, John H.: *See—*
Staal, Philip R.; Hughes, Richard C.; and Olsen, John H., 4,627,076, Cl. 375-36.000.

Olson, Gene H.; and Quy, Dennis A., to Rosemount Inc. Alternating communication channel switchover system. 4,627,045, Cl. 370-16.000.

Olson, George E.; and Nobiling, Jerry F., to A. O. Smith Harvestore Products, Inc. Pre-assembled turntable mounting unit for a storage structure. 4,626,161, Cl. 414-308.000.

Olsson, Billy E.; and Rupnik, David W., to AMP Incorporated. Contact assembly. 4,626,637, Cl. 200-284.000.

Olympus Optical Co. Ltd.: *See—*
Hiraoka, Yasunori, 4,625,713, Cl. 128-4.000.
Kobayashi, Minoru, 4,626,940, Cl. 360-96.300.
Mizoguchi, Toyokazu; Nishizawa, Jun-ichi; Suzuki, Sohbe; and Tamamushi, Takashige, 4,626,916, Cl. 358-213.120.
Nakamura, Hiroaki, 4,626,748, Cl. 315-241.00P.

Olympus Optical Ltd, Company: *See—*
Oinoue, Ken'ichi, 4,626,674, Cl. 250-201.000.

O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., to Rich Products Corporation. Fruit infusion using a syrup which has been subjected to enzyme treatment and concentrated. 4,626,434, Cl. 426-50.000.

O'Malley, Patrick J., to Motorola Inc. Programmable video display generator. 4,626,839, Cl. 340-750.000.

Omark Industries, Inc.: *See—*
Petrovich, Michael V., 4,625,610. Cl. 83-834.000.

Omary, M. Bishr: *See—*
Trowbridge, Ian S.; and Omary, M. Bishr, 4,626,507, Cl. 435-240.000.

Omega SA: *See—*
Fontana, Fernando, 4,625,508, Cl. 59-80.000.

Omori, Masayoshi: *See—*
Kimura, Takashi; Tanaka, Hiromi; and Omori, Masayoshi, 4,625,524, Cl. 62-278.000.

Omron Tateisi Electronics Co.: *See—*
Koga, Hirofumi; Maenishi, Kozo; Kashimoto, Shuichi; Honda, Sueaki; Tsuruyoshi, Kenichi; and Sano, Takezo, 4,626,813, Cl. 335-278.000.
Nakanishi, Youichi; and Maenishi, Kozo, 4,626,812, Cl. 335-132.000.

Omura, Satoshi; and Shimizu, Hideki, to Kitasato Institute, The. Antibiotic AM-2604-A, an anti-trichomonas agent, anti-caccidium agent, anti-viral agent and anti-fungal agent containing the same and methods of use of the same. 4,626,547, Cl. 514-450.000.

Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, to Sumitomo Chemical Company, Limited. Organic dye compound having both pyridiniotriazinyl and vinylsulfone type fiber-reactive groups. 4,626,589, Cl. 534-605.000.

Onda, Kenichi: *See—*
Abe, Kozin; Onda, Kenichi; Yabuno, Kohei; Nakajima, Shin; and Ogawa, Noboru, 4,626,976, Cl. 363-19.000.

O'Neill, Michael, to Perkin-Elmer Corporation, The. Vertically stable friction-free microbalance. 4,625,819, Cl. 177-212.000.

Oniki, Saburo; Okada, Takashi; and Mogi, Takao, to Sony Corporation. Video signal recording and reproducing system with automatic channel and time selection. 4,626,909, Cl. 358-114.000.

Onishi, Takanori, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas recirculation control device for diesel engine. 4,625,702, Cl. 123-571.000.

Ono, Motoyuki: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Ono, Taizo: *See—*
Scherer, Kirby V., Jr.; Ono, Taizo; and Yamanouchi, Kouichi, 4,626,608, Cl. 570-134.000.

Ono, Yasuichi; Amagishi, Yoshitada; and Nakamura, Moritoshi, to Alps Electric Co., Ltd. Connecting structure of terminal area of printed circuit board. 4,626,961, Cl. 361-398.000.

Onodera, Takayoshi, to Toyota Jidosha Kabushiki Kaisha. Split axle drive mechanism for part-time four-wheel drive vehicle. 4,625,584, Cl. 74-713.000.

Ootsuka, Shigeharu; Mizuno, Yuji; Kajimura, Junichi; and Mori, Takaaki, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for indicating the contact structure of electromagnetic contactor on the housing thereof using laser light. 4,626,656, Cl. 219-121.0LH.

Ooyama, Mitsuo: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.

Opfer, James E.: *See—*
Bloomquist, Darrel R.; Natarajan, Bangalore R.; and Opfer, James E., 4,626,336, Cl. 204-298.000.

Orenbuch, Louis: *See—*
Waldman, Herbert H., 4,626,630, Cl. 379-199.000.

Orth, David J.; and Love, George E. Implement coupler kit for tractor. 4,625,990, Cl. 280-415.00R.

Orzelek, Frank J.: *See—*
Zemek, Albert W.; Orzelek, Frank J.; and Dunlap, Charles, 4,625,399, Cl. 29-845.000.

Osaka Seihan Center Kyogyo Kumiai: *See—*
Uchida, Seiichi, 4,626,097, Cl. 355-77.000.

Osaki, Tatsuo, to Yoshida Kogyo K.K. Apparatus for automatically processing a slide fastener chain. 4,625,375, Cl. 29-33.200.

Osborne, Colin; and Chow, Peter N., to Dresser Industries, Inc. Diffuser for centrifugal compressors and the like. 4,626,168, Cl. 415-211.000.

Osborne, Deane C.: *See—*
Stapleford, Gary N.; and Osborne, Deane C., 4,627,001, Cl. 364-513.500.

Oshima, Sigeru; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Zoom lens. 4,626,076, Cl. 350-427.000.

Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, to Nippon Yakin Kogyo Kabushiki Kaisha; and Babock-Hitachi Kabushiki Kaisha. Ni-based alloy excellent in intergranular corrosion resistance, stress corrosion cracking resistance and hot workability. 4,626,408, Cl. 420-442.000.

Ostarek, Ralph: *See—*
Reetz, Manfred T.; Ostarek, Ralph; and Piejko, Karl-Erwin, 4,626,579, Cl. 526-194.000.

Ostermeier, Heinrich, to Happycard International Limited. Photographic camera. 4,626,091, Cl. 354-75.000.

Ostertag, Edward L.: *See—*
Knop, Charles M.; Ostertag, Edward L.; and Cheng, Yuk-Bun, 4,626,863, Cl. 343-781.00P.

Oswald, Hendrikus J.: *See—*
Li, Hsin L.; Largman, Theodore; and Oswald, Hendrikus J., 4,626,390, Cl. 264-46.100.

Ota, Yoshihiko: *See—*
Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, 4,626,934, Cl. 360-66.000.

Otake, Katsumasa: *See—*
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.

Otis Engineering Corporation: *See—*
Bayh, Russell I., III, 4,625,798, Cl. 166-106.000.
McCormick, William H.; and Cobb, Charles C., 4,625,799, Cl. 166-223.000.

Ott, Karl-Erich: *See—*
Wojtech, Bernhard; Mayer, Manfred; and Ott, Karl-Erich, 4,626,605, Cl. 568-757.000.

Otto, James A.; and Weaver, Marvin P., to Robertshaw Controls Company. Crankcase ventilating system, flow control device therefor and method of making the same. 4,625,703, Cl. 123-574.000.

Otto, Vedon W.: *See—*
Pierson, Willis A.; Hill, James D.; and Otto, Vedon W., 4,626,856, Cl. 342-174.000.

Ouchi, Kiyoshi, to Ebara Corporation. Electrical connector for submergible motor pump assembly. 4,626,721, Cl. 310-71.000.

Outboard Marine Corporation: *See—*
Mahoney, J. Michael, 4,625,549, Cl. 73-327.000.

Oval Engineering Co., Ltd.: *See—*
Murakami, Hideo; and Matsubara, Naoki, 4,625,564, Cl. 73-861.240.

Owen, Gwilym M.: *See—*
Spencer, Henry B.; and Owen, Gwilym M., 4,627,011, Cl. 364-566.000.

Owen, Trevor W., to Owen Tri-Cut Limited. Method and apparatus for extracting the contents of envelopes. 4,625,497, Cl. 53-492.000.

Owen Tri-Cut Limited: *See—*
Owen, Trevor W., 4,625,497, Cl. 53-492.000.

Owens-Corning Fiberglas Corporation: *See—*
Giancola, Dean L.; Kowalski, Craig D.; and Paetz, Frederic H., 4,625,433, Cl. 34-23.000.
Seng, Stephen, 4,625,920, Cl. 239-651.000.

Owens-Illinois, Inc.: *See—*
Karabedian, James A., 4,626,455, Cl. 428-35.000.

Owl Flex, Inc.: *See—*
Markman, Robert; and Markman, Larry N., 4,625,632, Cl. 98-102.000.

Oxborrow, Bernard H., to Metal Box Public Limited Company. Tray-type cartons erecting method and apparatus. 4,626,234, Cl. 493-167.000.

Oy Airam Ab Kometa: *See—*
Helasuo, Kalevi; and Ala-Jokimaki, Antero, 4,625,814, Cl. 175-57.000.

Ozaki, Hidetoshi: *See—*
Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, 4,626,934, Cl. 360-66.000.

Ozawa, Takashi, to NEC Corporation. High speed MOS input circuit with precision input-output characteristics. 4,626,712, Cl. 307-475.000.

Pace, Incorporated: *See—*
Barkley, Vincent P.; and Siegel, William J., 4,626,205, Cl. 432-225.000.

Packer, Lawrence G.; and James, David E., to Amoco Corporation. Purification of terephthalic acid. 4,626,598, Cl. 562-487.000.

Padgett, Harold A.: *See—*
Butcher, James A.; and Padgett, Harold A., 4,626,755, Cl. 318-473.000.

Paetz, Frederic H.: *See—*
Giancola, Dean L.; Kowalski, Craig D.; and Paetz, Frederic H., 4,625,433, Cl. 34-23.000.

Palazzetti, Mario: *See—*
Montuschi, Mario; and Palazzetti, Mario, 4,626,814, Cl. 335-281.000.

Pall Corporation: *See—*
Adiletta, Joseph G., 4,626,265, Cl. 55-316.000.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Quick change tool retainer. 4,626,152, Cl. 409-232.000.

Pamingle, Herve : *See—*
Schulte-Elte, Karl-Heinrich; and Pamingle, Herve , 4,626,602, Cl. 568-822.000.

Pant, Paul: *See—*
Jachowski, Johannes; Klasing, Helmut; Blum, Josef; and Pant, Paul, 4,626,464, Cl. 428-212.000.

Panzeri, Achille: *See—*
Faustini, Franco; d'Alessio, Roberto; Panzeri, Achille; and di Salle, Enrico, 4,626,597, Cl. 560-53.000.

Paper Converting Machine Company: *See—*
DuFresne, Allen J., 4,625,957, Cl. 271-214.000.

Papst-Motoren GmbH & Co KG: *See—*
Doemen, Benno, 4,626,751, Cl. 318-254.000.

Paradyne Corporation: *See—*
Armstrong, Thomas R., 4,627,077, Cl. 375-39.000.

Parisi, Vincent. Extendable trailer for marine vehicles. 4,626,162, Cl. 414-479.000.

Parke, Davis & Company: *See—*
Behme, Werner; and Berleth, Manfred, 4,625,608, Cl. 83-713.000.

Parker Hannifin Corporation: *See—*
Jelinek, Jerry G., 4,625,978, Cl. 277-180.000.
Stone, Walter H., 4,626,348, Cl. 210-248.000.

Parker, Jay S.; and Koziol, Leo B., to Northern Telecom Limited. Bus arrangement for addressing equipment units and a method therefor. 4,626,846, Cl. 340-825.520.

Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., to United States of America, National Aeronautics and Space Administration. Vinyl stilbazoles. 4,626,593, Cl. 546-339.000.

Parker, Ray: *See—*
Maltby, Peter J.; and Parker, Ray, 4,625,843, Cl. 192-8.00R.

Parks, Jerry W.: *See—*
Sadler, Wanda H.; Milligan, John; and Parks, Jerry W., 4,626,559, Cl. 523-122.000.

Parmeggiani, Aldo, to CISE-Centro Informazioni Studi Esperienze S.p.A. Method and apparatus for automatically producing thin-walled tubes. 4,626,644, Cl. 219-61.000.

Parsons, Jack D., to Sealright Co., Inc. Apparatus for applying recessed membrane seals to containers. 4,625,498, Cl. 53-526.000.

Patalong, Hubert; and Spenke, Eberhard, to Siemens Aktiengesellschaft. Thyristor with connectible current sources and method for operating same. 4,626,703, Cl. 307-252.00G.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Greiler, Wolfgang, 4,626,734, Cl. 313-51.000.

Patterson, Douglas H.: *See—*
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,627,016, Cl. 364-900.000.

Patterson, Robert W.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.

Patton, Dennis D.: *See—*
Patton, Roy A., 4,626,061, Cl. 339-217.00S.

Patton, Ronald A.: *See—*
Patton, Roy A., 4,626,061, Cl. 339-217.00S.

Patton, Roy A., to Patton, Ronald A.; and Patton, Dennis D. Crimp connect terminals. 4,626,061, Cl. 339-217.00S.

Paul Hettich GmbH & Co.: *See—*
Gross, Jurgen; and Sundermeier, Gunter, 4,626,049, Cl. 312-291.000.

Pauwels, Bernard J.; Huyghe, Paul J.; and Meyns, Ignace F., to N.V. Weefautomaten Picanol. Batten for weaving loom. 4,625,768, Cl. 139-188.00R.

Pav, Josef; Wenzel, Reinhard; Schmidt, Rainer; Svenka, Peter; and Rauf, Richard, to Kleimwefers GmbH. Roll assembly for use in calenders and the like. 4,625,637, Cl. 100-47.000.

Peacock, Richard C., deceased; and Peacock, Ruby L., personal representative. Tube-type termite control system. 4,625,474, Cl. 52-101.000.

Peacock, Ruby L., personal representative: *See—*
Peacock, Richard C., deceased; and Peacock, Ruby L., personal representative, 4,625,474, Cl. 52-101.000.

Pean, Jean-Louis. Process for obtaining solutions having a high content of dissolved gas. 4,626,376, Cl. 252-305.000.

Pearson, Bernard A.: *See—*
Snellman, Donald L.; Pearson, Bernard A.; and Jacobs, John W., 4,625,955, Cl. 271-10.000.

Pearson, Charles S.: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.

Peddinghaus, Carl-Ulrich: *See—*
Klaus, Siegfried, 4,625,855, Cl. 198-367.000.

Peekna, Andres, to R. R. Donnelley & Sons Company. Method of magnetic cylinder assembly. 4,625,928, Cl. 242-7.020.

Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence; and Newlove, John C., to Exxon Research and Engineering Company. Fluid loss control in oil field cements. 4,626,285, Cl. 106-90.000.

Pelgrom, Marcellinus J. M.; Harwig, Hendrik A.; and Slotboom, Jan W., to U.S. Philips Corporation. Semiconductor device for obtaining an accurate threshold voltage adjustment. 4,627,082, Cl. 377-60.000.

Pelgrom, Marcellinus J. M.; and Slotboom, Jan W., to U.S. Philips Corporation. Charge transfer device output. 4,627,083, Cl. 377-60.000.

Pellico, Michael A., to Laclede Professional Products, Inc. Dental impression composition containing finely sized polyacrylamide. 4,626,558, Cl. 523-109.000.

Pennwalt Corporation: *See—*
Dodge, Robert J., 4,626,852, Cl. 340-985.000.

Pentel Kabushiki Kaisha: *See—*
Fukui, Hishao; Shinohara, Yutaka; and Tamura, Takashi, 4,626,120, Cl. 401-260.000.

Penttila , Markku: *See—*
Aalto, Arvo; Aalto, Erkki; Hasa , Juhani; Penttila , Markku; Saukkonen, Harri; and Tolmunen, Arvi, 4,625,626, Cl. 98-1.000.

Pep Rally Paint, Inc.: *See—*
Sadler, Wanda H.; Milligan, John; and Parks, Jerry W., 4,626,559, Cl. 523-122.000.

Pepe, Enrico J.: *See—*
Marsden, James G.; and Pepe, Enrico J., 4,626,560, Cl. 523-145.000.

Pepmiller, Paul E.: *See—*
Head, Manley J.; Smith, William C.; and Pepmiller, Paul E., 4,627,071, Cl. 375-10.000.

Perches, Martin. Keyboard construction. 4,626,668, Cl. 235-145.00R.

Pereira, Robert, Jr.: *See—*
Blumkin, Rubin; and Pereira, Robert, Jr., 4,626,816, Cl. 336-192.000.

Perkin-Elmer Corporation, The: *See—*
O'Neill, Michael, 4,625,819, Cl. 177-212.000.
Tracy, David H., 4,626,312, Cl. 156-345.000.

Persoon, Eric H. J.; Vandenbulcke, Christian J. B. O. E.; Odijk, Eddy A. M.; and Stikvoort, Eduard F., to U.S. Philips Corporation. Integrated processor for the processing of word-wise receivable data. 4,627,021, Cl. 364-900.000.

Pescatore, John C.: *See—*
Cooper, Ronald J.; Marsico, Mario A.; and Pescatore, John C., 4,627,054, Cl. 371-11.000.

Peters, Raymond A. Illuminating glove. 4,625,339, Cl. 2-160.000.

Peterson, John G.: *See—*
Whalen, Barry H.; and Peterson, John G., 4,627,024, Cl. 364-900.000.

Peterson, Phillip R.; and Rushing, William C., to Berntsen, Inc. Anti-twist rod section and method of using the same in survey monument placement. 4,625,473, Cl. 52-98.000.

Petersson, Rolf: *See—*
Karlsson, Ingemar; Andersson, Karl-Hugo; and Petersson, Rolf, 4,625,434, Cl. 34-114.000.

Petitcollin, Jean-Marc: *See—*
Aubry, Claude; Chaumette, Jacques; Letemps, Bernard; Petitcollin, Jean-Marc; Gatzweiler, Werner; Rissmann, Heinz-Bernd; Vanaschen, Luc; and Zeitzen, Jurgen, 4,626,207, Cl. 432-253.000.

Petrarch Systems Inc.: *See—*
Arkles, Barry C., 4,626,583, Cl. 528-34.000.

Petrolite Corporation: *See—*
Buriks, Rudolf S.; and Dolan, James G., 4,626,379, Cl. 252-340.000.

Petrovich, Michael V., to Omark Industries, Inc. Cutting chain having automatic sharpening. 4,625,610, Cl. 83-834.000.

Pfaff Haushaltmaschinen GmbH: *See—*
Hammermann, Joachim, 4,625,667, Cl. 112-456.000.

Pfeiffer, Martin: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.

Pfender, Georg, to MBK Maschinenbau GmbH. Machine for fabricating a reinforcing body for a concrete pipe. 4,625,773, Cl. 140-112.000.

Pfirrmann, Rolf W., to Ed Geistlich Sohne Ag fur Chemische/Industrie. Compositions for combatting toxaemia. 4,626,536, Cl. 514-222.000.

Pfitzner, Jorg: *See—*
Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, 4,626,525, Cl. 514-18.000.

Pforzheimer Uhren Rohwerke Porta GmbH: *See—*
Kroener, Wolfgang, 4,626,109, Cl. 368-322.000.

Pfrimmer & Co. Pharmazeutische Werke Erlangen: *See—*
Iwatschenko, Peter; and Giebler, Fritz, 4,625,494, Cl. 53-432.000.

Pham, Ngu T., to Thomson-CSF. Circuit for limiting the deviation of logic voltages. 4,626,714, Cl. 307-550.000.

Pharmacia AB: *See—*
Joustra, Marius K.; and Blanche, Claes G., 4,626,355, Cl. 210-635.000.

Philip Morris Incorporated: *See—*
Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., 4,625,737, Cl. 131-355.000.

Phillips, Allyn E., to Emerson Electric Co. Single tapered bushing for shaft mount. 4,626,114, Cl. 384-584.000.

Phillips, Jerry G. Multi-function lighted walking cane. 4,625,742, Cl. 135-66.000.

Phillips, Pat: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.

Phillips Petroleum Company: *See—*
Henry, William E., 4,625,573, Cl. 73-864.440.
Miro, Nemesio D.; Farha, Floyd E.; and Capshew, Charles E., 4,626,519, Cl. 502-105.000.
Wyatt, Kay D., 4,627,036, Cl. 367-57.000.

Piatt, Michael J., to Eastman Kodak Company. Ink jet wet-storage system. 4,626,869, Cl. 346-75.000.

Piccoline, Marie A.: *See—*
Gleason, Patricia A.; and Piccoline, Marie A., 4,626,363, Cl. 252-8.514.

Picker International, Inc.: *See—*
Quedens, Phillip J.; Dutko, Peter J., Jr.; Larson, Raymond F.; and Donarumo, Ralph A., 4,625,731, Cl. 128-660.000.
Picot S.A.: *See—*
Lafrasse, Jean; and Chastan, Jean-Paul, 4,625,531, Cl. 72-150.000.
Piejko, Karl-Erwin: *See—*
Reetz, Manfred T.; Ostarek, Ralph; and Piejko, Karl-Erwin, 4,626,579, Cl. 526-194.000.
Pierre, Alain: *See—*
Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, 4,626,088, Cl. 351-204.000.
Pierson, Willis A.; Hill, James D.; and Otto, Vedon W., to General Dynamics Corporation. Radar signal correction system. 4,626,856, Cl. 342-174.000.
Pigott, Norman B., to Robotic Systems Limited. Locking device for movable arm assembly. 4,625,836, Cl. 188-67.000.
Pikal, Michael J.: *See—*
Fites, Alan L.; and Pikal, Michael J., 4,626,534, Cl. 514-203.000.
Pilny, James C.: *See—*
Tengler, John N.; and Pilny, James C., 4,626,054, Cl. 339-59.00M.
Pilot Manufacturing Company: *See—*
Brummet, William N., 4,625,601, Cl. 82-4.00C.
Pinegar, Richard K.; and Bates, Ronald B., to J. R. Simplot Company. Rotary cutting apparatus. 4,625,606, Cl. 83-403.000.
Pinson, George T., to Boeing Aerospace Company, The. Aerial missile having multiple submissiles with individual control of submissible ejection. 4,625,646, Cl. 102-489.000.
Pioneer Electronic Corporation: *See—*
Ishii, Satoshi, 4,626,715, Cl. 307-585.000.
Moriyama, Yoshiaki, 4,627,058, Cl. 371-37.000.
Shimakata, Masashi, 4,627,099, Cl. 455-76.000.
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, 4,627,044, Cl. 369-292.000.
Yashiro, Kenji, 4,627,035, Cl. 365-230.000.
Pitalo, Stephen K.; Russnak, Clarence J.; and Anderson, Wallace M., to Boeing Company, The. Multispectral collimator with built-in-test. 4,626,685, Cl. 250-341.000.
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., to Raychem Limited. Recoverable article for encapsulation. 4,626,458, Cl. 428-36.000.
Pitney Bowes Inc.: *See—*
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,627,016, Cl. 364-900.000.
Miciukiewicz, Joseph F., 4,626,047, Cl. 312-107.500.
Pitroda, Satyan G.; Mehta, Bakulesh A.; and Fechalos, William A., to Rockwell International Corp. Integrated voice and data telecommunication switching system. 4,627,047, Cl. 370-58.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; Luccarelli, Domenick, Jr.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with dialkylthioalkenes, dialkylthioalkylcycloalkenes and monoalkenylcycloalkens. 4,626,440, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Dithioethers of 2-phenyl-2-alkenals and organoleptic uses thereof. 4,626,599, Cl. 568-57.000.
Pittman, Doreen: *See—*
Witherspoon, Kent; Carroll, James P.; Allen, Bud; Norton, Terri; Odell, James; Pittman, Doreen; Phillips, Pat; Everett, Phillip; Hovater, Joe; Livingston, Hank; and Williams-Terry, Lisa, 4,625,570, Cl. 73-863.810.
Pittsburgh-Des Moines Corporation: *See—*
Murphy, John C.; and Swinderman, Robert H., 4,625,521, Cl. 62-55.500.
Pittway Corporation: *See—*
Keeler, Manley S., 4,626,695, Cl. 250-574.000.
Plastics Engineering Company: *See—*
Waitkus, Phillip A.; and Korb, Louis L., 4,626,569, Cl. 524-541.000.
Plessey Overseas Limited: *See—*
Taylor, Peter J., 4,625,558, Cl. 73-64.200.
Plus One, Inc.: *See—*
Gangnath, Robert B.; and Tudor, Nicolae, 4,625,342, Cl. 4-228.000.
Plyler, Robert G., to General Motors Corporation. Wire bundle and grommet assembly. 4,626,620, Cl. 174-153.00G.
Pointon, Ronald H.; and Nightingale, Allen F., to W & A Bates Limited. Method and apparatus for mixing particulate materials. 4,626,104, Cl. 366-162.000.
Polarmax Corporation: *See—*
Micklethwaite, Ian W., 4,626,864, Cl. 343-766.000.
Poly Processing Company, Inc.: *See—*
Carlin, Hervin A., Jr., 4,625,892, Cl. 220-465.000.
Polysar Limited: *See—*
Sato, Kyosaku; Liu, Richard W.; and Cheung, Seung-Tong, 4,626,568, Cl. 524-526.000.
Polytop Corporation: *See—*
Hazard, Robert E., 4,625,898, Cl. 222-517.000.
Pomeranz, Mark L. Penile prosthesis with rheopexic material enclosed in a chamber. 4,625,716, Cl. 128-79.000.
Pompei, Domenico A.: *See—*
Pompei, Francesco; Daya, Shiraz; and Pompei, Domenico A., 4,626,686, Cl. 250-342.000.
Pompei, Francesco; Daya, Shiraz; and Pompei, Domenico A., to Exergen Corporation. Variable field of view heat scanner. 4,626,686, Cl. 250-342.000.
Pool, James L., to Lisle Corporation. Pneumatic impact hammer. 4,625,812, Cl. 173-134.000.
Poole, Jon M., to Inco Alloys International, Inc. Activated sintering of metallic powders. 4,626,406, Cl. 419-12.000.
Poore, Bernard B.: *See—*
Allen, James R.; Wohlford, William P.; and Poore, Bernard B., 4,625,989, Cl. 280-479.00A.
Porta Systems Corp.: *See—*
Mazz, Thomas, 4,626,632, Cl. 379-29.000.
Porth, Robert J.: *See—*
Harvey, Keith B.; Litke, Cynthia D.; and Porth, Robert J., 4,627,069, Cl. 373-29.000.
Porucznik, Paul: *See—*
Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., 4,626,157, Cl. 413-1.000.
Poschner, Markus: *See—*
Hinsberg, Rene ; and Poschner, Markus, 4,626,036, Cl. 301-58.000.
Possati, Mario; and Dall'Aglio, Carlo, to Finike Italiana Marposs S.p.A. Head for checking dimensions of mechanical parts. 4,625,413, Cl. 33-143.00L.
Posso, Patrick P. P., to Gefitec S.A. Ring for sealing and storage of a spool of recording tape. 4,625,866, Cl. 206-400.000.
Post, Stephen F., to Curtis Instruments, Inc. Solid state d.c. motor control. 4,626,750, Cl. 318-139.000.
Poterala, Robert J. Adjustable sealing dams for a coating machine and method. 4,626,452, Cl. 427-356.000.
Pottig, Wolfram: *See—*
Schmidt, Alfred; and Pottig, Wolfram, 4,627,057, Cl. 371-25.000.
Poveda, Pierre: *See—*
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Powell, John C.: *See—*
Haveman, David L.; and Powell, John C., 4,625,787, Cl. 164-453.000.
Powers, Grady M.; Burgers, Henri T.; and Stowers, Jeffery P., to Virginia Panel Corporation. Tri-axis automated test system for printed circuit boards. 4,626,780, Cl. 324-158.00F.
PPG Industries, Inc.: *See—*
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Hsu, Ed C., 4,626,289, Cl. 106-287.340.
Reese, Thomas J.; Rayburn, David B.; and Cathers, William P., 4,626,267, Cl. 65-106.000.
PQ Corporation: *See—*
Hertzenberg, Elliot P., 4,626,550, Cl. 514-770.000.
Preimesberger, Ernest C.: *See—*
Champlin, Keith S.; Preimesberger, Ernest C.; and Miller, George W., 4,627,070, Cl. 375-3.000.
Premoli, Giacomo; and Cannalire, Giacomo, to GTE Communication Systems Corporation. Digital multifrequency signal receiver. 4,626,629, Cl. 379-386.000.
Preparation Gold, Inc.: *See—*
Gros, Chester P., 4,626,433, Cl. 424-154.000.
Prescher, Gunter: *See—*
Siegmeier, Rainer; Prescher, Gunter; and Maurer, Helmut, 4,626,603, Cl. 568-833.000.
Prewo, Karl M.; and Brennan, John J., to United Technologies Corporation. Gas turbine engine and composite parts. 4,626,461, Cl. 428-113.000.
Price, John J., Jr., to Motorola, Inc. NPN band gap voltage reference. 4,626,770, Cl. 323-313.000.
Priesnitz, Uwe: *See—*
Fuchs, Rainer; Maurer, Fritz; Priesnitz, Uwe; Riebel, Hans-Jochem; and Klauke, Erich, 4,626,601, Cl. 568-425.000.
Priess-Johnson Oil Tools International, Inc.: *See—*
Johnson, Joseph L., 4,625,941, Cl. 251-12.000.
Priestly, Ernest A., to Wyse Technology. Display interface apparatus. 4,626,837, Cl. 340-723.000.
Prince, Thomas F.; and Bishop, Julian J., to Ark-Les Corporation. Connector box for coaxial cable. 4,626,058, Cl. 339-97.00P.
Pringle, William L. Mount machining assembly. 4,626,148, Cl. 409-157.000.
Proffer, Stephen M. Tandem rider harness. 4,625,334, Cl. 2-1.000.
Protoned B.V.: *See—*
Brauning, Egon, 4,626,029, Cl. 297-367.000.
Protz, William F., Jr. Display package for garland or the like. 4,625,865, Cl. 206-388.000.
Prough, James R.; and Morin, James E., to Kamyr, Inc. Method of controlling a pulp refiner by measuring freeness and removing the latency from the pulp. 4,626,318, Cl. 162-49.000.
Pruett, James C., Jr.: *See—*
Farrington, Robert B.; and Pruett, James C., Jr., 4,626,832, Cl. 340-522.000.
Pu, Lyong S.: *See—*
Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., 4,626,485, Cl. 430-59.000.
Puhler, Alfred; and Simon, Reinhard, to Lubrizol Genetics, Inc. DNA transfer vector for gram-negative bacteria. 4,626,504, Cl. 435-172.300.
Pullman Standard Inc.: *See—*
Hesch, Harold E.; and Diluigi, Michael W., 4,626,154, Cl. 410-56.000.
Pump Engineer Associates, Inc.: *See—*
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,625,801, Cl. 166-267.000.
Pusey, Jon C. Sheet feeding apparatus. 4,625,954, Cl. 271-9.000.
Pylon Company, Inc.: *See—*
Boyle, Michael C., 4,626,779, Cl. 324-158.00F.

Pym, Kenneth B. Containers. 4,625,880, Cl. 220-4.00F.
QMC Industrial Research Limited: *See—*
Wilson, Edward G.; and Bloor, David, 4,627,029, Cl. 365-107.000.
Quackenbush, Howard M., to Flexsteel Industries, Inc. Three portion seat-bed for recreational vehicles. 4,625,346, Cl. 5-37.00R.
Quali-Tech Machine & Engineering Co., Inc.: *See—*
Brin, Edward; and Mette, James, 4,626,142, Cl. 408-81.000.
Quearry, Robert W.: *See—*
Gradinger, J. Gary; Quearry, Robert W.; Chalfant, Robert D.; and Wilson, Charles G., 4,626,035, Cl. 300-16.000.
Quedens, Phillip J.; Dutko, Peter J., Jr.; Larson, Raymond F.; and Donarumo, Ralph A., to Picker International, Inc. Ultrasonic image display mounting. 4,625,731, Cl. 128-660.000.
Queguiner, Alain: *See—*
Aumont, Gabriel; and Queguiner, Alain, 4,625,821, Cl. 180-14.200.
Quets, Jean M.: *See—*
Jackson, John E.; Adler, Thomas A.; and Quets, Jean M., 4,626,477, Cl. 428-457.000.
Quibel, Jacques: *See—*
Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, 4,626,607, Cl. 568-948.000.
Quy, Dennis A.: *See—*
Olson, Gene H.; and Quy, Dennis A., 4,627,045, Cl. 370-16.000.
R. R. Donnelley & Sons: *See—*
Schniter, Jorg, 4,625,952, Cl. 270-54.000.
R. R. Donnelley & Sons Company: *See—*
Peekna, Andres, 4,625,928, Cl. 242-7.020.
Raasch, Hans; and Wassenhoven, Heinz-Georg, to W. Schlafhorst & Co. Friction spinning device. 4,625,505, Cl. 57-401.000.
Rabinovici, Raul: *See—*
Krichevsky, Mendel; Rabinovici, Raul; and Sharir, Benjamin, 4,626,815, Cl. 336-5.000.
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Radaelli, Dario, to Alfa Romeo Auto S.p.A. Pressure regulator for a petrol injection system. 4,625,696, Cl. 123-463.000.
Radelkis Elektrokemiai Muszergyarto Ipari Szovetkezet: *See—*
Fejes, Kalman; and Nagy, Lajos, 4,626,242, Cl. 604-68.000.
Rado, Theodore A., to Kerr-McGee Chemical Corporation. Process for the manufacture of caustic soda. 4,626,426, Cl. 423-641.000.
Rahnenfuehrer, Eckhard: *See—*
Klein, Georg; and Rahnenfuehrer, Eckhard, 4,625,648, Cl. 102-286.000.
Rai, Yasuki; Kitamura, Yuji; and Hamada, Minoru, to Sanyo Electric Co., Ltd. Analog storing and reproducing apparatus utilizing non-volatile memory elements. 4,627,027, Cl. 365-45.000.
Rain Bird Consumer Products Mfg. Corp.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.
Rain Bird Sprinkler Mfg. Corp.: *See—*
Christen, Hans D., 4,625,913, Cl. 239-1.000.
Ramachandran, Pallassana N.: *See—*
Bauman, Robert A.; and Ramachandran, Pallassana N., 4,626,364, Cl. 252-8.800.
Rammos, Emmanuel, to U.S. Philips Corporation. Antenna element for orthogonally-polarized high frequency signals. 4,626,865, Cl. 343-786.000.
Ramsaran, Johann D.; Biray, Bora; Nizamuddin, Nadir; and Yung, Anthony, to Northern Telecom Limited. Telephone line circuit having time-shared DTMF receivers. 4,626,628, Cl. 379-283.000.
Rasoul, Husam A. A.: *See—*
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Raychem Limited: *See—*
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,626,458, Cl. 428-36.000.
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RCA Corporation: *See—*
Anderson, Mark R.; Albean, David L.; and Muterspaugh, Max W., 4,627,101, Cl. 455-194.000.
Carnes, Mark T.; and Smith, Lawrence E., 4,626,977, Cl. 363-21.000.
Fedele, Nicola J., 4,627,091, Cl. 381-46.000.
Gurumurthy, Kadagattor V., 4,626,913, Cl. 358-147.000.
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Harwood, Leopold A.; and Wargo, Robert A., 4,626,894, Cl. 358-31.000.
Nortrup, Kevin E.; Beyers, Billy W., Jr.; and Fuhrer, Jack S., 4,626,892, Cl. 358-21.00R.
Novajovsky, William A., 4,626,733, Cl. 313-40.000.
Reitmeier, Glenn A., 4,626,895, Cl. 358-31.000.
Speer, Walter F., 4,626,963, Cl. 361-424.000.
Su, Robert; and Leu, Fang-Nung, 4,626,981, Cl. 363-62.000.
Readhead, John B., to U.S. Philips Corporation. Infrared radiation detectors. 4,625,389, Cl. 29-572.000.
Recker, William J.: *See—*
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,625,801, Cl. 166-267.000.
Reddoch, Jeffery A. Kelly mud saver valve sub. 4,625,755, Cl. 137-327.000.
Reece, David N.: *See—*
Feldman, Martin; Reece, David N.; and Wagner, John S., 4,626,103, Cl. 356-363.000.
Reese, Thomas J.; Rayburn, David B.; and Cathers, William P., to PPG Industries, Inc. Method and apparatus to reduce tip curl of a glass sheet on a bending mold. 4,626,267, Cl. 65-106.000.
Reetz, Manfred T.; Ostarek, Ralph; and Piejko, Karl-Erwin, to Bayer Aktiengesellschaft. Process for the quasi-ionic polymerization of acrylic acid derivatives. 4,626,579, Cl. 526-194.000.
Regency Electronics, Inc.: *See—*
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Regtien, Paulus P. L., to Endress u. Hauser GmbH u. Co. Method and arrangement for measuring the contamination of a capacitive dew-point sensor. 4,626,774, Cl. 324-61.00R.
Reichart, Bruno; and Weinhold, Christian, to Weinhold, Christian. Heart valve bioprothesis. 4,626,255, Cl. 623-2.000.
Reid, Roger P. Filter cartridge. 4,626,350, Cl. 210-282.000.
Reinicke, Robert H., to Consolidated Controls Corporation. Implantable medication infusion device. 4,626,244, Cl. 604-141.000.
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Schulz, Guenter; Sauter, Hubert; Reissenweber, Gernot; and Ammermann, Eberhard, 4,626,544, Cl. 514-383.000.
Reiter, Eli; Robson, Joseph R.; and Latinski, Joseph W., to General Aero Products Corp. Stamp booklet dispenser mechanism. 4,625,893, Cl. 221-67.000.
Reitmeier, Glenn A., to RCA Corporation. Sampled data video signal chrominance/luminance separation system. 4,626,895, Cl. 358-31.000.
Rembold, David C., to Sunnen Products Company. Spot facer and boring head having replaceable carbide cutters. 4,626,143, Cl. 408-82.000.
Remes, Peter: *See—*
Kasa, Zoltan; Agoston, Mihaly; Bognar, Laszlo ; Hideg, Janos; Remes, Peter; and Hiros, Laszlo , 4,625,732, Cl. 128-670.000.
Rempfler, Hermann, to Ciba-Geigy Corporation. Certain 5-(pyridyl-2'-oxy)-2-nitrobenzoic acid ester derivatives herbicidal compositions containing same and their herbicidal use. 4,626,275, Cl. 71-94.000.
Remy, David C.: *See—*
King, Stella W.; and Remy, David C., 4,626,542, Cl. 514-325.000.
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Renggli, Werner; and Kung, Daniel, to Widmer, Urs. Apparatus for adjusting the head or foot section of the resting surface of a bed. 4,625,348, Cl. 5-71.000.
Renninger, Siegfried, to U.S. Philips Corporation. Method of and circuit arrangement for supplying interrupt request signals. 4,626,987, Cl. 364-200.000.
Rennison, Stuart C.: *See—*
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Reubke, Karl-Julius: *See—*
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REXA Corporation: *See—*
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Rexroth, Frederick W.: *See—*
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Reynolds, Desmond H. J., to Lucas Industries Public Limited Company. Vehicle hydraulic systems. 4,625,625, Cl. 91-378.000.
Rheinmetall GmbH: *See—*
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Riback, Richard; and Geneve, Francois, to Expert Corporation. Float switch cable clamp. 4,626,175, Cl. 417-40.000.
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Rice, Edward J., to Acrian, Inc. Method of fabricating mesa MOSFET using overhang mask and resulting structure. 4,625,388, Cl. 29-571.000.

Rich Products Corporation: *See—*
O'Mahony, John S.; Kahn, Marvin L.; and Adapa, Satya N., 4,626,434, Cl. 426-50.000.
Richard, Alexandra A. C., heir: *See—*
Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, 4,626,088, Cl. 351-204.000.
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Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, 4,626,088, Cl. 351-204.000.
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Richard, Jacques M. G., heir: *See—*
Joncour, Christian; Pierre, Alain; Renan, Patrice; Roumegoux, Jean-Louis; Richard, Francoise, deceased; Richard, Jacques M. G., heir; Richard, Alexandra A. C., heir; and Richard, Anne-Lise P. M., heir, 4,626,088, Cl. 351-204.000.
Richard, Pierre, to Bouygues. Bridge with prefabricated sections and with external prestressing by cables. 4,625,354, Cl. 14-73.000.
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Wienecke, Horst G. P.; and Stock, Karl-Wilhelm, 4,626,427, Cl. 424-35.000.
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Rickert, Robert G.: *See—*
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Ricoh Company, Ltd.: *See—*
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Miyagawa, Seiichi; Ikeda, Itsuo; and Suzuki, Shigeru, 4,626,876, Cl. 346-160.000.
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Murai, Toshiharu; Jinnai, Koichiro; Ameyama, Minoru; and Umezawa, Michio, 4,626,874, Cl. 346-140.00R.
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Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, to Beringer-Hydraulik GmbH. Pilot operated relief valve. 4,625,756, Cl. 137-491.000.
Rieke Corporation: *See—*
Baughman, Gary M., 4,625,889, Cl. 220-288.000.
Riemer, Jed A.: *See—*
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Riesen, Peter, to Sulzer Brothers Limited. Guide device for a weft picking element and a method of making same. 4,625,769, Cl. 139-188.00R.
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Rine, Paul A. Apparatus for measuring the angle of a hole in a surface. 4,625,427, Cl. 33-534.000.
Risher, Ted H.; and Wolfe, Glenn F., to Harris Corporation. ECL terminator comprised of a plural resistor network. 4,626,804, Cl. 333-22.00R.
Rissmann, Heinz-Bernd: *See—*
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Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. High purity high surface area silicon nitride. 4,626,422, Cl. 423-344.000.
Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Surgical adhesive systems for hard body tissues. 4,626,310, Cl. 156-307.300.
Rittscher, Dieter: *See—*
Baatz, Henning; and Rittscher, Dieter, 4,626,380, Cl. 250-506.100.
Baatz, Henning; and Rittscher, Dieter, 4,626,402, Cl. 376-272.000.
Baatz, Henning; and Rittscher, Dieter, 4,626,414, Cl. 422-159.000.
Rivier, Jean E. F.: *See—*
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,626,523, Cl. 514-12.000.
Rivier, Jean-Jacques. Construction panel. 4,626,070, Cl. 350-260.000.
Robbins, Clarence R.; and Steltenkamp, Robert J., to Colgate-Palmolive Company. Conditioning of hair with amides of trialkylacetic acids. 4,626,429, Cl. 424-70.000.
Robbins, Robert J. Liquid sampling method and means. 4,625,574, Cl. 73-864.630.
Robert Bosch GmbH: *See—*
Hohlfeld, Rainer; Schwerin, Ralph; Kader, Hans; and Heymann, Andreas, 4,627,107, Cl. 455-11.000.
Leiber, Heinz, 4,625,824, Cl. 180-197.000.
Muller, Alfred, 4,625,590, Cl. 74-866.000.
Muller, Jurgen, 4,626,932, Cl. 360-33.100.
Robert-Grandpierre, Jean-Claude: *See—*
Bui, Ngoc C.; Gete, Henry; and Robert-Grandpierre, Jean-Claude, 4,626,760, Cl. 318-696.000.
Robertshaw Controls Company: *See—*
Geary, Frederick J., 4,626,192, Cl. 431-46.000.
Otto, James A.; and Weaver, Marvin P., 4,625,703, Cl. 123-574.000.
Robertson, David E.: *See—*
Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., 4,625,914, Cl. 239-206.000.
Robertson, Paul E. Trailer structure for transporting sheet glass and frangible material. 4,626,017, Cl. 296-3.000.
Robotic Systems Limited: *See—*
Pigott, Norman B., 4,625,836, Cl. 188-67.000.
Robson, Joseph R.: *See—*
Reiter, Eli; Robson, Joseph R.; and Latinski, Joseph W., 4,625,893, Cl. 221-67.000.
Rocchelli, Gianpaolo. Device for dispensing liquid soap. 4,625,896, Cl. 222-180.000.
Rocco, Ajello. Selfinflating life preserver. 4,626,221, Cl. 441-108.000.
Rocco, Barbara B.: *See—*
Valente, Peter; Rocco, Matthew A.; and Rocco, Barbara B., 4,625,404, Cl. 30-114.000.
Rocco, Matthew A.: *See—*
Valente, Peter; Rocco, Matthew A.; and Rocco, Barbara B., 4,625,404, Cl. 30-114.000.
Roche, Joseph R., to Hydril Company. Marine riser well control method and apparatus. 4,626,135, Cl. 405-195.000.
Rockwell International Corporation: *See—*
Head, Manley J.; Smith, William C.; and Pepmiller, Paul E., 4,627,071, Cl. 375-10.000.
Pitroda, Satyan G.; Mehta, Bakulesh A.; and Fechalos, William A., 4,627,047, Cl. 370-58.000.
Rockwood, Robert E.: *See—*
Azibert, Henri V.; and Rockwood, Robert E., 4,625,977, Cl. 277-82.000.
Rode, Melvin A.: *See—*
Gunda, Rajamouli; and Rode, Melvin A., 4,625,622, Cl. 91-36.000.
Rodgers, Harvey B., Jr. Deer stand. 4,625,831, Cl. 182-116.000.
Roehm GmbH Chemische Fabrik: *See—*
Vetter, Eng H.; and Schanz, Karl-Heinrich, 4,626,398, Cl. 264-566.000.
Roemer, Leonhard J., Jr. Quick releasable connector for multiple bait fishing. 4,625,450, Cl. 43-43.120.
Roes, Christian: *See—*
Giesche, Ernst; Jung, Eggert; Meintz, Helma; and Roes, Christian, 4,626,903, Cl. 358-80.000.
Rogers Corporation: *See—*
Lockard, Steven C.; Hyslop, Michael S.; and Hernandez, Jorge M., 4,626,958, Cl. 361-306.000.
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Rogers, Robert S.: *See—*
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Rohsner, John D.: *See—*
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Rojey, Alexandre: *See—*
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Roling, Franz: *See—*
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.
Rolli, Jacques: *See—*
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Rolls-Royce plc: *See—*
Meetham, Geoffrey W.; Goulette, Michael J.; and Arthey, Roger P., 4,626,297, Cl. 148-404.000.
Rolm Corporation: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.
Roney, Lois Y. Body cooling cuff. 4,625,729, Cl. 128-402.000.
Rope, Eugene L.: *See—*
Tricoles, Gus P.; and Rope, Eugene L., 4,626,860, Cl. 342-442.000.
Rosar, George C.; and Wilson, James R., to E. F. Johnson Company. RF isolation switch. 4,626,806, Cl. 333-104.000.
Rose, Jochen: *See—*
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Rose, Leroy: *See—*
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Rosemount Inc.: *See—*
Olson, Gene H.; and Quy, Dennis A., 4,627,045, Cl. 370-16.000.
Rosenberg, Harvey. Diet management device. 4,625,675, Cl. 116-324.000.

Rosenstatter, Otto: *See—*
Malata, Peter; and Rosenstatter, Otto, 4,626,210, Cl. 433-29.000.
Rosenthal, Robert D., to Trebor Industries, Inc. Optical quantitative analysis using curvilinear interpolation. 4,627,008, Cl. 364-550.000.
Rosenwinkel, Donald A.: *See—*
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Rosl, Wolfgang: *See—*
Oesterle, Hermann F.; Rosl, Wolfgang; and Rose, Jochen, 4,626,699, Cl. 307-106.000.
Roth, Martin; Muller, Beat; Berger, Joseph; and Loew, Peter, to Ciba-Geigy AG. Process for the production of colored photographic polymer images. 4,626,497, Cl. 430-293.000.
Roth, Nancy L., to Top of the Line Nail Tips, Inc. Fingernail tip device. 4,625,740, Cl. 132-73.000.
Rothchild, Ronald D. Method and apparatus for expanding tobacco with water. 4,625,736, Cl. 131-296.000.
Rotpunkt Dr. Anso Zimmermann: *See—*
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Rouille, Claude: *See—*
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Rouse, David G., to Marconi Company Limited, The. Radar, sonar and similar systems. 4,626,855, Cl. 342-201.000.
Rowlette, John J., to California Institute of Technology. Battery plate containing filler with conductive coating. 4,625,395, Cl. 29-623.400.
Rubens, Louis C., to Dow Chemical Company, The. Oven having cavities of varying temperature. 4,626,660, Cl. 219-385.000.
Ruehl, William E.; and Swick, E. Grant, to Illinois Tool Works, Inc. In-line switched telephone line tester. 4,626,633, Cl. 379-27.000.
Ruger, William B., to Sturm, Ruger & Company, Inc. Grips for handguns. 4,625,445, Cl. 42-71.020.
Rule, Wilbur E.: *See—*
Shiner, James R.; and Rule, Wilbur E., 4,626,213, Cl. 433-173.000.
Rumble, Clive S. Electrical connectors. 4,626,052, Cl. 339-31.00M.
Rupnik, David W.: *See—*
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Rushing, William C.: *See—*
Peterson, Phillip R.; and Rushing, William C., 4,625,473, Cl. 52-98.000.
Russell, James L. L., to British Aerospace PLC. Projectiles. 4,625,649, Cl. 102-377.000.
Russell, Leonard E.: *See—*
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Russnak, Clarence J.: *See—*
Pitalo, Stephen K.; Russnak, Clarence J.; and Anderson, Wallace M., 4,626,685, Cl. 250-341.000.
Rutherford, Jerry, to Rutherford Scientific. Acoustical imaging system. 4,625,557, Cl. 73-635.000.
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Ryan, Allan: *See—*
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Ryan, James M.; and Alie, Enrique, to Falcon Jet Corporation. Airplane seat. 4,625,934, Cl. 244-122.00R.
Ryan, John O., to Macrovision. Method and apparatus for removing phase modulation from the color burst. 4,626,890, Cl. 358-19.000.
Rye, Glen. Container for electrical outlets. 4,626,617, Cl. 174-53.000.
Ryobi Ltd.: *See—*
Murakami, Hideo, 4,625,932, Cl. 242-84.51A.
Ryschka, Martin; Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl-Friedrich, to Dragerwerk Aktiengesellschaft. Receiving arrangement for filling an anaesthetic fluid. 4,625,779, Cl. 141-311.00R.
Ryu, Toshihiko; and Mizoguchi, Shoichi, to NEC Corporation. Equalizer modifying a phase of a gain control signal to carry out equalization. 4,627,072, Cl. 375-14.000.
S. C. Johnson & Son, Inc.: *See—*
McHenry, William E., 4,626,528, Cl. 514-119.000.
S. Soga & Co.: *See—*
Kiryu, Yuichi, 4,625,582, Cl. 74-640.000.
Saburo, Numata, to Fuji Photo Optical Co., Ltd. Electronic discharge tube and electronic light emitter using it. 4,626,744, Cl. 315-57.000.
Sackett, Robert R. Electronic inclination gauge. 4,625,423, Cl. 33-366.000.
Sadler, Wanda H.; Milligan, John; and Parks, Jerry W., to Pep Rally Paint, Inc. Non-permanent ornamental paint mixture. 4,626,559, Cl. 523-122.000.
Sadoya, Hisayoshi, to TDK Corporation. Piezoelectric gas-lighter. 4,626,731, Cl. 310-339.000.
Saeki, Satoshi: *See—*
Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., 4,626,485, Cl. 430-59.000.
Saelzer, Heinrich. Security window or door. 4,625,659, Cl. 109-49.500.
Safeway Products, Inc.: *See—*
Drapeau, Donald F., 4,626,819, Cl. 337-323.000.
Sagara, Takehiko; Suzuki, Hiroya; and Ohtsuka, Iwao, to Hitachi Metals, Ltd. Head for wire dot printer. 4,626,116, Cl. 400-124.000.
Saigusa, Kyuji, to Sankyorikagaku Kabushiki-Kaisha. Polishing wheel. 4,625,466, Cl. 51-403.000.
Saiji, Mitsuhiro: *See—*
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Saint Julian, Raymond M.; Gehant, Philippe M.; Bertrand, Ivan G.; and Folliet, Michel H., to Societe des Ciments Francais. High-temperature hot-air generator. 4,626,204, Cl. 432-222.000.
Saita, Kenji: *See—*
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Saito, Syuichiro, to Canon Kabushiki Kaisha. Shutter time switching device for rotary shutter. 4,626,094, Cl. 354-456.000.
Saito, Teruo; and Hieda, Kazuo, to Sumitomo Chemical Company, Ltd. Aromatic polysulfone resin composition. 4,626,564, Cl. 524-413.000.
Saitoh, Hiroyuki, to Fuji Xerox Co., Ltd. Picture signal discriminating circuit. 4,626,922, Cl. 358-282.000.
Saji, Keiichi: *See—*
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Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Photographic image receiving elements for silver salt diffusion transfer processes. 4,626,495, Cl. 430-232.000.
Sakai, Shigenori: *See—*
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Sakamoto, Hidesato, to Furnace Juko Kabushiki Kaisha. Furnace. 4,626,203, Cl. 432-138.000.
Sakamoto, Koji; Kaneko, Toshio; Kanno, Fuchio; and Yasuda, Wataru, to Ricoh Company, Ltd. Developing device. 4,625,676, Cl. 118-657.000.
Sakata, Masashi: *See—*
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Sakata, Tsuguhide, to Canon Kabushiki Kaisha. Phase locked loop providing three-level control signal to VCO. 4,626,797, Cl. 331-1.00A.
Sakata, Yoshiya: *See—*
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Salk Institute for Biological Studies, The: *See—*
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Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,626,523, Cl. 514-12.000.
Samples, Billy G.; Newton, Ralph L.; and Kaufman, Steven A., to Siemens Energy & Automation, Inc. Operating system for remote electrical equipment. 4,626,638, Cl. 200-331.000.
Samuels, George J.; and Garman, Joseph M., to Allied Corporation. Baths for the electrolytic deposition of nickel-indium alloys on printed circuit boards. 4,626,324, Cl. 204-43.100.
Sanden Corporation: *See—*
Terauchi, Kiyoshi, 4,626,179, Cl. 418-55.000.
Sanders, Gary G., to Scott & Fetzer Company, The. Capacitive digital integrated circuit pressure transducer. 4,625,560, Cl. 73-718.000.
Sanders, Robert E., Jr., to Aluminum Company of America. Lightweight armor plate and method. 4,626,294, Cl. 148-11.50A.
Sanderson, John R.: *See—*
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Sankyo Manufacturing Company Ltd.: *See—*
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Sano, Masafumi: *See—*
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Sano, Tetsu; Anno, Hidero; and Kume, Yuichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Image intensifier. 4,626,694, Cl. 250-483.100.
Sanshin Kogyo Kabushiki Kaisha: *See—*
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Sansui Electric Co., Ltd.: *See—*
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Sanyo Electric Co., Ltd.: *See—*
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Saphymo-Stel: *See—*
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Sapitowicz, Thomas P.; and MacLean-Blevins, Mark T., to General Instrument Corporation. Document processing apparatus. 4,626,672, Cl. 235-480.000.

Sargeant, John E.: *See—*
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Sarrasin, Denis: *See—*
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Sartorius GmbH: *See—*
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Sasagawa, Masaru: *See—*
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Sasaki, Fujio, to Kioritz Corporation. Carburetor chamber cover device. 4,626,266, Cl. 55-385.00R.

Sasaki, Hiroaki: *See—*
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Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, to Sumitomo Precision Products Co., Ltd. Method of producing aluminum alloy structures. 4,626,295, Cl. 148-127.000.

Sasaki, Satoshi: *See—*
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Sasaki, Takayuki; and Ichimura, Eiichi, to Sony Corporation. Digital data recovery circuit. 4,626,911, Cl. 358-141.000.

Sasaki, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and method for manufacturing the same. 4,625,391, Cl. 29-589.000.

Sasame, Hiroshi: *See—*
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Satake, Toshihiko, to Satake Engineering Co., Ltd. Automatic background brightness control device for color sorting apparatus. 4,625,871, Cl. 209-549.000.

Sato, Isao: *See—*
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Sato, Kozo; Kitaguchi, Hiroshi; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable photographic light-sensitive material. 4,626,500, Cl. 430-617.000.

Sato, Kuniaki; Muto, Shinichiro; and Wako, Noriaki, to Kawasaki Steel Corporation; and Nippon Furnace Kogyo Kaisha, Ltd. Low load burning burner. 4,626,195, Cl. 431-188.000.

Sato, Kyosaku; Liu, Richard W.; and Cheung, Seung-Tong, to Polysar Limited. Vibration and noise insulating rubber compositions. 4,626,568, Cl. 524-526.000.

Sato, Masanori; Nagahara, Shusaku; and Takahashi, Kenji, to Hitachi, Ltd. Optical filter for color imaging device. 4,626,897, Cl. 358-44.000.

Sato, Mituo: *See—*
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Sato, Takeshi; Uenishi, Akira; Yasugahira, Norio; and Hisano, Katsukuni, to Hitachi, Ltd. Turbine blade. 4,626,174, Cl. 416-223.00A.

Sato, Teiji: *See—*
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Sato, Tsutomu, to Ricoh Co., Ltd. Optical information recording medium. 4,626,496, Cl. 430-270.000.

Sato, Yoichi: *See—*
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Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,626,561, Cl. 523-318.000.

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Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, to Warner-Lambert Company. 3-aryl-3-pyrroline derivatives. 4,626,546, Cl. 514-429.000.

Saukkonen, Harri: *See—*
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Saurenman, Donald G., to Consan Pacific Incorporated. Static neutralization employing non-corroding ion dispensing tips. 4,626,917, Cl. 361-216.000.

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Schulz, Guenter; Sauter, Hubert; Reissenweber, Gernot; and Ammermann, Eberhard, 4,626,544, Cl. 514-383.000.

Sawada, Shigetomo; and Hinobayashi, Takeo, to Fujitsu Limited. Method and apparatus for suppressing the evaporation of lubricant film coated on magnetic disks of a disk storage. 4,626,941, Cl. 360-97.000.

Sayano, Akio: *See—*
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Sayegh, Georges: *See—*
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Saynajakangas, Seppo. Procedure and means for telemetric measuring of heartbeat and ECG signal, using a magnetic proximity field. 4,625,733, Cl. 128-687.000.

Scannell, James D., to Lamb Technicon Corp. Machine loader. 4,626,159, Cl. 414-112.000.

Schaltegger, Herbert E. High speed container placement apparatus. 4,625,775, Cl. 141-83.000.

Schan, Edward P., Jr.: *See—*
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Schanz, Karl-Heinrich: *See—*
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Scharf, Gerhard: *See—*
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Schaudt Maschinenbau GmbH: *See—*
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Schaus, John M., to Eli Lilly and Company. Trans-dl-1-alkyl-6-alkoxy-1,2,3,4,4a,5,8,8a octa-hydroquinolines. 4,626,591, Cl. 546-165.000.

Schedewie, Franz, to International Business Machines Corporation. Method and apparatus for mutually aligning objects. 4,626,907, Cl. 358-101.000.

Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., to GTE Products Corporation. Recovery of tungsten from ammoniacal solutions. 4,626,425, Cl. 423-593.000.

Scheitlin, George E.; Sickels, Mark A.; and Usleman, Robert T., to Arvin Industries, Inc. Exhaust processor. 4,625,511, Cl. 60-299.000.

Scheller, Gregg D., to Storz Instrument Company. Ophthalmic cassette. 4,626,248, Cl. 604-319.000.

Scherer, Kirby V., Jr.; Ono, Taizo; and Yamanouchi, Kouichi, to Green Cross Corporation. Persistent perfluoroalkyl free radicals useful as polymerization catalyst. 4,626,608, Cl. 570-134.000.

Schering Aktiengesellschaft: *See—*
Elger, Walter; and Beier, Sybille, 4,626,531, Cl. 514-171.000.

Scheurl, Robert: *See—*
Bodecker, Kay; Goth, Walter; Scheurl, Robert; and Strasser, Hans-Erwin, 4,626,786, Cl. 324-449.000.

Schick, David L.; Schumann, Gary M.; and Dolejs, Charles A., to UOP Inc. Disc-axial multiport valve. 4,625,763, Cl. 137-625.150.

Schiel, Christian; Flumig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, to J. M. Voith GmbH. Press roll for web material with clamped press jacket. 4,625,376, Cl. 29-119.000.

Schlaich, Robert. Circuit arrangement for checking liquid food for contaminants. 4,626,833, Cl. 340-540.000.

Schleffendorf, John J. Weight guide for exercising machine. 4,625,959, Cl. 272-118.000.

Schlosser, Donald E.: *See—*
McKee, Jere L.; Stephenson, William I.; and Schlosser, Donald E., 4,626,811, Cl. 335-46.000.

Schmerda, Richard F.: *See—*
Damiano, Michael A.; Gass, Dale L.; Kramer, Dennis M.; and Schmerda, Richard F., 4,626,954, Cl. 361-96.000.

Schmid, Eckhardt: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.

Schmid Laboratories, Inc.: *See—*
Lubbs, Eugene K., 4,626,286, Cl. 106-157.000.

Schmid, Steven L.; Fickle, J. Clark; and Hill, Keith E., to Deere & Company. Vibration isolating mountings for push-pull cables coupled to vibrating control arms. 4,625,826, Cl. 180-315.000.

Schmidt, Alfred; and Pottig, Wolfram, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method and arrangement for the functional testing of computers. 4,627,057, Cl. 371-25.000.

Schmidt, Delf: *See—*
Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, 4,626,525, Cl. 514-18.000.

Schmidt, Horst, to Ernst Leitz Wetzlar GmbH. Panoramic view apparatus. 4,626,905, Cl. 358-87.000.

Schmidt, Jurg: *See—*
Ulmann, Philippe; and Schmidt, Jurg, 4,626,973, Cl. 362-277.000.

Schmidt, Rainer: *See—*
Pav, Josef; Wenzel, Reinhard; Schmidt, Rainer; Svenka, Peter; and Rauf, Richard, 4,625,637, Cl. 100-47.000.

Schmidt, Robert R.: *See—*
Hausmann, Heinz; Schmidt, Robert R.; and Voege, Herbert, 4,626,274, Cl. 71-93.000.

Schmidt, Sabine; Kleihschmit, Peter; and Schwarz, Rudolf, to Degussa Aktiengesellschaft. Aqueous suspension of bentonite and its use for coating thermal insulating plates. 4,626,466, Cl. 428-247.000.

Schmidt, Wilfried, to General Motors Corporation. Fuel tank ventilating system, 4,625,777, Cl. 141-286.000.

Schmiegel, Klaus K.: *See—*
Molloy, Bryan B.; and Schmiegel, Klaus K., 4,626,549, Cl. 514-651.000.

Schmitt-Landsiedel, Doris; and Dorda, Gerhard, to Siemens Aktiengesellschaft. Static storage cell. 4,626,887, Cl. 357-43.000.

Schmotzer, Norman H. Wood drill and method of construction. 4,625,593, Cl. 76-108.00T.

Schneider, Barry L., to Hollister Incorporated. Male urinary collection system and external catheter therefor. 4,626,250, Cl. 604-352.000.

Schniter, Jorg, to R. R. Donnelley & Sons. Signature inserter. 4,625,952, Cl. 270-54.000.

Schobinger, Ulrich; Waldvogel, Robert; and Durr, Peter, to Schweizerische Eidgenossenschaft. Method for the preparation of alcohol-free wine. 4,626,437, Cl. 426-387.000.

Scholl, Wolfgang: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.

Schols, Gustaaf, to International Standard Electric Corporation. Method of making a high voltage DMOS transistor. 4,626,293, Cl. 148-1.500.

Scholz, Donald T. Electronic audio signal processor. 4,627,094, Cl. 38-61.000.

Scholz, Joachim. Force-controlled pressure regulating valve. 4,625,750, Cl. 137-116.500.

Schonberg, Michael. Improving poultry egg production. 4,625,728, Cl. 128-395.000.

Schoop, Gunther-Dietmar: *See—*
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.

Schrock, Wilfried: *See—*
Angerbauer, Rolf; Bober, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.

Schuessler, Richard C., to Gulton Industries, Inc. Thermal print head wear bar. 4,626,871, Cl. 346-76.0PH.

Schulte-Elte, Karl-Heinrich, to Firmenich SA. Process for the preparation of an isomeric mixture of 1-(2,6,6-trimethylcyclohexyl)-hexane-3-ol. 4,626,381, Cl. 252-522.00R.

Schulte-Elte, Karl-Heinrich; and Pamingle, Herve , to Firmenich SA. Aliphatic alcohols, their preparation and use of same as perfuming ingredients. 4,626,602, Cl. 568-822.000.

Schulte, Thomas L. Treatment of eye inflammation with biphenamine. 4,626,530, Cl. 514-166.000.

Schultz, Pamela J. Illuminated surgical tray apparatus. 4,626,971, Cl. 362-154.000.

Schulz, Donald N.: *See—*
Kowalik, Ralph M.; Duvdevani, Ilan; Kitano, Kissho; and Schulz, Donald N., 4,625,745, Cl. 137-13.000.

Schulz, Guenter; Sauter, Hubert; Reissenweber, Gernot; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Azole compounds and fungicides containing these compounds. 4,626,544, Cl. 514-383.000.

Schulze-Berge, Klaus: *See—*
Hack, Joachim; Schulze-Berge, Klaus; and Birkenmeier, Klaus, 4,626,944, Cl. 360-106.000.

Schumann, Gary M.: *See—*
Schick, David L.; Schumann, Gary M.; and Dolejs, Charles A., 4,625,763, Cl. 137-625.150.

Schurter, Rolf: *See—*
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Schwab, Kurt: *See—*
Swarovski, Daniel; and Schwab, Kurt, 4,626,080, Cl. 350-569.000.

Schwartzkopff, Ursula: *See—*
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.

Schwarz, Rudolf, to Staeubli Ltd. Key coupling for a rotation dobby. 4,625,767, Cl. 139-76.000.

Schwarz, Rudolf: *See—*
Schmidt, Sabine; Kleihschmit, Peter; and Schwarz, Rudolf, 4,626,466, Cl. 428-247.000.

Schweizerische Eidgenossenschaft: *See—*
Schobinger, Ulrich; Waldvogel, Robert; and Durr, Peter, 4,626,437, Cl. 426-387.000.

Schwerin, Ralph: *See—*
Hohlfeld, Rainer; Schwerin, Ralph; Kader, Hans; and Heymann, Andreas, 4,627,107, Cl. 455-11.000.

Sciaky, Mario: *See—*
Cazes, Roland; and Sayegh, Georges, 4,626,653, Cl. 219-121.0LC.

Sciaky, S.A.: *See—*
Cazes, Roland; and Sayegh, Georges, 4,626,653, Cl. 219-121.0LC.

Scott & Fetzer Company, The: *See—*
Sanders, Gary G., 4,625,560, Cl. 73-718.000.

Sealright Co., Inc.: *See—*
Parsons, Jack D., 4,625,498, Cl. 53-526.000.

Sebestyen, Bela: *See—*
Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl. 299-16.000.

Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., to Great Lakes Carbon Corporation. Anode assembly for molten salt electrolysis. 4,626,333, Cl. 204-286.000.

Sedillo, Lawrence: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence; and Newlove, John C., 4,626,285, Cl. 106-90.000.

Sedlak, Matthew: *See—*
Carter, Donald R., Sr.; Krauss, Timothy A.; and Sedlak, Matthew, 4,626,171, Cl. 416-90.00A.

Seewer AG: *See—*
Morgenthaler, Eugen; and Rolli, Jacques, 4,626,188, Cl. 425-145.000.

Segoshi, Touru, to Nissan Motor Co., Ltd. Auxiliary lamp arrangement for automotive vehicle or the like. 4,626,967, Cl. 362-61.000.

Sei, Hisasuke: *See—*
Mizumura, Motoo; and Sei, Hisasuke, 4,626,809, Cl. 333-202.000.

Seibert, Wolfram: *See—*
Belart, Juan; Fennel, Helmut; Seibert, Wolfram; and Batistic, Ivica, 4,626,043, Cl. 303-114.000.

Seibt, Gunter: *See—*
Bohme, Klaus; Seibt, Gunter; and Sieber, Klaus, 4,626,059, Cl. 339-143.00C.

Seki, Masaki: *See—*
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,627,003, Cl. 364-520.000.

Sekigami, Kazuo: *See—*
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, 4,626,180, Cl. 418-63.000.

Sekiguchi, Katsumi: *See—*
Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, 4,626,565, Cl. 524-423.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Shirai, Hideharu; and Nakahara, Yoshifumi, 4,626,183, Cl. 425-68.000.

Sekiya, Shinji, to Disco Co., Ltd. Wafer attracting and fixing device. 4,625,463, Cl. 51-216.00R.

Seldes, Michael B.: *See—*
Lee, Henry E.; and Seldes, Michael B., 4,626,853, Cl. 342-132.000.

Selick, Barbara: *See—*
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Selman, John J.: *See—*
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Sencorp: *See—*
Becht, Carl T., 4,625,903, Cl. 227-131.000.

Senft, Stephen P.: *See—*
Morris, Merle E.; and Senft, Stephen P., 4,626,735, Cl. 313-275.000.

Seng, Stephen, to Owens-Corning Fiberglas Corporation. Rotary distributor. 4,625,920, Cl. 239-651.000.

Senno, Ricardo G.; and de Toledo, Pamela. Universal triangle. 4,625,425, Cl. 33-477.000.

Senyard, Corley P., Jr.: *See—*
Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; and Senyard, Thomas J., 4,626,360, Cl. 210-799.000.

Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; and Senyard, Thomas J. Apparatus for separating sand and oil from a waste water stream. 4,626,360, Cl. 210-799.000.

Senyard, Thomas J.: *See—*
Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; and Senyard, Thomas J., 4,626,360, Cl. 210-799.000.

Seppala, Lynn G.: *See—*
Johnson, Steve A.; and Seppala, Lynn G., 4,627,068, Cl. 372-101.000.

Sepponen, Raimo, to Instrumentarium Oy. NMR imaging device. 4,626,784, Cl. 324-309.000.

Serby, Peter H.: *See—*
Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., 4,626,157, Cl. 413-1.000.

Server, Alfred, to General Hospital Corporation, The. Antiviral peptides. 4,626,524, Cl. 514-13.000.

Sevcik, Ladislav; and Svaty, Vladimir, to Elitex, koncern textilniho strojirenstvi. Apparatus for inserting two weft threads into two warp sheds in a loom with central jet insertion. 4,625,771, Cl. 139-435.000.

Sevenstrand Tackle Corporation: *See—*
Buchanan, Beverly J., 4,625,447, Cl. 43-17.100.

Sexton, Timothy C.; Lockwood, George H.; Robertson, David E.; Mason, Joseph D.; Mattson, Mark J.; and Patterson, Robert W., to Rain Bird Consumer Products Mfg. Corp. Rotary drive sprinkler. 4,625,914, Cl. 239-206.000.

Seya, Atsumi: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Shah, Dhiren N.; Domet, Jack; and Hammer, Gregory V., to Merrell Dow Pharmaceuticals Inc. Process for preparing sucrose encrusted methylcellulose particles for use in bulk laxative compositions. 4,626,287, Cl. 106-197.100.

Shanks, Ian A.: *See—*
Glasper, John L.; and Shanks, Ian A., 4,626,840, Cl. 340-752.000.

Shannon, John M., to U.S. Philips Corporation. Optically-sensitive semiconductor devices. 4,626,884, Cl. 357-30.000.

Sharir, Benjamin: *See—*
Krichevsky, Mendel; Rabinovici, Raul; and Sharir, Benjamin, 4,626,815, Cl. 336-5.000.

Sharp Kabushiki Kaisha: *See—*
Arai, Nobushige, 4,625,711, Cl. 126-450.000.
Hashimoto, Shintaro; and Saiji, Mitsuhiro, 4,627,023, Cl. 364-900.000.
Hashimoto, Shintaro; and Yoshida, Hideo, 4,627,093, Cl. 381-51.000.
Komai, Kensaku; and Shiono, Fusahiro, 4,626,990, Cl. 364-405.000.
Kotani, Matahira; Matsumoto, Masafumi; and Shirakoshi, Hiroshi, 4,626,873, Cl. 346-139.00R.

Tateda, Koichi, 4,626,663, Cl. 219-504.000.
Yamamoto, Yoichi; and Mori, Yuichirou, 4,626,870, Cl. 346-76.0PH.
Shea, William S.: *See—*
Knight, Edwin L.; and Shea, William S., 4,626,299, Cl. 156-71.000.
Shedigian, Vandos; and Voyles, Gerald A., to Emhart Industries, Inc. Dielectric fluid for metallized capacitors. 4,626,959, Cl. 361-315.000.
Sheikholeslami, Amir: *See—*
Nienaber, David K.; and Sheikholeslami, Amir, 4,626,835, Cl. 340-703.000.
Sheinberg, Haskell, to United States of America, Energy. Hard metal composition. 4,626,281, Cl. 75-238.000.
Shell Oil Company: *See—*
Fort, William C., III, 4,626,665, Cl. 219-534.000.
Hagiwara, Teruhiko, 4,626,785, Cl. 324-339.000.
Hi-Hwa Yuan, Herbert; Swanson, Benjamin F.; and Stapleton, Robert G., 4,625,544, Cl. 73-38.000.
Kollmeyer, Willy D., 4,626,543, Cl. 514-365.000.
Shell Western E&P Inc.: *See—*
Walhaug, Warren W.; and Moore, Boyd B., 4,625,803, Cl. 166-310.000.
Shelton, Kerry B.: *See—*
King, James L.; and Shelton, Kerry B., 4,626,726, Cl. 310-91.000.
Shen, Albert. Surgical sponge. 4,626,251, Cl. 604-362.000.
Shepherd, Robin G.: *See—*
White, Alan C.; and Shepherd, Robin G., 4,626,522, Cl. 564-355.000.
Sheppard, Darrel J., Sr. Combustion engine. 4,625,509, Cl. 60-39.350.
Shepperd, Michael B.; and Blevins, Allan L., to Myriad Concepts, Inc. Binary data transmission method. 4,627,073, Cl. 375-20.000.
Sherlock, Paul; Brausen, Benjamin; and Klein, Phillip P., to Sherwood Medical Company. Urine meter and drainage bag combination. 4,625,734, Cl. 128-762.000.
Sherman, Guy J., to Sherman Laboratories, Inc. Soft contact lens wetting and preservation method. 4,626,292, Cl. 134-26.000.
Sherman Laboratories, Inc.: *See—*
Sherman, Guy J., 4,626,292, Cl. 134-26.000.
Sherwood Medical Company: *See—*
Sherlock, Paul; Brausen, Benjamin; and Klein, Phillip P., 4,625,734, Cl. 128-762.000.
Shiba, Haruo: *See—*
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,626,948, Cl. 360-132.000.
Shibahata, Yasuji: *See—*
Nakamura, Kenji; Shibahata, Yasuji; Fukunaga, Yukio; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,625,822, Cl. 180-140.000.
Shibamoto, Hiroshi: *See—*
Suzuki, Masane; Shibamoto, Hiroshi; and Kanaya, Motonori, 4,625,724, Cl. 128-303.100.
Shibata, Itaru: *See—*
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Shibata, Tadahiko: *See—*
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Shigematsu, Nana: *See—*
Tanaka, Tatsuo; Shigematsu, Nana; and Koshika, Kazushige, 4,626,795, Cl. 330-257.000.
Shigeta, Masanobu; Mizukami, Makoto; and Nishihara, Toshikazu, to Victor Company of Japan, Limited. Magnetic recording medium comprising a vacuum-deposited magnetic film of a magnetic material and a tungsten oxide and method for making the same. 4,626,480, Cl. 428-694.000.
Shihabi, David S., to Mobil Oil Corporation. Aromatic compound conversion. 4,626,609, Cl. 585-467.000.
Shiley Incorporated: *See—*
Edelman, William; and Baranowski, Michael, 4,626,240, Cl. 604-43.000.
Shimada, Yoshikatsu, to Nihon Shuno System Kabushiki Kaisha. Partition wall. 4,625,476, Cl. 52-126.400.
Shimakata, Masashi, to Pioneer Electronic Corporation. Communication apparatus for transmitting and receiving signals on different frequency bands. 4,627,099, Cl. 455-76.000.
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, to Japan Atomic Energy Research Institute; and Fuji Electric Co., Ltd. Gas cooled current lead for superconducting machine. 4,626,614, Cl. 174-15.00S.
Shimano Industrial Company Limited: *See—*
Morimoto, Shinichi, 4,625,446, Cl. 43-17.000.
Nagano, Masashi, 4,626,229, Cl. 474-80.000.
Shimizu, Akihiko: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,626,645, Cl. 219-69.00W.
Shimizu, Hideki: *See—*
Omura, Satoshi; and Shimizu, Hideki, 4,626,547, Cl. 514-450.000.
Shimizu, Hiroshi, to NEC. Loop network system controlled by a simple clock station. 4,627,051, Cl. 370-86.000.
Shimizu, Masayuki: *See—*
Noguchi, Fujio; Oguni, Yasuo; and Shimizu, Masayuki, 4,626,006, Cl. 285-158.000.
Shimizu, Yukiharu: *See—*
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; and Shimizu, Yukiharu, 4,626,590, Cl. 534-635.000.
Shimomura, Yasuo: *See—*
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, 4,626,758, Cl. 318-603.000.
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Shiner, James R.; and Rule, Wilbur E., to Shiner, James R. Dental appliance. 4,626,213, Cl. 433-173.000.
Shinohara, Yutaka: *See—*
Fukui, Hishao; Shinohara, Yutaka; and Tamura, Takashi, 4,626,120, Cl. 401-260.000.
Shinryo Air Conditioning Co., Ltd.: *See—*
Suzuki, Akira; Shioya, Yasumi; and Watanabe, Norio, 4,626,356, Cl. 210-705.000.
Shiokawa, Kozo; Goto, Toshio; Kamochi, Atsumi; Moriya, Koichi; and Kohama, Shigeo, to Nihon Tokushu Noyaku Seizo K.K. Herbicidal novel 2-alkoxyaminosulfonyl-benzene-sulfonylureas. 4,626,273, Cl. 71-92.000.
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, to Murata Kikai Kabushiki Kaisha. Unmanned transfer system for transferring works to machining tools. 4,626,160, Cl. 414-222.000.
Shiono, Fusahiro: *See—*
Komai, Kensaku; and Shiono, Fusahiro, 4,626,990, Cl. 364-405.000.
Shiota, Mitsushige: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.
Shiotsu, Osamu: *See—*
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Suzuki, Akira; Shioya, Yasumi; and Watanabe, Norio, 4,626,356, Cl. 210-705.000.
Shioya, Yoshimi; Maeda, Mamoru; Ohyama, Yasushi; and Takagi, Mikio, to Fujitsu Limited. Apparatus for plasma chemical vapor deposition. 4,625,678, Cl. 118-723.000.
Shirahata, Ryuji: *See—*
Kitamoto, Tatsuji; Amari, Hiroshi; Nahara, Akira; Shirahata, Ryuji; and Arai, Yoshihiro, 4,626,315, Cl. 156-628.000.
Shirai, Hideharu; and Nakahara, Yoshifumi, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Apparatus for producing thermoplastic resin foam. 4,626,183, Cl. 425-68.000.
Shirai, Toshio: *See—*
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Shiraishi, Motoatsu: *See—*
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.
Shirakawa, Hiroshi; and Imai, Shigeru, to Yoshida Kogyo K.K. Space forming method for slide fastener chain. 4,625,382, Cl. 29-408.000.
Shirakoshi, Hiroshi: *See—*
Kotani, Matahira; Matsumoto, Masafumi; and Shirakoshi, Hiroshi, 4,626,873, Cl. 346-139.00R.
Shivashankara, Belur N.; Miller, Wendell R.; and Stubbs, Gene W., to Boeing Company, The. Acoustic reflector for ground plane microphone. 4,625,828, Cl. 181-175.000.
Shmulovich, Joseph, to AT&T Bell Laboratories. Electron beam pumped mosaic array of light emitters. 4,626,739, Cl. 313-469.000.
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, to Teac Corporation. Power-saving data transfer apparatus with a flexible magnetic disk or the like. 4,626,942, Cl. 360-97.000.
Shoji, Yutaka: *See—*
Nishikawa, Junichi; and Shoji, Yutaka, 4,626,107, Cl. 368-276.000.
Shone, Michael F.; and Belt, Roger F., to Litton Systems, Inc. Two-step method of manufacturing compressed bismuth-containing garnet films of replicable low anisotropy field value. 4,625,390, Cl. 29-576.00B.
Shuto, Sadanobu; Hayashi, Yasuhiro; Fujita, Munehisa; and Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Color reversal photographic light-sensitive material. 4,626,498, Cl. 430-379.000.
Sick, Erwin, to Erwin Sick GmbH Optik-Elektronik. Optical thread breakage monitoring apparatus for tufting machines. 4,625,666, Cl. 112-273.000.
Sickels, Mark A.: *See—*
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Sieber, Klaus: *See—*
Bohme, Klaus; Seibt, Gunter; and Sieber, Klaus, 4,626,059, Cl. 339-143.00C.
Siegel, William J.: *See—*
Barkley, Vincent P.; and Siegel, William J., 4,626,205, Cl. 432-225.000.
Siegmeier, Rainer; Prescher, Gunter; and Maurer, Helmut, to Degussa Aktiengesellschaft. Process for the continuous production of vicinal diols. 4,626,603, Cl. 568-833.000.
Siemens Aktiengesellschaft: *See—*
Angerer, Klaus, 4,626,655, Cl. 219-121.0LC.
Blaschke, Felix, 4,626,761, Cl. 318-803.000.
Bronold, Josef, 4,627,059, Cl. 371-51.000.
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Daisenberger, Georg, 4,626,625, Cl. 379-137.000.
Fruhauf, Waldemar, 4,626,790, Cl. 329-101.000.

Markwitz, Wernhard; and Kaeser, Edward, 4,627,074, Cl. 375-2.100.
Musil, Gerhard, 4,626,766, Cl. 323-222.000.
Ninnemann, Peter; and Wollscheid, Dieter, 4,627,025, Cl. 364-900.000.
Nossek, Josef, 4,626,808, Cl. 333-173.000.
Patalong, Hubert; and Spenke, Eberhard, 4,626,703, Cl. 307-252.00G.
Schmitt-Landsiedel, Doris; and Dorda, Gerhard, 4,626,887, Cl. 357-43.000.
Storck, Eckhard; and Wolff, Ulrich, 4,626,102, Cl. 356-328.000.
Tihanyi, Jeno , 4,626,886, Cl. 357-34.000.
Trausch, Guenter E., 4,626,323, Cl. 204-15.000.
Voigt, Ulrich, 4,625,397, Cl. 29-739.000.
Siemens Energy & Automation, Inc.: *See—*
Samples, Billy G.; Newton, Ralph L.; and Kaufman, Steven A., 4,626,638, Cl. 200-331.000.
Siemens Medical Laboratories, Inc.: *See—*
Menor, George; Tayag, Rolando; and Tran, Duc, 4,627,089, Cl. 378-157.000.
Siemon Company, The: *See—*
Knickerbocker, Robert H., 4,626,057, Cl. 339-91.00R.
Silcox, William H., to Chevron Research Company. Subsea drilling and production system for use at a multiwell site. 4,625,806, Cl. 166-358.000.
Simek, Stephen W.: *See—*
Hlinsky, Emil J.; and Simek, Stephen W., 4,626,155, Cl. 410-82.000.
Simon, Pierre: *See—*
Economopoulos, Marios; and Simon, Pierre, 4,625,532, Cl. 72-201.000.
Simon, Reinhard: *See—*
Puhler, Alfred; and Simon, Reinhard, 4,626,504, Cl. 435-172.300.
Sims, John C. Proximity detection system. 4,626,849, Cl. 340-902.000.
Sine Products Company: *See—*
Hadden, Edward L., Sr., 4,625,936, Cl. 248-544.000.
Singh, Param I.; and de Sieyes, David C., to Applied Biomedical Corporation. Gravity-independent infusion system. 4,626,243, Cl. 604-141.000.
Sinko Kogyo Co., Ltd.: *See—*
Wada, Eiichi; Gahara, Motohiro; and Tsubakishita, Hiroaki, 4,625,565, Cl. 73-861.740.
Sinks, Rod G.: *See—*
Johnson, Howard W.; Duncan, Michael G.; Sinks, Rod G.; Edwards, John D.; Graham, Martin H.; Kasson, James M.; and Corbalis, Charles M., 4,627,050, Cl. 370-85.000.
Sirois, Ronald A. Speaker grill. 4,625,829, Cl. 181-175.000.
Sjobom, Axel H., to Sunds Defibrator Aktiebolag. Screw feeder. 4,625,859, Cl. 198-665.000.
SKF (U.K.) Limited: *See—*
Forknall, John P.; and Woodbridge, Keith W., 4,626,113, Cl. 384-530.000.
Skovdal, Jorgen; and Goeller, Loretta D., to Clairol Incorporated. Heated bristle curling brush. 4,625,738, Cl. 132-9.000.
SKW Trostberg Aktiengesellschaft: *See—*
Michaud, Horst; Raveling, Hermann; and von Seyerl, Joachim, 4,626,270, Cl. 71-28.000.
Slaghuis, Hermann; and Bender, Heinz G., to W. Schlafhorst & Co. Method and device for avoiding irregular or ribbon windings during the winding of cheeses or cross-wound bobbins. 4,625,929, Cl. 242-18.100.
Slater, Brian G., to British Petroleum Company. Grab sampler. 4,625,571, Cl. 73-863.840.
Slepetys, Richard A.: *See—*
Martins, Evon; and Slepetys, Richard A., 4,626,283, Cl. 106-14.240.
Sloan, William H.: *See—*
Morgan, Richard A.; and Sloan, William H., 4,626,587, Cl. 528-481.000.
Slotboom, Jan W.: *See—*
Pelgrom, Marcellinus J. M.; Harwig, Hendrik A.; and Slotboom, Jan W., 4,627,082, Cl. 377-60.000.
Pelgrom, Marcellinus J. M.; and Slotboom, Jan W., 4,627,083, Cl. 377-60.000.
Smith, Edmund H.: *See—*
Greaves, John; Wilson, Robert S.; and Smith, Edmund H., 4,626,992, Cl. 364-418.000.
Smith Engineering: *See—*
Smith, Jay, III; and Karr, Gerald S., 4,627,090, Cl. 381-34.000.
Smith, Jay, III; and Karr, Gerald S., to Smith Engineering. Audio frequency multiplication device. 4,627,090, Cl. 381-34.000.
Smith, John A.: *See—*
McLeod, John; Smith, John A.; and Leather, Russell A., 4,627,061, Cl. 372-29.000.
Smith, Lawrence E.: *See—*
Carnes, Mark T.; and Smith, Lawrence E., 4,626,977, Cl. 363-21.000.
Smith, Michael W.: *See—*
Casey, William R.; Loser, Robert P.; Smith, Michael W.; and Waibel, Terry J., 4,626,302, Cl. 156-133.000.
Smith, Ronald E., to Bourns, Inc. Miniature electronic device with improved housing attachment. 4,626,823, Cl. 338-199.000.
Smith, Ruslon J., to Equipment Technology Incorporated. Capacitor lead wire manufacture. 4,625,374, Cl. 29-25.420.
Smith, Steve. High-speed feedback circuit with ungrounded load. 4,626,768, Cl. 323-282.000.
Smith, Steven J.: *See—*
Clappier, Robert R.; and Smith, Steven J., 4,626,767, Cl. 323-280.000.
Smith, Ulys. Apparatus for capturing insects. 4,625,453, Cl. 43-139.000.
Smith, William A.: *See—*
Marquis, Edward T.; Keating, Kenneth P.; Sanderson, John R.; and Smith, William A., 4,626,596, Cl. 556-57.000.
Smith, William C.: *See—*
Head, Manley J.; Smith, William C.; and Pepmiller, Paul E., 4,627,071, Cl. 375-10.000.
Snellman, Donald L.; Pearson, Bernard A.; and Jacobs, John W., to Snellman, Donald L. Sheet feeder. 4,625,955, Cl. 271-10.000.
Snowden-Pencer, Inc.: *See—*
Davison, John A.; and Kellar, Robert J., 4,625,725, Cl. 128-304.000.
Snyder, David E.; and Gundel, Norman L., to Axelson, Inc. Relay valve. 4,625,764, Cl. 137-625.660.
Societe Anonyme des Ateliers Houqet Duesberg Bosson: *See—*
Beckers, Michel, 4,625,506, Cl. 57-413.000.
Societe Chimique de la Grande Pariosse, Azote et Produits Chimiques: *See—*
Jacquinot, Bernard; Quibel, Jacques; and Mari, Roger, 4,626,607, Cl. 568-948.000.
Societe des Ciments Francais: *See—*
Saint Julian, Raymond M.; Gehant, Philippe M.; Bertrand, Ivan G.; and Folliet, Michel H., 4,626,204, Cl. 432-222.000.
Societe Europeenne de Propulsion: *See—*
Habermann, Helmut; Brunet, Maurice; and Tassel, Andre , 4,626,754, Cl. 318-460.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Ladecky, Vilhelme, 4,625,805, Cl. 166-341.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,625,995, Cl. 280-723.000.
Luciano, Gerard; Poveda, Pierre; and Croiset, Pierre, 4,625,933, Cl. 242-99.000.
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,172, Cl. 416-134.00A.
Societe Nationale Industrielle et Aerospatiale: *See—*
Laures, Pierre, 4,625,647, Cl. 102-214.000.
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,626,173, Cl. 416-134.00A.
Sogabe, Masatoyo: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,626,725, Cl. 310-89.000.
Sole-Leris, Roger. Rigid clothing for card flats. 4,625,367, Cl. 10-113.000.
Soma, Masahiro; Atago, Takeshi; and Kido, Takayuki, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Electromagnetic fuel injection valve. 4,625,919, Cl. 239-585.000.
Someya, Shinzo: *See—*
Suzuki, Akinori; Isogai, Akira; Hyeon, Suong B.; Kikkawa, Takashi; and Someya, Shinzo, 4,626,277, Cl. 71-113.000.
Sonntag, Siegfried: *See—*
Maucher, Paul; Friedmann, Oswald; and Sonntag, Siegfried, 4,626,696, Cl. 290-38.00R.
Sony Corporation: *See—*
Fukuda, Shinichi; and Kojima, Yuichi, 4,626,826, Cl. 340-347.0DD.
Hara, Nobuyuki, 4,627,042, Cl. 369-77.100.
Hori, Takeshi; Higano, Yoshiharu; Shirai, Toshio; and Naganuma, Toru, 4,626,931, Cl. 360-16.000.
Murakami, Yoshikazu; Ito, Seigo; and Yamada, Toshiro, 4,626,800, Cl. 331-96.000.
Oniki, Saburo; Okada, Takashi; and Mogi, Takao, 4,626,909, Cl. 358-114.000.
Sasaki, Takayuki; and Ichimura, Eiichi, 4,626,911, Cl. 358-141.000.
Wilkinson, James H., 4,626,912, Cl. 358-141.000.
Sony/Tektronix Corporation: *See—*
Miki, Yasuhiko, 4,626,716, Cl. 307-590.000.
Sorensen, Ansgar C. H. Method and apparatus for the continuous psychrometric measurement of the concentration of a vaporous component in a gas. 4,625,550, Cl. 73-338.000.
Sozanski, Jean-Pierre: *See—*
Charlier, Jacques; Buys, Bruno; Sozanski, Jean-Pierre; Moschetto, Yves; Hache, Jean-Claude; and Francois, Pierre, 4,626,090, Cl. 351-226.000.
Spease, Arthur L., to Teleflex Incorporated. Capped core element terminal. 4,625,579, Cl. 74-501.00R.
Speciality Equipment Companies, Inc. Taylor Freezer Division: *See—*
Bradbury, George; and Bradbury, David (said David Bradbury assors. to), 4,625,525, Cl. 62-330.000.
Specialty Research, Inc.: *See—*
Johnson, Carl W., 4,625,552, Cl. 73-865.500.
Spector, George: *See—*
Burke, Joseph J.; and Spector, George, 4,625,883, Cl. 220-93.000.
Garrard, Burdette; and Spector, George, 4,625,360, Cl. 15-265.000.
Speer, Walter F., to RCA Corporation. Wave solderable RF shield member for a printed circuit board. 4,626,963, Cl. 361-424.000.
Spence, Scott L.: *See—*
Hayes, Thomas E.; Jamieson, J. Scott; and Spence, Scott L., 4,626,681, Cl. 250-231.00P.
Spencer, Henry B.; and Owen, Gwilym M., to National Research Development Corp. Vehicle monitoring device. 4,627,011, Cl. 364-566.000.
Spenke, Eberhard: *See—*
Patalong, Hubert; and Spenke, Eberhard, 4,626,703, Cl. 307-252.00G.

Spercel, Robert J. Tuning device. 4,625,614, Cl. 84-306.000.
Sperry Corporation: *See—*
Trost, John R.; and Zenk, Daniel K., 4,627,018, Cl. 364-900.000.
Spie-Batignolles: *See—*
Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , 4,626,306, Cl. 156-180.000.
Spies, Klaus. Drilling equipment, especially for use in underground mining. 4,625,815, Cl. 175-73.000.
Splittstoesser, Clair D., to Dixon Industries, Inc. Resilient rod coupling member and adjusting structure for friction drive mechanism. 4,625,586, Cl. 74-721.000.
Sprague Electric Company: *See—*
Field, Thomas L., 4,626,801, Cl. 331-111.000.
Square D Company: *See—*
McGuire, Thomas B., 4,626,980, Cl. 363-56.000.
Staal, Philip R.; Hughes, Richard C.; and Olsen, John H., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Low power digital bus. 4,627,076, Cl. 375-36.000.
Stack, Paul D., Jr., to Cooper Industries, Inc. Conductor unwrapping attachment for motor driven tool. 4,625,774, Cl. 140-123.000.
Stackman, Robert W.; and Rasoul, Husam A. A., to Celanese Corporation. Crosslinkable thermotropic polyesters derived from allylically substituted hydroxybenzoic acid and a process for preparing a shaped article of the polyesters. 4,626,584, Cl. 528-192.000.
Staedtler & Uhl.: *See—*
Egerer, Josef, 4,625,366, Cl. 19-97.000.
Staeubli Ltd.: *See—*
Schwarz, Rudolf, 4,625,767, Cl. 139-76.000.
Standard Manufacturing Company, Inc.: *See—*
Mankey, Harry S.; and Garner, Charles C., 4,625,944, Cl. 254-8.00R.
Standard Telephones and Cables, Public Limited Company: *See—*
Monk, Trevor K., 4,627,028, Cl. 365-72.000.
Standard Textile Co., Inc.: *See—*
Taylor, Jeffrey L., 4,626,311, Cl. 156-308.200.
Stanley Aviation Corporation: *See—*
Valentine, Gordon A.; and Gale, Edwin J., 4,625,999, Cl. 285-24.000.
Stansfield, Edward V., to Racal Research Limited. Direction finding systems. 4,626,859, Cl. 343-442.000.
Stapleford, Gary N.; and Osborne, Deane C., to Wang Laboratories, Inc. Editing voice data. 4,627,001, Cl. 364-513.500.
Stapleton, Robert G.: *See—*
Hi-Hwa Yuan, Herbert; Swanson, Benjamin F.; and Stapleton, Robert G., 4,625,544, Cl. 73-38.000.
Starling, LaFerne L. Ladies' resilient garment for smoothing arm flabbiness. 4,625,338, Cl. 2-106.000.
Stauffer Chemical Company: *See—*
Kim, Ki-Soo, 4,626,474, Cl. 428-416.000.
Stehning, Werner, to Gottfried Bischopp Bau Kompl. Gasreinigungs- und Wasseruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Scrubber for an apparatus for the desulfurization of flue gas. 4,626,264, Cl. 55-213.000.
Stein Associates, Inc.: *See—*
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.
Steinberger, Ned, to Steinberger Sound Corporation. Adjustable bridge and tuning unit for a stringed musical instrument. 4,625,613, Cl. 84-298.000.
Steinberger Sound Corporation: *See—*
Steinberger, Ned, 4,625,613, Cl. 84-298.000.
Steinbis, Fritz K.: *See—*
Kollross, Gunter; and Steinbis, Fritz K., 4,625,362, Cl. 17-33.000.
Steinbrecher, Wolfgang: *See—*
Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.
Steiner, Karl: *See—*
Schiel, Christian; Flumig, Hans; Grososman, Udo; Mullner, Josef; and Steiner, Karl, 4,625,376, Cl. 29-119.000.
Steinkraus, Keith H., to Cornell Research Foundation, Inc. Method for extending the viability of virulent *Bacillus popilliae*. 4,626,508, Cl. 435-242.000.
Steinkuhl, Bernd: *See—*
Breuer, Oswald; Steinkuhl, Bernd; Roling, Franz; Hesse, Norbert; Rassmann, Christoph; Schoop, Gunther-Dietmar; and Holtken, Werner, 4,626,034, Cl. 299-91.000.
Steltenkamp, Robert J.: *See—*
Robbins, Clarence R.; and Steltenkamp, Robert J., 4,626,429, Cl. 424-70.000.
Stenhede, Jan U.: *See—*
Kjellberg, Ulf A.; Nyqvist, Per G. H.; Stenhede, Jan U.; and Stenmark, Lars B., 4,626,532, Cl. 514-195.000.
Stenmark, Lars B.: *See—*
Kjellberg, Ulf A.; Nyqvist, Per G. H.; Stenhede, Jan U.; and Stenmark, Lars B., 4,626,532, Cl. 514-195.000.
Stephens, Lawrence K., to International Business Machines Corp. Text placement on graphics screen. 4,627,015, Cl. 364-900.000.
Stephenson, William I.: *See—*
McKee, Jere L.; Stephenson, William I.; and Schlosser, Donald E., 4,626,811, Cl. 335-46.000.
Stevens, Walter T., Jr. Clogging dance tap device. 4,625,436, Cl. 36-113.000.
Stewart-Warner Corporation: *See—*
Hickman, Ronald J.; and Gerula, John M., 4,626,636, Cl. 200-83.00P.
Stifter, Gustav. Fluid-tight flexible connection between hollow sections. 4,626,005, Cl. 285-137.100.
Stikvoort, Eduard F.: *See—*
Persoon, Eric H. J.; Vandenbulcke, Christian J. B. O. E.; Odijk, Eddy A. M.; and Stikvoort, Eduard F., 4,627,021, Cl. 364-900.000.
Stites, David G.: *See—*
Zuelke, Robert D.; Friedrich, Paul H.; and Stites, David G., 4,626,099, Cl. 355-99.000.
Stiver, C. Edward: *See—*
Brooks, Thomas W.; Masseth, David A.; Malecka, Joseph R.; Stiver, C. Edward; Pearson, Charles S.; and Fox, James D., 4,625,539, Cl. 72-402.000.
Stock, Karl-Wilhelm: *See—*
Wienecke, Horst G. P.; and Stock, Karl-Wilhelm, 4,626,427, Cl. 424-35.000.
Stohrer, Charles E., Jr., to Harper-Wyman Company. Spark ignited gas burner. 4,626,196, Cl. 431-264.000.
Stoilov, Nikola D., to Institute za Metalorejeshti Mashini. Cutting machine with automatic changing of tools and tool magazines. 4,625,387, Cl. 29-568.000.
Stokes, Vijay K., to General Electric Company. Method of manufacturing a molded rotatable assembly for dynamoelectric machines. 4,625,392, Cl. 29-598.000.
Stone, Walter H., to Parker-Hannifin Corporation. End cap which will accommodate flow reversal. 4,626,348, Cl. 210-248.000.
Stoner, Donald L., to Microperipheral Corporation, The. Data communication system. 4,627,078, Cl. 375-45.000.
Storage Technology Partners II: *See—*
Abed, Majeed; and McIntosh, Robert P., 4,627,038, Cl. 369-44.000.
Storck, Eckhard; and Wolff, Ulrich, to Siemens Aktiengesellschaft. Bragg cell spectral analyzer with a prism expansion system. 4,626,102, Cl. 356-328.000.
Stordy Combustion Engineering Limited: *See—*
Mills, Paul, 4,626,194, Cl. 431-90.000.
Storz Instrument Company: *See—*
Scheller, Gregg D., 4,626,248, Cl. 604-319.000.
Stowers, Jeffery P.: *See—*
Powers, Grady M.; Burgers, Henri T.; and Stowers, Jeffery P., 4,626,780, Cl. 324-158.00F.
Strasser, Hans-Erwin: *See—*
Bodecker, Kay; Goth, Walter; Scheurl, Robert; and Strasser, Hans-Erwin, 4,626,786, Cl. 324-449.000.
Stratman, Jerome F.: *See—*
Benson, John T.; Hart, William; and Stratman, Jerome F., 4,626,224, Cl. 446-297.000.
Strauss, Juergen M. Archery bow sighting device. 4,625,421, Cl. 33-265.000.
Street, Glenn M., to Cleveland Clinic Foundation, The. Upper body exercise apparatus. 4,625,962, Cl. 272-132.000.
Streitmatter, Ronald W.: *See—*
Cherkas, Paul; Fritsche, Joel L.; Groezinger, John J.; LaGorce, Paul D.; and Streitmatter, Ronald W., 4,626,307, Cl. 156-218.000.
Stritzke, Detlef; Ewest, Eckhart; and Heimerl, Wilfried, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method of producing a glass block containing radioactive fission products and apparatus therefor. 4,626,382, Cl. 252-629.000.
Strong-Grainger, Vonda. Intraoral dental radiographic film packet pad. 4,626,216, Cl. 433-229.000.
Struye, Luc A., to AGFA-Gevaert, N.V. Device for accurately focussing a laser beam. 4,626,673, Cl. 250-201.000.
Stubbs, Gene W.: *See—*
Shivashankara, Belur N.; Miller, Wendell R.; and Stubbs, Gene W., 4,625,828, Cl. 181-175.000.
Stull, Gene. Hand-held dispenser with automatic venting. 4,625,899, Cl. 222-521.000.
Sturm, Ruger & Company, Inc.: *See—*
Ruger, William B., 4,625,445, Cl. 42-71.020.
Stwalley, William C.; and Koch, Mark E., to University of Iowa Research Foundation. Excimer laser pumped by dissociative recombination. 4,627,066, Cl. 372-57.000.
Su, Robert; and Leu, Fang-Nung, to RCA Corporation. Dual voltage converter circuit. 4,626,981, Cl. 363-62.000.
Suchdev, Jagan N.; and Dailey, Mark, to General Motors Corporation. Connector member. 4,626,126, Cl. 403-353.000.
Suda, Kaoru: *See—*
Nakata, Yukio; Shiotsu, Osamu; Morito, Motoyoshi; and Suda, Kaoru, 4,626,789, Cl. 329-50.000.
Suda, Yorishige: *See—*
Awane, Misao; Suda, Yorishige; Hara, Seiji; and Kobayashi, Satoshi, 4,627,056, Cl. 371-16.000.
Sudbury, Barry A.: *See—*
Kaufmann, Edward J.; and Sudbury, Barry A., 4,626,372, Cl. 252-90.000.
Suddards, Arthur D.: *See—*
Cockburn, James; and Suddards, Arthur D., 4,625,839, Cl. 191-40.000.
Suematsu, Toshio: *See—*
Takeda, Yuuji; Suematsu, Toshio; Anzai, Katsushi; and Ito, Yoshiyasu, 4,626,997, Cl. 364-431.050.
Suenaga, Yutaka: *See—*
Nakamura, Eiji; and Suenaga, Yutaka, 4,626,079, Cl. 350-525.000.

Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Amplifier circuit using a P channel MOS transistor. 4,626,794, Cl. 330-253.000.
Sugiura, Noboru: *See—*
Kashimura, Yuichi; and Sugiura, Noboru, 4,625,692, Cl. 123-425.000.
Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Rotary recording medium having different video signals recorded on mutually adjacent tracks and reproducing apparatus therefor. 4,626,930, Cl. 358-342.000.
Sugiyama, Masahiko: *See—*
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, 4,626,180, Cl. 418-63.000.
Sugo, Hiroyuki; and Aoki, Takashi, to Hitachi, Ltd. Cylinder power balance diagnostic apparatus for internal combustion engine. 4,625,546, Cl. 73-116.000.
Sukahara, Yusuke; Takeuchi, Eiji; and Hayashi, Eisaku, to Toppan Printing Co., Ltd. Method of layer thickness measurement. 4,625,556, Cl. 73-602.000.
Sullivan, Mark. Toy-like cereal serving apparatus. 4,625,882, Cl. 220-23.830.
Sullivan, Michael J.: *See—*
Doherty, John P.; Dufour, David L.; Gebo, Russell E.; and Sullivan, Michael J., 4,627,005, Cl. 364-525.000.
Sulzer Brothers Limited: *See—*
Muller, Ulrich A., 4,625,517, Cl. 60-721.000.
Riesen, Peter, 4,625,769, Cl. 139-188.00R.
Sumi, Makoto: *See—*
Ashikawa, Noboru; Nakayama, Hiroshi; and Sumi, Makoto, 4,625,577, Cl. 74-475.000.
Sumitomo Chemical Company, Limited: *See—*
Harada, Mithuhiro; and Saita, Kenji, 4,625,710, Cl. 126-430.000.
Matsuo, Yoshikazu; Nakamatsu, Toshio; Moriwaki, Toshikazu; Abeta, Sadaharu; and Imada, Kunihiko, 4,626,257, Cl. 8-638.000.
Okumura, Takuzo; Yanase, Masataka; and Kikui, Hitoshi, 4,626,304, Cl. 156-163.000.
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.
Saito, Teruo; and Hieda, Kazuo, 4,626,564, Cl. 524-413.000.
Sumitomo Electric Industries, Inc.: *See—*
Ohashi, Kazuo; and Yamakawa, Takuya, 4,627,105, Cl. 455-612.000.
Sumitomo Electric Industries, Ltd.: *See—*
Morita, Tetsuo; and Nishie, Mitsuaki, 4,626,678, Cl. 250-214.00A.
Sumitomo Heavy Industries, Ltd: *See—*
Kawasaki, Mikio; and Matsumoto, Kiyoshi, 4,625,860, Cl. 198-819.000.
Sumitomo Metal Mining Company Limited: *See—*
Takano, Sho, 4,625,816, Cl. 175-371.000.
Sumitomo Precision Products Co., Ltd.: *See—*
Sasaki, Kantaro; Iwasaki, Shosuke; Abiko, Tetsuo; Baba, Yoshio; Hagiwara, Michiki; and Nanba, Keizo, 4,626,295, Cl. 148-127.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Yamada, Mikio, 4,625,964, Cl. 273-62.000.
Sun, Mei H.: *See—*
Wickersheim, Kenneth A.; and Sun, Mei H., 4,626,110, Cl. 374-131.000.
Sun, Paul, to DeKalb-Pfizer Genetics. Iron deficiency chlorosis resistant soybean variety. 4,626,610, Cl. 800-1.000.
Sunbeam Corporation: *See—*
Kemnitz, Glen; and Williams, Richard H., 4,625,394, Cl. 29-611.000.
Sunbeam Plastics Corporation: *See—*
Wortley, Michael, 4,625,897, Cl. 222-205.000.
Sunder, Swaminathan: *See—*
Garg, Diwakar; and Sunder, Swaminathan, 4,626,342, Cl. 208-419.000.
Sundermeier, Gunter: *See—*
Gross, Jurgen; and Sundermeier, Gunter, 4,626,049, Cl. 312-291.000.
Sundet, Sherman A., to Du Pont de Nemours, E. I., and Company. Microporous support layer with interfacially polymerized copolyamide thereon. 4,626,468, Cl. 428-315.500.
Sunds Defibrator Aktiebolag: *See—*
Sjobom, Axel H., 4,525,859, Cl. 198-665.000.
Sunnen Products Company: *See—*
Rembold, David C., 4,626,143, Cl. 408-82.000.
Sunset Ltd.: *See—*
Guibert, Raul, 4,625,867, Cl. 206-499.000.
Supra Products, Inc.: *See—*
Larson, Wayne F., 4,626,007, Cl. 292-65.000.
Surmiak, Thomas M.: *See—*
Bradley, Alan B.; Geary, James H.; Hutchison, James W.; Jones, Thomas S.; Mather, Donald A.; Mather, Scott D.; and Surmiak, Thomas M., 4,626,436, Cl. 426-289.000.
Suss, Hans-Ulrich: *See—*
Kruger, Horst; Suss, Hans-Ulrich; Arnold, Gerhard; Anspach, Sigrid; Schwartzkopff, Ursula; and Jelitto, Hans, 4,626,319, Cl. 162-65.000.
Sustmann, Scarlet, to Henkel Kommanditgesellschaft auf Aktien. Insertion applicator. 4,626,238, Cl. 604-15.000.
Sutabiraiza Company, Limited: *See—*
Sutekiyo, Uozumi, 4,625,681, Cl. 123-3.000.
Sutekiyo, Uozumi, to Sutabiraiza Company, Limited. Method of obtaining mechanical energy utilizing H_2O plasma generated in multiple steps. 4,625,681, Cl. 123-3.000.
Suzuki, Akinori; Isogai, Akira; Hyeon, Suong B.; Kikkawa, Takashi; and Someya, Shinzo, to Agro-Kanesho Co., Ltd. Plant growth regulator. 4,626,277, Cl. 71-113.000.
Suzuki, Akira; Shioya, Yasumi; and Watanabe, Norio, to Shinryo Air Conditioning Co., Ltd. Sludge concentration method. 4,626,356, Cl. 210-705.000.
Suzuki, Hiroya: *See—*
Sagara, Takehiko; Suzuki, Hiroya; and Ohtsuka, Iwao, 4,626,116, Cl. 400-124.000.
Suzuki, Kazuhiko: *See—*
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; and Suzuki, Kazuhiko, 4,626,290, Cl. 106-288.00B.
Suzuki, Masane; Shibamoto, Hiroshi; and Kanaya, Motonori, to Fuji Photo Optical Co., Ltd. Laser vascular anastomosis apparatus. 4,625,724, Cl. 128-303.100.
Suzuki, Masanori: *See—*
Yamaguchi, Yoshimitsu; Suzuki, Masanori; and Shibata, Tadahiko, 4,625,499, Cl. 53-542.000.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Rotatable door mirror for a motor vehicle. 4,626,085, Cl. 350-604.000.
Suzuki, Migaku; Sasaki, Satoshi; Mitsuno, Takashi; and Inagaki, Hiroyuki, to Uni-Charm Corporation. Disposable diaper and method for incorporation of elastic member into such diaper. 4,626,305, Cl. 156-164.000.
Suzuki, Nobuyoshi: *See—*
Hirota, Akira; Tsushima, Takuya; and Suzuki, Nobuyoshi, 4,626,927, Cl. 358-310.000.
Suzuki, Shigeru: *See—*
Miyagawa, Seiichi; Ikeda, Itsuo; and Suzuki, Shigeru, 4,626,876, Cl. 346-160.000.
Suzuki, Sohbe: *See—*
Mizoguchi, Toyokazu; Nishizawa, Jun-ichi; Suzuki, Sohbe; and Tamamushi, Takashige, 4,626,916, Cl. 358-213.120.
Suzumura, Masanaga: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.
Svaty, Vladimir: *See—*
Sevcik, Ladislav; and Svaty, Vladimir, 4,625,771, Cl. 139-435.000.
Svenka, Peter: *See—*
Pav, Josef; Wenzel, Reinhard; Schmidt, Rainer; Svenka, Peter; and Rauf, Richard, 4,625,637, Cl. 100-47.000.
Swann, Jack D. Pickup van. 4,626,024, Cl. 296-216.000.
Swanson, Benjamin F.: *See—*
Hi-Hwa Yuan, Herbert; Swanson, Benjamin F.; and Stapleton, Robert G., 4,625,544, Cl. 73-38.000.
Swarovski, Daniel; and Schwab, Kurt, to D. Swarovski & Co. Optical instrument, in particular binoculars. 4,626,080, Cl. 350-569.000.
Swasey, Archie N.; and Winter, William J., to Farrel Corporation. Self-compensating anti-friction bearing clearance device. 4,626,111, Cl. 384-99.000.
Sweet, Richard F. Playing card holder with curvature. 4,625,966, Cl. 273-150.000.
Sweet, Roger H., to Mattel, Inc. Toy weapon pack for figure toy. 4,626,222, Cl. 446-268.000.
Sweet, Roger H., to Mattel, Inc. Toy vehicle assembly. 4,626,223, Cl. 446-279.000.
Swendrowski, Steven: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; and Morrison, Barry L., 4,626,167, Cl. 414-786.000.
SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.
Swick, E. Grant: *See—*
Ruehl, William E.; and Swick, E. Grant, 4,626,633, Cl. 379-27.000.
Swift & Company: *See—*
Muschany, Theodore R., 4,627,007, Cl. 364-550.000.
Swift Instruments, Inc.: *See—*
Nishizawa, Tadao, 4,626,081, Cl. 350-569.000.
Swinbanks, Brian J.: *See—*
Swinbanks, Duncan J.; and Swinbanks, Brian J., 4,625,449, Cl. 43-42.740.
Swinbanks, Duncan J.; and Swinbanks, Brian J., to Knotless Fishing Tackle Limited. Knotless paternoster boom. 4,625,449, Cl. 43-42.740.
Swinderman, Robert H.: *See—*
Murphy, John C.; and Swinderman, Robert H., 4,625,521, Cl. 62-55.500.
Swiss Aluminium Ltd.: *See—*
Buxmann, Kurt; and Bolliger, Martin, 4,625,788, Cl. 164-481.000.
Switzer, Jay A., to Union Oil Company of California. Photoelectrochemical preparation of a solid-state semiconductor photonic device. 4,626,322, Cl. 204-2.100.
Sydansk, Robert D., to Marathon Oil Company. Potassium silicate clay stabilization process. 4,625,802, Cl. 166-292.000.
Sylvan, Richard: *See—*
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,625,604, Cl. 83-102.100.

Szabo, Rene : *See—*
Chabrier, Gilbert; Moine, Guy; Maurion, Roger; and Szabo, Rene , 4,626,306, Cl. 156-180.000.
Szczepanski, Henry: *See—*
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,626,272, Cl. 71-92.000.
Szenbanyak, Mecseki: *See—*
Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl. 299-16.000.
Szeto, Kenneth H.; and Hill, Frank A., to TRW Inc. Multi-master communication bus system with parallel bus request arbitration. 4,626,843, Cl. 340-825.500.
TAB Leasing: *See—*
Nelson, Craig E., 4,625,542, Cl. 73-1.00R.
Tabak, Samuel A., to Mobil Oil Corporation. Olefin upgrading system for extracted feed. 4,626,415, Cl. 422-190.000.
Tabbia, Augusto: *See—*
Losa, PierAntonio; and Tabbia, Augusto, 4,625,652, Cl. 105-4.100.
Tachibana, Kaoru: *See—*
Hamano, Toshio; Tachibana, Kaoru; and Aoki, Hideji, 4,626,960, Cl. 361-388.000.
Tachikawa Spring Co., Ltd.: *See—*
Hatsutta, Susumu; and Ikisu, Yasuji, 4,626,028, Cl. 297-289.000.
Urai, Muneharu; and Abe, Tadafumi, 4,625,350, Cl. 5-448.000.
Tada, Eisuke: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
Tagawa, Shigetaro; Murata, Mitsuru; Sekigami, Kazuo; Sugiyama, Masahiko; and Konno, Gen, to Hitachi, Ltd. Rotary compressor with spiral oil grooves for crankshaft. 4,626,180, Cl. 418-63.000.
Taguchi, Masahiro: *See—*
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, 4,626,410, Cl. 420-590.000.
Taguchi, Sadanori: *See—*
Yamamoto, Shigehiko; Taguchi, Sadanori; and Aida, Toshiyuki, 4,626,470, Cl. 428-336.000.
Taiho Pharmaceutical Company, Limited: *See—*
Tanaka, Motoaki; Kajitani, Makoto; and Yamazaki, Tomio, 4,626,384, Cl. 540-306.000.
Taisei Road Construction Co., Ltd.: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.
Taiyo Altight Kogyo Co., Ltd.: *See—*
Ito, Motohiko, 4,625,887, Cl. 220-231.000.
Taiyo Yuden Co., Ltd.: *See—*
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,393, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,394, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,395, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,396, Cl. 264-65.000.
Tajima, Takashi; and Tsuji, Tatsuyoshi, to Musashi Seimitsu Kogyo Kabushiki Kaisha. Pivot joint assembly capable of amplified wear indication. 4,626,121, Cl. 403-27.000.
Takagi, Masayuki: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.
Takagi, Mikio: *See—*
Shioya, Yoshimi; Maeda, Mamoru; Ohyama, Yasushi; and Takagi, Mikio, 4,625,678, Cl. 118-723.000.
Takahashi, Hideyuki; Kenmotsu, Isami; and Okajima, Takahiro, to Pioneer Electronic Corporation. Automatic record loading player. 4,627,044, Cl. 369-292.000.
Takahashi, Katsuhiko: *See—*
Ikenaga, Yukio; Takahashi, Katsuhiko; Okada, Tsuneyoshi; Hijikata, Kenji; and Kanoe, Toshio, 4,626,371, Cl. 252-62.540.
Takahashi, Ken: *See—*
Yagi, Yasuomi; Takahashi, Ken; and Nemoto, Takeo, 4,625,520, Cl. 62-45.000.
Takahashi, Kenji: *See—*
Sato, Masanori; Nagahara, Shusaku; and Takahashi, Kenji, 4,626,897, Cl. 358-44.000.
Takahashi, Kihei: *See—*
Fukuroi, Takeo; Takahashi, Kihei; and Inazawa, Keichi, 4,625,370, Cl. 24-599.000.
Takahashi, Kotei: *See—*
Okuda, Michihiro; and Takahashi, Kotei, 4,625,576, Cl. 74-473.00R.
Takahashi, Mikoto: *See—*
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.
Takahashi, Noriyuki: *See—*
Usui, Koichi; Sato, Teiji; Tanaka, Masanori; Mizoguchi, Yasuo; and Takahashi, Noriyuki, 4,626,420, Cl. 423-326.000.
Takahashi, Reijiro: *See—*
Fukasaku, Yoshinori; Noto, Kunihiro; and Takahashi, Reijiro, 4,626,720, Cl. 310-62.000.
Takahashi, Susumu; and Horiguchi, Kiwami, to Tokyo Kagaku Kikai Kabushiki Kaisha. Ophthalmic instrument having a focus detecting system. 4,626,089, Cl. 351-208.000.
Takahashi, Tadahiro; Ohi, Shinichi; and Kobayashi, Kashiwa, to Diesel Kiki Company, Ltd. Thermoswitch. 4,626,820, Cl. 337-354.000.
Takahashi, Takeshi: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,443, Cl. 426-602.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,444, Cl. 426-602.000.
Takahashi, Toru: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.
Takahashi, Toyofumi: *See—*
Takata, Akira; and Takahashi, Toyofumi, 4,626,704, Cl. 307-264.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, to Meiji Milk Products Company Limited. Process for preparing dressings comprising W/O/W type multiple emulsions. 4,626,443, Cl. 426-602.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, to Meiji Milk Products Company Limited. Process for preparation of dressings comprising W/O/W type multiple emulsions. 4,626,444, Cl. 426-602.000.
Takahashi, Yoshikazu: *See—*
Shimamoto, Susumu; Andoh, Toshinari; Tada, Eisuke; Takahashi, Yoshikazu; Ishihara, Akira; Shindoh, Yoshihiko; and Itoh, Ikuo, 4,626,614, Cl. 174-15.00S.
Takai, Kazuki; Ikahata, Toshihiro; and Watanabe, Wataru, to Clarion Co., Ltd. Ejection mechanism for tape player. 4,626,939, Cl. 360-96.500.
Takano, Hiroshi, to Mitsuboshi Belting Ltd. Spring-locked variable speed pulley. 4,626,227, Cl. 474-8.000.
Takano, Shigeru, to Regency Electronics, Inc. Wide band radio receiver. 4,627,100, Cl. 455-160.000.
Takano, Sho, to Sumitomo Metal Mining Company Limited. Boring drill bit. 4,625,816, Cl. 175-371.000.
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, to Fujikura Ltd. DC electric power cable. 4,626,618, Cl. 174-105.0SC.
Takasaki, Yukio: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.
Takasu, Katsuji: *See—*
Hirai, Yutaka; Echizen, Hiroshi; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,626,449, Cl. 427-53.100.
Takasugi, Eiji: *See—*
Hara, Masato; Niiho, Masaaki; Takasugi, Eiji; and Honda, Ryouji, 4,626,682, Cl. 250-231.0SE.
Takata, Akira; and Takahashi, Toyofumi, to Ricoh Company, Ltd. Voltage level converting circuit. 4,626,704, Cl. 307-264.000.
Takatsu, Norihiko, to Nippon Kogaku K.K. MOS solid-state image pickup device having vertical overflow drains. 4,626,915, Cl. 358-213.190.
Takayasu, Hidekazu, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying system for internal combustion engine. 4,625,688, Cl. 123-73.00B.
Takeda, Akimichi; and Uomori, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Flash welding machine. 4,626,647, Cl. 219-97.000.
Takeda, Yuuji; Suematsu, Toshio; Anzai, Katsushi; and Ito, Yoshiyasu, to Toyota Jidosha Kabushiki Kaisha. Method of and system for controlling ignition timing retard limit in internal combustion engine. 4,626,997, Cl. 364-431.050.
Takei, Akihiko; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Control unit for antilock brake systems. 4,626,045, Cl. 303-119.000.
Takekoshi, Tomoaki: *See—*
Nishioka, Akira; Nakayama, Takao; and Takekoshi, Tomoaki, 4,626,484, Cl. 430-273.000.
Takekura, Hiroyuki: *See—*
Kitamura, Masatsugu; Tanaka, Mitsuaki; and Takekura, Hiroyuki, 4,626,827, Cl. 340-347.0SH.
Takenaka, Shigeo; Hamano, Eizaburo; and Kamohara, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Mask focusing color picture tube. 4,626,737, Cl. 313-402.000.
Takeno, Shozo, to Kabushiki Kaisha Toshiba. Thermal print head. 4,626,872, Cl. 346-76.0PH.
Takeshita, Akira: *See—*
Omura, Takashi; Kayane, Yutaka; Takahashi, Mikoto; Miyamoto, Tetsuya; Takeshita, Akira; Harada, Naoki; and Otake, Katsumasa, 4,626,589, Cl. 534-605.000.
Takeshita, Fumitaka: *See—*
Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, 4,625,714, Cl. 128-6.000.
Takeuchi, Eiji: *See—*
Sukahara, Yusuke; Takeuchi, Eiji; and Hayashi, Eisaku, 4,625,556, Cl. 73-602.000.
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, to Tokyo Keiki Company, Ltd. Digital valve control apparatus. 4,626,758, Cl. 318-603.000.
Takeuchi, Masaru: *See—*
Kuwano, Yukinori; Nakano, Shoichi; and Takeuchi, Masaru, 4,626,878, Cl. 357-19.000.
Takeuchi, Shinichi: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto,

Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.
Takeuchi, Takashi: *See—*
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Takeuchi, Yoshimitsu: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.
Takimoto, Hiroshi: *See—*
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Tamai, Shigeru: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,443, Cl. 426-602.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,444, Cl. 426-602.000.
Tamamushi, Takashige: *See—*
Mizoguchi, Toyokazu; Nishizawa, Jun-ichi; Suzuki, Sohbe; and Tamamushi, Takashige, 4,626,916, Cl. 358-213.120.
Tamaru, Takuya; and Ogusu, Mikio, to Nippon Gakki Seizo Kabushiki Kaisha. Disc reproducing apparatus. 4,627,037, Cl. 369-77.200.
Tamez, Carlos; and Castaneda, Miguel P. Brake adjustment tool. 4,625,353, Cl. 7-100.000.
Tamura, Tadashi; and Kikuchi, Reiji, to Kabushiki Kaisha Sato. Web-meandering preventing device. 4,625,931, Cl. 242-68.300.
Tamura, Takashi: *See—*
Fukui, Hishao; Shinohara, Yutaka; and Tamura, Takashi, 4,626,120, Cl. 401-260.000.
Tanahashi, Tooru, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator. 4,625,834, Cl. 187-29.00R.
Tanaka, Akira: *See—*
Tanaka, Ryuichi; and Tanaka, Akira, 4,626,700, Cl. 307-118.000.
Tanaka, Hiroaki: *See—*
Kashiwagi, Hideki; Akita, Shigeyuki; Tanaka, Hiroaki; and Kuno, Akira, 4,625,411, Cl. 33-1.0PT.
Tanaka, Hiromi: *See—*
Kimura, Takashi; Tanaka, Hiromi; and Omori, Masayoshi, 4,625,524, Cl. 62-278.000.
Tanaka, Hiroyuki: *See—*
Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., 4,626,485, Cl. 430-59.000.
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, to TDK Corporation. Magnetic tape cartridge pivot pin and supporting member. 4,626,948, Cl. 360-132.000.
Tanaka, Kunio: *See—*
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,627,003, Cl. 364-520.000.
Tanaka, Masafumi, to Japan Storage Battery Company Limited. Apparatus for indicating remaining battery capacity. 4,626,765, Cl. 320-48.000.
Tanaka, Masanori: *See—*
Usui, Koichi; Sato, Teiji; Tanaka, Masanori; Mizoguchi, Yasuo; and Takahashi, Noriyuki, 4,626,420, Cl. 423-326.000.
Tanaka, Mitsuaki: *See—*
Kitamura, Masatsugu; Tanaka, Mitsuaki; and Takekura, Hiroyuki, 4,626,827, Cl. 340-347.0SH.
Tanaka, Motoaki; Kajitani, Makoto; and Yamazaki, Tomio, to Taiho Pharmaceutical Company, Limited. Penam derivatives. 4,626,384, Cl. 540-306.000.
Tanaka, Ryuichi; and Tanaka, Akira, to Nippon Air Brake Co., Ltd. Hydraulic reservoir with fluid level detector. 4,626,700, Cl. 307-118.000.
Tanaka, Shun-ichiro; Ikeda, Kazuo; and Sayano, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing sintered ceramic body. 4,626,451, Cl. 427-123.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,625,994, Cl. 280-707.000.
Tanaka, Tatsuo; Shigematsu, Nana; and Koshika, Kazushige, to Kabushiki Kaisha Toshiba; and Tosbac Computer System Co., Ltd. Differential amplifier. 4,626,795, Cl. 330-257.000.
Tanaka, Tetsuya; and Yamaguchi, Kazuaki, to Aisin Seiki Kabushiki Kaisha. Heater head assembly of heated-gas engine. 4,625,514, Cl. 60-517.000.
Tani, Akihiko; Aoyagi, Takashi; Ikeda, Shuji; and Nagasawa, Kouichi, to Hitachi, Ltd. Process for producing semiconductor devices. 4,626,450, Cl. 427-93.000.
Tani, Yuichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Tracking input device. 4,626,908, Cl. 358-111.000.
Taniguchi, Shigeki; Furukawa, Kusuo; Yanagishima, Fumiya; and Sasaki, Hiroaki, to Kawasaki Steel Corporation. Apparatus for butt welding steel strips by using a laser beam in a steel strip-processing line. 4,626,651, Cl. 219-121.0LC.
Taniguchi, Tadasu: *See—*
Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; and Taniguchi, Tadasu, 4,626,082, Cl. 350-573.000.
Taniguchi, Yasutaka: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanioka, Hiroshi, to Canon Kabushiki Kaisha. Image processing apparatus using multiple dither matrices. 4,626,901, Cl. 358-75.000.
Tannewitz, Inc.: *See—*
Vanden Brink, Donald J., 4,625,603, Cl. 83-74.000.
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, to Matsushita Refrigeration Company. Method of manufacturing fin-tube heat exchangers. 4,625,378, Cl. 29-157.30A.
Tardif, Arthur J.; and Anthony, Samuel D., to Raytheon Company. Broadband doppler simulator. 4,626,217, Cl. 434-8.000.
Tarshis, Morris: *See—*
Ahn, Youngkee; and Tarshis, Morris, 4,626,962, Cl. 361-399.000.
Task, Harry L.; Tutin, Michael B.; and Bothe, Gregory R., to United States of America, Air Force. Semi- two-dimensional decoys. 4,625,972, Cl. 273-348.000.
Tassel, Andre : *See—*
Habermann, Helmut; Brunet, Maurice; and Tassel, Andre , 4,626,754, Cl. 318-460.000.
Tate & Lyle Public Limited Company: *See—*
Bennett, Michael C.; Coote, Nicholas; and Byers, Andrew, 4,626,359, Cl. 210-793.000.
Tateda, Koichi, to Sharp Kabushiki Kaisha. Method and apparatus for detecting problems of temperature control device. 4,626,663, Cl. 219-504.000.
Tatemoto, Minoru: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,992, Cl. 280-703.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,625,994, Cl. 280-707.000.
Taub, David, to Merck & Co., Inc. Amino acid derivatives as enzyme inhibitors. 4,626,545, Cl. 514-423.000.
Tavergnier, Jean-Pierre: *See—*
Dubots, Patrick; Kermarrec, Jean-Claude; and Tavergnier, Jean-Pierre, 4,625,503, Cl. 57-6.000.
Tayag, Rolando: *See—*
Menor, George; Tayag, Rolando; and Tran, Duc, 4,627,089, Cl. 378-157.000.
Taylor, Attalee S.: *See—*
Andrews, Howard W., Jr.; Bobb, Clifford F.; and Taylor, Attalee S., 4,626,056, Cl. 339-75.0MP.
Taylor, Edward F., to General Motors Corporation. Method of finishing a body panel joint. 4,626,391, Cl. 264-46.600.
Taylor, Garthwood R.: *See—*
Denman, Stephen A.; and Taylor, Garthwood R., 4,625,947, Cl. 254-323.000.
Taylor, Jeffrey L., to Standard Textile Co., Inc. Cloth product having an antitheft device and method of making same. 4,626,311, Cl. 156-308.200.
Taylor, Mark P.: *See—*
Chyung, Kenneth; Gadkaree, Kishor P.; and Taylor, Mark P., 4,626,515, Cl. 501-32.000.
Taylor, Peter J., to Plessey Overseas Limited. Fuel monitoring systems. 4,625,558, Cl. 73-64.200.
Tazou, Ken: *See—*
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,625,540, Cl. 72-405.000.
TDK Corporation: *See—*
Ohe, Kazuhide; and Kawashima, Yukio, 4,626,334, Cl. 204-290.00R.
Sadoya, Hisayoshi, 4,626,731, Cl. 310-339.000.
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,626,948, Cl. 360-132.000.
Wakayama, Katsuhiko; and Harada, Hiraku, 4,626,370, Cl. 252-62.520.
Teac Corporation: *See—*
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, 4,626,942, Cl. 360-97.000.
Teagle, David A.: *See—*
Bones, Roger J.; Teagle, David A.; Brooker, Steven D.; and Galloway, Roy C., 4,626,483, Cl. 429-50.000.
Teepak, Inc.: *See—*
Kollross, Gunter; and Steinbis, Fritz K., 4,625,362, Cl. 17-33.000.
Teijin Seiki Company Limited: *See—*
Fukui, Kiyozumi, 4,626,722, Cl. 310-82.000.
Tejral, Richard A.: *See—*
Unruh, Rudy R.; Lamb, James A.; and Tejral, Richard A., 4,626,984, Cl. 364-132.000.
Tektronix, Inc.: *See—*
Jones, Keith E., 4,626,805, Cl. 333-33.000.
Teledex: *See—*
Van Gilluwe, Frank L.; Dunham, Samuel B.; and Cross, Douglas A., 4,626,627, Cl. 379-214.000.
Teledyne Industries, Inc.: *See—*
Wheelock, James G., 4,625,704, Cl. 123-611.000.
Teleflex Incorporated: *See—*
Spease, Arthur L., 4,625,579, Cl. 74-501.00R.

Telefonaktiebolaget LM Ericsson: *See—*
Lindberg, Torsten G., 4,626,866, Cl. 343-880.000.
Telefunken Electronic GmbH: *See—*
Moser, Helmut; and Militzer, Karl, 4,626,793, Cl. 330-59.000.
Tengler, John N.; and Pilny, James C., to Minnesota Mining and Manufacturing Company. Cable termination system with diagonal signal terminator. 4,626,054, Cl. 339-59.00M.
Tepe, David J.: *See—*
Jagosz, Theodore T.; and Tepe, David J., 4,625,641, Cl. 101-240.000.
Terakura, Yukio: *See—*
Ikemoto, Kazuhito; and Terakura, Yukio, 4,625,844, Cl. 192-53.00F.
Terauchi, Kiyoshi, to Sanden Corporation. Axial thrust load mechanism for a scroll type fluid displacement apparatus. 4,626,179, Cl. 418-55.000.
Terumo Kabushiki Kaisha: *See—*
Fujii, Tadashi, 4,625,555, Cl. 73-597.000.
Terumoto, Susumu, to Hitachi, Ltd. Fuel supply pump. 4,626,178, Cl. 417-366.000.
Tessler, Martin M.: *See—*
Trzasko, Peter T.; Tessler, Martin M.; and Dirscherl, Teresa A., 4,626,288, Cl. 106-210.000.
Testa, Raymond T.: *See—*
Lee, May D.; Fantini, Amedeo A.; Labeda, David P.; Maiese, William M.; Testa, Raymond T.; and Borders, Donald B., 4,626,503, Cl. 435-75.000.
Testrite, Inc.: *See—*
Holm, Albert E.; and Holm, Grant A., 4,625,545, Cl. 73-40.000.
Tetra Pak International AB: *See—*
Billberg, Alf, 4,625,902, Cl. 226-2.000.
Tetras: *See—*
Berger, Jean-Claude, 4,626,095, Cl. 355-3.0BE.
Texaco Inc.: *See—*
Lewis, Paul H.; Dai, Eugene P.; and Holst, Edward H., 4,626,419, Cl. 423-244.000.
Marquis, Edward T.; Keating, Kenneth P.; Sanderson, John R.; and Smith, William A., 4,626,596, Cl. 556-57.000.
Texas Instruments Incorporated: *See—*
Hyslop, Adin E.; and Duvvury, Charvaka, 4,627,033, Cl. 365-205.000.
McIntosh, Ricky A., 4,626,206, Cl. 432-230.000.
Th. Goldschmidt AG: *See—*
Berger, Roland; Fink, Hans-Ferdi; Koerner, Gotz; Langner, Jaroslav; and Weitemeyer, Christian, 4,626,378, Cl. 252-321.000.
Thermo-O-Disc, Incorporated: *See—*
Versaw, Douglas P., 4,626,821, Cl. 337-380.000.
Thesing, Richard A.: *See—*
Keritsis, Gus D.; Nichols, Walter A.; Burnett, George H.; Thesing, Richard A.; and Nepomuceno, Jose G., 4,625,737, Cl. 131-355.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track switch leveling, lining and tamping machine. 4,625,651, Cl. 104-7.200.
Thomas, Betty O'Grady, executor: *See—*
Alworth, Charles W.; Davis, Ward B.; and Thomas, John C., deceased, 4,626,320, Cl. 201-2.000.
Thomas, John C., deceased: *See—*
Alworth, Charles W.; Davis, Ward B.; and Thomas, John C., deceased, 4,626,320, Cl. 201-2.000.
Thompson, Andy L. Ground actuated lid operating system. 4,625,888, Cl. 220-262.000.
Thompson, Harvey W.: *See—*
Nemes, John J.; Thompson, Harvey W.; and Waller, John E., 4,626,411, Cl. 422-13.000.
Thompson, Larry. Artificial voice apparatus. 4,627,095, Cl. 381-70.000.
Thomson Components-Mostek Corporation: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; and Morrison, Barry L., 4,626,167, Cl. 414-786.000.
Briggs, Willard S., 4,626,985, Cl. 364-200.000.
Lee, Robert D., 4,626,713, Cl. 307-548.000.
van Tran, Hiep, 4,627,031, Cl. 365-190.000.
Thomson-CSF: *See—*
Pham, Ngu T., 4,626,714, Cl. 307-550.000.
Thouvenin, Jean-Marie, to Saphymo-Stel. Static power frequency converter. 4,626,978, Cl. 363-37.000.
Thunderline Corporation: *See—*
Barton, Bruce G., 4,625,940, Cl. 249-83.000.
Tihanyi, Jeno , to Siemens Aktiengesellschaft. Power transistor. 4,626,886, Cl. 357-34.000.
Timberlake, John R.: *See—*
Cohen, Samuel A.; Hosea, Joel C.; and Timberlake, John R., 4,626,399, Cl. 376-136.000.
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Chang, Chin-Der, 4,626,164, Cl. 414-735.000.
TMC Corporation: *See—*
Leichtfried, Friedrich, 4,625,991, Cl. 280-632.000.
Tobias, Jackie L.; Kline, Larry R.; and Moser, Ted O., to General Motors Corporation. Lead alloying apparatus. 4,625,950, Cl. 266-200.000.
Tod, Christopher J. N.: *See—*
Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., 4,626,157, Cl. 413-1.000.
Todokoro, Hideo; and Komoda, Tsutomu, to Hitachi, Ltd. Apparatus for chopping a charged particle beam. 4,626,690, Cl. 250-396.00R.
Toei, Jun-ichi; Baba, Nobuyuki; Housako, Keiichi; and Ikushige, Tetsuo, to Toyo Soda Manufacturing Co., Ltd. Liquid injection device. 4,625,569, Cl. 73-863.720.
Togashi, Seigo, to Citizen Watch Company Limited. Method of driving matrix display device. 4,626,841, Cl. 340-805.000.
Tokai Electric Wire Company Limited: *See—*
Fukui, Takeshi, 4,625,858, Cl. 198-465.100.
Tokita, Yasuo: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.
Tokuda, Hiroyasu: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, 4,626,514, Cl. 501-10.000.
Tokyo Electric Co., Ltd.: *See—*
Norigoe, Takashi, 4,626,115, Cl. 400-124.000.
Tokyo Electron Limited: *See—*
Asakawa, Teruo, 4,626,749, Cl. 318-135.000.
Tokyo Kagaku Kikai Kabushiki Kaisha: *See—*
Takahashi, Susumu; and Horiguchi, Kiwami, 4,626,089, Cl. 351-208.000.
Tokyo Keiki Company, Ltd.: *See—*
Takeuchi, Kunihiko; Baba, Fujio; Hayashi, Kiyoshi; Shimomura, Yasuo; and Morishige, Yuji, 4,626,758, Cl. 318-603.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Awane, Misao; Suda, Yorishige; Hara, Seiji; and Kobayashi, Satoshi, 4,627,056, Cl. 371-16.000.
Kishi, Hiroyasu; Kimoto, Yuji; and Mori, Keizo, 4,626,881, Cl. 357-23.600.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Sano, Tetsu; Anno, Hidero; and Kume, Yuichiro, 4,626,694, Cl. 250-483.100.
Sasaki, Yoshitaka, 4,625,391, Cl. 29-589.000.
Takenaka, Shigeo; Hamano, Eizaburo; and Kamohara, Eiji, 4,626,737, Cl. 313-402.000.
Tanaka, Shun-ichiro; Ikeda, Kazuo; and Sayano, Akio, 4,626,451, Cl. 427-123.000.
Tani, Yuichiro, 4,626,908, Cl. 358-111.000.
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Toma, Shozo: *See—*
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, 4,626,942, Cl. 360-97.000.
Tomcufcik, Andrew S.: *See—*
Dusza, John P.; Tomcufcik, Andrew S.; and Albright, Jay D., 4,626,538, Cl. 514-258.000.
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, to Matsushita Electric Industrial Co., Ltd. Beam scanning device producing a horizontally uniform electron beam. 4,626,899, Cl. 358-65.000.
Tomita, Itizo, to Diesel Kiki Co., Ltd. Air conditioner system for automobiles. 4,625,911, Cl. 237-12.30C.
Tomita, Takeshi; and Ishibashi, Yu, to JEOL Ltd. Electron beam focusing system for electron microscope. 4,626,689, Cl. 250-396.00R.
Tomomitsu, Osahiko: *See—*
Nozue, Ikuo; Tomomitsu, Osahiko; Yumoto, Yoshiji; and Matsumura, Yoshio, 4,626,556, Cl. 522-99.000.
Tooze, Michael J., to GEC Avionics Limited. Aircraft display devices. 4,626,851, Cl. 340-975.000.
Top of the Line Nail Tips, Inc.: *See—*
Roth, Nancy L., 4,625,740, Cl. 132-73.000.
Toppan Printing Co., Ltd.: *See—*
Sukahara, Yusuke; Takeuchi, Eiji; and Hayashi, Eisaku, 4,625,556, Cl. 73-602.000.
Torii, Shunichi, to Hitachi, Ltd. Data processor with parallel-operating operation units. 4,626,989, Cl. 364-200.000.
Torikoshi, Kaoru: *See—*
Kin, Seki; Tanaka, Hiroyuki; Saeki, Satoshi; Torikoshi, Kaoru; and Pu, Lyong S., 4,626,485, Cl. 430-59.000.
Torney, Gary D. Variable spray sprinkler. 4,625,917, Cl. 239-446.000.
Toro-Lira, Guillermo L.: *See—*
Holmes, Duane C.; and Toro-Lira, Guillermo L., 4,627,009, Cl. 364-559.000.
Tosbac Computer System Co., Ltd.: *See—*
Tanaka, Tatsuo; Shigematsu, Nana; and Koshika, Kazushige, 4,626,795, Cl. 330-257.000.
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W. Oil collection/recirculation for vapor-compression refrigeration system. 4,625,523, Cl. 62-193.000.
Toyama, Niichi: *See—*
Motomura, Masatoshi; Toyama, Niichi; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; and Kozai, Takehisa, 4,626,562, Cl. 523-466.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Toei, Jun-ichi; Baba, Nobuyuki; Housako, Keiichi; and Ikushige, Tetsuo, 4,625,569, Cl. 73-863.720.
Toyoda Gosei Co., Ltd.: *See—*
Noguchi, Fujio; Oguni, Yasuo; and Shimizu, Masayuki, 4,626,006, Cl. 285-158.000.
Toyoda, Kenji, to Nippon Kogaku K. K. Photoelectric reader/printer with variable reading area. 4,626,925, Cl. 358-285.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hotta, Yasumichi; Akatsuka, Takao; Kawaguchi, Masao; Nakano, Jiro; and Ishibashi, Takao, 4,626,337, Cl. 204-429.000.
Ikemoto, Kazuhito; and Terakura, Yukio, 4,625,844, Cl. 192-53.00F.
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,625,699, Cl. 123-489.000.
Matsui, Hitoshi; and Kawahata, Fumiaki, 4,625,904, Cl. 228-168.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; Katagiri, Hidenori; Hayashi, Yoshiro; and Taguchi, Masahiro, 4,626,410, Cl. 420-590.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,626,561, Cl. 523-318.000.
Noguchi, Fujio; Oguni, Yasuo; and Shimizu, Masayuki, 4,626,006, Cl. 285-158.000.
Ohyama, Yasuo, 4,626,086, Cl. 350-632.000.
Ohyama, Yasuo, 4,626,087, Cl. 350-632.000.
Okamoto, Yuzi, 4,625,458, Cl. 49-374.000.
Onishi, Takanori, 4,625,702, Cl. 123-571.000.
Onodera, Takayoshi, 4,625,584, Cl. 74-713.000.
Takeda, Yuuji; Suematsu, Toshio; Anzai, Katsushi; and Ito, Yoshiyasu, 4,626,997, Cl. 364-431.050.
Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, to Fuji Photo Optical Co., Ltd. Endoscope having a control for image stand still and photographing the image. 4,625,714, Cl. 128-6.000.
TP Orthodontics, Inc.: *See—*
Hall, Arthur B., 4,626,208, Cl. 433-3.000.
Tractech, Inc.: *See—*
Dissett, Walter L., 4,625,585, Cl. 74-715.000.
Tracy, David H., to Perkin-Elmer Corporation, The. Plasma etching system for minimizing stray electrical discharges. 4,626,312, Cl. 156-345.000.
Trambouze, Yves: *See—*
Charmes, Michel; and Trambouze, Yves, 4,626,659, Cl. 219-343.000.
Tran, Duc: *See—*
Menor, George; Tayag, Rolando; and Tran, Duc, 4,627,089, Cl. 378-157.000.
Trans Consultants AB: *See—*
Igielska, Jadwiga, 4,625,670, Cl. 114-78.000.
Trapp, Orlin D.: *See—*
Burgess, David L.; and Trapp, Orlin D., 4,625,460, Cl. 51-125.000.
Trausch, Guenter E., to Siemens Aktiengesellschaft. Method for the manufacture of a printing element for an ink droplet printing unit. 4,626,323, Cl. 204-15.000.
Trebor Industries, Inc.: *See—*
Rosenthal, Robert D., 4,627,008, Cl. 364-550.000.
Tred-X Corporation: *See—*
Barefoot, Carlton K., 4,626,300, Cl. 156-96.000.
Tricoles, Gus P.; and Rope, Eugene L., to General Dynamics Corporation, Electronics Division. Passive synthetic aperture system for imaging a source of electromagnetic radiation. 4,626,860, Cl. 342-442.000.
Trihey, John M. Internal combustion engine. 4,625,693, Cl. 123-432.000.
Triplett, James T.: *See—*
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,626,458, Cl. 428-36.000.
Trivedi, Arvind J.; and Miller, Vincent G. Method and apparatus for coring in subaqueous structures. 4,625,813, Cl. 175-20.000.
Trogisch, Gunter: *See—*
Kober, Horst; and Trogisch, Gunter, 4,626,462, Cl. 428-137.000.
Trost, John R.; and Zenk, Daniel K., to Sperry Corporation. Priority requestor accelerator. 4,627,018, Cl. 364-900.000.
Troutman, Ronald R.: *See—*
Cottrell, Peter E.; Craig, William J.; and Troutman, Ronald R., 4,626,882, Cl. 357-23.130.
Trowbridge, Ian S.; and Omary, M. Bishr, to Salk Institute for Biological Studies, The. Hybridomas producing monoclonal antibodies specific for a human cell surface glycoprotein. 4,626,507, Cl. 435-240.000.
Trube, Hans: *See—*
Egner-Walter, Bruno; Schmid, Eckhardt; Scholl, Wolfgang; Epple, Anton; Trube, Hans; Pfeiffer, Martin; Berger, Josef; and Frey, Egon, 4,625,359, Cl. 15-250.210.
True Temper Railway Appliances, Inc.: *See—*
Fee, Graham M., 4,625,912, Cl. 238-349.000.
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Mihm, Gerhard, to Karl Thomae GmbH. Process for the preparation of 4-hydroxy-1,2-benzisothiazol-3(2H)-one-1,1-dioxide. 4,626,325, Cl. 204-59.00R.
Trutzschler GmbH & Co. KG: *See—*
Leifeld, Ferdinand, 4,625,368, Cl. 19-200.000.
TRW Cam Gears Limited: *See—*
Adams, Frederick J., 4,625,624, Cl. 91-375.00A.
TRW Inc.: *See—*
Allard, Ira L., 4,626,298, Cl. 156-55.000.
McIver, George W., 4,627,084, Cl. 377-60.000.
Szeto, Kenneth H.; and Hill, Frank A., 4,626,843, Cl. 340-825.500.
Whalen, Barry H.; and Peterson, John G., 4,627,024, Cl. 364-900.000.
TRW Probe Electronics Co. Ltd.: *See—*
Harbour, John, 4,626,041, Cl. 303-100.000.
Trzasko, Peter T.; Tessler, Martin M.; and Dirscherl, Teresa A., to National Starch and Chemical Corporation. Starch derivatives forming reversible gels. 4,626,288, Cl. 106-210.000.
Tsai, Chien F. Continuous, multi-chromatic and multi-productive press. 4,625,639, Cl. 101-181.000.
Tsai, Irving R. Method and apparatus for non-impact printing. 4,626,868, Cl. 346-1.100.
Tsai, Min H.; and Sargeant, John E., to Unitek Corporation. Orthodontic bracket with metallic coated bonding base. 4,626,209, Cl. 433-9.000.
Tsals, Izrail: *See—*
Campbell, Peter; Tsals, Izrail; and Matsuura, David, 4,626,241, Cl. 604-49.000.
Tsang, Won-Tien: *See—*
Logan, Ralph A.; and Tsang, Won-Tien, 4,627,065, Cl. 372-50.000.
Tsubakimoto Chain Co.: *See—*
Nagano, Satoshi, 4,626,231, Cl. 474-152.000.
Tsubakishita, Hiroaki: *See—*
Wada, Eiichi; Gahara, Motohiro; and Tsubakishita, Hiroaki, 4,625,565, Cl. 73-861.740.
Tsubota, Yasumasa: *See—*
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Tsuda, Hisanori: *See—*
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Hirai, Yutaka; Echizen, Hiroshi; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,626,449, Cl. 427-53.100.
Tsuji, Sadahiko: *See—*
Oshima, Sigeru; and Tsuji, Sadahiko, 4,626,076, Cl. 350-427.000.
Tsuji, Tatsuyoshi: *See—*
Tajima, Takashi; and Tsuji, Tatsuyoshi, 4,626,121, Cl. 403-27.000.
Tsujioka, Shigeo; Kanema, Seiichi; Akamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, to Hitachi, Ltd. Filled shaped generating apparatus. 4,626,838, Cl. 340-744.000.
Tsukano, Moriyoshi, to Ricoh Company, Ltd. Dry-process developer replacing and supplying device for electrophotographic recording apparatus. 4,625,895, Cl. 222-63.000.
Tsuruoka, Yoshihisa: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; and Tsuruoka, Yoshihisa, 4,626,741, Cl. 313-497.000.
Tsuruta, Masahiko: *See—*
Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, 4,626,934, Cl. 360-66.000.
Tsuruyoshi, Kenichi: *See—*
Koga, Hirofumi; Maenishi, Kozo; Kashimoto, Shuichi; Honda, Sueaki; Tsuruyoshi, Kenichi; and Sano, Takezo, 4,626,813, Cl. 335-278.000.
Tsushima, Takuya: *See—*
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Tsutsumi, Jiro; Uchiyama, Minolu; and Katagiri, Kunio, to Japan Metals and Chemicals Co., Ltd. Chemical injection tube mounting structure for a geothermal well. 4,625,797, Cl. 166-90.000.
Tsuyuguchi, Hiroshi: *See—*
Shoji, Makoto; Tsuyuguchi, Hiroshi; Toma, Shozo; Hiraki, Kazuhiro; and Morita, Tsutomu, 4,626,942, Cl. 360-97.000.
Tucker, Albert: *See—*
Gray, Kenneth; and Tucker, Albert, 4,626,658, Cl. 219-230.000.
Tuckey, Charles H., to Walbro Corporation. Fuel pressure regulator. 4,625,695, Cl. 123-463.000.
Tudor, Nicolae: *See—*
Gangnath, Robert B.; and Tudor, Nicolae, 4,625,342, Cl. 4-228.000.
Tuenkers, Josef-Gerhard. Hydraulic vibratory pile driver. 4,625,811, Cl. 173-49.000.
Tung, Randy W.; Fisher, Verner J., Jr.; Wilstermann, William D.; and Neale, Brian K., to General Motors Corporation. Vehicle sunshade structural assembly. 4,626,019, Cl. 296-97.00H.
Turner, John E., Jr. Elastic powered compressed air gun. 4,625,706, Cl. 124-67.000.
Tutin, Michael B.: *See—*
Task, Harry L.; Tutin, Michael B.; and Bothe, Gregory R., 4,625,972, Cl. 273-348.000.
Tye, Ronald G., to Minnesota Mining and Manufacturing Company. Device for reducing splash and spray from vehicles. 4,625,983, Cl. 280-154.50R.
Uchida, Seiichi, to Osaka Seihan Center Kyogyo Kumiai. Process for preparing printing plates. 4,626,097, Cl. 355-77.000.
Uchida, Tatsuro; Matsumoto, Hisayuki; and Arita, Teiji, to Daikin Industries; and Yokohama Aeroquip Co. Ltd. Corrosion-resistant, quick disconnecting coupling assembly for piping use. 4,625,761, Cl. 137-614.030.
Uchiyama, Masaki: *See—*
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,626,487, Cl. 430-109.000.
Uchiyama, Minolu: *See—*
Tsutsumi, Jiro; Uchiyama, Minolu; and Katagiri, Kunio, 4,625,797, Cl. 166-90.000.
Uda, Tsuyoshi: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Uda, Tsuyoshi; Takasaki, Yukio; Kusano, Chushirou; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,626,885, Cl. 357-31.000.
Ueda, Atsushi: *See—*
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,625,691, Cl. 123-425.000.
Ueda, Noboru, to Nippon Rubber Co., Ltd. Sports shoe. 4,625,435, Cl. 36-68.000.

Ueda, Takeo, to NSK-Warner K.K. Seat belt buckle. 4,625,371, Cl. 24-641.000.
Uehara, Tsukasa, to Canon Kabushiki Kaisha. Head shifting apparatus. 4,627,043, Cl. 369-215.000.
Uematsu, Hiroaki: *See—*
Oku, Narihiro; Usui, Seiji; Uematsu, Hiroaki; and Kohno, Takeshi, 4,626,512, Cl. 436-8.000.
Uematsu, Tadayuki, to Furukawa Electric Co., Ltd., The. Water impervious rubber or plastic insulated power cable. 4,626,619, Cl. 174-106.0SC.
Uemura, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Automatic focusing system for reading information from a recording medium. 4,627,041, Cl. 369-45.000.
Uenishi, Akira: *See—*
Sato, Takeshi; Uenishi, Akira; Yasugahira, Norio; and Hisano, Katsukuni, 4,626,174, Cl. 416-223.00A.
Ulmann Holding AG: *See—*
Ulmann, Philippe; and Schmidt, Jurg, 4,626,973, Cl. 362-277.000.
Ulmann, Philippe; and Schmidt, Jurg, to Ulmann Holding AG. Lamp junction, method of assembly thereof and lamp. 4,626,973, Cl. 362-277.000.
Umeda, Hiroyuki; and Ashida, Kazutaka, to Victor Company of Japan, Ltd. Tape loading device in a recording and/or reproducing apparatus. 4,626,938, Cl. 360-95.000.
Umezawa, Kiyoshi: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.
Umezawa, Michio: *See—*
Murai, Toshiharu; Jinnai, Koichiro; Ameyama, Minoru; and Umezawa, Michio, 4,626,874, Cl. 346-140.00R.
Uni-Charm Corporation: *See—*
Suzuki, Migaku; Sasaki, Satoshi; Mitsuno, Takashi; and Inagaki, Hiroyuki, 4,626,305, Cl. 156-164.000.
Union Camp Corporation: *See—*
Bose, Ajit K., 4,626,397, Cl. 264-565.000.
Union Carbide Corporation: *See—*
Gardner, Hugh C., 4,626,570, Cl. 525-12.000.
Jackson, John E.; Adler, Thomas A.; and Quets, Jean M., 4,626,477, Cl. 428-457.000.
Kaplan, Leonard; and Walker, Wellington E., 4,626,551, Cl. 518-701.000.
Londry, Calvin H.; and Adler, Thomas A., 4,626,476, Cl. 428-457.000.
Marsden, James G.; and Pepe, Enrico J., 4,626,560, Cl. 523-145.000.
Union Oil Company of California: *See—*
Jost, John W.; and Ghandehari, Mohammad H., 4,626,329, Cl. 204-148.000.
Switzer, Jay A., 4,626,322, Cl. 204-2.100.
Young, Donald C., 4,626,417, Cl. 423-235.000.
Unisearch Limited: *See—*
Wenham, Stuart R.; and Green, Martin A., 4,626,613, Cl. 136-255.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Duffin, Henry C.; Golding, Peter; and Jaweera-Bandara, Asoka M., 4,626,606, Cl. 568-931.000.
Glasper, John L.; and Shanks, Ian A., 4,626,840, Cl. 340-752.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Transportation in Her Britannic Majesty's Government of the: *See—*
Hopes, George D., 4,625,838, Cl. 188-181.00A.
United States Gypsum Company: *See—*
Bounini, Larbi, 4,626,199, Cl. 432-58.000.
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Air Force: *See—*
Caldwell, Robert S., 4,626,068, Cl. 350-96.340.
Cho, Frederick Y.; Adamo, Michael D.; and Leeson, David E., 4,626,775, Cl. 324-73.00R.
Task, Harry L.; Tutin, Michael B.; and Bothe, Gregory R., 4,625,972, Cl. 273-348.000.
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Barr, Thomas A., Jr.; McCracken, William E.; and McKnight, William B., 4,627,067, Cl. 372-81.000.
Brandmayr, Ronald J., 4,626,316, Cl. 156-637.000.
Hunter, Joe S., 4,625,426, Cl. 33-537.000.
Johnson, John L., 4,626,100, Cl. 356-152.000.
Energy: *See—*
Cohen, Samuel A.; Hosea, Joel C.; and Timberlake, John R., 4,626,399, Cl. 376-136.000.
Cooper, James A., 4,626,708, Cl. 307-441.000.
Farrington, Robert B.; and Pruett, James C., Jr., 4,626,832, Cl. 340-522.000.
Gavin, Basil F., 4,626,691, Cl. 250-423.00R.
Haushalter, Robert C., 4,626,296, Cl. 148-403.000.
Hays, Auda K., 4,626,448, Cl. 427-39.000.
Jassby, Daniel L.; and Micklich, Bradley J., 4,626,400, Cl. 376-146.000.
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Meldner, Heiner W.; Cusson, Ronald Y.; and Johnson, Ray M., 4,626,791, Cl. 329-109.000.
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National Aeronautics and Space Administration: *See—*
Collins, Earl R., Jr., 4,626,046, Cl. 305-36.000.
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,626,593, Cl. 546-339.000.
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Ceniza, Rogelio R., 4,625,619, Cl. 89-1.570.
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McManis, George E., III; Bratcher, John O.; and Dettling, Ronald F., 4,626,611, Cl. 136-212.000.
Richter, Herbert P.; and Johnson, Joseph H., 4,626,383, Cl. 252-700.000.
Walker, Basil E., Jr., 4,626,369, Cl. 252-62.900.
Weinhardt, Robert A., 4,626,764, Cl. 320-9.000.
U.S. Philips Corporation: *See—*
Breimer, Hendrik, 4,626,914, Cl. 358-148.000.
Coulmance, Jean-Pierre, 4,626,626, Cl. 379-394.000.
Dammann, Hans; and Killat, Ulrich, 4,626,069, Cl. 350-162.200.
Gerlach, Hans G., 4,626,738, Cl. 313-414.000.
Hensing, Johannes M. M.; and Munnig Schmidt, Robert H., 4,626,717, Cl. 310-36.000.
Hutterer, Heribert; and Veigl, Johann, 4,626,937, Cl. 360-90.000.
Janson, Jan, 4,626,727, Cl. 310-156.000.
Knochel, Reinhard, 4,627,104, Cl. 455-327.000.
Mansell, John R., 4,626,736, Cl. 313-399.000.
Martens, Gerhard; and Liehr, Manfred R., 4,626,680, Cl. 250-231.00P.
Nguyen Minh, Chau; and Vertongen, Bernard, 4,626,880, Cl. 357-23.400.
Pelgrom, Marcellinus J. M.; Harwig, Hendrik A.; and Slotboom, Jan W., 4,627,082, Cl. 377-60.000.
Pelgrom, Marcellinus J. M.; and Slotboom, Jan W., 4,627,083, Cl. 377-60.000.
Persoon, Eric H. J.; Vandenbulcke, Christian J. B. O. E.; Odijk, Eddy A. M.; and Stikvoort, Eduard F., 4,627,021, Cl. 364-900.000.
Rammos, Emmanuel, 4,626,865, Cl. 343-786.000.
Readhead, John B., 4,625,389, Cl. 29-572.000.
Renninger, Siegfried, 4,626,987, Cl. 364-200.000.
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Vredenbregt, Jakob; Van Gerwen, Johannes W. C. M.; de Leeuw, Petrus H.; and Vleeskens, Franciscus T., 4,626,014, Cl. 294-88.000.
United Technologies Corporation: *See—*
Adams, Don L.; Wright, Stuart C.; Fischer, William C.; and Verzella, David J., 4,626,998, Cl. 364-434.000.
Carter, Donald R., Sr.; Krauss, Timothy A.; and Sedlak, Matthew, 4,626,171, Cl. 416-90.00A.
Hsing, Frederick F.; and Leogrande, John A., 4,626,169, Cl. 416-95.000.
McBrien, Gregory J., 4,626,759, Cl. 318-689.000.
Prewo, Karl M.; and Brennan, John J., 4,626,461, Cl. 428-113.000.
Veltri, Richard D.; and Galasso, Francis S., 4,626,407, Cl. 419-18.000.
Unitek Corporation: *See—*
Tsai, Min H.; and Sargeant, John E., 4,626,209, Cl. 433-9.000.
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van Dyk Soerewyn, Herman F., 4,626,478, Cl. 428-596.000.
Universal Instruments Corporation: *See—*
Zepek, Albert W.; Orzelek, Frank J.; and Dunlap, Charles, 4,625,399, Cl. 29-845.000.
University of California, The Regents of the: *See—*
Hirschfeld, Tomas B., 4,626,693, Cl. 250-458.100.
Wudl, Fred; Heeger, Alan J.; and Dirk, Carl W., 4,626,586, Cl. 528-374.000.
University of Iowa Research Foundation: *See—*
Stwalley, William C.; and Koch, Mark E., 4,627,066, Cl. 372-57.000.
University of Minnesota, The Regents of the: *See—*
Gleason, Florence K., 4,626,271, Cl. 71-66.000.
Unruh, Rudy R.; Lamb, James A.; and Tejral, Richard A., to Valmont Industries, Inc. Remote computer control for irrigation systems. 4,626,984, Cl. 364-132.000.
Uomori, Akiyoshi: *See—*
Takeda, Akimichi; and Uomori, Akiyoshi, 4,626,647, Cl. 219-97.000.
UOP Inc.: *See—*
Schick, David L.; Schumann, Gary M.; and Dolejs, Charles A., 4,625,763, Cl. 137-625.150.
Verachtert, Thomas A., 4,626,341, Cl. 208-235.000.
Uphus, Arnold, to Westfalia Separator AG. Device for separating solids from liquids. 4,626,349, Cl. 210-250.000.
Urai, Muneharu; and Abe, Tadafumi, to Tachikawa Spring Co. Ltd. Seat cushion with welt. 4,625,350, Cl. 5-448.000.
Urlik, Randall G., to Goldberg Brothers, Inc. Film winding and rewinding apparatus. 4,625,930, Cl. 242-67.30R.
Urma Aktiengesellschaft: *See—*
Berner, Willy, 4,626,144, Cl. 408-143.000.
Ushiyama, Hisayuki: *See—*
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.
Usleman, Robert T.: *See—*
Scheitlin, George E.; Sickels, Mark A.; and Usleman, Robert T., 4,625,511, Cl. 60-299.000.

Usui, Koichi; Sato, Teiji; Tanaka, Masanori; Mizoguchi, Yasuo; and Takahashi, Noriyuki, to Mizusawa Industrial Chemicals, Ltd. Synthetic fraipontite and process for preparation thereof. 4,626,420, Cl. 423-326.000.
Usui, Seiji: *See—*
Oku, Narihiro; Usui, Seiji; Uematsu, Hiroaki; and Kohno, Takeshi, 4,626,512, Cl. 436-8.000.
Vale, Wylie W., Jr.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. GRF analogs II. 4,626,523, Cl. 514-12.000.
Valente, Peter; Rocco, Matthew A.; and Rocco, Barbara B., to Matthew & Barbara Rocco Cheese segmenter. 4,625,404, Cl. 30-114.000.
Valentine, Gordon A.; and Gale, Edwin J., to Stanley Aviation Corporation. Remotely-operable ball joint connector. 4,625,999, Cl. 285-24.000.
Valeo: *See—*
Minet, Michel, 4,626,643, Cl. 219-10.55B.
Valeo - Societe Anonyme Francais: *See—*
Cadars, Patrick, 4,623,793, Cl. 165-151.000.
Valley, David P.; and Ryan, Allan, to Analog Devices, Inc. Voltage/-current source. 4,626,769, Cl. 323-283.000.
Valls, Jose E.: *See—*
Vassallo, Efrain D.; and Valls, Jose E., 4,625,383, Cl. 29-445.000.
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Aula, Jouko; and Kerttula, Raima, 4,625,430, Cl. 34-13.000.
Valmont Industries, Inc.: *See—*
Unruh, Rudy R.; Lamb, James A.; and Tejral, Richard A., 4,626,984, Cl. 364-132.000.
Vanaschen, Luc: *See—*
Aubry, Claude; Chaumette, Jacques; Letemps, Bernard; Petitcollin, Jean-Marc; Gatzweiler, Werner; Rissmann, Heinz-Bernd; Vanaschen, Luc; and Zeitzen, Jurgen, 4,626,207, Cl. 432-253.000.
Van Avermaete, Gilbert L. Ch. H. L. Internal combustion engine. 4,625,684, Cl. 123-48.00A.
Vanden Brink, Donald J., to Tannewitz, Inc. Vertical cutoff saw with feed rate control. 4,625,603, Cl. 83-74.000.
Vandenbulcke, Christian J. B. O. E.: *See—*
Persoon, Eric H. J.; Vandenbulcke, Christian J. B. O. E.; Odijk, Eddy A. M.; and Stikvoort, Eduard F., 4,627,021, Cl. 364-900.000.
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van der Heijden, Bernardus F., to U.S. Philips Corporation. Microwave arrangement for heating material. 4,626,640, Cl. 219-10.55A.
van der Loos, Jozef L. M.: *See—*
Ashida, Kaneyoshi; and van der Loos, Jozef L. M., 4,626,385, Cl. 540-451.000.
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., to GTE Products Corporation. Recovery of tungsten, scandium, iron, and manganese from tungsten bearing material. 4,626,280, Cl. 75-101.00R.
Vanderpool, Clarence D.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,626,425, Cl. 423-593.000.
Van Dyk, Garritt C., Jr., to Keene Corporation. RF expansion joint for an electrically sealed enclosure. 4,626,615, Cl. 174-35.0MS.
van Dyk Soerewyn, Herman F., to Unitrode Corporation. Electronic circuit device components having integral spacers providing uniform thickness bonding film. 4,626,478, Cl. 428-596.000.
Van Dyke, Korbin S.: *See—*
Burleson, Wayne P.; Wagner, Lawrence F.; and Van Dyke, Korbin S., 4,626,825, Cl. 340-347.0DD.
Van Gerwen, Johannes W. C. M.: *See—*
Vredenbregt, Jakob; Van Gerwen, Johannes W. C. M.; de Leeuw, Petrus H.; and Vleeskens, Franciscus T., 4,626,014, Cl. 294-88.000.
Van Gilluwe, Frank L.; Dunham, Samuel B.; and Cross, Douglas A., to Teledex. Telephone line selector for use with a PBX. 4,626,627, Cl. 379-214.000.
Van Howard, Johnny. Welding ring gauge. 4,625,414, Cl. 33-180.00R.
van Tran, Hiep, to Thomson Components-Mostek Corporation. CMOS memory arrangement. 4,627,031, Cl. 365-190.000.
Van Zeeland, Donald L., to Eaton Corporation. Through-beam optical detector system with alignment aid. 4,626,683, Cl. 250-239.000.
Varco International, Inc.: *See—*
Boyadjieff, George I., 4,625,796, Cl. 166-77.500.
Vasquez, Eduardo C. Goldsmith's wax ring pre-form sizing tool. 4,626,145, Cl. 403-196.000.
Vassallo, Efrain D.; and Valls, Jose E., to Vassallo Research and Development Corporation. Method for seating a gasket in a plastic pipe bell using a hard configured ring. 4,625,383, Cl. 29-445.000.
Vassallo Research and Development Corporation: *See—*
Vassallo, Efrain D.; and Valls, Jose E., 4,625,383, Cl. 29-445.000.
VEB Edelstahlwerk "8 Mai 1945" Freital: *See—*
Esser, Fred; Klopper, Detlev; Lachner, Walter; and Scharf, Gerhard, 4,626,654, Cl. 219-121.0PR.
VEB "Otto Buchwitz": *See—*
Bohme, Klaus; Seibt, Gunter; and Sieber, Klaus, 4,626,059, Cl. 339-143.00C.
VEB Werk fuer Fernsehelektronik: *See—*
Demus, Dietrich; Frach, Roger; Deutscher, Hans-Joachim; and Zaschke, Horst, 4,626,375, Cl. 252-299.630.
Vega Precision Laboratories, Inc.: *See—*
Fleming, Robert F., III; and Irby, Raymond F., 4,627,075, Cl. 375-23.000.
Veigl, Johann: *See—*
Hutterer, Heribert; and Veigl, Johann, 4,626,937, Cl. 360-90.000.
Velo-Bind, Inc.: *See—*
Hymmen, Karl, 4,625,996, Cl. 281-21.00A.
Veltri, Richard D.; and Galasso, Francis S., to United Technologies Corporation. Method of making amorphous boron carbon alloy cutting tool bits. 4,626,407, Cl. 419-18.000.
Venkatesan, Valadi N., to Mobil Oil Corporation. Method of recovering medium or high gravity crude oil. 4,625,800, Cl. 166-256.000.
Vera, Samuel I., to Mobil Oil Corporation. Method and apparatus for extending ventilation ductwork. 4,625,631, Cl. 98-50.000.
Verachtert, Thomas A., to UOP Inc. Process for mercaptan extraction from olefinic hydrocarbons. 4,626,341, Cl. 208-235.000.
Verbatim Corporation: *See—*
Brock, George W.; Mroz, Edward; Janning, Robert J., Jr.; and Rogers, Robert S., 4,626,949, Cl. 360-133.000.
Verkade, John G., to Iowa State University Research Foundation. Medical drainage apparatus. 4,626,246, Cl. 604-174.000.
Versaw, Douglas P., to Thermo-O-Disc, Incorporated. Sealed thermostat for use in defrost control systems. 4,626,821, Cl. 337-380.000.
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Verzella, David J.: *See—*
Adams, Don L.; Wright, Stuart C.; Fischer, William C.; and Verzella, David J., 4,626,998, Cl. 364-434.000.
Vetter, Eng H.; and Schanz, Karl-Heinrich, to Roehm GmbH Chemische Fabrik. Process for the production of extruded web multiple panel with undulated webs. 4,626,398, Cl. 264-566.000.
Vetter, Ulrich, to Schaudt Maschinenbau GmbH. Method and apparatus for positioning work supporting units in grinding machines. 4,625,461, Cl. 51-165.770.
Viaud, Jean: *See—*
Gerhardt, Ralph A.; and Viaud, Jean, 4,625,502, Cl. 56-341.000.
Vickers, Incorporated: *See—*
Gunda, Rajamouli; and Rode, Melvin A., 4,625,622, Cl. 91-36.000.
Victaulic Company PLC, The: *See—*
Ansell, Donald J., 4,626,308, Cl. 156-257.000.
Victor Company of Japan, Ltd.: *See—*
Hirota, Akira; Tsushima, Takuya; and Suzuki, Nobuyoshi, 4,626,927, Cl. 358-310.000.
Ichinoi, Yutaka; and Nishimoto, Naomichi, 4,626,929, Cl. 358-310.000.
Ishigaki, Yukinobu, 4,626,788, Cl. 328-165.000.
Kitamura, Masatsugu; Tanaka, Mitsuaki; and Takekura, Hiroyuki, 4,626,827, Cl. 340-347.0SH.
Shigeta, Masanobu; Mizukami, Makoto; and Nishihara, Toshikazu, 4,626,480, Cl. 428-694.000.
Sugiyama, Hiroyuki, 4,626,930, Cl. 358-342.000.
Umeda, Hiroyuki; and Ashida, Kazutaka, 4,626,938, Cl. 360-95.000.
Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, 4,626,934, Cl. 360-66.000.
Vida, Denes, to Egyesult Izzolempa os Villamossagi Rt. High-pressure sodium lamp. 4,626,743, Cl. 313-571.000.
Vida, Zoltan: *See—*
Nemeth, Jozsef; Belley, Laszlo ; Gergo, Gyorgy; Sebestyen, Bela; and Vida, Zoltan, 4,626,031, Cl. 299-16.000.
Vinai, Mario. Rescue and securing harness integrally affixed to a garment. 4,625,335, Cl. 2-69.000.
Vinal, Albert W., to International Business Machines Corporation. Twin track vertical read-write head structure. 4,626,946, Cl. 360-113.000.
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Curtis, Donald E.; Vincent, James P.; and Weidmann, Mary E., 4,626,836, Cl. 340-706.000.
Virginia Panel Corporation: *See—*
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Virnig, Michael J.; Clark, James P.; and DiDomenico, Edward D., to Henkel Corporation. Acryloxymethyl substituted fatty compounds. 4,626,582, Cl. 526-298.000.
Vitafin N.V.: *See—*
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Vleeskens, Franciscus T.: *See—*
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Vlnaty, Joseph: *See—*
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VLSI Technology, Inc.: *See—*
Burleson, Wayne P.; Wagner, Lawrence F.; and Van Dyke, Korbin S., 4,626,825, Cl. 340-347.0DD.
Vock, Manfred H.: *See—*
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Voege, Herbert: *See—*
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Voigt, Ulrich, to Siemens Aktiengesellschaft. Plug-in and pulling tool. 4,625,397, Cl. 29-739.000.
Von Roll AG: *See—*
Brungger, Walter; and Cerny, Peter A., 4,625,660, Cl. 110-165.00R.
von der Embse, Urban A., to Hughes Aircraft Company. Method and apparatus for acquiring and tracking a communications signal. 4,627,079, Cl. 375-96.000.
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Davenport, John M.; and von Herrmann, Pieter J., 4,626,745, Cl. 315-179.000.
Von Kohorn, Henry. Device for illuminating centripetally viewed three-dimensional objects in wet locations. 4,626,968, Cl. 362-122.000.
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Michaud, Horst; Raveling, Hermann; and von Seyerl, Joachim, 4,626,270, Cl. 71-28.000.
von und zu Aufsess, Freidrich: *See—*
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Vredenbregt, Jakob; Van Gerwen, Johannes W. C. M.; de Leeuw, Petrus H.; and Vleeskens, Franciscus T., to U.S. Philips Corporation. Gripper having gripper arms supported in a rotatable sliding guide. 4,626,014, Cl. 294-88.000.
W & A Bates Limited: *See—*
Pointon, Ronald H.; and Nightingale, Allen F., 4,626,104, Cl. 366-162.000.
W. Schlafhorst & Co.: *See—*
Raasch, Hans; and Wassenhoven, Heinz-Georg, 4,625,505, Cl. 57-401.000.
Slaghuis, Hermann; and Bender, Heinz G., 4,625,929, Cl. 242-18.100.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Klatt, Alfred, 4,625,841, Cl. 192-3.630.
Wada, Eiichi; Gahara, Motohiro; and Tsubakishita, Hiroaki, to Sinko Kogyo Co., Ltd. Wind velocity sensor. 4,625,565, Cl. 73-861.740.
Wada, Masatoshi; Matsubara, Shigekazu; Moritsu, Yukikazu; and Sakai, Tetsuo, to Okuno Chemical Industries Co., Ltd.; and Nippon Hoso Kyokai. Optical filter made of inorganic material for red light. 4,626,071, Cl. 350-311.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Method of manufacturing low temperature sintered ceramic materials for use in solid dielectric capacitors or the like. 4,626,393, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Method of manufacturing low temperature sintered ceramic materials for use in solid dielectric capacitors or the like. 4,626,394, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Method of manufacturing low temperature sintered ceramic materials for use in solid dielectric capacitors or the like. 4,626,395, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Method of manufacturing low temperature sintered ceramic materials for use in solid dielectric capacitors of the like. 4,626,396, Cl. 264-65.000.
Wagner, John S.: *See—*
Feldman, Martin; Reece, David N.; and Wagner, John S., 4,626,103, Cl. 356-363.000.
Wagner, Lawrence F.: *See—*
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Waibel, Terry J.: *See—*
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Waitkus, Phillip A.; and Korb, Louis L., to Plastics Engineering Company. Process for producing a molded product and the molded product produced thereby. 4,626,569, Cl. 524-541.000.
Wakamiya, Katsutoshi: *See—*
Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, 4,626,490, Cl. 430-138.000.
Wakasa, Jack Y.: *See—*
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Wakayama, Katsuhiko; and Harada, Hiraku, to TDK Corporation. Magnetic fluid. 4,626,370, Cl. 252-62.520.
Waki, Kokichi; and Karino, Yukio, to Fuji Photo Film Co., Ltd. Hardened color diffusion transfer photographic materials. 4,626,494, Cl. 430-213.000.
Wako, Noriaki: *See—*
Sato, Kuniaki; Muto, Shinichiro; and Wako, Noriaki, 4,626,195, Cl. 431-188.000.
Walbro Corporation: *See—*
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Waldman, Herbert H., to Orenbuch, Louis. Telephone call forwarding device. 4,626,630, Cl. 379-199.000.
Waldorf, Allan J.: *See—*
Dobrowolski, Jerzy A.; and Waldorf, Allan J., 4,626,445, Cl. 427-7.000.
Waldvogel, Robert: *See—*
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Walhaug, Warren W.; and Moore, Boyd B., to Shell Western E&P Inc. Method and apparatus for injecting well treating liquid into the bottom of a reservoir interval. 4,625,803, Cl. 166-310.000.
Walker, Basil E., Jr., to United States of America, Navy. Lead zirconate titanate ceramics. 4,626,369, Cl. 252-62.900.
Walker, James A. Oxygen-fuel welding and cutting cabinet assembly. 4,625,949, Cl. 266-48.000.
Walker, Wellington E.: *See—*
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Waller, John E.: *See—*
Nemes, John J.; Thompson, Harvey W.; and Waller, John E., 4,626,411, Cl. 422-13.000.
Wallis, F. Patrick. Length-measuring attachment for chain saw. 4,625,407, Cl. 30-383.000.
Wallroth, Carl-Friedrich: *See—*
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Walter Scheele GmbH & Co. KG: *See—*
Mertens, Heinz, 4,625,760, Cl. 137-615.000.
Wampler, Richard K., to Nimbus, Inc. High-capacity intravascular blood pump utilizing percutaneous access. 4,625,712, Cl. 128-1.00D.
Wang, Chen-Shih; and Nelson, Darrel S., to General Motors Corporation. Microwave method of curing a thermoset polymer. 4,626,642, Cl. 219-10.55M.
Wang Laboratories, Inc.: *See—*
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Wankel, Felix, to Wankel, Felix; and Aisin Seiki Co., Ltd. External shaft rotary piston machine. 4,626,182, Cl. 418-191.000.
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Warhol, Nicholas, to Minnesota Mining and Manufacturing Company. Mounting structure for security strip. 4,626,459, Cl. 428-40.000.
Warin, Francis J., to ARES, Inc. Compact foldable gun. 4,625,621, Cl. 89-197.000.
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Warner, David J.: *See—*
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Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Herrmann, Manfred; Fritschi, Edgar; and Steinbrecher, Wolfgang, 4,626,546, Cl. 514-429.000.
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Watanabe, Akira; Takeuchi, Yoshimitsu; Tokuda, Hiroyasu; Kihara, Seiji; Makino, Yasuhiro; and Kamegawa, Keiji, to Kyushu Refractories Co., Ltd. Good aesthetic artificial dental materials by calcium phosphate glass-ceramic. 4,626,514, Cl. 501-10.000.
Watanabe, Hiroshi: *See—*
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Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. High toughness sintered bodies. 4,626,517, Cl. 501-96.000.
Watanabe, Masakazu; Iio, Satoshi; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. Method for manufacturing high toughness sintered bodies. 4,626,518, Cl. 501-104.000.
Watanabe, Masakazu: *See—*
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Watanabe, Norio: *See—*
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Watanabe, Yoshio: *See—*
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Watson, David B., to Cooper Industries, Inc. Method of breaking out and terminating fiber optic elements from a multifiber cable. 4,626,067, Cl. 350-96.200.
Watson, Talmadge G. Squirrel skinning apparatus. 4,625,363, Cl. 17-44.200.
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Wehmeyer, Donald T.; Barnhart, Ronald W.; and Beymer, Craig, to Economy Engineering, Inc. Work platform centering apparatus. 4,625,830, Cl. 182-19.000.
Weidmann, Mary E.: *See—*
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Weigel, Paul H., to Board of Regents, University of Texas. Dihydroxyacryl. 4,626,571, Cl. 525-54.100.
Weigel, Paul H., to Board of Regents, University of Texas. Dihydroxyacryl. 4,626,581, Cl. 526-288.000.
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Weiner, Hans: *See—*
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Weisberg, Renee; and Krebaum, Lawrence J., to Weisberg, Renee. Compositions and process for applying protective covering and extensions to fingernails. 4,626,428, Cl. 424-61.000.
Weitemeyer, Christian: *See—*
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Wenham, Stuart R.; and Green, Martin A., to Unisearch Limited. Laser grooved solar cell. 4,626,613, Cl. 136-255.000.
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Williams, Bertrand J., to Advanced Micro Devices, Inc. ECL slave reference generator. 4,626,771, Cl. 323-349.000.
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Wilson, Edward G.; and Bloor, David, to QMC Industrial Research Limited. Information holding device. 4,627,029, Cl. 365-107.000.
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Woolf, Stephen R. Programmable multi-function feedback cooking apparatus. 4,626,662, Cl. 219-501.000.

Worbois, Robert J., to American Standard Inc. Railway vehicle penalty brake control system. 4,626,039, Cl. 303-19.000.

Wortley, Michael, to Sunbeam Plastics Corporation. Metering dispensers. 4,625,897, Cl. 222-205.000.

Wright, Charles W. Modular furniture design aid. 4,626,218, Cl. 434-73.000.

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Wurtman, Richard J.; Conlay, Lydia; and Blusztajn, Krzysztof, to Massachusetts Institute of Technology. Process for utilizing choline to sustain muscular performance. 4,626,527, Cl. 514-78.000.

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Yagi, Yasuomi; Takahashi, Ken; and Nemoto, Takeo, to Hitachi, Ltd. Superconducting device. 4,625,520, Cl. 62-45.000.

Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, to Yuwa Sangyo Kabushiki Kaisha; and Nippon Steel Corporation. Apparatus for wrapping the end surface of cylindrical object. 4,625,493, Cl. 53-378.000.

Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Conveyor in plastic working machine. 4,625,540, Cl. 72-405.000.

Yamada, Mikio, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,625,964, Cl. 273-62.000.

Yamada, Mitsuhiko, to Dainippon Screen Manufacturing Co., Ltd. Method and system for processing a border pixel. 4,626,902, Cl. 358-75.000.

Yamada, Seiji, to Ishida Scales Mfg. Co, Ltd. Combinatorial weighing method. 4,627,012, Cl. 364-567.000.

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Yamaguchi, Yoshimitsu; Suzuki, Masanori; and Shibata, Tadahiko, to Nippondenso Co., Ltd. Device for loading products to a predetermined location. 4,625,499, Cl. 53-542.000.

Yamaji, Hiroshi: *See—*
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Yamaki, Yooji; and Sakai, Shigenori, to Hitachi, Ltd. Method of repairing semiconductor memory. 4,627,053, Cl. 371-10.000.

Yamamoto, Goki: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Lens mount with built-in motor. 4,626,077, Cl. 350-429.000.

Yamamoto, Masakazu; Masaki, Akira; and Kamikawai, Ryotaro, to Hitachi, Ltd. Stacked differentially driven transmission line on integrated circuit. 4,626,889, Cl. 357-71.000.

Yamamoto, Shigehiko; Taguchi, Sadanori; and Aida, Toshiyuki, to Hitachi, Ltd. Impregnated cathode. 4,626,470, Cl. 428-336.000.

Yamamoto, Yoichi; and Mori, Yuichirou, to Sharp Kabushiki Kaisha. Dual density two-sided thermal head. 4,626,870, Cl. 346-76.0PH.

Yamanaka, Junichi, to Kabushiki Kaisha Toshiba. White balance adjusting system for plural color television cameras. 4,626,893, Cl. 358-29.000.

Yamanouchi, Hiroshi: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Yamanouchi, Kouichi: *See—*
Scherer, Kirby V., Jr.; Ono, Taizo; and Yamanouchi, Kouichi, 4,626,608, Cl. 570-134.000.

Yamaoka, Nobutatsu: *See—*
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,393, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,394, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,395, Cl. 264-65.000.
Wada, Takeshi; Nakamura, Hiroshi; Fukui, Masami; and Yamaoka, Nobutatsu, 4,626,396, Cl. 264-65.000.

Yamashita, Ichiro; Hase, Hiroyuki; and Ise, Yukihiko, to Matsushita Electric Industrial Co., Ltd. Amorphous magnetic alloy sensor. 4,625,562, Cl. 73-728.000.

Yamashita, Kiyoshi, to Kabushiki Kaisha Toshiba. Cylinder pump. 4,625,572, Cl. 73-864.160.

Yamashita, Kunio: *See—*
Harada, Yutaka; Yamashita, Kunio; Kotera, Nobuo; and Kawabe, Ushio, 4,626,701, Cl. 307-245.000.

Yamauchi, Kiyoshi: *See—*
Osozawa, Koichiro; Nemoto, Rikio; Fujiwara, Yoshito; Okazaki, Tomoaki; Miura, Yasuhiro; and Yamauchi, Kiyoshi, 4,626,408, Cl. 420-442.000.

Yamauchi, Mineo: *See—*
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,626,256, Cl. 8-471.000.

Yamazaki, Masuo; Wakamiya, Katsutoshi; Matsumoto, Toru; Ohsaki, Ichiro; Nakahara, Toshiaki; and Ushiyama, Hisayuki, to Canon Kabushiki Kaisha. Encapsulated toner. 4,626,490, Cl. 430-138.000.

Yamazaki, Tomio: *See—*
Tanaka, Motoaki; Kajitani, Makoto; and Yamazaki, Tomio, 4,626,384, Cl. 540-306.000.

Yanagishima, Fumiya: *See—*
Taniguchi, Shigeki; Furukawa, Kusuo; Yanagishima, Fumiya; and Sasaki, Hiroaki, 4,626,651, Cl. 219-121.0LC.

Yanase, Masataka: *See—*
Okumura, Takuzo; Yanase, Masataka; and Kikui, Hitoshi, 4,626,304, Cl. 156-163.000.

Yang, Tai-Her. Workbench and clamp structure. 4,625,951, Cl. 269-88.000.

Yang, Tsen-Shau: *See—*
Allen, Michael; and Yang, Tsen-Shau, 4,626,706, Cl. 307-272.00A.

Yashiro, Kenji, to Pioneer Electronic Corp. Switching circuit for memory devices. 4,627,035, Cl. 365-230.000.

Yasuda, Tomohiko: *See—*
Ichiyama, Shuichi; Aoyagi, Yukio; and Yasuda, Tomohiko, 4,627,013, Cl. 364-567.000.

Yasuda, Wataru: *See—*
Sakamoto, Koji; Kaneko, Toshio; Kanno, Fuchio; and Yasuda, Wataru, 4,625,676, Cl. 118-657.000.

Yasugahira, Norio: *See—*
Sato, Takeshi; Uenishi, Akira; Yasugahira, Norio; and Hisano, Katsukuni, 4,626,174, Cl. 416-223.00A.

Yasuhara, Seishi, to Nissan Motor Company, Limited. Device for sensing damage to a cogged belt. 4,626,230, Cl. 474-106.000.

Yatsuo, Tsutomu: *See—*
Nagano, Takahiro; Yatsuo, Tsutomu; Oikawa, Saburo; and Horie, Akira, 4,626,888, Cl. 357-38.000.

Yokata, Masato: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Yokohama Aeroquip Co. Ltd.: *See—*
Uchida, Tatsuro; Matsumoto, Hisayuki; and Arita, Teiji, 4,625,761, Cl. 137-614.030.

Yokoyama, Kenichi: *See—*
Azuma, Siro; Yokoyama, Kenichi; and Kitai, Tatsuya, 4,626,964, Cl. 361-433.000.

Yoneda, Hiroshi: *See—*
Tanno, Satoshi; Koma, Hachiro; Aoki, Yukichi; Ito, Hironori; Yoneda, Hiroshi; and Aoyama, Shigeo, 4,625,378, Cl. 29-157.30A.

Yonemura, Hideo: *See—*
Okada, Kenichi; Asao, Hiroshi; and Yonemura, Hideo, 4,625,533, Cl. 72-302.000.

Yoneyama, Mitsugu: *See—*
Tsujioka, Shigeo; Kanema, Seiichi; Okamura, Eiji; Umezawa, Kiyoshi; Ooyama, Mitsuo; Aoshima, Toshihisa; and Yoneyama, Mitsugu, 4,626,838, Cl. 340-744.000.

Yoshida, Hideo: *See—*
Hashimoto, Shintaro; and Yoshida, Hideo, 4,627,093, Cl. 381-51.000.

Yoshida Kogyo K. K.: *See—*
Fukuroi, Takeo; Takahashi, Kihei; and Inazawa, Keichi, 4,625,370, Cl. 24-599.000.
Kando, Akiyoshi, 4,625,398, Cl. 29-768.000.

Yoshida Kogyo K.K.: *See—*
Ikemura, Akio; and Kajiki, Minoru, 4,625,628, Cl. 98-32.000.
Kaminaga, Hiromitsu, 4,625,482, Cl. 52-235.000.
Osaki, Tatsuo, 4,625,375, Cl. 29-33.200.
Shirakawa, Hiroshi; and Imai, Shigeru, 4,625,382, Cl. 29-408.000.

Yoshida, Masajhi; Hirota, Akira; Ota, Yoshihiko; Tsuruta, Masahiko; and Ozaki, Hidetoshi, to Victor Company of Japan, Ltd. Cue signal recording circuit for magnetic recording and reproducing apparatus. 4,626,934, Cl. 360-66.000.

Yoshida, Shotaro: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Yoshida, Shotaro; Niwa, Toshio; Takahashi, Toru; Kataoka, Keiichiro; and Yamanouchi, Hiroshi, 4,626,618, Cl. 174-105.0SC.

Yoshida, Tadashi, to Canon Kabushiki Kaisha. Image processing apparatus. 4,626,923, Cl. 353-283.000.

Yoshida, Toshihiro: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.

Yoshida, Toshinori: *See—*
Nanba, Tadashige; Tokita, Yasuo; Fukuzawa, Tetsuo; Shiota, Mitsushige; Yoshida, Toshinori; Yokata, Masato; Ichida, Kozaburo; Nagira, Norichika; Yamamoto, Goki; and Mitsuzuka, Masashi, 4,625,431, Cl. 34-62.000.

Yoshida, Toshiro: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,443, Cl. 426-602.000.
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,626,444, Cl. 426-602.000.

Yoshihara, Akio: *See—*
Kawai, Yoichi; Abe, Masaru; Sekiguchi, Katsumi; Yoshihara, Akio; and Hayashi, Shigeru, 4,626,565, Cl. 524-423.000.

Yoshinari, Tsuneo: *See—*
Narishige, Shinji; Yoshinari, Tsuneo; Sato, Mituo; Takagi, Masayuki; Nagaike, Sadanori; Yoshida, Toshihiro; and Mitsuoka, Katsuya, 4,626,947, Cl. 360-126.000.

Yoshino, Kazuo, to Sansui Electric Co., Ltd. Relative velocity control device for magnetic recording and reproducing apparatus. 4,626,936, Cl. 360-70.000.

Yoshioka, Toshiharu: *See—*
Nakano, Yasuo; and Yoshioka, Toshiharu, 4,625,985, Cl. 280-276.000.

Younes, Usama E., to Atlantic Richfield Company. Flame-retardant molded composition incorporating a poly(N-(bromophenyl)maleimide-co-styrene-co-maleic anhydride) copolymer. 4,626,573, Cl. 525-148.000.

Young, Archie R.: *See—*
Chianelli, Russell R.; Ho, Teh C.; Jacobson, Allan J.; and Young, Archie R., 4,626,339, Cl. 208-18.000.

Young, Donald C., to Union Oil Company of California. Methods for chemically reducing nitrogen oxides. 4,626,417, Cl. 423-235.000.

Yu, Chin-Lai. Movable surface global puzzle. 4,625,967, Cl. 273-153.00S.

Yuen, Raymond C., to Applied Micro Circuits Corporation. Flip-flop control circuit. 4,627,085, Cl. 377-81.000.

Yumoto, Yoshiji: *See—*
Nozue, Ikuo; Tomomitsu, Osahiko; Yumoto, Yoshiji; and Matsumura, Yoshio, 4,626,556, Cl. 522-99.000.

Yung, Anthony: *See—*
Ramsaran, Johann D.; Biray, Bora; Nizamuddin, Nadir; and Yung, Anthony, 4,626,628, Cl. 379-283.000.

Yuwa Sangyo Kabushiki Kaisha: *See—*
Yagi, Yoshio; Kondo, Toshihiko; Matsubara, Norio; Miyazaki, Shoichiro; Seya, Atsumi; Matsunami, Akira; and Fujiwara, Keizo, 4,625,493, Cl. 53-378.000.

Z-Loda Corporation: *See—*
Kuehl, Guenther L., 4,625,857, Cl. 198-465.100.

Zacky, Ralf G.; and Alexander, Gordon L., to Aspects, Inc. Connector system for furniture panels. 4,625,483, Cl. 52-239.000.

Zaderej, Andrew. Power control circuit. 4,626,746, Cl. 315-208.000.

Zahn, Daniel P. Safety rain suit. 4,625,337, Cl. 2-82.000.

Zak, Bennie: *See—*
Artiss, Joseph D.; and Zak, Bennie, 4,626,511, Cl. 436-8.000.

Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., to General Foods Corporation. 3-hydroxy-4-alkyloxyphenyl heterocyclic aromatic carboxylates. 4,626,442, Cl. 426-548.000.

Zaschke, Horst: *See—*
Demus, Dietrich; Frach, Roger; Deutscher, Hans-Joachim; and Zaschke, Horst, 4,626,375, Cl. 252-299.630.

Zato, Thomas J., to Zenith Electronics Corporation. Remote control transmitter system. 4,626,847, Cl. 340-825.560.

Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,626,259, Cl. 44-57.000.

Zeeff, Thomas J.: *See—*
Deichmann, Helmut; and Zeeff, Thomas J., 4,625,854, Cl. 198-416.000.

Zeewy, Abraham: *See—*
Davis, William H.; Goba, John J.; Riggs, Dean D.; Zeewy, Abraham; and Flint, Howard M., 4,626,669, Cl. 235-380.000.

Zeiler, Hans-Joachim: *See—*
Angerbauer, Rolf; Boberg, Michael; Kinast, Gunther; Metzger, Karl G.; Schrock, Wilfried; and Zeiler, Hans-Joachim, 4,626,535, Cl. 514-203.000.
Benz, Gunter; Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; and Zeiler, Hans-Joachim, 4,626,525, Cl. 514-18.000.

Zeitzen, Jurgen: *See—*
Aubry, Claude; Chaumette, Jacques; Letemps, Bernard; Petitcollin, Jean-Marc; Gatzweiler, Werner; Rissmann, Heinz-Bernd; Vanaschen, Luc; and Zeitzen, Jurgen, 4,626,207, Cl. 432-253.000.

Zellweger, Adolf, to Buchi Laboratoriums-Technik AG. Adjustable-height support for rotary evaporators. 4,625,935, Cl. 248-297.100.

Zellweger Uster Ltd.: *See—*
Ertl, Stefan; and Jola, Martin, 4,625,543, Cl. 73-1.00G.

Zemek, Albert W.; Orzelek, Frank J.; and Dunlap, Charles, to Universal Instruments Corporation. Method and apparatus for inserting leads of electrical components into corresponding holes according to different spacings of said holes. 4,625,399, Cl. 29-845.000.

Zenith Electronics Corporation: *See—*
Nienaber, David K.; and Sheikholeslami, Amir, 4,626,835, Cl. 340-703.000.
Zato, Thomas J., 4,626,847, Cl. 340-825.560.

Zenk, Daniel K.: *See—*
Trost, John R.; and Zenk, Daniel K., 4,627,018, Cl. 364-900.000.

Zimmer, Ernst, to Kuka Schweissanlagen + Roboter GmbH. Holding brake for manipulator. 4,625,837, Cl. 188-170.000.

Zimmerman, Mark E. Individual coffee brewing. 4,626,435, Cl. 426-78.000.

Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Jug, more particularly insulating jug. 4,625,884, Cl. 222-131.000.

Zimmermann, Ulrich: *See—*
Arnold, William M.; and Zimmermann, Ulrich, 4,626,506, Cl. 435-173.000.

Zimpro Inc.: *See—*
Hoffman, Clarence A.; Copa, William M.; and Mayer, Michael R., 4,626,354, Cl. 210-603.000.

Zoltan, Steven I.: *See—*
Duffield, Peter; Hudson, David; and Zoltan, Steven I., 4,625,373, Cl. 29-25.350.

Zones, Stacey I., to Chevron Research Company. Preparation of magadiite. 4,626,421, Cl. 423-326.000.

Zuelke, Robert D.; Friedrich, Paul H.; and Stites, David G., to Bell & Howell Company. Film duplication system for microimage recorders. 4,626,099, Cl. 355-99.000.

Zurcher, Josef: *See—*
Riedel, Hans-Peter; Zurcher, Josef; and Haussler, Hubert, 4,625,756, Cl. 137-491.000.

Zweekly, Raymond; and Lowe, Tony M., to GTE Valeron Corporation. Chip control insert. 4,626,140, Cl. 407-114.000.

501 Sinano Electric Co., Ltd.: *See—*
Hemmi, Saburo; and Sato, Isao, 4,625,534, Cl. 72-326.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baer, Harold J.; and Morse, Glenn B., to Baer, Harold J.; Baer, Harold J., Jr.; and Baer, Lawrence J. Liquid-separating device. Re. 32,298, Cl. 210-223.000.

Baer, Harold J., Jr.: *See—*
Baer, Harold J.; and Morse, Glenn B., Re. 32,298, Cl. 210-223.000.

Baer, Lawrence J.: *See—*
Baer, Harold J.; and Morse, Glenn B., Re. 32,298, Cl. 210-223.000.

Gorman, William G.; and Popp, Karl F., to Sterling Drug Inc. Basic amino or ammonium antimicrobial agent-polyethylene glycol ester surfactant-betaine and/or amine oxide surfactant compositions and method of use thereof. Re. 32,300, Cl. 514-635.000.

Hydroconsult, S.A.: *See—*
Oules, Jacques, Re. 32,297, Cl. 37-66.000.

Minnesota Mining and Manufacturing Company: *See—*
Randklev, Ronald M., Re. 32,299, Cl. 501-59.000.

Morse, Glenn B.: *See—*
Baer, Harold J.; and Morse, Glenn B., Re. 32,298, Cl. 210-223.000.

Oules, Jacques, to Hydroconsult, S.A. Appliance for dredging the bottom of a body of water. Re. 32,297, Cl. 37-66.000.

Popp, Karl F.: *See—*
Gorman, William G.; and Popp, Karl F., Re. 32,300, Cl. 514-635.000.

Randklev, Ronald M., to Minnesota Mining and Manufacturing Company. Glass composition and articles. Re. 32,299, Cl. 501-59.000.

Sterling Drug Inc.: *See—*
Gorman, William G.; and Popp, Karl F., Re. 32,300, Cl. 514-635.000.

LIST OF DESIGN PATENTEES

Abrams, G. Lawrence. Retractable plant hanger or similar article. 286,961, 12-2-86, Cl. D6-513.000.

Akiyama, Steven R.; and Stanuch, Edward S., to Federal Signal Corporation. Combined vehicle warning light and adjustable mounting bracket therefor. 286,988, 12-2-86, Cl. D10-114.000.

Akiyama, Steven R.; and Stanuch, Edward S., to Federal Signal Corporation. Combined vehicle warning light and reflector therefore. 286,989, 12-2-86, Cl. D10-114.000.

Aldridge, Rufus W., Jr., to Spencer Wright Industries, Inc. Crankshaft grinding machine. 287,017, 12-2-86, Cl. D15-124.000.

American Tack & Hardware Company, Inc.: *See—*
Emmerling, Ronald A., 287,034, Cl. D21-56.000.
Lewis, Joseph J., 287,035, Cl. D21-56.000.

Anderson, Andrew W., deceased; and by Anderson, Miriam, executrix, to Scandia Packaging Machinery Company. Packaging control wheel. 287,019, 12-2-86, Cl. D15-138.000.

Anderson, Miriam, executrix: *See—*
Anderson, Andrew W., deceased; and Anderson, Miriam, executrix, 287,019, Cl. D15-138.000.

Appel, Mel, to Mel Appel Company, The. Covered mug. 286,967, 12-2-86, Cl. D7-9.000.

Asaki, James T., to ITT Corporation. Telephone set. 287,009, 12-2-86, Cl. D14-53.000.

Ault, Charles M.: *See—*
Fletcher, William E.; Ault, Charles M.; and Sawyer, Dennis O., 287,006, Cl. D13-40.000.

Avoy, Richard; Cheatham, Burton L., II; and Sheridan, Christopher, to Critikon, Inc. Blood pressure monitor. 287,052, 12-2-86, Cl. D24-21.000.

Axel, Edwin. Boat. 287,003, 12-2-86, Cl. D12-314.000.

Baker, Knapp & Tubbs Inc.: *See—*
Doezema, William, 286,959, Cl. D6-446.000.

Bancroft, Joseph C. Vent jamb. 287,057, 12-2-86, Cl. D25-74.000.

Bates, Felix E. Cooking pot. 286,970, 12-2-86, Cl. D7-360.000.

Beck, Robert H.: *See—*
Silverman, Gary S., 287,058, Cl. D26-47.000.

Belue, Cathy S.; and Tucker, Sandra J. Doll. 287,039, 12-2-86, Cl. D21-166.000.

Berg, Franco, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Louvered grating or similar article. 287,046, 12-2-86, Cl. D23-115.000.

Berry, Kevin J. Can crusher. 287,015, 12-2-86, Cl. D15-123.000.

Bethea, Malcolm S. Combined eye nut and washer. 286,979, 12-2-86, Cl. D8-397.000.

Black & Decker Company, The: *See—*
McCloskey, Don R., 286,969, Cl. D7-139.000.

Borden, Charles D.: *See—*
Tourville, David A.; and Borden, Charles D., 287,033, Cl. D21-35.000.

Bottom Booster, Inc.: *See—*
Eisler, Kim E., 286,965, Cl. D6-596.000.

Bratton, Rickey B. Air deflector for attachment to an air conditioning unit or the like. 287,048, 12-2-86, Cl. D23-137.000.

Brinly-Hardy Co., Inc.: *See—*
Doering, Charles W., 286,992, Cl. D12-105.000.

Bucchianeri, Richard M.; and Sevcik, John J., to Ivac Corporation. Syringe plunger for an IV infusion pump. 287,053, 12-2-86, Cl. D24-25.000.

Burlingham, Stephen. Jewelry finding. 286,990, 12-2-86, Cl. D11-1.000.

Butler, Donald L.; and Martin, Thomas E. Spin cooler support frame or the like. 287,014, 12-2-86, Cl. D15-79.000.

Canon Kabushiki Kaisha: *See—*
Masaki, Nobuo, 287,023, Cl. D16-32.000.

Chalabian, Jack S., to K-Jack Engineering Co., Inc. Newspaper vending machine. 287,030, 12-2-86, Cl. D20-6.000.

Cheatham, Burton L., II: *See—*
Avoy, Richard; Cheatham, Burton L., II; and Sheridan, Christopher, 287,052, Cl. D24-21.000.

Cogburn, Denver L. Curtain rod clamp. 286,978, 12-2-86, Cl. D8-396.000.

Colani, Luigi, to Union Sils, Van De Loo & Co., GmbH. Bicycle pedal. 286,994, 12-2-86, Cl. D12-125.000.

Consolidated Devices, Inc.: *See—*
Grabovac, Bosko, 286,973, Cl. D8-24.000.

Cooper, Robert G.: *See—*
Proctor, Robert H.; and Cooper, Robert G., 287,016, Cl. D15-123.000.

Crews, Jay A. Carrier. 286,972, 12-2-86, Cl. D8-14.000.

Critikon, Inc.: *See—*
Avoy, Richard; Cheatham, Burton L., II; and Sheridan, Christopher, 287,052, Cl. D24-21.000.

$CRYO_2$ Corporation: *See—*
Perkins, Warren E.; and Novak, Mark T., 287,050, Cl. D24-8.000.
Perkins, Warren E.; and Novak, Mark T., 287,051, Cl. D24-8.000.

Cunitz, Robert J. No diving sign. 287,031, 12-2-86, Cl. D20-31.000.

Curran, William F. Massager. 287,056, 12-2-86, Cl. D24-40.000.

Dickie, Robert G., to Northern Technologies Ltd. Electrical connector cover. 287,004, 12-2-86, Cl. D13-24.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Pulled cart. 286,992, 12-2-86, Cl. D12-105.000.

Doerner, Frank. Hinge element for chairs or the like. 286,975, 12-2-86, Cl. D8-323.000.

Doezema, William, to Baker, Knapp & Tubbs Inc. Buffet or the like. 286,959, 12-2-86, Cl. D6-446.000.

Dondero, John: *See—*
Parks, Gerald R.; and Dondero, John, 286,946, Cl. D29-10.000.

Durand, Jean-Jacques. Perfume bottle or similar article. 286,982, 12-2-86, Cl. D9-377.000.

Durand, Jean-Jacques. Perfume bottle or similar article. 286,983, 12-2-86, Cl. D9-385.000.

Durand, Jean-Jacques. Perfume bottle or similar article. 286,984, 12-2-86, Cl. D9-395.000.

Durand, Jean-Jacques. Perfume bottle or similar article. 286,985, 12-2-86, Cl. D9-407.000.

Eisler, Kim E., to Bottom Booster, Inc. Cushion or similar article. 286,965, 12-2-86, Cl. D6-596.000.

Emmerling, Ronald A., to American Tack & Hardware Company, Inc. Bingo chip dispenser. 287,034, 12-2-86, Cl. D21-56.000.

Everest & Jennings, Inc.: *See—*
Stephenson, Robert L., 286,997, Cl. D12-131.000.

Falk, Ronald J., to Micro Component Technology, Inc. Combined reel feeder mounting rack and detachable feeder for use in printed circuit assembly machines. 287,020, 12-2-86, Cl. D15-199.000.

Federal Signal Corporation: *See—*
Akiyama, Steven R.; and Stanuch, Edward S., 286,988, Cl. D10-114.000.
Akiyama, Steven R.; and Stanuch, Edward S., 286,989, Cl. D10-114.000.

Fick, David J.: *See—*
Fick, Thoedore J.; Fick, David J.; and Reder, James E., 287,055, Cl. D24-29.000.

Fick, Thoedore J.; Fick, David J.; and Reder, James E., to Washington Marine Products, Inc. Universal IV equipment holder. 287,055, 12-2-86, Cl. D24-29.000.

Fisher, Richard E. Combined children's bed, storage unit and amusement center. 286,955, 12-2-86, Cl. D6-384.000.

Fletcher, William E.; Ault, Charles M.; and Sawyer, Dennis O., to Termiflex Corporation. Housing for electrical components and the like. 287,006, 12-2-86, Cl. D13-40.000.

Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 286,964, Cl. D6-569.000.
Gecchelin, Bruno, 286,968, Cl. D7-81.000.

Fujiwara, Tadanori: *See—*
Yanagida, Koji; and Fujiwara, Tadanori, 287,012, Cl. D14-58.000.

Funai Electric Company Limited: *See—*
Funai, Tetsuro, 287,032, Cl. D21-13.000.

Funai, Tetsuro, to Funai Electric Company Limited. Cockpit type game machine. 287,032, 12-2-86, Cl. D21-13.000.

Future Computers Limited: *See—*
Satherley, Richard, 287,013, Cl. D14-106.000.

Gander, Terence W.: *See—*
Oakley, Peter H.; Woodhall, Michael B.; and Gander, Terence W., 287,029, Cl. D20-4.000.

Gant, Patrice C. Add-on vehicular storage compartment. 286,951, 12-2-86, Cl. D3-40.000.

Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Combined wall mounted shelf and hooks. 286,964, 12-2-86, Cl. D6-569.000.

Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Combined set of jars and wall mounted holder. 286,968, 12-2-86, Cl. D7-81.000.

Gille, Mary C. Eyebrow razor. 287,059, 12-2-86, Cl. D28-46.000.

Gitchel, Clinton L.; and Gitchel, Joan M. Infant shelter or similar article. 287,041, 12-2-86, Cl. D21-253.000.

Gitchel, Joan M.: *See—*
Gitchel, Clinton L.; and Gitchel, Joan M., 287,041, Cl. D21-253.000.

Golan, James R.; Wilson, Kevin G.; and Gordon, Sidney, to Procter & Gamble Company, The. Container blank. 286,987, 12-2-86, Cl. D9-433.000.

Gold, Meyer. Folding matchbook. 286,981, 12-2-86, Cl. D9-304.000.

Goodman, Frank R. Boat. 287,002, 12-2-86, Cl. D12-303.000.

Gordon, Sidney: *See—*
Golan, James R.; Wilson, Kevin G.; and Gordon, Sidney, 286,987, Cl. D9-433.000.

Grabovac, Bosko, to Consolidated Devices, Inc. Electronic torque wrench. 286,973, 12-2-86, Cl. D8-24.000.

Graham, Charles E. Heel cushion. 286,948, 12-2-86, Cl. D2-314.000.

Green, Stephen T.: *See—*
Miles, Richard; and Green, Stephen T., 286,950, Cl. D3-39.000.

Gregory, John: *See—*
Parks, Gerald R.; and Dondero, John, 286,946, Cl. D29-10.000.

Gualtieri, Peter J. Base cabinet. 286,958, 12-2-86, Cl. D6-432.000.

Hardman, Kenneth A. Carrier for a paint can or the like. 286,949, 12-2-86, Cl. D3-106.000.

Hartmann, Jan D.; Voegler, Bernd; and Konzorr, Hubert, to Union Sils, Van De Loo & Co., GmbH. Bicycle pedal. 286,996, 12-2-86, Cl. D12-125.000.

Heaton, Cecil W., to Medco Medical Corporation. Pressure dressing clamp. 287,054, 12-2-86, Cl. D24-27.000.

Herben, William J. Perforating attachment for a printing press. 287,026, 12-2-86, Cl. D18-22.000.

Hideaway Step, Inc.: *See—*
Jarvie, William G.; and Roller, Allen L., 287,001, Cl. D12-203.000.

Hiranaka, Shinichi, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 286,999, 12-2-86, Cl. D12-163.000.

Hoffman Design, Inc.: *See—*
Hoffman, Phillip W., 287,042, Cl. D22-118.000.

Hoffman, Phillip W., to Hoffman Design, Inc. Knife handle. 287,042, 12-2-86, Cl. D22-118.000.

Hughes, Richard E. Automatic fluid shutoff valve. 287,043, 12-2-86, Cl. D23-19.000.

Hughes, Richard E. Fluid control valve. 287,044, 12-2-86, Cl. D23-19.000.

In-Mech Industries: *See—*
Lund, John G., 286,971, Cl. D8-394.000.

International Playtex, Inc.: *See—*
Shonk, Phyllis, 286,945, Cl. D2-24.000.

ITT Corporation: *See—*
Asaki, James T., 287,009, Cl. D14-53.000.

Ivac Corporation: *See—*
Bucchianeri, Richard M.; and Sevcik, John J., 287,053, Cl. D24-25.000.

Iwatsu Electric Co., Ltd.: *See—*
Sekiguchi, Akira; Shimakage, Hideo; and Tamogami, Kenji, 287,010, Cl. D14-53.000.

Jarvie, William G.; and Roller, Allen L., to Hideaway Step, Inc. Electro-mechanical step unit for vehicles. 287,001, 12-2-86, Cl. D12-203.000.

Johnson, Carlos J. Combined camera and eyeglasses. 287,021, 12-2-86, Cl. D16-1.000.

Johnson, Joseph. Bud vase holder. 286,957, 12-2-86, Cl. D6-403.000.

Jonsson, Jan-Olof, to Ljusne Katting, AB. Stud for chain links. 286,980, 12-2-86, Cl. D8-499.000.

K-Jack Engineering Co., Inc.: *See—*
Chalabian, Jack S., 287,030, Cl. D20-6.000.

Kabushiki Kaisha Matsushiro: *See—*
Matsushiro, Yukimitsu, 287,037, Cl. D21-150.000.

Kaku, Noriaki, to Matsushita Electric Industrial Co., Ltd. Telephone set. 287,011, 12-2-86, Cl. D14-57.000.

Kenney, William: *See—*
Ruiz, Audias G., 286,962, Cl. D6-521.000.

Kojima, Katsumi, to Sanyo Electric Co., Ltd. Electronic copying machine. 287,022, 12-2-86, Cl. D16-31.000.

Konzorr, Hubert: *See—*
Hartmann, Jan D.; Voegler, Bernd; and Konzorr, Hubert, 286,996, Cl. D12-125.000.

Kotamaki, Esko, to Tunturipyora Oy. Pedal. 286,993, 12-2-86, Cl. D12-125.000.

L & D, S.A.: *See—*
Torres, David F., 287,049, Cl. D23-150.000.

Leroux, Joseph. Hair brush with retractable cover. 286,952, 12-2-86, Cl. D4-136.000.

Lewis, Joseph J., to American Tack & Hardware Company, Inc. Bingo chip loader. 287,035, 12-2-86, Cl. D21-56.000.

Link, Manfred; and Schwarz, Robert, to Triumph Adler AG. Ribbon cartridge for typewriter or the like. 287,025, 12-2-86, Cl. D18-12.000.

Ljusne Katting, AB: *See—*
Jonsson, Jan-Olof, 286,980, Cl. D8-499.000.

Lockwood, Lawrence B. Combined automatic information terminal and vending machine booth. 286,956, 12-2-86, Cl. D6-396.000.

Lund, John G., to In-Mech Industries. Offset clamp. 286,971, 12-2-86, Cl. D8-394.000.

Mars G.B. Limited: *See—*
Oakley, Peter H.; Woodhall, Michael B.; and Gander, Terence W., 287,029, Cl. D20-4.000.

Martin, Thomas E.: *See—*
Butler, Donald L.; and Martin, Thomas E., 287,014, Cl. D15-79.000.

Masaki, Nobuo, to Canon Kabushiki Kaisha. Developing unit for an electrographic copier. 287,023, 12-2-86, Cl. D16-32.000.

Masco Corporation: *See—*
Veverka, Kenneth A., 286,974, Cl. D8-107.000.

Masura, Emil S. Toy football. 287,040, 12-2-86, Cl. D21-204.000.

Matsushiro, Yukimitsu, to Kabushiki Kaisha Matsushiro. Changeable robot toy. 287,037, 12-2-86, Cl. D21-150.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kaku, Noriaki, 287,011, Cl. D14-57.000.

Mayo, Jon. Picnic table. 286,953, 12-2-86, Cl. D6-337.000.

McCloskey, Don R., to Black & Decker Company, The. Cordless electric knife housing. 286,969, 12-2-86, Cl. D7-139.000.

Medco Medical Corporation: *See—*
Heaton, Cecil W., 287,054, Cl. D24-27.000.

Mel Appel Company, The: *See—*
Appel, Mel, 286,967, Cl. D7-9.000.

Micro Component Technology, Inc.: *See—*
Falk, Ronald J., 287,020, Cl. D15-199.000.

Miles, Richard; and Green, Stephen T., to Samsonite Corporation. Train case. 286,950, 12-2-86, Cl. D3-39.000.

Montblanc-Simplo GmbH: *See—*
Thevenot, Gilles, 287,028, Cl. D19-51.000.

Murray Corporation: *See—*
Proctor, Robert H.; and Cooper, Robert G., 287,016, Cl. D15-123.000.

Neworld Ice Cream Corporation: *See—*
Saladino, Salvatore; and Samson, Vicki M., 286,940, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,941, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,942, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,943, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,944, Cl. D1-101.000.

Newton, Charles L., to Shipley Company Inc. Control panel. 287,005, 12-2-86, Cl. D13-35.000.

Ninomiya, Yasuaki. Model airplane. 287,036, 12-2-86, Cl. D21-89.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Tragatschnig, Joerg, 287,008, Cl. D14-36.000.

Northern Technologies Ltd.: *See—*
Dickie, Robert G., 287,004, Cl. D13-24.000.

Novak, Mark T.: *See—*
Perkins, Warren E.; and Novak, Mark T., 287,050, Cl. D24-8.000.
Perkins, Warren E.; and Novak, Mark T., 287,051, Cl. D24-8.000.

Nygren, Kenneth V. Heat transfer system. 287,047, 12-2-86, Cl. D23-136.000.

Oakley, Peter H.; Woodhall, Michael B.; and Gander, Terence W., to Mars G.B. Limited. Combined packaged coffee vending machine and accessories storage cabinet. 287,029, 12-2-86, Cl. D20-4.000.

Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable dinosaurian toy. 287,038, 12-2-86, Cl. D21-150.000.

Ohya, Toshio: *See—*
Wada, Yuko; and Ohya, Toshio, 287,007, Cl. D14-11.000.

Okumura, Tadao, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 286,998, 12-2-86, Cl. D12-163.000.

Pai, Chen-Jong. Pedal for racing bicycle. 286,995, 12-2-86, Cl. D12-125.000.

Parks, Gerald R.; and Dondero, John, to Gregory, John. Short chest protector with back protection. 286,946, 12-2-86, Cl. D29-10.000.

Perkins, Warren E.; and Novak, Mark T., to $CRYO_2$ Corporation. Portable oxygen therapy unit. 287,050, 12-2-86, Cl. D24-8.000.

Perkins, Warren E.; and Novak, Mark T., to $CRYO_2$ Corporation. Portable oxygen therapy unit. 287,051, 12-2-86, Cl. D24-8.000.
Price Pfister, Inc.: *See*—
Yost, Holly K., 287,045, Cl. D23-28.000.
Procter & Gamble Company, The: *See*—
Golan, James R.; Wilson, Kevin G.; and Gordon, Sidney, 286,987, Cl. D9-433.000.
Rader, Vernon C., 286,986, Cl. D9-413.000.
Proctor, Robert H.; and Cooper, Robert G., to Murray Corporation. Hose and ferrule assembling apparatus. 287,016, 12-2-86, Cl. D15-123.000.
Quick Release Terminals Limited: *See*—
Waghorn, Clifford D., 286,963, Cl. D6-549.000.
Rader, Vernon C., to Procter & Gamble Company, The. Bottle. 286,986, 12-2-86, Cl. D9-413.000.
Reder, James E.: *See*—
Fick, Thoedore J.; Fick, David J.; and Reder, James E., 287,055, Cl. D24-29.000.
Ritman, Joost R. Beverage cup. 286,966, 12-2-86, Cl. D7-9.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Berg, Franco, 287,046, Cl. D23-115.000.
Roller, Allen L.: *See*—
Jarvie, William G.; and Roller, Allen L., 287,001, Cl. D12-203.000.
Rougier, Roger. Chair. 286,954, 12-2-86, Cl. D6-374.000.
Ruiz, Audias G., to Kenney, William, a part interest. Toilet tissue holder. 286,962, 12-2-86, Cl. D6-521.000.
Saladino, Salvatore; and Samson, Vicki M., to Neworld Ice Cream Corporation. Combined edible cone and ice cream therefor. 286,940, 12-2-86, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., to Neworld Ice Cream Corporation. Combined edible cone and ice cream therefor. 286,941, 12-2-86, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., to Neworld Ice Cream Corporation. Combined edible cone and ice cream therefor. 286,942, 12-2-86, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., to Neworld Ice Cream Corporation. Combined edible cone and ice cream therefor. 286,943, 12-2-86, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., to Neworld Ice Cream Corporation. Combined edible cone and ice cream therefor. 286,944, 12-2-86, Cl. D1-101.000.
Samson, Vicki M.: *See*—
Saladino, Salvatore; and Samson, Vicki M., 286,940, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,941, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,942, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,943, Cl. D1-101.000.
Saladino, Salvatore; and Samson, Vicki M., 286,944, Cl. D1-101.000.
Samsonite Corporation: *See*—
Miles, Richard; and Green, Stephen T., 286,950, Cl. D3-39.000.
Sanyo Electric Co., Ltd.: *See*—
Kojima, Katsumi, 287,022, Cl. D16-31.000.
Yanagida, Koji; and Fujiwara, Tadanori, 287,012, Cl. D14-58.000.
Satake, Noriko, to Sharp Corporation. Electronic calculator. 287,024, 12-2-86, Cl. D18-7.000.
Satherley, Richard, to Future Computers Limited. Video display terminal. 287,013, 12-2-86, Cl. D14-106.000.
Sawyer, Dennis O.: *See*—
Fletcher, William E.; Ault, Charles M.; and Sawyer, Dennis O., 287,006, Cl. D13-40.000.
Scandia Packaging Machinery Company: *See*—
Anderson, Andrew W., deceased; and Anderson, Miriam, executrix, 287,019, Cl. D15-138.000.
Schwarz, Robert: *See*—
Link, Manfred; and Schwarz, Robert, 287,025, Cl. D18-12.000.
Sekiguchi, Akira; Shimakage, Hideo; and Tamogami, Kenji, to Iwatsu Electric Co., Ltd. Mobile telephone unit. 287,010, 12-2-86, Cl. D14-53.000.
Sevcik, John J.: *See*—
Bucchianeri, Richard M.; and Sevcik, John J., 287,053, Cl. D24-25.000.
Shaffer, Melvin E.; and Tishner, David L. Grinding wheel mount. 287,018, 12-2-86, Cl. D15-126.000.
Sharp Corporation: *See*—
Satake, Noriko, 287,024, Cl. D18-7.000.
Sheridan, Christopher: *See*—
Avoy, Richard; Cheatham, Burton L., II; and Sheridan, Christopher, 287,052, Cl. D24-21.000.
Shimakage, Hideo: *See*—
Sekiguchi, Akira; Shimakage, Hideo; and Tamogami, Kenji, 287,010, Cl. D14-53.000.
Shipley Company Inc.: *See*—
Newton, Charles L., 287,005, Cl. D13-35.000.
Shonk, Phyllis, to International Playtex, Inc. Brassiere. 286,945, 12-2-86, Cl. D2-24.000.
Silverman, Gary S., to Beck, Robert H. Combination flashlight and toy truck. 287,058, 12-2-86, Cl. D26-47.000.
Sony Corporation: *See*—
Wada, Yuko; and Ohya, Toshio, 287,007, Cl. D14-11.000.
Spencer Wright Industries, Inc.: *See*—
Aldridge, Rufus W., Jr., 287,017, Cl. D15-124.000.
Stanuch, Edward S.: *See*—
Akiyama, Steven R.; and Stanuch, Edward S., 286,988, Cl. D10-114.000.
Akiyama, Steven R.; and Stanuch, Edward S., 286,989, Cl. D10-114.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., to Steck Manufacturing Company, Inc. Clamp plate. 286,976, 12-2-86, Cl. D8-394.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., to Steck Manufacturing Company, Inc. Clamp. 286,977, 12-2-86, Cl. D8-394.000.
Steck, Laurence D.: *See*—
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,976, Cl. D8-394.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,977, Cl. D8-394.000.
Steck Manufacturing Company, Inc.: *See*—
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,976, Cl. D8-394.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,977, Cl. D8-394.000.
Steck, Raymond E.: *See*—
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,976, Cl. D8-394.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 286,977, Cl. D8-394.000.
Stephenson, Robert L., to Everest & Jennings, Inc. Wheelchair. 286,997, 12-2-86, Cl. D12-131.000.
Stiler, Bruno V. Card-key for electronic card-reading receptacle. 287,027, 12-2-86, Cl. D19-10.000.
Takara Co., Ltd.: *See*—
Ohno, Kouzin, 287,038, Cl. D21-150.000.
Tamogami, Kenji: *See*—
Sekiguchi, Akira; Shimakage, Hideo; and Tamogami, Kenji, 287,010, Cl. D14-53.000.
Taub Family Trust: *See*—
Taub, Ronald H., 286,960, Cl. D6-475.000.
Taub, Ronald H., to Taub Family Trust. Merchandise display stand. 286,960, 12-2-86, Cl. D6-475.000.
Termiflex Corporation: *See*—
Fletcher, William E.; Ault, Charles M.; and Sawyer, Dennis O., 287,006, Cl. D13-40.000.
Thevenot, Gilles, to Montblanc-Simplo GmbH. Ball point pen. 287,028, 12-2-86, Cl. D19-51.000.
Tishner, David L.: *See*—
Shaffer, Melvin E.; and Tishner, David L., 287,018, Cl. D15-126.000.
Torres, David F., to L & D, S.A. Air freshener. 287,049, 12-2-86, Cl. D23-150.000.
Tourville, David A.; and Borden, Charles D. Game board. 287,033, 12-2-86, Cl. D21-35.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Hiranaka, Shinichi, 286,999, Cl. D12-163.000.
Okumura, Tadao, 286,998, Cl. D12-163.000.
Tragatschnig, Joerg, to Nippon Gakki Seizo Kabushiki Kaisha. Headphone. 287,008, 12-2-86, Cl. D14-36.000.
Triumph Adler AG: *See*—
Link, Manfred; and Schwarz, Robert, 287,025, Cl. D18-12.000.
Tucker, Sandra J.: *See*—
Belue, Cathy S.; and Tucker, Sandra J., 287,039, Cl. D21-166.000.
Tunturipyora Oy: *See*—
Kotamaki, Esko, 286,993, Cl. D12-125.000.
Tutt, Thomas W., to Zwicky Engineering Limited. Track alignment device. 286,991, 12-2-86, Cl. D12-42.000.
Union Sils, Van De Loo & Co., GmbH: *See*—
Colani, Luigi, 286,994, Cl. D12-125.000.
Hartmann, Jan D.; Voegler, Bernd; and Konzorr, Hubert, 286,996, Cl. D12-125.000.
Veverka, Kenneth A., to Masco Corporation. Utility knife handle. 286,974, 12-2-86, Cl. D8-107.000.
Vitaloni, Alberto, to Vitaloni S.p.A. Rear view mirror. 287,000, 12-2-86, Cl. D12-187.000.
Vitaloni S.p.A.: *See*—
Vitaloni, Alberto, 287,000, Cl. D12-187.000.
Voegler, Bernd: *See*—
Hartmann, Jan D.; Voegler, Bernd; and Konzorr, Hubert, 286,996, Cl. D12-125.000.
Wada, Yuko; and Ohya, Toshio, to Sony Corporation. Magnetic tape cassette or the like. 287,007, 12-2-86, Cl. D14-11.000.
Waghorn, Clifford D., to Quick Release Terminals Limited. Towel rack. 286,963, 12-2-86, Cl. D6-549.000.
Warner-Lambert Company: *See*—
Wootton, Alfred P., 286,947, Cl. D2-226.000.
Washington Marine Products, Inc.: *See*—
Fick, Thoedore J.; Fick, David J.; and Reder, James E., 287,055, Cl. D24-29.000.
Wilson, Kevin G.: *See*—
Golan, James R.; Wilson, Kevin G.; and Gordon, Sidney, 286,987, Cl. D9-433.000.
Woodhall, Michael B.: *See*—
Oakley, Peter H.; Woodhall, Michael B.; and Gander, Terence W., 287,029, Cl. D20-4.000.
Wootton, Alfred P., to Warner-Lambert Company. Disposable decontamination apron. 286,947, 12-2-86, Cl. D2-226.000.
Yanagida, Koji; and Fujiwara, Tadanori, to Sanyo Electric Co., Ltd. Telephone instrument. 287,012, 12-2-86, Cl. D14-58.000.
Yost, Holly K., to Price Pfister, Inc. Faucet handle. 287,045, 12-2-86, Cl. D23-28.000.
Zwicky Engineering Limited: *See*—
Tutt, Thomas W., 286,991, Cl. D12-42.000.

LIST OF PLANT PATENTEES

Ball Pan Am Plant Company: *See*—
Shoesmith, Leonard H., deceased, 5,816, Cl. 74.000.
van der Knaap, Jacques C. M., 5,818, Cl. 78.000.
Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant named Yellow Favor. 5,819, 12-2-86, Cl. 78.000.
Fleischle, Gerhard, to Oglevee Associates, Inc. Distinct variety of Streptocarpus named Nancy. 5,814, 12-2-86, Cl. 68.000.
Gardner, Leith M.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,813, Cl. 38.000.
Hoek Breeding B.V.: *See*—
Hoek, Leendert A.; and Hoek, Jan, 5,815, Cl. 74.000.
Hoek, Jan: *See*—
Hoek, Leendert A.; and Hoek, Jan, 5,815, Cl. 74.000.
Hoek, Leendert A.; and Hoek, Jan, to Hoek Breeding B.V. Chrysanthemum plant named Delta. 5,815, 12-2-86, Cl. 74.000.
Oglevee Associates, Inc.: *See*—
Fleischle, Gerhard, 5,814, Cl. 68.000.
Persson, Kjell-Ake. Chrysanthemum plant named Yellow Dramatic. 5,817, 12-2-86, Cl. 74.000.
Shoesmith, Leonard H., deceased (by Shoesmith, May Victoria, executrix), to Ball Pan Am Plant Company. Chrysanthemum plant named Hopscotch. 5,816, 12-2-86, Cl. 74.000.
Shoesmith, May Victoria, executrix: *See*—
Shoesmith, Leonard H., deceased, 5,816, Cl. 74.000.
van der Knaap, Jacques C. M., to Ball Pan Am Plant Company. Chrysanthemum plant named Westland Sun. 5,818, 12-2-86, Cl. 78.000.
Yoder Brothers, Inc.: *See*—
Duffett, William E., 5,819, Cl. 78.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G. Plum tree (Blue Knight). 5,813, 12-2-86, Cl. 38.000.
Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,813, Cl. 38.000.
Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,813, Cl. 38.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 2ND DAY OF DECEMBER, 1986

A. E. Staley Manufacturing Company: *See*—
McDaniel, Robert S.; Vander Burgh, Leonard F.; and Urfer, Allen D., H171, Cl. 252-174.170.
Adolph, Horst G.: *See*—
Koppes, William M.; and Adolph, Horst G., H181, Cl. 149-88.000.
AT&T Bell Laboratories: *See*—
Hurst, Jerry C.; and Rizzo, John S., H180, Cl. 53-435.000.
Johnstone, Alexander, Jr., H176, Cl. 285-31.000.
Bailey, William C.: *See*—
Claborn, Kenneth D.; and Bailey, William C., H173, Cl. 342-372.000.
Biggar, Allan M., to United States of America, Army. Reserve battery with improved wet-stand characteristics. H178, 12-2-86, Cl. 429-114.000.
Binari, Steven G., to United States of America, America. Self aligned notch for InP planar transferred electron oscillator. H170, 12-2-86, Cl. 29-576.00B.
Burelbach, James P.: *See*—
Saiveau, James G.; Kann, William J.; and Burelbach, James P., H177, Cl. 376-261.000.
Cho, Sung: *See*—
Forster, James J.; Kobialka, Chester J.; and Cho, Sung, H167, Cl. 102-524.000.
Claborn, Kenneth D.; and Bailey, William C., to United States of America, Army. Temperature and frequency compensated array beam steering unit. H173, 12-2-86, Cl. 342-372.000.
Conner, Michael, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. H168, 12-2-86, Cl. 71-93.000.
Curtis, Donald L.: *See*—
Pribyl, William J.; and Curtis, Donald L., H172, Cl. 252-305.000.
Cytron, Sheldon J.; and Willison, Kenneth, to United States of America, Army. Residual stress reduction of processed DU alloy rods. H175, 12-2-86, Cl. 318-116.000.
Du Pont de Nemours, E. I., and Company: *See*—
Conner, Michael, H168, Cl. 71-93.000.
Forster, James J.; Kobialka, Chester J.; and Cho, Sung, to United States of America, Navy. Projectile obturator. H167, 12-2-86, Cl. 102-524.000.
Higgins, Thair L.: *See*—
Klingensmith, George B.; and Higgins, Thair L., H179, Cl. 526-125.000.
Hurst, Jerry C.; and Rizzo, John S., to AT&T Bell Laboratories. Assembling articles in a tube. H180, 12-2-86, Cl. 53-435.000.
Johnstone, Alexander, Jr., to AT&T Bell Laboratories. Slip tee pipe fitting. H176, 12-2-86, Cl. 285-31.000.
Kann, William J.: *See*—
Saiveau, James G.; Kann, William J.; and Burelbach, James P., H177, Cl. 376-261.000.
Klingensmith, George B.; and Higgins, Thair L. Polybutylene. H179, 12-2-86, Cl. 526-125.000.
Kobialka, Chester J.: *See*—
Forster, James J.; Kobialka, Chester J.; and Cho, Sung, H167, Cl. 102-524.000.
Koppes, William M.; and Adolph, Horst G., to United States of America, Navy. Bis(2-fluoro-2,2-dinitroethoxy)acetonitrile and a method of preparation. H181, 12-2-86, Cl. 149-88.000.
Mackenzie, Gerald L.; Petri, Robert O.; and Rose, James E., to United States of America, Navy. Ignition composition. H169, 12-2-86, Cl. 149-19.300.
McDaniel, Robert S.; Vander Burgh, Leonard F.; and Urfer, Allen D., to A. E. Staley Manufacturing Company. Branched chain glycosides. H171, 12-2-86, Cl. 252-174.170.
Mermagen, William H., to United States of America, Army. High spin compound air bearing. H174, 12-2-86, Cl. 384-108.000.
Petri, Robert O.: *See*—
Mackenzie, Gerald L.; Petri, Robert O.; and Rose, James E., H169, Cl. 149-19.300.
Pribyl, William J.; and Curtis, Donald L., to United States of America, Army. Air purge system for vehicle engine exhaust smoke systems. H172, 12-2-86, Cl. 252-305.000.
Rizzo, John S.: *See*—
Hurst, Jerry C.; and Rizzo, John S., H180, Cl. 53-435.000.
Rose, James E.: *See*—
Mackenzie, Gerald L.; Petri, Robert O.; and Rose, James E., H169, Cl. 149-19.300.
Saiveau, James G.; Kann, William J.; and Burelbach, James P., to United States of America, Energy. Fuel handling system for a nuclear reactor. H177, 12-2-86, Cl. 376-261.000.
United States of America
America: *See*—
Binari, Steven G., H170, Cl. 29-576.00B.
Army: *See*—
Biggar, Allan M., H178, Cl. 429-114.000.
Claborn, Kenneth D.; and Bailey, William C., H173, Cl. 342-372.000.
Cytron, Sheldon J.; and Willison, Kenneth, H175, Cl. 318-116.000.
Mermagen, William H., H174, Cl. 384-108.000.
Pribyl, William J.; and Curtis, Donald L., H172, Cl. 252-305.000.
Energy: *See*—
Saiveau, James G.; Kann, William J.; and Burelbach, James P., H177, Cl. 376-261.000.
Navy: *See*—
Forster, James J.; Kobialka, Chester J.; and Cho, Sung, H167, Cl. 102-524.000.
Koppes, William M.; and Adolph, Horst G., H181, Cl. 149-88.000.
Mackenzie, Gerald L.; Petri, Robert O.; and Rose, James E., H169, Cl. 149-19.300.
Urfer, Allen D.: *See*—
McDaniel, Robert S.; Vander Burgh, Leonard F.; and Urfer, Allen D., H171, Cl. 252-174.170.
Vander Burgh, Leonard F.: *See*—
McDaniel, Robert S.; Vander Burgh, Leonard F.; and Urfer, Allen D., H171, Cl. 252-174.170.
Willison, Kenneth: *See*—
Cytron, Sheldon J.; and Willison, Kenneth, H175, Cl. 318-116.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 2, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

1 4,625,334
69 4,625,335
79 4,625,336
82 4,625,337
106 4,625,338
160 4,625,339
247 4,625,340
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638 4,626,257

CLASS 10

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33.2 4,625,375
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149.5 B 4,625,377
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576 B 4,625,390
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623.4 4,625,395
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114 4,625,434
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CLASS 36

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113 4,625,436

CLASS 37

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141 R 4,625,437
141 T 4,625,438
142 R 4,625,439

CLASS 38

61 4,627,094
102.5 4,625,440

CLASS 40

10 R 4,625,441

CLASS 42

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42.03 4,625,443
69.02 4,625,444
71.02 4,625,445

CLASS 43

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43.12 4,625,450
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131 4,625,452
139 4,625,453

CLASS 44

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CLASS 47

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6 4,625,503
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413 4,625,506

CLASS 59

78.1 4,625,507
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CLASS 60

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517 4,625,514
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CLASS 66

123 4,625,527
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23.3 4,625,529

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28 4,626,270
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CLASS 73

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64.2 4,625,558
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152 4,625,547
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865.5 4,625,552

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484 R 4,625,578
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594.4 4,625,580
606 R 4,625,581
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247 4,626,282

CLASS 76

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108 T 4,625,593
112 4,625,594

CLASS 81

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461 4,625,599
462 4,625,600

CLASS 82

4 C 4,625,601
36 R 4,625,602

CLASS 83

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CLASS 84

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CLASS 89

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CLASS 91

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375 A 4,625,624
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CLASS 101

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CLASS 102

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377 4,625,649
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CLASS 104

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CLASS 105

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CLASS 109

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49.5 4,625,659

CLASS 110

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CLASS 111

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CLASS 112

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262.3 4,625,665
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CLASS 118

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CLASS 119

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CLASS 125

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CLASS 126

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94 4,625,719
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304 4,625,725
328 4,625,726
334 C 4,625,727
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419 D 4,625,730
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CLASS 131

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CLASS 134

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CLASS 135

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CLASS 136

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188 R 4,625,768
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301 4,625,778
311 R 4,625,779
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CLASS 144

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11.5 A 4,626,294
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403 4,626,296
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CLASS 150

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452 4,625,785

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308.2 4,626,311
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643 4,626,317

CLASS 160

84 R 4,625,786

CLASS 162

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65 4,626,319

CLASS 164

453 4,625,787
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151 4,625,793
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338 4,625,804
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370 4,625,807

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749 4,625,810

CLASS 173

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134 4,625,812

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371 4,625,816

CLASS 177

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CLASS 178

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9.1 4,625,820
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29 R 4,625,834

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24.11 4,625,835
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CLASS 198

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465.1 4,625,857
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331 4,626,638
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CLASS 203

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CLASS 204

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CLASS 209

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CLASS 210

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110 4,626,346
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721 4,626,357
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793 4,626,359
799 4,626,360

CLASS 211

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122 4,625,874

CLASS 215

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256 4,625,876
366 4,625,877

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4 R 4,625,879
23.83 4,625,882
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93 4,625,883
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216 4,625,886
231 4,625,887
262 4,625,888
288 4,625,889
319 4,625,890
327 4,625,891
465 4,625,892

CLASS 221

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193 4,625,894

CLASS 222

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205 4,625,897
517 4,625,898
521 4,625,899

CLASS 224

42.07 4,625,900

CLASS 225

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CLASS 226

2 4,625,902

CLASS 227

131 4,625,903

CLASS 228

168 4,625,904

CLASS 229

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45 EC 4,625,906
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45 R 4,625,908
92.1 4,625,909

CLASS 235

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470 4,626,671
480 4,626,672

CLASS 237

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12.3 C 4,625,911

CLASS 238

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CLASS 239

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446 4,625,917
533.3 4,625,918
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651 4,625,920

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186 R 4,625,924
236 4,625,925
261.2 4,625,926

CLASS 242

4 R 4,625,927
7.02 4,625,928
18.1 4,625,929
67.3 R 4,625,930
68.3 4,625,931
84.51 A 4,625,932
99 4,625,933

CLASS 244

122 R 4,625,934

CLASS 248

297.1 4,625,935
544 4,625,936
545 4,625,937
550 4,625,938
638 4,625,939

CLASS 249

83 4,625,940

CLASS 250

201 4,626,673
4,626,674
211 J 4,626,675
214 A 4,626,677
4,626,678
214 R 4,626,676
227 4,626,679
231 P 4,626,680
4,626,681
231 SE 4,626,682
239 4,626,683
328 4,626,684
338 4,626,687
341 4,626,685
342 4,626,686
361 R 4,626,688
396 R 4,626,689
4,626,690
423 R 4,626,691
432 R 4,626,692
458.1 4,626,693
483.1 4,626,694
506.1 4,626,380
574 4,626,695

CLASS 251

12 4,625,941
305 4,625,943
327 4,625,942

CLASS 252

1 4,626,361
8.51 4,626,362
8.514 4,626,363
8.8 4,626,364
12 4,626,365
32.7 E 4,626,366
49.5 4,626,367
49.9 4,626,368
62.52 4,626,370
62.54 4,626,371
62.9 4,626,369
90 4,626,372
96 4,626,373
174.13 4,626,374
299.63 4,626,375
305 4,626,376
321 4,626,377
4,626,378
340 4,626,379
522 R 4,626,381
629 4,626,382
700 4,626,383

CLASS 254

8 R 4,625,944
25 4,625,945
274 4,625,946
323 4,625,947

CLASS 256

72 4,625,948

CLASS 260

502.4 R 4,626,386

CLASS 261

153 4,626,387

CLASS 264

2.1 4,626,388
40.7 4,626,389
46.1 4,626,390
46.6 4,626,391
62 4,626,392
65 4,626,393
4,626,394
4,626,395
4,626,396
565 4,626,397
566 4,626,398

CLASS 266

48 4,625,949
200 4,625,950

CLASS 269

88 4,625,951

CLASS 270

54 4,625,952

CLASS 271

1 4,625,953
9 4,625,954
10 4,625,955
183 4,625,956
214 4,625,957
274 4,625,958

CLASS 272

118 4,625,959
130 4,625,960
132 4,625,961
4,625,962
135 4,625,963

CLASS 273

62 4,625,964
81.3 4,625,965
150 4,625,966
153 S 4,625,967
156 4,625,968
157 R 4,625,969
257 4,625,970
272 4,625,971
348 4,625,972
366 4,625,973
407 4,625,974

CLASS 277

9.5 4,625,975
12 4,625,976
82 4,625,977
180 4,625,978
4,625,979

CLASS 280

5 A 4,625,980
63 4,625,981
95 R 4,625,982
154.5 R 4,625,983
242 WC 4,625,984
276 4,625,985
282 4,625,986
293 4,625,987
415 R 4,625,990
461 A 4,625,988
479 A 4,625,989
632 4,625,991
703 4,625,992
707 4,625,993
4,625,994
723 4,625,995

CLASS 281

21 A 4,625,996

CLASS 285

5 4,625,997
7 4,625,998
24 4,625,999
39 4,626,000
94 4,626,001
95 4,626,002
98 4,626,003
122 4,626,004
137.1 4,626,005
158 4,626,006

CLASS 290

38 R 4,626,696

CLASS 292

65 4,626,007
169.17 4,626,008
327 4,626,009
341.16 4,626,010

CLASS 293

120 4,626,011

CLASS 294

81.3 4,626,012
88 4,626,013
4,626,014
152 4,626,015

CLASS 296

1 R 4,626,016
3 4,626,017
65 R 4,626,018
97 H 4,626,019
107 4,626,020
4,626,021
182 4,626,022
216 4,626,023
4,626,024
218 4,626,025
4,626,026
223 4,626,027

CLASS 297

289 4,626,028
367 4,626,029
429 4,626,030

CLASS 299

16 4,626,031
36 4,626,032
37 4,626,033
91 4,626,034

CLASS 300

16 4,626,035

CLASS 301

58 4,626,036
108 S 4,626,037

CLASS 303

6 C 4,626,038
19 4,626,039
96 4,626,040
100 4,626,041
106 4,626,042
114 4,626,043
116 4,626,044
119 4,626,045

CLASS 305

36 4,626,046

CLASS 307

18 4,626,697
38 4,626,698
106 4,626,699
118 4,626,700
228 4,626,702
245 4,626,701
252 G 4,626,703
264 4,626,704
269 4,626,705
272 A 4,626,706
355 4,626,707
441 4,626,708
455 4,626,709
457 4,626,710
471 4,626,711
475 4,626,712
548 4,626,713
550 4,626,714
585 4,626,715
590 4,626,716

CLASS 310

36 4,626,717
37 4,626,718
49 R 4,626,719
62 4,626,720
71 4,626,721
82 4,626,722
83 4,626,723
88 4,626,724
89 4,626,725
91 4,626,726
156 4,626,727
316 4,626,728
324 4,626,729
326 4,626,730
339 4,626,731
348 4,626,732

CLASS 312

107.5 4,626,047
208 4,626,048
291 4,626,049
293 4,626,050

CLASS 313

40 4,626,733
51 4,626,734
275 4,626,735
399 4,626,736
402 4,626,737
414 4,626,738
469 4,626,739
478 4,626,740
497 4,626,741
503 4,626,742
571 4,626,743

CLASS 315

57 4,626,744
179 4,626,745
208 4,626,746
209 R 4,626,747
241 P 4,626,748

CLASS 318

135 4,626,749
139 4,626,750
254 4,626,751
4,626,752
334 4,626,753
460 4,626,754
473 4,626,755
573 4,626,756
583 4,626,757
603 4,626,758
689 4,626,759
695 4,626,760
803 4,626,761
809 4,626,762
811 4,626,763

CLASS 320

9 4,626,764
48 4,626,765

CLASS 323

222 4,626,766
280 4,626,767
282 4,626,768
283 4,626,769
313 4,626,770
349 4,626,771

CLASS 324

52 4,626,772
58.5 B 4,626,773
61 R 4,626,774
73 PC 4,626,776
73 R 4,626,775
117 R 4,626,777
127 4,626,778
158 F 4,626,779
4,626,780
174 4,626,781
253 4,626,782
307 4,626,783
309 4,626,784
339 4,626,785
449 4,626,786

CLASS 328

14 4,626,787
165 4,626,788

CLASS 329

50 4,626,789
101 4,626,790
109 4,626,791

CLASS 330

4.3 4,626,792
59 4,626,793
253 4,626,794
257 4,626,795

CLASS 331

1 A 4,626,796
4,626,797
4,626,798
47 4,626,799
96 4,626,800
111 4,626,801
117 FE 4,626,802

CLASS 332

9 R 4,626,803

CLASS 333

22 R 4,626,804
33 4,626,805
104 4,626,806
164 4,626,807
173 4,626,808
202 4,626,809
243 4,626,810

CLASS 335

46 4,626,811
132 4,626,812
278 4,626,813
281 4,626,814

CLASS 336

5 4,626,815
192 4,626,816

CLASS 337

162 4,626,817
166 4,626,818
323 4,626,819
354 4,626,820
380 4,626,821

CLASS 338

195 4,626,822
199 4,626,823

CLASS 339

14 R 4,626,051
31 M 4,626,052
32 M 4,626,053
59 M 4,626,054
60 M 4,626,055
75 MP 4,626,056
91 R 4,626,057
97 P 4,626,058
143 C 4,626,059
147 P 4,626,060
217 S 4,626,061

CLASS 340

347 DD 4,626,824
4,626,825
4,626,826
4,626,828
4,626,829
347 SH 4,626,827
365 VL 4,626,830
500 4,626,831
522 4,626,832
540 4,626,833
649 4,626,834
703 4,626,835
706 4,626,836
723 4,626,837
744 4,626,838
750 4,626,839
752 4,626,840
805 4,626,841
825.31 4,626,844
825.44 4,626,842
825.48 4,626,845
825.5 4,626,843
825.52 4,626,846
825.56 4,626,847
825.69 4,626,848
902 4,626,849
903 4,626,850
975 4,626,851
985 4,626,852

CLASS 342

20 4,626,857
132 4,626,853
174 4,626,856
196 4,626,854
201 4,626,855
374 4,626,858
442 4,626,860
458 4,626,861

CLASS 343

442 4,626,859
702 4,626,862
766 4,626,864
781 P 4,626,863
786 4,626,865
880 4,626,866

CLASS 346

1.1 4,626,867
4,626,868
75 4,626,869
76 PH 4,626,870
4,626,871
4,626,872
139 R 4,626,873
140 R 4,626,874
4,626,875
160 4,626,876
200 4,626,877

CLASS 350

3.71 4,626,062
6.9 4,626,063
96.10 4,626,064
96.15 4,626,065
96.18 4,626,066
96.20 4,626,067
96.34 4,626,068
162.2 4,626,069
260 4,626,070
311 4,626,071
333 4,626,072
344 4,626,073
345 4,626,074
354 4,626,075
427 4,626,076
429 4,626,077
504 4,626,078
525 4,626,079
569 4,626,080
4,626,081
573 4,626,082
604 4,626,083
4,626,084
4,626,085
632 4,626,086
4,626,087

CLASS 351

204 4,626,088
208 4,626,089
226 4,626,090

CLASS 353

283 4,626,923

CLASS 354

75 4,626,091
212 4,626,092
415 4,626,093
456 4,626,094

CLASS 355

3 BE 4,626,095
14 D 4,626,096
77 4,626,097
85 4,626,098
99 4,626,099

CLASS 356

152 4,626,100
237 4,626,101
328 4,626,102
363 4,626,103

CLASS 357

19 4,626,878
23.13 4,626,882
23.4 4,626,879
4,626,880
23.6 4,626,881
30 4,626,883
4,626,884
31 4,626,885
34 4,626,886
38 4,626,888
43 4,626,887
71 4,626,889

CLASS 358

19 4,626,890
21 R 4,626,891
4,626,892
29 4,626,893
31 4,626,894
44 4,626,897
48 4,626,898
65 4,626,899
67 4,626,900
75 4,626,901
4,626,902
80 4,626,903
84 4,626,904
87 4,626,905
93 4,626,906
101 4,626,907
111 4,626,908
114 4,626,909
140 4,626,910
141 4,626,911
4,626,912
147 4,626,913
148 4,626,914
213.12 4,626,916
213.19 4,626,915
225 4,626,918
4,626,919
234 4,626,920
260 4,626,921
282 4,626,922
285 4,626,924
4,626,925
296 4,626,926
310 4,626,927
4,626,928
4,626,929
342 4,626,930

CLASS 360

16 4,626,931
33.1 4,626,932
51 4,626,933
66 4,626,934
67 4,626,935
70 4,626,936
90 4,626,937
95 4,626,938
96.3 4,626,940
96.5 4,626,939
97 4,626,941
4,626,942
99 4,626,943
106 4,626,944
110 4,626,945
113 4,626,946
126 4,626,947
132 4,626,948
133 4,626,949
134 4,626,950

CLASS 361

8 4,626,951
55 4,626,952
63 4,626,953
96 4,626,954
119 4,626,955
152 4,626,956
216 4,626,917
275 4,626,957
306 4,626,958
315 4,626,959
388 4,626,960
398 4,626,961
399 4,626,962
424 4,626,963
433 4,626,964

CLASS 362

33 4,626,965
35 4,626,966
61 4,626,967
122 4,626,968
147 4,626,969
4,626,970
154 4,626,971
251 4,626,972
277 4,626,973
396 4,626,974
418 4,626,975

CLASS 363

19 4,626,976
21 4,626,977
37 4,626,978
41 4,626,979
56 4,626,980
62 4,626,981
80 4,626,982
132 4,626,983

CLASS 364

4,626,984
200 4,626,985
4,626,986
4,626,987
4,626,988
4,626,989
405 4,626,990
414 4,626,991
418 4,626,992
424 4,626,993
4,626,994
4,626,995
431.05 4,626,997
434 4,626,998
474 4,626,999
483 4,627,000
513.5 4,627,001
519 4,627,002
520 4,627,003
521 4,627,004
525 4,627,005
527 4,627,006
550 4,627,007
4,627,008
559 4,627,009
4,627,010
566 4,627,011
567 4,627,012
4,627,013
571 4,627,014
900 4,627,015
4,627,016
4,627,017
4,627,018
4,627,019
4,627,020
4,627,021
4,627,022
4,627,023
4,627,024
4,627,025
4,627,026

CLASS 365

45 4,627,027
72 4,627,028
107 4,627,029
189 4,627,030
190 4,627,031
203 4,627,032
205 4,627,033
226 4,627,034
230 4,627,035

CLASS 366

162 4,626,104

CLASS 367

57 4,627,036

CLASS 368

10 4,626,105
107 4,626,106
276 4,626,107
291 4,626,108
322 4,626,109

CLASS 369

44 4,627,038
4,627,039
4,627,040
45 4,627,041
77.1 4,627,042
77.2 4,627,037
215 4,627,043
292 4,627,044

CLASS 370

16 4,627,045
58 4,627,046
4,627,047
60 4,627,048
81 4,627,049
85 4,627,050
86 4,627,051
88 4,627,052

CLASS 371

10 4,627,053
11 4,627,054
16 4,627,055
4,627,056
25 4,627,057
37 4,627,058
51 4,627,059
62 4,627,060

CLASS 372

29 4,627,061
36 4,627,062
38 4,627,063
41 4,627,064
50 4,627,065
57 4,627,066
81 4,627,067
101 4,627,068

CLASS 373

29 4,627,069

CLASS 374

131 4,626,110

CLASS 375

2.1 4,627,074
3 4,627,070
10 4,627,071
14 4,627,072
20 4,627,073
23 4,627,075
36 4,627,076
39 4,627,077
45 4,627,078
96 4,627,079
110 4,627,080

CLASS 376

136 4,626,399
146 4,626,400
245 4,626,401
272 4,626,402
4,626,403
447 4,626,404
448 4,626,405

CLASS 377

58 4,627,081
60 4,627,082
4,627,083
4,627,084
81 4,627,085

CLASS 378

4 4,627,087
119 4,627,086
122 4,627,088
157 4,627,089

CLASS 379

27 4,626,633
28 4,626,634
29 4,626,632
95 4,626,623
99 4,626,622
137 4,626,624
4,626,625
165 4,626,631
199 4,626,630
214 4,626,627
283 4,626,628
386 4,626,629
394 4,626,626

CLASS 381

34 4,627,090
46 4,627,091
48 4,627,092
51 4,627,093
70 4,627,095

CLASS 382

8 4,627,096
46 4,627,097

CLASS 384

99 4,626,111
300 4,626,112
530 4,626,113
584 4,626,114

CLASS 400

124 4,626,115
4,626,116
716 4,626,117

CLASS 401

104 4,626,118
123 4,626,119
260 4,626,120

CLASS 403

27 4,626,121
51 4,626,122
141 4,626,123
295 4,626,124
324 4,626,125
353 4,626,126

CLASS 404

14 4,626,127

CLASS 405

12 4,626,128
43 4,626,129
44 4,626,130
59 4,626,131
71 4,626,132
107 4,626,133
184 4,626,134
195 4,626,135
224 4,626,136
4,626,137
232 4,626,138
259 4,626,139

CLASS 407

114 4,626,140
4,626,141

CLASS 408

81 4,626,142
82 4,626,143
143 4,626,144
196 4,626,145
239 R 4,626,146

CLASS 409

133 4,626,147
157 4,626,148
191 4,626,149
199 4,626,150
210 4,626,151
232 4,626,152
304 4,626,153

CLASS 410

56 4,626,154
82 4,626,155

CLASS 412

33 4,626,156

CLASS 413

1 4,626,157
6 4,626,158

CLASS 414

112 4,626,159
222 4,626,160
308 4,626,161
479 4,626,162
685 4,626,163
735 4,626,164
4,626,165
786 4,626,166
4,626,167

CLASS 415

211 4,626,168

CLASS 416

29 4,626,170
90 A 4,626,171
95 4,626,169
134 A 4,626,172
4,626,173
223 A 4,626,174

CLASS 417

40 4,626,175
54 4,626,176
271 4,626,177
366 4,626,178

CLASS 418

55 4,626,179
63 4,626,180
83 4,626,181
191 4,626,182

CLASS 419

12 4,626,406
18 4,626,407

CLASS 420

442 4,626,408
533 4,626,409
590 4,626,410

CLASS 422

13 4,626,411
50 4,626,412
78 4,626,413
159 4,626,414
190 4,626,415

CLASS 423

12 4,626,416
235 4,626,417
243 4,626,418
244 4,626,419
326 4,626,420
4,626,421
344 4,626,422
366 4,626,423
593 4,626,424
4,626,425
641 4,626,426

CLASS 424

35 4,626,427
61 4,626,428
70 4,626,429
92 4,626,430
101 4,626,431
4,626,432
154 4,626,433

CLASS 425

68 4,626,183
83.1 4,626,184
110 4,626,185
115 4,626,186
131.1 4,626,187
145 4,626,188
146 4,626,189
539 4,626,190

CLASS 426

50 4,626,434
78 4,626,435
289 4,626,436
387 4,626,437
438 4,626,438
517 4,626,439
535 4,626,440
548 4,626,441
4,626,442
602 4,626,443
4,626,444

CLASS 427

7 4,626,445
8 4,626,446
39 4,626,447
4,626,448
53.1 4,626,449
93 4,626,450
123 4,626,451
356 4,626,452
397.7 4,626,453

CLASS 428

13 4,626,454
35 4,626,455
4,626,456
4,626,457
36 4,626,458
40 4,626,459
4,626,460
113 4,626,461
137 4,626,462
143 4,626,463
212 4,626,464
225 4,626,465
247 4,626,466
288 4,626,467
315.5 4,626,468
323 4,626,469
336 4,626,470
402.21 4,626,471
407 4,626,472
409 4,626,473
416 4,626,474
423.1 4,626,475
457 4,626,476
4,626,477
596 4,626,478
663 4,626,479
694 4,626,480

CLASS 429

18 4,626,481
27 4,626,482
50 4,626,483

CLASS 430

59 4,626,485
86 4,626,486
109 4,626,487
4,626,488
137 4,626,489
138 4,626,490
190 4,626,491
191 4,626,492
201 4,626,493
213 4,626,494
232 4,626,495
270 4,626,496
273 4,626,484
293 4,626,497
379 4,626,498
559 4,626,499
617 4,626,500

CLASS 431

12 4,626,191
46 4,626,192
71 4,626,193
90 4,626,194
188 4,626,195
264 4,626,196
302 4,626,197

CLASS 432

13 4,626,198
58 4,626,199
101 4,626,200
105 4,626,201
107 4,626,202
138 4,626,203
222 4,626,204
225 4,626,205
230 4,626,206
253 4,626,207

CLASS 433

3 4,626,208
9 4,626,209
29 4,626,210
137 4,626,211
144 4,626,212
173 4,626,213
174 4,626,214
198 4,626,215
229 4,626,216

CLASS 434

8 4,626,217
73 4,626,218
162 4,626,219
236 4,626,220

CLASS 435

6 4,626,501
7 4,626,502
75 4,626,503
172.3 4,626,504
4,626,505
173 4,626,506
240 4,626,507
242 4,626,508
287 4,626,509
317 4,626,510

CLASS 436

8 4,626,511
4,626,512
518 4,626,513

CLASS 441

108 4,626,221

CLASS 446

268 4,626,222
279 4,626,223
297 4,626,224
394 4,626,225

CLASS 455

11 4,627,107
70 4,627,098
76 4,627,099
160 4,627,100
194 4,627,101
221 4,627,102
226 4,627,103
327 4,627,104
612 4,627,105
617 4,627,106

CLASS 464

64 4,626,226

CLASS 474

8 4,626,227
49 4,626,228
80 4,626,229
106 4,626,230
152 4,626,231
205 4,626,232
206 4,626,233

CLASS 493

167 4,626,234
210 4,626,235
257 4,626,236

CLASS 494

37 4,626,237

CLASS 501

10 4,626,514
32 4,626,515
59 Re.32,299
92 4,626,516
96 4,626,517
104 4,626,518

CLASS 502

105 4,626,519
115 4,626,520
328 4,626,521

CLASS 514

12 4,626,523
13 4,626,524
18 4,626,525
46 4,626,526
78 4,626,527
119 4,626,528
159 4,626,529
166 4,626,530
171 4,626,531
195 4,626,532
202 4,626,533
203 4,626,534
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222 4,626,536
237 4,626,537
258 4,626,538
282 4,626,539
297 4,626,540
4,626,541
325 4,626,542
365 4,626,543
383 4,626,544
423 4,626,545
429 4,626,546
450 4,626,547
469 4,626,548
635 Re.32,300
651 4,626,549
770 4,626,550

CLASS 518

701 4,626,551
712 4,626,552

CLASS 521

27 4,626,553
57 4,626,554
59 4,626,555

CLASS 522

99 4,626,556

CLASS 523

100 4,626,557
109 4,626,558
122 4,626,559
145 4,626,560
318 4,626,561
466 4,626,562

CLASS 524

168 4,626,563
413 4,626,564
423 4,626,565
490 4,626,566
493 4,626,567
526 4,626,568
541 4,626,569

CLASS 525

12 4,626,570
54.1 4,626,571
67 4,626,572
148 4,626,573
240 4,626,574
329.5 4,626,575
332.8 4,626,576
369 4,626,577
484 4,626,578

CLASS 526

194 4,626,579
253 4,626,580
288 4,626,581
298 4,626,582

CLASS 528

34 4,626,583
192 4,626,584
212 4,626,585
374 4,626,586
481 4,626,587
4,626,588

CLASS 534

605 4,626,589
635 4,626,590

CLASS 540

306 4,626,384
451 4,626,385

CLASS 546

165 4,626,591
192 4,626,592
339 4,626,593

CLASS 548

262 4,626,594

CLASS 549

559 4,626,595

CLASS 556

57 4,626,596

CLASS 560

53 4,626,597

CLASS 562

487 4,626,598

CLASS 564

355 4,626,522

CLASS 568

57 4,626,599
411 4,626,600
425 4,626,601
757 4,626,605
822 4,626,602
833 4,626,603
881 4,626,604
931 4,626,606
948 4,626,607

CLASS 570

134 4,626,608

CLASS 585

467 4,626,609

CLASS 604

15 4,626,238
31 4,626,239
43 4,626,240
49 4,626,241
68 4,626,242
141 4,626,243
4,626,244
167 4,626,245
174 4,626,246
312 4,626,247
319 4,626,248
329 4,626,249
352 4,626,250
362 4,626,251
370 4,626,252
374 4,626,253
383 4,626,254

CLASS 623

2 4,626,255

CLASS 800

1 4,626,610

D1—	101	286,940		513	286,961	D9—	304	286,981		203	287,001	D16—	1	287,021		253	287,041
		286,941		521	286,962		377	286,982		303	287,002		31	287,022	D22—	118	287,042
		286,942		549	286,963		385	286,983		314	287,003		32	287,023	D23—	19	287,043
		286,943		569	286,964		395	286,984	D13—	24	287,004	D18—	7	287,024			287,044
		286,944		596	286,965		407	286,985		35	287,005		12	287,025		28	287,045
D2—	24	286,945	D7—	9	286,966		413	286,986		40	287,006		22	287,026		115	287,046
	226	286,947			286,967		433	286,987	D14—	11	287,007	D19—	10	287,027		136	287,047
	314	286,948		81	286,968	D10—	114	286,988		36	287,008		51	287,028		137	287,048
D3—	39	286,950		139	286,969			286,989		53	287,009	D20—	4	287,029		150	287,049
	40	286,951		360	286,970	D11—	1	286,990			287,010		6	287,030	D24—	8	287,050
	106	286,949	D8—	14	286,972	D12—	42	286,991		57	287,011		31	287,031			287,051
D4—	136	286,952		24	286,973		105	286,992		58	287,012	D21—	13	287,032		21	287,052
D6—	337	286,953		107	286,974		125	286,993		106	287,013		35	287,033		25	287,053
	374	286,954		323	286,975			286,994	D15—	79	287,014		56	287,034		27	287,054
	384	286,955		394	286,971			286,995		123	287,015			287,035		29	287,055
	396	286,956			286,976			286,996			287,016		89	287,036		40	287,056
	403	286,957			286,977		131	286,997		124	287,017		150	287,037	D25—	74	287,057
	432	286,958		396	286,978		163	286,998		126	287,018			287,038	D26—	47	287,058
	446	286,959		397	286,979			286,999		138	287,019		166	287,039	D28—	46	287,059
	475	286,960		499	286,980		187	287,000		199	287,020		204	287,040	D29—	10	286,946

CLASSIFICATION OF PLANTS

P.—	38	5,813															
	68	5,814		74	5,815			5,816			5,817		78	5,818			5,819

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29—	576 B	H170	102—	524	H167	252—	174.17	H171	318—	116	H175	376—	261	H177	429—	114	H178
53—	435	H180	149—	19.3	H169		305	H172									
71—	93	H168		88	H181	285—	31	H176	342—	372	H173	384—	108	H174	526—	125	H179

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PATENTS

01 :	4,625,426	4,625,712	4,626,481		4,627,090		4,625,484		4,625,952		
	4,625,570	4,625,721	4,626,507	08 :	4,625,631		4,625,535		4,625,959		
	4,625,646	4,625,725	4,626,523		4,625,757		4,625,593		4,625,979		
	4,625,665	4,625,734	4,626,530		4,625,791		4,625,618		4,626,051		
	4,625,704	4,625,740	4,626,543		4,625,802		4,625,632		4,626,067		
	4,625,820	4,625,741	4,626,558		4,625,930		4,625,716		4,626,099		
	4,626,100	4,625,746	4,626,586		4,625,999		4,625,719		4,626,126		
	4,626,105	4,625,796	4,626,593		4,626,344		4,625,723		4,626,142		
	4,626,139	4,625,806	4,626,608		4,626,413		4,625,742		4,626,155		
	4,626,491	4,625,807	4,626,611		4,626,829		4,625,915		4,626,161		
	4,626,685	4,625,808	4,626,627		4,626,832		4,626,013		4,626,175		
	4,626,688	4,625,867	4,626,631		4,626,933		4,626,016		4,626,190		
	4,626,858	4,625,872	4,626,662		4,626,943		4,626,145		4,626,196		
	4,627,067	4,625,876	4,626,668		4,627,038		4,626,245		4,626,199		
04 :	4,625,345	4,625,894	4,626,670		4,627,039		4,626,247		4,626,225		
	4,626,010	4,625,901	4,626,691		4,627,097		4,626,309		4,626,250		
	4,626,346	4,625,913	4,626,693		4,627,106		4,626,358		4,626,313		
	4,626,428	4,625,914	4,626,697	09 :	4,625,342		4,626,804		4,626,314		
	4,626,770	4,625,917	4,626,706		4,625,400		4,626,920		4,626,341		
	4,626,775	4,625,966	4,626,709		4,625,640		4,627,077		4,626,456		
	4,626,839	4,625,978	4,626,711		4,625,731	13 :	4,625,414		4,626,502		
	4,626,958	4,625,990	4,626,750		4,625,738		4,625,485		4,626,598		
06 :	4,625,338	4,626,001	4,626,764		4,625,775		4,625,753		4,626,610		
	4,625,340	4,626,012	4,626,767		4,625,819		4,625,890		4,626,633		
	4,625,341	4,626,046	4,626,768		4,625,857		4,626,024		4,626,634		
	4,625,353	4,626,054	4,626,771		4,625,886		4,626,239		4,626,635		
	4,625,388	4,626,061	4,626,791		4,626,047		4,626,467		4,626,636		
	4,625,393	4,626,110	4,626,823		4,626,057		4,626,638		4,626,695		
	4,625,395	4,626,128	4,626,825		4,626,111	15 :	4,625,474		4,626,719		
	4,625,409	4,626,137	4,626,837		4,626,118		4,625,671		4,626,747		
	4,625,423	4,626,193	4,626,843		4,626,119	16 :	4,625,606		4,626,802		
	4,625,428	4,626,201	4,626,850		4,626,169		4,625,674		4,626,822		
	4,625,437	4,626,209	4,626,860		4,626,171		4,625,743		4,626,830		
	4,625,447	4,626,213	4,626,862		4,626,235		4,626,106		4,626,835		
	4,625,448	4,626,220	4,626,890		4,626,265		4,626,336		4,626,845		
	4,625,457	4,626,222	4,626,917		4,626,312		4,626,350		4,626,847		
	4,625,460	4,626,223	4,626,919		4,626,407	17 :	4,625,346		4,626,863		
	4,625,468	4,626,224	4,626,949		4,626,461		4,625,369		4,626,953		
	4,625,483	4,626,240	4,626,979		4,626,615		4,625,526		4,626,955		
	4,625,488	4,626,244	4,626,980		4,626,759		4,625,588		4,626,962		
	4,625,525	4,626,258	4,626,992		4,626,819		4,625,598		4,626,969		
	4,625,557	4,626,276	4,627,004		4,626,968		4,625,604		4,626,971		
	4,625,563	4,626,298	4,627,009		4,626,998		4,625,630		4,627,007		
	4,625,601	4,626,307	4,627,024		4,627,016		4,625,650		4,627,019		
	4,625,611	4,626,317	4,627,034	10 :	4,626,468		4,625,655		4,627,047		
	4,625,612	4,626,322	4,627,050		4,626,505		4,625,656		4,627,048		
	4,625,615	4,626,329	4,627,061		4,626,539		4,625,763		4,627,060		
	4,625,619	4,626,348	4,627,068		4,626,550		4,625,801		4,627,098		
	4,625,638	4,626,372	4,627,073	11 :	4,625,672		4,625,830	18 :	4,625,347		
	4,625,641	4,626,383	4,627,079	12 :	4,625,344		4,625,850		4,625,511		
	4,625,658	4,626,417	4,627,084		4,625,441		4,625,879		4,625,515		
	4,625,675	4,626,421	4,627,085		4,625,469		4,625,928		4,625,616		
	4,625,685	4,626,435	4,627,089		4,625,472		4,625,937		4,625,636		

	4,625,827		4,626,757		4,625,996		4,625,784		4,627,036		4,625,799
	4,625,889		4,626,769	33 :	4,625,445		4,625,883	41 :	4,625,334		4,625,800
	4,625,950		4,626,779		4,626,048		4,625,893		4,625,336		4,625,803
	4,626,154		4,626,798		4,626,217		4,625,905		4,625,358		4,625,804
	4,626,208		4,626,801		4,626,321		4,625,906		4,625,407		4,625,885
	4,626,300		4,626,849		4,626,648		4,625,907		4,625,451		4,625,941
	4,626,476		4,626,950		4,627,000		4,625,934		4,625,610		4,625,942
	4,626,477		4,627,005		4,627,001		4,625,967		4,625,635		4,625,944
	4,626,534		4,627,094		4,627,080		4,625,981		4,625,735		4,625,965
	4,626,549	26 :	Re.32,298	34 :	4,625,390		4,626,130		4,625,969		4,625,989
	4,626,566		4,625,351		4,625,401		4,626,156		4,626,007		4,626,003
	4,626,572		4,625,377		4,625,404		4,626,168		4,626,133		4,626,032
	4,626,591		4,625,385		4,625,421		4,626,218		4,626,215		4,626,050
	4,626,600		4,625,405		4,625,436		4,626,219		4,626,438		4,626,135
	4,626,661		4,625,412		4,625,438		4,626,318		4,626,805		4,626,136
	4,626,681		4,625,417		4,625,480		4,626,324	42 :	4,625,374		4,626,166
	4,626,742		4,625,422		4,625,486		4,626,361		4,625,420		4,626,167
	4,626,746		4,625,509		4,625,490		4,626,434		4,625,481		4,626,206
	4,626,753		4,625,516		4,625,495		4,626,442		4,625,521		4,626,211
	4,626,755		4,625,545		4,625,518		4,626,446		4,625,600		4,626,237
	4,626,799		4,625,561		4,625,627		4,626,460		4,625,609		4,626,419
	4,626,844		4,625,567		4,625,633		4,626,471		4,625,707		4,626,520
	4,626,892		4,625,579		4,625,643		4,626,474		4,625,722		4,626,559
	4,626,913		4,625,581		4,625,736		4,626,503		4,625,936		4,626,563
	4,626,959		4,625,585		4,625,745		4,626,508		4,625,938		4,626,571
	4,626,963		4,625,602		4,625,765		4,626,515		4,625,962		4,626,581
	4,626,977		4,625,603		4,625,813		4,626,516		4,626,008		4,626,596
	4,627,101		4,625,622		4,625,829		4,626,538		4,626,037		4,626,665
19 :	4,625,502		4,625,623		4,625,873		4,626,541		4,626,039		4,626,677
	4,625,751		4,625,695		4,625,875		4,626,560		4,626,056		4,626,713
	4,625,809		4,625,698		4,625,877		4,626,630		4,626,151		4,626,773
	4,625,812		4,625,705		4,625,899		4,626,632		4,626,162		4,626,785
	4,625,826		4,625,774		4,626,004		4,626,698		4,626,198		4,626,834
	4,625,842		4,625,787		4,626,066		4,626,705		4,626,200		4,626,836
	4,625,988		4,625,940		4,626,075		4,626,740		4,626,212		4,626,852
	4,626,163		4,625,954		4,626,103		4,626,787		4,626,267		4,626,856
	4,626,189		4,625,968		4,626,241		4,626,792		4,626,280		4,626,985
	4,626,246		4,625,980		4,626,251		4,626,810		4,626,289		4,627,015
	4,627,066		4,626,019		4,626,253		4,626,816		4,626,294		4,627,031
20 :	4,625,586		4,626,020		4,626,269		4,626,824		4,626,342		4,627,033
	4,625,664		4,626,021		4,626,283		4,626,868		4,626,362		4,627,046
	4,625,752		4,626,140		4,626,285		4,626,879		4,626,404		4,627,071
	4,625,888		4,626,141		4,626,286		4,626,883		4,626,418		4,627,095
	4,626,035		4,626,147		4,626,288		4,626,909		4,626,422	49 :	4,625,778
	4,626,249		4,626,148		4,626,291		4,626,966		4,626,424	50 :	4,626,882
	4,626,782		4,626,159		4,626,296		4,626,988		4,626,425	51 :	4,625,737
21 :	4,625,380		4,626,192		4,626,316		4,627,014		4,626,453		4,625,987
	4,625,620		4,626,366		4,626,326		4,627,017		4,626,542		4,626,205
	4,625,654		4,626,385		4,626,327		4,627,020		4,626,554		4,626,780
	4,626,114		4,626,391		4,626,339		4,627,087		4,626,573		4,626,796
	4,626,132		4,626,447		4,626,347	37 :	4,625,453		4,626,576		4,626,848
	4,626,735		4,626,526		4,626,357		4,625,530		4,626,583		4,627,075
22 :	4,625,381		4,626,540		4,626,363		4,625,661		4,626,637	53 :	4,625,364
	4,625,755		4,626,578		4,626,364		4,625,891		4,626,733		4,625,455
	4,625,892		4,626,642		4,626,368		4,626,946		4,626,763		4,625,542
	4,626,017		4,626,660		4,626,377		4,626,995		4,626,811		4,625,596
	4,626,259		4,626,726		4,626,390		4,627,054		4,626,817		4,625,828
	4,626,292		4,626,846		4,626,397	38 :	4,625,662		4,626,831		4,625,859
	4,626,353	27 :	Re.32,299		4,626,399	39 :	4,625,379		4,626,871		4,625,946
	4,626,360		4,625,384		4,626,400		4,625,427		4,626,965		4,625,955
	4,626,433		4,625,465		4,626,415		4,625,433		4,627,006		4,626,068
	4,626,552		4,625,726		4,626,429		4,625,477		4,627,030		4,626,216
	4,626,592		4,626,033		4,626,440		4,625,560		4,627,032		4,626,401
23 :	4,626,509		4,626,053		4,626,441		4,625,605	43 :	4,625,383		4,626,803
24 :	4,625,343		4,626,127		4,626,482		4,625,614	44 :	4,625,898		4,626,861
	4,625,491		4,626,143		4,626,492		4,625,621		4,625,963		4,627,078
	4,625,708		4,626,262		4,626,519		4,625,854		4,626,236	54 :	4,626,406
	4,625,730		4,626,271		4,626,545		4,625,903		4,626,776		4,626,551
	4,625,882		4,626,459		4,626,548		4,625,912		4,626,982		4,626,587
	4,625,971		4,626,582		4,626,557		4,625,920	45 :	4,625,396	55 :	4,625,337
	4,626,369		4,626,652		4,626,570		4,625,922		4,625,541		4,625,473
	4,626,672		4,626,806		4,626,599		4,625,945		4,625,832		4,625,512
	4,626,684		4,627,018		4,626,609		4,625,947		4,625,924		4,625,549
	4,626,853		4,627,045		4,626,739		4,625,970		4,626,405		4,625,552
	4,626,854		4,627,070		4,626,894		4,625,972		4,626,452		4,625,574
	4,626,904		4,625,363		4,626,895		4,625,998		4,626,616		4,625,679
	4,627,008	28 :	4,625,394		4,626,972		4,626,022	47 :	4,625,668		4,625,823
25 :	4,625,357		4,625,831		4,627,065		4,626,112		4,625,703		4,625,833
	4,625,373		4,625,949		4,627,091		4,626,186		4,626,018		4,625,864
	4,625,415		4,626,528	35 :	4,625,786		4,626,287		4,626,330		4,625,865
	4,625,513		4,626,723		4,626,281		4,626,302		4,626,333		4,625,881
	4,625,717		4,625,349		4,626,448		4,626,311		4,626,974		4,625,957
	4,625,780	29 :	4,625,442		4,626,708		4,626,436	48 :	4,625,365		4,625,974
	4,625,926		4,625,452	36 :	Re.32,300		4,626,455		4,625,440		4,626,009
	4,625,977		4,625,498		4,625,339		4,626,475		4,625,475		4,626,138
	4,626,058		4,625,539		4,625,360		4,626,521		4,625,478		4,626,152
	4,626,243		4,625,592		4,625,392		4,626,567		4,625,523		4,626,184
	4,626,278		4,625,653		4,625,399		4,626,574		4,625,544		4,626,354
	4,626,299		4,625,852		4,625,402		4,626,575		4,625,547		4,626,439
	4,626,345		4,625,862		4,625,425		4,626,620		4,625,548		4,626,454
	4,626,473		4,626,232		4,625,450		4,626,669		4,625,553		4,626,457
	4,626,478		4,626,248		4,625,496		4,626,745		4,625,599		4,626,525
	4,626,501		4,626,335		4,625,537		4,626,821		4,625,644		4,626,569
	4,626,513		4,626,379		4,625,613		4,626,869		4,625,645		4,626,584
	4,626,524		4,626,412		4,625,629		4,626,999		4,625,706		4,626,612
	4,626,527		4,627,062		4,625,657	40 :	4,625,573		4,625,729		4,626,641
	4,626,650	31 :	4,625,984		4,625,683		4,625,810		4,625,754		4,626,683
	4,626,664		4,626,430		4,625,727		4,626,011		4,625,762		4,626,818
	4,626,671		4,626,984		4,625,728		4,626,320		4,625,764		4,626,954
	4,626,686	32 :	4,625,900		4,625,782		4,626,426		4,625,798		4,626,975
	4,626,730										

DESIGN PATENTS

01 :	286,970		286,973		287,050	24 :	286,969		286,967		286,977
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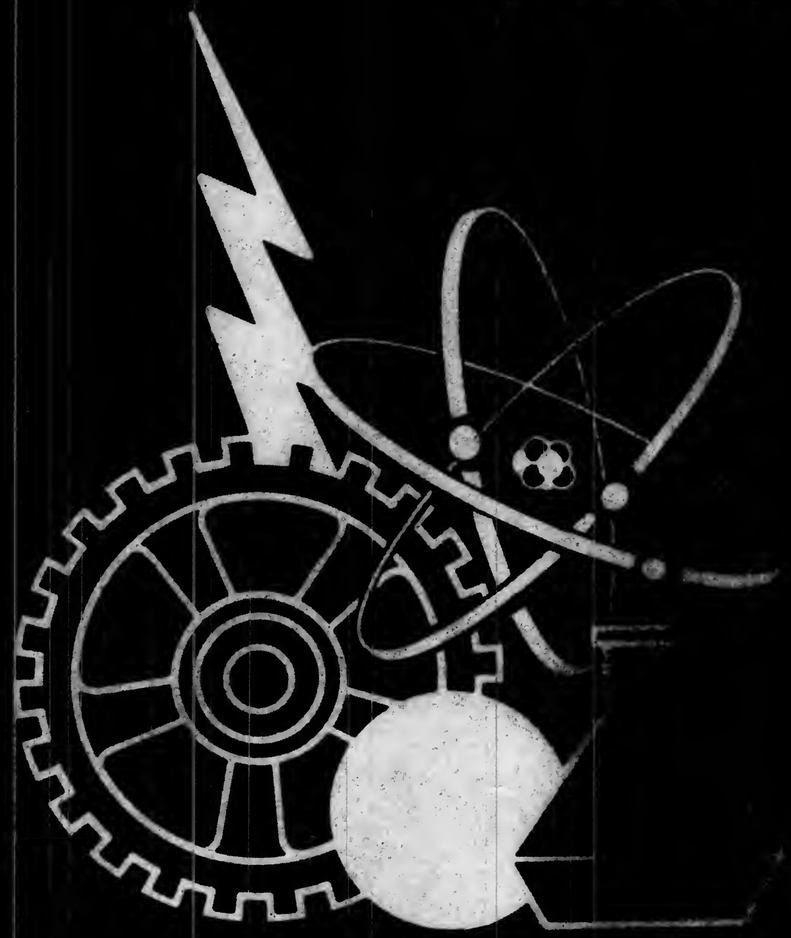
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 9, 1986



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 9, 1986 Volume 1073 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printipg authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 6, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,418,431 through 4,419,770
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 21, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,349,932	06/254,450	9/21/82
4,349,934	06/234,985	9/21/82
4,349,960	06/218,277	9/21/82
4,349,961	06/306,752	9/21/82
4,349,963	06/223,080	9/21/82
4,349,975	06/240,845	9/21/82
4,349,984	06/233,493	9/21/82
4,349,989	06/246,602	9/21/82
4,350,005	06/285,266	9/21/82
4,350,016	06/236,523	9/21/82
4,350,042	06/223,990	9/21/82
4,350,067	06/261,007	9/21/82
4,350,070	06/238,005	9/21/82
4,350,080	06/216,802	9/21/82
4,350,085	06/217,997	9/21/82
4,350,087	06/245,869	9/21/82
4,350,110	06/221,157	9/21/82
4,350,117	06/239,416	9/21/82
4,350,142	06/222,633	9/21/82
4,350,195	06/235,925	9/21/82
4,350,199	06/231,651	9/21/82
4,350,201	06/224,035	9/21/82
4,350,341	06/274,823	9/21/82
4,350,344	06/235,783	9/21/82
4,350,417	06/241,287	9/21/82
4,350,423	06/281,892	9/21/82
4,350,425	06/260,281	9/21/82
4,350,445	06/216,774	9/21/82
4,350,483	06/226,499	9/21/82
4,350,488	06/278,834	9/21/82
4,350,493	06/248,625	9/21/82
4,350,545	06/264,954	9/21/82
4,350,553	06/287,424	9/21/82
4,350,562	06/274,883	9/21/82
4,350,568	06/254,305	9/21/82
4,350,569	06/265,476	9/21/82
4,350,584	06/242,408	9/21/82
4,350,590	06/237,937	9/21/82
4,350,596	06/266,201	9/21/82
4,350,610	06/252,592	9/21/82
4,350,617	06/255,568	9/21/82
4,350,623	06/236,064	9/21/82
4,350,646	06/265,654	9/21/82
4,350,650	06/219,964	9/21/82
4,350,660	06/263,912	9/21/82
4,350,662	06/227,285	9/21/82
4,350,668	06/246,065	9/21/82
4,350,689	06/322,789	9/21/82
4,350,703	06/222,282	9/21/82
4,350,712	06/233,153	9/21/82
4,350,722	06/241,646	9/21/82
4,350,762	06/231,152	9/21/82
4,350,769	06/282,679	9/21/82
4,350,775	06/300,302	9/21/82
4,350,781	06/286,419	9/21/82
4,350,782	06/302,400	9/21/82
4,350,824	06/236,484	9/21/82
4,350,837	06/233,465	9/21/82
4,350,890	06/215,596	9/21/82
4,350,931	06/223,397	9/21/82
4,350,968	06/229,422	9/21/82
4,350,995	06/255,982	9/21/82
4,351,020	06/247,643	9/21/82
4,351,046	06/237,873	9/21/82
4,351,048	06/297,053	9/21/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,856,513, Re. S.N. 922,290, Filed Oct. 23, 1986, Cl. 148/403, NOVEL AMORPHOUS METALS AND AMORPHOUS METAL ARTICLES, Ho-Sou Chen, et al., Owner of Record: *Inventor,* Attorney or Agent: James Riesenfeld, et al., Ex. Gp.: 111

4,243,546, Re. S.N. 854,220, Filed Apr. 21, 1986, Cl. 252/355, STABLE AQUEOUS COMPOSITIONS CONTAINING ENZYMES, Elias H. Shaer, Owner of Record: *Drackett Co., Cincinnati, Ohio,* Attorney or Agent: Prabodh I. Almaula, et al., Ex. Gp.: 223

4,348,081, Re. S.N. 897,066, Filed Aug. 15, 1986, Cl. 350/412, PROJECTION LENS, Ellis I. Betensky, Owner of Record: *U. S. Precision Lens, Cincinnati, Ohio,* Attorney or Agent: Peter L. Costas, et al., Ex. Gp.: 257

4,476,584, Re. S.N. 916,708, Filed Oct. 8, 1986, Cl. 455/182, DIGITAL FREQUENCY LOCK TUNING SYSTEM, Chuck Dages, Owner of Record: *Jerrold Electronics Corp., Hatboro, Pa.,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 263

4,476,799, Re. S.N. 919,233, Filed Oct. 15, 1986, Cl. 114/103, SAILS, Stephen D. Bandy, Owner of Record: *Inventor,* Attorney or Agent: Robert D. Lyon, et al., Ex. Gp.: 315

4,477,167, Re. S.N. 920,047, Filed Oct. 16, 1986, Cl. 354/400, PROTECTIVE DEVICE FOR AUTOMATIC FOCUSING CAMERA, Norio Ishikawa, et al., Owner of Record: *Minolta Camera Co., Osaka, Japan,* Attorney or Agent: Joseph W. Price, et al., Ex. Gp.: 211

4,477,607, Re. S.N. 918,820, Filed Oct. 14, 1986, Cl. 523/212, THIXOTROPIC CYANOACRYLATE COMPOSITIONS, Alan E. Litke, Owner of Record: *Loctite Corp., Newington, Conn.,* Attorney or Agent: Robert O. Vidas, et al., Ex. Gp.: 151

4,478,570, Re. S.N. 922,305, Filed Oct. 23, 1986, Cl. 431/344, FLOW CONTROL DEVICE FOR DISPOSABLE GAS LIGHTER, Stig Johansson, Owner of Record: *Feudor S.A., Rhone, France,* Attorney or Agent: Herbert Dubno, Ex. Gp.: 345

4,479,366, Re. S.N. 923,043, Filed Oct. 24, 1986, Cl. 62/304, EVAPORATIVE COOLER, Ted B. Lanier, et al., Owner of Record: *Tradewinds Technologies, Inc., Tempe, Ariz.,* Attorney or Agent: John W. Chestnut, Ex. Gp.: 344

4,500,724, Re. S.N. 911,614, Filed Sept. 25, 1986, Cl. 556/472, METHOD FOR MAKING ALKYLHALOSILANES, William J. Ward III, et al., Owner of Record: *General Electric Co., Waterford, N.Y.,* Attorney or Agent: William A. Teoli, Ex. Gp.: 124

4,512,907, Re. S.N. 918,140, Filed Oct. 14, 1986, Cl. 252/70, ICE MELTER AND METHOD OF MAKING SAME, Forrest M. McConnell, Owner of Record: *Koos, Inc., Kenosha, Wis.,* Attorney or Agent: John M. Mann, et al., Ex. Gp.: 157

4,539,020, Re. S.N. 922,323, Filed Oct. 23, 1986, Cl. 141/103, METHODS FOR OBTAINING HIGH-PURITY CARBON MONOXIDE, Toshikazu Sakuraya, et al., Owner of Record: *Kawasaki Steel Corp., Kyogo, Japan; Osaka Sanso Kogyo, Osaka, Japan,* Attorney or Agent: Alvin Browdy, et al., Ex. Gp.: 243

4,542,198, Re. S.N. 919,124, Filed Oct. 2, 1986, Cl. 526/125, POLYMERIZATION CATALYSTS, Adolfo Mayr, et al., Owner of Record: *Inventor,* Attorney or Agent: Patricia Q. Peake, et al., Ex. Gp.: 155

4,587,459, Re. S.N. 916,992, Filed Oct. 2, 1986, Cl. 315/158, LIGHT-SENSING LIGHT FIXTURE CONTROL SYSTEM, Frederick H. Blake, Owner of Record: *Inventor,* Attorney or Agent: Bruce A. Kaser, et al., Ex. Gp.: 266

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,760,669, Reexam. No. 90/001,113, Requested: Oct. 10, 1986, Cl. 83/208, SHEET MATERIAL FEEDING AND CUTTING APPARATUS AND CONTROL SYSTEM THEREFOR, Ben J. Rosenthal, et al., Owner of Record: *Rosenthal Mfg. Co., Inc., Chicago, Ill.,* Attorney or Agent: None, Ex. Gp.: 320, Requester: Thermal Equipment, Inc., Goddard, Kans.

3,794,732, Reexam. No. 90/001,104, Requested: Oct. 3, 1986, Cl. 514/460, RUMINANT FEED UTILIZATION IMPROVEMENT, Arthur P. Raun, Owner of Record: *Eli Lilly & Co., Indianapolis, Ind.,* Attorney or Agent: Finnegan, Henderson, et al., Ex. Gp.: 120, Requester: Hoffmann-Laroche, Inc., Nutley, N.J.

3,979,709, Reexam. No. 90/001,116, Requested: Oct. 20, 1986, Cl. 337/186, ELECTRIC FUSE HAVING A MULTIPLY CASING OF A SYNTHETIC RESIN GLASS CLOTH LAMINATE, Daniel P. Healey, Owner of Record: *Gould, Inc., Rolling Meadow, Ill.,* Attorney or Agent: Paul Edgell, Ex. Gp.: 210, Requester: Owner

4,102,933, Reexam. No. 90/001,108, Requested: Oct. 6, 1986, Cl. 568/648, PROCESS FOR PREPARING A STRIALKOXY BENZENE, Barrie D. Howarth, et al., Owner of Record: *Oce-Andeno B.V., Venlo, Weg, The Netherlands,* Attorney or Agent: Reed, Smith, et al., Ex. Gp.: 120, Requester: Owner

4,104,822, Reexam. No. 90/001,118, Requested: Oct. 23, 1986, Cl. 46/74, ROTATING CIRCULAR AIRFOIL, Henry Wendell Rodgers, Owner of Record: *Inventor, Lakewood, Colo.,* Attorney or Agent: Greg J. Anderson, Ex. Gp.: 330, Requester: Alan J. Adler, Palo Alto, Calif.

4,236,078, Reexam. No. 90/001,117, Requested: Oct. 16, 1986, Cl. 250/484, METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A RADIATION IMAGE, Noboru Kotera, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan,* Attorney or Agent: Gerald J. Ferguson, Ex. Gp.: 250, Requester: Owner

4,238,799, Reexam. No. 90/001,109, Requested: Oct. 6, 1986, Cl. 343/715, WINDSHIELD MOUNTED HALF-WAVE COMMUNICATION ANTENNA ASSEMBLY, Dale R. Parfitt, Owner of Record: *Orion Industries, Inc., Wilmington, Del.,* Attorney or Agent: Dressler, Goldsmith, et al., Ex. Gp.: 250, Requester: Charles T. McCrink, Rancho Santa Fe, Calif.

4,351,753, Reexam. No. 90/001,112, Requested: Oct. 6, 1986, Cl. 252/357, LIQUIFIED NORMALLY SOLID POLYOXALKYLENE BLOCK POLYMERS, Thomas M. Kaneko, Owner of Record: *B.A.S.F. Wyandotte Corp., Wyandotte, Mich.,* Attorney or Agent: Bernard R. Swick, Ex. Gp.: 150, Requester: John J. McDonnell, Chicago, Ill.

4,422,338, Reexam. No. 90/001,115, Requested: Oct. 14, 1986, Cl. 73/861, METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT, James E. Smith, Owner of Record: *Micro Motion, Inc., Boulder, Colo.,* Attorney or Agent: Mary Helen Sears, Ex. Gp.: 260, Requester: Exac Corp., Campbell, Calif.

4,439,311, Reexam. No. 90/001,110, Requested: Oct. 6, 1986, Cl. 208/179, REREFINING USED LUBRICATING OIL WITH HYDRIDE REDUCING AGENTS, Richard H. O'Blasny, Owner of Record: *Delta Central Refining, Inc., Natchitoches, La.,* Attorney or Agent: Jenner & Block, Ex. Gp.: 110, Requester: Wayne E. Nacker, Chicago, Ill.

4,486,944, Reexam. No. 90/001,107, Requested: Oct. 3, 1986, Cl. 29/557, METHOD OF MAKING SINGLE POLY MEMORY CELL, Kim C. Hardee, Owner of Record: *Inmos Corp., Colorado Springs, Colo.,* Attorney or Agent: Edward D. Manzo, Ex. Gp.: 110, Requester: Owner

4,504,383, Reexam. No. 90/001,111, Requested: Oct. 6, 1986, Cl. 208/179, REREFINING USED OIL WITH BOROHYDRIDE REDUCING AGENTS, Richard H. O'Blasny, Owner of Record: *Delta Central Refining, Inc., Natchitoches, La.,* Attorney or Agent: Jenner & Block, Ex. Gp.: 110, Requester: Wayne E. Nacker, Chicago, Ill.

4,551,930, Reexam. No. 90/001,106, Requested: Oct. 2, 1986, Cl. 36/30, SOLE CONSTRUCTION FOR FOOTWEAR, Kenneth W. Graham, et al., Owner of Record: *New Balance Athletic Shoes, Inc., Boston, Mass.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 240, Requester: Owner

4,558,179, Reexam. No. 90/001,105, Requested: Sept. 30, 1986, Cl. 179/630, MESSAGE PLAYBACK CONTROL SYSTEM FOR TELEPHONE ANSWERING MACHINE, Raymond G. Bond, Owner of Record: *Fortel, Inc., Compton, Calif.,* Attorney or Agent: Jessup & Beecher, Ex. Gp.: 260, Requester: Chittaranjan Nirmel, Alexandria, Va.

4,575,123, Reexam. No. 90/001,114, Requested: Oct. 10, 1986, Cl. 281/48, REPORT COVER, John P. Giblin, Owner of Record: *Champion International Corp., Stamford, Conn.,* Attorney or Agent: Evelyn M. Sommers, Ex. Gp.: 320, Requester: Barry D. Josephs, Framingham, Mass.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Earl C. Recker, d/b/a Earl C. Recker Co., assignee, by mesne assignment, of Recker-Best Co., Mesa, Ariz., Reg. No. 308,133, for the mark "GOLD RUSH", Canc. No. 15,416.

Walter Holder, d/b/a Holder Chemical Co., assignee of Joseph H. James, Ponca City, Okla., Reg. No. 618,453, for the mark "JAMES 'PERMA-KILL' AND DESIGN", Canc. No. 15,632.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Patent Counsel Turbine Legal Operations, 1 River Rd., Schenectady, N.Y. 12345.

4,537,560. * RADIAL KEY FOR STEAM TURBINE WHEELS.
4,538,455. * METHOD AND APPARATUS FOR AXIALLY ALIGNING THE COUPLED SHAFTS OF A STEAM TURBINE.
4,567,914. * TWO-STAGE HYDRAULIC SOLENOID VALVE.
4,551,017. * LASER DOPPLER VELOCIMETER FOR MEASURING TORSIONAL VIBRATION.
4,551,018. * ACOUSTIC EMISSION ANALYZER.

The patents for the inventions listed below and owned by the estate of Rome Rudolph, are available for licensing or sale.

Please contact Attorney Edward L. Flaherty, Jr., 5916 Penn Mall, Pittsburgh, Pa. 15206

3,820,411. * IN LINE, POSITIVE DRIVE, INDEXING UNIT.
3,835,716. * GEARLESS INTERMITTENT MOTION DEVICE.
4,427,399. * OVERLOAD COUPLING OR CLUTCH.
4,452,093. * DRIVE UNIT.

SN. 4,231,061. * INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Sammuel Freeman,* 13 Birchwood Ct. East, Syosset, N.Y. 11791.
SN. 06,690,888. * ROTARY INTERNAL COMBUSTION ENGINE, *Joseph F. Frasca,* 5801 Yorkstown Rd., Lorain, Ohio 44053.
SN. 06,780,963. * PNEUMATIC GAS CYLINDER VALVE ACTIVATOR. *Joseph F. Long,* 603 W. 13 St., Austin, Tex. 78701.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 9, 1986

Re. 32,091	4,553,732	4,587,424	4,604,096
4,255,677	4,554,495	4,588,683	4,604,426
4,360,542	4,554,635	4,589,517	4,605,339
4,407,410	4,555,523	4,589,770	4,605,370
4,412,648	4,559,859	4,590,855	4,605,394
4,420,624	4,560,587	4,592,869	4,605,521
4,443,631	4,560,720	4,593,598	4,605,718
4,471,378	4,564,921	4,593,822	4,605,719
4,488,948	4,568,658	4,594,010	4,605,764
4,490,363	4,569,111	4,594,346	4,606,869
4,500,621	4,570,640	4,594,858	4,607,096
4,504,930	4,570,673	4,596,426	4,607,173
4,515,785	4,570,929	4,596,462	4,607,238
4,525,281	4,575,040	4,596,643	4,607,915
4,532,054	4,575,414	4,596,812	4,608,386
4,532,198	4,575,709	4,599,022	4,608,640
4,532,655	4,576,972	4,599,216	4,608,642
4,536,460	4,578,466	4,599,239	4,609,884
4,537,981	4,579,653	4,599,273	4,610,228
4,538,182	4,579,911	4,599,687	4,610,428
4,538,622	4,580,644	4,599,926	4,610,739
4,540,129	4,581,389	4,600,543	4,610,991
4,540,933	4,582,685	4,600,906	4,611,348
4,542,155	4,582,888	4,600,930	4,612,057
4,544,440	4,583,063	4,601,127	4,612,857
4,549,091	4,584,419	4,601,769	4,613,633
4,550,708	4,584,507	4,601,975	4,614,216
4,551,405	4,585,123	4,602,037	4,615,777
4,551,645	4,586,242	4,603,203	
4,552,159	4,586,431	4,603,284	
4,552,961	4,587,358	4,603,401	

Disclaimers

4,483,016.—*Peter A. Hochstein,* Sterling Heights, and *Kelvin Shih,* Brighton, Mich. AUDIO AMPLIFIER. Patent dated Nov. 13, 1984. Disclaimer filed Oct. 6, 1986, by the *inventors.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,536,449.—*Peter Kennedy,* Broughton and *Kenneth Parkinson,* Wirral, United Kingdom. REACTION BONDED SILICON CARBIDE ARTEFACTS. Patent dated Aug. 20, 1985. Disclaimer filed Sept. 24, 1986, by the assignee, *United Kingdom Atomic Energy Authority.*

Hereby enters this disclaimer to claim 1 of said patent.

4,541,819.—*Philip J. Mazziotti,* Toledo, Ohio. UNIVERSAL JOINT EMPLOYING BEARING ROLLERS. Patent dated Sept. 17, 1985. Disclaimer filed Oct. 17, 1986, by the assignee, *The Zeller Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
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	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
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Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 8, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,475,765 to 3,480,965, inclusive
Plant Patents . . . . . Numbers 2,937 to 2,944 inclusive

REISSUES

DECEMBER 9, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,301

METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTIBLE MIXTURE OF AN ENGINE

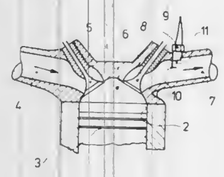
Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,372,270, dated Feb. 8, 1983, Ser. No. 747,676, Dec. 6, 1976. Application for reissue Jul. 1, 1983, Ser. No. 510,455

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554988

Int. Cl.[4] **F02B** *3/00*

U.S. Cl. 123—440 **25 Claims**



1. A method for controlling the fuel-air mixture of an internal combustion engine, said engine including combustion chambers, inlet conduits leading to said combustion chambers and exhaust conduits leading from said combustion chambers to the atmosphere, comprising the steps of

placing an ion-current sensor in the exhaust conduit for measuring an ion-current;

generating a nominal value of the ion-current;

periodically integrating the measured values of the ion-current during one working cycle of a piston of the engine,

comparing the [magnitude] *values* of the *integrated* ion-current with [the] *said* nominal value and generating a signal representing the difference between the measured value of the ion-current and said nominal value; and

[periodically integrating a signal derived from the signal representing the difference between the measured value of the ion-current and said nominal value, especially during one working cycle of a piston of the engine, and]

altering the fuel-air mixture of the engine in dependence on the result of [the integration] *said comparison.*

Re. 32,302

FRACTURING METHOD FOR STIMULATION OF WELLS UTILIZING CARBON DIOXIDE BASED FLUIDS

Stephen W. Almond, Ventura, Calif., and Phillip C. Harris, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Original No. 4,480,696, dated Nov. 6, 1984, Ser. No. 436,763, Oct. 25, 1982. Application for reissue Aug. 6, 1985, Ser. No. 763,121

Int. Cl.[4] **E21B** *43/267*

U.S. Cl. 166—308 **49 Claims**

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing an aqueous liquid with liquid carbon dioxide and a selected surfactant comprising at least one member selected from the group consisting of alkyl quaternary amines, betaines, sulfated alkoxylates and ethoxylated linear alcohols to form a stabilized emulsion, said emulsion comprising *an amount of liquid carbon dioxide whereby upon conversion of said liquid carbon dioxide to a gas and said emulsion to a foam, said foam contains* from about [50] *53* to in excess of about 96 percent by per volume carbon dioxide and said surfactant being present in said emulsion in an amount sufficient to stabilize said emulsion;

introducing said emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid;

maintaining said emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a stabilized foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion; and

fracturing said subterranean formation with said foam.

Re. 32,303

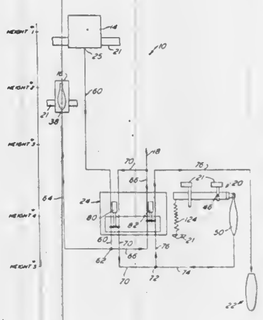
PERITONEAL DIALYSIS APPARATUS

Norman Lasker, Philadelphia, Pa., and Bruce E. Jarrell, Richmond, Va., assignors to American Medical Products Corp., Freehold, N.J.

Original No. 3,872,863, dated Mar. 25, 1975, Ser. No. 384,316, Jul. 31, 1973. Application for reissue Mar. 24, 1977, Ser. No. 781,031

Int. Cl.[4] **A61M** *5/00, 1/03*

U.S. Cl. 604—29 **11 Claims**



1. A dialysis apparatus comprising first means for supplying dialysis fluid, second means for measuring a predetermined quantity of dialysis fluid, a catheter, third means for detecting a minimum quantity of dialysis fluid, means for supporting said first means above said second means, said second means above said catheter, and said third means below said catheter so that dialysis fluid moves through said apparatus under the force of gravity, fluid flow conduits interconnected between said first and second means[,] *and between* said second means and said catheter and *between* said catheter [in] *and* said third means, fourth means *including a single actuator for plural valves* for *simultaneously* regulating the flow of dialysis fluid [and] *in* said [conduits] *conduit* between said first and second means and *the conduit between* said catheter and said third means *in a manner so that flow is simultaneously on or off*, fifth means *including a single actuator for plural valves* for *simultaneously* regulating the flow of dialysis fluid *in the conduit* between said second means and said catheter[,] and *a conduit* from said third means *in a manner so that flow is simultaneously on or off*, and means for controlling said *actuators for said* fourth and fifth means to alternately permit flow of dialysis fluid in the conduits regulated thereby so that the dialysis fluid is permitted to flow through said apparatus and a patient and then from said third means.

PLANT PATENTS

GRANTED DECEMBER 9, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,820

RUIMEVA ROSE PLANT

Gijsbert DeRuiter, Hazerwoude, Netherlands, assignor to Carlton Rose Nurseries, Carlton, Oreg.

Filed Jan. 18, 1985, Ser. No. 692,503
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from a seed parent of the Varlon class and a pollen parent of the Meigerion variety, characterized by its vigorous growth, its orange-red color, its ability to yield on a continuous basis in a greenhouse large long lasting blooms which maintain true color after being cut from bud through petal drop, substantially as shown and described.

5,821

PEACH TREE (WHITE LADY)

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 4, 1985, Ser. No. 697,871
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—42 **1 Claim**

1. A new and distinct variety of peach tree which is of large size, vigorous, upright in growth and a regular and productive bearer of large, very firm, white flesh, freestone fruit with very good eating quality; the fruit is further characterized by coloring 7 to 10 days before maturity and having more attractive red skin color than most other white fleshed commercial varieties.

5,822

GRAPEVINE NAMED ISON

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,051
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,823

GRANNY VAL GRAPEVINE

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,052
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,824

GRAPEVINE NAMED BLACK FRY

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,053
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,825

KALANCHOE PLANT NAMED STROMBOLI

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Ball Panam Plant Company, Parris, Fla.

Filed Feb. 28, 1985, Ser. No. 706,594
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe named Stromboli, as described and illustrated, and particularly characterized by its red flower color, strong growth and freely branching habit, high floriferousness, relatively short crop time, and adaptability for production in pots of varying diameter.

5,826

KALANCHOE PLANT NAMED ETNA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Ball Panam Plant Company, Parrish, Fla.

Filed Feb. 28, 1985, Ser. No. 706,606
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe named Etna, as described and illustrated, and particularly characterized by its large orange-red flowers, floriferous habit, medium growth habit, an average 12 weeks crop time, and by its adaptability to pots of varying size.

PATENTS

GRANTED DEC. 9, 1986

ERRATA

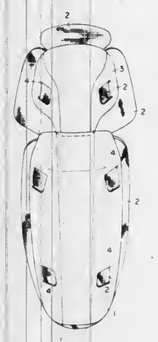
For CLASS	See PATENT NO.
379-051	4,628,152
379-163	4,628,153
381-189	4,628,154
381-156	4,628,155
379-410	4,628,156
379-410	4,628,157
379-010	4,628,158
358-010	4,628,342
366-265	4,628,391
363-134	4,628,438
364-167	4,628,499

PATENTS

GRANTED DECEMBER 9, 1986

GENERAL AND MECHANICAL

4,627,108
KNEE AND SHIN PROTECTOR
Jyrki H. Järvinen, Vaasa, Finland, assignor to Yoko-team Oy, Forssa, Finland
Filed Nov. 21, 1984, Ser. No. 673,949
Claims priority, application Finland, Dec. 29, 1983, 834838
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—22 **2 Claims**



1. A knee and shin protector providing a two-piece outer shield and a separate padding layer fitted in, and serving to join said two-piece shield together, comprising

a molded plastic shin guard comprising one piece of said outer shield,

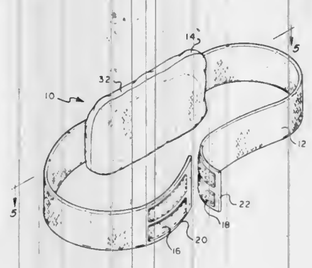
a separate molded plastic knee guard comprising the second piece of said outer shield,

each piece of said shield being defined by outer edges and having a plurality of integral lugs spaced away from outer edges of said shield and defined by cut-out portions leaving only an integral attachment portion, and

a single padding member larger in area than the total area of said outer shield and having a plurality of notches, each receiving one of said lugs therethrough,

so that said single padding member is united to said two shield pieces by said lugs and notches.

4,627,109
LUMBOSACRAL SUPPORT
Robert A. Carabelli, Cherry Hill Medical Arts Bldg., 7740 Maple Ave., Pennsauken, N.J. 08109, and Allan G. Edmund, Ocean City, N.J., assignors to Robert A. Carabelli, Philadelphia, Pa.
Filed Oct. 4, 1985, Ser. No. 784,337
Int. Cl.[4] A61F *5/02*
U.S. Cl. 2—44 **9 Claims**



1. A lumbosacral support comprising:

a belt adapted to be worn around a person's waist and including means adjacent the ends thereof for connecting said ends together;

a fabric-covered foam pad carried by said belt intermediate the ends thereof so that said pad is positioned only against a person's lower back when said belt is being worn;

said pad having a vertically extending trough-like groove cut away from the central portion thereof, said groove extending throughout the height of said pad but only partially through the thickness thereof and being positioned such that when said belt is worn, said groove directly overlies and is in substantial alignment with the person's spine whereby when said person presses against a seat back, said foam pad puts pressure on the supporting lumbosacral musculature on either side of the spine but does not put pressure directly on the spinal column.

4,627,110
ARTICLE OF WEARING APPAREL WITH AN ERASABLE WRITING SURFACE
Anthony M. Tengs, P.O. Box 45008, Seattle, Wash. 98145
Filed Oct. 17, 1983, Ser. No. 542,270
Int. Cl.[4] A41D *1/00, 27/08*
U.S. Cl. 2—69 **16 Claims**



1. A garment comprising:

an article of wearing apparel for covering the torso of a human body, said article of wearing apparel having a writing surface provided on a torso covering exterior portion thereof that is readily observable by others when the article of wearing apparel is worn by a user, said writing surface forming a permanent portion of said article of wearing apparel, said article of wearing apparel also having permanent writing provided on said torso covering exterior portion thereof adjacent to said writing surface, said permanent writing being predeterminedly positioned with respect to said writing surface; and

writing means for writing on said writing surface,

said writing surface and said writing means being comprised of materials which allow a user to write on, and remove writing from said writing surface.

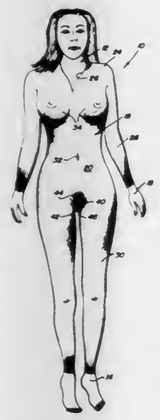
13. Apparatus for creating a message bearing garment suitable for covering the torso of a human body, said apparatus comprising:

an article of wearing apparel for covering the torso of a human body, said article of wearing apparel having a writing surface on the exterior of the torso covering portion thereof that is readily observable by others when the article of wearing apparel is worn by a user, said writing surface forming a permanent portion of said article of wearing apparel, said writing surface being formed of a material to which an elastomeric sealant will adhere to and be peelable away from without damage to said writing surface; and,

elastomeric sealant writing means for creating a stable viewable image on said writing surface, said elastomeric sealant

being formed of an adhesive caulking compound that sets from a flowable application phase to a dry semihard phase at room temperature, said adhesive caulking compound being adhesively attachable to said writing surface when in said flowable application phase and manually peelable away from said writing surface when in said dry semihard phase.

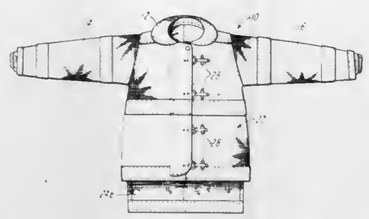
4,627,111
BODY SUIT
Lyndola M. Storie, 1739 Cherokee, Caseyville, Ill. 62232
Filed Aug. 22, 1985, Ser. No. 768,236
Int. Cl.[4] A41B *1/12*
U.S. Cl. 2—69 **2 Claims**



1. A body suit for enclosing and completely covering the torso area of a female human wearer in skintight relation comprising a torso enclosing member consisting only of a front panel and a rear panel of integral construction and provided with shoulder engaging regions, a neck opening, arm openings and a crotch area with leg openings, said torso enclosing member being constructed of thin, flexible porous resilient material having external appearance, surface texture, feel and shape characteristics closely simulative of ideal physical appearance, shape and size characteristics of a natural torso of a female human body with the body suit covering unsightly body areas such as stretch marks, scars, moles and the like, said front panel including pockets receiving the natural breasts, if present, and breast prostheses to provide replacement breasts in the event of mastectomies or enhance breast size and shape, said crotch area including an opening extending longitudinally from front to rear to enable normal body functions to be performed including coital intercourse while the body suit is being worn without requiring removal of any garments, said torso enclosing member including a simulative navel in the front panel and simulated pubic hair in the crotch area and front panel to provide all of the appearance characteristics of a natural naked human female body.

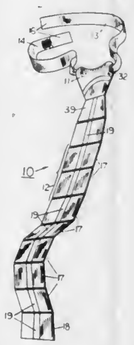
4,627,112
FIREFIGHTER'S COAT
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed May 13, 1985, Ser. No. 733,195
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 **3 Claims**

1. An improved firefighter's coat adapted for use with firefighter's pants extending downwardly from the waist of the firefighter to provide for full protection of the firefighter while also providing for less weight and improved freedom of movement and ventilation to reduce stress, comprising a jacket constructed of heat, flame and water resistant materials, the jacket including full length sleeve portions connected by a neck portion, a front portion and a rear portion, the front portion extending downwardly from the neck portion and having a lower edge disposed below the firefighter's waist and adjacent the upper part of the firefighter's legs, the rear portion extending downwardly from the neck portion and having a lower edge disposed significantly below the lower edge of the front portion and substantially above the knees of the firefighter to form a limited tail extension covering the lower rear



part of the torso of the firefighter, the front portion thus being significantly shorter than the rear portion to provide the firefighter's legs with freedom of movement while crawling and climbing, in addition to improved ventilation under the front portion, the limited tail extension of the rear portion of the jacket protecting the lower rear part of the torso of the firefighter especially during forward bending or crawling, and the combined portions of the jacket also providing for reducing the total weight of the firefighter's coat.

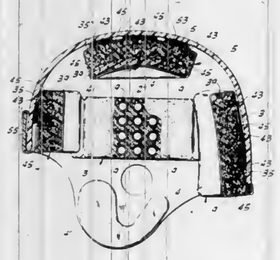
4,627,113
DECORATIVE NECKWEAR
Allen Lord, Frenchman's Rd., New Milford, Conn. 06776
Filed Jan. 10, 1986, Ser. No. 817,606
Int. Cl.[4] A41D *25/00, 25/02*
U.S. Cl. 2—144 **26 Claims**



1. A decorative neckwear device incorporating
A. a pillow-shaped simulated knot having a generally trapezoidal edge outline shape with a convex front face and a rear face converging downwardly toward each other from an upper central region of substantial thickness, with both faces terminating in a thin lower edge,
B. a vertically elongated fabric strip having an upper end secured to the lower edge of the simulated knot, a front face, a rear face, and a depending lower end,
C. a first plurality of substantially rigid thin flat panels of sheet material, each being less than one-tenth the thickness of the central region of the simulated knot and having upper and lower parallel edges, all said thin flat panels being successively adhesively bonded to the front face of the fabric strip , with the lower edge of each panel positioned parallel to and closely adjacent to the upper edge of the next lower panel,

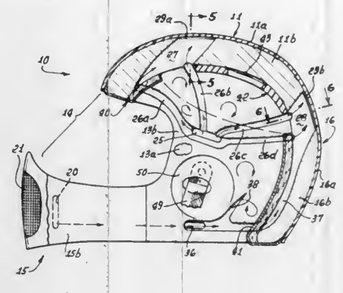
D. a corresponding second plurality of substantially rigid thin flat panels of sheet material, each substantially corresponding in shape and thickness to a juxtaposed one of said first plurality of panels, and each successively adhesively bonded to the rear face of the fabric strip with its upper and lower edges substantially juxtaposed to corresponding respective upper and lower edges of said juxtaposed one of said first plurality of panels, forming a suple and resiliently flexibly hinged panel array of successive thin, flat sandwich panels connected for free undulatory flexing movement with both positive and negative curvature in adjacent regions of the array, and
E. non-elastic neckband means connected to the simulated knot and protruding laterally therefrom to encircle the wearer's neck, having a first end and a second end adjustably and releasably securable to the first end, whereby the simulated knot is positioned in front of the wearer's neck, displaying the flexibly arrayed plurality of flat panels vertically depending therefrom.

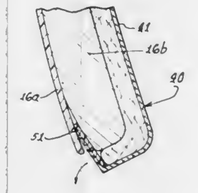
4,627,114
SHOCK ATTENUATION STRUCTURE
Hal D. Mitchell, Rolla, Mo., assignor to Figgie International, Inc., Willoughby, Ohio
Filed Aug. 23, 1984, Ser. No. 643,429
Int. Cl.[4] A42B *3/02;* **F16F** *1/00*
U.S. Cl. 2—414 **23 Claims**



12. Protective apparatus for the head comprising a shell of substantially rigid material adapted to fit on the head and a plurality of separate shock attenuating modules disposed around the inside of the shell for protecting the head, at least one of said modules comprising a shock attenuating structure having a breadth greater than its thickness and a breadthwise cross section comprising a series of layers arranged side-by-side, said series comprising a first plurality of layers of shock-absorbing material having a relatively high resistance to compression and a second plurality of layers of shock-absorbing material having a lower resistance to compression, the layers of said first and second pluralities being disposed in contiguous side-by-side relation across substantially the entire breadth of the structure to form a substantially unitary structure, the layers of said second plurality alternating with the layers of said first plurality across the breadth of the structure and providing lateral support to the layers of the first plurality, said structure being mounted on the inside of the shell with its breadth generally perpendicular to the direction of impact force for broadside loading of the structure during an impact, said layers in the area of impact being adapted resiliently to deform for attenuating the shock resulting from said impact, with said layers of said second plurality providing lateral support to the layers of said first plurality during said impact.

4,627,115
VENTILATED HELMET
Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.
Continuation of Ser. No. 572,893, Jan. 23, 1984, Pat. No. 4,555,816. This application Aug. 26, 1985, Ser. No. 769,386
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—425 **11 Claims**





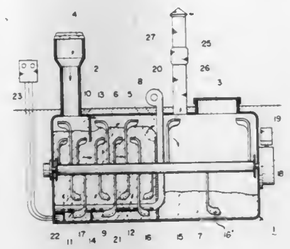
1. In a motorcyclist or bicyclist helmet having dome shaped top wall structure, side wall structures, a front opening for forward viewing, a lower front wall structure which juts forwardly, and rear wall structure, the combination comprising:
(a) said wall structure defining passage means for circulating cooling air flow, and
(b) removable pad means carried by the helmet to extend across at least a portion of said passage means,
(c) and pad means retention structure comprising clip structure attached to the pad means and wedged upwardly between the shell and liner at a level or levels below major extent of said air flow passage means.

4,627,116
COMPOST TOILET APPARATUS
Hiroshi Shimizu, 24-19, Uedatsutsumi 1-chome, Morioka-shi, Iwate-ken, Japan
Filed Apr. 18, 1985, Ser. No. 724,853
Claims priority, application Japan, Apr. 18, 1984, 59-78920
Int. Cl.[4] A47K *11/02*
U.S. Cl. 4—111.6 **7 Claims**

1. A compost toilet apparatus, comprising:
a container having a longitudinal axis, upper and lower walls, longitudinal end walls and side walls;
a dividing wall, substantially perpendicular to said longitudinal axis, said wall extending from the bottom of said container to a position below the upper wall of said container, said dividing wall dividing said container into a fermentative chamber and a reservoir chamber, the space above said dividing wall comprising a connecting means for connecting said reservoir chamber to said fermentative chamber;
an input port connected to the upper wall of said fermentative chamber;
an output port connected to said reservoir chamber;
a stirring shaft mounted horizontally and extending through

said fermentative chamber in a longitudinal direction, said stirring shaft further extending through said dividing wall into said reservoir chamber;

stirring means, attached to that portion of said stirring shaft within said fermentative chamber, for causing sewage dumped into said fermentative chamber through said



input port to be directed toward said reservoir chamber through said connecting means while mixing the contents of said fermentative chamber; and

mixing means connected to that portion of said stirring shaft extending into said reservoir chamber for mixing the contents of said reservoir chamber.

4,627,117

PAPER COVER FOR LAVATORY SEAT

Kanji Morishita, 652, Higashihama Minamimachi, Fushimi-ku, Kyoto, Japan

Continuation of Ser. No. 571,532, Jan. 17, 1984, abandoned. This application Feb. 3, 1986, Ser. No. 825,769

Claims priority, application Japan, Jun. 13, 1983, 58-92276[U]

Int. Cl.[4] A47R *13/22*

U.S. Cl. 4—247 **2 Claims**



1. A roll of paper covers for a toilet bowl seat which seat has laterally spaced bowl-shaped side portions, said roll comprising a web of a plurality of lengths of paper at least as long as the front to back dimension of a bowl-shaped side portion and having a width greater than the width of the bowl-shaped side portion, said lengths of paper being defined by continuous transverse lines of perforations, each length of paper having at least one linear line of perforations extending inwardly from the opposite side edges substantially perpendicular thereto and at a position intermediate the ends of said lengths of paper, said line of perforations terminating short of the middle portion of each length of paper leaving the middle portion of each length of paper unperforated, the distance across said middle portion being sufficient to make the paper strong enough to remain untorn under a force substantially in the longitudinal direction of said web and which is sufficient to tear the paper along said continuous transverse lines of perforations.

4,627,118

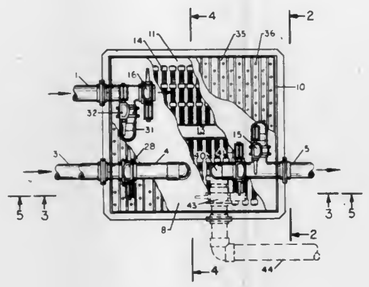
VACUUM FILTER FOR SWIMMING POOLS CONTROLLING WATER RECIRCULATION CAPACITY TO ACCOMMODATE VARYING GUTTER FLOW

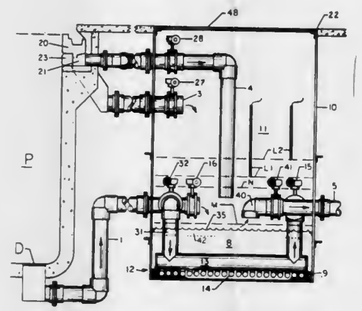
William H. Baker, 50 Fairway Ridge, Clover, S.C. 29710

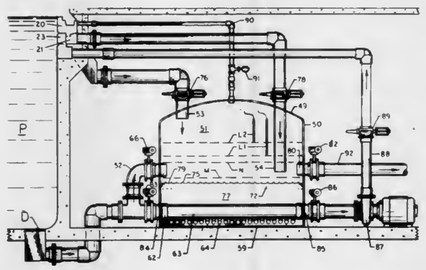
Filed May 4, 1984, Ser. No. 607,338

Int. Cl.[4] E04H *3/18, 7/00*

U.S. Cl. 4—510 **48 Claims**







1. A vacuum filter for vacuum flow filtration through a filter bed of water from a swimming pool including flow from the pool and from the gutter of the swimming pool, and controlling water recirculation capacity to accommodate varying gutter flow, comprising, in combination, a tank; a filter bed of particulate material in the tank; a first inlet line communicating the swimming pool with the tank for gravity flow into the tank and maintaining a predetermined level of water in the tank in relation to a level of water in the swimming pool, thereby providing a head of water for gravity backwash flow through the filter bed; a second inlet line communicating the tank with the perimeter gutter for the swimming pool for gravity flow into the tank; a third inlet line communicating the tank with the perimeter gutter for the swimming pool for suction flow into the tank; an outlet line communicating the tank with the water recirculation system; a pump drawing a vacuum downstream of the filter bed and recirculating filtered water to the swimming pool; and at least one water level-responsive sensor sensing and directly responding to the level of water in the tank and ajusting the valve controlling suction flow, to increase gutter drain flow to the tank sufficiently to prevent gutter water flooding back from the gutter to the pool.

4,627,119

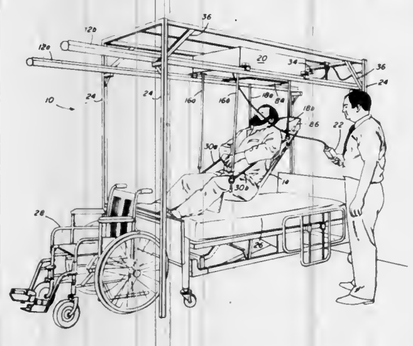
APPARATUS TO ASSIST THE DISABLED

Francis J. Hachey, North Reading, and Henry J. Hachey, Fitchburg, both of Mass., assignors to ParaSystems, Inc., Waltham, Mass.

Filed Jan. 22, 1985, Ser. No. 693,294

Int. Cl.[4] A61G *7/10*

U.S. Cl. 5—83 **11 Claims**



1. Apparatus for repositioning a disabled person, said apparatus comprising:

a pair of parallel support rails extending horizontally;

a cradle assembly for placement under the person disposed beneath said support rails, the cradle assembly comprising:

a flexible support material extending between a first pair of foot end lifting points connected to the material and a second pair of head end lifting points also connected to the material and longitudinally spaced apart from said first points; and

at least one stabilizing member connecting said first and second lifting points;

at least two first elongate support members attachable to said first pair of lifting points and at least two second elongated support members attachable to said second pair of lifting points on said cradle assembly, said support members being mounted for sliding horizontal movement along said rails;

first means for adjusting the length of both of said first support members between said cradle assembly and said rails to permit simultaneous raising and lowering of said first points on said cradle;

second means for adjusting the length of both of said second support members between said cradle assembly and said rails, independent of the length of said first support members, to permit simultaneous raising and lowering of said second lifting points on said cradle independent of said first lifting points and;

a control for actuating independently said first and second means for adjusting.

4,627,120

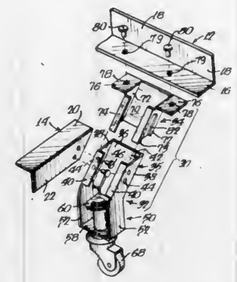
BED FRAME ASSEMBLY

George M. Harris, Homewood, Ill., assignor to Harris-Hub Company, Inc., Harvey, Ill.

Filed Jun. 4, 1984, Ser. No. 616,898

Int. Cl.[4] A47C *19/02*

U.S. Cl. 5—201 **8 Claims**



1. A bed frame comprising a pair of spaced longitudinally extending parallel side-frame members, each said side-frame member having a horizontal leg portion,

a pair of spaced parallel cross-frame members extending between said side-frame members, each said cross-frame member having a vertical leg portion defining fastener receiving openings,

means for securing said side-frame members to the ends of said cross-frame members and for supporting said frame on a floor, said securing and supporing means comprising a plurality of first and second leg members, and floor engaging means,

a pair of said second leg members being mechanically secured to each of said side-frame members and tdlescopically disposed relative to said first leg members,

each said first leg member comprising an upper portion which is generally rectilinear in cross-section and which defines an upper end which is generally coplanar with the upper edge of said vertical leg portion of said cross-frame member, said upper portion comprising opposed spaced side walls, at least one of said side walls defining openings aligned with said openings in said cross-frame member vertical leg portion for receiving mechanical fasteners, said first leg member being positioned to confront and bear against said cross-frame member vertical leg portion, said upper portion being inclined inwardly and downwardly at an acute angle of at least 20 degrees relative to said cross-frame member,

said first leg member further defining a lower portion which is vertically disposed and which is integrally formed with said upper portion, said lower portion being disposed to mount said floor engaging means and to support said bed frame on a floor,

said second leg member being generally rectilinear in cross-section and defining side wall members parallel with the side walls of said first leg member, aaid second leg member being slidably and telescopically received entirely within the upper portion of an associated first leg member, said second leg member having ear means positioned to confront and engage said side-frame member horizontal leg portion, said horizontal leg portion and said ear means each defining aligned apertures for receiving mechanical fasteners, said second leg member defining recess means in said second leg side wall members for accommodating said mechanical fasteners in said cross frame members, said second leg member being inclined inwardly and downwardly at an acute angle substantially equal to the angle at which the associated first leg member upper portion is inclined,

and wherein, when said first leg members are telescopically

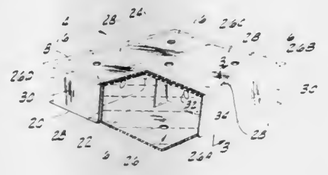
disposed relative to said associated second leg members, the side-frame and cross-frame members are secured to each other to form said bed frame and said leg member lower portions and associated floor engaging means are disposed inset of said side-frame members.

4,627,121

DAMPED WATERBED MATTRESS AND METHOD FOR MANUFACTURING SAME

Howard A. Winther, Union City, Calif., assignor to Royal Waterbeds, Inc., Ellisville, Mo.

Division of Ser. No. 567,466, Jan. 3, 1984, Pat. No. 4,574,026.
This application Aug. 19, 1985, Ser. No. 766,520
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 **5 Claims**



1. A damped waterbed comprising:

a flexible, nonporous envelope having a top wall, a bottom wall and a side wall for enclosing a liquid;

a plurality of cells, each having a top cell wall, bottom cell well and side cell wall contained within said envelope, said cells having at least one cell aperture enabling fluid communication between the inside of said cells and the outside of said cells.

means for partitioning said cells into at least an inner chamber and an outer chamber, said partitioning means comprising a sole continuous loop of pliant material that connects said top cell wall and said bottom cell wall said partitioning means including at least one aperture enabling fluid conmmunication between said inner chamber and said outer chamber;

means for supporting said top cell wall proximate said top wall of said envelope; and

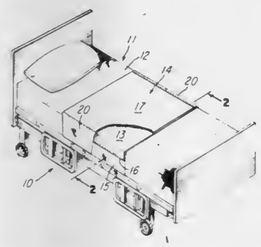
means for positioning said bottom cell wall proximate said bottom wall of said envelope.

4,627,122

HOSPITAL BED, METHOD OF MAKING SAME AND COMPONENTS THEREFOR

Marcel F. Hopp, Cincinnati, Ohio, assignor to Standard Textile Co. Inc., Cincinnati, Ohio

Filed Feb. 21, 1984, Ser. No. 581,576
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—484 **20 Claims**



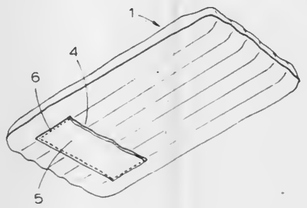
11. In a method of making a bed for a hospital or the like comprising the steps of, providing mattress means, disposing a bottom sheet means in covering relation on said mattress means, placing a waterproof layer over the central portion of said bottom sheet means, and placing a cover over said layer, the improvement in said method in which, said step of placing said layer comprises placing said layer comprised of a sheet of moisture impervious polymeric material having opposite ends of a particular width and having top and bottom moisture impervious surfaces in which at least one of said top and bottom surfaces of said sheet is completely exposed said sheet having a first pair of tails each made of a material which is different than said polymeric material and each having a width equal to said particular width, said first pair of tails extending from said opposite ends with each of said first pair of tails being attached along its full width, said step of placing said cover comprises placing said cover which is made only of three pieces consisting of a water-absorbent pad made of a particular material and having opposite end portions of a given width and having completely exposed top and bottom surfaces of said particular material between said end portions, said pad having a second pair of tails each made of a material which is different than said particular material of said pad and each having a width equal to said given width, said second pair of tails extending from and being attached in an exposed manner respectively against said opposite end portions, each of said second pair of tails being attached along its full width, and disposing said first and second pair of tails under said mattress means as the sole means holding said layer and pad securely on said bottom sheet means, said layer and pad being separate and readily individually removable from said bed for laundering thereof by pulling the respective tails thereof from under said mattress means.

4,627,123

BED TICK WITH POCKET FOR USER'S FEET

Kristian Uggerud, Peder Holters vei 1, 1168 Oslo 11, Norway

PCT No. PCT/NO84/00036, § 371 Date May 20, 1985, § 102(e) Date May 20, 1985, PCT Pub. No. WO85/01200, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 19, 1984, Ser. No. 740,268
Claims priority, application Norway, Sep. 20, 1983, 833382
Int. Cl.[4] A47G *9/02*
U.S. Cl. 5—485 **4 Claims**



1. A bed tick for a quilt having an external pocket near an end thereof dimensioned to receive solely the feet of an adult user, comprising:

a bed tick extending in a longitudinal direction from one end to another end thereof, said bed tick having a predetermined width; and

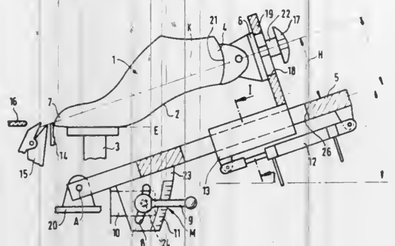
at least one pocket comprising a piece of fabric having a marginal edge along the periphery thereof extending transversely to said longitudinal direction and facing away from said one end of said bed tick, said marginal edge defining an opening into said pocket; said piece of fabric having the remaining portion of the periphery thereof fixedly secured by a seam to said bed tick, said pocket extending in said longitudinal direction for a distance less than said predetermined width of said bed tick.

4,627,124

DEVICE FOR SUPPORTING THE LAST ON A TOE LASTING MACHINE

Gerhard Winter, Hauenstein, Fed. Rep. of Germany, assignor to Schon & Cie. Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,679
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3331020
Int. Cl.[4] A43D *21/08*
U.S. Cl. 12—12.4 **11 Claims**



1. A device for supporting a last on a toe lasting machine comprising:

last support means, adapted to be supported on a lasting machine frame, said last support means for supporting a last near the tip end thereof with a sole portion of the last facing in a downward direction, said last support means having a support surface extending in a plane; and

heel support means adapted to be supported on the lasting machine frame, said heel support means including a heel support carrier which extends in a longitudinal direction, said heel support means further including a heel support, said heel support having an abutment face which is shaped to substantially the shape of a heel portion of the last, said heel support being mounted for movement along said heel support carrier towards and away from said last support means for adjustment of the distance between said last support means and said heel support, said heel support carrier being pivotable about an axis, said axis being vertically below said last support means, said axis being parallel to said plane and said axis being perpendicular to said longitudinal direction of said heel support carrier, whereby said heel support carrier may be pivoted to an angular position such that said heel support is substantially parallel to a force acting in a longitudinal directon of the last during a lasting operation.

4,627,125

PAINT BRUSH

James H. Gruns, 5080 Woodson Dr., Mission, Kans. 66202

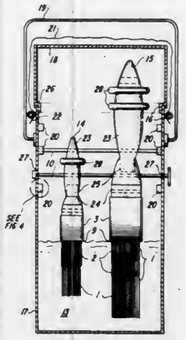
Continuation-in-part of Ser. No. 431,788, Sep. 30, 1982, Pat. No. 4,490,875. This application Oct. 22, 1984, Ser. No. 663,953
Int. Cl.[4] A46B *3/02, 17/06*
U.S. Cl. 15—105 **3 Claims**

1. A surface coatings applicator and applicator cleaning container assembly, wherein the applicator is comprised of a tubular ferrule having a cluster of bristles inserted part way into one end substantially to seal one end or said ferrule; a hardened mass of cured, resinous cement disposed atop said cluster of bristles in firm adhesive connection with portions of said cluster of bristles in said ferrule; and an integral handle including a contoured gripping portion extending outwardly from the other end of said tubular ferrule;

said handle being of rigid material and having a series of vertically aligned openings that extend through said handle such that a rod may inserted completely through a selected opening;

said openings having a round, triangular, polygon, or oval cross-section, and are located at specific distances from the lower edge of the ferrule, into which the bristle cluster is inserted, such that said rod, can be used to support one or more applicators of the same or differing length and/or size in a container of solvent, such that the level of solvent only covers the bristles of each applicator up to the lower edge of each ferrule for proper soaking and cleaning of all clusters of bristles;

said openings having a cross-section, such that said rod being provided with a similar cross section as said openings, will prevent rotation of the brush around said rod when the brush centroid of mass of the brush is above said rod;



said cluster of bristles being made of two bristle sub-groups and being distinctly different in bristle length and/or bristle color and/or shade;

said first bristle sub-group being longer and used for applying the surface coatings;

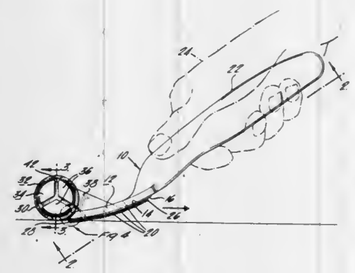
said second bristle sub-group being significantly shorter and/or of a contrasting color and/or shade to the first bristle sub-group, so as the reduce the possibility of a painter dipping the applicator too deeply into the coatings supply container.

4,627,126

CLEANING DEVICE FOR HOOK AND LOOP FASTENERS

Thomas K. Nichols, 365 Amity Rd., Andover, N.J. 07821

Filed Sep. 5, 1985, Ser. No. 772,683
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—105 **17 Claims**



1. A device for cleaning the hooked portion of hook and loop fasteners comprising a body member, means on said body member defining a convexly curved surface, an array of hooked fastener elements secured to said curved surface, and means providing a sticky, debris attracting surface closely adjacent one edge of said array of hook fastener elements on said curved surface in substantially tangential alignment therewith, the relative movement of said device across a debris laden hooked fastener material engaging the array of hooked

fastener elements with the debris to lift the debris therefrom for collection on said sticky surface.

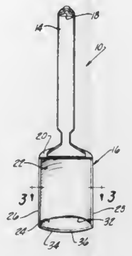
4,627,127
CYLINDRICAL BRUSH
Eugene J. Dupre, Somerset, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 13, 1985, Ser. No. 701,103
Int. Cl.[4] A46B *3/02, 7/10;* **A46D** *3/00*
U.S. Cl. 15—179 **12 Claims**



1. A cylindrical brush comprising
(a) an inner layer comprising a first elongate fabric strip formed of low-stretch cloth having a tensile strength greater than 200 psi and less than 8% stretch at 100 lbs. load and having parallel sides wound into a first helix with adjacent coils in said first helix abutting to provide a cylindrical shell having a hollow core,
(b) an outer layer comprising a second elongate fabric strip having parallel sides wound into a second helix with adjacent coils in said second helix abutting to provide a substantially continuous outer surface, said outer layer contacting and overlapping said inner layer, the curve formed by said second helix intersecting the curve formed by said first helix,
(c) adhesive material interposed between said layers to adherently bond together said inner layer and said outer layer; and
(d) bristles fastened to and covering at least a portion of the outer surface of said outer layer.

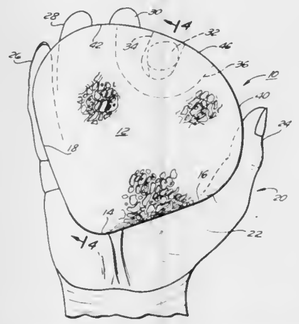
7. Method of preparing a cylindrical brush comprising the steps of:
(a) providing a cylindrical mandrel having two ends and comprising a plurality of separable elongated elements, which elements, when separated, form a circumferential plane having greater circumference than when unseparated,
(b) inserting at each end of said mandrel a means for separating said elongated elements,
(c) winding a first elongate fabric strip formed of low-stretch cloth having a tensile strength greater than 200 psi and less than 8% stretch at 100 lbs. load helically around said mandrel and in contact therewith,
(d) applying to at least one of said first fabric strip or to a second elongate fabric strip a curable adhesive material,
(e) while said adhesive material is still uncured, winding said second elongate fabric strip helically over said first strip and in contact therewith, the curve of said first helix intersecting the curve of said second helix, said first strip and said second strip forming a hollow cylinder,
(f) curing said adhesive material to form an adherent bond between said first fabric strip and said second fabric strip,
(g) removing aaid separating means to allow said elongated elements to become unseparated,
(h) removing said mandrel from said hollow cylinder.

4,627,128
TOOL FOR CLEANING THE INTERIOR SURFACES OF A CONTAINER
Thomas M. Shea, 1865 Harvest La., Bloomfield Hills, Mich. 48013
Filed May 6, 1985, Ser. No. 730,846
Int. Cl.[4] A47L *17/06*
U.S. Cl. 15—236 R **8 Claims**



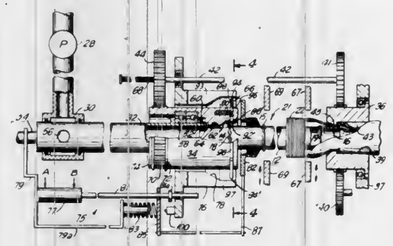
1. A tool for scraping and cleaning an interior surface of a cylindrical container, said tool comprising:
an elongated handle having a longitudinal axis; and a blade member integrally secured to one end of said handle wherein said blade member comprises:
a substantially semicircular first end wall, said first end wall disposed perpendicular to said longitudinal axis of said handle, said first end wall having a semicircular edge;
an intermediate main portion having a substantially semicylindrical concave curvature formed about said axis of said handle wherein said main portion extends from and has a curvature coinciding with the semicircular edge of said first end member; and
a substantially elliptical second end wall secured to the opposite end of said main portion from said first end wall wherein said second end wall forms an obtuse angle with respect to said axis of said handle, said second end wall being flexible whereby said second end wall yields as second second end wall engages a bottom surface of said cylindircal container.

4,627,129
SPONGE AND FABRICATION METHOD
James M. Wittes, Linden, N.J., assignor to Stiefel Laboratories, Inc., Coral Gables, Fla.
Filed Jul. 19, 1984, Ser. No. 632,411
Int. Cl.[4] A47L *13/16*
U.S. Cl. 15—244 C **7 Claims**



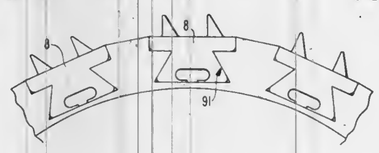
1. A sponge, said sponge having a washing surface and a rounded back surface shaped to fit into a slightly cupped hand and to be held in said hand with a minimal bending of the fingers of said hand, said sponge having a finger-receiving notch in one edge, which sponge has a flap of sponge material which is positioned adjacent said finger notch so that a finger in said notch can be used to press on the flap.

4,627,130
ROTATABLY DRIVEN CORED CASING ARTICLE
Joseph A. Nausedas, Oak Forest, and Michael P. Kazaitis, Chicago, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Dec. 29, 1983, Ser. No. 566,828
Int. Cl.[4] A22C *13/00*
U.S. Cl. 17—1 R **29 Claims**



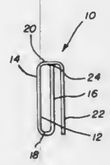
1. An elongated substantially rigid tubular core for supporting a shirred casing on a stuffing machine of the type having a rotary drive operable during stuffing of the casing, said tubular core comprising:
(a) fore and aft ends with said aft end being releasably connectable to a foodstuff discharge outlet of the stuffing machine to receive foodstuff pressed through the outlet for passage through said tubular core;
(b) a flange on said tubular core adjacent said aft end, said flange having a side surface extending generally upright to the longitudinal axis of said tubular core; and
(c) drivable means on said side surface engagable by the rotary drive of the stuffing machine for rotatably driving said tubular core about its longitudinal axis.

4,627,131
COMBING ROLLER FOR AN OPEN-END SPINNING MACHINE
Kunio Iwata, Itami, Japan, assignor to Kanai Juyo Kogyo Co., Ltd., Hyogo, Japan
Filed Jul. 11, 1985, Ser. No. 753,877
Int. Cl.[4] D01G *15/84*
U.S. Cl. 19—97 **6 Claims**



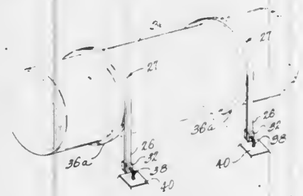
1. A combing roller comprising:
a roller body having in the circumferential surface thereof a plurality of dovetail-shaped grooves extending substantially parallel to the axis of said roller body and spaced at regular intervals around said roller body; and
a plurality of needle plate laminated members removably fixed in said grooves; each needle plate laminated member having a plurality of needle plates each having a needle base portion with at least one needle head on the radially outer side thereof and a dovetail-shaped needle insertion portion on the radially inner side thereof with a receiving opening at the radially inner side of said needle insertion portion, said plates being in side by side relationship with said receiving openings aligned, and a connecting means extending through said receiving openings and holding said plates in side by side relation in said needle plate laminated member, said laminated needle plate members being held in said grooves against radial forces by the engagement of said needle insertion portions in said grooves.

4,627,132
BELT CLASP
Vivian C. Markham, 1490 Lowell Ct., Crofton, Md. 21114
Filed Nov. 6, 1984, Ser. No. 668,797
Int. Cl.[4] A44B *13/00*
U.S. Cl. 24—169 **1 Claim**



1. A belt clamp for clamping the loose end of a belt against the body encircling portion of the belt to prevent the loose end from hanging, comprising a substantially U-shaped clasp having two legs and a connecting member, one of said legs being longer than the other and turned upon itself to form a third leg inside the U-shaped clasp and being parallel to the other two legs, the end of said longer turned in leg contacting the inner portion of the connecting member of the U and attached thereto to form a closed loop.

4,627,133
PULTRUDED UNDERGROUND TANK HOLD-DOWN STRAP ASSEMBLY
David H. Bartlow, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Aug. 8, 1985, Ser. No. 763,723
Int. Cl.[4] B65D *63/02;* **A44B** *21/00*
U.S. Cl. 24—298 **4 Claims**



1. A pultruded strap assembly for holding down underground tanks, said assembly comprising a flat glass fiber reinforced resin strap particularly characterized in that it is formed by the pulling of glass fiber reinforcing material through hardenable liquid resin and thereafter through a heated curing and shaping die, each of a pair of opposite end portions of the strap being secured flatwise between a pair of flat plates disposed respectively on opposite sides thereof and connected to each other solely by fasteners extending through the strap, each plate having an aperture extending therethrough, and each end portion of the strap having an aperture extending therethrough and aligned with the apertures of the respective pair of plates, whereby each pair of plates and the respective end portion of the strap are adapted to receive a portion of a retaining rod extending perpendicularly thereto through said apertures.

4,627,134

BALL-SIDE PIECE OF SNAP FASTENER

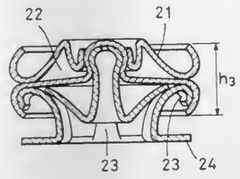
Akihiko Takata, Fujisawa, Japan, assignor to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,175

Claims priority, application Japan, Jan. 24, 1985, 60-7323[U]

Int. Cl.⁴ A44B *1/38*

U.S. Cl. 24—687 **4 Claims**



1. A ball-side piece of a snap fastener comprising an inside member having a portion adapted to be in contact with one side of a fabric or the like and a guide face portion provided therearound to receive and guide curved tips, or claws, of a backing member, and an outside member extended over and secured to the periphery of the inside member, said outside member having a round head adapted to engage a socket-side piece of the snap fastener, a flat flange portion adapted to contact the one side of the fabric or the like and hold the deformed claws of the backing member as attached to the fabric or the like, and a curved guide face portion extending over the guide face portion of the inside member toward the periphery of the flat flange portion so as to receive and guide the claws of the backing member.

4,627,135

BURNER UNIT FOR THE FLAME TREATMENT OF FLAT TEXTILE MATERIALS

Walter Osthoff, Wuppertal, Fed. Rep. of Germany, assignor to Osthoff Senge GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

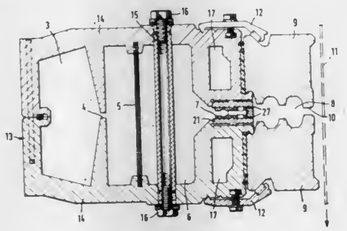
PCT No. PCT/DE84/00200, § 371 Date May 29, 1985, § 102(e) Date May 29, 1985, PCT Pub. No. WO85/01529, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 29, 1984, Ser. No. 740,045

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335302

Int. Cl.⁴ D06C *9/02*

U.S. Cl. 26—3 **13 Claims**



1. Burner unit for the flame treatment of flat textile materials, especially a burner unit for singeing machines, with a combustion chamber terminating in a singeing slot supplied from a gas mixture chamber by way of two parallel burner slots, the gas mixture chamber being encased by a burner element including two substantially U-shaped profile members clamped together along their longitudinal edges with the interposition of a mixture distributing rail delimiting the burner slots respectively along an inner longitudinal side, characterized in that the mixture distributing rail is enclosed between two guide strips respectively defining the outer longitudinal side of the burner slots, the guide strips are clamped together with the mixture distributing rail as a package between the two substantially U-shaped profile members, and in that the guide strips include a narrow bulge upstream of the burner slots along their outer side, these strips being clamped in place between the two substantially U-shaped profile members at this bulge.

8. Burner unit for the flame treatment of flat textile materials, especially a burner unit for singeing machines, with a combustion chamber terminating in a singeing slot supplied from a gas mixture chamber by two parallel burner slots, the gas mixture chamber being encased by a burner element including two substantially U-shaped profile members clamped together along their longitudinal edges with the interposition of a mixture distributing rail delimiting the burner slots respectively along an inner longitudinal side, characterized in that the mixture distributing rail is enclosed between two guide strips respectively defining the outer longitudinal side of the burner slots, the guide strips being clamped together with the mixture distributing rail as a package between the two substantially U-shaped profile members, and in that each guide strip is provided with a fitting lug on its contact surface facing the mixture distributing rail, and that this fitting lug engages in a corresponding counter groove of the mixture distributing rail.

4,627,136

METHOD OF MANUFACTURING DENTURES

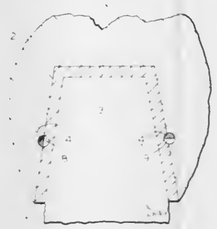
Hans-Albert Kreylos, Langen, and Manfred P. Zeiser, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Guenter Ruebeling, Bremerhaven, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 374,604

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118890; European Pat. Off., Apr. 5, 1982, 82102899.0

Int. Cl.⁴ B23P *13/02*

U.S. Cl. 29—160.6 **14 Claims**



1. A method of manufacuting dentures, such as crown bridges, partial or complete dentures and the like, including a preformed metal primary part and a preformed metal secondary part which is coupled to the primary part by at least one releasable holding element, the method comprising the steps of setting the secondary part totally preformed to its final form on the preformed primary part and forming in said primary part and said secondary part recesses simultaneously in one working step by sparking erosion, said recesses together constituting an opening for receiving said holding element, said holding element being soldered within one of said recesses to connect the primary part to the secondary part.

4,627,137

DEVICE FOR TREATING NONWOVENS

Eberhard Wildt, Grenzach-Wyhlen, Fed. Rep. of Germany, assignor to Robert Casaretto KG, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,443

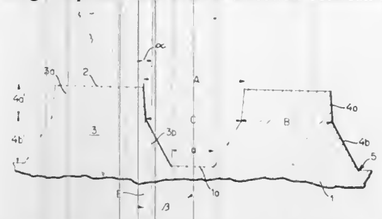
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326281

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 29—121.2 **16 Claims**

1. a device for heat- and/or solvent-treatment of fibers in

nonwovens or the like, comprising a rotary body having a substantially cylindrical peripheral surface, and a plurality of neighboring protrusions extending outwardly beyond said peripheral surface, each of said protrusions including a first section having a top land, and a second section between said



surface and said first section, said first sections having first facets each making with the respective top land a first acute angle, and said second sections having second facets each making with the respective top land a second acute angle which is smaller than the first acute angle, each of said first angles being greater than about 20°.

4,627,138

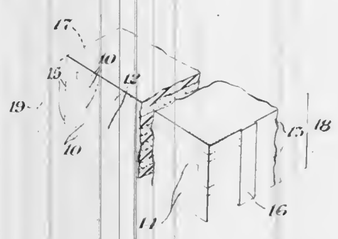
METHOD OF MAKING PIEZOELECTRIC/PYROELECTRIC ELEMENTS

Jang-hi Im, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1985, Ser. No. 762,884

Int. Cl.⁴ H01L *41/00*

U.S. Cl. 29—25.35 **7 Claims**



1. A method for manufacturing a piezoelectric element comprising the steps of:

(a) coextruding alternating layers of

(1) polymeric piezoelectric meterial; and

(2) polymeric electrode material arranged so that a single edge of each successive layer of polymeric electrode material is alternatingly exposed to one of two separate faces of the piezoelectric element;

(b) electrically interconnecting on each of the two separate faces the exposed single edges of polymeric electrode material layers with conductive material; and

(c) polarizing the polymeric piezoelectric material.

4,627,139

METHOD FOR MANUFACTURING CERAMIC CAPACITORS

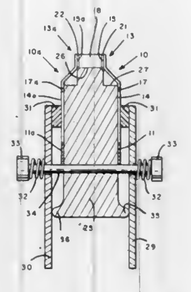
Rolf Müller, Auenwald-Unterbüden, Fed. Rep. of Germany, assignor to Vitramon, Incorporated, Monroe, Conn.

Filed Jun. 21, 1983, Ser. No. 506,295

Int. Cl.⁴ H01G *4/06, 1/14*

U.S. Cl. 29—25.42 **8 Claims**

1. Method for manufacturing a plurality of monolithic ceramic capacitors comprising the steps of providing a pair of parallel lead carriers formed from thin flat conductive metal, each of said carriers comprising an elongate base strip and a plurality of uniformly-spaced, parallel lead elements extending upwardly therefrom, each said lead element having a leg portion removably-connected to said base strip and an upper contact face portion and having a width greater than its thickness, aligning and spacing said parallel lead carriers so that the contact faces of lead elements on each of said lead carriers face each other and are spaced by a distance similar to the length of an elongate capacitor body to form opposed lead pairs, supporting an elongate capacitor body with its end terminals in predetermined fixed position against the contact faces of the lead elements of each said lead pair, pressing the lead elements of each said lead pair against the end terminals of each said capacitor body with sufficient force to form an assembly in



which each said capacitor body is held in place against the effects of gravity, inverting said assembly and immersing said capacitor bodies in a bath of liquid solder to form conductive solder connections in predetermined fixed positions between the contact face portions of each of said lead elements and an end terminal of a capacitor body whereby each said opposed lead pair is soldered to a capacitor body and the width of the leg portions of said lead elements extends in a direction perpendicular to the axis of the elongate capacitor bodies, and disconnecting the leg portions of said lead elements from said lead carriers at a location adjacent the base strips thereof.

4,627,140

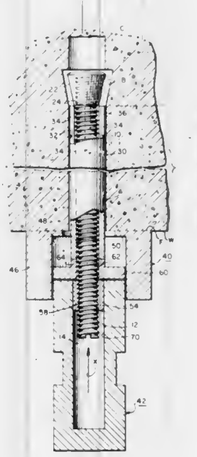
ANCHOR BOLT SETTING IMPACT TOOL

Maurice J. Davis, Hicksville, N.Y., assignor to Drillco Devices Limited, Long Island City, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,418

Int. Cl.⁴ B23P *19/04;* **B25B** *27/14*

U.S. Cl. 29—264 **11 Claims**



1. An impact tool for positioning and setting an anchor bolt assembly in a hole extending inwardly through the wall surface

of a structure, the anchor asssembly being of the type including a stud bolt having a threaded outer end extending from the wall and an inner end carrying the smaller end of a cone which enlarges away from said surface and the assembly further including a sleeve surrounding the bolt and operative to have its inner end expanded by the cone when the sleeve is axially moved over it, the tool comprising:

(a) a holder member having a bore therethrough to receive the outer end of the bolt and the sleeve and having means to rigidly support the threaded outer end of the bolt, and having at one end of said bore a transverse face oriented normal to the axis of the bolt to abut the surface of the wall and position the cone a fixed distance inside the hole;

(b) a driver member which is an element separate from said holder member and which is insertable into the bore of the holder member in axial alignment with the outer end of the sleeve and operative to be impact-driven in the direction of said cone to drive the sleeve further into the wall so that its inner end is expanded over the rigidly positioned cone; and

(c) said means to rigidly support the outer end of the bolt to position the cone at a fixed distance inside the hole comprising complementarily threaded means in said holder member to receive and engage the threaded end of the stud bolt.

4,627,141

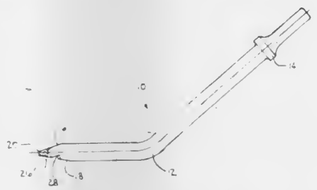
AUTOMOBILE HINGE PIN REMOVER

Eldor M. Teske, P.O. Box 107, North Prairie, Wis. 53153

Filed Mar. 12, 1985, Ser. No. 711,059

Int. Cl.[4] B25B *27/02*

U.S. Cl. 29—275 **9 Claims**



1. A hinge pin remover for use on a hinge pin having a pointed end, a shaft portion and a head with an underside, said remover comprising a member which is a shaft having opposite first and second ends and a diameter, said first end being adapted to be driven by hammer means, and second end being tapered and including opposite, converging, generally flat first and second surfaces, said first and second surfaces converging to form a flat end having a thickness substantially less than the diameter of said shaft, said flat end being adapted to engage the underside of the head of the hinge pin for driving the hinge pin out of a hinge, and said flat end including a first depression adapted to engage the shaft portion of the hinge pin and to locate said flat end relative to the hinge pin, and one of said surfaces including a second, elongated depression extending longitudinally of said shaft from said first depression, said member including means adjacent said second end for engaging the pointed end of the hinge pin for driving the hinge pin out of the hinge.

4,627,142

CRIMPING

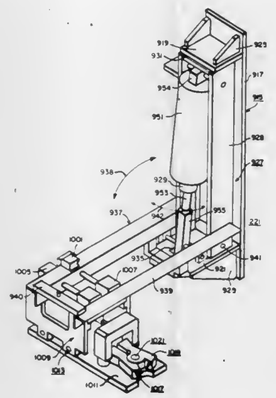
Leonard P. Hornak, North Huntingdon Township, Irwin County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1984, Ser. No. 617,855

Int. Cl.[4] B25B *25/00*

U.S. Cl. 29—283.5 **8 Claims**

1. A crimping tool for use in replacing the old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, each of said new split-pin assemblies including a new split-pin secured to said guide tube by a new nut, said new nut having a locking cap secured thereto, said locking cap to be crimped onto said new split pin, the said new split-pin assembly being in position to be processed, said crimping tool having a crimping mechanism, a support for said crimping mechanism, said support being in the standby state of said tool, in generally vertical position, a drive, a driven member, connected to said drive, movable by said drive over a predetermined path, means, connecting said driven member to said



support, to move said support vertically from said generally vertical position to a generally horizontal position, as said driven member is driven by said drive along a first part of said path, and cam means, cooperative with said driven member, as said driven member is driven over a succeeding second part of said path, actuable, when said support is in generally horizontal position, for moving said support generally horizontally to set said crimping mechanism in position, relative to said split-pin assembly positioned to be processed, to crimp said locking cap onto said split pin.

4,627,143

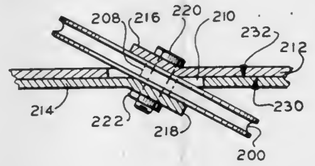
METHOD OF FORMING TELESCOPING SHUTTLE TABLE FOR MOUNTING AT LEAST ONE SHEAVE THERETO

Weston R. Loomer, Florence, Ky., assignor to Litton Systems Inc.

Division of Ser. No. 504,416, Jun. 15, 1983. This application Oct. 16, 1985, Ser. No. 787,917

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—434 **3 Claims**



1. The method of forming a telescoping shuttle table for mounting at least one sheave thereto; comprising:

(a) forming a first table plate with first and second surfaces;

(b) forming a flap of material from the material of said first table plate at a predetermined location thereon and so as to extend outwardly at an acute angle from said surface of said first surface;

(c) forming a second table plate of substantially the same size and configuration as said first table plate and with first and second surfaces;

(d) forming a flap of material from the material of said second table plate at a predetermined location thereon and so as to extend outwardly from said first surface of said second table plate at an acute angle with respect to said first surface of said second table plate;

(e) affixing said first table plate to said second table plate so that said second surface of said first table plate contacts said second surface of said second table plate and so that said flaps of said first and said second table plates are aligned with parallel to and overlapped but spaced from each other and rotatably mounting a sheave between said spaced flaps.

4,627,144

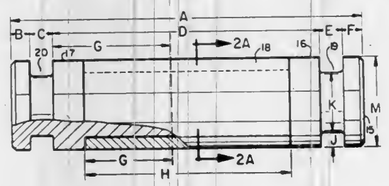
METHOD OF MAKING PIN WITH MANGANESE STEEL SHROUD

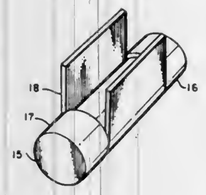
James E. Burke, Philadelphia, Pa., assignor to Wescott Steel, Inc., Trevose, Pa.

Filed Mar. 8, 1985, Ser. No. 709,503

Int. Cl.[4] B23P *11/02;* **F16C** *11/06*

U.S. Cl. 29—447 **14 Claims**





1. A method of making a pin for a bushing for a high wear, high abrasion, heavy loading joint comprising:

heat forming a plate of austenitic manganese steel into a U form having a radiused section which matches the radius of a reduced diameter groove in a core of high strength, hardened alloy steel;

assembling said U-form with its radiused section in the groove in said core;

forging the legs of said U-form into the groove in said core to produce a shroud of austenitic manganese steel in said groove.

4,627,145

WINDOW GLASS MOUNTING ARRANGEMENTS

Gerd Niemanns, Grefrath, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed May 15, 1984, Ser. No. 610,597

Claims priority, application United Kingdom, May 20, 1983, 8314079

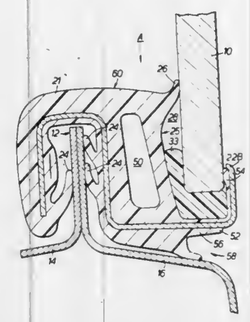
Int. Cl.[4] B23P *11/02;* **E04B** *1/62*

U.S. Cl. 29—450 **11 Claims**

1. A window glass mounting arrangement, comprising

first and second parts for mounting in respectively different positions on a mounting flange extending around a window opening and respectively defining channel means for receiving the window glass,

the first part being mounted along at least one side of the window opening and the channel means in the said first part comprising flexible material having a rigid metal insert extending along the full length of the said at least one side and defining a first portion which embraces the said flange and a second portion which emerges from the flexible material to provide a rigid outside wall means of



the channel means for requiring the window glass to be slid in position through the open mouth of the channel means of this part, and

the second part being mounted along at least the opposite side of the window opening and the channel means of the second part having a flexible outside wall means for flexing outwardly to enable the window glass to be moved bodily sideways into the channel means in the said second part, the outside wall means of the second part thereafter resiling.

4,627,146

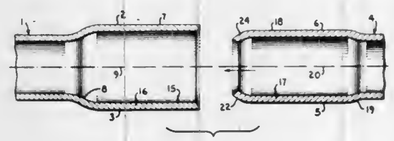
METHOD OF PRODUCING PIPE JOINTS

Gregg D. Ward, Olathe, Kans., assignor to Energy Pipelines International Company, Kansas City, Mo.

Filed May 25, 1984, Ser. No. 613,973

Int. Cl.[4] B23P *25/00*

U.S. Cl. 29—458 **6 Claims**



1. A method of forming pin and bell joints between the ends of tubular elements mode of metallic material subject to strain hardening, the method including the steps of:

(a) expanding the end of one element to form a substantially cylindrical pin;

(b) expanding the end of the other element a greater amount to form a substantially cylindrical bell with an inside diameter less than the outside diameter of said pin;

(c) the respective expansions being sufficient to strain the material of said tubular elements beyond the elastic limit thereof so as to induce strain hardening therein;

(d) the strain hardening in said bell being below the ultimate strength of the bell material;

(e) said differences in diameter being such that upon press-fit insertion of said pin into said bell, said bell is further strained beyond the elastic limit thereof to a point where

the ultimate strength of the bell material is approached; and

(f) press-fit inserting said pin into said bell.

6. A method of forming pin and bell joints between ends of first and second tubular elements made of metallic material subject to strain hardening, said method including the steps of:

(a) expanding said ends beyond the elastic limit of said material to form an expanded pin on an end of said first tubular element and an expanded bell on an end of said second tubular element; said expanding forming an interfering pin and bell of such conditions as to permit further deformation of at least one of said pin and bell further beyond the elastic limit thereof when said pin is press-fit inserted into said bell;

(b) said expanding straining the material sufficiently to produce strain hardening of the resultant pin and bell; and,

(c) further straining beyond the elastic limit of said material at least one of said pin and bell;

(i) said further straining being produced by press-fit insertion of said pin into said bell thereby straining at least one of said pin and bell further beyond the elastic limit thereof to a point where the ultimate strength of the material of at least one of said pin and bell is approached.

4,627,147

METHOD OF CONSTRUCTING A REFRACTORY PLATE ASSEMBLY FOR USE IN A SLIDING CLOSURE UNIT

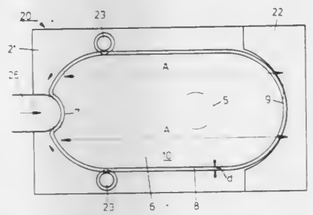
Otto Kägi, Cham, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Apr. 8, 1985, Ser. No. 721,068

Claims priority, application Switzerland, Apr. 24, 1984, 2002/84

Int. Cl.⁴ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—515 **14 Claims**



1. A method of manufacturing a prefabricated refractory closure plate assembly adapted to be readily inserted in a sliding closure unit, said assembly being of the type including a plate-shaped refractory member having therethrough at least one discharge opening and a metal jacket in tension surrounding and compressing the peripheral edge of said refractory member, said method comprising:

providing said refractory member with at least one indentation extending inwardly from said peripheral edge of said refractory member;

positioning a metal ring of a given width and thickness to surround said peripheral edge of said refractory member such that the entire width of a portion of said metal ring extends across said indentation;

pressing said portion of said metal ring across the entire width thereof into said indentation until an innermost external surface of said portion is spaced a predetermined distance from the external surface of said metal ring at a position at said peripheral edge of said refractory member opposite said indentation; and

said pressing comprising permanently increasing the length of said metal ring by stressing said metal ring beyond the elastic limit thereof and thereby permanently deforming and tensioning said metal ring into intimate compression contact with said peripheral edge of said refractory member, thereby forming a prefabricated assembly of said refractory member and said metal ring permanently connected thereto which may be assembled within a supporting frame of a sliding closure unit.

4,627,148

METHOD OF PRODUCING HIGH-PURITY METAL MEMBER

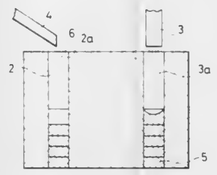
Hiromichi Imahashi; Masahisa Inagaki, both of Hitachi; Kimihiko Akahori, Katsuta, and Hajime Umehara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,075

Claims priority, application Japan, Dec. 7, 1983, 58-231036

Int. Cl.⁴ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—516 **10 Claims**



1. A method of producing a composite nuclear fuel cladding comprising an outer tube of zirconium alloy and a liner of pure zirconium, which comprises the steps of:

charging a raw material of sponge zirconium into a hearth disposed horizontally under a high vacuum atmosphere;

irradiating the raw material with an electron beam having a density of at least 50 W/mm^2 to melt the raw material in a limited area and to evaporate away impurities from the molten raw material;

shifting the hearth in its lengthwise direction to provide high purity ingots of zirconium;

forming a columnar ingot by remelting said ingots;

forging said columnar ingot;

perforating said columnar ingot to form a sleeve;

reducing the sectional area of said sleeve by rolling to form a liner, said liner being inserted into said outer tube; and

subjecting said liner inserted in said outer tube to hot extrusion, cold rolling and annealing.

4,627,149

METHOD OF MOUNTING AN ANNULAR ELEMENT ON A METAL TUBE OF ALUMINUM OR AN ALLOY THEREOF

Francois Colas, Bourg La Reine, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Apr. 16, 1984, Ser. No. 600,831

Claims priority, application France, Apr. 20, 1983, 83 06874

Int. Cl.⁴ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—516 **8 Claims**

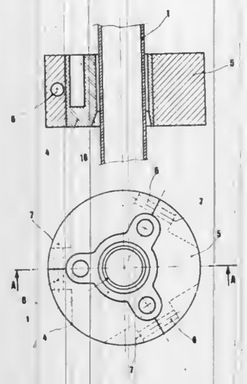
1. A method for mounting an element on a metal tube, which comprises:

surrounding the said tube by a tubular sleeve of aluminum or an alloy thereof, which is sufficiently thin to be plastically deformable and have a similar cross-section, with suitable clearance, with one of the sleeve ends having an outside bevel;

surrounding said tube, on the side of the sleeve bevel, with an annular element to be fastened, wherein said annular element has an external shape and at least one opening whose crosswise dimensions are greater than those of said tube, and whose radial clearance with said tube is less than the thickness of said sleeve, and which has, on the sleeve side, an inside bevel whose maximum crosswise dimensions are greater than the crosswise dimensions of the end of the sleeve without the bevel;

temporarily surrounding and supporting said annular element with a detachable hoop having an internal shape and size corresponding to said shape and size of said annular element;

moving the beveled end of said annular element and the beveled end of said sleeve toward one another by a suitable means, and introducing said sleeve by force between the annular element and said tube while radially inwardly



plastically deforming and interlocking said sleeve and said tube, said sleeve being radially inwardly plastically deformed over substantialy its whole length, thereby permanently mounting the said annular element on said tube without deforming said external shape of said annular element; and

removing said hoop.

4,627,150

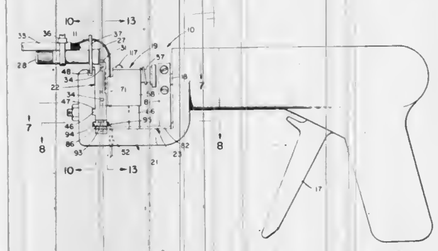
TOOL FOR INSERTING CABLE WIRES IN CONNECTOR CONTACTS

David W. Burnett, Arlington Heights, Ill., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 28, 1983, Ser. No. 566,257

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—566.4 **1 Claim**



1. A hand tool for inserting wires into contacts of an electrical device, which comprises:

a frame formed with a first and a second elongated open slot;

a holder slideably mounted in said frame for supporting the electrical device with a pair of its contacts positioned in an insertion site;

a block assembly mounted in said frame and including a first slot formed therein, a plate having a stepped surface, and a pair of holes extending from said stepped surface for receiving a pair of wires to be inserted in a pair of contacts of the device;

a pair of adjacent vertically displaced insertion blades slideably mounted in said first slot of the block assembly and adapted to ride on said stepped surface during their movement toward and away from the insertion site, each of said insertion blades having a first tip section for exerting a force against a wire and a second tip section for shearing a wire;

a trigger operated means for simultaneously moving the insertion blades into the insertion site to force the pair of wires interposed between the insertion blades and the pair of contacts into engagement with the contacts and to shear said wires in said holes at points adjacent to the contacts in which the wires are inserted upon depression of the trigger operated means;

means operated by the release of the trigger operated means for indexing the holder to move the next pair of contacts into the insertion site; and

a dressing plate detachably mounted on said holder and having one edge formed with a series of wire receiving slots and the other edge fittable within said first elongated open slot for guiding said holder to move transversely of said insertion blades, said holder being formed with a transversely extending flange slidably mounted in said second slot for guiding said holder during said transverse movements.

4,627,151

AUTOMATIC ASSEMBLY OF INTEGRATED CIRCUITS

Wayne A. Mulholland, Plano; Daniel J. Quinn; Robert H. Bond, both of Carrollton, and Michael A. Olla, Flower Mound, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Mar. 22, 1984, Ser. No. 592,185

Int. Cl.⁴ H01L *21/28*

U.S. Cl. 29—569 R **7 Claims**

1. A method of processing semiconductor integrated circuit devices comprising the steps of:

a. applying a dielectric top coating having a top surface over at least two integrated circuits on a wafer;

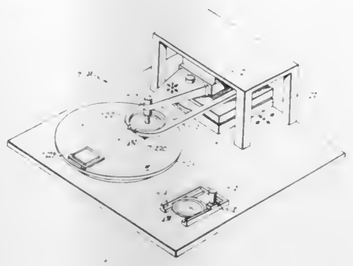
b. forming at least two arrays of conductive leads from predetermined nodes of said integrated circuits along said top surface of said dielectric top coating to at least two corresponding predetermined arrays of electrical contacts disposed on said top surface of said dielectric above each of said at least two circuits;

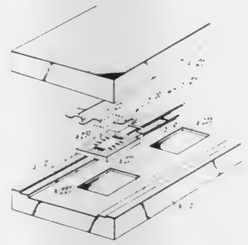
c. separating said at least two circuits to form at least two circuit chips by cutting entirely through said wafer while leaving a cover portion of said dielectric above each of said integrated circuits and below said standard arrays;

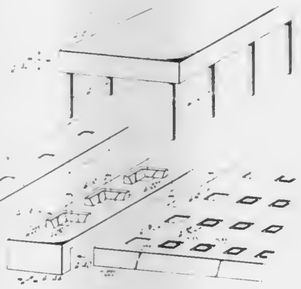
d. removing a selected chip from said at least two circuit chips by striking an adhesive support member having an adhesive side to which said selected chip is attached and an opposite side at a point on said opposite side opposite said selected chip, thereby releasing said chip from said adhesive;

e. positioning a leadframe, having an array of contact members disposed in a lead contact array positionally matching said predetermined array of electrical contacts, in alignment with said selected chip so that said lead contact array touches said array of electrical contacts, said at least two predetermined arrays of electrical contacts being sized to fit on at least two different integrated circuit chips so that

said leadframe may be used with more than one integrated circuit; and







f. conductively bonding at least two of said array of electrical contracts to said lead contact array simultaneously.

4,627,152
AUTOMATIC LAYOUT FOR CASCODE VOLTAGE SWITCH LOGIC

Mitchell R. DeHond, Essex Junction, and Paul J. Ledak, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

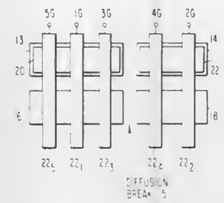
Filed May 24, 1985, Ser. No. 737,614
Int. Cl.[4] H01L *29/78, 21/78*
U.S. Cl. 29—571 **4 Claims**

1. A method of synthesizing a circuit comprising paired N-type and P-type field effect transistors from a logic gate representation, comprising the steps of:

dividing said logic gate representation into one or more functional blocks, each said block having no more than a first predetermined number of serially connected P-type transistors and no more than a second predetermined number of serially connected N-type transistors;

ordering the pairs of transistors for maximizing the number of pairs of contigously connected transistors, said P-type transistors being arranged in a first linear array and said N-type transistors being arranged in a second linear array;

then establishing the internal wiring connections exclusive of said contiguous connections between said transistors in said first array and between said transistors in said second array from the types of logic gates represented by said transistors; and



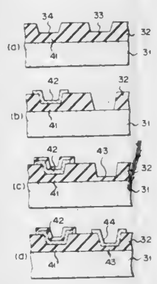
creating a circuit layout of said first linear array of said ordered P-type transistors parallel to said second linear array of said ordered N-type transistors including said contiguous connections; and

interconnecting said N-type transistors and interconnecting said P-type transistors according to said internal wiring connections.

4,627,153
METHOD OF PRODUCING A SEMICONDUCTOR MEMORY DEVICE

Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 344,047, Jan. 29, 1982, Pat. No. 4,525,811.
This application Apr. 15, 1985, Ser. No. 723,294
Claims priority, application Japan, Feb. 6, 1981, 56-16651
Int. Cl.[4] H01L *29/78, 29/60*
U.S. Cl. 29—571 **1 Claim**



1. A method for manufacturing an MOS static RAM including enhancement type MOS transistors in a flip-flop circuit of a memory cell, enhancement type MOS transistors for selection of said memory cell, and enhancement type MOS transistors in a peripheral circuit, all said enhancement type transistors being formed in a common semiconductor substrate also containing a memory matrix, said method comprising the steps of:

(a) forming a thick oxide film on a surface of said substrate;

(b) removing portions of said thick oxide film from an area corresponding to an enhancement type MOS transistor formation region to expose a first area of said substrate surface;

(c) forming a first gate oxide film on said exposed first area of said substrate surface;

(d) forming a first polysilicon layer on said thick oxide film and on a portion of said first gate oxide film corresponding to said enhancement type MOS transistors for memory cell selection;

(e) selectively removing said first polysilicon layer to form a gate electrode and a wiring layer for each enhancement type MOS transistor for memory cell selection;

(f) removing said first gate oxide film from an area corresponding to said enhancement type MOS transistors in said peripheral circuit and in said flip-flop circuit to expose a second area of said substrate surface;

(g) forming a second gate oxide film on said exposed second area of said substrate surface, said second gate oxide film being thinner than said first gate oxide film;

(h) forming a second polysilicon layer on said thick oxide film and an area of said second gate oxide film corresponding to said enhancement type MOS transistors in said flip-flop circuit and in said peripheral circuit;

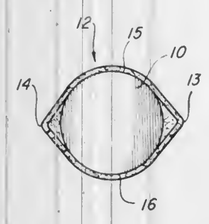
(i) selectively removing said second polysilicon layer to provide a wiring layer and a gate electrode for each enhancement type MOS transistor in said flip-flop circuit and in said peripheral circuit; and

(j) diffusing an impurity into source and drain formation regions of each of said enhancement type MOS transistors to form source and drain regions for said transistors.

4,627,154
CELL JACKETING

Timothy A. Pattison, Lilburn, Ga., assignor to Duracell Inc., Bethel, Conn.

Filed Sep. 3, 1985, Ser. No. 771,914
Int. Cl.[4] H01M *2/02*
U.S. Cl. 29—623.1 **13 Claims**



1. A method for uniform heat shrink jacketing of an electrochemical cell container, with a heat shrink jacketing material, with reduced distortion of said jacketing material upon heat shrinking, characterized in that said method comprises the steps of heating said cell container to a temperature for a period of time sufficient to soften the heat shrink jacketing material when positioned thereon but below a temperature which will rapidly heat shrink the jacketing material, positioning said jacketing material on said cell container, permitting the jacketing material and the cell container to heat stabilize, and thereafter rapidly heat shrinking said jacketing material onto said cell container.

4,627,155
TUBE EXTRACTING APPARATUS

Robert C. Mancabelli, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,770
Int. Cl.[4] B23P *15/26, 19/00*
U.S. Cl. 29—726 **20 Claims**

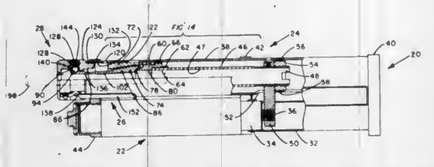
1. A tube extracting apparatus, comprising:

a pull shaft having opposite end portions and being reciprocative between an extended position and a retracted position,

a compression member being connected to one of said end portions of said pull shaft for reciprocative movement therewith between said extended and said retracted positions, and

a collet member being disposed with said compression member for reciprocative movement therewith between said extended and said retracted positions, and having an engageable gripping means for gripping radially inwardly when engaged,

said compression member having a compressing means generally peripherally disposed about said gripping means for compressively engaging said gripping means when moving from said extended position to said retracted position

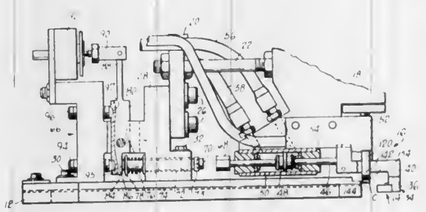


and for disengaging said gripping means when moving from said retracted position to said extended position, whereby a tube inserted in said gripping means is continuously extracted by the reciprocative movement of said gripping means from said extended position to said retracted position wherein said compressing means compresses said gripping means against the tube, and from said retracted position to said extended position wherein said compressing means disengages from said gripping means.

4,627,156
PLACEMENT HEAD FOR MICRO-COMPONENT ASSEMBLY MACHINE

Stanley R. Vancelette, Manchester, N.H., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 565,749, Dec. 27, 1983, abandoned.
This application Nov. 19, 1985, Ser. No. 800,351
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—740 **6 Claims**



1. An apparatus for automatically positioning micro-electronic components on conductive lands of a printed circuit board, comprising:

a. a placement head including means for placing the components on the board;

b. an enclosed conveyor for transporting the components by air to said placement head linearly normal to said placement head;

c. means for receiving the components from said conveyor and positioning the components beneath said placement means;

d. means for adjustably positioning said receiving means with respect to said placement means to accommodate variable sized components to assure each component is properly positioned on said placement means for placement on the conductive lands of the board;

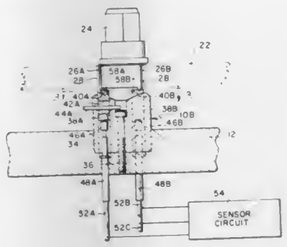
e. means limiting the adjusted position of said receiving means to a predetermined position to assure the accuracy of the position of the component beneath the placement means.

4,627,157

INSERTION VERIFICATION AND CRIMPING OF LEADS

Carl Campisi, Chicago; Abraham Lev, and Richard G. Schmid, both of Glenview, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 614,349, May 25, 1984, abandoned.
This application Feb. 10, 1986, Ser. No. 828,584
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—741 **7 Claims**



1. In the mounting of an electronic component having a plurality of leads on a first side of a circuit board and in circuit with conductors positioned on a second side of said circuit board, said circuit board having a plurality of apertures therein through each of which a respective lead is inserted, apparatus for detecting the insertion of said leads through said apertures, for coupling each of said leads to a respective conductor, and for testing the electronic component following the mounting of the electronic component on said circuit board, said apparatus comprising:

support means;

a housing mounted to said support means and maintained in position adjacent the apertures in said circuit board on the second side thereof, said housing including a plurality of channels extending therethrough and aligned with a respective circuit board aperture;

a plurality of conductive crimping means, wherein each of said crimping means includes an elongated member linearly displaceable along and within a respective channel of said housing between a first proximal and a second distal end stop position relative to said circuit board and wherein each elongated member has a beveled distal end portion for engaging a respective component lead and positioning said lead in electrical contact with a conductor on the second side of said circuit board;

displacement stop means coupled to each of said elongated members for limiting the displacement thereof between said first proximal and said second distal end stop positions, wherein a distal end of a component lead is deflected laterally when a respective elongated member engaging said component lead is displaced toward said second distal end stop position, with said component lead then deflected toward said circuit board when said elongated member reaches said second distal end stop position so as to be positioned in electrical contact with a circuit board conductor; and

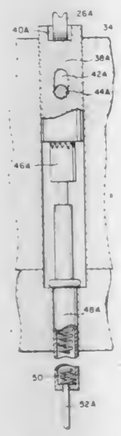
detector means coupled in circuit to each of said crimping means for detecting the engagement of each of said crimping means with a respective component lead, whereupon the electronic component is in circuit with said detector means for testing the operation of the electronic component following the mounting of the electronic component on the circuit board.

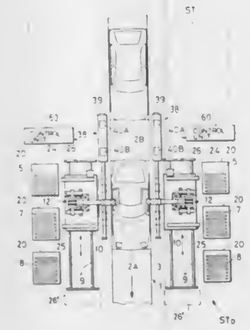
4,627,158

APPARATUS FOR SETTING DOORS TO VEHICLE BODIES

Syunji Mitoh, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Aug. 5, 1985, Ser. No. 762,331
Claims priority, application Japan, Aug. 13, 1984, 59/169127; Aug. 13, 1984, 59/169128; Aug. 13, 1984, 59/169129
Int. Cl.[4] B23P *21/00, 19/00*
U.S. Cl. 29—771 **17 Claims**





1. Apparatus for setting a door to a vehicle body comprising;

a robot installed on a carriage movable along a vehicle body assembly line and operating with a predetermined working path to hold and carry a door,

a plurality of pallets arranged along a moving direction of said carriage for sorting and storing doors of plural different types thereon, and

door positioning means for positioning a door taken out by said robot from one of said pallets in proper relation to said robot,

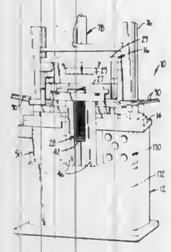
the apparatus being so constituted that when a vehicle body is conveyed to a door mounting station in said vehicle body assembly line, said robot picks out one of the doors sorted on said pallets, which is fit for said vehicle body conveyed or being to be conveyed to the door mounting station, to cause the same to engage with said door positioning means so that the door picked out by said robot is positioned by said positioning means, and then holds and carries the door positioned by said door positioning means to set the same to the vehicle body at the door mounting station.

4,627,159

APPARATUS AND METHOD FOR PROCESSING A SEMICONDUCTOR LEAD FRAME

Kurt Waldner, 12260 Saraglen Dr., Saratoga, Calif. 95170

Filed Oct. 1, 1984, Ser. No. 656,818
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—827 **16 Claims**



1. Apparatus for processing semiconductor lead frames comprising:

a support having first means on one side thereof for mounting a first stack of lead frames to be processed and second means on the opposite side thereof for receiving a second stack of lead frames after they have been processed;

means coupled with the first means for incrementally elevating a stack of lead frames, the second means being operable to allow processed lead frames to move into the second stack;

a pair of processing dies mounted near the upper end of the support, one of the dies being movable toward and away from the other die;

means coupled with said one die for shifting the same toward the other die to cause a lead frame in an operative position between the dies to be processed;

means mounted for reciprocation along a path extending between the dies for moving a lead frame from the first stack in one direction into said operative position between the dies for processing, said moving means being operable to advance a processed lead frame toward and into alignment with the second stack as said processed lead frame is moved in one direction, said moving means being movable in the opposite direction into a retracted position to place the moving means in position for shifting the uppermost lead frame of the first stack toward said operative position between; and

means coupled with said moving means for reciprocating the latter with respect to said dies.

16. A method of processing a plurality of semiconductor lead frames comprising:

moving the uppermost lead frame laterally off a first stack of lead frames and into a processing zone;

processing the first lead frame in said zone;

advancing said first frame to a position toward a second stack of lead frames, whereby the first lead frame can gravitate into the second stack when it becomes aligned therewith; and

repeating the moving, processing and advancing steps until all of the lead frames from the first stack have been processed and have been placed in the second stack.

4,627,160

METHOD FOR REMOVAL OF CARBONACEOUS RESIDUES FROM CERAMIC STRUCTURES HAVING INTERNAL METALLURGY

Lester W. Herron, Hopewell Junction; Ananda H. Kumar; Raj N. Master, both of Wappingers Falls, and Robert W. Nufer, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,713
Int. Cl.[4] H05K *3/46*
U.S. Cl. 29—830 **17 Claims**

1. In a method of forming a glass-ceramic composite substrate wherein a slurry is prepared which includes sinterable particles of a crystallizable glass, an organic resin binder, and a solvent for the binder, forming the slurry into green ceramic sheets, forming via holes in the sheets, depositing electrically conductive material in the via holes and in line patterns on the surface of the sheets, assembling the sheets, and heating the assembly in an environment to oxidize and remove the resin binder, and subsequently heating the assembly at a higher temperature to fuse the glass particles, the improvement comprising,

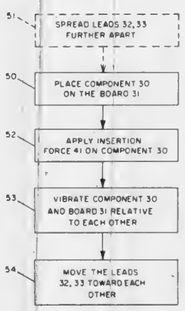
incorporating a catalyst to accelerate the binder oxidation of said slurry and eliminate carbonaceous binder residue, said catalyst selected from the group consisting of fine particles of Cu, Cu_2O, CuO, Cu_2SO_4, $CuCl_2$, Cu- organometallic compounds and mixtures thereof, in an amount in the range of 0.01 to 3.0% by weight of the said crystallizable glass, said catalyst capable of accelerating the oxidation and removal of said binder during said heating in the oxidizing environment.

4,627,161

METHOD FOR INSERTING MULTILEAD COMPONENTS INTO PRINTED WIRING BOARDS

Robert H. Cushman, Princeton, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 562,956, Dec. 19, 1983, abandoned.
This application Jun. 24, 1985, Ser. No. 747,694
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—838 **21 Claims**



1. A method for mounting a multilead component on a substrate having a plurality of apertures arranged in a pattern and adapted to receive the leads of said component, the method comprising the steps of:

placing the component with its leads on the substrate such that the pattern of said apertures is within the tip portions of said leads;

applying a force on the component in a direction substantially perpendicular to the plane of the substrate;

vibrating the component and the substrate relative to each other; and

laterally moving the tip portions of the leads inwardly toward the apertures while simultaneously vibrating the component and substrate relative to each other thereby

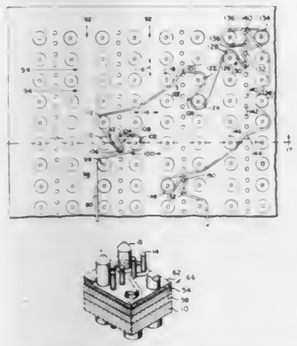
inserting each lead in a corresponding aperture in said substrate.

4,627,162

METHOD OF PRODUCING A WIRED CIRCUIT BOARD

Richard C. Holt, Fairhaven, Mass., assignor to Augat Incorporated, Mansfield, Mass.

Filed Nov. 4, 1983, Ser. No. 549,484
Int. Cl.[4] H05K *3/02*
U.S. Cl. 29—847 **23 Claims**



1. A method for producing a wired circuit board comprising the steps of:

routing a continuous insulated wire along a predetermined path through a plurality of pins projecting from a fixture plate;

adhering the continuous wire to an adhesive layer to form a wire mat;

severing the continuous wire at selected locations to form a wire mat having at least one wire net;

mating a circuit board having a plurality of conductive pads disposed on the board surface with the wire mat such that selected points of said wire nets confront selected conductive pads; and

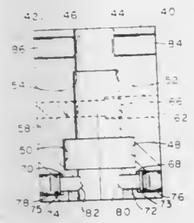
interconnecting said selected points of said wire nets with said selected conductive pads.

4,627,163

TUBE CUTTER FOR CUTTING TWO CONCENTRIC TUBES BULGED TOGETHER

Gary W. Cuba, Hopkins, and Edward N. Laughlin, Columbia, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,978
Int. Cl.[4] B23D *21/06*
U.S. Cl. 30—95 **9 Claims**



1. A cutter mechanism for making a cut through a tube section having a circumferential bulge wherein said cut is to be made adjacent said bulge, said cutter mechanism comprising:

(a) an elongated housing being formed by at least two matable portions having first longitudinal matching recesses which define an axial bore through said housing having a first diameter extending from one end of said housing and a second diameter larger than the first diameter extending from the opposite end of said housing when said portions are mated together and having second transverse matching recesses which define a circumferential groove when said portions are mated together;

(b) means for clamping said portions together in a mating relationship which form said housing after said portions are assembled on said tube section such that said tube section extends through said axial bore and said bulge is contained within said circumferential groove;

(c) means defining a radial bore in at least one of said portions of said housing at one axial end portion of said housing between said circumferential groove and one terminal end of said housing, said radial bore extending radially from said axial bore of said housing;

(d) cutting means including at least one cutter bit being mounted in said radial bore of said housing and positioned adjacent the outer surface of said tube section when said housing is assembled on said tube section, said cutter bit being extendable into said axial bore to make a circumferential cut in said tube section upon rotation of said housing relative to said tube section; and

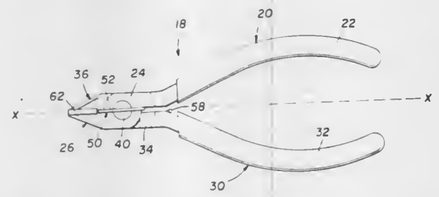
(e) means on said housing to facilitate rotation of said housing about said tube section for applying said cut, said means to facilitate rotation being located on an opposite axial end portion of said housing defined between said circumferential groove and the other terminal end of said housing.

4,627,164

WIRE STUB RETAINER AND HANDLE OPENING SPRING

Frank Mikic, Kenosha, and Daniel W. Williams, Milwaukee, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Feb. 19, 1985, Ser. No. 703,207
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—135 **6 Claims**



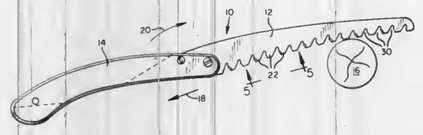
1. For use in a wire cutting pliers having first and second arms pivotally coupled at respective intermediate portions thereof and including respective cutting edges on first ends thereof, a resilient wire retainer comprising an intermediate mounting portion adapted to receive and grip the pivotally coupled intermediate portions of the first and second arms, for mounting thereon by gripping engagement therewith solely by reason of the shape of said intermediate mounting portion and without any other attachment means said mounting portion having opposed top and bottom portions for respectively engaging the pivotally coupled intermediate portions along the top and bottom thereof and opposed end portions for respectivey engaging the pivotally coupled intermediate portions along front and rear ends thereof, an elongated forward portion extending from said intermediate mounting portion and positioned immediately adjacent to and extending along the length of one of the cutting edges so as to engage and maintain a section of severed wire in firm contact with the other cutting edge when the cutting edges engage the wire, and an aft portion extending from the rear most part of said intermediate mounting portion substantially perpendicular to said top and bottom portions and terminating in a free distal end, said after portion being positioned in abutting contact with one of the arms for biasing the pliers to an open configuration wherein the cutting edges are displaced from one another.

4,627,165

HAND HELD CUTTING TOOLS

Duane M. Gibson, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 583,983, Feb. 27, 1984, abandoned.
This application May 6, 1985, Ser. No. 730,266
Int. Cl.[4] B27B *23/00*
U.S. Cl. 30—166 R **7 Claims**



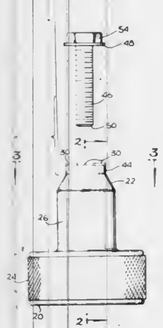
1. A hand saw for severing wood materials comprising; a handle and an elongated blade extended therefrom, said elongated blade having a bottom cutting blade edge designed for cutting by lengthwise reciprocation of the blade defining thereby a cutting direction, said cutting blade edge formed by a series of cutting teeth, the spacing between the teeth forming gullets for carrying wood chips, certain of said teeth having a depth seeking front surface and a depth controlling bottom surface cooperatively formed for controlled depth cutting of the wood material, said front surface and bottom surface intersecting to form a leading cutting edge having a leading cutting point, said depth controlling bottom surface being angled rearwardly and inwardly relative to the cutting direction from the cutting edge within a shallow angular range, and said bottom surface extending from said cutting edge a major portion of the distance between successive teeth with the length of the bottom surface and the length of the gullet having a ratio in the range of about 3 to 2 and greater, said controlling bottom surface being angled laterally and inwardly from one side edge to the other side edge, and said combination of angles and extended bottom surface providing operator control to controllably limit the depth of engagement of the preceding and succeeding cutting teeth.

4,627,166

WASHER CUTTER

William D. McMinn, 42215 52nd St. W., Quartz Hill, Calif. 93534

Filed Mar. 26, 1984, Ser. No. 593,671
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—277 **8 Claims**



6. A device for the removal of washers affixed to shafts of bolts comprising:

a handle for holding the device and supporting said bolts, said handle comprising a small diameter region at one end of said handle for supporting said bolt and a large diameter region for holding said device during operation, said large diameter region being knurled and of a size to be held in a user's hand;

a blade assembly removably coupled by coupling means to said small diameter region of said handle, said blade assembly having an outside diameter at least as large as the outside diameter of the washer to be removed; and an axially located opening for the insertion of the shaft of the bolt, said opening having a diameter slightly larger than the outside diameter than the shaft of the bolt, whereby the shaft of the bolt may be readily inserted into said opening; and

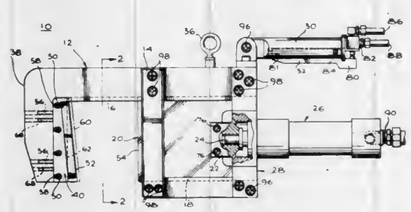
at least three substantially radially distributed blades on the surface of said blade assembly and extending from the diameter of said opening to at least the outer diameter of the washer, whereby said blades are in contact with the washer for a substantial portion of the width of the washer when the bolt bearing the washer is fully inserted in said opening.

4,627,167

LEG SHEAR

Ralph K. Karubian, and Gregorio J. Coelho, both of Los Angeles, Calif., assignors to Kentmaster Mfg. Co., Inc., Los Angeles, Calif.

Filed Jul. 1, 1985, Ser. No. 750,175
Int. Cl.[4] B26B *15/00*
U.S. Cl. 30—228 **3 Claims**



1. A leg shear including a frame having opposed upper and lower members and an anvil portion depending from said upper member, said opposed upper and lower members having opposed grooves in the edges thereof facing and parallel to each other;

a movable blade slidably carried in said opposed grooves and having a first rectilinear cutting edge normal to said grooves;

a fixed blade having a second rectilinear cutting edge, said fixed-blade being supported from said anvil portion with said second rectilinear cutting edge positioned facing said first rectilinear cutting edge and laterally displaced from alignment with said first rectilinear cutting edge a distance such that said movable blade makes sliding contact with said fixed blade when said first rectilinear cutting edge passes over said second rectilinear cutting edge during movement of said movable blade, said second rectilinear cutting edge lying in a plane parallel to the plane in which said first rectilinear cutting edge lies, and said second rectilinear cutting edge being non-parallel with said first rectilinear cutting edge;

said movable blade being supported throughout its travel by at least one of said opposed grooves;

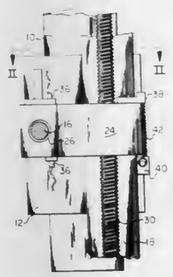
a spacing plate supported in said frame in contiguous relation to said fixed blade and parallel to and aligned with said movable blade but recessed from said second rectilinear cutting edge;

said movable blade carrying at opposite ends of said first rectilinear cutting edge blocks having a flat surface

aligned with said first rectilinear cutting edge and with said spacing plate;

said spacing plate and said first rectilinear cutting edge being adjustable in position along the direction of the path of said movable blade.

4,627,168
GAGE POSITION CONTROL
Stephen S. Maples, Adrian, Mich., assignor to Acer Automation, Adrian, Mich.
Filed Feb. 27, 1985, Ser. No. 706,443
Int. Cl.⁴ G01B *7/02*
U.S. Cl. 33—169 R **11 Claims**



1. Gage positioning apparatus comprising, in combination, a gage arm, gage arm support means supporting said arm for movement through an operative path, a protective shield having an opening defined therein receiving said gage arm, protective shield support means supporting said shield for movement through an operative path substantially corresponding to said gage arm operative path, power operated protective shield drive means operatively connected to said protective shield for moving said shield through its operative path, and sensing means sensing the relative position of said shield to said gage arm controlling said drive means preventing direct engagement of said shield with said gage arm wherein said shield is protectively associated with said gage arm without interfering with the movement thereof during gaging.

4,627,169
REMOTE CENTER COMPLIANCE DEVICE
Paolo R. Zafred, Pittsburgh, and Luciano Veronesi, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 27, 1986, Ser. No. 822,727
Int. Cl.⁴ G01B *5/25*
U.S. Cl. 33—169 C **11 Claims**

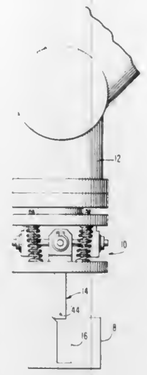
1. A remote center compliance device having a high degree of translational and rotational compliance for use in connection with a manipulator device comprising:

a first member adapted to be connected to said manipulator device;

a second member spaced from said first member; and

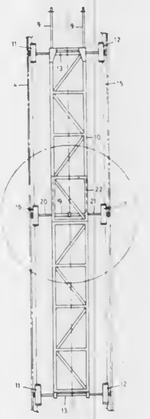
means interconnecting said first member with said second member for providing both rotational and translational compliance about a remote center of compliance external to said compliance device;

said interconnecting means including a pair of crossed, interconnected shafts, one of said shafts being connected to said first member and the other of said shafts being connected to said second member;



said interconnecting means further including a plurality of axially compressible and laterally deformable elements connected between said first and second members.

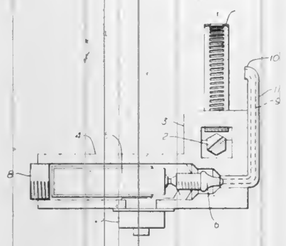
4,627,170
SHAFT GUIDE ALIGNMENT MEASUREMENT
Ronald M. K. McKechnie, Vaal Reefs, South Africa, assignor to Vaal Reefs Exploration and Mining Co., Transvaal, South Africa
Filed Oct. 17, 1985, Ser. No. 788,446
Claims priority, application South Africa, Oct. 17, 1984, 84/8102
Int. Cl.⁴ G01B *7/31*
U.S. Cl. 33—181 R **9 Claims**



1. A conveyance guide alignment measuring device adapted to track along conveyance guides extending along a shaft comprising a substantially rigid frame, opposed roller assemblies at either end of the frame, the assemblies on one side of the frame being rigidly mounted on the frame for engagement with a reference guide and the assemblies opposed thereto on the other side of the frame being biased resiliently outwardly for engagement with a second guide, a sub-frame movably suspended from the frame and including a roller assembly rigidly mounted on the sub-frame for engagement with the reference guide and a roller assembly biased outwardly from the sub-frame for engagement with the second guide, and motion sensors mounted to detect and measure relative motion

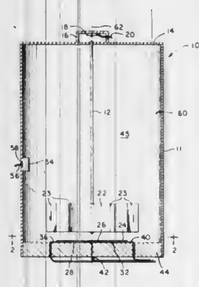
of the frame, the sub-frame and the roller assemblies mounted on the sub-frame.

4,627,171
RETICLE ILLUMINATOR
Morris S. Dudney, 2001 E. Fifth St., Austin, Tex. 78702
Filed May 9, 1983, Ser. No. 493,033
Int. Cl.⁴ F41G *1/32*
U.S. Cl. 33—241 **12 Claims**



1. An attachment device for illuminating the reticle of a telescopic device through the eyepiece lens thereof, comprising: a housing; a light source enclosed in said housing and power source means also in said housing for actuating said light source; optical fiber means mounted to said housing, said optical fiber means having a first input end proximate said light source and a second output end located proximate the external side of said eyepiece lens for providing an illuminating light path from said light source to said reticle through said eyepiece lens; and means for removably positioning said housing on said telescopic device adjacent said eyepiece lens so that said second output end of said fiber optics means is adjacent said eyepiece lens.

4,627,172
INCLINOMETER HAVING TWO DEGREES OF FREEDOM
Martin A. Afromowitz, Seattle, Wash., assignor to Innovation Associates, Bellevue, Wash.
Filed Aug. 17, 1984, Ser. No. 641,790
Int. Cl.⁴ G01C *9/06*
U.S. Cl. 33—366 **9 Claims**



1. An inclinometer comprising:

a housing means defining an internal chamber;

means for producing a light beam, wherein said means for producing a light beam are at least partially located within said chamber and have one end rigidly supported by said housing means; and

an optical detector means secured to said housing means and located to be adapted to receive a spot of light from said means for producing a light beam;

wherein at least a portion of said means for producing a light beam is free to move, with respect to its said rigidly supported end, in two degrees of freedom of motion under the influence of gravity in response to any inclination of said inclinometer, to enable the light beam it produces in operation to correspondingly move in two degrees of freedom of motion;

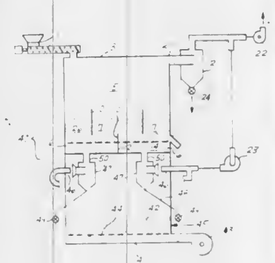
wherein said optical detector means has an at least substantially continuous light-sensitive surface area fashioned to measure the position of said spot of light when moving in said two degrees of freedom of motion;

wherein said optical detector means uniquely detects the position of said spot of light falling entirely anywhere on its said light-sensitive surface area regardless of the direction in which said spot of light moves on said light-sensitive surface area;

wherein said position of said spot of light falling on said light-sensitive surface area provides an indication, through the output signals generated by said optical detector in response to said spot of light, of the amount and direction of the inclination of said inclinometer;

wherein said means for producing a light beam comprise an optical rod and means for producing a light; wherein one end portion of said optical rod is rigidly secured to said housing; wherein said means for producing a light is secured to said housing means in a location to enable light it produces to be coupled to said optical rod; and wherein said optical rod is fabricated from an at least nearly perfect elastic material which is not appreciably affected by anelastic deformation.

4,627,173
FLUID BED HOG FUEL DRYER
Michael A. O'Hagan, Cupertino, and Richard D. Smith, Palo Alto, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.
Filed Apr. 11, 1983, Ser. No. 483,973
Int. Cl.⁴ F26B *3/08*
U.S. Cl. 34—10 **10 Claims**



1. A process for drying, in a fluid bed reactor, wet wood waste having a range of particle sizes to a substantially uniform moisture content, comprising:

feeding said wood waste into a first fluid bed treating zone;

fluidizing said wood waste in said first zone with a hot gas of sufficient velocity whereby the finest particle size portion of said waste is entrained in said gas and departs the fluid bed as said fines portion achieves a desired moisture content; establishing said desired moisture content of said material to avoid significant distillation of volatiles from said wood;

transporting said remaining wood waste in a fluidized state, now partially dried, to subsequent fluid bed treating zones;

adjusting the velocity of said fluidizing hot gases in each subsequent zone whereby the finest portion of the remaining wood waste in each zone is entrained and departs the fluid bed as each fines portion in each zone achieves the desired moisture content with the remaining partially dried material in a zone proceeding to the next treating zone;

discharging the final remaining portion of the wood waste from the fluid bed as it reaches the desired moisture content, and;

separating and collecting, simultaneously with the above steps, the entrained fines portion of wood waste from the fluidizing gas as it departs the fluid bed.

4,627,174

PROCESS AND SYSTEM FOR THE DRY QUENCHING OF COKE

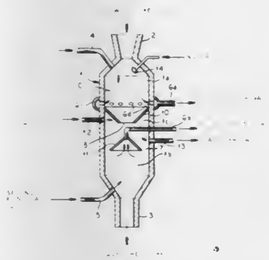
Kurt Hedden, Karlsruhe; Kurt-Günther Beck, Essen-Bredeney; Wolfgang Rohde, and Horst Schumacher, both of Essen-Heisingen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen-Krey, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 462,901, Feb. 1, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,048

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203731; Feb. 4, 1982, 3203732

Int. Cl.[4] F26B *3/16*

U.S. Cl. 34—20 **4 Claims**



1. A process for quenching glowing coke in a plant in which the coke to be quenched is discharged from a coking chamber to be recharged with coal dried in a drying and preheating stage by direct contact with a hot gas picking up water vapor from the coal, comprising the steps of:

(a) feeding the glowing coke from above into a quenching duct divided into an upper and a lower compartment from which quenched coke is extracted at the bottom whereby said coke descends in said compartments and from said upper compartment to said lower compartment;

(b) passing a first flow of a cooling gas which is inert with respect to said descending coke in countercurrent to said coke through said upper compartment for reducing the coke temperature therein to a range between substantially 700° and 800° C. by direct contact of said cooling gas with said coke and withdrawing the first flow of gas from a lower portion of said upper compartment;

(c) passing a second flow of a cooling gas which is said hot gas obtained from said drying and preheating stage and containing water vapor after traversing said drying and preheating stage through said lower compartment in countercurrent to the descending coke for further reducing the temperature thereof to a level below substantially 300° C. by direct contact of said second flow of said cooling gas with said coke;

(d) laterally withdrawing said second flow of cooling gas, heated by said direct contact with the descending coke in said lower compartment at an upper portion of said lower compartment and recirculating the withdrawn second flow of gas through said drying and preheating stage as said hot gas and then back to said duct; and

(e) maintaining separation of said first and second flows of cooling gas from one another at a location corresponding substantially to a lower portion of said upper compartment and an upper portion of said lower compartment while permitting said coke to pass therebetween.

4,627,175

FLUIDIZED-BED APPARATUS

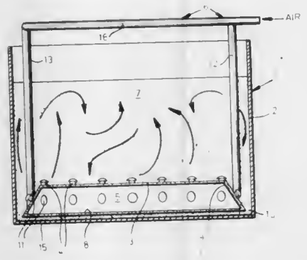
Ewald Schwing, Wiesfurther Str. 99, 4133 Neukirchen-Vluyn; Peter Sommer, Johann-Strauss-Str. 13, 4174 Issum 2, and Horst Uhrner, Schumannstr. 9, 4174 Issum, all of Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,283

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340099

Int. Cl.[4] F26B *17/10*

U.S. Cl. 34—57 A **5 Claims**



1. In an apparatus for the fluidized-bed treatment of objects, which apparatus includes a housing having a floor and vertical circumferential wall means and defining interiorly thereof an upwardly open fluidized-bed chamber, a fluidizing-gas distributor compartment located in said fluidized-bed chamber and including a nozzle plate provided with a plurality of nozzles therethrough, and means for feeding fluidizing-gas into said fluidizing-gas distributor compartment, said nozzles serving to enable said gas to flow from said fluidizing-gas distributor compartment into said fluidized-bed chamber;

the improvement comprising that:

(a) said fluidizing-gas distributor compartment is an independent structure substantially corresponding in circumferential outline to said fluidized-bed chamber,

(b) said fluidizing-gas distributor compartment has a planar top wall constituting said nozzle plate and further has peripheral side walls and a bottom wall,

(c) said fluidizing-gas distributor compartment is removably positioned in said fluidized-bed chamber on said floor of said housing, and

(d) peripheral side walls of said fluidizing-gas distributor compartment converge toward one another from said bottom wall and said floor to said top wall of said compartment and are provided with additional nozzles through said side walls.

4,627,176

DRYING CYLINDER FOR A WEB MATERIAL MACHINE, PARTICULARLY A PAPER MACHINE

Francois Brieu, Saint-Cloud, France, assignor to Chleq Frote et Cie, Paris, France

PCT No. PCT/FR84/00242, § 371 Date Jun. 24, 1985, § 102(e) Date Jun. 24, 1985, PCT Pub. No. WO85/01969, PCT Pub. Date May 9, 1985

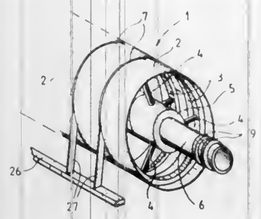
PCT Filed Oct. 24, 1984, Ser. No. 752,197

Claims priority, application France, Oct. 27, 1983, 83 17132

Int. Cl.[4] F26B *13/18*

U.S. Cl. 34—115 **18 Claims**

1. Drying cylinder designed for equipping a drier and/or after-drier for a machine producing material in webs, namely paper, the cylinder having two axial ends and a hollow structure internally heated and presenting a cylindrical outer side surface, circular in section, against which a web is to be applied, wherein the outer side surface is delimited by several cylindrical rims, circular in section, of the same radius and coaxially placed side by side, and made out of a good heat conducting material, each rim exchanging heat with an individually controlled internal heating device that the rim surrounds, and each rim being integral in rotation with at least one hub fixed to at least one rotating shaft of the cylinder, wherein each rim is separated from a neighboring rim by a small axial



gap, and wherein the two axial ends of the cylinder are sealed and relatively gas-tight and wherein the inside of the cylinder is connected to a vacuum pressure source, so that the web is sucked against the rims through the axial gaps between the rims.

4,627,177

INSOLE STRUCTURE

Stuart R. Meyers, 2910 Wallace Ave., Bronx, N.Y. 10467

Continuation of Ser. No. 626,424, Jul. 2, 1984, abandoned, which is a continuation of Ser. No. 438,389, Nov. 1, 1982, abandoned. This application Aug. 1, 1985, Ser. No. 761,662

Int. Cl.[4] A43B *13/38*

U.S. Cl. 36—43 **7 Claims**



1. A footwear insole member comprising a first portion the upper surface of which approximately underlies a substantial portion the area of the longitudinal arch and a second portion the upper surface of which underlies at least about 10% of the medial area of the heel and where the second portion extends through substantially the whole of the medial heel, contiguously beyond from about 0% to about 50% of the lateral area of the heel, said first and second portions being contiguous with each other and being contiguous with and less compressible than the remaining portions of said member, the edges of said first and second portions adjacent to said remaining portions undercutting said remaining portions at a downwardly sloping angle of up to about 85° from the vertical to form a wedge which, at its heel end terminus, is entirely in the medial portion of the heel.

4,627,178

MOLDED SHOE INNERSOLE

James B. Sullivan, and Richard B. Fox, both of 60 Perseverance Way, Hyannis, Mass. 02601

Division of Ser. No. 470,638, Feb. 28, 1983, Pat. No. 4,581,187. This application Sep. 18, 1985, Ser. No. 777,459

Int. Cl.[4] A43B *13/40*

U.S. Cl. 36—44 **9 Claims**

1. A molded shoe innersole for employment in footwear to provide support and cushioning to the foot, which innersole comprises a contoured heel and arch section having a generally flat, lower surface and a heel and arch, contoured top surface, the heel and arch sections contoured to provide a contoured arch section and a heel cup section composed of a molded, resilient, elastomeric, open-cell, polyurethane foam material of low compression set, and a top flexible sheet material having the general shape of a foot, the sheet material directly bonded in the molding process to the upper surface of the heel and arch section, said lower surface of the heel and



arch section extending forward of the arch section and gradually tapering into a thin diagonal line across the width of the sheet material and into the plane of the said bottom surface of the sheet material, the sheet material forming an exposed uniform edge about the top peripheral edge of the heel and arch section.

4,627,179

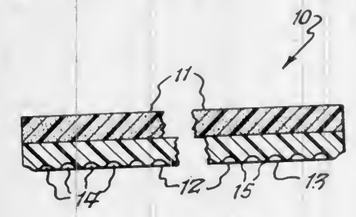
SHOCK ABSORBING INSOLE CONSTRUCTION

Benedict R. McElroy, Greencastle, Pa., assignor to Action Products, Inc., Hagerstown, Md.

Filed Jul. 10, 1985, Ser. No. 753,694

Int. Cl.[4] A43B *13/40*

U.S. Cl. 36—44 **15 Claims**



1. An insole construction comprising an upper layer of plastic material having a storage modulus of between about 500 and 2,000 psi/cycle and a lower layer of viscoelastic polyurethane material having a storage modulus of between about 10 and 85 psi/cycle and a specific gravity of between about 0.95 and 1.10.

4,627,180

EXCAVATING BUCKET

Harold Learnahan, 4206 W. Melrose, Chicago, Ill. 60641

Filed Jan. 16, 1984, Ser. No. 570,778

Int. Cl.[4] B66C *3/02*

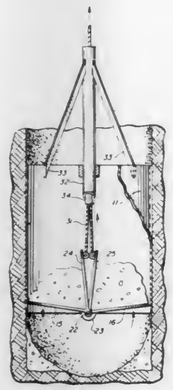
U.S. Cl. 37—184 **8 Claims**

1. An excavating device comprising:

a generally cylindrical casing having both an upper and a lower open end, each generally lying in a plane perpendicular to the axis of the casing, said casing at said lower open end being generally tapered;

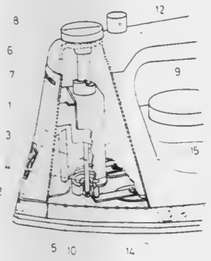
a blade assembly including hinging means rotatably mounted along the diameter of said casing at the lower open end of the casing, said assembly including a first and a second blade, each of said blades having a cutting part and a bulkhead part and a first and second surface means to simultaneously rotate said blades in opposite directions about said hinging means from a lower position in which said blade assembly extends downwardly generally perpendicular to the plane of said lower open end with said second surfaces juxtaposed and the bottom of said casing is open, to and from an upper position in which said blade assembly forms a substantially flat plane substantially

closing the bottom of said casing and the first surface of each blade faces inward from the lower end of said casing,



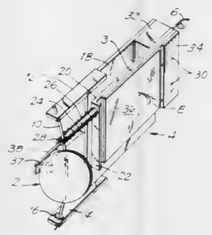
and the second surface of each blade faces outward from the lower end of said casing.

4,627,181
FLOW REGULATING VALVE FOR STEAM IRON STEAM CHAMBER
Tomas Bastida, Eibar, Spain, assignor to Ofcina de Investigacion Agrupada, S.A., Eibar, Spain
Filed Nov. 26, 1984, Ser. No. 674,575
Int. Cl.[4] D06F *75/18*
U.S. Cl. 38—77.7 **7 Claims**



1. A valve for controlling the flow of water from a water reservoir to a steam generating chamber, comprising:
a closing shaft having a lower end for seating in a hole in said steam generating chamber;
a shaft carrying member affixed to the upper end of said closing shaft.
a projection extending radially from said shaft carrying member;
an external control affixed to said shaft carrying member for rotating said shaft carrying member and projection;
a displaceable bridge-shaped member positioned outside said water reservoir and spaced apart from said shaft carrying member, said bridge-shaped member having two legs, and said shaft extending through said bridge-shaped member and between said legs;
a contour cam adjacent said bridge-shaped member and through which said shaft and shaft carrying member pass, said contour cam having a first slanted surface along its circumference upon which said projection may rest;
a spring fixed to said external control and said shaft for urging said shaft into said hole; and
two bimetallic elements sensitive to predetermined temperature changes, each of said elements being located on said steam generating chamber, symmetrically positioned with respect to said closing shaft, and below a leg of said bridge-shaped member such that when the bimetallic members reach a predetermined temperature, they exert upward pressure against the legs of said bridge-shaped member and raise said bridge-shaped member toward said shaft carrying member thereby permitting a flow of water from said reservoir to said steam generating chamber.

4,627,182
BI-STABLE DISPLAY DEVICE
Gerhart Weiss, Flushing, N.Y., assignor to Tempo Instrument Incorporated, Commack, N.Y.
Filed Jun. 3, 1985, Ser. No. 740,923
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—447 **47 Claims**



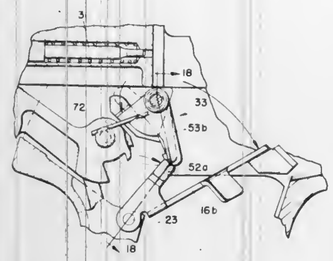
1. A display device comprising:
display means having at least two surfaces of different visual appearance;
piezoelectric crystal drive means having at least one end fixed relative to the display means, the crystal drive means having a region which can be displaced in response to an applied voltage; and
coupling means for converting displacement of the drive means in the rotation of the display means so as to position one of the surfaces for viewing.

4,627,183
FIREARM WITH AIMING LIGHT
Lowell R. Stuckman, 1315 Cuatro Cerros Tr. SE., Albuquerque, N. Mex. 87123
Filed Apr. 11, 1985, Ser. No. 721,946
Int. Cl.[4] F41G *1/34*
U.S. Cl. 42—1.01 **13 Claims**



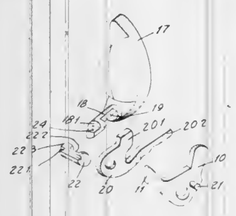
1. A firearm including in combination a barrel having a discharge end, an aiming light assembly secured with said barrel to project a visible light beam along said barrel beyond said discharge end of said barrel in intersecting relationship with said barrel to impinge on and produce a lighted area on a target circumscribing an impact area of a shot pattern from said firearm on said target and to produce an aiming shadow from said discharge end of said barrel substantially triangular in shape and having an apex pointing at said shot pattern, and means for turning said light assembly "on" and "off".

4,627,184
EJECTOR MANUALLY OPERABLE TO ROTATE FIRING PIN BLOCK FOR SLIDE REMOVAL AND DISASSEMBLY
William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.
Filed Oct. 16, 1984, Ser. No. 661,522
Int. Cl.[4] F41C *15/06*
U.S. Cl. 42—25 **7 Claims**



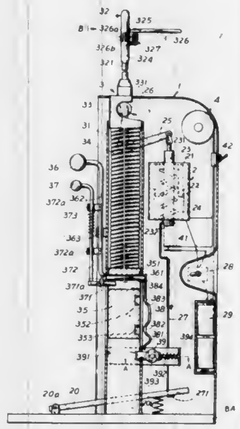
2. In a semi-automatic firearm having a frame, a reciprocating slide, a magazine, a cartridge, a cartridge ejector port, a firing pin mounted for reciprocal movement in the slide as urged toward the cartridge by its momentum as the slide reciprocates and away from the cartridge as urged by a spring, a rotatable firing pin blocking piece mounted on the frame, the improvement comprising
(a) an elongated cartridge ejector means including a base portion pivotally mounted on the frame and a stem portion extendable into the cartridge ejection port for ready engagement by the hand of the firearm operator through the cartridge ejection port;
(b) positioning means on the frame and on the ejector base portion for holding the ejector means in two (2) distinct positions; a first position in which the stem portion is positioned in the cartridge ejection port for ejecting cartridges during operation of the firearm and a second position; and
(c) extension means on the ejector means for engagement with the firing pin blocking piece to cause the blocking piece to rotate to unblock the firing pin when the ejector means is moved to such second position.

4,627,185
SAFETY HAMMER LOCK FOR A HAND WEAPON
Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany
Filed Jan. 18, 1985, Ser. No. 692,907
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402007
Int. Cl.[4] F41C *17/04*
U.S. Cl. 42—66 **16 Claims**



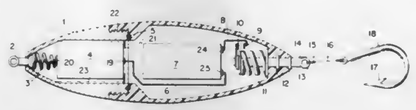
9. In a revolver having a revolver frame formed with a grip and a barrel, a trigger swingable about an axis perpendicular to an axis of the barrel, a cock swingable about an axis parallel to the trigger axis, a cylinder having a plurality of cartridge chambers rotatable on said frame about an axis parallel to said barrel, and a cylinder cover flap swingable adjacent an end of said cylinder turned away from said barrel between a closed position wherein said chambers are inaccessible and an open position wherein at least one of said chambers is accessible for loading, the improvement which comprises a safety mechanism, said safety mechanism comprising:
a locking member shiftable transversely to said cock and confronting a flank thereof forming a stop for said member, said flank being formed with a recess receiving said member for immobilizing said cocks; and
a shaft connected to said flap and rotatable in said frame with said flap, said shaft being operatively connected to said member whereby said flap is prevented from pivoting into said open position unless said recess registers with said member and swinging of said flap into said open position immobilizes said cock, said locking member being formed with a groove defined between two surfaces and said shaft has an axially extending finger projecting into said groove and engageable with said surfaces to shift said member.

4,627,186
AUTOMATIC FISHING MACHINE
Jeng-Maw Wang, P.O. Box 10160, Taipei, Taiwan
Filed Nov. 12, 1985, Ser. No. 797,414
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—16 **7 Claims**



1. An automatic fishing machine comprising:
a casing (1) mounted on a base BA:
an actuating means (2) formed in said casing (1) and including an electromagnet switch (21), electrically connected with a normal-open microswitch (28) and a power source (29);
a rod-biasing means (3) formed in the rear side of said casing (1) and including a rod clamp (32) for clamping the grip of the fishing rod (F) and operated by said actuating means (2) to raise said fishing rod when bitten by a fish;
an alarm (4) including a manual switch (42) and a contactor switch (41) electrically closed by said electromagnet switch (21), and electrically connected with said micro switch (28) and said power source (29);
and a fulcrum means (5) formed on the front portion of said casing (1) for supporting said fishing rod (F) and serving as a fulcrum for said rod (F), wherein said micro switch (28) of said actuating means (2) wound by the fishing wire (W) between the reel (R) and the bait (BT) will be triggered to actuate the electromagnet switch (21) to operate said rod-biasing means (3) to automatically raise the fishing rod (F) for hooking up the biting fish, and to sound the alarm (4) to remind the fisherman to hold the fishing rod to pick up the hooked fish.

4,627,187
FISH STUNNING ASSEMBLY
Theodore M. Williams, 1360 Keneki Pl., Hilo, Hi. 96720
Filed Jun. 10, 1985, Ser. No. 742,959
Int. Cl.[4] A01K *79/02, 85/00*
U.S. Cl. 43—17.1 **2 Claims**



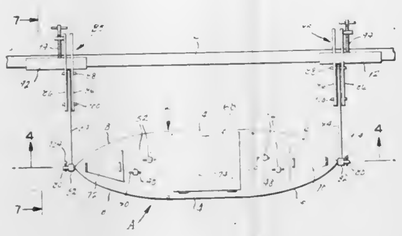
1. A high voltage underwater fish stunning assembly, comprising an elongated cylinder tapered at the ends and connected to a fishing line at one end, an insulated leader wire and partially insulated hook extending from the other end of the assembly, an electric high voltage booster inside the cylinder, a dry cell storage battery arranged to supply electricity to said electrical high voltage booster, a movable shaft with a connecting eye at one end secured to said leader wire, a pair of contact points, one of said contact points being movable and supported by the other end of said shaft, the other contact point of said pair being connected to said high voltage booster, a spring on said shaft biasing the movable contact to an open position against the pull of the leader wire, whereby closure of the contact points closes a circuit that allows a surge of the stored high voltage electricity to surge thru the shaft leader wire and hook rendering the fish unconscious.

4,627,188
FISHING ROD ASSEMBLY
Regino V. Razote, 6747 Birch Trace, Pineville, La. 71360
Filed Nov. 12, 1985, Ser. No. 797,124
Int. Cl.[4] A01K *89/017*
U.S. Cl. 43—21 **11 Claims**



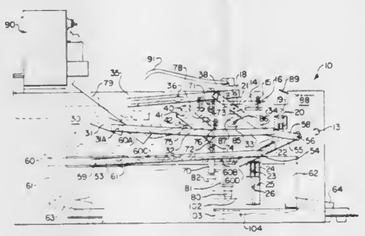
1. A fishing rod assembly comprising:
(a) reel mount means having a rod mount base at one end and a handle base at the opposite end;
(b) hollow, flexible, elongated rod means carried by said rod mount base of said reel mount means;
(c) a handle carried by said handle base of said reel mount means, and switch means cooperating with said handle;
(d) an electric motor in electrical cooperation with said switch means and spool means in driven relationship with said electric motor, with said electric motor and said spool means removably carried by said reel mount means for extending and retrieving a fishing line wound on said spool means and projecting through said rod means when said electric motor and said switch means are connected to a source of electric current; and
(e) a housing enclosing said electric motor and said spool means, with front and rear end caps closing said housing, respectively, and a front aperture in said front end cap to provide access for the fishing line, and a rear aperture in said rear end cap to provide access for electric wiring to energize said electric motor.

4,627,189
PORTABLE LIVE WELL
Harold G. Pippin, and Hilma M. Pippin, both of R.R. 1, Box 97A, Brighton, Mo. 65617
Filed Jun. 24, 1985, Ser. No. 747,804
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **22 Claims**



1. A live well apparatus comprising: a hull adapted for placement in a body of water and having spaced apart upright ends and at least one interior compartment for holding water and fish within the water, the hull having at least one port for providing communication between the compartment and the exterior of the hull and being located such that when the hull is in an upright orientation in the body of water, water may enter the compartment through the port; a valve located at the port for closing the port; bracket means configured and adapted to be attached firmly to the gunwale of a small boat; swing arms pivotally connected to the hull at the ends of the hull and to the bracket means to enable the hull to be moved in the upright orientation between an outside position, wherein it is located outside of the boat to the side of the gunwale, and a stored position, wherein it is located generally within the boat, the swing arms rotating and passing through an upright position as the hull moves between its outside and stored positions.

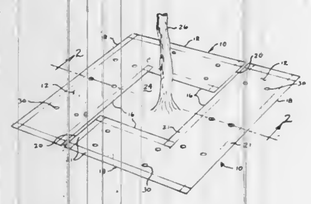
4,627,190
APPARATUS FOR PLANTING SEED IN SEED GERMINATING TRAY
James K. Little, Rte. 6, Box 488, Concord, N.C. 28025
Filed Jul. 19, 1984, Ser. No. 632,324
Int. Cl.[4] A01C *00/00;* **A01G** *00/00;* **B23Q** *7/04;* **B65G** *59/00*
U.S. Cl. 47—1 A **4 Claims**



1. An apparatus for planting seed row-by-row in a compartmented seed germinating tray, comprising:
(a) a seed hopper;
(b) a plurality of vertically disposed seed holding vacuum nozzles, each having a tip adapted to receive and hold a seed by means of vacuum applied through the nozzle and mounted for translation reciprocating motion between a vertical seed receiving position in said seed hopper and a laterally spaced-apart vertical seed discharge position wherein a seed is released from each of the nozzles and conveyed through an aperture in a seed delivery bar to the tray for discharge into respective compartments;

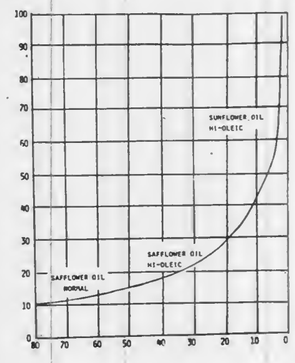
(c) a plurality of soil punchers for forming a seed-receiving depression in the soil of each of a plurality of compartment in a row of the tray in advance of receiving a seed therein, said seed delivery bar including means for positioning the exit point of the seeds to permit an accurate discharge of seed in closely spaced-apart relation into a tray having a relatively shallow depth and in a tray having a relatively greater depth, and wherein said plurality of soil punchers includes readily removeable extension soil punches for being connected to and extending downwardly from the plurality of soil punchers for forming a seed-receiving depression in the bottom of a tray having a relatively shallow depth with said extension soil punchers thereon and in trays having a relatively greater depth with said extension soil punchers removed;
(d) tray moving means for moving the tray forward to align an empty row of compartments in seed-receiving relation after each reciprocation of said seed holding vacuum nozzles and for moving a seeded tray out of seeding position and moving another tray into seeding position, said tray moving means including;
(i) said apparatus defining a void through said apparatus from an unseeded tray entrance to a seeded tray exit;
(ii) a tray entry trigger mounted adjacent the tray entrance on one end of a tray carrier arm;
(iii) a tray exit trigger mounted adjacent the tray exit on the other end of said tray carrier arm;
(iv) said tray carrier arm mounted for translational, reciprocating forward and rearward movement, the forward movement of said tray carrier arm causing said tray entry trigger and said tray exit trigger to move forward and thereby move the tray forward by engagement with either one or both of the tray entry trigger or tray exit trigger, depending on the location of the tray within said apparatus and during the rearward movement of said tray carrier arm, said tray entry trigger and said tray exit trigger moving rearwardly to one or the other or both engage a next row of tray compartments depending on the location of the tray or trays within said apparatus; and
(e) a drive means and a linkage means mechanically communicating said tray moving means, said vacuum nozzles, said seed delivery bar, and said soil punches for operating the apparatus in a sequenced and coordinated manner.

4,627,191
ARTICLE FOR TREATING SOIL AROUND GROWING PLANTS
Emric W. Bergere, 7250 Frankline Ave., Los Angeles, Calif. 90046
Filed Aug. 5, 1985, Ser. No. 762,523
Int. Cl.[4] A01G *17/00*
U.S. Cl. 47—25 **1 Claim**



1. A package containing soil conditioning agents, the package being adapted to be placed adjacent the stem of a plant and comprising:
a pair of confronting flexible, flat panels of at least initially moisture impermeable material joined along their peripheries by a continuous bond to define a sealed chamber containing the soil conditioning agents, the package being substantially flat and the panels defining surfaces so that in use the package shelters the root system of the plant against over-watering and inhibits weed growth, the confronting panels being adapted to be pierced by the user so as to predetermine the rate of release of the soil conditioning agents from the package, the panels being L-shaped whereby a pair of said packages may be placed in abutting, complimentary relationship to define a central opening for the plant stem, the area of each of the panels comprising four square units of equal area, the units being arranged in a three-by-two pattern facilitating the manufacture of said packages from a continuous web of panel material without waste.

4,627,192
SUNFLOWER PRODUCTS AND METHODS FOR THEIR PRODUCTION
Gerhardt N. Fick, Breckenridge, Minn., assignor to Sigco Research Inc., Breckenridge, Minn.
Filed Nov. 16, 1984, Ser. No. 672,359
Int. Cl.[4] A01H *1/02*
U.S. Cl. 47—58 **62 Claims**

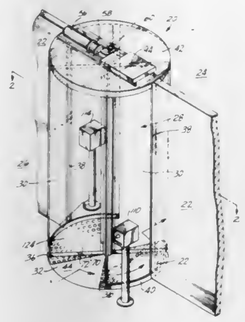


1. A sunflower seed having an oleic acid content of approximately 80% or greater, relative to the total fatty acid content of said seed, and a ratio of the amount of linoleic acid in said seed to the amount of oleic acid in said seed of less than about 0.09.

4,627,193
REVOLVING DOOR CONTROL SYSTEM
Milan Schwarz, 1370 Canyon View Dr., LaVerne, Calif. 91750
Continuation-in-part of Ser. No. 533,983, Sep. 20, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,557
Int. Cl.[4] E05D *15/02*
U.S. Cl. 49—42 **45 Claims**

1. A control for a security door of the type having a housing with an entrance and an exit, a member rotatably disposed in the housing and having a plurality of wings which, in cooperation with the housing, define at least one compartment movable between the entrance and exit in response to rotation of the member, the control comprising:
means for enabling the member for rotation to move a selected compartment from the entrance to the exit in response to identification of an authorized person;
means for generating pulses as the selected compartment moves between the entrance and exit, each pulse representing an increment of movement for the selected compartment;
means for determining the position of the selected compartment from the pulses;
means for sensing persons or objects in said selected compartment at at least one region between the entrance and exit, the sensing means generating a signal indicative of such persons or objects; and

means for comparing the position of the selected compartment with the signal to indicate the passage of an authorized individual through the region, the comparing means issuing a command to prevent further rotation of the



member and motion of the selected compartment when the position of the selected compartment and the signal indicates the presence of a second, unauthorized person or object in said region.

4,627,194

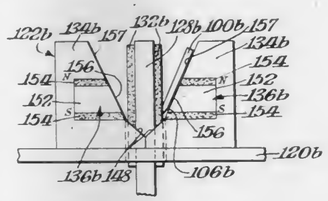
METHOD AND APPARATUS FOR KNIFE AND BLADE SHARPENING

Daniel D. Friel, Box 4319, Greenville, Del. 19807

Filed Mar. 12, 1984, Ser. No. 588,794

Int. Cl.⁴ B24B *9/00*

U.S. Cl. 51—58 **17 Claims**



1. A knife sharpening apparatus for sharpening a knife having a face terminating at a cutting edge facet comprising an abrasive surface, drive means operatively connected to said abrasive surface for imparting a motion to said abrasive surface, magnetic knife guide means having a magnetic guide surface in a plane disposed at a predetermined angle to and intersects said abrasive surface to form a line of intersection therewith, said magnetic knife guide surface having two opposite polarity magnetic poles comprising a north pole and a south pole, oriented such that each pole lies along a line which is substantially parallel to said line of intersection one of said north and said south poles being disposed along a portion of said magnetic guide surface which is remote from said abrasive surface and the other of said north and said south poles being disposed along a portion of said magnetic guide surface which is contiguous to said abrasive surface to create a magnetic field at said abrasive surface, said magnetic field being of a strength to provide a thrust to move the cutting edge facet into contact with said abrasive surface and a force to hold the cutting edge facet in contact with said abrasive surface while said abrasive surface is in motion.

4,627,195

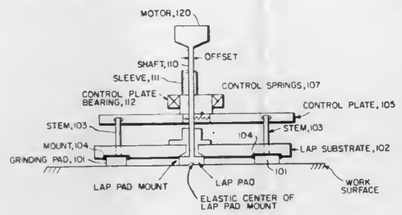
COMPUTER CONTROLLER OPTICAL SURFACING (CCOS) LAP PRESSURE CONTROL SYSTEM

Allen H. Greenleaf, Pownal, Me., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 18, 1985, Ser. No. 777,141

Int. Cl.⁴ B24B *7/00*

U.S. Cl. 51—119 **3 Claims**



1. A rotary lapping system capable of generating a controlled pressure gradient including positive and negative lift when lapping a workpiece which is coated with an abrasive slurry liquid, said rotary lapping system comprising:

a rotating means;

a shaft connected to and being rotated by said rotating means;

a lap substrate connected to and rotated by said shaft;

a plurality of adjustable grinding pads mounted beneath and being rotated by said lap substrate, and adjustable grinding pads generating positive lift when rotated in said abrasive slurry liquid with a positive angle of attack, said adjustable grinding paths generating a negative lift when rotated in said abrasive slurry liquid with a negative angle of attack, and wherein each of said plurality of grinding pads comprises a grinding pad mounted beneath said lap substrate, said grinding pad having a grinding surface on its bottom which is presented to the workpiece, and an upwardly extending stem on its top which passes through the lap substrate to the adjusting means, said stem tilting the grinding pad at positive and negative angles of attack when tilted by said adjusting means;

a means for mounting each of said plurality of adjustable grinding pads to said lap substrate;

a control plate fixed on the shaft above the lap substrate and rotating with the lap substrate, said control plate having a plurality of notches into which each stem from said plurality of adjustable grinding pads is inserted; and

a plurality of adjustable control springs, each mounted in one of the notches of the control plate and holding the stem of an adjustable grinding pad in an adjustable position to tilt the adjustable grinding pad into the variable angles of attack including: positive angles of attack, a neutral angle of attack, and negative angles of attack.

4,627,196

PRESSURE-COMPENSATED HYDRAULIC POSITIONING SYSTEM

John P. Veale, Snohomish County, Wash., assignor to Western Gear Machinery Co., Everett, Wash.

Division of Ser. No. 455,212, Jan. 3, 1983, Pat. No. 4,490,944. This application Sep. 7, 1984, Ser. No. 648,365

Int. Cl.⁴ B24B *1/00*

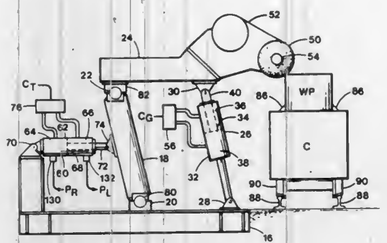
U.S. Cl. 51—281 R **4 Claims**

1. A method of controlling the transverse position of a grinding wheel across a workpiece surface in accordance with a postion command, said grinding wheel being transversely moved by a hydraulic actuator having a cylinder divided into two chambers by a piston that moves responsive to differential pressure thereacross to control the transverse position of said grinding wheel, the flow of fluid into and out of said hydraulic actuator being controlled by an electrically controlled valve in

accordance with a control signal applied to its control input, said method comprising:

determining the transverse position of said grinding wheel;

comparing the transverse position of said grinding wheel to said position command to generate a position error;



determining the differential fluid pressure across the piston of said hydraulic actuator; and

generating said control signal as the difference between said position error and a value derived from the differential fluid pressure across said piston.

4,627,197

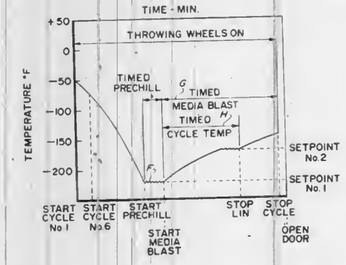
PROCESS CONTROL FOR CRYOGENIC DECOATING

David J. Klee, Emmaus; Thomas W. Burke, Allentown, both of Pa., and Scott A. Miller, Lexington, Mass., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 8, 1983, Ser. No. 559,522

Int. Cl.⁴ B24C *1/00*

U.S. Cl. 51—319 **14 Claims**



1. In a process for removal of bonded coatings from articles by chilling the articles in a closed treating chamber to effect embrittlement of the coatings thereon and subjecting the chilled articles in said chamber to high velocity impact by blasting media centrifugally hurled thereon by a rotating bladed impeller, the improvement which comprises the cycle sequence:

(a) initiating the process cycle by subjecting the coated articles to a cooldown stage in an initial environment of cryogenic fluid until a preset lowest temperature level is attained within said initial environment;

(b) continuing exposure of said articles at said first preset temperature level for a fixed present time period to assure pre-chilling of said articles to below embrittlement temperature of the coatings thereon;

(c) at the expiration of said pre-chilling time period, initiating impact of the articles with the blasting media;

(d) while continuing said impact, subjecting said articles to a controlled warming temperature environment until the warming environment reaches a second preset temperature level and when the second preset temperature level is attained continuing said impact at substantially said second preset temperature level for the remainder of a fixed time period measured from the time of initiation of impact with the blasting media;

(e) at the expiration of the remainder of said last-mentioned fixed time period, discontinuing continuous injection of cryogenic fluid into said cryogenic environment while maintaining exposure of said articles to temperatures proximate that of said second preset temperature while continuing impact with blasting media to the end of said treating cycle;

(f) and thereafter discharging the thus treated decoated articles from the treating chamber.

4,627,198

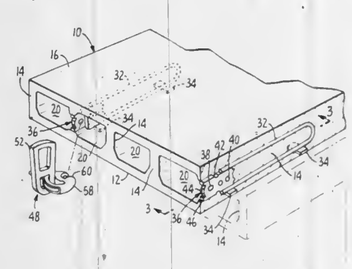
HOISTING ANCHOR ASSEMBLY FOR USE IN CAST CONCRETE PANELS AND METHOD

Sidney E. Francies, III, San Mateo, Calif., assignor to The Burke Company, San Mateo, Calif.

Filed Sep. 17, 1984, Ser. No. 651,282

Int. Cl.⁴ E04B *21/2*

U.S. Cl. 52—125.5 **11 Claims**



1. An anchor assembly to be embedded in a cast panel member, said anchor assembly comprising:

anchor head means for receiving a hoisting unit;

anchoring means for anchoring said anchor head means in the panel member, said anchoring means including an arcuate elongated member having an outside bottom surface and first and second ends rigidly secured to said anchor head means; and

support means for supporting said elongated member in a first plane, said support means including at least one plate fixed to the outside bottom surface of said elongated member and extending generally transverse to said first plane.

4,627,199

TACKABLE ACOUSTICAL STRUCTURE

Raymond W. Capaul, Rte. #3, Wildwood Dr., Box 643, Aurora, Ill. 60504

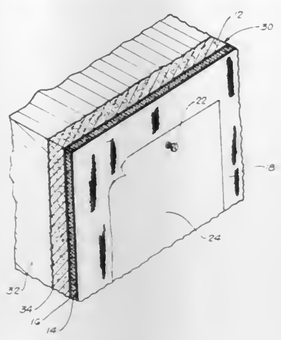
Filed Sep. 24, 1984, Ser. No. 653,364

Int. Cl.⁴ B32B *17/06*; **E04B** *1/82, 1/84*; **E04C** *2/26*

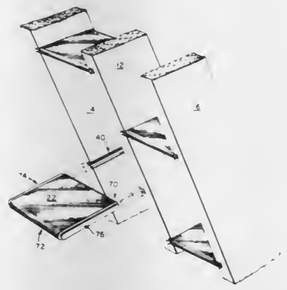
U.S. Cl. 52—145 **5 Claims**

1. A tackable acoustical structure, consisting essentially of: a layer of tack pin retaining material formed of compressed wood fiber; a layer of a sound absorption material formed of compressed glass fibers or rock wool; and a continuous, thin film of a tack pin penetrable metal foil between and abutting both the tack pin retaining layer and the sound absorption layer, wherein a substantially fire-resistant decorative facing is provided on the exposed surface of the sound absorption layer, the sound absorption layer and the film of metal foil being characterized in that their combined thickness is such that the

pin of a tack can pass therethrough and enter the tack pin retaining layer thereby enabling a tack to be firmly, yet releasably, secured on the structure, the tackable acoustical structure having a flame spread index below about 25.

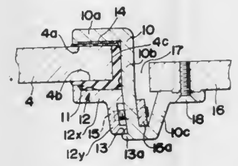


4,627,200
RECESSED MORTISE STAIR
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Filed Mar. 5, 1984, Ser. No. 586,099
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—191 **14 Claims**



1. A stair comprising:
a central stringer having first and second sides, a front edge and a rear edge and adapted for mounting between an upper level and a lower level at a specified angle of inclination, said central stringer having a plurality of substantially horizontal recessed dovetail mortises disposed in alternating arrangement on respective sides of the stringer and extending substantially from said front edge to said rear edge;
side stringer disposed on respective first and second sides of the central stringer, each side stringer having a central stringer facing side, a front edge and a rear edge, and at least one substantially horizontal recessed dovetail mortise in the central stringer facing side extending substantially from the respective side stringer front edge to the rear edge in corresponding opposed relation to the central stringer recessed mortises; and
a plurality of tread members, at least one of said tread members having opposing ends of a defined length with dovetail tenons extending therefrom along substantially the entire length of the respective ends, the tread member ends being slidably disposed in the respective central and side stringer recessed mortises to interlock the respective central and side stringers in fixed spatial relation and maintain the tread members in alternating arrangement on respective sides of the central stringer;
wherein each of the central and side stringer recessed dovetail mortises includes a substantially rectangular recess defining upper and lower shoulders, and each dovetail mortise is centrally disposed with respect to the recess.

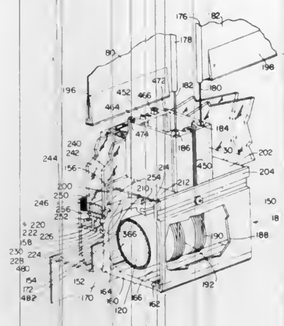
4,627,201
WINDOW STAY
Atsushi Hamamoto, Hyogo, and Yoshio Kawaoto, Gifu, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Alna Koki Co., Ltd., both of Hyogo, Japan
Filed Jul. 25, 1984, Ser. No. 634,363
Claims priority, application Japan, Jul. 27, 1983, 58-138584
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 **4 Claims**



1. A window stay which comprises:
a frame member having an abutment flange for contact with the peripheral edge portion of a panel member;
a panel retaining member adapted to be secured firmly to the frame member in a manner with the peripheral edge portion of the panel member sandwiched tightly between it and the abutment flange;
an elastic cushioning member encircling the peripheral edge portion of the panel member and sandwiched between the panel retaining member and the abutment flange together with the peripheral edge portion of the panel member, said elastic cushioning member so positioned as to be inwardly compressed to provide fluid tightness in addition to the cushioning effect derived from its own resilience, said elastic cushioning member comprising an elastic cushioning strip made of resilient material and an elastic adhesive strip, said adhesive strip being applied to the abutment flange prior to a glass plate being mounted in the frame member; and
a rim projection provided on the frame member for avoiding any possible displacement of the panel retaining member relative to the frame member by the action of a reactive force exerted by the compressed elastic cushioning member, a circumferential surface of said panel retaining member being slightly greater than that of the rim projection.

4,627,202
STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR CONTROLLING AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLING SHADING
Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.
Division of Ser. No. 455,475, Jan. 4, 1983, Pat. No. 4,596,093.
This application Mar. 5, 1985, Ser. No. 708,500
Int. Cl.[4] E06B *7/14*
U.S. Cl. 52—209 **16 Claims**

1. A solar greenhouse construction comprising glazing, support means to support said glazing in a combination to define an at least partly enclosed space, said glazing being permeable to solar radiation to allow said radiation to pass into said space, and shade means in said space and adapted for being positioned adjacent at least part of said glazing to intercept at least part of the radiation passing through said glazing, said support means being provided with at least one track channel in which the shade means in engaged and by which the shade means is guided along said glazing, said solar greenhouse construction further comprising a horizontal base sill including a sloped upper wall and a vertical wall extending along and upwardly from the sloped wall to define a moisture drain therewith, said support means including vertical bars supporting said glazing and including angled lower extremities accommodated in the drain formed by said sloped upper wall and vertical wall, said lower extremities and drain having matching profiles.

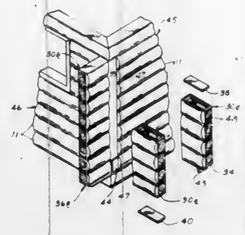


4,627,203
POST-TENSIONED FLOOR WITH IN-FLOOR DISTRIBUTION SYSTEM
Hoshang H. Presswalla, Wheaton, Ill., and Yale R. Shea, Hales Corners, Wis., assignors to INRYCO, Inc., Milwaukee, Wis.
Filed Jun. 24, 1985, Ser. No. 747,953
Int. Cl.[4] E04B *5/48*; E04C *2/52*
U.S. Cl. 52—221 **9 Claims**



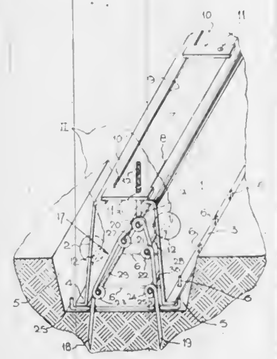
1. A floor structure comprising a poured-in-place slab of concrete, a plurality of cellular raceways extending generally parallel to each other and embedded in said concrete, a trench extending across the upper surfaces of said raceways and having points of intersection with said raceways, the upper side of said trench being substantially level with the upper surface of said concrete and the underside of said trench being embedded in said concrete and engaging the upper sides of said raceways, a plurality of preset service outlets embedded in said concrete and extending from said raceways to substantially the upper surface of said concrete, and a plurality of post-tensioned tendons embedded in said concrete and extending underneath said trench, and said trench extending substantially along a line of substantially zero bending moment of said concrete slab.

4,627,204
SIMULATED LOG END UNIT FOR BUILDINGS
Leedice S. Smith, Rte. 1, Box 155-A, Spokane, Wash. 99009
Filed Apr. 8, 1985, Ser. No. 720,998
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 **18 Claims**



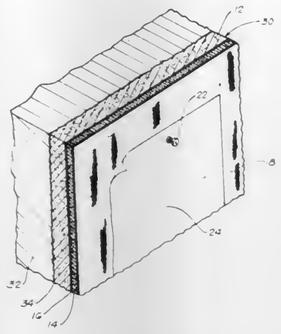
1. A simulated log end unit for buildings usage, comprising;
a back panel adapted to be rigidly attached to an upright building frame member, said back panel having oppositely facing side edges;
a pair of side panels constructed from preformed log siding and including opposed front and back edges, wherein the front edges of the side panels are mitered toward their respective back edges, the back edges of the side panels being rigidly attached to the side edges of the back panel at right angles thereto;
a planar front panel rigidly attached between and flush with the mitered front edges of the side panels;
and one or more sets of concentric rings visually presented on the exterior of said front panel, said rings simulating the end grain of wood logs.

4,627,205
BUILDING FOUNDATIONS INVENTION
William G. Hitchins, "Fiddawn", New Cascade Road, Norfolk Island 2899
Filed Jul. 23, 1985, Ser. No. 758,082
Claims priority, application Australia, Jul. 23, 1984, PG6164
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—294 **4 Claims**

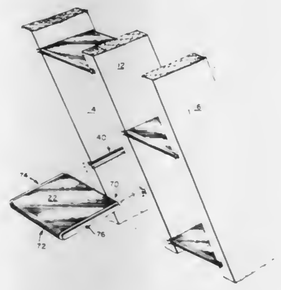


1. In combination, a form for in-situ casting of concrete foundations, and a plurality of associated sacrificial adjuncts; comprising a pair of elongated side members disposable parallel to each other with their ends generally in register, said side members being so disposable as to extend upwardly and inwardly with respect to each other; horizontal flanges extending outwardly from bases of said side members and having therein a plurality of apertures through which bent-up ends of a corresponding plurality of width-control rods are receivable;

pin of a tack can pass therethrough and enter the tack pin retaining layer thereby enabling a tack to be firmly, yet releasably, secured on the structure, the tackable acoustical structure having a flame spread index below about 25.

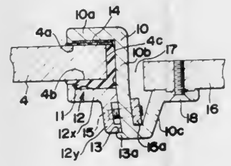


4,627,200
RECESSED MORTISE STAIR
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Filed Mar. 5, 1984, Ser. No. 586,099
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—191 **14 Claims**



1. A stair comprising:
a central stringer having first and second sides, a front edge and a rear edge and adapted for mounting between an upper level and a lower level at a specified angle of inclination, said central stringer having a plurality of substantially horizontal recessed dovetail mortises disposed in alternating arrangement on respective sides of the stringer and extending substantially from said front edge to said rear edge;
side stringer disposed on respective first and second sides of the central stringer, each side stringer having a central stringer facing side, a front edge and a rear edge, and at least one substantially horizontal recessed dovetail mortise in the central stringer facing side extending substantially from the respective side stringer front edge to the rear edge in corresponding opposed relation to the central stringer recessed mortises; and
a plurality of tread members, at least one of said tread members having opposing ends of a defined length with dovetail tenons extending therefrom along substantially the entire length of the respective ends, the tread member ends being slidably disposed in the respective central and side stringer recessed mortises to interlock the respective central and side stringers in fixed spatial relation and maintain the tread members in alternating arrangement on respective sides of the central stringer;
wherein each of the central and side stringer recessed dovetail mortises includes a substantially rectangular recess defining upper and lower shoulders, and each dovetail mortise is centrally disposed with respect to the recess.

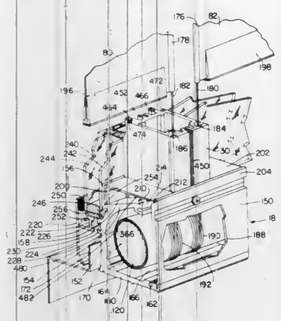
4,627,201
WINDOW STAY
Atsushi Hamamoto, Hyogo, and Yoshio Kawaoto, Gifu, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Alna Koki Co., Ltd., both of Hyogo, Japan
Filed Jul. 25, 1984, Ser. No. 634,363
Claims priority, application Japan, Jul. 27, 1983, 58-138584
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 **4 Claims**



1. A window stay which comprises:
a frame member having an abutment flange for contact with the peripheral edge portion of a panel member;
a panel retaining member adapted to be secured firmly to the frame member in a manner with the peripheral edge portion of the panel member sandwiched tightly between it and the abutment flange;
an elastic cushioning member encircling the peripheral edge portion of the panel member and sandwiched between the panel retaining member and the abutment flange together with the peripheral edge portion of the panel member, said elastic cushioning member so positioned as to be inwardly compressed to provide fluid tightness in addition to the cushioning effect derived from its own resilience, said elastic cushioning member comprising an elastic cushioning strip made of resilient material and an elastic adhesive strip, said adhesive strip being applied to the abutment flange prior to a glass plate being mounted in the frame member; and
a rim projection provided on the frame member for avoiding any possible displacement of the panel retaining member relative to the frame member by the action of a reactive force exerted by the compressed elastic cushioning member, a circumferential surface of said panel retaining member being slightly greater than that of the rim projection.

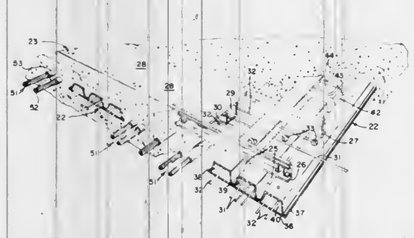
4,627,202
STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR CONTROLLING AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLING SHADING
Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.
Division of Ser. No. 455,475, Jan. 4, 1983, Pat. No. 4,596,093.
This application Mar. 5, 1985, Ser. No. 708,500
Int. Cl.[4] E06B *7/14*
U.S. Cl. 52—209 **16 Claims**

1. A solar greenhouse construction comprising glazing, support means to support said glazing in a combination to define an at least partly enclosed space, said glazing being permeable to solar radiation to allow said radiation to pass into said space, and shade means in said space and adapted for being positioned adjacent at least part of said glazing to intercept at least part of the radiation passing through said glazing, said support means being provided with at least one track channel in which the shade means in engaged and by which the shade means is guided along said glazing, said solar greenhouse construction further comprising a horizontal base sill including a sloped upper wall and a vertical wall extending along and upwardly from the sloped wall to define a moisture drain



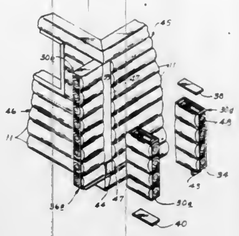
therewith, said support means including vertical bars supporting said glazing and including angled lower extremities accommodated in the drain formed by said sloped upper wall and vertical wall, said lower extremities and drain having matching profiles.

4,627,203
POST-TENSIONED FLOOR WITH IN-FLOOR DISTRIBUTION SYSTEM
Hoshang H. Presswalla, Wheaton, Ill., and Yale R. Shea, Hales Corners, Wis., assignors to INRYCO, Inc., Milwaukee, Wis.
Filed Jun. 24, 1985, Ser. No. 747,953
Int. Cl.[4] E04B *5/48*; E04C *2/52*
U.S. Cl. 52—221 **9 Claims**



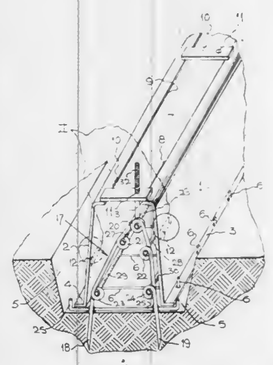
1. A floor structure comprising a poured-in-place slab of concrete, a plurality of cellular raceways extending generally parallel to each other and embedded in said concrete, a trench extending across the upper surfaces of said raceways and having points of intersection with said raceways, the upper side of said trench being substantially level with the upper surface of said concrete and the underside of said trench being embedded in said concrete and engaging the upper sides of said raceways, a plurality of preset service outlets embedded in said concrete and extending from said raceways to substantially the upper surface of said concrete, and a plurality of post-tensioned tendons embedded in said concrete and extending underneath said trench, and said trench extending substantially along a line of substantially zero bending moment of said concrete slab.

4,627,204
SIMULATED LOG END UNIT FOR BUILDINGS
Leedice S. Smith, Rte. 1, Box 155-A, Spokane, Wash. 99009
Filed Apr. 8, 1985, Ser. No. 720,998
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 **18 Claims**



1. A simulated log end unit for buildings usage, comprising;
a back panel adapted to be rigidly attached to an upright building frame member, said back panel having oppositely facing side edges;
a pair of side panels constructed from preformed log siding and including opposed front and back edges, wherein the front edges of the side panels are mitered toward their respective back edges, the back edges of the side panels being rigidly attached to the side edges of the back panel at right angles thereto;
a planar front panel rigidly attached between and flush with the mitered front edges of the side panels;
and one or more sets of concentric rings visually presented on the exterior of said front panel, said rings simulating the end grain of wood logs.

4,627,205
BUILDING FOUNDATIONS INVENTION
William G. Hitchins, "Fiddawn", New Cascade Road, Norfolk Island 2899
Filed Jul. 23, 1985, Ser. No. 758,082
Claims priority, application Australia, Jul. 23, 1984, PG6164
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—294 **4 Claims**



1. In combination, a form for in-situ casting of concrete foundations, and a plurality of associated sacrificial adjuncts; comprising a pair of elongated side members disposable parallel to each other with their ends generally in register, said side members being so disposable as to extend upwardly and inwardly with respect to each other; horizontal flanges extending outwardly from bases of said side members and having therein a plurality of apertures through which bent-up ends of a corresponding plurality of width-control rods are receivable;

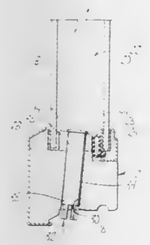
at least two web members connecting upper edges of said side members, each said web member being provided with an aperture therethrough; a plurality of reinforcement-positioning pins, each of inverted V-shape and each having limbs with ends being insertable into the ground; a plurality of reinforcing rods adapted to extend through loops in said reinforcement-positioning pins in parallel array; and a hook-bolt associated with each said web member and having a bight adapted as to fit around a said reinforcing rod and having a shank extendable upwardly through the aperture of the said web member, said shank being externally threaded so as to accept a co-operating nut.

4,627,206

WINDOW SASH BREATHER DEVICE

Timothy B. Cox, Knoxville, Iowa, assignor to Rollscreen Company, Pella, Iowa

Filed Sep. 12, 1985, Ser. No. 775,382
Int. Cl.[4] E06B *7/12*
U.S. Cl. 52—302 **13 Claims**



8. A breather device for use in a vent hole comprising:
an elongated hollow sleeve member adapted to extend into said hole and having opposite interior and exterior ends; and
a plurality of resilient fingers extending axially from said exterior end of said member;
said fingers are provided with tip portions which are closely spaced so as to inhibit entry of foreign matter into said sleeve and being resilient so as to deflect radially outwardly when a cleaning tool is inserted through said device for removing any foreign matter therein.

4,627,207

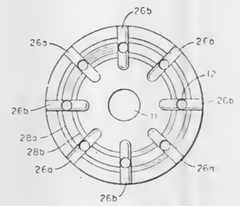
FASTENER FOR SECURING ROOFING MATERIAL TO CEMENTITIOUS ROOF DECKS HAVING REMOVABLE TAB

Kenneth E. Young, Snow Camp, N.C.; Robert T. Frohlich, Bedford; Hubert T. Dudley, Chelmsford, both of Mass., and Robert L. Hallock, Jr., Larchmont, N.Y., assignors to W. R. Grace & Co., Cambridge, Mass. and E.S. Products Co., New Rochelle, N.Y.

Division of Ser. No. 882,709, Mar. 2, 1978. This application Oct. 15, 1981, Ser. No. 311,697
Int. Cl.[4] F16B *15/02, 15/04*
U.S. Cl. 52—361 **7 Claims**

1. A tab for a nail used to attach a base ply of a multi-ply built-up roofing membrane to a soft not fully cured cementitious construction material and over which ply fluid asphalt is to be applied after installation, said nail having a penetrating shank, said tab being generally planar and having broad upper and lower opposed planar surfaces, narrow terminal end surfaces and a means for holding said nail, said tab being wider in cross-wise dimension than said nail shank so that a portion of said tab extends beyond said nail shank, said tab having a plurality of openings therethrough distributed around its portion extending beyond said nail shank which openings extend from said upper planar surface to said lower planar surface, said tab further having at least one circumferential embossment raised from at least one of its said planar surfaces communicating with said openings and acting as an asphalt-conducting channel and at least one additional embossment extending from said opening to a said terminal edge acting as an asphalt-conducting channel between said opening and said edge, whereby fluid asphalt applied over said nail, tab and base ply is permitted to fill said openings and also to flow between said tab and said base ply in order to bond the portion of the base ply beneath said tab and increase the resistance of the roofing membrane to uplifting by wind.

5. The combination of roofing material for waterproofing a roof deck and a nail for securing said roofing material to the deck, comprising said roofing material including at least one base-ply layer of resilient sheet material engaging said deck and a layer of waterproof adhesive covering said resilient sheet material, said adhesive being flowable when it is applied and



substantially non-flowable after it sets, said nail including a tab portion comprised generally of a flat body having upper and lower surfaces and an outer edge, means for penetrating said resilient sheet material and attaching said nail to the deck with a substantial portion of said lower surface engaging said sheet material, said tab portion having as plurality of openings therethrough extending from its said upper surface to its said lower surface, said tab further having at least one circumferential embossment raised from at least one of its said surfaces communicating with said openings and acting an an adhesive-conducting channel and at least one additional embossment extending from a said opening to said outer edge to conduct said fluid adhesive between said opening and said edge, whereby fluid adhesive applied over said nail, tab portion and base ply fills said opening and also said embossments to bond the portion of the said base ply beneath said tab portion and increase the resistance of the roofing membrane to uplifting by wind.

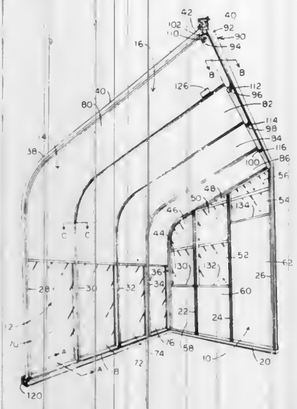
4,627,208

STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE

Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.

Division of Ser. No. 455,475, Jan. 4, 1983. This application Mar. 5, 1985, Ser. No. 708,501
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—483 **2 Claims**

1. A structural arrangement comprising an elongated hollow bar provided with a first longitudinally extending track channel having a relatively narrow longitudinally extending slot-type mouth, said bar being provided with a second track channel and mouth arranged in mirror image relationship to said first channel and the first said mouth and opening in opposite direction to the latter, the channels being substantially circular in cross-section and the mouths defining reentrant angles therewith, the bar being generally quadrilateral in shape and having four corners and including two pairs of parallel sides, said mouths being located in respective of the sides of one pair adjacent two of said corners, the sides of the other pair being provided with screw grooves, one of the sides of said other pair being provided with at least one channel adapted for receiving a sealing member, said structural arrangement further comprising a sealing member in the latter said channel, a glazing member against the sealing member, a muntin against



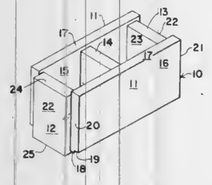
the glazing member, and a fastening means extending through the muntin into the corresponding screw groove.

4,627,209

INTERLOCKING BLOCKS AND CONSTRUCTION SYSTEM COMPRISING SAID BLOCKS

Ervin J. Schwartz, 70071 C.R.3, R.R. 3, Nappanee, Ind. 46550

Filed Apr. 15, 1985, Ser. No. 723,528
Int. Cl.[4] E04C *1/10*
U.S. Cl. 52—589 **5 Claims**



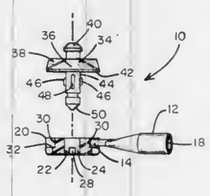
1. A building block of integral monolithic construction comprising:
(a) two identical sidewalls of rectangular perimeter, each having (1) an interior surface, (2) a flat exterior surface, (3) a flat straight upper abutment edge surface which spans the distance between said interior and exterior surfaces, (4) a lower edge disposed below the corresponding upper abutment edge and parallel thereto in spanning relationship between said interior and exterior surfaces and having at least two steps, the first of said steps being a flat straight abutment surface contiguous to said interior surface, the second of said steps extending between said first step and said exterior surface, and positioned closer to said upper abutment edge than said first step, and (5) first and second vertical edge surfaces of flat straight configuration perpendicularly disposed between said interior and exterior surfaces, the corresponding several edge surfaces of the two sidewalls being in coplanar alignment, and
(b) first and second transverse walls located adjacent said first and second vertical edge surfaces, respectively, and disposed between the facing interior surfaces of said sidewalls in perpendicular spanning relationship therewith, each transverse wall being of substantially rectangular perimeter and bounded by a flat exterior abutment surface, an interior surface, and upper and lower edge surfaces perpendicularly disposed between interior and exterior surfaces of the transverse wall, the lower edge surfaces of said transverse walls being disposed below the lower edge surfaces of said sidewalls, the upper edge surfaces of said transverse walls being disposed below the upper edge surfaces of said sidewalls, the positioning of said first transverse wall being such that its exterior abutment surface is located forwardly of said first vertical edge surfaces, and the positioning of said second transverse wall being such that its exterior abutment surface is inwardly displaced from said second vertical edge surfaces in the direction of said first transverse wall, whereby
(c) the lower extremities of the transverse walls of the building block make snug interlocking contact with the interior surfaces of the sidewalls of an underlying building block of the same construction, and
(d) when placed end to end, the first transverse wall of a building block partially enters the interior space between the sidewalls of a horizontally adjacent building block, interlocking therewith and causing the flat exterior abutment surface of the first transverse wall of one building block to contact the flat exterior abutment surface of the second transverse wall of the next horizontally adjacent building block,
(e) said interactive abutment of the building block with identical underlying and horizontally adjacent building blocks causing formation of horizontal and vertical troughs, respectively.

4,627,210

HUB ASSEMBLY FOR COLLAPSIBLE STRUCTURE

Bryan J. Beaulieu, 1205 - 132nd St. West, Burnsville, Minn. 55337

Filed Oct. 28, 1985, Ser. No. 792,130
Int. Cl.[4] A45F *1/16*
U.S. Cl. 52—646 **10 Claims**



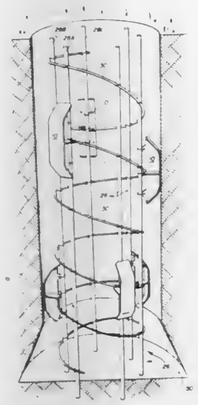
1. A hub assembly for pivotally holding the ends of column-like support rods which make up the skeletal frames of collapsible, self-supporting structures, comprising
(a) a plurality of support rod ends, each support rod end comprising a spherical head joined to a neck having a narrowed portion adjacent the head and an enlarged portion adjacent a rod, said enlarged portion including a receptacle for receiving a rod;
(b) a circular hub body having a circumference arranged with a plurality of radially inward extending retaining sockets, each socket adapted for receiving and pivotally holding a head of one of said support rod ends, said hub body further having a central opening extending axially relative to said circumference;
(c) a circular locking disk having top and bottom faces, the bottom face having a centrally located bayonet adapted for reception into the central opening to align the bottom face of the disk in confronting relationship with the hub body to thereby retain the heads of the support rod ends within the sockets; and
(d) releasable interlocking means for holding the bayonet within the central opening to thereby pivotally secure the support rod ends to form the hub assembly.

4,627,211

SLED FOR A REINFORCING CAGE USED IN A PIER

Thomas W. Foster, Jr., 3901 Shady Valley Dr., Arlington, Tex. 76013

Filed Sep. 23, 1985, Ser. No. 778,975
Int. Cl.[4] E04H *12/12;* E02D *5/22*
U.S. Cl. 52—652 12 Claims



1. A combination mobile support and static spacer adapted for positioning a reinforcing cage with respect to an earthen pier hole in both static and dynamic conditions, comprising:

(a) a runner having first and second ends and a substantially smooth plate therebetween, and the two ends being inclined in the same direction away from the plate so as to form a generally concave shape, and the plate having an area of at least 18 square inches for contacting the earth in the pier hole;

(b) a web extending longitudinally of the runner and affixed thereto so as to reinforce the runner and to hold the same in a generally concave shape;

(c) means associated with the web for bearing against a given one of the longitudinal reinforcing rods in a reinforcing cage; and

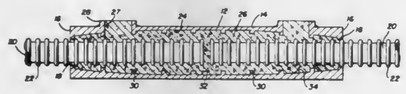
(d) means including a pair of wing elements which extend transversely of the web for positioning and orienting the web at a desired location alongside the reinforcing cage, and including means for permitting a tie-wiring connection of the wing elements to members of the reinforcing cage.

4,627,212

SPLICE SLEEVE FOR REINFORCING BARS WITH CYLINDRICAL SHELL

Alfred A. Yee, Honolulu, Hi., assignor to Hysao Miyamoto, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,063
Int. Cl.[4] F16B *7/00*
U.S. Cl. 52—726 3 Claims



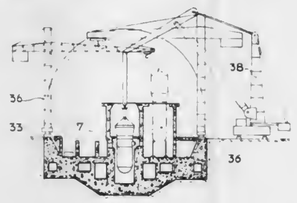
1. A splice sleeve for connecting reinforcing bars in reinforced concrete construction comprising an elongated shell of one-piece construction, said shell including substantially constant diameter internal and external cylindrical surfaces and end surfaces having an opening receiving the end portions of reinforcing bars to be connected, said internal surface of the shell including a plurality of longitudinally spaced, inwardly extending annular ridges spaced from the exterior of the reinforcing bars inserted into the shell, said internal surface and ridges constructed in a manner to provide a wedging action and radial inward compression for grouting material inserted into the annular space between the reinforcing bars and internal surface of the shell thereby locking the shell, grouting and reinforcing bars fixedly throughout their length whereby the external cylindrical configuration of the shell enables a splice sleeve to be utilized with a smaller external diameter for a given diameter of reinforcing bars thereby enabling the splice sleeve to be utilized in thinner concrete wall structures and columns of less cross-sectional area, said internal surface of the sleeve being cylindrical throughout its length, said means providing a wedge action including said ridges progressively increasing in their inward radial dimension from the innermost ridges toward the outermost ridges thereby providing a wedging action and compression of grouting introduced into the shell, the outermost end ridges on the internal surface defining end flanges with a central opening receiving the reinforcing bars.

4,627,213

METHOD OF CONSTRUCTING A NUCLEAR POWER STATION

Raymond Magnin, Nanterre, France, assignor to Framatome, Courbevoie, France

Division of Ser. No. 194,131, Oct. 6, 1980, Pat. No. 4,416,849.
This application Jun. 22, 1983, Ser. No. 506,920
Claims priority, application France, Nov. 14, 1979, 79 28067
Int. Cl.[4] G21C *13/00*
U.S. Cl. 52—745 3 Claims



1. Method of constructing on a single one-piece foundation a nuclear power station comprising a reactor building (1) containing a reactor core and a primary cooling circuit between said core and at least one steam generator, a fuel building (2) for processed new and used fuel, an ancillary building (3) for nuclear, electrical and safety equipment and an engine building (6) for turbogenerator units, said buildings being arranged in the general shape of a T, said fuel building (2) and ancillary building (3) being arranged in line and adjacent either side of said reactor building (1) which is perpendicular to the said engine building, and pre-fabricated vaulted enclosures having identical profiles for each of said buildings (1, 2, 3) and rigidly connected with said foundation, said vaults having a generally cylindrical shape with horizontal generatrices parallel to the longitudinal axes of said buildings (1, 2, 3), said method comprising the steps of

(a) constructing a single one-piece foundation for supporting all of said reactor, fuel and ancillary buildings (1, 2, 3);

(b) laying service tracks (33) parallel to and on both sides of said foundation;

(c) positioning lifting and transport means (36, 38) on said service tracks;

(d) constructing concrete inner structures of said buildings (1, 2, 3) of pre-fabricated units brought and positioned by said lifting and transport means;

(e) placing large pieces of said nuclear, electrical and safety equipment in place in said ancillary building while concurrently constructing and positioning supports for said equipment with the aid of said lifting and transport means;

(f) positioning said vaulted enclosures on said foundation (28) with the aid of said lifting and transport means; and

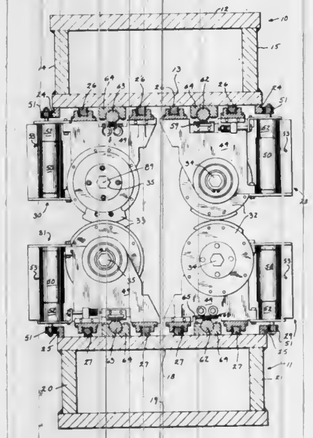
(g) assembling said vaulted enclosures to form one continuous vaulted enclosure for said buildings.

4,627,214

SLITTING-SCORING MACHINE

Leland J. Anderson, Catawba; James K. Jourdan, and Carl R. Marschke, both of Phillips, all of Wis., assignors to Marquip, Inc., Phillips, Wis.

Filed Sep. 23, 1985, Ser. No. 779,153
Int. Cl.[4] B26D *9/00*
U.S. Cl. 83—71 16 Claims



1. A machine for slitting and scoring a web of longitudinally traveling cardboard or the like along the upstream-to-downstream direction of web travel, comprising, in combination:

(a) a frame (4,5),

(b) an upper and a lower heavy box beam (10, 11) connected to said frame and adapted to extend transversely across a web (2) with the web disposed between said beams,

(c) longitudinally spaced transversely extending rotatable shafts (34, 35) connected to each said upper and lower box beam (10, 11) and forming pairs of upstream and downstream shafts,

(d) a plurality of generally opposed web scoring blades (32) mounted on one of said pairs of shafts for rotation therewith,

(e) a plurality of generally opposed web slitting blades (33) mounted on the other of said pairs of shafts for rotation therewith,

(f) scoring and slitting assemblies (28–31) associated with each said respective blade (32, 33),

(g) and means (26, 27) mounting said assemblies to said upper and lower box beams.

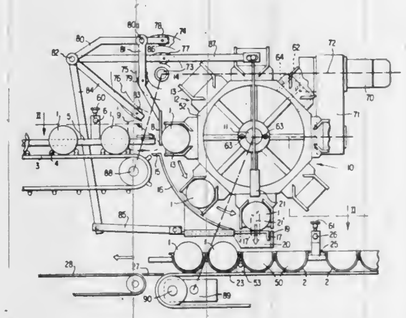
4,627,215

APPARATUS FOR CHARGING RECEPTACLES WITH STACKED, FLAT ITEMS

Theo Walz, Neunkirch, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 9, 1985, Ser. No. 732,274
Claims priority, application Switzerland, May 9, 1984, 2272/84
Int. Cl.[4] B65B *5/06*
U.S. Cl. 53—246 10 Claims

1. In an apparatus for charging receptacles with groups of stacked, flat, wafer-shaped articles, including a first conveyor means for advancing article groups thereon towards a discharge end thereof; a second conveyor means, situated below said first conveyor means, for advancing receptacles to a filling position and third conveyor means for receiving the article groups from the discharge end of the first conveyor means and advancing the article groups to a container dwelling in said filling position on said second conveyor means, the improvement comprising pusher means for sequentially pushing article groups from the discharge end of said first conveyor means into said third conveyor means and wherein said third conveyor means comprises a plurality of positioning devices, each having article group holding means, travelling sequentially and intermittently from adjacent said discharge end of said first conveyor means downwardly to a location immediately above said filling position, and means for introducing the article groups from a respective said positioning device in said location thereof into a respective said container in said filling position thereof; said means for introducing the article groups including a bottom gate situated in said filling position and having a first position in which it is situated such as to prevent article groups from passing from said location into said container in said filling position thereof and a second position in which it is situated such as to allow article groups to pass from said location into said container in said filling position; guide plate means situated in said location between the positioning device dwelling in said location and said container dwelling in said filling position for guiding each article group in said location from the positioning device into the container; and ejector means positioned in alignment with said location and said filling position for pushing the article group from the positioning device dwelling in said location toward said container dwelling in said filling position.



4,627,216

APPARATUS FOR THE POSITIVE TRANSFER OF TUBES FROM THE LINE WHICH PROCESSES THEM INTO BOXES OF TUBE-FILLING AND BOXING MACHINES

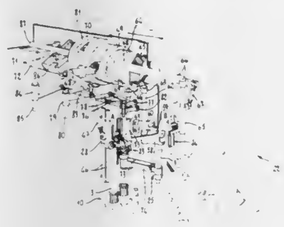
Ivo Argazzi, Pianoro Nuova, Italy, assignor to I.M.A.—Industria Macchine Automatiche—S.p.A., Ozzano Emilia, Italy

Filed Jun. 27, 1985, Ser. No. 749,876
Claims priority, application Italy, Aug. 3, 1984, 3555 A/84
Int. Cl.[4] B65B *5/04, 7/14*
U.S. Cl. 53—251 1 Claim

1. An apparatus for the positive supply of preformed crushable tubes which are filled with their bases open from a processing line to boxes in a tube-filling and boxing machine, the said processing line comprising a plurality of uniformly spaced resilient take-up members and the boxes being supplied made up with their filling apertures upwardly open from tubular blanks which are folded flat with their respective panels superimposed in mutual contact and taken rhythmically from the base of an inclined store containing them in a stacked said arrangement, said apparatus comprising first gripper means which can be moved vertically with an alternating movement for the rhythmic take-up of the tubes from the said processing

line, second gripper means movable vertically in alternating manner for the rhythmic insertion of these tubes into boxes made up with their filling apertures upwardly open, and further gripper means moving horizontally for the rhythmic transfer of the tubes from the first to the second gripper means,

said first gripper means comprising two jaws supported and coupled such that said jaws can be moved in counter-rotation, a first system of articulated levers with an end of one of the levers pivoted rigidly on the axis of rotation of one of said jaws and an end of the other of said levers held slidably in a vertical guide element asociated with a lever of a second articulated lever system controlled by control means;



said second gripper means comprising a fixed jaw and a movable jaw, the movable jaw of said second gripper means having an arm held slidably by a free end thereof in a vertical guide element associated with a corresponding articulated lever system controlled by respective control means; and

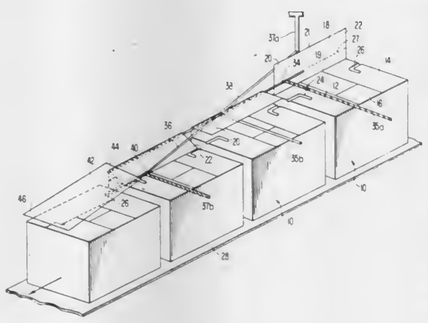
said further gripper means being formed by arms shaped at their respective free ends as semicircular jaws arranged in mirror image and provided with control means for the actuation of the arms of said further gripper means and therefore of the jaws thereof, said control means of said first, second and further gripper means being coordinated for the takeup and insertion of said tubes.

4,627,217

APPARATUS FOR AUTOMATICALLY CLOSING L-SLIDE LOCK CASES

John Plaskett, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 20, 1985, Ser. No. 767,595
Int. Cl.[4] B65B *7/24*
U.S. Cl. 53—374 **16 Claims**



1. Apparatus for automatically closing the top of a case having a closing flap and L-slide lock slots for receiving opposite free end corners of the closing flap while the case is moving with its longitudinal axis in the direction of movement, the apparatus comprising:

(a) a conveyor for moving a case, the case having a top portion which includes an open closing flap having a free longitudinal edge and opposite free end corners, the top portion further including L-slide lock slots for receiving respective free end corners of the closing flap;

(b) means for guiding the case to accurately position the case on the conveyor during movement of the conveyor with the longitudinal axis of the case in the direction of movement of the case;

(c) means for bending the closing flap to form a longitudinal bend in the closing flap while the case is moving on the conveyor so that the free longitudinal edge of the closing flap is positioned at about a level with the top of the case and the opposite free corners of the closing flap are positioned adjacent respective L-slide lock slots, the longitudinal bend being generally parallel with the direction of movement of the case;

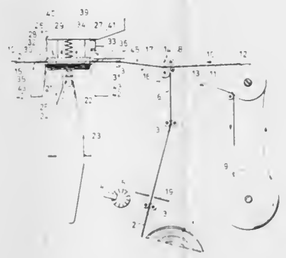
(d) means for tucking the opposite free end corners of the closing flap into the respective L-shaped slots during movement of the case by the conveyor, the closing flap tucking means including means for holding the longitudinal edge of the closing flap at about a level with the top of the case, the closing flap tucking means further including means for guiding the longitudinal bend of the closing flap to a position at about a level with the top of the case, while the case is moving on the conveyor, to cause each of said free end corners to enter the respective L-shaped slots and thereby close the top of the case.

4,627,218

METHOD OF AUTOMATICALLY BANDEROLING BUNDLED SHEET OBJECTS AND APPARATUS FOR CARRYING OUT THE METHOD

Bengt Akerström, Lidingö , and Friedrich Hartmann, Saltsjöbaden, both of Sweden, assignors to Esselte Security Systems, Stockholm, Sweden

Continuation of Ser. No. 569,153, Jan. 9, 1984, abandoned. This application Jul. 9, 1985, Ser. No. 753,810
Int. Cl.[4] B65B *51/06*
U.S. Cl. 53—399 **13 Claims**



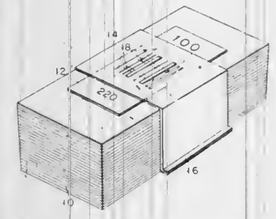
1. A method of automatically banderoling sheet objects, such as banknotes, arranged in a bundle, by laying a banderole strip, such as a paper strip, about the bundle, and thereafter sealing the bundle by joining together the end portions of the strip, comprising: advancing a desired length of said strip with one strip end leading in the direction of movement toward a receiving position at the base of a structure by which a plurality of sheet objects are assembled and placed as a bundle with the face of the first one sheet object against the mid-portion of the strip with end portions of the strip extending from both sides of the bundle location; separating said desired length of strip from a supply means to form a strip trailing end; attaching one portion of a small self-adhesive label to and extending forwardly from the leading end of said strip, so that the second portion of the label projects forward from said leading strip end portion, prior to its being advanced to said receiving position; continuing to feed said separated desired length of strip, with the attached label on the strip leading end, in said direction into said receiving position, said leading end of said separated strip being an overlying end portion in a strip folding operation, the other, trailing, end portion of said separated strip being an underlying end portion in said strip folding operation; said strip folding operation comprising engaging and folding the end portions of said strip past and against the opposed side ends of the bundle of sheet objects at said receiving position; then further folding the strip trailing end portion, which will become the underlying end portion, over and flat against the face of the final sheet object in the bundle; folding the strip leading end portion, which will become the overlying end portion, the end with the label attached, over and flat against the same face of the final sheet object so that the two ends of the strip are juxtaposed and the projected portion of the label overlaps the underlying trailing end portion of said strip; and pressing the projected second portion of the label into adhered condition to said underlying trailing end portion of the strip, thereby sealing the strip around the bundle of sheet objects.

4,627,219

METHOD FOR BUNDLING PAPER SHEETS OR THE LIKE

Shozo Omori, Tokyo, Japan, assignor to Omori Machinery Co., Ltd., Kawasaki and Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 370,819, Apr. 22, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,214
Claims priority, application Japan, Sep. 24, 1981, 56-141710[U]; Nov. 16, 1981, 56-169383[U]
Int. Cl.[4] B65B *11/02, 61/20*
U.S. Cl. 53—399 **11 Claims**



1. A method for bundling sheets of paper or the like comprising:

a first step of stacking the sheets of paper;

a second step of positioning a nonadhesive first side of a label adjacent to and in contact with an uppermost sheet in the stack, said label also having a printable side, opposite to said first side upon which bundle identifying information is printed;

a third step including (a) winding, one direction, the stacked sheets of paper with a transparent tape made of a heat-activated adhesive material such that the tape extends across the printable side of the label in said one direction so that at least one portion of the tape is in registry with the printable side thereof, whereby the bundle identifying information is visually perceivable through the wound tape and (b) superposing both end portions of the tape with each other such that both end portions of the tape are contact with each other;

a fourth step of heating the superposed end portions of the wound tape to heat adhere both end portions to each other without heat adhering the transparent tape to the sheets in the bundle to firmly hold the stacked sheets of paper; and

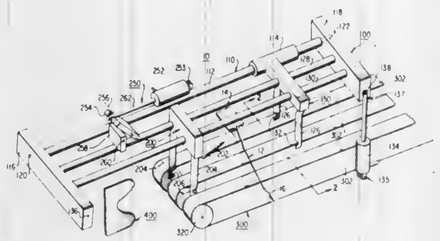
a fifth step of heating only the one portion of the tape in registry with the label so that the label is heat-adhered only to the tape and not to the uppermost sheet in the stack by virtue of heat-adherance between the printable side and the registered portion of the tape and by virtue of the nonadhesive first side of the label being in contact with the uppermost sheet in the stack.

4,627,220

CONVEYING AND GROUPING OF STRINGED TAGS

Steve J. Lynch, Milford, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 685,925, Dec. 24, 1984. This application Aug. 30, 1985, Ser. No. 770,904
Int. Cl.[4] B65B *27/10*
U.S. Cl. 53—414 **5 Claims**



5. Method of grouping stringed tags, comprising the steps of:

(a) collecting the stringed tags on a conveyor;

(b) conveying the stringed tags at a first speed until a designated number of tags have been collected;

(c) conveying the stringed tags at a second speed to separate the designated number of stringed tags from incoming stringed tags;

(d) lowering a forward rake behind the collected stringed tags;

(e) moving the forward rake to gather the stringed tags until same are held between the forward rake and an accumulating rake;

(f) moving the rakes with the held tags into a tying apparatus to tie the tags;

(g) withdrawing the tied stringed tags from the tying apparatus;

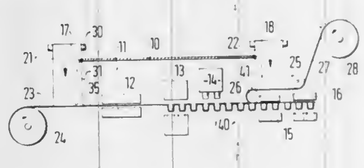
(h) moving the rearward rake away from the forward rake, whereby the tied stringed tags are released.

4,627,221

METHOD FOR PRODUCING STERILE PACKAGES

Norbert Buchner, Winnenden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,992
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439020
Int. Cl.[4] B65B *55/02*
U.S. Cl. 53—425 **6 Claims**



1. A method for producing packages containing a sterile product in seriatim in a sterile atmosphere comprising the steps of:

introducing a first deformable packaging material in the form of a tubular homogeneous strip into said atmosphere, said tubular strip having a sterile inner face portion,

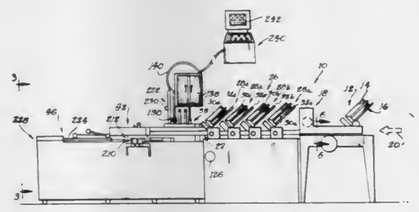
opening said tubular strip by severing longitudinally and exposing said inner face portion in said atmosphere,
forming depressions in the opened strip whereby the inside of said depressions is constituted by said sterile inner face portion,
filling said depressions with a sterile product,
introducing a second packaging material in the form of a homogeneous tubular strip having a sterile inner face portion into said atmosphere,
opening said second tubular strip by severing longitudinally and exposing said inner face portion in said atmosphere, causing said second strip to form a running length of strip material with a sterile face portion,
bringing in contact the sterile face portion of said second strip with the inner face portion surrounding the filled depressions of said first strip, and
sealing said contacted surfaces together to form sealed packages having a sterile interior and severing the packages.

4,627,222

SYSTEM FOR IN-LINE PROCESSING OF ENVELOPES AND THE LIKE

Jack W. Cantile, Richmond, Va., assignor to Hammermill Paper Company, Erie, Pa.

Filed Jun. 10, 1982, Ser. No. 387,106
Int. Cl.⁴ B65B *35/30*
U.S. Cl. 53—443 **36 Claims**



1. A system for processing envelopes and the like comprising:
conveyor means adapted to receive and convey envelopes in a continuous stream along a predetermined path;
first feed means, adapted to support a plurality of primary envelopes in a generally upstanding stack, for sequentially feeding said primary envelopes in a continuous stream onto said conveyor means and for interrupting said continuous stream to leave selcted spaces in said stream in response oto first predetermined command signals;
first printer means, cooperative with said conveyor means, for printing indicia on envelopes fed onto said conveyor means by said first feed means in response to first print command signals;
at least one inserter means, adapted to support a plurlaity of insert envelopes in a generally upstanding stack and cooperative with said conveyor means, for feeding said insert envelopes onto said conveyor means in said selected spaces in response to predetermined inserter command signals;
second printer means, cooperative with said conveyor means and operative in response to predetermined second print command signal, for printing individualized indicia on each successive primary and insert envelope passed along said predetermined path by said conveyor means; and
control means operatively associated with said conveyor means, first feed means, inserter means and first and second printer means, said control means being adapted to provide said first predetermined command signals, said inserter command signals and said first and second print command signals in a predetermined sequence so as to automatically establish predetermined spacing between successive primary envelopes fed onto said conveyor means, cause successive primary envelopes to be printed by said first printer means, cause insert envelopes to be inserted into said selected spaces between said primary envelopes created for this purpose, and effect printing of individualized indicia on each success ive envelope by said second printer means.

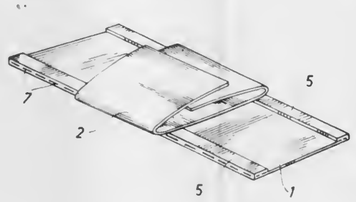
31. A continuous envelope processing method for church offering envelope sets wherein each set comprises a plurality of primary envelopes and at least one special insert envelope in a predetermined sequence and wherein each of the envelopes of a set has alphanumeric indicia printed on at least one print line parallel with the major longitudinal axis of the envelopes; said method comprising the steps of:
feeding primary envelopes in a continuous stream from a first supply of envelopes onto a conveyor means such that the movement of the primary envelopes is parallel to said print line;
interrupting said continuous stream of primary envelopes at timed intervals such that a selected space is left in the continuous flow of envelopes;
inserting in the said selected space said at least one spacial insert envelope from a second supply of envelopes; and
serially printing the alphanumeric indicia on each envelope as it moves along said conveyor means.

4,627,223

PACKAGE BLANK AND PACKAGING METHOD

Veikko I. Janhonen, Långvik, 02420 Jorvas, Finland

PCT No. PCT/FI83/00006, § 371 Date Sep. 26, 1983, § 102(e) Date Sep. 26, 1983, PCT Pub. No. WO83/02764, PCT Pub. Date Aug. 18, 1983
PCT Filed Jan. 26, 1983, Ser. No. 541,328
Claims priority, application Finland, May 5, 1982, 821571; Feb. 5, 1983, 820384
Int. Cl.⁴ B65B *11/58*
U.S. Cl. 53—449 **4 Claims**



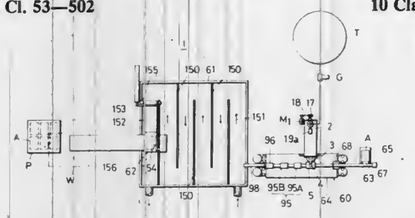
1. A package blank comprising:
a flat, elongated, rectangular outer cardboard sheet free of laterally extending creases and fold lines, the longer edge portions of said outer sheet being folded back upon and bonded to an inner face of said outer sheet to reinforce the longer edges, said edge portions being of uniform width throughout their length; and
an elongated, rectangular inner sheet of a flexible material free of laterally extending creases and fold lines, said outer sheet being of a material substantially stiffer than the material of said inner sheet, the length of said inner sheet being at least approximately double the width between the folded edges of said outer sheet, said inner sheet having a width less than half the length of said outer sheet; said inner sheet and said outer sheet being arranged perpendicularly to each other and adhesively secured together, whereby an article shorter than said width of said outer sheet can be wrapped and covered by said inner sheet and recessed between said folded edges of said outer sheet so that said edge portions protect the article and absorb impact.

4,627,224

METHOD AND AN APPARATUS FOR PACKING A SEMISOLID COMPOUND IN BAGS

Hideki Hamamoto, Himeji; Tsutomu Fujita, Suita, and Takuzo Mori, Takatsuki, all of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha and Showa Rekisei Kogyo Kabushiki Kaisha, both of Hyogo, Japan

Filed Jul. 6, 1984, Ser. No. 628,630
Claims priority, application Japan, Mar. 30, 1984, 59-64680
Int. Cl.⁴ B65B *3/28*
U.S. Cl. 53—502 **10 Claims**



1. An apparatus for continuous packing semisolid compound into a bag, comprising:
a bag supplying means for removing synthetic resin bags from a stack of said bags, having an opened end, said bag supplying means including a bag removal device which is caused to remove said bags one-by-one and deliver them with their opened ends upward to transporting means;
said transporting means being for intermittently moving said bags to a position in which said bags are filled with a semisolid compound;
a precooling device for cooling down a molten high temperature semisolid compound to a desired temperature;
a weighing and delivering device for receiving semisolid compound from said precooling device and delivering a predetermined quantity of said semisolid compound to a filling valve;
said filling valve being caused to inject said predetermined quantity of said semisolid compound into said bags one-by-one as said bags are moved by said transporting means;
said supporting means including a pair of endless belts forming a space therebetween for supporting the sides of said bags and a lower supporting means positioned below and between said endless belts for supporting the bottom of said bags;
cooling means positioned along the path of said transporting means for cooling said bags while they are being moved by said transporting means;
heat sealing means positioned along the path of said transporting means for heat sealing said opened end of said bags while they are being moved by said transporting means;
a cooling water tank positioned at one end of said transporting means for cooling said bags after said bags are sealed; and
a bag removal means for removing said filled and sealed bags from said water tank and for transporting said bags away from said water tank.

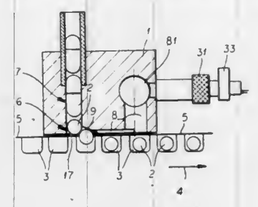
4,627,225

LOADING APPARATUS FOR A PACKAGING MACHINE FOR SMALL PRODUCTS

Peter Faller, Biberach; Herbert Rittinger, and Detlev Gertitschke, both of Laupheim, all of Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GmbH & Co. KG, Laupheim/Wurtt., Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,440
Claims priority, application Fed. Rep. of Germany, May 2, 1984, 3416200; Sep. 12, 1984, 3433371
Int. Cl.⁴ B65B *55/24*
U.S. Cl. 53—510 **12 Claims**

1. A loading apparatus for a packaging machine for small products comprising:
a filling shoe for input of said products into one of a plurality of receptacles of a package component moving past and under said filling shoe;
means to move said receptacles in a given direction past said filling shoe;
at least one feed chamber formed in said filling shoe and having a mouth open toward said package component and a receptacle of said package component aligned with said chamber to receive a product therefrom;
a product duct communicating with said feed chamber for feeding said products in series one after another to said feed chamber;
at least one vacuum passage formed in said shoe and connected with a vacuum source for evacuating a flow of air, said passage opening into said chamber at a location other than that at which said duct is connected thereto and adjacent said mouth and being formed as a groove in said given direction in said shoe opening directly toward said component and into said receptacle aligned with said chamber to remove dust and facilitate the transport of said products into said receptacles.

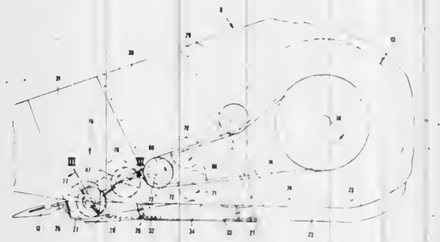


4,627,226

CROP GATHERING ATTACHMENT FOR CROP HARVESTING MACHINE

Frans J. G. C. De Coene, Zedelgem, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed Jan. 23, 1985, Ser. No. 694,197
Claims priority, application United Kingdom, Feb. 4, 1984, 8403017
Int. Cl.⁴ A01D *41/06*
U.S. Cl. 56—14.6 **7 Claims**



1. A crop gathering attachment for a crop harvesting machine having crop receiving means capable to receive crop from the ground, first crop feeder means, and second crop feeder means disposed between the crop-receiving means and the first feeder means, an improved said second feeder means comprising:
a plurality of longitudinally spaced rotatable members mounted for rotation about a transverse axis, each said rotatble member having retractable crop conveying means operable to retract and extend relative to said rotatable member upon rotation thereof;
drive means for rotating said rotatable members so that the respective said retractable crop conveying means operatively cooperate with adjacent crop conveying means to convey crop rearwardly from one rotatable member to

the other until said crop is delivered to said first feeder means; and

a transversely extending removable section disposed between said first and second feeder means to permit a changing of the longitudinal distance between said first and second feeder means.

4,627,227

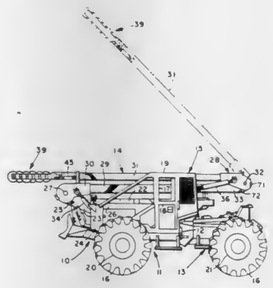
RIGHT-OF-WAY TREE LINE TRIMMER

Raymond E. Dixon, Box 59, Broaddus, Tex. 75929

Continuation of Ser. No. 435,718, Oct. 21, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,706

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—235 **11 Claims**



1. A right-of-way tree line trimmer comprising a vehicle having an operator's station, a boom assembly having multiple articulated parts located in a generally vertically extending principal cutting plane laterally offset from and generally parallel to a longitudinal axis of the vehicle, said articulated parts comprising pivot means mounted on said base member forming a first horizontal axis;

a lower boom, said pivot means supporting one end of said lower boom for pivotal movement relative to said first axis in said common plane; and

an upper boom pivotally mounted to the other end of said lower boom pivotally mounted to the other end of said lower boom for vertical movement in said common plane about a second axis parallel to said first axis, each of said upper and lower booms having substantial length so that the combined length thereof is at least twice the length of the vehicle;

a first power means for pivotally moving the lower boom vertically relative to the base member,

a second power means for pivotally moving the upper boom relative to the lower boom for at least 90° relative to the lower boom,

an elongated cutter head, said cutter head including a plurality of circular saw blades, each saw blade mounted on a rotatable shaft which are mounted parallel to each other and in the same plane, said saw blades positioned in radially overlapping but axially offset relationship, and means for driving said saw blades,

means for mounting one end of said cutter head to the outer end of said upper boom in longitudinal alignment with the upper boom,

means to control the flow of fluid to said first and second power means to raise and lower said upper and lower booms either simultaneously or independently so that the cutter head may be moved in successive arcuate vertical swaths in said common plane to thereby cut tree limbs extending across the vertical plane in which the cutter head is operating.

4,627,228

METHOD OF AND APPARATUS FOR STARTING UP INDIVIDUAL WORKING ELEMENTS OF A TEXTILE MACHINE, E.G. A SPINNING MACHINE

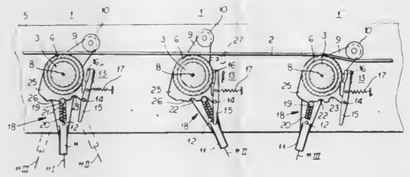
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,596

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413764

Int. Cl.⁴ D01H *13/00;* **F16H** *7/12*

U.S. Cl. 57—88 **18 Claims**



1. A method of starting up individual working elements of a textile machine in which a multiplicity of working elements each have a whorl in tangential contact with a common belt, comprising, while a number of said elements are driven by tangential contact at a normal operating pressing force of their respective whorls with said belt at a given operating speed, the steps of:

individually starting up one of said elements from standstill over an acceleration interval to said operating speed by applying said belt to said whorl of said element at standstill with a substantially greater friction force than that between said belt and the whorls of said elements at said operating speed;

by applying said belt with increased pressing force against the whorl of the accelerated element;

maintaining a greater friction force between said belt and the whorl of the element thus accelerated from standstill over at least a major portion of said acceleration interval by the application of increased pressing force of the belt against the whorl of the accelerated element; and

decreasing the pressing force applied by said belt to the accelerated whorl to said normal operating pressing force when the latter whorl reaches said given operating speed.

4,627,229

COMPACT STEEL CORD FOR IMPROVED TENSILE STRENGTH

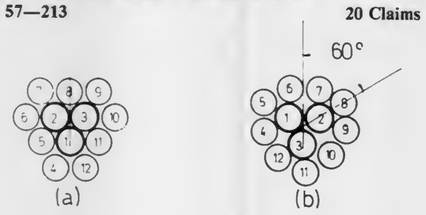
Luc Bourgois, Waregem-Desselgem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Jun. 26, 1985, Ser. No. 748,988

Claims priority, application United Kingdom, Jul. 9, 1984, 8417485; Oct. 22, 1984, 8426654

Int. Cl.⁴ D02G *3/48;* **D07B** *1/06*

U.S. Cl. 57—213 **20 Claims**



1. A rubber adherable steel cord adapted for reinforcement of resilient articles, comprising:

(a) a core of wires, each wire having a predetermined diameter, twisted together with a predetermined twist pitch,

(b) a surrounding layer of wires, each wire having a predetermined diameter, twisted with a predetermined pitch in the same sense as the core,

(c) the twist pitch of the core being substantially different from the twist pitch of the surrounding layer, and

(d) the diameter of the core wires being substantially larger than the diameter of the wires of the surrounding layer.

4,627,230

OPEN-END FRICTION SPINNING MACHINE

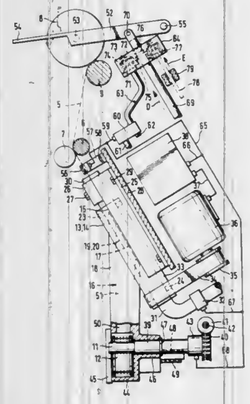
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,263

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416886

Int. Cl.⁴ D01H *15/00, 13/16*

U.S. Cl. 57—401 **26 Claims**



1. An open-end friction spinning apparatus having a plurality of spinning units, each said unit containing friction surface means forming a yarn formation zone for the formation of yarn, friction driving means for driving said friction surface means in said yarn formation zone, wind-up spool means for winding up formed yarn, spool driving means for driving said wind-up spool means and yarn guard means for sensing yarn breakage in said spinning unit, comprising:

automatic friction drive disengaging means at each said unit for disengaging said friction drive means from said friction surface means, and

automatic spool drive disengaging means at each said unit for disengaging said spool driving means from said wind-up spool means,

said automatic friction drive disengaging means and said automatic spool drive disengaging means being responsive to said yarn breakage sensed by said yarn guard means.

4,627,231

MESH BAND

Manabu Kiuchi, 2-12-21, Shinjyuku, Zushi-Shi, Kanagawa-Ken, Japan

Filed Nov. 7, 1984, Ser. No. 669,190

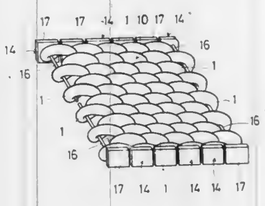
Claims priority, application Japan, Mar. 1, 1984, 59-039283

Int. Cl.⁴ F16G *13/00*

U.S. Cl. 59—80 **16 Claims**

1. A mesh band comprising a plurality of juxtaposed helical members, each of said helical members having a first end and a second end, said plurality of juxtaposed helical members being disposed such that said first ends define an end face extending longitudinally of the mesh band and said second ends define a second end face extending longitudinally of the mesh band such that said first end face is spaced from said second end face by the length of said helical members, a plurality of first pin members each having a first head and at least one first elongated pin body integrally formed with said first head, said first pin bodies having a longitudinal length not exceeding one half the length of said helical members, said first pin members being disposed along said first end face such that said first pin bodies extend partially into said helical members from said first end face and said first heads are disposed along said first end face to cover said first ends of said helical members,

a plurality of second pin members each having a second head and at least one second elongated pin body integrally formed with said second head, said second pin bodies having a longitudinal length not exceeding one half the length of said helical members, said second pin members being disposed along said second end face such that said second pin bodies extend partially into said helical members from said second end face and said second heads are disposed along said second end face to cover said second ends of said helical members, said helical members being rigidly fixed to said first and second pin bodies for connecting said helical members together by means of said first and second pin members to form a unitary mesh band, said first and second heads protectively covering said first and second ends of said helical members respectively so that the mesh band can be safely worn by a user without exposure to said first and second ends of said helical members.



4,627,232

LINK CHAIN

Peter Bruce, Onchan, Isle of Man, assignor to Brupat Limited, Onchan, United Kingdom

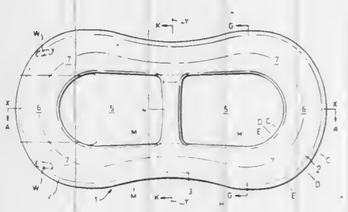
PCT No. PCT/GB84/00154, § 371 Date Jan. 3, 1985, § 102(e) Date Jan. 3, 1985, PCT Pub. No. WO84/04370, PCT Pub. Date Nov. 8, 1984

PCT Filed May 8, 1984, Ser. No. 690,492

Claims priority, application United Kingdom, May 5, 1983, 8312251

Int. Cl.⁴ F16G *13/06*

U.S. Cl. 59—84 **13 Claims**



1. A chain comprising a series of interconnected links, each link comprising a pair of opposed C-shaped ends joined by joining limb portions when viewed at right angles to a longitudinal plane of symmetry bisecting said C-shaped ends and said joining limb portions, said longitudinal bisecting plane defining the plane of the link, each C-shaped end including a central crown portion and shoulders located on each side of said central crown portion, the section modulus about an axis perpendicular to said plane of the link of a cross-section of each shoulder being greater than the corresponding section modulus of a cross-section of the corresponding central crown portion.

4,627,233

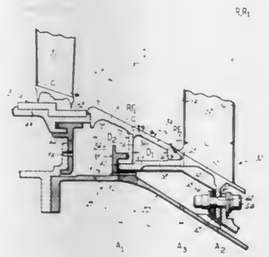
STATOR ASSEMBLY FOR BOUNDING THE WORKING MEDIUM FLOW PATH OF A GAS TURBINE ENGINE

Walter J. Baran, Jr., South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 518,908, Aug. 1, 1983. This application Apr. 19, 1985, Ser. No. 725,175

Int. Cl.⁴ F02C *1/06;* **F01D** *5/14;* **F03B** *7/00*

U.S. Cl. 60—39.161 **4 Claims**



1. An arcuate duct segment for an axial flow gas turbine engine, the engine having a high pressure turbine, a low pressure turbine and a transition region extending between the turbines, the segment having an axis of radius R_1, a convex side and a concave side disposed about the axis, the concave side adapting the duct segment to bound the transition region, which comprises:

a first foot which extends circumferentially about the convex side of the segment, which is radially oriented with respect to the axis R_1, and which has a radial length R_{f1} from the concave side;

a second foot which extends circumferentially about the convex side of the segment, which is radially oriented with respect to the axis R_1, which has a radial length R_{f2} from the concave side and which is spaced axially from the first foot by a first distance D_1;

a transition piece having said concave side which is angled with respect to the axis of the segment, which has a span extending between the first foot and the second foot for joining the first foot to the second foot and which has an extension projecting from the first foot in cantilevered fashion and extending a second distance D_2 from the first foot;

wherein the distance D_2 is equal to or greater than the first distance D_1 and wherein the radial length R_{f1} of the first foot is greater than one and one half times the radial length R_{f2} of the second foot such that a change in the length of the first foot facilitates accommodating a change in the angle of the concave side with respect to the axis of the segment during a redesign of the turbine which causes the diameter of the flow path of the high pressure turbine to change with respect to the flow path of the low pressure turbine.

4,627,234

GAS TURBINE ENGINE/LOAD COMPRESSOR POWER PLANTS

Paul A. Schuh, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 15, 1983, Ser. No. 504,441

Int. Cl.⁴ F02C *7/26, 9/28*

U.S. Cl. 60—39.281 **6 Claims**

1. A single shaft gas turbine engine power plant comprising:

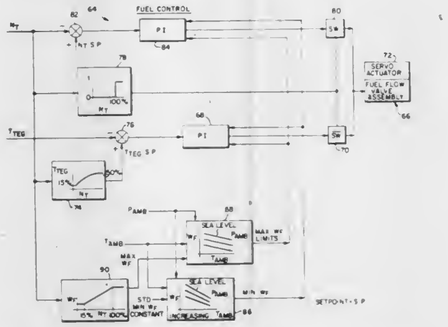
a power head and a radial load compressor driven by said power head, said power head being an air breathing gas turbine engine comprising a radial compressor;

a combustor for heating, and thereby adding energy to, the air discharged from said radial compressor; and

a radial gas turbine driven by hot gases flowing thereto from said combustor, said radial gas turbine being drive connected to the engine and load compressor; and

said power plant further comprising means for so scheduling a flow of fuel to said turbine engine combustor as to be simultaneously responsive to a radial gas turbine exhaust temperature and to gas turbine engine speed to thereby maintain the turbine exhaust temperature below selected maximums during start-up and acceleration of said gas turbine engine to a specified speed and to thereafter keep the gas turbine engine speed from exceeding a selected maximum;

said fuel flow scheduling means including means which is effective when the engine reaches a selected speed to switch the functioning of the scheduling means from a turbine exhaust gas temperature input mode of operation to an engine speed input mode of operation and a modulating type fuel flow control valve controllingly coupled to the means for switching the functioning of the fuel flow scheduling means;



said means for switching the functioning of the fuel flow scheduling means including a first gating means for transmitting a first, exhaust gas temperature responsive signal to an actuator of said fuel flow control valve, a second gating means for transmitting a second, turbine speed responsive signal to said actuator, and means operable when the engine reaches said selected speed to inactivate the first and activate the second of said gating means; and

said means for so scheduling the flow of fuel to said turbine engine combustor as to maintain the turbine exhaust gas temperature below said selected maximums comprising means for summing and providing a flow correction signal from a first signal indicative of measured turbine exhaust gas temperature and a second signal indicative of an exhaust gas set point temperature and means for establishing corrected minimum and maximum limits of the flow correction signal for the actuator of said fuel flow control valve.

4,627,235

COMPACT ELECTROHYDRAULIC DRIVE FOR VALVES OF TURBOMACHINES, ESPECIALLY TURBINES

Wolfgang Kindermann; Ernst Kloster; Hans-Joachim Leupers, and Helmut Schaper, all of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,661

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309421; Jan. 9, 1984, 3400488

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—415 **11 Claims**

1. Electrohydraulic compact drive for turbomachine valves having valve housings and spindles, comprising:

means for supplying electric power and for receiving electrical addressing signals;

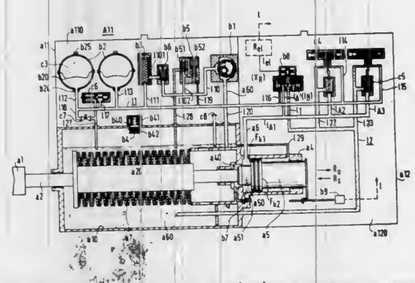
means connected to said supplying and receiving means for converting said signals into corresponding hydraulic positioning and control variables;

a self-sufficient hydraulic supply system including a hydraulic fluid tank for hydraulic fluid connected to said converting means, means for cooling the hydraulic fluid, at least one fluid pump having an inlet side fed by said fluid tank and an outlet side, an electric motor driving said fluid pump, at least one hydraulic accumulator with a given usable volume connected to said outlet side of said pump, and a hydraulic manifold connected to said at least one accumulator;

a hydraulic power system including a control cylinder, a power piston movable in said cylinder, a piston rod connected from said piston to the valve spindle of a turbomachine valve, and shutoff spring biasing said piston with a closing motion in a closing direction of the valve spindle, said shutoff spring being formed as a stack of cup springs;

an electrohydraulic addressing system including control means connected to said hydraulic manifold, to said hydraulic power system and to said hydraulic fluid tank for generating a pressurized fluid flow from said at least one accumulator to said hydraulic power system causing an opening motion of the valve spindle against the force of said shutoff spring dependent upon said positioning and control variables;

said control means of said electrohydraulic addressing system, said hydraulic power system and said hydraulic supply system being integrated into a compact drive block disposed at the housing of a turbomachine valve;



said at least one fluid pump producing a system pressure at said outlet side thereof up to a given pressure limit, said system pressure being several times higher than the fluid pressure of substantially 36-bar in conventional electrohydraulic control drives with a central fluid pressure supply;

minimum and maximum pressure switch means for connecting said outlet side of said at least one fluid pump intermittently to a pressure line for charging said at least one accumulator and to an outlet side of said hydraulic fluid tank;

said pressure switch means enabling said at least one pump to charge said at least one accumulator in said charging operation until said upper charging pressure is reached and returning the hydraulic fluid to said hydraulic fluid tank in substantially pressureless circulating operation after one of said switching operations, until said lower charging pressure is reached and one of said switching operations switches to said charging operation depending on said pressure limit;

housing sections of said hydraulic supply system, said hydraulic power system and said electrohydraulic addressing system, a central supporting cup-shaped housing for said housing sections,

said shutoff spring being guided on said piston rod,

said hydraulic fluid tank being in the form of an installation space for said shutoff spring and said cup-shaped housing; and

said usable accumulator volume and said lower charging pressure being sufficiently high for extreme control processes such that:

$$AV = \int_{P_{min}}^{P_m} pdv$$

is available, where

AV is the work capacity of said at least one accumulator,

P_{min} is the minimum operating pressure of said supply system,

P_m is said lower charging pressure, and

dv is the time-dependent increase of the equalizing volume of said accumulator for decreasing accumulator pressure.

4,627,236

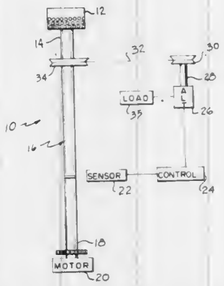
APPARATUS AND METHOD FOR CONTROLLING THE SPEED OF ROTATION OF SHAFT

Michael Melnyk, Jr., Chester, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 29, 1984, Ser. No. 614,842

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—435 **3 Claims**



1. In an apparatus having shaft means with a driven end portion rotatably driven by an air motor and a driving end portion rotating a centrifugal molten metal casting pot, the improvement comprising speed control means for maintaining the speed of rotation of the driving end portion of the shaft means at a predetermined speed, the driven end portion of the shaft means being at a driven speed greater than the predetermined speed, said speed control means comprising:

sensing means for sensing and for generating a first signal representative of the sensed speed of rotation of the shaft means;

means for comparing said first signal with a second signal representative of the predetermined speed and for generating a control signal representative of the comparison; and

electrically actuated brake means responsive to said control signal for applying a braking force to the shaft means when power is supplied to said apparatus and for applying no braking force when power is not furnished said apparatus to thereby allow rotation of said shaft means at the driven speed, the braking force being proportional to said control signal so that the braking force maintains the speed of rotation of the driving end portion of the shaft means at the predetermined speed, said brake means comprising an alternator having a shaft, and belt means for operatively associating said alternator shaft with the driving end portion of the shaft means, said control signal being fed to the field of said alternator so that the force opposing rotation of said alternator shaft is representative of the magnitude of the control signal, changes in the strength of the field exerting a varying braking force on said alternator shaft and on said belt means which is transmitted to the driving end portion of the shaft means to

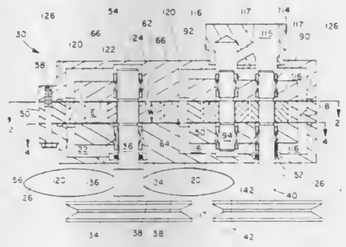
thereby maintain the speed of rotation of the driving end portion of the shaft means at the predetermined speed.

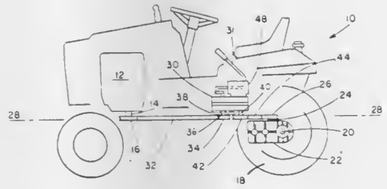
4,627,237

HYDROSTATIC TRANSMISSION WITH FIXED FLUID CAPACITY RATIO BETWEEN PUMP AND MOTOR

Allan I. Hutson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 30, 1984, Ser. No. 595,167
Int. Cl.[4] F16D *33/02*
U.S. Cl. 60—487 **23 Claims**





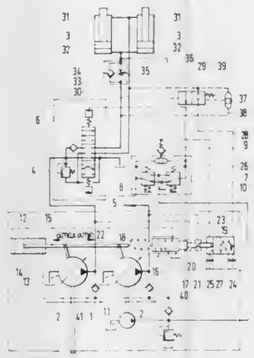
1. A hydrostatic transmission comprising a hydraulic pump driven by an input shaft and in fluid communication with a hydraulic motor having an output shaft, said pump having a pump rotating element which at least in part generates a pumping action and is operatively connected to said input shaft, said motor having a motor rotatable element operatively connected to the output shaft and subjected to fluid flow from said pump and at least in part providing a rotating output to said output shaft, a housing having a center section of uniform width and located between a pair of side sections, said center section being provided with a first opening of uniform cross section at least in part forming a pumping chamber and extending the width of said center section, said center section having a second opening of uniform cross section at least in part forming a motor chamber and also extending the width of said center section, said center section being of substantially the same width as said pumping chambers, said pumping chamber containing said pump rotating element with the fluid capacity of said pump being substantially proportional to the width of said pumping chamber, said motor chamber containing said motor rotatable element with the fluid capacity of said motor being substantially proportional to the width of said motor chamber, and said pumping chamber and said motor chamber being in side-by-side relationship, and wherein a transmission of selectable capacity which can be obtained by utilizing a common pair of housing side sections and selecting a width of the center section to provide the desired transmission capacity and wherein a ratio of pump capacity to motor capacity remains constant regardless of the width of center section selected.

4,627,238

OUTPUT CONTROL APPARATUS FOR A HYDROSTATIC DRIVE WITH DELIVERY ADJUSTMENT

Albert Mayr, Senden, and Oskar Stickel, Langenau, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,384
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340332
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—452 **2 Claims**



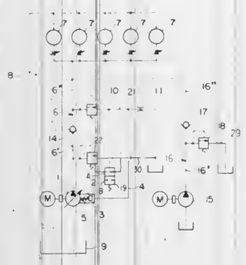
1. Output control apparatus for a hydrostatic drive in an open circuit having a device for regulating the delivery of a hydraulic pump of the drive, including a regulating piston having a piston surface acted upon by a regulating pressure; a path measuring spring having one end biased against said regulating piston; an output valve having a spool subjected to a biasing action from the other end of said path measuring spring, said output valve controlling the regulating pressure acting on the regulating piston; said drive being connected to said pump, said spool of said output valve being subjected to the pressure of the working medium of the hydrostatic drive against the force of the path measuring spring, said spool being stressed against the path measuring spring in the "minimum delivery" switch position when said hydraulic pump is not under load, a control piston being operatively connected with said spool; a pressure spring retaining said control piston against the force of the path measuring spring in contact with said spool, and said pressure spring holding the spool in the direction of the "minimum delivery" switching position of the hydraulic pump, means for subjecting a first piston area of said control piston to an adjustable control pressure against the force of the pressure spring, which pressure determines the power consumption of a load which is driven by the hydrostatic drive, means for imparting a restoring pressure to a second piston area of said control piston in the direction of the force of the pressure spring, in which the restoring pressure corresponds to a prescribed working pressure when there is a return movement of the load with reduced power consumption, said hydrostatic drive including a working piston having first and second areas subjected to a working medium for moving a load back and forth; a control valve being connected with a pressure line for the supply of said working medium to said working piston for effecting a return movement of the load; and a contact valve opening responsive to the working pressure in a pressure line connected to the working piston for effecting a forward movement of the load and transmitting the working pressure for the return movement of the load as a restoring pressure to the second piston area of the control piston.

4,627,239

HYDRAULIC CIRCUIT ARRANGEMENT

Hisaaki Nishimune, Akashi; Yoshikuni Ichimura, Kobe, and Kentaro Hata, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation-in-part of Ser. No. 271,712, Jun. 8, 1981, abandoned. This application Jan. 28, 1985, Ser. No. 695,744
Claims proirity, application Japan, Jun. 6, 1980, 55-79572[U]; Jun. 6, 1980, 55-76893
Int. Cl.[4] F16H *39/46;* **F15B** *13/06*
U.S. Cl. 60—484 **3 Claims**



1. Hydraulic circuit arrangement for operating a plurality of actuators by means of a pressurized fluid, comprising

a variable displacement type main pump having a regulator attached thereto for controlling the discharge rate of the main pump while holding the pressurized fluid from the main pump constant, said main pump including a high pressure line extending from the main pump to the actuators for transmitting the pressurized fluid to the actuators to substantially operate all the actuators by the pressurized fluid from the main pump when operated,

a check valve situated in said high pressure line to prevent the pressurized fluid from flowing back to the main pump, said check valve dividing the high pressure line into a pump line and an actuator line,

an auxiliary pump having a delivery line connected to said actuator line, said auxiliary pump transmitting pressurized fluid to the actuator line at a pressure higher than that of the main pump, volume of the pressurized fluid from the auxiliary pump being less than that of the main pump,

means for controlling the regulator situated between the actuator line and the regulator to change the operating condition of the main pump so that when the actuators are not operated, the pressurized fluid from the auxilary pump flows into the regulator thorugh the means for controlling the regulator to thereby operate the main pump at a minimum operating condition, and when the actuators are operated, the pressurized fluid from the auxiliary pump flows into the actuators and substantially no pressurized fluid flows into the regulator through the means for controlling the regulator to thereby operate the main pump at a regular operating condition, said means for controlling the regulator substantially preventing the pressurized fluid of the main pump from passing therethrough when the main pump fully operates, whereby the actuators are operated by the pressurized fluid flowing from the main pump and the auxiliary pump, and

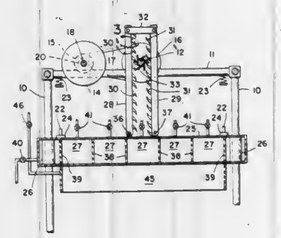
means for relieving the main pump pressure situated between the pump line and the downstream side of the means for controlling the regulator so that when the pressurized fluid from the auxiliary pump is applied to the regulator, the pressure relieving means operates to allow the fluid from the main pump to pass therethrough for exhausting the fluid outwardly, and when the pressurized fluid from the auxiliary pump is not substantially applied to the regulator, the pressure relieving means operates to allow the fluid from the main pump to flow to the actuators, said pressure relieving means including a relief valve connected to the pump line for exhausting the pressurized fluid outwardly, and a directional control valve connected between the relief valve and the downstream side of the means for controlling the regulator, said directional control valve, when detecting the pressurized fluid above a predetermined pressure passing through the regulator control means, allowing the relief valve to open for exhausting the fluid from the main pump outwardly, and when detecting the pressurized fluid below the predetermined pressure passing through the regulator control means, allowing the relief valve to cloase for directing the fluid from the main pump to the actuators, the relief valve being automatically opened to relieve pressure in the pump line when pressure in the pump line exceeds a predetermined level.

4,627,240

WAVE POWERED MACHINE

William A. Holmes, 209 Highland Ave., Piedmont, Calif. 94611

Filed Feb. 27, 1981, Ser. No. 238,696
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—507 **11 Claims**



1. A device to convert the motion of waves in a body of water to other forms of energy comprising:

a. vertical supports fixed to the bottom of said body of water,

b. rail means supported by said vertical supports,

c. a frame fixed to said vertical supports at an elevation above the surface of said body of water,

d. a shaft supported on said frame to rotate,

e. rotating means fixed to said shaft,

f. a float engaged with said rail means to move vertically up and down from the influence of waves, said float carrying actuating means in the form of two vertical racks pivotally connected to said float and with their upper extremities pivotally connected to a common link, one of said racks adapted to drive said rotating means on an upstroke of said float and the other of said racks to drive said rotating means on a downstroke of said float, said actuating means cooperating with said rotating means to cause said rotating means to rotate unidirectionally during a power stroke of said actuating means,

g. a power take-off from said shaft, and

h. said float having a skirt fixed to the bottom thereof, said skirt having means to vent the space beneath it.

4,627,241

CLOSED LOOP SOLAR COLLECTOR SYSTEM POWERING A SELF-STARTING UNIFLOW STEAM ENGINE

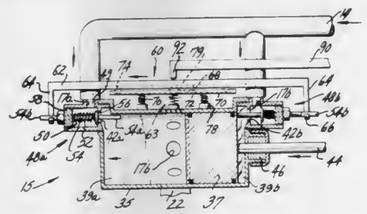
Barry W. Johnston, 1622 Q St., Washington, D.C. 20009

Division of Ser. No. 520,240, Aug. 4, 1983. This application Sep. 17, 1984, Ser. No. 650,887
Int. Cl.[4] F01L *21/02, 33/00;* **F01K** *13/02*
U.S. Cl. 60—656 **10 Claims**

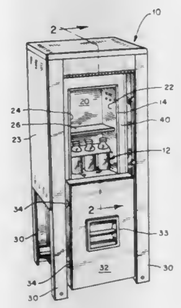
1. A uniform engine comprising:

(a) a cylinder having a pair of inlet openings respectively located at opposite ends thereof and a central discharge port between the inlet openings;

(b) a piston movable within said cylinder and including a drive shaft connected for delivery of power;
(c) first and second normally closed poppet inlet valves respectively located to open and close each inlet opening, each poppet valve being opened upon contact with said piston traveling into an end of stroke position to admit pressurized fluid into one of a pair of cylinder chambers located respectively on opposite ends of the piston, said chamber communicating with a source of pressurized fluid through the first and second valves; and
(d) a connecting rod simultaneously engageable with a valve rod of each said inlet valve for coordinating opening and closing of each of said first and second valves when pressure of fluid supplied to said engine is below a predetermined pressure level, including detent means for retaining said connecting rod means in a stationary position to maintain the first valve open and the second valve closed as said piston travels out of contact with the first valve, said connecting rod means being movable to close the first valve and open the second valve when the piston contacts the second valve with a force sufficient to overcome the bias of the detent means, said connecting rod means and detent means thereby maintaining one of said first or second valves open and the other valve closed when pressure of fluid is below said predetermined level to enable start-up of said engine and operation thereof in a non-expanded piston state.

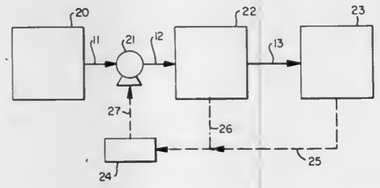


4,627,242
THERMOELECTRIC COOLER
Shlomo Beitner, Tel-Aviv, Israel, assignor to Vapor Corporation, Chicago, Ill.
Filed Apr. 19, 1984, Ser. No. 601,994
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **8 Claims**



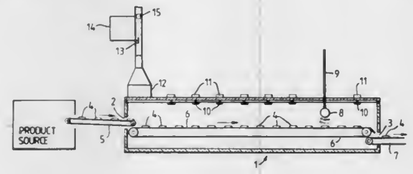
1. A thermoelectric cooler, comprising:
a storage compartment for the storage of items therein,
at least one, separate, detached coupling pad fabricated of thermoconductive material,
means for attaching said coupling pad onto said storage compartment,
a thermoelectric module secured to said pad with the cold face of said module against said pad; and
means mounting a heat exchanger on the hot face of said module in heat transfer relationship comprising;
at least two fasteners, a support bar and a spot shim between said heat exchanger and said support bar.

4,627,243
GAS SUPPLY SYSTEM FOR VARIABLE DEMAND APPLICATION
Herbert R. Schaub, Amherst, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Sep. 26, 1985, Ser. No. 780,278
Int. Cl.[4] F17C *7/04*; F04B *49/00, 49/06, 11/00*
U.S. Cl. 62—52 **22 Claims**



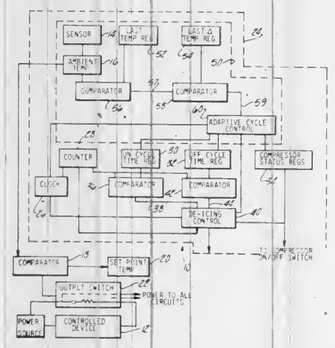
1. A method for providing gas to a variable consumption flowrate use point comprising: pumping liquid at an initial flowrate to a high pressure with a variable speed liquid pump having a maximum flowrate capability at least twice its minimum flowrate capability, vaporizing high pressure liquid to produce high pressure gas, passing high pressure gas to a high pressure gas storage tank, delivering high pressure gas from the storage tank to the use point, monitoring the use point consumption flowrate of said gas, determining if the use point consumption flowrate differs from the liquid pump initial flowrate, and, based on this determination, adjusting the liquid pump speed to provide a flowrate corresponding to the use point consumption flowrate, whereby the size of the high pressure gas storage tank is significantly reduced.

4,627,244
CRYOGENIC COOLING
Edward M. A. Willhoft, 41, Higher Green Epsom, Surrey KT17 3BB, England
Filed Apr. 9, 1985, Ser. No. 721,416
Claims priority, application United Kingdom, Apr. 13, 1984, 8409692; Feb. 7, 1985, 8503122
Int. Cl.[4] F25D *13/06*
U.S. Cl. 62—63 **6 Claims**



1. A process for carrying out the cryogenic cooling of a material which comprises introducing material to be cooled into an elongated cryogenic tunnel housing on means for conveying said material from an inlet end to an outlet end, spraying liquid cryogen onto said material as it travels through said tunnel at a position proximate said outlet end, passing vapor or gas derived from said liquid cryogen in counter-current flow over said material passing through the tunnel, removing from said tunnel at a position proximate said inlet end an exhaust comprising said vapor or gas and atmospheric air entrained thereby through said inlet end, determining the rate of flow of the exhaust and the content of molecular oxygen in said exhaust, calculating from the rate of flow of the exhaust and its oxygen content the rate of consumption of said liquid cryogen, relating the rate of consumption of said liquid cryogen to the rate of production of cooled material and controlling the operation of the tunnel to optimize the weight ratio of liquid cryogen consumed/cooled material.

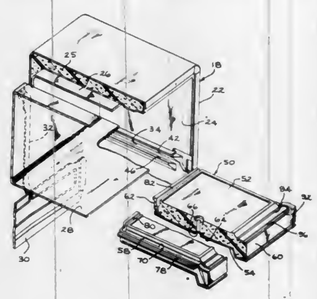
4,627,245
DE-ICING THERMOSTAT FOR AIR CONDITIONERS
Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 8, 1985, Ser. No. 699,580
Int. Cl.[4] G05D *23/32*
U.S. Cl. 62—157 **4 Claims**



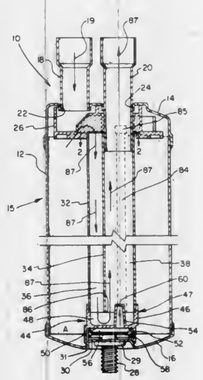
1. In an electronic thermostat adapted to be connected to an air-cooling apparatus to control the operative state of the apparatus and including means for generating a digital electrical signal representative of a desired temperature setpoint and means for generating a digital electrical signal representative of the ambient temperature at the thermostat, the improvement comprising:
means for generating control signals for the aircooling apparatus in order to inhibit the accumulation of ice on the cooling element of the air-cooling apparatus when the ambient temperature is above the temperature setpoint;
means, responsive to the control signals, for deenergizing the compressor in the air-cooling apparatus for a first preselected period of time whenever the compressor is determined to have run continuously for a second preselected period of time; and
means for adaptively adjusting the length of at least one of the first or second preselected periods of time as a function of the change in the rate of change of the ambient temperature.

4,627,246
REFRIGERATOR COMPARTMENT PARTITION AND METHOD OF ASSEMBLY
Arthur C. Wilson, Louisville, Ky., assignor to General Electric, Louisville, Ky.
Filed Jul. 2, 1984, Ser. No. 627,199
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—286 **8 Claims**

1. Compartment partition assembly for a refrigerator cabinet of the type having an outer shell, an inner liner with a rear wall and side walls and a partition separating the freezer and fresh food compartments comprising:
a sheet metal evaporator in the freezer compartment with one portion forming the bottom wall of the freezer compartment and a portion of the evaporator extends downwardly into the fresh food compartment,
a channel having a bottom and upper and lower side walls formed on each of the side walls of the liner,
a plate defining the top wall of the fresh food compartment, and
an insulating member forming a thermal compartment divider under the bottom wall of the freezer compartment and having top, bottom, side, front and rear walls, the bottom wall of which overlies said plate, said top wall formed to provide a drain and sealing system having troughs with exterior walls along the periphery of the top wall adjacent the side and rear walls of the insulating member and deflected inwardly by the rear wall of the liner and upper side walls of the liner channels, said top wall having two troughs with exterior walls along the periphery of the top wall adjacent the rear wall of the insulating member and they are spaced apart to accommodate the evaporator portion extending from the freezer into the fresh food compartment and the two troughs are inclined downwardly toward each other and there are drain openings through the insulating member at the lowest end of each of the respective troughs.



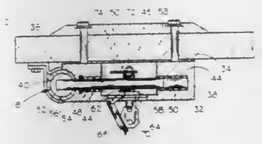
4,627,247
SUCTION ACCUMULATOR
Robert L. Morse, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Mar. 21, 1986, Ser. No. 842,311
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—503 **26 Claims**



1. A suction accumulator comprising:
a storage vessel including a casing having a first end wall and defining a liquid storage volume;
an inlet for said vessel;
a first conduit disposed in said vessel, said conduit having first and second ends, said conduit including a divider

means for forming first and second fluid passageways in said conduit, said first fluid passageway being open to said vessel at said conduit first end;
an outlet for said vessel connected to said second fluid passageway at said conduit first end;
a transition member secured to said conduit second end and forming a third fluid passageway, said third fluid passageway interconnecting said first fluid passageway and said second fluid passageway; and
a second conduit extending from said liquid storage volume into said second fluid passageway.

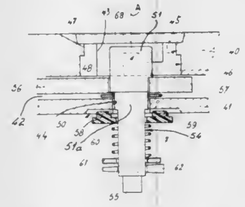
4,627,248
TRAILER DOOR LOCK SYSTEM
David L. Haworth, Papillion, Nebr., assignor to Sentry Lock Co., Inc., Gretna, Nebr.
Filed Sep. 23, 1985, Ser. No. 779,041
Int. Cl.[4] E05C *3/14;* **E05B** *65/14*
U.S. Cl. 70—134 **12 Claims**



1. A lock system for a conventional vehicle cargo door having a vertical lock bar rotatably mounted thereon, said lock system comprising,
a housing having a front wall, a flat back wall adapted for placement against a cargo door and transversely spaced-apart opposite side walls,
said vertical lock bar being of the type mounted for rotation about its own vertical axis,
one side wall of said housing including a vertically extended groove adapted for receiving the rotatable cargo door lock bar, said one side wall further having an opening in communication with said groove,
means for securing said housing to a cargo door at a position with the rotatable lock bar received within said groove,
an elongated lock pin,
means for supporting said lock pin for transverse sliding movement in said housing and through said side wall opening into said groove for insertion into a registered hole in a cargo door lock bar,
a key operated lock shaft supported on said housing generally perpendicular to the lock pin, and
a rocker arm secured to said lock shaft for rotation therewith and having a free end connected to said lock pin for transverse movement of the lock pin in response to rotation of said lock shaft.

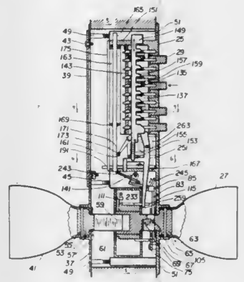
4,627,249
LATCH FOR UTILITY ACCESS DOOR
Robert Dumortier, 9 rue Duchartre, 34500 Beziers (Herault), France
Filed Sep. 12, 1985, Ser. No. 775,079
Claims priority, application France, Sep. 12, 1984, 84 14229
Int. Cl.[4] E05B *65/06*
U.S. Cl. 70—139 **5 Claims**

1. A latch assembly comprising:
relatively fixed and fixed inner and outer plates defining a space and formed with respective inner and outer bores aligned along a common axis, the outer plate being formed at its bore with at least one radially extending formation and the inner plate being formed adjacent its bore with at least two angularly offset and axially extending formations;
a plug extending through the bores and rotatable therein about the axis, the plug having an outer head in the outer bore and accessible from outside the plates and an opposite inner end exposed inward past the inner plate;
a locking dog extending radially from and angularly fixed to the plug in the space between the plates;
an inner abutment washer secured to the inner end of the plug and spaced axially inward of the inner plate;
a retaining washer angularly nondisplaceable on the inner end of the plug having an axially extending formation engageable with the formations of the inner plate;
a compression spring braced between the washers and



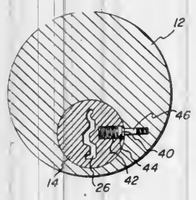
urging the formation of the retaining washer axially outward toward the inner plate;
a key engageable with the plug head and having an axially extending formation complementary with the formations of the outer plate, the plug with the pawl and retaining washer being angularly displaceable about the axis between a locking position in which the formations of the key and outer bore can interfit and the formation of the retaining washer engages one of the formations of the inner plate and a freeing position in which the formations of the key and outer bore cannot interfit and the formation of the retaining washer engages the other of the formations of the inner plate; and
a formation on the inner end of the plug adapted to be engaged for rotation of the plug from inside the inner plate.

4,627,250
COMBINATION LOCK
Sung B. Kim, 4418 Pickett Rd., Fairfax, Va. 22032
Filed May 22, 1984, Ser. No. 613,042
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—214 **27 Claims**



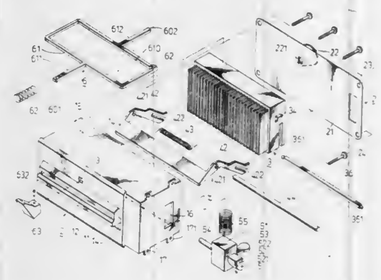
1. A combination lock comprising:
a plurality of user-operable means operable through an operating stroke between first and second positions;
first counter means for counting operating strokes including a respective first movably mounted member movable from an intial position to successive unique positions in response to successive operating strokes;
second counter means for counting operating strokes including a respective second movably mounted member movable from an initial position to successive unique positions in response to successive operating strokes;
combination setting means for connecting selected ones of said user-operable means to said first counter means to enable counting by said first counter means of the operating strokes of said selected user-operable means and for connecting the non-selected ones of said user-operable means to said second counter means to enable counting by said second counter means of the operating strokes of said non-selected user-operable means;
third counter means responsive to each operating stroke of said selected and non-selected user-operable means for counting the operating strokes thereof and including a respective third movably mounted member movable from an initial position to successive unique positions in response to each successive operating stroke of said selected and non-selected user-operable means; and
interlock means movable from an initial position to a second position when said first counter means counts a predetermined number of operating strokes of said selected user-operable means, said second counter means has not counted operating strokes of said non-selected user-operable means, and said third counter means has counted a predetermined number of operating strokes of said selected and non-selected user-operable means.

4,627,251
COMBINED MECHANICAL AND MAGNETIC LOCKING SYSTEM
Suresh K. Bhate, 1154 Mohawk St., Schenectady, N.Y. 12309
Filed Sep. 17, 1984, Ser. No. 651,171
Int. Cl.[4] E05B *27/06, 47/00*
U.S. Cl. 70—276 **2 Claims**



1. A lock mechanism comprising:
an outer cylinder;
an inner cylinder rotatably mounted within said outer cylinder for movement between a lock and open position, said inner cylinder having a keyhole therein;
a set of mechanical tumblers moveable between a lock position wherein each tumbler blocks the space between the cylinders thereby preventing rotation of the inner cylinder, and a release position where in each mechanical tumber does not block the space between the cylinders and thereby allows the inner cylinder to rotate;
at least one magnetically attractable tumbler, which is not a magnet, also moveable between a lock position wherein the separation between the inner and outer cylinders is traversed and the inner cylinder is prevented from rotating, and an open position wherein the space between the inner and outer cylinders is not traversed and the inner cylinder can rotate to its open position, said magnetically attractable tumbler being spring-biased to the lock position; and
a second tumber having a base and a separate stud portion, said tumbler being made of material which is not a magnet but is magnetically attractable, and positioned within the cylinders for movement between a release position wherein the space between the cylinders coincides with the space between the base and the stud, and a lock position wherein the stud traverses the space between the cylinders, said base being spring-biased to the open position and another spring biasing the stud to the base and pressing the stud toward the lockd position, such that when attracted by a magnet placed within the keyhole at a position adjacent to said second magnetic tumbler, the magnetic force, when sufficient, compresses the base biasing spring and said stud spring moves the stud to the lock position traversing the space between the cylinders.

4,627,252
CODED-CARD TYPE LOCK DEVICE
Chi-Woei Lo, 39, New Village, Fu-Shin-Li, Miao-Li City, Taiwan
Filed Nov. 14, 1985, Ser. No. 797,839
Int. Cl.[4] E05B *23/00*
U.S. Cl. 70—351 **8 Claims**



1. A coded-card type lock device comprising in combination:
an outer housing body with an open section at one side, a panel plate formed on another side, a bolt opening and a plurality of anchoring studs provided at a front portion for being fixed at a proper location in a door, said panel plate including a key slot horizontally formed in the middle, a rod opening located at a place over the key slot, and a plate trough below and parallel to the key slot for being exposed on the outer surface of the door;
a locking means with a plurality of coded and movable locking pieces fixedly installed in said outer housing body with a line of said coded and movable locking pieces exposed along the key slot for performing locking and unlocking operations;
an operating means with a press member and a turning arrangement movably installed in said outer housing body under said locking means with the press member extending out of the key slot for controlling the unlocking operation in conjunction with said locking means;
a lock bolt mechanism having a bolt head and a projecting member flexibly installed in the front portion of said outer housing body with the bolt head extending out of the bolt opening for being moved up and down along with said operating means to effect the locking and unlocking operations;
a resetting member formed in a rectangular frame structure with a first linking rod at one side and a second linking rod at another movably installed around an upper periphery of said locking means in said outer housing body with the first linking rod extending out of the rod opening of outer housing body for resetting the locking pieces of said locking means to their coded positions therein;
an elastic element coupled with the first linking rod in said outer housing body for applying an elastic force to said resetting means;
a hand grip connected to the first linking rod at the panel plate of said outer housing body for operating said restoring means;
an inner covering member with a knob opening at one side

and a cone-shaped connecting part with an orifice in its center formed at an upper portion thereof connected to said outer housing body over the open section thereof with the second linking rod movably connected to the cone-shaped connecting part;

a bolt socket frame having a locked space defined therein accommodating the bolt head of said bolt mechanism for being fixed on a door post opposite to the front portion of said outer housing body; and

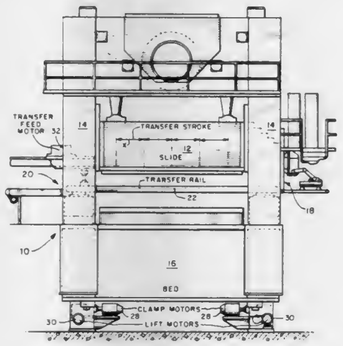
a card-type key having a plurality of segmented tooth-like sections formed at one side, in cooperation with the key slot of said outer housing body, for being coded according to a code arrangement of the locking pieces of said locking means; whereby, the lock device can be locked and unlocked conveniently with a high standard of security.

4,627,253

FAULT DETECTION SYSTEM FOR CONTINUOUSLY RUNNING TRANSFER PRESS

Rick L. Tennessen; Harry W. Schulz, both of Racine, Wis., and Allen J. Vanderzee, Lansing, Ill., assignors to Verson Allsteel Press Co., Chicago, Ill.

Filed Jul. 25, 1984, Ser. No. 634,159
Int. Cl.[4] B21D *55/00*
U.S. Cl. 72—4 **18 Claims**



1. In a continuously running transfer press of the type comprising at least one die which moves in a cycle, a workpiece transfer system having at least one axis of movement, and a controller comprising means for sensing the phase angle of the die in the cycle and means for controlling the transfer system to synchronize movement of the transfer system with the phase angle of the die in the cycle, the improvement comprising:

a die position sensor mounted to the transfer press to generate a die position signal indicative of the momentary position of the die in the cycle at a multiplicity of phase angles of the die in the cycle;

at least one transfer system position sensor mounted to the transfer press to generate at least one transfer system position signal indicative of the momentary position of the transfer system in at least one selected axis at said multiplicity of phase angles;

a fault detection system responsive to the at least one die position signal and the transfer system position signal, said fault detection system comprising means for comparing the die position signal and the transfer system position signal at said multiplicity of phase angles of the die in the cycle, and means for generating at least one fault signal in the event the at least one transfer system position signal faults to correspond to a predetermined function of the die position signal;

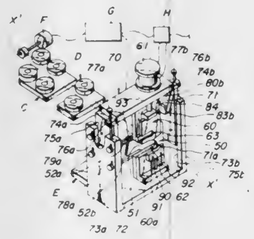
said die position sensor, at least one transfer system sensor and fault detection system cooperating to monitor the operation of the transfer system and the controller independently of the controller and to generate the at least one fault signal in the event the transfer system loses synchronization with the die.

4,627,254

CUTTING DEVICE FOR A MULTI-DIMENSIONAL BENDING APPARATUS

Motohiko Kitsukawa, and Atsuo Suzuki, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1985, Ser. No. 696,199
Claims priority, application Japan, Jan. 30, 1984, 59-14793; Jan. 30, 1984, 59-14794; Jan. 31, 1984, 59-15925; Jan. 31, 1984, 59-15926; Jan. 31, 1984, 59-15927; Jan. 31, 1984, 59-15928; Sep. 28, 1984, 59-203868
Int. Cl.[4] B21D *11/14, 43/28*
U.S. Cl. 72—6 **4 Claims**



1. A cutting device for a multi-dimensional bending apparatus for producing multi-dimensionally bent elongate articles, such as door sashes, various moldings for automobiles, and the like, and including a bending device for multi-dimensionally bending continuously supplied elongate material, wherein the cutting device comprises a fixed blade member formed therein with an opening through which the multi-dimensionally bent material is passed, and a movable blade member vertically movable with respect to, and kept in sliding contact with the fixed blade member, cutting edges being formed by the lower peripheral edge of the opening in the fixed blade member and the lower edge of the movable blade member, said blade members being movable also in the direction in which the material is supplied, synchronously with the cutting of the supplied material, said movable blade member having a lower dead point and being formed with a slit having a side aperture, which slit can be brought into alignment with the opening in the fixed blade member in the lower dead point of the movable blade member such that continuously supplied material is permitted to pass through the slit upon completion of the cutting, said slit having a width smaller than the maximum lateral excursion of the bent material and means to upwardly move the movable blade member to its original position when the bent material moves laterally out of said slit.

4,627,255

APPARATUS FOR BENDING METAL STRIP

John R. Archer; Michael J. Kellaway, both of Royston, and Douglas S. MacArthur, Haslingfield, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Feb. 1, 1984, Ser. No. 575,793
Claims priority, application United Kingdom, Feb. 12, 1983, 8303954
Int. Cl.[4] B21D *5/00*
U.S. Cl. 72—10 **4 Claims**

1. A machine for bending metal strip comprising

grounded guide means for guiding metal strip to an exit location,

a bending tool having a working surface for contacting the metal strip,

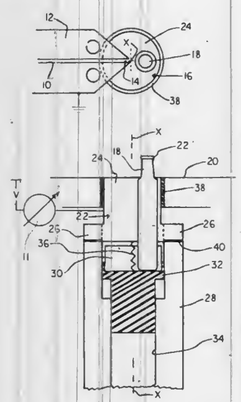
bending tool support means including

means for supporting said bending tool for displacement along an axis,

means for displacing said bending tool along said axis from a retracted position below the metal strip to an advanced bending position,

said bending tool being spaced from said exit location and mounted in said support means,

said bending tool being displaceable from a retracted position along a path normal to said axis to contact and bend the metal strip and being displaceable back to said retracted position,



means connected to said bending tool for applying a voltage potential directly to said working surface of said bending tool,

means connected to said bending tool for sensing the presence or absence of such applied voltage, and

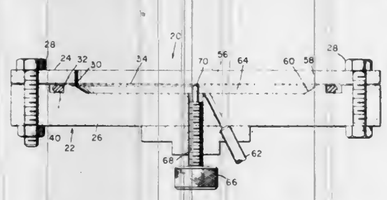
insulating means for preventing such applied voltage from being grounded through said bending tool support means whereby when said bending tool contacts the metal strip, said sensing means will sense that the applied voltage has dropped to zero and determine the exact location of the metal strip at the moment of contact or at the moment when contact is broken.

4,627,256

METHOD OF FORMING PRECISELY CURVED SURFACES

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1979, Ser. No. 106,985
Int. Cl.[4] B21D *26/02, 22/10*
U.S. Cl. 72—60 **14 Claims**



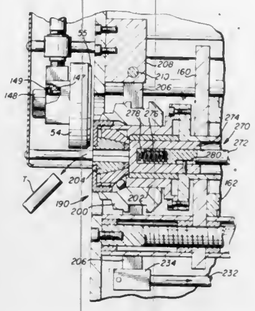
1. A method for forming a precisely curved surface comprising the sequential steps of applying substantially uniform isotropic and radially extending forces upon a substantially planar plastically deformable blank, and plastically deforming the blank to permanently form the precisely curved surface.

4,627,257

TUBE SPIN CLOSE APPARATUS

William G. McElhaney, Jacksonville, Tex., assignor to Coilco, Inc., Dallas, Tex.

Filed May 5, 1980, Ser. No. 146,755
Int. Cl.[4] B21D *15/00*
U.S. Cl. 72—102 **24 Claims**



1. Apparatus for substantially closing the end of a tube section comprising:

rotary means for rotating said tube section about the longitudinal axis of the tube section,

a forming wheel mounted relative to the end of said tube section, said forming wheel being freely rotatable about an axis substantially parallel to the rotational axis of the tube section, and

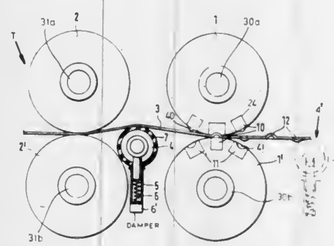
means for moving said forming wheel in a plane substantially perpendicular to the axis of rotation of the tube section into engagement with the end of the tube section and beyond the axis of rotation of the tube section to substantially close the end thereof.

4,627,258

APPARATUS FOR IMPRESSING A STRIP ALONG ITS EDGE

Hans J. Loges, and Hermann Wilkening, both of Düsseldorf, Fed. Rep. of Germany, assignors to IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,856
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 8419637[U]
Int. Cl.[4] B21D *13/04, 37/04, 37/06*
U.S. Cl. 72—196 **18 Claims**



1. An apparatus for shaping a strip, comprising:

at least one pair of working rolls provided with forming tools spaced about their circumference for embossing an edge of the strip;

at least one pair of guide rolls located upstream of said pair of working rolls and running in synchronism with the advance speed of the strip;

a roller provided between said pair of working rolls and said pair of guide rolls and being movable in a direction perpendicular to the advance plane of the strip for deflecting the latter out of said plane;

a resilient means positioned perpendicular to said advance plane, supporting said roller and urging the roller to abut against the strip;

gear means including bevel gears and a connection shaft coupling with one another and said pair of working rolls to said pair of guide rolls wherein said pair of working rolls has a circumferential speed higher than the advance speed of the strip.

4,627,259

INDUCTIVE EDGE HEATING DEVICE FOR HOT WORKING STRIP MATERIAL AND THE LIKE

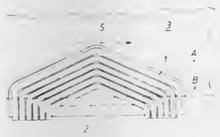
Lars Andersson; Hans Backlund; Bengt Henriksson, and Thomas Moström, all of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Nov. 29, 1985, Ser. No. 802,724

Claims priority, application Sweden, Nov. 30, 1984, 8406062

Int. Cl.[4] B21B *45/00*

U.S. Cl. 72—202 **5 Claims**



1. An edge-region heating device for use in the rolling of an elongated metal member having edge regions and a central part between the edge regions, which edge regions are cooler than said central part, which edge-region heating device is arranged to contain one edge region of the elongated member for inductively heating the same, wherein the heating device includes an induction coil having a plurality of coil parts, each of which coil parts is bent into a V-shape around the said one edge region of the elongated metal member with the apex of each V being further away from the outer edge of the elongated metal member than the remainder of said coil part such that the outermost parts of the said one edge region will pass more of the coil parts than parts of the member located closer to the said central part, the said one edge region of the elongated member thereby being heated to a greater extent than said parts of the member located closer to said central part to reduce the temperature difference between the said one edge region and the said central part.

4,627,260

ROLLING STAND WITH AXIALLY SHIFTABLE ROLLS

Willi Benz, Neuss, Fed. Rep. of Germany, assignor to SMS Sloemann Siegmag AG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,916

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325823

Int. Cl.[4] B21B *1/38, 31/18*

U.S. Cl. 72—247 **7 Claims**

1. A method of operating a roll stand comprising:

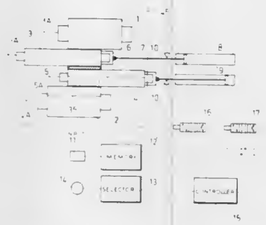
a support frame;

a pair of similar small-diameter working rolls rotatable about respective vertically spaced axes and defining a workpiece nip receiving a workpiece to be rolled;

a pair of similar large-diameter backup rolls rotatable about respective axes vertically flanking the working-roll axes and each bearing vertically on the respective working roll, the working rolls having ends and each having therebetween an effective axisl length equal to at least 1.3 times the effective axial length of the respective backup rolls; and

respective actuator means connected to the working rolls for displacing same axially relative to the backup rolls through an axial distance equal to about their own effective axial lengths between end positions each engaging only about helf of the respective backup roll; the method comprising the steps of:

selecting from a group of to-be-rolled strips a subgroup of strips comprised generally of pairs of complementarily



width-matched strips wherein the combined width of the strips of each pair is generally equal to the working-roll width;.

feeding to and through the stand the workpieces of the subgroup with the workpiece edges directed axially of the rolls; and

axially positioning the working rolls of the stand such that their ends are axially oppositely offset at one edge of one of the workpieces of each pair and so that the ends are axially oppositely offset and at the opposite edge of the other workpiece of the respective pair.

4,627,261

ROLL STAND WITH AXIALLY SHIFTABLE WORKING ROLLS

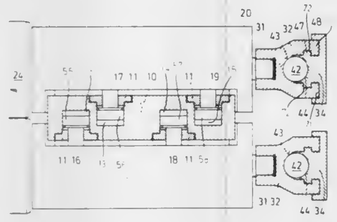
Günter Schiller, Kreuztal, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,777

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409221

Int. Cl.[4] B21B *31/18, 31/32*

U.S. Cl. 72—247 **20 Claims**



1. In a roll stand comprising a plurality of axially shiftable working rolls, each of said working rolls having at least one structural member attached thereto; a plurality of guide pieces, each of said guide pieces having one of said working rolls connected axially slidably thereto by at least one of said structural members, said guide pieces being slidable substantially vertically along at least one cylinder block by at least one balancing hydraulic cylinder mounted in one of said cylinder blocks for balancing and working roll bending, and at least one of said guide pieces is associated with at least one axially shifting hydraulic cylinder which causes said axial shifting of one of said working rolls, the improvement wherein a plurality of said balancing hydraulic cylinders acting upon said structural members having said working rolls connected thereto with balancing and bending forces are positioned in at least one projecting shoulder of said cylinder blocks, said balancing hydraulic cylinders are displaced from each other in a direction parallel to the axes said working rolls, each of said balancing hydraulic cylinders having a balancing cylinder piston rod, said balancing cylinder piston rods of said balancing cylinders taken individually along said direction parallel to said axis of said working rolls projecting alternately downward and upward from said shoulder to engage and act on said guide pieces of said working rolls, said axially shifting cylinder being located in said one of said guide pieces, a shifting cylinder piston rod of said axially shifting hydraulic cylinder being respectively provided with a coupling body attached to the free end of said shifting cylinder piston rod, said coupling body being connected to and providing a means of attachment to a lug jutting out from one of said structural members.

4,627,262

DEVICE FOR OPENING THE ROLL NIP IN AN APPARATUS COMPRISING A PAIR OF ROLLERS

Heinrich Tödter, Nienhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,638

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3339168

Int. Cl.[4] B21B *31/24*

U.S. Cl. 72—248 **5 Claims**

1. A device for rapidly opening the roll nip in an apparatus having a pair of rolls such as a calendar or the like, where each roll has first and second opposed ends, comprising:

(a) bearing blocks for mounting the first and second ends of one of said rolls,

(b) spindle means fixedly attached to each of said bearing blocks, an intermediate portion of said spindle means being exteriorly threaded,

(c) an axially fixed spur wheel positioned around each of said spindle means and internally threaded for engaging the threaded portion of said spindle means, and means for rotating said spur wheel, thereby providing axial adjustment of said spindle means for setting the adjustment of the roll nip, and

(d) auxiliary drive means independent of said spur wheel and directly engaging said spindle means, said auxiliary drive means being constructed and arranged so that when actuated, said auxiliary drive means causes simultaneous, direct and rapid axial movement of both of said spindle means, and thus said bearing blocks, in a direction away from the nip of the rolls, whereby the rolls are maintained out of contact with each other.

4,627,263

METHOD OF AND APPARATUS FOR MAKING SPACERS FOR USE IN MULTIPLE-PANE WINDOWS OR THE LIKE

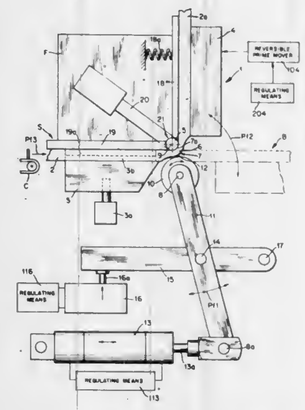
Franz Bayer, Elzach, and Karl Grosch, Wuppertal, both of Fed. Rep. of Germany, assignors to Franz Xaver Bayer Isolierglasfabrik, Elzach, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,444

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312764; Oct. 12, 1983, 3337058

Int. Cl.[4] B21D *9/15*

U.S. Cl. 72—298 **48 Claims**



1. A method of making a spacer for multiple-pane windows or the like, comprising the steps of at least partially filling a deformable circumferentially complete tubular blank with a desiccant; bending the blank through a preselected angle to form an elbow disposed between two neighboring sections and having a radailly inner and a radially outer wall; mechanically pasticizing and lengthening that portion of the blank which is being converted into the outer wall of the elbow; and expelling at least some desiccant from the elbow in the course of the plasticizing step.

4,627,264

CAM ACTUATED EJECTOR FOR A SHELL PRESS

Arthur L. Grow, Versailles; Charles J. Gregorovich, St. Marys, and Donald N. Seyfried, New Bremen, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Division of Ser. No. 455,000, Jan. 3, 1983, Pat. No. 4,513,600. This application Jan. 31, 1985, Ser. No. 696,713

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—345 **10 Claims**

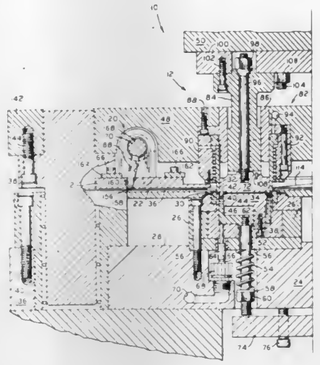
1. In a shell press having a crankshaft for reciprocating a slide adapted for having tooling mounted thereto and a forming station in which said tooling forms a shell, a shell ejector apparatus for ejecting formed shells comprising:

means for lifting a formed shell to a selected plane,

an ejector member having an end portion and being reciprocable in said plane, and

means constantly synchronized with said slide for positively driving said ejector member in said selected plane from a first position in said selected plane wherein said end portion is disposed out of said forming station and spacing from a position in the work station in which a shell to be ejected is normally supported to a second position in said

selected plane wherein said end portion is disposed in said forming station in a space normally occupied by a formed



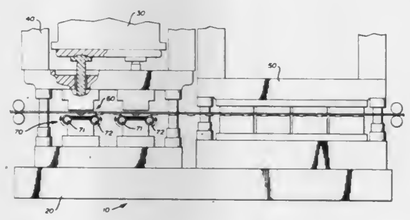
shell to be ejected and from the second position back to the first position.

4,627,265

DOUBLE ACTION CONVERSION SYSTEM

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Aug. 12, 1985, Ser. No. 764,716
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—354 **6 Claims**



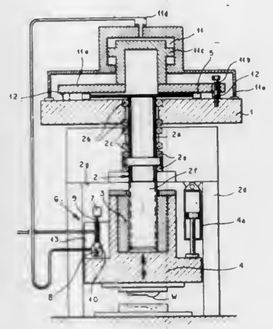
1. A high speed, double acting conversion press having a press frame and press crown for producing easy-open container end pieces from plain end pieces, comprising:
(A) a motor driver crank carried by the press crown;
(B) a press bed;
(C) a first, inner slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed;
(D) a second, outer slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed;
(E) end piece conversion tooling carried by said second, outer slide;
(F) metal scoring tooling carried by said first, inner slide;
(G) a third slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed and disposed in side-by-side relationship with said first and second slides;
(H) tab forming tooling carried by said third slide;
(I) first feed means for advancing container end pieces through the press; and
(J) second feed means for advancing the tabs normally to the path of the end pieces.

4,627,266

SPINDLE PRESS WITH CONTINUOUSLY ROTATING FLYWHEEL

Heinz Siebold, Heidedyk 4, D-4150 Krefeld, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,497
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3322064
Int. Cl.[4] B21J *7/46*
U.S. Cl. 72—444 **8 Claims**



1. A spindle press comprising:
a press frame;
a spindle journaled in said frame and having a threaded portion;
a spindle nut threadedly engaging said threaded portion of said spindle and displaceable parallel to an axis thereof upon rotation of said spindle;
a ram forming a tool and connected to said nut for displacement thereby in a pressing direction upon rotation of said spindle in one sense;
a continuously rotating flywheel journaled on said frame;
a fluid-operated clutch actuatable to couple said flywheel with said spindle for rotating said in said sense;
a control unit including a control mass on said arm movable with at least its principal component of movement in said direction for deactivating said clutch upon retardation of the movement of said ram in said direction, and means applying a restoring force to said mass relative to said ram to return said mass to an original position after inertial displacement of said mass relative to said ram in said direction, said control unit including a valve connected to said clutch and having an actuating rod extending in said direction and movable in said direction, said mass being operatively connected to said rod; and
means varying said restoring force.

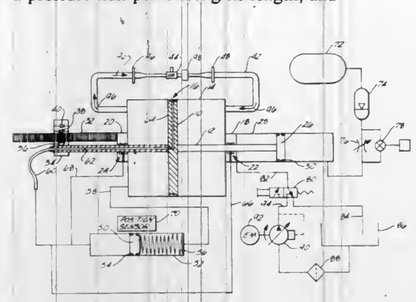
4,627,267

APPARATUS AND METHOD FOR DETERMINING THE FLOW CHARACTERSTIC OF A VOLUMETRIC FLOWMETER

Gary D. Cohrs, Tempe, and Edward E. Francisco, Jr., Paradise Valley, both of Ariz., assignors to Flow Technology, Inc., Phoenix, Ariz.

Filed Jul. 19, 1985, Ser. No. 757,272
Int. Cl.[4] G01F *25/00*
U.S. Cl. 73—3 **7 Claims**

1. A flowmeter calibrator comprising:
a fluid displacement measuring cylinder having at its respective ends an inlet and an outlet;
a fluid displacement measuring member adapted to travel through the measuring cylinder as a fluid barrier;
means for sensing the displacement of the measuring member as it travels through the measuring cylinder;
a fluid line external of the measuring cylinder connected between the inlet and outlet thereof, the fluid line having a pressure null point along its length; and



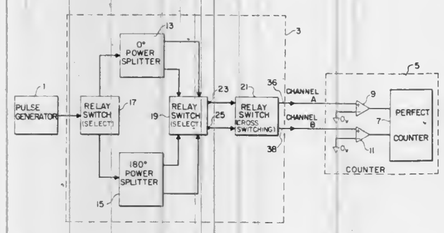
a flowmeter connected in the fluid line at the pressure null point.

4,627,268

METHOD FOR CALIBRATING INSTRUMENTS FOR TIME INTERVAL MEASUREMENTS

David C. K. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1985, Ser. No. 757,220
Int. Cl.[4] G01P *21/00*
U.S. Cl. 73—5 **11 Claims**



1. A method of calibration of a time-interval measuring apparatus having a plurality of signal channels comprising the steps of:
generating a test signal;
passively linearly splitting the test signal to form first and second coherent signals;
simultaneously a.c.-coupling the first coherent signal to a first respective channel and the second coherent signal to a second respective channel;
measuring the time interval between the coherent signals passing through the respective channels at an identical voltage level to provide a first result; and
using the first result to provide a calibration constant for the measuring apparatus.

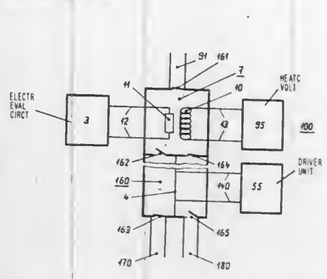
4,627,269

METHOD OF, AND APPARATUS FOR, DETECTING REDUCING GASES IN A GAS MIXTURE

Martin Forster, Jona, and Sigfrid Strässler, Baden-Dättwil, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Mar. 18, 1985, Ser. No. 712,682
Claims priority, application Switzerland, Apr. 4, 1984, 1699/84
Int. Cl.[4] G01N *27/12*
U.S. Cl. 73—23 **121 Claims**

1. A method of detecting at least one reducing gas in a gas mixture to be investigated, particularly in air, said method comprising the steps of:
selecting a gas sensor containing a metal oxide semiconductor possessing a selected property which is dependent on the presence of said at least one reducing gas in said gas mixture;
cyclically varying the temperature of said gas sensor by continuously increasing said temperature from a starting value to an upper threshold value and subsequently decreasing said temperature from said upper threshold value to said starting value;



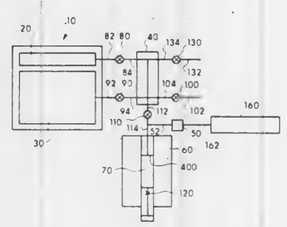
cyclically exposing said gas sensor to said gas mixture to be investigated and at least partially to a reference gas containing a smaller amount or none of said at least one reducing gas, whereby said selected property of said metal oxide semiconductor is subject to a cyclical variation as a function of time; and
measuring said cyclical variation of said selected property of said metal oxide semiconductor.

4,627,270

SYSTEM FOR MEASURING THE PORE VOLUME AND PERMEABILITY OF VERY TIGHT CORE PLUGS AND METHOD THEREFOR

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 6, 1986, Ser. No. 816,608
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **5 Claims**



1. A method for determining the pore volume of very tight core samples with an apparatus having a manifold in selective fluid communication with a sample holder holding said core sample, said sample holder having an outlet, said method comprising the steps of:
(a) sealing the outlet of the sample holder,
(b) pressurizing the manifold volume and the sample holder with a gas to a predetermined pressure, P_{FILL},
(c) sealing the core holder and pressure transducer from the manifold,
(d) waiting for the gas pressure in the core holder to reach a first equilibrium state, P_{E1},
(e) measuring the value of pressure P_{E1},
(f) venting the manifold to atmosphere so that the manifold pressure obtains zero psig,
(g) sealing the manifold in response to said venting so that the sealed manifold contains zero psig,

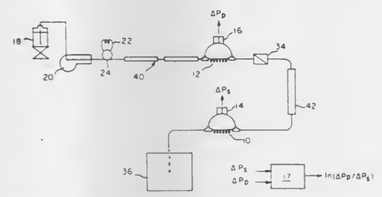
(h) delivering the pressurized gas at said first equilibrium pressure, P_{E1}, from the sample holder into the manifold,
(i) waiting for the delivered pressurized gas to reach a second equilibrium state, P_{E2},
(j) measuring the value of pressure PE2, and
(k) determining the pore volume, V_p, of the core plug in the sample holder based upon the measured values of pressures P_{E1} and P_{E2}.

4,627,271

DIFFERENTIAL PRESSURE CAPILLARY VISCOMETER FOR MEASURING VISCOSITY INDEPENDENT OF FLOW RATE AND TEMPERATURE FLUCTUATIONS

Scot D. Abbott, and Wallace W. Yau, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 669,017, Nov. 7, 1984, Pat. No. 4,578,990. This application Oct. 31, 1985, Ser. No. 792,041
Int. Cl.[4] G01N *11/04*
U.S. Cl. 73—55 **35 Claims**



1. A method of measuring either the intrinsic or inherent viscosity of a solute in solution with a solvent which is independent of flow rate and temperature fluctuations comprising the steps of:
passing the solvent through a first capillary tube,
passing the solution through a second capillary tube connected in series with the first capillary tube,
measuring separately the pressure drop ΔP_s across the first capillary tube and the pressure drop ΔP_p across the second capillary tube when each is full of flowing solvent and solution, respectively,
generating signals corresponding to the pressure drop across each capillary tube, and
feeding said signals to an amplification means selected from the group consisting of an analog divider or a high speed computer based on real time signal processing which processes the ratio of $\Delta P_p/\Delta P_s$ in real time for use in measuring either the intrinsic or inherent viscosity of the solute wherein the viscosity measured is independent of flow rate and temperature fluctuations.

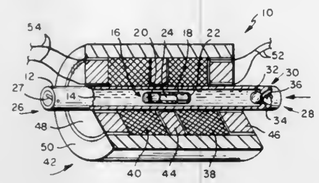
4,627,272

VISCOMETER

Hubert A. Wright, Cambridge, Mass., assignor to Cambridge Applied Systems, Inc., Cambridge, Mass.

Filed Nov. 28, 1984, Ser. No. 675,536
Int. Cl.[4] G01N *11/12*
U.S. Cl. 73—57 **23 Claims**

1. A viscometer comprising:
A. a bobbin including ferromagnetic material;
B. guide means for guiding the bobbin between first and second positions through a fluid whose viscosity is to be measured;
C. bobbin-driving means for driving the bobbin from the first position to the second position with a predetermined force;
D. first and second coils disposed adjacent the guide means and oriented with respect thereto so that the mutual inductance between the first and second coils changes as a function of bobbin position; and
E. means for monitoring the mutual inductance, measuring the time from the time at which the bobbin leaves the first position to the time at which the monitored inductance reaches the point in its position function that corresponds



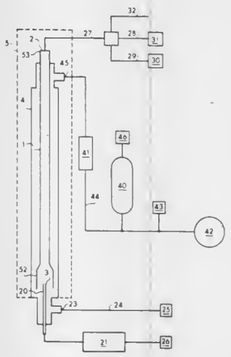
to the second position, and generating an indication of that time measurement, thereby indicating the viscosity of the fluid.

4,627,273

APPARATUS AND METHOD FOR DETERMINING THE MINIMUM MISCIBILITY PRESSURE OF A GAS IN A LIQUID

Richard L. Christiansen, and Hiemi Kim, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 28, 1985, Ser. No. 770,819
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—61.1 R **30 Claims**



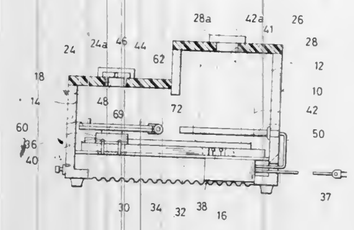
1. An apparatus for measuring the minimum miscibility pressure of a gas in a liquid comprising:
a substantially enclosed transparent pressure vessel;
a transparent tube having an open bottom and a closed top;
said tube mounted such that said pressure vessel substantially encloses said tube in a substantially constant pressure environment and the interior of said tube directly fluid communicates with the interior of said vessel essentially only via said open bottom;
a liquid feed means connected to said tube substantially above said open bottom for placing said liquid directly into said tube;
a bubble injection means directed into said open bottom of said tube for injecting a bubble formed from said gas into said tube via said open bottom;
a gas discharge means connected to said tube substantially above said open bottom and said bubble injection means for discharging said bubble from said tube; and
a pressure maintenance means in fluid communication with said vessel and said tube for maintaining said substantially constant pressure environment in said vessel and tube by automatically responding to the injection of said bubble into said tube.

4,627,274

APPARATUS FOR TESTING STABILITY OF HEAVY OIL

Takao Nagasawa, Kuwasaki, and Satoru Uchida, Matsudo, both of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Jun. 21, 1985, Ser. No. 749,471
Claims priority, application Japan, Jun. 27, 1984, 59-95266; Jun. 3, 1985, 60-82518
Int. Cl.[4] G01N *33/28*
U.S. Cl. 73—64 **20 Claims**



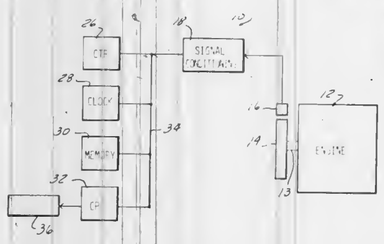
1. An apparatus for testing the stability of heavy oil, which comprises one case body within which a sample heating tank and an air bath tank, communicating with each other, are arranged in the lateral direction, at least one electric heating means arranged horizontally in the bottom portion of the case body, a temperature detecting element for detecting the temperature of air in said air bath tank, temperature control means for controlling the quantity of an electric current supplied to said heating means based on the detection value of said temperature detecting element so that the air temperature in said air bath tank is maintained at a predetermined level, a filter paper arranged in said air bath tank, on which a sample is dropped, filter paper holding means for maintaining said filter paper at a predetermined height in said air bath tank, a first cover covering the top face of said simple heating tank of said case body and having an opening in which the open top end portion of a sample vessel arranged in said heating tank is inserted, and a second cover covering the top face of said air bath tank of said case body and having a sample dropping opening, wherein a heavy oil sample heated in the sample vessel is dropped on the filter paper and the stability of heavy oil is determined based on the state of the spreaded heavy oil sample on the filter paper.

4,627,275

ENGINE DEFICIENCY INDICATOR

Naeim A. Henein, Grosse Pointe Shores, and Arun K. Sood, Southfield, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed May 7, 1984, Ser. No. 607,570
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—112 **14 Claims**



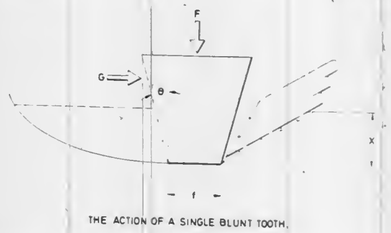
1. An apparatus for indicating deficient engine operation comprising:
means for continuously detecting a pre-determined amount of angular rotation of a rotatable component of an engine;
means, responsive to the detecting means, for continuously determining the time period of each pre-determined amount of engine rotation;
processing means, responsive to the determining means, for continuously generating a manifestation of engine efficiency and deficiency based on each time period; and
display means, responsive to the processing means, for continuously indicating the efficiency or deficiency of engine operation.

4,627,276

METHOD FOR MEASURING BIT WEAR DURING DRILLING

Trevor M. Burgess, and William G. Lesso, Jr., both of Missouri, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,851
Int. Cl.[4] E21B *12/00*
U.S. Cl. 73—151 **4 Claims**



1. A method of monitoring the wear of the teeth of milled tooth bits while drilling in formations that drill by a gouging and a scraping action comprising the steps of
measuring the weight on the bit, the torque required to rotate the bit, and the speed of rotation of the bit;
calculating the rate of penetration R in distance drilled per unit of time;
calculating the dimensionless torque T_D from the equation, $T_D=M/Wd$, where M is the measured torque, W is the weight on the bit, and d is the bit diameter using appropriate dimensions to produce a dimensionless T_D;
calculating the dimensionless rate of penetration R_D from the equation, $R_D=R/Nd$, where R is the rate of penetration, N is the rate of rotation of the drill pipe, and d is the diameter of the bit, using appropriate dimensions to produce a dimensionless R_D;
empirically determining the values of constants a_1 and a_2 for a sharp drill bit by plotting T_D vs R_D from data collected for a sharp drill bit, with a_1 being the intercept of the T_D axis and a_2 being the slope of the line through the plotted points; and
determining bit efficiency from the equation $E_D=(T_D-a_2 R_D)/a_1$; and
pulling the bit when the bit efficiency drops to a preselected amount.

4,627,277

MAGNET SELECTOR OR SWITCH

John S. Baer, Bar Harbor, Me., assignor to RainWise, Inc., Bar Harbor, Me.

Filed May 17, 1985, Ser. No. 735,372
Int. Cl.[4] G01W *1/04*; H01H *36/00*
U.S. Cl. 73—170 R **19 Claims**

1. A magnet switch for switching an electronic circuit device in a housing comprising:
at least one reed switch incorporated in said electronic circuit device in proximity to a horizontal surface of the housing;
an elongate sliding groove or sliding channel formed in said horizontal surface of the housing above the reed switch, said sliding channel having a cross sectional profile open

at the top; and a magnet element removable and replaceable in the sliding channel through the open top of the sliding channel, said magnet element being seated in the sliding channel for sliding motion back and forth along the sliding channel, said magnet element being magnetized

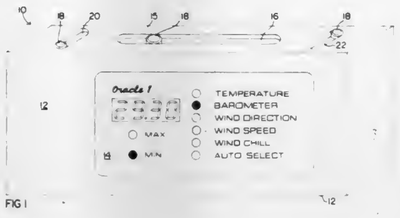


FIG 1

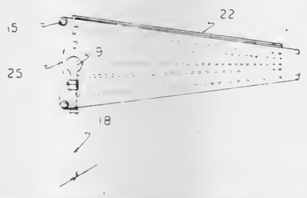
with magnetic lines of force extending into the housing below the magnet element when the magnet element is seated in the sliding channel for magnetic actuation of the reed switch according to the position of the magnet element in the sliding channel.

4,627,278

ILLUMINATED WIND SOCK

Henry L. Soto, 2030 Mission St., San Francisco, Calif. 94110

Filed Apr. 25, 1985, Ser. No. 727,321
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—188 **3 Claims**



1. An illuminated wind sock apparatus wherein the apparatus comprises:

a wind sock unit including an elongated tapered tubular sock member mounted on a framework member which is rotatably disposed on a pole member;

an illumination unit comprising at least one source of illumination disposed within the interior of the said tubular sock member; and

a fiber optic unit comprising a plurality of fiber optic members disposed on the exterior of the tubular sock member and having one end exposed to the light emanating from said at least one source of illumination.

4,627,279

DIRECT-HEATED GAS-FLOW MEASURING APPARATUS

Minoru Ohta, Okazaki; Kazuhiko Miura, Aichi; Seizi Huzino, Anjo; Kenji Kanehara, Aichi, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

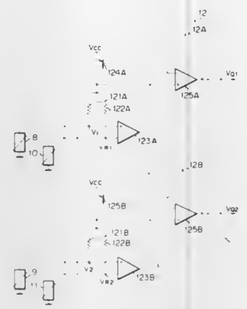
Filed May 2, 1985, Ser. No. 729,855
Claims priority, application Japan, May 9, 1984, 59-91042
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—195 **13 Claims**

1. A direct-heated gas-flow measuring apparatus for measuring the gas-flow rate within a passage, comprising:

two parallel supporting members disposed within said passage;

a plurality of film resistors for generating heat and detecting the temperature thereof, said film resistors extending between said supporting members to expose both surfaces of each of said film resistors to the gas-flow;

feedback control means, connected to said film resistors, for controlling the heat generated by each of said film resistors so that the temperature of each of said film resistors is a predetermined value, said feedback control means generating a plurality of output signals corresponding to voltages applied to said film resistors; and



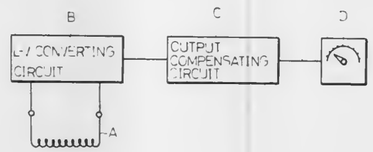
calculating means, connected to said feedback control means, for calculating a mean value of said plurality of output signal generated by said feedback control means, the mean value indicating the amount of gas-flow rate.

4,627,280

INDUCTANCE LIQUID LEVEL METER

Chikahisa Hayashi; Makoto Kawai, and Mikio Adachi, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 30, 1985, Ser. No. 739,476
Claims priority, application Japan, May 31, 1984, 59-112277; May 31, 1984, 59-112278; May 31, 1984, 59-112279; May 31, 1984, 59-112280; May 31, 1984, 59-81247[U]; May 31, 1984, 59-81248[U]; May 31, 1984, 59-81249[U]
Int. Cl.[4] G01F *23/76;* G01R *33/00*
U.S. Cl. 73—290 R **17 Claims**



1. A liquid level meter comprising:

(a) a core, and a coil wrapped therearound, the coil having an external circumference and extending in a longitudinal direction,

(b) a float which is provided at the external circumference of the coil so that it can move in the longitudinal direction thereof along the core and which has a conductor ring located around an inner circumference thereof so that the conductor ring is adjacent to different longitudinal areas of the coil depending on the fluid level,

(c) detector means for detecting a change of inductance of the coil caused by eddy current loss within the coil when the conductor ring is adjacent to different longitudinal areas of the coil,

(d) converting means for converting the change of inductance detected by the detector means into a change of voltage, and

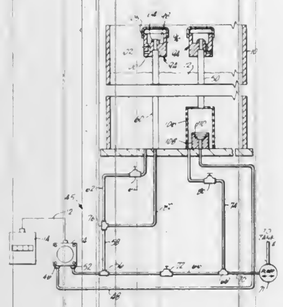
(e) an indicator of liquid level which is driven by a drive circuit based on a voltage of the converting means.

4,627,281

TANK GAGING SYSTEM

John A. Tavis, Mariposa, Calif., assignor to Tavis Corporation, Mariposa, Calif.

Filed May 10, 1985, Ser. No. 732,686
Int. Cl.[4] G01F *23/16, 23/18*
U.S. Cl. 73—302 **8 Claims**



1. An apparatus for measuring the level of a liquid in a tank, comprising:

a differential pressure transducer;

a first standpipe adapted to be filled with the liquid to a high level reference height in a first mode and to be placed in fluid communication with the liquid in the tank such that the liquid level in the standpipe will be the same as that in the tank in a second mode;

a second standpipe adapted to be filled with the liquid to the high level reference height in a first mode and to be drained of the liquid to a low level reference height in a second mode;

means allowing the transducer to compare, at different selected times, the pressure exerted by the liquid in the first standpipe in the first mode with the pressure exerted by the liquid in the second standpipe in the first mode for zero-drift check, the pressure exerted by the liquid in the first standpipe in the first mode with the pressure exerted by the liquid in the second standpipe in the second mode for sensitivity drift check, and the pressure exerted by the liquid in the first standpipe in the second mode with the pressure exerted by the liquid in the second standpipe in the second mode for measuring an output representative of the liquid level in the tank; and

means for selectively filling and draining the standpipes to achieve the several modes.

4,627,282

FLUID LEVEL SENSOR

Douglas I. Fales, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1985, Ser. No. 809,228
Int. Cl.[4] G01F *23/16*
U.S. Cl. 73—302 **2 Claims**

1. An apparatus for indicating the level of fluid in a tank, the apparatus comprising, in combination:

a casing disposed at the bottom of the tank and having opposed surfaces;

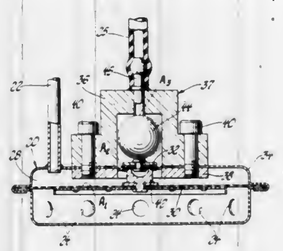
first and second diaphragms carried by the opposed surfaces of the casing, the casing and the first and second diaphragms forming an atmospheric chamber isolated from the fluid, the external surfaces of the chamber being exposed to the fluid pressure at the bottom of the tank, the fluid exerting a force equal to $A_1 * P_f$ on the first diaphragm and an opposing force $A_2 * P_f$ on the second diaphragm, where A_1 is the area of the first diaphragm, A_2 is the area of the second diaphragm and P_f is the fluid pressure per unit area at the bottom of the tank and which is proportional to the level of the fluid in the tank;

a valve including a moveable valve member and a valve seat having an area A_3;

means for transmitting the net force $P_f(A_1 - A_2)$ exerted by the fluid on the first and second diaphragms to the valve member in a sense tending to seat the valve member against the valve seat;

an output pressure line coupled between the pressure gage and the valve seat, the output pressure line being vented to the tank when the valve member is unseated from the valve seat;

a fluid pump for pumping fluid under pressure from the tank;



a fluid flow restrictor;

means for coupling the liquid under pressure to the output pressure line through the fluid flow restrictor to pressurize the output pressure line, the fluid pressure in the output pressure line generating a force equal to $P_g * A_3$ on the valve member tending to unseat the valve member from the valve seat, where P_g is equal to the pressure per unit area of the fluid in the output pressure line, the valve member being moved by the forces acting thereon to modulate the pressure P_g in the output pressure line to a value substantially equal to $P_f(A_1 - A_2)/A_3$; and

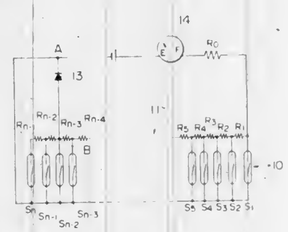
a pressure gage responsive to the fluid pressure in the output pressure line for providing a measure of the fluid level in the tank.

4,627,283

FUEL LEVEL DETECTOR FOR AUTOMOBILE FUEL TANK

Katsuhiko Nishida, Toyota; Tokio Naruse, and Hiroshi Shibata, both of Chiryu, all of Japan, assignors to Tsuchiya Co., Ltd., Nagoya, Japan

Filed Oct. 28, 1985, Ser. No. 791,711
Claims priority, application Japan, Aug. 13, 1985, 60-123589[U]
Int. Cl.[4] G01F *23/62;* H01H *35/18*
U.S. Cl. 73—313 **4 Claims**



1. A fuel level dectector for an automobile fuel tank comprising a struct vertically provided with the fuel tank, a float slidably fitted around the strut and having a permanent magnet therein, a plurality of magnetic induction type reed switches

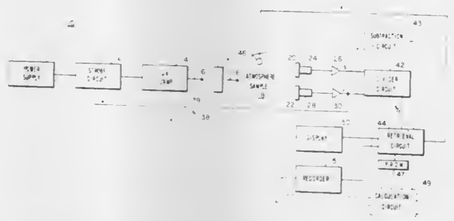
disposed along the strut and inclined relative thereto, the distance between the adjacent switches being such that the permanent magnet of said float always actuates two adjacent reed switches simultaneously, a plurality of resistances each respectively connected to said plurality of reed switches for changing current value according to said reed switches which are actuated, a residual quantity warning means comprising a light emitting body connected between a ground and a predetermined reed switch and the respective resistance among the plurality of reed switches for changing the brightness thereof as said float falls below said predetermined reed switch, and a distance retention mechanism for keeping constant a distance between said predetermined reed switch and the bottom surface of the fuel tank, said mechanism comprising a guide mounted to a base member for vertically guiding the strut and a spring mounted between the base member and the strut for urging the strut towards the bottom surface of the fuel tank.

4,627,284

ULTRAVIOLET ABSORPTION HYGROMETER

Michael E. Gersh, Bedford; Fritz Bien, Concord, and Lawrence S. Bernstein, Bedford, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Jul. 22, 1985, Ser. No. 757,165
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—336.5 **31 Claims**



1. An ultraviolet absorption hygrometer comprising:
a source of pulsed ultraviolet radiation for providing in each pulse radiation both in a first wavelength region where water absorbs significantly, and in a second proximate wavelength region where water absorbs weakly;
means for detecting ultraviolet radiation respectively in said first and second regions transmitted through a single sample path of gas;
means, responsive to said means for detecting, for comparing the intensity of the radiation transmitted in each of the first and second regions; and
means, responsive to said means for comparing, for determining the amount of water in the sample path.

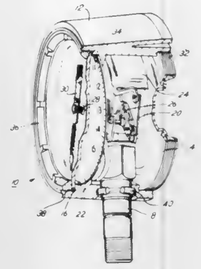
4,627,285

POINTER FOR LIQUID FILLED GAUGES

Edwin H. King, P.O. Box 67, Newburgh, Ind. 47630

Filed Apr. 2, 1985, Ser. No. 718,892
Int. Cl.[4] G01D *11/10*
U.S. Cl. 73—430 **2 Claims**

1. An improved construction for measuring the temperature or pressure of a fluid filled gauge, comprising, in combination:
a gauge enclosure, the enclosure being attached to a fluid source to be measured and filled with a damping liquid;
a unitary pointer constructed from a single strip of material, the pointer indicating by its rotation the temperature or the pressure of the measured fluid and being configured to resist rotational motion of the pointer by increasing the drag on the pointer against the liquid filling the enclosure during the gauge operation and resulting pointer movement, the pointer having at least one generally flat surface positioned approximately perpendicular to the pointer's plane of rotation, with at least one segment of the pointer's flat surface being twisted to be perpendicular to the pointer's axis of rotation to form the generally flat and approximately perpendicular surface, whereby increased drag on the pointer against the damping liquid results during pointer rotation; and



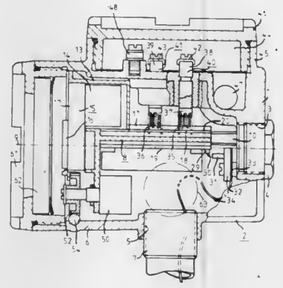
a mechanism adapted to rotate the pointer in response to temperature or pressure changes in the fluid source to be measured, whereby pointer fluctuation is dampened and resulting damage and wear to the mechanism from vibration related stress is reduced.

4,627,286

PRESSURE OR PRESSURE DIFFERENCE MEASURING INSTRUMENT

Horst Pehlgrim, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,229
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 8407656[U]
Int. Cl.[4] G01L *19/14*
U.S. Cl. 73—431 **11 Claims**



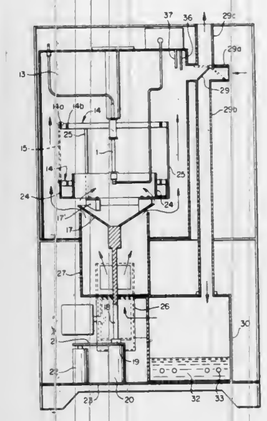
1. A pressure or pressure difference measuring instrument having a pot-like housing in which is accommodated at least one electronic circuit part and having an opening in one end of the pot-like housing for fastening a sensor for the detection of the pressure or pressure difference, the at least one electronic circuit part comprising a planar subassembly and being insertable into the pot-like housing by guide means disposed along the inside wall of the housing, the guide means extending in a plane parallel to the longitudinal axis of the instrument, the pot-like housing having at least one other opening to fasten the sensor in a wall thereof in an area below the planar subassembly.

4,627,287

LIGHT-RESISTANCE TESTER FOR MAINTAINING UNIFORM TEMPERATURE AT SURFACE OF SAMPLE

Shigeru Suga, 20-2, Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,845
Claims priority, application Japan, Oct. 20, 1984, 59-226766
Int. Cl.[4] G01N *17/00*
U.S. Cl. 73—865.6 **5 Claims**



1. A light resistance tester for maintaining a uniform temperature of the surface of a sample being tested, comprising:
a testing chamber;
a light source mounted in the center of said testing chamber;
an annular sample mounting frame positioned around said light source and rotatable around said light source as the center of rotation;
air circulation means mounted in the lower portion of said testing chamber below said sample mounting frame and circulating air upwardly in said testing chamber toward said sample mounting frame; and
an air flow divider between said sample mounting frame and said light source for dividing the upward flow of air from said air circulation means into a portion flowing in an upward path within said sample mounting frame and spaced inwardly from samples mounted on said frame and around said light source, and a portion flowing along an upward path along the outside of said sample mounting frame.

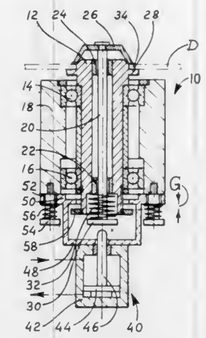
4,627,288

BEARING UNLOADING MECHANISM FOR DISC CLAMPING UNIT

Nahum Guzik, Mountain View; John L. Guerini, San Jose, and Semyon Sherstinsky, San Francisco, all of Calif., assignors to Guzik Technical Enterprises, Sunnyvale, Calif.

Filed Aug. 12, 1985, Ser. No. 764,413
Int. Cl.[4] G01M *1/19*
U.S. Cl. 73—432.1 **13 Claims**

1. A bearing unloading mechanism for a disc clamping unit, comprising:
stationary casing means;
hollow spindle means rotatably mounted in said stationary casing means;
disc support means mounted on said spindle means;
a disc clamping element;
a longitudinal element slidingly arranged in said hollow spindle means and attached to said disc clamping element;
first resilient means mounted between said hollow spindle means and said longitudinal element, said first resilient means normally urging said first resilient means in a direction which urges said attached disc clamping element to said disc support means;
moveable casing means;
an actuator rigidly attached to said moveable casing means, said actuator having a working element positioned to engage said longitudinal element so that when said actuator is in an actuated position, it overcomes the force of said first resilient means and releases said disc clamping element from said support means; and



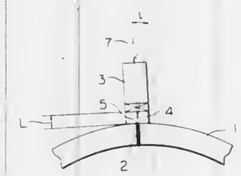
moveable connection means moveably connecting said stationary casing means to said moveable casing means so that when said actuator is in an actuated position, a floating system is formed of said actuator, said moveable casing means, said longitudinal element, said hollow spindle means, said disc support means, said disc clamp element, and said first resilient means.

4,627,289

METHOD FOR THE ULTRASONIC FLAW DETECTION OF AN ELECTRIC WELDED PIPE

Shinichi Fukuda; Masaki Kajiyama, and Takeshi Ikemoto, all of Hikari City, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,425
Claims priority, application Japan, Nov. 6, 1984, 59-232491
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 **3 Claims**



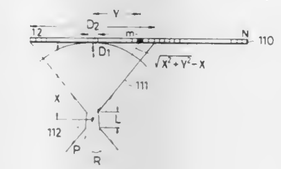
1. A method for ultrasonic flaw detection of flaws in the weld zone of an electric resistance welded pipe, comprising:
projecting an ultrasonic wave beam having a frequency in the range of 25 MHz to 500 MHz onto the outer surface of said weld zone at an angle of incidence to a perpendicular to the tangent to said pipe at the weld zone, which angle is between 0° and 12°,
whereby cold weld defects, inclusions and penetrators in the weld zone are detected.

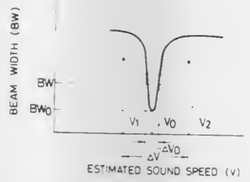
4,627,290

METHOD AND APPARATUS FOR DETECTING ACOUSTIC HOMOGENEITY OF OBJECT

Toshio Ogawa, Nishitama; Kageyoshi Katakura, Meguro, and Shinichiro Umemura, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,157
Claims priority, application Japan, Apr. 13, 1984, 59-72838
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—628 **4 Claims**





1. A method of detecting the acoustic homogeneity of an object, comprising:

transmitting a pulsating sound wave beam into an object using an array-type transducer which consists of a plurality of elements, and receiving the reflected waves using said transducer while electronically focusing the reflected waves, the sound waves being transmitted and reflected repeatedly;

adjusting the degree of electronic focusing at the time of repetitively transmitting and receiving the sound wave beam so that the focal point of the receive wave beam is made coincident with a specified reflector in said object;

detecting the beam width of the sound wave beam at the specified reflector from the detector signals produced by said transducer after the focal point has been made to coincide with said reflector; and

utilizing said detected beam width as an index to represent the acoustical homogeneity of said object.

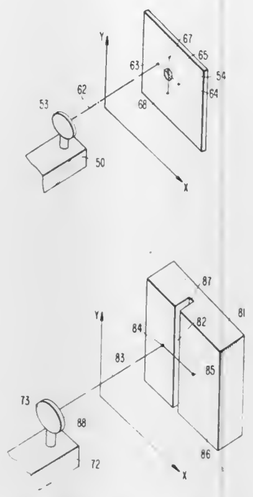
4,627,291

POSITION SENSING APPARATUS FOR AN OBJECT TO BE MEASURED

Toshinori Otsuki, Yawata, and Teruo Maruyama, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP84/00287, § 371 Date Feb. 1, 1985, § 102(e) Date Feb. 1, 1985, PCT Pub. No. WO84/04961, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 5, 1984, Ser. No. 705,470
Claims priority, application Japan, Jun. 6, 1983, 58-101113; Jun. 24, 1983, 58-114527; Nov. 8, 1983, 58-210210
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—634 **4 Claims**

1. A position sensing apparatus for an object to be measured which comprises: a first means including an ultrasonic wave transmit-receive element for transmitting an ultrasonic wave to the object to be measured and for receiving a reflected wave therefrom; a second means for maintaining said ultrasonic wave transmit-receive element at a predetermined distance from said object and for effecting a linear movement of said element with respect to said object, said element having a wave transmit-receive surface which is inclined at a predetermined angle of inclination with respect to a measured surface



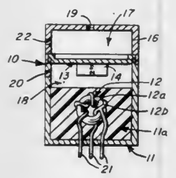
of said object; and a third means for detecting a center position of a bore or groove formed in said measured surface of said object by utilizing a change in intensity of a signal corresponding to said reflected wave from said measured surface.

4,627,292

AC TRANSDUCERS, METHODS AND SYSTEMS

Stephen A. Dekrone, Chesapeake, Va., assignor to Randek Inc., Richmond, Va.

Filed Jul. 3, 1984, Ser. No. 627,667
Int. Cl.[4] G01L *7/08, 9/10*
U.S. Cl. 73—728 **40 Claims**



1. A pressure transducing device comprising a movable wall to receive at least one variable applied pressure to be measured, and movable in response thereto, magnet means associated with said movable wall for movement therewith, and a toroidal inductor adjacent thereto, the position of said magnet means being generally radial of said toroidal inductor and being directly related to the applied pressure, said toroidal inductor comprising a toroidal core upon which is wound coil means of suitable inductance, said coil means being configured to allow sinusoidal excitation of a portion thereof from an external source and formed as a transformer, wherein an applied pressure will cause said magnet to continuously variably coerce the magnetic flux contained within the aforementioned toroidal core to effect a measurement of the variable pressure, the variation in such coercion being dependent upon the radial separation of said magnet means and said toroidal core thereby

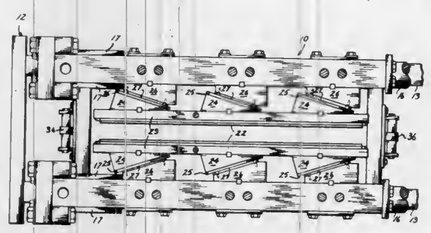
continuously varying the toroidal inductor output amplitude from a second portion of said coil means when said first coil portion is excited.

4,627,293

APPARATUS FOR TENSION TESTING OF LUMBER

Friend K. Bechtel, Moscow, Id., assignor to Metriguard, Inc., Pullman, Wash.

Filed Oct. 3, 1985, Ser. No. 783,469
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—831 **2 Claims**



1. An apparatus for longitudinal strength testing of lumber, comprising:

grip plate means for engaging opposite surfaces of a board at two longitudinally spaced locations along its length;

force means operably connected to the grip plate means for selectively applying a progressively increasing longitudinal tensile force to the board engaged thereby in a direction parallel to its engaged surfaces;

wedge means interposed between said force means and said grip plate means for applying a transverse clamping force to the grip plates that varies as a function of the tensile force applied to the board engaged by said grip plate means;

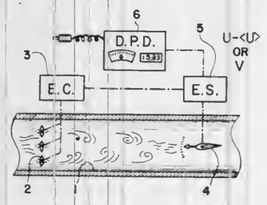
said wedge means includes an inclined bearing surface area of polytetrafluoroethylene sliding against steel arranged at a wedge angle relative to the engaged surfaces of the board between relatively movable elements operably connected to said force means and to said grip plate means respectively, said inclined bearing surface area having a coefficient of friction that progressively decreases with increasing load in a direction normal to the inclined bearing surface area as tensile force is applied to the board engaged by said grip plate means, to progressively increase the ratio of the clamping force to the tensile force in a non-linear manner at a decreasing rate as the tensile force applied to the board is increased.

4,627,294

PULSED EDDY FLOW METER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Aug. 12, 1985, Ser. No. 764,890
Int. Cl.[4] G01F *1/72*
U.S. Cl. 73—861.05 **14 Claims**



1. A pulsed eddy flow meter comprising in combination:

(a) a flow passage;

(b) an eddy generating means disposed within said flow passage at one section of said flow passage wherein the generation of eddies in fluid medium flowing across said one section of said flow passage is enhanced when said eddy generating means is in an activated state and the generation of eddies in fluid medium flowing across said one section of said flow passage is suppressed when said eddy generating means is in a deactivated state;

(c) an eddy sensing means disposed within said flow passage at another section of said flow passage downstream from said one section;

(d) a transducer converting mechanical effect of eddies on said eddy sensing means to an electric signal;

(e) a controller receiving said electrical signal from said transducer, said controller imposing one state out of said activated state and said deactivated state on said eddy generating means wherein said controller automatically imposes said activated state following a deactivated state of a predetermined duration and imposes said deactivated state at an instant when said eddy sensing means detects an eddy of an intensity greater than a thresh-hold intensity, which thresh-hold intensity is greater than the intensity of eddies generated by said eddy generating means at said deactivated state and is less that the intensity of eddies generated by said eddy generating means at said activated state; and

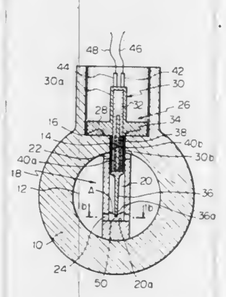
(f) means for obtaining a representative fluid velocity by dividing the distance between said eddy generating means and said eddy sensing means by the duration of the imposition of the most recent activated state.

4,627,295

VORTEX FLOW METER

Naoki Matsubara; Hideo Numata, and Yutaka Ogawa, all of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 554,155, Nov. 15, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 821,222
Claims priority, application Japan, Nov. 25, 1982, 57-206800; Nov. 25, 1982, 57-206801; Jul. 26, 1983, 58-116935[U]; Jul. 26, 1983, 58-116936[U]; Jul. 26, 1983, 58-116937[U]; Sep. 22, 1983, 58-146388[U]
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **18 Claims**



1. A vortex flow meter for measuring the flow rate of a fluid flowing through an internal space of a conduit by sensing the pressure variation which occurs in proportion to the flow rate, said vortex flow meter comprising, in combination:

(a) a bluff body disposed in the internal space of the conduit to face the flow of the fluid and having a pressure sensing chamber defined in an internal space of said bluff body for sensing the pressure variation due to vortices generated by the flow of the fluid, said pressure sensing chamber having an upper pressure induction passageway and a lower pressure induction passageway;

(b) a pressure receiving member disposed in the internal

space of said bluff body to mechanically oscillate or displace in response to the pressure variation, said pressure receiving member comprising a flat pressure receiving plate which protrudes into the pressure sensing chamber to bisect the chamber;

(c) a cylindrical member mounted in and extending through a wall portion of the conduit and connected to the pressure receiving member at a lower end of the cylindrical member, said cylindrical member having an internal space; and

(d) a pressure sensor member disposed in said internal space of said cylindrical member such as to prevent said pressure sensor member from being contacted by the fluid flow in said conduit, said pressure sensor member having imparted thereto the mechanical displacement of said pressure receiving plate to thereby measure the flow rate in said conduit, said pressure sensor member comprising a resilient substrate, a converter element for converting the mechanical displacement of said pressure receiving plate due to the vortices to an electrical signal, said converter element being bonded to at least one of opposite surfaces of said substrate, and an electrically insulative filling agent for fixing said substrate and converter element in the internal space of said cylindrical member.

17. A vortex flow meter for measuring a flow rate of a fluid flowing through an internal space of a conduit by sensing a pressure variation which occurs in proportion to the flow rate, said vortex flow meter comprising:

(a) a bluff body disposed in the internal space of the conduit to face the flow of the fluid and having a pressure sensing chamber defined in an internal space thereof, said pressure sensing chamber having an upper pressure induction passageway and a lower pressure induction passageway;

(b) a pressure receiving member disposed in the internal space of said bluff body to be displaceable in response to the variation;

(c) a drain port in the pressure sensing chamber in a position lower than the lower pressure induction passageway and lower than a free end of the pressure receiving member, whereby part of the fluid tending to deposit on a bottom wall of the pressure sensing chamber is discharged;

(d) a wall rising from a central portion of the bottom wall of the pressure sensing chamber to regulate a clearance which is defined between the pressure receiving member and the bottom wall;

(e) a sensor member arranged to be positioned in a wall portion of the conduit and outwardly thereof; and

(f) a cylindrical member mounted in the wall portion of the conduit and connected to the pressure receiving member at a lower end thereof, said cylindrical member accommodating the sensor member fixed in place in an internal space thereof.

4,627,296

SHUNT CALIBRATION SYSTEM FOR A TRANSDUCER MOUNTED ON A ROTATING MEMBER

Paul W. Morgan, Pontiac, and Kish Amlani, Troy, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,066

Int. Cl.⁴ G01L *3/02*

U.S. Cl. 73—862.33 **8 Claims**

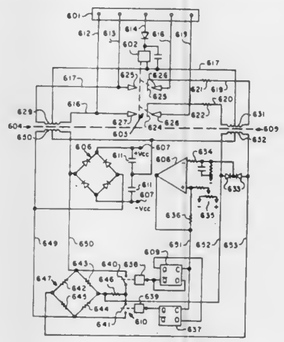
1. In a transducer system including a rotatable shaft, a transducer mounted on said rotatable shaft, a rotary transformer means including a rotor member operatively associated with said rotatable shaft for rotation therewith and a stationary stator member, said rotary transformer means coupling a transducer output signal between said rotor member and said stator member without physical contact, the improvement of a selectively operable shunt calibration system comprising:

a. impedance means secured to said rotatable shaft for rotation therewith,

b. switch means mounted on said rotatable shaft for rotation therewith, said switch means operable for coupling said impedance means across at least a first part of said transducer,

c. means for generating first and second encoded signals and transmitting the first and second encoded signals from the stator member to the rotor member through said rotary transformer means to control the actuation of the switch means, and

d. switch actuating means mounted on said rotor member for operating said switch means and said switch actuating



means being connected to receive the first and second encoded signals and said transducer output signal, said first and second encoded signals being distinguished from said transducer output signal by amplitude, said switch actuating means causing said switch means to couple and decouple said impedance means to at least said first part of said transducer in accordance with the first and second encoded signals, said first and second encoded signals being pulse encoded and being distinguished from one another by time sequence.

4,627,297

APPARATUS FOR MEASURING THE MAGNITUDE OF A LOAD

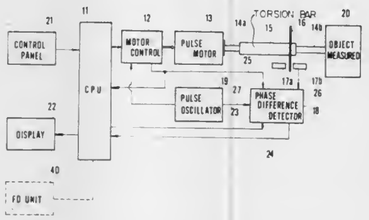
Shigeyuki Akimoto, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,148

Claims priority, application Japan, Jul. 12, 1984, 59-143217

Int. Cl.⁴ G01L *3/12*

U.S. Cl. 73—862.34 **6 Claims**



1. An apparatus for measuring the magnitude of a load connected to a drive shaft, comprising:

drive shaft rotating means for intermittently driving the drive shaft into rotation in response to a drive signal of a changing level;

drive transmission means connecting the drive shaft to the load and rotated by the drive shaft for transmitting rotation of the drive shaft to the load;

displacement means provided in a section of said drive transmission means for being rotatively displaced by the load by an amount corresponding to the magnitude of the load;

sensing means for sensing the rotational position of said displacement means on a side thereof at which said transmission means is connected to the load, and for producing an output signal indicative of said rotational position;

phase difference detecting means for detecting a phase difference between the output signal of said sensing means and the drive signal; and

calculating means for calculating the magnitude of the load based on the phase difference detected by said phase difference detecting means.

4,627,298

TORQUE SENSOR OF THE NONCONTACT TYPE

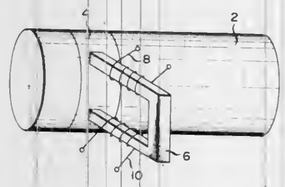
Masashi Sahashi, Fujisawa; Koichiro Inomata, and Tadahiko Kobayashi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 24, 1984, Ser. No. 643,703

Claims priority, application Japan, Aug. 30, 1983, 58-158717; Sep. 17, 1983, 58-164857; Dec. 8, 1983, 58-230580

Int. Cl.⁴ G01L *3/10*

U.S. Cl. 73—862.36 **10 Claims**



1. A torque sensor of a noncontact type for sensing a rotary torque applied to a shaft, comprising:

a first film shaped magnetic ribbon bonded to the shaft along the circumferential direction of the shaft, said ribbon comprising a magnetic material having a previously induced magnetic anisotropy in a direction of an angle θ to the circumferential direction of the shaft;

a first core member formed of a magnetic material and having end faces opposite to said ribbon bonded to said shaft;

a first exciting coil wound around said first core member for producing a magnetic flux; and

a first detecting coil wound around said first magnetic core member for detecting a magnetic flux produced by the first exciting coil and introduced to the core member through said ribbon along the circumferential direction of the shaft and generating an output signal.

4,627,299

ENGINE STARTER GEARING

Harold R. Mortensen, Sr., Murfreesboro, N.C., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Dec. 20, 1984, Ser. No. 684,663

Int. Cl.⁴ F02N *15/06*

U.S. Cl. 74—7 A **15 Claims**

1. An engine starter for engagement with a starting gear of an engine to be started, said engine starter comprising:

a power shaft;

a pinion gear mounted to said power shaft for axial and rotatable movement relative thereto, said pinion gear further being engageable with said starting gear;

clutch means slidably mounted to said power shaft, said clutch means further comprising:

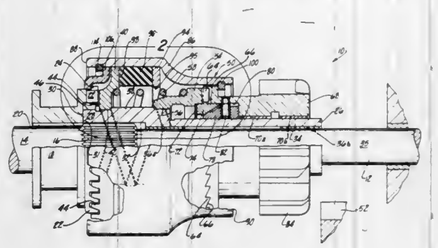
a primary clutch;

a secondary clutch mounted adjacent said primary clutch to communicate therewith;

said secondary clutch comprising a secondary driving member mounted to said shaft and a secondary driven member mounted concentric to said secondary driving member and communicating with said primary clutch;

said primary clutch comprising a primary driving member and a primary driven member mounted adjacent said primary driving member for communication therewith, said primary driven member further being connected with said pinion gear such that rotational force from said power shaft is translated to said pinion gear by said primary and secondary clutch;

means for resiliently biasing said secondary clutch closed to translate rotational force from said power shaft to



said primary clutch for rotating said starting gear of the engine to be started, said resilient biasing means adapted to permit said secondary clutch to slip when torsional force is imposed by said engine to said power shaft; and

means for separating said primary clutch when said pinion gear is driven by said starting gear of the engine to be started at a predetermined speed of rotation faster than the speed of said power shaft.

4,627,300

POSITIONING ACTUATOR FOR SIX-HIGH ROLL STAND

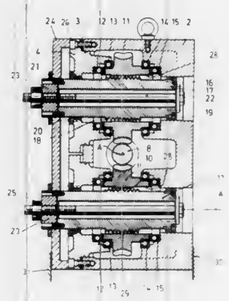
Erich Stoy, Ratingen, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,402

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335858

Int. Cl.⁴ F16H *19/00, 25/20*

U.S. Cl. 74—89.15 **9 Claims**



1. A positioning actuator for location within a window of a roll-stand frame between a pair of working-roll journal blocks and wall of the window of the roll-stand frame so as to shift the working rolls horizontally in a lateral direction of strip travel, the actuator comprising:

a housing of a size to fit in said window between said wall and said journal blocks;

a worm shaft rotatable in the housing about a main axis and formed with two axially offset worms;

respective pairs of worm wheels flanking and meshing with the worms, the wheels being rotatable in the housing about respective parallel axes lying in planes parallel to, flanking, and offset from the main axis, the worm wheels

each being formed internally centered on the respective axis with a screwthread;

respective pusher rods extending along the worm-wheel axes through the worm wheels and each formed with an external screwthread complementary to and meshing with the respective internal screwthread;

means engaging the rods and housing for inhibiting rotation of the rods about the respective worm-wheel axes while permitting movement of the rods along the respective worm-wheel axes, the screwthreads being of such hand that rotation of the worm shaft in one direction about the main axis moves the rods synchronously along the respective worm-wheel axes in one direction while opposite worm-shaft rotation moves the pusher rods axially oppositely; and

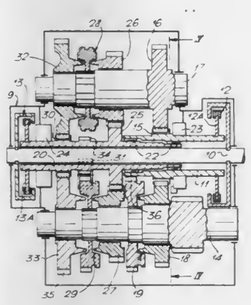
two respective axial-thrust bearings and two respective radial-thrust bearings supporting each of the worm wheels in the housing.

4,627,301

CHANGE SPEED TRANSMISSION

Wilfred N. Bainbridge, Banbury, and Alastair J. Young, Kenilworth, both of United Kingdom, assignors to Automotive Products plc, Leamington Spa, England

Filed Mar. 18, 1985, Ser. No. 713,284
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—333 **11 Claims**



1. a change speed transmission including gear trains which provide increasing speed ratios and two clutches which are independently operable and provide alternative drive paths through the gear trains between an input and an output, the gear trains providing alternate ratios driven respectively through one and the other clutch said input comprising a first shaft rotatably fast with a driven member of one clutch and a second shaft rotatably fast with a driven member of the other clutch, a layshaft being provided through which drive in a selected ratio is transmitted from one of the first and second shafts to the other of the first and second shafts to drive the output, one of the first and second shafts having a gear thereon which meshes with a gear on the output.

4,627,302

COUNTERSHAFT TRANSMISSION

Rick A. Laylock, Washington, and Michael R. Theobald, Princeville, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 26, 1985, Ser. No. 780,140
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—360 **18 Claims**

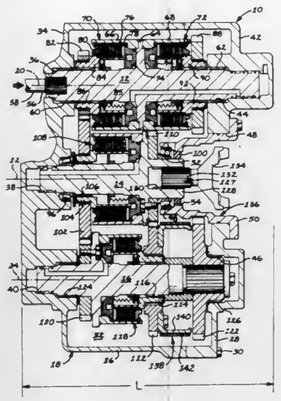
1. A countershaft transmission comprising:

an input shaft, an output shaft and an intermediate shaft arranged in parallel relation;

a reverse clutch assembly and a forward clutch assembly mounted on the input shaft;

a first speed clutch assembly mounted on the output shaft;

a second speed clutch assembly mounted on the intermediate shaft; and



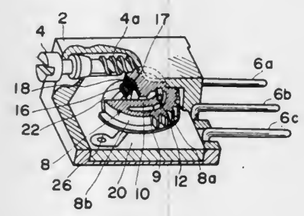
gear means mounted on the shafts and operatively associated with each other for effecting two forward and two reverse output shaft speeds in response to rotation of the input shaft and selective actuation of the clutch assemblies.

4,627,303

VARIABLE RESISTANCE DEVICE

Masashi Hirose, Iruma, Japan, assignor to Copal Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,535
Claims priority, application Japan, Aug. 4, 1983, 58-140709
Int. Cl.[4] F16H *1/16, 1/20, 57/00;* H01C *10/34*
U.S. Cl. 74—425 **7 Claims**



1. A variable resistance device, comprising:

a resistive element and a conductive element;

a contact member in movable contact with said resistive and conductive elements;

and means for moving one of said contact member, and said resistive and conductive elements, relative to the other, said means including

a worm screw having thread, rotatable about a worm screw axis in opposite directions,

a worm gear, rotatable in opposite directions about a worm gear axis, having a periphery surrounding said worm gear axis and gear teeth along said periphery except a toothless sector devoid of gear teeth, said teeth being engaged by said thread such that rotation of said screw rotates said gear in a corresponding direction about said worm gear axis, said gear being rotatable by said screw to a position in which said screw opposes said toothless sector and is out of engagement with said teeth,

a housing, said gear being mounted in said housing,

a resilient finger resiliently fixed to and carried by said gear, said gear having a stop member thereon, and

channel means defining an arcuate channel formed in said

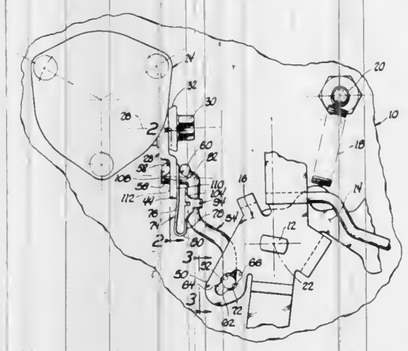
housing, said channel having opposite end surfaces formed in said housing, said resilient finger being fixed to said gear, said gear being rotatively moveable relative to said channel means, said stop projecting into said channel and being relatively moveable therein between said end surfaces with rotation of said gear about said worm gear axis such that when said gear rotates in one direction corresponding to a corresponding rotational direction of said screw, out of engagement with said screw with said toothless sector opposing said threads, said stop abuts one of said end surfaces and said one end surface resiliently deforms said finger so as to bias said gear in a direction opposite said one direction so as to enable said teeth to re-engage said screw when said screw is rotated oppositely to the direction corresponding to said one direction of rotation of said gear.

4,627,304

LINKAGE ANTI-RATTLE DEVICE AND ARRANGEMENT

Michael Dougherty, East Detroit, and William J. House, Sterling Heights, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,107
Int. Cl.[4] G05G *1/00;* F02M *19/12;* F16B *7/04*
U.S. Cl. 74—469 **7 Claims**



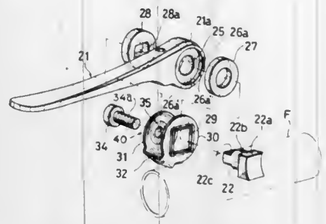
1. An anti-rattle apparatus for use in combination with first and second operatively interconnected linkage means in order to at least minimize the occurrence of rattling noises between said first and second linkage means, and wherein at least one of said linkage means carries abutment means, said anti-rattle apparatus comprising a first body portion having first and second ends, a second body portion having first and second ends, a resilient bight portion integrally joined to said first end of said first body portion and to said first end of said second body portion, and a connector portion carried by said second body portion as to be spaced from said bight portion, said connector portion being effective for operative connection to said second linkage means, said second end of said second body portion being effective to be placed in operative engagement with said second linkage means as to thereby resiliently urge said first and second linkage means in respectively opposite directions until said abutment means of said at least one of said linkage means operatively abuts against the other of said linkage means.

4,627,305

BICYCLE SPEED CHANGE LEVER

Mikio Hosokawa, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,517
Claims priority, application Japan, Jun. 19, 1984, 59-91269[U]
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—489 **5 Claims**



1. A bicycle speed change lever comprising:

a stationary support spindle adapted to be fixed to a bicycle frame tube and having an internally threaded axial hole formed therein,

a lever handle rotatably mounted at its holded end portion on said spindle,

a plurality of washers supported on said spindle,

a clipping holder which has a pair of axially spaced, holed disk-like portions, that is, an outside disk-like portion and an inside disk-like portion, resiliently connected to an integral cross arm and which is non-rotatably mounted on said spindle,

said inside disk-like portion being provided with means for preventing relative rotation of said clipping holder with respect to said spindle,

said washers and said holed end portion of the lever handle being sandwiched between said pair of disk-like portions and held together by pressure, and

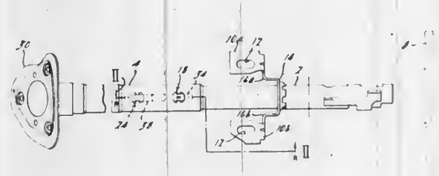
a lock bolt having a threaded shank engaged with said threaded axial hold of said spindle.

4,627,306

ENERGY ABSORBING STEERING COLUMN FOR MOTOR VEHICLES

Karim Berenjian, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,538
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **24 Claims**



1. An energy absorbing steering column comprising:

an upper column tube;

a lower column tube telescopically engaged with said upper column tube;

a steering shaft rotatably suppended within said telescopically engaged lower and upper column tubes;

a steering wheel secured to the rearward end of said steering shaft;

first means for mounting said upper column tube to a vehicle body and for absorbing impact loads through plastic deformation as said column tubes move together axially; and

second means for securing said upper column tube to said

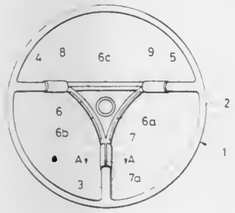
lower column tube and for allowing said tubes to move axially relative to each other inhibited only by said first means for an initial segment of travel, followed by one or more segments of travel characterized by inhibition resulting from the action of both of said means.

4,627,307

FIBER-REINFORCED PLASTIC CORE MATERIAL FOR STEERING WHEELS

Yasushi Yamazawa; Yasuhiro Tsutiya; Masaki Terada; Tosio Aoki, and Hiroyuki Sato, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 22, 1985, Ser. No. 757,498
Claims priority, application Japan, Sep. 6, 1984, 59-186790
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **9 Claims**



1. A method of forming a core material for steering wheels, comprising the steps of:

setting a boss in the center of a jig formed in the shape of a ring which has spoke portions, said boss having sleeves each of which is provided with a slit and being positioned relative to said jig such that said sleeve align with the spoke portions of said jig;

forming at least two spokes of said core material by winding and stretching, in a superposed manner, continuous long-staple fiber strands impregnated with a resin around the boss and the spoke portions of said jig, while introducing said continuous long-staple fiber strands into said sleeves through the slits therein; and

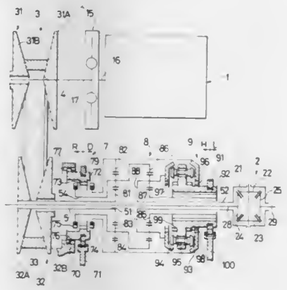
removing said jigs after said resin has hardened.

4,627,308

AUTOMATIC TRANSMISSION FOR A VEHICLE

Shuzo Moroto, and Shiro Sakakibara, both of Aichi, Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Apr. 27, 1984, Ser. No. 604,722
Int. Cl.[4] F16H *37/02*
U.S. Cl. 74—689 **2 Claims**



1. An automatic transmission for a vehicle, comprising:

a coupling means having an input shaft and an output shaft;

a belt type continuously-variable speed transmission system having an input pulley mounted coaxially on a first shaft, an output pulley mounted coaxially on a second shaft and a belt extending between said first and second pulleys to transfer power, each of said first and second pulleys having a fixed sheave and a movable sheave, said first shaft being disposed coaxially with and rotatably coupled with said output shaft of said coupling means, said second shaft being disposed side by side and in parallel with said first shaft;

a planetary gear mechanism having a first planetary gear set including a first sun gear, a first planetary gear, a first ring gear and a first planetary carrier, a second planetary gear set including a second sun gear, a second planetary gear, a second ring gear and a second planetary carrier, an input shaft disposed coaxially with and rotatably coupled at one end thereof with said second shaft of said belt type continuously-variable speed transmission system connected at the other end thereof concentrically with said first sun gear, an output shaft disposed coaxially with said input shaft and connected at one end thereof concentrically with said second planetary carrier, a first intermediate shaft disposed concentrically with and radially outward in connection with said input shaft and connected at one end thereof with said first ring gear and said second sun gear and a second intermediate shaft disposed concentrically with and between said input shaft and said first intermediate shaft in radial direction and connected at one end thereof with said first planetary carrier and said second ring gear, each of said first and second intermediate shaft having splines on an outer circumference thereof at the other end which is positioned between said output pulley of said belt type continuously-variable speed transmission system and said planetary gear mechanism;

a forward-reverse changeover mechanism having one and single shift lever and one and single first sleeve, said first sleeve being positioned between said output pulley of said belt type continuously-variable speed transmission system and said planetary gear mechanism and disposed concentrically with and slidably movable but nonrotatable with respect to the rotational axis of said input shaft of said planetary gear mechanism and having splines on an inner circumference thereof adapted to selectively mesh with said splines formed on said first and second intermediate shafts, said shift lever being adapted to shift said first sleeve between a first position where said splines formed on said first sleeve is selectively meshed with said splines formed on said first intermediate shaft to hold said first ring gear and second sun gear in a stationary position to establish a forward range gear train and a second position where said splines formed on said first sleeve is selectively meshed with said splines formed on said second intermediate shaft to hold said first planetary carrier and said second ring gear in a stationary position to establish a reverse range gear train, and

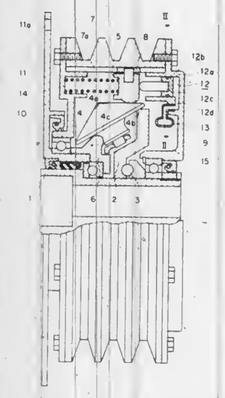
a low-high speed changeover mechanism having a second sleeve disposed concentrically with and slidably and rotatably with respect to the rotational axis of said output shaft of said planetary gear mechanism, a first and second discs disposed perpendicularly to and rotatably with respect to the rotational axis of said output shaft of said planetary gear mechanism, respectively, and a shift lever being engaged with said second sleeve at one end thereof, said first disc being linked to said first ring gear and having splines on an inner circumference thereof, said second disc being linked to said second planetary carrier and having splines on an inner circumference thereof, said second sleeve being slidably connected to and integrally rotatable with said second sun gear and having splines on an outer circumference thereof and adapted to selectively mesh with said splines formed on said first and second discs, said shift lever being adapted to shift said second sleeve between a first position where said splines formed on said second sleeve is meshed with said splines formed on said first disc to establish a forward speed range gear train and a second position where said splines formed on said second sleeve is meshed with said splines formed on said second disc to establish another forward speed range gear train.

4,627,309

ACCESSORY DRIVE DEVICE IN ENGINE

Kazutoshi Kaneyuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 802,749
Claims priority, application Japan, Nov. 30, 1984, 59-182907
Int. Cl.[4] F16H *17/06, 15/50, 15/16*
U.S. Cl. 74—752 C **5 Claims**



1. A device for driving accessories such as an alternator, a cooling water pump, an air-conditioning compressor or the like, utilizing power taken from an output shaft of an engine, said device comprising:

an input shaft rotatably supported by a stationary element and receiving output from said output shaft and rotated at a rotational speed corresponding to that of said output shaft;

a transmission output member rotatably supported on said input shaft for transmitting power to said accesories;

a planetary cone which can rotate on said input shaft in revolution around the axial center of the input shaft and in rotation around its axial center inclined with respect to said axial center of the input shaft, said planetary cone having a first part of nearly conical shape, and a second part of nearly cylindrical shape leading to a bottom surface of the first part, and first, second and third frictional transmission surfaces being formed on the conical surface of the first part, the bottom periphery of the first part and the circumferential surface of the second part, respectively;

an input transmission member installed rotatable with said input shaft and engaged at outer periphery in frictional engagement with the second frictional transmission surface of said planetary cone;

an orbit ring installed non-rotatably with respect to said stationary element, said orbit ring extending along the revolution path of said planetary cone and having an annular frictional engaging surface to be engaged in frictional engagement with the third frictional transmission surface of said planetary cone;

a shifting ring supported on said transmission output member and movable only in the axial direction thereof and having a frictional engaging surface engaged in frictional engagement with the first frictional transmission surface of said planetary cone always within the movable region in the axial direction;

a hydraulic piston/cylinder assembly for setting the position of said shifting ring adjustably toward or away from the rotation center of said planetary cone; and

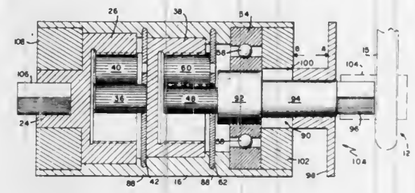
a Pitot tube for supplying the inside of a hydraulic cylinder of said hydraulic piston/cylinder assembly with hydraulic pressure corresponding to the rotational speed of said transmission output member.

4,627,310

RATIO SPEED ADAPTOR

Brian Coburn, 79 Bailey St., Lawrence, Mass. 01843

Continuation-in-part of Ser. No. 408,135, Aug. 16, 1982, Pat. No. 4,535,653. This application Aug. 19, 1985, Ser. No. 766,928
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] F16H *57/10, 3/44, 1/28;* **B25B** *17/00*
U.S. Cl. 74—763 **1 Claim**



1. A speed transformer adaptor comprising;

a substantially cylindrical casing;

a first gear system coaxially and rotatable positioned in fixed alignment within said casing comprising a first portion forming a first drive shaft extending beyond one end of said casing, and a second integral cylindrical portion having internal gear teeth;

a second gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first gear system comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said first gear system and having external gear teeth, and a second integral cylindrical portion having internal gear teeth;

a first pinion gear disposed in fixed position within the cylindrical portion of said first gear system and meshing with said sun gear of said second gear system and said internal gear of the cylindrical portion of said first gear system;

a third gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first and second gear systems comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said second gear system and having external gear teeth, and a second integral portion forming a second drive shaft extending beyond the other end of said casing;

a second pinion gear disposed in fixed position within the cylindrical portion of said second gear system and meshing with the sun gear of said third gear system and the internal gear of the cylindrical portion of said second gear system; and

a clutch member slidably mounted on said second drive shaft of said third gear system and adapted to slidably engage said casing whereby to interlock said casing and gear systems to provide a direct drive between said first and second drive shafts.

4,627,311

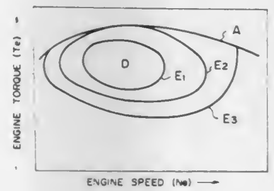
AUTOMOTIVE DRIVING CONTROL SYSTEM UTILIZING A STEPLESS TRANSMISSION

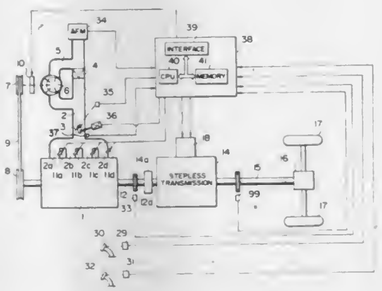
Katsuhiko Yokooku; Nobuhide Seo; Hiroyuki Oda; Shizuo Sumida, and Satoshi Yatomi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 21, 1984, Ser. No. 591,876
Claims priority, application Japan, Apr. 11, 1983, 58-64364
Int. Cl.[4] B60K *41/18, 41/12*
U.S. Cl. 74—866 **15 Claims**

1. An automotive driving control system comprising a step-

less transmission provided between an engine and driving wheels, a transmission control means for controlling the transmission ratio of the stepless transmission, a throttle valve driving means for driving the throttle valve of the engine, an accelerator position detecting means for detecting the amount of depression of the accelerator pedal, an actuable engine torque increasing means for increasing engine torque, and control means which receives the signal from the accelerator position detecting means and controls the transmission control means and the throttle valve driving means according to the amount of depression of the accelerator pedal, said control means being adapted to control, when the amount of depression of the accelerator pedal is within a predetermined range between first and second preset values, the throttle valve driving means so that the opening degree of the throttle valve is fixed at a near full open position irrespective of the amount of depression of the accelerator pedal, and to control the transmission control means to control the transmission ratio of the stepless transmis-





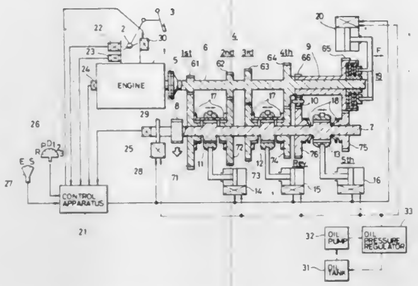
sion to change the engine speed so that the engine output requirement represented by the amount of depression of the accelerator pedal can be obtained with the near full open position of the throttle valve, said first preset value being smaller than said second preset value; when the amount of depression of the accelerator pedal is not larger than the first preset value, to control the transmission control means to control the transmission ratio of the stepless transmission so that the engine speed is maintained at the minimum stable speed and to control the throttle valve driving means to control the opening degree of the throttle valve so that the engine output requirement represented by the amount of depression of the accelerator pedal can be obtained; and when the amount of depression of the accelerator pedal is larger than the second preset value, controls the transmission control means to control the transmission ratio of the stepless transmission so that the engine speed is maintained at the maximum stable speed and said engine torque increasing means is actuated so that engine torque is increased.

4,627,312

AUTOMATIC TRANSMISSION

Mamoru Fujieda, Tomobe, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,327
Claims priority, application Japan, Aug. 10, 1984, 59-166438
Int. Cl.⁴ B60K *41/18*; F16H *5/46*
U.S. Cl. 74—866 **7 Claims**



1. An automatic transmission for an automobile comprising;
a first and a second shaft, one of which is connected to an engine of the automobile and the other is connected to a load;
a plurality of gear pairs having different reduction ratios only one pair of which is selected and conducts the torque transmission between said first and second shafts;
a torque transmitting means provided between said first and second shafts for sharing the torque transmission at least during the change of the selection of said gear pairs, the degree of the torque transmitted being adjustable in accordance with the condition of the operation of the engine and the load; and
a control means which receives signals representative of the condition of the operation of the engine and the load and outputs signals for selecting the gear pair and adjusting the degree of the torque transmission of said torque transmitting means wherein, when the ratio of the number of revolutions between said both shafts becomes substantially equal to a predetermined value, one of said gear pair having the reduction ratio corresponding to the predetermined value of said ratio of the number of revolutions is selected to effect the torque transmission between said both shafts.

4,627,313

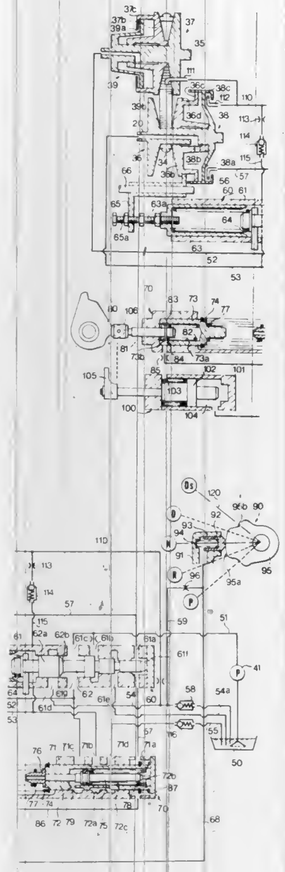
CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,000
Claims priority, application Japan, Jan. 30, 1984, 59-14750
Int. Cl.⁴ B60K *41/12*
U.S. Cl. 74—867 **3 Claims**

1. In a control system for an infinitely variable belt-drive transmission having a selector device including a drive range position and a neutral position, a drive pulley having a hydraulically shiftable disc and a servo chamber for shifting the disc, a driven pulley having a hydraulically shiftable disc and a servo chamber for shifting the disc, and a belt engaged with both the pulleys, a hydraulic control circuit for supplying oil to the servo chambers and for draining the servo chambers, the hydraulic control circuit being provided with a pressure regulator valve for providing a line pressure and a transmission ratio control valve for applying the line pressure to the servo chamber of the drive pulley, the improvement comprising:
a lubricating oil circuit provided in the hydraulic control circuit for supplying lubricating oil to the drive and driven pulleys;

a passage for supplying a part of the lubricating oil to the servo chamber of the drive pulley;
a check valve provided in the passage for preventing the reverse flow of the lubricating oil; and



a select position detecting valve for enabling the supply of the lubricating oil to the servo chamber at the selection of the neutral position.

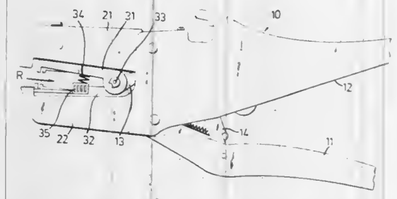
4,627,314

STRIPPING DEVICE, PARTICULARLY FOR CONDUCTORS WITH TOUGH INSULATION

Ulrich Wiebe, Dörentrup, and Manfred Wilmes, Detmold, both of Fed. Rep. of Germany, assignors to C.A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,613
Claims priority, application Sweden, Nov. 9, 1983, 8306163
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.43 **13 Claims**

1. A stripping device, in particular for electrical conductors having a tough insulation and provided with a cutting means and with a positioning device for locating and retaining a treated conductor at a selected position relative to the cutting means, the stripping device comprising a pair of jaws movable toward and away from one another and an actuating means for at least one of the jaws to perform said movement; each said jaw extending in a longitudinal direction between a front end and a rear end and provided at said front end with an insulation cutting knife defining a part of said cutting means and having a front face, a rear face and a cutting edge, all extending transversely to said longitudinal direction, said positioning device comprising in a first jaw of said pair of jaws a first grasping member closely adjacent the rear face of the respective knife, and having a tapering recess defining said selected position; a resilient carrier arm extending parallel to said longitudinal direction between a front end and a rear end and supporting at its said front end the first grasping member so as to urge it exclusively by resilient force in a maximally projecting position relative the adjacent cutting edge when the jaws are maximally moved apart; said rear end being fixedly anchored in the first jaw and in the second jaw of said pair of jaws, opposite said recess, a second grasping member extends parallel to the rear face of the respective cutting knife, and is carried at the front end of a second resilient carrier arm extending parallel to said longitudinal direction between a front and a rear end and resiliently urging the second grasping member in a maximally projecting position relative the adjacent cutting edge when the



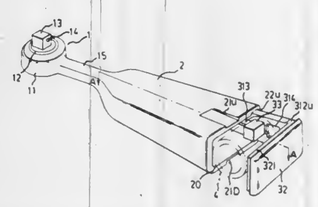
jaws are maximally moved apart, said rear end of the second resilient carrier arm being fixedly anchored in the second jaw, said second grasping member cooperating with said first grasping member in forcing the treated conductor into said recess to retain it there by the effect of said resilient force opposing the retreat of the first grasping member from its maximally projecting position, so that a conductor is grasped and guided before the cutting edge of the respective cutting knife begins to penetrate into the insulation layer, the first grasping member resiliently recedes until the cutting edge has reached its end position in the insulation layer, and an outer pair of jaws embodying a part of said actuating means and wherein said pair of jaws is mounted in the outer pair of jaws for translatorial rearward movement relative thereto in the sense of said longitudinal direction when actuated by said actuating means so as to tear off and move rearward a severed portion of the insulation, said outer pair of jaws including a means for gripping the conductor during said rearward movement of said pair of jaws.

4,627,315

SOCKET WRENCH WITH ATTACHABLE SOCKET STORAGE MEANS IN HANDLE

Patrick Lin, 12th Fl., No. 1034, Min Sheng East Rd., Taipei, Taiwan

Filed Jul. 2, 1985, Ser. No. 751,209
Int. Cl.⁴ B25G *1/08*
U.S. Cl. 81—177.4 **4 Claims**



1. A socket wrench with an attachable socket storage means, comprising:
a head carrying a socket mounting stub,
a longitudinally extending handle provided with a storage

cavity therein for housing said attachable socket storage means, and

a neck integrally connecting said head and handle together, said attachable socket storage means being longitudinally slidable relative to said handle and comprising:

a side plate and a cover plate connected together to form an L-shaped structure wherein said plate is longitudinally slidable within said cavity and is provided with a narrow, longitudinally elongate guide slot, said slot having one end thereof formed with an enlarged aperture, and

a plurality of mounting stubs for carrying sockets, each stub comprising:

a rectangular portion for mating with a rectangular hole in a socket,

a projecting portion, and

a narrow neck integrally connecting said rectangular and projecting portions together such that said projecting portion is insertable through said enlarged aperture to slidably disposed said neck within said slot.

4,627,316

AUTOMATIC SCREWDRIVER

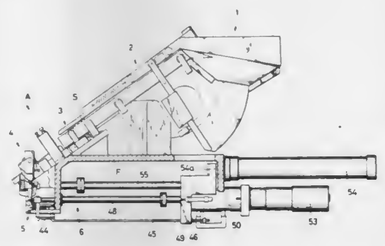
Takashi Mori, Koriyama; Kouichi Mizu, Hirakata, and Yasunori Jo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 370,194, Apr. 21, 1982, Pat. No. 4,495,841. This application Jan. 2, 1985, Ser. No. 688,828

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] B25B *23/06*

U.S. Cl. 81—430 **9 Claims**



1. An automatic screwdriver for driving a screw into a workpiece, comprising:

a frame;

a chute mounted on said frame for supporting a plurality of screws arranged in a row in the chute, said screws having shanks directed generally parallel to each other in a first direction;

a gate mounted on said frame at one end of said chute and being selectively openable to allow the screws to be discharged one at a time out of said chute;

an index mechanism mounted on said frame and having a carrier arm angularly movable between a first position in which said carrier arm receives a screw discharged by said gate and a second position in which said screw is oriented in a second direction different from said first direction;

a catcher unit mounted on said frame at said second position to receive the screw supplied from said index mechanism;

a screwdriver bit unit mounted on said frame and having an axially movable suction pipe for drawing the screw from said catcher unit into the pipe and towards a screwdriver bit rotatably disposed in said suction pipe for axial movement therewith to advance the screw past said catcher unit;

means for actuating the gate; and

means for actuating said screwdriver bit unit, wherein said chute has a groove extending therealong to receive the shanks of said screws, said gate including an escape slide having a curved slot, the escape slide being slidable transversely of said chute for allowing one of the screws at a time to move along said groove and said curved slot past said gate and wherein said escape slide has a roller cam follower, said gate and index mechanism actuating means having a cam surface engageable with said roller cam follower for moving said escape slide to open said gate in response to movement of said carrier arm to said first position.

4,627,317

CONSUMABLE CERAMIC LEDGE TOOL

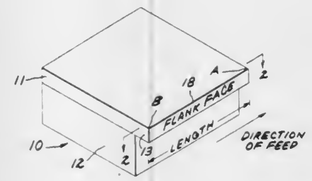
Ranga Komanduri, and William R. Reed, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,319

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] B23B *1/00, 27/16*

U.S. Cl. 82—1 C **12 Claims**



7. The high-speed method for the machining of a metal workpiece of superalloy composition, which comprises the steps of

(a) rigidly mounting a cutting tool relative to said workpiece with a cantilevered longitudinally-extending portion of said tool as the cutting element thereof, the material of said cutting element being an alumina-base ceramic having a value for transverse rupture strength in the range of from about 80 Ksi to about 150 Ksi and a value for fracture toughness in the range of from about 4 to about 7, said cutting element providing the flank and rake faces of said tool with said flank face being located a substantially uniform distance in the range of from 10 mils to 60 mils from any support for said cutting element and having a clearance angle to the workpiece of about one degree or less, said cutting element (a) having a maximum substantially uniform thickness in the range of from 20 mils to 60 mils and (b) being of substantially uniform transverse cross-section along said length;

(b) rotating said workpiece at a speed of at least about 1000 surface feet per minute;

(c) bringing said cutting element against said rotating workpiece with a depth of cut of at least about 0.015 inch and a feed of at least 0.0025 inch per revolution; and

(d) advancing said tool to maintain contact between said cutting element and said workpiece as metal is removed from said workpiece and said cutting element is consumed by wear along the length thereof, said wear being of the brittle microchipping type.

4,627,318

METHOD OF AND APPARATUS FOR GAPPING A SLIDE-FASTENER TAPE

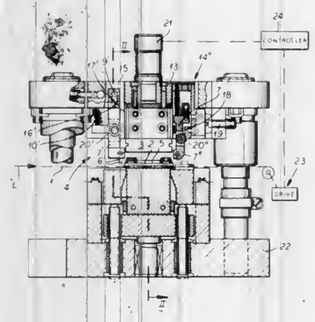
Franz Hochlehnert, Essen; Werner Rademacher, Essen-Kettwig, and Lothar Grosskreuz, Dortmund, all of Fed. Rep. of Germany, assignors to Opti Patent-, Forschungs- und Fabrikations-AG, Riedern-Allmeind, Switzerland

Filed Dec. 13, 1985, Ser. No. 808,889

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445865

Int. Cl.[4] B26D *7/02, 7/14*

U.S. Cl. 83—18 **9 Claims**



1. In a method of gapping a slide-fastener assembly comprising a pair of longitudinally extending and parallel tapes having adjacent edges carrying respective coupling coils that form coupling heads and that are interleaved with one another, the method comprising the steps of:

advancing the assembly in steps through a punching location;

engaging the coils upstream and downstream of the location by respective upstream and downstream grippers and holding the assembly stationary in the station between steps; and

punching the heads off the coils between the grippers while the assembly is held stationary in the station, the improvement comprising the step of

displacing the grippers apart to longitudinally tension the coils after engaging the grippers with the coils and before punching the heads off the coils.

4,627,319

DEVICE FOR SUPPLYING WEBS OF WRAPPING MATERIAL TO A CIGARETTE MAKING MACHINE OF THE TWO ROD TYPE

Riccardo Mattei, and Armando Neri, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Feb. 22, 1985, Ser. No. 704,589

Claims priority, application Italy, Feb. 23, 1984, 3351 A/84

Int. Cl.[4] B23Q *15/22*

U.S. Cl. 83—73 **7 Claims**

1. A device for supplying webs of wrapping material to a cigarette making machine of the two rod type, comprising:

a cutter means for separating longitudinally a web of wrapping material, defined as the main web, into a first web and a second web;

means for guiding the main web to the cutter means;

means for guiding the first and the second web to a utilization area;

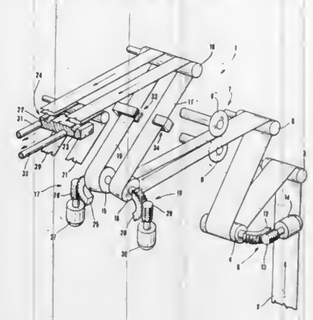
a first deviation device associated with said main web for detecting the displacement thereof in a direction crosswise to that in which said main web moves forward;

two additional deviation devices, one of which is associated with said first web and the other of which is associated with said second web, for detecting the respective displacement thereof in a direction crosswise to the directions in which the first and second webs move forward;

motor means for driving the first deviation device and the two additional deviation devices; and

detector means for checking and correcting the width and the position of the first web and the second web;

said detector means being associated with said first web and said second web for checking, upstream of the utilization



area, the width of at least one of the first web and the second web and the position of their edges;

said detector means including circuit means interlocked thereto for operating, in response to output signals of the detector means, the motor means with respect to each of said deviation devices until corrections of the widths and the positions of the first web and the second web are effected.

4,627,320

COMPACT SHEARING MACHINE WITH SCRAP SHEARS

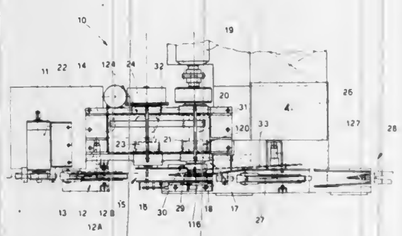
Giorgio Fuccaro, Udine, Italy, assignor to Danieli & C. Officine Meccaniche S.p.A., Italy

Filed Jan. 23, 1985, Ser. No. 694,078

Claims priority, application Italy, Jan. 27, 1984, 83311 A/84

Int. Cl.[4] B23D *5/12*

U.S. Cl. 83—163 **14 Claims**



1. A compact shearing machine containing scrap shears, said machine comprising

a shears means for cutting objects to size,

a scrap shears means,

motor means to actuate at least said scrap shears means,

a scrap shearing channel located downstream of said shears means and leading to said scrap shears means,

a shearing-to-size channel located downstream of said scrap shears means and leading to at least one collection channel, said scrap shearing channel and said shearing-to-size channel being positioned substantially in parallel, said scrap shears means located in a position offset from said shears means for cutting objects to size, and

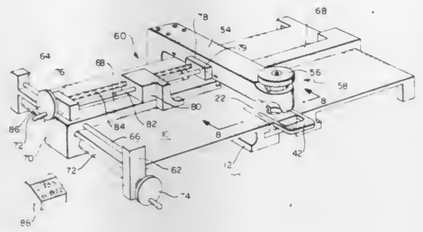
means for directing the objects to be cut to either said scrap shearing channel or said shearing-to-size channel, said means for directing located upstream of said shears means.

4,627,321

PUNCH PRESS MACHINE INCLUDING A WORKPIECE POSITIONING MEANS WITH A QUICK CHANGE DIE HOLDER, PUNCH AND STRIPPER UNIT

Scott B. Moore, 2401 S. 6th St., Springfield, Ill. 62703

Filed Dec. 10, 1985, Ser. No. 807,138
Int. Cl.[4] B26F *1/14;* B21D *28/34*
U.S. Cl. 83—468 6 Claims



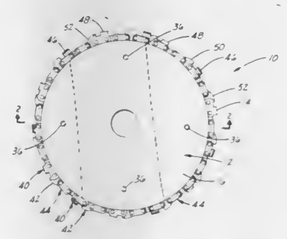
1. A punch press machine assembly including a workpiece supporting table and a table support means which comprises:
- an opening in said supporting table and said table support for receiving a die holder,
- said die holder including a die opening for receiving a die therein,
- oppositely disposed pins on opposite sides of said die opening, and
- a U-shaped handle connected to said oppositely disposed pins for lifting and lowering said pins for removal and replacement of said die holder.

4,627,322

CIRCULAR SAW BLADE ASSEMBLY

Vondene D. Hayhurst, Jr., Nicoma Park, Okla., assignor to Lebever Co., Oklahoma City, Okla.

Filed Sep. 17, 1985, Ser. No. 777,241
Int. Cl.[4] B23D *61/02;* B27B *17/02, 33/14*
U.S. Cl. 83—831 5 Claims



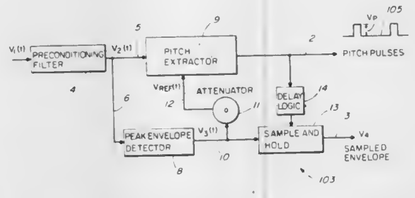
1. A circular saw blade assembly adapted to be secured to a power-driven saw arbor and rotated thereby, the circular saw comprising:
- a circular saw blade formed of first and second discs, the first and second discs each being characterized as having a medial portion, a peripheral portion and a central bore extending through the medial portion, the medial portions being disposed substantially adjacent so that the bores therein are aligned and adapted to receive the power-driven saw arbor in an assembled mode of the first and second discs, the first and second discs diverging radially from the medial portion defining the bore to form a relief opening extending to the peripheral portion of the discs so that the peripheral portions of the first and second discs define a chain track peripheral portion;
- disc connector means disposed within the relief opening for connecting the first and second discs at a position between the medial portions of the first and second discs and the chain track peripheral portion in the assembled mode thereof; and,
- a saw chain having a plurality of cutter elements projecting outwardly from one side thereof and a plurality of drive link elements projecting outwardly from an opposite side thereof, the saw chain extendible about the perimeter of the first and second discs such that the drive link elements are disposed within the chain track peripheral portion and frictionally engage the first and second discs defining the chain track peripheral portion.

4,627,323

PITCH EXTRACTOR APPARATUS AND THE LIKE

Calman Gold, Post Mills, Vt., assignor to New England Digital Corporation, White River Junction, Vt.

Filed Aug. 13, 1984, Ser. No. 639,737
Int. Cl.[4] G10H *1/00, 3/18*
U.S. Cl. 84—1.01 23 Claims



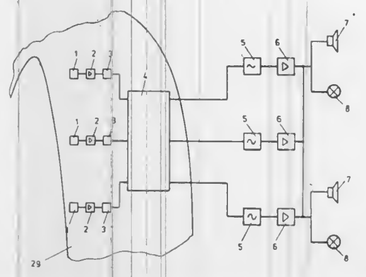
1. A method of extracting the fundamental pitch period of a complex electrical signal $V_2(t)$, that comprises the serial steps:
- deriving a time varying reference signal $V_{ref}(t)$ from the complex electrical signal $V_2(t)$, which reference signal $V_{ref}(t)$ adjusts each cycle to peak amplitude excursions of the complex electrical signal $V_2(t)$;
- sensing ascending values of the signal $V_2(t)$ to a first point at which the maximum magnitude of the signal $V_2(t)$ of one polarity is reached and reversal of direction thereof occurs;
- storing the first substantially instantaneous difference in magnitude between the complex electrical signal $V_2(t)$ and the time varying reference signal $V_{ref}(t)$ at said first point;
- thereafter sensing a point at which the magnitude of the signal $V_2(t)$ minus said first substantially instantaneous difference equals zero;
- thereafter sensing ascending values of the signal $V_2(t)$ to a further point at which a maximum magntiude of the signal $V_2(t)$ of opposite polarity to said one polarity is reached and reversal of direction thereof occurs;
- then storing the value of the signal $V_2(t)$ at said further point; and
- sensing ascending value of the signal $V_2(t)$ to a still further point at which the substantially instantaneous value of the signal $V_2(t)$ exceeds the stored value of the signal $V_2(t)$ at said further point by an amount equal to the substantially instantaneous value of the time varying reference signal $V_{ref}(t)$, said pitch period being the time span between successive occurrences of said still further point.

4,627,324

METHOD AND INSTRUMENT FOR GENERATING ACOUSTIC AND/OR VISUAL EFFECTS BY HUMAN BODY ACTIONS

Helge Zwosta, Görresstrasse 2, D-8902 Neusäss, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,163
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422737
Int. Cl.[4] G09B *15/04;* G10H *1/00*
U.S. Cl. 84—1.01 19 Claims



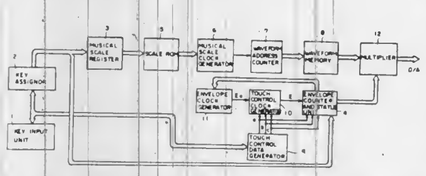
1. An instrument for generating at least one of acoustic and visual effects by human body actions comprising:
- (a) a plurality of transducer means each adapted to be attached to desired parts of the human body and responsive to accelerations/decelerations caused by a movement thereof to generate electrical signals;
- (b) means for producing at least one of said acoustic and visual effects;
- (c) a plurality of drive signal generator means for driving said producing means;
- (d) logic means connected between said plurality of transducer means and said plurality of drive signal generator means for selectively routing said electrical signals generated by predetermined of transducer means to predetermined of said drive signal generator means.

4,627,325

TOUCH RESPONSE APPARATUS FOR ELECTRONIC MUSICAL APPARATUS

Youji Kaneko, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 512,143, Jul. 8, 1983, Pat. No. 4,535,669.
This application Feb. 12, 1985, Ser. No. 700,628
Claims priority, application Japan, Jul. 13, 1982, 57-120551; Jul. 13, 1982, 57-120552; Jul. 13, 1982, 57-120553
Int. Cl.[4] G10H *1/057*
U.S. Cl. 84—1.26 7 Claims



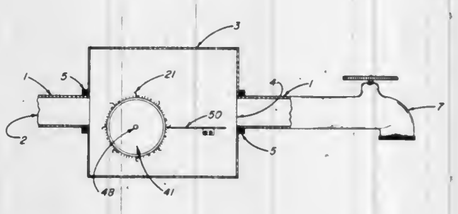
1. A touch response apparatus for an electronic musical instrument having a keyboard, comprising,
- touch data generating means for generating touch data as a function of a key depression status of an operated key of said keyboard;
- envelope generating means for generating envelope data corresponding to an envelope, said envelope generating means including means for counting up to a level data corresponding to each said touch data generated by said touch data generating means in an attack status of the operated key, and means for counting down from said level data in a release status of the operated key;
- said envelope generating means including:
  - setting means for establishing a reached value of a count value of said counting up means in accordance with said touch data generated by said touch data generating means;
  - relative value data generating means for generating a relative value data of a present value data of said envelope data generated by said counting up means and counting down means relative to said reached value data; and
  - count rate control means for controlling a count rate of said counting up means and counting down means in accordance with said relative value data generated by said relative value data generating means; and
- control means coupled to said envelope generating means and to said touch data generating means for comparing the envelope data with said touch data so as to change the count status of said envelope generating means according to the comparing result.

4,627,326

MUSICAL FAUCET

John McFarland, Box 478, Victor, Mont. 59875

Filed Jul. 11, 1985, Ser. No. 753,885
Int. Cl.[4] G10F *1/06*
U.S. Cl. 84—94 C 12 Claims



1. A musical water faucet apparatus:
- a water conduit;
- water take-off means located within said conduit;
- a water tap for controlling the flow of water within said conduit; and
- music production means connected to and driven by said waterpower take-off means.

4,627,327

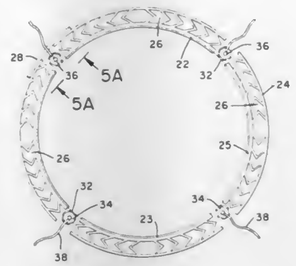
HYBRID UNITIZED SHOCK AND VIBRATION MITIGATION SYSTEM

Michael S. Huber, Milpitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1985, Ser. No. 740,673
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.816 4 Claims

1. A shock absorbing system circumferentially arrayed within a launch tube around a missile comprising:
- (a) a first plurality of arcuate sheets bonded to said launch tube;
- (b) a second plurality of regularly segmented arcuate sheets also spaced radially inward from said first plurality of arcuate sheets;
- (c) a structured array of shock absorbing struts located between said first and said second plurality of arcuate sheets to form a plurality of regularly segmented pad rings positioned about said missile;
- (d) means for connecting said plurality of regularly segmented pad rings such that lateral movement of said mis-

sile into any portion of said pad rings is resisted by all of said shock absorbing struts in said pad rings; and



(e) means for varying the shock absorbing characteristic of said means for connecting said pad rings.

4,627,328

HYDRAULIC ACTUATOR-CONTROL ARRANGEMENT FOR CONCRETE PUMP

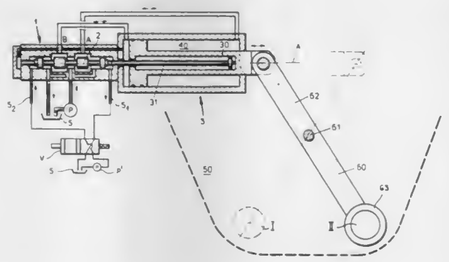
Klaus-Helmut Renders, Unna-Stockum, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele GmbH & Co. KG, Unna-Massen, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,761

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333849

Int. Cl.[4] F15B *13/042*

U.S. Cl. 91—410 **4 Claims**



1. In combination with a concrete pump having a distributor pipe displaceable by a controlled element between positions corresponding to end positions of the controlled element, a hydraulic controlling and actuating system comprising:

a hydraulic source having a high-pressure side and a low-pressure side;

means including a hydraulic actuator connected to the element and having one compartment pressurizable for moving the element into one of its end positions and another compartement pressurizable for moving the element into the other of its end positions;

a valve having

a source-side port connected to the high-pressure side,

a source-side port connected to the low-pressure side,

respective valve-side ports connected to the actuator compartments, and

a valve body displaceable from a center position interconnecting and permitting flow freely between all of the ports into two position end postions in one of which the high-pressure source-side port is connected to the one actuator compartment and the low-pressure source-side port is connected to the other actuator compartment and in the other of which the low-pressure source-side port is connected to the one actuator compartment and the high-pressure source-side port is connected to the other actuator compartment,

the valve being so constructed and arranged that on displacement between either end valve position and the center valve position the flow through the valve between the source and the actuator is smoothly and regularly varied from maximum flow in the end valve positions to no flow in the center valve position;

reversible operating means for urging the valve body alternatively out of one or the other of its end positions; and

link means connected between the actuator and the valve body for displacing the valve body at least as the element nears either of its end positions from the respective end valve position to the center valve position and for retaining the valve body in the center position until the operating means reverses, the end positions of the valve body and controlled element being so oriented that displacement of the controlled element by the external force out of either of its end positions displaces the valve body in a direction applying pressure to the compartments to correct the externally applied displacement.

4,627,329

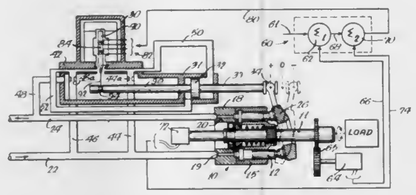
POWER DRIVE UNIT AND CONTROL SYSTEM THEREFOR

William G. Durtschi, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 19, 1984, Ser. No. 633,211

Int. Cl.[4] F01B *3/10, 13/04*

U.S. Cl. 91—506 **2 Claims**



1. An electro-hydraulic control system for a power drive unit having a wobbler-controlled variable displacement hydraulic motor wherein the control system causes the displacement of the hydraulic motor to match a load to be driven by a power drive unit output shaft coupled to said motor, said system comprising: electro-hydraulic servo means operatively associated with said wobbler for control of the position of the wobbler including a servo cylinder with a servo piston associated with a reciprocal link connected to said wobbler and an electrically operable valve member for applying a differential pressure to said servo piston, signal summing means electrically coupled to said electro-hydraulic servo means and responsive to an input command signal and one or more signals representative of speed and/or position of said power drive unit output shaft for generating a control signal applied to said electrically operable valve member of said electro-hydraulic servo means, summing means at the electro-hydraulic servo valve for summing said control signal with the actual position of the wobbler for controlling the position of the wobbler by applying a force to said electrically operable valve member representative of wobbler position, and an extension of said link directly connected to said electrically operable valve member for indicating to said summing means the actual position of said wobbler by linear movement thereof.

4,627,330

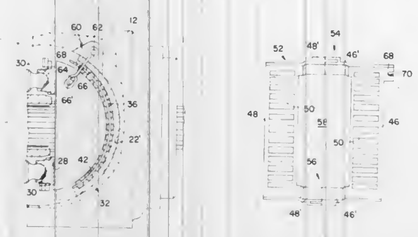
UNITARY BEARING RETAINER FOR A SWASHPLATE BEARING

Richard Beck, Jr., Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1984, Ser. No. 680,438

Int. Cl.[4] F01B *13/04*

U.S. Cl. 92—12.2 **18 Claims**



1. A variable displacement hydraulic unit comprising a housing, a cylinder block mounted in said housing for rotation about an axis, said cylinder block having a plurality of axial cylinders therein each containing a reciprocating piston, a swashplate for controlling the displacement of said pistons within said cylinders, a rotatable shaft connected to said cylinder block and extending along said axis through an opening formed in said swashplate, support means for tiltably supporting said swashplate in said housing, and positioning means for controlling the tilt of said swashplate relative to said housing, said support means comprising at least two spaced apart sets of rollable bearing elements positioned between said swashplate and said housing with said shaft extending between said at least two of said sets of bearing elements, means constraining said bearing elements to a rolling motion in a generally arcuate path, said constraining means including a unitary bearing cage assembly for retaining said bearing elements of at least two of said sets.

4,627,331

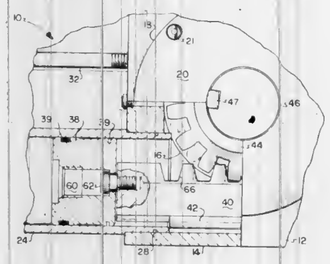
ROTARY ACTUATOR HAVING CAST PISTON AND ARCUATE RACK BEARING

Julius Fejes, Orrville, Ohio, assignor to Flo-Tork, Inc., Orrville, Ohio

Filed May 31, 1985, Ser. No. 740,017

Int. Cl.[4] F16J *1/10*

U.S. Cl. 92—129 **4 Claims**



1. A rotary actuator having

(a) a housing having a longitudinally extending bore therein;

(b) a pair of cylinders axially aligned with said bore, the inside diameter of said cylinders being less than the diameter of said bore;

(c) a rack reciprocable in said cylinders;

(d) a pair of floating pistons and means for securing said pistons to said rack at the opposite ends thereof;

(e) a floating rack bearing having an arcuate outer surface conforming to the curvature of said bore, said outer surface being larger in diameter than the inside diameters of said cylinders, and a concave curved inner surface which abuts said rack,

(f) said rack having a longitudinally extending recess for said rack bearing, said recess and the inner surface of said rack bearing being complementary in shape, said recess being formed by a recessed curved outer wall portion, said outer wall portion and the inner surface of said rack having the same curvature and width and being in abutting relationship.

4,627,332

SEALING MEMBERS FOR MASTER CYLINDERS

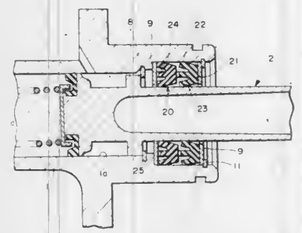
Youichi Furuta, and Chiaki Ochiai, both of Chiryu, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 9, 1984, Ser. No. 578,692

Claims priority, application Japan, Mar. 31, 1983, 58-45794[U]

Int. Cl.[4] F16J *15/18*

U.S. Cl. 92—168 **2 Claims**



1. An annular sealing member assembly to be disposed in an annular space defined by the inner wall of a cylindrical bore, the outer wall of an operating piston axially movable in said bore, and a pair fixed, axially-spaced annular surfaces, said assembly comprising at least two sealing members, each said sealing member including an annular base portion, an outer annular lip portion integrally formed on said base portion for sealing engagement with said inner wall, an inner annular lip portion integrally formed on said base portion for sliding and sealing contact with said outer wall, and an annular rib portion integrally formed on said base portion radially between said lip portions, said rib portion axially extending in the same direction as and for a distance greater than said lip portions and having a plurality of radially-extending slots permitting uniform distribution of fluid between the peripheries of said sealing member, wherein said sealing members in said assembly are axially abutting and so oriented that the base portion of one sealing member abuts one said annular surface, the base portion of the other sealing member abuts the end of the rib portion of said one sealing member, and the end of the rib portion of the other sealing member abuts the other annular surface.

4,627,333

STORAGE STRUCTURE

Thomas H. Anderson; Donald E. Anderson, both of 1833 S. Holland Sylvania Rd., Maumee, Ohio 43537; Glenn E. Hall, and Roy W. Blanton, both of Toledo, Ohio, assignors to The Andersons, Maumee, Ohio

Filed Nov. 27, 1984, Ser. No. 675,207

Int. Cl.[4] A01F *25/08*

U.S. Cl. 98—56 **17 Claims**

1. An improved storage assembly for storing a particulate material, said storage assembly comprising, in combination,

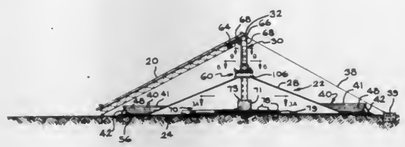
a vertically extending chute having vertically spaced openings;

a cap assembly surrounding said vertically extending chute

and mounted for movement on said vertically extending chute;

a cover having its upper end operatively attached to said cap assembly; and

a ring assembly vertically movable on said cap assembly and engaging said cover, whereby said ring assembly may be vertically moved relative to said cap assembly, said cover being tensioned by said ring assembly retarding the formulation of circumferential folds in said cover during loading.



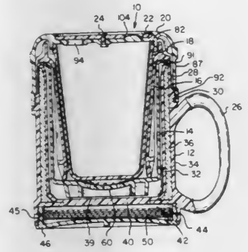
6. An improved storage assembly according to claim 1, wherein said cap assembly surrounds said vertically extending chute, said cap assembly defining a plurality of spaced openings, said openings defining a fluid flow path with the interior of said cover, and valve members mounted adjacent said spaced openings, whereby one or more valve members may be moved to establish such fluid flow path to the interior of said cover.

4,627,334

PORTABLE, NESTABLE BEVERAGE BREWING SYSTEM

William C. Shanklin, 4105 N. 39th, Tacoma, Wash. 98407

Filed Dec. 3, 1985, Ser. No. 804,685
Int. Cl.[4] A47J *31/02*
U.S. Cl. 99—306 **22 Claims**



1. A portable, nestable beverage brewing system comprising:

a water receiving vessel;

a filter holder having first and second ends, said first end being sized to detachably engage said water receiving vessel during the brewing of said beverage, said filter holder being adapted to retain a filter between said filter holder and said water receiving vessel;

a brewed beverage receiver sized to detachably engage said second end of said filter holder during the brewing of said beverage, said brewed beverage receiver also being sized to receive and retain therein said water receiving vessel and filter holder;

a powdered beverage storage canister sized for receipt within said brewed beverage receiver after the receipt of said water receiving vessel and filter holder within said brewed beverage receiver; and

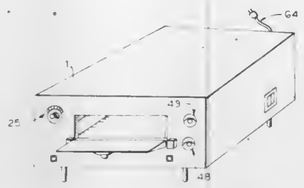
locking means for maintaining said water receiving vessel, filter holder, and powdered beverage storage canister within said brewed beverage receiver.

4,627,335

APPARATUS FOR COOKING FOOD

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11106; Ilya Zborovsky, 3285 Wolfson Dr., Baldwin, N.Y. 11510, and William Sanchez, 35-69 169 St., Flushing, N.Y. 11358

Filed Nov. 25, 1985, Ser. No. 801,781
Int. Cl.[4] A47J *37/00*
U.S. Cl. 99—325 **10 Claims**



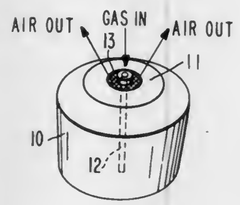
1. An apparatus for cooking food, comprising at least two solid plates, at least one of said plates being movable relative to the other plate so that an initial food material can be directly contacted by said plates from both sides; means for heating said plates to a high temperature; means for acting on at least said one plate and including driving means for driving said one plate into movement toward said other plate so as to develop in the initial food material a high pressure, so that cooking is performed not only under the action of the high temperature, but also under simultaneous action of the high pressure which increases the temperature of evaporation of liquid matter from the initial food material; and means for adjusting the pressure in the initial food material in dependence on the nature of the initial food material, said adjusting means including a sensing element which senses at least one parameter of the movement of said one plate and when said parameter reaches a value corresponding to said pressure in the initial food material said sensing element switches off said driving means so as to stop said one plate.

4,627,336

APPARAUTS FOR STORAGE OF PERISHABLES

Kang H. Nam, 15634 E. Amar Rd., #E, La Puente, Calif. 91744

Filed Sep. 25, 1985, Ser. No. 779,921
Int. Cl.[4] B65D *81/20, 51/16*
U.S. Cl. 99—467 **1 Claim**



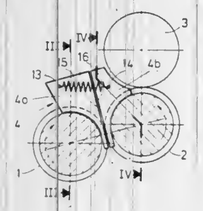
1. An assembly for storage of perishables, comprising, in combination, a circular pot for containing said perishables, and a housing supporting said pot; said pot including a removable lid thereupon, a vertical tube through a center of said lid extending into a lower portion of an interior of said pot for entry of inert gas thereinto, a circular vent opening through said lid surrounding said tube concentrically, and a screen means extending across said vent opening for centrally securing said tube to said lid; and said housing including a base upon which said pot is placed, an inert gas tank inside said base, said housing including a roof parallel to said base and spaced above said pot, a tube connected to the roof for connecting to said vertical tube, a channel inside said roof, one end of said channel being connected to said tube connected to said roof, and the other end of said channel being connected to said inert gas tank for said gas to travel from said tank to said pot.

4,627,337

LEAK-RESISTANT FEEDING CHAMBER FOR CHOCOLATE REFINING MACHINES

Sergio Ripani, and Giulio Serafini, both of Milan, Italy, assignors to Carle & Montanari S.p.A., Italy

Filed Apr. 15, 1985, Ser. No. 723,318
Claims priority, application Italy, May 10, 1984, 20861 A/84
Int. Cl.[4] B02C *25/00*
U.S. Cl. 99—485 **13 Claims**



1. A leak-resistant feeding chamber for feeding chocolate paste to a chocolate refining machine, comprising:

(a) a pair of feeding rolls each elongated along, and rotatable about, different longitudinal axes of rotation,

(b) one of the feeding rolls having a cylindrically elongated first main portion of a predetermined diameter, a cylindrical first end portion at one end region of the first main portion, and a cylindrical second end portion at an opposite end region of the first main portion, each end portion of the one feeding roll having a diameter less than said predetermined diameter of the first main portion,

(c) the other of the feeding rolls having a cylindrically elongated second main portion of a predetermined diameter, a cylindrical first end portion at one end region of the second main portion, and a cylindrical second end portion at an opposite end region of the second main portion, each end portion of the other feeding roll having a diameter less than said predetermined diameter of the second main portion,

(d) said first and second main portions longitudinally engaging and juxtaposed with each other, and having conveying surfaces which convey chocolate paste to the machine during rotation of the feeding rolls, said conveying surfaces bounding a base for the feeding chamber,

(e) a pair of upright first end walls respectively mounted on, and transversely spanning between, the first end portions of the feeding rolls, and together bounding one end for the feeding chamber,

(f) a pair of upright second end walls respectively mounted on, and transversely spanning between, the second end portions of the feeding rolls, and together bounding an opposite end for the feeding chamber,

(g) said first end walls sealingly engaging each other to resist chocolate paste from escaping from the feeding chamber at said one end thereof, and

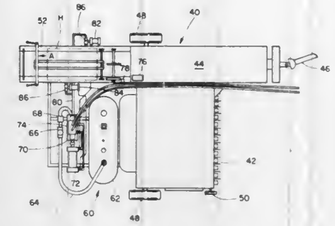
(h) said second end walls sealingly engaging each other to resist chocolate paste from escaping from the feeding chamber at said opposite end thereof.

4,627,338

APPARATUS FOR THE TREATMENT OF RUMINANT FORAGE MATERIAL OR SOIL

David J. Sprott, Lansing, and C. Alan Rotz, Haslett, both of Mich., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 561,393, Dec. 14, 1983. This application Sep. 12, 1985, Ser. No. 775,949
Int. Cl.[4] A23K *1/22*
U.S. Cl. 99—534 **20 Claims**



1. An apparatus for protecting a formed bale of tightly compacted, interwoven fibrous material with a liquid preservative; comprising a bale platform for receiving the formed bale along a predetermined path; storage means for a supply of said liquid preservative; means for withdrawing a quantity of said liquid preservative from said storage means; means for pressurizing said withdrawn liquid preservative; injection valve means for receiving a quantity of said pressurized liquid preservative from said pressurizing means; said valve means including at least one jet spray discharge orifice located closely adjacent said predetermined path of dispense a high pressure jey spray of the pressurized liquid preservative through an outside surface of the baled material and into the interior thereof to vaporize and disperse the liquid preservative throughout the baled material; and control means for actuating said valve means to eject said pressurized liquid preservative from said discharged orifice.

4,627,339

APPARATUS FOR REMOVING SKINS AND PITS FROM AVOCADOS AND THE LIKE

Ronald C. Bushman, Hacienda Heights, Calif., assignor to Brown International Corporation, Covina, Calif.

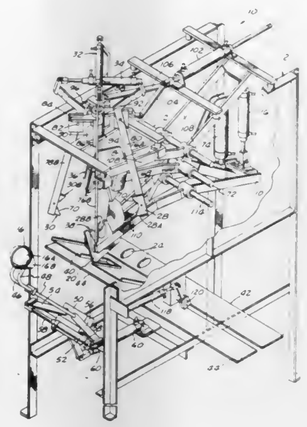
Filed Dec. 18, 1984, Ser. No. 682,832
Int. Cl.[4] A23N *4/00, 7/00*
U.S. Cl. 99—540 **18 Claims**

1. Apparatus for removing skins and pits from avocados and the like, comprising:

knife means for cutting through the skin and flesh of an avocado and for engaging and holding the avocado pit,

jaw means for engaging the avocado skin on opposite sides

of the knife means and removing it from the avocado flesh, and



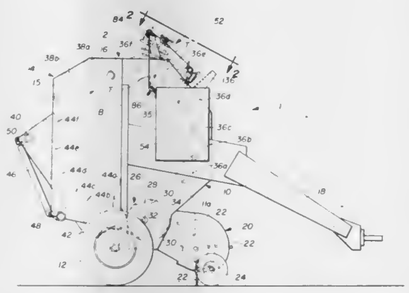
stripper means for separating flesh portions of the avocado from the pit while the pit is engaged and held by said knife means.

4,627,340

TWINE WRAPPING APPARATUS WITH TRIP MECHANISM ACTUATED TWINE DISPENSING MEMBER

Emmett F. Glass, Akron, and Robert A. Wagstaff, Lancaster, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Oct. 16, 1985, Ser. No. 787,880
Int. Cl.[4] B65B *13/18*
U.S. Cl. 100—5 **3 Claims**



1. In a roll baling machine having means for forming crop material into roll bales, and apparatus for wrapping the roll bales with twine, said apparatus comprising:

a twine dispensing arm mounted for pivoting movement to dispense twine;

clamp means for clamping the twine dispensed by said twine dispensing arm, said clamp means including a stationary jaw member and a movable jaw member, said jaw members having end portions defining a mouth therebetween for receiving the twine, said movable jaw having a closed position wherein twine is clamped between said jaw members and an open position wherein twine is released from said jaw members, said clamp means also including a stationary knife disposed adjacent said mouth for severing the twine; and

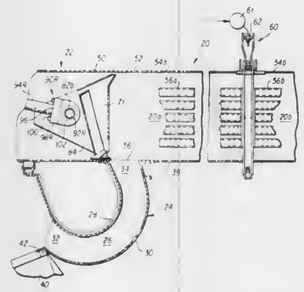
trip means connected to said clamp means, said trip means being actuated by said twine dispensing arm during its pivoting movement to release the twine from said clamp means, said trip means including a control rod connected at one end to said movable jaw member, said trip means also including a pin movably mounted on the other end of said control rod for engagement with said twine dispensing arm, said pin being movable from a trip position to an actuating position for actuating said control rod in order to move said movable jaw member into said open position, said pin also being movable from said trip position to a non-actuating position without actuating said control rod so that said movable jaw member remains in said closed position, said trip means further including a spring urging said pin into said trip position, said pin being moved from said trip position to said actuating position when said twine dispensing arm is moving in one direction, and said pin being moved from said trip position to said non-actuating position when said twine dispensing arm is moving in another direction.

4,627,341

BALE DENSITY CONTROL SENSING APPARATUS AND METHOD

Cecil R. Sudbrack; Linwood H. Bowen, both of New Holland, Pa., and Donald O. Bigelow, Webster, N.Y., assignors to New Holland, Inc., New Holland, Pa.

Filed Sep. 6, 1985, Ser. No. 773,471
Int. Cl.[4] B30B *15/26*
U.S. Cl. 100—41 **33 Claims**



18. A method for controlling the density of bales of crop material discharged from an agricultural baling machine, said method comprising the steps of:

introducing crop material into a bale case;

reciprocably driving plunger means disposed in said bale case in a manner whereby said plunger means applies a compactive force to crop material introduced into said bale case, said plunger means being connected to plunger driving means by connecting means comprising a wrist pin mounted on said plunger means and a connecting rod assembly having a first end connected to said plunger driving means and a second end connected to said wrist pin;

sensing the stress experienced by said wrist pin during the application of said compactive force applied by said plunger means and for producing an electrical signal in accordance with said sensed stress; and,

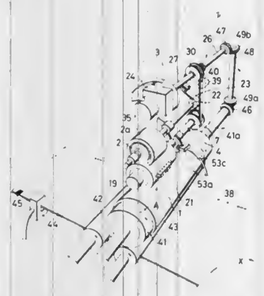
adjusting in response to said signal the degree of resistance to the movement of crop material through said bale case and thereby controlling the density of bales of crop material being discharged therefrom.

4,627,342

HEATED SLEEVE PRINTING ROLL COUPLE WITH CLUTCH-BRAKE UNIT CONTROL

Katsufumi Yui, Saitama, Japan, assignor to E.D.M. Corporation, Tokyo, Japan

PCT No. PCT/JP84/00461, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO86/01774, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 27, 1984, Ser. No. 759,431
Claims priority, application Japan, Sep. 13, 1984, 59-139115; Sep. 13, 1984, 59-139116; Sep. 13, 1984, 59-139117
Int. Cl.[1] B41F *1/07*
U.S. Cl. 101—25 **3 Claims**



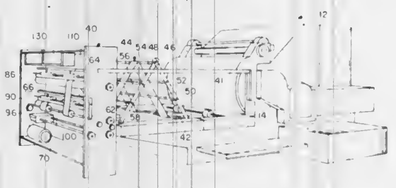
1. A printer comprising a printing roll mounted on a main shaft, means for effecting rotation of said printing roll main shaft, an ink roll presented in axial parallel relationship to said printing roll and provided with heat-soluble ink, a clutch-brake unit operatively connected to said printing roll and said ink roll for controlling rotation thereof consonant with the printing interval of material to be printed, an encoder for translating the rate of feed of said material to be printed into a pulse of unit length, said printing roll rotatable cooperatively with said clutch-brake unit, a heat sleeve concentrically disposed upon said main shaft for rotation therewith, a heater element provided within said heat sleeve for heating thereof and being fixedly mounted whereby said sleeve will rotate relatively thereto, a printing type holder removably mounted on the outer periphery of said heat sleeve and printing type carried on said holder for receiving ink from said ink roller for application upon the material to be printed.

4,627,343

CYLINDER PRESS CONVERSION FOR HOT DIE APPLICATION OF FOIL

Dirk Liepelt, deceased, late of Cornelius, Oreg. (by Joan A. Liepelt, personal representative), assignor to Liepelt & Son, Inc., Hillsboro, Oreg.

Filed Jun. 11, 1985, Ser. No. 743,375
Int. Cl.[4] B41F *3/18*
U.S. Cl. 101—27 **16 Claims**



1. Apparatus usable in conjunction with a cylinder press having a cylinder and a reciprocatingly movable chase carrying a die, for hot die stamping of foil onto stock carried on the cylinder of the press, the apparatus comprising:

(a) supply means mounted on said chase for holding ready a supply of foil-carrying material;

(b) foil draw means fixedly located with respect to said press and separate from said chase, for periodically pulling foil-carrying material from said supply through a predetermined position with respect to said chase, said foil draw means being fixedly located with respect to said press;

(c) foil support means for controlling the location of said foil-carrying material and keeping a portion of said foil-carrying material located between said supply means and said foil draw means from coming into unintended contact with a die carried on said chase during reciprocating movement of said chase, said foil support means including a first longitudinal member pivotably attached to said chase and a second longitudinal member pivotably attached to said foil draw means, said first and second longitudinal members being pivotably connected with one another at a hinge joint located intermediate said chase and said foil draw means;

(d) transverse horizontal crossbar means located proximate to said hinge joint, for supporting said foil-carrying material clear of said hot die during said reciprocating movement of said chase; and

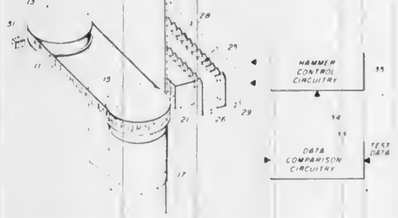
(e) draw control means for adjustably controlling the distance through which said foil draw means pulls said foil-carrying material.

4,627,344

IMPACT PRINTER WITH MAGNETIC INTERACTION COMPENSATION

Robert E. Costello, Utica, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Apr. 11, 1985, Ser. No. 721,994
Int. Cl.[4] B41J *1/20*
U.S. Cl. 101—93.14 **7 Claims**



1. In a high speed impact printer in which a plurality of magnet coils are arranged in an array and are energized repeatedly in varying patterns thereby to effect printing, a compensation system for magnetic interaction between the coils comprising:

for each coil, a respective input circuit which may be actuated to represent that the coil is to be energized on the current print cycle;

for each coil, means for providing a delay which is of programmable duration;

for each coil, means for energizing the respective coil at the completion of the respective delay;

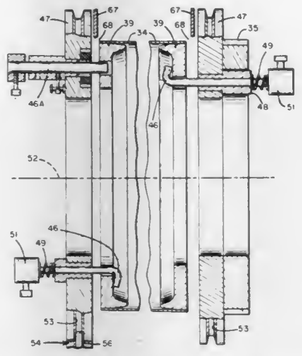
for each coil, logic means responsive to the state of the respective input circuit and to the states of the input circuits for physically adjacent coils for programming the respective delay means to a delay value which is a predetermined logical function of said states, whereby interaction effects between said coils may be offset by varying delays.

4,627,345

ROTARY SCREEN PRINTING APPARATUS

John D. Watts, Newtown, Conn., assignor to Lockwood Technical, Inc., Monterey, Calif.

Continuation of Ser. No. 581,548, Feb. 21, 1984, abandoned.
This application Dec. 10, 1984, Ser. No. 679,996
Int. Cl.[4] B41L *13/06, 23/20*
U.S. Cl. 101—119 32 Claims



21. A rotary screen printing device for delivering heated coating fluid from the inside of a thin-walled heated print cylinder, having a longitudinal central axis, through patterned openings formed therein onto an adjacent advancing substrate, comprising:

a base frame;

a print cylinder support frame mounted on the base frame incorporating interconnected upstanding side members, having respective outer faces and facing inner faces;

a plurality of minor idlers mounted for rotation in a plane substantially perpendicular to the longitudinal central axis near the inner face of each side member, and respectively positioned at equal distances from the longitudinal central axis;

a pair of ring-shaped major idlers having their periphery retained in rolling contact with and supported by the minor idlers near each side member for rotation about the longitudinal central axis, at least one major idler having a driven gear attached thereto on a side toward the inner face of an upstanding side member in spaced relation thereto;

a thin-walled print cylinder having patterned fluid delivery openings formed therein, and a pair of end rings, each secured in telescoped relationship inside one end of the print cylinder and thereby maintaining it in a relatively rigid tubular configuration, the total length of said print cylinder and said pair of secured end rings being less than the distance between the inner faces of said major idlers;

a plurality of cylinder tensioning devices attached to each of said major idlers and respectively connectable to each of said end rings, said tensioning devices having resilient mountings providing outwardly directed tension to said print cylinder along the longitudinal axis while maintaining space between each of said end rings and respective major idlers;

an impression cylinder support frame mounted on the base frame, and an impression cylinder affixed to a rotatable shaft rotatively secured to the impression cylinder support frame along a second axis parallel to said longitudinal axis, and means for rotating the shaft;

a drive gear affixed to said rotatable shaft at a position in alignment with said driven gear;

means for causing relative parallel movement between said longitudinal axis and said second axis without causing disengagement of said drive gear and said driven gear;

a liquid delivery manifold passing inside said print cylinder proximate said longitudinal axis, including means for heating said manifold; and

a radiant heater affixed to said print cylinder support frame, including means for directing radiant heat energy toward the outside of said thin-walled print cylinder; and

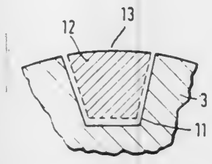
a heat shield at least partially enclosing said thin-walled print cylinder and extending to said radiant heater, said heat shield having walls extending into the space between each of said end rings and respective major idlers.

4,627,346

ROTATIVE PRINTING PROCESS AND APPARATUS FOR CARRYING OUT SAID PROCESS

Hans-Peter Dietzell, Rosenheim-Aisingerwies, and Friedrich Kratzert, Stephanskirchen, both of Fed. Rep. of Germany, assignors to Niedermayr Papierwarenfabrik AG, Rosenheim, Fed. Rep. of Germany

Continuation of Ser. No. 627,348, Jul. 3, 1984, abandoned, which is a continuation of Ser. No. 581,210, Feb. 22, 1984, abandoned, which is a continuation of Ser. No. 338,937, Jan. 12, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,712
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101243
Int. Cl.[4] B41M *1/10*
U.S. Cl. 101—170 13 Claims



1. A rotative printing process which comprises delivering printing ink diluted with a solvent to a rotating cylinder, said cylinder having a cylindrical surface with cups on said surface, said cups receiving said ink, said ink having a viscosity sufficiently low for ready delivery to said cups, and heating the printing ink after it is delivered to said screen cups so as to increase the temperature of the ink while in said cups by an amount sufficient to evaporate a portion of said solvent so as to increase the viscosity of said ink, and removing the ink from the surface of said cylinder between said cups, and transferring the ink only from said cups to a printing carrier to provide distinct points on the printing carrier, each said point corresponding to the ink transferred from one respective cup, said ink being allowed to cool during the transfer from the cups to the printing carrier, the partial evaporation of the solvent serving to minimize point growth on the carrier by increasing the viscosity of the ink.

4,627,347

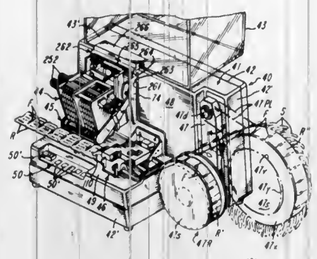
PRINTING APPARATUS

Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,421,425.
This application Feb. 1, 1984, Ser. No. 576,090
Int. Cl.[4] B41F *1/08*
U.S. Cl. 101—292 7 Claims

1. Printing apparatus, comprising: a frame, a print head, a platen cooperable with the print head, means including a support mounting the print head for reciprocating movement to the frame, means for feeding a web of record members to a printing position between the print head and the platen, a

cover guarding the user from the print head and the feeding means, a hinge having a first portion connected to the cover



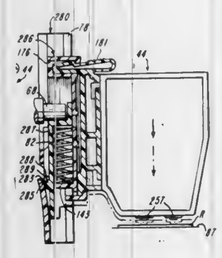
and a second portion secured by being captive between the frame and the support.

4,627,348

PRINTING APPARATUS

Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,441,425.
This application Feb. 1, 1984, Ser. No. 575,969
Int. Cl.[4] B41F *1/08*
U.S. Cl. 101—292 3 Claims



1. Printing apparatus, comprising: a frame, a platen mounted on the frame, a print head movable into and out of printing cooperation with the platen at a printing position, a first mounting member rigidly secured to the frame and having a pair of spaced guides, a second mounting member guided for straight line movement in the guides, a drive member movable back and forth for moving the print head, wherein the first mounting member has an elongated slot and the drive member includes a drive pin movable in the slot, a spring device coupling the drive member and the second mounting member, and means for releasably latching the print head to the second mounting member.

4,627,349

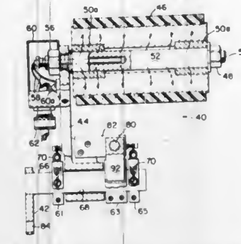
HEATED INKING ROLL FOR A PRINTER

Gary J. Claussen, 3150 King Ave., #4, Billings, Mont. 59102

Filed May 2, 1985, Ser. No. 729,878
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—348 14 Claims

1. Apparatus for applying ink to a printing element such as a grade stamp, which comprises:

means for supporting an associated generally cylindrical ink roll for rotational movement and means for heating the associated ink roll, said means for heating being an elongated electric resistance heating element disposed within said means for supporting and also within the associated ink roll disposed on said means for supporting, said means for supporting including a bushing through which heat is conducted, said bushing extending in axially overlapping relationship to said elongated elastic resistance heating element and the associated ink roll, and said electric resistance elongated heating element being in substantially



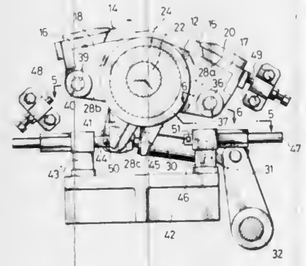
coaxial relationship with said ink roll whereby heat is transferred radially from said electric resistance heating element to the ink roll.

4,627,350

CONVERTIBLE INK SCRAPER DEVICE CORRESPONDING TO REVERSE-ROTATABLE MESH ROLLER

Masayoshi Sato, 76-3, Mukaigaoka, Takatsu-ku, Kawasaki 213; Noritake Harada, 5408-57, Hino, Konan-ku, Yokohama 233, and Kunio Suzuki, 4-11 Ichiba-Shita-machi, Tsurumi-ku, Yokohama 230, all of Japan

Filed Nov. 8, 1983, Ser. No. 549,997
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—350 3 Claims



1. A convertible ink scraper device corresponding to a reverse-rotatable mesh roller comprising:

a fountain roller for picking up ink from an ink pan;

a mesh roller being spaced slightly from said fountain roller and having minute recesses defined in a peripheral surface thereof;

first and second doctor blades disposed in symmetrical locations one on each side of a position in which said mesh roller is disposed adjacent to said fountain roller, and each said doctor blade having a distal end confronting and pressable against said mesh roller;

switch means for independently displacing the doctor blades so as to selectively engage either one or neither of said doctor blades with said mesh roller, means for driving said mesh roller in either a normal or reverse direction, said means for driving including clutch means for selectively rotating said mesh roller in either the normal or reverse direction.

4,627,351

FUSE FOR PROJECTILES

Gunnar G. Thordarson, and Sven O. Bidö , both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1984, Ser. No. 646,731
Claims priority, application Sweden, Sep. 8, 1983, 8304814
Int. Cl.[4] F42C *13/02*
U.S. Cl. 102—213 7 Claims



1. A device for initiating burst of a projectile which rotates about its length axis and has directive maximum explosive force when the projectile is close to a target, such device comprising:

a first sensor having a narrow sensitivity lobe in a direction oblique to the length axis of the projectile and which is at a predetermined angle with respect to the direction of maximum explosive force of the projectile, such first sensor delivering a pulse-shaped signal signifying target detection each time it is directed towards the target during the rotation of the projectile;

a second sensor adapted to monitor the distance to the target and to deliver a pulse-shaped signal when the projectile has entered a predetermined distance zone from the target, such second sensor having a limited sensitivity lobe in a direction oblique to the length axis of the projectile and which is at a predetermined angle with respect to the sensitivity lobe of the first sensor, the signal produced thereby being phase displaced with respect to the signal produced by the first sensor;

an ignition circuit for igniting the projectile;

a coincidence circuit connected to both sensors for supplying an ignition signal to the ignition circuit to cause it to ignite the projectile in response to concurrent signals from both sensors; and

means for comparing the phase of the pulse signals of both sensors and applying them to the coincidence circuit only when such signals are at a predetermined phase relative to each other, whereby only concurrent signals at said predetermined phase can cause the coincidence circuit to supply an ignition signal to the ignition circuit.

4,627,352

SINGLE- OR MULTIPLE-BASE POWDER CHARGES FOR PROPELLANTS AND PROCESS FOR THEIR MANUFACTURE

Heinrich Brachert, Troisdorf-Oberlar; Dieter Girke, Troisdorf, and Gerd Kellner, Aresing, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 47,862, Jun. 13, 1979, abandoned, which is a continuation of Ser. No. 796,870, May 16, 1977, abandoned, which is a continuation of Ser. No. 685,393, May 10, 1976, abandoned. This application Feb. 17, 1984, Ser. No. 611,165
Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520882; Aug. 5, 1975, 2534898
Int. Cl.[4] C06B *45/00*
U.S. Cl. 102—290 19 Claims



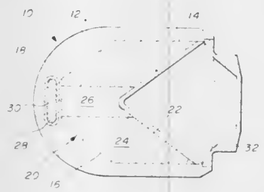
1. A single- or multiple-base powder charge for propellants having at least one internal cavity formed therethrough, which comprises at least one powder grain in the form of a shaped mass of powder, the diameters of the internal cavities of the powder grains constituting said propellant charge being different and at least a portion thereof being smaller than the critical diameter pertaining to the ignition pressure and governing the penetration of the ignition flame into the internal cavities; and at least a portion of the internal cavities being ignited with a retardation only with gas pressures rising above the ignition pressure; at least the predominant portion of the internal cavities having diameters that are present in a predetermined distribution of from about 10 to 250μ.

4,627,353

SHAPED CHARGE PERFORATING APPARATUS

Manmohan S. Chawla, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 25, 1985, Ser. No. 791,634
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—307 2 Claims



1. An explosive shaped charge comprising:

a housing having a forwardly opening cavity formed therein;

a quantity of explosive material within said cavity, said quantity of explosive material comprising first and second explosive materials having different detonation rates wherein said first explosive material comprises an explosive material having a relatively fast detonation rate, said detonation rate in a range exceeding approximately 8,500 meters/second and wherein said second explosive material comprises an explosive material having a relatively slow detonation rate said detonation rate in a range below approximately 8,000 meters/second;

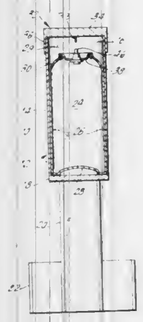
a liner cooperatively arranged to retain said explosive material in said cavity.

4,627,354

LAUNCHABLE AEROSOL GRENADE

George B. Diamond, Anthony & Woodglen Rds., Glen Gardner, N.J. 08826, and Ralph H. Helmrich, Glen Gardner, N.J., assignors to George B. Diamond, Glen Gardner, N.J.

Filed Sep. 13, 1984, Ser. No. 649,982
Int. Cl.[4] F42B *27/06*
U.S. Cl. 102—368 14 Claims



1. A projectile for delivering a quantity of pressurized material to a target area and for dispersing said material at the target area, said projectile comprising:

a sealed can containing said quantity of pressurized material;

a hollow housing having a rear region and a front region which leads said rear region, said can being rearwardly and slidably positioned within the hollow of said housing, said can being sized relative to said housing for being retained rearwardly in said housing prior to impact and for being adapted to slide forwardly toward said front region when said can impacts the target area;

exit means in said can for allowing said pressurized material to exit from said can; and

actuating means on said housing for actuating said exit means to allow said pressurized material to exit from said can into said housing when said can slides toward said front region of said housing.

4,627,355

JOINT RELEASE MECHANISM

James E. Gause, Severna Park, and Ronald E. Armiger, Millersville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,298
Int. Cl.[4] F42B *15/10*
U.S. Cl. 102—378 11 Claims

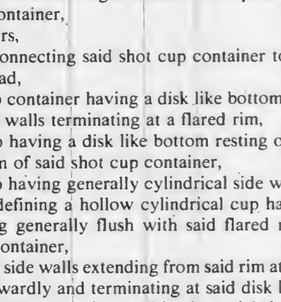
1. A joint release mechanism comprising:

(A) a first cylindrical body portion having a longitudinal axis and an outer surface;

(B) a second cylindrical body portion coaxially arranged with respect to said first cylindrical body portion and having an outer surface;

(C) a cylindrically shaped member of frangible material affixed to both said first and second cylindrical body portions to secure them in position relative to one another and being entirely within the confines of said outer surfaces of said first and second cylindrical body portions; and

(D) plunger means positioned behind said frangible material and being entirely within the confines of said outer surfaces of said first and second cylindrical body portions for



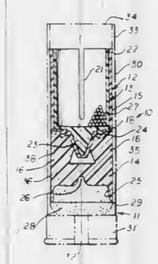
breaking said frangible material whereby said first and second cylindrical body portions may separate.

4,627,356

TWO-PIECE BOOSTER SHOT SHELL WAD

Louis Buczkowski, 1332 E. Seventh St., Erie, Pa. 16503

Filed Jun. 11, 1985, Ser. No. 743,620
Int. Cl.[4] F42B *7/08*
U.S. Cl. 102—453 11 Claims



1. In combination, a shell case and a two-piece booster shot shell wad comprising a shell case, a one-piece wad, a shot cup, said one piece wad having a concave over powder wad,

a shot cup container,

resilient pillars,

said pillars connecting said shot cup container to said over powder wad,

said shot cup container having a disk like bottom and cylindrical side walls terminating at a flared rim,

said shot cup having a disk like bottom resting on said disk like bottom of said shot cup container,

said shot cup having generally cylindrical side walls and an open top defining a hollow cylindrical cup having a rim terminating generally flush with said flared rim of said shot cup container,

said shot cup side walls extending from said rim at said upper end downwardly and terminating at said disk like bottom of said shot cup container and having axial slots dividing said side walls into spaced segments.

4,627,357

AMMUNITION PROJECTILE

Pranas Gobis, 6849 Vernon, Dearborn Heights, Mich. 48127

Filed Sep. 27, 1984, Ser. No. 654,971
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—503 5 Claims

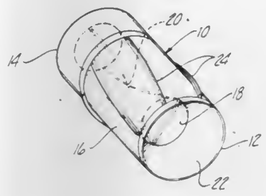
1. An ammunition projectile comprising

an elongated cylindrical body having an axis and an axial cylindrical throughbore,

a helical fin contained within said throughbore for spinning

said body about its longitudinal axis during flight of said body, said helical fin being angled to spin said body in a first rotational direction during flight;

a plurality of exterior fins, said exterior fins being secured to and circumferentially spaced around an outer periphery of said body, said exterior fins being angled with respect to the axis of said body so that said exterior fins spin said body in said first rotational direction during flight,



wherein said body has a forward end and a rearward end, wherein said throughbore flares outwardly from a position spaced inwardly from said forward end and to said forward end of said body to form a conical surface, and wherein said helical fin extends only between said rearward end of said body and said inwardly spaced position.

4,627,358

CONTINUOUS ACTION TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 498,261, May 26, 1983, Pat. No. 4,596,193. This application May 10, 1984, Ser. No. 609,026

Claims priority, application Austria, Sep. 9, 1982, 3386/82; Dec. 16, 1983, 4407/83

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] E01B *29/17*

U.S. Cl. 104—7.2 **38 Claims**



1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast, which comprises

(a) an elongated, heavy, bridge-like main frame supported on two undercarriages spaced apart for continuous movement in an operating direction,

(b) drive means for continuously advancing the main frame along the track in the operating direction,

(c) an operator's cab, a power plant and operating control means on the main frame,

(d) a lighter subframe means arranged between the two undercarriages and leading one of the undercarriages in the operating direction,

(e) tamping means mounted on the subframe means for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties,

(f) track lifting and lining means associated with the two rails mounted on the subframe means ahead of the tamping means at a fixed distance therefrom and sufficiently spaced from the undercarriages in the operating direction to permit leveling and lining of the track,

(1) the tamping, lifting and lining means being arranged within sight of the operator's cab, and

(g) a drive connecting the lighter subframe means to the heavy main frame for adjusting the position of the subframe means in relation to the main frame in the operating direction,

(1) the drive means of the main frame and the drive for the subframe means being synchronized whereby the subframe means may be held stationary intermittently with the tamping, lifting and lining means during each one of the tamping cycles while the main frame is advanced continuously, and

(2) the power plant delivering power to, and the operating control means controlling, the drive and the tamping, track lifting and lining means.

4,627,359

METHOD FOR THE RENEWAL OF A RAILROAD SWITCH OR CROSSING AND TRAIN FOR CARRYING OUT THE METHOD

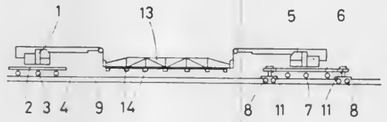
Fritz Bühler, Ecublens, Switzerland, assignor to Les Fils d'Auguste Scheuchzer, S.A., Lausanne, Switzerland

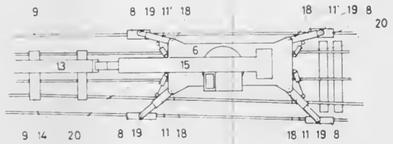
Filed Dec. 18, 1984, Ser. No. 683,184

Claims priority, application Switzerland, Dec. 20, 1983, 6768/83

Int. Cl.[4] E01B *29/02*

U.S. Cl. 104—3 **9 Claims**





1. A train for carrying out the renewal of a switch or crossing in a track, comprising first and second chassis, each having running gear comprising bogies for running on standard gauge track, said two chassis being spaced apart from one another a distance greater than the track-wise extent of a switch or crossing to be renewed, a girder disposed between said chassis and extending lengthwise of the track, a first crane on said first chassis supporting a first end of said girder, a second crane on said second chassis supporting a second end of said girder, and means on said girder for gripping a switch or crossing to be renewed, support means on at least one of said chassis for running along side rails disposed on both sides of said switch or crossing, said means for running on said side rails being also adaptable for running on standard gauge track when transporting a railroad switch or crossing to increase the stability of the crane on said chassis during such transport.

4,627,360

MOBILE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Filed Jun. 7, 1984, Ser. No. 618,121

Claims priority, application Austria, Oct. 5, 1983, 3534/83

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] E01B *29/17*

U.S. Cl. 104—7.2 **10 Claims**

1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on

ballast, the machine being adapted for use in tangent and switch track sections, which comprises

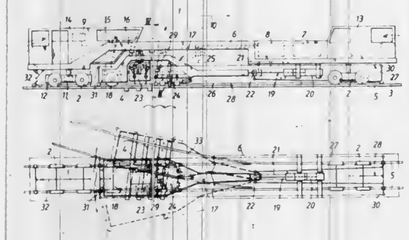
(a) a machine frame supported on undercarriages for continuous movement in an operating direction,

(b) a power plant and operating control means carried by the machine frame,

(c) a tool carrier frame having a front end and a rear end,

(d) an undercarriage supporting and guiding the tool carrier frame rear end on the track,

(e) tamping means mounted on the tool carrier frame immediately ahead of the undercarriage supporting and guiding the tool carrier frame rear end, the tamping means comprising pairs of tamping tools associated with each rail, the tamping tools being arranged for reciprocation in a plane extending in the direction of the rails and at least some of the tamping tools being laterally pivotal in a plane extending perpendicularly to the plane of reciprocation, and the



tamping means being arranged for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties in tangent and switch track sections,

(f) track lifting and lining means associated with the two rails mounted on the tool carrier frame ahead of the tamping means at a fixed distance therefrom in the operating direction and comprising vertically adjustable lifting hooks and flanged lining rollers arranged for engagement with each rail, the track lifting and lining means being arranged on the tool carrier frame between two undercarriages spaced in the direction of the track for lifting and lining the track in tangent and switch track sections,

(g) track leveling and lining reference systems associated with the track lifting and lining means, and

(h) a longitudinally adjustable coupling device pivotally linking the front end of the tool carrier frame to the machine frame, the tool carrier frame having a lateral pivoting range sufficient to pivot and guide the tool carrier frame in switch track sections.

4,627,361

OVERHEAD CABLE TRANSPORT INSTALLATION WITH REGULAR SPACED LOAD SUPPORTING CARRIAGES

Serge Tarassoff, Seyssinet-Pariset, France, assignor to Pomagalski, S.A., France

Filed Jan. 13, 1984, Ser. No. 570,687

Claims priority, application France, Jan. 17, 1983, 83 00749

Int. Cl.[4] B61B *11/00, 1/00*

U.S. Cl. 104—28 **4 Claims**

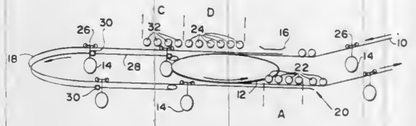
1. An overhead cable transport installation, in particular a gondola lift or a chairlift, comprising:

a continuously moving endless overhead cable extending between two terminals,

a plurality of carriages each supporting a gondola or a chair and having a detachable grip for coupling on said cable,

a transfer rail in each terminal for connecting an inward line and an outward line constituted by said endless cable so as to form with said lines an endless travel path on which the carriages move continuously without stopping, and

a rail section of said transfer rail equipped with a rhythm device, the rhythm device including a first carriage driving means for driving the carriage at slow speed during a first travel time on said rail section, a second carriage driving means for driving the carriage at higher speed during a second travel time on said rail section, said travel times being variable, the length of the first travel time varying inversely with the length of the second travel time so as to change the mean travel speed of said carriage and the whole travel time on said rail section and to monitor the carriage intervals.



4,627,362

AIR SLIDING DEVICE FOR WORK PALLETS OR THE LIKE

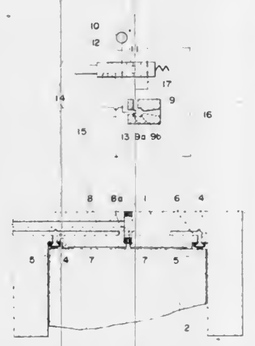
Yoji Ise; Minoru Kato, and Keiichi Tachikawa, all of Tokyo, Japan, assignors to Kabushiki Kaisha Myotoku, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,730

Claims priority, application Japan, Jun. 28, 1983, 58-116619; Sep. 30, 1983, 58-182249

Int. Cl.[4] B60V *1/11, 1/16;* **B61B** *13/04;* **B61H** *9/00*

U.S. Cl. 104—23.2 **10 Claims**



4. Apparatus for precisely positioning a pallet supporting workpieces, tools and the like comprising

(a) a fixed base member comprising a flat surface and an elongated guide rail having a flat surface,

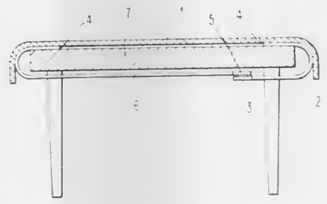
(b) a pallet having an upper surface for said workpiece, tools and the like slidably mounted on said guide rail and having a lower surface lying in direct opposition to the surface of said base, said pallet being displaceable over said guide rail toward and away from said surface of said guide rail, and

(c) means for feeding air under pressure to the surfaces between said pallet and said guide rail to impose an air cushion therebetween, and

(d) seal means extending about the peripheral edge of the lower surface of said pallet surrounding the space defined between the surface of said guide rail and the lower

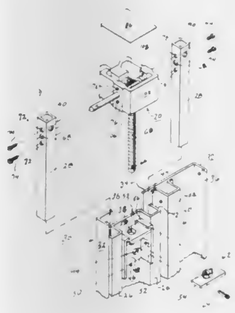
surface of said pallet, and an exhaust port communicating with the space surrounded by said seal means through which a vacuum may be applied causing said pallet to be attracted to said base and said seal means to sealingly enclose said space to hold said pallet in fixed position.

4,627,363
TABLE COVERING APPARATUS
Juliana C. Jones, 1025 Fisk St., Scranton, Pa. 18509
Filed May 10, 1985, Ser. No. 732,602
Int. Cl.[4] A47B *13/08*
U.S. Cl. 108—90 **5 Claims**



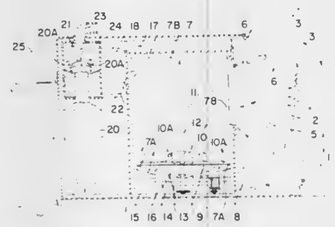
1. An apparatus for covering a table in combination with a table comprising
   a. a table covering with first and second opposing edges with dimensions accommodatingly larger than the table;
   b. a first set of strips attached on one end to the underside of said covering adjacent to the first edge; and aligned with the table edge and extending on the other end outwardly therefrom;
   c. a second set of strips attached on one end to the underside of said covering adjacent to the second edge opposing the first edge; and aligned with the table edge and extending, on the other end, outwardly therefrom in a direction opposing said first set for strips and of a length essentially longer than said first set of strips;
   d. means for attaching the end of each first strip to the end of each opposing second strip;
   whereby the table is covered and said strips are attached end to end at a location unseen under said table thereby securing the covering thereto while allowing the table covering to drape.

4,627,364
VERTICALLY-ADJUSTABLE DESK STRUCTURE
Thomas A. Klein, Plainwell, and Peter M. Baker, Mattawan, both of Mich., assignors to Lear Siegler, Inc., Kalamazoo, Mich.
Filed Dec. 20, 1985, Ser. No. 811,691
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—147 **13 Claims**



1. In a vertically-adjustable desk having a flat top supported by a leg member having a fixed base portion and an adjustable top portion and means for adjusting said leg member to raise and lower said flat top comprising a driveshaft, a driven shaft, means for turning said driveshaft, an elevator screw threaded into a female screw affixed to said base portion of said leg member, and means for connecting said elevator screw to said driven shaft, whereby rotation of said driveshaft one way raises said top and rotation thereof in the other direction lowers it; the improvement in which the means for affixing said female screw member to the fixed portion of said leg member comprises a flat supporting plate unitarily comprising said female threaded member with the axis thereof normal thereto and horizontally-disposed, plate-supporting means affixed to the fixed base portion of said leg member, said supporting means having a transverse opening therein through which said flat supporting plate can be slid horizontally into said plate-supporting means.

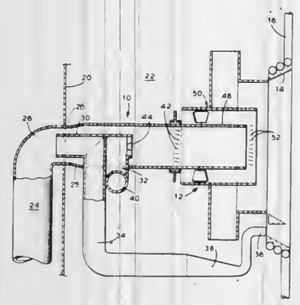
4,627,365
MOBILE GARBAGE INCINERATOR
Kuo-yuan Tseng, No. 287. tzu yu Road, Feng Shan, Taiwan
Filed Sep. 23, 1985, Ser. No. 779,031
Int. Cl.[4] F23G *5/40*
U.S. Cl. 110—240 **5 Claims**



1. A mobile garbage incinerator comprising:
an incinerator unit body;
a hanging drum, located at a back portion of said incinerator unit body, movable to and fro in a vertical direction between a low garbage filling position to a high garbage dumping position;
a hanging drum drive means for lifting or lowering said hanging drum between said low garbage filling position to said high garbage dumping position;
a collecting tank, located adjacent and forward of the hanging drum relative to said incinerator unit body for receiving garbage dumped from said hanging drum;
a pushing plate rotatably mounted within said collecting tank for sweeping and lifting garbage from a bottom of said collecting tank;
a movable cover located above and operatively connected to said collecting tank for opening said collecting tank to receive garbage from said hanging drum and for sealing said collecting tank after a quantity of garbage has been dumped into said collecting tank from said hanging drum for processing;
a movable cover actuating means operatively connected to said movable cover for driving said movable cover;
a main incinerating room, located adjacent and forward of said collecting tank relative to said incinerator unit body;
a first burner operatively connected to said main incinerating room for providing an incinerating flame within said main incinerating room;
an incinerating room door located between said main incinerating room and said collecting tank for pushing trash from said pushing plate into said main incinerating room, for opening said incinerating room to receive garbage from said collecting tank and for sealing said main incinerating room during a first stage incineration of trash delivered to the main incinerating room;
a blower operatively connected to said main incinerating room for providing air for the first stage incineration of garbage and for providing a high positive pressure within said main incinerating room for forcing waste gas from said main incinerating room;

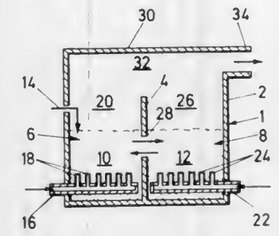
a first tube operatively connected to said main incinerating room for passage of waste gas from said main incinerating room;
a secondary incinerating room operatively connected to said main incinerating room by said first tube;
a second burner operatively connected to said secondary incinerating room for providing an incinerating flame within said main incinerating room;
a second tube operatively connected to said secondary incinerating room for passage of quasi-purified air from said secondary incinerating room;
an air-circulating tank operatively connected to said secondary incinerating room, by said second tube, for separating dust particles from the quasi-purified air including an exit hole for expelling further purified air from said air-circulating tank;
a water curtain located above and surrounding said exit air hole for washing the expelled further purified air; and
an exhaust port for releasing the washed air from the mobile garbage incinerator into the atmosphere.

4,627,366
PRIMARY AIR EXCHANGE FOR A PULVERIZED COAL BURNER
Albert D. LaRue, Uniontown; Roger A. Clocker, Wadsworth, and Norman F. Smith, Jr., Doylestown, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 16, 1985, Ser. No. 776,194
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—263 **11 Claims**



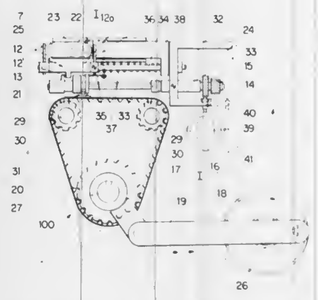
1. A primary air exchange device for a pulverized fuel burner comprising:
   a supply line for supplying a combination of primary air and pulverized fuel to a furnace;
   separator means secured to said supply line for removing from said supply line a first mixture comprising generally one half of said primary air and a relatively small percentage of said pulverized fuel;
   a rich fuel line connected to said supply line for conveying a second mixture comprising the remainder of said primary air and the remaining relatively large percentage of said pulverized fuel past said separator, said rich fuel line forming a burner nozzle for injecting said second mixture into said furnace;
   a hot air injector intermediate said furnace and said separator means, for injecting hot air into said rich fuel line for mixing with said second mixture; and,
   hot air means connected to said hot air injector for supplying said hot air to said hot air injector.

4,627,367
HOT GAS GENERATION
Andrew R. Butt, Quedgeley, England, assignor to Coal Industry (Patents) Limited, England
Filed Nov. 14, 1984, Ser. No. 671,470
Claims priority, application United Kingdom, Dec. 6, 1983, 8332506
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **10 Claims**



1. A method of generating a hot gas including the steps of establishing a first fluidised bed of particulate material and a second fluidised bed of particulate material adjacent the first fluidised bed, feeding coal to the first fluidised bed, partially gasifying the coal in the said first fluidised bed to generate a combustible gas and char, circulating material in a bi-directional manner between the first and second beds across a mutual boundary, fluidising the material at the boundary during circulation thereof, burning the char in the second fluidised bed to generate oxygen rich gases, mixing the combustible and oxygen rich gases downstream of the first and second beds, and burning the combustible gas in the oxygen rich gases to generate a hot gas product.

4,627,368
EMBROIDERING STATION WITH SCHIFFLI-SHUTTLES
Rudolf Reich, Neuwied, Fed. Rep. of Germany, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland
Continuation-in-part of Ser. No. 408,819, Aug. 12, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,629
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133333
Int. Cl.[4] D05C *3/02, 11/00*
U.S. Cl. 112—83 **9 Claims**



1. An apparatus for selectively driving schiffli-shuttles in embroidering stations of an embroidering machine, comprising:
   at least one schiffli-shuttle guideway fixed to a frame member of the embroidering machine to extend in a predetermined direction of extent;

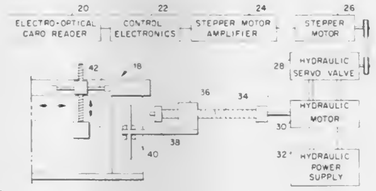
a schiffli-shuttle guided in each said at least one schiffli-shuttle guideway;
stationary longitudinal guide means fixed to said frame member and extending substantially parallel to said predetermined direction of extent of said schiffli-shuttle guideway;
a shuttle driver translatably guided by said stationary longitudinal guide means and provided with coupling means;
barrier means mounted at said shuttle driver and extending substantially transversely into said at least one schiffli-shuttle guideway for entraining and restraining said schiffli-shuttle in said schiffli-shuttle guideway;
rotatable longitudinal guide means journaled in said frame member;
an entrainment coupling translatably guided by said rotatable longitudinal guide means and provided with at least one entrainment means;
means for preventing rotation of said entrainment coupling in relation to said rotatable longitudinal guide means;
said rotatable longitudinal guide means having a first angular orientation in which said coupling means engages said at least one entrainment means and a second angular orientation in which said coupling means disengages from said at least one entrainment means;
a reciprocating drive member engaging said at least one entrainment means for transmitting drive motion through said entrainment coupling and said shuttle driver to said schiffli-shuttle; and
control means for selectively rotating said rotatable longitudinal guide means between said first angular orientation and said second angular orientation.

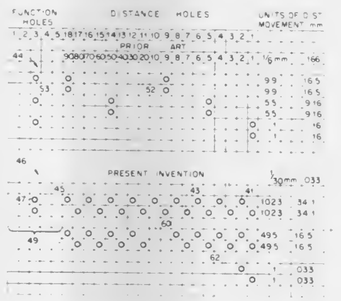
4,627,369

SYSTEM FOR IMPROVING EMBROIDERED ARTICLES

Erich H. Conrad, Asheville; Bernhard Conrad, Weaverville; Robert L. Anderson, and Gilbert E. Carlson, both of Asheville, all of N.C., assignors to Conrad Industries, Inc., Weaverville, N.C.

Filed Jun. 27, 1983, Ser. No. 508,139
Int. Cl.⁴ D05C *9/06*; D05B *21/00*
U.S. Cl. 112—103 **4 Claims**





1. A system for improving adjustments of automatically operated embroidery machines having a movable frame comprising:

an elongated tape having a plurality of rows, each row having at least nine predetermined spaces, said tape being of a jacquard type, said spaces adapted to be selectively encoded forming intelligence means on said tape;

a grouping of said intelligence means in each row corresponding to a binary number;

means for reading said binary number from said tape;

means for converting said binary number into electrical pulses;

means for driving the frame of said embroidery machine in the direction and distance in response to said pulses for providing an embroidered stitch;

said intelligence means including holes punched in said tape, the information contained on said tape is substantially equally divided into two sides, one side providing information for frame movement in the X-axis, and the other side providing information for frame movement in the Y-axis;

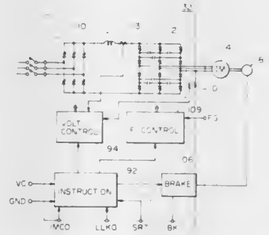
each side of row having a separate group of holes for forming a separate binary number, the two sides adapted to be read substantially simultaneously whereby the combination of the two numbers dictate the angular direction and distance of the stitch, each side of said tape having at least nine spaces.

4,627,370

SEWING MACHINE DRIVE DEVICE

Takashi Nakamura, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00326, § 371 Date Apr. 18, 1983, § 102(e) Date Apr. 18, 1983, PCT Pub. No. WO83/00708, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 20, 1982, Ser. No. 491,962
Claims priority, application Japan, Aug. 20, 1981, 56/130718; Aug. 20, 1981, 56/130719
Int. Cl.⁴ D05B *69/22*
U.S. Cl. 112—275 **3 Claims**



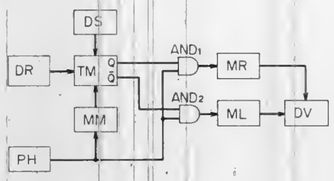
1. A sewing machine drive device comprising a sewing machine drive mechanism having an induction motor and a braking unit; and a position detector connected to the output side of said induction motor, characterized by comprising: a stop position control section, a motor speed detection and control circuit including an inverter circuit, said stop position control section causing said motor speed detection and control circuit to subject said induction motor to variable forward driving, to operate said braking unit with the aid of a detection signal from said position detector, and to reverse the direction of rotation of said induction motor when required, thereby to stop the sewing needle at a predetermined position.

4,627,371

SEWING MACHINE HAVING A STITCH CONTROL DEVICE

Yasukata Eguchi, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,019
Claims priority, application Japan, Dec. 9, 1983, 58-231267
Int. Cl.⁴ D05B *3/02*
U.S. Cl. 112—451 **1 Claim**



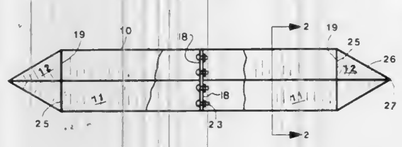
1. A sewing machine for producing stitch patterns in forward and backward fabric feeding directions, the sewing machine comprising an upper drive shaft rotated to vertically reciprocate a needle, the upper drive shaft having a rotation phase in which the needle is moved above a fabric to be sewn; first memory means ML storing stitch control signals including a straight stitch control signal; drive means DV for swinging the needle laterally of the fabric feeding direction, the drive means being responsive to the straight stitch control signal to shift the needle to a predetermined basic needle position; and a stitch control device including second memory means MR storing a swing control signal for swinging the needle laterally of the fabric feeding direction: detecting means PH for detecting the rotation phase of the upper drive shaft to produce a phase detecting signal which is effective during a predetermined time period corresponding to the rotation phase of the upper shaft; and switching means TM rendered operative in response to information indicating an operation of the sewing machine forming the straight stitches while the fabric is transported in the backward fabric feeding direction, the switching means being responsive to the phase detecting signal to produce a first signal, said first signal making effective the swing control signal of the second memory means to operate the drive means to swing the needle laterally of the fabric feeding direction from the predetermined basic needle position, the switching means subsequently producing a second signal during the predetermined time period, the second signal making effective the straight stitch control signal of the first memory means ML to operate the drive means to thereby return the needle to the predetermined basic needle position.

4,627,372

FLOTATION HULL AND BOATS MADE THEREFROM

Otis W. Douglas, III, 5218-C Castlewood Rd., Richmond, Va. 23234

Filed Jun. 17, 1985, Ser. No. 745,497
Int. Cl.⁴ B63B *7/04*
U.S. Cl. 114—61 **12 Claims**



1. A flotation hull comprised of:

(a) at least one pontoon unit of block-like configuration comprised of four flat side walls of rectangular configuration joined at their edges to form four parallel side corners, and two bulkhead end walls positioned at the extremities of said side walls in perpendicular relationship thereto and forming end corners therewith, said end walls being adapted to permit joinder of adjacent pontoon units in a manner such that their end walls are in close parallel juxtaposition while the side walls of adjacent pontoon units are in coplanar alignment, and

(b) a nose piece attached to each terminal end wall of a sequence of one or more pontoon units, said nose piece having a four sided pyramidal shape with a base periphery congruent with the end corners of said terminal end wall, the pointed extremities of said nose pieces being directed away from said pontoon units,

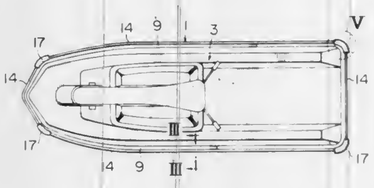
(c) said hull being impervious to entrance of water into the interior thereof.

4,627,373

CONSTRUCTION FOR COUPLING DECK TO HULL OF SMALL-SIZED MARINE CRAFT

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 5, 1985, Ser. No. 698,427
Claims priority, application Japan, Feb. 8, 1984, 59-17171[U]
Int. Cl.⁴ B63B *5/24*
U.S. Cl. 114—182 **2 Claims**



2. A deck-hull coupling construction for a small-sized marine craft comprising:

a deck flange extending horizontally from a peripheral edge of a deck of said marine craft;

a hull flange extending horizontally from a peripheral edge of a hull of said marine craft and adapted to underlie said deck flange;

an upwardly extending deck bumper constituted by upwardly bent outer extremity of said deck flange;

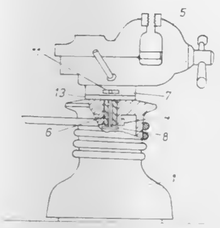
a downwardly extending hull bumper constituted by downwardly bent outer extremity of said hull flange;

protector means having a C-shaped cross-section and fitting around both said extremities and the periphery of said deck bumper and said hull bumper and retained by said extremities along spaced portions of the periphery of said bumpers;

said upwardly extending deck bumper and downwardly extending hull bumper extending peripherally of said craft and terminating adjacent sharply rounded corners of said craft leaving gaps in said bumpers, said protector means extending substantially coextensively with said bumpers; and

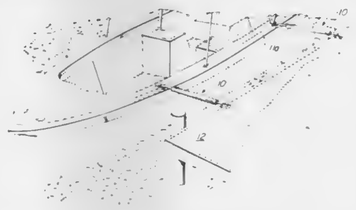
fender means having a C-shaped cross-section and extending along said gaps in said bumpers to cover said flanges and attached to end portions of said protector means adjacent said gaps.

4,627,374
ACCESSORY FOR YACHTS
Brian L. Wright, 338 Bideford Green, Linslade, Bedfordshire, England LU7 7TX
Continuation-in-part of Ser. No. 358,350, Mar. 15, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 658,039
Claims priority, application United Kingdom, Mar. 19, 1981, 8108568; Jun. 15, 1981, 8118276; Nov. 4, 1981, 8133187
Int. Cl.[4] B63B *21/16*
U.S. Cl. 114—218 5 Claims



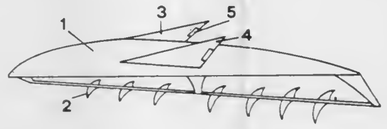
1. A mounting device capable of rigidly mounting an accessory or one of a range of accessories on a yacht, comprising:
(a) mounting means for the accessory,
(b) a supporting leg depending from said mounting means and adapted to locate in the handle receiving socket of a winch,
(c) a locking device provided on said support leg and by which the mounting means can be releasably locked in the winch socket, said locking device comprising a plate of the same shape and dimensions as the cross-section of said leg and which can be dis-placed from a first position in which it does not extend beyond the cross-section of the leg and so permits insertion of the leg into said socket, to a second position in which it projects laterally from said cross-section to effect locking of said leg in said socket,
(d) a post integral with said plate and extending along the inside of said leg,
(e) a pin which extends transversely through said post whereby by angular movement of said pin about the axis of said post, said post can be rotated within said leg to move said plate between said first and second positions, and
(f) a clamping member threadedly engaging with the outside of said leg whereby after said mounting device has been locked in the winch said clamping member can be adjusted by screwing it down said leg to engage the winch and so take up any slackness in the mounting of the mounting device to the winch.

4,627,375
BOAT MOORING DEVICE
Roy F. Davis, and William Murphy, both of 1223 Periwinkle Way, Sanibel, Fla. 33957
Filed Mar. 4, 1985, Ser. No. 707,961
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 5 Claims



1. A device for mooring a boat to a dock comprising an elongated cylinder having an axial hole in each of its two ends for slidable passage of a piston rod,
a first piston designed to move back and forth along the axis of said cylinder,
a first piston rod having one end affixed to said first piston and its other end designed to be removably attached to the boat,
a first helical coiled spring surrounding that portion of the first piston rod lying within said cylinder,
a second piston designed to move back and forth along the axis of said cylinder,
a second piston rod having one end affixed to said second piston and its other end designed to be removably attached to the dock, and
a second coiled helical spring floating within said cylinder between said first and second pistons.

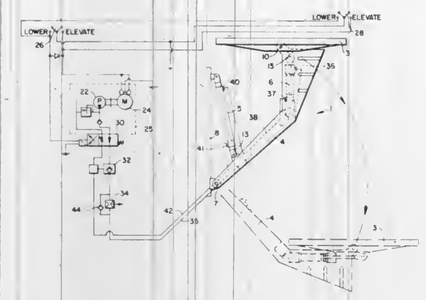
4,627,376
WATERCRAFT PROVIDED WITH TRIM STABILIZERS UTILIZING DIFFERENT FLUIDS
Corrado Scarfo, and Paolo Scarfo, both of Via Bevagna 68, Roma, Italy
Continuation of Ser. No. 419,190, Sep. 17, 1982, abandoned. This application May 2, 1985, Ser. No. 729,666
Claims priority, application Italy, Sep. 21, 1981, 49332 A/81
Int. Cl.[4] B63B *1/16*
U.S. Cl. 114—272 2 Claims



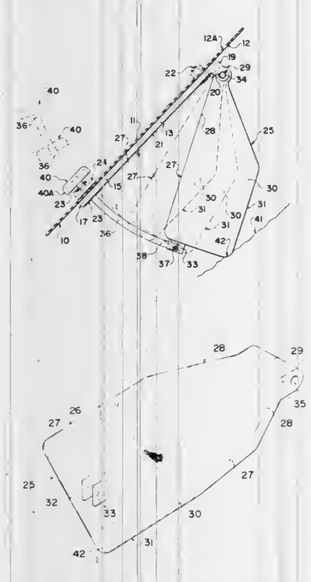
1. A watercraft having attitude stabilizing members utilizing different fluids, said watercraft comprising a hull with a bow and a stern and having a longitudinal axis, a beam having a longitudinal axis located beneath the hull and extending along the length of the hull, the longitudinal axis of the beam being in a plane with the longitudinal axis of the hull and non-parallel thereto, the two axes intersecting adjacent the bow of the boat, a first stabilizing member which effects longitudinal attitude stabilization by contact with water, said first stabilizing member comprising at least three narrow hydrodynamic wings attached in a row along the length of the beam, the largest dimension of the wings being transverse to the longitudinal axis of the beam and extending on both sides thereof, the wings being of differing surface areas with the wing having the largest surface area being nearest the stern and with the wing having the smallest surface area being nearest the bow, and two second attitude stabilizing members attached to the hull and extending generally upwardly so as to effect transverse stabilization by contact with air, the second attitude stabilizing members each comprising an aerial wing having a controllable aileron, the outward ends of each of the aerial wings having means for emitting a fluid in an amount and at a pressure sufficient to help effect stabilization.

4,627,377
DAVIT DEVICE
Alain Zoonens, 147 bis rue de Silly, Boulogne, France
Filed Feb. 15, 1985, Ser. No. 702,086
Int. Cl.[4] B63B *23/02*
U.S. Cl. 114—373 10 Claims

1. A lifting and lowering device for use with a vehicle comprising a platform mounted on the vehicle and extending outside said vehicle, pivoting arm means having a free end articulated to the platform and its other end pivoted to the vehicle, a first hydraulic jack mounted between the platform and said arm means and a second hydraulic jack mounted between said arm means and said vehicle, means for connecting one or the other of respective opposite ends of said first and second jacks to a source of fluid pressure while simultaneously connecting to drain that one of said opposite ends which is not connected to said source, and means fluidly connecting together the other respective opposite ends of said jacks such that when either one of said jacks is operated in response to fluid pressure it transmits fluid pressure to the other jack to operate it simultaneously with said one jack.

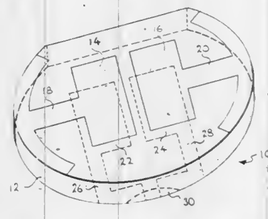


4,627,378
FILL GATE FOR GRAIN BINS AND THE LIKE
Cecil E. Manness, Box 4, Domain, Manitoba, Canada R0G 0M0, and Leo J. Nolette, Box 195, St. Agathe, Manitoba, Canada R0G 1Y0
Filed May 6, 1985, Ser. No. 730,591
Claims priority, application Canada, May 10, 1984, 453990
Int. Cl.[4] G01F *23/32, 23/34*
U.S. Cl. 116—229 16 Claims



1. A fill indicator for grain bins and the like having a sloping roof; comprising in combination a mounting member for securement to the sloping roof, a substantially wedge shaped float with means pivotally secured at one end thereof to said mounting member to depend therefrom when installed, guide means secured adjacent the other end of said float and extending upwardly therefrom, and indicating means on the distal end of guide means, said float including a substantially planar upper surface having side edges extending substantially parallel to one another from the other end of said float towards said one end thereof and converging towards said one end and terminating in a mounting means adjacent said one end, a pair of sides depend downwardly and inwardly from said side edges to form a keel portion substantially parallel to the upper surface from said other end towards said one end, said keel then inclining upwardly towards said one end at which said keel substantially meets said upper surface at said pivotably secured means, said sides also converging towards said one end from the location at which the keel commences inclining upwardly.

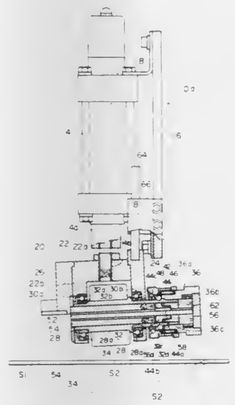
4,627,379
SHUTTER APPARATUS FOR FINE-TUNING A COUPLED-DUAL RESONATOR CRYSTAL
Gerald E. Roberts, Lynchburg, and Samuel Toliver, Rustburg, both of Va., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,124
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—721 13 Claims



1. Shutter apparatus for use in tuning resonator crystals or the like by the vapor deposition process in which a material is plated on both the active and ground sides of a crystal through masks associated with each side of the crystal, the shutter apparatus comprising:
a first sliding shutter disposed between a first deposition material source and an active side mask having a plurality of apertures equal to the number of areas to be plated on the active side of the crystal, said first sliding shutter having a plurality of apertures equal to the number of active side mask apertures, each first shutter aperture being separated laterally and vertically from the other first shutter apertures, said first sliding shutter being movable to a number of positions equal to the number of first shutter apertures, and wherein at each position only one first shutter aperture is aligned with one active side mask aperture;
a second sliding shutter disposed between said first deposition material source and said active side mask, said second sliding shutter being movable to two positions, a first position at which said second sliding shutter blocks the flow of deposition material to said active side mask regardless of the position of said first sliding shutter, and a second position at which said second sliding shutter does not interfere with the flow of deposition material through said first sliding shutter apertures regardless of the position of said first sliding shutter;
means attached to said first and second sliding shutters for moving said shutters sequentially from one position to another;
a third sliding shutter disposed between a second deposition material source and a ground side mask having a coupling adjust spot aperture therein, said third sliding shutter having an aperture therethrough in substantial alignment with said coupling adjust spot aperture when said third sliding shutter is in a first position and in complete misalignment with said coupling adjust spot aperture when said third sliding shutter is in a second position; and

means attached to said third sliding shutter for sliding said shutter between its first and second positions.

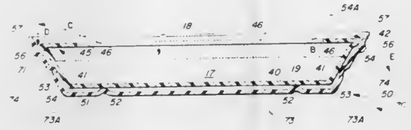
4,627,380
MARKING APPARATUS FOR COLORING LATERAL EDGE OF SHEET
Yoshinori Tahara, Numazu, Japan, assignor to Mei San Co., Ltd., Japan
Filed Jun. 17, 1985, Ser. No. 745,626
Claims priority, application Japan, Mar. 9, 1985, 60-47292
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—77 **5 Claims**



1. A marking apparatus for coloring a lateral edge of a sheet moving along its longitudinal axis which comprises:
(a) a marking head comprising (i) a body, (ii) a tubular shaft mounted on said body for rotation about an axis of said shaft, (iii) a roller fixedly mounted on said tubular shaft for rotation therewith, (iv) an elongated coloring element of a solid material received in said tubular shaft and having one end extending outwardly of one end of said tubular shaft a predetermined distance, and (v) means for preventing the rotation of said coloring element relative to said tubular shaft; and
(b) an actuator operable to move said marking head in a plane perpendicular to the plane of the sheet in which the lateral edge of the sheet lies so as to bring an end face of the one end of said coloring element into contact with the lateral edge of the sheet to apply a marking thereto, the axis of said tubular shaft being disposed transversely of a path of travel of the sheet and inclined with respect to the plane of the sheet with one end of said tubular shaft being closer to the plane of the sheet than the other end of said tubular shaft.

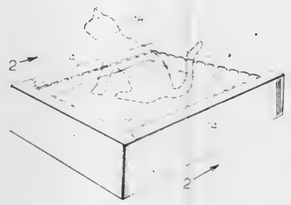
4,627,381
DISPOSABLE TRAY AND STAND
David M. Reed, 1924 E. 5th Ave., Mesa, Ariz. 85204, and Michael R. Johnson, 829 S. Extension, Mesa, Ariz. 85202
Filed Aug. 2, 1985, Ser. No. 761,688
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 **1 Claim**

1. A disposable tray with litter for animals, including
a. a container having a base and a substantially upright wall about the periphery of said base, said upright wall having an upper edge circumscribing said base;
b. a volume of absorbent particles in said container, said volume being sufficient to maintain a generally horizontally disposed upper surface level of particles above said base and beneath said upper edge of said wall when said particles are evenly distributed over said base;
c. a lip attached to and outwardly extending from said upper edge of at least one of said side walls over said base, and having an inner edge spaced away from said wall and spaced away from said upper surface level of said particles; and,
d. a lid having a peripheral lip and shaped and dimensioned to be positioned beneath said base such that
(i) said container is generally maintained in said lid with said base and wall of said container spaced away from said lid;



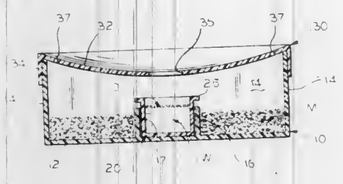
(ii) said lid receives said container such that
said lid extends upwardly above said lip of said container, and
particles directed from said container over said lip thereof and against said lip of said lid can fall downwardly between said wall of said container and said lid.

4,627,382
DISPOSABLE LITTER BOX
Dennis K. Muzzey, 16402 Jacquie Ave., Lockport, Ill. 60441
Filed Sep. 4, 1984, Ser. No. 646,783
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 **1 Claim**



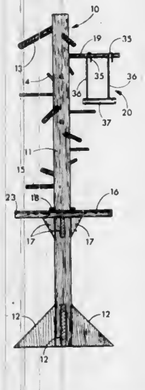
1. A storable and shippable disposable litter box for cat wastes, comprising:
a box fillable with cat litter;
a flat top lid removably mounted on said box, containing a plurality of perforations and reusable as an absorbant bottom liner for the cat litter,
means for moisture proofing, the exterior of said box so that moisture does not ingress during storage and shipment and the cat wastes do not egress after use,
wherein said top lid has a top surface that is uncoated and a bottom surface which is moisture proofed so that before said top lid is removed the disposable litter box is moisture proofed and the uncoated top surface can be used for imprinting for the box and when the disposable litter box is used said top lid is placed uninverted with said uncoated top surface facing upwardly, under the cat litter, so as to act as an absorbant bottom liner, and
wherein said perforations are semi-circular in shape and contain inwardly facing arcs and straight line edges, said edges and arcs being moisture proofed, so that one or more user fingers can be inserted for removing said top lid, wherein said semi-circular perforations being closely spaced so that when said top lid is removed, the surface area of said box not moisture proofed is minimized.

4,627,383
ANIMAL WASTE COLLECTION ARRANGEMENT
Romain Metzger, Deerfield, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Feb. 7, 1985, Ser. No. 699,352
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **6 Claims**



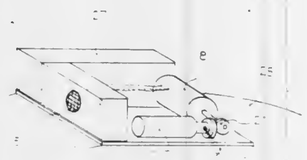
1. In a sanitary arrangement for collecting pet animal wastes, the combination of:
(a) a housing having a bottom wall and at least one side wall extending upwardly therefrom to form therewith a box-like structure open at the top;
(b) a readily removable cover seated on said housing;
(c) said cover having an opening extending therethrough at the lowest area thereof for the passage of animal wastes and being inclined gradually downwardly from its outer periphery toward said opening;
(d) a removable waste receiving receptacle positioned on the bottom wall of said housing under said opening;
(e) a wall-like element extending upwardly from said said housing bottom wall to surround said receptacle.

4,627,384
BIRD TREE APPARATUS
Marc A. Courteau, 7538 18th Ave., S., Richfield, Minn. 55423
Filed Dec. 17, 1984, Ser. No. 682,689
Int. Cl.[4] A01K *31/12*
U.S. Cl. 119—26 **10 Claims**



1. A bird tree apparatus for exercising the anatomical features of a domestic bird to reduce the atrophying effect on the leg and foot muscles, for removably collecting food and bird droppings, and for holding aviary toys, said bird tree apparatus comprising:
a. an upright support member having upper, lower and intermediate portions and having a predetermined width, said intermediate portion further having a horizontally disposed slot thereinto and having generally parallel top and bottom surfaces spaced a predetermined height and further having opposing platform support members each having a generally flat top surface affixed to said support member, said platform support member top surfaces being in planar communication with the bottom surface of said support member slot,
b. a plurality of outwardly extending base members attached to the lower portion of said support member to hold said support member in a generally vertical position,
c. a frictionally held and quickly removable horizontally disposed platform member having an elongated notch thereinto and extending to generally its midportion for engaging said support member, said platform member being for collecting bird food, aviary toys and droppings, said platform member being removably mountable at said horizontally disposed slot at the intermediate portion of said upright support member, and for placement on said opposing platform support members,
d. a locking plate member having a predetermined thickness approximately said predetermined support member slot height and having a width greater than said predetermined support member width, said locking plate for insertion into said support member slot and for engaging said platform member for permitting the quick removal of said platform member without disassembly of the structural elements of said device, and
e. a plurality of elongated perch members attached to and extending outwardly from said upper portion of said support member, said perch members consisting of a plurality of diameter dimensions to provide a bird with means to exercise its leg muscles by providing perch members having a plurality of claw gripping diameters, said elongated perch mambers further being of a wood dowel construction having a diameter range from 1/16 to 2 inches.

4,627,385
BARK RESTRAINING DEVICE FOR DOGS
Rene Vinci, 4 Rue Raymond Bistors, Perpignan, Pyrenees Orientales, France
Filed Mar. 7, 1985, Ser. No. 709,433
Int. Cl.[4] A01K *15/00*
U.S. Cl. 119—29 **6 Claims**



1. A device for dissuading a dog from barking and adapted to be carried by a collar worn by the dog around its neck, said device comprising:
sound sensing means sensitive to sound frequencies characteristic of the frequency of the bark of the dog, said sound sensing means further being adapted to emit an electrical signal when actuated by the bark of the dog; and
means responsive to said electrical signal and carrying a substance which is adapted to dissuade the dog from barking, said means further being adapted to discharge a portion of said substance in the region of the head of the dog in response to said electrical signal, said means responsive to said electrical signal comprising a tank, said substance carried by said means responsive to said electrical signal being carried within said tank in a pressurized condition, said means responsive to said electrical signal further comprising a spray valve operatively associated with said tank, said spray valve further being activatable

by said electrical signal to release said substance from said tank and to discharge said substance in a spray through said spray valve.

4,627,386

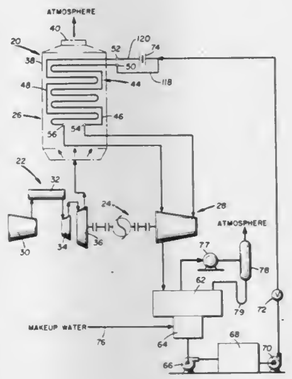
STEAM GENERATORS AND COMBINED CYCLE POWER PLANTS EMPLOYING THE SAME

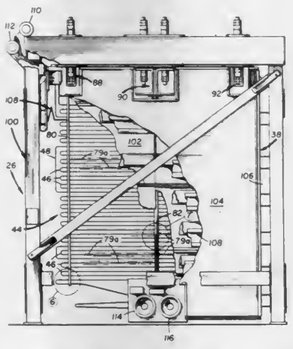
Thomas E. Duffy, San Diego; John P. Archibald, La Jolla, and Alan H. Campbell, Encinitas, all of Calif., assignors to Solar Turbines, Inc., San Diego, Calif.

Continuation of Ser. No. 483,437, Apr. 8, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,648

Int. Cl.⁴ F22B *33/14*

U.S. Cl. 122—1 B **7 Claims**





1. A once-through boiler comprising: a vertical casing having a gas inlet and a gas outlet respectively located at the lower and upper ends thereof; an overhead support structure in said casing; a plurality of independent steam generating circuits hung from said support structure, each of said circuits comprising a single, sinuous low pressure tube with horizontal tube runs and a high pressure tube of similar configuration internested with the low pressure tube, said horizontal tube runs being so staggered as to increase the transfer of heat from hot gases flowing upwardly through said casing to said high and low pressure tubes and said high pressure tubes each having feedwater, vaporizer, and superheater sections with said vaporizer and superheater sections being of greater diameter than the feedwater sections; and a feedwater pump for effecting a flow of water into said low and high pressure tubes at the inlet ends thereof.

4,627,387

FLUIDIZED-BED APPARATUS WITH A HEAT EXCHANGER AND AN ADDITIONAL-AIR BLOWING NETWORK

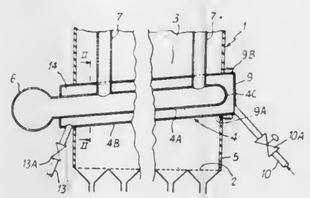
Roger M. Puff, Lens, and Jacques P. Dreuilhe, L'Isle Adam, both of France, assignors to Charbonnages de France; Framatome and Institut Francais du Petrole, all of Paris, France

Filed Oct. 1, 1985, Ser. No. 782,556

Claims priority, application France, Oct. 2, 1984, 84 15105

Int. Cl.⁴ F22B *1/00*

U.S. Cl. 122—4 D **10 Claims**



1. A fluidised-bed apparatus with at least one heat exchanger having a lower header which is slightly inclined to the horizontal and is situated in the fluidised bed during operation, an upper header, and a plurality of upright tubes which extend between the lower header and the upper header, the lower header consisting of an internal duct, which is connected to a circuit for the heat-exchange fluid and from which the upright tubes extend, and an external duct, which is connected to an additional blowing gas supply line and is provided with blowing nozzles.

4,627,388

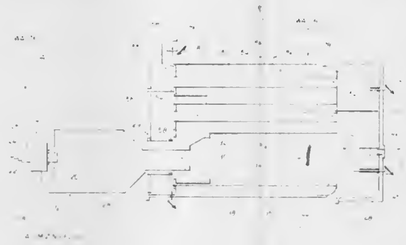
COMBUSTION OF HALOGENATED HYDROCARBONS WITH HEAT RECOVERY

Jack E. Buice, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich,

Filed Jul. 22, 1985, Ser. No. 757,224

Int. Cl.⁴ F22B *7/12*

U.S. Cl. 122—149 **16 Claims**



1. A water-cooled, horizontal fire-tube boiler having an affixed end section, a boiler section, and a second end section, which comprises in combination:

(a) a boiler section comprising a generally closed shell having a vertically disposed metal tube-sheet at each end, said shell holding water between said ends, a relatively long secondary combustion chamber extending along the length of, and within, said shell, and communicating through said tube-sheets, a plurality of relatively small metal return-tubes extending the length of, and within, the boiler shell and communicating through said tube-sheets, the secondary combustion chamber and the return-tubes being in spaced horizontal relationship;

(b) wherein said boiler section defines a folded multi-segment flue gas discharge path therethrough;

(c) a front end nozzle section adjacent a confined primary combustion chamber for containing combustion gases, said primary combustion chamber communicating with said secondary combustion chamber and into said return-tubes, and having feed means for feeding air, supplemental fuel, and halogenated hydrocarbons into a burner nozzle within the primary combustion chamber;

(d) means for blowing air past said nozzle to define a flame front having a temperature in the range of from about 1,000° C. to about 1,800° C. to combust halogenated hydrocarbons;

(e) said primary combustion chamber having an elongate extent sufficient to enclose therein the flame front, and wherein said primary combustion chamber terminates opposite said burner nozzle in an aligned and streamlined relation therewith, insulation covered wall means defining an outlet directing flue gas flow from said primary combustion chamber into said secondary combustion chamber;

(f) said outlet being sufficiently spaced from the flame front and sufficiently long that flue gas temperature at the end of said secondary combustion chamber is less than 1,000° C. at entry into said folded multi-segment flue gas discharge path;

(g) end section means comprising a confined space for containing combustion gases, said space communicating with said secondary combustion chamber and said return-tubes and defining a portion of said folded multi-segment flue gas discharge path;

(h) said shell and said end section means having surfaces, except for the tube-sheet surfaces, which are exposed to the combustion gases when the boiler is in operation, made of corrosion-resistant material or covered with an amount of insulation predetermined to maintain the temperature of such surfaces within a predetermined temperature range during operation;

(i) means for supplying water into said shell;

(j) a means for removing steam from said shell; and

(k) flue means for removing combustion gases from one of the end sections.

4,627,389

TWO-STROKE INTERNAL COMBUSTION ENGINE

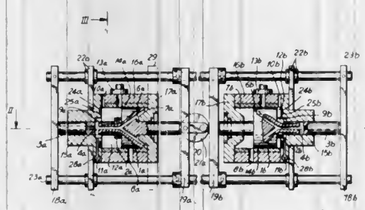
Istvan Simon, Rosengässchen 7, 8200 Schaffhausen, Switzerland

Filed Jul. 22, 1985, Ser. No. 757,658

Claims priority, application Switzerland, Jul. 24, 1984, 3575/84

Int. Cl.⁴ F02D *19/00*; F02B *75/24*

U.S. Cl. 123—25 C **8 Claims**



1. In a two-stroke internal combustion engine having two coaxial pistons mounted for equal movements on opposite strokes, a crankshaft located between the pistons which have faces adjacent the crankshaft formed to assist the introduction of fresh air during the inlet stroke, and a fresh air inlet port and a waste gas outlet port located on opposite sides of the piston chamber near its centre, the improvement comprising

(a) two piston rods, each carrying one of the pistons,

(b) a frame-like guide cradle in which said piston rods are mounted,

(c) a cylindrical extension on the combustion chamber face of piston,

(d) an extension of the combustion chamber of each cylinder which receives the corresponding cylindrical piston extension in the compression position of the piston,

(e) a fresh air supply channel extending longitudinally of each piston rod,

(f) fresh air supply channels which lead from each piston end face adjacent the crankshaft into said associated longitudinal channel,

(g) a further channel extending across each piston rod communicating with said longitudinal channel and opening, in the dead centre position of the associated piston, when in the compression position, into said extension of the combustion chamber of the associated cylinder,

(h) a projecting guide boss on the base of each cylinder remote from the crankshaft which guide boss receives the associated piston rod and closes the associated further cross channel when said channel is located within the boss,

(i) a fuel injection port formed in each cylinder casing adjacent the base of the cylinder,

(j) a separate water injection port leading into the extension of each combustion chamber,

(k) a separate non-return valve connected to each water injection port.

4,627,390

FUEL INJECTION DEVICE FOR TWO-STROKE ENGINE

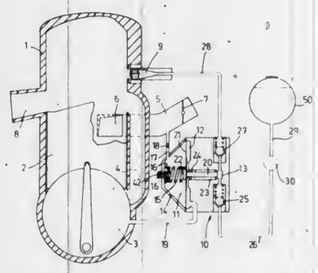
Hubert J. F. Antoine, Chemin des Vignerons 32, 5150 Xépion, Belgium

Filed Jul. 19, 1984, Ser. No. 632,310

Claims priority, application Belgium, Jul. 28, 1983, 0/211260; May 28, 1984, 0/213014

Int. Cl.⁴ F02D *3/02*

U.S. Cl. 123—73 CB **12 Claims**



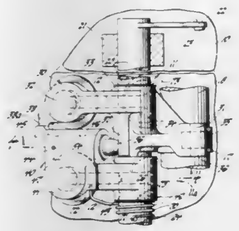
1. Fuel injection device for a two-stroke engine with precompression in its casing, characterised by a pump body comprising a first chamber vented to outer atmosphere, the first chamber also communicating with an air intake pipe, a second chamber having a communication line communicating with a precompression casing of the engine, said second chamber being separated from the first chamber by a movable partition which is integral with a support held by a spring; a piston resting on the support and sliding axially in a channel when the movable partition displaces the support; and a third chamber having an opening communicating with a fuel inlet opening into an engine cylinder in a substantially radial direction so as to spray the fuel over the sweeping current, the third chamber being located at an end of said channel so that when the movable partition displaces the support one end of the piston is displaced, thereby varying the pressure prevailing in the third chamber, so as to take in a quantity of fuel when the movable partition compresses the spring and to force a quantity of fuel towards the injector when the spring is released.

4,627,391

ENGINE VALVE TRAIN SYSTEM

John G. Derringer, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,459
Int. Cl.[4] F02D *13/06;* **F01L** *1/34*
U.S. Cl. 123—90.16 **3 Claims**



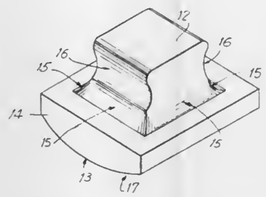
1. A reciprocating internal combustion engine of the type having an engine block means defining at least one cylinder with an associate pair of ports, a valve located for axial movement in each of said ports with each said valve normally biased to a valve closed position relative to its associate port, rocker shaft support means fixed to said engine block means, and a valve actuator spaced from said valves and operable to effect reciprocation of said valves, the improvement comprising: a rocker shaft pivotably supported by said rocker shaft support means, said rocker shaft having an axial passage adapted to be in continuous flow communication with the pressurized lubricant supply of the engine; a first rocker arm pivotably supported on said rocker shaft in position for engagement with said valve actuator and with one of said valves and actuated in rocking movement whereby it can operate to effect opening and closing movement of said one of said valves, and a second rocker arm pivotably supported on said rocker shaft next adjacent to said first rocker arm and operatively engaging the other one of said valves, said second rocker arm having a hydraulic cylinder means therein, a piston sealingly journaled in said hydraulic cylinder means and located so as to permit engagement of said piston with said first rocker arm, said second rocker arm having a supply/drain passage means therein to said hydraulic cylinder means, and a drain passage which extends to the exterior of said second rocker arm and which is located in circumferentially spaced apart relationship to said supply/drain passage means, said rocker shaft having at least one radial riser supply passage in flow communication with said axial passage and a chordal exterior drain groove circumferentially spaced from said supply passage both said radial riser supply passage and said chordal exterior drain groove being axially located on said rocker shaft so as to be in radial alignment with said supply/drain passage means and with said drain passage in said second rocker arm; and, drive means operatively connected to said rocker shaft to effect pivotable movement thereof between a first position at which said supply passage is in flow communication with said supply/drain passage means whereby pressurized lubricant can be supplied to said hydraulic cylinder to effect movement of said piston in a direction whereby said second rocker arm will be operatively driven by said first rocker arm, and a second position at which said supply passage is out of flow communication with said supply/drain passage means and said drain groove is in a position to effect flow communication between said supply/drain passage means and said drain passage whereby said second rocker arm will be operatively disconnected from said first rocker arm.

4,627,392

CERAMIC TIP CAST IN VALVE ROCKER ARM

Keisuke Tashiro, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and NGK Insulators, Ltd., both of Japan

Filed Apr. 17, 1985, Ser. No. 724,061
Claims priority, application Japan, Apr. 18, 1984, 59-55892
Int. Cl.[4] F01L *1/18*
U.S. Cl. 123—90.39 **6 Claims**



1. In a cast ceramic tip for a rocker arm of an automotive engine, a slipper block having a contoured cam engaging surface extending longitudinally of one face thereof, and having a retainer block formed integrally with said slipper block and extending substantially perpendicular to an opposite face of said slipper block, said retainer block having opposite longitudinally extending faces and opposite laterally extending faces, the improvement comprising:

radiused fillets extending laterally of said opposite faces of said slipper block, and providing transitions between said opposite face thereof and said opposite laterally extending faces of said retainer block; and,

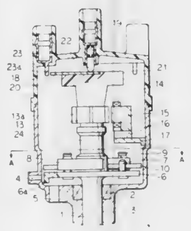
retaining channels formed exclusively in said longitudinally extending faces of said retainer block, said laterally extending faces being substantially planar.

4,627,393

IGNITION DISTRIBUTOR

Akihiko Takenaka, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 20, 1985, Ser. No. 746,791
Claims priority, application Japan, Jun. 28, 1984, 59-134782
Int. Cl.[4] F02P *7/02*
U.S. Cl. 123—146.5 A **6 Claims**



2. An ignition distributor for an internal combustion engine, comprising:

a distributor housing including a body and a cap;

a drive shaft rotatably supported by said housing to be driven by the internal combustion engine;

a rotor electrode secured to a rotor drivingly connected with said drive shaft;

a plurality of spaced counter-electrodes carried by said cap; and

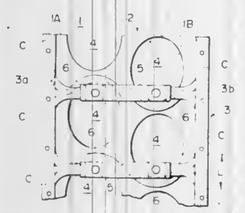
means for controlling ventilation communication between the inside and the outside of said distributor housing in accordance with the timing of the discharges between said rotor electrode and said counter-electrodes.

4,627,394

CYLINDER BLOCK FOR INTERNAL COMBUSTION ENGINE

Koji Asanomi, and Ryoji Abe, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 15, 1985, Ser. No. 712,142
Claims priority, application Japan, Mar. 21, 1984, 59-40236[U]
Int. Cl.[4] F02F *7/00*
U.S. Cl. 123—195 R **3 Claims**



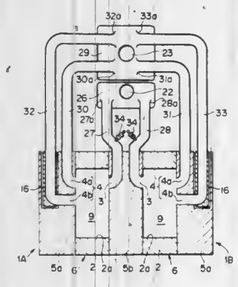
1. A cylinder block for a V-type engine comprising a cylinder portion and a skirt portion connected to a lower side of said cylinder portion, said cylinder portion comprising a pair of cylinder banks, each cylinder bank having a plurality of cylinders arranged in a row and a pair of opposed side walls extending in a direction along the rows of the cylinders with the cylinders each having a contour and being disposed between said side walls said skirt portion defining a crank chamber and having a pair of opposed side walls extending in a direction along the rows of the cylinders, and each integrally formed of a plurality of sinuous outwardly bulging bight portions, characterized in that the bight portions in one side wall of said skirt portion have a phase which is displaced from that in the other side wall of said skirt portion wherein the outwardly bulging light portions of each of the side wall of said skirt portion is formed in alignment corresponding to integrally formed outwardly bulging bight portions of the row of the cylinders of the respective cylinder banks which follow the contour of each of the cylinders.

4,627,395

INTAKE SYSTEM FOR ROTARY PISTON ENGINES

Tomoo Tadokoro; Haruo Okimoto, and Ikuo Matsuda, all of Hiroshima, Japan, assignors to Madza Motor Corporation, Hiroshima, Japan

Filed Apr. 17, 1985, Ser. No. 724,313
Claims priority, application Japan, Apr. 19, 1984, 59-79547; May 23, 1984, 59-104993; May 24, 1984, 59-106255
Int. Cl.[4] F02B *53/04*
U.S. Cl. 123—216 **10 Claims**



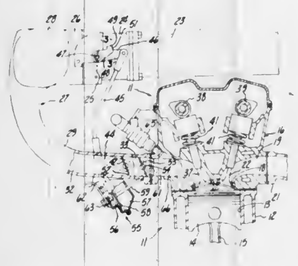
1. A two rotor type rotary piston engine including a casing comprised of a pair of rotor housings each having an inner wall of trochoidal configuration, an intermediate housing located between the rotor housings and a pair of side housings secured to outer sides of the respective rotor housings to define rotor cavities in the respective rotor housings, a pair of substantially polygonal rotors disposed in the respective rotor cavities with apex portions in sliding engagement with the inner walls of the respective rotor housings to define working chambers of cyclically variable volumes, said rotors being carried by eccentric shaft means so that said rotors are rotated with 180° phase difference in terms of angle of rotation of said eccentric shaft means, intake means including individual intake port means provided in at least one of said intermediate and side housings to open to the respective rotor cavities and adapted to be cyclically closed by said rotors as the rotor rotates, intake passage means including common air chamber means and individual passage means having one set of ends leading respectively to said intake port means and the other ends opened to said air chamber means through openings which are opposed to each other in said air chamber means with a spacing therebetween, said intake port means having opening period which is related to overall length of said individual passage means and said spacing between said openings so that a compression wave produced in one individual passage means in opening timing of one intake port means is transmitted to the other intake port means just before said other intake port means is closed to obtain an additional charge within a specific engine speed range.

4,627,396

INTAKE CONTROL SYSTEM OF ENGINE

Takumori Yoshida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 10, 1982, Ser. No. 356,811
Claims priority, application Japan, Mar. 12, 1981, 56-34558
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—302 **17 Claims**



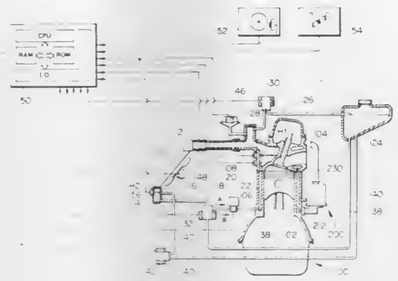
1. In an induction system for a internal combustion engine comprising a chamber, a first intake passage communicating with said chamber, a second intake passage communicating with said chamber, said intake passages having a common portion upstream of their communication with said chamber, and a first manually operated throttle valve in said common portion of said intake passages, the improvement comprising a second manually operated throttle valve in said first intake passage between said first manually operated throttle valve and said chamber, linkage means for controlling the position of said second manually operated throttle valve in response to the position of said first manually operated throttle valve, a third throttle valve in said second induction passage between said first throttle valve and said chamber, and means for automatically operating said third throttle valve.

4,627,397

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 780,936
Claims priority, application Japan, Sep. 29, 1984, 59-202945
Int. Cl.[4] F01P *3/22, 3/12*
U.S. Cl. 123—41.27 **15 Claims**



1. A cooling system for an internal combustion engine having a structure subject to high heat flux and a lubricant system, comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and permitted to boil;

a radiator in which gaseous coolant is condensed to its liquid state;

a vapor transfer conduit leading from said coolant jacket to said radiator for transferring coolant vapor from said coolant jacket to said radiator for condensation therein;

means for returning liquid coolant from said radiator to said coolant jacket in a manner to maintain said structure immersed in a predetermined depth of liquid coolant;

a device associated with said radiator for varying the rate of heat exchange between the radiator and a cooling medium which surrounds said radiator;

a first parameter sensor for sensing a parameter which varies with the temperature of the coolant in said coolant jacket;

a second parameter sensor for sensing a parameter which varies with the load on the engine;

a circuit response to said first and second parameter sensors for operating said device in a manner which tends to maintain the temperature of the coolant in said coolant jacket at a level determined in response to the load on said engine;

a housing in fluid communication with said coolant jacket; and

a heat exchanger disposed in said housing and immersed in liquid coolant, said heat exchanger being arranged to have lubricant from engine lubricating system circulated therethrough.

4,627,398

ELECTRONIC SPARK ADVANCE-TYPE IGNITION SYSTEM

Hiroshi Koike, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,862
Claims priority, application Japan, Nov. 30, 1983, 58-224248
Int. Cl.[4] F02P *5/155*
U.S. Cl. 123—418 **5 Claims**

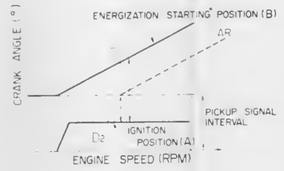
1. An electronic spark advance-type ignition system for an internal combustion engine comprising:

an ignition coil;

a magnetic pickup for generating a pair of pulse signals with a time interval therebetween substantially corresponding to a maximum advance angle in terms of crankshaft rotation degrees for each rotation of a crankshaft of said engine;

signal generating means responsive to said pair of pulse signals from said pickup for generating a pair of comparison signals of different levels within each of the crankshaft rotation degrees of said maximum advance angle and the other crankshaft rotation degrees; and

control means for comparing the signal levels of each of said pairs of comparison signals to generate an energization starting position signal and an ignition timing determining ignition position signal for said ignition coil,



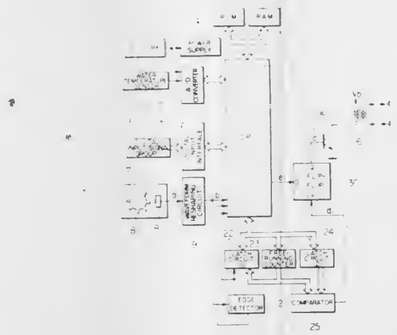
said signal generating means including means for controlling the waveform of one of said pair of comparison signals so that said ignition position signal is advanced in angle with respect to said energization starting position signal, whereby said energization starting position signal is generated under all conditions prior to the timing of generation of the earlier one of the next pair of pulse signals generated from said pickup and said ignition position signal is generated within said maximum advance angle at a point in time following generation of said earlier one of said next pair of pulse signals by at least a predetermined amount.

4,627,399

LOAD DETECTING APPARATUS AND IGNITION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Tatsuya Yoshida, Katsuta, and Hiroshi Katada, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,542
Claims priority, application Japan, Mar. 7, 1984, 59-43358
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—419 **21 Claims**



1. An ignition control apparatus for an internal combustion engine comprising:

a crankshaft reference position detector for detecting a plurality of reference angular positions of a crankshaft of an engine and for producing pulse signals at said reference angular positions;

means responsive to said pulse signals from said crankshaft reference position detector for determining the interval rotation speed of the engine for each of the intervals between said pulses;

means responsive to said interval rotation speeds from said interval rotation speed determining means for determining a speed pulsation value for each revolution of said crankshaft;

means for determining the speed of said engine; and

means for controlling the ignition of said engine in accordance with said speed pulsation value from said speed pulsation value determining means and said engine speed from said engine speed determining means.

4,627,400

PORTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshihiko Takata, and Yoshiharu Nakayama, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 26, 1985, Ser. No. 759,602
Claims priority, application Japan, Jul. 27, 1984, 59-155470
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—432 **31 Claims**



1. In an internal combustion engine having a variable volume chamber comprising first, second and third intake passages each serving said chamber through respective first, second and third intake ports, a first charge former for supplying a fuel/air mixture to said chamber through said first and second intake passages, and a second charge former for supplying a fuel/air mixture to said chamber through said third intake passage.

4,627,401

HIGH-VELOCITY CARBURETOR FOR AN OTTO ENGINE

Burkhard Brandner, Werdohl; Helmut Schilly, Bergneustadt-Pernze; Albert Stübs, Lüdenscheid, and Dieter Stojek, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Atlas Fahrzeugtechnik GmbH, Werdohl and Ford-Werke AG, Cologne, both of Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,430
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337261
Int. Cl.[4] F02M *7/24*
U.S. Cl. 123—439 **8 Claims**

1. A high velocity carburetor for an Otto engine, comprising:

(a) a suction pipe having a cross-sectional area;

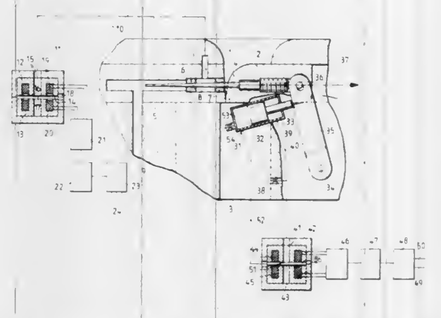
(b) a slide, and means for mounting said slide so as to change the cross-sectional area of said suction pipe;

(c) a nozzle connection having coaxially mounted therein apertured nozzle members in spaced relation so as to define therebetween an intermediate chamber;

(d) a profiled nozzle needle mounted on said slide and extending through the aperture of said nozzles, and means for axially moving said profiled nozzle needle relative to said nozzle members so as to form and variably control an annular gap between said nozzle needle and said nozzle members;

(e) a flow control valve for controlling the supply of air to the carburetor, said flow control valve having an outlet channel communicating with said intermediate chamber and an input channel connecting with atmospheric air, said control valve further having a freely movable, low inertia ferromagnetic membrane-like valve plate functioning as an electromagnetic core, and opposed electromagnetic cores for operating said valve plate in response to signal outputs;

(f) a pulse generator having push-pull outputs connected to said cores, said pulse generator having an adjustable pulse



duty factor and generating output signals which define the opening period of the flow control valve and thus the quantity of air supplied; and

(g) an address memory for controlling the pulse duty factor of said pulse generator, said address memory being addressed by operating load values, and speed and temperature values of the engine, said memory storing performance characteristic field information values for the pulse duty factor;

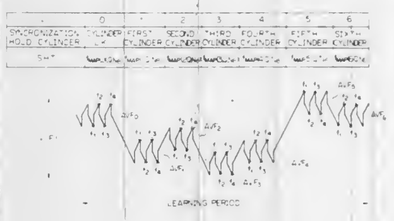
whereby the precise amount of air supplied to said intermediate chamber can be adjusted in accordance with said information values and consequently the pulse duty factor.

4,627,402

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Kimitaka Saito; Kenzi Iwamoto, both of Nishio; Tsuneyuki Egami, Gamagori; Tsutomu Saito, Okazaki, and Takesi Matuyama, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 13, 1985, Ser. No. 797,815
Claims priority, application Japan, Nov. 14, 1984, 59-238590
Int. Cl.[4] F02B *33/00*
U.S. Cl. 123—440 **10 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine having a plurality of cylinders, comprising the steps of:

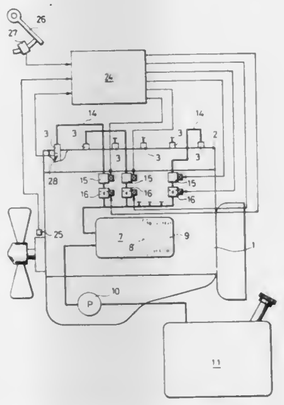
calculating a base fuel amount in accordance with predetermined parameters of said engine;
generating an air-fuel ratio signal of said engine;
selecting a cylinder from said cylinders;
sampling and holding said air-fuel ratio signal corresponding to said selected cylinder;
calculating an air-fuel ratio feedback amount in accordance with the sampled and held air-fuel ratio signal during a first predetermined engine state;
adjusting the actual air-fuel ratio in accordance with said base fuel amount and said air-fuel ratio feedback amount;
determining a cylinder on the leanest side by changing said selected cylinder during a second predetermined engine state; and
setting said cylinder on the leanest side as said selected cylinder during a state other than said second predetermined engine state.

4,627,403

FUEL INJECTION APPARATUS

Osamu Matsumura, No. 402, 1-29-9, Kamiochiai, Shinjuku, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,143
Claims priority, application Japan, Dec. 27, 1983, 58-248659; Dec. 27, 1983, 58-248660
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—447 **9 Claims**



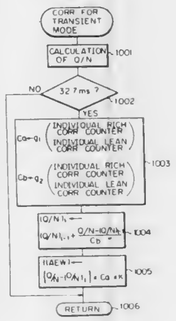
1. A fuel injection apparatus wherein fuel under pressure is supplied to an injecting nozzle for injecting a mist of fuel, said injection apparatus comprising:
(a) an accumulator for holding the fuel under pressure;
(b) a timing control valve for controlling the timing of the supply of fuel from said accumulator to said injecting nozzle;
(c) a quantity control valve for controlling the quantity of fuel injected by said injecting nozzle at one time, said quantity control valve being coupled to its respective injecting nozzle, and said quantity control valve controlling the effective area of the injecting hole of said injecting nozzle; and
(d) an electric control means for controlling said timing control valve and said quantity control valve in response to the number of revolutions and engine load.

4,627,404

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Kimitaka Saito, Okazaki; Tokio Kohama, Nishio; Tsuneyuki Egami, Nukata; Tsutomu Saito, Okazaki; Hiroshi Takahashi, Toyota, and Kunihiko Sato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Nov. 28, 1984, Ser. No. 675,704
Claims priority, application Japan, Nov. 29, 1983, 58-223196
Int. Cl.⁴ F02B *33/00*
U.S. Cl. 123—492 **31 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of:
calculating a base fuel amount in accordance with first predetermined engine operating parameters;
determining whether or not said engine is in a transient state;
detecting an air-fuel ratio deviation from the optimum air-fuel ratio for each of a plurality of regions, said regions being defined by predetermined ranges of values of a second engine operating parameter, said detecting only occurring when said engine is in a transient state;
calculating a transient fuel correction amount in accordance with said detected air-fuel ratio deviation for each region as defined by said second engine operating parameter; and
calculating a fuel amount to be supplied to said engine by correcting said base fuel amount in accordance with said calculated transient fuel correction amount.

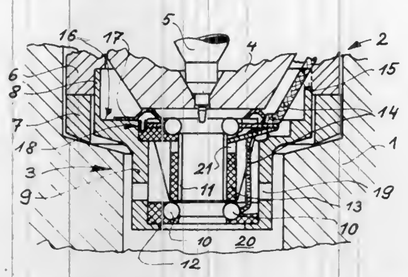
4,627,405

APPARATUS FOR INJECTING FUEL INTO COMBUSTION CHAMBERS

Ernst Imhof, Münchingen; Iwan Komaroff, Regensburg; Gunther Schmid, Stuttgart; Werner Grunwald, Gerlingen, and Helmut Reum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00073, § 371 Date Jan. 14, 1985, § 102(e) Date Jan. 14, 1985, PCT Pub. No. WO84/04567, PCT Pub. Date Nov. 22, 1984
PCT Filed Mar. 30, 1984, Ser. No. 699,977
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317503; Aug. 2, 1983, 3327773
Int. Cl.⁴ B05B *1/24;* **F02M** *23/14, 31/02*
U.S. Cl. 123—549 **24 Claims**

1. An apparatus for heating and injecting fuel-air into combustion chambers of self-igniting internal combustion engines, having a fuel injection nozzle for periodically injecting at least one aimed fuel spray through a passage of a combination air guide device and heating device, characterized in that the fuel being injected is accompanied by a flow of combustion air which is guided past the heating device and subsequently aspirated into said passage, said heating device further including at least two heating elements of different effectiveness, at least one of said heating elements is a rapid-heating element for rapid heating the air prior to being aspirated for operating said



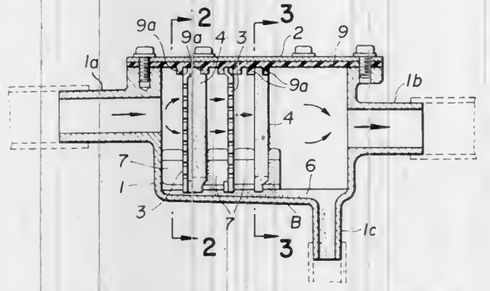
internal combustion engine in a cold state and at least one continuous-heating element for use during constant operation.

4,627,406

OIL SEPARATOR FOR RECYCLED BLOW-BY GAS

Kyoji Namiki, Urawa; Shunji Abe, Kawagoe; Shigeki Yamashita, Higashimatsuyama, and Yukio Kashiwaba, Saitama, all of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,466
Int. Cl.⁴ F02B *25/06*
U.S. Cl. 123—573 **12 Claims**



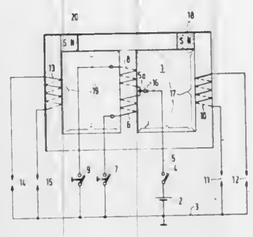
1. An oil separator for recycled blow-by gas, comprising:
a casing having an inlet pipe for blow-by gas entrance, an outlet pipe for blow-by gas discharge, and an oil return pipe for separated oil discharge, said inlet and outlet pipes being located at first and second ends of said casing, respectively;
first and second perforated plates disposed within said casing, said first perforated plate being located nearer to said casing first end than said second perforated plate, said first and second perforated plates having first and second perforated sections, respectively, which are located opposite to each other with respect to a longitudinal axis of said casing;
first and second plate type filter members formed of a porous material and disposed within said casing, said first filter member being located between said first and second perforated plates, said second filter member being located nearer to said casing second end than said second perforated plate; and
means defining a first space between said first perforated plate and said first filter member, and a second space between said second perforated plate and said second filter member, said second space being larger than said first space.

4,627,407

IGNITION COIL FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Dieter Betz, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,092
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411844
Int. Cl.⁴ F02P *3/02*
U.S. Cl. 123—634 **6 Claims**



1. Ignition coil, for a distributorless ignition system of an internal combustion engine, having
first (6) and second (8) primary windings;
first (10) and second (13) secondary windings, one each being associated with a primary winding;
means (7, 9) for selectively energizing one of said primary windings;
a unitary E-shaped core having a central branch defining a main core portion (16), on which the primary windings are wound, and two outer core branches defining secondary core portions magnetically coupled to the main core portion and located magnetically in shunt with respect to each other, and forming, with the main core portion (16), two parallel secondary magnetic circuits (17, 19),
each secondary core portion having a secondary winding (10,13) wound thereon,
wherein, in accordance with the invention,
a further crossbar core portion is provided, having two end each separated by a gap from one of said outer core branches, said crossbar core portion being disposed contiguous to said main core portion,
each secondary magnetic circuit (17, 19) is a ferro-magnetically continuous circuit and includes, in said gap between said crossbar core portion and said outer core branch a permanent magnet (18, 20) filling said gap, completing said magnetic circuit and polarized to apply a magnetic bias, to the respective magnetic circuit (17, 19), which bias is opposite to the magnetic field induced in the secondary magnetic circuit (17, 19) upon energization of
the selected primary winding (6,8) controlling generation of an ignition spark impulse from
the secondary winding (10,13) associated with said selected primary winding (6,8) and wound on the respective secondary core portion, which portion forms part of the respective secondary magnetic circuit (17,19).

4,627,408

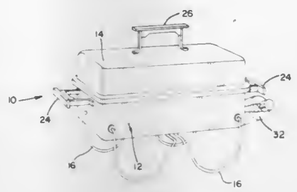
VAPORIZING ELEMENT FOR PORTABLE GRILL

Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 24, 1985, Ser. No. 758,244
Int. Cl.⁴ F24C *3/04*
U.S. Cl. 126—41 R **2 Claims**

1. In a rectangular gas grill including a rectangular lower portion having a flat bottom wall and having a single elongated burner tube positioned centrally adjacent said bottom wall of said grill and a rectangular searing element having first and second inclined flat walls merging at an apex that is spaced above and axially aligned with said tube, said flat walls having

lower edges supported on said bottom wall to define a predetermined spacing between said tube and said apex, said flat walls having upwardly- and outwardly-deformed rectangular



tabs that produce elongated vent openings for accommodating flow of oxygen to said burner tube, said tabs covering said vent openings in a vertical direction of said grill to prevent grease drippings from passing therethrough.

4,627,409

COOKING APPLIANCE OF HOT AIR CIRCULATION TYPE

Yoshiteru Kagomoto, Kashihara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

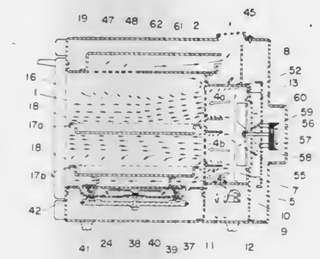
PCT No. PCT/JP83/00112, § 371 Date Dec. 9, 1983, § 102(e) Date Dec. 9, 1983, PCT Pub. No. WO83/03658, PCT Pub. Date Oct. 27, 1983

Continuation of Ser. No. 562,591, Dec. 9, 1983, abandoned. This PCT application Apr. 13, 1983, Ser. No. 782,607

Claims priority, application Japan, Apr. 14, 1982, 57-62727; Jul. 22, 1982, 57-128785

Int. Cl.⁴ F24C *15/32*

U.S. Cl. 126—21 A **4 Claims**



1. A cooking appliance comprising

a heating chamber for storing a heating load;

a heating device for heating said heating load in said heating chamber;

a compartment adjacent said heating chamber;

fan means accommodated in said compartment for circulating hot air through said heating chamber and said compartment;

blow-out means for conducting into said heating chamber hot air which has been circulated by said fan means;

a partition plate separating said heating chamber from said compartment, said partition plate having blow-out ports defined by a multiplicity of openings divided into a plurality of groups disposed near the right and left ends of said partition plate;

a plurality of spaced substantially horizontal control plates partitioning said blow-out line means thereby separating the air reaching each of said groups of blow-out ports; and

barrier wall means abutting against each of said control plates and extending in the vertical direction from said blow-out ports, the ratio of the lengths of the portions of said barrier wall means above and below said blow-out ports being varied to control the blowing direction of hot air in the vertical direction.

4,627,410

BARBECUE GRILL

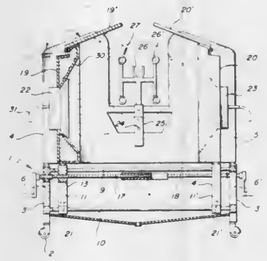
Kwan S. Jung, 54-18, 1-Ka, Myong Dong Chung-Ku, Seoul, Rep. of Korea

Filed Sep. 18, 1984, Ser. No. 651,861

Claims priority, application Rep. of Korea, May 31, 1984, 84-5282[U]

Int. Cl.⁴ A47J *37/00, 37/04*

U.S. Cl. 126—25 A **13 Claims**



1. A cooking oven which comprises

a pair of opposing end walls,

a pair of opposing side walls containing radiating heating means, said side wall disposed inside of said end walls and defining, together with said end walls, a cooking chamber, said radiating heating means being surrounding by heat reflectors which are sloped to direct the heat toward the food being cooked,

a supporting frame adapted to support said end walls and said side walls,

opposing slider means mounted for movement on said supporting frame, said side walls being operatively mounted on said slider means, and

means for moving said slider means containing said side walls with said heating means mounted thereon towards or away from each other, whereby the size of the cooking chamber and the position of the heating means can be varied depending on the size of the food to be cooked.

4,627,411

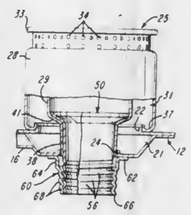
GAS BURNER AND MANIFOLD ASSEMBLY

Gary W. Mertler, 7916 N. Congress Park Dr., Dayton, Ohio 45459

Filed Dec. 4, 1984, Ser. No. 677,798

Int. Cl.⁴ F24C *3/10*

U.S. Cl. 126—39 E **5 Claims**



1. In a gas burner assembly including a manifold having upper and lower sheet metal walls joined together to define a gas supply passage extending to an annular chamber, said upper and lower walls having means defining corresponding upper and lower openings for said chamber, a gas burner unit mounted on said manifold and having concentric inner and outer sheet metal walls defining an annular chamber, said outer

wall of said burner unit being seated on said upper wall of said manifold around said upper opening in said upper wall, said inner wall of said burner unit including an annular shoulder and a reduced tubular section projecting downwardly from said shoulder into said lower opening in said lower wall of said manifold for connecting said annular chamber within said manifold to said annular chamber within said burner unit, the improvement comprising a drawn sheet metal fitting including a flange portion projecting outwardly from a tubular portion, said flange portion seated on said annular shoulder, said tubular portion having a corrugated wall configuration in axial cross-section and defining helical threads, said tubular portion projecting downwardly from said flange portion within said tubular section of said inner wall of said burning unit, said tubular portion projecting through said lower opening within said bottom wall of said manifold, a drawn sheet metal nut member mounted on said fitting and including a polygonal portion extending downwardly from an outwardly projecting flange portion engaging said bottom wall of said manifold, and said nut member further including a tubular portion projecting downwardly from said polygonal portion and having a corrugated wall configuration in axial cross-section to form helical threads mating with said threads on said fitting for quickly and positively securing said burner unit to said manifold.

4,627,412

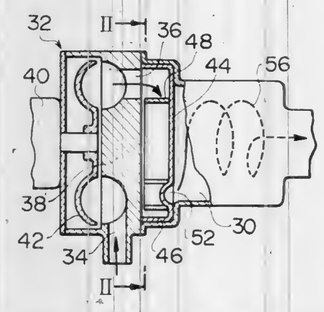
LIQUID FUEL COMBUSTION APPARATUS

Katsuji Sawada; Yoshiaki Kimijima, and Hidetoshi Umehara, all of Tochigi, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,685

Int. Cl.⁴ F24H *3/06*

U.S. Cl. 126—110 B **11 Claims**



1. In a vaporized liquid fuel combustion apparatus of the type including:

a cylinder defining a combustion chamber, said cylinder having an inlet end for receipt of combustion air and an outlet end for exhausting gaseous combustion products;

an end plate covering said inlet end of said cylinder;

a blower, including a rotor and a casing, for supplying combustion air to said combustion chamber, the improvement comprising:

a discharge port, formed in said end plate, for discharging air from the blower into the combustion chamber, said discharge port being offset with respect to the longitudinal axis of said combustion apparatus; and

air deflector means for causing the air to exit said discharge port at an acute angle with respect to said end plate, said air deflector means defining a surface inclined at an acute angle with respect to said end plate, said inclined surface covering said discharge port.

4,627,413

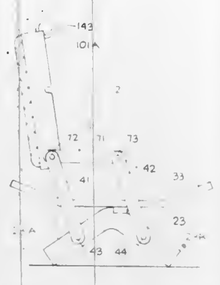
THREE POSITION FIREPLACE COOKER

Gary Q. Watson, El Paso, Tex., assignor to ROCA Technologies, Inc., San Antonio, Tex.

Filed Oct. 29, 1985, Ser. No. 792,678

Int. Cl.⁴ F24B *1/26*

U.S. Cl. 126—137 **31 Claims**



1. A heating and cooking apparatus, comprising:

a frame adapted to be supported by a base, said frame having first and second sides and rear and forward ends,

bar means supported by said frame for holding wood or the like to be burned,

a first set of rear and forward arms having lower ends pivotally coupled to said first side of said frame such that said first set of arms may be pivoted between rear and forward positions,

a second set of rear and forward arms having lower ends pivotally coupled to said second side of said frame such that said second set of arms be pivoted between rear and forward positions,

first link means having rear and forward ends pivotally coupled to the upper ends of said first set of rear and forward arms respectively forming a first movable support means movable between rear and forward positions,

second link means having rear and forward ends pivotally coupled to the upper ends of said second set of rear and forward arms respectively forming a second movable support means movable between rear and forward arms positions,

food support means having rear and forward ends,

the rear end of said food support means being pivotally coupled to the rear and upper ends of said first and second movable support means such that said food support means may be moved with said first and second movable support means between said rear and forward positions above said bar means and also may be pivoted:

(a) rearward relative to said first and second link means such that said forward end of food support means is located away from said first and second link means, and

(b) next to said forward ends of said first and second link means for supporting food.

4,627,414

STAND FOR SUPPORTING COOKING LIQUID SPRAY DISPENSER RELATIVE TO A HEATED SURFACE AND CONTROLLING THE TEMPERATURE OF THE LIQUID

Neal H. Chazin, 1305 Rexford Ave., Pasadena, Calif. 91107

Continuation-in-part of Ser. No. 510,905, Jul. 5, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,546

Int. Cl.⁴ F24C *15/10;* **A47G** *23/02*

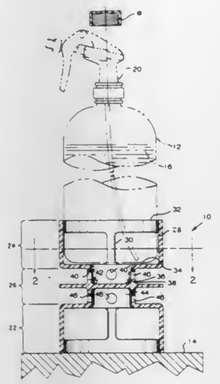
U.S. Cl. 126—215 **19 Claims**

1. A stand made of insulating material for supporting a spray dispenser of non-stick cooking liquid at a predetermined elevation above a heated surface to maintain the temperature of the liquid at a level at which it can be readily sprayed, said stand comprising:

an upper section adapted to receive and grip the spray dis-

penser, the upper section including a transverse bottom wall;

a base section adapted to rest on the heated surface, the base section being spaced from said upper section and including a transverse upper wall having a substantially horizontal outer surface; and



an intermediate section joining the transverse bottom wall of the upper section and the substantially horizontal outer surface of the base section, said intermediate section, said upper and base sections comprising open frame structures including cutaway portions defining generally vertically oriented struts joined at their outer ends by a ring defining chamber means opening into said upper and base sections.

4,627,415

COOKING STOVE HAVING REMOVABLE TOP PLATE

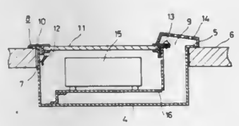
Tetuo Kamo; Junichi Miyagawa; Kazuichi Okada, and Eiji Shiota, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

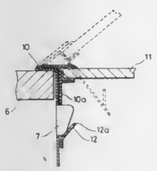
Filed Oct. 31, 1985, Ser. No. 794,783

Claims priority, application Japan, Nov. 2, 1984, 59-231512

Int. Cl.[4] F24C *15/20*

U.S. Cl. 126—299 R **6 Claims**





1. A cooking stove comprising:

a box-shaped housing having an open top and sides;

a top plate removably mounted upon an upper portion of said housing such as to form an air inlet/outlet aperture between at least one end of said top plate and said housing, said top plate comprising a peripherally disposed frame which is of T-shaped cross-sectional configuration including an inner peripheral portion, an outer peripheral portion and at least one depending side wall, and a flat plate member which is fixedly retained within said inner peripheral portion of said frame, said outer peripheral portion of said frame being disposed upon said upper portion of said housing for supporting said top plate thereon;

first catch means formed on one of said sides of the interior of said housing, and second catch means formed on said side wall of said top plate, said first and second catch means being adapted to removably attach said top plate to said housing; and

a cover member dimensioned to cover said air inlet/outlet aperture.

4,627,416

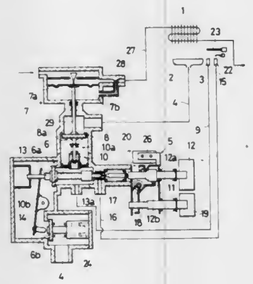
WATER HEATER

Hiroshi Ito; Kanae Aida; Masanobu Shinozaki; Masahiko Koumura; Kazumi Tamada, and Katsushi Mizutani, all of Nagoya, Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 6, 1984, Ser. No. 586,603

Int. Cl.[4] F23H *1/00*

U.S. Cl. 126—351 **3 Claims**



1. A water heater, comprising:

a heat exchanger for heating water from a water supply;

a main burner for heating said heat exchanger;

a standing burner proximal to said main burner for igniting the same;

a main fuel passage means for supplying fuel from a fuel supply to said main burner;

a manual valve on said main fuel passage means which is operable by a manual operation nember;

an automatic valve disposed in said main fuel passage means at a point downstream from said manual valve, a water pressure sensitive member disposed between said water supply and said heat exchanger, said automatic valve operable in response to the pressure of a supply of water at said water pressure sensitive member;

a standing burner fuel passage means for supplying fuel from said fuel supply to said standing burner, said standing burner fuel passage means drawing fuel from said main fuel passage means at a point between said manual valve and said automatic valve; and

a lock means attached to said water pressure sensitive member by an actuation rod, said lock means engageable with said manual operation member when a supply of water is sensed by said water pressure sensitive member for preventing said manual operation member from opening said manual valve and such that said lock means are not engaged with said manual operation member when no supply of water is sensed by said water pressure sensitive member and wherein said lock means is slidable with respect to said actuation rod and is biased toward said manual operation member, wherein said lock means comprises a flat face generally perpendicular to said operation rod, said lock means arranged to be engageable with a projection on said manual operation member for stopping the movement of said manual operation member when a supply of water is provided to said water pressure sensitive member;

wherein said manual operation member includes,

(a) a pushbutton inserted through an operation panel constituting a front surface of a main body of the water heater, said pushbutton having three positions, a starting end position, an intermediate position and a final end position, and

(b) an operation rod fixed to and extending from said pushbutton, said operation rod being partially disposed within said main fuel passage means,

and wherein said manual valve includes,

(a) a cut-off valve fixed to said operation rod said cut-off valve disposed within said main fuel passage for cutting off the supply of fuel through said main fuel passage, such that said cut-off valve is closed when said pushbutton, and therefore said operation rod, returns from said intermediate to said starting end position, and

(b) a safety valve disposed within said main fuel passage upstream from said cut-off valve for stopping the supply of fuel through said main fuel passage, said safety valve being operatively connected to said operation rod and responsive to movement of said operation rod, such that said safety valve is open when said pushbutton is at said final end position and is allowed to close when said pushbutton is returned to said intermediate position from said final end position.

4,627,417

STEAM PRESSURE COOKER

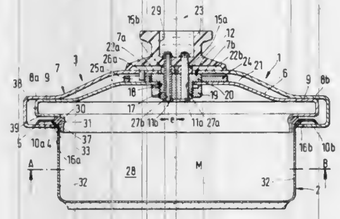
Reinhard von der Becke, Obere Rebhalde 21, CH-6340 Baar, Switzerland, and Horst Schultz, Bergmannweg 2, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,373

Claims priority, application Switzerland, Aug. 25, 1983, 4699/83

Int. Cl.[4] F24D *1/00*

U.S. Cl. 126—369 **35 Claims**



1. A steam pressure cooker having a pot and a cover unit for pressure sealing said pot by means of a ring-shaped sealing element in which said pot has a circular, smooth pot rim angled toward the outside, which pot rim from a top plan view has a continuous circular outer edge and said cover unit has a lower lid and an upper lid, said upper lid comprising half lids forming a sealing element where in said half lids are movable relative to the lower lid and said pot in a plane parallel to the plane of said pot rim to provide a locking position in which said upper rim section of said half lids are disposed over an outer rim portion of the lower lid and a lower flange of said combination of half lids encirles and engages under the pot rim in locking position wherein the improvement comprises said upper lid consisting of two half-lids in which both half-lids are centrally rotatably hinged relative to the lower lid and the pot about their own swivel axes which are essentially parallel to the central, vertical geometrical axis (M) of the pot, in which said swivel axes lie eccentrically to said central axis (M) of the pot and diametrically opposite each other relative to the central axis (M) and a swivel mechanism hinged in the middle of the lower lid for activating said centrally rotatably hinged half lids.

4,627,418

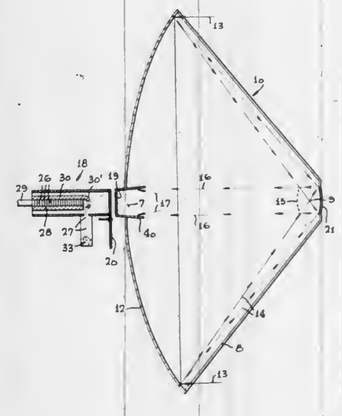
APPARATUS FOR THE CARBOTHERMIC REDUCTION OF METAL OXIDES USING SOLAR ENERGY

James O. Gibson, and Mark G. Gibson, both of Pacific Palisades, Calif., assignors to Geruldine Gibson, Santa Monica, Calif., a part interest

Division of Ser. No. 184,957, Sep. 8, 1980, Pat. No. 4,472,367, which is a continuation-in-part of Ser. No. 961,536, Nov. 17, 1978, abandoned. This application Jan. 16, 1984, Ser. No. 570,858

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—438 **10 Claims**



1. Apparatus for the carbothermic reduction of a metal oxide to produce a metal carbide utilizing solar energy comprising:

(a) at least one reflective surface for collecting, reflecting and focusing collected solar radiation;

(b) a focal mirror in spaced relation to said reflective surface having a reflective face facing the reflective surface for receiving focused and reflected solar radiation from the reflective surface and for focusing such solar radiation received;

(c) a reaction chamber in spaced relation to said focal mirror for receiving focused solar radiation from said focal mirror;

(d) a transparent window on said reaction chamber through which the focused solar radiation can pass into the reaction chamber;

(e) a target area within said reaction chamber toward which the solar energy rays from the focal mirror are focused, said target area located beyond the focal point of the focused energy rays and positioned at a point where the rays diverge;

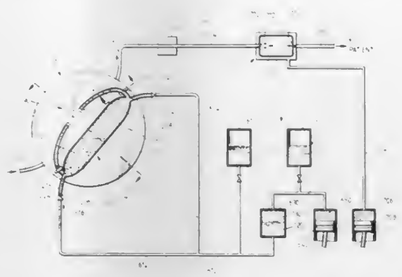
(f) means within the reaction chamber for delivering a homogeneous mixture of metal oxide and carbon to the target area;

(g) a Fresnel lens positioned in front of said transparent window of said reaction chamber along the focal pathway of solar radiation reflected from said focal mirror, for further focusing and concentrating the solar radiation, the Fresnel lens being isolated by the transparent window from the reaction taking place in the reaction chamber;

(h) means for providing a cooling fluid flow between the transparent window and the Fresnel lens; and

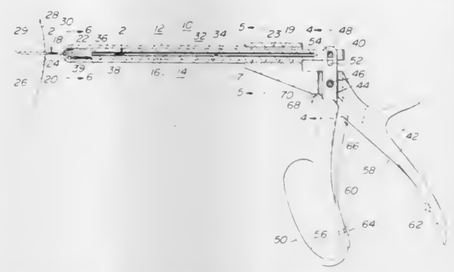
(i) means for revolving said transparent window so that a different portion of said transparent window is positioned to transmit focused solar radiation to the reaction chamber.

4,627,419
BLOOD PUMP APPARATUS AND METHOD
Brian A. Hills, Friendswood, Tex., assignor to The Board of Regents, The University of Texas, Austin, Tex.
Filed Aug. 29, 1984, Ser. No. 645,605
Int. Cl.[4] A61M *1/03*
U.S. Cl. 128—1 D 14 Claims



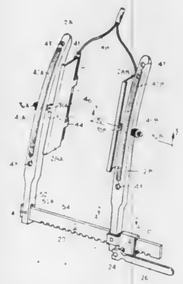
1. Apparatus for the pressure treatment of blood comprising:
(a) a flaccid chamber having an interior surface, exterior surface, an inlet for accepting blood, an outlet for expelling blood;
(b) a pressure housing including pressure applying means for applying pressure isotropically to blood in said flaccid chamber;
(c) means for introducing a physiologically inert fluid which is heavier than and immiscible with blood into said flaccid chamber so as to displace blood from said flaccid chamber; and
(d) means for rotating said flaccid chamber in order to change the orientation of the inlet and outlet with respect to one another.

4,627,420
NEEDLE INSERTING INSTRUMENT FOR INTERSTITIAL RADIOTHERAPY
Harry R. Katz, 10121 Darmuid Green Dr., Potomac, Md. 20854
Filed Oct. 31, 1983, Ser. No. 547,250
Int. Cl.[4] A61N *5/12*
U.S. Cl. 128—1.1 12 Claims



1. An instrument for inserting a hollow needle into a body for interstitial radiotherapy comprising a unit having an elongated portion with an opening therethrough and a handle portion, a tubular element received within the opening of the unit and having an opening means for slidably receiving therein a needle to be implanted into a body, the element being movable in a linear direction along the opening of the unit between first and second positions and having means for engaging and securing against slidable movement a needle received within its opening means when the element is in its first position, and actuating means comprising a lever pivotally secured with the handle portion of the unit having a first end proximate to the handle portion for manual actuation and a second end which engages the element and is movable with the actuation of the first end of the lever for linearly moving the element between its first and second positions and normally retaining the element in its second position.

4,627,421
STERNAL RETRACTOR
Panagiotis N. Symbas, 3661 Cloudland Dr., Atlanta, Ga. 30327; J. Lee Baisden, 5010 Timber Lookout, San Antonio, Tex. 78250, and Stothe P. Kezios, 1060 Winding Creek Trail, N.W., Atlanta, Ga. 30327
Filed Aug. 3, 1984, Ser. No. 637,419
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 10 Claims



1. Apparatus for spreading the walls of an opening in the body of a human or other animal comprising:
a cross-bar;
two elongate arms, each of said arms having a free end and an end pivotally mounted to said cross-bar;
means for moving the pivoting end of one of said arms laterally along said cross-bar; and
means mounted on each of said arms for engaging the walls of an opening.

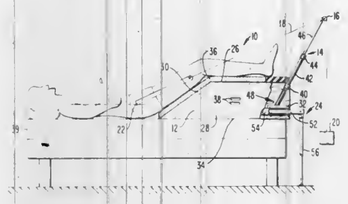
4,627,422
VARIABLE TRACTION APPARATUS AND METHOD
Thomas J. Bates, 120 Hillcrest Rd., Berkeley, Calif. 94706
Filed Oct. 24, 1985, Ser. No. 790,811
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—71 8 Claims



1. Apparatus for applying variable traction to a person having a predetermined height comprising:
an elongated base having track means in the elongated direction and having a length in said direction longer than said height of said person;
a traction bed including a flat elongated surface for allowing said person to recline thereon, said bed being mounted for slidable movement in said elongated direction on said track means of said base and substantially parallel to and coextensive with said base;
means for controllably lifting an end of said base and said associated traction bed and maintaining at a selected inclination;

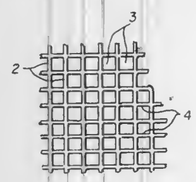
means for tethering an extremity of a said person reclining on said traction bed to said lifted end of said base.

4,627,423
PORTABLE TRACTION DEVICE
Stanley L. Kampner, 1270 Armsby St., Hillsborough, Calif. 94010
Filed Sep. 10, 1984, Ser. No. 649,091
Int. Cl.[4] A61H *1/02*; A61F *5/00*
U.S. Cl. 128—75 14 Claims



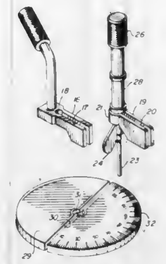
1. A self-contained traction device for use on a bed comprising:
a platform having a flat bottom surface and an upper surface which includes a portion inclined relative to said flat bottom surface, said inclined portion at its lowest point joining said bottom surface, said inclined portion having a width sufficient to support a portion of a person's body to be placed in traction, said platform having a length less than the length of said bed;
a pulley mounted to said platform proximate an upper end of said inclined portion; and
flexible cable means looped over the pulley having a first end proximate the inclined portion and attached to the person's body and a second end connected to a weight.

4,627,424
COLD WATER CURABLE ORTHOPEDIC CAST
Kenneth S. Baron, San Ramon, and David W. Wood, San Francisco, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.
Continuation-in-part of Ser. No. 322,657, Nov. 18, 1982, Pat. No. 4,427,002. This application Jun. 8, 1983, Ser. No. 502,280
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—83 9 Claims



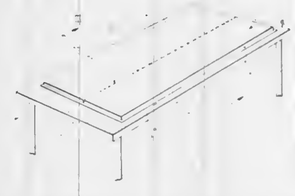
1. A bandage material for forming in place an orthopedic cast comprising a pliant, large mesh fabric carrier formed from a knot of a high-strength, high-modulus fiberglass yarn with a low moisture pick-up, the fabric carrier having openings of relatively large transverse dimension, and being coated with a polymer composition comprising (a) a water curable polyurethane prepolymer comprising the reaction product of a polyalkylene ether diol, a polyalkylene ether triol and a diisocyanate, wherein the ratio of diol to triol is from 1:9 to 9:1 and (b) an amine catalyst.

4,627,425
OSTEOTOMY APPLIANCES AND METHOD
H. William Reese, 1450 S. Dobson, Suite 201, Mesa, Ariz. 85202
Continuation-in-part of Ser. No. 536,782, Sep. 28, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 601,069
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VY 3 Claims



1. An osteotomy appliance for the precision location of a second bone cut in angular relation to a first bone cut for use on a bone having a hole drilled therein substantially at the intersection of the two cuts to be made therein, said appliance comprising a pin member adapted for placement in said hole, a follower extending radially outwardly from said pin member and adapted to be positioned in said first saw cut, a saw guide extending radially outwardly from said pin member, said saw guide and said follower being angularly movable with respect to each other about the axis of said pin member, and a handle extending axially from said pin member and adapted to be grasped for manipulation of the appliance, said handle being threadably connected to said pin member for releasably tightening said follower and said saw guide together in predetermined angular relationship.

4,627,426
TEAR-AWAY STERILE AND ABSORBENT SHEET FOR OPERATING TABLE USE
Jack Wegener, Gloucester, N.J.; Raynor A. Johnson, Newark, Del., and Robert Weedling, Stockertown, Pa., assignors to American Industrial Research, Inc., Newark, Del.
Filed May 17, 1985, Ser. No. 735,233
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 R 8 Claims



1. A tear-way sterile absorbent material operating table sheet for operating table use, said absorbent material sheet being adapted for placement in an overlying position on the top of an operating table and between a patient centered longitudinally and laterally thereon and the table top, the improvement wherein said sheet is of a length on the order of the length of the patient and is of a width in excess of the width of the patient and comprises:
two separable sheet sections joined along a longitudinal centerline underlying and in line with the patient supported thereby by a weakened line extending longitudinally through the longitudinal centerline of said sheet,

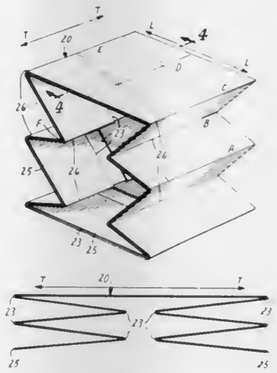
such that said sheet sections may be removed by tearing of the sheet along the weakened line from one end to the other by lateral pulling of the sections apart to effect separation and removal from beneath the patient, without moving the patient relative to the table top.

4,627,427

UNIVERSAL MEDICAL COVER SHEET AND PROCESS FOR DRAPING

Judith A. Arco, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1984, Ser. No. 661,688
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 D **19 Claims**



1. An article adaptable for draping non-surgical areas of patient and providing a surgical zone during an invasive medical procedure comprising draping material having opposing side edges of substantially equal length and a surgical zone integrally associated with the draping material, the article being formed in a closed loop and being dimensioned such that opening of the loop yields a surgical cover sheet wherein the surgical zone is positioned within the draping material so that non-surgical areas of the patient are covered sufficiently for surgical purposes by draping material when the surgical zone is placed to permit access to the body area involved in the procedure.

19. A process for draping a patient for an invasive medical procedure comprising:

providing a closed loop article comprised of draping material and a surgical zone integrally associated with the draping material;

opening the loop along a line distanced an appropriate length from the surgical zone to create a cover sheet with the surgical zone positioned within the draping material between the surgical zone and the respective ends of the cover sheet so as to provide lengths of draping material adequate to sufficiently cover non-surgical areas of the patient when the surgical zone is placed to permit access to the body area involved in the procedure; and

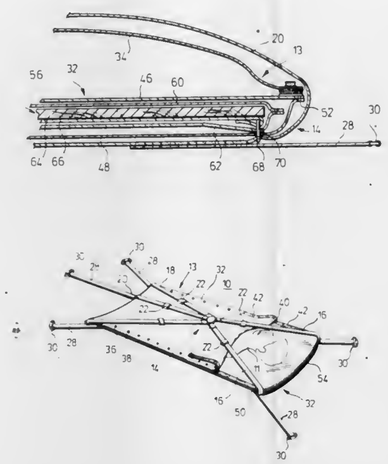
positioning the cover with respect to the patient so that the surgical zone is placed to permit access to the body area involved in the procedure and adequately cover the non-surgical areas of the patient.

4,627,428

CHILD RESTRAINT DEVICE WITH REMOVABLE SEMI-RIGID SUPPORT

David A. Brooks, 165 LaRose Avenue, Suite 106, Weston, Ontario, Canada M9P 3S9

Continuation-in-part of Ser. No. 619,018, Jun. 11, 1984, abandoned. This application Aug. 17, 1984, Ser. No. 641,877
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—135 **12 Claims**



1. A child safety restraining apparatus for restraining a child in a substantially flat position relative to a medical transporting device, comprising:

child support means including a semi-rigid base comprising upper and lower layers of material joined along or adjacent side edges thereof to provide a pocket between the layers of material which is open at one end, the lower layer of material having a plurality of apertures located at predetermined locations therein, a semi-rigid support member insertable into the pocket through the open end, said support member including fastening members secured to the lower surface thereof at predetermined positions which correspond to the location of the apertures in the lower layer of material such that each of the fastening members extends through a corresponding aperture when the support member is inserted in the pocket; said child support means further including a cover attachable to the upper layer of material to protectively secure the child between the upper layer of material of the base and the cover; and

restraining means connectable to the fastening members of the child support means to secure the child support means to the transporting device whereby movement of the child support means relative to the transporting device is restrained.

4,627,429

STORAGE-STABLE TRANSDERMAL ADHESIVE PATCH

Andrew G. Tsuk, Clinton, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,255
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **1 Claim**

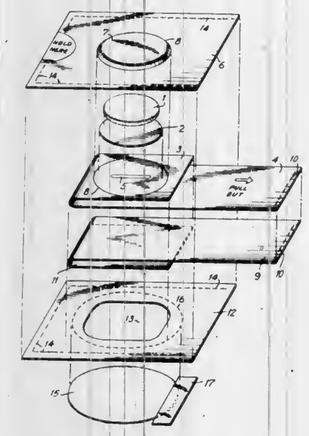
1. A storage-stable transdermal adhesive bandage structure comprising:

(a) a first pull tab having an upper surface and a heat-sealable film laminate lower surface and being folded over such that a portion of the lower surface is upwardly facing, said pull tab having disposed on the upwardly facing lower surface;

(b) a matrix having a medicinal formulation incorporated therein said matrix being small in area than the upwardly facing lower surface of the pull tab;

(c) an occlusive film adhesively bonded to the matrix and situated between the upwardly facing lower surface of the pull tab and the lower surface of the matrix, said film extending outwardly from the periphery of the matrix;

(d) a cover having a heat-sealable film laminate lower surface covering the occlusive film and being heat-sealably bonded to the heat-sealable upwardly facing lower surface of the pull tab surrounding the occlusive film;



(e) a second pull tab having an upper adhesive release surface folded under such that the upwardly facing adhesive release surface is coextensive with the lower surface of the first pull tab, said first and second pull tabs being fastened together at the extremity opposite the fold;

(f) a release liner having upper and lower surfaces coextensive with the cover and being fastened along its periphery to the cover, the release liner having an ipening therein larger in area than the occlusive film covering the matrix;

(g) a non-occlusive adhesive film covering the opening in the release liner and extending outwardly from the periphery of the opening, and said peripherally extending film portion being adhesively bonded to the lower surface of the release liner.

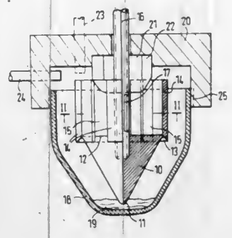
4,627,430

INHALATOR APPARATUS

Hans U. Klimt, Rufenbergweg 14, D-7912 Weissenhorn-Bubenahusen, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,426
Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419148
Int. Cl.[4] A61M *11/00*
U.S. Cl. 128—200.17 **20 Claims**

1. In an inhalator apparatus comprising a container for holding a liquid inhalant, a suction cone having an upper peripheral edge and a lower tip and mounted within said container such that said tip would be submerged in said liquid inhalant, means connected to said suction cone and extending through said container for rotating said suction cone about its axis rotated by an electric motor, an air inlet into said container, and an aerosol outlet from said container for discharging a mixture of liquid inhalant and air in the form of a fine mist, the improvement comprising a radial blower having a plurality of vanes **(14)** extending upwardly and radially from said peripheral edge **(12)** of said suction cone **(10)**, said vanes **(14)** defining a hollow cylinder comprising longitudinal sections divided by longitudinal slots **(15)** of the hollow cylinder, said longitudinal sections being integral with said peripheral edge **(12)** and said longitudinal slpts **(15)** extending to said peripheral edge **(12)**, said vanes **(14)** having inner surface sides displaced inwardly from said peripheral edge **(12)** toward the axis of said suction cone **(10)**, and said vanes **(14)** having undersides **(13)** adjacent said peripheral edge **(12)** projecting below said peripheral edge **(12)**



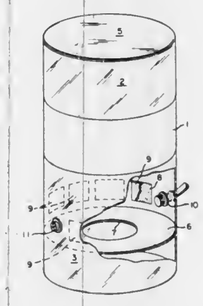
toward said tip **(11)** of said suction cone **(10)** and defining divergent surfaces in continuously increasing distance from the outer surface of said suction cone **(10)**, said radial blower attached to said suction cone **(10)** and adapted to be rotated therewith, and said air intake communicating with the sapce enclosed by said vanes **(14)** of said radial blower.

4,627,431

PROTECTIVE HOOD WITH CO_2 ABSORBENT

Bertil Werjefelt, Kailua, Hi., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1985, Ser. No. 710,670
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—201.25 **13 Claims**



1. A hood for providing the user of the hood with breathable air, the hood comprising:

(a) a generally tubular portion having open upper and lower ends and a substantially non-perforated continuous sidewall having inner and outer side surfaces, the generally tubular portion being comprised of a substantially gas-impermeable film;

(b) a generally circular hood portion comprised of the gas-impermeable film, the circular hood portion being connected to the upper end of the tubular portion;

(c) a substantially annular, resilient neck seal attached to the inner side portion of the lower end of the tubular portion, the neck seal having an opening for permitting at least the head of the user into the hood to form a closure around the user; and

(d) CO_2 absorption means disposed interiorly of the hood, a semi-permeable membrane retaining said CO_2 absorption means against a non-perforated portion of the inner surface of said tubular portion, the membrane having a porosity sufficient to retain the CO_2 absorption means out of

contact with the user and allow CO_2 and moisture to pass through the membrane.

4,627,432
DEVICES FOR ADMINISTERING MEDICAMENTS TO PATIENTS

Robert E. Newell, Pinner, and Robert A. Fitzsimmons, Eggle-stone, both of England, assignors to Glaxo Group Limited, London, England

Filed Oct. 7, 1983, Ser. No. 540,203
Claims priority, application United Kingdom, Oct. 8, 1982, 8228887; May 24, 1983, 8314307
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—203.15 10 Claims



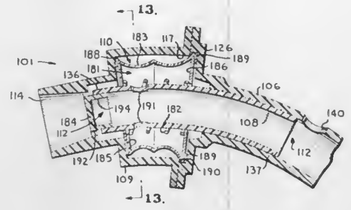
1. A device for administering to patients medicaments contained in a plurality of containers arranged in a circle on a carrier, the said device being charactered by a housing with a chamber therein, an air inlet into the chamber, a circular disc having an axis substantially coaxial to the chamber axis and rotatable inside the chamber and provided with a plurality of apertures therethrough arranged in a circle, said apertures being sized and positioned so that each aperture is adapted to be aligned with a different container, the said disc being arranged so that the carrier can be placed in contact with one face of the disc with one of the containers located in each one of the apertures, an outlet through which a patient may inhale leading out of the chamber, an opening in said housing alignable with respective ones of the apertures in the disc as the disc is rotated, a plunger operatively connected to said housing and having a penetrating member, said penetrating member being displaceable to pass through said opening and the corresponding aperture in the disc registered with it thereby to penetrate and open a container located in the aperture so that the medicament will be released from the container and entrained in the air flow produced by a patient inhaling through the outlet, and means between said disc and said housing for rotatably indexing the disc to register each of the apertures in turn with the housing opening.

4,627,433
TRACHEOSTOMY DEVICE

Edgar M. Lieberman, 210 Westport Rd., Kansas City, Mo. 64111

Division of Ser. No. 674,243, Nov. 23, 1984, Pat. No. 4,596,248.
This application Mar. 3, 1986, Ser. No. 835,760
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.16 2 Claims

1. A tracheostomy device for insertion into a trachea and allowing a human patient to speak during a ventilation process; said device comprising:
(a) an outer cannula having a first end and a second end; said outer cannula having a fenestration therethrough; said fenestration adapted to be located within a patient's trachea;
(b) sealing means for forming a seal with a wall of the trachea and surrounding a portion of said outer cannula second end;
(c) an inner cannula slidably received in said outer cannula and having a first end and a second end; said inner cannula having an orifice therethrough near said first end thereof;
(d) a housing defining a chamber connected to said outer cannula second end; said housing chamber including



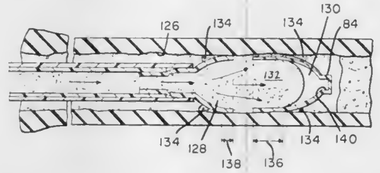
means adapted to be in flow communication with an air source; and
(e) dual valve means responsive to a patient's inhalation and exhalation process so as to selectively permit and inhibit flow of air from said air source while respectively inhibiting and permitting flow of air through said outer cannula fenestration

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4,627,434
BONE CEMENT SYSTEM AND METHOD

William M. Murray, 145 Bryce Rd., Camp Hill, Pa. 17011

Filed May 3, 1985, Ser. No. 730,379
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R 18 Claims

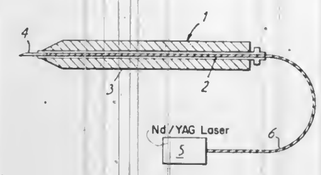


1. An intramedullary canal plug including a base imperforate to bone cement and an umbrella-type cement shield extending from the base, the shield comprising a plurality of ribs joined at one end to the base, circumferentially spaced around the base and extending outwardly of the base to a shield lip and a plurality of flexible sheeting portions each extending between adjacent ribs from the base to the shield lip, each sheeting portion including a first relatively more flexible part near one adjacent rib and a second relatively less flexible part near the other adjacent rib whereby upon collapse of the shield the first sheeting parts fold inwardly before the second sheeting parts fold inwardly.

4,627,435
SURGICAL KNIVES

William J. Hoskin, Harpenden, United Kingdom, assignor to MICRA Limited, Luton, United Kingdom

Filed May 14, 1984, Ser. No. 610,169
Claims priority, application United Kingdom, May 14, 1983, 8313374
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 16 Claims

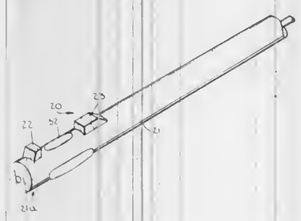


1. A surgical knife comprising:
a diamond blade,
a holder mounting said blade, and
means carried by said holder and coupled to the blade for heating the blade.

4,627,436
ANGIOPLASTY CATHETER AND METHOD FOR USE THEREOF

Michael E. Leckrone, Indianapolis, Ind., assignor to Innoventions Biomedical Inc., Indianapolis, Ind.

Filed Mar. 1, 1984, Ser. No. 585,112
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 16 Claims

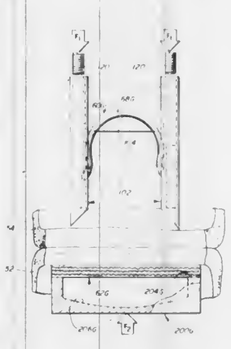


1. A catheter device for use in removing undesired material from a duct within a patient's body comprising a catheter having a proximal end portion and a distal end portion adapted to be inserted within a duct in the patient's body;
means disposed adjacent the distal end portion of the catheter for intersecting and releasing undesired material from the interior of the duct in a patient's body when the distal end portion of the catheter is disposed adjacent to the undesired material, said means comprising a first and a second abutment extending radially from the outer surface of the catheter and spaced apart from one another along the length of the catheter with the second abutment disposed adjacent the distal end portion thereof, the first and second abutments being adapted to form a chamber therebetween when the first and second abutments are urged against the inner surface of the duct, and a laser delivery means extending within the interior of the catheter from the proximal end portion thereof to between the first and second abutments to deliver laser energy across the chamber formed by the first and second abutments and toward the second abutment adjacent the distal end of the catheter when the laser delivery means is connected to a source of laser energy, the second abutment preventing the laser energy from impinging on the inner surface of the duct,
an inflatable bladder mounted on the catheter adjacent the distal end portion thereof disposed substantially opposite the intersecting and releasing means, and
means for controllably inflating the bladder when the device is disposed in a duct to enable the inflated bladder to contact the inner surface of the duct and urge the distal end portion of the catheter, including the first and second abutments, against the inner surface of the duct adjacent thereto,
whereby the means for intersecting and releasing the undesired material is positioned adjacent to the inner surface of the duct.

4,627,437
METHOD OF APPLYING A FASTENER TO TISSUE WITH A PAIR OF HOLLOW NEEDLES

James J. Bedi, Stockton; Donald M. Golden, Cherry Hill, both of N.J., and William P. McVay, Clearwater, Fla., assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 506,146, Jun. 20, 1983, abandoned.
This application Jun. 5, 1985, Ser. No. 741,404
Int. Cl.[4] A61B *17/10*
U.S. Cl. 128—334 C 1 Claim



1. A method for applying a fastener to close a wound or incision in mammalian tissue by holding together portions of said tissue defining the wound or incision so as to facilitate healing of the wound or incision, said fastener being of the type comprising at least a fastening member and a receiver, said fastening member having a pair of legs joined by a link, said receiver being adapted to receive at least portions of said fastening member legs so that said fastener can remain in said tissue portions with at least a portion of said link lying substantially against one of said tissue portions on a first side of the wound or incision, with the receiver lying against other of said tissue portions on a second side of the wound or incision and with at least a portion of each of said legs being received in said receiver and being secured thereto, said method comprising the steps of:
(a) approximating said tissue portions in generally face-to-face relationship;
(b) providing a pair of spaced-apart needles, that are oriented in generally parallel planes, each needle having a distal end adapted for piercing said tissue portions, each needle being hollow and having a passage extending along its length from a fastener receiving opening to a discharge opening a said distal end, and each said needle defining a slot extending along its length in communication with said passage and facing the slot in the other needle;
(c) providing an anvil to hold at least said receiver adjacent said other tissue portion on said second side of said wound or incision;
(d) placing a leg guide member on said anvil;
(e) placing said receiver on said leg guide member;
(f) moving said anvil toward said needles to urge said receiver against said other tissue portion;

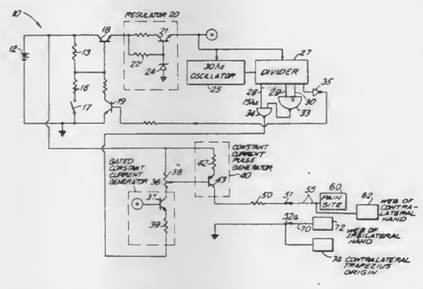
(g) inserting said needles through said approximated tissue portions to
(1) locate said receiving openings on said first side of said wound or incision, and
(2) locate at least portions of said discharge openings on said second side of said wound or incision;
(h) before, during, or after step (g), loading said fastening member into said needles through said receiving openings with
(1) each of said legs being disposed in one of said needle passages and
(2) said link extending through said needle slots between said needles;
(i) urging said fastening member along said needles to
(1) locate at least a portion of said link on said first side of said wound or incision adjacent said one tissue portion, and
(2) locate and secure at least a portion of each said leg on said second side of said wound or incision adjacent said other tissue portion; and
(j) withdrawing said needles from said tissue portions whereby the fastener remains holding together said tissue portions.

4,627,438

ELECTRONIC MIGRAINE MODULATOR APPARATUS AND METHODOLOGY

Saul Liss, and Bernard Liss, both of Glen Rock, N.J., assignors to Pain Suppression Labs, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 569,476, Jan. 9, 1984, Pat. No. 4,550,733. This application Aug. 13, 1984, Ser. No. 640,104
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R **3 Claims**



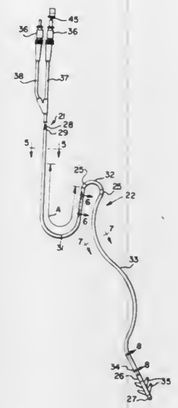
1. Electronic migraine modulator apparatus and methodology for employing a transcutaneous electronic wave to reduce and control migraine headaches, first positive contact electrode means being placed at the pain site and a second positive contact means is placed at the web of the contra-lateral hand; a first negative contact is placed at the contra-lateral trapezius origin, and a second negative contact electrode means is placed at the web of the ipsilateral hand, and means for supplying an electronic current wave comprising a high frequency electrical wave bearing a low frequency amplitude modulation to said first and said second electrode.

4,627,439

PREBENT VENTRICULAR/ATRIAL CARDIAC PACING LEAD

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 561,648, Dec. 15, 1983. This application Nov. 16, 1984, Ser. No. 672,334
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P **12 Claims**



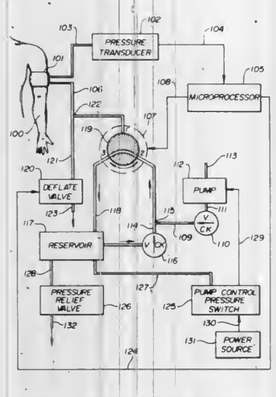
1. A ventricular/atrial prebent lead for cardiac pacing or diagnosis, comprising:
a preshaped, prebent elongated flexible polymeric material insulating sheath having a distal end portion and a proximal end portion structured for connecting engagement with pacing equipment;
a multifilar coil encased within said preshaped, prebent elongated flexible sheath, said multifilar coil having a plurality of coaxially wound coil conductors alternately interwound with each other, each said coil conductor being insulated, each said coil conductor having a proximal end for electrically conductive engagement with the pacing equipment, and each said coil conductor having a distal end along an unbranched length of the preshaped, prebent elongated sheath, at least one of said distal ends defining an atrial coil conductor having a length shorter than at least one other coil conductor having its distal end defining a ventricular coil conductor;
an electrically conductive ventricular electrode at the distal end portion of said single unbranched length of the preshaped, prebent elongated sheath, said ventricular electrode being in electrically conductive communication with the distal end of said ventricular coil conductor;
an electrically conductive atrial electrode at an atrial location along said single, unbranched length of the preshaped, prebent elongated sheath, said atrial location being between the proximal end portion and the distal end portion of the sheath and being positioned for engaging an atrial portion of a heart within which the lead is implanted, and said atrial electrode is in electrically conductive communication with said shorter length atrial coil conductor; and
wherein said unbranched length of the prebent elongated flexible polymeric material sheath includes a flexible enhanced stiffness section that is made of a polymeric material which is stiffer than the polymeric material out of which the remainder of the unbranched length is made, said flexible enhanced stiffness section having an outer diameter substantially the same as that of the remainder of the unbranched length.

4,627,440

SPHYGMOMANOMETRIC CUFF PRESSURIZING SYSTEM

Maynard Ramsey, III; James M. Muskatello; Rush W. Hood, Jr., all of Tampa; Richard Medero, Lutz, and Stanley K. Stephenson, Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 5, 1985, Ser. No. 751,835
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—682 **19 Claims**



16. Blood pressure measuring apparatus comprising:
(a) an inflatable and deflatable pressure cuff;
(b) means defining a pneumatic reservoir;
(c) a pneumatic pump;
(d) first valve means interconnecting said pump and the interior of said reservoir means for selectably supplying air under pressure from said pump to said reservoir means to pressurize said reservoir means;
(e) second valve means interconnecting said reservoir means and said cuff for selectably establishing air transfer communication between said reservoir means and said cuff to cause a rapid inflation of said cuff;
(f) means coupled to said cuff for sensing cuff pressure;
(g) deflate valve means coupled to said cuff for releasing air from said cuff; and
(h) means coupled to said first and second valve means for controlling the operation thereof to inflate said cuff upon initiation of a blood pressure measuring cycle,
(i) wherein said first and second valve means are constituted by a single multi-position valve mechanism having a first position for coupling an outlet of said pump to the interior of said reservoir means, and having a second position for coupling said reservoir means to said cuff.

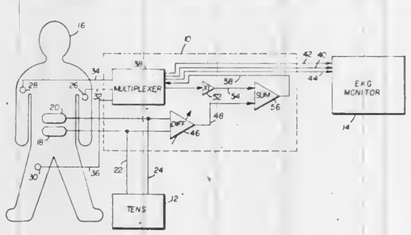
4,627,441

B MEDICAL MONITORING CIRCUIT

Eric A. Martin, St. Anthony, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 604,797, Apr. 27, 1984. This application Nov. 6, 1985, Ser. No. 795,553
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 **4 Claims**

1. Medical monitoring circuit for use in conjunction with an electrical stimulator of the type which includes two stimulating electrodes which are attached to a human body and which provides an electrical output to said stimulating electrodes by which means an electrical potential difference is applied to said human body and for use with a monitoring device of the type which includes two monitor inputs and a monitor ground input, and which displays the potential difference between signals applied to the said two monitor inputs and for use in conjunction with first, second and third sensing electrodes coupled to said human body at three different locations, said monitoring circuit comprising:
circuit ground means for coupling to said third sensing electrode and for providing a reference ground;
first input means coupled to said circuit ground means for coupling to said first sensing electrode and for generating a first signal indicative of the electrical potential difference between said first sensing electrode and said circuit ground;
second input means coupled to said circuit ground means for coupling to said second sensing electrode and for generating a second signal indicative of the potential difference between said second sensing electrode and said circuit ground, whereby the electrical potential difference between said first and second signals is a result both of electrophysiological activity of said body and of said electrical potential difference applied by said stimulating electrodes;
third input means coupled to said circuit ground means for coupling to said electrical stimulator and responsive to the



output of said electrical stimulator and for generating a third signal indicative of the electrical potential difference applied to said human body by said stimulating electrodes;
first output means coupled to said first input means for providing said first signal to one of said two monitor inputs of said monitoring device;
second output means coupled to said second and third input means for adding said third signal to said second signal and for providing the sum of said second and third signals to the other of said two monitor inputs of said monitoring device, said second output means including adjustment means for adjusting the amplitude of said third signal prior to adding said third signal to said second signal whereby said third signal may be appropriately adjusted such that the electrical potential difference between said second and third signals reflects only the electrophysiological activity of said human body; and
third output means coupled to said circuit ground means, for coupling said circuit ground means to said monitor ground input.

4,627,442

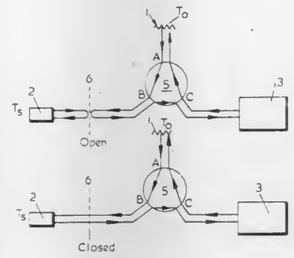
MICROWAVE THERMOGRAPHIC APPARATUS

David V. Land, Glasgow, Scotland, assignor to The University Court of the University of Glasgow, Glasgow, Scotland

Filed Jan. 10, 1984, Ser. No. 569,661
Claims priority, application United Kingdom, Jan. 12, 1983, 8300779
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—736 **4 Claims**

1. Apparatus for use in microwave thermography, said apparatus comprising a signal-receiving aerial sensitive to microwave radiation emanating from a portion of a living-tissue body, said body having a mean body temperature and a mean tissue impedance and said aerial having an output for delivering a thermal noise signal representative of said microwave radiation, a single-throw on-off solid state diode microwave switch connected to said aerial output, a fixed-impedance reference load which is maintained at a predetermined temperature substantially equal to said mean body temperature and

said reference load having an output capable of emitting a thermal noise signal at microwave frequency corresponding to that predetermined temperature, a receiver having an input with an input impedance matched to the impedance of said reference load said receiver having an output and switchable detection means for establishing at said output the difference between the thermal noise signals delivered to the receiver input and emanating from said aerial and from said reference load, synchronous switching means connected to drive said



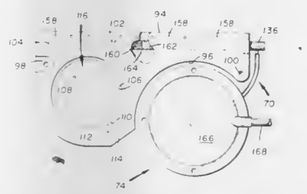
detection means and said solid-state diode microwave switch, a three-port non-reciprocal circulator interconnecting said aerial, reference load and receiver, said circulator having respective ports taken in circulation order connected to the noise-signal output of said reference load, to the output of the aerial via said single-throw on-off diode microwave switch, and to the receiver input, and adding means connected to the output of the receiver and to the output of the reference load for establishing a measure of the temperature of said body portion.

4,627,443

X-RAY READABLE IMPLANTABLE PRESSURE SENSOR

John G. Chubbuck, Silver Spring, and Melvin H. Epstein, Glyndon, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 29, 1980, Ser. No. 201,757
Int. Cl.[4] D61B *5/00*
U.S. Cl. 128—748 **10 Claims**



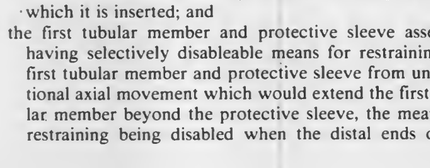
1. A biological pressure sensor for implantation at selected site within the body of a human subject comprising:
- a housing plate, said plate having disposed therein a bellows recess and an elongated metering channel opening on one end thereof into said recess, said housing plate adapted to be fixedly secured to biological tissue;
- a closed ended bellows for mounting in said bellows recess, the interior of said bellows communicating through an aperture disposed in a wall thereof to said bellows recess and therefore to the interior of said one end of said metering channel;
- a pressure tube fixedly secured on one end thereof to the other end of said metering channel, said tube communicating with the interior of said metering channel;
- a flexible tambour operably connected to the other end of said pressure tube, said flexible tambour for positioning at said selected site, the pressure of which is to be measured;
- an X-ray detectable liquid disposed in said bellows and the interior of the adjacent portion of said metering channel; and
- a second liquid immiscible with said X-ray detectable liquid disposed in said tambour, the interior of said pressure tube, and the balance of the interior of said metering channel not filled with said X-ray detectable liquid, said X-ray detectable liquid being relatively radiopaque in comparison to said second liquid, the interface between said liquids moving along the length of said metering channel in proportion to increases and decreases of said pressure.

4,627,444

DEVICE FOR SAMPLING TISSUES AND FLUIDS FROM BODILY CAVITIES

Doris C. Brooker, Eden Prairie, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 20, 1985, Ser. No. 746,910
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—758 **16 Claims**



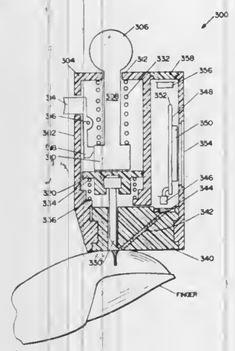
14. An apparatus for the collection of tissue and fluid samples from a bodily cavity having a cavity opening leading to a bodily passageway extending from the exterior to the bodily cavity including:
- a curette comprising a first tubular member having a central curette passageway and having a distal end portion adapted for insertion into a bodily cavity to be sampled, said distal end portion having a curette opening open to the central curette passageway of the tubular member for sampling solids, said first tubular member having a length sufficient to be inserted through the bodily passageway into a bodily cavity such that with the distal end within such bodily cavity a proximal end thereof extends to the exterior of such bodily cavity;
- means for attaching a proximal end of said aspirating curette to a vacuum producing means such that a vacuum may be formed in the central curette passageway to facilitate tissue and fluid sampling through the curette opening;
- a tubular protective sleeve having a distal end and a proximal end encasing the distal end portions of said first tubular member to form an assembly and including means for sealing a provided sleeve opening of said protective sleeve adjacent the distal end of the protective sleeve for preventing contamination of the central curette passageway of the first tubular member from material entering the sleeve opening at the distal end of the protective sleeve, said first tubular member being slidable relative to the protective sleeve between a retracted position within the protective sleeve and a second position whereby the curette opening is positioned outwardly from the distal end of the protective sleeve within the bodily cavity, the means for sealing being disabled upon positive movement of the first tubular member relative to the protective sleeve to its second position, the first tubular member being slidably retractable into the protective sleeve prior to removal of the assembly from such bodily cavity in which it is inserted; and
- the first tubular member and protective sleeve assembly having selectively disableable means for restraining the first tubular member and protective sleeve from unintentional axial movement which would extend the first tubular member beyond the protective sleeve, the means for restraining being disabled when the distal ends of the protective sleeve and tubular member are within such bodily cavity to permit the first tubular member to be moved to its second position.

4,627,445

GLUCOSE MEDICAL MONITORING SYSTEM

Fernando S. Garcia; Hartmut Ginnow-Merkert; Paul J. Anderson; David E. Linde, and Bertram J. Hudson, all of Eden Prairie, Minn., assignors to Garid, Inc., Eden Prairie, Minn.

Filed Apr. 8, 1985, Ser. No. 720,906
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—770 **8 Claims**



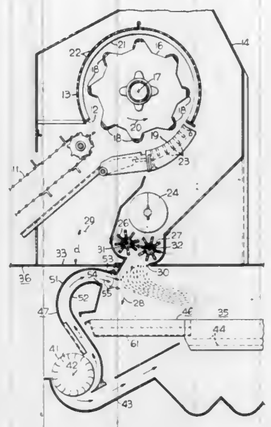
1. Hand-held pocketable medical diagnostic system for extraction and qualitative analysis of a component of blood in a living body, comprising:
- a. housing member including an internal spring actuating means surrounding a contained core means, said spring actuating means including an actuator spring, cocking means for said actuator spring, and means for releasing said actuator spring in response to a predetermined pressure against the skin of a body to move said core means, optical measurement means contained within said housing member, said optical measurement means including a light source and a light sensor in said housing member for measuring light emanating from said source, a blood reagent chemistry between said light source and said light sensor and having an optical characteristic responsive to the component to be measured and in contact with the blood to be measured, said optical measurement means generating an electrical signal proportional to light reflectance of said blood reagent chemistry and therefore also the component of the blood to be measured, display means in said housing member responsive to said electrical signal to provide a visual readout representative of the quantitative analysis, and socket means at one end of said housing member for removably receiving a disposable probe package;
- b. disposable probe package shaped to be inserted into said socket means, including said blood reagent chemistry, means for supporting said blood reagent chemistry within said probe package, and a needle supported internal to said probe package below said core means and adjacent to said blood reagent chemistry; and,
- c. diaphragm means operatively connected to said needle and said blood reagent chemistry for causing vacuum action of said diaphragm means to transport the blood along said needle to said blood reagent chemistry for reaction therewith, thereby resulting in a color change yielding said reflectance of light which is read by said optical measurement means when said spring actuating means through said core means drives said needle through the skin.

4,627,446

DOWNWARDLY AND REARWARDLY DIRECTED AIR STREAM FOR HARVESTER WITH VERTICALLY OFFSET ACCELERATOR ROLLS

Michael L. Huhman, Kansas City, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Mar. 14, 1985, Ser. No. 711,632
Int. Cl.[4] A01F *12/44*
U.S. Cl. 130—27 Z **5 Claims**



1. In an agricultural harvester having a threshing section with a threshing rotor disposed on a generally horizontal axis and a concave on the underside of said rotor, and a cleaning section having a grain pan below said concave and a sieve rearwardly of said grain pan, the combination comprising:
- front and rear counterrotating accelerator rolls disposed above said grain pan and in underlying relation to said concave, said accelerator rolls being disposed on a pair of generally horizontal and parallel axes and receiving therebetween threshed material from said concave, the axis of said front accelerator roll being vertically offset above the axis of the rear accelerator roll whereby threshed material is accelerated in a downwardly and forwardly direction toward said grain pan, and
- air delivery means including a lower duct directing a flow of air rearwardly and upwardly through said sieve and an upper duct having an outlet portion disposed a predetermined distance below and parallel to a plane through said axes of said accelerator rolls, said outlet portion directing a layer of laminar flow air rearwardly and downwardly toward said sieves, and through and transverse to the accelerated threshed material passing from said accelerator rolls thereby blowing chaff and stalk particles rearwardly from the kernels of grain which pass downwardly to said grain pan.

4,627,447

TOBACCO WINNOWING METHOD AND APPARATUS

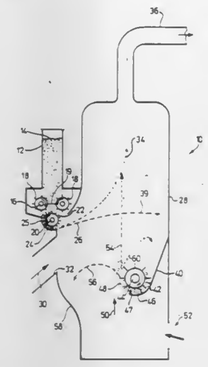
Warren A. Brackmann, and Stanislav M. Snaidr, both of Mississauga, Canada, assignors to Rothmans of Pall Mall Canada Limited, North York, Canada

Filed Dec. 14, 1983, Ser. No. 561,296
Claims priority, application United Kingdom, Dec. 16, 1982, 8235883
Int. Cl.[4] A24B *3/06*
U.S. Cl. 131—109.1 **29 Claims**

1. A method of separating a mass of tobacco fragments and heavier tobacco fragments, which comprises:
- metering tobacco fragments from a reservoir containing the mass of shredded tobacco material and having open upper and lower ends by rotating a pair of horizontally-spaced

rollers located at the lower end of the reservoir about parallel axes,

opening the metered tobacco fragments to provide a substantial proportion of the tobacco fragments in substantially separated condition by a third roller located below and substantially equidistantly from the axes of the pair of rollers for rotation about an axis parallel to the axes of the pair of rollers, and



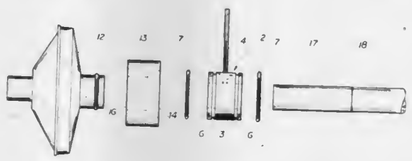
exposing said opened tobacco mass to a generally upwardly-flowing gas stream having a velocity sufficient to entrain the lighter tobacco fragments therein but insufficient to entrain the heavier tobacco fragments, whereby said lighter fragments are carried with the gas stream while the heavier fragments are not.

4,627,448

TOBACCO SMOKE ARTICLE HOLDER AND METHOD THEREFOR

Roger D. Kamm, 77 Marion Rd., Watertown, Mass. 02172, and Louis Fine, 601 North Grove, Oak Park, Ill. 60302

Filed Feb. 25, 1985, Ser. No. 705,160
Int. Cl.⁴ A24F *13/02, 13/08*
U.S. Cl. 131—187 **14 Claims**



1. A tobacco smoke article holder for use with a tobacco article smoke testing machine capable of simulating tobacco smoke article filter - human lip mucosal relation comprising: a conduit having an inlet and an outlet end; fluid pressure means in fluid communication with the interior of the conduit; a circumferential thin-walled flexible liner sized to circumferentially line the inner wall surface of said conduit with the opposite ends of the liner at the conduit inlet end and outlet end fastened in sealed relation, with sealing means to the inlet end and outlet end of said conduit; said conduit with said liner having a length of approximately 12 mm, said lined conduit having a cross-section when said liner of said conduit is in relaxed state approximate to the cross-section of the tobacco smoke article to be tested; said circumferential flexible liner being inflated by fluid passing through said fluid pressure means into the interface of said circumferential flexible liner and inner wall surface of said conduit to a pressure in the range of 0 Torr to 150 Torr so that said liner will exert a pressure in the range of 0 Torr to 150 Torr on a tobacco smoke article inserted into the inlet end of said lined conduit resulting in simulating tobacco smoke article - human lip mucosal relation; and the sealing means at the outlet end of said lined conduit also constituting a connecting means to sealingly connecting the lined conduit to a coupler means for coupling the lined conduit to the smoke testing machine.

4,627,449

PROCESS FOR AUGMENTING OR ENHANCING AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLE USING ALDEHYDE COMPOSITION

Jacob Kiwala, Brooklyn, N.Y.; Braja D. Mookherjee, Holmdel, and Robert W. Trenkle, Point Pleasant, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 12, 1985, Ser. No. 754,122
Int. Cl.⁴ A24B *3/12, 15/30*
U.S. Cl. 131—276 **4 Claims**

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with the smoking tobacco, an aroma or taste augmenting or enhancing quantity of a composition of matter consisting essentially of:

(a) from about 0.5 up to about 7% by weight of said composition of n-hexanal;

(b) from about 5 up to about 21% by weight of said composition of n-octanal;

(c) from about 30 up to about 80% by weight of said composition of n-nonanal;

(d) from 0 up to about 40% by weight of said composition of n-decanal;

(e) from 0 up to about 7% by weight of said composition of n-tetradecanal;

(f) from about 7 up to about 12% by weight of said composition of n-heptanal;

(g) from 0 up to about 12% by weight of said composition of n-undecanal; and

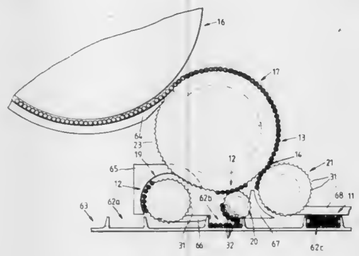
(h) from 0 up to about 12% by weight of said composition n-dodecanal.

4,627,450

PROCESS FOR FORMING GROUPS OF CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Division of Ser. No. 379,197, May 17, 1982, Pat. No. 4,592,374. This application Mar. 13, 1985, Ser. No. 711,332
Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120674
Int. Cl.⁴ A24C *5/35*
U.S. Cl. 131—282 **2 Claims**



1. A process for forming multiple layer groups of cigarettes (**10**), comprising:

(a) supplying cigarettes (**10**) continuously in a tight row,

(b) removing from the tight row a succession of row segments of cigarettes (**10**) of corresponding number in sequence, and

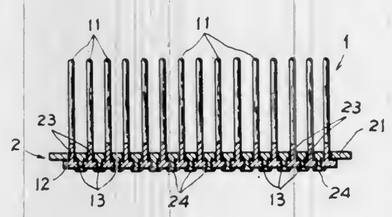
(c) depositing said row segments of corresponding number of cigarettes in multiple row superposed layer contact with each other, with the cigarettes (**10**) of one row layer laterally offset and in saddle position with respect to the adjacent row layer to thereby form a multi-layer cigarette group (**11**).

4,627,451

MEANS OF COMB BRISTLES BY OVERALL PLANTING METHOD

Che-Yuan Chang, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 26, 1984, Ser. No. 674,743
The portion of the term of this patent subsequent to Apr. 9, 2003, has been disclaimed.
Int. Cl.⁴ A45D *24/00*
U.S. Cl. 132—11 A **4 Claims**



1. An improved means of comb bristles comprising:

a bristle holder which is integratedly formed with a plurality of bristles extending from a bristle base and a plurality of holes on said bristle base, each hole positioned between every two bristles; and

an embedding element which is formed with a plurality of fixing tips each corresponding to each hole on said bristle base, and a plurality of bristle holes corresponding to said bristles,

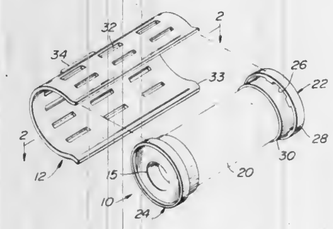
said embedding element being combined with said bristle holder by inserting all fixing tips into all holes on said bristle base and then heating said fixing tips to melt as butts to seal all holes on said bristle base and firmly bind said embedding plate with said bristle base to prevent from the retraction of said bristles during combing operation, said bristles being overall electroplated before inserting into embedding plate to have beautiful appearance and prevent from rust.

4,627,452

ELECTRICALLY HEATED HAIR ROLLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Filed Jun. 9, 1983, Ser. No. 502,890
Int. Cl.⁴ A45D *2/12*
U.S. Cl. 132—33 R **11 Claims**



1. Apparatus comprising a hair curler having a core arranged at one end for temporary contact with an external electrical heater, said core being an electrically conductive metal, a non-metallic end cap connected to each end of the core, a generally C-shaped shield open at both ends, said shield frictionally embracing a portion of said end caps, said shield having its inner surface spaced from said core by said end caps, means defining slots through which steam may enter the space between the shield and core while the core is being heated, and said shield being provided with a handle to facilitate manipulation thereof, said handle projecting generally radially outwardly of the sleeve at a location adjacent its bight.

4,627,453

ARTIFICIAL FINGERNAILS AND METHOD OF APPLICATION

Bonnie J. Isler, 1801 James Town Rd., Apt. 1, Belleville, Ill. 62221

Filed Jun. 15, 1984, Ser. No. 621,244
Int. Cl.⁴ A45D *29/00*
U.S. Cl. 132—73 **8 Claims**



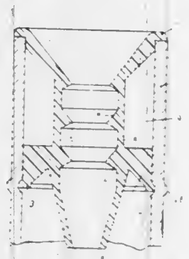
1. A method of forming an artificial nail including the steps of adhering a first layer of organic material over substantially the entire surface of a wearer's natural nail with an inner edge of the first layer spaced from the wearer's cuticle, adhering a second layer of organic material over substantially the entire surface of the first layer with an inner edge of the second layer adjacent the cuticle, applying adhesive over the second layer and then applying hardening solution to harden the nail.

4,627,454

COSMETIC STICK WITH APPLICATOR

Klaus-Peter Dahm, Stettiner Strasse 25A, 3011 Rethen/Leine, Fed. Rep. of Germany

Continuation of Ser. No. 965,657, Dec. 1, 1978, abandoned, which is a continuation of Ser. No. 644,186, Dec. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 539,735, Jan. 9, 1975, abandoned. This application May 27, 1983, Ser. No. 498,956
Int. Cl.⁴ A45D *40/26*
U.S. Cl. 132—88.7 **18 Claims**



1. A one-piece, integrally and simultaneously formed hollow wiper member for use in connection with an applicator assembly which includes a container having an open end and an applicator having an elongated shaft and an application member secured to one end of said shaft which is insertable into said

one end of said container so as to remove a liquid or powdery preparation contained therein, comprising:

a hollow wiper housing having an internal surface defining an internal channel and at least two annular, asymmetrical, resilient, radially-deformable first wiper lips disposed successively in said channel of said wiper housing adjacent to said open end of said container and directed radially-inwardly from said surface of said wiper housing, each of said first wiper lips having a generally triangular cross section and having a radially inwardly and downwardly sloping upper surface and a radially inwardly and upwardly sloping lower surface converging into a wiping edge at an angle of about at least 90°, said upper surface being longer than said lower surface, said edge having a diameter which is less than the diameter of said application shaft;

at least one second wiper lip disposed beneath and spaced apart from said first wiper lips in said housing, said second wiper lip having a smaller diameter than the application member so that when the applicator shaft and the member are withdrawn from said container, said second wiper lip makes wiping contact with the application member to portion the amount of liquid or powder removed from said container, and said first wiper lips become radially deformed and make wiping contact with said applicator shaft so as to completely clean and remove the powder or liquid adhering to the surface of said applicator shaft.

4,627,455

UMBRELLA RIB LINKAGE SYSTEM

Toshio Okuda, Hirakata, Japan, and Tsun-Zong Wu, Taipei, Taiwan, assignors to 'totes', incorporated and Fu Tai Umbrella Works Ltd.

Filed Nov. 27, 1984, Ser. No. 675,209

Claims priority, application Taiwan, Nov. 30, 1983, 7228218; Japan, Dec. 12, 1983, 58-191922[U]

Int. Cl.⁴ A45B *19/00, 25/00*

U.S. Cl. 135—25 A **28 Claims**



1. An umbrella comprising

a centerpost having a runner slidable thereon,

a cover connected at its center to said centerpost, and

a topless rib linkage beneath said cover, said linkage having a cover rib to which said cover is connected, said cover rib having a bend therein at an inner end closest to said centerpost, a straight stretcher rib connecting said runner and said cover rib, said stretcher rib being attached to said cover rib at the inner end thereof on one side of said bend, a support rib connecting said stretcher rib and said centerpost, and a control link located beneath said stretcher rib and connecting said support rib and said cover rib, said control link being attached to said cover rib on the other side of said bend and spaced away from said cover rib inner end, said bend of said cover rib being oriented to angle said inner end of said cover rib away from said cover so that the connection of said cover rib and said stretcher rib is displaced away from said cover when said rib linkage is in a full opened position, and said stretcher rib, cover rib, support rib and control link defining a profile opening of generally parallelogram configuration beneath said stretcher rib of when said umbrella is held upright and said rib linkage is between full opened and full closed positions, and defining a profile opening of a generally triangle configuration beneath said stretcher rib when said umbrella is held upright and said rib linkage is in said full opened position, wherein said support rib further comprises a bend between the connections of said stretcher rib and said control link providing a generally coaxial alignment of an outermost segment of the support rib and the control link when said linkage is in said full opened position.

4,627,456

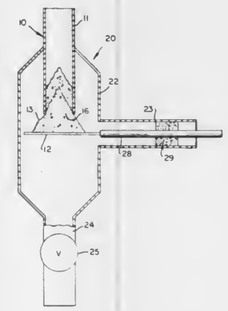
VALVE SYSTEM FOR PARTICULATE SOLID FLOW CONTROL

William E. BeVier; Kenneth C. Kather, both of Kenmore, and Lawrence S. Graczyk, Orchard Park, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 31, 1985, Ser. No. 760,922

Int. Cl.⁴ F16K *3/02*

U.S. Cl. 137—1 **12 Claims**



1. A method for controlling the flow of particulate solid material and fluid material enabling reduction in valve wear and in particle abrasion and breakdown comprising: passing particulate solid material and fluid material into an enclosure through an essentially vertically oriented inlet conduit having a downward directed opening; positioning within the enclosure a surface structure beneath and vertically spaced from said inlet conduit opening; piling particulate solid material passing through the inlet opening into the surface structure in a roughly conical pile having an angle of repose sufficient to enable the pile to completely block the inlet opening; opening a fluid flow control valve in an outlet conduit; thereafter removing the surface structure from the defined position beneath the downward directed opening; passing particulate solid material out from the enclosure through said open valve; and closing the valve in the outlet conduit after the flow of particulate solid material through the valve has ceased, whereby pressure contact between particulate solid material and valve surfaces is avoided.

4,627,457

METHOD AND APPARATUS FOR TREATING A PLURALITY OF ZONES OF A PROCESSING LINE

Kenneth J. H. Bird, Beeston; Robert J. Cross, Allestree, and Manjit Singh, Kimberley, all of England, assignors to Diversey Corporation, Mississauga, Canada

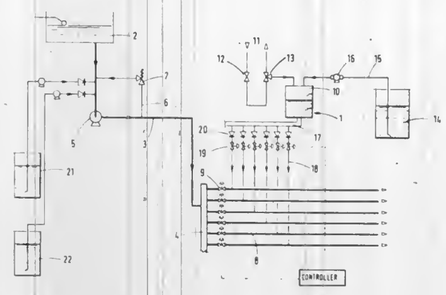
Filed Jul. 18, 1985, Ser. No. 756,757

Claims priority, application United Kingdom, Jul. 24, 1984, 8418778

Int. Cl.⁴ B65G *45/02*

U.S. Cl. 137—1 **19 Claims**

1. A method of treating a plurality of zones of a processing line with a liquid, the liquid comprising a treatment liquid and a carrier liquid, wherein the treatment liquid is introduced as discrete slugs, into pipes conveying the carrier liquid to each



zone, and wherein the volume of each slug is selectively variable or wherein each slug may be introduced into the pipes at a selectively variable frequency.

4,627,458

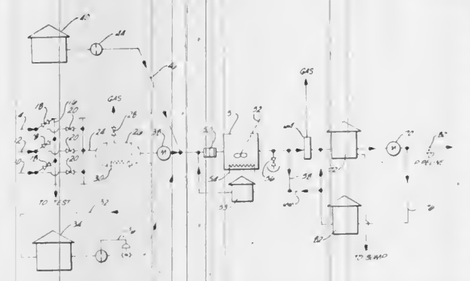
ONE-STEP PROCESS FOR TRANSFORMING A WATER-IN-OIL EMULSION INTO AN OIL-IN-WATER EMULSION

Rama R. S. Prasad, Bakersfield, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 585,435, Mar. 2, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,851

Int. Cl.⁴ F17D *1/16*

U.S. Cl. 137—13 **17 Claims**



1. A process for the production of an oil-in-water emulsion for pipeline transmission which comprises:

(a) producing a hydrocarbon crude including a water-in-oil emulsion;

(b) adding to said hydrocarbon crude when said crude is at a temperature of from about 100° to about 200° F., an emulsifier system capable of forming and sustaining an oil-in-water emulsion at said temperature and at ambient pipeline transmission temperatures, the amount of emulsifier system added being sufficient to form and sustain an oil-in-water emulsion having a selected water content of from about 15 percent to about 35 percent by weight water and a viscosity sufficiently low for pipeline transmission;

(c) agitating the hydrocarbon crude including a water-in-oil emulsion and the added emulsifier system, to form an oil-in-water emulsion; and

(d) separating any excess water from the formed oil-in-water emulsion.

4,627,459

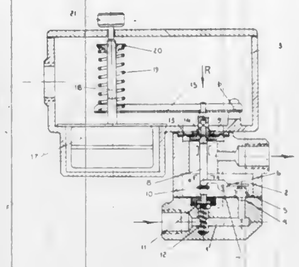
PNEUMATIC PRESSURE TRANSMITTER

Izrail B. Gulko, #305-1121-15 Ave SW., Calgary, Alberta, Canada T2R 0S8

Continuation-in-part of Ser. No. 558,388, Dec. 5, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,441

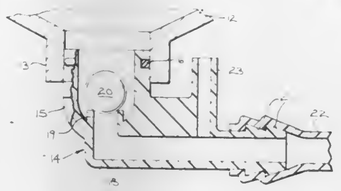
Int. Cl.⁴ G05D *16/06*

U.S. Cl. 137—116.5 **2 Claims**



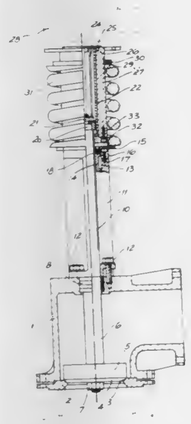
1. A pneumatic pressure transmitter for accurate pressure setting having a pressure regulating means comprising a frame with a supply pressure chamber, a control pressure chamber and a reference pressure chamber, a loading diaphragm which separates the control pressure chamber and the reference pressure chamber, a loading spring for putting a reference force on the the loading diaphragm; an exhaust port in the centre of said diaphragm, means for ventilation of excess pressure from the control pressure chamber; the control pressure chamber contains an inlet port in communication with the supply pressure chamber; an inlet plug means for closing the inlet port; a stem having a shouldermount (10) on its surface, and an exhaust plug at one end for closing the exhaust port; a two arm lever with a pivot fixed at the frame, one arm of said lever is fork shaped and rests by its prongs on the shouldermount, the other arm pushes the inlet plug closing the inlet port; a balance diaphragm separates the supply pressure chamber from the control pressure chamber and creates a balance force proportional to the difference between supply and control pressure, that force is applied to the other end of the stem; an auxilliary spring means for putting an additional force at the stem; said inlet and exhaust ports, stem with the exhaust plug and shouldermount, lever, inlet plug, loading diaphragm, balance diaphragm and auxilliary spring interact in such a way, that force created by the balance diaphragm and the auxilliary spring pushes the stem and, through the shouldermount, pushes the fork shaped arm of the lever, while the other arm of said lever pushes the inlet plug and closes the inlet port; when the reference force is counterbalanced by the pressure in the control pressure chamber, the loading diaphragm with the exhaust port moves onto the exhaust plug and closes the exhaust port; the balance force together with the force of the auxilliary spring is sufficient to keep the both ports closed; whereby a surplus pressure in the control pressure chamber lifts the loading diaphragm with the exhaust port and opens said port, while the fork shaped arm of the lever prevents the stem with the exhaust plug from following the exhaust port; the other arm of the lever pushes the inlet plug and keeps the inlet port closed; lack of pressure in the control pressure chamber moves the loading diaphragm in the opposite direction, and that action closes the exhaust port, pushes the stem, removes or reduces the force from the fork shaped arm of the lever and, consequently, from the inlet plug, whereby the force of supply pressure opens the inlet port.

4,627,460
CONDENSATE DISCHARGE DEVICE FOR COMBUSTION APPARATUS
John P. Eising, Oconomowoc, Wis., assignor to A. D. Smith Corporation, Milwaukee, Wis.
Continuation-in-part of Ser. No. 616,608, Jun. 4, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,793
Int. Cl.[4] F16T *1/20*
U.S. Cl. 137—192 **6 Claims**



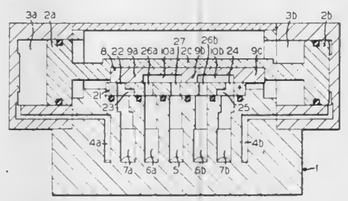
1. A condensate discharge device for a combustion appartus, comprising a housing having an inlet connected to a conduit containing waste gases of combustion and having an opening in the lower end, an outlet tube havihg one end disposed within the opening and defining a seat, a spherical float disposed within the housing and disposed to engage the seat to prevent flow through said outlet tube, condensate generated by cooling of said combustion gases flowing from said conduit into said housing and an accumulation of condensate above the level of said seat causing the float to lift from the seat to permit the discharge of condensate while preventing discharge of gas through said outlet tube, and a vent tube connected to said outlet tube and extending upwardly therefrom, an accumulation of condensate in said outlet tube being discharged through said vent tube to prevent said condensate from backing-up into said conduit.

4,627,461
SELF CLEANING VALVE
Patrick J. Gordon, Cromer, Australia, assignor to K. J. Baillie Pty. Ltd., New South Wales, Australia
Filed Oct. 3, 1985, Ser. No. 783,433
Int. Cl.[4] F16K *29/00, 31/50*
U.S. Cl. 137—243.1 **3 Claims**



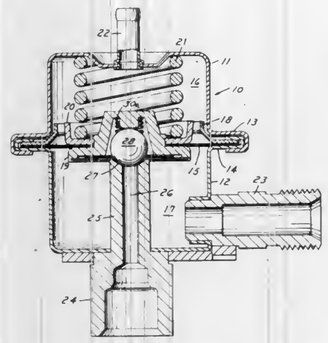
1. A fluid control valve having an actuator, a valve seat, a circular closure member cooperating with said valve seat to control fluid flow through the valve, a spindle turned by said actuator and provided with an externally threaded section and having said closure member at its lower end, a sleeve turned at its upper end by said actuator and rotating said spindle which extends into its lower end, a formation on the upper end of said spindle engaging the interior of said sleeve which is shaped to allow said formation to slide axially in said sleeve without relative rotation occurring therebetween, a housing provided with upper and lower tubular coaxially arranged and spaced casings one of which contains said sleeve and the other of which surrounds said threaded section of said spindle, an internally threaded collar screwed onto said threaded section of said spindle and having a part which engages with the surrounding casing in a way which constrains said collar to move axially but without rotation in the surrounding casing when the spindle is rotated by the sleeve, a flange extending radially outwards from said collar between said two casings with sufficient clearance to allow axial movement of said collar in a direction away from said valve seat, an adjustment nut screwed onto a threaded section of one of the surrounding casings, and a coil spring coaxially surrounding the casing carrying the nut and engaging said nut at one end and said flange at the other end to exert a resilient bias urging said spindle towards said valve seat while yielding resiliently to allow movement of said collar in a direction away from said valve seat.

4,627,462
SELECTABLE FUNCTION VALVE DEVICE
Michael D. Lyons, Lexington, Ky., assignor to American Standard Inc., Lexington, Ky.
Filed Apr. 1, 1983, Ser. No. 481,192
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—270 **14 Claims**



1. A multiposition valve device comprising:
(a) a housing;
(b) operating means for selectively positioning said valve device in selected valve positions;
(c) a dynamic plate having at least one cavity carried by said operating means for axial movement therewith;
(d) a plurality of fluid-carrying passageways in said housing connectable to fluid devices;
(e) a stationary plate mounted in said housing intermediate said passageways and said dynamic plate;
(f) said stationary plate having a plurality of through-bores;
(g) at least one of said through-bores having an enlarged diameter opening on one side of said stationary plate;
(h) said stationary plate being of a generally symmetrical design about the plane perpendicularly intersecting the axis of said through-bore, such that said stationary plate can be mounted in said housing with said enlarged diameter opening adjacent said dynamic plate, and alternatively with said enlarged diameter opening adjacent said passageways in said housing; and
(i) at least portions of said one side of said stationary plate and the opposite side of said stationary plate having surfaces to provide slidable sealing with said dynamic plate.

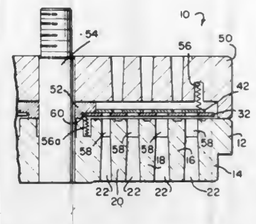
4,627,463
FUEL PRESSURE REGULATOR
David L. Johnstone, Waterford, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.
Filed Apr. 11, 1985, Ser. No. 721,958
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—510 **3 Claims**



1. A fuel pressure regulator comprising a housing,
a diaphragm dividing the housing into a first chamber and second chamber,
a passage from the exterior of the housing to said first chamber,
an inlet and an outlet associated with the second chamber of the housing,
a frustoconical valve seat associated with the outlet,
a cage mounted on and movable with the diaphragm,
a spring within the first chamber yieldingly urging the cage toward the valve seat,
a cage,
a first plate fixedly mounted on said cage and having an opening therethrough,
a second plate overlying said first plate and having an opening therethrough,
a ball positioned between said cage and said second plate and engaging the opening in said second plate,
said cage having a cavity into which said ball is attached,
said ball being rotatable relative to said second plate,
the opening in said second plate having a diameter less than the diameter of said ball,
the diameter of the opening in said first plate being less than the outer diameter of said second plate,
a light spring interposed between said cage and said ball urging said ball through the opening in said first plate toward said valve seat,
the outer diameter of said second plate being less than the diameter of the portion of the cage which surrounds the periphery of said second plate such that said ball and said second plate can move laterally to accommodate any misalignment between the ball and the valve seat.

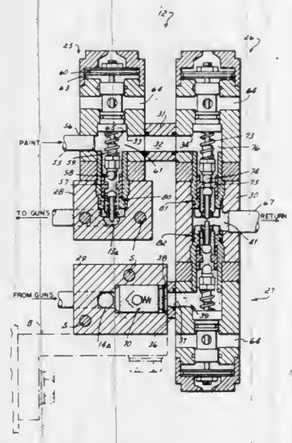
4,627,464
UNIDIRECTIONAL, FLUID CONTROL VALVE
Kevin Hartshorn, Plainsboro, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Dec. 20, 1985, Ser. No. 811,446
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—516.13 **8 Claims**

1. A unidirectional, fluid control valve, comprising:
first means defining a valve seat having a seating surface, and fluid ports formed therein;
second means, coupled to said valve seat, defining a ported, valving element stop having a planar, stop surface; and
third means, movably disposed between said seat and said stop, (a) for engaging said seat and occluding said ports in said seat, and (b) for lift thereof from said seat to expose said ports in said seat, thereby to prohibit, and to permit, fluid flow through said ports in said seat, respectively; wherein
said third means comprises an apertured valving element, and an apertured buffer element;



said buffer element is interposed between said valving element and said seat; and
apertures in said buffer element are occluded by said valving element; and further including
means interposed between said seating surface and said stop surface for restricting lift of said buffer element.

4,627,465
COLOR CHANGER
James A. Kolibas, Broadview Heights, and William P. Mueller, Elyria, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio
Continuation of Ser. No. 680,134, Dec. 10, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,444
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—563 **23 Claims**



17. A recirculating color changer for selectively controlling introduction of paint from respective supplies of paint of various colors to a paint application and for recirculating paint to a respective paint supply, said color changer comprising:
a plurality of color module means, each for selectively directing paint of one color from a first paint color supply to said application and for returning paint of said one color from said first supply to said first supply when said color is not selected and for returning excess paint of said color to said first supply during painting with said color;
each said module means defining a respective portion of a universal applicator paint supply manifold, means for conveying paint of a selected color to said applicator, and a universal applicator paint return manifold for returning

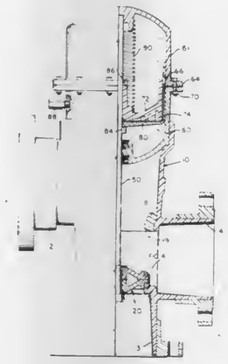
excess paint of a selected color from said applicator to a paint supply for paint of said selected color.

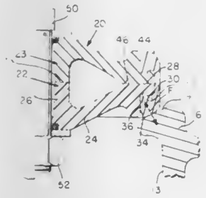
4,627,466

VALVE AND ACTUATOR

Robert G. Stark, Sr., 735 NE. 198th St., Seattle, Wash. 98155; Robert G. Stark, Jr., 5731 SW. Idaho, Portland, Oreg. 97221; Tom Stark, 551 Lakeside Dr., Sedro Wooley, Wash. 98284, and Joseph W. Anderson, 9845 NE. 22nd St., Bellevue, Wash. 98004

Filed Sep. 5, 1985, Ser. No. 773,373
Int. Cl.[4] F16K *11/044, 31/145;* **F01B** *19/00;* **F16J** *3/02*
U.S. Cl. 137—625.5 **13 Claims**





1. A valve having first and second axially aligned ports, each having a valve seat with a contact surface, comprising:
a valve actuating rod adapted to be moved axially past said seats;
means for moving said actuating rod;
a plastic valve disk having a hollow-interior connected to said rod, said valve disk having a circumferential mounting flange;
said mounting flange for said valve disk including on each axially spaced side thereof a radially outer, axially protruding lip and a radially inner, axially protruding ledge, said lip and ledge forming a recess; and
a deformable sealing ring tightly fitted over and secured to the entire periphery of said flange, wherein the mounting flange also mechanically interlocks the sealing ring to the valve disk.

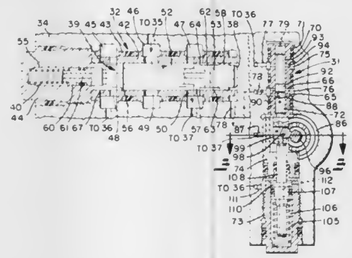
4,627,467

PILOT OPERATED DIRECTIONAL CONTROL VALVE

Eugene J. Martin, Portage, Mich., assignor to Pneumo Corporation, Boston, Mass.

Continuation of Ser. No. 402,741, Jul. 28, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 790,808
Int. Cl.[4] F16K *35/00;* **F15B** *13/42*
U.S. Cl. 137—625.6 **20 Claims**

1. A valve mechanism comprising a manually operated pilot valve stage and a hydraulically operated power valve stage, means for communicating fluid to and from said pilot valve stage and said power valve stage by connecting each of said pilot valve stage and said power valve stage to a fluid pressure source and to a fluid return means, said pilot valve stage including a manually movable pilot valve plunger movable between second and first positions for respectively providing a signal pressure to said power valve stage when said pilot valve stage is connected to such fluid pressure source and for venting said signal pressure to said fluid return means, spring means for providing a preload force on said pilot valve plunger urging said pilot valve plunger toward said first position when said pilot valve stage is disconnected from such fluid pressure source, and means for removing said spring means preload force in response to fluid pressure being supplied to said pilot valve stage, said power valve stage including a signal end to which such signal pressure is respectively supplied and vented by said pilot valve stage through passage means in said power valve stage and pilot valve stage during such movements of said pilot valve plunger between said second and first positions as aforesaid, said power valve stage including a power valve



plunger responsive to the pressurizing and venting of said signal end to cause movement of said power valve plunger between two different porting positions for respectively connecting an outlet port in said power valve stage to a pressure port which is directly connected to said fluid pressure source and to a return port which is directly connected to said fluid return means, said power valve plunger having one end exposed to said signal end, whereby when a signal pressure is supplied to said signal end, said signal pressure acting on said one end of said power valve plunger causes said power valve plunger to move to one of said porting positions, and another end of said power valve plunger having a differential area smaller than said one end of said power valve plunger, said differential area on said powre valve plunger being exposed to the fluid pressure source which is directly connected to said pressure port, whereby when said signal end is vented, the fluid pressure source which is directly connected to said pressure port acting on said differential area on said another end of said power valve plunger causes said power valve plunger to move to another of said porting positions.

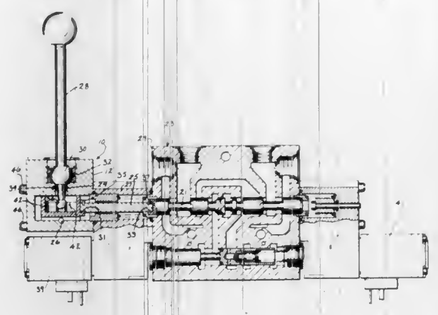
4,627,468

HYDRAULIC CONTROL VALVE WITH MANUAL OVERRIDE

Raud A. Wilke, Brookfield, and Michael Paik, Waukesha, both of Wis., assignors to Husco International, Inc., Waukesha, Wis.

Filed Aug. 30, 1985, Ser. No. 771,291
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—625.66 **6 Claims**

1. A hydraulic control valve of the type including housing means containing an axially movable valve spool and remotely controllable means which provide for actuation of the spool between working and non-working positions, characterized by manually operable means for shifting said spool, comprising:
a driver in the housing means, for actuating the spool;
means mounting the driver in the housing means adjacent to one end portion of the spool to provide for back and forth motion of the driver lengthwise of the spool axis and for motion of the driver crosswise of the spool axis between a neutral position at which the spool is movable relative to the driver and an operative position relative to the spool;
a handle operatively connected to the driver and projecting to the exterior of the housing means to provide for actuation of the driver crosswise of the spool axis as well as lengthwise of said axis;
and means for establishing a driving connection between the spool and driver effective upon handle produced motion of the driver to its operative position, whereby the spool can then be moved axially between working and non-working positions in consequence of handle produced actuation of the driver lengthwise of the spool axis.

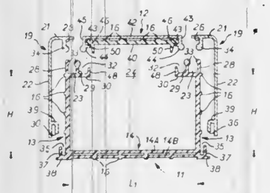


4,627,469

COMPOSITE STRUCTURE DUCT

Yvon Buard, Voutre, France, assignor to Legrand, Limoges, France

Filed Dec. 7, 1984, Ser. No. 679,215
Claims priority, application France, Dec. 7, 1983, 83 19563
Int. Cl.[4] H02G *3/04*
U.S. Cl. 138—92 **21 Claims**



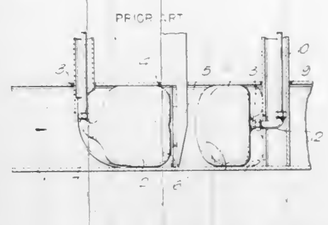
1. A duct comprising a body member of plastic material and having a U-shaped cross section and having opposed sidewalls, a base wall and an open end, a cover for closing off said open end of said body member, a first metal casing element for cladding an outer face of one of said sidewalls of said body member, a second metal casing element for cladding an outer face of the other of said sidewalls of said body member, said body member having external engagement means, said casing elements each having complementary engagement means fittingly engageable with said external engagement means for securing said casing elements on said body member.

4,627,470

SEALING DUCTS

Alec R. Carruthers, Nr. Westbury, England, assignor to ALH Systems Limited, Westbury, England

Filed Jun. 1, 1984, Ser. No. 616,158
Claims priority, application United Kingdom, Jun. 2, 1983, 8315198
Int. Cl.[4] F16L *55/12*
U.S. Cl. 138—93 **7 Claims**



1. Apparatus for sealing a pre-existing duct against fluid flow therein, said apparatus being adapted to be inserted radially into a pre-existing duct through holes provided for this purpose in the wall thereof and comprising:
a primary inflatable bag adapted to be inserted radially into said duct through a first hole of said holes in the wall of said duct, said primary inflatable bag having an upstream end and a downstream end and having an inflation opening at said upstream end thereof for introduction of an inflation fluid into said primary bag;
tube means for inflating said primary bag, said tube means being adapted to be inserted radially into said duct through said first hole of said holes and connected to said primary bag at said upstream end thereof for introduction of an inflation fluid through said inflation opening at said upstream end of said primary bag and into said primary bag to inflate said primary bag into sealing contact with said duct to seal said duct against fluid flow therein;
stop means adapted to be inserted radially into said duct through a second hold of said holes said stop means being located in a primary bag supporting position in a said duct, said position being downstream of said primary bag and located such that said stop means supports said downstream end of said primary bag when said primary bag is inflated into sealing contact with said duct;
a secondary inflatable bag adapted to be inserted radially into said duct through a third hole of said holes in the wall of a said duct downstream of said stop means, said secondary inflatable bag having an upstream end and a downstream end and having an inflation opening at said downstream end thereof for introduction of an inflation fluid into said secondary bag, said secondary bag being adapted to be inserted into said duct with said downstream end having said inflation opening oriented downstream in said duct and with said upstream end oriented upstream in said duct;
further tube means for inflating said secondary bag, said further tube means being adapted to be inserted radially into said duct through said third hole of said holes and adapted to be connected to said secondary bag at said downstream end thereof for introduction of an inflation fluid through said inflation opening and into said secondary bag to inflate said secondary bag into sealing contact with said duct to act as a seal for said duct in the event of a failure of the primary bag;
means for connecting said further tube means to said inflation opening of said secondary bag;
a tubular support member oriented radially in said duct through said third hole of said holes such that said tubular support member extends substantially fully diametrically across said duct, said tubular support member having an upstream face adapted to be positioned substantially coplanar with the downstream end of said secondary bag to

support said secondary bag when said secondary bag is inflated into sealing contact with said duct;

means for securing said tubular support member in fixed position and extending substantially fully diametrically across said duct;

the distance, in the axial direction of said duct, from the location of said further tube means, when said further tube means is inserted radially into said duct and connected to said secondary bag, to said downstream end of said secondary bag when said secondary bag is inflated into sealing contact with said duct, being not substantially greater than a distance, in the axial direction of said duct, from said location of said further tube means to the upstream face of said tubular support member whereby, when said secondary bag is inflated in said duct, an upstream face of said tubular support member is substantially coplanar with the downstream end of said secondary bag; and

the axial length of the area of the secondary bag adapted to contact the duct when said secondary bag is inflated in said duct being at least 0.7 times the diameter of the secondary bag.

4,627,471

SEALING JOINTS AND LEAKS

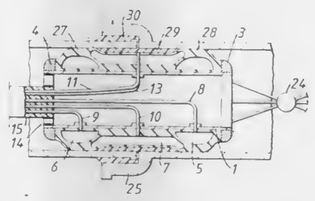
Adrian S. Parkes, Burgess Hill; Gordon J. Corbett, Croydon; Peter S. Clough, Manchester, and Colin N. H. Barker, Stockport, all of England, assignors to British Gas Corporation, United Kingdom

Division of Ser. No. 612,842, May 22, 1984. This application Mar. 25, 1985, Ser. No. 715,453

Claims priority, application United Kingdom, May 23, 1983, 83 14209

Int. Cl.⁴ F16L *55/18*

U.S. Cl. 138—97 **2 Claims**



1. Apparatus for sealing a joint or leak in a fluid-transporting pipeline or main, the apparatus comprising a tubular pig which is movable endwise through the pipeline or main, the pig being hollow to permit fluid to flow therethrough and having an inflatable surface adapted to form with an internal wall of the pipeline or main space which is substantially free of the fluid and which communicates with the joint or leak, an outlet in the surface of the pig, an inlet in the surface of the pig, a reservoir for containing sealant to be supplied to the space to seal the joint or leak, a feed line connecting the reservoir to the outlet in the surface of the pig to feed sealant to the space so formed, a return line connecting the reservoir to the inlet in the surface of the pig to return unused sealant from the space so formed to the reservoir, and means for circulating the sealant between the reservoir and the space by way of the feed and return lines.

4,627,472

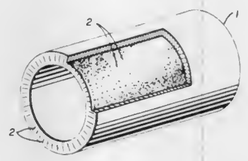
HOSE REINFORCED WITH DISCONTINUOUS FIBERS ORIENTED IN THE RADIAL DIRECTION

Lloyd A. Goettler, and Arthur J. Lambright, both of Akron, Ohio, assignors to Monsanton Company, St. Louis, Mich.

Continuation of Ser. No. 929,486, Jul. 31, 1978, abandoned, which is a continuation of Ser. No. 792,458, Apr. 29, 1977, abandoned. This application Jan. 18, 1980, Ser. No. 113,143

Int. Cl.⁴ F16L *11/08*

U.S. Cl. 138—174 **1 Claim**



1. A hose having the shape of a hollow cylinder with definite wall thickness and outside diameter and indefinite length, which hose has a smooth surface and is constructed of extrudable polymer reinforced with discontinuous fibers wholly contained therein oriented so that the radial component of fiber orientation exceeds both the circumferential component of orientation and the axial component of orientation whereby the hose will swell, upon exposure to an organic solvent capable of swelling said polymer, in such a manner that the percent increase in its wall thickness is less than the percent increase in its outside diameter as a result of said swelling.

4,627,473

POWER LOOM TEMPLE

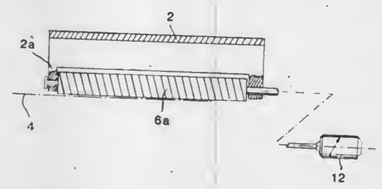
Hubertus Ludwig, Lindau-Bodolz, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,456

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335208

Int. Cl.⁴ D03J *1/22*

U.S. Cl. 139—294 **4 Claims**



1. In a power loom, a pair of temples maintaining the width of a fabric having a pair of edges extending in a lengthwise direction said temples each having a substantially cylindrical rotary retaining member engaging said edge over a predetermined gripping angle and exerting a force in a direction perpendicular to said lengthwise direction, said temples each further having a cover covering said gripping angle and having a respective first and second end facing said fabric, the improvement comprising

a first and second threaded rod respectively arranged at said first and second end, said rods extending in a direction substantially parallel to said retaining member and making contact with said fabric; and

wherein said fabric is transported in said lengthwise direction at a predetermined transport speed relative to said rods so that said rods stretch said fabric in the direction of said width.

4,627,474

YARN STORING, FEEDING AND MEASURING DEVICE

Lars H. G. Tholander, Huskvarna, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

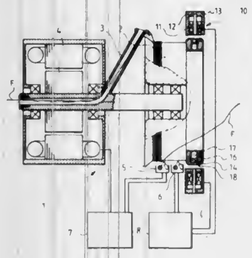
PCT No. PCT/EP83/00254, § 371 Date May 17, 1984, § 102(e) Date May 17, 1984, PCT Pub. No. WO84/01394, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1983, Ser. No. 614,774

Claims priority, application Sweden, Sep. 3, 1982, 8205598; Dec. 10, 1982, 8207096; Sep. 13, 1983, 8304891; Sep. 20, 1983, 8305040; PCT Int'l Appl., Sep. 30, 1983, PCT/EP83/00254

Int. Cl.⁴ D03D *47/36;* **B65H** *51/20*

U.S. Cl. 139—452 **27 Claims**



1. In a yarn storing, feeding and measuring device for jet looms, having a stationary storage drum onto which an intermediate yarn store is wound by a winding-on device and from which the yarn is withdrawn spiralling around a withdrawal end of said storage drum, yarn sensing means arranged such that the yarn periodically passes its detection area during withdrawal from the drum, said yarn sensing means producing a pulse signal each time the yarn passes the detection area of said yarn sensing means, a plurality of independently actuable yarn stopping devices arranged at spaced angular intervals around said storage drum, said yarn stopping devices including yarn stopping elements and actuator means for moving said stopping elements into and out of the path of the yarn being withdrawn, and an actuator control device having means for selecting a desired yarn length to be withdrawn, said control device being responsive to said pulse signals in such a way that an actuating signal is transmitted to a selected yarn stopping device whose angular position corresponds to the angular position of the yarn when the desired yarn length has been withdrawn, the improvement comprising wherein said yarn sensing means includes at least one yarn sensor, the number thereof being less than and independent from the number of said yarn stopping devices, and wherein said control device includes storing means for storing information regarding the yarn stopping device actuated at the end of a previous yarn withdrawal cycle and calculating means for selecting one said yarn stopping device which is to be actuated next on the basis of input information representing said desired yarn length and on the basis of said stored information.

16. Method for controlling a loom having a yarn storing, feeding and measuring device which includes a storage drum on which a yarn is wound, a plurality of stopping devices arranged at spaced angular locations about said drum, and a yarn sensor which generates a signal each time the yarn passes its detection area during withdrawal from said drum, comprising the steps of:

calculating an actuation time on the basis of a desired yarn length, said actuation time defining the period of time between deactuation of one of said stopping devices which was actuated at the end of the immediately preceding withdrawal cycle and actuation of a selected one of said stopping devices which is to be actuated next,

measuring the period of time which has elapsed since deactuating said previously actuated stopping device,

correcting said measured period of time on the basis of the signal generated by said yarn sensor, and

actuating said selected stopping device as soon as said corrected period of time corresponds to said calculated actuation time.

4,627,475

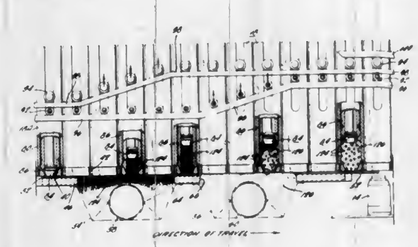
PRODUCT-DISPENSING APPARATUS

Wolf A. von Lersner, Cherry Hill, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Aug. 22, 1985, Ser. No. 768,352

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—107 **5 Claims**



1. Dispensing apparatus for taking a plurality of different component products from respective sources of said component products and for dispensing them as a composite product which is substantially homogeneous with respect to the distribution of said component products within it, comprising:

(a) a cylinder chamber and a plurality of concentric pistons therein, each independently reciprocable in said chamber along the axis thereof;

(b) a plurality of sources of a corresponding number of component products;

(c) motive means for moving one end of said cylinder chamber sequentially into communication with said plurality of sources;

(d) means for retracting said pistons into said cylinder sequentially and in synchronization with said moving of said end of said chamber, whereby each of said component products flows into said chamber in a predetermined amount;

(e) a product dispensing station, and means for moving said one end of said chamber to said product dispensing station, while said pistons remain retracted, thereby to carry said component products to said product dispensing station; and

(f) discharge means for moving all of said pistons outwardly while said chamber is at said dispensing station, to discharge all of said component products together as a composite product.

4,627,476

TONER REFILL CONTAINER

Gerhard Wilcke, Berlin, Fed. Rep. of Germany, assignor to Berolina International Marketing Strategie GmbH, Berlin, Fed. Rep. of Germany

PCT No. PCT/DE83/00216, § 371 Date Aug. 10, 1984, § 102(e) Date Aug. 10, 1984

PCT Filed Dec. 21, 1983, Ser. No. 642,677

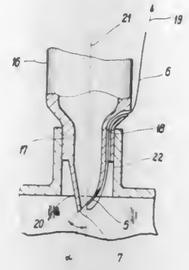
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247965

Int. Cl.⁴ B65D *47/10;* **G03G** *15/08*

U.S. Cl. 141—364 **1 Claim**

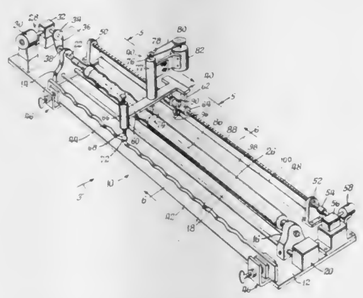
1. A toner refill container for a copying or printing device which has a toner reservoir including a filler neck defining an inlet into said reservoir, said toner refill container comprising a nozzle for insertion into said inlet port and a coupling ring, said coupling ring adapted to be secured to said filler neck when said nozzle is inserted into said inlet port, said coupling ring at

least partially surrounding said nozzle, said coupling ring defining a guide channel therein, a foil sealing an opening of said nozzle, a cord attached to said foil, said cord being received in said guide channel in said coupling ring and extending from said filler neck so that said foil may be removed from said



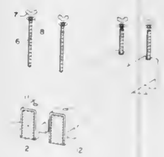
nozzle by pulling said cord from outside of said filler neck, a nozzle edge bordering the opening of the nozzle having a slope to the longitudinal axis of the nozzle, and said cord being attached to the lower edge of said foil and extending thereacross when the container is inverted in said filler neck.

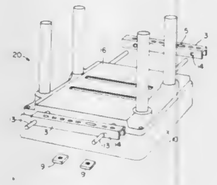
4,627,477
LATHE, DUPLICATING
Mahlon Wise, 1709 S. Pulaski, South Bend, Ind. 46613
Filed Nov. 5, 1984, Ser. No. 668,333
Int. Cl.[4] B23B *3/28;* B23Q *35/10*
U.S. Cl. 142—7 **5 Claims**



1. A woodworking duplicating lathe comprising,
a base,
a headstock and a tailstock on the base operable for supporting a workpiece for rotation on a longitudinal axis located generally centrally, transversely, of the base,
a variable speed motor operatively connected to said headstock for rotating the workpiece,
a rotatable threaded rod at one side of the base and parallel with said longitudinal axis,
a variable speed motor operatively connected to said threaded rod for rotating the threaded rod,
a template mounted on the base on the side thereof opposite the threaded rod and extending essentially parallel with said longitudinal axis,
a carriage extending transversely of the base above the workpiece, mounted at one end on the threaded rod and movable by the threaded rod in the direction of said longitudinal axis of the workpiece, and swingable on the threaded rod about the axis of the threaded rod, and having a template follower on its other end,
a rotatable cutter bit in the carriage at a generally central position thereof,
a variable speed motor on said carriage for rotating the cutter bit,
the carriage being swingable between a lower operating position in which the template follower engages the template and the cutter bit engages the workpiece, and an upper inactive position in which the workpiece is exposed to access,
means supporting the threaded rod between the ends of the latter, and movable therealong in response to rotation of the threaded rod, and
rail means on the bed engageable by said supporting means, and providing bearing support for the supporting means.

4,627,478
ATTACHMENT FOR A STANDARD POWER PLANER TABLE
John E. Gamble, 10 Annette Ave., Smithtown, L.I., N.Y. 11788
Filed Jan. 31, 1985, Ser. No. 697,075
Int. Cl.[4] B25H *1/00*
U.S. Cl. 144—287 **1 Claim**

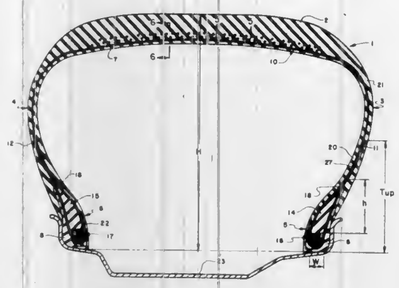




1. In a power planer having a planer table to support board lumber having two pair of parallel extending handles in a plane parallel to and below the upper surface of said table, the improvement comprising a pair of parallel extending rails straddling said handles on opposite sites of said planer table, each of said rails having an upper surface with a plurality of spaced openings therethrough, a pair of parallel extending guides mounted at the ends thereof on said rails to span the upper surface of said planer table, each of said guides being notched at each end to fit over and accommodate a rail passing through each notch, a threaded member for each end of said guide to pass through each guide and engage a threaded nut plate under a spaced opening in each rail, and a wing nut for each threaded member to lock each said guide to said rails, thereby securing said guides in place on said planer table, said guides having sufficient height and being properly spaced by the selection of spaced openings in said rails to support a board lumber upright with an edge exposed to permit planing thereof.

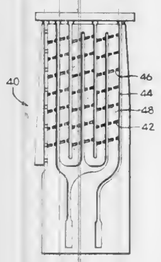
4,627,479
TIRE CONSTRUCTION UTILIZING LOW-TWIST BODY PLY YARN WITH HIGH TURN-UP ENDS
Louis W. Shurman, Canton, and Thomas W. Bell, Mogadore, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Nov. 27, 1984, Ser. No. 675,260
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **9 Claims**

1. An improved pneumatic tire of the type having a tread portion, a pair of side wall portions, a pair of bead portions located below the side wall portions which include an annular bead core and a generally triangular-shaped bead filler, and a body ply structure extending circumferentially about the tire and being turned-up around the bead portions from the inside to the outside and terminating in a pair of turn-up end portions adjacent the bead filler, said improvement being characterized by:
(a) the body ply being formed of a low twist yarn having between 2 and 5 turns-per-inch;



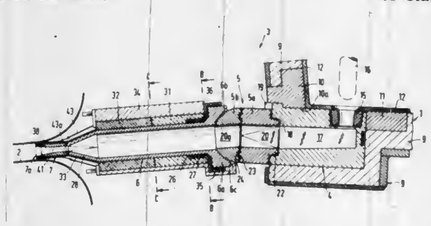
(b) the turn-up end portions extending along the side wall portions a distance of between 35% and 65% of the tire section height;
(c) the bead filler consisting of a high hardness rubber having a Shore A hardness of between 75 and 98, a height of between 20% and 50% of the tire section height, and a maximum base width of between 5% and 25% of the bead filler height; and
(d) said side wall portions between the tread portion and bead portion being free of any additional textile or metal reinforcement except that provided by the body ply structure.

4,627,480
ANGLED TURBULENCE PROMOTER
Ching-Pang Lee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 549,219, Nov. 7, 1983, Pat. No. 4,514,144, which is a continuation-in-part of Ser. No. 506,156, Jun. 20, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 696,623
Int. Cl.[4] B22C *9/10*
U.S. Cl. 164—369 **4 Claims**



1. A ceramic core for use in the casting of a hollow turbine blade comprising at least one passage core portion with first and second opposite surfaces, wherein:
a plurality of first grooves are disposed on said first surface at a first angle with respect to the center line of said first surface; and
a plurality of second grooves are disposed on said second surface at a second angle with respect to the center line of said second surface; said first angle being less than 90° and said second angle being greater than 90°.

4,627,481
REFRACTORY CONDUIT ASSEMBLY FOR SUPPLYING MOLTEN STEEL FROM A DISCHARGE VESSEL TO AN INGOT MOLD
Laurenz Keisers, Krefeld; Gerd Artz, Ratingen; Dieter Figge, Essen; Clemens Philipp, Meerbusch, and Hans Siemer, Essen, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany
Filed Jul. 31, 1984, Ser. No. 636,241
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328586
Int. Cl.[4] B22D *11/10*
U.S. Cl. 164—440 **46 Claims**



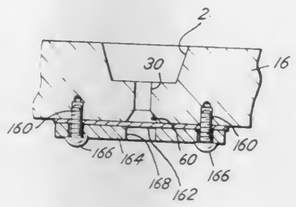
1. A refractory conduit assembly, particularly for the transfer of molten steel from a discharge vessel to an ingot mold of a horizontal continuous casting plant having revolving ingot mold walls in the form of endless belts, said assembly comprising:
a replaceable spout member adapted to be removably connected at a predetermined location to a vessel, said spout member having therethrough a discharge channel of rectangular cross section to receive from the interior of the vessel a flow of molten steel and to lead such flow to the exterior of the vessel, said spout member comprising a prefabricated wedge-shaped element adapted to be built into a lining of the vessel and to be accessible from the outer surface thereof, and means for locating said spout member in said predetermined location in the vessel lining;
shut off means for interrupting the flow to said discharge channel, said shut off means including an outlet member embedded in said spout member and having therethrough a discharge opening joining said discharge channel and adapted to be blocked by a stopper;
a casting tube located at a position outside of the vessel, said casting tube having therethrough a flow passage with inlet and outlet ends;
a coupling means for connecting said inlet said end of said flow passage to said discharge channel, such that the flow of molten steel passes through said casting tube, said coupling means located at a position outside of the vessel;
said outlet end of said flow passage having a cross-sectional configuration different from that of said inlet end thereof and adapted to that of an ingot mold to which the flow of molten steel is to be supplied; and
a nozzle having an inlet end connected to said casting tube and an outlet end having thereat means for sealingly contacting walls of the ingot mold, said nozzle having therethrough a flow channel to pass the flow of molten steel from said casting tube to the ingot mold.

4,627,482

ARC-FURNACE FOR THE PRODUCTION OF SMALL INVESTMENT CASTINGS OF REACTIVE OR REFRACTORY METALS SUCH AS TITANIUM

Richard M. Waterstrat, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Continuation of Ser. No. 258,673, Apr. 29, 1981, abandoned.
This application Feb. 5, 1985, Ser. No. 698,268
Int. Cl.[4] B22D *23/00*
U.S. Cl. 164—514 **3 Claims**



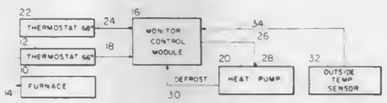
1. An improved arc furnace and investment casting apparatus capable of melting and casting small quantities of reactive or refractory metals such as titanium comprising, in combination:
(a) an arc furnace, vacuum sealed melting chamber for maintaining an inert gas atmosphere including a readily removable internally cooled inert material bottom enclosure wall as an anode, a metal crucible integrally defined in the internally cooled inert bottom wall, said crucible positioned substantially at the middle of the bottom wall;
(b) a non-consumable cathode projecting into the melting chamber over the metal crucible;
(c) means for providing power to the cathode and the anode to melt the crucible contents;
(d) a passage through the bottom wall from the metal crucible;
(e) a vacuum sealed casting chamber, for maintaining a vacuum, suspended from the bottom wall beneath the crucible passage, said casting chamber including a removable bottom cover for access to the interior of the casting chamber;
(f) a removable hot mold assemby within the casting chamber including an opening to the mold position below the crucible passage;
(g) a meltable vacuum sealing foil valve in the casting chamber at the bottom of the crucible passage;
(h) means for evacuating each chamber; and
(i) means for purging each chamber with inert gas.

4,627,483

HEAT PUMP CONTROL SYSTEM

John H. Harshbarger, III, and John H. Harshbarger, Jr., both of Xenia, Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Jan. 9, 1984, Ser. No. 569,218
Int. Cl.[4] F25B *13/00, 29/00*
U.S. Cl. 165—2 **39 Claims**



32. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperatures in the interior space sensed by the thermostat, said method comprising: sensing when the supplemental heat source is operating during a cyclically recurring time interval, and disabling the heat pump when the supplemental heat source is operating for a predetermined portion of the cyclically recurring time interval.

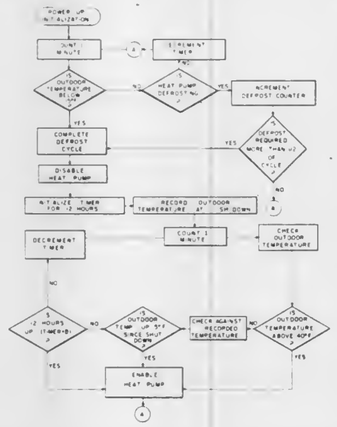
39. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperature sensed by the thermostat, said method comprising: sensing when the supplemental heat source is operating simultaneously with the heat pump during a cyclically recurring time interval, and disabling the heat pump when simultaneous heat pump and supplemental heat source operation occurs for a predetermined portion of the cyclically recurring time interval.

4,627,484

HEAT PUMP CONTROL SYSTEM WITH DEFROST CYCLE MONITORING

John H. Harshbarger, Jr., and John H. Harshbarger, III, both of Xenia, Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Jan. 9, 1984, Ser. No. 569,258
Int. Cl.[4] F25B *13/00, 29/00*
U.S. Cl. 165—2 **28 Claims**



23. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperature sensed by the thermostat, said method comprising: sensing when the heat pump is in a defrost cycle, calculating a value representing the portion of its cyclically recurring heating cycle during which the heat pump is in its defrost cycle, and disabling the heat pump when the defrost portion value exceeds a predetermined value representative of a given percentage of a given cyclically recurring heating cycle.

4,627,485

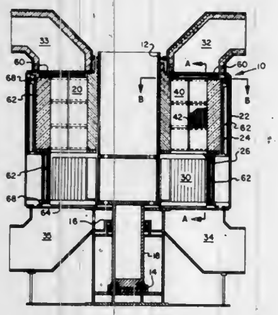
ROTARY REGENERATIVE HEAT EXCHANGER FOR HIGH TEMPERATURE APPLICATIONS

Henry H. Osborn, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Oct. 23, 1984, Ser. No. 664,124
Int. Cl.[4] F28D *19/04*
U.S. Cl. 165—8 **2 Claims**

1. A rotary regenerative heat exchanger comprising:
a. A vertical rotor post adapted for rotation about a vertical axis;

b. a lower rotor mounted concentrically about and supported from a lower region of said vertical rotor post, said lower rotor adapted to house a mass of metallic heat absorbent element;
c. an upper rotor, mounted concentrically about and supported from an upper region of sAid vertical rotor post, said upper rotor disposed axially above said lower rotor, said upper rotor adapted to house a mass of ceramic heat absorbent element comprised of a plurality of substantially trapezoidal shaped ceramic blosks disposed in at least two layers about said rotor post, each of said ceramic blocks having a plurality of axially aligned flow channels extending therethrough and having a pair of side plates disposed along opposite sides thereof adapted to interlock with a neighboring block in an adjacent layer of said upper rotor;



d. housing means surrounding the upper and lower rotors add including inlet and outlet openings at each end thereof, said housing means defining a first flow passage for passing heating fluid therethough from an inlet at the upper end thereof to an outlet at the lower end thereof and a second flow passage for passing a fluid to be heated therethrough from an inlet at the lower end thereof to an outlet at the upper end thereof, whereby heat will be transferred from the heating fluid to said ceramic and metallic heat absorbent element as the upper and lower rotors rotate through the first flow passage and thence from said ceramic and metallic heat absorbent element to the fluid to be heated as the upper and lower rotors rotate through the second flow passage; and
e. bearing means disposed at the lower end of said rotor post for supporting said rotor post for rotation about its vertical axis and for precluding lateral movement thereof.

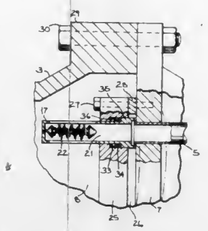
4,627,486

CORRECTION FOR TUBE SHEET MISALIGNMENT IN HEAT EXCHANGERS HAVING TUBE CLEANING ARRANGEMENTS THEREIN

Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed May 28, 1985, Ser. No. 738,430
Int. Cl.[4] F28G *1/12*
U.S. Cl. 165—81 **9 Claims**

1. In combination in a heat exchanger having a hosing (2) with end head elements (3, 4), and having a plurality of longitudinally extending fluid flow tubes (5) disposed within said housing, and having tube sheet elements (6, 7) disposed within said housing and with said tube sheet elements having openings in communication with the ends of said tubes, and further having longitudinally extending basket elements (17) positioned for receiving shuttling tube cleaning devices (22) from said tubes:
(a) a retaining late (25) disposed longitudinally outwardly of and generally parallel to a said tube sheet element (7) and with said basket elements (17) extending through said retaining plate (25) and being mounted for free sliding movement relative thereto in operative position,
(b) and longitudinally compressible means (36, 45–48) disposed between said retaining plate (25) and at least one of



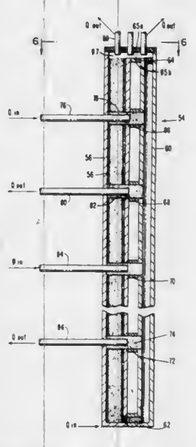
said elements (17, 3, 7) to compensate for misalignment of a said tube sheet element (7) relative to the heat exchanger housing by individually positioning said basket elements (17) in proper sealing relationship with said tube sheet elements (6, 7).

4,627,487

SEPARATE LIQUID FLOW HEAT PIPE SYSTEM

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1983, Ser. No. 562,916
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.26 **6 Claims**



1. A heat pipe system comprising:
an elongated heat pipe vapor tube extending in the direction of desired heat transfer, said vapor tube being at least partially lined with a heat pipe liquid wicking material;
a liquid return tube, said return tube being subcooled and substantially without heat pipe liquid wicking material therein;
a first connector between said liquid return tube and said vapor tube adjacent the first end thereof;
a second connector between said liquid return tube and said vapor tube adjacent the second end thereof;
at least one connector between said liquid return tube and said vapor tube between said first and second ends thereof;
heat pipe liquid wicking material filling all of said connectors so as to pass liquid to and from said liquid return tube so that said tubes are connected only through said wicking material; and
a thermal connection connected to said wicking material in

said intermediate connector so that heat exchange takes place within said system intermediate the ends thereof.

4,627,488

ISOLATION GRAVEL PACKER

David D. Szarka, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 20, 1985, Ser. No. 703,630
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—51 **19 Claims**



1. A well treatment apparatus comprising:
a housing means;
a stinger receptacle disposed in said housing means, said stinger receptacle including:
an open upper end; and
an inner cylindrical seal bore for sealingly receiving a concentric inner tubing string means for delivering a treatment fluid;
treatment fluid passage means disposed laterally through said housing means for communicating an interior of said stinger receptacle at an elevation below said seal bore with a well zone to be treated;
first and second external seal means, disposed on an exterior of said housing means above and below said treatment fluid passage means, respectively, for sealing between said housing means and a liner bore; and
bypass means, disposed in said housing means, for bypassing well fluid around said first and second external seal means as said apparatus is moved longitudinally within a well.

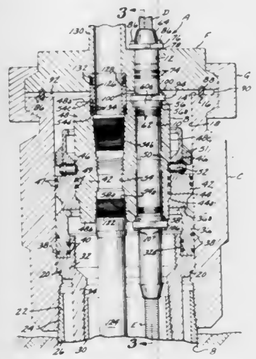
17. A method of treating a well, said method comprising the steps of:
(a) making up on a lower end of an outer tubing string a tool string including a well treatment apparatus, said well treatment apparatus including a stinger receptacle, a treatment fluid passage means for communicating said stinger receptacle with a well zone to be treated, and a return fluid passage means isolated from said treatment fluid passage means and communicated with an inner bore of said outer tubing string;
(b) lowering said outer tubing string into said well until said well treatment apparatus is appropriately located for treatment of said well zone;
(c) lowering a concentric inner tubing string into said outer tubing string;
(d) stabbing a lower stinger of said concentric inner tubing string into said stinger receptacle;
(e) flowing well treatment fluid from a surface location down through said concentric inner tubing string, then through said treatment fluid passage means to said well zone; and
(f) during step (e), flowing a return fluid from said well zone upward through said return fluid passage means of said well treatment apparatus, then up through an annulus between said outer tubing string and said concentric inner tubing string to said surface location.

4,627,489

TOP ENTRY ELECTRICAL TRANSMISSION SAFETY ASSEMBLY FOR SUBMERSIBLE PUMPING

Lehman T. Reed, Bakersfield, Calif., assignor to Midway Fishing Tool Co., Long Beach, Calif.

Filed Nov. 13, 1984, Ser. No. 671,114
Int. Cl.[4] E21B *33/03*
U.S. Cl. 166—65.1 **8 Claims**



1. In a well head that removably supports a tubing hanger having upper and lower end surfaces in the interior thereof and from which tubing hanger a tubing string depends downwardly in a bore hole to an electrically operated submersible pump that has an electric power receiving cable extending upwardly therefrom in said bore hole to terminate in a first end at a position adjacent said lower end surface of said tubing hanger; a bonnet removably mounted on said well head; a source of electric power; an electric power supply cable that has first and second ends, said first end removably connected to said source of electric power, the combination with said well head of a top entry electrical transmission safety assembly of multiple part structure that is mounted in first and second aligned vertical bores in said tubing hanger and bonnet for supplying electric power to said electric power receiving cable from said electric power supply cable and that may have the portion thereof that extends through said second bore separated from the balance thereof for inspection and maintenance without removing said tubing hanger from said well head but only after said electric power supply cable has been disconnected from said source of electric power and said bonnet separated from said well head to prevent the possibility of sparking and arcing between the portions of said electrical transmission safety assembly in a potentially hazardous zone containing hydrocarbon fumes, said top entry electrical transmission safety assembly including:
a. an elongate electric power receiving element secured to said first end of said power receiving cable that extends upwardly in said first bore to terminate in an upper end and a plurality of transversely spaced, metallic, elongate engageable electrical conducting means on said upper end;
b. first means for securing said electric power receiving element in said tubing hanger to dispose said upper end in a predetermined intermediate position in said first bore between said upper and lower end surfaces of said tubing hanger;

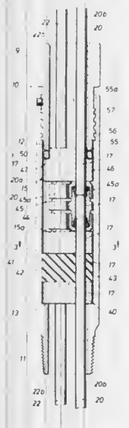
c. an elongate electric power supply element secured to said second end of said electric power supply cable that is removably mounted in said first bore, said electric power supply element including a lower end that has a plurality of elongate, electrical conducting metallic engaging means projecting therefrom that slidably engage said engageable means, said electric power supply element of sufficient length as to project upwardly through said second bore to a position above said bonnet when the latter is mounted on said well head after said electric power supply cable has been threaded through said second bore;
d. second means for removably securing said electric power supply element to said tubing hanger when said second means is in a first position, with said second means incapable of being moved to a second position to permit said electric power supply element to be removed from said tubing hanger when said bonnet is mounted on said well head; and
e. third means for removably securing said bonnet to said well head, with said electric power receiving cable receiving electric power when said first end of said electric power supply cable is connected to said source of electric power, with said electric power supply element incapable of being inadvertently separated from said electric power receiving element to cause sparking in a potentially hazardous zone containing hydrocarbon fumes due to said separation capable of being carried out until after said third means has been released from engagement with said bonnet and well head, said first end of said electric power supply cable has been disconnected from said source of electric power, said bonnet separated from said well head, said electric power supply cable drawn through said second bore to separate it from said bonnet, and said second means moved to said second position to permit said electric power supply element to be withdrawn from said first bore and uncoupled from said electric power receiving element.

4,627,490

WELL BORE BARRIER PENETRATOR ARRANGEMENT AND METHOD FOR MULTIPLE CONDUCTOR PUMP POWER CABLE

Boyd B. Moore, 427 Mignon, Houston, Tex. 77024

Filed Jan. 15, 1985, Ser. No. 691,558
Int. Cl.[4] E21B *33/10, 17/043*
U.S. Cl. 166—65.1 **15 Claims**



1. In a wellhead apparatus including a wellhead, the combination of:
hanger means supported on the wellhead;
means in said hanger for supporting a production tubing with an electric pump thereon in the well;
said hanger and wellhead having an opening for multiple conductor power cable to extend to the pump in the well;
housing means for connecting with the opening in the wellhead;
support means in said housing having a plurality of openings for receiving in each opening an individual conductor of the multiple conductor power cable;
said support means including:
engaging means in said housing means for engaging the individual conductors to restrain them against longitudinal movement relative to said housing means;
seal means in said housing for sealingly engaging with the individual conductors; and
positioning means movable relative to said housing means to secure said engaging means against longitudinal movement relative to said housing means and to compress said seal means into sealing engagement with each of the multiple conductors.

4,627,491

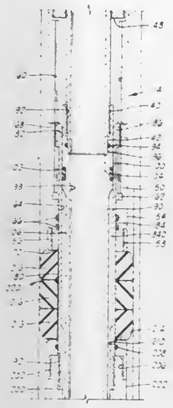
WELL PACKER

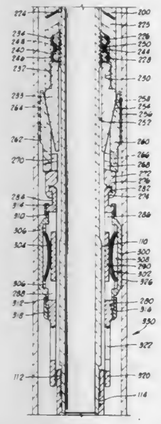
Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,109
Int. Cl.[4] E21B *33/28*
U.S. Cl. 166—126 **8 Claims**

1. A pack-off device for use in a wellbore, comprising:
a tubular mandrel;
an upper slip assembly slidably disposed on said mandrel;
biasing means acting in a downward direction on said upper slip assembly;
bypass seal means disposed about the exterior of said mandrel on a raised annular shoulder below said upper slip assembly;
ratchet teeth on said mandrel below said bypass seal means;
at least one J-slot lug radially extending from said mandrel below said ratchet teeth; and
a housing assembly disposed about said mandrel in slidable relationship thereto, said housing assembly including;
an upper slip wedge collar;
an upper bypass case secured to said upper slip wedge collar;
a packer saddle extending upwardly inside said upper bypass case in telescoping longitudinally slidable, non-rotatable relationship thereto;
packer element means disposed on said packer saddle;
a lower bypass case secured to said packer saddle;
a lower slip wedge collar secured to said lower bypass case and defining a ratchet dog annulus therewith and with said mandrel;
a plurality of inwardly-biased ratchet dogs disposed in said ratchet dog annulus and having teeth on their radially inward surfaces adapted to mate with said mandrel ratchet teeth;
a plurality of circumferentially disposed lower slips slidably secured to said lower slip wedge collar;
a drag block assembly secured to said plurality of slips, said drag block assembly including a plurality of outwardly biased drag blocks thereon and at least one J-slot therein adapted to cooperate with said at least one J-slot lug extending from said mandrel; and
a closeable bypass passage between said housing assembly and said mandrel extending between upper bypass ports in said upper bypass case and lower bypass ports in said lower bypass case through an annular channel defined between said mandrel below said bypass seal means and the interior of said packer saddle, said bypass passage

being closeable through longitudinal movement of said mandrel with respect to said packer saddle, whereby said





bypass seal means carried on said mandrel sealingly engages the interior of said packer saddle.

4,627,492

WELL TOOL HAVING LATCHING MECHANISM AND METHOD OF UTILIZING THE SAME

Scott T. MacLaughlin, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 25, 1985, Ser. No. 780,070
Int. Cl.[4] E21B *34/12, 43/12*
U.S. Cl. 166—250 **13 Claims**

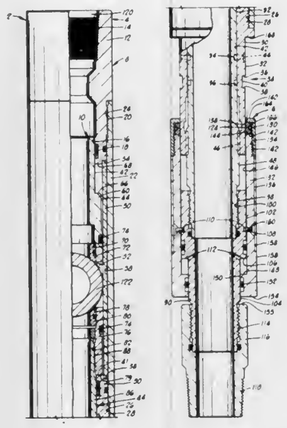
1. A tester tool for controlling fluid flow through a pipe string disposed in a well comprising:

a first valve housing portion having a first engagement shoulder defined therein;

a second valve housing portion having a second engagement shoulder defined therein, said second valve housing portion slidably connected with said first valve housing portion;

a valve member movably retained within said first and second housing portions; and

latch means, slidably disposed adjacent said first and second housing portions, for moving, in response to an applied pressure, between an unlatched position, wherein said first and second housing portions can move relative to each other, and a latched position, wherein said first and second housing portions are latched to prevent relative movement, said latch means having third and fourth engagement shoulders defined therein for engaging said first and second engagement shoulders when said latch means is moved by the applied pressure to said latched position, wherein said latch means includes:



a slide member having a surface defining said fourth engagement shoulder;

a locking dog having a surface defining said third engagement shoulder; and

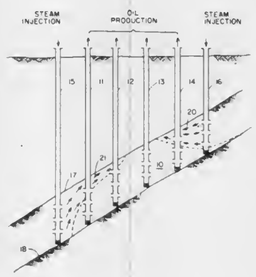
retainer means for retaining said locking dog with said slide member so that said locking dog is moved by said slide member.

4,627,493

STEAMFLOOD RECOVERY METHOD FOR AN OIL-BEARING RESERVOIR IN A DIPPING SUBTERRANEAN FORMATION

Bassem R. Alameddine, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,556
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—263 **9 Claims**



1. A method for enhancing the rate of oil production from an oil-bearing reservoir within a dipping subterranean formation, comprising the steps of:

(a) penetrating said dipping formation with a plurality of production wells,

(b) injecting steam into said dipping formation above the upper-most one of said production wells to heat the oil-bearing reservoir within said formation, and

(c) co-injecting steam into said dipping formation below the lower-most one of said production wells, the injection of steam above the upper-most production well exhibiting a gas cap effect on the oil-bearing reservoir and the injection of steam below the lower-most production well exhibiting a fluid drive with an override effect on the oil-bearing reservoir, thereby increasing the growth rate of steam surrounding said reservoir and accelerating the rate of heat communication to said reservoir.

4,627,494

METHOD OF USING A LIGNOSULFONATE/CARBOHYDRATE SYSTEM AS A SACRIFICIAL AGENT FOR SURFACTANT FLOODING

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,990
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **16 Claims**

1. A method of recovering hydrocarbons from a subterranean hydrocarbon formation which is penetrated by at least one injection well and at least one production well wherein chemicals are injected into the formation to sweep oil through the formation to at least one production well, which comprises:

injecting into the formation a solution containing about 0.1% to about 10% by weight of a mixture of at least two sacrificial agents designed to prevent the loss to the formation of said injected chemicals,

said mixture of at least two sacrificial agents comprised of one sacrificial agent which is a lignosulfonate and a second sacrificial agent selected from the group consisting of alkoxylated starch, esterified starch, oxidized starch, phosphated starch, alkoxylated cellulose, carboxyalkyl cellulose, carboxyalkylalkoxylated cellulose, alkylalkoxylated cellulose, cellulose sulfates, and cellulose acetate sulfates.

4,627,495

METHOD FOR STIMULATION OF WELLS WITH CARBON DIOXIDE OR NITROGEN BASED FLUIDS CONTAINING HIGH PROPPANT CONCENTRATIONS

Phillip C. Harris; Vincent G. Reidenbach, both of Duncan, Okla., and Pat T. Chisholm, Portland, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 4, 1985, Ser. No. 719,669
Int. Cl.[4] E21B *43/267*
U.S. Cl. 166—280 **32 Claims**

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing an aqueous liquid containing varying quantities of a proppant material and a gelling agent with liquid carbon dioxide and a surfactant which is present in an amount sufficient to form an emulsion, said emulsion having an internal phase ratio of from about 50 to in excess of about 96 percent;

adjusting the volume of carbon dioxide admixed with said aqueous liquid to at least substantially maintain said internal phase ratio constant as the quantity of said proppant is varied whereby the viscosity of said emulsion is caused to remain substantially unchanged as the quantity of said proppant varies;

introducing said emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid and cause a fracture to be formed in said subterranean formation;

maintaining said emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion; and

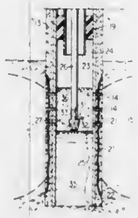
depositing at least a portion of said proppant material in said subterranean formation with said foam.

4,627,496

SQUEEZE CEMENT METHOD USING COILED TUBING

James D. Ashford; Terry W. Harrison; James K. Eastlack, all of Anchorage; Curtis G. Blount, Wasilla; Gary D. Herring, Anchorage, all of Ak., and David R. Underdown, Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 29, 1985, Ser. No. 760,259
Int. Cl.[4] E21B *31/13*
U.S. Cl. 166—292 **21 Claims**



8. A method of squeeze cementing a well wherein said well has a casing throughout the wellbore, casing cement between said casing and the wellbore of said well, perforations through said casing and said casing cement to establish fluid communication between the interior of said casing and a formation adjacent said perforations, channels in said casing cement in fluid communication with at least some of said perforations, a well tubing string in said casing extending from the surface to the proximity of said perforations, and a packer means for sealing between said tubing and said casing above said perforations, said method comprising:

isolating said casing adjacent said perforations;

lowering a coiled tubing down said well tubing string to a point adjacent said peforations;

flowing uncontaminated squeeze cement through said coiled tubing and through said perforations into said channels;

flowing a cement contaminating liquid down said coiled tubing to mix with the squeeze cement remaining in said casing;

allowing said uncontaminated squeeze cement in said channels to harden; and

removing said contaminated squeeze cement from said casing through said coiled tubing.

4,627,497

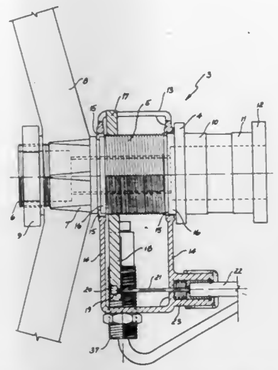
STOP VALVE ALARM FOR SPRINKLER SYSTEM

Barry F. Byrne, Killarney Heights, Australia, assignor to Wormald International Ltd., New South Wales, Australia

Continuation of Ser. No. 470,985, Mar. 1, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 837,337
Claims priority, application Australia, Mar. 5, 1982, PF2996
Int. Cl.[4] G08B *21/00*
U.S. Cl. 169—23 **2 Claims**

1. A supervisory alarm accessory for a fire sprinkler stop valve of the type including a rotatable valve actuator driving a valve spindle, said accessory comprising an adaptor sleeve connectable between said actuator and said spindle to rotate with said actuator and said adaptor sleeve having an externally threaded part, a fixed housing supported on said sleeve to permit relative rotation of said sleeve and enclosing said threaded part, a follower threadably engaged with said threaded part and keyed to said housing, said follower being linearly displaceable without rotation with respect to said housing with rotation of said sleeve, an alarm generator, and

activating means supported on said housing and providing an activating connection between said alarm generator and said follower to initiate an alarm with predetermined displacement of said follower with respect to said housing.



4,627,498

FUSE DESIGN FOR FIRE LIMITERS OR OTHER SAFETY APPLIANCES IN VENTILATION INSTALLATIONS

Erkki Aalto, Kausala; Harri Saukkonen, Kouvola, and Juhani Häsä, Kausala, all of Finland, assignors to Halton Oy, Finland

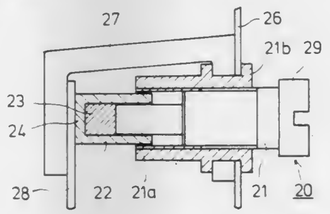
PCT No. PCT/FI83/00069, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/01906, PCT Pub. Date May 24, 1984

PCT Filed Nov. 11, 1983, Ser. No. 629,831

Claims priority, application Finland, Nov. 12, 1982, 823899

Int. Cl.[4] E05F *1/00*

U.S. Cl. 169—42 **11 Claims**



1. A fuse arrangement, comprising

a first part,

a second part,

said first part being constituted by a sleeve-like member disposed about said second part, and

fusible material disposed between said first and second parts and normally maintaining said parts in fixed position with respect to one another when said fusible material is in solid form,

a narrow path being defined in one of said first part, said second part, between said parts, or in said fusible material itself, for flow of said fusible material in molten form, and

mens for urging said first and second parts towards one another, said urging means comprising a fire damper comprising

an outer shell, said second part being secured into said outer shell, and

a clamping arc abutting against said first sleeve-like member,

whereby said parts are caused to move towards one another by said urging means when said fusible material melts and flows through said narrow path,

said parts stop moving when said fusible material stops flowing, and

said parts are again maintained in a new fixed position with respect to one another when said fusible material resolidifies and said fire damper being reclamped by tightening said second part in said shell after said fusible material has resolidified.

4,627,499

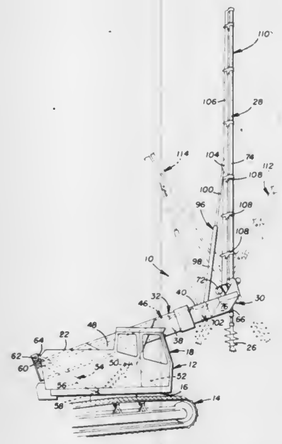
MOBILE DRILLING MACHINE

William E. Magee, 155 Shevlin Rd., Novato, Calif. 94947; Michael Geister, 64 Rock Rd., Kentfield, Calif. 94914, and John N. Dillenburg, Jr., 1249 Leafwood Heights, Novato, Calif. 94947

Filed Apr. 27, 1984, Ser. No. 604,746

Int. Cl.[4] E21B *15/04*

U.S. Cl. 173—43 **9 Claims**



1. A heavy duty, mobile drilling machine, comprising

a vehicle with a rotatable turntable, housing means for an operator station and other vehicle components mounted on said turntable and including a boom disposed thereon,

said boom comprising a telescoping portion,

bracket means providing a pivotal mounting for said boom on a forward portion of said turntable,

motor means for pivotally operating said boom, said motor means being interconnected between said boom rearwardly of said pivotal mounting and said turntable, and

an elongated drill implement pivotally interconnected to a forward end of said boom telescoping portion permitting movement of said drill implement into an erect position on said boom, said drill implement being mounted on said forward end of said boom by relatively transverse pivot means for facilitating 360° adjustment of said drill element on said boom and said boom being pivotal on said turntable by said motor means for facilitating operation of said drill implement, said drill implement also being movable into a transport position generally parallel with said boom to facilitate transport without disassembly, the arrangement of said motor means and pivotal mounting for said boom and the arrangement of said boom permitting maximum elevation and lowering of said drill implement on said boom, said telescoping portion of said boom further comprises means within said telescoping portion adapted for receiving ballast in order to selectively increase effective mass of said drill implement during operation.

4,627,500

COAL-COMPACTING POWER-HAMMER ROD ACTIVATOR

Heinz Stegmann, Fischbach, Fed. Rep. of Germany, assignor to Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH, Saarbrucken, Fed. Rep. of Germany

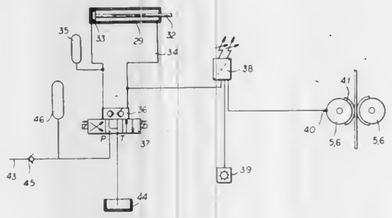
PCT No. PCT/DE82/00136, § 371 Date Feb. 24, 1983, § 102(e) Date Feb. 24, 1983, PCT Pub. No. WO83/00160, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 1, 1982, Ser. No. 474,634

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125840

Int. Cl.[4] C10R *45/02*

U.S. Cl. 173—53 **7 Claims**



1. A coke compactor comprising:

a plurality of power hammers adapted to be raised and dropped to compact coke, each of said hammers being provided with an upstanding rod having a web;

a respective actuator for each of said hammers, each of said actuators comprising:

a pair of cams flanking a web of a respective rod of the respective hammer and bearing against said web, said cams being formed along their periphery with surfaces frictionally entraining the respective web upwardly and surfaces which release the respective web to permit the respective hammer to drop,

respective levers flanking the respective rod rotably carrying said cams, said levers being formed with mutually meshing gear segments whereby the displacement of one lever about a fulcrum constituting an axis of one gear segment causes the other lever to swing oppositely and synchronously for controlled application of said cams against the respective web,

a respective fluid-operated cylinder operatively connected to one of said levers for controlling the force with which said cams are applied against the respective web, and

respective pinions operatively connected to said cams; and

a common drive for all of said actuators, said drive including a gear train meshing with said pinions.

4,627,501

BORER HEAD WITH PLANETARY GEARING

Wolfgang Ebeling, Hanover, Fed. Rep. of Germany, assignor to Turmag-Turbo-Maschinen-Aktiengesellschaft Nuesse & Graefer, Sprockhoevel, Fed. Rep. of Germany

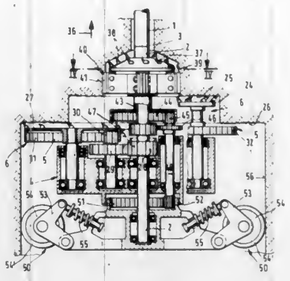
Filed Feb. 22, 1985, Ser. No. 704,291

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406855; Dec. 13, 1984, 3445492

Int. Cl.[4] E21B *10/12, 10/28*

U.S. Cl. 175—319 **27 Claims**

1. A borer head for drilling boreholes in rock structures, comprising a central shaft (**2**); a single drill pipe (**1**) coupled to the central shaft; at least one tool holder (**4**) carrying cutters thereon; a planetary gearing (**28**, **29**, **30**, **31**, **32**) driving, coupling and rotating said tool holder with said central shaft; and a supporting device (**40**) operated to press against a cylindrical wall of a borehole being drilled and including a plurality of supporting elements (**41**, **54**, **59**, **74**) radially symmetrically positioned on the supporting device in respect to said central shaft, said supporting device being coupled by a gearing (**44**, **45**, **46**, **47**) to said central shaft, on the one hand, and to said tool holder, on the other hand, so that said tool holder is driven to a slow rotation about said central shaft.



4,627,502

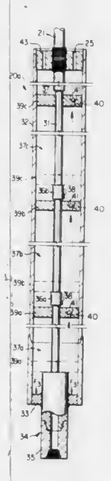
LIQUID-FILLED COLLAR FOR TOOL STRING

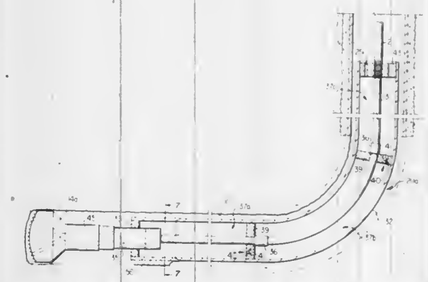
Newton B. Dismukes, 2952 Buttonwood Dr., Carrollton, Tex. 75006

Filed Jul. 18, 1985, Ser. No. 756,785

Int. Cl.[4] E21B *17/16*

U.S. Cl. 175—320 **26 Claims**





1. A collar adapted to be connected to the nether end of a tool string which, in turn , is to be used in a wellbore filled with a wellbore liquid; said collar comprising:

a body having a long longitudinal annulus extending throughout thereof and being closed at its lower end;

a dense liquid filling at least a portion of said annulus, said dense liquid having a density greater than that of said wellbore liquid; the head of said dense liquid adapted to apply a force onto said lower end closure of said annulus when said collar is in an operable position in a wellbore; and

means for fluid communication between the upper end of said annulus above said dense liquid and said wellbore fluid when said collar is in an operable postion within said wellbore.

22. A fluid continuum means for transmitting a useful portion of the weight of a dense liquid from a substantially vertical wellbore to a substantially horizontal section of said wellbore, said wellbore being filled with a wellbore liquid, said means comprising:

a conduit, said conduit having a closure at the bottom thereof and in fluid communication with said wellbore liquid at the top thereof;

a volume of dense liquid inside said conduit, said dense liquid having a density greater than said wellbore liquid;

a volume of low density liquid in said conduit below said dense liquid, said low density liquid having a density less than said wellbore liquid;

a means in said conduit separating said dense liquid and said low density liquid;

a tool means affixed to said closure; and

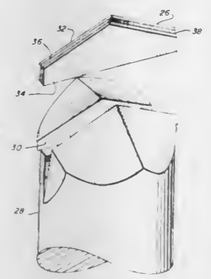
a means for advancing said conduit into said wellbore whereby at least a portion of the weight of said dense liquid acts through said liquid continuum to advance said tool means in said horizontal wellbore section.

4,627,503

MULTIPLE LAYER POLYCRYSTALLINE DIAMOND COMPACT

M. Duane Horton, Provo, Utah, assignor to Megadiamond Industries, Inc., Provo, Utah

Filed Aug. 12, 1983, Ser. No. 522,896
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **17 Claims**



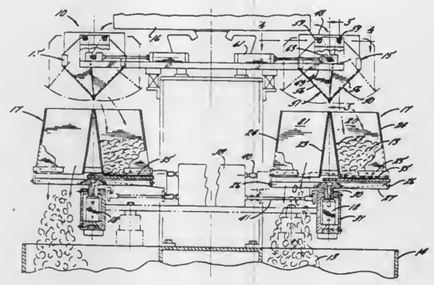
7. A cutting element having a center layer of polycrystalline material, an exposed side layer of material having a Young's Modulus less than approximately 45×10^6 psi said side layer being directly bonded to the polycrystalline material layer without an intervening layer, and an exposed opposite side layer of material also having a Young's Modulus less than approximately 45×10^6 psi and said opposite side layer also being directly to the polycrystalline material layer without an intervening layer.

4,627,504

METHOD FOR TAKING TARE WEIGHTS IN AUTOMATIC COMBINATION WEIGHING MACHINES

Michael J. Moran, Raleigh, N.C., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 7, 1985, Ser. No. 742,553
Int. Cl.[4] G01G *19/22, 13/24, 13/14*
U.S. Cl. 177—1 **9 Claims**



1. A method of measuring tare weights in an automatic combination weighting machine having N weighing buckets with each bucket having at least two compartments of which only one is filled at any given time with produce whose weight is a fraction of a target weight, said method comprising the steps of:

(a) measuring the gross weight of each of the N buckets;

(b) subtracting a stored predetermined tare weight of each bucket form the gross weight in order to find the net weight of the producet held in the filled compartment of each bucket;

(c) dumping the product from the filled compartment of the M buckets which contain the combination of M net weights whose total weight most closely approximates said target weight, where M is less than or equal to N;

(d) refilling the previously empty M buckets with product;

(e) repeating the weight cycle defined by steps a, b, c, and d so as to create a cyclic repetition of finding combinations of net weights which most closely approximate the target weight;

(f) interrupting said cyclic repetition after step (c) but before step (d) in a given cycle;

(g) measuring the tare weight of the M buckets emptied in the given cycle and replacing the stored tare weight values for these M buckets with the measured tare weight values;

(h) filling the M buckets with product; and

(i) resuming the cyclic repetition of step e by sequentially executing steps a, b, c and d.

4,627,505

WEIGHING APPARATUS AND METHOD FOR AUTOMATICALLY MONITORING A CONSTANT CURRENT SOURCE

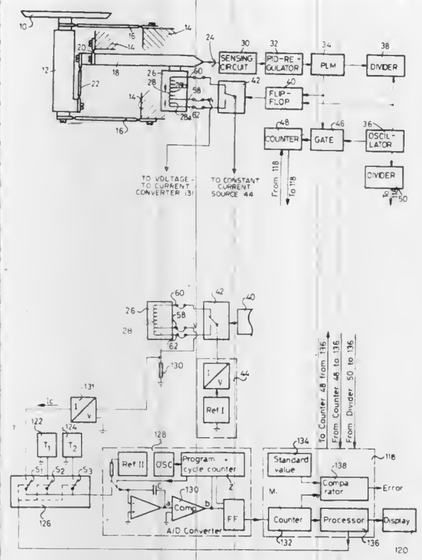
Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Jun. 12, 1985, Ser. No. 743,905
Claims priority, application Switzerland, Jun. 29, 1984, 3140/84
Int. Cl.[4] G01G *7/00;* **G01L** *1/08*
U.S. Cl. 177—1 **6 Claims**

1. In a weighing apparatus for the load-compensation type including a frame; load support means connected for movement from a normal no-load position relative to said frame; load compensation means including a compensation coil connected with said load support means, permanent magnet means connected with said frame adjacent said compensation coil, and position-responsive means operable upon the application of a load to the load support for periodically supplying compensation current pulses from a constant current source (**44**) to the compensation coil to displace the load support means towards its initial no-load position; and means for digitally processing and displaying the magnitude of the applied load as a function of the compensation current supplied to the compensation coil;

the improvement which comprises

function error recognition means for generating an error



signal when the current of said constant current source deviates a given extent from a standard value, including

(a) means including analog-to-digital converter means (**128**) for producing a periodically digitized signal that is a function of the current supplied by said constant current source; and

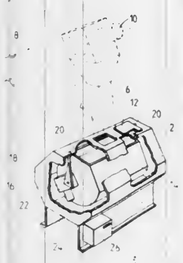
(b) means (**118**) including comparison means (**138**) for generating an error signal when the digitalized current differs by a given amount from a standard value.

4,627,506

BATCH WEIGHING APPARATUS

Niels S. Veng, Glyngöre, Denmark, assignor to Brdr. Skov A/S, Glyngöre, Denmark

Filed Jul. 25, 1984, Ser. No. 634,065
Claims priority, application Denmark, Jul. 29, 1983, 3475/83
Int. Cl.[4] G01G *19/22, 19/00, 13/14*
U.S. Cl. 177—25 **3 Claims**



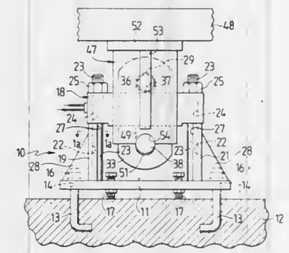
1. A weighing apparatus of the batch weighing type for receiving a flow of a material such as feedstuff and for summarized weight determination of successively discharged portions of the material, comprising an automatically dischargeable weighing container connected with a real weighing system for absolute weighing of each material portion before and after discharge thereof to obtain automatic taring in connection with the weighing of each material portion, said weighing system having means for producing a control signal for effecting temporary stoppage of the supply flow of the material when a coarse weight has been reached in response to the container being filled to a predetermined load and means for shortly thereafter effecting an accurate weighing of the container and transferring the weighing result into an associated summarizing register upon correction for the weight of an empty container, a control unit operable for actuating discharging of the container subsequent to the weighing and for restarting of the supply flow of the material when the container is ready to receive the next material portion, and means included in the container system suspended in a weighing cell system and comprising a gear motor for tilting the weighing container between a receiving position and a discharge position.

4,627,507

MOUNTING FOR DOUBLE-ENDED SHEAR BEAM LOAD CELLS

David L. Powell, Stayton, Oreg., and Philip W. Bair, Jasper, Ala., assignors to Powell All-Steel Scales, Inc., Jasper, Ala.

Filed Aug. 19, 1985, Ser. No. 766,509
Int. Cl.[4] G01G *3/14, 21/24*
U.S. Cl. 177—211 **14 Claims**



1. Apparatus for mounting a double-end shear beam load cell for use in a scale comprising:

(a) means for supporting said load cell in a predetermined position and orientation;

(b) an upper pin adapted for engagement with said load cell over a specified area and positioned above said load cell;

(c) a lower pin positioned beneath said load cell and parallel to said upper pin, said lower pin receiving the weight of said load; and

(d) link means for connecting the ends of said upper pin to said lower pin with said lower pin supported by said upper pin and said lower pin being free to oscillate responsive to the forces exerted on said lower pin in said scale, such that the force transferred to said load cell remains substantially constant in direction and area of application.

4,627,508

STEP-NEGOTIATING VEHICLE

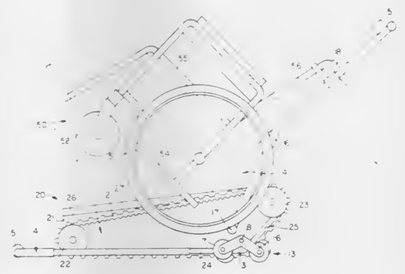
Peter Auer, Ausserdorf 3, 8479 Truttikon, Switzerland

Filed Dec. 11, 1984, Ser. No. 680,476
Claims priority, application Switzerland, Dec. 12, 1983, 6618/83
Int. Cl.[4] B60B *5/02;* **B62D** *55/02*
U.S. Cl. 180—9.22 **30 Claims**

1. A step-negotiating vehicle for transporting a wheelchair, up or down a series of steps, said wheelchair having two axially aligned wheels and a user support structure, and said vehicle comprising:

a chassis having a bottom surface, a top surface and first and second sides wherein said chassis extends beneath the user support structure and between the axially aligned wheels of said wheelchair when said wheelchair is loaded upon said vehicle;

a track drive assembly on said chassis, said track drive assembly comprising power supply means, a motor powered by said power supply means, transmission means operatively connected to said motor, at least two drive rollers connected to said transmission means to be rotatively driven thereby, drive tracks mounted to said drive rollers



to be driven thereby, and track guide means for guiding the drive tracks;

at least one extension means removably mounted to said chassis and extending from the sides of said chassis in proximal relation to said bottom surface and extending laterally from the sides of said chassis beyond the periphery of said chassis, said extension means providing additional lateral and longitudinal support for said chassis for enhanced stability of said vehicle; and

roller means mounted to said chassis to support said vehicle when said vehicle is positioned on a flat surface.

4,627,509

POWER ASSISTANCE STEERING SYSTEMS FOR VEHICLES

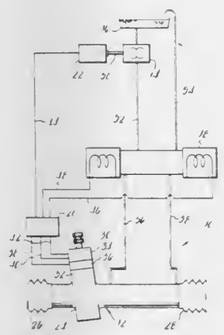
Frederick J. Adams, Clevedon, and Kenneth J. D. Heap, Cheddar, both of England, assignors to TRW Cam Gears Limited, Clevedon, England

Filed Apr. 26, 1985, Ser. No. 727,822

Claims priority, application United Kingdom, May 5, 1984, 8411607

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **4 Claims**



1. A power assistance steering system for a vehicle comprising:

a fluid pressure device for providing steering power assistance and having opposite chambers;

a fluid pump for providing fluid pressure directed to said fluid pressure device;

a variable speed electric motor for driving said fluid pump at different speeds to provide for variations in fluid pressure directed from said fluid pump;

solenoid operated valve means for selectively controlling fluid flow from said fluid pump to said opposite chambers of said fluid pressure device in accordance with a desired steering direction, said valve means being movable between a fully open position in which fluid flows from said fluid pump to a respective opposite chamber and a closed position in which fluid flow from said fluid pump to said fluid pressure device is blocked; and

sensor means for sensing a steering torque and for generating a signal in response to the steering torque for controlling the speed of said variable speed electric motor in accordance with the steering torque to thereby control variations in fluid pressure directed from said fluid pump to said solenoid operated valve means.

4. A power assistance steering system for a vehicle comprising:

a fluid pressure device for providing power assistance to steering and having opposite chambers;

a fluid pump for providing fluid pressure directed to said fluid pressure device;

motor means for driving said pump at a constant speed;

solenoid operated valve means for selectively controlling fluid flow from said fluid pump to said opposite chambers of said fluid pressure device in accordance with a desired steering direction, said valve means being movable between a fully open position in which fluid flows from said fluid pump to a respective opposite chamber and a closed position in which fluid flow from said fluid pump to said fluid pressure device is blocked;

a proportional pressure control valve means located upstream of said solenoid operated valve means and downstream of said fluid pump for controlling variation in fluid pressure directed to said solenoid operated valve means; and

sensor means for sensing a steering torque and for generating a signal in response to the steering torque for controlling operation of said proportional pressure control valve means.

4,627,510

HYDRAULIC ASSISTED STEERING FOR MOTOR VEHICLES

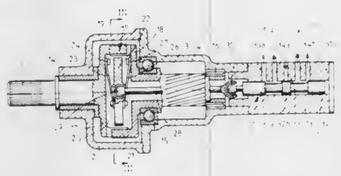
Gérard Camus, Cormeilles-en-Parisis, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur Seine, both of France

Filed Dec. 21, 1984, Ser. No. 684,903

Claims priority, application France, Dec. 23, 1983, 83 20977

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—148 **11 Claims**



1. A hydraulic-assist steering apparatus for an automotive vehicle having steerable wheels, a steering linkage connected to said wheels, and a hydraulic-assist cylinder connected to said wheels and adapted to be supplied with fluid for hydraulically displacing said linkage, said apparatus comprising in combination:

a housing;

a control shaft in said housing rotatable to initiate steering movement of said wheels;

a follower shaft positioned in said housing so as to be rotatably entrained by rotation of said control shaft, but with freedom of limited relative angular displacement therebetween, each of said shafts being operatively connected rotationally with a respective one of a pair of axially juxtaposed relatively rotatable members in said housing;

an intermediate element axially juxtaposed in said housing with said members and received between them with freedom of axial movement relative to said members;

a plurality of first elongated flexible blades in said housing oriented obliquely in one rotational direction and peripherally coupling said intermediate element to one of said members, and a plurality of second elongated flexible blades in said housing oriented obliquely in an opposite rotational direction and peripherally coupling said intermediate element to the other of said members, whereby upon relative angular displacement of said shafts said intermediate element moves axially toward one or the other of said members depending upon the direction of said relative angular displacement;

a slide valve having a moveable valve slide on said housing axially aligned with said members and said element; and

means in said housing axially connecting said slide with said intermediate element.

4,627,511

OPTICAL TRACKING ROBOT SYSTEM

Hiroshi Yajima, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,162

Claims priority, application Japan, Oct. 18, 1984, 59-217237

Int. Cl.[4] B62D *1/00*

U.S. Cl. 180—167 **10 Claims**



1. An optical tracking robot system comprising:

light emitting means attached to a target, said light emitting means including a source of operating voltage; at least one light emitting element coupled to said operating voltage source for emitting a light beam modulated into pulses; and modulator means for modulating the operating voltage of said light emitting element impulses;

tracking sensor means for monitoring the light beam emitted from said light emitting means and including means for generating drive control signals to determine the drive direction of a tracking robot;

approach sensor means including a light receiving element provided at a front portion of the tracking robot at a different height from said light emitting element, for detecting an approach to the target; aperture means provided in front of said light receiving element for restricting the light receiving area of said light receiving element such that an approach detection distance from the target can be adjusted to a desired value; an amplifier detector means including means for amplifying pulse signals received by said light receiving element, means coupled to said amplifying means for demodulating the amplified signals by means of a band-pass filter, and output means coupled to said demodulating means for generating an output signal; and comparator means for comparing the level of the output signal generated by said output means of said amplifier detector means with a predetermined threshold level and generating stop control signals to stop the tracking robot based on the result of said comparison when the tracking robot approaches the target;

travel control means for receiving said drive control signals from said tracking sensor means and said stop control signals from said approach sensor means and for generating drive signals and stop signals; and

driver means for driving the tracking robot in response to said drive signals from said travel control means and for stopping the robot in response to said stop signals from said travel control means.

4,627,512

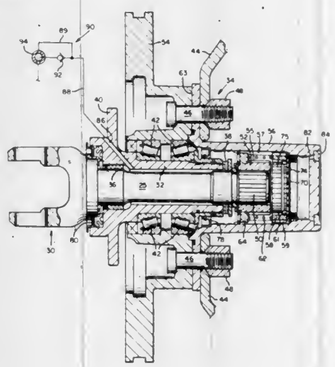
AIR ACTUATED CLUTCH FOR FOUR WHEEL DRIVE VEHICLES

Kip E. Clohessy, Portland, Oreg., assignor to Warn Industries, Inc., Bellevue, Wash.

Filed Apr. 12, 1985, Ser. No. 722,659

Int. Cl.[4] F16D *43/28*

U.S. Cl. 180—247 **10 Claims**



1. A control system for selectively engaging and disengaging a vehicle wheel and a vehicle drive mechanism comprising;

a spindle having inside and outside rotative support surfaces, said spindle adapted to be mounted to a vehicle frame, an axle portion rotatably supported on the inside support surface, and drive means for selectively and rotatively driving said axle portion relative to said spindle;

a wheel hub assembly adapted to carry a vehicle wheel, said hub assembly rotatively supported on the outside support surface of said spindle, a first set of gear teeth provided on said axle portion and a second set of gear teeth provided on said hub assembly, and a clutch ring having first and second sets of gear teeth that mate with the first and second sets of gear teeth on the axle portion and hub assembly, said clutch ring being mounted on one of the axle portion and hub assembly in gear meshing relationship with the gear teeth thereof, and being movable between a gear meshing interlocking relationship and a non-gear meshing unlocking relationship with the gear teeth of the other of the axle portion and hub assembly;

a sealed expansion chamber defined in part by the spindle, the axle portion, the hub assembly and a movable wall carried by the hub assembly, venting means venting the outer side of the movable wall to atmospheric pressure, said clutch ring engaged by said movable wall for movement of the clutch ring with movement of the movable wall as induced by a pressure difference generated within said chamber, and pressurizing means for selectively pressurizing and depressurizing the expansion chamber to thereby selectively shift the clutch ring between the positions of interlocking the axle portion and hub assembly and unlocking the axle portion and hub assembly.

4,627,513

INTERMEDIATE DIFFERENTIAL FOR A VEHICLE INCLUDING A SPUR GEAR/PLANETARY GEAR ARRANGEMENT

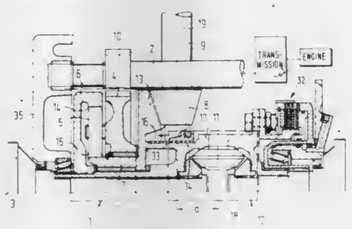
Peter Tutzer, Kornwestheim, Fed. Rep. of Germany, assignor to Dr. Ing h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,855

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318251

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—249 **21 Claims**



1. A spur gear-planetary gearing means arrangement for use as a power transfer differential mechanism for an engine-driven four-wheel drive vehicle having a first and second axle and a transmission means for transferring power from the engine to said first and second axles, and wherein an output shaft of the engine is disposed transversely to the longitudinal axis of the vehicle and substantially parallel to an output shaft of the transmission means, said first and second axles being driven from the transmission means through a power-divider transfer differential gearing means comprising:

a planetary gear carrier (**4**) having outside toothing driven by a spur gear (**10**) driven by said output shaft of the transmission means, a planet gear (**5**) carried by said planetary gear carrier (**4**), ring gear (**6**), and a sun gear (**7**), said planet gear (**5**) being arranged for asymmetrical load distribution for driving said ring gear (**6**) and said sun gear (**7**), said ring gear (**6**) driving said first vehicle axle through a differential gear means, said sun gear (**7**) driving said second axle through a gearing drive means, and clutch means to drivingly connect the differential gear means to said gearing drive means.

4,627,514

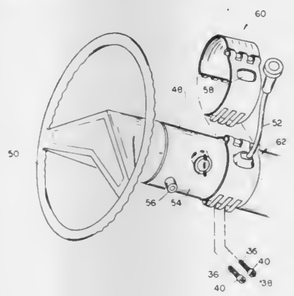
VEHICLE ANTI-THEFT DEVICE

Clarence Brown, 7358 Hurtgen Forest, Houston, Tex. 77033

Filed Apr. 24, 1985, Ser. No. 726,662

Int. Cl.⁴ B60R *25/02*

U.S. Cl. 180—287 **7 Claims**



1. An anti-theft device for use on an automobile steering column comprising:

a pair of rigid, semi-circular band portions hingedly connected along their respective first end edges and adpated for encircling the steering column in close surrounding relationship when their respective second end edges are brought together;

a pair of opposed flanges, each of said flanges being mounted on one of said band portions adjacent its first end edge, said flanges having a pair of aligned openings;

a screw for insertion through one of said aligned openings and threaded engagement of the other of said aligned openings to secure said band portions when their respective second end edges are brought together; and

a pair of laterally spaced reinforcing bands mounted on one of said band portions to prevent lateral access to the head of said screw with a pair of pliers or the like.

4,627,515

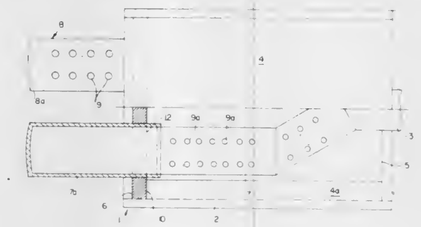
EXHAUST DEVICE

Luigi D'Alessandro, Geerenstrasse 12, CH-8157 Dielsdorf, Switzerland

Continuation-in-part of Ser. No. 659,085, Oct. 1, 1984, abandoned. This application Aug. 13, 1985, Ser. No. 765,260

Int. Cl.⁴ F01N *1/10*

U.S. Cl. 181—258 **8 Claims**



1. An exhaust device for transporting exhaust gases of a motor vehicle, comprising

a housing having a wall defining an interior and an exterior,

a tube, for transporting said gases, a portion of said tube within said housing and a portion of said tube outside said housing, the portion of said tube outside said housing being closed at its end and having at least one aperture around its periphery, the portion of said tube within said housing also having at least one aperture around its periphery,

a filter in fluid communication with the interior of said tube, and

a second filter in fluid communication with the interior of said tube, said second filter being disposed along the interior wall of said housing.

4,627,516

SELF-LEVELING LADDER CONSTRUCTION

Lewis O. Studer, Summerfield, Ohio, assignor to Harry V. Moore, Walkerville, Mich., a part interest

Filed Jan. 2, 1986, Ser. No. 815,557

Int. Cl.⁴ E06C *7/44*

U.S. Cl. 182—202 **13 Claims**

1. A self-leveling ladder construction including:

(a) a pair of spaced vertical rung supporting members;

(b) a leg axially slidably mounted within each of the rung supporting members at the bottom of each of said supporting members;

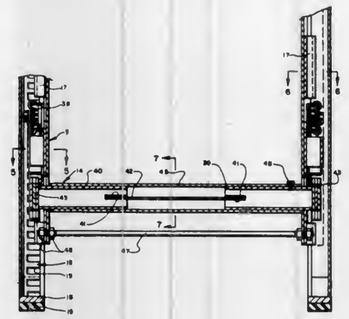
(c) a rack affixed to each of said legs;

(d) a rotatably mounted gear engaging each of said racks;

(e) drive means interconnecting the gears for simultaneous rotation in the same direction, said gears engaging the racks on opposite sides of the gears whereby movement of one of the legs in one direction produces an opposite movement of the other leg;

(f) gear lock means mounted on each of the rung supporting members adjacent each of the gear for engaging the gears to releaseably lock the gears in a selected position; and

(g) said drive means including a stub shaft attached to each of the gears, a tubular telescoping member extending



generally between the rung supporting members adapted to function as a lower rung and conected to one of the stub shafts for rotation with said shaft, and a leaf spring extending between and in engagement with the stub shafts within said tubular telescoping member, said stub shafts having outer diameters generally equal to the inner diameter of the telescoping member whereby said stub shafts support said telescoping member.

4,627,517

STAIRLIFT

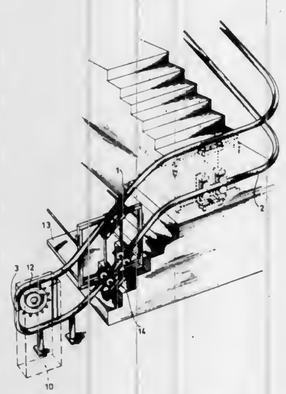
Jan H. Bor, van Boeyenplantsoen 21, 2253 WS Voorschoten, Netherlands

Filed Feb. 13, 1985, Ser. No. 701,082

Claims priority, application Netherlands, Feb. 13, 1984, 8400458

Int. Cl.⁴ B66B *9/06*

U.S. Cl. 187—12 **12 Claims**



1. Stairlift provided with an endless tubular guide track in the form of two parallel rails one above the other and two connecting parts, with at least the top rail having a groove running parallel to the center line of the tube, a series of transmission elements inside the guide track, a toothed wheel which is driven by a motor and the teeth of which can engage via said groove with an aperture in each transmission element, and a carrying platform which is designed for carrying persons or goods and is connected to a carriage whose top end is attached to a roller or the like which moves inside the top rail, and whose bottom end is conducted by guide elements relative to the outer surface of the bottom rail, characterized in that the carriage consists of a parallelogram of vertical bars (**15**) and crossbars (**16**), and crossbars (**16**) being hingedly connected with the vertical bars (**15**) about a vertical and about a horizontal axis, and in that the carrying platform (**13**) is hingedly connected with a point on each (**26**) of the crossbars (**16**) located more or less directly above one another.

4,627,518

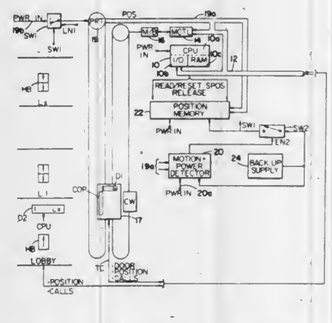
BACKUP POSITION SIGNALING IN AN ELEVATOR

Gary M. Meguerdichian, Waterbury, and Isabel B. Hovey, Bristol, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 25, 1985, Ser. No. 727,313

Int. Cl.⁴ B66B *3/02*

U.S. Cl. 187—29 R **3 Claims**



1. An elevator comprising a car, a car controller, and position transducer connected to a car for providing distinct car position signals, a source of system power, the elevator being characterized by:

position memory means for storing position signals from the transducer therefrom for retrieval by the controller after the controller is shut down and restarted;

a backup power supply;

first switch means for connecting the supply to the position memory means in response to a first control signal;

second switch means for connecting the power supply to the position sensor in response to a second control signal;

logic means for receiving a car position signal from the position transducer for sensing system power level and providing said first and second control signals when the level decreases below a reference level.

4,627,519

HYDRAULIC DISK BRAKE HAVING A BRAKING TORQUE-TO-HYDRAULIC FORCE CONVERTER

Lorin V. Larsen, Long Beach, and Brian L. Eidem, Cerritos, both of Calif., assignors to Armco Inc., Middletown, Ohio

Filed Mar. 29, 1984, Ser. No. 594,795

Int. Cl.⁴ B60T *13/12;* **B66D** *1/44*

U.S. Cl. 188—1.11 **13 Claims**

1. A disk brake apparatus for a cable hoisting drum mounted for rotation and having a brake disk coupled for rotation therewith, the combination comprising:

a support located adjacent the drum;

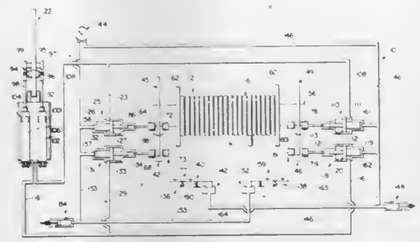
a pair of brake calipers having an opposed pair of friction pads thereon located on opposite sides of the brake disk, and having a pair of hydraulic rectilinear motors for driving said pads against the brake disk;

means for coupling said calipers to said support;

a hydraulic fluid pump having an actuating lever movable between first and second positions and generating a hy-

draulic force proportional to the location of said lever between said first and second positions;

hydraulic fluid lines interconnecting said pump and said motors for delivering said hydraulic force to each of said motors and thus to said friction pads as generated by said actuating lever; and



adjustable converter means, coupled to said pair of brake calipers and to said hydraulic fluid lines, for converting the braking reaction force caused by the torque applied to said calipers, when said friction pads engage the rotating disk, to an additional hydraulic force proportional to the amount of torque so applied to said calipers and applying this additional hydraulic force to said motors.

4,627,520

FRONT BRAKE APPARATUS IN MOTORIZED THREE-WHEELED VEHICLE

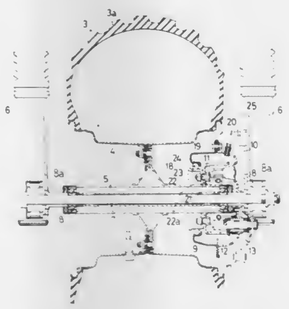
Shinji Matsubayashi, Tokyo; Satoru Kiyota, Yokohama, and Eiji Hosoya, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 550,146, Nov. 9, 1983, abandoned. This application Sep. 9, 1985, Ser. No. 774,187

Claims priority, application Japan, Nov. 11, 1982, 57-169824[U]

Int. Cl.⁴ B60T *1/06*

U.S. Cl. 188—18 R **3 Claims**



1. A front brake and wheel supporting apparatus for a front wheel of a three wheeled vehicle said wheel including a rim, said vehicle having a pair of front forks, said apparatus comprising:

an axle fixedly provided between the pair of front forks,

a pair of bearings, each mounted on said axle near one of said front forks,

a wheel hub rotatably mounted on and extending between said pair of bearings, the wheel being attached to said wheel hub,

a drum setting plate fixed to and extending radially from said wheel hub, said drum setting plate being positioned axially inwardly of a circumferential edge of the rim of the wheel and having an axially outwardly facing surface and an outer circumference,

a brake drum bolted to said outwardly facing surface,

a brake panel fixed to said wheel axle and positioned substantially axially outwardly of said brake drum and substantially axially outwardly of the circumferential edge of the rim, said panel having a radially outer circumferential portion extending axially inwardly to a position which is axially inwardly of the circumferential edge of the rim,

brake shoes provided on said brake panel arranged to be brought into internal contact with said brake drum,

a drum cover attached to said radially outer circumferential portion of said brake panel and extending to cover a surrounding portion of said brake drum,

a drum side seal receiving member integrally formed along said outer circumference of said drum setting plate and extending axially inwardly thereof substantially in parallel to and separate from said wheel hub,

a cover side seal receiving member facing said drum side seal receiving member and being formed of a nearly U-shaped cross-sectional bent end portion of said drum cover, and

a seal member interposed between said drum side seal receiving member and said cover side seal receiving member, said seal member comprising: an outer member, and an inner support plate encased in said outer member and being bent into a channel form having a curved portion of U-shape in section opening in an axial direction to take up deformation of said drum side seal receiving member in a radial direction.

4,627,521

MOTOR AND BRAKE CONTROLS

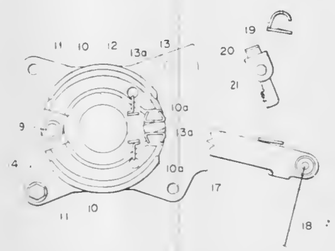
Katsumi Takagaki, Urawa; Yukinori Ito, Kawagoe, and Kiyohide Sumi, Koga, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,114

Claims priority, application Japan, Jun. 28, 1983, 58-116611

Int. Cl.⁴ B60K *41/20*

U.S. Cl. 192—2 **9 Claims**



1. In a motor and brake control device for an engine having a flywheel secured to a crankshaft of the engine so that the flywheel turns and respectively stops with turning and stopping respectively of the crankshaft, a crankcase, a flywheel magneto having magnetic steel at the periphery of the flywheel, the improvement comprising

an annular brake drum formed on said flywheel having an inner circumference of said brake drum comprising a braking surface,

a pair of expandable brake shoes engageable with the braking surface for stopping the flywheel, the crankshaft and the engine,

an actuating member engaged with an end of each brake shoe, said actuating member being mounted movably so as to expand said brake shoes into engagement with the braking surface to brake said drum,

a spring disposed between said shoes for biasing said shoes so that said end of each brake shoe engages said actuating member,

switch means for shutting off the engine,

a supporting plate secured to said crankcase axially adjacent to said flywheel and substantially perpendicular to the axis of the flywheel,

said supporting plate constitutes means for supporting another end of each said brake shoe, one end of said actuating member, and said switch means such that the latter is operated by the actuating member by movement of the latter, and

said actuating member, said brake shoes and said switch means being so arranged on said supporting plate adjacent said flywheel with a minimum axial length of the device providing a compact construction, said brake shoes being disposed inside said annular brake drum.

4,627,522

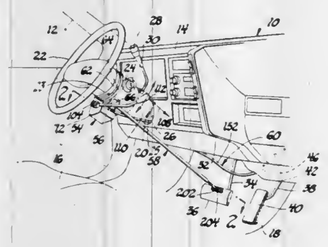
HAND ENGINE AND BRAKE CONTROL MECHANISM FOR A VEHICLE

Paul L. Ulrich, Redford; James Richards, Sterling Heights, and Eugene T. Tanke, II, Vassar, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1984, Ser. No. 680,977

Int. Cl.⁴ G05G *9/04*; B60K *41/20*

U.S. Cl. 192—35 **1 Claim**



1. A hand operated engine throttle and vehicle brake control mechanism for a passenger vehicle having a steering column capable of axial movement or collapse under impact and including a tiltable column section, a steering wheel on said steering column tiltable column section, an instrument panel through which said steering column extends, a brake pedal suspended below the instrument panel on a brake pedal arm for brake actuating movements generally parallel to the steering column, an accelerator pedal mounted below the instrument panel and positioned for operation by foot in the usual manner, said accelerator pedal and having a pedal and lever forming a part of the engine control linkage, the pedal lever extending under and behind the instrument panel and being pivoted so that depression of the accelerator pedal by a vehicle operator causes a portion of the pedal lever to pivotally move generally toward the steering wheel to increase engine speed and/or power, said mechanism comprising:

a hand control body assembly secured to said steering column tiltable column section immediately below said steering wheel, said body assembly having a pilot lever input member movable by a hand of the vehicle operator throughout a generally rectangular pattern defined by an engine control plane of movement generally parallel to said steering wheel and a brake control plane of movement perpendicular to said engine control plane of movement and limit positions of engine control from idle to full speed and limit positions of brake control from brake release to full brake application;

said body assembly also having a push-pull cable output member movable axially between limit positions of engine control from idle to full speed and a brake rod output member movable axially between limit positions of brake control from brake release to full brake application;

said body assembly having a rotatably movable first shaft mounted therein and connected with said pilot lever input member, said first shaft being rotationally responsive only to components of said pilot lever input member movements in the rectangular pattern which are in or parallel to said engine control plane of movement to axially move said push-pull cable;

a gear sector mounted on said first shaft for arcuate movement therewith;

a second shaft rotatably mounted in said body assembly axially parallel to said first shaft, said second shaft having a gear thereon engaging said gear sector in gear driven relation;

a first pulley rotatably mounted in body assembly with the axis of said first pulley being between and perpendicularly skew to the axis of said first and second shafts;

a second pulley secured to said second shaft to be rotatably driven thereby and having a peripheral groove with said push-pull cable laid wherein with one cable end secured to said second pulley;

said first pulley having a peripheral groove positioned in perpendicular tangential alignment with said second pulley peripheral groove with said push-pull cable also being laid therein and positioned in free leading relation from said second pulley peripheral groove;

said body assembly having cable guide means through which said push-pull cable extends from said first pulley in general axially parallel relation to the axis of said first shaft and passes outwardly of said body assembly;

said push-pull cable having another end remote from said body assembly and a lost motion connection by which said cable another end is connected to said pedal lever under and behind said instrument panel for causing said pedal lever portion to move generally toward the steering wheel to increase engine speed and/or power and permitting return movements thereof to the engine idle limit position, said lost motion connection permitting axial movements of said cable in the increasing throttle opening direction to cause corresponding throttle control linkage throttle openings movements and axial movements of said cable in the decreasing throttle opening direction permitting the throttle control linkage to move in the throttle closing direction, said lost motion connection permitting throttle control linkage throttle opening movements via the accelerator pedal independently of said input control member without moving said cable;

said body assembly having torsion spring means secured therein and acting torsionally on said first shaft and continually urging said first shaft and said gear sector and said second shaft and said second pulley and said push-pull cable toward the engine idle limit position;

said body assembly also having an adjustable length brake rod pivotally attached to said pilot lever input member at one rod end and to said brake pedal at the other rod end and responsive only to components of said pilot lever input member movements in the rectangular pattern in or parallel to said brake control plane of movement for causing said rod to move to depress said brake pedal in the brake apply direction of pedal movement and to return to the brake release limit position upon movement of said pilot lever input member to its brake release limit position;

said brake rod extending generally parallel to and closely adjacent to the steering column and having its pivotally connected ends so positioned axially and translationally relative to the tiltable steering column section as to accommodate full tilting movement of said tiltable column section without effecting axial rod movement and to also accommodate brake applications via the brake pedal independently of said input control member without effecting any axial movement of said push-pull cable;

said accelerator pedal and said brake pedal by virtue of said push-pull cable, said lost motion connection, and the position of said brake rod pivotally connected ends, being movable independently of said hand control mechanism to control the engine and the vehicle brakes, said control mechanism being unaffected by tilting and axial movements of said steering wheel insofar as its functional capa-

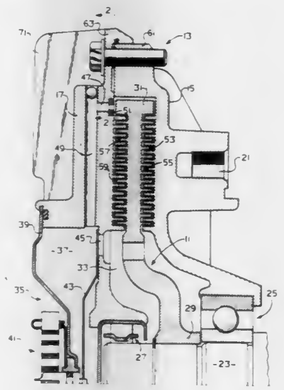
bility to control said accelerator pedal and said brake pedal is concerned.

4,627,523

FLUID COUPLING DEVICE WITH IMPROVED FLUID COOLING

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 21, 1985, Ser. No. 789,599
Int. Cl.[4] F16D *35/00*
U.S. Cl. 192—58 B **10 Claims**



1. A fluid coupling device comprising a first rotatable coupling assembly defining an axis of rotation, enclosure means associated with said first rotatable coupling assembly to define a fluid chamber therebetween, valve means associated with said first rotatable coupling assembly and disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first rotatable coupling assembly, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber, characterized by:

(a) said first coupling assembly defining a cooling fluid chamber disposed radially outwardly from said fluid operating chamber, said cooling fluid chamber including an inlet opening and an outlet opening, said inlet opening and said outlet opening comprising substantially the only fluid communication between said operating chamber and said cooling fluid chamber;

(b) first fluid directing means disposed adjacent said fluid operating chamber and being operable to direct fluid through said inlet opening into said cooling fluid chamber in response to relative rotation between said first coupling assembly and said second coupling member;

(c) second fluid directing means disposed adjacent said outlet opening and being operable to direct fluid through said outlet opening into said operating chamber in response to relative rotation between said first coupling assembly and said second coupling member; and

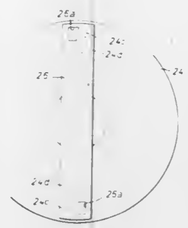
(d) said cooling fluid chamber being configured to extend circumferentially about a substantial portion of said operating chamber, whereby a substantial amount of heat is transferred to said first coupling assembly from fluid flowing through said cooling fluid chamber.

4,627,524

VISCOUS FLUID COUPLING DEVICE

Masaharu Hayashi, and Masato Itakura, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 14, 1983, Ser. No. 542,199
Claims priority, application Japan, Oct. 22, 1982, 57-159734[U]
Int. Cl.[4] F16D *35/00*
U.S. Cl. 192—58 B **6 Claims**



1. A viscous fluid coupling device, comprising:

a housing rotatably mounted on an input shaft to store therein a predetermined amount of viscous fluid;

a rotor fixed to said input shaft and located in said housing;

a partition plate secured in said housing to subdivide the interior of said housing into an operation chamber containing therein said rotor and a portion of the viscous fluid and a reservoir chamber storing therein the remaining portion of the viscous fluid, said partition plate being provided with a first slot and a second slot spaced radially inwardly from said first slot;

a first labyrinth between said partition plate and said rotor to be supplied with the viscous fluid through said first slot from said reservoir chamber;

a second labyrinth between said rotor and the inner wall of said housing to be supplied with the viscous fluid through said second slot from said reservoir chamber;

a valve plate rotatable in said reservoir chamber to open and close said first and second slots to control the quantity of the viscous fluid supplied into said first and second labyrinths; and

thermally responsive means arranged to rotate said valve plate in response to changes in the ambient temperature of said coupling device;

wherein said valve plate is provided with a single slot to be overlapped with said first slot in said partition plate, and wherein said valve plate further comprises means for closing both said first and second slots in a first position of said valve plate with respect to said partition plate, for effecting overlapping of only said first slot and said single slot formed in said valve plate in a second position of said valve plate with respect to said partition plate, for closing both said first and second slots in a third position of said valve plate with respect to said partition plate, and for opening both said first and second slots in a fourth position of said valve plate with respect to said partition.

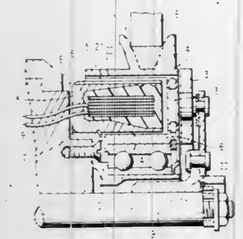
4,627,525

ELECTROMAGNETIC CLUTCH FOR A DRIVE ASSEMBLY OF A MOTOR VEHICLE

Selcuk Geldec, Talheim, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 632,014
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326686
Int. Cl.[4] F16D *27/10*
U.S. Cl. 192—84 C **8 Claims**

1. Electromagnetic clutch for a motor vehicle drive assembly to produce a rotational connection between a rotational drive element and a shaft of the assembly, having a stationary excitation device, and having an armature connected rotationally fixed to the shaft, which armature becomes coupled to the rotational drive element when the excitation device is activated, the excitation device comprising an annular disc-shaped yoke with two ring flanges concentrically arranged, extending substantially at right angles to the yoke and accommodating a coil, the rotational drive element comprising an annular disc with a first partition ring surrounding said excitation device concentrically with a small air gap between said first partition



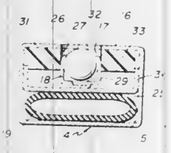
ring and the excitation device, and a second partition ring concentrically disposed within said excitation device with a small air gap therebetween, the excitation device and the rotational drive element of the electromagnetic clutch being configured to function also as a pulse generator, both one ring flange on a periphery thereof and one partition ring on a periphery opposite to the said one ring flange having tooth-type protrusions and recesses of substantially the same number and distribution disposed in an axial direction for generating from said excitation device pulses having a frequency proportional to the rotational speed of the drive element.

4,627,526

CONVEYOR SYSTEM WITH ROLLERS AND PLUNGERS

Camillo Masciarelli, 415 Berlin Rd., Marlboro, Mass. 01752

Filed Jul. 15, 1985, Ser. No. 755,065
Int. Cl.[4] B65G *13/075, 13/10*
U.S. Cl. 193—35 A **3 Claims**



2. Conveyor system, comprising:

(a) a frame on which is mounted a series of rollers for supporting and driving an article along the frame, the rollers being arranged in spaced, parallel relationship with a space between each adjacent pair of rollers,

(b) a conveyor element located in one of the said spaces, the element consisting of a main body having an upper surface located below the level of the tops of the rollers, the main body having a series of bores in which plungers are slidably carried, the plungers being provided with ball-type anti-friction members, and

(c) a pneumatic bladder located in the main body to move the plungers from a first position below the said level of the rollers to a second position above the said level, wherein several conveyor elements are provided in a closely-related group to form a table,

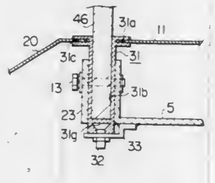
wherein the main body includes a tube with a rectangular cross-section and with a flat upper wall having the said upper surface and formed with circular apertures defining part of the said bores, and wherein the main body includes a polymer slab located within the tube and formed with the remainder of the said bores, wherein a pressure plate lies between the bladder and the slab, and wherein coil springs are located between the pressure plate and the slab to continuously press the slab against the upper wall of the main body during both inflated and the non-inflated conditions of the bladder.

4,627,527

BALUSTRADE FOR PASSENGER CONVEYOR

Chuichi Saito, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 437,307, Oct. 28, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,889
Claims priority, application Japan, Oct. 30, 1981, 56-172743; Apr. 28, 1982, 57-70477
Int. Cl.[4] B66B *23/22*
U.S. Cl. 198—335 **3 Claims**



1. A balustrade for passenger conveyor, the balustrade comprising:

a glass panel located beneath a movable endless handrail;

an inner deck cover and an outer deck cover respectively located inside and outside a lower portion of said glass panel;

a packing mounted between said glass panel and said inner and outer deck cover;

a support bed for supporting said glass panel;

said packing being of a unitary structure formed of a hard material and including a groove for receiving a lower end portion of the glass panel without forming a gap therebetween and grooves formed in an upper portion of said packing at both sides of the latter for respectively receiving end portions of the inner and outer deck covers, said packing being disposed so that one side surface thereof is in contact with the support bed and being threadably secured at a lower end thereof to a main body frame or a support member;

a pressing plate disposed on an opposite side surface of the packing and being in contact therewith; and

bolt means extending through said pressing plate, said packing and said glass panel for securing the pressing plate, packing and glass panel to said support bed so as to provide a stable support of the glass panel whereby the glass panel is prevented from being displaced in an upward and downward direction.

4,627,528

CONVEYING SYSTEM FOR MULTIPLE DIE PRESSES OR PRESS LINES

Gerald Mikusch; Wolfgang Hübner, and Werner Münch, all of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,370
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3229943
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—621 **10 Claims**

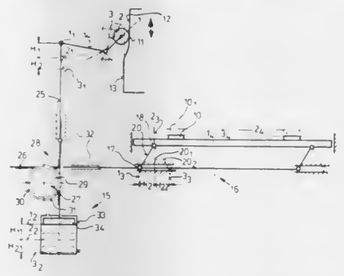
1. A conveying system for one of a multiple-die press and a press lien having gripper rail means extending in the conveying

direction of the work pieces and carrying gripper devices that interact for gripping the work pieces, with said gripper rail means being responsive to interruptable driving movements led off the drive of the press for the lifting and lowering movement of the gripper rail means, comprising

a press-driven cam means having cam parts for positioning the gripper rail means to a highest position and a lowest position,

a control pulley on a deflecting lever for interacting with the cam means,

a regulating means operable into positions corresponding to



the highest and the lowest position of the gripper rail means and also into a position that lifts the control pulley off the cam means, and

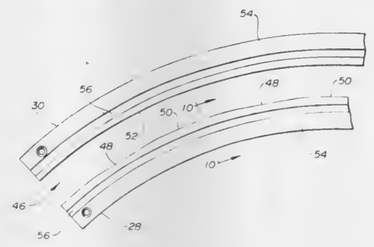
a lever means having a joint coupling point and coupled to the control pulley and the regulating means and having a pickup point coupled at the gripper rail means, positionable between a first end position to place the gripper rail means in its lowest position, and a second central position to place the gripper rail means in its highest position, and a third position to place the gripper rail means below the highest position for admitting removal of said gripper devices.

4,627,529

SPIRAL CONVEYOR

Curtis S. Tarlton, Florham Park, and Richard A. Ford, Blackwood, both of N.J., assignors to C. & T. Tarlton, Inc., Union, N.J.

Filed Apr. 22, 1985, Ser. No. 725,387
Int. Cl.[4] B65G *21/18, 21/20*
U.S. Cl. 198—778 **13 Claims**



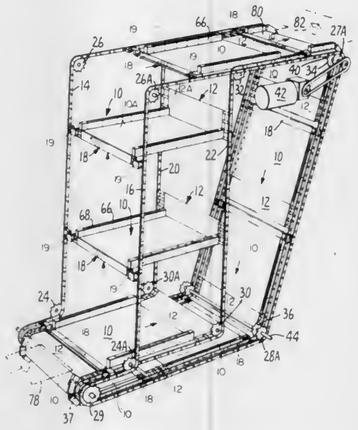
1. A conveyor assembly comprising a central tubular member having a longitudinal axis, track means mounted on said tubular member spaced outwardly therefrom and defining a generally helical path about said member having an infeed end and an outfeed end, said track means comprising a pair of parallel tracks for supporting endless conveyor means between said infeed and outfeed ends, said track means including a multi-sided polygonal construction and arrangement comprising a plurality of curved surfaces and a plurality of flat straight surfaces for reducing frictional contact with respect to said conveyor means whereby the capstan effect of said conveyor means relative to said track means is substantially overcome, an inner one of said tracks adjacent said member having an inner surface extending in the direction of said longitudinal axis facing a corresponding surface of an outer one of said tracks, said inner surface comprising a substantially multisided polygonal construction for each 360° about said central member including said plurality of flat straight surfaces which extend in the direction of said conveying path arranged in helical fashion about said frame for reducing frictional contact with said conveyor means and overcomming the capstan effect of said conveyor means relative to said inner track, said outer one of said tracks comprising a smooth continuous curved surface, drive means including a primary drive located at one of said infeed and outfeed ends, power means mounted for supplying power to said primary drive, said primary drive operably engaging said endless conveyor means for being driven at said one end in a first direction comprising a conveying path, said conveyor means having an endless return path opposite in direction and corresponding to said conveying path.

4,627,530

ELEVATING CHAIN CONVEYOR

Walter Franke, Fremont, Calif., assignor to Universal Conveyor Co., Inc., Fremont, Calif.

Continuation of Ser. No. 543,854, Oct. 20, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,057
Int. Cl.[4] B65G *17/16*
U.S. Cl. 198—799 **8 Claims**



1. A conveyor for moving articles from one level to another as well as in a horizontal path, comprising, in combination:

first and second pairs of endless chains arranged on a plurality of sprockets around a path including horizontal and vertical runs, with one of each pair of chains being on one side of said path and the other of each pair being on the opposite side of said path,

plural spaced-apart pluralities of contiguous support members extending from one side of the path to the other, each plurality of contiguous support members combining to form a substantially continuous-surface articulated carrier which is rigid to support a load when the carrier is supported from its ends,

first support means extending from one side of the path to the other for supporting a respective first end of each of said continuous-surface carriers, the opposite ends of each said first support means being each connected to a respective one of said first pair of endless chains,

at least one separator element having a substantially continuous surface extending across said path with opposite ends thereof being supported by said first pair of chains to form an articulated separator having a substantially continuous surface and being substantially contiguous with the said first end of each respective carrier, and

second support means extending from one side of the path to the other for supporting a respective second end of each of said continuous-surface articulated carriers, the opposite ends of each said second support means being each connected to a respective one of said second pair of endless chains, said second support means extending across said path and being substantially contiguous with the said second end of the respective carrier,

adjacent ones of said plural spaced-apart continuous-surface carriers being substantially coplanar with each other and with the respective separator and second support means therefor when the chains on each side of said path lie adjacent one another, and the space between each adjacent pair of said spaced-apart coplanar carriers being substantially filled with a respective pair of said separator elements and second support means, the contiguous substantially continuous surfaces of all said carriers, separators and support means thus providing a substantially continuous surface when said chains lie adjacent one another,

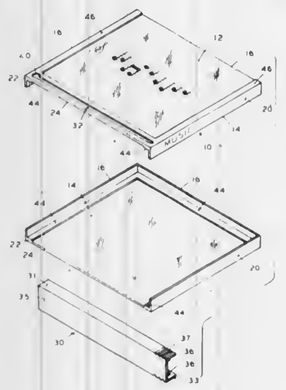
whereby articles transported by said spaced-apart carriers cannot fall therebetween, said separators and said second support means serving to provide with said carrier means a substantially continuous surface when the respective chains lie adjacent one another, said separators also serving as an abutment when the chains are separate from each other and the carriers are one above another.

4,627,531

RECORDING DISK ENCLOSURE

Philip M. Clemens, 2424 Forest Park Blvd., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 709,399, Mar. 7, 1985. This application Apr. 24, 1985, Ser. No. 726,790
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—309 **16 Claims**



1. A recording disc enclosure, which comprises:

(a) a semi-rigid, generally rectangular top portion;

(b) a semi-rigid, generally rectangular bottom portion substantially the size of the top portion;

(c) four side portions adjoining said top and bottom portions about the periphery of said top and bottom portions, forming an enclosed area between said sides and said top and bottom portions, said enclosed area sized to receive a recording disc therein;

(d) an elongated aperture disposed through one of the side portions, said aperture of a size sufficient to pass a recording disc therethrough;

(e) an externally disposed top and bottom guide slot means, extending in parallel alignment substantially along the top and bottom portions of the enclosure in proximity to the aperture side;

(f) an elongated closure strip having a side sized to substantially cover the elongated aperture, the closure strip further having top and bottom confronting portions adjoining the closure strip side in spaced relation;

(g) a top and bottom guide post means, disposed upon the confronting top and bottom portions of the closure strip, the guide post means sized to align and guide the closure strip along the guide slot means from a closed position substantially covering the aperture to an intermediate extended position parallel to the aperture side; and

(h) a relieved area disposed at one end of the top and bottom guide slot means, the relieved area positioned to receive the top and bottom guide post means when the closure strip is extended to the intermediate position, the relieved area providing a means for rotation of the extended closure strip from the intermediate position to a position tangent to the closed position of the closure strip, and adjacent to the side of the enclosure adjoining the aperture side.

10. An enclosure for protecting a recording disc therein, which comprises:

(a) a semi-rigid, generally rectangular top portion having at least three depending sides;

(b) a semi-rigid, generally rectangular bottom portion sized to align with the depending sides of the top portion;

(c) a means to secure the top and bottom portions in spaced relation to form an enclosed space of a size sufficient to receive a recording disc therebetween;

(d) an aperture disposed through one side of the enclosure, the aperture sized to receive a recording disc therethrough;

(e) an externally disposed top and bottom guide slot means, extending in parallel alignment substantially along the top and bottom portions of the enclosure in proximity to the aperture side;

(f) an elongated closure strip having a closure side with adjoining top and bottom confronting sides, the closure strip sized to extend substantially the length of the aperture in a closed position, with confronting top and bottom sides of the closure strip closely received about the guide slot means;

(g) a top and bottom guide post means, disposed upon the confronting top and bottom sides of the closure strip, the guide post means positioned to align and guide the closure strip along the top and bottom guide slot means;

wherein the closure strip may be manually biased from the closed position to an intermediate extended position in parallel alignment with the closed position, and subsequently rotated from the intermediate extended position to a position adjacent to the side adjoining the aperture side and tangent to the closed position of the closure strip.

4,627,532

DIGITAL AUDIO DISK ENCLOSURE

Philip M. Clemens, 2424 Forest Park Blvd., Fort Wayne, Ind. 46805

Filed Mar. 7, 1985, Ser. No. 709,399
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—309 **20 Claims**

1. An enclosure for protecting a digital audio disk, which comprises:

(a) a semi-rigid, generally rectangular top portion with four depending sides;

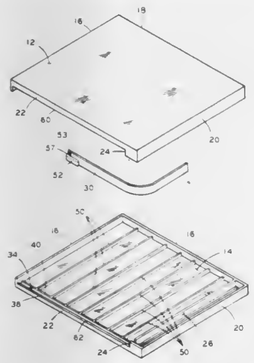
(b) a generally rectangular bottom portion with four depending sides sized to align with the four depending sides of said top portion;

(c) a means to secure said top portion to said bottom portion

to form an enclosed area sized to receive a digital audio disk therebetween;

(d) a first relief extending through one of said depending sides of said top portion, and a second relief extending through one of said depending sides of said bottom portion, said first and second reliefs aligned to form an elongated aperature through one said side when said sides are secured by said means to secure said four depending sides; said aperature sized to receive a digital audio disk therethrough;

(e) a guide means disposed upon said bottom portion in spaced parallel alignment substantially along said aperature side and substantially along one adjoining side, said guide means disposed upon said bottom portion in spaced



alignment with a guide means disposed upon said top portion, when said top and bottom portions are secured together in a manner to form a contiguous aligned guide means within said enclosure;

(g) a flexible closure strip sized to be slidably received within said aligned guide means, said closure strip of a length and width sufficient to enclose said aperature;

(h) a tab means disposed near one end of said closure strip, said tab means disposed upon said closure strip externally of said enclosed area to provide means to manually bias said tab means between open and closed positions within said aperature, said open position exposing an opening through said aperature sufficient to pass a digital audio disk therethrough.

4,627,533

CERAMIC PACKAGE FOR COMPENSATED CRYSTAL OSCILLATOR

Gary B. Pollard, Santa Ana, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 29, 1984, Ser. No. 665,594

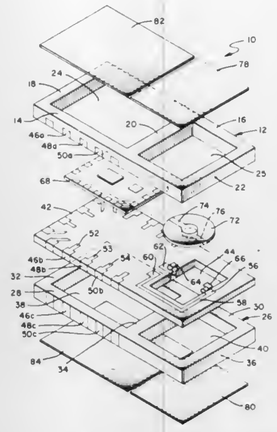
Int. Cl.⁴ B65D *73/02*

U.S. Cl. 206—328 **16 Claims**

1. A ceramic package comprising:

an upper body, a center body and a lower body, said bodies being made of vitrified ceramic and joined together by vitrified ceramic;

first and second openings in said upper body, first and second openings in said lower body and an opening in said center plate, said second openings in said upper and lower bodies being in communication with said opening in said center plate to define an oscillator crystal cavity, said first openings in said upper body and said lower body being out of communication with each other and out of communication with said oscillator crystal cavity to define an oscillator network cavity and a compensation network cavity; and



cover means over each of said cavities to form separate closed oscillator crystal, oscillator network and compensation network cavities.

4,627,534

MAGNETIC TAPE CASSETTE STORAGE CASE

Choji Komiyama, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1985, Ser. No. 720,250

Claims priority, application Japan, Apr. 6, 1984, 59-50298

Int. Cl.⁴ B65D *85/672*

U.S. Cl. 206—387 **2 Claims**



1. A magnetic tape cassette storage case, comprising:

a casing having a pocket into which a rear half of a magnetic tape cassette may be inserted, and a wide wall formed by extending one wall of said pocket in such a manner that said one wall will confront one of a front and rear surface of said magnetic tape cassette;

a first cover having a pair of rotation preventting protrusions insertable into reel shaft insertion holes of said magnetic tape cassette and a recess for receiving a thicker portion of said magnetic tape cassette, said first cover being swingably connected through a hinge to said pocket;

a second cover having another recess for receiving said cassette's thicker portion, said second cover being swingably connected through a hinge to said wide wall; and

said first and second covers having locking parts which are engaged with each other to close said cassette storage case.

4,627,535

CONTAINER FOR MAGNETIC TAPE CASSETTES

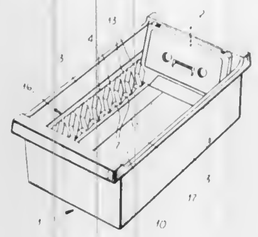
Balthasar Kirchner, and Siegfried Schleicher, both of Eferding, Austria, assignors to Ernst Stadelmann Gesellschaft m.b.H., Bahnhofstrasse, Austria

Filed Feb. 27, 1985, Ser. No. 705,989

Claims priority, application European Pat. Off., May 29, 1984, 84890097.3

Int. Cl.⁴ B65D *85/672, 1/24*

U.S. Cl. 206—387 **10 Claims**



1. In a container for holding parallelepipedic articles comprising:

a bottom and side walls defining an upwardly open space,

said space being delimited at least in part by two horizontally spaced apart vertical walls rising from said bottom, and

a plurality of receptacles provided between said two vertical walls and adapted to slidably receive respective ones of said articles, each of said receptacles comprising two upwardly open horizontally spaced apart tracks extending adjacent to confronting side faces of respective ones of said vertical walls for receiving opposite edges of respective articles,

the improvement residing in that

each of said receptacles comprises laterally spaced apart supports disposed near said bottom and adapted to slidably support one of said articles received in the respective receptacle, each of said tracks of each of said receptacles has above the respective supports a pair of formations projecting toward one another and defining a respective throat engageable with a respective one of said articles in said receptacle on each side of said article,

said throat of each of said receptacles are horizontally aligned so that one of said articles which is contained in one of said receptacles and has a thickness that is slightly smaller than the width of each of said throats is tiltable in said receptacle about fulcrums formed by said tracks at said throats, and

said tracks of each of said receptacles are provided with stops for limiting the tilting movement of such article in said receptacle,

each of said tracks having horizontally spaced apart guiding surfaces, which diverge symmetrically from said throat in upward and downward directions.

4,627,536

MODULAR DISPLAY PACKAGE

Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 639,902, Aug. 13, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,248

Int. Cl.⁴ B65D *85/44*

U.S. Cl. 206—426 **1 Claim**

1. The combination of a modular display package for individual articles having rear, top, bottom and side wall assemblies and an article interposed between said rear, top, bottom and side wall assemblies with each of said side wall assemblies having a cutout portion extending inwardly toward said rear wall assembly, and a package sleeve for packaging a plurality of said modular display packages with portions of the individual articles exposed for inspection comprising a package blank having a top panel, a bottom panel, and a pair of side panels, package engaging lock means on said said panels, and one free edge of one side panel being fastened to a free edge of said top or bottom panel to form said package sleeve, said package engaging lock means comprising a foldable retaining tab on each of said side walls, each of said side walls having a cutout and said foldable retaining tabs being hingedly attached to and



extending from the cutouts in said side walls, said retaining tabs cooperating with and foldable around the cutouts in the side wall panels of the modular display packages to hold the modular display packages securely in place said plurality of modular display packages comprises a pair of modular display packages positioned in side-by-side position, so that one sleeve retaining tab is foldable around a cutout in one modular display package side wall and another sleeve retaining tab is foldable around a cutout in another modular display package.

4,627,537

LID FOR DRINKS CONTAINER

John D. Rogers, Ontario, Canada, assignor to Amhil Enterprises Ltd., Mississauga, Canada

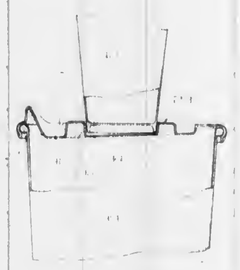
Filed Jul. 12, 1985, Ser. No. 754,163

Claims priority, application United Kingdom, Nov. 19, 1984, 8429214

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.⁴ B65D *21/02, 41/26*

U.S. Cl. 206—501 **16 Claims**



1. A circular lid for a container of liquids, which lid is vacuum formed in thin extruded sheet plastic; wherein

the lid includes a depressed well, which is surrounded by a raised ridge which is in turn surrounded by a depressed trough, which is in turn surrounded by a rim, each of said well, ridge, trough and rim being substantially circular;

the bottom of the well and the top of the ridge each being flat;

the side walls and top of the ridge being of such height and radial width that a person's thumb and forefinger can be easily placed well in contact with the respective side walls, one inside and one outside the ridge;

the plane of the bottom of the well being at a small angle to the plane of the top of the ridge, such that the height of the side walls of the ridge varies around the circumference of the ridge;

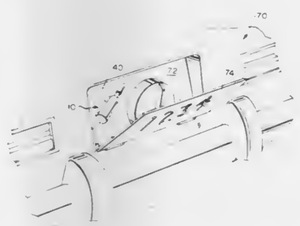
there being a cut or slit in the trough outside the ridge;
the orientation at which said walls are the highest with respect to the bottom of the well being substantially coincident with the orientation at which the said cut is formed;
said cut or slit being so placed that when a finger and thumb are in place on either side of said ridge, one of said finger and thumb, upon squeezing the ridge, enters the cut or slit and thereby tends to spread the cut or slit so that liquid may be poured therethrough; and
said cut or slit being out of line with the axis of extrusion or grain of the extruded sheet.

4,627,538

VESSEL CLOSURES AND METHOD OF FORMING THE CLOSURES

Nick H. Kafkis, 8537 Skokie Blvd., Skokie, Ill. 60077

Filed Mar. 25, 1985, Ser. No. 715,920
Int. Cl.[4] B65D *27/12, 85/00*
U.S. Cl. 206—524.1 **18 Claims**



1. An improved vessel closure for a vessel having an elongate filling/dispensing tube with an open end, said vessel having a liquid therein, said improvement comprising:
the open end of said tube having a closed end, said closed end formed by a portion of the tube heat sealed to itself;
said tube further including means for reusably sealing said open end which can be utilized to reseal said tube after use; and
adhesive means secured to said vessel for affixing said vessel to a convenient surface, wherein said vessel includes a lock deicing liquid therein and said vessel is affixed to a surface on the outside of an automobile by said adhesive means.

7. A method of sealing and mounting a vessel, comprising:
providing a vessel having an elongate filling/dispensing tube with an open end, said vessel having a liquid therein;
closing the open end of said tube by sealing said open end, including reusably sealing said open end by folding said open end of said tube back against said tube and securing said folded over open end to said tube; and
securing adhesive means to said vessel to affix said vessel to a convenient surface, including securing said folded over open end to said tube by placing a tube of heat shrinkable material over at least said open end and said tube and heat shrinking said material to form said seal.

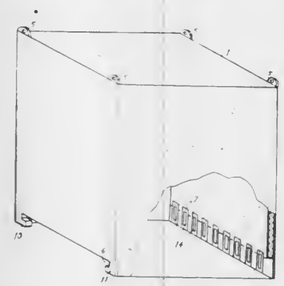
4,627,539

METHOD OF AND APPARATUS FOR TRANSPORTING GOODS

Wei-Chuan Chang, 49 Tung-An Lane, Lao-Pi Village, Nei-Pu Hsiang, Ping Tung Hsien, and Yang Yin-Lung, 24-4 Lane 51, Yung Nien Street, Kaohsiung, both of Taiwan

Filed Apr. 24, 1984, Ser. No. 603,353
Int. Cl.[4] B65D *19/00*
U.S. Cl. 206—597 **2 Claims**

1. An apparatus for loading and shipping a consignment of goods, said apparatus comprises a bottomless container case, a removable railing bottom plate and, a pallet, said bottomless container case having bottom opening wide opened to each side wall of the container case, said pallet comprising a base plate in the same size as the bottom opening of the container case plus the thickness of the side walls, a number of railing bars being fixedly arranged in parallel and equal apart on said base plate occupying a size little smaller than the bottom opening, so that said railing bars can project into the bottom opening of the container case when the latter is put to cover the pallet, a slot and certain number of hook rings or sockets which serve as automatic connections means for the railing bottom plate are formed at lower edges of the front and rear side walls of the container case respectively, the railing bottom plate comprising a same number of railing bars minus 1 as the pallet and are arranged in parallel and equal apart, they have a common lateral bar formed at their forward ends, on the other end



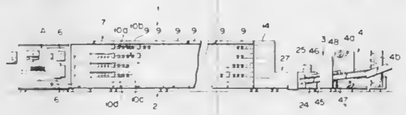
of them having notches formed thereon for the automatic connection means, each railing bar of the railing bottom plate is made smaller in width and height than the space between the paralleled railing bars and the height of the railing bars of pallet respectively, but are longer in length in order that when the railing bottom plate is to be inserted into the container case through said slot and the interval gaps of the railing bars of the pallet, they are long enough to reach into the hook rings or sockets for the automatic connection, thus when the container case is lifted to transport, both ends of the railing bars of the bottom plate may be lifted up by said automatic connections like a sedan chair and transferring the consignment from the pallet onto the railing bottom plate.

4,627,540

AUTOMATIC MAIL PROCESSING APPARATUS

Kazuo Takeda, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 496,989
Claims priority, application Japan, May 29, 1982, 57-91688; May 29, 1982, 57-91689
Int. Cl.[4] B07C *5/10*
U.S. Cl. 209—555 **5 Claims**



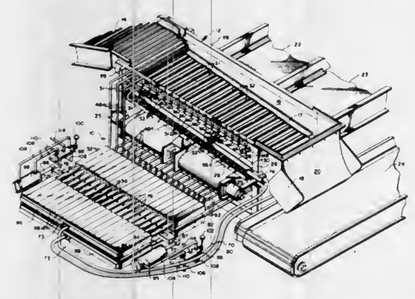
1. An automatic mail processing apparatus comprising:
reading and sorting means for (i) reading out mail sorting data, (ii) forming mail stacks in accordance with said sorting data, and (iii) automatically and successively removing the mail stacks;
convey means for transporting, along one direction, a stack of mail removed from said reading and sorting means;
labeling means, provided on said convey means downstream of the reading and sorting means along said one direction, for attaching a label bearing the corresponding sorting data to a stack of mail transported by said convey means from said reading and sorting means;
bundling means provided on said convey means downstream of said labeling means, for bundling a mail stack having said label attached thereto by said labeling means;
detection means disposed between said labeling means and said bundling means for detecting a thickness of a mail stack transported by said convey means; and
mail reject means disposed between said detection means and bundling means and including (a) a reject member movable between a first inoperative position relative to said convey means and a second operative position relative to said convey means, and (b) actuation means for normally holding said reject member in first inoperative position and for moving said reject member from said first inoperative position to said second operative position to thereby remove said mail stack from said convey means in response to said detection means detecting a thickness of said mail stack less than a predetermined thickness which is sufficient to prevent damage by said bundling means;
said detection means including a light source and light receptor means for receiving light from said light source, said light source and said light receptor means establishing therebetween a light path which tranverse said convey means, and
wherein said light source and said light receptor means are placed at a height corresponding to said predetermined thickness of a mail stack whose rigidness inhibits the bundling action from damaging the mail stack.

4,627,541

APPARATUS AND METHOD FOR SORTING PRODUCE

Lynn F. Johnson, American Falls, Id., assignor to Double L Manufacturing, American Falls, Id.

Filed Jan. 4, 1985, Ser. No. 688,744
Int. Cl.[4] B07B *1/14*
U.S. Cl. 209—668 **47 Claims**



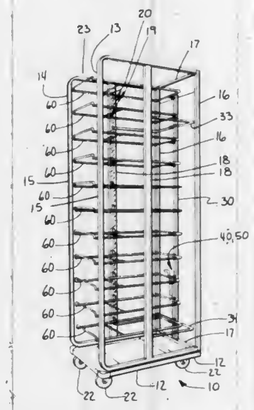
1. An apparatus for sorting products according to size comprising:
a roller conveyor for transporting products placed on said roller conveyor from one end thereof to the other, said roller conveyor comprising a plurality of rollers; and
individual hydraulic means associated with each said roller for hydraulically controlling the position of each said roller so as to individually control the spacing between each pair of adjacent rollers such that the spacing between pairs of adjacent rollers is selectively adjustable in one of a plurality of modes, the modes comprising (a) adjusting all of the rollers at once by a uniform amount, (b) adjusting all of the rollers at once by uniformly increasing or decreasing the spacing between adjacent rollers from one end to the other, and (c) adjusting the spacing between one pair of rollers independently of the spacing between any other pair of rollers, whereby products of a selected size and smaller will drop through the spaces between said rollers while larger products will be transported to the end of said roller conveyor.

4,627,542

DISPLAY APPARATUS HAVING A MECHANISM FOR TILTING SHELVES

Howard J. Fredrickson, Cannon Valley Township, Goodhue County, Minn., assignor to Cornelius Cannon, Inc., Cannon Falls, Minn.

Filed Mar. 18, 1983, Ser. No. 476,751
Int. Cl.[4] A47F *5/13*
U.S. Cl. 211—150 **29 Claims**



1. A combination transport and display cart having multiple bi-stable shelves which are easily moved from a stable horizontal transport position to a stable inclined display position, comprising:
a. an upright frame having opposed sides;
b. pivot means in each side for pivotal support of a plurality of shelves;
c. a plurality of shelves mounted in the frame, said shelves being substantially parallel to each other and being one above the other, each shelf being individually pivotally mounted in the pivot means and having a rotator lever spaced from the shelf's respective axis of rotation;
d. a shelf tilt column connected to said shelf rotator levers, said column being vertically and fore-aft movable with said levers through an arcuate path as the shelves remain parallel to each other and pivotally rotate either from the horizontal to the inclined position or from the inclined to the horizontal position;
e. vertically extendible tilt means connecting the column to the frame for vertically moving the column with respect to the frame, for pivoting the shelves between the positions; and
f. a first hinge on the frame and connecting the tilt means directly to the frame, and a second hinge on the column and connecting the tilt means directly to the column.

4,627,543

COMPRESSION SLEEVE CORNER STRUCTURE FOR ADJUSTABLE SHELVING

Charles W. Nicely, Dallas Township, Luzerne County, Pa., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed Jun. 25, 1985, Ser. No. 748,548
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—187 **5 Claims**

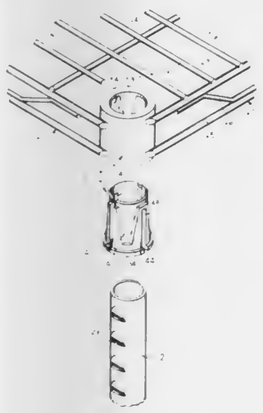
1. In a shelving unit having a plurality of upright posts, at least one shelf, and a corner structure coacting between said shelf and each said post for stationarily securing said shelf to said posts at a selected location, comprising the improvement wherein:
said corner structure includes first and second separable

clamping members for clampingly connecting a corner of the shelf to one of the posts;

said first clamping member comprising a one-piece compression sleeve constructed of a synthetic material and having a bore of substantially uniform diameter extending therethrough for accommodating the post therein, said compression sleeve having a projection which projects radially inwardly of said bore for engagement with a dimple provided in the respective post;

said compression sleeve including a plurality of angularly spaced and axially projecting recesses formed therein and extending axially downwardly from the upper end thereof, said recesses having a width as measured in the circumferential direction of the sleeve which is of a converging tapered cross section as the recess projects axially downwardly, said recesses opening through only a portion of the wall thickness of the compression sleeve so that the recesses open outwardly through the outer annular wall of the sleeve, said recesses having a back wall thereof defined by a surface of generally cylindrical configuration;

said compression sleeve also having a plurality of narrow but axially elongated slots formed therein and extending radially through the sidewall thereof, said plurality of slots including a first slot which is disposed midway between an angularly adjacent pair of said recesses and opens axially



upwardly from the lower end of said compression sleeve, said first slot extending through a majority of the axial length of said sleeve but terminating short of the upper end thereof, said plurality of slots including a second axially elongated slot which is also disposed midway between an angularly adjacent pair of said recesses and opens axially downwardly from the upper end of said sleeve, said second slot extending over a majority of the axial length of said sleeve but terminating short of the lower end thereof;

said second clamping member comprising a one-piece rigid collar constructed as a non-split sleeve member, said collar being fixed to said shelf adjacent a corner thereof so that said collar defines a substantially cylindrical bore which extends coaxially and vertically therethrough;

said collar including a plurality of angularly spaced wedgelike parts which project axially upwardly from the lower end thereof, said wedgelike parts being of a diverging cross section in the peripheral direction of the collar as they project axially upwardly; and

said collar being axially telescoped downwardly over said compression sleeve with said wedgelike parts being wedging received into the recesses of the compression sleeve to effect circumferential compression of the sleeve and radial inward deformation thereof into snug gripping engagement with the post.

4,627,544

CLOTHES HANGER ASSEMBLY

Afra Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S., Treviso, Italy

Filed Jan. 16, 1985, Ser. No. 692,034
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—189 **10 Claims**



1. A clothes hanger assembly comprising a plurality of modular elements provided with accessary holders for the display of garments, said modular elements being adapted to be joined to one another to form a plurality of displays in different shapes and sizes, at least one of said modular elements being formed as a mannequin, said modular elements being formed of tubular components adapted to be engageable with one another, each of said tubular components including straight tubes of different lengths and tubes bent at 90°, said tubular components being engageable with one another by the interposition between at least some of said tubular components of a clamping member, said clamping member comprising:

a sleeve having the same diameter as said tubular components;

a pair of superposed plates disposed in said sleeve and having extremities protruding therefrom for insertion into the ends of the tubular components to be joined, one of said plates being formed with a threaded bore centrally thereof; and

a set screw threaded into said bore through an opening formed in the wall of said sleeve, said set screw bearing on the other of said plates for driving said superposed plates apart, whereby said tubular components to be joined are engaged and clamped.

4,627,545

CAR COUPLER WITH ENLARGED GATHERING ZONE

Donald L. Herbert, Lexington; Lynn A. Schneider, and Zoltan Kovacs, both of Mansfield, all of Ohio, assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jun. 14, 1984, Ser. No. 620,486
Int. Cl.[4] B61G *3/00*
U.S. Cl. 213—100 R **12 Claims**

1. A car coupling head with an enlarged gathering zone matable with a substantially identical head on another car comprising the combination of

a housing having a generally rectangular front plate with a generally flat face and upper and lower horizontal edges;

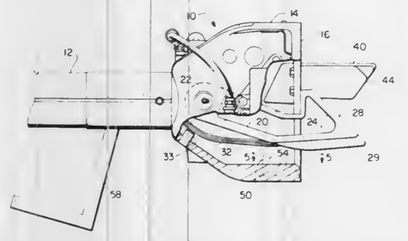
means defining a generally rectangular pocket opening through said front plate, the longer dimension of said pocket opening being horizontal;

a hook pivotally mounted in said housing for movement about a vertical axis,

said hook extending through said pocket opening and having a portion protruding beyond said front face with a majority of the protruding portion lying to one side of the longitudinal center line of said head;

a guide member protruding from a first corner of said front plate and means defining a guide hole in a second corner of said front plate to receive the guide member of a mating head, said first and second corners being on substantially the same horizontal line;

a guide horn mounted near one of said horizontal edges of said front plate and protruding from the face thereof, said guide horn having an inwardly facing surface vertically offset from the closest surface of said hook, said horn being laterally offset from said longitudinal centerline to the other side from said hook;



means defining an opening adjacent said horn for receiving the horn of a mating head; and

a guide wedge mounted in said housing adjacent an edge of said opening for engaging the horn of a mating head to align the respective flat faces of the heads in parallel relationship,

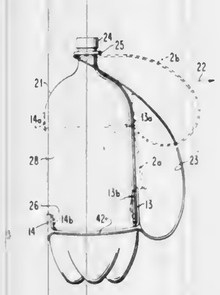
said horn including a portion extending into said housing having a curved surface protruding laterally toward said wedge.

4,627,546

FLEXIBLE DETACHABLE HANDLE AND CARRIER FOR A PLASTIC BOTTLE AND THE COMBINATION THEREOF

Jose R. Carranza, San Francisco, Calif., assignor to Merrick Industries, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 425,353, Sep. 28, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,243
Int. Cl.[4] B65D *23/10*
U.S. Cl. 215—100 A **4 Claims**



1. Structure for use in carrying and pouring from a plastic bottle having a narrowed neck and a cylindrical bottle bottom of greater diameter than said neck, comprising an integral two-ended piece of flat flexible material comprising:

means at one end thereof for attachment to a bottle neck;

means at the other end thereof for attachment to a bottle bottom; and

means, between said one end and said other end, for providing a hand hold thereby to enable a user to carry or pour from any bottle attached to said structure,

wherein said means for attachment to said bottle bottom comprises a flexible and twistable ring having an inner diameter larger than the outer diameter of the bottle bottom to which it is to be attached and adapted to be fitted around the circumference of a lower portion of a bottle below the bottle neck in a bottle-holding mode; and

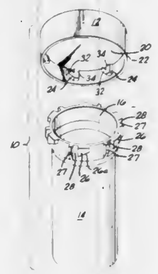
in which said flexible ring is circular and has a pair of stabilizing tabs each extending inwardly for different lengths at opposed diametrical positions of said ring, in-line with said hand hold means and said bottle neck attachment means, said ring and said tabs in bottle-mounted position being twisted from said in-line position to surround said bottle bottom and to extend parallel to vertical sides of said bottle bottom, respectively.

4,627,547

CHILD RESISTANT PACKAGE

Carl W. Cooke, 5106 Perry Park Rd., Sedalia, Colo. 80135

Filed Jan. 3, 1986, Ser. No. 816,009
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—222 **7 Claims**



1. A child resistant package comprising an open-mouthed container and a closure therefor including a top wall and depending skirt portion for receiving and sealing the mouth of said container, resilient means to urge said closure axially away from said container as said closure is drawn into the sealing position over the mouth of said container and cooperating sets of locking elements disposed on the inner surface of the depending skirt portion of said closure and rimming the open mouth of said container, the invention comprising:

one set of said locking elements comprising latch members defining a retaining portion and a stop element and said other set comprising pairs of spaced apart projections defining an openended, through-running channel therebetween for receiving the stop element of a corresponding latch member, the projections providing a positive stop for the stop element to prevent removal of said closure by mere turning, one of the projections engaging the retaining portion of the corresponding latch member to retain said closure in opposition to the urging of the resilient member, there being required the combination of an axially downward force on and a turning of said closure with respect to said container to remove said closure from the sealed and locked position on said container, and in the event said projections are damaged by shearing due to forced removal of the closure and the like, the through-running channels permitting the latch members to be positioned in the channel toward the mouth of said container with the stop element thereof of contiguity with undamaged portions of the projections to retain the locking action between the cooperating sets of locking elements.

4,627,548

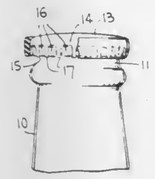
SAFEGUARD FOR SERRATED TWIST-OFF BOTTLE CAP

Kenneth H. Thompson, 4613 Saul Rd., Kensington, Md. 20895

Filed Apr. 26, 1985, Ser. No. 727,677

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—295 17 Claims



1. In combination:

a container having an annular open end defined in a neck portion;

a twist-off cap disposed about said open container end, said twist-off cap having a circumferential sidewall configured as an endless series of serrations in the form of radially outward protrusions alternating with recesses crimped against and in direct contact with said neck portion; and

gripping means in the form of a continuous band disposed circumferentially about said sidewall, said band having a radially inner surface projecting into said recesses and entirely covering said protrusions and recesses, said band having a sufficiently high coefficient of friction to prevent the hand of a user from slipping when turning the band and cap relative to the container end, yet being sufficiently smooth to prevent abrasions when sliding along a user's hand.

4,627,549

BULK CARGO CONTAINERS

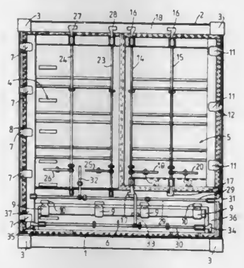
Sheron L. Dudding, Brough, England, assignor to International Ferry Freight Limited, England

Filed Mar. 21, 1986, Ser. No. 842,299

Claims priority, application United Kingdom, Mar. 28, 1985, 8508132

Int. Cl.[4] B65D *7/26*

U.S. Cl. 220—1.5 6 Claims



1. A freight container for bulk and non-bulk cargoes comprising a substantially rectangular hollow box-like structure having at least one opening therein through which a cargo in bulk form may be loaded, two main doors (4,5) at one end of the container through which non-bulk cargo may be loaded and unloaded and a substantially full width bulk discharge hatch (6) incorporated in one of the two main doors (4,5) through which bulk cargo may be unloaded.

4,627,550

CONTAINER WITH TAMPER-EVIDENT LID

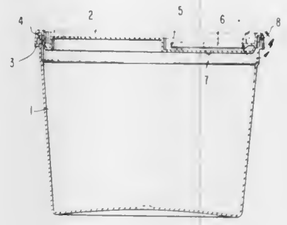
Keith W. Dines, Grays, England, assignor to Dines Plastics Limited, Essex, England

Continuation of Ser. No. 550,587, Nov. 10, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,773

Claims priority, application United Kingdom, Nov. 12, 1982, 8232326

Int. Cl.[4] B65D *41/16, 41/18*

U.S. Cl. 220—306 10 Claims



1. A tamper-evident lid for a container, the lid being molded as a one piece structure from plastic material and having, as integral parts thereof, a closure element, a securing arm and a release element having a tamper evident facility, the securing element being so arranged that the lid is removable only by using the release element to pull the lid from the container, wherein the closure element includes a recess defined on an upper surface thereof, the recess having an inner peripheral wall, the integral release element being secured in an inactive or stowed position in the recess by integrally molded frangible means so that the integral release element is surrounded by said inner peripheral wall and is located in the recess below the level of the upper surface of the closure element, the frangible means being of such a strength, in relation to that of the securing element, that pulling the release element sufficiently hard so as to pull the lid from the container will cause the release element to move out of the recess into an active position, and in so doing break off the frangible means thus providing a tamper evident facility, the release element then being usable to release the securing means and pull the lid from the container, the upper surface of the lid being unbroken by movement of the release element to the active position whereby the lid, once the frangible means have been broken, is reusable as a sealing lid for the container.

4,627,551

DISPENSER SYSTEM AND METHOD FOR DISPENSING PUTTY-LIKE MATERIAL

Raun A. Kopp, Brunswick, Ohio, assignor to Oatey Co., Cleveland, Ohio

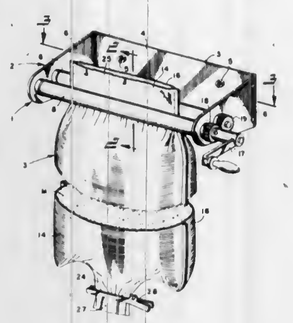
Filed Mar. 5, 1984, Ser. No. 586,118

Int. Cl.[4] B65D *35/28*

U.S. Cl. 222—1 7 Claims

1. A dispenser system for dispensing putty-like material comprising flexible bag-like container means of a size for holding at least approximately two gallons of putty-like material, and a pair of squeeze roller means for squeezing the putty-like material from said container means, said container means being made from two flat plastic sheets placed one on top of the other to form opposed flat sides which are heat sealed along the side edges, top and bottom, said bottom being heat sealed to form a funnel shape spout, the lowermost heat sealed edge of said funnel shape spout being cut off to provide a discharge opening at the bottom of said spout for discharging the material from said container means as said container means is pulled upwardly between said roller means, a hand crank attached to one of said roller means for turning one of said roller means, ratchet-less gear means between said roller means for driving the other of said roller means in unison with said one roller

means but in the opposite direction in response to turning movement of said one roller means in one direction, said roller means having rubber-like cover means thereon having a Shore A Durometer hardness of 45±5 which are compressed against each other approximately 0.050 inch each for frictionally gripping opposite sides of said container means when said container means is inserted therebetween with sufficient force to support the entire weight of said container means when filled



with at least approximately two gallons of such putty-like material without any external force being applied to said roller means or crank, and for pulling said container means upwardly between said roller means without slippage upon turning said crank in such one direction by hand and substantially flattening out the sides of said container means to squeeze out substantially all of the putty-like material from between said sides as said sides pass upwardly between said roller means.

4,627,552

FUEL SUPPLYING APPARATUS

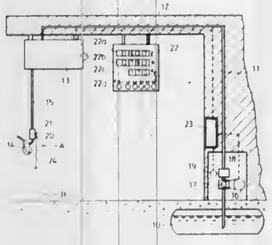
Takeomi Yoshida, Fujisawa; Kazuhisa Yamashita, Kawasaki, and Yukio Miura, Fujisawa, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Oct. 19, 1984, Ser. No. 663,034

Claims priority, application Japan, Oct. 20, 1983, 58-162427[U]

Int. Cl.[4] B67D *5/10*

U.S. Cl. 222—14 6 Claims



1. A fuel supplying apparatus comprising:

(a) a fuel supplying hose having a fuel supplying nozzle provided on a tip end thereof

(b) a pump for supplying fuel to said fuel supplying hose

(c) driving means for driving said pump

(d) measuring means for measuring a flow quantity of the fuel which is supplied through said fuel supplying hose

(e) a mode setting switch provided on said fuel supplying hose at a position in a vicinity of said fuel supplying nozzle

(f) discriminating means coupled to said measuring means and said mode setting switch for discriminating whether the fuel supplying apparatus is in a state before a fuel supplying operation is started or in a state during the fuel supplying operation in response to an output of said measuring means, and for setting the fuel supplying apparatus in a preset quantity supplying mode when said mode setting switch is manipulated in the state before the fuel supplying operation is started and setting the fuel supplying apparatus in an integral quantity supplying mode when said mode setting switch is manipulated in the state during the fuel supplying operation, said discriminating means producing an output indicating the mode of the fuel supplying apparatus; and

(g) control means coupled to said discriminating means for controlling said driving means in response to the output of said discriminating means so that a preset quantity fuel supplying operation is performed to supply a fuel supplying quantity which is preset in response to a manipulation of said mode setting switch when the output of said discriminating means indicates the preset quantity supplying mode and an integral quantity fuel supplying operation is performed to supply a minimum integral fuel supplying quantity when the output of said discriminating means indicates the integral quantity supplying mode, said minimum integral fuel supplying quantity being greater than a quantity of supplied fuel at a time when said mode setting switch is manipulated.

4,627,553

FUEL SUPPLYING APPARATUS HAVING QUANTITY AND PRICE PRESET SWITCHES

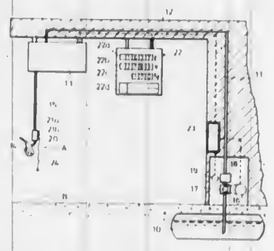
Takeomi Yoshida, Kanagawa; Kazuhisa Yamashita, Kawasaki, and Yukio Miura, Fujisawa, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Jan. 18, 1985, Ser. No. 692,913

Claims priority, application Japan, Jan. 20, 1984, 59-5857[U]

Int. Cl.[4] B67D *5/30*

U.S. Cl. 222—14 5 Claims



1. A fuel supplying apparatus comprising: a fuel supplying hose having a fuel supplying nozzle provided on a tip end thereof;

preset switch means comprising a fuel supplying quantity preset switch and a fuel supplying price preset switch provided on said fuel supplying hose at a position in the vicinity of said fuel supplying nozzle, said fuel supplying quantity preset switch being a switch for selectively and sequentially presetting a predetermined quantity of fuel for preset quantity fuel supplying operation in response to the number of manipulation times of the switch, said fuel supplying price preset switch being a switch for selectively and sequentially presetting a predetermined price of fuel for preset price fuel supplying operation in response to the number of manipulation times of the switch;

indicating means for indicating either one of the predetermined quantity and the predetermined price preset by said preset switch means; and

control means for presetting either one of the preset quantity or the preset price selected from a predetermined plural number of preset quantities and a predetermined plural number of preset prices, in response to the selective manipulation of either one of said fuel supplying quantity preset switch and said fuel supplying price preset switch

as well as to the number of manipulation times of the selected switch, said indicating means indicating said preset fuel quantity or said preset fuel price preset in said control means,

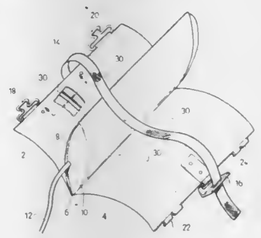
said control means changing the fuel supplying mode from one of the preset quantity fuel supplying mode and the preset price fuel supplying mode to the other mode, during a fuel supplying operation, whereby said selective manipulation of one of said fuel supplying preset switches places said apparatus in the respective fuel supplying mode and said fuel supplying mode is changed, during said fuel supplying operation, when the other of said fuel supplying preset switch is manipulated.

4,627,554

DEVICE FOR DISPENSING A LIQUID FROM A COLLAPSIBLE CONTAINER

Saul Leibinsohn, 11 Olei Hagardom Street, Rishon Lezion, Israel

Filed Jan. 24, 1985, Ser. No. 694,250
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—103 **17 Claims**



1. A device for dispensing a liquid from a collapsible container, comprising: a pair of elastic plates hingedly mounted to each other along one edge permitting them to be pivoted to an open position or to a closed position; a sleeve of flexible material secured to the pair of elastic plates along their hinged edges for receiving a liquid-filled collapsible container; each of said pair of elastic plates being pre-formed with a curve which is convex from the side facing said flexible sleeve such that when the liquid-filled collapsible container is received within said flexible sleeve and the two curved elastic plates are pivoted to their closed positions, they apply, due to their elasticity, a continuous force to the collapsible container for dispensing the liquid therefrom; each of said elastic plates being sectioned along parallel lines perpendicular to their hinged edges such as to permit compact folding of the assembly when not in use; and retainer means for releasably retaining said pair of elastic plates in their closed position.

4,627,555

INGREDIENT FEEDER APPARATUS

Michael P. Locke, 15 Reppert Blvd., Uniontown, Pa. 15401

Filed Apr. 19, 1985, Ser. No. 725,236
Int. Cl.[4] G01F *11/20*
U.S. Cl. 222—200 **19 Claims**

1. An ingredient feeder apparatus for adding a first ingredient to a second ingredient, said apparatus comprising:

(a) a hopper adapted to receive and discharge a first ingredient;

(b) a rotating auger located within said hopper, with a portion of said auger extending out of said hopper;

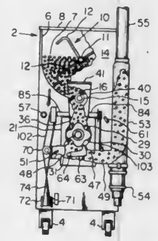
(c) a cylindrical auger housing surrounding the portion of said auger extending out of said hopper, said auger housing having a discharge opening formed therein;

(d) a metering wheel housing having a top positioned beneath said auger housing, said metering wheel housing having an inlet and an outlet formed therein and a metering wheel located within said metering wheel housing, with said inlet in said metering wheel housing being aligned with said auger housing discharge opening;

(e) a hollow chamber funnel pivotally mounted to said auger housing and surrounding said auger housing discharge opening, said funnel having a lower end spaced above the top of said metering wheel housing and said funnel being positioned to direct a first ingredient passing from said auger housing discharge opening and into said metering wheel housing inlet;

(f) means forming a passage having an inlet end and an outlet end and extending beneath said metering wheel housing outlet, said passage having an intermediate opening in communication with said metering wheel housing outlet, whereby a first ingredient discharged from said metering wheel housing outlet is dispensed into a second ingredient flowing through said passage;

(g) means for oscillating said funnel relative to said auger housing which includes a first arm connected to said funnel and extending outwardly therefrom over the top of



said metering wheel housing, a second arm connected to said funnel and extending outwardly therefrom over the top of said metering wheel housing and in a direction generally opposite that of said first arm, resilient means connecting said first arm to a fixed point, and means connecting said second arm to a vertically reciprocating means; and

(h) means for periodically and abruptly stopping the oscillation of said funnel, said means generating a force on said funnel sufficient to jar loose any first ingredient which becomes lodged in said funnel or in said metering wheel housing inlet, whereby said oscillation of said funnel results from both the force exerted on said second arm from said reciprocating means and from the force exerted on the first arm when the resilient means is tensioned during the motion of said funnel about said auger housing from said reciprocating means and the oscillation of said funnel being periodically and abruptly stopped when said first arm and said second arm strike the top of said metering wheel housing.

4,627,556

ICE DISPENSER FOR A HOUSEHOLD REFRIGERATOR

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

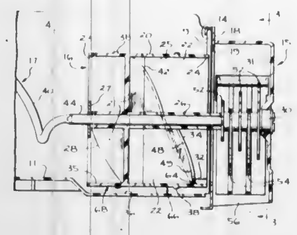
Filed Jul. 26, 1984, Ser. No. 634,745
Int. Cl.[4] B65G *65/46*; F25C *5/16*; G01F *11/24*
U.S. Cl. 222—240 **12 Claims**

1. An ice piece dispenser comprising:

a receptacle for storing ice pieces and including a front plate having a discharge opening therein;

dispensing means horizontally supported in said receptacle and including,

a rotatable feed section having an inlet end and a discharge end and a central axle, said feed section comprising two separate bodies mated together and having a cylindrical collar adjacent the front plate and a double bladed screw auger forming two helical passages, said blades extending from the central axle to the collar with the junction of the blades and central axle being spaced rearwardly from the front plate and the trailing edge of each blade being curved rearwardly in the direction of the inlet end of the feed section between the axle and collar sufficiently to prevent ice pieces being wedged



between the front plate and the blades during rotation of the feed section,

a rotatable wire auger secured to the rotatable feed section, and

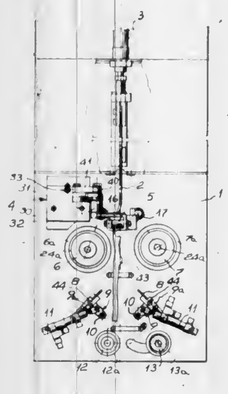
drive means engaging the rotatable wire auger at the end opposite the feed section.

4,627,557

APPARATUS FOR REVERSING HOSE

Armando Canton, Solbiate Arno, Italy, assignor to Fadis S.p.A., Solbiate Arno, Italy

Filed Sep. 30, 1985, Ser. No. 782,297
Claims priority, application Italy, Sep. 28, 1984, 22902 A/84
Int. Cl.[4] D05B *21/00*
U.S. Cl. 223—39 **10 Claims**



1. An apparatus for reversing hose, comprising:

gripper means engageable with a toe of an article of hose to be reversed, with said article depending from said gripper means and shiftable horizontally from a position in which said gripper means engages said article into a reversing position;

a first pair of rollers disposed at said reversing position and receiving said article between them and relatively displaceable toward and away from one another to engage said article below said toe upon displacement of said article by said gripper means into said reversing position;

a vertically elongated blade disposed above the first pair of rollers and provided with means for lowering said blade whereby said blade is engageable with said toe of said article to carry said toe downwardly between said rollers of said first pair while counterrotation of said rollers causes said article to turn inside out along said blade; and

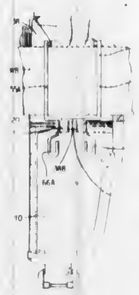
a second pair of rollers disposed below said first pair and engageable with said article on said blade while being rotatable opposite the rollers of said first pair to draw the article, turned inside out, off said blade.

4,627,558

UNIVERSAL MILITARY HOLSTER

John E. Bianchi; Martin R. Miller, and Richard D. E. Nichols, all of Fallbrook, Calif., assignors to Bianchi International, Temecula, Calif.

Filed Sep. 26, 1984, Ser. No. 655,036
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—238 **8 Claims**



1. A holster including a sheet of material formed to define a pouch having a pair of major faces with an opening for the insertion and removal of a handgun therefrom;

an overlying layer on each of the major faces of said holster;

said overlying layer including a pair of generally horizontal slots aligned above one another and with the next adjacent layer defining a flat passage therebetween;

clip means including a first portion including a substantially flat region generally coextensive in width with said flat passage and with length greater than the distance between said slots engagable with said holster through said slots and said flat passage and said clip means including a pair of overlying pivotal resilient means extending at least the distance between said slots adapted to enclose a belt between the adjacent overlying layer and said overlying pivotal resilient means;

the first portion of said clip means including a hinge for said pivotal resilient means positionable in the region of one of said slots and a catch for said overlying pivoted resilient means spaced from said hinge a sufficient distance to extend out of the other of said slots.

4,627,559

ROOF RACK FOR A VEHICLE

Sven R. Andersson, Sollebrunn, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 19, 1984, Ser. No. 622,249
Claims priority, application Sweden, Jun. 20, 1983, 8303535
Int. Cl.[4] A45C *1/04*
U.S. Cl. 224—329 **8 Claims**



1. Roof rack section for a vehicle, comprising a crossbeam provided at either end with a foot which is formed with mounting means for enabling mounting of the roof rack section above the vehicle roof in a transverse direction, characterized in that said mounting means at each foot comprises at least two fixed

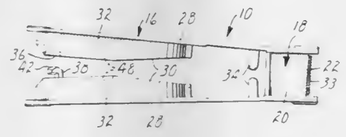
location pins which are directed inwardly in the longitudinal direction of the crossbeam, and adapted for accommodation in permanent recesses in the vehicle body intended for this purpose when the roof rack section is fitted to the vehicle, and in that said roof rack section is provided with clamping means which can, by manual operation, cause the feet to assume different mutual spacing and thereby enable clamping the section to the vehicle body by the feet being caused to bear against the respective sides of the vehicle body, while the locating pins locate in the recesses in the vehicle body.

4,627,560

DISPENSER FOR TAPE WOUND ON THREE INCH CORES

Bruce E. Samuelson, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 22, 1985, Ser. No. 736,255
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—66 **3 Claims**



1. In a tape dispenser comprising a frame including a tape guide portion having inner and outer ends, oposite edges extending between said ends, and a generally planar tape guide surface; side wall portions attached to said opposite edges of said guide portion and including parts projecting past the inner end of said guide portion; and arcuate hub portions having an axis attached to and projecting inwardly from said parts of said side wall portions in oposed positions spaced from said guide portion, said hub portions being adapted to support a roll of pressure sensitive adhesive coated tape for rotation about said hub portions with the periphery of said roll spaced from the inner end of said guide portion; and means for cutting the tape disposed along the outer end of said guide portion; the improvement wherein said hub portions are adapted to suport a roll of pressure sensitive adhesive coated tape having a three inch diameter central opening, one of said hub portions has a rib projecting at generally a right angle to said axis, and the other of said hub portions includes walls defining a slot adapted to receive said rib in a close fitting relationship, said rib and said walls defining said slot being disposed only along parts of said hub portions diametrically opposite parts of said hub portions adjacent said tape guide portion, and said hub portions and said parts of said side wall portions being resiliently bendable to facilitate positioning said rib in said slot to restrict relative movement of said hub portions in a direction parallel to said axis during use of the dispenser, and to facilitate removing said rib from said slot to change the roll of tape.

4,627,561

FIBER OPTIC TERMINUS CLEAVING APPARATUS

Marik Balyasny, Van Nuys; Kenneth B. Baldwin, Newbury Park, and William E. Lovell, Los Angeles, all of Calif., assignors to G&H Technology, Inc., Santa Monica, Calif.

Filed Nov. 12, 1985, Ser. No. 796,703
Int. Cl.[4] C03B *37/16*
U.S. Cl. 225—96 **12 Claims**

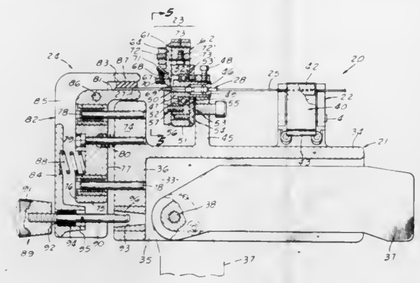
1. Apparatus for cleaving the end portion of an optical fiber extending from a contact within which it is held such that the cleaved fiber end is located slightly recessed within the contact, comprising:

a base;

selectively releasable fiber holding means mounted on the base;

fiber pretensioning means mounted on the base for clampingly engaging the fiber end portion and placing it in tension along the fiber longitudinal axis; and

fiber scoring means mounted on the base intermediate said holding means and said pretensioning means including;



rotor means having a bore extending therethrough, the bore axis coinciding with the rotational axis of said rotor means,

means for supporting the contact within the rotor means bore in a fixed predetermined position, and

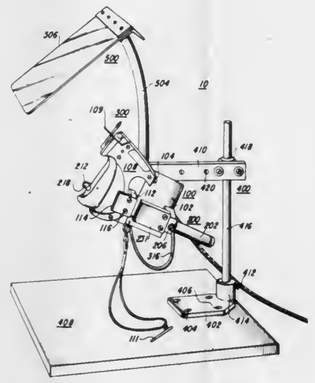
knife blade means mounted to rotate with said rotor means and having a knife edge means for contacting the fiber end portion at the point at which said fiber end portion leaves the contact for scoring the fiber on rotor rotation.

4,627,562

OPERATION OF TRIGGER ACTUATED DEVICES

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 13, 1984, Ser. No. 670,104
Int. Cl.[4] A43D *69/00*
U.S. Cl. 227—67 **6 Claims**



1. In combination: a hand-holdable fastener dispensing gun which includes a pivoted trigger, means for supporting and for pivoting said gun to a prescribed position to facilitate the operation thereof by an operator;

wherein said means for supporting and for pivoting said gun further comprises means for mounting and aligning said gun, a source of high pressure fluid, a trigger pulling assembly responsive to said source, means for cooperating with said trigger pulling assembly for controlling said source, and support means cooperating with said means for mounting and aligning to retain said gun in a nonvertical operational position;

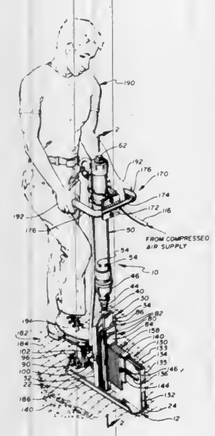
and wherein said means for supporting and for pivoting said gun further comprises an attachment plate rotatably mounted to said support means, and in fixed relation to said means for mounting and aligning, and an extension bar attached to said attachment plate.

4,627,563

DEVICE FOR DRIVING U-SHAPED ANCHORS INTO THE GROUND

Dennis W. Meyer, 635 Julie St., Willmar, Minn. 56201

Filed Aug. 20, 1985, Ser. No. 767,785
Int. Cl.[4] B25C *5/06, 5/13*
U.S. Cl. 227—130 **12 Claims**



1. A device for driving a U-shaped anchor into the ground comprising an elongated sole plate having a bottom surface adapted to engage the upper surface of sheet-like material at a site where the anchor is to be inserted, said sole plate having a transverse slot therein possessing a rectangular shape through which said anchor is to be driven, means on said sole plate for advancing said U-shaped anchor in a horizontal and longitudinally directed relation to said sole plate into registry with said transverse slot, actuating means on said sole plate including a plunger having a lower end corresponding generally to the rectangular shape of said slot for striking the closed end of said U-shaped anchor, guide means engaging said plunger to maintain the lower end thereof in an angularly oriented relationship with said transverse slot so as to cause the lower end of said plunger to drive said anchor downwardly through said slot, through said material and into the ground, and means for limiting the downward travel of said actuating means and hence the downward travel of said plunger so that the lower end of said plunger projects a distance slightly beneath the bottom surface of said sole plate when said plunger has completed its downward stroke.

4,627,564

APPARATUS FOR FORMING A TRUSS ASSEMBLY

Donald M. Bowser, Barrie, Canada, assignor to Truswal Systems Corporation, Madison Heights, Mich.

Filed Mar. 2, 1984, Ser. No. 585,906
Int. Cl.[4] B27F *7/15, 7/32*
U.S. Cl. 227—152 **15 Claims**

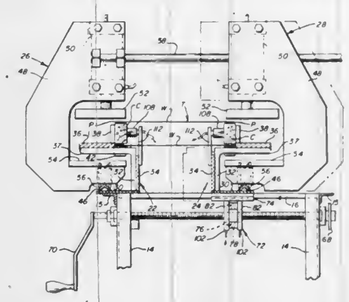
1. An apparatus for forming a truss assembly having a pair of spaced chords and a plurality of webs extending between the chords and connected thereto with connector portions, the apparatus comprising:

a frame;

first and second laterally spaced support rail means supported by said frame in generally parallel relation for receiving said chords and said webs for fabrication of the truss assembly;

means mounting said first and second support rail means for relative lateral movement with respect to each other; and

means for effecting said relative lateral movement of said first and second support rail means, comprising means for moving one of said support rail means laterally of said frame to facilitate formation of truss assemblies of varying finished heights, and fluid pressure means for urging said one support rail means toward the other of said support rail means during formation of said truss assembly,



said second support rail means being supported by said frame for lateral movement with respect thereto, said moving means comprising means for laterally moving said second support rail means,

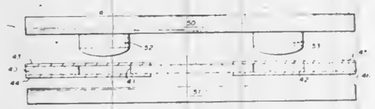
said apparatus including first and second pressure clamp means respectively mounted on said first and second support rail means for selective positioning longitudinally of said frame for applying clamping pressure to the connector portions of said truss assembly, said second clamp means being movable with said second support rail means laterally of said frame.

4,627,565

MECHANICAL BONDING OF SURFACE CONDUCTIVE LAYERS

Robert B. Lomerson, Rte. #9, Box 196, Fort Worth, Tex. 76179

Continuation of Ser. No. 359,607, Mar. 18, 1982, abandoned.
This application Apr. 16, 1984, Ser. No. 600,213
The portion of the term of this patent subsequent to Oct. 9, 2002, has been disclaimed.
Int. Cl.[4] B23K *20/06*
U.S. Cl. 228—107 **3 Claims**



1. A method for establishing an electrically conductive path through an insulating plate which comprises the steps of:

(a) forming a hole through said plate,

(b) placing conductive material over each opening of said hole and in flush contact with each surface of said plate, and

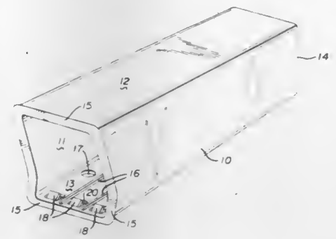
(c) applying opposed forces against said conductive materials to drive them into contact through said hole where said forces are of magnitude and character to produce a cold weld metallurgical junction between said conductive materials at the zone of contact where said opposed forces are applied by the shock wave created by the detonation of an explosive material.

4,627,566

NEWSPAPER DELIVERY TUBE WITH NEWSPAPER RETAINING FLAPS

C. Kenneth Fibus, Youngstown, Ohio, assignor to The Steel City Corporation, Youngstown, Ohio

Filed Jul. 22, 1985, Ser. No. 757,422
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—1 C **9 Claims**



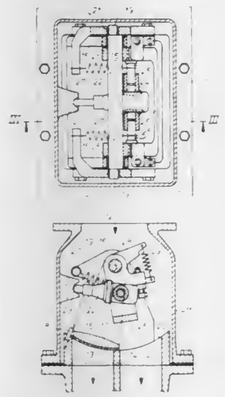
1. A newspaper delivery tube for the deposit of newspapers and the like having means for retaining newspapers therein and comprising a tubular body having upper, lower and side walls with inner and outer surfaces and an open end and a closed end, said newspaper retaining means consisting of a plurality of flaps normally extending upwardly from said inner surface of said lower wall and positioned transversely of said lower wall and adjacent said open end of said tubular body, said tubular body being formed of a resilient deformable synthetic resin with said flaps formed in said lower wall in first positions on a plane common with said lower wall and movable to second positions upstanding with respect to said first positions, means on said flaps for normally holding the same in said upstanding second positions relative to said lower wall of said tubular body.

4,627,567

PIVOTAL SLIDE VALVE

Walter Thorn, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,456
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444417
Int. Cl.[4] F01P *7/16;* **F16K** *11/052*
U.S. Cl. 236—34.5 **12 Claims**



1. A pivotal slide valve for the temperature-dependent control of the through-flow of a cooling medium, comprising valve housing means provided with an inlet and two outlet openings, a closure member constructed as pivotal slide valve member pivotable to control the flow through the two outlets and supported on a shaft, the shaft being eccentrically supported in the valve housing means by way of bearing means connected with the valve housing means, a valve actuating working element in the valve housing which is circumcirculated by the cooling medium and supported at the valve housing means, and counter-abutment means in the housing attached to and movable by the working element, said counter-abutment means being supported in a lug means securely connected with said shaft, the lug means being provided with an adjustable stop means for connecting and driving the pivotal slide valve member between the two outlets after a predetermined movement of the counter-abutment means.

9. A pivotal valve element according to claim **1**, wherein the working element is temperature responsive to the cooling medium to expand and move the counter-abutment means in response to a heating of the cooling medium.

4,627,568

MOISTURE ELIMINATOR FOR AIR WASHER

Richard P. Lortie, Winston-Salem, N.C.; Philippe H. Vercaemert, Littleton, Mass., and Douglas L. Gunnell, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 11, 1984, Ser. No. 599,245
Int. Cl.[4] G05D *21/00;* **B01D** *19/00*
U.S. Cl. 236—44 B **19 Claims**



1. An air conditioning system for maintaining a conditioned zone at predetermined temperature and humidity levels comprising in combination

(a) an air washer comprising a water spray section, means for supplying water to said water spray section and for collecting excess spray water, and a moisture eliminator adjacent to said water spray section having a maximum effective face area through which a stream of air to be treated by the air washer passes,

(b) damper means for admitting to said air washer for treatment controlled quantities of outside air and air returned from said conditioned zone,

(c) means for moving variable volumes of air per unit of time through said air washer, and

(d) means for changing the effective face area of said moisture eliminator in response to changes in the volume of air moving through the air washer per unit of time.

4,627,569

FOUR FUNCTION PNEUMATIC CONTROLLER

John C. Morris, Castro Valley, Calif., assignor to Staefa Control System Inc., San Diego, Calif.

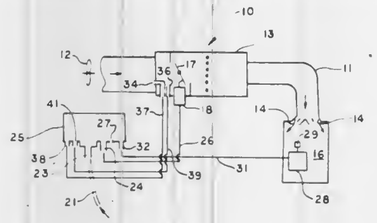
Filed Jun. 10, 1985, Ser. No. 743,163
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49 **18 Claims**

1. A pneumatic controller for use in controlling air flow in a distribution system for supplying conditioned air to a room, comprising,

a housing with input ports for total air, static air, and main air supply, for connection to conduits leading to a velocity probe and a static air monitor in a duct of the system, and to a supply of compressed air, and with an actuator output port for connection to a conduit leading to an actuator or motor operating an air flow damper in the duct, for control of the actuator by the controller,

differential pressure responsive valve means in the housing for receiving total air and static air inputs and for adjusting a flow of compressed air between the main air supply input port and the actuator output port in response to the magnitude of a pressure differential between the total air and the static air, said valve means comprising a single differential pressure responsive valve member for all modes of operation of the controller, and including spring means biasing the valve means against the influence of the pressure differential,

a reset unit connected to the housing with a reset input port for connection to a conduit leading to a thermostat in the



room, of the type which adjusts a flow of compressed supply air in response to changes in temperature in the room relative to a set point temperature on the thermostat, the reset unit including air pressure responsive shifting means for controlling the position of a spring-biased movable shifter in response to input of compressed air at the reset input port,

reset means for adjusting the pressure of the spring means to thereby adjust the level of pressure differential required to move the differential pressure responsive valve means against the spring means, in response to movement of said shifter in the reset unit, and

system variation accommodation means for enabling reconfiguration of the controller as a direct acting/direct reset controller, a reverse acting/reverse reset controller, a direct acting/reverse reset controller or a reverse acting-/direct reset controller, to accommodate different types of actuation and thermostats in different systems utilizing a single differential pressure responsive valve means.

4,627,570

FUEL INJECTION UNIT FOR EACH CYLINDER OF A DIESEL ENGINE

Josef Morell, and Harnld Schmidt, both of Vienna, Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 6, 1984, Ser. No. 577,133
Claims priority, application Austria, Feb. 17, 1983, 541/83
Int. Cl.[4] F02M *47/00*
U.S. Cl. 239—90 **9 Claims**

1. A fuel injection unit for each cylinder of a diesel engine, said fuel injection unit comprising a housing,

a pump cylinder within said housing, said pump cylinder having an inner wall defining a working surface having a predetermined inner diameter,

a section chamber communicating fuel to said pump cylinder through a fuel bore,

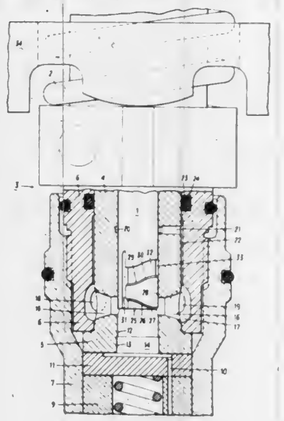
an injection nozzle communicating with said pump cylinder, said injection nozzle having a spring-loaded needle valve for delivery of fuel from said pump cylinder to said diesel engine cylinder,

a cover disposed between an end of said pump cylinder and said injection nozzle,

a securing flange disposed between said fuel bore and said cover,

tensioning means for stressing said securing flange against said cover, and

a piston disposed within said pump cylinder, said piston including a front end facing said cover, said piston having a peripheral surface having a predetermined outer diameter, said peripheral surface separated from said working surface of said pump cylinder by a very small clearance, said piston being rotatably and reciprocally movable within said pump cylinder, said piston passing over said fuel bore with its front end during its reciprocal movement within said pump cylinder, said piston being pro-



vided with slanted front and rear control edges for regulating the quantity of fuel communicated to said pump cylinder through said fuel bore, said slanted front control edge being located adjacent to said front end of said piston,

wherein said pump cylinder includes a cylindrically offset region of said working surface having an inner diameter which is larger than said predetermined inner diameter, said region of enlarged inner diameter being located opposite to said securing flange, and

wherein said front control edge of said piston is formed on the peripheral surface of said piston with a first recess and a step adjacent thereto, so that the outer diameter of said first recess and step are smaller than said predetermined outer diameter.

4,627,571

FUEL INJECTION NOZZLE

Masaaki Kato; Hirotaka Nakatsuka, both of Kariya; Shigeki Tojo, Mie, and Kazuyoshi Arai, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 14, 1985, Ser. No. 711,838
Claims priority, application Japan, Mar. 15, 1984, 59-49664
Int. Cl.[4] F02M *47/02*
U.S. Cl. 239—90 **8 Claims**

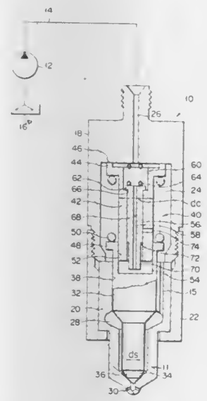
1. A fuel injection nozzle which is adapted to be connected to a fuel injection pump and which serves to inject fuel into a combustion chamber in an internal combustion engine, comprising:

a body in which a suction passage and an accumulating chamber are defined, the suction passage being adapted to be connected with a fuel injection pump and the accumulating chamber being connected with the suction passage;

a non-return valve means for allowing the fuel to flow from the suction passage to the accumulating chamber but

prohibiting the fuel from flowing from the accumulating chamber to the suction passage, thereby storing the fuel in the accumulating chamber, the fuel being supplied from a fuel injection pump and having a certain pressure and amount, and the non-return valve means including a valve nember which is arranged in the accumulating chamber, is movable along the axis of the body and is urged, with a predetermined force, in a direction for closing the connection between the suction passage and the accumulating chamber, a connector recess being formed at one end of the valve member that faces the suction passage, the connector recess communicating with the suction passage even when the connection is closed;

a needle valve means for injecting the fuel stored in the accumulating chamber into a combustion chamber in an engine, the needle valve means including a nozzle needle



arranged coaxially and in series with the valve member with end portions thereof being adjacent, the nozzle needle being urged in the opposite direction to the valve member, one of the adjacent end portions of the valve member and the nozzle needle being slidably and liquid-tightly fitted into the other to define therein a damping chamber;

a damping plunger coaxially fitted into the valve member in the manner that the damping plunger is urged toward the nozzle needle and has one end protruding into the damping chamber and engageable by the nozzle needle, the damping plunger including a through hole for communicating the damping chamber with the connector recess; and

throttle means disposed in the through hole in the damping plunger, for restricting the fuel flow between the damping chamber and the connector recess.

4,627,572

MODULAR CENTRAL-PILLAR ASSEMBLIES FOR CENTER-PIVOT IRRIGATION APPARATUS

Theodore V. Olson, Box 758, and Theodore D. Olson, Jr., R.R. 4, both of Atkinson, Nebr. 68713

Continuation-in-part of Ser. No. 515,780, Jul. 21, 1983, abandoned. This application Jan. 24, 1985, Ser. No. 694,655

Int. Cl.[4] B05B *3/00*

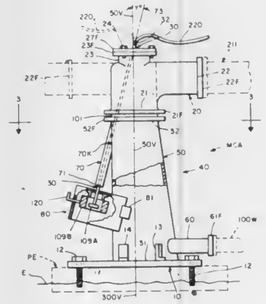
U.S. Cl. 239—728 **7 Claims**

1. For a self-propelled sprinkler irrigation apparatus of the type comprising a lenghty water distributing conduit elevated above the earth's surface and adapted to rotate as an axis around a vertical-axis center-pivot site, said site including an earth anchored member and a water inflow-pipe leading toward the vertical-axis, a modular portable central-pillar assembly providing the water flow connection between said inflow-pipe and the water distributing conduit thereabove, said modular central-pivot assembly comprising:

A. base means providing the lower terminus of the assembly and being attachable to the earth anchorable member;

B. outflow-elbow means located loftily above said base means, said outflow-elbow means having a generally horizontal lower inlet-end surrounding said vertical-axis and an outlet-end thereabove that is attachable to the lengthy water distributing conduit;

C. an upright tubular column surrounding a columnar-axis superimposable along said vertical-axis, said upright tubular column having an annular lower-end and an annular upper-end both surrounding said columnar-axis, said outflow-elbow means inlet-end surrounding the columnar-axis and being rotatably secured to the column upper-end whereby the outflow-elbow means is rotatable about the colinear vertical-axis and columnar-axis, said column lower-end being attached in fluid sealed relationship to the base means, said tubular column converging from lower-end to upper-end and providing sufficient columnar strength to maintain the laden outflow-elbow means elevated loftily above the base means and the earth anchorable member;



D. a water inlet-pipe intersecting the tubular column and adapted to be attached to said inflow-pipe;

E. a tubular oblique-pipe angularly depending as a branch from the tubular column and communicating therewith nearer to the upper-end than to the lower-end, said oblique-pipe throughout surrounding a linear branch-axis that intersects the columnar-axis at an intersection-point located above the inlet-end of the outflow-elbow means;

F. a linear drive-conduit surrounding said linear branch-axis and having a medial length portion surrounded by and being in water sealing engagement with the oblique-pipe, the drive-conduit having an upper length portion in water sealing engagement relationship with the outflow-elbow means loftily above the lower inlet-end and being in co-rotatable engagement with the outflow-elbow means, and the drive-conduit having a lower length portion located below the oblique-pipe and carrying an armature portion of the electrical commutation means; and

G. a brushes-holder in electrical commutation relationship with said armature portion, said brushes-holder being attached to the tubular column member of said central-pillar assembly.

4,627,573

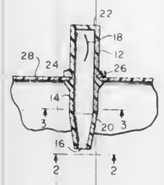
PRESSURE COMPENSATOR/EMITTER

Glenn G. Havens, deceased, late of La Messa, by Florine P. Havens, executrix, and by Richard C. Thompson, executor, San Diego, all of Calif., assignors to Havens International, San Diego, Calif.

Continuation-in-part of Ser. No. 251,180, Apr. 4, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 581,286

Int. Cl.[4] B05B *1/30*

U.S. Cl. 239—542 **4 Claims**



1. A pressure compensating flow control device for compensating for irregular pressure for maintaining a predetermined generally uniform flow rate over a predetermined pressure range comprising:

a flexible tubular member having collapsible walls of a substantially uniform thickness defining a central bore, an inlet end having an inlet orifice for communicating with a fluid source, and an outlet end having an outlet port; said inlet orifice and outlet port communicating with said central bore, said inlet orifice having a teardrop cross sectional configuration and said central bore collapsing such that as fluid source pressure varies from zero to a first pressure the flow rate increases from zero to a maximum flow rate and as fluid source pressure varies from said first pressure to a second higher pressure said maximum flow rate is substantially maintained

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4,627,574

FILTER FOR FUEL INJECTION NOZZLE

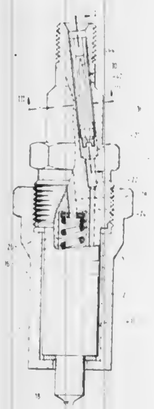
Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,950

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201218

Int. Cl.[4] B05B *1/14*

U.S. Cl. 239—590.5 **10 Claims**



1. A fuel injection nozzle for internal combustion engines comprising a rod-shaped filter body disposed in a fuel inlet conduit upstream of an ejection orifice, said rod-shaped filter body is provided with collars disposed on opposite ends thereof, said collars arranged to fit snugly within said fuel conduit, said rod-shaped filter body is further provided with a central section between said collars which has a uniform diameter which is less than the diameter of each of said collars and forms a mantle surface in which two groups of longitudinal grooves are formed, one of said two groups of longitudinal grooves originating at an outer end of a collar on one end of said filter and the other group of said two groups of longitudinal grooves originating at an outer end of said collar on the opposite end of said filter, each of said groups of longitudinal grooves having an extent and a terminus in said central section, in which the width and depth of each longitudinal groove of each of said groups of longitudinal grooves is formed with a constantly changing cross section which continuously decreases over the entire length of said extent towards said terminus in said central section between said collars, each longitudinal groove of said group of longitudinal grooves includes a straight base line located in a plane which is disposed parallel to and spaced apart by a distance a from a plane through the longitudinal axis of said filter body, and said straight base line of each said longitudinal grooves being disposed at an angle (β) from the longitudinal axis of the filter body.

4,627,575

UPGRADING SOLID FUELS

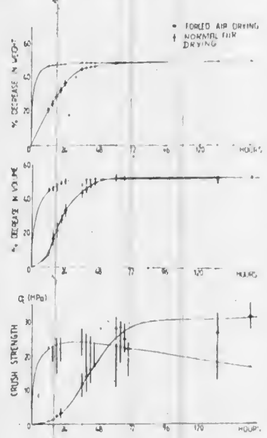
Reginald B. Johns, North Balwyn; Alan L. Chaffee, Ashfield; David A. Cain, Heidelberg, and Alan S. Buchanan, Kallista, all of Australia, assignors to University of Melbourne and CRA Services Limited, both of Victoria, Australia

Filed Feb. 15, 1984, Ser. No. 580,260

Claims priority, application Australia, Feb. 17, 1983, PF8078

Int. Cl.[4] B02C *23/18*

U.S. Cl. 241—15 **23 Claims**



1. Process for treatment of brown coal which comprises subjecting the said brown coal to shearing forces to produce a wet plastic mass said mass being capable of conversion by subsequent compaction and drying into a fuel of increased density and enhanced calorific value.

4,627,576

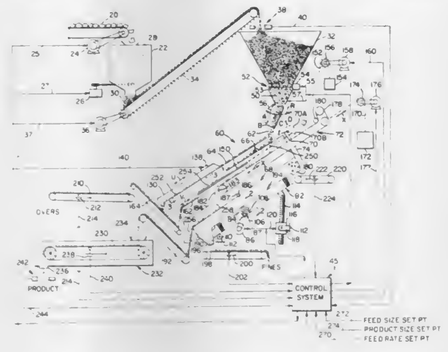
DIFFERENTIAL RATE SCREENING

William F. Hahn, 2500 Fidelity Building, Philadelphia, Pa. 19109; Hirimie T. McAdams, Clarence, and Robert L. Talley, Marilla, both of N.Y., assignors to William F. Hahn, Devon, Pa.

Continuation of Ser. No. 366,961, Apr. 9, 1982, Pat. No. 4,544,101, and a continuation of Ser. No. 366,965, Apr. 9, 1982, Pat. No. 4,544,102. This application Apr. 11, 1985, Ser. No. 722,209

Int. Cl.[4] B02C *23/14, 23/16*

U.S. Cl. 241—24 12 Claims



1. A differential rate screening apparatus for continuously screening a feed of particulate material so as to provide a product having a preselected size distribution substantially different from a predetermined size distribution of said feed which has particles distributed among a plurality of substreams each of a different size class, said screening apparatus comprising screen means having a screening member; feed means for introducing a stream of said feed onto said screening member, said screening member having apertures of sufficient size to pass at least two of said substreams as undersize substreams; separation means for separating said feed stream into at least a first throughs stream and one other first stream by causing part of each of said undersize substream to pass through the apertures of said screening member and into said first throughs stream at first partial flow rates substantially greater than zero and substantially less than conventional flow rates at which said undersize substreams would pass through the apertures of said screening member upon screening said undersize substreams to provide essentially complete screening, said first partial flow rates being such as to provide control over the size distribution of said first throughs stream; and control means for controlling said first partial flow rates so as to provide substantially said preselected size distribution in a particulate product stream comprising at least a portion of at least one of said first throughs stream and said other first stream, said control means including means for controllably varying the relative flow rates at which said undersize substreams pass into said first throughs stream.

4,627,577

FLOW CONTROL SYSTEM IN SHREDDING MACHINE

Kounosuke Hyuga, Naka; Koutaro Nakamura, Kamakura, and Shouzou Ogawa, Ibaraki, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,488

Claims priority, application Japan, Dec. 27, 1983, 58-244866

Int. Cl.[4] B02C *25/00*

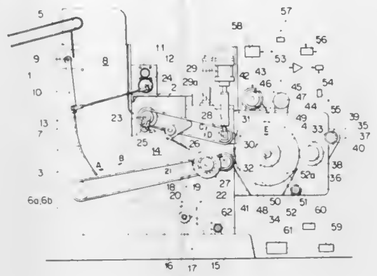
U.S. Cl. 241—30 14 Claims

1. A flow control system in combination with a shredder having raw material conveyor means upstream of a rotary shredder means, comprising:

(a) torque measuring means for connection to a shredder means for monitoring the operating torque of the shredder means;

(b) tachometer means for connection to the shredder means for monitoring the number of revolutions per unit time of the shredder means;

(c) means for generating a target constant;



(d) means for comparing the product of the measured torque and the number of revolutions with said target constant; and,

(e) speed control means for connection to the shredder means for regulating the rotary speed of the shredder means in response to deviations of the product with said target constant so that a constant shredding rate is maintained.

4,627,578

METHODS OF AND/OR APPARATUS FOR DETECTING AND CONTROLLING REFINER PLATE CLASHING

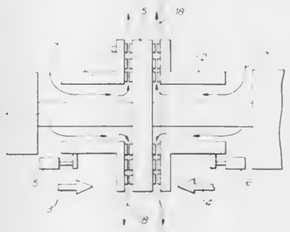
Donald M. Whyte, Kawerau, New Zealand, assignor to Tasman Pulp and Paper Company Limited, Kawerau, New Zealand

Filed Dec. 18, 1980, Ser. No. 217,805

Claims priority, application New Zealand, Dec. 19, 1979, 192459

Int. Cl.[4] G08B *21/00;* B02C *7/14*

U.S. Cl. 241—30 14 Claims



1. A method of predicting the clashing of refiner plates comprising the steps of sensing the vibration of at least one refiner plate during normal safe operation, sensing decreases in vibration of said at least one refiner plate due to a reduction in the quantity of material flowing between said refiner plates, and producing a signal in response to said decrease in vibration.

4,627,579

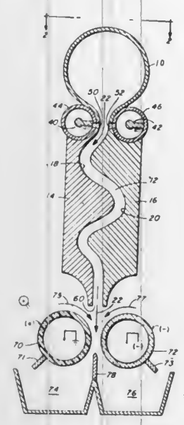
PARTICLE CHARGING AND COLLECTING SYSTEM

Stanley R. Rich, Wellesley Hills, Mass., assignor to Advanced Energy Dynamics, Inc., Natick, Mass.

Continuation-in-part of Ser. No. 520,649, Aug. 5, 1983, abandoned. This application Jun. 5, 1984, Ser. No. 617,319

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—79.1 14 Claims



1. Apparatus for the benefication of a finely-comminuted feed coal which includes both coal and impurity constitutents comprising a tubular envelope providing a contact surface, means rotatable within said envelope to bring said feed coal into contact with said surface, including means within and extending along the axis of said envelope to supply said feed coal to said rotatable member, and means to rotate said rotatable member at an angular speed sufficient to accelerate said feed coal to a velocity relative to said surface sufficient to fracture and further comminute the feed coal and to impart respective high differential electical charges to the coal and impurity constituents of said feed coal, and, located downstream of said contact surface, for receiving the output of said further comminuted and differentially charged constituents, electrical means to separate the coal constituent physically from the impurity constituent.

4,627,580

APPARATUS FOR SEVERING FOAMED MATERIAL

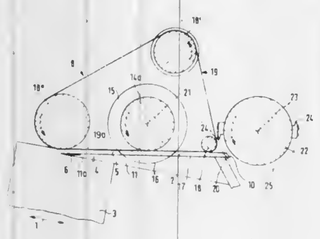
Karl G. Marbach, Weinsberg, Fed. Rep. of Germany, assignor to Karl G. Marbach GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,006

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336562

Int. Cl.[4] B02C *18/06, 19/12*

U.S. Cl. 241—101.4 26 Claims



1. Apparatus for comminuting layers which are obtained in response to slitting of a block of foamed material, comprising means for advancing the layer in a predetermined direction along a predetermined path; a first severing device adjacent to a first portion of said path and including a driven shaft extending transversely of said path and a plurality of tools arranged to subdivide each layer into elongated strips which move along said path lengthwise beyond said first portion, said tools including spaced-apart rotary disc-shaped knives on said shaft; a second severing device adjacent to a second portion of said path which is disposed downstream of said first portion, as considered in said direction, said second severing device being arranged to repeatedly sever the oncoming strips transversely of said direction so that each strip yields a succession of discrete chips, said advancing means comprising a plurality of endless flexible conveyors disposed in planes extending in parallelism with said direction and at right angles to said path, said conveyors having stretches which extend between said path and said shaft intermediate said knives along and beyond the first portion of said path to engage and entrain the strips in said direction into the range of said second severing device; a third severing device having a knife arranged to sever layers from the block; and means for effecting a relative movement between the block and said third severing device so that the latter removes layers from the block.

4,627,581

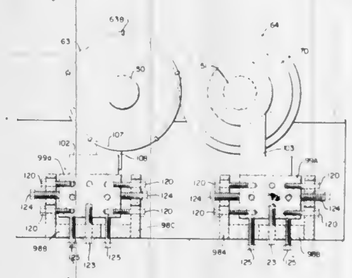
ANTI-FOUL DEVICE FOR TIRE CARCASS CUTTING AND SHREDDING APPARATUS

William E. Holiman, and Henry O'Keefe, both of Houston, Tex., assignors to Tire-Gator, Inc., Houston, Tex.

Filed Jun. 24, 1985, Ser. No. 747,847

Int. Cl.[4] B02C *18/14*

U.S. Cl. 241—167 5 Claims



1. For use with a tire carcass shredding apparatus having a base frame in which are journalled at least one pair of opposed parallel shafts on which are carried slotted mandrels and cutter blades having spacers between each adjacent mandrel and cutter blade all being spline mounted for rotation with each shaft and forming cutter assemblies, the cutter blades being carried by one shaft entering the slots of the mandrels of the opposed shafts; an anti-foul device comprising an inverted U-shaped support bar means for each of said opposed parallel shafts, clean out fingers and anti-foul fingers carried by and positionable along the major axis of said inverted U-shaped support bar means for cleaning interdigitation between said mandrels and cutter blades, there being foul fingers positionable along each said support bar means and the axis of said cutting mandrels and discs for engagement with the cutter assemblies, and means adjustably connected between said base frame and each support bar means carrying said clean out fingers and said anti-foul fingers for moving the fingers securely supported on said U-shaped support bar means toward and away from the cutter blades and mandrels of each cutter assembly to remove debris entrapped within and between said cutter assemblies resulting from shredding tires.

4,627,582

APPARATUS FOR COMMINUTION OF WASTE MATERIAL SUCH AS PAPER BLOCKS

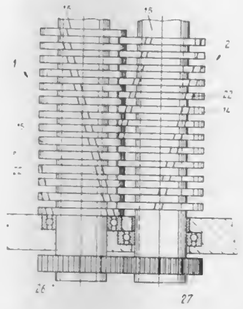
Albert Goldhammer, Uberlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktechnik Schliecher & Co., Markdoff, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 362,466, Mar. 26, 1982, abandoned. This application Feb. 12, 1985, Ser. No. 700,911

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112639

Int. Cl.[4] B02L *18/06*

U.S. Cl. 241—236 **9 Claims**



1. An apparatus for the comminution of waste material, suchs as thick paper blocks, which can include metal fasteners and a plurality of sheets greater than 50 in number; comprising:

opposing cutter blocks mounted in parallel and driven in counter-rotating directions in meshing relationship with regard to each other,

each cutter block having a plurality of knife disks of generally cylindrical configuration spaced from each other and intermeshing with a plurality of similar knife disks of an adjacent cutter block so as to provide primarily scissor-like knife cuts to said waste materials, each of said knife disks of said cutter blocks having at its outer circumference a plurality of teeth provided with a saw-tooth profile, and said teeth having two convergingly inclined sides which are spaced apart at a top edge, said saw tooth profile performing a sawing action on said waste material when same is in near to clogging positions between said opposing cutter blocks,

said inclined sides including a leading inclined side and a lagging inclined side, said leading and lagging inclined sides each having an angle of predetermined inclination, the angle of inclination of said leading inclined side being greater than the angle of inclination of said lagging inclined side,

both of said inclined sides having therebetween said top edge forming a dull tip for each tooth; the top edge having, in circumferential direction, smaller dimensions than the distance between two adjacent top edges of the same knife disk, the axial length of said top edge being the same as the thickness of the generally cylindrical knife disk, and

each said knife disk having at least one groove with a groove bottom, said at least one groove being formed at the periphery of each said knife disk and at the trailing side of the saw tooth profile, and said groove bottom forming a wide base which is at least as wide as the distance between two adjacent top edges, said grooves being spaced from each other and interrupting the toothed outer circumference of said knife disk;

whereby said cutter blocks do not seize or jam when in use comminuting waste material even despite thick paper blocks having metal fasteners therein and more than 50 sheets, inasmuch as the toothed circumferences including the inclined sides and the dull tips of the teeth in combination with the grooves grab and draw said paper blocks into the opposing meshing cutter blocks in an incremental manner with a tip being formed continuously and repeatedly as sheets are drawn between said cutter blocks and the paper blocks become thinner and thinner, and such comminuting being formed without the need for any external forces bearing on or pressing said waste material against said cutter blocks.

4,627,583

WINDING EQUIPMENT

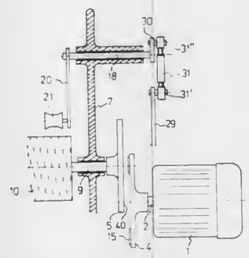
Franz X. Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

Filed Aug. 2, 1985, Ser. No. 762,158

Claims priority, application Switzerland, Aug. 30, 1984, 04150/84

Int. Cl.[4] B65H *59/38*

U.S. Cl. 242—45 **4 Claims**



1. A yarn winder which comprises:

a winder frame;

a bobbin shaft journaled on said frame and carrying a bobbin upon which a yarn is to be wound;

a driven plate mounted on an end of said bobbin shaft;

an electric motor having a drive shaft parallel to said bobbin shaft;

a drive plate on said drive shaft juxtaposable with said driven plate and magnetically couplable therewith to rotate said bobbin when said motor is energized, one of said plates being provided with permanent magnets, the other of said plates being composed of a magnetically permeable material for magnetic coupling with said permanent magnets;

support means for pivotally mounting said drive shaft for angular displacement about a pivot axis parallel to said shafts but offset from said drive shaft to displace said drive plate generally radially with respect to said driven plate to vary the magnetic coupling between said plates;

a dancing arm swingably mounted on said frame and provided with a dancing roller about which a loop of said yarn passes and forming a yarn-tension detector; and

means coupling said arm with said support means for swinging said drive shaft about said pivot axis to decrease said magnetic coupling by a said generally radial displacement of said drive plate in one direction upon an increase in yarn tension and to increase said magnetic coupling by a reverse generally radial displacement of said drive plate.

4,627,584

METHOD AND APPARATUS FOR FEEDING A PLASTIC RIBBON

Philip A. Kuhn, Canandaigua, and Paul V. Osborn, Webster, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 652,253, Sep. 20, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 842,071

Int. Cl.[4] B65H *16/00, 27/00, 23/04*

U.S. Cl. 242—54 R **33 Claims**

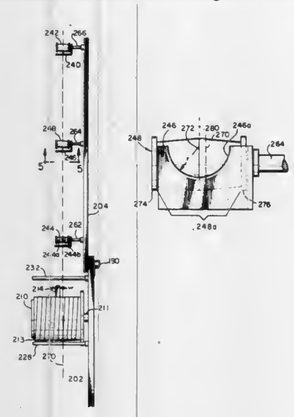
25. A plastic film tape feed apparatus comprising:

a spool having a multiplicity of wraps of a plastic film tape around a spool surface having an axial length many times greater than the width of said tape;

a cylindrical turning surface proximal to the spool having an axial length approximately equal to the axial length of the wrapped surface of the spool;

a pulley spaced from said turning surface for redirecting the direction of the tape fed from the turning surface;

a concave tape guide surface adjoining the pulley, receiving said tape directly from said turning surface, increasing the wrap of said tape about said pulley and having a width transverse to the fed tape greater than said tape width and several times smaller than said axial length of the turning



surface and further having a fixed central plane of symmetry extending in a direction generally transverse to a central axis of said cylindrical turning surface;

said cylindrical turning surface being fixedly secured against transverse movement in a direction normal to said central plane of symmetry; and

the tape guide surface being positioned sufficiently far from the cylindrical surface such that the maximum angle in degrees between a tape fed from any point on said turning surface and said plane of symmetry is no greater than about 6.5 times the inverse of the width of said tape expressed in inches.

4,627,585

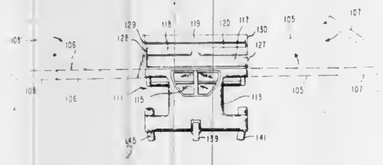
PUSHER TYPE AUTO-PLANE

Harry Einstein, 25 Midvale Dr., Springfield, N.J. 07081

Filed Jun. 25, 1984, Ser. No. 624,521

Int. Cl.[4] B64C *3/56, 37/00*

U.S. Cl. 244—2 **8 Claims**



1. In a Pusher type auto-plane for aircraft use and road vehicle use having both a Pusher aviation engine and an independent land vehicle engine, the improvement comprising:

(a) a Pusher type aircraft fuselage having a leading point and a trailing point, and having an imaginary centerline from said leading point to said trailing point;

(b) two main wings connected to said fuselage, each of said wings being cut twice approximately parallel to said imaginary centerline, once at about one-quarter and once at about three-quarters the distance in from the wing's outer tip to said imaginary centerline, so as to create a cut main wing and a segment tip for each of the two main wings, each of the two main wings being hinged at each of said two cuts, and, as to the cuts located at about three-quareters of the distance in from the wing's outer tip to said imaginary centerline, one of said two main wings being hinged along said cut at its top surface and the second of said two wings being hinged along said cut and above its top surface at a height at least one wing thickness above its top and at a height sufficient to allow both of said two wings to be folded inward 180° with one resting atop the other and with each of the segment tips being folded inwardly, one downward, and one upward, nesting between the two cut main wings in substantially the same horizontal plane;

(c) a rear stabilizer system having a horizontal stabilizer and two vertical stabilizers, an elevator functionally connected to said horizontal stabilizer and rudders functionally connected to said vertical stabilizers, said system being substantially symmetrical to said imaginary centerline;

(d) a Pusher propeller located at approximately the trailing point of said fuselage;

(e) at least three wheels located on the underside of said fuselage in an aviation landing relationship, at least one of said wheels being connected to be driven by an independent land vehicle engine; and,

(f) aviation controls located within said fuselage connectively related to a Pusher aviation engine, and said propeller, elevator and rudders.

4,627,586

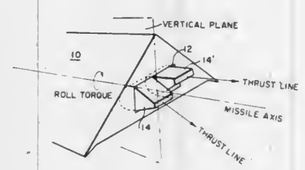
THRUST VECTORING APPARATUS FOR MANEUVERING MISSILE IN FLIGHT

Maigonis V. Krumins, Bethesda, and Leon H. Schindel, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,866

Int. Cl.[4] F42B *15/033*

U.S. Cl. 244—3.21 **11 Claims**



1. In a jet exhaust propelled missile, associated thrust vectoring apparatus for imparting bank and pitch to the missile for maneuvering it in flight, comprising:

wall means defining a jet exhaust opening of generally rectangular cross section;

plug means disposed within the jet exhaust opening for defining a plug nozzle therein;

said plug means comprising a pair of generally two-dimensional plugs pivotally mounted in side-by-side adjacency on axes extending across the rectangular jet exhaust opening; and

means responsive to guidance commands for selectively pivoting each plug independently about its axis for vectoring thrust of jet exhaust gasses passing through the defined plug nozzle;

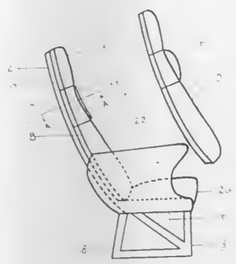
whereby, when the plugs are pivoted in opposite directions, the missile is caused to bank about its longitudinal extent, and when the plugs are both pivoted in the same direction the missile is caused to pitch about an axis transverse to its longitidinal extent thereby providing maneuvering of the missile in flight.

4,627,587

AIRPLANE SEAT WITH CONVERTIBLE FLOTATION-CUSHION SYSTEM

Diane R. McCutchan, 245 Hillview Dr., Fremont, Calif. 94536; Gretchen W. Roeding, and Gordon R. Kibby, both of Fremont, Calif., assignors to Diane R. McCutchan, Fremont, Calif.

Filed Jul. 18, 1984, Ser. No. 632,158
Int. Cl.⁴ B64D *25/04*
U.S. Cl. 244—122 R **5 Claims**



1. An airplane passenger seat comprising:
a seat body having a back member and a seat member;
a back cushion;
means for removably attaching the back cushion to the back member of the seat body, said back cushion having a central section and a number of side sections pivotally mounted on the central section, the side sections being initially coplanar with the central section, the side sections being of buoyant material and the central section having a buoyancy less than that of the side sections, said attaching means including a release mechanism for each of the side sections respectively, each release mechanism having means to urge a respective side section out of the plane of the central section as the back cushion is separated from the back member of the seat body; and
means coupled to the back cushion for removably securing the back cushion to a passenger sitting on the seat member.

4,627,588

INFANT ARTICLE SUSPENSION STRUCTURE

Richard M. Block, 1340 Custer St., Cincinnati, Ohio 45208

Filed Sep. 7, 1984, Ser. No. 648,659
Int. Cl.⁴ F16M *13/32*
U.S. Cl. 248—163.2 **13 Claims**



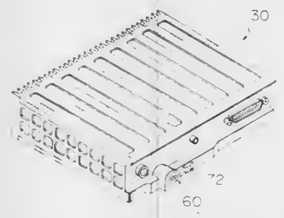
1. A self-supporting structure for supporting one or more articles above an infant, comprising:
(a) a bridge structure spanning a predetermined horizontal distance, said bridge structure including a pair of rigidly interconnected parallel bar structures, each of said parallel bar structures having an arcuate configuration and being adapted for suspending one or more articles above a support surface, each of said parallel bar structures being formed by a series of longitudinally aligned pipe sections joined by interconnecting fittings;
(b) at least one suspension member hanging downwardly from said bridge structure for vertically supporting an article above the support surface in a predetermined relationship to an infant positioned substantially beneath said bridge structure; and
(c) support means extending from each horizontal end of said bridge to said support surface for supporting said bridge in a vertically elevated position above the support surface, said support means being in contact with the support surface only in the area about the horizontal ends of said bridge and leaving the area beneath said bridge unencumbered, whereby the support means does not interfere with placement of an infant beneath the bridge.

4,627,589

HOUSING FOR ELECTRONIC APPARATUS OR THE LIKE

Minoru Hotsumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,912
Claims priority, application Japan, Sep. 5, 1983, 58-137730[U]
Int. Cl.⁴ A47B *91/00*
U.S. Cl. 248—346 **9 Claims**



1. An arrangement for accommodating and fixing an apparatus, comprising:
a housing for accommodating the apparatus therein, said housing having a first engaging member at one of opposite side walls thereof and a second engaging member at the other of said opposite side walls;
a space defining member for defining an elongate space along said other side wall of said housing and constituting part of said other side wall;
a slide plate disposed in said space to be slidable therealong;
a lock engaged with said slide plate to cause said slide plate into a sliding motion; and
housing mounting means for mounting the housing, said housing mounting means having a third engaging member engagable with the first engaging member, a fourth engaging member engagable with the second engaging member, and a fifth engaging member engagable with the slide plate in a predetermined position of the slide plate.

4,627,590

STOWAGE RECEIVER FOR FIXED LENGTH ROD

Daniel H. Zeorlin, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 3, 1984, Ser. No. 677,568
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—351 **7 Claims**

1. A bracket for releasably securing in standby position the free end of an elongated, rigid rod used to prop a swingable cover of an airplane engine cowl, said rod being mounted at one end to the cowl for swinging movement about a pivot point, said bracket comprising:
a support adapted to be mounted to the airplane in fixed position adjacent the free end of the rod when the latter is in said standby position;

an arm pivotally coupled to the support for swinging movement toward and away from said rod free end when the rod is in said standby position;
means carried by the arm and adapted to engage the rod free end for releasably securing the arm to the rod; and
spring means operably coupled with the support and with the arm for yieldably biasing the arm toward the rod, the arm being in disposition relative to the rod for exerting a



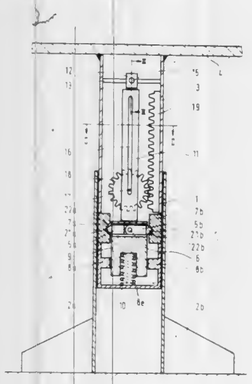
compressive force longitudinally of the rod under the influence of said spring means when the rod is engaged with the bracket at said standby position, whereby the rod and arm may be manually swung to respective positions of mutual engagement of the rod free end and said securing means for releasably securing the rod in the standby position with said compressive force exerted on the rod dampening any tendency of the rod to rattle during operation of the engine.

4,627,591

ADJUSTABLE LEGS FOR FURNITURE AND LOCKING MEANS FOR SECURING SUCH ADJUSTMENT

Peter Heckmann, Stangenstrasse 20, 7022 Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,980
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341088
Int. Cl.⁴ F16M *11/00*
U.S. Cl. 248—411 **7 Claims**



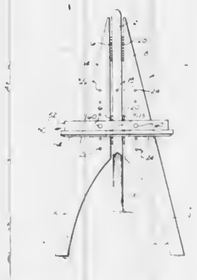
1. In furniture of the type having leg means of adjustable height, said leg means comprising:
an outer leg segment having an inner surface,
an inner leg segment telescopingly received in said outer leg segment for vertical movement relative to said outer leg segment so that said inner leg segment is vertically adjustable,
locking means disposed within and carried by said inner leg segment for securing said inner leg segment in adjusted vertical relationships, said locking means comprising
first and second brake shoes mounted on said inner leg segment and arranged for movement transversely of a longitudinal axis of said inner leg segment to project through opening means in said inner leg segment,
a body carried by said inner leg segment for movement therewith,
first and second levers pivotably connected to said body by a horizontal pivot axle common to both said levers, said first and second levers being engageable with said first and second brake shoes, respectively, such that said first and second levers can be oriented horizontally to exert forces against respective ones of said first and second brake shoes in a direction oriented perpendicularly to said inner surface of said outer leg segment to press said brake shoes against said inner surface, said first and second levers being swingable relative to said inner leg segment and out of said horizontal orientation for shortening the effective transverse dimension of said levers to enable said brake shoes to be retracted away from said inner surface,
spring means for yieldably biasing said body toward a position in which said first and second levers are horizontally oriented to press said brake shoes against said inner surface, and
release means carried by said inner leg segment for displacing said body longitudinally against the bias of said spring means to move said levers out of said horizontally oriented position.

4,627,592

EASEL

Merriam B. Stillwell, Rte. 1, Six Mile, S.C. 29682

Filed Nov. 15, 1984, Ser. No. 671,558
Int. Cl.⁴ A47B *97/04*
U.S. Cl. 248—465 **16 Claims**



1. An improved, collapsible easel comprising:
(a) a body, said body comprising an elongated central member, a first side member hingedly secured along an edge of said elongated central member and a second side member hingedly secured along an opposite edge of said central member, said first and second side members being movable about said hinge connections between an operative position in which said side members and said central member are generally coplanar and a collapsed position in which said side members are turned rearwardly, generally transverse to said central member, said side members further having depending legs secured thereto;
(b) at least one rear leg pivotally secured at its upper end to said body, an opposite free end of said leg being movable away from said body and cooperating with said side member legs when in said operative position for support of said easel;
(c) means to secure said at least one rear leg when same is moved away from said body for support of said easel; and
(d) article receiving means securable in a generally horizontal disposition across said body in said operative position, said article receiving means and said body cooperating to support an article thereon.

4,627,593

PIPE SUPPORTS

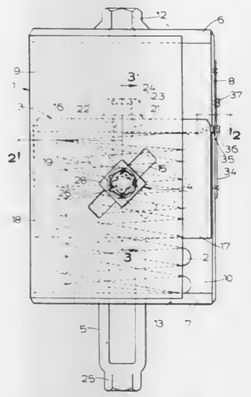
Anthony J. Salter, Cherry Trees, The Ridgeway, Sedgley, Dudley, West Midlands, DY3 1BS, England

Filed Oct. 31, 1984, Ser. No. 666,975

Claims priority, application United Kingdom, Nov. 5, 1983, 8329632

Int. Cl.[4] **F16M** *13/00*

U.S. Cl. 248—561 **14 Claims**



1. A pipe support comprising a body, spring means located by said body, a piston upon which said spring means acts and which is axially movable relative to said body, carrier means connected to said piston adapted to be engaged with a pipe to be supported, and locking means for locking said piston against movement relative to said body, said body having an axially extending part that has a first slot inclined with respect to the direction of movement of said piston, said piston comprising a crown plate which provides a seating for the spring means and an axially extending part which extends axially from the crown plate and which co-operates with said axially extending body part to guide said piston in its axial movement relative to said body, said axially extending piston part having adjacent to said axially extending body part a second slot which is oppositely inclined to said first slot, said first and second slots being so arranged as to have portions in register within the range of movement of said piston, and said locking means including clamping members interconnected through said registering portions of said slots and adapted to clamp said piston to said body part to retrain movement of said piston, said clamping members being releasable to allow said piston to move relative to said body.

4,627,594

MUDFLAP MOUNTING ASSEMBLY

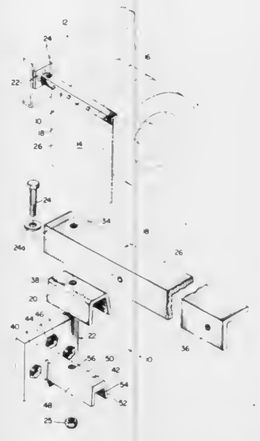
Jesse L. Reed, RD #1, Wendell Rd., New Salem, Mass. 01364

Filed Jun. 18, 1985, Ser. No. 746,255

Int. Cl.[4] **B62D** *25/16*

U.S. Cl. 248—632 **5 Claims**

1. A mounting assembly for mounting a mudflap on a vehicle comprising an elongated rigid bracket member adapted to receive a mudflap thereon, said bracket member having an inner end and having an inner surface comprising an upper surface portion and a pair of spaced side surface portions which extend downwardly therefrom and cooperate therewith to define a longitudinally extending channel in said bracket member, resilient pad means in said channel, a pedestal member comprising a mounting portion for mounting said pedestal member on said vehicle and an elongated pedestal element which extends from said mounting portion and has an outer pedestal element surface thereon, said outer pedestal element surface comprising an upper surface portion and a pair of spaced side surface portions which extend downwardly therefrom, said pedestal member being received in said channel so that said pad means is interposed between said pedestal element and said bracket member along the upper and side surface portions of said pedestal element outer surface and said bracket member inner surface, the upper surface portions of said pedestal element outer surface and said bracket member inner surface being dimensioned and configured to be received in substantially mating relation with said pad means therebetween, and means drawing the upper portions of said bracket member inner surface and said pedestal element outer surface together



so that said pad means is compressed therebetween, the side surface portions of said bracket member inner surface and said pedestal element outer surface and said pad means being constructed so that when the upper surface portions of said bracket member inner surface and said pedestal element outer surface are drawn together, said pad means is increasingly compressed between the side surface portions of said bracket member inner surface and said pedestal element outer surface in the downward extents thereof away from their respective upper surface portions.

4,627,595

ICE CONTAINER HAVING COILED STRIP PARTITION

Ronny Q. Rhodes, 16 Oakwood Ct., Tuscaloosa, Ala. 35402, and Jack W. Duke, 429 21st St., Suite 4, Tuscaloosa, Ala. 35401

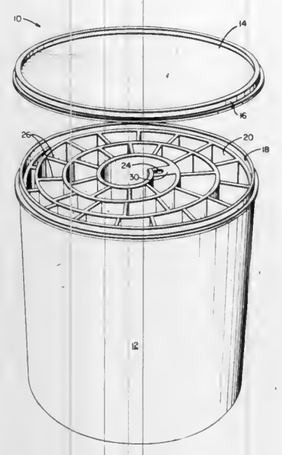
Filed Mar. 7, 1985, Ser. No. 709,421

Int. Cl.[4] **F25C** *1/04, 1/24*

U.S. Cl. 249—121 **12 Claims**

12. An ice container comprising:

a vessel for holding water or ice cubes, said vessel having a central vertical axis; and at least one coiled strip positioned within said vessel, said coiled strip having a plurality of transverse ribs attached at intervals along the length of said strip, said coiled strip and transverse ribs being integrally molded of polyethylene, said strip being in a generally horizontal position with the curvature of the coils of said strip



being generally concentric with the central vertical axis of said vessel.

4,627,596

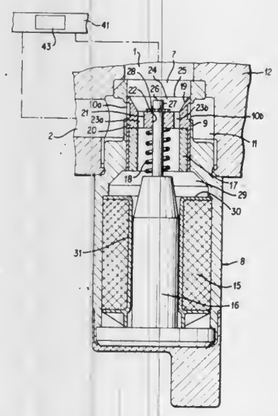
ELECTROMAGNETICALLY-CONTROLLED VALVE, SUITABLE FOR CONTROLLING AN ADDITIONAL AIR FLOW IN A FEED EQUIPMENT FOR AN INTERNAL COMBUSTION ENGINE

Pietro Busacchi, Bologna, Italy, assignor to Weber S.p.A., Toruio, Italy

Continuation of Ser. No. 600,451, Apr. 16, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 783,817

Int. Cl.[4] **F16K** *31/02*

U.S. Cl. 251—129.07 **4 Claims**



1. An electromagnetically controlled valve for controlling additional air flow delivered by feed equipment associated with an internal combustion engine, said feed equipment including at least an engine intake passage and a throttle valve disposed in said passage, said electromagnetically controlled valve comprising:

an air inlet for air coming from a first part of the intake passage, said air inlet being positioned upstream of said throttle valve;

an air outlet for air moving toward a second part of the intake passage, said air outlet being positioned downstream of the throttle valve;

a hollow tubular element connected to said air inlet and having primary connecting orifices between said air inlet and said air outlet;

a movable obturator housed within said tubular element, said obturator comprising a bushing of non-magnetic material and a magnetic keeper housed within said bushing, said obturator being slidable within said tubular element;

first and second stopping means for stopping movement of said obturator at limit positions within said tubular element;

magnetic field generating means for generating a magnetic field to move said obturator between said limit positions, said generating means including a core disposed in a winding energizable by electrical control means;

a return spring means for biasing said obturator against said magnetic field;

said first stopping means including a first support supported by said core;

said bushing including a second support for said spring, said second support being disposed in said bushing;

said bushing including secondary orifices to connect said air inlet with an internal part of said tubular element; and

said obturator including a conical edge means positioned to selectively open said primary connecting orifices responsive to energization of said winding to obtain laminar air flow across said primary connecting orifices, said laminar air flow being directly proportional to an air passage section provided by said primary connecting orifices.

4,627,597

VALVE ACTIVATION APPARATUS

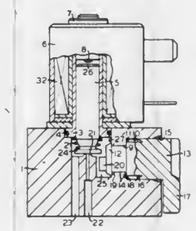
Walter Brausfeld, Hanover; Helmut Göttling, Isernhagen; Rudolf Möller, Gehrden; Peter Müller, Hanover, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to Wabco Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,007

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446410

Int. Cl.[4] **F16K** *31/06*

U.S. Cl. 251—129.03 **13 Claims**



1. Activation apparatus for operating, under emergency and manual conditions, an electromagnetically-controlled multiway valve, having at least one inlet and one outlet port, and at least one valve arrangement disposed therebetween, and all formed in a valve housing, said activation apparatus comprising:

(a) an activation member disposed in a housing recess formed in the valve housing, said activation member extending at least partially into a pressure chamber in which the at least one valve arrangement is disposed;

(b) sealing means connected to said activation member for sealing said activation member against said housing recess;

(c) holding means partially formed in said housing recess, and interacting with said activation member for holding said activation member in an engageable position with said housing recess, said holding means including first and

second stop surfaces formed on said activation member, which interact with at least one complementary stop surface, formed in said housing recess, so as to limit movement of said activation member in the direction of the longitudinal axis of said housing recess;

(d) at least one of said first and second stop surfaces formed on said activation member being elastically-deformable such that, upon introduction of said activation element into said housing recess, said activation member can be guided past said complementary stop surface and, once past said complementary stop surface, said elastically-deformable at least one stop surface can resume its original shape and interact with said complementary stop surface in the manner of a snap-connection;

(e) said first and second stop surfaces and said sealing means being permanently affixed to said activation member to form essentially a single-piece component; and

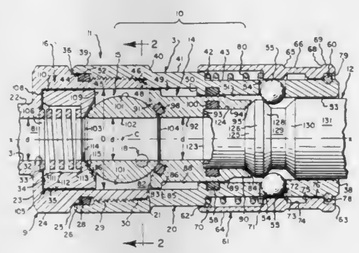
(f) valve moving means formed on a portion of said activation member, extending into said pressure chamber, for moving a valve body portion of the at least one valve arrangement when the electromagnetically-controlled multiway valve is operating under such emergency and manual conditions.

4,627,598

COUPLING DEVICE WITH ECCENTRICALLY-MOUNTED ROTARY VALVE ELEMENT

Raoul Fremy, Villa Emilia, 17 Rue Cecile Vallet, 92340 Bourg La Reine, France

Filed Jan. 31, 1986, Ser. No. 824,433
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.2 **15 Claims**



1. A coupling device section, comprising:

an elongated tubular housing having a flow passage therethrough, said flow passage having a conduit portion and having an enlarged chamber, said housing also having an abutment surface arranged to face into said chamber;

an annular seat member arranged within said chamber for sliding movement therealong toward and away from said abutment surface, the inner surface of said seat member having a diameter substantially equal to the diameter of said conduit portion;

a rotary valve element having a center and arranged within said chamber, said valve element having an outer surface continuously in engagement with said seat member and having a through-bore arranged such that the axis of said through-bore intersects said valve element center;

biasing means continuously urging said valve element and seat member to move toward said abutment surface; and

pivot means operatively arranged between said housing and said valve element for causing said valve element to rotate about a pivotal axis transverse and eccentric to said bore axis as said valve element moves along said chamber;

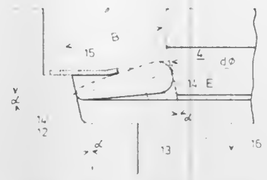
whereby, as said valve element moves along said housing, said valve element will be caused to rotate about said pivotal axis between a flow-preventing position and a flow-permitting position.

4,627,599

SEALING MECHANISM FOR HIGH VACUUM VALVE

Gerhard Ehmig, Rankweil-Brederis, Austria, assignor to Siegfried Schertler, Haag, Switzerland

Filed Dec. 9, 1985, Ser. No. 806,790
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445236
Int. Cl.[4] F16K *1/38, 1/42*
U.S. Cl. 251—334 **4 Claims**



1. A sealing mechanism for a high vacuum valve device including a movable member having a longitudinal axis and movable in the direction of said axis for opening and closing said valve device comprising:

a first sealing surface designed as a surface of revolution;

a second sealing surface also designed as a surface of revolution arranged coaxially relative to said axis with said first surface;

one of said first and second sealing surfaces being formed on said movable member, said sealing surfaces being movable relative to each other in the direction of said axis by movement of said movable member and being located spaced from each other in the closed position of said valve device; and

a solid sealing member configured as a conical annular disk arranged between said first and second sealing surfaces adapted to bridge the space therebetween, said solid sealing member being formed with rounded edges on opposite sides thereof, said rounded edges being located to engage and roll off against said first and second sealing surfaces respectively during the process of closing said valve device;

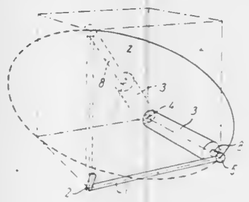
said rounded edges being formed with different radii of curvature.

4,627,600

MECHANISM TO BE MOUNTED BETWEEN TWO PARTS, WHOSE MUTUAL DISTANCE MUST BE VARIABLE

Eskild Pontoppidan, Lyngby, Denmark, assignor to Flemming HVIDT Mobelarkitektfirma A/S, Denmark

PCT No. PCT/DK84/00100, § 371 Date Jun. 14, 1985, § 102(e) Date Jun. 14, 1985, PCT Pub. No. WO85/01645, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 16, 1984, Ser. No. 749,625
Claims priority, application Denmark, Oct. 17, 1983, 4784/83
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—124 **6 Claims**



1. Mechanism to be mounted between two parts, whose mutual distance must be variable, preferably against a load, e.g.

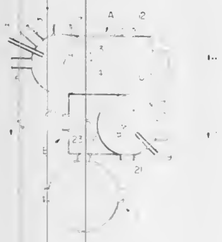
the bottom and the frame of a bed, which mechanism has a bar (1) pivotally journalled in a bearing (2) and connected with one of the parts of one end, the bar also being coupled with a pivotally suspended (4) driving means (3,8) wherein the driving means (3,8) actuates the bar (1) substantially transverse to its longitudinal direction, and wherein the axis of the bearing (2) of the bar (1) extends obliquely in relation to a plane containing the connecting line between a suspension point (4) of the driving means (3,8) and its point of application on the bar (1).

4,627,601

INSTALLATION FOR THE PRODUCTION OF STEEL BY PRE-SMELTING OF PIG IRON

Aristide Berthet, and Guy Denier, both of Metz, France, assignors to IRSID, Maizieres-les-Metz, France

Filed Jun. 24, 1985, Ser. No. 748,118
Claims priority, application France, Jun. 22, 1984, 84 09819
Int. Cl.[4] C21C *1/00*
U.S. Cl. 266—212 **8 Claims**



1. Installation for the production of steel by pre-smelting of pig iron comprising a stage of desilication and of dephosphorization followed by a decarburization stage, wherein said desilication and dephosphorization stage is constituted by at least one closed unit comprising

(a) a first reactor (1) in which the pig iron to be pre-smelted forms a bath whose surface is maintained at a first predetermined level (N_1), said reactor having

(i) an upper part above said first predetermined level (N_1), provided with means (5) for introducing the pig iron to be pre-smelted, means (6) for introducing agents for oxidizing silicon and phosphorus, agents for forming a desilication and dephosphorization slag, and means (8) for creating an oxidizing atmosphere above said bath; and

(ii) a lower part, below said first predetermined level (N_1), provided with means (9) for stirring of the metallic bath; and

(b) a decanter (2) separated from said first reactor (1) by a partition (3) comprising a communication opening (4) below said first predetermined level (N_1) and whose free upper end, extending above said first predetermined level (N_1) constitutes a sill encircling the slag formed in the reactor, this decanter comprising

(i) an outlet opening (10) located below said first predetermined level (N_1) and communicating with a connecting conduit (11) to permit the circulation of a flow of desilicated and dephosphorized pig iron toward said decarburization stage; and

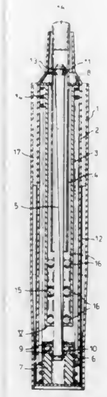
(ii) an overflow (12) located above said first predetermined level (N_1) for evacuating the decanted desilication and dephosphorization slag coming from said first reactor (1) to the exterior.

4,627,602

MECHANICAL LIFTING DEVICE

Claus L. Sporck, Cedar, Mich., assignor to Hag A/S, Oslo, Norway

Filed May 31, 1985, Ser. No. 739,998
Claims priority, application Norway, Jun. 5, 1984, 842262
Int. Cl.[4] F16F *1/00*; A47C *3/24*
U.S. Cl. 267—182 **9 Claims**



1. A mechanical lifting device adapted for use with a chair having a chair seat and a supporting chair subframe, which comprises:

an exterior tube, and an elevating tube mounted at least partially internally of the exterior tube, the exterior tube and elevating tube being movable mutually telescopically, one of the tubes being joined to the chair seat, and the other of the tubes being joined to the chair sub-frame;

an outer locking tube mounted to the elevating tube and disposed therein;

a hollow pressure rod coaxially surrounded by the outer locking tube;

an elongated locking screw at least partially received by the hollow pressure rod, the screw being mounted at one end to the exterior tube and pivotal about the longitudinal axis of the exterior tube, the locking screw having formed on its outer surface a thread of a predetermined pitch; and

threaded nut means having an adjustable thread pitch and being adapted for selectively preventing pivotal movement of the elongated screw, the nut means being spring biased to be expandable and compressible in the longitudinal direction of the outer locking tube, the nut means including a plurality of spring biased threaded locking nuts arranged longitudinally with respect to the locking tube, and biasing spring means positioned between adjacent nuts, each locking nut having an individual thread pitch corresponding to the thread pitch of the elongated screw, each nut of the nut means engaging the screw, and engaging the outer locking tube so as to be non-rotatable with respect to the locking tube, the nut means being adapted to be compressed to a first state and expanded to a second state so that the distance between adjacent nuts is adjustable to be greater or less, respectively, wherein, when the nut means is in the first state, the thread pitch of the nut means is substantially different from that of the elongated screw to prevent the elongated screw from pivoting and when the nut means is in the second state, the threaded pitch of the nut means is substantially the same as that of the elongated screw to allow the screw to pivot.

4,627,603

CLAMPING DEVICE

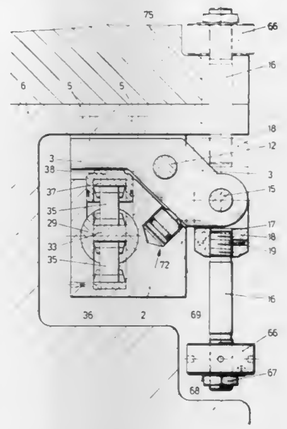
Bernhard Stahl, Neunkirchen, and Horst Böhm, Siegen, both of Fed. Rep. of Germany, assignors to Optima Spanntechnik GmbH, Siegen, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,301

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425275

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 269—32 **13 Claims**



1. In a clamping device for clamping a workpiece in position, said clamping device including a main housing, a clamping piston slidable in said housing, means for subjecting said clamping piston to fluid under pressure, a sliding member, means transversely slidably mounting said sliding member in said clamping piston, toggle members co-operating with said sliding member, saddle bearings at the sides of said main housing, said toggle levers extending between said sliding member and said saddle bearings on both sides of said sliding member, each of said toggle levers being movable by said clamping piston between a position inclined to the axis of movement of said clamping piston and an extended position, a clamping anchor, means mounting said clamping anchor on said housing and means for loading said clamping anchor from said toggle levers, the improvement comprising a clamping lever, means mounting said clamping lever to pivot about an axis in said main housing, means slidably guiding one end of said clamping lever in said main housing, means movably mounting one of said saddle bearings in said main housing for movment by one of said toggle levers, said movably mounted saddle bearing acting upon said one end of said clamping lever, and pivot means pivotally mounting said clamping anchor on the other end of said clamping lever for pivotal movement through an angle of up to 180° from a release position into a clamping position, said other end of said clamping lever projecting from said main housing.

4,627,604

ADJUSTABLE CLAMP

Sang B. Choi, 8709 Old Mt. Vernon Rd., Alexandria, Va. 22309

Filed Apr. 11, 1985, Ser. No. 722,201

Int. Cl.⁴ B25B *1/02*

U.S. Cl. 269—214 **12 Claims**

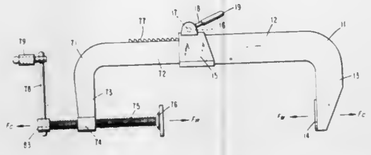
1. An adjustable clamp for clamping a workpiece to another object, comprising:

a generally L-shaped first end piece, having a substantially hollow first arm of predetermined internal cross section and, attached to said first arm, a second arm provided with a gripping surface;

a first hollow intermediate extension piece, of uniform internal cross section, shaped and sized to fit in close controlled insertion at a first end inside said hollow first arm of said first end piece;

a generally L-shaped second end piece having a third arm shaped and sized to fit in close controlled insertion inside a second end of said hollow intermediate extension piece and, attached to said third arm, a fourth arm having an internally threaded boss at its unattached end;

a threaded screw inserted into said threaded boss, rotatably moveable therewithin toward said gripping surface to provide a clamping action on said workpiece positioned



therebetween, said threaded screw having a gripping element at its end nearest said workpiece;

first locking means for positively locking said first intermediate extension piece in a predetermined juxtaposition with respect to and inside said hollow first arm with said first end of said first intermediate extension piece inserted therein; and

second locking means for positively locking said third arm in a predetermined juxtaposition with respect to and inside said second end of said first intermediate extension piece.

4,627,605

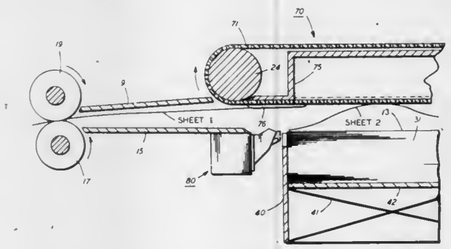
FRONT AIR KNIFE TOP VACUUM CORRUGATION FEEDER

George J. Roller, Penfield, and Kendolph A. Thomas, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,593

Int. Cl.⁴ B65H *3/12*

U.S. Cl. 271—94 **10 Claims**



1. A high speed top sheet separator-feeder for separating and forwarding sheets including flimsy sheets and downcurled sheets seriatim from the top of a stack of sheets, comprising a stack tray for supporting a stack of sheets to be fed, endless perforated vacuum belt means extending from a position above a portion of the sheet stack tray to at least the front end of the sheet stack tray for acquiring and advancing the top sheet of the stack, said vacuum belt means including a roughened surface to increase the coupling between a sheet and said vacuum belt means and extending across a support surface having vacuum ports therein for positioning a negative pressure at the back of said vacuum belt means and a corrugation means located on one surface of said support surface that is adapted to corrugate a sheet drawn thereto due to the actuation of said negative pressure so that any sheets initially adhering to the top sheet in the stack of sheets will break away from the top sheet and fall back onto the sheet stack, air knife means positioned in front of the stack tray for applying air pressure to the sheets in the stack tray to separate the top sheet from the next adjacent sheet, said air knife means including separation jets and a converging slot jet for separating the top sheet in the stack from the rest of the stack and vectored auxiliary separation jets for assisting in separating downcurled sheets, vacuum means for applying a continuous and uniform negative pressure to said vacuum ports during the feeding of sheets from the stack tray in order to increase the throughput of said separator-feeder, and gate means adapted to prevent multifeeds from said stack tray.

4,627,606

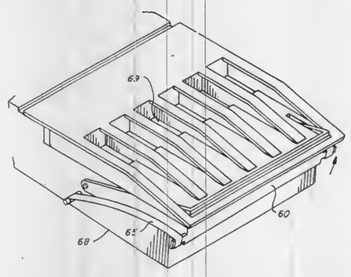
BOTTOM SHEET FEEDING APPARATUS EMPLOYING A COMBINATION SLIDE PLATE AND VACUUM VALVE

Kenneth P. Moore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,415

Int. Cl.⁴ B65H *3/08*

U.S. Cl. 271—98 **2 Claims**



1. A bottom sheet separator-feeder for separating and forwarding sheets seriatim from the bottom of a stack of sheets to be fed, comprising a stack tray for supporting the sheets to be fed, air knife means positioned in front of the stack tray and adapted to provide a layer of air between said tray and the bottom sheet in the stack and the remainder of the sheets in the stack, and vacuum feeding means located within the front portion and in line with the top surface of said tray, said feeding means including a slide plate member having a first surface portion extending along the plane of the bottom surface of said tray and a second surface portion that is sloped down and away from said first surface portion and said tray and extending the width of said tray for bending the front portion of the bottom sheet in the stack down and away from the remainder of the stack, said slide plate member having a plurality of sheet hold down slots in said first and second surface portions and a vacuum plenum arranged for communication with said sheet hold down slots to attract the bottommost sheet in the stack to said slide plate member, said vacuum plenum remaining stationary while said slide plate member is reciprocated to move sheets from under said stack to a take-away position, and including a two position wall connected to said vacuum plenum and positioned with respect to a forward end of said vacuum plenum for blocking air knife flow to the stack during initial sheet acquisition when in a first of said two positions while simultaneously facilitating a higher and faster negative pressure rise below the stack and for allowing full air knife flow to the stack when in the second of said two positions.

4,627,607

SHEET FEEDING SYSTEM

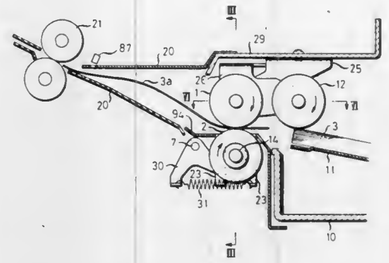
Yasuaki Ishii, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,376

Claims priority, application Japan, Oct. 15, 1982, 57-155225[U]; Oct. 15, 1982, 57-179782; Oct. 16, 1982, 57-180559; Feb. 10, 1983, 58-17444[U]

Int. Cl.⁴ B65H *3/06*

U.S. Cl. 271—122 **9 Claims**



1. A sheet feeding system of the frictional sheet separation roller type comprising:

(a) a feed roller rotatable about its axis to feed a sheet in a sheet feeding direction;

(b) a separation roller opposing said feed roller and rotatable opposite to the sheet feeding direction;

(c) a separation roller shaft supporting said separation roller at one free end thereof and pivotably supported at its other end in a pivot;

(d) biasing means for exerting a first pressing force on said shaft between said separation roller and said pivot to press said separation roller against said feed roller, and guiding means for guiding said shaft under said pressing force to be pivotable toward said feed roller in a plane including its own axis and the axis of said feed roller;

(e) a driven gear mounted on said separation roller shaft between said pivot and said separation roller, and a drive gear in mesh therewith for rotating said separation roller shaft in the direction opposite to the sheet feeding direction, said driven gear by engagement with said drive gear applying a second pressing force by a torque on said separation roller shaft; and

(f) a torque limiter mounted on said separation roller shaft between said driven gear and said separation roller, said torque limiter having the torque on said separation roller shaft applied thereto and transmitting a selected torque to said separation roller to provide a sheet returning force,

whereby a pressing force of said separation roller against said feed roller can be determined by the relation of the positions of the driven gear, biasing means, and separation roller from said pivot, and by said first and second pressing forces, and said sheet returning force is provided by the torque transmitted by said torque limiter from said second pressing force.

4,627,608

VACUUM TAKE-OFF CONVEYOR

Jeffrey W. Harms, Olathe, Kans., assignor to Gill Studios, Inc., Shawnee Mission, Kans.

Filed May 1, 1985, Ser. No. 729,283

Int. Cl.⁴ B65H *3/12*

U.S. Cl. 271—197 **8 Claims**

1. A vacuum take-off conveyor for transferring a printed sheet from the discharge end of a delivery conveyor to a sheet stacking apparatus, said vacuum take-off conveyor comprising:

(a) a vacuum chamber structure having side walls and top and bottom walls and defining a vacuum chamber there-

within; said side walls having respective first and second ends;

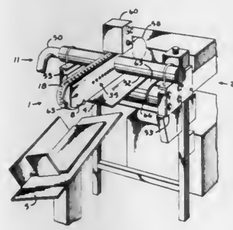
(b) a drive pulley associated with said side wall first ends and rotatable on an axis transverse to said side walls;

(c) adjustable motive means for rotating said drive pulley about said drive pulley axis at different rotational speeds;

(d) an idler pulley associated with said side wall second ends and rotatable on an axis transverse to said side walls;

(e) an endless foraminous belt having a multiplicity of apertures extending along a length of said belt; said belt being received on said chamber structure so as to run as a loop around said drive pulley and said idler pulley and along said top and bottom walls; said belt being engaged by said drive pulley so as to be responsive to rotation of said drive pulley, whereby said belt generally moves in a continuous loop between said first and second ends along said bottom wall and away from said delivery conveyor and toward said sheet stacking apparatus;

(f) vacuum means for creating a lower air pressure within said vacuum chamber than in the surrounding atmosphere;



(g) air communication means along said vacuum chamber bottom wall to allow air to flow from the surrounding atmosphere through said belt apertures and into said vacuum chamber, whereby a suction is created along a portion of said belt traveling along said air communication means;

(h) damping means situated within said vacuum chamber; said damping means separating said vacuum chamber into a high vacuum region and a low vacuum region, said high vacuum region being situated in close proximity and above said delivery conveyor discharge end such that a sheet on said delivery conveyor is delivered beneath and adjacent the high vacuum region of said vacuum chamber and is sucked upwardly against said belt and moved toward said low vacuum region where it adheres to said belt with lesser force to facilitate discharge from beneath said belt onto said sheet stacking apparatus; and

(i) said damping means including a plate adjustably extending generally between said top and bottom walls and defining a space therebetween for adjustably modifying air flow communication between said high and low vacuum regions.

4,627,609

SHEET DELIVERY DEVICE, ESPECIALLY FOR SMALL OFFSET PRINTING MACHINE

Gottfried Höfer, Mauer, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

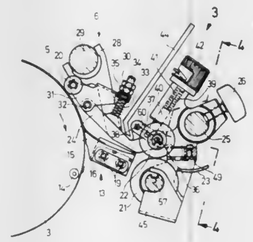
Filed Apr. 15, 1985, Ser. No. 723,091

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413943

Int. Cl.[4] B65H *29/54*

U.S. Cl. 271—311 **9 Claims**

1. Sheet delivery device for a printing machine wherein a sheet is peeled from an impression cylinder and introduced into a nip formed between two conveyor rollers rolling on one another, comprising a sheet guiding device located downstream of the conveyor rollers in travel direction of a peeled sheet, guide rollers for a trailing region of the peeled sheet, said guide rollers being in operative engagement with the impression cylinder, a carrying element carrying and uniting the conveyor rollers, said sheet guiding device and said guide rollers into a single unit so that they are adjustable in common therewith to a selected format width, adjusting means carried by said carrying element for adjusting respective forces of application of the conveyor rollers and said guide rollers and including another carrying element, a respective one of said guide rollers, and one of the two conveyor rollers acting as an application roller being arranged on each of said carrying elements, one of said carrying elements being disposed at a location adjacent the left-hand side of the sheet and the other of said carrying elements being disposed at a location adjacent the right-hand side of the sheet, said carrying elements being mounted laterally slidable and lockable on cross bars extending



across the width of the printing machine, the other of said two conveyor rollers cooperating with said one conveyor roller acting as an application roller and being mounted axially displaceably on a drive shaft likewise extending across the width of the printing machine, said other conveyor roller being in entraining connection with said carrying element, and including adjusting means engaging said carrying element for adjusting and displacing said bracket relative to said carrying element in a direction as viewed across the width of the printing machine, said adjusting means comprising knurled nuts engaging a strap of a bracket forming said entraining connection for laterally adjusting said bracket and thus said other conveyor roller with respect to said guide roller and said one conveyor roller arranged on said carrying element, said knurled nuts being screwed onto a threaded pin engaging in a threaded bore formed in said carrying element.

4,627,610

MULTI-PURPOSE EXERCISING APPARATUS

Hiroshi Ishida, La Mirada, Calif., and Yujen Wang, Tainan, Taiwan, assignors to Rocket Industries, Inc., Pico Rivera, Calif.

Filed Apr. 1, 1985, Ser. No. 718,153

Int. Cl.[4] A63B *69/06, 21/00*

U.S. Cl. 272—72 **14 Claims**

1. A multi-purpose exercising apparatus for selective usage as a rowing machine or for performing other types of exercises such as a bench press, comprising:

a generally horizontal base frame having opposed sides and a forward end and a rearward end;

a longitudinally-extending track on said frame;

a seat mounted on said track for longitudinal movement relative to said frame;

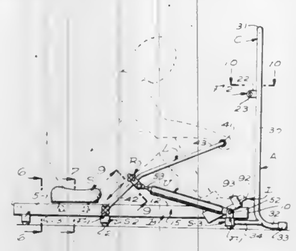
at least one movable lever member having the inner end thereof connectable to said frame by releasable attachment means for pivotal movement relative to said frame and containing handle means at the other end thereof to be grasped and moved by a user's hand;

elongate resistent means having one end thereof operatively

connected to said lever member providing resistence to the pivotal movement of said lever member, the other end of said resistence member being connected to the frame;

foot bracing means mounted on the frame for bracing the user's feet during use of the apparatus as a rowing machine;

a vertically extending column member attached to the base frame adjacent the forward end thereof; and



attachment means on said column member for receiving and releasably connecting the inner end of the lever member to said column member for pivotal movement relative thereto when said inner member is not connected to the base frame, thereby providing means for performing exercises not available using a rowing machine.

4,627,611

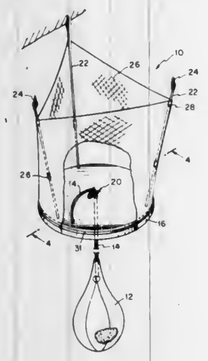
IMPACT TRAINING DEVICE

Stephen R. Kauffman, 2650 N. Miracle Mile, Apartment 819, Tucson, Ariz. 85705

Filed Sep. 12, 1984, Ser. No. 649,728

Int. Cl.[4] A63B *69/00*

U.S. Cl. 272—77 **13 Claims**



1. An impact training device, comprising:

a bag commensurate in size with the human hand and foot,

a flexible and resilient cord member connected at its lower end to said bag,

a board member approximately twice the size of the bag,

said cord member having an upper end portion adjustably connected to said board member to vary the position of said bag relative to said board member,

a flexible net member having a lower end portion surrounding and connected to said board member, said net member extending upwardly from said board member a sufficient distance to be engaged by said bag when it is struck and moves upwardly, and

said net member having a mounting means secured to said board member for connecting it to a support; whereby said cord member is lengthwise adjustable to vary the distance between said bag and said board member or said net member.

4,627,612

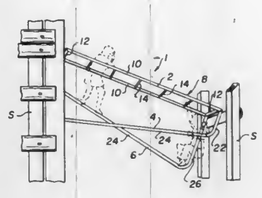
OVERHEAD CLIMBER

Roger D. Gehlbach, 4321 John St., Vancouver, British Columbia, Canada V5V 3W8

Filed Feb. 22, 1985, Ser. No. 704,481

Int. Cl.[4] A63B *9/00*

U.S. Cl. 272—113 **7 Claims**



1. A play device comprising:

a pair of longitudinal members, each member having a first end and a second end;

a plurality of cross members joining the longitudinal members;

a first member attached to one longitudinal member at each end of the longitudinal member by different length limbs and including a straight support section joining the limbs, the support section extending in a gradual, uniform slope, relative to the longitudinal member;

a second member attached to the other longitudinal member at each end of the longitudinal member by different length limbs and including a straight support section joining the limbs, the support section extending in a gradual, uniform slope, relative to the longitudinal member;

the first support member having its longer limb at that end of the play device where the second member has its shorter limb; and

locating means for the play device.

4,627,613

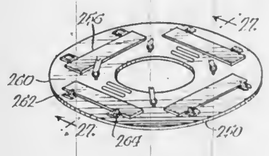
HYDRODYNAMIC JUMPER

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 411,853, Aug. 26, 1982, Pat. No. 4,458,896, which is a continuation-in-part of Ser. No. 310,788, Oct. 13, 1981, Pat. No. 4,416,451, which is a continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Jun. 25, 1984, Ser. No. 624,123

Int. Cl.[4] A63B *21/20*

U.S. Cl. 272—116 **9 Claims**



1. A jumper aquatic exercise assembly for use in repetitively squatting and doing knee bends underwater to strengthen muscles and improve muscle tone in the user's legs, comprising:

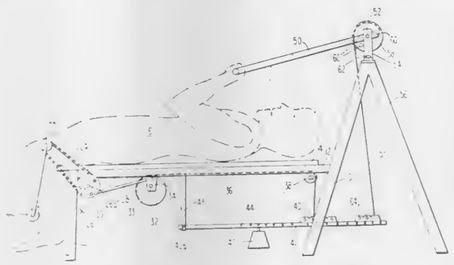
a substantially rigid annular hydrodynamic member extending substantially continuously and laterally away from and about the waist of the user defining a waist-receiving

opening, said annular member having a substantially rigid annular, downwardly facing surface descendingly engaging the water and creating substantial hydrodynamic fluid resistance and a downward pressure head when said annular member is lowered in the water and a substantially rigid annular, upwardly facing surface for ascendingly engaging the water and creating hydrodynamic fluid resistance and an upward pressure head when said rigid member is raised in the water;

flexible strap means operatively connected to said annular member for supporting said annular member from the user's shoulders generally about the waist of the user; and

substantially rigid fluid resistance enhancing means positioned symmetrically about and extending integrally from said rigid annular hydrodynamic member for increasing the hydrodynamic fluid resistance and pressure head of said rigid annular member when said rigid annular member is raised in the water.

4,627,614
EXERCISE APPARATUS
Michael M. de Angeli, 225 Church St., Philadelphia, Pa. 19106
Division of Ser. No. 160,614, Jun. 18, 1980, Pat. No. 4,422,636. This application Dec. 19, 1983, Ser. No. 563,161
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **9 Claims**



1. Apparatus for the exercise of an athlete's legs by lifting weight against the force of gravity, comprising:

a frame;

a weight;

a bench mounted on said frame;

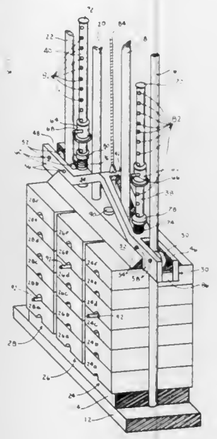
a single arm mounted on said frame for being rotated about a first generally horizontal axis upon exertion of force thereon by an athlete;

a drum mounted on said frame for rotation about a second axis;

means connecting said single arm to said drum for transmitting force therebetween, such that said drum is rotated upon rotation of said arm about its axis; and

a flexible tension member connected to said drum to be wound onto said drum upon rotation thereof, said tension member being connected to said weight to lift and lower the same when said single arm is rotated, wherein said means connecting said single arm and said drum includes means for permitting the athlete to select which of two possible directions of rotation of said arm about said first axis will rotate said drum to wind said tension member thereupon so as to lift said weight in response to movement of said arm in either selected direction in perfomance of a given exercise, and to permit the point at which rotation of said arm from a rest position causes commencement of lifting of said weight from a rest position to be varied independent of the distance through which said weight is lifted by rotation of said arm through a given degree of rotation.

4,627,615
PROGRESSIVE WEIGHT RESISTANCE WEIGHTLIFTING MECHANISM
Paul S. Nurkowski, 50 Goodwin Parkway, Sewell, N.J. 08080
Filed Nov. 13, 1984, Ser. No. 670,091
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **14 Claims**



1. Progressive resistance mechanism for a weight-lifting machine comprising:

(a) a base;

(b) a plurality of spaced vertical guide members upstanding from the base;

(c) a carriage adapted for vertically reciprocative motion along said vertical guide members;

(d) a plurality of weight stacks on said base beneath the carriage, each stack including a plurality of stacked weights;

(e) an upright vertically movable selector post for each stack extending from below the lowermost weight of the stack to above the carriage;

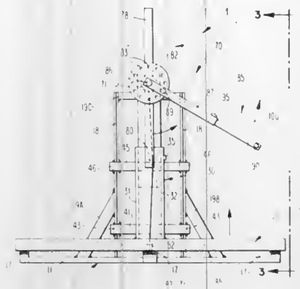
(f) means for connecting the lowermost weight of a selected number of weights to said post; and

(g) carriage engaging means on said post above the carriage for engagement by said carriage on upward movement of said carriage, the carriage engaging means on at least one post being vertically adjustable with respect to said post, the independent adjustment of the carriage engaging means on said post resulting in selected progressive sequential weight resistance during a single user repetition.

4,627,616
EXERCISE APPARATUS
Brad Kauffman, 35 Back Cove Estates, Portland, Me. 04103
Filed Jul. 9, 1985, Ser. No. 753,321
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—120 **10 Claims**

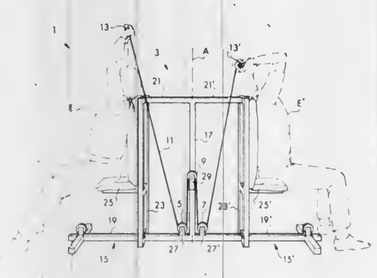
1. An exercising machine comprising: stationary frame means including track means; platform means movably engaging said track means; cable means for moving said platform means along said track means in response to an external force; lever means mounted to said platform means for producing means against which said external force may be applied and for

permitting engagement with said cable means at various locations to vary the amount of said external force required to be



applied to said lever means to move said platform means in relation to said stationary frame means.

4,627,617
EXERCISE DEVICE WITH OPPONENT SUPPLIED RESISTANCE
Douglas D. Gilmore, 501 Lookout Mtn Rd., Golden, Colo. 80401, and G. Michael Harz, Golden, Colo., assignors to Douglas D. Gilmore, Lakewood, Colo.
Filed Jun. 3, 1985, Ser. No. 740,834
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—120 **15 Claims**



1. An exercise device primarily intended for use by two individuals working against one another to provide the resistance to movement of the other rather than working alone against dead weight, said exercise device including:

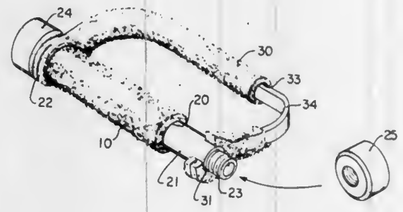
a flexible cable member having first and second end portions,

first and second user engaging members and means for attaching said first user engaging member to the first end portion of said cable member and means for attaching said second user engaging member to the second end portion of said cable member, and

a frame having first and second side portions, said first and second side portions extending away from each other relative to a vertical plane centrally located relative to said frame, first and second seat members and means for respectively mounting said seat members to the first and second side portions of said frame on opposite sides of the central, vertical plane of said frame with said seat members facing in opposite directions, and first and second pulley members, and means for mounting said first pulley member to the first side portion of said frame for rotation about a first, horizontal axis and means for mounting said second pulley member to the second side portion of said frame for rotation about a second, horizontal axis wherein said cable member is run through said frame from one side portion to the other side portion with said cable member being received partially about the respective pulley members below the respective horizontal, rotational axes thereof whereby the two individuals can sit on respective ones of said seat members, grip a respective one of said user engaging members, and continuously apply an upward force thereto with each individual alternately applying a greater upward force than the other to alternately draw the cable member through the frame toward him while the other individual resists such movement wherein the two individuals always hold the same muscles in tension while exercising on the device

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4,627,618
AEROBIC HAND WEIGHTS
Leonard Schwartz, 5526 Northumberland St., Pittsburgh, Pa. 15217
Continuation-in-part of Ser. No. 413,807, Sep. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 127,474, Mar. 5, 1980, Pat. No. 4,351,526. This application Feb. 28, 1983, Ser. No. 470,621
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **11 Claims**



1. A hand weight structure particularly adapted for aerobic and related extended-time exercises comprising an elongate rapid body member of sufficient weight for use in aerobic exercise having a surrounding soft, resilient central hand portion, where the ends of said body member extend from said central hand portion, a rigid three sided member adapted to overlay the back and sides of a hand, and a soft resilient hand engaging means surrounding said three sided member and engaging the ends of said body member at each side of said central hand portion, said hand engaging means having sufficient resilience so as to urge said rigid member toward said elongated body member thus engaging the hand between the three sided member and body member in a soft, frictional engagement.

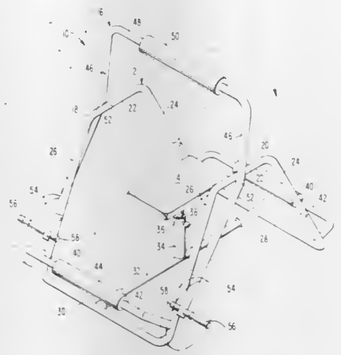
5. A hand weight for aerobic and similar extended time exercises comprising a generally cylindrical elongate hand portion including an elongate weight body member and an elongate hollow resilient foam hand grip member slidably receiving the elongate weight body member where the ends of said elongated weight body member extend from said hand grip member, a hollow resilient foam hand engaging means engaged at each end on said ends of the elongate weight body member, and a generally C-shaped rigid member within said hollow hand engaging member and spaced from the elongate weight body member, said hand engaging member having sufficient resilience so as to urge said rigid member toward said elongated weight body member thus engaging the hand between the C-shaped rigid member and the elongated weight body member in a frictional engagement.

4,627,619

ABDOMINAL AND BACK WEIGHT TYPE EXERCISING DEVICE

Gary Rockwell, LaGrange, Ga., and Randall Bartlett, Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Jan. 31, 1985, Ser. No. 696,705
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **5 Claims**



1. An abdominal/back exerciser comprising:
a frame having spaced side members;
a seat attached to said frame between said frame side members;
foot bracing means between said frame side members on each side of said seat;
a generally U-shaped lever assembly having parallel side legs pivoted intermediate their length to said frame side members about a pivot axis, and a padded torso-engaging member interconnecting said side legs;
weight mounting means at the distal end of each of said side legs for mounting selected weights; and
stop means extending laterally between said side legs of said lever assembly and said side members of said frame for limiting downward movement of said side legs to a start position, said torso-engaging member being elevated above said seat in said start position so that a user seated on said seat facing said torso-engaging member may exercise the user's abdominal muscles by leaning forwardly against said torso-engaging member to rotate said lever assembly and raise said weight and so that a user seated on said seat with the user's back to said torso-engaging member may exercise the user's lower back muscles by leaning backwardly against said torso-engaging member to rotate said lever assembly and raise said weight.

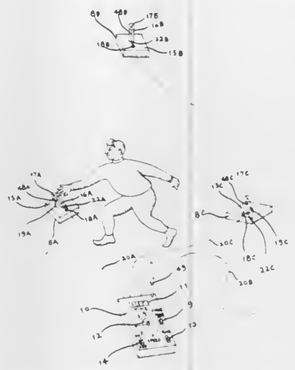
4,627,620

ELECTRONIC ATHLETE TRAINER FOR IMPROVING SKILLS IN REFLEX, SPEED AND ACCURACY

John P. Yang, 59 Royce Brook Rd., Belle Mead, N.J. 08502

Filed Dec. 26, 1984, Ser. No. 686,467
Int. Cl.[4] A63B *71/02, 71/06*
U.S. Cl. 273—1 GC **2 Claims**

1. A training apparatus comprising in combination multiple targets which are to be placed around the player with different distances and heights; an electronic device having electronic components for controlling the operation of said training apparatus; means for randomly selecting said targets; sound generator means acting as a coordinating means to coordinate the hearing, vision and body control of the player, responsive to said target selection means to automatically create a sound as said targets are selected by said target selection means; indicating means responsive to said target selection means for indicating when said targets are selected by said target selections; means for resetting said target selections; means for measuring elapsed time between said target selections and said target resettings; indicating means for indicating elapsed time measured by said measuring means; selection means for designating selection speeds of said target selections; means for selecting fake mode of said target selections in which true target selection is preceded by fake target selections for improving the judgment and coordination abilities of the player; means for communication between said electronic device and said targets whereby said targets can be placed at different distances and



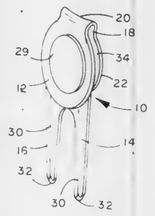
heights from the player, wherein means for supporting said target means and controlling means for generating reset signal is a rod with its top being connected to said target means and its bottom being hinged to said base means and positioned right on top of said means for generating reset signal whereby when said rod is in straight position, said means for generating reset signal is closed by the weight of said rod and when said rod is in tilted position due to the hitting of said target means by the player, said means for generating reset signal is open, thus generating a reset signal.

4,627,621

GOLF ACCESSORY

John R. Tate, 10869 Portal Dr., Los Alamitos, Calif. 90720

Filed Sep. 11, 1985, Ser. No. 774,729
Int. Cl.[4] A45F *5/00*
U.S. Cl. 273—32 B **15 Claims**



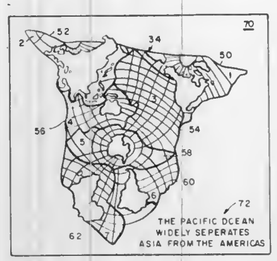
1. A combination clip and golfing accessory comprising a metal disk having a pair of thin, longitudinal legs lying in the plane of said disk and spaced from each other, a saddle curved concave upwardly and extending rearwardly from said disk opposite said legs and terminating in a spherical segment with a convex surface facing forwardly toward said disk and a concave surface facing rearwardly directly behind said disk and formed at a radius equal to the radius of a golf ball.

4,627,622

MAP PUZZLE HAVING PERIODIC TESSELATED STRUCTURE

Athelstan Spilhaus, P.O. Box 1063, Middleburg, Va. 22117

Filed Mar. 15, 1985, Ser. No. 712,364
Int. Cl.[4] A63F *9/10;* **G09B** *29/02*
U.S. Cl. 273—157 R **17 Claims**



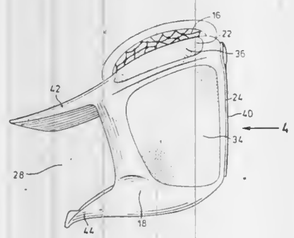
1. A map puzzle in the form of a plurality of separable interfitting pieces, the pieces obtained by:
projecting a spherical map onto a polyhedral surface having apices located adjacent preselected significant points on said spherical map, said significant points corresponding to selected locations represented on said spherical map to define planar projected figures of said spherical map on the sides of said polyhedron that enclose areas of said spherical map which are to be emphasized;
unfolding said polyhedral surface; and
arbitrarily dividing the resultant unfolded polyhedral projection into the plurality of arbitrarily shaped interfitting pieces so that when assembled the pieces form a single tesselated representation of said spherical map.

4,627,623

HANDHELD DEVICE FOR BALL GAME

Francesco Perilli, Piazza T. Marconi 21, 64015 Nereto Teramo, Italy

Filed Sep. 4, 1985, Ser. No. 772,550
Claims priority, application Canada, Feb. 22, 1985, 474978
Int. Cl.[4] A63B *59/00, 67/00*
U.S. Cl. 273—328 **18 Claims**



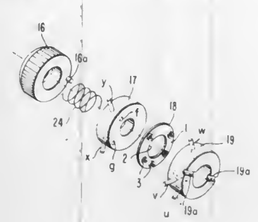
1. A game device for catching and hitting a ball comprising pocket means adapted to catch a ball, closed at one end and open at the other end, a hand enclosure, a frame extending from and connected to one side of said enclosure to which the open end of said pocket means is connected, handle means attached to and located in said hand enclosure whereby said device can be held in one hand, and wherein said hand enclosure has two or more exterior surfaces provided thereon and adapated for hitting said ball.

4,627,624

PACKING HAVING MULTIPLE SEAL PORTIONS

Seiji Usui, and Kunio Terada, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 12, 1985, Ser. No. 797,033
Claims priority, application Japan, Dec. 19, 1984, 59-193552[U]
Int. Cl.[4] F16J *15/06;* **F16K** *11/02*
U.S. Cl. 277—12 **2 Claims**



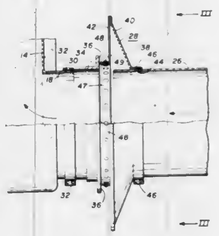
1. A packing, comprising an annular sheet formed of an elastic material, having a center axis and opposite first and second generally planar annular surfaces centered at and extending perpendicularly to said axis, and a plurality of seal portions formed integral with said sheet at circumferentially spaced apart locations about said axis, each of said seal portions extending outwardly from said first surface and having a hole therein extending parallel to said axis entirely through said sheet.

4,627,625

AIR SEAL BETWEEN RELATIVELY MOVEABLE DUCTS

Samuel C. Johnson, and James C. Elliott, both of Spartanburg, S.C., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 2, 1981, Ser. No. 250,322
Int. Cl.[4] F16J *15/08, 15/52*
U.S. Cl. 277—27 **4 Claims**



1. A seal assembly for substantially sealed air flow communication between a first duct having a vibrational motion generally transverse to the direction of flow and a second generally stationary duct, said seal assembly comprising:
a collar member attached to and encircling said first duct adjacent the outlet thereof and providing an annular sealing surface in a plane generally perpendicular to air flow therethrough, said sealing surface having a radial dimension greater than the amplitude of vibration; and,
a diaphragm mechanism attached to and encircling the inlet to said second duct and defining a pair of annular outwardly converging side members connected at their outer periphery with one of said side members sealingly attached to said second duct and the other of said members supporting an annular sealing ring terminating in a place substantially parallel to the plane of said annular surface and extending axially into an abutting sealing engaging relationship with said annular surface, and in axial alignment therewith such that during relative vibrational movement therebetween, full annular engagement is maintained, whereby internal air pressure within said dia-

phragm mechanism provides a biasing force for maintaining said sealing engagement.

4,627,626

CHUCK FOR A HAMMER OR ROTARY IMPACT DRILL

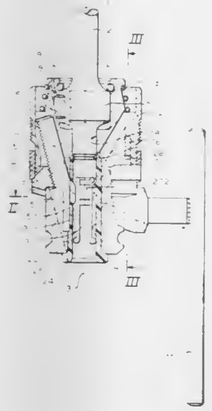
Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,596

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416964

Int. Cl.[4] B25D *17/08*

U.S. Cl. 279—1 A **16 Claims**



1. In a chuck for a drill bit having a drill bit shaft for engagement in said chuck, particularly a hammer drill chuck, comprising a chuck body connected to a drive shaft that provides hammer blows to a drill bit, a mounting opening formed in said chuck body coaxial with a chuck axis of said chuck body, said drill bit shaft being held in said mounting opening, a plurality of clamp jaws guided in said chuck body so as to be centrally advanceable to and retractable from said mounting opening, an axial passage formed in said chuck body between said drive shaft and said mounting opening, said hammer blows of said drive shaft being transmitted through said axial passage to said drill bit shaft in said mounting opening, the improvement wherein a chuck sleeve is rigidly clamped in said mounting opening and said drill bit shaft is axially slidable in said chuck sleeve.

4,627,627

PERCUSSION OR IMPACT DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,583

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422195

Int. Cl.[4] B23B *31/04;* **B25D** *17/08*

U.S. Cl. 279—19.3 **14 Claims**

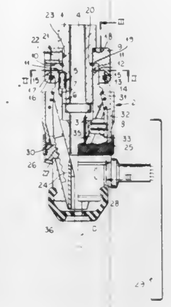
11. An impact drill chuck adapted to be secured on a drill spindle through which an impact rod is displaceable, said chuck comprising:

a chuck body;

means for keying said chuck body on said spindle for limited axial displacement relative to said spindle and rotation jointly therewith;

a ring axially fixed on said spindle, said ring having a first annular surface axially juxtaposed with a second annular surface formed on said body;

a formation projecting axially on one of said surfaces and dimensioned to brace against the other of said surfaces to preclude axial displacement of said body on said spindle; and



a recess formed in the other of said surfaces dimensioned to receive said formation to permit axial displacement of said body on said spindle upon relative rotation of said ring and said body.

4,627,628

HAMMER DRILL CHUCK

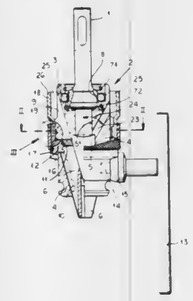
Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,888

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406668

Int. Cl.[4] B25D *17/08*

U.S. Cl. 279—20 **9 Claims**



1. In a drill chuck for a hammer drill having a rotatable chuck body connected to a drill spindle, said chuck body being formed with a tool holder for a drill bit and an open axial passage aligned therewith, said open passage being positioned so that a hammer effect can be transmitted through said open passage onto an end of said drill bit, said drill bit being engageable between a plurality of clamp jaws in said tool holder, said clamp jaws being fed through said rotatable chuck body, said clamp jaws being advanced and retracted by means of a rotatably adjustable and axially nonshiftable operating ring bearing an actuating jacket, a locking sleeve being provided on said chuck body so that it is shiftable axially between two axial positions, said locking sleeve having teeth on an end turned toward teeth on said ring, whereby said teeth mesh when said sleeve is shoved toward said ring to prevent undesired rotation during drilling, and wherein said teeth are out of engagement when said sleeve is drawn away from said ring, the improvement wherein said jacket is disposed with radial clearance from an outer surface of said chuck body so as to define a circular space between said chuck body and said jacket; said sleeve is engageable with said ring in said circular space and said jacket snugly overlaps said sleeve axially; and a plurality of cleaning passages are provided in said chuck body, each of said cleaning passages opening at one end onto an outer circumferential surface of said chuck body and at an opposite end into said tool holder, said passages being positioned to be cleared by said sleeve, mouths of said cleaning passages at said opposite ends being positioned adjacent said axial passage in said tool holder, said cleaning passages diverging toward a spindle side of said chuck body at an acute angle to a chuck axis.

4,627,629

TRUCK TRAILER ADAPTED TO CARRY FLUID AND DRY FREIGHT AND METHOD FOR LOADING THE SAME

Hugh O'Neill, Chagrin Falls, Ohio, assignor to Transport Investment Corp., Cleveland, Ohio

Filed Jul. 3, 1984, Ser. No. 627,350

Int. Cl.[4] B60P *3/22*

U.S. Cl. 280—5 D **4 Claims**



1. A truck trailer adapted to carry dry and fluid freight comprising an elongated hollow trailer body having front and rear ends, a rear running gear movably supporting the trailer body adjacent the rear end of said trailer body, a first fluid carrying tank contained in said trailer body generally adjacent the front end of said trailer body, a second fluid carrying tank normally contained in said trailer body adjacent the rear end thereof and generally above said rear running gear, and a dry freight section between said first and second fluid carrying tanks, means releasably to secure said second fluid carrying tank to said trailer, an access means in said trailer body to permit said second fluid carrying tank to be removed from and inserted into said trailer body, said access means consisting essentially of an opening in the rear end of the trailer dimensioned to allow movement of the second fluid carrying tank therethrough, said second fluid carrying tank being adapted to be selectively removed from said trailer body through said access means to permit dry freight to be loaded through said access means into the dry freight section of said trailer body before reinserting the second fluid carrying tank, means selectively to fill and empty the first and second fluid carrying tanks, a rear bulkhead across said trailer body immediately in front of said second fluid carrying tank, said rear bulkhead having access doors therein selectively to permit dry freight to be passed through said rear bulkhead.

4,627,630

CHAIN LINK RUNNER ASSEMBLY

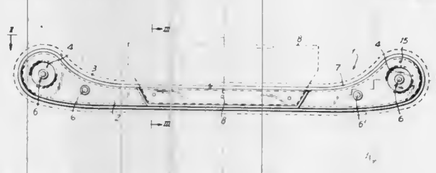
Hans-Georg Hütter, Beckgasse 46, A 1130 Vienna, Austria

Filed Sep. 26, 1984, Ser. No. 654,777

Claims priority, application European Pat. Off., Sep. 27, 1983, 83890170.0

Int. Cl.[4] B62D *57/00*

U.S. Cl. 280—28.5 **11 Claims**



1. A chain link runner assembly comprised by:

a frame provided by opposed frame members of mirror image configuration arranged in juxtaposition and joined to each other at least at their peripheral edges, said frame members in combination defining a rigid and hollow support member of substantially closed box cross-section;

a continuous peripheral flange on each of said frame members, said respective flanges, in transverse cross-section defining opposed channel members for the reception, support and retention of retaining members of links of a chain link belts, and defining spaced guide surfaces for engagement with guide members of said belt;

said chain link belt including a plurality of link sections each hinged to an adjacent link section at its respective ends;

anti-friction members interposed between each said link section and an outwardly presented peripheral surface of said flanges;

guide members fast with each said link member and extending between said spaced guide surfaces; and

a retaining member fixed within apertures in said guide members and extending transversely of said flanges and laterally beyond said guide surfaces.

4,627,631

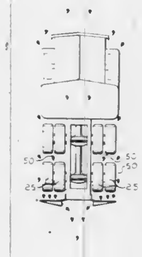
SPRAY-SUPPRESSING MUD FLAP ASSEMBLY

Robert C. Sherman, Clinton, Conn., assignor to Carl J. Messina, Clinton, Conn.

Filed Jun. 1, 1984, Ser. No. 616,131

Int. Cl.[4] B62D *25/16*

U.S. Cl. 280—154.5 R **22 Claims**



1. A spray-suppressing mud flap for mounting to the farme rail of truck vehicle, comprising:

a sheet element having opposed forward and rearward surfaces and being adapted for mounting aft of the vehicle tires of a truck so that said forward surface faces forwardly toward the vehicle tires,

said sheet element having upper and lower portions and opposed inboard and outboard sides,

said upper portion of said sheet element having an upper planar mounting portion and a flared portion,

said flared portion extending downwardly and inwardly so as to open downwardly, inwardly and rearwardly to form an air guiding surface in said forward surface of said sheet element to direct air downwardly and inboard of the truck,

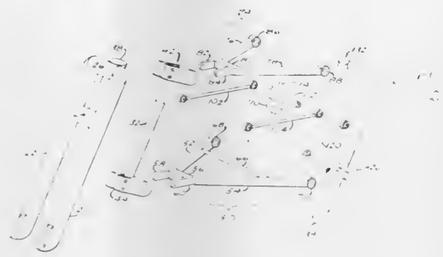
said lower portion of said sheet element being substantially rearwardly of said upper planar mounting portion and extending substantially vertically from said flared portion for dispersal of spray downwardly, rearwardly and inwardly when mounted to a truck,

first blade means for stopping water and spray from passing upwardly over the top of said sheet element, said first blade means extending across said planar upper portion between said inboard and outboard sides and protruding forwardly from said forward surface of said sheet element, and

second blade means for stopping water and spray from passing outwardly from said outboard side of said sheet member, said second blade means extending along said

outboard side of said sheet element and protruding forwardly from said forward surface of said sheet element.

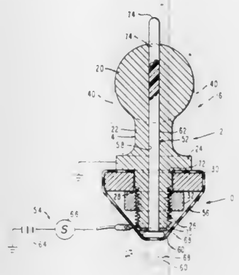
4,627,632
CYCLE SUSPENSION SYSTEM
Ollie H. McKagen, Rte. 3, Box 264, Blacksburg, Va. 24060
Filed Jul. 29, 1985, Ser. No. 760,179
Int. Cl.[4] B62K *11/12*
U.S. Cl. 280—276 **7 Claims**



1. A suspension system for the front wheel of a motorcycle having a frame assembly for supporting the suspension system, said system comprising:
- a pair of upright bars, said bars having upper and lower ends and adapted to rotatably mount a wheel between their lower ends,
- brace means attached to said bars adjacent the upper ends thereof to hold the bars in spaced and parallel position,
- a parallelogram mechanism affixed to the cycle frame and to the pair of upright bars to control up and down movement and to allow rotary movement of said pair of bars,
- a pair of semi-handlebars movably mounted on the cycle frame,
- linkage means operatively connecting each semi-handlebar to the bar pair, both linkages pivoting about a common pivot pin whereby the pair of bars may be rotated by movement of either semi-handlebar independent of the other semi-handlebar,
- wherein the vertical axis of the pivot pin which is the common pivot point for both handlebar linkages is parallel to the axis of rotation of the pair of bars taken in the medial longitudinal plane of the cycle, and
- wherein each handlebar linkage comprises an arm connected to one of the handlebars, an intermediate link pivotally carried on the common pivot pin and operatively associated with the arm from the handlebar and a steering link connecting said intermediate link to the pair of bars.

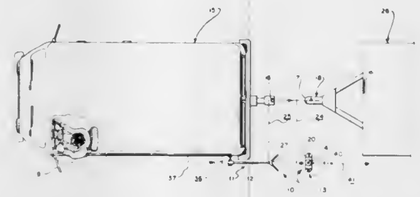
4,627,633
TRAILER HITCH UNCOUPLE DETECTING AND SIGNALING APPARATUS
Roland P. Gehman, Stevens, and Raymond G. Martin, East Earl, both of Pa., assignors to MGS, Inc., Denver, Pa.
Filed Mar. 17, 1986, Ser. No. 840,304
Int. Cl.[4] B60D *1/12*
U.S. Cl. 280—432 **17 Claims**

1. A hitch uncouple detecting and signaling apparatus for use with a ball member of a trailer hitch, comprising:
- (a) a plunger rod reciprocally mountable through said ball member and being longer than the height of said ball member such that one or the other opposite ends of said rod will extend beyond one or the other opposite ends of said ball member;
- (b) an electrical circuit adapted for connection to a source of electrical power and including operator signaling means and a pair of contacts, one contact being carried by one end of said rod and the other contact being defined on one end of said ball member; and
- (c) flexble means interconnectible to said rod and said ball member so as to bias said rod to an extended position wherein its other end extends beyond the other end of said ball member and said one contact on its one end is disposed in electrical engagement with said other contact on said one end of said ball member causing activation of said signaling means, said flexible means being yieldable so as to permit movement of said rod toward and retention thereof at a retracted position upon engagement and movement of its other end due to seating of a trailer hitch socket member on said other end of said ball member, said



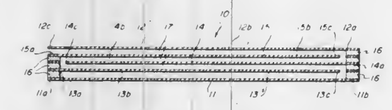
movement of said rod causing displacement and electrical disengagement of said one contact from said other contact and deactivation of said signaling means, whereby said signaling means is activated whenever the trailer hitch socket member is uncoupled from said ball member sufficiently to allow movement of said rod to its extended position, whereas said signaling means is deactivated whenever said socket member is coupled to said ball member sufficiently to retain said rod away from its extended position.

4,627,634
SIDE VISION AID FOR TRAILER HITCHING
Gary W. Coleman, Coleman Mobile Home Park, 8615 So. Highway 89, No. 16, Willard, Utah 84340
Filed Sep. 3, 1985, Ser. No. 772,042
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 280—477 **14 Claims**



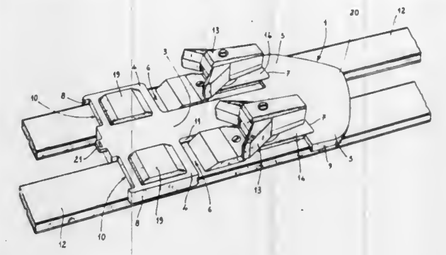
13. A vehicle positioning aid for joining the hitch coupling of a towing vehicle to a mating hitch coupling of a trailer, the positioning aid comprising:
- a vehicle-attachable sighting assembly including a base member with an elongate slot therethrough, a pair of suction cups each mounted upon one of a pair of externally threaded elongate stems disposed through the slot, each stem carrying a pair of internally threaded nuts, one on each side of the base member; and a sighting rod of at least two slideably adjustable telescopic portions, a connector joining one end of said sighting rod to one end of said base member angularly thereto, said connector being adjustably pivotal about an axis generally parallel to the base member; and
- a trailer target assembly having a target rod, a base, and means securing said rod to said base, said base being adapted to support the assembly upon the ground with the rod vertically upstanding therefrom, and means for its removable attachment to the trailer hitch coupling with the target rod vertically upstanding directly thereabove.

4,627,635
VIBRATION DAMPING UNITS AND VIBRATION DAMPED PRODUCTS
Michael T. Kowda, 15 Murray Ave., Port Washington, N.Y. 11050
Continuation-in-part of Ser. No. 534,065, Sep. 20, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,132
Int. Cl.[4] A63C *5/06*
U.S. Cl. 280—602 **34 Claims**



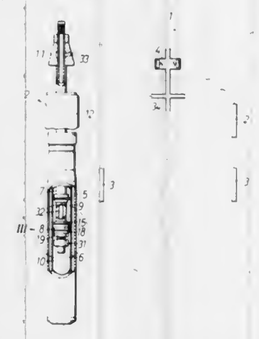
1. A discrete flexible vibration damping unit to co-extend with a vibratile product for sensing and damping vibrations of said product, said unit including; a framework comprising laminar group and framework portion means and said means including, a laminar group of flexible strip members of said framework having opposed side faces directly confronting one another interiorly of said group, with there being a flexible first strip member in said group, and all other of said flexible strip members in said group, including a flexible strip member next to said first strip member, being longitudinally movably free-ended and connected in said framework with said flexible first strip member in said group, and said laminar group and framework portion means having portions of said framework interconnected in said framework through said flexible first strip member in said group and said framework portions to be secured to said vibratile product with said unit co-extending with said product side facially of said framework toward said product, for said flexible strip members in said group to be flexed from side to side and longitudinally relatively move with reference to one another having said all other of said flexible strip members in said group remain connected with said flexible first strip member and longitudinally movably free-ended, when said group is flexed between said framework portions; and a tacky visco-elastic substance longitudinally reaching between said opposed side faces of all of said flexible strip members in said group about as far as said opposed side faces of one and next of said flexible strip members in said group longitudinally co-extend directly opposing one another, and said tacky visco-elastic substance directly visco-elastically interengaging said opposed side faces with one another in said group, for said unit to have said flexible strip members in said group flex from side to side and be retarded in said relative longitudinal movements thereof by said tacky visco-elastic substance when said flexible unit is on said vibratile product co-extending with said product side facially of said framework toward said product while having said framework portions secured to said product and said unit is responding to vibrations of said product by flexing between said framework portions, with said all other of said flexible strip members in said group remaining connected with said flexible first strip member in said group and longitudinally movably free-ended.

4,627,636
MONOSKI CONVERTER
Fernand Payraud, "Le Clos Baron" Domancy, 74700 Sallanches, France
Filed Apr. 10, 1985, Ser. No. 721,598
Claims priority, application France, Apr. 10, 1984, 84 05861
Int. Cl.[4] A63C *11/00*
U.S. Cl. 280—607 **13 Claims**



1. In combination with
- a pair of skis each having an upper surface provided with a toe clamp and a heel clamp and respective ski boots securable by the clamps to the upper surfaces of the skis, a monoski converter having a rigid longitudinal stem having a front end and a rear end, the latter being integrally formed with respective rigid transversely projecting rear tabs, the tabs and stem forming a pair of like parallel seats that extend longitudinally and that are dimensioned to fit over the respective skis with the rear tabs on the respective upper surfaces between the respective toe and heel clamps, the ski boots being fitted to the clamps of the respective skis over the respective rear tabs with same pressed tightly directly by the boots against the upper surfaces of the respective skis, whereby the two skis are locked together against substantial movement relative to the boots into a monoski.

4,627,637
DAMPING FORCE-VARIABLE DAMPER DEVICE FOR VEHICLES PROVIDED WITH POWER STEERING DEVICE
Yoshihiko Toshimitsu, Asaka; Toshihiko Aoyama, Tsurugashima, and Takashi Ishida, Kawaguchi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1985, Ser. No. 714,426
Claims priority, application Japan, Mar. 29, 1984, 59-61873
Int. Cl.[4] F16F *9/46*
U.S. Cl. 280—714 **3 Claims**



1. In a vehicle including: a power steering device having an oil container whose pressure increases to a high level as a

steering angle becomes large; and a damper device consisting of a cylinder filled therein with a working oil and a piston fitted slidably in said cylinder to divide an interior of the cylinder into an upper oil chamber and a lower oil chamber, said damper device being adapted to damp relative movements of a chassis and a wheel support member,

a damping force-variable damper device wherein a variable throttle mechanism is interposed between said upper and lower oil chambers, said variable throttle mechanism being operable to increase a degree of restriction thereof in response to an increase of the pressure in said oil container of said power steering device.

4,627,638

SHOCK ABSORBING MATERIAL

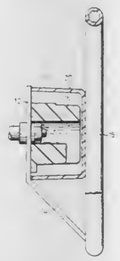
Akira Mabuchi; Sadao Uchida, and Masanao Ishikake, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 15, 1985, Ser. No. 712,254

Claims priority, application Japan, Mar. 15, 1984, 59-50632

Int. Cl.[4] B62D *1/16*

U.S. Cl. 280—779 **2 Claims**



1. A pad for an automobile steering assembly provided with a shock absorbing body composed of:

(a) a core portion having a density of 0.02 to 0.1 g/cm^3, said core portion being formed of an isocyanurate ring-containing foam, said isocyanurate ring-containing foam being a product obtained by reacting a polyhydroxy compound having a hydroxyl value of 200 to 700, triethanolamine and a polymethylene polyphenyl isocyanate having a mean functional group number of 2.3 to 3.5 in an equivalent value of NCO/OH=2.5 to 5 in the presence of a foaming agent and a trimerization catalyst, and

(b) a skin layer integrally formed on said core portion by foaming, said skin layer having a higher density than that of said core portion which is 0.1 to 1.0 g/cm^3 and being formed of an isocyanurate ring-containing foam, said isocyanurate ring-containing foam being a product obtained by reacting a polyhydroxy compound having a hydroxyl value of 200 to 700, triethanolamine and a polymethylene polyphenyl isocyanate having a mean functional group number of 2.3 to 3.5 in an equivalent value of NCO/OH=2.5 to 5 in the presence of a foaming agent and a trimerization catalyst.

4,627,639

SAFETY BELT SYSTEM

Gerhard Sedlmayr, Hamburg, and Herbert Just, Honstorf, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,639

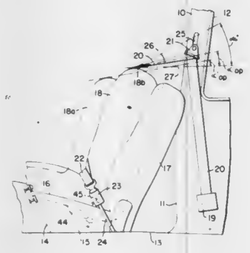
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407377

Int. Cl.[4] B60R *22/48;* **A62B** *22/20*

U.S. Cl. 280—808 **20 Claims**

1. A safety belt system, especially for motor vehicles, which includes a three-point safety belt, a self-locking belt reel-in mechanism mounted on a structural part of said vehicle, and a clamping mechanism for the belt strap of said safety belt; said clamping mechanism having at least one movable clamping jaw, and being movably disposed and guided on said structural part, with a drive mechanism being provided for effecting movement of said at least one clamping jaw of said clamping mechanism;

the improvement therewith wherein said clamping mechanism, adjustable to change adaptive positioning of said safety belt for strapping-in of a person; and wherein, for automatic vertical adjustment of said clamping mechanism, a value-determining and computing unit is provided which senses the position of said belt strap relative to at



least one parameter of its functional connection with a strapped-in person, and which undertakes a comparison, with reference to a fixed desired value and the actual value of said belt strap position as determined relative to said at least one parameter to ascertain whether a deviation exists between said two values; said value-determining and computing unit, via an adjusting mechanism, accordingly having an operative relationship that initiates a vertical adjustment of said clamping mechanism when said ascertained deviation continuously exceeds a designated deviation between said desired value and said actual value.

4,627,640

ALBUM WITH FOLDABLE SHEETS

Margaret Markovics, Upper St. Clair, Pa., assignor to ACT Laboratories, McMurray, Pa.

Filed Sep. 27, 1985, Ser. No. 780,896

Int. Cl.[4] B42D *19/00, 3/18;* **G09B** *29/04;* **G09F** *1/00*

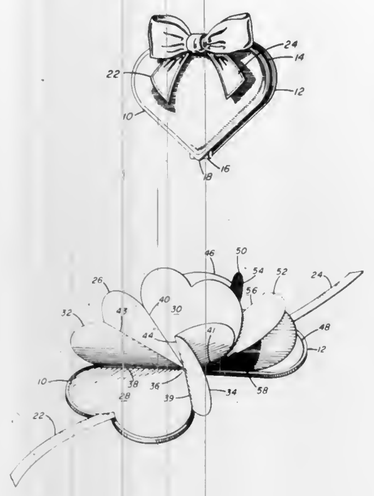
U.S. Cl. 281—5 **12 Claims**

1. An automatically foldable and unfoldable album assembly comprising a front cover and a rear cover hingedly joined together and with a plurality of foldable sheets joined together in strip fashion,

each of said foldable sheets formed from a first outer panel, a second outer panel, a first inner panel and a second inner panel, with said first inner panel disposed between said outer panels and joined thereto along diagonal fold lines, with said second inner panel disposed opposite said first inner panel and between said outer panels and joined thereto along diagonal fold lines,

said panels each being confined within the diagonal quadrants of a square, each of said outer panels having the same configuration, each of said inner panels having a central vertical fold extending therethrough, said inner panels being complementary with said outer panels whereby when said sheet is moved to a folded configuration, said inner panels fold inwardly toward each other and are completely enclosed by said outer panels,

with a rear surface of the first outer panel of a first of said sheets joined to said front cover, with a rear surface of the second outer panel of the last of said sheets joined to said rear cover, and with a rear surface of the second outer panel of each of the sheets, except for the last sheet, joined to a rear surface of the first outer panel of the sheet immediately adjacent thereto, whereby when one sheet is moved to a closed configuration the sheet immediately



adjacent thereto will automatically be moved to an open configuration.

4,627,641

TWO-COLOR THERMOSENSITIVE LABEL

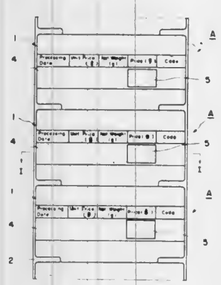
Hatsuo Kawaguchi, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Aug. 12, 1983, Ser. No. 522,568

Claims priority, application Japan, Aug. 12, 1982, 57-123128[U]

Int. Cl.[4] G09F *3/00, 3/10*

U.S. Cl. 283—81 **3 Claims**



1. A thermosensitive label, comprising:

a label substrate; and

first and second color developing materials, said first color developing material being applied over the entire label substrate, said second color developing material being applied over said label substrate at a predetermined location, and said first and second color developing materials being selectively developable to provide respective colors by application of approximately the same temperatures to respective portions of said locations where the respective colors are desired.

4,627,642

METHOD OF MARKING FOR DETERRING FRAUD WITH VALUABLE DOCUMENTS

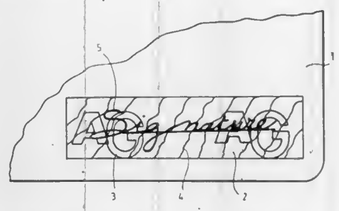
Georges Peronneau, La Celle St Cloud, and Bernard Chalus, Ollainville, both of France, assignors to Sotimag (SARL), Massy, France

Filed Sep. 5, 1985, Ser. No. 772,764

Claims priority, application France, Sep. 7, 1984, 84 13760

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—92 **19 Claims**



1. A method for deterring fraud with documents having monetary value comprising a substrate (1) including a predetermined signature location, including the steps of:

depositing on the signature location a first supporting layer of ink (2) including a pigment having a predetermined porosity with respect to the substrate;

depositing on selected zones of the first supporting layer (2) a porous varnish layer (3), including in solution a powder enabling a fluorescence of a desired color to be obtained under ultraviolet light;

printing a filigree pattern on selected zones of the first supporting ink layer (2) and on the varnish layer (3) by silk-screening, using a second pigmented vinyl ink (4); and

applying an identifying signature (5) to the card using a felt-tip pen having an indelible ink wherein the porosities of the first ink layer (2) and of the layer (3) are different, and the penetration of the vinyl ink is better on the first ink layer (2) than on the varnish layer (3); and

the adherence of the indelible ink on the first ink layer (2) is better than the adherence of the varnish layer (3) on the first ink layer (2).

4,627,643

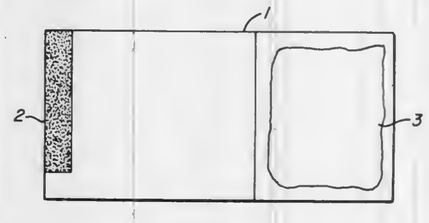
CONTEST CARD HAVING ELASTOMERIC COATING REMOVAL MEANS

Fred L. Leonetti, and Richard L. Leonetti, both of P.O. Box 6622, Concord, Calif. 94519

Continuation-in-part of Ser. No. 803,002, Nov. 29, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,870

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—102 **4 Claims**



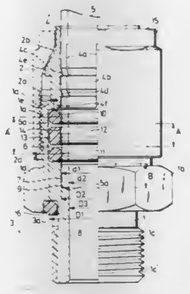
1. In a flexible card whose surface contains printed information concealed by an opaque coating, the improvement comprising a layer of abrasive material on said card for abrading said opaque coating to expose said printed information when said card is folded, bringing said layer of abrasive material into contact with said removable opaque coating.

4,627,644

ARRANGEMENT FOR A PUSH-IN COUPLING

Kjell R. Ekman, Aberenrain 43, CH-6340 Baar, Switzerland

Filed Aug. 9, 1983, Ser. No. 521,766
Claims priority, application Sweden, Aug. 27, 1982, 8204910
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—3 **15 Claims**



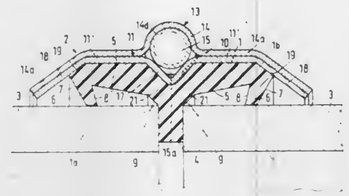
1. A coupling device for the rapid and simple push-in connection of one end of a first element to a second element through which fluid, and/or pressure exerted by fluid, is conducted utilizing a retaining arrangement where at least the external surface near said end of said first element is made of a soft material into which at least one retaining means of said arrangement can be engaged after said end has been pushed in to retain said end, said arrangement comprising: an outer part having a first outer part element and a second outer part element, said second outer part element having a tapered inner wall and said second outer part element being interconnected onto said first outer part element; an insertion part confined between said tapered inner wall surface of said second outer part element and an end surface of said first outer part element, said insertion part further bearing said retaining means; a cavity formed along the inner wall in said first outer part element and a seal arrangement disposed in said cavity for coacting with the external surface of said end of said first element to seal the inside of the outer part and the fluid and/or pressure exerted by the fluid from the exterior of the outer part, said seal arrangement comprising two sealing devices and a guiding device, said sealing devices disposed one on each side of said guiding device, said guiding device effecting the guiding of said end while it is being pushed in and also continuing to center the end in the cavity after the push-in connection has been completed, wherein said guiding and sealing devices are adapted to provide a vibration-damping double seal with the sealing devices spaced apart from each other as viewed in the longitudinal direction of the end, wherein the insertion part due to its resilient qualities has an inherent retaining effect on said end, wherein said insertion part is longitudinally movable inside the outer part relative to the outer part, between said tapered wall of said second outer part element and said end surface of said first outer part element and in front of the seals, viewed from the insertion direction of said end, wherein said insertion part has a reduced end portion extending into said second element toward said sealing means, and wherein an L-shaped radial gap is formed between said end of said insertion part and said end surface of said first outer part element for preventing removal of said sealing means from the sealing position.

4,627,645

FLEXIBLE PIPE COUPLING

Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 699,320
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404739
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—39 **14 Claims**



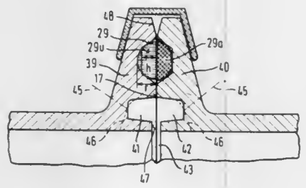
1. A coupling for the establishment of a fluidtight connection between the neighboring end portions of two pipes, comprising an elastic sleeve having two open ends, an external surface, an internal surface, and an annular partition extending from said internal surface intermediate said open ends and between those end portions of the pipes which are inserted into the sleeve through the respective open ends; and a clamp including a split ring surrounding said external surface and having first and second end portions, and female tightening means comprising first and second substantially strip-shaped components externally bonded to the respective end portions of said split ring and each extending transversely of the split ring, each of said components having a tunnel-like median section with a circumferential extent greater than the strip thickness spaced apart from and defining a passage with the respective end portion of said split ring, and said clamp further including male tightening means comprising a shank extending through said passages and two retaining elements extending from said shank and flanking the median sections of said components, said split ring including a band having two marginal portions overlying the open ends of said sleeve, and each of said marginal portions sloping inwardly as considered in a direction away from said partition and defining an acute angle with the longitudinal axis of said sleeve, said components being bonded to said band at said marginal portions.

4,627,646

PIPE FITTING

Bernhard Kessel, Bahnhofstr. 31, 8071 Lenting, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,220
Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218061; Nov. 3, 1982, 3240582
Int. Cl.⁴ F16L *13/04*
U.S. Cl. 285—114 **9 Claims**



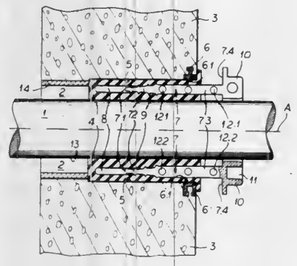
1. A pipe fitting assembly comprising:
a first pipe fitting having a body formed with a flow cross section between two openings formed in said body so that a flow path between said openings forms an arcuate bend extending over an arc length at least 45°, said openings being bounded by radially outwardly extending peripheral flanges lying in respective planes and formed unitarily on said body with respective axially outwardly facing grooves, said flanges being inclined with respect to one another at at least 45° and having a thickness at an outermost region of each flange only slightly exceeding the wall thickness of said body;
a second fitting having a flange extending peripherally around an opening thereof; and
a clamping collar forming a channel engaging around one of said flanges of said first fitting and said flange of said second fitting which is positioned to abut said one of said flanges of said first fitting to bear upon respective flanks of the flanges around which said collar engages, said flanks tapering outwardly away from interiors of said fitting toward one another and said channel having sides engaging said flanks which converge outwardly, said flanges of said first fitting being spaced apart sufficiently to accommodate said collar between them, all of said flanges and openings having the same diameters, respectively, said abutting flanges being relatively rotatable through 360° prior to tightening of said collar, each of said flanges interconnected by said collar being formed with a circular groove opening toward the groove in the other flange and registering therewith whereby said grooves receive a common sealing ring, and between said groove and the respective opening in each of the flanges connected by said collar, a respective annular recess is provided opening at a surface of the flange and serving to define a bending zone of reduced thickness between the outer portion of the respective flange and said body.

4,627,647

WALL FEEDTHROUGH FITTING

Werner Hauff, Herlbühlsstr. 19, 7925 Dischingen-Ballmertshofen, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,877
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1984, 3408122; Aug. 30, 1984, 3431805
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 285—189 **7 Claims**



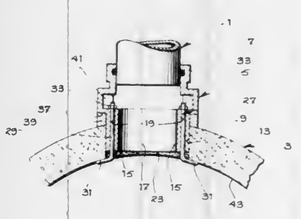
1. A feedthrough fitting for a conduit, the fitting comprising:
a wall formed with a throughgoing passage extending along an axis and having a radially inwardly directed wall surface, whereby a conduit passes axially through the passage;
an elastomeric adapter sleeve having
an outer surface complementarily radially outwardly engaging the wall surface,
an inner surface snugly surrounding and engaging the conduit, and
an axially backwardly open and annular groove between the inner and outer sleeve surfaces, having generally cylindrical and confronting inner and outer groove surfaces, and being between the inner and outer groove surfaces of a predetermined radial width in a relaxed condition of the sleeve; and
a tightening ring having an axially forwardly tapered portion and a generally cylindrical portion extending axially backward therefrom and of a radial dimension greater than the width of the groove between the groove surfaces and fitting so tightly in the groove as to press the sleeve radially outward against the surface of the passage and inward against the conduit along the full length of the cylindrical portion, the ring being formed of at least two similar sector-shaped ring parts having the same radius of curvature as the groove and having ends provided with angularly interfitting formations.

4,627,648

PIPE SADDLE JOINT AND ASSEMBLY

Jean Montpetit, Boucherville, Canada, assignor to Uroplast Inc., Longueuil, Canada

Filed Dec. 9, 1985, Ser. No. 806,514
Int. Cl.⁴ F16L *41/08*
U.S. Cl. 285—197 **16 Claims**



1. A pipe saddle joint comprising:
an essentially tubular body having a longitudinal axis and including a branch pipe insertion part and a main pipe connecting part coaxial with said insertion part; said parts defining radial shoulder means therebetween, inwardly of said body, and said connecting part having an outer end located away from said inward shoulder means;
said connecting part being formed with at least two bolt passages extending between said shoulder means and said outer end;
two L-shaped anchor bolts, each having a stem portion threaded at one end and a bent portion at the other end; each of said stem portions extending through one of said passages with the threaded end thereof projecting above said inward shoulder means, said bent ends facing said outer end, and
a pair of bolt nuts, each screwed over one of said threaded ends.

4,627,649

REMOTE CONTROL LOCKING AND UNLOCKING DEVICE, ESPECIALLY FOR AN ANTI-PANIC BAR

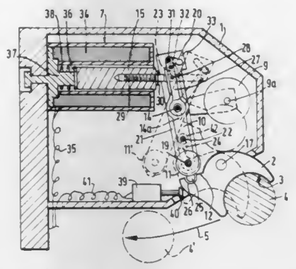
Robert Leplat, La Garenne Colombes, France, assignor to Brunam Controle Sarl, Suresnes, France

Filed Nov. 7, 1984, Ser. No. 669,025
Claims priority, application France, Oct. 19, 1984, 84 16104
Int. Cl.⁴ E05C *15/02*
U.S. Cl. 292—92 **9 Claims**

1. A remote control locking and unlocking anti-panic device comprising:
a latch rotatably oscillating within a housing and including a first cam outline and a second hollow external outline, said second hollow external outline being adapted to conform with at least one part of a peripheral section of an anti-panic bar and adapted to mesh with said section in order to assume a position which blocks displacement of the anti-panic bar; and
a lever arm having first and second ends articulated on a pivoting axle;

an electromagnet means having a core connected to said second end of said lever arm for selectively maintaining said lever arm in a first position which prevents rotation of said latch; and

supplementary locking means formed in said lever arm for locking rotation of said latch with respect to said lever arm when said lever arm assumes said first position;



whereby energization of said electromagnet means causes said lever arm to pivot and be maintained in said first position; and

whereby de-activation of said electromagnet means releases said lever arm from said first position, thereby enabling rotation of said latch and displacement of said anti-panic bar.

4,627,650

CLASP FOR CLOSABLE ARTICLES

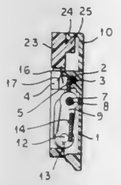
Franz Hauschulte, Menden, Fed. Rep. of Germany, assignor to Sudhaus Schloss- und Beschlagetechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,325

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 8412303[U]

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—113 **8 Claims**



1. In combination with a receptacle having an upper portion and a lower portion, a clasp comprising;

an upper part affixed to said upper portion and having a projection;

a base plate supporting a lower part of said clasp and fixed to said lower portion;

an actuating lever pivotally mounted on said base plate and having a pair of opposite longitudinal edges along longitudinal edges of said base plate;

a U-shaped tension member having legs straddling said lever and providing respective longitudinal edges respectively juxtaposed with the longitudinal edges of said lever, said tension member being engageable with said projection to draw said parts together, the juxtaposed longitudinal edges of said lever and said member being provided at opposite ends with respective pins each extending toward the other longitudinal edge; and

a pair of links each received between two of said juxtaposed edges and traversed by the said pins thereof for coupling said lever to said tension member, said base plate being formed along its longitudinal edges at an upper side thereof with a pair of cams engageable with cams formed on said legs for biasing said tension member outwardly upon swinging movement of said lever into an open position said base plate being formed with respective flanks along its longitudinal edges at a lower side of said plate engageable with said tension member for biasing an upper portion of said tension member inwardly against said upper part upon swinging movement of said lever in an opposite sense into a closed position of said lever.

4,627,651

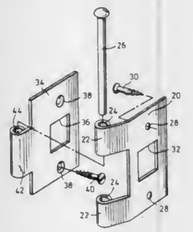
SAFETY LOCKING DEVICE FOR DOORS

Robert H. Grimbly, 337 Upper Ottawa Street, Hamilton, Ontario, Canada (L8T 3S5)

Continuation of Ser. No. 654,714, Sep. 27, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,247

Int. Cl.[4] E05C *19/18*

U.S. Cl. 292—288 **2 Claims**



1. The combination of a safety device with a door and its surrounding door frame and with a door lock or passage set mounted on the door and the frame and having a door frame edge strike plate, a door face plate and a lock bolt for holding the door closed in the frame, the safety device being fastened to the vertical opening edge of the door and the adjacent vertical edge of the frame, the safety device comprising:

a thin strike plate portion replacing or installed over the strike plate of the door lock or passage set, the strike plate portion having an aperture therein through which the lock bolt passes and apertures therein through which pass fastening means fastening the portion to the said door frame vertical edge, the portion providing at least one respective connecting lock pin receiving passage projecting beyond the door frame outer face;

a thin face plate portion replacing or installed over the face plate of the door lock or passage set, the face plate portion having an aperture therein through which the lock bolt passes and apertures therein through which pass fastening means fastening the portion to the said door vertical edge, the portion providing at least one respective connecting lock pin receiving passage projecting beyond the door outer face registering with the door closed with the said pin receiving passage of the strike plate portion; and

a connecting lock pin inserted in the registered pin receiving passages of the said two portions connecting them together and thereby holding the door closed.

4,627,652

LOCK FOR SLIDING DOORS AND WINDOWS

Thomas Sakkas, and Athanasios Sakkas, both of 10th Kilom. National Road, Athens-Lamia, Chamomylon-Acharnes, Greece

Filed Aug. 12, 1985, Ser. No. 764,578

Claims priority, application Greece, Oct. 24, 1984, 80579

Int. Cl.[4] E05C *3/26*

U.S. Cl. 292—229 **5 Claims**

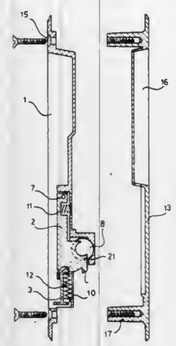
1. A lock for sliding doors and windows, comprising:

an inside plate for mounting on the inside of a door frame, said plate having a cylindrical opening formed therein,

a latch lever pivotally attached to said plate, said latch lever having a pair of detents thereon, said detents being located so as to define first and second locking positions,

a headed member extending from said jamb plate toward said opening,

means on said lever for engaging said headed member when said member lies within said cylindrical opening,



spring means biasing said lever toward a first position out of engagement with said member, and

catch means, adapted to engage either of said detents, for holding said lever in a second position in engagement with said member whereby said door or window may be secured.

4,627,653

CARPET STRETCHER

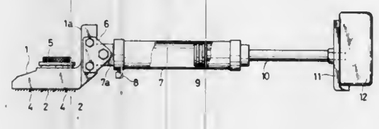
Arata Koroyasu, Tatsuno, Japan, assignor to Kyokuto Sanki Kabushiki Kaisha, Tatsuno, Japan

Filed Aug. 27, 1985, Ser. No. 769,830

Claims priority, application Japan, Aug. 27, 1984, 59-129641[U]

Int. Cl.[4] A47G *27/04;* **B26F** *1/32;* **F04F** *21/20*

U.S. Cl. 294—8.6 **2 Claims**



1. A carpet stretcher for stretching a fabric carpet, the carpet stretcher comprising:

an engaging head having an array of prongs thereon extending downwardly therefrom and at an oblique angle thereto to slant in a first direction for engaging the fabric of the carpet to push the carpet in the first direction;

an unvented fluid cylinder having first and second ends, wherein the first end of the cylinder is connected to the engaging head;

an inlet port adjacent to the first end of the cylinder for applying pressurized gas to the cylinder, the port including means for sealing the port to retain the gas in the cylinder;

a piston rod assembly having a piston disposed in the cylinder between the first and second ends wherein the first end is projected beyond the second end of the fluid cylinder, and

a knee pad connected to the second end of the piston for abuttment with an operator's knee wherein the distance between the engaging head and knee pad is readily adjustable to suit operators of various sizes; wherein the gas within the cylinder is compressed upon impulsing the knee pad with one's knee while holding the cylinder in one's hand to absorb the shock of the impulse, and wherein expansion of the compressed gas after the impulse contributes to stretching the carpet.

4,627,654

ARTICULATED PARALLELOGRAM GRIPPER

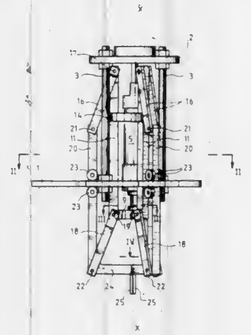
Michel D. Van Oost, Marcoussis, France, assignor to Automobiles Citroen, Neuilly sur Seine and Automobiles Peugeot, Paris, both of France

Filed Feb. 6, 1985, Ser. No. 698,768

Claims priority, application France, Feb. 7, 1984, 84 02116

Int. Cl.[4] B66C *1/00*

U.S. Cl. 294—106 **4 Claims**



1. A gripper for fitting to a robot and adapted for gripping a circular workpiece of a workpiece having a circular bore, said gripper comprising:

a support including a guide in a guide plane perpendicular to an axis and provided with a plurality of windows elongated in generally radial directions with respect to said axis and angularly spaced thereabout;

respective articulated parallelogrammatic linkages lying in respective axial planes and received in respective ones of said windows, each of said linkages including:

a first arm generally perpendicular to said guide plane and moveable substantially exclusively parallel to said guide plane,

at least one pair of rollers journalled at fixed locations on said first arm and riding on said guide,

a second arm parallel to said first arm and movable in the respective window generally perpendicular to said guide plane,

respective links coupling said arms together, and

a clamping finger on an end of said first arm and positioned to cooperate with the clamping fingers of the other parallelogrammatic linkages to grip a said workpiece; and

actuating means coupled to said second arms and connected with said support for displacing said second arms generally perpendicular to said guide place to simultaneously cause said fingers to approach and recede from one another selectively.

4,627,655

PICK-UP CAP CONSTRUCTION

John Collins, Elkhart, Ind., assignor to Leer, Incorporated, Elkhart, Ind.

Filed Jan. 21, 1983, Ser. No. 460,034

Int. Cl.[4] B60P *3/32;* **B62D** *27/00*

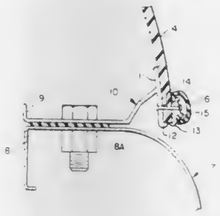
U.S. Cl. 296—167 **11 Claims**

1. Pick-up cap construction comprising:

a shell body exhibiting a top and sidewalls extending downwardly therefrom,

mounting rail means extending longitudinally along the

respective inside bottom portions of said shell body sidewalls, said mounting rail means including a horizontally extending base member part and a shell body sidewall support part formed integrally therewith, said base member part being supportingly engageable with upwardly facing pick-up truck box sidewall means when said cap construction is in an in-use position on a pick-up, and said shell body sidewall support part being engagable underneath and along the inside of a shell body sidewall.



trim holder means extending along the outside of the bottom portion of each of said shell body sidewalls, said trim holder means including an upwardly facing portion engagable under the respective sidewall and in facing relationship to said shell body sidewall support part, said trim holder means including a profile shape for interlockingly holding a decorative trim piece, and

connecting means extending through said trim holder means, sidewall, and shell body sidewall support to clampingly and fixedly hold the same together.

4,627,656

SEAT FOR AUTOMOBILE

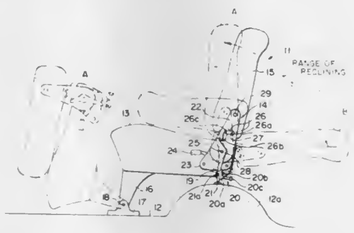
Hiroyuki Gokimoto, and Isao Kiyomitsu, both of Hiroshima, Japan, assignors to Mazda Motor Corporation and Delta Kogyo Co., Ltd., both of Japan

Continuation of Ser. No. 410,637, Aug. 23, 1982, abandoned. This application Apr. 2, 1985, Ser. No. 719,140

Claims priority, application Japan, Aug. 26, 1981, 56-133720; Sep. 4, 1981, 56-140063

Int. Cl.[4] B60N *1/02*; A47C *13/00*

U.S. Cl. 296—65 R **9 Claims**



1. An automobile seat comprising a seat bottom rotatable around a transverse axis approximately parallel to a car body floor up to a position where the rear portion of the seat bottom is free from the floor, a seat back inclinably mounted on said seat bottom, a seat bottom locking means for releasably locking the rear portion of said seat bottom to said floor so as to allow forward rotation of said seat bottom around said transverse axis when unlocked, a seat back locking means for releasably locking said seat back to said seat bottom, and an operating member, movable from a first position to a second position, connected to said seat bottom locking means and said seat back locking means by a connecting means for simultaneously releasing both said seat bottom locking means and said seat back locking means when said operating member is moved from said first position to said second position.

4,627,657

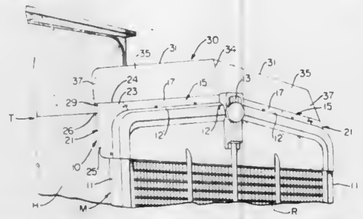
TRUCK DEFLECTOR SHIELD

John A. Daniels, Arvada, and John H. Ziegler, Longmont, both of Colo., assignors to Autotron Products, Inc., Longmont, Colo.

Filed May 17, 1984, Ser. No. 611,499

Int. Cl.[4] B60J *1/20*

U.S. Cl. 296—91 **14 Claims**



1. A shield assembly for mounting on a motor vehicle characterized by having a hood portion with a radiator grille suspended by a peripheral molding, said molding having a generally horizontal upper edge surface and opposite vertical side edge surfaces, said shield assembly comprising:

an elongated shield of transparent material having a lower edge, opposite ends of said shield being angled rearwardly with respect to the plane of said shield;

a mounting base portion comprising a pair of elongated horizontal frame members disposed in end-to-end relation traversing and conforming to the contour of said upper edge surface of said molding between said side edge surfaces, and end cap members disposed at opposite distal ends of said frame members and forming continuations thereof, said end cap members curving rearwardly and downwardly along said side edge surfaces of said molding, said frame members and said end caps each having a front wall and a rear wall defining a rearwardly inclined, upwardly opening channel therebetween, said lower edge of said shield and said opposite ends thereof inserted in said channel; and

means for connecting said base portion and said end cap members in contact with said upper edge surface and said side edge surfaces, respectively, of said radiator molding.

4,627,658

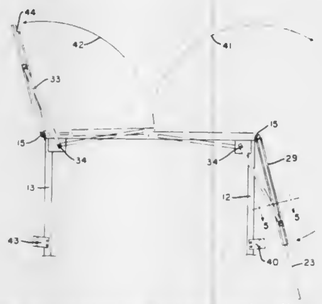
POWER-ASSISTED SEMI-TRAILER TRUCK BODY TOP COVER

Donald J. Vold, Pottsville, Pa.; Saul R. Spector, Hallandale, Fla.; Anthony J. Piller, Schuylkill Haven, Pa., and Hilda M. Vold, legal representative of said Donald J. Vold, deceased, assignors to Set Manufacturing Co., Pottsville, Pa., a part interest

Filed Feb. 29, 1984, Ser. No. 584,601

Int. Cl.[4] B60P *7/02*

U.S. Cl. 296—100 **4 Claims**



1. A power-driven hinged, sectional semi-trailer truck body roof cover in combination comprising:

an open top semi-trailer truck body having a transverse

cabside wall, a longitudinal, curbside wall, a second longitudinal roadside wall and a transverse rear wall each wall having a top and

(a) a metal tubular, roadside, longitudinal, tubular member upon which are mounted hinges for attaching the half-frame to the top of the curbside wall of the trailer body, said member's length being essentially equal to that of the top of the sidewall; said half-frame having

(1) a second tubular longitudinal member which is longer than the distance which is defined between the transverse walls such that overlapping portions are created at the ends of the second member permitting it to rest on the tops of the transverse walls when the half-frame is rotated inboard on the hinges to rest on the trailer transverse wall tops and such that the half-frame provides cover means to a half of the trailer body top over which it rests, said half-frame also having

(2) a long transverse tubular member centrally disposed across the longitudinal members of the half frame and of a length defined by the distance from the first longitudinal member to the outer edge of the side wall opposite; said half-frame also having

(3) a metal transverse, extruded member forming the cabside end of the half-frame which member has a "C" shaped cross-section which defines a semi-enclosed track with a longitudinal opening, said transverse member being mounted on the half-frame such that the opening faces cabside and is of a length defined by the distance between the first and second longitudinal members and such that

(4) inside the track is slidably and rollably fitted a disc shaped roller, rotably mounted on a pin which is slidably mounted in a bearing in a first end portion of an arm which is of rectilinear cross-section and which is mounted perpendicularly to a longitudinal axis thereof, such that the pin may slide perpendicularly to the longitudinal axis of the arm, the arm further having a second end portion which is affixed perpendicularly to a cabside directed rotatable shaft of a powered rotating means which is mounted on the cabside wall below the top thereof such that when the powered shaft is rotated in one direction the arm will rotate in the same direction and the roller will rollably slide in the track causing the half-frame to rotate in an arc about the hinges and swing up from the trailer body and outward thereof to a position which is determined by stopping the shaft rotation and which provides access to the trailer body portion under the half-frame and such that when the shaft is rotated oppositely the arm will also rotate and the roller will rollably slide in the track in the opposite direction causing the half-frame to close and such that when closed the half-frame will lie flat across a half opening of the trailer body thereby enclosing half of it, and

(b) a metal tubular, curbside, longitudinal, rectilinear, open top half-frame, covered with debris arresting means which half frame has a first longitudinal, tubular member upon which are mounted hinges for attaching the half-frame to the top of the remaining, roadside wall of the trailer body, said member's length being essentially equal that of the top of the sidewall; and half-frame having

(1) a second tubular, longitudinal member which is longer than the distance which is defined between the transverse walls such that overlapping portions are created at the ends of the second member permitting it to rest overlappingly on the first half-frame when the second half-frame is rotated on its hinges inboard of the trailer open top and such that the second half-frames provides cover means to a remaining half of the trailer body; and second half-frame also having

(2) a metal transverse, extruded member forming the cabside end and having a "C" shaped cross-section which defines a semi-enclosed track with a longitudinal opinion, said transverse member being mounted on the half-frame such that the opening faces cabside and is of a length defined by the distance between the first and second longitudinal members of the half-frame said transverse member also having a notch cut into its inboard end such that the half-frame is enabled to seat itself snugly, overlapping and longitudinally alongside the first half-frame, and

(3) inside the transverse track member is slidably and rollably fitted a disc shaped roller, rotably mounted on a pin which is slidably mounted in a bearing in a first end portion of an arm which is of rectilinear cross-section and which is mounted perpendicularly to a longitudinal axis thereof such that the pin may slide perpendicularly to the longitudinal axis of the arm, the arm further having a second end portion which is affixed perpendicularly to a cabside directed rotatable shaft of a powered rotating means which is mounted on the cabside wall below the top thereof such that when the powered shaft is rotated it will provide rotable motion to the roadside half-frame identical with that of the curbside half-frame and such that when the power means is activated by sequential switching means, each half-frame may be swung open providing access to the top of the trailer body, or closed, thereby covering the trailer body top opening and arresting debris attempting to escape therefrom.

4,627,659

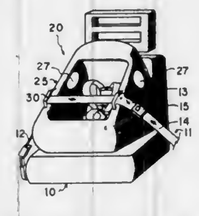
INFANT'S SEAT AND RESTRAINER

Dennis E. Hall, Reseda, Calif., assignor to T. Ghiglia, Reseda, Calif.

Filed May 6, 1985, Ser. No. 731,028

Int. Cl.[4] A47C *31/00*

U.S. Cl. 297—488 **11 Claims**



1. An infant's seat, said seat being adapted to be inflated and being mountable on an automobile seat in conjunction with an existing standard seat-belt-buckle arrangement, said inflatable seat comprising in combination:

an inflatable seat portion which in its inflated condition with an upwardly directed wall is adapted to support the legs and lower torso of an infant;

an inflatable generally upright back portion unitarily joined to said seat portion and which in its inflated condition with a forwardly directed wall provides support for an infant using the seat in a sitting position;

an inflatable canopy portion unitarily joined to said seat portion to shield the head region of an infant;

upstanding side walls for limiting lateral and allowing sufficient freedom of movement of an infant using the seat; with every side wall having a height which exends between said canopy portion and said seat portion and every side wall being unitarily joined to said seat portion, said back portion, and said canopy;

said seat portion, said upright back portion, said canopy portion, and said side walls being unitarily joined to form a continuously hollow and inflatable structure of open shell configuration of a depth allowing substantially full

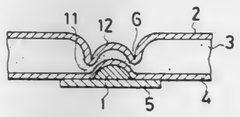
freedom of movement of the legs and arms of an infant using said seat;
at least one window means in each side wall for increasing the viewing range of an infant;
at least one air inflator valve for inflating and deflating said inflatable structure;
on each side wall an integrally joined ring for passing therethrough a respective seat belt whereby the infant's seat is fixed on the automobile seat in the secured condition of a respective seat belt; and
harness means secured to the forwardly directed wall of said back portion, said harness means contributing substantially to the protection of a user in said seat.

4,627,660

BUTTON FOR AN AUTOMOTIVE SEAT

Shigeki Kon, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,603
Claims priority, application Japan, Feb. 28, 1985, 60-28333[U]
Int. Cl.[4] A47C *27/00*
U.S. Cl. 297—219 **4 Claims**



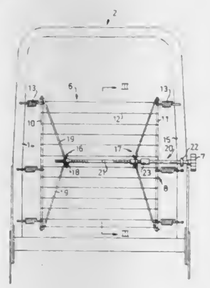
1. A button for use in an automotive seat, comprising:
a trim cover assembly comprising a lamination of a top cover member, a wadding of foam material and a wadding cover,
a button core member disposed on the side of said wadding cover of said trim cover assembly,
a reinforcing member for fixing said button core member to said trim cover assembly, and,
a recessed portion formed on the side of said top cover member of said trim cover assembly by pressing and heating said trim cover assembly and said reinforcing member around said button core member for integral welding thereof.

4,627,661

CHAIR BACK WITH ADJUSTABLE LUMBAR SUPPORT

John Rönnhult, Södertälje, and Jan Eklund, Möonsterås, both of Sweden, assignors to BE - GE Stolindustri AB, Oskarshamn, Sweden

Filed Jul. 25, 1984, Ser. No. 634,229
Int. Cl.[4] A47C *7/46*
U.S. Cl. 297—284 **6 Claims**



1. In a seat back having generally upright, spaced-apart side members, a forward face and a back face: two generally upright side elements disposed between said side members, said side elements being of stiff, resilient rod-like construction; transverse tension members connecting each rod-like side element to a respective one of said side members; elongated transverse connecting members connected between said rod-like side elements and maintained in tension by the force of said tension members on said rod-like side elements; a buckling assembly including tensioning members connected to the opposite ends of each rod-like side element for applying thereto buckling forces which cause the respective rod-like side element to arch in a direction such that the center region of the respective rod-like side element moves forward whereby said rod-like side elements and said transverse connecting members form a lumbar support assembly; an adjustable tensioning means supported by said seat back intermediate the ends of the side elements for adjusting said tensioning members in a manner to selectively increase and decrease the buckling forces applied to the opposite ends of said rod-like side elements to thereby change the amount of buckling of said rod-like side elements.

4,627,662

TILTING MECHANISM FOR A CHAIR

David E. Carter, Hemel Hempstead; Malcolm J. Bailey, Newport Pagnell, and Brian A. Willatts, Milton Keynes, all of England, assignors to Pledge Office Chairs Limited, London, England

PCT No. PCT/GB84/00272, § 371 Date Apr. 3, 1985, § 102(e) Date Apr. 3, 1985, PCT Pub. No. WO85/00734, PCT Pub. Date Feb. 28, 1985
PCT Filed Aug. 8, 1984, Ser. No. 719,282
Claims priority, application United Kingdom, Aug. 9, 1983, 8321400; Oct. 17, 1983, 8327750
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—313 **10 Claims**



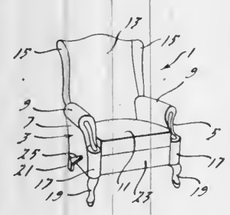
1. A tilting mechanism for a chair comprising
(a) a seat frame member for mounting a seat portion of the chair thereon, said seat frame member defining an inverted channel including a base and parallel side flanges,
(b) a backrest frame member for mounting a backrest portion of the chair thereon, a first horizontal axis extending between said parallel side flanges, said backrest frame member being pivotally mounted on said first horizontal axis for movement towards or away from said inverted channel,
(c) a support frame member for mounting on a base part of the chair, a second horizontal axis extending between said parallel side flanges, said seat frame member being pivotally mounted on said second horizontal axis for movement about said support frame member,
(d) a first quadrant member pivotally mounted between said parallel side flanges for movement in a plane parallel to said side flanges, an upper edge of the first quadrant member, a plurality of recesses in said upper edge of the first quadrant member, a first link means pivotally connected between said backrest frame member and said first quadrant member converting pivotal adjustment movement of the backrest frame member into pivotal movement of the first quadrant member,
(e) a second quadrant member pivotally mounted between said parallel side flanges for movement in a plane parallel to an upper edge of the second quadrant member, a plurality of recesses in said upper edge of the second quadrant member, said side flanges, a second link means pivotally connected between said support frame member and said second quadrant member converting pivotal adjustment movement of the seat frame member into pivotal movement of the second quadrant member,
(f) two locking levers disposed along the base and between the side flanges of the inverted channel, each locking lever having a free end and being mounted for pivotal movement between the side flanges, the respective free ends of the two locking levers being releasably engageable with recesses of the first and second quadrants respectively thereby to lock each of the quadrants in a selected pivotal position,
(g) a control lever mounted on the seat frame member for rotation to a number of set positions, the control lever extending beneath both of said locking levers, a manually operable portion of the control lever, said manually operable portion extending to one side of the seat frame member, cam means on the control lever, the cam means including respective cam portions selectively engageable with the locking levers in said set positions of said control lever, a first set position of the control lever corresponding to one of the locking levers being raised by a cam portion to be out of engagement with said first quadrant, while the second quadrant remains engaged by its locking lever, and a second set position of the control lever corresponding to the other locking lever being raised by the other cam portion to lie out of engagement with the second quadrant, while the first quadrant remains engaged by its locking lever, free pivotal adjustment movement of the backrest frame member with the seat frame member being fixed being possible in said first set position, and free pivotal adjustment movement of the seat frame member with the backrest frame member being fixed being possible in said second set position, both the backrest and seat frame members being lockable in a selected position after adjustment by means of the locking levers and quadrants.

4,627,663

RECLINING CHAIR

Larry P. LaPointe, LaSalle, Mich., assignor to La-Z-Boy Chair Company, Monroe, Mich.

Filed Apr. 4, 1984, Ser. No. 596,689
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—316 **9 Claims**



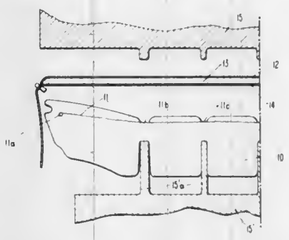
1. A chair comprising a substantially rigid chair frame, means supporting the chair frame in a normally upright position on and relative to the floor, said chair frame including vertically extending left and right hand side members, a horizontally extending seat frame located between the side members, a normally vertically extending back frame at the rear of the chair frame and extending upwardly above the seat and chair frame, left and right hand rear swing links, first pivot means pivoting said rear swing links to said left and right hand side members respectively of said chair frame for pivoting about a rear horizontal axis located above said seat frame, second pivot means pivoting lower portions of said rear swing links to the left and right hand sides respectively of the seat frame at the rear thereof whereby the rear of said seat frame is supported and suspended by said rear swing links for pivotal movement about said horizontal axis, weight of the seat frame and of a chair occupant when not leaning against the back frame being centered forwardly of said rear horizontal axis and providing a moment tending to pivot the swing links on the first pivot means so that the second pivot means moves toward the rear of the chair, left and right hand front swing links pivoted respectively to left and right hand sides of said seat frame at the front thereof, said front swing links extending downwardly from the seat frame and being pivoted to said chair frame for pivoting about a front horizontal axis located below the seat frame, said seat frame being movable forwardly and upwardly on said front and rear swing links, means securing the back frame to said rear swing links above said rear horizontal axis and so that back pressure of a chair occupant on said back frame pivots said rear swing links on said first pivot means to produce recline movement of the back frame and corresponding forward and upward movement of the seat frame, said back frame and rear swing links being movable together between a position wherein the back frame is upright and a position wherein it is fully reclined, left and right hand counterbalance coil tension springs connected between said chair frame and the respective front swing links to be energized by movement of the front swing links and to provide spring assistance to return movement of the back frame toward an upright position, and left and right hand spring connector link means operatively connecting respectively the front ends of said counterbalance springs to the left and right hand front swing links adjacent the tops thereof and serving to reduce the amount of extension of the springs as compared with that which would occur if the springs were anchored directly on the front swing links.

4,627,664

SEAT ASSEMBLY

Hiroshi Okazaki, and Motoi Hyodo, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 21, 1983, Ser. No. 544,054
Claims priority, application Japan, Oct. 28, 1982, 57-189872
Int. Cl.[4] A47C *7/18*; B32B *3/06, 5/18*
U.S. Cl. 297—452 **6 Claims**



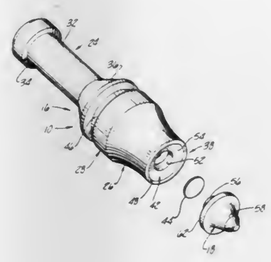
1. A seat assembly having a seat cushion comprising:
a seat pad having an outer surface;
a pair of support members embedded within said seat
a net embedded within said seat pad and extending along a substantial portion of said seat pad between said pair of support members, said net including predetermined sections extending along said outer surface and being formed of a heat weldable material; and
a seat cover enveloping a portion of said outer surface, said predetermined sections of said net being welded to said seat cover.

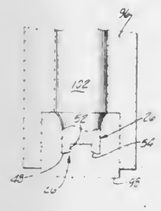
4,627,665

COLD-HEADED AND ROLL-FORMED PICK TYPE CUTTER BODY WITH CARBIDE INSERT

Paul E. Ewing, Farmington Hills, Mich., and B. Randall Grubb, Everett, Pa., assignors to SS Indus., Plymouth, Mich. and Kennametal, Inc., Latrobe, Pa.

Filed Apr. 4, 1985, Ser. No. 719,764
Int. Cl.[4] E21C 35/18; B21K 5/01
U.S. Cl. 299—79 7 Claims





1. The method of making a bit comprising a cutter body and a carbide insert having a cylindrical base and a cutting tip with an annular beveled seating flange between the base and the tip, said cutter body being of the type comprising a unitary steel body including a cylindrical shank for supporting said bit and a conical head with a socket in the end thereof adapted to receive said insert, said method comprising the steps of:

cold-heading a cylindrical steel blank to provide an intermediate blank with a cylindrical shank and a conical head with a socket in the forward end of the head, said cold-heading including the steps of squaring-up the forward end of said blank by cold-heading thereof into cylindrical shape with a flat forward end, preforming said blank with a conical recess on the forward end thereof by a forming die working against the forward end of said blank, and punching a cylindrical hole into the central portion of said conical recess leaving an annular beveled seating surface surrounding said hole,

reducing said cylindrical shank by roll-forming to provide a neck defining a first annular groove in the shank,

reducing said cylindrical shank by roll-forming to provide a neck defining a second annular groove between the head and said first annular groove,

and brazing the base and seating flange of said carbide insert to the socket.

5. A cutting bit comprising a cutter body and a carbide insert,

said cutter body comprising a unitary steel body including a cylindrical shank for supporting the bit and a conical head on said shank with a socket in the end thereof adapted to receive a carbide insert said socket comprising a cylindrical hole surrounded by a annular beveled seating surface, said steel body also including a cylindrical section between said shank and said head,

said unitary steel body being cold-headed to form said conical head with said socket in the end thereof and to form said cylindrical shank and cylindrical section, whereby said steel body comprises work-hardened steel,

said shank being roll-formed after being cold-headed to form an annular retaining groove in said shank,

said cylindrical section being roll-formed after being cold-headed to form an annular extraction groove in said section,

said socket being formed of densified, work-hardened steel as a result of said cold-forming and adapted to receive said carbide insert,

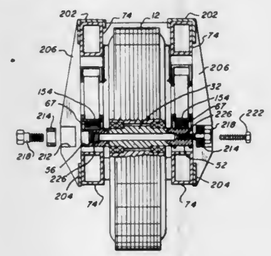
said carbide insert having a cylindrical base and a cutting tip with an annular beveled flange between the base and the tip, said cylindrical base being disposed in said hole with said flange disposed opposite said seating surface, and a brazed joint between said base and said socket and between said flange and said socket.

4,627,666

WHEEL ASSEMBLY

William B. O'Neill, P.O. Box 1144, Fort Morgan, Colo. 80701

Division of Ser. No. 417,355, Sep. 13, 1982, Pat. No. 4,511,303.
This application Apr. 12, 1985, Ser. No. 722,339
Int. Cl.[4] B60B 35/14
U.S. Cl. 301—125 6 Claims



1. A wheel assembly including a hub adapted to be mounted to a wheel and connected to a frame, said wheel and hub generally enclosed by longitudinally extending structural members and laterally extending structural members of said frame comprising, in combination:

a generally cylindrical hub having a concentric bore therethrough and means thereon for connection to said wheel, said hub rotatable around an intermediate spindle between said longitudinal members, said intermediate spindle selectively and releasably connected at either end to an inner spindle and an outer spindle, respectively, said inner spindle and outer spindle connected to a leaf spring, which leaf spring is connected to said frame, whereby said wheel can be removed from said frame by disconnecting and spreading the inner and outer spindles from said intermediate spindle and lifting said intermediate spindle, hub and connected wheel vertically from said enclosure defined by said longitudinal and lateral members.

4,627,667

VEHICLE SUSPENSION ASSEMBLY

Fritz Mahnig, Schaffhausen, Switzerland, and Günter Schulte, Velbert, Fed. Rep. of Germany, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Jun. 25, 1984, Ser. No. 623,947
Claims priority, application Switzerland, Jun. 24, 1983, 3458/83
Int. Cl.[4] B60B 35/00; B60G 3/20
U.S. Cl. 301—126 11 Claims

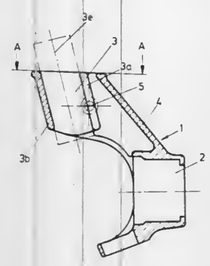
1. A swivel bearing, for use in connection with an axle unit and a shock absorber having a leg, of a vehicle suspension, comprising,

a wheel bearing housing,

engaging means adapted to engage a shock absorber leg, and a hollow, shaped connecting portion therebetween,

said engaging means including a hollow sleeve adapted to receive said shock absorber leg, and

clamping means operable to tighten said sleeve around the shock absorber leg when said leg is positioned in said sleeve, said clamping means comprising oppositely disposed internal projection formed integrally with said sleeve, said internal projections defining a gap therebetween and dividing said sleeve into a first substantially circular hollow portion adapted to receive said shock absorber leg, and a second hollow portion, said sleeve and clamping means forming an unbroken enclosure about said shock absorber leg.

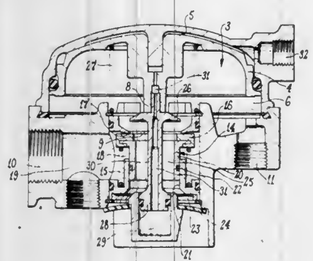


4,627,668

RELAY VALVE

John J. Camm, East Malvern, Australia, assignor to Repco Limited, Australia

Filed Sep. 17, 1984, Ser. No. 651,300
Claims priority, application Australia, Sep. 28, 1983, 1612/83
Int. Cl.[4] B60T 15/02
U.S. Cl. 303—40 19 Claims



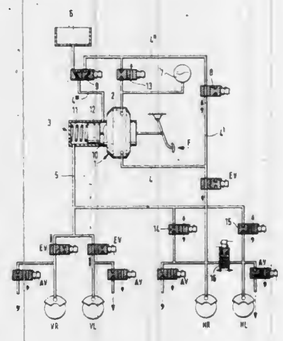
1. A relay valve for use in a vehicle brake system including, a hollow body, a main compartment within said body, an operating piston slidable within said compartment and dividing it into control and feed chambers, a control port connected to said control chamber, a plurality of outlet ports connected to said feed chamber, an inlet compartment formed within said body, an inlet port connected to said inlet compartment, an orifice through which said feed chamber communicates with said inlet compartment, a closure member mounted within said body for movement towards and away from a position at which it closes said communication through said orifice, means operatively connecting said closure member and said operating piston so that said closure member moves away from said communication closing position in response to movement of said operating piston in one direction, a damping chamber formed within said body, a damping piston slidable within said body and exposed to said damping chamber, passage means connecting said damping chamber to one of said control and feed chambers so that the pressure within that chamber acts on said damping piston to thereby cause resistance to movement of the operating piston in said one direction, said operating and damping pistons being connected to respective opposite ends of a rod which is coaxial with each said piston, and said passage means includes a passage extending axially within said rod.

4,627,669

SLIP-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf; Lutz Weise, Mainz, and Wolfram Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,154
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407537
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—114 2 Claims



1. A slip-controlled brake system for automotive vehicles having wheel brakes associated with front and rear axles, said system comprising, in combination:

a braking pressure generator having a master cylinder including at least one working chamber and having a pedal-actuated power brake booster connected to said master cylinder of said pressure generator;

an auxiliary pressure source connected to said brake booster;

a first hydraulic brake circuit connecting said brake booster to the wheels of one axle;

a second hydraulic brake circuit connecting said master cylinder to the wheels of the other axle; and,

first valve means for connecting said auxiliary pressure source and said working chamber of said master cylinder of said pressure generator during traction slip control; and,

second and third valve means, each connecting said second hydraulic brake circuit to a respective one of said wheels of said one axle during traction slip control.

4,627,670

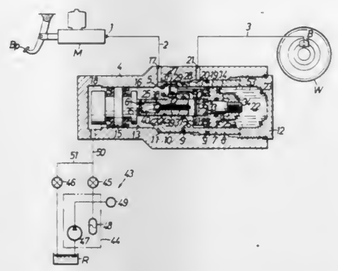
HYDRAULIC BRAKING PRESSURE CONTROL APPARATUS FOR VEHICLES

Shohei Matsuda, Utsunomiya, and Makoto Sato, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,502
Claims priority, application Japan, Jul. 17, 1984, 59-148235; Jul. 17, 1984, 59-148237; Nov. 5, 1984, 59-232562
Int. Cl.[4] B60T 8/02
U.S. Cl. 303—115 11 Claims

1. A hydraulic braking pressure control apparatus for vehicles, comprising: an input hydraulic chamber communicating with an output port of a master cylinder and an output hydraulic chamber communicating with a wheel brake and adapted to generate a hydraulic braking pressure corresponding to a hy-

draulic pressure in said input hydraulic chamber, said output hydraulic chamber being adapted to be enlarged in volume in accordance with a liquid pressure within a control chamber, which is adjusted by an anti-lock control means, when a vehicle wheel is about to be locked, wherein provided between said input and output hydraulic chambers are a first valve mecha-



nism adapted to be closed in response to an increase in the liquid pressure of said control chamber and a second valve mechanism adapted to be opened to prevent the hydraulic pressure in said output hydraulic chamber from being reduced below a set value when said hydraulic pressure in said output hydraulic chamber falls below the level of said set value.

4,627,671

ANTISKID CONTROL DEVICE

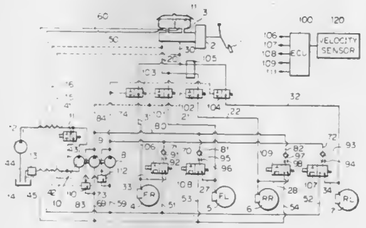
Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Yuichi Imani, Hamamatsu; Akira Kuno, Oobu, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jodosha Kabushiki Kaisha, Toyota, both of Japan

Filed Oct. 28, 1985, Ser. No. 792,007

Claims priority, application Japan, Nov. 1, 1984, 59-228889; Feb. 6, 1985, 60-19837; Mar. 15, 1985, 60-53042; Jul. 2, 1985, 60-143856

Int. Cl.[4] B60T *8/04*

U.S. Cl. 303—116 **9 Claims**



1. An antiskid control device controlling pressure in wheel cylinders of a brake system provided in a vehicle for preventing the vehicle from skidding through locking of the wheels thereof, said device comprising;

a main line system having a first hydraulic source, a main line connecting said first hydraulic source to said wheel cylinders, and a cut-off valve provided in said main line to open and close said main line,

a means for switching said cut-off valve to normally open said main line, and to close said main line when a locking condition occurs in the wheels of the vehicle,

an oil hydraulic mechanism having an oil hydraulic source constantly generating a hydraulic pressure, an oil hydraulic motor rotating when said hydraulic pressure is transmitted from said oil hydraulic source, an oil hydraulic pump discharging a pressurized oil, a means for connecting said oil hydraulic motor to said oil hydraulic pump to drive said pump, and a means for transmitting the hydraulic pressure of said oil hydraulic source to said oil hydraulic motor when a locking condition occurs in the wheels,

a subline system having a subline connecting said hydraulic pump to said wheel cylinders, a switching valve provided in said subline to open and close said subline, and a means for releasing a pressurized oil in the wheel cylinder to outside thereof when said switching valve. is closed,

a means for controlling said switching valve to open or close said subline when a locking condition occurs in said wheels.

4,627,672

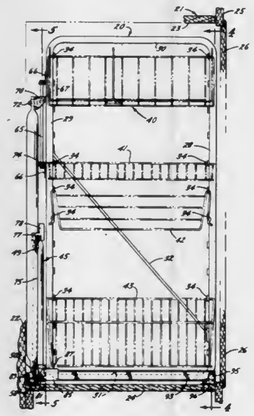
PULL-OUT RACK FOR A CABINET

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 18, 1985, Ser. No. 713,232

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—331 **13 Claims**



1. A pull-out rack for a cabinet having a bottom wall and having a front opening, said rack having interconnected front and rear upright frame members spaced from one another, means on said front and rear frame members for supporting various holders in vertically spaced relation, and means mounting said rack for inward and outward movement between a stored position located completely within the cabinet and an accessible position in which substantially the entire rack is located completely outside the cabinet, said mounting means comprising a first pivot arm having upper and lower end portions, means supporting the lower end portion of said first pivot arm to pivot about a laterally extending horizontal axis located adjacent the rear end of the bottom wall of the cabinet, means connecting the upper end portion of said first pivot arm to said rack intermediate the ends of said rear frame member to slide upwardly and downwardly relative to said rear frame member and to pivot about a laterally extending horizontal axis relative to said rear frame member, said connecting means comprising an upright rod secured to and spaced rearwardly from the rear side of said rear frame member, a block slidable upwardly and downwardly on said rod, and a bracket fixed to the upper end portion of said first pivot arm and pivotally connected to said block, a second pivot arm having upper and lower end portions, means connecting the upper end portion of said second pivot arm to said first pivot arm intermediate the ends thereof to pivot about a laterally extending horizonal axis, means supporting the lower end portion of said second pivot arm to said rack adjacent the lower end portion of said rear frame member to pivot about a laterally extending horizontal axis, said pivot arms being upright and being collapsed adjacent one another with said second pivot arm disposed between said first pivot arm and said rear frame member when said rack is in said stored position, said pivot arms pivoting in opposite

directions when said rack is pulled outwardly to said accessible position and expanding during such pivoting to cause a first triangle to be formed by said bottom wall, said second pivot arm and the lower section of said first pivot arm and to cause a second triangle to be formed by said rear frame member, said second pivot arm and the upper section of said first pivot arm, horizontal guide track means extending between said upper and lower frame members adjacent the lower ends thereof, and roller means mounted on the front end portion of the bottom wall of the cabinet to turn about a laterally extending horizontal axis and coacting with said track means to guide said rack for inward and outward movement between said stored and accessible positions.

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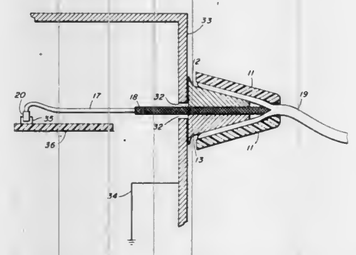
GROUNDING AND STRAIN RELIEF CLAMP FOR FLAT CABLES

George H. Barrus, Jr., Dracut, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 20, 1985, Ser. No. 811,590

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—14 R **6 Claims**



1. A cable clamp for shielded, jacketed flat cables comprising

an insulated housing having a truncated wedge-shaped cavity with apertures at its narrow and wide ends for passage of flat electrical cable therethrough;

top and bottom wedge plates for insertion into the wide end of the cavity above and below a cable passing therebetween; and

means for mounting the clamp on an electrically grounded cabinet;

the dimensions of the wedge plate permitting an insulating jacket of a cable stripped from a the cable to be located between the sloped surface of a wedge plate and the sloped surface of the cavity to anchor the cable to the electrically grounded cabinet;

the flat bottom surfaces of the wedge plates in electrical contact with an exposed conductive layer of a cable.

4,627,674

TRI-LEAD CONNECTOR

Wilbur A. Hamsher, Jr., New Cumberland, and Raymond V. Pass, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 485,922, Apr. 18, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 744,281

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—14 P **23 Claims**

21. An electrical connector for terminating signal and ground conductor means of tri-lead cable means for electrically connecting the signal and ground conductor means to a pin terminal and a ground rail respectively of a panelboard, comprising:

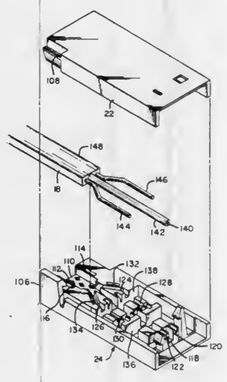
dielectric housing means having parallel passageway means extending therethrough which communicate with respective opening means at a front end of a housing means into which the pin terminal and the ground rail extend;

signal terminal means disposed along one of said passageway means and including contact means in alignment with the said respective opening means for the pin terminal for electrical connection therewith;

ground terminal means disposed along the other of said passageway means and including contact member means in alignment with the said respective opening means for the ground rail for electrical connection therewith;

terminating means provided by said signal and ground terminal means for respectively terminating the signal and ground conductor means thereto;

means in which said terminating means and said signal and ground conductor means terminated thereto are insulatively mounted, said insulative mounting means and said



housing means being adapted to allow limited axial movement relative to each other;

terminal-securing means on said signal and ground terminal means and said housing means securing said respective terminal means in said housing means and adapted to allow limited axial movement of said respective terminal means with respect to said housing means;

latching means on said signal terminal means which latchably engages the pin terminal when electrically connected therewith; and

means in said passageway means containing said signal terminal means engageable with said latching means when said housing means is moved axially relative to said terminal means thereby causing said latching means to be unlatched from the pin terminal enabling the connector to be disconnected from the pin terminal and the ground rail.

4,627,675

WIRING SYSTEM WITH QUICK CONNECT WIRE TERMINALS

Richard D. Taylor, and Phillip W. Stumpff, both of P.O. Box 802, Madill, Okla. 73446

Continuation-in-part of Ser. No. 520,237, Aug. 4, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 671,129

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—14 R **21 Claims**

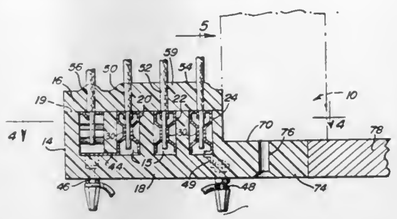
1. A plug-in electrical wiring apparatus, comprising:

an insulating housing, having a wire receiving housing opening disposed through a wall thereof; and

an electrical contact strip disposed in said housing, said strip including:

a middle web portion having a wire receiving web opening disposed therethrough in registry with said wire receiving housing opening, said web portion further including retaining means for engaging said wire when

said wire is inserted through said housing opening and said web opening and for resisting withdrawal of said wire from said web opening; and



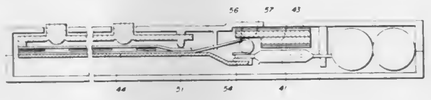
first and second leg portions extending from said web portion away from said wall of said housing, said leg portions being arranged to receive said wire therebetween, such that said wire is grippingly engaged by said leg portions.

4,627,676

ELECTRONIC ASSEMBLY INCLUDING INTEGRATED CIRCUIT PACKAGE AND LIQUID CRYSTAL DISPLAY PANEL

Tadashi Tomino, Yamatokoriyama, and Masayuki Higuchi, Ueno, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 349,925, Feb. 18, 1982, Pat. No. 4,508,402. This application Jul. 18, 1984, Ser. No. 632,038
Claims priority, application Japan, Feb. 27, 1981, 56-29250; Apr. 9, 1981, 56-54066; Sep. 30, 1981, 56-157151
Int. Cl.⁴ H05K *11/00*
U.S. Cl. 339—17 CF **1 Claim**



1. An assembly comprising:
display means having external terminals;
integrated circuit means having a plurality of external signal terminals arranged at a single side thereof, such that said external signal terminals are overlapped with said external terminals of said display means;
flexible citcuit board means carrying a wiring pattern for providing signals into said integrated circuit means; and
elastic engagement means comprising an electrically conductive material electrically and mechanically connecting said external terminals of said display means and on end of said wiring pattern of said circuit board means against said external signal terminals of said integrated circuit means.

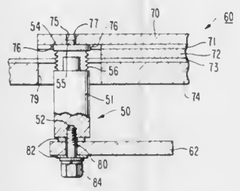
4,627,677

FLEXIBLE CURRENT FEEDING POST

Izumi Ono, Hachioji; Iwami Manago, Yokohama; Haruo Takayama, Sagamihara, and Yasuo Takahashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1985, Ser. No. 738,864
Claims priority, application Japan, May 31, 1984, 59-111280; Dec. 18, 1984, 59-192545
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—17 M **9 Claims**

1. A flexible current feeding post for mechanically and electrically interconnecting first and second substrates at respectively corresponding, predetermined contact surfaces thereof, to maintain the substrates in substantially parallel and nominally predetermined, spaced relationship and to feed current from the contact surface of one of said substrates to the contact surface of the other of said substrates, comprising:
a metal post of a first predetermined axial length having first and second ends and defining a central axis, said first end having a coaxial, threaded bore for positioning in alignment with an aperture in a corresponding contact surface of the first substrate, the aligned said aperature and bore being adapted to receive a screw therethrough for rigidly securing said first end of said post to the corresponding contact surface of the first substrate, and said metal post further having a cylindrical extension of a second predetermined axial length extending coaxially from said second end of said post and having a free end;
a conductive, flexible bellows of a nominal third predetermined axial length greater than the second predetermined axial length and having first and second ends, said bellows being received coaxially about said cylindrical extension and secured at said first end thereof to said second end of said metal post, with said second end of said bellows extending beyond said free end of said cylindrical extension by a nominal, predetermined amount corresponding to the difference between the second and third axial lengths;



a solid conductive disc having first and second, generally parallel, spaced planar surfaces disposed transversely to the central axis and coaxially with said bellows, said first planar surface of said disc being secured to said second end of said bellows and displaced thereby from said free end of said extension by the nominal, predetermined amount, and said second planar surface of said disc having a central projection extending coaxially therefrom for being received in an aperture extending through a corresponding contact surface of the second substrate thereby to align said second planar surface of said disc in contacting relationship with the associated contact surface of the second substrate, said second planar surface of said disc being adapted for being bonded to the corresponding contact surface of said second substrate; and
the first predetermined length of said metal post, the third, nominal predetermined length of said flexible bellows, and the thickness of said solid conductive disc defined by the spacing of said parallel planar surfaces thereof nominally defining the predetermined, spaced relationship between the first and second substrates.

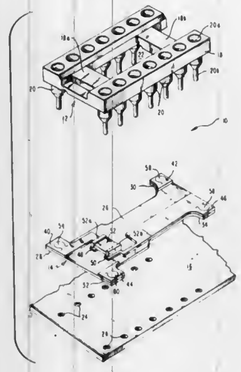
4,627,678

ELECTRONIC PACKAGE ASSEMBLY AND ACCESSORY COMPONENT THEREFOR

Ranjit Biswas, Plainsboro, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 460,434, Jan. 24, 1983, Pat. No. 4,519,658. This application Feb. 20, 1985, Ser. No. 703,259
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—17 CF **6 Claims**

1. An accessory circuit for connection to an electrical package having an elongate housing and a plurality of extending contacts aligned along two transversely spaced longitudinally extending edges thereof, said circuit comprising:
a flat elongate planar conductive member having a plurality of openings aligned along two transversely spaced longitudinaly extending edges thereof for corresponding alignment with and receipt of said contacts of said package, said conductive member further including a plurality of apertures aligned in two transversely spaced longitudinally extending rows, substantially parallel to and spaced transversely inwardly from said openings, said apertures defining a connection region between said apertures and said longitudinal edges of said conductive members inclusive of said openings, portions of said connection region



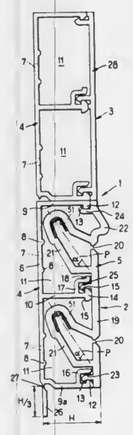
being selectively removable, to thereby define plural connection extents for engagement with plural selected contacts of said package, said conductive member further including a central region between said rows of apertures defining a conductive path between said central region and said connection extents, portions of said central region being selectively removable to create an open electrical circuit between said central region and said connection extents.

4,627,679

CONTINUOUS-ACCESSIBILITY ELECTRICAL CONDUITS

Philippe M. Billette de Villemeur, Paris; Gerard L. Pournain, Mortain, and Louis A. Cahu, Ducey, all of France, assignors to Establissements A. Gregoire & Barilleau, Maisons Alfort, France

Filed Nov. 21, 1984, Ser. No. 673,710
Claims priority, application France, Nov. 21, 1983, 83 18492
Int. Cl.⁴ H01R *25/14*
U.S. Cl. 339—21 R **18 Claims**



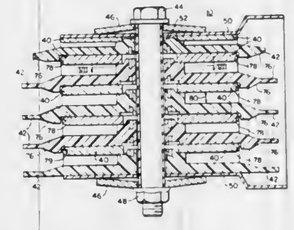
1. Continuous - accessibility electrical conduit designed to contain at least two electrical conductors and to have the appearance of a plinth or molding, when mounted on a wall or similar structural surface, comprising:
a base means in the form of a case (**4**; **30**) having a back wall (**6**) and two lateral walls (**9**, **9***a*), each joined at a first end to said back wall and having a second end free, and defining a substantially U-shaped cross-section with an open portion, said base means being adapted to be fastened onto a structural surface, the case further comprising longitudinal interior partition means (**10**) having a first end attached to the back wall and having a second end free, said interior partition means delimiting individual compartments (**11**);
cover means (**5**; **31**; **37**) adapted to be mounted to said base means and to close said open portion of the case, said cover means comprising a non-conducting material having a front surface and in a first cover configuration at least two narrow, parallel longitudinal access means (**21**), each access means having a slot (**20**), each access means being adapted to contain an electrical conductor and each access means being adapted to fit into a respective one of said individual compartments; and snap lock means (**12**, **23**, **24**; **14**, **25**; **39**, **39***a*) provided on the longitudinal free end of said interior partition means, and provided longitudinally on the cover means in a location opposite to said longitudinal free ends of said lateral walls and interior partitions means of the case, when said cover means is mounted on said base means;
and further characterized in that adjoining snap lock means are separated by a distance which alternatively is less than or greater than a constant value;
whereby, when said cover means is mounted on said base means with said snap lock means, each electrical conductor is enclosed in a non-conductive compartment and is electrically insulated from each adjoining electrical conductor and each compartment is substantially rigid and mechanically closed over the entire length of the two longitudinal free ends of said lateral walls and said interior partition means defining said compartments.

4,627,680

BRIDGING JOINT FOR ELECTRIC POWER BUSWAY

Charles L. Weimer, Patterson Heights, and Barry R. Richards, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

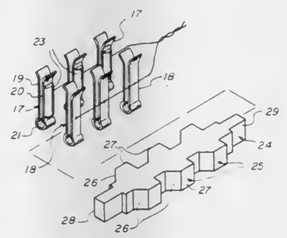
Filed May 8, 1985, Ser. No. 731,698
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—22 B **10 Claims**



1. A busway joint construction for electrically connecting busway sections together, comprising:
a pair of busway sections;
at least one elongated bus bar supported in each section with the end portion of one bus bar being spaced from the end portion of the other bus bar;
joint means for electrically connecting the spaced end portions and including a joint assembly of spaced plates, one plate being a conductor and the other plate being an electrical insulator;
the plates having aligned apertures and surrounding facing

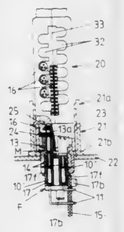
surfaces for clamping contact with the end portions of both bus bars;
one of the plates having a spacer collar around the aperture which collar has a support surface engaging the facing surface of the other plate; and
clamping means extending through the aligned apertures for clamping the bus bar portions in good electrical contact with the conductor plate.

4,627,681
LOCKING ELECTRICAL CONNECTOR
Douglas Hong, 12106 Rustic Hill Dr., Bowie, Md. 20715
Filed Feb. 15, 1985, Ser. No. 702,270
Int. Cl.[4] H01R *13/631*
U.S. Cl. 339—75 P **3 Claims**



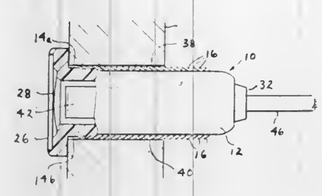
1. A locking, multiple socket female electrical connector for extension cords, appliances and the like, comprising:
an elongate body of electrically non-conductive material having a longitudinally extending passage therethrough defined by spaced apart side walls, said body having inwardly projecting shoulders formed thereon at opposite ends of the passage, defining stops around reduced diameter guide openings at the opposite ends of the passage;
a plurality of generally U-shaped female contacts carried by the body on opposite sides of the passage and spaced uniformly apart along the length of the passage, said contacts each comprising a pair of spaced apart legs joined at one end by a bight portion and being inherently resiliently biased to said spaced apart position, a first leg and the bight portion of each contact being fixed in the material of the body and the second leg of each contact being disposed substantially in the plane of the passage side wall, each said second leg having a rounded cam guide surface formed thereon on the side toward the passage, said cam guide surface extending throughout substantially the entire length of the leg; and
an elongate, one-piece wedge member longitudinally slidable in said passage, said wedge member having a cross-sectional dimension less than the cross-sectional dimension of the passage, and having a plurality of inclined cam surfaces on opposite sides thereof, each terminating at one end in a recessed portion of the wedge member and terminating at the other end in a generally flat wedging surface disposed closely adjacent and parallel to the side wall of the passage in a position to engage the cam guide surfaces on said second legs of the contacts and urge said second legs toward the first legs of each contact, said wedge member having opposite end portions projecting through the reduced diameter guide openings, defining combination guides and actuators extending beyond the end of the body, the length of the wedge member, including the actuators, being such that when the actuator at one end of the wedge member projects from the body, the actuator at the other end of the wedge member is substantially flush with the end of the body, said wedge member having stop surfaces formed at the inner or base ends of the actuators for engaging the stops formed in the body to limit axial movement of the wedge member so that when the wedge member is in an unlocked position the recesses thereof are in registry with said contacts so that the legs of the contacts are in their at-rest spaced apart position, and when the wedge member is in a locked position the wedging surfaces thereon are in engagement with the cam guide surfaces on said second legs, urging the second legs toward the first legs for securely gripping a male electrical contact when inserted between the legs of the female contact.

4,627,682
MULTI-PIN MALE AND FEMALE CONTACT BARS
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany
Filed Jul. 30, 1984, Ser. No. 635,539
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327387
Int. Cl.[4] H01R *4/24, 4/02*
U.S. Cl. 339—99 R **5 Claims**



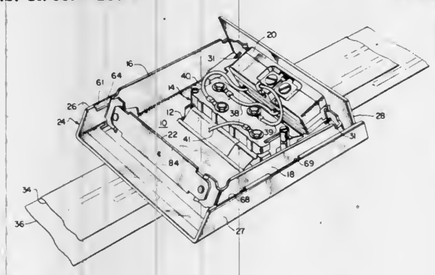
4. A pluggable multi-pin contact bar for the connection of a large number of narrowly spaced electrical leads of a printed circuit board or of a flat ribbon cable to the leads of a mating multi-pin contact bar, the pluggable contact bar comprising in combination:
an elongated block-shaped horizontal contact post housing of injection-molded plastic material, the housing having opposite upper and lower longitudinal sides;
at least one row of contact post apertures extending vertically through the contact post housing and defining a vertical contact post center plane, the contact post apertures being spaced at a regular longitudinal pitch;
vertical conatct posts engaged in the contact post apertures of the contact post housing; and
means for vertically seating the contact posts in their contact post apertures; and wherein
each contact post includes an upper contact post portion in the form of a U-shaped female contact member defined by a pair of substantially parallel vertical tines on opposite sides of and equidistant from a vertical contact post center plane and a transverse web portion joining the vertical tines at their lower extremities, the two vertical tines having converging upper end portions adapted to receive between them a male plug pin, while being forcibly separated by said plug pin, the upper contact post portion yielding resiliently to permit said separation, while applying a pinching contact force against said plug pin;
each contact post further includes a lower contact post portion in the form of a cable-penetrating contact member of U-shaped outline with a pair of substantially parallel vertical tines and a transverse web portion joining the two tines at their upper extremities, the two vertical tines defining two yoke-shaped contact blades with transversely aligned vertically oriented central blade slots which are open at the lower extremity of the contact blades, where they form a diverging entry taper; and
the web of the lower contact post portion is butt-welded to the web of the upper contact post portion.

4,627,683
ELECTRICAL OUTLET
Kiyosji Shimomura, Tokyo, Japan, assignor to Rainbow Trading Co., Inc., New York, N.Y.
Filed Aug. 7, 1984, Ser. No. 638,662
Int. Cl.[4] H02B *1/04*
U.S. Cl. 339—128 **8 Claims**



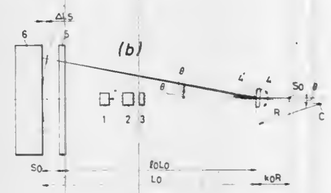
1. A self-contained electrical outlet for mounting within a cut out through a furniture panel or the like comprising: a resilient, flexible body portion having at least one axial surface thereon positionable adjacent one planar surface, said planar surface being one of the walls of said cut out; at least one deflectable detent formed on said axial surface, said detent movable between an initial position and a further position; said detent being moved from its initial position towards said further position as said outlet is moved through said cut out in a first direction and said detent engages said one planar surface and said detent moves towards said initial position to engage said one planar surface in such a way that a tip of said detent is in frictional contact with said planar surface, said planar surface being the only surface said detent is in contact with, to prevent withdrawal of said outlet from said cut out when forces are placed on said outlet in a second direction opposite said first direction; at least one set of receptacle terminals mounted in said outlet to mechanically and electrically engage the prongs of an electrical plug and connection means coupled said receptacle terminals and adapted to be coupled to a source of electrical energy.

4,627,684
HOUSING FOR ELECTRICAL CONNECTORS
Michael J. D'Amato, North Haven, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.
Filed Jul. 23, 1984, Ser. No. 633,467
Int. Cl.[4] H01R *13/46*
U.S. Cl. 339—206 R **5 Claims**



1. An electrical connector housing comprising
a first lower housing portion having
a generally rectangular base frame having a central opening therethrough,
first and second side walls extending upwardly from opposite sides of said base frame and
terminating at upper edges, and
a first end wall sloping inwardly and upwardly from a third side of said base frame beyond said upper edges, said end wall having means defining openings therethrough to provide access to an electrical connector device and an attachment hole;
a second upper housing portion having
a generally rectangular top plate,
third and fourth side walls extending downwardly from opposite side edges of said top plate and terminating at lower edges, and
a second end wall sloping downwardly and outwardly from a third edge of said top plate beyond said lower edges; and
means on said upper and lower housing portions for coupling said portions together to form a closed housing ends and with said first and second end walls at opposite ends and with said upper and lower edges of said side walls in substantially contiguous, abutting relationship, said means for coupling including
hook means on one of said housing portions extending beyond the edges of the side walls of said one portion; and
means defining inwardly opening grooves extending longitudinally along the inner surfaces and adjacent the edges of the side salls of the other housing portion for receiving said hook and permitting relative sliding motion of said upper and lower housing portions between a closed position in which said second end wall is adjacent the fourth side of said base frame and said first end wall is adjacent the fourth edge of said top plate and an open position in which said first end wall is spaced from said top plate to permit access to the interior of said housing, said grooves including
stop means for establishing the relative locations of said housing portions in said open position, and
upwardly extending grooves for receiving said hook means approaching in a downard direction.

4,627,685
POST-OBJECTIVE TYPE SCANNING DEVICE
Nobuo Sakuma, str.add-No. 1283, Higashi-naganuma, Inagi-shi, Tokyo, Japan
Filed Dec. 20, 1984, Ser. No. 683,880
Claims priority, application Japan, Dec. 22, 1983, 58-240861
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **4 Claims**



1. A post-objective type scanning device having reduced image surface curvature comprising a deflector whose reflection surface is a convex spherical surface having a radius R or a cylindrical mirror, a photosensitive surface in which a light beam deflected by said deflector scans and a cylindrical optical element installed in the neighbourhood of said photosensitive surface, characterized in that if the radius of said deflector is R and the relation of $L_o = L_\theta$ is present, where L_o is the length from the deflecting point to the scanning surface when the rotational angle of the deflector is O and L_θ is the length from the deflecting point to the scanning surface at said rotational angle θ, the following relation is established:

$$R = \{(1/\cos\theta) + \cos\theta/(1+\cos\theta) - 1\}L_o.$$

4,627,686

SPLICING TRAY FOR OPTICAL FIBERS

Otto I. Szentesi, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Aug. 10, 1984, Ser. No. 639,585
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **7 Claims**



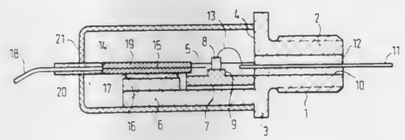
1. A splicing tray for optical fibers and fiber optic cable comprising:
(a) a base;
(b) optical fiber receiving means attached to the base including a slot having a median and two terminal portions, each of said terminal and median portions delimited by two upstanding sidewalls, only the sidewalls of the terminal portions having first, second and third portions, each of said first, second and third portions being spaced apart from and respectively paired opposite from a like first, second and third portion of an adjacent sidewall to form sidewall pairs delimiting first, second and third slots, all of such slots in communication with one another, all having predetermined bottoms and widths, the width of the first slot being less than the width of the second slot and the width of the second slot being less than the width of the third slot, the bottom of the first slot being spaced apart from the bottom of the second slot and the bottom of the second slot being spaced apart from the bottom of the third slot, the median portion of the first-mentioned slot being delimited only by opposing third portions of the sidewalls wherein each first slot is adapted to grasp a first buffered optical fiber when a buffered optical fiber is inserted therein and each second slot is adapted to grasp a second buffered optical fiber when a second buffered optical fiber is inserted therein, said second buffered optical fiber having an outer diameter greater than the outer diameter of said first buffered optical fiber.

4,627,687

DEVICE FOR HOLDING IN POSITION A TRANSDUCER AND AN OPTICAL WAVEGUIDE

Reimund Dorn, Schwieberdingen; Heinz Ebner, Ditzingen; Johann Gundert, Korntal; Ernst Halder, Renningen; Werner Haspel, Stuttgart; Ingo Isert, Bietigheim-Bissingen; Gunter Kuhnemann, Vaihingen/Enz; Felix Lutz, Stuttgart; Gerhard Seibold, Remseck, and Gerhard Wessel, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,177
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307465
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **6 Claims**



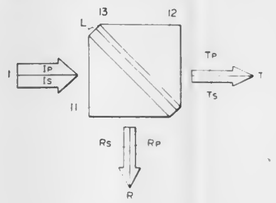
1. A device holding in position an electrical-to-optical or optical-to-electrical transducer and an optical waveguide ending in front of said transducer and having improved separation of heat flow between the transducer and the waveguide comprising:
a bolt having on one end thereof a first supporting member for said transducer and a second supporting member for said waveguide, said bolt having a longitudinal axis;
a protective cap on said one end of said bolt enclosing said supporting members, transducer and the waveguide;
said second supporting member comprising a semi-cylindrical shell having an extended supporting arm and said shell having slots which extend along the longitudinal sides of said supporting arm;
a guide sleeve containing said waveguide mounted on said arm concentric with said axis;
said transducer intersecting said axis;
said first supporting member having a substantially flat body and having longitudinal sides mounted in said shell and having a flat bottom spaced from said shell providing an air gap therebetween whereby the slots and the air gap separate the heat flow between said first supporting member and said second supporting member;
a bore extending through said bolt;
a conductor extending through said bore and insulated from said bolt, and
means making electrical connection between said conductor and said transducer.

4,627,688

BEAM SPLITTER

Takeshi Kobayashi; Kazuo Endo; Nobumasa Nanbu, and Yoshizi Kawamura, all of Sano, Japan, assignors to Sano Kiko Co., Ltd., Japan

Continuation of Ser. No. 510,287, Jul. 1, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 800,095
Int. Cl.⁴ G02B *27/14*
U.S. Cl. 350—173 **13 Claims**



1. A beam splitter consisting essentially of a transparent substrate having a refractive index N_S, one or more low refractive index film layers, each low refractive index film layer having a refractive index N_L higher than said refractive index N_S, and one or more high refractive index film layers, each high refractive index film layer having a refractive index N_H higher than said refractive index N_L, whereby $N_S<N_L<N_H$, said low refractive index film layer and said high refractive index film layer being alternately stacked on said transparent substrate in such a manner that the uppermost film layer of the stack is the low refractive index film layer.

4,627,689

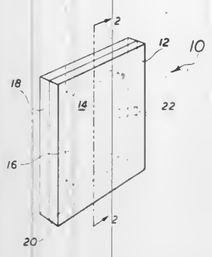
CRYSTALLINE COLLOIDAL NARROW BAND RADIATION FILTER

Sanford A. Asher, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,437
Int. Cl.⁴ G02B *26/00, 5/18*
U.S. Cl. 350—362 **21 Claims**

1. A filtering device for separating a narrow wavelength band from a broader spectrum of electromagnetic radiation comprising

a crystalline colloidal structure having a pair of substantially planar and parallel outer surfaces, said crystalline colloidal structure having a lattice structure which has a lattice spacing and a degree of order sufficient to Bragg diffract



greater than about 90% of the intensity of a 200 Å wavelength band of the broader spectrum while passing greater than about 50% of the intensity of wavelengths adjacent to said wavelength band.

4,627,690

OPTICAL SYSTEM WITH ANAMORPHIC PRISM

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 8, 1985, Ser. No. 709,921
Int. Cl.⁴ G02B *13/10*
U.S. Cl. 350—421 **8 Claims**



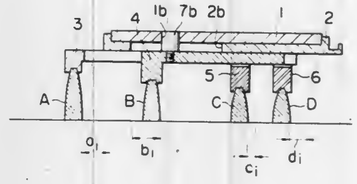
1. An optical system for effecting changes in the cross-sectional dimension of a beam of light along one of two mutually perpendicular cross-sectional axes thereacross comprising:
at least one optical prism comprising first and second substantially planar polished surfaces inclined to one another at an acute angle, said acute angle being subtended by a third substantially planar polished surface positioned to receive the incident beam of light, said first planar surface being inclined with respect to said third planar surface such that the beam of light incident to said third planar surface thereafter impinges upon said first planar surface at an angle of incidence at least equal to or greater than the critical angle of incidence so as to be internally reflected therefrom, said second substantially planar surface being inclined with respect to said first and third substantially planar surfaces such that the beam of light internally reflected by said first planar surface thereafter impinges upon said second planar surface at an angle of incidence at least equal to or greater than the critical angle of incidence so as to be internally reflected therefrom back toward said first substantially planar surface at an angle of incidence less than the critical angle of incidence thereby resulting in the beam of light being refracted at said first substantially planar surface as it exits from said optical prism, the cross-sectional dimension of the exiting beam being reduced along one of two mutually perpendicular cross-sectional axes thereacross.

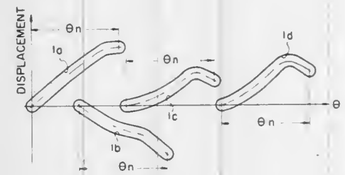
4,627,691

CAM GROOVES FOR DISPLACING LENSES

Yasumasa Tomori, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 597,206, Apr. 6, 1984, abandoned, which is a continuation of Ser. No. 212,140, Dec. 2, 1980, abandoned. This application Dec. 17, 1984, Ser. No. 682,808
Claims priority, application Japan, Dec. 4, 1979, 54-156378
Int. Cl.⁴ G02B *15/00*
U.S. Cl. 350—429 **3 Claims**





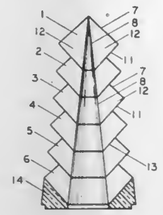
1. A method determining the loci of a plurality of cam grooves associated with a plurality of lenses of a lens system for guiding said plurality of lenses for movement relative to each other over a total focal length of the lens system, said method comprising:
(a) dividing said total focal length into a plurality of minute ranges;
(b) determining the displacement distances of said lenses over each of said minute ranges;
(c) selecting a fixed maximum lead angle for said lens system;
(d) selecting a lens of said lens system which experiences maximum displacement distance in one of said minute ranges;
(e) for said one minute range, determining an angle of rotation based on said fixed maximum lead angle and maximum displacement displacement distance of said selected lens;
(f) setting the loci of the cam groove associated with said selected lens at said fixed lead angle and for a distance determined by said angle of rotation to effectively position said selected lens in said one minute range;
(g) for said one minute range, setting the loci of the remaining cam grooves associated with the remaining lenses at lead angles equal to or less than said fixed maximum lead angle and for distances determined by said angle of rotation to effectively position the remaining lenses; and
(h) repeating steps (d) through (g) for each of the remaining minute ranges to set the loci of all cam grooves of said lens system so loci as said fixed maximum lead angle is present in all minute ranges over the total focal length of the lens system.

4,627,692

LOUVERED CONICAL BEAM CONCENTRATOR RT:C

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Jun. 12, 1985, Ser. No. 743,831
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 **1 Claim**



1. A louvered conical beam concentrator RT:C comprising six component lenses (**1–6**) aligned on the vertical optic axis of the concentrator and mounted on an annular base (**14**);

upper component lens (**1**) having a convex conical section (**7**) which forms the apex of the concentrator, a concave conical section (**8**), an opaque lower convex conical wall (**11**), and twelve opaque radial walls (**12**),

lower component lenses (**2–6**) each having a convex conical section (**7**), a concave conical section (**8**), an opaque lower convex conical wall (**11**), twelve opaque radial walls (**12**), and an upper concave conical wall (**13**) parallel and opposed to lower wall (**11**),

said convex conical sections (**7**) being so disposed as to receive and transmit a convergent conical incipient beam (**9**) of diffused sunlight, and

said concave conical sections (**8**) being so disposed as to receive and refract beam (**9**), forming a concentrated circular whole beam (**10**) which is emitted parallel to the vertical optic axis.

4,627,693

TRANSMISSION TYPE ILLUMINATING DEVICE FOR STEREOMICROSCOPES

Yoichi Iba, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,355
Claims priority, application Japan, Nov. 22, 1983, 58-220261; Nov. 22, 1983, 58-220262; Nov. 22, 1983, 58-220263
Int. Cl.[4] G02B *21/06*
U.S. Cl. 350—523 **12 Claims**



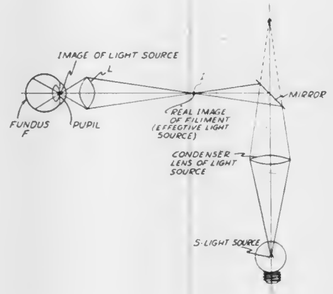
1. A transmission type illuminating device for stereomicroscopes comprising a light source, a collector lens, a pair of light source image forming lenses located in positions symmetrical with respect to the optical axis of said collector lens and a light source image relay lens arranged on the optical axis of said collector lens, said light source, collector lens, light source image forming lenses and light source image relay lens being arranged in the order mentioned above, said light source being in a position conjugate with a sample placing surface with respect to said collector lens and relay lens, and said pair of light source image forming lenses being so arranged that their respective optical axes can be positioned such that they coincide respectively with a pair of rays from said light source to intersect at said sample placing surface, a pair of observation optical systems including means defining a pair of entrance pupils of the stereomicroscope, said light source image relay lens and said pair of observation optical systems being positioned such that a pair of light source images produced by the pair of light source image forming lenses are conjugate with respect to the entrance pupils of said observaation optical systems.

4,627,694

INDIRECT OPHTHALMOSCOPY LENS FOR USE WITH SLIT LAMP BIOMICROSCOPE

David Volk, 3366 Kersdale Rd., Pepper Pike, Ohio 44124

Filed May 1, 1985, Ser. No. 727,764
Int. Cl.[4] A61B *3/14, 3/10;* G02B *13/18*
U.S. Cl. 351—214 **10 Claims**



1. A symmetrical biconvex aspheric indirect ophthalmoscopy lens of homogeneous transparent optical material for use with the slit lamp biomicroscope, each coaxial surface of said lens being a surface of revolution having an apical umbilical point at which the derivative of curvature vanishes, the magnitude and shape of each of the identical surfaces defined by the polynomial:

$$y=(Ax+Bx^2)^{\frac{1}{2}}+Cx^{(p)}+Dx^{(q)}+Ex^{(z)}\ldots,$$

where A is twice the apical radius of curvature of each surface, values of A ranging from about 20 mm to 7 mm, and B is (e^2-1). e being the apical eccentricity of each surface with the value of e being within the range of 1.1 to 1.7, and C, D, and E are coefficients of successive terms in the polynomial, the range of values of each of said coefficients being from 0 to about 500 in integral or fractional amounts, and p, q, and z are exponents in said successive terms with values ranging integrally or fractionally from 0 to 8.

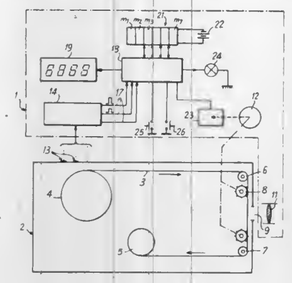
4,627,695

DEVICE FOR AUTOMATICALLY METERING AND DISPLAYING THE FOOTAGE OF DELIVERED FILM CONTAINED IN EACH OF A PLURALITY OF INTERCHANGEABLE MAGAZINES ADAPTED TO BE MOUNTED ON THE BODY OF A CINEMATOGRAPHIC CAMERA

Jean-Pierre Beauviala, Grenoble, and Jean-Pierre Charras, Brignoud, both of France, assignors to Societe Anonyme dite: Aaton Rg., Grenoble, France

Filed Oct. 7, 1985, Ser. No. 784,895
Claims priority, application France, Oct. 8, 1984, 84 15392
Int. Cl.[4] G03B *23/02*
U.S. Cl. 352—72 **5 Claims**

1. A device for automatically metering and displaying the footage of delivered film contained in each of a plurality of interchangeable magazines adapted to be mounted on the body of a cinematographic camera comprising, on each magazine, an assembly of coded identification marks peculiar to each magazine and, on the body of the camera, a device for reading and identifying the various assemblies of coded marks borne by the various magazines, a memory with a plurality of zones allocated respectively to the various magazines and permanently containing information relative to the footage of film consumed in each magazine, a microprocessor receiving signals coming from the device for identifying the magazines, as well



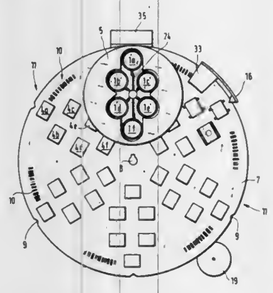
as a metering pulse emitted by a pulse generator coupled to the motor driving the film and emitting a pulse for each image, and a display device connected to the microprocessor for indicating at any moment the footage of film delivered and contained in the magazine used.

4,627,696

PROJECTION APPARATUS

Friedrich-Josef Sacher, Agnesstrasse 52a, 5210 Troisdorf, Fed. Rep. of Germany

PCT No. PCT/EP83/00318, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02200, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 29, 1983, Ser. No. 638,471
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244394
Int. Cl.[4] G03B *23/10, 23/16*
U.S. Cl. 353—110 **18 Claims**



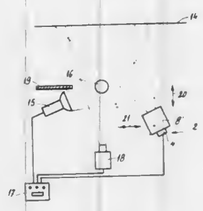
1. A projection apparatus for transparencies, comprising at least four projectors each including a projection lamp, a condensor and an objective and arranged to point at the same part of a picture screen, said projectors being offset from one another, said objectives and said condensors having axes which are transversely offset from one another so as to project on the picture screen pictures in register, said projection lamps being adjustable in their brightness independently of one another; a common-lamp support arranged to support said projection lamps and being readily replaceable; a flat disc for supporting a plurality of transparencies with offset similar to said projectors, said disc having a central axis and being rotatable about said central axis, said disc being subdivided into a plurality of substantially equal sectors each arranged for supporting a group of at least four transparencies to be associated with said four projectors; an objective support supporting said objectives of said projectors with offset relative to one another; a condensor support supporting said condensors of said projectors with offset which is similar to the offset of said objectives; and an elective drive for driving said disc for supporting the transparencies about said central axis.

4,627,697

BACKGROUND PROJECTION SYSTEM FOR PHOTOGRAPHY

Paul Second, 251 "Les Erables," La Duchere, Lyon, France

Continuation of Ser. No. 654,790, Sep. 26, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 819,987
Claims priority, application France, Sep. 26, 1983, 83 15734
Int. Cl.[4] G03B *15/00*
U.S. Cl. 354—77 **9 Claims**



1. A photographic apparatus comprising:

a backdrop;

a subject station located in front of said backdrop;

a camera trained on said subject station having an optical axis and a photographic field encompassing said station and at least a portion of said backdrop directly behind said station along said optical axis;

a background decor projector training a light beam upon said backdrop and at least upon said portion thereof without interception by said subject and from a location offset from said optical axis, said background decor projector comprising:

a flat Fresnel element having a working surface along which an object can be deposed to produce an image adapted to be projected on said backdrop,

a backdrop decor flash lamp for generating said light beam and positioned so that said light beam traverses said Fresnel element,

an objective lens unit disposed along an optical axis of said Fresnel element and receiving the light beam after it has passed said object, and

a mirror between said objective lens unit and said backdrop and out of the optical axis of said camera for reflecting an image of said object onto said backdrop so that the image on said backdrop is fully visible independently of a view finder of said camera; and

means for synchronously triggering said flash lamps and said camera to photograph said subject on a background formed by said image.

4,627,698

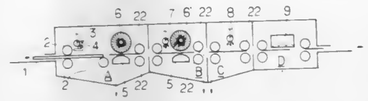
PROCESSING APPARATUS FOR PRINTING PLATES

Masahiro Yamasaki, Otsu; Masayoshi Wakabayashi, Inugami-gun; Jun Yamada, and Takao Senga, both of Nagaokakyo, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,351
Claims priority, application Japan, Oct. 3, 1983, 58-185509
Int. Cl.[4] G03D *5/04*
U.S. Cl. 354—317 **6 Claims**

1. An apparatus for processing printing plates which have a base plate and an organic photoconductive layer on which a toner layer is electrophotographically fixed, the apparatus comprising: conveyor means for conveying said printing plate along a conveying path; supply means for supplying a processing solution evenly over the entire width of the upper surface

of said printing plate; and stirring means provided along said conveying path subsequent to said supply means, and arranged



so as to contact the processing solution on said printing plate without being contactable with said printing plate.

4,627,699

AUTOMATIC FOCUSING ADAPTOR FOR CAMERA LENS

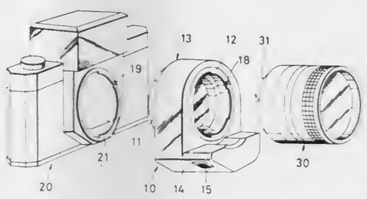
Tadao Takagi, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,320

Claims priority, application Japan, Jan. 31, 1984, 59-15510; Mar. 29, 1984, 59-61697; Apr. 19, 1984, 59-79063

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **10 Claims**



1. In an automatic focusing unit to be interposed between a photographing lens and a camera body and having a lens system cooperative with the photographing lens to form an image of an object and driving means for moving said lens system in accordance with a detection signal from a focus detector so as to focus said object image on the focal plane, said camera body having a portion to be held by the right hand of the operator in a first direction on a plane perpendicular to the optical axis of said lens system, the improvement comprising:

(a) a cylindrical member having two ends one of which is connectable with the photographing lens and the other is connectable with the camera body and containing therein the lens system;

(b) a casing member for covering the outside of said cylindrical member excepting at least the two ends thereof; and

(c) focus locking means for acting on said driving means to retain the lens system at the position moved by said driving means, said focus locking means including an operation member for disabling said driving means, said operation member being provided on said casing member at such position which lies lower than the optical axis and shifted toward said first direction from the optical axis when the camera body and the automatic focusing unit are held with the optical axis and said first direction extending parallel with the horizontal plane.

4,627,700

FOCUS DETECTING AND INDICATING DEVICE FOR CAMERA

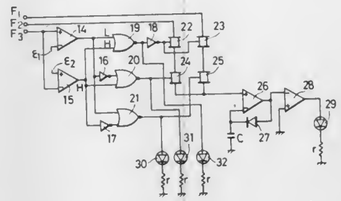
Kazuo Nakamura; Masao Jyojiki, both of Saitama, and Harumi Aoki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,931

Claims priority, application Japan, Feb. 15, 1979, 54-16445

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—409 **6 Claims**



1. In a camera of the type having a photographing lens which may be at an in-focus position, front-focus position or rear-focus position, an electrical focus detecting and indicating device of the type including means for generating a first focus detection signal (**F1**) having a maximum value at a front focus position of said lens, a second focus detection signal (**F2**) having a maximum value at a rear-focus position of said lens and a third focus-detection signal (**F3**) having a higher value on one side of said in-focus position than on the other side of said in-focus position, said electrical focus detecting and indicating device further comprising:

a first circuit (**14–21**) responsive to said third focus detection signal for providing output signals indicating the front, rear or in-focus position of said lens;

a second circuit (**22–28**) responsive to said first circuit output signals and to said first and second signals for providing an output signal indicating whether or not said photographing lens is moving in a direction toward said in-focus position; and

a display circuit (**29**) responsive to said second circuit output signal for displaying to a camera operator whether or not the photographic lens is presently moving toward said in-focus position.

4,627,701

CORONA DISCHARGER SYSTEM

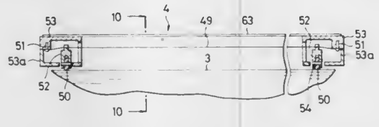
Shigeyoshi Onoda, Yokohama; Akihiro Nomura, Kawasaki; Morikazu Mizutani, Tokyo; Shinji Kanemitsu, Ichikawa; Mototada Toriumi, Yokohama, and Fumio Nishino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 494,867, May 16, 1983, Pat. No. 4,575,221. This application Oct. 4, 1985, Ser. No. 784,368

Claims priority, application Japan, May 20, 1982, 57-85608; Jul. 21, 1982, 57-127027; Sep. 30, 1982, 57-171905

Int. Cl.[4] G03G *15/02*

U.S. Cl. 355—3 CH **10 Claims**



1. A corona discharger system comprising a corona wire; means for supporting both ends of the corona wire; a member movable into facing relation with said corona wire and having a surface which will hold an electrostatic latent image; and corona wire positioning member located between said surface

and the mounted corona wire and always biased toward said surface by the tension of said wire.

4,627,702

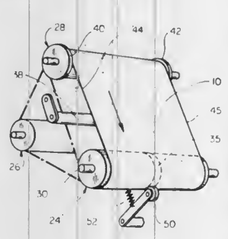
WIDE BELT TRACKING METHOD AND APPARATUS

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Systems, Inc., San Jose, Calif. and Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 586,028, Mar. 5, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 753,045

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 BE **13 Claims**



1. A belt assembly for supporting an endless belt having an electrophotographic region movable through a plurality of electrophotographic processing stations arranged around the assembly including

at least two rollers having parallel axes for carrying said belt,

one of said rollers having flanges for centrally positioning said belt,

drive means connected to a second one of said rollers for moving said belt,

said belt moving roller have a single narrow frictional surface at the center of said second roller functioning as a pulley for movably engaging said belt to decouple the remaining width of the belt from the drive roller surface, the ratio of the width of said narrow frictional surface to the width of said one roller with flanges defining a width to pulley spacing of 10:1.

4,627,703

APPARATUS FOR FORMING IMAGES FROM POSITIVE AND NEGATIVE ORIGINALS

Hiroaki Suzuki, Hachiohji; Shinji Murata, Tokyo; Masanari Shirai, Chigasaki, and Kazuhiko Onuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 669,064, Nov. 7, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,550

Claims priority, application Japan, Nov. 17, 1983, 58-216794; Nov. 17, 1983, 58-216795; Nov. 17, 1983, 58-216796

Int. Cl.[4] G03G *15/00*

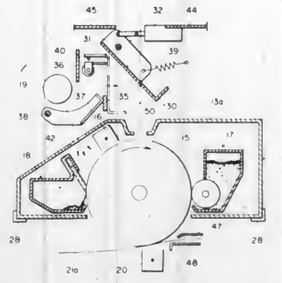
U.S. Cl. 355—3 R **21 Claims**

1. A cartridge detachably mountable into an image forming apparatus, comprising:

a photosensitive member;

a casing for supporting said photosensitive member; and

means, operable when mounted in the main assembly, for actuating means for preventing a non-image area of said



photosensitive member from being exposed to light, upon formation of a positive image from a negative original.

4,627,704

LIGHT AMOUNT LIMITING DEVICE OF ELECTROPHOTOGRAPHIC COPYING MACHINE

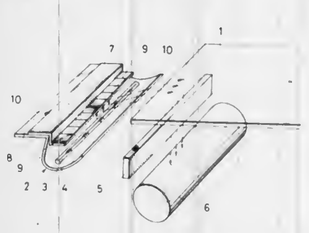
Hideaki Hamasaki; Shigeharu Maehara, both of Nara, and Shinsuke Saita, Habikino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1983, Ser. No. 547,400

Claims priority, application Japan, Nov. 4, 1982, 57-167691[U]

Int. Cl.[4] G03G *15/04*; **G03B** *27/72*

U.S. Cl. 355—3 R **2 Claims**



1. An electrophotographic copying machine comprising:

means for supporting a document to be copied;

a photoconductive image member;

an elongated light source for projecting light onto a surface of said document for reflection onto the photoconductive image member;

a bowl-shaped reflector extending the length of said elongated light source for projecting light onto said document; and

a light limiting assembly positioned between said elongated light source and said document, said light limiting assembly including a plurality of discrete, separately adjustable light limiting blades disposed along the length of the elongated light source and supported on a portion of said bowl-shaped reflector;

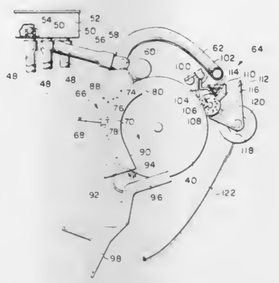
whereby the amount of light incident on said document may be selectively varied along the length of said elongated light source by bending each of said separately adjustable light limiting blades to fixed positions with respect to the elongated light source.

4,627,705

MULTIPLE COLOR LIQUID DEVELOPER ELECTROPHOTOGRAPHIC COPYING MACHINE AND LIQUID DISTRIBUTION SYSTEM THEREFOR

Benzion Landa, Alberta, Canada, and Josef Rosen, Rehovot, Israel, assignors to Savin Corporation, Stamford, Conn.

Filed Jul. 6, 1984, Ser. No. 628,462
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—4 **10 Claims**



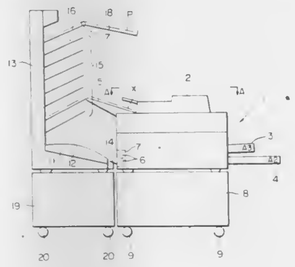
1. A copying machine including in combination means for providing a surface for receiving an electrostatic latent image, a developer applicator for applying liquid developer to said image, a plurality of supplies of liquid developer of different colors, first common conduit means for feeding liquid to said applicator, first feeding means for selectively feeding liquid from one of said supplies to said first common conduit means, second common conduit means for collecting from said surface liquid fed to said applicator by said first common conduit means, second feeding means for selectively feeding liquid from said second conduit means to the supply from whence it came, a supply of cleaning liquid, and third feeding means for feeding cleaning liquid from said cleaning liquid supply to said first common conduit means.

4,627,706

SORTING MACHINE AND IMAGE REPRODUCING APPARATUS

Seiji Takahashi; Masayuki Miyazaki; Tsugio Hirabayashi, and Yoshikazu Maekawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,358
Claims priority, application Japan, Apr. 12, 1984, 59-74420
Int. Cl.[4] G03G *15/00;* **B65H** *39/10*
U.S. Cl. 355—14 SH **28 Claims**



1. A sorting machine for collating sheets ejected from an image-reproducing apparatus comprising

a plurality of sorting bins comprising at least one large bin and at least one small bin;

a conveying means for transporting the sheets to the bins;

a guide means for selectively leading the sheets being transported by the conveying means into the bins;

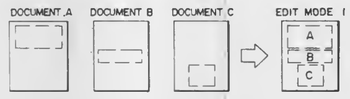
a control means for controlling the guide means to lead a large sheet which is incapable of being received in the small bin to the large bin in response to a signal generated by a means mounted in the image-reproducing machine for detecting a selection of the large sheet.

4,627,707

COPIER WITH IMAGE EDITING FUNCTION

Tatsuo Tani, Urayasu; Akira Midorikawa, Yokohama; Masaji Ito, Ageo; Masashi Kuno, Tokyo; Masayuki Shinada, Yokohama; Hirobumi Yoshino, and Yoshihiro Nakashima, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 745,121
Claims priority, application Japan, Jun. 16, 1984, 59-122911; Jun. 16, 1984, 59-122912; Jun. 16, 1984, 59-122913; Jun. 16, 1984, 59-122914; Jun. 16, 1984, 59-122915; Jun. 16, 1984, 59-122916; Jun. 16, 1984, 59-122917; Jun. 16, 1984, 59-122918; Jun. 16, 1984, 59-122919; Jun. 16, 1984, 59-122920; Jun. 16, 1984, 59-122921; Jun. 16, 1984, 59-122922; Jun. 16, 1984, 59-122923; Jun. 16, 1984, 59-122924; Jun. 16, 1984, 59-122925
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **15 Claims**



1. A copier having an image editing function, comprising:

a photoconductive element and a charger for depositing a uniform electrostatic charge on said photoconductive element;

an illuminating and exposing optical device for projecting an optical image of a document onto the photoconductive element;

a developing device for developing an image provided on a surface of the photoconductive element;

an erasing device for selectively erasing the image provided on the surface of the photoconductive element;

a sheet feeding device for feeding a transfer sheet;

a detaining device for temporarily detaining the transfer sheet to which the image developed by the developing device has been transferred;

a discharging device for discharging the transfer sheet to which the image developed by the developing device has been transferred;

a discharge path extending from a predetermined transfer station to said discharging device;

a communication path for providing communication between said transfer position and the detaining device;

a selector for selecting one of said discharge path and said communication path;

an image inputting device for inputting an image carried on a document;

a display device for displaying an input condition; and

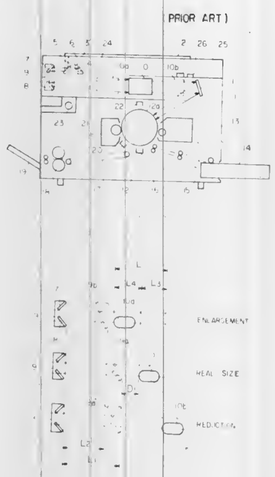
a control device for causing a copying operation to be started after specifying a desired area of a first document and, during said copying operation, specifying a desired area of a second document and, thereby, repeatedly specifying desired areas of a plurality of documents.

4,627,708

PHOTOCOPYING APPARATUS

Kouichi Arai, and Yukio Akita, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,057
Claims priority, application Japan, Jul. 18, 1983, 58-130575
Int. Cl.[4] G03G *15/04;* **G03B** *27/34*
U.S. Cl. 355—14 R **8 Claims**



1. A photocopying apparatus comprising an optical device which can be moved in a reciprocal manner, for having an original exposed and scanned, means for enabling the optical device to perform a reciprocal movement, a lens for projecting an image of the original from the optical device onto a photosensitive member, lens position detecting means for detecting a position of the lens, means for designating a magnification ratio of a photocopying, means for moving said lens through an electric circuit in accordance with said designating means, and a position detecting switch for determining whether said optical device is positioned at a predetermined position outside the area where said lens moves, and operational means for operating said means for moving the lens after the optical device is moved into said predetermined position when said position detecting switch detects that said optical device is not positioned at said predetermined position and said lens position detecting means detects that the lens is not at a position for enlargement copying.

4,627,709

AUTOMATIC SHEET FEEDER AND AN IMAGE RECORDING APPARATUS PROVIDED THEREWITH

Tadayuki Kitajima, Yokohama; Makoto Kitahara, Tokyo, and Koichi Murakami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,245
Claims priority, application Japan, Nov. 8, 1983, 58-209692; Nov. 10, 1983, 58-211423
Int. Cl.[4] G03G *15/00;* **B65H** *5/22*
U.S. Cl. 355—14 SH **7 Claims**

1. An automatic sheet feeding apparatus, comprising:

stacking means for stacking sheets thereon;

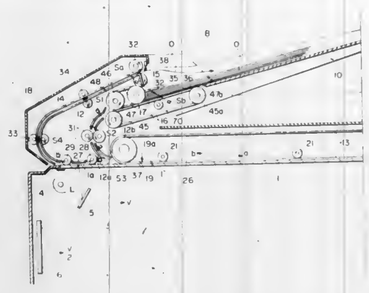
feeding means for feeding one by one the sheets stacked from said stacking means;

conveying means for conveying the sheets fed out of the sheet stacking means by said feeding means and reversing the face orientation of the sheets;

switch-back means for receiving sheets in a direction and stopping the sheets conveyed by said conveying means and sending the sheets back in an opposite direction;

returning means for returning to said sheet stacking means the sheets sent back by said switch-back means;

a first exposure station for scanning the sheets while they are



moving, after the sheets are reversed in the face orientation but before the sheets are returned to the sheet stacking means by the returning means; and

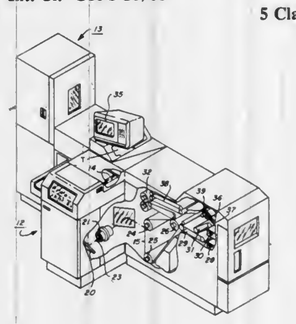
a second exposure station for scanning the sheets while they are stationary by being stopped by said switch-back means.

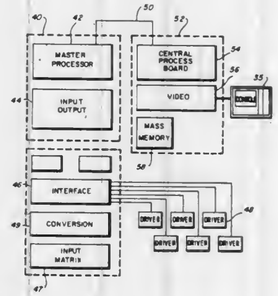
4,627,710

CUSTOMIZED JOB DEFAULT SET-UP

Frank M. Goetz, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1985, Ser. No. 707,778
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—14 R **5 Claims**





1. In a printing machine for producing impressions of an original, the printing machine having a photosensitive member,

a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce the impressions upon support material, and a controller having an operating console and a display, the console providing a plurality of switches to select job parameters, the machine upon cycle out at the end of a job requirement reverting to a given set of job parameters, said given set of job parameters being the dominant machines mode, the method of changing said dominant machine mode including the steps of:

initially setting up, said given set of job parameters to be returned to upon machine cycle out,

displaying on the display said given set of machine parameters, and

selectively changing at least one of the displayed parameters whereby upon machine cycle out the machine will revert to a second given set of job parameters, said second given set of job parameters being a new dominant machine mode.

4,627,711

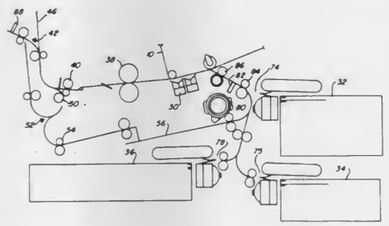
MACHINE SHUTDOWN CONTROL

Steven M. Schron, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1985, Ser. No. 781,569

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH **13 Claims**



1. In a printing machine having a plurality of operating components including a copy sheet path cooperating with one another to produce images on copy sheets, the copy sheet path being divided into a plurality of zones for movement of the copy sheets, each of the zones including an associated copy sheet drive, and a control including a processor and memory, the memory having a plurality of sections, each section maintaining status information relating to the location and travel of the copy sheets in the copy sheet path, including the source and destination of each of the copy sheets within the copy sheet path, the control monitoring the conveyance of copy sheets along the copy sheet path for the occurrence of malfunctions to determine either a cycle down or an immediate shutdown, the method of controlling of the shutdown of the machine upon the detection of a copy sheet malfunction comprising the steps of

tracking both the lead edge and the trail edge of each copy sheet and dynamically updating this information in memory for each sheet in the copy sheet path,

recognizing the location of the malfunction,

determining that a specific copy sheet is the source of the machine malfunction and identifying that either the lead edge or the trail edge of said copy sheet is the source of the malfunction,

identifying the zone of location of each of the copy sheets within the copy sheet path, and

deciding either a cycle down or an immediate shutdown and responding in accordance with either a cycle down or immediate shutdown.

4,627,712

IMAGE DENSITY CONTROL APPARATUS

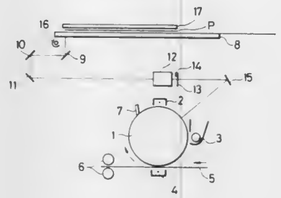
Akihiro Usami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,493

Claims priority, application Japan, Aug. 6, 1983, 58-144121; Aug. 6, 1983, 58-144122

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **9 Claims**



1. An image density control apparatus for controlling image processing procedures, comprising:

detection means for detecting a density of an image prior to image processing;

memory means for storing therein data representing the density detected by said detection means, said data being stored in relationship to a plurality of positions on an original; and

control means for adjusting a condition for image processing corresponding to each of said plurality of positions on the original, in response to said data stored in relation to each said position on the original.

4,627,713

COPYING MACHINE

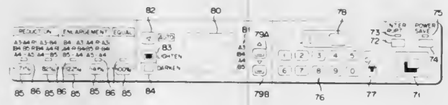
Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

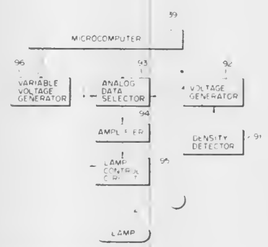
Filed Dec. 13, 1984, Ser. No. 681,571

Claims priority, application Japan, Dec. 20, 1983, 58-238809

Int. Cl.[4] G03G *15/04*

U.S. Cl. 355—14 R **3 Claims**





1. A copying machine comprising:

reading means for optically scanning a document and reading image data of the document;

copying means for forming a copy of the document in accordance with the image data read by said reading means and a density signal;

manual density adjusting means, having first and second operation members, for setting a manual adjusting mode and generating a plurality of limited and discrete density signals, wherein a density of the density signal is increased in accordance with an operation of said first operation member and is decreased in accordance with an operation of said second operation member;

automatic density adjusting means, connected to said reading means and having a third operation member for setting an automatic adjusting mode, for detecting a density of the document so as to generate a density signal in accordance with the detected density; and

selecting means, connected to said manual density adjusting means and automatic density adjusting means for supplying an output to said copying means from said manual density adjusting means in the manual adjusting mode and from said automatic density adjusting means in the automatic adjusting mode.

4,627,714

RECORDING APPARATUS WITH CONTROLLED POWER SOURCE FOR HEAT FUSING DEVICE

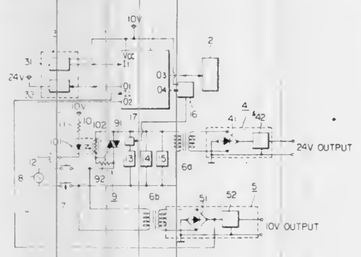
Hiromi Nozaki, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,183

Claims priority, application Japan, Jun. 8, 1982, 99027

Int. Cl.[4] G03G *13/20, 15/20*

U.S. Cl. 355—14 FU **21 Claims**



9. In a recording apparatus having a heat fusing device, a power source for supplying power to said heat fusing device, and means for cutting off the supply of power to said heat fusing device after the lapse of a given period of time after completion of a recording operation,

the improvement comprising control means coupled to said heat fusing device and to said power source for controlling the supply of power to said heat fusing device, said control means comprising:

means for supplying power from said power source to said heat fusing device to produce a predetermined heat temperature at said heat fusing device during a recording operation;

means for supplying power from said power source to said heat fusing device during a first given period of time beginning after the completion of a recording operation to maintain said heat fusing device at a given temperature sufficient for recording;

means for gradually reducing the power supplied from said power source to said heat fusing device during a second given period of time beginning after the end of said first period of time in accordance with a given time function over said second given period of time; and means for cutting-off completely the supply of power from said power source to said heat fusing device at the end of said second given period of time.

4,627,715

PROGRAMMABLE COPIER

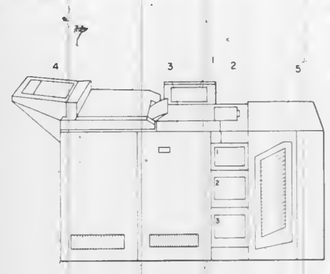
Mitsutoyo Kikuno, Machida, Japan, assignor to Ricoh Company, Ltd., Japan

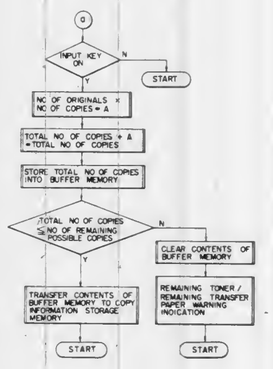
Filed Aug. 29, 1984, Ser. No. 645,916

Claims priority, application Japan, Aug. 31, 1983, 58-157904; Sep. 21, 1983, 58-173245

Int. Cl.[4] G03G *21/00, 15/00*

U.S. Cl. 355—14 R **4 Claims**





1. Apparatus for making copies automatically in accordance with temporarily stored copy information, comprising:

input means for inputting said copy information for each copy job, said copy information including at least a number of originals from which one or more copies are to be made and a number of copies to be made from each of said originals;

storing means for storing said copy information job by job;

detecting means for detecting current conditions of said apparatus;

control means for controlling storing of said copy information for each job input by said input means into said storing means such that said copy information for each job is allowed to be stored into said storing means as long as a cumulative total number of copies to be made does not exceed a maximum number of copies obtained from the current conditions detected by said detecting means; and

means for making copies in accordance with the copy information stored in said storing means.

4,627,716

TONER HANDLING APPARATUS FOR ELECTRO-PHOTOGRAPHIC COPYING MACHINES

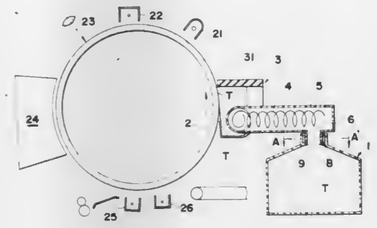
Tateki Oka, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1984, Ser. No. 638,716

Claims priority, application Japan, Aug. 12, 1983, 58-125940[U]; Aug. 12, 1983, 58-125941[U]

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 19 Claims



1. A toner handling apparatus for use in a transfer-type electrophotographic copying machine comprising an opening in said toner handling apparatus, a thermally expandable resin provided in said opening and heating means for expanding said resin.

4,627,717

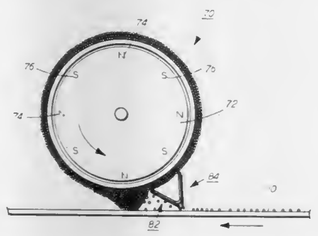
CLEANING APPARATUS FOR A XEROGRAPHIC REPRODUCING APPARATUS

Michael D. Thompson, Rochester, and Clifford W. Imes, IV, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1985, Ser. No. 701,890

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 6 Claims



3. Apparatus for forming toner images on a charge retentive surface and removing residual toner from the surface, said apparatus comprising:

a magnetic brush having bristles and being supported adjacent said charge retentive surface such that said bristles contact said charge retentive surface;

a residual toner disturber supported adjacent said charge retentive surface upstream of said magnetic brush and adapted to condition said residual toner for removal by said magnetic brush;

said bristles comprising magnetic particles; and

said disturber comprising a magnetic structure supported adjacent said magnetic brush whereby a magnetic field is passed therethrough upon rotation of said magnetic brush and said bristles are caused to contact residual toner on said charge retentive surface.

4,627,718

SHEET CURL CONTROL APPARATUS FOR A COPIER

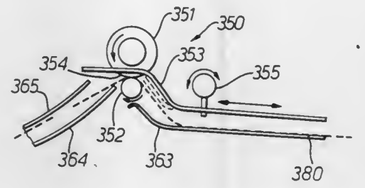
Andrew F. Wyer, Comberton, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,336

Claims priority, application United Kingdom, Jun. 8, 1983, 8315732

Int. Cl.[4] G03G *21/00;* D21H *5/24*

U.S. Cl. 355—35 H 8 Claims



8. A copier for duplex copying, including a photoreceptor, a copy sheet tray, a duplex buffer tray, sheet feeders associated with said trays for feeding sheets from said trays to the photoreceptor, a fuser for fixing images received on sheets at the photoreceptor, a sheet return path of conveying simplex sheets which have received an image on one side at the photoreceptor to receive a second image on the other side, and a sheet curl control apparatus in said sheet return path comprising a pair of coating rolls and a baffle means extending from a position upstream of said rolls to a position downstream of said rolls and having a portion thereof extending downward at an acute angle from immediately before a nip formed between said rolls to immediately after the nip in relation to a tangential line through the nip so as to bend a sheet passing between the rolls about one of said rolls.

4,627,719

METHOD AND APPARATUS FOR REPRODUCING THE IMAGES OF FILM FRAMES

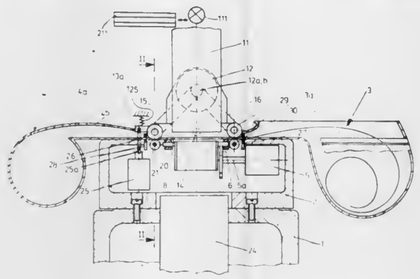
Wilhelm Nitsch; Helmut Treiber, both of Munich, and Gerhard Benker, Pullach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,613

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437222

Int. Cl.[4] G03B *27/52, 27/32*

U.S. Cl. 355—41 31 Claims



1. A method of copying successive image carrying sections of a series of such sections on a length of photographic material, comprising the steps of advancing the length of photographic material longitudinally in a first direction; individually photoelectrically monitoring predetermined parameters of successive sections of said series in the course of said advancing step and generating and storing signals denoting characteristic values which are representative of said predetermined parameters; thereupon transporting the length of photographic material longitudinally in a second direction counter to said first direction; and reproducing the images of said sections in the course of said transporting step starting with the last monitored section and proceeding toward the first monitored section, including exposing the sections to copying light and influencing the copying light as a function of the respective stored signals.

4,627,720

VARIABLE MAGNIFICATION IMAGE PROJECTOR

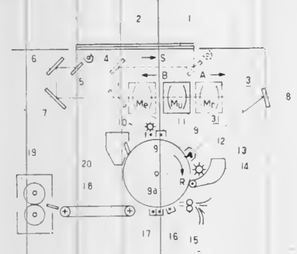
Takaji Yonemori, Tokyo, and Hideki Adachi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 717,470, Mar. 28, 1985, which is a continuation of Ser. No. 565,368, Dec. 27, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 778,166

Claims priority, application Japan, Jan. 6, 1983, 58-181

Int. Cl.[4] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 32 Claims



1. A variable magnification image projecting apparatus for projecting the image of an original onto a photosensitive member with a selected magnification, said apparatus comprising:

a zoom lens for forming an image of the original on the photosensitive member;

lens drive means for moving said zoom lens along a predetermined path;

focal-length changing means for changing the focal length of said zoom lens in association with the operation of said lens drive means; and

control means for controlling said lens drive means such that in response to a selected magnification, said zoom lens is shifted to a goal position spaced away from an initial position of said zoom lens by a distance D and such that the focal length of said zoom lens is changed to a value corresponding to the selected magnification,

said control means controlling said lens drive means such that said zoom lens is moved through the distance D in the first direction when said goal position corresponding to the selected magnification is far in a first direction as viewed from said initial position and such that when said goal position corresponding to the selected magnification is far in a second direction opposite to the first direction as viewed from said initial position, said zoom lens is moved to a reversal position spaced away from said initial position by a distance (D+ΔD) in the second direction and then moved back by a distance ΔD is the first direction.

4,627,721

AUTOMATIC SCANNING OPTICS ALIGNMENT

Tuan A. Nguyen; Ronald T. Sosinski, both of Rochester, and Wayne A. Buchar, Holcomb, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1985, Ser. No. 800,176

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—77 6 Claims

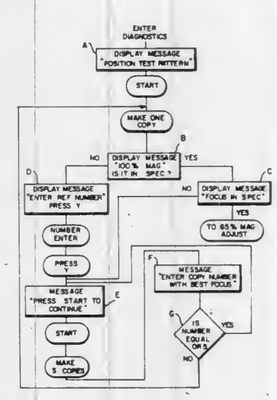
1. In an electrophotographic printing machine having a scan illumination optical system for illuminating a document to be copied on a platen surface and for projecting an image of the document along an optical path onto a photoreceptor to form a latent image, the scan illumination system including a lens and a plurality of mirrors, the printing machine including a controller having a memory, the method of aligning the optical system comprising the steps of:

entering the diagnostic mode,

positioning a test pattern on the platen and making one copy thereof,

visually inspecting the test pattern and the copy for variations,

entering a number at the control panel indicating the degree of variation,



calculating a reference number for storage and memory indicating the relative positions of the lens and mirrors,

making additional copies of the test pattern in response to the new relative position of the optical components,

visually comparing the additional copies with the test pattern to select the best copy for focus,

entering the best copy number at the control console and calculating a new relative position of the optical components for focus, and

storing the new number representing the new relative position in memory.

4,627,722

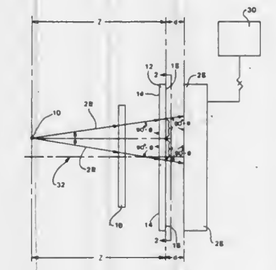
METHOD AND APPARATUS FOR OPTICALLY MEASURING THREE-DIMENSIONAL COORDINATES

Robert A. Falk, Kent, Wash., and Gary L. Phillis, Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 31, 1984, Ser. No. 646,638

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—4.5 14 Claims



1. An apparatus for simultaneously measuring one to three of

the three-dimensional coordinates of one or more distant points, comprising:

a means for providing a point optical radiation source at each said distant point;

a multiple-beam interferometer means which receives optical radiation emitted from each said point optical radiation source, and which creates at least one interference fringe with respect to each said point optical radiation source due to the optical radiation received therefrom;

a photo-electric detection means which detects at least a portion of said one interference fringe created with respect to each said point optical radiation source, and which transmits electric signals in response to each of the detected interference fringes; and

processor means which receives said electric signals, and which employs the electric signals to determine one to three of the three-dimensional coordinates of each said distant point.

4,627,723

OPTICAL RANGE SIMULATOR DEVICES

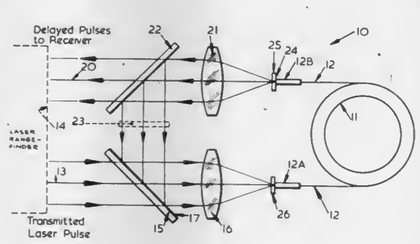
Timothy O. French, Kings Park; Derek R. Carless, Ralston; Reginald A. Ault, Bearsden, and Michael B. Darlow, Glasgow, all of Scotland, assignors to Barr & Stroud, Glasgow, Scotland

Filed May 9, 1984, Ser. No. 608,411

Claims priority, application United Kingdom, May 19, 1983, 8313875; Feb. 14, 1984, 8403899

Int. Cl.[4] G01C *3/08, 25/00*

U.S. Cl. 356—5 **9 Claims**



1. An optical range simulator device for testing the ranging function of a laser rangefinder, comprising first means defining a first optical axis for receiving output light pulses from the rangefinder to be tested, second means defining a second optical axis parallel to said first optical axis for delivering return light pulses to the rangefinder, an optical fibre delay line having a fibre input end and a fibre output end, the input end being coupled to receive light pulses from said first optical axis and the output end being coupled to deliver light pulses to said second optical axis, and optical bridging means comprising a pair of orthogonal beamsplitters one beamsplitter being disposed across said second optical axis and the other being disposed across said first optical axis, said optical bridging means being arranged to collect at least a portion of each light pulse delivered at the output end of said delay line and to deliver each said collected light pulse portion to the fibre input end of said delay line, whereby for each output light pulse received from the rangefinder along said first optical axis a series of successively delayed return light pulses are delivered at the output end of the delay line at ranges successively augmented by that range distance represented by the optical fibre delay line.

4,627,724

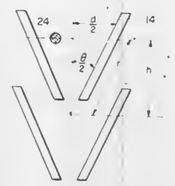
RADIATION SCANNING AND DETECTION SYSTEM

Scott H. Cameron, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 511,811

Int. Cl.[4] G01B *11/26;* **G01C** *1/00*

U.S. Cl. 356—141 **8 Claims**



1. A radiation scanning and detection system comprising:

a plurality of optical radiation detectors positioned to detect radiation in azimuth and elevation from a remote source, each detector being adapted to provide a signal representative of said radiation, said detectors including a plurality of pairs of infrared sensitive elements aligned and spaced vertically in a common plane, respective said pairs having a V-shape including symmetrical elements spaced from each other about a vertical axis;

optical scanning means for scanning a field of view and directing radiation from said remote source transversely across said plurality of pairs of vertically aligned detectors, each said pair being adapted to cover a small angle of elevation in the field of view in accordance with the vertical position in said plane;

threshold means associated with each separate detector element for sensing each said signal at respective vertical positions and providing a digital pulse when each said signal exceeds a predetermined amplitude;

digital filter means for establishing a predetermined sequence of digital pulses representative of said signal and supplying an output pulse upon the occurrence of said sequence; and

signal processing means for processing a plurality of output pulses from a plurality of said digital filter means to locate the position of said remote source in said field of view.

4,627,725

OPTICAL AXIS MONITORING SYSTEM

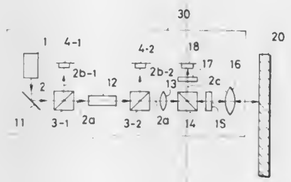
Takashi Nishio, Saitama, and Tomoyoshi Ikeya, Yamanashi, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,458

Claims priority, application Japan, Apr. 18, 1983, 58-57795[U]

Int. Cl.[4] G01B *11/26;* **G11B** *5/09*

U.S. Cl. 356—152 **3 Claims**



1. In an optical information recording apparatus for optically recording information on a recording surface of a record member comprising:

a laser beam source providing a laser beam directed onto said surface,

an electro-optical modulator positioned between said source and said surface and intercepting said beam to modulate said beam,

the improvement comprising:

a first beam splitter positioned in the path of said light beam downstream of said source and upstream of said modulator separating said beam into a main beam and a first sub-beam,

a first monitoring light detector element positioned in the path of said sub-beam,

a second beam splitter positioned in the path of said main beam downstream of said modulator further separating said main beam and forming a second sub-beam,

a second monitoring light detecting element positioned in the path of said second sub-beam,

a polarizing beam splitter positioned in the path of said main beam downstream of said second beam splitter and including a quarter-waveplate for rotating the main beam incident on said recording surface,

a lens interposed between said polarizing beam splitter quarter-waveplate and said recording surface for reflecting light from said recording surface to said polarizing beam splitter through said quarter-waveplate, such that the reflected light is rotated by the beam splitter through a given angle,

and wherein said polarizing beam splitter separates said reflected polarized light beam into a main reflected polarized light beam, and a polarized reflected light sub-beam, and

a polarized light sub-beam light detecting element positioned in the path of said polarized reflected light sub-beam;

whereby, an output signal is developed by the polarized light sub-beam detector element for controlling the position of the objective lens in a direction perpendicular to the recording surface so that the main recording light beam is prevented from being defocused by warpage of the recording surface under focus-servo operation, recording beam convergence is maintained on the recording surface at all time, and the optical axis of the main beam is maintained coincident with the designated optical axis by comparing the output signals of the two monitoring light detecting elements and permitting optical axis alignment with the designated optical adjustment solely by adjusting the laser beam source and without further adjustment of the balance of the components of the optical information recording apparatus.

4,627,726

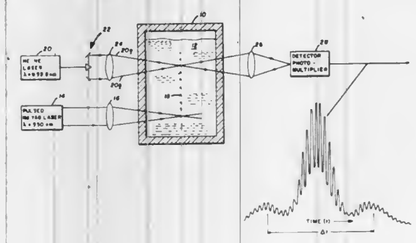
METHOD AND APPARATUS USING LASER RADIATION FOR GENERATING AND MEASURING GAS BUBBLES

Robert Turner, Silver Springs, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jun. 17, 1985, Ser. No. 745,119

Int. Cl.[4] G01N *15/02*

U.S. Cl. 356—336 **7 Claims**



1. A non-intrusive system for measuring the quality of a liquid disposed within a container transparent to laser radiation comprising, in combination,

a first laser means external to said container producing a laser beam focused at a predetermined location within said liquid,

said focused laser beam heating said liquid locally to generate bubbles from gas dissolved within said liquid,

said bubbles migrating upwardly from said predetermined location at a velocity which varies in proportion to bubble size, and

a laser Doppler velocimeter including second laser means external to said container producing a pair of intersecting laser beams traversed by said migrating bubbles and a detector photomultiplier means generating an output electrical signal indicative of the velocity and the diameter of said bubbles as a measure of liquid quality.

4,627,727

MONITORING DEFLOCCULATED PARTICLES IN A SUSPENSION

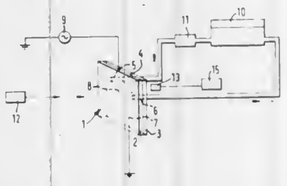
Barry R. Jennings, Chertsey, United Kingdom; Harold H. Trimm, Binghamton, N.Y., and Terence W. Webb, St. Austell, United Kingdom, assignors to English Clays Lovering Pochin & Company, Ltd., St. Austell, England

Filed Apr. 27, 1984, Ser. No. 604,849

Claims priority, application United Kingdom, Apr. 29, 1983, 8311800

Int. Cl.[4] G01N *21/00, 21/47, 21/51*

U.S. Cl. 356—338 **16 Claims**



1. A method of monitoring the deflocculation of particles in a liquid suspension, which particles, when deflocculated, are such that they can become aligned in an applied disturbance field, the method comprising:

(a) supplying the liquid suspension to a monitoring region;

(b) applying a beam of radiation to the suspension in said region;

(c) applying a disturbance field to said region, said field being in a direction parallel to the direction of said beam of radiation; and

(d) detecting a change, if any, in the forward radiation scattering properties of the suspension with respect to the beam in said region due to the aligning of any deflocculated particles of said suspension in said field.

4,627,728

COMPENSATED FABRY PEROT SENSOR

Jolyon P. Willson, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,204

Claims priority, application United Kingdom, Mar. 16, 1983, 8307241

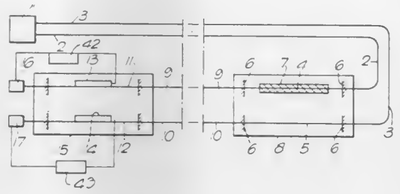
Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—345 **7 Claims**

1. A sensor system responsive to an independent sensed parameter to be evaluated, said system including first and second waveguide Fabry Perot cavities, said first cavity being the sensor cavity, said first and second cavities having similar optical path lengths and being optically in series, a first feedback control loop for monitoring the transmission of the series combination of said first and second cavities and being opera-

tively coupled to one of said first and second cavities to maintain a predetermined phase relationship between said optical path lengths of said first and second Fabry Perot cavities by controlling the path length of said first cavity while the optical path length of said first cavity is modulated by said sensed parameter, comprising:

a reference waveguide Fabry Perot cavity thermally strapped to one of said first and second cavities and being



of equivalent construction and optical path length vis-a-vis the associated one of said first and second cavities; and

a second feedback control loop for monitoring, at least in part, the transmission of said reference cavity and being operatively coupled to one of said second and reference cavities for maintaining a predetermined phase relationship between said reference cavity and one of said first and second cavities, by controlling the optical path length of one of said reference cavities or said second cavity.

4,627,729

DIFFERENTIAL HOLOGRAPHIC METHOD

Bernd Breuckmann, Neubiberg, and Werner Thieme, Munich, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Postfach, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,082

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303876

Int. Cl.[4] G01B *9/025*

U.S. Cl. 356—347 **2 Claims**



1. An improvement in a differential holographic method for measuring and verifying the changing condition of objects by holographic exposure in a method in which a first intermediate hologram of a reference object in an unchanged state is recorded, a second intermediate hologram of the reference object in a changed state is recorded, a test object, having a surface contour similar to that of the reference object, in an unchanged state is illuminated with the reconstructed object wave field from the first intermediate hologram, and the test object in a changed state is illuminated with the reconstructed object wave field from the second intermediate hologram, the improvement comprising: producing the first and second intermediate holograms of the reference object positioned in a holder while using successive reference beams incident on a single holographic plate, removing the reference object from the holder and replacing it with the test object, and successively illuminating the test object with the reconstructed object wave field from the first and second intermediate holograms on the single holographic plate by employing associated conjugated first and second reference beams on the single holographic plate, and recording the holograms resulting from the interference between the light reflected by the successive illumination of the test object with a third reference beam on a second holographic plate for subsequent interpretation.

4,627,730

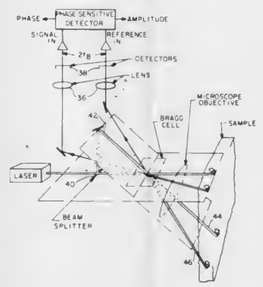
OPTICAL SCANNING MICROSCOPE

Roger L. Jungerman, Palo Alto, and Gordon S. Kino, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 6, 1984, Ser. No. 628,181

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **18 Claims**



1. An optical scanning microscope comprising means for focusing at least two optical beams on a sample under study,

means for optically scanning one of said beams across the surface of the sample independent of movement of the sample itself, the other of said optical beams being held stationary relative to a fixed point on the surface of the sample whereby the distance between the landing points of said beams over the surface of the sample is variable,

means for comparing the phase of the reflected beams to determine the phase shift of the scanned beam relative to the phase of the stationary beam as representing surface variation anywhere on the surface of the object covered by said scanned beam.

4,627,731

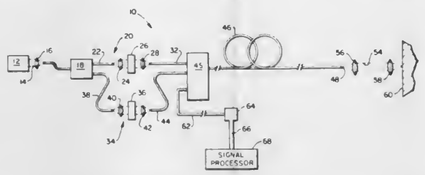
COMMON OPTICAL PATH INTERFEROMETRIC GAUGE

James P. Waters, Ellington, and Mark R. Fernald, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 3, 1985, Ser. No. 772,106

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **6 Claims**



1. A common optical path interferometric gauge for measuring motion of a workpiece surface, comprising:

optical source means for providing an optical beam having a coherence length;

optical apparatus for splitting said optical beam into first and second beams and providing modulation thereto, said first and second beams guided along first and second optical paths respectively, having an optical path length difference selected to be greater than said coherence length;

common optical path means responsive to said first and second beams for forming a combined beam therefrom, guiding said combined beam therein, and splitting said combined beam into reference and measurement beams, guided respectively along a reference optical path and a measurement optical path including the workpiece surface, said measurement and reference optical paths having an optical path length difference selected to be approximately equal to the optical path length difference between said first and said second optical paths such that coherence is restored therebetween, said common path means combining said reference and measurement beams forming an interference beam;

detector means for receiving said interference beam and providing an electrical signal equivalent thereof; and

signal processing means for receiving and demodulating said electrical signal to determine a component thereof indicative of the motion of the workpiece surface.

4,627,732

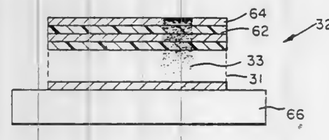
MODE DISCRIMINATION APPARATUS

Kenneth H. Braun, North Billerica, and Michael S. Perlmutter, Sherborn, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 265,712, May 20, 1981, Pat. No. 4,519,708. This application Sep. 6, 1985, Ser. No. 714,402

Int. Cl.[4] G01C *19/64;* **H01S** *3/05*

U.S. Cl. 356—350 **27 Claims**



1. In combination:

an optical system comprising means for producing a plurality of electromagnetic waves;

dielectric material means within an optical path of said optical system for altering the phase and amplitude characteristics of said electromagnetic waves; and

said dielectric material means comprising a dielectric material having one or more areas of said material treated with an electron beam for producing said phase and amplitude alterations to said waves.

4,627,733

FLATNESS MEASURING APPARATUS

Toshiaki Wada, Takatsuki, Japan, assignor to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Dec. 14, 1982, Ser. No. 449,733

Claims priority, application Japan, Dec. 25, 1981, 56-215418; Feb. 24, 1982, 57-29620; Feb. 24, 1982, 57-29621; Feb. 24, 1982, 57-29622; Feb. 24, 1982, 57-29623

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—359 **7 Claims**

1. A flatness measuring apparatus which obtains interference fringes related to a plane to be measured and a reference plane, thereby measuring the flatness of said plane to be measured based on said interference fringes, said apparatus comprising:

an optical system for producing said interference fringes with a light means;

a one-dimensional image sensor having a number of photoelectric conversion elements arranged in a row to detect said interference fringes;

said image sensor being disposed to longitudinally detect said interference fringes in the direction of the width thereof;

a data processing unit which computes said flatness based on an output of said image sensor;

a data input means for inputting numeric data to said data processing unit;

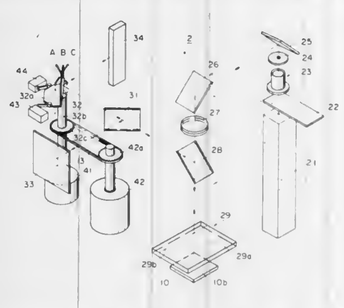
an optical means for turning the light from the interference fringes produced by said optical system toward said image sensor;

said optical means being pivotally supported to be turnable for changing the visual field of said image sensor in the extending direction of said interference fringes,

and,

a means for detecting the turning position of said optical means;

said data processing unit using information related to the detected turning position of said optical means as specific information related to the visual field of said image sensor



in computation of the flatness of said plane to be measured, and using said numeric data from said data input means as an information which specifies said visual field of said image sensor;

said data processing unit comparing the data which has been computed based on the outputs of said image sensor, said computed data corresponding to the positions of said interference fringes as detected by said image sensor, and said outputs being successively output and said data processing unit identifying two of said data outputs corresponding to the positions of two fringes as detected by said image sensor as actually being data corresponding to the same fringe when the dimensional difference in the positions of said two fringes, as detected by said image sensor, is equal to or less than a quarter of the wavelength of said light means used for generating the interference fringes.

4,627,734

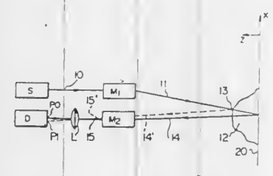
THREE DIMENSIONAL IMAGING METHOD AND DEVICE

Marc Rioux, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 509,373, Jun. 30, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,477

Int. Cl.[4] G01C *3/00;* **G01B** *11/24*

U.S. Cl. 356—376 **22 Claims**



1. In a method of determining the profile of a surface relative

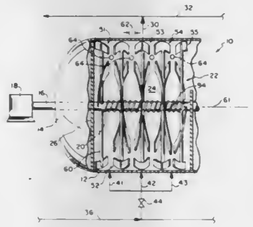
to a reference plane, comprising projecting a beam of radiation to strike an area of the surface and detecting a beam reflected by such surface area, portions of the projected and detected beams that intersect at said area defining a beam plane that intersects the reference plane along a direction X; the improvement comprising synchronously scanning said beam portions in the beam plane to move in the direction X the surface area at which said beam portions intersect, whereby each detected position of the detected beam in the direction X represents a deviation of a respective said area from the reference plane in a direction Z perpendicular to the reference plane.

4,627,735

DOUBLE REVERSE HELIX AGITATOR

Philip M. Rose, Naperville, and Yoon S. Song, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 7, 1985, Ser. No. 699,335
Int. Cl.[4] B01F *7/00*
U.S. Cl. 366—329 **17 Claims**



1. For use in a gas phase olefin polymerization reactor having at least one polymerization section, a double reverse helix agitator comprising:
a shaft having a spiral screw thread,
a first helix flight and a second helix flight each having approximately a same radius from an axis of rotation of said shaft and mounted to said shaft,
said first helix flight and said second helix flight each having a same pitch of between 0.5:1 and 2:1 with said pitch of said first helix flight extending in an axial direction opposite to said pitch of said second helix flight.

4,627,736

THIN CARD-TYPE ELECTRONIC APPARATUS

Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 503,541, Jun. 13, 1983, abandoned.
This application Nov. 26, 1984, Ser. No. 675,251
Claims priority, application Japan, Jun. 15, 1982, 57-104373
Int. Cl.[4] G04C *23/02;* **G06F** *1/00;* **H01H** *13/70;* **H05K** *7/00*
U.S. Cl. 368—88 **13 Claims**



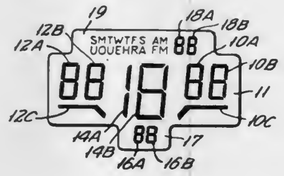
1. An electronic apparatus consisting essentially of:
a substrate having a first wiring pattern on a first surface thereof, said first wiring pattern including first key contacts and first electrically conductive paths connected to said first key contacts;
at least one recess in said first surface of said substrate for receiving an electronic component;
at least one electronic component positioned within said at least one recess, said electronic component having electrical conductor leads;
a flexible layer having a second wiring pattern on a first surface thereof, said second wiring pattern comprising second key contacts and second electrically conductive paths connected to said second key contacts;
said flexible layer being positioned on said substrate such that said first surface of said flexible layer faces said first surface of said substrate and said first key contacts are aligned with said second key contacts and said flexible layer covers said at least one recess;
spacer means interposed between said substrate and said flexible layer at least adjacent said first and second key contacts to space said key contacts from each other; and
power supply means;
wherein said electrical conductor leads of said electronic component and said power supply means are each electrically engaged with at least one of said first and second electrically conductive paths of said first and second wiring patterns.

4,627,737

FULLY BI-DIRECTIONAL DIGITAL TIME DISPLAYS

Edwin P. Nance, Hong Kong, Hong Kong; Marc H. Segan, New York, and Berj A. Terzian, Briarcliff Manor, both of N.Y., assignors to Equitime, Inc., Briarcliff Manor, N.Y.

Filed May 16, 1985, Ser. No. 734,979
Int. Cl.[4] G04C *17/00*
U.S. Cl. 368—239 **15 Claims**



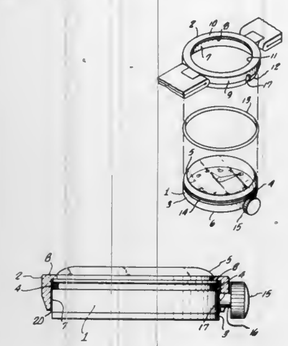
1. Fully bi-directional digital time displays which comprise:
(a) hour elements operable for display of current or next hour digits during the same hour;
(b) first minute elements operable for display of minute digits in a position to the right of a displayed current hour;
(c) second minute elements operable for display of minute digits in a position to the left of a displayed next hour;
(d) seconds elements operable to display either increasing or decreasing seconds;
(e) means for operating the first minute elements (b) to display increasing values of minutes from none to thirty while a current hour is on display and for operating the seconds elements (d) to display increasing values of seconds from zero to fifty nine during the period of each such minute except after thirty elapsed minutes;
(f) means for operating the second minute elements (c) to display decreasing values of minutes from twenty nine to none while a next hour is on display and for operating the seconds elements (d) to display decreasing values of seconds from fifty nine to zero during the period of each such minute except before twenty nine remaining minutes; and
(g) means for displaying zero to about thirty seconds while the first minute elements (b) are displaying thirty minutes, then switching the display at the next second by blanking the first minute elements (b) and advancing the hour digit (a) to the next hour, and displaying about twenty nine to zero seconds while the second minute elements (c) are displaying twenty nine minutes.

4,627,738

WATCHCASE AND WATCHFRAME ASSEMBLY

Chung-fu Kao, 2440 S. Hacienda Blvd., No. 112, Hacienda Heights, Calif. 91745

Filed Jan. 28, 1985, Ser. No. 695,279
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—281 **3 Claims**



1. A watchcase and a watchframe suitable for mating and unmating one with the other comprising:
(a) A watchcase having a mating surface which surface has a recessed groove therein, a shoulder, a top surface and a back surface;
(b) A watchframe having a mating surface, an interior rim, a normal exterior surface, an exterior rim, a top opening, and a bottom opening;
(c) A mating means substantially fixed within said recessed groove of the mating surface of the watchcase which means is suitable for mating the watchcase with the watchframe by slidably translating the mating surface of the watchcase within the mating surface of the watchframe to provide a substantially contiguous fit between the mating surfaces of said watchcase and watchframe;
(d) Said watchcase and watchframe mating by maintaining the watchframe stationary relative to the watchcase, placing the top surface of the watchcase into the bottom opening of the watchframe, applying sufficient pressure to the back surface of the watchframe, slidably translating the watchcase into the watchframe, substantially abutting said watchcase shoulder with said interior rim of the watchframe, said mating means substantially abutting both the mating surface of the watchframe forming a substantially contiguous fit between both mating surfaces; AND
(e) Said watchcase and watchframe unmating by maintaining the watchframe stationary, applying sufficient pressure to the top surface of the watchcase, slidably translating the watchcase out of the watchframe.

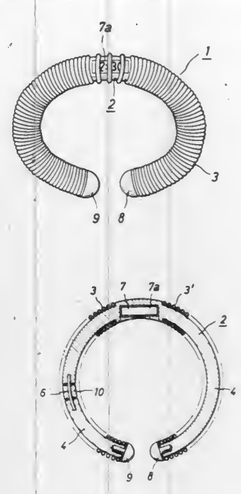
4,627,739

BRACELET TYPE WRIST WATCH

Ichikawa Shingo; Hisahide Nakagawa; Hayao Kano, and Koji Kudo, all of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 697,077
Claims priority, application Japan, Feb. 3, 1984, 59-13987[U]; Feb. 3, 1984, 59-13988[U]; Feb. 3, 1984, 59-13989[U]
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—282 **9 Claims**

1. A bracelet type wrist watch comprising:
a curved body having a watch module embedded therein; and
a coil spring having an outer dimension which is greater than the outer dimension of said curved body enclosing at least part of said curved body including said watch module, the portion of said coil spring enclosing said watch module being movable to at least a first position wherein said portion of the coil spring is compressed to cover said watch module and a second position wherein said portion



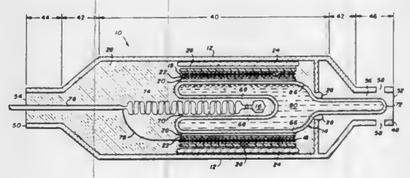
of the coil spring is expanded to permit viewing of said watch module.

4,627,740

SELF-CALIBRATING TEMPERATURE PROBE APPARATUS AND METHOD FOR USE THEREOF

James B. Jerde, Scotts Valley, and James E. Vasbinder, San Jose, both of Calif., assignors to Digital Dynamics, Inc., Scotts Valley, Calif.

Filed Apr. 6, 1984, Ser. No. 597,511
Int. Cl.[4] G01K *15/00*
U.S. Cl. 374—1 **20 Claims**



1. A self-calibrating thermostat apparatus comprising:
a housing;
a substance within the housing, the substance having a solid phase, a liquid phase and a melting point which melting point is at a temperature in excess of the ambient temperature surrounding the housing;
container means disposed within the housing the containing the substance in a leak proof manner;
the housing has two end portions joined by a central section, said central section being greater in area than said end portions, and at least one end portion has portions defining circulation apertures through which air from the envionment surrounding the housing may pass into said end portion having said circulation apertures, the container means is a vial having a neck section and a base section, said base section being of a greater area than said neck section, and a predetermined portion of said neck section is within said end portion of the housing having said circulation apertures so that said portion of said neck section is exposed to the ambient termperature;
a temperature sensor adjacent the container means and capa-

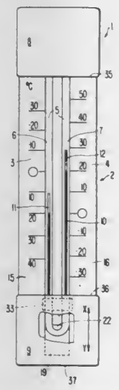
ble of generating electrical signal responsive to temperature variations;
temperature control means positioned about the container means for heating the substance;
a layer of encapsulating material about the heating means;
a layer of insulation means positioned intermediated the encapsulating material and the housing for isothermally insulating the container means from the environment outside of the housing; and
a sealant means positioned about the inside of the housing for sealing the container within the housing in a leak proof manner.

4,627,741

MAXIMUM-MINIMUM-THERMOMETER

Dagmar Faller, Otto-Schott-Strasse 19, D-6980 Wertheim, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,511
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332644
Int. Cl.[4] G01K *5/20*
U.S. Cl. 374—104 **11 Claims**



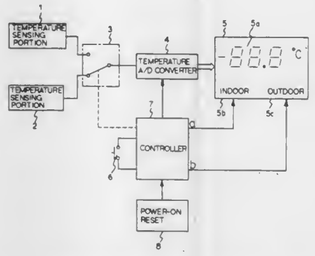
1. Maximum-minimum thermometer with a base plate having a top end and a lower end, temperature scales arranged on said base plate, with a U-shaped capillary tube having a top end and a lower end and having two legs connected at their lower ends by a bent section containing an extension medium, a mercury filament as well as magnetically attractable display pins and having on both legs of the capillary tube parallel permanent magnetic adhesive strips for the temporary fixing of the display pins showing the maximal-minimal temperatures which can be returned to their initial position by magnets moved on the outside of said capillary tube, wherein the adhesive strips (**13, 14**) are arranged and secured on the front or the back of said base plate (**2**) behind the two legs (**6, 7**) of the capillary tube (**5**) or laterally therefrom, and in that on said base plate (**2**) a slide element (**9**) is provided which is movable along the two legs (**6, 7**) of the capillary tube (**5**) and along the temperature scale (**3, 4**) and overlaps them, on which at least one permanent magnet (**33**) is arranged with a fource which exceeds the magnetic force of the adhesive strips (**13, 14**) by which magnetic force the two display pins (**11, 12**) can be simultaneously returned by a corresponding movement of said slide element (**9**) from their extreme positions to their initial positions at the ends of the mercury filament (**10**), and wherein said slide element forms a lower end cap for covering said bent section of said U-shaped capillary tube and is movable from the bottom of the lower end of the base plate to the extreme positions of the display pins for returning said display pins to their initial positions when the lower end cap is returned to the bottom of the lower end of the base plate.

4,627,742

COMPUTER CONTROLLED ELECTRONIC THERMOMETER

Tamaki Sakamoto, Kyoto, and Sakamoto Yoshihisa, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 8, 1985, Ser. No. 709,750
Claims priority, application Japan, Mar. 8, 1984, 59-33888
Int. Cl.[4] G01K *1/02, 3/00*
U.S. Cl. 374—109 **3 Claims**



1. An electronic thermometer, comprising:
a first and a second temperature sensing means for detecting temperature at two different locations, each of which temperature sensing means produces an output corresponding to the respective detected temperature;
a display means for displaying a temperature or temperatures in a display mode selected from a first mode in which the temperature detected by said first temperature means is continuously displayed, a second mode in which the temperature detected by said second temperature sensing means is continuously displayed, and a third mode in which the temperatures detected by said first and second temperature sensing means are alternately displayed;
a computer-controlled control means for selectively setting the display mode of said display means, said computer-controlled control means including a command means for manually entering a command for selecting one of said display modes and a control unit responsive to the entered command for controlling the selective setting of the display mode;
a first selection means connected to said computer-controlled control means for selecting the desired display mode to be set by said computer-controlled control means; and
a second selection means connected to said computer-controlled control means and directly responsive thereto for selectively connected the respective desired outputs of said first and second temperature sensing means to said display means,
said second selection means inclusing a change-over means for selecting one of the respective outputs of said first and second temperature sensing means and including output signalling means for producing an output signal to which said display means is directly responsive to display the desired display mode.

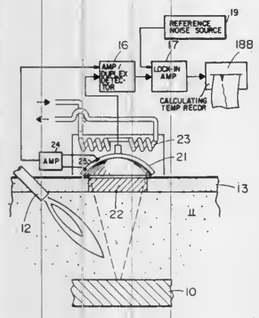
4,627,743

MEASURING TEMPERATURE OF A HEATED METAL

Takahiro Okabe, Nagoya, and Masashi Mizuno, Chita, both of Japan, assignors to Educational Foundation Daido Gakuen and Daido Tokushuko Kabushiki Kaisha, both of Nagoya, Japan

Filed Jul. 19, 1984, Ser. No. 632,360
Claims priority, application Japan, Jul. 19, 1983, 58-131631
Int. Cl.[4] G01J *5/06, 5/10*
U.S. Cl. 374—122 **2 Claims**

1. A method for measuring the temperature of steel pieces in a heating furnace having an atmosphere containing a flame and suspended particles, comprising:
positioning a parabolic antenna facing a specific area of a surface of at least one of the steel pieces in the furnace,
providing said parabolic antenna with a heat insulating material on its front surface;
with said parabolic antenna receiving microwaves of a wavelength in the range of 1 to 10 cm emitted from said specific area of the surface of said at least one steel piece;
measuring the intensity of the received microwaves as the flame is selectively turned on and off;



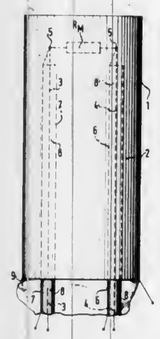
compensating the measuring for fluctuation in sensitivity of the received microwaves associated with changes in the temperature of said parabolic antenna itself;
comparing the intensity of the received, compensated microwaves with the intensity of microwaves of a reference noise source; and
determining the relative intensity of the received microwaves to obtain the surface temperature of the at least one steel piece corresponding thereto.

4,627,744

TEMPERATURE SENSOR UTILIZING THERMAL NOISE AND THERMAL COUPLE ELEMENTS, AND ASSOCIATED CONNECTING CABLE

Heinz Brixy, Niederzier, and Hubert Hoewener, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,596
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325381
Int. Cl.[4] G01K *7/06, 7/30*
U.S. Cl. 374—175 **15 Claims**



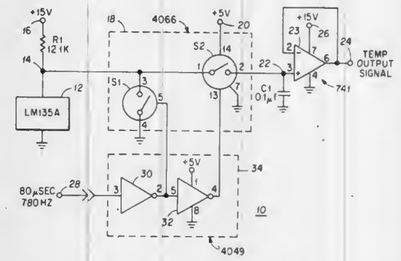
1. A temperature sensor comprising:
a metallic protective casing;
a resistive element generating a temperature-dependent noise voltage and disposed within said casing and having at least one conductor independent from said casing extending therethrough in insulated relationship from said casing; and
a thermoelectric element in said casing having first and second leads forming a junction generating a temperature-dependent electromotive force, said conductor being tubular, composed of a nonmagnetic material, and surrounding only one of said leads while being electrically insulated therefrom, said noise voltage being measured across said tubular conductor and a further conductor independent from said one of said leads, said electromotive force being measured across said leads.

4,627,745

FAST RESPONDING TEMPERATURE TRANSDUCER CIRCUIT

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 21, 1983, Ser. No. 553,739
Int. Cl.[4] G01K *7/00, 7/16*
U.S. Cl. 374—183 **15 Claims**



1. A method of sensing temperature using a temperature sensor coupled to provide an output voltage related to the sensed temperature, the improvement in said method comprising:
sampling said output voltage during at least one first time period to provide a signal representing temperature;
shorting said output voltage across said sensor during at least one second time period so that there is substantially no voltage output from said sensor during said at least one second time period;
providing said sampled output voltage as a temperature signal; and
repeating said sampling and shorting steps to intermittently interrupt current flow through said sensor at a rate sufficient to reduce heat dissipation causing temperature increases in said sensor and in turn reduce transient error in said output voltage indicating temperature.

4,627,746

HYDRO-DYNAMIC FLUID BEARING COMPRISING BEARING MEMBERS SUBJECT TO PROGRESSIVE PRE-LOADING

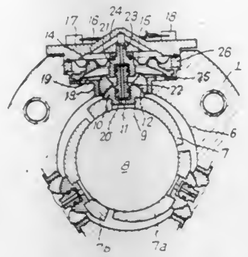
Charles H. Grisel, Bezons, and Henri Hus, Igny, both of France, assignors to Hispano-Suiza, Saint-Cloud, France

Filed Dec. 6, 1985, Ser. No. 805,747
Claims priority, application France, Dec. 6, 1984, 84 18592
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—99 **8 Claims**

1. In a hydro-dynamic fluid bearing assembly
a rotary shaft,
bearing members disposed around the rotary shaft with the interposition, in operation, of a pressure fluid film,
a bearing housing for said members,
a resilient member acting, when the shaft is stationary, on

one of the bearing members, so as to produce a limited pre-load on that member, and

means, operable during use of the assembly, to subject the said resilient means to the action of pressure fluid bled



from the film of pressure fluid lying beneath the bearing member so that the loading on the bearing member increases with the pressure of the fluid film as the rotational speed of the shaft increases.

4,627,747

DEVICE FOR BALANCING OF ROTORS WITHOUT JOURNALS

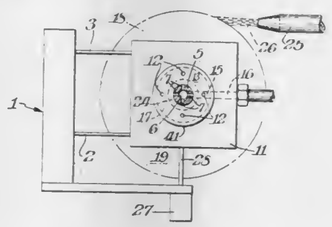
Harald Schönfeld, Darmstadt, and Angelo Bauer, Rossdorf, both of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Division of Ser. No. 530,419, Sep. 8, 1983, Pat. No. 4,543,825. This application May 2, 1985, Ser. No. 729,630

Claims priority, application European Pat. Off., Sep. 25, 1982, 82108883.8

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—113 **2 Claims**



1. A bearing arrangement for balancing rotating bodies (rotors without journals) by meansuring vibration resulting from unbalance of the rotating body comprising a main support with a non-rotating arbor extending therefrom, the arbor having passages therein for the passage and delivery of fluid to the space between the exterior surface of the arbor and the inside surface of the body to be balanced via a plurality of circumferentially distributed openings, fluid supply means connected to supply the passages with fluid under pressure, means to rotate the body to be balanced relative to the main support and the arbor extending therefrom, the means to rotate the body to be balanced comprising a nozzle constructed and arranged to tangentially direct a stream of fluid onto the outside surface of the body to be balanced, and means to supply the nozzle with fluid under pressure.

4,627,748

WRITING-PLOTTING APPARATUS WITH KEYBOARD

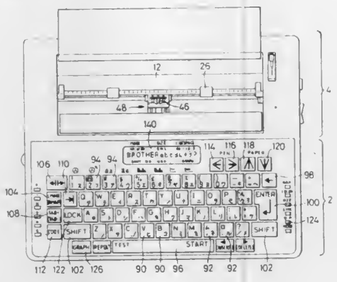
Kenji Mizuno, and Ryoichi Sasaki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1985, Ser. No. 714,478

Claims priority, application Japan, Mar. 27, 1984, 59-60261

Int. Cl.⁴ B41J *3/04*

U.S. Cl. 400—17 **9 Claims**



1. A recording apparatus capable of writing characters in a writing mode and plotting graphs in a plotting mode, comprising:

a keyboard having a multiplicity of keys including character keys corresponding to said characters, said keyboard being operable in a first mode in which at least numerals can be keyed in, and in a second mode in which letters and symbols can be keyed in;

a paper feeding device for supporting and feeding a sheet of paper in opposite directions;

a carriage supporting a writing instrument, and movable in a direction perpendicular to a line of feed of said sheet of paper;

control means for controlling the operations of said paper feeding device and said carriage, to write with said writing instrument in said writing mode the characters which are keyed in through said character keys with said keyboard placed selectively in said first or second mode, and to plot the graphs with said writing instrument in said plotting mode based on the operations of said multiplicity of keys with said keyboard placed in said first mode;

mode-memory means for storing, upon selection of said plotting mode, mode data indicative of one of said first and second modes which has been established in the writing mode before said selection of the plotting mode; and

automatic mode setting means for placing said keyboard into said first mode upon said selection of the plotting mode, and placing said keyboard, upon selection of said writing mode, into said one of the first and second modes which is represented by said mode data stored in said mode-memory means.

4,627,749

CHARACTER GENERATOR SYSTEM FOR DOT MATRIX PRINTERS

Joseph Meo, and Michael P. Taylor, both of Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 581,631

Int. Cl.⁴ B41J *3/02;* **G06F** *3/12*

U.S. Cl. 400—121 **8 Claims**

1. A character generator system for supplying text information to a dot matrix printer whereby text including characters may be printed on a record member, comprising:

a data input for receiving information in the form of an M bit code representative of the text to be printed;

a microprocessor connected to said input for receiving therefrom the information in the form of the M bit code and including means for expanding the M bit code to an N bit code where N is greater than M;

a text buffer connected to said microprocessor for receiving and storing the expanded text information and outputting character start addresses;

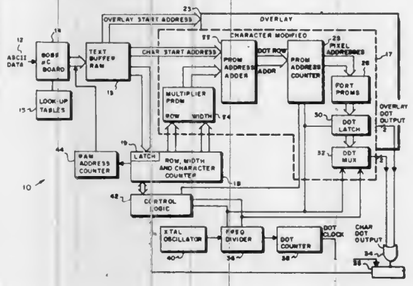
an address adder in connection with said text buffer for receiving character start addresses;

a first address counter connected to the said address adder;

a multiplier connected to said address adder;

a row, width and character counter connected to said multiplier and to said text buffer for receiving dot row addresses, character width and character height information;

a second address counter connected intermediate said microprocessor and said row, width and character counter for synchronizing the output of said text buffer with the output of said multiplier;



a plurality of font PROMs connected to said first address counter to receive pixel addresses and generate pixel information; and a control logic in connection with said row, width and character counter and said second address counter for synchronizing activities thereof

whereby;

said multiplier receives counts from said row, width and character counter and generates character address offsets, said address adder receives and adds the offsets from said multiplier and character start addresses from said text buffer to generate dot row addresses and said first address counter receives the dot row addresses from said address adder to generate pixel addresses that are received by said font proms in response to which said font proms generate pixel information.

4,627,750

RECEIVING ARRANGEMENT FOR A MULTIPLE TYPE CARRIER FOR AN IMPACT PRINTER

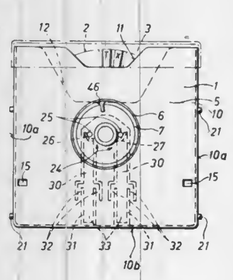
Arthur Kittel, Wilhelmshaven, and Heiner Gerken, Jever, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Continuation of Ser. No. 40,214, May 18, 1979. This application Mar. 23, 1981, Ser. No. 246,696

Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822313

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—144.2 **16 Claims**



1. In a combination including a print wheel provided with a plurality of elastic spokes carrying print type faces and a cassette carrying the print wheel for removably mounting the print wheel in an impact printer having a printing hammer mechanism arranged to act on the type faces, a rotatable setting shaft, connecting means for releasably fastening the print wheel to the setting shaft and holding members for holding the cassette in a mounted position in the printer, the improvement wherein: said print wheel comprises positioning means; said cassette comprises arresting means for normally engaging said positioning means in order to hold said print wheel in a predetermined angular position relative to said cassette when said cassette and print wheel are removed from the printer, said arresting means being disengageable from said positioning means when said cassette is in the mounted position in the printer and said printer wheel is fastened to the setting shaft; said positioning means comprise pin elements protruding axially from said print wheel; and said arresting means comprise two supporting tongues and support means supporting said tongues on said cassette for movement in the direction of the axis of said print wheel into a position where said tongues engage said pin elements, and further comprising control means mounted on the printer to act on said support means to disengage said tongues from said pin elements when said cassette is in said mounted position.

4,627,751

CONTROL APPARATUS FOR HAMMER TYPE IMPACT PRINTER

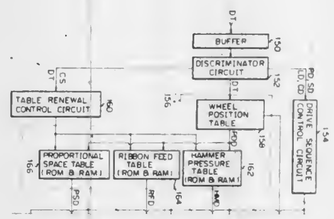
Yoshinori Nakajima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 404,799, Aug. 3, 1982, abandoned. This application Jun. 17, 1985, Ser. No. 745,750

Claims priority, application Japan, Aug. 7, 1981, 56-123059

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—144.2 **24 Claims**



1. A control apparatus for a hammer type impact printer comprising:

read-only storage means for storing a first code conversion table for a first rotary type element;

read-write storage means for storing a second code conversion table for a second rotary type element;

said read-only storage means further storing a third code conversion table for producing type position values for respective input character codes, the first and second code conversion tables producing hammer pressure values for the respective input character codes;

said first and second code conversion tables producing the hammer pressure values in response to the respective type position values from the third code conversion table; and

alteration means for altering a predetermined portion of the second code conversion table stored in the read-write storage means such that the data in the second code con-

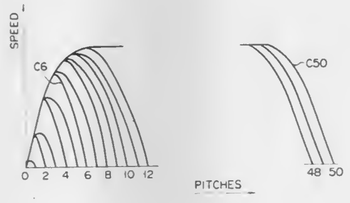
version table after alteration constitutes a fourth code conversion table for a third rotary type element and discriminating means for discriminating data for altering the second code conversion table in the read-write storage means from input data and feeding the data to the alteration means.

4,627,752

DAISY WHEEL PRINTING DEVICE WITH VARIABLE HAMMER DELAY

Norio Yagi, Shizuoka, and Akira Nuita, Mishima, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,456
Claims priority, application Japan, Oct. 7, 1983, 58-187935
Int. Cl.⁴ B41J *1/30*
U.S. Cl. 400—144.2 **6 Claims**



1. A daisy wheel type printing device comprising:
a daisy wheel having a plurality of type holding members including type at the respective ends thereof;
means for determining the amount of daisy wheel rotation required to set the type designated by input character data to a printing position;
wheel driving means coupled to the determining means for rotating the daisy wheel such that when the rotation is for a Preset amount or less the daisy wheel is accelerated and immediately decelerated, whereas when the rotation is for more than said preset amount the daisy wheel is accelerated, then rotated at a contant speed, and finally decelerated;
a printing hammer including means for hitting the type set to the printing position;
timer means coupled to said determining means, said timer means including means responsive to arrival of the type designated by the input character data at the printing position for establishing a delay period starting at the time of such arrival and having a first duration when the daisy wheel is rotated by said preset amount or less, and a second duration which is shorter than said first duration when the daisy wheel is rotated by more than said preset amount; and
control means for driving the printing hammer when said delay period elapsed.

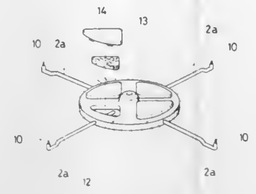
4,627,753

DAISY-WHEEL TYPE PRINTING SYSTEM WITH MULTIPLE FUNCTIONS

Hirotoshi Matsui, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1985, Ser. No. 694,676
Claims priority, application Japan, Jan. 27, 1984, 59-10447[U]; Jan. 27, 1984, 59-10448[U]
Int. Cl.⁴ B41J *1/46*
U.S. Cl. 400—174 **12 Claims**

1. A daisy print wheel for use in a rotary wheel impact printer comprising:
a hub;
a plurality of type elements for impressing desired type characters on a desired surface;
a plurality of spokes radially extending from said hub, each said type element being supported at a selected distance from said hub by an associated said spoke;
a pen including means for supplying ink therethrough;



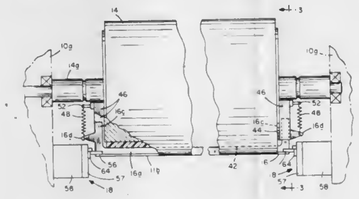
said plurality of spokes including a pen supporting spoke associated with and supporting said pen at said selected distance from said hub, said pen supporting spoke including an ink passage formed therethrough.

4,627,754

DRUM CLAMPING MECHANISM FOR A PRINTER

Albert A. Sholtis, Long Beach, and Jon S. Guy, Garden Grove, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 13, 1985, Ser. No. 765,078
Int. Cl.⁴ B41F *21/04;* **B41J** *11/04*
U.S. Cl. 400—649 **12 Claims**



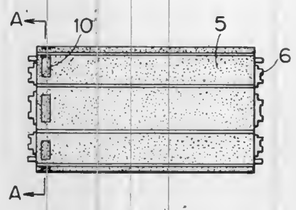
1. Drum clamping mechanism for a rotary printing drum having a surface for wrapping a sheet to be printed on, said drum having a first position which it assumes prior to printing on the sheet and a second position angularly displaced from the first position which it assumes after completion of printing on the sheet, said mechanism comprising
A. clip means extending along the length of the drum for clamping the leading edge of a sheet to the drum surface;
B. means for movably mounting said clip means to the drum so that the clip means are movable between
(1) an open position whereby a sheet-receiving gap is formed between said clip means and said drum surface, and
(2) a clamping position whereby the leading edge of a sheet positioned between the clip means and the drum surface is clamped to the drum so that, when the drum is rotated in one direction, the sheet is wrapped about the drum;
C. means for urging the lip means to said clamping position;
D. uni-directionaly deflectable cam means; and
E. means for mounting the cam means adjacent to the drum at a selected angular position about the rotary axis of the drum so that when the drum is rotated to said second position in said one direction, said cam means are deflected by the engaging clip means which thereupon remain in their closed position, but when said drum is rotated to said second position in the direction opposite said one direction, said clip means are unable to deflect said cam means but are cammed thereby to said open position.

4,627,755

PLATEN OF A PRINTER

Masaru Moriyama, and Yoshio Yamaguchi, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,075
Claims priority, application Japan, Nov. 10, 1983, 58-173148[U]
Int. Cl.⁴ B41J *11/02, 11/04, 11/057*
U.S. Cl. 400—662 **4 Claims**



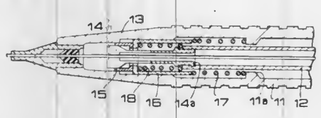
1. An ink impregnated platen of a printer having a printing head, comprising: a platen base arranged opposite to said printing head and rotatable with respect to said printing head; a plurality of porous bodies made of a sintered resin and having a first density for absorbing inks of different colors, each of said bodies having a non-printing portion; means for detachably attaching said porous bodies to said platen base; a plurality of porous ink color indicating members made of the same sintered resin as said porous bodies and having a second density for absorbing inks of different colors, the second density of said indicating members being higher than the first density of said porous bodies, one of said ink color indicating members being embedded in each of said porous bodies at said non-printing portion thereof.

4,627,756

LEAD PROPELLING MECHANISM FOR A MECHANICAL PENCIL

Hidehei Kageyama, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Aug. 13, 1985, Ser. No. 765,128
Claims priority, application Japan, Apr. 2, 1985, 60-48121[U]
Int. Cl.⁴ B43K *21/22, 21/04*
U.S. Cl. 401—94 **6 Claims**



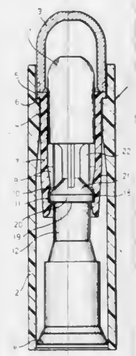
1. A lead propelling mechanism for a mechanical pencil comprising:
a lead chuck having a front end defining its head and a rear end, said chuck having on its outer peripheral surface a groove including a shoulder located adjacent to said rear end thereof;
a ring fitted loosely about said chuck for tightening said head thereof;
a sleeve having a front end contacting said ring; and
a coiled spring having a front end bearing on said front end of said sleeve and a rear end held by said shoulder, said rear end of said spring being adapted to bear against an adjacent end of a lead holding tube to urge said ring to tighten said head; and
said spring having a smaller diameter at its rear end portion defining said rear end, and a larger substantially uniform diameter in the remaining portion thereof, solely said smaller diameter rear end portion being contained within said groove.

4,627,757

WRITING INSTRUMENT WITH SIGNALING CAP

Christoph Manusch, Hanover, and Günter Scholz, Garbsen, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,456
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401739
Int. Cl.⁴ B43K *9/00*
U.S. Cl. 401—194 **13 Claims**



1. A writing instrument comprising:
an elongated writing implement having a writing tip; and
a cap removably mounted on said implement and including:
a sleeve adapted to be fitted over said tip,
an elongated insert movable in said sleeve and receiving at least a portion of said tip at one end of said insert in a blind passage of said insert to protect said tip against drying out, said insert engaging said tip with a friction force,
threshold latching means in said sleeve engageable in said insert for retaining it with a threshold force greater than the friction force of said insert against said tip in a first position with said sleeve until said insert is fully seated on said tip whereby said threshold force is then exceeded and said insert is shifted in said sleeve to a second position, and said friction is sufficient to return said insert to said first position upon withdrawal of said sleeve from said instrument, said latching means including a latching ring fixed in said sleeve and formed with a plurality of axially extending inwardly biased spring tongues surrounding said insert and having surfaces of different inclinations engaging a shoulder formed on said insert and spaced from said end with said threshold force to retain said insert in said first position until said threshold force is exceeded, and
a signal pin on said insert fully visible only in said second position of said insert at a free end of said sleeve remote from said end of said insert receiving said tip.

4,627,758

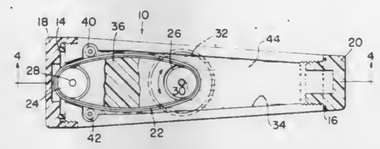
NAIL POLISH REMOVING APPARATUS

Marilyn P. Winthrop, 54 Magnolia Hill Rd., West Hartford, Conn. 06117

Filed Apr. 29, 1985, Ser. No. 728,688
Int. Cl.⁴ A45D *34/00, 34/04;* **B05C** *17/02*
U.S. Cl. 401—208 **2 Claims**

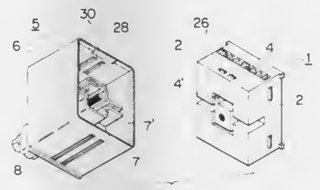
1. A nail polish removing apparatus, which comprises: an elongated hollow housing having a first opening at a first end thereof;

a reservoir for nail polish removing fluid disposed in said housing;
a continuous belt of absorbent material extending from said reservoir to said opening;
said apparatus further includes means for mounting said belt to permit axial portions of said belt to move from said reservoir to said first opening in said housing;
said means for mounting comprises first and second mounting rollers disposed at axially spaced points;
said means for mounting includes means extending out of



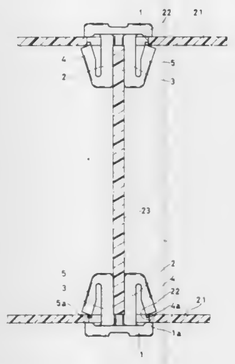
said elongated hollow housing for permitting manual rotation of one of said mounting rollers to cause axial portions of said belt to move from said reservoir to said first opening;
said apparatus further includes seal means extending across said housing and around said absorbent material to seal said reservoir at said first opening in said housing;
said seal means comprises elongated openings, said openings engaging discrete axial sections of said belt; and
said elongated openings are bounded by at least one rotatably mounted squeezing roller.

4,627,759
SCREW TYPE CONNECTOR SET
Shinichi Kato; Kiyoto Watanabe, both of Atsugi; Yoji Saito, and Akio Yamagata, both of Gotenba, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Yazaki Corporation, Tokyo, both of Japan
Filed Jun. 13, 1984, Ser. No. 620,302
Claims priority, application Japan, Jun. 17, 1983, 58-92025[U]
Int. Cl.[4] F16D *9/00;* **F16P** *5/00*
U.S. Cl. 403—2 **10 Claims**



1. A screw type connector set comprising:
a first connector member including a first housing, said first housing having an engaging portion in the form of a nut; and
a second connector member including a second housing, a support member fixed within said second housing and having a chamber to receive said engaging portion of the first housing therein, and a bolt rotatably extending within said chamber to be screwed into the nut, said bolt having a tapered stepped portion therein, and a stop member engaging said tapered stepped portion to prevent axial movement of said bolt relative to said second connector; and
said bolt having a constricted portion therein weaker than said connector members, whereby excessive torison applied to tightening said bolt will cause it to break at said restricted portion and permit disassembly of said first and second connectors.

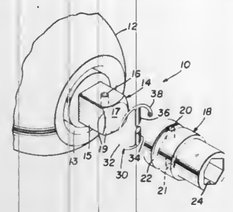
4,627,760
PLATE HOLDER
Masaru Yagi, Tsushima; Nobuaki Fujimoto, Okazaki, and Yoshitoki Hayashi, Aichi, all of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan and Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed Jul. 2, 1985, Ser. No. 751,212
Claims priority, application Japan, Jul. 24, 1984, 59-112236[U]
Int. Cl.[4] F16B *9/02*
U.S. Cl. 403—201 **4 Claims**



1. A plate holder for securing a first plate to a second plate, said plate holder comprising:
a plate like base having means for engaging one surface of said first plate;
first and second substantially parallel resilient holding plates fittable through an aperture in said first plate, each said holding plate having one end connected to one surface of said base and freely extending from said base without mutual contact to define a second plate holding space therebetween;
elastic non-return pieces each having a first end connected to a distal end of one said holding plate and extending toward said base to a second end adjacent said base; and
means on said second end of each said non-return piece for engaging an edge defined between another surface of said first plate and said aperture when said holding plates are fitted through said first plate;
whereby the engagement of said means for engagement with said first plate when said second plate is in plate holding space resiliently presses said holding plates together to hold said second plate in said second plate holding space.

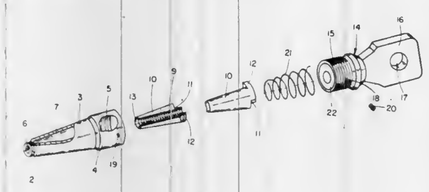
4,627,761
RETAINER
Gene E. Olson, Kenosha, and Norbert J. Kot, Milwaukee, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Sep. 28, 1984, Ser. No. 655,234
Int. Cl.[4] B25G *3/26;* **B25B** *23/16*
U.S. Cl. 403—324 **11 Claims**

1. A retainer for interconnecting a polygonal stud in the polygonal bore of an outer tubular member, the outer tubular member having diametrically opposed first and second apertures, the stud having a transverse hole therethrough, said retainer being of one-piece construction and comprising an elongated flexible arm having first and second ends and first and second fingers of substantially the same length formed integrally with said arm in spaced relation along said arm and extending laterally from said arm near opposite ends thereof, said first finger being positionable through the first aperture and into one end of said hole, said second finger being positionable through the second aperture and into the other end of said hole, with free ends of said first and second fingers being located adjacent to one another in said hole of said stud in substantially abutting relationship when so positioned, the length of said arm between said first and second fingers being



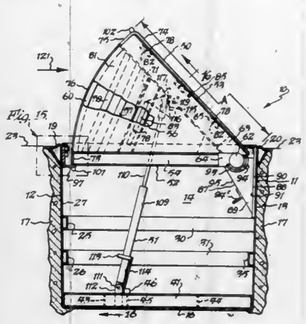
no more than half the circumference of the outer tubular member whereby said arm is positioned in tight fitting relation around the periphery of the outer tubular member when said fingers are located within respective apertures of the outer tubular member.

4,627,762
DEVICE FOR RAPIDLY FIXING THE ENDS OF CABLES AND THE LIKE
Marino D. Scotti, Milan, Italy, assignor to Douglas Marine s.r.l., Milan, Italy
Filed Jun. 28, 1985, Ser. No. 749,667
Claims priority, application Italy, Nov. 2, 1984, 23688/84[U]
Int. Cl.[4] B25G *3/20;* **F16B** *2/00*
U.S. Cl. 403—369 **9 Claims**



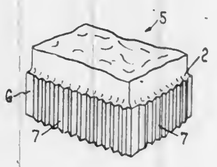
1. A device for rapidly fixing cables, ropes and the like to support, which comprises (1) a base (a) having an opening (**6**) and a tapered orifice (7) in the interior thereof; (2) a conical body (**8**) housed within the said tapered orifice, said conical body (**8**) consisting of two elements (**10**) which form a central threaded opening (**9**), said elements (**10**) being held among themselves to prevent relative longitudinal displacement but capable of radial displacement; (3) a spring (**21**) urging against said conical body (**8**), said elements (**10**) being so shaped whereby one is a male element and the other is a female element; said base (**1**) having an opening (**5**) at the distal end for the entry of said cable, (4) a head (**14**) closing the end (**4**) of said base (**1**) opposite to said distal end, said head (**14**) having a threaded portion (**15**), said end (**4**) being internally threaded (**5**), said threaded portion (**5**) engaging with said threaded portion (**15**), said head (**14**) being provided with means (**16–17**) for fixing to a support, wherein said two elements (**10**) which form said conical body (**8**) are identical and each one is provided with a recess (**11**) and a projection (**12**) the projection of each element engaging the recess of the other element.

4,627,763
VEHICLE BARRIER CONSTRUCTION
Mitchel B. Roemer, Amherst, and Nicholas B. Roemer, Elma, both of N.Y., assignors to Roemac Industrial Sales, Inc., North Tonawanda, N.Y.
Filed Jul. 3, 1984, Ser. No. 627,445
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **15 Claims**



14. A vehicle barrier comprising a housing, a barrier having a roadway surface and a barrier surface, means for mounting said barrier for movement between a retracted position where said roadway surface lies substantially flush with a roadway and an extended position where said barrier surface obstructs a vehicle on said roadway, motor means effectively located between said housing and said barrier for moving said barrier between said retracted position and said extended position, and cooperating means on said housing and on said barrier for effecting automatic alignment between said barrier and said motor means upon installation of said barrier means into said housing, said cooperating means comprising a support for orienting said motor means in a predetermined position, and guide means on said barrier for guiding motor means into engagement with said barrier means, said motor means comprising a piston and cylinder, and said support orienting said cylinder in a predetermined alignment, and said guide means comprising funnel-like means for guiding said piston into operative relationship with said barrier.

4,627,764
PAVING STONE, PROCESS FOR MANUFACTURING SAME AND DEVICE FOR CARRYING OUT THE MANUFACTURING PROCESS
Rolf Scheiwiller, Beichelacker, 3115 Gerzensee, Switzerland
Continuation of Ser. No. 358,036, Mar. 15, 1982, abandoned. This application Jan. 17, 1985, Ser. No. 692,329
Claims priority, application European Pat. Off., Mar. 25, 1981, 81810120
Int. Cl.[4] E01C *5/00*
U.S. Cl. 404—41 **11 Claims**



1. A paving stone comprising:
a lower portion having at least three vertical faces with each vertical face having a upper edge, and at least one of the

faces having a plurality of vertical, regularly-spaced ribs; and

an upper portion, integrally connected atop said lower portion; having a plurality of vertical sides equal in number to the vertical faces and respectively integral with and offset inward from the upper edge of a respective one of the vertical faces, the upper portion further having an upper surface, said upper portion having a horizontal cross section of different configuration than a horizontal cross section of said lower portion.

4,627,765

TUNNELING MACHINE

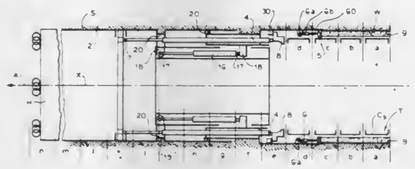
Volker Hentschel, Dorsten, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,895

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342903

Int. Cl.[4] E21D *9/08*

U.S. Cl. 405—146 **6 Claims**



1. A tunneling machine comprising:

a leading shield adapted to be advanced with an excavating head in a subterranean structure to form a tunnel having a tunnel wall along which said leading shield is advanced in a tunnel-advance direction;

a trailing shield disposed along said wall rearwardly of said leading shield with respect to said direction;

a telescoping shield assembly bridging said leading shield and said trailing shield and having an outer portion connected at a joint to a rear edge of said leading shield and receiving an inner portion connected to said trailing shield, said portions being telescopingly connected for contraction and extension of said shield assembly;

a plurality of angularly spaced first cylinder units pivotally connected to said leading shield and adapted to advance said leading shield relative to said trailing shield and along said tunnel, and to draw said trailing shield from said leading shield;

a plurality of second cylinder units interconnecting said portions of said assembly for contracting and extending said assembly independently of the advance of said leading shield; and

a form connected to said trailing shield by a plurality of third cylinder units for defining a concrete emplacement front within said trailing shield.

4,627,766

MULTI-PURPOSE MARINE BARRIER SYSTEM

Maurice C. Marquet, 2188 Oakridge Crescent, R.R. #5, Abbotsford, British Columbia, Canada V2S 4N5

Filed Mar. 13, 1986, Ser. No. 840,413

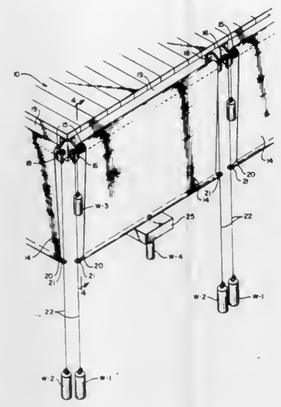
Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—195 **22 Claims**

1. A barrier system for use in concealing the above water exposed portions of piles used to support a waterfront structure and for converting the vertical plane outboard of the exposed portions of the piles between the waterline and the level of the waterfront structure supported on the piles to utilitarian space, said barrier system comprising, in combination:

(a) fine mesh screen having upper and lower vertically spaced apart parallel edges;

(b) means for suspending said screen along it's upper edge from the waterfront structure in the region of the upper ends of the piles and outboard thereof; and,



(c) means for maintaining said lower edge of said screen in the same vertical plane containing said upper edge of said screen with said lower edge of said screen adjacent to the waterline so that said screen effectively conceals the piles from visual observation while simultaneously presenting a surface for display of graphic media.

4,627,767

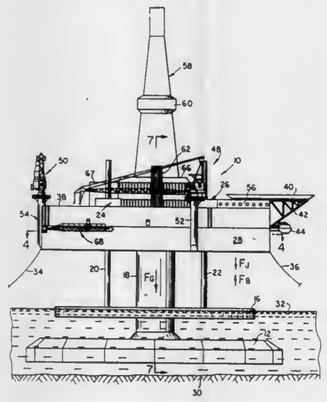
MOBILE SEA BARGE AND PLATFORM

Almeron J. Field, Los Angeles; Daniel G. Whyte, and Gerald L. Johnson, both of Orange, all of Calif., assignors to Santa Fe International Corporation, Alhambra, Calif.

Continuation of Ser. No. 516,371, Jul. 22, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 816,993

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—196 **43 Claims**



1. 1 A mobile barge having both surface-floating and bottom-resting modes of operation comprising:

a unitary lower hull having sufficient buoyancy to permit said barge to have a surface-floating operational mode and having a bottom surface adapted for providing gravity-forced contacting support from the sea floor when said barge is in the bottom-resting mode;

a vertically positioned support member centrally mounted in and extending above said lower hull;

an upper hull connected to the top end portion of said support member, said upper hull containing equipment for conducting barge operating functions;

a stabilizing hull arranged about said support member and adapted for controlled movement between a position adjacent to the top surface of said lower hull to a position adjacent to the bottom surface of said upper hull; and

a control means for providing motive force to enable movement of said stabilizing hull with respect to said upper hull and for transmitting buoyancy force from said stabilizing hull to the remainder of said barge, with said stabilizing hull continuously movable vertically between said upper and lower hulls to position and maintain said stabilizing hull at the water line for various depths of submergence of said lower hull and to position said stabilizing hull out of the water while said lower hull is in the bottom-resting mode;

with said stabilizing hull adapted to provide controlled bottom founding of said barge from a surface-floating mode to the bottom-resting operational mode.

4,627,768

LOCKING DEVICE FOR OIL PLATFORMS

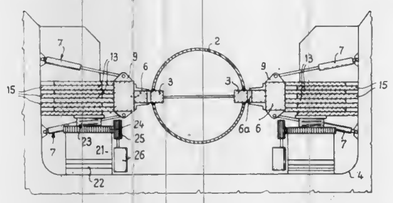
Pierre-Armand Thomas, Puteaux, and Jean-Claude Naudin, Paris, both of France, assignors to Technip Geoproduction, Paris la Defense, France

Filed Feb. 28, 1985, Ser. No. 706,749

Claims priority, application France, Feb. 28, 1984, 84 03066

Int. Cl.[4] E02B *17/08;* **B66F** *1/00*

U.S. Cl. 405—198 **10 Claims**



1. A locking device in combination with a self-raising oil platform which comprises legs, a shell mounted to be movable along the legs, raising mechanisms for moving the shell along the legs including racks mounted on at least a part of the length of the legs, said device being associated with each rack and comprising a toothed member having a part constituting a counter-rack mounted on the shell of the platform, means for displacing said toothed member transversely of the rack with which the device is associated for selectively engaging the teeth of said toothed member in the teeth of the rack and disengaging them from the teeth of the rack, clamping elements constituting plates connected to said toothed member, clamping elements constituting counter-plates connected to said platform, said plates and counter-plates having interengageable surfaces contained in parallel planes and being freely relatively movable in a given direction substantially perpendicular to said planes between a first position in which they are spaced apart and a second position in which said surfaces are interengaged, and means cooperative with the plates and counterplates for clamping substantially in said given direction said plates and counter-plates in said second position and ensuring the locking of said toothed member in position on said rack.

4,627,769

CONCRETE FOUNDATION PILE

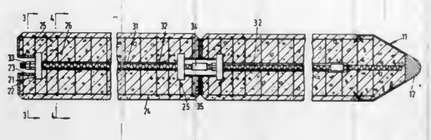
Paul Lee, 602-608 Nathan Rd., 19th Fl., Kowloon, Hong Kong

Filed Dec. 22, 1980, Ser. No. 218,711

Claims priority, application United Kingdom, Jan. 14, 1980, 8001147

Int. Cl.[4] E02D *5/30, 7/02*

U.S. Cl. 405—256 **7 Claims**



1. A concrete pile comprising a concrete body, an end wall of the concrete body having a recess therein, a steel anchorage plate set in the concrete body and having at least a portion of one face thereof exposed in said recess, a central reinforcement bar within the body releasably connected to the steel anchorage plate, a capping plate disposed over the end wall of the body, the capping plate being formed with an opening for access to the recess and the reinforcement bar and a steel tube lining the recess and extending from beneath the capping plate to the face of the anchorage plate so that the load of hammer blows on the capping plate are spread to the anchorage plate through the steel tube.

4,627,770

GEAR CUTTER

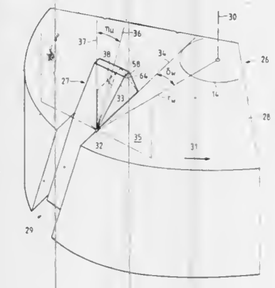
Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,485

Claims priority, application Switzerland, Mar. 16, 1982, 1626/82

Int. Cl.[4] B26D *1/12*

U.S. Cl. 407—21 **6 Claims**



1. A face cutter head for configuring the tooth bearing pattern of gears containing teeth having an arcuate cycloid shape and moving in a predetermined direction during a continuous gear teeth cutting operation, comprising:

a predetermined number of cutters arranged in said face cutter head;

each cutter of said predetermined number of cutters defining at least one predetermined cutting edge;

a cutter radius;

an orientation line;

said orientation line and said cutter radius defining a plane which is essentially parallel to an end face of said face cutter head;

a normal plane extending essentially perpendicular to said orientation line;

said orientation line intersecting said cutter radius in said normal plane and being inclined with respect to said cutter radius by a predetermined orientation angle;

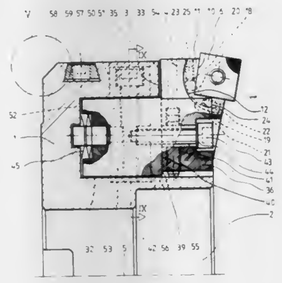
each of said cutters defining a rake surface thereof;
said orientation line lying within said rake surface irrespective of a possible rake angle defined between said rake surface and said normal plane; and
a projection of a selected one of an inner cutting edge and an outer cutting edge defined by said at least one predetermined cutting edge into said normal plane appearing inclined by an undercut angle with respect to a line extending normally with respect to said plane which is parallel to said end face of said face cutter head such that an end of said at least one predetermined cutting edge remote from said end face leads as viewed in the direction of movement of said face cutter head for configuring the tooth bearing pattern by an effective twisting of a longitudinal tooth flank line and an effective curvature of a tooth flank.

4,627,771

MILLING-CUTTER

Walter Kieninger, An den Stegmatten 7, D-7630 Lahr 17 (Mietersheim), Fed. Rep. of Germany

PCT No. PCT/EP84/00147, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04478, PCT Pub. Date Nov. 22, 1984
PCT Filed May 16, 1984, Ser. No. 694,520
Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317916
Int. Cl.⁴ B26D *1/00*
U.S. Cl. 407—39 **20 Claims**



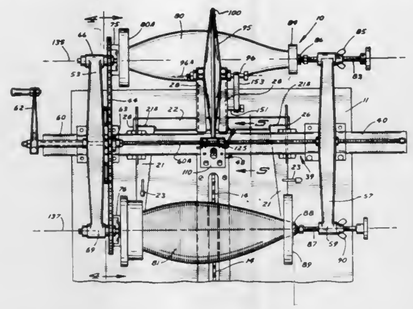
1. A milling tool, comprising:
a disc-shaped base member (**1**) having a central securement bore (**2**) and a plurality of substantially equidistantly spaced retainer cutouts (**3**) disposed about the perphery of said base member and open towards a front face of said base member (**1**);
a plurality of cutting plate supports (**4**), each said support (**4**) being disposed in and including means to adjustably secure said supports to one of said plural retainer cutouts (**3**) so that said support (**4**) is independently movable and fixable in an axial and in a radial direction with respect to said disc-shaped base member (**1**);
a plurality of cutting plates (**6**), each said cutting plate (**6**) being carried by one of said supports (**4**) so that its main plane is oriented in a generally radial direction;
a plurality of cutting plate spacers (**11**), each said spacer (**11**) having a cutout (**10**) and each said cutting plate (**6**) being located in one of said cutting plate spacer cutouts (**10**); each said cutting plate spacer cutout (**10**) substantially matching the shape of the cutting plate (**6**) located therein; and
a plurality of first adjustable securement means, each mounting one of said cutting plate spacers (**11**) to a respective one of said cutting plate supports (**4**) so that the cutting plate spacer (**11**) is independently rotatable about an axis defined substantially perpendicular to a radial plane containing a central axis (**5**) of said base member (**1**) and so that said cutting plate spacer (**10**) is independently positionally fixable relative to said respective cutting plate support (**4**) by said first adjustable securement means.

4,627,772

CARVING ATTACHMENT FOR TABLE SAWS

Paul S. Petersen, Minnetonka, Minn., assignor to Newmark, Inc., Minneapolis, Minn.

Filed Aug. 23, 1984, Ser. No. 643,658
Int. Cl.⁴ B23D *45/02*
U.S. Cl. 409—121 **16 Claims**



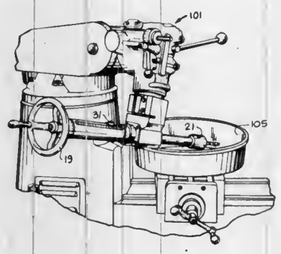
1. For use in combination with a circular saw assembly having a saw table with a table surface, and a saw blade rotatable about an axis generally parallel to the table surface protruding above the table surface, a carving attachment including:
a base mountable on a table surface of a saw table adjacent to said saw blade;
a carriage mounted on said base for rocking movement about a rocker axis generally transverse to the plane of the saw blade, said carriage including headstock means and tailstock means spaced apart along said carriage, said headstock means and tailstock means each comprising arms extending transversely to the rocker axis so that when mounted on a saw table first ends of each of the headstock and tailstock arms are on an opposite side of the rocker axis from the saw balde, and second ends of the headstock and tailstock arms are adjacent a saw blade of a circular saw assembly on which the carving attachment is mounted with a plane of such saw blade between the headstock and tailstock arms, respectively;
first means to support a pattern between the first ends of the headstock and tailstock arms;
second means to support a workpiece between second ends of said headstock and tailstock arms, with the workpiece generally above the cutting edge of the saw blade of a circular saw assembly on which the carving attachment is mounted;
a pair of upright arms mounted on the base between the headstock and tailstock arms;
a tracer wheel mounted on the upright arms in position to engage a pattern held between the first ends of the headstock and tailstock arms and rotatably mounted about an axis that is fixed relative to the base and above the table surface on which the base is mounted, said tracer wheel comprising a pair of dish-shaped plates spaced apart to have a maximum width dimension along the axis of rotation adjacent such axis of rotation, and said plates tapering in toward a bisecting plane at the outer rim of the plates, said plates being fixed together at the outer rim to form a narrow edge for engaging a pattern;
means for simultaneously rotating the first means and second means, and;
separate means driven with the means to rotate to move said carriage in direction generally along the rocker axis at the same time the means to rotate is operated, whereby as the tracer wheel follows a pattern held in the headstock and tailstock arms, the carriage will tilt about the rocker axis, and will be moved in direction along the rocker axis.

4,627,773

RIGHT ANGLE SPINDLE FOR MACHINE TOOLS

Richard E. Ehnert, 690 Persian Dr., #82, Sunnyvale, Calif. 94086

Filed Apr. 13, 1981, Ser. No. 253,898
Int. Cl.⁴ B23C *1/12*
U.S. Cl. 409—215 **8 Claims**



1. A system for advancing and retracting a rotating tool such as a drill bit, comprising,
a uniform diameter screw colinear with a lengthwise axis of a hollow headstock, the hollow headstock terminating at one end in an annular collar, the hollow headstock having a peripheral lengthwise keyway, and terminating at another end in a tool holding member,
a feed nut having a threaded section adapted to engage threads of the screw and an adjacent hollow section seating an annular thrust bearing, the screw passing through the thrust bearing, the hollow section terminating in a rim engaging said collar whereby the collar may rotate relative to the rim but may not move lengthwise with respect thereto,
a rotating quill, supported in a housing by opposed bearings, the quill disposed coaxial with the screw, but fixed relative to axial motion, said quill having a lengthwise keyway adapted to communicate rotational motion by slidably engaging the hollow headstock keyway and simultaneously permitting lengthwise bidirectional motion of the headstock along the keyway, whereby lengthwise motion may be transferred to the hollow headstock by the screw while simultaneously the headstock is rotating, said quill having a first gear connected coaxially thereto, and
power shaft means having a second gear extending at a right angle to the first gear of the quill and meshing therewith at all times for causing quill rotation, thereby rotating the headstock.

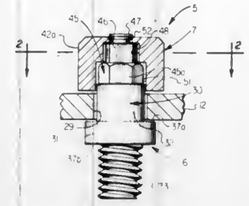
4,627,774

LIMITING TORQUE BOLT-NUT ASSEMBLY

Earl T. Bradley, Frisco, Tex., assignor to Ebaa Iron Inc., Eastland, Tex.

Filed May 23, 1985, Ser. No. 737,807
Int. Cl.⁴ F16B *23/00, 35/06*
U.S. Cl. 411—5 **12 Claims**

1. A torque limiting bolt-nut assembly comprising:
a bolt having a threaded shank;
a secondary drive head on said shank;
a shearable primary drive head on said secondary drive head; and
a hollow drive nut over said primary and secondary drive heads and a portion of said shank, said drive nut being adapted to turn said primary drive head and being rotatable relative to said secondary drive head and said shank.

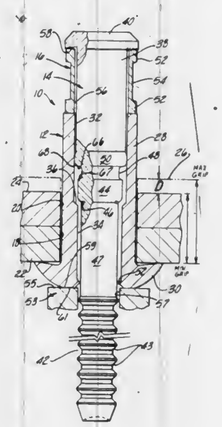


4,627,775

BLIND FASTENER WITH GRIP COMPENSATING MEANS

Richard D. Dixon, San Juan Capistrano, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Sep. 1, 1983, Ser. No. 528,449
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—34 **15 Claims**



1. A blind fastener for securing a plurality of workpieces having aligned openings and a combined total thickness varying from a preselected minimum thickness to a preselected maximum thickness with the difference therebetween being the grip range for the fastener and with the workpieces having a front surface and an opposite rear surface, said fastener comprising:
a hollow sleeve having a through bore,
said sleeve having a sleeve shank portion and an enlarged sleeve head at one end, said sleeve head adapted to engage the front surface of the workpieces and said sleeve shank portion adapted to be located within said aligned openings within a preselected minimum and maximum clearance,
a pin,
said pin having a shank portion and an enlarged pin head,
said pin shank portion adapted to be located within said bore of said sleeve with said pin head located at the end of said sleeve shank portion opposite said sleeve head,
said pin adapted to move relative to said sleeve shank portion and to cause deformation of the same to form a blind head opposite said sleeve head in response to a relative axial force applied between said pin and said sleeve, said pin shank portion having a breakneck groove and being adapted to locate said breakneck groove at a generally uniform preselected position relative to said sleeve head

when said fastener is applied to workpieces having a total thickness within the grip range between said preselected minimum and maximum thicknesses,

grip compensating means located between said pin head and said opposite end of said sleeve shank and actuable to form said blind head from said sleeve shank and locate said breakneck groove at said generally uniform preselected position with said blind head formed,

said grip compensating means moving within said bore of said sleeve to form said blind head and deforming radially to a greater extent from said minimum to said maximum thickness whereby the application of said fastener to workpieces varying in total thickness over said grip range is compensated by the magnitude of radial deformation of said compensating means,

said pin having an enlarged diameter, extruding land portion,

said through bore of said sleeve having a reduced diameter lock forming bore portion located substantially within said shank portion in radial alignment with said aligned openings over a substantial axial length and having a preselected interference with said extruding land portion whereby there will be excess material of said lock forming portion relative to said minimum and maximum clearance as said extruding land portion is moved therethrough, a lock groove located in said pin generally immediately adjacent said extruding land portion,

said extruding land portion being movable within said lock forming bore portion for radially expanding said sleeve shank to fill said clearance with said aligned openings and to move said excess material into said lock groove to form a lock between said pin and said sleeve, said extruding land portion having a leading surface extending generally transversely to the pin axis, said leading extruding land surface terminating in a radially outer surface for engaging said lock forming bore portion and being generally inclined in a direction towards said pin head whereby shearing of said lock forming bore portion is inhibited,

said lock groove being substantially wide and being contoured to have a relatively flat root with a preselected depth to define a desired volume such that at said maximum clearance said lock groove will be filled by said excess material across its axial width but not to its full depth and at said minimum clearance said excess material will generally not exceed said desired volume when said pin has moved to locate said breakneck groove at said preselected position,

said lock forming bore portion communicating with an enlarged bore portion and extending in said sleeve shank generally from said sleeve head to a position around the location of said opposite rear surface at said minimum thickness of workpieces, a sleeve lock shoulder defined by the juncture of said lock forming bore portion and said enlarged bore portion, said outer surface of said leading extruding land surface having a maximum diameter to be snugly received within said enlarged bore portion,

said lock groove having a width approximately one-third of the axial length of engagement of said lock forming bore portion by said extruding land portion.

4,627,776

FASTENER

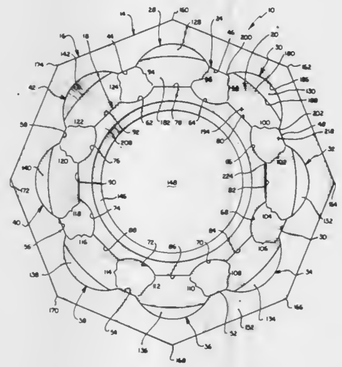
W. Richard Pamer, and James A. Zils, both of Parma, Ohio, assignors to Russell, Burdsall & Ward Corporation, Brooklyn Heights, Ohio

Continuation-in-part of Ser. No. 733,978, May 14, 1985. This application Dec. 2, 1985, Ser. No. 803,727

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—179 **9 Claims**

1. A fastener adapted to be received in a member and held against axial and rotational movement relative to the member by interaction between the member and said fastener, said fastener comprising a head section having a central axis, a shank section extending axially outwardly from said head section and having a central axis coincident with the central axis of said head section, said head and shank sections including surface means for defining an internal thread convolution extending axially through said head and shank sections, said head section including a rim which extends axially along said shank section, said rim of said head section and said shank section cooperating to at least partially define a generally annular groove which extends around said shank section and has a generally annular bottom surface which faces axially outwardly toward an outer end portion of said shank section, said groove being adapted to receive the material of the member upon mounting of the fastener on the member, said shank section including a plurality of axially extending indentations having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed in the outer end portion of said shank section, said shank section including a plurality of axially extending side surfaces disposed between the indentations in said shank section and having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed in the outer end portion of said shank section, said indentations and said side surfaces of said shank section cooperating to form a radially inner and axially extending side wall of the groove, said indentations in said shank section intersecting said side surfaces of said shank section to form axially extending corners which apply shear forces to the material of the member upon application of



torque loads to said fastener, said rim having a bearing surface which extends transverse to the central axis of said shank section and which faces axially outwardly toward the outer end portion of said shank section and which is engageable with the material of the member, said rim including a plurality of axially extending indentations having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions adjacent to said bearing surface, said rim including a plurality of axially extending side surfaces disposed between the indentations in said rim and having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed adjacent to said bearing surface, said indentations and said side surfaces of said rim cooperating to form a radially outer and axially extending side wall of the groove, said indentations in said rim intersecting said side surfaces of said rim to form axially extending corners which apply shear forces to the material of the member upon application of torque loads to said fastener, each of said side surfaces of said rim being disposed radially outwardly of at least a portion of one of said indentations in said shank section to form a plurality of first constriction means for applying deformation forces to the material of the member at a plurality of locations disposed between said indentations in said shank section and

said side surfaces of said rim upon application of torque loads to said fastener, each of said indentations in said rim being disposed radially outwardly of at least a portion of one of said side surfaces of said shank section to form a plurality of second constriction means for applying deformation forces to the material of the member at a plurality of locations disposed between said side surfaces of said shank section and said indentations in said rim upon application of torque loads to said fastener, said fastener and member cooperating to resist relative rotation under the combined influence of cold working forces applied to the material of the member by said first and second constriction means and of shear forces applied to the material of the member by the corners of said rim and shank section.

4,627,777

ATTACHMENT MEANS

Eskil T. Johansson, Sunnanvindsvägen 1, S-58272 Linköping, Sweden

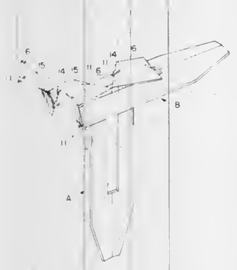
PCT No. PCT/SE83/00316, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00991, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 7, 1983, Ser. No. 609,076

Claims priority, application Sweden, Sep. 7, 1982, 8205064

Int. Cl.[4] F16B *15/00*

U.S. Cl. 411—439 **3 Claims**



1. Attachment means comprising at least two identical parts each part comprising:

an elongated section having a first portion with substantially parallel long sides and a second portion which tapers toward a first end, said elongated section comprising a longitudinal bend centered between said long sides so that said elongated section is V-shaped in cross-section;

a head member attached to said elongated section at its second end, said head member comprising two trapezoidal-shaped head parts, each trapezoidal-shaped head part having shorter and longer parallel sides, said head parts being attached to the edge of said elongated section at right angles thereto along said longer parallel sides, said sides being placed next to each other, the combined length of said long parallel sides being greater than the width of said elongated section, said head member extending outwardly from said elongated section in the direction opposite to said V-shaped bend, and

a slot in said elongated section having an unobstructed portion, said slot coinciding with said longitudinal bend, and the width of said unobstructed portion of said slot defined perpendicular to the longitudinal bend and the length of said unobstructed portion of said slot defined parallel to the longitudinal bend are selected to allow insertion of one said identical part into the slot of the other said identical part with a friction fit, whereby said long sides of said elongated section of one said identical part and its bend engage the opposite edges of the slot of said other identical part.

4,627,778

Patent Not Issued For This Number

4,627,779

DEVICE FOR WITHDRAWING AND UNLOADING CROP-ENDS OF METAL BARS FROM A BAR PUSHER

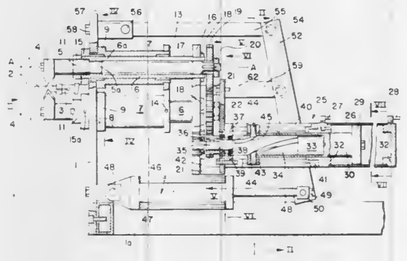
Giovanni Cucchi, and Pietro Cucchi, both of Bussero, Italy, assignors to F.LLI Cucchi S.r.l., Milan, Italy

Filed May 15, 1985, Ser. No. 734,071

Claims priority, application Italy, May 31, 1984, 21190 A/84

Int. Cl.[4] B23Q *5/22*

U.S. Cl. 414—17 **14 Claims**



1. A device for use with an equipment for feeding metal bars to a multi-spindle lathe, suitable for drawing the crop-end of said bars out a bar pusher and unloading said crop-end in a unloading area, and suitable also for introducing one end of said metal bars into said bar pusher, comprising a pair of jaws rotatable for clamping and unclamping said crop-end and sliding longitudinally along the feeding axis of said bars, each jaw being supported by an associated rotary shaft contained within a sleeve member, each sleeve member being slidably

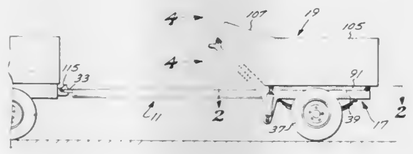
contained within an associated support member fixed to a stationary frame, said shafts being connected to means for causing the rotary movements of said shafts, and said sleeve members being connected to means for causing the sliding movements of said sleeve members, characterized in that said means causing the rotary movements of said shafts (5) include at least one operative piston (25) suitable for transforming the sliding movements of a member movable along an axis generally parallel to the axis along which said sleeve members (6) are moving into rotary movements of a further member kinematically connected to said shaft (5).

4,627,780

FORWARDLY DUMPABLE TRAILER

Ethiel L. Munz, P.O. Box 1383, Hawaiian Gardens, Calif. 90716

Filed Feb. 1, 1985, Ser. No. 697,456
Int. Cl.[4] B60P *1/16*
U.S. Cl. 414—346 **5 Claims**



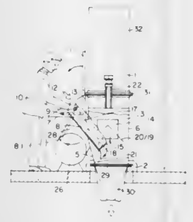
1. A forwardly dumpable trailer to be hauled behind a truck having a trailer hitch and an upwardly opening box, said trailer comprising:
a transverse support axle;
an intermediate frame carried on said axle, including longitudinally extending slides;
latch means mounted on said intermediate frame and including lock and unlock modes;
a trailer frame including at least one forwardly and rearwardly extending rail formed with tracks slidably receiving said slides for slidable travel longitudinally therealong, to shift said intermediate frame from a transport location at the rear of said trailer to a forward position adjacent said truck box;
hitch means at the forward end of said trailer frame for hitching to said trailer hitch;
a latch element on said trailer frame, engageable with said latch means when said intermediate frame is in said transport location to lock said trailer frame against shifting relative to said intermediate frame and releasable from said latch means when said latch means is in said unlock mode;
a trailer box mounted on said intermediate frame for receiving a load and pivotally connected thereto at its front extremity to accommodate tilting of the rear end of said trailer box upwardly to a forward dump position;
said trailer box being formed at its forward extremity with a forwardly opening dump chute arranged to, when said trailer box is in said forward position, and also in said forward dump position, dump said load in said truck box; and
lift means coupled between said intermediate frame of said trailer box for tilting selectively said box to said forward dump position whereby said intermediate dump frame, and support axle, may be selectively shifted to said rearward transport position on said rails and latched in position by said latch means, and may be subsequently shifted to said forward position and said lift means actuated to raise the rear end of said dump box to said forward dump position to thereby cause said load to be dumped out said chute into said truck box.

4,627,781

BAG CUTTING-AND EMPTYING-DEVICE WITH CONNECTED COLLECTIVE DUST-REMOVAL FILTER

Klaus Borgner, Hirzenhain, Fed. Rep. of Germany, assignor to Luco-Technic GmbH Verfahrenstechische Anlagen, Ortenberg, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,549
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340894
Int. Cl.[4] B65B *69/00*
U.S. Cl. 414—412 **10 Claims**



1. A bag cutting and emptying device, comprising:
a substantially closed housing, said housing including front, rear, and sidewalls, said housing having an opening therein for receiving a bag to be cut and emptied, said sidewalls being double-walled and having lateral projections,
a flexible apron substantially covering said opening,
dust removal means extending into said housing,
a horizontal support table adjoining said housing, said support table being located between said lateral projections,
a bag chute connected to said support table, said bag chute extending downwardly into said housing,
an actuable stop flap located adjacent the lowermost portion of said bag chute, said stop flap being pivotable between a support position and an emptying position,
first fluid pressure means associated with said stop flap for actuating said stop flap,
an actuable knife for opening said bag, said knife being located inside said housing, said knife being pivotable about an axis when actuated.
second fluid pressure means associated with said knife for actuating said knife, and
lever means connecting said knife to said second fluid pressure means, said lever means causing said knife to travel in an arc and to cut said bag in a curved manner in an area adjacent an edge of said bag supported by said stop flap upon actuation of said knife.

4,627,782

GRAIN STORAGE AND TRANSPORTATION CONTAINER

Gordon C. Larson, 511 4th Ave. Southeast, Minneapolis, Minn. 55414

Continuation of Ser. No. 444,372, Nov. 26, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,541
Int. Cl.[4] B60P *1/04*
U.S. Cl. 414—491 **4 Claims**

1. A storing and transporting container particularly adapted for use with grains and comprising,
a rigid container unit having a rigid wall portions defining a grain storage chamber therewithin and having a generally flat bottom portion with a discharge opening therethrough, said flat bottom providing a flat surface for supporting engagement with underlying supporting means,

openable flat hopper doors normally closing the discharge opening,
certain of said side wall portions sloping downwardly toward the bottom discharge opening to direct the grain to said opening during the discharging operation,
said container having a filler opening in the upper portion thereof with a removable cover normally closing said filler opening,



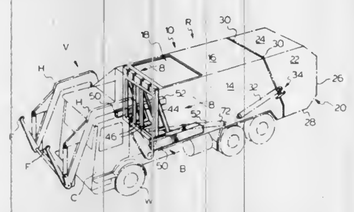
means for connecting the upper portions of the sloping side wall portions to a wheeled vehicle for transporting the same from one location to another, and
hollow perforated tube means extending across from one side wall to the other in fixed relation to both of said side walls and having sufficient strength to provide structural reinforcement to the container unit.

4,627,783

REFUSE DISPOSAL APPARATUS AND VEHICLE

Quinto De Filippi, 29 Edenvalley Drive, Islington, Ontario, Canada

Continuation-in-part of Ser. No. 440,719, Jan. 21, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 714,881
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—517 **9 Claims**



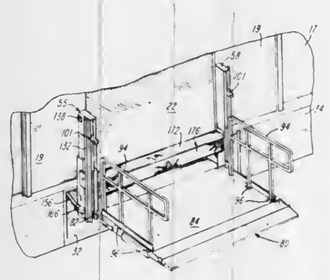
1. A refuse compacting system comprising:
an elongated refuse container having a generally rectangular shape in cross-section, and defining a bottom wall, side walls and a top wall, and having an ejection opening at an ejection end thereof;
a movable door member movable between opening and closing positions for said ejection opening said door member having a generally horizontally directed power means with a lost motion connection that simultaneously moves and locks/unlocks the door member;
a refuse entry opening in said top wall at an entry end of said container;
a compactor assembly within said container, and being normally located at said entry end thereof remote from said ejection end, and having a dimension sufficient to substantially fill said rectangular cross-section of said container, and said compactor assembly including a generally angled blade member defining width and height dimensions substantially equal to the width and height of the interior of said refuse container, said blade member having a lower portion closer to said ejection opening and an upper portion more remote therefrom, and load bearing supporting means located on one side of said blade member, supporting and bracing the same at such angle;
power operated means including two pairs of dual parallel connected power cylinders, mounted side-by-side on opposite sides of said compactor assembly;
connection means extending between each said cylinder in a said pair, securing same together in parallel side-by-side relation for movement in unison;
a cylinder rod extending from each said cylinder in a said pair, a first said cylinder rod extending towards said entry end, and being fixed, a second said cylinder rod extending towards said ejection end and attached to said compactor assembly, operation of said cylinders procuring movement of said compactor assembly and both said cylinders in both said pairs simultaneously, while said first cylinder rods in both said pairs remain stationary for moving said compactor assembly from said entry end towards said ejection end and back again for compacting refuse and for ejecting refuse;
power cylinder housing means of elongated hollow shape having upper walls and side walls, and being closed at their forward ends and open at their rearward ends, said housing means being attached to said compactor assembly on either side thereof adjacent said lower portion of said blade member, and said housing means extending from said blade member on the side thereof remote from said load bearing supporting means and towards said ejection opening along each side of said refuse container, and,
guide rail means fastened within said refuse container on either side thereof, and extending substantially uninterrupted from one end to the other of said container, and engaging said upper walls of respective said power cylinder housing means, whereby to restrain tilting movement of said compactor assembly, during operation of said cylinders whereby said power cylinder housing means may move along substantially the full length of said container from one end to the other, said movement being guided by said guide means throughout the full extent thereof.

4,627,784

LOADING AND UNLOADING APPARATUS FOR A VEHICLE

Larry R. Collins, Cincinnati, Ohio, assignor to Venco Manufacturing, Inc., Cincinnati, Ohio

Filed Jan. 21, 1986, Ser. No. 821,060
Int. Cl.[4] B60P *1/44*
U.S. Cl. 414—540 **22 Claims**



1. Apparatus for loading articles onto the floor of a wheel-supported vehicle, said apparatus comprising a set of rigidly connected and parallel spaced elongated posts, means supporting said posts for longitudinal and tilting movement as a unit between a generally horizontal storage position under the floor of the vehicle and a generally vertical operating position adjacent a wall of the vehicle, an article support platform, elevator means mounted on said posts for longitudinal movement, means mounted on said elevator means and supporting said platform for pivotal movement between a retracted position

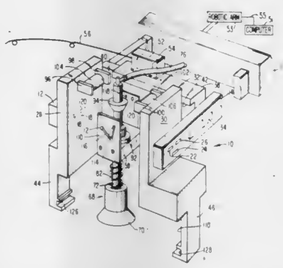
extending generally parallel to said posts and an extended position projecting outwardly generally perpendicular to said posts, power operated means for moving said elevator means and said platform longitudinally of said posts when said posts are in said vertical operating position and said platform is in said extended position to move said platform between a lower position and an elevated position, power operated means for moving said posts between said operating position and said storage position, and means for retaining said platform in said retracted position when said posts are in said storage position.

4,627,785

EXCHANGEABLE MULTI-FUNCTION END EFFECTOR TOOLS

Mathew L. Monforte, Hamilton, N.J., assignor to Monforte Robotics, Inc., Hamilton, N.J.

Filed May 14, 1984, Ser. No. 610,032
Int. Cl.[4] B25J *15/04*
U.S. Cl. 414—730 **3 Claims**



1. An exchangeable multiple function end effector tool suitable for use with a robotic end effector having a pair of extending fingers, including indexing means and locking means, disposed on the distal end of a robotic arm, comprising in combination:

(A) means for removably affixing said multiple function end effector tool to said pair of extending fingers;

(B) multiple function tool means having said tool affixing means disposed thereon, said multiple function tool means including;

(a) first gripping means for acquiring a first element and releasably retaining said first element in said multiple function tool, said first gripping means including,

(i) spring means for urging said first gripping means to its lowermost position,

(ii) collar means disposed on said first gripping means for limiting the travel of said first gripping means between its lowermost and uppermost positions, and

(iii) sensing means disposed proximate said first gripping means for providing an electrical signal when said first gripping means is in its uppermost and lowermost position; and

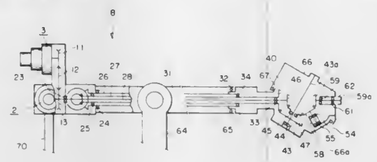
(b) second gripping means for acquiring a second element and releasably retaining said second element in said multiple function tool.

4,627,786

INDUSTRIAL ROBOT

Yoshihiko Minematsu; Minoru Tanaka; Kenichiro Sakamoto, and Masayuki Yamamoto, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,785
Claims priority, application Japan, Mar. 10, 1983, 58-41068; Mar. 10, 1983, 58-41069; Mar. 10, 1983, 58-41070; Mar. 10, 1983, 58-41072; Mar. 10, 1983, 58-41073; Nov. 18, 1983, 58-218218; Nov. 18, 1983, 58-218219
Int. Cl.[4] B25J *17/02*
U.S. Cl. 414—735 **10 Claims**



1. An industrial robot including a plurality of motors provided at an end of a hollow link, torque transmission means provided within said link for transmitting rotational torques of said plurality of motors, and rotary means for effecting a plurality of independent rotational motions in response to each of said motors, said rotary means being provided at the other end of said link and being drivingly connected to said torque transmission means, said rotary means comprising a first torque transmission means, said rotary means comprising a first rotary device having a first box (**65**) and rotating about an axis of said link, a second rotary device having a second box (**66**) and rotating about a rotary axis which obliquely intersects with a rotary axis of said first device, and a third rotary device having an output shaft and rotating about a rotary axis which intersects obliquely with the rotary axis of said second rotary device, said second rotary device including a first transmission shaft (**43***a*) one end portion of which is directly connected to said second box (**66**) and the other end portion of which is drivingly connected to said torque transmission means, said second rotary device substantially surrounding said third rotary device, said first box (**65**) being drivingly connected to a first drive shaft (**26**), said second rotary device further including a first bevel gear (**40**) coupled to a second drive shaft (**27**), and a second bevel gear (**43**) engaging said first bevel gear (**46**), said first transmission shaft (**43***a*) having at one end said second bevel gear (**43**) and obliquely intersecting with said rotary axis of said first device, and said third rotary device including a third bevel gear (**46**) coupled to a third rotary drive shaft (**28**), a fourth bevel gear (**47**) rotatable in coaxial relation with said first transmission shaft (**43***a*), a fifth bevel gear (**58**) engaging with said fourth bevel gear (**47**) and having a rotary axis of said second rotary device, and a sixth bevel gear (**59**) engaging with said fifth bevel gear (**58**), said output shaft (**59***a*) being coupled to said sixth bevel gear.

4,627,787

CHIP SELECTION IN AUTOMATIC ASSEMBLY OF INTEGRATED CIRCUIT

Robert H. Bond, Carrollton; Steven Swendrowski, The Colony; Michael A. Olla, Flower Mound; Barry L. Morrison, Bedford; Ricky Parkinson, Lewisville; Linn Garrison, Garland, and John D. Pace, Irving, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

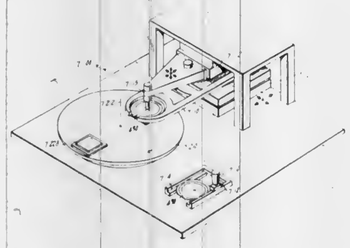
Filed Mar. 22, 1984, Ser. No. 592,156
Int. Cl.[4] B25J *9/00*
U.S. Cl. 414—786 **6 Claims**

1. A method of removing selected integrated-circuit dice from an array of non-contiguous dice adhesively attached to a support member having an upper striking side and a lower

adhesive side to which bottom sides of said dice are attached, said integrated circuit dice further having a contact side opposite said bottom side, said array of dice arranged so as to face down, comprising the steps of:

locating said support member at a predetermined location in space with said contact side of said array of dice facing in a predetermined direction;

striking said striking side of said support member at a contact point opposite a selected die of said array of dice with a predetermined impulse sufficient to dislodge said selected die from said support member, whereby said selected die is released from said adhesive attachment;



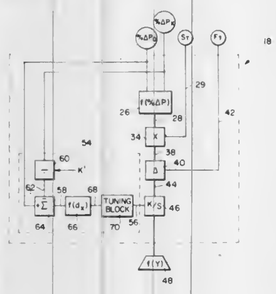
positioning a selected die receptacle at a predetermined distance below said selected die prior to striking, whereby said selected die falls away from said array into said receptacle, resting in said receptacle with said bottom side facing up; and repetitively executing said positioning and striking steps for a series of selected dice at a series of predetermined receptacle locations, said series of predetermined receptacle locations being and locations of a predetermined series of die receptacles positioned in space with a predetermined receptacle relationship, said support member being repetitively moved to locate a next selected die above a next receptacle so that a selected die is positioned at a striking location above a predetermined selected receptacle prior to striking.

4,627,788

ADAPTIVE GAIN COMPRESSOR SURGE CONTROL SYSTEM

Marion A. Keyes, IV, Chagrin Falls, and Jeremiah J. Shaffer, Euclid, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 20, 1984, Ser. No. 642,284
Int. Cl.[4] F04B *27/02*
U.S. Cl. 415—11 **3 Claims**



1. An adaptive gain surge control system for a centrifugal compressor having an associated surge line and a bypass line comprising:

a proportional and integral mode controller for controlling the bypass line of the compressor having a variable gain setting;

first means for determining the distance d between a surge control line and the compressor surge line;

second means for establishing a control signal in response to the distance d for changing the gain of said controller;

bypass valve control means connected to said controller for varying the amount of bypass across the compressor in response to the control signal therefrom; and

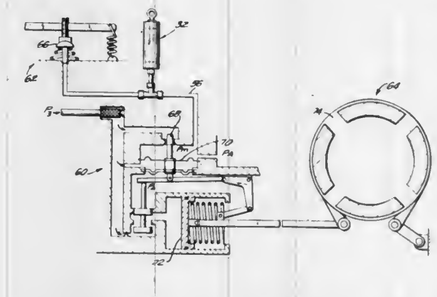
wherein said proportional and integral mode controller includes an antiwindup adjustment to adjust the integral mode of the controller to shift the proportional band of the proportional mode of the controller to the same side of the control line the measurement is on when the controller reaches it output limit to prevent overshoot thereby.

4,627,789

APPARATUS METHOD FOR CALIBRATING AND SETTING COMPRESSOR AIR BLEED VALVE SCHEDULES

David J. Petro, Milford, and Steven L. Battaini, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sep. 19, 1984, Ser. No. 651,886
Int. Cl.[4] F01B *25/00*
U.S. Cl. 415—28 **8 Claims**



1. A calibration and testing apparatus for use with a gas turbine engine, said engine including a compressor having at least one compressor bleed valve and an air bleed actuator which is operative to open or close the bleed valve on the compressor, said apparatus comprising:

a float tube having opposed first and second ends, said first end of said float tube being in communication with said air bleed actuator;

an accumulator having a single aperture therein, said second end of said float tube being in communication with the accumulator at said single aperture; and

a float slidably disposed in said float tube, said float being dimensioned to permit controlled fluid communication between said air bleed actuator and said accumulator, said float being urged toward the first end of the float tube by a decrease in pressure in said air bleed actuator and being urged toward the second end of said float tube by an increase in pressure in said air bleed actuator, whereby said float will move from the first end of the tube to the second end thereof in response to pressure changes indicative of the initial opening of the bleed valve.

4,627,790

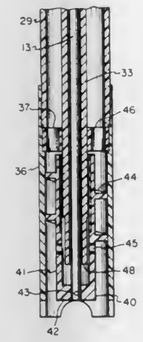
PORTABLE PUMP WITH AIR SEAL

H. David Bowes, and Edward S. Kuhn, both of Erie, Pa., assignors to Thompson-Chemtrex, Inc., Erie, Pa.

Filed Nov. 16, 1984, Ser. No. 672,371
Int. Cl.[4] F04D *29/10, 3/02*
U.S. Cl. 415—53 R **14 Claims**

1. An axial flow liquid pump comprising:

an outer tube having an intake opening at one end for liquid to be pumped and an outlet opening near the opposite end;
an inner tube within the outer tube and means placing the interior of the inner tube in continuous communication with a supply of gas;
a driven shaft with one end journaled near the outlet end of the inner tube and the other end free;
a rotor having a sidewall, said rotor being secured on the free end of the shaft such that its sidewall is at least partially spaced between the inner tube and the outer tube;



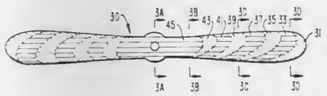
said rotor having means to cause a pressure differential along the interior of the outer tube;
said rotor having at least one radial impeller passage in the sidewall, there being a first clearance between the inner surface of the inner tube and the shaft to permit a continuous flow of gas, there being a second clearance between the outer surface of the inner tube and the inner surface of the sidewall of the rotor, said radial impeller passages positioned such that gas and liquid are continuously drawn through the first and second clearances respectively and expelled through the passage.

4,627,791

AEROELASTICALLY RESPONSIVE COMPOSITE PROPELLER

Andrew C. Marshall, 2147 Wilmington Dr., Walnut Creek, Calif. 94596

Filed Nov. 10, 1982, Ser. No. 440,761
Int. Cl.[4] B64C *11/26, 11/34*
U.S. Cl. 416—132 R **10 Claims**



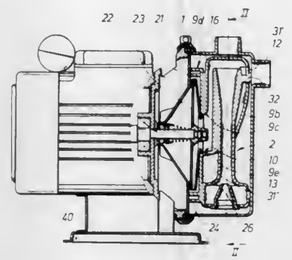
1. An improved propeller blade of the type having a leading edge, a trailing edge, a root, a tip and an axis extending from the root to the tip, the improvement comprising:
a laminate of a plurality plies of uniaxial fibers, said plies of uniaxial fibers oriented at varying angles to one another so the propeller blade pitch varies with the load on the propeller blade and with the axial position along the propeller blade, said plies of uniaxial fibers including a first set and a second set, said first set extending from said root to a position greater than about half way from said root to the tip, said second set extending from the root to the tip, the average axial orientation of said first set being radially outwardly and towards the leading edge of the propeller blade and the average axial orientation of said second set being radially outwardly and toward the trailing edge of the propeller blade so the blade exhibits increasing and then a decreasing pitch from the root to the tip.

4,627,792

ROTATING FLOW PUMP WITH A FEED PUMP UNIT FORMED AS AN EJECTOR

Niels D. Jensen, and Gunnar Langgaard, both of Bjerringbro, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Sep. 12, 1985, Ser. No. 775,160
Int. Cl.[4] F04B *23/14*
U.S. Cl. 417—83 **10 Claims**



1. In an arrangement of a centrifugal pump and a feed pump unit formed as an ejector, centrifugal pump conprising an impeller rotatably mounted on a substantially horizontal shaft in a chamber defined by a casing, said chamber communicating with an inlet, and said ejector comprising an inlet portion, a nozzle, and a diffuser arranged in series in the flow direction and in a plane substantially perpendicular to said shaft, said diffuser having a channel means defining an inner channel which gradually increases in cross-sectional area along at least a portion of its length and a jacket means defining an annular channel which surrounds and is substantially coaxial with said inner channel, said inner channel having an outlet which communicates with a reversal chamber defined by an end wall of said jacket means, said reversal chamber further communicating with said annular channel for producing a substantially 180° reversal of the flow exiting said inner channel, said annular channel having an outlet which communicates with said inlet of said centrifugal pump, the improvement wherein said annular channel has a gradually increasing cross-sectional area in-the flow direction, said inlet portion and said inner channel form a U shape, and said inlet portion communicates with a suction pipe arranged above said inlet to said centrifugal pump.

4,627,793

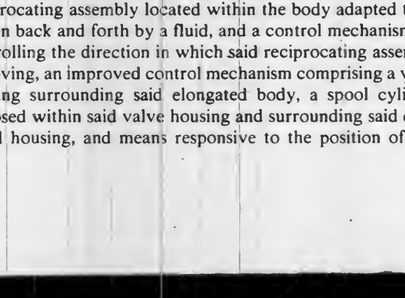
MOTOR-DRIVEN RADIAL PLUNGER PUMP

Masatoshi Kuroyanagi, Kariya; Masahiko Suzuki; Yasuhiro Horiuchi, both of Aichi; Kazuma Matsui, Toyohashi; Kouichi Moriguchi, Nagoya, and Yukio Hashimoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 28, 1985, Ser. No. 738,649
Claims priority, application Japan, Jun. 13, 1984, 59-122799; Jun. 25, 1984, 59-131430
Int. Cl.[4] E04B *23/14;* **F15B** *21/04*
U.S. Cl. 417—203 **9 Claims**

1. A motor-driven radial plunger pump including:
an outer housing provided with fluid inlet and outlet;
a motor section including a motor housing so disposed in said outer housing as to cooperate therewith to define a fluid passage therebetween and an electric motor disposed in said motor housing;
said fluid inlet being communicated with said fluid passage;
a pump section including a pump housing disposed in said outer housing, a rotor disposed in said pump housing, a coupling member drivingly coupling said motor to said rotor, a plurality of radial cylinder bores in said rotor, plungers disposed in said cylinder bores for sliding movement therein, respectively, so that the radially inner ends of said plungers cooperate with associated cylinder bores to define variable volume chambers, a suction passage means communicated with said fluid passage and adapted to be communicated with successive variable volume chambers when in suction strokes, and a discharge passage communicated with said fluid outlet in said outer housing and adapted to be communicated with successive variable volume chambers when in discharge strokes; and
a filter element disposed in said fluid passage upstream of said pump section.

2. A motor-driven radial plunger pump including:
an outer housing provided with fluid inlet and outlet;
a motor section including a motor housing so disposed in said outer housing as to cooperate therewith to define a fluid passage therebetween and an electric motor disposed in said motor housing;
said fluid inlet being communicated with said fluid passage; and
a pump section including a pump housing disposed in said outer housing, a rotor disposed in said pump housing, a



coupling member drivingly coupling said motor to said rotor, a plurality of radial cylinder bores in said rotor, plungers disposed in said cylinder bores for sliding movement therein, respectively, so that the radially inner ends of said plungers cooperate with associated cylinder bores to define variable volume chambers, a suction passage means communicated with said fluid passage and adapted to be communicated with successive variable volume chambers when in suction strokes, and a discharge passage communicated with said fluid outlet in said outer housing and adapted to be communicated with successive variable volume chambers when in discharge strokes, said coupling member being so shaped as to provide feed holes disposed between said fluid passage and said suction passage and being rotatable with said rotor and said feed holes each being provided with means for positively feeding the working fluid from said fluid passage into said suction passage.

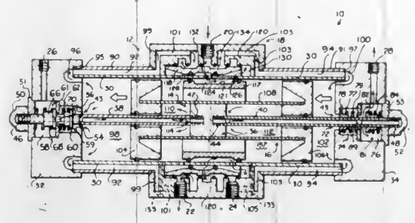
4,627,794

FLUID PRESSURE INTENSIFIER

Ethan A. Silva, 410 McAuley, Oakland, Calif. 94609

Continuation-in-part of Ser. No. 454,062, Dec. 28, 1982, Pat. No. 4,523,895. This application May 24, 1985, Ser. No. 738,061
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—225 **13 Claims**

1. In fluid pressure intensifier including an elongated body, a reciprocating assembly located within the body adapted to be driven back and forth by a fluid, and a control mechanism for controlling the direction in which said reciprocating assembly is moving, an improved control mechanism comprising a valve housing surrounding said elongated body, a spool cylinder disposed within said valve housing and surrounding said elongated housing, and means responsive to the position of said reciprocating assembly and operative to direct a pilot pressure to said spool cylinder, said spool cylinder directing the flow of



an input fluid through passages provided in said body to move said reciprocating assembly in a desired direction.

4,627,795

PISTON ASSEMBLY FOR A COMPRESSOR OR THE LIKE

Hans-Helmut Schmitz-Montz, Cologne, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany and Atlas Copco Aktiebolag of Nacka, Stockholm, Sweden

Filed Mar. 29, 1983, Ser. No. 480,114
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211763
Int. Cl.[4] F04B *3/00, 39/00*
U.S. Cl. 417—267 **5 Claims**

1. A piston compressor comprising housing means including a plurality of axially spaced cylinders having respective cylindrical walls, and a piston assembly reciprocatable in said cylinders, said assembly comprising a piston rod and respective pistons secured to said rod in axially spaced relationship and each received in a respective one of said cylinders for compressing gas therein, guide piston means formed by at least one of said pistons constituted as a guide piston and being provided with piston and guide rings slidably engaging a wall of the respective cylinder, at least one other of said pistons being provided as a contactless piston maintaining a clearance with the wall of the respective cylinder, said guide piston means constituting the sole guiding means reciprocation of said assembly in said housing means, said rod being received with clearance over its entire length within said housing whereby said assembly is unsupported except by said guide piston means.

4,627,796

AIR REMOVING APPARATUS

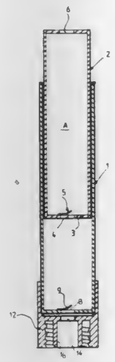
Gary R. Moore, 22 Magdalen Crescent, Napier, New Zealand

Filed Oct. 3, 1984, Ser. No. 657,263

Claims priority, application New Zealand, Nov. 16, 1983, 206298; Dec. 10, 1983, 205936

Int. Cl.[4] A47C *31/00;* **F04B** *39/12, 21/04*

U.S. Cl. 417—313 **2 Claims**



1. Apparatus for burping a waterbed having a filling and burping opening with a fitting therein for a removable cap for sealingly closing the opening, comprising:

an externally screw-threaded tubular shaped fitting connected with the opening;

a tubular hand operated vacuum pump having an inlet port at one end and an outlet at the other end for extracting air and/or liquid; and

a separate cap member attachable to said one end of said pump and sealingly engageable with said fitting comprising a base portion adjacent said one end of said pump,

a hole through said base portion aligned with said inlet port,

inner and outer substantially coaxial spaced sleeve elements to provide an annulus therebetween, and

an internal screw-thread on the inner surface of said outer sleeve element cooperatively and removably engageable with the external screw-thread on said fitting with the inner sleeve member inserted into said fitting,

so that the fitting is supported in said annulus and said inlet port communicates with said filling and burping opening when said vacuum pump is attached to the fitting and operation of said vacuum pump will extract air and/or liquid through the opening.

4,627,797

STANDBY AQUARIUM PUMP

Robert W. Rill, Jr., P.O. Box 20711, Sarasota, Fla. 33583-4711

Filed Oct. 15, 1985, Ser. No. 787,607

Int. Cl.[4] F04B *35/04, 17/00*

U.S. Cl. 417—411 **5 Claims**

1. A standby aquarium pump comprising:

housing means for containing the components of said aquarium pump;

an air pump;

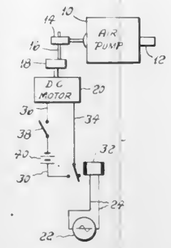
a direct current motor operatively connected to drive said air pump;

a direct current power supply;

a circuit between said direct current motor and said direct current power supply;

relay means having an alternating current input and being energized by alternating current; and

said relay means operatively connected in said circuit between said direct current motor and said direct current power supply for opening said circuit whenever alternating current power is available and for closing said circuit whenever said alternating current power is interrupted whereby said standby aquarium pump is operated when



alternating power is interrupted and will not operate when said alternating current is available;

4,627,798

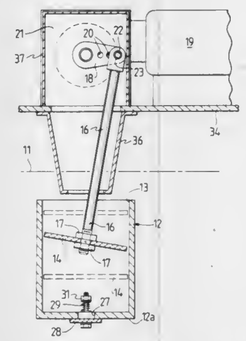
APPARATUS FOR CIRCULATING CLEANING FLUID THROUGH A COOLING SYSTEM

Dalton A. Thomas, Rte. 1, Box 97, Alpine, Ala. 35014

Continuation-in-part of Ser. No. 804,765, Dec. 5, 1985, abandoned. This application Apr. 24, 1986, Ser. No. 858,561

Int. Cl.[4] F04B *35/04, 21/00;* **B08B** *9/00*

U.S. Cl. 417—415 **13 Claims**



1. Apparatus for circulating cleaning fluids from a reservoir thereof through a cooling system submerged in said reservoir comprising:

(a) a cylinder having an open top and a closed bottom mounted within said reservoir with said open top submerged within said cleaning fluid, with said cylinder having an intake port operable connected to said cooling system, and a discharge port communicating with said reservoir;

(b) valve means for opening said discharge port responsive to an increase in pressure within said cylinder and closing said discharge port responsive to decrease in pressure within said cylinder;

(c) a thin washer-like member mounted within said cylinder for reciprocating motion therewithin, with said washer-like member having a predetermined annular clearance from the interior of said cylinder;

(d) drive means mounted externally of said reservoir for imparting reciprocatory motion to said washer-like member within said cylinder; and

(e) means for covering said reservoir including an elongated sleeve-like splash guard extending concentrically above said cylinder and adapted to retain heat and fluids within said reservoir.

4,627,799

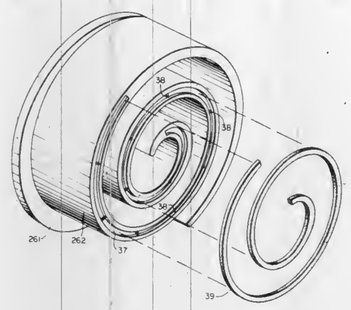
AXIAL SEALING MECHANISM FOR A SCROLL TYPE FLUID DISPLACEMENT APPARATUS

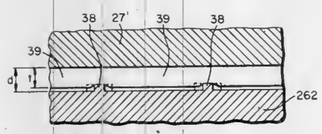
Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Japan

Continuation of Ser. No. 644,378, Aug. 27, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,929

Int. Cl.[4] F01C *1/04, 19/08*

U.S. Cl. 418—55 **1 Claim**





1. In a scroll type fluid displacement apparatus including a pair of scrolls each having an end plate and a spiral wrap extending from one side of said end plate, said spiral wrap having a groove formed in its axial end surface along the spiral curve, said spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts which define at least one pair of fluid pockets, a driving mechanism operatively connected to one of said scrolls to orbit said one scroll relative to the other scroll while preventing rotation of said one scroll to thereby change the volume of the fluid pockets, the improvement comprising a plurality of non-resilient projections integrally formed with and immovably fixed to the bottom surface of said groove at a predetermined spacing, said projections engaging and fixed to inner and outer circumferential walls of said groove so that said projections extend completely across said groove, a resilient seal element disposed on said projections along said groove, said seal element having a thickness greater than the depth of said groove minus the depth of said projections so that said seal element partly extends from said groove to contact and be compressed by the opposing circular end plate along its entire length to thereby axially seal the fluid pockets.

4,627,800

SCROLL TYPE FLUID DISPLACEMENT COMPRESSOR WITH SPIRAL WRAP ELEMENTS OF VARYING THICKNESS

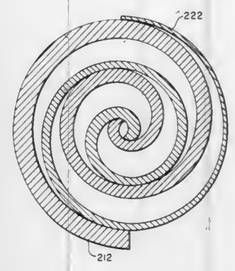
Yasuyuki Matsudaira, Isesaki, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 4, 1985, Ser. No. 697,747

Int. Cl.[4] F04C *18/04*

U.S. Cl. 418—55 **2 Claims**

1. In a scroll type fluid displacement compressor including a housing having a fluid inlet port and fluid outlet port, a fixed scroll fixedly disposed within said housing and having a circular end plate from which a first wrap extends, an orbiting scroll having a circular end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll and a rotation prevention device to prevent the rotation of said orbiting scroll during orbital motion so that the volume of the fluid pockets changes, the improvement comprising said second wrap of said orbiting scroll having a thickness which is gradually reduced along its entire length from the inner end portion to the outer end portion thereof to strengthen the inner portion of said second wrap without increasing the centrifugal force generated by said orbiting scroll during its orbital motion, an inner wall surface and outer wall surface of said second wrap being formed by involute curves generated from generating circles having different radii, and said first wrap of said fixed scroll having a thickness which is gradually increased along its entire length from the inner end portion of the outer end portion to compensate for the reduction in thickness of said second wrap to thereby achieve proper line contacts between said first and second wraps to improve radial sealing.



4,627,801

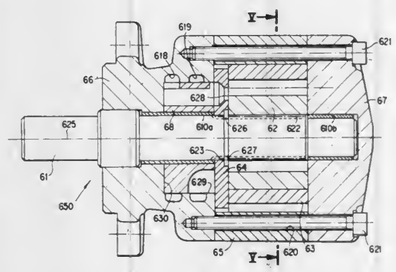
ROTARY GEAR MACHINE WITH COMMUTATOR AND SHAFT IN FLANGE HOUSING

Peter Wüsthof; Johann Schneider, both of Lohr, and Ewald Schulz, Neubuetten, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 562,745, Dec. 19, 1983. This application Dec. 24, 1984, Ser. No. 686,309

Int. Cl.[4] F01C *1/113;* **F03C** *2/08*

U.S. Cl. 418—61 B **6 Claims**



1. A rotary piston machine comprising:

a housing;

flange housing means on said housing for mounting the machine on suitable support means;

a shaft rotatably supported within said housing;

a rotor fixedly mounted on said shaft and adapted to rotate together with said shaft;

a hollow gear for forming compressing chambers in cooperation with said rotor;

a commutator fixedly mounted within said housing and adapted to supply pressure medium to, and to remove pressure medium from, said compressing chambers;

wherein said shaft extends out of said flange housing means and said commutator is located in said flange housing means and is fixedly mounted therein against rotation, wherein the commutator has a flat side and is press-fit into an axial bore of said flange housing means and sealingly abuts with the flat side against the bottom of the bore; a control disc arranged between the commutator and the rotor, and a safety element provided between the control disc and the rotor, said safety element being fixedly secured with respect to displacement in the axial direction of said shaft, said safety element being located in relief means of said control disc, and wherein said safety element further abuts at a face of the rotor which faces towards said flange housing means.

4,627,802

ROTARY VANE COMPRESSOR WITH INLET AND OUTLET VALVES IN THE ROTOR

Rudolph Draaisma, and Werner Reichmann, both of Öresundsgatan 30, S-252 28 Helsingborg, Sweden

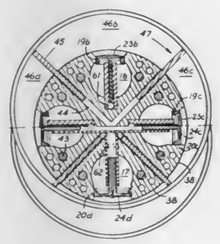
PCT No. PCT/SE84/00133, § 371 Date Dec. 11, 1984, § 102(e) Date Dec. 11, 1984, PCT Pub. No. WO84/04137, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 12, 1984, Ser. No. 681,850

Claims priority, application Sweden, Apr. 12, 1983, 8302006

Int. Cl.⁴ F04C *18/00, 23/00, 29/08;* **F16K** *31/12*

U.S. Cl. 418—185 **5 Claims**



1. A vane compressor comprising a rotor eccentrically arranged in a cylindric housing and vanes located in the rotor and defining spaces between the periphery of the rotor and the inner surface of the housing, the volume of each of said space varyng during the rotation of the rotor,

said rotor comprising at least two inlet valves, each located in the rotor between an inlet of the compressor and one of said spaces, and at least two outlet valves each located in the rotor between one of said spaces and an outlet of the compressor and adapted to open when the pressure in said space exceeds the counterpressure at the outlet during the compression stroke,

said inlet valves being adapted to open when the pressure in said space is below the pressure of the inlet in order to suck in air inside said space during the intake stroke of the rotor; and

said inlet valves and outlet valves being physically interconnected in such a way that the inlet valve at one side of the rotor is opened substantially at the same time as the outlet valve at the diametrically opposite side of the rotor.

4,627,803

APPARATUS FOR PRODUCING POLYACETYLENE FILM

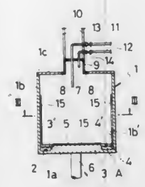
Junichi Umetsu, No. 3-17, Kikusui 5-jo 2-chome, Shiroishi-ku, Sapporo, Japan

Filed Aug. 31, 1984, Ser. No. 646,228

Claims priority, application Japan, Aug. 31, 1983, 58-134886[U]; Sep. 12, 1983, 58-141186[U]

Int. Cl.⁴ C08F *4/00*

U.S. Cl. 425—6 **11 Claims**



1. An apparatus for the catalytic film polymerization of a gaseous monomer, comprising:

(a) a polymerization vessel having an interior surface defining a sidewall portion and a bottom portion;

(b) means for retaining a quantity of liquid catalyst in said bottom portion along a perimeter area of said bottom portion;

(c) a raised portion projecting from a central area of said bottom portion and having an upper surface extending from a liquid surface of said liquid catalyst;

(d) means for feeding a monomer gas to said vessel;

(e) means for coating said catalyst along said interior surface and said upper surface of said raised portion, forming thereby a catalyst film, said monomer gas being polymerized in the presence of said catalyst to produce a polymer film of uniform thickness along said interior surface and said upper surface of said raised portion.

4,627,804

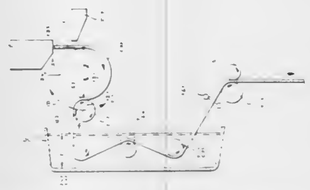
SHEET FORMING APPARATUS

Yoshio Kobayashi; Kuniharu Tobita, and Kazuo Kishimoto, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 640,598, Aug. 14, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,478

Int. Cl.⁴ B29B *7/82*

U.S. Cl. 425—71 **2 Claims**



1. An apparatus for forming double-side polished sheet of thermoplastic resin, comprising:

a first cooling roll;

means for forming a sheet of thermoplastic synthetic resin on said first cooling roll along a contact angle Θ_1;

a second cooling roll having a smaller diameter than said first cooling roll and mounted adjacent said first cooling roll for engaging the outer surface of the sheet formed on said first cooling roll and nipping the sheet between said cooling rolls for receiving the sheet from said first cooling roll onto a part of the surface thereof along a contact angle Θ_2;

mounting means on which said second cooling roll is mounted for being movable along the outer circumference of said first cooling roll for varying said contact angles while continuing to nip the sheet between said cooling rolls;

a water tank having at least one guide roller therein and positioned for receiving the sheet directly from said second cooling roll and guiding the sheet from said second cooling roll directly into said water tank; and

means for varying the water level in said water tank in accordance with said contact angles for making the distance from the point at which the sheet leaves said second cooling roll to the water level is such that the surfae temperature of the sheet is below the melting point of the resin when the sheet reaches the water.

4,627,805

VERTICAL FOIL-BLOWING HEAD

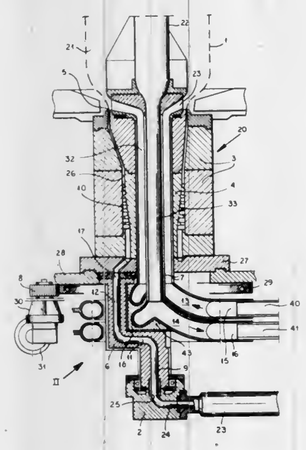
Willi Schnell, Cologne, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co., Troisdorf, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,608

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331832

Int. Cl.⁴ B29C *47/24*

U.S. Cl. 425—72 R **6 Claims**



1. A vertical foil-blowing head comprising:

a stationary lower part disposed along a vertical axis, connected with a source of a thermoplastic melt, said stationary lower part further having a vertical axial outlet for said melt;

a foil-blowing rotatable die disposed above said stationary part along said axis and comprising a rotatable ring member and a rotatable core member defining a flow passage for said melt terminating in an annular mouth from which said melt engages to be blown into a foil tube;

means for retaining said die about said axis;

rotatable ducts extending through said rotatable core member along said axis and communicating with said foil tube for introducing blowing and cooling air into said foil tube and discharging said air therefrom;

a rotatable distributor connecting said stationary part with said rotatable die, said rotatable distributor being provided with a distributor passage connected with said outlet, said rotatable distributor having a substantially horizontal portion extending outwardly beyond said rotatable ducts, and a substantially vertical portion connected to said substantially horizontal portion and opening into said flow passage at a single non-annular inlet orifice disposed outwardly of said ducts and offset from said axis; and

wherein said rotatable ducts are provided with radial branches extending away from said rotatable distributor and communicating with annular channels for said air, said rotatable ducts being separated from said rotatable distributor by an insulating free space filled either with air or a thermal insulation material.

4,627,806

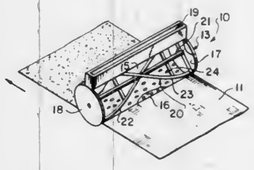
APPARATUS FOR THE MANUFACTURE OF FIBROUS WEBS WITH HELICAL ROTOR

Jeffrey J. Johnson, Menasha, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Filed Aug. 30, 1985, Ser. No. 770,949

Int. Cl.⁴ B28B *5/00*

U.S. Cl. 425—83.1 **6 Claims**



1. An apparatus for depositing a uniform web of dry fibers on a moving forming wire, comprising:

a fiber distributor housing having upper and lower wall sections of generally semi-cylindrical shape and end walls extending transversely thereof, said walls being cooperatively disposed to define a generally cylindrical chamber having its axis of curvature extending transversely of the direction of movement of said wire,

said lower wall section comprising means defining a screen disposed above said forming wire for accommodating passage of fiber therethrough:

means defining an elongate opening in said upper wall and extending in the direction of its axis of curvature for introducing air-entrained dry fibers into said chamber; and

a rotor having an axis of rotation substantially coextensive with the axis of curvature said chamber,

said rotor including a plurality of substantially equally angularly spaced helical rotor blades, said rotor blades being spaced equidistant from the axis of rotation and extending between said end walls in close proximity to said lower and upper wall sections,

whereby upon rotation of said rotor, air-entrained fibers introduced into said chamber through said opening are caused by said helical rotor blades to move axially of said chamber, uniformly to distribute said fibers in cross machine direction, while said fibers are being moved radially outwardly of said rotor for passage through said screen.

4,627,807

APPARATUS FOR MANUFACTURING SLIDE FASTENER WITH SEPARABLE END STOP

Kazuki Kuse, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,419

Claims priority, application Japan, May 10, 1984, 59-93278

Int. Cl.⁴ B29D *5/02*

U.S. Cl. 425—116 **3 Claims**

1. In an apparatus for manufacturing a slide fastener with a separable end stop, including:

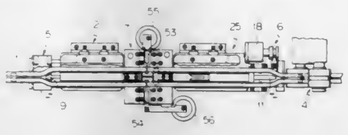
a conveyor device for conveying engaged stringers of continuous length which have space portions disposed at intervals in their longitudinal directions;

a stringer separating device for separating said engaged stringers as they are moved, and a stringer recombining device for re-engaging the separated stringers;

an injection molding station for molding upper stops and pins which constitute a separable end stop at both ends, respectively, of each of said space portions, said station being provided between said stringer separating and recombining devices; and

a positioning device which suspends said conveyor device when sensing one of said space portions in such a manner that the sensed spaced portion is stopped at said injection molding station,

an improvement characterized by comprising:



a device for independently bending a portion of a tape which constitutes each of said stringers at said space portion within said injection molding station; and

stoppers provided such as to be immovable relative to said injection molding station in terms of the moving direction of said stringers, said stoppers respectively engaging with end fastener elements at the opposite ends of said space portion while said bending operation is being effected, thereby positioning said fastener elements.

4,627,808

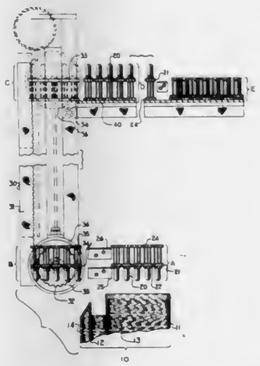
APPARATUS FOR MAKING CAPSULE HAVING PLURAL CHAMBERS

Raymond J. Hughes, P.O. Box 801, Mantoloking, N.J. 08738

Filed May 31, 1985, Ser. No. 739,624

Int. Cl.⁴ B29C *41/02, 41/14, 41/40*

U.S. Cl. 425—270 **7 Claims**



1. A multiple chamber hard capsule making apparatus, comprising cleft dipping pins connected to mounting bars, and stripping rings connected by slide rods to said mounting bars for ejecting capsules from said pins.

4,627,809

METAL MOLD AND STAMPER FOR INJECTION MOLDING OF A PLASTIC DISC FOR A HIGH-DENSITY INFORMATION RECORDING CARRIER

Norio Okabayashi, Himeji, and Yoshio Onizawa, Hyogo, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

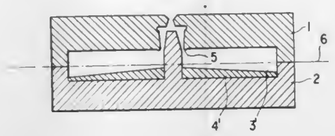
Filed Aug. 21, 1984, Ser. No. 642,905

Claims priority, application Japan, Sep. 22, 1983, 58-174173

Int. Cl.⁴ B29C *45/37*

U.S. Cl. 425—555 **9 Claims**

1. In a metal mold to be used for injection-molding a flat plastic disc having uniform thickness for a high-density information recording carrier by injecting molten resin into a flat and annular mold cavity, the improvement characterized in that an axial thickness of the flat and annular injection mold cavity is substantially continuously increased away from a gate



at the center of the molding cavity outwardly from the gate to the mold cavity perimeter for injecting the molten resin into the center of the mold and forming a flat resin disc having uniform thickness when molten resin is injection molded in said cavity.

4,627,810

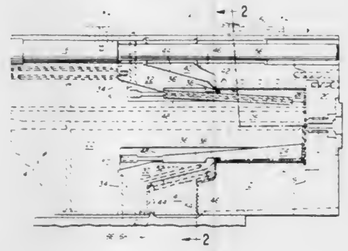
COLLAPSIBLE CORE

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Sep. 26, 1985, Ser. No. 781,131

Int. Cl.⁴ B29C *33/02*

U.S. Cl. 425—577 **27 Claims**



1. In an injection mold having a mold cavity portion and a collapsible core portion, said mold cavity portion and collapsible core portion being movable between open and closed positions, and including means for defining a mold chamber between said mold cavity portion and collapsible core portion in the closed position, plus aperture means permitting filling of the mold chamber with molding compound, said core portion defining a core base, and outer core members longitudinally movable along said core base between a molding position and a collapsed position, the improvement comprising, in combination:

said collapsible core portion also including a first mold ring positioned about said core base, said first mold ring being longitudinally movable to define a first, annular parting line between said core base and first mold ring, said first mold ring carrying said outer core members to control the longitudinal positioning of said outer core members while permitting said outer core members to move radially inwardly and outwardly between molding and collapsed positions; a second mold ring carried on said collapsible core portion, said second mold ring including stripper ring means, said second mold ring being longitudinally movable to define a second, annular parting line with said first mold ring, said second mold ring also forming a third, annular parting line with the mold cavity portion; means for relatively moving said core base, mold cavity portion, and first and second mold rings in a longitudinal direction relative to each other; and locking means for locking at least said third parting line closed in the molding position and to sequentially open said parting lines, whereby, as the mold moves from the closed position to the open position, the first parting line, the third parting line, and then the second parting line are sequentially opened, and means to cause said outer core members to move to a collapsed position as the first parting line opens, and to cause said outer core members to move again outwardly to a molding position as the first parting line closes.

14. In an injection mold having a mold cavity portion and a collapsible core portion, said mold cavity portion and collapsible core portion being longitudinally movable between open and closed positions, and including means for defining a mold chamber between said mold cavity portion and collapsible core portion in the closed position, plus aperture means permitting filling of the mold chamber with molding compound, said core portion defining a core base having tapered side portions, and outer core members longitudinally movable along said core base between a molding position and a collapsed position, and the improvement comprising, in combination:

said collapsible core portion also including a first mold ring positioned about said core base, said first mold ring being longitudinally movable to define a first, annular parting line between said core base and first mold ring, said first mold ring carrying said outer core members to control the longitudinal position of said outer core members, but permitting said outer core members to move radially inwardly and outwardly between molding and collapsed positions while moving along said tapered core base; a second mold ring carried on said collapsible core portion, said second mold ring including stripper ring means, said second mold ring being longitudinally movable to define a second, annular parting line with said first mold ring, said second mold ring also forming a third, annular parting line with the mold cavity portion; first rack means carried by said core base; second rack means carried by said mold cavity portion; and pinion means carried by said second mold ring, said first and second rack means and pinion means being positioned so that the pinion means is placed between the first and second rack means, said pinion means simultaneously rolling against both of said first and second rack means; means for longitudinally moving said first mold ring; and means to sequentially open said first, second, and third annular parting lines, whereby, as the mold moves from the closed position to the open position, the first parting line, the third parting line, and then the second parting line are sequentially opened; and means to cause the outer mold members to collapse inwardly to the collapsed positioned as the first parting line opens and to cause said outer core members to move again outwardly into a molding position as the first parting line closes.

27. In a mold having more than two movable separable portions said movable, separable portions defining a plurality of parting lines, the improvement comprising, in combination:

a longitudinally positioned bar pivotally attached to one of said movable, separable portions; first cam means carried on at least one other of said movable, separable portions said cam means being positioned to engage and hold said bar in a first predetermined angular position; latch member means carried on said bar and latch sites carried on two of said other separable portions, said latch member means and latch sites being positioned to lock together to prevent separation of two of said separable portions while the bar is in the first predetermined angular position, to lock at least one of the parting lines, and second means for causing said bar to pivot to another angular position, as the movable, separable portions move to another predetermined position, in which the latch member means and latch sites can separate, whereby said one parting line can be automatically opened later than at least one other parting line by moving said movable, separable portions.

4,627,811

APPARATUS FOR PRODUCING A SPUNBOND

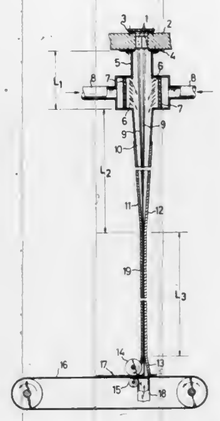
Wolfgang Greiser, Neusäss, and Hans Wagner, Bobingen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,305

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401639

Int. Cl.⁴ B29C *47/14, 47/88*

U.S. Cl. 425—72 S **5 Claims**



1. In an apparatus for producing a spunbond by pneumatic take-off and laying of melt-spun filaments including a superatomospheric pressure chamber connected to melt spinneret in a gas-tight manner and having discharge orifices for the filaments, the improvement according to which the superatomspheric pressure chamber has a gradual tapering portion merging into a drawing cell, air supply means connected to supply the superatomspheric pressure chamber with air through two opposite rows of air supply means arranged at some distance from the spinnerets, and deflection means disposed to deflect air flow from the supply means in the direction of filament movement.

4,627,812

FLUIDIZED BED COMBUSTOR

Felix T. Kelly, Bagshot; David C. Newey, Byfleet, and Gordon W. Sutton, Bisley, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 661,268, Oct. 16, 1984, abandoned, which is a continuation of Ser. No. 384,925, Jun. 4, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 835,430

Claims priority, application United Kingdom, Jun. 11, 1981, 17964

Int. Cl.⁴ F23D *11/00*

U.S. Cl. 431—7 **10 Claims**

1. A method of starting up a fluidized bed combustor comprising the steps of:

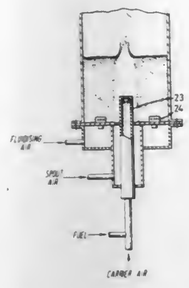
(a) passing an oxygen containing gas from an outlet beneath the surface of a slumped bed of particulate material to cause a spout zone of particulate material above the surface of the slumped bed;

(b) introducing liquid fuel from a nozzle within the bed into the effective spouting zone of the bed whereby a mixture of liquid fuel and oxygen containing gas is rapidly transported through the bed to the upper surface of the bed;

(c) igniting the liquid fuel/oxygen containing gas mixture above the surface of the bed;

(d) after ignition passing an oxygen containing gas into the bed to thereby obtain a controlled rise in the temperature of the bed until the entire bed is fluidized; and

(e) decreasing the flow of oxygen containing gas causing the spout simultaneously with said controlled temperature



rise and stopping the flow of oxygen containing gas causing the spout when the entire bed is fluidized.

4,627,813

THERMAL FIXING APPARATUS

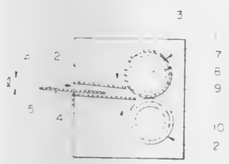
Yoshitaka Sasaki, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,192

Claims priority, application Japan, May 25, 1983, 58-91974; May 25, 1983, 58-91975

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 432—60 **3 Claims**



1. A thermal fixing apparatus for a sheet bearing a tonr image comprising: a pair of rolls in contact with one another forming a nip therebetween, at least one of said rolls being heated, the other of said rolls being covered with an elastically deformable outer layer; and

a plate-like form of heater element having a width corresponding substantially to an axial length of said pair of rolls, and disposed substantially parallel to the passage of image-bearing sheet conveyed into a said nip, wherein an edge of said heater element being located adjacent to the surface of one of said rolls;

wherein said heater element elevates the temperatures of a sheet carrying a toner image so as to make said toner semimolten and said pair of rolls elevates said sheet temperature further to fix said toner image and the surface temperature of said heated roll along its axial length is less at its ends than at its central portion and said surface temperature of said heater element is greater at end portions thereof, adjacent ends of said rolls, than at a central portion of said heater element, whereby the toner image will be melted uniformly.

4,627,814

CONTINUOUS TYPE ATMOSPHERE HEAT TREATING FURNACE

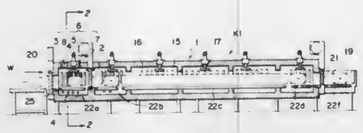
Fumihiko Hattori, Izumi, and Yoshikazu Shimosato, Yahata, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,939

Claims priority, application Japan, Jul. 17, 1984, 59-149130

Int. Cl.⁴ F27B *9/02, 5/04, 5/14;* **F27D** *7/04*

U.S. Cl. 432—128 **8 Claims**



1. A continuous heat treating furnace for heat treating a ferrous metal work in a combustible protective atmosphere, said furnace being lined with refractories and comprising:

a charge door which is provided at one end of said furnace;

a discharge door which is provided at the other end of said furnace;

a partition door for separating said furnace into a charge chamber and a heat treating chamber;

a heating means for heating said work in said charge chamber and said heat treating chamber;

a transport means for transporting said work in said charge chamber and said heat treating chamber;

a recirculating fan for transferring convectional heat to said work;

a gas purge means for purging said charge chamber;

a combustion means for burning, into burnt exhaust gas, combustible exhaust gas generated by burning an atmosphere in said charge chamber so as to supply the potential heat of the burnt exhaust gas, as radiant heat, to said charge chamber;

said recirculating fan, said purge means and said combustion means being provided in said charge chamber; and

an agitating means for agitating the combustible protective atmosphere supplied into said heat treating chamber, which is provided in said heat treating chamber, whereby said work is preheated in said charge chamber to a temperature enabling sufficient vaporization of such impurities as oil on said work and then, is subjected to a predetermined heat treatment in said heat treating chamber.

4,627,815

CERAMIC TEMPERATURE STABILIZATION BODY, AND METHOD OF MAKING SAME

Fritz Aldinger, Rodenbach, and Waltraud Werdecker, Hanau, both of Fed. Rep. of Germany, assignors to W.C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,499

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337630

Int. Cl.⁴ F27D *7/00*

U.S. Cl. 432—24 **14 Claims**

1. Method of equalizing temperature within a confined area, where the temperature is above 1000° C., comprising the step of

surrounding at least a portion of the confined area with a ceramic stabilization body,

said temperature stabilization body comprising

a densely sintered mixture of

(a) powdered aluminum nitride;

(b) a first additive of from 0.05% to 2% of aluminum powder, having a grain size under 1 micrometer, and

(c) a second additive of from 0.1% to 10%, comprising at least one of the materials of the group consisting of: an oxide of an alkaline earth; an oxide of a rare earth metal; an oxide of a transition metal of the IVth, Vth, and VI groups of the periodic system; and silicon dioxide,

said second additive being present in powder form,

said body having been first cold-pressed and then densely sintered at a temperature of between 1700° C. to 2000° C.,

all percentages being by weight and with reference to the aluminum nitride.

4,627,816

ORTHODONTIC APPARATUS

Hans Günzel, Dachauerstr. 65, 8037 Neuesting, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 735,225

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419348

Int. Cl.⁴ A01C *7/00*

U.S. Cl. 433—11 **9 Claims**



1. Orthodontic arch apparatus comprising

a lock adapted for attachment to a tooth having a passage therethrough with a least one aperture formed in a side wall of said passage;

spring means adapted for attachment to said lock, a portion of said spring means extending through said aperture and into said passage;

a latch adapted for bearing an orthodontic arch wire, said latch being receivable in said passage and having at least one recess adapted for locking engagement with said portion of said spring means.

4,627,817

DENTAL BRIDGE REMOVER

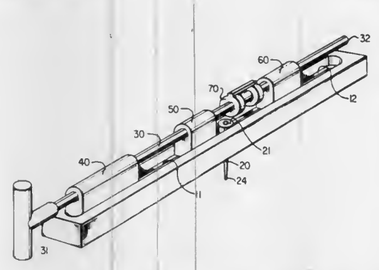
Jack Higa, 925 Esquimalt, West Vancouver, British Columbia, Canada V7T 1J8

Filed Mar. 14, 1985, Ser. No. 711,987

Claims priority, application Canada, Mar. 20, 1984, 449953

Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—152 **32 Claims**



1. An instrument for removing dental bridgework, comprising:

(a) a support beam having sufficient longitudinal extension to extend into a patient's mouth over bridgework bonded therein;

(b) a bracing pin having a upper end mounted to said beam, said bracing pin for holding said beam at said upper end mount at a fixed position away from said bridgework during removal of said bridgework; and,

(c) pulling means comprises an elongated rotatable shaft supported by said beam for rotatably engaging and drawing a pulling cord looped beneath said bridgework in an occlusal direction towards said beam to break said bond when said beam is braced by said pin.

4,627,818

PSYCHOTECHNOLOGICAL TESTING METHOD AND DEVICE THEREFOR

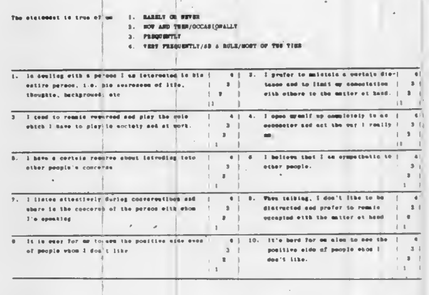
Jost Von Fellenberg, Auf der Bürglen 27, 8627 Grüningen, Switzerland

Filed Aug. 26, 1985, Ser. No. 769,558

Claims priority, application Switzerland, Aug. 28, 1984, 4124/84-5

Int. Cl.⁴ G09B *19/00*

U.S. Cl. 434—236 **14 Claims**



1. A psychotechnological method for detecting the disposition of a human test subject toward a selected trait, said method comprising:

(a) formulating and presenting to the test subject a plurality of sets of statements, each set containing first and second groups which respectively include first and second complementary statements, and a preselected choice of at least three responses for each statement, the test subject selecting one of the responses in answer to each statement, each response being assigned a respective predetermined weighting factor which determines a response value which is assigned to each response;

(b) adding the response values which correspond to the responses selected by the test subject on a group by group basis to derive for each group a group test score;

(c) plotting the group test scores of each one of the groups that is associated with the first complementary statements on a respective axis of an indexed polar coordinate system having at least as many axes as said number of sets of statements;

(d) plotting the group test scores of each one of the groups that are associated with the second complementary statements on a respective axis of a second indexed polar coordinate system having at least as many axes as as said number of sets of statements; and

(e) comparing and evaluating the plotted response values which appear on the first and second coordinate systems to determine the characteristic or disposition of the test subject.

4,627,819

TEACHING OR AMUSEMENT APPARATUS

Roger I. Burrows, Manhattan Beach, Calif., assignor to Price/-Stern/Sloan Publishers, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 697,973, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 478,680, Mar. 25, 1983, abandoned. This application Oct. 31, 1985, Ser. No. 793,705

Int. Cl.⁴ G09B *5/06*

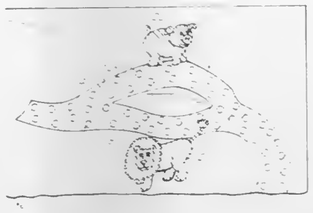
U.S. Cl. 434—337 **8 Claims**

4. In an apparatus incorporating an infrared reflective substrate having first selected areas printed in infrared absorptive

carbon black ink and second selected areas printed in infrared transparent ink, the improvement comprising:

said first areas comprising bars of a bar code, said bars each being printed in a determined screen of carbon black ink dots;

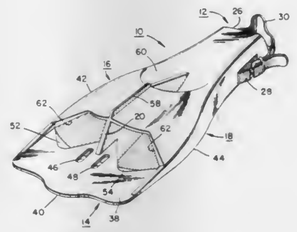
said second areas comprising spaces between said bars of



said bar code and each being printed in a screen corresponding with said determined screen in said first areas, but in infrared transparent simulated black ink dots;

whereby said bars and said spaces are rendered visually indistinguishable from each other, but are readily distinguishable from each other by an infrared emitting and reflectance measuring device.

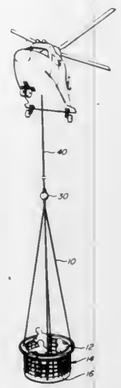
4,627,820
SWIM FIN
Larry M. Penebre, 138 Haseco Ave., Port Chester, N.Y. 10573
Filed Jun. 18, 1985, Ser. No. 745,911
Int. Cl.[4] A63B *31/08*
U.S. Cl. 441—64 **20 Claims**



1. A swim fin comprising a foot portion, an essentially horizontal flipper and shell means coupling said foot portion and said flipper and defining channel means between said shell means on one side and, on the other side, said flipper and said foot portion, said channel means initiating at water inlet aperture means and terminating at water outlet aperture means and with said flipper extending across and outboardly of said channel means and said water outlet aperture means.

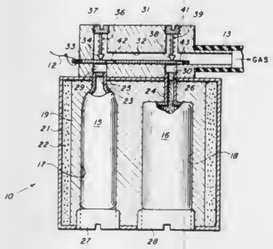
4,627,821
HELICOPTER RESCUE DEVICE
James Bradley, Delta; George E. Evans, West Vancouver; Donald Mackenzie, Delta, and Michael Marcuson, Burnaby, all of Canada, assignors to Empra Systems Corp., Richmond, Canada
Filed Jun. 19, 1984, Ser. No. 622,270
Claims priority, application Canada, Sep. 2, 1983, 436049
Int. Cl.[4] B64D *47/00*
U.S. Cl. 441—83 **4 Claims**

1. A device which provides buoyant support for persons in water and is suitable for lifting by a helicopter comprising a buoyant floatation ring large enough to surround several standing persons, a rigid, non-buoyant substantially flat apertured deck for supporting said persons when standing on the deck, collapsible netting connecting said ring and said deck and fully surrounding the deck area, the floatation ring having sufficient buoyancy to support the whole device and deck in the water with the deck suspended below water level, and supporting cable means for suspending said device with several persons therein from a helicopter, said cable means allowing easy entry



over the top of said ring and being connected to the deck and limited in movement relative to the ring so that when the device is suspended by the cable means, the major lifting forces are transmitted to the deck while the ring is held well spaced above the deck, and wherein said deck comprises a series of flat metal bars set on edge and forming a grid pattern.

4,627,822
LOW TEMPERATURE INFLATOR APPARATUS
John J. Esposito, Langhorne, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 20, 1985, Ser. No. 729,725
Int. Cl.[4] B63C *9/12*
U.S. Cl. 441—92 **7 Claims**



1. A low temperature inflator apparatus for an inflatable device comprising, in combination:

first means containing a liquified gas;

second means containing a combustible solid;

heat transfer means contiguous with said first means and said second means for transferring to said first means heat generated by combustion of said solid;

actuator means operatively connected to said first and second means for concomitant actuation of said first and second means and formed to conduct the gases therefrom to the inflatable device.

4,627,823
SAFETY LATCHED AUTOMATIC ACTUATOR AND THROWABLE PERSONAL FLOTATION ASSEMBLY
Glenn Mackal, 4923 - 59th Ave., South, St. Petersburg, Fla. 33707
Filed Jul. 23, 1984, Ser. No. 633,607
Int. Cl.[4] B63H *16/06*
U.S. Cl. 441—95 **18 Claims**



1. A safety latched automatic actuator for actuating an inflator, the inflator including a striker pin reciprocatingly mounted within a body for fracturing a frangible seal of a cartridge containing compressed gas, the actuator comprising in combination:

a housing including a bottom portion and a top portion;

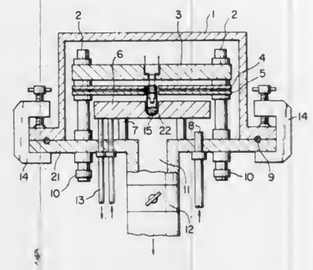
an actuator pin mounted within the housing, the actuator pin being movable to and from a safety position, a cocked position, and an actuated position;

a first means for operatively connecting the actuator pin within the housing to actuate the striker pin of the inflator when the actuator pin moves from the cocked position to the actuated position;

a fluid-activated trigger assembly for preventing the actuator pin from moving from the cocked position to the actuated position until triggering of the trigger assembly by exposure to a fluid; and

safety latch means for retaining the actuator pin in the safety position when the safety latch means is in a non-armed position, and for permitting the actuator pin to move from the safety position to the cocked position and, upon triggering of the trigger assembly, to further move to the actuated position when the safety latch means is moved from the non-armed position to an armed position, the safety latch means comprising a latch lever movable to and from the non-armed position and the armed position, and further comprising second means for operatively connecting the latch lever to the actuator pin to retain the actuator pin in the safety position when the latch lever is in the non-armed position and to permit the actuator pin to move from the safety position to the cocked position and, upon triggering of the trigger assembly, to further move to the actuated position when the latch lever is in the armed position, the second connecting means comprising a retaining pin positioned transversely through a proximal end of the actuator pin protruding from the top portion of the housing, the latch lever comprising a non-removable forked safety latch lever having a pair of legs defining a slotted opening therebetween for receiving the proximal end of the actuator pin, each of the legs including a retaining pin slot disposed therein for slidably and rotatably receiving the respective end of the retaining pin, the retaining pin being aligned and extending into the respective retaining pin slots such that the retaining pin bears against the edges of the retaining pin slots to retain the actuator pin in the safety position when the forked latch lever is in the non-armed position and, upon pivotable movement of the forked latch lever about the axis of the retaining pin, such that the longitudinal axes of the retaining pin slots are substantially parallel to the axis of the actuator pin when the forked latch lever is in the armed position to allow free movement of the retaining pin in the retaining pin slots.

4,627,824
METHOD OF AND APPARATUS FOR MANUFACTURING SMALL-SIZE GAS-FILLED LAMPS
Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Electric Lamp Co., Ltd., Tokyo, Japan
Filed Jan. 6, 1984, Ser. No. 568,850
Claims priority, application Japan, Jan. 12, 1983, 58-3872; Jan. 12, 1983, 58-3874; Jan. 12, 1983, 58-3875; Jan. 12, 1983, 58-3876; Jan. 12, 1983, 58-3880
Int. Cl.[4] H01J *9/38, 9/18*
U.S. Cl. 445—27 **6 Claims**



4. A method of manufacturing a gas-filled lamp, comprising the steps of:

providing an openable structure defining therein a sealable and pressurizable chamber;

providing a hollow bulb having an open end and a closed lens-defining head at the other end;

providing a bead unit having a bead of a meltable material provided with a pair of lead wires projecting therethrough and joined together by a filament;

supporting said bulb on a cooling member which is positioned within said chamber by disposing the closed head end of the bulb within an upwardly-directed recess formed in the cooling member so that the bulb is supported in an upright position with the open end being disposed uppermost;

positioning a heating member within said chamber in direct surrounding relationship to the open end of said bulb so that said heating member is spaced upwardly from said cooling member;

positioning an insulator member vertically between said heating and cooling members and in close surrounding relationship to the bulb so as to prevent heating of the bulb except in the vicinity of the open end thereof;

supporting said bead unit within said chamber directly above said bulb so that said bead is suspended downwardly and disposed directly within the open end of said bulb;

closing and sealing said chamber after the bulb and bead unit have been positioned therein as defined above;

creating at least a partial vacuum within said chamber to effect withdrawal of air therefrom;

thereafter introducing a pressurized gas into said chamber at a pressure in excess of atmospheric pressure so as to fill said chamber and said bulb with said gas and to create an elevated pressure therein;

heating said open end of said bulb and said bead by said heating member to sealingly fuse them together while maintaining said chamber at said elevated pressure;

cooling the closed head of said bulb by the cooling member simultaneous with the heating step defined above so as to effect at least partial cooling of the gas within the bulb to maximize the quantity of gas within the bulb prior to and during the sealing of the bead and bulb together; and

thereafter terminating the heating step, relieving the pressure in the chamber, and removing the fused bulb and bead from the chamber.

4,627,825

APPARATUS FOR THE ANGULAR ADJUSTMENT OF A SHAFT, SUCH AS A CAMSHAFT, WITH RESPECT TO A DRIVE WHEEL

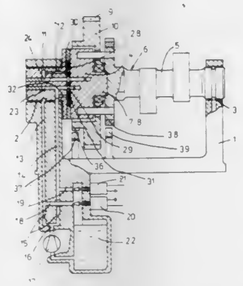
Karl-Heinz Bruss, Monchen-Gladbach, and Hans Baumgartner, Viersen, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,318

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415861

Int. Cl.[4] F01L *1/34*; F16D *3/10*

U.S. Cl. 464—2 **25 Claims**



1. Apparatus for the relative angular displacement of a shaft and a drive wheel for said shaft in which said angular displacement is effected by hydraulic means as a function of whether or not pressure fluid is fed to the apparatus, said apparatus comprising at least one pair of hydraulic cylinders disposed in radial opposition in said shaft and including respective pistons displaceable in opposite directions in said cylinders, and three position valve means for controlling flow of pressure fluid to said hydraulic cylinders for controlling relative angular displacement between said shaft and drive wheel, said valve means having first and second end positions and an intermediate position, said valve means in each said end position pressurizing a respective cylinder while the other cylinder is vented to effect relative angular displacement selectively in opposite directions, said cylinders being unvented with the valve means in said intermediate position to block said pistons.

4,627,826

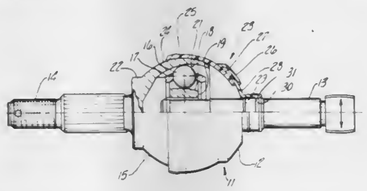
MULTI-SEGMENT, NON-FLEXIBLE BOOT FOR MECHANICAL JOINT

Peter M. Juziuk, Huntington Woods, and Daniel W. Hazebrook, Detroit, both of Mich., assignors to GKN Automotive Components Inc., Southfield, Mich.

Filed Feb. 15, 1985, Ser. No. 702,051

Int. Cl.[4] F16D *3/84*

U.S. Cl. 464—171 **12 Claims**



1. A boot for sealing a power transmitting mechanical joint, said joint comprising an input shaft, an output shaft, an outer race connected to one of said shafts, and means to transmit power from the other of said shafts to said outer race, said outer race having a spherical outer surface, said input shaft and said output shaft being subject to articulation relative to one another during the operation of said mechanical joint, said boot comprising, in combination:

a first portion comprising a first boot segment formed from a non-flexible material and surrounding a portion of said spherical outer surface of said outer race, said first portion having a spherical inner surface which engages said spherical outer surface of said outer race in surface-to-surface sealing relationship therewith, said first portion having a spherical groove which faces the other of said shafts and being capable of articulating with respect to said outer race without the loss of the sealing relationship therewith; and

a second portion comprising a second boot segment formed from a non-flexible material and extending from said first portion and sealingly engaging the other of said shafts, said second portion, together with said first portion, sealing the joint between said outer race and the other of said shafts to retain lubricant within said joint and to prevent dirt and other contaminants from entering said joint, said second portion having a spherical end which is sealingly and slidingly received in said spherical groove of said first portion and being capable of being sealingly articulated with respect to said first portion;

said spherical groove in said first portion being of a limited extent so that the articulation of said second portion with respect to said first portion causes said spherical end of said second portion to bottom in said spherical groove in said first portion, said boot being capable of further articulation by the articulation of said first portion with respect to said outer race of said power transmitting mechanical joint after said spherical end of said second portion bottoms in said spherical groove in said second portion.

4,627,827

DEVICE FOR THE ASSEMBLY ESPECIALLY OF THE JOINT OF THE CHAIN-GUIDE TENSIONING ARM OF THE SPEED CHANGE GEARS FOR BICYCLES AND SIMILAR VEHICLES

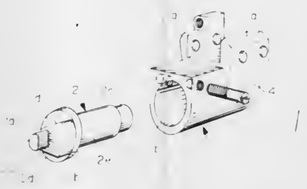
Henri Juy, 3-5 rue de la Breuchilliere, Dijon zone industrielle Dijon, St-Appolinarie, France

Filed Apr. 26, 1985, Ser. No. 727,567

Claims priority, application France, Apr. 24, 1984, 84 06761

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—80 **10 Claims**



1. Device for the assembly of the joint of the chain-guide tensioning arm of speed change gears for bicycles and similar vehicles, in which the tensioning arm (D) is swivelling with a limited angular motion in both directions under an elastic pushing action in one direction, in a bracket (**1**) at a lower part of a crosswise motion system (C) of the change gear, wherein a joint bolt (**2**) of the tensioning arm (D) is fastened integral with said chain-guide tensioning arm or with a flange (Da) of this arm, while a lower support (**1**) which is arranged to be fastened to the crosswise motion system (C) of the change gear, is provided with a cylindrical recess (**1***b*–**1***c*) to accomodate said bolt, said recess being open on the tensioning arm end and closed on an external end, characterized in that a rod (**4**) or equivalent means is mounted in a lower bracket (**1**) perpendicularly to a cylindrical recess axis (**1***b*) and secant with a peripheral part of said recess, to assume a dual function of holding the bolt (**2**) with respect to the bracket (**1**) and end stopping the rotation of the tensioning arm (D) integral with the bolt (**2**) with respect to the bracket (**1**), due to the arrangement of a bearing surface (**2***d*) of the bolt which is in a plane with and opposite the rod (**4**); an elastic means (**5**) for re-tensioning the tensioning arm being mounted inside the bracket and connected to the bolt and to said bracket.

4,627,828

TOOTHED BELT

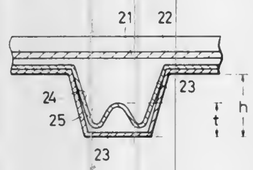
Takaji Nagai; Hiroyuki Ookawa; Takahide Mizuno; Fumihito Nakagawa, and Yoshiaki Onaka, all of Hyogo, Japan, assignors to Mitsuboshi Belting Ltd., Hyogo, Japan

Filed Feb. 24, 1984, Ser. No. 583,465

Claims priority, application Japan, Oct. 7, 1983, 58-156626[U]

Int. Cl.[4] F16G *1/08*

U.S. Cl. 474—205 **9 Claims**



1. A toothed belt comprising: a rubber substrate in which a plurality of teeth are formed; an inner fabric layer covering said teeth, said inner fabric layer having a large mesh size, large stretchability, a warp of 30 to 210 d, a normal weft, and a sum of cover factors of said warp and weft of no more than 20; and an outer fabric layer outside of and covering said inner fabric layer.

4,627,829

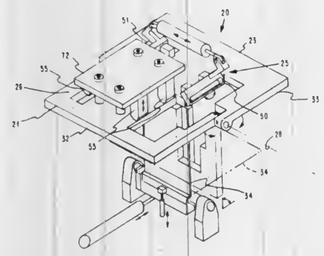
CENTERFOLD FORMING APPARATUS FOR A DISK ENVELOPE

William A. Brady, Jr., Lake Worth; Stanley R. Jordan, Boca Raton; Eugenio J. Morgado, Miami; Julius J. Perlini, Boynton Beach, and Alfred A. Stricker, Pompano Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,513

Int. Cl.[4] B31B *21/02, 21/26, 21/60*

U.S. Cl. 493—189 **4 Claims**



1. Apparatus for preforming an envelope for a plastic disk from a prepunched, flexible, plastic blank having two sections connected at the heads thereof and containing a drive hole at the same location in each section, one section having folding flaps extending from three edges thereof comprising:

a first and second folding plate positioned head to head each having a first and second surface thereon so that the first surfaces thereof are contiguous and lie in the same horizontal plane,

means for holding said flexible plastic material blank against said first surfaces of said first and second folding plates,

drive means for providing pivoting motion between said first and second folding plates to move said folding plates in an arcuate path so that the first surfaces are positioned in vertical planes facing each other,

a hub located at the same location in each first surface of each first and second folding plate so that said hubs register with one another when said plates are positioned in the vertical planes, said drive hole in each section of the flexible blank fitting over said respective hub to locate the blank on said first surfaces,

a mandrel extendable vertically and having an edge thereof in the extended position pressing against said blank in the area between said first and second plates pulling said drive holes in the blank taut on said hubs thereby locating the center line of said blank,

said drive means moving said folding plates from the horizontal to the vertical facing position causing said blanks to bend along the pressing edge of said mandrel forming the centerfold,

side flap fold forming apparatus attached to the second surface of the one of said first and second folding plates having said section of said blank having folding flaps extending from the three edges thereof held on said first surface thereof,

a side flap fold sealing apparatus attached to the back surface of the other of said first and second folding plates, said side flap folding and sealing apparatus being in operating position when said folding plates are positioned so that said first surfaces are positioned in vertical planes facing each other to form said centerfold,

cutout sections located along the side edges of said first and second folding plates and providing room for said side flap folding apparatus to fold said side flaps about said mandrel and for said sealing apparatus to perform said sealing operation on said folded flaps, respectively,

means for heating said centerfold and said side flap folds to a predetermined temperature to anneal the material, thereby reducing internal stresses therein.

4,627,830

BOX-ERECTING MACHINE

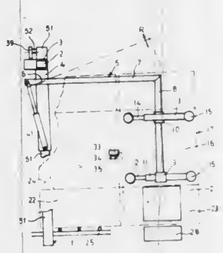
Joseph J. Smidt, Const. Huygenslaan 51, 2332 TS Leiden, Netherlands

Filed Apr. 18, 1985, Ser. No. 724,591

Claims priority, application Netherlands, Apr. 18, 1984, 8401256

Int. Cl.[4] B31B *1/80*

U.S. Cl. 493—316 **3 Claims**



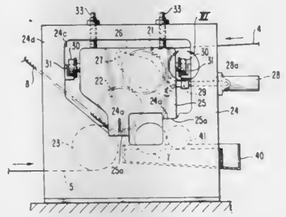
1. A box-erecting machine, comprising:

(a) a frame with support means for receiving a stack of tubular box blanks disposed one against the other in a substantially vertical orientation;

(b) means comprising an arm provided with a plurality of suction cups for engaging a wall of the forwardmost box blank of said stack of blanks and withdrawing said wall in a forward direction so that it forms the leading wall of an erected box;

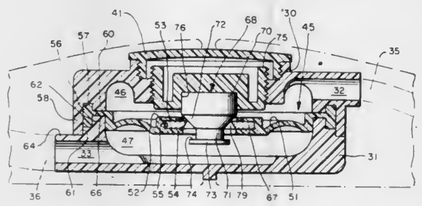
(c) a leg supporting said arm such that the arm is rotatable in a plane parallel to the plane of said leading wall of the box blank;
(d) a sleeve connected to said leg;
(e) a guide rod supporting said sleeve for non-rotatable movement in a direction perpendicular to the plane of said leading wall, said guide rod being disposed at one side of said frame, such that an edge of said box blank not forming part of the leading wall is disposed adjacent said one side of said frame;
(f) guiding means connected to said frame for preventing movement of the edge of a box blank disposed adjacent said one side of said frame during initial movement of the leading wall, for thereafter providing further unfolding of said box blank and for moving upwardly the bottom flap of the box blank connected to said leading wall;
(g) means comprising a lever, supported by said frame at a point below said stack for rotation in a plane perpendicular to said leading wall, for bringing the rear bottom flap of said box blank into the closed position thereof;
(h) a motor drive means associated with said arm for rotating said arm in said parallel plane through a predetermined angle;
(i) a motor drive means associated with said sleeve for moving said sleeve in said perpendicular direction to and fro along said guide rod; and
(j) control means associated with said suction cups and said motor drive means for rotating said arm, for controlling the application of suction to said suction cups, for controlling release of said suction from said suction cups, and for switching on and off said motor drive means for rotating said arm.

4,627,831
SINGLE FACER
Tadashi Hirakawa; Kiyomitsu Yoshikawa; Shigenari Yoshioka, and Hiroaki Sasashige, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 14, 1984, Ser. No. 681,785
Claims priority, application Japan, Jan. 20, 1984, 59-7083; May 2, 1984, 59-64994[U]; May 2, 1984, 59-64995[U]; May 2, 1984, 59-64996[U]
Int. Cl.[4] B31F *1/28*; B31B *1/88*
U.S. Cl. 493—337 **11 Claims**



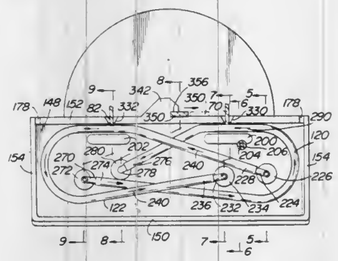
1. A single facer comprising:
a main frame;
a paste application roll rotatably supported on said main frame, said paste application roll having a roll axis extending in a transverse direction;
a pressure roll rotatably supported on said main frame, said pressure roll having a roll axis which is parallel to said transverse direction;
a movable frame movable in said transverse direction between a fixed position on said main frame for making a single-faced corrugated sheet and a position off of said main frame;
a lower corrugated roll rotatably supported on said movable frame, said lower corrugated roll having a roll axis parallel to said transverse direction;
an upper corrugated roll rotatably mounted on support means pivotally mounted on said movable frame, said upper corrugated roll having a roll axis parallel to said transverse direction,
means on said main frame for supporting said movable frame in said fixed position on said main frame; and
transfer means for moving said movable frame in said transverse direction between a position vertically above said fixed position at which said movable frame is supported by said main frame and said position off of said main frame at which said movable frame is not supported by said main frame for replacing said movable frame with another movable frame having corrugated rolls with corrugations of a different height and pitch, said transfer means including means on one of said main frame and said movable frame for moving said movable frame vertically between said position vertically above said fixed position and said fixed position on said main frame for making single-faced corrugated sheet.

4,627,832
THREE STAGE INTRACRANIAL PRESSURE RELIEF VALVE HAVING SINGLE-PIECE VALVE STEM
Michael D. Hooven, Miami, Fla., and Christian Sainte-Rose, Paris, France, assignors to Cordis Corporation, Miami, Fla.
Filed May 8, 1984, Ser. No. 608,137
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 **15 Claims**



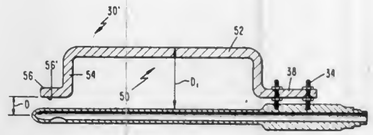
1. A valve for regulating the flow of fluid from one location in the body to another location, comprising:
a bio-compatible housing;
a flexible bio-compatible diaphragm dividing the interior of said housing into first and second interior chambers;
inlet port means for establishing fluid communication between said first interior chamber and the one location;
outlet port means for establishing fluid communication between said second interior chamber and the other location;
a bio-compatible valve seat carried on said diaphragm for movement therewith, said valve seat defining a fluid passageway having a predetermined minimum diameter and opening from said first interior chamber to said second interior chamber, and defining a first valving surface concentrically oriented with respect to the axis of said fluid passageway, said valve seat and diaphragm having a static position within said housing in the absence of a pressure differential between said chambers;
means comprising an elongated bio-compatible valve closure member attached at one end to said housing within said first interior chamber and extending therefrom through said fluid passageway into said second interior chamber, said valve closure member being axially aligned with the axis of said passageway and defining a second valving surface concentrically oriented with respect to said axis for coacting with said first valving surface to form a flow restriction within said passageway between said first and second chambers;
said second valving surface including, progressing from said valve closure member, a first portion progressively decreasing in diameter from a first predetermined diameter greater than said minimum diameter of said passageway to a second predetermined diameter less than said minimum diameter, and a second portion of finite axial extend having a maximum diameter greater than said second predetermined diameter and less than said mimimum diameter of said passageway;
said second valving surface coacting with said first portion of said first valving surface when said valve seat is in said static position to close said passageway to provide a first valving mode wherein said flow between said first and second interior chambers is prevented; and
said diaphragm being displaceable from said static position in a direction along said axis of said fluid passageway away from said one end of said valve closure member in response to an increase in pressure differential between said first interior chamber and said second interior chamber to cause said first valving member to successively coact with said first and second portions of said second valving surface, and successively to be axially spaced from said second portion, thereby providing second, third and fourth valving modes, in said second valving mode fluid flow occurring between said interior chambers so as to maintain a first substantially constant predetermined pressure in said first chamber, in said third valving mode fluid flow remaining substantially constant between said chambers notwithstanding changes in differential pressure, and in said fourth valving mode fluid flow occurring between said chambers to maintain a second substantially constant predetermined pressure in said first interior chamber.

4,627,833
MICROSURGICAL SYSTEM CASSETTE ASSEMBLY
Kenneth P. Cook, Blue Bell, Pa., assignor to Site Microsurgical Systems, Inc., Horsham, Pa.
Continuation of Ser. No. 383,635, Jun. 1, 1982, Pat. No. 4,493,695. This application Jun. 4, 1984, Ser. No. 616,633
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—34 **11 Claims**



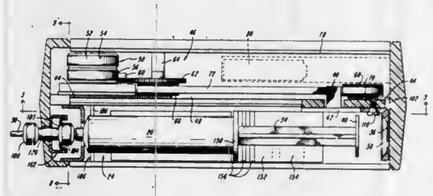
1. A cassette assembly adapted for releasable securement to a control console for use in ophthalmic surgery comprising:
a housing having at least one rigid surface and having an externally accessible suction port;
a first port internal to said housing in fluid communication with said suction port;
a second port internal to said housing and means through which fluid may flow to a source of vacuum in a control console;
a first occludable tubular conduit means disposed in said housing and coupled between said first and second ports and providing fluid communication therebetween;
at least a portion of said occludable tubular conduit means aligned with said housing rigid surface;
a collection vessel supported by said housing and having a first port for providing fluid communication between a source of vacuum and said collection vessel and having a second port in fluid communication with said first occludable tubular conduit means.

4,627,834
APPARATUS FOR PERFORMING SUCTION LIPECTOMY
Hans Lee, Suite 200, 415 Morris St., Charleston, W. Va. 25301
Continuation-in-part of Ser. No. 607,714, May 7, 1984. This application Sep. 18, 1984, Ser. No. 651,720
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—49 **5 Claims**



1. A device for surgically aspirating subcutaneous fatty tissue and the like from an animate body, comprising:
(a) a cannula having a tip and a handle at opposite ends thereof, the tip being formed with a hole and a longitudinal passage extending through the cannula in communication with the hole, said passage being connectable to a source of vacuum so that suction can be applied to surgically aspirate fatty tissue through the hole when the tip is inserted into the tissue;
(b) a guide bar having one end connected to the cannula at a portion thereof remote from the tip and an opposite end portion terminating adjacent the hole and spaced a first predetermined distance D from the tip, said opposite end having a guide surface in contact with, during surgery, a portion of the skin overlying the fatty tissue to limit the depth at which the hole penetrates the tissue, said guide bar including an elevated portion formed between the guide surface and the said one end of the guide bar and spaced a second predetermined distance D1 from a part of the cannula formed adjacent said elevated portion, wherein D1>D, said elevated portion being manually engageable by one hand of the surgeon while the surgeon's other hand engages the gripping portion of the cannula to thereby facilitate surgical manipulation of said device by allowing the surgeon to manually direct the length of the cannula and the tip through the tissue in reciprocating strokes with the guide surface being in substantially constant contact with the surface of said skin overlying the fatty tissue during said strokes; and
(c) means for connecting the guide bar to the cannula.

4,627,835
TUBING ASSEMBLY FOR INFUSION DEVICE
Paul V. Fenton, Jr., Marblehead, Mass., assignor to Strato Medical Corporation, Beverly, Mass.
Filed Mar. 11, 1985, Ser. No. 710,011
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—67 **12 Claims**



1. In an infusion device and syringe positioned therein, said infusion device including means for driving the plunger of said syringe along a reference axis toward a fluid dispensing outlet port thereof, wherein said infusion device includes a support member for supporting said syringe said support member in-

cluding at least one support surface, the improvement comprising:

a tube assembly coupled to said fluid dispensing outlet port of said syringe including:

A. an elongated tube defining a central bore therethrough, and

B. a rigid connector member affixed to said tube and defining a linear central bore extending therethrough, said bore defining a continuous passageway extending from an input port of said connector member, and said connector member including means for coupling said input port to said outlet port of said syringe,

wherein said connector member includes at least two support portions spaced apart along the axis of said connector member central bore and an interface portion connecting said support portions, and

wherein the outer surfaces of said support portions are substantially identical in shape, said shape being adapted to interfit with said one support surface of said support member, whereby either of said support portions may be supported by said one support surface of said support member.

4,627,836

CARDIOVASCULAR PROSTHETIC DEVICES AND IMPLANTS WITH POROUS SYSTEMS

David C. MacGregor, 81 Wimbleton Road, Islington, Ontario, Canada

Division of Ser. No. 351,526, Feb. 23, 1982, Pat. No. 4,459,252, which is a division of Ser. No. 95,965, Nov. 20, 1979, Pat. No. 4,355,426, which is a division of Ser. No. 824,296, Aug. 15, 1977, Pat. No. 4,281,669, which is a continuation-in-part of Ser. No. 683,382, May 5, 1976, Pat. No. 4,101,984. This application Jun. 30, 1983, Ser. No. 486,796

Claims priority, application Canada, May 9, 1975, 226993; United Kingdom, Dec. 22, 1975, 52474/75; Canada, Aug. 13, 1976, 259054; United Kingdom, Oct. 19, 1976, 43407/76

Int. Cl.[4] A61M *11/00*

U.S. Cl. 604—93 **5 Claims**

1. A blood stream controlled release device comprising a hollow chamber containing a source of material to be released to blood and a porous surface of said chamber adapted to interface with a blood stream to establish communication between the blood stream and the interior of the chamber to permit said material release into the blood through a network of interconnected pores, said porous surface being formed of rigid material inert to blood and selected from metals, polymeric materials, ceramics and carbon, said porous surface having a porosity of at least 8% by volume up to the limit of coherence of the surface, an interstitial pore size of about 1 to about 1000 microns and a thickness up to 1 cm.

4,627,837

CATHETER DEVICE

German Gonzalo, 30 Oaklane Dr., Ottawa, Ill. 61350

Filed May 30, 1984, Ser. No. 615,399

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—101 **16 Claims**

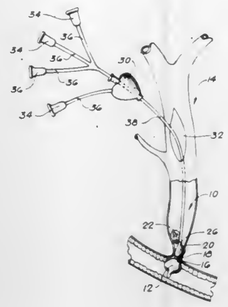
1. A catheter device for use in removing biliary stones, comprising:

a main channel;

means for removing biliary stones from the common duct mounted on said channel including an inflatable balloon and means for remotely inflating the same;

biliary stone removal means for removing biliary stones from the common duct;

anchoring means for securing the catheter in the common duct; and



fluid exuding means for flushing biliary stones as they are removed from the common duct, said fluid exuding means being connected to said balloon.

4,627,838

STYLET ACTUATED WINGED CATHETER

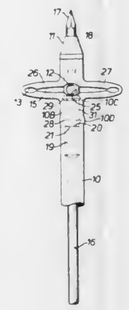
David E. Cross, Tyne and Wear; Robert D. Adams, Bristol, and Terence J. Floyd, Bath, all of England, assignors to Bard Limited, Sunderland, England

Filed Dec. 10, 1984, Ser. No. 679,947

Claims priority, application United Kingdom, Dec. 9, 1983, 8332983; Dec. 7, 1984, 8430924

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—105 **27 Claims**



1. A catheter comprising a patient (distal) end for location in a bodily cavity in a human or animal body, an outer (proximal) end to remain outside the body, a catheter tube which defines a fluid flow passage connecting the patient end and the outer end, a catheter retaining wind assembly immediately inward of the patient end which wing assembly is movable between a transport disposition wherein its diameter is substantially that of the flow passage and a retaining disposition wherein its diameter is sufficiently greater than that of the flow passage to prevent withdrawal of the patient end from the cavity, and actuating means removably received within and running the length of the catheter tube, said actuating means being manipulable from the said outer end for moving the retaining wing assembly from the transport disposition into the retaining disposition as said actuating means moves from said catheter tube through said outer end, and which is thereafter removed from the catheter, releasable latching means for releasably securing said actuating means to said catheter tube adjacent said patient end for movement of said patient end toward said outer end upon longitudinal retraction of said actuating means from said catheter tube through said outer end to effect said movement of said wing assembly into said retaining disposition, said latch means releasing upon predetermined increase in resistance to movement of said patient end, and means for providing said predetermined increase in resistance, said retaining wing assembly comprising first and second holding surfaces which interlock upon engagement, said first and second holding surfaces being spaced from one another in the transport disposition and engaging each other as the retaining wing assembly moves into the retaining disposition to sustain the retaining wing assembly on the retaining disposition.

4,627,839

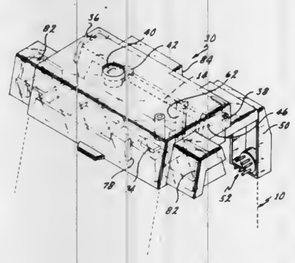
PATIENT CONTROLLED ANALGESIA CONVERSION

Joe W. Young, Laguna Hills, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Nov. 21, 1985, Ser. No. 800,281

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—121 **4 Claims**



1. An accessory for converting a programmable infusion pump to a patient-controlled analgesia device, comprising:

(a) a converter shaped to fit on said pump, said converter having a cover portion movable between an open position in which said converter is releasable from said pump and a closed position in which said converter can be secured to said pump;

(b) lockout switch means on said converter for preventing modification of the program of said infusion pump when said cover portion is closed, said lockout switch means being inaccessible when said cover portion is closed;

(c) dosing switch means attached to said converter for triggering operation of said pump under patient control, said dosing switch means being accessible when said cover portion is closed;

(d) connector means on said converter for electrically connecting said switch means to said pump;

(e) connector latching means for releasably holding said connector means in engagement with said pump, said latching means being inoperable to release said connector means when said cover portion is closed; and

(f) locking means for selectively locking said cover portion into said closed position and to secure said converter to said pump.

4,627,840

FLOW MONITORING DEVICE

Emilio Cuadra, and Roberto DelValle, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Jan. 28, 1985, Ser. No. 695,303

Int. Cl.[4] A61M *5/00*

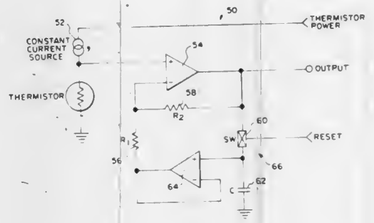
U.S. Cl. 604—151 **17 Claims**

1. A pulsatile flow monitoring device in combination with an implantagle drug delivery system which includes a solenoid actuated pump and which delivers a drug in quantatized liquid doses at measured intervals, said pulsatile flow monitoring device comprising:

a liquid conduit for conveying liquid drug doses, said conduit having a wall establishing a lumen in said conduit and an inside wall surface and an outside wall surface, said conduit wall having a portion of normal thickness and a reduced-in-thickness portion which is at least moderately thermally conductive;

temperature sensing means mounted to said liquid conduit on the outside surface of the reduced-in-thickness wall portion for transducing the temperature of the reduced-in-thickness wall portion, the temperature of which varies with the flow of liquid drug doses;

an electrical power supply coupled to said temperature sensing means for providing electrical energy to said temperature sensing means;



regulating means coupled to said power supply for determining a rate at which electrical energy is provided to said temperature sensing means during preselected and discrete power delivery intervals related to said measured intervals; and

measuring means coupled to said power supply and temperature sensing means for measuring the rate parameters at which electrical energy is consumed by said temperature sensing means, the consumption rate being proportional to the reduced-in-thickness wall temperature of said conduit and thus proportional to the flow of liquid drug doses.

4,627,841

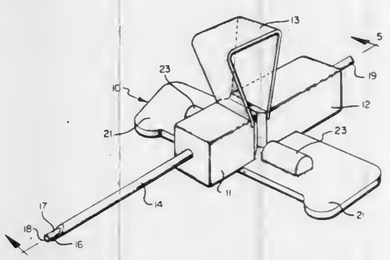
INFUSION NEEDLE

Robert T. Dorr, 1130 S. Avenida Conalea, Tucson, Ariz. 85748

Filed Feb. 18, 1986, Ser. No. 830,076

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—158 **5 Claims**



1. An infusion device comprising:

a catheter having a blunt end;

a catheter hub attached to said catheter and spaced from said blunt end;

a hollow needle having a first end and a sharpened tip at a second end,

a needle hub attached to said needle at said first end;

said catheter being telescopically received in said needle with said needle hub adjacent said catheter hub,

the telescoping respective lengths of said catheter and said needle being such that said blunt end of said catheter

protrudes from said sharpened tip of said needle when said hubs are in contact;

spring means interconnecting and biasing said hubs toward each other; and

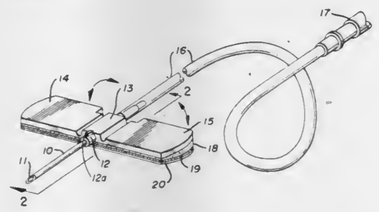
wedge means mounted on one of said hubs and insertable between said hubs to separate said hubs against the restoring force exerted by said spring means a distance sufficient to cause said sharpened tip of said needle to protrud beyond said blunt end of said catheter.

4,627,842

INTRAVENOUS NEEDLE ASSEMBLY

William Katz, 548 Gypsy La., Youngstown, Ohio 44505

Filed Nov. 19, 1984, Ser. No. 672,926
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—177 **4 Claims**



1. An improvement in an intravenous needle assembly having an elongated flexible body member with a central section and oppositely extending sections wih respect thereto and a hollow needle having a beveled end positioned through said central section transversely of said elongated flexible body member on a transverse horizontal plane; the improvement comprising first means for tilting said elongated flexible body member, and the hollow needle from said transverse horizontal plane to an angular transverse plane with respect to said transverse horizontal plane when said assembly is applied to a patient's skin, and secondary means for rotating said hollow needle on its longitudinal axis, said first means comprising at least one longitudinally extending transversely tapered resilient pad positioned on said elongated flexible body member in oppositely disposed relation to said central section and said hollow needle and said secondary means comprising a cylindrical member rotatably located in said central section and transversely of said elongated flexible body member, said hollow needle positioned in said cylindrical member on said transverse horizontal plane whereby positioning said hollow needle of said assembly through a patient's skin and into a vein of said patient and engaging said tapered pad on said patient's skin tilts said central section and said hollow needle relative to said patient's skin and vein and spaces the beveled end of said hollow needle in unencumbered relation to the walls of said vein.

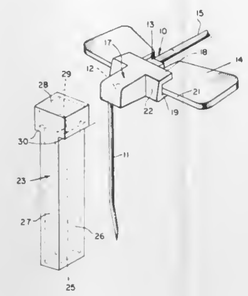
4,627,843

GUARD FOR RIGHT ANGLE INFUSION NEEDLE

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 747,569, Jun. 24, 1985. This application Sep. 26, 1985, Ser. No. 780,310
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—263 **8 Claims**

1. A guard for a right angle infusion needle having a wing and finger pad attachment comprising an elongated trough-like body portion having an open side and being adapted to receive and protect the shank of the infusion needle, and a socket extension on one end of the trough-like body portion and extending at right angles to said body portion, said socket extension having a cross-sectional shape corresponding to the shape of a part of said wing and finger pad attachment and



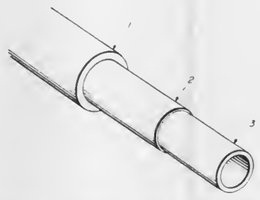
receiving said part to releasably hold the infusion needle assembled with said guard.

4,627,844

TRI-LAYER TUBING

Jerry A. Schmitt, Lionville, Pa., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Filed Oct. 30, 1985, Ser. No. 792,904
Int. Cl.[4] A61M *5/325, 25/001*
U.S. Cl. 604—264 **5 Claims**



1. A coextruded tri-layered medical-surgical tubing for the administration of common medicines such as insulin and nitroglycerin solutions, said tubing comprising an outer layer of polyvinyl chloride, a core layer of low-density polyethylene, and an intermediate layer of an ethylene-vinyl acetate copolymer interposed between said outer layer and said core layer.

4,627,845

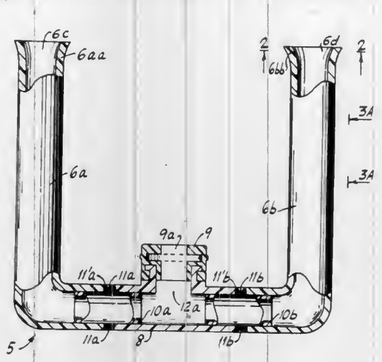
EYES-BATHING FAUCET-MATEABLE STRUCTURE

Frank E. DeMotte, MR-18 Blue Mill Rd., Morristown, N.J. 07960

Filed Dec. 4, 1984, Ser. No. 678,052
Int. Cl.[4] A61H *35/00*
U.S. Cl. 604—295 **5 Claims**

1. An eye-bathing device for mating with a faucet, comprising in combination: portable tubular structure separate from non-portable water faucet structure, and having a water-inlet end and having water-outlet ends interconnected by tubular through space therebetween adapted for continuous flow of water into and from said water-inlet end to and out-of said water-outlet ends said tubular through space including means for slidable adjustment to lesser or greater distances of space between said water-outlet ends and said water-inlet end comprising a water-faucet flexible-attaching means adapted for detachably intermittently mounting and mating said water-inlet end on a rigid spigot-outlet structure of a conventional water-faucet for continuous passage of water from the conventional water-faucet through the water-inlet end into said tubular space, and said water-outlet ends being substantially oval in

shape of circumscribing walls of outlet space of the water-outlet ends and being of a predetermined size such that the water-outlet ends are comfortably substantially fitable against or adjacent the eyes of a person while bathing water is continuously exiting the water-outlet ends, said water-outlet ends having circumscribing walls substantially flared, and there being two of said water-outlet ends spaced-apart a predeter-



mined distance such that the two spaced-apart water-outlets are substantially alignable with paired eyes of an individual concurrently washing both eyes with water continuously flowing from the two spaced-apart water-outlet ends, and the water-faucet attaching means including alternate-faucet-attaching structure of flexible composition adapted to be mateable on faucet structures of the different conventional shapes and structures.

4,627,846

INCONTINENCE SHIELD FOR MEN

Maj I. Ternström, Mölnlycke, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

Filed Jun. 12, 1984, Ser. No. 620,081
Claims priority, application Sweden, Jun. 27, 1983, 8303663
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 **10 Claims**



1. An incontinence shield for men intended to embrace the penis of the wearer either fully or partially in a container-like fashion, and comprising an outer-side made of liquid-impermeable material, an innerside made of liquid-permeable material, and an intermediate body of absorbent material, the shield further comprising a front-piece, a back-piece and a centre-piece which connects said front-piece and said back-piece and is narrower than said pieces and forms the bottom of said container; the shield being arranged to embrace both the penis and the scrotum of the wearer;

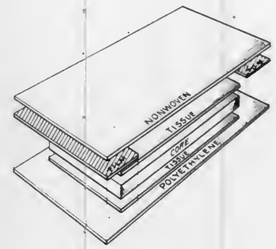
the back-piece having a slit or recess which extends from the free edge thereof; wing-like portions formed by said slit or recess and located on respective sides thereof adapted to be clamped securely against the body of the wearer, beneath the scrotum thereof, the absorbent body being soft and compressible, and in addition to functioning as an absorption medium being also arranged to impart a given requisite stability to said wing-like portions, so as to be compressibly mouldable beneath the scrotum of the wearer, thereby to hold the shield firmly in position.

4,627,847

HOT MELT ADHESIVE WASTE BARRIER

Paul P. Puletti, and Stanley J. Decowski, Jr., both of Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 3, 1985, Ser. No. 719,196
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 **1 Claim**



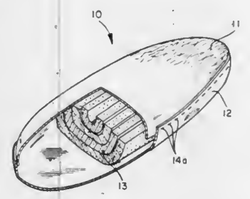
1. A disposable diaper comprising an absorbent core encased in an outer layer, wherein the outer layer comprises a liquid permeable nonwoven topsheet and a liquid impermeable backsheet portion; the diaper being provided with a leakage resistant waste barrier formed by coating a water insoluble or water impermeable hot melt adhesive onto the lateral end portions of the surface of the nonwoven topsheet which is in contact with the core, the barrier extending over a portion of the lateral end of the absorbent core.

4,627,848

ANATOMICAL PAD

Frederich O. Lassen; Dianne S. Masten, both of Winnebago County; Cheri L. Schultz, and Robert J. Peerenboom, both of Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 23, 1984, Ser. No. 603,064
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—370 **30 Claims**



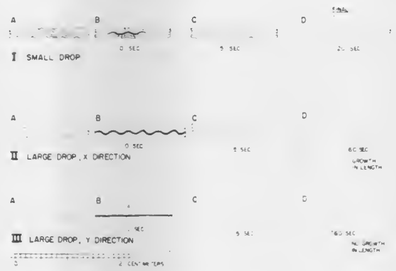
1. An elongate anatomical pad having a leading end and a distal end with an absorbent matrix, a fluid pervious cover overlying said absorbent matrix and a fluid impermeable baffle surrounding the portion of the absorbent matrix opposite said cover said absorbent matrix being ellipsoidal in horizontal and in vertical cross section dimensioned to be positioned essentially completely within the vulva with said device not contacting vaginal walls within the vulva with said device not contacting vaginal walls after positioning wherein the oval contour of the pad's vertical cross section enables said pad to mold against the folds of the labia providing a seal against fluid leakage and wherein said pad comprises a series of U-shaped absorbent layers with their layer orientation such that the longitudinal axis of the U is in the same direction as the longitu-

dinal axis of said pad and the ends of said U-shaped layers are adjacent said previous cover.

4,627,849
TAMPON

Richard R. Walton, Boston; Richard C. Walton, East Orleans; George E. Munchbach, Roslindale, all of Mass., and Robert W. Young, New York, N.Y., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 393,543, Jun. 30, 1982, abandoned.
This application Jul. 11, 1985, Ser. No. 754,669
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—379 **33 Claims**



1. A tampon for absorbing menstrual discharge comprising at least one layer formed of absorbent fibers, said layer being in a prethickened, preshortened microundulated state as a result of longitudinal micro-compressive pretreatment prior to incorporation by subsequent compression into the form of said tampon,

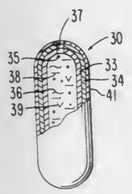
said layer being characterized by being preshortened at least 20% of its original length in the direction of pretreatment, there being at least 10 microundulations per inch in said layer in the direction of said pretreatment, adjacent microundulations in said layer residing with their sides abutting one another, with the length of a microundulation being generally of the order of the thickness of said prethickened layer,

the microundulations of said layer being shape-retentive when dry with stored mechanical energy and being responsive to moisture to cause release of mechanical energy to expand in the direction of treatment of the layer to cause rapid expansion of said tampon during use.

4,627,850
OSMOTIC CAPSULE

Joseph C. Deters, Mountain View; Felix Theeuwes, Los Altos; Kevin J. Mullins, Berkeley, and James B. Eckenhoff, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calff.

Filed Nov. 2, 1983, Ser. No. 548,219
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—892 **26 Claims**



1. An osmotic capsule for the delivery at a controlled rate of a beneficial agent formulation to a fluid environment of use, the osmotic capsule comprising:

(a) a lamina comprising in at least a part of a semipermeable composition that substantially maintains its integrity in the environment of use, is permeable to the passage of fluid present in the environment of use, and substantially impermeable to the passage of a beneficial agent formulation, the lamina surrounding:

(b) a capsule comprising a hydrophilic body and a matching cap telescopically joined to define a lumen;

(c) a beneficial agent formulation in the lumen, said formulation a member selected from the group consisting of solid, powdered, pulverized, micronized and particle formulations that form, when the osmotic capsule is in operation in the environment of use in the presence of fluid that enters the osmotic capsule, a member selected from the group consisting of a solution and suspension; and,

(d) at least one orifice through the lamina and the capsule communicating with the lumen and the exterior of the osmotic capsule for delivering the beneficial agent formulation from the osmotic capsule.

4,627,851
COLONIC-THERAPEUTIC DELIVERY SYSTEM

Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 665,332
Int. Cl.[4] A61K *9/22, 9/24*
U.S. Cl. 604—892 **5 Claims**

1. An osmotic device for delivery a drug to a biological environment of use, said device comprising:

(a) a shaped laminated wall comprising: (1) a first lamina comprising a semipermeable composition permeable to the passage of fluid and substantially impermeable to the passage of drug; (2) a second lamina comprising a polymer and a salt of a fatty acid, said second lamina permeable to the passage of fluid; and a third lamina comprising a member selected from the group consisting of cellulose acetyl phthalate, cellulose diacetyl phthalate, cellulose triacetyl phthalate, cellulose acetate phthalate, hydroxypropylmethyl cellulose phthalate, cellulose ester phthalate, cellulose ether phathalate, sodium cellulose acetate phthalate, methyl cellulose phthalate, and hydroxypropl cellulose phthalate; said laminated wall surrounding and defining:

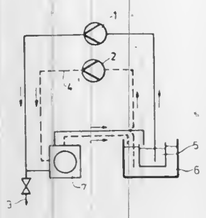
(b) a compartment containing a dosage amount of a beneficial drug formulation; and,

(c) at least one passageway through the laminated wall communicating with the compartment and the exterior of the osmotic device for dispensing the drug formulation from the device to the environment of use.

4,627,852
ACTIVE COMPOUND RELEASE SYSTEMS

Miklos von Bittera, Leverkusen, and Rolf-Volker Meyer, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,977
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347278
Int. Cl.[4] A61F *7/02*
U.S. Cl. 604—897 **15 Claims**



1. In a medical plaster comprising a covering layer which is essentially impermeable to the active compound, an active compound reservoir layer and a protective layer which can be pulled off and which is essentially impermeable to the active compound, the improvement wherein the reservoir layer contains about 1–30% of active compound comprising an antiphlogistic in an elastomer mixture comprising a diene rubber which can optionally be randomly copolymerised with an α-olefin, mixed with from 0 up to about 70% by weight of a polyisobutylene, polybutadiene oil and/or paraffin oil, and a tackifying resin.

4,627,853
METHOD OF PRODUCING PROSTHESES FOR REPLACEMENT OF ARTICULAR CARTILAGE AND PROSTHESES SO PRODUCED

Todd D. Campbell, Corona, and Aws S. Nashef, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 29, 1985, Ser. No. 738,994
Int. Cl.[4] A61F *2/28, 2/38;* **A61K** *35/32*
U.S. Cl. 623—16 **10 Claims**



1. A method of producing a prosthesis for replacing articular cartilage comprising:

(a) machining a bone segment into a desired shape,

(b) differentially demineralizing said bone segment to produce both demineralized and non-demineralized portions of said bone segment, such that demineralized portion has a spongy texture similar to natural cartilage, and the non-demineralized portion is a matrix into which adjacent host bone grows,

(c) tanning said bone segment to render it non-antigenic, biocompatible and stable.

4,627,854

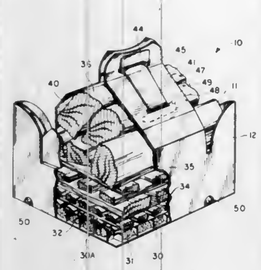
SELF-CONTAINED LOG FIRE STARTING KIT

Lawrence M. Pratt, Los Gatos, Calif., assignor to Firebox Corporation, Los Gatos, Calif.

Filed Nov. 4, 1985, Ser. No. 794,643

Int. Cl.[4] C10L *11/00*

U.S. Cl. 44—40 1 Claim



1. A fire building kit comprising:

a carton made of combustible material and having a bottom wall, side walls and a handle extending from two side walls and over the top of said carton;

a spacer on said bottom wall;

kindling made of a combustible material resting on said spacer;

a plurality of first elongated logs of small cross section horizontally positioned on said kindling in layers with each layer being of first logs extending normal to the logs of the adjacent layer;

a plurality of second logs of greater cross section being positioned on said first logs and extending normal to said handle so as to be held tightly when the carton is lifted by said handle; and

a highly combustible fire starter such as paper inside said spacer whereby when said kindling is ignited, the first logs will burn evenly and provide a level platform during the ignition and burning of said second logs.

4,627,855

METHOD OF PREPARING AN AQUEOUS SLURRY OF SOLID CARBONACEOUS FUEL PARTICLES AND AN AQUEOUS SLURRY SO PREPARED

Mait M. Mathiesen, Summit, N.J., and Kent O. Svensson, Helsingborg, Sweden, assignors to AB Carbogel, Helsingborg and Berol Kemi AB, Stenungsund, both of, Sweden, a part interest

Filed Aug. 17, 1984, Ser. No. 419,996

Claims priority, application United Kingdom, Aug. 26, 1983, 8323011

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 17 Claims

1. A method of preparing an aqueous slurry of about 65 to about 80% by weight of solid carbonaceous fuel particles consisting essentially of the following steps:

(a) conditioning the surfaces of said solid carbonaceous fuel particles by exposing them to the action of a reagent consisting essentially of at least about 0.0001% by weight, based upon the weight of the solid fuel particles, of a water-soluble chemical oxidising agent other than air to oxidise said surfaces and make the more hydrophilic and

(b) suspending the thus-conditioned carbonaceous fuel particles in water with the aid of a dispersion-producing amount of a water-soluble surface-active dispersant,

provided, however, that when the oxidising agent is oxygen, it is used in the presence of a catalyst.

4,627,856

PROCESS FOR THE ADSORPTIVE SEPARATION OF STEAM AND A LESS READILY ADSORBABLE COMPONENT FROM A GASEOUS STREAM

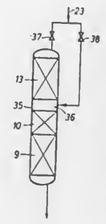
Ulrich von Gemmingen, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,670

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345438

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—31 8 Claims



1. In a process for the adsorptive separation of steam and less readily adsorbable component from a gaseous stream comprising passing the gaseous stream during an adsorption phase to the inlet end of an adsorber and withdrawing from the outlet end of the adsorber the gaseous stream depleted of steam and less readily adsorbable component; terminating the adsorption phase; passing a hot scavenging gas through the adsorber and withdrawing from the adsorber a scavenging gas loaded with desorbed less readily adsorbable component and steam; the improvement, in which the gaseous stream is air and the less readily adsorbable component is carbon dioxide which comprises passing the air stream during the adsorption phase, through two series-connected adsorption beds where the two adsorption beds are arranged in an adsorber common to both of them, the first adsorption bed being subdivided into two layers, wherein essentially only steam is adsorbed in the first layer contiguous to the inlet end of the adsorber, and wherein steam and carbon dioxide are absorbed in the second layer, the first adsorption bed in the adsorber contains alumina gel in the first layer and a zeolite molecular sieve in the second layer, and in the first adsorption bed, essentially the entire amount of steam is adsorbed and in the second adsorption bed, substantially only carbon dioxide is adsorbed; and passing the scavening gas during a first part of the hot-scavening phase, directly to the outlet end of the second adsorption bed and during a second part of the hot scavenging phase, directly to the outlet end of the first adsorption bed; and withdrawing, during a first and second part of the hot-scavenging phase, scavenging gas loaded with desorbed carbon dioxide and steam from the first adsorber inlet end.

8. In a process for the adsorptive separation of methanol and less readily adsorbable component from a gaseous stream comprising passing the gaseous stream during an adsorption phase to the inlet end of an adsorber and withdrawing from the outlet end of the adsorber the gaseous stream depleted of methanol and less readily adsorbable component; terminating the adsorption phase; passing a hot scavenging gas through the adsorber and withdrawing from the adsorber a scavenging gas loaded with desorbed less readily adsorbable component and methanol; the improvement in which the gaseous stream is air and the less readily adsorbable component in carbon dioxide which comprises passing the air stream during the adsorption phase, through two series-connected adsorption beds where the two adsorption beds are arranged in an adsorber common to both of them, the first adsorption bed being subdivided into two layers, wherein essentially only methanol is adsorbed in the first layer contiguous to the inlet end of the adsorber, and wherein methanol and carbon dioxide are adsorbed in the

second layer, the first adsorption bed in the adsorber contains alumina gel in the first layer and a zeolitic molecular sieve in the second layer, and in the first adsorption bed, essentially the entire amount of methanol is adsorbed and in the second adsorption bed, substantially only carbon dioxide is adsorbed; and passing the scavenging gas during a first part of the hot-scavenging phase, directly to the outlet end of the second adsorption bed and during a second part of the hot scavenging phase, directly to the outlet end of the first adsorption bed; and withdrawing during a first and second part of the hot-scavenging phase, scavenging gas loaded with desorbed carbon dioxide and methanol from the first adsorber inlet end.

4,627,857

CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Johnstown, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Division of Ser. No. 561,005, Dec. 13, 1983, Pat. No. 4,526,887, which is a continuation-in-part of Ser. No. 475,797, Mar. 16, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 709,467

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—70 **20 Claims**

1. A process for separating gas mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes comprising passing the gas through a carbon molecular sieve prepared from a naturally occurring substrate and selected from the group consisting of molecular sieves having:

(a)

(i) an oxygen diffusivity of 800×10^{-8} cm^2/sec or less; and

(ii) a diffusivity ratio of oxygen to nitrogen of 15 to 100;

(b)

(i) an oxygen diffusivity of 600×10^{-8} cm^2/sec or less; and

(ii) a diffusivity ratio of oxygen to nitrogen greater than 100; and

(c)

(i) an oxygen diffusivity greater than 800×10^{-8} cm^2/sec; and

(ii) a diffusivity ratio of oxygen to nitrogen greater than 5; here the diffusivity is measured using a starting gas pressure of one atmosphere (+/−5%) at a temperature of 25° +/−5% for 30 seconds.

4,627,858

VACUUM CLEANER FILTER

Gernot J. M. Jacob, Weissach-Flacht, Fed. Rep. of Germany, assignor to Progress - Electrogeraete, Fed. Rep. of Germany

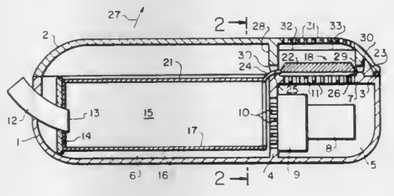
PCT No. PCT/EP84/00358, § 371 Date Jul. 11, 1985, § 102(e) Date Jul. 11, 1985, PCT Pub. No. WO85/02100, PCT Pub. Date May 23, 1985

PCT Filed Nov. 12, 1984, Ser. No. 756,978

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341458

Int. Cl.[4] B01D *46/02*; **A47L** *9/14*

U.S. Cl. 55—126 **13 Claims**



1. A vacuum cleaner comprising a housing, an air inlet channel connected to said housing at one location and an air outlet for discharging exhaust air in said housing at a spaced location from said inlet channel, a dust collecting chamber in said housing, a filter dust bag in said dust collecting chamber connected to said inlet channel, a motor-fan unit in said housing, an exhaust air filter adjacent to said air outlet, a connecting piece connecting said filter dust bag to said exhaust air filter whereby said filter dust bag is positioned upstream of said motor-fan unit and said exhaust air filter is positioned downstream of said motor-fan unit.

4,627,859

FACILITATED GAS ENRICHMENT MEMBRANE COMPOSITES AND A PROCESS FOR THE PREPARATION THEREOF

Joseph J. Zupancic, Bensenville, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 15, 1985, Ser. No. 702,172

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—158 **22 Claims**

1. A facilitated gas enrichment membrane composite which comprises an organometallic gas carrier interdispersed within an interpenetrating polymer network matrix, said interpenetrating polymer network matrix being comprised of (1) an isocyanate-capped polymer physically entwined with (2) a nitrogen-containing polymer, said component (1) being physically entwined with component (2) by means of a substituted polyurea, said polyurea being formed by the curing of said membrane at a temperature in the range of from about ambient to about 100° C. in an atmosphere which possesses relative humidity in the range of from about 0% to about 100% for a period of time sufficient to generate an amine-capped polymer by the hydrolysis of a portion of said isocyanate-capped polymer, with said amine-capped polymer subsequently reacting with a portion of the isocyanate groups present in said membrane to form a substituted polyurea which serves to physically entwine said component (2) in said membrane, said organometallic gas carrier being interdispersed within said interpenetrating polymer network, capable of reversible reaction with oxygen or other gases and comprising a transition metal complexed with an organic compound selected from the group consisting of porphyrins, phthalocyanines, derivatives thereof and phosphorus complexes.

4,627,860

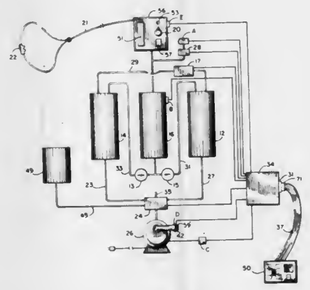
OXYGEN CONCENTRATOR AND TEST APPARATUS

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation-in-part of Ser. No. 634,595, Jul. 26, 1984, Pat. No. 4,561,287, which is a continuation-in-part of Ser. No. 396,705, Jul. 9, 1982, Pat. No. 4,516,424. This application Mar. 18, 1985, Ser. No. 713,339

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—162 **26 Claims**



1. In an oxygen concentrator comprising

a plurality of molecular sieve beds for alternately receiving atmospheric air for selectively adsorbing nitrogen therefrom to increase the oxygen concentration of an oxygen enriched product gas recovered therefrom,

a reservoir for receiving said product gas from said sieve beds and flow control means for selecting the withdrawal rate of said product gas from said reservoir,

a compressor including means for providing line voltage for operating said compressor, and

a valve cooperating with said compressor for alternately charging said sieve beds with atmospheric air and timing means for switching said valve to alternately charge said sieve beds according to a timing cycle, the improvement comprising

(a) flow rate sensing means independent of said flow control means for sensing the rate of withdrawal of product gas from said reservoir and for communicating the sensed rate of withdrawal of said product gas to a modem,

(b) oxygen-sensing means for sensing the oxygen concentration in said oxygen enriched product gas and for communicating the sensed oxygen concentration in said product gas to a modem,

(c) a modem for receiving quantitative signals communicated from said flow rate sensing means and said oxygen sensing means and for transmitting said signals to a remote test apparatus, and

(d) a remote test apparatus in telephonic communication with said modem for receiving transmitted signals from said modem and having means for displaying the flow rate and oxygen concentration of said product gas.

16. In an oxygen concentrator for increasing the oxygen concentration of a gaseous mixture comprising a valve having a first position for charging atmospheric air under pressure from a compressor into a molecular sieve bed and selectively adsorbing nitrogen therefrom to produce an oxygen enriched gaseous product and a second position in which desorbed nitrogen is released from said sieve bed, a reservoir for receiving said gaseous product from said sieve bed and flow control means for selecting the withdrawal rate of said product gas from said reservoir, the improvement comprising:

(a) flow rate sensing means independent of said flow control means for sensing the flow rate of gaseous product withdrawn from said reservoir and means for communicating the sensed flow rate to a microprocessor,

(b) oxygen sensor for sensing the oxygen concentration of said gaseous product and means for communicating the measured oxygen concentration to a microprocessor,

(c) a microprocessor cooperating with said flow rate sensing means and said oxygen sensor for receiving quantitative signals therefrom and memory means for storing the last determined gaseous product flow rate and sensed oxygen concentration, and

(d) a testing apparatus removably connected with said microprocessor having selective digital display means for displaying the gaseous product flow rate and sensed oxygen concentration received from said microprocessor.

4,627,861

OIL SEPARATOR

Yoshiro Ibaraki, Ibaraki; Toshiaki Kawabata, Tokyo; Tsuneo Kan, Ibaraki, and Atsuo Kishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 352,378, Feb. 25, 1982. This application Apr. 12, 1984, Ser. No. 599,485

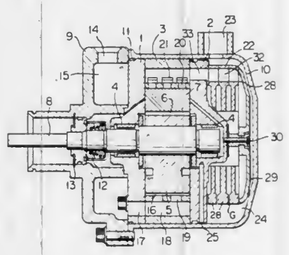
Claims priority, application Japan, Mar. 6, 1981, 56-31325; Dec. 21, 1981, 56-205347

Int. Cl.[4] B01D *45/02, 45/06, 50/00*

U.S. Cl. 55—278 **6 Claims**

1. An oil separator installed in a compressed gas discharge section of a gas compressor to separate oil from exhausted gas containing refrigerant gas and minute particles of oil in the refrigerant gas, the oil separator comprising:

a plurality of grooved plates each formed with a plurality of grooves on opposite surfaces thereof and with openings serving as passageways for the exhausted gas, a blind plate and upper and lower partition wall portions on each plate, said grooved plates being arranged in juxtaposed, spaced apart, parallel relationship, said blind plate being disposed at one end of the plurality of grooved plates, said exhausted gas passageways of each grooved plate being sealingly aligned with passageways of adjacent grooved plates to introduce the exhausted gas therethrough toward said blind plate, said grooves are arranged so as to extend in a substantially vertical direction, said blind plate is disposed outwardly of the grooved plate most remote from the compressor discharge section, said blind plate cooperating with the grooved plates so that the exhausted gas introduced through the gas passageways impinges on



the blind plate and changes direction, said gas passageways are formed in peripheral portions of each of said grooved plates, at least one additional opening is provided in each of the grooved plates in a central area so that the exhausted gas flows through the spaces between adjacent grooved plates substantially at right angles to the grooves, said upper and lower partition wall portions prevent the exhausted gas from flowing parallel to the grooves in the grooved plates, said partition wall portions being substantially at right angles to said grooves, the grooved plates closely contact each other at the upper partition wall portions and have a gap between the lower partition wall portions, whereby the oil can be trapped by the grooved plates and flow along the grooves by gravity through the gap between lower partition wall portions.

4,627,862

AIR CLEANING APPARATUS

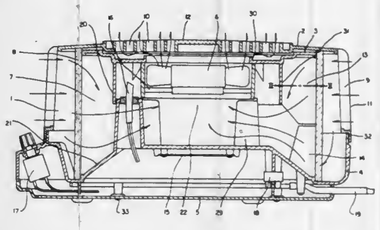
Roland Frei, and Franz Gutmann, both of Rebstein, Switzerland, assignors to Plaston AG, Widnau, Switzerland

Filed Jan. 31, 1985, Ser. No. 696,778

Claims priority, application Switzerland, Feb. 7, 1984, 565/84

Int. Cl.[4] B01D *50/00*

U.S. Cl. 55—316 **6 Claims**



3. An air cleaning apparatus comprising a housing having inlet opening means for admitting air into said housing and outlet opening means for delivering cleaned air therefrom, a motor unit including an axial air circulating fan having an inlet extending about the axis of said axial air circulating fan, and filter means for cleaning the air admitted into said housing, said

housing comprising first and second housing parts defining a chamber therebetween, said motor unit being located in said chamber, each of said first and second housing parts having surface means thereon facing each other and defining an air channel at least partially circumscribing said motor unit and extending about the axis of said axial air circulating fan for conducting air from said inlet opening means to said inlet of said axial air circulating pump, said inlet opening means being arranged on the side of said housing located radially outwardly of said air channel, said outlet opening means being located on the axis of said axial air circulating fan and in an end surface of said housing extending transverse to the axis of said axial air circulating fan, said filter means being in the form of a shell located between said inlet opening means and said air channel in circumscribing relationship relative to said air channel, and said filter shell completely enclosing said air channel, said surface means on said first and second housing parts having air flow conducting surface portions converging toward said axial air circulating fan at least in the vicinity of said inlet.

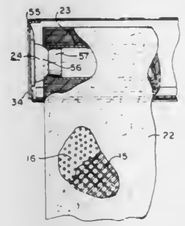
5. An apparatus as set forth in claim 3 wherein the filter shell is formed of a plurality of layers of which at least one layer contains active carbon and another layer consists of electrostatically charged nonwoven material.

4,627,863

FILTER FOR AIR HANDLING EQUIPMENT

Max Klein, P.O. Box 3, Dalton, N.J. 01226

Filed Jul. 31, 1985, Ser. No. 761,018
Int. Cl.[4] B01D *46/18*
U.S. Cl. 55—354 **15 Claims**



1. For an air-handling housing having a vertically-oriented elongated air flow passage and a support structure in vertical registry with said passage, filter apparatus adapted to use a filter medium in continuous web form wound in a roll on a selected cylindrical core, said core comprising a hollow shell of resilient material having hollow ends, said apparatus comprising a storage chamber mounted on said support structure,

a discharge slot in said chamber adjacent one end of said passage and at least coextensive in width with said passage, and

means in said chamber adapted to mount said roll of filter medium in a position to afford dispensing of said filter medium web through said discharge slot, and

guide means below said discharge slot to slidably receive said filter medium web, said guide means extending from said slot across the entire length of said flow passage to slidably position said web in covering relationship thereto,

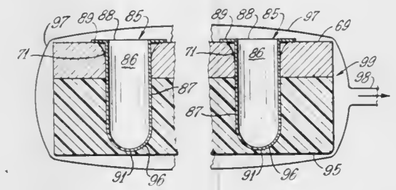
said mounting means in said chamber comprising a pair of axially aligned stub shafts fixedly mounted when in operating position against rotation and axial displacement in said chamber and spaced apart a given distance less than the length of the said selected core, and adapted to telescopically engage in the hollow ends of said core, the material of said core and said shafts providing confronting friction surfaces, said stub shafts being of rigid material and having expanding bell-shaped outlines for insertion into the hollow ends of the shell to frictionally engage said expanding outlines with the free ends of the shell, the shape and axial spacing of said shafts in said operating position being selected relative to the shape and axial spacing of said hollow ends of the core so as to produce a frictional drag affording controlled rotation of said roll as said web is dispensed through said slot by manual withdrawal.

4,627,864

METHOD OF MAKING GLASS FIBER FORMING FEEDERS

Mohinder S. Bhatti, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 9, 1984, Ser. No. 639,177
Int. Cl.[4] C03B *37/08;* **B23K** *35/24*
U.S. Cl. 65—1 **9 Claims**



1. A method of making an orificed discharge wall for supplying a plurality of streams of molten inorganic material to be attenuated into filaments comprising:

inserting elements in apertures in a member;

positioning said elements and member within a precured elastomeric sheath adapted to isostatically transmit pressure to said elements and member;

applying cold isostatic pressure to the sheathed elements and member to mechanically seal the elements to the member; and

fusing the mechanically sealed elements and member together to prevent the unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,627,865

PROCESS OF MANUFACTURING OPTICAL FIBERS OF EXTREMELY LOW LOSS IN THE MEDIUM INFRARED

Giacomo Roba, Turin, Italy, assignor to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 12, 1984, Ser. No. 650,296
Claims priority, application Italy, Sep. 15, 1983, 67956 A/83
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 **3 Claims**

1. In a process for manufacturing optical fibers of extremely low loss in transmission of infrared radiation, wherein a preform from which the fibers are drawn is made from metal fluoride glass obtained by vapor phase reaction and deposition on a substrate, the improvement wherein said glass is obtained by the reaction between a gaseous reactant containing fluorine and an organometallic compound of the formula

$$M(C_\gamma H_\delta)_\psi A_\eta$$

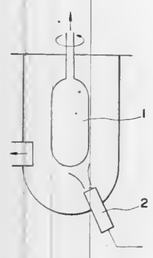
where M represents a metal whose fluoride is to be obtained by reactive synthesis, C is carbon, H is hydrogen, A is a halogen, and symbols γ, δ, ψ, η are all at least equal to one and represent the molecular coefficients of atoms C, H, of group CH and of halogen A respectively.

4,627,866

METHOD FOR PRODUCING OPTICAL FIBER PREFORM

Hiroo Kanamori; Gotaro Tanaka, both of Yokohama, and Kazunori Chida, Mito, all of Japan, assignors to Sumitomo Electric Industries Ltd., Osaka and Nippon Telegraph and Telephone Public Corporation, Tokyo, both of Japan

Filed Dec. 6, 1984, Ser. No. 679,030
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 **5 Claims**



1. A method for producing an optical fiber preform comprising the steps of:

injecting an oxide glass-forming raw material and oxygen gas from a primary nozzle, a gaseous fluorine-containing material and oxygen gas from a first nozzle which surrounds said primary nozzle or is surrounded by said primary nozzle, inert gas from a second nozzle which surrounds said first nozzle and said primary nozzle, and hydrogen gas from a third nozzle which surrounds said second nozzle,

flame hydrolyzing the glass-forming raw material to synthesize glass soot particles,

depositing the glass soot particles on a tip of a rotating seed rod until an optical fiber preform is formed, and

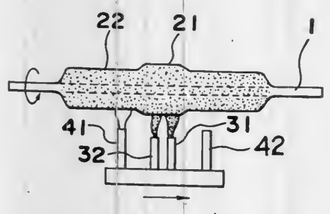
fusing the optical fiber preform to produce an oxide glass optical fiber preform containing fluorine.

4,627,867

METHOD FOR PRODUCING HIGHLY PURE GLASS PREFORM FOR OPTICAL FIBER

Gotaro Tanaka; Hiroo Kanamori, and Futoshi Mizutani, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 4, 1985, Ser. No. 708,051
Claims priority, application Japan, Mar. 7, 1984, 59-43640
Int. Cl.[4] C03B *37/018, 19/06*
U.S. Cl. 65—3.12 **1 Claim**



1. A method for producing a glass preform for an optical fiber by an outside vapor-phase deposition method, which comprises the steps of:

forming glass soot particles by jetting and combusting gaseous glass-forming raw material and fuel gas from a first burner, in the presence of oxygen,

depositing the particles on a seed rod with control being provided so as to form a soot rod at such a temperature that a specific bulk density $\rho/\rho 0$, wherein ρ is a bulk density of the soot rod and $\rho 0$ is a bulk density of perfectly sintered glass, of the soot rod being formed is from 0.02 to 0.1,

subsequently heating the soot rod by a second burner with control being provided so as to increase the bulk density of the soot rod to from 0.15 to 0.5, and then

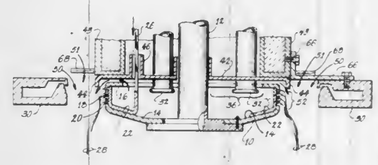
sintering the soot rod to obtain a transparent glass preform for an optical fiber.

4,627,868

METHOD AND APPARATUS FOR PRODUCING MINERAL FIBERS

Farrokh Kaveh, Dublin, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 19, 1985, Ser. No. 767,224
Int. Cl.[4] C03B *37/04*
U.S. Cl. 65—6 **11 Claims**



9. A method of producing mineral fibers comprising the steps of: flowing molten mineral material into a spinner having an orificed peripheral wall; rotating said spinner forcing the molten mineral material through said orificed wall to form fibers; forcing high velocity air against said fibers by means of a blower mounted circumferentially about said spinner in a spaced apart relationship with said spinner defining a gap between said blower and said spinner; inducing ambient air to flow through said gap by means of said high velocity air and controlling said induced ambient air flow by means of a screen mounted in said gap.

4,627,869

METHOD FOR INHIBITING AXILLARY BUD GROWTH

In-Kook Chang, Painesville, Ohio, assignor to SDS Biotech Corporation, Painesville, Ohio

Filed Jul. 12, 1984, Ser. No. 630,307
Int. Cl.[4] A01N *37/10*
U.S. Cl. 71—78 **2 Claims**

1. A method for inhibiting the growth and development of buds on plants, which method comprises contacting the plant with an effective amount of dimethyl 2,3,5,6-tetrachloroterephthalate.

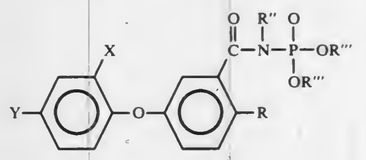
4,627,870

CERTAIN PHENOXY-BENZAMIDO-DIPHENYL-PHOSPHONATE ESTERS HAVING HERBICIDAL ACTIVITY

Sreeramulu Nagubandi, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 25, 1985, Ser. No. 704,988
Int. Cl.[4] C07F *9/24;* **A01N** *57/28, 57/30*
U.S. Cl. 71—86 **6 Claims**

1. A diphenyl ether derivative of the formula



and tautomers thereof wherein

X is selected from the group consisting of chlorine, bromine, iodine, fluorine, methyl, cyano or hydrogen;

Y is CF_nH_{3-n} or chlorine, wherein n is an integer from 0 to 3;

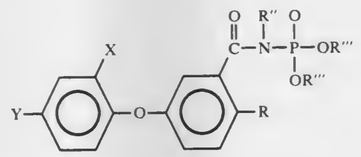
R is selected from the group consisting of nitro, hydrogen or halogen;

R'' is hydrogen, alkyl, phenyl wherein the alkyl group has from 1 to 10 carbon atoms;

R''' is the same or different and is selected from C_1-C_{10} alkyl, phenyl, or hydrogen; and

agriculturally acceptable salts thereof.

5. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



and tautomers thereof wherein

X is selected from the group consisting of chlorine, bromine, iodine, fluorine, methyl, cyano or hydrogen;

Y is CF_nH_{3-n} or chlorine, wherein n is an integer from 0 to 3;

R is selected from the group consisting of nitro, hydrogen or halogen;

R'' is hydrogen, alkyl, phenyl wherein the alkyl group has from 1 to 10 carbon atoms;

R''' is the same or different and is selected from C_1-C_{10} alkyl, phenyl, or hydrogen; and

agriculturally acceptable salts thereof.

4,627,871

HERBICIDAL 2-[4-SUBSTITUTED CARBOXYAMINO-PHENOXY (OR PHENYL MERCAPTO)]-SUBSTITUTED PYRIMIDINES

Klaus Sasse, Bergisch-Gladbach; Ludwig Eue, Leverkusen; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

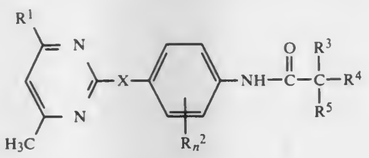
Filed May 24, 1985, Ser. No. 737,977

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422077

Int. Cl.[4] A01N *43/48;* **C07D** *239/02*

U.S. Cl. 71—92 **19 Claims**

1. A substituted carboxylic acid anilide of the formula



in which

X represents oxygen or sulphur,

R^1 represents hydrogen, halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, phenyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, or phenyl substituted with chlorine, trifluoromethyl and/or methyl,

R^2 represents halogen or methyl,

n represents 0, 1 or 2,

R^3 represents hydrogen, halogen, alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms substituted with fluorine, chlorine and/or bromine, phenyl, benzyl, phenyl or benzyl each substituted with fluorine, chlorine, bromine, trifluoromethyl, methoxy and/or methyl, or the radicals —OR^6 or —SO_m—R^6,

wherein

R^6 represents alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms substituted by fluorine, chlorine and/or bromine, phenyl, or phenyl substituted by fluorine, chlorine, bromine and/or alkyl with 1 to 4 carbon atoms, and

m represents 0, 1 or 2, and

R^4 and R^5 independently of one another represent halogen, alkyl with 1 to 6 carbon atoms or alkyl with 1 to 6 carbon atoms substituted by fluorine, chlorine and/or bromine, or

R^4 and R^5, together with the adjacent carbon atom, represent a carbocyclic ring with 3 to 8 ring carbon atoms optionally substituted by fluorine, chlorine and/or alkyl with 1 to 4 carbon atoms.

17. A method of combating weeds, which comprises applying to the weeds, or to their habitat, a herbicidally effective amount of a substituted carboxylic acid anilide as claimed in claim **1**.

4,627,872

2,4-DIAMINOPYRIMIDINES

Michael Schwamborn, Cologne; Engelbert Kühle, Bergisch-Gladbach; Ludwig Eue, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Hans-Joachim Santel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

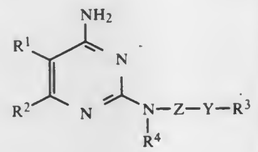
Filed Dec. 5, 1985, Ser. No. 806,053

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445293

Int. Cl.[4] A01N *43/54;* **C07D** *239/48*

U.S. Cl. 71—92 **6 Claims**

1. A 2,4-Diaminopyrimidine of the formula



in which

R^1 represents hydrogen or halogen,

R^2 represents optionally halogen-substituted alkyl with 1-6 C atoms, or represents halogen or alkoxy with 1-6 C atoms,

R^3 represents alkyl with 1-6 C atoms,

R^4 represents hydrogen or alkyl with 1-6 C atoms,

Y represents oxygen or sulfur and

Z represents branched or unbranched alkylene with 2 to 10 C atoms.

6. A method of combating weeds comprising applying to said weeds or to the location in which said weeds are growing a herbicidally effective amount of a 2-4-diaminopyrimidine of the formula according to claim **1**.

4,627,873

AGRICULTURAL SULFONAMIDES

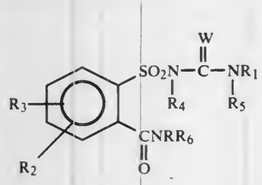
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 480,591, Mar. 30, 1983, Pat. No. 4,545,808, which is a division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Jul. 11, 1985, Ser. No. 753,892

Int. Cl.[4] C07D *251/50, 251/52, 251/44;* **A01N** *43/70*

U.S. Cl. 71—93 **20 Claims**

1. A compound selected from



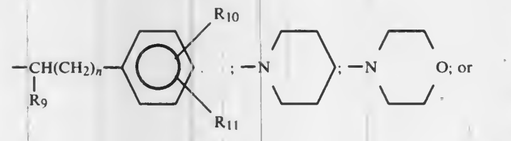
wherein

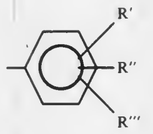
R is hydrogen, C_1-C_{12} alkyl, $(CH_2CH_2O)_{n'''}R_{12}$, $CH_2CH_2CH_2OR_{12}$, C_3-C_{10} alkenyl, C_3-C_6 alkynyl; C_3-C_8 cycloalkyl; C_5-C_6 cycloalkenyl;

R is also C_5-C_8 cycloalkyl substituted with 1 to 3 substituents selected from (a) 0-2 OCH_3 groups, (b) 0-3 CH_3 groups or (c) C_2H_5;

R is also trifluoromethylcyclohexyl, C_4-C_{10} cycloalkylalkyl, C_4-C_8 cycloalkyl substituted with 1-2 CH_3 groups, CH_2CN, CH_2CH_2CN, $C(CH_3)_2CN$, OCH_3, $N(CH_3)_2$;

R is also





n''' is 1, 2 or 3

R_{12} is CH_3, CH_2CH_3, $CH(CH_3)_2$ or phenyl;

n is 0, 1, 2 or 3;

R_9 is H or C_1-C_3 alkyl;

R_{10} is H, C_1-C_3 alkyl, Cl, Br, OCH_3 or OC_2H_5;

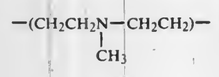
R_{11} is H, C_1-C_3 alkyl, Cl, Br, OCH_3 or OC_2H_5;

R' is H, C_1-C_4 alkyl, OCH_3, F, Br, Cl, CF_3, CN, NO_2, SO_2CH_3, SCH_3 or $N(CH_3)_2$;

R'' is H, C_1-C_4 alkyl, OCH_3, F, Br or Cl;

R''' is H, CH_3, Cl, F or Br;

R_6 is H, C_1-C_6 alkyl, allyl, CH_2CN, or CH_2CH_2CN, or R and R_6 may be taken together to form —$(CH_2)_4$—, —$(CH_2)_5$—, —$(CH_2)_6$—, —$(CH_2CH_2OCH_2CH_2)$— or



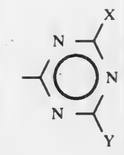
provided that

a. when R is OCH_3, then R_6 is CH_3;

b. when R_6 is CH_2CH_2CN or CH_2CN, then R is CH_2CH_2CN or CH_2CN; and

c. R and R_6 have a total number of carbon atoms less than or equal to 13;

R_1 is



R_2 is H, Cl, Br, F, C_1-C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN;

R_3 is H, Cl, Br, F or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3 or OCH_3;

W is O or S;

X is H, Cl, CH_3, OCH_3, OCH_2CH_3 or $OCH_2CH_2OCH_3$;

Y is H, F, Cl, Br, C_1-C_4 alkyl, C(O)L, C_1-C_4 alkyl substituted with (a) OCH_3, (b) OC_2H_5, (c) CN, (d) C(O)L or (e) 1-3 atoms of F, Cl or Br;

Y is also C_3-C_4 alkenyl, $CH_2C{\equiv}CR_{13}$, $A(CH_2)_{n'}A_1(C_1$-C_{13} alkyl), $ACH_2C(O)L$, $ACH(CH_3)C(O)L$, ACH_2CH_2-$C(O)L$, SCN, N_3, $NR_{16}R_{17}$, OR_{14} or SR_{15};

R_{13} is H, CH_3 or CH_2Cl;

n' is 2 or 3;

A is O or S;

A' is O, S or SO_2;

L is NH_2, OH, $N(OCH_3)CH_3$, $NH(C_1$-C_4 alkyl), $N(C_1$-C_4 alkyl)$_2$, or C_1-C_6 alkoxy;

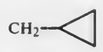
R_{16} is H or CH_3;

R_{17} is H, OCH_3, C_1-C_6 alkyl, C_1-C_4 alkyl substituted with (a) CN or (b) C(O)L;

R_{17} is also C_3-C_4 alkenyl, C_3-C_6 cycloalkyl or C_2-C_3 alkyl substituted with (a) OCH_3 or (b) OC_2H_5;

R_{16} and R_{17} may be taken together to form —$CH_2CH_2CH_2CH_2$— or —$CH_2CH_2OCH_2CH_2$—;

R_{14} is C_1-C_4 alkyl, C_2-C_4 alkyl substituted with 1-3 atoms of F, Cl or Br, C_1-C_4 alkyl substituted with CN, C_3-C_4 alkenyl, $CH_2C{\equiv}CR_{13}$, or



R_{15} is C_1-C_4 alkyl, allyl, propargyl or C_1-C_2 alkyl substituted with CN;

provided that

a. when Y is greater than or equal to 4 carbon atoms, then R is less than or equal to 4 carbon atoms; and

b. when X is Cl, then Y is Cl, and when X and Y are both H, then R is less than or equal to 4 carbon atoms.

17. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

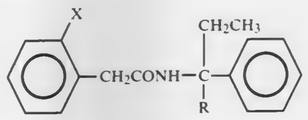
4,627,874

N-(α,α-DIALKYLBENZYL)-PHENYLACETAMIDE COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING SAID COMPOUNDS

Tetsuo Takematsu; Nobuyuki Kikkawa, both of Utsunomiya, and Hideaki Ogawa, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Division of Ser. No. 118,746, Feb. 5, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,142
Claims priority, application Japan, Feb. 7, 1979, 54-12211
Int. Cl.[4] A01N *37/18*; C07C *103/22*
U.S. Cl. 71—118 5 Claims

1. N-(α,α-dialkylbenzyl)-phenylacetamide compounds having the general formula



wherein X is a chlorine atom or a bromine atom, and R is a methyl group or an ethyl group.

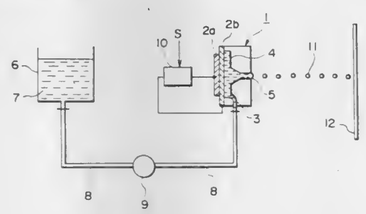
5. A herbicidal composition comprising (i) a herbicidal carrier, and (ii) a herbicidally effective amount of at least one comound as defined in any one of claims 1, 2, 3 or 4.

4,627,875

RECORDING LIQUID

Masatsune Kobayashi; Tsuyoshi Eida; Shoji Koike, all of Yokohama, and Keiko Nakousai, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 647,156, Sep. 4, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,590
Claims priority, application Japan, Sep. 12, 1983, 58-168547
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 4 Claims



1. A recording liquid which comprises (1) 0.1 to 20 weight percent C.I. Acid Red 8 as a recording agent for forming an image and (2) a liquid medium comprising at least
(a) 1 to 30 weight percent of a member selected from the group consisting of polyethylene glycol, polyethylene glycol monomethyl ether and a mixture thereof,
(b) 1 to 40 weight percent of a member selected from the group consisting of diethylene glycol, sulfolane and a mixture thereof,
(c) 1 to 40 weight percent of a member selected from the group consisting of N-methyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone and a mixture thereof, and
(d) 10 to 90 weight percent water; said weight percents being based on the total weight of the recording liquid.

4,627,876

PRINTING INK

Werner Fries, Weil der Stadt, and Karl-Wilhelm Klemm, Stuttgart, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 554,625, Nov. 23, 1983, abandoned. This application May 8, 1985, Ser. No. 731,765
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243532
Int. Cl.[4] C09D *11/06*
U.S. Cl. 106—27 14 Claims

1. In a printing ink which is deinkable from printed paper and which consists of pigment, an alkyd resin binder which has been modified with fatty acids having an iodine number below 20,
the improvement comprising said alkyd resin, at least 40% by weight, based on total binder content, comprising an epoxy alkyd resin which has an acid number below 11 and which has been prepared by reacting
(a) a compound selected from the group consisting of fatty acids having 6–20 carbon atoms, triglycerides of said fatty acids, or a mixture of said acids;
(b) a polyol;
(c) an epoxy resin having a molecular weight of 380–2,900, an epoxide equivalent weight of 175 to 2,050 and an ester equivalent weight of 80 to 200; and
(d) a dicarboxylic acid, the proportion of said epoxy resin amounting to 1 to 40 mole percent, based on the total amount of said polyol and said epoxy resin.

4,627,877

METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING A CEMENT CLINKER

Tadashi Ogawa, 12-10, Miyakubo 2-chome, Ichikawa-shi, Chiba-ken; Shunichiro Ono, 2-10, Kitamachi 4-chome, Kichijoji, Musashino-shi, Tokyo, and Kyoichi Shibuya, 7-6-203, Tsudanuma 3-chome, Narashino-shi, Chiba-ken, all of Japan

Division of Ser. No. 134,461, Mar. 27, 1980, Pat. No. 4,295,823. This application Jul. 30, 1980, Ser. No. 173,604
Claims priority, application Japan, Apr. 3, 1979, 54-39337
The portion of the term of this patent subsequent to Sep. 9, 2002, has been disclaimed.
Int. Cl.[4] C04B *7/02*
U.S. Cl. 106—100 11 Claims

1. An improved method for continuously producing a cement clinker, comprising the steps of:
feeding a cement material into a preheating or calcining region;
preheating or calcining said fed cement material in a predetermined temperature range;
forwarding said preheated or calcined cement material into a heating region;
heating said preheated or calcined cement material at a predetermined temperature to convert said cement material to a cement clinker;
moving said cement clinker into a cooling region;
cooling said cement clinker with cooling air to a decreased temperature, and;
flowing an exhaust gas from said heating region through said preheating or calcining region, which method is characterized by the steps of:
feeding a combustible material into a heat-decomposing region located betwen said heating region and said preheating or calcining region;
introducing at least a portion of said exhaust gas from said heating region into said heat-decomposing region to heat-decompose said combustible material and to generate a combustible gas therefrom;
introducing said combustible gas from said heat-decomposing region into said preheating or calcining region, and;
burning said combustible gas in said preheating or calcining region to preheat or calcine said cement material.

4,627,878

METHOD OF PRODUCING POROUS MAGNESIA CLINKER

Hiroshi Hagiwara, Urawa; Masaru Shirasaka, Tokyo, and Tsunenori Moriyama, Nagasaki, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi and Omura Refractories Co., Ltd., Nagasaki, both of, Japan

Filed Apr. 11, 1984, Ser. No. 599,068
Claims priority, application Japan, Apr. 14, 1983, 58-64591
Int. Cl.[4] C04B *3/00*
U.S. Cl. 106—121 2 Claims

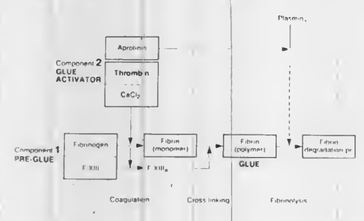
1. A method for producing a porous magnesia clinker comprising the steps of
(a) admixing a magnesia material having a grain size of less than about 0.1 mm with from about 10 to 60 percent by weight of the mixture of fluid oil coke having a grain size of about 1 mm or less;
(b) calcining the resulting mixture at a temperature of from about 900° C. to 1,600° C. for a time sufficient to burn off said coke and thereby to form pores in said magnesia material, and
(c) firing the resulting product at a temperature of from about 1600° C. to 2,030° C. to produce porous magnesia clinker.

4,627,879

FIBRIN ADHESIVE PREPARED AS A CONCENTRATE FROM SINGLE DONOR FRESH FROZEN PLASMA

Eric Rose, Palisades, N.Y., and Arthur Dresdale, Plainfield, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 648,752, Sep. 7, 1984, abandoned. This application Jan. 3, 1985, Ser. No. 688,601
Int. Cl.[4] A61B *17/04*; A61F *13/00*; A61K *37/00*; C08L *89/00*
U.S. Cl. 106—124 21 Claims



1. A method of preparing a fibrin glue useful in surgical procedures which comprises:
(a) preparing a cryoprecipitated suspension containing fibrinogen and Factor XIII by freezing fresh frozen plasma from a single donor which has been screened for blood transmitted diseases at about −80° C. for at least about 6 hours, raising the temperature of the frozen plasma so as to form a supernatant and a cryoprecipitated suspension containing figrinogen and Factor XIII, and recovering the cryoprecipitated suspension;
(b) applying a defined volume of the suspension to a desired site; and
(c) applying a composition containing a sufficient amount of thrombin to the site so as to cause the fibrinogen in the suspension to be converted to the fibrin glue which then solidifies in the form of a gel.

4,627,880

UNPROCESSED COMPLETE CANE SUGAR AND METHOD OF PRODUCING IT

Arnold Langen, Elsdorf; Herta Benecke, Frechen-Grefrath, and Udo Breithaupt, Kerpen-Horrem, all of Fed. Rep. of Germany, assignors to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,534
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407364
Int. Cl.[4] F24C *5/00*
U.S. Cl. 127—43 11 Claims

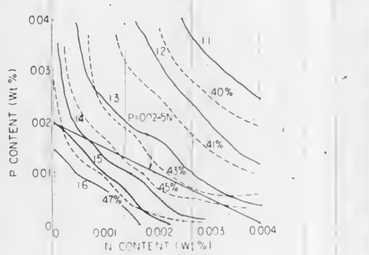
1. A method of producing substantially complete cane sugar from sugarcane juice, consisting essentially of pressing sugarcane to squeeze out only up to about 50% of the sugarcane juice contained therein, the juice having a sucrose content of more than 20% by weight and more than 90% sucrose in terms of the total solids content, rapidly heating the juice to a pasteurizing temperature of 65° to 80° C. for 5 to 15 minutes, which temperature is above the second flocculation point and below the third flocculation point of the waxes, fats, proteins, and pentosans, separating the flocculate, thickening the remaining juices at a maximum temperature of 60° C. to form a syrup, and rapidly extracting the residual water from the syrup thereby to form a dry and pourable product.

4,627,881

COLD ROLLED STEEL SHEET HAVING EXCELLENT PRESS FORMABILITY AND METHOD FOR PRODUCING THE SAME

Tsuyoshi Kawano; Shiroh Sanagi, and Koe Nakajima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 591,902, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 419,055, Sep. 16, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,097
Claims priority, application Japan, Sep. 18, 1981, 56-146348; Sep. 18, 1981, 56-146349
Int. Cl.[4] C21D *7/02, 7/13, 7/14*
U.S. Cl. 148—12 C 8 Claims



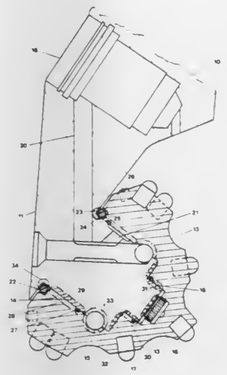
1. A method for producing a cold rolled steel sheet having press formability, which comprises:
hot rolling, at a temperature of at least 850° C., and Al-killed, boron-free steel consisting of, by weight, not more than 0.07% C, 0.10–0.40%Mn, 0.010–0.050% Al, not more than 0.0020%N, not more than 0.010%P, and not more than 0.02%Si, wherein the relation between P and N is such that $P+5N \leqq 0.0175\%$, the remainder of the steel being Fe and unavoidable impurities,
cold rolling the hot rolled steel at a reduction of at least 50%, and
subjecting the cold rolled steel to recrystallization continuous annealing at a temperature between the recrystallization temperature and the A_3 point for not longer than five minutes.

4,627,882

METHOD OF MAKING A ROTARY DRILL BIT

Gunnar T. Söderström, Nickelgatan, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Division of Ser. No. 442,005, Nov. 16, 1982. This application Apr. 26, 1985, Ser. No. 727,789
Claims priority, application Sweden, Dec. 15, 1981, 8107488
Int. Cl.⁴ C21D *1/09*
U.S. Cl. 148—14 **9 Claims**



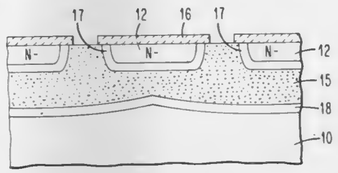
1. A method of making a rotary drill bit comprising forming cooperating friction bearing surfaces on a bearing pin and a roller cutter rotatably carried thereon, the bearing surface of the roller cutter being integral with said cutter and being made by tough-hardening an annealing resistant steel alloy having a carbon percentage exceeding 0.30 comprising surface-hardening the bearing surface of the roller cutter by means of a thermal hardening method, providing said bearing surface of said roller cutter with an inlay of a solid lubricant, and applying a wear resistant material on the bearing surface of the bearing pin in at least a lower load bearing fraction thereof, said wear resistant material having higher wearability than the surface-hardened bearing surface of the roller cutter.

4,627,883

METHOD OF FORMING AN ISOLATED SEMICONDUCTOR STRUCTURE

Roger P. Holmstrom, Wayland, and Jim-Yong Chi, Bedford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 1, 1985, Ser. No. 718,254
Int. Cl.⁴ H01L *21/38, 21/465*
U.S. Cl. 148—187 **14 Claims**



1. The method of producing a semiconductor integrated circuit structure comprising

providing a body of single crystal silicon having a layer of P-type conductivity or of N-type conductivity of low resistivity with a plurality of regions of N-type conductivity of high resistivity inset in said layer at a surface thereof, each of said regions being surrounded by silicon of said layer except at said surface and having an interface with the silicon of said layer;

converting silicon of said layer contiguous with the interfaces with said regions to porous silicon;

diffusing conductivity type imparting material through the porous silicon into portions of said regions contiguous with said interfaces to alter the electrical characteristics thereof; and

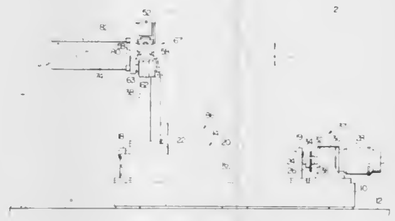
oxidizing portions of the porous silicon contiguous with said interfaces to form insulating material electrically isolating each of said regions.

4,627,884

METHOD OF AND APPARATUS FOR APPLYING LOOPED RUBBER MEMBER ONTO TIRE BUILDING DRUM

Yusuke Araki, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,814
Claims priority, application Japan, Mar. 15, 1984, 59-49926
Int. Cl.⁴ B29D *30/32*
U.S. Cl. 156—131 **13 Claims**



1. A method of applying a looped rubber member from a looped member forming machine onto a collapsible tire building drum having grooves formed in the periphery thereof, comprising the steps of

inserting at least two pairs of retaining members in a first direction into said looped rubber member depending from the looped member forming machine;

retaining said looped rubber member on said retaining members from the looped member forming machine;

rotating said retaining members with said looped rubber member retained thereon toward the collapsible tire building drum to a second direction which is opposite to said first direction;

forming said looped rubber member on said retaining members into a substantially circular configuration;

transferring said substantially circular looped rubber member toward the collapsible tire building drum into a first position in which the center of the looped rubber member is in axial alignment with the longitudinal center axis of the collapsible tire building drum;

further transferring said substantially circular looped rubber member from said first position into a second position in which said looped rubber member surrounds the periphery of the collapsible tire building drum radially contracted;

receiving said retaining members in the grooves in the periphery of the collapsible tire building drum;

applying said substantially circular looped rubber member onto the periphery of the collapsible tire building drum; and

withdrawing said retaining members from the grooves in the periphery of the collapsible tire building drum.

7. An apparatus for applying a looped rubber member from a looped member forming machine onto a collapsible tire building drum having grooves formed in the periphery thereof, comprising

at least two pairs of retaining members for retaining the looped rubber member thereon from the looped member forming machine;

retaining member driving means having said retaining members mounted thereon and adapted for driving one pair of the retaining members of said two pairs to move toward and away from each other and the other pair of the retaining members to move angularly with respect to said one pair of the retaining members;

support member for supporting said retaining member driving means thereon;

support member rotating means mounted on said support member and adapted for rotating said support member about the center of the support member;

carrier plate having said support member rotatably mounted thereon;

carrier plate driving means having said carrier plate mounted thereon and adapted for driving said carrier plate to move vertically toward and away from the collapsible tire building drum;

slide block having said carrier plate driving means mounted thereon; and

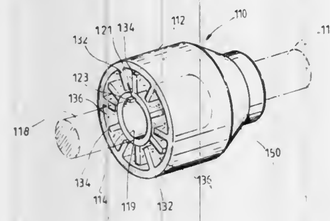
slide block driving means having said slide block threadably mounted thereon and adapted for driving said slide block to move horizontally toward and away from the tire building machine.

4,627,885

METHOD OF PRODUCING A COMPRESSION LOADED TORSIONAL COUPLING DEVICE

Edward J. Arlt, Arlington, Tex., assignor to LTV Energy Products Company, Houston, Tex.

Filed Nov. 17, 1983, Ser. No. 552,823
Int. Cl.⁴ B32B *31/14*
U.S. Cl. 156—160 **3 Claims**



1. A method of producing a compression loaded torsional coupling device comprising the steps of:

a. positioning a first coupling member, axially mountable on the end of a powered shaft, in spaced relationship from a second coupling member, axially mountable on the end of a driven shaft, so that each fin of a plurality of fins, mounted on the first coupling member in spaced radial configuration about the axis of rotation of the coupling, is positioned between adjacent fins of a like number of fins, mounted on the second coupling member in spaced radial configuration about the axis of rotation of the coupling, the fins of the first coupling member being positioned in spaced relationship from the second coupling member, the fins of the second coupling member being positioned in spaced relationship from the first coupling member;

b. placing inserts in the spaces between one coupling member and the opposed fins of the other coupling member in alternate gaps between adjacent fins;

c. molding elastomeric material into the alternate gaps between adjacent fins to substantially fill the alternate gaps;

d. curing and cooling the elastomeric material during which the elastomeric material is bonded to the fins;

e. removing the inserts;

f. applying a torque to rotate the coupling member with respect to each other to compress the elastomeric material;

g. placing inserts in the spaces between one coupling member and the opposed fins of the other coupling member in the remaining alternate gaps;

h. molding elastomeric material into the remaining alternate gaps to substantially fill the remaining alternate gaps;

i. curing and cooling the elastomeric material during which the elastomeric material is bonded to the fins;

j. removing the inserts from the remaining alternate gaps; and

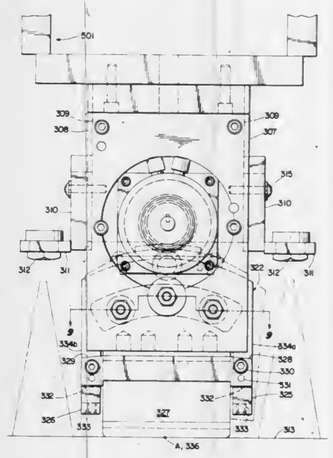
k. releasing the torque.

4,627,886

COMPOSITE TAPE LAYING MACHINE WITH PIVOTING PRESSER MEMBER

Robert J. Grone, Elsmere, Ky., and Michael N. Grimshaw, Loveland, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 30, 1985, Ser. No. 739,359
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—361 **9 Claims**



1. In a laminating machine of the type having a head with presser member that presses a strip of material against a contoured surface to apply it to the surface along a path, the machine including means for mounting the head for pivotal movement about the path and where the head and presser member are aligned along a common line substantially normal to the path and passing through a point on the path, apparatus for mounting the presser member for pivotal movement about the path, said apparatus comprising:

arcuate cam means for connecting the presser member to the head and for allowing pivotal movement of the presser member about an axis parallel to said path and passing through said point, the presser member pivotal movement being independent of the head pivotal movement; and

means for realigning the head with the presser member after said member is pivoted about said axis.

4,627,887

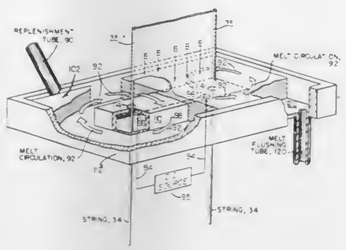
MELT DUMPING IN STRING STABILIZED RIBBON GROWTH

Emanuel M. Sachs, 42 Old Middlesex Rd., Belmont, Mass. 02178

Continuation of Ser. No. 214,741, Dec. 11, 1980, abandoned, Continuation-in-part of Ser. No. 109,865, Jan. 7, 1980, abandoned. This application Nov. 5, 1982, Ser. No. 439,603
Int. Cl.⁴ C30B *15/00*
U.S. Cl. 156—608 **8 Claims**

1. In a process in which a ribbon of crystal is grown from a body of melt at a growth interface, with string stabilization

being employed at the edges of said ribbon, a method for minimizing the introduction of impurities from said melt to said crystal grown therefrom comprising: reducing build-up of impurities in the body of the melt due to impurity segregation at the growth interface during crystal growth by continually replenishing the melt with new raw material, and dumping and



completely removing a fraction of molten material from said body of melt continually during the crystal growth process, said fraction being removed at a rate less than the rate of addition of new raw material such that the concentration of impurities in said body of melt and therefore in the growth crystal is reduced during crystal growth, in an open loop process.

4,627,888

CAUSTICIZING METHOD

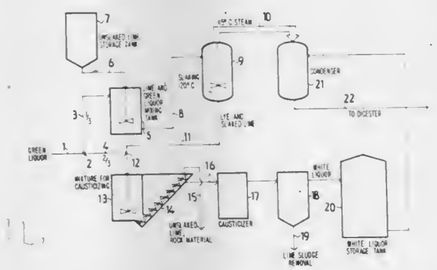
Holger Engdahl, Savonlinna, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

Filed Feb. 22, 1984, Ser. No. 582,455

Claims priority, application Finland, Feb. 23, 1983, 830606

Int. Cl.⁴ C01F *5/24*

U.S. Cl. 162—30.11 **4 Claims**



1. A causticizing method for producing white liquor and lime sludge from soda lye and unslaked lime using a lime slaking process which is carried out under pressure, followed by a causticizing reaction which is carried out under normal atmospheric pressure, and using the heat released from the lime slaking for heating purposes, wherein the soda lye to be causticized is divided into two parts, one of which is used for the slaking of lime by adding to it all the unslaked lime needed for the causticizing process and is, at most, one half of the total amount of lye to be causticized, and after slaking, bringing the two volumes together for the causticizing reaction involving the total amount of lye used.

4,627,889

PROCESS FOR SIZING PAPER WITH ANIONIC HYDROPHOBIC SIZING AGENTS AND CATIONIC RETENTION AIDS

Michael Bernheim, Arlesheim; Hubert Meindl, Riehen; Peter Rohringer, Schönenbuch; Hans Wegmüller, Riehen, and Dieter Werthemann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1983, Ser. No. 497,307

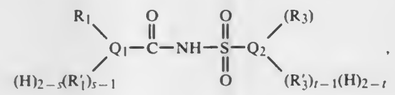
Claims priority, application Switzerland, Mar. 30, 1983, 1757/83

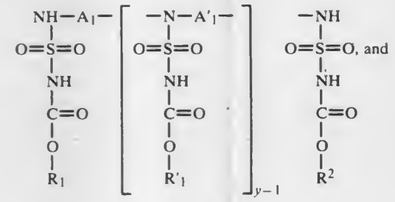
Int. Cl.⁴ D21H *3/12*

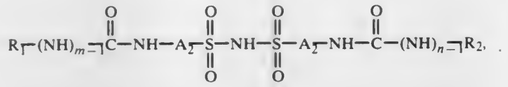
U.S. Cl. 162—158 **7 Claims**

1. A process for sizing paper or cardboard, which comprises adding to an aqueous dispersion of cellulose fibers

(A) A sizing agent which contains a compound selected from the group consisting of







in which R_1, R'_1 and R_2 are each alkyl or alkenyl having 6 to 22 carbon atoms, R_3 and R'_3 are alkyl or alkenyl of 6 to 22 carbon atoms, phenyl or methyl-substituted phenyl, s and t each is 1 or 2, A_1 and A'_2 is ethylene or propylene, A_2 is phenyl or halophenyl, C_1–C_4-alkyl-phenyl or C_1–C_4-alkoxy-phenyl, Q_1 is —O—, —NH— or —N<, Q_2 is —NH— or —N<, and m and n are each 1 or 2, s and t being 2 if Q_1 and Q_2 are —N<, y is an integer form 1 to 5 and

(B) a polymeric cationic retention aid;

and forming said paper or cardboard from said aqueous dispersion of cellulose fibers, sizing agent and cationic retention aid.

4,627,890

CENTRIFUGAL DEVICE

John E. Porter, Newcastle upon Tyne, and Colin Ramshaw, Norley, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 22, 1982, Ser. No. 443,731

Claims priority, application United Kingdom, Nov. 24, 1981, 8135406

Int. Cl.⁴ B01D *3/30;* **F28D** *9/00*

U.S. Cl. 202—235 **6 Claims**

1. In a centrifugal mass transfer device comprising a rotary fluid-permeable element formed as an annulus about its axis rotation, the improvement comprising:

at least one annular plate which is thin in the direction of said axis, has two opposite surfaces, is made of a heat conductive material and is mounted adjacent a cylindrical face of said permeable element with one said surface of said plate in fluid transfer communication with said adjacent face of said permeable element and the other said surface isolated

from fluid transfer communication with said adjacent face of said permeable element;

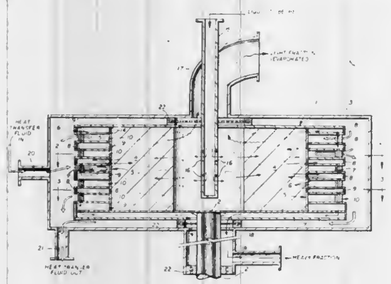
and means to supply a heat transfer fluid to said other surface of each said plate while isolating such fluid from direct contact with said one surface of each said plate.

6. A distillation device comprising:

a rotary permeable element formed as an annulus about its axis of rotation and having a radially inner face and a radially outer face;

condensing means which

(a) is in the form of a plurality of annular plates, mounted in parallel, axially spaced relationship adjacent the radially inner face of said rotary permeable element, each of said annular plates being thin in the direction of the said axis and being made of a heat conductive material, alternate spaces between said plates being in fluid flow communication with said adjacent radially inner face such that vapour discharged through said adjacent radially inner face flows into said alternate spaces but



other spaces between said plates being isolated from fluid flow communication with said adjacent radially inner face, and

(b) is provided with means to supply a heat transfer fluid to said other spaces beween said plates where it absorbs heat while isolating said heat transfer fluid from fluid flow communication with said alternate spaces,

(i) which heat is lost by a portion of the said vapour in the said alternate spaces as it liquifies forming a liquid at least some of which flows from said alternate spaces into said permeable element and

(ii) which heat passes through the thickness of said annular plates to the heat transfer fluid;

vapourising means to vapourise liquid discharged from the radially outer face of the permeable element;

means to supply a fluid feedstock for said distillation to said rotary permeable element; and

means to remove a lighter product fraction and a heavier product fraction from the device.

4,627,891

METHOD OF GENERATING ELECTRICAL AND MAGNETIC FIELDS IN SALT WATER MARINE ENVIRONMENTS

Henry F. Gibbard, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 660,242, Oct. 11, 1984, which is a continuation of Ser. No. 487,791, Apr. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 372,785, Apr. 28, 1982, abandoned. This application Aug. 21, 1985, Ser. No. 768,022

Int. Cl.⁴ C25B *11/10*

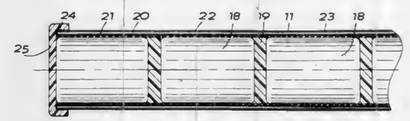
U.S. Cl. 204—1 R **40 Claims**

1. The method of generating electrical and magnetic fields in salt water marine environments comprising the steps of:

providing a first electrode adapted to be trailed in a salt water marine environment;

providing a buoyant, flexible, electrically conductive sweep cable adapted to be trailed in said salt water marine environment;

providing at least one dimensionally stable second electrode helically wound on an elongted, flexible floatation means provided on the distal end of said sweep cable, said floatation means being buoyant when wound with said second electrode, said second electrode having a conductive core, a protective layer of titanium, and a current carryiing outer layer consisting essentially of a conductive material selected from the group consisting of ruthenium dioxide,



iridium oxide, and mixtures of ruthenium oxide and tin oxide in an effective amount for preventing rapid deterioration of said second electrode when employed in salt water marine environments;

trailing said electrodes in spaced relationship to one another in said salt water marine environment; and

applying a preselected voltage between said electrodes causing a high current flow there between, said current flow having current density of at least about 50 mA/cm^2 at said electrode surfaces.

4,627,892

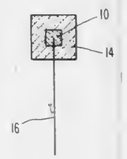
ELECTROCHEMICAL SENSORS AND METHODS FOR THEIR MANUFACTURE AND USE

Wayne L. Worrell, Narberth, and Qing-Guo Liu, Philadelphia, both of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed Feb. 22, 1985, Ser. No. 704,385

Int. Cl.⁴ G01N *27/58*

U.S. Cl. 204—1 T **39 Claims**



1. An electrochemical sensor for a species comprising:

a shaped body isostatically formed from a blend, said blend comprising a solid solution having a fluorite crystal structure comprising:

a metal oxide;

admixed with said metal oxide, an oxide of an element from group IIA or IIIB of the periodic table in an amount sufficient to render said blend ionically conductive: and

a reference electrode composition substantially completely contained within the shaped body;

said shaped body having not been subjected to thermal densification.

21. A method of monitoring the concentration of a species in a metallurgical melt comprising contacting said melt with the electrochemical sensor of claim 1 or 18.

22. A method of fabricating an electrochemical sensor for a species comprising:

selecting a metal oxide;

admixing with said metal oxide, an oxide of an element from groups IIA or IIIB of the periodic table of the elements to

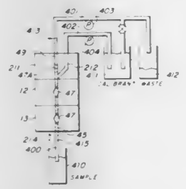
form a blend in an amount sufficient to render said blend ionically conductive;
providing reference electrode composition; and
isostatically forming said blend into a shaped body substantially surrounding said reference electrode composition;
said, shaped body not being subjected to thermal densification.

4,627,893

MEANS AND METHODS FOR QUANTITATIVE DETERMINATION OF ANALYTE IN LIQUIDS

Alan D. Cormier, Newburyport, Mass., and Melvin S. Weinberg, Nashua, N.H., assignors to AMDEV, Inc., Danvers, Mass.

Filed Mar. 28, 1984, Ser. No. 594,246
Int. Cl.⁴ G01N *27/30, 27/38*
U.S. Cl. 204—1 T **19 Claims**



1. A testing module unit dimensioned and arranged to be used with at least one other module unit in an arrangement for testing an analyte in a liquid,
said module unit having a body and a narrow diameter through passageway,
said passageway having an enlarged chamber intermediate ends of said passageway, said chamber being formed on one side by a membrane of an electrode,
said chamber lying substatially in a plane with a first portion of said passageway opening into an inlet of said chamber at an angle to said plane to cause turbulence substantially confined to said opening while permitting smooth flow beyond said opening whereby said chamber acts as a defuser at its entrance and as a nozzle at an exit thereof,
said chamber inlet having an opposed outlet with said chamber varying in cross section from said opening to exit,
said varying cross section being enlarged toward the center of the chamber and restricted at said exit in a generally diamond shape,
said passageway having a cross-sectional area corresponding to a diameter of from 0.015 inch to 0.05 inch,
said chamber having a maximum cross-sectional area less than ten times the cross-sectional area of said passageway.

3. An electrode holder for use in a testing module unit,
said electrode holder comprising an elongated electrode body having a source of electricity connected therethrough to an internal electrode lying within a first chamber therein,
said first chamber being elongated and open to a second chamber underlying a chemically sensitive ion testing membrane,
said second chamber being filled with a gelatinous electrically conductive material and said first chamber being filled with an electrically conductive liquid whereby there is electrical continuity between said internal electrode and said testing membrane.

8. A method of determining the ionic activity of a fluid by passing said fluid in a stream between a first measuring electrode and a second measuring reference electrode,
said first measuring electrode comprising a portion of a sampling chamber, said first measuring electrode having a membrane with a gel of electrically conductive material underlying the membrane and interspersed between it and an internal electrode portion surrounded by a conductive fluid,
and measuring the electromotive force between said reference electrode and said measuring electrode.

17. A method of cleaning and calibrating a first sampling measuring chamber contained in a modular measuring chamber unit which unit is positioned adjacent a second modular unit containing a reference electrode second chamber,
wherein said units define a passageway between said chambers and through said units,
a second one-way valve passageway intersecting said passageway between said reference electrode second chamber and said sampling measuring chamber, said method comprising
passing a liquid sample through said passageway from said sampling measuring chamber to said reference chamber whereby a measurement of electrical potential can be taken between said chambers while maintaining said second passageway filled with a second fluid other than said sample,
reversing fluid flow between said reference chamber and sampling measuring chamber by passing a cleaning fluid from said reference chamber through said sampling measuring chamber to remove the sample fluid while maintaining said second passageway filled with a fluid,
passing a cleansing fluid flow through said secondary passageway to said sampling measuring chamber without said last-mentioned flow first passing to said reference chamber,
and reversing flow again to pass a calibrant fluid from said sampling chamber to said reference chamber while said secondary passageway maintains a stationary fluid whereby a calibration measurement can be made to measure electrical potential between said sampling chamber and said reference chamber.

4,627,894

METHOD OF MANUFACTURING A BODY MOLDED FROM A PLASTICS MATERIAL AND COVERED WITH A METALLIC LAYER

Michel J. Monnier, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 645,896
Claims priority, application France, Sep. 7, 1983, 83 14254
Int. Cl.⁴ C25D *1/20*
U.S. Cl. 204—4 **8 Claims**

1. A method of manufacturing a molded body of plastic material covered with a metallic layer, comprising the steps of:
(a) electrolytically depositing the metallic layer on a passivated inner surface of a metallic mold, said passivated inner surface forming a uniform intermediate layer of a composition to which the deposited metallic layer has poor adhesion;
(b) introducing the plastic material into the mold to form the moulded body; and
(c) after the plastic material hardens, bringing the mould and the molded body to respective temperatures at which said body and the metallic layer adhering thereto separate from the mold.

4,627,895

MANUFACTURING PROCESS FOR A PLATED CARBONIZED RESIN-COATED PAPER STRUCTURE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 738,401, Apr. 1, 1986. This application Mar. 21, 1986, Ser. No. 842,300
Int. Cl.⁴ C25D *5/54*
U.S. Cl. 204—20 **4 Claims**

1. A process for forming metallic structures out of shapes made of paper comprising the steps of:
forming said paper into a desired shape;
coating said paper with a carbonizable resin;
saturating said paper with said resin;
curing said resin;

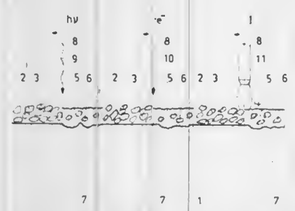
baking said cured resin-saturated structure in an inert atmosphere;
carbonizing said resin by said baking step; and
plating said carbon structure with a metallic plating.

4,627,896

METHOD FOR THE APPLICATION OF A CORROSION-PROTECTION LAYER CONTAINING PROTECTIVE-OXIDE-FORMING ELEMENTS TO THE BASE BODY OF A GAS TURBINE BLADE AND CORROSION-PROTECTION LAYER ON THE BASE BODY OF A GAS TURBINE BLADE

Mohamed Nazmy, Gebenstorf, and Robert Singer, Untersiggenthal, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 27, 1985, Ser. No. 749,547
Claims priority, application Switzerland, Jul. 16, 1984, 3455/84
Int. Cl.⁴ C25D *5/50*
U.S. Cl. 204—37.1 **10 Claims**



1. A method for applying a corrosion protection layer to a base body of a gas turbine blade, which comprises
applying to said base body, silicon carbide particles together with a superalloy material in the form of particles or layers which forms a metallic matrix of the protective layer,
compacting, pressing, and welding or fusing said matrix-forming material such that the protective layer matrix is firmly bonded to said base body, wherein silicon carbide particles are at least partially embedded in the form of fine particles which negligibly protrude above the surface of said protective layer matrix, and said silicon carbide particles partially react with said matrix-forming material so that some silicon migrates into said matrix.

4,627,897

PROCESS FOR THE ELECTROLYSIS OF LIQUID ELECTROLYTES USING FILM FLOW TECHNIQUES

Karl-Heinz Tetzlaff, Kelkheim; Dieter Schmid, Schwalbach, and Jürgen Russow, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,306
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401637
Int. Cl.⁴ C25B *1/00, 3/00;* **C25C** *1/00*
U.S. Cl. 204—59 R **8 Claims**



1. A process for the electrolysis of liquid electrolytes in which gas bubbles are formed in the electrolyte, in electrolytic cells which are non-partitioned or partitioned by at least one separator and in which at least one electrode is perforated, which comprises causing the electrolyte to flow by means of gravity through the electrolytic cell in such a manner that a gas space is formed laterally to the main direction of flow of the electrolyte.

4,627,898

ELECTROLYTIC PRODUCTION OF PRASEODYMIUM

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 7, 1984, Ser. No. 648,722
Int. Cl.⁴ C25C *3/34*
U.S. Cl. 204—64 R **10 Claims**

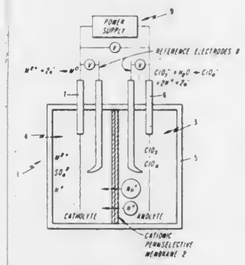
1. A method for preparing praseodymium metal by electrolyzing praseodymium oxide in a molten electrolyte comprising lithium fluoride and praseodymium fluoride, wherein an initial weight ratio of lithium fluoride to praseodymium fluoride is about 0.1 to about 0.4, and collecting said praseodymium metal at temperatures at or above the melting point of the metal.

4,627,899

ELECTROLYTIC CELL AND METHODS COMBINING ELECTROWINNING AND ELECTROCHEMICAL REACTIONS EMPLOYING A MEMBRANE OR DIAPHRAGM

Gerald R. Smith, Columbia, and William R. Thompson, Wheaton, both of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 15, 1985, Ser. No. 702,201
Int. Cl.⁴ C25B *1/24;* **C25C** *1/06, 1/10, 1/00*
U.S. Cl. 204—95 **11 Claims**



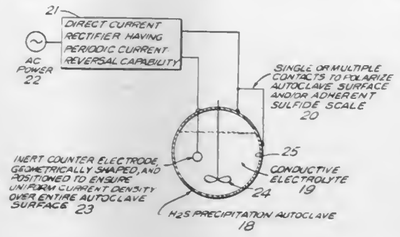
1. A process for combining at compatible cell geometries and current densities the electrowinning of a free metal element on a cathode in a catholytic electrolyte in a cell in which there is an anode with an anolytic electrolyte with a cationic permselective membrane between the catholytic electrolyte and anolytic electrolyte thereby forming a catholytic half-cell compartment and an anolytic half-cell compartment, where the voltage for the combined catholytic half-cell and anolytic half-cell is reduced greater than 50% as compared to the sum of the cell voltages of two independently operating nonmembrane cells using an electrolyte selected from the catholytic electrolyte or the anolytic electrolyte and with water electrolysis at the anode, comprising:
(a) introducing a metal sulfate salt into said catholytic electrolyte in said half-cell catholytic compartment
(b) introducing an alkali metal chlorate and an alkali metal perchlorate into said anolytic electrolyte in said half-cell anolytic compartment; and
(c) applying an electromotive force across said cathode and anode whereby an oxidation electrochemical reaction occurs at the anode to produce a perchlorate while the free metal element of said metal salt is deposited at said cathode.

4,627,900

ELECTROCHEMICAL DISSOLUTION AND CONTROL OF NICKEL SULFIDE SCALE

William G. Sherwood; Paul B. Queneau, both of Golden; Jean-Paul Duterque, Arvada, and Donald R. Hodges, Denver, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Aug. 27, 1982, Ser. No. 412,056
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 **7 Claims**



1. A method for electrochemically minimizing scale buildup of metal sulfide on the surface of an acid solution-resistant metal precipitation vessel, wherein said solution-resistant vessel is an autoclave formed of an electrochemically polarizable or film-forming metal, and wherein said metal sulfide is precipitated from a sulfuric acid solution containing metal sulfate by adding a sulfide-precipitating agent thereto, said method comprising,

forming an electrical circuit between said autoclave and an inert electrode immersed in metal sulfate acid solution contained in said vessel,

passing a direct current from said autocalve as the anode through said solution to said inert electrode in said solution such that anodically NiS is converted to $S^{\circ}+Ni^{2+}+2e-$,

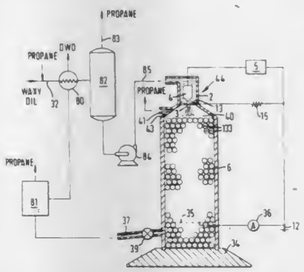
and periodically reversing said current flow at predetermined intervals such that during cathodic treatment $NiS^{\circ}+2H^{+}+2e-$ is converted to $Ni^{\circ}+H_2S$ and during anodic treatment Ni° is converted to $Ni^{2+}+2e-$, the periodic reversal being repeated for a time sufficient to minimize build-up of sulfide scale on the surface of said autoclave during sulfide precipitation.

4,627,901

SEPARATING WAX FROM HYDROCARBON MIXTURE BOILING IN THE LUBRICATING OIL RANGE

Douglas G. Ryan, Rockaway; Anthony E. Cerkanowicz, Livingston; Robert J. L. Chimenti, Short Hills, and Donald J. Mintz, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 11, 1985, Ser. No. 722,160
Int. Cl.[4] B03C *5/00, 5/02*
U.S. Cl. 204—190 **56 Claims**



1. A method of pretreating a hydrocarbon oil mixture boiling in the lubricating oil range and containing dissolved wax, comprising the steps of reducing the solubility for the wax so as to cause dissolved wax in the oil to form a dispersion of wax particles in the oil mixture and introducing free excess charge which is net unipolar into the oil mixture, whereby wax particle agglomeration and particle size growth occurs.

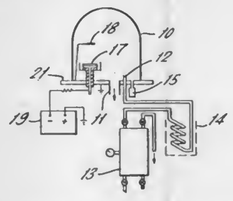
15. A method as claimed in claim 1, wherein a first oil solvent liquid is added to the waxy oil mixture to form an admixture, the admixture is cooled to the cloud point of the admixture in the absence of any introduced free excess charge, and then a second oil solvent liquid is added to said admixture, said second oil solvent liquid having a lower solubility for wax than for said admixture, so as to cause the wax to precipitate as wax particles, and the free excess charge is introduced into the admixture of waxy oil mixture and first and second oil solvents, to bring about agglomeration and growth of the precipitated wax particles.

4,627,902

METHOD OF PRODUCING A RESISTANCE ELEMENT FOR A RESISTANCE THERMOMETER

James S. Johnston, Bognor Regis; Leslie Holland, Crawley, and Christopher R. Wright, Bognor Regis, all of England, assignors to Rosemount Engineering Company Limited, England

Continuation-in-part of Ser. No. 359,872, Mar. 19, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 597,164
Claims priority, application United Kingdom, Mar. 24, 1981, 8109239; Aug. 11, 1981, 8124559
Int. Cl.[4] C23C *14/38*
U.S. Cl. 204—192.21 **18 Claims**



1. A method of producing a thin film platinum resistance thermometer element having a TCR of about 3.85×10^{-3} ppm/°C. which comprises magnetron sputtering a platinum film onto an insulating substrate in a sputtering atmosphere consisting of at least about 20% by volume of oxygen, with the balance gas consisting primarily of nitrogen, and heat treating the film after sputtering to remove any entrapped oxygen from the film and reduce or dissociate platinum oxide in the film to platinum metal.

4,627,903

ELECTRODE FOR AN ELECTROSTATIC ATOMIZING DEVICE

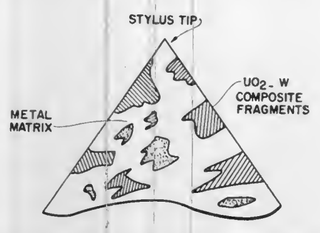
Alan T. Chapman, Atlanta, and David N. Hill, Chamblee, both of Ga., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jul. 26, 1982, Ser. No. 401,833
Int. Cl.[4] B05B *5/00;* B22F *3/00*
U.S. Cl. 204—275 **3 Claims**

1. An improved electrode for an electrostatic atomizing device which comprises a cell having a chamber disposed therein, a discharge spray means in communication with the cell, at least two electrodes disposed in said chamber and being in liquid contact with a liquid in said chamber, and a third electrode disposed externally to said cell and said discharge means, wherein the improved electrode comprises a machined alloy of a blend mixture of a metal oxide-metal composite particle and a metal power, said alloy of said blend mixture formed under heat and pressure, wherein the volume fraction of said metal oxide-metal composite particle is 10 to 80 percent of said blend mixture, wherein said metal oxide-metal composite particles contain between 10^6 to 5×10^7 aligned, submicron diameter, metallic fibers per cm_2, wherein said composite particles are selected from the group consisting of UO_2—W, $Gd_2O_3(CeO_2)$—Mo, $ZrO_2(Y_2O_3)$—W and CeO_2—Mo, wherein said metal powder is selected from the group consisting of Cu, Co, Ni and Ni—Cu—CO and mixtures thereof.

2. A process for forming an electrode for an electrostatic atomizing device which comprises the steps of:

(a) blending a mixture of composite particles and metal powders, wherein the composite material is selected from the group consisting of UO_2—W, $Gd_2O_3(CeO_2)$—Mo, $ZrO_2(Y_2O_3)$—W and CeO_2—Mo, wherein said metal powders are selected from the group consisting of Cu, Ni, Co, and Ni—Cu—Co and mixtures thereof, and wherein



the volume fraction of said composite particles is 10 to 80 percent of said blend mixture;

(b) consolidating said mixture under sufficient heat and pressure;

(c) forming said mixture into a disc;

(d) cutting said disc into a square shaped bar; and

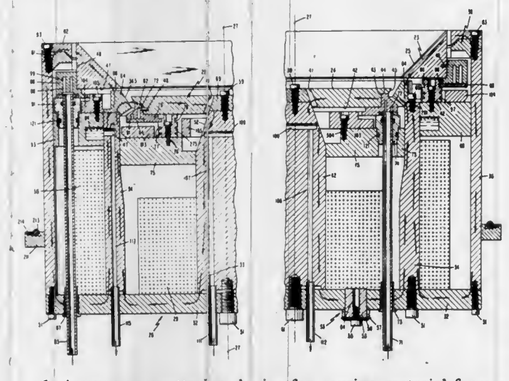
(e) machining said square shaped bar into a stylus shaped electrode.

4,627,904

MAGNETRON SPUTTER DEVICE HAVING SEPARATE CONFINING MAGNETIC FIELDS TO SEPARATE TARGETS AND MAGNETICALLY ENHANCED R.F. BIAS

Donald M. Mintz, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 759,722, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 611,435, May 17, 1984, Pat. No. 4,595,482. This application Dec. 19, 1985, Ser. No. 811,595
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 **15 Claims**



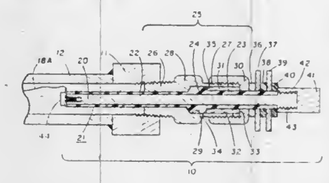
1. A vacuum sputtering device for causing material from a target means to be sputtered onto a workpiece, the target means including a first target having a planar material emitting surface with a circular outer perimeter and a second target having a sloped emitting surface relative to said planar emitting surface, said second target being a circular annulus having an axial thickness at an outer perimeter which is greater than an axial thickness at an inner perimeter, the device comprising means for supplying an ionizable gas to a space adapted to be evacuated, the space being between the target and workpiece, means for establishing an ionizing electric field for the gas in the space, means for establishing a confining magnetic field for the gas ionized by the electric field in the vicinity of the emitting surfaces of the first and second targets, means for mounting the targets so that emitted material is sputtered from the sloped emitting surface outside of the first target, magnetic mirror means located behind the workpiece for moving a plasma away from the workpiece, and means for connecting and R.F. bias power source to the workpiece.

4,627,905

MONITOR ASSEMBLY FOR MONITORING ANODIC CORROSION PROTECTION OF CARBON STEEL VESSELS

Andrew Garner, and Douglas L. Singbeil, both of Pointe Claire, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Continuation-in-part of Ser. No. 657,996, Oct. 5, 1984, abandoned. This application Jan. 28, 1986, Ser. No. 823,440
Int. Cl.[4] G01N *27/46;* C23F *13/00*
U.S. Cl. 204—404 **15 Claims**



1. A monitor assembly for monitoring the effectiveness of anodic protection of carbon steel vessels comprising:

(a) an electrically conductive mount rod adapted to be electrically connected through a voltmeter to said carbon steel vessel;

(b) an electrically non-conductive sleeve on said mount rod;

(c) an electrical sealing gland encasing said sleeve;

(d) a stainless steel apertured spacer disc mounted on said sleeve in electrical contact with said electrical sealing gland;

(e) a first carbon steel coupon mounted on said sleeve in electrical contact with said stainless steel disc;

(f) A first spacer element of electrically non-conductive material mounted on said sleeve adjacent to, in pressing contact with, said first carbon steel coupon;

(g) a second carbon steel coupon identical to said first carbon steel coupon mounted on said sleeve adjacent to, and in pressing contact with, said first spacer element;

(h) a second spacer element of electrically non-conductive material mounted on said sleeve adjacent to, and in pressing contact with, said second carbon steel coupon; and

(i) a reference electrode detachably but securely mounted in direct electrical contact with, and on said mount rod so that said reference electrode, but not said mount rod is wetted by the liquid contents of said carbon steel vessel;

said mount rod, and said electrical sealing gland being made of any metal with sufficient mechanical and chemical stability to withstand the corrosive environment within the carbon steel vessel and the mechanical stress; said electrically non-conductive sleeve and said electrically non-conductive spacer elements being formed of any electrically non-conductive material having sufficient mechanical and chemical stability to withstand the corrosive environment with the carbon steel vessel and the mechanical stress; and said reference electrode being formed from any metal which provides a stable potential when exposed to the liquid contents of said carbon steel vessel.

4,627,906

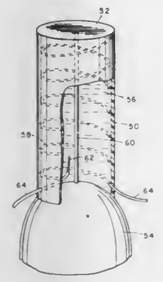
ELECTROCHEMICAL SENSOR HAVING IMPROVED STABILITY

David A. Gough, Cardiff By the Sea, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 538,123, Oct. 3, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,125
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—415 **9 Claims**

1. An electrochemical sensing device comprising an electrolyte container, an aqueous electrolyte in said container, a hol-

low cylindrical hydrophobic membrane forming a portion of said container and having a first outer surface accessible to a fluid to be monitored and a second inner surface accessible to said electrolyte, a cathode working electrode, a reference electrode and a counter electrode of cylindrical shape and open structure disposed adjacent the inner surface of said membrane and having its entire inner surface area exposed to and contacting said electrolyte in said container, said membrane being permeable to a component to be determined of said fluid, said counter electrode being coaxial with the interior of said membrane between said membrane and said working electrode and being constructed to allow free diffusion



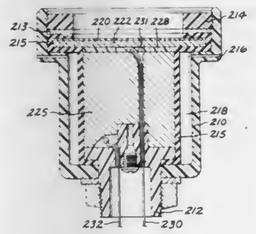
through it radially into said electrolyte and to said working electrode of said component to be determined, said working electrode being a rod extending along the axis of said cylindrical hydrophobic membrane and counter electrode along the entire length of said counter electrode and having all portions of it's surface in contact with said electrolyte and at a constant spacing from said counter electrode along the length of said cylindrical hydrophobic membrane to provide a substantially uniform current flux through the electrolyte between all points of said working electrode and opposed points of said counter electrode.

4,627,907

LONG LIFE PORTABLE OXYGEN SENSOR WITH HIGH STABILITY

Leonard W. Niedrach, Schenectady, and Fritz G. Will, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,934
Int. Cl.[4] G01N *27/52*
U.S. Cl. 204—415 **8 Claims**



1. An oxygen sensor of improved stable sensitivity which comprises

a sensor electrode adapted to reduce oxygen which permeates thereto through a diffusion barrier,

a counter electrode of porous cadmium metal formed on a support structure of nickel foam metal

a set of conductors and a thermistor/resistor network providing a series electric connection between said electrodes and a voltmeter in parallel with said network and providing indication of oxygen level by calibrated readings of said voltmeter, and

an aqueous alkaline solution providing an electrolytic path between said electrodes.

4,627,908

PROCESS FOR STABILIZING LUBE BASE STOCKS DERIVED FROM BRIGHT STOCK

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 24, 1985, Ser. No. 790,704
Int. Cl.[4] C10G *65/08, 65/12*
U.S. Cl. 208—58 **14 Claims**

1. An improved process for stabilizing a nitro-aromatic-containing lubricating oil base stock derived from a hydrocracked bright stock, comprising:

(a) contacting said hydrocracked bright stock with hydrogen in the presence of a catalyst having hydrodenitrification activity under conditions effective to reduce the nitrogen content of said stock and to minimize cracking to produce a substantially nitrogen-free product; and

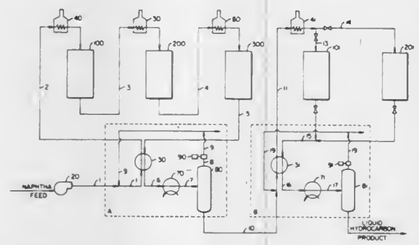
(b) contacting said substantially nitrogen-free product with hydrogen in the presence of a catalyst having hydrogenation activity under mild conditions to produce a stabilized lubricating oil base stock having improved oxidation stability as shown by oxidator BN.

4,627,909

DUAL RECYCLE PRESSURE-STEP REFORMER WITH CYCLIC REGENERATION

Richard C. Robinson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 2, 1985, Ser. No. 730,698
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—65 **3 Claims**



1. A process for reforming a hydrocarbon feedstock which comprises the steps of:

A. contacting said feedstock and a first hydrogen-containing gas with a reforming catalyst, wherein said catalyst is bifunctional and comprises one or more platinum group metals supported on a porous alumina carrier, under reforming conditions including a first reforming pressure of about 200 psig in a first reforming zone said reforming zone comprises at least two reactors in series such that the effluent from the outlet of preceding reactor is fed directly to the inlet of a succeeding reactor;

B. separating a first hydrogen-containing gas phase and a first liquid hydrocarbon product phase from the effluent from said first reforming zone;

C. recycling at least a portion of said first gas phase to provide said first hydrogen-containing gas passed into said first reforming zone;

D. contacting said first product phase in the presence of hydrogen with a desulfurization catalyst to produce a desulfurized product phase;

E. contacting said desulfurized first product phase and a second hydrogen-containing gas with a reforming catalyst, wherein said catalyst is monofunctional and comprises a platinum group metal supported on a large pore zeolite, under reforming conditions including a second reforming pressure ranging from about 75 psig to about 125 psig said reforming zone comprises at least two reactors in parallel such that a given reactor can be isolated for regeneration while the other reactor remains in service;

F. separating a second hydrogen-containing gas phase and a second liquid hydrocarbon product phase from the effluent of said second reforming zone;

G. recycling at least a portion of said second gas phase to provide said second hydrogen-containing gas passed into said second reforming zone; and

H. recovering said second liquid product phase.

4,627,910

HYDROCARBON CONVERSION PROCESS

William S. Millman, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 491,882, May 5, 1983, Pat. No. 4,425,221, which is a division of Ser. No. 287,022, Jul. 27, 1981, Pat. No. 4,392,985. This application Oct. 19, 1983, Ser. No. 543,245
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.[4] C10G *11/04, 45/08, 49/04*
U.S. Cl. 208—112 **37 Claims**

9. A process for the removal of nitrogen from a hydrocarbon feedstock, boiling primarily above 100° F., which comprises contacting said feedstock with hydrogen under denitrogenation conditions including a superatmospheric pressure and a hydrogen flow rate in the range from about 25 SCF/bbl to about 20,000 SCF/bbl in the presence of a catalytic composition which is prepared by the method comprising the steps of (1) impregnating support particles with an aqueous solution comprising dissolved cobalt, phosphorus, at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and ammonium ions with a molar concentration greater than 1.5, said solution having a pH less than 1.0 and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.01 to 0.5, and (2) activating the impregnated support particles.

22. A process for removing metals from a hydrocarbon feedstock boiling primarily above 100° F. by contacting said feedstock with hydrogen under demetallizing conditions including a superatmospheric pressure and a hydrogen flow rate in the range from about 25 scf/bbl to about 20,000 scf/bbl in the presence of a catalytic composition which is prepared by the method comprising the steps of (1) impregnating support particles with an aqueous solution comprising dissolved cobalt, phosphorus, at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and ammonium ions with a molar concentration greater than 1.5, said solution having a pH less than 1.0 and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.01 to 0.5, and (2) activating the impregnated support particles.

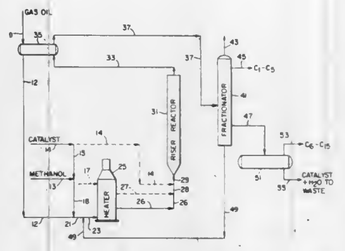
33. A hydrocarbon cracking process comprising contacting hydrocarbons boiling primarily above 100° F. under cracking conditions comprising a superatmospheric pressure and a temperature of at least 400° F. with a catalytic composition prepared by the method comprising the steps of (1) impregnating support particles with an aqueus impregnating solution comprising dissolved cobalt, phosphorus, and at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.05 to about 0.5, said solution having a pH less than 1.0 and is characterized by a maximum extinction coefficient in the ultraviolet spectrum of about 0.7×10^4 to about 1.8×10^4 liters/cm-.moles of Group VIB metal, and (2) activating the impregnated support particles.

4,627,911

DISPERSED CATALYST CRACKING WITH METHANOL AS A COREACTANT

Nai Y. Chen, Titusville, N.J., and Thomas F. Degnan, Jr., Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 767,666, Aug. 21, 1985, abandoned, which is a continuation of Ser. No. 622,818, Jun. 21, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 815,660
Int. Cl.[4] C10G *11/05, 47/16;* **C07C** *1/24*
U.S. Cl. 208—120 **12 Claims**



1. A process for thermally sustaining an endothermal catalytic hydrocarbon cracking reaction without catalyst regeneration, said process comprising:

A. admixing a hydrocarbon, a carbon oxygenate, and a finely divided and highly active zeolite catalyst capable of cracking said hydrocarbon and exothermically converting said carbon oxygenate to a hydrocarbon of increased carbon content to form a feed mixture, within which said zeolite catalyst is dispersed, and feeding said mixture to a reaction zone; said zeolite catalyst provided in amounts of up to 5.0 wt. % of said hydrocarbon and having an α activity of at least 1600

B. heating said feed mixture to a reaction temperature at which said feed mixture is volatilized;

C. reacting said feed mixture within said reaction zone without substantial use of surface heat exchanging whereby said endothermic catalytic hydrocarbon cracking reaction is sustained substantially entirely by said exothermic catalytic carbon oxygenate conversion reaction; and

D. withdrawing said catalyst and the combined reaction products of said cracking and conversion reactions from said reaction zone.

4,627,912

REFORMING PROCESS HAVING A HIGH SELECTIVITY AND ACTIVITY FOR DEHYDROCYCLIZATION, ISOMERIZATION, AND DEHYDROISOMERIZATION

Leslie A. Field, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 509,277, Jun. 30, 1983, abandoned. This application Nov. 14, 1983, Ser. No. 550,841
Int. Cl.[4] C10G *35/08*
U.S. Cl. 708—139 **9 Claims**

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed with a reforming catalyst in the presence of a halogen at conditions which favor dehydrocyclization, isomerization, and dehydroisomerization of the hydrocarbon feed; wherein said reforming catalyst comprises a type L zeolite containing at least one Group VIII metal and an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

4,627,913

CATALYTIC COAL LIQUEFACTION WITH TREATED SOLVENT AND SRC RECYCLE

Diwakar Garg, Macungie; Edwin N. Givens, Bethlehem, and Frank K. Schweighardt, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 9, 1985, Ser. No. 690,009
Int. Cl.[4] C10G *1/06*
U.S. Cl. 208—415 8 Claims

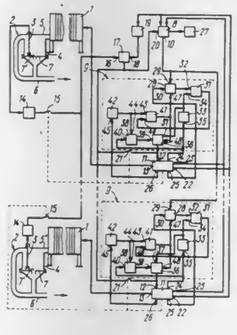
1. A process for the catalytic solvent refining of coal comprising contacting coal at elevated temperature and pressure in a hydrogen atmosphere and using a hydrocarbon solvent boiling in the range of 350° to 950° F. in which a predominant amount of the phenolic and nitrogenous base constituents from the solvents are removed when the solvent is recycled and the solvent refining is performed in the presence of an added catalyst to produce liquid hydrocarbons and normally solid, solvent-refined coal wherein at least a portion of the pyridine-soluble, pentane-insoluble solvent-refined coal is recycled to the process.

4,627,914

DEVICE FOR AUTOMATIC CONTROL OF PRESSURE FILTERS

Viktor I. Antonenko, Narimanova, 6, kv. 140, Kharkov, ploschad, U.S.S.R.

PCT No. PCT/SU85/00050, § 371 Date Feb. 7, 1986, § 102(e) Date Feb. 7, 1986, PCT Pub. No. WO86/00240, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 21, 1985, Ser. No. 830,526
Claims priority, application U.S.S.R., Jun. 21, 1984, 3759875
Int. Cl.[4] B01D *25/12*
U.S. Cl. 210—96.1 2 Claims



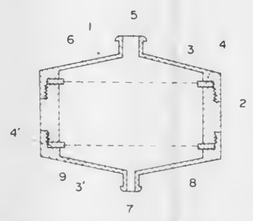
1. A device for automatic control of pressure filters used to dewater suspensions, comprising a control assembly connected to at least one pressure filter (**1**) and intended for determination of the duration of the suspension dewatering process and provided with a sensor (**3**) which determines, in the course of dewatering, the moment the solid phase of the suspension reaches assigned parameters, a unit (**8**) for timing the process of suspension dewatering, which is electrically connected to the sensor (**3**), control consoles (**11**) whose number is equal to that of the pressure filters (**1**), an input (**12**) of each control console (**11**) being electrically connected to an output of the timer unit (**8**), while an output (**13**) of each control console (**11**) is connected to an actuating device of each respective pressure filter (**1**), characterized in that it also comprises a frequency generator (**19**) whose control input and a first control input of the timer unit (**8**) are joined together and connected to outputs (**22**) of the control consoles (**11**), a second control input of the timer unit (**8**) is connected to outputs (**23**) of the control consoles (**11**), control units (**9**) whose number is equal to that of the pressure filters (**1**), a first input of each control unit (**9**) is connected to the output of the timer unit (**8**), an output of each control unit (**9**) is connected to the input (**12**) of the respective control console (**11**), the control assembly being connected to at least one pressure filter (**1**) by means of a filtrate pipe (**2**), the control assembly being essentially a vertically arranged pipe (**4**) whose cross-section is equal to or larger than that of the filtrate pipe (**2**) and which is communicated by the upper end thereof with an initial portion (**5**) of the filtrate pipe (**2**), while the lower end thereof is limited by a baffle (**7**) having a calibrated opening (**7'**) through which the pipe (**4**) communicates with a final portion (**6**) of the filtrate pipe (**2**), the sensor (**3**) is a capacitance-type element arranged inside the pipe (**4**) throughout its length so that the axis of the capacitance-type element is displaced in relation to the axis of the calibrated opening (**7'**), the electrical connection of the sensor (**3**) with the timer unit (**8**) is effected via a series-connected elements, namely a capacitance-to-frequency converter (**14**), a switch (**15**) for sensor engagement and a frequency coincidence unit (**17**) connected to an output of the frequency generator (**19**) and via suspension dewatering termination switches (**21**) whose number is equal to that of the pressure filters (**1**) and which are connected to the input (**12**) of each control console (**11**), which is joined with an input (**20**) of the unit (**8**), outputs (**24, 25, 26**) of each control console (**11**) being connected respectively to a second, third and fourth inputs of respective control console (**11**), the sensor switch (**15**) and the suspension dewatering termination switch (**21**) of a respective pressure filter (**1**) being joined with the switch of the control console (**11**) of the same pressure filter (**1**).

4,627,915

ABSORBENT OF AUTOANTIBODY AND IMMUNE COMPLEXES, ADSORBING DEVICE AND BLOOD PURIFYING APPARATUS COMPRISING THE SAME

Toru Kuroda, and Naokuni Yamawaki, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1984, Ser. No. 592,631
Claims priority, application Japan, Apr. 6, 1983, 58-59197; Apr. 6, 1983, 58-59199
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—195.2 16 Claims



16. A blood purifying apparatus for adsorbing and removing an autoantibody and/or immune complexes from blood plasma, which comprises a blood introduction means, a purified blood discharge means, a blood circulation passage provided with a plasma separating means and a blood-plasma mixing means, and a plasma recycle passage having both ends connected respectively to intermediate portions of said blood circulation passage to introduce plasma, which is separated by the plasma separating means, into said mixing means, through a plasma purifying means, said blood circulation passage running between said blood introduction means and said purified blood discharge means, and wherein said plasma purifying means comprises a vessel having a fluid inlet and a fluid outlet and, contained in the vessel, an adsorbent comprising a surface and, linked with the surface, at least one hydrophobic member having 6 to 700 carbon atoms and further, linked with the surface or with the hydrophobic member or with the both, at least one negative charge-producing member having no carbon atom or having 1 to 5 carbon atoms, said negative charge-producing member being adapted to produce such an effective number of negative charges in a body fluid that the ratio of:

$$\frac{\text{Effective number of negative charges}}{\text{Number of said hydrophobic members}}$$

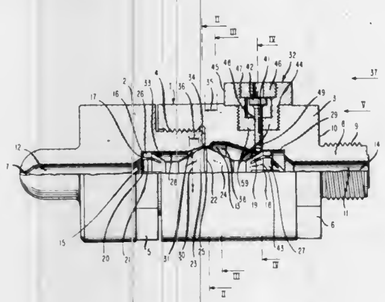
is greater than 1.

4,627,916

DIRT FILTER FOR SEMIFLUID THERMOPLASTIC MEDIA

Karl-Heinz Dörsam, Buchen-Bödigheim, Fed. Rep. of Germany, assignor to Odenwälder Kunststoffwerke GmbH, Buchen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 656,903, Oct. 2, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 783,237
Claims priority, application European Pat. Off., Jan. 28, 1984, 84100896.4; Aug. 22, 1984, 84109965.8; Fed. Rep. of Germany, Jul. 19, 1985, 8520879
Int. Cl.[4] B29C *47/68, 45/17*
U.S. Cl. 210—488 21 Claims



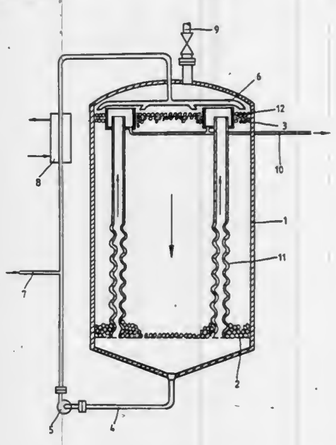
1. A dirt filter for semifluid thermoplastic media comprising:
a housing for a filter chamber hollowed out from said housing;
means for opening the housing;
a flow axis;
a barrier member disposed in the filter chamber, which barrier member is adjustable in its position by sliding along the flow axis from a filtering position to a cleaning position and vice versa;
a feed line inlet hollowed out from the housing, which issues into the filter chamber;
a discharge line hollowed out from the housing, which is led out of the housing on a side which is opposite to
a side of the barrier member, having the feed line inlet;
an annular slot disposed between a surrounding area of the barrier member disposed coaxially to the flow axis and to an oppositely disposed inner wall of the filter chamber, the annular slot being part of the flow connection between feed line inlet and discharge line; in the filtering position of the barrier member the annular slot is a blocking slot, which is narrower than the diameter of the dirt particles to be retained so such particles cannot pass through;
when the barrier member is in the cleaning position clearance between the barrier member and chamber wall is greater than the diameter of the dirt particles retained by the blocking slot so the particles can pass through; an adjustment member accessible from the outside for adjusting the position of the blocking member from its filtering position into the cleaning position and vice versa;
a guide body adjoining the end of the blocking body on the side disposed toward the feed line inlet; a bead provided at the guide body and protruding outwardly in a radial direction relative to the flow axis and matching a guide recess of the housing when the barrier member is displaced in the direction of the flow axis and where the adjustment member is coupled in a force transmitting way at the circumference of the bead; channels distributed along the circumference of the bead of the guide body for flow through of semifluid thermoplastic media, where the passage width of the channels is larger than the passage width of the blocking slot.

4,627,917

PROCESS FOR THE ANAEROBIC DECOMPOSITION OF ORGANIC SUBSTRATE

Manfred Morper, Gauting, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,279
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414999
Int. Cl.[4] C02F *3/28*
U.S. Cl. 210—617 8 Claims



1. In a process for the anaerobic decomposition of organic substrate in which organic substrate to be treated is conducted through a submerged filter bed arranged in a treatment zone or reactor, said filter bed being a carrier for settling biodegrading microorganisms therein or thereon, and substrate treated in the filter bed is partially recycled thereto, the improvment comprising conducting the organic substrate being treated in a downflow mode through said submerged filter bed to thereby treat said organic substrate, said recycling being conducted by separating a partial stream of substrate treated at the bottom of the treatment zone and passing it to the top, and conducting another partial stream of treated substrate in an upflow mode in contact with nicroorganisms fixed within conduit means through which said stream is passed and discharging treated effluent directly from said another partial stream from a region in the vicinity of the top of the treatment zone.

4,627,918

CHROMATOGRAPHY COLUMN USING HORIZONTAL FLOW

Vinit Saxena, Pinole, Calif., assignor to Sepragen Corporation, Pinole, Calif.

Filed Nov. 4, 1985, Ser. No. 794,727
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—656 32 Claims

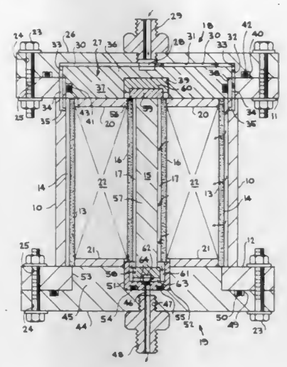
1. A chromatography column utilizing horizontal flow of sample material passing therethrough comprising:
a housing defining a chamber therein and including at least one removable end section,
a pair of longitudinally extending porous frits positioned in spaced relation within said chamber of said housing,
a bed of chromatographic separation material positioned in

said chamber of said housing and intermediate said porous frits,

one of said porous frits being spaced from said housing to define an inlet channel therebetween,

another of said porous frits being positioned to define an outlet channel,

distribution means operatively connected to said inlet channel,



collector means operatively connected to said outlet channel,

said distribution means and said inlet channel being constructed to direct associated material to be separated in said bed evenly across a longitudinal length of said bed in a substantially horizontal direction.

4,627,919

RESOLVING AGENT

Yoichi Yuki, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 21, 1986, Ser. No. 821,084
Int. Cl.[4] B01B *15/08*
U.S. Cl. 210—656 **6 Claims**

1. A method for the optical resolution of a racemic mixture with a compound having the formula:

$$\begin{array}{c} Y^1 \\ | \\ Y^2-Si-X-R \\ | \\ Y^3 \end{array} \quad (I)$$

wherein at least one group selected from among Y^1, Y^2 and Y^3 represents silica gel and/or a siloxane bond moiety therewith while others represent each a hydrogen atom, an alkyl group having one to 20 carbon atoms, an aryl group having six to 20 carbon atoms, an arylalkyl group having seven to 20 carbon atoms, a halogen atom, a hydroxyl group, an alkoxy group having one to 20 carbon atoms or a combination thereof; X represents a spacer having one to 30 carbon atoms; and R is a metal salt of optically active t-leucine or tryptophane.

4,627,920

PROCESS FOR THE RETENTION OF A SUBSTANCE DISSOLVED IN A SOLUTION

Roger Chatelin, Lozanne; Jean-Francois Combes, Servian, and Daniel Wattiez, Lozanne, all of France, assignors to Institut Textile de France, Boulogne Billancourt, France

Filed Jul. 17, 1984, Ser. No. 631,680
Claims priority, application France, Jul. 22, 1983, 83 12187
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—668 **18 Claims**

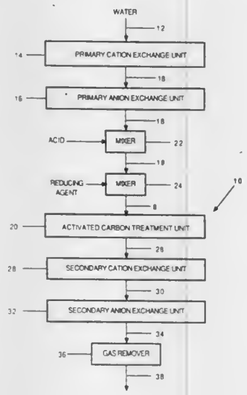
1. A process for the retention of at least one substance dissolved in a solution, wherein, in a first step, an excess of a soluble organic polyelectrolyte capable of forming an ionic association with the said substance is added to the solution to form a soluble entity wherein said polyelectrolyte contains electrolyte groups ionically associated with said substance and other electrolyte groups not ionically associated with said substance and in a second step, the solution thus obtained is brought into contact with a material possessing ionic groups which retain the polyelectrolyte by virtue of said electrolyte groups not ionically associated with the said substance.

4,627,921

TREATMENT OF WATER TO LOWER THE OXYGEN AND THE TOTAL ORGANIC CARBON WITHIN THE SAME

Peter S. Meyers, West Covina, and Gerald Alexander, La Canada, both of Calif., assignors to L A Water Treatment Corporation, City of Industry, Calif.

Filed Apr. 29, 1985, Ser. No. 728,289
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—668 **3 Claims**



1. A process of treating water to lower the total organic carbon and oxygen content of the water which comprises the steps of:

adjusting the acidity of the water being treated to a pH of from about 4 to about 6.9 by the addition of a mineral acid to said water;

adding a reducing agent selected from the group consisting of hydrazine, morpholine, sodium sulfite and sodium acid sulfite capable of reacting with the total organic carbon and oxygen in said water so as to reduce the levels of both of them in excess of an amount necessary to react with all of the oxygen and total organic carbon in said water and allowing contact between the water and the reducing agent for a time period and at a temperture in order to achieve such reduction; and

passing water mixed with the reducing agent through an absorbent, adsorbent bed within a housing while maintaining the interior of said housing anaerobic.

4,627,922

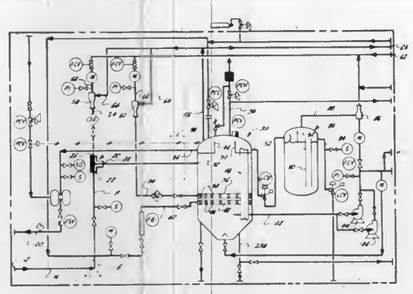
METHOD OF REMOVING DISSOLVED OIL FROM PRODUCED WATER

Carrol L. Viator; Glenn E. Gilley, both of Lafayette; Paul C. Broussard, Sr., Maurice; Curtis Broussard, and Dennis Gracy, both of Lafayette, all of La., assignors to Gilley and Associates, Lafayette, La.

Filed Oct. 29, 1984, Ser. No. 665,741
Int. Cl.[4] C02F *1/24*
U.S. Cl. 210—704 **29 Claims**

1. A method of removing dissolved oil from water, the dissolved oil being comprised of hydrocarbon additives solvated by water molecules, the hydrocarbon additives having a hydrocarbon structure with an attached group for providing extra electrons for attaching the hydrocarbon additive to metal, the method comprising the steps of:

turbulently contacting a first gas comprising dichlorodifluo-



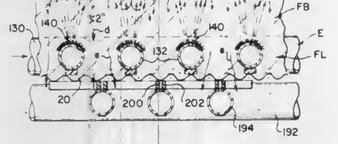
romethane with the water to create bubbles that move dissolved oil particles to a surface of the water, the first gas comprising an effective amount of dichlorodifluoromethane to molecularly attract the dissolved oil particles through hydrogen bonding, and preferentially displace solvating water molecules, and removing the dissolved oil from the surface.

4,627,923

APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT

David S. Ross, Lorain, Ohio, assignor to International Tectonics Incorporated, Avon Lake, Ohio

Filed Sep. 20, 1984, Ser. No. 652,873
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—744 **45 Claims**



1. Method of operating a waste effluent filter including a tank having a lower portion; a generally flat fine mesh element supported adjacent said lower portion and having a multitude of apertures; an underdrain cavity adjacent said lower portion and under said fine mesh element and generally coextensive with said fine mesh element; a filter bed of particulate material having an upper surface; a parallel lower surface on said generally flat fine mesh element, a generally uniform depth between said fine mesh element and said upper surface and an effective particle size at least greater than the size of said apertures of said fine mesh elements; means for directing effluent into said filter above said upper surface; and, means for directing filtered effluent from said underdrain cavity, said method comprising the steps of:

(a) allowing liquid in said tank to increase to a level substantially above said upper surface during filtering; and,

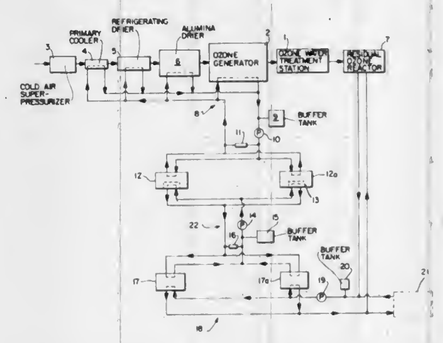
(b) during such filtering, periodically regenerating said upper surface by folding filtered material at said upper surface into said filter bed by directing a plurality of evenly distributed hydraulic jets upwardly through said filter bed from a position in said bed and above said flat fine mesh element a given distance whereby a lower filtering layer of said bed remains undisturbed between said jets and said fine mesh element while said upper surface is regenerated.

4,627,924

PROCESS AND APPARATUS FOR THE RECOVERY OF ENERGY FROM AN OZONE PRODUCTION UNIT

Christian Coste, Versailles, France, assignor to Degremont, Rueil-Malmaison, France

Continuation of Ser. No. 490,412, May 2, 1983, abandoned. This application Feb. 13, 1985, Ser. No. 700,342
Claims priority, application France, Mar. 29, 1983, 83 05117
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—760 **10 Claims**



1. A process for the recovery of energy from an ozone production unit including an ozone generator supplied with gas from pretreatment units, and using ozone produced thereby to treat water said process comprising:

providing a first closed fluid circuit having therein a first fluid;

circulating said first fluid through said first closed fluid circuit and in heat exchange relationship with gas in said pretreatment units and said ozone generator, thereby transferring heat from said gas to said first fluid;

providing said first closed fluid circuit with at least one refrigerating unit having a condenser, and by said at least one refrigerating unit cooling the thus heated said first fluid and maintaining constant the temperatures in said pretreatment units and said ozone generator;

providing a second closed fluid circuit having therein a second fluid and including said condenser and at least one heat pump;

circulating said second fluid through said condenser in said second closed fluid circuit in heat exchange relationship with said heat first fluid and thereby transferring said heat to said second fluid;

providing a third closed fluid circuit having therein a third fluid;

circulating said third fluid through said third closed fluid circuit in heat exchange relationship with the thus heated said second fluid in said at least one heat pump and thereby transferring heat to said third fluid;

providing an ozone water treatment facility and treating water therein by means of ozone produced by said ozone generator;

providing a residual ozone reactor and transferring thereto residual ozone remaining after treatment thereby at said facility; and

passing said heated third fluid to said residual ozone reactor and utilizing the heat from said third fluid for destroying said residual ozone in said reactor.

4,627,925
AQUEOUS CONCENTRATED FABRIC SOFTENING COMPOSITION

Robert M. Butterworth; John R. Martin, and Edwin Willis, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,676

Claims priority, application United Kingdom, Apr. 19, 1984, 8410321

Int. Cl.⁴ D06M *11/00*

U.S. Cl. 252—8.8 **6 Claims**

1. An aqueous concentrated fabric softening composition comprising:

(i) an aqueous base;

(ii) more than 10% by weight of a water-insoluble cationic fabric softener; and

(iii) about 3.5% by weight of a nonionic material which is a fatty coco amine ethoxylated with an average of approximately 5 ethylene oxide groups per molecule,

the total level of the cationic softener and the nonionic material being not more than 36% by weight.

4,627,926
THERMALLY STABLE BOREHOLE FLUIDS

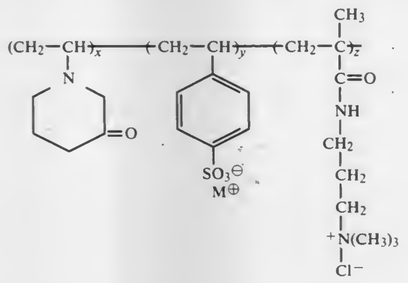
Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J.; Lawrence P. Sedillo, Houston, and John Newlove, Kingwood, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 19, 1984, Ser. No. 651,900

Int. Cl.⁴ E21B *43/00; 43/26*

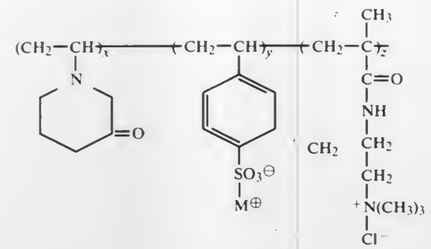
U.S. Cl. 252—8.55 R **8 Claims**

1. A method of completing a subterranean formation of an oil or gas well to increase the recovery of hydrocarbons from the producing reservoir which comprises dissolving about 0.25 to about 20 lb/bbl of a water soluble terpolymer in an aqueous salt solution to viscosify said aqueous salt solution and pumping said aqueous salt solution with said water base terpolymer dissolved therein into said well to control the subsurface pressures of said well, wherein said terpolymer has the formula:



wherein x is about 70 to about 98 mole %, y is about 1 to about 15 mole %, z is about 1 to about 15 mole %, wherein y and z are less than 60 mole %, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and II of the Periodic Table of Elements.

5. A method of fracturing a subterranean formation of a gas or oil well which comprises dissolving about 0.25 to about 20 lb/bbl of a water soluble terpolymer into an aqueous salt solution to viscosify said aqueous salt solution and pumping said aqueous salt solution with terpolymer dissolved therein into said well to apply hydraulic pressure to such formation wherein said terpolymer has the formula:



4,627,927
ADDITIVE COMPOSITION FOR GRANULAR DETERGENT

Takenobu Sakatani, Chiba, and Shigeru Suzuki, Ichikawa, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 509,728, Jun. 30, 1983, abandoned. This application May 28, 1985, Ser. No. 738,514

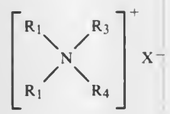
Claims priority, application Japan, Jul. 5, 1982, 57-116589

Int. Cl.⁴ D06M *13/46;* **C11D** *7/32*

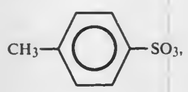
U.S. Cl. 252—8.75 **4 Claims**

1. An additive composition for a granular detergent comprising:

(a) a quaternary ammonium salt having the general formula (I):



wherein R_1 and R_2 independently represent an alkyl group having 12 to 26 carbon atoms, R_3 and R_4 independently represent an alkyl group having 1 to 4 carbon atoms, a benzyl group, a hydroxyalkyl group having 2 to 4 carbon atoms, or a polyoxyalkylene group having 1 to 5 mole oxyalkylene units, and X represents a halogen atom, CH_3SO_4, $C_2H_5SO_4$, or



and

(b) at least one nonionic surfactant selected from the group consisting of alkyl- or alkenyl-ethoxylates having an alkyl or alkenyl with 9 to 11 carbon atoms and having an average ethylene oxide addition mole number of 5 to 12, alkyl- or alkenyl-phenylethoxylates having an alkyl or alkenyl with 6 to 13 carbon atoms and having an average ethylene oxide addition mole number of 3 to 8, sucrose mono- or di-fatty acid esters, and sorbitan mono- or di-fatty acid esters, the ratio of component (a)/component (b) in a weight basis of 99.5/0.5 to 50/50, and

said additive composition being granulated from a mixture of the molten quaternary ammonium salt having the general formula (I) and the nonionic surfactant by (i) spraying the mixture, followed by cooling or (ii) solidifying the mixture upon cooling, followed by crushing.

4,627,928
BASIC NON-CARBONATED MAGNESIUM COMPOSITIONS AND FUEL, LUBRICANT AND ADDITIVE CONCENTRATE COMPOSITIONS CONTAINING SAME

Jack L. Karn, Richmond Hgts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 267,441, May 27, 1981, abandoned, which is a continuation of Ser. No. 718,448, Aug. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 322,246, Jan. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,154, Nov. 22, 1971, abandoned. This application Jul. 29, 1985, Ser. No. 761,296

Int. Cl.⁴ C10M *179/26;* **C10L** *1/32*

U.S. Cl. 252—33 **44 Claims**

1. A process for preparing a noncarbonated, basic magnesium salt of a substituted hydroxy-containing aromatic carboxylic acid having a magnesium content of at least 150% and up to about 250% of the stoichiometrically equivalent amount, based on the total amount of acid present, which consists essentially of reacting at a temperature of about 25° C. up to the decomposition temperature of a reactant, in the absence of any inorganic acid material

(A) at least one hydrocarbyl-substituted or substantially hydrocarbyl-substituted aromatic hydroxy carboxylic acid, salt or saponifiable derivative thereof, wherein the substantially hydrocarbon substituent contains up to about 10 weight percent of polar groups selected from the group consisting of mercapto, halogen, nitro, amino, nitroso, sulfo, keto, oxo groups and various combinations thereof, and;

(B) a stoichiometric excess of at least one basically reactive magnesium compound selected from the group consisting of magnesium oxides, hydroxides and alkoxides for each equivalent of said acid salt or derivative thereof, in the presence of

(C) at least about 0.1 mole of water for each equivalent of magnesium compound, and then refluxing the resulting mixture for a least about 0.5 hour with the proviso that the reaction is carried out in the absence of any carboxylic acid other than (A).

4,627,929
STABILIZED LUBRICANTS BASED ON POLYETHERS

Hans-Josef Buysch, Krefeld; Siegfried Kussi, and Günther Boehmke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

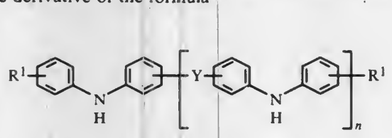
Filed Dec. 2, 1985, Ser. No. 803,458

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444884

Int. Cl.⁴ C10M *165/18, 119/24*

U.S. Cl. 252—47 **10 Claims**

1. A stabilized lubricant composition comprising a polyether lubricant, and an effective stabilizing amount of a diphenylamine derivative of the formula



in which R^1 denotes hydrogen, a straight-chain or branched C_4 to C_{12}-alkyl group, a straight-chain or branched C_4 to C_{12}-alkylene group, a C_7 to C_{12}-aralkyl group, a C_7 to C_{12}-aralkylene group, a C_5 to C_{12}-cycloalkyl group which is optionally substituted by C_1 to C_6-alkyl, -alkenyl, -cycloalkyl or -cycloalkenyl, or a C_5 to C_{12}-cycloalkenyl group which is optionally substituted by C_1 to C_6-alkyl, -alkenyl or -cycloalkenyl, but does not denote a hydrocarbon group derived from a terpene, in the ortho- or para-position relative to the particular N atom, n represents an integer from 1 to 29 and Y represents a bifunctional radical —A— and optionally additionally a bifunctional radical —B—, in each case in the ortho- or para-position relative to the N atoms, wherein —A— denotes a straight-chain or branched C_4 to C_{12}-alkylene radical, a C_7 to C_{12}-aralkylene radical, or a C_5 to C_{12}-cycloalkylene radical which is optionally substituted by C_1 to C_6-alkyl or -cycloalkyl, but does not denote a hydrocarbon radical derived from a terpene, and —B— denotes —S— or

wherein R^2 represents hydrogen, C_1 to C_6-alkyl or C_5 to C_6-cycloalkyl and wherein —B— makes up an amount of 0 to 50 mol% of Y.

4,627,930
BORON-CONTAINING HETEROCYCLIC COMPOUNDS AND LUBRICATING OIL CONTAINING SAME

Richard A. Holstedt, Whittier; Kenneth Baron, Diamond Bar, and Peter J. Jessup, Santa Ana, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

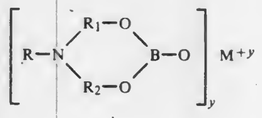
Continuation-in-part of Ser. No. 679,286, Dec. 7, 1984, Ser. No. 525,691, Aug. 23, 1983, abandoned, Ser. No. 525,718, Aug. 23, 1983, abandoned, Ser. No. 525,719, Aug. 23, 1983, abandoned, Ser. No. 525,720, Aug. 23, 1983, abandoned, Ser. No. 482,941, Apr. 7, 1983, Ser. No. 476,513, Mar. 1, 1983, Pat. No. 4,533,480, Ser. No. 418,196, Sep. 15, 1982, Pat. No. 4,511,516, and Ser. No. 329,385, Dec. 10, 1981, said Ser. No. 679,286, is a continuation-in-part of Ser. No. 158,981, Jun. 12, 1980, abandoned, said Ser. No. 525,718, is a continuation-in-part of Ser. No. 158,828, Jun. 12, 1980, Pat. No. 4,400,284, Ser. No. 158,981, and Ser. No. 418,196, which is a continuation-in-part of Ser. No. 158,828, and Ser. No. 158,981, said Ser. No. 525,720, is a continuation-in-part of Ser. No. 476,513, Ser. No. 434,602, Oct. 15, 1982, Pat. No. 4,490,265, Ser. No. 333,998, Dec. 23, 1981, Pat. No. 4,412,928, Ser. No. 329,384, Dec. 10, 1981, Pat. No. 4,427,560, Ser. No. 329,385, and Ser. No. 319,073, Nov. 9, 1981, Pat. No. 4,410,436, said Ser. No. 482,941, is a division of said Ser. No. 158,828. This application Jan. 29, 1985, Ser. No. 695,959

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ C10M *1/20, 1/32, 1/54*

U.S. Cl. 252—49.6 **59 Claims**

1. A boron-containing heterocyclic compound of the formula:



wherein:

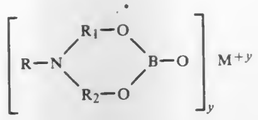
y is an integer;

M is a metal, semimetal or metalloid selected from the periodic groups IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA, VA;

R is hydrogen, an inorganic radical or a C_1 to C_{50} organic radical; and

R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4. A lubricating composition comprising a major portion of a lubricating oil and a minor proportion of a boron-containing heterocyclic compound of the formula:



wherein:
y is an integer;
M is a metal;
R is hydrogen, an inorganic radical or C_1 to C_{50} organic radical; and
R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4,627,931

METHOD AND COMPOSITIONS FOR HARD SURFACE CLEANING

Arshad H. Malik, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 29, 1985, Ser. No. 696,688
Int. Cl.[4] C11D *1/722, 3/33, 3/43*
U.S. Cl. 252—153 **12 Claims**

1. A liquid hard surface detergent composition comprising, on a total weight basis:

(a) from about 0.1 to about 50 weight percent of a nonionic surfactant component at least about 10 weight percent of which, on a total nonionic surfactant component weight basis, is a glycoside surfactant of the formula:

$$RO(R'O)_y(Z)_x \quad \text{I}$$

wherein R is a monovalent organic radical containing from about 6 to about 30 carbon atoms; R' is a divalent hydrocarbon radical containing from 2 to about 4 carbon atoms; y is a number having an average value of from 0 to about 12; Z is a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; and x is a number having an average value of from 1 to about 10;

(b) from about 0.1 to about 50 weight percent of a water miscible organic solvent selected from the group consisting of alkylene glycol ether solvents and polyalkylene glycol ether solvents;

(c) from about 0.1 to about 50 weight percent of a water soluble detergent builder; and

(d) from about 10 to about 99.7 weight percent water.

4,627,932

BICYCLIC AMIDE ACETALS AS MOISTURE SCAVENGERS

Anil B. Goel, Worthington, and Harvey J. Richards, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 4, 1985, Ser. No. 697,830
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—194 **4 Claims**

1. The method for removing water from mixtures of monohydroxyl vinyl monomers and water comprising adding to said mixtures a bicyclic amide acetal and allowing the water to react with the bicyclic amide acetal at a temperature in the range of from about room temperature up to about 200° C.

4,627,933

LIQUID CRYSTALLINE PHASES CONTAINING ALKYLENE-TYPE BRIDGES

Rudolf Eidenschink; Joachim Krause, both of Dieburg; Beatrice M. Andrews, South Humberside; George W. Gray, and Neil Carr, both of North Humberside, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany and The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, Great Britain

Filed Jul. 7, 1983, Ser. No. 511,609
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225290
Int. Cl.[4] C07C *69/62, 69/612, 13/28, 43/205, 15/12, 25/18, 121/64, 121/60, 121/75;* **C09K** *3/34;* **G02F** *1/13;* **C07D** *319/06*
U.S. Cl. 252—299.6 **14 Claims**

1. A liquid-crystal dielectric useful for electro-optical display elements and comprising at least two liquid-crystal components, wherein at least one of the components is a compound of the formula

$$R^1—Q^1—(CH_2)_4—Q^2—R^2, \quad \text{(a)}$$

$$R^1—Q^1—(CH_2)_6—Q^2—R^2, \quad \text{(b)}$$

$$R^1—Q^1—CH_2—COO—CH_2—Q^2—R^2, \text{ or} \quad \text{(c)}$$

$$R^3—Cy—Phe—CH_2CH_2—COO—Phe—R^2 \quad \text{(d)}$$

wherein

R^1 and R^2 are each independently alkyl or alkoxy each of 1–12 C atoms, F, Cl, Br, CN or $—Q^3—R^3$, or one of R^1 and R^2 can also be H;

Q^1, Q^2 and Q^3 are each independently 1,4-phenylene (Phe), or 1,4-cyclohexylene (Cy), each of which is unsubstituted or substituted by 1–4 fluorine, chlorine or bromine atoms;

R^3 is alkyl or alkoxy each of 1–8 C atoms, H, F, Cl, Br or CN;

but with the proviso that in formula (a), Q^3 is unsubstituted 1,4-phenylene or 1,4-phenylene substituted by a fluorine, chlorine or bromine atom, only when at least one of R^1 to R^3 is F, Cl or Br or none of R^1 to R^3 is CN or two of the radicals R^1 to R^3 are CN.

4,627,934

SINGLE PHASE CLEAR LIQUID AFTER-SHAVE TREATMENT PRODUCT CONTAINING ALOE VERA

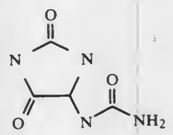
Jerome I. Lindauer, Hillsdale, N.J., and Sharon L. Reich, Briarwood, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 25, 1985, Ser. No. 695,074
Int. Cl.[4] A61K *7/46*
U.S. Cl. 252—522 R **1 Claim**

1. A clear liquid phase, single phase composition consisting essentially of:

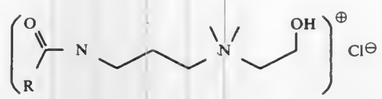
(i) from about 45 up to about 75% by weight of ethylalcohol;

(ii) from about 0.05% up to about 1.0% by weight of said composition of allantoin having the structure:



(iii) from about 2.0% up to about 5.0% of a poly lower alkylene glycol having a molecular weight of from about 8,000 up to about 20,000;

(iv) from about 0.2% up to about 1.0% of a quaternary ammonium salt having the structure:



wherein R is a Mink oil fatty acid residue;

(v) from about 0.75% up to about 3.50% of a polyalkoxylated lanolin oil which is lanolin oil bonded to 12 monomeric units of polypropylene glycol and 65 monomeric units of polyethylene glycol;

(iv) from about 2.0% up to about 5.0% of polypropylene glycol stearol ether;

(vii) from about 0.05% up to about 1.0% of polyalkylene glycol having a molecular weight of from about 8,000 up to about 20,000;

(viii) from about 20% up to about 40% by weight of said mixture of water;

(ix) from about 0.5% up to about 3.0% of a perfume oil; and

(x) from about 0.5% up to about 3.0% of aloe vera oil soluble fraction

said perfume oil being totally miscible with said aloe vera oil soluble fraction, said aloe vera oil soluble fraction produced according to the process comprising the steps of:

(a) forming aloe vera gel or a product resulting from steam distilling aloe vera leaves and separating the resulting oil phase from the resulting aqueous phase;

(b) extracting the oil miscible aloe vera fraction from the organic phase of the steam distillation product or from the aloe vera gel by intimately admixing therewith, a quantity of extraction solvent and physically separating the extract phase from the raffinate phase; and

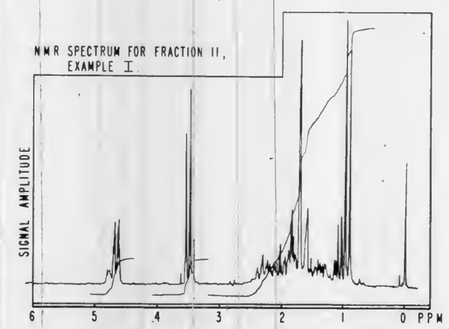
(c) separating the extraction solvent from the oil miscible aloe vera extract phase.

4,627,935

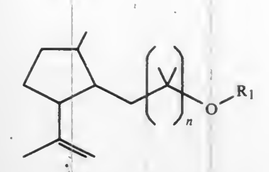
2-ISOPROPENYL-5-METHYLCYCLOPENTANEALKANOLS, ESTERS THEREOF AND ORGANOLEPTIC USES OF SAME

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 6, 1985, Ser. No. 698,862
Int. Cl.[4] C11B *9/00;* **A61K** *7/46;* **C07C** *35/06*
U.S. Cl. 252—522 R **9 Claims**



1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of at least one 2-isopropenyl-5-methylcyclopentanealkanols and esters thereof defined according to the structure:



wherein R_1 represents hydrogen or C_2–C_3 acyl and n represents 0 or 1.

4,627,936

TOWEL PREMOISTENED WITH ANTISTATIC SOLUTION FOR CLEANING CATHODE-RAY TUBES AND THE LIKE

Peter J. Gould, and Philip D. Turits, both of Greenwich, Conn., assignors to Gould Paper Corp., New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,260
Int. Cl.[4] C11D *1/12, 1/755*
U.S. Cl. 252—558 **23 Claims**

1. An antistatic solution for cleaning cathode ray tubes or the like consisting essentially of

(a) from about 0.1 to 1 weight percent of a first surfactant of an alkali metal salt of an alkylated aryl disulfonate wherein the alkyl group has between 10 to 15 carbon atoms;

(b) from about 0.1 to 1 weight percent of a second surfactant of an alkylated aryl sulfonate wherein the alkyl group has between 10 to 15 carbon atoms; and

the balance of said composition constituting a liquid carrier comprising an alcohol, water and mixtures thereof.

4,627,937

PROCESS FOR DENITRATING NITRIC ACID AND ACTINIDE CONTAINING WASTE SOLUTIONS WHILE SIMULTANEOUSLY SEPARATING THE ACTINIDES

Klaus Gompper, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,798
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243841
Int. Cl.[4] G21F *9/04, 9/10;* **B01D** *21/01*
U.S. Cl. 252—631 **4 Claims**

1. Process for denitrating aqueous nitric acid and salt containing waste solutions in which actinides are present, while simultaneously separating the actinides, comprising: agitating the waste solution with diethyl oxalate at room temperature, and heating the resulting suspension to at least 75° C.

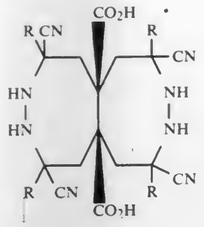
4,627,938

POLYMERIZATION INITIATOR

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 668,059, Nov. 5, 1984, Pat. No. 4,556,512. This application Jul. 29, 1985, Ser. No. 759,771
Int. Cl.[4] C07D *00/00*
U.S. Cl. 540–473 **1 Claim**

1. A compound having the formula



wherein each R separately represents a methyl or ethyl moiety.

4,627,939

P-FORMYL-N,N-DIPOLYOXYALKYLENESUBSTITUTEDANILINE

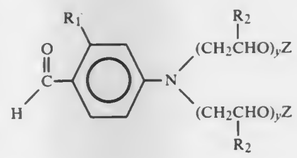
Patrick D. Moore, Spartanburg, and Robert L. Mahaffey, Jr., Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 644,375, Aug. 27, 1984. This application Oct. 8, 1985, Ser. No. 785,628

Int. Cl.⁴ C07C *95/08*

U.S. Cl. 260—404 **1 Claim**

1. A compound of the formula:



wherein R_1 is selected from an alkyl group having from one to about two carbon atoms, a halide group selected from chlorine, bromine or iodine, or an alkoxy group having from one to about two carbon atoms; R_2 is selected from H or an alkyl group having from one to about two carbon atoms; y is a number of from 2 to about 200; and Z is



where W is alkyl.

4,627,940

PROCESS FOR PREPARING A POLYAMIDE

Earl R. Beaver; J. Harvey Lester, Jr., and Thomas J. Thompson, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 427,088

Int. Cl.⁴ C07C *102/04;* **C08G** *69/26*

U.S. Cl. 260—501.11 **4 Claims**

1. In a process for the production of nylon salt from a dicarboxylic acid where the dicarboxylic acid is separated from the product stream in the form of wet crystals and where the dicarboxylic acid crystals, prior to shipment, are dried, loaded into a shipping container at one location, shipped to another location, and thereafter unloaded, mixed with sufficient amounts of water to form an aqueous dicarboxylic acid solution and then with aqueous diamine to form a nylon salt solution, the improvement comprising loading the wet dicarboxylic acid into the shipping container without prior drying; and unloading the dicarboxylic acid from the shipping container to a second container by feeding an aqueous solution of nylon salt into the shipping container, thereby entraining the wet dicarboxylic acid and concomitantly providing a solution of nylon salt and unreacted dicarboxylic acid, draining the salt-dicarboxylic solution from the shipping container, adding diamine to the drained salt-dicarboxylic solution in an amount to react with the unreacted dicarboxylic acid and continuously recirculating the resulting salt solution to the shipping container with subsequent further addition of diamine so as to dissolve and remove most of the dicarboxylic acid from the shipping container.

4,627,941

GAS/LIQUID CONTACTING APPARATUS

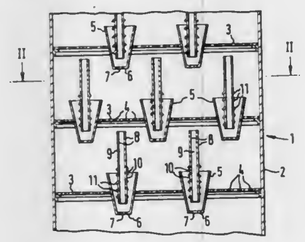
Jeremy B. Bentham, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 711,873, Mar. 14, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,056

Claims priority, application United Kingdom, Mar. 14, 1984, 8406634

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—109 **7 Claims**



1. Gas/liquid contacting apparatus comprising:

a normally vertically extending column having a plurality of substantially horizontal trays arranged one above the other in the column;

each of said trays having a plurality of apertures for ascending gas and a plurality of liquid discharge devices for descending liquid;

said liquid discharge devices being open at their upper ends and extending at least partly below the relevant trays with the parts of the liquid discharge devices extending below the trays being provided with bottom walls which are pierced by bottom located liquid discharge openings;

each of said liquid discharge devices being also provided with a gas passage which (a) has at least one gas entry opening located within the lower part of the liquid discharge device, (b) has walls separated by distances such that the velocity of the upward flowing gas is small enough to permit liquid entrained in that gas to be separated from the gas by gravity flow and (c) has an outlet located substantially above the upper end of the liquid discharge device; and

the areas of said bottom located liquid discharge openings in said liquid discharge devices being arranged for providing an aggregate area sufficient for discharging all the liquid flowing downward through the column while maintaining within each liquid discharge device a column of liquid having a hydrostatic head sufficient to prevent said ascending gas from entering the liquid discharge devices through said bottom located liquid discharge openings, so that the discharging of liquid through the bottom located openings and the separating of liquid from gas within the gas passages maintains a substantially continuous and unhindered entry of liquid into the upper ends of the liquid discharge devices.

4,627,942

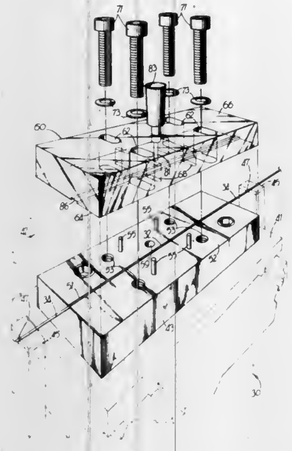
METHOD AND APPARATUS FOR RECOATING SPLICED END PORTIONS OF OPTICAL FIBERS

Paul F. Gagen, Duluth; Jane F. Kuhl, Atlanta; Stephen C. Mettler, Decatur, and Carl R. Taylor, Lawrenceville, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1985, Ser. No. 706,268

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.5 **10 Claims**



1. A method of recoating bared, spliced end portions of optical fibers, said method including the steps of:

positioning bared spliced end portions of optical fibers in a groove which opens to a surface of a base plate;

enclosing the groove with a cover which includes a channel and which engages the surface of the base plate;

introducing a curable coating material into the groove to encapsulate the bared spliced end portions of the optical fibers;

causing relative movement between the baseplate and the cover along the surface of the base plate to shear across the coating material in the groove to align the channel in the cover with the groove and thereby cause the coating material in the groove to have a free surface which is effective to allow a portion of the coating material to be substantially uninhibited during its contraction to facilitate redistribution of coating material and to avoid the formation of voids therein;

curing the coating material which encapsulates the spliced end portions of the fibers; and

removing the recoated spliced end portions form the groove.

4. An apparatus for coating a portion of an optical fiber, said apparatus including:

a mold plate which includes a groove for holding the portion of the optical fiber, said groove communicating with a surface of said mold plate;

cover means for enclosing the groove, said cover means including a channel which extends parallel to the groove;

injection means for introducing a coating material into the groove to encapsulate the portion of the optical fiber; and

means for mounting said cover means to facilitate relative movement between said mold plate and said cover means between one position whereat said injection means is aligned with the groove to permit introduction of the coating material into the groove and another position where the channel is aligned with the groove to allow the coating material to be cured while it is exposed to a free surface, the relative movement between the cover means and the mold plate between the two positions causing a shearing across the coating material along the surface of the mold plate to which the groove opens.

4,627,943

PROCESS FOR THE PRODUCTION OF SPHERICAL METALLIC PARTICLES

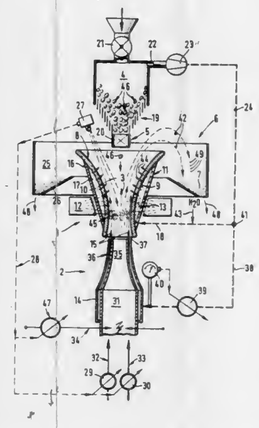
Wolfgang Seidler, Gartenweg 5, 4600 Dortmund 50, Fed. Rep. of Germany

Filed Dec. 11, 1984, Ser. No. 680,400

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345983

Int. Cl.⁴ B29B *9/10*

U.S. Cl. 264—14 **16 Claims**



1. In a process for the production of spherical metal particles for use as an abrasive wherein a particulate metal starting material is liquified and formed into molten droplets which are solidified by contact with a cooling gas, the improvement which comprises: passing the particulate starting material downwardly into an upward flowing stream of hot gas surrounded by a cooling envelope gas stream, the flow rate of the hot gas stream being sufficient to place the particles in a fluidized state creating a fluidized bed zone to which a magnetic field is applied and the temperature of the hot gas being sufficient to melt the particles.

4,627,944

METHOD FOR PRODUCING A CARBON SHEET AND A FUEL CELL SEPARATOR

Shigeru Murakami; Yasuto Komatsu, both of Omachi; Makoto Watanabe, Tokyo, and Takeo Uemura, Omachi, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,322

Claims priority, application Japan, Aug. 19, 1983, 58-150360

Int. Cl.⁴ B29C *25/00;* **C01B** *31/02*

U.S. Cl. 264—29.4 **6 Claims**

1. A separator of a fuel cell produced by a method, comprising the steps of:

forming a shaped body in the form of a single sheet comprising cellulose fibers and a thermosetting resin which is filled between the cellulose fibers;

curing the thermosetting resin of the shaped body; and

baking the shaped body at a temperature of from 800 to 1200° C., thereby converting the thermosetting resin into carbon.

4,627,945

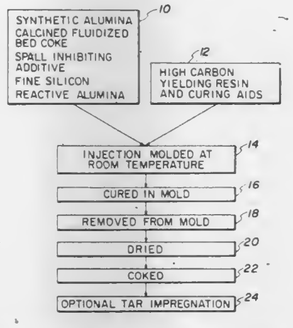
METHOD OF MANUFACTURING AN INJECTION MOLDED REFRACTORY SHAPE AND COMPOSITION THEREOF

Howard M. Winkelbauer, McKeesport; Ke-Chin Wang, Pittsburgh; Frank H. Walther, Jr., Upper St. Clair, and Donald F. Stock, Pittsburgh, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 27, 1984, Ser. No. 635,076

Int. Cl.[4] B29C *45/73*

U.S. Cl. 264—29.5 **10 Claims**



1. A method for manufacturing an alumina-carbon shaped object comprising the steps of:

mixing 1-8 weight percent fine silicon, 1-16 weight percent reactive alumina, 1-30 weight percent calcined fluidized bed coke, 1-30 weight percent of a spall inhibiting additive, and the balance of the mix synthetic alumina with the additions of 5-10 weight percent of a high carbon yielding resin as a molding vehicle, 0.5-4 weight percent solvent and up to 2 weight percent of a low temperature curing agent;

injection molding the mix to produce shaped objects;

initially curing the shapes at a temperature less than 100° C.;

stripping the shape from the mold;

further curing the shape at a temperature above 100° C.; and

enhancing the strength of the shape by heating the shape at a relatively high temperature above 550° C. to promote coking of the resin molding vehicle.

4,627,946

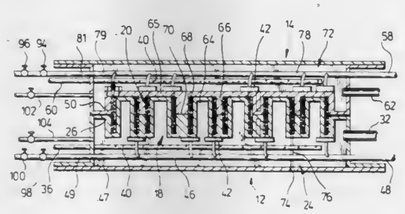
METHOD AND MOLDING APPARATUS FOR MOLDING EXPANDED POLYSTYRENE ARTICLES HAVING SMOOTH SURFACES

Larry V. Crabtree, Kitchener, Canada, assignor to Morval-Durofoam Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 548,957, Nov. 7, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,067

Int. Cl.[4] C08J *9/22, 9/34*

U.S. Cl. 264—51 **22 Claims**



1. A method of forming an expanded plastic part of a predetermined shape from prefoamed resin beads comprising introducing prefoamed resin beads into a partially open mold cavity of said predetermined shape, said cavity being defined by inner surface of separable mold wall portions, said mold having a chamber defined exterior of and associated with each of said wall portions, a plurality of nozzles provided in at least one of said wall portions and a corresponding plurality of tubes interconnecting said nozzles to a manifold located in the corresponding chamber for fluid communication between the respective nozzle and manifold, said manifold being spaced from a corresponding said wall portion, each of said nozzles having an opening of cross-sectional area which is sufficiently small to preclude formation of evident surface marks on the formed part in the vicinity of each nozzle opening, introducing into said chamber a heating medium to heat said wall portions to a desired molding temperature with said cavity closed and filled with resin beads, injecting a pressurized steam from said manifold through said nozzles into said cavity to expand said resin beads until they fuse and form the desired part, said injection of said steam continuously removing from said manifold any condensate formed in said manifold through means in fluid communication with said manifold for providing a controlled continuous discharge of steam and condensate from said manifold, said manifold discharge means being provided on said manifold at its lowermost position when in use, removing said heating medium from said chambers and introducing into said chambers a cooling medium to cool said wall portions at least until said formed part has cooled sufficiently for removal, and opening said mold and removing the formed part from said cavity by separating said mold wall portions.

4,627,947

PROCESS FOR PRODUCING POURABLE SPHERICAL-SEGMENT-SHAPED PACKING MATERIAL PARTICLES MADE OF PLASTIC

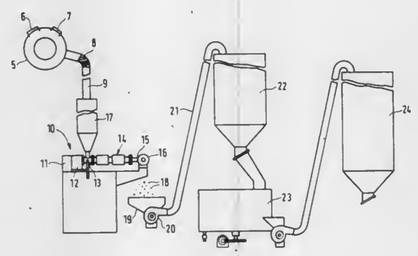
Gerd Voss, Metzingen, Fed. Rep. of Germany, assignor to Storopack, Hans Reichenecker GmbH & Co., Metzingen, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 677,055

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422425

Int. Cl.[4] C08J *9/16, 9/14;* **B28B** *9/02*

U.S. Cl. 264—53 **5 Claims**



1. A process for producing pourable spherical-segment-shaped packing material particles made of an expanded plastic which have an external convex and an internal concave surface, where granules of plastic material containing an expanding agent are mixed with additives, such as cell-forming agents (nucleating agents), color pigments or similar substances, and by means of a feeding funnel, is fed into an extruder through an opening in a bush surrounding the extrusion screw, where the plastic material is plasticized in the course of the extruder and, because of the difference in speed existing over the cross section of the mass, comes out of an opening in the die with a bent surface, and the extruded plastic material is cut off directly at the opening of the die and before any considerable expansion has taken place, the improvement wherein a cell-forming agent (nucleating agent) having a grain size of less than about 40μ is uniformly distributed and adhered on the surface of the plastic granules before their processing in the extruder in an amount less than 0.2 percent by weight based on the weight of said granules.

4,627,948

METHOD OF MANUFACTURING A SINTERED DOLOMITE IN A SHAFT KILN

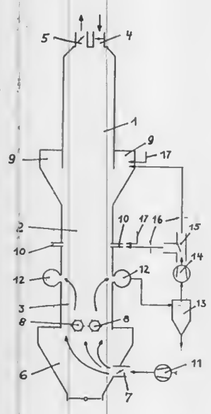
Karl H. Zepter, Mettmann; Dieter Opitz, Breitscheid; Alfred Roeder, Duisburg, and Max Chmiel, Hagen, all of Fed. Rep. of Germany, assignors to Dolomitwerke GmbH, Wulfrath, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,683

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209836

Int. Cl.[4] C04B *33/32*

U.S. Cl. 264—56 **6 Claims**



1. In a method of manufacturing sintered dolomite having raw densities exceeding about 3.0 grams per cubic centimeter and total foreign oxide content of 1 to 3% by weight based on an initial ignition loss free mixture in a shaft kiln from ground raw dolomite briquetted or pelletized into shaped bodies, the steps comprising

deacidifying and heating said shaped bodies to a temperature of at least 1000° C. in an upper region of said shaft kiln in a preheating and deacidifying zone heated with fuels of a low thermal content,

thereafter sintering said shaped bodies in a lower sintering zone heated with fuels of high thermal content, so as to heat said shaped bodies to a temperature of about 1600° C. to about 2000° C.,

subsequently passing the sintered bodies into a lower cooling zone, and cooling said bodies therein, and, thereafter,

discharging said sintered bodies from said shaft kiln.

4,627,949

PROCESS FOR THE PREPARATION OF SHAPED ARTICLES OF STABILIZED POLYCARBONATE BY THE DEVOLATILIZING INJECTION-MOULDING OR DEVOLATILIZING EXTRUSION PROCESS

Rolf Dhein, Krefeld; Helmut M. Meier, Hattingen; Hans J. Meissner, Krefeld-Bockum; Klaus Kircher, Leverkusen, all of Fed. Rep. of Germany, and Udo Oels, Baytown, Tex., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,484

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332065

Int. Cl.[4] B28B *0/00*

U.S. Cl. 264—101 **2 Claims**

1. Process for the production of polycarbonate shaped articles by the devolatilizing injection-moulding or devolatilizing extrusion process, wherein the thermoplastic polycarbonate composition contains 0.1 to 0.1% of a phosphane of the general formula (I)

$$(R)_2PR^1 \qquad (I)$$

wherein

R is selected from the group consisting of unsubstituted C_6-C_{14}-aryl radicals, alkyl substituted C_6-C_{14}-aryl radicals and hydroxy substituted C_6-C_{14}-aryl radicals, and R^1 is selected from the group consisting of unsubstituted C_6-C_{14}-aryl radicals, unsubstituted C_1-C_{18}-alkyl radicals and substituted C_6-C_{14}-aryl and C_1-C_{18}-alkyl radicals wherein substitutes are any of hydroxy, alkyl-carboxyl, cyano or phenyl radicals.

4,627,950

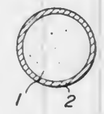
METHOD OF PRODUCING ABRASIVE FIBERS

Masao Matsui, Takatsuki; Hiroshi Naito, and Takao Osagawa, both of Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers, Ltd., Osaka, both of Japan

Filed Apr. 24, 1985, Ser. No. 726,526

Int. Cl.[4] D02G *1/20*

U.S. Cl. 264—103 **22 Claims**



1. A method of producing abrasive fibers, which comprises providing a conjugate fiber comprising at least one abrasive layer composed of a polymer containing at least 20% by weight of abrasive particles and at least one coating layer substantially covering the abrasive layer, said coating layer being composed of a polymer containing substantially no abrasive particles, and removing at least a part of the coating layer from the conjugate fiber with a solvent or a decomposer to expose at least a part of the abrasive layer from the coating layer.

4,627,951

PROCESS FOR MANUFACTURING COMPOSITE PRODUCTS FROM LIGNOCELLULOSIC MATERIALS

Kuo C. Shen, Ottawa, Canada, assignor to K. C. Shen Technology International Ltd., Ottawa, Canada

Filed Mar. 30, 1983, Ser. No. 480,570

Int. Cl.[4] B32B *5/16*

U.S. Cl. 264—109 **9 Claims**

1. A process for making waterproof composite products from comminuted sugar containing lignocellulosic materials without the addition of adhesive binders or chemical catalysts or high pressure steam, which comprises the steps of separating the raw materials into particles, fibres, strands, and flakes, drying the comminuted raw materials, forming the previously dried raw materials into a desired mat, pressing the mat in an open pressing step, and heating the formed mat at a temperature of 180° C. or higher and a pressure and a time sufficient to consolidate said mat into a molded article, while the adhesive bond is developed and thermoset in situ, transforming and polymerizing sugars and water soluble materials into an insoluble and infusible crosslinked substance as bonding and bulking agent which is resistant to boiling water and to acid hydrolysis, wherein the sugars and water soluble materials contain lignocellulosic materials and are selected from sugar cane stalks, sorghum stalks, corn stalks, and sun flower stalks.

4,627,952

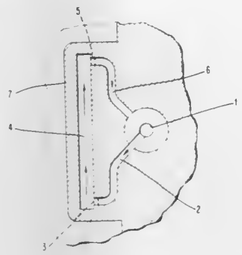
INJECTION MOLDING PROCESS

Zohar Ophir, Haifa, Israel, assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 414,558, Sep. 3, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,326

Int. Cl.⁴ B29C *45/76*

U.S. Cl. 264—328.12 **18 Claims**



1. An improved process for injection molding thermotropic liquid crystalline polymer, comprising the steps of:

a. providing a molten stream of thermotropic liquid crystalline polymer;

b. injecting said molten stream so as to flow in substantially laminar fashion through an inlet communicating with an upstream end of a cavity in a mold and into said cavity;

c. allowing a portion of said molten stream to flow through an outlet communicating with said cavity at the downstream thereof, so as to allow molten material to flow out of said cavity while said cavity is being filled in order to minimize rebound molecular wave motion in said molten material within said cavity and substantially preserve said laminar flow;

d. continuing to allow said molten stream to flow out of said cavity during the entire filling of said cavity with said molten stream so as to continue to minimize rebound molecular wave motion in said molten material within said cavity and substantially preserve said laminar flow; and

e. solidifying said molten material present in said cavity into a molded article.

4,627,953

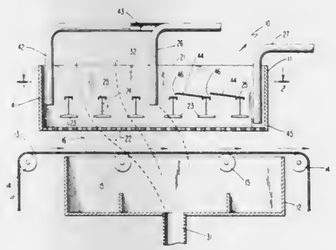
METHOD FOR FORMING DRY LAID WEBS

Jeffrey J. Johnson, Lynchburg, Va., assignor to The James River Corporation, Conn.

Division of Ser. No. 460,986, Jan. 25, 1983, Pat. No. 4,482,308. This application Oct. 10, 1984, Ser. No. 659,522

Int. Cl.⁴ B27N *3/04*

U.S. Cl. 264—518 **9 Claims**



1. A method for forming dry laid non-woven webs on a foraminous wire moving horizontally in an upstream-to-downstream direction substantially free of cross-machine ripples at forming speeds of greater than 500 feet per minute comprising:

introducing fibers into a distributor disposed above the foraminous wire for downward dispersion of said fibers onto the moving foraminous wire, said fibers being introduced proximate the upstream end of the distributor relative to the moving wire;

inducing a pressure gradient in the downstream direction by means of a suction box disposed beneath the foraminous wire offset in a downstream direction relative to the distributor and drawing air through a top end of the distributor; and

creating a zone of reduced pressure within the distributor in the downstream end of the distributor by use of baffling within the distributor to impart an increased horizontal velocity component to the fibers being dispersed upon the foraminous wire sufficient to substantially avoid said cross-machine ripples.

4,627,954

PROCESS FOR DETECTING FAULTS IN THE POWER DISTRIBUTION OF A PRESSURIZED WATER NUCLEAR REACTOR CORE AND DEVICE FOR MAKING USE OF THIS PROCESS

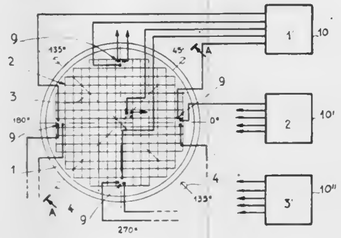
Jean Leroy, Gif-sur-Yvette, and Pierre Ruiz, Blanc Mesnil, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed May 7, 1984, Ser. No. 607,472

Claims priority, application France, May 19, 1983, 83 08276

Int. Cl.⁴ G21C *7/36*

U.S. Cl. 376—216 **9 Claims**



1. Process for detecting faults in the distribution of the core power of a pressurized water nuclear reactor, comprising the steps of

(a) measuring at least one parameter representing the power of the core at a predetermined number of points in different radial positions with reference to said core;

(b) determining for each parameter the difference between two extreme measured values (**12** and **12'**; **29** and **30**) and the ratio (**16**; **34**) of this difference to the smallest measured value (**12'**; **30**);

(c) comparing this ratio (**16**; **34**) to a set value, a fault being detected if this ratio (**16**; **34**) is greater than said set value.

4,627,955

PROCESS FOR DETECTING THE VARIATIONS IN THE REACTIVITY OF THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR AND DEVICE FOR MAKING USE OF THIS PROCESS

Jean Leroy, Gif-Sur-Yvette, and Pierre Ruiz, Blanc Mesnil, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed May 7, 1984, Ser. No. 607,474

Claims priority, application France, May 19, 1983, 83 08275

Int. Cl.⁴ G21C *7/36*

U.S. Cl. 376—216 **5 Claims**

1. Process for detecting the variations, due to a fault in the position of the core control clusters, in the reactivity of the core of a pressurized water nuclear reactor having at least one cooling loop, comprising the steps of

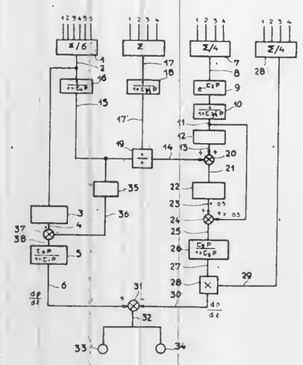
(a) measuring the core neutron power by means of neutron flux measuring chambers outside said core;

(b) calculating from said measured core neutron power an instantaneous value of the reactivity of said reactor;

(c) measuring the mean temperature in said core;

(d) measuring the mean boron concentration in the primary fluid passing through said core, .

(e) calculating from said measured mean temperature and



mean boron concentration a second instantaneous value representing the reactivity of said reactor; and

(f) comparing said first instantaneous value of the reactivity to the second instantaneous value of said reactivity for detecting a fault in the position of the core control clusters, in the case where said values of reactivity are different.

4,627,956

SHOCK ABSORBERS

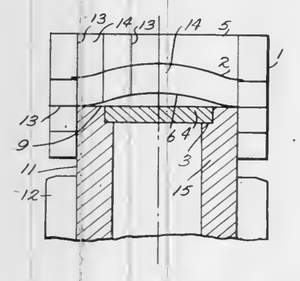
Werner Botzem, Alzenau, and Elmar Schlich, Gründau, both of Fed. Rep. of Germany, assignors to Transnuclear GmbH, Hanau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 306,643, Sep. 29, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,359

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037328

Int. Cl.⁴ G21F *5/00*; **G21C** *19/00*

U.S. Cl. 376—272 **2 Claims**



1. In a transportation, storage container having an end portion surrounding an opening, a cover for said opening, a rim on said end portion with said cover spaced inwardly from said rim, with said rim constituting a bearing surface, a shock absorber means comprising a body for attachment to said end and over said cover, said body having an outer wall which extends along at least a portion of the side of the container when said shock absorber means is disposed on said end of said container, said body having an inner surface which faces the container cover and which is out of contact with said cover, said body including a plurality of cup-shaped, resilient sheets, each having a curvature bending away from said end when said shock absorber means is placed on said end of said container, each said sheet being spaced from an adjacent sheet along a central axis, one of said sheets being disposed adjacent said end of said container and having an outer periphery in sliding engagement with said bearing surface of said end of said container, said outer periphery being movable with respect to said body of said shock absorber into said sides of said shock absorber, said one sheet providing a space between said cover and said one sheet when said shock absorber means is attached to said container end, said shock absorber means further including wall means defining a plurality of chamber means, including between said sheets, each filled with shock absorbing material.

4,627,957

NUCLEAR FUEL ROD WITH POROUS PLUG CLOSURE

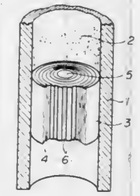
Richard W. Stratton, Windisch; Michel Nicolet, Baden, and Glenn Andrews, Grand-Lancy, all of Switzerland, assignors to Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen, Berne, Switzerland

Continuation of Ser. No. 320,099, Nov. 10, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 647,251

Claims priority, application Switzerland, Jan. 20, 1981, 348/81

Int. Cl.⁴ G21C *3/18*

U.S. Cl. 376—412 **5 Claims**



1. A nuclear fuel rod comprising:

a metal cladding tube;

a body of nuclear fuel in said tube in the form of particles; and

a porous plug closing at least one end of said tube and comprising:

a central pin, and

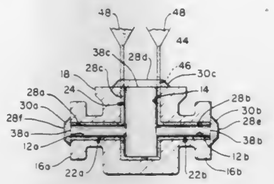
a metal non-porous strip, spirally wound around said pin in a tightened coil, the adjacent turns of which being freely slidable against each other under intrinsic elasticity of said tightened coil, the diameter of which corresponding substantially to the inside diameter of said cladding tube so that the said tightened coil can be fitted into said cladding tube and maintained in a tightened coil by the wall of said tube, said tightened coil being elastically expanded by sliding of said turns when the inside diameter of said tube thermally expands by heating, said strip being formed on at least one surface with channels defining a plurality of passages extending in an axial direction with respect to said tube between successive turns, said passage each having a maximum radial dimension of about 20 microns and at least one of the dimensions of the cross section of said passages being smaller than the size of the finest particles of the fuel.

4,627,958

DENSIFICATION OF METAL POWDER TO PRODUCE CLADDING OF VALVE INTERIORS BY ISODYNAMIC COMPRESSION

Charles Hays, Pearland, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Dec. 27, 1983, Ser. No. 565,434
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 **14 Claims**



1. A method for cladding the interior cavity walls of a metal article by a process which utilizes loose metal powder and an inert, vitreous pressure transmitting medium of variable rheological state, comprising the steps of:
(a) forming a solid inert member of said vitreous medium, generally conforming in shape to the cavity walls;
(b) fixturing the insert member within the cavity to provide a generally concentric, annular space of predetermined distance between the insert member and the adjacent walls to be clad, and to expose an exterior surface of the insert member;
(c) sealing the exposed surface of the insert member against the article to form a closed activation volume including said annular space;
(d) selecting a metal powder blend having a known densification temperature-pressure relationship and filling the activation volume to the tap density of said powder blend;
(e) evacuating the activation volume to remove undesired impurities in the blend, and sealing the activation volume to form a loaded article ready for densification from powder to clad;
(f) heating the loaded article to a process temperature T at which the insert member becomes pliable, and which satisfies the condition $0.5\ T_m<T<T_m$ where T_m is the melting temperature of the powder blend;
(g) applying a substantially uniform pressure to the exterior surface of the insert member while at temperature T, to cause a rheological flow of the insert member whereby an isodynamic pressure is applied to said activation volume sufficient to compress and densify the powder blend to form a bonded clad deposit;
(h) cooling the loaded article and removing the insert member from the cavity.

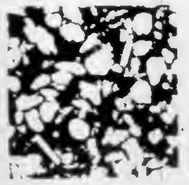
4,627,959

PRODUCTION OF MECHANICALLY ALLOYED POWDER

Paul S. Gilman, Suffern, N.Y., and Walter E. Mattson, West Milford, N.J., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jun. 18, 1985, Ser. No. 745,890
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—61 **30 Claims**

1. A method for the production on a commercial scale of a mechanically alloyed powder product, said powder product being characterized in that it has or can be converted on heating to a substantially uniform chemical composition and microstructure, said powder product being convertible to an end product having predetermined properties and said powder being produced by dry, impact milling particulate components for the powder product in the presence of a predetermined amount of process control agent, said method comprising determining the duration of time to produce a powder product having an apparent density of at least about 25% of the fully compacted density of the powder as compacted and extruded, the apparent density being determined according to ASTM Test No. B 212-48 (for flowable powder) or No. B 417-64 (for non-free-flowing powder), using said determination of the duration of time to obtain said apparent density in determining



the duration of time for impact milling of the particulate components; whereby the mill throughput is maximized and an acceptable processing level is obtained for the powder product, said acceptable processing level being one criterion for determining whether the powder product is suitable for producing an end product capable of having the predetermined properties.

4,627,960

COPPER-BASED ALLOY

Takashi Nakajima, and Kenji Kubosono, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,894
Int. Cl.[4] C22C *0/9;* **H01L** *23/48*
U.S. Cl. 420—472 **2 Claims**

1. A copper-based alloy consisting essentially of 1.2 to 2.5 wt% tin, 0.07 to 0.15 wt% phosphorous, 0.01 to 0.6 wt% nickel, 0.05 to 1 wt% zinc, and the remainder being copper and minute amounts of unavoidable impurities, said alloy being substantially free of manganese.

4,627,961

CALCIUM-ALUMINUM BRIQUETTES

David M. Dudek, Great Barrington, Mass., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 4, 1985, Ser. No. 772,293
Int. Cl.[4] C22C *11/02*
U.S. Cl. 420—564 **3 Claims**

1. A calcium-aluminum briquette which comprises a mechanically compressed mixture of 65 to 80% by weight of calcium granules and 20 to 35% by weight of aluminum granules.

4,627,962

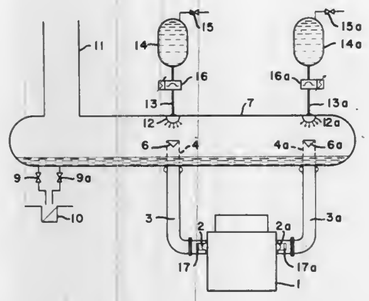
PROCESS AND APPARATUS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION FROM THE DECOMPOSITION OF HIGH PRESSURE INDUSTRIAL PROCESS ETHYLENE GASES

Daniel Grasset, Saint Nicolas de la Taille, and Bernard Martinot, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages--CdF Chimie, Paris, France

Division of Ser. No. 406,997, Aug. 10, 1982, Pat. No. 4,534,942, which is a continuation of Ser. No. 143,631, Apr. 25, 1980, abandoned. This application May 31, 1985, Ser. No. 739,845
Claims priority, application France, Apr. 25, 1979, 79 10442
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] G05B *9/00;* **C08F** *2/34;* **C08G** *85/00*
U.S. Cl. 422—40 **12 Claims**

1. A process for reducing the chances of ignition and explosion resulting from the decomposition of ethylene in a high-pressure vessel operating at a pressure of at least 100 bars,

comprising evacuating said decomposition gases of ethylene into an apparatus adjacent to said vessel, said apparatus comprising:
(a) means defining a reservoir with a volume between 2 and 100 times that of the vessel;
(b) conduit means connecting and communicating said vessel to said reservoir means and having at least one safety means separating said apparatus from said vessel for releasing said decomposition gases from said vessel, said conduit means being located at least in part outside of both



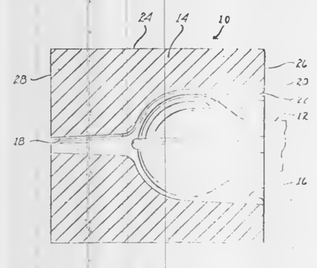
said vessel and said reservoir means whereby said vessel and said reservoir means are in a spaced-apart relationship, said conduit means constituting means for passing said decomposition gases released from said vessel to said reservoir means;
(c) at least one vertically oriented chimney connecting the reservoir means to the atmosphere; and
(d) a sealing means across the entire cross-section of said chimney, whereby an inert atmosphere is provided within said chimney.

4,627,963

HEAT ACTIVATED DISPENSER AND METHOD OF DISPENSING A VAPOR THEREFROM

Donald M. Olson, Scottsdale, Ariz., assignor to LAD Technology, Inc., Phoenix, Ariz.

Filed Feb. 29, 1984, Ser. No. 584,826
Int. Cl.[4] A61L *9/03*
U.S. Cl. 422—125 **20 Claims**



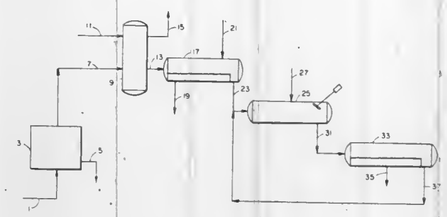
1. A heat activated vapor dispenser comprising:
a volume of diatomite compacted under high pressure into a shape constructed so as to accept heat from a heat source and having at least one surface to be oriented towards the heat source, further having at least one surface to be oriented away from the heat source; and
a vaporizable material to be dispensed, charged into volume.

4,627,964

PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM SOUR GAS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,415
Int. Cl.[4] C01B *17/16, 31/20*
U.S. Cl. 423—228 **25 Claims**



1. A process for removing hydrogen sulfide from sour gas and arsenic from shale oil produced during oil shale retoring comprising:
(a) decomposing said oil shale in a retort thereby forming a sour gas containing hydrogen sulfide and a shale oil containing arsenic;
(b) introducing into the retort at retoring temperatures an aqueous ammonia or amino compound solution in an amount sufficient to react with hydrogen sulfide in said sour gas and arsenic in said shale oil; and
(c) separating the generated shale oil into an aqueous layer and an oil layer and washing said oil layer with water thereby removing said hydrogen sulfide, substantially removing said arsenic and cooling said shale oil.

4,627,965

METHOD OF DESULFURIZING INDUSTRIAL FLUE GASES

Karl-Rudolf Hegemann, Essen-Bergerhausen, and Ulrich Kleeberg, Mühlheim/Ruhr, both of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserrückkühlanlagen GmbH & Co., Essen, Fed. Rep. of Germany

Continuation of Ser. No. 640,704, Aug. 14, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,933
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329633
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—242 **2 Claims**

1. A method of desulfurizing an industrial flue gas which comprises the steps of:
(a) providing a scrubbing colum defining (i) in an upper region of said column a scrubbing zone of predetermined length traversed by a plurality of atomizing nozzles arranged in a plurality of vertically spaced multinozzle tiers having separate control valves for selective blocking of fluid access thereto, and (ii) in a lower region of said column an oxidation zone below said scrubbing zone;
(b) spraying a scrubbing liquid including calcium carbonate in aqueous solution into said upper region of said column through at least one selected tier of said nozzles, under pressure of a pump communicating with said nozzles, to form atomized droplets of said scrubbing liquid of a predetermined mean droplet size moving downwardly through said scrubbing zone;
(c) passing said flue gas upwardly through said scrubbing zone in countercurrent flow to said droplets of said scrubbing liquid while, with reference to the mean droplet size, the rate of flow of said flue gas through said scrubbing zone and the length of the latter, controlling the mean residence time of said droplets in said scrubbing zone by regulating said pump pressure and by selectively activat-

ing said control valves to permit the flow of said scrubbing liquid to and through said at least one tier of said nozzles, for effecting an uptake of sulfur dioxide by said droplets from said flue gas, during the movements of said flue gas and said droplets through said scrubbing zone, sufficient to impart to said scrubbing liquid in said droplets a pH between 3 and 6, whereby calcium sulfite and calcium hydrogen sulfite form and collect in a body of said scrubbing liquid in said lower region of said column and said body of said scrubbing liquid has the same pH between 3 and 6 as said droplets of said scrubbing liquid;

(d) oxidizing the calcium sulfite and calcium hydrogen sulfite in said body of said scrubbing liquid in said oxidation zone at said same pH to form calcium sulfate;

(e) introducing calcium carbonate into said body of said scrubbing liquid in said lower region of said column; and

(f) circulating said scrubbing liquid by means of said pump from said lower region of said column to said at least one tier of said nozzles and therethrough into said scrubbing zone in the form of said atomized droplets of said scrubbing liquid.

4,627,966

FORMATION OF FINE PARTICLE SINTERABLE CERAMIC POWDERS

Adolph L. Micheli, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 591,177, Mar. 19, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,028

Int. Cl.⁴ C01F *17/00;* **C01G** *25/02*

U.S. Cl. 423—263 **3 Claims**

1. A method of preparing a sinterable metal oxide ceramic precursor powder, comprising

mixing an aqueous solution of polyvalent metal cations of one or more metals taken from the group consisting of yttrium and zirconium with an aqueous solution of ammonium polyacrylate to form a metal polyacrylate precipitate,

separating the precipitate from the aqueous mother liquid,

burning out the organic portion of the precipitate, and

calcining the ash to form a sinterable ceramic percursor powder.

4,627,967

PHOSPHAZENE TRIMER PURIFICATION

W. Dirk Klobucar, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 5, 1984, Ser. No. 658,307

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.⁴ C01B *25/10*

U.S. Cl. 423—300 **20 Claims**

1. A process for purifying impure cyclic phosphonitrilic chloride to obtain polymerization grade trimer said process comprising:

(a) crystallizing cyclic phosphonitrilic chloride trimer from a solution of impure phosphonitrilic chloride trimer in an inert solvent;

(b) separating said crystallized trimer from said inert solvent; and

(c) distilling the separated crystalline trimer to obtain polymerization grade trimer.

4,627,968

SYNTHESIS OF CRYSTALLINE ALUMINOSILICATE WITH ALKYLUREA OR ALKYLTHIOUREA

Tadashi Kai, Machida, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 10, 1985, Ser. No. 774,454

Claims priority, application Japan, Sep. 10, 1984, 59-188165

Int. Cl.⁴ C10B *33/28*

U.S. Cl. 423—329 **10 Claims**

1. A process for synthesizing a crystalline aluminosilicate, which comprises heating an aqueous mixture containing a silica source, an alumina source and an alkali metal source in the presence of at least one compound selected from the group consisting of lower alkylureas and lower alkylthioureas.

4,627,969

PRODUCTION OF CHLORINE DIOXIDE

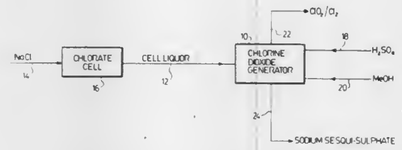
Maurice C. J. Fredette, and Ching-Shi Yang, both of Mississauga, Canada, assignors to Tenneco Canada Inc., Islington, Canada

Filed Sep. 13, 1984, Ser. No. 649,923

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.⁴ C01B *11/02, 11/14*

U.S. Cl. 423—478 **10 Claims**



1. A process for the production of chlorine dioxide, which comprises:

feeding to a reaction zone an aqueous solution of sodium chlorate and sodium chloride having a concentration of about 3.5 to about 6.5 molar $NaClO_3$ and a concentration of about 3.5 to about 1 molar NaCl,

feeding methanol to the reaction zone,

feeding sulphuric acid to the reaction zone,

said feeds of sulphuric acid, methanol, and aqueous solution of sodium chlorate and sodium chloride being fed at rates and in concentrations sufficient to provide, in said reaction zone, an aqueous reaction medium having a total acid normality of about 7 to about 12 normal and a chlorate ion concentration of about 0.5 to about 3.5 molar, and to generate chlorine dioxide and chlorine at high efficiency from said reaction medium at least about 50% by reaction between the fed sodium chlorate, methanol and sulphuric acid and up to about 50% by reaction between the fed sodium chlorate, sodium chloride and sulphuric acid,

said reaction medium having a chloride ion concentration of about 0.001 to about 0.3 molar resulting from but not controlled by the feed rate of said aqueous solution of sodium chlorate and sodium chloride to said reaction zone,

maintaining said reaction medium at its boiling point under a subatmospheric pressure applied to the reaction zone,

removing said generated chlorine dioxide and chlorine from the reaction zone in gaseous admixture with steam, and

precipitating a sodium acid sulphate comprising sodium sesquisulphate from the reaction medium once the reaction medium becomes saturated therewith after start up.

4,627,970

METHOD OF TREATMENT OF SLUDGE FROM A FLUE GAS DESULFURIZATION PLANT

Berthold Krüger, Herne, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserrückkühlanlagen GmbH & Co., Essen, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,189

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414822

Int. Cl.⁴ C01F *1/46;* **C01B** *17/00;* **B01D** *37/02;* **C02F** *1/00*

U.S. Cl. 423—555 **5 Claims**

1. A method of treating a desulfurization sludge containing a solids component rich in calcium sulfate and an aqueous liquid component containing soluble precipitatable impurities from the scrubbing of a flue gas and forming a liquid phase, said method comprising the steps of:

(a) dewatering said desulfurization sludge to form a thin layer of said solids component;

(b) washing said thin layer of said solids component in at least one washing stage with fresh water;

(c) neutralizing said liquid phase to precipitate out said precipitatable impurities; and

(d) collecting said precipitatable impurities on said thin layer of said solids component before the washing thereof with fresh water but after the thin layer has been formed in step (a).

4,627,971

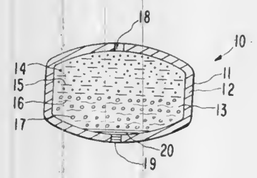
OSMOTIC DEVICE WITH SELF-SEALING PASSAGEWAY

Atul D. Ayer, Mt. View, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 22, 1985, Ser. No. 725,832

Int. Cl.⁴ A61K *9/26, 9/24;* **A61J** *3/00*

U.S. Cl. 424—15 **2 Claims**



1. An osmotic dispensing device for delivering a beneficial medicine formulation to an environment of use, comprising:

(a) a wall comprising at least in part a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of the beneficial medicine formulation, which wall surrounds and forms:

(b) a compartment;

(c) a first passageway in the wall;

(d) a second passageway in the wall;

(e) a first layer comprising a beneficial medicine formulation in the compartment communicating with the first passageway;

(f) a second layer comprising an expandable osmopolymer in the compartment, said second layer in communication with the second passageway; and

(g) means possessing the ability to flow, form a film and seal the second passageway in the second layer for closing the second passageway during manufacture of the osmotic device.

4,627,972

EFFERVESCENT DENTIFRICE

Anthony J. Gioffre, Ridgefield, Conn., and Ronald J. Ross, Upper Nyack, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 16, 1984, Ser. No. 672,351

Int. Cl.⁴ A61K *7/16, 9/46, 9/12, 7/18*

U.S. Cl. 424—44 **23 Claims**

1. An effervescent dentifrice composition which upon contact with water provides an effervescent action wherein said effervescent dentrifice composition comprises a dry aluminum collapsible tube and extrudable tubed dessicated dental cream formulation of between about 1 and about 99 percent by weight inorganic oxide material and an anhydrous dentifrice base medium admixed and blended under a CO_2 or N_2 atmosphere with an effective amount of a gas-containing inorganic oxide dehydrated material containing an effective amount between about 1 and about 25 percent by weight of at least one adsorbed gas selected from the group consisting of nitrogen, oxygen, helium, argon, fluorine, chlorine and carbon dioxide wherein said inorganic oxide material is at least one inorganic oxide material selected from the group consisting of zeolites, aluminophosphates and silicoaluminophosphates.

4,627,973

SKIN MOUSSE

Robert P. Moran, Elmwood Park, and Edward P. Carhart, Jr., Cliffwood Beach, both of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,529

Int. Cl.⁴ A61K *7/00*

U.S. Cl. 424—47 **6 Claims**

1. A method for enhancing stability of a moisturizer or fragrance mousse, which mousse include an effective amount of a hydrocarbon propellant, which comprises incorporating therein a mixture of acetylated lanolin alcohol, an alkoxylated methyl glucose derivative and an alkoxylated lanolin derivative, wherein said alkoxylated methyl glucose derivative is present in an amount within the range from about 0.1 to about 3% by weight of said mousse and is selected from the group consisting of polypropylene glycol-20 methyl glucose ether, polyethylene glycol-10 methyl glucose ether, and polyethylene glycol-20 methyl glucose ether, said alkoxylated lanolin derivative is present in an amount within the range of from about 1 to about 5% by weight of said mousse and is selected from the group consisting of polyethylene glycol-85 lanolin, polyethylene glycol-75 lanolin, polyethylene glycol-40 lanolin, and polyethylene glycol-27 lanolin, and said acetylated lanolin alcohol is present in an amount within the range of from about 1 to about 5% by weight of the said mousse and is the acetyl ester of lanolin alcohol.

4,627,974

DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

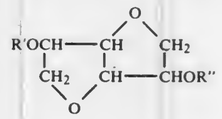
Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649. This application Dec. 27, 1985, Ser. No. 813,842

Int. Cl.⁴ A61K *9/68*

U.S. Cl. 424—48 **8 Claims**

1. A method for inhibiting the formation of plaque and calculus on relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of the throat, mouth, teeth and gums by chewing a chewing gum composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of $—CH_3$, $—C_2H_5$, $—C_3H_7$, $—C_4H_9$ or —H when other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

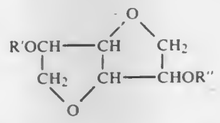
4,627,975

DENTAL FLOSS DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,045
Int. Cl.[4] A61K *7/16, 9/68*
U.S. Cl. 424—49 7 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums by flossing the teeth with dental floss containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

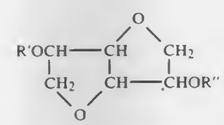
4,627,976

DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,118
Int. Cl.[4] A61K *7/16*
U.S. Cl. 424—49 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with a toothpaste gel containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,627,977

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton, and Thomas G. Polefka, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,851
Int. Cl.[4] A61K *7/16, 7/18, 9/68*
U.S. Cl. 424—52 11 Claims

1. A method of inhibiting dental calculus comprising applying to teeth a calculus-inhibiting amount of a dentifrice composition having a pH of about 4.5 to about 9 containing, in an orally acceptable vehicle, approximately by weight, 0.1 to 7% of one or a mixture of linear molecularly dehydrated polyphosphate salts selected from the group consisting of water soluble alkali metal pyrophosphates, tripolyphosphates and hexametaphosphates, a dentally acceptable silica polishing material, and for the purpose of inhibiting hydrolysis of P-O-P bonds in said polyphosphate salts by phosphatase enzymes in saliva to orthophosphates which are relatively ineffective as inhibitors of hydroxyapatite formation, an amount of a fluorine ion source sufficient to supply 25 ppm. to 2,000 ppm. of fluoride ions and 0.05% to 3% of a water-soluble alkali metal or ammonium synthetic anionic linear polymeric polycarboxylate salt having a molecular weight of about 1,000 to about 1,000,000 said composition when so applied to teeth being effective to inhibit dental calculus.

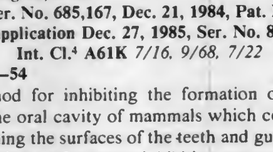
4,627,978

TOOTH DROP DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,112
Int. Cl.[4] A61K *7/16, 9/68, 7/22*
U.S. Cl. 424—54 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with tooth drops containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

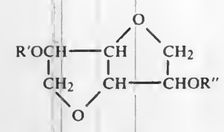
4,627,979

TOOTHPASTE DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,119
Int. Cl.[4] A61K *7/16, 9/68, 7/22*
U.S. Cl. 424—54 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with a toothpaste composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

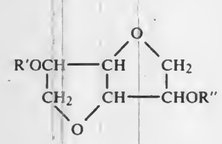
4,627,980

HARD CANDY DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE IRRITATION AND PLAQUE ACCUMULATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 813,866
Int. Cl.[4] A61K *7/22, 7/16*
U.S. Cl. 424—54 8 Claims

1. A method for inhibiting the formation of plaque and calculus and relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of the throat, mouth, teeth and gums by dissolving in the mouth a hard candy composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_4H_9 or —H wherein R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,627,981

ATTRACTANT-INGESTION STIMULANT PREPARATIONS FOR *PERIPLANETA AMERICANA* L

Kimihide Shimano, Shiraoka; Haruo Shimamura, Yono; Hiroshi Yamaguchi, Tokyo; Hiroshi Murayama, Houya; Ryohei Kaneko, Kiryu, and Katsura Seki, Utsunomiya, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,180
Claims priority, application Japan, Sep. 14, 1984, 59-192787; Sep. 18, 1984, 59-195469
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 14 Claims

1. A method of attracting *Periplaneta americana* L comprising applying a composition comprising an attractant-ingestion stimulant agent in a location wherein *Periplaneta americana* L are present in the environment, said attractant-ingestion stimulant agent comprising an amount of at least one compound selected from the group consisting of ar-α-tetralol, ar-β-tetralol, ac-α-tetralol, α-naphthol, β-naphthol and iristectorumin's alcohol effective to attract *Periplaneta americana* L whereby *Periplaneta americana* L are attracted to said composition.

4,627,982

PARTIALLY PURIFIED BONE-INDUCING FACTOR

Saeid Seyedin, Mountain View, and Thomas Thomas, Davis, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 630,938, Jul. 16, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,479
The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.
Int. Cl.[4] A61K *35/32*
U.S. Cl. 424—95 8 Claims

1. A process for preparing a partially purified bone-inducing factor which comprises:

(a) treating demineralized bone with a chaotropic extractant that solubilizes nonfibrous proteins;

(b) subjecting the extract from step (a) to gel filtration to recover a fraction containing proteins of molecular weight 10,000–30,000;

(c) adsorbing the fraction from step (b) onto a carboxymethyl cellulose cation exchanger at approximately pH 4.5–5.5; and

(d) eluting an osteogenically active fraction from the cation exchanger with a sodium chloride gradient of about 10 mM to about 150 mM in the presence of a nonionic chaotropic agent.

4,627,983

FUNCTIONAL PROTEIN HYDROLYZATES, A PROCESS FOR THEIR PREPARATION, USE OF THESE PROTEIN HYDROLYZATES AS A FOOD ADDITIVE, AND FOODS CONTAINING THESE PROTEIN HYDROLYZATED

Udo Scharf, Frankfurt am Main; Merten Schlingmann, Königstein, and Gert-Wolfhard von Rymon Lipinski, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 438,753, Nov. 3, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 775,101
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143947
Int. Cl.[4] A23J *3/00;* A23L *1/305;* C12P *21/06*
U.S. Cl. 426—7 19 Claims

1. A functional hydrolyzate obtained from enzymatically hydrolyzed microbial protein isolates, with properties comprising

a protein content of more than 90% by weight,
a nucleic acid content of less than 2% by weight,
a lipid content of less than 1% by weight,
a suspendability of 80–100%,
a foaming capacity characterized by a foaming index of 4–7,
a foam stability characterized by a half-life of 10–300 minutes,
an emulsifying capacity characterized by a value of 300–500 ml of oil/g of protein, and
a molecular weight of between 125,000 and 100 Daltons.

4,627,984

PROCESS FOR MANUFACTURING AND PACKAGING SOFT CHEESE

Marc Authelet, Laneuveville Dt Nancy, and Jean Perrin, Tomblaine, both of France, assignors to Saint-Hubert Industrie Laitiere, Ludres, France

Filed Dec. 20, 1984, Ser. No. 684,050
Claims priority, application France, Dec. 23, 1983, 83 20699
Int. Cl.[4] A23C *19/097*
U.S. Cl. 426—37 12 Claims

1. A process for extending the shelf life of soft cheese with a bloomed or washed rind to a period of at least three months comprising:

a. wrapping said cheese in a wrapper having a moisture-absorbing inside layer on the side of the wrapper in

contact with the cheese, and a moisture-proof outside layer;

b. placing the so wrapped cheese into a hermetically sealable box with at least the inside surface thereof being coated with a heat sealable, moisture-impervious coating, said box having an upper edge for receiving a moisture-impermeable lid;

c. sealing a moisture-impermeable lid onto said upper edge so as to effect a hermetical seal; and

d. pasteurizing the so wrapped and boxed cheese at a temperature between 100° C. and 130° C.

4,627,985

PROCESSED SOYBEAN FOODS AND THEIR PRODUCTION

Hideo Yada, Settsu; Kunihisa Akaba, Iida, and Megumi Mukaiyama, Shimoina, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan, by said Hideo Yada and Asahi-Matsu Foods Inc., Nagano, Japan, by said Kunihisa Akaba and Megumi Mukaiyama

Filed Apr. 23, 1984, Ser. No. 602,721

Claims priority, application Japan, Apr. 25, 1983, 58-73602

Int. Cl.⁴ A23L *1/20;* **A23J** *3/00*

U.S. Cl. 426—92 **2 Claims**

1. A method of producing a fibrous or granular processed soybean food having improved flavor and palatability, which comprises coating the surfaces of fibrous or granular soybean preparation which is produced by adjusting the water content of whole grains of soybean to between 30 to 60% by weight and grinding said grains between two opposing disc grinding members separated by a gap not larger than 1 mm, wherein one of the grinding members rotates at a peripheral speed from 8 to 8000 r.p.m., and wherein the opposing discs are concave to form a central hollow portion therebetween having an approximately trapezoidal cross section with fish-paste in the form of aqueous slurry having a viscosity of 10 centipoises to 1×10^4 poises, the fibrous or granular soybean preparation having a water content of 20% by weight or less at the time of coating, and the fish-paste being coated in an amount of about 50 to 250 g per 1 kg of the fibrous or granular soybean preparation, on a dry basis thereby producing said soybean food having improved flavor and palatability.

4,627,986

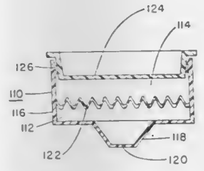
PRESSURIZED CONTAINER PROVIDING FOR THE SEPARATE STORAGE OF A PLURALITY OF MATERIALS

Robert F. Bardsley, Harrington Park, N.J.; Thomas P. Finucane, Martsdale, N.Y.; Carl Hebel, Dover Foxcroft, Me.; Charles D. Schoonmaker, Boonton Township, Morris County, N.J., and Philip J. Wruk, Wilton, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 336,838, Jan. 4, 1982, Pat. No. 4,399,158, which is a continuation of Ser. No. 917,262, Jun. 20, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,295

Int. Cl.⁴ B65D *25/08*

U.S. Cl. 426—112 **3 Claims**



1. A container arrangement for separately storing a first liquid material and a second material in a container and providing for the automatic admixing of the first and second materials upon opening of the container, comprising a sealed container containing said first liquid material at superatmospheric pressure, with the pressure surrounding said container being atmospheric, a separate closed compartment arranged within said container and containing said second material out of admixing contact with said first liquid material in said container, said compartment comprising a first pressure chamber and a separate material chamber containing said second material, said two chambers of said separate closed compartment being separated from each other by a flexible wall, a portion of the wall of the compartment which defines said pressure chamber having at least one small aperture therein and a portion of the wall of the compartment which defines the material chamber having a rupturable or separable portion, said at least one small aperture in said chamber wall being of such small size and the rupturable or separable portion being of such weakness, and the at least one small aperture, said flexible wall, and said rupturable or separable portion being of such orientation to each other, such that when the container is pressurized, said at least one small aperture allows the pressure chamber to gradually assume the pressure of the container but upon opening the container, the pressure in the container rapidly drops to atmospheric, however said at least one small aperture being too small to allow the pressure in the pressure chamber to adjust too rapidly to the lower pressure then present in the container and therefore the pressure chamber being momentarily at a much higher pressure than the surrounding container interior such that the higher pressure causes the flexible wall to expand pushing the second material against the rupturable or separable portion such that the portion ruptures or separates, such that the second material is released into the liquid material of the container.

4,627,987

EDIBLE MATERIAL CONTAINING META-HYDROXYBENZOIC OR SALTS

Ronald E. Barnett, Suffern, and Ronald G. Yarger, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 477,799, Mar. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 274,035, Jun. 15, 1981, abandoned. This application Dec. 20, 1984, Ser. No. 683,972

Int. Cl.⁴ A23L *1/236*

U.S. Cl. 426—548 **16 Claims**

1. An edible composition comprising

an edible material,

a food-acceptable sweetener for sweetening said edible material, other than m-hydroxybenzoic acid or a food-acceptable, non-toxic salt thereof, said sweetener being present in an amount sufficient to sweeten said edible composition and above 1 wt. % sucrose equivalents, and

a sweetness-modifying agent selected from m-hydroxygenzoic acid, food-acceptable, non-toxic salts thereof, and mixtures thereof wherein the sweetness modifying agent is present in an amount from 0.01 to 0.4% by weight based on the consumed weight of said edible material, said edible composition having a pH of from 2 to 5.5.

4,627,988

METHOD FOR APPLYING MATERIAL TO A SEMICONDUCTOR WAFER

Keith G. Spanjer, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 29, 1985, Ser. No. 759,792

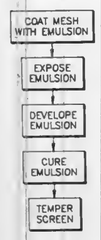
Int. Cl.⁴ H01L *21/312*

U.S. Cl. 427—5 **15 Claims**

1. A method of applying material containing a solvent damaging to a photosensitive emulsion to a semiconductor wafer comprising the steps of:

applying said photosensitive emulsion to a screen;

patterning said photosensitive emulsion;



tempering said patterned photosensitive emulsion at an elevated temperature for a prolonged period; and

applying said material to said wafer through said screen.

4,627,989

METHOD AND SYSTEM FOR A VACUUM EVAPORATIVE DEPOSITION PROCESS

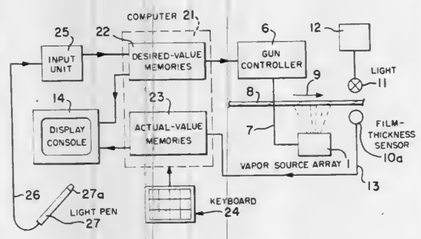
Albert Feuerstein, Neuberg; Gernot Thorn, Hanau am Main, and Horst Ranke, Filderstadt, all of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 639,363

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330092

Int. Cl.⁴ C23C *13/04, 13/08*

U.S. Cl. 427—10 **5 Claims**



1. A method for a vacuum evaporative deposition process in which the local evaporation power of a vapor source is adjustable to control the evaporation rate from the vapor source for controlling the thickness of a film deposited on a substrate by the vapor evaporated from the vapor source, comprising:

determining the local evaporation power of each vapor source and the thickness of the film deposited on the substrate by each vapor source;

displaying the determined local evaporation power and film thickness as spatially-coordinated bars of charts thereof on a single display screen, at least the film-thickness bar chart being at least relatively calibrated on the display screen; and

adjusting the local evaporation power of any vapor source to correct any deviation of any bar of the film-thickness bar chart from a film thickness desired relative to the calibration thereof.

2. A system for a vacuum evaporative deposition process in which the local evaporation power of a vapor source is adjustable to control the evaporation rate from the vapor source for controlling the thickness of a film deposited on a substrate by the vapor evaporated from the vapor source, comprising:

means for determining the local evaporation power of each vapor source and the thickness of the film deposited on the substrate by each vapor source;

means for displaying the determined local evaporation power and film thickness as spatially-coordinated bars of charts thereof on a single display screen, at least the film-thickness bar chart being at least relatively calibrated on the display screen; and

means for adjusting the local evaporation power of any vapor source to correct any deviation of any bar of the film-thickness bar chart from a film thickness desired relative to the calibration thereof.

4,627,990

METHOD OF AND APPARATUS FOR SUPPLYING POWDERY MATERIAL

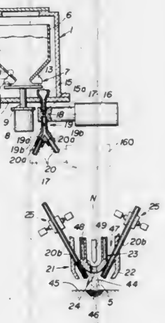
Toshihiko Saga; Tsuyoshi Makita; Hisao Hirono, and Akitaka Inno, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,916

Claims priority, application Japan, Mar. 7, 1984, 59-44250; Apr. 9, 1984, 59-70678; Apr. 9, 1984, 59-70679

Int. Cl.⁴ B05D *1/00, 3/12*

U.S. Cl. 427—10 **16 Claims**



1. A method of supplying a powdery material to a workniece to be processed thereby, comprising the steps of:

(a) discharging the powdery material from storage means;

(b) feeding the powdery metal material discharged from said storage means into the tube means extending into the shield cap of a plasma torch nozzle in the vicinity of the workpiece; and

(c) ultrasonically vibrating said tube means for supplying the powdery material therethrough through said shield cap to said workpiece.

4,627,991

METHOD FOR FORMING A PROTECTIVE FILM ON A SEMICONDUCTOR BODY

Yasukazu Seki, Tokyo; Noritada Sato, and Osamu Ishiwata, both of Kanagawa, all of Japan, assignors to Fuji Electric Corporate Research & Development Co., Ltd. and Fuji Electric Co., Ltd., both of Kanagawa, Japan

Filed May 16, 1984, Ser. No. 610,638

Claims priority, application Japan, May 26, 1983, 58-93221

Int. Cl.⁴ B05D *3/06*

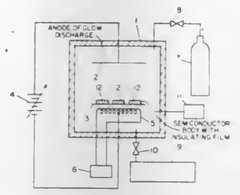
U.S. Cl. 427—39 **1 Claim**

1. A method for forming a protective film on a semiconductor body having a surface film of a compound of the semiconductor material, comprising:

placing a semiconductor body with a surface film of a compound of said semiconductor material in a vacuum chamber maintained at a high vacuum,

heating said semiconductor body to a temperature below about 400° C.,

introducing a diborane gas into said chamber, and



generating a glow discharge in said chamber to thereby deposit a protective boron film containing boron on the surface film of the semiconductor.

4,627,992

PROCESS FOR THE PRODUCTION OF FILTER ELEMENTS BASED ON AROMATIC POLYAMIDE

Charles T. Badenhop, Bad Kreuznach; Anna-Luise Bourguignon, Mittelreidenbach, and Joachim Fischer, Bad Kreuznach, all of Fed. Rep. of Germany, assignors to Seitz-Filter-Werke Theo & Geo Seitz GmbH & Co., Bad Kreuznach, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,654

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342823

Int. Cl.⁴ B05D *5/00*

U.S. Cl. 427—244 **14 Claims**

1. A process for the production of an aromatic-polyamide-based filter element in the form of a filter membrane, membrane/deep filter combination or filter body, said process comprising the steps of:

(a) preparing a solution of a filter-forming aromatic polyamide in an aprotic solvent;

(b) preparing a solvent mixture by adding to the said solvent of the aromatic polyamide a liquid pore former and a precipitating agent in such quantities that the said solvent mixture contains:

a pore former, said former being ethylene glycols of molecular weight ranging from 50 to 400, in a quantity of from 20 to 35% by weight,

a precipitating agent, said agent being water, in a quantity ranging from 1% by weight to the limit of the solution stability of the polyamide, and

remainder comprising aprotic solvent, the said solution of the aromatic polyamide being retained in a true stable solution status within the said solution mixture;

(c) forming a desired semi-finished filter element by pouring said solution mixture unto a smooth support strip and treating immediately after forming the said semi-finished fliter element in a precipitation and coagulation bath at a bath temperature of from 5° C. to 35° C. over a period from 3 to 10 minutes until complete precipitation of the aromatic polyamide, said precipitation and coagulation bath having apart from the aromatic polyamide the same components but at a substantially higher quantity of precipitation agent than said solution mixture, said precipitation and coagulation bath containing from 35 to 55% by weight of the same solvent as the solvent mixture and from 1% by weight to 40% by weight of the same pore former as the solution mixture, the remainder being precipitating agent, so that the bath has

(c1) a pore former content of from 1% by weight to the same percentage pore former content as the solution mixture for forming filter elements having an asymmetric cell structure and a pore size in an active separating layer formed from said aromatic polyamide of from 0.05 μm to 10 μm for separating particles by microfilitration or

(c2) a pore former content in the range extending from the same percentage pore former content as the solution mixture to 40% by weight, for forming filter elements having a symmetric cell structure and a pore size of 0.05 μm to 10 μm for the separation of particles by microfiltration, whereas

(d) after coagulation of the aromatic polyamide, the filter element is washed in water unit complete removal of the solvent and pore former and precipitation agent used.

4,627,993

THERMOPLASTIC ELASTOMERIC COMPOSITIONS BASED ON COMPATIBLE BLENDS OF AN ETHYLENE COPOLYMER AND VINYL OR VINYLIDENE HALIDE POLYMER

Gary L. Loomis, Drexel Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 572,078, Jan. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 427,413, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 394,329, Jul. 1, 1982, abandoned. This application May 9, 1985, Ser. No. 732,089

Int. Cl.⁴ C08L *181/00, 77/00;* **C08F** *265/04;* **C08K** *3/00*

U.S. Cl. 428—36 **18 Claims**

1. A partially crosslinked, thermoplastic, melt-processible, elastomeric blend of

(a) a copolymer of ethylene and one or more ethylenically unsaturated organic monomers selected from the class consisting of esters of unsaturated C_3–C_{20} mono- or dicarboxylic acids, vinyl esters of saturated C_2–C_{18} carboxylic acids, vinyl alkyl ethers wherein the alkyl group has 1–18 carbon atoms, vinyl or vinylidene halides, acrylonitrile, methacrylonitrile, norbornene, alpha-olefins of 3–12 carbon atoms, and vinyl aromatic compounds; and

(b) between 5 and 75 weight percent, based on the composition, of a vinyl or vinylidene halide polymer

wherein the comonomer content in (a) is such that the ethylene copolymer is compatible with the vinyl or vinylidene halide polymer; there being present in the blend no polymerizable polyunsaturated compound or polymer of such compound.

4,627,994

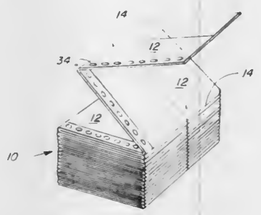
LABEL BEARING CONTINUOUS BUSINESS FORM

Bernhard J. Welsch, Cary, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Jan. 16, 1986, Ser. No. 819,380

Int. Cl.⁴ B32B *3/06*

U.S. Cl. 428—41 **9 Claims**



1. A continuous business form comprising:

an elongated ply of label stock of a desired width and having one side coated with a pressure sensitive adhesive;

an elongated ply of release liner stock of about said desired width and having a release side engaged with said adhesive on said one side;

said release liner and said label stock plies being laterally offset from one another so that a narrow longitudinal strip of adhesive unengaged with said release liner exists; and

an elongated ply of record or message bearing stock adhered at one edge to said label stock at said narrow longitudinal strip of adhesive.

4,627,995

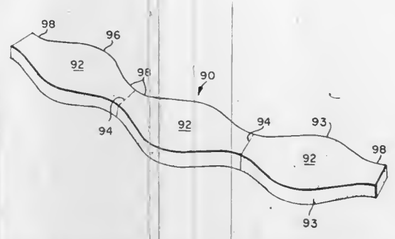
FIBERGLASS INSULATION WRAP FOR INSULATING A PIPE ELBOW

Chris J. Botsolas, St. Petersburg, Fla., assignor to Carol Botsolas, St. Petersburg, Fla.

Continuation of Ser. No. 535,911, Sep. 26, 1983, Pat. No. 4,553,308. This application Jun. 14, 1985, Ser. No. 745,418

Int. Cl.⁴ F16I *9/22*

U.S. Cl. 428—43 **8 Claims**



1. Fiberglass insulation for use in insulating a pipe elbow, said insulation comprising a continuous strand of a plurality of removably connected fiberglass wraps, each of said wraps comprising a pair of opposed ends having essentially the same width and a mid-section connecting the opposed ends having opposed arcuate sides wherein the width of the mid-section measured at any point along the opposed arcuate sides is greater than the width of the opposed ends.

4,627,996

SODIUM-SULFUR STORAGE BATTERY AND A MANUFACTURING METHOD OF THE SAME

Hiroshi Kagawa, Takatsuki, Japan, assignor to Yuasa Battery Co., Ltd., Osaka, Japan

Filed Oct. 30, 1985, Ser. No. 792,742

Claims priority, application Japan, Dec. 7, 1984, 59-259594

Int. Cl.⁴ H01M *10/00;* **B32B** *3/06*

U.S. Cl. 428—104 **7 Claims**



1. A sodium-sulfur storage battery comprising a solid electrolyte tube; and alpha alumina ring jointed with solder glass to the solid electrolyte tube; a negative cover thermocompressively jointed to the upper surface of said alpha alumina ring and a positive cover thermocompressively jointed to the lower surface of said alpha alumina ring, there being, diffusion layers of chrome provided on the surfaces of the negative and positive covers, and coating layers of aluminum provided at least on the surfaces, which are thermocompressively jointed, of the negative and positive covers.

4. A manufacturing method of a sodium-sulfur storage battery wherein a negative cover is thermo-compressively jointed to an upper surface of an alpha alumina ring which are jointed with solder glass to a solid electrolyte tube, and a positive cover is thermocompressively jointed to a lower surface of said alpha alumina ring, there being diffusion layers of chrome provided on the surfaces of the negative and positive covers, coating layers of aluminum provided at least on the surfaces, which are thermocompressively jointed, of the negative and positive covers, and thermocompressively jointing surfaces thermocompressively jointed in the air with aluminum rings thereon, respectively.

4,627,997

THERMAL TRANSFER RECORDING MEDIUM

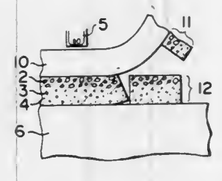
Youji Ide, Mishima, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,160

Claims priority, application Japan, Jun. 22, 1984, 59-128841; Aug. 29, 1984, 59-179862; Mar. 15, 1985, 60-52823; Mar. 19, 1985, 60-55121; Apr. 2, 1985, 60-70508

Int. Cl.⁴ B41M *3/12*

U.S. Cl. 428—216 **16 Claims**



1. In a thermal transfer recording medium which comprises a heat-resistant substrate and a thermally meltable inking layer consisting essentially of a coloring agent, waxes and a binder on said substrate, the improvement which comprises; a fluorescent substance consisting of a wax-like substance solid solution or a resin solid solution of a fluorescent dye, said solid solution having a melting or softening point of 50°–140° C., is further contained in said inking layer.

4,627,998

CARBON FIBER REINFORCED CONCRETE

Shigeyuki Akihama, Kanagawa; Tatsuo Suenaga, Tokyo; Makoto Saito, Kanagawa; Hideki Ikeda; Masanori Aya, both of Tokyo; Seiichi Koyama, Ibaraki; Masashi Kamakura, Hyogo; Naoto Mikami, Hyogo, and Hideaki Miyuki, Hyogo, all of Japan, assignors to Kajima Corporation, Tokyo, Japan

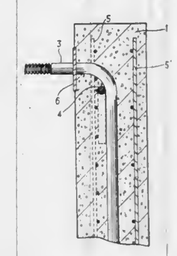
PCT No. PCT/JP85/00103, § 371 Date Oct. 16, 1985, § 102(e) Date Oct. 16, 1985, PCT Pub. No. WO85/03930, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 1, 1985, Ser. No. 795,697

Claims priority, application Japan, Mar. 2, 1984, 59-38866; Mar. 2, 1984, 59-38867

Int. Cl.⁴ B32B *15/00*

U.S. Cl. 428—285 **7 Claims**



5. A precast composite structure of carbon fiber reinforced concrete comprising a matrix of cured carbon fiber reinforced concrete containing 0.2 to 10% by volume of carbon fiber, at least one ferrous metallic member at least partly buried in said matrix and an insulating layer on the surface of said ferrous metallic member for preventing contact of said ferrous metallic member with the carbon fiber, said insulating layer having an electric resistance of at least about 100 ohms.

4,627,999

PROCESS FOR PREFINISHED EXTERIOR HARDBOARD

Tracy C. Hsu, Avon Lake, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 20, 1985, Ser. No. 713,767
Int. Cl.[4] B32B *22/00;* B05D *3/02*
U.S. Cl. 428—326 9 Claims

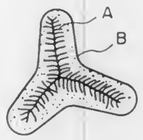
1. In a process for the manufacturing of a prefinished hardboard to withstand moisture and weathering which comprises:
(a) forming the board in a press from lignocellulosic fibers under heat and pressure,
(b) releasing the hardboard from the press,
(c) applying one or more coatings in the nature of primer and top finish coatings,
(d) curing the coated board after each coating application;
the improvement which comprises treating said hardboard between steps (b) and (c) with a vinylidene chloride copolymer prepaint sealer and curing or drying said sealed board before application of the primer or finish coat which comprises:
(a) 50–90 weight percent vinylidene chloride;
(b) 10–50 weight percent other copolymerizable monomers selected from the group consisting of acrylic and methacrylic acid and their C_{1-20} alkyl or unsaturated alkyl esters, styrene, acrylonitrile, and hydroxyalkyl or aminoalkyl acrylate or methacrylate; and
wherein said sealer is optionally formulated with 0.01 to 1.25 parts per hundred parts resin of a surfactant selected from the group consisting of nonionic, anionic, cationic and amphoteric fluorosurfactants and non-fluorinated surfactants and mixtures thereof.

4,628,001

PITCH-BASED CARBON OR GRAPHITE FIBER AND PROCESS FOR PREPARATION THEREOF

Hideharu Sasaki; Toru Sawaki, and Yoshiaki Yoshioka, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 3, 1985, Ser. No. 719,585
Claims priority, application Japan, Jun. 20, 1984, 59-125047; Jun. 20, 1984, 59-125048; Aug. 15, 1984, 59-169199
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—367 9 Claims



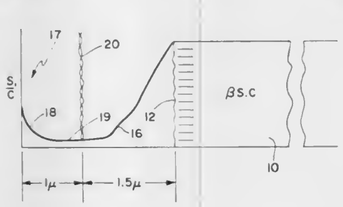
1. A pitch-based carbon or graphite fiber having a leafy lamella arrangement in at least 30% of the fiber cross-sectional area and having a tensile strength of at least 300 kg/mm^2.

4,628,002

SILICON CARBIDE MONOFILAMENT FOR TRANSVERSE COMPOSITE PROPERTIES

Raymond J. Suplinskas, Haverhill; Thomas W. Henze, Lawrence, both of Mass., and James V. Marzik, Nashua, N.H., assignors to Avco Corporation, Lowell, Mass.

Filed May 28, 1985, Ser. No. 738,614
Int. Cl.[4] D02G *3/00;* B32B *9/00*
U.S. Cl. 428—367 10 Claims



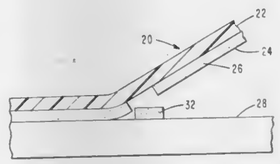
1. An SiC monofilament for use in combination with a matrix material to form a composite material comprising:
an SiC monofilament having a bulk SiC layer;
a layer of fine grain SiC having a finer grain size than the grain size of the bulk SiC deposited on the bulk SiC; and
a surface transition zone deposited on the fine grain SiC layer for interacting with the matrix.

4,628,000

THERMAL TRANSFER FORMULATION AND MEDIUM

Shashi G. Talvalkar, Kettering, and Thomas P. Besselman, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 28, 1984, Ser. No. 687,221
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—341 22 Claims



14. A ribbon for use in non-impact printing comprising a substrate and a transfer layer which is a mixture containing about 3 to 80% sucrose benzoate transfer agent, about 3 to 30% drying oil, about 1 to 10% dye, about 1 to 3% lecithin, about 5 to 20% coloring pigment, about 2 to 40% wax, all by dry weight, and about 40 to 60% solvent by wet weight for solubilizing the mixture.

4,628,003

HIGH TEMPERATURE HEAT SEAL FILM

Morton Katz, 2245 Lane Rd., Columbus, Ohio 43220

Continuation of Ser. No. 439,187, Nov. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 290,870, Aug. 7, 1981, abandoned. This application Mar. 20, 1985, Ser. No. 713,947
Int. Cl.[4] B32B *15/08, 27/30*
U.S. Cl. 428—377 7 Claims

1. A laminar structure for use in wrapping around cable or wire to provide continuous, heat sealed, electrical insulation comprising an inner layer of a polyimide and two outer layers of a pigmented fluoropolymer, wherein the outer layers have a thickness from 1 to 200 microns and consist essentially of a heat sealing fluoropolymer exhibiting a melting point of not more than about 300° C. and including from 1 to 10 percent, by weight, of heat absorbing carbon pigment with substantially the same amount of pigment dispersed in each of the outer layers.

5. A wire or cable spirally wrapped by a strip of the laminar structure of claim 1 wherein edges of the strip of the laminar structure overlap and the strip has been heat sealed to itself at the overlapped edges.

4,628,004

POWDER METAL AND/OR REFRACTORY COATED FERROUS METAL

Richard A. Nickola, Munster, and Brian A. Sok, Cedar Lake, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Continuation-in-part of Ser. No. 511,570, Jul. 7, 1983, Pat. No. 4,542,048. This application Mar. 25, 1985, Ser. No. 715,892
Int. Cl.[4] B32B *27/38;* B05D *3/02*
U.S. Cl. 428—413 25 Claims

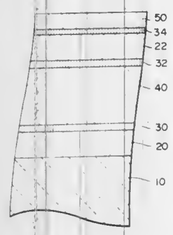
1. A method of providing a ferrous metal strip with a ductile adherent protective coating having improved deep drawing properties comprising;
(a) applying to a clean surface of the ferrous metal strip a uniform fluid coating of a finely divided protective coating material selected from the group consisting of powdered protective metal and nonmetallic refractory material uniformly dispersed in a solution of a synthetic resin binder solubilized with an organic solvent which is volatilized at a temperature between about 30° C. (86° F.) and about 274° C. (525° F.);
(b) said resin binder being adherent to said surface of the metal strip and having a Tukon hardness range of between 10 and 15 and a glass transition temperature which is between about 35° C. and 180° C. (95° F. and 356° F.) and said resin binder comprising between about 10 volume percent and 50 volume percent of said coating on a solvent free basis with the balance being powdered protective coating material;
(c) heating the fluid coated metallic strip to remove said volatile solvent and set the resin binder to provide a dry cured resin-powder protective coating on the surface of said ferrous metal strip which is formable at room temperature and exhibits deep drawing properties;
(d) and said resin-powder coated ferrous metal strip characterized by forming an adherent formable resin free protective coating on said strip when said strip is heated to a sintering and diffusion temperature.

4,628,005

HEAT WAVE SHIELDING LAMINATION

Tadayoshi Ito, and Taga Yasunori, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Aichi, Japan

Filed Dec. 6, 1984, Ser. No. 678,704
Claims priority, application Japan, Dec. 9, 1983, 58-233224
Int. Cl.[4] G02B *1/10*
U.S. Cl. 428—432 4 Claims



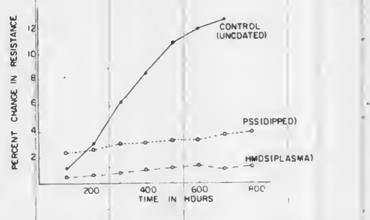
1. A heat wave shielding lamination having improved abrasion resistance, without effecting its optical characteristics, comprising: a visible light transparent substrate; and an overlying composite lamination consisting of at least two layers of visible light transparent substance of a low refractive index and at least two layers of visible light transparent substance of a high refractive index lying alternately on each other, with the topmost layer being said low-refractive layer, and at least one interfacial layer of Al_2O_3 provided between said high-refractance and low-refractance layers, said interfacial layer being much thinner than said high-refractance and low-refractance layers with the thickness of the interfacial layer being in the range of 5–20 nm said high-refractance layers being formed of a material selected from TiO_2, CeO_2, ZnS, CdS and ZrO_2, each of which being thick enough to reflect infrared rays, and said low-refractance layers being formed of a material selected from SiO_2, MgF_2, LiF, CeF_3 and CaF_2, the top most layer thereof being of a thickness which prevents reflection of visible light and other layers thereof being thick enough to reflect infrared rays.

4,628,006

PASSIVATION OF HYBRID MICROELECTRONIC CIRCUITS

Bonnie L. Rathbun, Ithaca, and Philipp W. H. Schuessler, Endwell, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,340
Int. Cl.[4] B32B *9/04;* B05D *5/12, 1/00*
U.S. Cl. 428—446 2 Claims



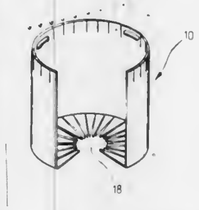
1. A process for passivating a microelectronic device comprising the steps of:
drawing a vacuum of 10 to 20 microns on a reaction chamber;
introducing hexamethyldisilazane (HMDS) monomer into said reaction chamber;
subjecting the monomer to electromagnetic energy at a frequency of 13.56 Mhz to form a plasma thereof within the chamber;
exposing the device to said plasma for depositing a polymerized thin film layer of the HMDS on the device; and
continuing said deposition until the layer of a desired thickness has been deposited on the device.

4,628,007

TRASH BAG INSERT

Paul Ledsham, 361 Sandford Street, Newmarket, Ontario, Canada L3Y 4S2

Filed Jan. 10, 1984, Ser. No. 569,725
Int. Cl.[4] B65D *5/56*
U.S. Cl. 428—542.8 6 Claims



1. An insert for holding open and supporting in a general upright position a trash bag not capable of self-support,

said insert comprising a generally rectangular member which is rollable under pressure upon itself for fitting within the trash bag and having resiliency characteristics and a thickness to resist such rolling with opposing outer edges of said insert being free to allow rolling and unrolling of said insert such that upon releasing the pressure, said member springs open and automatically unrolls in a generally circular configuration until restrained by the bag, thereby holding the bag open and supported in a generally upright position,

said insert having a plurality of bottom edge serrations providing generally triangular bottom portions foldable inwardly to form a bottom end of said insert, said bottom portions being free of one another such that said bottom end is adjustable with unrolling of said insert to the size of the bag.

4,628,008

METHOD FOR ELIMINATING, OR MINIMIZING THE EFFECTS OF, DEFECTS IN MATERIALS

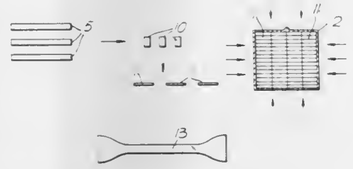
Ralph I. Conolly, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 10, 1983, Ser. No. 550,558

Claims priority, application United Kingdom, Nov. 16, 1982, 8232721

Int. Cl.[4] B21K *3/00;* **B23P** *15/04*

U.S. Cl. 448—548 **12 Claims**



1. A method for manufacturing an article from a defect-immunized material comprising the steps of:

subjecting at least one initial body of material to a working process imparting a high degree of plastic deformation to the body to produce an upset ratio of at least 5:1 along at least one principal axis of the body;

cutting the deformed at least one body into a plurality of smaller pieces;

deforming each said smaller piece along an axis thereof different from said principal axis, thereby to put further work into the material;

stacking at least some of the deformed smaller pieces in a sealable container;

evacuating the container; and

bonding the pieces in the container together using a hot isostatic pressing technique to form the article.

4,628,009

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu; Toshiaki Ide; Yoshiaki Saito, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

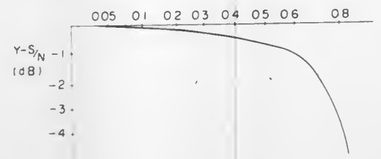
Continuation of Ser. No. 627,608, Jul. 3, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 796,526

Claims priority, application Japan, Jul. 26, 1983, 58-135127

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—694 **4 Claims**

1. A magnetic recording medium which comprises a plastic base film, a continuous thin film magnetic metal layer formed on one side of the base film and a thermoset backing layer formed on the other side of the base film, wherein the backing layer is made of thermosetting composition consisting essentially of a vinyl chloride-vinyl acetate-vinyl alcohol copolymer, a polyurethane prepolymer and a polyisocyanate and has a surface roughness of from 0.05 to 0.6 μm, whereby curling of



the medium induced by the presence of the thin magnetic metal layer is avoided.

4,628,010

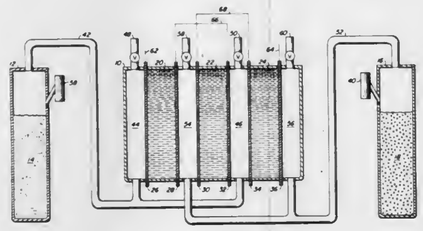
FUEL CELL WITH STORABLE GAS GENERATOR

Bernard L. Iwanciow, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 13, 1985, Ser. No. 808,776

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—19 **1 Claim**



1. A system for providing gaseous hydrogen and oxygen to a hydrogen/oxygen fuel cell, the combination which comprises:

(a) a hydrogen/oxygen fuel cell assembly;

(b) a hydrogen gas generator having a first heterogeneous mixture comprising lithium borohydride and iron oxide contained therein;

(c) a means to initiate said first mixture to generate gaseous hydrogen;

(d) a means to feed said gaseous hydrogen to said hydrogen-/oxygen fuel cell;

(e) an oxygen gas generator having a second heterogeneous mixture comprising sodium chlorate and elemental iron contained therein;

(f) a means to initiate said second mixture to generate gaseous oxygen; and

(g) a means to feed said gaseous oxygen to said hydrogen-/oxygen fuel cell.

4,628,011

REJUVENATION OF NICKEL-CADMIUM AIRCRAFT BATTERY ELECTROLYTE

Kieva Feldman, Ottawa; Robert J. Charest, Nepean; Gaston Verville, Ottawa, and Joseph L. Lackner, Kanata, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, England

Filed Jan. 19, 1983, Ser. No. 459,141

Claims priority, application Canada, Feb. 16, 1982, 396358

Int. Cl.[4] H01M *10/42*

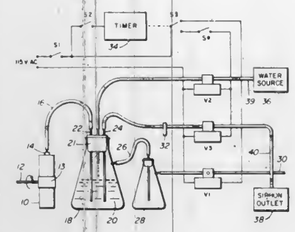
U.S. Cl. 429—49 **4 Claims**

1. A process for the regeneration of contaminated electrolyte outside an electrolytic cell, comprising:

(a) providing an electrolytic cell containing a volume of contaminated electrolyte;

(b) providing an external reservoir for containing a larger volume of clean electrolyte of suitable battery concentration and connecting said reservoir to said cell;

(c) applying a vacuum to said external reservoir to withdraw a quantity of the contaminated electrolyte from said cell into said external reservoir;



(d) mixing the contaminated electrolyte with said larger volume of clean electrolyte of suitable battery concentration in said external reservoir;

(e) releasing the vacumm in said external reservoir to return the mixed electrolyte to said cell; and

(f) repeating steps (c) to (e) until the concentration of contaminant in the cell electrolyte and the reservoir electrolyte are substantially equal.

4,628,012

EXPLOSION-PROOF, HERMETICALLY SEALED GALVANIC CELL

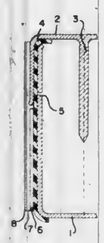
Dieter Spahrbier, Kelkheim-Fischbach, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 20, 1985, Ser. No. 799,945

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443453

Int. Cl.[4] H01M *2/12*

U.S. Cl. 429—53 **12 Claims**



1. A galvanic cell with a tightly sealed metal housing which is protected from the risk of explosion and which comprises:

a first cylinder which is closed at one end; and

a second cylinder which is closed at one end;

wherein the cylinders are adapted for press-fit engagement with one another with the first cylinder being overlapped by the second cylinder;

an electrical insulation material disposed between the first and second cylinders in such a way that the cylinders can be pushed off from each other only in response to a predetermined internal pressure; and

at least one vent hole in the wall of the first cylinder in the region wherein the second cylinder overlaps the first cylinder.

4,628,013

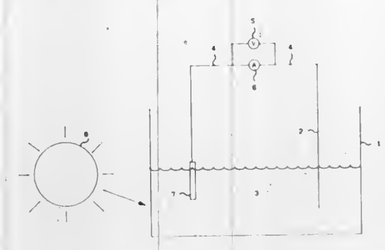
PHOTOELECTROCHEMICAL CELL

Joseph E. Figard; David C. Rohlfing, both of Bartlesville, Okla., and Ralph S. Becker, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1983, Ser. No. 490,595

Int. Cl.[4] H01M *6/36*

U.S. Cl. 429—111 **15 Claims**



1. A photoelectrochemical cell comprising a semiconductive intrinsic amorphous silicon hydride cathode.

4,628,014

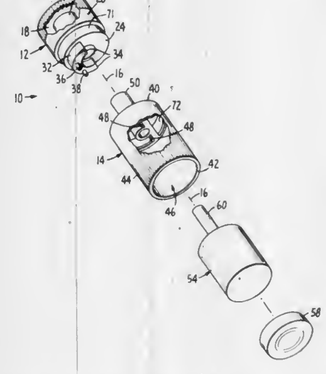
DEFERRED-ACTION BATTERY

Wayne R. Hruden, San Luis Obispo, Calif., assignor to Ultimate Survivor of America Inc., San Luis Obispo, Calif.

Filed Jan. 28, 1986, Ser. No. 823,399

Int. Cl.[4] H01M *6/30*

U.S. Cl. 429—113 **20 Claims**



1. A deferred-action battery comprising:

a rotor means having a longitudinal axis therethrough, said rotor means including a first chamber capable of holding an electrolytic solution, said first chamber having at least one off-axis portion thereof that protrudes axially away from the remainder of said first chamber; and

a stator means rotatably mounted about said axis, said stator means having a second chamber which is capable of holding a carbon rod, cathode mix, separator, a bottom insulator and an anode, said stator means axially adjacent to said rotor means, said rotor means and said stator means being rotatable with respect to each other, said axis portion axially extending into said second chamber, said stator means including rupturing means extending radially from said axis and rotatable to contact said off-axis portion of said first chamber, said rupturing means capable of destroying the integrity of said off-axis portion upon rotation

of said rotor means with respect to said stator means to allow communication between said first and second chambers and activation of the battery.

4,628,015

INSOLUBLE AND INFUSIBLE SUBSTRATE WITH A POLYACENE-TYPE SKELETAL STRUCTURE, AND ITS APPLICATIONS FOR ELECTRICAL CONDUCTOR AND ORGANIC CELL

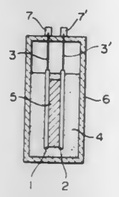
Shizukuni Yata, Hyogo, and Yukinori Hato, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,889

Claims priority, application Japan, Sep. 20, 1984, 59-197838; Sep. 27, 1984, 59-203450; Sep. 27, 1984, 59-203451

Int. Cl.[4] H01M *4/60, 10/40*

U.S. Cl. 429—194 **37 Claims**



1. An insoluble and infusible substrate with a polyacene-type skeletal structure having a hydrogen/carbon atomic ratio of from 0.05 to 0.60 and a specific surface area, measured by the BET method, of at least 600 $m^2/9$, said substrate being a heat-treated product of a mixture comprising an aromatic condensation polymer consisting of carbon, hydrogen and oxygen as a matrix and a fiber component selected from the group consisting of phenol resin fibers and carbon fibers dispersed in said matrix.

4,628,016

MIRROR WAFER OF COMPOUND SEMICONDUCTOR

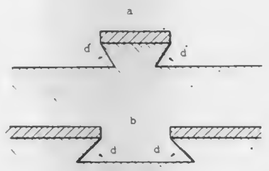
Jun Yamaguchi, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,578

Claims priority, application Japan, Feb. 2, 1984, 59-13672[U]

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—30 **8 Claims**



1. A mirror wafer comprising a compound semiconductor wafer having a front surface and a rear surface wherein anisotropic patterns are naturally formed on said rear surface by an etching process, and wherein said wafer has a structure permitting easy determination of the mesa direction.

6. A mirror wafer of compound semiconductor having anisotropic patterns artificially formed on the rear surface by a photoetching process for denoting the mesa direction.

4,628,017

ELECTROSTATIC IMAGE FORMING METHOD

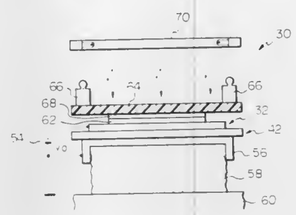
Izumi Tagoku, Tokyo, Japan, assignor to Ricoh Company, Limited, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,914

Claims priority, application Japan, Nov. 2, 1984, 59-232003; Nov. 2, 1984, 59-232002; Nov. 2, 1984, 59-232001; Nov. 2, 1984, 59-232004; Nov. 2, 1984, 59-232005

Int. Cl.[4] G03G *13/044*

U.S. Cl. 430—48 **7 Claims**



1. An electrostatic image forming method for an image forming apparatus, said apparatus being provided with a photoconductive element having an electrode layer and a photoconductive layer, and a recording medium having at least a dielectric layer, at least one of the photoconductive element and the recording medium having transmissivity, said method comprising the steps of:

(a) causing the photoconductive layer of the photoconductive element and the dielectric layer of the recording medium to face and make close contact with each other with the intermediary of an air gap;

(b) applying a DC voltage across the electrode layer of the photoconductive element and the dielectric layer of the recording medium;

(c) projecting a light image for exposure from a back of one of the photoconductive element and the recording medium which has transmissivity; and

(d) controlling a light quantity of the light image;

whereby a positive electrostatic image or a negative electrostatic image is formed on the dielectric layer of the recording medium.

4,628,018

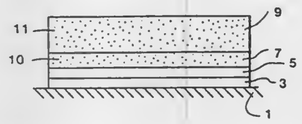
SILYLATED COMPOSITIONS, AND DEUTERATED HYDROXYL SQUARAINE COMPOSITIONS AND PROCESSES

John W. Lin, and Lesley P. Dudek, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 613,137, May 23, 1984, Pat. No. 4,585,884. This application Aug. 16, 1985, Ser. No. 766,326

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 **23 Claims**



1. A photoresponsive device comprised of a conductive supporting substrate, a photoconductive layer comprised of the hydroxyl squaraines, and a top hole transporting layer comprised of a transporting molecule dispersed in a resinous binder, wherein the squaraines are prepared by affecting functionalization of a hydroxyl squaraine in an organic solvent system wherein the hydroxyl groups are silylated, and thereafter subjecting the resulting silylated products to hydrolysis enabling conversion to purified squaraine compositions.

6. A photoresponsive device in accordance with claim 1 wherein the charge transporting molecule is N,N'-diphenyl-N,N'-bis-3-methylphenyl-1,1'-biphenyl-4,4'-diamine.

4,628,019

PROCESS FOR DEVELOPING ELECTROSTATIC IMAGES AND TONER THEREFOR

Koshi Suematsu, Kawasaki; Takeshi Ikeda, Yokohama; Atsuko Yamamoto, Komae; Koji Goto, Kawasakishi, and Eiichi Imai, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,546

Claims priority, application Japan, Apr. 27, 1984, 59-85318

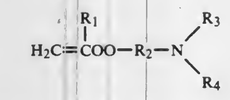
Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—106.6 **16 Claims**

1. A process for developing an electrostatic image, comprising:

defining a developing zone by disposing an electrostatic image bearing member having an electrostatic image on a surface thereof and a toner carrying member in an opposed relationship with a clearance therebetween;

providing a layer of a substantially non-magnetic toner on a surface of said toner carrying member, said toner layer having a thickness less than the distance defined by said clearance at the developing zone, wherein said toner comprises a colorant and a binder resin comprising a nitrogen-containing copolymer having a ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) which is less than 3.5, said nitrogen-containing copolymer being a copolymer of a vinyl monomer and an aminoacrylic monomer of the formula:



wherein R_1 is hydrogen, methyl or ethyl, R_2 is an alkylene having 1 to 4 carbon atoms, R_3 is an alkyl having 1 to 6 carbon atoms or phenyl and R_4 is an alkyl having 1 to 6 carbon atoms or phenyl; and

electrically transferring said toner to said electrostatic image bearing member by causing said toner to jump onto said electrostatic image bearing member, thereby developing said electrostatic image.

4,628,020

LIGHT-SENSITIVE COMPOUND MIXTURE AND COPYING MATERIAL COMPRISING O-NAPHTHQUINONEDIAZIDE COMPOUND

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

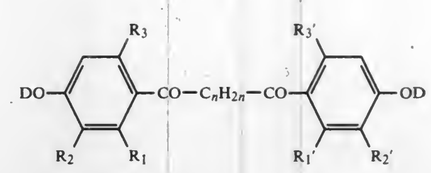
Filed Jan. 11, 1982, Ser. No. 338,640

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100856

Int. Cl.[4] G03C *1/54, 1/94;* **C07C** *113/00*

U.S. Cl. 430—165 **10 Claims**

1. A light-sensitive copying material comprising a support and a light-sensitive layer containing a 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the formula:



wherein

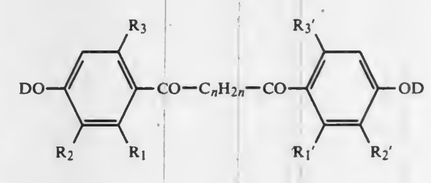
D represents a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

R_1, R_2, R_3, R_1', R_2' and R_3' each represent hydrogen, halogen, alkyl groups having a 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring.

4. A light sensitive mxiture comprising a light-sensitive 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the general formula:



wherein

D represent a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

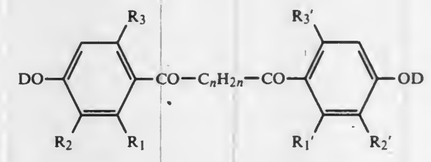
R_1, R_2, R_3, R_1', R_2', and R_3' each represent hydrogen, halogen, or alkyl groups having 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring, and

a water-insoluble binder which is soluble or swellable in aqueous-alkaline solutions.

7. A light-sensitive compound comprising a light-sensitive 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the general formula:



wherein

D represents a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

R_1, R_2, R_3, R_1', R_2' and R_3' each represent hydrogen, halogen, alkyl groups having 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring.

4,628,021

HEAT DEVELOPABLE COLOR PHOTOGRAPHIC MATERIALS WITH SILVER HALIDE CONTAINING IODIDE

Satoru Sawada, and Shingo Nishiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1984, Ser. No. 595,757
Claims priority, application Japan, Apr. 1, 1983, 58-56878
Int. Cl.[4] G03C *1/40, 5/54, 1/02*
U.S. Cl. 430—203 **29 Claims**

22. A method of forming a color image, comprising the steps of:

imagewise exposing a heat developable color photographic material, comprising:

a support having thereon;

a light-sensitive crystal silver haloiodide which does not show a pattern of pure silver iodide in an X-ray diffraction pattern having a silver iodide content of 4 to 40 mole% and which is prepared by simultaneously reacting sources of Ag, I and at least one other halogen while maintaining a constant pAg;

a hydrophilic binder; and

a dye-providing substance capable of providing a mobile dye, when the silver haloiodide is reduced to silver upon heating, in chemical relation to the reaction, which has the general formula C-L-D, wherein D is an image-forming dye moiety, L is a bonding group in which the C-L bonding is cleaved at the reaction of an oxidation product of the reducing agent and C is a moiety bonding Po an oxidation product of a reducing agent and has a ballast group.

4,628,022

MULTILAYER CIRCUIT BOARD FABRICATION PROCESS AND POLYMER INSULATOR USED THEREIN

Jose A. Ors, Solebury Township, Bucks County, Pa., and Richard D. Small, Jr., West Windsor Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 513,485, Jul. 13, 1983, Pat. No. 4,511,757.
This application Mar. 4, 1985, Ser. No. 707,596
Int. Cl.[4] G03C *1/68;* **C08F** *8/00*
U.S. Cl. 430—280 **3 Claims**



1. An energy sensitive material capable of curing under the influence of radiation comprises a non-rubber modified first epoxy resin wherein the terminal groups have been at least partially acrylated, a rubber modified second epoxy resin having a rubber in the backbone of the resin derived from reacting an epoxy resin with a carboxy terminated butadiene-acrylonitrile containing rubber and the terminal groups of which have been at least partially acrylated, said second epoxy resin being compatible with the first epoxy resin.

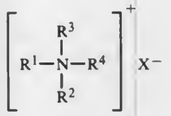
4,628,023

METAL ION FREE PHOTORESIST DEVELOPER COMPOSITION WITH LOWER ALKYL QUATERNARY AMMONIUM HYDROZIDE AS ALKALAI AGENT AND A QUATERNARY AMMONIUM COMPOUND AS SURFACTANT

John F. Cawston, Winchester, and Paul E. Becker, Norwood, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 485,409, Apr. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 252,915, Apr. 10, 1981, abandoned. This application Mar. 31, 1986, Ser. No. 846,824
Int. Cl.[4] G03C *5/24, 5/34*
U.S. Cl. 430—331 **12 Claims**

1. An aqueous metal ion-free developer composition for developing an image in an exposed photoresist consisting essentially of a mixture of a metal ion-free alkali hydroxide as a source of alkalinity and a metal ion-free surfactant, said source of alkalinity being a lower alkyl quaternary ammonium hydroxide and said surfactant being one or more quaternary ammonium compounds that differs from the alkali hydroxide, but conforms to the general formula:

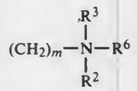


wherein

R^1 is a saturated or unsaturated, straight or branched chain hydrocarbon having from 6 to 20 carbon atoms, and from 0 to 3 atoms, provided that each oxygen atom is separated from another by at least one carbon atom, and which is alkoxy substituted or unsubstituted;

R^2 and R^3 are the same or different where each is selected from the group of alkyl having from 1 to 3 carbon atoms and $(R^5O)_nH$, wherein R^5 is alkylene having from 1 to 3 carbon atoms and n is an integer of from 1 to 20; or R^2 and R^3 together is a member selected from the group of a cycloaliphatic hydrocarbon having from 2 to 8 carbon atoms with from 0 to 2 heteroatoms selected from the group consisting of O, N, and S, provided that each heteroatom is separated from another heteroatom and from the quaternary nitrogen by at least one carbon atom; and a cycloaromatic hydrocarbon having from 2 to 8 carbons with from 0 to 2 nitrogen heteroatoms, provided that each nitrogen is separated from another and from the quaternary nitrogen by at least 1 carbon atom;

R^4 is a member selected from the group of a saturated or unsaturated, straight or branched hydrocarbon having from 1 to 10 carbon atoms; $(R^5O)_nH$ as defined above; phenalkyl, wherein the alkyl moiety has from 0 to 3 carbon atoms; and



where m is an integer of from 1 to 4, R^2 and R^3 are as defined above, and R^6 is a saturated, straight or branched hydrocarbon having from 1 to 10 carbon atoms or $(R^5O)_nH$ as defined above; and

X is a member selected from the group of halo, hydroxy, silicate, and the corresponding amino oxide of said quaternary ammonium compounds;

said alkali being present in sufficient quantity to provide a photoresist developer having a pH of at least 11 and said surfactant being present in a quantity sufficient to reduce the exposure energy required to form a latent image in a photoresist by at least 20 percent compared to said developer free of said surfactant.

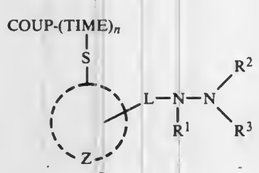
4,628,024

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hidetoshi Kobayashi; Keiji Mihayashi, and Isamu Itoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 583,901, Feb. 27, 1984, abandoned. This application Jan. 9, 1986, Ser. No. 817,239
Claims priority, application Japan, Feb. 25, 1983, 58-31611
Int. Cl.[4] G03C *1/40*
U.S. Cl. 430—376 **19 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer and a compound represented by the following general formula (I):

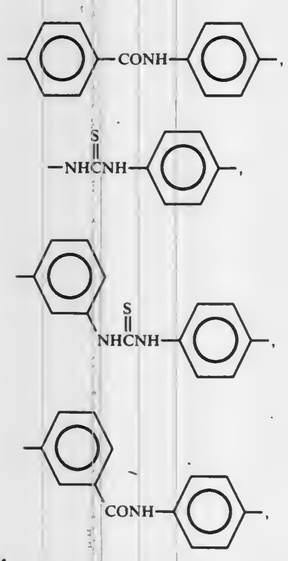


(I)

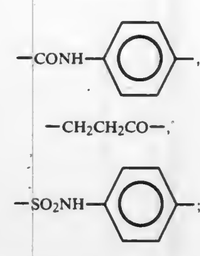
wherein COUP represents a coupler residue capable of being subjected to a coupling reaction with an oxidation product of an aromatic primary amine developing agent; TIME represents a timing group which is released upon the coupling reaction and subsequently releases



Z represents a 5- or 6-membered monocyclic heterocyclic ring or a 9-membered condensed heterocyclic ring, said heterocyclic ring consisting of nitrogen and carbon atoms; L represents a divalent linking group selected from the groups having the following formulae:



-continued



R^1 represents a hydrogen atom or an alkoxycarbonyl group; R^2 represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a thioacyl group or a thiocarbamoyl group; R^3 represents a hydrogen atom; R^2 and R^3 may be bonded to each other to form a hydrazone structure; a part of L and R^1 may be bonded to each other to form a hydrazone structure; and n represents 0 or 1.

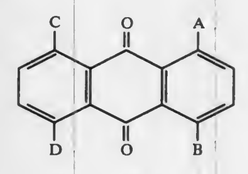
4,628,025

POLYESTER SUPPORT FOR PHOTOGRAPHIC USE

Toshiki Komaita; Takanori Nakadate; Yoshiyuki Funabashi, and Kazuto Kiyohara, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

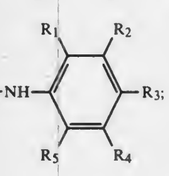
Filed Jul. 12, 1985, Ser. No. 754,258
Claims priority, application Japan, Jul. 13, 1984, 49-146324
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—533 **7 Claims**

1. A support for photographic use comprizing a polyester film containing at least one compound of the following formula (I) and at least one quaternary ammonium salt of the following formula (II):



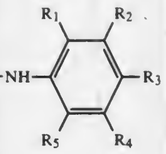
(I)

(wherein A is

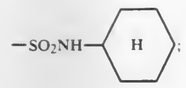


)

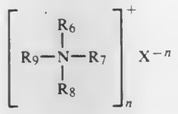
B, C and D are each



a hydroxyl group, a nitro group, an amino group or a hydrogen atom; R_1, R_2, R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an alkoxy group, an alkyl group, an aryloxy group, an aralkoxy group, a hydroxyalkyl group, $-(OCH_2-)_mOH$ (m is an integer or 1 to 4) or



B, C and D are not simultaneously at least one member selected from the group consisting of a hydrogen atom, a nitro group and an amino group);



(II)

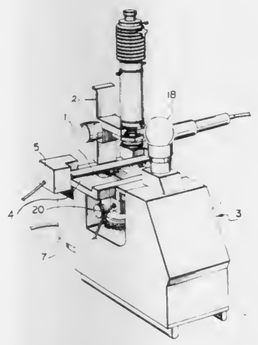
(wherein R_6, R_7, R_8 and R_9 are each an alkyl group, an aralkyl group or an allyl group; X is an anion; and n represents the number of charges on X).

4,628,026

METHOD AND APPARATUS FOR AUTOMATED DOUBLE FLUOROCHROMIZATION ANALYSIS IN LYMPHOCYTOTOXICITY TESTING

Dietlind Gardell, Box 38, Oxford Station, Ontario, K0G 1T0, and Gail Rock, 270 Sandridge Road, Rockcliffe Park, Ottawa, Ontario, K1L 5A2, both of Canada

Filed Nov. 15, 1983, Ser. No. 552,090
Int. Cl.[4] G01N *33/53, 33/554*
U.S. Cl. 435—7 **24 Claims**



1. For use in fluorescence assays of specimens exhibiting fluorescence at two distinguishable wavelength bands when irradiated respectively by light of two pre-selected distinguishable wavelength bands; apparatus comprising:

a movable specimen container having spaced compartments for a plurality of individual specimens to be assayed;

alignment means for moving the container to provide predetermined sequential centered alignment of individual compartments of the container with a predetermined optical path;

irradiating means for sequentially irradiating said specimens, as each is aligned in the optical path, alternately with light of the two pre-selected distinguishable wavelength bands beamed along the optical path;

light collection means for receiving and distinguishing light produced by fluorescence in each said specimen along the optical path;

detector means for detecting and recording the intensity of the light produced by fluorescence of each said specimen at each of said two distinguishable wavelength bands;

analyzing means for calculating the quotient of the intensities of the light sequentially received from each said specimen at the two distinguishable wavelength bands and for comparing such quotient with at least one control quotient thereby to classify such specimen according to such comparison; and

synchronization means for controlling, coordinating and synchronizing the operation of the alignment means, irradiating means, light collection means, detector means and analyzing means.

4,628,027

VITRO DIAGNOSTIC METHODS USING MONOCLONAL ANTIBODIES AGAINST CONNECTIVE TISSUE PROTEINS

Steffen Gay, Birmingham, Ala., assignor to Molecular Engineering Associates, Ltd. and The Board of Trustees of the Universtiy of Alabama, both of Birmingham, Ala.

Continuation of Ser. No. 379,704, May 19, 1982, abandoned. This application Apr. 18, 1984, Ser. No. 601,438
Int. Cl.[4] G01N *33/68, 33/577*
U.S. Cl. 435—7 **60 Claims**

1. A method for immunochemically monitoring the effectiveness of cancer therapy in a human cancer patient, comprising:

(a) reacting a first serum sample taken from said patient prior to initiation of therapy with a known titer of a soluble monoclonal antibody specific for a connective tissue protein which is released by tumor cells of said cancer and is present in an unknown amount in said serum sample;

(b) allowing said antibodies and connective tissue protein to interact to form antigen-antibody complexes in the reaction mixture;

(c) measuring the amount of antigen-antibody complexes formed to determine the amount of said connective tissue protein present in said reaction mixture;

(d) repeating each of said steps on a second serum sample taken from said patient subsequent to the initiation of therapy; and

(e) comparing the amount of said connective tisue protein in said first and second serum samples to determine whether said connective tissue protein has decreased in the interval between the taking of the first and second serum samples, where a decrease reflects successful therapy, thereby monitoring the effectiveness of such therapy in said patient.

4,628,028

NOVEL THERMOSTABLE PULLULANASE ENZYME AND METHOD FOR ITS PRODUCTION

Dennis M. Katkocin, Danbury, Conn.; Nancy W. Zeman, Sleepy Hollow, and Shiow-Shong Yang, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 23, 1985, Ser. No. 737,309
Int. Cl.[4] C12P *19/22, 19/16;* **C12N** *9/44;* **C12R** *1/01*
U.S. Cl. 435—95 **8 Claims**

1. A thermostable pullulanase enzyme preparation derived from a *Thermoanaerobium brockii* microorganism, said enzyme being capable of retaining at least about 50% of its pullulan-hydrolyzing activity when held at 70° C. in an aqueous solution in the absence of substrate at pH 5.0 for 100 minutes.

4,628,029

METHOD FOR THE CONVERSION OF A CELLULOSIC SUBSTRATE TO GLUCOSE USING *MICROBISPORA BISPORA*, STRAIN RUTGERS P&W

Douglas E. Eveleigh, Rocky Hill, N.J.; Clarence R. Waldron, Napoleon, Ohio, and Timothy Bartley, Piscataway, N.J., assignors to Parsons & Whittemore, Inc., New York, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,407
Int. Cl.[4] C12P *19/14, 19/02, 1/04;* **C12N** *9/42, 1/20;* **D21C** *1/00, 3/00*
U.S. Cl. 435—99 **45 Claims**

41. A cellulase three-enzyme complex of endoglucanase, cellobiohydrolase and β-glucosidase, produced by the microorganism *Microbispora bispora* Rutgers P&W having accession No. 15568 and mutants thereof which retain cellulolytic activity, having: a β-glucosidase level of activity of at least about 0.1 unit per ml, as measured by a p-nitrophenyl glucoside substrate assay and as derived from a cell free sonicate produced from a 3 day old cell culture broth; substantial resistance to glucose inhibition of its saccharification activity; a functional temperature range of from about 45° C. to about 85° C.; and a functional pH range of about 5.5 to 7.5.

4,628,030

PROCESS FOR THE PRODUCTION OF RHAMNOLIPIDS

Othmar Kaeppeli, Würenlos, and Luis Guerra-Santos, Zurich, both of Switzerland, assignors to Petrotec Forschungs AG, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,377
Claims priority, application Switzerland, Aug. 9, 1983, 4327/83
Int. Cl.[4] C12P *19/04;* **C12R** *1/385*
U.S. Cl. 435—101 **17 Claims**

1. In a process for producing rhamnolipids usable as surfactants by the cultivation of rhamnolipid producing microorganisms of the genus Pseudomonas in an aqueous culture medium suitable for the growth of said microorganisms, the improvement which comprises

(a) culturing said microorganisms in a continuous submerged culture under aerobic conditions and with a continuous supply of fresh culture medium, and continuous removal of a solution of partially spent culture medium and produced surfactants, at a dilution rate of below 0.3 h^{-1} and

(b) limiting the amount of at least two essential growth substances selected from the group consisting of carbon, nitrogen, sulfur, phosphorous, sodium, potassium, magnesium, calcium, iron, zinc, manganese, boron, cobalt, copper and molybdenum, in the culture medium such that the quantity of essential growth substance in the partially spent culture medium is less than half of the amount in the fresh culture medium.

4,628,031

THERMOSTABLE STARCH CONVERTING ENZYMES

Joseph G. Zeikus, Okemos, Mich., and Hyung-Hwan Hyun, Madison, Wis., assignors to Michigan Biotechnology Institute, East Lansing, Mich.

Filed Sep. 18, 1984, Ser. No. 652,586
Int. Cl.[4] C12N *9/34, 9/44;* **C12P** *19/20, 19/16, 7/14;* **C12R** *1/145*
U.S. Cl. 435—205 **3 Claims**

1. A method of producing a thermostable glucoamylase and a thermostable pullulanase which comprises anaerobically culturing a thermostable glucoamylase and pullulanase producing *Clostridium thermohydrosulfuricum* in a nutrient medium until substantial enzymatic activity is detectable and thereafter isolating the glucoamylase and pullulanase.

4,628,032

MONOCLONAL ANTIBODY SPECIFIC FOR A MAMMARY TUMOR CYTOPLASMIC ANTIGEN

Christine A. White, Encinitas; Renato Dulbecco, La Jolla, and William R. Allen, Encinitas, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Dec. 5, 1984, Ser. No. 678,260
Int. Cl.[4] C12N *5/00;* **C07K** *15/00*
U.S. Cl. 435—240 **2 Claims**

1. A cell line selected from the group consisting of hybridoma cell line 3B18 and antibody-producing reclones thereof.

4,628,033

NOVEL HOST STRAIN FOR TRANSFORMATION OF *YARROWIA LIPOLYTICA*

John R. DeZeeuw, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,363
Int. Cl.[4] C12N *15/00, 1/00, 1/16*
U.S. Cl. 435—255 **3 Claims**

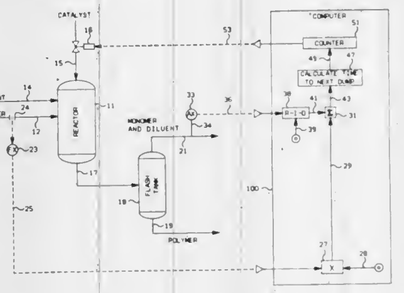
1. A biologically pure culture of *Yarrowia lipolytica* having the identifying characteristics of ATCC 20688.

4,628,034

CONTROL OF A POLYMERIZATION REACTION

James A. Hofferber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 394,089, Jul. 1, 1982, Pat. No. 4,533,517. This application Apr. 30, 1985, Ser. No. 728,913
Int. Cl.[4] C08F *2/00;* **G01N** *31/00*
U.S. Cl. 436—55 **4 Claims**



1. A method for maintaining a desired unreacted monomer concentration in the reaction effluent withdrawn from a polymerization reactor, wherein monomer is provided as a feed to said polymerization reactor, wherein catalyst is provided periodically through a catalyst feeder valve to said polymerization reactor and wherein said reaction effluent contains polymer and unreacted monomer, said method comprising the steps of:

establishing a first signal representative of the time which should elapse until the next actuation of said catalyst feeder valve in order to maintain a desired concentration of unreacted monomer in the reaction effluent withdrawn from said polymerization reactor, wherein actuation of said catalyst feeder valve introduces a predetermined volume of catalyst into said polymerization reactor and wherein said first signal is established in part in response to the actual unreacted monomer concentration; and

actuating such catalyst feeder valve when the time represented by said first signal has elapsed to add catalyst to said polymerization reactor so as to maintain a desired concentration of unreacted monomer in the reaction effluent withdrawn from said polymerization reactor.

4,628,035

IMMUNOASSAY METHOD

Daizo Tokinaga; Teruaki Kobayashi, both of Hachioji, and Kazumichi Imai, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,423
Claims priority, application Japan, Sep. 9, 1983, 58-164992
Int. Cl.[4] G01N *33/543*
U.S. Cl. 436—518 **19 Claims**

1. An immunoassay method for measuring a concentration of an antigen contained in a sample by fixing said antigen with an immobilized antibody according to antigen-antibody reaction, comprising (a) a step of immobilizing an antibody over substantially the whole surface of a supporting matrix for

electrophoresis; (b) a step of moving the antigen in the sample to be measured by electrophoresis with direct current to fix the antigen by the antigen-antibody reaction onto the immobilized antibody; (c) a step of moving a labelled antibody to said fixed antigen by direct current electrophoresis for reaction with said antigen; and (d) a step of measuring an enzyme activity, luminescence, or fluorescence of said labelled antibody to measure the concentration of the antigen in the sample.

4,628,036

IMMUNOLOGICAL ASSAY WITH TEST TUBE HAVING BOTTOM FORMING A STRIP

Antonius H. J. M. Scheepens, Vlijmen; Hans van Hell, Oss, and Hendrikus J. J. Theunissen, Ravenstein, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

PCT No. PCT/NL82/00043, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/02009, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 24, 1982, Ser. No. 518,801

Claims priority, application Netherlands, Nov. 26, 1981, 8105341

Int. Cl.[4] G01N *33/555*

U.S. Cl. 436—520 **7 Claims**



1. Method for qualitatively or semi-quantitavely detecting the presence of an antigen or antibody in a test liquid by bringing this test liquid into contact either with an erythrocyte-coupled binding partner of the antigen or antibody to be detected, or with a mixture of an erythrocyte-coupled antigen or erythrocyte-coupled antibody itself and the binding partner of the antigen or antibody to be detected, which is not coupled to a carrier, and thereafter ascertaining the presence or absence of the antigen or antibody in the test liquid from the characteristic sedimentation pattern of the erythrocytes formed at the bottom of a test tube, comprising carrying out the test in a test tube having a bottom in the shape of an inverted prism or trucated prism such that the lower edge of the test tube forms a strip having a length which is at least equal to one-fourth of the distance between two opposite walls of the test tube or at least equal to one-fourth of the diameter of the test tube and wherein the sedimentation pattern is read as formed at the bottom of the test tube.

4,628,037

BINDING ASSAYS EMPLOYING MAGNETIC PARTICLES

Mark S. Chagnon, Lowell; Ernest V. Groman, Brookline; Lee Josephson, Arlington, and Roy A. Whitehead, Hingham, all of Mass., assignors to Advanced Magnetics, Inc., Cambridge, Mass.

Division of Ser. No. 493,991, May 12, 1983, Pat. No. 4,554,488. This application Jun. 13, 1985, Ser. No. 744,351

Int. Cl.[4] G01N *33/553*

U.S. Cl. 436—526 **11 Claims**

1. A method for determining the concentration of a ligate in a solution which comprises:

(a) reacting the solution, a known amount of labeled ligate, and magnetically-responsive particles to which a ligand specific for the ligate in solution is covalently coupled, to form ligand/ligate complexes;

(b) magnetically separating the magnetically-responsive particles from the reaction solution;

(c) measuring the amount of label associated with the magnetically-responsive particles or remaining free in solution; and

(d) relating the amount of label measured in step (c) to a standard curve to determine ligate concentration,

wherein the magnetically-responsive particles of step (a) individually comprise a magnetic metal oxide core generally surrounded by a coat of polymeric silane, a mass of the particles being dispersable in aqueous media to form an aqueous dispersion having (i) a fifty-percent-turbidity-decrease settling time of greater than about 1.5 hours in the absence of a magnetic field, and (ii) a ninty-five-percent-turbidity-decrease separation time of less than about 10 minutes in the presence of a magnetic field, the magnetic field being applied to the aqueous dispersion by bringing a vessel containing a volume of the dispersion into contact with a pole face of a permanent magnet, the permanent magnet having a volume which is less than the volume of the aqueous dispersion in the vessel.

4,628,038

WATER RESISTANT GLASS FIBERS

Douglas A. Weirauch, Jr., Murrysville, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 27, 1985, Ser. No. 749,322

Int. Cl.[4] C03C *13/00*

U.S. Cl. 501—35 **2 Claims**

1. A devitrification resistant and water resistant glass fiber consisting essentially of in approximate weight percent 52.6% to 54.6% SiO_2, 14.5% to 17.5% Al_2O_3, 15.5% to 16.5% CaO, 2% to 3% MgO, 6.5% to 7.5% Na_2O, 2.5% to 4.5% B_2O_3, and 1% or less F_2, and less than 2% TiO_2, Fe_2O_3, K_2O and SO_3 combined, said glass fiber having a delta T of at least about 365° F. and a durability (% fiber weight loss at 96° C.) in water for 24 hours of less than about 0.9%, said glass having a viscosity, in poise, of 10 to the 2.5 power at a temperature of about 2345° F. to about 2385° F.

4,628,039

SINTERED SILICON NITRIDE BODY

Michitaka Mizutani, Tsu, and Kiyoshi Yokoyama, Kokubu, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Mar. 5, 1985, Ser. No. 708,349

Claims priority, application Japan, Mar. 6, 1984, 59-43575; Aug. 25, 1984, 59-178089

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—97 **7 Claims**

1. A highly oxidation resistant sintered silicon nitride based body consisting essentially of:

(i) 80 to 99.8 mole % of silicon nitride;

(ii)

(a) at least one oxide of an element of the group IIIa of the Periodic Table having an ionic radius smaller than 0.97 Å and

(b) at least one oxide of an element of the group IIIa of the Periodic Table having an ionic radius larger than 0.97 Å,

the total amount of the oxides (a) and (b) being 0.2 to 20 mole % of the sum of components (i) and (ii), and the (a)/(b) molar ratio being within a range of from 10/90 to 90/10, wherein the oxide of Ce and the oxide of Eu are considered to be within category (a) and the oxide of Pr is considered to be within category (b); and

(iii) SiO_2 or an oxide or nitride of an element selected from the group consisting of Al, Ti, Cr, Ga, Zr and elements of the group IIa of the Periodic Table, in an amount of 0.1 to 5 parts by weight per 100 parts by weight of the sum of the components (i) and (ii).

4,628,040

METHOD OF MAKING UNIFORM SPHEROIDAL CATALYST BEADS

Gary J. Green, Yardley, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 596,990, Apr. 5, 1984. This application Sep. 17, 1985, Ser. No. 776,924

Claims priority, application Canada, Mar. 25, 1985, 477372

Int. Cl.[4] B01J *35/08*

U.S. Cl. 502—9 **14 Claims**

1. A method of producing uniform spheroidal beads from a bead-forming liquid comprising:

supplying said liquid to a capillary tube;

supplying an immiscible fluid which flows through a venturi throat in which the other end of said capillary tube is positioned;

detaching uniform, spherical droplets of said bead-forming liquid from the other end of said capillary tube by said flow of said immiscible fluid; and

hardening said droplets into uniform spheroidal beads.

4,628,041

RHODIUM AND IODINE RECOVERY METHOD

Brad L. Smith, Portland; George P. Torrence, and Adolfo Aguiló, both of Corpus Christi, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 10, 1986, Ser. No. 827,699

Int. Cl.[4] B01J *38/68, 27/08;* **C07C** *53/08, 51/12*

U.S. Cl. 502—24 **4 Claims**

1. A process for the recovery of rhodium and iodine values and the separation of rhodium from corrosion metal salts in the manufacture of acetic acid by the carbonylation of methanol wherein the reaction mixture contains from about none to about 20 wt % of water, from about 2 to about 20 wt % of alkali metal or alkaline earth metal iodide, methanol, acetic acid, methyl iodide, and carbon monoxide which comprises: (1) removing at least a portion of the reaction solution from the reactor, (2) removing at least a portion of the product acetic acid from the portion in (1) by distillation, (3) adding an excess of methyl acetate to the product depleted material in (2) and heating the resultant mixture to a sufficiently high temperature to convert the methyl acetate to methyl iodide (4) removing the resulting methyl iodide by distillation, (5) continuing to heat the resulting mixture at a temperature and time sufficient to precipitate the rhodium as rhodium iodide, and (6) separating the rhodium iodide and returning it to the reaction mixture.

2. The process of claim 1 wherein after the methyl acetate is added, the mixture is heated to from about 130°–190° C. to convert the methyl acetate to methyl iodide.

3. The process of claim 2 wherein the rhodium iodide is precipitated at a temperature of from about 100°–190° C.

4,628,042

POROUS MULLITE

Barry K. Speronello, River Edge, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 505,650, Jun. 20, 1983, abandoned. This application May 9, 1985, Ser. No. 732,905

Int. Cl.[4] B01J *21/12, 20/16*

U.S. Cl. 502—263 **21 Claims**

1. The method for producing hard porous bodies of synthetic mullite which comprises:

(a) mixing hydrous clay thermally convertible to mullite and free silica or a mixture of hydrous clay and calcined clay thermally convertible to mullite and free silica with a fugitive binder such as water, said hydrous clay being composed of particles having a particle size distribution or being a mixture of particles of hydrous clay and particles of calcined clay such that after step (c), below, the resulting calcined bodies will possess porosity,

(b) forming said mixture into self-supporting green bodies of desired shape and size,

(c) calcining said green bodies at a temperature and for a time sufficient to substantially decompose the kaolin clay into mullite crystals and free silica but insufficient to completely sinter said bodies and to result in calcined bodies having at least 0.1 cc/g of porosity in the range of 30–20,000 Angstrom units,

(d) leaching sufficient free silica from said calcined bodies with alkali without destroying the shape of said bodies and without decomposing said mullite crystals to create pores in the meso-size range in said bodies; and

(e) recovering porous hard bodies comprising mullite.

5. The method of claim 1 wherein the bodies recovered in step (e) have a molar ratio of Al_2O_3/SiO_2 in excess of 0.50 and up to about 1.65, a surface area in the range of about 20 to 60 m^2/g, a total pore volume in excess of 0.15 cc/g an a pore structure in the range of 100 to 600 A characterized by a pore volume in that range of an excess of 0.1 cc/g and the greatest volume of porosity in that range centered around a pore diameter in the range of 150 to 350 Angstrom units.

15. The method of claim 1 comprising the further step of impregnating the bodies from step (e) with a catalytically active material or precursor thereof.

4,628,043

HYPOTHALAMIC GRF AGONISTS

Joachim Spiess, Encinitas; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of LaJolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 488,748, Apr. 26, 1983, Pat. No. 4,595,676. This application Mar. 21, 1985, Ser. No. 714,687

Int. Cl.[4] A61K *37/43;* **C07K** *7/10*

U.S. Cl. 514—12 **20 Claims**

1. A synthetic peptide having the formula: H—R_1—Ala—Asp—Ala—Ile—Phe—Thr—R_8—Ser—R-10—Arg—R_{12}—R_{13}—Leu—R_{15}—Gln—Leu—R_1-8—Ala—Arg—Lys—Leu—Leu—R_{24}—R_{25}—Ile—R_{27}—R_2-8—Arg—Gln—Gln—Gly—Glu—R_{34}—Asn—Gln—-Glu—R_{38}—R_{39}—R_{40}—Arg—R_{42}—R_{43}—Leu—Y wherein R_1 is Tyr, Met, Leu, D—Tyr, D—His or His; R_8 is Ser or Asn; R_{10} is Tyr or D—Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{15} is Gly or D—Ala; R_{18} is Tyr or Ser; R_{24} is His or Gln; R_{25} is Glu or Asp; R_{27} is Met, Ala, Nle, Ile, Leu or Val; R_{28} is Asn or Ser; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe or Ala; R_{43} is Asn or Arg; and Y represents the carboxyl moiety of the amino acid residue at the C-terminus and is the radical —COOR, —CRO, —CONHNHR, —CON(R)(R′) or —CH_2OR, with R and R′ being lower alkyl, fluoro lower alkyl or hydrogen, provided however that at least two but not more than six of the following residues are present: R_8 is Asn, R_{12} is Lys, R_{13} is Val, R_{18} is Ser, R_{24} is Gln, R_{25} is Asp, R_{28} is Ser, or a fragment thereof extending from the N-terminus in a continuous sequence at least to the residue in position 29, which fragment is biologically active to cause the release of GH from the pituitary, or a pharmaceutically acceptable nontoxic salt of such peptide or peptide fragment.

4,628,044

LHRH ANTAGONISTS

Hubert J. J. Loozen, Uden, Netherlands, assignor to Akzo N.V., Netherlands

Filed Aug. 16, 1984, Ser. No. 641,194

Claims priority, application Netherlands, Aug. 16, 1983, 8302875; Jan. 18, 1984, 8400153

Int. Cl.[4] A61K *37/43;* **C07K** *7/20*

U.S. Cl. 514—15 **4 Claims**

1. Peptides of the general formula

X-R^1-R^2-R^3-Ser-Tyr-R^4-R^5-R^6-R^7-R^8-NH_2

wherein

X represents hydrogen or a lower acyl(1–6C) group,

R^1 and R^2 represent either the same or different groups selected from D-3-(benzothien-2-yl)-alanyl, D-3-(benzothien-3-yl)-alanyl, D-3-(1-naphthyl)-alanyl, D-3-(2-naphthyl)-alanyl, D-Phe or D-Phe substituted at the phenyl moiety by one or more halogen, alkyl(1–4C), alkoxy(1–4C) or nitro groups;

R^3 represents D-Trp, D-3-(benzothien-2-yl)-alanyl, D-3-(benzothien-3-yl)-alanyl, D-3-(1-naphthyl)-alanyl, D-3-(2-naphthyl)-alanyl or D-pyridyl-alanyl, with the proviso that at least one of the symbols R^1 or R^3 represents a D-3-(benzothien-2- or -3-yl)-alanyl group;

R^4 represents D-Arg, D-Lys, D-homo Arg or D-diaklyl (1–4C)-homo Arg;

R^5 represents L-Leu, L-Met, L-cysteine-alkyl(1–4C) or phenylalkyl(7–10C) ether, L-serine-alkyl(1–4C) or phenylalkyl(7–10C) ether or L-homoserine-alkyl(1–4C) or phenylalkyl(7–10C) ether;

R^6 represents L-Lys or L-Arg;

R^7 represents L-Pro or L-thiaprolyl, and

R^8 represents D-Ala or Gly,

and acid addition salts thereof.

4,628,045

IMMUNOTHERAPEUTIC ANTIALLERGIC POLYPEPTIDE AGENTS WHICH BIND TO BASOPHIL IMMUNOGLOBIN FC RECEPTORS

Gary S. Hahn, Solana Beach, Calif., assignor to Immunetech Pharmaceuticals, San Diego, Calif.

Continuation of Ser. No. 746,175, Jun. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 522,601, Aug. 12, 1983, abandoned. This application Feb. 3, 1986, Ser. No. 824,945

Claims priority, application South Africa, Aug. 9, 1984, 84/6192

Int. Cl.⁴ A61K *37/02;* **C07K** *7/06*

U.S. Cl. 514—17 **1 Claim**

1. An active site peptide which blocks immune complex binding to immunoglobulin Fc receptors, said peptide having an amino acid sequence Asp-Ser-Glu-Pro-Arg.

4,628,046

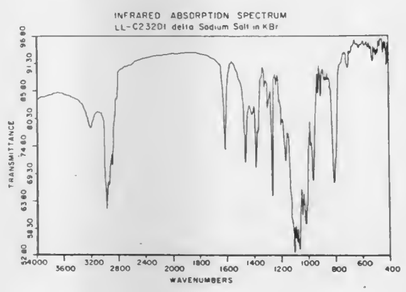
ANTIBIOTIC LL-C23201δ

David P. Labeda, Monsey; Joseph J. Goodman, Spring Valley, and John H. E. J. Martin, deceased, late of New York, all of N.Y. (by Mary B. Martin, executrix), assignors to American Cyanamid Company, Stamford, Conn.

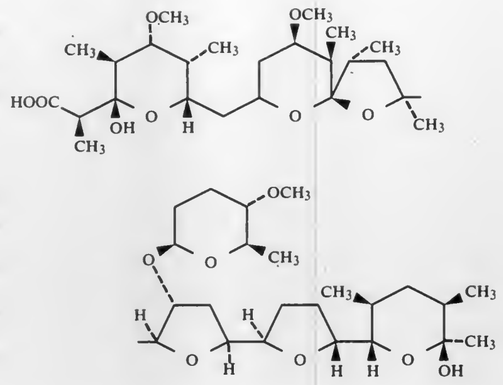
Filed Jun. 20, 1983, Ser. No. 506,170

Int. Cl.⁴ A61K *31/71*

U.S. Cl. 514—33 **7 Claims**



7. A method for the control of coccidiosis infections in poultry comprising orally administering to said poultry a coccidially-effective amount of the compound LL-C23201δ of the formula



or the pharmaceutically-acceptable salts thereof.

4,628,047

AGENT FOR ENHANCING ANTITUMOR ACTIVITY OF ANTITUMOR AGENT

Yoshio Sakurai, Mitaka, and Takashi Tsuruo, Tokyo, both of Japan, assignors to Japanese Foundation for Cancer Research, Tokyo and Tanabe Seiyaku Co., Ltd., Osaka, both of, Japan

Filed May 27, 1983, Ser. No. 498,639

Claims priority, application Japan, May 28, 1982, 57-91850

Int. Cl.⁴ A61K *31/70, 31/55, 31/44*

U.S. Cl. 514—34 **3 Claims**

1. A pharmaceutical composition useful for treating or preventing a tumor selected from the group consisting of chronic lymphatic leukemia, chronic myelogenous leukemia and Hodgkin's disease which comprises 10 mg to 120 mg of diltiazem or a pharmaceutically acceptable acid addition salt thereof and 3 μg to 30 mg of a compound selected from the group consisting of vincristine and doxorubicine.

4,628,048

ORGANOSILYL COMPOUNDS FUNGICIDAL COMPOSITIONS AND USE

Rolf-Dieter Acker, Leimen; Ernst Buschmann, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 487,313, Apr. 21, 1983, abandoned. This application Mar. 18, 1986, Ser. No. 842,059

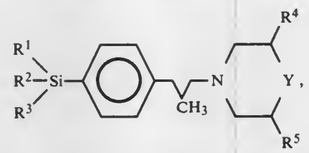
Claims priority, application Germany, Apr. 24, 1982, 3215409

Int. Cl.⁴ A01N *55/00;* **C07F** *7/10*

U.S. Cl. 514—63 **2 Claims**

1. A cis organosilyl compound of the formula

(I)



where R^1 and R^3 are n-Cl-3-alkyl and R^2 is n-C_{3-5} alkyl R^4 and R^5 are cis and are identical or different and each is n-C_1–C_5-alkyl and Y is oxygen, or a salt thereof.

4,628,049

FUNGICIDAL COMPOSITION COMPRISING A SYNERGISTIC MIXTURE OF A CYCLOIMIDE FUNGICIDE AND TOLCLOFOS-METHYL

Toshiro Kato, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 18, 1984, Ser. No. 601,684

Claims priority, application Japan, May 13, 1983, 58-84457

Int. Cl.⁴ A01N *43/38, 57/10*

U.S. Cl. 514—147 **3 Claims**

1. A fungicidal composition containing as an active ingredient, 1 to 90% by weight of a mixture of 1 part of N-(3,5-dichlorophenyl)-1,2-dimethylcyclopropane-1,2-dicarboximide and 0.2 to 1.5 parts by weight of 0,0-dimethyl 0-(2,6-dichloro-4-methylphenyl)phosphorothioate, and an inert carrier.

4,628,050

ANTINEPHRITIC PHARMACEUTICAL COMPOSITION CONTAINING 24, 25-DIHYDROXYCHOLECALCIFEROL AS AN ACTIVE INGREDIENT

Yuji Maeda, Nagareyama; Hideyuki Yamato; Takayoshi Fujii, both of Tokyo; Yasuhiko Kobayashi, Niiza; Kenichi Saito; Tadaaki Kato, both of Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,114

Claims priority, application Japan, Nov. 27, 1984, 59-250313

Int. Cl.⁴ A61K *31/59*

U.S. Cl. 514—167 **4 Claims**

1. A method for the treatment of uremia, renal failure and nephritis, which comprises administering to a patient suffering from uremia, renal failure or nephritis a therapeutically effective amount of a compound of 24,25-dihydroxycholecalciferol.

4,628,051

TRIPHASIC ORAL CONTRACEPTIVE

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 607,038, May 4, 1984, Pat. No. 4,544,554, which is a continuation-in-part of Ser. No. 536,135, Sep. 26, 1983, Pat. No. 4,530,839. This application Jun. 11, 1985, Ser. No. 743,344

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ A61K *31/56;* **A01N** *45/00*

U.S. Cl. 514—170 **25 Claims**

1. A method of contraception which comprises administering for 21 successive days to a female of childbearing age a combination of an estrogen and a progestogen in a low but contraceptively effective daily dosage corresponding in estrogenic activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.065–0.75 mg of norethindrone for 5–8 days; for the next 7–11 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.250–1.0 mg of norethindrone; and for the next 3–7 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity 0.35–2.0 mg of norethindrone; followed by 6–8 days without estrogen and progestogen administration, provided that the estrogen daily dosage is the same for each period.

4,628,052

PHARMACEUTICAL COMPOSITIONS CONTAINING DEHYDROEPIANDROSTERONE AND OTHER ANESTHETIC STEROIDS IN THE TREATMENT OF ARTHRITIS AND OTHER JOINT DISABILITIES

Raymond F. Peat, P.O. Box 3427, Eugene, Oreg. 97403

Filed May 28, 1985, Ser. No. 738,482

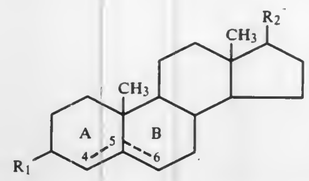
Int. Cl.⁴ A61K *31/56*

U.S. Cl. 514—171 **15 Claims**

1. A method for treating arthritis and joint pain and disability, comprising administering to a patient in need of such treatment a pharmacologically effective dose of dehydroepiandrosterone.

10. A pharmaceutical composition useful for the treatment of arthritis comprising an effective amount of at least one compound selected from the group consisting of the formula:

I



wherein R_1 is O or OH and R_2 is O, or OH; and which may contain one double bond in ring A and/or ring B and tocopherol, in a suitable pharmaceutical carrier.

11. The composition of claim 10 in which said steroid is selected from the group consisting of dehydroepiandrosterone, iso-androsterone, and etiochlolanolone, in a suitable pharmaceutical carrier.

4,628,053

STABILIZED INJECTABLE SOLUTIONS OF PIROXICAM

Walter F. Fries, Illertissen, Fed. Rep. of Germany, assignor to Heinrich Mack Nachf., Illertissen, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 784,903

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437232

Int. Cl.⁴ A61K *31/54*

U.S. Cl. 514—222 **6 Claims**

1. A stable aqueous injectable solution of piroxicam comprising (A) as the solvent therefor from about 30% to about 50% by volume of propylene glycol, from about 5% to about 15% by volume of ethanol and from about 40% to about 60% by volume of water, based on the total volume of the solvent, said water being present in sufficient amount to total 100%, and (B) as the essential active ingredient therein from about 1% to about 8% by weight of piroxicam, based on the total volume of the solution, together with from about 0.2 mole to about 0.9 mole of D-(−)-N-methylglucamine per mole of piroxicam, said solution having a pH value in the range of from about pH 8 to about pH 9.

4,628,054

STABILIZING QUINOXALINE DI-N-OXIDES AGAINST LIGHT DEGRADATION

Herbert Voege, Leverkusen, and Hans U. Sieveking, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

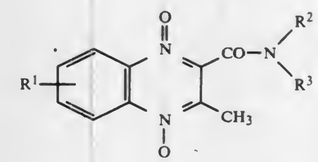
Continuation of Ser. No. 520,100, Apr. 4, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 767,012

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230273

Int. Cl.⁴ C07D *241/44, 413/06, 403/06;* **A61K** *31/495*

U.S. Cl. 514—234 **11 Claims**

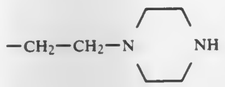
1. A composition consisting essentially of a quinoxaline di-N-oxide of the formula



wherein

R^1 represents a hydrogen or chlorine atom or a lower alkyl group of lower alkoxy group,

R^2 represents a straight-chain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or represents the group

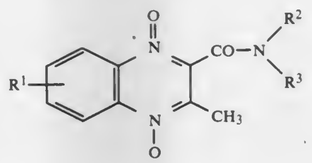


and

R^3 represents a hydrogen atom or a straightchain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or in which R^2 and R^3, together with the amide nitrogen atom to which they are attached, can form a pyrrolidino, piperidino, morpholino or piperazino radical; it being possible for the latter to be substituted in the 4-position by a lower alkyl radical; lower alkyl or alkoxy groups being understood in all cases to mean groups having 1 to 4 carbon atoms,

and a light stablizing amount of a substance which absorbs light within the wavelength range from 200 to 450 nm and selected from the group consisting of quiuronium sulphate, tartrazine XX, rutin, sodium salt of fluorescein, water-soluble bixin and sodium alizarin sulphonate.

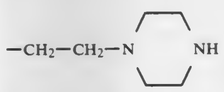
9. In the administration of a quinoxaline di-N-oxide of the formula



wherein

R^1 represents a hydrogen or chlorine atom or a lower alkyl group or lower alkoxy group,

R^2 represents a straight-chain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or represents the group



and

R^3 represents a hydrogen atom or a straightchain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or in which R^2 and R^3, together with the amide nitrogen atom to which they are attached, can form a pyrrolidino, piperidino, morpholino or piperazino radical; it being possible for the latter to be substituted in the 4-position by a lower alkyl radical; lower alkyl or alkoxy groups being understood in all cases to mean groups having 1 to 4 carbon atoms, to an animal by dissolving the quinozaline di-N-oxide in water and then adding the solution to the animal's drinking water or food product, the improvement which comprises adding to the solution a substance which absorbs light within the wavelength range from 200 to 450 nm and selected from the group consisting of quiuronium sulphate, tartrazine XX, rutin, sodium salt of fluorescein, water-soluble bixin and sodium alizarin sulphonate.

4,628,055

METHOD FOR TREATING ALLERGIC REACTIONS AND COMPOSITIONS THEREFORE

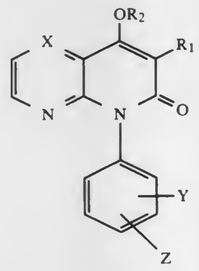
Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 533,674, Sep. 19, 1983, Pat. No. 4,492,702, which is a continuation-in-part of Ser. No. 438,681, Nov. 3, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 661,017

Int. Cl.[4] **C07D** *471/04, 487/04;* **A61K** *31/495, 31/44*

U.S. Cl. 514—249 **41 Claims**

1. A method for treating allergic reactions in a mammal which method comprises administering an anti-allergic effective amount of a compound having the structural formula I



I

wherein

X is N;

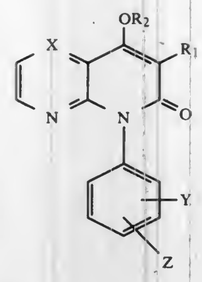
Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl—$S(O)_m$— having from 1 to 6 carbon atoms wherein m is 0, 1 or 2, trifluoromethyl, trifluoromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms or alkyl having from 1 to 10 carbon atoms which may be substituted with hydroxy, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $R_aR_bN(CH_2)_n$— (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine.

10. A compound having the structural formula I



I

wherein

X is N;

Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl—$S(O)_m$— having from 1 to 6 carbon atoms wherein m is 0, 1 or 2, trifluoromethyl, trifluoromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 3 to 6 carbon atoms or alkyl having from 1 to 10 carbon atoms which may be substituted with a substituent selected from hydroxy, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $R_aR_bN(CH_2)_n$— (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine.

4,628,056

NOVEL OXOPYRIMIDINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTICONVULSANT, ANTIANXIETY AND MUSCLE RELAXANT AGENTS

Barrie Levitt, Haifa, and Morris Stolar, Tel Aviv, both of Israel, assignors to Taro Pharmaceutical Industries Ltd., Israel

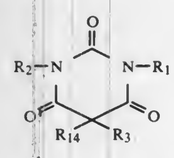
Filed Sep. 5, 1984, Ser. No. 647,680

Claims priority, application Israel, Sep. 14, 1983, 69722

Int. Cl.[4] **A61K** *31/515;* **C07D** *239/62, 239/64*

U.S. Cl. 514—270 **10 Claims**

1. A compound of formula I:



wherein R_1 and R_2 may be the same or different and are each hydrogen or lower alkyl optionally substituted by lower alkoxy, and R_3 and R_4 may be the same or different and are each phenyl, phenyl substituted by lower alkyl or phenyl substituted by halogen provided that when R_1 and R_2 are both hydrogen R_3 and R_4 are each a substituted phenyl; and addition salts thereof.

8. A method of treating convulsion in mammals comprising administering to a patient an effective amount of a compound of the general formula I as defined in claim **1**.

9. A method of effecting muscle relaxation in mammals comprising administering to a patient an effective amount of a compound of the general formula I as defined in claim I.

10. A method of treating anxiety in mammals comprising administering to mammals an effective amount of a compound of the general formula I as defined in claim **1**.

4,628,057

TETRAHYDRO-β-CARBOLINE DERIVATIVES AND TREATMENT OF LIVER DISEASES

Ikuo Iijima, Urawa; Yutaka Saiga, Ageo; Toshikazu Miyagishima, Wako; Yuzo Matsuoka, Tondabayashi, and Mamoru Mntsumoto, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

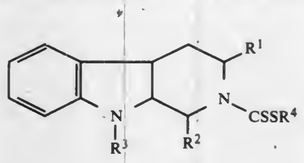
Filed Oct. 30, 1984, Ser. No. 666,481

Claims priority, application United Kingdom, Nov. 12, 1983, 8330260

Int. Cl.[4] **A61K** *31/395;* **C07D** *471/02*

U.S. Cl. 514—292 **27 Claims**

1. A tetrahydro-β-carboline derivative of the formula:



wherein

R^1 is carboxyl, a lower alkoxycarbonyl, carbamoyl, an N,N-di-lower alkylcarbamoyl, an N-(phenyl-substituted lower alkylidenamino)carbamoyl, an [N,N-di(lower alkyl)-amino]-lower alkyl, or a tetrazolyl;

R^2 is a hydrogen atom, a lower alkyl, or a hydroxy-lower alkyl group, or

R^2 is combined with R^1 to form a group —CO—O—CH_2—;

R^3 is a hydrogen atom, a lower alkyl, a phenyl-lower alkyl, or a group of the formula: —CCS—R^4;

R^4 is a hydrogen atom, a C1-C10 alkyl group, or a group of the formula: —$(CH_2)_nY^1$;

n is 0, 1 or 2,

Y^1 is a lower alkenyl, a phenyl-substituted lower alkenyl, an N,N-di(lower alkyl)amino, a lower alkylmercapto, a lower alkoxycarbonyl, benzoyl, naphthyl, a cycloalkyl of 5 to 6 carbon atoms, thienyl, furyl, pyridyl, phenyl, or a phenyl having one or two substituents selected from the group consisting of a halogen, amino, benzloxycarbonylamino, formylamino, a lower alkoxy, nitro, a lower alkyl, carboxyl and a halogenated lower alkyl group, or a pharmaceutically acceptable salt thereof.

4,628,058

N-(2,3-DIHYDROBENZOFURAN-2-YL)-AZOLYLUREAS AND FUNGICIDES CONTAINING THESE COMPOUNDS

Costin Rentzea, Heidelberg; Stefan Karbach; Eberhard Ammermann, both of Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

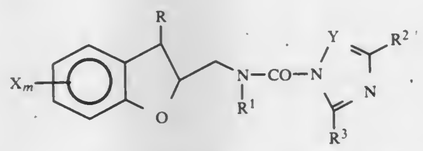
Filed Mar. 19, 1985, Ser. No. 713,642

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410925

Int. Cl.[4] A01N *47/38;* C07D *405/12*

U.S. Cl. 514—383 4 Claims

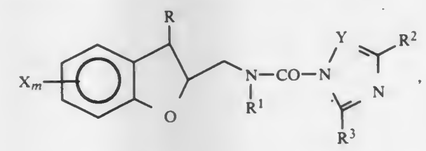
1. An N-((2,3-dihydrobenzofuran)-2-yl)-azolylurea of the formula



I

where R is hydrogen or alkyl of 1 to 4 carbon atoms, X is hydrogen, halogen, nitro, cyano, trifluoromethyl or alkyl, alkoxy or alkylthio, each of 1 to 4 carbon atoms, or phenyl or phenoxy, m is an integer from 1 to 4, the individual groups X being identical or different when m is greater than 1, and Y is CH or N, R^1 is alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkylalkyl, each of not more than 12 carbon atoms, or phenyl or benzyl, each of which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro or cyano, and R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4. A process for combatting fungi, wherein the fungi or the materials, areas, plants or seed threatened by fungus attack are treated with a fungicidally effective amount of an N-((2,3-dihydrobenzofuran)-2-yl)-azolylurea of the formula



I

where R is hydrogen or alkyl of 1 to 4 carbon atoms, X is hydrogen, halogen, nitro, cyano, trifluoromethyl or alkyl, alkoxy or alkylthio, each of 1 to 4 carbon atoms, or phenyl or phenoxy, m is an integer from 1 to 4, the individual groups X being identical or different when m is greater than 1, and Y is CH or N, R^1 is alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkylalkyl, each of not more than 12 carbon atoms, or phenyl or benzyl, each of which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro or cyano, and R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,628,059

DOPAMINE-β-HYDROXYLASE INHIBITORS

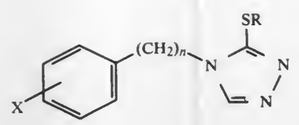
Joseph A. Finkelstein, Philadelphia, Pa.; Carl Kaiser, Haddon Heights, and Lawrence I. Kruse, Haddonfield, both of N.J., assignors to SmithKlein Beckman Corporation, Philadelphia, Pa.

Filed Oct. 31, 1985, Ser. No. 793,513

Int. Cl.[4] A61K *31/41;* C07D *249/08*

U.S. Cl. 514—384 21 Claims

1. A compound represented by the Formula:



in which:

n is 0–5;

R is hydrogen or C_{1-4} alkyl; and

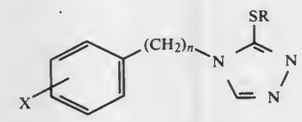
X is hydrogen, halo, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, CHO, CH_2OH, OH, C_{1-4} alkoxy, CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_aH_{2a+1}$ wherein a is 1–5, or any accessible combination thereof of up to 5 substituents; or any pharmaceutically acceptable salt or hydrate thereof;

except compounds in which:

n is O and X is hydrogen, CH_3, OCH_3, OCH_2CH_3, $OCH_2CH_2CH(CH_3)_2$, Br, Cl, F, I, CF_3, NO_2, COOH, or combinations thereof; and

n is 1 and X is hydrogen.

15. A method of inhibiting dopamine-β-hydroxylase activity in mammals that comprises administering internally to a subject in need of such inhibition an effective amount of a compound having the Formula:



in which:

n is 0–5;

R is hydrogen or C_{1-4} alkyl; and

X is hydrogen, halo, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, CHO, CH_2OH, OH, C_{1-4} alkoxy, CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_aH_{2a+1}$ wherein a is 1–5, or any accessible combination thereof of up to five substituents; or any pharmaceutically acceptable salt or hydrate thereof.

4,628,060

FUNGICIDAL TETRAHYDROTHIOPYRAN-3,5-DIONE DERIVATIVES, INTERMEDIATE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Herbert Gayer, Monheim; Wolfgang Krämer, Wuppertal; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

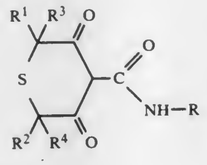
Filed May 2, 1984, Ser. No. 606,316

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318648

Int. Cl.[4] A61K *31/38;* C07D *335/02*

U.S. Cl. 514—432 16 Claims

1. A substituted tetrahydrothiopyran-3,5-dione-4-carboxamide of the formula



in which

R is alkyl having up to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, aralkyl which is optionally substituted and has 1 or 2 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety, and aryl which is optionally substituted and has 6 to 10 carbon atoms, aryl substituents in each case independently being halogen, cyano, nitro, alkyl, alkoxy and alkylthio each having up to 4 carbon atoms, halogenoalkyl, halogenoalkoxy and halogenoalkylthio each having 1 or 2 carbon atoms and up to 5 identical or different halogen atoms, dioxyalkylene which is optionally substituted by halogen or lower alkyl and has 1 or 2 carbon atoms in the alkylene radical, phenoxy which is optionally substituted by halogen, lower alkyl and lower halogenoalkyl, and alkoxycarbonylalkyl and alkoxycarbonylalkenyl each having 1 or 2 carbon atoms in the alkoxy moiety and each having up to 2 carbon atoms in the alkyl or alkenyl moiety,

R^1, R^2 and R^3 each independently is hydrogen or alkyl having up to 6 carbon atoms, and

R^4 is alkyl having 1 to 6 carbon atoms

excepting the compounds in which

R^1 and R^3 are hydrogen

R^4 is methyl,

R is alkyl, phenyl or phenyl which is substituted by halogen and/or methyl, and

R^2 is hydrogen or methyl.

14. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

15. The method according to claim 14, wherein such compound is

2-isopropyltetrahydrothiopyran-3,5-dione-4-[N-3,4-dichlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-(N-tert.-butyl)-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-(N-p-tolyl)-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-trifluoromethylphenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-nitrophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(4-chlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3,4-dichlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-chloro-4-trifluoromethylphenyl)]-carboxamide,

2-isopropyl-6-methyl-tetrahydrothiopyran-3,5-dione-4-[N-(4-chlorophenyl)]-carboxamide or

2-isopropyl-6-methyl-tetrahydrothiopyran-3,5-dione-4-[N-3,4-dichlorophenyl)]-carboxamide.

4,628,061

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB82/00348, § 371 Date Aug. 23, 1983, § 102(e) Date Aug. 23, 1983, PCT Pub. No. WO83/02273, PCT Pub. Date Jul. 7, 1983

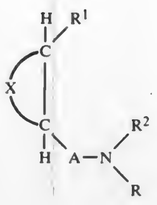
PCT Filed Dec. 10, 1982, Ser. No. 531,899

Claims priority, application United Kingdom, Dec. 23, 1981, 8138715

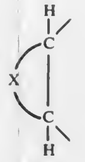
Int. Cl.[4] C07D *493/08, 177/00;* C07C *177/00;* A61K *31/34, 31/215*

U.S. Cl. 514—469 38 Claims

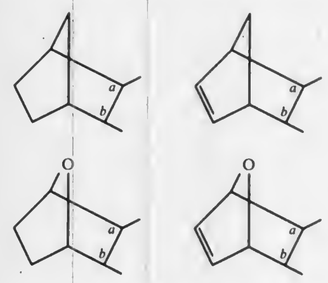
1. A compound of formula (I)



wherein



represents one of the cyclic groups shown below;



the letters a and b indicating in each case the points of attachment of the substituents R^1 and A—NR^2R, respectively; R^1 is a 6-carboxyhex-2-enyl group, or a modification thereof in which the group is altered by one, or an appropriate combination of two or more of the following: (a) alteration of the position of the double bond from the 2,3-position to the 3,4-position, (b) reduction of the double bond, (c) replacement of a methylene group at position 2 or 3 by an oxygen or sulphur atom in conjunction with reduction of the double bond, (d) alteration of the chain length through a decrease or an increase of one or two methylene groups, and (e) formation of a derivative of the carboxy group in the form of a pharmaceutically acceptable salt, C_{1-10} alkyl ester or an amide containing a group —$CONH_2$ or such a group in which the nitrogen atom is substituted by one or two groups selected from C_{1-10} alkyl groups, phenyl and phenyl substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups, or by one group —SO_2R^6 in which R^6 is a C_{1-10} alkyl group; A is an aliphatic C_{1-10} hydrocarbon group with a chain length between the points of attachment to the divalent cyclic group and to the group NR^2R of 1 to 5 carbon atoms or such a group substituted by a group Ar, where Ar represents a phenyl, naphthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methyldihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups; R_2 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar; and R is a group —$CO.NR^3R^4$, —$CS.NR^3R^4$,

—CNH.NR^{3}R^4, —CO.R^4 or —CS.R^4 in which R^3 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar, but with the proviso that both R^2 and R^3 may not be other than hydrogen, and R^4 is a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar and/or by a group OAr, SAr, OR^5 or SR^5 wherein R^5 is a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar.

4,628,062

1,4-NAPHTHOQUINONE DERIVATIVES HAVING ANTI-INFLAMMATORY ACTION

Wolfgang Opitz, Overath; Bernhard Pelster, St. Augustin; Romanis Fruchtmann, Cologne; Udo Krupka, Marburg; Walter Gauss, Cologne; Hartmut Kiehne, Odenthal, and Hermann Oediger, Cologne, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

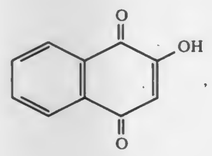
Filed Dec. 17, 1984, Ser. No. 682,408

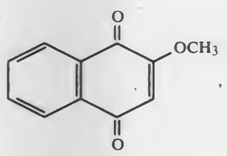
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347658

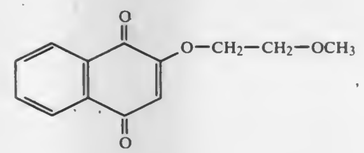
Int. Cl.[4] **A61K** *31/12;* **C07C** *50/14, 97/22*

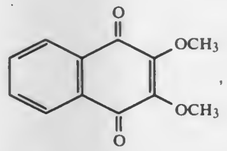
U.S. Cl. 514—569 **15 Claims**

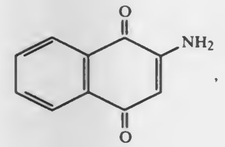
1. An anti-inflammatory composition in the form of a tablet, coated tablet, capsule, pill, suppository or ampule and comprising a diluent and an anti-inflammatory effective amount of a compound selected from the group consisting of



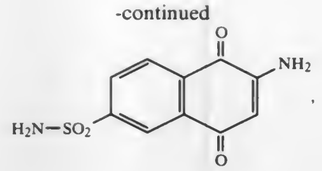


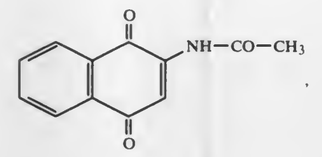


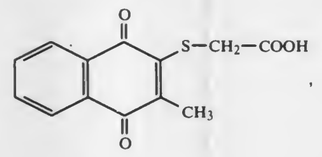


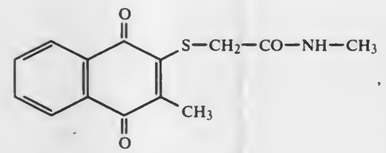


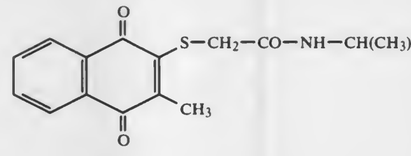
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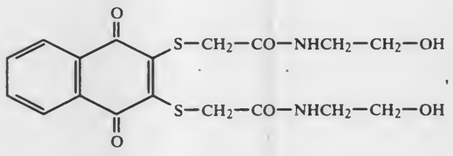


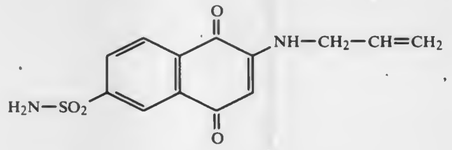




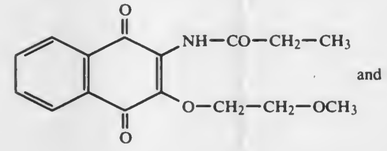


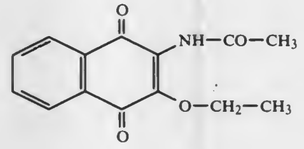






and





4,628,063

ANTIVIRAL PHARMACEUTICAL PREPARATIONS AND METHODS FOR THEIR USE

Harold G. Haines, and Caroline B. Dickens, both of Miami, Fla., assignors to Dana P. Brigham, Miami Lakes, Fla.

Filed Mar. 8, 1984, Ser. No. 587,398

Int. Cl.[4] **A61K** *31/16, 31/195*

U.S. Cl. 514—626 **8 Claims**

1. A method of treating herpes virus infections in a mammal which comprises administering to said mammal an effective antiviral amount of a mixture comprising;

(a) lidocaine or a pharmaceutically acceptable salt thereof in a concentration of 0.5 to 10% w/v, and

(b) pantothenol or a pharmaceutically acceptable salt thereof in a synergistically effective amount of at least 3% w/v producing an enhancemcnt in the antiviral effect.

4,628,064

EPININE AND THE THERAPEUTIC USE THEREOF

Cesare Casagrande, Arese; Paolo Ghirardi, Milan, both of Italy; Leon I. Goldberg, Chicago, Ill., and Germano Marchetti, Milan, Italy, assignors to SIMES, Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Filed Jul. 17, 1984, Ser. No. 631,751

Claims priority, application Italy, Jul. 19, 1983, 22118 A/83

Int. Cl.[4] **A61K** *31/135*

U.S. Cl. 514—654 **5 Claims**

1. A method for stimulated heart contractility, vasodilation of the circulatory system and bronchodilation, for treating congestive heart failure in man comprising administering epinine or a pharmaceutical salt thereof at a dose corresponding to from 0.5 to 5 μg/kg/min. of epinine.

4,628,065

PROCESS FOR METHANOL SYNTHESIS FROM CARBON OXIDES AND HYDROGEN IN THE PRESENCE OF A SOLUBLE COPPER AND ZINC CATALYST

Didier Prouteau, Aubergenville; Francois Hagues, Nanterre; Yves Chauvin, Le Pecq, and Dominique Commereuc, Meudon, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 21, 1985, Ser. No. 747,206

Claims priority, application France, Jun. 21, 1984, 84 09942

Int. Cl.[4] **C07C** *27/06, 31/04*

U.S. Cl. 518—700 **20 Claims**

1. In a catalytic process for manufacturing methanol comprising reacting carbon oxides with hydrogen, in an inert liquid medium, the improvement wherein the reaction is conducted in the presence of a catalyst soluble in said medium, said catalyst obtained by interaction of at least one copper compound, with at least one zinc compound of zero valence having the formula ZnR_2, wherein each R is a monovalent hydrocarbon or alkoxy with the provision that at least one R is a monovalent hydrocarbon and wherein the interaction of the zerovalent zinc compound with the copper compound is conducted in an inert liquid medium and unnder a non-oxidizing atmosphere.

4,628,066

PROCESS FOR THE PRODUCTION OF METHANOL

Leo W. Bonnell, Macungie, and Joseph M. Pietrantonio, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 12, 1986, Ser. No. 828,920

Int. Cl.[4] **C07C** *27/06, 31/04*

U.S. Cl. 518—700 **13 Claims**

1. In a gas phase synthesis loop for the production of methanol from a syngas feed containing carbon dioxide and hydrogen, the improvement for increasing the capacity of methanol production which comprises:

(a) passing said syngas feed, in a single pass, to a liquid phase methanol reactor to convert a portion of the syngas to methanol, thereby forming a methanol-containing syngas reactor effluent;

(b) cooling said methanol-containing syngas reactor effluent to condense the methanol, thereby producing a first methanol stream and an unreacted syngas stream;

(c) passing said unreacted syngas stream to a gas phase synthesis loop to produce a second methanol stream; and

(d) recovering both the first and second methanol streams.

4,628,067

MICROPOROUS POLYBENZIMIDAZOLE PARTICULATES

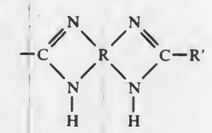
Paul N. Chen, Sr., Charlotte, and Richard O. Tucker, Oakboro, both of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,022

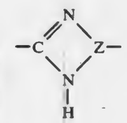
Int. Cl.[4] **B01J** *39/18;* **C08G** *2/30;* **C08L** *77/06*

U.S. Cl. 521—25 **27 Claims**

1. Microporous particles of polybenzimidazole resins selected from a group consisting of polybenzimidazoles and modified polybenzimidazoles functionalized by treatment with an organic or inorganic acid, said polybenzimidazole resin consisting essentially of reoccurring units selected from the formula:



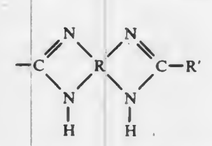
wherein R is a tetravalent aromatic nucleus, preferably symmetrically substituted, with the nitrogen atoms forming the benzimidazole rings being paired upon adjacent carbon atoms, i.e., ortho carbon atoms, of the aromatic nucleus, and R′ is a member of the class consisting of (1) an aromatic ring, (2) an alkylene group, and (3) a heterocyclic ring from the class consisting of (a) pyridine, (b) pyrazine, (c) furan, (d) quinoline, (e) thiophene. and (f) pyran, and the formula



wherein Z is an aromatic nucleus having the nitrogen atoms forming the benzimidazole ring paired upon adjacent carbon atom of the aromatic nucleus, said microporous particles being characterized by a reduced bulk density, a specific surface area of at least about 10 m^2/g, a porosity of at least about 10%, and an average pore diameter of from about 50 to about 500 angstroms.

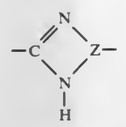
11. A process for the preparation of microporous particles of polybenzimidazole resin suitable for use as the stationary phase in chromatographic processes or supported chemical reactions, comprising the steps of:

(a) forming in a suitable solvent a 2 to about 10% solution of a polybenzimidazole resin consisting essentially of reoccurring units selected from the formula:



wherein R is a tetravalent aromatic nucleus, preferably symmetrically substituted, with the nitrogen atoms form-

ing the benzimidazole rings being paired upon adjacent carbon atoms, i.e., ortho carbon atoms, of the aromatic nucleus, and R′ is a member of the class consisting of (1) an aromatic ring, (2) an alkylene group, and (3) a heterocyclic ring from the class consisting of (a) pyridine, (b) pyrazine, (c) furan, (d) quinoline, (e) thiophene, and (f) pyran, and the formula:



wherein Z is an aromatic nucleus having the nitrogen atoms forming the benzimidazole ring paired upon adjacent carbon atoms of the aromatic nucleus;

(b) emulsifying said polybenzimidazole solution with a non-polar organic solvent in a volume ratio of polybenzimidazole solution to non-polar organic solvent of from about 1:2 to about 1:4 under conditions of shear sufficient to produce substantially spherical droplets of polybenzimidazole resin;

(c) precipitating said spherical droplets of polybenzimidazole resin from said emulsion in the form of substantially spherical microporous beads by contacting said emulsion with a non-solvent for said polybenzimidazole resin; and

(d) recovering the resulting microporous particles of polybenzimidazole resin.

4,628,068

ANTI-STATIC STYRENE POLYMER PARTICLES BY COATING

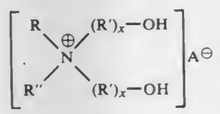
Haven S. Kesling, Jr., Drexel Hill, and James J. Harris, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 812,091, Dec. 23, 1985, Pat. No. 4,603,149. This application May 1, 1986, Ser. No. 858,334

Int. Cl.⁴ C08J *9/22*

U.S. Cl. 521—57 **6 Claims**

1. A composition comprising a styrene polymer containing dispersed throughout 3 to 20 weight percent of a blowing agent and coated on the surface thereof by 0.1 to 0.4 weight percent of a quaternary ammonium salt having general formula



wherein R may be C_1–C_{11} linear or branched alkyl groups and mixtures thereof, R′ may be oxyethylene, oxypropylene, oxybutylene and mixtures thereof, R″ may be C_1–C_4 linear or branched alkyl or benzyl, x may be an integer from 1 to 20, and A may be any anion.

4,628,069

POLYAMIDES CONTAINING PHENOLIC COMPOUNDS

Rolf-Volker Meyer; Friedrich Fahnler; Rolf Dhein, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,301, Dec. 14, 1983, abandoned. This application May 23, 1985, Ser. No. 737,103

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248329

Int. Cl.⁴ C08K *5/13*

U.S. Cl. 524—339 **5 Claims**

1. A thermoplastic polyamide moulding composition consisting essentially of (i) one polyamide and (ii) from 3 to 15% by weight, based on polyamide, an unsubstituted or substituted C_{10}–C_{22} sterically unhindered monophenolic compound, which when substituted is substituted in at most of one o-position by one or more C_1–C_{12} alkyl or C_7–C_{15} aralkyl groups, or hydroxy diphenyls or hydroxy triphenyls optionally substituted by one or more C_1–C_6 alkyl group, the rings of which may optionally be attached through —O— or C_1–C_3 alkylene.

4,628,070

VINYL CHLORIDE RESIN-BASED COMPOSITION FOR FLOPPY DISC JACKET

Tohru Yokota, Ibaraki; Kaname Inoue, Kanagawa; Ryozo Tanizawa, Tokyo; Hideyuki Asou, Ibaraki, and Hajime Kitamura, Chiba, all of Japan, assignors to Shin Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,354

Claims priority, application Japan, Feb. 6, 1985, 60-21473

Int. Cl.⁴ C08K *3/04*; **C08L** *39/04, 51/00, 53/00*

U.S. Cl. 524—504 **3 Claims**

1. A vinyl chloride resin-based composition for floppy disc jackets having a Clash-Berg temperature of 75° C. or higher which comprises:

(A) 100 parts by weight of a vinyl chloride-based resin base composed of

(a) 10 to 100% by weight of a copolymer of vinyl chloride and a N-substituted maleimide in a weight proportion of 50:50 to 95:5 having an average degree of polymerization in the range from 400 to 1000, and

(b) up to 90% by weight of a polyvinyl chloride resin having an average degree of polymerization in the range from 400 to 1000;

(B) from 1 to 20 parts by weight of an impact-strength improving agent; and

(C) from 0.1 to 5 parts by weight of carbon black.

4,628,071

EMULSION COPOLYMERIZATION PROCESS

Lee W. Morgan, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 584,662, Aug. 21, 1984, abandoned. This application Aug. 16, 1985, Ser. No. 752,878

Int. Cl.⁴ C08F *2/22, 220/06*

U.S. Cl. 524—832 **7 Claims**

1. An aqueous emulsion polymerization process for preparing homogeneous, low molecular weight alkali soluble polymer from a water insoluble vinylic monomer and acrylic acid which comprises:

(a) forming an aqueous precharge consisting essentially of sufficient acrylic acid to inhibit formation of homopolymers of said water insoluble vinylic monomer and to promote formation of a homogeneous copolymer of said water insoluble vinylic monomer and acrylic acid, said precharge being initiator free;

(b) adding a comonomers charge of said water insoluble vinylic monomer and acrylic acid to said acrylic acid precharge in the presence of an initiator and a chain transfer agent, wherein the weight ratio of said comonomers in said charge corresponds to a preselected ratio of said comonomers in said alkali soluble polymer and wherein the addition rate of said comonomers charge is no greater than the polymerization rate for said comonomers at a steady state condition; and wherein (1) the polymerization reaction is starved of water insoluble monomer and (2) the initiator is added to the emulsion polymerization reaction mixture immediately preceding and/or simultaneously with the comonomers charge; and

(c) maintaiing a sufficient solids concentration during said polymerization reaction to reduce the tendency of acrylic acid to partition into the aqueous phase.

4,628,072

MODIFIED BLOCK COPOLYMER COMPOSITION

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP82/00316, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO83/00492, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 13, 1982, Ser. No. 432,923

Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650

Int. Cl.⁴ C08L *51/00, 53/00, 53/02*

U.S. Cl. 525—57 **18 Claims**

1. A modified block copolymer composition comprising:

(a) at least one thermoplastic polymer selected from the group consisting of polar thermoplastic polymers each containing at least one polar functional group, polyoxymethylenes, polycarbonates, modified polycarbonates, polysulfones, modified polysulfones, nitrile polymers, polyphenylene ethers, modified polyphenylene ethers, polyarylene sulfides and modified polyarylene sulfides and

(b) at least one modified block polymer which comprises a base block copolymer of at least one monovinyl substituted aromatic hydrocarbon polymer block A and at least one olefin compound polymer block B having an ethylenic unsaturation degree not exceeding 20%, said base block copolymer having at least one molecular unit grafted thereto, said at least one molecular unit containing at least one member selected from a carboxylic acid group and groups derived therefrom, said monovinyl substituted aromatic hydrocarbon being contained in said base block copolymer in an amount of over 60% by weight up to 95% inclusive by weight based on said base block copolymer, said at least one thermoplastic polymer (a) being present in a weight ratio of 90:10 to 5:95 relative to said at least one modified block copolymer (b),

said polar thermoplastic polymers excluding said modified block copolymer (b).

4,628,073

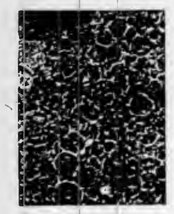
SOFT, RUBBERY, MULTIPHASE MATRIX MATERIAL AND METHODS FOR ITS PRODUCTION

W. Keith Fisher, New Britain, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 3, 1984, Ser. No. 657,168

Int. Cl.⁴ C08L *51/00*

U.S. Cl. 525—70 **36 Claims**



1. A soft, rubbery composition of matter, comprising:

(a) an elastomer selected from the group consisting of natural rubbers, synthetic organic rubbers, gutta percha, polybutadiene, polyisoprene, styrene-butadiene rubber, multiply unsaturated rubber, ethylene propylene diene monomer rubber, conjugated diene-butyl rubber, and blends or admixture thereof, where the elastomer has a determinable fluxing temperature and where the viscosity of said elastomer is sufficiently reduced at said fluxing temperature for incorporating polymer particles therein; and

(b) a cross-linkable polymer selected from the group consisting of cross-linkable organic hompolymers, copolymers, graft copolymers and blends thereof and having an average viscosity molecular weight between 50,000 and 300,000, said polymer existing an discrete 0.3 to 70 micron particles distributed within said elastomer and said polymer having a softening temperature in excess of said fluxing temperature.

4,628,074

POLYCARBONATE COMPOSITIONS

Omar M. Boutni, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 14, 1985, Ser. No. 797,999

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—146 **19 Claims**

1. Resinous polycarbonate composition exhibiting improved impact strength consisting essentially of, in physical admixture:

(i) a blend consisting essentially of

(a) at least one aromatic polycarbonate resin, and

(b) at least one copolyester resin containing the reaction products of (A) at least one polyol selected from 1,4-cyclohexanedimethanol or a mixture of 1,4-cyclohexanedimathanol and ethylene glycol, and (B) at least one aromatic dicarboxylic acid or its ester forming reactive derivative selected from isophthalic acid, terephthalic acid, or mixtures thereof; and

(ii) an amount at least effective to improve the impact strength of said blend of at least one olefin diene terpolymer.

4,628,075

ACID HALIDE FUNCTIONAL MATERIALS

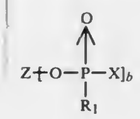
James D. Gabbert, St. Louis; Albert Y. Garner, Manchester, and Ross M. Hedrick, St. Louis, all of Mo., assignors to DSM RIM Nylon VOF, Netherlands

Continuation of Ser. No. 467,622, Feb. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,851, May 4, 1982, abandoned, which is a continuation of Ser. No. 274,131, Jun. 16, 1981, abandoned. This application Jul. 3, 1985, Ser. No. 752,261

Int. Cl.⁴ C08F *8/40, 8/30, 8/18*

U.S. Cl. 525—403 **28 Claims**

1. Acid halide functional material of the formula:



wherein:

X is a halogen;

b is an integer greater than 2;

R_1 is an alkyl, aryl, aralkyl, halogen, alkyloxy, aryloxy or aralkyloxy group; and

Z is a segment of: (1) a polyether provided said polyether is not solely polyarylene polyether; (2) a polyester containing polyether or polymeric hydrocarbon segments; (3) a polysiloxane; or (4) combinations thereof.

4,628,076

CURABLE COATING VEHICLE BASED UPON AMINOALKYLOXY SILANES AND ORGANIC ISOCYANATES

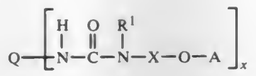
Wen-Hsuan Chang, and David T. McKeough, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 17, 1984, Ser. No. 682,644

Int. Cl.⁴ C08F *20/00*

U.S. Cl. 525—440 **24 Claims**

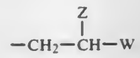
1. An ungelled resin comprising a compound corresponding to the formula,



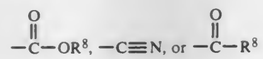
wherein

Q represents the residue of an organic isocyanate having an average isocyanate functionality of at least 1,

R^1 independently represents H, a C_1 to C_{10} alkyl radical, a C_1–C_{10} hydroxyalkyl radical or a radical corresponding to the formula



wherein Z represents H or C_1 to C_4 alkyl, and W represents



in which R^8 represents C_1 to C_8 alkyl,

X represents a divalent radical containing at least 2 carbon atoms,

A represents a monovalent silicon-containing group corresponding to the formula

wherein

R^2 independently represents hydrogen, a C_1 to C_{10} alkyl group, a C_4 to C_{10} cycloalkyl group, a C_6 to C_{10} aryl group, or a monovalent aminoalkyl group, that is attached directly to Si,

Y represents a hydrolyzable group that is attached directly to Si,

m is an integer ranging from 1 to 5,

e is a positive integer wherein $1 \leqq e \leqq 11$, d is zero or a positive integer wherein $0 \leqq d \leqq 10$, and $3 \leqq d+e \leqq 11$, and

wherein x is a positive number which is equal to or less than the average isocyanate functionality of said organic isocyanate.

4,628,077

PREPARATION OF POLYAMIDE WITH CATALYST COMPRISING TRANSITION METAL ATTACHED TO A LIGAND WHICH CONTAINS ELECTRON WITHDRAWING GROUPS

Michael J. Desmond, Cleveland Heights; Raymond J. Weinert, Jr., Garfield Hts.; Lawrence E. Ball, Akron, and Kenneth C. Benton, Macedonia, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 562,270, Dec. 16, 1983, abandoned. This application Nov. 1, 1985, Ser. No. 794,584

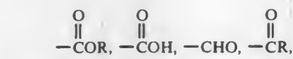
Int. Cl.⁴ C08G *69/00*

U.S. Cl. 526—90 **25 Claims**

1. A process for producing a nylon type polyamide, containing a plurality of



amide groups as integral parts of the main polymer chain, comprising contacting at a temperature sufficient to cause polymerization, at least one polyamide forming reactant with a transition metal complex catalyst, wherein the catalyst comprises at least one transition metal attached to a ligand containing electron withdrawing substituents wherein the electron withdrawing substituents are selected from the group consisting of —F, —Cl, —Br, —I, $—CF_3$,



—CN, $—NH_3^+$, $—NO_2$, and $—NR_3^+$ where R is an alkyl or an aryl radical.

4,628,078

ACRYLAMIDE-DIALKYLAMINOACRYLATE-DIALKYLAMINOMETHACRYLATE CATIONIC POLYELECTROLYTES AND THEIR PRODUCTION

Rodney Glover, Heckmondwike, and Martin R. Brown, Liversedge, both of United Kingdom, assignors to Allied Colloids Ltd., England

Filed Jun. 12, 1985, Ser. No. 743,759

Claims priority, application United Kingdom, Jun. 12, 1984, 8414950

Int. Cl.⁴ C08F *20/60, 120/60, 220/60*

U.S. Cl. 526—303.1 **12 Claims**

1. A high molecular weight cationic polyelectrolyte formed from acrylamide and cationic monomer characterised in that the polymer is a terpolymer of (a) dialkylaminoalkyl acrylate acid addition or quaternary ammonium salt with (b) dialkylaminoalkyl methacrylate acid addition or quaternary ammonium salt and (c) acrylamide, in which the molar ratio a:b is about 88:15 to about 5:95 and in which the molar amount of acrylamide based on the total molar amount of (A), (B) and (C) is 20 to 99%.

4,628,079

POLYAMIDE IMIDES PRODUCED FROM EITHER LACTAMS OR POLYAMIDES WITH ISOCYANATES OR ANHYDRIDES IN WHICH PRODUCTS ARE PRECIPITATED WITH A NON-SOLVENT

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,515, Aug. 28, 1984, Pat. No. 4,549,006. This application Jun. 20, 1985, Ser. No. 746,715

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332031

Int. Cl.⁴ C08G *18/82*

U.S. Cl. 528—49 **10 Claims**

1. A thermoplastic material which comprises polyamide imides produced in a solvent from polyisocyanates, polycarboxylic acid anhydrides and lactams or polyamides, precipitated with a non-solvent and then granulated.

4,628,080

CURE RATE CONTROL IN EPOXY RESIN COMPOSITIONS

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1985, Ser. No. 782,749

Int. Cl.⁴ C08G *59/68, 59/72*

U.S. Cl. 528—88 **12 Claims**

1. A composition comprising:

(a) an epoxy resin;

(b) a cationic curing agent for the epoxy resin; and

(c) from about 0.01 to about 10 weight percent, based on the weight of the epoxy resin, of a surfactant.

4,628,081

POLYCARBONATE EXHIBITING IMPROVED IMPACT PROPERTIES

Victor Mark, deceased, late of Evansville, Ind., by Carol M. Mark, Ester H. Mark, legal representatives, and Edward N. Peters, Lenox, Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 12, 1985, Ser. No. 797,254

Int. Cl.⁴ C08G *63/62*

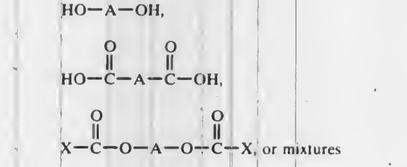
U.S. Cl. 528—176 **27 Claims**

1. A thermoplastic aromatic carbonate resin comprised of the polymerized reaction products of:

(i) at least one dihydric phenol;

(ii) a carbonate precursor; and

(iii) an amount at least effective to improve the impact properties of said resin of at least one polymer selected from polymers represented by the formulae



thereof;

wherein A is selected from the divalent residue of at least one polymerized and substantially fully hydrogenated alkadiene and has a weight average molecular weight of at least about 600 and up to about 20,000, and X is independently selected from halogen radicals.

4,628,082

DERIVATIVES OF AZOBARBITURIC ACID OR SALTS OR COMPLEXES THEREOF

Manfred Lorenz, Cologne, and Karl H. Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

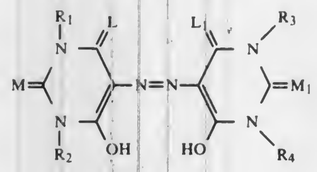
Continuation of Ser. No. 670,433, Nov. 9, 1984, abandoned, which is a continuation of Ser. No. 408,346, Aug. 16, 1982, abandoned. This application May 14, 1985, Ser. No. 734,364

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134725; Apr. 29, 1982, 3215875

Int. Cl.⁴ C09B *29/036, 29/52, 45/14, 45/22*

U.S. Cl. 534—707 **13 Claims**

1. A compound which, in the form of its free acid corresponds in one of its tautomeric structures to the formula



in which

L=O or NR_7,

L_1=O or NR_7,

with the proviso that only one of L and L_1 can at the same time be NR_7,

one of M or M_1=O and the other is O, NR_7, CN or



R_6 represents hydrogen, alkyl, cycloalkyl, aryl or aralkyl and

R_7 represents hydrogen, cyano, alkyl cycloalkyl, aryl, aralkyl or acyl which acyl is (C_1–C_6-alkyl)carbonyl, phenylcarbonyl, C_1–C_6-alkylsulphonyl, phenylsulphonyl, carbamoyl, carbamoyl substituted by C_1–C_6-alkyl, phenyl or naphtyl, sulphamoyl, sulphamoyl substituted by C_1–C_6-alkyl, pheny or naphthyl, said alkyl radical being unsubstituted or substituted by halogen, —OH, —CN, $—NH_2$ or C_1–C_6-alkoxy, and said phenyl and naphthyl radicals being unsubstituted or substituted by halogen, —OH, C_1–C_6-alkyl, C_1–C_6-alkoxy, $—NH_2$, NO_2 or CN,

R_1, R_2, R_3 and R_4 represent hydrogen, alkyl, cycloalkyl, aryl or aralkyl or salts or complexes of mono-, di-, tri and tetra-anions of said compound, said salts and complexes containing a metal selected from the group consisting of Li, Cs, Mg, Cd, Co, Al, Cr, Sn, Na K, Ca, Sr, Ba, Zn, Fe, Ni, Cu, Mn and Pb with the exception of azobarbituric acid and its salts and complexes.

4,628,083

2-HYDROXY-5-(ARYLAZO)-BENZENE ALKANOIC ACIDS

Karl H. Agback, Upsala, Sweden, assignor to Pharmacia AB, Uppsala, Sweden

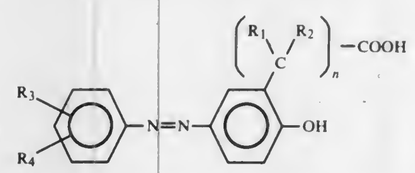
Continuation of Ser. No. 542,508, Oct. 17, 1983, abandoned. This application Jan. 18, 1985, Ser. No. 692,417

Int. Cl.⁴ A61K *31/655;* **C07C** *107/06;* **C09B** *29/14, 43/136*

U.S. Cl. 534—798 **6 Claims**

1. An arylazo compound of the general formula

I



wherein R_1 and R_2 independently of each other represent hydrogen or C_{1-3} alkyl, R_3 represents hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy, carboxy, C_{1-3} alkoxycarbonyl, C_{1-3} akylcarbonyl or a group $X—NH—SO_2—$, wherein X represents a heterocyclic ring, R_4 represents hydrogen, halogen or C_{1-3} alkyl, and n is the integer 1 or 2, the two groups



being the same or different when n is 2, or a lactone or a salt thereof.

4,628,084

PROCESS FOR 3-ACYLAMINO BENZODIAZEPINES

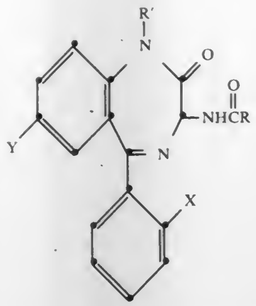
Mark G. Bock, Hatfield; Daniel F. Veber, Ambler, and Robert M. DiPardo, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 2, 1986, Ser. No. 815,620

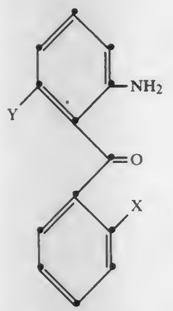
Int. Cl.⁴ C07D *243/24*

U.S. Cl. 540—509 **5 Claims**

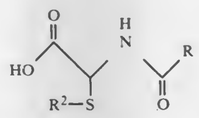
1. A process for the preparation of 3-acylamino benzodiazepines of the formula:



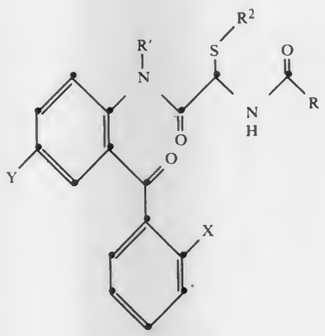
wherein X and Y are hydrogen or halogen, which comprises reacting an o-aminobenzophenone of the formula:



with an amidothiol derivative of glyoxylic acid of the formula:



to form an N-acylbenzophenone of the formula:

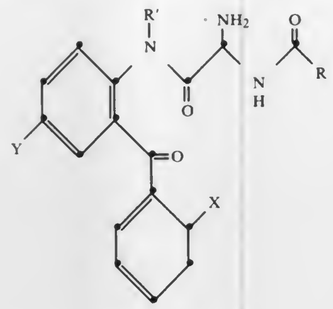


wherein:

R is loweralkyl of from 1–6 carbon atoms, aryl such as phenyl or halophenyl, aralkyl, alkyloxy or aralkyloxy, indolyl or substituted indolyl;

R′ is hydrogen, loweralkyl of from 1–6 carbon atoms, carboxymethyl, or carbalkoxymethyl wherein the alkoxy groups contain from 1–4 carbon atoms;

R² is loweralkyl, aralkyl, or aryl; treating said N-acylbenzophenone with ammonia in the presence of silver or mercury salts to form a compound of the formula:



and heating said product.

4,628,085

USE OF SILICA CATALYST FOR SELECTIVE PRODUCTION OF LACTAMS

Frank Mares, Whippany; Reginald T-H. Tang, Warren; James E. Galle, Madison, and Rose M. Federici, Princeton, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 3, 1985, Ser. No. 771,854
Int. Cl.⁴ C07D *201/08, 223/10*
U.S. Cl. 540—539 **27 Claims**

1. A process for selective preparation of lactams which comprises contacting, in the vapor phase, an aliphatic or aromatic aminonitrile having the formula $HR_1N—D—CN$, wherein D is a divalent organic moiety and wherein R_1 is $(C_1–C_4)$alkyl or hydrogen, with an effective amount of a silica catalyst, in the form of substantially spherical beads having a BET surface area greater than about 250 m^2/g and an average pore diameter less than about 20 nanometers at a temperature in the range of about 200° to about 400° C. and at a hydrogen or inert gas pressure in the range of about 0 to about 500 kPa, in the presence of:

(a) ammonia in an amount equal to from 0 to about 50 mole percent of the molar amount of aliphatic or aromatic aminonitrile present; and

(b) water in an amount from at least about 1.0 to about 50 times the molar amount of aliphatic or aromatic aminonitrile present

for a time sufficient to produce the corresponding lactam.

9. A process for the selective conversion of ϵ-aminocapronitrile into ϵ-caprolactam which comprises contacting, in the vapor phase, ϵ-aminocapronitrile, in the presence of adiponitrile, with an effective amount of a silica catalyst at a temperature in the range of about 200° to about 400° C. and at a hydrogen or inert gas pressure in the range of about 0 to about 500 kPa in the presence of:

(a) ammonia in an amount equal to about 0 to about 50 mole percent of the ϵ-aminocapronitrile present; and

(b) water in an amount from at least about 1.0 to about 50 times the molar amount of the aminocapronitrile present

for a time sufficient to produce ϵ-caprolactam and to recover substantially all the adiponitrile initially present.

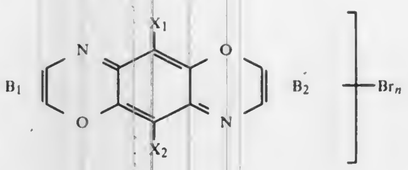
4,628,086

PREPARATION OF DIOXAZINE COMPOUNDS

Günter Franke, Leichlingen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1985, Ser. No. 803,457
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444888
Int. Cl.⁴ C07D *265/34, 279/14*
U.S. Cl. 544—31 **13 Claims**

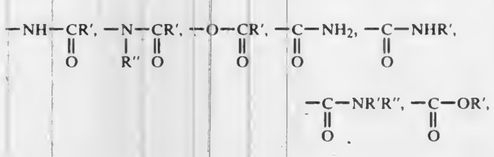
1. A process for the preparation of a dioxazine compound of the formula



in which

B_1 and B_2 designate a ring system with 1, 2, 3 or 4 carbocyclic and/or heterocyclic rings which can be substituted, and

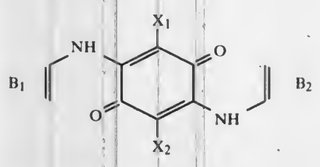
X_1 and X_2 designate hydrogen, halogen, —R′, —OR′, —NHR′, —NR′R″,



R′ and R″ representing alkyl, cycloalkyl, aryl and aralkyl and

n denoting 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11, it being possible for the n bromine atoms, independently of one another, to replace both H atoms of the ring systems B_1 and B_2 or their substituents and H atoms of X_1 and X_2 as well as X_1 and X_2 themselves,

wherein a compound of the formula



is reacted with bromine.

4,628,087

PROCESS FOR THE PREPARATION OF PHARMACOLOGICALLY ACTIVE COMPOUNDS CONTAINING A SULFOXIDE GROUP

Mariano Meneghin, Revine-Lago, Italy, assignor to Zambon S.p.A., Vicenza, Italy

Filed May 7, 1984, Ser. No. 607,562
Claims priority, application Italy, May 13, 1983, 21073 A/83
Int. Cl.⁴ C07D *279/24;* **C07C** *147/14*
U.S. Cl. 544—41 **8 Claims**

1. A process for the preparation selectively of compounds containing a sulfoxide group while substantially avoiding undesired sulfones consisting of oxidizing the corresponding thioethers with an alkali metal hypochlorite in an alkaline medium having a pH higher than 10 and at a temperature between 0° and 40° C.

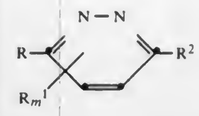
4,628,088

PREPARATION OF SUBSTITUTED PYRIDAZINES

Jack G. Samaritoni, Knightstown, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 17, 1984, Ser. No. 631,654
Int. Cl.⁴ C07D *237/12*
U.S. Cl. 544—224 **7 Claims**

1. A process for preparing a substituted pyridazine of the formula (I)



(I)

which comprises reacting a less substituted pyridazine of the formula (A)



(A)

with a carboxylic acid of the formula R^1COOH in the presence of peroxydisulfate ion, a catalytic amount of silver ion, and mineral acid, whose anion will not cause precipitation of the corresponding silver salt, all in an aqueous solvent system at a temperature from about 40° to about 80° C.; wherein

R is chloride, $C_1–C_4$ alkyl, or phenyl;

R^1 is $C_3–C_6$ secondary or tertiary alkyl;

R^2 is halo; and

m is 1.

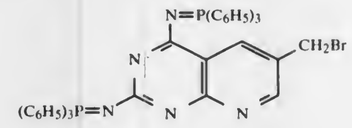
4,628,089

PYRIDO(2,3-D)PYRIMIDINES

Carroll G. Temple; John A. Montgomery, and Robert D. Elliott, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Division of Ser. No. 673,283, Nov. 20, 1984, Pat. No. 4,536,575, which is a division of Ser. No. 413,501, Aug. 31, 1982, Pat. No. 4,526,964, which is a continuation-in-part of Ser. No. 338,542, Jan. 11, 1982, Pat. No. 4,431,805, which is a continuation-in-part of Ser. No. 305,907, Sep. 25, 1981, abandoned. This application Mar. 15, 1985, Ser. No. 712,116
Int. Cl.⁴ C07D *487/02*
U.S. Cl. 544—244 **1 Claim**

1. A dimethylacetamide solution of a compound having the structure:



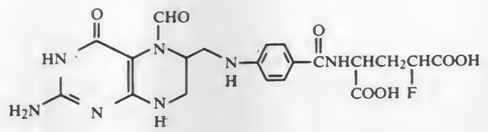
4,628,090

FLUORINE-CONTAINING ANTIFOLATES INCAPABLE OF POLYGLUTANAYTE FORMATION RELATED COMPOUNDS

James K. Coward, Troy, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 642,808, Aug. 21, 1984, Pat. No. 4,584,375. This application Aug. 19, 1985, Ser. No. 767,122
Int. Cl.⁴ C07D *475/08*
U.S. Cl. 544—258 **2 Claims**

1. A compound having the formula:



4,628,091
PROCESS FOR PRODUCING DIANTHRAQUINONE-N,N'-DIHYDRAZINE AND ITS CHLORINATION PRODUCT

Kimitoshi Kato; Hiroshi Aiga; Tamio Mikoda, and Tunehiro Sakai, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,398

Claims priority, application Japan, Jun. 16, 1983, 58-106789; Feb. 27, 1984, 59-34405

Int. Cl.⁴ C07D *241/46*

U.S. Cl. 544—339 **4 Claims**

1. A process for producing dianthraquinone-N,N'dihydrazine or its chlorination product, which process comprises condensing 1-amino-anthraquinone at an elevated temperature in the presence of 1,3-dimethyl-2-imidazolidinone using an oxidizing agent and an alkaline condensing agent, from 1.0 to 10 parts by weight of the 1,3-dimethyl-2-imidazolidinone and from 0.1 to 10 parts by weight of the alkaline condensing agent being used per part by weight of the 1-aminoanthraquinone, and subjecting the resultant condensation product to purification.

4,628,092
TRIETHYLENEDIAMINE CONTAINING ACETYLENIC ALCOHOLS AS FLOW AIDS

Akio Takahashi, Macungie, and Robert G. Petrella, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 21, 1985, Ser. No. 747,620

Int. Cl.⁴ C07D *487/08;* **B01J** *2/30*

U.S. Cl. 544—351 **16 Claims**

1. A method for improving the flowability of stored triethylenediamine which comprises mixing with the triethylenediamine a flow improving amount of a C_5–C_{28} acetylenic alcohol.

9. A composition consisting essentially of triethylenediamine admixed with a flow promoting amount of a C_5–C_{28} acetylenic alcohol.

4,628,093
RED NICKEL AZINE PIGMENT

Rütger Neeff; Meinhard Rolf, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

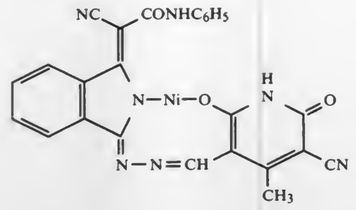
Filed Oct. 23, 1984, Ser. No. 663,781

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338622

Int. Cl.⁴ C07D *401/12;* **C08K** *5/34;* **C09B** *57/04*

U.S. Cl. 546—6 **3 Claims**

1. Red pigment which, in one of its tautomeric forms, corresponds to the formula



(I)

4,628,094
TRIS(DISUBSTITUTED AMINO)SULFONIUM PERFLUOROALKOXIDES AND PERFLUOROALKYLMERCAPTIDES AND PROCESS FOR THEIR PREPARATION

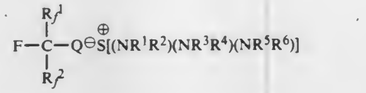
William B. Farnham, Wilmington, Del., and William J. Middleton, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1984, Ser. No. 618,736

Int. Cl.⁴ C07D *145/02, 207/48, 211/96*

U.S. Cl. 546—186 **22 Claims**

1. Tris(disubstituted amino)sulfonium perfluoroalkoxide and -perfluoroalkylmercaptide of the formula



wherein

R^1 through R^6, each selected independently, are $C_{1\text{-}20}$ alkyl, each having at least 2 alpha hydrogen atoms, or any or all of the pairs R^1 and R^2, R^3 and R^4, and R^5 and R^6, each pair selected independently, are $(CH_2)_4$ or $(CH_2)_2CHY(CH_2)_2$, wherein Y is hydrogen or methyl;

R_f^1 and R_f^2, each selected independently, are F, $C_{1\text{-}12}$ perfluoroalkyl, $C_{2\text{-}12}$ perfluoro(alkoxyalkyl), $C_{3\text{-}12}$ perfluoro(alkoxyalkoxyalkyl), $C_{4\text{-}12}$ perfluorocycloalkyl, or XR_f^3 wherein R_f^3 is $C_{1\text{-}12}$ perfluoroalkylene or $C_{4\text{-}12}$ perfluorocycloalkylene and X is Cl, Br or I, or R_f^1 and R_f^2 taken together are $(CF_2)_n$ wherein n is an integer and is 2 to 6; and

Q is O or S.

4,628,095
SUBSTITUTED N-BENZYL-4-(BENZHYDRYL) PIPERIDINES

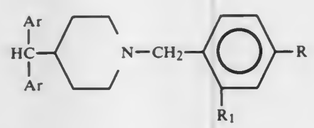
Kurt J. Rorig, Glenview; Stevan W. Djuric, Evanston; Kerry W. Fowler, Chicago, and Chi-Dean Liang, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 5, 1985, Ser. No. 741,648

Int. Cl.⁴ C07D *211/10, 211/08*

U.S. Cl. 546—234 **7 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein Ar are the same or different and represent phenyl or halogen substituted phenyl; R is di (lower alkyl) amino; and R_1 is carboxy, lower alkoxy-carbonyl or lower alkylaminocarbonyl.

4,628,096
PREPARATION OF 2-HALO-5-METHYLPYRIDINES FROM 4-METHYL-4-PENTENE DERIVATIVES

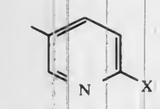
Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 496,680, May 20, 1983, Pat. No. 4,504,664. This application Dec. 20, 1984, Ser. No. 684,149

Int. Cl.⁴ C07D *213/61*

U.S. Cl. 546—250 **19 Claims**

1. A method for the preparation of a 2-halo-5-methylpyridine of the following formula (I):



(I)

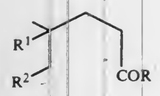
wherein X is a halogen atom, said method comprising the steps of:

(a) reacting a 4-methyl-4-pentene derivative of the following formula (II):



(II)

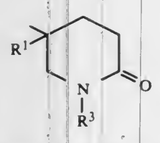
wherein R is a halo, aryloxy or alkoxy group with a halohydrination, haloalkanoyloxylation, halogenation or oxidation agent to produce a pentane derivative of the following formula (III):



(III)

wherein R^1 and R^2 are (i) independently alkanoyloxy, hydroxy or halogen groups or (ii) are joined together to form a 3-membered heterocyclic ring;

(b) reacting the pentane derivative of formula (III) with an amine to produce a pyridone of the following formula (IV):



(IV)

wherein R^3 is alkoxy, alkanoyloxy or hydroxy; and

(c) reacting the pyridone of formula (IV) with a halogenation agent to produce the 2-halo-5-methylpyridine of formula (I).

4,628,097
PROCESS FOR THE PREPARATION OF 2-AMINO-ALKYLPYRIDINES

Helmut Le Blanc; Lothar Puppe, both of Burscheid, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

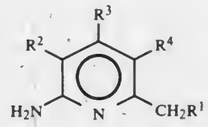
Filed Aug. 30, 1984, Ser. No. 645,947

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332687

Int. Cl.⁴ C07D *213/73, 213/09*

U.S. Cl. 546—251 **3 Claims**

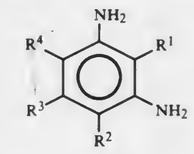
1. A process for the preparation of a 2-amino-alkylpyridine of the formula



wherein

R^1 to R^4 are identical or different and represent hydrogen, C_1 to C_6 alkyl, C_3 to C_{12} cycloalkyl, aralkyl with 7 to 12 carbon atoms or unsubstituted aryl or aryl substituted by alkyl with 6 to 12 carbon atoms,

which comprises heating a reaction mixture consisting essentially of a 1,3-diaminobenzene of the formula



wherein

R^1 to R^4 have the above-mentioned meanings

in the presence of ammonia and a catalyst selected from the group consisting of zeolites and gamma-Al_2O_3, the process being carried out at a temperature of 250° to 500° C. and at a pressure of 10 to 250 bar.

4,628,098
2-[2-PYRIDYLMETHYLTHIO-(SULFINYL)]BENZIMIDAZOLES

Akira Nohara, and Yoshitaka Maki, both of Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

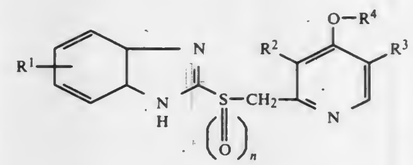
Filed Jul. 29, 1985, Ser. No. 760,568

Claims priority, application Japan, Aug. 16, 1984, 59-171069

Int. Cl.⁴ C07D *401/12*

U.S. Cl. 546—271 **36 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, methoxy or trifluoromethyl, R^2 and R^3 are independently hydrogen or methyl, R^4 is a $C_{2\text{-}5}$ fluorinated alkyl and n denotes 0 or 1, and a pharmacologically acceptable salt thereof.

4,628,099

TRIFLUOROMETHYL PYRIDINYLOXYPHENOXY PROPANOIC ACID CHLORIDES

Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 918,550, Jun. 23, 1978, which is a continuation-in-part of Ser. No. 817,943, Jul. 22, 1977, abandoned. This application Apr. 8, 1985, Ser. No. 720,844

Int. Cl.⁴ C07D *213/64*

U.S. Cl. 546—302 **2 Claims**

1. The acid chloride of 2-(4-((3-chloro-5-(trifluoromethyl)-2-pyridinyl)oxy)phenoxy)propanoic acid.

4,628,100

INTERMEDIATES FOR THE PREPARATION OF ARYL SUBSTITUTED PYRIDO[1,4]BENZODIAZEPINES

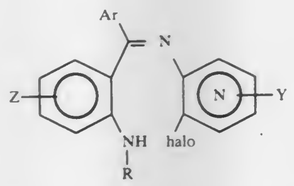
Young S. Lo, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 597,413, Apr. 6, 1984, Pat. No. 4,560,510. This application Jun. 26, 1985, Ser. No. 748,790

Int. Cl.⁴ C07D *213/75, 471/04*

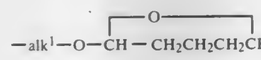
U.S. Cl. 546—304 **3 Claims**

1. A compound selected from the group having the formula:



wherein;

R is selected from the group consisting of hydrogen, loweralkyl, —alk¹—NR¹R², —alk¹—N=CH—OC₂H₅ or



R¹ and R² are selected from the group consisting of loweralkyl, —C(O)—O—loweralkyl or R¹ and R² taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-piperidinyl, 1-phthalimido, 1-pyrrolidinyl, 4-morpholino, 1-piperazinyl and 4-substituted —1—piperazinyl substituted in the 4-position by loweralkyl or an alkoxy-carbonyl blocking group;

Ar is selected from the group consisting of 2, 3, and 4-pyridinyl, 2 or 3-thienyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

alk¹ is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

Y is selected from the group consisting of hydrogen or 1–2 radicals selected from from loweralkyl, loweralkoxy or hydroxy and may be the same or different,

or the acid addition salts thereof.

4,628,101

COMPOUNDS HAVING A ANTIDOTE ACTIVITY FOR THE PROTECTION OF CULTIVATIONS OF AGRARIAN INTEREST FROM THE ACTION OF NONSELECTIVE HERBICIDES

Giovanni Camaggi, Lodi; Franco Gozzo, San Donato Milanese; Ernesto Signorini, Malnate, and Ottorino Palla, Crema, all of Italy, assignors to Montedison S.p.A., Milan, Italy

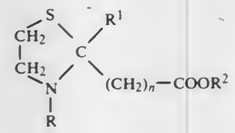
Continuation of Ser. No. 528,169, Aug. 31, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 834,773

Claims priority, application Italy, Sep. 1, 1982, 23092 A/82; Jul. 12, 1983, 22015 A/83

Int. Cl.⁴ C07D *277/04, 277/06*

U.S. Cl. 548—200 **8 Claims**

1. A compound of formula:



wherein:

R represents the group



in which R³ is a C_1–C_3 haloalkyl containing from 1 to 3 halogen atoms or phenyl;

R¹ represents a hydrogen atom, methyl or phenyl;

R² represents a C_1–C_8 alkyl, C_5–C_6 cycloalkyl, cyclohexyl methyl, phenyl, benzyl, allyl or propargyl optionally substituted with halogen atoms;

n is zero or one;

provided that, when contemporaneously R is a haloacetyl group, R¹ is hydrogen, and n is zero, R² is different from a C_1–C_4 alkyl.

4,628,102

NOVEL MONOMERS CONTAINING BICYCLIC AMIDE ACETAL AND EPOXY FUNCTIONAL GROUPS

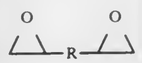
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 16, 1985, Ser. No. 766,361

Int. Cl.⁴ C07D *498/00*

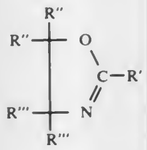
U.S. Cl. 548—218 **14 Claims**

1. The process for preparing a monomer which contains both bicyclic amide acetal and epoxy groups comprising reacting a compound of Formula I



I

with A compound of Formula II



II

wherein R represents a linear or cyclic alkylene group having from 1 to 30 carbon atoms, an arylene group having from 6 to 12 carbon atoms, an alkylene ether group having from 1 to 20 carbon atoms, or an arylene ether group having from 6 to 12 carbon atoms; R′ represents an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms L or an alkaryl group having from 7 to 20 carbon atoms, and R″ and R‴ independently represent hydrolgen, an alkyl group having from 1 to 10 carbon atoms or an aryl group having from 6 to 12 carbon atoms.

4,628,103

PROCESS FOR THE PREPARATION OF 3-AMINO-1,2,4-TRIAZOLE

Michel Alicot, La Barthe de Neste, France, assignor to Atochem, France

Filed Jun. 19, 1985, Ser. No. 746,287

Claims priority, application France, Jun. 20, 1984, 84 09663

Int. Cl.⁴ C07D *249/14*

U.S. Cl. 548—266 **10 Claims**

1. A process for the preparation of 3-amino-1,2,4-triazole which comprises simultaneously adding hydrazine hydrate and formic acid to cyanamide at a temperature of from 0° to 10° C. and a pH (measured at 4° C.) of 6 to 7; bringing the mixture so formed to a temperature of 60° to 100° C. at a pH (measured at 20° C.) of 7 to 8 and maintaining the mixture at such temperature and pH, until substantially no hydrazine hydrate remains, to obtain aminoguanidine formate; evaporating liquid from the aminoguanidine formate solution at a temperature of from 30° to 60° C. to obtain a suspension having a solids content of from 100 to 700 g/L; filtering the suspension obtained to remove the solids from suspension in the mother liquor; washing the solids so obtained with a wash medium to produce a dicyandiamide content of less than 0.25 percent by weight, based on the dry formate; withdrawing the wash medium from the solids; and heating the washed solids so obtained to a temperature of from 110° to 200° C. to cyclize the formate and produce the aminotriazole.

4,628,104

IMIDAZOLE KETONE DERIVATIVES

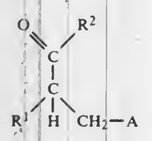
Jonathan P. Dickens, and William R. McKay, both of High Wycombe, United Kingdom, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 8, 1985, Ser. No. 720,917

Int. Cl.⁴ C07D *233/54, 249/08, 233/66, 401/00*

U.S. Cl. 548—341 **2 Claims**

1. A compound of the formula:



wherein

R¹ is phenyl or C_1–C_4 alkylphenyl;

R² is dihalophenyl; and

A is imidazol-1-yl 1,2,4-triazol-1-yl or substituted imidazol-1-yl wherein the substituent is one or more groups selected from class consisting of C_1–C_4 alkylthio and carboxy(C_2–C_4 alkenyl);

and pharmaceutically acceptable acid addition salts thereof.

4,628,105

NOVEL IMIDAZOLIDES AND THEIR USE AS CURING AGENTS FOR POLYEPOXIDE COMPOUNDS

Rolf Schmid, Schwarzenburg; Helmut Zondler, Bottmingen; Michael Fischer, Tafers, and Werner Stauffer, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

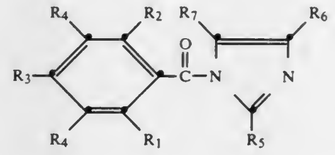
Division of Ser. No. 602,260, Apr. 20, 1984, Pat. No. 4,587,311. This application Jan. 29, 1986, Ser. No. 823,695

Claims priority, application Switzerland, Apr. 29, 1983, 2316/83

Int. Cl.⁴ C07D *233/60*

U.S. Cl. 548—341 **5 Claims**

1. An imidazolide of the formula I



(I)

wherein

R_1 is methyl, ethyl or isopropyl,

R_2, R_3 and R_4 independently of one another are each hydrogen, methyl, ethyl or isopropyl, with the proviso that R_2 is hydrogen only when R_1 is isopropyl,

R_5, R_6 and R_7 independently of one another are each hydrogen, methyl, ethyl or isopropyl, or phenyl which is unsubstituted or substituted by methyl or ethyl groups, with the proviso that at least one of the symbols R_5, R_6 and R_7 is phenyl which is unsubstituted or substituted according to definition.

4,628,106

PROCESS FOR THE PREPARATION OF 2-HYDROXY-(9H)-CARBAZOLE

Otto E. Schweikert, Kelkheim; Walter Reimann, Hofheim am Taunus; Werner Wykypiel, Rodgau, and Karl E. Mack, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,485

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410232

Int. Cl.⁴ C07D *209/88*

U.S. Cl. 548—440 **1 Claim**

1. A process for the preparation of 2-hydroxy-(9H)-carbazole, which comprises catalytically hydrogenating 1,2,3,4-tetrahydro-7-hydroxy-(9H)-carbazole in an inert organic solvent selected from the group consisting of alcohols, ether alcohols and mixtures thereof.

4,628,107

INTERMEDIATE 8-CARBOXALDEHYDE-(-CHROMONE AND -THIOCHROMONE) DERIVATIVES

Siegfried Goldmann; Gerhard Franckowiak, both of Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

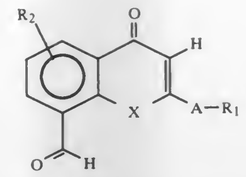
Continuation-in-part of Ser. No. 589,436, Mar. 14, 1984, Pat. No. 4,540,789, and a continuation-in-part of Ser. No. 589,615, Mar. 14, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,571

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311004; Mar. 25, 1983, 3311005

Int. Cl.⁴ C07D *405/06, 405/12, 409/06, 409/12*

U.S. Cl. 549—23 **8 Claims**

1. A compound of the formula



in which
R_1 represents hydrogen, a straight-chain, cyclic or branched C_1–C_{10} alkyl radical, a C_1–C_{10} alkyl carboxylate, or a phenyl, 3H-thienyl; 2H-pyridyl, furyl or pyrryl radical which optionally has 1–5 identical or different halogen, C_1–C_{10}-alkyl or C_1–C_{10}-alkoxy substituents,
R_2 represents hydrogen or 1 to 3 halogen atoms, A represents a single bond, a C_1–C_{20} alkylene chain or a C_2–C_{20} alkenylene chain which can optionally be interrupted by oxygen or sulphur, and
X represents oxygen or sulphur.

4,628,108

PRODUCTION OF 2-SUBSTITUTED-1,3-DIOXOLANES FROM 1,3-DIOXOLANE AND FORMALDEHYDE

John R. Sanderson, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,548
Int. Cl.⁴ C07D *317/00*
U.S. Cl. 549—453 **14 Claims**

1. A method for the preparation of 2-hydroxyalkyl-1,3-dioxolanes which comprises reacting 1,3-dioxolane under non-acidic conditions with formaldehyde in the presence of a hydroperoxide and a metal salt.

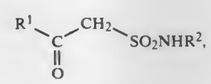
4,628,109

2-KETOSULFONAMIDES AND PROCESS FOR THEIR PREPARATION

Erwin Schmidt; Dieter Günther, both of Kelkheim, and Klaus-Dieter Kampe, Bad Sodem am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

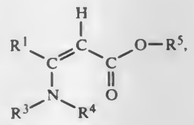
Filed Jun. 27, 1984, Ser. No. 624,938
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323510
Int. Cl.⁴ C07C *143/74, 143/78*
U.S. Cl. 560—13 **4 Claims**

1. A process for the preparation of 2-ketosulfonamide of the formula I



(I)

in which
R^1 is a C_1–C_4 alkyl radical, and
R^2 is a hydrogen atom,
wherein a 3-aminoalk-2-enoic acid ester of the formula II

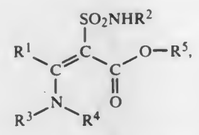


(II)

in which R^1 has the meaning given above, R^3 and R^4 are identical or different and are hydrogen, C_1–C_4 alkyl radicals which may be linked together to form a ring, or C_6–C_{12} aralkyl or C_6–C_{12} aryl radicals having 0 to 2 heteroatoms, and R^5 is a branched or unbranched C_1–C_{18} alkyl radical which may contain heteroatoms, is reacted with an amidosulfonyl halide of the formula III

$$X\text{-}SO_2NH\text{-}R^2 \quad \text{(III)},$$

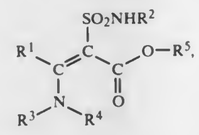
in which R^2 has the abovementioned meaning and X is chlorine, bromine or fluorine, in the presence of at least one equivalent, based on the ester used, of a base, and the resulting 3-amino-2-sulfamoylalk-2-enoic acid ester of the formula IV



(IV)

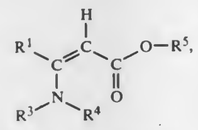
in which R^1, R^2, R^3, R^4 and R^5 have the abovementioned meanings, is subjected to acid or alkaline saponification and decarboxylation.

4. A process for the preparation of 3-amino-2-sulfamoylalk-2-enoic acid esters of the formula IV



(IV)

in which
R^1 is a C_1–C_4 alkyl radical, and
R^2 is a hydrogen atom,
R^3 and R^4 are identical or different and are hydrogen, C_1–C_4 alkyl radicals which may be linked together to form a ring, or C_6–C_{12} aralkyl or C_6–C_{12} aryl radicals having 0 to 2 heteroatoms, and R^5 is a branched or unbranched C_1–C_{18} alkyl radical which may contain heteroatoms,
wherein a 3-aminoalk-2-enoic acid ester of the formula II



(II)

in which R^1, R^3, R^4 and R^5 have the abovementioned meanings, is reacted with an amidosulfonyl halide of the formula III

$$X\text{—}SO_2NH\text{—}R^2 \quad \text{(III)},$$

in which R^2 has the abovementioned meaning and X is chlorine, bromine or fluorine, in the presence of at least one equivalent, based on the ester used, of a base.

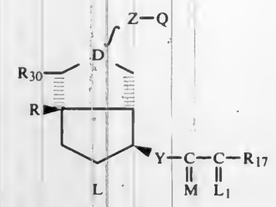
4,628,110

NOVEL 9-SUBSTITUTED CARBACYCLIN ANALOGS

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 349,122, Feb. 16, 1982. This application Oct. 30, 1984, Ser. No. 666,404
Int. Cl.⁴ C07C *177/00, 57/26*
U.S. Cl. 560—119 **6 Claims**

1. A compound of the formula



wherein R is C_1–C_4 alkyl; R_{30} is hydrogen or R_{30} and R taken together form a methylene moiety;
wherein D is cis>C═C(R_3)—, trans>C═C(R_3)— or >$CHCH_2$, wherein R_3 is hydrogen or fluoro; wherein Z is:
(1) —CH_2—$(CH_2)_f$—$C(R_4)_2$— wherein each R_4 is the same and is hydrogen or fluoro, and f is zero, one, 2 or 3;
(2) trans—CH_2—CH═CH—; or
(3) —(Ph)—$(CH_2)_g$— wherein Ph is 1,2-, 1,3-, or 1,4-phenylene and g is zero, one, 2 or 3; with the proviso that when Z is —(Ph)—$(CH_2)_g$—, R_3 is hydrogen;
wherein Q is
(1) —$COOR_5$, wherein R_5 is
(a) hydrogen,
(b) (C_1–C_{12})alkyl,
(c) (C_3–C_{10})cycloalkyl,
(d) (C_7–C_{12})aralkyl,
(e) phenyl optionally substituted with one, 2 or 3 chloro or (C_1–C_4)alkyl,
(f) phenyl substituted in the para-position with —NH-COR_6, —COR_7, —OC(O)R_8 or —CH═N—NH-$CONH_2$, wherein R_6 is methyl, phenyl, acetamidophenyl, benzamidophenyl or —NH_2; R_7 is methyl, phenyl, —NH_2, or methoxy; and R_8 is phenyl or acetamidophenyl;
(g) phthalidyl,
(h) 3-(5,5-dimethyl-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide.
(i) 3-(5,5-di(hydroxymethyl)-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide, or
(j) a pharmacologically acceptable cation;
(2) —CH_2OH;
(3) —COL_2, wherein L_2 is
(a) an amino group of the formula —NR_9R_{10} wherein R_9 is hydrogen or (C_1–C_{12})alkyl and R_{10} is
(i) hydrogen
(ii) (C_1–C_{12})alkyl
(iii) (C_3–C_{10})cycloalkyl,
(iv) (C_7–C_{12})aralkyl
(v) phenyl optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5)-alkoxycarbonyl, or nitro,
(vi) (C_2–C_5)carboxyalkyl,
(vii) (C_2–C_5)carbamoylalkyl,
(viii) (C_2–C_5)cyanoalkyl,
(ix) (C_3–C_6)acetylalkyl,
(x) (C_7–C_{12})benzoalkyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)-alkoxy, carboxy, (C_2–C_5)-alkoxycarbonyl, or nitro,
(ix) pyridyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,
(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)-alkyl,
(xiii) (C_1–C_4)hydroxyalkyl,
(xiv) (C_1–C_4)dihydroxyalkyl,
(xv) (C_1–C_4)trihydroxyalkyl;
(b) cycloamine selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrroline, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12})alkyl;
(c) carbonylamino of the formula —$NR_{11}COR_{10}$, wherein R_{11} is hydrogen or (C_1–C_4)alkyl and R_{10} is other than hydrogen, but otherwise defined as above;
(d) sulfonylamino of the formula —$NR_{11}SO_2R_{10}$, wherein R_{11} and R_{10} are defined in (c);
(4) —$CH_2NL_3L_4$, wherein L_3 and L_4 are hydrogen or (C_1–C_4)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when Q is —$CH_2NL_3L_4$; or (5) —CN;
wherein L is H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;
wherein Y is trans —CH═CH—, cis—CH═CH—, —CH_2-H_2—, or —C≡C—;
wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;
wherein L_1 is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro; wherein



taken together is —C_pH_{2p}CH═CH_2 wherein p is an integer of from 3 to 7, and individual optical isomers thereof.

4,628,111

N-BENZYLOXYCARBONYL-L-THREONINE AMIDE HEMIHYDRATE

Akihiro Mashiba, Tokyo; Kazuteru Hagita, Oomiya; Yoshinobu Miyazawa, Tokyo; Tetsushi Saino, Yono, and Yasuhisa Tashiro, Yokohama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,658
Claims priority, application Japan, Apr. 26, 1984, 59-82962
Int. Cl.⁴ C07C *125/065*
U.S. Cl. 560—159 **1 Claim**

1. Non-hygroscopic N-Benzloxycarbonyl-L-threonine amide hemihydrate crystal.

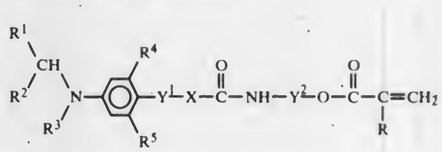
4,628,112

AMINES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN COMPOSITIONS WHICH CAN UNDERGO FREE RADICAL POLYMERIZATION

Jens Winkel, Cologne; Gerhard Klein, Monheim; Helmut-Martin Meier, Hattingen; Carlhans Süling, Odenthal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

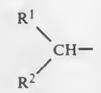
Filed Nov. 28, 1984, Ser. No. 675,689
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345103
Int. Cl.⁴ C07C *125/065*
U.S. Cl. 560—160 **12 Claims**

1. A compound of the formula

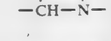


in which
R represents hydrogen or a methyl group,
Y^1 represents an optionally branched alkylene radical with 1 to 6 C atoms,
Y^2 represents an optionally branched alkylene radical with 2 to 8 C atoms,
X denotes oxygen or an —NH— group,

R^1 and R^2 are identical or different and denote hydrogen, or an alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl or alkylaryl group which has up to 11 C atoms and is optionally substituted by one or more,
hydroxyl or amino, groups, or
R^1 and R^2 together form a 3-membered to 6-membered ring, which optionally contains nitrogen, oxygen or sulphur as hetero-atoms,
R^3 has the meaning of R^1 or represents a group



or
R^2 and R^3, together with the



group, form a 5-membered or 6-membered ring, which optionally contains oxygen as a further heteroatom, and
R^4 and R^5 are identical or different and represent hydrogen, an alkyl or alkenyl group which has up to 10 C atoms and is optionally substituted by halogen, or halogen.

4,628,113

ALCOHOL CARBONYLATION PROCESS USING A BIMETALLIC COBALT CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1982, Ser. No. 393,934
Int. Cl.⁴ C07C *29/32, 31/08, 45/49, 51/12, 67/36*
U.S. Cl. 560—232 **10 Claims**

1. A process for the preparation of carboxylic acids, alcohols, aldehydes or carboxylic acid esters which comprises reacting a primary, secondary, or tertiary alcohol having from one to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a cobalt component and a Group V-B, VI-B or Actinide element component and in the absense of a halide promoter, wherein the reaction products formed have at least one more carbon atom than the starting alcohol.

4,628,114

CARBOXYLIC ACID ESTER HOMOLOGATION USING A SULFIDED NICKEL CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 23, 1983, Ser. No. 507,307
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.⁴ C07C *67/36*
U.S. Cl. 560—232 **7 Claims**

1. A process for the conversion of carboxylic acid esters to homologous carboxylic acid esters which comprises reacting a carboxylic acid ester having from two to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a nickel component and a Group VI-B element component cocatalyst and in the absence of a halide promoter.

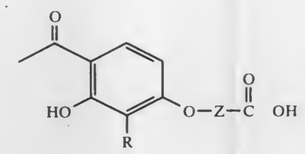
4,628,115

SUBSTITUTED 4-ACETYL-3-HYDROXYPHENOXY ALKANOIC ACIDS

Matthew Carson, Nutley; Ronald A. LeMahieu, North Caldwell, and William C. Nason, Mountain Lakes, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 25, 1985, Ser. No. 715,440
Int. Cl.⁴ C07L *59/76*
U.S. Cl. 562—464 **22 Claims**

1. A compound of the formula



1

wherein R is hydrogen or lower alkyl, Z is $—C^*H_2—CH_2—CH_2—C\equiv C—$, $—C^*H_2—C\equiv C—(CH_2)_3—$, and $—[(CH_2)_2O]_m(CH_2)_2—$ wherein n is an integer of 1 to 3, the carbon atom marked with an asterisk is linked to the phenoxy moiety,
or a salt thereof with a pharmaceutically acceptable base.

4,628,116

VINYL BROMIDE EXTRACTION OF BUTYRIC ACID AND BUTANOL FROM MICROBIAL FERMENTATION BROTH

Richard J. Cenedella, Rte. 1, Box 28, Kirksville, Mo. 63501

Filed Jan. 8, 1986, Ser. No. 519,974
Int. Cl.⁴ C07C *29/86, 31/12, 51/48, 53/124*
U.S. Cl. 562—513 **7 Claims**

1. A process of extracting butyric acid and n-butyl alcohol from microbial fermentation broth, containing the same, said process comprising:
contacting an aqueous solution of a microbial fermentation broth having a pH of about 4.0 or less, and containing butyric acid and/or n-butanol with vinyl bromide at a temperature from about 4° C. to about 15° C. to extract said butyric acid and/or said n-butanol from said fermentation broth into said vinyl bromide,
separating said vinyl bromide from said broth, and
separating said butyric acid and/or said n-butanol from said vinyl bromide by evaporation to leave in susbtantially pure isolated form said butyric acid and/or said n-butanol.

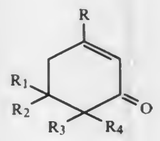
4,628,117

PROCESS FOR THE OZONIZATION OF α,β-UNSATURATED CYCLOHEXANONES TO 5-KETOALKANOIC ACIDS

Hubert J. Sharkey, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 464,454, Feb. 7, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 698,044
Int. Cl.⁴ C07C *51/34*
U.S. Cl. 562—577 **12 Claims**

1. A process for the preparation of 5-ketoalkanoic acids from α,β-unsaturated cyclohexanones which comprises:
(1) introducing ozone into a mixture of (a) an α,β-unsaturated cyclohexanone of the formula



where R is a C_{1-18} alkyl group and R_1, R_2, R_3, and R_4 are hydrogen or a C_{1-4} alkyl group, (b) a C_{1-6} saturated aliphatic monocarboxylic acid containing from 0.1 up to 50 percent by weight water, and (c) 0.001 to 1.0 weight percent, based on the α,β-unsaturated cyclohexanone, of a soluble manganous salt, said mixture maintained at a temperature from 15° C. to 50° C. and intimately contacted with said ozone until one mol ozone is reacted per mol of α,β-unsaturated cyclohexanone;
(2) terminating the addition of ozone and maintaining the temperature of the mixture in the range 15° C. to 50° C. until a negative starch iodide test is obtained; and
(3) recovering the 5-ketoalkanoic acid.

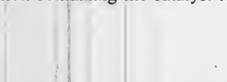
4,628,118

5,5-DICHLORO-3,3-DIMETHYLPENTANOIC ACID

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 518,855, Aug. 1, 1983, abandoned. This application Oct. 10, 1985, Ser. No. 786,251
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230274
Int. Cl.⁴ C07C *53/19, 59/147;* **C07D** *309/30, 309/32*
U.S. Cl. 562—602 **1 Claim**

1. 5,5-Dichloro-3,3-dimethylpentanoic acid of the formula



4,628,119

PROCESS FOR PREPARING HYDRAZINE HYDROHALOGENIDE

Takanari Nawata, Tokyo; Shuzabu Sakaguchi, Ibaraki, and Osamu Aoki, Chiba, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,553
Claims priority, application Japan, Feb. 17, 1984, 59-28323
Int. Cl.⁴ C07C *109/04*
U.S. Cl. 564—314 **10 Claims**

1. A process for preparing a hydrazine hydrohalogenide which comprises the steps of:
(a) oxidizing a benzophenone-imine with molecular oxygen in the presence of a copper halide catalyst and benzophenone as a solvent, at a temperature of from 60° to 250° C. under an oxygen partial pressure of from 0.01 to 20 atms to produce a benzophenone-azine;
(b) contacting the oxidation reaction mixture obtained in step (a) with a 10 to 60 wt% aqueous solution of a hydrohalogenic acid in an amount of from 0.8 to 2 moles per mole of the benzophenone-azine at a temperature of from 60° to 200° C. under a pressure of from 0.1 to 10 atms, thereby hydrolyzing the benzophenone-azine to produce a hydrazine hydrohalogenide and, at the same time, extracting and removing the catalyst from the reaction mixture with the hydrohalogenic acid-containing aqueous solution, to obtain an aqueous solution containing the hydrazine hydrohalogenide and the catalyst;
(c) separating the aqueous solution containing the hydrazine hydrohalogenide and catalyst which is obtained in step (b) and adjusting the solution to a pH of from 3 to 7 with an alkali in the absence of oxygen;
(d) contacting the aqueous solution of pH 3 to 7 obtained in step (c) with benzophenone-imines at a temperature of from 0° to 200° C. in the absence of oxygen to extract the catalyst from the aqueous solution with the benzophenone-imines; and
(e) separating the benzophenone-imines solution containing the catalyst and the aqueous solution containing the hydrazine hydrohalogenide, to thereby recover the hydrazine hydrohalogenide as an aqueous solution and to recycle the solution containing the catalyst to step (a).

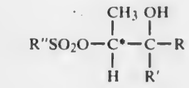
4,628,120

PREPARING METHOD OF OPTICALLY ACTIVE KETONES

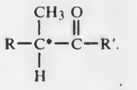
Genichi Tsuchihashi, Tama, and Keisuke Suzuki, Chigasaki, both of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,440
Claims priority, application Japan, Oct. 19, 1983, 58-195487
Int. Cl.⁴ C07C *45/51*
U.S. Cl. 568—322 **19 Claims**

1. In a Pinacol-type rearrangement, the improvement comprising:
contacting an optically active sulfonyloxy alcohol of the formula:



wherein R is a C_2 to C_{20} hydrocarbon group, R′ is a C_1 to C_{20} hydrocarbon group, R″ is a C_1 to C_{20} hydrocarbon group, and * represents an asymmetric center, and wherein R is more electron donative than R′ except when R and R′ are identical, with an organoaluminum compound of the formula $R_n'''AlX_{3-n}$, wherein R‴ is a C_1 to C_{20} hydrocarbon group, X is a hydrogen atom, and $0<n\leqq 3$, to obtain an optically active ketone of the formula



4,628,121

PREPARATION OF ACETALDEHYDE

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Little Ferry, N.J.

Filed Sep. 27, 1985, Ser. No. 780,861
Int. Cl.⁴ C07C *45/49*
U.S. Cl. 568—487 **6 Claims**

1. A process for the preparation of acetaldehyde which comprises reacting methanol with carbon monoxide and hydrogen in the presence of a catalyst composition comprising a cobalt component selected from the group consisting of carboxylates, carbonyls, oxides, hydroxides, carbonates, halides, and mixture thereof, a tin component selected from the group consisting of carboxylates, halides, oxides, inorganic salts, organo-tin compounds, and mixtures thereof, and a halogen component selected from the group consisting of elemental halogens, iodides, salts, organic halides, and mixtures thereof, wherein the molar ratio of the halogen to the cobalt is, at most, 5:1, said reaction being carried out at a temperature of 100°–180° C, and a pressure of 800–5000 psig.

4,628,122

PROCESS FOR CONCENTRATING AND RECOVERING CHLORAL

Frederick J. Kuntz, Lake Charles, La., and Henry W. Schussler, North Canton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

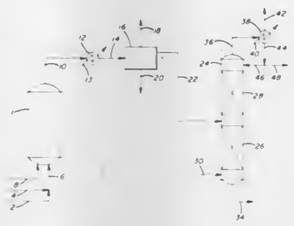
Filed Nov. 1, 1985, Ser. No. 793,876
Int. Cl.⁴ C07C *45/80*
U.S. Cl. 568—492 **22 Claims**

1. In the method wherein:
(a) a feed composition comprising both aqueous hydrochloric acid and from about 1 to about 12 percent by weight chloral is introduced to a stripping zone;
(b) aqueous hydrochloric acid containing chloral is counter-

currently contacted in said stripping zone with steam or reboiled aqueous acid vapors under superatmospheric pressure conditions to produce a purified, aqueous hydrochloric acid solution having a lower concentration of chloral than said feed composition; and

(c) at least a portion of said solution is recovered, the improvement comprising:

(d) introducing liquid reflux to a rectifying zone at a reflux ratio of from about 0.4:1 to about 15:1, said liquid reflux



comprising water and chloral in which the chloral concentration is in the range of from 30 to about 89 percent by weight;

(e) countercurrently contacting in said rectifying zone under superatmospheric pressure conditions, vapors comprising hydrochloric acid vapor and chloral vapor with descending liquid comprising chloral and water; and

(f) recovering a product comprising chloral and water in which the chloral concentration is in the range of from 30 to about 89 percent by weight.

4,628,123

PROCESS FOR THE SYNTHESIS OF 2-METHOXY-6-BROMO-NAPHTHALENE

Giampiero Borsotti, Novara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Oct. 22, 1985, Ser. No. 790,220
Claims priority, application Italy, Oct. 23, 1984, 23280 A/84
Int. Cl.[4] C07C *41/22, 41/24*
U.S. Cl. 568—634 **12 Claims**

1. A process for the synthesis of 2-methoxy-6-bromo-naphthalene, wherein 2-methoxy-naphthalene, in solution in a carboxylic acid, is brominated by means of bromine to 1,6-dibromo-2-methoxy-naphthalene and the latter is then dehalogenated, without any separation from the liquid medium of reaction, by the addition of iron.

4,628,124

TETRABROMOBISPHENOL-A PROCESS

Bonnie G. McKinnie, Baton Rouge, La., and Olan W. Mitchell, Magnolia, Ark., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 23, 1985, Ser. No. 778,710
Int. Cl.[4] C07C *39/16*
U.S. Cl. 568—726 **9 Claims**

1. A process for brominating bisphenol-A to make mainly tetrabromobisphenol-A while minimizing the formation of by-products, said process comprising:

(a) dissolving bisphenol-A in methanol in a weight ratio of about 1–6 parts methanol per each part bisphenol-A,

(b) feeding a solution of bromine in methanol to the bisphenol-A solution with stirring the bromine:methanol weight ratio in said bromine solution being about 1–4:1, and

(c) recovering tetrabromobisphenol-A.

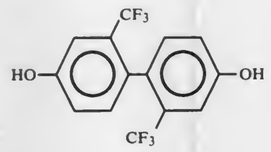
4,628,125

MONOMERS CONTAINING BIS(TRIFLUOROMETHYL)BIPHENYLENE RADICALS

Howard G. Rogers, Weston, Mass.; Russell A. Gaudiana, Merrimack, N.H., and Richard A. Minns, Arlington, Mass., assignors to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Division of Ser. No. 414,473, Sep. 2, 1982, Pat. No. 4,433,132.
This application Feb. 9, 1984, Ser. No. 578,694
Int. Cl.[4] C07C *39/15*
U.S. Cl. 568—730 **1 Claim**

1. The compound having the formula



4,628,126

PROCESS FOR THE PRODUCTION OF DIHYDROXYBENZENES

Karlheinz Drauz, Freigericht, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,847
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308726
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] C07C *37/00*
U.S. Cl. 568—771 **43 Claims**

1. A process for the production of a dihydroxy phenol or hydroxyphenyl ether comprising reacting phenol, a substituted phenol, or a phenol ether with hydrogen peroxide in a high boiling organic solvent having not over 1 weight % of water, which organic solvent does not form an azeotrope with water or which forms an azeotrope with water that boils near or above the boiling point of hydrogen peroxide at normal pressure and using a catalyst of the formula XO_2 wherein X is sulfur, selenium, or tellurium.

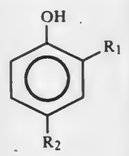
4,628,127

HETEROGENEOUS CATALYTIC ALKYLATION

Silas W. Holmes, Columbia; Edward A. Burt, and Dixie E. Goins, both of Orangeburg, all of S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1985, Ser. No. 748,744
Int. Cl.[4] C07C *37/14, 39/06*
U.S. Cl. 568—781 **33 Claims**

1. A process for producing 2,4-di-substituted phenols comprising reacting an ol-efin and a phenol of structure I:



(I)

wherein one of R_1 and R_2 is H and the other is independently selected from the group consisting of H, alkyl of from 1–12 carbon atoms, cycloalkyl of from 5–12 carbon atoms, and aralkyl of from 7–12 carbon atoms; said reacting being carried out in the presence of a heterogeneous catalyst comprising an aluminum phenoxide bonded to a solid polymeric resin having acidic functional groups; and forming as the major product 2,4-di-substituted phenol.

4,628,128

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL BY CATALYTIC HYDROGENATION

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 4, 1985, Ser. No. 697,926
Int. Cl.[4] C07C *29/136, 31/20*
U.S. Cl. 568—864 **17 Claims**

1. A process for the preparation of ethylene glycol comprising the steps of contacting, in the vapor phase, hydrogen, with at least one of di(lower alkyl) oxalate and lower alkyl glycolate in the presence of a hydrogenation catalyst comprising from about 1 to about 50% by weight, based on the total weight of the catalyst, of copper, and a silica carrier, wherein the silica carrier is characterized by a relative activity index of at least about 1.0, said relative activity index being defined by the formula, relative activity index $=1.38+0.39a+0.76b+0.001c+0.35d-0.39ab+0.012bc+0.003cd$, wherein a is defined as the nominal external surface area of a typical carrier particle (S), expressed in square millimeters per particle units, divided by the volume (V) of the same carrier particle, expressed in cubic millimeters per particle units minus 1.96 ((S/V)−1.96); b is defined as the pore volume (P) of the carrier, expressed in cc/gram units, minus 0.84 (P−0.84); c is defined as the average pore diameter (D), expressed in Angstrom units, minus 169 (D−169); and d is defined as the macroporosity variable (M) minus 0.24 (M−0.24), wherein the macroporosity variable is assigned a value of 1.0 if said carrier has at least about 20% of its pore volume associated with pores having a diameter of at least about 1000 Angstroms, and a value of zero if said carrier has less than about 20% of its pore volume associated with pores having a diameter of at least about 1000 Angstroms.

4,628,129

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 4, 1985, Ser. No. 697,927
Int. Cl.[4] C07C *29/136, 31/20*
U.S. Cl. 568—864 **24 Claims**

19. A process for the preparation of ethylene glycol comprising the steps of contacting, in the vapor phase, hydrogen with at least one of di(lower alkyl)oxalate and lower alkyl glycolate in the presence of a hydrogenation catalyst comprising from about 1 to about 50% by weight, based on the total weight of the catalyst, of copper and a silica carrier, wherein the carrier has a leachable iron content not greater than 0.03%, by weight of the carrier, a leachable sulfur content, expressed as sulfate, not greater than 0.04%, by weight of the carrier, and a leachable alkali metal content sufficiently low so as to enhance the physical stability of the catalyst in the process.

4,628,130

PROCESS FOR PRODUCING ALCOHOLS BY HYDROGENOLYSIS OF CARBOXYLIC ACID ESTERS IN THE PRESENCE OF A CATALYST CONTAINING NICKEL AND TIN, GERMANIUM OR LEAD

Jean-Paul Bournonville, Cergy Pontoise; Jean-Pierre Candy, Caluire, and Gil Mabilon, St Germain en Laye, all of France, assignors to Institut Francais du Petrole, Rueil-Maimaison, France

Filed Aug. 8, 1985, Ser. No. 763,596
Claims priority, application France, Aug. 8, 1984, 84 12635
Int. Cl.[4] C07C *29/136, 37/055*
U.S. Cl. 568—885 **18 Claims**

1. A process for manufacturing alcohols, wherein a carboxylic acid ester is treated with hydrogen in the presence of a catalyst containing nickel and at least one second element selected from the group consisting of germanium, tin and lead, characterized in that the catalyst results from the incorporation of at least one hydrocarbyl compound of at least one germanium, tin and lead metal to Raney nickel or a nickel-containing carrier.

4,628,131

VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,360
Int. Cl.[4] C07C *79/10*; B01J *23/00*
U.S. Cl. 568—937 **24 Claims**

1. In a process for the vapor phase nitration of aromatic compounds where an aromatic compound-containing feed mixture is contacted with a nitrating agent in the vapor phase to produce the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst which consists essentially of:

a Group 4b-Group 3b mixed oxide composition represented by the empirical formula:

$$(M^1_aM^2_bO_c)_x(NO_2)_y$$

wherein M^1 is at least one element selected from Group 4b of the Periodic Table of the Elements, M^2 is at least one element selected from Group 3b of the Periodic Table of the Elements, a is 1, b is 0 to 20, c is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist in the composition, x is 1, and y is 0 to c.

4,628,132

COMPOSITION AND METHOD FOR INHIBITING FORMATION OF POLYMERS DURING GAS SCRUBBING OF MONOMERS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 23, 1984, Ser. No. 674,205
Int. Cl.[4] C07C *7/18*
U.S. Cl. 585—4 **13 Claims**

1. A polymerization inhibiting composition for vinyl monomers comprising an aqueous solution of a dialkyl amine of the formula RR'NH, a dialkylhydroxylamine of the formula RR'NOH, and an alkali metal salt of a tertiary-alkylcatechol wherein R and R' are the same or different and each is straight chain or branched alkyl having 2 to 10 carbon atoms, the amount of dialkylamine in the composition is greater than about 0.5 weight percent, and the tertiary-alkyl moiety of tertiary-alkylcatechol has a total of 4 to 21 carbon atoms.

4,628,133

PROCESS FOR THE PREPARATION OF HYDROCARBONS FROM A MIXTURE OF CO AND H_2

Johannes K. Minderhoud; Martin F. M. Post; Swan T. Sie, and Ernst J. R. Sudholter, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 666,527, Oct. 30, 1984. This application Sep. 23, 1985, Ser. No. 779,328
Claims priority, application Netherlands, Nov. 15, 1983, 8303910
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[4] C07C *27/08*
U.S. Cl. 585—310 **17 Claims**

1. A process for the preparation of C_9+ hydrocarbons from C_4- hydrocarbons present in a feed stream and C_8- hydrocarbons present in a recycle stream which comprises:

(1) passing C_4- hydrocarbons as a feed stream and C_8- hydrocarbons as a recycle stream to a steam reforming zone to steam reform said hydrocarbons into a mixture of carbon monoxide and hydrogen at a temperature of from

about 700° to 1000° C. and a pressure of from about 2 to about 25 bars in the presence of a steam reforming catalyst comprising an iron-group metal catalyst and, (2) passing at least a portion of said mixture of carbon monoxide and hydrogen from said steam reforming zone to a synthesis zone at an elevated temperature of about 125° to 350° C. and a pressure of from about 5–100 bar in in contact with a catalyst comprising 3–60 pbw cobalt and 0.1 to 100 pbw of at least a second metal selected from the group consisting of zirconium, titanium and chromium all per 100 pbw of a support selected from the group consisting of silica, alumina and combinations of silica and alumina, which catalyst has been prepared by impregnation or kneading and impregnating in accordance with:

$$(3 + 4R) > \frac{L}{S} > (0.3 + 0.4R),$$

wherein

L=the total quantity of cobalt present on the catalyst, expressed as mg Co/ml catalyst;

S=the surface area of the catalyst, expressed as m^2/ml catalyst; and

R=the weight ratio of the quantity of cobalt deposited on said support by impregnation to the total quantity of cobalt present on the catalyst;

to form a product of a mixture of C_9+ hydrocarbons, unconverted hydrogen, carbon monoxide, steam and a mixture of C_8- hydrocarbons, all of which is withdrawn and separated into (1) a liquid product stream comprising said C_9+ hydrocarbons and (2) a gaseous stream comprising said unconverted hydrogen, carbon monoxide, steam and C_8- hydrocarbons and recycling at least a portion of said gaseous stream as said recycle stream said carbon monoxide, steam, C_8- hydrocarbons and at least a portion of said unconverted hydrogen in the gaseous phase as said recycle stream.

4,628,134

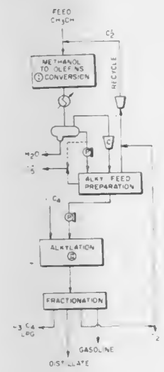
MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO ALKYLATED LIQUID HYDROCARBONS

Ronald M. Gould, Sewell, and Samuel A. Tabak, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 692,261, Jan. 17, 1985, Pat. No. 4,543,435, and a continuation-in-part of Ser. No. 733,994, May 14, 1985, Pat. No. 4,579,999. This application Sep. 23, 1985, Ser. No. 779,347

Int. Cl.⁴ C07C *1/20, 2/00*

U.S. Cl. 585—331 **19 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature and moderate pressure to convert at least a portion of the feedstock oxygenate to hydrocarbons containing a major fraction of C_2–C_4 olefins and a minor fraction containing C_5+ hydrocarbons;

(b) cooling and separating effluent from step (a) to provide an aqueous liquid byproduct stream, a heavy hydrocarbon liquid stream and a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

(c) compressing at least a portion of the olefinic light hydrocarbon stream to condense a liquid olefinic hydrocarbon stream rich in C_3–C_4 olefins and recovering an ethene-rich gaseous stream;

(d) further reacting the condensed liquid olefinic hydrocarbon stream from step (c) with isobutane in a secondary alkylation stage with acid catalyst to convert at least a portion of C_3–C_4 olefins to a heavier C_7+ liquid hydrocarbon product stream comprising alkylate gasoline; and

(e) recycling ethene in a gaseous stream to the primary catalytic stage.

4,628,135

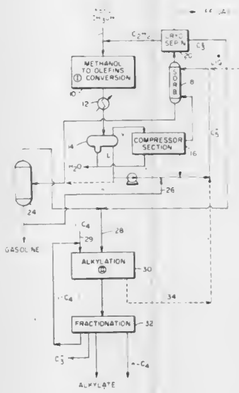
INTEGRATED PROCESS FOR CONVERTING OXYGENATES TO LIQUID HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,363

Int. Cl.⁴ C07C *1/20, 2/00*

U.S. Cl. 585—331 **12 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature to convert at least a portion of the feedstock oxygenate predominantly to an olefinic fraction rich in C_2–C_4 olefins and a minor heavy hydrocarbon portion containing C_5+ aliphatic and aromatic hydrocarbons;

(b) cooling and separating effluent from step (a) to provide an aqueous liquid byproduct stream, a heavy hydrocarbon liquid stream and a light hydrocarbon stream rich in C_2–C_4 olefins;

(c) compressing and contacting the light hydrocarbon stream in a sorption tower with a liquid hydrocarbon sorbent stream containing a major amount of said heavy liquid stream from step (b) to selectively sorb C_3+ components in a liquid sorbate stream;

(d) fractionating the sorbate stream to provide a gasoline-rich stream and a light hydrocarbon stream rich in C_3–C_4 olefins;

(e) further reacting the olefinic light hydrocarbon stream from step (d) with isoparaffin in a secondary alkylation stage in the presence of liquid phase acid catalyst to convert at least a portion of C_3–C_4 olefins to a heavier C_7+ liquid hydrocarbon product stream comprising alkylate gasoline;

(f) recycling ethene in a gaseous stream from the sorption tower to the primary catalytic stage for further conversion; and

(g) recycling a portion of gasoline from step (d) to step (c) for use as lean sorbent.

4,628,136

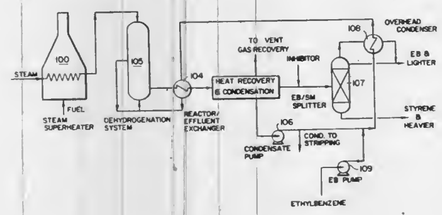
DEHYDROGENATION PROCESS FOR PRODUCTION OF STYRENE FROM ETHYLBENZENE COMPRISING LOW TEMPERATURE HEAT RECOVERY AND MODIFICATION OF THE ETHYLBENZENE-STEAM FEED THEREWITH

Helion H. Sardina, Waldwick, N.J., assignor to Lummus Crest, Inc., Bloomfield, N.J.

Filed Dec. 17, 1985, Ser. No. 809,913

Int. Cl.⁴ C07C *4/02*

U.S. Cl. 585—441 **11 Claims**



1. In a process for the production of styrene from the catalytic dehydrogenation of ethylbenzene in a dehydrogenation zone at elevated temperatures in the presence of steam, whereby the dehydrogenation effluent is cooled and then separated into three phases consisting of a gaseous phase comprising hydrocarbons, an aqueous phase comprising steam condensate, and an organic phase comprising crude styrene and unreacted ethylbenzene, and whereby said crude styrene is separated from said unreacted ethylbenzene by distillation and the styrene monomer product is recovered, the overhead from the distillation column for separating said crude styrene from said unreacted ethylbenzene being passed into a condenser into indirect heat exchange with a fluid comprising ethylbenzene and water passing through said condenser, the improvement comprising operating the ethylbenzene—water side of said condenser at a pressure between about 8 psia and about 25 psia; operating said column under conditions sufficient for its overhead to have a pressure in excess of about 100 mm mercury; said fluid comprising water and ethylbenzene and being vaporized during said indirect heat exchange into a gaseous mixture; and said gaseous mixture being passed into said dehydrogenation zone.

4,628,137

PROCESS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 452,471, Dec. 23, 1982, Pat. No. 4,496,662. This application Sep. 14, 1984, Ser. No. 650,398

Int. Cl.⁴ C07C *2/10*

U.S. Cl. 585—445 **6 Claims**

1. In a process of dehydrogenating para-ethyltoluene to selectively form para-methylstyrene comprising contacting the para-ethyltoluene under dehydrogenation reaction conditions with a catalyst composition consisting essentially of:

(a) from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of a potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% by weight of a chromium compound, calculated as chromic oxide,

the improvement wherein the process is conducted with a catalyst composition consisting essentially of, in addition to the components (a), (b) and (c), a modifying component (d) capable of enhancing the conversion of para-ethyltoluene when the modified catalyst is used to provide the preferential formation of para-methylstyrene from para-ethyltoluene, the modifying component (d) being a magnesium compound present to the extent of from about 1% to 15% by weight of the catalyst composition, calculated as magnesium oxide.

4,628,138

CATALYST AND PROCESS FOR OLIGOMERIZATION OF ETHYLENE

Kenneth W. Barnett, Worthington, and Mary J. Brown, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Columbus, Ohio

Filed Sep. 20, 1985, Ser. No. 778,143

Int. Cl.⁴ C07C *2/02*

U.S. Cl. 585—531 **15 Claims**

1. A method of oligomerizing an olefin comprising:

contacting said olefin with a nickel-omega zeolite catalyst at a pressure, temperature and for a time effective to cause oligomerization of said olefin;

said catalyst comprising

a nickelocene compound reduced onto an omega zeolite support in the presence an effective amount of a promoter;

wherein the nickelocene compound is selected from the group consisting of (R_a-η^5 cyclopentadienyl) (cyclopentadienyl) Ni and bis(R_a-η^5 cyclopentadienyl) Ni wherein R represents C_1–C_{10} alkyl and "a" represents 0–5; and

wherein the promoter is selected from the group consisting of an oxide of copper, nickel, iron and mixtures thereof.

4,628,139

BIS(1,5-CYCLOOCTADIENE)NI(O) CATALYST AND PROCESS FOR OLIGOMERIZATION OF ETHYLENE

Kenneth W. Barnett, Worthington, Ohio, assignor to Ashland Oil, Inc., Columbus, Ohio

Filed Sep. 20, 1985, Ser. No. 778,147

Int. Cl.⁴ C07C *2/02*

U.S. Cl. 585—531 **13 Claims**

1. A method of oligomerizing an olefin comprising:

contacting said olefin with a nickel zeolite catalyst at a pressure, temperature and for a time effective to cause oligomerization of said olefin;

said catalyst comprising

a bis(1,5-cyclooctadiene)Ni (O) compound deposited onto a zeolite support;

wherein the bis(1,5-cyclooctadiene)Ni(O) compound is selected from the group consisting of (R_a- 1,5-cyclooctadiene) (cyclooctadiene) Ni (O) and bis(R_a- 1,5-cyclooctadiene) Ni (O) wherein R represents C_1–C_{10} alkyl and "a" represents 0–8; and

wherein said zeolite support is selected from the group consisting of omega zeolites and type Y zeolites.

4,628,140

PROCESS FOR THE PRODUCTION OF DIENES FROM ALDEHYDES

Lawson G. Wideman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 3, 1986, Ser. No. 835,494
Int. Cl.[4] C07C *1/24, 1/253*
U.S. Cl. 585—606 **11 Claims**

1. In a process for the conversion of an aldehyde of 4 to 6 carbon atoms to the corresponding diene which comprises contacting the aldehyde in a vapor phase at a temperature of from 200° to 400° C. with a dehydration catalyst, the improvement comprising the addition of from 0.1to 5.0 percent by weight of an aromatic compound selected from the group consisting of phenol, catechol, alkylated catechol, resorcinol, hydroquinone and aniline; wherein the alkyl radical can be from 1 to 10 carbon atoms; to the aldehyde feed prior to contact with the dehydration catalyst.

4,628,141

FLEXIBLE CONDUIT FIXTURING

James M. Wieszeck, and Paul C. Wieszeck, both of Box 175, Salem, N.H. 03079

Filed May 28, 1985, Ser. No. 737,782
Int. Cl.[4] H01L *35/28, 35/02*
U.S. Cl. 136—233 **5 Claims**



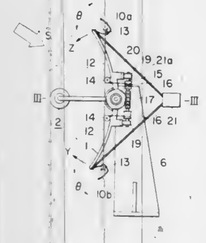
1. A thin wire temperature sensing device insertable in a cavity, said cavity having an element inserting end and a closed sensing end, a thin wire element sheathed in spirally convoluted flexible conduit adapted to be mounted in said cavity, and an open-ended, hollow cap adapted to be releasably lockably mounted on the cavity inserting end of said conduit, said cap having fixed therein a spiral spring having a plurality of convolutions interlaced with the convolutions of said conduit whereby constriction of said conduit upon locking of said cap grips said spring to immobilize said conduit relative to said cap.

4,628,142

SOLAR TRACKING MECHANISMS

Kenichi Hashizume, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1985, Ser. No. 712,539
Claims priority, application Japan, Mar. 19, 1984, 59-51103
Int. Cl.[4] H02N *6/00;* **F24J** *3/02*
U.S. Cl. 136—246 **10 Claims**



1. A solar collector including a tracking mechanism for continuously tracking the movement of the sun with time, comprising:

a solar radiant energy receiver secured to be rotatable about a rotating shaft which is supported by a base having a frame;

means connected to said solar radiant energy receiver for tracking the movement of the sun with time; and

means operatively connected to said sun tracking means for rotating said rotating shaft of said solar radiant energy receiver;

said sun tracking means comprising at least a pair of compound parabolic concentrators, each being secured to a horizontal edge of said solar radiant energy receiver in parallel to said rotating shaft, and shape memory alloy coils each having one end connected to one end of a respective said compound parabolic concentrator and located at a position coincident with a focal line of the respective compound parabolic concentrator.

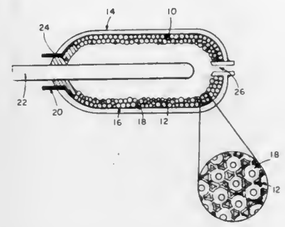
5. The solar collector according to claim 1, wherein said solar radiant energy receiver comprises a solar cell panel having a plurality of solar cell modules and a support frame for supporting said modules, and wherein said shape memory alloy coil includes means for shrinking into a memorized tightly wound-up coil shape when heated to a predetermined temperature, and wherein the other end of each said shape memory alloy coil is connected to one end of a tension wire, the other end of said tension wire being connected to said means for rotating said rotating shaft.

4,628,143

FOAMED NUCLEAR CELL

Gregory R. Brotz, 218 Pioneer Rd., Sheboygan, Wis. 53081

Filed Mar. 12, 1984, Ser. No. 588,344
Int. Cl.[4] H01L *31/04*
U.S. Cl. 136—253 **4 Claims**



1. An electric current generating cell comprising:

an open-cellular foamed semiconductor;

a vessel containing such open-cellular foamed semiconductor;

a continuous electroconductive layer formed around the outer sides of said open-cellular foamed semiconductor;

means to excite said semiconductor to produce electric current;

electrode means to carry said electric current outside said open-cellular foam semiconductor, said electrode means being further adapted to form said cells output terminals, said electrodes means including:

a first electrode entered into said vessel and surrounded by said open-cellular foam semiconductor;

a second electrode contiguous with said continuous electroconductive layer around said open-cellular foamed semiconductor; and

said means to excite said semiconductor including:

means to enter gas into said cell; and

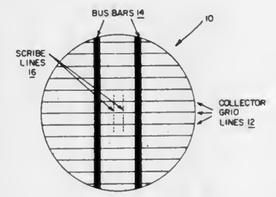
a gas entered into said cell through said means to enter gas to cause the production of electricity from said cell.

4,628,144

METHOD FOR CONTACT RESISTIVITY MEASUREMENTS ON PHOTOVOLTAIC CELLS AND CELL ADAPTED FOR SUCH MEASUREMENT

Dale R. Burger, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jun. 7, 1983, Ser. No. 501,909
Int. Cl.[4] H01L *31/04;* **G01R** *27/14*
U.S. Cl. 136—256 **11 Claims**



7. In a photovoltaic cell having a plurality of electrically interconnected grid contacts for collection of solar current generated by the cell, an improvement comprised of at least three parallel segments of said grid contacts electrically isolated for use in determining parameters of the cell by applying

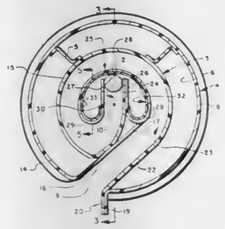
a constant current between a first pair of isolated segments and measuring voltage between a second pair of isolated segments, where said first and second pairs are selected from among said isolated segments and have at least one segment of each pair in common.

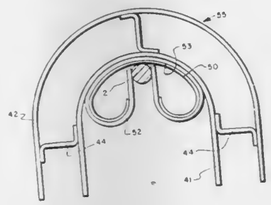
4,628,145

PROTECTIVE COVER FOR ELECTRICAL CONDUCTORS

Nestor Kolcio, 11500 Jerome Rd., Plain City, Ohio 43064, and Richard A. Peszlen, 5675 Lindenwood Rd., Columbus, Ohio 43229

Filed Nov. 22, 1985, Ser. No. 800,752
Int. Cl.⁴ H02G *1/02*; H01B *17/58*
U.S. Cl. 174—5 R **17 Claims**





1. An improved protective cover adapted to insulate an energized conductor including:

(a) an elongated tubular-shaped member formed by inner and outer housings of dielectric material, said housings being generally circular in cross-section and spaced generally concentric with respect to each other forming an air gap therebetween and being open at a lower side;

(b) spacer means extending between the housings for maintaining the air gap therebetween;

(c) a central sleeve of dielectric material extending generally throughout the longitudinal length of the inner housing and in cross-section having an upper curved portion with a concave surface forming a central space, with said curved portion terminating in an open lower side;

(d) a spiral passageway formed by portions of the inner housing and central sleeve extending from the open lower side of the inner and outer housings to the central space formed by said central sleeve to admit a conductor from the exterior of the tubular-shaped member to said central space for supporting the protective cover in a suspended position on a conductor; and

(e) conductive means provided on the concave surface of the central sleeve extending generally throughout the length of said sleeve adapted to contact an energized conductor when the protective cover is suspended on the energized conductor for increasing the electrical insulation in the vicinity of the energized conductor.

16. An improved protective cover adapted to insulate an energized conductor including:

(a) an elongated member formed by inner and outer housings of dielectric material forming an insulating air gap therebetween, said housings having a generally inverted U-shape in transverse cross section, with said inner housing having a central sleeve of dielectric material exiending generally throughout the longitudinal length of said inner housing;

(b) spacer means extending between the housings for maintaining the air gap therebetween; and

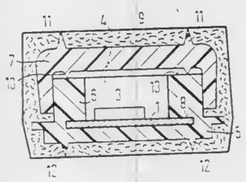
(c) conductive means provided on an inner surface of the central sleeve and extending generally throughout the length of said sleeve and adapted to contact an energized conductor for increasing the electrical insulation in the vicinity of the energized conductor.

4,628,146

CASING FOR ELECTRICAL COMPONENTS, COMPONENT ASSEMBLIES OR INTEGRATED CIRCUITS

Ernst Schmotz, Willing, and Hans Stelzl, Vaterstetten, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,057
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410787
Int. Cl.⁴ H05K *5/06*
U.S. Cl. 174—52 PE **6 Claims**



1. A casing for electrical components having an electrically active element where the electrically active element rests on a base strip which projects outgoing connectors through walls of the casing, the connectors providing mechanical and electrical connection to a printed circuit board, the casing comprising a thermosetting-plastic trough which adheres closely to the under surface of the base strip, and having side-walls each having a heel which rests on a border of the upper surface of the base strip, and a thermosetting-plastic lid which is positioned over the thermosetting-plastic trough to form an assembly, the electrically active element being contained in an enclosure of the assembly of thermosetting-plastic trough and lid, the assembly including the enclosed electrically active element being coated in thermosetting plastic.

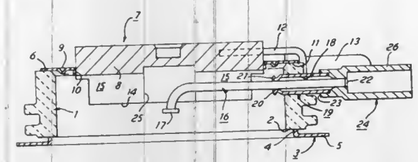
4,628,147

SEMICONDUCTOR HOUSINGS

Roger F. C. Bennett, Melksham, United Kingdom, assignor to Westinghouse Brake and Signal Company Limited, United Kingdom

Filed Apr. 22, 1985, Ser. No. 725,590
Claims priority, application United Kingdom, Apr. 27, 1984, 8410847
Int. Cl.⁴ H01L *23/02*
U.S. Cl. 174—52 P **6 Claims**

1. A semiconductor housing for a multi-terminal semiconductor device comprising a hermetically sealed enclosure bounded by a wall of electrically insulating ceramic material, said ceramic material having a first coefficient of expansion, said wall having an aperture and a hollow member passing through said aperture and extending on either side thereof, said hollow member having first and second hermetic seals on opposing end portions, said first and second hermetic seals being spaced from said wall, and a conductive wire passing through said hollow member and establishing a connection from inside said enclosure to connector means outside said enclosure, said hollow member being formed of material having a coefficient of expansion substantially equal to said first coefficient of expansion, said hollow member being hermetically sealed to said wall within said aperture, said first and second hermetic seals being formed by high temperature brazing, said hollow member being circumferentially spaced from said conductive wire between said hermetic seals, thereby forming an electrical connection of high strength, yet sufficiently resilient to withstand thermal cycling stresses and maintain said hermetic seals about said hollow member.

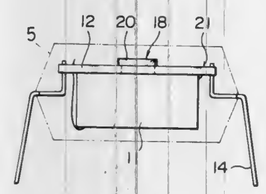


4,628,148

ENCAPSULATED ELECTRONIC CIRCUIT

Kunihisa Endou, Kawagoe, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 715,177
Claims priority, application Japan, Mar. 27, 1984, 59-43929[U]; Mar. 27, 1984, 59-43930[U]
Int. Cl.⁴ H01F *27/02*
U.S. Cl. 174—52 PE **7 Claims**



1. An electronic component device comprising: a component body including at least one coil and having leads attached thereto; a protecting elastic body in which said component body is entirely embedded, the leads of said component body passing through said elastic body and outside thereof; a base plate having side portions; means for coupling said protecting elastic body and said base plate, said coupling means being provided on said protecting elastic body and on said base plate; external terminals attached to said side portions of said base plate and electrically connected to said leads; said external terminals having free end portions; and encapsulation means surrounding said base plate and said protecting elastic body; the free end portions of said external terminals extending outside said encapsulation.

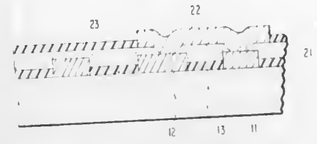
4,628,149

SUBSTRATE HAVING A PATTERN OF AN ALLOY OF GOLD AND A NOBLE AND A BASE METAL WITH THE PATTERN ISOLATED BY OXIDES OF THE NOBLE AND THE BASE METALS

Akihiro Dohya, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,097
Claims priority, application Japan, Nov. 30, 1981, 56-190518; May 17, 1982, 57-82917
Int. Cl.⁴ H05K *1/09*
U.S. Cl. 174—68.5 **4 Claims**

1. A wired substrate comprising a substrate having an insulating surface, a conductive pattern directly on said insulating surface, and an insulating layer which lies directly on said insulating surface and contiguous to said conductive pattern and is thinner than said conductive pattern, wherein said conductive pattern is formed of an alloy consisting essentially of gold, a first metal selected from the group consisting of titanium, aluminum and copper and a second metal selected from the group consisting of palladium, ruthenium and rhodium, said first and second metals being included in said alloy in a total amount less than said gold and said insulating layer is formed of a mixture of oxides of said first and second metals.

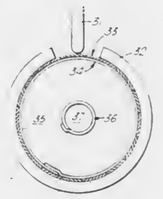


4,628,150

BONDING AND BONDED PRODUCTS

Penelope J. V. Luc, Great Bookham, England, assignor to Luc Technologies Limited, London, England

Filed Jul. 25, 1983, Ser. No. 516,910
Claims priority, application United Kingdom, Jul. 27, 1982, 8221702; Jul. 30, 1982, 8222100
Int. Cl.⁴ B23K *1/02, 20/12*; H01R *43/02*
U.S. Cl. 174—88 C **19 Claims**

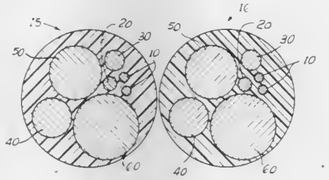


1. An electrical assembly including a first electrical or electronic component with a first plurality of conductors disposed in a first linear array and further including a second electrical or electronic component with a second plurality of conductors disposed in a second linear array, the conductors of said first linear array being aligned with and bonded to respective conductors of said second linear array, the bonding between the conductors being achieved by a friction bonding process wherein a rotating friction wheel in contact with an outer surface of one of said first and said second component is translated along a linear path to bond the conductors of said first array one after the other to the respective conductors of said second array, the conductors of said first array being in contact with the respective conductors of said second array during the translation of said friction wheel, the bonds between the conductors of said first array and the respective conductors of said second array being permanent conductive metallurgical bonds.

2. An electrical assembly of at least two components having predetermined forms and including an end portion of an outer conductor of an electrical cable and a cable jointing element bonded to one another, a surface of one of said components extending along the length thereof overlapping a surface of the other of said components extending along the length thereof, said cable jointing element being bonded to said outer conductor along the overlapping surfaces of said components by a friction bonding process wherein a relative rubbing movement is produced between a rotating friction wheel and an outer surface of one of said components facing away from an interface between said components while substantially maintaining the predetermined forms of said components, whereby a per-

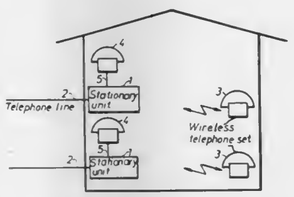
manent conductive metallurgical bond is formed between said components.

4,628,151
MULTI-STRAND CONDUCTOR CABLE HAVING ITS STRANDS SIZED ACCORDING TO THE GOLDEN SECTION
George F. Cardas, 1158 N. Columbia, Ontario, Calif. 91764
Filed Dec. 30, 1985, Ser. No. 814,727
Int. Cl.[4] H01B *7/00, 11/00*
U.S. Cl. 174—114 R **9 Claims**



1. A multi-strand conductor cable comprising a plurality of individual conductors insulated from one another wherein the plurality of conductors is characterized by having at least one conductor of each of at least three different diameters wherein the ratio of one diameter to the next larger diameter is approximately as the ratio of the next larger diameter is to the sum of the one diameter and the next larger diameter.

4,628,152
METHOD AND APPARATUS FOR TRANSMISSION OF TELEPHONE CALLS TO A PORTABLE, WIRELESS TELEPHONE SET
Dag E. Akerberg, S-17563 Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Aug. 11, 1983, Ser. No. 522,410
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—51 **14 Claims**

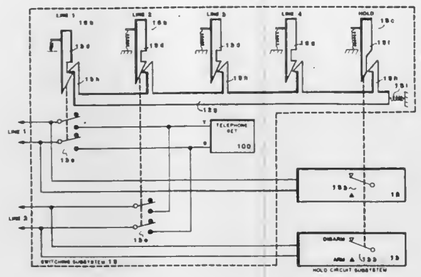


1. A method of coupling a stationary unit, said unit being provided with a radio transmitter and a radio receiver and connected to a telephone line, with a coacting portable, wireless telephone unit provided with a radio transmitter and a radio receiver at a relatively short distance from the stationary unit, the method comprising the steps of

independently searching by means of the radio receiver belonging to a first of the coacting units and a channel selector connected to said receiver for a usable radio speech channel among radio speech channels common to at least the pair of coacting units, said channels having respective numbers, and

sending, on a radio signalling channel to the second of the coacting units, a coded call from the first unit and the number of the usable radio speech channel, the signalling channel being an unvarying radio signalling channel common to the pair of units.

4,628,153
STAND-ALONE KEYPHONE SYSTEM
Marshall Daly, 740-A Cieneguitas St., Santa Barbara, Calif. 93110
Filed Dec. 17, 1984, Ser. No. 682,194
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—163 **12 Claims**



1. A stand-alone keyphone system comprising:

A. a telephone set,

B. a key adapter set integrally connected to said telephone set where said key adapter set comprises:

(1) a switching subsystem further comprising:

(a) a mechanically latched pushbutton assembly further comprising:

(1) a plurality of telephone line pushbuttons that provide the means to allow said telephone set to be connected to any of the telephone lines connected to said system,

(2) a hold pushbutton section that when pressed, disconnects said telephone set load from the circuit and connects a hold load onto the circuit that places the selected telephone line in a hold status, where said hold pushbutton section includes a non-latching straight post having an upper override camming slope extending outwardly from upper part of said post,

(b) a telephone line connect switch connected to each telephone line where switch is mechanically linked and actuated by the respective said telephone pushbutton where when said switch is closed by said telephone pushbutton an electrical contact is made that allows said telephone set to be connected to the corresponding telephone line,

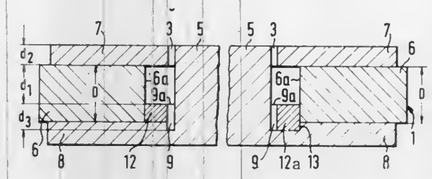
(2) a plurality of hold circuit subsystem means where each of said hold circuit subsystem means allows said telephone set to be temporarily disconnected from the telephone line selected by said switching means,

(3) a line status display subsystem means that monitors and displays the status of each of said telephone lines connected to said key adapter set, and

C. a system power supply having means to supply said system with required voltages and currents.

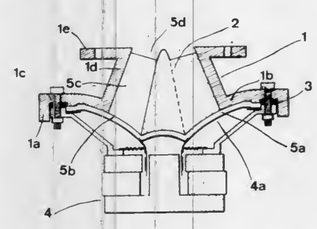
4,628,154
ANNULAR GAP MAGNET SYSTEM, PARTICULARLY FOR LOW FREQUENCY LOUDSPEAKERS
Eckehard K. Kort, Lichtenhagen 28, 3251 Ottenstein 2, Fed. Rep. of Germany
Filed Dec. 23, 1982, Ser. No. 452,769
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151530; Sep. 17, 1982, 8226166[U]
Int. Cl.[4] H04R *9/02*
U.S. Cl. 381—189 **9 Claims**

3. An annular gap magnet system, particularly for low frequency loudspeakers, comprising a moving coil moveable in the working air gap, said working air gap having an outer diameter, a cylindrical pole core of soft iron; an annular permanent magnet arranged at a distance from said pole core; a first pole plate which limits the outer diameter of the working air gap; a second pole plate contacting said pole core and having a cross-section, said annular permanent magnet being positioned between said first and second pole plates, said second pole plate being at a distance from said first pole plate which is at least equal to the thickness of said first pole plate, wherein a braking air gap is formed surrounding said pole core adjacent to said second pole plate as an axial extension of the working



air gap, wherein said braking air gap extends into said second pole plate for decreasing the cross-section of said second pole plate below the bottom of said braking air gap to produce a magnetic resistance, wherein there is a magnetic flux through the braking air gap and a stray flux above the braking air gap, both fluxes directed opposite to a magnetic flux in the working air gap and also oppositely to a stray flux below the working air gap, wherein the flux in the braking air gap is at least equal in magnitude to the stray flux below the working air gap.

4,628,155
ELECTROACOUSTIC MOTOR FOR HORNS
Philippe Robineau, 51 rue Truffaut, 75017 Paris, and Eric Vincenot, 12, rue Léon Giraud, 75019 Paris, both of France
Continuation of Ser. No. 397,194, Jul. 12, 1982. This application Oct. 19, 1984, Ser. No. 662,508
Int. Cl.[4] G10K *13/00*
U.S. Cl. 381—156 **22 Claims**



1. An acoustic adaptor for acoustically and mechanically coupling a selected horn to a direct radiation cone type speaker including a diaphragm flaring towards and attached to a rim of a speaker chassis, said acoustic adaptor comprising:

means for center said adaptor with respect to the axis of the speaker;

sealing means defining a fluid-tight connection between the speaker chassis rim and said adaptor;

means for securing the speaker chassis to said adaptor;

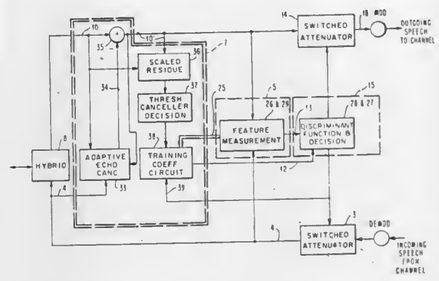
a tapered annular portion of configuration complementary to an outer annular zone of the diaphragm for defining with the outer annular zone part of a compression chamber;

a projecting tubular portion extending from the radially inner periphery of said tapered annular portion and having an input orifice defined within said tapered annular portion and an output orifice at an end remote from said tapered annular portion for communication with a horn; and

means at the end of said tubular portion adjacent said output orifice for mounting said adaptor to the horn.

5. The acoustic adaptor according to claim 1, wherein said sealing means is accommodated in a recess adapted to face a flat sealing surface on the speaker chassis rim.

4,628,156
CANCELLER TRAINED ECHO SUPPRESSOR
David R. Irvin, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 27, 1982, Ser. No. 453,322
Int. Cl.[4] H04B *3/20*
U.S. Cl. 379—410 **3 Claims**



2. An improved echo control means for a multiple voice link speech coder communication system comprising:

a plurality of voice links;

a speech coder;

at least one trainer means comprising an adaptive echo canceller connectable individually to each said voice link;

a suppressor circuit connected to each said voice link;

a monitor means connected to each said voice link for obtaining signal feature measurements thereof and individually supplying said feature measurements to said trainer means and to the respective suppressor circuit connected to each respective voice link;

said trainer means utilizing said feature measurements from each said voice link and, responsive thereto, generating control coefficients for each suppressor circuit connected to each said voice link; and

means for supplying said control coefficients to each said suppressor circuit connected to each said voice link.

4,628,157
BIDIRECTIONAL ADAPTIVE VOICE FREQUENCY REPEATER
Christopher P. Chance, Winston-Salem; Ralph P. Coble, Jr., Greensboro; Edwin C. Ingle, Jamestown, and Joye A. Jones, Greensboro, all of N.C., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 7, 1984, Ser. No. 648,327
Int. Cl.[4] H04B *3/20*
U.S. Cl. 379—410 **10 Claims**

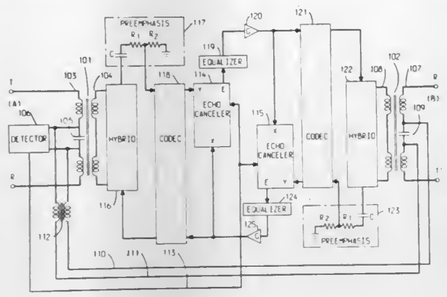
1. A signal transmission network including:

at least first means adapted to connect said transmission network to at least a first bidirectional transmission facility;

at least first echo canceler means for cancelling echo signals resulting in said transmission network because of said first bidirectional transmission facility, said echo canceler means including signal processor means for generating a predetermind number of amplitude coefficients which form an impulse response characteristic, said signal processor means being adapted to be supplied with an input signal and being responsive to an error signal for generating an estimate of an echo signal to be canceled by adjusting said impulse response characteristic, and means for algebraically combining said echo signal estimate with an outgoing signal to generate said error signal; and

at least first preemphasis means comprising a high pass filter

supplied with signals incoming to said at least first echo canceler means for shaping low frequency signal components as a function of energy in said incoming signals within a voice frequency pass band to obtain a prescribed low frequency roll-off function for voice frequency trans-



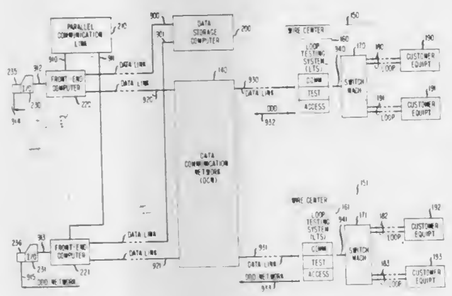
mission within said voice frequency pass band so that said amplitude coefficients form an impulse response characteristic to generate said echo signal estimate without being responsive to excessive low frequency components in said incoming signals.

4,628,158

STORED PROGRAM CONTROLLER

Harvey Rubin, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,175
Int. Cl.[4] H04J *3/14;* **H04M** *3/22*
U.S. Cl. 379—10 **12 Claims**
MICROFICHE APPENDIX INCLUDED
(42 Microfiche, 2554 Pages)



1. In a data communications or telephone system, a controller for processing a series of request messages received over an input bus and for distributing corresponding command messages of predetermined types derived from each of said request messages over output busses connected to said controller, said controller comprising

microprocessor means (e.g., **2045**) having an accessible memory, interrupt processing circuitry (**510**) including an interrupt processing routine to signal the completion of events and a multitasking operating system including means for scheduling, according to a predetermined priority, corresponding tasks to be initiated as a result of said completion of events,

input means (e.g., **2070**), connected to said input bus and serviced at interrupt level by said microprocessor means, for assembling said command messages by interpreting each of said request messages, for storing said command messages in allocated buffers in said memory and for signaling message-complete events, and

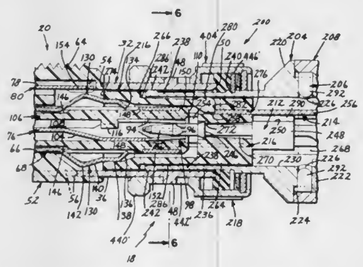
output means (e.g, **2045**), connected to said output busses and serviced at interrupt level by said microprocessor means, said output means including a task processor associated with each of said command message types for accessing an associated one of said buffers as directed by said microprocessor means, for extracting said corresponding command message, and for formatting and transmitting each said corresponding command message over one of said output busses.

4,628,159

ELECTRICAL CONNECTOR APPARATUS

James C. Deitch; Nels E. Kemppainen, both of Bloomington; James D. Bradley, Mound, and George B. Pfeffer, Minnetonka, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Nov. 6, 1984, Ser. No. 668,754
Int. Cl.[4] H01R *19/00*
U.S. Cl. 200—51.05 **10 Claims**



1. A jack for mounting on a circuit board, said jack for receiving one of a first plug and a second plug, said first plug having one first plug conductor and a first plug ground, said second plug having a pair of second plug conductors and a second plug ground, said jack comprising:

a housing having a base and a barrel;

first and second jack conductors;

means for supporting said first and second jack conductors with respect to said housing, said supporting means supporting said first and second jack conductors at one end for protrusion from said base of said housing for mounting on said circuit board, said supporting means supporting said first and second jack conductors at a second end within said barrel, said supporting means including means for insulating said first and second jack conductors from one another; and

means for maintaining ground continuity with one of said first plug ground and said second plug ground of said one of said first and second plugs when said one of said first and second plugs is received by said jack, said first conductor including means for switching between open and closed continuity positions with said ground continuity means, said switching means being closed when said first plug is received by said jack, said switching means being open when said second plug is received by said jack;

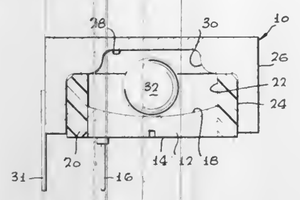
whereby said first jack conductor is in continuity with said one first plug conductor of said first plug and said second jack conductor is in continuity with said ground continuity means when said first plug is received by said jack and said first and second jack conductors of said jack are in continuity with said pair of second plug conductors of said second plug and said first jack conductor is disconnected from said ground continuity means when said second plug is received by said jack.

4,628,160

ELECTRICAL TILT SWITCH

Ronald D. Canevari, Panorama City, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 28, 1985, Ser. No. 791,829
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R **4 Claims**



1. An electrical tilt switch including a pair of electrical contacts and moveable means for making and breaking electrical continuity between said contacts,

characterized in that said switch comprises a generally cylindrical cap member having a ridge extending internally of its internal sidewall and spaced a significant distance from its bottom edge such that said sidewall extends only a part of the height of said cap member, the internal top surface of said cap extends only a part of the distance from its center toward said internal sidewall, and a radially inwardly extending surface extends from said internal sidewall, said ridge being form in a generally "S" shaped convex surface from said top surface to said radially inwardly extending surface,

a generally cylindrical base having an upper face having a smooth concave dished surface,

an annular insulating member of generally cylindrical shape having an internal surface fastened to said base member and an external surface fastened to the internal sidewall of said cap member,

electrical leads attached to said cap and base members, and

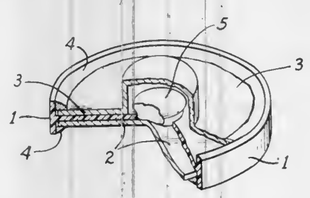
a spherical contact member carried on said concave dished surface and moveable against said ridge when said switch is tilted from the vertical by a specified amount, thereby closing said switch.

4,628,161

DISTORTED-POOL MERCURY SWITCH

James D. Thackrey, 13852 Dall La., Santa Ana, Calif. 92705

Filed May 15, 1985, Ser. No. 734,597
Int. Cl.[4] H01H *35/02*
U.S. Cl. 200—61.47 **1 Claim**



1. A multidirectional miniature mercury tilt switch with axial terminals, comprising:

a pool of mercury, and

a disc-shaped lower terminal on which said pool of mercury rests when the switch is level, and

an insulating separator having a first portion into which said disc-shaped lower terminal fits, a second portion into which an upper terminal fits, and a third portion comprising a circular central web of which the center is open, the open center being smaller in diameter than said pool of mercury and the central web portion covering the upper surface of said disc-shaped lower terminal except for the open center at which, due to the thickness of the central web portion, said pool of mercury rests, and

said upper terminal shaped generally like a hat, having a rim portion and a head cavity portion, the outside of the rim portion fitting into said second portion of said insulating separator, the sidewall of the cavity portion being of slightly larger diameter than that which said pool of mercury has when the switch is not tilted, and the top closure being far enough above the rim, that is the cavity portion being of sufficient depth, to completely contain said pool of mercury when the switch is inverted, and

sealing means to seal the rim portions of said upper terminal and said lower terminal to said insulating separator,

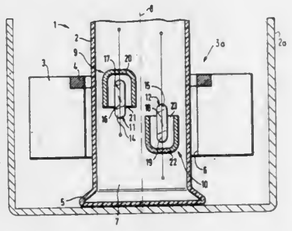
whereby said pool of mercury distorts when the switch is tilted, touching the sidewall of the cavity in said upper terminal and closing the switch.

4,628,162

FLUID LEVEL INDICATOR FOR A RESERVOIR

Hans-Dieter Reinartz, Frankfurt am Main, and Helmut Steffes, Eschborn, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,037
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410858
Int. Cl.[4] H01H *35/18*
U.S. Cl. 200—84 C **4 Claims**



1. A fluid level indicator for a master cylinder reservoir comprising:

a float mounted on said reservoir for movement in response to changes in the level of fluid in said reservoir;

a magnet mounted to said float at a predetermined location therein for creating a magnetic field;

a contact switch assembly including a magnetically operable reed contact adapted to be electrically coupled to an electrical circuit and a magnetic field shield around said reed contact, said shield including an opening, said reed contact and said shield affixed together with said opening disposed at a constant first predetermined position relative to said reed contact providing for passage of said magnetic field therethrough to operate said reed contact, and said contact switch assembly is fixedly mounted within said reservoir with said opening in said shield disposed at a second predetermined position relative to said reservoir, said first predetermined position of said opening and said second predetermined position of said opening defining a desired fluid level in said reservoir.

4,628,163

POWER SWITCH

Teijiro Mori; Yuichi Wada, both of Hyogo; Masahiro Kakizoe, Aichi; Shigeru Masuda, Aichi, and Shizutaka Nishizako, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

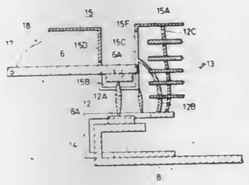
PCT No. PCT/JP84/00578, § 371 Date Aug. 7, 1985, § 102(e) Date Aug. 7, 1985, PCT Pub. No. WO85/02711, PCT Pub. Date Jun. 20, 1985

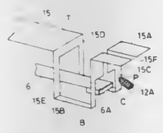
PCT Filed Dec. 7, 1984, Ser. No. 767,293

Claims priority, application Japan, Dec. 7, 1983, 58-231136; Dec. 7, 1983, 58-231140; Mar. 19, 1984, 59-53103; Mar. 19, 1984, 59-53106

Int. Cl.⁴ H01H *33/08*

U.S. Cl. 200—144 R **6 Claims**





1. A power switch comprising a fixed contact member **8**, a fixed contact **8A** joined to the fixed contact member **8**, a movable contact member **6**, a movable contact **6A** joined to the movable contact member **6** and movable into and out of contact with said fixed contact **8A**, a commutation electrode **15** having a first plate **15A** extending parallel to the surface of said fixed contact **8A** and spaced a prescribed distance from said fixed contact member **8**, a second plate **15B** extending parallel to the surface of said fixed contact **8A** and positioned between the surface **6C** of said movable contact member **6** to which no movable contact **6A** is joined and said fixed contact member **8** at the time said movable contact **6A** and said fixed contact **8A** are separated, a third plate **15C** connecting said first and second plates **15A**, **15B** to each other, a fourth plate **15D** extending from said second plate **15B** in the direction in which said movable contact **6A** is separated, and a recess **15E** defined in a portion confronting said movable contact **6A** and extending from said second plate **15B** to said third plate **15C** and from said second plate **15B** to said fourth plate **15D**, and a plurality of metal extinguishing plates **13** disposed parallel to the surface of said fixed contact member **8** and between said fixed contact member **8** and said first plate **15A**.

4,628,164

ARC CONTACT SYSTEM FOR ELECTRICAL CIRCUIT BREAKERS, IN PARTICULAR OF THE TYPE USING AN ARC EXTINGUISHING FLUID

Gianpietro Talpo, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

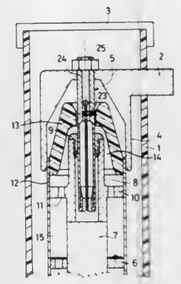
Filed Jan. 30, 1985, Ser. No. 696,524

Claims priority, application Italy, Feb. 10, 1984, 20810/84[U]

Int. Cl.⁴ H01H *33/88*

U.S. Cl. 200—148 A **11 Claims**

1. An arc contact system for electrical circuit breakers, particularly of the type using an arc extinguishing fluid, comprising a stationary elongated generally cylindrical stationary contact of a predetermined exterior circumference and a movable tubular contact of an interior circumference corresponding generally to said exterior circumference; means mounting said contacts for relative sliding telescopic movement between a first position at which said stationary contact is inserted within said movable contact a predetermined maximum axial extent, a second position at which said contacts are axially spaced from each other and at least a third intermediate position between the first and second positions at which said stationary contact is within said movable contact at an axial distance less than said predetermined maximum axial extent; a nozzle in spaced surrounding relationship to said movable tubular contact and said stationary contact at least in said first and third positions and defining therewith a generally annular



gas chamber, an opening in said nozzle coaxial with and spaced from an end portion of said movable tubular contact through which said stationary contact passes, said movable tubular contact end portion carrying arc resistant material, and passage means formed along said stationary contact extending from a free end portion thereof for an axial length greater than said third intermediate position distance for dispersing compressed gas, prior to said contacts reaching said second position upon relative movement from said first position and while said stationary contact is within said nozzle opening, from said annular gas chamber through said passage means beyond said nozzle.

4,628,165

ELECTRICAL CONTACTS AND METHODS OF MAKING CONTACTS BY ELECTRODEPOSITION

Fred I. Nobel, Sands Point; James L. Martin, Merrick, and Michael P. Toben, Smithtown, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Filed Sep. 11, 1985, Ser. No. 774,634

Int. Cl.⁴ H01H *1/02;* **C25D** *3/56, 5/10*

U.S. Cl. 200—268 **21 Claims**

1. A method for increasing the ductility and reducing the porosity or tendency for cracking in a dual layer palladium alloy electrodeposit upon a substrate which comprises:

electrodepositing a first layer of a palladium/nickel or palladium/cobalt alloy comprising between about 20 and 95 weight percent palladium and between about 5 and 80 weight percent nickel or cobalt upon the substrate in a thickness of at least about 0.5 microinches to increase the ductility and reduce the porosity and tendency for cracking of the dual layer electrodeposit; and

electrodepositing a second layer of palladium or a palladium/silver alloy upon said first layer in a thickness of greater than about 5 microinches for use as an electrical contact, said second layer having a thickness greater than said first layer.

4. A palladium or palladium/silver electrical contact comprising a substrate and a dual layer electrodeposit comprising at least about 0.5 microinches of a first layer of a palladium/-nickel or palladium/cobalt alloy comprising between about 20 and 95 weight percent palladium and between about 5 and 80 weight percent nickel or cobalt and greater than about 5 microinches of a second layer of palladium or a palladium/silver alloy; said second layer being thicker than said frist layer and

providing the electrical characteristics of the electrical contact.

4,628,166

SEALED SLIDE SWITCH

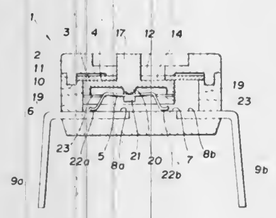
Hideyuki Bingo, Uji; Takashi Yoshimura, Mishima; Masatsuga Yamashita, Kyoto; Shinichi Hashizume, Kusatsu, and Norio Iwakiri, Otokuni, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 18, 1984, Ser. No. 651,761

Claims priority, application Japan, Sep. 19, 1983, 58-173946; Sep. 19, 1983, 58-145162[U]; Sep. 19, 1983, 58-145163[U]; Sep. 21, 1983, 58-147164[U]

Int. Cl.⁴ H01H *9/04*

U.S. Cl. 200—302.1 **4 Claims**



1. A slide switch, comprising:

(a) a casing formed in a hollow box shape with an open top;

(b) a plurality of fixed contacts disposed on an internal bottom surface of said casing;

(c) a plurality of terminals extending outside of said casing, each one of said terminals being electrically connected to one of said fixed contacts;

(d) a cover mounted to close said open top of said casing, said cover comprising a hole opposed to said fixed contacts;

(e) a slide member disposed inside said casing, comprising a control portion protruding out through said hole in said cover;

(f) a movable contact portion made of a resilient electrically conducting material which has at least one leg portion directed toward said internal bottom surface of said casing such that said movable contact portion is elastically loaded against said internal bottom surface of said casing to thereby produce a biasing force on said slide member to impel it in a direction toward said cover;

(g) said movable contact portion being slidable with said control portion of said slide member to selectively electrically connect said leg portion of said movable contact portion with said fixed contacts to connect a combination of said fixed contacts with each other;

(h) a seal member interposed between an internal side of said cover and a side of said slide member facing said internal side of said cover, said seal member being squeezed between said slide member and said cover to provide a seal between an inside of the casing and outside thereof, a periphery of said seal member being clamped between said cover and said casing.

4,628,167

APPARATUS FOR INDUCTIVELY HARDNEING THE INTERIOR SURFACE OF OBJECTS

William D. West, Warren, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Jun. 27, 1985, Ser. No. 749,525

Int. Cl.⁴ H05B *6/38*

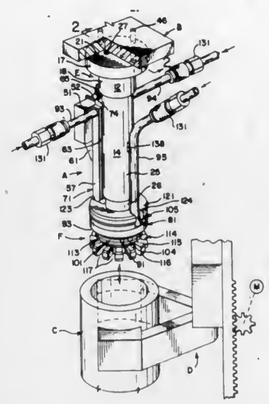
U.S. Cl. 219—10.57 **16 Claims**

1. An inductor and quench head apparatus for heat treating elongated bores of substantially uniform cross-sectional shape comprising:

a mandrel including a mounting base, an intermediate shaft portion, a downwardly facing surface and a pilot shaft portion of substantially constant cross-sectional shape;

an inductor module comprising:

an inductor coil, means supplying electrical current to said inductor coil, quench means dispensing quench fluid near said inductor coil and means supplying fluid to said



quench means, said inductor module having a central aperture slightly larger in cross-section than said pilot shaft portion and an upwardly facing surface;

said inductor module being releasably fixed to said mandrel by a first fastener means with said central aperture engaging said pilot shaft, and said upwardly facing surface engaging said downwardly facing surface.

4,628,168

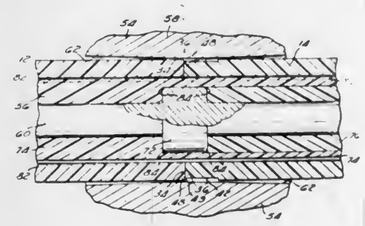
DIELECTRIC HEATING DEVICE FOR HEATING CANNULA MEMBERS

Perry A. Nebergall, Laguna Hills, and Robert C. French, El Toro, both of Calif., assignors to Shiley, Inc., Irvine, Calif.

Division of Ser. No. 463,029, Feb. 1, 1983, Pat. No. 4,547,641, which is a division of Ser. No. 149,568, May 14, 1980, Pat. No. 4,419,095. This application Aug. 5, 1985, Ser. No. 762,268

Int. Cl.⁴ H05B *6/54*

U.S. Cl. 219—10.81 **7 Claims**



1. A dielectric heating device, comprising:

an annular outer electrode for generating a high frequency electrical current to heat the mated ends of a cannula member and a radiopaque tip, thereby joining said mated ends at a joint to form a unitary, integral cannula for insertion into the body of a patient, said outer electrode positioned over said cannula proximate said joint so that the interior surface of said outer electrode closely surrounds said cannula, said interior surface comprising:

a mid-section positioned generally adjacent said joint, the inner diameter of said mid-section closely approximating the outer diameter of said cannula providing means for

concentrating said heat at said joint and forming a substantially smooth exterior surface on said cannula; and

tapered end sections having gradually increasing inner diameters just slightly larger than said inner diameter of said mid-section for providing air vent means for permitting the escape of air from the vicinity of said joint and for preventing the burning of said cannula;

an elongate inner electrode inserted within said cannula so as to be generally opposite said outer electrode, said inner electrode having an enlarged section located generally at said joint for concentrating said heat at said joint;

insulation means encapsulating said inner electrode for (i) preventing said cannula from burning and (ii) forming an inner mandrel, the outer diameter of said inner mandrel closely approximating the inner diameter of said cannula for forming a substantially smooth interior surface on said cannula, said mandrel including groove means for venting air from the vicinity of said joint and preventing the burning of said cannula;

means for conducting high frequency electrical current through said electrodes and said mated ends of said cannula to heat said mated ends; and

means for exerting an axial force on said tip for eliminating irregularities inthe mating surfaces of said cannula member and said tip and for fusing said mating surface together to form said unitary, integral cannula.

4,628,169

MINI ELECTRICAL SYRINGE NEEDLE DESTROYER

Hsieh Ch'ing-Lung, 113, 5th F., Section 5, Yen-Ping N. Road, Taipei, Taiwan

Filed Nov. 16, 1983, Ser. No. 552,324
Int. Cl.⁴ B23H *9/00;* **H05B** *3/00*
U.S. Cl. 219—68 **1 Claim**



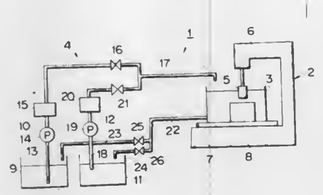
1. A destruction device for a flanged needle head attached to a syringe, the device including a casing having a top wall provided with a needle head insertion opening, electric circuit means associated with the casing including a pair of electrodes within the casing under the needle head insertion opening, the electrodes being mutually located for receiving a needle portion of a needle head inserted in the opening therebetween whereby a short circuit is created between the electrodes for melting the needle portion, and the casing further including separator means for disconnecting the needle head with melted needle portion from the syringe, and collector means into which the separated needle head falls, wherein the separator means comprises an elongate guide track in the top wall of the casing extending from the needle head insertion opening, the guide track having downwardly inclined side walls for receiving the needle head flange thereunder after melting of the needle portion whereby sliding of the needle head along the guide track effects separation of the needle head from the syringe.

4,628,170

EDM USING TWO SEPARATE DIELECTRIC FLUIDS AND A SYSTEM FOR MAINTAINING SEGREGATION OF THE FLUIDS

Toshihiko Furukawa, Yamato, Japan, assignor to Sodick Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1982, Ser. No. 352,975
Claims priority, application Japan, Mar. 17, 1981, 56-037314
Int. Cl.⁴ B23H *1/10, 7/36;* **B01D** *17/025*
U.S. Cl. 219—69 D **10 Claims**



5. An apparatus for electric discharge machining in which electric discharge machining is carried out as a dielectric fluid is fed to a machining gap between a workpiece and a tool electrode, comprising:

a feed-oil system having an oil tank;

a feed-water system having a water tank;

a feeding means for selectively feeding water or oil as the dielectric fluid to said machining gap by selecting said feed-water system or said feed-oil system; and

means for returning the dielectric fluid used in said machining gap to the corresponding tank and

a dielectric fluid recovery device for separating and recovering the dielectric fluid, wherein said dielectric fluid recovery device comprises a separate tank for separating the oil and the water into an upper layer and a lower layer, a first feeding means for sending the fluid near the bottom of said dielectric fluid in said oil tank to said separating tank, a second feeding means for sending the fluid at near the surface of said dielectric fluid in said water tank to said separating tank, the second feeding means including an oil-removing device for removing the oil floating on the surface of the water in the water tank, and means for recovering the oil and the water by separation in said separating tank and returning them to said oil tank and said water tank respectively.

4,628,171

MECHANICAL FEED EDM MACHINE FOR MAKING THREADED AND NONTHREADED BORES

Lloyd E. Colby, and John E. Ingalls, both of Whitehall, Mich., assignors to Port City Machine & Tool Company, Muskegon Heights, Mich.

Filed Jan. 11, 1985, Ser. No. 690,534
Int. Cl.⁴ B23H *1/00, 7/26;* **B23G** *1/16*
U.S. Cl. 219—69 G **19 Claims**

1. An electrical discharge machining device for producing variously sized, threaded apertures with corresponding, threaded cutting electrodes, comprising:

a normally stationary support member;

a carriage mounted on said support member for generally longitudinal translation therealong;

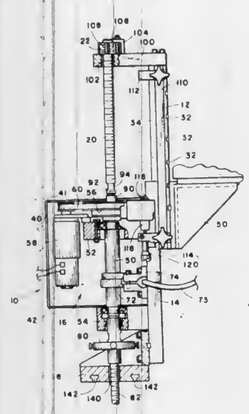
a drive shaft, having first and second ends, and being mounted on said carriage for generally axial rotation thereon;

a motor mounted on said carriage, and operably coupled to said drive shaft for axially rotating said drive shaft;

a threaded lead screw for translating said carriage with respect to said stationary support member; said lead screw having first and second ends, with the first end of said lead screw removably and interchangeably coupled to the first end of said drive shaft; said lead screw having a predetermined thread pitch corresponding to the pitch of the threaded aperture to be formed;

a lead screw guide removably and interchangeably mounted on said stationary support member, and having a threaded aperture therethrough in which said threaded lead screw is matingly received; said lead screw guide having a predetermined thread pitch corresponding to the pitch of the threaded aperture to be formed;

means for removably and interchangeably coupling a selected, corresponding one of a plurality of electrodes with one of said drive shaft second end, and said lead screw second end for rotation therewith, whereby rotation of



said motor both rotates the selected electrode and simultaneously translates the selected electrode longitudinally with respect to a corresponding electrically conductive workpiece for automatically regulating the rate of longitudinal movement of the selected electrode to insure accurately formed threads; and

means for applying electrical energy to the selected electrode, and being removably connected therewith, so that multiple pairs of lead screws and lead screw guides, having different thread pitches, can be easily removed and interchanged with said machining device to produce variously sized threaded apertures.

4,628,172

GAP ENERGIZING SYSTEM FOR TW ELECTROEROSION

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Sep. 21, 1984, Ser. No. 653,191
Claims priority, application Japan, Sep. 21, 1983, 58-173171; Sep. 21, 1983, 58-173172; Sep. 22, 1983, 58-174102; Apr. 9, 1984, 59-70581
Int. Cl.⁴ B23H *7/04*
U.S. Cl. 219—69 W **8 Claims**

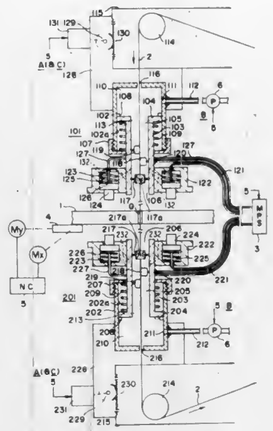
1. A gap energizing system for TW electroerosion, comprising:

a fluid delivery assembly having an internal fluid passage longitudinally traversed by a straight-line path for a traveling wire-like electrode traversing an electrically conductive workpiece while defining a machining gap therewith, said passage being supplied with a machining fluid from an external fluid source and ending with a nozzle outlet for discharging the supplied fluid as an envelop flow surrounding the electrode towards the workpiece and into said machining gap;

guide means disposed in said internal passage for holding the axis of the electrode traveling therethrough in alignment with said path;

first contact means disposed in said internal passage and maintained in contact with the traveling electrode therein for electrically energizing the same; and

second contact means movably mounted on said fluid delivery assembly so as to surround the electrode passing



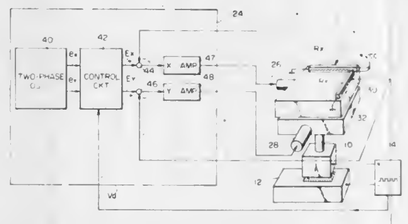
through said nozzle outlet and operably arranged for movement parallel to said path towards the workpiece to make contact therewith for energizing the machining gap, only upon development of a fluid pressure in said passage representing delivery of the machining fluid into said gap.

4,628,173

FABRICATING MACHINE

Tetsuro Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 300,864, Sep. 10, 1981, Pat. No. 4,491,712.
This application Nov. 16, 1984, Ser. No. 672,005
Claims priority, application Japan, Sep. 10, 1980, 55-125798; Sep. 17, 1980, 55-129868; Sep. 19, 1980, 55-130166; Sep. 19, 1980, 55-130167
Int. Cl.⁴ B23H *7/28*
U.S. Cl. 219—69 G **7 Claims**



1. A discharge machining method for machining an electrically conductive workpiece by applying electric current to said workpiece and an electrode through a dielectric machining solution in the machining gap between said electrode and said workpiece, said method comprising the steps of:

moving an electrode and a workpiece relative to each other in a primary or main machining direction;

subsequently controlling the machining gap along a plane substantially perpendicular to the primary machining direction to maintain an electric discharge enabling state wherein discharge can properly take place;

finish machining said workpiece by moving said electrode relative to said workpiece substantially in a circular motion;

while continuing the circular motion of said electrode relative to said workpiece, changing a radius of the circular motion of said electrode at a first rate in a direction for reducing the machining gap between said electrode and said workpiece when a machining state between said electrode and workpiece is acceptable; and

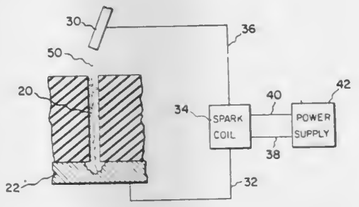
while continuing the circular motion of said electrode relative to said workpiece, changing the radius of the circular motion of said electrode at a second rate, greater than said first rate in a direction for increasing the machining gap between said electrode and said workpiece when the machining state between said electrode and said workpiece becomes deteriorated.

4,628,174

FORMING ELECTRICAL CONDUCTORS IN LONG MICRODIAMETER HOLES

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,014
Int. Cl.⁴ B23K *28/00*
U.S. Cl. 219—76.13 **4 Claims**



1. A method of forming a through conductor in a small bore hole through a wafer having a length to diameter ratio in excess of six which comprises

disposing a vaporizable metal at the bottom of said hole,

disposing a thin electrode over the top of the hole, and

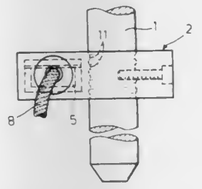
creating a spark between the metal and electrode to vaporize metal into and through said hole.

4,628,175

RESISTANCE WELDING EQUIPMENT HAVING AN OPTICAL ACCELEROMETER FOR MEASURING ELECTRODE ACCELERATION

Norbert Nissl, Aresing, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,699
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404692
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—110 **17 Claims**



1. In a resistance pressure welding device having an electrode, means for measuring the acceleration of said electrode, and means for controlling the welding current responsive to the measured acceleration, the improvement comprising:

said acceleration measuring means comprises at least one optical accelerometer, and

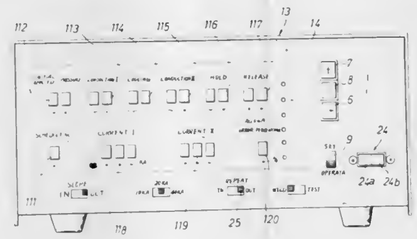
means clamping said optical accelerometer directly onto said electrode in a force-locking manner.

4,628,176

APPARATUS FOR SETTING SCHEDULES OF A RESISTANCE WELDING MACHINE

Koji Kojima, Tokyo, and Kiyosi Kajiwara, Saitama, both of Japan, assignors to Kabushiki Kaisha Tetrak, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,624
Claims priority, application Japan, Sep. 19, 1984, 59-19638
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—110 **5 Claims**



1. Apparatus for entering program data for a programmable resistance welding machine, said apparatus having control means operatively connected to said machine for controlling the operation of the machine, said control means including a computer means having a memory for storing said program data, said apparatus comprising

(a) a numerical data entry keyboard consisting of a shift key for producing a first signal for designating selection of an item of program data to be entered, an incrementing key for producing a second signal for incrementing the numerical value of an item of program data, and a decrementing key for producing a third signal for decrementing the numerical value of an item of program data said apparatus having no other numerical data entry keyboards;

(b) said computer means comprising a microprocessor connected with said keyboard to receive said first, second and third signals, to sequentially designate each item of program data in said memory in response to said first signal, and to set a numerical value for each item of program data designated on the basis of said second and third signals; and

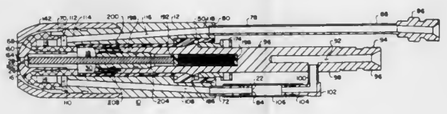
(c) a display unit connected to said keyboard and said computer means for displaying the numerical values of each item of program data.

4,628,177

ARC WELDING TORCH

Will R. Dempsey, Owens Cross Roads, Ala.; Ernest O. Bayless, Petersburg, Tenn., and Samuel D. Clark, Huntsville, Ala., assignors to B & B Precision Machines, Inc., Owens Cross Roads, Ala.

Filed Aug. 10, 1984, Ser. No. 639,444
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—121 PN **6 Claims**



1. A plasma arc welding torch assembly comprising:

an elongated, generally cylindrical, housing having an opening at one end;

a first annular chamber having an inlet coupled to receive a shield gas and an outlet, said outlet being concentric with said opening, and providing to said opening said shield gas;

a removable nosepiece sealably countersunk within said opening against said housing inboard of said first annular chamber, said nosepiece having a passageway therethrough and an orifice concentric with said opening;

a heat exchanger positioned adjacent to and heat conductively coupled to said nosepiece, said heat exchanger including a coolant chamber adjacent to and outboard of said nosepiece, and said coolant chamber being fluid coupled to a fluid inlet and outlet, whereby a cooling fluid may be circulated through said coolant chamber, cooling said heat exchanger and said nosepiece; and

electrode holding means for holding an electrode within said passageway adjacent said orifice, said electrode holding means comprising:

insulating means for electrically insulating said electrode from said housing and said nosepiece,

spring biasing means for biasing said electrode toward said orifice;

gripping means for selectively gripping said electrode and overcoming said bias to retain said electrode in a selected position with respect to said orifice,

electrical means for electrically biasing said electrode with respect to said nosepiece, and

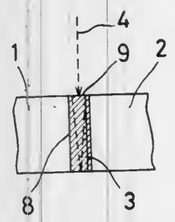
electrode adjustment means, including a tubular member adapted to extend through said opening and around said electrode, for operating said gripping means and biasing said spring bias means to vary the longitudinal position of said electrode with respect to said orifice.

4,628,178

TOOL FOR WARM AND HOT FORGINGS AND PROCESS FOR MANUFACTURING THE SAME

Masaya Miyake; Yasuhiro Saito, and Matsuo Higuchi, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 23, 1985, Ser. No. 737,397
Claims priority, application Japan, May 29, 1984, 59-110568; Oct. 23, 1984, 59-223785; Nov. 7, 1984, 59-234563; Feb. 4, 1985, 60-20230
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LD **12 Claims**



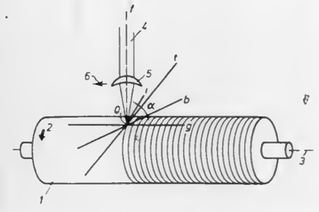
1. A tool for warm and hot forgings manufactured by bonding cemented carbide to steel by use of high-energy beams, characterised in that said cemented carbide comprises a hard phase of tungsten carbide and 15-35% by weight of a binder metal phase, said binder metal phase comprising at least one selected from the group consisting of nickel, cobalt and iron, and at least one selected from the group consisting of chromium, molybdenum and tungsten forming a solid solution in said binder metal phase.

4,628,179

METHOD OF IMPROVING THE STATE OF THE SURFACE OF A ROLL

Jean R. Crahay, Francorchamps, Belgium, assignor to Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Feb. 28, 1984, Ser. No. 584,394
Claims priority, application Luxembourg, Mar. 11, 1983, 84687
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LH **10 Claims**



1. A method of forming an isotropic roughness in the form of a helical groove on the surface of a rolling mill roll comprising:

providing a substantially continuous corpuscular beam;

focusing said beam onto the outer peripheral surface of the roll;

rotating said roll about its longitudinal axis;

producing relative translational movement between said beam and said roll in the axial direction of the roll so that the area of impact of the beam on the surface of the roll traces a helical path on the surface of the roll;

adjusting the power of said beam at said impact area, the rotational speed of the roll and the speed of relative translational movement so that the beam produces a helical groove in the roll surface and the ratio of the pitch of the helical groove to the width of the beam at the area of impact is less than 1;

injecting a jet of gas in the impact zone of the beam on the roll surface; and

varying at least one of the parameters of said gas jet to modify the critical value of said pitch of the helical groove to ensure a predetermined depth of the groove, said parameters comprising direction, speed, pressure and flow rate of said gas jet.

4,628,180

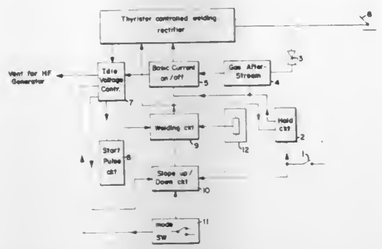
WELDING SYSTEM FOR TIG WELDING

Heini Edberg, Kirkevej 15, 4930 Maribo, Denmark

PCT No. PCT/DK84/00049, § 371 Date Feb. 15, 1985, § 102(e) Date Feb. 15, 1985, PCT Pub. No. WO85/00024, PCT Pub. Date Jan. 3, 1985
PCT Filed May 25, 1984, Ser. No. 711,470
Claims priority, application Denmark, Jun. 15, 1983, 2742/83
Int. Cl.⁴ B23K *9/06*
U.S. Cl. 219—124.01 **4 Claims**

1. Method of electronically controlling starting of TIG welding comprising the steps of: bringing a tungsten electrode into momentary contact with an object to be welded, then separating the electrode from said object to initiate an arc, providing a low short-circuit current at the contact and at the

separation of said contact the current is increased to a value above a predetermined welding current, and thereupon, after a



short period of time, the current is decreased to said predetermined welding current value at.

4,628,181

METHOD OF CONTROLLING THE OUTPUT CHARACTERISTIC OF A WELDING POWER SOURCE, APPARATUS FOR ARC WELDING, AND ELECTRICAL CIRCUIT TO BE USED FOR SUCH APPARATUS

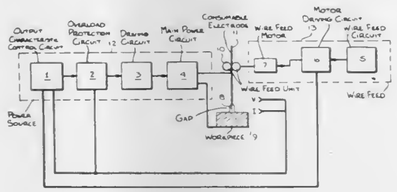
Jiluan Pan; Renhao Zhang; Zhiming Ou, and Zhiqion Wu, all of Tsinghua Yuan, Beijing, China

Filed Mar. 7, 1985, Ser. No. 709,388

Claims priority, application European Pat. Off., Jul. 5, 1984, 84107840.5

Int. Cl.[4] B23K *9/09*

U.S. Cl. 219—130.33 **16 Claims**



1. In a welding machine power supply connected to a welding electrode and a workpiece having an operating point including an output voltage and output current detected across the electrode and workpiece, a transfer circuit means for connecting together a plurality of output characteristic segments of the power supply having different slopes and lengths with substantially no overlap or mismatch of endpoints of adjacent segments and allowing movement of the operating point along the output characteristic segments so that the output current and output voltage values at the end of one segment are substantially equal to the operating current and voltage values on the adjacent segment to form a substantially continuous nonlinear output characteristic for conditions between open circuit voltage and short circuit voltage, comprising:

First feedback circuit to conduct when the sum of the output current and output voltage signals are greater than a first reference current;

Second feedback circuit to conduct when the output voltage is greater than a first reference voltage;

Third feedback circuit to conduct when the output current is greater than a second reference current;

Fourth feedback circuit to conduct when the output voltage is greater than a second reference voltage;

Fifth feedback circuit to conduct when the output current is greater than a third reference voltage;

First diode to block the operation of the first feedback circuit when the second or third feedback circuit is operating;

Second diode to block the operation of the second feedback circuit when the first feedback circuit is operating;

Third diode to block the operation of the third feedback circuit when the first or second feedback circuit is operating;

Fourth diode to block the operation of the fourth feedback circuit when the first, second, third or fifth feedback circuit is operating;

Fifth diode to block the operation of the fifth feedback circuit when the first, second, third or fourth feedback circuit is operating;

sixth diode connected to the output of the first, second, and third diodes to block the operation of the first, second, and third feedback circuits when the fourth or fifth feedback circuit is operating.

4,628,182

HOT-WIRE TIG WELDING APPARATUS

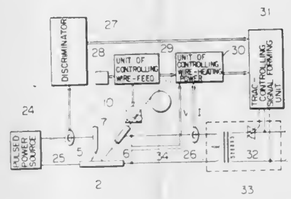
Katsuyoshi Hori; Eiji Watanabe; Toshiharu Myoga; Toshiaki Takuwa, and Kazuki Kusano, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,134

Claims priority, application Japan, Jul. 2, 1984, 59-135071

Int. Cl.[4] B23K *9/09*

U.S. Cl. 219—130.51 **7 Claims**



1. A hot wire TIG welding apparatus having, in combination, pulsed arc TIG welding power supply means and wire heating power supply means, said TIG welding apparatus comprising:

(a) means for detecting the pulsed arc current;

(b) a discriminating means which discriminates, upon receipt of a signal from said detecting means, the peak current and the base current of said pulsed arc current; and

(c) a controller which controls, in response to a signal from said discriminating means, the operation of said wire heating power supply in such a manner that the supply of heating power to the wire is conducted only during a base period in which said arc current is formed only by said base current.

4,628,183

HEATING-FIXING ROLLER AND FIXING DEVICE HAVING THE SAME

Hiroshi Satomura, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,676

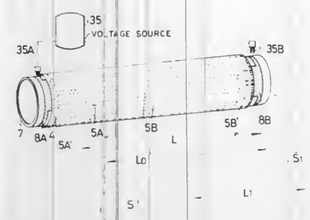
Claims priority, application Japan, Dec. 19, 1983, 58-237838

Int. Cl.[4] G03G *15/20;* **H05B** *3/10*

U.S. Cl. 219—216 **26 Claims**

1. A heating-fixing roller having over an axial direction thereof a heat-generating layer formed through the step of mixing a raw material capable of obtaining a positive temperature coefficient of resistivity characteristic by sintering and a binder for holding said raw material and forming an unsintered annular substrate and the step of providing an electrode to which an applied voltage is supplied on said mixture during said forming step, and thereafter through the step of sintering

said unsintered annular substrate on which said electrode is formed, said heat-generating layer having a positive temperature coefficient of resistivity characteristic after said sintering and having said electrode formed on the surface thereof.



4,628,184

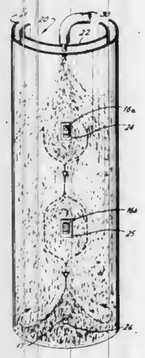
FOAM INSULATED WATER HEATER AND METHOD OF MAKING SAME

Eugene L. West, Grand Rapids, Mich., assignor to Bradford-White Corporation, Philadelphia, Pa.

Filed Mar. 26, 1985, Ser. No. 716,024

Int. Cl.[4] F24H *1/18*

U.S. Cl. 219—312 **20 Claims**



1. In a water heater comprising a water tank having a component intended to be kept substantially free from contact with an expandable foam insulating material and a jacket surrounding the tank and providing an insulating space therebetween, a pair of flexible sheets forming an apron, the sheets being joined to form a seal protecting said component from contact with the foam, the apron being positioned over a part of the tank surface in a position whereby the seal surrounds said component, the apron being substantially unsealed along its top and sides wherein the foam introduced between the sheets flows out of the unsealed sides of the apron to fill said space.

4,628,185

TOASTER OVEN AND PROTECTIVE HOOD

Richard L. Norwood, Waterbury; Charles Z. Krasznai, Trumbull; Roman Czernik, Trumbull, and Olle E. Haggstrom, Trumbull, all of Conn., assignors to Black & Decker, Inc., Newark, Del.

Filed Aug. 5, 1985, Ser. No. 762,425

Int. Cl.[4] H05B *3/06;* **A47F** *5/08;* **F24C** *7/00*

U.S. Cl. 219—386 **7 Claims**

1. An electric toaster oven and a protective hood for installing an electric toaster oven under a kitchen cabinet comprising;

a. an electric toaster oven including a generally horizontal top wall, generally vertical side walls, a generally vertical rear wall and a front opening to provide access to the inside of the toaster oven;

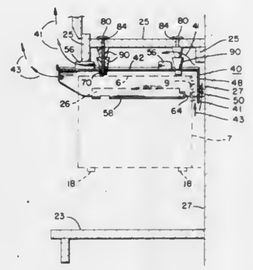
b. each of said side walls including an outwardly extending generally horizontal handle projection;

c. a protective hood for mounting the toaster oven including a top generally horizontal wall, an integrally formed depending rear wall, and downwardly extending vertical side walls;

d. means for securing the hood;

e. means for spacing the hood to provide cooling air flow over the top of the hood;

f. an inwardly extending flange formed on each of the vertical side walls of said hood for slidable engagement with the horizontal handle projections of said toaster oven;



g. means formed on each of said handle projections of the toaster oven for cooperating with means formed on each of said inwardly extending flanges of said hood for spacing the rear wall of the toaster oven at least one-half inch from the rear wall of the hood and for spacing the top of the toaster oven at least onehalf inch from the top wall of the protective hood to provide cooling air flow upwardly between the rear wall of the hood and the rear wall of the toaster oven and then forwardly between the top wall of the hood and the top wall of the toaster oven where it can be vented in front of the hood.

4,628,186

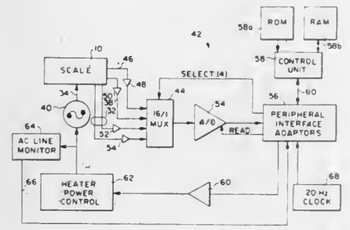
HEATER-SCALE FOR HEATING FLUIDS FOR INJECTION INTO A PATIENT

David Bergemann, Vernon Hills; Alan A. Figler, Algonquin; Rene Lamadrid, Lake Forest; Stanley Pernic, Round Lake, and John J. Selman, Vernon Hills, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 30, 1984, Ser. No. 676,766

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **15 Claims**



1. A heat-scale comprising:

means for supporting a selected contained volume of fluid to be weighed and heated including a first generally horizontal concave supporting surface for receiving the contained volume of fluid with said heating means affixed to a second, spaced apart, surface thereof and including tempera-

ture sensing means extending through said first and second surfaces toward the contained volume so as to be in contact with the contained volume of fluid;

distributed means affixed to a selected surface of said supporting means for evenly heating the volume of fluid in response to an electrical signal applied thereto;

means for sensing the temperature of the contained volume of fluid and for comparing the sensed temperature to a predetermined temperature;

means for switching the electrical signal to said heating means on and off for selected, time intervals which vary nonlinearly with respect to the comparison between the sensed temperature and the predetermined temperature to evenly heat the contained volume of fluid to said predetermined temperature without overshoot and to maintain said volume at the predetermined temperature;

means for comparing an electrical signal corresponding to a sensed initial weight of the contained volume of fluid to a first predetermined threshold and for enabling said switching means provided said sensed initial weight exceeds said first threshold; and

means for continuously monitoring said electrical signal applied to said heating means and for interrupting said switching on of said signal in response to sensing a selected condition.

4,628,187

PLANAR RESISTANCE HEATING ELEMENT

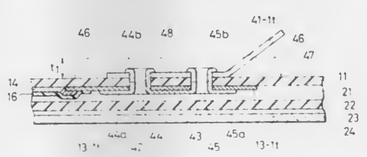
Tsugio Sekiguchi, Machida; Noboru Sato, Hachioji; Hiroki Igarashi, Hatano; Akiyoshi Ozawa, Zama, and Iemi Nakazawa, Sagamihara, all of Japan, assignors to Tokyo Cosmos Electric Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,535

Claims priority, application Japan, Mar. 2, 1984, 59-31049[U]

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—505 **14 Claims**



1. A planar resistance heating element comprising:

(a) an insulating substrate;

(b) at least two electrodes disposed on a surface of said insulating substrate in spaced substantially parallel relation to each other;

(c) a resistive body layer disposed between said electrodes and having a positive temperature coefficient, said resistive body layer being composed of a crystalline resin with electrically conductive particles dispersed therein;

(d) a phenolic resin layer covering an entire surface of said resistive body layer;

(e) an adhesive layer disposed on said phenolic resin layer and extending to a peripheral edge of said insulating substrate; and

(f) an insulating protective film disposed on said adhesive layer in covering relation to an entire surface thereof.

4,628,188

ELECTRIC HEATING PAD FOR SEATS AND BACK-RESTS

Jan Andreasson, Mullsjö , Sweden, assignor to AB Mekania-Verken, Mullsjo, Sweden

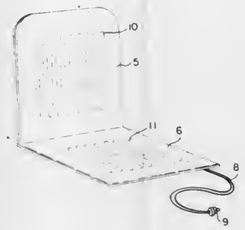
PCT No. PCT/SE84/00150, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO84/04440, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 19, 1984, Ser. No. 692,888

Claims priority, application Sweden, May 4, 1983, 8302536

Int. Cl.⁴ H05B *3/34*

U.S. Cl. 219—528 **5 Claims**



1. In a heating pad for seats in vehicles, and the like, having a heated seating surface and back-rest to provide heat to a user's back and seat area, comprising, in combination:

(a) seat cushion means for covering a seat section and a back rest of a seat to be heated, and including a bottom part and an overlying top part each comprising a back portion and a seat portion and constructed of a relatively soft material having a conductivity which varies as a function of compression of the material, the back rest normally storing more heat than the seat section;

(b) electrical resistance seat section heater means disposed between the seat portion of the top part and the seat portion of the bottom part of the seat cushion means;

(c) electrical resistance back-rest heater means disposed between the back portion of the top part and the back portion of the bottom part of the seat cushion means, each of the heater means being electrically connected in series to the other of the heater means and selectively connectible to a voltage source;

the improvement wherein the electrical resistance seat section heater means comprises a first resistance wire section having a variation in resistance thereof which is directly proportional to temperature over a range of temperatures to which the first wire section is subjected and the electrical resistance back-rest heater means comprises a second resistance wire section having a substantially constant resistance over a range of temperatures to which the second wire section is subjected in order to reduce the amount of energy stored in the back rest.

4,628,189

ELECTRIC RESISTANCE HEATER

Michael Danko, Bland County, Va., assignor to Emerson Electric Co., St. Louis, Mo.

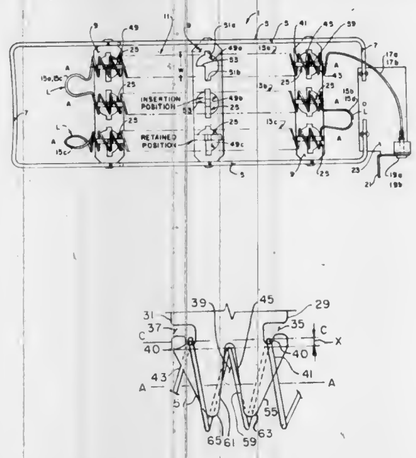
Filed Feb. 11, 1985, Ser. No. 700,116

Int. Cl.⁴ H05B *3/06*

U.S. Cl. 219—532 **6 Claims**

1. In an electrical resistance heater having an elongate wire heating element of generally helical coil construction, said coil having a coil axis and a plurality of convolutions spaced at substantially equal intervals along said coil axis, said heater having a frame and a plurality of electrical insulators supporting said heating element on said frame, wherein the improvement comprises: each of said insulators having a unitary body of a suitable electrical insulative material, said body having a first and a second side facing in generally opposite direction,

means for mounting said insulator body with respect to said frame such that said first and second sides of said insulator body are generally in line with said coil axis, said insulator body having a side notch in each of its said first and second sides, each of said side notches extending generally inwardly toward the center of said insulator body and having in inner end, at least a portion of said first and second sides of said insulator body being substantially planar and spaced outwardly with respect to said frame from said mounting means and angling inwardly so as to constitute a pair of planar, angled outer faces converging toward one another, said insulator body having an outer end between said angled outer faces, said outer end having a pair of inwardly converging, planar center notch faces defining a center notch extending inwardly toward said mounting means, means for wedgingly expanding said coil upon installation of said coil on said insulator, this last said means comprising a pair of body end portions or tips between the outer ends of each of said planar, angled outer faces and the outer end of its adjacent said planar center notch face with the distance between said center notch and each of said tips being less than the axial spacing of said convolutions along said coil axis when said coil is substantially unstretched so as to permit said insulator body and said coil to be assembled by disposing said insulator body relative to said coil with said first and



second sides of said insulator body facing in opposite directions with respect to said coil axis, with one convolution of said coil substantially in register with said center notch, and with adjacent convolutions of said coil on opposite sides of said one convolution being disposed for wedging engagement by respective said planar angled outer faces of said insulator body such that said one convolution is received within said center notch and such that each of said tips is disposed between said one convolution and a next adjacent convolution so that said next adjacent convolutions are wedgingly spread outwardly away from said one convolution by engagement with a respective said planar angled outer face until said next adjacent convolutions are in register with and are received in said side notches, and means for positively retaining said coil in position on said insulator including said center notch having a base which is offset relative to said coil axis with respect to a line established by the inner ends of said side notches, and further including each of said side notches having a first or entry portion extending generally inwardly of the insulator from the respective first or second side thereof and a second or end portion at an angle with respect to said entry portion and extending toward said outer end of said insulator thereby defining a retaining shoulder between said entry and end portion of said slot so as to positively prevent said coil convolutions received in said side slots from exiting said side slots.

4,628,190

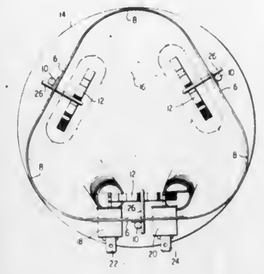
DUCT HEATER

Jimmy L. Sherrill, Cookeville, Tenn., assignor to Tutco, Inc., Cookeville, Tenn.

Filed Oct. 10, 1984, Ser. No. 659,454

Int. Cl.⁴ H05B *3/06*

U.S. Cl. 219—532 **5 Claims**



1. Electrical heater support apparatus for insertion into a duct comprising

a first bracket means,

a second bracket means spaced from said first bracket means,

frame bar means attached to said first and second bracket means for maintaining said first and second bracket means in a fixed relationship with each other,

insulating support means attached to said frame bar means for engaging and supporting a heater element having electrical terminals,

wherein each of said first and second brackets comprises a thin strip formed into a geometric shape and having a plurality of flexible portions forming corners and a plurality of sections intermediate adjacent corners, said frame bar means being attached to each of said first and second bracket means at at least one of said intermediate sections, and wherein each of said plurality of corners lies on a common geometric curve and each of said sections lies within said curve whereby said apparatus may be inserted into a duct having a cross-section in the form of said curve and said apparatus will engage said duct only at said plurality of corners.

4,628,191

ELECTRIC THERMAL UNIT

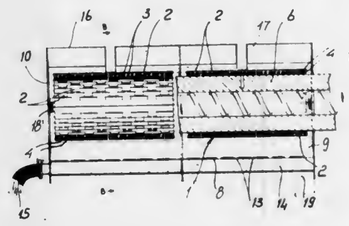
Gaetano Piazzola, Via Borri, 148, 21100 - Varese, Italy

Filed Mar. 12, 1984, Ser. No. 588,678

Claims priority, application Italy, Mar. 17, 1983, 20130 A/83

Int. Cl.⁴ H05B *3/58*

U.S. Cl. 219—535 **1 Claim**



1. An electric thermal unit for heating an extruder cylinder (6) in extruders, injection presses and drawing machines, comprising an outer casing (16) a plurality of shaped strips (2) positioned within said casing, said strips being mutually coupled to define a substantially annular structure effective to

encompass an extruder cylinder and to be supported thereby, said strips including substantially continuous holes (3) housing a heating spiral coil resistance element (4) to be supplied by an outside electric power source, an insulating material layer (8) substantially concentrically arranged around said strips and having an outer surface and a grooved and reflective inner surface (11) which defines with said strips a first inner interspace (9), said outer casing encompassing said insulating material layer and defining with said outer surface of said layer a second outer interspace (17), end discs (10) for supporting said insulating material layer and said outer casing, said outer casing having a bottom and being provided at said bottom with an opening (19) for coupling to a ventilating air source, whereby ventilating air is conveyed through said opening into said second interspace, said insulating material layer having a top and being so arranged as to define, at said top a slot (12) for allowing said ventilating air to enter said first interspace to be heated by said spiral coil heating resistance element, and, at the bottom of said material layer a plurality of openings (13) to be coupled to a heated air recovering duct.

4,628,192

CASH HANDLING MACHINE

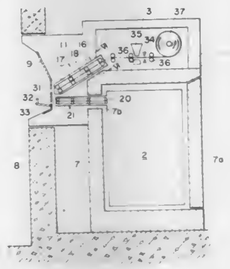
Tadao Suzuki, Ashiya, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 14, 1985, Ser. No. 797,944

Claims priority, application Japan, Nov. 19, 1984, 59-175971[U]

Int. Cl.⁴ G07G *5/00*

U.S. Cl. 235—1 R **3 Claims**



1. A cash handling machine comprising:

(a) a cash containing device housed within a safe and formed with a cash container inlet or outlet;

(b) a receipt printer mounted on the safe movably backward for printing transaction data on a receipt;

(c) an operation panel disposed in front of the safe and the receipt printer and formed with a cash inlet or outlet and a receipt outlet;

(d) cash carrying means for carrying cash discharged from the cash containing device at the cash container outlet to the cash outlet formed in the operation panel or for carrying cash charged from the cash inlet formed in the operation panel to the cash container inlet of the cash containing device; and

(e) receipt carrying means for carrying a receipt on which predetermined data are printed by the receipt printer to the receipt outlet formed in the operation panel, said receipt carrying means being pivotally supported by the receipt printer at one end thereof.

4,628,193

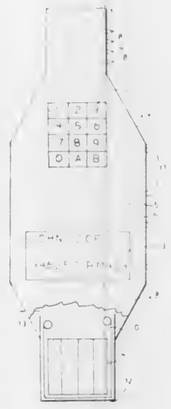
CODE READING OPERATIONS SUPERVISOR

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Filed Jan. 30, 1980, Ser. No. 116,678

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 235—375 **11 Claims**



1. Portable apparatus for controlling, supervising, and recording operations by an operator which require,

1. operator travel to multiple sites remote from personal supervision,

2. correct operator identification at said sites of unique elements, bearing machine readable identifying codes, from the group including items on lists, persons, sites, packages, pharmaceutical containers and the like, and

3. correct treatment of said elements by said operator at said sites on the basis of said identifications, comprising:

a. reading means for reading said machine readable identifying code data;

b. input/output means for communicating data with external data processing and storage means;

c. manual input means and output means for communicating with said operator;

d. data storage means interconnected to means (a), (b) and (c) for storing data transmitted therethrough.

e. data processing means interconnected to said data storage means to ascertain by data processes operant upon said stored data that a particular one of said identified elements at said remote site has been correctly associated with at least one other of said identified elements as required for said correct treatment;

f. signal means connected to said data processing means to signal to said operator by a first signal when said data processing means has ascertained that a correct association of said elements has been made, and to signal by a second, different signal when an incorrect association has been made, said storage means storing data from said external data processing and storage means relating codes of elements which must be associated for said correct treatment, and said elements which must be associated for said correct treatment bearing identifying codes which are not identical to prevent said operator from defeating the system integrity by reading one of said identifying codes twice.

4,628,194

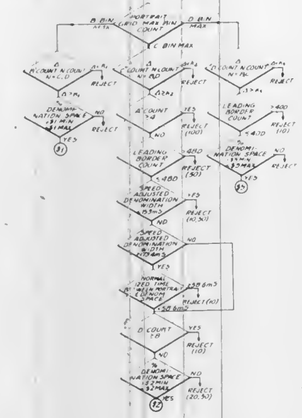
METHOD AND APPARATUS FOR CURRENCY VALIDATION

Bob M. Dobbins, Phoenixville, and Elwood E. Barnes, Parkesburg, both of Pa., assignors to Mars, Inc., McLean, Va.

Filed Oct. 10, 1984, Ser. No. 659,411

Int. Cl.⁴ G06F *15/30*

U.S. Cl. 235—379 **52 Claims**



1. A method for determining the authenticity and denomination of paper currency, said currency having a plurality of distinct areas each containing currency identifying characteristics, said method comprising the steps of:

scanning one of said areas with an electrical signal generating sensor and thereby generating a sequence of electrical signals in response to the currency identifying characteristics detected by the sensor in the area scanned,

measuring the intervals between the generated signals,

classifying each of the measured intervals into one of a plurality of sets, the classification of each of the measured intervals being dependent upon the length of that interval, and

determining the difference between the number of intervals in one of said sets and the number of intervals in another of said sets.

4,628,195

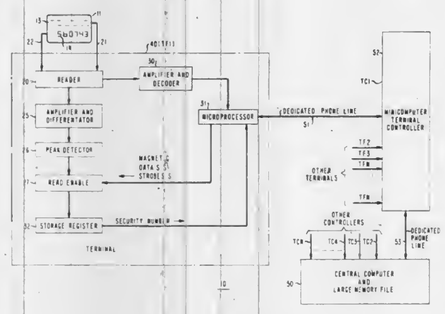
CREDIT CARD SECURITY SYSTEM

Rene Baus, Rancho Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed Mar. 9, 1984, Ser. No. 588,048

Int. Cl.⁴ G06K *7/00*

U.S. Cl. 235—440 **12 Claims**



1. a credit card security system for a card bearing data embodies in first and second forms on first and second tracks respectively, such system comprising:

reader means for simultaneously sensing said data in said first and second forms, wherein said first and second forms are magnetic representations on a magnetic stripe and embossed representations respectively, and for producing first and second signal trains representative of said data in said first and second forms respectively, so that the first and second signal trains have a unique phase relationship therebetween characteristic of the physical location of the data embodies in said card; and

means responsive to said first and second signal trains for generating a code representative of said characteristic phase relationship.

4,628,196

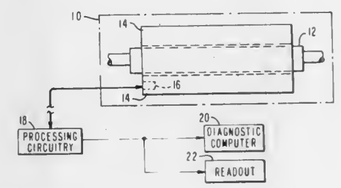
TEMPERATURE MEASURING APPARATUS

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1985, Ser. No. 772,587

Int. Cl.⁴ G02F *1/01;* **G01K** *11/14*

U.S. Cl. 250—225 **9 Claims**



1. Apparatus for determining temperature, comprising:

(A) a temperature sensing element having a portion which rotates as a function of the temperature to which the element is exposed;

(B) a first polarizing filter coupled to said portion for rotation therewith;

(C) a first light detector;

(D) a light source;

(E) optical fiber means positioned to convey light from said source to said first polarizing filter and to said first light detector;

(F) a rotatable, second polarizing filter interposed between said first light detector and the end of said optical fiber means conveying said light to said first light detector;

(G) a second light detector;

(H) means for projecting a reference light onto said second detector;

(I) a manually rotatable polarizing filter;

(J) said manually rotatable polarizing filter and said second polarizing filter being interposed in the light path between said means for projecting and said second detector;

(K) means for continuously rotating said second polarizing filter so that each said detector provides respective AC signals;

(L) means for comparing the phase difference between said AC signals; and

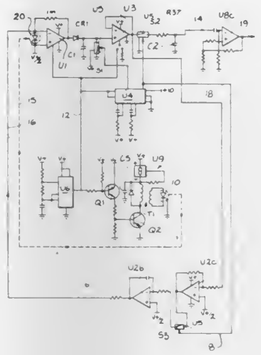
(M) means for converting said phase difference to an equivalent temperature signal.

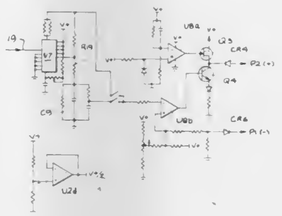
4,628,197

ELECTRONICS FOR FIBER OPTIC VORTEX SHEDDING FLOW METER

William L. Thompson, Montville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 21, 1984, Ser. No. 612,284
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 8 Claims





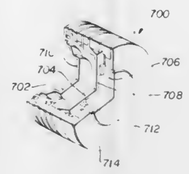
1. An optical sensor arrangement comprising:
light-emitting means;
light-detecting means;
light-connection means connected between said light-emitting means and said light-detecting means for varying an attenuation of light from said light-emitting means to said light-detecting means according to a variable to be measured;
pulse generator means connected to said lightemitting means for applying low-duty cycle, high-current pulses to said light-emitting means for generating lowduty cycle light pulses which are transmitted to said light-detecting means for generating detected pulses;
sample and hold means having an input connected to said light-detecting means for sampling said detected pulses and for holding a peak value for each pulse at an output of said sample and hold means;
feedback means connected between said input and said output of said sample and hold means for returning a signal to said input immediately after each low duty cycle high current pulse of said pulse generator means to suppress said detected pulses after each low-duty cycle, high-current pulse; and
square wave generator means connected to said sample and hold means for forming a square wave signal corresponding to the variable to be measured.

4,628,198

IMAGE INTENSIFIER WITH AN ELECTROPHORETIC GETTER DEVICE

Ettore Giorgi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 8, 1985, Ser. No. 709,641
Claims priority, application Italy, Mar. 16, 1984, 20097 A/84
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT 8 Claims



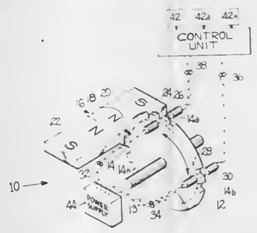
1. An image intensifier comprising:
A. an input window having an external face and an internal face;
B. a photocathode on the internal face of the input window;
C. an output window juxtaposed from the input window, said output window having an internal face and an external face;
D. a phosphor screen adjacent the internal face of the output window;
E. a microchannel plate interposed between the input window and the output window; and
F. a getter device within said image intensifier said getter device comprising a getter support, said getter support having thereon an electrophoretic deposition of at least one member selected from the group consisting of Zr-Al-Fe alloys, Zr-Ni alloys, Zr-Fe alloys, Zr-Ti-Fe alloys, Zr-M_1-M_2 alloys wherein M_1 is vanadium or niobium and M_2 is nickel or iron, Zr, Ta, Hf, Ni, Ti, Th, V and hydrides thereof.

4,628,199

ROTARY NOISELESS DETENT SWITCH

Michael M. Mueller, 7925 S. W. 11th Ave., Portland, Oreg. 97219, and Thomas D. Gonzales, 8810 S. W. Alden St., Portland, Oreg. 97223

Filed Oct. 13, 1983, Ser. No. 541,697
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—229 9 Claims



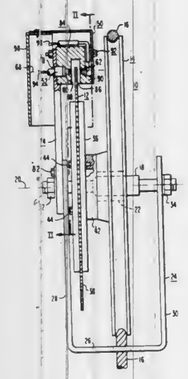
1. A noiseless magnetic detent switch for making interconnection between circuits, and having a rest position, comprising:
a. a magnetic pole piece;
b. a ferromagnetic member movably mounted with respect to said pole piece, said member having a first edge and a second edge and being in close proximity to said pole piece in said rest position;
c. detection means for detecting said first edge when said member is moved in one direction from said rest position and for detecting said second edge when said member is moved in the opposite direction to said one direction from said rest position; and
d. means for making said interconnection in response to said detection of said first edge and for disconnecting said interconnection in response to said detection of said second edge.

4,628,200

PULSE WHEEL SYSTEM WITH SHAFT MOUNTING

Pantelis G. Tinios, Mt. Arlington, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 20, 1984, Ser. No. 642,906
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE 1 Claim



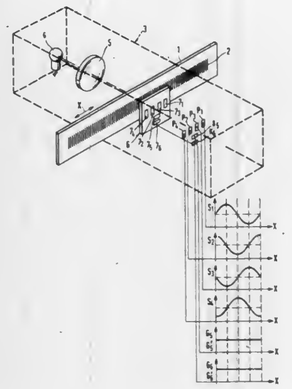
1. A pulse wheel system for developing at least first and second pulse trains having a predetermined phase shift between them, comprising:
a pulse wheel including a rotational axis, and a series of perimetrically spaced discontinuities,
a shaft having a longitudinal axis,
a rotatable element journaled for rotation about said shaft,
means mounting said pulse wheel for rotation with said rotatable element, coaxial with said shaft,
mounting plate mounted on said shaft,
and first and second detector means having predetermined center lines, said first and second detector means being mounted on said mounting plate to detect the discontinuities of said pulse wheel and provide first and second pulse trains in response thereto,
said mounting plate having an opening for receiving said shaft and openings for orienting the center lines of said first and second detector means relative to the longitudinal axis of said shaft, with said mounting plate being devoid of means for changing the dimensional between its openings,
with the center of the openings which orient the center lines of the first and second detector means being located a like distance from the longitudinal axis of the shaft, spaced apart on the periphery of a circle whose center coincides with the longitudinal axis of the shaft, and with the spacing between the center of the openings being selected to provide the predetermined phase shift between the first and second pulse trains,
and wherein the series of perimetrically spaced discontinuities include teeth having a width T spaced by a dimension N, each detector means includes a beam of electromagnetic radiation having a diameter D, with the pulse wheel system providing pulse trains having a resolution R, and wherein the width T is equal to $\frac{1}{2}R+2D$ and the width N is equal to $\frac{1}{2}R-2D$, to provide pulse trains having equal on and off times.

4,628,201

SCANNING SIGNAL BALANCING CIRCUIT

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,768
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307931
Int. Cl.[4] A45B *3/08;* H01J *40/14*
U.S. Cl. 250—237 G 13 Claims



1. In a digital position measuring system of the type comprising a measuring scale, a scanning unit including at least one scanning element positioned to scan the scale and to generate in response thereto a scanning signal, and an evaluating circuit coupled to the at least one scanning element to evaluate the scanning signal, the improvement comprising:
a balancing circuit coupled to the measuring system and comprising:
at least one bridge circuit; and
at least one balancing element for balancing at least one signal parameter of the scanning signal, said balancing element included in the bridge circuit;
said bridge circuit defining a first pair of diagonal nodes circuited parallel to the at least one scanning element in the scanning unit.

4,628,202

METHOD AND APPARATUS FOR GAMMA RAY WELL LOGGING

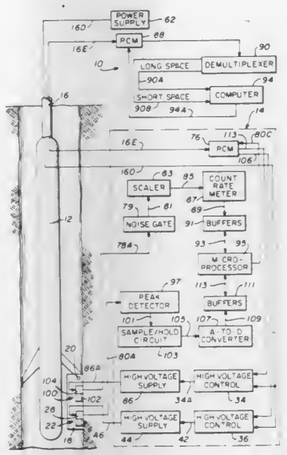
Daniel C. Minette, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 485,150, Apr. 15, 1983. This application May 21, 1985, Ser. No. 736,589
Int. Cl.[4] G01V *5/12*
U.S. Cl. 250—269 12 Claims

1. A method of investigating a subsurface earth formation traversed by a borehole comprising:
introducing a first plurality of photons into said formation;
detecting a second plurality of photons emanating from said formation;
generating electrical signals in said borehole for all said detected photons, each electrical signal representing the energy of a respective different photon in said second plurality of photons, wherein said energy is substantially within the range of 60 to 660 KeV comprising said second plurality of photons emanating from said formation into said borehole;
delivering all of said electrical signals to the surface;
establishing a plurality of preselected energy ranges, each said range corresponding to a different amplitude range of said electrical signals;

deriving a plurality of count rates, each count rate being for a different one of said energy ranges and each said count rate corresponding to the number of said electrical signals occurring per unit of time within said corresponding amplitude range;

deriving a first function f(SH,ρ) of SH and ρ from a model of subsurface formations;



deriving a first soft-to-hard ratio from said count rates; and

determining a first photoelectric cross-section from said soft-to-hard ratio and said first function, where f is said function; where

S and H are count rates of low and high energy gamma rays in said formation, respectively; and

ρ is the density of said formation.

4,628,203

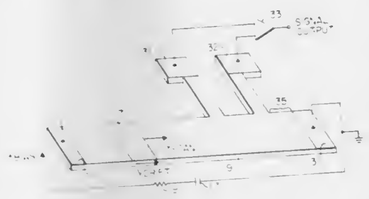
NON-DELINEATED DETECTOR HAVING A DIFFERENTIAL READOUT

Marion B. Reine, Wellesley, and Ronald R. Kusner, Concord, both of Mass., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 14, 1985, Ser. No. 690,908

Int. Cl.[4] G01L *31/08*

U.S. Cl. 250—334 **5 Claims**



1. In a thermal radiation imaging system comprising detector means and scanning means for scanning a thermal radiation image across said detector means, a radiation detector comprising:

an elongated strip of semiconductor material which is photoconductive by the generation of electron and hole photocarriers when said radiation image is scanned along said strip, said strip having first and second ends;

a first contact at said first end and a second contact at said second end;

means for applying lengthwise through said strip, between said first contact and said second contact, a bias electric current producing an ambipolar drift of photocarriers in said strip whose velocity and direction of drift substantially match respectively the velocity and direction of scanning of said strip;

first and second readout electrodes connected to said strip near said second end of said strip, said strip having an active length and said readout electrodes having a separation such that minority photocarriers in said drift reach said separation between said readout electrodes in a time less than the average electron hole recombination time of said semiconductor material; and wherein

said first and second readout electrodes are spaced from said second contact such that the readout electrode nearest said second contact is located a distance from said second contact which is no less than the upstream diffusion length (L_u) of said detector, wherein L_u is defined by the relationship

$$\frac{1}{L_u} = \frac{\sqrt{\delta^2 + 1} - \delta}{L_a}$$

where L_a is the ambipolar diffusion length and δ is the drift velocity (V_{drift}) divided by τ, where τ, is the minority carrier lifetime.

4,628,204

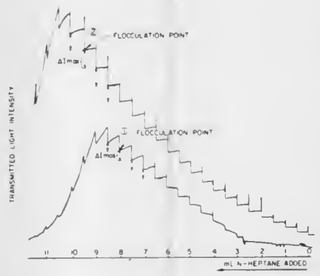
OPTICAL METHOD TO STUDY THE STABILITY OF COLLOIDAL SYSTEMS

Jean Pierre Maes, Merebeke, Belgium, assignor to S.A. Texaco Belgium N.V., Brussels, Belgium

Filed Aug. 16, 1984, Ser. No. 641,228

Int. Cl.[4] G01N *21/27*

U.S. Cl. 250—343 **14 Claims**



1. Apparatus for continuously determining the ratio of diluent to colloidal fluid at which flocculation occurs in a mixture of said diluent and said fluid comprising in combination

a conduit for said fluid,

means for causing said fluid to flow through said conduit at a predetermined rate,

means for adding said diluent at a measured incremental rate to said fluid at each of a plurality of successive positions along said conduit to make successive trial mixtures of said diluent and fluid,

monitor means located downstream of each said diluent-adding position along said conduit for generating an electrical signal indicative of the ability of each said trial mixture of diluent and fluid to transmit radiation, and

means for collecting said electrical signals and automatically computing therefrom the ratio of diluent to colloidal fluid at which flocculation occurs in a mixture of said diluent and said fluid.

4,628,205

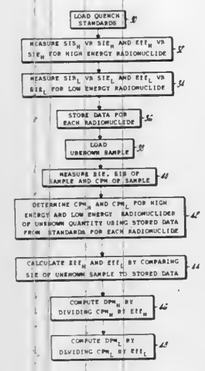
REGIONLESS MULTIPLE LABEL SCINTILLATION COUNTING

Gustav C. van Cauter, Batavia; Leroy J. Everett, Glen Ellyn, and Stanley J. DeFilippis, Naperville, all of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Apr. 8, 1985, Ser. No. 721,264

Int. Cl.[4] G01T *1/20*

U.S. Cl. 250—361 R **17 Claims**



10. A regionless method for ascertaining the unknown quantity of multiple known radioactive nuclides in a test sample which comprises the steps of:

establishing a first set of correlation curves between a first quench-indicating parameter and a second quench-indicating parameter for each of the known radionuclides;

storing a second set of correlation curves between the second quench-indicating parameter and efficiency for each of the known radionuclides;

determining a second quench-indicating parameter and a count rate for the test sample;

comparing the second quench-indicating parameter of the test sample to the first set of correlation curves to determine the relative proportions that each radionuclide contributes to the count rate for the test sample;

ascertaining the efficiency for each radionuclide by comparing the measured second quench-indicating parameter of the sample to the second set of correlation curves; and

calculating the unknown quantity of each radionuclide by dividing the proportional count rate for the radionuclide by the efficiency value for the radionuclide from the step of ascertaining.

4,628,206

VISIBLE-UV HORIZON SENSOR

Robert W. Astheimer, Westport, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed Aug. 27, 1984, Ser. No. 644,549

Int. Cl.[4] G01J *1/42*

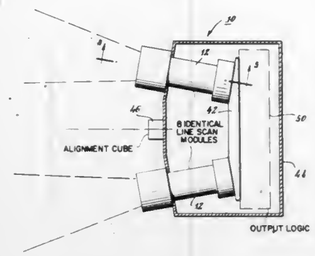
U.S. Cl. 250—372 **7 Claims**

1. A visible-UV horizon sensor for providing attitude information at geosynchronous altitudes from a satellite comprising:

a plurality of detector means selectively responsive to scattered sunlight in the visible and ultraviolet spectral bands,

means for directing the fields of view of said detector means over the earth's disc at a plurality of locations whereby said detector means generate electrical signals in response to the intensity of visible and ultraviolet radiation from the crescent or fully illuminated earth disc,

circuit means having said electrical signals from said detector means applied thereto for producing attitude informa-



tion for said satellite providing the satellite's position with respect to the earth.

4,628,207

SPECIAL ENDOSCOPE FOR VISUALLY TESTING FOR CRACKS

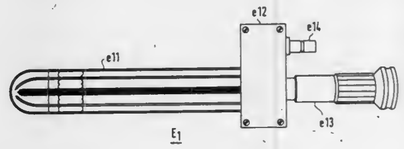
Bernd Elfert, Mülheim, and Werner Schölly, Denzlingen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,576

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412434; Oct. 24, 1984, 3438971

Int. Cl.[4] G02B *23/26*

U.S. Cl. 250—461.1 **17 Claims**

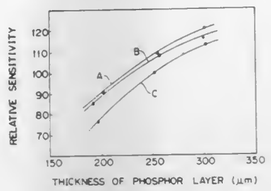


1. Special endoscope for examining the structure of surfaces of measuring sites in narrow gaps formed in parts to be inspected, comprising a probe having an end, a narrow canal with a substantially uniform cross section disposed in said probe, at least one magnifying image-conducting optical system disposed in said canal having a receiving end face, image-illuminating optical systems disposed in said probe in the form of a plurality of optical waveguide strands having transmitting end faces at said end of said probe in immediate vicinity of said receiving end face, said transmitting end faces being grouped about said receiving end face for illuminating the measuring site, a UV light source connected to said image-illuminating optical systems for transmitting rays from said transmitting end faces and reflecting the rays off the surface structure in the visible frequency range onto said receiving end face, means connected to said image-conducting optical system for producing a real image from the rays, said canal being in the form of one capillary disposed substantially along a center line of said probe and other capillaries in which said image-illuminating optical systems are disposed, an arched protective bracket defining an outer contour of said probe and surrounding said image-conducting optical system, said image-illuminating optical systems and said transmitting and receiving end faces, and a stiffening leaf interconnecting and mutually fixing said capillaries and said bracket in place.

4,628,208
RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 17, 1983, Ser. No. 542,651
Claims priority, application Japan, Oct. 19, 1982, 57-182111
Int. Cl.[4] G01J *1/58;* G01N *21/64, 23/38;* G01T *1/00*
U.S. Cl. 250—483.1 14 Claims

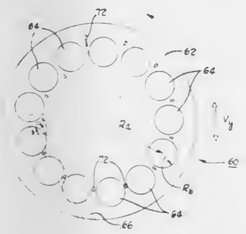


1. A radiation image storage panel comprising a support and at least one phosphor layer provided thereon which comprises a binder and a stimulable phosphor dispersed therein, said panel, in use, being subjected to a radiation having passed through an object or having radiated from an object to cause said stimulable phosphor to absorb said radiation, followed by exciting said stimulable phosphor with an electromagnetic wave to release radiation stored in said stimulable phosphor as emitted light, and detecting said emitted light, wherein the support is a resin film containing anatase-type titanium dioxide.

4,628,209
PARTICLE IMPLANTATION APPARATUS AND METHOD

Andrew Wittkower, Rockport, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1985, Ser. No. 742,492
Int. Cl.[4] A61K *27/02;* G21K *5/00;* H01J *37/00*
U.S. Cl. 250—492.2 14 Claims

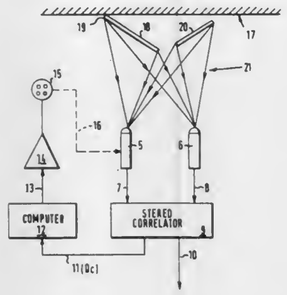


1. A system for treating a workpiece by directing a beam of particles at the workpiece, comprising:
- a support having means for mounting said workpiece for rotation through the beam to cause particles to impinge upon the workpiece, said support defining a plurality of apertures at different distances from a support axis of rotation to allow particles from said beam to pass through said support;
- detector means for measuring the intensity of particles passing through the apertures in said support; and
- drive means for moving said support relative to said beam to cause said beam to be directed at different regions of said support and to pass through different ones of said plurality of apertures.

4,628,210
BINOCULAR ARTIFICIAL VISION SYSTEM WITH VARIABLE EYEBASE IN RESPONSE TO A QUALITY OF CORRELATION SIGNAL

Gilbert L. Hobrough, Westbury, 5 Station Road, Bentley, Farnham, Hampshire, England

Filed Oct. 14, 1983, Ser. No. 542,188
Claims priority, application United Kingdom, Oct. 28, 1982, 8230799
Int. Cl.[4] G01C *11/12*
U.S. Cl. 250—558 5 Claims

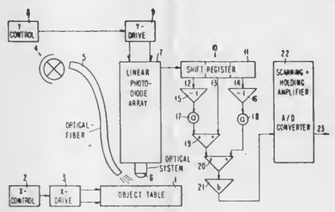


1. A binocular artificial vision system including:
- (i) left and right video cameras so arranged on an eyebase as to have overlapping fields-of-view of a workspace including a background and at least one object separated from said background, said video cameras respectively producing left and right video signals;
- (ii) means mounting said cameras for relative physical movement to vary said eyebase;
- (iii) stereo correlator means so connected to said left and right video cameras as to receive said left and right video signals and to provide as an output a correlated range distance signal and a quality of correlation signal; and
- (iv) means so connected to said camera mounting means and to said stereo correlator means as to receive said quality of correlation signal and vary said camera eyebase in response to the value of said quality of correlation signal.

4,628,211
CIRCUIT ARRANGEMENT FOR CROSSTALK COMPENSATION IN ELECTRO-OPTICAL SCANNERS

Werner Ruppert, Schonaich, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1984, Ser. No. 588,468
Claims priority, application European Pat. Off., Mar. 30, 1983, 83103166.1
Int. Cl.[4] H04N *3/14*
U.S. Cl. 250—578 5 Claims



1. In an electro-optical scanner having a linear array of photodetector cells, each of said cells having means for producing a signal R related to light intensity, said array including adjacent cells (i−1), (i) and (i+1) which produce signals of

value $R_{(i-1)}$, $R_{(i)}$ and $R_{(i+1)}$, a circuit arrangement for crosstalk compensation comprising:
- (a) means for storing the value $R_{(i)}$ of the signal produced by cell (i) and the values $R_{(i-1)}$ and $R_{(i+1)}$ from adjacent cells (i−1) and (i+1) respectively; and
- (b) means, connected to said storing means, for producing a compensated output I_i for cell (i) whereby $I_{(i)}$ is computed in accordance with the relationship

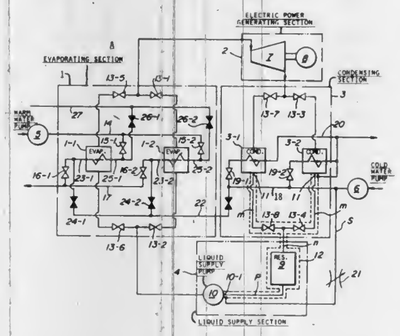
$$I(i) \approx \frac{R_{(i)} - aR_{(i+1)} - aR_{(i-1)}}{1 - 2a - 2a^2}$$

wherein a is a constant factor determined by the degree of crosstalk between adjacent cells.

4,628,212
OCEANO-THERMOSTERIC POWER PLANT

Haruo Uehara, and Tsutomu Nakaoka, both of Saga, Japan, assignors to Saga University, Saga, Japan

Filed Apr. 12, 1985, Ser. No. 722,368
Claims priority, application Japan, Apr. 17, 1984, 59-75788
Int. Cl.[4] H02P *9/04;* F03G *7/04*
U.S. Cl. 290—54 3 Claims

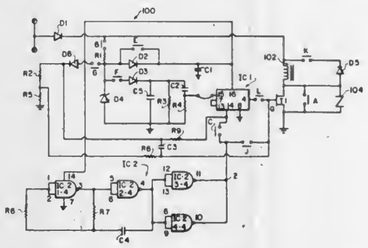


1. An oceano-thermosteric power plant, comprising
- generating means for generating electrical energy from the vapor of an actuating liquid, said generating means having an input and an output;
- evaporating means including a plurality of evaporators each having a first part for the circulation therethrough of warm ocean water drawn from a superficial layer of the ocean and a second part for receiving said actuating liquid, the outputs of the second parts of said evaporators being connected to the input of said generating means,
- condensing means including a plurality of condensers each having a first part for the circulation of cold ocean water therethrough, said cold water being obtained from a location in the ocean relatively far below the surface thereof, and a second part for receiving vapor from the output of said generating means, the inputs of the second parts of said condensers being connected to the output of said generating means;
- actuating liquid supply means comprising a liquid reservoir and a liquid supply pump connected thereto, the input of said actuating liquid supply means being connected to the outputs of the second parts of said condensers, and the output of said actuating liquid supply means being connected to the inputs of the second parts of said evaporators, said actuating liquid being formed in said condensing means by condensing vapor exhausted from the output of said generating means;
- means for supplying said warm water to the first parts of said evaporators, said warm water flowing through said evaporators in a given direction to transform the liquid from the output of said actuating liquid supply means to a vapor for introduction into said generating means; and
- means for disconnecting the supply of warm water from the first part of at least one selected evaporator and for circulating said cold water through said selected evaporator in a direction opposite said given direction, whereby during periods of relatively light electrical load cold water is circulated through said selected evaporator to remove filth deposited therein.

4,628,213
ELECTRONIC CIRCUITS FOR DRIVING BELLS OR ELECTROMAGNETIC DEVICES

William P. Buyak, New Hartford, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 9, 1985, Ser. No. 764,154
Int. Cl.[4] H02J *17/00;* G08B *3/00*
U.S. Cl. 307—80 5 Claims



1. An electronic circuit for driving a bell or the like comprising:
- a first source of AC and DC power;
- a first diode and a coil connected in series to said power source;
- a second power source, including a first resistor and a second diode connectible in series with said first diode, and a filter capacitor in shunt with said second diode;
- a solid state switch connectible to said coil;
- an oscillator connectible between (a) the junction of said first resistor and said second diode, and (b) an input of said solid state switch;
- a counter connectible to an input of said solid state switch;
- a first network connectible to a first input of said counter;
- a second network connectible from said junction to a second input of said counter and to said input of said solid state switch;
- switching means having a plurality of movable contacts and associated fixed contacts;
- said switching means being operative to establish a first, second, third, and fourth modes of operation for said current, whereby in a first position of said switching means the first diode and coil are connected alone in series with said AC power;
- in a second position of said switching means, DC power is connected, said solid state switch is connected in series with said first diode and said coil, and said second power source is connected to an input of said oscillator, the output of said oscillator being connected to said input of said solid state switch;
- in a third position, AC power is connected, said counter has its output connected to said input of said solid state switch, said first network is connected from said junction of said first resistor and said second diode to an input of said counter, and said second network is connected from said junction to another input of said counter, as well as to said input of said solid state switch;
- and in a fourth position of said switching means, DC power is again connected, said oscillator is connected to another input of said counter and said second network is disconnected therefrom.

4,628,214

BACK BIAS GENERATOR

Horst Leuschner, Phoenix, Ariz., assignor to SGS Semiconductor Corporation, Phoenix, Ariz.

Filed May 22, 1985, Ser. No. 736,851
Int. Cl.[4] H02M *3/18;* **H03K** *17/687, 17/30*
U.S. Cl. 307—296 R **18 Claims**



1. An improved on-chip back-bias generator circuit for an NMOS integrated circuit using only N channel transistors, the integrated circuit being powered by voltages, V_{SS} and V_{CC} and having a substrate at a voltage V_{SS}, the improved circuit adapted for being driven by an output signal from an oscillator, the improvement comprising:

a charge pump capacitor having an input end and an output end thereof;

means for applying a charging voltage to said input end of said capacitor, said charging voltage having a value essentially equal to a highest voltage on the integrated circuit chip;

means for clamping said output end of said capacitor to a voltage essentially equal to a lowest voltage on the integrated circuit during a time when the capacitor is being charged;

means for essentially isolating said output end of said capacitor from the substrate during said time when said capacitor is being charged; and

means for coupling said output end of said capacitor to said substrate essentially without any voltage drop during a time when the capacitor is not being charged, said coupling means further comprising:

a switched transistor having a source terminal, a drain terminal and a gate terminal;

a constant current source, said constant current source being connected between said gate terminal of said switched transistor and the substrate for biasing the average gate-to-source potential difference of the switched transistor to zero volts so that during the time said capacitor is being charged it is negative and during the capacitor non-charging time it is more positive than the switched transistor threshold voltage said source terminal of said switched transistor being connected to said output end of said capacitor, said drain terminal of said switched transistor being connected to the substrate and said gate terminal of said switched transistor being connected via a further capacitor to the oscillator output signal terminal.

4,628,215

DRIVE CIRCUIT FOR SUBSTRATE PUMP

Perry W. Lou, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1984, Ser. No. 651,140
Int. Cl.[4] H03L *1/00;* **G05F** *3/24;* **H03K** *17/693*
U.S. Cl. 307—297 **8 Claims**

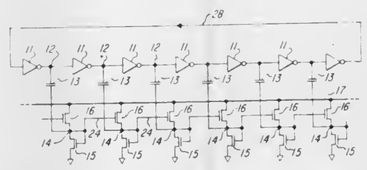
6. A substrate pump circuit for a semiconductor chip, comprising:

a plurality of inverters, each inverter having an input and an output, the output of each of said inverters connected to the input of another of said inverters;

a plurality of drive circuits, each drive circuit associated with one of said inverters, and each drive circuit comprising:

a pump node,

a capacitor connected between said pump node and the output of the inverter stage associated with said drive circuit,



a first transistor having a source-to-drain path coupling said pump node to a ground terminal and having a gate connected to said pump node, and

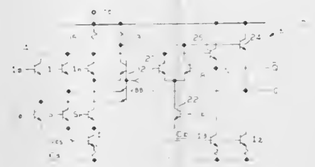
a second transistor having a source-to-drain path coupling said pump node to the substrate of said chip, and having a gate connected to the pump node of another of said drive circuits.

4,628,216

MERGING OF LOGIC FUNCTION CIRCUITS TO ECL LATCH OR FLIP-FLOP CIRCUIT

Nikhil C. Mazumder, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 9, 1984, Ser. No. 628,706
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **11 Claims**



1. A combination circuit formed of a functional circuit portion coupled to a latch circuit portion which is fabricated as a single gate on an integrated circuit semiconductor chip, said combination circuit comprising:

a latch circuit portion including a pair of first and second latch transistors whose emitters are commonly connected;

the bases of said first and second latch transistors being coupled to receive input signals from a master circuit portion;

a latch enable transistor having its collector tied to the common emitters of said first and second latch transistors, its emitter connected to a first current source, and its base connected to a latch enable terminal;

a first output transistor having its base connected to the collector of said first latch transistor, its collector connected to a supply potential and its emitter coupled to a true output signal terminal;

a second output transistor having its base connected to the collector of said second latch transistor, its collector connected to the supply potential and its emitter coupled to a complementary output signal terminal;

the emitter of said first output transistor being connected to the base of said second latch transistor and to a second current source and the emitter of said second output transistor being connected to the base of said first latch transistor and to a third current source;

a functional circuit portion having inputs and outputs, the inputs of said functional circuit portion being coupled to receive data signals;

a master circuit portion having inputs and outputs, the inputs of said master circuit portion being connected to the outputs of the functional circuit portion;

the master circuit portion having its outputs coupled to the bases of said first and second latch transistors of said latch circuit portion to provide the input signals; and

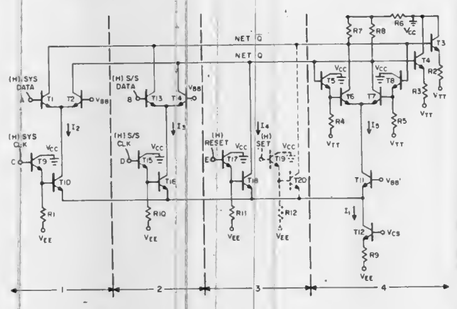
said master circuit portion and said latch portion forming a flip-flop circuit.

4,628,217

FAST SCAN/SET TESTABLE LATCH USING TWO LEVELS OF SERIES GATING WITH ONE CURRENT SOURCE

Dale F. Berndt, Plymouth, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 22, 1984, Ser. No. 592,149
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—467 **5 Claims**



1. In interconnection to and functional augmentation of a two-level-series-gated one-current-source feedback latch circuit

employing one current source supplying current, serially connected to

a first-level current-switch responisve to a received system clock signal for steering said current either to maintain, as a feedback current, said latch circuit in a set or clear state or else steering said current to one second-level current-switch responsive to a received system data signal for steering current received of said first-level current switch to either a clear Q or else to a set Q signal outputs of said latch circuit in order to respectively set or clear said latch circuit,

a circuit apparatus interconnected to said feedback latch circuit for making said feedback latch fircuit functionally responsive to received scan/set data and scan/set clock signals thereby making said feedback latch circuit scan/set testable, said circuit apparatus comprising:

a first-level gating-circuit

constituting a substitutionary inverting one-half of said first-level current switch while a normal inverting one-half of said first-level current switch is inactive due to absence of said received system clock signal,

said first-level gating-circuit connected intermediary said current source and another second-level current switch,

said first gating-circuit being interactive with the normal non-inverting one-half of said first-level current-switch, which said normal non-inverting one-half of said first-level current-switch is also connected to said current source and upon said first-level, in order to sufficiently form by said being interactive a complete current-switch upon said first-level,

WHEREIN said complete current-switch is responsive to said scan/set clock signal for IF said scan/set clock signal is true THEN steering said current received of said current source to said another second-level current-switch ELSE IF said scan/set clock signal is false THEN steering no current to said another second-level current-switch and doing naught but presenting but a small, non-interfering, impedance to the operation of said normally constituted first-level current-switch; and

said another second-level current switch is connected between said first-level gating circuit and said signal outputs of said feedback latch, comprising collector-dotted connections to each said clear Q and set Q signal outputs of said feedback latch circuit, for IF supplied with a current steered from said complete current-switch THEN, responsively to the binary state of a received said scan/set data signal, IF said scan/set data input signal is true THEN steering said current to said clear Q signal output of said feedback latch circuit sufficient to set said feedback latch circuit ELSE IF said scan/set data input signal is false THEN steering said current to said set Q signal output of said feedback latch circuit sufficient to clear said feedback latch circuit, ELSE IF not supplied with a current steered from said complete current-switch THEN doing naught but presenting a small capacitance to said set Q and said clear Q signal outputs of said feedback latch circuit.

4,628,218

DRIVING CIRCUIT SUPPRESSING PEAK VALUE OF CHARGING CURRENT FROM POWER SUPPLY TO CAPACITIVE LOAD

Kazuo Nakaizumi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,420
Claims priority, application Japan, Feb. 3, 1982, 57-16122
Int. Cl.[4] H03K *17/12, 17/04, 19/017, 17/13*
U.S. Cl. 307—451 **11 Claims**



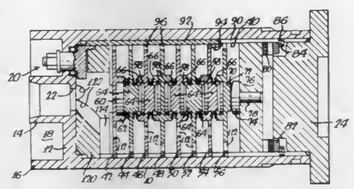
1. An inverter circuit comprising a first field effect transistor of one conductivity type, a second field effect transistor of the opposite conductivity type connected with said first transistor in series between two terminals of a power supply, an input terminal coupled to the gates of said first and second transistors, an output terminal coupled to the connection point of said first and second transistors, a capacitive load coupled to said output terminal, a capacitor, first means coupled to said capacitor and to one of said two terminals of the power supply for charging said capacitor at a time other than a transient time when a potential at said output terminal transfers from a first level to a second level, and a second means coupled to said capacitor and said capacitive load for charging said capacitive load with a discharging current from said capacitor during said transient time.

4,628,219

RECTIFIER ASSEMBLY FOR MOUNTING IN A ROTOR

Mark A. Troscinski, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 13, 1985, Ser. No. 775,664
Int. Cl.[4] H02K *11/00*; F02N *25/08*
U.S. Cl. 310—68 D **11 Claims**



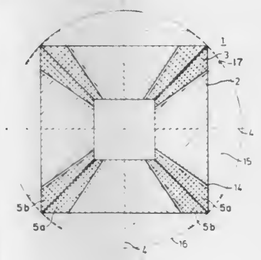
1. A rectifier assembly adapted to be mounted in a generator rotor for rotation therewith comprising:
a generally tubular housing;
a stack of relatively thin plates formed of thermally and electrically conductive material within said housing;
at least one face of some of said plates including an axially directed annular ridge centrally of the face and defining a recess;
at least another face of others some of said plates having a central, axially projecting stud aligned with a recess in the adjacent face of the adjacent plate;
a diode wafer within each said recess;
means for applying a compressive pressure to said stack to bring said plates, studs, and wafers into good thermal and electrical contact;
electrical conductors extending through said stack and in electrical contact with predetermined ones of said elements and electrically isolated from predetermined others of said elements; and
means for flowing a coolant through said housing including non-aligned apertures in said plates.

4,628,220

MOTOR ARRANGEMENT COMPRISING AT LEAST THREE CO-PLANAR CONICAL MOTORS

Anders G. Flogvall, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,205
Claims priority, application Sweden, Jun. 23, 1982, 8203884
Int. Cl.[4] H02K *16/00*
U.S. Cl. 310—114 **9 Claims**



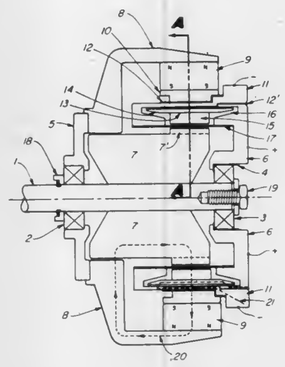
1. A motor arrangement comprising at least three electric motors, axes of rotation of the motors being substantially coplanar and equi-angularly spaced about a common intersection of the axes,
characterized in that each of said motors has a conical stator having a conical exterior surface, and a conical rotor, said stator and rotor each being a substantially rotational symmetrical body, each of said motors being shaped as a frustrum of a cone having the truncated face facing the intersection.

4,628,221

HOMOPOLAR MOTOR WITH PRESSURIZED LIQUID METAL CONTACT

Niels O. Young, 1735 Rush Rd., Eagle, Id. 83616

Filed Oct. 15, 1985, Ser. No. 787,322
Int. Cl.[4] H02K *31/04*
U.S. Cl. 310—178 **4 Claims**



1. A homopolar machine of the type wherein a liquid metal provides electrical connection between two fixed current collector rings and one rotatable current conducting ring, said homopolar machine comprising:
a rotor,
a stator assembly including magnetic means to provide a magnetic field and said two fixed current collector rings;
a frame of magnetic flux conducting material enclosing the rotor and the stator assembly;
said fixed current collector rings defining a void, said void disposed between the rotor and the magnetic means, said void concentric with the rotor, said void sealed for containing the liquid metal under pressure;
said rotatable current conducting ring disposed within said void, said liquid metal providing electrical contact between each edge of said rotatable current conducting ring and a different one of said two fixed current collector rings, and said liquid metal hydrodynamically supporting said rotatable current conducting ring in a spaced-apart gap defining relation with the stator assembly for permitting rotation of the rotatable current conducting ring relative to the stator assembly in response to an electrical current flowing in the rotatable current conducting ring; and
magnetic coupling means for magnetically coupling a torque from said rotatable current conducting ring to said rotor.

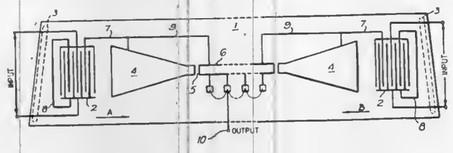
4,628,222

PROTECTION OF SAW DEVICES COMPRISING METALLIZED REGIONS ON DIELECTRIC SUBSTRATES

Meirion F. Lewis, Malvern, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 396,900, Jul. 8, 1982, Pat. No. 4,448,805.
This application Mar. 1, 1984, Ser. No. 585,166
Claims priority, application United Kingdom, Nov. 17, 1980, 8036806; PCT Int'l Appl., Oct. 12, 1981, PCT/GB81/00222
Int. Cl.[4] H03H *9/25*; B05D *5/12*
U.S. Cl. 310—313 R **20 Claims**

1. In a surface acoustic wave device having at least two thin film structures disposed on the surface of a substrate, there being a gap between said structures, said structures being arranged so that a surface acoustic wave traversing a first of said structures is communicated across said gap to the second of said structures, and a thin film loop electrically shunting said gap to prevent cracks in the gap region of said substrate from being induced during fabrication of said surface acoustic wave device.

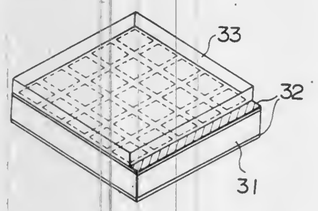


4,628,223

COMPOSITE CERAMIC/POLYMER PIEZOELECTRIC MATERIAL

Hiroshi Takeuchi, Matsudo; Chitose Nakaya, Tokyo; Shinichiro Umemura, Hachioji, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,098
Claims priority, application Japan, Oct. 19, 1983, 58-194233
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—358 **3 Claims**



1. An ultrasonic probe comprising a plate of a composite piezoelectric material having a region of piezoelectric ceramic polarized uniformly in a thicknesswise direction and a region of polymer, both said regions existing along the thicknesswise direction and being dispersed alternately in a direction parallel to a major plate surface, electrodes formed on each major plate surface of said plate of the composite piezoelectric material, and an acoustic connecting layer formed on at least one major plate surface of said plate of the composite piezoelectric material composed of a material harder than said polymer and having a modulus of elasticity in the range of 0.4×10^{10} to 1.3×10^{10} N/m^2.

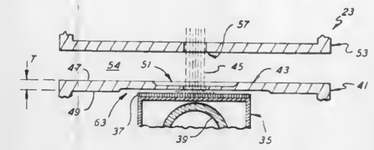
4,628,224

BEAM SHAPING CRT ELECTRODE

Floyd K. Collins, Seneca Falls, and Donald L. Say, Waterloo, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Continuation of Ser. No. 175,165, Aug. 4, 1980, abandoned. This application Sep. 3, 1985, Ser. No. 771,957
Int. Cl.[4] H01J *29/46*
U.S. Cl. 313—414 **4 Claims**

1. An improved CRT electron gun assembly comprised of several related electron guns, each gun having a cathode and a plurality of sequentially arranged cooperating electrodes, including a G1 grid electrode positioned adjacent the cathode and a G2 grid electrode adjacent the G1 grid electrode, the G1 grid electrode having a one piece effectual portion transversely oriented to the path of the beam bundle of electrons, the effectual portion having:
an upper surface and a lower surface defining a material thickness T;
an elongated recess formed inward from the upper surface and forming a substantially sharp parametrical edge with the upper surface at least in the central region thereof, the recess having a width W and a depth D; a depression formed inward from the lower surface in opposed orientation to and symmetrical with the recess, the depression having a substantially circular shape when viewed transversely to the path of the beam bundle of electrons, and having a depth d; the bottom of the recess and the bottom of the depression defining a material thickness t less than thickness T, the depth D not exceeding the thickness t, and the depth d being less than the thickness t; an aperture formed in symmetrical relationship with the recess and the depression, the aperture having a width A slightly less than the width W of the recess; the G1 and G2 electrodes together beneficially modifying the shaping of the beam bundle of electrons passing therethrough.

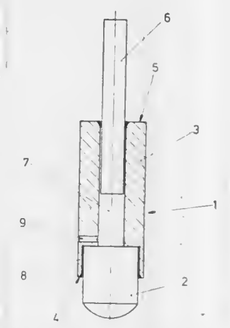


4,628,225

ELECTRODE FOR LASER STIMULATION LAMPS

Dieter Keim, Mühlheim/Main, and Helmut Fischer, Hanau, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,614
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240359
Int. Cl.[4] H01J *61/06*
U.S. Cl. 313—631 **11 Claims**



1. In combination with a laser stimulation lamp
an easily length-adjustable electrode (1) comprising
a tubular cylindrical carrier body (3) having a longitudinal central bore (7) and a vent hole (9) from said central bore (7) to an outer surface of said carrier body (3) to provide for communication between said central bore and the interior of said envelope (13);
an electrode element (2) of a material having a low work function for the emission of charge carriers secured and partially located within a widened portion of said central bore (7) at a first end portion (4) of said carrier body (3), said electrode element projecting from said first end portion of the carrier body (3)
a mounting pin (6) of predetermined length having a first

terminal portion telescopically received within and located partially in said central bore (7), telescopically slidable into and out of said central bore (7) through a second end portion (5) of the carrier body (3);

and means (10*a*. 10*b*) for securing the mounting pin in fixed position within said central bore to determine the total length of the electrode, said positioning means permitting locating the carrier body (3) at a selected axial position with respect to the mounting pin and to locate the carrier body (3) and hence the electrode element (2) projecting from the carrier body at a selected position to thereby define the total length of the electrode.

4,628,226

METHOD AND ARRANGEMENT FOR PREVENTING CATHODE DAMAGE WHEN SWITCHING ON FIELD EMISSION ELECTRON GUNS

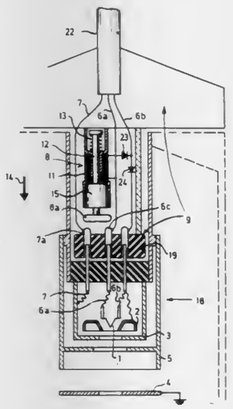
Dieter Kurz, Aalen, and Norbert Schäfer, Essingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,625

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332549

Int. Cl.⁴ H05B *39/00;* **H01J** *19/32*

U.S. Cl. 315—102 **15 Claims**



8. An electron gun wherein a burn-in period for the cathode thereof precedes normal operation of the gun thereby preventing damage to the cathode, the electron gun comprising:

a field emission cathode assembly including: a cathode; a first electrode; and, a ground electrode;

extraction voltage supply means for applying an extraction voltage across said cathode and said first electrode;

accelerating voltage supply means for applying an accelerating voltage across said cathode and said ground electrode;

switching means for establishing a galvanic connection between said cathode and said first electrode before said extraction voltage and said acceleration voltage are applied;

actuating means for actuating said switching means to establish and interrupt said galvanic connection whereby said galvanic connection is maintained for a predetermined burn-in time period before normal operation of said electron gun is begun; and,

circuit means for applying only said accelerating voltage across said cathode and said ground electrode during said burn-in time period.

4,628,227

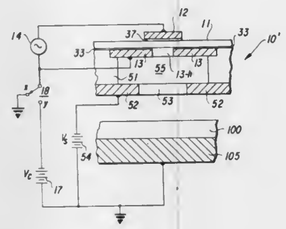
MICA-ELECTRODE LAMINATIONS FOR THE GENERATION OF IONS IN AIR

Richard L. Briere, Hopkinton, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 194,649, Oct. 6, 1980, Pat. No. 4,381,327. This application Mar. 28, 1983, Ser. No. 479,547

Int. Cl.⁴ H01J *7/24;* **H05B** *31/26*

U.S. Cl. 315—111.81 **18 Claims**



1. An ion generator comprising:

a mica sheet;

at least one "driver" electrode bonded to a face of said mica sheet;

at least one "control" electrode bonded to an opposite face of said mica sheet; and

a time-varying potential applied between said electrodes to form ion-producing glow discharges in an air region in the vicinity of said control electrode and said mica sheet,

wherein said electrodes are bonded to said mica sheet with a thermoplastic adhesive of a thickness in the range 0.5 micron–5 microns.

4,628,228

GAS DISCHARGE DISPLAY DEVICE

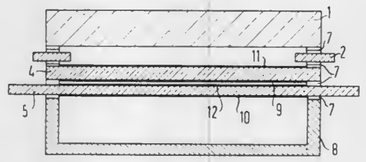
Walter Geffcken, Munich; Burkhard Littwin, Hohenschäftlarn, and Rolf Wengert, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 470,702, Feb. 28, 1983, abandoned. This application Mar. 27, 1985, Ser. No. 716,526

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207685

Int. Cl.⁴ G09G *3/10;* **H01J** *17/49*

U.S. Cl. 315—169.4 **11 Claims**



1. Gas discharge display device having a gas-filled space gas-tightly closed on one side by a front plate and on a side opposite thereto by a back plate and subdivided by a control plate into a gas discharge space and a post-acceleration space, the control plate having electrode paths disposed thereon respectively addressable separately and forming a matrix as row conductors on one side of the control plate and as column conductors on the other side of the control plate, and having, together with the electrode paths, control through-holes at intersection points of the matrix, a fluorescent screen disposed on the side of the front plate oppoite the control plate and defining the post-acceleration space, the fluorescent screen having an anode layer thereon, and at least one insulated cathode on a side of the back plate and defining the gas discharge space, the control plate having, on the side thereof facing towards the post-acceleration space, a plate having a raster of holes formed therein coincident with a raster of the control holes formed in the control plate, comprising a supplementary control plate having a selective number of at most two additional potential planes separated from one another, and strip lines disposed on at least one side of said supplementary control plate for conducting an electric current, said strip lines being aligned parallel to the row conductors of the control plate and having selectively applicable thereto an electric passing and blocking potential for electrons flying towards the fluorescent screen.

4,628,229

FLASHLIGHT EMISSION APPARATUS

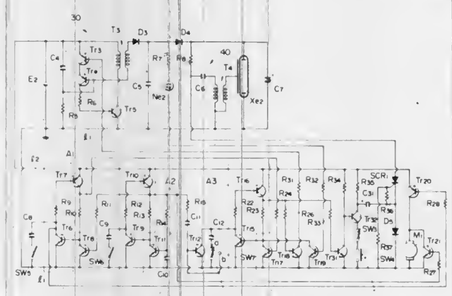
Akira Inoue, Hachioji, Japan, assignor to Olympus Optical Company, Ltd, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 562,179

Claims priority, application Japan, Feb. 15, 1983, 58-23625; Feb. 22, 1983, 58-28174

Int. Cl.⁴ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—241 P **15 Claims**



1. A flashlight emission apparatus comprising:

a converter for effecting a booster action for an output from a low voltage source;

a main discharge capacitor connected to be charged by an output from the converter;

detector means for generating an output when the main capacitor has been charged to a given voltage;

latch means which are turned on when the main discharge capacitor is charging to enable said converter and being turned off responsive to said detector means to disable said converter and prevent further charging of the main discharge capacitor when it has been charged to said given voltage;

a flash discharge tube connected to cause a discharge of the main capacitor therethrough to emit flashlight;

semiconductor means coupled between said converter and detector means and said main capacitor to permit discharge of the main capacitor only through said flash tube;

means for initiating the emission of flashlight from the flash discharge tube comprising a trigger circuit associated with the flash discharge tube for developing a trigger condition and having a trigger capacitor charged by said converter; and

means responsive to an output from the detecting means for disabling the emission initiating means until the voltage across the nain capacitor reaches the given value, said disabling means comprising a switching element within the emission initiating means responsive to the on state of said latch means for normally preventing the operation of the emission initiating means and responsive to the turn off of the latch means by the detecting means output for enabling the emission initiating means.

4,628,230

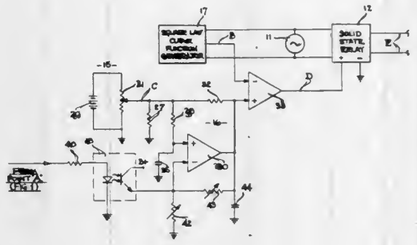
REGULATED LIGHT DIMMER CONTROL

William G. Krokaugger, Chatsworth, Calif., assignor to Mole-Richardson Company, Hollywood, Calif.

Filed Aug. 5, 1985, Ser. No. 762,716

Int. Cl.⁴ H02B *37/02*

U.S. Cl. 315—307 **4 Claims**



1. A light dimmer circuit for controlling the level of illumination of lamps comprising:

an A.C. power source;

dimmer control means for providing a preselected D.C. output;

timing circuit means for providing a periodic D.C. waveform, the A.C. power source being connected to said timing circuit means to synchronize said periodic waveform with said power source;

rectifier and filter means for rectifying A.C. from said power source to D.C. and filtering the rectified D.C.;

means for providing a negative D.C. feedback signal from the output of said rectifier and filter means to limit the output of said rectifier and filter means;

a differential amplifier for receiving said negative D.C. feedback signal and a signal in accordance with the preselected D.C. output of said dimmer control means and providing a D.C. output signal in accordance with the difference therebetween;

solid state relay means interposed between the A.C. power source and said rectifier and filter means for connecting said A.C. power source to said rectifier and filter means; and

voltage controller means for firing said solid state relay means in accordance with the voltage output of said dimmer control means, said voltage controller means comprising a voltage comparator connected to receive the D.C. output of said dimmer control means, the D.C. output of said differential amplifier, and the D.C. periodic waveform output of said timing circuit means and operating to fire said solid state relay and maintain said relay activated only during periods when said D.C. outputs provide a signal having an amplitude equal to or greater than that of said waveform output;

the rectifier and filter means being connected to said lamps to provide D.C. thereto in accordance with the duration of the period during which the solid state relay is fired which is a function of the D.C. output of said dimmer control means.

4,628,231

DC MOTOR WITH ELECTRONIC COMMUTATION CIRCUIT

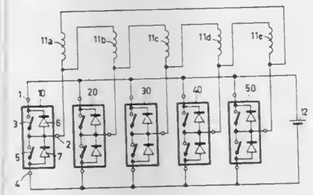
Wolfgang Radziwill, Aachen; Günter Döring, Würselen, both of Fed. Rep. of Germany, and Hans Steinbusch, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,104

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940637

Int. Cl.⁴ H02K *29/00*

U.S. Cl. 318—138 **11 Claims**



1. A DC motor comprising a permanent-magnet rotor and an electronic commutation circuit including a plurality of magnetically controllable switches in the form of an integrated semiconductor circuit and controlled by the magnetic field of the rotor, a stator comprising m phase windings, each magnetically controllable switch including first and second input terminals, an output terminal and first and second switching paths between the first and second input terminals, respectively, and the output terminal, means connecting one end of each phase winding to the output terminal of a magnetically controllable switch, and a power supply source connected between the first and the second input terminals of each switch, said first and second switching paths being controllable so that, when a switch is exposed to a magnetic field B, its first switching path is closed if $B>B_0+[(\Delta B)/2]$, its second switching path is closed if $B<[(\Delta B)/2]$, and its two switching paths are open if $|B-B_0|<[(\Delta B)/2]\times\epsilon$, where $0<\epsilon<1$ and $\Delta B\geqq 0$, the individual switches being symmetrically arranged about the stator of the motor so that they are controlled by the rotor magnetic field in a cyclic sequence.

4,628,232

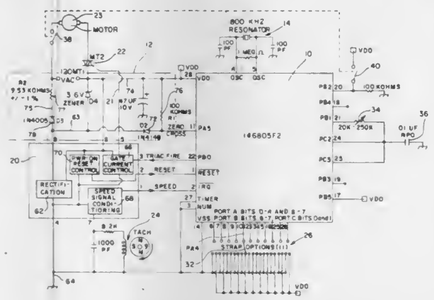
ANTI-PLUG REVERSING MODULE

Abraham Saganovsky, Brooklyn, and William W. Chester, Bronx, both of N.Y., assignors to KB Electronics Inc., Brooklyn, N.Y.

Filed May 28, 1985, Ser. No. 737,698

Int. Cl.⁴ H02P *1/22, 3/10*

U.S. Cl. 318—284 **6 Claims**



1. A circuit for reversing the direction of rotation of a D.C. motor comprising;

relay means, having a deenergized state and an energized state, for reversing the direction of current flow through the D.C. motor armature,

a three position, three wire, switch having a forward position, a reverse position and a motor braking position, each switch position corresponding to a motor operation,

means responsive to said switch being moved from said forward position to said reverse position while said D.C. motor is rotating in a forward direction, for removing motor driving voltage from said D.C. motor and for sensing motor counter-EMF to determine when said D.C. motor has essentially ceased rotation, and

means responsive to said means for sensing motor counter-EMF for operating said relay means to reverse the direction of current flow through the D.C. motor armature at a point at which motor rotation has essentially ceased.

4,628,233

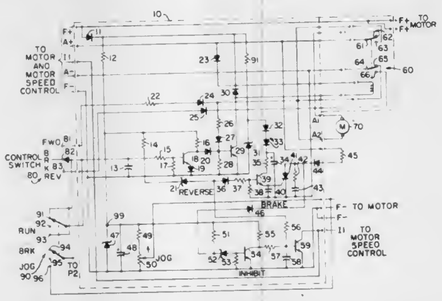
MICROPROCESSOR BASED MOTOR CONTROL

Robert Bradus, Randallstown, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 592,809, Mar. 23, 1984. This application Oct. 4, 1985, Ser. No. 784,702

Int. Cl.⁴ H02P *7/28*

U.S. Cl. 318—306 **39 Claims**



1. A method of controlling a motor operable over a range of conduction angles comprising the steps of,

defining a first operating zone corresponding to conduction angles below a predetermined first angle;

defining a second operating zone corresponding to conduction angles between said first angle and a predetermined second angle greater than said first angle;

defining a third operating zone corresponding to conduction angles greater than said second angle;

selecting one of said operating zones and operating said motor according to the following

(a) for said first zone, operating said motor in an open loop configuration,

(b) for said second zone, varying the conduction angle in relation to the load, but not exceeding said second angle, to maintain a predetermined speed for conduction angles below said second angle,

(c) for said third zone, operating said motor in a closed loop configuration.

4,628,234

SAFETY DEVICE FOR AUTOMATIC WINDOW REGULATOR

Ken Mizuta, Miyagi, and Shiro Kondo, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 14, 1985, Ser. No. 765,607

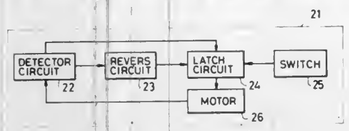
Claims priority, application Japan, Aug. 14, 1984, 59-168872

Int. Cl.⁴ H02P *1/22*

U.S. Cl. 318—267 **4 Claims**

1. In a safety device for an automatic window regulator of the type having means for driving a motor for opening or closing a window in a frame, detector means for detecting a locked condition of the motor when a foreign object is caught between the window and the frame, and stopping means for stopping the motor from closing the window in response to a detection signal from the detector means,

the improvement wherein said detector means includes a sensor for detecting a voltage across said motor during



driving of said motor, a time delay and adder circuit for generating a lagging signal representing the voltage across said motor shifted by a predetermined time delay and having a predetermined voltage increment added thereto, and a comparator for comparing a voltage corresponding to the current actually driving said motor with said lagging signal and for providing a detection signal when said voltage corresponding to said current exceeds said lagging signal.

4,628,235

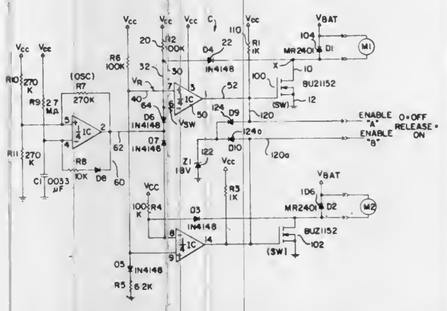
CONTROL CIRCUIT FOR MOTOR DRIVER

James R. Goings, Troy, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sep. 19, 1985, Ser. No. 777,747

Int. Cl.⁴ H02P *1/04*

U.S. Cl. 318—430 **30 Claims**



1. A control circuit for operating a power switch with an associated resistance, said power switch having nonconductive and conductive conditions and adapted to apply a driving voltage across an electrical load circuit when said power switch is in its conductive condition, said control circuit comprising: means for creating a variable monitored signal corresponding to the generally instantaneous voltage across said power switch and associated resistance; means for creating a fixed reference signal; means for creating a control signal having a preselected electrical characteristic when said monitored signal has a given relationship with said reference signal; first means for shifting said power switch from the conductive condition to the nonconductive condition upon creation of said control signal; and, second means for periodically creating an energizing signal in the form of pulses shifting said power switch into said conductive condition when it is in said nonconductive condition.

29. A method of operating a power switch with an associated resistance, said power switch having nonconductive and conductive conditions and adapted to apply a driving voltage across an electrical load circuit when said power switch is in its conductive condition, said method comprising the steps of:

(a) rendering said power switch conductive;

(b) measuring the voltage across said power switch and associated resistance;

(c) shifting said power switch to the nonconductive condition when said measured voltage exceeds a preselected value; and,

(d) creating a series of energizing pulses having a low duty cycle and a high frequency which pulses will render said power switch conductive when it is nonconductive.

4,628,236

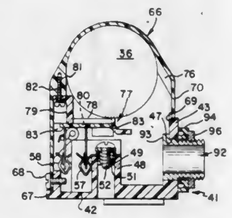
ELECTRIC MOTOR CONTROL

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 632,955, Jul. 20, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 821,777

Int. Cl.⁴ H04R *11/02*

U.S. Cl. 318—558 **16 Claims**



1. An electric motor control for attachment to a support wall or to a pressure switch, comprising a support having a base portion and a mounting portion, said base portion having a plurality of first electrical terminals attached thereto and having at least one lead opening formed therein for electrical leads, said mounting portion having a first hole formed therein, a motor control switch including a plurality of second electrical terminals connected to said terminals of said base portion, said mounting portion including first means for attaching said support to a pressure switch and second means for attaching said mounting portion to a support wall.

4,628,237

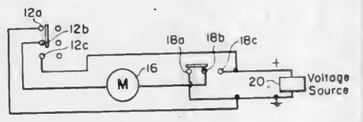
MOTORIZED UNIT FOR HOME ENTERTAINMENT DEVICES

Hien Vodinh, and Robert E. Pooler, both of Knoxville, Tenn., assignors to NAP Consumer Electronics Corp., New York, N.Y.

Filed Jul. 31, 1985, Ser. No. 761,132

Int. Cl.⁴ G05G *5/00*

U.S. Cl. 318—626 **4 Claims**



1. Apparatus for moving an appliance containing unit of a cabinet from a first to a second predetermined position or from said second to said first predetermined position relative to said cabinet in response to user activation, comprising

motor means for moving said unit from said first toward said second or from said second toward said first predetermined position upon energization in a first or second direction, respectively;

user operable control switch means having a first and second control position for energizing said motor means in said second or first direction, respectively;

limit switch means connected to said motor means and said

control switch means, said limit switch means having a first operating position adapted to maintain energization of said motor means in said first direction and prevent energization of said motor means in said second direction, and a second operating position maintaining energization of said motor means in said second direction and interrupting energization of said motor means in said first direction, said limit switch means comprising a single pole double throw switch mounted on said cabinet in a predetermined position relative to said appliance containing unit; and

limit switch operating means for moving said limit switch to said second or first operating position, respectively, when said unit is within a predetermined distance of said first or second predetermined position, respectively, said limit switch operating means comprising switch activating means mounted on said unit for movement therewith.

4,628,238

POSITIONING DEVICE COMPRISING PRE-STRESSED CONTACTLESS BEARINGS

Hendricus F. G. Smulders; Johannes L. M. Hagen, and Marinus J. J. Dona, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,057

Claims priority, application Netherlands, Mar. 29, 1985, 8500930

Int. Cl.⁴ G05B *1/06*

U.S. Cl. 318—653 **15 Claims**



1. A positioning device comprising a flat table, a horizontal plate-shaped carrier displaceable in two orthogonal coordinate directions with respect to said flat table, said device including a first translation drive coupled to the carrier for exerting pushing and pulling forces on the carrier in a first coordinate direction, a second translation drive coupled to the carrier for exerting pushing and pulling forces on the carrier in a second coordinate direction at right angles to the first coordinate direction, said forces exerted on the carrier by said first and second drives lying in one horizontal plane, a first horizontally operating static push and pull bearing coupling said first drive to the carrier in a contactless manner via a viscous medium, and a second horizontally operating static push and pull bearing coupling said second drive to the carrier in a contactless manner via a viscous medium, each said first and said second push and pull bearings being pre-stressed in its respective first and second coordinate directions with an associated force acting to attract said carrier to said first and second drives to oppose the respective maximum occurring pulling force between said first and said second drives on the one hand and said carrier on the other hand whereby said drives and said carrier remain in operative relationship with each other notwithstanding the application of said maximum occurring pulling force.

4,628,239

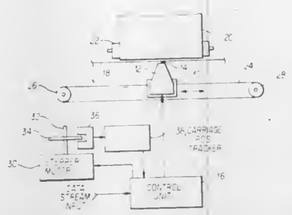
DUAL OPTICAL MECHANICAL POSITION TRACKER

Seth L. Everett, Jr., Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 6, 1985, Ser. No. 742,152

Int. Cl.⁴ G05B *19/40*

U.S. Cl. 318—685 **11 Claims**



1. Apparatus for determining the position and direction of print head carriage movement of an impact type printer, comprising:

drive motor means having a rotatable shaft coupled to a moveable carriage containing a print head;

a timing wheel mounted on said shaft, said timing wheel further including a single set of circumferentially equally spaced apertures having a mutual arcuate separation substantially equal to the arcuate distance across said apertures, said arcuate distance further being capable of framing pairs of photo emitter/sensor elements arranged side by side;

a pair of photo emitter elements arranged side by side adjacent said apertures on one side of said timing wheel;

a pair of photo sensor elements arranged side by side adjacent said apertures on the other side of said timing wheel and being in registration with said pair of emitter elements so that each emitter element directs a light beam toward a respective sensor element; and

means coupled to and being responsive to said pair of photo sensor elements for tracking a change of position from a last intentionally driven rest position in the presence of external forces applied such as shock and vibration and activating the drive motor means to return to said last driven rest position.

4,628,240

SYNCHRONOUS MOTOR CONTROL SYSTEM

Mitsuo Kurakake, Hino; Keiji Sakamoto, Hachioji, and Jiro Kinoshita, Yamato, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP84/00082, § 371 Date Nov. 5, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO84/03596, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 2, 1984, Ser. No. 673,742

Claims priority, application Japan, Mar. 3, 1983, 58-34866

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—723 **4 Claims**

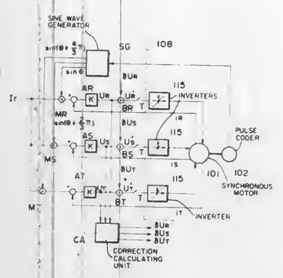
1. A synchronous motor control system for controlling a synchronous motor, comprising:

a detector, coupled to the synchronous motor, for detecting a rotational angle of the synchronous motor;

a control circuit, coupled to said detector, for generating a sine value corresponding to the rotational angle detected by said detector and for multiplying an effective current command by the sine value to produce an inverter drive signal in each phase; and

an inverter, having a physical saturable quantity and coupled to said control circuit and the synchronous motor, for providing current commands to armature windings of the synchronous motor in dependence upon the inverter drive signals from said control circuit, said control circuit determining, for each phase, when the corresponding inverter drive signal is in excess of the physical saturable quantity

of said inverter in that phase, and correcting that phase of the inverter drive signal which is provided to said inverter by a correction quantity, said control circuit correcting the inverter drive signals in the other phases based on the



correction quantity, said control circuit executing the corrections so that the waveforms of the current commands provided to the armature windings of the synchronous motor are always sine waves.

4,628,241

START-UP CONTROL METHOD AND APPARATUS FOR POLYPHAE INDUCTION MOTOR

Raymond E. Bristow, South Brent; Michael Fitzpatrick, Yealmpton, and David C. Groom, Harbertonford, all of England, assignors to Fairford Electronics Limited, Devon, England

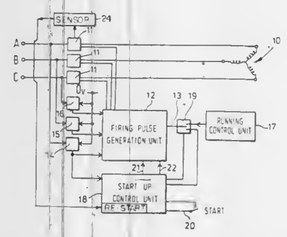
PCT No. PCT/GB84/00118, § 371 Date Dec. 3, 1984, § 102(e) Date Dec. 3, 1984, PCT Pub. No. WO84/04005, PCT Pub. Date Oct. 11, 1984

PCT Filed Apr. 4, 1984, Ser. No. 678,566

Claims priority, application United Kingdom, Apr. 5, 1983, 8309226

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—778 **9 Claims**



1. A method of controlling the start-up of a three phase a.c. induction motor (**10**) by the controlled firing of respective switching means (**11**) connected in series with each of the supply phases (A,B,C,) or motor windings, the switching means (**11**) each being of the type which conduct from the moment of application of a firing pulse until current therethrough ceases, said method comprising the steps of:

effecting an initial selective firing of the switching means (**11**) to cause current to flow between two only of the supply phases (B,C), this firing being timed relative to a predetermined point on one of the phase voltage waveforms (V_A) such that the voltage between said two phases (B,C) is decreasing in value at the moment of firing,

effecting firing of the third-phase immediately before the current in the said two phases first falls to zero, and

thereafter effecting sequential firing of the switching means (**11**) such as to progressively increase the angle of conduction of each switching means (**11**) from an initial minimum value.

4,628,242

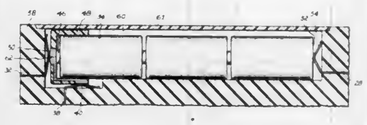
SYSTEM FOR CHARGING A RECHARGEABLE BATTERY

Clifford L. Scholefield, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Dec. 30, 1985, Ser. No. 814,442

Int. Cl.⁴ H02J *7/00*; **H01M** *10/46*

U.S. Cl. 320—2 **4 Claims**



1. For use in an energy-using device adapted to operate from an external source of A-C power and from either rechargeable type or non-rechargeable type batteries of the same standard size and configuration, a charging system comprising in combination:

a housing for said energy-using device, said energy-using device operable in a first mode when connected to said external source of A-C power to supply said A-C power to a load disposed within said energy-using device and to recharge said rechargeable battery type and in a second mode when disconnected from said source of A-C power to supply power to said load alternatively from said rechargeable or non-rechargeable battery types;

an electrical charging circuit disposed within said housing of said energy-using device for charging said rechargeable battery type when said energy-using device is connected to said external source of A-C power;

a cavity disposed within said housing of said energy-using device for alternatively receiving therein batteries of both of said rechargeable and non-rechargeable types, each of said types having a positive power terminal and a negative power terminal for providing electrical energy from said battery types to said energy-using device;

a pair of discharge terminals for receiving power discharged from either of said battery types, said pair of discharge terminals residing in said cavity and permanently affixed within said housing, one of said pair adapted for current conducting engagement with one of said power terminals of said non-rechargeable battery type and the other of said pair adapted for current conducting engagement with the other of said power terminals of said non-rechargeable battery type;

a charging contact connected in said charging circuit and residing in said cavity, said charging contact spaced-apart from each of said discharge terminals;

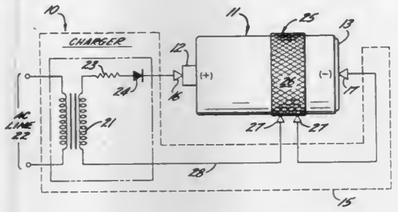
a removable charging adapter residing in said cavity when said rechargeable battery type is inserted into said cavity, said charging adapter carrying current conducting means for engaging said charging contact and for providing a current conducting path between said charging contact and one of said power terminals of said rechargeable battery type, the other of said power terminals of said rechargeable battery type engaging one of said discharge terminals whereby said one of said discharge terminals is operable as a second charging contact during charging of said rechargeable battery type, said removable adapter being removable from said cavity when said non-rechargeable battery type is residing within said cavity to preclude charging of said non-rechargeable battery type

4,628,243

BATTERY CHARGING SYSTEM HAVING MEANS FOR DISTINGUISHING BETWEEN PRIMARY AND SECONDARY BATTERIES

John S. Hodgman, and Ferdinand H. Mullersman, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Oct. 11, 1984, Ser. No. 659,918
Int. Cl.[4] H02J *7/00;* **H01M** *10/44*
U.S. Cl. 320—2 **25 Claims**



1. A battery charging system adapted to distinguish a rechargeable battery type from a nonrechargeable battery type, both said types being of substantially similar size, said system comprising, in combination:

a rechargeable battery having first and second external load terminals for delivery electrical energy;

indicia means on the rechargeable battery for providing an indication distinguishing said rechargeable battery from a non-rechargeable battery;

a charging device including a battery charging circuit having a first non-charging mode and a second charging mode, said circuit having first and second charging contacts arranged for engagement with the first and second external load terminals respectively when said rechargeable battery is connected to the charger, said first and second charging contacts each engageable by one of a pair of load terminals of a non-rechargeable battery; and

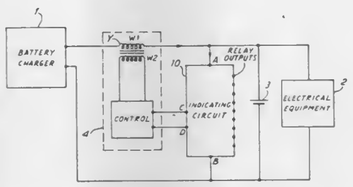
enabling means in said charging device for sensing the presence of the indicia means on the rechargeable battery and in response thereto enabling said charging mode, whereby the charger will be enabled to deliver charge current only by batteries of the rechargeable type.

4,628,244

ELECTRICAL INDICATING CIRCUIT

David L. Neasham, Penkridge, England, assignor to Thorn Emi Automation Limited, Rugeley, England

Filed Mar. 26, 1985, Ser. No. 716,250
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—48 **4 Claims**



1. An electrical indicating circuit suitable for indicating an open circuit condition in a battery charging circuit in which a battery charger is coupled across a battery, the indicating circuit comprising

first circuit means for generating respective voltages related to the output current and the output voltage from the battery charger,

second circuit means for generating a ratio signal related to the ratio of the voltages, generated by said first circuit means, and so to the output impedance of the battery charger,

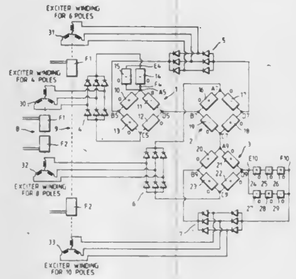
and third circuit means for comparing said ratio signal with a threshold signal and for generating an indication, indicative of an open circuit condition, in dependence on the comparison.

4,628,245

MULTIPOLAR EXCITATION SYSTEMS

George P. Quayle, Preston, England, assignor to Associated Electrical Industries Limited, England

PCT No. PCT/GB84/00195, § 371 Date Feb. 13, 1985, § 102(e) Date Feb. 13, 1985, PCT Pub. No. WO85/00078, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 6, 1984, Ser. No. 705,334
Claims priority, application United Kingdom, Jun. 15, 1983, 8316283
Int. Cl.[4] H02P *9/00*
U.S. Cl. 322—32 **7 Claims**



1. A variable pole number D.C. excited rotor winding arrangement for a dynamoelectric machine, comprising:

(i) a closed loop of at least three series-connected rotor winding sections;

(ii) at least first, second and third current supply terminals at respective interconnections of said winding sections;

(iii) a first pair of said winding sections wound for generating magnetic poles of opposite senses when fed in parallel, said first pair of winding sections being common to said first current supply terminal;

(iv) a second pair of said winding sections wound for generating magnetic poles of opposite senses when fed in series, said second pair of winding sections being common to said second current supply terminal;

(v) current supply means comprising:

(a) independently energizable first and second exciter windings for energizing said winding sections via said first and said second current supply terminals respectively,

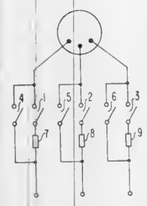
(b) respective first and second rotating rectifiers connected to said exciter windings; said current supply means reversing the current through at least one of said winding sections, according to the exciter winding which is energized, and thereby varying the pole number.

4,628,246

METHOD FOR PHASIC SEQUENTIAL COUPLING OF THREE-PHASE SHORT-CIRCUIT GENERATORS

Olav Dronen, 3520 Farum, Denmark

PCT No. PCT/DK82/00037, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO82/03952, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 29, 1982, Ser. No. 456,055
Claims priority, application Denmark, Apr. 29, 1981, 1893/81
Int. Cl.[4] H02J *3/08*
U.S. Cl. 322—100 **4 Claims**



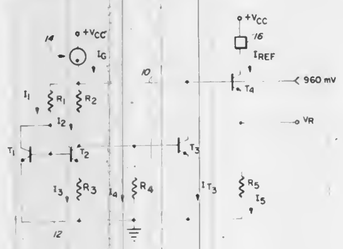
1. A method for phasic sequential coupling of a three-phase short-circuit generator to a power line, whereby coupling means in all three or at least two phase are actuated in a successive manner, characterized in detecting the instantenous voltage across the unactuated coupling means of at least the first power-supplying phase and actuating the respective coupling means in response to said detection at such a moment of time where said voltage shows a relative maximum amplitude.

4,628,247

VOLTAGE REGULATOR

Nazzareno Rossetti, Scottsdale, Ariz., assignor to SGS Semiconductor Corporation, Phoenix, Ariz.

Filed Aug. 5, 1985, Ser. No. 762,273
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—314 **6 Claims**



1. In a prior art integrated circuit voltage regulator having an unregulated voltage input terminal and a regulated voltage output terminal, and further comprising:

a first transistor having an emitter, a collector and a base, the first transistor having a first base-emitter voltage characteristic, the collector of the first transistor being connected through a first resistor to a current source, said current source being derived from the unregulated voltage, the emitter of the first transistor being connected through a second resistor to a reference voltage; and

a second transistor having an emitter, a collector and a base, the second transistor having a second base-emitter voltage characteristic, the base of the second transistor being connected to the collector of the first transistor, the collector of the second transistor being connected to the current source, the emitter of the second transistor being connected to the reference voltage, the regulated output of the voltage regulator being provided at the collector of the second transistor and the regulated voltage output being a function of the first base-emitter voltage characteristic of the first transistor plus the quantity comprising the difference between the first base-emitter voltage characteristic of the first transistor and the second base-emitter voltage characteristic of the second transistor, times the ratio of the value of resistance of the first resistor and the value of resistance of the second resistor;

the improvement comprising:

a third transistor having a collector, an emitter and a base, said third transistor having a third base-emitter voltage characteristic, said third base-emitter voltage characteristic being substantially equal to said second base-emitter voltage characteristic, said collector of said third transistor being connected to the unregulated voltage source through a load, said emitter of said third transistor being connected to the voltage reference through a third resistor and said base of said third transistor being connected to the current source; and

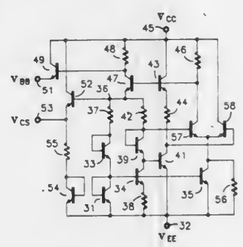
a fourth resistor being connected between the collector of the first transistor and the reference voltage, a regulated and temperature compensated voltage source being provided from said emitter of said third transistor, said regulated and temperature compensated voltage being regulated with respect to the reference voltage, and said emitter of said third transistor being connected to the regulated voltage output terminal.

4,628,248

NPN BANDGAP VOLTAGE GENERATOR

Mark S. Birrittella; Robert R. Marley, both of Phoenix, and Keith D. Nootbaar, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1985, Ser. No. 761,207
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—314 **15 Claims**



1. A voltage reference circuit including a first output terminal for providing an output, a first supply voltage terminal, and a second supply voltage terminal, comprising:

first means for developing a first voltage having a positive temperature coefficient, comprising:

a first NPN transistor having an emitter coupled to said first output terminal, a collector coupled to said first supply voltage terminal, and a base;

second means coupled between said first output terminal and said second supply voltage means for providing a resistance;

a first resistor;

a second resistor;

a first diode;

a second diode;

third means for providing a resistance; and

a second NPN transistor having an emitter coupled to said second supply voltage terminal by said first resistor, a base coupled both to said second supply voltage terminal by said first diode and to said base of said first NPN transistor by said third means, and a collector coupled to a node by said second diode, said node coupled to said base of said first NPN transistor by said second resistor;

fourth means coupled to said first means for developing a

second voltage having a negative temperature coefficient, wherein said first and second voltages are combined to establish a temperature compensated voltage as an output;
fifth means coupled to said first and fourth means for sourcing current to both said first and fourth means; and
sixth means coupled to said first and fourth means and responsive to said first and second voltages and coupled to said fifth means for biasing said fifth means.

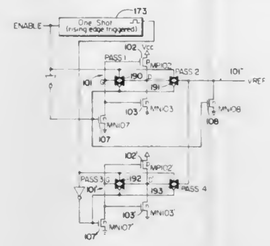
4,628,249
POWER SUPPLY HAVING A PREDETERMINED VALUE OF INPUT IMPEDANCE
Yoshihiro Ikefuji, and Mitsuru Koiwa, both of Kyoto, Japan, assignors to Rohn Company Limited, Kyoto, Japan
Filed Jul. 13, 1984, Ser. No. 630,491
Claims priority, application Japan, Jul. 18, 1983, 58-131176
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—315 **1 Claim**



1. A circuit for power supply, comprising:
a comparator circuit means for comparing an input signal voltage, in which alternating current signals are superposed on a direct current voltage, with a reference voltage and producing a non-inverted signal when said input signal has a fluctuation less than said reference voltage and an inverted signal when said input signal has a fluctuation more than said reference voltage;
a first constant-output-cuurent circuit means for generating a constant-output-current in response to a non-inverted output current from said comparator circuit means;
a first output-voltage-stabilizing circuit means for generating a stabilized output voltage in response to an output from said first constant-output-current circuit means;
a second output-voltage-stabilizing circuit means for receiving said input signal voltage and generating said reference voltage; and
a second constant-output-current circuit means including a first current mirror circuit means driven in response to an inverted output current from said comparator circuit means and a second current mirror circuit means driven by an output from said first current mirror circuit means and having NPN type transistors for flowing a superfluous current to a low potential line, said NPN type transistors each being connected at the collector thereof to a high potential line and at the emitter thereof to said low potential line.

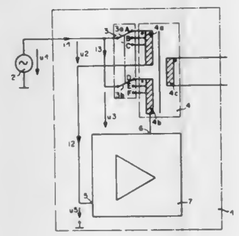
4,628,250
POWER CONSERVING CMOS REFERENCE VOLTAGE SOURCE
Robert D. Lee, Denton, Tex., assignor to Thomson Components-Mostok Corporation, Carrollton, Tex.
Filed Nov. 20, 1984, Ser. No. 674,104
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—317 **4 Claims**

1. A power-conserving CMOS reference voltage generation circuit comprising
first (**101**) and second (**101'**) parallel reference voltage sources, coupled to a common ENABLE input, and having a common reference voltage output node (**101''**), each source including a first, p-channel (**102,102'**) and a second, n-channel (**103,103'**) CMOS transistor series-connected between Vcc and ground, said first and second transistors having respective gates connected at a common gate node (G, G') and respective drains connected to a common drain node (D, D'),
characterized in that:
said second reference voltage source (**101'**) is of relatively large capacity compared to said first source (**101**),
means (**173, 107'**), responsive to a rising signal edge at said ENABLE input, are provided for temporarily enabling said second source (**101'**), thereby shortening the time



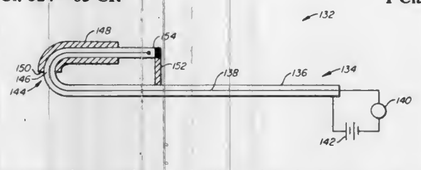
required to drive the reference voltage at said output node (**101''**) to a desired level, i.e. enhancing the slew rate of said node, and
means (**190–194**) are provided for interconnecting said common gate nodes (G,G'), said common drain nodes (D,D'), and said common output reference voltage output node (**101''**) in response to a high signal on said ENABLE input and for isolating said nodes from one another in response to a low signal on said ENABLE input, thereby conserving power.

4,628,251
PRECISION MEASUREMENT VOLTAGE TRANSDUCER
Mathis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland
Filed May 16, 1984, Ser. No. 611,018
Claims priority, application Switzerland, Jun. 1, 1983, 2994/83
Int. Cl.[4] G05F *7/00*
U.S. Cl. 323—340 **19 Claims**



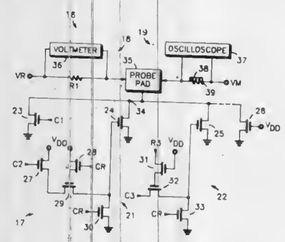
1. A precision measurement voltage transducer comprising
a reference voltage source providing an alternating voltage;
a servo amplifier having an input and an output;
a magnetic coupling means;
a feedback winding engaging the magnetic coupling means and feeding the reference voltage from the reference source to the input of the servo amplifier;
an output winding engaging the magnetic coupling means and having an output; and
a magnetizing winding engaging the magnetic coupling means and connecting the reference source voltage and the output of the servo amplifier, where the output of the servo amplifier is magnetically inductively engaging the feedback winding via the magnetizing winding such that the resulting input voltage of the servo amplifier is approximately zero and the voltage drop in the feedback winding is transformed into an output voltage at the output winding corresponding to the number of turns of the output winding and of the feedback winding.

4,628,252
CORROSIVE IMPURITY SENSOR
James H. Terhune, San Jose, and Gerald M. Gordon, Soquel, both of Calif., assignors to General Electric Company, San Jose, Calif.
Filed Dec. 12, 1983, Ser. No. 560,121
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—65 CR **1 Claim**



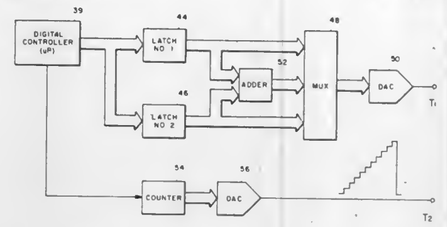
1. A sensor, in combination with an electrical source capable of delivering power to the sensor and meter means capable of indicating an electrical conduction produced by the sensor, for detecting the presence of at least one corrosive impurity in a fluid, the sensor comprising:
(a) a tube, bent to be stressed below its yield strength, provided with a weak groove area at the bend which is relatively weaker than the remainder of the tube, which tube is positioned in a fluid possibly having at least one impurity which if in sufficient concentration will cause the weak area to fracture; and
(b) a corrosion detecting element means, disposed within the tube, electrically connected to said electrical source, capable of conducting in the presence of at least one impurity if the tube fractures.

4,628,253
CLOCK SIGNAL TEST CIRCUIT
Ruey J. Yu, and William L. Martino, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 30, 1984, Ser. No. 595,194
Int. Cl.[4] G01R *15/12, 31/08;* **H03K** *5/13*
U.S. Cl. 324—73 R **15 Claims**



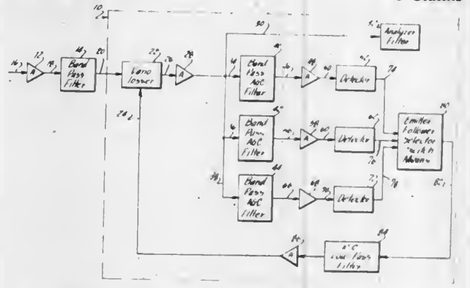
1. An integrated circuit for being tested by a test apparatus which is external to the integrated circuit, comprising:
serially connected first, second, and third clock drivers for sequentially providing, first, second, and third clock signals, respectively;
first current source means for passing current between a current node and a first power supply terminal in response to receiving the first clock signal;
second current source means for passing current between the current node and the first power supply terminal in response to receiving the second clock signal;
third current source means for passing current between the current node and the first power supply terminal in response to receiving the third clock signal; and
a probe pad coupled to the current node for providing a connecting point to the integrated circuit for the test apparatus which is external to the integrated circuit.

4,628,254
METHOD FOR DIGITALLY MEASURING WAVEFORMS
L. Rodney Bristol, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Jan. 16, 1984, Ser. No. 571,319
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 R **5 Claims**



1. A method of digitally measuring a waveform display, comprising the steps of:
(a) adjusting the separation of a first pair of selected points on a waveform to a predetermined reference spacing by using a variable control;
(b) aligning first and second cursors with respective ones of a second pair of selected points on a waveform thereby to provide a measurement spacing; and
(c) determining by digital measurement means the ratio of said measurement spacing to said reference spacing.

4,628,255
AGC TECHNIQUE FOR SPECTRUM ANALYZERS
William O. Dunnican, Pompton Plains, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 8, 1969, Ser. No. 889,854
Int. Cl.[4] G01R *23/165*
U.S. Cl. 324—77 C **5 Claims**



1. An automatic gain control system for use in a low frequency spectrum analyzer of the type having a band pass filter connected to receive RF signals having as components low frequency signals including background signals and higher intensity signals of discrete frequencies, and operative to pass a band of frequencies including a predetermined central frequency of interest, said system comprising:
vario-losser means for receiving signals throughout said band of frequencies and for providing a degree of attenuation of said signals in accordance with a control voltage;
RF amplifier means for receiving attenuated signals from said vario-losser means and for effecting amplification thereof, a portion of the amplified signals being taken as the output of said gain control system;
a plurality of narrow band pass filters for receiving and filtering amplified signals from said RF amplifier means, said filters including ones having peak transmittances close to and on both sides of said frequency of interest;
a plurality of detector means for receiving filtered signals from respective ones of said filter means and for rendering rectification of said filtered signals;

selector switch means for receiving the rectified outputs of each of said detector means and for selectively switching through only the lowest level input from said detector means;

low pass filter means for receiving the output of said selector switch means and for reducing ripple therein; and

D.C. amplifier means for receiving and amplifying the output of said low pass filter means to provide said control voltage to said vario-losser means.

4,628,256

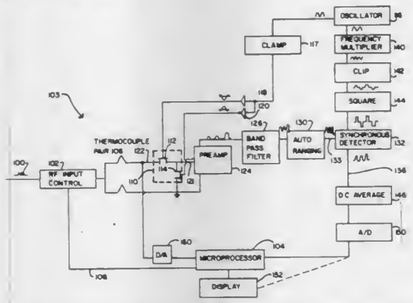
THERMOCOUPLE POWER METER

Robert Powell, Gaithersburg, Md., assignor to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed Jun. 27, 1983, Ser. No. 508,090

Int. Cl.[4] G01R *21/04, 19/24, 19/18*

U.S. Cl. 324—95 **30 Claims**



1. A meter for measuring an RF power, the meter comprising:

thermocouple means for converting RF power into a d.c. signal which varies with the RF power level;

means for establishing a sinusoidal signal having an offset from a reference level;

chopper means for receiving and chopping the d.c. signal; and

means for driving the chopper means with said offset sinusoidal input, the chopper means driven with said offset sinusoidal input providing an output signal that includes a series of sinusoidally-shaped, single-polarity pulses, the pulses varying in amplitude with the d.c. signal received by the chopper means; and

means for producing from said chopper means output signal, a signal at a predetermined harmonic frequency of said sinusoidal input, wherein the predetermined harmonic signal varies in amplitude with the amplitude of the chopper means output signal.

4,628,257

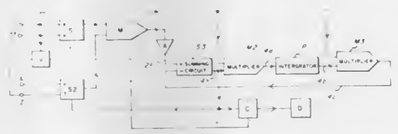
WATTMETER

Norbert L. Kusters, and Glen A. Herriot, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 26, 1984, Ser. No. 674,975

Int. Cl.[4] G01R *17/02, 15/10, 5/22*

U.S. Cl. 324—142 **4 Claims**



1. In a wattmeter for determining power corresponding to a.c. voltage and current components from respective proportional representative a.c. signals u and i, comprising

(a) first source means for providing a d.c. voltage reference signal U,

(b) second source means for providing a d.c. current signal I,

(c) first summing means for adding together signals u and U to generate a first output,

(d) second summing means for adding together signals i and I to generate a second output,

(e) means for multiplying together said first and second outputs to generate a third output,

(f) a feedback line supplying said third output to the second summing means,

(g) control means acting on said second source means for adjusting the signal I to tend to bring said third output to zero, and

(h) display means responsive to the condition of the control means for providing an indication of the power to be determined,

comprising improvement of means for substantially eliminating from said feedback line an undesirable fundamental frequency a.c. ripple component that is in-phase with the signal u, said eliminating means comprising

(i) means for multiplying said third output with the signal u to generate a fourth output,

(j) means for integrating said fourth output to obtain a fifth output in the form of a d.c. signal proportional to said undesirable component,

(k) means for multiplying said fifth output with the signal u to generate a correction signal equal to and in-phase with said undesirable component, and

(l) means for injecting said correction signal with opposite polarity into the feedback line to substantially eliminate said component therefrom.

4,628,258

METHOD AND APPARATUS FOR ELECTRICAL TESTING OF MICROWIRED STRUCTURES WITH THE ASSISTANCE OF PARTICLE PROBES

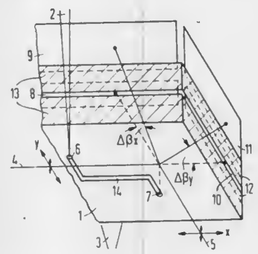
Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,525

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420552

Int. Cl.[4] G01R *31/02, 31/22;* **G06F** *11/32*

U.S. Cl. 324—158 P **14 Claims**



1. A method of testing microwired structures to determine if there is electrical continuity between first and second circuit nodes, comprising the steps of:

applying a first particle beam to the first node to charge the node and create an electric field at the second node when there is continuity between the two nodes;

directing a second particle beam past the second node resulting in deflection of the second particle beam in response to the presence of an electric field at the second node; and

detecting the deflection of the second particle beam as a measure of the voltage at the second node.

4,628,259

MAGNETO RESISTIVE SENSOR FOR DETECTING MOVEMENT OF A ROTATING BODY

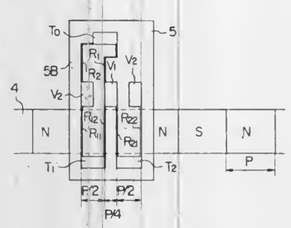
Tadashi Takahashi, Hitachi; Hiroshi Hayashida, Mito; Kunio Miyashita, and Sadao Sekizawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,233

Claims priority, application Japan, Sep. 29, 1980, 55-134372; Oct. 9, 1980, 55-140502

Int. Cl.[4] G01B *7/14;* **G01R** *33/02;* **H01L** *41/12*

U.S. Cl. 324—208 **16 Claims**



1. A rotation detecting means for a rotating body comprising:

a rotating body whose rotation state is to be detected;

a magnetic recording medium which is fixed to said rotating body centering around the center axis of said rotating body, N and S magnetic poles being alternately recorded at a prescribed interval on said recording medium in the rotation direction of said rotating body;

at least two groups of magnet-resistive elements disposed at a fixed position opposite to said magnetic recording medium so that their values of resistance may vary with the action of said magnetic poles as recorded on said magnetic recording medium, the widths of said magnet-resistive elements in the rotation direction being made sufficiently smaller than the pitch P of said magnetic poles recorded on said magnetic recording medium, said each group having two branches that comprise one magnet-resistive element, said two branches being disposed at an interval of an odd integer multiple of a minimum interval of P/2 in the rotation direction; and

low resistive parts comprising the parts which connect said two branches in series and the parts which connect said two groups in parallel to apply a prescribed voltage to each group so that output signals related to the rotation state of said rotating body may be derived from said connection parts of said two branches;

said magnet-resistive elements of each group being disposed in such a manner that the intervals between the groups of magnet-resistive elements are shifted from each other so that output signals have a phase difference.

4,628,260

EDDY CURRENT DEFECT-DETECTING SYSTEM FOR DETERMINING AN INNER OR OUTER DEFECT AND ITS DEPTH IN METAL TUBES

Sanshiro Kimoto, 1-4-32 Nakayamahigashi, Higashi-ku, Hiroshima-shi, Hiroshima-ken; Hisao Kokubo, 4-8-16 Tatsumidaihigashi, Ichihara-shi, Chiba-ken; Yasunobu Yamabayashi, 1-1 Yuushuudaihigashi, Ichihara-shi, Chiba-ken, and Kenichi Hidejima, 3-2 Yuushuudaihigashi, Ichihara-shi, Chiba-ken, all of Japan

Filed Oct. 19, 1983, Ser. No. 543,357

Claims priority, application Japan, Oct. 21, 1982, 57-185696

Int. Cl.[4] G01N *27/72, 27/82;* **G01R** *33/12*

U.S. Cl. 324—220 **10 Claims**

1. An eddy current defect-detecting system for a metal tube, comprising:

(a) a detector including test coil means movable axially through the metal tube for detecting as an impedance variation a variation in an eddy current produced due to a defect present in the metal tube;

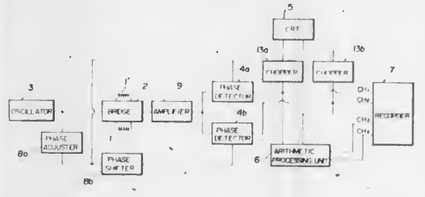
(b) an oscillator exciting said detector at a high frequency;

(c) a phase adjuster responsive to an oscillated output from said oscillator for adjusting the phase of the oscillated output to produce a first control signal;

(d) a phase shifter responsive to said first control signal from said phase adjuster for issuing a second control signal which is 90° out of phase with said first control signal;

(e) two phase detectors for producing a first X-axis defect signal by effecting first phase detection on an output signal from said detector with said first control signal and a second Y-axis defect signal by effecting second phase detection on the output signal from said detector with said second control signal;

(f) an arithmetic processing unit for electrically reading amplitudes of said first and second defects signals from said two phase detectors to determine phase angles thereof indicative of whether the defect is on an inner surface or an outer surface and of the depth of the defect, said arithmetic processing unit determining the phase angle θ of said Y-axis signal when the amplitude of said Y-axis signal exceeds a



predetermined value and said arithmetic processing unit determining whether said Y-axis signal is positive or negative when a half amplitude of the Y-axis signal is at least half of said predetermined value, said phase angle $\theta=\tan^{-1}|Y|/|X|$ or $\theta=180°-\tan^{-1}|Y|/|X|$, a calculated phase angle in a first range indicating that the defect is on an inner surface and a phase angle in a second range, different from said first range, indicating that the defect is on an outer surface, said arithmetic processing unit providing a first defect-indicating output signal proportional to the calculated phase angle when an inner surface defect is detected and providing a second defect-indicating output signal proportional to the calculated phase angle when an outer surface defect is detected; and

(g) recorder means for separately recording signals from said arithmetic processing unit which are representative of the defect on the inner surface and the depth thereof or the defect on the outer surface and the depth thereof, said first defect-indicating output signal being issued to one channel of said recorder means and said second defect-indicating output signal being issued to a second channel of said recorder means.

4,628,261

METHOD AND APPARATUS FOR SEPARATING MAGNETIC FIELD ATTRIBUTABLE TO FLAWS IN A MATERIAL FROM MAGNETIC FIELDS ATTRIBUTABLE TO OTHER PHENOMENA

Gerhard Hüschelrath, Laufach-Frohnhofen, and Ursula Ruth, Ronneburg, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 5, 1983, Ser. No. 482,284

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213267

Int. Cl.[4] G01N *27/90;* **G01R** *33/12*

U.S. Cl. 324—240 **14 Claims**

8. An apparatus for detecting flaws in electrically conductive material comprising:

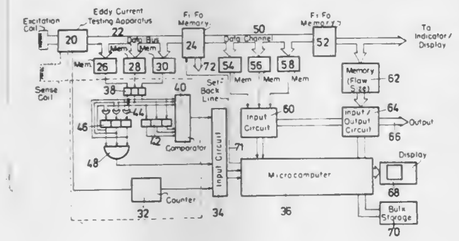
means for inducing magnetic fields in a material to be tested

for flaws, thereby causing eddy currents to flow in said material;

means for detecting the magnetic fields, induced by said inducing means, in proximity to said material and producing eletrical signals in response thereto;

means for converting said electrical signals, received from said detecting means, to at least one initial digital value representing a complex number;

means for characterizing said initial value, received from said converting means, as included in one or more of three ranges, a value included in a first of said three ranges corresponding to a field produced by phenomena other than a flaw in said material, a value included in a second of said three ranges corresponding to a field produced in part by a flaw in said material and in part by phenomena other



than a flaw in said material, a value included in a third of said three ranges corresponding to a field produced only by a flaw in said material;

means for removing components attributable to phenomena other than a flaw in said material from said initial value, received from said characterizing means, to produce a processed value if said characterizing means characterizes said initial value as included in said second range; and

means for determining parameters of a flaw in said material in response to said initial value if said characterizing means characterizes said initial value as being included in said third range and in response to said processed value produced by said removing means if said characterizing means characterizes said initial value as being included in said second range.

4,628,263

NUCLEAR MAGNETIC RESONANCE SPECTROMETER

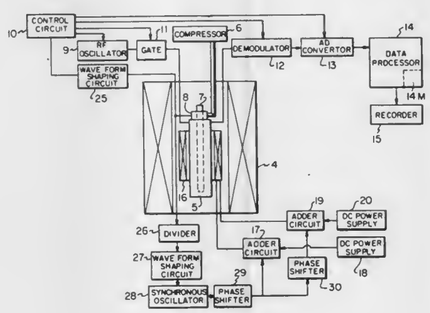
Jun Kida, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

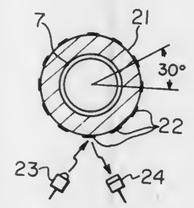
Filed Jun. 11, 1984, Ser. No. 619,005

Claims priority, application Japan, Jun. 13, 1983, 58-105386; Aug. 12, 1983, 58-147885

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—321 **5 Claims**





4,628,262

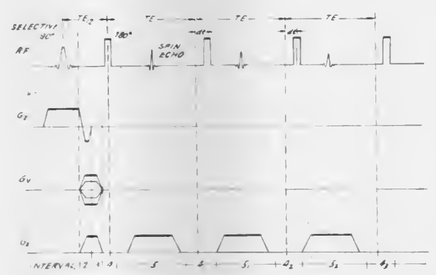
MULTIPLE ECHO CHEMICAL SHIFT IMAGING

Andrew A. Maudsley, Boston, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Feb. 5, 1985, Ser. No. 697,972

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **18 Claims**



1. A method of acquiring NMR information, comprising:

exciting at least some of the atoms of an object;

providing a plurality of refocusing pulses, each for generating a respective spin echo signal; after each refocusing pulse, providing a corresponding observation gradient field during the respective spin echo signal for spatially encoding the excited atoms; providing the plurality of refocusing pulses comprising timing at least one of the refocusing pulses in relation to the corresponding observation gradient field for spectrally encoding the excited atoms, thereby causing the excited atoms to provide both spatial and spectral information in the respective spin echo signal; and

after at least one of the refocusing pulses, receiving the respective spin echo signals from the object.

1. A nuclar magnetic resonance spectrometer having a means for producing a static magnetic field in the direction of Z-axis, a means for rotating a sample tube holding a sample therein in the magnetic field about the Z-axis, and a means for irradiating the sample with radio-frequency pulses and detecting the free induction decay signal emitted from the sample after the irradiation, said nuclear magnetic resonance spectrometer comprising:

a means for sensing the angular position of the sample tube; and

a means for adding the free induction decay signals;

wherein the radio-frequency pulses are applied according to the output signal from the angular position sensing means when a certain location of the sample tube arrives at a first specific position and also when the certain location arrives at a second position diametrically opposite to the first position, whereby two free induction decay signals are added by the adding means.

4,628,264

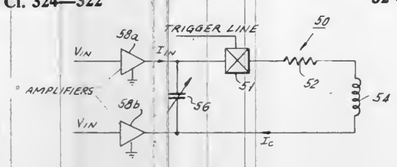
NMR GRADIENT FIELD MODULATION

Richard R. Rzedzian, Lexington, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Mar. 14, 1984, Ser. No. 589,539

Int. Cl.[4] G01R *00/00*

U.S. Cl. 324—322 **32 Claims**



1. A circuit for generating a gradient field for a nuclear magnetic resonance imaging system comprising:

input power circuitry for providing input power;

a capacitive circuit connected to the input power circuitry for storing energy in response to the input power;

a gradient coil; and

circuitry for connecting the gradient coil to the capacitive circuit, the gradient coil and the capacitive circuit when connected by the connecting circuitry being resonant at a resonant frequency to exchange energy in a sinusoidal manner at the resonant frequency for providing a sinusoidally modulated gradient field; the input power circuitry being operable for providing input power at about the resonant frequency to maintain the sinusoidally modulated gradient field at about a constant amplitude; the connecting circuitry comprising a switch circuit connected between the capacitive circuit and the gradient coil for closing and opening a switched connection therebetween to begin and end a sinusoidal exchange of energy for providing the sinusoidally modulated gradient field.

4,628,265

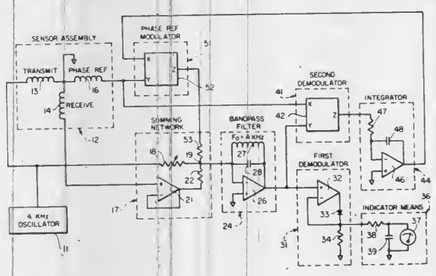
METAL DETECTOR AND CLASSIFIER WITH AUTOMATIC COMPENSATION FOR SOIL MAGNETIC MINERALS AND SENSOR MISALIGNMENT

David E. Johnson, Los Banos, and Richard W. Williams, Dos Palos, both of Calif., assignors to FRL, Inc., Los Banos, Calif.

Filed Apr. 22, 1983, Ser. No. 487,699

Int. Cl.[4] G01V *3/08, 3/10;* G01N *33/12;* G01R *27/72*

U.S. Cl. 324—329 **13 Claims**



1. In apparatus for locating a metal object: a transmitting coil, means for applying a square wave excitation voltage to the transmitting coil to transmit an alternating magnetic field, a receiving coil located within the transmitted field for producing a signal having components of different phases corresponding to metal objects and other disturbances in the field, first and second synchronous demodulators for demodulating the received signal at the phase of the transmitted field and in quadrature with the phase of the transmitted field, means for providing a square wave signal in quadrature with the transmitted field, an integrator for providing a signal of generally triangular waveform in response to the square wave signal in quadrature with the transmitted field, means for clipping the triangular signal to provide a sinusoidal signal at the fundamental frequency of the magnetic field, means for applying the sinusoidal signal to the first demodulator, a differentiator responsive to the sinusoidal signal for providing a signal which is shifted in phase by 90 degrees with respect to the sinusoidal signal, means for applying the phase shifted signal to the second demodulator, means responsive to one of the demodulated signals for indicating the presence of a metal object in the field, a bandpass filter responsive to the received signal for passing a signal corresponding to the third harmonic of the received signal, a third synchronous demodulator for demodulating the third harmonic signal at the phase of the transmitted field, means for applying a reference phase signal to the third demodulator at the phase of the transmitted field, means for integrating the demodulated third harmonic signal, means responsive to the integrated signal for proving a correction signal in phase with the transmitted field, and means for combining the correction signal with the received signal to null out a component of said signal of the phase of the transmitted field.

4,628,266

APPARATUS FOR DIRECT AIRBORNE ELECTROMAGNETIC PROSPECTING OF HYDROCARBON DEPOSITS.

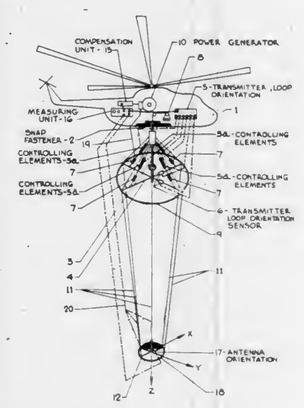
Jan Dzwinel, Krakow, Poland, assignor to Instytut Gornictwa Naftowego, Krakow, Poland

Division of Ser. No. 385,228, Jun. 4, 1982. This application Jan. 17, 1985, Ser. No. 693,002

Claims priority, application Poland, Jun. 10, 1981, 231633

Int. Cl.[4] G01V *3/165, 3/16*

U.S. Cl. 324—330 **1 Claim**



1. A helicopter mounted apparatus for direct electromagnetic prospecting of hydrocarbon deposits comprising in combination a transmitting system, a receiving system, and a processing system, wherein:

(a) the transmitting system consists of a high power generator mounted on a helicopter board which supplies alternating current in the frequency range of 0.1 to 10 Hz through a supply cable to an induction transmitter loop consisting of a large number of windings of a single insulated conductor,

(i) said transmitter loop being suspended vertically beneath the helicopter by means of a snap fastener, a shaft with an articulated joint, and a supporting frame,

(ii) said shaft extending vertically below the helicopter and being connected to the helicopter via said snap fastener, and the lower end of said shaft being rigidly, orthogonally connected to said supporting frame,

(iii) said supporting frame consisting of two crossed bars at whose ends said transmitter loop is rigidly connected,

(iv) said articulated joint on said shaft enabling said frame and said transmitter loop to be oriented in any direction and at any angle, such orientation being achieved with a controlling assembly consisting of a transmitter loop orientation controller, controlling elements, loop orientation sensors, and shock absorbers,

(v) said orientation controller mounted on the helicopter board and connected to a microprocessor also mounted on the helicopter board, said microprocessor controlling the entire apparatus and sending signals of predetermined orientation characteristics to said orientation controller, and said orientation controller in turn sending signals to said controlling elements,

(vi) said controlling elements mounted on arms which connect the shaft to said support frame, and adjusting the relative length of said arms to obtain the desired orientation,

(vii) said loop orientation sensors mounted on said supporting frame and continuously sending signals of the actual orientation back to said orientation controller, which in turn continuously adjusts the signal to the controlling elements,

(viii) said shock absorbers being mounted on the arms connecting the shaft to said support frame, and

(ix) the signal from said loop orientation sensors being sent to said microprocessor as one input to be stored;

(b) the receiving system consisting of three orthogonal induction receiver antennae each consisting of two circuits wound on a permalloy core, one a measuring circuit to measure the deviation of phase and amplitude of one of the three components H_x, H_y, H_z of said primary electromagnetic fields, and the other a compensation circuit which is used to compensate for the deviation of phase and amplitude signals measured by said inducation receiver antennae over locations known not to contain hydrocarbons (reference locations),

(i) said induction receiver antennae being rigidly attached to a horizontal aerodynamic shield, said aerodynamic shield stabilizing said induction receiver antennae while in flight and being suspended vertically from the transmitter loop supporting frame by means of steel lines,

(ii) signals received by the induction receiver antennae over said reference locations for all combinations of transmitter induction loop orientation, frequency, and helicopter altitude being transmitted to the microprocessor via measuring cables and stored in magnetic storage controlled by said microprocessor, and when flights are performed over locations for which it is to be determined whether or not hydrocarbons occur (prospecting locations), signals being sent to the compensation circuits from said microprocessor to compensate for the signals previously obtained over said reference locations, and

(iii) the orientation of said inducation receiver antennae being sensed by antennae orientation sensors mounted on one of said inducation receiver antennae, said antennae orientation sensors generating a signal which is sent via an additional measuring cable to said microprocessor and then stored on said magnetic storage;

(c) the processing system consisting of a digital meter assembly, a microprocessor, magnetic storage, and a monitor,

(i) said digital meter assembly being located on the helicopter board and accepting as input the signals of the compensated phase and amplitude from said measuring circuits of said induction receiver antennae, the orientation of said induction transmitter loop as sensed by said loop orientation sensors, the orientation of said induction receiver antennae as sensed by said antennae orientation sensors, the helicopter altitude and geographic co-ordinates as measured by standard helicopter instruments,

(ii) said microprocessor being located on the helicopter board and being linked electronically to the transmitting system, receiving system, and digital meter assembly, and controlling the generator output and the orientation of said transmitting induction loop, and

(iii) said microprocessor also gathering and storing in said magnetic storage the signals of phase and amplitude from said measuring circuits of said induction receiver antennae, the helicopter altitude, the frequency of the signal supplied to said transmitting induction loop, the orientation of said induction receiver antennae, and the geographic co-ordinates of the helicopter, and

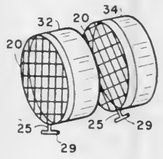
(iv) said microprocessor processing this data to obtain a probability level of hydrocarbon occurrence over each said prospecting location on the basis of pattern recognition theory and displaying said probability level on said monitor located in the helicopter, or alternately, said processing being performed after the helicopter lands by a second microprocessor on the ground and plotting a map of probability contours from data obtained over all said prospecting locations.

4,628,267

MEASURING OF ELECTRICAL CHANGES INDUCED BY IN SITU COMBUSTION THROUGH FLOW-THROUGH ELECTRODES IN A LABORATORY SAMPLE OF CORE MATERIAL

David O. Lee; Paul C. Montoya, and James R. Wayland, Jr., all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1983, Ser. No. 485,154
Int. Cl.[4] G01V *3/02*
U.S. Cl. 324—376 **11 Claims**



1. Apparatus for obtaining dynamic electrical parameter data for a core of material, said apparatus comprising:

a plurality of test electrodes, each electrode including structural means for permitting nondestructive passage of a phase front therethrough;

a plurality of reconstituted core material samples; and

housing means defining a combustion tube for holding an alternating pattern of said core material samples and said test electrodes;

the electrical impedance between two of said test electrodes providing accurate dynamic characteristics of said core material throughout the passage of the phase front.

4,628,268

TEST DEVICE FOR TESTING AN ACTUATOR CIRCUIT

Takehiro Matsubara, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,300
Claims priority, application Japan, Nov. 18, 1982, 58-204145
Int. Cl.[4] G01R *31/32*
U.S. Cl. 324—418 **10 Claims**

1. A test device for testing an actuator circuit when the actuator in the circuit is turned off to determine whether the circuit is operating normally, the actuator circuit having an actuator power supply and a relay output in series with said actuator, said test device comprising a test circuit including a test circuit power supply, a relay input actuated by said test circuit power supply under test conditions and coupled to operate said relay output to connect said actuator power supply to said actuator, voltage limiting means in said actuator circuit for limiting the voltage applied to said actuator from said actuator power supply under test conditions when said relay output is operated, means for detecting characteristics of current flow in said actuator circuit under test conditions and for discriminating between normal and abnormal circuit operation, and means connected in parallel with said voltage limiting means for bypassing said voltage limiting means except under test conditions.

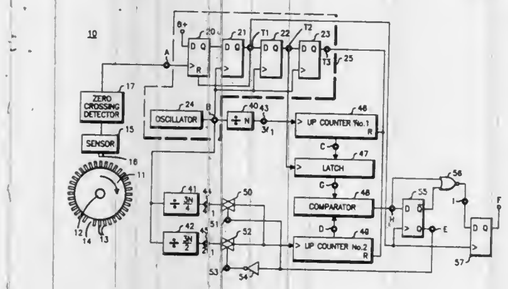


4,628,269

PULSE DETECTOR FOR MISSING OR EXTRA PULSES

Roy Hunninghaus, Des Plaines, and Edward Q. Almquist, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 23, 1984, Ser. No. 613,654
Int. Cl.[4] H03K *5/19, 5/26*
U.S. Cl. 328—120 **23 Claims**



1. A pulse detector for producing a pulse detection output signal in response to either an absence of a pulse or an occurrence of an extra pulse in a variable frequency periodic pulse train signal, said detector comprising:

first means for receiving a variable frequency periodic pulse train signal, comprising periodic pulses having a predetermined repetition rate, and providing an arming output signal in response to a second time duration between successive pulse train pulses which exceeds in one polarity sense by a first predetermined amount a first preceding time duration between successive pulse train pulses, and

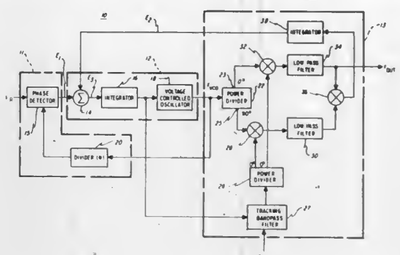
second means coupled to said first means for receiving said arming output signal and providing a pulse detection output signal in response to the providing of said arming output signal and a third time duration, between successive pulse train pulses subsequent to said second time duration, which exceeeds in an opposite polarity sense, by a second predetermined amount, said second time duration, whereby the occurrence of a missing or extra pulse indicated by said pulse detection output signal is more readily distinguishable from a reduction or increase in the predetermined repetition rate of the periodic pulses in the variable frequency periodic pulse train signal.

4,628,270

FREQUENCY-AGILE SYNCHRONOUS DEMODULATOR

Richard D. Roberts, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 10, 1985, Ser. No. 721,747
Int. Cl.[4] H03D *3/02*
U.S. Cl. 329—50 **37 Claims**



1. A frequency-agile synchronous demodulator for demodulating a carrier signal modulated by an information signal, wherein said frequency-agile synchronous demodulator is tunable for demodulating any modulated carrier signal within a band of carrier frequencies, and wherein said frequency-agile synchronous demodulator comprises:

means for providing an oscillating signal;

processor means responsive to said oscillating signal and the modulated carrier signal for producing a first signal representing the phase difference between said oscillating signal and the modulated carrier signal;

means for receiving a frequency-reference signal, having a frequency related to the frequency of the modulated carrier signal which it is desired to demodulate;

phase detector means responsive to said frequency-reference and said oscillating signals for producing a second signal representing the phase difference between said frequency-reference and said oscillating signals; and

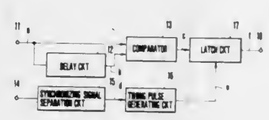
wherein said means for providing said oscillating signal is responsive to said first and second signals for controlling the frequency and phase of said oscillating signal to lock said oscillating signal to the frequency and phase of the desired modulated carrier signal for demodulation thereof.

4,628,271

DIFFERENTIAL PHASE SHIFT KEYING DEMODULATOR

Makoto Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

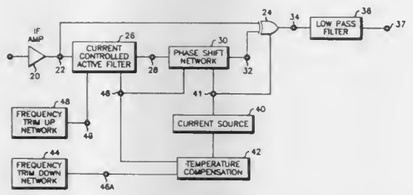
Filed Nov. 1, 1984, Ser. No. 667,015
Claims priority, application Japan, Nov. 2, 1983, 58-206443; Nov. 2, 1983, 58-206446
Int. Cl.[4] H04L *27/22*
U.S. Cl. 329—50 **18 Claims**



1. A differential phase shift keying demodulator, comprising:

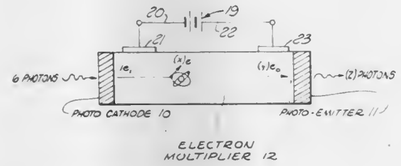
(a) delay means for delaying a modulated signal, the delay time of said delay means being set at a value which is an integral number times as much as the period of the carrier wave of said modulated signal, and the delay time being shorter than a transmission period for one bit of said modulated signal; and
(b) comparison means for comparing an output signal of said delay means and the modulated signal.

4,628,272
TUNED INDUCTORLESS ACTIVE PHASE SHIFT DEMODULATOR
Walter L. Davis, Plantation, and Yolanda Prieto, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 1, 1984, Ser. No. 655,822
Int. Cl.[4] H03D *3/02*
U.S. Cl. 329—110 **23 Claims**



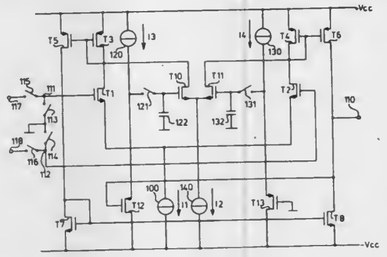
1. An inductorless quadrature demodulator for demodulating a frequency modulated (FM) signal which deviates in frequency about a center frequency, comprising:
inductorless active phase shifting means receiving said FM signal, for shifting the phase of said FM signal linearly over a predetermined range of frequencies about said center frequency to produce a quadrature signal, said inductorless active phase shifting means having a Q factor greater than 1;
frequency adjusting means, coupled to said inductorless active phase shifting means, for adjusting the frequency at which said quadrature signal is produced; and
phase detecting means, having an output node, for detecting a difference in phase between said FM signal and said quadrature signal and for producing a signal varying with said difference in phase at said output node.

4,628,273
OPTICAL AMPLIFIER
Weldon R. H. Vlasak, Van Nuys, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 12, 1933, Ser. No. 560,631
Int. Cl.[4] H01S *3/00;* **G02B** *6/14;* **H01J** *43/04*
U.S. Cl. 330—4.3 **12 Claims**



1. An optical amplifier comprising:
a solid body of intrinsic material adapted to produce secondary emission upon electron bombardment thereof;
a photocathode deposited by doping to a first end of said solid body of intrinsic material;
a photo-emitter deposited by doping to a second end of said solid body of intrinsic material; and
means to establish a potential gradient lengthwise across said solid body of intrinsic material between said first end and said second end thereof such that said second end adjacent said photo-emitter is more positive than said first end adjacent said photocathode , said potential gradient means being a voltage source having a negative electrode and a positive electrode, said negative electrode being directly connected to said first end of said solid body of intrinsic material and said positive electrode being directly connected to said second end of said solid body of intrinsic material.

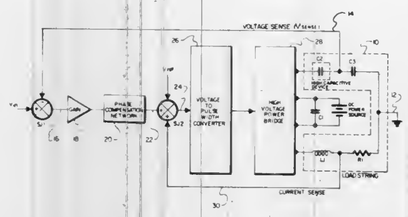
4,628,274
AMPLIFIER WITH INPUT DRIFT VOLTAGE COMPENSATION
Eric A. Vittoz, Cernier, and Henri J. Oguey, Corcelles, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland
Filed Apr. 30, 1985, Ser. No. 728,883
Claims priority, application Switzerland, Apr. 4, 1984, 2179/84
Int. Cl.[4] H03F *1/14*
U.S. Cl. 330—9 **7 Claims**



1. An amplifier having at least one main input, an output and means for nullifying, during a compensation phase, the signal which is applied to said main input, said amplifier having a first gain value between said at least one main input and said output, said amplifier comprising:
at least one secondary input having a substantially lower gain value between said at least one secondary input and said output, than said first gain value;
a capacitor connected between a point which is common to said secondary input and a point at a fixed potential;
switch means which are disposed between the output of the amplifier and the point which is common to said capacitor and to said secondary input and which permit the voltage level of the output of the amplifier to be stored in said capacitor during said compensation phase; and
compensation means which are controlled by said stored voltage level to compensate for the effect of the drift voltage of said main input.

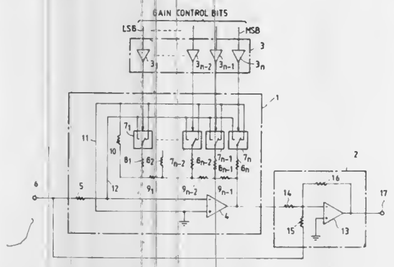
4,628,275
EFFICIENT POWER AMPLIFIER FOR HIGH CAPACITIVE DEVICES
John D. Skipper, and Steven M. Long, both of Albuquerque, N. Mex., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jul. 29, 1985, Ser. No. 759,717
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 **14 Claims**

1. A power amplifier circuit for driving a high-capacitive device, comprising:
a load string including inductive means connected to said device;
capacitive means connected to said load string, wherein during operation of said circuit said inductive means exchanges energy between said device and said capacitive means;
a dc power source for charging said capacitive means;
means for producing a full wave alternating triangular waveform of current in said load string including,
current sensing means connected to said load string, and
comparing means connected to said current sensing means for comparing current circulating in said load string to equal and opposite polarity reference levels so that



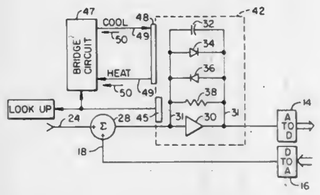
equal charge is alternately removed from said capacitive means and delivered to said device through said inductive means then returned to said capacitive means with any losses replenished by said dc power source;
means connected to said load string for sensing charge contained in said high capacitive device and to modulate said full wave alternating triangular current waveform;
whereby, said amplifier behaves as a stable linear dc coupled single pole operational amplifier delivering a large reactive current with only slight losses.

4,628,276
LOGARITHMICALLY LINEARLY CONTROLLED VARIABLE GAIN AMPLIFIER
Mikio Mizutani, Tokyo, Japan, assignor to Matsushita Graphic Communications Systems, Inc., Japan
Filed Dec. 14, 1984, Ser. No. 682,596
Claims priority, application Japan, Dec. 15, 1983, 58-236695; Aug. 18, 1984, 59-171997
Int. Cl.[4] H03G *3/20*
U.S. Cl. 330—86 **13 Claims**



9. A variable gain amplifier comprising:
an input terminal and an output terminal;
divider means having a first input connected to said input terminal to receive an analog input signal and a second input to which an n-bit digital gain control signal having a gain control value x is applied for dividing said analog input signal by the control value x;
subtractor means having a first input connected to an output of said divider means and a second input connected to said input terminal, the subtractor means providing to said output terminal an analog output signal, whereby the ratio of the analog input signal to the analog output signal is $(2^n/x)-1$ which approximates a logarithmically linear function of said control signal, said divider means comprising:
an operational amplifier having an input connected to said input terminal; and
a feedback circuit including a variable resistance means connected from the output of said operational amplifier to an input of said operational amplifier, the variable resistance means being responsive to said gain control signal to vary the resistance value of the feedback circuit; said resistance means comprising a ladder network having a series of first resistors connected from the output of the amplifier and a plurality of second resistors, each of said second resistors having a first end and a second end, the first end of each of said second resistors being connected respectively to said first resistors, a like plurality of switches selectively connecting the second ends of said second resistors to the input of said operational amplifier in response to binary signals representing said gain control signal, wherein the resistance value of each of said second resistors is twice as high as the resistance value of each of said first resistors.

4,628,277
FEMTOAMMETER
William D. Hill, San Jose, and David D. Akers, Los Gatos, both of Calif., assignors to General Electric Company, San Jose, Calif.
Filed May 1, 1985, Ser. No. 729,455
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—110 **7 Claims**



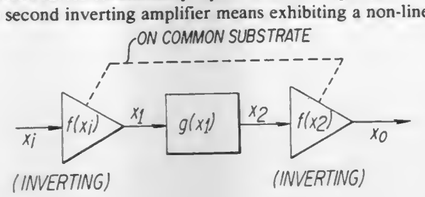
1. A femtoammeter comprising in combination:
an amplifier having a first leg connected to an input and a second leg to a reference standard voltage;
said amplifier having an output and a feedback loop from said output to said input leg;
first and second log diodes placed in parallel across said feedback loop, said first diode being opposed in direction to said second diode, said respective diodes being provided in a heat sink to maintain said diodes at a relatively constant temperature;
at least one temperature sensor connected to said heat sink, said temperature sensor outputting a signal to indicate in real time the operating temperature of said amplifier for calibrating said amplifier output in real time.

4,628,278
LOW EVEN-ORDER HARMONIC DISTORTION AMPLIFIER AND METHOD
Jeffrey S. Bottman, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Jun. 28, 1984, Ser. No. 625,547
Int. Cl.[4] H03F *1/32*
U.S. Cl. 330—149 **13 Claims**

1. Apparatus for amplifying an input signal which comprises:
(a) first inverting amplifier means exhibiting a non-linear amplifying characteristic having an input adapted to be coupled to the input signal for providing a first signal at a first output which is based on the input signal amplified by a first gain;

(b) attenuator means having an input coupled to said first output for providing a second signal at a second output which is based on said first signal attenuated by an attenuation factor substantially equal to said first gain; and

(c) second inverting amplifier means exhibiting a non-linear



amplifying characteristic substantially similar to that exhibited by said first inverting amplifier means having an input coupled to said second output for providing an output signal at a third output which is based on said second signal amplified by a second gain substantially equal to said first gain.

4,628,279

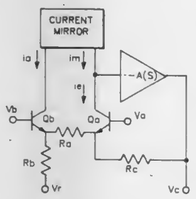
WIDEBAND FEEDBACK AMPLIFIER

David A. Nelson, Loveland, Colo., assignor to Comlinear Corporation, Fort Collins, Colo.

Filed Dec. 26, 1985, Ser. No. 813,590

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—257 **10 Claims**



1. A wideband feedback amplifier, the amplifier comprising:

first transistor means having at least first, second, and third terminals, the first terminal of which is connected to receive a first input signal;

second transistor means having corresponding first, second, and third terminals, the first terminal of which is connected to receive a second input signal;

a first resistance connected between the second terminal of said first transistor means and the second terminal of said second transistor means;

a second resistance connected between the second terminal of said first transistor means and a third input signal;

inverting gain means having an input connected to the third terminal of said second transistor means and having an output;

a third resistance connected between the second terminal of said second transistor means and the output of said inverting gain means; and

current mirror means having a first terminal connected to the third terminal of said first transistor means and having a second terminal connected to the third terminal of said second transistor means for supplying a current to the third terminal of said second transistor means that is equal to a current flowing into the third terminal of said first transistor means.

4,628,280

AMPLIFIER ARRANGEMENT

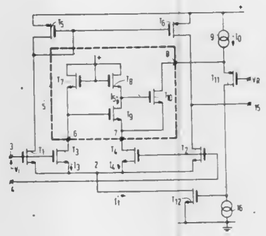
Evert Seevinck, Delden, and Roelof F. Wassenaar, Enschede, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1985, Ser. No. 764,142

Claims priority, application Netherlands, Aug. 20, 1984, 8402541

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—259 **15 Claims**



1. An amplifier arrangement comprising:

a first transistor and a second transistor of the same conductivity type each of which comprise a control terminal for receiving an input signal, a first main terminal and a second main terminal, the first main terminals being coupled to a common terminal, and

means for applying to the common terminal a bias current which depends on the input signal, said means comprising a third transistor and a fourth transistor each of which comprise a control terminal and a first and a second main terminal, currents in the third and fourth transistors being related to currents in the first transistor and in the second transistor, respectively,

characterized in that, the bias current applying means further comprise:

means for generating a control signal which is a measure of the difference between a reference current and the smaller of the currents in the third transistor and the fourth transistor, and

negative-feedback means which minimize the control signal from the control-signal generating means by controlling the bias current applied to the common terminal.

4,628,281

FEEDBACK AMPLIFIER WITH REDUCED DISTORTION

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,081

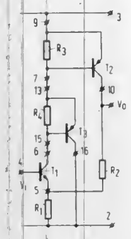
Claims priority, application Netherlands, Nov. 22, 1984, 8403549

Int. Cl.[4] H03F 3/04

U.S. Cl. 330—288 **4 Claims**

1. An amplifier arrangement having an input and an output and comprising, between a first and a second power-supply terminal, a first transistor having a control terminal coupled to the input of the amplifier arrangement, a first main terminal connected to a first end of a first resistor whose second end is coupled to the first power-supply terminal, and a second main terminal coupled to an input terminal of a first current multiplier circuit which multiplier circuit has an output terminal for supplying the multiplied input current and a sum terminal for

supplying the sum of the currents in the input terminal and the output terminal, which sum terminal is coupled to the input terminal of a second current multiplier circuit which has an output terminal for supplying the multiplied input current and a sum terminal for supplying the sum of the currents in the input terminal and the output terminal, which sum terminal is coupled to the second power-supply terminal, characterized in



that the output terminal of the second current multiplier circuit is connected to the first end of the first resistor via a second resistor and the output of the amplifier arrangement is connected to that end of the second resistor which is remote from the first end, and in that the output terminal of the first current multiplier circuit is directly connected to the first power-supply terminal.

4,628,282

CLOCK GENERATOR FOR DIGITAL DEMODULATORS

Kazuo Hikawa, Tokyo; Kazuya Toyomaki, Zama, and Hiroyuki Yamazaki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 28, 1985, Ser. No. 717,094

Claims priority, application Japan, Mar. 30, 1984, 59-62849

Int. Cl.[4] H03L 7/00

U.S. Cl. 331—1 A **19 Claims**

1. A clock generator adapted to receive a digital bit stream, comprising:

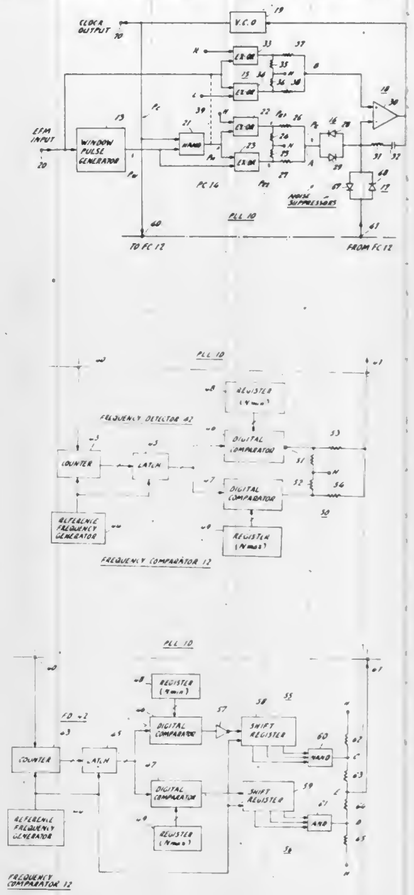
a voltage-controlled oscillator for generating clock pulses having a frequency and a phase which are variable in response to an input signal applied thereto;

means for generating a window pulse having a pulse duration smaller than the pulse spacing of said clock pulses in response to a predetermined transition between binary "1" s and binary "0" s in said bit stream;

a phase comparator responsive to said window and clock pulses for generating a phase control signal representing the difference in phase between said window pulse and said clock pulse;

a frequency comparator responsive to said clock pulse for detecting whether the frequency of said clock pulse is below a lower limit of a predetermined range or above an upper limit thereof and producing a frequency control signal of different levels depending on whether said frequency is below said lower limit or above said upper limit; and

means for combining said phase control signal and said frequency control signal and applying the combined signals to said voltage-controlled oscillator as said input signal.



4,628,283

HERMETICALLY SEALED OSCILLATOR WITH DIELECTRIC RESONATOR TUNED THROUGH DIELECTRIC WINDOW BY ADJUSTING SCREW

Allan Reynolds, Flushing, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.

Filed Nov. 7, 1983, Ser. No. 548,924

Int. Cl.[4] H03B 5/02, 7/00; H01P 7/10

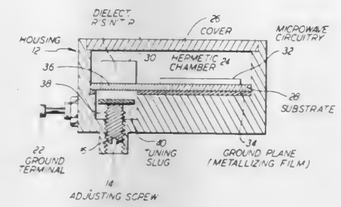
U.S. Cl. 331—68 **35 Claims**

1. In a microwave resonator apparatus of the class comprising a dielectric resonator puck having a microwave natural frequency, a driving circuit for exciting the puck to resonate at its natural frequency and develop a microwave field thereabout, and a mechanically movable tuning member arranged to be moved selectively into different positions of interference with a portion of said microwave field, thereby to cause the frequency at which the puck resonates when excited by said driving circuit to deviate from said natural frequency as a function of the tuning member's interference with said microwave field portion, the improvement wherein:

the dielectric resonator puck and the driving circuit are jointly housed within a hermetically sealed chamber from which the mechanically movable tuning member is ex-

cluded in order to maintain the hermetic integrity of said chamber;

the hermetically sealed chamber is bounded by material which is substantially opaque to microwave fields and which, in a manner consonant with said hermetic integrity of said chamber, is provided with microwave field transparency in a region thereof proximate the dielectric resonator puck in order to transmit out of said chamber said portion of the microwave field developed about said puck; and



the mechanically movable tuning member is located in relation to said region of field transparency and the transmission path therethrough of said portion of the microwave field developed about the dielectric resonator puck so as to effect said deviation from said natural frequency by the selective movement of said tuning member into said different positions of interference with said microwave field portion.

4,628,284

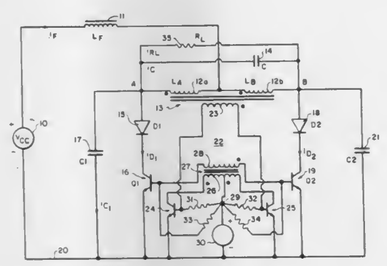
HIGH FREQUENCY HIGH VOLTAGE POWER SUPPLY PREVENTING SIMULTANEOUS TRANSISTOR CONDUCTION

Gert W. Bruning, Tuckahoe, N.Y., and Mark W. Fellows, Buffalo Grove, Ill., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,461

Int. Cl.⁴ H03B *9/10*

U.S. Cl. 331—86 **13 Claims**



1. A solid state power oscillator comprising:

a pair of input terminals for connection to a current source,

a parallel resonant tank circuit comprising a primary winding of a transformer connected in parallel with a first capacitor,

first and second diodes,

first and second switching transistors,

means connecting the first diode and the first transistor in a first series circuit between a first end terminal of the tank circuit and a first of said input terminals,

means connecting the second diode and the second transistor in a second series circuit between a second end terminal of the tank circuit and said first input terminal,

a second capacitor coupled in parallel with the first series circuit,

a third capacitor coupled in parallel with the second series circuit,

means connecting a tap on the primary winding to a second of said input terminals, and

a drive circuit including a secondary winding of said transformer and coupled to control electrodes of the first and second transistors for supplying drive signals thereto so as to alternately switch the transistors on and off in push-pull operation and with a forced switching delay such as to provide a dead-time wherein both transistors are simultaneously off during the switching interval of the transistors.

4,628,285

3-TERMINAL OSCILLATING ELEMENT AND OSCILLATOR EMPLOYING THE SAME

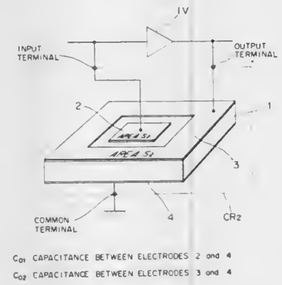
Hiroshi Nakatani, Kanazawa; Jiro Inoue, Ishikawa, and Masashige Miyamori, Hakui, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 441,644, Nov. 15, 1982. This application Dec. 27, 1984, Ser. No. 686,010

Claims priority, application Japan, Nov. 16, 1981, 56-184194

Int. Cl.⁴ H03B *5/32*

U.S. Cl. 331—163 **5 Claims**



1. A 3-terminal oscillating element (CR_2) provided in place of a combination of 2-terminal oscillating element (CR_1) and two externally provided capacitors (C_1 and C_2) in a Colpitts circuit, wherein the first external capacitor (C_1) is connected to the input side of an amplifier of said Colpitts circuit and the second external capacitor (C_2) is connected to the output side of said amplifier, said 3-terminal oscillating element (CR_2) having: a piezoelectric body (**1**) having first and second surfaces in face-to-face relation to each other, said piezoelectric body having a central section pre-polarized in one direction between said first and second surfaces and a perimeter section pre-polarized in the opposite direction to said one direction; a first electrode (**2**) provided on the first surface over said central section of the piezoelectric body; a second electrode (**3**) provided on the first surface, in a spaced relation to said first electrode (**2**) and over said perimeter section of the piezoelectric body (**1**); and a counter electrode (**4**) provided on said second surface covering both said first and second sections of said piezoelectric body, said 3-terminal oscillating element (CR_2) characterized in that:

the following equations are substantially satisfied:

$$\frac{C_2}{C_1} = \frac{1}{n} \cdot \frac{C_{02}}{C_{01}}$$

wherein C_{01} is an electrostatic capacitance between the first electrode (**2**) and the counter electrode (**4**), C_{02} is an electrostatic capacitance between the second electrode (**3**) and the counter electrode (**4**), and n is an transformation ratio of an ideal transformer; and

$$1 \leqq \frac{S_2}{S_1} \leqq 10$$

wherein S_1 and S_2 are areas of first and second electrodes, respectively.

4,628,286

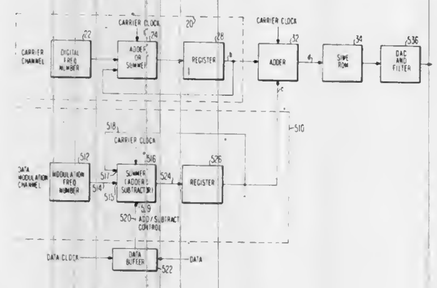
DIGITAL FREQUENCY MODULATOR

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 17, 1985, Ser. No. 724,310

Int. Cl.⁴ H03C *3/00*

U.S. Cl. 332—9 R **15 Claims**



1. A frequency modulator, comprising:

a source of digital sawtooth signal having a recurrence rate equal to the rest recurrence rate of the carrier to be frequency-modulated;

a source of digital information signal;

digital ramp signal generating means coupled to said source of digital information signal for generating a digital ramp signal having slope and polarity, at least said polarity being controlled in response to said digital information signal;

adding means coupled to said source of digital sawtooth signal and to said digital ramp signal generating means for adding together said digital sawtooth signal and said digital ramp signal for generating a frequency-modulated digital sawtooth signal; and

memory means including addressable memory locations, said memory means being coupled to said adding means for being addressed by said frequency-modulated digital sawtooth signal, each of said memory locations which is accessed being preprogrammed with a portion of a sinusoidal signal, whereby said memory means produces a frequency-modulated sinusoidal signal.

4,628,287

MULTIPORT RECTANGULAR TE_{10} TO CIRCULAR TE_{01} MODE TRANSDUCER HAVING PYRIMIDAL SHAPED TRANSDUCING MEANS

William H. Zinger, and Jerry A. Krill, both of Columbia, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Sep. 16, 1983, Ser. No. 532,892

Int. Cl.⁴ H01P *1/16*

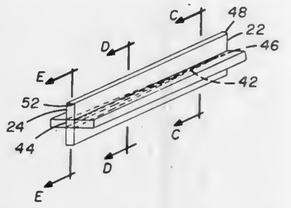
U.S. Cl. 333—137 **6 Claims**

1. A waveguide apparatus for transducing between a circular TE_{01} mode and multiple (n) rectangular TE_{10} modes comprising:

a first waveguide means having a circular cross section at one end thereof supporting said circular TE_{01} mode and a multiple (n) arm cross section at its opposite end forming a multiplicity (n) of radially extending waveguide arm segments, each supporting an intermediate TE mode,

a second waveguide means having a multiple (n) radially extending arm cross section along its length and being connected at one end to mate with said opposite end of said first waveguide means, the opposite end of said second waveguide means being formed as a multiplicity (n) of radially extending rectangular arms each open on one of its shorter sides facing the center of said second waveguide means,

a pyramidal means having an apex centered within said second waveguide means adjacent to but physically disconnected from said one end of said second waveguide means and having a base centered within said second waveguide means at the opposite end of said second waveguide means, said pyramidal means having a multiplicity (n) of sides extending the length of said second waveguide



means but disconnected physically from said second waveguide means except adjacent the base of said pyramidal means to close the open side of each of said multiplicity (n) of radially extending rectangular arms and complete formation of a multiplicity (n) of rectangular waveguide elements, each supporting said rectangular TE_{10} mode, and

a third waveguide means comprising a multiplicity (n) of separate rectangular waveguide members each supporting said rectangular TE_{10} mode and each having one end connected to a respective one of the waveguide elements formed by the connection of said second waveguide means and the base of said pyramidal means.

4,628,288

CIRCUIT INTERRUPTER

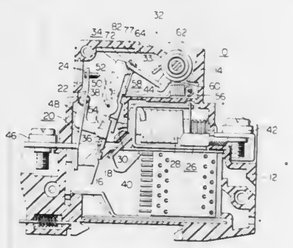
Hiroaki Fujihisa; Hirotoshi Ohishi, both of Fukuyama; Hiroshi Fujii, Asaguchi County, and Yoshiaki Kobayashi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 721,895

Claims priority, application Japan, May 15, 1984, 59-99216; May 15, 1984, 59-99217

Int. Cl.⁴ H01H *9/20*

U.S. Cl. 335—166 **6 Claims**



1. A circuit interrupter comprising:

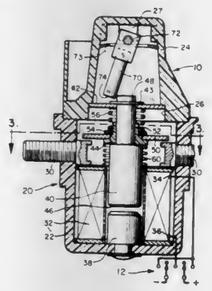
a pair of separable contacts, at least one of which is movable;

an operating handle for manually operating said interrupter; and

an operating mechanism operatively connected to move the movable contact relative to the other contact for opening and closing said circuit interrupter;

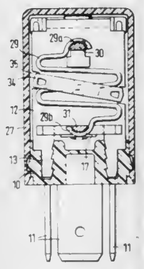
said operating mechanism including:
a movable contact arm carrying the movable contact at one end and providing a latch surface at the other end;
a latch member pivotally mounted on said movable contact arm and having a latching end spaced from said latch surface to form a jaw therebetween;
a toggle link mechanism connected at one end to an operating handle and at the other end with said movable contact arm and said latch member, said toggle link mechanism including a first link connected to said operating handle and a second link pivotally connected to said first link at one end and having roller means rotatably mounted on the other end thereof, said mechanism having an extended position corresponding to an open contact position of said handle and a collapsed position corresponding to a closed contact position of said handle, said second link being adapted to be received and held in said jaws by engagement with said latching end and said latching surface to operate said movable contact arm to manually open and close said contacts by said interrupter upon movement of said handle between open and closed positions, said roller means being slidably released from said jaw by coaction with said latch surface upon movement of said latching end away from said latch surface caused by movement of said operating mechanism to the collapsed position to trip said interrupter; and
means on said movable contact arm providing a stop surface for preventing the movement of said other end of said toggle link mechanism beyond the point at which said toggle link mechanism is partly collapsed when said contacts are welded to each other.

4,628,289
LATCHING RELAY
William B. Huber, Oak Park, Ill., assignor to Nuvatec, Inc., Downers Grove, Ill.
Filed Oct. 11, 1985, Ser. No. 786,612
Int. Cl.[4] H01H *9/20*
U.S. Cl. 335—168 **17 Claims**



1. A latching relay comprising:
a frame;
a switch mounted to the frame and including at least one movable contact movable between a first state and a second state, wherein the switch is open in one of the first and second states and closed in the other;
moving means for generating an electromagnetic field to electromagnetically move the contact to the first state;
means for biasing the contact to the second state;
a blocking member comprising a permanent magnet which generates a magnetic field, said blocking member movably mounted to the frame and movable between a blocking position, in which the blocking member holds the contact in the first state, and an unblocking position, in which the blocking member allows the biasing means to move the contact to the second state;
said electromagenetic field operative to interact with the magnet to electromagnetically shift the blocking member between the blocking position and the unblocking position;
said blocking member cooperating with the frame when the blocking member is in the blocking position to restrain movement of the contact to the second state with a force independent of the strength of the magnetic field.

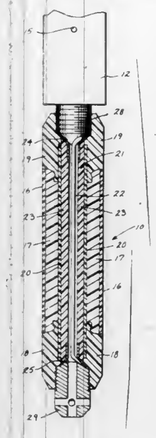
4,628,290
ELECTROMAGNETIC RELAY WITH ZIG-ZAG ARMATURE SPRING
Joachim Naser, Nuremberg; Olaf Schmid, Schwabach; Gerhard Schmidt, Weihenzell; Theodor Sturm, Sachsen, and Berthold Walter, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jun. 17, 1985, Ser. No. 745,572
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423269
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—274 **6 Claims**



1. Electromagnetic relay comprising an inverted-L magnet yoke upstanding from a base of insulation material through which pass connection prongs fixed in said base, an electromagnet core extending from said yoke towards said base having a winding spool and a winding in said spool supported so as to encircle said core,
said yoke (**12**) having a bearing seat aligned substantially parallel to said base for an armature, near its attachment to said base;
a substantially flat armature of a configuration enabling it to swing in a space between said core and said base about said bearing seat on said yoke (**12**), having a portion extending in a first direction from said bearing seat towards the side of said relay remote from said armature bearing seat and a portion extending in a second direction substantially opposite to said first direction across and beyond said bearing seat;
a switch contact resiliently mounted on said armature so as to move in a path near said side of said relay remote from said armature bearing seat;
at least one fixed contact mounted for cooperation with said switch contact, and
a spring for returning said armature to its state of rest, in the form of a spring wire (**29**) bent into meander shape (**28**), connected at one end to said magnet yoke (**12**) and at the other end to said armature portion (**31**) extending in said second direction across said bearing seat.

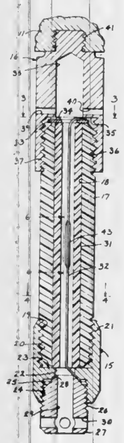
4,628,291
FULL RANGE OIL EXPULSION FUSE
Wayne W. Lien, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.
Filed May 22, 1985, Ser. No. 736,959
Int. Cl.[4] H01H *85/02*
U.S. Cl. 337—203 **18 Claims**

1. An under oil expulsion fuse, comprising a tubular assembly having an electrically conductive contact on each end, a fuse link supported within the assembly being electrically connected to each of said contacts, and support for said fuse link which includes a resilient material with a bore opening to accept the fuse link, said tubular assembly includes an arc resistant surface layer, a high strength intermediate layer of



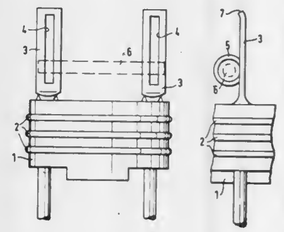
non-conducting material which secures the end contacts in place and contains the forces developed during fuse clearing, and an inner layer of reilient non-tracking, non-conducting material with the ability to absorb and contain particulate matter impacted upon it.

4,628,292
UNDER OIL EXPULSION FUSE CARTRIDGE ASSEMBLY
Frank J. Muench, Waukesha, and Gordon T. Borck, Cudahy, both of Wis., assignors to RTE Corporation, Waukesha, Wis.
Filed Jun. 24, 1985, Ser. No. 748,266
Int. Cl.[4] H01H *85/02, 85/14*
U.S. Cl. 337—204 **19 Claims**



1. An under-oil expulsion fuse cartridge assembly, comprising:
a tubular housing of non-electrical conductive material having a bore extending longitudinally therethrough;
an electrically conductive contact member mounted on each end of said housing;
a fuse liner tube removably receivable within the bore of said housing, and having an opening extending longitudinally therethrough;
a fuse link removably receivable within the opening of said fuse liner tube;
mounting means for mounting one end of said fuse link, said mounting means including spacer means engageable with one of said end contact members to prevent direct contact of said one end of said fuse link with said one end contact member; and
clamping means for clamping the other end of said fuse link in engagement with the other end contact member.

4,628,293
SUB-MINIATURE FUSE
Werner Marx, Witten, Fed. Rep. of Germany, assignor to Wickmann Werke GmbH, Fed. Rep. of Germany
Filed Mar. 5, 1985, Ser. No. 708,532
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408854
Int. Cl.[4] H01H *85/52, 85/62*
U.S. Cl. 337—216 **5 Claims**

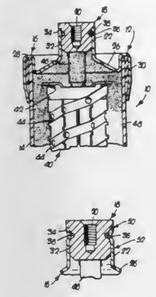


1. Electric sub-miniature fuse of the type comprising at least
plastic base means defining an upper side and a lower side;
two electric conductor means passing through said base means to form upper and lower conductor extensions beyond said upper and said lower sides, respectively;
electric fuse wire means bridging said upper conductor extensions and having soldered connections therewith;
wherein each of said upper conductor extensions is formed with holder means for engagement with said fuse wire means, respectively, and defining the positions for said soldered connections at said upper conductor extensions, said holder means being formed by a deformation of each one of said upper conductor extensions, respective, said soldered connections being formed by soft solder melting material applied to said holder means and said fuse wire means for reinforcing said engagement of said fuse wire means by said holder means.

4,628,294
END CAP ASSEMBLY FOR A FLUID RESISTANT ELECTRICAL DEVICE
Delbert R. Parker, and Daren A. Clark, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.
Filed Nov. 22, 1985, Ser. No. 800,718
Int. Cl.[4] H01H *85/14, 85/04*
U.S. Cl. 337—248 **17 Claims**

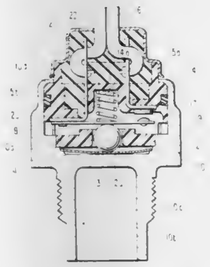
1. In an end cap assembly for a fluid resistant electrical device, the combination of:
an end cap engageable with an insulating tube and having solderable walls defining a tubular opening;
an insert having a solderable body portion positioned within said tubular opening of said end cap,
said walls defining said tubular opening being formed for complemental, mating contact with said body portion such that mechanical interference is provided to limit movement of said insert relative to said end cap during assembly,

said body portion having a peripheral groove adjacent said walls defining said opening, said walls being disposed to each side of said groove; and



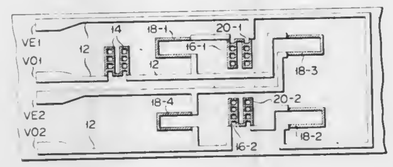
a quantity of solder located within said groove and adhering to at least a portion of said walls and said body portion to preclude movement of said insert relative to said end cap.

4,628,295
TEMPERATURE RESPONSIVE SWITCH
Keiji Yasuda, Handa, and Hideo Haneda, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan
Filed May 3, 1985, Ser. No. 730,148
Claims priority, application Japan, May 4, 1984, 59-065596[U]
Int. Cl.⁴ H01H *37/52*
U.S. Cl. 337—354 **1 Claim**



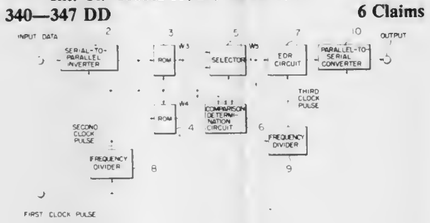
1. A temperature responsive switch comprising a switch body, a bimetallic disc disposed in said switch body and adapted to be snapped over center in response to changes in the surrounding temperature, a guide member disposed within said body adjacent said bimetal disc and having a hole extending therethrough, a spherical member moveably disposed within said hole of said guide member in contact with the center of said bimetal disc, an electrically conductive leaf spring fixed to said body at one end thereof and overlying said hole in engagement with said spherical member, an electrical contact secured to the other end of said leaf spring for movement therewith in response to movement of said spherical member, a stationary electrical contact fixed within said switch body for contact by said moveable electric contact upon movement thereof in response to changes in the configuration of said bimetal disc in response to temperature changes and biasing means disposed within said body for normally biasing said leaf spring in a direction towards the spherical member to separate said electrical contacts.

4,628,296
LOAD CELL
Tohru Kitagawa, and Koichiro Sakamoto, both of Mishima, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Jun. 4, 1984, Ser. No. 616,964
Claims priority, application Japan, Jun. 13, 1983, 58-105497
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 338—3 **18 Claims**



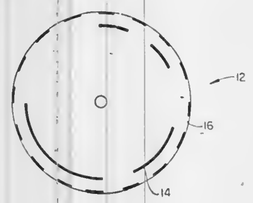
1. A load cell comprising:
a beam body having at least one strain generating section with a substantially flat, straight-edged, multi-sided surface section;
a plurality of strain gauge resistors formed on and insulated from said beam body, each strain gauge having one portion closest to an associated edge of said surface;
a conductive pattern including a conductive layer formed along at least a portion of the periphery of said beam body and coupling said strain gauge resistors to form a bridge circuit, said conductive layer being interposed between said one portion of each of said strain gauge resistors and its associated surface edge;
each of said strain guage resistors having its said one portion spaced at a preset distance from the portion of the interposed conductive layer to which it is closest, said present distance for one strain gauge resistor being equal to the preset distance for at least another of said strain gauge resistors.

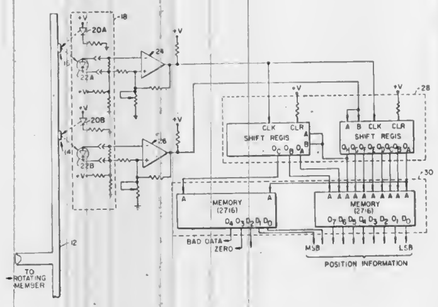
4,628,297
CODE MODULATION SYSTEM
Seiichi Mita, Kanagawa; Morishi Izumita, Inagi; Masuo Umemoto, Tokyo; Yoshizumi Eto, Sagamihara; Morito Rokuda, Katsuta, and Hidehiro Kanada, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan
Filed Jan. 30, 1985, Ser. No. 696,477
Claims priority, application Japan, Feb. 1, 1984, 59-15228
Int. Cl.⁴ H03K *13/24;* **G11B** *5/09*
U.S. Cl. 340—347 DD **6 Claims**



1. A code modulation apparatus for converting input data levels into an output signal in the form of code words, comprising:
a first ROM and a second ROM for respectively providing predetermined code weights in the form of code words, said code weights changing in level in accordance with changes in the input data level along a stairlike characteristic, a code weight provided by said first ROM for an input data level in the vicinity of a transition point in the changes in level of the stairlike characteristic being different from that provided by said second ROM for the same input data level;
a selector for selecting either the output of said first ROM or the output of said second ROM and sending out the output thus selected;
a comparison determination circuit for receiving the output of said first ROM and the output of said second ROM and for sending a selection command to said selector in accordance with predetermined determination criteria, said selector selecting either the output of said first ROM or that of said second ROM as an output thereof on the basis of said selection command, in accordance with said predetermined determination criteria, the output of said first ROM being selected for changes in the increasing direction of said input data level and the output of said second ROM being selected for changes in the decreasing direction of said input data level; and
an exclusive-OR circuit for inverting the output of said selector for every other code word and sending out the inverted and non-inverted code words as said output signal.

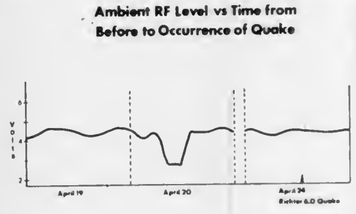
4,628,298
CHAIN CODE ENCODER
Ralph S. Hafle, Benton, and Mark D. Love, Littlerock, both of Ark., assignors to BEI Motion Systems Company, Inc., Santa Barbara, Calif.
Filed Jun. 22, 1984, Ser. No. 623,843
Int. Cl.⁴ H03M *1/00*
U.S. Cl. 340—347 P **15 Claims**





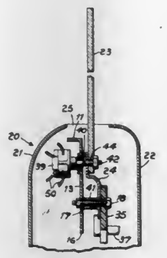
1. An apparatus providing information of the position of a rotating member having an axis of rotation, comprising
code means positioned for rotation with the rotating member for providing a code sequence of code cycles arranged circumferentially about the axis of rotation of the rotating member, wherein each code cycle is associated with a unique position of the rotating member and provides position data, and further wherein the position data from each code cycle, in combination with the position data from adjacent N-1 consecutive code cycles, defines a pattern which is unique from the pattern formed by the position data from any other N consecutive code cycles in the code sequence, so that each N consecutive code cycles identify a unique position of the rotating member wherein the code sequence comprises a series of bits formed by the bits occupying a selected bit position in each of the words in a sequence of N-bit code words the sequence of N-bit code words being formed according to the steps of:
a. beginning with all N-bits of a first N-bit code word in a first logic state;
b. shifting the bits in the first N-bit code word by one bit position so that a bit position is vacated;
c. setting the vacated bit position to a second logic state, different from the first logic state, to form a new N-bit code word and assigning the new N-bit code word to the sequence of N-bit code words if the new N-bit code word does not match any of the other N-bit code words in the sequence of N-bit code words;
d. setting the vacated bit position to the first logic state to form an alternate N-bit code word and assigning the alternate N-bit code word to the sequence of N-bit code words if the new N-bit code word of step "c" matches any of the other N-bit code words in the sequence of N-bit code words; and
e. repeating steps "b" through "d" until 2^N N-bit code words are present in the sequence of N-bit code words, wherein in step "b" the "first N-bit code word" is replaced by the N-bit code word that was assigned to the sequence of N-bit code words in steps "c" and "d";
means for reading the code cycles of the code sequence which are brought into instantaneous registration with a monitoring point as the rotating member is rotated, wherein the monitoring point is fixed in position relative to the rotating member;
means coupled to the reading means for extracting the position data from the code cycles being read by the reading means and for temporarily storing the position data in the order received; and
means coupled to the extracting and storing means for converting the consecutive sequence of the N most recently received position data into positional information.

4,628,299
SEISMIC WARNING SYSTEM USING RF ENERGY MONITOR
Joseph B. Tate, Sausalito, and David E. Brown, Mill Valley, both of Calif., assignors to David Pressman, San Francisco, Calif., a part interest
Filed Jan. 28, 1985, Ser. No. 695,632
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—540 **20 Claims**



1. A method for providing an early warning of the future occurrence of an earthquake, comprising the following steps:
(a) measuring the field strength of at least one broadcast radio frequency signal at a location separated from the place of transmission of said signal, and
(b) providing a humanly-sensible indication if the strength of said signal decreases beyond a predetermined amount from a previous value thereof.

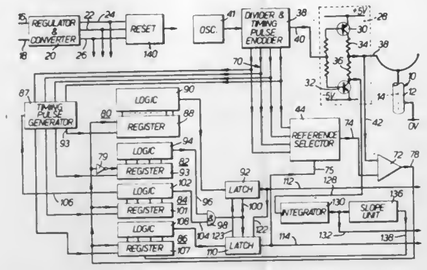
4,628,300
MOTOR VEHICLE LOCK COVER DEVICE
Louis Amato, 69 Winfield Ave., Staten Island, N.Y. 10305
Filed Jun. 3, 1985, Ser. No. 740,535
Int. Cl.[4] E05B *45/06, 17/00*
U.S. Cl. 340—542 **8 Claims**



1. A motor vehicle lock cover protective device for a motor vehicle door having an outside door panel, a door lock with a plurality of levers controlling the locks, window glass and a window sash designed to hold the window glass, comprising:
(a) a cover strip of rigid material of predetermined length and width to substantially cover the space between the vehicle window glass and the outside panel of the vehicle door;
(b) a rigid support strip extending downwardly along the length of one edge of the cover strip at a right angle to the cover strip;
(c) a rigid mounting plate extending downwardly from the free edge of the support strip at a right angle to the cover strip, the plate having an upper base along the edge of the support strip, a lower base and two sides, the opposed ends of the strips extending beyond the ends of the upper base of the mounting plate; and
(d) means to fixedly secure the mounting plate to the window sash for movement therewith, the mounting plate being positioned at a predetermined distance along the length of the support strip and being of predetermined height from the lower base to the upper base whereby the mounting plate extends to the window sash for securing thereto and the cover strip is held in a position recessed below the window sill.

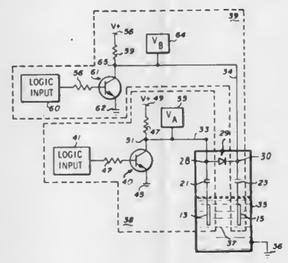
4,628,301
ELECTRICAL CIRCUIT ARRANGEMENTS
Alfred R. Brown, Stanwell, and Richard A. Whetton, Maidenhead, both of England, assignors to Graviner Limited, Buckinghamshire, England
Filed Oct. 30, 1984, Ser. No. 666,399
Claims priority, application United Kingdom, Nov. 4, 1983, 8329473
Int. Cl.[4] G08B *17/06;* **G01K** *7/00*
U.S. Cl. 340—584 **23 Claims**

1. An electrical circuit arrangement, comprising
detecting means whose charge storage capability increases under predetermined conditions,
driving means connected to the detecting means to apply thereto a continuous alternately positive and negative test waveform, the driving means incorporating circuit means providing respectively different impedances for the positive and negative portions of the waveform, and
digital testing means responsive to the said waveform and operative at predetermined time instants during its positive and negative portions to compare its amplitude with predetermined reference thresholds whereby to determine



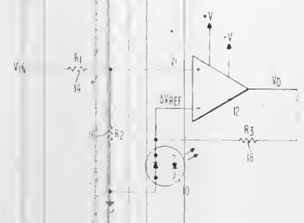
asymmetry of the waveform caused by an increase in the charge storage capabilities of the detecting means.

4,628,302
LIQUID LEVEL DETECTION SYSTEM
A. Brinkley Barr, Woodinville, and D. Craig Edwards, Bellevue, both of Wash., assignors to Baker International Corporation, Orange, Calif.
Filed Sep. 14, 1984, Ser. No. 651,047
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—620 **21 Claims**



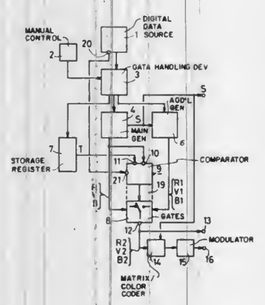
1. A system for detecting the presence and absence of an electrically-conductive liquid at a particular level in a vessel comprising:
(a) first and second metallic probe members for mounting at a fixed location within the interior of a vessel containing electrically-conductive liquid;
(b) first and second capacitor means connected to the first and second probe members, respectively;
(c) first switch means to selectively couple the first capacitor means to ground, and second switch means to concomitantly couple a constant voltage source to the second capacitor means;
(d) comparator means connected to said second capacitor means to sense the magnitude of the electrical charge thereon at predetermined times following coupling of the second capacitor means to the voltage source, the sensed charge magnitude being indicative of the presence of electrically-conductive liquid surrounding the second probe member; and
(e) indicator means coupled to the comparator means and responsive thereto to indicate the presence of electrically-conductive liquid at the level in the vessel at which the second probe member is mounted.

4,628,303
VISUAL MONITOR FOR ELECTRICAL SIGNALS
Richard C. Boyle, Springfield, Pa., assignor to System Development Corporation, McLean, Va.
Filed Jun. 5, 1985, Ser. No. 741,474
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—661 **6 Claims**



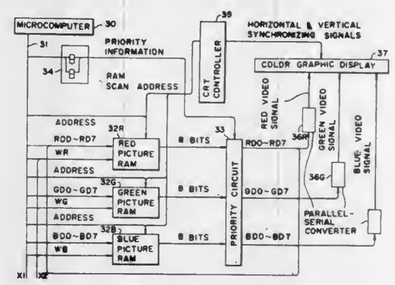
1. A circuit for monitoring the status of electrical signals comprising:
a circuit input terminal for receiving said electrical signals, a voltage divider network coupled between said input terminal and a source of reference potential,
an operational amplifier having a first and a second input terminal and an output terminal, means coupling said first input terminal of said amplifier to a predetermined point on said divider network,
an LED indicator having a pair of terminals, means coupling the output terminal of said operational amplifier in common to said second input terminal of said amplifier and to one of said terminals of said LED indicator, the other of said terminals of said LED indicator being coupled to said source of reference potential.

4,628,304
SYSTEM FOR GENERATING TRICOLOR VIDEO SIGNALS, SUCH AS A GAME, AND A REMOVABLE CARTRIDGE INTENDED FOR SUCH A SYSTEM
Michel Bottiau, Maurepas, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 28, 1983, Ser. No. 479,597
Claims priority, application France, Sep. 14, 1982, 82 15532
Int. Cl.[4] H04N *7/00*
U.S. Cl. 340—703 **6 Claims**



1. A system for generating color video signals comprising:
a source for storing and supplying digital data;
a device for processing digital data coupled to an output of said source;
manual control means coupled to said processing device for the control thereof; and
a generator coupled to a first output of said processing device for generating color signals R, V, B in the form of a range of quantized values, and field and line synchronizing signals, these signals forming on a screen a picture from the digital data supplied by said source; wherein said system further comprises:
an additional generator coupled to a second output of said processing device for generating color signals R_1, V_1, B_1, for forming on said screen an additional picture, said addition generator also being coupled to said generator for receiving said field and line synchronizing signals so that said additional picture is synchronous with the picture formed on said screen by said generator;
a storage register coupled to a third output of said processing device for storing at least one predetermined color code corresponding to a combination of values in said range of values of the color signals R, V, B;
a selection device coupled to an output of said generator and an output of said additional generator, said selection device including a set of selection gates for selectively applying the signals R, V, B and R_1, V_1, B_1, respectively, to an output thereof; and
a comparator having a first input comprising a decoder to which the signals R, V, B are applied, a second input coupled to an output of said storage register, and an output coupled to a control input of said set of selection gates, whereby said selection gates apply the signals R_1, V_1, B_1 generated by the additional generator to the output thereof instead of the signals R, V, B generated by said generator, each time said predetermined color code supplied by said storage register and the signals R, V, B generated by said generator and decoded by said decoder are identical.

4,628,305
COLOR DISPLAY UNIT
Yoshiaki Ikeda, Hachioji, Japan, assignor to Fanuc Ltd, Hino, Japan
Filed Sep. 29, 1983, Ser. No. 536,877
Claims priority, application Japan, Sep. 29, 1982, 57-172459
Int. Cl.[4] G09G *1/00, 1/28*
U.S. Cl. 340—703 **12 Claims**



1. A color display unit comprising:
a plurality of picture RAMS, each having memory locations corresponding to display points of a display, and each said picture RAM corresponding to a predetermined color;
write means for writing respective graphic form information into the plurality of picutre RAMs;
priority specifying means for setting therein respective predetermined priority levels of the outputs of the plurality of picture RAMs;
a CRT controller for accessing the plurality of picture RAMs in synchronism with one another;
a priority circuit for respectively outputting in accordance with the priority levels specified by the priority specifying means, the outputs of the plurality of picture RAMs accessed by the CRT controller; and
a color dispaly means for providing said display with said display points, said color display means being supplied with the output of the priority circuits, for displaying graphic forms determined by the combination of the

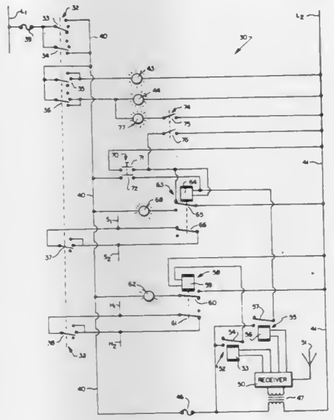
graphic form information in said plurality of picture RAMs and said priority levels, in colors also determined by said combination.

4,628,306

REMOTE CONTROL SYSTEM FOR AUTOMATED EQUIPMENT

Robert H. Root, Vermilion, Ohio, assignor to South Coast Research, Inc., Vermilion, Ohio

Filed Sep. 6, 1983, Ser. No. 529,218
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.00 **11 Claims**



1. A control unit for automated equipment having hard stop and soft stop controls comprising:
an RF receiver capable of receiving two different RF signals from a transmitter;
a momentary contact relay means comprising a first relay operator and first relay contacts, the first relay operator connected to the receiver to be energized in response to the receipt of one of the two RF signals, the first relay contacts connected to the hard stop control of the automated equipment;
a latch relay means comprising a second relay operator and a second relay contacts, the second relay operator connected to the receiver to be energized in response to the receipt of the other of the two RF signals, the second relay contacts connected to the soft stop control of the automated equipment, the second relay operator connected to the second relay contacts to disable the second relay operator after it has been energized;
reset switch means connected to the second relay operator to energize the second relay operator independently of the receiver; and
override switch means connected to the second relay operator to permit the second relay operator to be reenergized in response to the receipt of said other of the two RF signals.

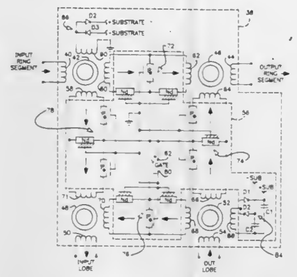
4,628,307

FET SWITCH FOR HIGH FREQUENCY SIGNALS

William G. Crouse, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 18, 1984, Ser. No. 683,104
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.05 **27 Claims**

1. An improved circuit arrangement comprising:
a control means operable for providing an enabling signal; and
a switching means being responsive to said enabling signal; said switching means comprising a first FET device having a gate electrode, a source electrode and a drain electrode;
a second FET device having a gate electrode, a source electrode and a drain electrode; and
a third FET device having a gate electrode, a source electrode and a drain electrode;
wherein the source electrodes of the FET devices are connected to a first common node so that the first and second FET devices are connected in series and the third FET



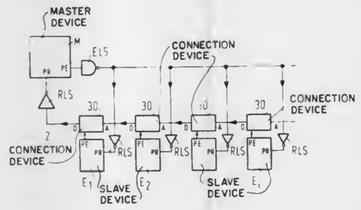
device is connected in parallel with the serially connected pair and the gate electrodes of the FET devices are connected to a second common node, whereby said first and said second FET devices are made to conduct and the third FET device is made not to conduct when the enabling signal of a first polarity is applied to the first and the second common nodes and said first and said second FET devices are made not to conduct and said third FET device is made to conduct when the enabling signal of a different polarity is applied to the common nodes.

4,628,308

COMMUNICATION NETWORK HAVING A MASTER-SLAVE TYPE SERIES ARCHITECTURE AND PROVIDING MASTER-TO-SLAVE AND SLAVE-TO-MASTER COMMUNICATION

Serge Robert, Jouy en Josas, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,453
Claims priority, application France, Dec. 21, 1983, 83 20481
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.43 **4 Claims**



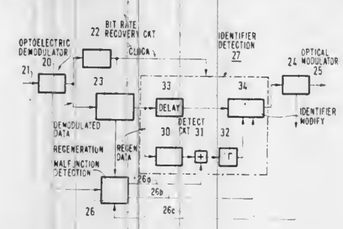
1. A communication network having a series architecture and comprising an electronic master device and a plurality (N) of electronic slave devices, each electronic slave device being provided with an associated connection device having a first input connected to a transmitting port of the relevant electronic slave device and an output, each connection device which is associated with a slave device other than the first in the series has a second input, the second input of the connection device associated with a j-th ($2 \leqq j \leqq N$) electronic slave device being connected via a communication channel to the output of the connection device associated with the (j—1)-th electronic slave device in the series, the output of the connection device associated with the N-th electronic slave device being connected to a line input of a first dedicated line receiver having a line output connected to a receiving port of the electronic master device, said first dedicated line receiver effecting a voltage-level conversion in order to derive a relatively small voltage-level swing from a relatively large voltage-level swing applied to its line input and applying said relatively small voltage-level swing to its line output, each of said connection devices comprises voltage level conversion means connected between said first input and said output, said voltage level conversion means effecting a voltage level conversion from said supplied relatively small voltage-level swing to said relatively large voltage-level swing and applying said relatively large voltage-level swing to said output, each of said connection devices having a second input comprising a second dedicated line receiver for carrying out a voltage level conversion from said relatively large voltage-level swing applied on said second input to said relatively small voltage-level swing and for applying said relatively small voltage-level swing to an input of the voltage level conversion means of the corresponding connection device.

4,628,309

SYSTEM AND DEVICE FOR REMOTE SURVEILLANCE OF EQUIPMENT ON A DIGITAL TRANSMISSION LINK WITHOUT INTERRUPTING TRAFFIC

Bernard Allias, Bretigny sur Orge, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 6, 1983, Ser. No. 558,672
Claims priority, application France, Dec. 6, 1982, 82 20406
Int. Cl.[4] H04Q *9/00;* **H04B** *17/02;* **G06F** *11/00*
U.S. Cl. 340—825.54 **5 Claims**



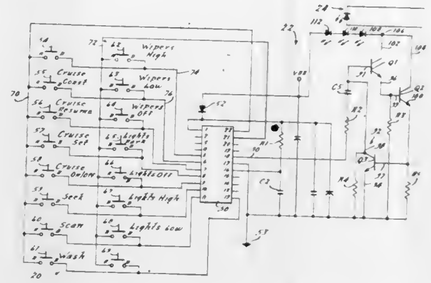
1. A system for remote surveillance of equipment on a digital transmission link connecting a transmitter terminal to a receiver terminal without interrupting traffic, said link transmitting an on-line signal using a redundant code having at least one prohibited configuration, said system comprising:
first means at the transmitter terminal for periodically introducing into the on-line signal an interrogation identifier containing said prohibited configuration;
second means for recognizing interrogation identifiers as they pass through each equipment unit;
third means for changing one interrogation identifier out of r recognized interrogation identifiers to encode remote surveillance data in equipment having remote surveillance data to be transmitted, r being an integer greater than one;
fourth means at said receiver terminal for receiving unchanged interrogation identifiers and responsive to said unchanged interrogation identifiers for determining periodic time slots occupied in said on-line signal by interrogation identifiers changed or unchanged;
fifth means responsive to said fourth for separating said interrogation identifiers from said on-line signal at said receiver terminal; and
sixth means for decoding said interrogation identifiers to provide said remote surveillance data.

4,628,310

MULTIFUNCTION STEERING WHEEL

Robert P. Reighard, Holland; Wilbur L. McCoy, Toledo, and William P. Gobeille, Sylvania, all of Ohio, assignors to Sheller-Globe Corporation, Toledo, Ohio

Continuation of Ser. No. 475,891, Mar. 16, 1983, abandoned. This application Nov. 1, 1985, Ser. No. 794,953
Int. Cl.[4] G08C *23/00*
U.S. Cl. 340—825.72 **1 Claim**



1. A multifunction steering wheel for controlling the operation of devices disposed on a vehicle having a steering column comprising:
steering wheel member rotatably carried on said steering column and having a hollow spokelike arm;
manually actuable hermetically sealed keypad disposed on said steering wheel member, said keypad comprising a plurality of individual switches connected in a matrix configuration;
a transmitter module disposed within said arm and coupled to said switches, said transmitter module having encoder means for providing strobe signals to said switching and having an input bus coupled to said switches for interrogating said switches, said encoder means further having an output means for providing predetermined encoded output pulses in response to activation of said switches;
said transmitter module having transistor driver circuit comprising a first transistor having the base thereof coupled to said output means of said encoder and comprising a second transistor having the base thereof coupled to the emitter of said first transistor and said first and second transistors having their respective collectors coupled together to provide an output node;
said transmitter module further having a current limiting circuit comprising load resistor coupled between the emitter of said second transistor and ground and comprising a third transistor having the base thereof coupled to said load resistor and having the emitter thereof coupled to ground and having the collector thereof coupled to the base of said first transistor and further having second resistor coupled between the collector of said third transistor and ground;
said current limiting circuit being operable to sense the collector current of said first transistor and to turn off said first transistor to prevent excessive current flow;
a plurality of mutually connected light emitting diodes coupled to said output node of said driver circuit for producing light impulses in accordance with said output pulses, said light emitting diodes being equally spaced about a circular locus and positioned to direct illumination toward said steering column;
a receiver module positioned within said steering column, said receiver module including a phototransistor mounted to receive illumination from said light emitting diodes, and further including amplifier circuit capacitively coupled to said phototransistor for providing amplified signals in accordance with said output pulses;

a decoder module positioned within said steering column and receptive of said amplified signals, said decoder module providing a plurality of input/output ports for providing a binary signals indicative of said encoded output pulses, said decoder module further including binary to decimal decoder means for receiving said binary signals and providing a plurality of individual output terminals, each terminal corresponding to a different one of said devices disposed on a vehicle; and

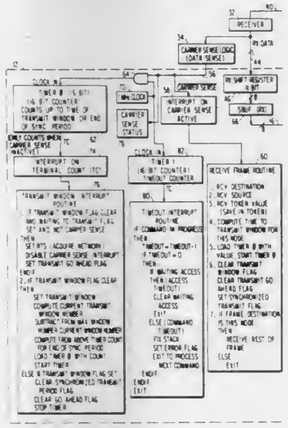
at least one flip flop means coupled to said output terminals for controlling at least one of said devices.

4,628,311

CARRIER SENSE MULTIPLE ACCESS WITH COLLISION AVOIDANCE UTILIZING ROTATING TIME STAGGERED ACCESS WINDOWS

Philip E. Milling, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,632
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.5 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 95 Pages)



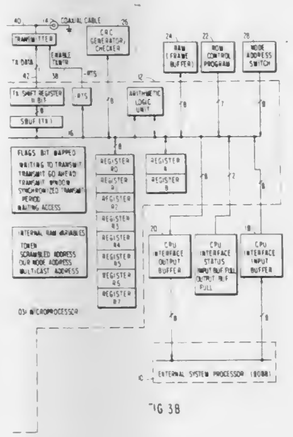


FIG 3B

1. In a communications system wherein a plurality of stations each transmit at different times to one another over a shared communications medium, each said station including detection means for detecting the presence or absence of a transmission on said communications medium, a method of controlling access by each station to said communications medium, said method comprising the steps of:

reserving an arbitration period of time commencing from the termination of each transmission on said medium,;

dividing said arbitration period into a plurality of access windows;

assigning unique arbitration addresses to stations sharing said medium;

generating, at each station desiring access to said medium, an access control number independent of the address of said each station to be transmitted to said medium as part of its communication;

receiving said access control number at each other station desiring access to said medium and combining said received access control number with the respective assigned address of said each other station to determine one of said plurality of access windows assigned to said each other station during the next arbitration period;

detecting at each station the termination of a transmission transmitted over said medium;

generating at each station a new access control number calculated from the current access control number; and

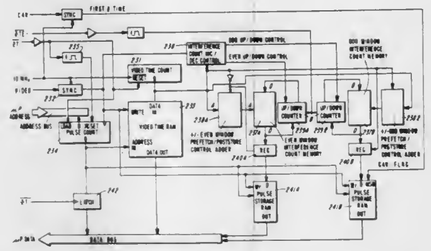
transmitting said new access control number from any station desiring access to said medium, during its respective access window if no other station has transmitted during a previous access window in the same arbitration period.

4,628,312

DECODING APPARATUS AND METHOD FOR A POSITION CODED PULSE COMMUNICATION SYSTEM

James G. Hwang; Robert F. Fleming, III, and Robert G. Hayworth, all of Vienna, Va., assignors to Vega Precision Laboratories, Inc., Vienna, Va.

Filed Oct. 19, 1983, Ser. No. 543,405
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.640 **37 Claims**



1. A decoder for extracting data encoded in a plurality of position-coded pulse trains occurring at a substantially constant pulse format repetition frequency (PFRF), each of the pulse trains having a predetermined format including at least a first pair of pulses spaced from each other at a first interpulse interval representing predetermined address information, and a second pair of pulses spaced from each other at a second interpulse interval representing data, said decoder comprising:

recognition means for providing a verification signal upon each receipt of said pulse train having the predetermined format;

synchronization means responsive to the verification signals for calculating the PFRF of each of the pulse trains having the predetermined format and for providing an enabling signal window during a period representing the predicted occurrence of the next one of the pulse trains;

pulse storage means responsive to the enabling signal window for determining and storing an arrival time for each pulse arriving during said period; and

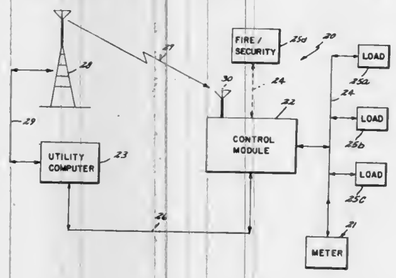
decoder processor means for determining the data by calculating from the stored arrival times the second interpulse interval.

4,628,313

APPARATUS AND METHOD FOR REMOTELY MONITORING A UTILITY METER BY USE OF A LIQUID CRYSTAL DISPLAY

Peter P. Gombrich, Minneapolis; Steven K. Case, St. Louis Park, and Lawrence R. Konicek, Richfield, all of Minn., assignors to TeleMeter Corporation, Minneapolis, Minn.

Filed Sep. 12, 1984, Ser. No. 649,912
Int. Cl.[4] G08C *17/00*
U.S. Cl. 340—870.02 **9 Claims**



1. An apparatus for optically sensing the angular position of a pointer member fixedly mounted on a rotatable shaft for rotational movement therewith as the shaft rotates about an axis of rotation, said apparatus comprising:

(a) a follower member fixedly interconnected into the rotatable shaft for rotation about the axis of rotation with the pointer member, said follower member and said pointer having a circumferential path of travel, said follower member having first and second opposite sides facing in opposite axial directions, a first portion of said first side being generally reflective for reflecting light in a forward direction and a second portion being generally absorptive;

(b) light emitting means positioned forward of said following member for emitting light in a backward direction towards said first side of said follower member;

(c) light detecting means positioned forward of said follower member for detecting light reflected off of said follower member in a forward direction;

(d) liquid crystal display means positioned forward of said follower member, between said follower member and said light detecting means, said liquid crystal display means defining six distinct areas disposed about the circumferential path of the follower member and a background area encompassing the remaining area of said liquid crystal shutter means;

(e) control means for switching said six distinct areas and said background area between an opaque state and a transparent state, said control means further providing for switching all of said distinct areas and said background area to the opaque state and then selectively switching each of said distinct areas, one at a time, to the transparent state while the remaining five areas and the background area are switched to the opaque state; and

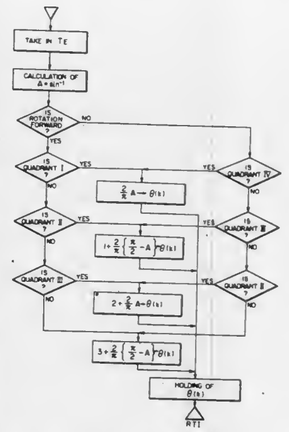
(f) means operatively interconnected to said light detection means for monitoring said light detection means and obtaining input signals therefrom so as to obtain a read-out of the angular position of the pointer member.

4,628,314

METHOD AND APPARATUS FOR DETECTING POSITION AND VELOCITY OF MOVING BODY

Shigeki Morinaga, Hitachi; Yasuyuki Sugiura, Takahagi; Kunio Miyashita, and Tadashi Takahashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 668,893
Claims priority, application Japan, Nov. 8, 1983, 58-208221
Int. Cl.[4] G08C *19/16;* **G01P** *3/52, 13/00*
U.S. Cl. 340—870.24 **5 Claims**



1. A method for detecting position and velocity of a moving body by using a two-phase encoder mounted directly on said moving body, said encoder generating two sinusoidally varying original signals differing in phase, the method comprising the steps of:

pulse-width modulating one of said original signals by using a sampling carrier wave so as to derive a pulse-width modulated signal;

measuring a pulse width of said pulse-width modulated signal;

calculating, on the basis of said pulse width of said pulse-width modulated signal and a sampling time length of said sampling carrier wave, an angular position relative to a reference point of said moving body;

deriving, on the basis of said two original signals, information indicative of a quadrant of said one original signal in which said moving body is located;

deriving, on the basis of said angular position and said quadrant, the position of said moving body; and

deriving, on the basis of variations in said position, the velocity of said moving body.

4,628,315

ADDRESSABLE TRANSDUCER WITH IMPROVED ADDRESS SIGNAL PROCESSING

Norman F. Douglas, Albuquerque, N. Mex., assignor to Sparton Corporation, Jackson, Mich.

Filed Aug. 16, 1983, Ser. No. 523,693
Int. Cl.[4] G08C *19/16, 19/04*
U.S. Cl. 340—870.26 **4 Claims**

1. An addressable transducer for use in a monitoring system of the type including a central station and multiple addressable transducers for monitoring the values of selected physical conditions at multiple locations with one of said transducers at each of said multiple locations,

said system being characterized by a single pair of transmission lines extending from the central station to all of said multiple locations and having a voltage thereon which is modulated at controlled intervals to produce successive binary address signals each including a train of pulses

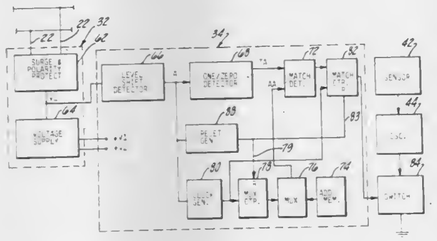
representing the binary bits of a transmitted address signal for selectively addressing one of the multiple transducers to obtain a data signal therefrom,

said transducer comprising:

a current sink oscillator having a frequency determining circuit for determining the oscillator frequency and being adapted to oscillate in response to application of an operating voltage,

a sensor including a condition responsive impedance element coupled with said frequency determining circuit and adapted to modify said oscillation frequency according to variations in value of said physical condition,

an address signal processing circuit coupled with said pair of lines and including memory means for storing multiple bits of a stored address signal assigned to the transducer, generating means including a clocking means responsive



to the pulses of said transmitted address signal for generating a train of pulses representing the binary bits of said stored address signal in bit-by-bit synchronism with the train of pulses of said transmitted address signal, a match detector for comparing said trains of pulses bit-by-bit, and a match counter for producing a control signal in response to a match of all bits of the transmitted address signal with all bits of the stored address signal,

and switching means responsive to said control signal for operatively coupling said oscillator to said pair of lines for deriving an operating voltage therefrom,

whereby said oscillator draws current from said pair of lines, said current having an undulating amplitude at the frequency of the oscillator whereby the frequency of the undulating current in said lines at said central station corresponds to the value of said physical condition.

4,628,316

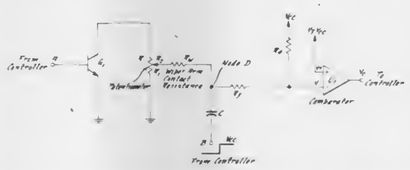
TEMPERATURE COMPENSATION CIRCUIT AND METHOD FOR POSITION SENSORS

Salim A. Momin, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 2, 1984, Ser. No. 585,804

Int. Cl.[4] G08C *15/00, 15/06*

U.S. Cl. 340—870.38 **4 Claims**



1. In a position sensing device to sense the position of a movable portion of a mechanism, the position sensing device with a controller to store data from and to present control signals to a temperature compensation circuit comprising:

a variable resistor with two end leads and a wiper arm;

a switching device connected across the two end leads of the variable resistor with the ability to short the two end leads upon command from a control signal from the controller to the device;

the wiper arm of the variable resistance device being mechanically connected to the movable portion of the mechanism;

a comparator with inverting and non-inverting inputs;

a voltage supply means, a fraction of which is connected to the non-inverting input to the comparator as a reference voltage;

a resistor connected between the wiper arm of the variable resistor and the inverting input to the comparator;

a capacitor with one lead connected to the wiper arm of the variable resistor and the other lead available for a step function control signal from the controller;

the comparator, changing output states when the voltage at its inverting input exceeds or drops below the reference voltage at the non-inverting input in response to the changing voltage on the capacitor as signaled by the controller;

the controller, storing the output curve of the comparator and providing a position signal representative of the position of the movable portion of the mechanism;

the position signal derived by comparing portions of the comparator's output curve generated in response to the step function control signals presented to the capacitor.

4,628,317

INTER-VEHICLE DISTANCE CONTROL SYSTEM FOR VEHICLES

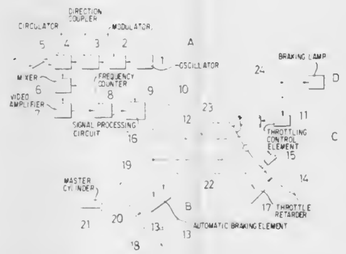
Masao Nishikawa, Tokyo, and Takashi Aoki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,033

Claims priority, application Japan, Aug. 4, 1980, 55-106949

Int. Cl.[4] G08G *1/16;* **B60Q** *1/44;* **B60T** *7/12;* **G01S** *13/93*

U.S. Cl. 340—903 **11 Claims**



1. An inter-vehicle distance control system for a vehicle having brake means and throttle means, comprising:

a control signal generating means for providing a control signal output indicative of a possibility of collision with an object ahead of the vehicle;

throttle control means for imparting to a throttle pedal a reaction force according to the intensity of said control signal output;

said reaction force being imparted in the direction of urging said throttle pedal to the engine-idling position thereof;

brake control means for operating in conjunction with said throttle control means in response to said control signal output to brake the vehicle automatically if a possibility of collision increases in the throttle control means activated condition;

said control signal output including a first signal provided when the distance between said vehicle and said object drops below a predetermined maximum reference value;

said first signal being fed directly to said throttle control means to operate said throttle control means;

said throttle control means including an assembly for producing said reaction force according to the intensity of said first signal;

said control signal output includes a second signal provided when the distance between said vehicle and said object drops below a predetermined minimum reference value; and

said second signal serving to operate said brake control means to brake said vehicle regardless of the operative condition of said throttle pedal.

4,628,318

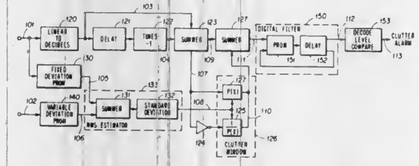
GROUND CLUTTER SUPPRESSION TECHNIQUE

Orville J. Alitz, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 2, 1983, Ser. No. 557,679

Int. Cl.[4] G01S *13/95*

U.S. Cl. 342—26 **17 Claims**



1. In a pulsed Doppler radar, a ground clutter identification circuit comprising:

a bifurcated parallel return signal processing circuit, one branch having a signal delay capability and both branches having linear-to-logarithmic conversion capability and respective outputs;

a deviation generator circuit for generating at least one deviation input functionally related to apparatus limitations for each signal received; and

means for summing said outputs of said processing circuit, coupled to both branches and to said deviation generator circuit.

4,628,319

NAVIGATION SYSTEM

Bo A. Morwing, Åsa Stn; Bengt L. Andersson, Lindome, and Per-Olof G. Gustavsson, Mölnlycke, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00364, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01838, PCT Pub. Date May 26, 1983

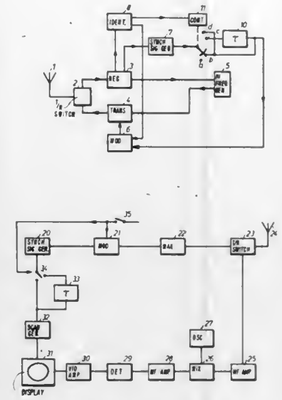
PCT Filed Nov. 2, 1982, Ser. No. 514,827

Claims priority, application Sweden, Nov. 16, 1981, 8106798

Int. Cl.[4] G01S *13/80, 13/74*

U.S. Cl. 342—46 **9 Claims**

1. A navigation system comprising at least one pulse radar means for transmitting interrogating radar pulses of determinable repetition period and including a display means for making a display of echo signals which may include reflected signals, and at least one transponder means for receiving radar pulses and for transmitting in response to said pulses high frequency pulse modulated response signals, the transponder means including delay means and means associated with delay means for transmitting, on receiving an interrogating signal from the pulse radar means, response signals with a delay such that response signals from the said transponder means are displayed on the display with displacement relative to the position that the response signals would be displayed without said delay, said radar means including means for generating a scan on said display means and delay means for delaying the start of the scan by the same value as the delay of the response signal whereby the echo signals which are received from objects within a predetermined range of said pulse radar means are received before the start of the scan and thus are not shown whereas response signals from the transponder are displayed in the display, both said delay means providing respective delays of equal value and of such substantial fraction of the repetition



period as to eliminate all but the strongest echo signals received after the start of the scan.

4,628,320

CANCELLATION OF SCATTER JAMMING

John W. Downie, Dewitt, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 29, 1964, Ser. No. 363,645

Int. Cl.[4] G01S *3/16, 3/28, 7/36*

U.S. Cl. 342—16 **6 Claims**



1. A signal processor for receiving desired signals and undesired signals and for cancelling the undesired signals comprising:

a main signal transmitting channel capable of imparting high gain to desired signals and relatively low gain to most undesired signals,

a subtracting circuit connected in said main signal transmitting channel between its input and output;

two auxiliary signal transmitting channels capable of imparting low gain to said desired signals and to said undesired signals,

a delay line connected in series with one of said auxiliary channels to provide a delay to desired and undesired

signals in said channel such as to bring said undesired signals into time synchronization with undesired signals in said main signal transmitting channel,

means including a separate correlator connected between the output of said main channel and each of said auxiliary channels to correlate said desired and undesired signals and to generate error signals adjusted in phase and in amplitude to correspond to the undesired signals in said main channel, and

means for applying said error signals to said subtracting circuit to reduce the magnitude of said undesired signals at the output of said main channel.

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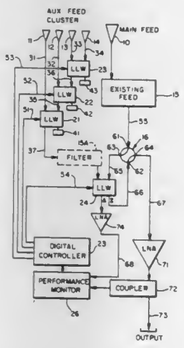
APERTURE TRANSFORMATION SIDELOBE CANCELLER

Gayle P. Martin, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 368,458, Apr. 14, 1982. This application Apr. 14, 1983, Ser. No. 484,844

Int. Cl.[4] H01J *29/52*

U.S. Cl. 342—379 **49 Claims**



1. For use in antenna system having a principal feed element and a reflector arrangement for directing energy to said principal feed-element, an auxiliary system for controlling the response pattern of said system comprising:

a plurality of auxiliary feed elements, disposed adjacent to said principal feed element;

first means, coupled to the signal output paths from said auxiliary feed elements, for selectively weighting and combining the outputs of said auxiliary feed elements;

second means, coupled to said first means and to said principal feed element, for selective combining and weighting the output of said first means and the output of said principal feed element; and

third means, coupled to said first and second means, for monitoring the output of said second means and controlling the selective weighting and combining action of said first means in response thereto.

4,628,322

LOW PROFILE ANTENNA ON NON-CONDUCTIVE SUBSTRATE

Paul D. Marko, Pembroke Pines; Thomas F. Kneisel, Davie, and Oscar M. Garay, N. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 596,747, Apr. 4, 1984, Pat. No. 4,684,585. This application Mar. 17, 1986, Ser. No. 840,109

Int. Cl.[4] H01Q *1/24, 1/48*

U.S. Cl. 343—702 **4 Claims**

1. A low profile antenna, comprising:

a non-conductive substrate having a first side and a second side;

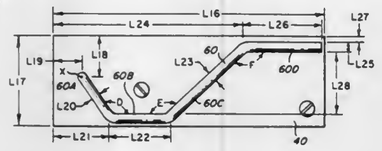
a first metallization pattern connected to said first side of said substrate and forming a passive element;

a second metallization pattern, connected to said second side of said substrate and forming an active element;

a ground plate in spaced parallel relation to said substrate; and

conductor means, for directly electrically connecting said passive element to said ground plate,

said driver element having a first mid-portion, a first end portion extending angularly inward from said first mid-



portion to a point constituting the antenna feed point, a second mid-portion extending angularly from said first mid-portion and a second end portion extending from said second mid-portion and overlapping the parasitic element,

said antenna having a low impedance coupling between said feedpoint and said passive element ground plate connection and a high impedance coupling between said second end of said driven element and said passive element, attributable to both the amount of overlap of said elements and the thickness of said substrate.

4,628,323

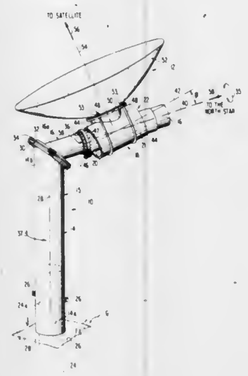
SIMPLIFIED POLAR MOUNT FOR SATELLITE TRACKING ANTENNA

Robert F. Crean, P.O. Box 1431, White River Junction, Vt. 05091

Filed Nov. 1, 1983, Ser. No. 547,613

Int. Cl.[4] H01Q *3/08*

U.S. Cl. 343—765 **13 Claims**



1. A polar mount apparatus for aligning a microwave directional antenna axis at a given site on the earth with a given satellite or a series of satellite within the earth's equatorial geosynchronous orbit track sector defining an equitorial plane, said apparatus comprising:

a directional antenna,

a cylindrical base member mounted for rotation about a vertical axis on the earth site and being cut at a diagonal at its upper end,

a cylindrical latitude adjustment member cut at one end at a diagonal, matching that of said base member,

means for rotatably mounting the cut ends of said members, end-to-end and for fixing said members after rotation such that said members rotate in the plane of the cuts tending between axial in line and right angle postions,

means for mounting said antenna to said latitude adjustment member for rotation about the axis of the latitude adjustment member and for fixing said antenna after rotation, and

said antenna mounting means comprises a declination angle adjustment head assembly carried by said cylindrical latitude adjustment member comprising means for adjusting the inclination of the axis of the antenna relative to the axis of the latitude adjustment member and for fixing the antenna axis at that inclination to a degree of declination necessary to compensate for the location of said polar mount apparatus on said earth site from said equatorial plane;

whereby, aligning is achieved by a series of steps comprising; rotating said latitude adjustment member on said base member to a position corresponding to the earth's latitude location and locking of said members together, rotating said cylindrical base member to align the axis of said latitude adjustment member to a position where said latitude adjustment member points to the north star and fixing it thereat, adjusting the position of the antenna on said latitude adjustment member to compensate for the declination angle relative to said equatorial plane at that latitude, and rotating said antenna about the axis of the latitude adjustment member until the directive antenna points to said given satellite within said sector.

4,628,324

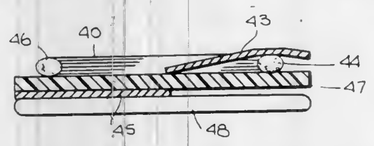
COIL ASSEMBLY FOR SUBSTANTIALLY ISOTROPIC FLUX LINKAGE IN A GIVEN PLANE

Thomas A. O. Gross, Lincoln, Mass.; Raymond L. Barrett, Jr., Oakland Park, and Henry F. Pfister, Wilton Manors, both of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Continuation of Ser. No. 368,370, Apr. 14, 1982, Pat. No. 4,549,186. This application Oct. 1, 1985, Ser. No. 782,738

Int. Cl.[4] H01Q *7/00*

U.S. Cl. 343—788 **9 Claims**



1. A coil assembly for us in an article surveillance system in which coupling between said assembly and another component is to be established by linking said assembly and said component with an alternating magnetic field, said assembly comprising a coil in the form of a loop of flat configuration formed with electrically conductive turns encircling a first axis that is normal to the general plane of said coil, and means including magnetically permeable material in strip form throughout and extending inwardly across the interior of said coil from a first location beyond the perimeter of said coil inwardly through said coil interior to a second location also beyond the perimeter of said coil for providing a continuous low reluctant path through said coil which diverts flux of said field parallel to said general plane of said coil through said coil, such magnetically permeable material being movable in unison with said coil and having negligible effect upon linkage of said coil with flux in a direction normal to said general plane of said coil.

4,628,325

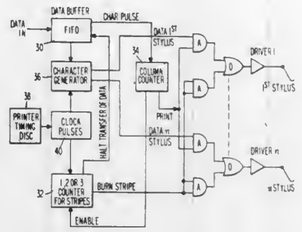
ELECTROMAGNETIC INTERFERENCE SUPPRESION FOR ELECTRICAL DISCHARGE PRINTERS

Flavius A. Mathamel, Dearborn Heights, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 27, 1984, Ser. No. 583,634

Int. Cl.[4] G01D *15/08;* **B32B** *3/00*

U.S. Cl. 346—1.1 **35 Claims**



1. A method of operating an electrical discharge type printer in order to reduce the level of radiated electromagnetic emissions, said method comprising the steps of:

a. printing a number of sequences of images between the longitudinal edges of a length of electrosensitive paper; and

b. after printing said number of sequences, printing an isolation band extending across the entire width of said length of electrosensitive paper.

4,628,326

APPARATUS FOR PREVENTING DRYING-UP OF DRAWING NEEDLE PENS

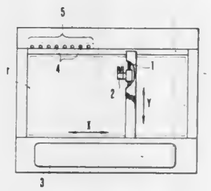
Sadaaki Fukumura, Tokyo; Takeji Hashimoto, and Hirofumi Tano, both of Kyoto, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of Japan

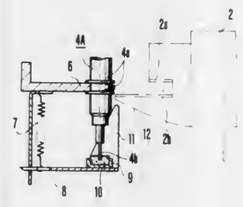
Filed Jan. 23, 1985, Ser. No. 693,933

Claims priority, application Japan, Feb. 14, 1984, 59-19700[U]

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—29 **8 Claims**





1. An apparatus for plotting markings with drawing needle pens when used and for preventing drying-up of the pens containing ink and pen tips thereof prior to use, comprising

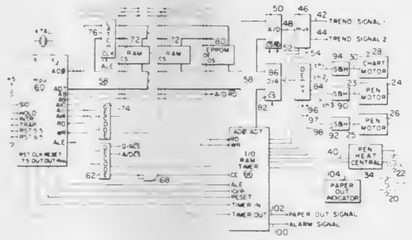
a plotting plane on which desired markings are drawn by the pens;
a pen carriage for holding a selected drawing needle pen to be used, said carriage being connected with at least one motor and being movable longitudinally and laterally relative to said plotting plane;
storing means for storing at least one of the drawing needle pens, said storing means including a supporting member for holding the pens prior to use; and
anti-dry means for preventing the pen tips of the drawing needle pens containing ink and stored in said storing means from drying-up, said anti-dry means being disposed in said storing means and comprising a pad having elastic and hermetic properties made of non-porous closed-cells, into which pad said pen tips are insertable and hermetically sealed by the pad for preventing drying-up of ink in the pens and tips.

4,628,327

PHYSIOLOGICAL TREND DATA RECORDER

Donald G. Anderson, Meriden, Conn., and Elisa M. Ferrara-Jordan, Longmeadow, Mass., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 398,019, Jul. 14, 1982, Pat. No. 4,513,294. This application Jan. 24, 1985, Ser. No. 694,547
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.[4] G01D *9/00*; A61B *5/04*
U.S. Cl. 346—33 ME **2 Claims**



1. A strip chart recorder responsive to the occurrence of an alarm condition for recording first and second trend signals representative of a physiological condition on one strip chart comprising:
recording means operable for recording the first and second trend signals on the strip chart at different rates in response to first and second rate signals, respectively;
storing means for storing said first trend signal representative of said physiological condition in the past; and
controlling means operable for controlling the storing means so as to provide the stored first trend signal to the recording means in response to the occurrence of an alarm condition and for providing the first rate signal, the second rate signal and the second trend signal to the recording means; said second trend signal representative of the physiological condition at points in time subsequent to those represented by the first trend signal and being provided to the recording means after recordation of the first trend signal.

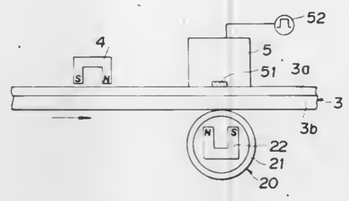
4,628,328

THERMOMAGNETIC RECORDING APPARATUS

Yuichi Takahashi, Ebina; Akira Tasaki, Ibaragi; Teruhiko Itami, and Shunsuke Tomiyama, both of Ebina, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 6, 1985, Ser. No. 730,387
Claims priority, application Japan, Jul. 6, 1984, 59-140385
Int. Cl.[4] G01D *15/12*
U.S. Cl. 346—74.4 **7 Claims**

1. A thermomagnetic recording apparatus comprising a heating head array driven in response to a printing signal, a magnetic recording layer previously magnetized in a prescribed direction on which a latent magnetic image is formed by heat generation of said heating head array, developing means for developing said latent magnetic image with a magnetic toner, transferring means for transferring a toner image developed to a recording medium, and fixing means for fixing the image transferred, said magnetic recording layer having a



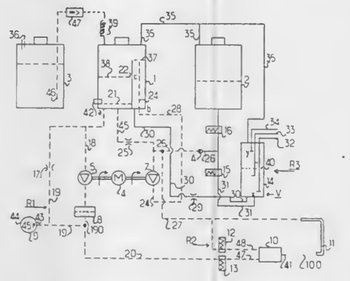
chemical composition which provides the magnetic material and has a Curie point which varies in response to the ratio of the chemical constituents in said chemical composition, said Curie point being set higher than the ambient temperature by a prescribed value dependent on the ratio of said chemical constituents, said chemical composition forming said magnetic recording layer having a hardness lower than the hardness of the heat generating element of the heating head array.

4,628,329

CIRCUIT FOR FEEDING INK TO AN INK-JET PRINTING HEAD

Luc Regnault, Bourg les Valence, France, assignor to Image S.A., Bourg les Valence, France

PCT No. PCT/FR84/00228, § 371 Date May 23, 1985, § 102(e) Date May 23, 1985, PCT Pub. No. WO85/01696, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 11, 1984, Ser. No. 740,049
Claims priority, application France, Oct. 13, 1983, 83 16440
Int. Cl.[4] G01D *15/18, 18/00*
U.S. Cl. 346—75 **8 Claims**



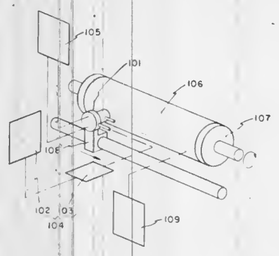
1. A circuit for feeding ink to an ink-jet printing head comprising an ink reservoir, said reservoir having a bottom wall, a first pipe connected at one end thereof to a first outlet in said bottom wall, a pressurizing pump connected to another end of said first pipe so that ink is supplied thereto, communication means connecting said pressurizing pump to said printing head for supplying ink thereto, a wetting pipe connected at one end thereof to a second outlet in said bottom wall, a depressurizing pump connected to another end of said wetting pipe, a recovery trough positioned to receive unused ink from said printing head in fluid communication with said depressurizing pump for drawing ink therefrom, means connecting said depressurizing pump with an inlet to said reservoir for conveying said unused ink to said reservoir, and a viscosimeter placed at a lower level than said reservoir comprising a vessel, three electrodes extending downwardly within said vessel, each electrode terminating at a different fluid level so as to detect a top fluid level and a bottom fluid level, whereby filling time between the bottom fluid level and the top fluid level can be determined and thereby the viscosity of the ink, and means for adding solvent to said viscosimeter when a reference value of the viscosity considered as a limit is attained.

4,628,330

INK-JET RECORDING APPARATUS

Michihisa Suga, and Mitsuo Tsuzuki, both of Tokyo, Japan, assignors to NEC, Japan

Continuation of Ser. No. 724,047, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 449,620, Dec. 12, 1982, abandoned. This application Jan. 24, 1986, Ser. No. 822,695
Claims priority, application Japan, Dec. 14, 1981, 56-201270
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **1 Claim**



1. An ink on demand ink-jet printer for producing a recording responsive to picture signals, said printer comprising recording head means for directing ink toward a recording medium, said recording head means having a chamber with a jet nozzle leading directly out of said chamber with no intervening passageway between said chamber and said nozzle, pressurized ink supply means upstream of said head and coupled through a passageway leading into said chamber and jet nozzle, the pressure of said ink supply being greater than atmospheric pressure, valve means forming part of said chamber and being interposed in said ink passageway system between said supply means and said jet nozzle, said valve means comprising a diaphragm controlled by a piezoelectric means located on said diaphragm and operated responsive to picture signals for selectively operating said valve means to open said passageway to enable said pressurized ink supply to expel ink from said chamber and nozzle when said picture signals call for a deposit of ink on a recording medium, said valve means closing said passageway to terminate the expulsion of said pressurized ink when said picture signal does not call for a deposit of ink on a recording medium, said piezoelectric means causing said diaphragm to increase the volume of said chamber to open said valve so that said upstream ink supply may expel a drop of ink from said nozzle and decreasing the volume of said chamber to close said valve, and means extending from said chamber at a point between said diaphragm and said nozzle for scavenging any excess ink which may accumulate.

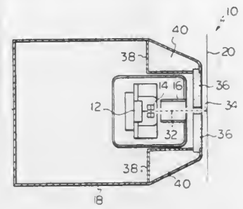
4,628,331

INK MIST COLLECTION APPARATUS FOR INK JET PRINTER

Chuji Ishikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,621
Claims priority, application Japan, Nov. 18, 1980, 55-162193
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

1. An ink jet printing apparatus comprising:
an ink jet head for ejecting a jet of ink;
charging means for electrostatically and selectively charging ink droplets separated from the ink jet;
deflection means for electrostatically deflecting the charged ink droplets; and
ink mist adsorbing means interposed between a paper sheet and said ink head for adsorbing an ink mist produced by said charged ink droplets upon impingement of the ink droplets on the paper sheet;
said ink adsorbing means comprising a first adsorptive member disposed between the paper sheet and deflection means and a second adsorptive member which is held in contact with the first adsorptive member to thereby adsorb the ink mist which is adsorbed by the first adsorptive member;
the adsorption capacity of said second adsorptive member being larger than that of said first adsorptive member, the second adsorptive member extending outwardly from the first adsorptive member in a direction perpendicular to the ink jet.

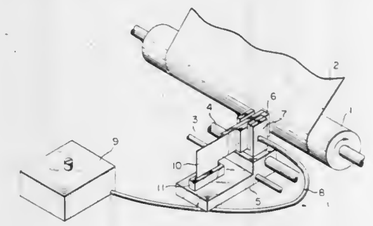


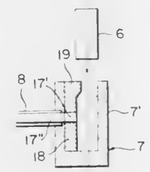
4,628,332

INK PRINTHEAD WITH HOLDER MOUNT

Haruyuki Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,167
Claims priority, application Japan, Jan. 30, 1984, 59-13315
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **13 Claims**





1. A liquid jet recording apparatus comprising:
a recording head for discharging recording liquid as flying liquid droplets,
a head mounting portion for fixing said recording head,
fixing means disposed interiorly of said head mounting portion and including an elastic material for removably at-

taching said recording head to said head mounting portion, and

liquid supply means including an opening extending through said head mounting portion and said fixing means for supplying recording liquid to said recording head.

4,628,333

INK JET RECORDING HEAD AND INK JET RECORDER

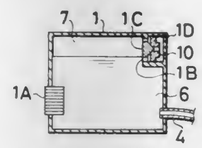
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,405

Claims priority, application Japan, Dec. 29, 1983, 58-249393; Dec. 29, 1983, 58-249394

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **11 Claims**



1. An ink jet recording head comprising:

a nozzle for discharging ink;

an ink chamber for supplying ink to said nozzle; and

a valve mechanism actuated by a vacuum arranged in said ink chamber, wherein an air layer is created in said ink chamber as ink is supplied thereto.

4,628,334

INK JET PRINT HEAD CARTRIDGE ASSEMBLY

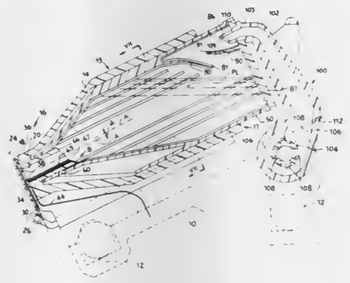
Giandomenico Dagna, Ivrea, and Franco Morin, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 15, 1985, Ser. No. 702,061

Claims priority, application Italy, Feb. 15, 1984, 67137 A/84

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **18 Claims**



8. An ink jet printing head for printing in a variety of colours, wherein the ink is selectively projected onto a printing carrier through a plurality of nozzles, comprising a holder for removably housing a plurality of separate cartridges, each containing an ink conduit normally closed by a diaphragm, said holder being closed at one end by a front wall portion carrying a nozzle plate facing said printing carrier and being open at the opposite end to permit the cartridges to be separately inserted in and removed from the holder, said front wall carrying hollow engaging elements each one aligned and communicating with a corresponding nozzle, whereby upon the insertion of a single cartridge in said holder, said engaging element penetrates into said conduit by perforating said diaphragm to permit said ink to reach said nozzle.

4,628,335

HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi; Kenji Ikeda, and Kensuke Ikeda, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1985, Ser. No. 781,575

Claims priority, application Japan, Sep. 28, 1984, 59-203822; Oct. 18, 1984, 59-219040; Oct. 18, 1984, 59-219044; Oct. 19, 1984, 59-220144; Dec. 14, 1984, 59-264184

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—208 **11 Claims**

1. A heat-sensitive recording material comprising a support and a heat-sensitive color forming layer containing a colorless or pale colored electron donating dye precursor and an electron accepting compound that reacts with said dye precursor to develop color, wherein said electron accepting compound is a bishydroxycumylbenzene or bishydroxy-α-methylbenzylbenzene compound.

4,628,336

THERMOSENSITIVE RECORDING SHEET

Toshimi Satake; Toshiaki Minami; Fumio Fujimura, all of Tokyo; Satoshi Oda, and Masato Magami, both of Nakatsu, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo and Yoshitomi Pharmaceutical Industries Ltd., Osaka, both of Japan

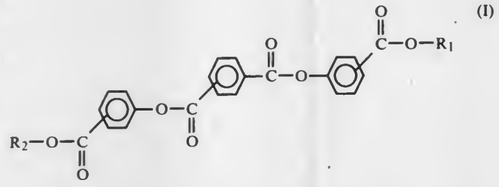
Filed Jul. 11, 1985, Ser. No. 753,905

Claims priority, application Japan, Jul. 18, 1984, 59-147684

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—209 **8 Claims**

1. A thermosensitive recording sheet having a thermosensitive color developing layer containing a basic leuco dye and an organic color developer, said layer containing a polyphenyl ester compound of the general formula



wherein R^1 and R^2, independently from each other, represent an alkyl group, a cycloalkyl group, or an aryl, aralkyl or aryloxyalkyl group which may have at least one substituent selected from the class consisting of halogen atoms, nitro groups, hydroxyl groups, lower alkyl groups and lower alkoxy groups.

4,628,337

REVERSIBLE IMAGE-FORMING MATERIAL

Mikiya Sekine, Warabi; Toshihiko Matsushita, Tokyo; Sadao Morishita, Ibaraki, and Yasuhiko Oiri, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd. and Nippon Hoso Kyo Kai, both of Tokyo, Japan

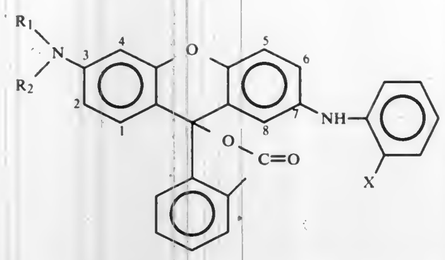
Filed Mar. 14, 1985, Ser. No. 711,837

Claims priority, application Japan, Mar. 15, 1984, 59-50069; Jun. 1, 1984, 59-112261; Jun. 4, 1984, 59-115233

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—217 **14 Claims**

1. A reversible image-forming material capable of forming black colored images by a thermal head and conversely erasing the formed images by water or moisture which comprises a support having provided on one surface thereof a recording layer comprising at least one fluorane color former represented by general formula (I):



(I)

wherein R_1 and R_2 each represents an alkyl group and X represents a halogen atom; at least one color developer selected from the group consisting of gallic acid and phlorglucinol; and a binder and further having provided an overcoat layer on said recording layer.

4,628,338

SEMICONDUCTOR DEVICE

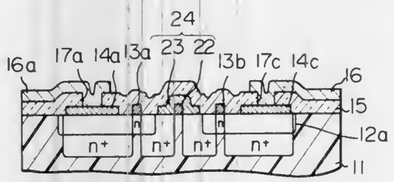
Yoshiro Nakayama, Yokohama, and Hidetake Suzuki, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 437,125, Oct. 28, 1982, abandoned. This application Sep. 25, 1985, Ser. No. 779,618

Claims priority, application Japan, Oct. 29, 1981, 56-174038

Int. Cl.⁴ H01L *29/48, 29/80*

U.S. Cl. 357—15 **16 Claims**



1. A semiconductor device comprising:

a semiconductor layer;

an n-type active area partially surrounding a portion of said semiconductor layer;

an electrode including:

a first part, formed on and in contact with said portion of said semiconductor layer partially surrounded by said n-type active area and comprising a material selected from the group consisting of high melting point metals and a silicide of the group of high melting point metals, for making Schottky contact with said semiconductor layer; and

a second part, formed on and in contact with a portion of said n-type active area and on and in contact with said first part of said electrode, and comprising a material different from said material of said first part of said electrode, for making ohmic contact with said portion of said n-type active area, said first and second parts of said electrode contacting each other over said semiconductor layer, and said entire electrode, comprising said first and second parts, acting as an ohmic electrode for said portion of said n-type active area.

4,628,339

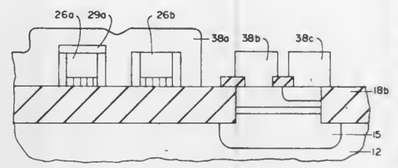
POLYCRYSTALLINE SILICON SCHOTTKY DIODE ARRAY

Madhukar B. Vora, Los Gatos, and Hemraj K. Hingarh, San Jose, both of Calif., assignors to Fairchild Camera & Instr. Corp., Cupertino, Calif.

Continuation of Ser. No. 537,136, Sep. 29, 1983, which is a division of Ser. No. 233,348, Feb. 11, 1981. This application Nov. 4, 1985, Ser. No. 794,586

Int. Cl.⁴ H01L *29/48, 27/12, 27/10, 29/04*

U.S. Cl. 357—15 **22 Claims**



1. A Schottky diode comprising:

a substrate;

an insulating layer formed over said substrate;

a layer of metal silicide formed over said insulating layer;

a layer of polysilicon formed over said metal silicide and self-aligned with the edges thereof and in contact with said metal silicide;

a wall of insulating material formed over all exposed polysilicon and silicide surfaces except the entire top surface of said polysilicon; and

a layer of metal in contact with said top surface of said polysilicon.

4,628,340

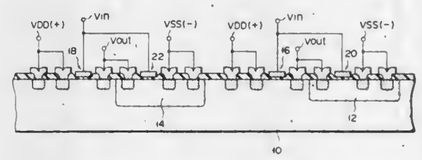
CMOS RAM WITH NO LATCH-UP PHENOMENON

Kazuhiko Hashimoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 22, 1983, Ser. No. 468,209

Int. Cl.⁴ H01L *29/78, 27/02*

U.S. Cl. 357—42 **5 Claims**



1. A complementary-symmetry MOS RAM-type semiconductor device for use in applications having peripheral systems, the device having a circuit for interacting with the peripheral systems as well as a circuit to provide the RAM function, the device comprising:

a semiconductor substrate of a first conductivity type;

a first well region of a second conductivity type which is formed in the surface region of said substrate;

a second well region of a second conductivity type which is formed in the surface region of said substrate with a smaller resistance per unit area than said first well region;

a first complementary-symmetry MOS circuit formed of said first well region and substrate; and

a second complementary-symmetry MOS circuit formed of said second well region and substrate,

wherein said first complementary-symmetry MOS circuit constitutes the RAM function circuit and said second complementary-symmetry MOS circuit constitutes the peripheral systems interaction circuit, for suppressing the

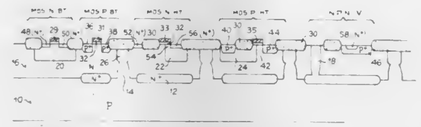
occurrence of latch-up without decreasing the degree of integration of said semiconductor device.

4,628,341

INTEGRATED CIRCUIT STRUCTURE COMPRISING CMOS TRANSISTORS HAVING HIGH BLOCKING VOLTAGE CAPABILITY AND METHOD OF FABRICATION OF SAID STRUCTURE

Gilles Thomas, Le Fontanil, France, assignor to Thomson CSF, Paris, France

Filed Sep. 27, 1985, Ser. No. 780,980
Claims priority, application France, Sep. 28, 1984, 84 14988
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **2 Claims**



1. An integrated circuit structure incorporating low-voltage n-channel and p-channel MOS transistors and high-voltage n-channel and p-channel MOS transistors, comprising

a semiconductor wafer formed by a substrate covered with a lightly doped n-type epitaxial layer;

first lightly doped p^- type regions extending from the surface of the semiconductor wafer to part of the depth of the epitaxial layer, these regions being such as to constitute compartments in which are formed the source, the drain and the channel of low-voltage n-channel MOS transistors;

heavily doped p^+ type regions which are of smaller depth than the p^- type regions, which extend from the surface of the semiconductor wafer, and which constitute the source and the drain of the p-channel MOS transistors;

heavily doped n^+ type regions which are of smaller depth than the p^- type regions, which extend from the surface of the semiconductor wafer, and which constitute the source and the drain of the n-channel MOS transistors; wherein provision is also made for:

at least a second p^- type region having the same concentration profile as the first regions and extending to the same depth, said second region being adapted to surround an n^+ type source region and to constitute a channel region of a high-voltage n-channel MOS transistor which further comprises an n^+ type drain region located outside the second region and in spaced relation thereto so as to permit the existence of a lightly doped n-type epitaxial layer zone not directly controlled by the transistor gate between said drain region and said second region;

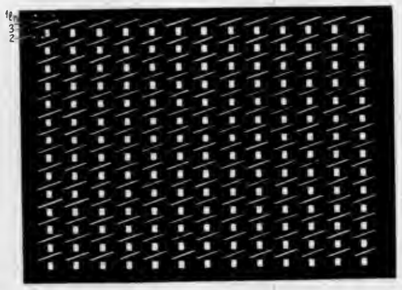
at least a third p^- type region having the same concentration profile as the first and second regions and extending to the same depth, said third region being adapted to surround a p^+ type drain region of a high-voltage p-channel MOS transistor in which the channel region is constituted by a lightly doped n-type epitaxial layer region adjacent to the third region, the p^+ type drain region of said transistor being in spaced relation to the channel region so as to form between these latter a zone of the third region which is not directly controlled by the transistor gate, and the source region of said transistor being located outside said third region.

4,628,342

OPTICAL TEST PATTERN FOR CORRECTING CONVERGENCE DEFECTS OF A COLOR CAMERA

Gerard Desmons, and Gilles Marchand, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed May 10, 1983, Ser. No. 493,272
Claims priority, application France, May 14, 1982, 82 08486
Int. Cl.[4] H04N *17/00*
U.S. Cl. 358—10 **11 Claims**



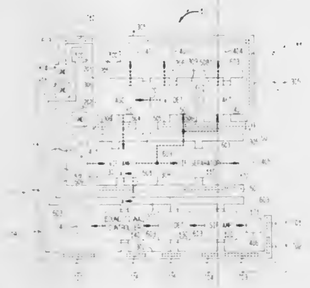
1. An optical test pattern for correcting convergence defects of a color camera, said test pattern comprising an integer number LN of identical pattern elements (1_{ln}) each disposed within one of LN rectangles resulting from a camera-screen lattice arrangement formed by L groups each consisting of M lines and N columns, each said pattern element being constituted by one vertical pattern component and one diagonal pattern component.

4,628,343

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE FREE FROM MUTUAL INTERFERENCE BETWEEN CIRCUIT BLOCKS FORMED THEREIN

Yuji Komatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 549,604, Nov. 7, 1983. This application Mar. 31, 1986, Ser. No. 846,822
Claims priority, application Japan, Nov. 8, 1982, 57-195480
Int. Cl.[4] H01L *23/50, 27/06*
U.S. Cl. 357—84 **7 Claims**



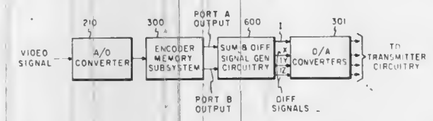
1. A semiconductor device comprising a semiconductor body, an isolation region formed in said semiconductor body and partitioning said semiconductor body into at least two surface areas, a plurality of first circuit elements formed in one of said at least two surface areas to define a first circuit block which processes a first signal of a first frequency, a plurality of second circuit elements formed in another of said at least two surface areas to constitute a second circuit block which processes a second signal of a second frequency different from said first frequency, a first wiring layer formed on said semiconductor body for supplying a first operating voltage to said first circuit block, a second wiring layer formed on said semiconductor body separately from said first wiring layer and supplying a second operating voltage to said first circuit block, said second wiring layer having a portion extended along said isolation region between said one surface area and said another surface area, said extended portion of said second wiring layer being connected to said isolation region between said one surface area and said another surface area, a third wiring layer formed on said semiconductor body separately from said first and second wiring layers and supplying said first operating voltage to said second circuit block independently of said first wiring layer, said third wiring layer having a portion extended along said isolation region between said one surface area and said another surface area in parallel to said extended portion of said second wiring layer, said extended portions of said second and third wiring layers preventing a signal crosstalk between said first and second circuit blocks, and a fourth wiring layer formed on said semiconductor body separately from said first, second and third wiring layers and supplying said second operating voltage to said second circuit block independently of said second wiring layer.

4,628,344

METHOD AND APPARATUS FOR ENCODING AND DECODING VIDEO

William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technoloy, Old Westbury, N.Y.

Continuation-in-part of Ser. No. 418,055, Sep. 14, 1982, Pat. No. 4,517,597. This application Apr. 8, 1983, Ser. No. 483,126
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] H04N *11/06*
U.S. Cl. 358—12 **18 Claims**



1. Apparatus for encoding and decoding a video signal, comprising:

(A) an encoder, including:

means responsive to said video signal for deriving a representation of low spatial frequency components of the images represented by said video signal;

means responsive to said video signal for deriving a representation which includes high spatial frequency components of the images represented by said video signal;

means for producing output frames of said low spatial frequency component representation at a fast frame refresh rate;

means for producing output frames of said high spatial frequency component representation at a slow frame refresh rate in the range of 3 to 15 frames per second; and

means for delaying said output frames of low spatial frequency component representation with respect to said output frames of high spatial frequency component representation; and

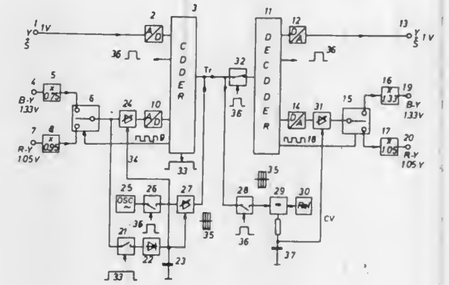
(B) a decoder, including means for combining the low spatial frequency component representation with the high spatial frequency component representation to obtain a decoded video signal.

4,628,345

CIRCUIT FOR ANALOG DIGITAL CONVERSION OF A COLOR TELEVISION SIGNAL EMPLOYING VARIABLE SIGNAL AMPLIFICATION

Erich Geiger, Unterkirnach; Bernhard Otto, VS-Rietheim, and Jürgen Kaaden, VS-Pfaffenweiler, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 651,272
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333071
Int. Cl.[4] H04N *11/04, 9/68*
U.S. Cl. 358—13 **19 Claims**



12. A circuit for analog to digital conversion of a color television signal, which includes in three different paths (**1**, **4**, **7**) a signal relating to a luminous density (Y), a first and a second chrominance signal (B-Y), (R-Y), where the chrominance signals alternate going from line to line, characterized in that

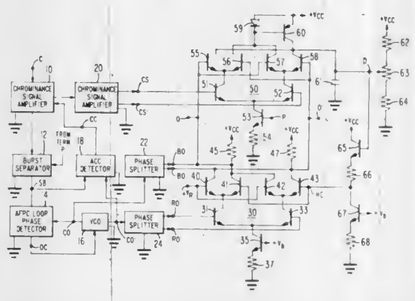
in each case the signal fed to an analog digital converter (**2**,**6**) is controlled in its amplitude by a set parameter (Us) derived from the original amplitude of the signal such that the signal assumes always about the full control amplitude region of a converter (**10**) and that the set parameter (Us) is transmitted with a control signal via the transmission line (U) fed by the converter (**10**) and the set parameter serves for feedback controlling the amplitude of the signal to the original amplitude (amplifier **31**).

4,628,346

ELECTRICAL SERVO SYSTEM HAVING MANUAL OVERRIDE AFFECTING SERVO LOOP GAIN

Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,250
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—28 **4 Claims**



1. An electrical servo system including a source of electrical

signals, and means for processing said electrical signals, said signal processing means having a control voltage input terminal and providing a processed signal output having a parameter subject to variation in accordance with the voltage applied to said control voltage input terminal; said system comprising:

means forming a servo control loop for opposing departures of said parameter of the processed signal output of said signal processing means from a predetermined relationship with a reference parameter; said servo control loop forming means including detector means, responsive to said processed signal output and to a reference signal indicative of said reference parameter, for developing a control voltage indicative of the magnitude and sense of such departures, and means for utilizing said control voltage to alter the voltage at said control voltage input terminal of said processing means in a sense tending to reduce the departure;

a DC voltage source;

manually adjustable means, coupled to said DC voltage source, for deriving from said DC voltage source a DC voltage of a magnitude adjustable within a predetermined range of magnitudes; and

means for rendering the voltage appearing at said control voltage input terminal responsive to the adjustable magnitude of said derived DC voltage while concomitantly rendering the gain of said servo control loop responsive to the adjustment condition of said manually adjustable means.

4,628,347

CHARGE TRANSFER DEVICE FOR MULTIPLEXING SIGNALS

Maki Sato, Sagamihara, and Takeo Hashimoto, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

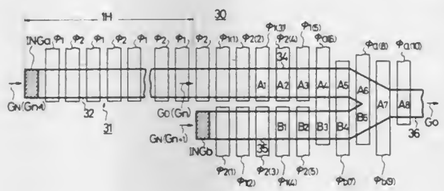
PCT No. PCT/JP83/00150, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984, PCT Pub. No. WO83/04344, PCT Pub. Date Dec. 8, 1983

PCT Filed May 19, 1983, Ser. No. 576,372

Claims priority, application Japan, May 21, 1982, 57-86258

Int. Cl.⁴ H04N *9/64, 9/077;* **H01L** *29/78;* **G11C** *19/28*

U.S. Cl. 358—39 **2 Claims**



1. A charge transfer device for multiplexing signals comprising: first and second charge-coupled transfer channels for transferring signal charges arranged side-by-side, each channel having a plurality of transfer electrodes which are aligned with corresponding transfer electrodes of the other channel, a third charge-coupled transfer channel arranged to alternately receive signal charges from said first and second charge-coupled transfer channels and having a plurality of transfer electrodes, said transfer electrodes of said first and second charge-coupled channels receiving first clock signals with said corresponding aligned transfer electrodes receiving said first clock signals at different phases, said transfer electrodes of said third charge-coupled transfer channel receiving second clock signals which have a frequency of two times said first clock signals, wherein a pair of input signals is applied to said first and second charge-coupled transfer channels and an output means receives an output of said third charge-coupled transfer channel.

2. A charge transfer device for multiplexing signals comprising: first, second and third charge-coupled transfer channels for transferring signal charges arranged side-by-side, a fourth charge-coupled transfer channel arranged to alternately receive signal charges from said first, second and third charge-coupled transfer channels, a first plurality of transfer electrodes extending transversely over said first, second and third transfer channels, each of said first plurality of transfer electrodes having portions longitudinally offset from each other such that a particular transfer electrode portion over said first transfer channel is offset from a transfer electrode portion over said second transfer channel which in turn is offset from a transfer electrode portion over said third transfer channel, a second plurality of transfer electrodes extending transversely over said, first, second and third transfer channels, and a third plurality of transfer electrodes extending over said fourth transfer channel.

4,628,348

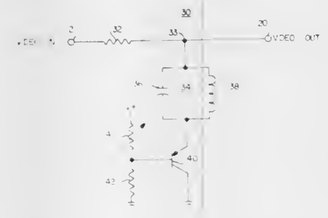
LUMINANCE CLIPPER WITH COLOR SUBCARRIER FILTER TO PREVENT CLIPPING OF SUBCARRIER

James W. Ensinger, Roselle, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 2, 1985, Ser. No. 718,682

Int. Cl.⁴ H04N *9/77, 5/16*

U.S. Cl. 358—39 **3 Claims**



1. In combination:

an input terminal in which is developed a baseband color video signal, including a luminance component and a carrier-based chrominance component;

first means coupled to said terminal responsive to said chrominance component; and

second means coupled to said terminal for maintaining the amplitude of signal applied thereto below a predetermined threshold voltage;

said first means and said second means being connected in a series circuit with said terminal;

said second means being a clipper for keeping said luminance component below said predetermined threshold voltage;

said first means rendering said second means ineffective for said chrominance component to maintain the amplitude of said luminance component below said predetermined threshold voltage while enabling passage of said chrominance component in substantially unchanged condition.

4,628,349

VIDEO-INDEX SIGNAL MIXER

Richard W. Midland, Inverness, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 9, 1985, Ser. No. 721,721

Int. Cl.⁴ H04N *9/24, 9/22*

U.S. Cl. 358—67 **6 Claims**

1. A video amplifier-index signal mixer for a wide-band beam index system including a CRT comprising:

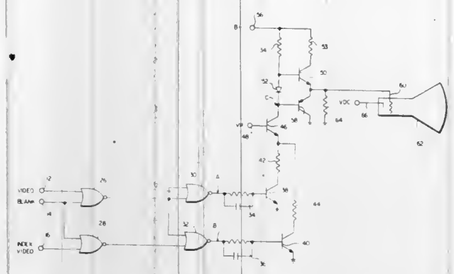
video switch means for controlling the amplitude of signal applied to said CRT, said video switch means having first and second inputs;

video signal means enabled responsive to a video signal, coupled to the first of said inputs;

index signal means, enabled responsive to an index signal, coupled to the second of said inputs;

said video switch means being driven conductive by either said video signal means or said index signal means being enabled; and

gate means interconnecting said video signal means and said



index signal means for enabling said index signal means whenever said video signal means is enabled, whereby during occurrence of a video signal, both said inputs to said video switch means are enabled.

4,628,350

IMAGE ENHANCEMENT

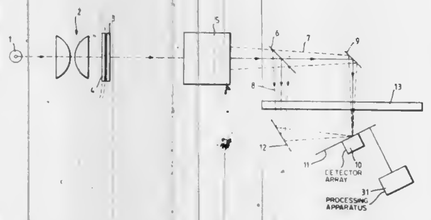
John E. Aughton, London, and Robert J. Oldershaw, Norfolk, both of England, assignors to Crosfield Electronics (USA) Limited, London, England

Filed Aug. 16, 1985, Ser. No. 766,320

Claims priority, application United Kingdom, Aug. 24, 1984, 8421512

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—75 **9 Claims**



1. Scanning apparatus for generating signals representing color components of successively scanned picture elements of an original colored image, said apparatus comprising a light source adapted to generate a light beam; means for causing relative movement between said original image and a light beam generated by said light source whereby successive picture elements of said original image are scanned; means for generating a sharp light beam for each color component of each said element; means for generating an unsharp light beam for at least one color component of each said element; common detection means for receiving said sharp and unsharp light beams and for providing corresponding output signals; and sequencing means for causing said sharp and unsharp beams sequentially to impinge on said detection means.

4,628,351

COOKING APPARATUS WITH A VIDEO DISPLAY

Man Y. Heo, Daegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Apr. 23, 1984, Ser. No. 603,138

Int. Cl.⁴ H04N *5/645*

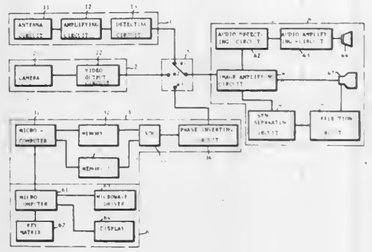
U.S. Cl. 358—93 **3 Claims**

1. A cooking apparatus with a video display, comprising

(a) a television processing means for processing a first video signal,

(b) a camera-image processing means for processing a second video signal from a video camera,

(c) a heat-controlling means which performs general functions of a cooking apparatus characterized in that a micro-video processing means for converting automatic cooking information into a third video signal is connected to said heat-controlling means and is adapted to monitor said cooking apparatus during a cooking cycle, and



(d) an image-processing means for displaying said video signals, and

(e) a switching means connected to said television processing means, said camera-image processing means and said micom-video processing means to permit switching of each means for displaying said video signal according to the user's selection.

4,628,352

DEVICE FOR CORRECTING VIDEO SIGNALS IN A SYSTEM FOR ACQUISTION AND SCANNING OF FAST SIGNALS INVOLVING THE USE OF A STREAK CAMERA

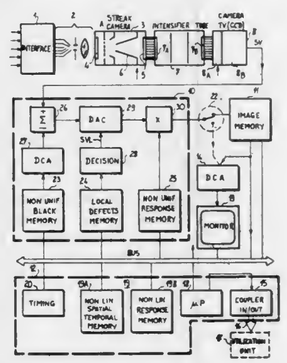
Philippe Boue, Villennes sur Seine, France, assignor to Thomson CSF, Paris, France

Filed Aug. 16, 1985, Ser. No. 767,772

Claims priority, application France, Aug. 21, 1984, 84 13018

Int. Cl.⁴ H04N *3/15, 5/335, 7/18*

U.S. Cl. 358—93 **8 Claims**



1. A system for acquisition and scanning of fast signals, which makes use of a streak camera upstream of a solid-state television camera and is equipped with a device for correcting the detected video signal, said signal being transmitted to a processing circuit comprising means for analog-to-digital conversion and digital-to-analog conversion, for storage in memory, for management and computation, for subtraction and

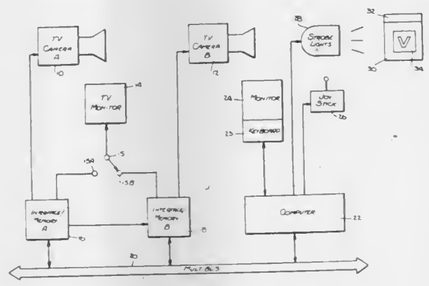
multiplication in order to correct defects of nonuniformity of black, local defects and defects of nonuniformity of response, in which the correction for nonuniformity of black is made by analog subtraction in a subtracting circuit and which also receives the video signal of the television camera and the data relating to correction for nonuniformity of black and stored in a first memory, correction for local defects being made by validation in the case of a correct element of the sensing matrix and by sampling of the signal corresponding to the preceding element if the element is defective, correction for nonuniformity of response being made by computation of a coefficient of proportionality and storage of said data in a second memory and by multiplication of the corresponding corrective term with a corrected video signal of the black, wherein the output of the subtracting circuit is connected to the multiplying circuit through an analog-to-digital converter which receives a signal for validation of local defects stored in a third memory, correction for nonuniformity of response being made in digital form in said multiplying circuit which delivers the corrected video signal via a digital output to an image memory in which it is stored, the means for management and computation being employed in order to produce from the data stored in the image memory data for correction of complementary defects represented by the defects of nonlinearity of response of the complete chain and by geometrical defects of spatial and temporal nonlinearities caused by the elements upstream of the television camera, said complementary data being stored in a fourth and fifth memory respectively.

4,628,353

VIDEO MEASURING SYSTEM

Ray E. Davis, Jr., Old Lyme; Robert G. Foster, Clinton; Michael J. Westkamper, Oakdale; Dana L. Duncan, Old Lyme, and James R. Hall, Clinton, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Apr. 4, 1984, Ser. No. 596,842
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—107 **42 Claims**



1. A video measuring system comprising:

(a) a TV camera for taking a picture, said camera having a two-axis array of photosensors;

(b) interface/memory circuitry connected to said TV camera for digitizing and storing said picture;

(c) a digital computer connected to said interface/memory circuitry;

(d) a monitor connected to said computer for displaying the stored picture;

(e) a keyboard connected to said computer to permit an operator to communicate with said computer;

(f) means connected to said computer for locating a plurality of start search points for the picture on the monitor;

(g) means for storing the start search points;

(h) means for selecting and storing gradient thresholds for a plurality of points for the picture on the monitor, said gradient thresholds comprising digital numbers having both a sign and a magnitude; and

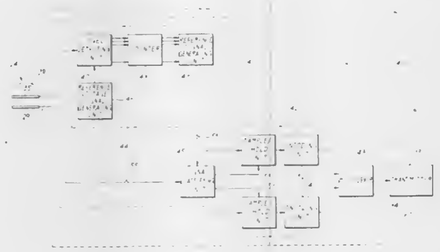
(i) means for storing the difference between a pair of points for the picture on the monitor.

4,628,354

IMAGE DATA TRANSMISSION SYSTEM CAPABLE OF REPRODUCING A HIGH RESOLUTION IMAGE BY THE USE OF A SIMPLE STRUCTURE

Riichi Nagura, Tokyo, assignor to NEC Corporation, Japan

Filed Mar. 14, 1985, Ser. No. 712,013
Claims priority, application Japan, Mar. 15, 1984, 59-49830; Jan. 21, 1985, 60-8609
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—109 **9 Claims**



1. In an image data transmission system for use in combination with a craft capable of flying along a flight path over an object zone, said image data transmission system comprising image pickup means carried by said craft for picking up optical images from said object zone to produce a succession of first image signals representative of the optical images and a succession of second image signals having a predetermined delay time relative to said first image signals and image processing means for processing said first and said second image signal successions into a processed signal succession, each of said first and said second image signals having a variable amplitude in dependency upon said optical images, the improvement wherein said image processing means comprises:

classifying means responsive to said first and said second image signal successions for classifying said amplitudes of said second image signals into classified signal successions falling within a predetermined number of amplitude ranges which are determined with reference to said first image signal succession, respectively;

encoding means coupled to said classifying means for individually encoding said classified signals into encoded signal successions, respectively; and

combining means for combining said encoded signal successions into said processed signal succession.

4,628,355

DIAGNOSTIC X-RAY APPARATUS

Ichiro Ogura; Motomu Suzuki, both of Otawara; Senzo Fujii, Nishinasuno, and Michitaka Honda, Otawara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1983, Ser. No. 527,553
Claims priority, application Japan, Aug. 28, 1982, 57-149775
Int. Cl.[4] H05G *1/64;* **H04N** *5/32*
U.S. Cl. 358—111 **6 Claims**

1. A diagnostic X-ray apparatus for producing visible difference images from X-ray images obtained from pulsed X-ray radiation, comprising:

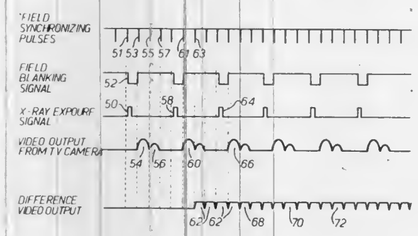
an X-ray generating source for emitting pulsed X-ray radiation to produce a pulsed X-ray image;

television means, including a television camera having a predetermined field rate, for converting said X-ray image into a series of analog video signals;

synchronizing means for generating field synchronizing signals at the field rate of said television camera;

exposure control means reponsive to said field synchronizing signals for generating X-ray exposure signals to control the exposure period of the pulsed X-ray radiation emitted from said X-ray generating source, said exposure period being less than the interval of said field synchronizing signals, and said exposure control means including means for generating field blanking signal synchronously with the exposure period of said X-ray generating source;

analog-to-digital converting means for converting into digital video signals said analog video signals corresponding to a complete television field image resulting from said



pulsed X-ray radiation and following said field blanking signals;

a digital memory system including means for storing said digital video signals in a predetermined sequence;

subtracting means for producing digital difference video signals by performing a subtraction between digital video signals recently stored and digital video signals previously stored in said digital memory system;

a digital-to-analog converter for converting said digital difference video signals from said subtracting means into analog difference video signals; and

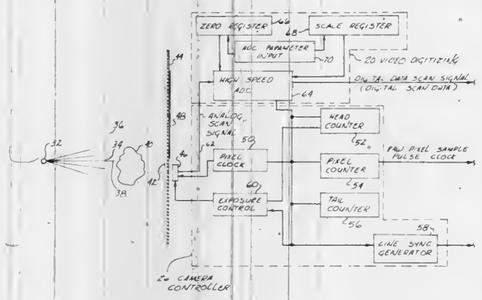
display means for producing visible difference images corresponding to said analog difference video signals.

4,628,356

DIGITAL X-RAY SCANNER

Donald W. Spillman, Aurora, and Thomas W. Shilling, Littleton, both of Colo., assignors to Imagex, Inc., Aurora, Colo.

Filed Oct. 15, 1984, Ser. No. 660,853
Int. Cl.[4] H05G *1/64;* **H04N** *5/32*
U.S. Cl. 358—111 **8 Claims**



1. An X-ray imaging system for electronically detecting and imaging X-ray shadows of an object comprising:

X-ray source means for generating a generally rectangularly shaped X-ray beam;

scanning means for inducing relative motion between said object and said X-ray beam to produce said shadows of said object;

linear photosite detector array means for detecting said X-ray shadows of said object and producing an analog scan signal representative of said X-ray shadows;

video digitizing means for producing a digital scan signal in response to said analog scan signal, said video digitizing means comprising:

high speed analog to digital converter means for producing said digital scan data in response to said analog scan signal;

means for setting operational parameters of said high speed analog to digital converter means;

camera controller means for controlling exposure and clocking of said linear photosite detector array means comprising:

pixel clock means for generating pixel clock pulses;

exposure control means for setting the exposure time of said linear photosite detector array means;

pixel counter means for counting said pixel clock pulses to determine the number of pixels on each raster line;

line sync generator means for producing a line sync generator pulse at the end of each raster line of pixel data points;

raw data storage means for storing digital scan data from said digital scan signal;

data formatting means for mapping said digital scan data for storage in said raw data storage means and generating read address signals for reading said digital scan data from said raw data storage means;

means for selecting a predetermined window of said raw image data and retrieving said window of data from said storage means for display;

picture processing means for processing said digital scan data for display comprising:

data compression means for compressing said digital scan data in two dimensions to increase the amount of said data which can be displayed on a monitor;

means for processing said digital scan data to enhance an image formed by displaying said digital scan data;

display frame buffer means generating an analog image display signal comprising:

display look-up table means for storing said digital scan data in address locations corresponding to the positional location for display of said data on said monitor means and generating a binary signal corresponding to the magnitude of said digital scan data;

display address generator means for generating address signals of data to be displayed on said monitor means;

load address generator means for generating load address signals for storage of said digital scan data in said display look-up table means at said address locations corresponding to said positional locations for display of said data on said monitor means;

digital to analog converter means for generating said analog image display signal;

monitor means for electronically displaying said analog image display signal.

4,628,357

DIGITAL FLUOROGRAPHIC SYSTEMS

Paul Fenster, Petach Tikvah, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Feb. 10, 1984, Ser. No. 579,202
Int. Cl.[4] H04N *5/32*
U.S. Cl. 358—111 **14 Claims**

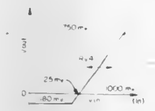
1. A digital fluorographic system for displaying radiographic images of objects; said system comprising:

an image acquisition section for acquiring video signals representative of images of the object, comprising:

image processing means for processing said video signals prior to display, said processing means including log amplifier means for amplifying said video signals by a log function, and

means for cutting off said amplified video signal at a value

above that corresponding to the zero input of said amplifier to improve the signal to noise ratio and to prevent amplifications of signal errors close to the zero point on the response curve.



4,628,358

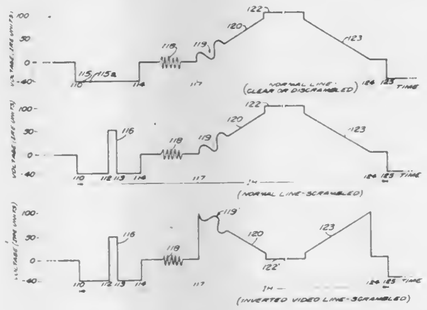
TELEVISION SIGNAL ENCRYPTION SYSTEM WITH PROTECTED AUDIO

Clyde N. Robbins, Fort Washington, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,250

Int. Cl.[4] H04N *7/167*

U.S. Cl. 358—121 **12 Claims**



1. In combination in a system for communicating a television program which includes encrypted audio and video signals; signal originating means including a first pseudo random generator for generating an audio scrambling control signal, means for generating polarity inverted and non-inverted versions of the television audio signal, and selection means controlled by said first controlling means for operatively selecting for communication the polarity inverted or the non-inverted version of the television audio signal; and receier means including means for receiving the signal supplied by said selection means, said receiver means including a second pseudo random generator for generating a replica of said udio scrambling control signal, means for generating polarity inverted and non-inverted versions of the signal received by said receiving means, and additional selection means controlled by said second controlling means for operatively selecting for listening said inverted or non-inverted version of said received audio signal, whereby the output of said additional selection means comprises polarity restored audio, said signal originating means further including selective inversion means for selectively inverting the video information content of video lines about an inversion reference level and for not inverting the video information content of other lines, signal distribution means for distributing the output signal produced by said selective video inversion means, and means for distributing a measure of said inversion reference level with the composite signal distributed by said signal distribution means; and wherein said receiver means further includes means for receiving said composite signal from said signal distribution means; said decrypting means including inversion reference means for recovering the received video inversion reference level, and means for selectively reinverting the video information content of inverted video lines about the recovered inversion reference of said inversion reference means.

4,628,359

MEMORY SELECTING SYSTEM FOR SCRAMBLED TELEVISION RECEIVER

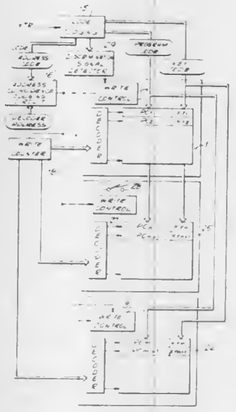
Takashi Okada, Yokohama, and Takao Mogi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,257

Claims priority, application Japan, Mar. 24, 1983, 58-49583

Int. Cl.[4] H04N *7/167*; **G11B** *5/02*

U.S. Cl. 358—122 **16 Claims**



11. Apparatus for descrambling signals transmitted in scrambled form that are to be recorded and reproduced and which include a scrambled television program, an identification code, a program code, and a descrambling key signal corresponding to the program code, the apparatus comprising:

temporary memory means for temporarily memorizing program codes and corresponding key codes when the scrambled transmitted signals are recorded;

permanent memory means for permanently memorizing program codes and corresponding key codes when scrambled transmitted signals are recorded;

means for detecting the identification code in said transmitted signals and selecting either said temporary memory means or said permanent memory means, respectively, for memorizing said program codes and corresponding key codes in response thereto;

means for comparing program codes memorized in said temporary memory means or in said permanent memory means with the program code of the scrambled signals being reproduced and choosing the one of the memorized program codes coinciding with said program code of the scrambled signals being reproduced;

means for generating a descrambling pattern based upon the memorized descrambling key code that corresponds to said one program code which is chosen; and

means for descrambling the reproduced scrambled signals in accordance with said descrambling pattern.

4,628,360

METHOD AND APPARATUS FOR DETERMINING THE IMAGE TRANSFER QUALITY OF AN IMAGING SYSTEM

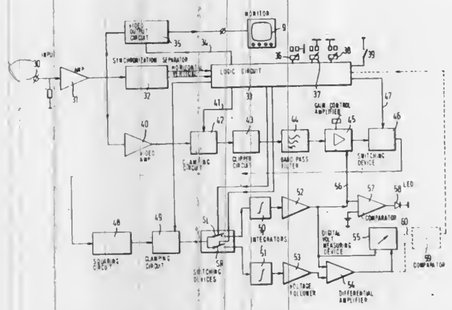
Adrianus Mook, Delft, and Ronald J. Geluk, Nootdorp, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft" , Netherlands

Filed Feb. 21, 1984, Ser. No. 582,076

Claims priority, application Netherlands, Feb. 25, 1983, 8300725

Int. Cl.[4] H04N *17/00*

U.S. Cl. 358—139 **26 Claims**



1. A method of determining the image transfer quality of an imaging system on the basis of signal-to-noise ratio and including forming a television signal, characterized by: presenting to an input of said imaging system a reference pattern comprising at least two different portions, one portion of said reference pattern resulting, after formation of said television signal, in a first section of image carrying information of a television output signal and being a measure for occurrent noise, and another portion of said reference pattern resulting, after formation of said television signal, in a second section of image carrying information of said television output signal and comprising a like amount of said occurrent noise in combination with an image signal component; and comparing said first section of image carrying information associated with said one portion of said reference pattern with said second section of image carrying information associated with said other portion of said reference pattern to generate a signal-to-noise ratio.

4,628,361

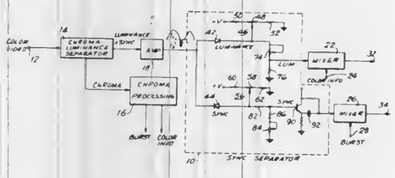
VIDEO SYNCHRONIZING SIGNAL SEPARATOR

Sam Andreas, Brooklyn, N.Y., assignor to Recoton Corporation, Long Island City, N.Y.

Filed Jan. 8, 1985, Ser. No. 689,645

Int. Cl.[4] H04N *5/08*

U.S. Cl. 358—153 **10 Claims**



1. A synchronizing signal separator for separating the luminance and synchronizing signal components from a composite video signal supplied thereto, comprising: first and second oppositely conductive diodes having an anode of one and a cathode of the other coupled to a common terminal to receive said composite video signal; first and second bias means coupled to said first and second diodes, respectively, to establish respective turn-off levels for said first and second diodes to render said respective first and second diodes non-conductive when said composite video signal crosses respective threshold voltage levels, at least one of said bias means including a source of voltage; adjustable resistance means coupled to said source of voltage to produce an adjustable bias voltage; means for applying said adjustable bias voltage to the cathode of said first diode; luminance output means comprising first variable attenuating means coupled to the cathode of said first diode for attenuating by a selected amount said luminance signal component to supply a luminance signal component substantially free of said synchronizing signal component; and synchronizing output means coupled to said second diode to supply a synchronizing signal component substantially free of said luminance signal component; whereby said first diode is conductive during the luminance signal interval of said composite video signal and is biased to non-conduction in response to said synchronizing signal component of said composite video signal, and said second diode is conductive during the synchronizing signal interval of said composite video signal and is biased to non-conduction in response to said luminance signal component of said composite video signal.

4,628,362

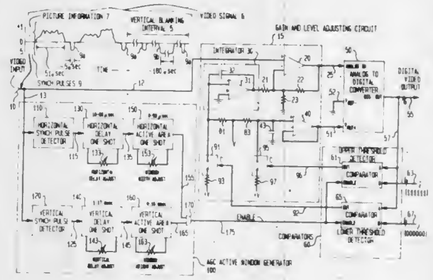
COMBINED VIDEO AGC AND DIGITIZING CIRCUIT

Glenn C. Waehner, New Canaan, Conn., assignor to American Dynamics Corporation, Orangeburg, N.Y.

Filed May 2, 1985, Ser. No. 729,813

Int. Cl.[4] H04N *5/53, 5/52, 5/57*

U.S. Cl. 358—174 **16 Claims**



1. A circuit, having an automatic gain control (AGC), for providing a digital output signal having digital values representing analog picture information in an incoming video signal, said incoming video signal also having vertical and horizontal synchronization pulses, said circuit comprising:

an analog-to-digital converter, having a dynamic range and a certain gain and operative in response to an analog input signal, for producing the digital output signal,

means, connected to said converter and operative in response to said incoming video signal and to at least one feedback signal, for producing the analog input signal and for ensuring that picture information contained in said analog input signal consumes substantially all of the dynamic range of the converter,

means, operative in response to the occurrence of said synchronization pulses for providing an enable signal and for selectively varying the starting time and duration of the enable signal so as to selectively define an active window, within a video image, on which the AGC is to operate; and

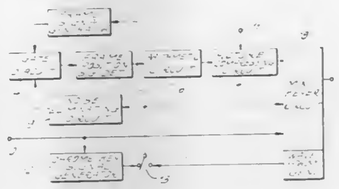
means, responsive to said digital output signal and to the enable signal, for comparing the digital values against predefined minimum and maximum values and, in response thereto, generating said feedback signal.

4,628,363

CHROMA-KEY TRACKING APPARATUS

Masahiro Kashiwa; Masashi Onosato, and Hiroshi Takahashi, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 21, 1983, Ser. No. 553,753
Claims priority, application Japan, Nov. 19, 1982, 57-203170
Int. Cl.[4] H04N *5/275, 9/74*
U.S. Cl. 358—183 **9 Claims**



1. A tracking apparatus for inserting a first television picture into a part of a second television picture to obtain a special effect, comprising:

means responsive to a second television signal which is indicative to said second television picture for generating a key signal which represents an area of a television frame of said second television picture which is occupied by said first television picture;

noise eliminating means for removing from said key signal a picture noise component having a dimensional width which is less than a predetermined dimensional width value, said noise eliminating means measuring said picture noise component to determine the dimensional width thereof to produce a noise-free key signal;

means responsive to said noise free key signal from said noise eliminating means for detecting a surrounding frame surrounding the boundary of said frame represented by said key signal;

means responsive to said surrounding frame for producing an imaginary frame indicating a size to which a first television signal corresponding to said first television picture is to be compressed;

means responsive to said imaginary frame for compressing said first television signal to the size of said imaginary frame; and

means for inserting said compressed first television signal from said compression means into said second television signal corresponding to said second television picture in accordance with said key signal.

4,628,364

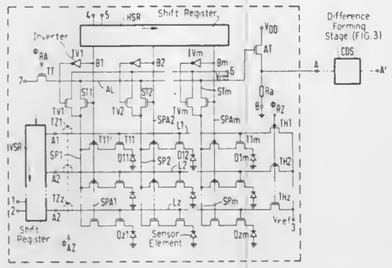
TWO-DIMENSIONAL SEMICONDUCTOR IMAGE SENSOR INCLUDING AN ARRANGEMENT FOR REDUCING BLOOMING

Rudolf Koch, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,283
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236073
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 **9 Claims**

1. In a two-dimensional image sensor of the type wherein a plurality of sensor elements are carried in columns and rows by a doped semiconductor body, wherein row lines are selected by way of assigned parallel outputs of a row shift register to selectively drive first selection transistors respectively connected to the sensor elements for transmitting exposure-dependent sensor signals, formed in the sensor elements, over the first selection transistors to respective column lines, wherein the column lines are successively connected to a read-out line connected to a read output for reading the sensor signals via respective column selection transistors each serially connected to a respective first selection transistor and driven by parallel outputs of a column shift register, the improvement therein comprising:

second selection transistors each serially connected between a respective first selection transistor and a respective column line and connected to and driven by the outputs of the column shift register;



a plurality of switching transistors each serially connected between a respective column line and a reference potential; and

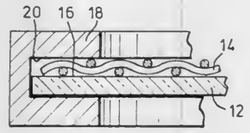
inverter means connecting the respective outputs of the column shift register to said switching transistors so that said column selection transistors and said switching transistors are inversely driven relative to one another.

4,628,365

RADIATION FILTER

Roger Carlton, Periphlex Inc., 5230 Finch Ave. E., Unit 5, Scarborough, Ontario, Canada (M1S 4P1)

Continuation of Ser. No. 540,932, Oct. 11, 1983, abandoned.
This application Mar. 17, 1986, Ser. No. 844,241
Int. Cl.[4] H04N *5/65, 5/72*
U.S. Cl. 358—245 **9 Claims**



1. A radiation filter for the screen of a video display terminal comprising a transparent sheet of radiation absorbent material dimensioned to extend across and be disposed adjacent to said screen, an open mesh material juxtaposed on a surface of said sheet of radiation absorbent material directed away from said screen and means to secure said mesh to said sheet, said sheet of radiation absorbent material being interposed between said mesh and said screen to absorb radiation emitted therefrom, whereby light incident upon and transmitted through said sheet is absorbed by said mesh.

4,628,366

PICTURE SCANNING AND RECORDING METHOD

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 23, 1983, Ser. No. 507,719
Claims priority, application Japan, Jul. 12, 1982, 57-121460
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **2 Claims**

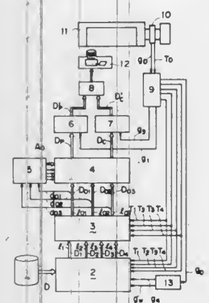
1. A method for recording a reproduced image in a desired layout based on image data obtained by photoelectrically scanning an original picture, a line drawing and a picture pattern existing mixedly in the reproduced image, the method comprising the steps of:

storing line drawing data and picture pattern data, obtained from photoelectrically scanning the original, in a memory

sequentially reading the image data, including the line drawing data and the picture pattern data, out of said memory in the order of record scanning lines, said image data being represented as an image signal for each picture element of the original picture in the form of one of said line drawing data or said picture pattern data, both being on data formats of equal length;

providing each of said data formats with a discrimination bit for discriminating whether the image data represented on a data format are line drawing data or picture pattern data;

arranging the image data of a required picture element on a



first scanning line to be recorded and the image data of a picture element on a scanning line adjacent to said first scanning line in the sequential order of scanning lines;

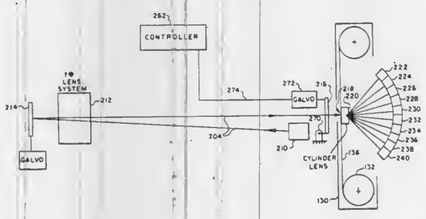
and discriminating the arranged image data and, when the image data of a first picture element on a central scanning line to be recorded are line drawing data when discriminated, outputting the picture pattern data of a picture element adjacent to said first picture element in a subscanning line to said first picture element by superimposing the picture pattern data on the line drawing data, the output of the picture pattern data being controlled per one picture element, and the output of the line drawing data being controlled per one subpicture element obtained by further dividing said first picture element.

4,628,367

METHOD AND DEVICE FOR READING DIGITAL DATA IN AN OPTICAL MASS MEMORY SYSTEM USING ELECTROPHOTOGRAPHY

Manfred Kuehnle, New London, N.H.; Lysle D. Cahill, Dayton; John C. Butler, Centerville, both of Ohio, and Lawrence J. Bassuk, Des Plaines, Ill., assignors to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 489,309, Apr. 28, 1983, Pat. No. 4,515,879.
This application Jan. 29, 1985, Ser. No. 696,027
Int. Cl.[4] H04N *1/04, 1/40*
U.S. Cl. 358—285 **6 Claims**



1. For use in an optical mass memory system, a method of reading digital data represented by a toned image carried by a transparent medium, the medium having a length and a width and the toned image being formed of opaque areas and at least translucent areas forming optically discernable elements arranged in a pattern on the medium, the digital data being represented by said elements, said method comprising:

providing a plurality of rays spaced from one another of radiant energy, each ray having a size just smaller than the size of said elements;

scanning said toned image with said rays by deflecting said rays across the width and length of said medium in a pattern corresponding to the pattern in which the elements are arranged on the medium;

sensing the radiant energy from each of said rays that is transmitted through said member at said at least translucent elements and converting the transmitted radiant energies into analog electrical signals; and

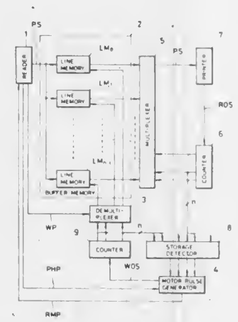
converting said analog electrical signals into digital electrical signals representing said digital data.

4,628,368

METHOD FOR CONTROLLING SUB-SCANNING OF DOCUMENT READING APPARATUS

Masami Kurata; Tadashi Yamamoto, and Noriyoshi Ishikawa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,724
Claims priority, application Japan, Jul. 12, 1983, 58-126590
Int. Cl.[4] H04N *1/10*
U.S. Cl. 358—293 **14 Claims**



1. A method for controlling the movement speed of reading means in a document reading apparatus, said reading means having a certain weight and moving along a platen on which a document is supported so as to read picture information on said document in a line by line manner, said read picture information being temporarily stored in a buffer memory for subsequent utilization, comprising the steps of:

detecting the amount of picture information currently stored in said buffer memory not yet utilized, and

controlling said movement speed of said reading means according to said detected picture information to minimize the vibration of said reading means.

4,628,369

VIDEO SIGNAL DROPOUT COMPENSATION CIRCUIT

Yutaka Ichinoi, Yokohama, and Naomichi Nishimoto, Tokyo, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

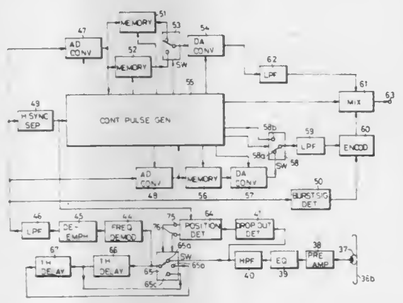
Filed Mar. 12, 1984, Ser. No. 588,378
Claims priority, application Japan, Mar. 17, 1983, 58-44766
Int. Cl.[4] H04N *5/76, 9/493*
U.S. Cl. 358—314 **3 Claims**

1. A new video signal dropout compensation circuit in a reproducing apparatus which is designed to reproduce a re-

corded signal from a recording medium, said recording medium being recorded with a time-division-multiplexed signal which has been frequency modulated, each horizontal scanning period of said time-division-multiplexed signal comprising a first transmitting duration in which a time base compressed luminance signal is transmitted and a second transmitting duration in which a time base compressed line-sequential color difference signal is transmitted, said reproducing apparatus frequency-demodulating a reproduced frequency modulated time-division-multiplexed signal in a frequency demodulator, and time base expanding the time base compressed line-sequential color difference signal and the time base compressed luminance signal which are within the reproduced time-division-multiplexed signal back to an original time base so as to obtain a reproduced line-sequential color difference signal and a reproduced luminance signal, said dropout compensation circuit comprising:

a dropout detecting circuit for producing a dropout detection signal when said reproduced frequency modulated time-division-multiplexed signal assumes a level which is smaller than a preset predetermined level;

a position detecting circuit supplied with the output signal of said dropout detecting circuit for passing said dropout detection signal through a first output terminal when said dropout detection signal is supplied thereto within said first transmitting duration and for passing said dropout detection signal through a second output terminal when said dropout detection signal is supplied thereto within said second transmitting duration;



a switching circuit which is controlled in response to signals from said first and second output terminals of said position detecting circuit; and

delay means supplied with a signal which is selectively passed by said switching circuit for delaying said signal which is selectively passed by said switching circuit, said delay means comprising first and second delay circuits which are connected in series and respectively have a delay time of one horizontal scanning period,

said switching circuit comprising a first terminal supplied with said reproduced frequency modulated time-division-multiplexed signal, a second terminal supplied with an output signal of said second delay circuit which has been delayed by a total delay time of two horizontal scanning periods, and a third terminal supplied with an output signal of said first delay circuit which has been delayed by a delay time of one horizontal scanning period, said position detecting circuit controlling said switching circuit so as to selectively pass an input signal to said third terminal when said dropout detection signal is supplied to said switching circuit only through said first output terminal of said position detecting circuit, to selectively pass an input signal to said second terminal when said dropout detection signal is supplied to said switching circuit only through said second output terminal of said position detecting circuit, and to selectively pass an input signal to said first terminal when said dropout detection signal is not produced by said dropout detecting circuit.

4,628,370

APPARATUS FOR COPYING MAGNETIC TAPE

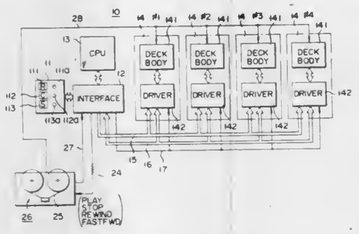
Norio Fukuoka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,488

Claims priority, application Japan, Jun. 20, 1983, 58-110597; Jul. 27, 1983, 58-137329

Int. Cl.[4] G11B *5/86, 15/48*

U.S. Cl. 360—15 **4 Claims**



1. An apparatus for copying magnetic tape, comprising:

a slave deck having an operation panel and a plurality of copying units for receiving tapes to be copied;

a master deck means having a master tape and providing a reproduced output from the master tape to the tapes to be copied by the slave deck and producing start and finish signals corresponding respectively to the start and finish of the master tape's contents to be copied; and

control means coupled to said operation panel, to said slave deck and to said master deck, for selectively setting said copying units of the slave deck to a copying mode, a rewinding mode, or a stopping mode responsive to the setting of said operation panel, for setting of the master deck to a reproducing mode, rewinding mode, or stopping mode, and for causing rewinding of the tapes to be copied and the master tape to their initial state responsive to finish signals corresponding to the finish of the master tape's contents when the slave deck is set to the copying mode and the master deck is set to the reproducing mode;

wherein said control means comprises first means for detecting the state of the respective copying units, and second means for setting said copying units to the stopping mode responsive to detection of a defective copying unit by said detecting means, and for interrupting a following rewinding operation of the defective copying unit thereafter;

whereby operation of said operation panel and changing of tapes in said slave deck are carried out at said slave deck.

4,628,371

DROP-OUT COMPENSATOR FOR A RECORDED SIGNAL PLAYBACK SYSTEM

Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,522

Claims priority, application Japan, Dec. 25, 1982, 57-197673[U]

Int. Cl.[4] H04N *5/76*

U.S. Cl. 360—38.1 **2 Claims**

1. A drop-out compensator for a system for playing a recording medium carrying an RF signal having a component modulated by a main channel audio signal and a sub carrier signal modulated by a sub channel audio signal comprising:

an input means for receiving an RF signal read from said recording medium;

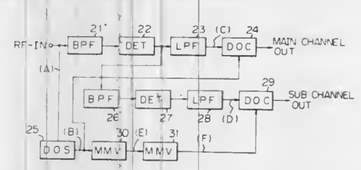
first demodulating means connected to said input means for demodulating said RF signal and producing a first demodulation signal including said main channel audio signal and said sub carrier signal;

a drop-out sensor connected for sensing one of a drop-out of said RF signal and a drop-out of said first demodulation signal and for producing a drop-out sensing signal;

first separating means connected to said first demodulating means for separating said main channel audio signal from said first demodulation signal, said separating means having a delay characteristic of a first delay time;

a first drop-out compensator connected to said first separating means, for compensating for a drop-out of said main channel audio signal in accordance with said drop-out sensing signal;

second demodulating means connected to said fist demodulating means for demodulating said first demodulation signal and producing a second demodulation signal including said sub channel audio signal;



second separating means connected to said second demodulating means for separating said sub channel audio signal from said second demodulation signal, said second separating means having a delay characteristic of a second delay time longer than said first delay time;

delay means responsive to said drop-out sensing signal, for producing an additional drop-out sensing signal by delaying the transmission of said drop-out sensing signal, said delay of transmission being substantially equal to the difference between said first delay time and said second delay time;

a second drop-out compensator connected to said second separating means, for compensating for a drop-out of said sub channel audio signal in accordance with said additional drop-out sensing signal.

4,628,372

METHOD AND APPARATUS FOR IDENTIFYING RECORDED INFORMATION SEGMENTS ON A RECORD MEDIUM

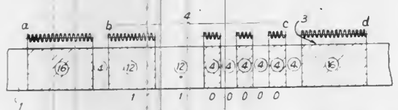
Takashi Morisawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 632,963

Claims priority, application Japan, Jul. 21, 1983, 58-133226

Int. Cl.[4] G11B *5/09, 15/18*

U.S. Cl. 360—40 **20 Claims**



1. A method of recording address signals on a magnetic tape, for use in identifying respective program segments on said magnetic tape, in spaces arranged between the program segments, comprising the steps of:

providing a first burst signal having a first number of continuous sine waves of low frequency relative to the audio frequency band and a first blank signal having a length equal to said first burst signal, each representing the same one level of a binary signal;

providing a second burst signal having a second number of continuous sine waves of said low frequency, said second number being at least two times said first number, and a second blank signal having a length equal to said second burst signal, each representing the same other level of a binary signal;

arranging a plurality of said first burst signals and said first blank signals and said second burst signals and said second blank signals in a binary code pattern for each respective program segment, in which said step of arranging includes the step of assuring that a blank signal is always adjacent a burst signal in said binary code pattern; and

recording said binary code pattern in said space on said magnetic medium adjacent the respective program segment, whereby said respective program segment is identified by said binary code pattern recorded on said magnetic tape.

4,628,373

ROTATING HEAD TYPE MAGNETIC RECORD/REPRODUCE APPARATUS

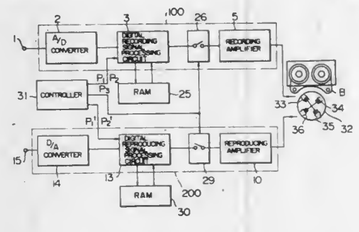
Hiroaki Takahashi; Shigeru Yamazaki; Takaharu Noguchi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,554

Claims priority, application Japan, Jun. 10, 1983, 58-102606; Jun. 15, 1983, 58-105879

Int. Cl.[4] G11B *15/12, 5/00*

U.S. Cl. 360—62 **2 Claims**



1. A helical-scan type rotating head PCM record/reproduce apparatus comprising:

(a) PCM recording signal processing means having a convertor for converting an analog input signal to a digital signal, and digital signal processing means for adding an error detecting/correcting signal to said digital signal;

(b) record/reproduce means for recording an output signal from said PCM recording signal processing means on a magnetic tape in an oblique direction and reproducing said recorded output signal, said means having first and second record heads and first and second reproduce heads alternately disposed in the rotating direction;

(c) PCM reproducing signal processing means having a digital-signal processing circuit for performing error detection/correction process to the signal from said reproduce head, and a D/A converter for converting said processed signal to the original signal; said first record and reproduce heads and second record and reproduce heads of said record/reproduce means being disposed with a spacing of not more than 90°, and said record heads being displaced by a predetermined track width from said reproduce heads in the track width direction so that the same track is traced by said record and reproduce heads;

(d) storage devices coupled to said digital-signal processing circuits of said PCM recording signal and reproducing signal processing means so as to write the digital signals from said processing circuits and to read at different time from said writing time;

(e) record/reproduce change-over switch circuits provided on the lines for a signal to be recorded and for a reproduced signal of said PCM recording signal and reproducing signal processing means so as to turn on and off said signals, respectively; and

(f) control means coupled to said digital signal processing circuits and said switch circuits of said PCM recording

signal and reproducing signal processing means so as to compress, expand and on-off control the digital signals, said control means including a timebase-conversion control section coupled to said digital-signal processing circuits of said PCM recording signal and reproducing signal processing means so as to compress the timebases of the digital signals in said digital-signal processing circuits to within a head-rotation angle of 90°, and expand the timebases of said timebase compressed signals to a head-rotation angle of 180°, and a record/reproduce switching control section coupled to said switch circuits of said PCM recording signal and reproducing signal processing means so as to alternately turn on and off said switch circuits in association with said timebase compression and expansion time,

whereby said digital signal is recorded and reproduced alternately and intermittently.

4,628,374

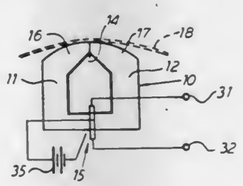
MAGNETIC RECORDING SYSTEM AND METHOD

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 621,490, Jun. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 293,838, Aug. 18, 1981, Pat. No. 4,455,581. This application Jul. 29, 1985, Ser. No. 760,254

Int. Cl.⁴ G11B *5/03, 5/127*

U.S. Cl. 360—66 **21 Claims**



1. A transducer system comprising:

a magnetic transducer head including a magnetic core having a coupling region at a record medium path for coupling of the transducer head with a channel of a magnetic record medium moving along said record medium path,

record medium drive means for moving a magnetic record medium along said record medium path during recording of a signal on a channel of the record medium, and

recording means comprising current conductor means coupling with said magnetic core for producing an effective recording field at said coupling region in accordance with a signal to be recorded, such that the signal is recorded along a channel of the record medium,

said recording means supplying an alternating polarity pulse electric current to said current conductor means with each successive pulse having alternately opposite polarity and with the pulses having a constant amplitude and having substantially a given pulse repetition rate with respect to pulses of the same polarity, and having a discontinuous pulse waveform with relatively short duration pulses of alternate polarity and with substantially zero amplitude intervals of relatively long duration between each pair of the successive pulses of alternate polarity,

said magnetic transducer head having an effective frequency response extending at least to the third harmonic of said pulse repetition rate but having a recording resolution so as to be incapable of recording effectively the fundamental frequency corresponding to said pulse repetition rate.

4,628,375

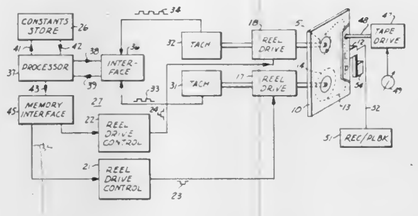
CONTROL SYSTEMS FOR MAGNETIC RECORDING TAPES

Wilfried Stadlmann, Butzbach, Fed. Rep. of Germany, assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Jun. 28, 1985, Ser. No. 750,526

Int. Cl.⁴ G11B *15/43*

U.S. Cl. 360—71 **20 Claims**



1. In a method of recording information with a magnetic recording head on a magnetic recording tape reeled from a first rotating tape coil into a second rotating tape coil, the improvement of assuring constant head-to-tape contact with constant tape tension independently of variations in coil diameter, comprising in combination steps of:

providing a first tape drive for the first tape coil;

providing a second tape drive for the second tape coil;

providing a first control signal for controlling the first tape drive;

providing a second control signal for controlling the second tape drive;

determining for a series of diameter ratios between the first and second tape coils a series of corresponding values of said first and second control signals for effecting advancement of the magnetic recording tape relative to the magnetic recording head with said first and second tape drives at constant head-to-tape contact with constant tape tension for all diameter ratios of said series;

providing first and second tachometer signals indicative of simultaneous rates of rotation of the first and second rotating tape coils;

providing in response to said first and second tachometers signals an electric third signal indicative of instantaneous diameter ratio between the first and second tape coils;

selecting for each diameter ratio of said series in response to said electric third signal those of said corresponding values of said first and second control signals effecting said advancement of the magnetic recording tape relative to the magnetic recording head at constant head-to-tape contact with constant tape tension at the particular diameter ratio; and

controlling said first and second tape drives with the latter first and second control signals having values selected for each diameter ratio of said series for advancement of the magnetic recording tape at constant head-to-tape contact with constant tape tension.

4,628,376

MAGNETIC DISC UNIT

Masahiro Kato, Chichibu, and Tetsu Ogawa, Hanazono, both of Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed May 3, 1984, Ser. No. 607,399

Claims priority, application Japan, May 12, 1983, 58-81713; May 13, 1983, 58-82586

Int. Cl.⁴ G11B *19/00*

U.S. Cl. 360—71 **16 Claims**

1. A magnetic disc unit comprising:

magnetic disc eject signal generating means for generating a magnetic disc eject signal for automatically ejecting a magnetic disc from said magnetic disc unit;

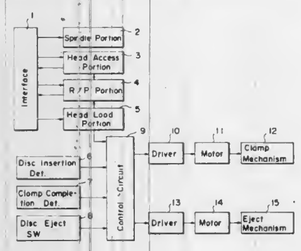
head load signal generating means for generating a head load signal for loading a magnetic head relative to said magnetic disc;

prohibition means responsive to said magnetic disc eject signal and said head load signal for inhibiting the generation of said magnetic disc eject signal; and

control means responsive to the output from said prohibition means for controlling the ejection of said magnetic disc from said magnetic disc unit.

14. A magnetic disc unit comprising:

a clamping member for clamping a magnetic disc;



a control member for controlling the clamping operation of said clamping member;

a motor for driving said clamping member via said control member to perform the clamp of said magnetic disc and to release the clamping of said magnetic disc;

a clamp releasing member for driving said clamping member via said control member to manually release the clamping of said magnetic disc; and

an ejecting member controlled by said control member driven to release the clamping of said magnetic disc by either of said motor and said clamp releasing member for ejecting the released magnetic disc.

4,628,377

INFORMATION SIGNAL REPRODUCING APPARATUS

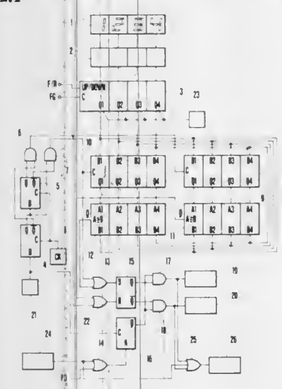
Isao Harigaya, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed May 3, 1984, Ser. No. 606,705

Claims priority, application Japan, May 12, 1983, 58-83915; May 12, 1983, 58-83916; May 12, 1983, 58-83917

Int. Cl.⁴ G11B *15/18, 19/00*

U.S. Cl. 360—72.1 **36 Claims**



1. An information signal reproducing apparatus, comprising:

(a) reproducing means for reproducing information signals recorded on a recording medium;

(b) moving means for moving said recording medium relative to said reproducing means;

(c) manually operable means for indexing a first position and a second position on said recording medium; and

(d) control means for controlling at least the operation of said moving means so that those of the information signals which have been recorded in an area of the medium between said first and said second positions are repeatedly reproduced in either direction.

4,628,378

INFORMATION SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

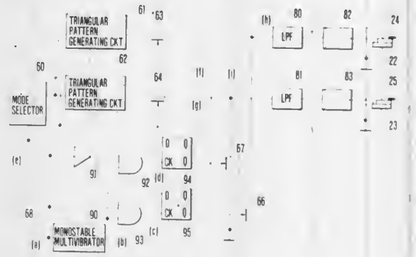
Nobutoshi Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,806

Claims priority, application Japan, Aug. 26, 1983, 58-156688; Sep. 9, 1983, 58-167071

Int. Cl.⁴ G11B *21/02*

U.S. Cl. 360—77 **16 Claims**



1. An information signal recording and/or reproducing apparatus for recording and/or reproducing the information signal on and/or from tracks on a recording medium; comprising:

(a) a pair of heads to trace the recording medium;

(b) a pair of shifting means for shifting said pair of heads, said heads being respectively mounted on said pair of shifting means;

(c) first driving means to generate first and second driving signals for driving said pair of respective shifting means, said first and second driving signals being respectively a signal for tracing said pair of heads along the tracks when the apparatus is in a first recording and/or reproducing mode;

(d) second driving means to generate third and fourth driving signals for driving said pair of shifting means respectively, said third and fourth driving signals being signals for tracing said pair of heads along the tracks when the apparatus is in a second recording and/or reproducing mode, a maximum value of level difference between the third and fourth driving signals obtained at the same time being smaller than a maximum value of level difference between the first and second driving signals obtained at the same time;

(e) mode selection means for switching between said first and second recording and/or reproducing modes; and

(f) driving control means for driving said pair of shifting means by selectively using said first, second, third and fourth driving signals to the same extent in the same direction in response to said mode selection means switching from the first mode to the second mode.

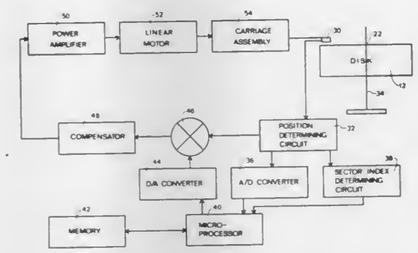
4,628,379

DISK RUNOUT COMPENSATOR

Thomas L. Andrews, Jr.; Thomas A. Fiers, and Richard G. Laatt, all of Longmont, Colo., assignors to Amcodyne Incorporated, Longmont, Colo.

Filed Sep. 25, 1984, Ser. No. 655,355
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 **8 Claims**

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 7 Pages)



6. In a system for reducing runout associated with a rotating disk, an apparatus comprising:

means for gathering position information related to the runout;

means for reducing said position information to obtain discrete data associated with the runout;

means for determining a representation of the runout using said discrete data, said means for determining including means for determining a first sinusoidal component and for separately determining a second sinusoidal component, said first sinusoidal component having an amplitude and said second sinusoidal component having an amplitude, each of said amplitudes being separately obtained using said position information and said means for determining; and

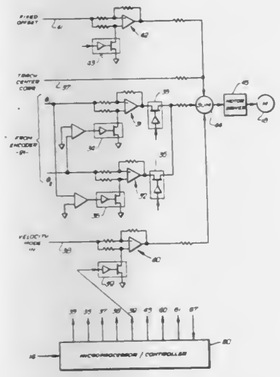
means for generating a signal substantially equal to the representation of the runout to compensate for the runout.

4,628,380

ENCODER OUTPUT PHASE SELECTION SYSTEM FOR MAGNETIC DISK MEMORY

James E. Quackenbush, Chatsworth, Calif., assignor to Computer Memories, Inc., Chatsworth, Calif.

Filed Apr. 17, 1985, Ser. No. 724,191
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—78 **5 Claims**



1. A system for selecting which encoder output phase is to be used for track servoing in a magnetic disk drive memory in which the position of the read/write head is indicated by an encoder having plural output phases, comprising:

a region of concentric control tracks on a disk of said memory situated adjacent to the data storage area of said disk, alternate ones of said control tracks containing a certain marker burst pattern,

first means for moving said head to the middle of said region of said control tracks using one of said encoder output phases,

second means for determining whether said marker burst pattern is detectable by said head at the position to which it was moved by said first means,

(a) and if so, for then offsetting said head in the radially inward and radially outward directions respectively by about one-third track spacing, and determining at each such position if the marker burst pattern is still detectable by said head,

(b) and if not, for thereafter repositioning said head utilizing other encoder output phases, until one such phase results in positioning of the head such that said marker burst pattern is detected at such position and at at least one other position offset by plus or minus approximately one-third track spacing therefrom, and

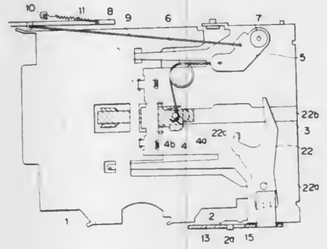
means for provisionally electing as the phase for subsequent track follow servoing that encoder phase which resulted in burst detection at the position reached using that encoder phase and at at least one other position plus or minus about one-third track spacing therefrom.

4,628,381

EJECTION MECHANISM FOR TAPE PLAYER

Kazuki Takai, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,159
Claims priority, application Japan, Mar. 31, 1983, 58-53992
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—93 **7 Claims**



1. An ejection mechanism for a tape player, comprising:

a pack guide into which a tape pack can be inserted in an insertion direction and means supporting said pack guide for movement in directions transverse to said insertion direction between an insertion position and a loaded position;

a pack stopper and means supporting said pack stopper for movement relative to said pack guide in directions approximately parallel to said insertion direction along a path of movement between first and second positions so that, when said pack guide and said pack stopper are respectively in said insertion and first positions, a tape pack inserted into said pack guide will engage said pack stopper and move it toward its second position, wherein as said pack stopper moves from its first position to its second position it passes through a third position located between said first and second positions;

a swing plate and means supporting said swing plate for rotation relative to said pack guide between a normal position and an eject position;

a movable, manually operable ejection lever and means operatively coupling said ejection lever to said swing plate for effecting movement of said swing plate between its normal and eject positions in response to movement of said ejection lever;

inversion means for yieldably urging said pack stopper toward said first position when said pack stopper is between said first and third positions and when said swing plate is in said normal position, for yieldably urging said pack stopper toward said second position when said pack stopper is between said second and third positions and when said swing plate is in said normal position, and for yieldably urging said pack stopper toward said first position when said swing plate is in said eject position, said inversion means including an inversion spring operatively connected to said pack stopper and to said swing plate;

an eject lock arm and means supporting said eject lock arm for pivotal movement relative to said pack guide so that a first end of said eject lock arm moves along the path of movement of said pack stopper in the region of said second position of said pack stopper, said first end of said eject lock arm being engageable with a side of said pack stopper facing in said insertion direction;

a movable lock plate operatively coupled to a second end of said eject lock remote from said first end for movement therewith, said lock plate being moved between a locking position and a release position in response to movement of said eject lock arm, wherein as said lock plate moves to its release position said first end of said eject lock arm moves in said insertion direction, said lock plate having means for releasably locking said pack guide in said insertion position when said lock plate is in said locking position and for permitting said pack guide to move freely between said insertion and loaded positions relative to said lock plate when said lock plate is in said release position;

a lock spring yieldably urging said lock plate toward said locking position; and

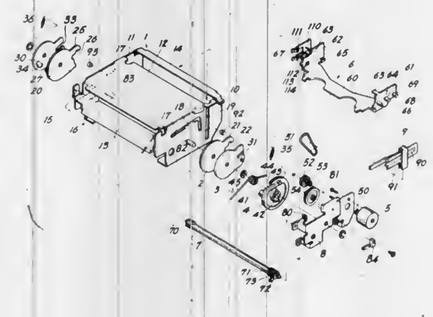
check means provided on said eject lock arm and engageable with said pack stopper for limiting movement of said pack stopper away from said second position in a direction opposite said insertion direction until said pack guide is in its insertion position and said lock plate is in its locking position.

4,628,382

CASSETTE LOADING DEVICE FOR VTR

Yuuzi Okumura, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 31, 1985, Ser. No. 760,794
Claims priority, application Japan, Dec. 20, 1984, 59-269847
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—93 **7 Claims**



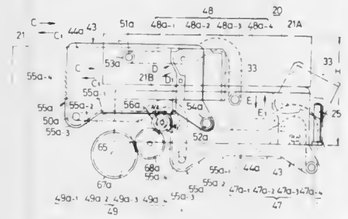
1. A cassette loading device comprising a cassette holder for holding a cassette inserted through a cassette inlet, transport means for moving the cassette from an insertion position to a completely loaded position by driving the cassette holder, and a reduction drive assembly for coupling the transport means to a drive source, the reduction drive assembly comprising a first drive mechanism having a small reduction ratio and disengageably in engagement with the transport means when the cassette holder is located between the insertion position and the completely loaded position, and a second drive mechanism having a great reduction ratio and disengageably engageable with the transport means when the cassette holder is brought to the completely loaded position or immediately therebefore.

4,628,383

TAPE CASSETTE LOADING DEVICE IN A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Ritsu Miyamoto, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,874
Claims priority, application Japan, Jan. 28, 1983, 58-13071; Jan. 28, 1983, 58-13072; Feb. 22, 1983, 58-24479[U]; Mar. 1, 1983, 58-34127; Mar. 1, 1983, 58-30116[U]; Mar. 4, 1983, 58-31155[U]
Int. Cl.[4] G11B *15/00, 5/008*
U.S. Cl. 360—96.5 **9 Claims**



1. A tape cassette loading device in a magnetic recording and/or reproducing apparatus, said recording and/or reproducing apparatus having a member which relatively enters within a tape cassette as the tape cassette is loaded into a predetermined loading position inside the recording and/or reproducing apparatus, said member being required to carry out recording and reproduction, said tape cassette loading device comprising:

a cassette holder for accommodating and holding the tape cassette which is inserted therein, said cassette holder being movable together with the inserted tape cassette between a cassette inserting position where the tape cassette is inserted and the predetermined loading position where said member relatively enters within the tape cassette;

guiding means for guiding said cassette holder so that said cassette holder undergoes in sequence a horizontal frontward movement of the cassette holder from the cassette inserting position, a subsequent obliquely upward movement of the cassette holder for avoiding the horizontal frontward movement from being interfered with by said member, and a subsequent downward movement of the cassette holder to the predetermined loading position, said horizontal frontward movement coinciding with the direction in which the tape cassette is inserted into the cassette holder;

driving means which starts to operate when the tape cassette is inserted into the cassette holder which is in the cassette inserting position; and

tape cassette loading means driven by said driving means, said tape cassette loading means moving said cassette holder under guidance of said guiding means to the predetermined loading position together with the tape cassette which is accommodated within the cassette holder.

4,628,384

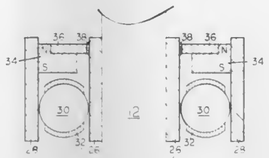
BEARING ASSEMBLY WITH INTEGRATED FERROFLUID SEAL

Kuldip Raj, Merrimack, and Raoul Casciari, Bedford, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 526,781, Aug. 26, 1983, which is a continuation-in-part of Ser. No. 450,339, Dec. 16, 1982, Pat. No. 4,407,508. This application Jan. 9, 1984, Ser. No. 569,189

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—97 **15 Claims**



1. A bearing assembly with an integrated ferrofluid seal, which bearing assembly comprises:

(a) a bearing assembly adapted to surround a rotatable shaft and having an inner race and a spaced-apart outer race to define a raceway therebetween, and roller elements in the raceway and cage means to retain the roller elements in the raceway, to provide for the rotation of the inner and outer races relative to one another; and

(b) a ferrofluid seal apparatus in the raceway and generally closely adjacent the roller elements of the bearing assembly, which ferrofluid seal apparatus comprises

(i) a single magnetic pole piece having a one and another end, the one end radially extending into a close, noncontacting relationship with a surface of the inner or outer race to define a small radial gap,

(ii) an annular axially-polarized permanent magnet having a radially disposed one end and another end relative to the axis of said shaft, the permanent magnet having a generally L-shaped cross-sectional configuration, the one end of the permanent magnet extending toward said radial gap to form an air gap with the said surface, said other end of said pole piece being in contact with the permanent magnet between arms of the L-shaped configuration, the permanent magnet having a permeability which is not much greater than the magnetic permeability of air and acting as a magnetic insulating housing about the other end of the pole piece, and

(iii) ferrofluid retained in the radial gap by the magnetic flux from the permanent magnet, to provide a ferrofluid exclusion seal with said surface, the magnetic flux circuit passing between the pole piece, the ferrofluid in the radial gap, said surface, the air gap, and the permanent magnet.

12. A computer-disk-drive system which comprises in combination:

(a) the bearing assembly of claim 1;

(b) a rotatable disk-drive-spindle shaft extending through the bearing assembly and secured to the inner race;

(c) a memory-reading head in a protected environment;

(d) a computer disk on the shaft and read by the reading head in the environment;

(e) means to rotate the shaft; and

(f) the ferrofluid seal having a radial gap formed with the inner surface of the inner race or the inner surface of the outer race positioned between the protected environment and the bearing assembly.

4,628,385

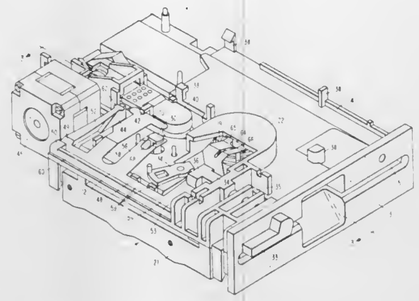
TWO STAGE COLLETING IN A FLEXIBLE DISK DRIVE

Donovan M. Janssen; Alan J. Kirton, both of Boulder; Robert M. Murphy, Longmont, and Leroy Rose, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,633

Int. Cl.⁴ G11B *5/016, 17/02*

U.S. Cl. 360—99 **6 Claims**



1. In a flexible disk drive having a frame for receiving a cartridge with a flexible disk therein, with said cartridge and said flexible disk each having a central aperture therein, apparatus for precisely centering and clamping the flexible disk to the spindle of the disk drive, said apparatus comprising:

a collet shaft extending from said frame, said shaft having a first portion adjacent to said frame and having a second portion outwardly from said first portion with the diameter of said second portion being less than that of said first portion;

a collet slidably mounted on said collet shaft, said collet being substantially constrained from lateral movement while adjacent to said first portion of said collet shaft; and

actuating means for causing said collet to be moved from a first position adjacent to the first portion of said collet shaft to a second position adjacent to the second portion of said collet shaft, said collet penetrating the central aperture of said flexible disk and engaging said spindle for centering and clamping said flexible disk to the spindle during said movement of said collet from said first position to said second position, and said collet being moveable laterally with respect to the axis of said spindle while adjacent to said second portion of said collet shaft to thereby precisely center said disk with respect to said spindle axis.

4,628,386

MAGNETIC READING AND/OR WRITING HEAD SUPPORT ASSEMBLY

Jacques Chabrolle, Bagnolet, France, assignor to LCC.CICE-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Feb. 24, 1983, Ser. No. 469,457

Claims priority, application France, Feb. 26, 1982, 82 03260

Int. Cl.⁴ G11B *5/48, 21/20*

U.S. Cl. 360—104 **5 Claims**

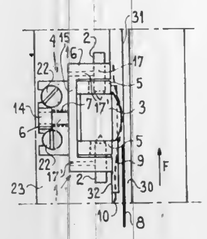
1. In a magnetic reading and/or writing device having a guide for guiding a magnetic data carrier in a first direction, and a magnetic head for reading and/or writing data on said carrier, a magnetic head support comprising:

a mobile stirrup piece positioned adjacent said guide with said data carrier positionable therebetween;

pivot means fixed to said stirrup piece and pivotally supporting said head for rotation only about an axis parallel to said first direction;

a fixed piece fixed adjacent said guide;

means associated with said fixed piece for supporting and guiding said stirrup piece only for movement in a linear second direction transverse to said first direction, wherein said fixed piece has two grooves extending in said second direction and in which said pivot means are engaged, said



grooves forming a portion of said supporting and guiding means for said mobile stirrup piece; and

means for biasing said stirrup piece towards said guide, whereby said carrier is pressed against said head and said guide.

4,628,387

READ/WRITE AND TRIM ERASE MAGNETIC HEAD ASSEMBLY

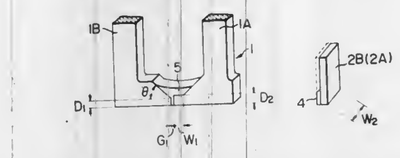
Shinji Furuichi, Kumagaya, Japan, assignor to Hitachi Metals, Inc., Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,858

Claims priority, application Japan, Feb. 10, 1982, 57-19900

Int. Cl.⁴ G11B *5/265, 5/325*

U.S. Cl. 360—121 **6 Claims**



1. A read/write and trim erase magnetic head assembly comprising:

a read/write magnetic head having a read/write magnetic core including a projecting portion establishing a read/write gap, said projecting portion having a predetermined height measured in the direction perpendicular to said read/write gap;

a plurality of eraser magnetic heads abutting said read/write magnetic head, each of said eraser magnetic heads having a respective eraser magnetic core; and

a plurality of non-magnetic predetermined thickness respectively disposed individually between said read/write magnetic head and each of said eraser magnetic heads,

each of said eraser magnetic heads having an eraser gap of a width defined by the thickness of the respective non-magnetic member and a depth defined by said projecting portion height of said read/write magnetic core.

4,628,388

HEAD CLEANING APPARATUS

Hirokazu Kawabe, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Japan

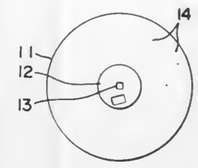
Filed Jun. 7, 1985, Ser. No. 742,409

Claims priority, application Japan, Nov. 27, 1984, 59-249967

Int. Cl.⁴ G11B *23/03;* **A47L** *1/00*

U.S. Cl. 360—128 **8 Claims**

1. A head cleaning apparatus comprising: a case formed to the same shape and dimension of a hard case of hard-cased floppy disks; and a cleaning sheet rotatably installed in the case, the cleaning sheet formed to the same shape and dimension of the magnetic disk of a floppy disk, the cleaning sheet



having microcapsules containing cleaning liquid attached on both sides of the sheet.

4,628,389

LOCK MEMBER FOR THE LID OF A MAGNETIC TAPE CASSETTE

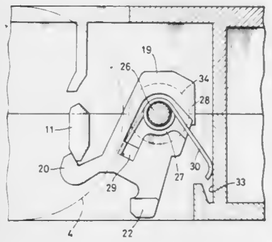
Kimio Tanaka, Saku; Haruo Shiba, Komoro, and Yoshiya Sakata, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,337

Claims priority, application Japan, Sep. 13, 1983, 58-140910; Sep. 13, 1983, 58-140911

Int. Cl.⁴ G11B *23/04;* **G03B** *1/04*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette comprising:

a cassette housing having a front opening;

a lid pivotally connected to the front of the housing to open and close the front opening;

a lock member having a pivot for pivotally mounting the lock member on one front side portion of the housing and the lock member being lockingly engageable with and disengageable from an inner surface of the lid;

the lock member having a recess surrounding the pivot with a lateral side opening and a rear side opening, the lateral side opening being parallel to the front side portion of the housing, the rear side opening being opposite the front of the housing; and

a lock-member-biasing spring accommodated in the recess, a first end of the spring extending rearwardly through the rear side opening of the recess and engaging the housing, the lock-member-biasing spring biasing the member into locking engagement with the inner surface of the lid.

4,628,390

FOOT SWITCH APPARATUS FOR A TRANSCRIBER

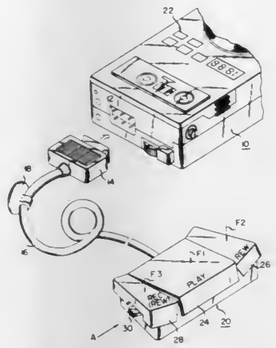
Kazuyasu Motoyama, and Katsumi Kanayama, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 322,230, Nov. 17, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 582,150

Claims priority, application Japan, Nov. 26, 1980, 55-169363[U]

Int. Cl.⁴ G11B *19/08, 19/00*

U.S. Cl. 360—137 **7 Claims**



4. A foot switch apparatus for an electronically controlled tape recorder which does not per se include an automatic back space operation mode, the tape recorder being provided with a mode control circuit having control input terminals for at least playback, stop and rewind operation modes of the tape recorder, and mode selection switches coupled to the control input terminals for selecting each of the playback, stop and rewind operation modes; said foot switch apparatus being external to the tape recorder and comprising:

switch means adapted to be coupled to the playback operation mode control input terminal and the stop operation mode control input terminal of the mode control circuit, and responsive to pressure selectively applied by a foot switch operator, for switching to the playback operation mode control input terminal a playback signal when said pressure is applied, and for switching to the stop operation mode control input terminal a stop signal after said pressure is removed;

back spacing means coupled to said switch means and adapted to be coupled to the rewind operation mode control input terminal of the mode control circuit, for generating a back spacing signal for a given period of time after said pressure is removed, so that the tape recorder performs a rewind operation according to said back spacing signal during said given period of time, and for preventing actuation of the stop mode of the tape recorder during said given period of time; and

prohibiting means adapted to be coupled to the playback operation mode control input terminal of the mode control circuit and coupled to said back spacing means, for prohibiting operation of said back spacing means from generating said back spacing signal while the mode selection switches on the tape recorder are set to select the playback operation mode;

wherein said prohibiting means includes:

diode means arranged to be connected between the playback operation mode control input terminal of the mode control circuit and a node in said back spacing means, for allowing a voltage potential to develop at said node to produce said back spacing signal when said switch means of the foot switch apparatus is used for switching of said playback signal, and for preventing said voltage potential from developing when the mode selection switches of the tape recorder are operated to select the playback operation mode.

4,628,391

METHOD FOR DISPERSING TWO PHASES IN LIQUID-LIQUID EXTRACTION

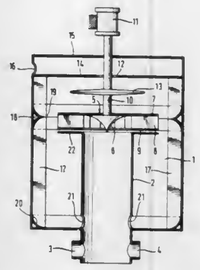
Bror G. Nyman, Vanha-Ulvila; Stig-Erik Hultholm, Pori; Launo L. Lilja, Pori, and Valto J. Mäkitalo, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed May 14, 1984, Ser. No. 609,737

Claims priority, application Finland, May 12, 1983, 831657

Int. Cl.⁴ B01F *3/08, 5/10*

U.S. Cl. 366—265 **3 Claims**



1. A process, for mixing a light liquid phase and a heavy liquid phase in liquid-liquid extraction with each other to produce a good dispersion, comprising maintaining the light phase continuous and dispersing in the heavy phase in the light phase, said continuous light phase having a volume smaller than or at most equal to the volume of the dispersed heavy phase, by causing a substantially vertical circulation flow to take place in the dispersing volume, and including initiating said circulation flow in the said light phase; and wherein the dispersion is circulated in the dispersion volume through several cycles before it is removed from the dispersion volume and the circulating time of the dispersion is shorter than the separating time of the solution phases in the dispersion.

4,628,392

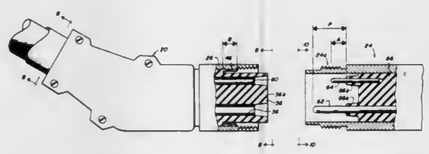
EXPLOSION PROOF ELECTRICAL CONNECTOR SYSTEM WITH QUICK POWER DISCONNECT

Robert G. Didier, Santa Rosa, Calif., assignor to BIW Cable Systems, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 563,503, Dec. 20, 1983. This application May 15, 1984, Ser. No. 610,595

Int. Cl.⁴ H02H *7/00*

U.S. Cl. 361—2 **3 Claims**



1. An explosion-proof electrical connector system that couples first and second connector members carrying main electrical power conductors in a fluid environment that can include combustible gases comprising:

a set of power contacts that electrically connect said power conductors between said connector members, said power contacts having first and second members mounted on said first and second connector members, respectively, and being axially movable with respect to one another over an axial distance P between a fully withdrawn position where the electrical connection is broken and a fully inserted position where there is an electrical connection between said power contacts,

a circuit breaker connected to said main conductors,

means for operating said circuit breaker when said connectors are uncoupled and separated axially,

said operating means including a set of auxiliary contacts each having first and second members mounted in said first and second connector members, respectively, and being axially movable with respect to one another over an axial distance A between a withdrawn position where the electrical connection between said first and second auxiliary contact members is broken and a fully inserted position where there is an electrical connection between said auxiliary contact members, said distance P being greater than said distance A, and

an annular, resilient, insulating lip seal secured at one fixed end to said first connector and having a free end of smaller diameter than and surrounding a portion of said second connector in a radially stretched condition, said lip seal being disposed to block leaking of fluid between said lip seal and said connector portion and isolate the interior of said connectors adjacent said contacts from fluid external to said connectors.

4,628,393

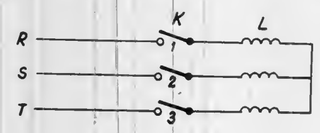
METHOD FOR SWITCHING IN A THREE-PHASE HIGH VOLTAGE CIRCUIT

Bertus Griesen, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Continuation of Ser. No. 239,050, Feb. 27, 1981, abandoned. This application Mar. 11, 1982, Ser. No. 357,131

Int. Cl.⁴ H02H *3/033*

U.S. Cl. 361—3 **2 Claims**



1. A method for interrupting power to an inductive load supplied from a three-phase high voltage source to prevent virtual chopping and using a vacuum switch having quick dielectric recovery characteristics in each phase of the high voltage network, comprising the steps of:

opening the vacuum switch in a first phase at a given time; and

opening at least one of the two remaining vacuum switches at a time subsequent to said given time equal to or greater than at least one-third of the period of the three-phase high voltage network frequency plus the minimum arcing time of the vacuum switch in the said first phase wherein the time of opening said at least one of the two remaining vacuum switches subsequent to said given time is less than one cycle of the power frequency.

4,628,394

VOLTAGE SURGE SUPPRESSOR

John J. Crosby, and John J. Napiorkowski, both of Cape Elizabeth, Me., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 629,288, Jul. 9, 1984, Pat. No. 4,584,622. This application Sep. 27, 1984, Ser. No. 655,126

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

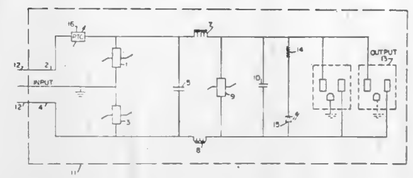
Int. Cl.⁴ H02H *9/04*

U.S. Cl. 361—56 **3 Claims**

1. A voltage surge suppressor for AC power lines comprising: a circuit, an RFI/EMI filter, a semiconductor voltage limiting device and an output to which electronic equipment can be connected;

said circuit comprising an input consisting of a line, a neutral and a ground; a first varistor connected between the line and ground; a second varistor connected between the neutral and ground;

said RFI/EMI filter comprising a first capacitor in parallel with the two varistors; a first choke connected in series with the line after the first varistor and first capacitor; a



second choke connected in series with the neutral after the second varistor and first capacitor; said semiconductor voltage limiting device being a third varistor connected between the line and neutral after the two chokes; and a second capacitor in parallel with said third varistor.

4,628,395

OVERLOAD PROTECTING CIRCUIT FOR AN INVERTER DEVICE

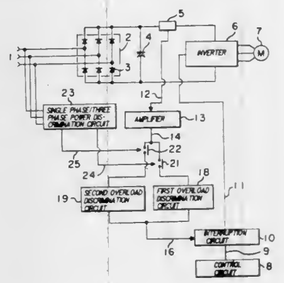
Eiichi Sugishima, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,988

Claims priority, application Japan, Nov. 21, 1983, 58-219003; Jan. 13, 1984, 59-4431

Int. Cl.⁴ H02H *3/26*

U.S. Cl. 361—18 **3 Claims**



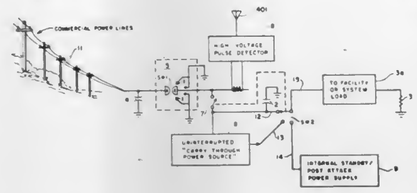
1. An overcurrent protecting circuit protecting an inverter device which converts an alternating current from an a.c. power source into a direct current by a converter, the direct current resulted by said converter means smoothed by a smoothing capacitor, said smoothed direct current being subjected to inversion by an inverter to be an alternating current which is used for driving an alternating current load, including a power discrimination means for discriminating whether an input power is single phase or three phase and an overcurrent level changing means for reducing a level of overcurrent to protect said inverter from damage caused by overcurrent, said overcurrent level changing means being connected to said power discrimination means.

4,628,396

HIGH VOLTAGE DISCONNECT/RECONNECT SWITCHING DEVICE

D. Frank E. Flemming, East Spanaway, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1984, Ser. No. 672,239
Int. Cl.⁴ H02H *3/20*
U.S. Cl. 361—91 **5 Claims**



1. A high-voltage power switch arrangement for use with a power source with power supplied via feed lines comprising:

primary contacts including a fixed contact and a moving contact located within an enclosure having a vacuum or other special nonconducing environment, said contacts being normally closed to connect a power source to a load, probe means located within said enclosure positioned at a probe dielectric distance approximately equal to the normal source voltage, which is slightly behind the moving contact, the probe means being connected to ground, the moving contact having an open rest position in which it is connected to ground, a high-voltage pulse detector for detecting abnormal high-voltage components, actuator means electrically coupled to the high-voltage pulse detector and mechanically coupled to the moving contact;

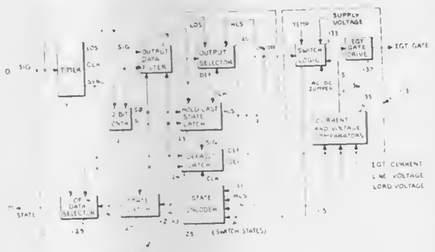
operative in response to the detection of a high-voltage component by the high-voltage pulse detector to operate the actuator means to move the moving contact from the closed position to the open rest position, with the probe means providing a ground path for the extremely high electrical energy component, induced onto said feed lines, and greater than the source voltage, throughout the transition of the moving contact to the open rest position, where it is grounded, this being an open full isolate position.

4,628,397

PROTECTED INPUT/OUTPUT CIRCUITRY FOR A PROGRAMMABLE CONTROLLER

Ronald E. Gareis, and Mark J. Kocher, both of Charlottesville, Va., assignors to General Electric Co., Charlottesville, Va.

Filed Jun. 4, 1984, Ser. No. 617,095
Int. Cl.⁴ H02H *3/093*
U.S. Cl. 361—98 **17 Claims**



1. Overcurrent protected input/output control circuitry for use in an input/output (I/O) system of a programmable controller, comprising:

control means for controlling load current to a connected load, said control means being responsive to a command signal to be turned on and off and including a main current section for carrying a major portion of said load current and a shunt current section for carrying a fractional portion of said load current;

current sensing means responsive to said fractional portion of the load current for provision of a signal indicative of load current;

first reference means for providing a first reference signal, said first reference signal being indicative of an intermediate level of load current; and

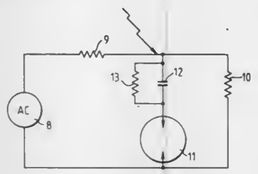
first comparator means, including timing means, for receiving said load current indicative signal and said intermediate reference signal and operative to initiate said command signal for causing said control means to turn off the load current at a time which depends on (i) the time duration that said load current indicative signal exceeds said intermediate reference signal, and (ii) the magnitude of said load current indicative signal.

4,628,398

SURGE VOLTAGE PROTECTION ARRANGEMENTS

Kenneth G. Cook, Middlesex, England, assignor to The M-O Valve Company Limited, England

Continuation of Ser. No. 351,468, Feb. 23, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,173
Claims priority, application United Kingdom, Mar. 2, 1981, 8106562
Int. Cl.⁴ H02H *9/04*
U.S. Cl. 361—120 **8 Claims**



1. A circuit arrangement comprising: a load, which is connected across a periodic A.C. supply, and a surge voltage protection arrangement for the load, said surge voltage protection arrangement comprising a gas-filled excess voltage arrester, a capacitance connected in series across the load and a resistance connected in parallel with the capacitance; the arrester constituting the sole voltage arrester of the surge voltage arrangement and starting to conduct at a voltage greater than that at which it will extinguish; and the capacitance having a value such that, with the arrester conducting and the A.C. supply voltage applied across the load, the capacitance charges substantially to the instantaneous value of the supply voltage, thereby extinguishing the arrester in a fraction of the A.C. supply period.

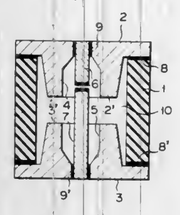
4,628,399

ANTI-OVERVOLTAGE PROTECTOR

Daizo Shigemori, Sagamihara, and Yuji Muramatsu, Tokyo, both of Japan, assignors to Kabushiki Kaisha Sankosha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,879
Int. Cl.⁴ H02H *9/04;* **H01T** *2/02*
U.S. Cl. 361—120 **14 Claims**

1. An anti-overvoltage protector comprising a hollow cylindrical member formed of insulating material, a pair of main electrodes which are each formed of an electrically conductive material having a thermal coefficient of expansion greater than that of said hollow cylindrical member and which are hermetically mounted, by fusion of metal having a low melting point, onto both end openings, of said hollow cylindrical member and which have their main discharge surfaces opposed, in said hollow cylindrical member, to each other with a gap interposed therebetween, a recess portion which is formed in said main discharge surface of at least one of said pair of main electrodes, and a pair of trigger electrodes which are conductively connected to said pair of main electrodes respectively and which are opposed, in said recess portion, to each other to



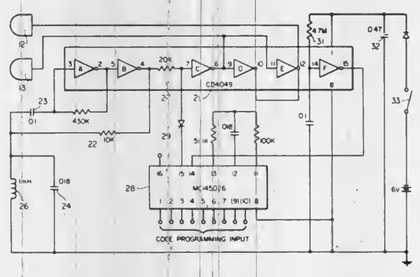
form a trigger discharge gap, whereby the dimension of said trigger discharge gap is given as the dimension of said gap between said trigger electrodes which is produced due to the difference in the thermal coefficients of expansion between said pair of main electrodes and said hollow cylindrical member when said trigger electrodes are allowed to contact each other by zeroing the gap therebetween and, in this state, said pair of main electrodes are hermetically mounted, by fusion of metal having a low melting point, onto both end openings of said hollow cylindrical member and, thereafter, the resultant unit is cooled down to room temperature.

4,628,400

ELECTRONIC KEYED LOCK

Eugene Y. Ho, San Carlos, Calif., assignor to Techne Electronics Ltd., Palo Alto, Calif.

Continuation of Ser. No. 576,812, Feb. 3, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 837,568
Int. Cl.⁴ H01H *47/28*
U.S. Cl. 361—172 **4 Claims**



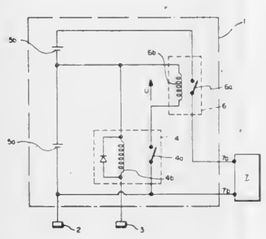
1. An electronic keyed lock comprising a key including an oscillator operated to provide signals at a predetermined frequency outside the range of FCC licensing frequencies, means including an encoder for receiving said oscillator signals and providing programmed pulses of energy having said predetermined frequency means for applying power to said key and means for delaying the provision of programmed pulses for a predetermined time, a lock, means for coupling said programmed predetermined frequency pulses to said lock, means for receiving said programmed pulses of energy and forming output programmed pulses and a decoder pre-programmed with said pulse program for receiving said output pulses and providing an output signal when the output programmed pulses twice match the pre-programmed pulse program in said decoder.

4,628,401

ELECTRIC FEED DEVICE WHICH CAN BE STARTED BY A LIQUID

James B. Parlant, Touvre; Michel Etourneau, Ruelle, and Christian C. Bled, Equeurdreville, all of France, assignors to Etat Francais, Paris, France

Filed Nov. 20, 1984, Ser. No. 673,513
Claims priority, application France, Nov. 22, 1983, 83 18538
Int. Cl.⁴ H01H *47/22*
U.S. Cl. 361—178 **10 Claims**



1. An electric device which can be started by immersion in a liquid, comprising:

a first circuit comprising, in series, two electrodes, a first voltage source and a first relay coil controlling a first relay switch;

a second circuit comprising, in series, said first voltage source, a second voltage source, a second relay switch controlled by a second relay coil, and use terminals for connection to an external load, the voltage across said use terminals being substantially equal to the sum of the voltages across said first and second voltage sources; and

said first relay switch and said second relay coil being connected in series to a voltage source selected from the group consisting of said first voltage source, said second voltage source and a third voltage source.

4,628,402

LIGHTNING PROTECTION OF FASTENERS IN COMPOSITE MATERIAL

James H. Covey, Snohomish, assignor to The Boeing Company, Seattle, Wash.

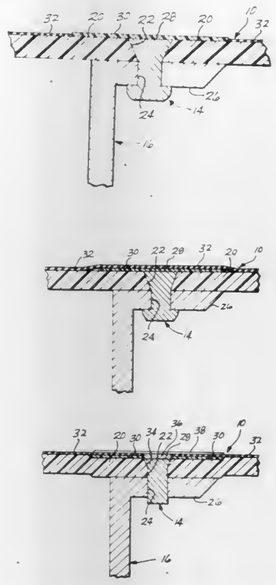
Filed Sep. 30, 1985, Ser. No. 782,226
Int. Cl.⁴ H05F *1/02*
U.S. Cl. 361—218 **7 Claims**

1. For a lightning accessible skin member made of a composite material and having a relatively low electrical conductivity, said skin member being attached to another member by a fastener having a relatively high electrical conductivity, said fastener extending through a bore in said skin member and having a head portion positioned in substantially flush relationship with the other surface of said skin member, a system for diverting a lightning strike away from said fastener, comprising:

a conductive layer of material on the outer surface of said skin member, said conductive layer extending across said surface to at least within a certain preselected distance from and about said fastener's head portion, to define a border region on said skin member's outer surface having a relatively low conductivity which surrounds said head portion; and

a layer of dielectric material covering said head portion and said border region, said dielectric layer extending away

from said head portion across said border region, wherein the edge of said dielectric layer is in meeting relationship



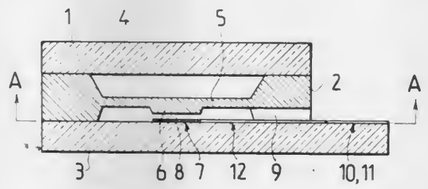
with the edge of said conductive layer, to divert a lightning strike from said fastener and to said conductive layer.

4,628,403

CAPACITIVE DETECTOR FOR ABSOLUTE PRESSURE

Heikki T. Kuisma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Feb. 15, 1985, Ser. No. 701,857
Claims priority, application Finland, Feb. 21, 1984, 840699
Int. Cl.[4] G01L *9/12*; H01G *5/16*
U.S. Cl. 361—283 **8 Claims**



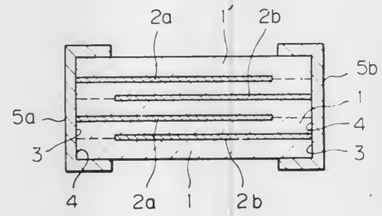
1. A capacitive detector for the measurement of the absolute pressure of a medium, which comprises:
- a first insulating plate functioning as a base;
- a stationary capacitor plate attached onto said first insulating plate;
- a silicon plate attached onto said first insulating plate and having a thin, membrane-like middle portion functioning as a mobile capacitor plate and defining a chamber between itself and said first insulating plate, and a channel allowing free entrance of the medium into said chamber;
- a second insultating plate attached hermetically onto said silicon plate so as to define an aneroid capsule between itself and said membrane-like middle portion, the distance of said membrane-like middle portion from said stationary capacitor plate being a function of the absolute pressure to be measured;
- a first terminal arranged outside said silicon plate in conductive contact therewith, and
- a second terminal arranged outside said silicon plate; and
- a conductor electrically connecting said second terminal with said stationary capacitor plate through said channel.

4,628,404

DIELECTRIC COMPOSITION AND LAMINATED CAPACITOR

Nobuo Yokoe; Takashi Okawa; Nobuyoshi Fujikawa, and Kazuyoshi Yamashita, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jan. 9, 1986, Ser. No. 817,517
Int. Cl.[4] H01G *4/10*; C04B *35/46*
U.S. Cl. 361—321 **5 Claims**



3. A multilayer ceramic capacitor comprising
(a) a laminated monolithic structure obtained by preparing a plurality of units each consisting of a thin layer of a dielectric ceramic composition and a thin layer of a metal paste formed as an internal electrode on the surface of the ceramic layer so that it reaches one end of the ceramic layer but does not reach the other end, stacking the units so that the metal pastereaching ends of the ceramic layers and the other ends are each alternately situated on the same side, pressbonding them, and sintering the entire assembly, and
(b) external electrodes provided on both sides of the laminated structure;
wherein
said dielectric ceramic composition is a dielectric ceramic composition prepared by adding 0.1 to 1.3% by weight of B_2O_3, 1.0 to 3.0% by weight of SiO_2 and 0.5 to 3.0% by weight of ZnO to a major proportion of a composition comprising 18.0 to 27.0% by weight of $BaTiO_3$, 31.6 to 36.3% by weight of Nd_2O_3, 27.6 to 35.5% of TiO_2, 2.5 to 8.1% by weight of Bi_2O_3 and 5.6 to 9.0% by weight of Pb_3O_4, and
the internal electrode is made of a silver-palladium alloy in which silver is present in a major amount.

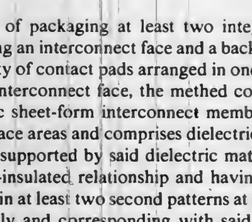
4,628,405

INTEGRATED CIRCUIT PRECISION CAPACITOR

John A. Lippert, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 19, 1985, Ser. No. 766,474
Int. Cl.[4] H01G *4/10, 7/00*
U.S. Cl. 361—321 **6 Claims**

1. A capacitor suitable for fabrication on a monolithic silicon integrated circuit, said capacitor having a very low voltage coefficient of capacitance and comprising:
- a first plate composed of a material selected from the group consisting of refractory metals and refractory metal silicides;
- a dielectric layer located on said first plate, said dielectric layer being characterized as having a very low incidence of interface trapping states where it contacts the first plate;
- a second plate located on top of said dielectric layer; and



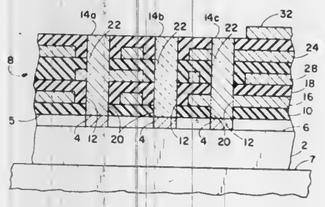
means for making electrical connnections to said first and second plates.

4,628,406

METHOD OF PACKAGING INTEGRATED CIRCUIT CHIPS, AND INTEGRATED CIRCUIT PACKAGE

Kenneth R. Smith, Aloha; Kent H. Johnston; George S. LaRue, both of Beaverton; Robert A. Mueller, Portland, all of Oreg., and Steven A. Tabor, Aptos, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 20, 1985, Ser. No. 736,205
Int. Cl.[4] H05K *1/11*
U.S. Cl. 361—386 **8 Claims**



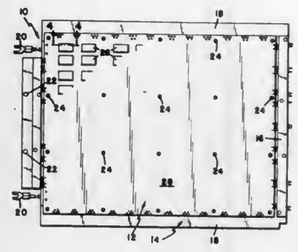
1. A method of packaging at least two integrated circuit chips each having an interconnect face and a back face and also having a plurality of contact pads arranged in one or more first patterns on its interconnect face, the methed comprising providing an elastic sheet-form interconnect member that has at least two main face areas and comprises dielectric material and conductor runs supported by said dielectric material in mutually electrically-insulated relationship and having termination points arranged in at least two second patterns at said main face areas respectively and corresponding with said first patterns respectively, placing said interconnect face of each chip in mutually confronting relationship with the main face area at which is arranged the pattern of termination points that corresponds with the pattern of contact pads of the chip, bringing the pattern of contact pads of the chip and the corresponding pattern of termination points of the interconnect member into mutually registering relationship, so as to form an assembly of the interconnect member and the integrated circuit chips wherein electrically conductive contact is established between said pads and said termination points, and forming a metallurgical bond between each contact pad and the corresponding termination point of the interconnect member.

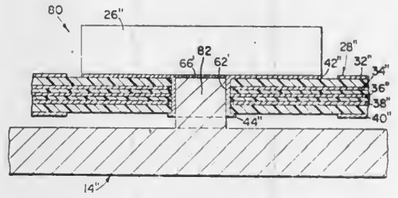
4,628,407

CIRCUIT MODULE WITH ENHANCED HEAT TRANSFER AND DISTRIBUTION

Melvin C. August, and John T. Williams, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 487,516, Apr. 22, 1983, Pat. No. 4,535,385. This application Apr. 17, 1984, Ser. No. 599,688
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 **8 Claims**





1. A circuit module with enhanced heat transfer and distribution characteristics, comprising:
- a circuit board having top and bottom sides, and conductive signal plane and ground plane layers;
- a plurality of electronic devices mounted on the top side of said circuit board, each electronic device being located over at least one through-hole extending between the top and bottom sides of said circuit board;
- a cooling plate extending adjacent to the bottom side of said circuit board;
- means mechanically interconnecting said circuit board and said cooling plate in predetermined minimal spaced-apart relationship; and
- a first thermally-conductive pad engaged between each electronic device and the top side of said circuit board;
- said cooling plate including a plurality of integral extensions extending through the through-holes in said circuit board into engagement with said electronic devices, said extensions being isolated from the signal plane layers but connected to the ground plane layer of said circuit board so as to distribute heat from said electronic devices across said board while conducting heat through said board for transfer to said cooling plate.

4,628,408

INPUT DEVICE

Kiyoshi Kimura, Aza-Fujigasaki, Japan, assignor to Alps Electric Co., Ltd., Japan

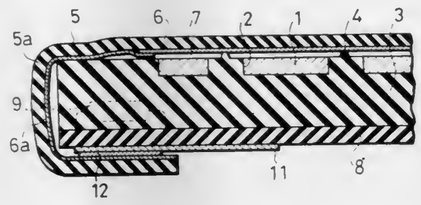
Filed Sep. 3, 1985, Ser. No. 771,889
Claims priority, application Japan, Sep. 3, 1984, 59-132668[U]
Int. Cl.[4] H01H *9/08*
U.S. Cl. 361—395 **3 Claims**

1. An input device comprising:
(a) a lower electrode of an electrically conductive material and having a plurality of apertures therein;

(b) a resilient insulating base superimposed on said lower electrode and having a plurality of integral dot spacers projecting through said apertures, said resilient insulating base having recessed spaces;

(c) an upper flexible insulating sheet disposed in confronting relation to said insulating base with said dot spacers interposed therebetween, said upper flexible insulating sheet supporting an upper electrode on one surface thereof;

(d) a printed-circuit board disposed below said insulating base;



(e) a plurality of diodes mounted on said printed-circuit board and accommodated in said spaces, said printed-circuit board having an electrically conductive pattern disposed on a lower surface thereof and connected to said diodes; and

(f) said upper insulating sheet having extensions extending around sides of said insulating base and said printed-circuit board onto the lower surface of the latter, said upper electrode having terminal leads extending over said extensions and connected by a heat seal to said electrically conductive pattern.

4,628,409

PRINTED CIRCUIT BOARDS

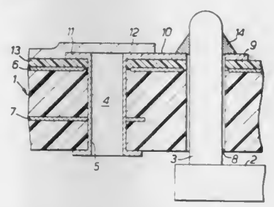
Gordon L. Thompson, Cheadle; Brian Gudgeon, Rossendale, and Kenneth J. Wombwell, Stockport, all of Great Britain, assignors to International Computers Limited, London, England

Continuation of Ser. No. 636,618, Aug. 1, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,239

Claims priority, application United Kingdom, Aug. 20, 1983, 8322473

Int. Cl.⁴ H05K *1/18*

U.S. Cl. 361—403 **3 Claims**



1. A multilayer printed circuit board including a plurality of internal conductive layers comprising conductive tracks; a plurality of unplated holes extending through the circuit board; a plurality of plated through-holes extending through the circuit board and being connected to selected ones of said conductive tracks of different layers; a surface pad of conductive material adjacent each unplated hole at a first face of the circuit board; surface conductors on said first face connecting at least some of the surface pads directly to plated through holes; at least one component having connection pins, each pin extending into an unplated hole and being soldered to its adjacent surface pad; and a layer of solder resist material extending over the plated through-holes at said first face.

4,628,410

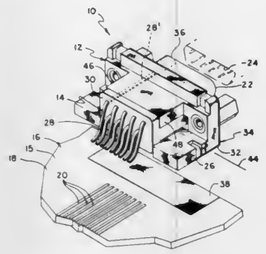
SURFACE MOUNTING CONNECTOR

David S. Goodman, Mission Viejo, and Leland W. Oliver, Santa Ana, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 10, 1985, Ser. No. 721,748

Int. Cl.⁴ H01R *23/72*

U.S. Cl. 361—413 **12 Claims**



1. A surface mounting connector for mounting on a circuit board that includes a row of conductive contact traces and a ground trace comprising:

a connector housing assembly having a substantially flat solderable bottom metal surface area which can rest stably on the board and which can be soldered to the ground trace; and a row of contacts, each having a main contact portion lying within said housing assembly at a location above said bottom surface area and fixed to said housing assembly, each contact having an elongated and bendable tail extending from said main contact portion and at a downward incline away from said housing assembly to rest on and be soldered to one of the contact traces when the housing assembly rests stably on the board;

said housing assembly including a housing formed of insulative material and having a rear end from which said tails extend and an opposite front end and said housing assembly also including a grounding plate with a front part lying on the front end of said housing, said contacts having front ends opposite said tails and said front part of said grounding plate substantially surrounding said front end of said contacts; and

said grounding plate including a solderable metal bottom portion lying at the bottom of the housing assembly, said solderable bottom portion including a plurality of recesses which receive solder to form solder fillets therein, to resist movement of the housing assembly parallel to the face of the circuit board.

4,628,411

APPARATUS FOR DIRECTLY POWERING A MULTI-CHIP MODULE FROM A POWER DISTRIBUTION BUS

Demetrios Balderes, Wappingers Falls; Andrew J. Frankovsky, Endwell, and Robert A. Jarvela, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 588,610, Mar. 12, 1984, abandoned. This application May 2, 1985, Ser. No. 729,831

Int. Cl.⁴ H05K *5/00*

U.S. Cl. 361—414 **5 Claims**

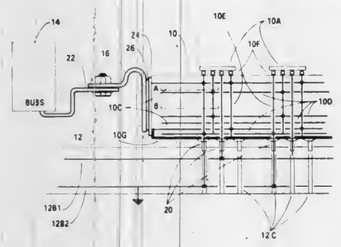
1. A system for providing a signal current and a power current to an integrated circuit chip, comprising:

a substrate;

at least one integrated circuit chip mounted on a top of said substrate;

electrical conductor means disposed within said substrate and connected to said integrated circuit chip and conducting an electric power current from an edge of said substrate to said integrated circuit chip and from said integrated circuit chip to said edge of said substrate, said electrical conductor means including a plurality of electrically conductive metalization layer means, each said metalization layer means including a body portion and a plurality of projections connected to said body portion and protruding therefrom, said integrated circuit chip being electrically connected to said metalization layer means;

tab means connected to one of said projections of one of said metalization layer means of said electrical conductor means at said edge of said substrate and conducting said electric power current directly from a power source to



said integrated circuit chip via the one projection of the one metalization layer mean of said electrical conductor means; and

input/output pin means disposed on a bottom of said substrate and connected to said integrated circuit chip via said electrical conductor means for conducting an electric signal current to and from said chip via said electrical conductor means, said input/output pin means conducting said electric signal current to or from said integrated circuit chip, the projections of said metalization layer means conducting said electric power current to or from said integrated circuit chip.

4,628,412

CASE FOR SHIELDING ELECTRONIC DEVICES

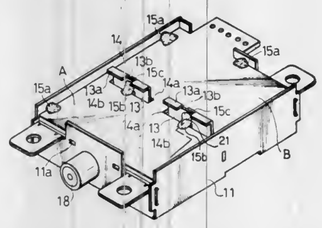
Shigeru Nigorikawa, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 12, 1984, Ser. No. 680,934

Claims priority, application Japan, Dec. 12, 1983, 58-191330[U]

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 361—424 **5 Claims**



1. A case housing an electronic device including a printed circuit board, comprising:

a metal frame having an opening on one side;

a metal cover covering said opening;

said circuit board being fixedly mounted in said frame spaced apart from said cover and having at least a hole defined therein;

a shield plate portion extending through said hole toward an inner surface of said cover and having a distal end thereof provided with a contact leg bent and held in contact against the inner surface of said cover;

said distal end further defining a recess adjacent said contact leg extending to one side of said shield plate portion, said circuit board including a projecting tongue defining a part of said hole extending proximate said one side of said shield plate portion in alignment with said recess;

whereby a solder connection can be readily formed between said projecting tongue and said one side of said shield plate portion in alignment with said recess, said recess allowing for solder not to be placed between said contact leg and said inner surface of said cover.

4,628,413

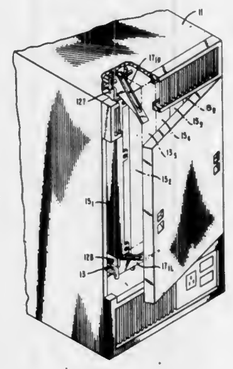
CARD CASSETTE EJECTOR APPARATUS

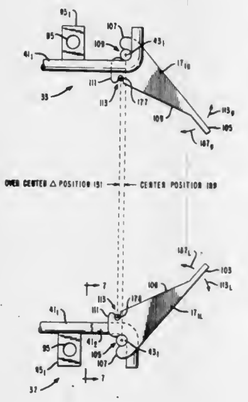
Floyd G. Speraw, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 18, 1985, Ser. No. 810,157

Int. Cl.⁴ H05K *7/16*

U.S. Cl. 361—415 **5 Claims**





1. An apparatus comprising:

a plurality of card cassettes, each of said card cassettes including upper and lower portions;

a housing for selectively receiving said plurality of cassettes; and

a plurality of pairs of first and second levers coupled to said housing for respective engagement with said plurality of card cassettes, said first and second levels of a given pair of said first and second levers being respectively rotatable in a first set of directions to respectively engage said upper and lower portions of an associated care cassette to force said associated card cassette into said housing and being respectively rotatable in a second set direction to respectively engage said upper and lower portions of said associ-

ated card cassette to pull said associated card cassette from said housing;

said housing including upper and lower racks, said upper rack including a plurality of parallel upper wires and a first crosswire, said lower rack including a plurality of parallel lower wires and a second crosswire, wherein associated pairs of upper and lower wires form a channel for each of said card cassettes;

each of said upper and lower portions of each of said card cassettes including a pin; and

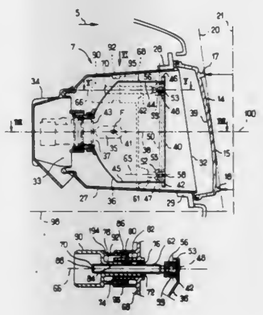
each of said first and second levers in a given pair of levers having an opening to enable said lever to be snapped over an associated one of said first and second crosswires, a detent for receiving an associated said pin, and a handle for rotating each said lever in an associated direction to force said associated pin to move horizontally to move an associated card cassette into or out of its associated channel.

4,628,414

METHOD OF MANUFACTURING AND OF ADJUSTING THE ORIENTATION OF A MOTOR VEHICLE HEADLAMP; AND A MOTOR VEHICLE HEADLAMP FOR PERFORMING SAID METHOD

Jacques Ricard, Paris, France, assignor to Cibie Projecteurs, France

Filed Jun. 27, 1985, Ser. No. 749,308
Claims priority, application France, Jul. 2, 1984, 84 10465
Int. Cl.[4] B60Q *1/06*; F16B *37/00*
U.S. Cl. 362—61 **5 Claims**



1. A method of adjusting the orientation of a motor vehicle headlamp of the type comprising a transparent glass fixed to bodywork of a vehicle wherein the following steps are performed to place the headlamp's optical axis in a first predetermined orientation relative to a plane which is fixed relative to said vehicle;

(1) providing a headlamp comprising:

transparent glass adapted to be fixed to a vehicle;

an optical assembly having an optical axis adapted to pass through said glass;

means defining a plane which is fixed relative to said glass and which, when said glass is fixedly mounted to said vehicle bodywork, occupies an orientation which at least approximately coincides with a second predetermined orientation relative to said plane which is fixed relative to said vehicle; and

means for connecting said optical assembly to said glass comprising both guide pivot means for guiding said optical assembly to pivot relative to said glass about a pivot axis which, when mounted, is at least approximately parallel to said plane which is fixed relative to said vehicle; and

graduated adjustment means for adjusting the position of said optical assembly relative to said glass by pivoting about said pivot axis;

(2) positioning a reference plane relative to said headlamp, said reference plane being fixed relative to said glass in such a manner that said plane which is fixed relative to said glass occupies said second predetermined orientation relative to said reference plane and that said pivot axis is at least approximately parallel to said reference plane, then acting on said graduated adjustment means to pivot said optical assembly relative to said glass about said pivot axis until said optical axis occupies said first predetermined orientation relative to said reference plane, and setting the graduation of said graduated adjustment means to have an origin corresponding to said relative position and to indicate the angular orientation of said optical axis relative to said reference plane and from said origin; and

mounting said headlamp on said vehicle and fixing said glass to said vehicle bodywork in such manner that said plane which is fixed relative to said glass is positioned as close as possible to said second predetermined orientation; and

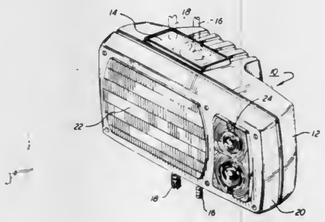
(3) measuring such angular offset as there may be between the mounted orientation and said second predetermined orientation and pivoting said optical axis through an angle as marked by said graduation equal to said measured offset and in such direction as to bring said optical axis into said first predetermined orientation.

4,628,415

AUTOMOTIVE LAMP

Donald W. Vescio, Fulton, and Harry T. Travers, Syracuse, both of N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,557
Int. Cl.[4] F21V *3/00*
U.S. Cl. 362—61 **8 Claims**



1. A vehicular lamp assembly comprising a housing; at least one twin-element bulb lamp of the bayonet type having two lamp elements and a cylindrical metal base serving as a common return electrode for said elements and a pair of conductive end pins each connected to a respective one of said elements; and a lampholder in which said at least one lamp is mounted within said housing, said lampholder including

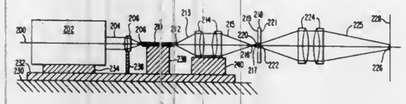
a conductive bulb retainer plate having formed therein means for holding said base and maintaining electrical contact with the same, a pair of conductive resilient contact strips parallel with one another and disposed in parallel relation with and spaced from said bulb retainer plate; a lampholder body of non-conductive rigid material and including means mounting said bulb retainer plate and mounting said contact strips for at least limited flexing motion towards and away from said retainer plate; and resilient means, mounted on said lampholder body and behind said contact strips at the location of the end pins of said lamp, for urging said contact strips into contact with the associated end pins.

4,628,416

VARIABLE SPOT SIZE ILLUMINATOR WITH CONSTANT CONVERGENCE ANGLE

David A. Dewey, Huntington Beach, Calif., assignor to CooperVision, Inc., Menlo Park, Calif.

Filed May 3, 1985, Ser. No. 729,983
Int. Cl.[4] F21V *7/04*; A61B *17/36*
U.S. Cl. 362—32 **12 Claims**



1. A variable spot size illuminator for projecting a variable size spot of light into an illumination plane comprising

a source of light,

fiberoptic image transmission means having an entrance surface and an exit surface,

means for projecting a cone of said light onto said entrance surface,

objective lens means for focusing light emerging from said exit surface into an illumination plane, and

means for varying the distance between said entrance surface and the vertex of said cone of light.

11. A laser photocoagulator having a variable spot size with substantially constant beam convergence angle for use with a slit lamp comprising

laser source of light,

flexible optical fiber means having an entrance end which receives light form said laser and an exit end from which said received light emerges,

fiberoptic image transmission means having an entrance surface and an exit surface,

means for projecting a cone of said light onto said entrance surface,

objective lens means for focusing light emerging from said exit surface into an illumination plane, and

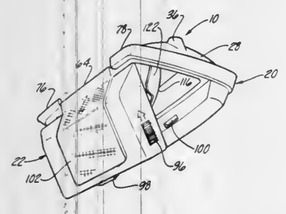
means for varying the distance between said entrance surface and the vertex of said cone of light.

4,628,417

COMBINATION DOME/CARGO LAMP

Les K. Kaminski, and Michael E. Dyke, both of Sterling Heights, Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 9, 1985, Ser. No. 806,912
Int. Cl.[4] B60Q *3/06*
U.S. Cl. 362—74 **9 Claims**



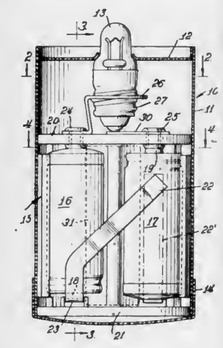
1. A combination dome/cargo lamp for a pickup truck including a cargo box and a cab having a rear window permitting viewing of the cargo box, the dome/cargo lamp comprising an outer casing having an upper portion securable to the ceiling of the cab adjacent to the rear window, the outer casing having a lower portion, an inner casing, pivot means connecting the inner casing to the lower portion of the outer casing, an electric bulb in the inner casing, a lens on the inner casing covering the bulb to direct light outwardly of the inner casing, the inner casing being pivotable by hand into the outer casing where the lens will direct light into the cab thereby functioning as a dome lamp and pivotable by hand downwardly away from the outer casing to a position where the lens will direct light through the rear window into the cargo box thereby functioning as a cargo lamp, the outer casing having an opening therethrough adjacent to the pivot means, a cover extending from the inner casing through the opening, electrical wire means extending from the upper portion of the outer casing through the opening and between the inner casing and the cover into operative connection with the bulb, the cover traveling through the opening during pivoting of the inner casing and at all times isolating the electrical wire means from an operative hand.

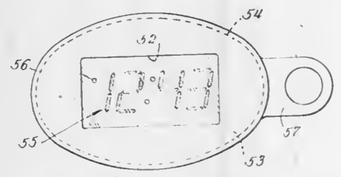
4,628,418

MULTI-PURPOSE MINIATURE FLASHLIGHT DEVICE

Paul R. Chabria, West Chicago, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.

Filed Feb. 14, 1986, Ser. No. 829,314
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—116 **16 Claims**





1. A multi-purpose miniature pocket flashlight comprising

a cartridge having top and bottom end wall means, capable of being accommodated within a flexible casing, and having means for holding a pair of batteries between said top and bottom end wall means;

the top end wall means including metal contacts extending therethrough to be in communication with each battery;

one said contact communicating with a bracket, the bracket extending upwardly from the top end wall, said other contact communicating with a metallic connector strip;

a lamp removably mounted to said bracket and having a bottom center contact thereof in communication with the metallic connector strip;

spring switch arm means electrically communicating with the positive terminal of one said battery, whereby upon squeezing the flexible casing, the spring switch arm means is capable of completing electrical continuity with the negative terminal of the other said battery whereby to illuminate the light;

a flexible casing accommodating said cartridge therein, said flexible casing having a top cap and a bottom cap, said top

cap having an aperture for the lamp to project outwardly therethrough in order to illuminate the surrounding area, one of said caps being removable whereby to grant access to the interior of the casing and permit the removal of the cartridge, lamp, batteries, and spring arm, as a unit therefrom; and,

mounting magnet means arranged between said cartridge and said flexible case whereby to permit said miniature flashlight to be magnetically mounted to metallic surfaces.

4,628,419

SIGNAL LAMP

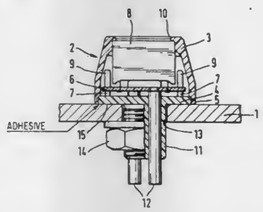
Willi Schmid, Fislisbach, Switzerland, assignor to W. Schmid AG, Fislisbach, Switzerland

Filed Aug. 8, 1984, Ser. No. 638,887

Claims priority, application Switzerland, Aug. 9, 1983, 4322/83

Int. Cl.⁴ F21V *3/00*

U.S. Cl. 362—145 **11 Claims**



1. The combination of a support, such as a control panel, having a front side, with a signal lamp comprising a housing including a front portion having an aperture disposed in a predetermined plane, a rear portion, a substantially flat rear side located in the region of said rear portion and disposed in front of said support, and a carrier which is at least substantially parallel to said plane and to said rear side, means for securing said housing to said support, said securing means being disposed in the region of, and including an adhesive coating on, said rear side, a light emitting diode mounted on said carrier behind said aperture and confined in said housing substantially in its entirety, and conductor means connected with said diode and extending from said housing through said rear side and adhesive coating.

4,628,420

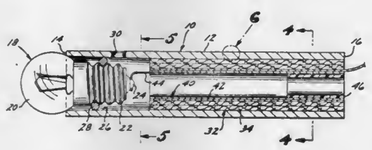
WATER ACTIVATED ELECTRIC CELL AND SURVIVAL LAMP SYSTEM

David T. McArthur, deceased, late of Lake Elsinore, Calif., by Donald E. Guilliams, executor, assignor to Beverly Safford, Yucaipa, Calif.

Filed Sep. 30, 1983, Ser. No. 537,818

Int. Cl.⁴ F21L *7/00*

U.S. Cl. 362—208 **16 Claims**



1. A survival lamp which comprises a hermetically sealed, generally cylindrical container having top and bottom walls, light bulb means mounted on said top wall and having an illuminating portion exposed to radiate light above said top wall, and a water-activated, deferred action electric cell supported within said container, said cell having an upper terminal portion electrically connected to said light bulb means and an open lower end portion to admit activating water therein, said bottom wall having a tear-out section constituting a major portion of the lower end portion which is adapted to be torn out so as to open the hermatically sealed container and freely admit water through said bottom wall,

wherein said cell further comprises first and second electrodes having spaced, opposed, surface portions, and porous water-absorbent electrical insulation material impregnated with dried water-soluble electrolyte material disposed between and in contact with said surface portions, a portion of said insulation material being exposed from between said surface portions for application of aqueous fluid thereto activate the cell;

said first electrode being composed principally of magnesium and having an electrically conductive, corrosion-inhibiting coating composed principally of detergent covering at least said surface portion thereof.

4,628,421

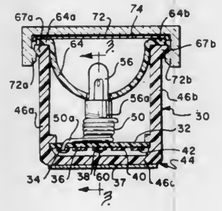
STRIP LIGHTING

Lawrence E. Saar, 810 Second Ave., Bensenville, Ill. 60106

Filed Jan. 23, 1986, Ser. No. 821,784

Int. Cl.⁴ F21V *19/06*

U.S. Cl. 362—238 **16 Claims**



1. A strip lighting arrangement comprising:

an elongated, generally flat circuit board having a plurality of spaced conductive strips aligned along the length thereof;

an elongated housing having a slot-like aperture along the length thereof and adapted to receive said circuit board within and along the length thereof;

a plurality of lamps, each lamp including a first terminal forming a threaded lateral base portion of said lamp and a second terminal positioned on the bottom of said lateral base portion of said lamp;

a plurality of mounting means positioned on and aligned along the length of said circuit board in spaced relation and coupled in circuit to said conductive strips thereon for receiving and engaging a respective one of said lamps for securely mounting on said circuit board and electrically coupling in circuit with said conductive strips each of said lamps, wherein each of said mounting means includes a helical spring for engaging and electrically coupling the first terminal lateral base portion of a respective lamp to a first conductive strip while maintaining the second terminal bottom portion of the lamp in electrical contact with a second conductive strip;

a concave reflector positioned over the aperture of said housing and extending substantially along the length thereof, said reflector having a plurality of spaced apertures along the length thereof, wherein each aperture is adapted to receive a respective lamp therein; and

a light transmitting cover positioned over said reflector and along the length of the aperture in said elongated housing, wherein said cover securely engages said housing adjacent to the aperture therein in a snap-acting manner.

4,628,422

DISPLAY COMPRISING LIGHT-EMITTING DIODES AND A METHOD AND AN INSTALLATION FOR ITS MANUFACTURE

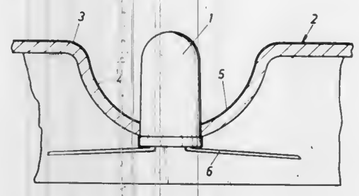
Rolf V. T. Ewald, Eldsberga, Sweden, assignor to Integrerad Teknik HB, Sweden

Continuation-in-part of Ser. No. 463,540, Feb. 3, 1983, abandoned. This application May 22, 1984, Ser. No. 613,091

Claims priority, application Sweden, Feb. 16, 1982, 8200913

Int. Cl.⁴ F21V *1/00*

U.S. Cl. 362—240 **2 Claims**



1. An improved display comprising light-emitting diodes, a plate for mounting said light-emitting diodes, dish-shaped reflectors formed in said plate, the improvement comprising openings formed in said plate, the diodes mounted in said openings with the diode walls arranged in tightly abutting relationship against edges of said openings to form a mechanical bond between said diodes and said plates, said diodes having a cross-sectional dimension increasing toward a rear portion to ensure that said diodes are securely wedged to said plate when mounted therein and adhesive furher strengthening said mechanical bond; connections in the form of rods, said rods interconnecting said diodes and extending parallel and spaced some distance from said plate of the display; a filler compound, said diode connections covered by said filler compound.

4,628,423

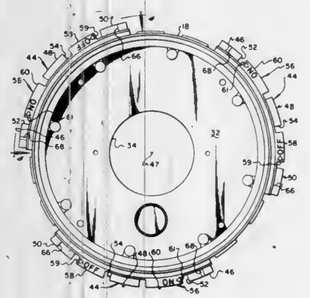
TWIST ON REFLECTOR FOR INDUSTRIAL LIGHT FIXTURE

William D. Ogle, Syracuse, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 20, 1985, Ser. No. 778,592

Int. Cl.⁴ F21V *7/00*

U.S. Cl. 362—341 **16 Claims**



1. In a light fixture including a housing for supporting a lamp socket and the like, means associated with said housing forming a generally cylindrical rim and including spaced apart radially extending projections forming groove means;

a lamp reflector adapted to be mounted on said housing and including a flange portion having radially extending projections cooperable with said projections on said means associated with said housing in such a way that said reflector may be supported on said housing by aligning said projections on said reflector in a predetermined position relative to said projections on said means associated with said housing and rotating said reflector to move said projections on said reflector into said groove means; and

means cooperable with said projections on said reflector for locking said reflector in said groove means and against unwanted movement relative to said housing.

4,628,424

CHANDELIER

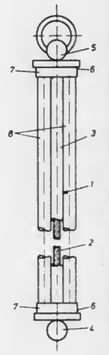
Friedhelm Bakalowits, 17, Halirschgasse, A-1170 Vienna, Austria

Filed Dec. 28, 1984, Ser. No. 687,151

Claims priority, application Austria, Dec. 28, 1983, 4547/83

Int. Cl.⁴ F21V *11/00*

U.S. Cl. 362—351 **10 Claims**



1. A chandelier hanging comprising a non-transparent supporting bar with a reflecting surface and at least one outer bar extending parallel to the supporting bar and consisting of translucent and substantially transparent material.

4,628,425

METHOD AND APPAPRATUS FOR THE CONVERSION OF A POLYPHASE VOLTAGE SYSTEM

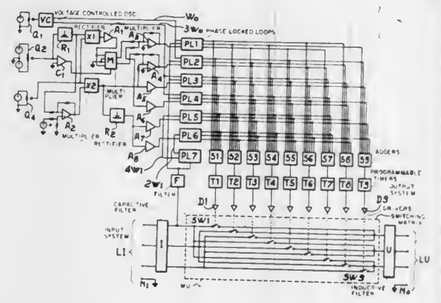
Marco Venturini, Via S. Scorza 15/21, Genova, and Alberto Alesina, Via Marazzani 12, Milano, both of Italy

Filed Nov. 26, 1984, Ser. No. 674,929

Claims priority, application Italy, Dec. 5, 1983, 24008 A/83

Int. Cl.⁴ H02M *5/22*

U.S. Cl. 363—10 **3 Claims**



1. A direct AC converter including input phase conductors and a neutral conductor for a balanced polyphase AC input voltage system, a plurality of output phase conductors and a neutral conductor for a polyphase AC output voltage system having at least one characteristic such as frequency, amplitude,

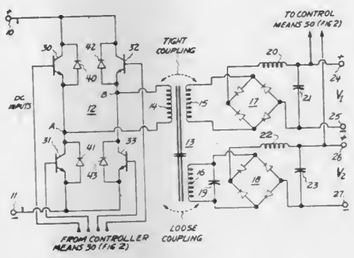
phase angle or phase displacement between voltage and current which is different from that of the input voltage system, the input and output neutral conductors being unconnected between them, a plurality of electronic switch means for individually connecting each input phase conductor to each output phase conductor, means for generating control signals to cyclically operate said electronic switch means at a repetition rate substantially higher than the frequency of both the input and the output voltage systems, in a way to connect to each output phase conductor respectively only one input phase conductor at a time, and to connect all said input phase conductors to each one output phase conductor a plurality of times during any cycle of said input system or of said output system adjusting the switch means connection times in such a way that all the output phase voltages as measured with respect to the input neutral conductor comprise a common term which is a linear combination of two sinusoidal waveforms, the first one having a frequency equal to the input frequency multiplied by the number of phase conductors of the input system, and the second one having a frequency equal to the output frequency multiplied by the number of phase conductors of the output system, whereby the amplitude of the voltage as measured between any two of the output phase conductors is rendered maximum while at the same time each output voltage as measured between any output phase conductor and the input neutral conductor does not exceed at any time the amplitude of the input voltage at said time as measured between any input phase conductor and the input neutral conductor.

4,628,426

DUAL OUTPUT DC-DC CONVERTER WITH INDEPENDENTLY CONTROLLABLE OUTPUT VOLTAGES

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,430
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 **9 Claims**



1. A DC-DC converter comprising:

a transformer having a primary winding, a tightly-coupled secondary winding having substantially no leakage inductance, and a loosely-coupled secondary winding having a predetermined leakage inductance;

DC to AC conversion means connected to said primary winding and adapted to be connected to a DC supply, said DC to AC conversion means for supplying a variable frequency, variable duty cycle AC signal to said primary winding;

first rectifying means coupled to said tightly-coupled secondary winding for providing a first DC output voltage;

second rectifying means coupled to said loosely-coupled secondary winding for providing a second DC output voltage; and

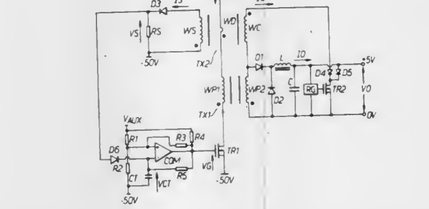
controller means coupled to said first and said second rectifying means and to said DC to AC conversion means for adjusting the duty cycle of said AC signal to regulate said first DC output voltage in response to a first voltage command and for adjusting the frequency of said AC signal to regulate said second DC output voltage in response to a second voltage command.

4,628,427

D.C. IMPULSE ARC WELDER EMPLOYING THYRISTORS

Ivan K. Marvakov, and Todor Y. Russev, both of Sofia, Bulgaria, assignors to ZNIKA, Sofia, Bulgaria

Continuation of Ser. No. 493,004, May 9, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 743,262
Int. Cl.[4] H03K *3/53;* **B23K** *9/10*
U.S. Cl. 363—27 **4 Claims**



1. In an apparatus for producing an impulse welding current, comprising a source of direct current having a constant voltage, a first thyristor connected to one of the poles of said current supply source, a closed series loop which comprise a capacitor, a second thyristor, and the primary winding of an impulse transformer, the second winding of the impulse transformer being adapted to be connected through a diode to a welding arc,

the improvement wherein a third thyristor is connected in parallel to the capacitor, and

between the first thyristor and the common point of the capacitor and the second thyristor there is connected a first choke,

a second choke is connected in series with the third thyristor and the common point of the capacitor, the second thyristor and the first choke, and

the common point of the primary winding of the impulse transformer and the capacitor is connected to the other pole of the constant voltage current supply source.

4,628,428

MODULATION CIRCUIT FOR DC-DC CONVERTER WITH R-C OSCILLATOR

John D. Walker, Coventry, England, assignor to The General Electric Company, p.l.c., England

Filed Nov. 14, 1984, Ser. No. 671,451
Claims priority, application United Kingdom, Dec. 23, 1983, 8334373
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **4 Claims**

1. A DC-DC converter in which the primary winding of a

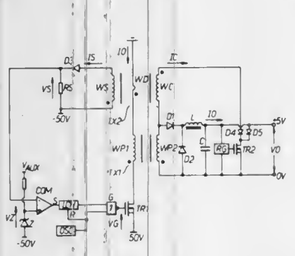
sense transformer is in series with the primary winding of a power transformer and a power switch, in which the on-off ratio of the power switch is directly controlled by a rectangular pulse output of a resistance-capacitance oscillator, in which the duration of and the time between pulses in said pulse output respectively correspond to the times taken for a capacitor within the oscillator to charge to and to discharge to respective first and second voltage reference values, in which the sense current in a secondary winding of the sense transformer is used to develop a unipolar sense voltage during each on-period of the power switch, in which said sense voltage is applied to the capacitor such that the time taken for the capacitor to charge to the first reference voltage value and hence the duration of the on-period of the power switch is variable dependent on the sense current during each said on-period, the time taken for the capacitor to discharge to the second reference voltage value being constant, in which said unipolar sense voltage which is applied to the capacitor is applied to one input of a comparator within the oscillator, in which a fixed reference voltage is applied to the other input of the comparator whereby the end of each said on-period is responsive to the output of the comparator which is galvanically connected to the power switch, in which the rising current in the primary winding of the sense transformer during each said on-period is dependent on the d.c. output current of the converter whereby current regulation of the converter output is provided via said sense current, in which a further winding of the sense transformer and a rectifier are connected in a series path which is in parallel with a secondary winding of the power transformer such that said further winding carries a unipolar current which is of constant amplitude during each said on-period and is switched synchronously with the current in the primary winding of the sense transformer, in which error signal means are provided to derive a voltage error signal from the d.c. output voltage of the converter, in which control means to which the voltage error signal is applied are provided in said series path including said further winding so that the constant amplitude of the current in said further winding during each on-period of the power switch is determined by the voltage error signal, and in which the amplitude of the rising said sense current during each said on-period is determined by the additive effect of the constant current in said further winding and the rising current in the primary winding of the sense transformer whereby voltage regulation of the converter output is also provided via said sense current.

4,628,429

DC-DC CONVERTER WITH GALVANICALLY ISOLATED FEEDBACK VOLTAGE REGULATION

John D. Walker, Coventry, England, assignor to The General Electric Company, p.l.c., England

Filed Nov. 14, 1984, Ser. No. 671,239
Claims priority, application United Kingdom, Dec. 23, 1983, 8334372
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **4 Claims**



1. A DC-DC converter in which a primary winding of a sense transformer is in series with a primary winding of a power transformer and a power switch

(a) in which a rising sense current in a secondary winding of the sene transformer during each on-period of the power switch develops a unipolar sense voltage which is applied by galvanic connection of the sense winding to one input of a comparator, a fixed reference voltage being applied to the other input of the comparator whereby the end of each said on-period is responsive to the output of the comparator which is galvanically connected to the power switch,

(b) in which the rising current in the primary winding of the sense transformer during each said on-period is dependent on the d.c. output current of the converter whereby current regulation of the converter output is provided via said sense current,

(c) in which a further winding of the sense transformer and a rectifier are connected in a series path which is in parallel with a secondary winding of the power transformer such that said further winding carries a unipolar current which is of substantially constant amplitude during each said on-period and is switched synchronously with the current in the primary winding of the sense transformer,

(d) in which error signal means are provided to derive a voltage error signal from the d.c. output voltage of the converter, in which control means to which the voltage error signal is applied are provided in said series path including said further winding so that the constant amplitude of the current in said further winding during each on-period of the power switch is determined by the voltage error signal,

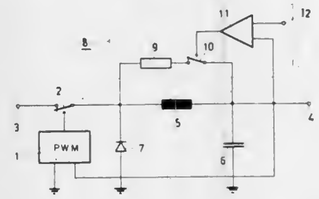
(e) and in which the amplitude of said rising sense current during each said on-period is determined by the additive effect of the constant current in said further winding and the rising current in the primary winding of the sense transformer, whereby voltage regulation of the converter output is also provided via said sense current.

4,628,430

SWITCHING POWER-SUPPLY UNIT WITH IMPROVED START-UP BEHAVIOR

Georg Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 22, 1984, Ser. No. 582,484
Claims priority, application Switzerland, Feb. 28, 1983, 1088/83
Int. Cl.[4] G05F *1/56*
U.S. Cl. 363—25 **13 Claims**



1. A switching power-supply unit having a DC-voltage input, which unit is normal operation generates at an output an output voltage which at least approximately corresponds to a rated value, and which includes a pulse-width modulator that is controlled by said output voltage; a first switch which is actuated by said modulator; and, at said output, a low-pass filter including an inductance and a capacitance, the improvement wherein said power-supply unit includes a bypassing circuit which bypasses said inductance, the impedance of said bypassing circuit having an inductive component which is low relative to said inductance, said bypassing circuit being conductive when said output voltage is below a minimum value that is not higher than said rated value of said output voltage, said first switch actuated by said modulator located between

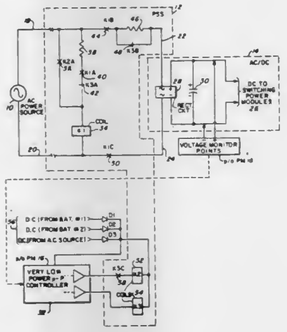
the input of said power-supply unit and said low-pass filter, the input of said low-pass filter connected to ground by a free-wheeling diode, said bypassing circuit including a second switch which is actuated by a comparator which compares said output voltage with a reference voltage.

4,628,431

POWER SUPPLY ON/OFF SWITCHING WITH INRUSH LIMITING

Dennis J. Kayser, Hudson, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 12, 1984, Ser. No. 681,156
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—49 **6 Claims**



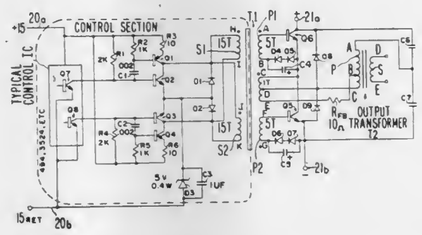
1. Power switching means for selectively connecting a power source to a digital data processing system, comprising:
(A) first switching means for connecting the power source to the system,
(B) means for providing a power on selection signal,
(C) second switching means for providing an initial turn-on signal to the first switching means in response to receiving an enabled power on selection signal, and
(D) third switching means having an active state and a normal state and
(1) arranged when in the active state to enable the second switching means to be responsive to the power on selection signal, and
(2) arranged when in the normal state to provide a sustaining signal to the first switching means.

4,628,432

PROPORTIONAL TRANSISTOR BASE DRIVE CIRCUIT FOR USE IN POWER CONVERTERS

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Inc., Milpitas, Calif.

Filed May 29, 1984, Ser. No. 615,009
Int. Cl.[4] H03K *3/16*; H02M *3/28*
U.S. Cl. 363—56 **13 Claims**



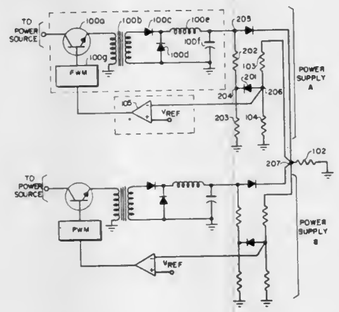
1. A power converter comprising:
an output transformer containing a primary winding and a secondary winding;
first means for causing current to flow through said primary winding in a first direction;
second means for causing current to flow through said primary winding in a second direction; and
means for feeding back a voltage proportional to a poriton of the voltage across said primary winding to said first and second means, the current flow caused by said first and second means being responsive to said voltage, thereby maintaining the current through said primary winding;
wherein said means for feeding back comprises:
means for applying a voltage proportional to the voltage across said primary winding to said first means for causing following the initiation of the current through said primary winding in said first direction thereby to regeneratively maintain said current through said primary winding in said first direction; and
means for applying a voltage proportional to the voltage across said primary winding to said second means for causing following the initiation of the current through said primary winding in said second direction thereby to regeneratively maintain current through said primary winding in said second direction, and
wherein said first means for causing comprises:
a first transistor, the collector of which is connected through a first capacitor to one end of said primary winding and the emitter of which is connected through a current feedback coil to the other end of said primary winding and the base of which is connected to a first source of a turn-on pulse, and
wherein said second means for causing comprises:
a second transistor, the emitter of which is connected through a second capacitor to one end of said pirmary winding, the collector of which is connected through said current feedback coil to the second end of said primary winding, and the base of which is connected to a second source of a turn-on pulse.

4,628,433

CONTROL CIRCUIT FOR DIODE-OR CONNECTED POWER SUPPLIES

Hubertus S. Notohamiprodjo, Hoffman Estates, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Dec. 30, 1985, Ser. No. 814,937
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—65 **11 Claims**



1. A control circuit for a power supply diode-or connected in a power supply system including a plurality of power supplies each power switching circuit being connected to a load via an output diode, said control circuit comprising:
first voltage indicating means connected between said load and said output diode and effective to provide a first signal representative of the voltage applied to said load;

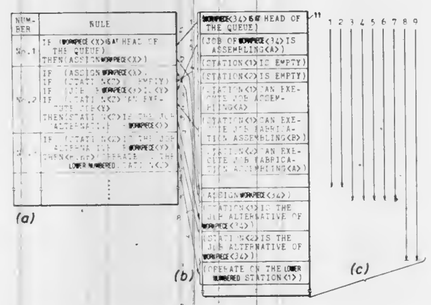
second voltage indicating means connected between said power switching circuit and said output diode and effective to provide a second signal representation of the output voltage of said power switching circuit; and
switching means connected between said first and second voltage indicating means and operated in response to said first signal having a magnitude larger than said second signal to electrically connect said first voltage indicating means to said second voltage indicating means;
said comparator being operated in response to said first signal having a magnitude larger than predetermined value to provide a control signal representative of the difference between said first signal and said predetermined value;
said power switching circuit being operated in response to said control signal to increase its output voltage by a proportionate amount.

4,628,434

FACILITIES CONTROL METHOD

Tsutomu Tashiro, Sagamihara; Koichi Haruna, Yokohama, and Norihisa Komoda, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,164
Claims priority, application Japan, May 9, 1983, 58-79341
Int. Cl.[4] G06F *15/18, 15/46*
U.S. Cl. 364—130 **2 Claims**



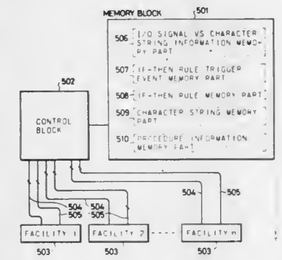
1. A control system having a controller for controlling the operation of a plurality of facilities in real time, and memory, coupled to said controller, for storing information in accordance with which said controller controls the operation of said facilities, wherein
said memory comprises
first memory means for storing facility status signals representative of the statuses of the facilities, command signals responsive to said status signals and information representative of correspondence between said status signals, said command signals and internal codes,
second memory means for storing information for specifying a series of rules to be triggered in accordance with the statuses of the facilities,
third memory means for storing rules converted into said internal codes, and
fourth memory means for storing internal codes of conclusions sequentially formed in accordance with the operation of control commands for corresponding facilities on the basis of the internal codes representative of the statuses of the facilities and internal codes representative of rules, and finally determined internal codes, and wherein
said controller comprises
settling means for monitoring the facility status signals and controlling the generation of said facility status signals, and the number of rule-set for use on the basis of the information stored in said second memory means,
internal code generating means for generating internal codes corresponding to said generated facility status signals on the basis of the information stored in said first memory means,
determining means for reading out corresponding rules from said third memory means on the basis of said number of the rule set having been determined by said settling means and for determining a final control command in accordance with information stored in said fourth memory means, and
command signal generating means for generating a command signal for a facility in accordance with an internal code for a determined control command on the basis of the information stored in said first memory means.

4,628,435

FACILITIES CONTROL METHOD

Tsutomu Tashiro, Sagamihara; Koichi Haruna, Yokohama, and Norihis Komoda, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,676
Claims priority, application Japan, Mar. 9, 1983, 58-37392
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—130 **6 Claims**



1. A control system having a controller, for controlling the operation of a plurality of facilities in real time, and memory, coupled to said controller, for storing information in accordance with which said controller controls the operation of said facilities, wherein
said memory comprises
a rule memory portion which stores information representative of a plurality of rules, each rule containing a conditional portion which describes at least one condition to be examined and a conclusive portion which describes an action to be taken upon said condition being satisfied, and
a status memory portion which stores information representative of the current status of each of said facilities, information representative of respective tasks to be performed by said facilities and information representative of the new current status of each of said facilities resulting from the satisfaction of the conditional part of a rule and wherein
said controller comprises
detecting means for detecting the current status of each of said facilities and generating information representative thereof,
input means, coupled with said detecting means, for coupling facility status representative information generated by said detecting means to the status memory portion of said memory to be stored thereby,
rule applying means for comparing current status information stored in said status memory with information representative of the conditional portions of the rules stored in said rule memory portion and, in response to the satisfaction of the conditional part of a rule, causing information representative of the conclusive portion of that rule to be stored as the new current status of a facility in the status memory portion of said memory, and for generating information representative of control instructions for controlling the operation of said facilities, said control instruction information being formed by a combination of rules conditional portions of which have been satisfied by the current status of said facilities, and
output means, coupled to said rule applying means, for

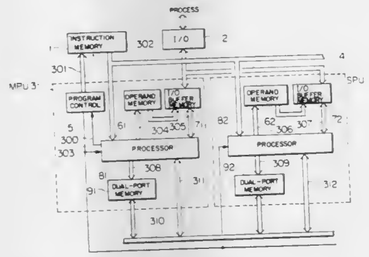
generating command signals for controlling the operation of said facilities in accordance with the control instruction information generated by said rule applying means, and coupling said command signals to respective ones of said facilities.

4,628,436

DIGITAL CONTROLLER

Tadashi Okamoto, and Hiromasa Yamaoka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,541
Claims priority, application Japan, Feb. 24, 1983, 58-28541
Int. Cl.⁴ G06F *15/16, 9/00*
U.S. Cl. 364—131 **3 Claims**



1. A digital controller for controlling a plurality of objectives to be controlled, which objectives are of the same kind, wherein a plurality of processors are provided in correspondence to said plurality of objectives, comprising:

an instruction memory for storing instruction codes which are provided as a common control program for controlling said plurality of processors to execute said objectives, and addresses of storage locations holding operand addresses associated with said instruction codes;

common control means connected to said instruction memory and said plurality of processors for reading out an instruction code and the associated storage location address from said instruction memory to all of said processors, and for generating a parallel execution process signal in each of said processors to effect execution of said instruction code in parallel by said processors;

an operand memory provided in each of said processors, each operand memory having storage locations storing operand addresses, which storage locations are accessed by the same storage location address read out from said instruction memory; and

an input/output data buffer memory provided in each of said processors and operatively associated with the operand memory therein for storing data accessed by the operand addresses stored in said operand memory;

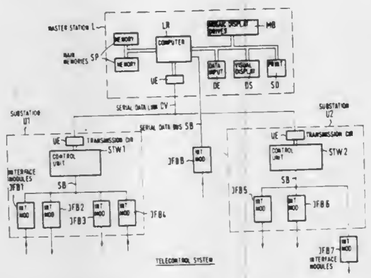
wherein a similar operation is carried out in each of said processors in parallel in response to the same instruction code read out from said instruction memory and data accessed from the input/output data buffer memory provided in each of the processors on the basis of the operand address which is obtained by accessing the operand memory with the storage location address associated with the instruction code read out of said instruction memory.

4,628,437

TELECONTROL SYSTEM

Werner Poschmann, Renningen; Wolfgang Klenner, Ditzingen; Günter Wattach, Walzbachtal, and Peter Maas, Pforzheim, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,645
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236812
Int. Cl.⁴ G08C *19/00*; H04Q *9/00*
U.S. Cl. 364—131 **3 Claims**



1. A telecontrol system with at least one master station and a plurality of substations connected to the master station via data transmission units, each substation containing a control unit equipped with a microcomputer and a plurality of plug-in interface modules connected to the control unit and serving to enter messages and measured values and to deliver commands, wherein said interface modules are equipped with microcomputers, and that both the control unit and all interface modules of a substation have interfaces to, and are interconnected by, a serial data bus permitting the use of protection coding techniques wherein each interface module has a first subcircuit which includes said microcomputer, and is coupled to said control unit by a serial data bus over which said interface module is cyclically scanned for temporarily stored messages; and a second subcircuit for providing isolation between said interface module and a facility to be monitored, and wherein said first subcircuits in all interface modules are of the same design and contain, besides the microcomputer with main memory and program memory and the interface to the serial data bus, a function-code memory in which the function of the respective interface module can be fixed by coding, and wherein said second subcircuit includes all components necessary for adaptation to the technical facility to be monitored and controlled.

4,628,438

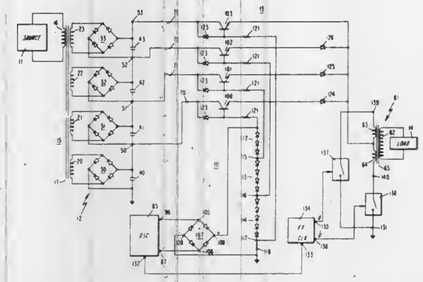
POWER CONVERTER APPARATUS AND METHOD EMPLOYING PLURAL BRANCHES

Herbert R. Montague, Binghamton, N.Y., assignor to Control Concepts Corporation, Binghamton, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,185
Int. Cl.⁴ H02M *7/538*
U.S. Cl. 363—134 **5 Claims**

1. A converter wherein a DC input is converted to AC in response to a gradually changing sinusoidal control source comprising N branch circuits, where N is an integer greater than one, input means connected to the DC input for coupling DC to each of the branch circuits, output means coupled to each of the branch circuits for deriving the AC output, branch circuit k being connected between the input and output means, where k is selectively one through N, branch circuit k including variable response means responsive to the control source so that branch circuit k is conducting to the exclusion of all other branch circuits in response to the control source amplitude being in a predetermined range, the variable response means of branch circuit k, while conducting, responding to the control

source to have an output with a gradually changing envelope, branch circuit k being connected to the input and output means so the envelope changes between a minimum voltage for branch circuit k to a maximum voltage for branch circuit k and the source being arranged so that each branch circuit while conducting responds to the gradual changes of the source to dissipate the same amount of energy, the minimum voltage for branch circuit (k+1) being approximately equal to the maximum voltage for branch circuit k, the output means including means for combining the outputs from the N branch circuits, and means for coupling the sinusoidal source to branch circuit k to cause the phase angle, θ_k, when branch circuit k changes from a conducting to a non-conducting state, and the phase angle θ_{k-1}, when branch circuit k begins to conduct, to be such that $\sin \theta_k \cos \theta_{k-1} - (\theta_k - \theta_{k-1})/2 - \frac{1}{4}(\sin 2\theta_k + \sin 2\theta_{k-1})$ is the same for each branch circuit.

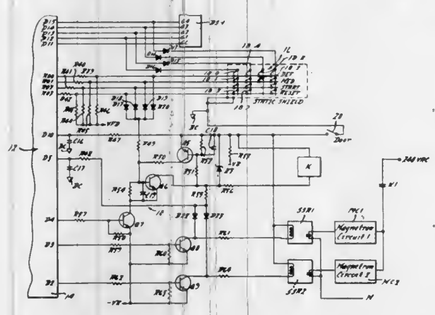


4,628,439

SUPERVISED START SYSTEM FOR MICROPROCESSOR BASED APPLIANCE CONTROLS

Daniel L. Fowler, Kentwood, and Brian J. Kadwell, Holland, both of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 12, 1983, Ser. No. 560,169
Int. Cl.⁴ G05B *9/02, 15/02*; H05B *6/64*
U.S. Cl. 364—138 **15 Claims**



1. A supervisory start system for an appliance control that includes a microprocessor, manually actuatable keyboard switch means, and first and second relay means;

the microprocessor including first, second and third input means and first, second and third output means and being conditioned to generate control signals at said output means upon receipt of electrical signals at said input means;

said supervisory start circuit comprising, in combination, first, second and third transistors each having a base, an emitter and a collector, said first transistor means controlling energization of said first relay means and being controlled by said manually actuatable switch means;

said manually actuatable switch means being electrically connected to said first output means of said microprocessor and said base of said first transistor;

the base of said second transistor being connected to said second output means of said microprocessor, the emitter of said second transistor being connected to a source of potential, the collector of said second transistor being connected to the emitter of said first transistor;

the collector of said first transistor being connected to said first relay means;

said second transistor being operable to connect the emitter of said first transistor to said source of potential when a signal from said second output means of said microprocessor is applied to the base of said second transistor;

said microprocessor being conditioned to emit a signal at said second output means upon receipt of a signal at said first input means;

means for latching said first transistor in a conducting condition upon being energized;

means for applying an electrical signal to said second input means when said first transistor means is in a conducting condition;

said third transistor having the base thereof connected to said third output means of said microprocessor, said third transistor having the emitter thereof connected to said source of potential and the collector thereof connected to said second relay means, said third transistor being operable to connect said relay means to said source of potential upon receipt of a signal from said third output means of said microprocessor; and

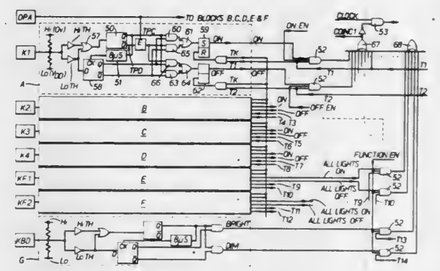
said microprocessor being conditioned to emit a signal at said third output means upon receipt of a signal at said second input means.

4,628,440

ELECTRICAL APPLIANCE CONTROL

David R. Thompson, Fife, Scotland, assignor to Pico Electronics Limited, Scotland

Continuation of Ser. No. 436,647, Oct. 25, 1982, abandoned.
This application Nov. 12, 1985, Ser. No. 796,531
Claims priority, application United Kingdom, Oct. 26, 1981, 8132173
Int. Cl.⁴ G05B *11/01*; H04M *11/04*; H01N *9/26*
U.S. Cl. 364—140 **27 Claims**



1. A transmitter for controlling n slave units by means of a digital control signal containing an area code common to said n slave units, an address for at least one of said n slave units and a command, the transmitter comprising:

first means for generating an area code;

second means for generating selectively any one of n addresses for respective ones of said n slave units;

third means for generating a command;

m (<n and >1) actuator means coupled to the first, second and third generating means such that a single actuation of one of said m actuator means causes the generation of a digital control signal comprising said area code, an address selected from said n addresses, and said command; and

address selector means presettable to any one of a plurality of conditions, each of which condition presets a group of

m addresses where m is less than n, for defining which addresses constitute said group of m addresses;

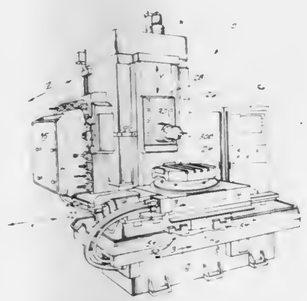
whereby all n slave units, in sequence of operation of said selector means, are controllable by said actuator means of said transmitter in groups of up to m slave units for each condition of the selector means.

4,628,441

AUTOMATIC DYNAMIC ERROR COMPENSATOR

Richard Johnstone; Edward E. Kirkham, both of Brookfield; Han C. Chung, West Allis, and Lyle D. Ostby, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Jun. 29, 1983, Ser. No. 509,214
Int. Cl.[4] G05B *19/18, 19/29;* G06F *15/46*
U.S. Cl. 364—167 **10 Claims**



1. In a machine tool controlled by a numberical control circuit comprising:

a base,

a movable member carried by said base for movement in a prescribed path of travel,

a servo positioning system connected to drive the movable member along its path of travel in accordance with commands received from a recorded program,

a transducer responsive to the movement of the movable member for producing a position signal which represents the indicated position of the movable member at any instant of time,

the improvement comprising, a position verifier actuated by the passage of said movable member past a predetermined point on said base to produce a verifier signal indicating a precise actual position of the movable member at the instant said verifier signal occurs,

a feedback processor coupled to receive the position signal from said transducer,

means coupling said feedback processor to receive the verifier signal from said position verifier,

means in said feedback processor for determining the difference between the indicated position of the movable member as represented by said transducer position signal and the actual position as represented by said verifier signal and to generate therefrom a compensation factor signal,

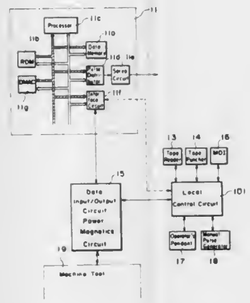
and adjustment means in the numerical control circuit connected to receive said compensation factor signal for adjusting the control of the movement of the movable member so that it is precisely positioned according to the command from the program.

4,628,442

CENTRALIZED PERIPHERAL INTERFACE WITH A NUMERICAL CONTROL UNIT

Shinichi Isobe, and Kazuo Sawada, both of Hino, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP82/00379, § 371 Date May 18, 1983, § 102(e) Date May 18, 1983, PCT Pub. No. WO83/01129, PCT Pub. Date Mar. 31, 1983
Continuation of Ser. No. 499,163, May 18, 1983, abandoned.
This PCT application Sep. 22, 1982, Ser. No. 808,665
Claims priority, application Japan, Sep. 22, 1981, 56-149819
Int. Cl.[4] G05B *19/18;* G06F *15/00*
U.S. Cl. 364—167 **6 Claims**



1. A numerical control apparatus for controlling a machine, comprising:

a numerical control unit;

a data input unit for entering NC data into said numerical control unit;

a manual data input unit for manually entering NC data into said numerical control unit;

an operator's pendant for entering data into said numerical control unit;

a local control circuit for controlling the transfer of data between said data input unit and said numerical control unit, said manual data input unit and said numerical control unit, and said operator's pendant and said numerical control unit, said local control circuit including:

receiver means, respectively connected to said data input, said manual input and said operator's pendant, for receiving NC data from said data input, said manual input and said operator's pendant;

driver means, respectively connected to said data input and said operator's pendant, for providing output NC data to said data input and said operator's pendant;

first data selector means, operatively connected to said receiver means, for selectively providing said received NC data in response to control signals;

second data selector means, operatively connected to said driver means, for providing said output NC data to said driver means in response to said control signals;

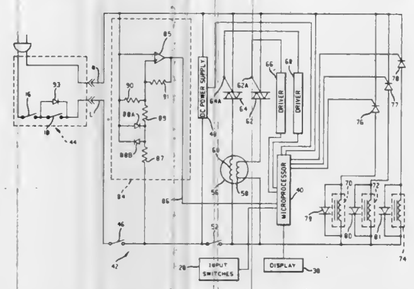
shift register means for receiving in parallel said received NC data from said first data selector means, for providing in parallel said received NC data to said second data selector means, for serially receiving over a single data line said output NC data for said second data selector means, and for serially providing over said single data line said received NC data from said first data selector means, such that said numerical control unit selectively exchanges NC data with said data input unit, said manual input and said operator's pendant over said single data line.

4,628,443

TEST INITIATING APPARATUS FOR APPLIANCES HAVING SELF-DIAGNOSTIC TESTING CAPABILITY

Jimmy R. Rickard, and Robert K. Hollenbeck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 16, 1984, Ser. No. 672,070
Int. Cl.[4] G05B *9/02;* G06F *11/00;* H04M *11/04*
U.S. Cl. 364—184 **9 Claims**



1. For an appliance of the type having a control circuit including logic control means for operating the appliance in a start-up mode each time power is applied to the control circuit and thereafter selectively in a normal operating mode or in a self-diagnostic/test mode, and energized by an alternating current power signal from an external power supply having a fixed nominal frequency coupled to the appliance by power lines, apparatus for initiating operation in the self-diagnostic/test mode comprising:

test circuit means adapted for connection in the power lines between the appliance and the power supply, said test circuit means being selectively switchable between a first state and a second state and operative in its first state to suppress power signal half-cycles of one polarity and in its second state to couple the power signal unchanged to the appliance control circuit;

means included in the control circuit for generating interrupt pulses marking the zero crossings of the power signal;

means included in the logic control means operative in the start-up mode to monitor the pulse rate of said interrupt pulses for a period of predetermined duration and detect a pulse rate different from that associated with the normal power supply frequency and to initiate operation in the self-diagnostic/test mode if such a change is detected and to initiate operation in the normal mode otherwise, whereby appliance operation in the self-diagnostic/test mode is initiated by switching said test circuit to its first state.

4,628,444

OPERATING INFORMATION INPUT METHOD IN NUMERICAL CONTROL APPARATUS

Ryoichiro Nozawa; Nobuyuki Kiya, and Motoaki Yoshino, all of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP83/00325, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01443, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 30, 1983, Ser. No. 616,216
Claims priority, application Japan, Oct. 1, 1982, 57-172862
Int. Cl.[4] G05B *19/00;* G06F *3/00*
U.S. Cl. 364—188 **10 Claims**

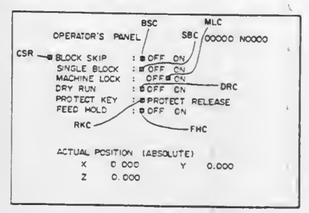
7. An operating information input method in a numerical control apparatus having a keyboard, a display with a screen and which executes prescribed numerical control processing based on numerical control program data and operating information items, said method comprising the steps of:

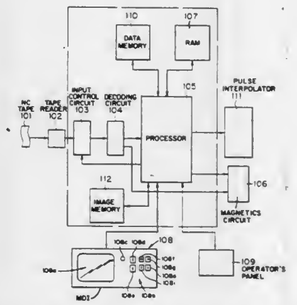
(a) desginating the start of inputting operating information items;

(b) displaying on the screen characters corresponding to a page of said operating information items including selectable items;

(c) positioning a first cursor on the screen for selecting a disired operating information item;

(d) moving a second cursor associated with said desired operating information item to identify a selectable item; and





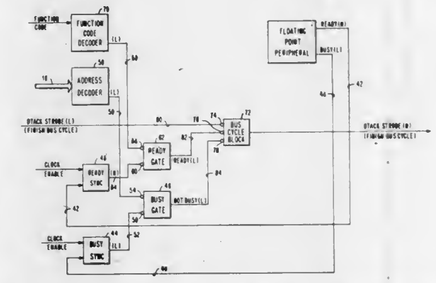
(e) displaying a bar graph on the screen in accordance with the movement of said second cursor to specify an operating quantity of said identified selectable item in accordance with the length of said graph.

4,628,445

APPARATUS AND METHOD FOR SYNCHRONIZATION OF PERIPHERAL DEVICES VIA BUS CYCLE ALTERATION IN A MICROPROCESSOR IMPLEMENTED DATA PROCESSING SYSTEM

Joseph P. Buonomo; Raymond E. Losinger, both of Endicott; Burton L. Oliver, Nanticoke, and Daniel J. Sucher, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 542,934, Oct. 18, 1983, abandoned.
This application Apr. 7, 1986, Ser. No. 848,620
Int. Cl.[4] G06F *13/42*
U.S. Cl. 364—200 **5 Claims**



2. A data processing system including a system bus, a processor means connected to the system bus, a peripheral device connected to the system bus, a storage means connected to the system bus for storing an address representative of said peripheral device, and an apparatus connected to said processor means and to said peripheral device for determining if said peripheral device is busy or not ready and for placing said

processor means in a waiting state when said peripheral device is busy or not ready, said processor means retrieving said address from said storage means and placing said address on said system bus when an access to said peripheral device during a current bus cycle is desired, said processor means developing a function code output signal when an access to said peripheral device during a subsequent bus cycle is desired, said processor means developing a strobe bus cycle signal representative of an attempt by said processor means to access said peripheral device, said peripheral device developing a ready signal when said peripheral device is ready to accept an access and a busy signal when said peripheral device is busy with an operation, said apparatus comprising:

first means responsive to said function code output signal from said processor means and to said ready signal from said peripheral device for developing a further ready signal when said ready signal indicates said peripheral device is ready to accept said access and said function code output signal indicates said operation is not to be performed by said peripheral device;

second means responsive to the presence or absence of said address on said system bus and to said busy signal from said peripheral device for developing a not busy signal when said address has not been placed on said system bus by said processor means and said busy signal indicates said peripheral device is not busy with said operation; and

third means responsive to said further ready signal, to said not busy signal, and to said strobe bus cycle signal for further developing said strobe bus cycle signal in response to said further ready signal and said not busy signal and for blocking the further development of said strobe bus cycle signal in response to the absence of either said further ready signal or said not busy signal,

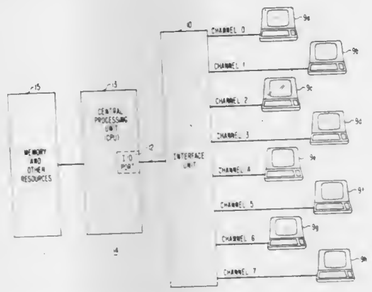
said processor means being placed in said waiting state when the further development of said strobe bus cycle signal is blocked.

4,628,446

MULTICHANNEL INTERFACE

Charles W. Hoffner, II, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1982, Ser. No. 447,272
Int. Cl.⁴ G06F *13/38*
U.S. Cl. 364—200 **33 Claims**



1. A method of interfacing a plurality of narrow-word communication channels to a wide-word communication channel wherein each narrow word appearing on a narrow-word communication channel has a predetermined interval of duration including a plurality of time slots, the method comprising the steps of:

sampling each narrow-word communication channel a plurality of times during each interval to obtain a plurality of samples of each narrow word appearing on each narrow-word communication channel;

storing the samples for processing;

during each one of a plurality of time slots of each interval, processing stored samples of a different one narrow-word communication channel selectively to identify among the processed samples of each narrow-word communication channel a particular sample of a narrow word appearing on that narrow word communication channel;

during a plurality of intervals, storing for each narrow-word communication channel particular samples of a plurality of narrow words appearing on that narrow-word communication channel to assemble from the particular samples a wide word associated with that narrow-word communication channel; and

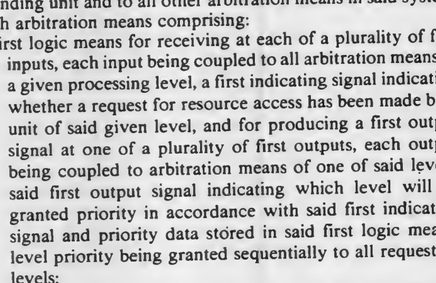
supplying each assembled wide word to the wide-word communication channel.

4,628,447

MULTI-LEVEL ARBITRATION SYSTEM FOR DECENTRALLY ALLOCATING RESOURCE PRIORITY AMONG INDIVIDUAL PROCESSING UNITS

Roger Cartret, and Giovanni Volpe, both of Colombes, France, assignors to Thomson CSF Telephone, Paris, France

Continuation of Ser. No. 281,108, Jul. 7, 1981, abandoned. This application Nov. 2, 1984, Ser. No. 667,391
Claims priority, application France, Jul. 8, 1980, 80 15156; Jul. 31, 1980, 80 16921
Int. Cl.⁴ G06F *15/16, 13/18*
U.S. Cl. 364—200 **2 Claims**



1. Apparatus for decentrally allocating resource priority among the individual processing units in a multi-processor system, each unit being assigned to a processing level and an individual position within that level, said apparatus including a plurality of arbitration means, each one coupled to a corresponding unit and to all other arbitration means in said system, each arbitration means comprising:

first logic means for receiving at each of a plurality of first inputs, each input being coupled to all arbitration means of a given processing level, a first indicating signal indicating whether a request for resource access has been made by a unit of said given level, and for producing a first output signal at one of a plurality of first outputs, each output being coupled to arbitration means of one of said levels, said first output signal indicating which level will be granted priority in accordance with said first indicating signal and priority data stored in said first logic means, level priority being granted sequentially to all requesting levels;

second logic means for receiving at each of a plurality of second inputs, each second input being coupled to a given unit with a same level as said corresponding unit, a second indicating signal indicating whether a request for resource access has been made by said given unit, and for producing a second output signal at one of a plurality of second outputs, said second output signal indicating which unit will be granted priority in accordance with said second indicating signal and priority data stored in said second logic means, unit priority being granted sequentially to all requesting units, and level priority having priority over unit priority;

third logic means connected to one of said first outputs and to one of said second outputs for producing a signal granting resource access to said corresponding unit when said first and second output signals indicate that level and unit priority are to be granted to said corresponding unit; and

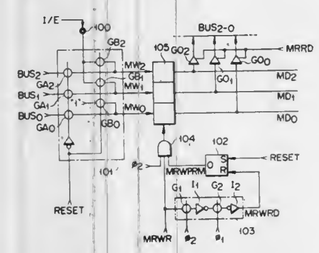
means responsive to a request for resource access by said corresponding unit for producing a third output signal to be applied to one of said second inputs of said second logic means and to second inputs of said second logic means of other arbitration means on said given level, and for producing a fourth output to a applied to one of said first inputs of arbitration means of other levels.

4,628,448

OPERATION MODE SETTING APPARATUS ON A SINGLE CHIP MICROPROCESSOR

Yutaka Murao, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 367,661, Apr. 12, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 675,270
Claims priority, application Japan, Apr. 21, 1981, 56-60127
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—200 **1 Claim**



1. An operation mode setting apparatus on a single chip microprocessor having an internal bus which comprises:

an n-bit operation mode-setting register means for storing the data which specifies one of 2^n operation modes, which modes include two start operation modes;

a single external pin connection for receiving externally supplied logic level signals for specifying one of the two start operations modes;

a first circuit means for generating, according to the logic level signal on said external connection pin, the data for designating the start operation mode;

a second circuit means for causing mode-setting data generated through a user program execution to select one of the 2^n operation modes;

a selector means for allowing said data for designating the start operation mode to be latched into the operation mode-setting register means at the reset state of the microprocessor and for selectively allowing said mode-setting data on the internal bus of the microprocessor to be latched into the operation mode-setting means after the reset state of the microprocessor; and

means for preventing data from being written in the mode-setting register means, until the microprocessor is again brought to a reset state after data is written in the mode-setting register means through said user program execution after the release of the reset state of the microprocessor.

4,628,449

VECTOR INTERRUPT SYSTEM AND METHOD

Fredrick L. Zardiackas, Sunnyvale, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

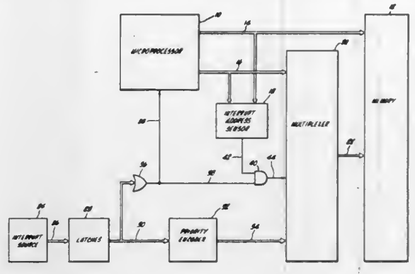
Filed Nov. 14, 1983, Ser. No. 551,300
Int. Cl.⁴ G06F *9/46*
U.S. Cl. 364—200 **5 Claims**

1. A microprocessor system for servicing multiple interrupts, including,

microprocessor means for executing instructions,

memory means, connected by an address bus to said microprocessor means, for storing instructions and data, and

circuit means, connected to said microprocessor means and said memory means, for sensing the presence of one or more copending interrupt requests and for servicing a second one of said co-pending interrupt requests directly after servicing a first one of said co-pending interrupt requests without first performing a restore operation followed by a store operation.

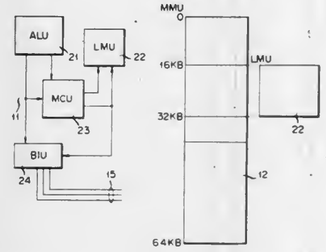


4,628,450

DATA PROCESSING SYSTEM HAVING A LOCAL MEMORY WHICH DOES NOT USE A DIRECTORY DEVICE WITH DISTRIBUTED RESIDENT PROGRAMS AND A METHOD THEREFOR

Fumitaka Sato, 4-18-3, Imadera, Oome-shi, Tokyo, and Kunihiro Nagura, 39-4-408, 1618-1, Ooazayamaguchi, Tokorozawa-shi, Saitama-ken, both of Japan

Continuation of Ser. No. 422,953, Sep. 24, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,884
Claims priority, application Japan, Sep. 29, 1981, 56-153045
Int. Cl.⁴ G06F *12/00*
U.S. Cl. 364—200 **9 Claims**



1. A data processing system comprising:

(a) a main memory having a first plurality of addressable memory locations;

(b) a central processing unit coupled with said main memory including means for producing a current address and, selectively, an access command to said main memory or a local memory using said current address;

(c) a local memory, coupled with said central processing unit, including:

(i) a second plurality of addressable memory locations having the same addresses as a fixed subset of said first plurality of addressable memory locations; and

(ii) means for addressing said second plurality in place of said main memory without use of a directory, using said same addresses and said access command;

so that data from said main memory is not rolled in and out of said local memory;

(d) memory control means for receiving said access command from said central processing unit and providing memory control outputs to said main memory and local memory including:

(i) means for comparing the address of said subset with said current address, which provides an output indicating whether said current address corresponds to a location within said subset; and

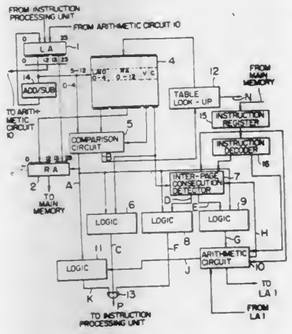
(ii) means, coupled with said output of said means for comparing, for selectively supplying to said main memory and said local memory at least one control signal indicating which of said main memory and said local memory is to be accessed.

4,628,451

DATA PROCESSING APPARATUS FOR VIRTUAL MEMORY SYSTEM

Hideo Sawada, and Kiyoshi Yata, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,120
Claims priority, application Japan, Feb. 12, 1982, 57-20721
Int. Cl.⁴ G06F *9/34*
U.S. Cl. 364—200 **10 Claims**



1. A data processing apparatus for a virtual memory system comprising:

a first register for holding a logical address;

a main memory including a plurality of addressable memory blocks for storing instructions and for storing multi-byte operands which are designated by a logical address of a top byte of the multi-byte operand in said instructions;

instruction means for holding and decoding an instruction to be executed and for supplying a logical address from said instruction to said first register;

table means for effecting address translation of said logical address to a real address for accessing said main memory, including a plurality of entries, each entry having a logical block address, a real block address corresponding to said logical block address and an indication bit indicative of whether an entry of a memory block logically adjacent to the memory block designated by the logical block address in the entry is present in said table means;

means connected to said first register and said table means for reading out an entry from said table means on the basis of the content of said first register;

a second register connected to said first register and said table means for holding a real address for the access of said main memory, said real address being composed of a part of the logical address received from said first register and the real block address in a read out entry from said table means;

means connected to said reading out means for generating a signal indicative of the fact that all bytes of a multi-byte operand designated by an instruction read out from said main memory and held by said instruction means are address-translatable by said table means at the time the address of the top byte of the operand is placed in said first register to read out an entry from said table means, when said indication bit in the read out entry indicates the presence of an entry of the next-adjacent memory block in said table means; and

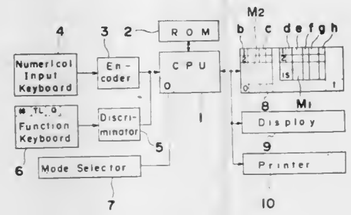
address generating means connected to said reading out means and said instruction means for generating and providing to said first register the byte address of the last byte of said multi-byte operand determined in accordance with said instruction held by said instruction means, when said indication bit in the read out entry indicates the absence of an entry of the adjacent memory block in said table means.

4,628,452

ELECTRONIC CASH REGISTER SYSTEM WITH INPUT VERIFICATION

Fusahiro Shiono, Habikino, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 20, 1983, Ser. No. 515,456
Claims priority, application Japan, Jul. 30, 1982, 57-133934
Int. Cl.⁴ G06F *15/02, 15/21*
U.S. Cl. 364—405 **4 Claims**



1. An electronic cash register comprising:

data processing means for processing data stored in and input to said cash register;

input means associated with said data processing means for inputting to said cash register amounts of money to be registered during the course of a transaction;

first memory means associated with said data processing means for storing a plurality of money amounts representing upper limits and lower limits of amounts of money which are permitted to be registered during the course of a transaction, said first memory means also storing a code associated with each money amount stored therein; and

second memory means associated with said data processing means for storing a plurality of codes associated with a plurality of different kinds of transactions which may be executed by said cash register, said codes stored in said second memory means corresponding to said codes stored in said first memory means for defining upper and lower limits of amounts of money which are permitted to be registered by said cash register during each of said different kinds of transactions by reference to money amounts in said first memory means corresponding to codes associated with a selected kind of transaction,

said data processing means comprising means for comparing money amounts input by said input means with amounts stored in said first memory means.

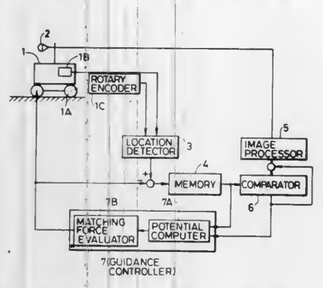
4,628,453

NAVIGATION APPARATUS FOR MOBILE SYSTEM

Kohji Kamejima; Yuji Hosoda, both of Ibaraki; Yoshiyuki Nakano, Hitachi; Masakatsu Fujie, Ibaraki; Taro Iwamoto, Mito; Kazuo Honma, and Takashi Yoshida, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,541
Claims priority, application Japan, Oct. 17, 1983, 58-192353
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—424 **8 Claims**

1. A navigation apparatus for guiding a mobile system along a predetermined path comprising means to detect a path movement of the mobile system, memory means to store three-dimensional predictive patterns relating to positional information of the mobile system, vision means to observe an actual environment and to detect an actual image thereof, image processing means to extract an observed feature pattern from the observed image obtained with said vision means, and guidance control means to compare the observed feature pattern from said image processing means and the predicted pattern delivered from said memory means in accordance with the positional information of the mobile system and to provide a guidance signal for the mobile system as an output.



4,628,454

AUTOMATIC RUNNING WORK VEHICLE

Katsumi Ito, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed May 20, 1983, Ser. No. 496,566
Claims priority, application Japan, Jul. 13, 1982, 57-121565
Int. Cl.⁴ G06F *15/50;* B62D *1/28*
U.S. Cl. 364—424 **7 Claims**

1. An automatic running work vehicle controllable to travel along a series of parallel straight courses on a defined work site, following a boundary between a worked area and an unworked area, and to reverse its travelling direction at an end of each of the courses, said vehicle comprising:

a plurality of position sensor means for detecting said boundary and a beginning and an end of said courses,

transmitter means for transmitting a pulse per unit of travelling distance upon detection of said beginning of the course by said position sensor means, and for continuing to transmit said pulse per unit of travelling distance until detection of said end of the course by said position sensor means,

orientation sensor means for detecting the travelling direction of the vehicle and for transmitting an orientation signal,

storing means for (i) counting the pulses when the vehicle starts running along the straight course, (ii) receiving said orientation signal when the count reaches a predetermined value, (iii) successively storing in order, pairs of data, each pair consisting of running distance data corresponding to said count and orientation data, and (iv) successively reading out said pairs of the data in reverse order to said order of storing said data, when the travelling direction of the vehicle is reversed at the end of said course, and

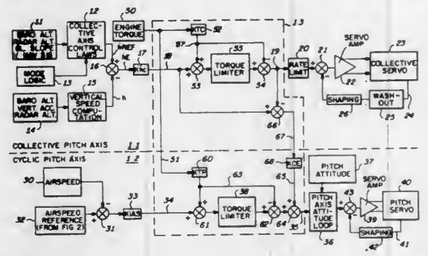
steering control means operatively connected to said position sensor means and said storing means for (a) steering said vehicle along said boundary in accordance with the detection of said boundary by said position sensor means and (b) steering said vehicle in accordance with said stored pairs of data in response to said boundary remaining undetected by said position sensor means for a predetermined time.

4,628,455

CROSS AXIS TORQUE LIMITER FOR HELICOPTER AUTOPILOT

Edmund Skutecki, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,294
Int. Cl.⁴ G06F *15/50;* G06G *7/78*
U.S. Cl. 364—434 **12 Claims**



1. A flight control system for helicopters having cyclic pitch means for controlling the pitch attitude thereof and collective pitch means for controlling the direct lift thereof, means for providing an altitude error rate signal corresponding to the algebraic difference between craft vertical speed and a vertical speed reference, means for providing an airspeed error signal corresponding to the algebraic difference of craft airspeed and an airspeed reference, and means for providing a signal representing developed engine torque, said torque having a predetermined maximum value, comprising:

first limiter means for receiving said altitude error rate signal and said engine torque signal and providing an altitude error rate signal limited to a predetermined maximum, and for providing a collective pitch command signal to said collective pitch means,

second limiter means for receiving said airspeed error signal and said engine torque signal and providing an airspeed error signal limited to a further predetermined maximum, and for providing a cyclic pitch command signal to said cyclic pitch means,

first algebraic summing means responsive to said altitude error rate signal and said collective pitch command signal for providing a vertical rate correction signal representing the difference between commanded torque and developed collective torque to said cyclic pitch means, and

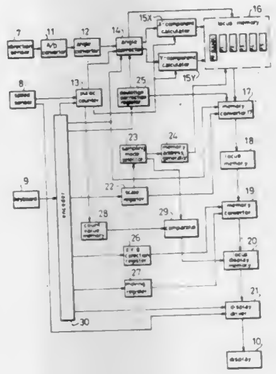
second algebraic summing means for receiving said vertical rate correction signal and said cyclic pitch command signal and conveying the sum of said vertical rate correction and cyclic pitch command signals to said cyclic pitch means, so that said cyclic pitch means responds only to said vertical rate correction signal and said direct lift is apportioned between said collective pitch means and said cyclic pitch means when said flight control system demands at least said predetermined maximum engine torque, and said collective pitch means and said cyclic pitch means are independently responsive to said respective altitude error rate and airspeed error signals when said demanded torque is less than said predetermined maximum.

4,628,456

COURSE GUIDANCE SYSTEM

Itaru Hatano, Morioka; Kenji Takahashi, Iwate; Shigeru Hirosawa, Iwate; Mikio Kanda, Iwate; Teruo Mimori; Toshio Sasaki, both of Yokohama; Tadashi Mukai, Tokyo; Tsuneo Takahashi, Saitama; Shinichiro Yasui, Tokyo, and Akira Ichikawa, Saitama, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 6, 1982, Ser. No. 405,767
Claims priority, application Japan, Aug. 7, 1981, 56-123876
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—449 **7 Claims**



1. In a course guidance system for a moving body which includes a direction sensor and a speed sensor mounted to the moving body, a display, a map displayed on said display, and a display information processing unit including position calculating means for periodically deriving the coordinates of the positions of the moving body relative to a predetermined reference position on said map based upon the outputs of said direction and speed sensors, a locus memory for sequentially storing locus data corresponding to the derived coordinates of positions traversed by the moving body from the reference position, and means including a locus display memory for storing and plotting a course locus corresponding to the locus data on the display in registration with said map,

the improvement wherein said display information processing unit further comprises:

a keyboard for inputting linear displacement and rotation data to said processing unit indicative of a desired adjusting movement of the entire course locus on the display relative to said map;

means for setting the desired scale of the map input through said keyboard and means for selecting the locus data in said locus memory corresponding to the desired map scale; and

means including a memory converter for converting the scale selected locus data from said locus memory in accordance with said linear displacement and rotation data and transferring the converted locus data to said locus display memory.

4,628,457

POSTAL RATE MEMORY MODULE WITH INTEGRAL BATTERY POWER

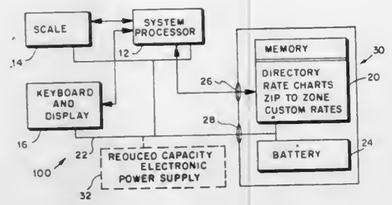
Flavio M. Manduley, Woodbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 19, 1984, Ser. No. 590,670
Int. Cl.⁴ G06F *15/21, 9/06*
U.S. Cl. 364—464 **17 Claims**

1. A memory module comprising;

(a) a postal rate memory storing postal rate information for use in a postal scale having a processor for computing appropriate postage for items to be mailed;

(b) a battery having sufficient capacity to provide at least a substantial portion of the power requirements of such scale until said memory is replaced with an updated postal rate memory;



(c) first means for connecting said battery to said memory to provide power to said memory; and,

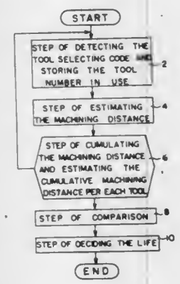
(d) second means for connecting said memory to said processor so that such processor may access said postal rate information to compute said appropriate postage.

4,628,458

METHOD OF DETECTING LIFT OF TOOL BASED UPON CUMULATIVE MACHINING DISTANCE

Takeshi Ohta, Nishio; Tetsuro Yamakage, Anjoh, and Yoshio Sakakibara, Handa, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 15, 1984, Ser. No. 621,233
Claims priority, application Japan, Jun. 30, 1983, 58-118493
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—474 **3 Claims**



1. A method of detecting the life of each of plural tools which are selectively used in accordance with a numerical control program to affect a machining operation on a workpiece in a machine tool, comprising the steps of:

detecting a tool selection code at each execution step of the NC program and storing a tool number of a tool currently in use as derived from the tool selection code;

calculating an actual machining distance for the currently in use tool during machining of the workpiece by the currently in use tool;

accumulating the actual machining distance for each tool by storing the actual machining distance determined in said calculating step for each tool and by adding thereto the actual machining distance calculated for subsequent uses of the respective tool;

comparing the accumulated actual machining distance with a predetermined machining life distance to indicate the life of each tool; and

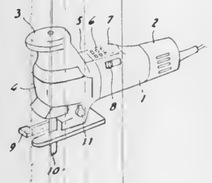
determining the life of each tool based on a result obtained in the comparing step.

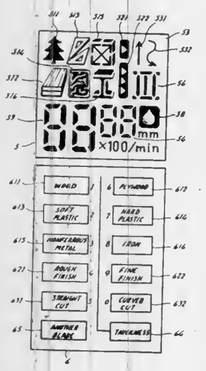
4,628,459

COMPUTERIZED CIRCUIT ARRANGEMENT FOR JIG SAW

Shigeru Shinohara; Shun Suzuki, both of Katsuta, and Tatsuo Innami, Mito, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Mar. 7, 1984, Ser. No. 586,925
Claims priority, application Japan, Mar. 8, 1983, 58-37975
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—475 **9 Claims**





1. A circuit arrangement for an electrical jig saw of the type arranged such that a replaceable blade is driven by an electrical motor so as to move along a locus selected from a plurality of orbital modes, comprising:

(a) first means for inputting information including the sort of the material of a workpiece to be cut, the thickness of the workpiece, desired degree of finish, and the way of cutting;

(b) second means for computing and determining optimum working conditions including an optimum sort of blade, optimum blade strokes, optimum orbital mode, and information as to the necessity of application of coolant oil by using said inputting information;

(c) third means for displaying inputting information from said first means and said optimum working conditions from said second means;

(d) fourth means for detecting the rotational speed of said motor and producing an output signal indicative of the speed measured;

(e) fifth means for producing a control signal by using said output signal from said fourth means and said optimum blade strokes from said second means; and

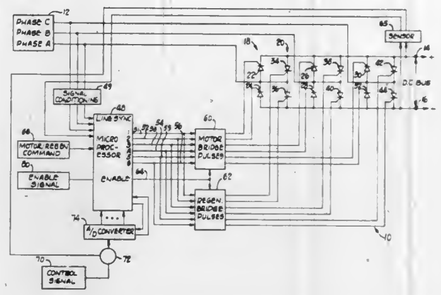
(f) sixth means for controlling the rotational speed of the motor in accordance with said control signal.

4,628,460

MICROPROCESSOR CONTROLLED PHASE SHIFTER

William L. Frederich, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 17, 1982, Ser. No. 419,285
Int. Cl.⁴ G06F *15/20;* **H02P** *5/16;* **H02M** *5/42*
U.S. Cl. 364—480 **10 Claims**



1. A method for controlling the conversion of AC electrical energy into DC electrical energy by controllably switching on and off the AC electrical energy source comprising the steps of:

(a) switching the AC electrical energy source on and off for outputting said DC electrical energy;

(b) controlling the switching of the AC electrical energy source in response to the AC electrical energy source;

(c) generating a control signal to control the switching of the AC electrical energy source to output a desired value of DC electrical energy;

(d) sensing said control signal a predetermined number of times during a cycle of the AC electrical energy source;

(e) periodically sensing frequency of said AC electrical energy source;

(f) determining the timing of gating signals for switching said AC electrical energy source on and off responsive to said periodically sensed frequency of said AC electrical energy source and to said control signal to produce a controllable DC electrical energy level; and

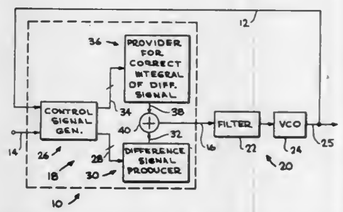
(g) generating said gating signals responsive to said determined timing of gating signals to control said switching of said AC electrical energy source.

4,628,461

PHASE DETECTOR

Neil R. Adams, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 30, 1984, Ser. No. 605,320
Int. Cl.⁴ H03L *7/08;* **H03K** *1/17*
U.S. Cl. 364—481 **19 Claims**



1. Apparatus for comparing in real time first signals and second signals, comprising:

(a) means for generating control signals corresponding to the occurrence of the first signals and the occurrence or non-occurrence of the second signals; and

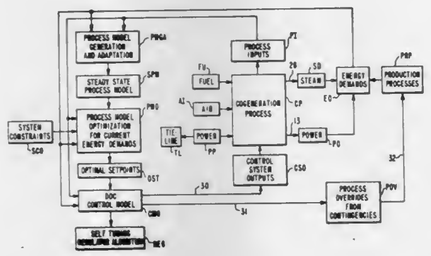
(b) means, responsive to said control signals, for producing an output signal indicating differences between the real time occurrence of the first signals and second signals, said means for producing being operative during the occurrence or non-occurrence of the second signals, said means for producing being operative during the non-occurrence of the second signals while producing no change in the output signal.

4,628,462

MULTIPLANE OPTIMIZATION METHOD AND APPARATUS FOR COGENERATION OF STEAM AND POWER

Richard E. Putman, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 11, 1984, Ser. No. 649,462
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—494 **7 Claims**



1. In a steam and power cogeneration system including a network of fluid flow for passing a demand of steam therethrough at respective higher and lower pressures, embodying at least two steam-to-power converter units operatively connected between corresponding ones of said flow lines at different pressures, and at least two pressure reducing valves operatively connected between corresponding ones of said flow lines at different pressures; the combination of:

means for optimizing power generation by said steam-to-power converter units and for optimizing steam flow through said network in accordance with a predetermined concurrent steam and power demand;

said optimizing means being operable in relation to a plurality of predetermined planes of control each defined by a given status and configuration of said network;

means being provided responsive to a change of actual network status and configuration for selecting optimization by said optimizing means by reference to a new plane of control associated with the new and actual status and configuration of said network;

means for controlling the distribution of steam through said network and concurrent generation of power in accordance with the optimizing results for said new plane of control.

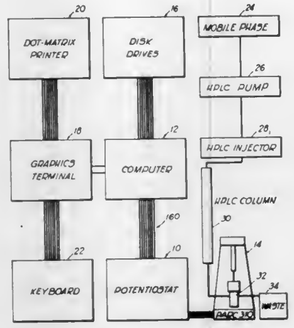
4,628,463

RAPID-SWEEP ELECTROCHEMICAL DETECTOR FOR CHEMICAL ANALYSIS OF FLOW STREAMS

Peter E. Sturrock, Doraville, and Gerald E. O'Brien, Atlanta, both of Ga., assignors to Georgia Tech. Research Institute, Atlanta, Ga.

Filed Mar. 5, 1984, Ser. No. 585,429
Int. Cl.[4] G01N *27/46;* **G06F** *15/20, 15/46*
U.S. Cl. 364—497 **17 Claims**

9. A data acquisition system comprising computer means and a measuring and control instrument, said instrument including analog circuit means for measuring at least one variable analog function with high sensitivity, logic means for controlling the measuring and control instrument, and an internal data bus as an input to said analog circuit means; an active data bus connected to said computer means; input means for sequentially connecting said active data bus as an input to said internal data bus and for grounding said internal data bus for a time sufficient to allow measurement with high sensitivity; and output means for repetitiously converting said variable analog function to digital format and for connecting said digital format to said active data bus.

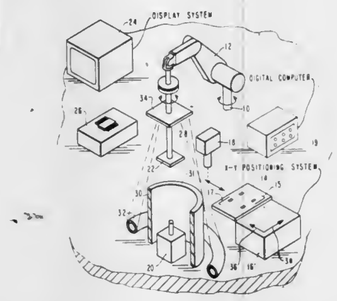


4,628,464

ROBOTIC SYSTEM FOR MOUNTING ELECTRICAL COMPONENTS

William P. McConnell, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 540,066, Oct. 7, 1983, abandoned. This application Feb. 25, 1986, Ser. No. 834,494
Int. Cl.[4] G06F *15/00;* **B25J** *9/00*
U.S. Cl. 364—513 **7 Claims**



1. A system for positioning an electrical component at a predetermined location on a circuit board, comprising:

(a) light producing means for projecting light in an array which is peripherally beyond the periphery of said component to avoid illuminating a bottom side of said component and to illuminate reflecting means spaced above the top side of said electrical component;

(b) visual means positioned to view the bottom side of said component and to produce a high contrast image of the peripheral shadow of said component;

(c) said visual means including means utilizing said high contrast shadow image for generating the angular rotational and position data of said electrical component;

(d) first positioning means utilizing said angular rotational data for rotating said electrical component to a predetermined angular position relative to said circuit board;

(e) second positioning means utilizing said position data for repositioning said electrical component relative to said circuit board in at least first and second directions; and

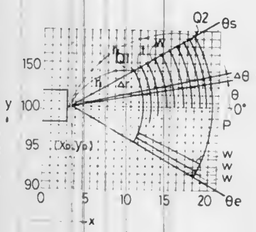
(f) third positioning means for positioning said electrical component in at least a third direction to position said electrical component at said predetermined location on said circuit board.

4,628,465

METHOD AND APPARATUS FOR MEASURING SHAPE OF INJECTED SUBSTANCE

Shinzo Ito, Chita-gun, and Yasuhiro Kaneko, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya City, Japan

Filed Nov. 6, 1984, Ser. No. 668,871
Claims priority, application Japan, Nov. 10, 1983, 58-211589
Int. Cl.[4] G06F *15/626*
U.S. Cl. 364—521 **7 Claims**



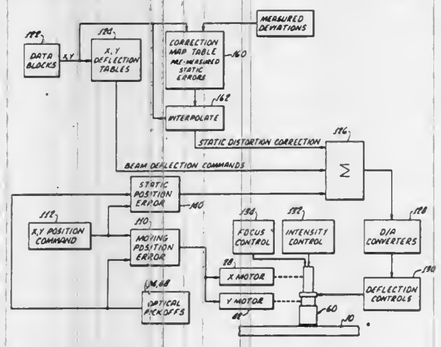
1. A method of measuring the shape of an injected substance, comprising the steps of; forming, on a photoelectric converter, an optical image of the substance injected from an opening; scanning the optical image on said photoelectric converter and thereby producing a video signal corresponding to the luminance of said optical image; sampling said video signal in conformity wih plane coordinates on said photoelectric converter and computing a plane luminance distribution function of said optical image; determining a line to cut said optical image, then selecting line elements of a fixed length perpendicular to said line, and computing an average luminance at the individual line elements on the basis of said plane luminance distribution function, thereby obtaining a linear luminance distribution function of said optical image along said cut line; and specifying the shape of said injected substance according to said linear luminance distribution function.

4,628,466

METHOD AND APPARATUS FOR PATTERN FORMING

LaRoy Tymes, San Jose, Calif., assignor to Excellon Industries, Torrance, Calif.

Filed Oct. 29, 1984, Ser. No. 665,930
Int. Cl.[4] G06F *15/60, 15/62*
U.S. Cl. 364—521 **33 Claims**



1. Pattern forming apparatus comprising

an image generator having means for projecting an energy beam to a target area of said image generator, and deflection means for causing said energy beam to scan said target area and form an image thereon,

a support for carrying a medium upon which a pattern is to be formed,

means for mounting said image generator and support for relative motion in a predetermined direction to enable the image generator to move across the surface of said medium, said image generator being positioned with said target area adjacent the surface of said medium,

drive means for relatively moving said image generator and support in said direction in discrete steps to each of a plurality of positions,

means for operating said image generator at individual ones of said positions to cause said energy beam to scan said target area and form a scanned image section, each said scanned image section comprising an individual section of a pattern to be formed on said medium,

sensing means for sensing relative positions of said image generator and support in said direction, and

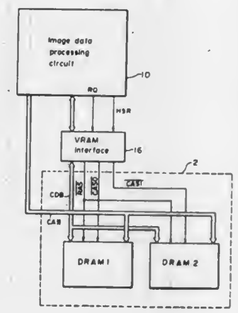
means responsive to said sensing means for controlling said deflection means to displace an image formed on said target area.

4,628,467

VIDEO DISPLAY CONTROL SYSTEM

Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, Hamamatsu; Takatoshi Okumura, Hamamatsu, and Minoru Morimoto, Hamamatsu, all of Japan, assignors to Ascii Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of Japan

Filed May 17, 1985, Ser. No. 735,370
Claims priority, application Japan, May 18, 1984, 59-100302
Int. Cl.[4] G06F *15/62;* **G09G** *1/02, 1/28*
U.S. Cl. 364—521 **3 Claims**



1. A video display control system adapted to be connected to a video display unit for displaying a video image on a screen of the video display unit comprising:

(a) first and second memory means for storing image data representative of the video image, each of said first and second memory means having (i) a plurality of addresses, (ii) a data input/output terminal, (iii) an address input terminal, (iv) row and column address strobe input terminals, (v) row address latch means responsive to a row strobe signal applied to said row address strobe input terminal for latching row address data applied to said address input terminal, and (vi) column address latch means responsive to a column strobe signal applied to said column address strobe input terminal for latching column address data applied to said address input terminal, said row and column address data latched by both of said row and column address latch means determining one of said plurality of addresses with which transfer of data is made through said data input/output terminal, said data input-

/output terminal being in a high-impedance state when no signal is applied to said column address strobe input terminal;

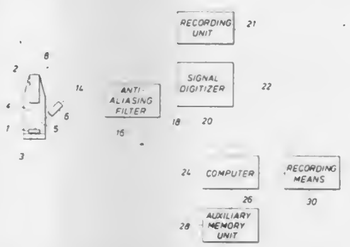
(b) display control means having (i) an address bus connected to both of said address input terminals of said first and second memory means, (ii) a data bus connected to both of said data input/output terminals of said first and second memory means, (iii) access control means for outputting row address data of a selected one of said plurality of addresses onto said address bus and for feeding a row address strobe signal to both of said row address strobe input terminals of said first and second memory means, said access control means subsequently outputting column address data of said selected address onto said address bus and feeding alternatively first and second column address strobe signals to said column address strobe input terminal of said first memory means and said column address strobe input terminal of said second memory means, respectively, whereby said display control means establishing an access to said selected address of each of said first and second memory means so that transfer of data with said selected addresses is effected through said data bus.

4,628,468

METHOD AND MEANS FOR DETERMINING PHYSICAL PROPERTIES FROM MEASUREMENTS OF MICROSTRUCTURE IN POROUS MEDIA

Arthur H. Thompson; Alan J. Katz, and Christine E. Krohn, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Apr. 13, 1984, Ser. No. 599,842
Int. Cl.⁴ H01J *37/26, 37/29;* **G01V** *1/40*
U.S. Cl. 364—556 **43 Claims**



10. A method for determining pore-dependent properties of a microporous rock, comprising the steps of:

(a) scanning the surface of a sample of the rock with a microscope operated at a first selected magnification to generate a microscope output signal indicative of geometric features of the sample intersecting a path on the surface;

(b) generating from the microscope output signal a feature size distribution signal indicative of the number of geometric features resolved by the microscope which intersect the path and which have size less than a selected fraction of the full-scale image size associated with said first selected magnification;

(c) repeating steps (a) and (b), operating the microscope used during each repetition at a selected magnification different from each magnification used in performing a previous repetition so as to generate during each repetition a microscope output signal associated with the selected magnification used during such repetition and a feature size distribution signal associated with the selected magnification used during such repetition; and

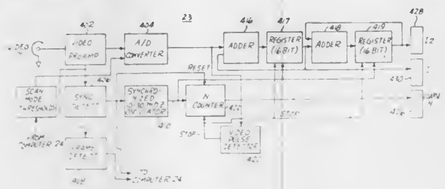
(d) determining from the generated feature size distribution signals the fractal dimensionality, D, of the sample pore space, from which the rock porosity, ϕ, is determined by the relation $\phi=(l_1/l_2)^{3-D}$, where l_1 is the minimum length at which the sample exhibits self-similarity and l_2 is the maximum length at which the sample exhibits self-similarity.

4,628,469

METHOD AND APPARATUS FOR LOCATING CENTER OF REFERENCE PULSE IN A MEASUREMENT SYSTEM

Steven J. White, Seattle, Wash., assignor to Technical Arts Corporation, Seattle, Wash.

Division of Ser. No. 426,840, Sep. 29, 1982, Pat. No. 4,498,778, which is a continuation-in-part of Ser. No. 249,131, Mar. 30, 1981, abandoned. This application Oct. 17, 1984, Ser. No. 661,780
Int. Cl.⁴ G01B *11/24;* **G02B** *26/10*
U.S. Cl. 364—560 **5 Claims**



1. In a method for determining spatial coordinates of a workpiece, the steps comprising:

(a) illuminating said workpiece with a planar source of light;

(b) electronically viewing the intersections of the planar source of light and said workpiece from a known location spaced apart from said workpiece;

(c) scanning electronic images formed by said electronic viewing along a plurality of scan lines, in which the scanning of each line produces a reference pulse corresponding to the location at which the planar light intersects said workpiece;

(d) determining the centroid of the reference pulse on at least one of said scan lines by the substeps of:

(i) sampling a pulse signal representing said reference pulse;

(ii) digitizing said samples to generate digital values representative of the magnitude of said pulse samples;

(iii) performing a first integration by sequentially adding said digital values to produce a first sum signal;

(iv) performing a second integration by adding intermediate sums associated with said substep of sequentially adding said digital values to produce a second sum signal; and

(v) dividing said second sum signal by said first sum signal to produce an offset distance representing an offset distance by which the centroid of said pulse signal precedes the location at which the last sample of said pulse signal was taken; and

(e) calculating the spatial coordinates of said point on the workpiece using the centroid of said reference pulse and said known location of said step of electronic viewing.

4. In an apparatus for determining spatial coordinates of a workpiece, the combination comprising:

(a) means for illuminating said workpiece with a planar source of light;

(b) means for electronically viewing the intersections of the planar source of light and said workpiece from a known location spaced apart from said workpiece;

(c) means for scanning electronic images formed by said electronic viewing along a plurality of scan lines, in which the scanning of each line produces a reference pulse corresponding to the location at which the planar light intersects said workpiece;

(d) means for determining the centroid of the reference pulse on at least one of said scan lines comprising the subcombination of:

(i) means for sampling a pulse signal representing said reference pulse;

(ii) means for digitizing said samples to generate digital values representative of the magnitude of said pulse samples;

(iii) means for performing a first integration by sequentially adding said digital values to produce a first sum signal;

(iv) means for performing a second integration by adding intermediate sums associated with said means for performing said first integration to produce a second sum signal; and

(v) means for dividing said second sum signal by said first sum signal to produce an offset distance signal representing an offset distance by which the centroid of said pulse signal precedes the location at which the last sample of said pulse signal was taken; and

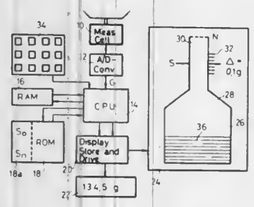
(e) means for calculating the spatial coordinates of said point on the workpiece using the centroid of said reference pulse and said known location of said means for electronic viewing.

4,628,470

APPARATUS AND METHOD FOR GENERATING A PICTORIAL DISPLAY ON A MEASURING INSTRUMENT DURING A METERING PROCESS

Arthur Baumann, Bertschikon, Switzerland, assignor to Mettler Instruments AG, Greifensee-Zurich, Switzerland

Filed Jan. 9, 1984, Ser. No. 569,175
Claims priority, application Switzerland, Jun. 10, 1983, 3197/83
Int. Cl.⁴ G09F *9/32;* **G06F** *15/20*
U.S. Cl. 364—567 **20 Claims**



1. Method for guiding an operator metering a substance from a starting value to a desired value on a measuring instrument having a display unit, comprising the steps of

creating from display element means a clearly defined outline of a container on said display unit;

creating weight signals indicative of the then-present weight of said substance on said measuring instrument;

creating weight indicating control signals in response to said weight signals;

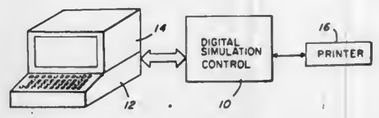
said weight indicating control signals displaying any change in the contents of said container on said display unit from said starting value to said desired value at a first image rate of change relative to the rate of change of said substance on said measuring instrument at the start of said metering, and at a second image rate of change relative to the rate of change of said substance before said desired value is reached.

4,628,471

DIGITAL SYSTEM SIMULATION METHOD AND APPARATUS HAVING TWO SIGNAL-LEVEL MODES OF OPERATION

Donald Schuler, Wayland, and Mahesh Doshi, Framingham, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 2, 1984, Ser. No. 576,423
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—578 **9 Claims**



1. Apparatus for simulating the behavior of a digital circuit, the digital circuit having a plurality of connected circuit elements, the apparatus comprising

means for defining inputs to said circuit elements,

means for defining output signal levels for outputs of said circuit elements based upon a functionally dependent relationship between said inputs and outputs, and

means for evaluating said circuit element input and output relationships for performing gate level simulation and switch level simulation,

said evaluation means operating

in a first lower signal-level simulation mode for gate level simulation, and

in a second higher signal-level simulation mode for switch level simulation,

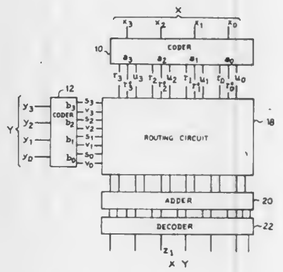
whereby said apparatus simulates said digital circuit behavior in either a lower level or a higher level simulation mode depending upon the class of circuit element for which a said input is being received.

4,628,472

BINARY MULTIPLIER USING TERNARY CODE

Thierry Fensch, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis², Grenoble, France

Filed Nov. 18, 1983, Ser. No. 553,488
Claims priority, application France, Nov. 26, 1982, 82 19921
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—759 **8 Claims**



3. A binary multiplier circuit for receiving in the form of logic electric signal a first binary number X and a second binary number Y, so as to supply in the form of logic electric signal the product of these two numbers, said multiplier circuit comprising a coder for converting n binary signals y_j(j=0 to n−1) representing number Y into n pairs of binary signals (s_j,v_j), each pair representing one coefficient b_j(j=0 to n−1), where b_j can be 0, 1 or −1 and where one signal (s_j) of the pair represents the sign of b_j and the other signal (v_j) of the pair

represents the module of b_j, where the product of two consecutive coefficients b_j and b_{j-1} is zero, and where the coefficients b_j are such that

$$Y=b_{n-1}2^{n-1}+b_{n-2}2^{n-2}+\ldots b_12^1+b_o$$

said multiplier circuit further comprising a second coder for converting m binary signals x_i representing number X into m pairs of binary sigals (r_i,u_i), each pair representing one coefficient a_i(i=0 to m−1), where a_i can be 0, 1 or −1 and where one signal r_i of the pair represents the sign of a_i and the other signal u_i of the pair represents the module of a_i, where the product of two consecutive coefficients a_i and a_{i-1} is zero, and where the coefficient a_i are such that

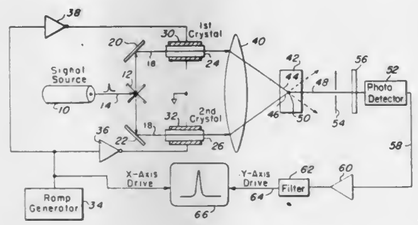
$$X=a_{m-1}2^{m-1}+a_{m-2}2^{m-2}+\ldots a_12^1+a_o$$

said multiplier further comprising a routing circuit and a binary adder stage, said routing circuit receiving the outputs of said second coder and the routing circuit being controlled by the outputs of said first coder, and said adder stage receiving outputs from the routing circuit.

4,628,473
SYSTEM FOR AUTOCORRELATING OPTICAL RADIATION SIGNALS

James A. Weaver, Palo Alto, Calif., assignor to Cooper Lasersonics, Inc., Santa Clara, Calif.

Filed Jul. 27, 1984, Ser. No. 635,007
Int. Cl.⁴ G06G *7/19*
U.S. Cl. 364—822 **28 Claims**

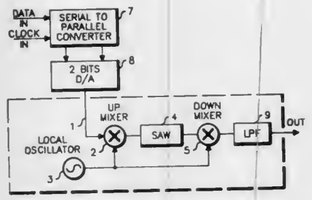


1. A system for autocorrelating an optical radiation signal comprising means for producing a first optical beam and a second optical beam from said optical radiation signal; beam delay means for selectively producing a relative time adjustment between said first and second optical beams; and means for determining the product of said optical beams over a range of time adjustments between said optical beams to provide a measurement of said optical radiation signal, said beam delay means comprising at least one electro-optic crystal, means for selectively applying an electric field across said crystal to vary the index of refraction of said crystal, and means for directing at least one of said optical beams through said electro-optic crystal before determining the product of said optical beams such that selected variations in the electric field across said crystal produce selected time adjustments between said optical beams.

4,628,474
MODIFIED DUOBINARY FILTER USING SAW TECHNIQUE

Salomon Serfaty, Doar Gaash, and Mordechay Cohen, Giv-'Atayim, both of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1984, Ser. No. 613,924
Claims priority, application United Kingdom, May 25, 1983, 8314478
Int. Cl.⁴ G06G *7/00*
U.S. Cl. 364—825 **7 Claims**



1. A modified-duobinary filter arrangement for filtering data symbols spaced at time intervals T, comprising:
a first mixer for translating the frequency of an analogue data input signal in a first direction to provide a data modulated intermediate frequency (I.F.) signal;
a surface acoustic wave filter for filtering the I.F. signal, and
a second mixer for translating the frequency of the filtered I.F. signal in a second direction opposite to the first direction;
wherein the surface acoustic wave filter has a transfer function response, H(f), as a function of frequency, f, given by:

$$H_2{}^T\mathrm{IF}(f)=H_2{}^T(f+f_o)+H_2{}^T(f-f_o)$$

where:

$$H_2{}^T(f)=\frac{H^T(f)}{H_1(f)},$$

f_o is the I.F. frequency, and

$$H_1(f)=\frac{T\sin(\pi fT)}{\pi fT};$$

where:
T is the symbol time interval, and
H^T(f) is a truncated version of a function H(f) whose time-domain response h(t) is given by:

$$h(t)=f_1\left[\frac{\sin 2\pi f_1(t+T)}{2\pi f_1(t+T)}-\frac{\sin 2\pi f_1(t-T)}{2\pi f_1(t-T)}\right]$$

where:
$f_1=1/2T$,
and the truncation is defined by:

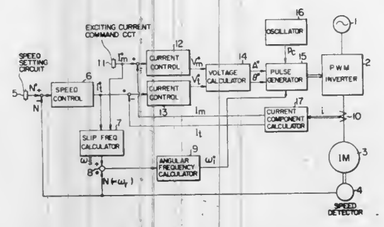
$$h^T(t)=\begin{cases}h(t) & -\tau/2<t<\tau/2,\\ 0 & \text{elsewhere,}\end{cases}$$

where τ is the truncation interval.

4,628,475
PULSE WIDTH MODULATION PULSE GENERATOR

Noboru Azusawa, and Hisayoshi Shiraishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,720
Claims priority, application Japan, Feb. 4, 1983, 58-16039
Int. Cl.⁴ G06G *7/16*; H02P *13/18, 8/00*; H02M *7/48*
U.S. Cl. 364—851 **4 Claims**



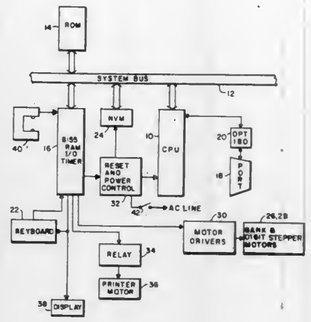
1. A pulse width modulation pulse generator comprising:
modulating wave generating means for generating a sine wave modulating signal which forms a fundamental component of an output voltage of a pulse width modulation inverter;
carrier generating means for generating a sine wave carrier signal which is at a frequency n times as high as a frequency of said sine wave modulating signal and synchronized with said sine wave modulating signal; and
comparison means connected to said modulating wave generating means and said carrier generating means for comparing said sine wave modulating signal with said sine wave carrier signal to generate a pulse width modulation pulse.

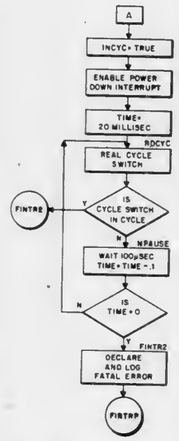
4,628,476
COMPLETING AN INCOMPLETE TRIP IN AN ELECTRONIC POSTAGE METER

Edward C. Duwel, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,918
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—900 **10 Claims**

1. A method for completing an incomplete trip in an electronic postage meter, comprising the steps of:
reading the state of a bistable member after the trip cycle has commenced;
setting a fatal error if the bistable member is in its Home state prior to completion of the trip cycle;
energizing a drive motor to try to complete the trip cycle;





reading the state of the bistable member;
de-energizing the drive motor after a selected maximum period of time.

4,628,477
PROGRAMMABLE PUSH-POP MEMORY STACK

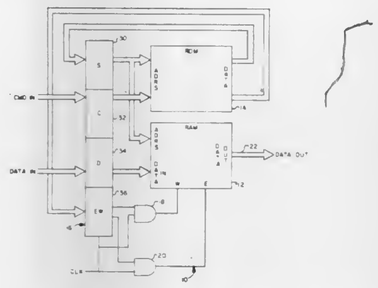
James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1983, Ser. No. 542,326
Int. Cl.⁴ G06F *12/00, 9/00*
U.S. Cl. 364—900 **5 Claims**

1. A data stack for sequentially receiving data from a data processing system including means for transmitting address signals, means for transmitting data and means for transmitting commands in synchronism with the data, the data stack storing the data and transmitting the stored data in a selected one of a FIFO and a LIFO sequence in response to commands from the data processing system, the data stack comprising:
means for generating timing signals;
a random access memory connected to the data transmitting means and having a plurality of addressable storage locations, means for receiving address signals and data signals and for storing the received data signals in a storage location identified by the address signals in response to the receipt of a write enabling signal, and means for transmitting contents of a storage location identified by the ad-

dress signals in response to the receipt of a read enabling signal;

state means connected to the timing signal generating means, the command transmitting means and the random access memory for generating read and write enabling signals and address signals identifying a storage location in the random access memory in response to each command in synchronism with the timing signals, the address signals being transmitted to the random access memory address



signal receiving means and the state means, the state means generating address signals in response to the commands and address signals transmitted by the state means at the next succeeding timing signal for reading information from the random access memory means in a selected one of a FIFO and a LIFO sequence; and

means for selectively coupling address signals from the data processing system or address signals from the state means to the random access memory.

4,628,478

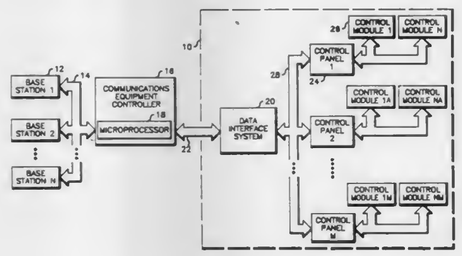
REMOTE DATA CONTROLLER FOR A COMMUNICATION SYSTEM

James A. Henderson, Jr., Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,611

Int. Cl.[4] G06F *13/00, 11/00*

U.S. Cl. 364—900 **9 Claims**



9. In a communications system including communications equipment having operator selectable functions and providing status signals representative of the operation condition of features of the communication equipment and means for controlling the communications equipment, the improvement in said controlling means comprising:

control modules each including means for receiving indicia data representative of the operational condition of the features of the communications equipment and providing indicia representative thereof, and means for generating data for controlling the functions selected on the communications equipment;

at least two control panel means each coupled to a predetermined plurality of said control modules for communicating digitally with each of said plurality, each of said control panel means including a panel selector having a predetermined address, and a module selector having a predetermined address for selecting one of the control modules associated with a control panel means;

data interface circuit means coupled between the communications equipment and each of said control panel means for communicating digitally with each of the control panel means, said data interface circuit means including a microprocessor means for selecting one of said panel means and one of its associated control modules via addressing the corresponding panel selector and module selector, writing indicia data representative of said status signal to the selected control module via the selected control panel means, and for reading said control data generated by said generating means as coupled by said control panel means; and

data transfer circuit means for controlling the transfer of data from said control modules to said microprocessor means and for controlling the transfer of data from said microprocessor means to said control modules, said data transfer circuit means including a single clock means for generating clock pulses which are coupled to said control panel means and control modules, said clock means providing the sole source of clock pulses for the control panel means and control modules.

4,628,479

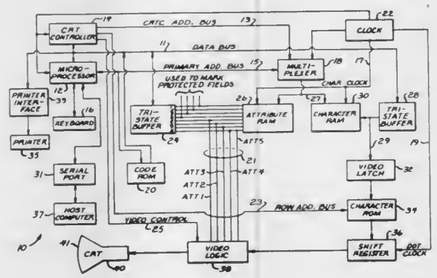
TERMINAL WITH MEMORY WRITE PROTECTION

Arthur N. Borg, Lake Forest, and Giora Bar-Hai, Oak Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 30, 1984, Ser. No. 646,275

Int. Cl.[4] G06F *12/16*

U.S. Cl. 364—900 **14 Claims**



1. A memory protection system for use in a terminal controlled by a signal processor and including a video display, said system comprising:

first memory means having a plurality of first memory areas accessed by respective memory addresses for storing data therein;

a first data bus coupling said signal processor to said first memory means for permitting said signal processor to write data into said first memory areas and to read data therefrom;

a second data bus coupling said first memory means to said video display for providing the data read from said first memory means to said video display for display thereon; and

second memory means coupled to said signal processor by means of said first data bus and to said video display, said second memory means having a plurality of second memory areas each corresponding to a respective first memory area of said first memory means and having stored therein one of a plurality of display attribute words, wherein said display attribute words are read by said signal processor and provided to said video display and to said first memory means for controlling the display of said data on the video display and wherein each of said display attribute words includes a memory protect portion for inhibiting said signal processor from writing data into a first memory area corresponding to a second memory area associated with said display attribute word.

4,628,480

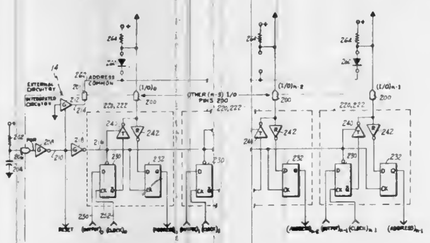
ARRANGEMENT FOR OPTIMIZED UTILIZATION OF I/O PINS

William M. Floyd, Livonia, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 7, 1983, Ser. No. 540,573

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—900 **9 Claims**



1. An arrangement for the input of address data to an integrated circuit via the same input/output (I/O) terminal pins utilized for the transfer of data comprising:

an integrated circuit having an internal/external interface and including a plurality of separate first I/O pins at the circuit internal/external interface, each said first I/O pin having both output circuit means and address circuit means connected thereto and positioned internally of said interface;

means for applying a first logic level to each of said first I/O pins via respective resistance means;

a further I/O pin at said interface;

a common conductor being connected to said further I/O pin and being positioned externally of said interface;

one or more unidirectionally conducting address means positioned externally of said interface and connected individually at one same end to respective selected ones of said first I/O pins in accordance with a desired address and connected at the other end to said common conductor;

level control means connected to said further I/O pin for placing said further I/O pin and common conductor at either a high impedance level or at a second logic level different than the first logic level in response to a gate signal;

means for generating a said gate signal and coupling said gate signal to said level control means such that said common conductor is temporarily placed at the second logic level which is required for said unidirectionally conducting means to conduct only for input of address data bits to the integrated circuit; and

each said address circuit means storing a respective said address bit having been input.

4,628,481

DATA PROCESSING APPARATUS

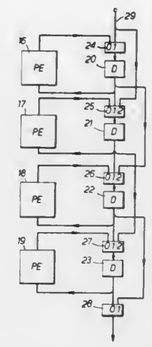
Stewart F. Reddaway, Baldock, Great Britain, assignor to International Computers Limited, London, England

Filed Dec. 6, 1984, Ser. No. 678,688

Claims priority, application United Kingdom, Jan. 24, 1984, 8401805

Int. Cl.[4] G06F *13/38*

U.S. Cl. 364—900 **6 Claims**



1. Data processing apparatus comprising a plurality of data processing elements each of which has an associated data rgister for receiving output data from that element, each data register having an associated multiplexing circuit connected to a data input of the data register, the data processing elements and their associated data registers being logically arranged in rows and columns, wherein each column of the data registers includes:

(a) a first set of connection paths each of which connects a data output of a respective one of the data registers to a first input of the multiplexing circuit associated with the next data register in the same column, and

(b) a second set of connection paths, distinct from the first set of connection paths, each of the second set of connection paths connecting the data output of a respective one of the data registers to a second input of the multiplexing circuit associated with the next-but-one data register in the same column,

whereby the multiplexing circuits are selectively operable to connect together either

(i) the even-numbered registers in each column,

(ii) the odd-numbered registers in each column, or

(iii) all the registsers in each column,

thereby forming a serial shift path in each column allowing data either from the even rows, the odd rows, or all the rows to be shifted out, one row at a time.

4,628,482

COMMON MEMORY CONTROL SYSTEM WITH TWO BUS MASTERS

Tsuguji Tachiuchi, Odawara, and Toyota Honda, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,227

Claims priority, application Japan, May 7, 1982, 57-75208

Int. Cl.[4] G06F *13/16*

U.S. Cl. 364—900 **11 Claims**

1. A data processing apparatus for controlling accessing of a memory comprising:

memory means having a number of address locations;

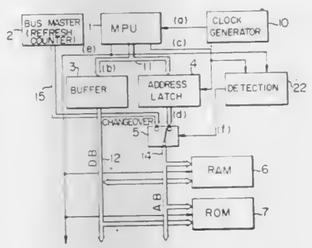
an address bus and a data bus;

microprocessing means, operating in time with successively received clock signals and connected to said memory means via said data bus, for generating an address signal during a first period of at least one clock signal to specify one of said address locations in said memory means and

for performing data transfer on said data bus between said microprocessing means and the address location in said memory means specified by said address signal during a second period of at least one clock signal following said first period;

detection means for detecting said second period during which said data transfer is to be effected on said data bus between said microprocessing means and the specified address location in said memory means;

bus master means separate from said microprocessing means for generating an address signal to specify an address location in said memory means for accessing said memory means; and



bus control means connected to said microprocessing means, said bus master means and said address bus and responsive to the output of said detection means for supplying said address signal from said microprocessing means to said memory means only during said second period of data transfer between said microprocessing means and said memory means, and for supplying said address signal from said bus master means to said memory means to specify a different address location of said memory means whenever no data transfer is being effected between said microprocessing means and said memory means and at least during said first period.

4,628,483

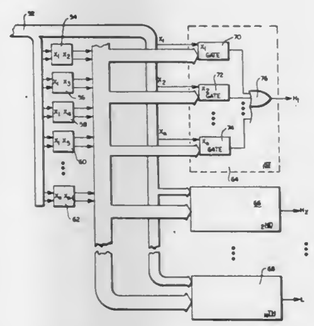
ONE LEVEL SORTING NETWORK

Raymond J. Nelson, 2400 Demington Dr., Cleveland, Ohio 44106

Division of Ser. No. 384,483, Jun. 3, 1982, which is a continuation of Ser. No. 73,640, Sep. 10, 1979, abandoned. This application Sep. 19, 1984, Ser. No. 652,304

Int. Cl.⁴ G06F *7/00*

U.S. Cl. 364—900 **3 Claims**



1. A sorting circuit for sorting three input values into first through third ascendingly ordered output values, said input values being represented by three input sequences, respectively, siad first through said third output values being represented by first through third output sequences, respectively, each of said input and said output sequences being a time sequence having a prescribed number of binary bits arranged from the most significant bit to the least significant bit, said input and said output sequences thereby having corresponding bits each binary bit having either of a logic "0" and a logic "1" level at a time, said sorting circuit comprising:

state specifying means for specifying any one of an initial state, six first-level states, and six second-level states at a time, each first-level state being accompanied by two second-level states with said two second-level states assigned to two first-level states including said each first-level state, respectively, so that each second-level state may indicate a particular order among said input values, said initial state being a state in which the order of said input values is not yet definite, each first-level state being another state in which the order is determined for only one input value, each of the two second-level states accompanying the last-mentioned first-level state being still another state in which the order is determined for two input values except for said only one input value;

means for resetting said state specifying means into said initial state;

checking and driving means coupled to said state specifying means for checking three corresponding bits of the respective input sequences from time to time to drive, when only one bit is checked to have one of the logic "0" and the logic "1" levels with the two binary bits corresponding thereto checked to have the other of the logic "0" and the logic "1" level for the first time after said state specifying means is reset into said initial state, said state specifying means from said initial state to one of said first-level states that is predetermined according to the input sequence in which said only one bit is present, said checking and driving means subsequently driving said state specifying means from said one first-level state to one of the two second-level states accompanying said one first-level state when a particular bit and the binary bit corresponding thereto of two input sequences except for the input sequence in which said only one bit is present are checked to have a predetermined one and the other of the logic "0" and the logic "1" levels, respectively, for the first time after said state specifying means is driven to said one first-level state; and

an output circuit coupled to said state specifying means for arranging said input sequences into said first through said third output sequences according to said initial state, said one first-level state, and said one second-level state.

4,628,484

SIGNAL AND POWER APPLYING UNIT FOR MEMORY CASSETTES

Seiichi Hattori, Tokyo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 452,140, Dec. 22, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,207

Claims priority, application Japan, Dec. 29, 1981, 56-213941

Int. Cl.⁴ G11C *5/04, 11/34*

U.S. Cl. 365—52 **5 Claims**

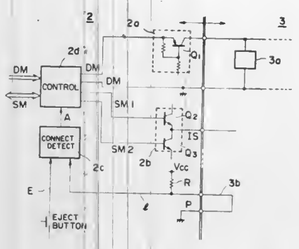
1. A device for applying an interface signal and a power supply voltage to a semiconductor memory cassette through an adapter, comprising:

first means for generating a connection signal when the memory cassette and the adapter are interconnected;

second means, separate from said first means, for generating a withdrawal signal when the memory cassette is disconnected from the adapter;

connection detecting means, operatively connectable to said first and connected to said second means and responsive to said connection and withdrawal signals, for producing first and second operation permit signals, respectively; and

control means, operatively connected to said connection detection circuit and responsive to said first operation permit signal, for applying the power supply voltage to the memory cassette through the adapter and rendering the interface signal active, and also responsive to said



second operation permit signal for switching off the power supply voltage and rendering the interface signal inactive, thereby preventing erasure in the semiconductor memory cassette.

4,628,485

MAGNETO-OPTICAL RECORDING MEDIUM

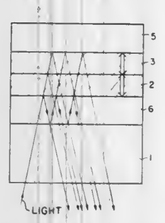
Fujio Tanaka, Tanashi; Yasuyuki Nagao, Yokohama, and Nobutake Imamura, Kamakura, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,580

Claims priority, application Japan, Jul. 20, 1983, 58-130771

Int. Cl.⁴ G11B *23/00;* **G11C** *11/42*

U.S. Cl. 365—122 **3 Claims**



1. A magneto-optical recording medium comprising: a recording layer of a magnetic thin film low in the Curie temperature or magnetic compensation temperature and high in coercive force and having an easy axis of magnetization in a direction perpendicular to the film surface; a reproducing layer disposed adjacent the recording layer and large in the magnetic Kerr rotation angle and having an easy axis of magnetization in a direction perpendicular to the film surface; a transparent substrate disposed on the side of incidence of light; a reflecting metal layer for reflecting incident light having entered from the side of the transparent substrate passed through the recording layer and the reproducing layer; and a dielectric layer disposed at least on the side of the transparent substrate with respect to the recording layer and the reproducing layer and effective to cause multiple light reflections by the reproducing layer or the recording layer so that Kerr rotation and Faraday rotation are increased.

4,628,486

MOS DYNAMIC RANDOM ACCESS MEMORY

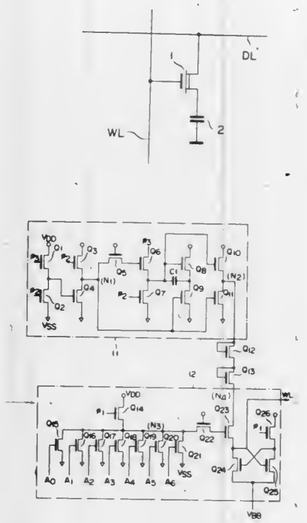
Koji Sakui, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1984, Ser. No. 681,024

Claims priority, application Japan, Mar. 31, 1984, 59-63533

Int. Cl.⁴ G11C *11/24, 8/00*

U.S. Cl. 365—149 **1 Claim**



1. A MOS-dynamic random access memory, comprising:

a semiconductor substrate;

a memory array formed of a plurality of memory cells arranged in a matrix on the substrate, each of said memory cells including a memory capacitor and a switching MOSFET having a gate, a source, a drain, and a channel region doped with impurities of a conductivity type opposite to that of the substrate;

a plurality of word lines formed on the substrate each connected in common with the gates of the switching MOSFETs of a plurality of said memory cells arranged along each corresponding row of said memory array;

a decoder formed on the substrate for selectively driving said plurality of word lines, including an output MOSFET and a flip-flop connected to the source of the output MOSFET, wherein a substrate bias voltage delivered from a back-gate bias circuit is used as a reference potential of said flip-flop;

a clock generator formed on the substrate for controlling the operating timing of the decoder; and

a level shift circuit formed on the substrate connected between an output of said clock generator and the drain of the output MOSFET of said decoder.

4,628,487

DUAL SLOPE, FEEDBACK CONTROLLED, EEPROM PROGRAMMING

Michael C. Smayling, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1984, Ser. No. 640,721

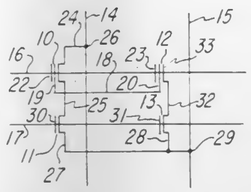
Int. Cl.⁴ G11C *11/34*

U.S. Cl. 365—185 **19 Claims**

1. A method of programming a floating gate memory cell of

the type having a thin-oxide area between a floating gate and another electrode, comprising the steps of:

applying a voltage to said memory cell to produce an electric field across said thin-oxide area, and increasing said voltage substantially linearly as a function of time at a first



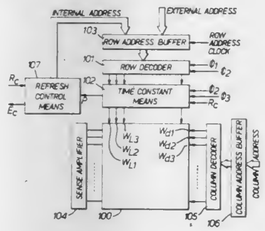
rate, abruptly changing the rate of increase of said voltage to a second rate lower than said first rate and then continuing to increase said voltage substantially linearly, then again abruptly ceasing said increase of voltage and thereafter maintaining said voltage constant at a given maximum level for a selected time.

4,628,488

SEMICONDUCTOR MEMORY DEVICE WITH A REFRESH MECHANISM

Koji Saku, Kawasaki, and Fumio Horiguchi, Itabashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,815
Claims priority, application Japan, Dec. 27, 1982, 57-226705
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—222 **10 Claims**



1. A semiconductor memory device with a refresh mechanism comprising:

a plurality of memory cells each consisting of one transistor and one capacitor which are integrated on a semiconductor substrate;

a plurality of word lines for addressing said memory cells;

a plurality of digit lines for reading and/or writing the data of said memory cells;

an access control means for accessing said memory cells by selecting said word lines;

a refresh control means for successively selecting said word lines connected to each of said memory cells and refreshing said memory cells word line by word line in a refresh period; and

a time constant means connected to each of said word lines which is activated whenever the word line connected to it is selected during an access period and which supplies a "refresh not required" signal until a first predetermined time has elapsed to said refresh control means in said refresh period, wherein

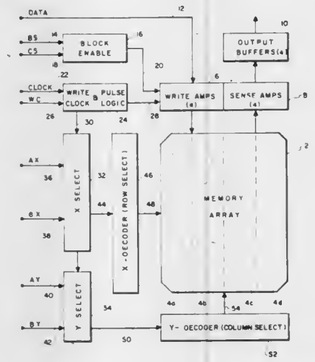
said refresh control means includes a pulse generator, a row address counter for successively selecting said word line by pulse signals from said pulse generator, a first circuit means for detecting the data in said row address counter and emitting a pulse signal indicating the end of said refresh period when said data indicates that the maximum row address has been exceeded, and a second circuit means for incrementing said row address counter by **1** when said "refresh not required" signal is supplied from said time constant means and stopping an incrementation of said row address counter for a second predetermined time period when said "refresh not required" signal is not supplied from said time constant means.

4,628,489

DUAL ADDRESS RAM

Richard H. Ong, Phoenix; Peter C. Economopoulos, Scottsdale, and Russell W. Guenthner, Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 3, 1983, Ser. No. 538,387
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—230 **4 Claims**



1. A memory unit for a digital computer comprising:

a memory array of a plurality of individual memory cells;

addressing means for selectively addressing individual ones of said cells in said memory array;

means for applying simultaneously a first and a second address signal to said addressing means;

a clock signal means for establishing a cyclic clock signal, each of said cyclic clock signals having two half cycle phases;

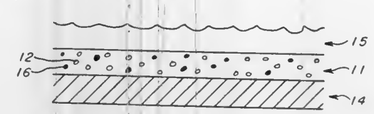
said addressing means including selecting means, said selecting means including a first input amplifier stage connected to receive and respond to said first address signal and a second input amplifier stage connected to receive and respond to said second address signal; said first input amplifier stage comprising a first differential amplifier for comparing said first address signal with a first fixed reference signal, and said second input amplifier stage comprising a second differential amplifier for comparing said second address signal with said first fixed reference signal; and an energizing current steering circuit connected to be responsive to said cyclic clock signals, said steering circuit comprising a differential amplifier for comparing said cyclic clock signal with a second referece signal, said steering circuit differential amplifier defining a first and a second current path, an energizing current source means connected to said steering circuit differential amplifier, said steering circuit responsive to the half cycle phases of each cyclic clock signal to steer energizing current from said current source means through said first or second path to selectively energize the first or second differential amplifiers of said first or second input amplifier stages, whereby said memory array may be addressed and accessed during each half cycle phase of a cyclic clock signal.

4,628,490

WIDEBAND SONAR ENERGY ABSORBER

Irvin R. Kramer, Baltimore, and Wayne T. Reader, Mourovia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1985, Ser. No. 813,310
Int. Cl.⁴ E04B *1/82*
U.S. Cl. 367—1 **6 Claims**



1. An acoustic energy absorbing material means comprising:

a non-conducting elastomeric matrix means having particles selected from the group consisting of piezoelectric and magnetostrictive material disposed therein for converting incident soundwave energy into heat,

a corrosion resistant means coated onto the particles for matching the properties of the piezoelectric and magnetostrictive particles for optimizing energy absorption of sonar waves of predetermined frequency,

said elastomeric matrix means designed so as to have a Poisson's ratio of about 0.5 for effectively utilizing all particles so the incident soundwaves are applied to the particles as a hydrostatic stress distribution,

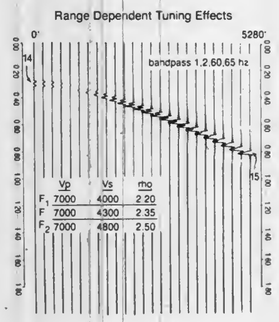
said acoustic energy absorbing material means consisting of a plurality of thin layers of the elastomeric matrix means and having high energy absorption per unit volume for providing a slight impedance mismatch between successive layers thus absorbing the predetermined energy of the soundwaves.

4,628,491

TIME VARIANT FILTER FOR RANGE DEPENDENT TUNING

John H. Bodine, and Jonathan Bork, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Mar. 30, 1984, Ser. No. 595,119
Int. Cl.⁴ G01V *1/36*
U.S. Cl. 367—45 **20 Claims**



1. A method of seismic exploration including acquiring seismic response data from seismic signals generated by a plurality of seismic sources and seismic receivers having at least one dimension for resolving seismic signal amplitude variations as a function of range comprising the steps of:

sorting the seismic response data into unstacked common depth point gathers of seismic signals;

specifying range separating each seismic source and each seismic receiver in a common depth point array of seismic sources and seismic receivers;

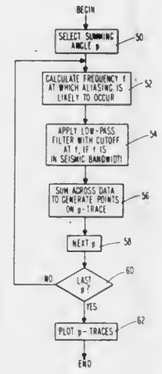
impressing a bandpass filter upon the seismic signal from each seismic receiver having a bandpass frequency dependent upon the range separating one seismic receiver from the seismic source initiating the seismic signal in a common depth point array to resolve seismic signal amplitude variations as a function of range in a common depth point gather of seismic signals.

4,628,492

METHOD OF AVOIDING ALIASING IN SLANT STACKING OF SEISMIC DATA

Randy A. Winney, Garland, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,820
Int. Cl.⁴ G01V *1/32*
U.S. Cl. 367—63 **2 Claims**



1. The method of transforming seismic data traces recorded in x-t space to τ-p space comprising the steps of:

selecting an initial summing angle p;

identifying frequency components of said input data liable to be aliased with respect to a given angle p, said frequency components of said data liable to be aliased are identified by the equation

$$f=[2g|p-(x/tv^2)|]^{-1}$$

f is frequency component of the data liable to be aliased,

p is the summing angle,

g is the trace spacing,

x is the source to receive distance at which the seismic data is taken,

t is time measured from the input of seismic energy to the earth, and

v is velocity of the seismic energy through the earth;

filtering said frequency components liable to be aliased prior to summation to generate points for said p trace;

summing individual elements of seismic traces in x-t space, said elements of said traces lying along a line making the angle p with respect to the horizontal to generate points on said p traces which together make up a τ-p transform;

repeating said steps with respect to differing angles p; and

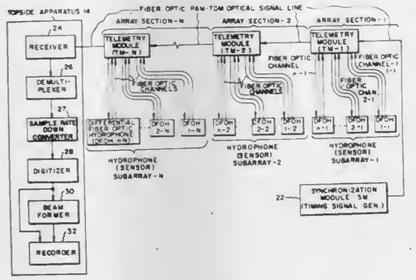
plotting said p traces to generate a τ-p representation of said data.

4,628,493

SENSOR SYSTEM WITH TIME DIVISION MULTIPLEXING TELEMETRY

David E. Nelson; David M. Berg, and Robert J. Hannon, all of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,902
Int. Cl.[4] G01V *1/22;* H04J *3/00*
U.S. Cl. 367—79 56 Claims



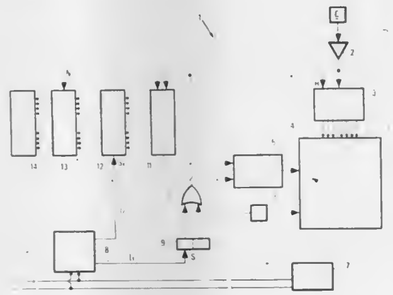
6. The method of telemetering signals from an array of sensors which comprises the steps of time division multiplexing said signals by sampling said signals to provide analog samples such that the samples from the same sensor are repetitive at a first rate higher than the Nyquist rate for the highest frequency component of interest of said signals, transmitting said samples to a receiving station sequentially at a second rate which is approximately proportional to said first rate multiplied by number of sensors in said array, demultiplexing and filtering said samples at said receiving station to provide output signals, time division multiplexing said output signals at a third rate lower than said first rate which is at least as high as said Nyquist rate for the highest frequency component of interest, and processing said multiplexed output signals to provide data from said array.

4,628,494

METHOD FOR THE REMOTE CONTROL OF SIGNAL ACQUISITION DEVICES BY MEANS OF A NARROW PASSBAND TRANSMISSION CHANNEL AND A DEVICE FOR THE IMPLEMENTATION OF THE METHOD

Joseph Rialan, Meudon, and Gérard Thierry, Paris, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 16, 1983, Ser. No. 562,223
Claims priority, application France, Dec. 16, 1982, 82 21284
Int. Cl.[4] G01V *1/22, 1/26*
U.S. Cl. 307—79 20 Claims



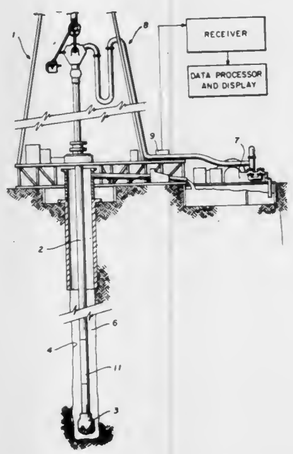
1. Method for the remote control of devices located at a distance from a control station to cause said devices to process and record received data signals in response to commands received from said control station on a narrow passband channel, the transmission time of such commands on said transmission channel being predetermined, and which makes it possible for the devices to acquire and process all signals which are received by said devices subsequent to a selected reference time (t_1), comprising the steps of transmitting on said narrow passband transmission channel a first command signal at an initial time which precedes the reference time by a time interval which is at least equal to said predetermined transmission time, initiating in said devices the processing and recording of the above-mentioned received signals upon receipt of said first command signal therein, transmitting on said narrow passband transmission channel a second command signal at said selected reference time with this second command signal being received by said devices at a later time (t_2) depending on said predetermined transmission time, and identifying from among all of the signals recorded by said devices, those signals recorded at and following a time which is prior to the time (t_2) by the amount of said predetermined transmission time.

4,628,495

MEASURING WHILE DRILLING APPARATUS MUD PRESSURE SIGNAL VALVE

James M. Peppers, and Farhat A. Shaikh, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 9, 1982, Ser. No. 406,741
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—85 8 Claims



1. In a measurement while drilling system for borehole drilling having a downhole instrument connectable in a drill string of a rotary drilling rig including apparatus to sense geological and geophysical parameters and a valve apparatus to pulse modulate drilling fluid flowing in said drill string, and surface apparatus connected to a drilling fluid flow conductor for extracting intelligence carrying information from the modulated drilling fluid, an improved valve apparatus comprising:

(a) a drilling fluid flow pulse modulating pressure pulse valve member longitudinally, movably mounted in a body member and movable from a retracted position substantially removed from the drilling fluid flow and an extended position disposed at least partially within the drilling fluid flow thereby temporarily restricting drilling fluid flow within the drill string;

(b) said pulse valve member is a tubular member having a lower end portion displaceable from said body member into said drilling fluid and an upper end portion with opposed fluid pressure force areas thereon being in fluid communciation with the drilling fluid flow such that forces due to said drilling fluid acting on said pressure pulse valve member are balanced in a longitudinal direction;

(c) said pulse valve member has a recess in an upper end portion thereof for receiving therein a plunger portion of said actuator;

(d) a seal assembly operably mounted between said body member and said pulse valve member sealably separating the exterior of said tubular member lower end portion that is immersed in said drilling fluid from upper portions of said pulse valve member;

(e) an actuator mounted with said pulse valve member and having means to move said pulse valve member longitudinally between said extended and retracted positions independent of pressures of the drilling fluid acting on said pulse valve member to a normally retracted position;

(f) said actuator has a plunger portion mounted in said body member and extending into said pulse valve member upper end portion recess; a seal assembly mounted in said body member contacts a mid portion of the pulse valve member and another seal assembly on said plunger of said actuator contact an interior surface of said pulse valve member separating said mud flow within said pulse valve member from said actuator, said seal assemblies being located on said pulse valve member in positions defining equal pressure force areas that are equal in area and opposite in force producing direction in order to force balance said pulse valve member with respect to the drilling fluid; and

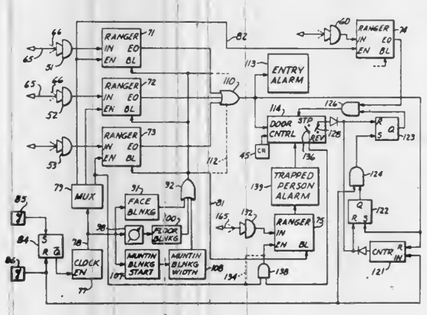
(g) said actuator and said means to move said pulse valve member include a piston and cylinder formed therebetween within said body member and displaceable by fluid pressure on opposite effective sides thereof to displace said pulse valve member.

4,628,496

ULTRASONIC SENSING AND MONITORING SYSTEMS

Charles E. Lee, Miller Place, N.Y., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Jul. 27, 1984, Ser. No. 635,300
Int. Cl.[4] G08B *21/00*
U.S. Cl. 367—93 58 Claims



1. A method of sensing the presence of a person in a space having thereat an object capable of reflecting ultrasonic pulses, comprising in combination the steps of:

sending ultrasonic pulses into said space and toward said object;

suspending transmission of those ultrasonic pulses into said space which would produce echoes at said object;

receiving echoes of ultrasonic pulses from said space; and

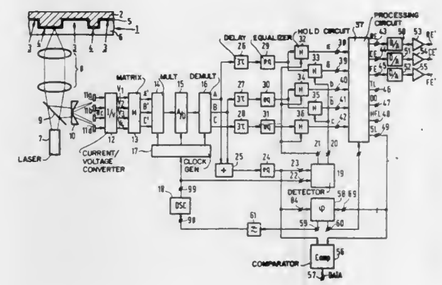
sensing said person with the aid of said received echoes.

4,628,497

APPARATUS FOR REPRODUCING INFORMATION FROM AN OPTICALLY READABLE RECORD CARRIER

Martinus P. M. Bierhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 9, 1984, Ser. No. 578,459
Claims priority, application Netherlands, Oct. 17, 1983, 8303562
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 8 Claims



1. An apparatus for reproducing information from an optically readable record carrier on which the information is digitally stored in the form of a track of optically detectable pit areas which alternate with intermediate land areas, such apparatus comprising:

an optical system for projecting a light beam which produces a spot of light on the record carrier which is reflected therefrom and modulated thereby;

an optical detector for detecting the light beam reflected from the record carrier and generating a first detection signal corresponding to the modulation produced by pit areas of said track and a second detection signal corresponding to the modulation produced by land areas of said track; and

track-loss detection means coupled to said optical detector for generating a track-loss signal which is an indication of a condition in which the spot of light produced on the record carrier by the light beam is positioned off the track to a specific extent, such track-loss signal being generated when said first detection signal exceeds a predetermined fraction of said second detection signal.

4,628,498

DISC LOADING APPARATUS FOR USE IN A DISC PLAYER

Ryoji Takamatsu; Kouji Umezawa, both of Kanagawa, and Tsutomu Toyoguchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,122
Int. Cl.[4] G11B *1/00, 17/04*
U.S. Cl. 369—77.1 6 Claims

1. An optical disc loading apparatus for use in an optical disc player having a disc rotating device, comprising:

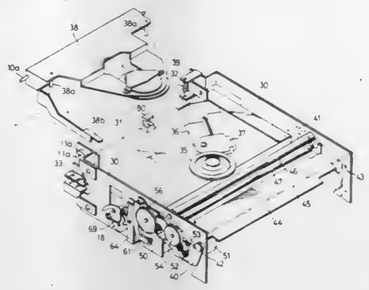
arm means movably supported by a frame between first and second positions,

an upper roller rotatably mounted on said frame,

a lower roller rotatably mounted on said arm means for moving a disc toward a first direction parallel to a plane of said disc in cooperation with said upper roller when said arm means is in said first position, and then moves downwardly beyond a plane of said disc rotating device for putting said disc on said disc rotating device free to be rotated thereby as said arm means moves from said first position to said second position,

a chassis having said disc rotating device and an optical head carried thereon and supported by resilient members relative to said frame, and

locking means including an engaging member provided on said chassis and a locking member provided on said frame for locking said chassis to said frame to engage with said engaging member when said arm means is at an intermediate third position between said first position and second



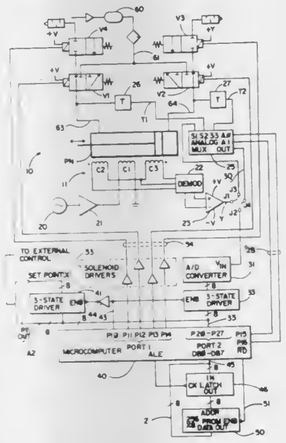
position, and means on said arm means acting when said lower roller is moved downwardly beyond said plane of said disc rotating device, for unlocking said chassis relative to said frame to release the chassis from said engaging member in response to the movement of said arm means to said second position from said intermediate position.

4,628,499

LINEAR SERVOACTUATOR WITH INTEGRATED TRANSFORMER POSITION SENSOR

Geoffrey G. Hammett, Duluth, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jun. 1, 1984, Ser. No. 616,292
Int. Cl.[4] G05B *11/28*; F15B *13/16*
U.S. Cl. 364—167 **25 Claims**



1. An integrated servomechanism and position sensor apparatus, comprising:

an actuator including a variably positionable magnetically permeable portion confined to move only within a predetermined space;

a split secondary transformer having a primary coil and a pair of spaced-apart secondary coils;

means for exciting said primary coil to produce a time-varying electromagnetic field within said predetermined space,

movement of said magnetically permeable portion within said predetermined space coupling said electromagnetic field into said secondary coils;

circuit means connected to said secondary coils for providing a coil signal which varies as a function of the position of said magnetically permeable portion of said actuator;

means responsive to said coil signal for transforming said coil signal into an actual position signal which varies as function of the position of said actuator;

command position signal means for providing a desired position signal corresponding to a desired position for said actuator;

means for providing a driving signal as a function of the difference between said desired position signal and said actual position signal; and

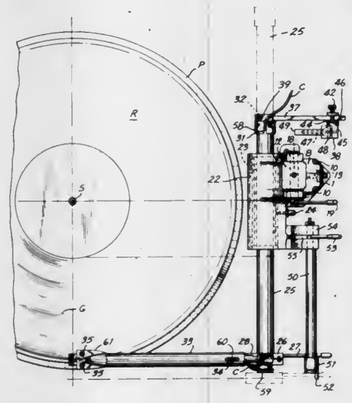
actuator moving means responsive to said driving signal for generating an actuator driving force within said predetermined space for causing said actuator to move toward said desired position.

4,628,500

AIR BEARING STRAIGHT LINE TRACKING PHONOGRAPH TONEARM

F. Bruce Thigpen, Tallahassee, Fla., and Edison A. Price, New York, N.Y., assignors to Eminent Technology, Inc., Tallahassee, Fla. and Edison Price, Inc., New York, N.Y.

Filed May 30, 1985, Ser. No. 739,426
Int. Cl.[4] G11B *3/38, 21/00*
U.S. Cl. 369—249 **6 Claims**



1. An air bearing straight line tracking phonograph tonearm comprising

a mounting base having a vertical extension with a tightening screw and a leveling setscrew and attachable through a sub-base plate to a mounting board for a phonograph record turntable;

a leveling post attached to the vertical extension of the mounting base and having a horizontal leveling slot and leveling setscrews at its lower end in engagement with the mounting base and having a vertical height adjustment slot at its upper end;

a vertical tracking angle arc adjustment block attached to the leveling post by a setscrew in the vertical height adjustment slot therein and having an arcuate rear face and a transverse slot with a corresponding arcuate rear face having a raised knurled rack thereon;

a rotatable knurled shaft passing through the transverse slot in the vertical tracking angle arc adjustment block and engaging the raised knurled rack on the arcuate rear face of the slot, the knurled shaft having a vertical tracking angle adjustment lever operating handle at one end and also passing through holes in bearing blocks attached to an air bearing housing containing an air manifold tube and having an air supply nipple;

a spindle tube passing through and slidable on an air cushion in the air manifold tube and having attached around one end a coupling joint with a lever arm and an expandable bifurcated collet with a setscrew and having attached around the other end a counterweight cap with a recess having a tightening screw at a slot in the recess end;

a tonearm tube with tapered wall thickness which is readily attachable and detachable at a length adjustment slot in its base end to the collet and which has a damped integral headshell at its outer end attached to a phonograph cartridge having a stylus for engaging and radially tracking a spiral groove in a phonograph record on the turntable;

a decoupled counterweight arm having counterweights thereon and a damped bifurcated leaf spring at one end, said arm being readily attachable and detachable into the recess and slot of the counterweight cap by engagement of the tightening screw with the damped bifurcated leaf spring which allows horizontal motion but prevents vertical motion; and

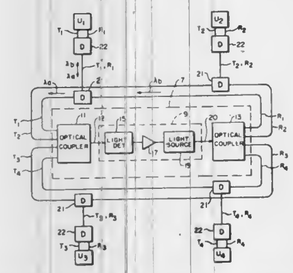
a rotatable eccentric cuing rod parallel to the spindle tube and engageable with the lever arm on the coupling joint, said cuing rod having at one end a cap with an eccentric pin and having at the other end a cuing lever operating handle and mounted in a cuing housing attached to the air bearing housing.

4,628,501

OPTICAL COMMUNICATIONS SYSTEMS

Claire E. Loscoe, Howell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,622
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **8 Claims**



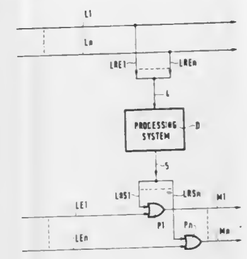
1. A wavelength diversity optical communication system comprising a plurality of user stations each connected to a central active star coupler by means of separate transmit and receive optical fibers and wherein all of said user stations comprise transmitters and tunable receivers, all of which transmitters operate on the same wavelength, λ_1, said star coupler comprising means to detect transmitted signals from all of said user stations on said transmit optical fibers at wavelength λ_1, and produce separate light signals at different wavelengths for each of said user stations, means to apply each of said separate light signals to an optical coupler having an output optical fiber for each of said user stations with the intelligence of all said user stations modulated thereon at a different wavelength, said output optical fibers comprising the receive signal fibers of said user stations, and wherein said tunable receiers can be tuned to any desired one of said different wavelengths.

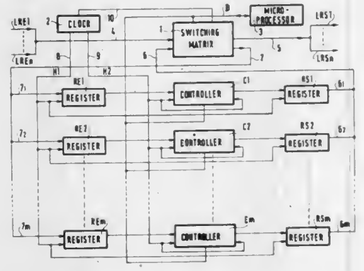
4,628,502

DATA AND SIGNALING TIME SLOT TRANSFER AND PROCESSING SYSTEM FOR A SET OF MULTIPLEX LINES

Pierre Boulard, Lannion, and Roger Gouriou, Louannec, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 11, 1984, Ser. No. 649,406
Claims priority, application France, Sep. 14, 1983, 83 14619
Int. Cl.[4] H04J *3/16, 3/02*; H04Q *11/04*
U.S. Cl. 370—84 **5 Claims**





1. A data and signaling time slot transfer and processing system for a set of n first 2.048 Mbit/s multiplex lines with the information in each data or signaling time slot having a bit rate of 64 kbit/s, comprising m serial communication controllers, a clock, input and output registers associated with said controllers, said input registers being adapted to effect a bit rate change from 2.048 Mbit/s to 64 kbit/s and said output registers being adapted to effect a bit rate change from 64 kbit/s to 2.048 Mbit/s, a switching matrix effecting space-division switching and time-division switching and adapted to be connected on its input side to said m first multiplex lines by switching matrix input lines and to m input lines and on its output side to a set of n second multiplex lines by switching matrix output lines and to m output lines, wherein each controllers is connected to an input register and an output register, each input register has its output connected to said switching matrix by an output line, each output register has its input connected to said switching matrix by an input line, said clock has a first output adapted to supply a composite clock signal to each input and output register and a second output adapted to supply a clock signal to each controllers, said clock is adapted to supply clock signals to said switching matrix, any time slot of said first multiplex lines is connected to a fixed time slot of any output line, said output line fixed time slot is the same for all output lines, the contents of said output registers are transferred into a fixed time slot of said input lines, said input line fixed time slot is the same for all input lines, a fixed time slot of said input line is connected to any time slot of any of said switching matrix output lines, and said input and output line fixed time slots are the same.

4,628,503

METHOD AND DEVICE FOR PERFORMING A BUS REQUEST AND COLLECTIVE ACKNOWLEDGEMENT IN A PROCESS BUS SYSTEM

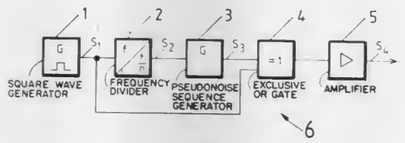
Timm Grams, Viernheim; Werner Deck, Ludwigshafen; Johannes Figge, Lorsch, and Hartmut Siebert, Mannheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,670

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304300

Int. Cl.⁴ H04J *3/00*

U.S. Cl. 370—85 **7 Claims**



1. Method for performing a bus request or collective acknowledgement on a bus system, in a process bus system for serial data transmission, including subscribers of the process bus system, and a bus control device, which comprises generating a band-limited signal capable of superimposition at all of the subscribers in accordance with a common given principle, transmitting the band limited signal by the subscribers for performing a bus request or collective acknowledgement, and analyzing the signal with the bus control device, the method which further comprises forming the signal which is capable of superimposition in the form of an identical digital pseudo noise signal at all of the subscribers, by:

phase modulating a pulse sequence of square-wave oscillations by means of a digital signal formed of a pseudostochastic binary sequence;

selecting a number of pulses per period of the binary sequence which is substantially twice as high as the maximum number of subscribers connectible to the process bus system; selecting the frequency of the square-wave oscillations in such a manner that the maximum of the power density spectrum of the pulse sequence substantially corresponds to the band center frequency f_M of a predetermined frequency band having a band width B; and selecting a number k of the square-wave oscillations per pulse of the binary sequence in such a manner that $1/k$ substantially correspond to a relative band width B/f_M.

4,628,504

DISTRIBUTED BUS CONTROL COMMUNICATION PROTOCOL

Jeffrey R. Brown, Chicago, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 31, 1983, Ser. No. 462,263

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—85 **24 Claims**

1. A variable time division distributed bus control system for determining the order in which a plurality of stations can communicate messages over a common communicatin channel, said messages including at least a global message requiring acknowledgement by a specified station and end-of-transmission messages to inform said stations in the communication system that the transmitting station has ended transmission, said system being arranged to support the immediate acknowledgement of said global messages by said specified stations, said system comprising:

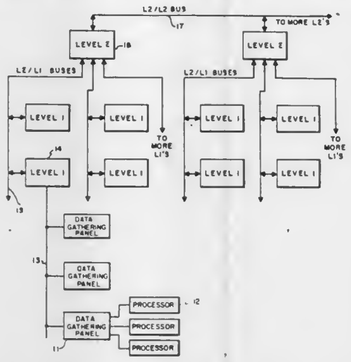
a communication medium for supporting the communication of information between a plurality of stations;

a plurality of stations connected to said communication medium;

each of said stations comprising

time slot means for determining at least one time slot during which an assigned station can transmit information over said comunication medium, each time slot having only one station asigned thereto,

transmission control means responsive to messages being transmitted over the communication medium and responsive to said time slot means for transmitting messages over said communication medium when it is the turn of each station to transmit, and



acknowledgement timer means for delaying the transmission of any further messages for a predetermined period of time after the transmission of a global message requiring acknowledgement unless said selected station has acknowledged said global message.

4,628,505

SIGNALING TERMINAL SYSTEM FOR CCITT NO. 7 COMMON CHANNEL SIGNALING SYSTEM

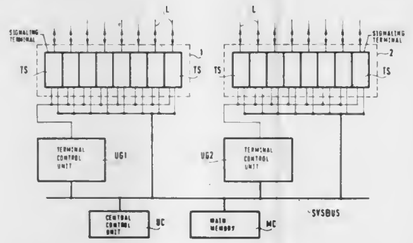
Bernard Paris, Lannion, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,457

Claims priority, application France, Dec. 15, 1983, 83 20124

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—85 **6 Claims**



1. A signaling terminal system for the CCITT No. 7 common channel signaling system, comprising a plurality of groups of signaling terminals adapted to be connected to a telecommunication exchange's switching network, a respective terminal control unit for each of said groups of signaling terminals, a central control unit, a main memory, a system bus connecting said signaling terminals and said terminal control units to said central control unit and said main memory, each group of signalling terminals having at least one access circuit connecting said signaling terminals to said system bus, and at least one interchange circuit connecting said signaling terminals to said respective terminal control unit.

4,628,506

METHOD FOR TRANSMITTING COMMUNICATIONS SERVICES VIA SATELLITES

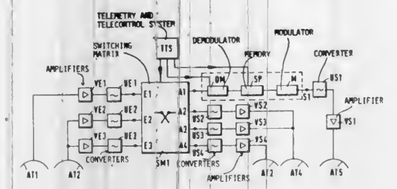
Josef Sperlich, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,337

Claims priority, application European Pat. Off., Oct. 21, 1983, EP83110528.3

Int. Cl.⁴ H04J *3/06, 15/00;* **H04B** *7/185, 7/19*

U.S. Cl. 370—104 **7 Claims**



1. Method for transmitting signals associated with a plurality of communications services in time division multiplex operation with multiple access (TDMA) via a satellite equipped with a plurality of receiving units for receiving signals from ground stations, a plurality of transmitting units for transmitting signals to ground stations, and a switching matrix having a plurality of inputs each connected to a respective receiving unit and a plurality of outputs each connected to a respective transmitting unit, the switching matrix being operative for establishing selected connections between its inputs and outputs, said method comprising: switching, by means of the matrix, signals associated with a plurality of services and received at the satellite by at least two of the receiving units to at least one of the transmitting units in the form of signal pulse bursts; demodulating the switched signals in the one transmitting unit; storing the demodulated signals in a memory of the one transmitting unit; then reading the stored signals out of the memory continuously at a pulse rate lower than that of the pulse bursts switched to the one transmitting unit; and broadcasting from the satellite the signals read out of the memory in the form of a continuous stream of signal bits at the lower pulse rate.

4,628,507

BIT ERROR DETECTION CIRCUIT FOR PSK-MODULATED CARRIER WAVE

Susumu Otani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,362

Claims priority, application Japan, Apr. 18, 1983, 58-67024

Int. Cl.⁴ H04B *17/00;* **G06F** *11/00*

U.S. Cl. 371—5 **2 Claims**



1. A bit error detection circuit for a PSK modulated carrier wave, comprising:

carrier wave recovery means (**403**) for recovering a reference carrier wave of an inputted PSK modulated carrier wave;

first demodulator means (**405**) responsive to the recovered reference carrier wave for phase-demodulating said input PSK carrier wave into a first demodulated signal;

clock signal recovery means (**411**) for providing a clock signal in response to the

first demodulated signal;

oscillator means;

modulator means (**407**) for phase-modulating the reference carrier wave with the output of the oscillator means (**408**);

second demodulator means (**406**) responsive to the output of said modulator means for phase-demodulating the input PSK modulated carrier wave into a second demodulated signal;

first discriminator means (**412**) for discriminating the first demodulated signal into a first digital signal in response to the clock signal;

second discriminator means (**413**) for discriminating the second demodulated signal into a second digital signal in response to the clock signal; and

comparator means (**409**) for comparing the first digital signal with the second digital signal to provide a pseudo bit error detection signal.

4,628,508

COMPUTER OF PROCESSOR CONTROL SYSTEMS

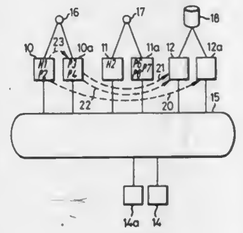
John C. Sager, Ipswich; Kenneth D. Odam; Robert T. Boyd, both of Woodbridge, and Peter W. Dell, Ipswich, all of England, assignors to British Telecommunications, London, England

Continuation of Ser. No. 363,521, Mar. 30, 1982, abandoned. This application May 7, 1985, Ser. No. 731,617

Claims priority, application United Kingdom, Mar. 31, 1981, 8110068

Int. Cl.⁴ G06F *11/20*

U.S. Cl. 371—9 **12 Claims**



1. A processor control system for simultaneously (a) controlling items of hardware and (b) performing data processing functions not directly associated with control of hardware items, said system comprising:

a plurality of interconnected digital signal processors arranged in pairs so that a pair of said processors is associated with each item of hardware, with each processor of such a pair being capable of independently controlling its associated item of hardware,

at least one additional processor interconnected with said pairs of processors to provide, in conjunction with all other processors in the system, spare processing capacity for said data processing software processes,

one processor of each said pair normally being arranged to operate at least one hardware control process for controlling its associated item of hardware and the other processor of each said pair normally being arranged to operate at least one data processing software process and wherein, in the event of a fault occuring in said hardware control process, then said data processing software process is transferred from said other processor to said provided spare processing capacity and the said at least one hard-

ware control process is transferred to said other processor of that pair.

4,628,509

TESTING APPARATUS FOR REDUNDANT MEMORY

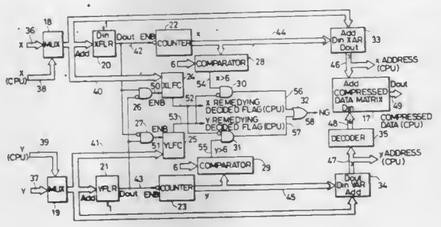
Ikuo Kawaguchi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,445

Claims priority, application Japan, May 11, 1983, 58-80898; May 11, 1983, 58-80897; May 11, 1983, 58-80899

Int. Cl.⁴ G06F *11/20*

U.S. Cl. 371—21 **12 Claims**



1. In an apparatus for testing a redundant memory including means for applying a test pattern to a memory under test which has a matrix of storage cells having X and Y addresses, means for determining failures in the data stored in the storage cells of said memory on the basis of test results obtained by comparing outputs from said memory under test with expected values, and means for remedying said failures along selected redundant lines in the X and/or Y directions of said matrix of storage cells, the improvement comprising:

(a) a compressed data matrix storage device for storing as compressed data only the data relating to failures determined from the test results of said failure determining means;

(b) an address conversion unit which converts the X and Y addresses of said failures detected by said failure determining means into addresses of said compressed data matrix storage device and controls the storing of failure data in said compressed data matrix storage device;

(c) an auxiliary processing unit which judges whether remedy of the failures is possible on the basis of the data of the test results stored in said compressed data matrix storage device and for controlling said remedying means when remedy of the failures is not possible;

(d) means for selecting said redundant lines by analyzing the data in said compressed data matrix storage device and for supplying the identify of said redundant lines to said remedying means; and

(e) means for supplying the data in said compressed data matrix storage device to said remedying means.

4,628,510

MEMORY DEVICE

Shuichi Endo, Takasaki, and Kenichi Tonomura, Gunma, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,720

Claims priority, application Japan, Apr. 22, 1983, 58-69967

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—21 **5 Claims**

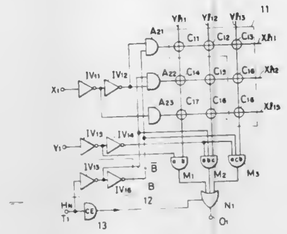
1. A memory device comprising:

(a) an array of memory cells including a plurality of main memory cells which are adapted to be utilized by a user for storing information and a plurality of checking memory cells which store data placed therein at the time of manufacturing of the array which is read out to check a performance characteristic of the array of memory cells prior to the storing of data in the main memory cells;

(b) an addressing means associated with the array of memory cells for permitting selective addressing of either the main memory cells or checking memory cells within the array by the application of selected first or second signal levels to addressing lines coupled to the array;

(c) an output means coupled to the array of memory cells for outputting data from within selected cells within the array in cooperation with the addressing means; and

(d) an inhibiting means for inhibiting the outputting of data



from said output means in response to the application of a control signal of a first predetermined magnitude, wherein the addressing means includes a checking memory addressing means coupled to the inhibiting means which inhibits the reading out of data from the checking memory cells upon application of a control signal of a second predetermined magnitude and enables the reading out of data from the checking memory cells upon the application of a control signal of a third predetermined magnitude.

4,628,511

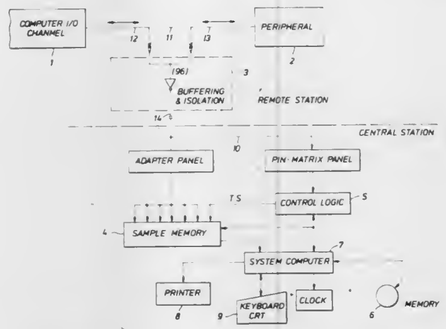
APPARATUS FOR ANALYSIS OF COMPUTER CHANNEL FAILURES

Teddy K. Stitzlein, and William P. Simonds, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 648,338, Sep. 6, 1984, abandoned, which is a continuation of Ser. No. 352,274, Feb. 25, 1982, abandoned. This application Aug. 8, 1985, Ser. No. 764,502

Int. Cl.⁴ G06F *11/22*

U.S. Cl. 371—22 **6 Claims**



1. Apparatus for monitoring signals on an input/output channel of a computer to passively detect communications failures between said computer and peripherals of said computer, comprising:

means for accessing and detecting signals on said input/output channel of said computer, without interfering with said signals;

first means interconnected with said means for accessing and detecting for preselecting at least one of said signals;

control means interconnected with said first means for (i) detecting the signal level of said at least one preselected signal, (ii) generating time information about a particular point in relative time at which said at least one preselected signal is detected, and (iii) generating a predetermined command based upon said detection of said at least one preselected signal and predetermined internal logic;

second means interconnected with said means for accessing and detecting and with said control means for storing signal, count, or time information, or combinations thereof, concerning said detection of said at least one preselected signal based upon said predetermined command; and

analysis means interconnected with said second means for analysis of said stored information to determine from said stored information the cause of said communications failures on said channel and interconnected with said control means for predetermining said internal logic of said control means.

4,628,512

ADDRESS DISTRIBUTION IN DATA STORAGE APPARATUS

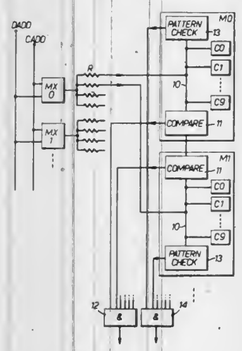
Johnson Loo, Newcastle-under-Lyme, England, assignor to International Computers Limited, London, England

Filed Jan. 11, 1985, Ser. No. 690,726

Claims priority, application United Kingdom, Jan. 24, 1984, 8401806

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—68 **3 Claims**



1. Data storage apparatus comprising:

(a) a plurality of groups of memory chips, each chip having an address input,

(b) a plurality of address busses, one for each of said groups of memory chips, each address bus having a first end and a second end, and each address bus being connected in parallel to the address inputs of all the memory chips in the group in question,

(c) means for applying an address signal in parallel to all the address busses,

(d) first comparator means connected to the first end of each address bus, for comparing the address signal on that bus with the address signal on another one of the address busses, and

(e) second comparator means connected to the second end of each address bus, for comparing the address signal on that bus with a predetermined value.

4,628,513

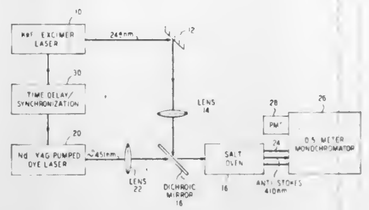
TUNABLE INDIUM UV ANTI-STOKES RAMAN LASER

Jonathan C. White, Stanford, Calif., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 535,808, Sep. 26, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,414

Int. Cl.⁴ H01S *3/30*

U.S. Cl. 372—3 **6 Claims**



1. A tunable anti-Stokes Raman laser comprising

an indium compound lasing medium including at least one ground state, an intermediate state, and at least one metastable state;

photodissociating means for creating a population inversion between said at least one ground state and a metastable state of said indium compound lasing medium; and

anti-Stokes tunable pump means for creating a transition between said metastable state and a predetermined region near said intermediate state of said indium compound lasing medium, thereby creating a Raman lasing output from said predetermined region to said ground state, where said predetermined region is varied to form said tunable anti-Stokes Raman laser.

4,628,514

MULTIMODE LASER

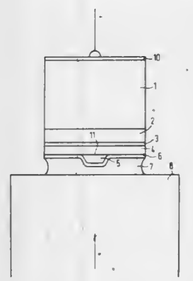
Reimund Dorn, Schwieberdingen, and Martin Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 24, 1984, Ser. No. 644,173

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332398

Int. Cl.⁴ H01S *3/045, 3/19*

U.S. Cl. 372—36 **3 Claims**



1. Multimode laser comprising;

a substrate;

an epitaxial intermediate layer; an epitaxial active layer; an epitaxial capping layer, the conductivity type of the intermediate layer being the same as that of the substrate and opposite to that of the capping layer;

a narrow epitaxial contact stripe of the same conductivity type as the capping layer, the contact stripe being doped to a higher level than the capping layer, the band gap in the contact stripe being smaller than that in the capping

layer, and the doping level at the surface of the contact stripe being higher than that of the remainder of the contact stripe;

a Schottky contact layer in direct contact with the contact stripe and those portions of the capping layer not covered by the contact stripe;

a heat sink; and

a solder body joining said Schottky contact layer to the heat sink.

4,628,515

RING LASER, ESPECIALLY FOR A RING LASER TYPE OF GYRO

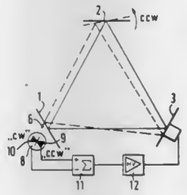
Rüdiger K. Rodloff, Meinersen, and Werner W. Jungbluth, Königslutter, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,322

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412017

Int. Cl.⁴ H01S *3/08*

U.S. Cl. 372—107 **10 Claims**



1. A ring laser, especially for a ring laser type gyro, comprising a block made of a thermally and mechanically highly-stable ceramic glass; three corner mirrors, one of which is mounted for tilting about an axis and one of which comprises a semi-transparent separating mirror; a servo-drive for tilting said tiltable mirror about said axis; a differential photo detector positioned behind said tiltable mirror in the beam path of the separated beam portion of one of the rotating wave trains of said ring laser, said differential photo detector comprising at least one differential photo diode, said differential photo diode producing an output signal and being constructed and oriented so that said output signal is a function of the relative position of said separated beam portion of said one of said rotating wave trains thereon; and a control responsive to said output signal for tilting said tiltable mirror with said servo-drive to position said separated beam portion of said one of said rotating wave trains in a predetermined stabilized position on said photo detector.

4,628,516

ELECTRODE ARRANGEMENT IN HEAT RUN VESSELS

Peter Voss-Spilker, Kempen; Wolfgang Reichelt, Moers-Kap.; Achim Kubon, Neuk.-Vluyn, and Franz Keutgen, Lissendorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,660

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339514

Int. Cl.⁴ H05B *7/02*

U.S. Cl. 373—72 **5 Claims**

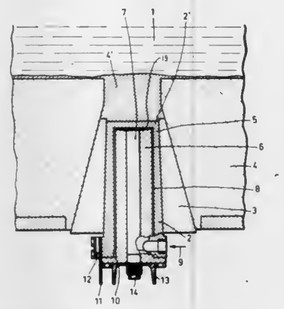
1. An electrode assembly for a melting furnace having a refractory lining defining an inner surface comprising:

an electrode having a head and a rear end including a casing and a replacement body disposed inside the casing, said body and said casing defining an annular slit between annular facing sides and defining a chamber at the head between the casing and the body, said chamber being in fluid communication with said annular slit;

said body having a central bore which is in fluid communication with a cooling medium inlet at the rear end and the chamber, said central bore extending from the rear end to the chamber;

an outlet disposed in the rear end and in fluid communication with the slit;

a terminal means formed on the rear end for connecting the electrode to an electrical circuit; and



a conical refractory component sheathing the exterior of the casing and being embedded in the refractory lining of the furnace, said conical refractory component being frusto-conical in shape with its broad end being disposed at the exterior of the furnace and its narrow end being adjacent the head, said head and said narrow end defining a base of a cavity formed in the refractory lining in which electrically conductive wear-resistant material of solidified melt collects to form a protective cap over the head of the electrode.

4,628,517

DIGITAL RADIO SYSTEM

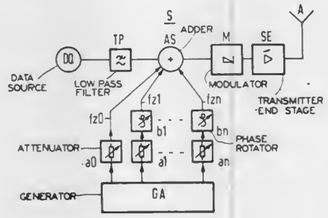
Wolfram Schwarz, Inning; Theodor Schwierz, Aichach, and Bernd Sommer, Lochham, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 644,652, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 363,770, Mar. 31, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 778,180

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121146

Int. Cl.⁴ H04B *7/02, 15/00*

U.S. Cl. 375—40 **13 Claims**



1. A digital radio system comprising:

a transmitting station operable to provide multi-path propagation including

input means for providing a digital information signal to be transmitted,

transmitter means including a frequency modulator having its own carrier oscillator for producing its own inherent carrier frequency which is frequency modulated by the digital information signal, and

frequency diversity means connecting said input means to said frequency modulator and operable to produce an additional modulation frequency and a plurality of harmonic modulation frequencies of said additional modulation frequency and feed the digital information signal and the additional modulation frequency to said frequency modulator for generating a plurality of carrier frequencies which are frequency modulated by said digital information signal said plurality of carrier frequencies including the frequency modulated inherent carrier frequency and at least two further frequency modulated carrier frequencies having frequency spacings from said inherent carrier frequency which are equal to said additional modulation frequency; and

a receiving station operable to receive multi-path propagation of the modulated carrier frequencies, including

conversion means, including oscillators which are coherent with respect to one another, for converting the modulated carrier frequencies into an equal frequency position, and

a combiner connected to said conversion means and operable to provide a sum signal having an optimum signal-to-noise ratio and counter transmission disturbances which are caused, in particular, by selected fading as a result of multi-path propagation.

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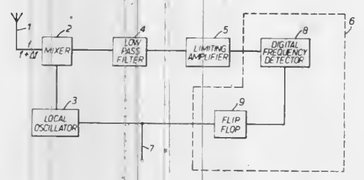
RADIO RECEIVER

Peter E. Chadwick; Philip A. K. Moon, both of Swindon, England, and Norman C. Thompson, Irvine, Calif., assignors to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 294,794, Aug. 20, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,653

Int. Cl.⁴ H04L *27/14*

U.S. Cl. 375—88 **9 Claims**



1. A radio receiver for receiving frequency shift keyed (FSK) radio signals in which differing binary bits are transmitted as a different one of two transmission frequencies, the receiver comprising:

a mixer means having a first input for receiving the FSK signal, a second input for receiving a first mixing signal and a second mixing signal having a different frequency from said first mixing signal, said mixer means having an output for providing a mixed signal at said output in dependence upon the received FSK signal and the received first or second mixing signal, said mixed signal having a frequency lying in a first band of frequencies or a second band of frequencies;

a local oscillator means for generating said first and second mixing signal, neither of which is midway between said two transmission frequencies, and having a mixing signal output coupled to said second input of the mixer means supplying said first and second mixing signals to said second input of said mixer means, and said local oscillator means having an input receiving a switching signal which is operative to switch the generation by said local oscillator means of said first and second mixing signals; and

a detector means having an input, coupled to said output of said mixer means which receives said mixed signal, and having a switching output for providing said switching signal, said detector means detecting whether said mixed signal lies in said first or said second band of frequencies and generating said switching signal in dependence upon a transition between the two bands of frequencies such that if said mixed signal lies in a predetermined one of said first or said second band of frequencies, said switching signal switches said local oscillator means thereby causing said mixed signal to shift to the other one of said first or second band of frequencies.

4,628,519

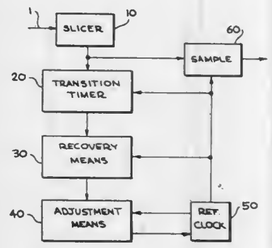
DIGITAL PHASE-LOCKED LOOP CIRCUIT

Hamid Najafi, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 6, 1984, Ser. No. 597,767

Int. Cl.⁴ H04L *7/02;* **H03D** *3/24*

U.S. Cl. 375—110 **12 Claims**



1. An apparatus for maintaining one signal in phase with another signal having a transition between a first level and a second level, comprising:

(a) transition timer means for generating a first signal indicating a duration of the transition of the other signal;

(b) recovery means, responsive to said first signal, for generating a recovery signal indicating the timing of the one signal relative to the other signal said recovery means including means for disregarding said first signal if said transition duration is longer than a preselected time; and

(c) adjustment means for adjusting the one signal in response to said recovery signal.

4,628,520

COUNTING APPARATUS FOR COUNTING OBJECTS BY MEANS OF A SHADOW MEASUREMENT

Jan W. Menger, Amerongen, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Jun. 22, 1984, Ser. No. 623,328

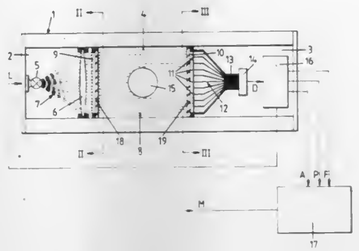
Claims priority, application Netherlands, Jun. 22, 1983, 8302230

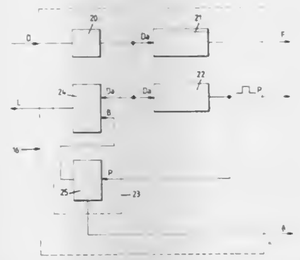
Int. Cl.⁴ G06M *7/00*

U.S. Cl. 377—6 **13 Claims**

1. A counting apparatus for counting objects passed in succession through a light beam present between a light source and a photodetector, in which the photodetector produces a detection signal upon each passage of an object through the light beam, the magnitude of which detection signal depends on the amount of light received by the photodetector and which detection signals are applied to an object counter for counting the number of objects so passed, characterized in that said counting apparatus includes a plurality of light receptors (12) for receiving the light beam (7,8), which receptors (12) are mounted, in-line vertically, the changes in the intensity of the collected light being detected by said photodetector (14); a voltage-to-frequency converter (21) joined to said photodetector for converting the detection signals (D, Da) into a frequency (F) varying in accordance with the magnitudes of the detection signals; a pulse former (22) also joined to said photodetector for converting the detection signals (D, Da) into

count pulses (P) whose width is indicative of the period of time required for an object (15) to pass by; and a data counter (27) operatively connected to said converter (21) and the pulse former (22) of cycles (Fs) of said frequency (F) during the





period of time that a count pulse (P) is present, an object pulse (Y) being applied from the data counter (27) to said object counter (38) in response to the data counter having counted a given number of said cycles (Fs).

4,628,521

INDICATING DEVICE IN MEASURING MACHINE

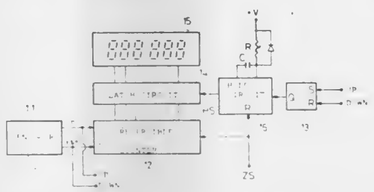
Takeji Nishimura, and Mamoru Yasuda, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,880

Claims priority, application Japan, Jul. 14, 1983, 58-128530

Int. Cl.⁴ G01D *7/00;* **G06M** *3/12*

U.S. Cl. 377—24 **1 Claim**



1. An indicating device in a measuring machine having a counter capable of conducting adding and subtracting calculations in accordance with up signals and down signals from an encoder operationally associated with relatively movable members relating to the measurement of length, a relative movement value between said relatively movable members being digitally indicated in an indicator on the basis of a counted value of said counter, said indicator being defined by an indicating unit having several digit displays comprised of seven segments, the improvement comprising wherein said indicating device includes:

a flipflop circuit means for receiving up signals and down signals from said encoder as input signals and sensing the change of said input signals from up signals to down signals and vice versa to produce an output signal;

a hold circuit means responsive to said output circuit for outputting a hold signal of a predetermined period of time when said change in said input signals is sensed by said flipflop circuit means, said period of time being variably determined by a time constant circuit means which includes a capacitor and a variable resistance; and

a latch circuit means for successively, renewingly storing the counted value from said counter and causing said indicator to indicate same, and for interrupting said renewingly storing of said counted values in response to a receiving of said hold signal from said hold circuit and latching said indicator to the last counted value, said last counted value being indicated for the duration of said period of time unless shortened by a disappearance of said hold signal.

4,628,522

X-RAY TUBE WITH A MAGNETICALLY SEATED ROTARY ANODE

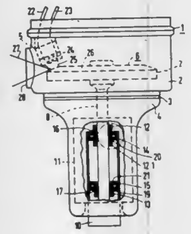
Hans Ebersberger, Kotzenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,039

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407269

Int. Cl.⁴ H01J *35/04, 35/10*

U.S. Cl. 378—132 **17 Claims**



1. In an x-ray tube having a rotary anode having a drive shaft and a magnetic bearing means for normally magnetically seating said anode within said x-ray tube, and having a mechanical bearing means positioned for supporting said anode in the event of failure of said magnetic bearing means, the improvement in said mechanical bearing means comprising:

said mechanical bearing means having an annular conical surface disposed symmetrically with respect to the axis of rotation of said anode and a complementary mating surface received within said conical surface and normally spaced therefrom when said magnetic bearing means is operational, said complementary mating surface being further positioned for coming into contact with said conical surface and for supporting said anode in the event of failure of said magnetic bearing means.

4,628,523

DIRECTION CONTROL FOR RADIOGRAPHIC THERAPY APPARATUS

Chester L. Heflin, San Jose, Calif., assignor to B.V. Optische Industrie de Oude Delft, Netherlands

Filed May 13, 1985, Ser. No. 733,196

Int. Cl.⁴ H05G *1/02;* **A61B** *6/08;* **H01J** *29/02*

U.S. Cl. 378—193 **13 Claims**

1. Radiant energy apparatus comprising:

a patient supporting table,

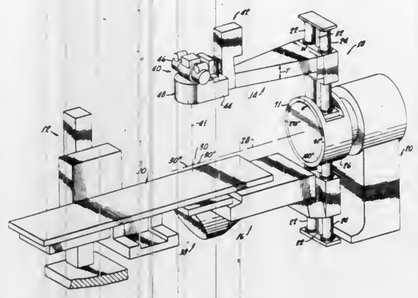
a machine support,

an energy beam source,

a support arm carried by said machine support,

said arm extending along and spaced from a portion of said table, and

means for mounting said energy beam source to said support arm to enable said energy beam source to project a target point along an energy beam axis toward an isocenter point having a predetermined position with respect to said machine support, said means for mounting comprising adjustable means for automatically adjusting the direction



of said energy beam axis relative to said support arm to decrease displacement between said projected target point and said isocenter point, said support arm being mounted to said machine support for rotation about a rotation axis extending through said isocenter point, and said adjustable means comprising means for adjusting the direction of said energy beam axis by an amount related to rotation of said support arm.

4,628,524

X-RAY TOMOGRAPH

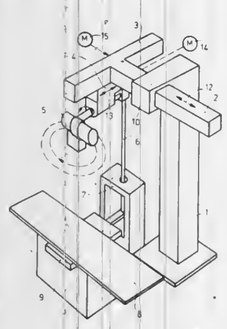
Jürgen Hepke, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,636

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406717

Int. Cl.⁴ H05G *1/02*

U.S. Cl. 378—197 **3 Claims**



1. An X-ray tomograph comprising:

X-ray table means for horizontally supporting a patient undergoing examination above a floor;

X-ray picture recording means disposed beneath the table means;

a vertical support column having a first end which is rigidly attached to the floor near the table means and a second end which extends from the floor above the height of the table means;

angular guide means attached to the second end of the column;

first horizontal support means journalled in said guide means for horizontal motion parallel to a longitudinal direction of the table means;

second horizontal support means affixed to one end of the first horizontal support means;

carriage means journalled in the second support means for horizontal motion perpendicular to the longitudinal direction of the table means;

an X-ray tube connected to the carriage means for projecting X-rays through the table means to the recording means;

a coupling rod connecting the carriage means to the recording means to produce coordinated motion of the carriage means and the recording means; and

motor means for horizontally displacing the first support parallel to the longitudinal direction with respect to the guide means and for horizontally displacing the carriage, perpendicular to the longitudinal direction, with respect to the second support means.

4,628,525

M-S TYPE STEREOPHONIC MICROPHONE

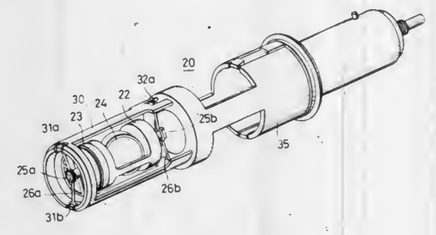
Makoto Iwahara, Sagamihara, and Hiroshi Ogawa, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 7, 1985, Ser. No. 709,209

Claims priority, application Japan, Mar. 9, 1984, 59-33653[U]

Int. Cl.⁴ H04R *5/00*

U.S. Cl. 381—26 **7 Claims**



1. An M-S type stereophonic microphone comprising:

a mid microphone unit having a main axis thereof directed to the front of said M-S type stereophonic microphone;

a side microphone unit having a main axis thereof directed to the side of said M-S type stereophonic microphone and perpendicular to the direction of the main axis of said mid microphone unit;

a unit support body for unitarily supporting said mid and side microphone units;

a main microphone body frame; and

resilient support means comprising resilient support members for resiliently supporting said unit support body on said frame,

said resilient support means resiliently supporting said unit support body so that said unit support body is movable in the main axis direction of said mid microphone unit and in the main axis direction of said side microphone unit.

4,628,526

METHOD AND SYSTEM FOR MATCHING THE SOUND OUTPUT OF A LOUDSPEAKER TO THE AMBIENT NOISE LEVEL

Horst Germer, Schortens, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,824

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334262; Jul. 14, 1984, 3426068

Int. Cl.⁴ H04R *27/00*

U.S. Cl. 381—57 **20 Claims**

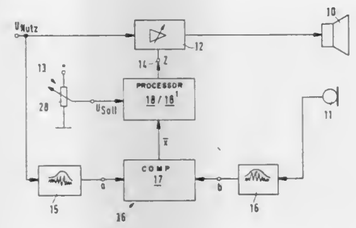
1. Method of automatically adjusting the acoustic output volume of a loudspeaker to accord with changes in ambient

noise level at the loudspeaker location, said loudspeaker having a controllable amplifier equipped with a manual volume control interposed between it and the output of a source of useful signals to be acoustically radiated and equipped with an amplification control terminal, comprising steps of:

producing a composite signal at the output of a microphone exposed to both the acoustic output of said loudspeaker and ambient noise;

producing a first envelope signal by envelope-detecting said useful signal provided at said output of said useful signal source;

producing a second envelope signal by envelope-detecting said composite signal;



continually comparing said first and second envelope signals with each other with respect to at least one parameter thereof and thereby generating a signal representative of the degree of similarity of said envelope signals to each other;

providing a reference signal value corresponding to the setting of said manual volume control;

producing a difference signal by comparing said similarity signal with said reference signal value, and

intergrating said difference signal and applying the integrated difference signal to said control terminal of said amplifier.

4,628,527

MINI HEARING AID

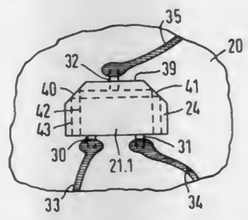
Hans Henneberger, Effeltrich, and Walter Puchta, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,798

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245030

Int. Cl.⁴ H04R *25/02*; H05G *1/04*

U.S. Cl. 381—69.2 **7 Claims**



1. A miniature hearing aid including a microphone, an amplifier, a battery and a receiver all contained in a housing, wherein said amplifier comprises a plurality of electrical circuit components and a circuit board having a plurality of openings adapted to receive said components; the improvement comprising at least one opening in said circuit board adapted for receiving a component and is in a generally rectangular shape wherein at least one corner portion of the opening is modified by a diagonal intersecting edge forming a cut-off and the openings adapted to receive a rectangular component inserted in the opening while the diagonal intersecting edge bears against a corner of the rectangular component to secure the rectangular component to the opening.

4,628,528

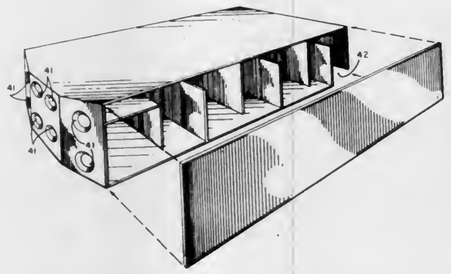
PRESSURE WAVE TRANSDUCING

Amar G. Bose, Wayland, and William R. Short, Wellesley, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Sep. 29, 1982, Ser. No. 427,785

Int. Cl.⁴ H04R *1/28, 1/02*; H03G *3/00*

U.S. Cl. 381—90 **41 Claims**



1. A system for transmitting pressure wave energy with a medium that propagates pressure waves comprising,

transducing means having a vibratile surface for converting energy in one of pressure wave and electrical forms to the other,

at least one low loss pressure wave transmission line means for transmitting energy between said medium and said vibratile surface,

said pressure wave transmission line means having one end adjacent to said vibratile surface and the other end adjacent to said medium and an effective length corresponding substantially to a quarter wavelength at the lowest frequency of pressure wave energy to be transmitted between said medium and said vibratile surface.

4,628,529

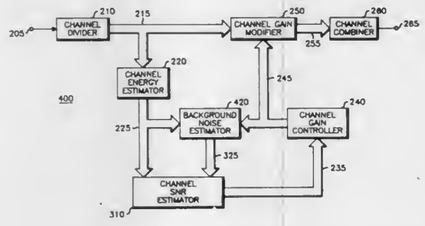
NOISE SUPPRESSION SYSTEM

David E. Borth, Palatine; Ira A. Gerson, Hoffman Estates, and Richard J. Vilmur, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,942

Int. Cl.⁴ H04B *15/00*

U.S. Cl. 381—94 **51 Claims**



9. An improved noise suppression system for attenuating the background noise from a noisy input signal to produce a noise-suppressed output signal, said noise suppression system comprising:

means for separating the input signal into a plurality of pre-processed signals representative of selected frequency channels;

means for modifying the gain of each of said plurality of pre-processed signals in response to estimates of the signal-to-noise ratio (SNR) in each individual channel to provide a plurality of post-processed signals; and

means for generating said SNR estimates in each individual channel based upon the current signal energy estimate of the pre-processed signal in each individual channel and the previous noise energy estimate of the pre-processed signal in each individual channel as determined by the detected minima of said plurality of post-processed signals.

4,628,530

AUTOMATIC EQUALIZING SYSTEM WITH DFT AND FFT

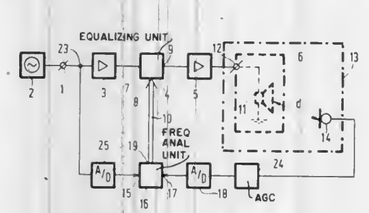
Franciscus J. Op De Beek, and Jacob M. Van Nieuwland, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,737

Claims priority, application Netherlands, Feb. 23, 1983, 8300671; Taiwan, Jul. 5, 1983, 72-12206

Int. Cl.⁴ H03G *5/00*

U.S. Cl. 381—103 **11 Claims**



1. An arrangement for converting an electric signal into an acoustic signal, which arrangement comprises:

an input terminal for receiving an electric input signal,

an electro-acoustic transducer unit for converting an electric signal into an acoustic output signal,

an equalizing unit having a first and a second input and an output, for correcting the frequency characteristic of said electric input signal, which is applied to its first input, under control of a control signal applied to its second input and for supplying the corrected electric signal on its output to said transducer unit,

pick-up means for detecting an acoustic signal and for generating an electric feedback signal which is a measure of the acoustic signal, and

a frequency analyzing unit having a first input coupled to a point in the signal path between the input terminal and the first input of the equalizing unit, having a second input coupled to the pick-up means, and an output for supplying the control signal, which output is coupled to the second input of the equalizing unit, the improvement wherein analog/digital converter means convert said electric input signal and said feedback signal to respective digital signals, the frequency analyzing unit is constructed to subject the previously digitized digital input and feedback signals respectively applied to its first and second input to a Fourier transform, to provide Fourier-transformed versions $F_x(f)$ and $F_y(f)$ respectively of said signals, to calculate a transfer function from the said two versions, and to determine the control signal using the information in this transfer function.

4,628,531

PATTERN CHECKING APPARATUS

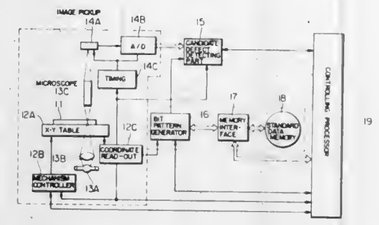
Kelichi Okamoto, Yokohama; Kozo Nakahata, Chigasaki; Yukio Matsuyama; Hideaki Doi, both of Yokohama; Susumu Aiuchi, and Mineo Nomoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,867

Claims priority, application Japan, Feb. 28, 1983, 58-30829

Int. Cl.⁴ G06K *9/00*

U.S. Cl. 382—8 **9 Claims**



1. A pattern checking apparatus comprising:

scanning and imaging means for two-dimensionally scanning a pattern to be checked so as to provide sequential image signals;

A/D converter means for converting the image signals sequentially received from said scanning and imaging means into digital image signals;

standard data generating means for sequentially generating standard pattern data corresponding to said pattern to be checked;

first buffer memory means for temporarily storing the digital image signal received from said A/D converter means;

second buffer memory means for temporarily storing the standard pattern data from said standard data generating means;

candidate defect detecting means for comparing the digital image signals and the standard pattern data to detect a candidate defect on the basis of detection of anti-coincidence therebetween;

a first analyzing memory for storing the digital image signal for a portion of said pattern to be checked inclusive of the candidate defect and signals relating to points around the candidate defect, the entry of the digital image signals into said first analyzing memory being stopped when said candidate defect detecting means detects the candidate defect;

a second analyzing memory for storing the standard pattern data for the portion of said pattern to be checked inclusive of the portion corresponding to the candidate defect and signals relating to points therearound; and

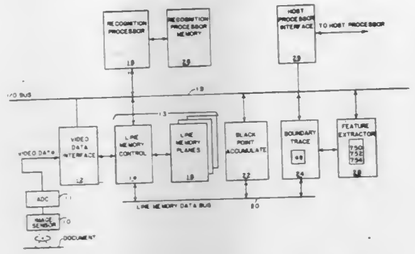
controlling processor means responsive to detection of the candidate defect by said candidate defect detecting means for reading and comparing the digital image signals stored in said first analyzing memory and the standard pattern data stored in said second analyzing memory to determine the amount of positioning error therebetween when a positioning error exists, for reading at least one of the digital image signals from said first buffer memory means and the standard pattern data from said second buffer memory means while relatively correcting said positioning error, and for entering the relatively corrected digital image signal or standard pattern data into said candidate defect detecting means and said first or second analyzing memory, so that in reading and comparing again the digital image signal stored in said first analyzing memory and the standard pattern data stored in said second analyzing memory, the inclusion of positioning errors as candidate defects is minimized and a candidate defect in a practically allowable error range is removed from the remaining candidate defects, thereby to detect a true defect.

4,628,532

ALPHANUMERIC HANDPRINT RECOGNITION

David H. Stone, West Hartford; Leon A. Pintsov, Manchester, and Donald P. D'Amato, Avon, all of Conn., assignors to Scan Optics, Inc., East Hartford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,403
Int. Cl.[4] G06K *9/48*
U.S. Cl. 382—21 **13 Claims**



1. An identification process comprising the steps of:

storing information commensurate with at least a portion of the boundary of an object to be identified;

analyzing the stored information to ascertain the location of points on the object boundary which meet preselected curvature conditions, at least some of said ascertained points being points of peak curvature which lie within regions of preselected length and curvature on the object boundary;

further analyzing the stored information to determine the geometric shape of the object boundary regions adjacent to the ascertained points;

identifying each of the analyzed boundary regions as a feature of a preselected set of features on the basis of geometric shape;

additionally analyzing the stored information to determine the position relative to the object as a whole of each identified feature;

also analyzing the stored information to determine the direction of each feature relative to a predetermined orientation;

preparing a range testable encoded description of the said object boundary portion in the entirety;

preparing a range testable encoded description at the identified features on the said boundary portion and their interrelationship;

generating a series of generalized descriptions which define the geometric shape of all probable permutations of the objects to be recognized, said generalized descriptions including both desired and undesired features and being in the said range testable code;

comparing the encoded descriptions with generalized descriptions of the series of generalized descriptions; and

noting the identify of the object when the encoded descriptions match a generalized description.

4,628,533

PATTERN RECOGNITION APPARATUS

Yasuo Hongo, and Yoshio Nitta, both of Tokyo, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 25, 1984, Ser. No. 573,810
Claims priority, application Japan, Jan. 26, 1983, 58-9805
Int. Cl.[4] G06K *9/62*
U.S. Cl. 382—27 **2 Claims**

1. A pattern recognition apparatus comprising:

(a) means for scanning an unknown pattern and providing a video signal corresponding to an image of the unknown pattern;

(b) binary and pixel conversion means for dividing the image into an array of pixel elements and converting the video signals into binary values using a threshold level, each of the binary values corresponding to a respective one of the pixel elements;

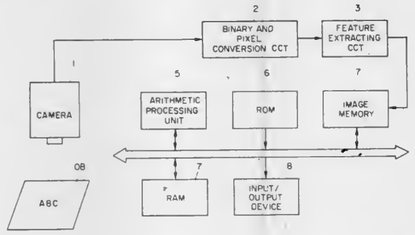
(c) feature extracting means for converting the binary values corresponding to the pixel elements into segment data corresponding to the image, the segment data being derived from segments of the image each consisting of a horizontal series of pixel elements having a first binary value;

(d) memory means for storing the segment data corresponding to the image of the unknown pattern and data representing a plurality of standard patterns, the data representing each of the standard patterns comprising:

(i) a standard bit matrix B_S^K derived by dividing a framed image of the standard pattern into a specified array of meshes, each of the meshes corresponding to a resepctive element of the matrix B_S^K, each element of the matrix B_S^K having the first or a second binary value depending respectively upon whether or not the element is preselected as a horizontal or vertical deformation element,

(ii) a mask bit matrix B_M^K having elements corresponding to respective ones of the meshes of the specified array, each element of the matrix B_M^K having the second or the first binary value depending respectively upon whether or not the element is preselected as a mask element,

(iii) a horizontal deformation bit matrix B_H^K having elements corresponding to respctive ones of the meshes of the specified array, each element of the matrix B_H^K having the first or the second binary value depending



respectively upon whether or not the element is preselected as a horizontal deformation element, and

(iv) a vertical deformation bit matrix B_V^K having elements corresponding to the meshes of the specified array, each element of the matrix B_V^K having the first or the second binary value depending respectively upon whether or not the element is preselected as a vertical deformation element;

(e) arithmetic means for performing preprogrammed operations on the data stored in the memory means including:

(i) means for comparing a width and a height of the unknown pattern with the width and height of a search frame,

(ii) means for framing the image of the unknown pattern and dividing the framed image into the specified array of meshes and deriving a bit matrix B of the image having elements corresponding to respective ones of the meshes of the specified array, each element of the matrix B having the first or the second binary value depending respectively upon whether or not a segment of the image of the unknown pattern is present in the corresponding mesh,

(iii) means for matching the unknown pattern to one of the standard patterns by computing the deviation $D^K(B)$ between the unknown pattern and each one of the standard patterns, the deviation $D^K(B)$ being computed by performing a prescribed operation on at least a corresponding block of the matrix B and the matrices B_S^K, B_M^K, B_H^K and B_V^K representing each one of the standard patterns wherein the prescribed operation is defined as

$$D_{ij}^K(B) = \Sigma B^K{}_S(k,l) \oplus [B^K{}_M(k,l) \cdot \{D^K{}_H(B(k,l)) + D^K{}_V(B(K,l))\}]$$

where

$D^K{}_H(B(k,l)) = B(k,l)$ if $\Sigma B^K{}_H(k,l)B(k,l) = 0$,

$D^K{}_H(B(k,l)) = B(k,l) + B^K{}_H(k,l)$ if $\Sigma B^K{}_H(k,l)B(k,l) \neq 0$,

$D^K{}_V(B(k,l)) = B(k,l)$ if $\Sigma B^K{}_V(k,l)B(k,l) = 0$,

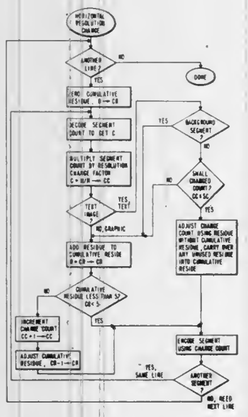
$D^K{}_V(B(k,l)) = B(k,l) + B^K{}_V(k,l)$ if $\Sigma B^K{}_V(k,l)B(k,l) \neq 0$.

4,628,534

METHOD FOR CHANGING THE RESOLUTION OF COMPRESSED IMAGE DATA

J. Nathaniel Marshall, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 6, 1984, Ser. No. 628,698
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **7 Claims**



1. A method for changing the horizontal resolution of a stored image while in compressed image data form, wherein the image data is originally represented as pixels in lines and columns of adjacent pixels, and wherein the image data in binary format is compressed by encoding the image data for each line of pixels such that all adjacent pixels having the same binary value are grouped and each group represented by a binary code indicating the particular binary value and a binary number indicating the number of pixels in each group, and comprising the steps of:

A. setting a cumulative fractional residue to zero in an incrementing and decrementing counter;

B. reading out of storage the compressed image data for one line of the image at a time;

C. multiplying the compressed image data representing each group of adjacent pixels having the same binary value within said one line at a time of the image by a number indicating the degree of horizontal resolution change desired in the image to get a changed pixel count which is the new number of pixels in each group of adjacent pixels having the same binary value;

D. adjusting said cumulative fractional residue such that when each of said changed pixel counts is a number having a whole integer and a fraction less than one-half, to round off the changed pixel count to the whole integer and add the deleted fraction to said cumulative fractional residue in said counter, and such that when each of said changed pixel counts is a number having a whole integer and a fraction greater than one-half to round off the changed pixel count to the next highest whole integer and subtract the deleted fraction from said cumulative fractional residue in said counter; and

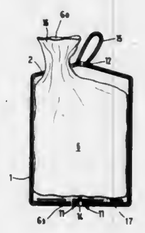
E. repeating steps B through D for each scan line of said compressed image.

4,628,535

LARGE SACK COMPRISING A DOUBLE-WALLED OUTER SACK AND AN INSERTED INNER SACK

Konrad Tetenborg, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,437
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207322
Int. Cl.[4] B65D *33/00, 33/14, 33/16*
U.S. Cl. 383—24 **11 Claims**



1. A large sack construction, comprising an outer sack formed by an essentially tubular member having double-ply walls, the walls having inner and outer wall portions joined by first and second opposite folded edges of the member which extend longitudinally when the outer sack is in a flattened, extended condition, and the walls also having at least one set of superposed severed edge portions extending transversely between respective ends of the opposite folded edges and interconnected by at least one seam, an inner sack inserted within the outer sack, first band means extending through a loop formed by the first folded edge of the essentially tubular member with portions of the first folded edge being ruffled together and held together by the first band means to form a base for the outer sack, second band means extending through loops formed by portions of the second folded edge of the essentially tubular member, the loops of the second folded edge being formed by slots in the essentially tubular member extending inwardly from the second folded edge, and portions of the loops of the second folded edge being separately ruffled and held together by the second band means to form a mouth for the outer sack.

4,628,536

BAG HAVING INTERMITTENT ORIENTATION DRAW TAPE AND METHOD OF MAKING

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 11, 1985, Ser. No. 722,045
Int. Cl.[4] B65D *33/28*
U.S. Cl. 383—75 **14 Claims**

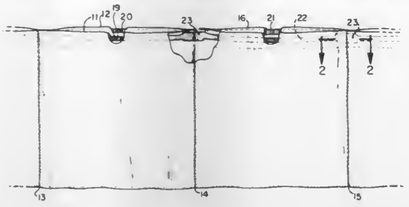
1. A draw tape bag for carrying trash and the like comprising:

two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag;

a hem of each panel being folded over adjacent said top, the bottom of each hem being secured to the adjacent panel;

draw tapes in each hem secured at said sides to said panels, each of said draw tapes having:

thick and wide end portions at the extremities where each draw tape is secured at said sides of said panels; and



a relatively thin and narrow central portion between said end portions.

4,628,537

SYSTEM FOR IDENTIFYING A RESPONDING STATION FOR A RADIO COMMUNICATIONS SYSTEM

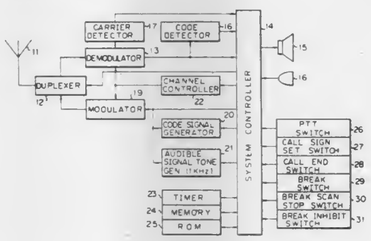
Masashi Shimakata; Katsuaki Kawamura; Toshiaki Tsuchiya; Yuichiro Shioya; Takao Inoue; Mitsuo Syoji, and Keiichi Kuroda, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,056

Claims priority, application Japan, Oct. 19, 1982, 57-183258; Oct. 19, 1982, 57-183260; Oct. 19, 1982, 57-183263

Int. Cl.[4] H04B *7/00*

U.S. Cl. 455—34 **2 Claims**



1. A communications system having a plurality of speech channels one of which is to be selected to convey an information, adapted to perform a simplex communication, comprising:

a searching operation control means for comanding sequential operations of (I) setting the communications system to a receiving state at a speech channel and detecting the presence of a carrier signal and in turn selecting a next speech channel and detecting the presence of a carrier signal if the carrier signal is present at said speech channel, (II) transmitting an audible signal at a selected speech channel at which the carrier signal is not detected, (III) detecting once more the presence of the carrier signal at the selected speech channel, and (IV) memorizing information of the selected speech channel as a non-busy speech channel only if the carrier signal is not present at the selected speech channel.

4,628,538

TELEVISION TRANSMISSION SYSTEM USING OVERMODED WAVEGUIDE

Laddie A. Basa, Claremont, Calif., assignor to Andrew Corporation, Orland Pk., Ill.

Filed May 13, 1985, Ser. No. 733,707

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—91 **10 Claims**

1. A television transmission system for transmitting UHF signals from a UHF signal generator, said system comprising

an antenna for radiating UHF signals generated by said UHF signal generator,

an overmoded section of waveguide for carrying said signals at least part of the way between said UHF signal generator and said antenna with a low level of power loss, and

a high-power mode filter coupled between the antenna and the overmoded section of waveguide comprising

an overmoded waveguide section for propagating said signals in both a desired mode and undesired higher order modes,



an undermoded waveguide section coupled to said overmoded section for propagating said signals only in said desired mode, the transition between said overmoded and undermoded waveguide sections reflecting said higher-order-mode signals into said overmoded section,

at least one pair of resonant slots formed in opposing walls of said overmoded section for coupling said higher-order-mode signals out of the transmission system,

a pair of side-arm waveguides for receiving said higher-order-mode signals from said slots, and

means in said side-arm waveguides for dissipating said higher-order-mode signals.

4,628,539

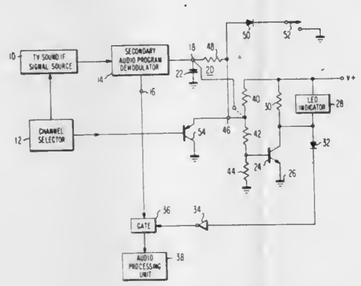
MUTING CIRCUIT

Anthony P. Selwa, Hendricks County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1985, Ser. No. 705,372

Int. Cl.[4] H04B *1/10, 1/16*

U.S. Cl. 455—194 **9 Claims**



1. In a receiver including carrier selection means for tuning to a selected signal and further including an information signal demodulator coupled to said carrier selection means, having a baseband output for supplying a demodulated signal to load means and having a logic output for providing a logic output signal, said logic output signal being of a first type when said information signal is present and being of a second type when said information signal is absent, a signal processing arrangement comprising:

low-pass filter means coupled to said logic output for providing a low-pass filtered logic signal corresponding to said logic output signal, said low-pass filter means including filter capacitance means for storing charge, wherein first and second levels of stored charge correspond to said filtered logic signal being of said first and second types, respectively;

resistance means having a first end coupled to said filter capacitance means and having a second end;

first and second control means respectively coupled to said second end of said resistance means for respectively selectively setting said stored charge to said second level; and

signal gate means having a control input coupled to one of said first and second ends of said resistance means, and being coupled between said baseband output and said load means for coupling said baseband signal to said load means when said filtered logic signal is of said first type and not coupling said baseband signal therebetween when said low-pass filtered logic signal is of said second type.

4,628,540

TUNING ARRANGEMENT HAVING A SUBSTANTIALLY CONSTANT FREQUENCY DIFFERENCE BETWEEN AN RF-CIRCUIT AND AN OSCILLATOR CIRCUIT

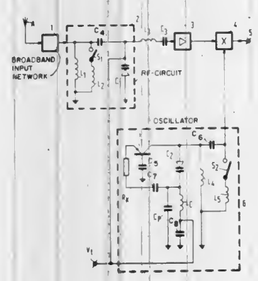
Johannes H. Hendriks, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,570

Claims priority, application Netherlands, Apr. 12, 1984, 8401174

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—197 **3 Claims**



1. A tuning arrangement comprising a mixer stage, a tunable RF-circuit coupled to an input of the mixer stage, an oscillator circuit, coupled to another input of said mixer stage, having a tunable resonant circuit, and means, coupled to said RF- and oscillator circuits, for tuning said circuits to mutually different resonant frequencies, of which at least one of said circuits, having a highest of said resonant frequencies, comprises a parallel arrangement of a circuit inductance and a series arrangement of a tuning capacitor and a padding capacitor, characterized in that in said one circuit, the padding capacitor is shunted by a coil, which reduces the effect of the capacitance of the padding capacitor within the tuning range of said one circuit, and the resonant frequency determined by the coil and the padding capacitor is located below a lowest tuning frequency of said one circuit.

4,628,541

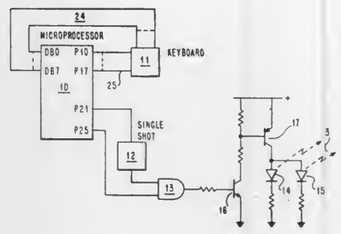
INFRA-RED DATA COMMUNICATIONS SYSTEM FOR COUPLING A BATTERY POWERED DATA ENTRY DEVICE TO A MICROCOMPUTER

John A. Beavers, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 522,063, Aug. 10, 1983, abandoned. This application Feb. 15, 1985, Ser. No. 702,282

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—603 **4 Claims**



1. An infra-red data communications system for coupling a battery powered keyboard data entry device to a microcomputer, in which said keyboard data entry device comprises means, including a microprocessor, for developing, in response to each keystroke, a binary data signal stream representing a start bit followed by a predetermined fixed number of data bits, each binary data signal comprising a predetermined signal level for a fixed period, and for driving an infra-red generator to develop, from each binary data signal, a single burst of infra-red pulses, of which the first pulse corresponds to the leading edge of the binary data signal, said burst extending for a period substantially less than half of the period of the binary data signal, and in which the microcomputer includes means for detecting and amplifying said bursts of infra-red pulses, and signal generating means coupled to the output of the detecting and amplifying means and responsive to detection of an initial pulse in a received burst comprising, when propagation loss is encountered, at least one but less than all of the developed burst of pulses, to generate an output binary code signal comprising a predetermined signal level for said fixed period and having a leading edge corresponding to said initial pulse, said microcomputer further including a microprocessor responsive to the lagging edge of the output signal representing the start bit to generate a series of sampling pulses to sample the output signals representing the data bits.

4,628,542

MODULATED TEA LASER RECEIVER

Neal T. Nomiyama, Sunnydale, Calif.; Robert S. Rohde, Alexandria, and Rudolph G. Buser, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1985, Ser. No. 714,234

Int. Cl.[4] H04B *9/00*

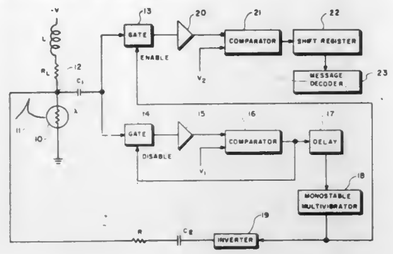
U.S. Cl. 455—619 **2 Claims**

1. A receiver for receiving information modulated onto the output of a pulsed TEA laser, wherein said output has an envelope shape including a relatively short and high-amplitude pulse portion followed by a relatively long and low-amplitude tail portion, whereby said information is amplitude-modulated onto said tail, said receiver including:

a photodetector responsive to the output of said laser, having a high-sensitivity state and a low-sensitivity state, and having an output;

means for switching said photodetector between said states, whereby said photodetector is in said low-sensitivity state in the absence of an output from said laser and during said pulse portion, and in said high-sensitivity state during said tail portion; and

energizable means for demodulating said output of said photodetector, wherein said means for switching includes means for biasing said photodetector to said low-sensitivity state and means responsive to the output of said photodetector during said pulse portion of said laser out-



put for supplying, after a predetermined interval, a first signal for energizing said energizable means for demodulating, and a second signal for biasing said photodetector to said high-sensitivity state.

DESIGN PATENTS

GRANTED DEC. 9, 1986

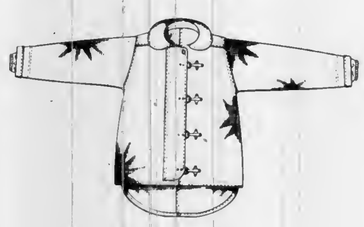
ERRATA

For CLASS	See PATENT NO.
D11-218	287,067
D23-138	287,167

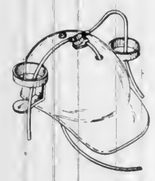
DESIGNS

DECEMBER 9, 1986

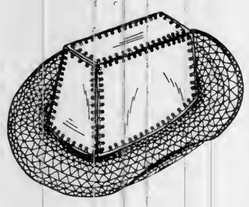
287,060
FIREFIGHTER'S JACKET
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed Aug. 23, 1984, Ser. No. 643,493
Term of patent 14 years
U.S. Cl. D2—187



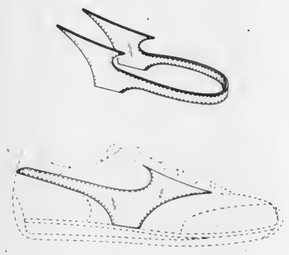
287,061
COMBINED HELMET AND BEVERAGE CONTAINER SUPPORTS
Patrick S. Bound, 658 Longfellow Ct., Warminster, Pa. 18974
Continuation-in-part of Ser. No. 753,921, Jul. 11, 1985, Pat. No. Des. 283,749. This application Feb. 18, 1986, Ser. No. 833,744
Term of patent 14 years
U.S. Cl. D2—246



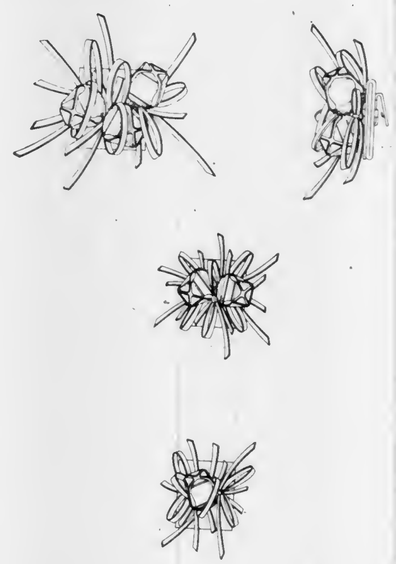
287,062
CROCHETED WESTERN HAT
Howard N. Hancock, 1375 W. 2950 South, Perry, Utah 84302
Filed Jul. 2, 1984, Ser. No. 627,200
Term of patent 14 years
U.S. Cl. D2—258



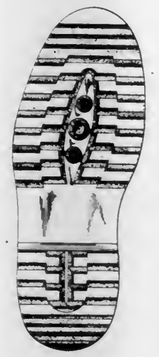
287,063
SIDE PANEL FOR A SHOE
Noboru Kohno, Nishinomiya, Japan, assignor to Mizuno Corporation, Osaka, Japan
Division of Ser. No. 212,540, Dec. 3, 1980. This application Oct. 15, 1984, Ser. No. 661,238
Claims priority, application Japan, Jun. 19, 1980, 55-24693; Jul. 3, 1980, 55-26618; Jul. 3, 1980, 55-26619; Jul. 3, 1980, 55-26621
Term of patent 14 years
U.S. Cl. D2—314



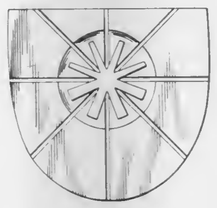
287,064
DETACHABLE ORNAMENT FOR FOOTWEAR
Marilyn A. Schnuck, 2701 S. Lindbergh, St. Louis, Mo. 63131
Filed Feb. 21, 1984, Ser. No. 581,546
Term of patent 14 years
U.S. Cl. D2—315



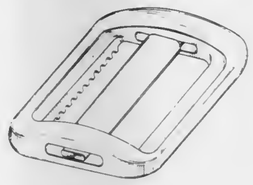
287,065
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Jul. 2, 1984, Ser. No. 627,019
Term of patent 14 years
U.S. Cl. D2—320



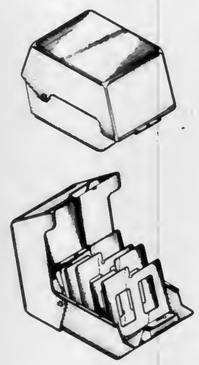
287,066
SHOE HEEL
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Jul. 2, 1984, Ser. No. 627,021
Term of patent 14 years
U.S. Cl. D2—323



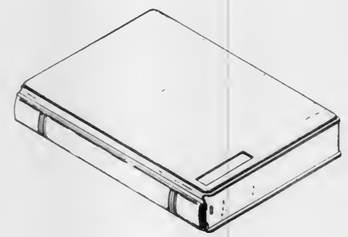
287,067
BELT ADJUSTER
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co. Ltd., Tokyo, Japan
Filed Apr. 17, 1984, Ser. No. 601,157
Claims priority, application Japan, Oct. 20, 1983, 58-45470
Term of patent 14 years
U.S. Cl. D11—218



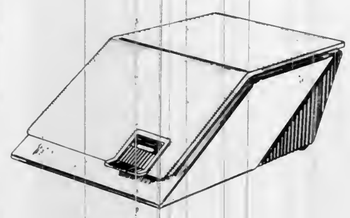
287,068
DISKETTE STORAGE CONTAINER FOR FLOPPY DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed Aug. 27, 1984, Ser. No. 644,869
Term of patent 14 years
U.S. Cl. D3—35

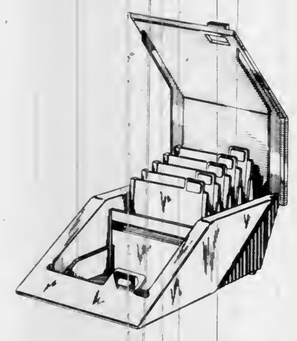


287,069
MAGNETIC DISK STORAGE CASE
Robert A. Egly, 38 Whitewater Dr., Corona del Mar, Calif. 92635, and Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680
Filed Apr. 9, 1984, Ser. No. 598,233
Term of patent 14 years
U.S. Cl. D3—35

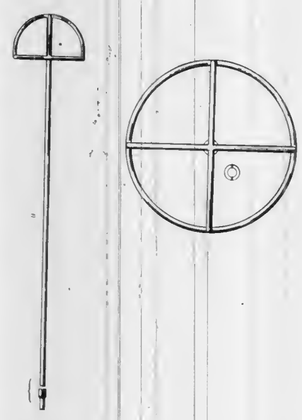


287,070
DISK HOLDER
Robert Staubitz, Avon, Conn., and John Leszczak, Roselle Park, N.J., assignors to The Bates Manufacturing Company, Hackettstown, N.J.
Filed May 18, 1984, Ser. No. 611,586
Term of patent 14 years
U.S. Cl. D3—35





287,071
GOLF BAG ACCESSORY
Howard L. Jobe, 6500 Capitol Dr., Greenbelt, Md. 20770
Filed Nov. 22, 1983, Ser. No. 600,342
Term of patent 14 years
U.S. Cl. D3—37



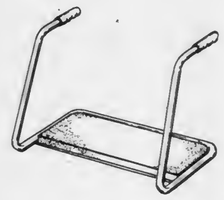
287,072
TOOTHBRUSH
Anthony Pfleger, 2705 Island Ave., Philadelphia, Pa. 19153
Filed Feb. 25, 1985, Ser. No. 705,208
Term of patent 14 years
U.S. Cl. D4—104



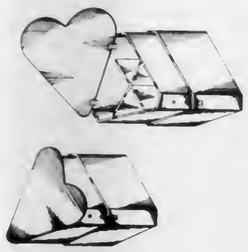
287,073
TOOTHBRUSH
Paul H. Thompson, P.O. Box 16, Forest Dale, Vt. 05745
Filed Jan. 3, 1985, Ser. No. 688,598
Term of patent 14 years
U.S. Cl. D4—105



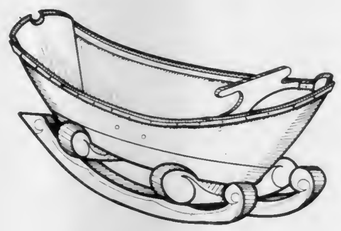
287,074
KNEELING FRAME OR SIMILAR ARTICLE
Daryl G. Ritchie, Melbourne, Australia, assignor to Ritch Engineering Pty. Ltd., Clayton, Australia
Filed Mar. 1, 1984, Ser. No. 585,178
Term of patent 14 years
U.S. Cl. D6—330



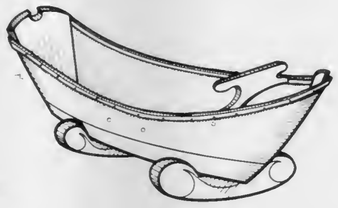
287,075
COMBINED SHOWER STALL FOOT STOOL AND STORAGE COMPARTMENT
George M. Colin, 32072 Sea Island Dr., Laguna Miguel, Calif. 92677, and Bettie L. Patterson, San Juan Capistrano, Calif., assignors to George M. Colin, Laguna Niguel, Calif.
Filed Sep. 11, 1984, Ser. No. 649,538
Term of patent 14 years
U.S. Cl. D6—349



287,076
CHILD'S ROCKER CRADLE OR SIMILAR ARTICLE
Leo Hart, Gloucester, Mass., assignor to Sanbree Corporation, Carlisle, Mass.
Filed Jun. 1, 1984, Ser. No. 616,408
Term of patent 14 years
U.S. Cl. D6—386



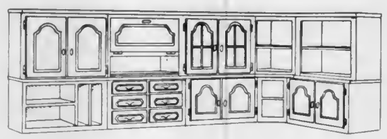
287,077
BABY ROCKING CRADLE
Leo Hart, Gloucester, Mass., assignor to Sanbree Corporation, Carlisle, Mass.
Filed Jun. 1, 1984, Ser. No. 616,407
Term of patent 14 years
U.S. Cl. D6—390



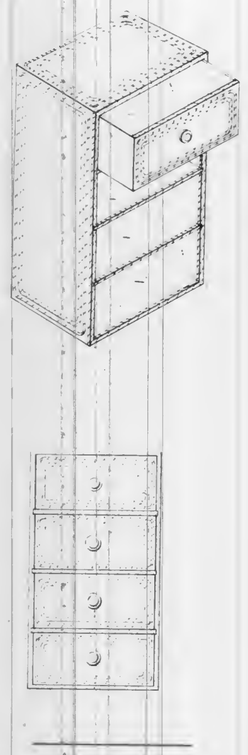
287,078
SHOE RACK
Robert L. Bowsher, 212 - 19th Ave., Moline, Ill. 61265
Filed Feb. 21, 1984, Ser. No. 582,002
The portion of the term of this patent subsequent to Nov. 29, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—450



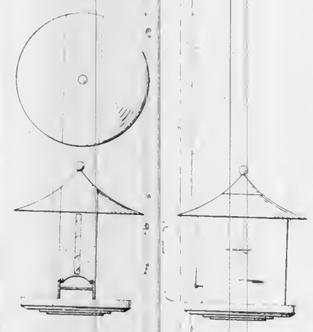
287,079
MODULAR STORAGE UNIT
Jules E. Mintjens, Westmalle, Belgium, assignor to Meubelfabrieken Karel Mintjens N. V., Belgium
Filed Nov. 21, 1983, Ser. No. 553,570
Term of patent 14 years
U.S. Cl. D6—436



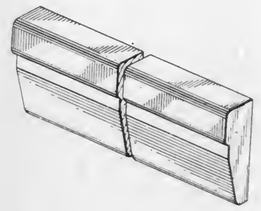
287,080
STORAGE CABINET
Mark Densen, 18 Blackburn Pl., Summit, N.J. 07901
Division of Ser. No. 535,246, Sep. 23, 1983, Pat. No. Des. 282,795. This application Sep. 18, 1985, Ser. No. 777,405
Term of patent 14 years
U.S. Cl. D6—446



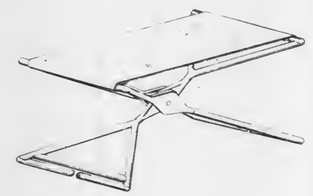
287,081
ROTATABLE DISPENSER FOR BABIES' DIAPERS AND TOILETRY
Jonathan Helinsky, 198 Woodward Ave., Staten Island, N.Y. 10314
Filed Jul. 9, 1984, Ser. No. 629,271
Term of patent 14 years
U.S. Cl. D6—457



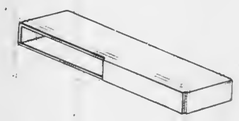
287,082
MOLDING FOR FURNITURE
Thomas F. Gambon, St. Louis, Mo., assignor to Charleswood Furniture Corp., Wright City, Mo.
Filed May 23, 1984, Ser. No. 613,311
Term of patent 14 years
U.S. Cl. D6—491



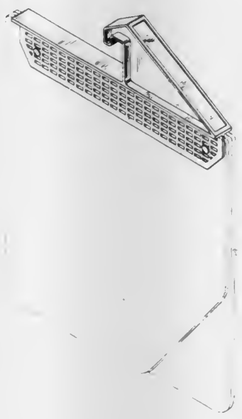
287,083
COLLAPSIBLE HEAD REST
Daniel F. Macedonio, 19020-3 Kittridge St., Reseda, Calif. 91335
Filed Jul. 25, 1984, Ser. No. 634,134
Term of patent 14 years
U.S. Cl. D6—502



287,084
COMPUTER TABLE STORAGE COMPARTMENT
Mark C. Jacobs, 4807 Marlborough Way, Carmichael, Calif. 95608
Filed Jul. 29, 1983, Ser. No. 518,539
Term of patent 14 years
U.S. Cl. D6—510



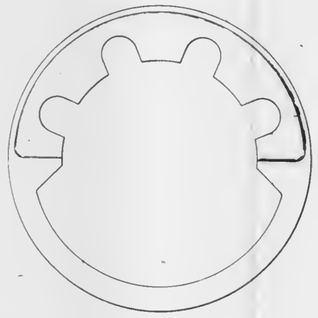
287,085
FLOOR MAT HANGER
Douglas B. Leeds, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Nov. 26, 1984, Ser. No. 674,679
Term of patent 14 years
U.S. Cl. D6—513



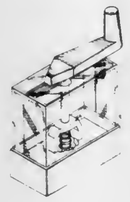
287,086
DRINKING MUG
James L. Meier, Des Plaines, and Scott F. Galloway, Evanston, both of Ill., assignors to Galloway Plastics Incorporated, Northfield, Ill.
Filed May 3, 1984, Ser. No. 606,752
Term of patent 14 years
U.S. Cl. D7—9



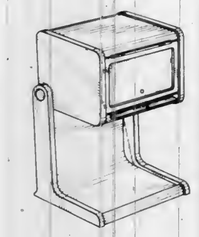
287,087
GOBLET RETAINER INSERT FOR A SERVING TRAY
Gregory E. Herrick, 15612 Highway 7, Minnetonka, Minn. 55343
Filed Jan. 17, 1983, Ser. No. 458,489
Term of patent 14 years
U.S. Cl. D7—39

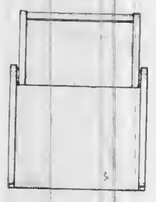


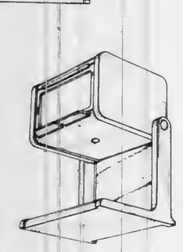
287,088
CONDIMENT MILL
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Aug. 29, 1984, Ser. No. 645,409
Term of patent 14 years
U.S. Cl. D7—53



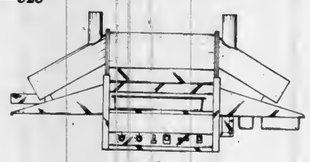
287,089
ELECTRIC BEVERAGE MAKER
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,444
Term of patent 14 years
U.S. Cl. D7—309



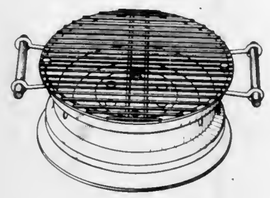




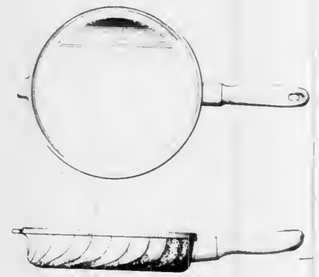
287,090
HUMPBACK TUNNEL OVEN-BROILER
Harold D. Wells, St. Louis County, Mo., assignor to Pet Incorporated, St. Louis, Mo.
Continuation-in-part of Ser. No. 380,553, May 21, 1982. This application May 10, 1984, Ser. No. 608,943
Term of patent 14 years
U.S. Cl. D7—323



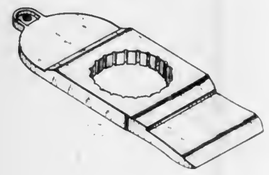
287,091
BARBECUE
Murray L. Elliston, 7064 Hillsboro St., San Diego, Calif. 92120
Filed Nov. 9, 1984, Ser. No. 670,165
Term of patent 14 years
U.S. Cl. D7—337



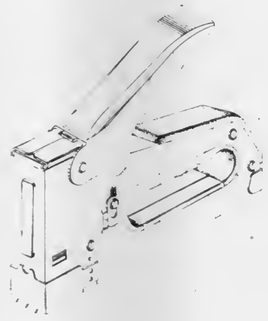
287,092
FRYING PAN OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed May 22, 1984, Ser. No. 612,883
Term of patent 14 years
U.S. Cl. D7—361



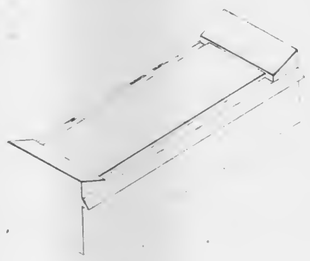
287,093
COMBINED BOTTLE CAP REMOVER, CAN OPENER AND ICE SCRAPER
Robert B. Ryan, 5025 Lillian St., Torrance, Calif. 90503
Filed Jul. 29, 1983, Ser. No. 518,657
Term of patent 14 years
U.S. Cl. D8—34



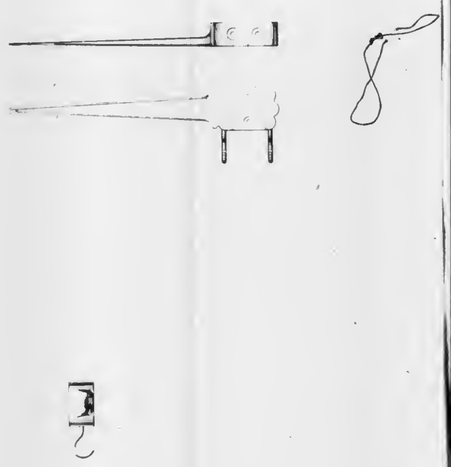
287,094
STAPLE GUN OR SIMILAR ARTICLE
Richard Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.
Filed May 21, 1984, Ser. No. 612,587
Term of patent 14 years
U.S. Cl. D8—49



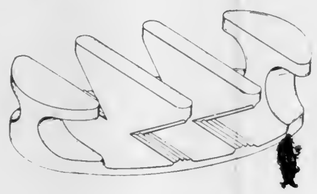
287,095
SHARPENING STONE HOLDER
James P. Hunter, Hot Springs, Ark., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.
Filed Mar. 21, 1984, Ser. No. 591,814
Term of patent 14 years
U.S. Cl. D8—91



287,096
COMBINATION WALL MOUNTED ENVELOPE OPENER, PEN AND KEY CHAIN HOLDER
Richard L. Vitacco, 1653 Thurston Ave., Racine, Wis. 53405
Filed Mar. 8, 1984, Ser. No. 587,457
Term of patent 14 years
U.S. Cl. D8—102



287,097
CLEAT
Bruce D. Nelson, Minneapolis, Minn., assignor to Goldeneye Products, Inc., Minneapolis, Minn.
Filed Feb. 24, 1984, Ser. No. 583,409
Term of patent 14 years
U.S. Cl. D8—382

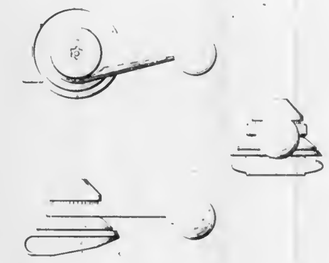


287,098
EARTH ANCHOR
Richard C. Wilson, Champlin, Minn., and Charles J. MacKarvich, Atlanta, Ga., assignors to Tie Down Engineering, Inc., Atlanta, Ga.
Filed Sep. 28, 1984, Ser. No. 655,243
Term of patent 14 years
U.S. Cl. D8—388

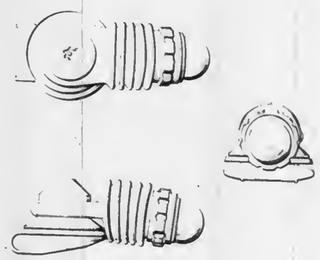


287,099
ELASTIC TIE DOWN STRAP
Milton T. Cory, Gastonia, N.C., assignor to Radiator Specialty Company, Harlotte, N.C.
Filed Dec. 5, 1984, Ser. No. 678,785
Term of patent 14 years
U.S. Cl. D8—394

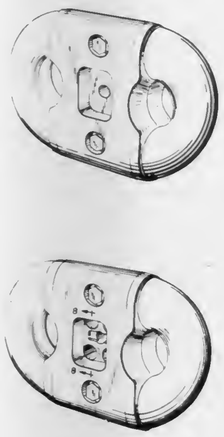
287,100
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,676
Term of patent 14 years
U.S. Cl. D8—395



287,101
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,678
Term of patent 14 years
U.S. Cl. D8—395



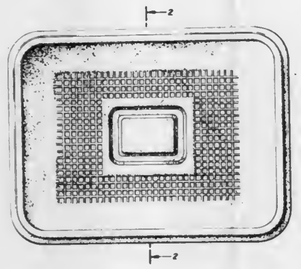
287,102
SEPARABLE CHAIN LINK
Rocco D. Albertini, Concordville, Pa., assignor to Baldt Incorporated, Chester, Pa.
Filed May 7, 1984, Ser. No. 607,761
Term of patent 14 years
U.S. Cl. D8—499



287,103
BOTTLE OR THE LIKE
Francois Thieffry, Paris, France, assignor to Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A., Paris, France
Filed Jul. 20, 1984, Ser. No. 632,835
Claims priority, application France, Jan. 20, 1984, 840239
Term of patent 14 years
U.S. Cl. D9—352



287,104
PACKAGING TRAY
M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed May 25, 1984, Ser. No. 614,209
Term of patent 14 years
U.S. Cl. D9—425

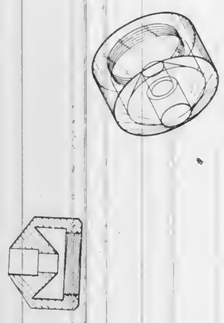


287,105
COMBINED PACKAGING AND DISPLAY CONTAINER
Ralph F. Osterhout, San Francisco, Calif., assignor to Tekna, Belmont, Calif.
Filed Jul. 24, 1984, Ser. No. 634,231
Term of patent 14 years
U.S. Cl. D9—415

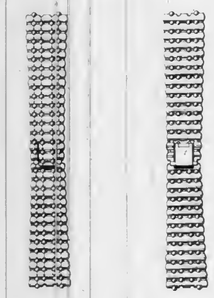
287,106
PORTABLE FLASHING SIGNAL LAMP
Thomas G. Wade, 3645 Birchbark Dr., Florissant, Mo. 63033
Filed Mar. 2, 1984, Ser. No. 585,826
Term of patent 14 years
U.S. Cl. D10—114



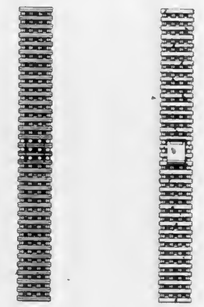
287,107
INDICATOR LENS
Ned Bergeron, and Theodore A. Stollberg, both of Houma, La., assignors to B.W.B. Controls, Inc., Houma, La.
Filed Mar. 28, 1983, Ser. No. 479,175
Term of patent 14 years
U.S. Cl. D10—121

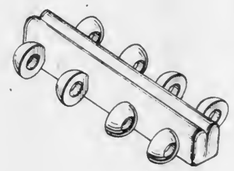


287,108
WATCH BRACELET
Maurice Levene, London, England, assignor to Accurist S.A., Switzerland
Filed Nov. 30, 1984, Ser. No. 676,793
Claims priority, application Switzerland, Jun. 1, 1984, 113782
Term of patent 14 years
U.S. Cl. D11—4

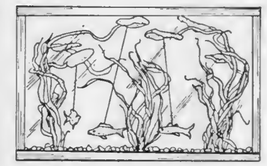


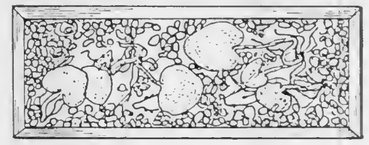
287,109
WATCH BRACELET
Maurice Levene, London, England, assignor to Accurist S.A., Switzerland
Filed Nov. 30, 1984, Ser. No. 676,792
Claims priority, application Switzerland, Jun. 1, 1984, 113782
Term of patent 14 years
U.S. Cl. D11—4





287,110
AQUATIC SCULPTURE OR SIMILAR ARTICLE
Otto Grun, 44 Cocoanut Row, Palm Beach, Fla. 33480
Filed May 7, 1984, Ser. No. 607,413
Term of patent 14 years
U.S. Cl. D11—158





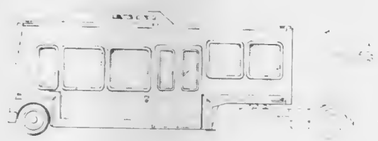
287,111
DEER AND ELK SLEIGH
Donald Walker, 2679 S. Memphis Way, Aurora, Colo. 80013
Filed Mar. 12, 1984, Ser. No. 588,716
Term of patent 14 years
U.S. Cl. D12—6



287,112
BUS VEHICLE
Paul Legueu, 85 avenue de Mazy, 44380 Pornichet, France
Filed Feb. 6, 1984, Ser. No. 577,386
The portion of the term of this patent subsequent to Feb. 7, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—84



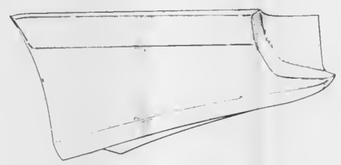
287,113
PASSENGER SEMITRAILER
Joseph M. FitzGerald, Buena Park, Calif., assignor to Superbus Associates, Buena Park, Calif.
Filed Sep. 25, 1984, Ser. No. 654,090
Term of patent 14 years
U.S. Cl. D12—97



287,114
SIDE FAIRING
Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076
Filed Dec. 4, 1984, Ser. No. 678,067
Term of patent 14 years
U.S. Cl. D12—181



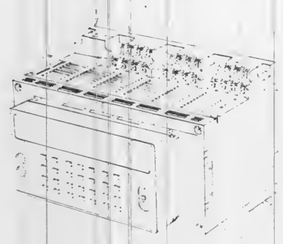
287,115
LEFT REAR SHIELD FOR ATTACHMENT TO AN AUTOMOBILE
Bjorn E. A. Envall, Vanersborg, Sweden, and Geoffrey P. Wardle, West Midlands, England, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Apr. 24, 1984, Ser. No. 603,941
Claims priority, application Sweden, Oct. 26, 1983, 83-2775
Term of patent 14 years
U.S. Cl. D12—190



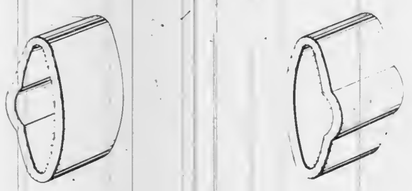
287,116
LEFT FRONT SHIELD FOR ATTACHMENT TO AN AUTOMOBILE
Bjorn E. A. Envall, Vanersborg, Sweden, and Geoffrey P. Wardle, West Midlands, England, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Apr. 24, 1984, Ser. No. 603,956
Claims priority, application Sweden, Oct. 26, 1983, 83-2775
Term of patent 14 years
U.S. Cl. D12—190



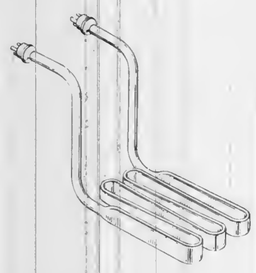
287,117
PROGRAMMABLE CONTROLLER
Tsukasa Saiki, Nakajo; Nobuyuki Kajima; Ryouichi Abe, both of Sibata, and Tatsuo Hujiwara, Nakajo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 9, 1984, Ser. No. 658,914
Term of patent 14 years
U.S. Cl. D13—12



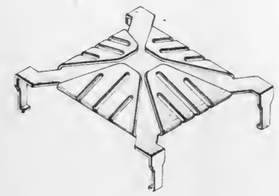
287,118
MARKING SLEEVE FOR ELECTRICAL CONDUCTORS OR THE LIKE
Lars Skarin, Otterbacken, Sweden, assignor to Partex Fabriksaktiebolag, Sweden
Filed May 8, 1984, Ser. No. 608,291
Claims priority, application Sweden, Feb. 3, 1984, 84-0347
Term of patent 14 years
U.S. Cl. D13—13



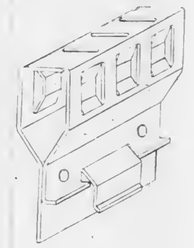
287,119
HEATING ELEMENT
Gurinder S. Wadia, Verdi, Nev., assignor to Wells Manufacturing Company, Verdi, Nev.
Filed Dec. 6, 1983, Ser. No. 558,511
Term of patent 14 years
U.S. Cl. D13—21



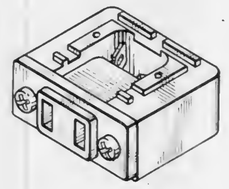
287,120
ELECTRONIC CHIP-CARRIER HEAT SINK
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 29, 1985, Ser. No. 717,945
Term of patent 14 years
U.S. Cl. D13—23



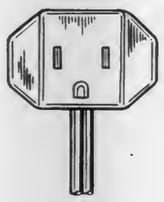
287,121
SHEET-METAL HEAT SINK FOR ELECTRONIC DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Apr. 23, 1984, Ser. No. 602,748
Term of patent 14 years
U.S. Cl. D13—23



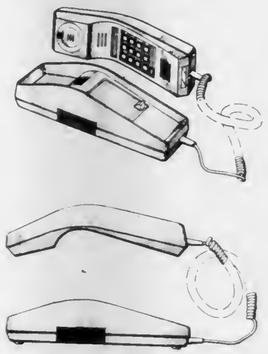
287,122
ADAPTER FOR CAMERA FLASH STROBE
Brent R. Hollister, 15848 Rayen St., Sepulveda, Calif. 91343
Filed Mar. 12, 1984, Ser. No. 588,442
Term of patent 14 years
U.S. Cl. D13—25



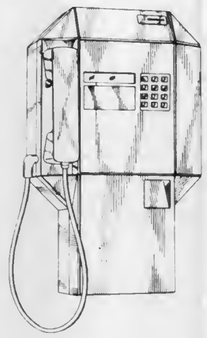
287,123
ELECTRICAL CONNECTOR
Saralee F. Ross, 25211 Stockport #313, Laguna Hills, Calif. 92653, and James R. Rydbeck, 3263 Old Bridgeport Way, San Diego, Calif. 92111
Filed Nov. 23, 1983, Ser. No. 554,976
Term of patent 14 years
U.S. Cl. D13—29



287,124
HANDSET TELEPHONE AND STAND UNIT
Peter Becker, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany
Filed May 9, 1985, Ser. No. 732,414
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 36892
Term of patent 14 years
U.S. Cl. D14—53

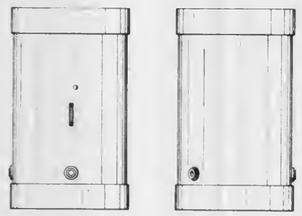


287,125
COIN-OPERATED TELEPHONE APPARATUS
Davorin Savnik, Ljubljana, Yugoslavia, assignor to Iskra-Sozd Electrokovinske Industrije N.Sol.O., Ljubljana, Yugoslavia
Filed Aug. 6, 1984, Ser. No. 638,009
Claims priority, application Yugoslavia, Feb. 6, 1984, 61/84
Term of patent 14 years
U.S. Cl. D14—55





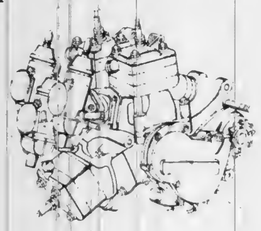
287,126
TELEPHONE AMPLIFIER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Ltd., Hong Kong, Hong Kong
Filed Jul. 10, 1984, Ser. No. 629,479
Claims priority, application United Kingdom, Jan. 19, 1984, 1017426
Term of patent 14 years
U.S. Cl. D14—57



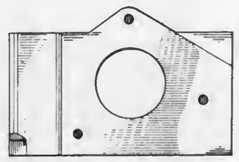
287,127
COMBINED TELEPHONE AMPLIFIER AND PEN HOLDER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Lmtd., Hong Kong, Hong Kong
Filed Jul. 5, 1984, Ser. No. 627,916
Claims priority, application United Kingdom, Jan. 19, 1984, 1017423
Term of patent 14 years
U.S. Cl. D14—57



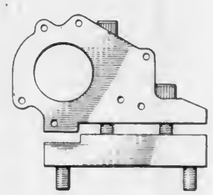
287,128
ENGINE FOR MOTORCYCLES
Kuniyuki Yamamoto, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 4, 1985, Ser. No. 740,967
Term of patent 14 years
U.S. Cl. D15—1



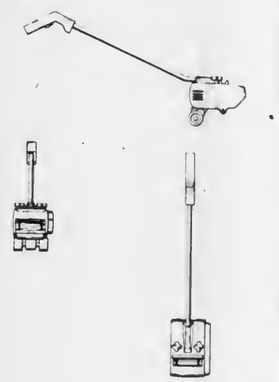
287,129
NOSE ADAPTER PLATE FOR AUTOMOBILE STARTERS
McLane Tilton, Jr., Solvang, Calif., assignor to Tilton Engineering, Inc., Buellton, Calif.
Filed Apr. 9, 1984, Ser. No. 598,450
Term of patent 14 years
U.S. Cl. D15—5



287,130
ADAPTER PLATE FOR AUTOMOBILE STARTERS
McLane Tilton, Jr., Solvang, Calif., assignor to Tilton Engineering, Inc., Buellton, Calif.
Filed Apr. 23, 1984, Ser. No. 603,284
Term of patent 14 years
U.S. Cl. D15—5



287,131
LAWN MOWER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Jul. 19, 1984, Ser. No. 632,303
Term of patent 14 years
U.S. Cl. D15—16



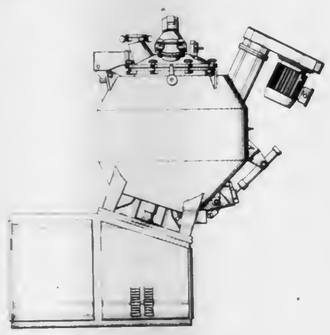
287,132
BLADE FOR SOIL MIXER
William A. Forbes, P.O. Box 1871, Westlock, Alberta T0G 2L0, Canada
Filed Feb. 15, 1985, Ser. No. 703,561
Term of patent 14 years
U.S. Cl. D15—19



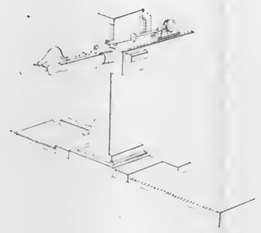
287,133
REFRIGERATOR
Roger W. Owen, 11809 Jefferson Pla., Omaha, Nebr. 68137
Filed Jul. 6, 1984, Ser. No. 628,487
Term of patent 14 years
U.S. Cl. D15—81



287,134
POT-TYPE MALAXATOR
Philippe Lappartient, 8, square Chanton, 92200 Neuilly-sur-Seine, France
Filed Jan. 28, 1983, Ser. No. 462,116
Term of patent 14 years
U.S. Cl. D15—122



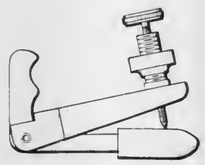
287,135
WELDING ROBOT
Ryoji Nagatani, Nagasaki, and Rikiya Iida, Takatsuki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 2, 1984, Ser. No. 606,454
Claims priority, application Japan, Feb. 3, 1984, 59-3790
Term of patent 14 years
U.S. Cl. D15—144



287,136
TELESCOPE
Joseph E. Murray, Jr., 27 Alpine St., #14, Malden, Mass. 02148
Filed Jan. 16, 1984, Ser. No. 570,870
Term of patent 14 years
U.S. Cl. D16—132



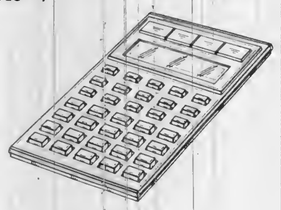
287,137
MUSICAL INSTRUMENT STRING ADJUSTER
James A. Bushman, St. Louis County, Mo., assignor to St. Louis Music Supply Company, St. Louis, Mo.
Filed Feb. 6, 1984, Ser. No. 577,522
Term of patent 14 years
U.S. Cl. D17—20



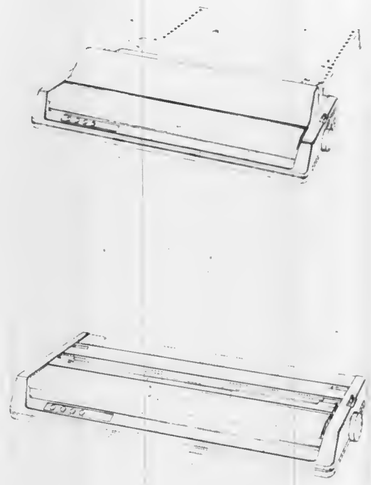
287,138
TYPEWRITER
Masakazu Sugiyama, and Kunio Akiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,011
Claims priority, application Japan, Nov. 7, 1983, 58-48438
Term of patent 14 years
U.S. Cl. D18—1



287,139
CALCULATOR
Shigeaki Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,015
Claims priority, application Japan, Nov. 4, 1983, 58-47937
The portion of the term of this patent subsequent to Jun. 10, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7



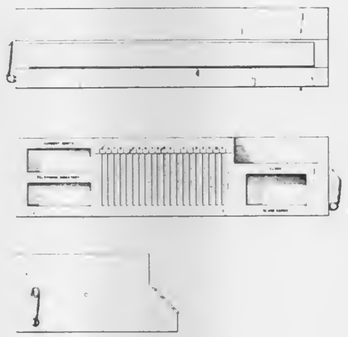
287,140
PRINTER FOR AN ELECTRIC CALCULATOR
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 26, 1984, Ser. No. 634,704
Term of patent 14 years
U.S. Cl. D18—12



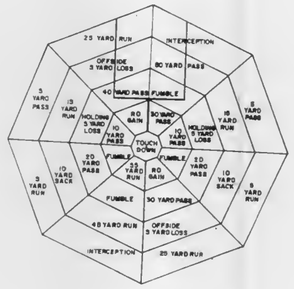
287,141
WRITING INSTRUMENT
Pierre Regnault, Valence, France, assignor to Etablissements Regnault, Valence, France
Filed Dec. 6, 1984, Ser. No. 678,978
Claims priority, application France, Jun. 6, 1984, 84 2518
Term of patent 14 years
U.S. Cl. D19—43



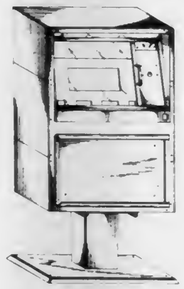
287,142
MEMORANDUM REMINDING DEVICE
Charles R. Goldman, Box 154, Evansville, Ark. 72729
Filed Apr. 18, 1984, Ser. No. 601,786
Term of patent 14 years
U.S. Cl. D19—75



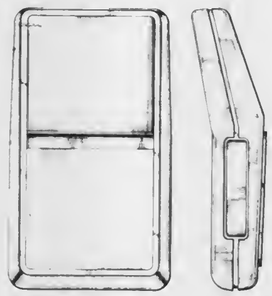
287,144
DART GAME BOARD
Matthew G. Dunn, 1637 Town St., Prentice, Wis. 54556
Filed Sep. 20, 1983, Ser. No. 534,086
Term of patent 14 years
U.S. Cl. D21—6



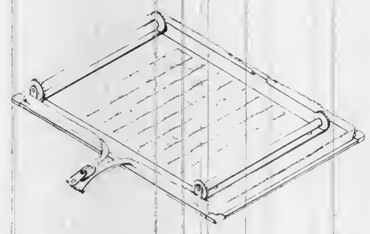
287,143
NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Nov. 25, 1983, Ser. No. 555,029
Term of patent 14 years
U.S. Cl. D20—6



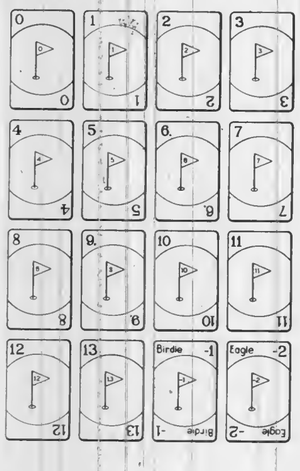
287,145
CASE FOR A PORTABLE COMPUTER GAME OR SIMILAR DEVICE
Albert R. Shilton, Los Angeles, and Greg L. DeSmet, Duarte, both of Calif., assignors to Avicom International, Inc., Pasadena, Calif.
Filed Oct. 9, 1984, Ser. No. 658,685
Term of patent 14 years
U.S. Cl. D21—13



287,146
COMBINED ROLLABLE CHESSBOARDS CLOTH AND ZIPPERED COVER THEREFOR
Tsung-Tzu Lin, 215, Sec. 2, chang Chiang Rd., Pan-Chiao City, Taipei Hsien, Taiwan
Filed Jan. 5, 1984, Ser. No. 568,464
Term of patent 14 years
U.S. Cl. D21—24



287,147
DECK OF PLAYING CARDS
Dorine M. Clapp, 547 Mulberry St., Clyde, Ohio 43410
Filed Sep. 7, 1984, Ser. No. 648,062
Term of patent 14 years
U.S. Cl. D21—43



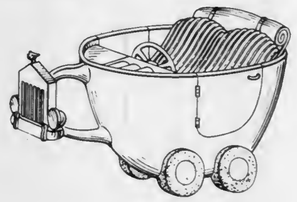
287,148
RATTLE
Peter G. Adams, Nether Stowey, England, assignor to Hestair Kiddicraft Limited, England
Filed Mar. 16, 1984, Ser. No. 590,267
Claims priority, application United Kingdom, Jan. 18, 1984, 1017390
Term of patent 14 years
U.S. Cl. D21—65



287,149
TOY RATTLE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Great Britain
Filed Feb. 19, 1985, Ser. No. 702,481
Term of patent 14 years
U.S. Cl. D21—65



287,150
SIMULATIVE TOY VEHICLE
Claude R. M. Moreau, 85-06 60th Ave., Elmhurst, N.Y. 11373
Filed Sep. 19, 1983, Ser. No. 533,250
Term of patent 14 years
U.S. Cl. D21—128



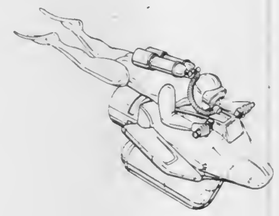
287,151
RECONFIGURABLE DINOSAURIAN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,425
Claims priority, application Japan, Apr. 10, 1984, 59-14287
Term of patent 14 years
U.S. Cl. D21—148



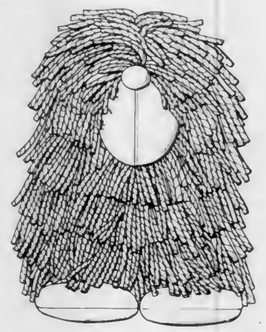
287,152
ANIMAL FIGURE
Linda D. Bussell, P.O. Box 30266, Honolulu, Hi. 96820
Filed Jun. 21, 1984, Ser. No. 622,956
Term of patent 14 years
U.S. Cl. D21—148



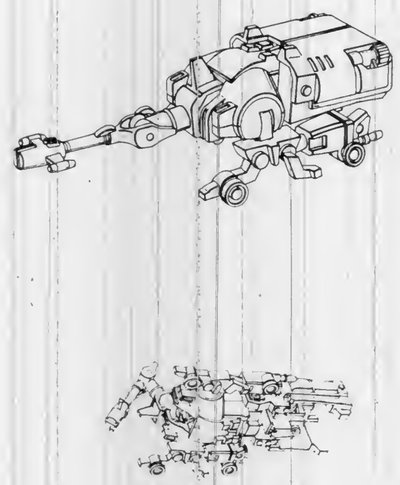
287,153
TOY SCUBA FIGURE
Tzi-Chan Choi, Kowloon, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong
Filed Apr. 25, 1984, Ser. No. 603,792
Claims priority, application United Kingdom, Nov. 14, 1983, 1016250
Term of patent 14 years
U.S. Cl. D21—150



287,154
DOLL OR SIMILAR ARTICLE
Carmen C. C. de Sanson, Calle San Ignacio, Qta Tanya, Prados del Este, Caracas, Venezuela
Filed Apr. 27, 1984, Ser. No. 605,622
Term of patent 14 years
U.S. Cl. D21—166



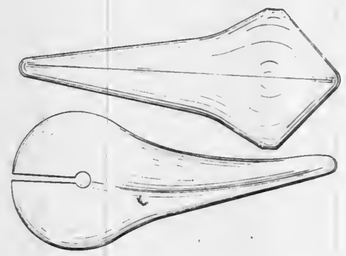
287,155
RECONFIGURABLE INSECT TOY
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1984, Ser. No. 643,264
Term of patent 14 years
U.S. Cl. D21—185



287,156
STAKE
Leo Sloane, Syosset, N.Y., assignor to Regent Sports Corporation, Hauppauge, N.Y.
Filed May 14, 1984, Ser. No. 609,859
Term of patent 14 years
U.S. Cl. D21—255



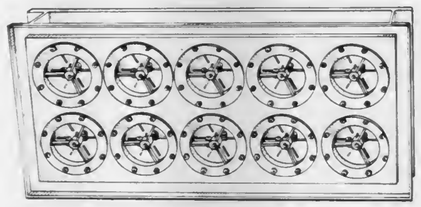
287,157
MOUTH-TOUCHING BOWSTRING-HELD ANCHOR NOCK FOR ARCHERY
Peter R. Griz, 2655 Baldwin, Oxford, Mich. 48051
Filed Jul. 26, 1983, Ser. No. 517,336
Term of patent 14 years
U.S. Cl. D22—107

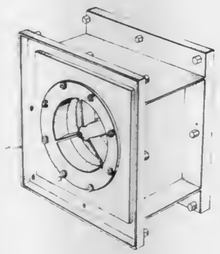


287,158
GUN BUTT PLATE
Henry P. Anderson, 21297 Hoekstra Ct., North, Forest Lake, Minn. 55025
Filed Apr. 16, 1984, Ser. No. 600,779
Term of patent 14 years
U.S. Cl. D22—111

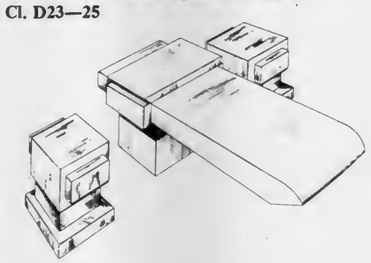


287,159
VALVE FOR EQUALIZING PRESSURE RESULTING FROM EXPLOSIONS OR BLASTS
Matti Purhonen, Helsinki, Finland, assignor to Temet Oy, Helsinki, Finland
Filed Jan. 6, 1983, Ser. No. 455,997
Claims priority, application Finland, Jul. 6, 1982, 589/82
Term of patent 14 years
U.S. Cl. D23—21





287,160
PAIR OF FAUCET HANDLES AND SPOUT SET
Manfred Rademacher, Freiligrathstrasse 19a, 4 Düsseldorf, Fed. Rep. of Germany
Filed Feb. 29, 1984, Ser. No. 584,810
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, M.R.5267
Term of patent 14 years
U.S. Cl. D23—25



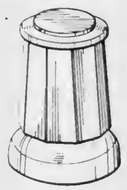
287,161
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,376
Term of patent 14 years
U.S. Cl. D23—28



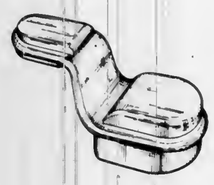
287,162
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,387
Term of patent 14 years
U.S. Cl. D23—28



287,163
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,386
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Term of patent 14 years
U.S. Cl. D23—28



287,164
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,377
Term of patent 14 years
U.S. Cl. D23—29



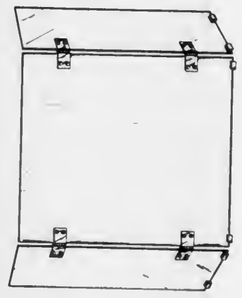
287,165
SURGICAL SUCTION DEVICE
Steven J. Lipsky, Pimento Cove, Reading P.O., St. James, Jamaica, and John D. Dale, 6005 Lincoln Dr., Scottsdale, Ariz. 85253
Filed May 4, 1984, Ser. No. 607,133
Term of patent 14 years
U.S. Cl. D24—51



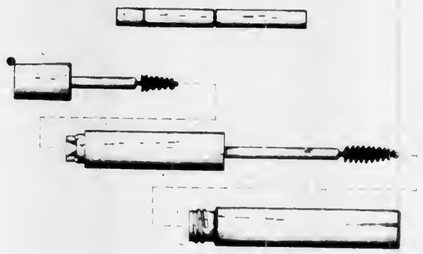
287,166
TIP GUARD FOR A SURGICAL SUCTION DEVICE
Steven J. Lipsky, Pimento Cove, Reading P.O., St. James, Jamaica, and John D. Dale, 6005 Lincoln Dr., Scottsdale, Ariz. 85253
Filed May 4, 1984, Ser. No. 607,134
Term of patent 14 years
U.S. Cl. D24—51



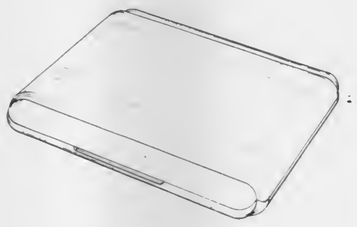
287,167
FIREPLACE SCREEN
Joseph J. Catania, deceased, late of Cheshire, Conn. by Hilda B. Catania, co-executor; Conn. National Bank, co-executor, New Haven, Conn.; Angelo Gaudino, Wallingford, Conn.; Russell DeTuzzi, Huntington, Conn., and Maxwell Gardner, Wallingford, Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Apr. 6, 1984, Ser. No. 597,740
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—138.3



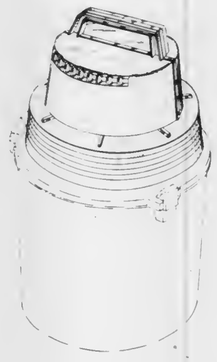
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Ted Kingsford, Memphis; Robert Baumgartner, Bartlett, and Sheila Rose, Memphis, all of Tenn., assignors to Plough, Inc., Memphis, Tenn.
Filed Aug. 16, 1984, Ser. No. 641,148
Term of patent 14 years
U.S. Cl. D28—77



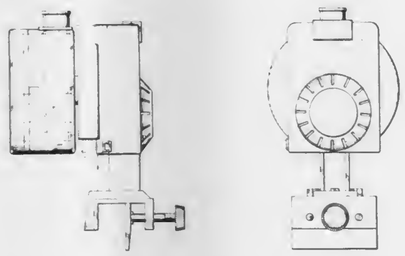
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Roberto Trabattoni, Petit-Lancy, Switzerland, assignor to Trasti S.A., Petit-Lancy, Switzerland
Filed Dec. 30, 1983, Ser. No. 567,360
Term of patent 14 years
U.S. Cl. D28—83



287,171
MOTOR HOUSING FOR CANISTER TYPE ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Robert L. Crevling, Jr., Williamsport, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 17, 1984, Ser. No. 571,562
Term of patent 14 years
U.S. Cl. D32—25



287,170
AUTOMATIC AQUARIUM FEEDER
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Phillips, Glen Cove, and Joseph Pesin, Brooklyn, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.
Filed Dec. 21, 1984, Ser. No. 685,139
Term of patent 14 years
U.S. Cl. D30—12



287,172
SQUEEGEE
Jo Ann Fulanovich, 7338 S. Rockwell, Chicago, Ill. 60629
Filed Sep. 27, 1984, Ser. No. 655,166
Term of patent 14 years
U.S. Cl. D32—41

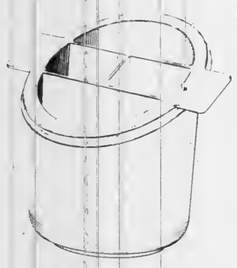


287,173
LIQUID APPLICATOR
Robert J. Libman, Champaign, Ill., assignor to Libman Broom Company, Arcola, Ill.
Filed May 3, 1984, Ser. No. 606,869
Term of patent 14 years
U.S. Cl. D32—51



287,174
BUCKET MOUNTABLE MOP HANGER
John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544
Filed Jun. 11, 1984, Ser. No. 619,537
Term of patent 14 years
U.S. Cl. D32—54

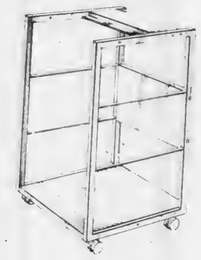
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Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Dec. 27, 1983, Ser. No. 565,712
Term of patent 14 years
U.S. Cl. D32—55



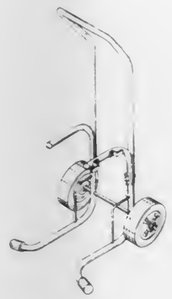
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COLLECTING CONTAINER FOR WASTE MATERIALS
Josephus N. M. Kouwenhoven, Dresdenlaan 25, NL-3055 WD Rotterdam, Netherlands
Filed May 16, 1984, Ser. No. 610,654
Term of patent 14 years
U.S. Cl. D34—9



287,177
CART
Victor R. Spicer, Auckland, New Zealand, assignor to Planhorse International NZ Limited, Auckland, New Zealand
Filed Aug. 13, 1984, Ser. No. 640,406
Claims priority, application New Zealand, Feb. 13, 1984, 18916
Term of patent 14 years
U.S. Cl. D34—21



287,178
CART FOR A DRAIN CLEANING MACHINE
Larry F. Babb, LaGrange, and Charles A. Boise, Wellington, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.
Filed Mar. 23, 1984, Ser. No. 592,514
Term of patent 14 years
U.S. Cl. D34—24



287,179
LUG WRENCH SUPPORT STAND OR SIMILAR ARTICLE
Roy E. Kuykendall, 45-425 Ash Ave., Indio, Calif. 92201
Filed May 14, 1984, Ser. No. 609,813
Term of patent 14 years
U.S. Cl. D34—31



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A. D. Smith Corporation: *See*—
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A. E. Staley Manufacturing Company: *See*—
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Aalto, Erkki; Saukkonen, Harri; and Hasa, Juhani, to Halton Oy. Fuse design for fire limiters or other safety appliances in ventilation installations. 4,627,498, Cl. 169-42.000.

AB Carbogel: *See*—
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AB Mekania-Verken: *See*—
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Abbott, Scot D.; and Yau, Wallace W., to Du Pont de Nemours, E. I., and Company. Differential pressure capillary viscometer for measuring viscosity independent of flow rate and temperature fluctuations. 4,627,271, Cl. 73-55.000.

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Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Copying machine. 4,627,713, Cl. 355-14.00R.

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Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Organosilyl compounds fungicidal compositions and use. 4,628,048, Cl. 514-63.000.

ACT Laboratories: *See*—
Markovics, Margaret, 4,627,640, Cl. 281-5.000.

Action Products, Inc.: *See*—
McElroy, Benedict R., 4,627,179, Cl. 36-44.000.

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Adams, Frederick J.; and Heap, Kenneth J. D., to TRW Cam Gears Limited. Power assistance steering systems for vehicles. 4,627,509, Cl. 180-142.000.

Adams, Neil R., to Advanced Micro Devices, Inc. Phase detector. 4,628,461, Cl. 364-481.000.

Adams, Robert D.: *See*—
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ADC Telecommunications, Inc.: *See*—
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Advanced Energy Dynamics, Inc.: *See*—
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Advanced Magnetics, Inc.: *See*—
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Advanced Micro Devices, Inc.: *See*—
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Advanced NMR Systems, Inc.: *See*—
Maudsley, Andrew A., 4,628,262, Cl. 324-309.000.
Rzedzian, Richard R., 4,628,264, Cl. 324-322.000.

Afromowitz, Martin A., to Innovation Associates. Inclinometer having two degrees of freedom. 4,627,172, Cl. 33-366.000.

Agback, Karl H., to Pharmacia AB. 2-hydroxy-5-(arylazo)-benzene alkanoic acids. 4,628,083, Cl. 534-798.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
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Aguilo, Adolfo: *See*—
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Aida, Kanae: *See*—
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Aiga, Hiroshi: *See*—
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Air Preheater Company, Inc., The: *See*—
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Air Products and Chemicals, Inc.: *See*—
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Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., 4,627,913, Cl. 208-415.000.
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Aisin Warner Kabushiki Kaisha: *See*—
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Aiuchi, Susumu: *See*—
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Akerberg, Dag E., to Telefonaktiebolaget LM Ericsson. Method and apparatus for transmission of telephone calls to a portable, wireless telephone set. 4,628,152, Cl. 379-51.000.

Akers, David D.: *See*—
Hill, William D.; and Akers, David D., 4,628,277, Cl. 330-110.000.

Akerstrom, Bengt; and Hartmann, Friedrich, to Esselte Security Systems. Method of automatically banderoling bundled sheet objects and apparatus for carrying out the method. 4,627,218, Cl. 53-399.000.

Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, to Kajima Corporation. Carbon fiber reinforced concrete. 4,627,998, Cl. 428-285.000.

Akimoto, Shigeyuki, to Copal Company Limited. Apparatus for measuring the magnitude of a load. 4,627,297, Cl. 73-862.340.

Akita, Yukio: *See*—
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Alameddine, Bassem R., to Mobil Oil Corporation. Steamflood recovery method for an oil-bearing reservoir in a dipping subterranean formation. 4,627,493, Cl. 166-263.000.

Aldinger, Fritz; and Werdecker, Waltraud, to W.C. Heraeus GmbH. Ceramic temperature stabilization body, and method of making same. 4,627,815, Cl. 432-24.000.

Alesina, Alberto: *See*—
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ALH Systems Limited: *See*—
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Alicot, Michel, to Atochem. Process for the preparation of 3-amino-1,2,4-triazole. 4,628,103, Cl. 548-266.000.

Alitz, Orville J., to Rockwell International Corporation. Ground clutter suppression technique. 4,628,318, Cl. 342-26.000.

Allen, William R.: *See*—
White, Christine A.; Dulbecco, Renato; and Allen, William R., 4,628,032, Cl. 435-240.000.

Allias, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. System and device for remote surveillance of equipment

on a digital transmission link without interrupting traffic. 4,628,309, Cl. 340-825.540.
Allied Colloids Ltd.: *See—*
Glover, Rodney; and Brown, Martin R., 4,628,078, Cl. 526-303.100.
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Amato, Louis: Motor vehicle lock cover device. 4,628,300, Cl. 340-542.000.
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Andrews, Thomas L., Jr.; Fiers, Thomas A.; and Laatt, Richard G., to Amcodyne Incorporated. Disk runout compensator. 4,628,379, Cl. 360-77.000.
ANT Nachrichtentechnik GmbH: *See—*
Sperlich, Josef, 4,628,506, Cl. 370-104.000.
Anthony, Thomas R., to General Electric Company. Forming electrical conductors in long microdiameter holes. 4,628,174, Cl. 219-76.130.
Antoine, Hubert J. F. Fuel injection device for two-stroke engine. 4,627,390, Cl. 123-73.0CB.
Antonenko, Viktor I. Device for automatic control of pressure filters. 4,627,914, Cl. 210-96.100.
Aoki, Harumi: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,627,700, Cl. 354-409.000.
Aoki, Osamu: *See—*
Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, 4,628,119, Cl. 564-314.000.
Aoki, Takashi: *See—*
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Aoki, Tosio: *See—*
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Aoyama, Toshihiko: *See—*
Toshimitsu, Yoshihiko; Aoyama, Toshihiko; and Ishida, Takashi, 4,627,637, Cl. 280-714.000.
Arai, Kazuyoshi: *See—*
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, 4,627,571, Cl. 239-90.000.
Arai, Kouichi; and Akita, Yukio, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Photocopying apparatus. 4,627,708, Cl. 355-14.00R.
Arai, Takao: *See—*
Takahashi, Hiroaki; Yamazaki, Shigeru; Noguchi, Takaharu; and Arai, Takao, 4,628,373, Cl. 360-62.000.
Arakawa, Satoshi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,628,208, Cl. 250-483.100.
Araki, Yusuke, to Bridgestone Corporation. Method of and apparatus for applying looped rubber member onto tire building drum. 4,627,884, Cl. 156-131.000.
Archer, John R.; Kellaway, Michael J.; and MacArthur, Douglas S., to USM Corporation. Apparatus for bending metal strip. 4,627,255, Cl. 72-10.000.
Archibald, John P.: *See—*
Duffy, Thomas E.; Archibald, John P.; and Campbell, Alan H., 4,627,386, Cl. 122-1.00B.
Arco, Judith A., to Minnesota Mining and Manufacturing Company. Universal medical cover sheet and process for draping. 4,627,427, Cl. 128-132.00D.
Argazzi, Ivo, to I.M.A.—Industria Macchine Automatiche—S.p.A. Apparatus for the positive transfer of tubes from the line which processes them into boxes of tube-filling and boxing machines. 4,627,216, Cl. 53-251.000.
Aristoff, Paul A., to Upjohn Company, The. Novel 9-substituted carbacyclin analogs. 4,628,110, Cl. 560-119.000.
Arlt, Dieter, to Bayer Aktiengesellschaft. 5,5-dichloro-3,3-dimethylpentanoic acid. 4,628,118, Cl. 562-602.000.
Arlt, Dieter: *See—*
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.
Arlt, Edward J., to LTV Energy Products Company. Method of producing a compression loaded torsional coupling device. 4,627,885, Cl. 156-160.000.
Armco Inc.: *See—*
Larsen, Lorin V.; and Eidem, Brian L., 4,627,519, Cl. 188-1.110.
Armiger, Ronald E.: *See—*
Gause, James E.; and Armiger, Ronald E., 4,627,355, Cl. 102-378.000.

Artz, Gerd: *See—*
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Kuroda, Toru; and Yamawaki, Naokuni, 4,627,915, Cl. 210-195.200.
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Tomori, Yasumasa, 4,627,691, Cl. 350-429.000.
Asahi-Matsu Foods Inc.: *See—*
Yada, Hideo; Akaba, Kunihisa; and Mukaiyama, Megumi (said Kunihisa Akaba and Megumi Mukaiyama assors. to), 4,627,985, Cl. 426-92.000.
Asanomi, Koji; and Abe, Ryoji, to Mazda Motor Corporation. Cylinder block for internal combustion engine. 4,627,394, Cl. 123-195.00R.
Ascii Corporation: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.
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Asher, Sanford A., to University of Pittsburgh. Crystalline colloidal narrow band radiation filter. 4,627,689, Cl. 350-362.000.
Ashford, James D.; Harrison, Terry W.; Eastlack, James K.; Blount, Curtis G.; Herring, Gary D.; and Underdown, David R., to Atlantic Richfield Company. Squeeze cement method using coiled tubing. 4,627,496, Cl. 166-292.000.
Ashland Oil, Inc.: *See—*
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Associated Electrical Industries Limited: *See—*
Quayle, George P., 4,628,245, Cl. 322-32.000.
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AT&T Bell Laboratories: *See—*
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.
Hoffner, Charles W., II, 4,628,446, Cl. 364-200.000.
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AT&T Technologies, Inc.: *See—*
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Ors, Jose A.; and Small, Richard D., Jr., 4,628,022, Cl. 430-280.000.
Atlantic Richfield Company: *See—*
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Atlas Fahrzeugtechnik GmbH: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.
Atochem: *See—*
Alicot, Michel, 4,628,103, Cl. 548-266.000.
Audeh, Costandi A., to Mobil Oil Corporation. Process for the removal of hydrogen sulfide from sour gas. 4,627,964, Cl. 423-228.000.
Auer, Peter. Step-negotiating vehicle. 4,627,508, Cl. 180-9.220.
Augat Incorporated: *See—*
Holt, Richard C., 4,627,162, Cl. 29-847.000.
Aughton, John E.; and Oldershaw, Robert J., to Crosfield Electronics (USA) Limited. Image enhancement. 4,628,350, Cl. 358-75.000.
August, Melvin C.; and Williams, John T., to Cray Research, Inc. Circuit module with enhanced heat transfer and distribution. 4,628,407, Cl. 361-388.000.
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Authelet, Marc; and Perrin, Jean, to Saint-Hubert Industrie Laitiere. Process for manufacturing and packaging soft cheese. 4,627,984, Cl. 426-37.000.
Autoflug GmbH: *See—*
Sedlmayr, Gerhard; and Just, Herbert, 4,627,639, Cl. 280-808.000.
Automobiles Citroen: *See—*
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Automobiles Peugeot: *See—*
Camus, Gerard, 4,627,510, Cl. 180-148.000.
Van Oost, Michel D., 4,627,654, Cl. 294-106.000.
Automotive Products plc: *See—*
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Autotron Products, Inc.: *See—*
Daniels, John A.; and Ziegler, John H., 4,627,657, Cl. 296-91.000.
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Ayer, Atul D., to ALZA Corporation. Osmotic device with self-sealing passageway. 4,627,971, Cl. 424-15.000.
Azusawa, Noboru; and Shiraishi, Hisayoshi, to Hitachi, Ltd. Pulse width modulation pulse generator. 4,628,475, Cl. 364-851.000.
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Babcock-Hitachi Kabushiki Kaisha: *See—*
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Andersson, Lars; Backlund, Hans; Henriksson, Bengt; and Mostrom, Thomas, 4,627,259, Cl. 72-202.000.
Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, to Seitz-Filter-Werke Theo & Geo Seitz GmbH & Co. Process for the production of filter elements based on aromatic polyamide. 4,627,992, Cl. 427-244.000.
Baer, John S., to RainWise, Inc. Magnet selector or switch. 4,627,277, Cl. 73-170.00R.
Bailey, Malcolm J.: *See—*
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Bainbridge, Wilfred N.; and Young, Alastair J., to Automotive Products plc. Change speed transmission. 4,627,301, Cl. 74-333.000.
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Baker, William H. Vacuum filter for swimming pools controlling water recirculation capacity to accommodate varying gutter flow. 4,627,118, Cl. 4-510.000.
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., to International Business Machines Corporation. Apparatus for directly powering a multi-chip module from a power distribution bus. 4,628,411, Cl. 361-414.000.
Baldwin, Kenneth B.: *See—*
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Falk, Robert A.; and Phillis, Gary L., 4,627,722, Cl. 356-4.500.
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Balyasny, Marik; Baldwin, Kenneth B.; and Lovell, William E., to G&H Technology, Inc. Fiber optic terminus cleaving apparatus. 4,627,561, Cl. 225-96.000
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Baran, Walter J., Jr., to United Technologies Corporation. Stator assembly for bounding the working medium flow path of a gas turbine engine. 4,627,233, Cl. 60-39.161.
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Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., to General Foods Corporation. Pressurized container providing for the separate storage of a plurality of materials. 4,627,986, Cl. 426-112.000.
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Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.
Barnes, Elwood E.: *See—*
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Barnes Engineering Company: *See—*
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Barnett, Kenneth W.; and Brown, Mary J., to Ashland Oil, Inc. Catalyst and process for oligomerization of ethylene. 4,628,138, Cl. 585-531.000.

Barnett, Kenneth W., to Ashland Oil, Inc. Bis(1,5-cyclooctadiene)Ni(O) catalyst and process for oligomerization of ethylene. 4,628,139, Cl. 585-531.000.

Barnett, Ronald E.; and Yarger, Ronald G., to General Foods Corporation. Edible material containing meta-hydroxybenzoic or salts. 4,627,987, Cl. 426-548.000.

Baron, Kenneth: *See*—
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Baron, Kenneth S.; and Wood, David W., to Hexcel Corporation. Cold water curable orthopedic cast. 4,627,424, Cl. 128-83.000.

Baron, Walter J., to Water Services of America, Inc. Correction for tube sheet misalignment in heat exchangers having tube cleaning arrangements therein. 4,627,486, Cl. 165-81.000.

Barr, A. Brinkley; and Edwards, D. Craig, to Baker International Corporation. Liquid level detection system. 4,628,302, Cl. 340-620.000.

Barr & Stroud: *See*—
French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., 4,627,723, Cl. 356-5.000.

Barrett, Raymond L., Jr.: *See*—
Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., 4,628,324, Cl. 343-788.000.

Barrus, George H., Jr., to Wang Laboratories, Inc. Grounding and strain relief clamp for flat cables. 4,627,673, Cl. 339-14.00R.

Bartlett, Randall: *See*—
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Bartley, Timothy: *See*—
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Bartley, William J., to Union Carbide Corporation. Process for the preparation of ethylene glycol by catalytic hydrogenation. 4,628,128, Cl. 568-864.000.

Bartley, William J., to Union Carbide Corporation. Process for the preparation of ethylene glycol. 4,628,129, Cl. 568-864.000.

Bartlow, David H., to Owens-Corning Fiberglas Corporation. Pultruded underground tank hold-down strap assembly. 4,627,133, Cl. 24-298.000.

Basa, Laddie A., to Andrew Corporation. Television transmission system using overmoded waveguide. 4,628,538, Cl. 455-91.000.

BASF Aktiengesellschaft: *See*—
Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,628,048, Cl. 514-63.000.
Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,628,058, Cl. 514-383.000.

BASF Farben & Fasern AG: *See*—
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Basiulis, Algerd, to Hughes Aircraft Company. Separate liquid flow heat pipe system. 4,627,487, Cl. 165-104.260.

Bassuk, Lawrence J.: *See*—
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Bastida, Tomas, to Ofcina de Investigacion Agrupada, S.A. Flow regulating valve for steam iron steam chamber. 4,627,181, Cl. 38-77.700.

Bates, Thomas J. Variable traction apparatus and method. 4,627,422, Cl. 128-71.000.

Battaini, Steven L.: *See*—
Petro, David J.; and Battaini, Steven L., 4,627,789, Cl. 415-28.000.

Bauer, Angelo: *See*—
Schonfeld, Harald; and Bauer, Angelo, 4,627,747, Cl. 384-113.000.

Baumann, Arthur, to Mettler Instruments AG. Apparatus and method for generating a pictorial display on a measuring instrument during a metering process. 4,628,470, Cl. 364-567.000.

Baumgartner, Hans: *See*—
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Baus, Rene, to American Magnetics Corporation. Credit card security system. 4,628,195, Cl. 235-440.000.

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Bayer Aktiengesellschaft: *See*—
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Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.
Franke, Gunter, 4,628,086, Cl. 544-31.000.
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.
Le Blanc, Helmut; Puppe, Lothar; and Wedemeyer, Karlfried, 4,628,097, Cl. 546-251.000.
Lorenz, Manfred; and Schundehutte, Karl H., 4,628,082, Cl. 534-707.000.
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,628,069, Cl. 524-339.000.
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,628,093, Cl. 546-6.000.
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Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
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von Bittera, Miklos; and Meyer, Rolf-Volker, 4,627,852, Cl. 604-897.000.
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,628,079, Cl. 528-49.000.

Bayer, Franz; and Grosch, Karl, to Franz Xaver Bayer Isolierglasfabrik. Method of and apparatus for making spacers for use in multiple-pane windows or the like. 4,627,263, Cl. 72-298.000.

Bayless, Ernest O.: *See*—
Dempsey, Will R.; Bayless, Ernest O.; and Clark, Samuel D., 4,628,177, Cl. 219-121.0PN.

BBC Brown, Boveri & Company, Limited: *See*—
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Nazmy, Mohamed; and Singer, Robert, 4,627,896, Cl. 204-37.100.

BE - GE Stolindustri AB: *See*—
Ronnhult, John; and Eklund, Jan, 4,627,661, Cl. 297-284.000.

Beaulieu, Bryan J. Hub assembly for collapsible structure. 4,627,210, Cl. 52-646.000.

Beauviala, Jean-Pierre; and Charras, Jean-Pierre, to Societe Anonyme dite: Aaton Rg. Device for automatically metering and displaying the footage of delivered film contained in each of a plurality of interchangeable magazines adapted to be mounted on the body of a cinematographic camera. 4,627,695, Cl. 352-72.000.

Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., to Monsanto Company. Process for preparing a polyamide. 4,627,940, Cl. 260-501.110.

Beavers, John A., to International Business Machines Corporation. Infra-red data communications system for coupling a battery powered data entry device to a microcomputer. 4,628,541, Cl. 455-603.000.

Bechtel, Friend K., to Metriguard, Inc. Apparatus for tension testing of lumber. 4,627,293, Cl. 73-831.000.

Beck, Kurt-Gunther: *See*—
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Beck, Richard, Jr., to Sundstrand Corporation. Unitary bearing retainer for a swashplate bearing. 4,627,330, Cl. 92-12.200.

Becker, Paul E.: *See*—
Cawston, John F.; and Becker, Paul E., 4,628,023, Cl. 430-331.000.

Becker, Ralph S.: *See*—
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Bedi, James J.; Golden, Donald M.; and McVay, William P., to Ethicon, Inc. Method of applying a fastener to tissue with a pair of hollow needles. 4,627,437, Cl. 128-334.00C.

BEI Motion Systems Company, Inc.: *See*—
Hafle, Ralph S.; and Love, Mark D., 4,628,298, Cl. 340-347.00P.

Beitner, Shlomo, to Vapor Corporation. Thermoelectric cooler. 4,627,242, Cl. 62-3.000.

Belart, Juan; Weise, Lutz; and Seibert, Wolfram, to Alfred Teves GmbH. Slip-controlled brake system for automotive vehicles. 4,627,669, Cl. 303-114.000.

Bell Helmets Inc.: *See*—
Broersma, Lester V., 4,627,115, Cl. 2-425.000.

Bell, Thomas W.: *See*—
Shurman, Louis W.; and Bell, Thomas W., 4,627,479, Cl. 152-541.000.

Benecke, Herta: *See*—
Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, 4,627,880, Cl. 127-43.000.

Benker, Gerhard: *See*—
Nitsch, Wilhelm; Treiber, Helmut; and Benker, Gerhard, 4,627,719, Cl. 355-41.000.

Bennett, Roger F. C., to Westinghouse Brake and Signal Company Limited. Semiconductor housings. 4,628,147, Cl. 174-52.00P.

Bentham, Jeremy B., to Shell Oil Company. Gas/liquid contacting apparatus. 4,627,941, Cl. 261-109.000.

Benton, Kenneth C.: *See*—
Desmond, Michael J.; Weinert, Raymond J., Jr.; Ball, Lawrence E.; and Benton, Kenneth C., 4,628,077, Cl. 526-90.000.

Benz, Willi, to SMS Sloemann Siegmag AG. Rolling stand with axially shiftable rolls. 4,627,260, Cl. 72-247.000.

Berenjian, Karim, to Ford Motor Company. Energy absorbing steering column for motor vehicles. 4,627,306, Cl. 74-492.000.

Berg, David M.: *See*—
Nelson, David E.; Berg, David M.; and Hannon, Robert J., 4,628,493, Cl. 367-79.000.

Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., to Baxter Travenol Laboratories, Inc. Heater-scale for heating fluids for injection into a patient. 4,628,186, Cl. 219-497.000.

Bergere, Emric W. Article for treating soil around growing plants. 4,627,191, Cl. 47-25.000.

Bergwerksverband GmbH: *See*—
Hedden, Kurt; Beck, Kurt-Gunther; Rohde, Wolfgang; and Schumacher, Horst, 4,627,174, Cl. 34-20.000.

Berndt, Dale F., to Sperry Corporation. Fast scan/set testable latch using two levels of series gating with one current source. 4,628,217, Cl. 307-467.000.

Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, to Ciba-Geigy Corporation. Process for sizing paper with anionic hydrophobic sizing agents and cationic retention aids. 4,627,889, Cl. 162-158.000.

Bernstein, Lawrence S.: *See*—
Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., 4,627,284, Cl. 73-336.500.

Berol Kemi AB: *See*—
Mathiesen, Mait M.; and Svensson, Kent O., 4,627,855, Cl. 44-51.000.

Berolina International Marketing Strategie GmbH: *See*—
Wilcke, Gerhard, 4,627,476, Cl. 141-364.000.

Berthet, Aristide; and Denier, Guy, to IRSID. Installation for the production of steel by pre-smelting of pig iron. 4,627,601, Cl. 266-212.000.

Besselman, Thomas P.: *See*—
Talvalkar, Shashi G.; and Besselman, Thomas P., 4,628,000, Cl. 428-341.000.

Betz, Dieter, to Robert Bosch GmbH. Ignition coil for multi-cylinder internal combustion engine. 4,627,407, Cl. 123-634.000.

BeVier, William E.; Kather, Kenneth C.; and Graczyk, Lawrence S., to Union Carbide Corporation. Valve system for particulate solid flow control. 4,627,456, Cl. 137-1.000.

Bhate, Suresh K. Combined mechanical and magnetic locking system. 4,627,251, Cl. 70-276.000.

Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method of making glass fiber forming feeders. 4,627,864, Cl. 65-1.000.

Bianchi International: *See*—
Bianchi, John E.; Miller, Martin R.; and Nichols, Richard D. E., 4,627,558, Cl. 224-238.000.

Bianchi, John E.; Miller, Martin R.; and Nichols, Richard D. E., to Bianchi International. Universal military holster. 4,627,558, Cl. 224-238.000.

Bido , Sven O.: *See*—
Thordarson, Gunnar G.; and Bido , Sven O., 4,627,351, Cl. 102-213.000.

Bien, Fritz: *See*—
Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., 4,627,284, Cl. 73-336.500.

Bierhoff, Martinus P. M., to U.S. Philips Corporation. Apparatus for reproducing information from an optically readable record carrier. 4,628,497, Cl. 369-44.000.

Bigelow, Donald O.: *See*—
Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., 4,627,341, Cl. 100-41.000.

Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., to Establissements A. Gregoire & Barilleau. Continuous-accessibility electrical conduits. 4,627,679, Cl. 339-21.00R.

Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, to Omron Tateisi Electronics Co. Sealed slide switch. 4,628,166, Cl. 200-302.100.

Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, to Diversey Corporation. Method and apparatus for treating a plurality of zones of a processing line. 4,627,457, Cl. 137-1.000.

Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., to Motorola, Inc. NPN bandgap voltage generator. 4,628,248, Cl. 323-314.000.

Biswas, Ranjit, to Thomas & Betts Corporation. Electronic package assembly and accessory component therefor. 4,627,678, Cl. 339-17.0CF.

BIW Cable Systems, Inc.: *See*—
Didier, Robert G., 4,628,392, Cl. 361-2.000.

Black & Decker Inc.: *See*—
Bradus, Robert, 4,628,233, Cl. 318-306.000.
Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., 4,628,185, Cl. 219-386.000.

Blanton, Roy W.: *See*—
Anderson, Thomas H.; Anderson, Donald E.; Hall, Glenn E.; and Blanton, Roy W., 4,627,333, Cl. 98-56.000.

Blaupunkt-Werke GmbH: *See*—
Germer, Horst, 4,628,526, Cl. 381-57.000.

Bled, Christian C.: *See*—
Parlant, James B.; Etourneau, Michel; and Bled, Christian C., 4,628,401, Cl. 361-178.000.

Block, Richard M. Infant article suspension structure. 4,627,588, Cl. 248-163.200.

Blount, Curtis G.: *See*—
Ashford, James D.; Harrison, Terry W.; Eastlack, James K.; Blount, Curtis G.; Herring, Gary D.; and Underdown, David R., 4,627,496, Cl. 166-292.000.

Blum, Alvin S. Code reading operations supervisor. 4,628,193, Cl. 235-375.000.

Board of Regents, The University of Texas, The: *See*—
Hills, Brian A., 4,627,419, Cl. 128-1.00D.

Bock, Mark G.; Veber, Daniel F.; and DiPardo, Robert M., to Merck & Co., Inc. Process for 3-acylamino benzodiazepines. 4,628,084, Cl. 540-509.000.

Bodine, John H.; and Bork, Jonathan, to Standard Oil Company. Time variant filter for range dependent tuning. 4,628,491, Cl. 367-45.000.

Boehmke, Gunther: *See*—
Buysch, Hans-Josef; Kussi, Siegfried; and Boehmke, Gunther, 4,627,929, Cl. 252-47.000.

Boeing Company, The: *See*—
Covey, James H., 4,628,402, Cl. 361-218.000.
Zeorlin, Daniel H., 4,627,590, Cl. 248-351.000.

Bohm, Horst: *See*—
Stahl, Bernhard; and Bohm, Horst, 4,627,603, Cl. 269-32.000.

Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., to Thomson Components-Mostek Corporation. Chip selection in automatic assembly of integrated circuit. 4,627,787, Cl. 414-786.000.

Bond, Robert H.: *See*—
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.

Bone, Arnold R., to Dennison Manufacturing Company. Operation of trigger actuated devices. 4,627,562, Cl. 227-67.000.

Bonnell, Leo W.; and Pietrantonio, Joseph M., to Air Products and Chemicals, Inc. Process for the production of methanol. 4,628,066, Cl. 518-700.000.

Bor, Jan H. Stairlift. 4,627,517, Cl. 187-12.000.

Borck, Gordon T.: *See*—
Muench, Frank J.; and Borck, Gordon T., 4,628,292, Cl. 337-204.000.

Borg, Arthur N.; and Bar-Hai, Giora, to Zenith Electronics Corporation. Terminal with memory write protection. 4,628,479, Cl. 364-900.000.

Borgner, Klaus, to Luco-Technic GmbH Verfahrenstechische Anlagen. Bag cutting-and emptying-device with connected collective dust-removal filter. 4,627,781, Cl. 414-412.000.

Bork, Jonathan: *See*—
Bodine, John H.; and Bork, Jonathan, 4,628,491, Cl. 367-45.000.

Borsotti, Giampiero, to Montedison S.p.A. Process for the synthesis of 2-methoxy-6-bromo-naphthalene. 4,628,123, Cl. 568-634.000.

Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., to Motorola, Inc. Noise suppression system. 4,628,529, Cl. 381-94.000.

Boschert Inc.: *See*—
Small, Kenneth T., 4,628,432, Cl. 363-56.000.

Bose, Amar G.; and Short, William R., to Bose Corporation. Pressure wave transducing. 4,628,528, Cl. 381-90.000.

Bose Corporation: *See*—
Bose, Amar G.; and Short, William R., 4,628,528, Cl. 381-90.000.

Botsolas, Carol: *See*—
Botsolas, Chris J., 4,627,995, Cl. 428-43.000.

Botsolas, Chris J., to Botsolas, Carol. Fiberglass insulation wrap for insulating a pipe elbow. 4,627,995, Cl. 428-43.000.

Bottiau, Michel, to U.S. Philips Corporation. System for generating tricolor video signals, such as a game, and a removable cartridge intended for such a system. 4,628,304, Cl. 340-703.000.

Bottman, Jeffrey S., to John Fluke Mfg. Co., Inc. Low even-order harmonic distortion amplifier and method. 4,628,278, Cl. 330-149.000.

Botzem, Werner; and Schlich, Elmar, to Transnuclear GmbH. Shock absorbers. 4,627,956, Cl. 376-272.000.

Boue, Philippe, to Thomson CSF. Device for correcting video signals in a system for acquistion and scanning of fast signals involving the use of a streak camera. 4,628,352, Cl. 358-93.000.

Boulard, Pierre; and Gouriou, Roger, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Data and signaling time slot transfer and processing system for a set of multiplex lines. 4,628,502, Cl. 370-84.000.

Bourgois, Luc, to N.V. Bekaert S.A. Compact steel cord for improved tensile strength. 4,627,229, Cl. 57-213.000.

Bourguignon, Anna-Luise: *See*—
Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, 4,627,992, Cl. 427-244.000.

Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, to Institut Francais du Petrole. Process for producing alcohols by hydrogenolysis of carboxylic acid esters in the presence of a catalyst containing nickel and tin, germanium or lead. 4,628,130, Cl. 568-885.000.

Boutni, Omar M., to General Electric Company. Polycarbonate compositions. 4,628,074, Cl. 525-146.000.

Bowen, Linwood H.: *See*—
Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., 4,627,341, Cl. 100-41.000.

Bowes, H. David; and Kuhn, Edward S., to Thompson-Chemtrex, Inc. Portable pump with air seal. 4,627,790, Cl. 415-53.00R.

Bowser, Donald M., to Truswal Systems Corporation. Apparatus for forming a truss assembly. 4,627,564, Cl. 227-152.000.

Boyd, Robert T.: *See*—
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Boyle, Richard C., to System Development Corporation. Visual monitor for electrical signals. 4,628,303, Cl. 340-661000.

Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, to Dynamit Nobel Aktiengesellschaft. Single- or multiple-base powder charges for propellants and process for their manufacture. 4,627,352, Cl. 102-290.000.

Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Tobacco winnowing method and apparatus. 4,627,447, Cl. 131-109.100.

Bradford-White Corporation: *See*—
West, Eugene L., 4,628,184, Cl. 219-312.000.

Bradley, Earl T., to Ebaa Iron Inc. Limiting torque bolt-nut assembly. 4,627,774, Cl. 411-5.000.

Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, to Empra Systems Corp. Helicopter rescue device. 4,627,821, Cl. 441-83.000.

Bradley, James D.: *See*—
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., 4,628,159, Cl. 200-51.050.

Bradus, Robert, to Black & Decker Inc. Microprocessor based motor control. 4,628,233, Cl. 318-306.000.

Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., to International Business

Machines Corporation. Centerfold forming apparatus for a disk envelope. 4,627,829, Cl. 493-189.000.

Brandes, Wilhelm: *See—*
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, to Atlas Fahrzeugtechnik GmbH; and Ford-Werke AG. High-velocity carburetor for an Otto engine. 4,627,401, Cl. 123-439.000.

Braun, Kenneth H.; and Perlmutter, Michael S., to Raytheon Company. Mode discrimination apparatus. 4,627,732, Cl. 356-350.000.

Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, to Wabco Westinghouse Steuerungstechnik GmbH & Co. Valve activation apparatus. 4,627,597, Cl. 251-129.030.

Brdr. Skov A/S: *See—*
Veng, Niels S., 4,627,506, Cl. 177-25.000.

Breithaupt, Udo: *See—*
Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, 4,627,880, Cl. 127-43.000.

Breuckmann, Bernd; and Thieme, Werner, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Differential holographic method. 4,627,729, Cl. 356-347.000.

Bridgestone Corporation: *See—*
Araki, Yusuke, 4,627,884, Cl. 156-131.000.

Briere, Richard L., to Dennison Manufacturing Company. Mica-electrode laminations for the generation of ions in air. 4,628,227, Cl. 315-111.810.

Brieu, Francois, to Chleq Frote et Cie. Drying cylinder for a web material machine, particularly a paper machine. 4,627,176, Cl. 34-115.000.

Brigham, Dana P.: *See—*
Haines, Harold G.; and Dickens, Caroline B., 4,628,063, Cl. 514-626.000.

Bristol, L. Rodney, to Tektronix, Inc. Method for digitally measuring waveforms, 4,628,254, Cl. 324-77.00R.

Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., to Fairford Electronics Limited. Start-up control method and apparatus for polyphae induction motor. 4,628,241, Cl. 318-778.000.

British Gas Corporation: *See—*
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.

British Petroleum Company p.l.c., The: *See—*
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., 4,627,812, Cl. 431-7.000.

British Telecommunications: *See—*
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Brixy, Heinz; and Hoewener, Hubert, to Kernforschungsanlage Julich GmbH. Temperature sensor utilizing thermal noise and thermal couple elements, and associated connecting cable. 4,627,744, Cl. 374-175.000.

Broersma, Lester V., to Bell Helmets Inc. Ventilated helmet. 4,627,115, Cl. 2-425.000.

Brooker, Doris C., to University of Minnesota, Regents of the. Device for sampling tissues and fluids from bodily cavities. 4,627,444, Cl. 128-758.000.

Brooks, David A. Child restraint device with removable semi-rigid support. 4,627,428, Cl. 128-135.000.

Brooks, Robert B., to General Electric Company. Ice dispenser for a household refrigerator. 4,627,556, Cl. 222-240.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Mizuno, Kenji; and Sasaki, Ryoichi, 4,627,748, Cl. 400-17.000.

Brotz, Gregory R. Manufacturing process for a plated carbonized resin-coated paper structure. 4,627,895, Cl. 204-20.000.

Brotz, Gregory R. Foamed nuclear cell. 4,628,143, Cl. 136-253.000.

Broussard, Curtis: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Broussard, Paul C., Sr.: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Brown, Alfred R.; and Whetton, Richard A., to Graviner Limited. Electrical circuit arrangements. 4,628,301, Cl. 340-584.000.

Brown, Boveri & Cie AG: *See—*
Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, 4,628,503, Cl. 370-85.000.

Brown, Clarence. Vehicle anti-theft device. 4,627,514, Cl. 180-287.000.

Brown, David E.: *See—*
Tate, Joseph B.; and Brown, David E., 4,628,299, Cl. 340-540.000.

Brown International Corporation: *See—*
Bushman, Ronald C., 4,627,339, Cl. 99-540.000.

Brown, Jeffrey R., to Honeywell Inc. Distributed bus control communication protocol. 4,628,504, Cl. 370-85.000.

Brown, Martin R.: *See—*
Glover, Rodney; and Brown, Martin R., 4,628,078, Cl. 526-303.100.

Brown, Mary J.: *See—*
Barnett, Kenneth W.; and Brown, Mary J., 4,628,138, Cl. 585-531.000.

Bruce, Peter, to Brupat Limited. Link chain. 4,627,232. Cl. 59-84.000.

Brunam Controle Sarl: *See—*
Leplat, Robert, 4,627,649, Cl. 292-92.000.

Bruning, Gert W.; and Fellows, Mark W., to North American Philips Corporation. High frequency high voltage power supply preventing simultaneous transistor conduction. 4,628,284, Cl. 331-86.000.

Brupat Limited: *See—*
Bruce, Peter, 4,627,232, Cl. 59-84.000.

Bruss, Karl-Heinz; and Baumgartner, Hans, to Pierburg GmbH & Co. KG. Apparatus for the angular adjustment of a shaft, such as a camshaft, with respect to a drive wheel. 4,627,825, Cl. 464-2.000.

Buard, Yvon, to Legrand. Composite structure duct. 4,627,469, Cl. 138-92.000.

Buchanan, Alan S.: *See—*
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.

Buchar, Wayne A.: *See—*
Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., 4,627,721, Cl. 355-77.000.

Buchner, Norbert, to Robert Bosch GmbH. Method for producing sterile packages. 4,627,221, Cl. 53-425.000.

Buczkowski, Louis. Two-piece booster shot shell wad. 4,627,356, Cl. 102-453.000.

Buhler, Fritz, to Les Fils d'Auguste Scheuchzer, S.A. Method for the renewal of a railroad switch or crossing and train for carrying out the method. 4,627,359, Cl. 104-3.000.

Buice, Jack E., to Dow Chemical Company, The. Combustion of halogenated hydrocarbons with heat recovery. 4,627,388, Cl. 122-149.000.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Double action conversion system. 4,627,265, Cl. 72-354.000.

Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., to International Business Machines Corporation. Apparatus and method for synchronization of peripheral devices via bus cycle alteration in a microprocessor implemented data processing system. 4,628,445, Cl. 364-200.000.

Burger, Dale R., to California Institute of Technology. Method for contact resistivity measurements on photovoltaic cells and cell adapted for such measurement. 4,628,144, Cl. 136-256.000.

Burgess, Trevor M.; and Lesso, William G., Jr., to Schlumberger Technology Corporation. Method for measuring bit wear during drilling. 4,627,276, Cl. 73-151.000.

Burke Company, The: *See—*
Francies, Sidney E., III, 4,627,198, Cl. 52-125.500.

Burke, James E., to Wescott Steel, Inc. Method of making pin with manganese steel shroud. 4,627,144, Cl. 29-447.000.

Burke, Thomas W.: *See—*
Klee, David J.; Burke, Thomas W.; and Miller, Scott A., 4,627,197, Cl. 51-319.000.

Burnett, David W., to AT&T Technologies, Inc. Tool for inserting cable wires in connector contacts. 4,627,150, Cl. 29-566.400.

Burron Medical Inc.: *See—*
Raines, Kenneth C., 4,627,843, Cl. 604-263.000.

Burroughs Corporation: *See—*
Mathamel, Flavius A., 4,628,325, Cl. 346-1.100.

Burrows, James L., to Sanders Associates, Inc. Programmable push-pop memory stack. 4,628,477, Cl. 364-900.000.

Burrows, Roger I., to Price/Stern/Sloan Publishers, Inc. Teaching or amusement apparatus. 4,627,819, Cl. 434-337.000.

Burt, Edward A.: *See—*
Holmes, Silas W.; Burt, Edward A.; and Goins, Dixie E., 4,628,127, Cl. 568-781.000.

Busacchi, Pietro, to Weber S.p.A. Electromagnetically-controlled valve, suitable for controlling an additional air flow in a feed equipment for an internal combustion engine. 4,627,596, Cl. 251-129.070.

Buschmann, Ernst: *See—*
Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,628,048, Cl. 514-63.000.

Buser, Rudolph G.: *See—*
Nomiyama, Neal T.; Rohde, Robert S.; and Buser, Rudolph G., 4,628,542, Cl. 455-619.000.

Bushman, Ronald C., to Brown International Corporation. Apparatus for removing skins and pits from avocados and the like. 4,627,339, Cl. 99-540.000.

Butler, John C.: *See—*
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Butt, Andrew R., to Coal Industry (Patents) Limited. Hot gas generation. 4,627,367, Cl. 110-347.000.

Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, to Lever Brothers Company. Aqueous concentrated fabric softening composition. 4,627,925, Cl. 252-8.800.

Buyak, William P., to General Signal Corporation. Electronic circuits for driving bells or electromagnetic devices. 4,628,213, Cl. 307-80.000.

Buysch, Hans-Josef; Kussi, Siegfried; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Stabilized lubricants based on polyethers. 4,627,929, Cl. 252-47.000.

B.V. Optische Industrie de Oude Delft: *See—*
Heflin, Chester L., 4,628,523, Cl. 378-193.000.

Byrne, Barry F., to Wormald International Ltd. Stop valve alarm for sprinkler system. 4,627,497, Cl. 169-23.000.

C.A. Weidmuller GmbH & Co.: *See—*
Wiebe, Ulrich; and Wilmes, Manfred, 4,627,314, Cl. 81-9.430.

C. & T. Tarlton, Inc.: *See—*
Tarlton, Curtis S.; and Ford, Richard A., 4,627,529, Cl. 198-778.000.

Cahill, Lysle D.: *See—*
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Cahu, Louis A.: *See—*
Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., 4,627,679, Cl. 339-21.00R.

Cain, David A.: *See—*
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.

Calgon Carbon Corporation: *See—*
Sutt, Robert F., Jr., 4,627,857, Cl. 55-70.000.

California Institute of Technology: *See—*
Burger, Dale R., 4,628,144, Cl. 136-256.000.

Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, to Montedison S.p.A. Compounds having a antidote activity for the protection of cultivations of agrarian interest from the action of nonselective herbicides. 4,628,101, Cl. 548-200.000.

Cambridge Applied Systems, Inc.: *See—*
Wright, Hubert A., 4,627,272, Cl. 73-57.000.

Cameron, Scott H., to United States of America, Army. Radiation scanning and detection system. 4,627,724, Cl. 356-141.000.

Camm, John J., to Repco Limited. Relay valve. 4,627,668, Cl. 303-40.000.

Campbell, Alan H.: *See—*
Duffy, Thomas E.; Archibald, John P.; and Campbell, Alan H., 4,627,386, Cl. 122-1.00B.

Campbell Soup Company: *See—*
von Lersner, Wolf A., 4,627,475, Cl. 141-107.000.

Campbell, Todd D.; and Nashef, Aws S., to American Hospital Supply Corporation. Method of producing prostheses for replacement of articular cartilage and prostheses so produced. 4,627,853, Cl. 623-16.000.

Campisi, Carl; Lev, Abraham; and Schmid, Richard G., to Zenith Electronics Corporation. Insertion verification and crimping of leads. 4,627,157, Cl. 29-741.000.

Camras, Marvin, to IIT Research Institute. Magnetic recording system and method. 4,628,374, Cl. 360-66.000.

Camus, Gerard, to Automobiles Peugeot; and Automobiles Citroen. Hydraulic assisted steering for motor vehicles. 4,627,510, Cl. 180-148.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., 4,628,011, Cl. 429-49.000.

Canadian Patents and Development Limited: *See—*
Kusters, Norbert L.; and Herriot, Glen A., 4,628,257, Cl. 324-142.000.
Rioux, Marc, 4,627,734, Cl. 356-376.000.

Candy, Jean-Pierre: *See—*
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-885.000.

Canevari, Ronald D., to Allied Corporation. Electrical tilt switch. 4,628,160, Cl. 200-61.45R.

Canon Denshi Kabushiki Kaisha: *See—*
Kato, Masahiro; and Ogawa, Tetsu, 4,628,376, Cl. 360-71.000.

Canon Kabushiki Kaisha: *See—*
Harigaya, Isao, 4,628,377, Cl. 360-72.100.
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, 4,627,709, Cl. 355-14.0SH.
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, 4,627,875, Cl. 106-22.000.
Matsumoto, Haruyuki, 4,628,332, Cl. 346-140.00R.
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Satomura, Hiroshi, 4,628,183, Cl. 219-216.000.
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.
Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, 4,627,703, Cl. 355-3.00R.
Takayama, Makoto, 4,628,271, Cl. 329-50[illegible].
Takayama, Nobutoshi, 4,628,378, Cl. 360-77.000.
Terasawa, Koji, 4,628,333, Cl. 346-140.00R.
Usami, Akihiro, 4,627,712, Cl. 355-14.00R.
Yonemori, Takaji; and Adachi, Hideki, 4,627,720, Cl. 355-57.000.

Cantile, Jack W., to Hammermill Paper Company. System for in-line processing of envelopes and the like. 4,627,222, Cl. 53-443.000.

Canton, Armando, to Fadis S.p.A. Apparatus for reversing hose. 4,627,557, Cl. 223-39.000.

Capaul, Raymond W. Tackable acoustical structure. 4,627,199, Cl. 52-145.000.

Carabelli, Robert A.; and Edmund, Allan G., to Carabelli, Robert A. Lumbosacral support. 4,627,109, Cl. 2-44.000.

Cardas, George F. Multi-strand conductor cable having its strands sized according to the golden section. 4,628,151, Cl. 174-114.00R.

Carhart, Edward P., Jr.: *See—*
Moran, Robert P.; and Carhart, Edward P., Jr., 4,627,973, Cl. 424-47.000.

Carl Schenck AG: *See—*
Schonfeld, Harald; and Bauer, Angelo, 4,627,747, Cl. 384-113.000.

Carl-Zeiss-Stiftung: *See—*
Kurz, Dieter; and Schafer, Norbert, 4,628,226, Cl. 315-102.000.

Carle & Montanari S.p.A.: *See—*
Ripani, Sergio; and Serafini, Giulio, 4,627,337, Cl. 99-485.000.

Carless, Derek R.: *See—*
French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., 4,627,723, Cl. 356-5.000.

Carlson, Gilbert E.: *See—*
Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., 4,627,369, Cl. 112-103.000.

Carlton, Roger. Radiation filter. 4,628,365, Cl. 358-245.000.

Carr, Neil: *See—*
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.

Carranza, Jose R., to Merrick Industries. Flexible detachable handle and carrier for a plastic bottle and the combination thereof. 4,627,546, Cl. 215-100.00A.

Carrier Corporation: *See—*
Mancabelli, Robert C., 4,627,155, Cl. 29-726.000.

Carruthers, Alec R., to ALH Systems Limited. Sealing ducts. 4,627,470, Cl. 138-93.000.

Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., to Hoffmann-La Roche Inc. Substituted 4-acetyl-3-hydroxyphenoxy alkanoic acids. 4,628,115, Cl. 562-464.000.

Carter, David E.; Bailey, Malcolm J.; and Willatts, Brian A., to Pledge Office Chairs Limited. Tilting mechanism for a chair. 4,627,662, Cl. 297-313.000.

Cartret, Roger; and Volpe, Giovanni, to Thomson CSF Telephone. Multi-level arbitration system for decentrally allocating resource priority among individual processing units: 4,628,447, Cl. 364-200.000.

Caruso, Richard. Electrically heated hair roller. 4,627,452, Cl. 132-33.00R.

Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, to SIMES, Societa Italiana Medicinali e Sintetici S.p.A. Epinine and the therapeutic use thereof. 4,628,064, Cl. 514-654.000.

Casciari, Raoul: *See—*
Raj, Kuldip; and Casciari, Raoul, 4,628,384, Cl. 360-97.000.

Case, Steven K.: *See—*
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.

Casio Computer Co., Ltd.: *See—*
Arai, Kouichi; and Akita, Yukio, 4,627,708, Cl. 355-14.00R.
Kaneko, Youji, 4,627,325, Cl. 84-1.260.
Yajima, Hiroshi, 4,627,511, Cl. 180-167.000.

Casio Electronics Manufacturing Co., Ltd.: *See—*
Arai, Kouichi; and Akita, Yukio, 4,627,708, Cl. 355-14.00R.

Caterpillar Inc.: *See—*
Laylock, Rick A.; and Theobald, Michael R., 4,627,302, Cl. 74-360.000.

Cawston, John F.; and Becker, Paul E., to Shipley Company Inc. Metal ion free photoresist developer composition with lower alkyl quaternary ammonium hydrozide as alkalai agent and a quaternary ammonium compound as surfactant. 4,628,023, Cl. 430-331.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Colas, Francois, 4,627,149, Cl. 29-516.000.

Celanese Corporation: *See—*
Chen, Paul N., Sr.; and Tucker, Richard O., 4,628,067, Cl. 521-25.000.
Ophir, Zohar, 4,627,952, Cl. 264-328.120.
Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, 4,628,041, Cl. 502-24.000.

Cenedella, Richard J. Vinyl bromide extraction of butyric acid and butanol from microbial fermentation broth. 4,628,116, Cl. 562-513.000.

Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie: *See—*
Crahay, Jean R., 4,628,179, Cl. 219-121.0LH.

Centre Electronique Horloger S.A.: *See—*
Vittoz, Eric A.; and Oguey, Henri J., 4,628,274, Cl. 330-9.000.

Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S.: *See—*
Scarpa, Afra; and Scarpa, Tobia, 4,627,544. Cl. 211-189.000.

Centronics Data Computer Corp.: *See—*
Costello, Robert E., 4,627,344, Cl. 101-93.140.

Cerberus AG: *See—*
Forster, Martin; and Strassler, Sigfrid, 4,627,269, Cl. 73-23.000.

Cerkanowicz, Anthony E.: *See—*
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.

Chabria, Paul R., to Press-A-Lite Corporation. Multi-purpose miniature flashlight device. 4,628,418, Cl. 362-116.000.

Chabrolle, Jacques, to LCC.CICE-Compagnie Europeenne de Composants Electroniques. Magnetic reading and/or writing head support assembly. 4,628,386, Cl. 360-104.000.

Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., to Plessey Overseas Limited. Radio receiver. 4,628,518, Cl. 375-88.000.

Chaffee, Alan L.: *See—*
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.

Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., to Advanced Magnetics, Inc. Binding assays employing magnetic particles. 4,628,037, Cl. 436-526.000.

Chalus, Bernard: *See—*
Peronneau, Georges; and Chalus, Bernard, 4,627,642, Cl. 283-92.000.

Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., to AT&T Bell Laboratories. Bidirectional adaptive voice frequency repeater. 4,628,157, Cl. 379-410.000.

Chang, Che-Yuan. Means of comb bristles by overall planting method. 4,627,451, Cl. 132-11.00A.

Chang, In-Kook, to SDS Biotech Corporation. Method for inhibiting axillary bud growth. 4,627,869, Cl. 71-78.000.

Chang, Wei-Chuan; and Yin-Lung, Yang. Method of and apparatus for transporting goods. 4,627,539, Cl. 206-597.000.

Chang, Wen-Hsuan; and McKeough, David T., to PPG Industries, Inc. Curable coating vehicle based upon aminoalkyloxy silanes and organic isocyanates. 4,628,076, Cl. 525-440.000.

Chapman, Alan T.; and Hill, David N., to Exxon Research & Engineering Company. Electrode for an electrostatic atomizing device. 4,627,903, Cl. 204-275.000.

Charbonnages de France: *See—*
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.

Charest, Robert J.: *See—*
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., 4,628,011, Cl. 429-49.000.

Charles of the Ritz Group Ltd.: *See—*
Moran, Robert P.; and Carhart, Edward P., Jr., 4,627,973, Cl. 424-47.000.

Charras, Jean-Pierre: *See—*
Beauviala, Jean-Pierre; and Charras, Jean-Pierre, 4,627,695, Cl. 352-72.000.

Chatelin, Roger; Combes, Jean-Francois; and Wattiez, Daniel, to Institut Textile de France. Process for the retention of a substance dissolved in a solution. 4,627,920, Cl. 210-668.000.

Chauvin, Yves: *See—*
Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, 4,628,065, Cl. 518-700.000.

Chawla, Manmohan S., to Dresser Industries, Inc. Shaped charge perforating apparatus. 4,627,353, Cl. 102-307.000.

Chazin, Neal H. Stand for supporting cooking liquid spray dispenser relative to a heated surface and controlling the temperature of the liquid. 4,627,414, Cl. 126-215.000.

Chen, Nai Y.; and Degnan, Thomas F., Jr., to Mobil Oil Corporation. Dispersed catalyst cracking with methanol as a coreactant. 4,627,911, Cl. 208-120.000.

Chen, Paul N., Sr.; and Tucker, Richard O., to Celanese Corporation. Microporous polybenzimidazole particulates. 4,628,067, Cl. 521-25.000.

Chesebrough-Pond's Inc.: *See—*
Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., 4,628,353, Cl. 358-107.000.

Chester, William: *See—*
Saganovsky, Abraham; and Chester, William, 4,628,232, Cl. 318-284.000.

Chevron Research Company: *See—*
Current, Steven P., 4,628,113, Cl. 560-232.000.
Current, Steven P., 4,628,114, Cl. 560-232.000.
Field, Leslie A., 4,627,912, Cl. 708-139.000.
Miller, Stephen J., 4,627,908, Cl. 208-58.000.
Robinson, Richard C., 4,627,909, Cl. 208-65.000.

Chi, Jim-Yong: *See—*
Holmstrom, Roger P.; and Chi, Jim-Yong, 4,627,883, Cl. 148-187.000.

Chida, Kazunori: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.

Chimenti, Robert J. L.: *See—*
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.

Ch'ing-Lung, Hsieh. Mini electrical syringe needle destroyer. 4,628,169, Cl. 219-68.000.

Chisholm, Pat T.: *See—*
Harris, Phillip C.; Reidenbach, Vincent G.; and Chisholm, Pat T., 4,627,495, Cl. 166-280.000.

Chleq Frote et Cie: *See—*
Brieu, Francois, 4,627,176, Cl. 34-115.000.

Chmiel, Max: *See—*
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.

Choi, Sang B. Adjustable clamp. 4,627,604, Cl. 269-214.000.

Christiansen, Richard L.; and Kim, Hiemi, to Marathon Oil Company. Apparatus and method for determining the minimum miscibility pressure of a gas in a liquid. 4,627,273, Cl. 73-61.10R.

Chrysler Motors Corporation: *See—*
Kaminski, Les K.; and Dyke, Michael E., 4,628,417, Cl. 362-74.000.
Momin, Salim A., 4,628,316, Cl. 340-870.380.

Chu, Chin-Chiun, to Mobil Oil Corporation. Process for para-ethyltoluene dehydrogenation. 4,628,137, Cl. 585-445.000.

Chu, David C. K., to Hewlett-Packard Company. Method for calibrating instruments for time interval measurements. 4,627,268, Cl. 73-5.000.

Chubbuck, John G.; and Epstein, Melvin H., to Johns Hopkins University, The. X-ray readable implantable pressure sensor. 4,627,443, Cl. 128-748.000.

Chugai Ro Co., Ltd.: *See—*
Hattori, Fumihiko; and Shimosato, Yoshikazu, 4,627,814, Cl. 432-128.000.

Chung, Han C.: *See—*
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.

Ciba-Geigy Corporation: *See—*
Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, 4,627,889, Cl. 162-158.000.
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.

Cibie Projecteurs: *See—*
Ricard, Jacques, 4,628,414, Cl. 362-61.000.

Cincinnati Milacron Inc.: *See—*
Grone, Robert J.; and Grimshaw, Michael N., 4,627,886, Cl. 156-361.000.

Citizen Watch Co., Ltd.: *See—*
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.

Clarion Co., Ltd.: *See—*
Takai, Kazuki, 4,628,381, Cl. 360-93.000.

Clark, Daren A.: *See—*
Parker, Delbert R.; and Clark, Daren A., 4,628,294, Cl. 337-248.000.

Clark, Samuel D.: *See—*
Dempsey, Will R.; Bayless, Ernest O.; and Clark, Samuel D., 4,628,177, Cl. 219-121.0PN.

Claussen, Gary J. Heated inking roll for a printer. 4,627,349, Cl. 101-348.000.

Clegg, John E. Louvered conical beam concentrator RT:C. 4,627,692, Cl. 350-432.000.

Clemens, Philip M. Recording disk enclosure. 4,627,531, Cl. 206-309.000.

Clemens, Philip M. Digital audio disk enclosure. 4,627,532, Cl. 206-309.000.

Clocker, Roger A.: *See—*
LaRue, Albert D.; Clocker, Roger A.; and Smith, Norman F., Jr., 4,627,366, Cl. 110-263.000.

Clohessy, Kip E., to Warn Industries, Inc. Air actuated clutch for four wheel drive vehicles. 4,627,512, Cl. 180-247.000.

Clough, Peter S.: *See—*
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.

Coal Industry (Patents) Limited: *See—*
Butt, Andrew R., 4,627,367, Cl. 110-347.000.

Coble, Ralph P., Jr.: *See—*
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.

Coburn, Brian. Ratio speed adaptor. 4,627,310, Cl. 74-763.000.

Coelho, Gregorio J.: *See—*
Karubian, Ralph K.; and Coelho, Gregorio J., 4,627,167, Cl. 30-228.000.

Cohen, Mordechay: *See—*
Serfaty, Salomon; and Cohen, Mordechay, 4,628,474, Cl. 364-825.000.

Cohrs, Gary D.; and Francisco, Edward E., Jr., to Flow Technology, Inc. Apparatus and method for determining the flow characterstic of a volumetric flowmeter. 4,627,267, Cl. 73-3.000.

Coilco, Inc.: *See—*
McElhaney, William G., 4,627,257, Cl. 72-102.000.

Colas, Francois, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Method of mounting an annular element on a metal tube of aluminum or an alloy thereof. 4,627,149, Cl. 29-516.000.

Colby, Lloyd E.; and Ingalls, John E., to Port City Machine & Tool Company. Mechanical feed EDM machine for making threaded and nonthreaded bores. 4,628,171, Cl. 219-69.00G.

Coleman, Gary W. Side vision aid for trailer hitching. 4,627,634, Cl. 280-477.000.

Colgate-Palmolive Company: *See—*
Gaffar, Abdul; and Polefka, Thomas G., 4,627,977, Cl. 424-52.000.

Collagen Corporation: *See—*
Seyedin, Saeid; and Thomas, Thomas, 4,627,982, Cl. 424-95.000.

Collins, Floyd K.; and Say, Donald L., to North American Philips Consumer Electronics Corp. Beam shaping CRT electrode. 4,628,224, Cl. 313-414.000.

Collins, John, to Leer, Incorporated. Pick-up cap construction. 4,627,655, Cl. 296-167.000.

Collins, Larry R., to Venco Manufacturing, Inc. Loading and unloading apparatus for a vehicle. 4,627,784, Cl. 414-540.000.

Colt Industries Operating Corp: *See—*
Dougherty, Michael; and House, William J., 4,627,304, Cl. 74-469.000.

Columbia University in the City of New York, The Trustees of: *See—*
Rose, Eric; and Dresdale, Arthur, 4,627,879, Cl. 106-124.000.

Combes, Jean-Francois: *See—*
Chatelin, Roger; Combes, Jean-Francois; and Wattiez, Daniel, 4,627,920, Cl. 210-668.000.

Comlinear Corporation: *See—*
Nelson, David A., 4,628,279, Cl. 330-257.000.

Commereuc, Dominique: *See—*
Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, 4,628,065, Cl. 518-700.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Allias, Bernard, 4,628,309, Cl. 340-825.540.
Boulard, Pierre; and Gouriou, Roger, 4,628,502, Cl. 370-84.000.
Paris, Bernard, 4,628,505, Cl. 370-85.000.

Computer Memories, Inc.: *See—*
Quackenbush, James E., 4,628,380, Cl. 360-78.000.

Conolly, Ralph I., to Rolls-Royce Limited. Method for eliminating, or minimizing the effects of, defects in materials. 4,628,008, Cl. 448-548.000.

Conrad, Bernhard: *See—*
Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., 4,627,369, Cl. 112-103.000.

Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., to Conrad Industries, Inc. System for improving embroidered articles. 4,627,369, Cl. 112-103.000.

Conrad Industries, Inc.: *See—*
Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., 4,627,369, Cl. 112-103.000.

Container Corporation of America: *See—*
Metzger, Romain, 4,627,383, Cl. 119-1.000.

Control Concepts Corporation: *See—*
Montague, Herbert R., 4,628,438, Cl. 363-134.000.

Cook, Kenneth G.; to M-O Valve Company Limited, The. Surge voltage protection arrangements. 4,628,398, Cl. 361-120.000.

Cook, Kenneth P., to Site Microsurgical Systems, Inc. Microsurgical system cassette assembly. 4,627,833, Cl. 604-34.000.

Cooke, Carl W. Child resistant package. 4,627,547, Cl. 215-222.000.

Cooper Industries, Inc.: *See—*
Ogle, William D., 4,628,423, Cl. 362-341.000.

Cooper Lasersonics, Inc.: *See—*
Weaver, James A., 4,628,473, Cl. 364-822.000.

CooperVision, Inc.: *See—*
Dewey, David A., 4,628,416, Cl. 362-32.000.

Copal Company Limited: *See—*
Akimoto, Shigeyuki, 4,627,297, Cl. 73-862.340.

Copal Electronics Co., Ltd.: *See—*
Hirose, Masashi, 4,627,303, Cl. 74-425.000.

Corbett, Gordon J.: *See—*
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.

Cordis Corporation: *See—*
Cuadra, Emilio; and DelValle, Roberto, 4,627,840, Cl. 604-151.000.
Harris, Donald L., 4,627,439, Cl. 128-419.00P.
Hooven, Michael D.; and Sainte-Rose, Christian, 4,627,832, Cl. 604-9.000.

Corley, Larry S., to Shell Oil Company. Cure rate control in epoxy resin compositions. 4,628,080, Cl. 528-88.000.

Cormier, Alan D.; and Weinberg, Melvin S., to AMDEV, Inc. Means and methods for quantitative determination of analyte in liquids. 4,627,893, Cl. 204-1.00T.

Cornelius Cannon, Inc.: *See—*
Fredrickson, Howard J., 4,627,542, Cl. 211-150.000.

Coste, Christian, to Degremont. Process and apparatus for the recovery of energy from an ozone production unit. 4,627,924, Cl. 210-760.000.

Costello, Robert E., to Centronics Data Computer Corp. Impact printer with magnetic interaction compensation. 4,627,344, Cl. 101-93.140.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Courteau, Marc A. Bird tree apparatus. 4,627,384, Cl. 119-26.000.

Covey, James H., to Boeing Company, The. Lightning protection of fasteners in composite material. 4,628,402, Cl. 361-218.000.

Coward, James K., to Rensselaer Polytechnic Institute. Fluorine-containing antifolates incapable of polyglutanayte formation related compounds. 4,628,090, Cl. 544-258.000.

Cox, Timothy B., to Rollscreen Company. Window sash breather device. 4,627,206, Cl. 52-302.000.

CPC International Inc.: *See—*
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, 4,628,028, Cl. 435-95.000.

CRA Services Limited: *See—*
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.060.

Crabtree, Larry V., to Morval-Durofoam Ltd. Method and molding apparatus for molding expanded polystyrene articles having smooth surfaces. 4,627,946, Cl. 264-51.000.

Crahay, Jean R., to Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie. Method of improving the state of the surface of a roll. 4,628,179, Cl. 219-121.0LH.

Cray Research, Inc.: *See—*
August, Melvin C.; and Williams, John T., 4,628,407, Cl. 361-388.000.

Crean, Robert F. Simplified polar mount for satellite tracking antenna. 4,628,323, Cl. 343-765.000.

Critikon, Inc.: *See—*
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.

Crosby, John J.; and Napiorkowski, John J., to GTE Products Corporation. Voltage surge suppressor. 4,628,394, Cl. 361-56.000.

Crosfield Electronics (USA) Limited: *See—*
Aughton, John E.; and Oldershaw, Robert J., 4,628,350, Cl. 358-75.000.

Cross, David E.; Adams, Robert D.; and Floyd, Terence J., to Bard Limited. Stylet actuated winged catheter. 4,627,838, Cl. 604-105.000.

Cross, Robert J.: *See—*
Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, 4,627,457, Cl. 137-1.000.

Crouse, William G., to International Business Machines Corp. FET switch for high frequency signals. 4,628,307, Cl. 340-825.050.

Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Roba, Giacomo, 4,627,865, Cl. 65-3.120.

Cuadra, Emilio; and DelValle, Roberto, to Cordis Corporation. Flow monitoring device. 4,627,840, Cl. 604-151.000.

Cuba, Gary W.; and Laughlin, Edward N., to Westinghouse Electric Corp. Tube cutter for cutting two concentric tubes bulged together. 4,627,163, Cl. 30-95.000.

Cucchi, Giovanni; and Cucchi, Pietro, to F.LLI Cucchi S.r.l. Device for withdrawing and unloading crop-ends of metal bars from a bar pusher. 4,627,779, Cl. 414-17.000.

Cucchi, Pietro: *See—*
Cucchi, Giovanni; and Cucchi, Pietro, 4,627,779, Cl. 414-17.000.

Current, Steven P., to Chevron Research Company. Alcohol carbonylation process using a bimetallic cobalt catalyst. 4,628,113, Cl. 560-232.000.

Current, Steven P., to Chevron Research Company. Carboxylic acid ester homologation using a sulfided nickel catalyst. 4,628,114, Cl. 560-232.000.

Cushman, Robert H., to AT&T Technologies, Inc. Method for inserting multilead components into printed wiring boards. 4,627,161, Cl. 29-838.000.

Czernik, Roman: *See—*
Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., 4,628,185, Cl. 219-386.000.

Dagna, Giandomenico; and Morin, Franco, to Ing. C. Olivetti & C., S.p.A. Ink jet print head cartridge assembly. 4,628,334, Cl. 346-140.00R.

Dahm, Klaus-Peter. Cosmetic stick with applicator. 4,627,454, Cl. 132-88.700.

Daicel Chemical Industries, Ltd.: *See—*
Okabayashi, Norio; and Onizawa, Yoshio, 4,627,809, Cl. 425-555.000.
Yuki, Yoichi, 4,627,919, Cl. 210-656.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Okabe, Takahiro; and Mizuno, Masashi, 4,627,743, Cl. 374-122.000.

Daimler-Benz Aktiengesellschaft: *See—*
Geldec, Selcuk, 4,627,525, Cl. 192-84.00C.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.
Yamada, Mitsuhiko, 4,628,366, Cl. 358-280.000.
Yamasaki, Masahiro; Wakabayashi, Masayoshi; Yamada, Jun; and Senga, Takao, 4,627,698, Cl. 354-317.000.

D'Alessandro, Luigi. Exhaust device. 4,627,515, Cl. 181-258.000.

Dalli, Alan G.: *See—*
Debenham, Michael, deceased; Dalli, Alan G.; Revill, Peter L.; Debenham, Barbara S., co-executor; and Debenham, David, co-executor, 4,627,778, Cl. 413-58.000.

Daly, Marshall. Stand-alone keyphone system. 4,628,153, Cl. 379-163.000.

D'Amato, Donald P.: *See—*
Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., 4,628,532, Cl. 382-21.000.

D'Amato, Michael J., to Harvey Hubbell Incorporated. Housing for electrical connectors. 4,627,684, Cl. 339-206.00R.

Danieli & C. Officine Meccaniche S.p.A.: *See—*
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Danko, Michael, to Emerson Electric Co. Electric resistance heater. 4,628,189, Cl. 219-532.000.

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Davis, Maurice J., to Drillco Devices Limited. Anchor bolt setting impact tool. 4,627,140, Cl. 29-264.000.

Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., to Chesebrough-Pond's Inc. Video measuring system. 4,628,353, Cl. 358-107.000.

Davis, Roy F.; and Murphy, William. Boat mooring device. 4,627,375, Cl. 114-230.000.

Davis, Walter L.; and Prieto, Yolanda, to Motorola, Inc. Tuned inductorless active phase shift demodulator. 4,628,272, Cl. 329-110.000.

Dean, Barry D., to Atlantic Richfield Company. Polymerization initiator. 4,627,938, Cl. 260-239.0BC.

de Angeli, Michael M. Exercise apparatus. 4,627,614, Cl. 272-117.000.

DeBruyn, William, to Amerock Corporation. Pull-out rack for a cabinet. 4,627,672, Cl. 312-331.000.

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DeHond, Mitchell R.; and Ledak, Paul J., to International Business Machines Corporation. Automatic layout for cascode voltage switch logic. 4,627,152, Cl. 29-571.000.
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., to ADC Telecommunications, Inc. Electrical connector apparatus. 4,628,159, Cl. 200-51.050.
Dekrone, Stephen A., to Randek Inc. AC transducers, methods and systems. 4,627,292, Cl. 73-728.000.
Dell, Peter W.: *See—*
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DeMotte, Frank E. Eyes-bathing faucet-mateable structure. 4,627,845, Cl. 604-295.000.
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Briere, Richard L., 4,628,227, Cl. 315-111.810.
Lynch, Steve J., 4,627,220, Cl. 53-414.000.
Derringer, John G., to General Motors Corporation. Engine valve train system. 4,627,391, Cl. 123-90.160.
Desmond, Michael J.; Weinert, Raymond J., Jr.; Ball, Lawrence E.; and Benton, Kenneth C., to Standard Oil Company, The. Preparation of polyamide with catalyst comprising transition metal attached to a ligand which contains electron withdrawing groups. 4,628,077, Cl. 526-90.000.
Desmons, Gerard; and Marchand, Gilles, to Thomson CSF. Optical test pattern for correcting convergence defects of a color camera. 4,628,342, Cl. 358-10.000.
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Dewey, David A., to CooperVision, Inc. Variable spot size illuminator with constant convergence angle. 4,628,416, Cl. 362-32.000.
DeZeeuw, John R., to Pfizer Inc. Novel host strain for transformation of *Yarrowia lipolytica*. 4,628,033, Cl. 435-255.000.
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, to Bayer Aktiengesellschaft. Process for the preparation of shaped articles of stabilized polycarbonate by the devolatilizing injection-moulding or devolatilizing extrusion process. 4,627,949, Cl. 264-101.000.
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Dorn, Reimund; and Schneider, Martin, to International Standard Electric Corporation. Multimode laser. 4,628,514, Cl. 372-36.000.
Dorr, Robert T. Infusion needle. 4,627,841, Cl. 604-158.000.
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Double L Manufacturing: *See—*
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Downie, John W., to General Electric Company. Cancellation of scatter jamming. 4,628,320, Cl. 342-16.000.
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Duke, Jack W.: *See—*
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Duncan, Dana L.: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
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Dzwinel, Jan, to Instytut Gornictwa Naftowego. Apparatus for direct airborne electromagnetic prospecting of hydrocarbon deposits. 4,628,266, Cl. 324-330.000.
E.D.M. Corporation: *See—*
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Ebeling, Wolfgang, to Turmag-Turbo-Maschinen-Aktiengesellschaft Nuesse & Graefer. Borer head with planetary gearing. 4,627,501, Cl. 175-319.000.
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Eguchi, Yasukata, to Janome Sewing Machine Co., Ltd. Sewing machine having a stitch control device. 4,627,371, Cl. 112-451.000.
Ehmig, Gerhard, to Schertler, Siegfried. Sealing mechanism for high vacuum valve. 4,627,599, Cl. 251-334.000.
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Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, to Merck Patent Gesellschaft mit beschrankter Haftung; and United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the. Liquid crystalline phases containing alkylene-type bridges. 4,627,933, Cl. 252-299.600.
Einstein, Harry. Pusher type auto-plane. 4,627,585, Cl. 244-2.000.
Eising, John P., to A. D. Smith Corporation. Condensate discharge device for combustion apparatus. 4,627,460, Cl. 137-192.000.
Eklund, Jan: *See—*
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Ekman, Kjell R. Arrangement for a push-in coupling. 4,627,644, Cl. 285-3.000.
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Endo, Shuichi; and Tonomura, Kenichi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Memory device. 4,628,510, Cl. 371-21.000.
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Energy Pipelines International Company: *See—*
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Ensinger, James W., to Zenith Electronics Corporation. Luminance clipper with color subcarrier filter to prevent clipping of subcarrier. 4,628,348, Cl. 358-39.000.
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Ernst Stadelmann Gesellschaft m.b.H.: *See—*
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Esposito, Christopher, to Four Seasons Solar Products Corp. Structural element especially suitable for solar controlling and the like and particularly utilizable for controlling shading. 4,627,202, Cl. 52-209.000.
Esposito, Christopher, to Four Seasons Solar Products Corp. Structural element especially suitable for solar greenhouses and the like. 4,627,208, Cl. 52-483.000.
Esposito, John J., to United States of America, Navy. Low temperature inflator apparatus. 4,627,822, Cl. 441-92.000.

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Eue, Ludwig: *See—*
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Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
Evans, George E.: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.
Eveleigh, Douglas E.; Waldron, Clarence R.; and Bartley, Timothy, to Parsons & Whittemore, Inc. Method for the conversion of a cellulosic substrate to glucose using *Microbispora bispora*, strain Rutgers P&W. 4,628,029, Cl. 435-99.000.
Everett, Leroy J.: *See—*
van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., 4,628,205, Cl. 250-361.00R.
Everett, Seth L., Jr., to United States of America, Army. Dual optical mechanical position tracker. 4,628,239, Cl. 318-685.000.
Ewald, Rolf V. T., to Integrerad Teknik HB. Display comprising light-emitting diodes and a method and an installation for its manufacture. 4,628,422, Cl. 362-240.000.
Ewing, Paul E.; and Grubb, B. Randall, to SS Indus.; and Kennametal, Inc. Cold-headed and roll-formed pick type cutter body with carbide insert. 4,627,665, Cl. 299-79.000.
Excellon Industries: *See—*
Tymes, LaRoy, 4,628,466, Cl. 364-521.000.
Exxon Production Research Co.: *See—*
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.
Exxon Research & Engineering Company: *See—*
Chapman, Alan T.; and Hill, David N., 4,627,903, Cl. 204-275.000.
Reiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, 4,627,926, Cl. 252-8.55R.
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.
F.LLI Cucchi S.r.l.: *See—*
Cucchi, Giovanni; and Cucchi, Pietro, 4,627,779, Cl. 414-17.000.
Facet Enterprises, Inc.: *See—*
Mortensen, Harold R., Sr., 4,627,299, Cl. 74-7.00A.
Fadis S.p.A.: *See—*
Canton, Armando, 4,627,557, Cl. 223-39.000.
Fahnler, Friedrich: *See—*
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,628,069, Cl. 524-339.000.
Fairchild Camera & Instr. Corp.: *See—*
Vora, Madhukar B.; and Hingarh, Hemraj K., 4,628,339, Cl. 357-15.000.
Fairford Electronics Limited: *See—*
Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., 4,628,241, Cl. 318-778.000.
Fales, Douglas I., to General Motors Corporation. Fluid level sensor. 4,627,282, Cl. 73-302.000.
Falk, Robert A.; and Phillis, Gary L., to Ball Corporation. Method and apparatus for optically measuring three-dimensional coordinates. 4,627,722, Cl. 356-4.500.
Faller, Dagmar. Maximum-minimum-thermometer. 4,627,741, Cl. 374-104.000.
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, to Josef Uhlmann Maschinenfabrik GmbH & Co. KG. Loading apparatus for a packaging machine for small products. 4,627,225, Cl. 53-510.000.
Fantone, Stephen D., to Polaroid Corporation. Optical system with anamorphic prism. 4,627,690, Cl. 350-421.000.
Fanuc Ltd.: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, 4,628,240, Cl. 318-723.000.
Fanuc Ltd: *See—*
Hattori, Seiichi, 4,628,484, Cl. 365-52.000.
Ikeda, Yoshiaki, 4,628,305, Cl. 340-703.000.
Isobe, Shinichi; and Sawada, Kazuo, 4,628,442, Cl. 364-167.000.
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, 4,628,444, Cl. 364-188.000.
Farnham, William B.; and Middleton, William J., to Du Pont de Nemours, E. I., and Company. Tris(disubstituted amino)sulfonium perfluoroalkoxides and perfluoroalkylmercaptides and process for their preparation. 4,628,094, Cl. 546-186.000.
Federici, Rose M.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.
Feinwerktechnik Schliecher & Co., Firma: *See—*
Goldhammer, Albert, 4,627,582, Cl. 241-236.000.
Fejes, Julius, to Flo-Tork, Inc. Rotary actuator having cast piston and arcuate rack bearing. 4,627,331, Cl. 92-129.000.
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Rejuvenation of nickel-cadmium aircraft battery electrolyte. 4,628,011, Cl. 429-49.000.
Fellows, Mark W.: *See—*
Bruning, Gert W.; and Fellows, Mark W., 4,628,284, Cl. 331-86.000.
Fensch, Thierry, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis^2 . Binary multiplier using ternary code. 4,628,472, Cl. 364-759.000.
Fenster, Paul, to Elscint, Ltd. Digital fluorographic systems. 4,628,357, Cl. 358-111.000.
Fenton, Paul V., Jr., to Strato Medical Corporation. Tubing assembly for infusion device. 4,627,835, Cl. 604-67.000.
Fernald, Mark R.: *See—*
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Ferrara-Jordan, Elisa M.: *See—*
Anderson, Donald G.; and Ferrara-Jordan, Elisa M., 4,628,327, Cl. 346-33.0ME.
Ferrofluidics Corporation: *See—*
Raj, Kuldip; and Casciari, Raoul, 4,628,384, Cl. 360-97.000.
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, to Leybold Heraeus GmbH. Method and system for a vacuum evaporative deposition process. 4,627,989, Cl. 427-10.000.
Fibus, C. Kenneth, to Steel City Corporation, The. Newspaper delivery tube with newspaper retaining flaps. 4,627,566, Cl. 232-1.00C.
Fick, Gerhardt N., to Sigco Research Inc. Sunflower products and methods for their production. 4,627,192, Cl. 47-58.000.
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., to Santa Fe International Corporation. Mobile sea barge and platform. 4,627,767, Cl. 405-196.000.
Field, Leslie A., to Chevron Research Company. Reforming process having a high selectivity and activity for dehydrocyclization, isomerization, and dehydroisomerization. 4,627,912, Cl. 708-139.000.
Fiers, Thomas A.: *See—*
Andrews, Thomas L., Jr.; Fiers, Thomas A.; and Laatt, Richard G., 4,628,379, Cl. 360-77.000.
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., to Phillips Petroleum Company. Photoelectrochemical cell. 4,628,013, Cl. 429-111.000.
Figge, Dieter: *See—*
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.
Figge, Johannes: *See—*
Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, 4,628,503, Cl. 370-85.000.
Figgie International, Inc.: *See—*
Mitchell, Hal D., 4,627,114, Cl. 2-414.000.
Figler, Alan A.: *See—*
Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.
Fine, Louis: *See—*
Kamm, Roger D.; and Fine, Louis, 4,627,448, Cl. 131-187.000.
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., to Smith-Klein Beckman Corporation. Dopamine-β-hydroxylase inhibitors. 4,628,059, Cl. 514-384.000.
Finucane, Thomas P.: *See—*
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., 4,627,986, Cl. 426-112.000.
Firebox Corporation: *See—*
Pratt, Lawrence M., 4,627,854, Cl. 44-40.000.
Firestone Tire & Rubber Company, The: *See—*
Shurman, Louis W.; and Bell, Thomas W., 4,627,479, Cl. 152-541.000.
Fischer, Helmut: *See—*
Keim, Dieter; and Fischer, Helmut, 4,628,225, Cl. 313-631.000.
Fischer, Joachim: *See—*
Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, 4,627,992, Cl. 427-244.000.
Fischer, Michael: *See—*
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.
Fisher, W. Keith, to Monsanto Company. Soft, rubbery, multiphase matrix material and methods for its production. 4,628,073, Cl. 525-70.000.
Fitzpatrick, Michael: *See—*
Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., 4,628,241, Cl. 318-778.000.
Fitzsimmons, Robert A.: *See—*
Newell, Robert E.; and Fitzsimmons, Robert A., 4,627,432, Cl. 128-203.150.
Fleming, Robert F., III: *See—*
Hwang, James G.; Fleming, Robert F., III; and Hayworth, Robert G., 4,628,312, Cl. 340-825.640.
Flemming, D. Frank E., to United States of America, Air Force. High voltage disconnect/reconnect switching device. 4,628,396, Cl. 361-91.000.

Flemming HVIDT Mobelarkitektfirma A/S: *See—*
Pontoppidan, Eskild, 4,627,600, Cl. 254-124.000.
Flo-Tork, Inc.: *See—*
Fejes, Julius, 4,627,331, Cl. 92-129.000.
Flogvall, Anders G., to U.S. Philips Corporation. Motor arrangement comprising at least three co-planar conical motors. 4,628,220, Cl. 310-114.000.
Flow Technology, Inc.: *See—*
Cohrs, Gary D.; and Francisco, Edward E., Jr., 4,627,267, Cl. 73-3.000.
Floyd, Terence J.: *See—*
Cross, David E.; Adams, Robert D.; and Floyd, Terence J., 4,627,838, Cl. 604-105.000.
Floyd, William M., to United Technologies Automotive, Inc. Arrangement for optimized utilization of I/O pins. 4,628,480, Cl. 364-900.000.
Focke & Co.: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,627,450, Cl. 131-282.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Process for forming groups of cigarettes. 4,627,450, Cl. 131-282.000.
Ford Motor Company: *See—*
Berenjian, Karim, 4,627,306, Cl. 74-492.000.
Ford, Richard A.: *See—*
Tarlton, Curtis S.; and Ford, Richard A., 4,627,529, Cl. 198-778.000.
Ford-Werke AG: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.
Forster, Martin; and Strassler, Sigfrid, to Cerberus AG. Method of, and apparatus for, detecting reducing gases in a gas mixture. 4,627,269, Cl. 73-23.000.
Foster, Robert G.: *See—*
Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., 4,628,353, Cl. 358-107.000.
Foster, Thomas W., Jr. Sled for a reinforcing cage used in a pier. 4,627,211, Cl. 52-652.000.
Four Seasons Solar Products Corp.: *See—*
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Esposito, Christopher, 4,627,208, Cl. 52-483.000.
Fowler, Daniel L.; and Kadwell, Brian J., to Robertshaw Controls Company. Supervised start system for microprocessor based appliance controls. 4,628,439, Cl. 364-138.000.
Fowler, Kerry W.: *See—*
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.
Fox, Richard B.: *See—*
Sullivan, James B.; and Fox, Richard B., 4,627,178, Cl. 36-44.000.
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Magnin, Raymond, 4,627,213, Cl. 52-745.000.
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.
Framatome & Cie.: *See—*
Leroy, Jean; and Ruiz, Pierre, 4,627,954, Cl. 376-216.000.
Leroy, Jean; and Ruiz, Pierre, 4,627,955, Cl. 376-216.000.
Francies, Sidney E., III, to Burke Company, The. Hoisting anchor assembly for use in cast concrete panels and method. 4,627,198, Cl. 52-125.500.
Francisco, Edward E., Jr.: *See—*
Cohrs, Gary D.; and Francisco, Edward E., Jr., 4,627,267, Cl. 73-3.000.
Franckowiak, Gerhard: *See—*
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.
Franke, Gunter, to Bayer Aktiengesellschaft. Preparation of dioxazine compounds. 4,628,086, Cl. 544-31.000.
Franke, Walter, to Universal Conveyor Co., Inc. Elevating chain conveyor. 4,627,530, Cl. 198-799.000.
Franklin Electric Co., Inc.: *See—*
Schaefer, Edward J., 4,628,236, Cl. 318-558.000.
Frankovsky, Andrew J.: *See—*
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Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H: *See—*
Theurer, Josef; and Hansmann, Johann, 4,627,360, Cl. 104-7.200.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,627,358, Cl. 104-7.200.
Franz Xaver Bayer Isolierglasfabrik: *See—*
Bayer, Franz; and Grosch, Karl, 4,627,263, Cl. 72-298.000.
Frederich, William L., to Eaton Corporation. Microprocessor controlled phase shifter. 4,628,460, Cl. 364-480.000.
Fredette, Maurice C. J.; and Yang, Ching-Shi, to Tenneco Canada Inc. Production of chlorine dioxide. 4,627,969, Cl. 423-478.000.
Fredrickson, Howard J., to Cornelius Cannon, Inc. Display apparatus having a mechanism for tilting shelves. 4,627,542, Cl. 211-150.000.
Frei, Roland; and Gutmann, Franz, to Plaston AG. Air cleaning apparatus. 4,627,862, Cl. 55-316.000.
Fremy, Raoul. Coupling device with eccentrically-mounted rotary valve element. 4,627,598, Cl. 251-149.200.
French, Robert C.: *See—*
Nebergall, Perry A.; and French, Robert C., 4,628,168, Cl. 219-10.810.
French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., to Barr & Stroud. Optical range simulator devices. 4,627,723, Cl. 356-5.000.
Friel, Daniel D. Method and apparatus for knife and blade sharpening. 4,627,194, Cl. 51-58.000.
Fries, Walter F., to Heinrich Mack Nachf. Stabilized injectable solutions of piroxicam. 4,628,053, Cl. 514-222.000.
Fries, Werner; and Klemm, Karl-Wilhelm, to BASF Farben & Fasern AG. Printing ink. 4,627,876, Cl. 106-27.000.
Frito-Lay, Inc.: *See—*
Plaskett, John, 4,627,217, Cl. 53-374.000.
FRL, Inc.: *See—*
Johnson, David E.; and Williams, Richard W., 4,628,265, Cl. 324-329.000.
Frohlich, Robert T.: *See—*
Young, Kenneth E.; Frohlich, Robert T.; Dudley, Hubert T.; and Hallock, Robert L., Jr., 4,627,207, Cl. 52-361.000.
Fruchtmann, Romanis: *See—*
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.
Fu Tai Umbrella Works Ltd.: *See—*
Okuda, Toshio; and Wu, Tsun-Zong, 4,627,455, Cl. 135-25.00A.
Fuccaro, Giorgio, to Danieli & C. Officine Meccaniche S.p.A. Compact shearing machine the scrap shears. 4,627,320, Cl. 83-163.000.
Fuji Electric Co., Ltd.: *See—*
Hongo, Yasuo; and Nitta, Yoshio, 4,628,533, Cl. 382-27.000.
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.
Fuji Electric Corporate Research & Development Co., Ltd.: *See—*
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Sakai, Yasuhito, 4,627,313, Cl. 74-867.000.
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.
Fuji Photo Film Co., Ltd.: *See—*
Arakawa, Satoshi, 4,628,208, Cl. 250-483.100.
Igarashi, Akira; Ikeda, Kenji; and Ikeda, Kensuke, 4,628,335, Cl. 346-208.000.
Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, 4,628,024, Cl. 430-376.000.
Komiyama, Choji; and Suzuki, Osamu, 4,627,534, Cl. 206-387.000.
Sawada, Satoru; and Nishiyama, Shingo, 4,628,021, Cl. 430-203.000.
Fuji Xerox Co., Ltd.: *See—*
Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, 4,628,368, Cl. 358-293.000.
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.
Fujie, Masakatsu: *See—*
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.
Fujieda, Mamoru; and Oyama, Yoshishige, to Hitachi, Ltd. Automatic transmission. 4,627,312, Cl. 74-866.000.
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,628,288, Cl. 335-166.000.
Fujii, Hiroshi: *See—*
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.
Fujii, Senzo: *See—*
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Fujii, Takayoshi: *See—*
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Fujikawa, Nobuyoshi: *See—*
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.
Fujimoto, Nobuaki: *See—*
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.
Fujimura, Fumio: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.
Fujita, Tsutomu: *See—*
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Fujitsu Limited: *See—*
Nakayama, Yoshiro; and Suzuki, Hidetake, 4,628,338, Cl. 357-15.000.
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.
Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, to Nippon Steel Corporation. Method for the ultrasonic flaw detection of an electric welded pipe. 4,627,289, Cl. 73-622.000.
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, to Iwatsu Electric Co., Ltd.; and Dainippon Screen Mfg. Co., Ltd. Apparatus for preventing drying-up of drawing needle pens. 4,628,326, Cl. 346-29.000.
Fukuoka, Norio, to Olympus Optical Co., Ltd. Apparatus for copying magnetic tape. 4,628,370, Cl. 360-15.000.
Funabashi, Yoshiyuki: *See—*
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.
Furuichi, Shinji, to Hitachi Metals, Inc. Read/write and trim erase magnetic head assembly. 4,628,387, Cl. 360-121.000.
Furukawa, Toshihiko, to Sodick Co., Ltd. EDM using two separate dielectric fluids and a system for maintaining segregation of the fluids. 4,628,170, Cl. 219-69.00D.

Furuta, Youichi; and Ochiai, Chiaki, to Aisin Seiki Kabushiki Kaisha. Sealing members for master cylinders. 4,627,332, Cl. 92-168.000.

G. D. Searle & Co.: *See—*
Dickens, Jonathan P.; and McKay, William R., 4,628,104, Cl. 548-341.000.
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.

G.D. Societa per Azioni: *See—*
Mattei, Riccardo; and Neri, Armando, 4,627,319, Cl. 83-73.000.

G&H Technology, Inc.: *See—*
Balyasny, Marik; Baldwin, Kenneth B.; and Lovell, William E., 4,627,561, Cl. 225-96.000.

Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., to DSM RIM Nylon VOF. Acid halide functional materials. 4,628,075, Cl. 525-403.000.

Gaffar, Abdul; and Polefka, Thomas G., to Colgate-Palmolive Company. Anticalculus oral composition. 4,627,977, Cl. 424-52.000.

Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., to AT&T Bell Laboratories. Method and apparatus for recoating spliced end portions of optical fibers. 4,627,942, Cl. 264-1.500.

Galle, James E.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.

Gamble, John E. Attachment for a standard power planer table. 4,627,478, Cl. 144-287.000.

Garay, Oscar M.: *See—*
Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., 4,628,322, Cl. 343-702.000.

Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., to Garid, Inc. Glucose medical monitoring system. 4,627,445, Cl. 128-770.000.

Gardell, Dietlind; and Rock, Gail. Method and apparatus for automated double fluorochromization analysis in lymphocytotoxicity testing. 4,628,026, Cl. 435-7.000.

Gareis, Ronald E.; and Kocher, Mark J., to General Electric Co. Protected input/output circuitry for a programmable controller. 4,628,397, Cl. 361-98.000.

Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., to Air Products and Chemicals, Inc. Catalytic coal liquefaction with treated solvent and SRC recycle. 4,627,913, Cl. 208-415.000.

Garid, Inc.: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.

Garner, Albert Y.: *See—*
Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., 4,628,075, Cl. 525-403.000.

Garner, Andrew; and Singbeil, Douglas L., to Pulp and Paper Research Institute of Canada. Monitor assembly for monitoring anodic corrosion protection of carbon steel vessels. 4,627,905, Cl. 204-404.000.

Garrett Corporation, The: *See—*
O'Hagan, Michael A.; and Smith, Richard D., 4,627,173, Cl. 34-10.000.

Garrison, Linn: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.

Gaudiana, Russell A.: *See—*
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Gause, James E.; and Armiger, Ronald E., to Westinghouse Electric Corp. Joint release mechanism. 4,627,355, Cl. 102-378.000.

Gauss, Walter: *See—*
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Gay, Steffen, to Molecular Engineering Associates, Ltd.; and Universtiy of Alabama, The Board of Trustees of the. Vitro diagnostic methods using monoclonal antibodies against connective tissue proteins. 4,628,027, Cl. 435-7.000.

Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidal tetrahydrothiopyran-3,5-dione derivatives, intermediate derivatives, compositions, and method of use therefor. 4,628,060, Cl. 514-432.000.

Geffcken, Walter; Littwin, Burkhard; and Wengert, Rolf, to Siemens Aktiengesellschaft. Gas discharge display device. 4,628,228, Cl. 315-169.400.

Gehlbach, Roger D. Overhead climber. 4,627,612, Cl. 272-113.000.

Gehman, Roland P.; and Martin, Raymond G., to MGS, Inc. Trailer hitch uncouple detecting and signaling apparatus. 4,627,633, Cl. 280-432.000.

Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, to Deutsche Thomson-Brandt GmbH. Circuit for analog digital conversion of a color television signal employing variable signal amplification. 4,628,345, Cl. 358-13.000.

Geister, Michael: *See—*
Magee, William E.; Geister, Michael; and Dillenburg, John N., Jr., 4,627,499, Cl. 173-43.000.

Geldec, Selcuk, to Daimler-Benz Aktiengesellschaft. Electromagnetic clutch for a drive assembly of a motor vehicle. 4,627,525, Cl. 192-84.00C.

Geluk, Ronald J.: *See—*
Mook, Adrianus; and Geluk, Ronald J., 4,628,360, Cl 358-139.000.

General Electric: *See—*
Wilson, Arthur C., 4,627,246, Cl. 62-286.000.

General Electric Company: *See—*
Anthony, Thomas R., 4,628,174, Cl. 219-76.130.
Boutni, Omar M., 4,628,074, Cl. 525-146.000.
Brooks, Robert B., 4,627,556, Cl. 222-240.000.
Downie, John W., 4,628,320, Cl. 342-16.000.
Gareis, Ronald E.; and Kocher, Mark J., 4,628,397, Cl. 361-98.000.
Hill, William D.; and Akers, David D., 4,628,277, Cl. 330-110.000.
Hodgman, John S.; and Mullersman, Ferdinand H., 4,628,243, Cl. 320-2.000.
Komanduri, Ranga; and Reed, William R., Jr., 4,627,317, Cl. 82-1.00C.
Lee, Ching-Pang, 4,627,480, Cl. 164-369.000.
Mark, Victor, deceased; and Peters, Edward N., 4,628,081, Cl. 528-176.000.
Niedrach, Leonard W.; and Will, Fritz G., 4,627,907, Cl. 204-415.000.
Rickard, Jimmy R.; and Hollenbeck, Robert K., 4,628,443, Cl. 364-184.000.
Roberts, Gerald E.; and Toliver, Samuel, 4,627,379, Cl. 118-721.000.
Scholefield, Clifford L., 4,628,242, Cl. 320-2.000.
Steigerwald, Robert L., 4,628,426, Cl. 363-17.000.
Terhune, James H.; and Gordon, Gerald M., 4,628,252, Cl. 324-65.0CR.

General Electric Company, p.l.c., The: *See—*
Walker, John D., 4,628,428, Cl. 363-21.000.
Walker, John D., 4,628,429, Cl. 363-21.000.

General Foods Corporation: *See—*
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., 4,627,986, Cl. 426-112.000.
Barnett, Ronald E.; and Yarger, Ronald G., 4,627,987, Cl. 426-548.000.

General Instrument Corporation: *See—*
Robbins, Clyde N., 4,628,358, Cl. 358-121.000.

General Motors Corporation: *See—*
Derringer, John G., 4,627,391, Cl. 123-90.160.
Fales, Douglas I., 4,627,282, Cl. 73-302.000.
Micheli, Adolph L., 4,627,966, Cl. 423-263.000.
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.

General Signal Corporation: *See—*
Buyak, William P., 4,628,213, Cl. 307-80.000.

Georg Fischer AG: *See—*
Mahnig, Fritz; and Schulte, Gunter, 4,627,667, Cl. 301-126.000.

Georgia Tech. Research Institute: *See—*
Sturrock, Peter E.; and O'Brien, Gerald E., 4,628,463, Cl. 364-497.000.

Gerken, Heiner: *See—*
Kittel, Arthur; and Gerken, Heiner, 4,627,750, Cl. 400-144.200.

Germer, Horst, to Blaupunkt-Werke GmbH. Method and system for matching the sound output of a loudspeaker to the ambient noise level. 4,628,526, Cl. 381-57.000.

Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., to Spectral Sciences, Inc. Ultraviolet absorption hygrometer. 4,627,284, Cl. 73-336.500.

Gerson, Ira A.: *See—*
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,628,529, Cl. 381-94.000.

Gertitschke, Detlev: *See—*
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.

Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen: *See—*
Stratton, Richard W.; Nicolet, Michel; and Andrews, Glenn, 4,627,957, Cl. 376-412.000.

Ghandehari, Mohammad H., to Union Oil Company of California. Electrolytic production of praseodymium. 4,627,898, Cl. 204-64.00R.

Ghirardi, Paolo: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Gibbard, Henry F., to Gould Inc. Method of generating electrical and magnetic fields in salt water marine environments. 4,627,891, Cl. 204-1.00R.

Gibson, Duane M., to Omark Industries, Inc. Hand held cutting tools. 4,627,165, Cl. 30-166.00R.

Gibson, Geruldine: *See—*
Gibson, James O.; and Gibson, Mark G., 4,627,418, Cl. 126-438.000.

Gibson, James O.; and Gibson, Mark G., to Gibson, Geruldine, a part interest. Apparatus for the carbothermic reduction of metal oxides using solar energy. 4,627,418, Cl. 126-438.000.

Gibson, Mark G.: *See—*
Gibson, James O.; and Gibson, Mark G., 4,627,418, Cl. 126-438.000.

Gill Studios, Inc.: *See—*
Harms, Jeffrey W., 4,627,608, Cl. 271-197.000.

Gilley and Associates: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Gilley, Glenn E.: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Gilman, Paul S.; and Mattson, Walter E., to Inco Alloys International, Inc. Production of mechanically alloyed powder. 4,627,959, Cl. 419-61.000.

Gilmore, Douglas D.; and Hartz, G. Michael, to Gilmore, Douglas D. Exercise device with opponent supplied resistance. 4,627,617, Cl. 272-120.000.

Ginnow-Merkert, Hartmut: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.

Gioffre, Anthony J.; and Ross, Ronald J., to Union Carbide Corporation. Effervescent dentifrice. 4,627,972, Cl. 424-44.000.

Giorgi, Ettore, to S.A.E.S. Getters S.p.A. Image intensifier with an electrophoretic getter device. 4,628,198, Cl. 250-213.0VT.

Girke, Dieter: *See—*
Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, 4,627,352, Cl. 102-290.000.

Givens, Edwin N.: *See—*
Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., 4,627,913, Cl. 208-415.000.

GKN Automotive Components Inc.: *See—*
Juziuk, Peter M.; and Hazebrook, Daniel W., 4,627,826, Cl. 464-171.000.

Glass, Emmett F.; and Wagstaff, Robert A., to New Holland Inc. Twine wrapping apparatus with trip mechanism actuated twine dispensing member. 4,627,340, Cl. 100-5.000.

Glaxo Group Limited: *See—*
Newell, Robert E.; and Fitzsimmons, Robert A., 4,627,432, Cl. 128-203.150.

Glenn, William E., to New York Institute of Technoloy. Method and apparatus for encoding and decoding video. 4,628,344, Cl. 358-12.000.

Glover, Rodney; and Brown, Martin R., to Allied Colloids Ltd. Acrylamide-dialkylaminoacrylate-dialkylaminomethacrylate cationic polyelectrolytes and their production. 4,628,078, Cl. 526-303.100.

Gobeille, William P.: *See—*
Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., 4,628,310, Cl. 340-825.720.

Gobis, Pranas. Ammunition projectile. 4,627,357, Cl. 102-503.000.

Goel, Anil B.; and Richards, Harvey J., to Ashland Oil, Inc. Bicyclic amide acetals as moisture scavengers. 4,627,932, Cl. 252-194.000.

Goel, Anil B., to Ashland Oil, Inc. Novel monomers containing bicyclic amide acetal and epoxy functional groups. 4,628,102, Cl. 548-218.000.

Goettler, Lloyd A.; and Lambright, Arthur J., to Monsanton Company. Hose reinforced with discontinuous fibers oriented in the radial direction. 4,627,472, Cl. 138-174.000.

Goetz, Frank M., to Xerox Corporation. Customized job default set-up. 4,627,710, Cl. 355-14.00R.

Goings, James R., to Gulf & Western Manufacturing Company. Control circuit for motor driver. 4,628,235, Cl. 318-430.000.

Goins, Dixie E.: *See—*
Holmes, Silas W.; Burt, Edward A.; and Goins, Dixie E., 4,628,127, Cl. 568-781.000.

Gokimoto, Hiroyuki; and Kiyomitsu, Isao, to Mazda Motor Corporation; and Delta Kogyo Co., Ltd. Seat for automobile. 4,627,656, Cl. 296-65.00R.

Gold, Calman, to New England Digital Corporation. Pitch extractor apparatus and the like. 4,627,323, Cl. 84-1.010.

Goldberg, Leon I.: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Golden, Donald M.: *See—*
Bedi, James J.; Golden, Donald M.; and McVay, William P., 4,627,437, Cl. 128-334.00C.

Goldhammer, Albert, to Feinwerktechnik Schliecher & Co., Firma. Apparatus for comminution of waste material such as paper blocks. 4,627,582, Cl. 241-236.000.

Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, to Bayer Aktiengesellschaft. Intermediate 8-carboxaldehyde-(-chromone and -thiochromone) derivatives. 4,628,107, Cl. 549-23.000.

Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., to TeleMeter Corporation. Apparatus and method for remotely monitoring a utility meter by use of a liquid crystal display. 4,628,313, Cl. 340-870.020.

Gompper, Klaus, to Kernforschungszentrum Karlsruhe GmbH. Process for denitrating nitric acid and actinide containing waste solutions while simultaneously separating the actinides. 4,627,937, Cl. 252-631.000.

Gonzales, Thomas D.: *See—*
Mueller, Michael M.; and Gonzales, Thomas D., 4,628,199, Cl. 250-229.000.

Gonzalo, German. Catheter device. 4,627,837, Cl. 604-101.000.

Goodman, David S.; and Oliver, Leland W., to ITT Corporation. Surface mounting connector. 4,628,410, Cl. 361-413.000.

Goodman, Joseph J.: *See—*
Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

Goodyear Tire & Rubber Company, The: *See—*
Wideman, Lawson G., 4,628,140, Cl. 585-606.000.

Gordon, Gerald M.: *See—*
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Gordon, Patrick J., to K. J. Baillie Pty. Ltd. Self cleaning valve. 4,627,461, Cl. 137-243.100.

Goto, Koji: *See—*
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.

Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserruckkuhlanlagen GmbH & Co.: *See—*
Hegemann, Karl-Rudolf; and Kleeberg, Ulrich, 4,627,965, Cl. 423-242.000.
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Gottling, Helmut: *See—*
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,627,597, Cl. 251-129.030.

Gough, David A., to University of California, The Regents of the. Electrochemical sensor having improved stability. 4,627,906, Cl. 204-415.000.

Gould Inc.: *See—*
Gibbard, Henry F., 4,627,891, Cl. 204-1.00R.

Gould Paper Corp.: *See—*
Gould, Peter J.; and Turits, Philip D., 4,627,936, Cl. 252-558.000.

Gould, Peter J.; and Turits, Philip D., to Gould Paper Corp. Towel premoistened with antistatic solution for cleaning cathode-ray tubes and the like. 4,627,936, Cl. 252-558.000.

Gould, Ronald M.; and Tabak, Samuel A., to Mobil Oil Corporation. Multistage process for converting oxygenates to alkylated liquid hydrocarbons. 4,628,134, Cl. 585-331.000.

Gouriou, Roger: *See—*
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Gozzo, Franco: *See—*
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.

Gracy, Dennis: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Graczyk, Lawrence S.: *See—*
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Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, to Brown, Boveri & Cie AG. Method and device for performing a bus request and collective acknowledgement in a process bus system. 4,628,503, Cl. 370-85.000.

Grasset, Daniel; and Martinot, Bernard, to Societe Chimique des Charbonnages--CdF Chimie. Process and apparatus for reducing the chances of igition and explosion from the decomposition of high pressure industrial process ethylene gases. 4,627,962, Cl. 422-40.000.

Graviner Limited: *See—*
Brown, Alfred R.; and Whetton, Richard A., 4,628,301, Cl. 340-584.000.

Gray, George W.: *See—*
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.

Gray Tool Company: *See—*
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Green, Gary J.; and Schwartz, Albert B., to Mobil Oil Corporation. Method of making uniform spheroidal catalyst beads. 4,628,040, Cl. 502-9.000.

Greenleaf, Allen H., to United States of America, Air Force. Computer controller optical surfacing (CCOS) lap pressure control system. 4,627,195, Cl. 51-119.000.

Gregorovich, Charles J.: *See—*
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,627,264, Cl. 72-345.000.

Greiser, Wolfgang; and Wagner, Hans, to Hoechst Aktiengesellschaft. Apparatus for producing a spunbond. 4,627,811, Cl. 425-72.00S.

Griesen, Bertus, to Hazemeijer B.V. Method for switching in a three-phase high voltage circuit. 4,628,393, Cl. 361-3.000.

Grilliot, Mary I.: *See—*
Grilliot, William L.; and Grilliot, Mary I., 4,627,112, Cl. 2-81.000.

Grilliot, William L.; and Grilliot, Mary I. Firefighter's coat. 4,627,112, Cl. 2-81.000.

Grimbly, Robert H. Safety locking device for doors. 4,627,651, Cl. 292-288.000.

Grimshaw, Michael N.: *See—*
Grone, Robert J.; and Grimshaw, Michael N., 4,627,886, Cl. 156-361.000.

Grisel, Charles H.; and Hus, Henri, to Hispano-Suiza. Hydro-dynamic fluid bearing comprising bearing members subject to progressive pre-loading. 4,627,746, Cl. 384-99.000.

Groman, Ernest V.: *See—*
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,628,037, Cl. 436-526.000.

Grone, Robert J.; and Grimshaw, Michael N., to Cincinnati Milacron Inc. Composite tape laying machine with pivoting presser member. 4,627,886, Cl. 156-361.000.

Groom, David C.: *See—*
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Grosch, Karl: *See—*
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Gross, Rainer: *See—*
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.

Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., to Sensormatic Electronics Corporation. Coil assembly for substantially isotropic flux linkage in a given plane. 4,628,324, Cl. 343-788.000.

Grosskreuz, Lothar: *See—*
Hochlehnert, Franz; Rademacher, Werner; and Grosskreuz, Lothar, 4,627,318, Cl. 83-18.000.

Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., to Minster Machine Company, The. Cam actuated ejector for a shell press. 4,627,264, Cl. 72-345.000.
Grubb, B. Randall: *See—*
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Jensen, Niels D.; and Langgaard, Gunnar, 4,627,792, Cl. 417-83.000.
Gruns, James H. Paint brush. 4,627,125, Cl. 15-105.000.
Grunwald, Werner: *See—*
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GTE Communication Systems Corp.: *See—*
Notohamiprodjo, Hubertus S., 4,628,433, Cl. 363-65.000.
GTE Laboratories Incorporated: *See—*
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GTE Products Corporation: *See—*
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Gudgeon, Brian: *See—*
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Guenthner, Russell W.: *See—*
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Guerini, John L.: *See—*
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Guerra-Santos, Luis: *See—*
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Guilliams, Donald E., executor: *See—*
McArthur, David T., deceased, 4,628,420, Cl. 362-208.000.
Gulf & Western Manufacturing Company: *See—*
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Gulko, Izrail B. Pneumatic pressure transmitter. 4,627,459, Cl. 137-116.500.
Gundert, Johann: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.
Gunnell, Douglas L.: *See—*
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Gunzel, Hans. Orthodontic apparatus. 4,627,816, Cl. 433-11.000.
Gustavsson, Per-Olof G.: *See—*
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Gutmann, Franz: *See—*
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Guzik Technical Enterprises: *See—*
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Hachey, Francis J.; and Hachey, Henry J., to ParaSystems, Inc. Apparatus to assist the disabled. 4,627,119, Cl. 5-83.000.
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Hafle, Ralph S.; and Love, Mark D., to BEI Motion Systems Company, Inc. Chain code encoder. 4,628,298, Cl. 340-347.00P.
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Hahn, Gary S., to Immunetech Pharmaceuticals. Immunotherapeutic antiallergic polypeptide agents which bind to basophil immunoglobin Fc receptors. 4,628,045, Cl. 514-17.000.
Hahn, William F.; McAdams, Hirimie T.; and Talley, Robert L., to Hahn, William F. Differential rate screening. 4,627,576, Cl. 241-24.000.
Haines, Harold G.; and Dickens, Caroline B., to Brigham, Dana P. Antiviral pharmaceutical preparations and methods for their use. 4,628,063, Cl. 514-626.000.
Halcon SD Group, Inc., The: *See—*
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Halder, Mathis, to LGZ Landis & Gyr Zug AG. Precision measurement voltage transducer. 4,628,251, Cl. 323-340.000.
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Hall, Glenn E.: *See—*
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Hall, James R.: *See—*
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Halliburton Company: *See—*
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Hamai, Jitsuo, to Hamai Electric Lamp Co., Ltd. Method of and apparatus for manufacturing small-size gas-filled lamps. 4,627,824, Cl. 445-27.000.
Hamamoto, Atsushi; and Kawaoto, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha; and Alna Koki Co., Ltd. Window stay. 4,627,201, Cl. 52-208.000.
Hamamoto, Hideki; Fujita, Tsutomu; and Mori, Takuzo, to Nihon Spindle Seizo Kabushiki Kaisha; and Showa Rekisei Kogyo Kabushiki Kaisha. Method and an apparatus for packing a semisolid compound in bags. 4,627,224, Cl. 53-502.000.
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke, to Sharp Kabushiki Kaisha. Light amount limiting device of electrophotographic copying machine. 4,627,704, Cl. 355-3.00R.
Hammermill Paper Company: *See—*
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Hammett, Geoffrey G., to Scientific-Atlanta, Inc. Linear servoactuator with integrated transformer position sensor. 4,628,499, Cl. 364-167.000.
Hamsher, Wilbur A., Jr.; and Pass, Raymond V., to AMP Incorporated. Tri-lead connector. 4,627,674, Cl. 339-14.00P.
Haneda, Hideo: *See—*
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Harigaya, Isao, to Canon Kabushiki Kaisha. Information signal reproducing apparatus. 4,628,377, Cl. 360-72.100.
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Harris, George M., to Harris-Hub Company, Inc. Bed frame assembly. 4,627,120, Cl. 5-201.000.
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Harris, Phillip C.; Reidenbach, Vincent G.; and Chisholm, Pat T., to Halliburton Company. Method for stimulation of wells with carbon dioxide or nitrogen based fluids containing high proppant concentrations. 4,627,495, Cl. 166-280.000.
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Harshbarger, John H., Jr.; and Harshbarger, John H., III, to Visual Information Institute, Inc. Heat pump control system with defrost cycle monitoring. 4,627,484, Cl. 165-2.000.

Harshbarger, John H., Jr.: *See—*
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Harshbarger, John H., III; and Harshbarger, John H., Jr., to Visual Information Institute, Inc. Heat pump control system. 4,627,483, Cl. 165-2.000.
Harshbarger, John H., III: *See—*
Harshbarger, John H., Jr.; and Harshbarger, John H., III, 4,627,484, Cl. 165-2.000.
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Harwood, Leopold A., to RCA Corporation. Electrical servo system having manual override affecting servo loop gain. 4,628,346, Cl. 358-28.000.
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Havens, Glenn G., deceased; and Thompson, Richard C., executor, 4,627,573, Cl. 239-542.000.
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Hayashi, Masaharu; and Itakura, Masato, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling device. 4,627,524, Cl. 192-58.00B.
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Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihis, 4,628,435, Cl. 364-130.000.
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Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann: *See*—
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Holmstrom, Roger P.; and Chi, Jim-Yong, to GTE Laboratories Incorporated. Method of forming an isolated semiconductor structure. 4,627,883, Cl. 148-187.000.
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Horiba, Ltd.: *See*—
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Horiguchi, Fumio: *See*—
Saku, Koji; and Horiguchi, Fumio, 4,628,488, Cl. 365-222.000.
Horiuchi, Yasuhiro: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.
Hornak, Leonard P., to Westinghouse Electric Corp. Crimping. 4,627,142, Cl. 29-283.500.
Horton, M. Dave, to Megadiamond Industries, Inc. Multiple layer polycrystalline diamond compact. 4,627,503, Cl. 175-329.000.
Hoskin, William J., to MICRA Limited. Surgical knives. 4,627,435, Cl. 128-303.100.
Hosoda, Yuji: *See*—
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.
Hosokawa, Mikio, to Maeda Industries, Ltd. Bicycle speed change lever. 4,627,305, Cl. 74-489.000.
Hosoya, Eiji: *See*—
Matsubayashi, Shinji; Kiyota, Satoru; and Hosoya, Eiji, 4,627,520, Cl. 188-18.00R.
Hotsumi, Minoru, to NEC Corporation. Housing for electronic apparatus or the like. 4,627,589, Cl. 248-346.000.
House, William J.: *See*—
Dougherty, Michael; and House, William J., 4,627,304, Cl. 74-469.000.
Hovey, Isabel B.: *See*—
Meguerdichian, Gary M.; and Hovey, Isabel B., 4,627,518, Cl. 187-29.00R.
Hruden, Wayne R., to Ultimate Survivor of America Inc. Deferred-action battery. 4,628,014, Cl. 429-113.000.
Hsu, Tracy C., to SCM Corporation. Process for prefinished exterior hardboard. 4,627,999, Cl. 428-326.000.
Huber, Michael S., to United States of America, Navy. Hybrid unitized shock and vibration mitigation system. 4,627,327, Cl. 89-1.816.
Huber, William B., to Nuvatec, Inc. Latching relay. 4,628,289, Cl. 335-168.000.
Hubner, Wolfgang: *See*—
Mikusch, Gerald; Hubner, Wolfgang; and Munch, Werner, 4,627,528, Cl. 198-621.000.
Huck Manufacturing Company: *See*—
Dixon, Richard D., 4,627,775, Cl. 411-34.000.
Hudson, Bertram J.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.
Hudson Oxygen Therapy Sales Company: *See*—
Rowland, Robert O., 4,627,860, Cl. 55-162.000.
Huemer, Franz X. Winding equipment. 4,627,583, Cl. 242-45.000.
Huggins, Orville C., to Monarch Marking Systems, Inc. Printing apparatus. 4,627,347, Cl. 101-292.000.
Huggins, Orville C., to Monarch Marking Systems, Inc. Printing apparatus. 4,627,348, Cl. 101-292.000.
Hughes Aircraft Company: *See*—
Basiulis, Algerd, 4,627,487, Cl. 165-104.260.
Myer, Jon H., 4,627,256, Cl. 72-60.000.
Pollard, Gary B., 4,627,533, Cl. 206-328.000.
Hughes, Raymond J. Apparatus for making capsule having plural chambers. 4,627,808, Cl. 425-270.000.
Huhman, Michael L., to Deutz-Allis Corporation. Downwardly and rearwardly directed air stream for harvester with vertically offset accelerator rolls. 4,627,446, Cl. 130-27.00Z.
Hultholm, Stig-Erik: *See*—
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.
Hunninghaus, Roy; and Almquist, Edward Q., to Motorola, Inc. Pulse detector for missing or extra pulses. 4,628,269, Cl. 328-120.000.
Hus, Henri: *See*—
Grisel, Charles H.; and Hus, Henri, 4,627,746, Cl. 384-99.000.
Huschelrath, Gerhard; and Ruth, Ursula, to Nukem GmbH. Method and apparatus for separating magnetic field attributable to flaws in a material from magnetic fields attributable to other phenomena. 4,628,261, Cl. 324-240.000.
Husco International, Inc.: *See*—
Wilke, Raud A.; and Paik, Michael, 4,627,468, Cl. 137-625.660.
Hutson, Allan L., to Sundstrand Corporation. Hydrostatic transmission with fixed fluid capacity ratio between pump and motor. 4,627,237, Cl. 60-487.000.
Hutter, Hans-Georg. Chain link runner assembly. 4,627,630, Cl. 280-28.500.
Huzino, Seizi: *See*—
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.
Hwang, James G.; Fleming, Robert F., III; and Hayworth, Robert G., to Vega Precision Laboratories, Inc. Decoding apparatus and method for a position coded pulse communication system. 4,628,312, Cl. 340-825.640.
Hydroacoustics Inc.: *See*—
Nelson, David E.; Berg, David M.; and Hannon, Robert J., 4,628,493, Cl. 367-79.000.
Hydromatik GmbH: *See*—
Mayr, Albert; and Stickel, Oskar, 4,627,238, Cl. 60-452.000.
Hyodo, Motoi: *See*—
Okazaki, Hiroshi; and Hyodo, Motoi, 4,627,664, Cl. 297-452.000.
Hyuga, Kounosuke; Nakamura, Koutaro; and Ogawa, Shouzou, to Japan Tobacco Inc. Flow control system in shredding machine. 4,627,577, Cl. 241-30.000.
Hyun, Hyung-Hwan: *See*—
Zeikus, Joseph G.; and Hyun, Hyung-Hwan, 4,628,031, Cl. 435-205.000.
I.M.A.—Industria Macchine Automatiche—S.p.A.: *See*—
Argazzi, Ivo, 4,627,216, Cl. 53-251.000.
Iba, Yoichi, to Olympus Optical Co., Ltd. Transmission type illuminating device for stereomicroscopes. 4,627,693, Cl. 350-523.000.
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, to Hitachi, Ltd. Oil separator. 4,627,861, Cl. 55-278.000.
Ichikawa, Akira: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Ichimura, Yoshikuni: *See*—
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Ichinoi, Yutaka; and Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Video signal dropout compensation circuit. 4,628,369, Cl. 358-314.000.
ICI Americas Inc.: *See*—
Lynch, Matthew J., 4,627,974, Cl. 424-48.000.
Lynch, Matthew J., 4,627,975, Cl. 424-49.000.
Lynch, Matthew J., 4,627,976, Cl. 424-49.000.
Lynch, Matthew J., 4,627,978, Cl. 424-54.000.
Lynch, Matthew J., 4,627,979, Cl. 424-54.000.
Lynch, Matthew J., 4,627,980, Cl. 424-54.000.
Nelson, Richard V.; and Stephen, John F., 4,628,096, Cl. 546-250.000.
Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.
Ide, Youji, to Ricoh Co., Ltd. Thermal transfer recording medium. 4,627,997, Cl. 428-216.000.
Idemitsu Kosan Company Limited: *See*—
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.
Igarashi, Akira; Ikeda, Kenji; and Ikeda, Kensuke, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,628,335, Cl. 346-208.000.
Igarashi, Hiroki: *See*—
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, to Tanabe Seiyaku Co., Ltd. Tetrahydro-β-carboline derivatives and treatment of liver diseases. 4,628,057, Cl. 514-292.000.
IIT Research Institute: *See*—
Camras, Marvin, 4,628,374, Cl. 360-66.000.
Ikeda, Hideki: *See*—
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Ikeda, Kenji: *See*—
Igarashi, Akira; Ikeda, Kenji; and Ikeda, Kensuke, 4,628,335, Cl. 346-208.000.
Ikeda, Kensuke: *See*—
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Ikeda, Takeshi: *See*—
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.
Ikeda, Yoshiaki, to Fanuc Ltd. Color display unit. 4,628,305, Cl. 340-703.000.

Ikefuji, Yoshihiro; and Koiwa, Mitsuru, to Rohn Company Limited. Power supply having a predetermined value of input impedance. 4,628,249, Cl. 323-315.000.

Ikemoto, Takeshi: *See—*
Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, 4,627,289, Cl. 73-622.000.

Ikeya, Tomoyoshi: *See—*
Nishio, Takashi; and Ikeya, Tomoyoshi, 4,627,725, Cl. 356-152.000.

Im, Jang-hi, to Dow Chemical Company, The. Method of making piezoelectric/pyroelectric elements. 4,627,138, Cl. 29-25.350.

Image S.A.: *See—*
Regnault, Luc, 4,628,329, Cl. 346-75.000.

Imagex, Inc.: *See—*
Spillman, Donald W.; and Shilling, Thomas W., 4,628,356, Cl. 358-111.000.

Imahashi, Hiromichi; Inagaki, Masahisa; Akahori, Kimihiko; and Umehara, Hajime, to Hitachi, Ltd. Method of producing high-purity metal member. 4,627,148, Cl. 29-516.000.

Imai, Eiichi: *See—*
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.

Imai, Kazumichi: *See—*
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, 4,628,035, Cl. 436-518.000.

Imamura, Nobutake: *See—*
Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, 4,628,485, Cl. 365-122.000.

Imani, Yuichi: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.

Imes, Clifford W., IV: *See—*
Thompson, Michael D.; and Imes, Clifford W., IV, 4,627,717, Cl. 355-15.000.

Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, to Robert Bosch GmbH. Apparatus for injecting fuel into combustion chambers. 4,627,405, Cl. 123-549.000.

Immunetech Pharmaceuticals: *See—*
Hahn, Gary S., 4,628,045, Cl. 514-17.000.

Imperial Chemical Industries PLC: *See—*
Porter, John E.; and Ramshaw, Colin, 4,627,890, Cl. 202-235.000.

Inagaki, Masahisa: *See—*
Imahashi, Hiromichi; Inagaki, Masahisa; Akahori, Kimihiko; and Umehara, Hajime, 4,627,148, Cl. 29-516.000.

Inao, Akitaka: *See—*
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, 4,627,990, Cl. 427-10.000.

Inco Alloys International, Inc.: *See—*
Gilman, Paul S.; and Mattson, Walter E., 4,627,959, Cl. 419-61.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Dagna, Giandomenico; and Morin, Franco, 4,628,334, Cl. 346-140.00R.

Ingalls, John E.: *See—*
Colby, Lloyd E.; and Ingalls, John E., 4,628,171, Cl. 219-69.00G.

Ingersoll-Rand Company: *See—*
Hartshorn, Kevin, 4,627,464, Cl. 137-516.130.

Ingle, Edwin C.: *See—*
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.

Inland Steel Company: *See—*
Nickola, Richard A.; and Sok, Brian A., 4,628,004, Cl. 428-413.000.

Innami, Tatsuo: *See—*
Shinohara, Shigeru; Suzuki, Shun; and Innami, Tatsuo, 4,628,459, Cl. 364-475.000.

Innovation Associates: *See—*
Afromowitz, Martin A., 4,627,172, Cl. 33-366.000.

Innoventions Biomedical Inc.: *See—*
Leckrone, Michael E., 4,627,436, Cl. 128-303.100.

Inomata, Koichiro: *See—*
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.

Inoue, Akira, to Olympus Optical Company, Ltd. Flashlight emission apparatus. 4,628,229, Cl. 315-241.00P.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,628,172, Cl. 219-69.00W.

Inoue, Jiro: *See—*
Nakatani, Hiroshi; Inoue, Jiro; and Miyamori, Masashige, 4,628,285, Cl. 331-163.000.

Inoue, Kaname: *See—*
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Gap energizing system for TW electroerosion. 4,628,172, Cl. 219-69.00W.

Inoue, Takao: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.

INRYCO, Inc.: *See—*
Presswalla, Hoshang H.; and Shea, Yale R., 4,627,203, Cl. 52-221.000.

Institut Francais du Petrole: *See—*
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-885.000.
Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, 4,628,065, Cl. 518-700.000.
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.
Rialan, Joseph; and Thierry, Gerard, 4,628,494, Cl. 307-79.000.

Institut Textile de France: *See—*
Chatelin, Roger; Combes, Jean-Francois; and Wattiez, Daniel, 4,627,920, Cl. 210-668.000.

Instytut Gornictwa Naftowego: *See—*
Dzwinel, Jan, 4,628,266, Cl. 324-330.000.

Integrerad Teknik HB: *See—*
Ewald, Rolf V. T., 4,628,422, Cl. 362-240.000.

International Business Machines Corporation: *See—*
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., 4,628,411, Cl. 361-414.000.
Beavers, John A., 4,628,541, Cl. 455-603.000.
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.
Crouse, William G., 4,628,307, Cl. 340-825.050.
DeHond, Mitchell R.; and Ledak, Paul J., 4,627,152, Cl. 29-571.000.
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.
Irvin, David R., 4,628,156, Cl. 379-410.000.
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Milling, Philip E., 4,628,311, Cl. 340-825.500.
Ruppert, Werner, 4,628,211, Cl. 250-578.000.

International Computers Limited: *See—*
Loo, Johnson, 4,628,512, Cl. 371-68.000.
Reddaway, Stewart F., 4,628,481, Cl. 364-900.000.
Thompson, Gordon L.; Gudgeon, Brian; and Wombwell, Kenneth J., 4,628,409, Cl. 361-403.000.

International Ferry Freight Limited: *See—*
Dudding, Sheron L., 4,627,549, Cl. 220-1.500.

International Flavors & Fragrances Inc.: *See—*
Hall, John B., 4,627,935, Cl. 252-522.00R.
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., 4,627,449, Cl. 131-276.000.
Lindauer, Jerome I.; and Reich, Sharon L., 4,627,934, Cl. 252-522.00R.

International Standard Electric Corporation: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.
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Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.
Willson, Jolyon P., 4,627,728, Cl. 356-345.000.

International Tectonics Incorporated: *See—*
Ross, David S., 4,627,923, Cl. 210-744.000.

International Telephone and Telegraph Corporation: *See—*
Vlasak, Weldon R. H., 4,628,273, Cl. 330-4.300.

IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung: *See—*
Loges, Hans J.; and Wilkening, Hermann, 4,627,258, Cl. 72-196.000.

IRSID: *See—*
Berthet, Aristide; and Denier, Guy, 4,627,601, Cl. 266-212.000.

Irvin, David R., to International Business Machines Corporation. Canceller trained echo suppressor. 4,628,156, Cl. 379-410.000.

Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, to Kabushiki Kaisha Myotoku. Air sliding device for work pallets or the like. 4,627,362, Cl. 104-23.200.

Isert, Ingo: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Ishida, Hiroshi; and Wang, Yujen, to Rocket Industries, Inc. Multi-purpose exercising apparatus. 4,627,610, Cl. 272-72.000.

Ishida, Takashi: *See—*
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Ishii, Takatoshi: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.

Ishii, Yasuaki, to Ricoh Company, Ltd. Sheet feeding system. 4,627,607, Cl. 271-122.000.

Ishikake, Masanao: *See—*
Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, 4,627,638, Cl. 280-779.000.

Ishikawa, Chuji, to Ricoh Company, Ltd. Ink mist collection apparatus for ink jet printer. 4,628,331, Cl. 346-75.000.

Ishikawa, Noriyoshi: *See—*
Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, 4,628,368, Cl. 358-293.000.

Ishiwata, Osamu: *See—*
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.

Isler, Bonnie J. Artificial fingernails and method of application. 4,627,453, Cl. 132-73.000.

Isobe, Shinichi; and Sawada, Kazuo, to Fanuc Ltd. Centralized peripheral interface with a numerical control unit. 4,628,442, Cl. 364-167.000.

Itakura, Masato: *See—*
Hayashi, Masaharu; and Itakura, Masato, 4,627,524, Cl. 192-58.00B.

Itami, Teruhiko: *See—*
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Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, to Rinnai Kabushiki Kaisha. Water heater. 4,627,416, Cl. 126-351.000.

Ito, Katsumi, to Kubota, Ltd. Automatic running work vehicle. 4,628,454, Cl. 364-424.000.

Ito, Masaji: *See—*
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Ito, Shinzo; and Kaneko, Yasuhiro, to Nippondenso Co., Ltd. Method and apparatus for measuring shape of injected substance. 4,628,465, Cl. 364-521.000.

Ito, Tadayoshi; and Yasunori, Taga, to Kabushiki Kaisha Toyoto Chuo Kenkyusho. Heat wave shielding lamination. 4,628,005, Cl. 428-432.000.

Ito, Tetsuro, to Mitsubishi Denki Kabushiki Kaisha. Fabricating machine. 4,628,173, Cl. 219-69.00G.

Ito, Yukinori: *See—*
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.

Itoh, Isamu: *See—*
Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, 4,628,024, Cl. 430-376.000.

ITT Corporation: *See—*
Goodman, David S.; and Oliver, Leland W., 4,628,410, Cl. 361-413.000.

Iwahara, Makoto; and Ogawa, Hiroshi, to Victor Company of Japan, Ltd. M-S type stereophonic microphone. 4,628,525, Cl. 381-26.000.

Iwakiri, Norio: *See—*
Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.

Iwamoto, Kenzi: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.

Iwamoto, Taro: *See—*
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.

Iwanciow, Bernard L., to United States of America, Navy. Fuel cell with storable gas generator. 4,628,010, Cl. 429-19.000.

Iwata, Kunio, to Kanai Juyo Kogyo Co., Ltd. Combing roller for an open-end spinning machine. 4,627,131, Cl. 19-97.000.

Iwatsu Electric Co., Ltd.: *See—*
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.

Izumita, Morishi: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.

Jacob, Gernot J. M., to Progress - Electrogeraete. Vacuum cleaner filter. 4,627,858, Cl. 55-126.000.

James River Corporation, The: *See—*
Johnson, Jeffrey J., 4,627,953, Cl. 264-518.000.

James River-Norwalk, Inc.: *See—*
Johnson, Jeffrey J., 4,627,806, Cl. 425-83.100.

Janhonen, Veikko I. Package blank and packaging method. 4,627,223, Cl. 53-449.000.

Janome Sewing Machine Co., Ltd.: *See—*
Eguchi, Yasukata, 4,627,371, Cl. 112-451.000.
Moriyama, Masaru; and Yamaguchi, Yoshio, 4,627,755, Cl. 400-662.000.

Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, to International Business Machines Corporation. Two stage colleting in a flexible disk drive. 4,628,385, Cl. 360-99.000.

Japan Tobacco Inc.: *See—*
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Japanese Foundation for Cancer Research: *See—*
Sakurai, Yoshio; and Tsuruo, Takashi, 4,628,047, Cl. 514-34.000.

Jarvela, Robert A.: *See—*
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., 4,628,411, Cl. 361-414.000.

Jarvinen, Jyrki H., to Yoko-team Oy. Knee and shin protector. 4,627,108, Cl. 2-22.000.

Jennings, Barry R.; Trimm, Harold H.; and Webb, Terence W., to English Clays Lovering Pochin & Company, Ltd. Monitoring deflocculated particles in a suspension. 4,627,727, Cl. 356-338.000.

Jensen, Niels D.; and Langgaard, Gunnar, to Grundfos A/S. Rotating flow pump with a feed pump unit formed as an ejector. 4,627,792, Cl. 417-83.000.

Jeol Ltd.: *See—*
Kida, Jun, 4,628,263, Cl. 324-321.000.

Jerde, James B.; and Vasbinder, James E., to Digital Dynamics, Inc. Self-calibrating temperature probe apparatus and method for use thereof. 4,627,740, Cl. 374-1.000.

Jessup, Peter J.: *See—*
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., 4,627,930, Cl. 252-49.600.

Jo, Yasunori: *See—*
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,627,316, Cl. 81-430.000.

Johansson, Eskil T. Attachment means. 4,627,777, Cl. 411-439.000.

John Fluke Mfg. Co., Inc.: *See—*
Bottman, Jeffrey S., 4,628,278, Cl. 330-149.000.

Johns Hopkins University, The: *See—*
Chubbuck, John G.; and Epstein, Melvin H., 4,627,443, Cl. 128-748.000.
Turner, Robert, 4,627,726, Cl. 356-336.000.
Zinger, William H.; and Krill, Jerry A., 4,628,287, Cl. 333-137.000.

Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., to University of Melbourne; and CRA Services Limited. Upgrading solid fuels. 4,627,575, Cl. 241-15.000.

Johnson, David E.; and Williams, Richard W., to FRL, Inc. Metal detector and classifier with automatic compensation for soil magnetic minerals and sensor misalignment. 4,628,265, Cl. 324-329.000.

Johnson, Gerald L.: *See—*
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., 4,627,767, Cl. 405-196.000.

Johnson, Jeffrey J., to James River-Norwalk, Inc. Apparatus for the manufacture of fibrous webs with helical rotor. 4,627,806, Cl. 425-83.100.

Johnson, Jeffrey J., to James River Corporation, The. Method for forming dry laid webs. 4,627,953, Cl. 264-518.000.

Johnson, Lynn F., to Double L Manufacturing. Apparatus and method for sorting produce. 4,627,541, Cl. 209-668.000.

Johnson, Michael R.: *See—*
Reed, David M.; and Johnson, Michael R., 4,627,381, Cl. 119-1.000.

Johnson, Raynor A.: *See—*
Wegener, Jack; Johnson, Raynor A.; and Weedling, Robert, 4,627,426, Cl. 128-132.00R.

Johnson, Samuel C.; and Elliott, James C., to Dresser Industries, Inc. Air seal between relatively moveable ducts. 4,627,625, Cl. 277-27.000.

Johnston, Barry W. Closed loop solar collector system powering a self-starting uniflow steam engine. 4,627,241, Cl. 60-656.000.

Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Trifluoromethyl pyridinyloxyphenoxy propanoic acid chlorides. 4,628,099, Cl. 546-302.000.

Johnston, James S.; Holland, Leslie; and Wright, Christopher R., to Rosemount Engineering Company Limited. Method of producing a resistance element for a resistance thermometer. 4,627,902, Cl. 204-192.210.

Johnston, Kent H.: *See—*
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Johnstone, David L., to Tom McGuane Industries, Inc. Fuel pressure regulator. 4,627,463, Cl. 137-510.000.

Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., to Kearney & Trecker Corporation. Automatic dynamic error compensator. 4,628,441, Cl. 364-167.000.

Jones, Joye A.: *See—*
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.

Jones, Juliana C. Table covering apparatus. 4,627,363, Cl. 108-90.000.

Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,628,061, Cl. 514-469.000.

Jones, Stanley C., to Marathon Oil Company. System for measuring the pore volume and permeability of very tight core plugs and method therefor. 4,627,270, Cl. 73-38.000.

Jordan, Stanley R.: *See—*
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.

Josef Uhlmann Maschinenfabrik GmbH & Co. KG: *See—*
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.

Josephson, Lee: *See—*
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,628,037, Cl. 436-526.000.

Jourdan, James K.: *See—*
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.

Jujo Paper Co., Ltd.: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Jung, Kwan S. Barbecue grill. 4,627,410, Cl. 126-25.00A.

Jungbluth, Werner W.: *See—*
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,628,515, Cl. 372-107.000.

Jungerman, Roger L.; and Kino, Gordon S., to Leland Stanford Junior University, The Board of Trustees of the. Optical scanning microscope. 4,627,730, Cl. 356-349.000.

Just, Herbert: *See—*
Sedlmayr, Gerhard; and Just, Herbert, 4,627,639, Cl. 280-808.000.

Juy, Henri. Device for the assembly especially of the joint of the chain-guide tensioning arm of the speed change gears for bicycles and similar vehicles. 4,627,827, Cl. 474-80.000.

Juziuk, Peter M.; and Hazebrook, Daniel W., to GKN Automotive Components Inc. Multi-segment, non-flexible boot for mechanical joint. 4,627,826, Cl. 464-171.000.

Jyojiki, Masao: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,627,700, Cl. 354-409.000.

K. C. Shen Technology International Ltd.: *See—*
Shen, Kuo C., 4,627,951, Cl. 264-109.000.

K. J. Baillie Pty. Ltd.: *See—*
Gordon, Patrick J., 4,627,461, Cl. 137-243.100.

Kaaden, Jurgen: *See—*
Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, 4,628,345, Cl. 358-13.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Kawaguchi, Hatsuo, 4,627,641, Cl. 283-81.000.
Kabushiki Kaisha Myotoku: *See—*
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.
Kabushiki Kaisha Nagaoka: *See—*
Kawabe, Hirokazu, 4,628,388, Cl. 360-128.000.
Kabushiki Kaisha Sankosha: *See—*
Shigemori, Daizo; and Muramatsu, Yuji, 4,628,399, Cl. 361-120.000.
Kabushiki Kaisha Tetrak: *See—*
Kojima, Koji; and Kajiwara, Kiyosi, 4,628,176, Cl. 219-110.000.
Kabushiki Kaisha Toshiba: *See—*
Abuyama, Yasuo, 4,627,713, Cl. 355-14.00R.
Hashizume, Kenichi, 4,628,142, Cl. 136-246.000.
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.
Sakui, Koji, 4,628,486, Cl. 365-149.000.
Kabushiki Kaisha Toyoto Chuo Kenkyusho: *See—*
Ito, Tadayoshi; and Yasunori, Taga, 4,628,005, Cl. 428-432.000.
Kabushiki Kaisha Tsuchiya Seisakusho: *See—*
Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, 4,627,406, Cl. 123-573.000.
Kadwell, Brian J.: *See—*
Fowler, Daniel L.; and Kadwell, Brian J., 4,628,439, Cl. 364-138.000.
Kaeppeli, Othmar; and Guerra-Santos, Luis, to Petrotec Forschungs AG. Process for the production of rhamnolipids. 4,628,030, Cl. 435-101.000.
Kafkis, Nick H. Vessel closures and method of forming the closures. 4,627,538, Cl. 206-524.100.
Kagawa, Hiroshi, to Yuasa Battery Co., Ltd. Sodium-sulfur storage battery and a manufacturing method of the same. 4,627,996, Cl. 428-104.000.
Kageyama, Hidehei, to Kotobuki & Co., Ltd. Lead propelling mechanism for a mechanical pencil. 4,627,756, Cl. 401-94.000.
Kagi, Otto, to Stopinc Aktiengesellschaft. Method of constructing a refractory plate assembly for use in a sliding closure unit. 4,627,147, Cl. 29-515.000.
Kagomoto, Yoshiteru, to Matsushita Electric Industrial Co., Ltd. Cooking appliance of hot air circulation type. 4,627,409, Cl. 126-21.00A.
Kai, Tadashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Synthesis of crystalline aluminosilicate with alkylurea or alkylthiourea. 4,627,968, Cl. 423-329.000.
Kaiser, Carl: *See—*
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., 4,628,059, Cl. 514-384.000.
Kajima Corporation: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Kajiwara, Kiyosi: *See—*
Kojima, Koji; and Kajiwara, Kiyosi, 4,628,176, Cl. 219-110.000.
Kajiyama, Masaki: *See—*
Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, 4,627,289, Cl. 73-622.000.
Kakizoe, Masahiro: *See—*
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Kalfoglou, George, to Texaco Inc. Method of using a lignosulfonate/-carbohydrate system as a sacrificial agent for surfactant flooding. 4,627,494, Cl. 166-274.000.
Kamakura, Masashi: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, to Hitachi, Ltd. Navigation apparatus for mobile system. 4,628,453, Cl. 364-424.000.
Kaminski, Les K.; and Dyke, Michael E., to Chrysler Motors Corporation. Combination dome/cargo lamp. 4,628,417, Cl. 362-74.000.
Kamm, Roger D.; and Fine, Louis. Tobacco smoke article holder and method therefor. 4,627,448, Cl. 131-187.000.
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, to Matsushita Electric Industrial Co., Ltd. Cooking stove having removable top plate. 4,627,415, Cl. 126-299.00R.
Kampe, Klaus-Dieter: *See—*
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Kampner, Stanley L. Portable traction device. 4,627,423, Cl. 128-75.000.
Kan, Tsuneo: *See—*
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kanada, Hidehiro: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Kanai Juyo Kogyo Co., Ltd.: *See—*
Iwata, Kunio, 4,627,131, Cl. 19-97.000.
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, to Sumitomo Electric Industries Ltd.; and Nippon Telegraph and Telephone Public Corporation. Method for producing optical fiber preform. 4,627,866, Cl. 65-3.120.
Kanamori, Hiroo: *See—*
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, 4,627,867, Cl. 65-3.120.
Kanayama, Katsumi: *See—*
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Kanda, Mikio: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Kanebo, Ltd.: *See—*
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.
Yata, Shizukuni; and Hato, Yukinori, 4,628,015, Cl. 429-194.000.
Kanebo Synthetic Fibers, Ltd.: *See—*
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.
Kanehara, Kenji: *See—*
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.
Kaneko, Ryohei: *See—*
Shimano, Kimihide; Shimamura, Haruo; Yamaguchi, Hiroshi; Murayama, Hiroshi; Kaneko, Ryohei; and Seki, Katsura, 4,627,981, Cl. 424-84.000.
Kaneko, Yasuhiro: *See—*
Ito, Shinzo; and Kaneko, Yasuhiro, 4,628,465, Cl. 364-521.000.
Kaneko, Youji, to Casio Computer Co., Ltd. Touch response apparatus for electronic musical apparatus. 4,627,325, Cl. 84-1.260.
Kanemitsu, Shinji: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Kaneyuki, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Accessory drive device in engine. 4,627,309, Cl. 74-752.00C.
Kano, Hayao: *See—*
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.
Kao, Chung-fu. Watchcase and watchframe assembly. 4,627,738, Cl. 368-281.000.
Karbach, Stefan: *See—*
Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,628,058, Cl. 514-383.000.
Karl G. Marbach GmbH & Co.: *See—*
Marbach, Karl G., 4,627,580, Cl. 241-101.400.
Karn, Jack L., to Lubrizol Corporation, The. Basic non-carbonated magnesium compositions and fuel, lubricant and additive concentrate compositions containing same. 4,627,928, Cl. 252-33.000.
Karubian, Ralph K.; and Coelho, Gregorio J., to Kentmaster Mfg. Co., Inc. Leg shear. 4,627,167, Cl. 30-228.000.
Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, to NEC Corporation. Chroma-key tracking apparatus. 4,628,363, Cl. 358-183.000.
Kashiwaba, Yukio: *See—*
Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, 4,627,406, Cl. 123-573.000.
Katada, Hiroshi: *See—*
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Katakura, Kageyoshi: *See—*
Ogawa, Toshio; Katakura, Kageyoshi; and Umemura, Shinichiro, 4,627,290, Cl. 73-628.000.
Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,628,223, Cl. 310-358.000.
Kather, Kenneth C.: *See—*
BeVier, William E.; Kather, Kenneth C.; and Graczyk, Lawrence S., 4,627,456, Cl. 137-1.000.
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, to CPC International Inc. Novel thermostable pullulanase enzyme and method for its production. 4,628,028, Cl. 435-95.000.
Kato, Kimitoshi; Aiga, Hiroshi; Mikoda, Tamio; and Sakai, Tunehiro, to Mitsui Toatsu Chemicals, Inc. Process for producing dianthraquinone-N,N'-dihydrazine and its chlorination product. 4,628,091, Cl. 544-339.000.
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, to Nippondenso Co., Ltd. Fuel injection nozzle. 4,627,571, Cl. 239-90.000.
Kato, Masahiro; and Ogawa, Tetsu, to Canon Denshi Kabushiki Kaisha. Magnetic disc unit. 4,628,376, Cl. 360-71.000.
Kato, Minoru: *See—*
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.
Kato, Shinichi; Watanabe, Kiyoto; Saito, Yoji; and Yamagata, Akio, to Nissan Motor Company, Ltd.; and Yazaki Corporation. Screw type connector set. 4,627,759, Cl. 403-2.000.
Kato, Tadaaki: *See—*
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.
Kato, Toshiro, to Sumitomo Chemical Company, Limited. Fungicidal composition comprising a synergistic mixture of a cycloimide fungicide and tolclofos-methyl. 4,628,049, Cl. 514-147.000.
Katz, Alan J.: *See—*
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.

Katz, Harry R. Needle inserting instrument for interstitial radiotherapy. 4,627,420, Cl. 128-1.100.
Katz, Morton. High temperature heat seal film. 4,628,003, Cl. 428-377.000.
Katz, William. Intravenous needle assembly. 4,627,842, Cl. 604-177.000.
Kauffman, Brad. Exercise apparatus. 4,627,616, Cl. 272-120.000.
Kauffman, Stephen R. Impact training device. 4,627,611, Cl. 272-77.000.
Kaveh, Farrokh, to Owens-Corning Fiberglas Corporation. Method and apparatus for producing mineral fibers. 4,627,868, Cl. 65-6.000.
Kawabata, Toshiaki: *See—*
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kawabe, Hirokazu, to Kabushiki Kaisha Nagaoka. Head cleaning apparatus. 4,628,388, Cl. 360-128.000.
Kawaguchi, Hatsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Two-color thermosensitive label. 4,627,641, Cl. 283-81.000.
Kawaguchi, Ikuo, to Hitachi, Ltd. Testing apparatus for redundant memory. 4,628,509, Cl. 371-21.000.
Kawai, Makoto: *See—*
Hayashi, Chikahisa; Kawai, Makoto; and Adachi, Mikio, 4,627,280, Cl. 73-290.00R.
Kawamura, Katsuaki: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
Kawamura, Yoshizi: *See—*
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, to Nippon Steel Corporation. Cold rolled steel sheet having excellent press formability and method for producing the same. 4,627,881, Cl. 148-12.00C.
Kawaoto, Yoshio: *See—*
Hamamoto, Atsushi; and Kawaoto, Yoshio, 4,627,201, Cl. 52-208.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Hamamoto, Atsushi; and Kawaoto, Yoshio, 4,627,201, Cl. 52-208.000.
Nishida, Hiroshi, 4,627,373, Cl. 114-182.000.
Nishimune, Hisaaki; Ichimura, Yoshikuni; and Hata, Kentaro, 4,627,239, Cl. 60-484.000.
Kayser, Dennis J., to Wang Laboratories, Inc. Power supply on/off switching with inrush limiting. 4,628,431, Cl. 363-49.000.
Kazaitis, Michael P.: *See—*
Nausedas, Joseph A.; and Kazaitis, Michael P., 4,627,130, Cl. 17-1.00R.
KB Electronics Inc.: *See—*
Saganovsky, Abraham; and Chester, William, 4,628,232, Cl. 318-284.000.
Kearney & Trecker Corporation: *See—*
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Keim, Dieter; and Fischer, Helmut, to W. C. Heraeus GmbH. Electrode for laser stimulation lamps. 4,628,225, Cl. 313-631.000.
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, to Didier-Werke AG. Refractory conduit assembly for supplying molten steel from a discharge vessel to an ingot mold. 4,627,481, Cl. 164-440.000.
Kellaway, Michael J.: *See—*
Archer, John R.; Kellaway, Michael J.; and MacArthur, Douglas S., 4,627,255, Cl. 72-10.000.
Kellner, Gerd: *See—*
Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, 4,627,352, Cl. 102-290.000.
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., to British Petroleum Company p.l.c., The. Fluidized bed combustor. 4,627,812, Cl. 431-7.000.
Kemppainen, Nels E.: *See—*
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., 4,628,159, Cl. 200-51.050.
Kennametal, Inc.: *See—*
Ewing, Paul E.; and Grubb, B. Randall, 4,627,665, Cl. 299-79.000.
Kentmaster Mfg. Co., Inc.: *See—*
Karubian, Ralph K.; and Coelho, Gregorio J., 4,627,167, Cl. 30-228.000.
Kernforschungsanlage Julich GmbH: *See—*
Brixy, Heinz; and Hoewener, Hubert, 4,627,744, Cl. 374-175.000.
Kernforschungszentrum Karlsruhe GmbH: *See—*
Gompper, Klaus, 4,627,937, Cl. 252-631.000.
Kesling, Haven S., Jr.; and Harris, James J., to Atlantic Richfield Company. Anti-static styrene polymer particles by coating. 4,628,068, Cl. 521-57.000.
Kessel, Bernhard. Pipe fitting. 4,627,646, Cl. 285-114.000.
Keutgen, Franz: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.
Keyes, Marion A., IV; and Shaffer, Jeremiah J., to Babcock & Wilcox Company, The. Adaptive gain compressor surge control system. 4,627,788, Cl. 415-11.000.
Kezios, Stothe P.: *See—*
Symbas, Panagiotis N.; Baisden, J. Lee; and Kezios, Stothe P., 4,627,421, Cl. 128-20.000.
Kibby, Gordon R.: *See—*
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Kida, Jun, to Jeol Ltd. Nuclear magnetic resonance spectrometer. 4,628,263, Cl. 324-321.000.
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Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.
Kieninger, Walter. Milling-cutter. 4,627,771, Cl. 407-39.000.
Kikkawa, Nobuyuki: *See—*
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.
Kikuno, Mitsutoyo, to Ricoh Company, Ltd. Programmable copier. 4,627,715, Cl. 355-14.00R.
Kim, Hiemi: *See—*
Christiansen, Richard L.; and Kim, Hiemi, 4,627,273, Cl. 73-61.10R.
Kim, Sung B. Combination lock. 4,627,250, Cl. 70-214.000.
Kimberly-Clark Corporation: *See—*
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.
Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., 4,627,849, Cl. 604-379.000.
Kimijima, Yoshiaki: *See—*
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, 4,627,412, Cl. 126-110.00B.
Kimoto, Sanshiro; Kokubo, Hisao; Yamabayashi, Yasunobu; and Hidejima, Kenichi. Eddy current defect-detecting system for determining an inner or outer defect and its depth in metal tubes. 4,628,260, Cl. 324-220.000.
Kimura, Kiyoshi, to Alps Electric Co., Ltd. Input device. 4,628,408, Cl. 361-395.000.
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, to Kraftwerk Union Aktiengesellschaft. Compact electrohydraulic drive for valves of turbomachines, especially turbines. 4,627,235, Cl. 60-415.000.
King, Edwin H. Pointer for liquid filled gauges. 4,627,285, Cl. 73-430.000.
Kino, Gordon S.: *See—*
Jungerman, Roger L.; and Kino, Gordon S., 4,627,730, Cl. 356-349.000.
Kinoshita, Jiro: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, 4,628,240, Cl. 318-723.000.
Kircher, Klaus: *See—*
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.
Kirchner, Balthasar; and Schleicher, Siegfried, to Ernst Stadelmann Gesellschaft m.b.H. Container for magnetic tape cassettes. 4,627,535, Cl. 206-387.000.
Kirkham, Edward E.: *See—*
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Kirton, Alan J.: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Kishi, Atsuo: *See—*
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kishimoto, Kazuo: *See—*
Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, 4,627,804, Cl. 425-71.000.
Kitagawa Industries Co., Ltd.: *See—*
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.
Kitagawa, Tohru; and Sakamoto, Koichiro, to Tokyo Electric Co., Ltd. Load cell. 4,628,296, Cl. 338-3.000.
Kitahara, Makoto: *See—*
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, 4,627,709, Cl. 355-14.0SH.
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, to Canon Kabushiki Kaisha. Automatic sheet feeder and an image recording apparatus provided therewith. 4,627,709, Cl. 355-14.0SH.
Kitamura, Hajime: *See—*
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.
Kitsukawa, Motohiko; and Suzuki, Atsuo, to Hashimoto Forming Industry Co., Ltd. Cutting device for a multi-dimensional bending apparatus. 4,627,254, Cl. 72-6.000.
Kittel, Arthur; and Gerken, Heiner, to Olympia Werke AG. Receiving arrangement for a multiple type carrier for an impact printer. 4,627,750, Cl. 400-144.200.
Kiuchi, Manabu. Mesh band. 4,627,231, Cl. 59-80.000.
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., to International Flavors & Fragrances Inc. Process for augmenting or enhancing aroma or taste of smoking tobacco and smoking tobacco article using aldehyde composition. 4,627,449, Cl. 131-276.000.
Kiya, Nobuyuki: *See—*
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, 4,628,444, Cl. 364-188.000.
Kiyohara, Kazuto: *See—*
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.
Kiyomitsu, Isao: *See—*
Gokimoto, Hiroyuki; and Kiyomitsu, Isao, 4,627,656, Cl. 296-65.00R.

Kiyota, Satoru: *See*—
Matsubayashi, Shinji; Kiyota, Satoru; and Hosoya, Eiji, 4,627,520, Cl. 188-18.00R.

Klee, David J.; Burke, Thomas W.; and Miller, Scott A., to Air Products and Chemicals, Inc. Process control for cryogenic decoating. 4,627,197, Cl. 51-319.000.

Kleeberg, Ulrich: *See*—
Hegemann, Karl-Rudolf; and Kleeberg, Ulrich, 4,627,965, Cl. 423-242.000.

Kleemann, Axel: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,628,126, Cl. 568-771.000.

Klein, Gerhard: *See*—
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carl-hans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.

Klein, Max. Filter for air handling equipment. 4,627,863, Cl. 55-354.000.

Klein, Thomas A.; and Baker, Peter M., to Lear Siegler, Inc. Vertically-adjustable desk structure. 4,627,364, Cl. 108-147.000.

Klemm, Karl-Wilhelm: *See*—
Fries, Werner; and Klemm, Karl-Wilhelm, 4,627,876, Cl. 106-27.000.

Klenner, Wolfgang: *See*—
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.

Klimt, Hans U. Inhalator apparatus. 4,627,430, Cl. 128-200.170.

Klobucar, W. Dirk, to Ethyl Corporation. Phosphazene trimer purification. 4,627,967, Cl. 423-300.000.

Kloster, Ernst: *See*—
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.

Kneisel, Thomas F.: *See*—
Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., 4,628,322, Cl. 343-702.000.

Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,628,024, Cl. 430-376.000.

Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, to Canon Kabushiki Kaisha. Recording liquid. 4,627,875, Cl. 106-22.000.

Kobayashi, Tadahiko: *See*—
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.

Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, to Sano Kiko Co., Ltd. Beam splitter. 4,627,688, Cl. 350-173.000.

Kobayashi, Teruaki: *See*—
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, 4,628,035, Cl. 436-518.000.

Kobayashi, Yasuhiko: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.

Kobayashi, Yoshiaki: *See*—
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.

Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Sheet forming apparatus. 4,627,804, Cl. 425-71.000.

Koch, Rudolf, to Siemens Aktiengesellschaft. Two-dimensional semiconductor image sensor including an arrangement for reducing blooming. 4,628,364, Cl. 358-213.000.

Kocher, Mark J.: *See*—
Gareis, Ronald E.; and Kocher, Mark J., 4,628,397, Cl. 361-98.000.

Kohama, Tokio: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.

Koike, Hiroshi, to Hitachi, Ltd. Electronic spark advance-type ignition system. 4,627,398, Cl. 123-418.000.

Koike, Shoji: *See*—
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, 4,627,875, Cl. 106-22.000.

Koiwa, Mitsuru: *See*—
Ikefuji, Yoshihiro; and Koiwa, Mitsuru, 4,628,249, Cl. 323-315.000.

Kojima, Koji; and Kajiwara, Kiyosi, to Kabushiki Kaisha Tetrak. Apparatus for setting schedules of a resistance welding machine. 4,628,176, Cl. 219-110.000.

Kokubo, Hisao: *See*—
Kimoto, Sanshiro; Kokubo, Hisao; Yamabayashi, Yasunobu; and Hidejima, Kenichi, 4,628,260, Cl. 324-220.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, 4,628,485, Cl. 365-122.000.

Kolcio, Nestor; and Peszlen, Richard A. Protective cover for electrical conductors. 4,628,145, Cl. 174-5.00R.

Koleda, Michael T. Vibration damping units and vibration damped products. 4,627,635, Cl. 280-602.000.

Kolibas, James A.; and Mueller, William P., to Nordson Corporation. Color changer. 4,627,465, Cl. 137-563.000.

Komai, Kensaku: *See*—
Shiono, Fusahiro; and Komai, Kensaku, 4,628,452, Cl. 364-405.000.

Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, to Konishiroku Photo Industry Co., Ltd. Polyester support for photographic use. 4,628,025, Cl. 430-533.000.

Komaki, Shigeki, to Sharp Kabushiki Kaisha. Thin card-type electronic apparatus. 4,627,736, Cl. 368-88.000.

Komanduri, Ranga; and Reed, William R., Jr., to General Electric Company. Consumable ceramic ledge tool. 4,627,317, Cl. 82-1.00C.

Komaroff, Iwan: *See*—
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.

Komatsu, Yasuto: *See*—
Murakami, Shigeru; Komatsu, Yasuto; Watanabe, Makoto; and Uemura, Takeo, 4,627,944, Cl. 264-29.400.

Komatsu, Yuji, to NEC Corporation. Semiconductor integrated circuit device free from mutual interference between circuit blocks formed therein. 4,628,343, Cl. 357-84.000.

Komiyama, Choji; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette storage case. 4,627,534, Cl. 206-387.000.

Komoda, Norihis: *See*—
Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihis, 4,628,435, Cl. 364-130.000.

Komoda, Norihisa: *See*—
Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihisa, 4,628,434, Cl. 364-130.000.

Kon, Shigeki, to Tachikawa Spring Co. Ltd. Button for an automotive seat. 4,627,660, Cl. 297-219.000.

Kondo, Shiro: *See*—
Mizuta, Ken; and Kondo, Shiro, 4,628,234, Cl. 318-267.000.

Konicek, Lawrence R.: *See*—
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.

Konishiroku Photo Industry Co., Ltd.: *See*—
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.
Nozaki, Hiromi, 4,627,714, Cl. 355-14.0FU.
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, 4,627,706, Cl. 355-14.0SH.

Kopp, Raun A., to Oatey Co. Dispenser system and method for dispensing putty-like material. 4,627,551, Cl. 222-1.000.

Koroyasu, Arata, to Kyokuto Sanki Kabushiki Kaisha. Carpet stretcher. 4,627,653, Cl. 294-8.600.

Kort, Eckehard K. Annular gap magnet system, particularly for low frequency loudspeakers. 4,628,154, Cl. 381-189.000.

Kot, Norbert J.: *See*—
Olson, Gene E.; and Kot, Norbert J., 4,627,761, Cl. 403-324.000.

Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei, 4,627,756, Cl. 401-94.000.

Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Gear cutter. 4,627,770, Cl. 407-21.000.

Koumura, Masahiko: *See*—
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Kovacs, Zoltan: *See*—
Herbert, Donald L.; Schneider, Lynn A.; and Kovacs, Zoltan, 4,627,545, Cl. 213-100.00R.

Koyama, Seiichi: *See*—
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Elfert, Bernd; and Scholly, Werner, 4,628,207, Cl. 250-461.100.
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.

Kramer, Irvin R.; and Reader, Wayne T., to United States of America, Navy. Wideband sonar energy absorber. 4,628,490, Cl. 367-1.000.

Kramer, Wolfgang: *See*—
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Krasznai, Charles Z.: *See*—
Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., 4,628,185, Cl. 219-386.000.

Kratzert, Friedrich: *See*—
Dietzell, Hans-Peter; and Kratzert, Friedrich, 4,627,346, Cl. 101-170.000.

Krause, Joachim: *See*—
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.

Kreylos, Hans-Albert; and Zeiser, Manfred P., to Ruebeling, Guenter. Method of manufacturing dentures. 4,627,136, Cl. 29-160.600.

Krill, Jerry A.: *See*—
Zinger, William H.; and Krill, Jerry A., 4,628,287, Cl. 333-137.000.

Krohn, Christine E.: *See*—
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.

Krokaugger, William G., to Mole-Richardson Company. Regulated light dimmer control. 4,628,230, Cl. 315-307.000.

Kruger, Berthold, to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserruckkuhlanlagen GmbH & Co. Method of treatment of sludge from a flue gas desulfurization plant. 4,627,970, Cl. 423-555.000.

Krumins, Maigonis V.; and Schindel, Leon H., to United States of America, Navy. Thrust vectoring apparatus for maneuvering missile in flight. 4,627,586, Cl. 244-3.210.

Krupka, Udo: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Kruse, Lawrence I.: *See*—
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., 4,628,059, Cl. 514-384.000.

Kubon, Achim: *See*—
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.

Kubosono, Kenji: *See*—
Nakajima, Takashi; and Kubosono, Kenji, 4,627,960, Cl. 420-472.000.

Kubota, Ltd.: *See*—
Ito, Katsumi, 4,628,454, Cl. 364-424.000.

Kubota, Yuichi: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.

Kudo, Koji: *See*—
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.

Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., to Coulter Systems Corporation. Method and device for reading digital data in an optical mass memory system using electrophotography. 4,628,367, Cl. 358-285.000.

Kuhl, Jane F.: *See*—
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.

Kuhle, Engelbert: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.

Kuhn, Edward S.: *See*—
Bowes, H. David; and Kuhn, Edward S., 4,627,790, Cl. 415-53.00R.

Kuhn, Philip A.; and Osborn, Paul V., to Mobil Oil Corporation. Method and apparatus for feeding a plastic ribbon. 4,627,584, Cl. 242-54.00R.

Kuhnemann, Gunter: *See*—
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Kuisma, Heikki T., to Vaisala Oy. Capacitive detector for absolute pressure. 4,628,403, Cl. 361-283.000.

Kumar, Ananda H.: *See*—
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.

Kuno, Akira: *See*—
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.

Kuno, Masashi: *See*—
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Kuntz, Frederick J.; and Schussler, Henry W., to PPG Industries, Inc. Process for concentrating and recovering chloral. 4,628,122, Cl. 568-492.000.

Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus and method for automatically monitoring a constant current source. 4,627,505, Cl. 177-1.000.

Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, to Fanuc Ltd. Synchronous motor control system. 4,628,240, Cl. 318-723.000.

Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, to Fuji Xerox Co., Ltd. Method for controlling sub-scanning of document reading apparatus. 4,628,368, Cl. 358-293.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.

Kuroda, Kazuo, to Pioneer Electronic Corporation. Drop-out compensator for a recorded signal playback system. 4,628,371, Cl. 360-38.100.

Kuroda, Keiichi: *See*—
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.

Kuroda, Toru; and Yamawaki, Naokuni, to Asahi Kasei Kogyo Kabushiki Kaisha. Absorbent of autoantibody and immune complexes, adsorbing device and blood purifying apparatus comprising the same. 4,627,915, Cl. 210-195.200.

Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, to Nippondenso Co., Ltd. Motor-driven radial plunger pump. 4,627,793, Cl. 417-203.000.

Kurz, Dieter; and Schafer, Norbert, to Carl-Zeiss-Stiftung. Method and arrangement for preventing cathode damage when switching on field emission electron guns. 4,628,226, Cl. 315-102.000.

Kusano, Kazuki: *See*—
Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, 4,628,182, Cl. 219-130.510.

Kuse, Kazuki, to Yoshida Kogyo K.K. Apparatus for manufacturing slide fastener with separable end stop. 4,627,807, Cl. 425-116.000.

Kusner, Ronald R.: *See*—
Reine, Marion B.; and Kusner, Ronald R., 4,628,203, Cl. 250-334.000.

Kussi, Siegfried: *See*—
Buysch, Hans-Josef; Kussi, Siegfried; and Boehmke, Gunther, 4,627,929, Cl. 252-47.000.

Kusters, Norbert L.; and Herriot, Glen A., to Canadian Patents and Development Limited. Wattmeter. 4,628,257, Cl. 324-142.000.

Kyocera Corporation: *See*—
Mizutani, Michitaka; and Yokoyama, Kiyoshi, 4,628,039, Cl. 501-97.000.
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.

Kyokuto Sanki Kabushiki Kaisha: *See*—
Koroyasu, Arata, 4,627,653, Cl. 294-8.600.

L A Water Treatment Corporation: *See*—
Meyers, Peter S.; and Alexander, Gerald, 4,627,921, Cl. 210-668.000.

L. Schuler GmbH: *See*—
Mikusch, Gerald; Hubner, Wolfgang; and Munch, Werner, 4,627,528, Cl. 198-621.000.

La-Z-Boy Chair Company: *See*—
LaPointe, Larry P., 4,627,663, Cl. 297-316.000.

Laatt, Richard G.: *See*—
Andrews, Thomas L., Jr.; Fiers, Thomas A.; and Laatt, Richard G., 4,628,379, Cl. 360-77.000.

Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased (by Martin, Mary B., executrix), to American Cyanamid Company. Antibiotic LL-C23201δ. 4,628,046, Cl. 514-33.000.

Lackner, Joseph L.: *See*—
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., 4,628,011, Cl. 429-49.000.

LAD Technology, Inc.: *See*—
Olson, Donald M., 4,627,963, Cl. 422-125.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,627,200, Cl. 52-191.000.

Lamadrid, Rene: *See*—
Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.

Lambright, Arthur J.: *See*—
Goettler, Lloyd A.; and Lambright, Arthur J., 4,627,472, Cl. 138-174.000.

Land, David V., to University of Glasgow, The University Court of the. Microwave thermographic apparatus. 4,627,442, Cl. 128-736.000.

Landa, Benzion; and Rosen, Josef, to Savin Corporation. Multiple color liquid developer electrophotographic copying machine and liquid distribution system therefor. 4,627,705, Cl. 355-4.000.

Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, to Pfeifer & Langen. Unprocessed complete cane sugar and method of producing it. 4,627,880, Cl. 127-43.000.

Langgaard, Gunnar: *See*—
Jensen, Niels D.; and Langgaard, Gunnar, 4,627,792, Cl. 417-83.000.

Lapeyre, James M., to Laitram Corporation, The. Recessed mortise stair. 4,627,200, Cl. 52-191.000.

LaPointe, Larry P., to La-Z-Boy Chair Company. Reclining chair. 4,627,663, Cl. 297-316.000.

Larsen, Lorin V.; and Eidem, Brian L., to Armco Inc. Hydraulic disk brake having a braking torque-to-hydraulic force converter. 4,627,519, Cl. 188-1.110.

Larson, Gordon C. Grain storage and transportation container. 4,627,782, Cl. 414-491.000.

Larson, Lawrence L.: *See*—
Ruger, William B.; and Larson, Lawrence L., 4,627,184, Cl. 42-25.000.

LaRue, Albert D.; Clocker, Roger A.; and Smith, Norman F., Jr., to Babcock & Wilcox Company, The. Primary air exchange for a pulverized coal burner. 4,627,366, Cl. 110-263.000.

LaRue, George S.: *See*—
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., to Kimberly-Clark Corporation. Anatomical pad. 4,627,848, Cl. 604-370.000.

Laughlin, Edward N.: *See*—
Cuba, Gary W.; and Laughlin, Edward N., 4,627,163, Cl. 30-95.000.

Laylock, Rick A.; and Theobald, Michael R., to Caterpillar Inc. Countershaft transmission. 4,627,302, Cl. 74-360.000.

LCC.CICE-Compagnie Europeenne de Composants Electroniques: *See*—
Chabrolle, Jacques, 4,628,386, Cl. 360-104.000.

Lear Siegler, Inc.: *See*—
Klein, Thomas A.; and Baker, Peter M., 4,627,364, Cl. 108-147.000.

Learnahan, Harold. Excavating bucket. 4,627,180, Cl. 37-184.000.

LeaRonal, Inc.: *See*—
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.

Lebever Co.: *See*—
Hayhurst, Vondene D., Jr., 4,627,322, Cl. 83-831.000.

Le Blanc, Helmut; Puppe, Lothar; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 2-amino-alkylpyridines. 4,628,097, Cl. 546-251.000.

Leckrone, Michael E., to Innoventions Biomedical Inc. Angioplasty catheter and method for use thereof. 4,627,436, Cl. 128-303.100.

Ledak, Paul J.: *See*—
DeHond, Mitchell R.; and Ledak, Paul J., 4,627,152, Cl. 29-571.000.

Ledsham, Paul. Trash bag insert. 4,628,007, Cl. 428-542.800.

Lee, Charles E., to Von Duprin, Inc. Ultrasonic sensing and monitoring systems. 4,628,496, Cl. 367-93.000.

Lee, Ching-Pang, to General Electric Company. Angled turbulence promoter. 4,627,480, Cl. 164-369.000.

Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., to United States of America, Energy. Measuring of electrical changes induced by in situ combustion through flow-through electrodes in a laboratory sample of core material. 4,628,267, Cl. 324-376.000.

Lee, Hans. Apparatus for performing suction lipectomy. 4,627,834, Cl. 604-49.000.

Lee, Paul. Concrete foundation pile. 4,627,769, Cl. 405-256.000.

Lee, Robert D., to Thomson Components-Mostok Corporation. Power conserving CMOS reference voltage source. 4,628,250, Cl. 323-317.000.

Leer, Incorporated: *See—*
Collins, John, 4,627,655, Cl. 296-167.000.

Legrand: *See—*
Buard, Yvon, 4,627,469, Cl. 138-92.000.

Leibinsohn, Saul. Device for dispensing a liquid from a collapsible container. 4,627,554, Cl. 222-103.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Jungerman, Roger L.; and Kino, Gordon S., 4,627,730, Cl. 356-349.000.

LeMahieu, Ronald A.: *See—*
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., 4,628,115, Cl. 562-464.000.

Leonetti, Fred L.; and Leonetti, Richard L. Contest card having elastomeric coating removal means. 4,627,643, Cl. 283-102.000.

Leonetti, Richard L.: *See—*
Leonetti, Fred L.; and Leonetti, Richard L., 4,627,643, Cl. 283-102.000.

Leplat, Robert, to Brunam Controle Sarl. Remote control locking and unlocking device, especially for an anti-panic bar. 4,627,649, Cl. 292-92.000.

Leroy, Jean; and Ruiz, Pierre, to Framatome & Cie. Process for detecting faults in the power distribution of a pressurized water nuclear reactor core and device for making use of this process. 4,627,954, Cl. 376-216.000.

Leroy, Jean; and Ruiz, Pierre, to Framatome & Cie. Process for detecting the variations in the reactivity of the core of a pressurized water nuclear reactor and device for making use of this process. 4,627,955, Cl. 376-216.000.

Les Fils d'Auguste Scheuchzer, S.A.: *See—*
Buhler, Fritz, 4,627,359, Cl. 104-3.000.

Lesso, William G., Jr.: *See—*
Burgess, Trevor M.; and Lesso, William G., Jr., 4,627,276, Cl. 73-151.000.

Lester, J. Harvey, Jr.: *See—*
Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.

Leupers, Hans-Joachim: *See—*
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.

Leuschner, Horst, to SGS Semiconductor Corporation. Back bias generator. 4,628,214, Cl. 307-296.00R.

Lev, Abraham: *See—*
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., 4,627,157, Cl. 29-741.000.

Lever Brothers Company: *See—*
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,627,925, Cl. 252-8.800.

Levine, Michael R., to Honeywell Inc. De-icing thermostat for air conditioners. 4,627,245, Cl. 62-157.000.

Levitt, Barrie; and Stolar, Morris, to Taro Pharmaceutical Industries Ltd. Novel oxopyrimidine derivatives, pharmaceutical compositions containing them and their use as anticonvulsant, antianxiety and muscle relaxant agents. 4,628,056, Cl. 514-270.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural sulfonamides. 4,627,873, Cl. 71-93.000.

Lew, Hyok S. Pulsed eddy flow meter. 4,627,294, Cl. 73-861.050.

Lewis, Meirion F., to National Research Development Corporation. Protection of saw devices comprising metallized regions on dielectric substrates. 4,628,222, Cl. 310-313.00R.

Leybold Heraeus GmbH: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.

LGZ Landis & Gyr Zug AG: *See—*
Halder, Mathis, 4,628,251, Cl. 323-340.000.

Liang, Chi-Dean: *See—*
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.

Lieberman, Edgar M. Tracheostomy device. 4,627,433, Cl. 128-207.160.

Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,627,450, Cl. 131-282.000.

Lien, Wayne W., to RTE Corporation. Full range oil expulsion fuse. 4,628,291, Cl. 337-203.000.

Liepelt, Dirk, deceased (by Liepelt, Joan A., personal representative), to Liepelt & Son, Inc. Cylinder press conversion for hot die application of foil. 4,627,343, Cl. 101-27.000.

Liepelt, Joan A., personal representative: *See—*
Liepelt, Dirk, deceased, 4,627,343, Cl. 101-27.000.

Liepelt & Son, Inc.: *See—*
Liepelt, Dirk, deceased, 4,627,343, Cl. 101-27.000.

Light, Gerard M., to Eaton Corporation. Fluid coupling device with improved fluid cooling. 4,627,523, Cl. 192-58.00B.

Lilja, Launo L.: *See—*
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.

Lin, John W.; and Dudek, Lesley P., to Xerox Corporation. Silylated compositions, and deuterated hydroxyl squaraine compositions and processes. 4,628,018, Cl. 430-59.000.

Lin, Patrick. Socket wrench with attachable socket storage means in handle. 4,627,315, Cl. 81-177.400.

Lindauer Dornier Gesellschaft mbH: *See—*
Ludwig, Hubertus, 4,627,473, Cl. 139-294.000.

Lindauer, Jerome I.; and Reich, Sharon L., to International Flavors & Fragrances Inc. Single phase clear liquid after-shave treatment product containing aloe vera. 4,627,934, Cl. 252-522.00R.

Linde Aktiengesellschaft: *See—*
Morper, Manfred, 4,627,917, Cl. 210-617.000.
Schmitz-Montz, Hans-Helmut, 4,627,795, Cl. 417-267.000.
von Gemmingen, Ulrich, 4,627,856, Cl. 55-31.000.

Linde, David E.: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.

Lion Corporation: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,627,927, Cl. 252-8.750.

Lippert, John A., to National Semiconductor Corporation. Integrated circuit precision capacitor. 4,628,405, Cl. 361-321.000.

Lischke, Burkhard, to Siemens Aktiengesellschaft. Method and apparatus for electrical testing of microwired structures with the assistance of particle probes. 4,628,258, Cl. 324-158.00P.

Liss, Bernard: *See—*
Liss, Saul; and Liss, Bernard, 4,627,438, Cl. 128-419.00R.

Liss, Saul; and Liss, Bernard, to Pain Suppression Labs, Inc. Electronic migraine modulator apparatus and methodology. 4,627,438, Cl. 128-419.00R.

Little, James K. Apparatus for planting seed in seed germinating tray. 4,627,190, Cl. 47-1.00A.

Litton Systems Inc.: *See—*
Loomer, Weston R., 4,627,143, Cl. 29-434.000.

Littwin, Burkhard: *See—*
Geffcken, Walter; Littwin, Burkhard; and Wengert, Rolf, 4,628,228, Cl. 315-169.400.

Liu, Qing-Guo: *See—*
Worrell, Wayne L.; and Liu, Qing-Guo, 4,627,892, Cl. 204-1.00T.

Lo, Chi-Woei. Coded-card type lock device. 4,627,252, Cl. 70-351.000.

Lo, Young S., to A. H. Robins Company, Incorporated. Intermediates for the preparation of aryl substituted pyrido[1,4]benzodiazepines. 4,628,100, Cl. 546-304.000.

Locke, Michael P. Ingredient feeder apparatus. 4,627,555, Cl. 222-200.000.

Lockwood Technical, Inc.: *See—*
Watts, John D., 4,627,345, Cl. 101-119.000.

Loges, Hans J.; and Wilkening, Hermann, to IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung. Apparatus for impressing a strip along its edge. 4,627,258, Cl. 72-196.000.

Lomerson, Robert B. Mechanical bonding of surface conductive layers. 4,627,565, Cl. 228-107.000.

Long, Steven M.: *See—*
Skipper, John D.; and Long, Steven M., 4,628,275, Cl. 330-10.000.

Loo, Johnson, to International Computers Limited. Address distribution in data storage apparatus. 4,628,512, Cl. 371-68.000.

Loomer, Weston R., to Litton Systems Inc. Method of forming telescoping shuttle table for mounting at least one sheave thereto. 4,627,143, Cl. 29-434.000.

Loomis, Gary L., to Du Pont de Nemours, E. I., and Company. Thermoplastic elastomeric compositions based on compatible blends of an ethylene copolymer and vinyl or vinylidene halide polymer. 4,627,993, Cl. 428-36.000.

Loozen, Hubert J. J., to Akzo N.V. LHRH antagonists. 4,628,044, Cl. 514-15.000.

Lord, Allen. Decorative neckwear. 4,627,113, Cl. 2-144.000.

Lorenz, Manfred; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Derivatives of azobarbituric acid or salts or complexes thereof. 4,628,082, Cl. 534-707.000.

Lortie, Richard P.; Vercaemert, Philippe H.; and Gunnell, Douglas L., to R. J. Reynolds Tobacco Company. Moisture eliminator for air washer. 4,627,568, Cl. 236-44.00B.

Loscoe, Claire E., to United States of America, Army. Optical communications systems. 4,628,501, Cl. 370-3.000.

Losinger, Raymond E.: *See—*
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.

Lou, Perry W., to Texas Instruments Incorporated. Drive circuit for substrate pump. 4,628,215, Cl. 307-297.000.

Love, Mark D.: *See—*
Hafle, Ralph S.; and Love, Mark D., 4,628,298, Cl. 340-347.00P.

Lovell, William E.: *See—*
Balyasny, Marik; Baldwin, Kenneth B.; and Lovell, William E., 4,627,561, Cl. 225-96.000.

LTV Energy Products Company: *See—*
Arlt, Edward J., 4,627,885, Cl. 156-160.000.

Lubrizol Corporation, The: *See—*
Karn, Jack L., 4,627,928, Cl. 252-33.000.

Luc, Penelope J. V., to Luc Technologies Limited. Bonding and bonded products. 4,628,150, Cl. 174-88.00C.

Luc Technologies Limited: *See—*
Luc, Penelope J. V., 4,628,150, Cl. 174-88.00C.

Luco-Technic GmbH Verfahrenstechische Anlagen: *See—*
Borgner, Klaus, 4,627,781, Cl. 414-412.000.

Ludwig, Hubertus, to Lindauer Dornier Gesellschaft mbH. Power loom temple. 4,627,473, Cl. 139-294.000.

Lummus Crest, Inc.: *See—*
Sardina, Helion H., 4,628,136, Cl. 585-441.000.

Lundberg, Robert D.: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, 4,627,926, Cl. 252-8.55R.

Lutz, Felix: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,974, Cl. 424-48.000.

Lynch, Matthew J., to ICI Americas Inc. Dental floss dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,975, Cl. 424-49.000.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,976, Cl. 424-49.000.

Lynch, Matthew J., to ICI Americas Inc. Tooth drop dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,978, Cl. 424-54.000.

Lynch, Matthew J., to ICI Americas Inc. Toothpaste dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,979, Cl. 424-54.000.

Lynch, Matthew J., to ICI Americas Inc. Hard candy dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce irritation and plaque accumulation. 4,627,980, Cl. 424-54.000.

Lynch, Steve J., to Dennison Manufacturing Company. Conveying and grouping of stringed tags. 4,627,220, Cl. 53-414.000.

Lyons, Michael D., to American Standard Inc. Selectable function valve device. 4,627,462, Cl. 137-270.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Breuckmann, Bernd; and Thieme, Werner, 4,627,729, Cl. 356-347.000.

M-O Valve Company Limited, The: *See—*
Cook, Kenneth G., 4,628,398, Cl. 361-120.000.

Maas, Peter: *See—*
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.

Mabilon, Gil: *See—*
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-835.000.

Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, to Toyoda Gosei Co., Ltd. Shock absorbing material. 4,627,638, Cl. 280-779.000.

MacArthur, Douglas S.: *See—*
Archer, John R.; Kellaway, Michael J.; and MacArthur, Douglas S., 4,627,255, Cl. 72-10.000.

MacGregor, David C. Cardiovascular prosthetic devices and implants with porous systems. 4,627,836, Cl. 604-93.000.

Mack, Karl E.: *See—*
Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., 4,628,106, Cl. 548-440.000.

Mackal, Glenn. Safety latched automatic actuator and throwable personal flotation assembly. 4,627,823, Cl. 441-95.000.

Mackenzie, Donald: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.

MacLaughlin, Scott T., to Halliburton Company. Well tool having latching mechanism and method of utilizing the same. 4,627,492, Cl. 166-250.000.

Mazda Motor Corporation: *See—*
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.

Maeda Industries, Ltd.: *See—*
Hosokawa, Mikio, 4,627,305, Cl. 74-489.000.

Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Antinephritic pharmaceutical composition containing 24, 25-dihydroxycholecalciferol as an active ingredient. 4,628,050, Cl. 514-167.000.

Maehara, Shigeharu: *See—*
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke, 4,627,704, Cl. 355-3.00R.

Maekawa, Yoshikazu: *See—*
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, 4,627,706, Cl. 355-14.0SH.

Maes, Jean Pierre, to S.A. Texaco Belgium N.V. Optical method to study the stability of colloidal systems. 4,628,204, Cl. 250-343.000.

Magami, Masato: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Magee, William E.; Geister, Michael; and Dillenburg, John N., Jr. Mobile drilling machine. 4,627,499, Cl. 173-43.000.

Magnin, Raymond, to Framatome. Method of constructing a nuclear power station. 4,627,213, Cl. 52-745.000.

Mahaffey, Robert L., Jr.: *See—*
Moore, Patrick D.; and Mahaffey, Robert L., Jr., 4,627,939, Cl. 260-404.000.

Mahnig, Fritz; and Schulte, Gunter, to Georg Fischer AG. Vehicle suspension assembly. 4,627,667, Cl. 301-126.000.

Maki, Yoshitaka: *See—*
Nohara, Akira; and Maki, Yoshitaka, 4,628,098, Cl. 546-271.000.

Makita, Tsuyoshi: *See—*
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, 4,627,990, Cl. 427-10.000.

Makitalo, Valto J.: *See—*
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.

Malik, Arshad H., to A. E. Staley Manufacturing Company. Method and compositions for hard surface cleaning. 4,627,931, Cl. 252-153.000.

Manago, Iwami: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.

Mancabelli, Robert C., to Carrier Corporation. Tube extracting apparatus. 4,627,155, Cl. 29-726.000.

Manduley, Flavio M., to Pitney Bowes Inc. Postal rate memory module with integral battery power. 4,628,457, Cl. 364-464.000.

Mannesmann Aktiengesellschaft: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.

Mannesmann Rexroth GmbH: *See—*
Wusthof, Peter; Schneider, Johann; and Schulz, Ewald, 4,627,801, Cl. 418-61.00B.

Manness, Cecil E.; and Nolette, Leo J. Fill gate for grain bins and the like. 4,627,378, Cl. 116-229.000.

Manusch, Christoph; and Scholz, Gunter, to Pelikan Aktiengesellschaft. Writing instrument with signaling cap. 4,627,757, Cl. 401-194.000.

Maples, Stephen S., to Acer Automation. Gage position control. 4,627,168, Cl. 33-169.00R.

Marathon Oil Company: *See—*
Christiansen, Richard L.; and Kim, Hiemi, 4,627,273, Cl. 73-61.10R.
Jones, Stanley C., 4,627,270, Cl. 73-38.000.

Marbach, Karl G., to Karl G. Marbach GmbH & Co. Apparatus for severing foamed material. 4,627,580, Cl. 241-101.400.

Marchand, Gilles: *See—*
Desmons, Gerard; and Marchand, Gilles, 4,628,342, Cl. 358-10.000.

Marchetti, Germano: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Marcuson, Michael: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.

Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., to Allied Corporation. Use of silica catalyst for selective production of lactams. 4,628,085, Cl. 540-539.000.

Mark, Carol M., Ester H. Mark, legal representatives: *See—*
Mark, Victor, deceased; and Peters, Edward N., 4,628,081, Cl. 528-176.000.

Mark, Victor, deceased (by Mark, Carol M., Ester H. Mark, legal representatives); and Peters, Edward N., to General Electric Company. Polycarbonate exhibiting improved impact properties. 4,628,081, Cl. 528-176.000.

Markham, Vivian C. Belt clasp. 4,627,132, Cl. 24-169.000.

Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., to Motorola, Inc. Low profile antenna on non-conductive substrate. 4,628,322, Cl. 343-702.000.

Markovics, Margaret, to ACT Laboratories. Album with foldable sheets. 4,627,640, Cl. 281-5.000.

Marley, Robert R.: *See—*
Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., 4,628,248, Cl. 323-314.000.

Marquet, Maurice C. Multi-purpose marine barrier system. 4,627,766, Cl. 405-195.000.

Marquip, Inc.: *See—*
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.

Mars, Inc.: *See—*
Dobbins, Bob M.; and Barnes, Elwood E., 4,628,194, Cl. 235-379.000.

Marschke, Carl R.: *See—*
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.

Marshall, Andrew C. Aeroelastically responsive composite propeller. 4,627,791, Cl. 416-132.00R.

Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Method for changing the resolution of compressed image data. 4,628,534, Cl. 382-41.000.

Martin, Eric A., to Medtronic, Inc. B medical monitoring circuit. 4,627,441, Cl. 128-696.000.

Martin, Eugene J., to Pneumo Corporation. Pilot operated directional control valve. 4,627,467, Cl. 137-625.600.

Martin, Gayle P., to Harris Corporation. Aperture transformation sidelobe canceller. 4,628,321, Cl. 342-379.000.

Martin, James L.: *See—*
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.

Martin, John H. E. J., deceased: *See—*
Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

Martin, John R.: *See—*
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,627,925, Cl. 252-8.800.

Martin, Mary B., executrix: *See—*
Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

Martin, Raymond G.: *See—*
Gehman, Roland P.; and Martin, Raymond G., 4,627,633, Cl. 280-432.000.

Martino, William L., Jr.: *See—*
Yu, Ruey J.; and Martino, William L., Jr., 4,628,253, Cl. 324-73.00R.

Martinot, Bernard: *See—*
Grasset, Daniel; and Martinot, Bernard, 4,627,962, Cl. 422-40.000.

Maruyama, Teruo: *See—*
Otsuki, Toshinori; and Maruyama, Teruo, 4,627,291, Cl. 73-634.000.

Marvakov, Ivan K.; and Russev, Todor Y., to ZNIKA. D.C. impulse arc welder employing thyristors. 4,628,427, Cl. 363-27.000.

Marx, Werner, to Wickmann Werke GmbH. Sub-miniature fuse. 4,628,293, Cl. 337-216.000.

Marzik, James V.: *See—*
Suplinskas, Raymond J.; Henze, Thomas W.; and Marzik, James V., 4,628,002, Cl. 428-367.000.

Maschinenfabrik Walter Scheele GmbH & Co. KG: *See—*
Renders, Klaus-Helmut, 4,627,328, Cl. 91-410.000.

Masciarelli, Camillo. Conveyor system with rollers and plungers. 4,627,526, Cl. 193-35.00A.

Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, to Nippon Kayaku Kabushiki Kaisha. N-benzyloxycarbonyl-L-threonine amide hemihydrate. 4,628,111, Cl. 560-159.000.

Masten, Dianne S.: *See—*
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.

Master, Raj N.: *See—*
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.

Mastner, Georg, to BBC Brown, Boveri & Company, Limited. Switching power-supply unit with improved start-up behavior. 4,628,430, Cl. 363-25.000.

Masuda, Shigeru: *See—*
Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, 4,628,163, Cl. 200-144.00R.

Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of producing a semiconductor memory device. 4,627,153, Cl. 29-571.000.

Mathamel, Flavius A., to Burroughs Corporation. Electromagnetic interference suppresion for electrical discharge printers. 4,628,325, Cl. 346-1.100.

Mathiesen, Mait M.; and Svensson, Kent O., to AB Carbogel; and Berol Kemi AB, a part interest. Method of preparing an aqueous slurry of solid carbonaceous fuel particles and an aqueous slurry so prepared. 4,627,855, Cl. 44-51.000.

Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, to Oval Engineering Co., Ltd. Vortex flow meter. 4,627,295, Cl. 73-861.240.

Matsubara, Takehiro, to Mitsubishi Denki Kabushiki Kaisha. Test device for testing an actuator circuit. 4,628,268, Cl. 324-418.000.

Matsubayashi, Shinji; Kiyota, Satoru; and Hosoya, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Front brake apparatus in motorized three-wheeled vehicle. 4,627,520, Cl. 188-18.00R.

Matsuda, Ikuo: *See—*
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.

Matsuda, Shohei; and Sato, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic braking pressure control apparatus for vehicles. 4,627,670, Cl. 303-115.000.

Matsudaira, Yasuyuki; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid displacement compressor with spiral wrap elements of varying thickness. 4,627,800, Cl. 418-55.000.

Matsui, Hirotoshi, to Sharp Kabushiki Kaisha. Daisy-wheel type printing system with multiple functions. 4,627,753, Cl. 400-174.000.

Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, to Nippondenso Co., Ltd.; and Toyota Jodosha Kabushiki Kaisha. Antiskid control device. 4,627,671, Cl. 303-116.000.

Matsui, Kazuma: *See—*
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.

Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, to Kanebo, Ltd.; and Kanebo Synthetic Fibers, Ltd. Method of producing abrasive fibers. 4,627,950, Cl. 264-103.000.

Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Ink printhead with holder mount. 4,628,332, Cl. 346-140.00R.

Matsumoto, Mamoru: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.

Matsumura, Osamu. Fuel injection apparatus. 4,627,403, Cl. 123-447.000.

Matsuoka, Yuzo: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kagomoto, Yoshiteru, 4,627,409, Cl. 126-21.00A.
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, 4,627,415, Cl. 126-299.00R.
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,627,316, Cl. 81-430.000.
Otsuki, Toshinori; and Maruyama, Teruo, 4,627,291, Cl. 73-634.000.

Matsushita Graphic Communications Systems, Inc.: *See—*
Mizutani, Mikio, 4,628,276, Cl. 330-86.000.

Matsushita, Toshihiko: *See—*
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.

Matsuyama, Yukio: *See—*
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, 4,628,531, Cl. 382-8.000.

Mattei, Riccardo; and Neri, Armando, to G.D. Societa per Azioni. Device for supplying webs of wrapping material to a cigarette making machine of the two rod type. 4,627,319, Cl. 83-73.000.

Mattson, Walter E.: *See—*
Gilman, Paul S.; and Mattson, Walter E., 4,627,959, Cl. 419-61.000.

Matuyama, Takesi: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.

Maudsley, Andrew A., to Advanced NMR Systems, Inc. Multiple echo chemical shift imaging. 4,628,262, Cl. 324-309.000.

Mayr, Albert; and Stickel, Oskar, to Hydromatik GmbH. Output control apparatus for a hydrostatic drive with delivery adjustment. 4,627,238, Cl. 60-452.000.

Mazda Motor Corporation: *See—*
Asanomi, Koji; and Abe, Ryoji, 4,627,394, Cl. 123-195.00R.
Gokimoto, Hiroyuki; and Kiyomitsu, Isao, 4,627,656, Cl. 296-65.00R.
Mitoh, Syunji, 4,627,158, Cl. 29-771.000.
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, 4,627,311, Cl. 74-866.000.

Mazumder, Nikhil C., to Advanced Micro Devices, Inc. Merging of logic function circuits to ECL latch or flip-flop circuit. 4,628,216, Cl. 307-455.000.

McAdams, Hirimie T.: *See—*
Hahn, William F.; McAdams, Hirimie T.; and Talley, Robert L., 4,627,576, Cl. 241-24.000.

McArthur, David T., deceased (by Guilliams, Donald E., executor), to Safford, Beverly. Water activated electric cell and survival lamp system. 4,628,420, Cl. 362-208.000.

McClung, James A.: *See—*
Bulso, Joseph D., Jr.; and McClung, James A., 4,627,265, Cl. 72-354.000.

McConnell, William P., to Westinghouse Electric Corp. Robotic system for mounting electrical components. 4,628,464, Cl. 364-513.000.

McCoy, Wilbur L.: *See—*
Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., 4,628,310, Cl. 340-825.720.

McCutchan, Diane R.; Roeding, Gretchen W.; and Kibby, Gordon R., to McCutchan, Diane R. Airplane seat with convertible flotation-cushion system. 4,627,587, Cl. 244-122.00R.

McElhaney, William G., to Coilco, Inc. Tube spin close apparatus. 4,627,257, Cl. 72-102.000.

McElroy, Benedict R., to Action Products, Inc. Shock absorbing insole construction. 4,627,179, Cl. 36-44.000.

McFarland, John. Musical faucet. 4,627,326, Cl. 84-94.00C.

McKagen, Ollie H. Cycle suspension system. 4,627,632, Cl. 280-276.000.

McKay, William R.: *See—*
Dickens, Jonathan P.; and McKay, William R., 4,628,104, Cl. 548-341.000.

McKechnie, Ronald M. K., to Vaal Reefs Exploration and Mining Co. Shaft guide alignment measurement. 4,627,170, Cl. 33-181.00R.

McKeough, David T.: *See—*
Chang, Wen-Hsuan; and McKeough, David T., 4,628,076, Cl. 525-440.000.

McKinnie, Bonnie G.; and Mitchell, Olan W., to Ethyl Corporation. Tetrabromobisphenol-A process. 4,628,124, Cl. 568-726.000.

McMinn, William D. Washer cutter. 4,627,166, Cl. 30-277.000.

McVay, William P.: *See—*
Bedi, James J.; Golden, Donald M.; and McVay, William P., 4,627,437, Cl. 128-334.00C.

Medero, Richard: *See—*
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.

Medtronic, Inc.: *See—*
Martin, Eric A., 4,627,441, Cl. 128-696.000.

Megadiamond Industries, Inc.: *See—*
Horton, M. Dave, 4,627,503, Cl. 175-329.000.

Meguerdichian, Gary M.; and Hovey, Isabel B., to Otis Elevator Company. Backup position signaling in an elevator. 4,627,518, Cl. 187-29.00R.

Mei San Co., Ltd.: *See—*
Tahara, Yoshinori, 4,627,380, Cl. 118-77.000.

Meier, Helmut M.: *See—*
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.

Meier, Helmut-Martin: *See—*
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.

Meindl, Hubert: *See—*
Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, 4,627,889, Cl. 162-158.000.

Meissner, Hans J.: *See—*
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.

Melnyk, Michael, Jr., to Reynolds Metals Company. Apparatus and method for controlling the speed of rotation of shaft. 4,627,236, Cl. 60-435.000.

Meneghin, Mariano, to Zambon S.p.A. Process for the preparation of pharmacologically active compounds containing a sulfoxide group. 4,628,087, Cl. 544-41.000.

Menger, Jan W., to Staalkat B.V. Counting apparatus for counting objects by means of a shadow measurement. 4,628,520, Cl. 377-6.000.

Meo, Joseph; and Taylor, Michael P., to Pitney Bowes Inc. Character generator system for dot matrix printers. 4,627,749, Cl. 400-121.000.

Merck & Co., Inc.: *See—*
Bock, Mark G.; Veber, Daniel F.; and DiPardo, Robert M., 4,628,084, Cl. 540-509.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.

Merrick Industries: *See—*
Carranza, Jose R., 4,627,546, Cl. 215-100.00A.

Mertler, Gary W. Gas burner and manifold assembly. 4,627,411, Cl. 126-39.00E.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Nissl, Norbert, 4,628,175, Cl. 219-110.000.

Messina, Carl J.: *See—*
Sherman, Robert C., 4,627,631, Cl. 280-154.50R.

Metriguard, Inc.: *See—*
Bechtel, Friend K., 4,627,293, Cl. 73-831.000.

Mettler Instrumente AG: *See—*
Kunz, Peter, 4,627,505, Cl. 177-1.000.

Mettler Instruments AG: *See—*
Baumann, Arthur, 4,628,470, Cl. 364-567.000.

Mettler, Stephen C.: *See—*
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.

Metzger, Romain, to Container Corporation of America. Animal waste collection arrangement. 4,627,383, Cl. 119-1.000.

Meyer, Dennis W. Device for driving U-shaped anchors into the ground. 4,627,563, Cl. 227-130.000.

Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, to Bayer Aktiengesellschaft. Polyamides containing phenolic compounds. 4,628,069, Cl. 524-339.000.

Meyer, Rolf-Volker: *See—*
von Bittera, Miklos; and Meyer, Rolf-Volker, 4,627,852, Cl. 604-897.000.

Meyers, Peter S.; and Alexander, Gerald, to L A Water Treatment Corporation. Treatment of water to lower the oxygen and the total organic carbon within the same. 4,627,921, Cl. 210-668.000.

Meyers, Stuart R. Insole structure. 4,627,177, Cl. 36-43.000.

MGS, Inc.: *See—*
Gehman, Roland P.; and Martin, Raymond G., 4,627,633, Cl. 280-432.000.

Michael, Dietrich: *See—*
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,628,069, Cl. 524-339.000.

Micheli, Adolph L., to General Motors Corporation. Formation of fine particle sinterable ceramic powders. 4,627,966, Cl. 423-263.000.

Michigan Biotechnology Institute: *See—*
Zeikus, Joseph G.; and Hyun, Hyung-Hwan, 4,628,031, Cl. 435-205.000.

MICRA Limited: *See—*
Hoskin, William J., 4,627,435, Cl. 128-303.100.

Middleton, William J.: *See—*
Farnham, William B.; and Middleton, William J., 4,628,094, Cl. 546-186.000.

Midland, Richard W., to Zenith Electronics Corporation. Video-index signal mixer. 4,628,349, Cl. 358-67.000.

Midorikawa, Akira: *See—*
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Midway Fishing Tool Co.: *See—*
Reed, Lehman T., 4,627,489, Cl. 166-65.100.

Mihayashi, Keiji: *See—*
Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, 4,628,024, Cl. 430-376.000.

Mikami, Naoto: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.

Mikic, Frank; and Williams, Daniel W., to Snap-on Tools Corporation. Wire stub retainer and handle opening spring. 4,627,164, Cl. 30-135.000.

Mikoda, Tamio: *See—*
Kato, Kimitoshi; Aiga, Hiroshi; Mikoda, Tamio; and Sakai, Tunehiro, 4,628,091, Cl. 544-339.000.

Mikuni Kogyo Kabushiki Kaisha: *See—*
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, 4,627,412, Cl. 126-110.00B.

Mikusch, Gerald; Hubner, Wolfgang; and Munch, Werner, to L. Schuler GmbH. Conveying system for multiple die presses or press lines. 4,627,528, Cl. 198-621.000.

Miller, Martin R.: *See—*
Bianchi, John E.; Miller, Martin R.; and Nichols, Richard D. E., 4,627,558, Cl. 224-238.000.

Miller, Richard F., to Atlantic Richfield Company. Composition and method for inhibiting formation of polymers during gas scrubbing of monomers. 4,628,132, Cl. 585-4.000.

Miller, Scott A.: *See—*
Klee, David J.; Burke, Thomas W.; and Miller, Scott A., 4,627,197, Cl. 51-319.000.

Miller, Stephen J., to Chevron Research Company. Process for stabilizing lube base stocks derived from bright stock. 4,627,908, Cl. 208-58.000.

Milliken Research Corporation: *See—*
Moore, Patrick D.; and Mahaffey, Robert L., Jr., 4,627,939, Cl. 260-404.000.

Milling, Philip E., to International Business Machines Corporation. Carrier sense multiple access with collision avoidance utilizing rotating time staggered access windows. 4,628,311, Cl. 340-825.500.

Millman, William S., to Union Oil Company of California. Hydrocarbon conversion process. 4,627,910, Cl. 208-112.000.

Mimori, Teruo: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.

Minami, Toshiaki: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., to Shell Oil Company. Process for the preparation of hydrocarbons from a mixture of CO and H_2. 4,628,133, Cl. 585-310.000.

Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot. 4,627,786, Cl. 414-735.000.

Minette, Daniel C., to Dresser Industries, Inc. Method and apparatus for gamma ray well logging. 4,628,202, Cl. 250-269.000.

Minnesota Mining and Manufacturing Company: *See—*
Arco, Judith A., 4,627,427, Cl. 128-132.00D.
Dupre, Eugene J., 4,627,127, Cl. 15-179.000.
Samuelson, Bruce E., 4,627,560, Cl. 225-66.000.

Minns, Richard A.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,628,125, Cl. 568-730.000.

Minolta Camera Kabushiki Kaisha: *See—*
Oka, Tateki, 4,627,716, Cl. 355-15.000.

Minster Machine Company, The: *See—*
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,627,264, Cl. 72-345.000.

Mintz, Donald J.: *See—*
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.

Mintz, Donald M., to Varian Associates, Inc. Magnetron sputter device having separate confining magnetic fields to separate targets and magnetically enhanced R.F. bias. 4,627,904, Cl. 204-298.000.

Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Code modulation system. 4,628,297, Cl. 340-347.0DD.

Mitchell, Hal D., to Figgie International, Inc. Shock attenuation structure. 4,627,114, Cl. 2-414.000.

Mitchell, Olan W.: *See—*
McKinnie, Bonnie G.; and Mitchell, Olan W., 4,628,124, Cl. 568-726.000.

Mitoh, Syunji, to Mazda Motor Corporation. Apparatus for setting doors to vehicle bodies. 4,627,158, Cl. 29-771.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.
Ito, Tetsuro, 4,628,173, Cl. 219-69.00G.
Kaneyuki, Kazutoshi, 4,627,309, Cl. 74-752.00C.
Matsubara, Takehiro, 4,628,268, Cl. 324-418.000.
Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, 4,627,786, Cl. 414-735.000.
Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, 4,628,163, Cl. 200-144.00R.
Nakajima, Takashi; and Kubosono, Kenji, 4,627,960, Cl. 420-472.000.
Nakamura, Takashi, 4,627,370, Cl. 112-275.000.
Sugishima, Eiichi, 4,628,395, Cl. 361-18.000.

Mitsubishi Gas Chemical Co., Inc.: *See—*
Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, 4,628,119, Cl. 564-314.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tashiro, Keisuke, 4,627,392, Cl. 123-90.390.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,627,831, Cl. 493-337.000.
Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, 4,627,804, Cl. 425-71.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.

Mitsuboshi Belting Ltd.: *See—*
Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, 4,627,828, Cl. 474-205.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Kato, Kimitoshi; Aiga, Hiroshi; Mikoda, Tamio; and Sakai, Tunehiro, 4,628,091, Cl. 544-339.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Nishimura, Takeji; and Yasuda, Mamoru, 4,628,521, Cl. 377-24.000.

Miura, Kazuhiko: *See—*
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.

Miura, Yukio: *See—*
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,552, Cl. 222-14.000.

Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,553, Cl. 222-14.000.

Miyagawa, Junichi: *See—*
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, 4,627,415, Cl. 126-299.00R.

Miyagishima, Toshikazu: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.

Miyake, Masaya; Saito, Yasuhiro; and Higuchi, Matsuo, to Sumitomo Electric Industries, Ltd. Tool for warm and hot forgings and process for manufacturing the same. 4,628,178, Cl. 219-121.0LD.

Miyamori, Masashige: *See—*
Nakatani, Hiroshi; Inoue, Jiro; and Miyamori, Masashige, 4,628,285, Cl. 331-163.000.

Miyamoto, Hysao: *See—*
Yee, Alfred A., 4,627,212, Cl. 52-726.000.

Miyamoto, Ritsu, to Victor Company of Japan, Ltd. Tape cassette loading device in a magnetic recording and/or reproducing apparatus. 4,628,383, Cl. 360-96.500.

Miyashita, Kunio: *See—*
Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, 4,628,314, Cl. 340-870.240.
Takahashi, Tadashi; Hayashida, Hiroshi; Miyashita, Kunio; and Sekizawa, Sadao, 4,628,259, Cl. 324-208.000.

Miyazaki, Masayuki: *See—*
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, 4,627,706, Cl. 355-14.0SH.

Miyazawa, Yoshinobu: *See—*
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, 4,628,111, Cl. 560-159.000.

Miyuki, Hideaki: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.

Mizu, Kouichi: *See—*
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,627,316, Cl. 81-430.000.

Mizuno, Kenji; and Sasaki, Ryoichi, to Brother Kogyo Kabushiki Kaisha. Writing-plotting apparatus with keyboard. 4,627,748, Cl. 400-17.000.

Mizuno, Masashi: *See—*
Okabe, Takahiro; and Mizuno, Masashi, 4,627,743, Cl. 374-122.000.

Mizuno, Takahide: *See—*
Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, 4,627,828, Cl. 474-205.000.

Mizuta, Ken; and Kondo, Shiro, to Alps Electric Co., Ltd. Safety device for automatic window regulator. 4,628,234, Cl. 318-267.000.

Mizutani, Futoshi: *See—*
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, 4,627,867, Cl. 65-3.120.

Mizutani, Katsushi: *See—*
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Mizutani, Michitaka; and Yokoyama, Kiyoshi, to Kyocera Corporation. Sintered silicon nitride body. 4,628,039, Cl. 501-97.000.

Mizutani, Mikio, to Matsushita Graphic Communications Systems, Inc. Logarithmically linearly controlled variable gain amplifier. 4,628,276, Cl. 330-86.000.

Mizutani, Morikazu: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.

Mobil Oil Corporation: *See—*
Alameddine, Bassem R., 4,627,493, Cl. 166-263.000.
Audeh, Costandi A., 4,627,964, Cl. 423-228.000.
Chen, Nai Y.; and Degnan, Thomas F., Jr., 4,627,911, Cl. 208-120.000.
Chu, Chin-Chiun, 4,628,137, Cl. 585-445.000.
Gould, Ronald M.; and Tabak, Samuel A., 4,628,134, Cl. 585-331.000.
Green, Gary J.; and Schwartz, Albert B., 4,628,040, Cl. 502-9.000.
Herrington, Fox J., 4,628,536, Cl. 383-75.000.
Kuhn, Philip A.; and Osborn, Paul V., 4,627,584, Cl. 242-54.00R.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,628,135, Cl. 585-331.000.
Winney, Randy A., 4,628,492, Cl. 367-63.000.

Mogi, Takao: *See—*
Okada, Takashi; and Mogi, Takao, 4,628,359, Cl. 358-122.000.

Mole-Richardson Company: *See—*
Krokaugger, William G., 4,628,230, Cl. 315-307.000.

Molecular Engineering Associates, Ltd.: *See—*
Gay, Steffen, 4,628,027, Cl. 435-7.000.

Moller, Rudolf: *See—*
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,627,597, Cl. 251-129.030.

Molnlycke AB: *See—*
Ternstrom, Maj I., 4,627,846, Cl. 604-349.000.

Momin, Salim A., to Chrysler Motors Corporation. Temperature compensation circuit and method for position sensors. 4,628,316, Cl. 340-870.380.

Monarch Marking Systems, Inc.: *See—*
Huggins, Orville C., 4,627,347, Cl. 101-292.000.
Huggins, Orville C., 4,627,348, Cl. 101-292.000.

Monforte, Mathew L., to Monforte Robotics, Inc. Exchangeable multifunction end effector tools. 4,627,785, Cl. 414-730.000.

Monforte Robotics, Inc.: *See—*
Monforte, Mathew L., 4,627,785, Cl. 414-730.000.

Monnier, Michel J., to U.S. Philips Corporation. Method of manufacturing a body moulded from a plastics material and covered with a metallic layer. 4,627,894, Cl. 204-4.000.

Monsanto Company: *See—*
Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.
Fisher, W. Keith, 4,628,073, Cl. 525-70.000.
Schumacher, Ignatius, 4,628,131, Cl. 568-937.000.

Monsanton Company: *See—*
Goettler, Lloyd A.; and Lambright, Arthur J., 4,627,472, Cl. 138-174.000.

Montague, Herbert R., to Control Concepts Corporation. Power converter apparatus and method employing plural branches. 4,628,438, Cl. 363-134.000.

Montedison S.p.A.: *See—*
Borsotti, Giampiero, 4,628,123, Cl. 568-634.000.
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.

Montgomery, John A.: *See—*
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,628,089, Cl. 544-244.000.

Montoya, Paul C.: *See—*
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,628,267, Cl. 324-376.000.

Montpetit, Jean, to Uroplast Inc. Pipe saddle joint and assembly. 4,627,648, Cl. 285-197.000.

Mook, Adrianus; and Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Method and apparatus for determining the image transfer quality of an imaging system. 4,628,360, Cl. 358-139.000.

Mookherjee, Braja D.: *See—*
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., 4,627,449, Cl. 131-276.000.

Moon, Philip A. K.: *See—*
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., 4,628,518, Cl. 375-88.000.

Moore, Boyd B. Well bore barrier penetrator arrangement and method for multiple conductor pump power cable. 4,627,490, Cl. 166-65.100.

Moore, Gary R. Air removing apparatus. 4,627,796, Cl. 417-313.000.

Moore, Harry V.: *See—*
Studer, Lewis O., 4,627,516, Cl. 182-202.000.

Moore, Kenneth P., to Xerox Corporation. Bottom sheet feeding apparatus employing a combination slide plate and vacuum valve. 4,627,606, Cl. 271-98.000.

Moore, Patrick D.; and Mahaffey, Robert L., Jr., to Milliken Research Corporation. P-formyl-N,N-dipolyoxyalkylenesubstitutedaniline. 4,627,939, Cl. 260-404.000.

Moore, Scott B. Punch press machine including a workpiece positioning means with a quick change die holder, punch and stripper unit. 4,627,321, Cl. 83-468.000.

Moran, Michael J., to USM Corporation. Method for taking tare weights in automatic combination weighing machines. 4,627,504, Cl. 177-1.000.

Moran, Robert P.; and Carhart, Edward P., Jr., to Charles of the Ritz Group Ltd. Skin mousse. 4,627,973, Cl. 424-47.000.

Morell, Josef; and Schmidt, Harald, to Steyr-Daimler-Puch AG. Fuel injection unit for each cylinder of a diesel engine. 4,627,570, Cl. 239-90.000.

Morgado, Eugenio J.: *See—*
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.

Morgan, Lee W., to S. C. Johnson & Son, Inc. Emulsion copolymerization process. 4,628,071, Cl. 524-832.000.

Morgan, Paul W.; and Amlani, Kish, to Eaton Corporation. Shunt calibration system for a transducer mounted on a rotating member. 4,627,296, Cl. 73-862.330.

Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, to Matsushita Electric Industrial Co., Ltd. Automatic screwdriver. 4,627,316, Cl. 81-430.000.

Mori, Takuzo: *See—*
Hamamoto, Hideki; Fujita, Tsutomu; and Mori, Takuzo, 4,627,224, Cl. 53-502.000.

Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, to Mitsubishi Denki Kabushiki Kaisha. Power switch. 4,628,163, Cl. 200-144.00R.

Moriguchi, Kouichi: *See—*
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.

Morimoto, Minoru: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.

Morin, Franco: *See—*
Dagna, Giandomenico; and Morin, Franco, 4,628,334, Cl. 346-140.00R.

Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, to Hitachi, Ltd. Method and apparatus for detecting position and velocity of moving body. 4,628,314, Cl. 340-870.240.

Morisawa, Takashi, to Sony Corporation. Method and apparatus for identifying recorded information segments on a record medium. 4,628,372, Cl. 360-40.000.

Morishita, Kanji. Paper cover for lavatory seat. 4,627,117, Cl. 4-247.000.

Morishita, Sadao: *See—*
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.

Morita, Hideo: *See—*
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 4,628,072, Cl. 525-57.000.

Moriyama, Masaru; and Yamaguchi, Yoshio, to Janome Sewing Machine Co., Ltd. Platen of a printer. 4,627,755, Cl. 400-662.000.

Moriyama, Tsunenori: *See—*
Hagiwara, Hiroshi; Shirasaka, Masaru; and Moriyama, Tsunenori, 4,627,878, Cl. 106-121.000.

Moroto, Shuzo; and Sakakibara, Shiro, to Aisin Warner Kabushiki Kaisha. Automatic transmission for a vehicle. 4,627,308, Cl. 74-689.000.

Morper, Manfred, to Linde Aktiengesellschaft. Process for the anaerobic decomposition of organic substrate. 4,627,917, Cl. 210-617.000.

Morris, John C., to Staefa Control System Inc. Four function pneumatic controller. 4,627,569, Cl. 236-49.000.

Morrison, Barry L.: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.

Morse, Robert L., to Tecumseh Products Company. Suction accumulator. 4,627,247, Cl. 62-503.000.

Mortensen, Harold R., Sr., to Facet Enterprises, Inc. Engine starter gearing. 4,627,299, Cl. 74-7.00A.

Morval-Durofoam Ltd.: *See—*
Crabtree, Larry V., 4,627,946, Cl. 264-51.000.

Morwing, Bo A.; Andersson, Bengt L.; and Gustavsson, Per-Olof G., to Telefonaktiebolaget L M Ericsson. Navigation system. 4,628,319, Cl. 342-46.000.

Mostrom, Thomas: *See—*
Andersson, Lars; Backlund, Hans; Henriksson, Bengt; and Mostrom, Thomas, 4,627,259, Cl. 72-202.000.

Motorola, Inc.: *See—*
Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., 4,628,248, Cl. 323-314.000.
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,628,529, Cl. 381-94.000.
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Henderson, James A., Jr., 4,628,478, Cl. 364-900.000.
Hunninghaus, Roy; and Almquist, Edward Q., 4,628,269, Cl. 328-120.000.
Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., 4,628,322, Cl. 343-702.000.
Serfaty, Salomon; and Cohen, Mordechay, 4,628,474, Cl. 364-825.000.
Spanjer, Keith G., 4,627,988, Cl. 427-5.000.
Yu, Ruey J.; and Martino, William L., Jr., 4,628,253, Cl. 324-73.00R.

Motoyama, Kazuyasu; and Kanayama, Katsumi, to Olympus Optical Co., Ltd. Foot switch apparatus for a transcriber. 4,628,390, Cl. 360-137.000.

MTU Friedrichshafen GmbH: *See—*
Thorn, Walter, 4,627,567, Cl. 236-34.500.

Mueller, Michael M.; and Gonzales, Thomas D. Rotary noiseless detent switch. 4,628,199, Cl. 250-229.000.

Mueller, Robert A.: *See—*
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Mueller, William P.: *See—*
Kolibas, James A.; and Mueller, William P., 4,627,465, Cl. 137-563.000.

Muench, Frank J.; and Borck, Gordon T., to RTE Corporation. Under oil expulsion fuse cartridge assembly. 4,628,292, Cl. 337-204.000.

Mukai, Tadashi: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.

Mukaiyama, Megumi: *See—*
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Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., to Thomson Components-Mostek Corporation. Automatic assembly of integrated circuits. 4,627,151, Cl. 29-569.00R.

Muller, Peter: *See—*
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,627,597, Cl. 251-129.030.

Muller, Rolf, to Vitramon, Incorporated. Method for manufacturing ceramic capacitors. 4,627,139, Cl. 29-25.420.

Muller, Walter: *See—*
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,628,093, Cl. 546-6.000.

Mullersman, Ferdinand H.: *See—*
Hodgman, John S.; and Mullersman, Ferdinand H., 4,628,243, Cl. 320-2.000.

Mullins, Kevin J.: *See—*
Deters, Joseph C.; Theeuwes, Felix; Mullins, Kevin J.; and Eckenhoff, James B., 4,627,850, Cl. 604-892.000.

Munch, Werner: *See—*
Mikusch, Gerald; Hubner, Wolfgang; and Munch, Werner, 4,627,528, Cl. 198-621.000.

Munchbach, George E.: *See—*
Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., 4,627,849, Cl. 604-379.000.

Munz, Ethiel L. Forwardly dumpable trailer. 4,627,780, Cl. 414-346.000.

Murakami, Koichi: *See—*
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, 4,627,709, Cl. 355-14.0SH.

Murakami, Shigeru; Komatsu, Yasuto; Watanabe, Makoto; and Uemura, Takeo, to Showa Denko Kabushiki Kaisha. Method for producing a carbon sheet and a fuel cell separator. 4,627,944, Cl. 264-29.400.

Muramatsu, Yuji: *See—*
Shigemori, Daizo; and Muramatsu, Yuji, 4,628,399, Cl. 361-120.000.

Murao, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Operation mode setting apparatus on a single chip microprocessor. 4,628,448, Cl. 364-200.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakatani, Hiroshi; Inoue, Jiro; and Miyamori, Masashige, 4,628,285, Cl. 331-163.000.

Murata, Shinji: *See—*
Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, 4,627,703, Cl. 355-3.00R.

Murayama, Hiroshi: *See—*
Shimano, Kimihide; Shimamura, Haruo; Yamaguchi, Hiroshi; Murayama, Hiroshi; Kaneko, Ryohei; and Seki, Katsura, 4,627,981, Cl. 424-84.000.

Murphy, Robert M.: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.

Murphy, William: *See—*
Davis, Roy F.; and Murphy, William, 4,627,375, Cl. 114-230.000.

Murray, William M. Bone cement system and method. 4,627,434, Cl. 128-303.00R.

Muskatello, James M.: *See—*
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.

Muzzey, Dennis K. Disposable litter box. 4,627,382, Cl. 119-1.000.

Myer, Jon H., to Hughes Aircraft Company. Method of forming precisely curved surfaces. 4,627,256, Cl. 72-60.000.

Myoga, Toshiharu: *See—*
Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, 4,628,182, Cl. 219-130.510.

Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, to Mitsuboshi Belting Ltd. Toothed belt. 4,627,828, Cl. 474-205.000.

Nagao, Yasuyuki: *See—*
Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, 4,628,485, Cl. 365-122.000.

Nagasawa, Takao; and Uchida, Satoru, to Nippon Oil Company, Limited. Apparatus for testing stability of heavy oil. 4,627,274, Cl. 73-64.000.

Nagubandi, Sreeramulu, to Stauffer Chemical Company. Certain phenoxy-benzamido-diphenyl-phosphonate esters having herbicidal activity. 4,627,870, Cl. 71-86.000.

Nagura, Kunihiro: *See—*
Sato, Fumitaka; and Nagura, Kunihiro, 4,628,450, Cl. 364-200.000.

Nagura, Riichi, to NEC Corporation. Image data transmission system capable of reproducing a high resolution image by the use of a simple structure. 4,628,354, Cl. 358-109.000.

Naito, Hiroshi: *See—*
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.

Najafi, Hamid, to Advanced Micro Devices, Inc. Digital phase-locked loop circuit. 4,628,519, Cl. 375-110.000.

Nakadate, Takanori: *See—*
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.

Nakagawa, Fumihito: *See—*
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Nakagawa, Hisahide: *See—*
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Nakahata, Kozo: *See—*
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Nakaizumi, Kazuo, to Nippon Electric Co., Ltd. Driving circuit suppressing peak value of charging current from power supply to capacitive load. 4,628,218, Cl. 307-451.000.

Nakajima, Koe: *See—*
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,627,881, Cl. 148-12.00C.

Nakajima, Takashi; and Kubosono, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Copper-based alloy. 4,627,960, Cl. 420-472.000.

Nakajima, Yoshinori, to Ricoh Company, Ltd. Control apparatus for hammer type impact printer. 4,627,751, Cl. 400-144.200.

Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting and indicating device for camera. 4,627,700, Cl. 354-409.000.

Nakamura, Koutaro: *See—*
Hyuga, Kounosuke; Nakamura, Koutaro; and Ogawa, Shouzou, 4,627,577, Cl. 241-30.000.

Nakamura, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Sewing machine drive device. 4,627,370, Cl. 112-275.000.

Nakano, Yoshiyuki: *See—*
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.

Nakaoka, Tsutomu: *See—*
Uehara, Haruo; and Nakaoka, Tsutomu, 4,628,212, Cl. 290-54.000.

Nakashima, Yoshihiro: *See—*
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Nakatani, Hiroshi; Inoue, Jiro; and Miyamori, Masashige, to Murata Manufacturing Co., Ltd. 3-terminal oscillating element and oscillator employing the same. 4,628,285, Cl. 331-163.000.

Nakatsuka, Hirotaka: *See—*
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Nakaya, Chitose: *See—*
Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,628,223, Cl. 310-358.000.

Nakayama, Yoshiharu: *See—*
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Nakayama, Yoshiro; and Suzuki, Hidetake, to Fujitsu Limited. Semiconductor device. 4,628,338, Cl. 357-15.000.

Nakazawa, Iemi: *See—*
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.

Nakousai, Keiko: *See—*
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Nam, Kang H. Apparauts for storage of perishables. 4,627,336, Cl. 99-467.000.

Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, to Kabushiki Kaisha Tsuchiya Seisakusho. Oil separator for recycled blow-by gas. 4,627,406, Cl. 123-573.000.

Nanbu, Nobumasa: *See—*
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.

Nance, Edwin P.; Segan, Marc H.; and Terzian, Berj A., to Equitime, Inc. Fully bi-directional digital time displays. 4,627,737, Cl. 368-239.000.

NAP Consumer Electronics Corp.: *See—*
Vodinh, Hien; and Pooler, Robert E., 4,628,237, Cl. 318-626.000.

Napiorkowski, John J.: *See—*
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Narda Microwave Corporation, The: *See—*
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Naruse, Tokio: *See—*
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Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, to Robert Bosch GmbH. Electromagnetic relay with zig-zag armature spring. 4,628,290, Cl. 335-274.000.

Nashef, Aws S.: *See—*
Campbell, Todd D.; and Nashef, Aws S., 4,627,853, Cl. 623-16.000.

Nason, William C.: *See—*
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National Distillers and Chemical Corporation: *See—*
Sharkey, Hubert J., 4,628,117, Cl. 562-577.000.

National Research Development Corporation: *See—*
Jones, Robert L.; and Wilson, Norman H., 4,628,061, Cl. 514-469.000.
Lewis, Meirion F., 4,628,222, Cl. 310-313.00R.

National Semiconductor Corporation: *See—*
Lippert, John A., 4,628,405, Cl. 361-321.000.

National Starch and Chemical Corporation: *See—*
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,627,847, Cl. 604-366.000.

Naudin, Jean-Claude: *See—*
Thomas, Pierre-Armand; and Naudin, Jean-Claude, 4,627,768, Cl. 405-198.000.

Nausedas, Joseph A.; and Kazaitis, Michael P., to Union Carbide Corporation. Rotatably driven cored casing article. 4,627,130, Cl. 17-1.00R.

Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, to Mitsubishi Gas Chemical Co., Inc. Process for preparing hydrazine hydrohalogenide. 4,628,119, Cl. 564-314.000.

Nazmy, Mohamed; and Singer, Robert, to BBC Brown, Boveri & Company Limited. Method for the application of a corrosion-protection layer containing protective-oxide-forming elements to the base body of a gas turbine blade and corrosion-protection layer on the base body of a gas turbine blade. 4,627,896, Cl. 204-37.100.

NCR Corporation: *See—*
Speraw, Floyd G., 4,628,413, Cl. 361-415.000.
Talvalkar, Shashi G.; and Besselman, Thomas P., 4,628,000, Cl. 428-341.000.

Neasham, David L., to Thorn Emi Automation Limited. Electrical indicating circuit. 4,628,244, Cl. 320-48.000.

Nebergall, Perry A.; and French, Robert C., to Shiley, Inc. Dielectric heating device for heating cannula members. 4,628,168, Cl. 219-10.810.

NEC: *See—*
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,628,330, Cl. 346-75.000.

NEC Corporation: *See—*
Hotsumi, Minoru, 4,627,589, Cl. 248-346.000.
Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, 4,628,363, Cl. 358-183.000.
Komatsu, Yuji, 4,628,343, Cl. 357-84.000.
Nagura, Riichi, 4,628,354, Cl. 358-109.000.
Otani, Susumu, 4,628,507, Cl. 371-5.000.

Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, to Bayer Aktiengesellschaft. Red nickel azine pigment. 4,628,093, Cl. 546-6.000.

Nelson, David A., to Comlinear Corporation. Wideband feedback amplifier. 4,628,279, Cl. 330-257.000.

Nelson, David E.; Berg, David M.; and Hannon, Robert J., to Hydroacoustics Inc. Sensor system with time division multiplexing telemetry. 4,628,493, Cl. 367-79.000.

Nelson, Raymond J. One level sorting network. 4,628,483, Cl. 364-900.000.

Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Preparation of 2-halo-5-methylpyridines from 4-methyl-4-pentene derivatives. 4,628,096, Cl. 546-250.000.

Neri, Armando: *See—*
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New England Digital Corporation: *See—*
Gold, Calman, 4,627,323, Cl. 84-1.010.

New Holland Inc.: *See—*
De Coene, Frans J. G. C., 4,627,226, Cl. 56-14.600.
Glass, Emmett F.; and Wagstaff, Robert A., 4,627,340, Cl. 100-5.000.
Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., 4,627,341, Cl. 100-41.000.

New York Institute of Technoloy: *See—*
Glenn, William E., 4,628,344, Cl. 358-12.000.

Newell, Robert E.; and Fitzsimmons, Robert A., to Glaxo Group Limited. Devices for administering medicaments to patients. 4,627,432, Cl. 128-203.150.

Newey, David C.: *See—*
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., 4,627,812, Cl. 431-7.000.

Newlove, John: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, 4,627,926, Cl. 252-8.55R.

Newmark, Inc.: *See—*
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NGK Insulators, Ltd.: *See—*
Tashiro, Keisuke, 4,627,392, Cl. 123-90.390.

Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., to Xerox Corporation. Automatic scanning optics alignment. 4,627,721, Cl. 355-77.000.

Nicely, Charles W., to United Steel & Wire Company. Compression sleeve corner structure for adjustable shelving. 4,627,543, Cl. 211-187.000.

Nichols, Richard D. E.: *See—*
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Nichols, Thomas K. Cleaning device for hook and loop fasteners. 4,627,126, Cl. 15-105.000.

Nickola, Richard A.; and Sok, Brian A., to Inland Steel Company. Powder metal and/or refractory coated ferrous metal. 4,628,004, Cl. 428-413.000.

Nicolet, Michel: *See—*
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Niedermayr Papierwarenfabrik AG: *See—*
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Niedrach, Leonard W.; and Will, Fritz G., to General Electric Company. Long life portable oxygen sensor with high stability. 4,627,907, Cl. 204-415.000.

Niemanns, Gerd, to Draftex Industries Limited. Window glass mounting arrangements. 4,627,145, Cl. 29-450.000.

Nigorikawa, Shigeru, to Alps Electric Co., Ltd. Case for shielding electronic devices. 4,628,412, Cl. 361-424.000.

Nihon Spindle Seizo Kabushiki Kaisha: *See—*
Hamamoto, Hideki; Fujita, Tsutomu; and Mori, Takuzo, 4,627,224, Cl. 53-502.000.

Nippon Electric Co., Ltd.: *See—*
Dohya, Akihiro, 4,628,149, Cl. 174-68.500.
Nakaizumi, Kazuo, 4,628,218, Cl. 307-451.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.

Nippon Hoso Kyo Kai: *See—*
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, 4,628,111, Cl. 560-159.000.

Nippon Kogaku K. K.: *See—*
Takagi, Tadao, 4,627,699, Cl. 354-400.000.

Nippon Oil Company, Limited: *See—*
Nagasawa, Takao; and Uchida, Satoru, 4,627,274, Cl. 73-64.000.

Nippon Soken, Inc.: *See—*
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.

Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.

Nippon Steel Corporation: *See—*
Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, 4,627,289, Cl. 73-622.000.
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,627,881, Cl. 148-12.00C.

Nippon Telegraph and Telephone Public Corporation: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.

Nippondenso Co., Ltd.: *See—*
Ito, Shinzo; and Kaneko, Yasuhiro, 4,628,465, Cl. 364-521.000.
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, 4,627,571, Cl. 239-90.000.
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.
Takenaka, Akihiko, 4,627,393, Cl. 123-146.50A.

Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, to Ascii Corporation; and Nippon Gakki Seizo Kabushiki Kaisha. Video display control system. 4,628,467, Cl. 364-521.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Construction for coupling deck to hull of small-sized marine craft. 4,627,373, Cl. 114-182.000.

Nishida, Katsuhiko; Naruse, Tokio; and Shibata, Hiroshi, to Tsuchiya Co., Ltd. Fuel level detector for automobile fuel tank. 4,627,283, Cl. 73-313.000.

Nishikawa, Masao; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Inter-vehicle distance control system for vehicles. 4,628,317, Cl. 340-903.000.

Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,628,009, Cl. 428-694.000.

Nishimoto, Naomichi: *See—*
Ichinoi, Yutaka; and Nishimoto, Naomichi, 4,628,369, Cl. 358-314.000.

Nishimune, Hisaaki; Ichimura, Yoshikuni; and Hata, Kentaro, to Kawasaki Jukogyo Kabushiki Kaisha. Hydraulic circuit arrangement. 4,627,239, Cl. 60-484.000.

Nishimura, Takeji; and Yasuda, Mamoru, to Mitutoyo Mfg. Co., Ltd. Indicating device in measuring machine. 4,628,521, Cl. 377-24.000.

Nishino, Fumio: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.

Nishio, Takashi; and Ikeya, Tomoyoshi, to Pioneer Electronic Corporation. Optical axis monitoring system. 4,627,725, Cl. 356-152.000.

Nishiyama, Shingo: *See—*
Sawada, Satoru; and Nishiyama, Shingo, 4,628,021, Cl. 430-203.000.

Nishizako, Shizutaka: *See—*
Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, 4,628,163, Cl. 200-144.00R.

Nissan Motor Co., Ltd.: *See—*
Hayashi, Yoshimasa, 4,627,397, Cl. 123-41.270.
Kato, Shinichi; Watanabe, Kiyoto; Saito, Yoji; and Yamagata, Akio, 4,627,759, Cl. 403-2.000.

Nissl, Norbert, to Messerschmitt-Bolkow-Blohm GmbH. Resistance welding equipment having an optical accelerometer for measuring electrode acceleration. 4,628,175, Cl. 219-110.000.

Nitsch, Wilhelm; Treiber, Helmut; and Benker, Gerhard, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for reproducing the images of film frames. 4,627,719, Cl. 355-41.000.

Nitta, Yoshio: *See—*
Hongo, Yasuo; and Nitta, Yoshio, 4,628,533, Cl. 382-27.000.

Nobel, Fred I.; Martin, James L.; and Toben, Michael P., to LeaRonal, Inc. Electrical contacts and methods of making contacts by electrodeposition. 4,628,165, Cl. 200-268.000.

Noguchi, Takaharu: *See—*
Takahashi, Hiroaki; Yamazaki, Shigeru; Noguchi, Takaharu; and Arai, Takao, 4,628,373, Cl. 360-62.000.

Nohara, Akira; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. 2-[2-pyridylmethyethio-(sulfinyl)]benzimidazoles. 4,628,098, Cl. 546-271.000.

Nolette, Leo J.: *See—*
Manness, Cecil E.; and Nolette, Leo J., 4,627,378, Cl. 116-229.000.

Nomiyama, Neal T.; Rohde, Robert S.; and Buser, Rudolph G., to United States of America, Army. Modulated TEA laser receiver. 4,628,542, Cl. 455-619.000.

Nomoto, Mineo: *See—*
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, 4,628,531, Cl. 382-8.000.

Nomura, Akihiro: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.

Nomura, Yoshihisa: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.

Nootbaar, Keith D.: *See—*
Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., 4,628,248, Cl. 323-314.000.

Nordson Corporation: *See—*
Kolibas, James A.; and Mueller, William P., 4,627,465, Cl. 137-563.000.

North American Philips Consumer Electronics Corp.: *See—*
Collins, Floyd K.; and Say, Donald L., 4,628,224, Cl. 313-414.000.

North American Philips Corporation: *See—*
Bruning, Gert W.; and Fellows, Mark W., 4,628,284, Cl. 331-86.000.

Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., to Black & Decker, Inc. Toaster oven and protective hood. 4,628,185, Cl. 219-386.000.

Nossen, Edward J., to RCA Corporation. Digital frequency modulator. 4,628,286, Cl. 332-9.00R.

Notohamiprodjo, Hubertus S., to GTE Communication Systems Corp. Control circuit for diode-or connected power supplies. 4,628,433, Cl. 363-65.000.

Nozaki, Hiromi, to Konishiroku Photo Industry Co., Ltd. Recording apparatus with controlled power source for heat fusing device. 4,627,714, Cl. 355-14.0FU.

Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, to Fanuc Ltd. Operating information input method in numerical control apparatus. 4,628,444, Cl. 364-188.000.

Nufer, Robert W.: *See—*
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.

Nuita, Akira: *See—*
Yagi, Norio; and Nuita, Akira, 4,627,752, Cl. 400-144.200.

Nukem GmbH: *See—*
Huschelrath, Gerhard; and Ruth, Ursula, 4,628,261, Cl. 324-240.000.

Numata, Hideo: *See—*
Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, 4,627,295, Cl. 73-861.240.

Nurkowski, Paul S. Progressive weight resistance weightlifting mechanism. 4,627,615, Cl. 272-118.000.

Nuvatec, Inc.: *See—*
Huber, William B., 4,628,289, Cl. 335-168.000.

N.V. Bekaert S.A.: *See—*
Bourgois, Luc, 4,627,229, Cl. 57-213.000.

N.V. Optische Industrie "De Oude Delft" : *See—*
Mook, Adrianus; and Geluk, Ronald J., 4,628,360, Cl. 358-139.000.

Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., to Outokumpu Oy. Method for dispersing two phases in liquid-liquid extraction. 4,628,391, Cl. 366-265.000.

Oatey Co.: *See—*
Kopp, Raun A., 4,627,551, Cl. 222-1.000.

O'Brien, Gerald E.: *See—*
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Occidental Petroleum Corporation: *See—*
Prasad, Rama R. S., 4,627,458, Cl. 137-13.000.

Ochiai, Chiaki: *See—*
Furuta, Youichi; and Ochiai, Chiaki, 4,627,332, Cl. 92-168.000.

Oda, Hiroyuki: *See—*
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Oda, Satoshi: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Odam, Kenneth D.: *See—*
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

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Oediger, Hermann: *See—*
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Oels, Udo: *See—*
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.

Ofcina de Investigacion Agrupada, S.A.: *See—*
Bastida, Tomas, 4,627,181, Cl. 38-77.700.

Ogawa, Hideaki: *See—*
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.

Ogawa, Hiroshi: *See—*
Iwahara, Makoto; and Ogawa, Hiroshi, 4,628,525, Cl. 381-26.000.

Ogawa, Shouzou: *See—*
Hyuga, Kounosuke; Nakamura, Koutaro; and Ogawa, Shouzou, 4,627,577, Cl. 241-30.000.

Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi. Method and apparatus for continuously producing a cement clinker. 4,627,877, Cl. 106-100.000.

Ogawa, Tetsu: *See—*
Kato, Masahiro; and Ogawa, Tetsu, 4,628,376, Cl. 360-71.000.

Ogawa, Toshio; Katakura, Kageyoshi; and Umemura, Shinichiro, to Hitachi, Ltd.; and Hitachi Medical Corporation. Method and apparatus for detecting acoustic homogeneity of object. 4,627,290, Cl. 73-628.000.

Ogawa, Yutaka: *See—*
Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, 4,627,295, Cl. 73-861.240.

Ogle, William D., to Cooper Industries, Inc. Twist on reflector for industrial light fixture. 4,628,423, Cl. 362-341.000.

Oguey, Henri J.: *See—*
Vittoz, Eric A.; and Oguey, Henri J., 4,628,274, Cl. 330-9.000.

Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Diagnostic X-ray apparatus. 4,628,355, Cl. 358-111.000.
O'Hagan, Michael A.; and Smith, Richard D., to Garrett Corporation, The. Fluid bed hog fuel dryer. 4,627,173, Cl. 34-10.000.
Ohishi, Hirotoshi: *See*—
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, to Nippon Soken, Inc. Direct-heated gas-flow measuring apparatus. 4,627,279, Cl. 73-195.000.
Ohta, Takeshi; Yamakage, Tetsuro; and Sakakibara, Yoshio, to Toyoda Koki Kabushiki Kaisha. Method of detecting lift of tool based upon cumulative machining distance. 4,628,458, Cl. 364-474.000.
Oiri, Yasuhiko: *See*—
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.
Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Toner handling apparatus for electro-photographic copying machines. 4,627,716, Cl. 355-15.000.
Okabayashi, Norio; and Onizawa, Yoshio, to Daicel Chemical Industries, Ltd. Metal mold and stamper for injection molding of a plastic disc for a high-density information recording carrier. 4,627,809, Cl. 425-555.000.
Okabe, Takahiro; and Mizuno, Masashi, to Educational Foundation Daido Gakuen; and Daido Tokushuko Kabushiki Kaisha. Measuring temperature of a heated metal. 4,627,743, Cl. 374-122.000.
Okada, Kazuichi: *See*—
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, 4,627,415, Cl. 126-299.00R.
Okada, Takashi; and Mogi, Takao, to Sony Corporation. Memory selecting system for scrambled television receiver. 4,628,359, Cl. 358-122.000.
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, to Hitachi, Ltd. Pattern checking apparatus. 4,628,531, Cl. 382-8.000.
Okamoto, Tadashi; and Yamaoka, Hiromasa, to Hitachi, Ltd. Digital controller. 4,628,436, Cl. 364-131.000.
Okawa, Takashi: *See*—
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.
Okazaki, Hiroshi; and Hyodo, Motoi, to Aisin Seiki Kabushiki Kaisha. Seat assembly. 4,627,664, Cl. 297-452.000.
O'Keefe, Henry: *See*—
Holiman, William E.; and O'Keefe, Henry, 4,627,581, Cl. 241-167.000.
Okimoto, Haruo: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.
Okuda, Toshio; and Wu, Tsun-Zong, to 'totes', incorporated; and Fu Tai Umbrella Works Ltd. Umbrella rib linkage system. 4,627,455, Cl. 135-25.00A.
Okumura, Takatoshi: *See*—
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.
Okumura, Yuuzi, to Sanyo Electric Co., Ltd. Cassette loading device for VTR. 4,628,382, Cl. 360-93.000.
Oldershaw, Robert J.: *See*—
Aughton, John E.; and Oldershaw, Robert J., 4,628,350, Cl. 358-75.000.
Oliver, Burton L.: *See*—
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Oliver, Leland W.: *See*—
Goodman, David S.; and Oliver, Leland W., 4,628,410, Cl. 361-413.000.
Olla, Michael A.: *See*—
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.
Olson, Donald M., to LAD Technology, Inc. Heat activated dispenser and method of dispensing a vapor therefrom. 4,627,963, Cl. 422-125.000.
Olson, Gene E.; and Kot, Norbert J., to Snap-on Tools Corporation. Retainer. 4,627,761, Cl. 403-324.000.
Olson, Theodore D., Jr.: *See*—
Olson, Theodore V.; and Olson, Theodore D., Jr., 4,627,572, Cl. 239-728.000.
Olson, Theodore V.; and Olson, Theodore D., Jr. Modular central-pillar assemblies for center-pivot irrigation apparatus. 4,627,572, Cl. 239-728.000.
Olympia Werke AG: *See*—
Kittel, Arthur; and Gerken, Heiner, 4,627,750, Cl. 400-144.200.
Olympus Optical Co., Ltd.: *See*—
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Olympus Optical Company, Ltd: *See*—
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Omark Industries, Inc.: *See*—
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Omori Machinery Co., Ltd.: *See*—
Omori, Shozo, 4,627,219, Cl. 53-399.000.
Omori, Shozo, to Omori Machinery Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Method for bundling paper sheets or the like. 4,627,219, Cl. 53-399.000.
Omron Tateisi Electronics Co.: *See*—
Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.
Sakamoto, Tamaki; and Yoshihisa, Sakamoto, 4,627,742, Cl. 374-109.000.
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Omura Refractories Co., Ltd.: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Moriyama, Tsunenori, 4,627,878, Cl. 106-121.000.
Onaka, Yoshiaki: *See*—
Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, 4,627,828, Cl. 474-205.000.
O'Neill, Hugh, to Transport Investment Corp. Truck trailer adapted to carry fluid and dry freight and method for loading the same. 4,627,629, Cl. 280-5.00D.
O'Neill, William B. Wheel assembly. 4,627,666, Cl. 301-125.000.
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., to Honeywell Information Systems Inc. Dual address RAM. 4,628,489, Cl. 365-230.000.
Onizawa, Yoshio: *See*—
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Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, to Fujitsu Limited. Flexible current feeding post. 4,627,677, Cl. 339-17.00M.
Ono, Shunichiro: *See*—
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, 4,627,877, Cl. 106-100.000.
Onoda Cement Co., Ltd.: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Moriyama, Tsunenori, 4,627,878, Cl. 106-121.000.
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, to Canon Kabushiki Kaisha. Corona discharger system. 4,627,701, Cl. 355-3.0CH.
Onosato, Masashi: *See*—
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Onuki, Kazuhiko: *See*—
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Ookawa, Hiroyuki: *See*—
Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, 4,627,828, Cl. 474-205.000.
Op De Beek, Franciscus J.; and Van Nieuwlnd, Jacob M., to U. S. Philips Corporation. Automatic equalizing system with DFT and FFT. 4,628,530, Cl. 381-103.000.
Ophir, Zohar, to Celanese Corporation. Injection molding process. 4,627,952, Cl. 264-328.120.
Opitz, Dieter: *See*—
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, to Troponwerke GmbH & Co., KG. 1,4-naphthoquinone derivatives having anti-inflammatory action. 4,628,062, Cl. 514-569.000.
Opti Patent-, Forschungs- und Fabrikations-AG: *See*—
Hochlehnert, Franz; Rademacher, Werner; and Grosskreuz, Lothar, 4,627,318, Cl. 83-18.000.
Optima Spanntechnik GmbH: *See*—
Stahl, Bernhard; and Bohm, Horst, 4,627,603, Cl. 269-32.000.
Ors, Jose A.; and Small, Richard D., Jr., to AT&T Technologies, Inc. Multilayer circuit board fabrication process and polymer insulator used therein. 4,628,022, Cl. 430-280.000.
Ortho Pharmaceutical Corporation: *See*—
Pasquale, Samuel A., 4,628,051, Cl. 514-170.000.
Osagawa, Takao: *See*—
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.
Osborn, Henry H., to Air Preheater Company, Inc., The. Rotary regenerative heat exchanger for high temperature applications. 4,627,485, Cl. 165-8.000.
Osborn, Paul V.: *See*—
Kuhn, Philip A.; and Osborn, Paul V., 4,627,584, Cl. 242-54.00R.
Ostby, Lyle D.: *See*—
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Osthoff Senge GmbH & Co. KG: *See*—
Osthoff, Walter, 4,627,135, Cl. 26-3.000.
Osthoff, Walter, to Osthoff Senge GmbH & Co. KG. Burner unit for the flame treatment of flat textile materials. 4,627,135, Cl. 26-3.000.
Otani, Susumu, to NEC Corporation. Bit error detection circuit for PSK-modulated carrier wave. 4,628,507, Cl. 371-5.000.
Otis Elevator Company: *See*—
Meguerdichian, Gary M.; and Hovey, Isabel B., 4,627,518, Cl. 187-29.00R.
Otsuki, Toshinori; and Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Position sensing apparatus for an object to be measured. 4,627,291, Cl. 73-634.000.

Otto, Bernhard: *See*—
Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, 4,628,345, Cl. 358-13.000.
Ou, Zhiming: *See*—
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion, 4,628,181, Cl. 219-130.330.
Outokumpu Oy: *See*—
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.
Oval Engineering Co., Ltd.: *See*—
Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, 4,627,295, Cl. 73-861.240.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., to Mobil Oil Corporation. Integrated process for converting oxygenates to liquid hydrocarbons. 4,628,135, Cl. 585-331.000.
Owens-Corning Fiberglas Corporation: *See*—
Bartlow, David H., 4,627,133, Cl. 24-298.000.
Bhatti, Mohinder S., 4,627,864, Cl. 65-1.000.
Kaveh, Farrokh, 4,627,868, Cl. 65-6.000.
Weirauch, Douglas A., Jr., 4,628,038, Cl. 501-35.000.
Oyama, Yoshishige: *See*—
Fujieda, Mamoru; and Oyama, Yoshishige, 4,627,312, Cl. 74-866.000.
Ozawa, Akiyoshi: *See*—
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Pace, John D.: *See*—
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Packard Instrument Company, Inc.: *See*—
van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., 4,628,205, Cl. 250-361.00R.
Paik, Michael: *See*—
Wilke, Raud A.; and Paik, Michael, 4,627,468, Cl. 137-625.660.
Pain Suppression Labs, Inc.: *See*—
Liss, Saul; and Liss, Bernard, 4,627,438, Cl. 128-419.00R.
Palla, Ottorino: *See*—
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.
Pamer, W. Richard; and Zils, James A., to Russell, Burdsall & Ward Corporation. Fastener. 4,627,776, Cl. 411-179.000.
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion. Method of controlling the output characteristic of a welding power source, apparatus for arc welding, and electrical circuit to be used for such apparatus. 4,628,181, Cl. 219-130.330.
ParaSystems, Inc.: *See*—
Hachey, Francis J.; and Hachey, Henry J., 4,627,119, Cl. 5-83.000.
Paris, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Signaling terminal system for CCITT No. 7 common channel signaling system. 4,628,505, Cl. 370-85.000.
Parker, Delbert R.; and Clark, Daren A., to A. B. Chance Company. End cap assembly for a fluid resistant electrical device. 4,628,294, Cl. 337-248.000.
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., to British Gas Corporation. Sealing joints and leaks. 4,627,471, Cl. 138-97.000.
Parkinson, Ricky: *See*—
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Parlant, James B.; Etourneau, Michel; and Bled, Christian C., to Etat Francais. Electric feed device which can be started by a liquid. 4,628,401, Cl. 361-178.000.
Parsons & Whittemore, Inc.: *See*—
Eveleigh, Douglas E.; Waldron, Clarence R.; and Bartley, Timothy, 4,628,029, Cl. 435-99.000.
Pasquale, Samuel A., to Ortho Pharmaceutical Corporation. Triphasic oral contraceptive. 4,628,051, Cl. 514-170.000.
Pass, Raymond V.: *See*—
Hamsher, Wilbur A., Jr.; and Pass, Raymond V., 4,627,674, Cl. 339-14.00P.
Pattison, Timothy A., to Duracell Inc. Cell jacketing. 4,627,154, Cl. 29-623.100.
Payraud, Fernand. Monoski converter. 4,627,636, Cl. 280-607.000.
Peat, Raymond F. Pharmaceutical compositions containing dehydroepiandrosterone and other anesthetic steroids in the treatment of arthritis and other joint disabilities. 4,628,052, Cl. 514-171.000.
Peerenboom, Robert J.: *See*—
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.
Pehlgrim, Horst, to Siemens Aktiengesellschaft. Pressure or pressure difference measuring instrument. 4,627,286, Cl. 73-431.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, to Exxon Research and Engineering Company. Thermally stable borehole fluids. 4,627,926, Cl. 252-8.55R.
Pelikan Aktiengesellschaft: *See*—
Manusch, Christoph; and Scholz, Gunter, 4,627,757, Cl. 401-194.000.
Pelster, Bernhard: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.
Penebre, Larry M. Swim fin. 4,627,820, Cl. 441-64.000.
Peppers, James M.; and Shaikh, Farhat A., to Dresser Industries, Inc. Measuring while drilling apparatus mud pressure signal valve. 4,628,495, Cl. 367-85.000.
Perilli, Francesco. Handheld device for ball game. 4,627,623, Cl. 273-328.000.
Perlini, Julius J.: *See*—
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Perlmutter, Michael S.: *See*—
Braun, Kenneth H.; and Perlmutter, Michael S., 4,627,732, Cl. 356-350.000.
Pernic, Stanley: *See*—
Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.
Peronneau, Georges; and Chalus, Bernard, to Sotimag (SARL). Method of marking for deterring fraud with valuable documents. 4,627,642, Cl. 283-92.000.
Perrin, Jean: *See*—
Authelet, Marc; and Perrin, Jean, 4,627,984, Cl. 426-37.000.
Peszlen, Richard A.: *See*—
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Peters, Edward N.: *See*—
Mark, Victor, deceased; and Peters, Edward N., 4,628,081, Cl. 528-176.000.
Petersen, Paul S., to Newmark, Inc. Carving attachment for table saws. 4,627,772, Cl. 409-121.000.
Petrella, Robert G.: *See*—
Takahashi, Akio; and Petrella, Robert G., 4,628,092, Cl. 544-351.000.
Petro, David J.; and Battaini, Steven L., to Avco Corporation. Apparatus method for calibrating and setting compressor air bleed valve schedules. 4,627,789, Cl. 415-28.000.
Petrotec Forschungs AG: *See*—
Kaeppeli, Othmar; and Guerra-Santos, Luis, 4,628,030, Cl. 435-101.000.
Pfeffer, George B.: *See*—
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., 4,628,159, Cl. 200-51.050.
Pfeifer & Langen: *See*—
Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, 4,627,880, Cl. 127-43.000.
Pfister, Henry F.: *See*—
Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., 4,628,324, Cl. 343-788.000.
Pfizer Inc.: *See*—
DeZeeuw, John R., 4,628,033, Cl. 435-255.000.
Dudek, David M., 4,627,961, Cl. 420-564.000.
Pharmacia AB: *See*—
Agback, Karl H., 4,628,083, Cl. 534-798.000.
Philipp, Clemens: *See*—
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.
Phillips Petroleum Company: *See*—
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., 4,628,013, Cl. 429-111.000.
Hofferber, James A., 4,628,034, Cl. 436-55.000.
Phillis, Gary L.: *See*—
Falk, Robert A.; and Phillis, Gary L., 4,627,722, Cl. 356-4.500.
Piazzola, Gaetano. Electric thermal unit. 4,628,191, Cl. 219-535.000.
Pico Electronics Limited: *See*—
Thompson, David R., 4,628,440, Cl. 364-140.000.
Pierburg GmbH & Co. KG: *See*—
Bruss, Karl-Heinz; and Baumgartner, Hans, 4,627,825, Cl. 464-2.000.
Pietrantonio, Joseph M.: *See*—
Bonnell, Leo W.; and Pietrantonio, Joseph M., 4,628,066, Cl. 518-700.000.
Piller, Anthony J.: *See*—
Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.
Pintsov, Leon A.: *See*—
Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., 4,628,532, Cl. 382-21.000.
Pioneer Electronic Corporation: *See*—
Kuroda, Kazuo, 4,628,371, Cl. 360-38.100.
Nishio, Takashi; and Ikeya, Tomoyoshi, 4,627,725, Cl. 356-152.000.
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
Pippin, Harold G.; and Pippin, Hilma M. Portable live well. 4,627,189, Cl. 43-55.000.
Pippin, Hilma M.: *See*—
Pippin, Harold G.; and Pippin, Hilma M., 4,627,189, Cl. 43-55.000.
Pitney Bowes Inc.: *See*—
Duwel, Edward C., 4,628,476, Cl. 364-900.000.
Manduley, Flavio M., 4,628,457, Cl. 364-464.000.
Meo, Joseph; and Taylor, Michael P., 4,627,749, Cl. 400-121.000.
Plaskett, John, to Frito-Lay, Inc. Apparatus for automatically closing L-slide lock cases. 4,627,217, Cl. 53-374.000.
Plaston AG: *See*—
Frei, Roland; and Gutmann, Franz, 4,627,862, Cl. 55-316.000.
Pledge Office Chairs Limited: *See*—
Carter, David E.; Bailey, Malcolm J.; and Willatts, Brian A., 4,627,662, Cl. 297-313.000.

Plessey Overseas Limited: *See—*
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., 4,628,518, Cl. 375-88.000.

Pneumo Corporation: *See—*
Martin, Eugene J., 4,627,467, Cl. 137-625.600.

Polaroid Corporation: *See—*
Fantone, Stephen D., 4,627,690, Cl. 350-421.000.

Polaroid Corporation, Patent Dept.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,628,125, Cl. 568-730.000.

Polefka, Thomas G.: *See—*
Gaffar, Abdul; and Polefka, Thomas G., 4,627,977, Cl. 424-52.000.

Pollard, Gary B., to Hughes Aircraft Company. Ceramic package for compensated crystal oscillator. 4,627,533, Cl. 206-328.000.

Pomagalski, S.A.: *See—*
Tarassoff, Serge, 4,627,361, Cl. 104-28.000.

Pommer, Ernst-Heinrich: *See—*
Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,628,048, Cl. 514-63.000.
Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,628,058, Cl. 514-383.000.

Pontoppidan, Eskild, to Flemming HVIDT Mobelarkitektfirma A/S. Mechanism to be mounted between two parts, whose mutual distance must be variable. 4,627,600, Cl. 254-124.000.

Pooler, Robert E.: *See—*
Vodinh, Hien; and Pooler, Robert E., 4,628,237, Cl. 318-626.000.

Port City Machine & Tool Company: *See—*
Colby, Lloyd E.; and Ingalls, John E., 4,628,171, Cl. 219-69.00G.

Porter, John E.; and Ramshaw, Colin, to Imperial Chemical Industries PLC. Centrifugal device. 4,627,890, Cl. 202-235.000.

Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, to International Standard Electric Corporation. Telecontrol system. 4,628,437, Cl. 364-131.000.

Post, Martin F. M.: *See—*
Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.

Pournain, Gerard L.: *See—*
Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., 4,627,679, Cl. 339-21.00R.

Powell All-Steel Scales, Inc.: *See—*
Powell, David L.; and Bair, Philip W., 4,627,507, Cl. 177-211.000.

Powell, David L.; and Bair, Philip W., to Powell All-Steel Scales, Inc. Mounting for double-ended shear beam load cells. 4,627,507, Cl. 177-211.000.

Powell, Robert, to Weinschel Engineering Co., Inc. Thermocouple power meter. 4,628,256, Cl. 324-95.000.

PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; and McKeough, David T., 4,628,076, Cl. 525-440.000.
Kuntz, Frederick J.; and Schussler, Henry W., 4,628,122, Cl. 568-492.000.

Prasad, Rama R. S., to Occidental Petroleum Corporation. One-step process for transforming a water-in-oil emulsion into an oil-in-water emulsion. 4,627,458, Cl. 137-13.000.

Pratt, Lawrence M., to Firebox Corporation. Self-contained log fire starting kit. 4,627,854, Cl. 44-40.000.

Press-A-Lite Corporation: *See—*
Chabria, Paul R., 4,628,418, Cl. 362-116.000.

Pressman, David: *See—*
Tate, Joseph B.; and Brown, David E., 4,628,299, Cl. 340-540.000.

Presswalla, Hoshang H.; and Shea, Yale R., to INRYCO, Inc. Post-tensioned floor with in-floor distribution system. 4,627,203, Cl. 52-221.000.

Price, Edison A.: *See—*
Thigpen, F. Bruce; and Price, Edison. A., 4,628,500, Cl. 369-249.000.

Price/Stern/Sloan Publishers, Inc.: *See—*
Burrows, Roger I., 4,627,819, Cl. 434-337.000.

Prieto, Yolanda: *See—*
Davis, Walter L.; and Prieto, Yolanda, 4,628,272, Cl. 329-110.000.

Prime Computer, Inc.: *See—*
Schuler, Donald; and Doshi, Mahesh, 4,628,471, Cl. 364-578.000.

Progress - Electrogeraete: *See—*
Jacob, Gernot J. M., 4,627,858, Cl. 55-126.000.

Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, to Institut Francais du Petrole. Process for methanol synthesis from carbon oxides and hydrogen in the presence of a soluble copper and zinc catalyst. 4,628,065, Cl. 518-700.000.

Puchta, Walter: *See—*
Henneberger, Hans; and Puchta, Walter, 4,628,527, Cl. 381-69.200.

Puff, Roger M.; and Dreuilhe, Jacques P., to Charbonnages de France; Framatome; and Institut Francais du Petrole. Fluidized-bed apparatus with a heat exchanger and an additional-air blowing network. 4,627,387, Cl. 122-4.00D.

Pugh, Richard E., to Anchor Hocking Corporation. Modular display package. 4,627,536, Cl. 206-426.000.

Puletti, Paul P.; and Decowski, Stanley J., Jr., to National Starch and Chemical Corporation. Hot melt adhesive waste barrier. 4,627,847, Cl. 604-366.000.

Pulp and Paper Research Institute of Canada: *See—*
Garner, Andrew; and Singbeil, Douglas L., 4,627,905, Cl. 204-404.000.

Puppe, Lothar: *See—*
Le Blanc, Helmut; Puppe, Lothar; and Wedemeyer, Karlfried, 4,628,097, Cl. 546-251.000.

Putman, Richard E., to Westinghouse Electric Corp. Multiplane optimization method and apparatus for cogeneration of steam and power. 4,628,462, Cl. 364-494.000.

Quackenbush, James E., to Computer Memories, Inc. Encoder output phase selection system for magnetic disk memory. 4,628,380, Cl. 360-78.000.

Quayle, George P., to Associated Electrical Industries Limited. Multipolar excitation systems. 4,628,245, Cl. 322-32.000.

Queneau, Paul B.: *See—*
Sherwood, William G.; Queneau, Paul B.; Duterque, Jean-Paul; and Hodges, Donald R., 4,627,900, Cl. 204-147.000.

Quinn, Daniel J.: *See—*
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.

R. E. Dietz Company: *See—*
Vescio, Donald W.; and Travers, Harry T., 4,628,415, Cl. 362-61.000.

R. J. Reynolds Tobacco Company: *See—*
Lortie, Richard P.; Vercaemert, Philippe H.; and Gunnell, Douglas L., 4,627,568, Cl. 236-44.00B.

Rademacher, Werner: *See—*
Hochlehnert, Franz; Rademacher, Werner; and Grosskreuz, Lothar, 4,627,318, Cl. 83-18.000.

Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, to U.S. Philips Corporation. DC motor with electronic commutation circuit. 4,628,231, Cl. 318-138.000.

Rainbow Trading Co., Inc.: *See—*
Shimomura, Kiyosji, 4,627,683, Cl. 339-128.000.

Raines, Kenneth C., to Burron Medical Inc. Guard for right angle infusion needle. 4,627,843, Cl. 604-263.000.

RainWise, Inc.: *See—*
Baer, John S., 4,627,277, Cl. 73-170.00R.

Raj, Kuldip; and Casciari, Raoul, to Ferrofluidics Corporation. Bearing assembly with integrated ferrofluid seal. 4,628,384, Cl. 360-97.000.

Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., to Critikon, Inc. Sphygmomanometric cuff pressurizing system. 4,627,440, Cl. 128-682.000.

Ramshaw, Colin: *See—*
Porter, John E.; and Ramshaw, Colin, 4,627,890, Cl. 202-235.000.

Randek Inc.: *See—*
Dekrone, Stephen A., 4,627,292, Cl. 73-728.000.

Ranke, Horst: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.

Rasmussen GmbH: *See—*
Sauer, Heinz, 4,627,645, Cl. 285-39.000.

Rathbun, Bonnie L.; and Schuessler, Philipp W. H., to United States of America, Navy. Passivation of hybrid microelectronic circuits. 4,628,006, Cl. 428-446.000.

Raytheon Company: *See—*
Braun, Kenneth H.; and Perlmutter, Michael S., 4,627,732, Cl. 356-350.000.

Razote, Regino V. Fishing rod assembly. 4,627,188, Cl. 43-21.000.

RCA Corporation: *See—*
Harwood, Leopold A., 4,628,346, Cl. 358-28.000.
Nossen, Edward J., 4,628,286, Cl. 332-9.00R.
Selwa, Anthony P., 4,628,539, Cl. 455-194.000.

Reader, Wayne T.: *See—*
Kramer, Irvin R.; and Reader, Wayne T., 4,628,490, Cl. 367-1.000.

Recoton Corporation: *See—*
Andreas, Sam, 4,628,361, Cl. 358-153.000.

Reddaway, Stewart F., to International Computers Limited. Data processing apparatus. 4,628,481, Cl. 364-900.000.

Redicon Corporation: *See—*
Bulso, Joseph D., Jr.; and McClung, James A., 4,627,265, Cl. 72-354.000.

Reed, David M.; and Johnson, Michael R. Disposable tray and stand. 4,627,381, Cl. 119-1.000.

Reed, Jesse L. Mudflap mounting assembly. 4,627,594, Cl. 248-632.000.

Reed, Lehman T., to Midway Fishing Tool Co. Top entry electrical transmission safety assembly for submersible pumping. 4,627,489, Cl. 166-65.100.

Reed, William R., Jr.: *See—*
Komanduri, Ranga; and Reed, William R., Jr., 4,627,317, Cl. 82-1.00C.

Reese, H. William. Osteotomy appliances and method. 4,627,425, Cl. 128-92.0VY.

Regnault, Luc, to Image S.A. Circuit for feeding ink to an ink-jet printing head. 4,628,329, Cl. 346-75.000.

Reich, Rudolf, to Aktiengesellschaft Adolph Saurer. Embroidering station with schiffli-shuttles. 4,627,368, Cl. 112-83.000.

Reich, Sharon L.: *See—*
Lindauer, Jerome I.; and Reich, Sharon L., 4,627,934, Cl. 252-522.00R.

Reichelt, Wolfgang: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.

Reichmann, Werner: *See—*
Draaisma, Rudolph; and Reichmann, Werner, 4,627,802, Cl. 418-185.000.

Reidenbach, Vincent G.: *See—*
Harris, Phillip C.; Reidenbach, Vincent G.; and Chisholm, Pat T., 4,627,495, Cl. 166-280.000.

Reifenhauser GmbH & Co.: *See—*
Schnell, Willi, 4,627,805, Cl. 425-72.00R.

Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., to Sheller-Globe Corporation. Multifunction steering wheel. 4,628,310, Cl. 340-825.720.

Reimann, Walter: *See—*
Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., 4,628,106, Cl. 548-440.000.

Reinartz, Hans-Dieter; and Steffes, Helmut, to Alfred Teves GmbH. Fluid level indicator for a reservoir. 4,628,162, Cl. 200-84.00C.

Reine, Marion B.; and Kusner, Ronald R., to Honeywell, Inc. Non-delineated detector having a differential readout. 4,628,203, Cl. 250-334.000.

Reinecke, Paul: *See—*
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Reinking, Klaus: *See—*
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,628,079, Cl. 528-49.000.

Renders, Klaus-Helmut, to Maschinenfabrik Walter Scheele GmbH & Co. KG. Hydraulic actuator-control arrangement for concrete pump. 4,627,328, Cl. 91-410.000.

Rensselaer Polytechnic Institute: *See—*
Coward, James K., 4,628,090, Cl. 544-258.000.

Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. N-(2,3-dihydrobenzofuran-2-yl)-azolylureas and fungicides containing these compounds. 4,628,058, Cl. 514-383.000.

Repco Limited: *See—*
Camm, John J., 4,627,668, Cl. 303-40.000.

Research Corporation: *See—*
Sprott, David J.; and Rolz, C. Alan, 4,627,338, Cl. 99-534.000.

Reum, Helmut: *See—*
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.

Reynolds, Allan, to Narda Microwave Corporation, The. Hermetically sealed oscillator with dielectric resonator tuned through dielectric window by adjusting screw. 4,628,283, Cl. 331-68.000.

Reynolds Metals Company: *See—*
Melnyk, Michael, Jr., 4,627,236, Cl. 60-435.000.

Rhodes, Ronny Q.; and Duke, Jack W. Ice container having coiled strip partition. 4,627,595, Cl. 249-121.000.

Rialan, Joseph; and Thierry, Gerard, to Institut Francais du Petrole. Method for the remote control of signal acquisition devices by means of a narrow passband transmission channel and a device for the implementation of the method. 4,628,494, Cl. 307-79.000.

Ricard, Jacques, to Cibie Projecteurs. Method of manufacturing and of adjusting the orientation of a motor vehicle headlamp; and a motor vehicle headlamp for performing said method. 4,628,414, Cl. 362-61.000.

Rich, Stanley R., to Advanced Energy Dynamics, Inc. Particle charging and collecting system. 4,627,579, Cl. 241-79.100.

Richards, Barry R.: *See—*
Weimer, Charles L.; and Richards, Barry R., 4,627,680, Cl. 339-22.00B.

Richards, Harvey J.: *See—*
Goel, Anil B.; and Richards, Harvey J., 4,627,932, Cl. 252-194.000.

Richards, James: *See—*
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.

Rickard, Jimmy R.; and Hollenbeck, Robert K., to General Electric Company. Test initiating apparatus for appliances having self-diagnostic testing capability. 4,628,443, Cl. 364-184.000.

Ricoh Company, Ltd.: *See—*
Anderson, Carl P., 4,627,702, Cl. 355-3.0BE.
Ide, Youji, 4,627,997, Cl. 428-216.000.
Ishii, Yasuaki, 4,627,607, Cl. 271-122.000.
Ishikawa, Chuji, 4,628,331, Cl. 346-75.000.
Kikuno, Mitsutoyo, 4,627,715, Cl. 355-14.00R.
Nakajima, Yoshinori, 4,627,751, Cl. 400-144.200.
Tagoku, Izumi, 4,628,017, Cl. 430-48.000.
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Ricoh Systems, Inc.: *See—*
Anderson, Carl P., 4,627,702, Cl. 355-3.0BE.

Rider, Billie F., to Rockwell International Corporation. Fast responding temperature transducer circuit. 4,627,745, Cl. 374-183.000.

Rill, Robert W., Jr. Standby aquarium pump. 4,627,797, Cl. 417-411.000.

Rinnai Kabushiki Kaisha: *See—*
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Rioux, Marc, to Canadian Patents and Development Limited. Three dimensional imaging method and device. 4,627,734, Cl. 356-376.000.

Ripani, Sergio; and Serafini, Giulio, to Carle & Montanari S.p.A. Leak-resistant feeding chamber for chocolate refining machines. 4,627,337, Cl. 99-485.000.

Rittinger, Herbert: *See—*
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.

Rivier, Jean E. F.: *See—*
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,628,043, Cl. 514-12.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of acetaldehyde. 4,628,121, Cl. 568-487.000.

Roba, Giacomo, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Process of manufacturing optical fibers of extremely low loss in the medium infrared. 4,627,865, Cl. 65-3.120.

Robbins, Clyde N., to General Instrument Corporation. Television signal encryption system with protected audio. 4,628,358, Cl. 358-121.000.

Robert Bosch GmbH: *See—*
Betz, Dieter, 4,627,407, Cl. 123-634.000.
Buchner, Norbert, 4,627,221, Cl. 53-425.000.
Hofmann, Karl, 4,627,574, Cl. 239-590.500.
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.

Robert Casaretto KG: *See—*
Wildt, Eberhard, 4,627,137, Cl. 29-121.200.

Robert, Serge, to U.S. Philips Corporation. Communication network having a master-slave type series architecture and providing master-to-slave and slave-to-master communication. 4,628,308, Cl. 340-825.430.

Roberts, Gerald E.; and Toliver, Samuel, to General Electric Company. Shutter apparatus for fine-tuning a coupled-dual resonator crystal. 4,627,379, Cl. 118-721.000.

Roberts, Richard D., to Harris Corporation. Frequency-agile synchronous demodulator. 4,628,270, Cl. 329-50.000.

Robertshaw Controls Company: *See—*
Fowler, Daniel L.; and Kadwell, Brian J., 4,628,439, Cl. 364-138.000.

Robineau, Philippe; and Vincenot, Eric. Electroacoustic motor for horns. 4,628,155, Cl. 381-156.000.

Robinson, Richard C., to Chevron Research Company. Dual recycle pressure-step reformer with cyclic regeneration. 4,627,909, Cl. 208-65.000.

ROCA Technologies, Inc.: *See—*
Watson, Gary Q., 4,627,413, Cl. 126-137.000.

Rock, Gail: *See—*
Gardell, Dietlind; and Rock, Gail, 4,628,026, Cl. 435-7.000.

Rocket Industries, Inc.: *See—*
Ishida, Hiroshi; and Wang, Yujen, 4,627,610, Cl. 272-72.000.

Rockwell, Gary; and Bartlett, Randall, to Diversified Products Corporation. Abdominal and back weight type exercising device. 4,627,619, Cl. 272-134.000.

Rockwell International Corporation: *See—*
Alitz, Orville J., 4,628,318, Cl. 342-26.000.
Rider, Billie F., 4,627,745, Cl. 374-183.000.
Skipper, John D.; and Long, Steven M., 4,628,275, Cl. 330-10.000.

Rodloff, Rudiger K.; and Jungbluth, Werner W., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Ring laser, especially for a ring laser type of gyro. 4,628,515, Cl. 372-107.000.

Roeder, Alfred: *See—*
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.

Roeding, Gretchen W.: *See—*
McCutchan, Diane R.; Roeding, Gretchen W.; and Kibby, Gordon R., 4,627,587, Cl. 244-122.00R.

Roemac Industrial Sales, Inc.: *See—*
Roemer, Mitchel B.; and Roemer, Nicholas B., 4,627,763, Cl. 404-6.000.

Roemer, Mitchel B.; and Roemer, Nicholas B., to Roemac Industrial Sales, Inc. Vehicle barrier construction. 4,627,763, Cl. 404-6.000.

Roemer, Nicholas B.: *See—*
Roemer, Mitchel B.; and Roemer, Nicholas B., 4,627,763, Cl. 404-6.000.

Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., to Polaroid Corporation, Patent Dept. Monomers containing bis(trifluoromethyl)biphenylene radicals. 4,628,125, Cl. 568-730.000.

Rogers, John D., to Amhil Enterprises Ltd. Lid for drinks container. 4,627,537, Cl. 206-501.000.

Rohde, Robert S.: *See—*
Nomiyama, Neal T.; Rohde, Robert S.; and Buser, Rudolph G., 4,628,542, Cl. 455-619.000.

Rohde, Wolfgang: *See—*
Hedden, Kurt; Beck, Kurt-Gunther; Rohde, Wolfgang; and Schumacher, Horst, 4,627,174, Cl. 34-20.000.

Rohlfing, David C.: *See—*
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., 4,628,013, Cl. 429-111.000.

Rohm, Gunter H. Safety hammer lock for a hand weapon. 4,627,185, Cl. 42-66.000.

Rohm, Gunter H. Chuck for a hammer or rotary impact drill. 4,627,626, Cl. 279-1.00A.

Rohm, Gunter H. Percussion or impact drill chuck. 4,627,627, Cl. 279-19.300.

Rohm, Gunter H. Hammer drill chuck. 4,627,628, Cl. 279-20.000.

Rohn Company Limited: *See—*
Ikefuji, Yoshihiro; and Koiwa, Mitsuru, 4,628,249, Cl. 323-315.000.

Rohringer, Peter: *See—*
Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, 4,627,889, Cl. 162-158.000.

Rokuda, Morito: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.

Rolf, Meinhard: *See—*
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,628,093, Cl. 546-6.000.
Roller, George J.; and Thomas, Kendolph A., to Xerox Corporation. Front air knife top vacuum corrugation feeder. 4,627,605, Cl. 271-94.000.
Rolls-Royce Limited: *See—*
Conolly, Ralph I., 4,628,008, Cl. 448-548.000.
Rollscreen Company: *See—*
Cox, Timothy B., 4,627,206, Cl. 52-302.000.
Ronnhult, John; and Eklund, Jan, to BE - GE Stolindustri AB. Chair back with adjustable lumbar support. 4,627,661, Cl. 297-284.000.
Root, Robert H., to South Coast Research, Inc. Remote control system for automated equipment. 4,628,306, Cl. 340-825.000.
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, to G. D. Searle & Co. Substituted N-benzyl-4-(benzhydryl) piperidines. 4,628,095, Cl. 546-234.000.
Rose, Eric; and Dresdale, Arthur, to Columbia University in the City of New York, The Trustees of. Fibrin adhesive prepared as a concentrate from single donor fresh frozen plasma. 4,627,879, Cl. 106-124.000.
Rose, Leroy: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Rose, Philip M.; and Song, Yoon S., to Standard Oil Company (Indiana). Double reverse helix agitator. 4,627,735, Cl. 366-329.000.
Rosemount Engineering Company Limited: *See—*
Johnston, James S.; Holland, Leslie; and Wright, Christopher R., 4,627,902, Cl. 204-192.210.
Rosen, Josef: *See—*
Landa, Benzion; and Rosen, Josef, 4,627,705, Cl. 355-4.000.
Ross, David S., to International Tectonics Incorporated. Apparatus and method of filtering solids from a liquid effluent. 4,627,923, Cl. 210-744.000.
Ross, Ronald J.: *See—*
Gioffre, Anthony J.; and Ross, Ronald J., 4,627,972, Cl. 424-44.000.
Rossetti, Nazzareno, to SGS Semiconductor Corporation. Voltage regulator. 4,628,247, Cl. 323-314.000.
Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,627,447, Cl. 131-109.100.
Rotz, C. Alan: *See—*
Sprott, David J.; and Rotz, C. Alan, 4,627,338, Cl. 99-534.000.
Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Oxygen concentrator and test apparatus. 4,627,860, Cl. 55-162.000.
Royal Waterbeds, Inc.: *See—*
Winther, Howard A., 4,627,121, Cl. 5-451.000.
RTE Corporation: *See—*
Lien, Wayne W., 4,628,291, Cl. 337-203.000.
Muench, Frank J.; and Borck, Gordon T., 4,628,292, Cl. 337-204.000.
Rubin, Harvey, to AT&T Bell Laboratories. Stored program controller. 4,628,158, Cl. 379-10.000.
Ruebeling, Guenter: *See—*
Kreylos, Hans-Albert; and Zeiser, Manfred P., 4,627,136, Cl. 29-160.600.
Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Ejector manually operable to rotate firing pin block for slide removal and disassembly. 4,627,184, Cl. 42-25.000.
Ruiz, Pierre: *See—*
Leroy, Jean; and Ruiz, Pierre, 4,627,954, Cl. 376-216.000.
Leroy, Jean; and Ruiz, Pierre, 4,627,955, Cl. 376-216.000.
Ruppert, Werner, to International Business Machines Corporation. Circuit arrangement for crosstalk compensation in electro-optical scanners. 4,628,211, Cl. 250-578.000.
Russell, Burdsall & Ward Corporation: *See—*
Pamer, W. Richard; and Zils, James A., 4,627,776, Cl. 411-179.000.
Russev, Todor Y.: *See—*
Marvakov, Ivan K.; and Russev, Todor Y., 4,628,427, Cl. 363-27.000.
Russow, Jurgen: *See—*
Tetzlaff, Karl-Heinz; Schmid, Dieter; and Russow, Jurgen, 4,627,897, Cl. 204-59.00R.
Ruth, Ursula: *See—*
Huschelrath, Gerhard; and Ruth, Ursula, 4,628,261, Cl. 324-240.000.
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., to Exxon Research and Engineering Company. Separating wax from hydrocarbon mixture boiling in the lubricating oil range. 4,627,901, Cl. 204-190.000.
Rzedzian, Richard R., to Advanced NMR Systems, Inc. NMR gradient field modulation. 4,628,264, Cl. 324-322.000.
S.A.E.S. Getters S.p.A.: *See—*
Giorgi, Ettore, 4,628,198, Cl. 250-213.0VT.
S. C. Johnson & Son, Inc.: *See—*
Morgan, Lee W., 4,628,071, Cl. 524-832.000.
Saab-Scania Aktiebolag: *See—*
Andersson, Sven R., 4,627,559, Cl. 224-329.000.
Saar, Lawrence E. Strip lighting. 4,628,421, Cl. 362-238.000.
Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH: *See—*
Stegmann, Heinz, 4,627,500, Cl. 173-53.000.
SACE S.p.A. Costruzioni Elettromeccaniche: *See—*
Talpo, Gianpietro, 4,628,164, Cl. 200-148.00A.
Sacher, Friedrich-Josef. Projection apparatus. 4,627,696, Cl. 353-110.000.
Sachs, Emanuel M. Melt dumping in string stabilized ribbon growth. 4,627,887, Cl. 156-608.000.
Safford, Beverly: *See—*
McArthur, David T., deceased, 4,628,420, Cl. 362-208.000.
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for supplying powdery material. 4,627,990, Cl. 427-10.000.
Saga University: *See—*
Uehara, Haruo; and Nakaoka, Tsutomu, 4,628,212, Cl. 290-54.000.
Saganovsky, Abraham; and Chester, William, to KB Electronics Inc. Anti-plug reversing module. 4,628,232, Cl. 318-284.000.
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., to British Telecommunications. Computer of processor control systems. 4,628,508, Cl. 371-9.000.
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, to Kabushiki Kaisha Toshiba. Torque sensor of the noncontact type. 4,627,298, Cl. 73-862.360.
Saiga, Yutaka: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
Saino, Tetsushi: *See—*
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, 4,628,111, Cl. 560-159.000.
Saint-Hubert Industrie Laitiere: *See—*
Authelet, Marc; and Perrin, Jean, 4,627,984, Cl. 426-37.000.
Sainte-Rose, Christian: *See—*
Hooven, Michael D.; and Sainte-Rose, Christian, 4,627,832, Cl. 604-9.000.
Saita, Shinsuke: *See—*
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke. 4,627,704, Cl. 355-3.00R.
Saito, Chuichi, to Hitachi, Ltd. Balustrade for passenger conveyor. 4,627,527, Cl. 198-335.000.
Saito, Kenichi: *See—*
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, to Nippon Soken, Inc. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,627,402, Cl. 123-440.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,627,404, Cl. 123-492.000.
Saito, Makoto: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Saito, Tsutomu: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Saito, Yasuhiro: *See—*
Miyake, Masaya; Saito, Yasuhiro; and Higuchi, Matsuo, 4,628,178, Cl. 219-121.0LD.
Saito, Yoji: *See—*
Kato, Shinichi; Watanabe, Kiyoto; Saito, Yoji; and Yamagata, Akio, 4,627,759, Cl. 403-2.000.
Saito, Yoshiaki: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.
Sakaguchi, Shuzabu: *See—*
Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, 4,628,119, Cl. 564-314.000.
Sakai, Tunehiro: *See—*
Kato, Kimitoshi; Aiga, Hiroshi; Mikoda, Tamio; and Sakai, Tunehiro, 4,628,091, Cl. 544-339.000.
Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. Control system for an infinitely variable transmission. 4,627,313, Cl. 74-867.000.
Sakakibara, Shiro: *See—*
Moroto, Shuzo; and Sakakibara, Shiro, 4,627,308, Cl. 74-689.000.
Sakakibara, Yoshio: *See—*
Ohta, Takeshi; Yamakage, Tetsuro; and Sakakibara, Yoshio, 4,628,458, Cl. 364-474.000.
Sakamoto, Keiji: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, 4,628,240, Cl. 318-723.000.
Sakamoto, Kenichiro: *See—*
Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, 4,627,786, Cl. 414-735.000.
Sakamoto, Koichiro: *See—*
Kitagawa, Tohru; and Sakamoto, Koichiro, 4,628,296, Cl. 338-3.000.
Sakamoto, Tamaki; and Yoshihisa, Sakamoto, to Omron Tateisi Electronics Co. Computer controlled electronic thermometer. 4,627,742, Cl. 374-109.000.
Sakata, Yoshiya: *See—*
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,628,389, Cl. 360-132.000.
Sakatani, Takenobu; and Suzuki, Shigeru, to Lion Corporation. Additive composition for granular detergent. 4,627,927, Cl. 252-8.750.

Sakkas, Athanasios: *See—*
Sakkas, Thomas; and Sakkas, Athanasios, 4,627,652, Cl. 292-229.000.
Sakkas, Thomas; and Sakkas, Athanasios. Lock for sliding doors and windows. 4,627,652, Cl. 292-229.000.
Saku, Koji; and Horiguchi, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device with a refresh mechanism. 4,628,488, Cl. 365-222.000.
Sakui, Koji, to Kabushiki Kaisha Toshiba. MOS dynamic random access memory. 4,628,486, Cl. 365-149.000.
Sakuma, Nobuo. Post-objective type scanning device. 4,627,685, Cl. 350-6.800.
Sakurai, Yoshio; and Tsuruo, Takashi, to Japanese Foundation for Cancer Research; and Tanabe Seiyaku Co., Ltd. Agent for enhancing antitumor activity of antitumor agent. 4,628,047, Cl. 514-34.000.
Salk Institute for Biological Studies, The: *See—*
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,628,043, Cl. 514-12.000.
White, Christine A.; Dulbecco, Renato; and Allen, William R., 4,628,032, Cl. 435-240.000.
Salter, Anthony J. Pipe supports. 4,627,593, Cl. 248-561.000.
Samaritoni, Jack G., to Eli Lilly and Company. Preparation of substituted pyridazines. 4,628,088, Cl. 544-224.000.
Samsung Electronics Co., Ltd.: *See—*
Heo, Man Y., 4,628,351, Cl. 358-93.000.
Samuelson, Bruce E., to Minnesota Mining and Manufacturing Company. Dispenser for tape wound on three inch cores. 4,627,560, Cl. 225-66.000.
Sanagi, Shiroh: *See—*
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,627,881, Cl. 148-12.00C.
Sanchez, William: *See—*
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Sanden Corporation: *See—*
Matsudaira, Yasuyuki; and Hiraga, Masaharu, 4,627,800, Cl. 418-55.000.
Terauchi, Kiyoshi, 4,627,799, Cl. 418-55.000.
Sanders Associates, Inc.: *See—*
Burrows, James L., 4,628,477, Cl. 364-900.000.
Sholtis, Albert A.; and Guy, Jon S., 4,627,754, Cl. 400-649.000.
Sanderson, John R.; and Yeakey, Ernest L., to Texaco Inc. Production of 2-substituted-1,3-dioxolanes from 1,3-dioxolane and formaldehyde. 4,628,108, Cl. 549-453.000.
Sano Kiko Co., Ltd.: *See—*
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.
Santa Fe International Corporation: *See—*
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., 4,627,767, Cl. 405-196.000.
Santel, Hans-Joachim: *See—*
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., 4,627,871, Cl. 71-92.000.
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
Santrade Limited: *See—*
Soderstrom, Gunnar T., 4,627,882, Cl. 148-14.000.
Sanyo Electric Co., Ltd.: *See—*
Okumura, Yuuzi, 4,628,382, Cl. 360-93.000.
Sardina, Helion H., to Lummus Crest, Inc. Dehydrogenation process for production of styrene from ethylbenzene comprising low temperature heat recovery and modification of the ethylbenzene-steam feed therewith. 4,628,136, Cl. 585-441.000.
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, to Teijin Limited. Pitch-based carbon or graphite fiber and process for preparation thereof. 4,628,001, Cl. 428-367.000.
Sasaki, Ryoichi: *See—*
Mizuno, Kenji; and Sasaki, Ryoichi, 4,627,748, Cl. 400-17.000.
Sasaki, Toshio: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Sasaki, Yoshitaka, to Hitachi Metals, Ltd. Thermal fixing apparatus. 4,627,813, Cl. 432-60.000.
Sasashige, Hiroaki: *See—*
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,627,831, Cl. 493-337.000.
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal 2-[4-substituted carboxyamino-phenoxy (or phenyl mercapto)]-substituted pyrimidines. 4,627,871, Cl. 71-92.000.
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, to Jujo Paper Co., Ltd.; and Yoshitomi Pharmaceutical Industries Ltd. Thermosensitive recording sheet. 4,628,336, Cl. 346-209.000.
Sato, Fumitaka; and Nagura, Kunihiro. Data processing system having a local memory which does not use a directory device with distributed resident programs and a method therefor. 4,628,450, Cl. 364-200.000.
Sato, Hiroyuki: *See—*
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Sato, Kunihiko: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Sato, Maki; and Hashimoto, Takeo, to Sony Corporation. Charge transfer device for multiplexing signals. 4,628,347, Cl. 358-39.000.
Sato, Makoto: *See—*
Matsuda, Shohei; and Sato, Makoto, 4,627,670, Cl. 303-115.000.
Sato, Masayoshi; Harada, Noritake; and Suzuki, Kunio. Convertible ink scraper device corresponding to reverse-rotatable mesh roller. 4,627,350, Cl. 101-350.000.
Sato, Noboru: *See—*
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Sato, Noritada: *See—*
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.
Satomura, Hiroshi, to Canon Kabushiki Kaisha. Heating-fixing roller and fixing device having the same. 4,628,183, Cl. 219-216.000.
Sauer, Heinz, to Rasmussen GmbH. Flexible pipe coupling. 4,627,645, Cl. 285-39.000.
Saukkonen, Harri: *See—*
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Savin Corporation: *See—*
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Sawada, Hideo; and Yata, Kiyoshi, to Hitachi, Ltd. Data processing apparatus for virtual memory system. 4,628,451, Cl. 364-200.000.
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, to Mikuni Kogyo Kabushiki Kaisha. Liquid fuel combustion apparatus. 4,627,412, Cl. 126-110.00B.
Sawada, Kazuo: *See—*
Isobe, Shinichi; and Sawada, Kazuo, 4,628,442, Cl. 364-167.000.
Sawada, Satoru; and Nishiyama, Shingo, to Fuji Photo Film Co., Ltd. Heat developable color photographic materials with silver halide containing iodide. 4,628,021, Cl. 430-203.000.
Sawaki, Toru: *See—*
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, 4,628,001, Cl. 428-367.000.
Saxena, Vinit, to Sepragen Corporation. Chromatography column using horizontal flow. 4,627,918, Cl. 210-656.000.
Say, Donald L.: *See—*
Collins, Floyd K.; and Say, Donald L., 4,628,224, Cl. 313-414.000.
Scan Optics, Inc.: *See—*
Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., 4,628,532, Cl. 382-21.000.
Scarfo, Corrado; and Scarfo, Paolo. Watercraft provided with trim stabilizers utilizing different fluids. 4,627,376, Cl. 114-272.000.
Scarfo, Paolo: *See—*
Scarfo, Corrado; and Scarfo, Paolo, 4,627,376, Cl. 114-272.000.
Scarpa, Afra; and Scarpa, Tobia, to Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S. Clothes hanger assembly. 4,627,544, Cl. 211-189.000.
Scarpa, Tobia: *See—*
Scarpa, Afra; and Scarpa, Tobia, 4,627,544, Cl. 211-189.000.
Schaefer, Edward J., to Franklin Electric Co., Inc. Electric motor control. 4,628,236, Cl. 318-558.000.
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Schaper, Helmut: *See—*
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Scharf, Udo; Schlingmann, Merten; and von Rymon Lipinski, Gert-Wolfhard, to Hoechst Aktiengesellschaft. Functional protein hydrolyzates, a process for their preparation, use of these protein hydrolyzates as a food additive, and foods containing these protein hydrolyzated. 4,627,983, Cl. 426-7.000.
Scharnowski, Gerhard: *See—*
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,627,597, Cl. 251-129.030.
Schaub, Herbert R., to Union Carbide Corporation. Gas supply system for variable demand application. 4,627,243, Cl. 62-52.000.
Scheepens, Antonius H. J. M.; van Hell, Hans; and Theunissen, Hendrikus J. J., to Akzo N.V. Immunological assay with test tube having bottom forming a strip. 4,628,036, Cl. 436-520.000.
Scheiwiller, Rolf. Paving stone, process for manufacturing same and device for carrying out the manufacturing process. 4,627,764, Cl. 404-41.000.
Schering Corporation: *See—*
Sherlock, Margaret H., 4,628,055, Cl. 514-249.000.
Schertler, Siegfried: *See—*
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Schiller, Gunter, to SMS Schloemann-Siemag AG. Roll stand with axially shiftable working rolls. 4,627,261, Cl. 72-247.000.
Schilly, Helmut: *See—*
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Schindel, Leon H.: *See—*
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Schleicher, Siegfried: *See—*
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Schlich, Elmar: *See—*
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Schlingmann, Merten: *See—*
Scharf, Udo; Schlingmann, Merten; and von Rymon Lipinski, Gert-Wolfhard, 4,627,983, Cl. 426-7.000.
Schlosser, Erich J., to Weber-Stephen Products Co. Vaporizing element for portable grill. 4,627,408, Cl. 126-41.00R.
Schlumberger Technology Corporation: *See—*
Burgess, Trevor M.; and Lesso, William G., Jr., 4,627,276, Cl. 73-151.000.
Schmid, Dieter: *See—*
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Schmid, Gunther: *See—*
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Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, to Ciba-Geigy Corporation. Novel imidazolides and their use as curing agents for polyepoxide compounds. 4,628,105, Cl. 548-341.000.
Schmid, Willi, to W. Schmid AG. Signal lamp. 4,628,419, Cl. 362-145.000.
Schmidt, Erwin; Gunther, Dieter; and Kampe, Klaus-Dieter, to Hoechst Aktiengesellschaft. 2-ketosulfonamides and process for their preparation. 4,628,109, Cl. 560-13.000.
Schmidt, Gerhard: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.
Schmidt, Harald: *See—*
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Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
Schmitt, Jerry A., to High Voltage Engineering Corporation. Tri-layer tubing. 4,627,844, Cl. 604-264.000.
Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Scanning signal balancing circuit. 4,628,201, Cl. 250-237.00G.
Schmitz-Montz, Hans-Helmut, to Linde Aktiengesellschaft; and Atlas Copco Aktiebolag of Nacka. Piston assembly for a compressor or the like. 4,627,795, Cl. 417-267.000.
Schmotz, Ernst; and Stelzl, Hans, to Siemens Aktiengesellschaft. Casing for electrical components, component assemblies or integrated circuits. 4,628,146, Cl. 174-52.0PE.
Schneider, Johann: *See—*
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Schneider, Lynn A.: *See—*
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Schneider, Martin: *See—*
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Schnell, Willi, to Reifenhauser GmbH & Co. Vertical foil-blowing head. 4,627,805, Cl. 425-72.00R.
Scholefield, Clifford L., to General Electric Company. System for charging a rechargeable battery. 4,628,242, Cl. 320-2.000.
Scholly, Werner: *See—*
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Schon & Cie. Gesellschaft mit beschrankter Haftung: *See—*
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Rathbun, Bonnie L.; and Schuessler, Philipp W. H., 4,628,006, Cl. 428-446.000.
Schuh, Paul A., to Sundstrand Corporation. Gas turbine engine/load compressor power plants. 4,627,234, Cl. 60-39.281.
Schuler, Donald; and Doshi, Mahesh, to Prime Computer, Inc. Digital system simulation method and apparatus having two signal-level modes of operation. 4,628,471, Cl. 364-578.000.
Schulte, Gunter: *See—*
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Schumacher, Ignatius, to Monsanto Company. Vapor phase nitration of aromatic compounds. 4,628,131, Cl. 568-937.000.
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Schussler, Henry W.: *See—*
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Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, to Bayer Aktiengesellschaft. 2,4-diaminopyrimidines. 4,627,872, Cl. 71-92.000.
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Schwartz, Ervin J. Interlocking blocks and construction system comprising said blocks. 4,627,209, Cl. 52-589.000.
Schwartz, Leonard. Aerobic hand weights. 4,627,618, Cl. 272-122.000.
Schwarz, Milan. Revolving door control system. 4,627,193, Cl. 49-42.000.
Schwarz, Wolfram; Schwierz, Theodor; and Sommer, Bernd, to Siemens Aktiengesellschaft. Digital radio system. 4,628,517, Cl. 375-40.000.
Schweighardt, Frank K.: *See—*
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Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., to Hoechst Aktiengesellschaft. Process for the preparation of 2-hydroxy-(9H)-carbazole. 4,628,106, Cl. 548-440.000.
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Schwing, Ewald; Sommer, Peter; and Uhrner, Horst. Fluidized-bed apparatus. 4,627,175, Cl. 34-57.00A.
Scientific-Atlanta, Inc.: *See—*
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SCM Corporation: *See—*
Hsu, Tracy C., 4,627,999, Cl. 428-326.000.
Scotti, Marino D., to Douglas Marine s.r.l. Device for rapidly fixing the ends of cables and the like. 4,627,762, Cl. 403-369.000.
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Second, Paul. Background projection system for photography. 4,627,697, Cl. 354-77.000.
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Seevinck, Evert; and Wassenaar, Roelof F., to U.S. Philips Corporation. Amplifier arrangement. 4,628,280, Cl. 330-259.000.
Segan, Marc H.: *See—*
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Seidler, Wolfgang. Process for the production of spherical metallic particles. 4,627,943, Cl. 264-14.000.
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Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, to Fuji Electric Corporate Research & Development Co., Ltd.; and Fuji Electric Co., Ltd. Method for forming a protective film on a semiconductor body. 4,627,991, Cl. 427-39.000.
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, to Tokyo Cosmos Electric Co., Ltd. Planar resistance heating element. 4,628,187, Cl. 219-505.000.
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, to Mitsubishi Paper Mills, Ltd.; and Nippon Hoso Kyo Kai. Reversible image-forming material. 4,628,337, Cl. 346-217.000.
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Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.

Selwa, Anthony P., to RCA Corporation. Muting circuit. 4,628,539, Cl. 455-194.000.
Sempel, Adrianus, to U.S. Philips Corporation. Feedback amplifier with reduced distortion. 4,628,281, Cl. 330-288.000.
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Sensormatic Electronics Corporation: *See—*
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Serfaty, Salomon; and Cohen, Mordechay, to Motorola, Inc. Modified duobinary filter using saw technique. 4,628,474, Cl. 364-825.000.
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Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.
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Shaikh, Farhat A.: *See—*
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Shanklin, William C. Portable, nestable beverage brewing system. 4,627,334, Cl. 99-306.000.
Sharkey, Hubert J., to National Distillers and Chemical Corporation. Process for the ozonization of α,β-unsaturated cyclohexanones to 5-ketoalkanoic acids. 4,628,117, Cl. 562-577.000.
Sharp Kabushiki Kaisha: *See—*
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Tomino, Tadashi; and Higuchi, Masayuki, 4,627,676, Cl. 339-17.0CF.
Shea, Thomas M. Tool for cleaning the interior surfaces of a container. 4,627,128, Cl. 15-236.00R.
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Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.
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Shen, Kuo C., to K. C. Shen Technology International Ltd. Process for manufacturing composite products from lignocellulosic materials. 4,627,951, Cl. 264-109.000.
Sherlock, Margaret H., to Schering Corporation. Method for treating allergic reactions and compositions therefore. 4,628,055, Cl. 514-249.000.
Sherman, Robert C., to Messina, Carl J. Spray-suppressing mud flap assembly. 4,627,631, Cl. 280-154.50R.
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William. Apparatus for cooking food. 4,627,335, Cl. 99-325.000.
Sherrill, Jimmy L., to Tutco, Inc. Duct heater. 4,628,190, Cl. 219-532.000.
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Shimizu, Hiroshi. Compost toilet apparatus. 4,627,116, Cl. 4-111.600.
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Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, to Citizen Watch Co., Ltd. Bracelet type wrist watch. 4,627,739, Cl. 368-282.000.
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Schwarz, Wolfram; Schwierz, Theodor; and Sommer, Bernd, 4,628,517, Cl. 375-40.000.

Siemer, Hans: *See—*
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.

Sieveking, Hans U.: *See—*
Voege, Herbert; and Sieveking, Hans U., 4,628,054, Cl. 514-234.000.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Walz, Theo, 4,627,215, Cl. 53-246.000.

Sigco Research Inc.: *See—*
Fick, Gerhardt N., 4,627,192, Cl. 47-58.000.

Signorini, Ernesto: *See—*
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.

Silva, Ethan A. Fluid pressure intensifier. 4,627,794, Cl. 417-225.000.

SIMES, Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Simon, Istvan. Two-stroke internal combustion engine. 4,627,389, Cl. 123-25.00C.

Simonds, William P.: *See—*
Stitzlein, Teddy K.; and Simonds, William P., 4,628,511, Cl. 371-22.000.

Singbeil, Douglas L.: *See—*
Garner, Andrew; and Singbeil, Douglas L., 4,627,905, Cl. 204-404.000.

Singer, Robert: *See—*
Nazmy, Mohamed; and Singer, Robert, 4,627,896, Cl. 204-37.100.

Singh, Manjit: *See—*
Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, 4,627,457, Cl. 137-1.000.

Site Microsurgical Systems, Inc.: *See—*
Cook, Kenneth P., 4,627,833, Cl. 604-34.000.

Skipper, John D.; and Long, Steven M., to Rockwell International Corporation. Efficient power amplifier for high capacitive devices. 4,628,275, Cl. 330-10.000.

Skutecki, Edmund, to Sperry Corporation. Cross axis torque limiter for helicopter autopilot. 4,628,455, Cl. 364-434.000.

Small, Kenneth T., to Boschert Inc. Proportional transistor base drive circuit for use in power converters. 4,628,432, Cl. 363-56.000.

Small, Richard D., Jr.: *See—*
Ors, Jose A.; and Small, Richard D., Jr., 4,628,022, Cl. 430-280.000.

Smayling, Michael C., to Texas Instruments Incorporated. Dual slope, feedback controlled, EEPROM programming. 4,628,487, Cl. 365-185.000.

Smidt, Joseph J. Box-erecting machine. 4,627,830, Cl. 493-316.000.

Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, to Celanese Corporation. Rhodium and iodine recovery method. 4,628,041, Cl. 502-24.000.

Smith, Gerald R.; and Thompson, William R., to United States of America, Interior. Electrolytic cell and methods combining electrowinning and electrochemical reactions employing a membrane or diaphragm. 4,627,899, Cl. 204-95.000.

Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., to Tektronix, Inc. Method of packaging integrated circuit chips, and integrated circuit package. 4,628,406, Cl. 361-386.000.

Smith, Leedice S. Simulated log end unit for buildings. 4,627,204, Cl. 52-233.000.

Smith, Norman F., Jr.: *See—*
LaRue, Albert D.; Clocker, Roger A.; and Smith, Norman F., Jr., 4,627,366, Cl. 110-263.000.

Smith, Richard D.: *See—*
O'Hagan, Michael A.; and Smith, Richard D., 4,627,173, Cl. 34-10.000.

SmithKlein Beckman Corporation: *See—*
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., 4,628,059, Cl. 514-384.000.

SMS Schloemann-Siemag AG: *See—*
Schiller, Gunter, 4,627,261, Cl. 72-247.000.
Stoy, Erich, 4,627,300, Cl. 74-89.150.

SMS Sloemann Siegmag AG: *See—*
Benz, Willi, 4,627,260, Cl. 72-247.000.

Smulders, Hendricus F. G.; Hagen, Johannes L. M.; and Dona, Marinus J. J., to U.S. Philips Corporation. Positioning device comprising pre-stressed contactless bearings. 4,628,238, Cl. 318-653.000.

Snaidr, Stanislav M.: *See—*
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,627,447, Cl. 131-109.100.

Snap-on Tools Corporation: *See—*
Mikic, Frank; and Williams, Daniel W., 4,627,164, Cl. 30-135.000.
Olson, Gene E.; and Kot, Norbert J., 4,627,761, Cl. 403-324.000.

Societe Anonyme dite: Aaton Rg.: *See—*
Beauviala, Jean-Pierre; and Charras, Jean-Pierre, 4,627,695, Cl. 352-72.000.

S.A. Texaco Belgium N.V.: *See—*
Maes, Jean Pierre, 4,628,204, Cl. 250-343.000.

Societe Chimique des Charbonnages--CdF Chimie: *See—*
Grasset, Daniel; and Martinot, Bernard, 4,627,962, Cl. 422-40.000.

Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis^2: *See—*
Fensch, Thierry, 4,628,472, Cl. 364-759.000.

Soderstrom, Gunnar T., to Santrade Limited. Method of making a rotary drill bit. 4,627,882, Cl. 148-14.000.

Sodick Co., Ltd.: *See—*
Furukawa, Toshihiko, 4,628,170, Cl. 219-69.00D.

Sok, Brian A.: *See—*
Nickola, Richard A.; and Sok, Brian A., 4,628,004, Cl. 428-413.000.

Solar Turbines, Inc.: *See—*
Duffy, Thomas E.; Archibald, John P.; and Campbell, Alan H., 4,627,386, Cl. 122-1.00B.

Solloway, Daniel S. Hydrodynamic jumper. 4,627,613, Cl. 272-116.000.

Sommer, Bernd: *See—*
Schwarz, Wolfram; Schwierz, Theodor; and Sommer, Bernd, 4,628,517, Cl. 375-40.000.

Sommer, Peter: *See—*
Schwing, Ewald; Sommer, Peter; and Uhrner, Horst, 4,627,175, Cl. 34-57.00A.

Song, Yoon S.: *See—*
Rose, Philip M.; and Song, Yoon S., 4,627,735, Cl. 366-329.000.

Sony Corporation: *See—*
Morisawa, Takashi, 4,628,372, Cl. 360-40.000.
Okada, Takashi; and Mogi, Takao, 4,628,359, Cl. 358-122.000.
Sato, Maki; and Hashimoto, Takeo, 4,628,347, Cl. 358-39.000.
Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, 4,628,498, Cl. 369-77.100.

Sood, Arun K.: *See—*
Henein, Naeim A.; and Sood, Arun K., 4,627,275, Cl. 73-112.000.

Sosinski, Ronald T.: *See—*
Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., 4,627,721, Cl. 355-77.000.

Sotimag (SARL): *See—*
Peronneau, Georges; and Chalus, Bernard, 4,627,642, Cl. 283-92.000.

Soto, Henry L. Illuminated wind sock. 4,627,278, Cl. 73-188.000.

South Coast Research, Inc.: *See—*
Root, Robert H., 4,628,306, Cl. 340-825.000.

Southern Research Institute: *See—*
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,628,089, Cl. 544-244.000.

Spahrbier, Dieter, to Varta Batterie Aktiengesellschaft. Explosion-proof, hermetically sealed galvanic cell. 4,628,012, Cl. 429-53.000.

Spanjer, Keith G., to Motorola Inc. Method for applying material to a semiconductor wafer. 4,627,988, Cl. 427-5.000.

Sparton Corporation: *See—*
Douglas, Norman F., 4,628,315, Cl. 340-870.260.

Spector, Saul R.: *See—*
Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.

Spectral Sciences, Inc.: *See—*
Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., 4,627,284, Cl. 73-336.500.

Speraw, Floyd G., to NCR Corporation. Card cassette ejector apparatus. 4,628,413, Cl. 361-415.000.

Sperlich, Josef, to ANT Nachrichtentechnik GmbH. Method for transmitting communications services via satellites. 4,628,506, Cl. 370-104.000.

Speronello, Barry K., to Engelhard Corporation. Porous mullite. 4,628,042, Cl. 502-263.000.

Sperry Corporation: *See—*
Berndt, Dale F., 4,628,217, Cl. 307-467.000.
Skutecki, Edmund, 4,628,455, Cl. 364-434.000.

Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Hypothalamic GRF agonists. 4,628,043, Cl. 514-12.000.

Spilhaus, Athelstan. Map puzzle having periodic tesselated structure. 4,627,622, Cl. 273-157.00R.

Spillman, Donald W.; and Shilling, Thomas W., to Imagex, Inc. Digital X-ray scanner. 4,628,356, Cl. 358-111.000.

Sporck, Claus L., to Hag A/S. Mechanical lifting device. 4,627,602, Cl. 267-182.000.

Sprott, David J.; and Rotz, C. Alan, to Research Corporation. Apparatus for the treatment of ruminant forage material or soil. 4,627,338, Cl. 99-534.000.

SS Indus.: *See—*
Ewing, Paul E.; and Grubb, B. Randall, 4,627,665, Cl. 299-79.000.

Staalkat B.V.: *See—*
Menger, Jan W., 4,628,520, Cl. 377-6.000.

Stadlmann, Wilfried, to Transamerica Delaval Inc. Control systems for magnetic recording tapes. 4,628,375, Cl. 360-71.000.

Staefa Control System Inc.: *See—*
Morris, John C., 4,627,569, Cl. 236-49.000.

Stahl, Bernhard; and Bohm, Horst, to Optima Spanntechnik GmbH. Clamping device. 4,627,603, Cl. 269-32.000.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open-end friction spinning machine. 4,627,230, Cl. 57-401.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,627,230, Cl. 57-401.000.

Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive compound mixture and copying material comprising o-naphthquinonediazide compound. 4,628,020, Cl. 430-165.000.

Standard Oil Company: *See—*
Bodine, John H.; and Bork, Jonathan, 4,628,491, Cl. 367-45.000.
Desmond, Michael J.; Weinert, Raymond J., Jr.; Ball, Lawrence E.; and Benton, Kenneth C., 4,628,077, Cl. 526-90.000.

Standard Oil Company (Indiana): *See—*
Rose, Philip M.; and Song, Yoon S., 4,627,735, Cl. 366-329.000.

Standard Textile Co. Inc.: *See—*
Hopp, Marcel F., 4,627,122, Cl. 5-484.000.

Stark, Robert G., Jr.: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W., 4,627,466, Cl. 137-625.500.

Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W. Valve and actuator. 4,627,466, Cl. 137-625.500.

Stark, Tom: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W., 4,627,466, Cl. 137-625.500.

Stauffer Chemical Company: *See—*
Nagubandi, Sreeramulu, 4,627,870, Cl. 71-86.000.

Stauffer, Werner: *See—*
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.

Steel City Corporation, The: *See—*
Fibus, C. Kenneth, 4,627,566, Cl. 232-1.00C.

Steffes, Helmut: *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,628,162, Cl. 200-84.00C.

Stegmann, Heinz, to Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH. Coal-compacting power-hammer rod activator. 4,627,500, Cl. 173-53.000.

Steigerwald, Robert L., to General Electric Company. Dual output DC-DC converter with independently controllable output voltages. 4,628,426, Cl. 363-17.000.

Steinbusch, Hans: *See—*
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, 4,628,231, Cl. 318-138.000.

Stelzl, Hans: *See—*
Schmotz, Ernst; and Stelzl, Hans, 4,628,146, Cl. 174-52.0PE.

Stephen, John F.: *See—*
Nelson, Richard V.; and Stephen, John F., 4,628,096, Cl. 546-250.000.

Stephenson, Stanley K.: *See—*
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.

Steyr-Daimler-Puch AG: *See—*
Morell, Josef; and Schmidt, Harald, 4,627,570, Cl. 239-90.000.

Stickel, Oskar: *See—*
Mayr, Albert; and Stickel, Oskar, 4,627,238, Cl. 60-452.000.

Stiefel Laboratories, Inc.: *See—*
Wittes, James M., 4,627,129, Cl. 15-244.00C.

Stillwell, Merriam B. Easel. 4,627,592, Cl. 248-465.000.

Stitzlein, Teddy K.; and Simonds, William P., to Shell Oil Company. Apparatus for analysis of computer channel failures. 4,628,511, Cl. 371-22.000.

Stock, Donald F.: *See—*
Winkelbauer, Howard M.; Wang, Ke-Chin; Walther, Frank H., Jr.; and Stock, Donald F., 4,627,945, Cl. 264-29.500.

Stojek, Dieter: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.

Stolar, Morris: *See—*
Levitt, Barrie; and Stolar, Morris, 4,628,056, Cl. 514-270.000.

Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., to Scan Optics, Inc. Alphanumeric handprint recognition. 4,628,532, Cl. 382-21.000.

Stopinc Aktiengesellschaft: *See—*
Kagi, Otto, 4,627,147, Cl. 29-515.000.

Storie, Lyndola M. Body suit. 4,627,111, Cl. 2-69.000.

Storopack, Hans Reichenecker GmbH & Co.: *See—*
Voss, Gerd, 4,627,947, Cl. 264-53.000.

Stoy, Erich, to SMS Schloemann-Siemag AG. Positioning actuator for six-high roll stand. 4,627,300, Cl. 74-89.150.

Strassler, Sigfrid: *See—*
Forster, Martin; and Strassler, Sigfrid, 4,627,269, Cl. 73-23.000.

Strato Medical Corporation: *See—*
Fenton, Paul V., Jr., 4,627,835, Cl. 604-67.000.

Stratton, Richard W.; Nicolet, Michel; and Andrews, Glenn, to Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen. Nuclear fuel rod with porous plug closure. 4,627,957, Cl. 376-412.000.

Stricker, Alfred A.: *See—*
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.

Stubs, Albert: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.

Stuckman, Lowell R. Firearm with aiming light. 4,627,183, Cl. 42-1.010.

Studer, Lewis O., to Moore, Harry V., a part interest. Self-leveling ladder construction. 4,627,516, Cl. 182-202.000.

Stumpff, Phillip W.: *See—*
Taylor, Richard D.; and Stumpff, Phillip W., 4,627,675, Cl. 339-14.00R.

Sturm, Ruger & Company, Inc.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,627,184, Cl. 42-25.000.

Sturm, Theodor: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.

Sturrock, Peter E.; and O'Brien, Gerald E., to Georgia Tech. Research Institute. Rapid-sweep electrochemical detector for chemical analysis of flow streams. 4,628,463, Cl. 364-497.000.

Sucher, Daniel J.: *See—*
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.

Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., to New Holland, Inc. Bale density control sensing apparatus and method. 4,627,341, Cl. 100-41.000.

Sudhaus Schloss- und Beschlagetechnik GmbH & Co.: *See—*
Hauschulte, Franz, 4,627,650, Cl. 292-113.000.

Sudholter, Ernst J. R.: *See—*
Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.

Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, to Canon Kabushiki Kaisha. Process for developing electrostatic images and toner therefor. 4,628,019, Cl. 430-106.600.

Suenaga, Tatsuo: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.

Suga, Michihisa; and Tsuzuki, Mitsuo, to NEC. Ink-jet recording apparatus. 4,628,330, Cl. 346-75.000.

Suga, Shigeru. Light-resistance tester for maintaining uniform temperature at surface of sample. 4,627,287, Cl. 73-865.600.

Sugishima, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Overload protecting circuit for an inverter device. 4,628,395, Cl. 361-18.000.

Sugiura, Yasuyuki: *See—*
Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, 4,628,314, Cl. 340-870.240.

Suling, Carlhans: *See—*
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.

Sullivan, James B.; and Fox, Richard B. Molded shoe innersole. 4,627,178, Cl. 36-44.000.

Sumi, Kiyohide: *See—*
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.

Sumida, Shizuo: *See—*
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, 4,627,311, Cl. 74-866.000.

Sumitomo Chemical Company, Limited: *See—*
Kato, Toshiro, 4,628,049, Cl. 514-147.000.

Sumitomo Electric Industries Ltd.: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.
Miyake, Masaya; Saito, Yasuhiro; and Higuchi, Matsuo, 4,628,178, Cl. 219-121.0LD.
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, 4,627,867, Cl. 65-3.120.
Yamaguchi, Jun, 4,628,016, Cl. 430-30.000.

Sumitomo Special Metals Co., Ltd.: *See—*
Wada, Toshiaki, 4,627,733, Cl. 356-359.000.

Sundstrand Corporation: *See—*
Beck, Richard, Jr., 4,627,330, Cl. 92-12.200.
Durtschi, William G., 4,627,329, Cl. 91-506.000.
Hutson, Allan I., 4,627,237, Cl. 60-487.000.
Schuh, Paul A., 4,627,234, Cl. 60-39.281.
Troscinski, Mark A., 4,628,219, Cl. 310-68.00D.

Suplinskas, Raymond J.; Henze, Thomas W.; and Marzik, James V., to Avco Corporation. Silicon carbide monofilament for transverse composite properties. 4,628,002, Cl. 428-367.000.

Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,627,857, Cl. 55-70.000.

Sutton, Gordon W.: *See—*
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., 4,627,812, Cl. 431-7.000.

Suzuki, Atsuo: *See—*
Kitsukawa, Motohiko; and Suzuki, Atsuo, 4,627,254, Cl. 72-6.000.

Suzuki, Hidetake: *See—*
Nakayama, Yoshiro; and Suzuki, Hidetake, 4,628,338, Cl. 357-15.000.

Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, to Canon Kabushiki Kaisha. Apparatus for forming images from positive and negative originals. 4,627,703, Cl. 355-3.00R.

Suzuki, Keisuke: *See—*
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,628,120, Cl. 568-322.000.

Suzuki, Kunio: *See—*
Sato, Masayoshi; Harada, Noritake; and Suzuki, Kunio, 4,627,350, Cl. 101-350.000.

Suzuki, Masahiko: *See—*
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.

Suzuki, Motomu: *See—*
Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, 4,628,355, Cl. 358-111.000.

Suzuki, Osamu: *See—*
Komiyama, Choji; and Suzuki, Osamu, 4,627,534, Cl. 206-387.000.

Suzuki, Shigeru: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,627,927, Cl. 252-8.750.

Suzuki, Shun: *See—*
Shinohara, Shigeru; Suzuki, Shun; and Innami, Tatsuo, 4,628,459, Cl. 364-475.000.

Suzuki, Tadao, to Omron Tateisi Electronics Co. Cash handling machine. 4,628,192, Cl. 235-1.00R.

Svensson, Kent O.: *See—*
Mathiesen, Mait M.; and Svensson, Kent O., 4,627,855, Cl. 44-51.000.

Swedo, Raymond J.: *See—*
Zupancic, Joseph J.; and Swedo, Raymond J., 4,627,859, Cl. 55-158.000.

Swendrowski, Steven: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.

Symbas, Panagiotis N.; Baisden, J. Lee; and Kezios, Stothe P. Sternal retractor. 4,627,421, Cl. 128-20.000.

Syoji, Mitsuo: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.

System Development Corporation: *See—*
Boyle, Richard C., 4,628,303, Cl. 340-661.000.

Szarka, David D., to Halliburton Company. Isolation gravel packer. 4,627,488, Cl. 166-51.000.

Szentesi, Otto I., to Siecor Corporation. Splicing tray for optical fibers. 4,627,686, Cl. 350-96.200.

T. Ghiglia: *See—*
Hall, Dennis E., 4,627,659, Cl. 297-488.000.

Tabak, Samuel A.: *See—*
Gould, Ronald M.; and Tabak, Samuel A., 4,628,134, Cl. 585-331.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,628,135, Cl. 585-331.000.

Tabor, Steven A.: *See—*
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Tachikawa, Keiichi: *See—*
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.

Tachikawa Spring Co. Ltd.: *See—*
Kon, Shigeki, 4,627,660, Cl. 297-219.000.

Tachiuchi, Tsuguji; and Honda, Toyota, to Hitachi, Ltd. Common memory control system with two bus masters. 4,628,482, Cl. 364-900.000.

Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, to Madza Motor Corporation. Intake system for rotary piston engines. 4,627,395, Cl. 123-216.000.

Tagoku, Izumi, to Ricoh Company, Limited. Electrostatic image forming method. 4,628,017, Cl. 430-48.000.

Tahara, Yoshinori, to Mei San Co., Ltd. Marking apparatus for coloring lateral edge of sheet. 4,627,380, Cl. 118-77.000.

Taisho Pharmaceutical Co., Ltd.: *See—*
Shimano, Kimihide; Shimamura, Haruo; Yamaguchi, Hiroshi; Murayama, Hiroshi; Kaneko, Ryohei; and Seki, Katsura, 4,627,981, Cl. 424-84.000.

Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, to Fuji Jukogyo Kabushiki Kaisha. Motor and brake controls. 4,627,521, Cl. 192-2.000.

Takagi, Tadao, to Nippon Kogaku K. K. Automatic focusing adaptor for camera lens. 4,627,699, Cl. 354-400.000.

Takahashi, Akio; and Petrella, Robert G., to Air Products and Chemicals, Inc. Triethylenediamine containing acetylenic alcohols as flow aids. 4,628,092, Cl. 544-351.000.

Takahashi, Hiroaki; Yamazaki, Shigeru; Noguchi, Takaharu; and Arai, Takao, to Hitachi, Ltd. Rotating head type magnetic record/reproduce apparatus. 4,628,373, Cl. 360-62.000.

Takahashi, Hiroshi: *See—*
Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, 4,628,363, Cl. 358-183.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.

Takahashi, Kenji: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.

Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, to Konishiroku Photo Industry Co., Ltd. Sorting machine and image reproducing apparatus. 4,627,706, Cl. 355-14.0SH.

Takahashi, Tadashi; Hayashida, Hiroshi; Miyashita, Kunio; and Sekizawa, Sadao, to Hitachi, Ltd. Magneto resistive sensor for detecting movement of a rotating body. 4,628,259, Cl. 324-208.000.

Takahashi, Tadashi: *See—*
Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, 4,628,314, Cl. 340-870.240.

Takahashi, Tsuneo: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.

Takahashi, Yasuo: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.

Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, to Fuji Xerox Co., Ltd. Thermomagnetic recording apparatus. 4,628,328, Cl. 346-74.400.

Takai, Kazuki, to Clarion Co., Ltd. Ejection mechanism for tape player. 4,628,381, Cl. 360-93.000.

Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, to Sony Corporation. Disc loading apparatus for use in a disc player. 4,628,498, Cl. 369-77.100.

Takata, Akihiko, to Scovill Japan Kabushiki Kaisha. Ball-side piece of snap fastener. 4,627,134, Cl. 24-687.000.

Takata, Toshihiko; and Nakayama, Yoshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Porting system for internal combustion engine. 4,627,400, Cl. 123-432.000.

Takayama, Haruo: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.

Takayama, Makoto, to Canon Kabushiki Kaisha. Differential phase shift keying demodulator. 4,628,271, Cl. 329-50.000.

Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information signal recording and/or reproducing apparatus. 4,628,378, Cl. 360-77.000.

Takeda Chemical Industries, Ltd.: *See—*
Nohara, Akira; and Maki, Yoshitaka, 4,628,098, Cl. 546-271.000.
Yada, Hideo; Akaba, Kunihisa; and Mukaiyama, Megumi (said Hideo Yada assors. to), 4,627,985, Cl. 426-92.000.

Takeda, Kazuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic mail processing apparatus. 4,627,540, Cl. 209-555.000.

Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, to Idemitsu Kosan Company Limited. N-(α,α-dialkylbenzyl)-phenylacetamide compounds and herbicidal compositions containing said compounds. 4,627,874, Cl. 71-118.000.

Takenaka, Akihiko, to Nippondenso Co., Ltd. Ignition distributor. 4,627,393, Cl. 123-146.50A.

Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Composite ceramic/polymer piezoelectric material. 4,628,223, Cl. 310-358.000.

Takuwa, Toshiaki: *See—*
Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, 4,628,182, Cl. 219-130.510.

Talley, Robert L.: *See—*
Hahn, William F.; McAdams, Hirimie T.; and Talley, Robert L., 4,627,576, Cl. 241-24.000.

Talpo, Gianpietro, to SACE S.p.A. Costruzioni Elettromeccaniche. Arc contact system for electrical circuit breakers, in particular of the type using an arc extinguishing fluid. 4,628,164, Cl. 200-148.00A.

Talvalkar, Shashi G.; and Besselman, Thomas P., to NCR Corporation. Thermal transfer formulation and medium. 4,628,000, Cl. 428-341.000.

Tamada, Kazumi: *See—*
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
Sakurai, Yoshio; and Tsuruo, Takashi, 4,628,047, Cl. 514-34.000.

Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,628,485, Cl. 365-122.000.

Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, to Sumitomo Electric Industries, Ltd. Method for producing highly pure glass preform for optical fiber. 4,627,867, Cl. 65-3.120.

Tanaka, Gotaro: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.

Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, to TDK Corporation. Lock member for the lid of a magnetic tape cassette. 4,628,389, Cl. 360-132.000.

Tanaka, Minoru: *See—*
Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, 4,627,786, Cl. 414-735.000.

Tandem Computers Incorporated: *See—*
Zardiackas, Fredrick L., 4,628,449, Cl. 364-200.000.

Tang, Reginald T-H.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.

Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, to Ricoh Company, Ltd. Copier with image editing function. 4,627,707, Cl. 355-14.00R.

Tanizawa, Ryozo: *See—*
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.

Tanke, Eugene T., II: *See—*
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.

Tano, Hirofumi: *See—*
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.

Tarassoff, Serge, to Pomagalski, S.A. Overhead cable transport installation with regular spaced load supporting carriages. 4,627,361, Cl. 104-28.000.

Tarlton, Curtis S.; and Ford, Richard A., to C. & T. Tarlton, Inc. Spiral conveyor. 4,627,529, Cl. 198-778.000.

Taro Pharmaceutical Industries Ltd.: *See—*
Levitt, Barrie; and Stolar, Morris, 4,628,056, Cl. 514-270.000.

Tasaki, Akira: *See—*
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.

Tashiro, Keisuke, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Ceramic tip cast in valve rocker arm. 4,627,392, Cl. 123-90.390.

Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihisa, to Hitachi, Ltd. Facilities control method. 4,628,434, Cl. 364-130.000.

Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihis, to Hitachi, Ltd. Facilities control method. 4,628,435, Cl. 364-130.000.

Tashiro, Yasuhisa: *See—*
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, 4,628,111, Cl. 560-159.000.

Tasman Pulp and Paper Company Limited: *See—*
Whyte, Donald M., 4,627,578, Cl. 241-30.000.

Tate, John R. Golf accessory. 4,627,621, Cl. 273-32.00B.

Tate, Joseph B.; and Brown, David E., to Pressman, David, a part interest. Seismic warning system using RF energy monitor. 4,628,299, Cl. 340-540.000.

Tavis Corporation: *See—*
Tavis, John A., 4,627,281, Cl. 73-302.000.

Tavis, John A., to Tavis Corporation. Tank gaging system. 4,627,281, Cl. 73-302.000.

Taylor, Carl R.: *See—*
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.

Taylor, Michael P.: *See—*
Meo, Joseph; and Taylor, Michael P., 4,627,749, Cl. 400-121.000.

Taylor, Richard D.; and Stumpff, Phillip W. Wiring system with quick connect wire terminals. 4,627,675, Cl. 339-14.00R.

TDK Corporation: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,628,389, Cl. 360-132.000.

Techne Electronics Ltd.: *See—*
Ho, Eugene Y., 4,628,400, Cl. 361-172.000.

Technical Arts Corporation: *See—*
White, Steven J., 4,628,469, Cl. 364-560.000.

Technip Geoproduction: *See—*
Thomas, Pierre-Armand; and Naudin, Jean-Claude, 4,627,768, Cl. 405-198.000.

Tecumseh Products Company: *See—*
Morse, Robert L., 4,627,247, Cl. 62-503.000.

Teijin Limited: *See—*
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, 4,628,001, Cl. 428-367.000.

Tektronix, Inc.: *See—*
Bristol, L. Rodney, 4,628,254, Cl. 324-77.00R.
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Telefonaktiebolaget L M Ericsson: *See—*
Morwing, Bo A.; Andersson, Bengt L.; and Gustavsson, Per-Olof G., 4,628,319, Cl. 342-46.000.

Telefonaktiebolaget LM Ericsson: *See—*
Akerberg, Dag E., 4,628,152, Cl. 379-51.000.

TeleMeter Corporation: *See—*
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.

Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., to Southern Research Institute. Pyrido(2,3-D)pyrimidines. 4,628,089, Cl. 544-244.000.

Tempo Instrument Incorporated: *See—*
Weiss, Gerhart, 4,627,132, Cl. 40-447.000.

Tengs, Anthony M. Article of wearing apparel with an erasable writing surface. 4,627,110, Cl. 2-69.000.

Tenneco Canada Inc.: *See—*
Fredette, Maurice C. J.; and Yang, Ching-Shi, 4,627,969, Cl. 423-478.000.

Tennessen, Rick L.; Schulz, Harry W.; and Vanderzee, Allen J., to Verson Allsteel Press Co. Fault detection system for continuously running transfer press. 4,627,253, Cl. 72-4.000.

Terada, Kunio: *See—*
Usui, Seiji; and Terada, Kunio, 4,627,624, Cl. 277-12.000.

Terada, Masaki: *See—*
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet recording head and ink jet recorder. 4,628,333, Cl. 346-140.00R.

Terauchi, Kiyoshi, to Sanden Corporation. Axial sealing mechanism for a scroll type fluid displacement apparatus. 4,627,799, Cl. 418-55.000.

Terhune, James H.; and Gordon, Gerald M., to General Electric Company. Corrosive impurity sensor. 4,628,252, Cl. 324-65.0CR.

Ternstrom, Maj I., to Molnlycke AB. Incontinence shield for men. 4,627,846, Cl. 604-349.000.

Terzian, Berj A.: *See—*
Nance, Edwin P.; Segan, Marc H.; and Terzian, Berj A., 4,627,737, Cl. 368-239.000.

Teske, Eldor M. Automobile hinge pin remover. 4,627,141, Cl. 29-275.000.

Tetenborg, Konrad, to Windmoller & Holscher. Large sack comprising a double-walled outer sack and an inserted inner sack. 4,628,535, Cl. 383-24.000.

Tetzlaff, Karl-Heinz; Schmid, Dieter; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Process for the electrolysis of liquid electrolytes using film flow techniques. 4,627,897, Cl. 204-59.00R.

Texaco Inc.: *See—*
Kalfoglou, George, 4,627,494, Cl. 166-274.000.
Sanderson, John R.; and Yeakey, Ernest L., 4,628,108, Cl. 549-453.000.

Texas Instruments Incorporated: *See—*
Lou, Perry W., 4,628,215, Cl. 307-297.000.
Smayling, Michael C., 4,628,487, Cl. 365-185.000.

Thackrey, James D. Distorted-pool mercury switch. 4,628,161, Cl. 200-61.470.

Theeuwes, Felix: *See—*
Deters, Joseph C.; Theeuwes, Felix; Mullins, Kevin J.; and Eckenhoff, James B., 4,627,850, Cl. 604-892.000.
Wong, Patrick S. L.; and Theeuwes, Felix, 4,627,851, Cl. 604-892.000.

Theobald, Michael R.: *See—*
Laylock, Rick A.; and Theobald, Michael R., 4,627,302, Cl. 74-360.000.

Theunissen, Hendrikus J. J.: *See—*
Scheepens, Antonius H. J. M.; van Hell, Hans; and Theunissen, Hendrikus J. J., 4,628,036, Cl. 436-520.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Continuous action track leveling, lining and tamping machine. 4,627,358, Cl. 104-7.200.

Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping machine. 4,627,360, Cl. 104-7.200.

Thieme, Werner: *See—*
Breuckmann, Bernd; and Thieme, Werner, 4,627,729, Cl. 356-347.000.

Thierry, Gerard: *See—*
Rialan, Joseph; and Thierry, Gerard, 4,628,494, Cl. 307-79.000.

Thigpen, F. Bruce; and Price, Edison A., to Eminent Technology, Inc.; and Edison Price, Inc. Air bearing straight line tracking phonograph tonearm. 4,628,500, Cl. 369-249.000.

Tholander, Lars H. G., to Aktiebolaget IRO. Yarn storing, feeding and measuring device. 4,627,474, Cl. 139-452.000.

Thomas & Betts Corporation: *See—*
Biswas, Ranjit, 4,627,678, Cl. 339-17.0CF.

Thomas, Dalton A. Apparatus for circulating cleaning fluid through a cooling system. 4,627,798, Cl. 417-415.000.

Thomas, Gilles, to Thomson CSF. Integrated circuit structure comprising CMOS transistors having high blocking voltage capability and method of fabrication of said structure. 4,628,341, Cl. 357-42.000.

Thomas, Gunter: *See—*
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.

Thomas, Kendolph A.: *See—*
Roller, George J.; and Thomas, Kendolph A., 4,627,605, Cl. 271-94.000.

Thomas, Pierre-Armand; and Naudin, Jean-Claude, to Technip Geoproduction. Locking device for oil platforms. 4,627,768, Cl. 405-198.000.

Thomas, Thomas: *See—*
Seyedin, Saeid; and Thomas, Thomas, 4,627,982, Cl. 424-95.000.

Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., to Exxon Production Research Co. Method and means for determining physical properties from measurements of microstructure in porous media. 4,628,468, Cl. 364-556.000.

Thompson-Chemtrex, Inc.: *See—*
Bowes, H. David; and Kuhn, Edward S., 4,627,790, Cl. 415-53.00R.

Thompson, David R., to Pico Electronics Limited. Electrical appliance control. 4,628,440, Cl. 364-140.000.

Thompson, Gordon L.; Gudgeon, Brian; and Wombwell, Kenneth J., to International Computers Limited. Printed circuit boards. 4,628,409, Cl. 361-403.000.

Thompson, Kenneth H. Safeguard for serrated twist-off bottle cap. 4,627,548, Cl. 215-295.000.

Thompson, Michael D.; and Imes, Clifford W., IV, to Xerox Corporation. Cleaning apparatus for a xerographic reproducing apparatus. 4,627,717, Cl. 355-15.000.

Thompson, Norman C.: *See—*
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., 4,628,518, Cl. 375-88.000.

Thompson, Richard C., executor: *See—*
Havens, Glenn G., deceased; and Thompson, Richard C., executor, 4,627,573, Cl. 239-542.000.

Thompson, Thomas J.: *See—*
Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.

Thompson, William L., to Babcock & Wilcox Company, The. Electronics for fiber optic vortex shedding flow meter. 4,628,197, Cl. 250-227.000.

Thompson, William R.: *See—*
Smith, Gerald R.; and Thompson, William R., 4,627,899, Cl. 204-95.000.

Thomson Components-Mostek Corporation: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.

Thomson Components-Mostok Corporation: *See—*
Lee, Robert D., 4,628,250, Cl. 323-317.000.

Thomson CSF: *See—*
Boue, Philippe, 4,628,352, Cl. 358-93.000.
Desmons, Gerard; and Marchand, Gilles, 4,628,342, Cl. 358-10.000.
Thomas, Gilles, 4,628,341, Cl. 357-42.000.

Thomson CSF Telephone: *See—*
Cartret, Roger; and Volpe, Giovanni, 4,628,447, Cl. 364-200.000.
Thordarson, Gunnar G.; and Bido , Sven O., to U.S. Philips Corporation. Fuse for projectiles. 4,627,351, Cl. 102-213.000.
Thorn Emi Automation Limited: *See—*
Neasham, David L., 4,628,244, Cl. 320-48.000.
Thorn, Gernot: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.
Thorn, Walter, to MTU Friedrichshafen GmbH. Pivotal slide valve. 4,627,567, Cl. 236-34.500.
Tinios, Pantelis G., to Westinghouse Electric Corp. Pulse wheel system with shaft mounting. 4,628,200, Cl. 250-231.0SE.
Tire-Gator, Inc.: *See—*
Holiman, William E.; and O'Keefe, Henry, 4,627,581, Cl. 241-167.000.
Toben, Michael P.: *See—*
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.
Tobita, Kuniharu: *See—*
Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, 4,627,804, Cl. 425-71.000.
Tocco, Inc.: *See—*
West, William D., 4,628,167, Cl. 219-10.570.
Todter, Heinrich, to Hermann Berstorff Maschinenbau GmbH. Device for opening the roll nip in an apparatus comprising a pair of rollers. 4,627,262, Cl. 72-248.000.
Tojo, Shigeki: *See—*
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, 4,627,571, Cl. 239-90.000.
Tokico Ltd.: *See—*
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,552, Cl. 222-14.000.
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,553, Cl. 222-14.000.
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, to Hitachi, Ltd. Immunoassay method. 4,628,035, Cl. 436-518.000.
Toko, Inc.: *See—*
Endou, Kunihisa, 4,628,148, Cl. 174-52.0PE.
Tokyo Cosmos Electric Co., Ltd.: *See—*
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Tokyo Electric Co., Ltd.: *See—*
Kitagawa, Tohru; and Sakamoto, Koichiro, 4,628,296, Cl. 338-3.000.
Yagi, Norio; and Nuita, Akira, 4,627,752, Cl. 400-144.200.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hashimoto, Kazuhiko, 4,628,340, Cl. 357-42.000.
Masuoka, Fujio, 4,627,153, Cl. 29-571.000.
Murao, Yutaka, 4,628,448, Cl. 364-200.000.
Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, 4,628,355, Cl. 358-111.000.
Omori, Shozo, 4,627,219, Cl. 53-399.000.
Saku, Koji; and Horiguchi, Fumio, 4,628,488, Cl. 365-222.000.
Takeda, Kazuo, 4,627,540, Cl. 209-555.000.
Toliver, Samuel: *See—*
Roberts, Gerald E.; and Toliver, Samuel, 4,627,379, Cl. 118-721.000.
Tom McGuane Industries, Inc.: *See—*
Johnstone, David L., 4,627,463, Cl. 137-510.000.
Tomino, Tadashi; and Higuchi, Masayuki, to Sharp Kabushiki Kaisha. Electronic assembly including integrated circuit package and liquid crystal display panel. 4,627,676, Cl. 339-17.0CF.
Tomiyama, Shunsuke: *See—*
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.
Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Cam grooves for displacing lenses. 4,627,691, Cl. 350-429.000.
Tonomura, Kenichi: *See—*
Endo, Shuichi; and Tonomura, Kenichi, 4,628,510, Cl. 371-21.000.
Toriumi, Mototada: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Torrence, George P.: *See—*
Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, 4,628,041, Cl. 502-24.000.
Toshimitsu, Yoshihiko; Aoyama, Toshihiko; and Ishida, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Damping force-variable damper device for vehicles provided with power steering device. 4,627,637, Cl. 280-714.000.
'totes', incorporated: *See—*
Okuda, Toshio; and Wu, Tsun-Zong, 4,627,455, Cl. 135-25.00A.
Toyo Stauffer Chemical Co., Ltd.: *See—*
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,628,120, Cl. 568-322.000.
Toyoda Gosei Co., Ltd.: *See—*
Hayashi, Chikahisa; Kawai, Makoto; and Adachi, Mikio, 4,627,280, Cl. 73-290.00R.
Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, 4,627,638, Cl. 280-779.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Ohta, Takeshi; Yamakage, Tetsuro; and Sakakibara, Yoshio, 4,628,458, Cl. 364-474.000.
Toyoguchi, Tsutomu: *See—*
Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, 4,628,498, Cl. 369-77.100.
Toyomaki, Kazuya: *See—*
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, 4,628,282, Cl. 331-1.00A.
Toyota Jidosha Kabushiki Kaisha: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Toyota Jodosha Kabushiki Kaisha: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.
Transamerica Delaval Inc.: *See—*
Stadlmann, Wilfried, 4,628,375, Cl. 360-71.000.
Transnuclear GmbH: *See—*
Botzem, Werner; and Schlich, Elmar, 4,627,956, Cl. 376-272.000.
Transport Investment Corp.: *See—*
O'Neill, Hugh, 4,627,629, Cl. 280-5.00D.
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Trenkle, Robert W.: *See—*
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Troscinski, Mark A., to Sundstrand Corporation. Rectifier assembly for mounting in a rotor. 4,628,219, Cl. 310-68.00D.
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TRW Cam Gears Limited: *See—*
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Tseng, Kuo-yuan. Mobile garbage incinerator. 4,627,365, Cl. 110-240.000.
Tsuchihashi, Genichi; and Suzuki, Keisuke, to Toyo Stauffer Chemical Co., Ltd. Preparing method of optically active ketones. 4,628,120, Cl. 568-322.000.
Tsuchiya Co., Ltd.: *See—*
Nishida, Katsuhiko; Naruse, Tokio; and Shibata, Hiroshi, 4,627,283, Cl. 73-313.000.
Tsuchiya, Toshiaki: *See—*
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Tsuk, Andrew G., to American Home Products Corporation. Storage-stable transdermal adhesive patch. 4,627,429, Cl. 128-156.000.
Tsuruo, Takashi: *See—*
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Tsutiya, Yasuhiro: *See—*
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Turner, Robert, to Johns Hopkins University, The. Method and apparatus using laser radiation for generating and measuring gas bubbles. 4,627,726, Cl. 356-336.000.
Tutco, Inc.: *See—*
Sherrill, Jimmy L., 4,628,190, Cl. 219-532.000.
Tutzer, Peter, to Dr. Ing h.c.F. Porsche AG. Intermediate differential for a vehicle including a spur gear/planetary gear arrangement. 4,627,513, Cl. 180-249.000.
Twerdochlib, Michael, to Westinghouse Electric Corp. Temperature measuring apparatus. 4,628,196, Cl. 250-225.000.
Tymes, LaRoy, to Excellon Industries. Method and apparatus for pattern forming. 4,628,466, Cl. 364-521.000.
Uarco Incorporated: *See—*
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Uchida, Satoru: *See—*
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Uggerud; Kristian. Bed tick with pocket for user's feet. 4,627,123, Cl. 5-485.000.
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Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, to General Motors Corporation. Hand engine and brake control mechanism for a vehicle. 4,627,522, Cl. 192-35.000.
Ultimate Survivor of America Inc.: *See—*
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Umehara, Hajime: *See—*
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Umetsu, Junichi. Apparatus for producing polyacetylene film. 4,627,803, Cl. 425-6.000.
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Bartley, William J., 4,628,129, Cl. 568-864.000.
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Air Force: *See—*
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Huber, Michael S., 4,627,327, Cl. 89-1.816.
Iwanciow, Bernard L., 4,628,010, Cl. 429-19.000.
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Smulders, Hendricus F. G.; Hagen, Johannes L. M.; and Dona, Marinus J. J., 4,628,238, Cl. 318-653.000.
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United Steel & Wire Company: *See—*
Nicely, Charles W., 4,627,543, Cl. 211-187.000.
United Technologies Automotive, Inc.: *See—*
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University of California, The Regents of the: *See—*
Gough, David A., 4,627,906, Cl. 204-415.000.
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Land, David V., 4,627,442, Cl. 128-736.000.
University of Melbourne: *See—*
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Gay, Steffen, 4,628,027, Cl. 435-7.000.
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Vancelette, Stanley R., 4,627,156, Cl. 29-740.000.
Usui, Seiji; and Terada, Kunio, to Horiba, Ltd. Packing having multiple seal portions. 4,627,624, Cl. 277-12.000.
Vaal Reefs Exploration and Mining Co.: *See—*
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van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., to Packard Instrument Company, Inc. Regionless multiple label scintillation counting. 4,628,205, Cl. 250-361.00R.
Vancelette, Stanley R., to USM Corporation. Placement head for micro-component assembly machine. 4,627,156, Cl. 29-740.000.
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Venco Manufacturing, Inc.: *See—*
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Veng, Niels S., to Brdr. Skov A/S. Batch weighing apparatus. 4,627,506, Cl. 177-25.000.
Venturini, Marco; and Alesina, Alberto. Method and apparatus for the conversion of a polyphase voltage system. 4,628,425, Cl. 363-10.000.
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Vescio, Donald W.; and Travers, Harry T., to R. E. Dietz Company. Automotive lamp. 4,628,415, Cl. 362-61.000.

Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, to Gilley and Associates. Method of removing dissolved oil from produced water. 4,627,922, Cl. 210-704.000.

Victor Company of Japan, Ltd.: *See*—
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Vilmur, Richard J.: *See*—
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Vinci, Rene. Bark restraining device for dogs. 4,627,385, Cl. 119-29.000.

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Harshbarger, John H., III; and Harshbarger, John H., Jr., 4,627,483, Cl. 165-2.000.

Vitramon, Incorporated: *See*—
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Vittoz, Eric A.; and Oguey, Henri J., to Centre Electronique Horloger S.A. Amplifier with input drift voltage compensation. 4,628,274, Cl. 330-9.000.

Vlasak, Weldon R. H., to International Telephone and Telegraph Corporation. Optical amplifier. 4,628,273, Cl. 330-4.300.

Vodinh, Hien; and Pooler, Robert E., to NAP Consumer Electronics Corp. Motorized unit for home entertainment devices. 4,628,237, Cl. 318-626.000.

Voege, Herbert; and Sieveking, Hans U., to Bayer Aktiengesellschaft. Stabilizing quinoxaline di-N-oxides against light degradation. 4,628,054, Cl. 514-234.000.

Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., to Set Manufacturing Co., a part interest. Power-assisted semi-trailer truck body top cover. 4,627,658, Cl. 296-100.000.

Vold, Hilda M.: *See*—
Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.

Volk, David. Indirect ophthalmoscopy lens for use with slit lamp biomicroscope. 4,627,694, Cl. 351-214.000.

Volpe, Giovanni: *See*—
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Von Duprin, Inc.: *See*—
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von Bittera, Miklos; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Active compound release systems. 4,627,852, Cl. 604-897.000.

von der Becke, Reinhard; and Schultz, Horst. Steam pressure cooker. 4,627,417, Cl. 126-369.000.

Von Fellenberg, Jost. Psychotechnological testing method and device therefor. 4,627,818, Cl. 434-236.000.

von Gemmingen, Ulrich, to Linde Aktiengesellschaft. Process for the adsorptive separation of steam and a less readily adsorbable component from a gaseous stream. 4,627,856, Cl. 55-31.000.

Von Holdt, John W. Collapsible core. 4,627,810, Cl. 425-577.000.

von Lersner, Wolf A., to Campbell Soup Company. Product-dispensing apparatus. 4,627,475, Cl. 141-107.000.

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Vora, Madhukar B.; and Hingarh, Hemraj K., to Fairchild Camera & Instr. Corp. Polycrystalline silicon Schottky diode array. 4,628,339, Cl. 357-15.000.

Voss, Gerd, to Storopack, Hans Reichenecker GmbH & Co. Process for producing pourable spherical-segment-shaped packing material particles made of plastic. 4,627,947, Cl. 264-53.000.

Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, to Mannesmann Aktiengesellschaft. Electrode arrangement in heat run vessels. 4,628,516, Cl. 373-72.000.

W.C. Heraeus GmbH: *See*—
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W. Schmid AG: *See*—
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Wada, Toshiaki, to Sumitomo Special Metals Co., Ltd. Flatness measuring apparatus. 4,627,733, Cl. 356-359.000.

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Wakabayashi, Masayoshi: *See*—
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Waldner, Kurt. Apparatus and method for processing a semiconductor lead frame. 4,627,159, Cl. 29-827.000.

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Walker, John D., to General Electric Company, p.l.c., The. Modulation circuit for DC-DC converter with R-C oscillator. 4,628,428, Cl. 363-21.000.

Walker, John D., to General Electric Company, p.l.c., The. DC-DC converter with galvanically isolated feedback voltage regulation. 4,628,429, Cl. 363-21.000.

Walter, Berthold: *See*—
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Walther, Frank H., Jr.: *See*—
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Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., to Kimberly-Clark Corporation. Tampon. 4,627,849, Cl. 604-379.000.

Walz, Theo, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for charging receptacles with stacked, flat items. 4,627,215, Cl. 53-246.000.

Wang, Jeng-Maw. Automatic fishing machine. 4,627,186, Cl. 43-16.000.

Wang, Ke-Chin: *See*—
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Wang Laboratories, Inc.: *See*—
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Ward, Gregg D., to Energy Pipelines International Company. Method of producing pipe joints. 4,627,146, Cl. 29-458.000.

Warn Industries, Inc.: *See*—
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Wassenaar, Roelof F.: *See*—
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Watanabe, Eiji: *See*—
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Water Services of America, Inc.: *See*—
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Waters, James P.; and Fernald, Mark R., to United Technologies Corporation. Common optical path interferometric gauge. 4,627,731, Cl. 356-349.000.

Waterstrat, Richard M., to American Dental Association Health Foundation. Arc-furnace for the production of small investment castings of reactive or refractory metals such as titanium. 4,627,482, Cl. 164-514.000.

Watson, Gary Q., to ROCA Technologies, Inc. Three position fireplace cooker. 4,627,413, Cl. 126-137.000.

Wattach, Gunter: *See*—
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Wattiez, Daniel: *See*—
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Watts, John D., to Lockwood Technical, Inc. Rotary screen printing apparatus. 4,627,345, Cl. 101-119.000.

Wayland, James R., Jr.: *See*—
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,628,267, Cl. 324-376.000.

Wayne State University: *See*—
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Weaver, James A., to Cooper Lasersonics, Inc. System for autocorrelating optical radiation signals. 4,628,473, Cl. 364-822.000.

Webb, Terence W.: *See*—
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Weber S.p.A.: *See*—
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Schlosser, Erich J., 4,627,408, Cl. 126-41.00R.

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Weedling, Robert: *See*—
Wegener, Jack; Johnson, Raynor A.; and Weedling, Robert, 4,627,426, Cl. 128-132.00R.

Wegener, Jack; Johnson, Raynor A.; and Weedling, Robert, to American Industrial Research, In. Tear-away sterile and absorbent sheet for operating table use. 4,627,426, Cl. 128-132.00R.

Wegmuller, Hans: *See*—
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Weimer, Charles L.; and Richards, Barry R., to Westinghouse Electric Corp. Bridging joint for electric power busway. 4,627,680, Cl. 339-22.00B.

Weinberg, Melvin S.: *See*—
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Weinert, Raymond J., Jr.: *See*
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Weinschel Engineering Co., Inc.: *See*—
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Weirauch, Douglas A., Jr., to Owens-Corning Fiberglas Corporation. Water resistant glass fibers. 4,628,038, Cl. 501-35.000.

Weise, Lutz: *See*—
Belart, Juan; Weise, Lutz; and Seibert, Wolfram, 4,627,669, Cl. 303-114.000.

Weiss, Gerhart, to Tempo Instrument Incorporated. Bi-stable display device. 4,627,182, Cl. 40-447.000.

Welsch, Bernhard J., to Uarco Incorporated. Label bearing continuous business form. 4,627,994, Cl. 428-41.000.

Wengert, Rolf: *See*—
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Werdecker, Waltraud: *See*—
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Werjefelt, Bertil, to Du Pont de Nemours, E. I., and Company. Protective hood with CO_2 absorbent. 4,627,431, Cl. 128-201.250.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
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Werthemann, Dieter: *See*—
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West, Eugene L., to Bradford-White Corporation. Foam insulated water heater and method of making same. 4,628,184, Cl. 219-312.000.

West, William D., to Tocco, Inc. Apparatus for inductively hardneing the interior surface of objects. 4,628,167, Cl. 219-10.570.

Western Gear Machinery Co.: *See*—
Veale, John P., 4,627,196, Cl. 51-281.00R.

Westinghouse Brake and Signal Company Limited: *See*—
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Westinghouse Electric Corp.: *See*—
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Gause, James E.; and Armiger, Ronald E., 4,627,355, Cl. 102-378.000.
Hornak, Leonard P., 4,627,142, Cl. 29-283.500.
McConnell, William P., 4,628,464, Cl. 364-513.000.
Putman, Richard E., 4,628,462, Cl. 364-494.000.
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White, Christine A.; Dulbecco, Renato; and Allen, William R., to Salk Institute for Biological Studies, The. Monoclonal antibody specific for a mammary tumor cytoplasmic antigen. 4,628,032, Cl. 435-240.000.

White, Jonathan C., to AT&T Bell Laboratories. Tunable indium UV anti-Stokes Raman laser. 4,628,513, Cl. 372-3.000.

White, Steven J., to Technical Arts Corporation. Method and apparatus for locating center of reference pulse in a measurement system. 4,628,469, Cl. 364-560.000.

Whitehead, Roy A.: *See*—
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,628,037, Cl. 436-526.000.

Whyte, Daniel G.: *See*—
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Whyte, Donald M., to Tasman Pulp and Paper Company Limited. Methods of and/or apparatus for detecting and controlling refiner plate clashing. 4,627,578, Cl. 241-30.000.

Wickmann Werke GmbH: *See*—
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Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Process for the production of dienes from aldehydes. 4,628,140, Cl. 585-606.000.

Wiebe, Ulrich; and Wilmes, Manfred, to C.A. Weidmuller GmbH & Co. Stripping device, particularly for conductors with tough insulation. 4,627,314, Cl. 81-9.430.

Wieszeck, James M.; and Wieszeck, Paul C. Flexible conduit fixturing. 4,628,141, Cl. 136-233.000.

Wieszeck, Paul C.: *See*—
Wieszeck, James M.; and Wieszeck, Paul C., 4,628,141, Cl. 136-233.000.

Wilcke, Gerhard, to Berolina International Marketing Strategie GmbH. Toner refill container. 4,627,476, Cl. 141-364.000.

Wildt, Eberhard, to Robert Casaretto KG. Device for treating nonwovens. 4,627,137, Cl. 29-121.200.

Wilke, Raud A.; and Paik, Michael, to Husco International, Inc. Hydraulic control valve with manual override. 4,627,468, Cl. 137-625.660.

Wilkening, Hermann: *See*—
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Will, Fritz G.: *See*—
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Willatts, Brian A.: *See*—
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Willhoft, Edward M. A. Cryogenic cooling. 4,627,244, Cl. 62-63.000.

Williams, Daniel W.: *See*—
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Williams, John T.: *See*—
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Williams, Richard W.: *See*—
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Williams, Theodore M. Fish stunning assembly. 4,627,187, Cl. 43-17.100.

Willis, Edwin: *See*—
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Willson, Jolyon P., to International Standard Electric Corporation. Compensated Fabry Perot sensor. 4,627,728, Cl. 356-345.000.

Wilmes, Manfred: *See*—
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Wilson, Arthur C., to General Electric. Refrigerator compartment partition and method of assembly. 4,627,246, Cl. 62-286.000.

Wilson, Norman H.: *See*—
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Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, to Bayer Aktiengesellschaft. Amines, processes for their preparation and their use in compositions which can undergo free radical polymerization. 4,628,112, Cl. 560-160.000.

Winkelbauer, Howard M.; Wang, Ke-Chin; Walther, Frank H., Jr.; and Stock, Donald F., to Dresser Industries, Inc. Method of manufacturing an injection molded refractory shape and composition thereof. 4,627,945, Cl. 264-29.500.

Winney, Randy A., to Mobil Oil Corporation. Method of avoiding aliasing in slant stacking of seismic data. 4,628,492, Cl. 367-63.000.

Winter, Gerhard, to Schon & Cie. Gesellschaft mit beschrankter Haftung. Device for supporting the last on a toe lasting machine. 4,627,124, Cl. 12-12.400.

Winther, Howard A., to Royal Waterbeds, Inc. Damped waterbed mattress and method for manufacturing same. 4,627,121, Cl. 5-451.000.

Winthrop, Marilyn P. Nail polish removing apparatus. 4,627,758, Cl. 401-208.000.

Wise, Mahlon. Lathe, duplicating. 4,627,477, Cl. 142-7.000.

Wittes, James M., to Stiefel Laboratories, Inc. Sponge and fabrication method. 4,627,129, Cl. 15-244.00C.

Wittkower, Andrew, to Eaton Corporation. Particle implantation apparatus and method. 4,628,209, Cl. 250-492.200.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Method of and apparatus for starting up individual working elements of a textile machine, e.g. a spinning machine. 4,627,228, Cl. 57-88.000.

Wombwell, Kenneth J.: *See*—
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Wong, Patrick S. L.; and Theeuwes, Felix, to ALZA Corporation. Colonic-therapeutic delivery system. 4,627,851, Cl. 604-892.000.

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Worrell, Wayne L.; and Liu, Qing-Guo, to University Patents, Inc. Electrochemical sensors and methods for their manufacture and use. 4,627,892, Cl. 204-1.00T.

Wright, Bernard S.: *See*—
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Wright, Brian L. Accessory for yachts. 4,627,374, Cl. 114-218.000.

Wright, Christopher R.: *See—*
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Wu, Zhiqion: *See—*
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Wusthof, Peter; Schneider, Johann; and Schulz, Ewald, to Mannesmann Rexroth GmbH. Rotary gear machine with commutator and shaft in flange housing. 4,627,801, Cl. 418-61.00B.
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Moore, Kenneth P., 4,627,606, Cl. 271-98.000.
Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., 4,627,721, Cl. 355-77.000.
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Yada, Hideo; Akaba, Kunihisa; and Mukaiyama, Megumi, to Takeda Chemical Industries, Ltd., by said Hideo Yada; and Asahi-Matsu Foods Inc., by said Kunihisa Akaba and Megumi Mukaiyama. Processed soybean foods and their production. 4,627,985, Cl. 426-92.000.
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, to Kitagawa Industries Co., Ltd.; and Kitagawa Industries Co., Ltd. Plate holder. 4,627,760, Cl. 403-201.000.
Yagi, Norio; and Nuita, Akira, to Tokyo Electric Co., Ltd. Daisy wheel printing device with variable hammer delay. 4,627,752, Cl. 400-144.200.
Yajima, Hiroshi, to Casio Computer Co., Ltd. Optical tracking robot system. 4,627,511, Cl. 180-167.000.
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Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, to Shin Etsu Chemical Co., Ltd. Vinyl chloride resin-based composition for floppy disc jacket. 4,628,070, Cl. 524-504.000.
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Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, to Tokico Ltd. Fuel supplying apparatus. 4,627,552, Cl. 222-14.000.
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, to Tokico Ltd. Fuel supplying apparatus having quantity and price preset switches. 4,627,553, Cl. 222-14.000.
Yoshida, Takumori, to Yamaha Hatsudoki Kabushiki Kaisha. Intake control system of engine. 4,627,396, Cl. 123-302.000.
Yoshida, Tatsuya; and Katada, Hiroshi, to Hitachi, Ltd. Load detecting apparatus and ignition control apparatus for internal combustion engines. 4,627,399, Cl. 123-419.000.
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Young, Alastair J.: *See—*
Bainbridge, Wilfred N.; and Young, Alastair J., 4,627,301, Cl. 74-333.000.
Young, Joe W., to American Hospital Supply Corporation. Patient controlled analgesia conversion. 4,627,839, Cl. 604-121.000.
Young, Kenneth E.; Frohlich, Robert T.; Dudley, Hubert T.; and Hallock, Robert L., Jr., to W. R. Grace & Co.; and E.S. Products Co. Fastener for securing roofing material to cementitious roof decks having removable tab. 4,627,207, Cl. 52-361.000.
Young, Niels O. Homopolar motor with pressurized liquid metal contact. 4,628,221, Cl. 310-178.000.
Young, Robert W.: *See—*
Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., 4,627,849, Cl. 604-379.000.
Yu, Ruey J.; and Martino, William L., Jr., to Motorola, Inc. Clock signal test circuit. 4,628,253, Cl. 324-73.00R.
Yuasa Battery Co., Ltd.: *See—*
Kagawa, Hiroshi, 4,627,996, Cl. 428-104.000.
Yui, Katsufumi, to E.D.M. Corporation. Heated sleeve printing roll couple with clutch-brake unit control. 4,627,342, Cl. 101-25.000.
Yuki, Yoichi, to Daicel Chemical Industries, Ltd. Resolving agent. 4,627,919, Cl. 210-656.000.
Zafred, Paolo R.; and Veronesi, Luciano, to Westinghouse Electric Corp. Remote center compliance device. 4,627,169, Cl. 33-169.00C.
Zambon S.p.A.: *See—*
Meneghin, Mariano, 4,628,087, Cl. 544-41.000.
Zardiackas, Fredrick L., to Tandem Computers Incorporated. Vector interrupt system and method. 4,628,449, Cl. 364-200.000.
Zborovsky, Ilya: *See—*
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William, 4,627,335, Cl. 99-325.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyamide imides produced from either lactams or polyamides with isocyanates or anhydrides in which products are precipitated with a non-solvent. 4,628,079, Cl. 528-49.000.
Zeikus, Joseph G.; and Hyun, Hyung-Hwan, to Michigan Biotechnology Institute. Thermostable starch converting enzymes. 4,628,031, Cl. 435-205.000.
Zeiser, Manfred P.: *See—*
Kreylos, Hans-Albert; and Zeiser, Manfred P., 4,627,136, Cl. 29-160.600.
Zeman, Nancy W.: *See—*
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, 4,628,028, Cl. 435-95.000.
Zenith Electronics Corporation: *See—*
Borg, Arthur N.; and Bar-Hai, Giora, 4,628,479, Cl. 364-900.000.
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., 4,627,157, Cl. 29-741.000.
Ensinger, James W., 4,628,348, Cl. 358-39.000.
Midland, Richard W., 4,628,349, Cl. 358-67.000.
Zeorlin, Daniel H., to Boeing Company, The. Stowage receiver for fixed length rod. 4,627,590, Cl. 248-351.000.
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, to Dolomitwerke GmbH. Method of manufacturing a sintered dolomite in a shaft kiln. 4,627,948, Cl. 264-56.000.
Zhang, Renhao: *See—*
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion, 4,628,181, Cl. 219-130.330.
Ziegler, John H.: *See—*
Daniels, John A.; and Ziegler, John H., 4,627,657, Cl. 296-91.000.
Zils, James A.: *See—*
Pamer, W. Richard; and Zils, James A., 4,627,776, Cl. 411-179.000.
Zinger, William H.; and Krill, Jerry A., to Johns Hopkins University, The. Multiport rectangular TE_{10} to circular TE_{01} mode transducer having pyrimidal shaped transducing means. 4,628,287, Cl. 333-137.000.
Zinser Textilmaschinen GmbH: *See—*
Wolf, Horst, 4,627,228, Cl. 57-88.000.
ZNIKA: *See—*
Marvakov, Ivan K.; and Russev, Todor Y., 4,628,427, Cl. 363-27.000.
Zondler, Helmut: *See—*
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.
Zoonens, Alain. Davit device. 4,627,377, Cl. 114-373.000.
Zunkel, Gary D., to Halliburton Company. Well packer. 4,627,491, Cl. 166-126.000.
Zupancic, Joseph J.; and Swedo, Raymond J., to Allied Corporation. Facilitated gas enrichment membrane composites and a process for the preparation thereof. 4,627,859, Cl. 55-158.000.
Zwosta, Helge. Method and instrument for generating acoustic and/or visual effects by human body actions. 4,627,324, Cl. 84-1.010.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Almond, Stephen W.; and Harris, Phillip C., to Halliburton Company. Fracturing method for stimulation of wells utilizing carbon dioxide based fluids. Re. 32,302, Cl. 166-308.000.

American Medical Products Corp.: *See—*
Lasker, Norman; and Jarrell, Bruce E., Re. 32,303, Cl. 604-29.000.

Bianchi, Valerio: *See—*
Latsch, Reinhard; and Bianchi, Valerio, Re. 32,301, Cl. 123-440.000.

Halliburton Company: *See—*
Almond, Stephen W.; and Harris, Phillip C., Re. 32,302, Cl. 166-308.000.

Harris, Phillip C.: *See—*
Almond, Stephen W.; and Harris, Phillip C., Re. 32,302, Cl. 166-308.000.

Jarrell, Bruce E.: *See—*
Lasker, Norman; and Jarrell, Bruce E., Re. 32,303, Cl. 604-29.000.

Lasker, Norman; and Jarrell, Bruce E., to American Medical Products Corp. Peritoneal dialysis apparatus. Re. 32,303, Cl. 604-29.000.

Latsch, Reinhard; and Bianchi, Valerio, to Robert Bosch GmbH. Method and apparatus for controlling the composition of the combustible mixture of an engine. Re. 32,301, Cl. 123-440.000.

Robert Bosch GmbH: *See—*
Latsch, Reinhard; and Bianchi, Valerio, Re. 32,301, Cl. 123-440.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See—*
McCarthy, Alfred F., 287,120, Cl. D13-23.000.
McCarthy, Alfred F., 287,121, Cl. D13-23.000.

Abe, Ryouichi: *See—*
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.

Accurist S.A.: *See—*
Levene, Maurice, 287,108, Cl. D11-4.000.
Levene, Maurice, 287,109, Cl. D11-4.000.

Adams, Peter G., to Hestair Kiddicraft Limited. Rattle. 287,148, 12-9-86, Cl. D21-65.000.

Akiyama, Kunio: *See—*
Sugiyama, Masakazu; and Akiyama, Kunio, 287,138, Cl. D18-1.000.

Albertini, Rocco D., to Baldt Incorporated. Separable chain link. 287,102, 12-9-86, Cl. D8-499.000.

Anderson, Henry P. Gun butt plate. 287,158, 12-9-86, Cl. D22-111.000.

Austin, Arnold S., to Quabaug Corporation. Shoe sole. 287,065, 12-9-86, Cl. D2-320.000.

Austin, Arnold S., to Quabaug Corporation. Shoe heel. 287,066, 12-9-86, Cl. D2-323.000.

Avicom International, Inc.: *See—*
Shilton, Albert R.; and DeSmet, Greg L., 287,145, Cl. D21-13.000.

B.W.B. Controls, Inc.: *See—*
Bergeron, Ned; and Stollberg, Theodore A., 287,107, Cl. D10-121.000.

Babb, Larry F.; and Boise, Charles A., to Emerson Electric Co. Cart for a drain cleaning machine. 287,178, 12-9-86, Cl. D34-24.000.

Baldt Incorporated: *See—*
Albertini, Rocco D., 287,102, Cl. D8-499.000.

Bates Manufacturing Company, The: *See—*
Staubitz, Robert; and Leszczak, John, 287,070, Cl. D3-35.000.

Baumgartner, Robert: *See—*
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.

Becker, Peter, to Krone GmbH. Handset telephone and stand unit. 287,124, 12-9-86, Cl. D14-53.000.

Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Motor housing for canister type electric vacuum cleaner. 287,171, 12-9-86, Cl. D32-25.000.

Bergeron, Ned; and Stollberg, Theodore A., to B.W.B. Controls, Inc. Indicator lens. 287,107, 12-9-86, Cl. D10-121.000.

Blue Box Toy Factory Limited: *See—*
Choi, Tzi-Chan, 287,153, Cl. D21-150.000.

Boise, Charles A.: *See—*
Babb, Larry F.; and Boise, Charles A., 287,178, Cl. D34-24.000.

Bound, Patrick S. Combined helmet and beverage container supports. 287,061, 12-9-86, Cl. D2-246.000.

Bounds, William E. Condiment mill. 287,088, 12-9-86, Cl. D7-53.000.

Bowsher, Robert L. Shoe rack. 287,078, 12-9-86, Cl. D6-450.000.

Bushman, James A., to St. Louis Music Supply Company. Musical instrument string adjuster. 287,137, 12-9-86, Cl. D17-20.000.

Bussell, Linda D. Animal figure. 287,152, 12-9-86, Cl. D21-148.000.

Catania, Hilda B., co-executor: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Catania, Joseph J., deceased (by Catania, Hilda B., co-executor); Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, to Century Fireplace Furnishings, Inc. Fireplace screen. 287,167, 12-9-86, Cl. D23-138.300.

Century Fireplace Furnishings, Inc.: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Cesaroni, William C., to Dart Industries Inc. Electric beverage maker. 287,089, 12-9-86, Cl. D7-309.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Newspaper vending machine. 287,143, 12-9-86, Cl. D20-6.000.

Charleswood Furniture Corp.: *See—*
Gambon, Thomas F., 287,082, Cl. D6-491.000.

Choi, Tzi-Chan, to Blue Box Toy Factory Limited. Toy scuba figure. 287,153, 12-9-86, Cl. D21-150.000.

Clapp, Dorine M. Deck of playing cards. 287,147, 12-9-86, Cl. D21-43.000.

Colin, George M.; and Patterson, Bettie L., to Colin, George M. Combined shower stall foot stool and storage compartment. 287,075, 12-9-86, Cl. D6-349.000.

Conn. National Bank, co-executor: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Cory, Milton T., to Radiator Specialty Company. Elastic tie down strap. 287,099, 12-9-86, Cl. D8-394.000.

Crevling, Robert L., Jr.: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.

Dale, John D.: *See—*
Lipsky, Steven J.; and Dale, John D., 287,165, Cl. D24-51.000.
Lipsky, Steven J.; and Dale, John D., 287,166, Cl. D24-51.000.

Dart Industries Inc.: *See—*
Cesaroni, William C., 287,089, Cl. D7-309.000.

Densen, Mark. Storage cabinet. 287,080, 12-9-86, Cl. D6-446.000.

de Sanson, Carmen C. C. Doll or similar article. 287,154, 12-9-86, Cl. D21-166.000.

DeSmet, Greg L.: *See—*
Shilton, Albert R.; and DeSmet, Greg L., 287,145, Cl. D21-13.000.

DeTuzzi, Russell: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

DiFede, John. Bucket mountable mop hanger. 287,174, 12-9-86, Cl. D32-54.000.

Dunn, Matthew G. Dart game board. 287,144, 12-9-86, Cl. D21-6.000.

Durand, Jean-Jacques. Frying pan or similar article. 287,092, 12-9-86, Cl. D7-361.000.

Egly, Robert A.; and Sullivan, Patrick. Magnetic disk storage case. 287,069, 12-9-86, Cl. D3-35.000.

Elliston, Murray L. Barbecue. 287,091, 12-9-86, Cl. D7-337.000.

Emerson Electric Co.: *See—*
Babb, Larry F.; and Boise, Charles A., 287,178, Cl. D34-24.000.

Envall, Bjorn E. A.; and Wardle, Geoffrey P., to Saab-Scania Aktiebolag. Left rear shield for attachment to an automobile. 287,115, 12-9-86, Cl. D12-190.000.

Envall, Bjorn E. A.; and Wardle, Geoffrey P., to Saab-Scania Aktiebolag. Left front shield for attachment to an automobile. 287,116, 12-9-86, Cl. D12-190.000.

Etablissements Regnault: *See—*
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Piesco, Nazzareno, 287,162, Cl. D23-28.000.
Piesco, Nazzareno, 287,163, Cl. D23-28.000.
Piesco, Nazzareno, 287,164, Cl. D23-29.000.

FitzGerald, Joseph M., to Superbus Associates. Passenger semitrailer. 287,113, 12-9-86, Cl. D12-97.000.

Forbes, William A. Blade for soil mixer. 287,132, 12-9-86, Cl. D15-19.000.

Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 287,175, Cl. D32-55.000.

Fulanovich, Jo Ann. Squeegee. 287,172, 12-9-86, Cl. D32-41.000.

Galloway Plastics Incorporated: *See—*
Meier, James L.; and Galloway, Scott F., 287,086, Cl. D7-9.000.

Galloway, Scott F.: *See—*
Meier, James L.; and Galloway, Scott F., 287,086, Cl. D7-9.000.

Gambon, Thomas F., to Charleswood Furniture Corp. Molding for furniture. 287,082, 12-9-86, Cl. D6-491.000.

Gardner, Maxwell: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Gaudino, Angelo: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Cutlery drainer. 287,175, 12-9-86, Cl. D32-55.000.

Goldeneye Products, Inc.: *See—*
Nelson, Bruce D., 287,097, Cl. D8-382.000.

Goldman, Charles R. Memorandum reminding device. 287,142, 12-9-86, Cl. D19-75.000.

Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, to Penn Plax Plastics, Inc. Automatic aquarium feeder. 287,170, 12-9-86, Cl. D30-12.000.

Goldman, Marvin: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.

Great Neck Saw Manufacturers, Inc.: *See—*
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Grilliot, Mary I.: *See—*
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Grilliot, William L.; and Grilliot, Mary I. Firefighter's jacket. 287,060, 12-9-86, Cl. D2-187.000.

Griz, Peter R. Mouth-touching bowstring-held anchor nock for archery. 287,157, 12-9-86, Cl. D22-107.000.

Grun, Otto. Aquatic sculpture or similar article. 287,110, 12-9-86, Cl. D11-158.000

Hancock, Howard N. Crocheted western hat. 287,062, 12-9-86, Cl. D2-258.000.

Hart, Leo, to Sanbree Corporation. Child's rocker cradle or similar article. 287,076, 12-9-86, Cl. D6-386.000.

Hart, Leo, to Sanbree Corporation. Baby rocking cradle. 287,077, 12-9-86, Cl. D6-390.000.

Hayashi, Shigeaki, to Sharp Corporation. Calculator. 287,139, 12-9-86, Cl. D18-7.000.

Helinsky, Jonathan. Rotatable dispenser for babies' diapers and toiletry. 287,081, 12-9-86, Cl. D6-457.000.

Herpel, Donald R. Side fairing. 287,114, 12-9-86, Cl. D12-181.000.

Herrick, Gregory E. Goblet retainer insert for a serving tray. 287,087, 12-9-86, Cl. D7-39.000.

Hestair Kiddicraft Limited: *See—*
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Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.

Hitachi, Ltd.: *See—*
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.

Holden, M. James, to Mobil Oil Corporation. Packaging tray. 287,104, 12-9-86, Cl. D9-425.000.

Hollister, Brent R. Adapter for camera flash strobe. 287,122, 12-9-86, Cl. D13-25.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Hujiwara, Tatsuo: *See—*
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Hunter, James P., to Kaman Sciences Corporation. Sharpening stone holder. 287,095, 12-9-86, Cl. D8-91.000.

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Innovative Concepts, Inc.: *See—*
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Iskra-Sozd Electrokovinske Industrije N.Sol.O.: *See—*
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Jacobs, Mark C. Computer table storage compartment. 287,084, 12-9-86, Cl. D6-510.000.

Jacoff, Richard, to Great Neck Saw Manufacturers, Inc. Staple gun or similar article. 287,094, 12-9-86, Cl. D8-49.000.

Jobe, Howard L. Golf bag accessory. 287,071, 12-9-86, Cl. D3-37.000.

John Manufacturing Ltd.: *See—*
Yuen, John S., 287,126, Cl. D14-57.000.

John Manufacturing Lmtd.: *See—*
Yuen, John S., 287,127, Cl. D14-57.000.

K-Jack Engineering Company, Inc.: *See—*
Chalabian, Jack S., 287,143, Cl. D20-6.000.

Kajima, Nobuyuki: *See—*
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Kaman Sciences Corporation: *See—*
Hunter, James P., 287,095, Cl. D8-91.000.

Kasai, Kazumi, to Nippon Notion Kogyo Co. Ltd. Belt adjuster. 287,067, 12-9-86, Cl. D11-218.000.

Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, to Plough, Inc. Mascara applicator bottle. 287,168, 12-9-86, Cl. D28-77.000.

Kohno, Noboru, to Mizuno Corporation. Side panel for a shoe. 287,063, 12-9-86, Cl. D2-314.000.

Kouwenhoven, Josephus N. M. Collecting container for waste materials. 287,176, 12-9-86, Cl. D34-9.000.

Krone GmbH: *See—*
Becker, Peter, 287,124, Cl. D14-53.000.

Kuykendall, Roy E. Lug wrench support stand or similar article. 287,179, 12-9-86, Cl. D34-31.000.

Lappartient, Philippe. Pot-type malaxator. 287,134, 12-9-86, Cl. D15-122.000.

Leeds, Douglas B., to Thomson-Leeds Company, Inc. Floor mat hanger. 287,085, 12-9-86, Cl. D6-513.000.

Legueu, Paul. Bus vehicle. 287,112, 12-9-86, Cl. D12-84.000.

Leszczak, John: *See—*
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Levene, Maurice, to Accurist S.A. Watch bracelet. 287,109, 12-9-86, Cl. D11-4.000.

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Libman, Robert J., to Libman Broom Company. Liquid applicator. 287,173, 12-9-86, Cl. D32-51.000.

Lin, Tsung-Tzu. Combined rollable chessboards cloth and zippered cover therefor. 287,146, 12-9-86, Cl. D21-24.000.

Lipsky, Steven J.; and Dale, John D. Surgical suction device. 287,165, 12-9-86, Cl. D24-51.000.

Lipsky, Steven J.; and Dale, John D. Tip guard for a surgical suction device. 287,166, 12-9-86, Cl. D24-51.000.

Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette storage container for floppy diskettes. 287,068, 12-9-86, Cl. D3-35.000.

Macedonio, Daniel F. Collapsible head rest. 287,083, 12-9-86, Cl. D6-502.000.

MacKarvich, Charles J.: *See—*
Wilson, Richard C.; and MacKarvich, Charles J., 287,098, Cl. D8-388.000.

Matsuda, Takashi, to Takara Co., Ltd. Reconfigurable insect toy. 287,155, 12-9-86, Cl. D21-185.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Electronic chip-carrier heat sink. 287,120, 12-9-86, Cl. D13-23.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Sheet-metal heat sink for electronic devices. 287,121, 12-9-86, Cl. D13-23.000.

Meier, James L.; and Galloway, Scott F., to Galloway Plastics Incorporated. Drinking mug. 287,086, 12-9-86, Cl. D7-9.000.

Meland, Ronald F.: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.

Meubelfabrieken Karel Mintjens N. V.: *See—*
Mintjens, Jules E., 287,079, Cl. D6-436.000.

Mintjens, Jules E., to Meubelfabrieken Karel Mintjens N. V. Modular storage unit. 287,079, 12-9-86, Cl. D6-436.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mizuno Corporation: *See—*
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Mobil Oil Corporation: *See—*
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Moreau, Claude R. M. Simulative toy vehicle. 287,150, 12-9-86, Cl. D21-128.000.

Murray, Joseph E., Jr. Telescope. 287,136, 12-9-86, Cl. D16-132.000.

Nagatani, Ryoji; and Iida, Rikiya, to Mitsubishi Denki Kabushiki Kaisha. Welding robot. 287,135, 12-9-86, Cl. D15-144.000.

Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Lawn mower. 287,131, 12-9-86, Cl. D15-16.000.

Nelson, Bruce D., to Goldeneye Products, Inc. Cleat. 287,097, 12-9-86, Cl. D8-382.000.

Nippon Notion Kogyo Co. Ltd.: *See—*
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Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable dinosaurian toy. 287,151, 12-9-86, Cl. D21-148.000.

Oki Electric Industry Co., Ltd.: *See—*
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Osterhout, Ralph F., to Tekna. Combined packaging and display container. 287,105, 12-9-86, Cl. D9-415.000.

Owen, Roger W. Refrigerator. 287,133, 12-9-86, Cl. D15-81.000.

Pape, John A.: *See—*
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.

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Patterson, Bettie L.: *See—*
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Penn Plax Plastics, Inc.: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.

Pesin, Joseph: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.
Pet Incorporated: *See—*
Wells, Harold D., 287,090, Cl. D7-323.000.
Pfleger, Anthony. Toothbrush. 287,072, 12-9-86, Cl. D4-104.000.
Phillips, Gerald: *See—*
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.
Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,161, 12-9-86, Cl. D23-28.000.
Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,162, 12-9-86, Cl. D23-28.000.
Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,163, 12-9-86, Cl. D23-28.000.
Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,164, 12-9-86, Cl. D23-29.000.
Planhorse International NZ Limited: *See—*
Spicer, Victor R., 287,177, Cl. D34-21.000.
Plough, Inc.: *See—*
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.
Purhonen, Matti, to Temet Oy. Valve for equalizing pressure resulting from explosions or blasts. 287,159, 12-9-86, Cl. D23-21.000.
Quabaug Corporation: *See—*
Austin, Arnold S., 287,065, Cl. D2-320.000.
Austin, Arnold S., 287,066, Cl. D2-323.000.
Rademacher, Manfred. Pair of faucet handles and spout set. 287,160, 12-9-86, Cl. D23-25.000.
Radiator Specialty Company: *See—*
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Raffo, David M.: *See—*
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.
Regent Sports Corporation: *See—*
Sloane, Leo, 287,156, Cl. D21-255.000.
Regnault, Pierre, to Etablissements Regnault. Writing instrument. 287,141, 12-9-86, Cl. D19-43.000.
Ritch Engineering Pty. Ltd.: *See—*
Ritchie, Daryl G., 287,074, Cl. D6-330.000.
Ritchie, Daryl G., to Ritch Engineering Pty. Ltd. Kneeling frame or similar article. 287,074, 12-9-86, Cl. D6-330.000.
Rose, Sheila: *See—*
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.
Ross, Saralee F.; and Rydbeck, James R. Electrical flat connector. 287,123, 12-9-86, Cl. D13-29.000.
Ryan, Robert B. Combined bottle cap remover, can opener and ice scraper. 287,093, 12-9-86, Cl. D8-34.000.
Rydbeck, James R.: *See—*
Ross, Saralee F.; and Rydbeck, James R., 287,123, Cl. D13-29.000.
Saab-Scania Aktiebolag: *See—*
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,115, Cl. D12-190.000.
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,116, Cl. D12-190.000.
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, to Hitachi, Ltd. Programmable controller. 287,117, 12-9-86, Cl. D13-12.000.
St. Louis Music Supply Company: *See—*
Bushman, James A., 287,137, Cl. D17-20.000.
Sanbree Corporation: *See—*
Hart, Leo, 287,076, Cl. D6-386.000.
Hart, Leo, 287,077, Cl. D6-390.000.
Saunders, Charles A., IV. Clip connector for windscreen extensions or the like. 287,100, 12-9-86, Cl. D8-395.000.
Saunders, Charles A., IV. Clip connector for windscreen extensions or the like. 287,101, 12-9-86, Cl. D8-395.000.
Savnik, Davorin, to Iskra-Sozd Electrokovinske Industrije N.Sol.O. Coin-operated telephone apparatus. 287,125, 12-9-86, Cl. D14-55.000.
Schnuck, Marilyn A. Detachable ornament for footwear. 287,064, 12-9-86, Cl. D2-315.000.
Sharp Corporation: *See—*
Hayashi, Shigeaki, 287,139, Cl. D18-7.000.
Sugiyama, Masakazu; and Akiyama, Kunio, 287,138, Cl. D18-1.000.
Shilton, Albert R.; and DeSmet, Greg L., to Avicom International, Inc. Case for a portable computer game or similar device. 287,145, 12-9-86, Cl. D21-13.000.
Shop-Vac Corporation: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.
Skarin, Lars, to Partex Fabriksaktiebolag. Marking sleeve for electrical conductors or the like. 287,118, 12-9-86, Cl. D13-13.000.
Sloane, Leo, to Regent Sports Corporation. Stake. 287,156, 12-9-86, Cl. D21-255.000.
Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A.: *See—*
Thieffry, Francois, 287,103, Cl. D9-352.000.
Spicer, Victor R., to Planhorse International NZ Limited. Cart. 287,177, 12-9-86, Cl. D34-21.000.
Staubitz, Robert; and Leszczak, John, to Bates Manufacturing Company, The. Disk holder. 287,070, 12-9-86, Cl. D3-35.000.
Stollberg, Theodore A.: *See—*
Bergeron, Ned; and Stollberg, Theodore A., 287,107, Cl. D10-121.000.
Sugiyama, Masakazu; and Akiyama, Kunio, to Sharp Corporation. Typewriter. 287,138, 12-9-86, Cl. D18-1.000.
Sullivan, Patrick: *See—*
Egly, Robert A.; and Sullivan, Patrick, 287,069, Cl. D3-35.000.
Superbus Associates: *See—*
FitzGerald, Joseph M., 287,113, Cl. D12-97.000.
Takara Co., Ltd.: *See—*
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Tekna: *See—*
Osterhout, Ralph F., 287,105, Cl. D9-415.000.
Temet Oy: *See—*
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Thieffry, Francois, to Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A. Bottle or the like. 287,103, 12-9-86, Cl. D9-352.000.
Thompson, Paul H. Toothbrush. 287,073, 12-9-86, Cl. D4-105.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., to Hestair Kiddicraft Limited. Toy Rattle. 287,149, 12-9-86, Cl. D21-65.000.
Thomson-Leeds Company, Inc.: *See—*
Leeds, Douglas B., 287,085, Cl. D6-513.000.
Tie Down Engineering, Inc.: *See—*
Wilson, Richard C.; and MacKarvich, Charles J., 287,098, Cl. D8-388.000.
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Tilton, McLane, Jr., 287,130, Cl. D15-5.000.
Tilton, McLane, Jr., to Tilton Engineering, Inc. Nose adapter plate for automobile starters. 287,129, 12-9-86, Cl. D15-5.000.
Tilton, McLane, Jr., to Tilton Engineering, Inc. Adapter plate for automobile starters. 287,130, 12-9-86, Cl. D15-5.000.
Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu, 287,131, Cl. D15-16.000.
Trabattoni, Roberto, to Trasti S.A. Cosmetic case. 287,169, 12-9-86, Cl. D28-83.000.
Trasti S.A.: *See—*
Trabattoni, Roberto, 287,169, Cl. D28-83.000.
Vitacco, Richard L. Combination wall mounted envelope opener, pen and key chain holder. 287,096, 12-9-86, Cl. D8-102.000.
Wade, Thomas G. Portable flashing signal lamp. 287,106, 12-9-86, Cl. D10-114.000.
Wadia, Gurinder S., to Wells Manufacturing Company. Heating element. 287,119, 12-9-86, Cl. D13-21.000.
Walker, Donald. Deer and elk sleigh. 287,111, 12-9-86, Cl. D12-6.000.
Wardle, Geoffrey P.: *See—*
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,115, Cl. D12-190.000.
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,116, Cl. D12-190.000.
Wells, Harold D., to Pet Incorporated. Humpback tunnel oven-broiler. 287,090, 12-9-86, Cl. D7-323.000.
Wells Manufacturing Company: *See—*
Wadia, Gurinder S., 287,119, Cl. D13-21.000.
Wilson, Richard C.; and MacKarvich, Charles J., to Tie Down Engineering, Inc. Earth anchor. 287,098, 12-9-86, Cl. D8-388.000.
Womack, James A.: *See—*
Long, Jerry M.; and Womack, James A., 287,068, Cl. D3-35.000.
Yamamoto, Kuniyuki, to Honda Giken Kogyo Kabushiki Kaisha. Engine for motorcycles. 287,128, 12-9-86, Cl. D15-1.000.
Yoshida, Kazuo, to Oki Electric Industry Co., Ltd. Printer for an electric calculator. 287,140, 12-9-86, Cl. D18-12.000.
Yuen, John S., to John Manufacturing Ltd. Telephone amplifier. 287,126, 12-9-86, Cl. D14-57.000.
Yuen, John S., to John Manufacturing Lmtd. Combined telephone amplifier and pen holder. 287,127, 12-9-86, Cl. D14-57.000.

LIST OF PLANT PATENTEES

Ball Panam Plant Company: *See—*
Van der Knaap, Jacques C. M., 5,825, Cl. 68.000.
Van der Knaap, Jacques C. M., 5,826, Cl. 68.000.
Carlton Rose Nurseries: *See—*
DeRuiter, Gijsbert, 5,820, Cl. 20.000.
DeRuiter, Gijsbert, to Carlton Rose Nurseries. Ruimeva rose plant. 5,820, 12-9-86, Cl. 20.000.
Gardner, Leith M.: *See—*
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 5,821, Cl. 42.000.
Ison, Bill. Grapevine named Ison. 5,822, 12-9-86, Cl. 47.000.
Ison, Bill. Granny Val grapevine. 5,823, 12-9-86, Cl. 47.000.
Ison, Bill. Grapevine named Black Fry. 5,824, 12-9-86, Cl. 47.000.
Van der Knaap, Jacques C. M., to Ball Panam Plant Company. Kalanchoe plant named Stromboli. 5,825, 12-9-86, Cl. 68.000.
Van der Knaap, Jacques C. M., to Ball Panam Plant Company. Kalanchoe plant named Etna. 5,826, 12-9-86, Cl. 68.000.
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Peach tree (White Lady). 5,821, 12-9-86, Cl. 42.000.
Zaiger, Gary N.: *See—*
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 5,821, Cl. 42.000.
Zaiger, Grant G.: *See—*
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 5,821, Cl. 42.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 9, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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4,627,907

CLASS 206

309 4,627,531
4,627,532
328 4,627,533
387 4,627,534
4,627,535
426 4,627,536
501 4,627,537
524.1 4,627,538
597 4,627,539

CLASS 208

58 4,627,908
65 4,627,909
112 4,627,910
120 4,627,911
415 4,627,913

CLASS 209

555 4,627,540
668 4,627,541

CLASS 210

96.1 4,627,914
195.2 4,627,915
488 4,627,916
617 4,627,917
656 4,627,918
4,627,919
668 4,627,920
4,627,921
704 4,627,922
744 4,627,923
760 4,627,924

CLASS 211

150 4,627,542
187 4,627,543
189 4,627,544

CLASS 213

100 R 4,627,545

CLASS 215

100 A 4,627,546
222 4,627,547
295 4,627,548

CLASS 219

10.57 4,628,167
10.81 4,628,168
68 4,628,169
69 D 4,628,170
69 G 4,628,171
4,628,173
69 W 4,628,172
76.13 4,628,174
110 4,628,175
4,628,176
121 LD 4,628,178
121 LH 4,628,179
121 PN 4,628,177
124.01 4,628,180
130.33 4,628,181
130.51 4,628,182
216 4,628,183
312 4,628,184
386 4,628,185
497 4,628,186
505 4,628,187
528 4,628,188
532 4,628,189
4,628,190
535 4,628,191

CLASS 220

1.5 4,627,549
306 4,627,550

CLASS 222

1 4,627,551
14 4,627,552
4,627,553
103 4,627,554
200 4,627,555
240 4,627,556

CLASS 223

39 4,627,557

CLASS 224

238 4,627,558
329 4,627,559

CLASS 225

66 4,627,560
96 4,627,561

CLASS 227

67 4,627,562
130 4,627,563
152 4,627,564

CLASS 228

107 4,627,565

CLASS 232

1 C 4,627,566

CLASS 235

1 R 4,628,192
375 4,628,193
379 4,628,194
440 4,628,195

CLASS 236

34.5 4,627,567
44 B 4,627,568
49 4,627,569

CLASS 239

90 4,627,570
4,627,571
542 4,627,573
590.5 4,627,574
728 4,627,572

CLASS 241

15 4,627,575
24 4,627,576
30 4,627,577
4,627,578
79.1 4,627,579
101.4 4,627,580
167 4,627,581
236 4,627,582

CLASS 242

45 4,627,583
54 R 4,627,584

CLASS 244

2 4,627,585
3.21 4,627,586
122 R 4,627,587

CLASS 248

163.2 4,627,588
346 4,627,589
351 4,627,590
411 4,627,591
465 4,627,592
561 4,627,593
632 4,627,594

CLASS 249

121 4,627,595

CLASS 250

213 VT 4,628,198
225 4,628,196
227 4,628,197
229 4,628,199
231 SE 4,628,200
237 G 4,628,201
269 4,628,202
334 4,628,203
343 4,628,204
361 R 4,628,205
372 4,628,206
461.1 4,628,207
483.1 4,628,208
492.2 4,628,209
558 4,628,210
578 4,628,211

CLASS 251

129.03 4,627,597
129.07 4,627,596
149.2 4,627,598
334 4,627,599

CLASS 252

8.55 R 4,627,926
8.75 4,627,927
8.8 4,627,925
33 4,627,928
47 4,627,929
49.6 4,627,930
153 4,627,931
194 4,627,932
299.6 4,627,933
522 R 4,627,934
4,627,935
558 4,627,936

631 4,627,937

CLASS 254

124 4,627,600

CLASS 260

239 BC 4,627,938
404 4,627,939
501.11 4,627,940

CLASS 261

109 4,627,941

CLASS 264

1.5 4,627,942
14 4,627,943
29.4 4,627,944
29.5 4,627,945
51 4,627,946
53 4,627,947
56 4,627,948
101 4,627,949
103 4,627,950
109 4,627,951
328.12 4,627,952
518 4,627,953

CLASS 266

212 4,627,601

CLASS 267

182 4,627,602

CLASS 269

32 4,627,603
214 4,627,604

CLASS 271

94 4,627,605
98 4,627,606
122 4,627,607
197 4,627,608
311 4,627,609

CLASS 272

72 4,627,610
77 4,627,611
113 4,627,612
116 4,627,613
117 4,627,614
118 4,627,615
120 4,627,616
4,627,617
122 4,627,618
134 4,627,619

CLASS 273

1 GC 4,627,620
32 B 4,627,621
157 R 4,627,622
328 4,627,623

CLASS 277

12 4,627,624
27 4,627,625

CLASS 279

1 A 4,627,626
19.3 4,627,627
20 4,627,628

CLASS 280

5 D 4,627,629
28.5 4,627,630
154.5 R 4,627,631
276 4,627,632
432 4,627,633
477 4,627,634
602 4,627,635
607 4,627,636
714 4,627,637
779 4,627,638
808 4,627,639

CLASS 281

5 4,627,640

CLASS 283

81 4,627,641
92 4,627,642
102 4,627,643

CLASS 285

3 4,627,644
39 4,627,645
114 4,627,646
189 4,627,647
197 4,627,648

CLASS 290

54 4,628,212

CLASS 292

92 4,627,649
113 4,627,650
229 4,627,652
288 4,627,651

CLASS 294

8.6 4,627,653

106 4,627,654

CLASS 296

65 R 4,627,656
91 4,627,657
100 4,627,658
167 4,627,655

CLASS 297

219 4,627,660
284 4,627,661
313 4,627,662
316 4,627,663
452 4,627,664
488 4,627,659

CLASS 299

79 4,627,665

CLASS 301

125 4,627,666
126 4,627,667

CLASS 303

40 4,627,668
114 4,627,669
115 4,627,670
116 4,627,671

CLASS 307

79 4,628,494
80 4,628,213
296 R 4,628,214
297 4,628,215
451 4,628,218
455 4,628,216
467 4,628,217

CLASS 310

68 D 4,628,219
114 4,628,220
178 4,628,221
313 R 4,628,222
358 4,628,223

CLASS 312

331 4,627,672

CLASS 313

414 4,628,224
631 4,628,225

CLASS 315

102 4,628,226
111.81 4,628,227
169.4 4,628,228
241 P 4,628,229
307 4,628,230

CLASS 318

138 4,628,231
267 4,628,234
284 4,628,232
306 4,628,233
430 4,628,235
558 4,628,236
626 4,628,237
653 4,628,238
685 4,628,239
723 4,628,240
778 4,628,241

CLASS 320

2 4,628,242
4,628,243
48 4,628,244

CLASS 322

32 4,628,245
100 4,628,246

CLASS 323

314 4,628,247
4,628,248
315 4,628,249
317 4,628,250
340 4,628,251

CLASS 324

65 CR 4,628,252
73 R 4,628,253
77 C 4,628,255
77 R 4,628,254
95 4,628,256
142 4,628,257
158 P 4,628,258
208 4,628,259
220 4,628,260
240 4,628,261
309 4,628,262
321 4,628,263
322 4,628,264
329 4,628,265
330 4,628,266
376 4,628,267
418 4,628,268

CLASS 328

120 4,628,269

CLASS 329

50 4,628,270
4,628,271
110 4,628,272

CLASS 330

4.3 4,628,273
9 4,628,274
10 4,628,275
86 4,628,276
110 4,628,277
149 4,628,278
257 4,628,279
259 4,628,280
288 4,628,281

CLASS 331

1 A 4,628,282
68 4,628,283
86 4,628,284
163 4,628,285

CLASS 332

9 R 4,628,286

CLASS 333

137 4,628,287

CLASS 335

166 4,628,288
168 4,628,289
274 4,628,290

CLASS 337

203 4,628,291
204 4,628,292
216 4,628,293
248 4,628,294
354 4,628,295

CLASS 338

3 4,628,296

CLASS 339

14 P 4,627,674
14 R 4,627,673
4,627,675
17 CF 4,627,676
4,627,678
17 M 4,627,677
21 R 4,627,679
22 B 4,627,680
75 P 4,627,681
99 R 4,627,682
128 4,627,683
206 R 4,627,684

CLASS 340

347 DD 4,628,297
347 P 4,628,298
540 4,628,299
542 4,628,300
584 4,628,301
620 4,628,302
661 4,628,303
703 4,628,304
4,628,305
825.00 4,628,306
825.05 4,628,307
825.43 4,628,308
825.5 4,628,311
825.54 4,628,309
825.640 4,628,312
825.72 4,628,310
870.02 4,628,313
870.24 4,628,314
870.26 4,628,315
870.38 4,628,316
903 4,628,317

CLASS 342

16 4,628,320
26 4,628,318
46 4,628,319
379 4,628,321

CLASS 343

702 4,628,322
765 4,628,323
788 4,628,324

CLASS 346

1.1 4,628,325
29 4,628,326
33 ME 4,628,327
74.4 4,628,328
75 4,628,329
4,628,330
4,628,331
140 R 4,628,332
4,628,333
4,628,334
208 4,628,335
209 4,628,336

217 4,628,337

CLASS 350

6.8 4,627,685
96.20 4,627,686
4,627,687
173 4,627,688
362 4,627,689
421 4,627,690
429 4,627,691
432 4,627,692
523 4,627,693

CLASS 351

214 4,627,694

CLASS 352

72 4,627,695

CLASS 353

110 4,627,696

CLASS 354

77 4,627,697
317 4,627,698
400 4,627,699
409 4,627,700

CLASS 355

3 BE 4,627,702
3 CH 4,627,701
3 R 4,627,703
4,627,704
4 4,627,705
14 FU 4,627,714
14 R 4,627,707
4,627,708
4,627,710
4,627,712
4,627,713
4,627,715
14 SH 4,627,706
4,627,709
4,627,711
15 4,627,716
4,627,717
35 H 4,627,718
41 4,627,719
57 4,627,720
77 4,627,721

CLASS 356

4.5 4,627,722
5 4,627,723
141 4,627,724
152 4,627,725
336 4,627,726
338 4,627,727
345 4,627,728
347 4,627,729
349 4,627,730
4,627,731
350 4,627,732
359 4,627,733
376 4,627,734

CLASS 357

15 4,628,338
4,628,339
42 4,628,340
4,628,341
84 4,628,343

CLASS 358

10 4,628,342
12 4,628,344
13 4,628,345
28 4,628,346
39 4,628,347
4,628,348
67 4,628,349
75 4,628,350
93 4,628,351
4,628,352
107 4,628,353
109 4,628,354
111 4,628,355
4,628,356
4,628,357
121 4,628,358
122 4,628,359
139 4,628,360
153 4,628,361
174 4,628,362
183 4,628,363
213 4,628,364
245 4,628,365
280 4,628,366
285 4,628,367
293 4,628,368
314 4,628,369

CLASS 360

15 4,628,370
38.1 4,628,371
40 4,628,372
62 4,628,373
66 4,628,374
71 4,628,375
4,628,376
72.1 4,628,377
77 4,628,378
4,628,379
78 4,628,380
93 4,628,381
4,628,382
96.5 4,628,383
97 4,628,384
99 4,628,385
104 4,628,386
121 4,628,387
128 4,628,388
132 4,628,389
137 4,628,390

CLASS 361

2 4,628,392
3 4,628,393
18 4,628,395
56 4,628,394
91 4,628,396
98 4,628,397
120 4,628,398
4,628,399
172 4,628,400
178 4,628,401
218 4,628,402
283 4,628,403
321 4,628,404
4,628,405
386 4,628,406
388 4,628,407
395 4,628,408
403 4,628,409
413 4,628,410
414 4,628,411
415 4,628,413
424 4,628,412

CLASS 362

32 4,628,416
61 4,628,414
4,628,415
74 4,628,417
116 4,628,418
145 4,628,419
208 4,628,420
238 4,628,421
240 4,628,422
341 4,628,423
351 4,628,424

CLASS 363

10 4,628,425
17 4,628,426
21 4,628,428
4,628,429
25 4,628,430
27 4,628,427
49 4,628,431
56 4,628,432
65 4,628,433
134 4,628,438

CLASS 364

130 4,628,434
4,628,435
104 4,627,741
131 4,628,436
109 4,627,742
4,628,437
122 4,627,743
138 4,628,439
175 4,627,744
140 4,628,440
183 4,627,745
167 4,628,441
4,628,442
4,628,499
40 4,628,517
184 4,628,443
88 4,628,518
188 4,628,444
110 4,628,519
200 4,628,445
4,628,446
4,628,447
4,628,448
4,628,449
4,628,450
4,628,451
405 4,628,452
424 4,628,453
4,628,454
434 4,628,455
449 4,628,456
464 4,628,457
474 4,628,458
475 4,628,459
480 4,628,460
481 4,628,461
494 4,628,462
497 4,628,463
513 4,628,464
521 4,628,465
4,628,466
4,628,467
556 4,628,468
560 4,628,469
567 4,628,470
578 4,628,471
759 4,628,472
822 4,628,473
825 4,628,474
851 4,628,475
900 4,628,476
4,628,477
4,628,478
4,628,479
4,628,480
4,628,481
4,628,482
4,628,483

CLASS 365

52 4,628,484
122 4,628,485
149 4,628,486
185 4,628,487
222 4,628,488
230 4,628,489

CLASS 366

265 4,628,391
329 4,627,735

CLASS 367

1 4,628,490
45 4,628,491
63 4,628,492
79 4,628,493
85 4,628,495
93 4,628,496

CLASS 368

88 4,627,736
239 4,627,737
281 4,627,738
282 4,627,739

CLASS 369

44 4,628,497
77.1 4,628,498
249 4,628,500

CLASS 370

3 4,628,501
84 4,628,502
85 4,628,503
4,628,504
4,628,505
104 4,628,506

CLASS 371

5 4,628,507
9 4,628,508
21 4,628,509
4,628,510
22 4,628,511
68 4,628,512

CLASS 372

3 4,628,513
36 4,628,514
107 4,628,515

CLASS 373

72 4,628,516

CLASS 374

1 4,627,740
4,627,741
4,627,742
4,627,743
4,627,744
4,627,745

CLASS 375

40 4,628,517
88 4,628,518
110 4,628,519

CLASS 376

216 4,627,954
4,627,955
272 4,627,956
412 4,627,957

CLASS 377

6 4,628,520
24 4,628,521

CLASS 378

132 4,628,522
193 4,628,523
197 4,628,524

CLASS 379

10 4,628,158
51 4,628,152
163 4,628,153
410 4,628,156
4,628,157

CLASS 381

26 4,628,525
57 4,628,526
69.2 4,628,527
90 4,628,528
94 4,628,529
103 4,628,530
156 4,628,155
189 4,628,154

CLASS 382

8 4,628,531
21 4,628,532
27 4,628,533
41 4,628,534

CLASS 383

24 4,628,535
75 4,628,536

CLASS 384

99 4,627,746
113 4,627,747

CLASS 400

17 4,627,748
121 4,627,749
144.2 4,627,750
4,627,751
4,627,752
174 4,627,753
649 4,627,754
662 4,627,755

CLASS 401

94 4,627,756
194 4,627,757
208 4,627,758

CLASS 403

2 4,627,759
201 4,627,760
324 4,627,761
369 4,627,762

CLASS 404

6 4,627,763
41 4,627,764

CLASS 405

146 4,627,765
195 4,627,766
196 4,627,767
198 4,627,768
256 4,627,769

CLASS 407

21 4,627,770
39 4,627,771

CLASS 409

121 4,627,772
215 4,627,773

CLASS 411

5 4,627,774
34 4,627,775
179 4,627,776
439 4,627,777

CLASS 414

17 4,627,779
346 4,627,780
412 4,627,781
491 4,627,782
517 4,627,783
540 4,627,784
730 4,627,785
735 4,627,786
786 4,627,787

CLASS 415

11 4,627,788
28 4,627,789
53 R 4,627,790

CLASS 416

132 R 4,627,791

CLASS 417

83 4,627,792
203 4,627,793
225 4,627,794
267 4,627,795
313 4,627,796
411 4,627,797
415 4,627,798

CLASS 418

55 4,627,799
4,627,800
61 B 4,627,801
185 4,627,802

CLASS 419

8 4,627,958
61 4,627,959

CLASS 420

472 4,627,960
564 4,627,961

CLASS 422

40 4,627,962
125 4,627,963

CLASS 423

228 4,627,964
242 4,627,965
263 4,627,966
300 4,627,967
329 4,627,968
478 4,627,969
555 4,627,970

CLASS 424

15 4,627,971
44 4,627,972
47 4,627,973
48 4,627,974
49 4,627,975
4,627,976
52 4,627,977
54 4,627,978
4,627,979
4,627,980
84 4,627,981
95 4,627,982

CLASS 425

6 4,627,803
71 4,627,804
72 R 4,627,805
72 S 4,627,811
83.1 4,627,806
116 4,627,807
270 4,627,808
555 4,627,809
577 4,627,810

CLASS 426

7 4,627,983
37 4,627,984
92 4,627,985
112 4,627,986
548 4,627,987

CLASS 427

5 4,627,988
10 4,627,989
4,627,990
39 4,627,991
244 4,627,992

CLASS 428

36 4,627,993
41 4,627,994
43 4,627,995
104 4,627,996
216 4,627,997
285 4,627,998
326 4,627,999
341 4,628,000
367 4,628,001
4,628,002
377 4,628,003
413 4,628,004
432 4,628,005
446 4,628,006
542.8 4,628,007
694 4,628,009

CLASS 429

19 4,628,010
49 4,628,011
53 4,628,012
111 4,628,013
113 4,628,014
194 4,628,015

CLASS 430

30 4,628,016
48 4,628,017
59 4,628,018
106.6 4,628,019
165 4,628,020
203 4,628,021
280 4,628,022
331 4,628,023
376 4,628,024
533 4,628,025

CLASS 431

7 4,627,812

CLASS 432

24 4,627,815
60 4,627,813
128 4,627,814

CLASS 433

11 4,627,816
152 4,627,817

CLASS 434

236 4,627,818
337 4,627,819

CLASS 435

7 4,628,026
4,628,027
95 4,628,028
99 4,628,029
101 4,628,030
205 4,628,031
240 4,628,032
255 4,628,033

CLASS 436

55 4,628,034
518 4,628,035
520 4,628,036
526 4,628,037

CLASS 441

64 4,627,820
83 4,627,821
92 4,627,822
95 4,627,823

CLASS 445

27 4,627,824

CLASS 448

548 4,628,008

CLASS 455

34 4,628,537
91 4,628,538
194 4,628,539
197 4,628,540
603 4,628,541
619 4,628,542

CLASS 464

2 4,627,825
171 4,627,826

CLASS 474

80 4,627,827
205 4,627,828

CLASS 493

189 4,627,829
316 4,627,830
337 4,627,831

CLASS 501

35 4,628,038
97 4,628,039

CLASS 502

9 4,628,040
24 4,628,041
263 4,628,042

CLASS 514

12 4,628,043
15 4,628,044
17 4,628,045
33 4,628,046
34 4,628,047
63 4,628,048
147 4,628,049
167 4,628,050
170 4,628,051
171 4,628,052
222 4,628,053
234 4,628,054
249 4,628,055
270 4,628,056
292 4,628,057
383 4,628,058
384 4,628,059
432 4,628,060
469 4,628,061
569 4,628,062
626 4,628,063
654 4,628,064

CLASS 518

700 4,628,065
4,628,066

CLASS 521

25 4,628,067
57 4,628,068

CLASS 524

339 4,628,069
504 4,628,070
832 4,628,071

CLASS 525

57 4,628,072
70 4,628,073
146 4,628,074
403 4,628,075
440 4,628,076

CLASS 526

90 4,628,077
303.1 4,628,078

CLASS 528

49 4,628,079
88 4,628,080
176 4,628,081

CLASSIFICATION OF PATENTS

	CLASS 534		186	4,628,094	453	4,628,108		4,628,135	158	4,627,841
707	4,628,082		234	4,628,095		**CLASS 560**	**CLASS 568**		441	4,628,136	177	4,627,842
798	4,628,083		250	4,628,096	13	4,628,109	322	4,628,120	445	4,628,137	263	4,627,843
	CLASS 540		251	4,628,097	119	4,628,110	487	4,628,121	531	4,628,138	264	4,627,844
509	4,628,084		271	4,628,098	159	4,628,111	492	4,628,122		4,628,139	295	4,627,845
539	4,628,085		302	4,628,099	160	4,628,112	634	4,628,123	606	4,628,140	349	4,627,846
	CLASS 544		304	4,628,100	232	4,628,113	726	4,628,124		**CLASS 604**	366	4,627,847
31	4,628,086			**CLASS 548**		4,628,114	730	4,628,125	9	4,627,832	370	4,627,848
41	4,628,087		200	4,628,101		**CLASS 562**	771	4,628,126	29	Re.32,303	379	4,627,849
224	4,628,088		218	4,628,102	464	4,628,115	781	4,628,127	34	4,627,833	892	4,627,850
244	4,628,089		266	4,628,103	513	4,628,116	864	4,628,128	49	4,627,834		4,627,851
258	4,628,090		341	4,628,104	577	4,628,117		4,628,129	67	4,627,835	897	4,627,852
339	4,628,091			4,628,105	602	4,628,118	885	4,628,130	93	4,627,836		**CLASS 623**
351	4,628,092		440	4,628,106		**CLASS 564**	937	4,628,131	101	4,627,837	16	4,627,853
	CLASS 546			**CLASS 549**				**CLASS 585**	105	4,627,838		**CLASS 708**
6	4,628,093		23	4,628,107	314	4,628,119	4	4,628,132	121	4,627,839	139	4,627,912
							310	4,628,133	151	4,627,840		
							381	4,628,134				

CLASSIFICATION OF DESIGNS

D2—	187	287,060		457	287,081			287,101		23	287,120		12	287,140		25	287,160
	246	287,061		491	287,082		499	287,102			287,121	D19—	43	287,141		28	287,161
	258	287,062		502	287,083	D9—	352	287,103		25	287,122		75	287,142			287,162
	314	287,063		510	287,084		415	287,105		29	287,123	D20—	6	287,143			287,163
	315	287,064		513	287,085		425	287,104	D14—	53	287,124	D21—		287,144		29	287,164
	320	287,065	D7—	9	287,086	D10—	114	287,106		55	287,125		13	287,145		138.3	287,167
	323	287,066		39	287,087		121	287,107		57	287,126		24	287,146	D24—	51	287,165
D3—	35	287,068		53	287,088	D11—	4	287,108			287,127		43	287,147			287,166
		287,069		309	287,089			287,109	D15—	1	287,128		65	287,148	D28—	77	287,168
		287,070		323	287,090		158	287,110		5	287,129			287,149		83	287,169
	37	287,071		337	287,091		218	287,067			287,130		128	287,150	D30—	12	287,170
D4—	104	287,072		361	287,092	D12—	6	287,111		16	287,131		148	287,151	D32—	25	287,171
	105	287,073	D8—	34	287,093		84	287,112		19	287,132			287,152		41	287,172
D6—	330	287,074		49	287,094		97	287,113		81	287,133		150	287,153		51	287,173
	349	287,075		91	287,095		181	287,114		122	287,134		166	287,154		54	287,174
	386	287,076		102	287,096		190	287,115		144	287,135		185	287,155		55	287,175
	390	287,077		382	287,097			287,116	D16—	132	287,136		255	287,156	D34—	9	287,176
	436	287,079		388	287,098	D13—	12	287,117	D17—	20	287,137	D22—	107	287,157		21	287,177
	446	287,080		394	287,099		13	287,118	D18—	1	287,138		111	287,158		24	287,178
	450	287,078		395	287,100		21	287,119		7	287,139	D23—	21	287,159		31	287,179

CLASSIFICATION OF PLANTS

P.—	20	5,820										
	42	5,821	47	5,822	5,823		5,824		68	5,825		5,826

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	4,628,089		4,627,573		4,628,252		4,628,327		4,627,541		4,628,081
	4,628,177		4,627,587		4,628,265		4,628,353		4,628,221		4,628,088
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	4,628,214		4,627,754		4,628,410		4,627,975		4,627,237		4,627,590
	4,628,247		4,627,767		4,628,416		4,627,976		4,627,302		4,627,608
	4,628,248		4,627,773		4,628,420		4,627,978		4,627,321	21 :	4,627,143
	4,628,455		4,627,775		4,628,432		4,627,979		4,627,329		4,627,246
	4,628,489		4,627,780		4,628,449		4,627,980		4,627,382		4,627,462
05 :	4,628,298		4,627,791		4,628,461		4,628,094		4,627,383		4,627,556
06 :	Re.32,302		4,627,794		4,628,466		4,628,096		4,627,408		4,627,886
	4,627,115		4,627,819		4,628,473	11 :	4,627,241		4,627,453		4,628,443
	4,627,121		4,627,839		4,628,513	12 :	4,627,375		4,627,538	22 :	4,627,188
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	4,627,166		4,627,851		4,628,523		4,627,440		4,627,735		4,627,922
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	4,627,339		4,627,982	09 :	4,627,113		4,628,272		4,628,374		4,627,724
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	4,627,414		4,628,014		4,627,345		4,628,321		4,628,421		4,627,899
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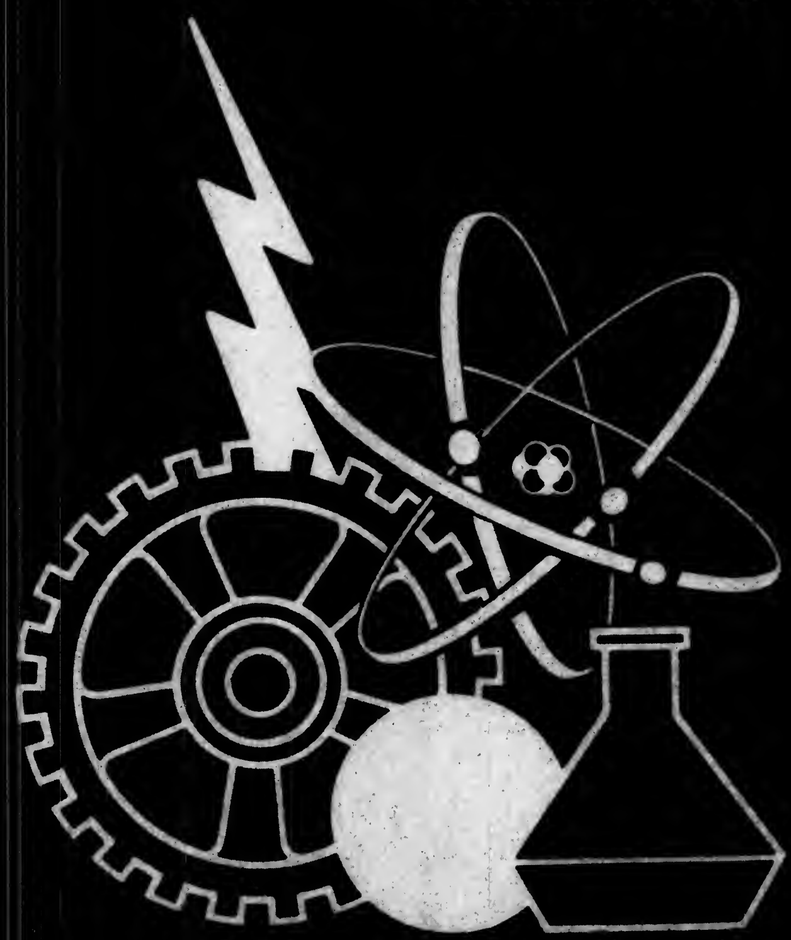
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 16, 1986



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

December 16, 1986 Volume 1073 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 13, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,419,771 through 4,420,842
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 28, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,351,065	06/237,948	9/28/82
4,351,081	06/252,954	9/28/82
4,351,143	06/259,485	9/28/82
4,351,144	06/249,450	9/28/82
4,351,159	06/240,750	9/28/82
4,351,164	06/261,907	9/28/82
4,351,165	06/223,121	9/28/82
4,351,168	06/220,520	9/28/82
4,351,184	06/226,639	9/28/82
4,351,232	06/286,151	9/28/82
4,351,248	06/298,760	9/28/82
4,351,276	06/241,680	9/28/82
4,351,314	06/244,274	9/28/82
4,351,332	06/248,567	9/28/82
4,351,335	06/246,213	9/28/82
4,351,376	06/307,782	9/28/82
4,351,378	06/227,805	9/28/82
4,351,389	06/287,376	9/28/82
4,351,436	06/261,499	9/28/82
4,351,449	06/266,460	9/28/82
4,351,462	06/223,786	9/28/82
4,351,533	06/287,540	9/28/82
4,351,535	06/220,111	9/28/82
4,351,630	06/221,917	9/28/82
4,351,649	06/278,135	9/28/82
4,351,651	06/215,967	9/28/82
4,351,654	06/217,222	9/28/82
4,351,655	06/256,197	9/28/82
4,351,660	06/243,709	9/28/82
4,351,661	06/244,129	9/28/82
4,351,684	06/257,612	9/28/82
4,351,687	06/254,878	9/28/82
4,351,705	06/278,928	9/28/82
4,351,719	06/236,032	9/28/82
4,351,720	06/274,924	9/28/82
4,351,727	06/246,478	9/28/82
4,351,783	06/266,709	9/28/82
4,351,791	06/216,965	9/28/82
4,351,824	06/231,683	9/28/82
4,351,832	06/245,798	9/28/82
4,351,837	06/266,274	9/28/82
4,351,889	06/272,753	9/28/82
4,351,941	06/317,548	9/28/82
4,351,944	06/266,667	9/28/82
4,351,949	06/231,596	9/28/82
4,351,971	06/240,435	9/28/82
4,351,975	06/247,087	9/28/82
4,351,987	06/249,372	9/28/82
4,352,023	06/223,120	9/28/82
4,352,028	06/264,140	9/28/82
4,352,063	06/261,759	9/28/82
4,352,085	06/248,433	9/28/82
4,352,090	06/230,294	9/28/82
4,352,095	06/277,298	9/28/82
4,352,175	06/276,691	9/28/82
4,352,202	06/234,467	9/28/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,859,437, Re. S.N. 803,148, Filed Dec. 2, 1985, Cl. 514/177, REDUCING CHOLESTEROL LEVELS, Alan H. Weigand, Owner of Record: *Intellectual Property Development Corp., New Rochelle, N.Y.,* Attorney or Agent: William H. Saltzman, Ex. Gp.: 125

4,308,199, Re. S.N. 853,820, Filed Apr. 18, 1986, Cl. 524/326, MERCAPTOPHENOL DERIVATIVES AS AGE RESISTORS FOR POLYMERS, Kirkwood S. Cottman, Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Donald O. Nickey, et al., Ex. Gp.: 153

4,443,533, Re. S.N. 643,157, Filed Aug. 22, 1984, Cl. 430/311, PHOTORESIST CURING METHOD, C. Richard Panico, Owner of Record: *Xenon Corp., Wilmington, Mass.,* Attorney or Agent: G. Roger Lee, Ex. Gp.: 150

4,453,041, Re. S.N. 870,580, Filed June 4, 1986, Cl. 179/84C, METHOD AND APPARATUS FOR PROCESSING CODED INFORMATION RECEIVED THROUGH A TELEPHONE LINE DURING THE NON-ACTIVE INTERVALS OF A RINGING PERIOD, Marcelo Castro, et al., Owner of Record: *Inventors,* Attorney or Agent: Martin Fleit, et al., Ex. Gp.: 261

4,455,799, Re. S.N. 879,280, Filed June 25, 1986, Cl. 52/200, SKYLIGHT CONSTRUCTION, Arthur P. Jentoft, et al., Owner of Record: *Wasco Products, Inc., Sanford, Me.,* Attorney or Agent: David M. Driscoll, et al., Ex. Gp.: 354

4,466,950, Re. S.N. 889,904, Filed July 28, 1986, Cl. 423/599, PROCESS FOR RECOVERING CESIUM FROM CESIUM ALUM, Peter G. Mein, Owner of Record: *Trefoil Capital Corp., Chicago, Ill.,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 113

4,494,527, Re. S.N. 894,578, Filed Aug. 8, 1986, Cl. 126/422, SOLAR HEATING, Marlene Resnick, et al., Owner of Record: *Inventors,* Attorney or Agent: Charles Hieken, Ex. Gp.: 345

4,512,505, Re. S.N. 897,559, Filed Aug. 18, 1986, Cl. 226/101, CONVERTIBLE PLATEN FOR GRAPHICS PLOTTER, Pernie E. Westly, et al., Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Richard I. Seligman, et al., Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as

undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Benjamin Christ, dba The National Association of Motor Sports, Thompson, Ohio, Reg. No. 992,691, for the mark "THE NATIONAL ASSOCIATION OF MOTORSPORTS AND DESIGN", Canc. No. 15,074.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 16, 1986

Re. 32,235	4,567,209	4,600,613	4,611,485
D. 285,062	4,567,824	4,600,739	4,611,522
4,275,861	4,568,176	4,600,979	4,611,619
4,386,227	4,568,922	4,601,300	4,611,678
4,399,106	4,569,030	4,601,813	4,611,998
4,435,278	4,569,493	4,603,067	4,612,052
4,435,423	4,569,674	4,603,498	4,612,186
4,454,330	4,570,843	4,604,584	4,612,236
4,467,206	4,574,456	4,605,222	4,612,291
4,505,598	4,577,245	4,605,597	4,612,648
4,507,196	4,583,099	4,605,865	4,612,779
4,518,836	4,583,891	4,606,136	4,612,861
4,530,563	4,584,060	4,606,395	4,612,910
4,533,617	4,586,184	4,607,360	4,613,047
4,534,842	4,586,514	4,607,639	4,613,398
4,534,855	4,588,638	4,607,760	4,613,400
4,535,061	4,589,611	4,607,794	4,613,412
4,535,948	4,589,848	4,608,064	4,613,458
4,536,071	4,593,003	4,608,286	4,613,572
4,542,078	4,593,533	4,608,574	4,613,788
4,542,449	4,593,817	4,609,177	4,613,819
4,550,638	4,594,299	4,609,337	4,614,006
4,551,431	4,595,646	4,609,370	4,614,166
4,552,489	4,595,770	4,609,739	4,614,243
4,553,155	4,596,161	4,610,062	4,614,308
4,554,656	4,596,679	4,610,333	4,614,641
4,556,675	4,596,688	4,610,563	4,615,224
4,558,359	4,597,726	4,610,882	4,615,541
4,559,260	4,599,830	4,610,908	4,616,233
4,561,725	4,600,204	4,611,002	
4,564,534	4,600,240	4,611,220	
4,564,592	4,600,411	4,611,346	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 8, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,475,765 to 3,480,965, inclusive

Plant Patents . . . . . Numbers 2,937 to 2,944 inclusive

REEXAMINATIONS

DECEMBER 16, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,885,957 (598th)

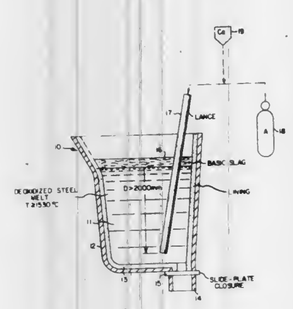
METHOD FOR THE DESULFURIZATION OF A STEEL MELT

Helmut Richter; Eckehard Forster; Edgar Spetzler; Jochen Wendorff, all of Oberhausen, and Heinrich-Wilhelm Rommerswinkel, Mulheim, all of Fed. Rep. of Germany, assignors to Thyssen Niederrhein AG Hutten-und-Walzwerke, Oberhausen, Fed. Rep. of Germany

Reexamination Request No. 90/000,905, Nov. 15, 1985.
Reexamination Certificate for Patent No. 3,885,957, issued May 27, 1975, Ser. No. 333,690, Feb. 20, 1973.
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1973, 2209902

Int. Cl.[4] C21C *7/00*

U.S. Cl. 75—58



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

New claim **12** is added and determined to be patentable.

1. A method of desulfurizing a deoxidized steel melt, comprising the steps of:

covering the deoxidized steel melt with a basic-slag layer containing at most 4 percent by weight FeO;

introducing at a location at least 2,000 mm below the surface of the deoxidized steel melt covered with said basic slag layer a stream of a calcium-containing substance in finely divided form in a neutral carrier gas;

maintaining the temperature of said melt during the introduction of said calcium-containing substance thereto at at least 1,530° C.,

maintaining said molten steel in contact with a lining containing at least 70 percent by weight aluminum oxide during introduction of the calcium-containing substance thereto; and

the introduction of said calcium-containing substance is carried out so that said steel melt contains at least 0.015 percent by weight aluminum.

B1 4,235,023 (599th)

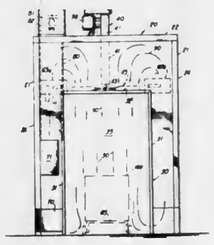
HIGH HEAT TRANSFER OVEN

Willie H. Best, 18C The Heritage, Columbia, S.C. 29201

Reexamination Request No. 90/000,799, Jun. 12, 1985.
Reexamination Certificate for Patent No. 4,235,023, issued Nov. 25, 1980, Ser. No. 916,214, Jun. 16, 1978.

Int. Cl.[4] F26B *3/04*

U.S. Cl. 34—31



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **21–25** and **28–38** is confirmed.

Claims **1, 2, 5, 13, 15, 16, 19, 26** and **27** are determined to be patentable as amended.

Claims **3, 4, 6–12, 14, 17, 18** and **20**, dependent on an amended claim, are determined to be patentable.

1. An oven for drying objects passed therethrough comprising:

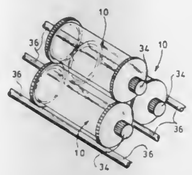
(a) a housing having opposed side walls and a top wall forming a roof defining an interior within which said objects are disposed;

(b) heating means for heating the air of said housing; [and]

(c) a fan assembly for said housing, said fan assembly having a fan with an air discharge front side and an air intake back side disposed within the interior of said housing for delivering air directly from its air discharge side in a turbulent condition against said objects and for circulating the air in essentially unobstructed paths back to the air intake side, a relatively minor portion of the air passing in heat exchanging relationship to said heating means, a shaft being disposed adjacent to said one of the walls, the inner end of said shaft being connected to said fan, means for journalling said shaft for rotation about its axis, and motor means for rotating said shaft; *and*

(d) means for progressively moving said objects through said open interior while said objects are being dried by the air directed against them by said fan.

B1 4,238,568 (600th)
ROLLER BOTTLE
Robert W. Lynn, Oxnard, Calif., assignor to Becton, Dickinson and Company, Rutherford, N.J.
Reexamination Request No. 90/000,490, Jan. 23, 1984.
Reexamination Certificate for Patent No. 4,238,568, issued Dec. 9, 1980, Ser. No. 949,450, Oct. 10, 1978.
Int. Cl.[4] C12M *1/24*
U.S. Cl. 435—285



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1-14** are cancelled.

[1. A roller bottle comprising a substantially cylindrical center portion having first and second ends, the first end of the center portion being inserted and sealed within a groove within a first cap portion, the second end of the center portion being inserted and sealed within a groove within a second cap portion, and at least part of the interior surfaces of the bottle being capable of allowing cell adhesion thereto.**]**

B1 4,366,093 (601st)
CYLINDRICAL MOLDED CATALYST
Ken Shiozaki, Hyogo; Kazunori Tsuge, Takasago, and Akira Ohnishi, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Reexamination Request No. 90/000,940, Jan. 27, 1986.
Reexamination Certificate for Patent No. 4,366,093, issued Dec. 28, 1982, Ser. No. 249,507, Mar. 31, 1981.
Claims priority, application Japan, Apr. 7, 1980, 55-45925
Int. Cl.[4] B01J *35/02*
U.S. Cl. 502—225

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

New claims **4-17** are added and determined to be patentable.

1. A molded catalyst having a cylindrical shape, the outer diameter of the circle being from 3 to 6 mm., the inner diameter of the circle being at least 1.0 mm., the thickness of the wall being at most 1.5 mm. and the height being from 3 to 6 mm., *said molded catalyst containing a catalytically effective component useful for performing oxychlorination.*

B1 4,452,053 (602nd)
STAMPED KNITTING-TOOL FOR KNITTING MACHINES
Gerhard Egbers, Reutlingen; Bernhard Schuler, Sonnenbühl-Erpfingen; Adolf Seidel, and Günter Bühler, both of Reutlingen, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany
Reexamination Request No. 90/000,792, Jun. 3, 1985.
Reexamination Certificate for Patent No. 4,452,053, issued Jun. 5, 1984, Ser. No. 291,934, Aug. 11, 1981.
Continuation of Ser. No. 38,316, May 11, 1979, abandoned. Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820925
Int. Cl.[4] D04B *35/02*
U.S. Cl. 66—123



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1-17** are cancelled.

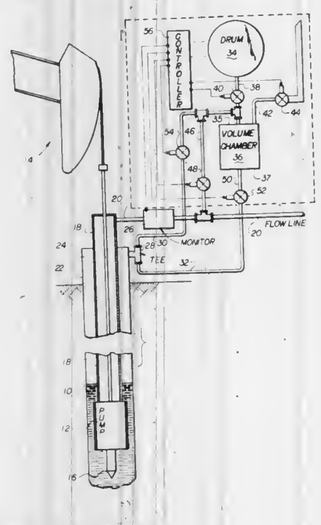
[1. A stamped knitting-tool which can be employed in knitting machines and has a head bent like a hook, a shaft having at least one bridge which consists of two guidepieces extending as far as the back of the knitting-needle and a stem arranged above the back to bridge across the guidepieces, and at least one butt coupled to the shaft in the region of the bridge, where the stem includes at least one first segment arranged between the head and the butt, said tool including means for controlling vibration within the needle and preventing tool breakage at increasing knitting speeds, said means including the shape of said needle which has said first segment **(14, 23, 31,48)** having a length of (l) of at least eight millimeters (8 mm) and a height (h) of at most eleven tenths of a millimeter (1.1 mm).**]**

REISSUES

DECEMBER 16, 1986

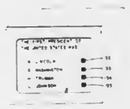
Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,304
CHEMICAL TREATMENT FOR LIQUID SYSTEMS
Richard Maxwell, 2021 E. 56th, Odessa, Tex. 79762
Original No. 4,436,148, dated Mar. 13, 1984, Ser. No. 257,780, Apr. 27, 1981. Application for reissue Sep. 23, 1985, Ser. No. 778,904
Int. Cl.[3] E21B *37/06, 37/08, 43/12, 44/00*
U.S. Cl. 166—53
4 Claims



4. In a liquid system having:
a. a liquid reservoir,
b. a pump with a pump intake in the reservoir,
c. a flow line from the pump having pressurized liquid from the reservoir,
d. a treatment drum, and
e. treatment liquid in the drum; wherein the improved structure for adding treatment liquid to the reservoir comprises:
f. a closed volume chamber having a top and bottom,
g. a flush line extending from the bottom of the volume chamber to the reservoir,
h. a flush valve in the flush line,
j. a treatment feed line connecting the treatment drum to the volume chamber,
k. a feed valve in the feed line,
l. a vent line extending from the top of volume chamber to atmosphere,
m. a vent valve in the vent line,
n. a liquid pressure line from the flow line to the volume chamber, and
o. a pressure valve in the pressure line,
p. a controller providing means for opening and closing said valves so that
(i) opening the feed valve and the vent valve and closing all other valves will fill the volume chamber with treatment liquid, and then
(ii) opening the flush valve and pressure valve and closing all other valves will flush the treatment liquid from the volume chamber into the reservoir, and
(iii) after flushing the treatment liquid into the reservoir, then opening the vent valve and leaving the flush valve open and closing all other valves will purge the volume chamber of liquid.

Re. 32,305
METHOD OF EMPLOYING A TELEVISION RECEIVER FOR ACTIVE PARTICIPATION
Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Original No. 3,829,095, dated Aug. 13, 1974, Ser. No. 62,691, Aug. 10, 1970. Division of Ser. No. 697,798, Jan. 15, 1968, abandoned. Application for reissue Jun. 27, 1977, Ser. No. 810,542
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—85 G
7 Claims



2. The method of **[**claim 1**]** *employing a standard home television receiver previously employed only for passive viewing of programs for adding active home entertainment capability by providing for active participation by players in the playing of amusement games on the screen of the television receiver by said players, comprising the steps of:*
generating controlled television video signals representing "dots" displayed on the screen of a single home television receiver wherein said step of generating video signals includes the steps of:
generating positive and negative pulse trains at the horizontal sync frequency;
generating positive and negative pulse trains at the vertical sync frequency;
delaying said positive pulse trains amounts proportional to the desired position on the screen where the "dots" are to be displayed;
AND gating said delayed positive pulse trains; summing said negative pulse trains and said AND gate delayed pulse trains; generating an rf signal; and
modulating said rf signal with said summed signal ;
disabling said single home television receiver from receiving broadcast television signals;
directly coupling said video signals only to a single television receiver being viewed by the players; and
moving the "dots" over the television screen of said home television receiver to play amusement games.

11. A method of employing a standard broadcast television receiver for active participation by players in the playing of games on the screen of the television receiver by said players, comprising the steps of:
generating controlled television video signals representing "dots" displayed on the screen of a single broadcast television receiver;
providing an initial background color for the screen of said television receiver;
disabling said single broadcast television receiver from receiving broadcast television signals and directly coupling said video signals only to said single broadcast television receiver being viewed by the players;
moving the "dots" over the television screen of said single broadcast television receiver to play games;
"shooting" at said "dots", said step including aligning a light responsive means with a displayed "dot"; and

causing the background color of the television screen to completely change colors for a lasting duration when the light responsive means receives light from a displayed "dot" wherein said color change is distinct from said initial color.

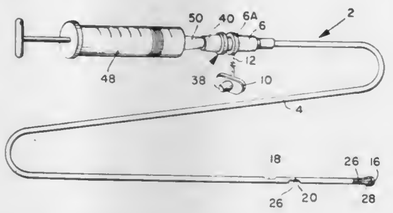
Re. 32,306
INTUBATING DEVICE

William E. Waters, Malvern, Pa., assignor to Biosearch Medical Products, Inc., Somerville, N.J.

Original No. 4,388,076, dated Jun. 14, 1983, Ser. No. 233,482, Feb. 11, 1981. Application for reissue Jun. 7, 1985, Ser. No. 742,286

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—165 **11 Claims**



1. An Enteric feeding device comprising:

[a flexible tube] *a tube having unrestricted flexibility in all directions and* having a self-sustaining diameter, free to be in any position at rest, and having an open proximal end and a discharge opening adjacent its distal end;

a hollow stylet connector plug having an inner diameter and removably secured to the proximal end of the tube;

a stylet [extending into the bore of said plug and] *immovably* secured to said plug *substantially against longitudinal movement therebetween* and extending through the interior of the tube to a point adjacent the distal end of the tube *when the plug is mounted to the proximal end of the tube*;

said stylet having an outer diameter smaller than the inner diameter of the tube and smaller than the inner diameter of the plug for passage of fluid *through said plug and* between the stylet and the tube [and the stylet and the plug]; and

a hollow connector fitting integral with said plug and having a passage communicating with the interior of the plug.

Re. 32,307
FLUIDIZED BED APPARATUS

Werner Glatt, 7851 Binzen, Bühlmühle, Fed. Rep. of Germany, and Kurt Bauer, Freiburg-Tiengen, Fed. Rep. of Germany, assignors to Werner Glatt, Binzen, Fed. Rep. of Germany

Original No. 4,323,312, dated Apr. 6, 1982, Ser. No. 154,682, May 30, 1980. Continuation-in-part of Ser. No. 936,955, Aug. 25, 1978, abandoned. Application for reissue May 9, 1983, Ser. No. 492,832

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738485; Feb. 9, 1978, 2805397; Feb. 15, 1980, 3005770

Int. Cl.[4] B01F *13/02, 15/02*

U.S. Cl. 366—102 **24 Claims**

1. A fluidized bed apparatus comprising:

[a fluidized bed vessel] *in three vertically contiguous sections, an upper section constituting an expansion zone, an intermediate section* having *a first* [walls tapered inwardly as it extends] *wall extending* upwardly, *and a lower section including a second wall tapered inwardly frustoconically as it extends downwardly* and [having a perforated] *terminating in a* bottom[,] *inlet for air, or other gas, said intermediate and lower sections constituting a fluidized bed vessel, with said second wall having an interior wall surface, said interior wall surface being divided into an upper portion and a lower portion, said upper portion being defined in the area of vertical movement of a rotor disc, said upper portion widening frustoconically in an upward direction;*

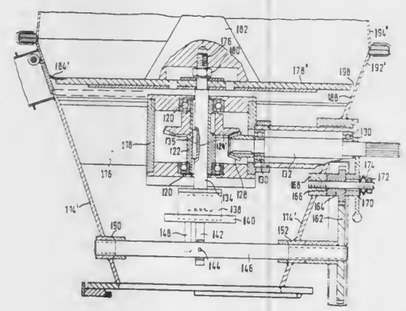
a substantially horizontal rotor disc *having a substantially flat bottom and being arranged for vertical movement, said rotor disc* arranged above said bottom *inlet* of said vessel[,] *and below the top of said lower section and in radial proximity with said upper portion of said interior wall surface of said lower section;*

said rotor disc being of smaller horizontal dimension than the [corresponding] horizontal dimension *of the top of said lower section* of *said interior wall surface of* said vessel [and] *but of larger horizontal dimension than the horizontal dimension of the bottom inlet of said lower section, and said rotor disc* forming an annular gap between the circumferential edge of said rotor disc and [the] *said* upwardly and [inwardly tapered] *outwardly frustoconically widening* [wall] *upper portion* of said *lower section of said* vessel[,];

adjusting means for adjusting the *vertical* height of said rotor disc connected to said rotor disc and thereby changing the width of said annular gap[,] *relative to the upper portion of said lower section from zero gap at the lowest position to a predetermined gap at the highest position of the rotor disc;*

means for rotating said rotor disc about an at least approximately vertical axis connected to said rotor disc[,];

sucking means *positioned above and in fluid communication with said upper section* for [moving] *sucking* a flow of air



or other gas into said vessel through said bottom *inlet* and through said annular gap around the periphery of said rotor disc[,] *so that the flow of air or other gas tends to follow the outwardly widening wall surface of the lower section;*

said adjusting means closing of said annular gap to cause said sucking means to create a pressure differential between the portion of said fluidized vessel on one side of said rotor disc and the remaining portion of said vessel on the other side of said rotor disc when said sucking means is operating;

means for releasing material to be treated into the *fluidized bed vessel above said rotor disc to form* [moving gas forming] a fluidized bed moved by said rotor disc and the [moving] gas [passing] *being sucked* through said annular gap[,]; *and*

nozzle means for introducing liquid into said fluidized bed vessel, said nozzle means including a plurality of nozzles disposed in a ring about the periphery of said vessel below said expansion zone;

whereby the velocity of the flow of gas through said annular gap[is] *may be* adjusted to the varying density, particle size, and surface characteristics of the material to be treated by varying the height of said rotor disc in relation to said [walls] *upper portion of said interior walls* of said vessel to decrease said gap and increase flow velocity and alternatively to increase said gap and decrease flow velocity.

* * * * *

The questions raised in reexamination request No. 90/000,329, filed 02/15/83, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

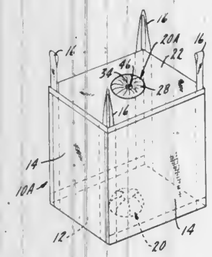
Re. 32,308
END WALL CLOSURE FOR BULK MATERIAL TRANSPORT BAG

Peter J. Nattrass, Fox River Grove, Ill., assignor to Bulk Lift International Incorporated, Carpentersville, Ill.

Original No. 4,364,424, dated Dec. 21, 1982, Ser. No. 278,195, Jun. 29, 1981. Application for reissue Mar. 31, 1983, Ser. No. 480,769

Int. Cl.[4] B65D *33/36*

U.S. Cl. 383—24 **8 Claims**



6. In a bag for transporting bulk materials, of the kind comprising an end wall joined to a plurality of side walls, all formed of strong, flexible material, an improved reusable fill/discharge closure comprising:

opening of maximum transverse dimension D in one end of the bag;

a fill/discharge tube of strong, flexible material having a maximum transverse dimension at least approximately equal to D and having a length L1;

a closure tube of strong, flexible material having a maximum transverse dimension at least approximately equal to D and having a length L2 no greater than D/2, with L1>L2;

the fill/discharge tube and the closure tube secured to each other and to the periphery of the bag end opening and projecting outwardly from the periphery of the opening in the end of the bag with the fill/discharge tube disposed within the closure tube and projecting outwardly beyond the end of the closure tube;

a drawstring disposed in a peripheral pocket in the outer end of the closure tube;

and tie means for releasably closing the outer end of the fill/discharge tube;

whereby the closed fill/discharge tube can be stuffed into the interior of the bag through the end opening and the drawstring tightened to form a flat openable closure for the end opening of the bag.

* * * * *

The questions raised in reexamination request No. 90/000,584, filed 07-06-84, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 32,309
FUSIBLE POWDERED METAL PASTE

Jennie S. Hwang, Pepper Pike, Ohio, assignor to SCM Corporation, New York, N.Y.

Original No. 4,557,767, dated Dec. 10, 1985, Ser. No. 649,493, Sep. 11, 1984. Continuation-in-part of Ser. No. 546,794, Oct. 31, 1983, abandoned. Application for reissue Jan. 27, 1986, Ser. No. 822,475

Int. Cl.[4] B23K *35/34*

U.S. Cl. 148—23 **57 Claims**

1. A nonaqueous noncorrosive inorganic salt free powdered metal soft solder paste composition containing from 75% to 95% by weight of a powdered soft solder metal or powdered soft solder metal alloy having an average particle size finer than 100 mesh (U.S. Standard Sieve Size) and *a vehicle containing* from [5% to 25] *0.5% to 75%* by weight *of said vehicle* of a nonaqueous organic liquid having a surface tension of from 43 to 65 or more dynes/cm. at 20° C., and a noncorrosive anhydrous flux.

Re. 32,310
DERIVATIVES OF A-21978C CYCLIC PEPTIDES

Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

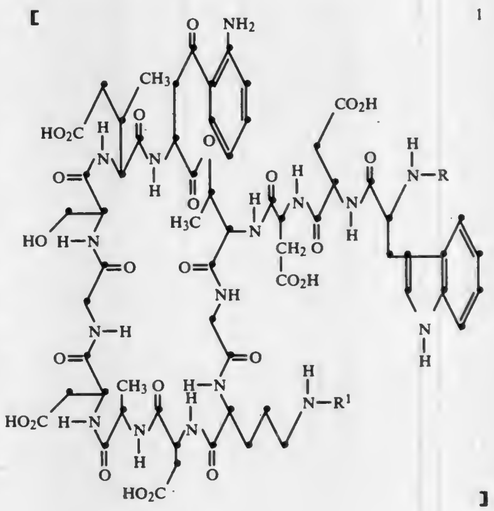
Original No. 4,399,067, dated Aug. 16, 1983, Ser. No. 380,498, May 21, 1982. Application for reissue Sep. 23, 1985, Ser. No. 779,372

Int. Cl.[4] C07K *5/12*

U.S. Cl. 530—317 **8 Claims**

1. An A-21978C cyclic peptide derivative of the formula:

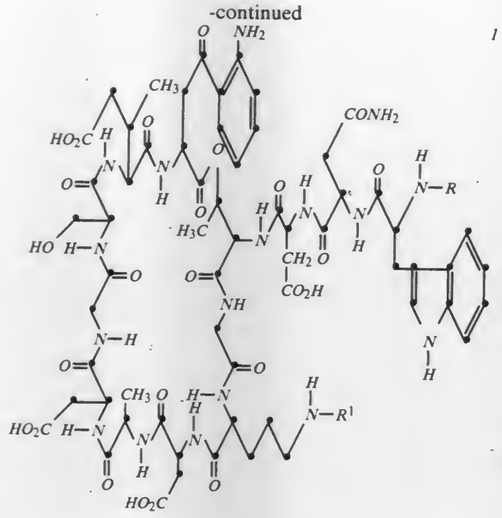
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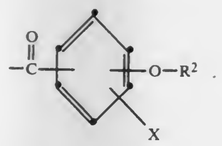
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]

-continued



wherein R is a substituted benzoyl group of the formula



R^2 is C_8-C_{15} alkyl; X is hydrogen, chloro, bromo, iodo, nitro, C_1-C_3 alkyl, hydroxy, C_1-C_3 alkoxy, or C_1-C_3 alkylthio; and R^1 is hydrogen or an amino-protecting group; and the salts thereof.

Re. 32,311

DERIVATIVES OF A-21978C CYCLIC PEPTIDES

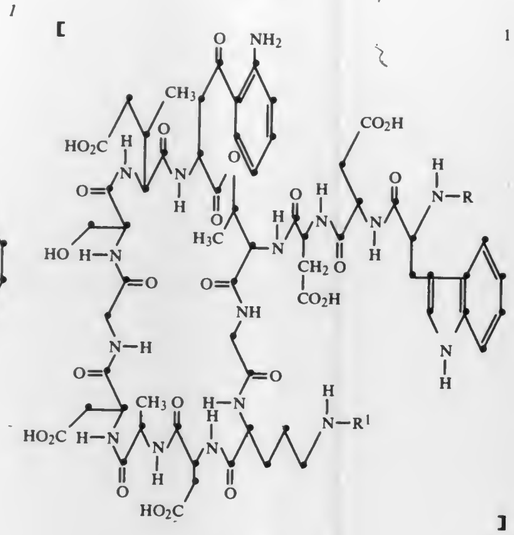
Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Original No. 4,396,543, dated Aug. 2, 1983, Ser. No. 380,499, May 21, 1982. Application for reissue Sep. 25, 1985, Ser. No. 780,130

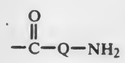
Int. Cl.[4] C07K *5/12*

U.S. Cl. 530—317 **34 Claims**

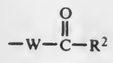
1. An A-21978C cyclic peptide derivative of the formula:



wherein R is hydrogen 8-methyldecanoyl, 10-methyldodecanoyl, 10-methylundecanoyl, the specific C_{10}-alkanoyl group of A-21978C_0 or the specific C_{12}-alkanoyl groups of A-21978C factors C_4 and C_5, an amino-protecting group, an aminoacyl group of the formula

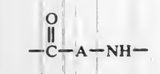


wherein Q is C_1-C_{16} alkylene, or an N-alkanoylamino acyl group of the formula



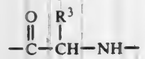
wherein:

W is a divalent aminoacyl radical of the formula:



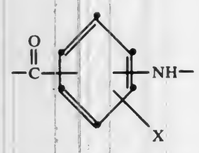
(a)

wherein A is C_1-C_{10} alkylene or C_5-C_6 cycloalkylene;



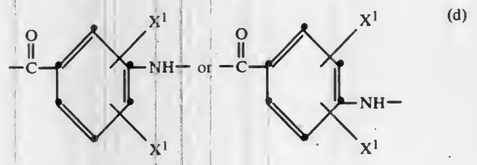
(b)

wherein R^3 is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indole-methyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, C_1-C_3 alkyl, hydroxy, C_1-C_3-alkoxy, C_1-C_3 alkylthio, carbamyl, or C_1-C_3 alkylcarbamyl;



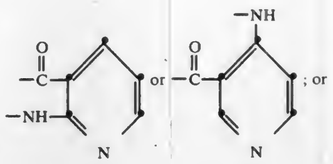
(c)

wherein X is hydrogen chloro, bromo, iodo, amino, nitro, C_1-C_3 alkyl, hydroxy, C_1-C_3 alkoxy, mercapto, C_1-C_3 alkylthio, carbamyl, or C_1-C_3 alkylcarbamyl;



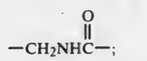
(d)

wherein X^1 is chloro, bromo, iodo, amino, hydroxy, C_1-C_3 alkyl or C_1-C_3 alkoxy;



(e)

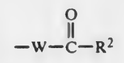
wherein B is a divalent radical of the formula: $-(CH_2)_n-$ and n is an integer from 1 to 3; —CH=CH—; —CH=CH—CH_2—; or



R^2 is C_1-C_{17} alkyl or C_2-C_{17} alkenyl; and

R^1 is hydrogen, an amino-protecting group, an aminoacyl group of the formula

as herein defined, or an N-alkanoylaminoacyl group of the formula



as herein defined; provided that, when R is other than aminoacyl or N-alkanoylaminoacyl, R^1 must be aminoacyl or N-alkanoylaminoacyl; and, when R^1 is an amino-protecting group, R must be aminoacyl or N-alkanoylaminoacyl; and the salts thereof.

PLANT PATENTS

GRANTED DECEMBER 16, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,827

ROSE PLANT

Anthony Perry, Hemet, Calif., assignor to Co-Operative Rose Growers, Inc., Tyler, Tex.

Filed Dec. 10, 1984, Ser. No. 680,291
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by multi-colored blooms which in open stage may have greyed purple outer petal segments and apricot orange flower centers varying to greyed purple petal edges, pale pink petals and apricot orange flower centers.

5,828

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 4, 1985, Ser. No. 698,221
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described, characterized particularly by unique Spinel red and Naples yellow bicolor flowers with red petal top surface and yellow petal undersurface.

5,829

OLIVE TREE, "HAAS IMPROVED MANZANILLO"

Alfred Haas, 440 W. Citrus Ave., Lindsay, Calif. 93427

Filed Jan. 22, 1985, Ser. No. 693,257
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of olive tree characterized by bearing fruit which is larger than that of the well known Manzanillo (unpatented) variety, but smaller than that of the Sevillano (unpatented) or Ascolano (unpatented) and being most nearly similar to the Manzanillo, from which it is further distinguished by having smaller leaves, producing fruit which is more nearly spherical, which fruit has smaller pits, and ripens five to seven days later than that of the Manzanillo and has an improved flesh to pit ratio.

5,830

DISTINCT VARIETY OF STREPTOCARPUS NAMED SELENA

Gerhard Fleischle, Vaihingen/E.-Ensingen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Feb. 7, 1985, Ser. No. 699,461
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

5,831

PEACH TREE ("ZEE-RED")

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 4, 1985, Ser. No. 698,122
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, as illustrated and described, characterized by its large size, vigorous, upright growth and being a productive and regular bearer of large, very firm, yellow flesh, freestone fruit with good eating, storage and shipping quality; the fruit is further characterized by being relatively uniform in size throughout the tree, having an attractive red skin color, and maturing 7 to 10 days before Fayette Peach (Non-patent).

5,832

PEACH TREE

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 4, 1985, Ser. No. 698,526
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree which is of large size, vigorous, upright growth, and a productive and regular bearer of large size, yellow flesh, freestone fruit, maturing approximately 10 days before O'Henry Peach (U.S. Plant Pat. No. 2,964); the fruit is further characterized by its high degree of red skin color, its excellent eating quality and a high degree of firmness when mature with very good shipping and storage quality.

5,833

GRAPEVINE, "EMPERATRIZ"

Angelino A. Gargiulo, Mendoza, Argentina, assignor to Milan M. Caratan and Luis M. Caratan, both of Delano, Calif.

Filed Dec. 11, 1984, Ser. No. 682,110
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine to be known as the Emperatriz substantially as illustrated and described, characterized principally by its production of seedless berries which mature approximately a week earlier than those of the Emperor grapevine, which it most nearly resembles, but from which it is distinguished by the berries being somewhat smaller and more nearly spherical than the berries of the Emperor, looser bunches which are much more susceptible to the action of gibberellic acid to enlarge the berries and to fill out the bunches than is the Emperor which has little or no reaction to gibberellic acid.

5,834

SPIRAEA×*BUMALDA* CV. MONHUB'

Tony Huber, Laval, Canada, assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Dec. 31, 1984, Ser. No. 688,443
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct selection of *Spiraea*×*bumalda* as substantially shown and described herein, characterized particularly as a novelty by the unique combination of mature foliage a lemon-green color, juvenile foliage yellow with russet new growth, autumn foliage a salmon russet color, light pink flowers, a dense compact uniform growth and tolerance of temperatures to minus 42° F.

PATENTS

GRANTED DEC. 16, 1986

ERRATA

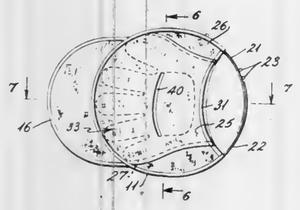
For CLASS	See PATENT NO.
222-019	4,629,107
239-069	4,629,164
180-336	4,629,206
384-049	4,629,260
404-001	4,629,376
123-198	4,629,471
264-109	4,629,474
420-038	4,629,504
429-059	4,629,622
536-007	4,629,786
379-056	4,629,829
379-058	4,629,829
340-825	4,629,830
379-213	4,629,831
340-825	4,629,832
381-068	4,629,833
381-068	4,629,834
379-029	4,629,835
379-012	4,629,836
340-995	4,630,065

PATENTS

GRANTED DECEMBER 16, 1986

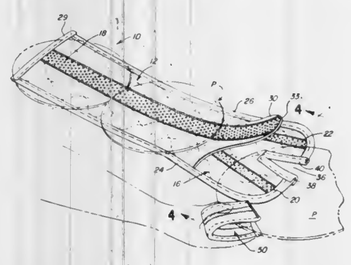
GENERAL AND MECHANICAL

4,628,543
COMBINATION CAP AND BASEBALL GLOVE
William J. Hunt, 2410 Kingsley Dr., Macon, Ga. 31204
Filed Oct. 25, 1985, Ser. No. 791,288
Int. Cl.[4] A41D *13/10, 19/00*
U.S. Cl. 2—19 **19 Claims**



1. A protective article of wearing apparel for selective use as a cap for covering a person's head or a baseball glove for wearing on a person's hand comprising crown portion to lower edge portions and which is defined by inner and outer surfaces, said cap being of a size to fit over the person's head, a material liner having edge portions which are attached to said main body of said cap to permit access into said pocket, said pocket being of a size to accommodate the person's hand therein, said liner and said cap thereby forming a baseball glove which may be selectively worn on a person's hand.

4,628,544
SERVER GAUNTLET
Joyce A. Erickson, 324 Cherrywood Ct., Vernon Hills, Ill. 60061
Filed Apr. 18, 1985, Ser. No. 724,772
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—158 **4 Claims**



1. A protective grip-enhancing gauntlet for protectively facilitating manual transport of temperature discomforting objects, such as a plurality of food laden plates, said covering comprising, in combination:

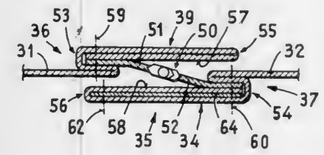
a mitt member having a hand-receiving opening for insertingly receiving a hand, for protectively covering the front of a hand, said mitt member being split to provide two enclosures, each enclosure being suitable for insertion of two fingers of a hand, and the enclosures being laterally moveable with respect to each other, and said mitt member including a palm-covering portion engaged with means for enhancing frictional contact between said mitt member and a temperature discomforting object;

a thumb protective member defining a thumb receiving enclosure for protectively covering the frontal grasping surface of a thumb, said thumb protective member being engaged with said mitt member;

a forearm protective member having an engagement end engaged with said mitt member adjacent said hand-receiving opening, said forearm protective member having a terminal end spaced longitudinally away from said engagement end to provide a protective covering for covering an inner forearm; and

means engaged with said forearm protective member and extending longitudinally along the upper surface of said forearm protective member substantially from said engagement end to said terminal end and then to the distal extremity of said thumb protective member, respective separate strips of said means extending along the outer surfaces of said two enclosures of said mitt-member, said means being suitable for enhancing frictional contact between said grip-enhancing gauntlet and surfaces of the temperature discomforting objects.

4,628,545
APPAREL ARTICLE HAVING ZIPPER CONNECTION AND ITS METHOD FOR FABRICATING
Herbert Metzler, Balgach, Switzerland, assignor to Metzler & Co. AG, Balgach, Switzerland
Filed Mar. 1, 1985, Ser. No. 707,214
Int. Cl.[4] A44B *19/34;* **A41B** *1/08*
U.S. Cl. 2—265 **26 Claims**



1. A zipper connection for apparel, comprising:

a zipper fastener having a first zipper half and a second zipper half;

an edge region of a first panel of apparel fabric;

an outwardly returned simple hem fold at said edge region of said first panel;

said first zipper half of said zipper fastener being located outwardly adjacent to said outwardly returned simple hem fold of said first panel;

an inward substantially parallel pleat in said first panel outwardly overlapping said first zipper half and said outwardly returned simple hem fold;

a stitch extending longitudinally through said inward parallel pleat, said first zipper half and said hem fold for uniting said first zipper half to said first panel as well as for fixing said inward substantially parallel pleat and said hem fold;

an edge region of a second panel of apparel fabric;

an inwardly returned simple hem fold at said edge region of said second panel;

said second zipper half of said zipper fastener being located inwardly adjacent to said inwardly returned simple hem fold of said second panel;

an outward substantially parallel pleat in said second panel inwardly overlapping said second zipper half and said inwardly returned simple hem fold for forming an outer lap;

a stitch extending longitudinally through said outward parallel pleat, said second zipper half and said hem fold for uniting said second zipper half to said second panel as well as for fixing said outward substantially parallel pleat and said hem fold; and

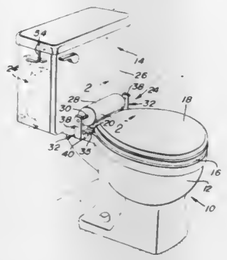
said first zipper half releasably engaging said second zipper half for releasably joining said first panel to said second panel.

4,628,546

COMMODE LID LOCKING DEVICE

Lexie A. Kauffman, 3900 Crestridge Dr., Midland, Tex. 79703

Filed Apr. 4, 1985, Ser. No. 719,811
Int. Cl.[4] A47K *13/24*
U.S. Cl. 4—253 **6 Claims**



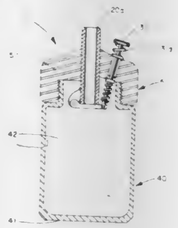
1. A locking device for a toilet bowl or the like having a hinged lid with a hinge axis and a vertical surface extending upwardly behind the lid hinge, said device comprising an elongated cylindrical blocking member with a longitudinal axis, and attachment means for releasably securing the blocking member to the bowl in a position between the lid hinge and said vertical surface with the longitudinal axis substantially parallel to the hinge axis, said attachment means is connected at opposite ends of the cylinder for securing the cylinder horizontally on a flange of the toilet bowl behind the lid hinge in blocking relation with the lid, the blocking member being configured for preventing, by interference, substantial raising of the lid toward said vertical surface from a closed substantially horizontal position of the lid.

4,628,547

APPARATUS FOR CONTAINMENT OF ORAL SECRETIONS

Walter D. Baker, 5401 Holly Cir., Raleigh, N.C. 27603

Filed Jul. 12, 1985, Ser. No. 754,246
Int. Cl.[4] A61J *19/02*
U.S. Cl. 4—259 **2 Claims**



1. A flask-type pocket cuspidor comprising:

A. a container including a bottom, side walls and an open top;

B. a top removably mounted to the open top of said container;

C. means for transferring spitum directly from the user's mouth into said contaienr, said transfer means including an elongated tube-like mouthpiece extending through said top, said tube-like mouthpiece including an outlet end disposed within said container and an inlet end disposed exteriorly thereof adapted to be placed against the user's mouth;

D. a flapper valve pivotally connected to said outlet end of said mouthpiece for closing the same, said flapper valve being movable between a closed position with respect to said outlet end and an open position;

E. a passageway extending through said top and communicating between the interior and exterior of said container for venting said interior while spitum is being directed through said mouthpiece;

F. a poppet type valve seated against the inner end of said passageway, said poppet valve being movable between a closed position with respect to said passageway and an open position;

G. hand-actuating means operatively connected with said flapper valve and said poppet valve for moving the same from said closed positions to said open positions, said hand actuating means including an actuating rod pivotally secured to said flapper valve and extending through said passageway for moving said flapper valve and said poppet valve from said closed positions to said open positions when said actuating rod is pressed and spring means for urging said flapper and poppet valves back to a closed position whe said hand-actuating means is released, said actuating rod having a diameter lesser than said passageway such that air may freely pass through said passageway.

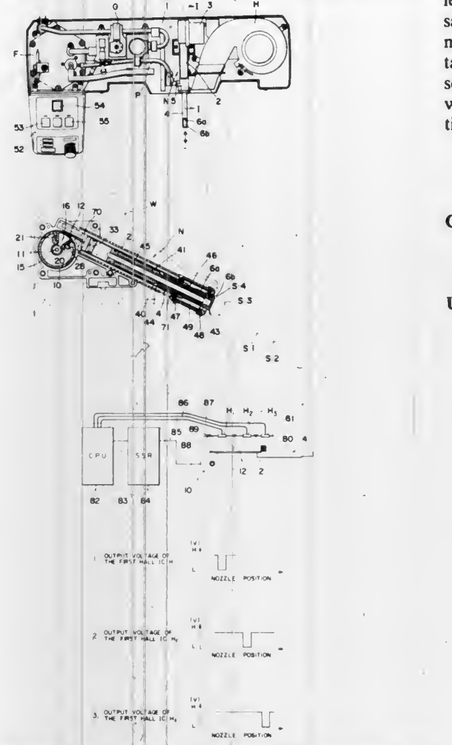
4,628,548

DEVICE AND METHOD OF MOVING AND CONTROLLING THE POSITION OF A SLIDABLE BODY SUCH AS USED FOR BODY CLEANSING

Masahiro Kurosawa; Shigeru Niki; Shigenari Kadomatsu; Motoki Moroi; Takao Yuasa, all of Yokohama; Masami Iida, Chigasaki; Tetsuhiro Katamune, Kitakyushu; Akiyoshi Seki, Kitakyushu, and Kazutaka Ide, Kitakyushu, all of Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed May 31, 1985, Ser. No. 740,127
Claims priority, application Japan, Mar. 23, 1985, 60-041817; Mar. 31, 1985, 60-067885; Mar. 31, 1985, 60-067886
Int. Cl.[4] A47K *3/20, 4/00;* **E03D** *9/08*
U.S. Cl. 4—420.4 **15 Claims**

1. A device for moving a cleansing nozzle connected to a water supply system comprising an elongated nozzle, a structure having a cylinder in which said nozzle is axially slidable, a motor mounted on said structure, said motor having an output shaft, a drum body mounted on said output shaft, said drum body having a cylindrical rim surface and a sectoral recess extending from said rim surface, a sectoral insert disposed in said recess and having a partial cylindrical surface conforming to and forming a continuation of said cylindrical rim surface, and a leaf spring having one end connected to said nozzle and the other end held between said drum body and said sectoral insert, whereby rotation of said drum body extends and withdraws said nozzle longitudinally as said leaf spring unwraps and wraps around said drum body.



4,628,549

FLOATABLE SHEET MATERIAL AND METHOD OF MAKING

Stanley Lazar, Willowdale, Canada, assignor to Cantar Corporation, Ontario, Canadn

Filed May 3, 1984, Ser. No. 606,601
Int. Cl.[4] E04H *3/16, 3/18;* **F16L** *22/02*
U.S. Cl. 4—498 **13 Claims**



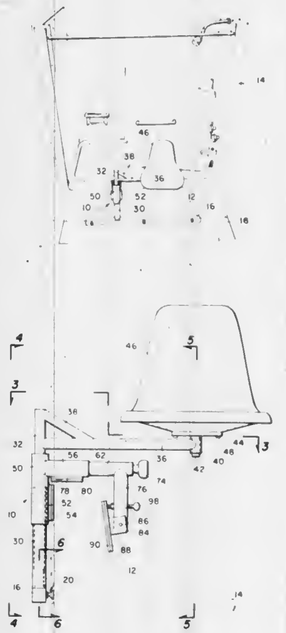
1. In a floatable on water, translucent heat laminated swimming pool cover being composed of a plurality of sections of plastic sheet material having a plastic embossed film with a plurality of embossments dispersed thereon except at the longitudinal edges thereof, said embossments being spaced apart and separated by land areas between said embossments, and a plastic backing film heat laminated to said embossed film at the said longitudinal edges and at said land areas, whereby air containing buoyant cells are formed by the embossments of the embossed film and the backing film, the improvement comprising fibrous material heat laminated to said sections of sheet material between the embossed film and the backing film at least at the longitudinal seam edges of each section, whereby said longitudinal seam edges are reinforced by the fibrous material and said reinforced longitudinal seam edges are attached by sewing to correspondingly reinforced longitudinal seam edges of another section of said sheet material and whereby substantially weakening of the attached sewed sections of sheet material at the seam edges thereof is avoided.

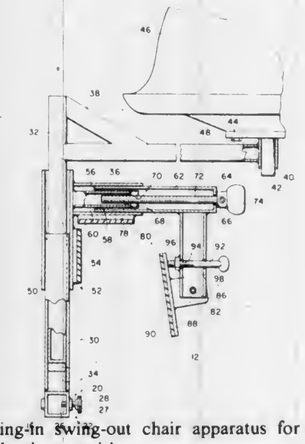
4,628,550

SWING-IN-SWING-OUT SHOWER CHAIR

Claude G. Walton, 401 W. 24th St., Apt. 67, Fayetteville, Ark. 72701

Filed Nov. 5, 1984, Ser. No. 667,998
Int. Cl.[4] A47K *3/12, 3/00*
U.S. Cl. 4—560 **9 Claims**





1. A swing-in swing-out chair apparatus for a bathtub-shower stall unit comprising:

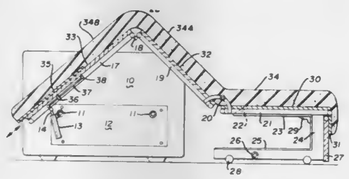
bar means adapted to be disposed on the floor adjacent the side wall of the bathtub-shower stall unit;
an upstanding pipe means fixed to said bar means;
a collar slideably secured to said pipe means;
a tube means slideably and rotatably mounted in the top of said pipe means and extending therefrom upwardly to a position above the upper limit of the side wall;
support arm means secured to the tube means and extending radially outwardly therefrom and moveable with the tube means;
seat means secured to the arm means and movable therewith to positions externally of or internally of the bathtub-shower stall unit;
anchoring means carried by the collar for removably securing the apparatus to the side wall of the bathtub-shower stall unit.

4,628,551

CONVERTIBLE BED CHAIR

Stan W. Atimichuk, 262 Durie St., Toronto, Canada (M9S 3G3)

Continuation-in-part of Ser. No. 575,305, Jan. 30, 1984, abandoned. This application Oct. 25, 1985, Ser. No. 791,528
Int. Cl.⁴ A47C *13/00, 17/13*
U.S. Cl. 5—12 R **5 Claims**



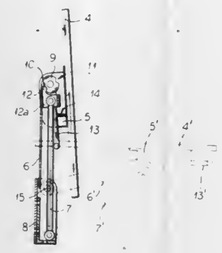
1. A convertible bed chair comprising spaced vertically standing arms with front and back portions, means for spacing said arms horizontally, said means consisting of metal plates on the inner sides of said arms in oppositely disposed relation and horizontally spaced cross bars extending between said metal plates and directly affixed thereto, a C-shaped seat support movably positioned between said arms for movement on a horizontal plane from a first position between said arms to a second position outwardly of the front portions of said arms, upper and lower portions of said seat support freely spaced vertically whereby said upper portions may be moved above said cross bars and said lower portions may be moved below said cross bars, vertical front frames secured to said upper and lower portions and defining an outer end of said seat support and said convertible bed chair when in bed configuration and when in seat configuration, three flat tubular frames arranged in end to end relation and hinges joining said flat frames to one another, one of said flat frames disposed on said seat support and means pivoting said one flat frame to said seat support, means detachably and pivotally connecting another of said flat frames to one of said cross bars, flat body members positioned on said flat frames and a single elevated cushion positioned on said flat body members for movement with respect thereto when said convertible bed chair is changed from a bed configuration to a chair configuration and vice versa and means slidably securing one of said flat body members to one of said flat tubular frames so as to permit relative longitudinal movement.

4,628,552

ADJUSTABLE BACK AND ARM STRUCTURE FOR BED HEADS, SOFAS AND THE LIKE

Vico Magistretti, Milan, Italy, assignor to Flou S.p.A., Milan, Italy

Filed Oct. 29, 1984, Ser. No. 665,626
Claims priority, application Italy, Nov. 15, 1983, 23725 A/83
Int. Cl.⁴ A47C *17/00, 20/04*
U.S. Cl. 5—52 **5 Claims**



1. An adjustable back and arm structure for beds, sofas, easychairs and the like, wherein said structure comprises at least one element having a backrest function and at least one other element having an armrest function, said elements each being provided with respective supporting means for enabling the elements to be arranged side by side in the same plane in a substantially vertical position of said elements and to be lowered and inclined into different positions, in particular said element having a backrest function being arrangeable in a slanting position and said element having an armrest function being arrangeable in a substantially horizontal position, wherein said means for supporting said element having an armrest function comprises a pair of connecting rods hinged at one end at two points of a fixed supporting structure and at the opposite end at two points of a plate supporting said armrest element, the reciprocal distances between said points of said supporting structure and said points of said plate being such as to cause the horizontal positioning of said armrest element in a lowered position thereof and the substantially vertical positioning in a raised position thereof, locking means being provided on said plate for locking said armrest element in at least one of the positions.

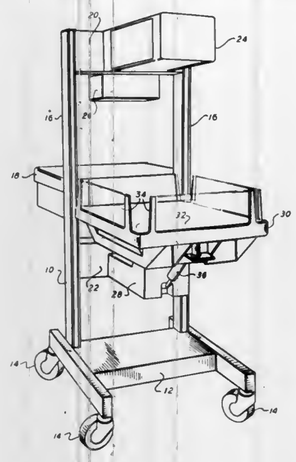
4,628,553

INFANT BED HYDRAULIC TILT MECHANISM

Anthony D. Buttitta, Sun Prairie, and Douglas D. Garden, Barneveld, both of Wis., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Mar. 25, 1985, Ser. No. 715,714
Int. Cl.⁴ A61G *7/10*
U.S. Cl. 5—62 **5 Claims**

1. An infant care unit comprising:
a standing frame member;
an infant bed tiltably suspended from said frame member and about an axis;
a double acting hydraulic piston assembly forming a movable support between said frame member and said infant bed, said hydraulic piston assembly comprising a cylinder and a piston movable therein, said piston dividing said cylinder into a pair of variable chambers, ports in said cylinder for communicating hydraulic fluid to and from each of said variable chambers, a closed hydraulic circuit connecting said ports to allow hydraulic fluid to pass from one chamber to the other as said piston is moved, and manual valve means located on said infant care unit convenient to an operator, said valve means being selectively operable to permit the movement of hydraulic fluid in said closed hydraulic circuit means to allow tilting of said infant bed and to prevent movement of hydraulic fluid in said closed hydraulic circuit to prevent movement of said piston in said cylinder assembly to fix the tilt position of said infant bed about said axis.

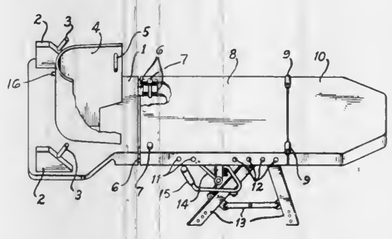


4,628,554

COLLAPSIBLE SUPPORT USED DURING COLONIC IRRIGATION

Roy A. Copp, P.O. Box 43, Banglamung Chonburi 20150, Thailand

Filed Sep. 17, 1985, Ser. No. 776,795
Int. Cl.⁴ A61G *7/02;* **A61M** *31/00*
U.S. Cl. 5—90 **2 Claims**



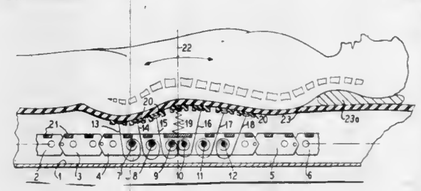
1. A bodyrest for use during a high enema, in which the body is generally horizontal, the legs drawn up, and the buttocks resting above and slightly short of a toilet bowl, comprising:
a collapsible support portion extending from the head to the buttocks, and
an extension portion which rests on the toilet bowl, and
attachment means connecting said collapsible support portion to said extension portion, and
a splash director shield passing through the central part of said extension portion, having a first part protruding through said extension portion, the first part being open toward the toilet, and a second part extending well above said extension portion and being open toward the buttocks, and
a collapsible stand supporting said collapsible support portion in a tiltable manner, the support point being closer to the head than is the center of gravity of bodyrest and body, and
a pin-jointed spreader attached between the lower part of said collapsible stand and an area on said collapsible support portion beyond the center of gravity of bodyrest and body, of a length such that the buttocks end of said collapsible support portion is lifted when said pin-jointed spreader is straightened, and
lever means, pivoted on said collapsible stand, for straightening or collapsing said pin-jointed spreader,
whereby the person receiving the enema may manipulate said lever means to tilt his body in order to control events during the enema.

4,628,555

INNERSPRING MATTRESS

Peter Forster, Flurstrasse 1, 8506 Langenzenn, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,123
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336324
Int. Cl.⁴ A47C *23/02, 20/00*
U.S. Cl. 5—247 **3 Claims**



1. An innerspring mattress spring assembly, comprising:
a plurality of springs which have securement ends attached at a frame and opposite support ends positioned to support an elastic material supporting surface upon which a user lies, said supporting surface forming a substantially planar surface prior to the user lying thereon;
said springs being designed and positioned such that a respective work axis of a spring force of each spring describes an angle with respect to a perpendicular of the planar surface on which the user lies such that a horizontal longitudinal component of the force is exerted longitudinally of the user through the supporting surface and a vertical component of the force vertically supports the user through the supporting surface;
said springs being secured in rows to parallel axel-like supports connected with the frame; and
said axel-like supports comprise axles which are rotatably seated, and stop means are positioned relative to said springs such that said springs can be pre-stressed when in abutting contact with the stop means by means of rotating said axles.

4,628,556

TILT-PREVENTION MECHANISM FOR ADJUSTABLE BED

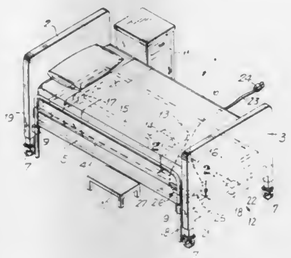
Lionel H. Blackman, West Palm Beach, Fla., assignor to Daniel J. Blackman, West Palm Beach, Fla., a part interest

Filed May 10, 1984, Ser. No. 609,003
Int. Cl.⁴ A47C *21/08, 21/00;* **A61G** *7/00*
U.S. Cl. 5—424 **9 Claims**

1. An anti-lateral tilt-preventing adjustable bed, especially for use in hospitals and similar institutions for bedridden patient care, comprising:
a mattress having a longitudinal axis that is parallel to and extends along a predetermined plane at least when a patient resting thereon is to assume a prostrate position;
a support for said mattress;
means for maintaining said support at an adjustable distance above ground in a plurality of positions in which said predetermined plane extends substantially horizontally, with freedom of movement of said support substantially normal to said predetermined plane, and at least limited freedom of undesired tilting in either circumferential

direction about said longitudinal axis, with attendant angular deviation of said predetermined plane from the horizontal;

means for moving said support substantially normal to said predetermined plane between said positions with the possibility of undesired tilting of said support in either circumferential direction about said longitudinal axis upon application of external forces thereto laterally and radially of said longitudinal axis at least during the operation of



said moving means, including a motor and means for energizing said motor when adjustment of said distance is desired; and

anti-lateral-tilt means including a level-sensitive switch for sensing the magnitude of said angular deviation when said switch is tilted from the horizontal, and for inactivating said energizing means when said magnitude exceeds a predetermined value selected to prevent the patient from tending to roll in a radial direction off the side of the bed.

4,628,557

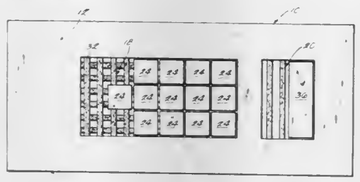
ADJUSTABLE HOSPITAL MATTRESS WITH REMOVABLE INSERTS

Michael E. Murphy, LaCrescent, Minn., assignor to Lutheran Hospital Foundation, Inc., LaCrosse, Wis.

Filed Sep. 14, 1984, Ser. No. 650,585

Int. Cl.[4] A47C *20/02, 27/00*

U.S. Cl. 5—446 **22 Claims**



1. In a mattress of the type comprising a main body including a cut out section disposed to underlie a patient recumbent thereon, and insert cushions adapted to be received in said cut out section, the improvement wherein said mattress further includes:

a first cover element, formed of flexible, generally impervious material, covering the exterior surfaces of said main body and forming a floor in respect of said cut out section;

second cover elements, associated with each said insert cushion, formed of flexible, generally impervious, material and covering the exterior surfaces of each of said associated insert cushions;

respective vent means, at least one associated with each of said insert cushions, for facilitating compression and re-expansion of said insert cushion;

repeatable adhesion means for releasably securing said insert cushions within said cut out section, said adhesion means comprising a first element disposed in a predetermined mesh pattern covering said floor of said cut out section and respective second elements disposed on said insert cushions, said first and second adhesion means elements being formed of respective materials which releasably interact to adhere when pressed together.

4,628,558

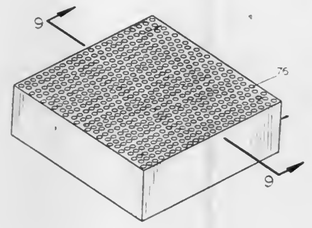
BEE NESTING BOX

Fred J. Pederson, P.O. Box 415, Ambrose, N. Dak. 58833

Filed Feb. 4, 1985, Ser. No. 698,093

Int. Cl.[4] A01K *47/00*

U.S. Cl. 6—1 **4 Claims**



1. A bee nesting box, comprising,

a quadrilateral-shaped member having a front portion, a back portion, a top edge, a bottom edge, and opposite side edges,

said member having a plurality of horizontally disposed and spaced-apart cylindrical bee tunnels formed therein extending between said front and back portions,

the outermost of said tunnels being spaced from top edge, bottom edge and opposite edges to provide a parasite barrier between said edges and said tunnels,

each of said tunnels being spaced approximately one-eighth inch apart to prevent parasites from boring from one tunnel to another,

said member being formed from a single molded piece of a lightweight fibrous and breathable material.

4,628,559

BONDING PRESS FOR SHOES

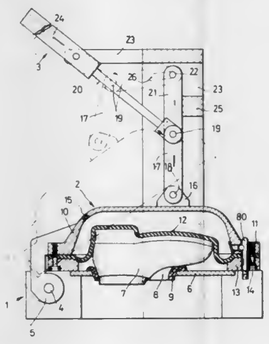
Herbert Funck, Am Wasserbogen 43, 8032 Graefelfing-Lochham, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,342

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338731; European Pat. Off., Sep. 11, 1984, 84110816.0

Int. Cl.[4] A43D *25/07, 25/06;* **B30B** *5/02;* **A44B** *21/00*

U.S. Cl. 12—33 **13 Claims**



1. A bonding press for bonding shoe soles to lasted uppers, comprising

a fixed bed structure including an exchangeable receptacle plate into a padded opening of which a lasted upper is

inserted and fixed with a sole laid thereon and facing upwards,

a pressing pad to which a pressurized medium may be applied, a dimensionally stable cowl of said pad being hingedly joined to said bed structure and hermetically sealed towards the bottom by a flexibly expandable diaphragm, and

linear drive means for pivoting said pressing pad and engaging it at an upper bearing block of said cowl,

characterized in

that said linear drive means engage said bearing block of said cowl through an articulated lever mechanism including toggle levers which are straightened out when said cowl is closed, and that a locking device is provided for locking said cowl in the closed position thereof until the internal pressure after completion of a pressing operation has dropped to a sufficiently low level, and further characterized

in that said articulated lever mechanism includes a swivel arm pivotally connected to one of said toggle levers, said swivel arm being pivoted with one end to said bearing block of said cowl and being supported by a stationary abutment when said pressing pad is closed and subjected to internal pressure, whereby said cowl is locked against opening forces.

4,628,560

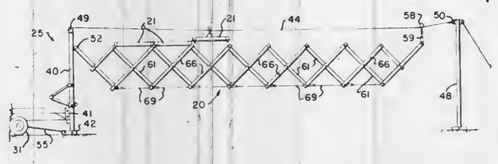
EXPANDABLE PORTABLE BRIDGE STRUCTURE

Merton L. Clevett, Littleton; Robert H. Lowdermilk, Denver; John K. Bright, Golden, all of Colo.; Clifford S. Coulter, 9940 W. 81st Dr., Arvada, Colo. 80005, and Tommy W. Melton, 9439 W. Burgundy Ave., Littleton, Colo. 80123, assignors to Fastspan, Inc., Englewood, Colo., by said Merton Clevett, Robert Lowdermilk, and John Bright

Filed Feb. 27, 1984, Ser. No. 583,839

Int. Cl.[4] E01D *15/12*

U.S. Cl. 14—2.4 **13 Claims**



4. A portable bridge comprising, in combination, an expandable and retractable pantograph bridge truss, a plurality of deck plates insertable in and removable from said truss, said pantograph truss comprising a plurality of inverted triangular shaped units defining first and second triangular frames, each first triangular frame having a pair of legs joined together at one end to define an apex and at their opposite ends joined to a transverse horizontal base bar, each second triangular frame having a pair of legs pivotally secured at one end at the apex of said first triangular frame and pivotally secured at their opposite end to the ends of a transverse base of another first triangular frame, said legs of said first and second triangular frames being pivotally secured intermediate their ends to corresponding legs of adjoining second and first triangular frames respectively to form said pantograph truss, and said deck plates each comprising a generally elongated rectangular panel having relatively short end edges and relatively long side edges and adapted to be forcibly inserted between pairs of said horizontal base bars for holding said truss in expanded form, said panels including means on the short edges thereof for releasably engaging said base bars, and flexible restraining cables engaged between the apexes of said truss frames for limiting the expansion of said truss when said deck plates are inserted in place.

4,628,561

TELESCOPIC RAMP

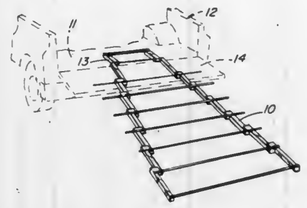
Delvin J. Kushniryk, Pense, Canada, assignor to Universal Ramps Limited, Pense, Canada

Filed Sep. 13, 1985, Ser. No. 776,036

Claims priority, application Canada, May 31, 1985, 482991

Int. Cl.[4] E01D *1/00, 9/00*

U.S. Cl. 14—69.5 **22 Claims**



1. A telescopic ramp comprising:

a plurality of pi-shaped modules each having a pair of parallel side members including side walls spaced apart in slidably nestable relation with corresponding side walls of an adjacent module;

a first cross member of uniform length transversely overlapping each pair of side members of a module and attached thereto in overlying relation to adjacent one end of the module; and

lug means attached to the free end of each side member for slidably engaging in overlying relation an uppermost surface of a corresponding side member in an adjacent module, whereby the lug end of each module is held slidably captive between the cross member and lug means of the adjacent module.

4,628,562

VEHICLE WASHING APPARATUS

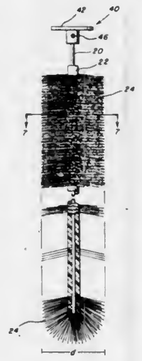
James W. Roncaglione, 9807 Bridleridge Ct., Vienna, Va. 22180

Continuation-in-part of Ser. No. 493,344, May 10, 1983, and Ser. No. 493,345, May 10, 1983, Pat. No. 4,510,639. This application May 8, 1984, Ser. No. 608,215

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] B60S *3/06*

U.S. Cl. 15—53 AB **18 Claims**



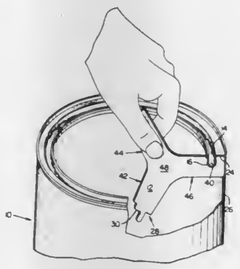
8. A vehicle washing apparatus, comprising:

overhead support means located above a path of a vehicle to be washed;

an elongate vertically disposed rotary vehicle member supported by said overhead support means and having a free lower end and having a flexible substantially non-resilient

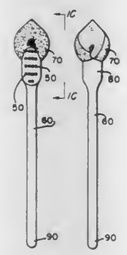
first support portion comprising an elongate cable means, an elongate second support portion co-axial with said first support portion, and washing material secured to said second support portion; and rotating means for imparting rotary motion to said elongate washing member.

4,628,563
PAINT CAN RIM AND LID SCRAPER
John H. Kramer, 30309 Driftwood Dr., Gold Beach, Oreg. 97444
Filed May 14, 1985, Ser. No. 733,897
Int. Cl.[4] B44D *3/16*
U.S. Cl. 15—105 **7 Claims**



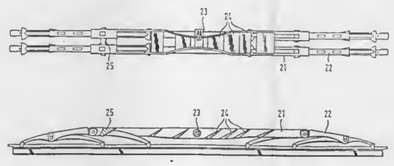
1. A scraping tool for scraping paint and other viscous materials from the annular sealing grooves and lips on the rims and lids of paint cans and the like, said cans having upwardly-opening rim and lid grooves forming downwardly-protruding rim and lid beads, a downwardly-opening rim pocket between the rim bead and can sidewall, and a downwardly-opening lid groove inwardly adjoining the lid bead, said tool comprising:
a thin, flat, one-piece plate-like member having marginal edge portions;
a first said marginal edge portion including a first scraping edge shaped complementally to said rim groove and sized for insertion therein for scraping residue therefrom;
a second said marginal edge portion spaced from said first portion and including a second scraping edge shaped complementally to said lid bead and inwardly-adjoining lid groove and sized to fit thereon for scraping residue therefrom; and
said member providing integral handle means for gripping said member while applying said portions.

4,628,564
TOOTHBRUSH
Kamal A. Youssef, P.O. Box 6548, W. Palm Beach, Fla. 33405
Filed Apr. 27, 1983, Ser. No. 489,104
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167 R **4 Claims**



1. A toothbrush, comprising:
a handle;
a bristle-supporting head at one end of said handle;
elongate rows of bristles fixed in, and extending from, said head; and
means for storing liquid fixed to said head; wherein
all bristles of said rows thereof have only single ends thereof fixed against movement, said ends being fixed in said head, remaining lengths of said bristles being in free projection from said head; and
said liquid-storing means is fixed to said head, and is set astride and in contacting engagement with first ends of said rows of bristles, whereby liquid stored by said means may be introduced into and along said rows said liquid-storing means comprises a resiliently compliant and absorbent material, said material being formed with a thickness diminishing to a pointed end which projects outwardly longitudinally from said head.

4,628,565
WINDSCREEN WIPERS WITH AT LEAST TWO WIPER BLADES
Hans Wolters, Hertelerstrasse 9, 3044 Neuenkirchen, Fed. Rep. of Germany
Filed Nov. 19, 1984, Ser. No. 672,880
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429957
Int. Cl.[4] B60S *1/02, 1/28*
U.S. Cl. 15—250.41 **6 Claims**

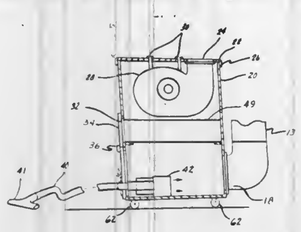


1. A windscreen wiper comprising at least two individual, essentially linear wiper blades defining a longitudinal direction and a bridge structure means coupling said wiper blades with each other in spaced, parallel relationship, said bridge structure means being provided as a light-weight low profile structure and comprising two elongated longitudinal bars connected to each other by cross-connector means, said bars extending in said longitudinal direction of said wiper blades, said longitudinal bars being substantially uncurved with respect to said wiper blades and running parallel to the latter, and having linear upper edges spaced a minimum distance from said wiper blades, whereby said profile of said bridge structure is sufficiently low to minimize the aerodynamic resistance of said windscreen wiper while in use.

4,628,566
FILTERING SYSTEM FOR PAPER HANDLING MACHINES
Gary Klapperich, Dexter, Mich., assignor to John C. Bertelsen, Dexter, Mich.
Continuation-in-part of Ser. No. 632,897, Jul. 20, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,447
Int. Cl.[4] A47L *5/36*
U.S. Cl. 15—300 A **9 Claims**

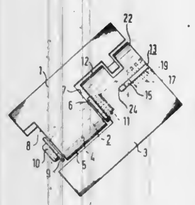
1. A combination filter means for removing paper dust, carbon black and the like from a computer room, comprising:
a housing having a discharge opening, a first inlet opening, and a second inlet opening;
an electrically energized squirrel cage fan, and means mounting the fan in the housing for moving air from the first inlet opening to the discharge opening;
filter pack means for removing materials from air being passed therethrough, the filter pack being mounted between the discharge opening and the first inlet opening for removal of material of a lesser size;

vacuum means mounted in the housing to provide an air flow through the second inlet opening, independent of air flowing through the first inlet opening;
a filter cartridge adapted to filter hydraulic fluids, the filter cartridge having an inlet for receiving unfiltered hydraulic fluid, and an outlet for removal of filtered hydraulic fluid, and filter means disposed between the inlet and the outlet for removal of material of a greater size;



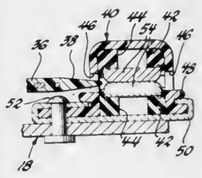
means for introducing air from the second housing inlet through the filter cartridge inlet for removal of material of said greater size, and for directing filtered air from the filter cartridge outlet toward the filter pack so as to be refiltered to remove material of said lesser size.
8. A combination as defined in claim 1, in which the means for introducing unfiltered air into the filter cartridge includes a flexible conduit means having a nozzle adapted to pick up carbon black and the like.

4,628,567
DOOR HINGE ASSEMBLY FOR MOTOR VEHICLES ENABLING DISMOUNTING AND REMOUNTING OF THE DOOR DURING ASSEMBLY
Ernst Brockhaus, Remscheid-Hasten, and Karl-Heinz Tölle, Wuppertal, both of Fed. Rep. of Germany, assignors to Ed. Scharwachter GmbH & Co, KG.
Filed Jul. 2, 1985, Ser. No. 751,084
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1984, 3424331
Int. Cl.[4] E05D *7/10, 5/10*
U.S. Cl. 16—267 **17 Claims**



1. A door hinge assembly for motor vehicles particularly adapted to enable removal and replacement of a vehicle door during assembly of the vehicle comprising:
a first and a second hinge member each having a hinge eye;
a hinge pin;
bushing means mounting said eye of said first hinge part on said hinge pin enabling relative rotative motion but preventing relative axial movement therebetween;
toothed means interposed between said hinge pin and said eye of said second hinge member effecting rotative interlocking therebetween while enabling relative axial displacement to permit said second hinge member to be dismounted from and remounted on said said hinge pin during assembly of a vehicle;
means securing said first and second hinge members against relative axial displacement through a predetermined operating angle;
recess means in said hinge pin;
carrier means arranged in said eye of said second hinge member projecting into said recess means to effect nonrotatable relative engagement between said second hinge part and said hinge pin; and
spring means interposed between said second hinge member and said carrier means urging said carrier means into engagement within said recess means.

4,628,568
FRICTION TYPE HOLD OPEN MECHANISM
Michael C. Lee, Troy; Daniel F. Raubinger, Sterling Heights, and Peter L. Swanney, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 1, 1985, Ser. No. 761,422
Int. Cl.[4] E05D *11/08*
U.S. Cl. 16—337 **3 Claims**



1. A friction type door hold open mechanism for a vehicle or the like having an electrically conductive body structure for retaining an electrically conductive door or the like hingedly mounted to said body structure in a hold open position, said mechanism being capable of being assembled to said body structure and door prior to said body structure and door being coated by a process in which said body structure and door are subjected to an electrostatic charge, comprising;
an arm member adapted to be secured to one of said body structure and door and movable relative to the other of said body structure and door as said door is moved to said hold open position, said arm member further including a frictional material that is electrically non-conductive,
an electrically non-conductive resilient member adapted to be secured to the other of said body structure and door, and,
a metal block secured to said resilient member and engagable with said frictional material on said arm member so as to compress said resilient member when said arm member moves relative to the other of said body structure and door, said compressed resilient member thereby acting both to electrically insulate said metal block from the other of said body structure and door and to engage said metal block under force with said frictional material to create a frictional force between said arm member and metal block,
whereby, said arm member, resilient member and metal block cooperate to provide a frictional hold open force to retain said door in a hold open position, while said non-conductive frictional material and resilient member also cooperate to insulate said hold open mechanism from electrostatic charge to allow it to be assembled to said body structure and door prior to being coated.

4,628,569
METHOD OF BUTCHERING A SIDE OF LAMB AND CUTS RESULTING THEREFROM
Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Southdown Meat Company, Inc., West Chester, Pa.
Continuation of Ser. No. 701,339, Feb. 13, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 840,537
Int. Cl.[4] A22B *25/18*
U.S. Cl. 17—52 **9 Claims**

1. A method of butchering a side of lamb into a plurality of cuts of lamb comprising:

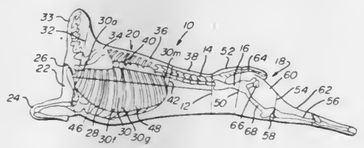
cutting along a line running generally perpendicular to the backbone at the point where the hip bone joins the backbone, to divide the side into a leg portion and a body portion;

removing the shoulder and foreshank;

cutting along a substantially straight line generally perpendicular to the ribs and passing through the first rib about one-half way along the length of the first rib and through the seventh rib about one-third along the length of the seventh rib measured from the backbone, the cut extending along the entire length of the body portion to sever a substantial portion of the ribs from the remainder of the body portion;

cutting along a line slightly forward of the first rib, and extending generally perpendicular to the backbone to sever the neck from the remainder of the body portion;

cutting along a line between the sixth and seventh ribs and extending generally perpendicular to the backbone to sever a first rack cut from the body portion; and



cutting along a line slightly beyond the thirteenth rib and extending generally perpendicular to the backbone to divide the remaining body portion into a second rack cut and a loin cut.

9. A leg cut of lamb formed from a side of lamb by the method comprising:

cutting along a line generally perpendicular to the backbone at the point where the hip bone joins the backbone to divide the side into a leg portion and a body portion;

cutting along a line extending generally perpendicular to the hip bone about half-way along the length of the hip bone to sever a hip cut from the remainder of the leg portion;

cutting along a line extending generally perpendicular to the hind shank bone at about the stifle joint to divide the remaining leg portion into a leg cut and a hind shank cut; and

removing the hip bone and the aitch bone from the leg cut and loosening the leg bone so as to be easily removable.

4,628,570

DEVICE FOR PROCESSING FILLETS OF FISH

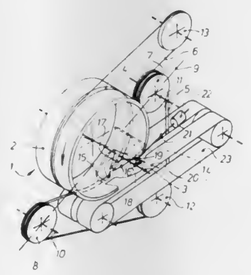
Werner Wenzel, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud., Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,542

Claims priority, application Sweden, Oct. 5, 1983, 8305475

Int. Cl.⁴ A22C *25/17*

U.S. Cl. 17—62 **8 Claims**



1. A device for processing fillets of fish provided in the form of pre-separated double fillets by skinning, which double fillets are composed of two fish fillet portions which are covered by skin defining an inside facing said fillet portions as well as an outside opposed thereto and adhere to each other by means of a flesh strip comprising fin holders of dorsel fins of said fish, said flesh strip being partially disconnected from said fillet portions by a pre-separating incision up to said inside of said skin leaving said skin essentially undamaged,

said device comprising:

a. drum means driven to rotate about an essentially horizontal axis in a selected direction of rotation, defining a circumferential surface and supporting said double fillets lying on said outside of said skin, said circumferential surface being provided with two groove means arranged next to each other for receiving a pair of flexible holding belt means surrounding a part of said circumferential surface,

b. a skinning tool having a central plane of symmetry and a center of gravity in said plane of symmetry, and having an inner surface shaped to make flush engagement with the circumferential surface of said drum, and an outer surface, said skinning tool having cutting edges extending substantially symmetrically to said plane of symmetry and diverging in said direction of rotation of said drum,

c. mounting means movably mounting said skinning tool adjacent to said drum and including a member pivotally mounted on the outer surface of said skinning tool at one point on said plane of symmetry and upstream of said center of gravity, whereby to allow free adaptation between the inner surface of said skinning tool and the circumferential surface of said drum, and

d. pressure means biasing said mounting means in a direction to press said skinning tool radially against said circumferential surface under a defined pressing force.

4,628,571

METHOD FOR PRODUCTION OF A NON-WOVEN FABRIC

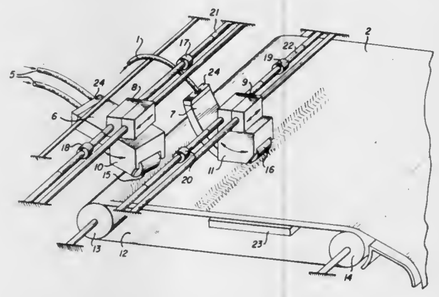
Karl Marx, Radebeul; Peter Offermann, Dresden; Ralf-Dieter Reumann, Dresden; Matthias Mägel, Dresden; Bertram Frenzel, and Dietmar Grenzendörfer, both of Karl Marx Stadt, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Division of Ser. No. 570,131, Jan. 12, 1984, Pat. No. 4,589,169. This application May 1, 1985, Ser. No. 729,443

Claims priority, application German Democratic Rep., Mar. 25, 1983, 2491717; Mar. 25, 1983, 2491725

Int. Cl.⁴ D01G *25/00*

U.S. Cl. 19—304 **13 Claims**



1. A method for the production of a non-woven fabric which comprises:

(a) providing a fiber material feed stream, said fiber feed stream containing a plurality of discrete individual fibers;

(b) forming a fiber flow stream from said fiber feed stream;

(c) providing a movable solid transport element, said element having a substantially planar and displaceable substantially horizontal transport surface, said transport surface being capable of supporting a non-woven fabric to be produced;

(d) placing said transport surface in linear motion, and in a generally rectilinear transport direction;

(e) passing said fiber flow stream onto said moving transport surface, and at an angle of less than 90° to the transport direction of the non-woven fabric to be produced, by transversely disposing the fibers of said fiber flow stream next to one another on said moving transport surface, so as to form a first substantially rectilinear independently oriented fiber layer on said moving transport surface, said first fiber layer being independently oriented substantially transversely to the direction of movement of said transport surface;

(f) combining said formed first fiber layer, including lateral border areas of said formed first fiber layer, with a preceding independently oriented second fiber layer, so as to reinforce the thus produced non-woven fabric; and

(g) recovering a product non-woven fabric from said solid transport element.

4,628,572

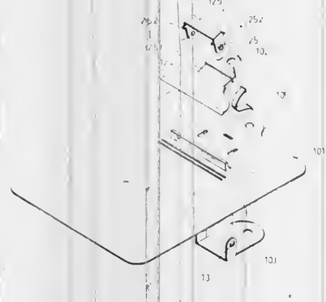
CLIP STRUCTURE

Shih-Ho Chang, No. 2-12, Chang Lu Road, Chang Hwa City, Taiwan

Filed Oct. 12, 1984, Ser. No. 660,040

Int. Cl.⁴ B42F *1/00*

U.S. Cl. 24—67.11 **14 Claims**



1. A clipboard comprising:

a board having two slots near one of its ends;

a U-shaped bracket having a bottom portion attached to the bottom side of said board and having two first folded portions passing through said slots and protruding out of the top side of said board respectively;

a clamping member having a front edge and pivotally connected to said two first folded portions; and

a spring member disposed between said clamping member and said board for biasing the front edge of said clamping member to firmly abut against said board, and for concurrently biasing said board to firmly abut against said U-shaped bracket.

4,628,573

PROCESS FOR PRODUCING ARRAY-TYPE ULTRASONIC PROBE

Akira Hamada; Keiichi Ohira, and Akira Funakoshi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,489

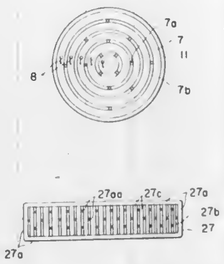
Claims priority, application Japan, Oct. 5, 1983, 58-185178

Int. Cl.⁴ H04R *17/00*

U.S. Cl. 29—25.35 **10 Claims**

1. A process for producing an array-type ultrasonic probe comprising a substrate and a plurality of transducer elements disposed on the substrate, said plurality of transducer elements comprising, in respective order from the substrate surface, a plurality of spaced back electrodes which also serve as reflection plates, a piezoelectric polymer film, and a front electrode, which process comprises the steps of:

providing an integral processed plate of a structure comprising said plurality of spaced back electrodes and at least one connecting portion which fills less than the entire



space between and connects adjacent said spaced back electrodes,

bonding the integral processed plate onto a receiving face of the substrate,

removing the at least one connecting portion to leave the plurality of spaced back electrodes separately bonded to the substrate, and

disposing the piezoelectric polymer film and the front electrode on the plurality of spaced back electrodes.

4,628,574

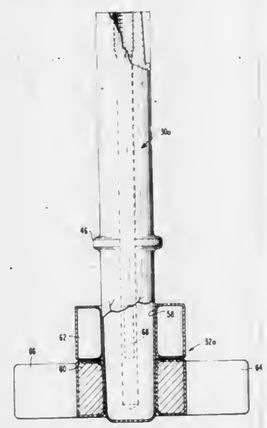
METHOD FOR CONSTRUCTING AN IMPELLER ASSEMBLY AND SHAFT HAVING INTERFERENCE FIT

Michael J. Lerman, Edison, N.J., assignor to De Dietrich (USA), Inc., Union, N.J.

Division of Ser. No. 534,657, Sep. 22, 1983, abandoned. This application May 9, 1984, Ser. No. 608,630

Int. Cl.⁴ B23P *15/04, 19/02*; B23Q *3/00*

U.S. Cl. 29—156.8 R **1 Claim**



1. A method of connecting a shaft and at least a first and second impeller assembly, each of which are coated with a coating of corrosion resistant material throughout their entire exposed surfaces, through an interference fitted connection between coatings comprising providing a first region at one

end of said shaft and at least a second region along said shaft, spaced from said first region, said first region of said shaft extending from said one end and both regions formed by a constant tapered surface, providing a tapered surface along a bore of a hub member of each impeller assembly which is complementary to at least a portion of the length of respective surfaces within said regions along said shaft, locating said tapered surfaces along a common axis, inserting said shaft end into said bore of a second impeller assembly, moving said shaft and impeller assembly in relative movement under an applied force, to locate said second impeller assembly in interference fitted connection within said second region and, then, inserting said shaft into said bore of said first impeller assembly and moving said shaft and impeller assembly in relative movement, also under an applied force, to locate said first impeller assembly in interference fitted connection within said first region.

4,628,575

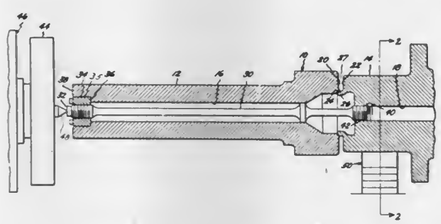
METHOD AND APPARATUS FOR WELDING TURBINE ROTOR SHAFTS

Oleg Klufas; Calvin H. Soldan, both of Schenectady, and William V. Coll, Jr., Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 605,020, Apr. 27, 1984, Pat. No. 4,581,816. This application Sep. 13, 1985, Ser. No. 775,569

Int. Cl.⁴ B21K *3/00;* **B23Q** *15/00*

U.S. Cl. 29—156.8 R **4 Claims**



1. A method for axially aligning respective adjacent opposing end faces of a first and a second shaft segment, respectively, of a steam turbine rotor to be welded together, each of said adjacent opposing end faces including a mutually mateable joint face, one of the joint faces including a crushable annular lip axially extending from said one joint face, the method comprising the steps of:

matingly engaging said respective joint faces with at least an axial component of force, so as to form an annular groove between the respective end faces and thereby placing said crushable annular lip under an axially compressive force;

rotatably supporting said first and second shaft segments, respectively axially outboard the respective joint face;

adjustably supporting at least one of said shaft segments axially intermediate the respective adjacent opposing end face and the respective rotatable support;

measuring the force at said axially intermediate position, said force counteracting the weight of said shaft segments;

measuring the axial extent of the annular groove at a plurality of circumferential and radially equidistant locations; and

minimizing the variance between the axial measurements of said annular groove by changing the elevation of said one shaft segment at said axially intermediate position thereby affecting the force at said axially intermediate position.

4,628,576

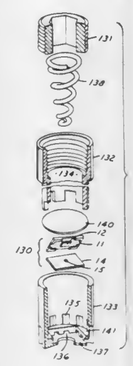
METHOD FOR FABRICATING A SILICON VALVE

Joseph M. Giachino, Farmington Hills, and James W. Kress, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 703,962, Feb. 21, 1985. This application Sep. 9, 1985, Ser. No. 774,274

Int. Cl.⁴ B21D *53/00, 39/00;* **F16K** *31/06, 31/42*

U.S. Cl. 29—157.1 R **1 Claim**



1. A method of fabricating a silicon valve for controlling fluid flow including the step of:

forming an orifice in a first generally planar silicon member;

forming a closed path trough in a second silicon member thereby leaving a raised mesa means within the closed path and a raised wall portion around the closed path trough; and

bonding the first and second silicon members together so that the wall portion is coupled to the surface of said first silicon member and the mesa means is relatively moveable with respect to said orifice for sealing the orifice to stop the passage of fluid and for being spaced from the orifice for permitting the passage of fluid through the orifice.

4,628,577

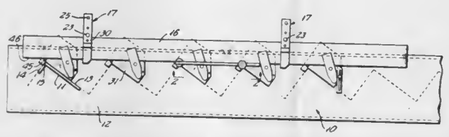
ASSEMBLY FIXTURE FOR STAIR STRINGER WELDMENTS AND THE LIKE

Stan Dahlgren, deceased, late of Atlantic Highlands, and by Paul Dahlgren, executor, 98 Ocean Blvd., Atlantic Highlands, both of N.J. 07716

Continuation of Ser. No. 671,003, Nov. 13, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,576

Int. Cl.⁴ B23K *37/04*

U.S. Cl. 29—281.1 **5 Claims**



1. A welding fixture for the fabrication of stair frame stringer weldments and the like of the type comprising a flanged beam and a plurality of tread supporting brackets secured thereto in uniformly spaced relation and in predetermined angular orientation, which comprises

(a) a plurality of reference clamps each comprising a pair of clamping elements and a flange-engaging lug projecting laterally from one of said clamping elements,

(b) means for securing the lugs of said clamps to the flange of stringer element to be fabricated,

(c) a straight edge reference beam received in and secured by said reference clamps,

(d) a reference beam being adjustably positioned by said reference clamps at a predetermined spacing with respect to said stringer flange,

(e) a plurality of carrier angle nesting blocks individually securable to said reference beam for positioning said tread supporting brackets, and

(f) gage means for establishing uniform spacing of said nesting blocks along said reference beam and uniform angular orientation of said nesting blocks in relation to said reference beam.

4,628,578

METHOD AND APPARATUS FOR AUTOMATIC PUNCHING

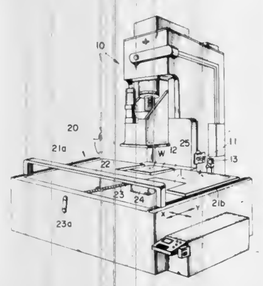
Toshio Yajima, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,772

Claims priority, application Japan, Aug. 19, 1983, 58-151376; Aug. 25, 1983, 58-131565[U]; Nov. 29, 1983, 58-184454[U]; Dec. 14, 1983, 58-192814[U]

Int. Cl.⁴ B23Q *17/00;* **B26D** *5/00, 5/38*

U.S. Cl. 29—407 **7 Claims**



1. In an automatic punching method comprising the steps of clamping with clamping means a sheet of material printed with a plurality of printing portions to be punched and a plurality of positioning marks near the printed portions with the printing portions and the positioning marks being arranged in a plurality of row; transferring the sheet of material in X and Y directions of rectangular coordinates so as to place the positioning marks within the view field of a visual sensor disposed at a predetermined position with respect to a press; detecting deviations between a reference position of the view field and center positions of the positioning marks with respect to the X and Y directions; positioning the printing portions with respect to a working position of the press based on the detected deviations; and punching the printing portions from the sheet of material, and further performing the steps of;

painting a mark corresponding to a defective printing portion detected beforehand by visual inspection when printing of the printing portions and positioning marks are completed so as to change the area of a positioning mark corresponding to the defective printing portion;

detecting whether or not the positioning mark corresponding to a defective printing portion is painted;

storing the numbers of the positioning marks which are detected to be defective; and

classifying the printing portions into normal and defective ones based on the numbers of the positioning marks thus stored.

4,628,579

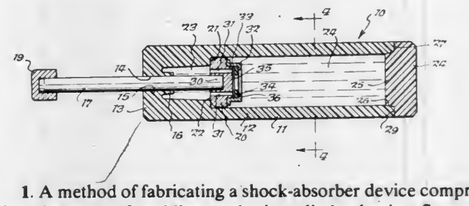
METHOD OF FABRICATING A LIQUID SPRING SHOCK ABSORBER WITH INTEGRAL PLASTIC BODY AND SEAL

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Division of Ser. No. 76,839, Sep. 19, 1979, Pat. No. 4,265,344, which is a continuation of Ser. No. 862,745, Dec. 21, 1977, abandoned. This application Apr. 1, 1981, Ser. No. 250,098

Int. Cl.⁴ F16F *9/43;* **B29D** *23/00*

U.S. Cl. 29—422 **2 Claims**



1. A method of fabricating a shock-absorber device comprising the steps of molding a plastic cylinder having first and second ends with a first opening at said first end and an integral end wall at said second end and a second opening in said end wall and a seal integral with said end wall surrounding said second opening, inserting a piston rod through said second opening in sealing engagement with said seal, filling said cylinder with compressible fluid, mounting an end cap in said first opening to confine said fluid therein, and causing said compressible fluid to be compressed by adjusting the position of said end cap on said second end.

4,628,580

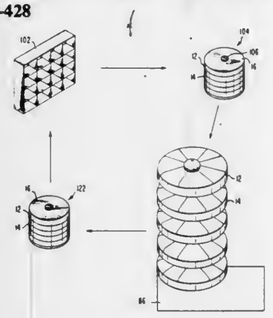
METHOD FOR USING KITTING PARTS CAROUSEL SYSTEM

Norman H. Gowan, Los Angeles; Stasys Petravicius, Rancho Palos Verdes; Ignacio Hernandez, Gardena; Robert E. Kuhlmann, Torrance; Donald R. Vande Walle, Jr., Harbor City; Ronald P. Weddell, Huntington Beach; Joseph M. Gates, Gardena; Kenneth J. Sitzwohl, Torrance; Charles D. Sands, San Pedro; Rick A. Gwinn, Torrance, and Milton J. Peterman, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 468,822, Feb. 23, 1983, Pat. No. 4,549,664. This application Aug. 14, 1985, Ser. No. 765,884

Int. Cl.⁴ B21D *39/00;* **B23P** *11/00;* **B23Q** *3/00, 7/00*

U.S. Cl. 29—428 **4 Claims**



1. The method of handling parts, comprising the steps of:

providing a plurality of injection molded synethetic polymer composition material carousels, each having a body having a bottom which is frustoconical about an axis and which slopes downwardly in the radially outward direction, a curved junction portion contiguous with said bottom, said curved junction being a portion of a toroid about said axis, said body having an outer wall which is a geometric surface about said axis, said outer wall being contiguous with said curved junction, an inner wall contiguous with said bottom, said inner wall having a surface which is substantially cylindrical about said axis and a

plurality of bin walls permanently molded within said body, said bin walls being substantially radial and each lying in a plane substantially passing through said axis, said bin walls adjoining said bottom, said curved junction, said outer wall and said inner wall and being formed therewith to form bins therebetween, said bin walls being of substantially constant height above said bottom whereby the downward slope of the tops of said bin walls matches the slope of the bottom of another said body which can rest upon the tops of said bin walls and completley close said bins;

filling selected bins with selected parts in predetermined quantity so as to supply a substantial number of parts for assembly into a predetermined number of assemblies, said substantial number of parts for said predetermined assemblies being placed in the bins of a plurality of said carousels;

stacking said carousels together so that each carousel closes the open top bins of the carousel therebelow and placing a cover over the top carousel, and with the carousels in the stacked position, storing the group of carousels as work-in-process and with the carousels in stacked position moving the parts to an assembly station;

separating the carousels at the assembly station so that at least one of the carousels has its bins exposed and successively removing parts from the bins to produce the predetermined number of assemblies; and

on completion of those assemblies, restacking the carousels and placing the cover on the top carousel thereof and returing the carousels to the filling point where they may be refilled.

4,628,581

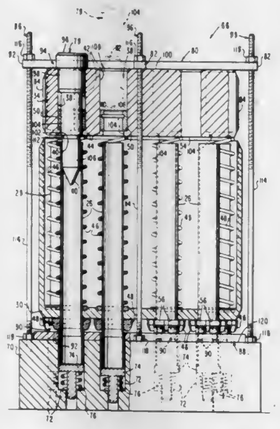
APPARATUS AND METHOD FOR PREASSEMBLING A TOP NOZZLE SUBASSEMBLY FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Robert K. Gjertsen, Monroeville Boro, and John F. Wilson, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1985, Ser. No. 695,131

Int. Cl.⁴ B21D *39/03;* **B23P** *17/00;* **B23Q** *3/00;* **B23D** *19/04*

U.S. Cl. 29—428 **15 Claims**



1. An apparatus for preassembling a top nozzle subassembly for latter mounting on a plurality of guide thimbles of a fuel assembly said preassembling apparatus comprising:

(a) a base having a plurality of bores defined therein in a pattern which matches that of said guide thimbles, each of said bores being adapted to receive a lower end of one of a plurality of guide thimble extension tubes;

(b) compliant means disposed in said bores of said base and being yieldable to support said extension tubes individually for vertical movement when said tubes are slidably received through respective holes being defined in a lower adapter plate in said pattern which matches that of said guide thimbles and have respective lower retainers attached thereto below said adapter plate which limit downward slidable movement of said adapter plate along said extension tubes, whereby said extension tubes are allowed to vertically move independently of one another until all of their respective lower retainers are brought individually into engagement with a lower surface of said adapter plate for supporting the same uniformly by all of said lower retainers;

(c) locating means disposable through passageways being defined in an upper bearing plate in said pattern which matches that of said guide thimbles and extendable into upper ends of said extension tubes for aligning said passageways individually with said respective extension tubes and guiding said extension tube upper ends into said passageways when said upper bearing plate is supported on a plurality of coil springs being disposed about said respective extension tubes and on said lower adapter plate and said bearing and adapter plates are moved relatively toward one another and against the bias of said coil springs so as to compress the same; and

(d) loading means operable to generate a force which causes relative movement of said upper bearing and lower adapter plates toward one another and compression of said coil springs therebetween when said bearing plate is supported on said coil springs and said locating means are disposed through said passageways of said bearing plate and extend into said upper ends of said extension tubes, whereby said upper ends of said extension tubes are brought into said passageways of said upper bearing plate for attachment to upper retainers for limiting upward slidable movement of said upper bearing plate relative to said extension tubes and thereby holding said coil springs in a state of compression between said lower adapted and upper bearing plates.

4,628,582

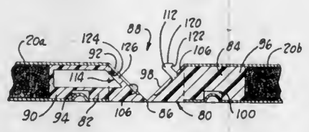
METHOD OF MAKING SPACER FRAME FOR AN INSULATING GLASS PANEL

Edmund A. Leopold, Hudson, Ohio, assignor to Glass Equipment Development, Inc., Twinsburg, Ohio

Division of Ser. No. 327,579, Dec. 4, 1981, Pat. No. 4,530,195, which is a continuation-in-part of Ser. No. 136,872, Apr. 4, 1980, abandoned. This application Apr. 18, 1985, Ser. No. 724,822

Int. Cl.⁴ B23P *11/02*

U.S. Cl. 29—451 **8 Claims**



1. A method of constructing a spacer frame for an insulating glass panel from four separate open ended spacer frame segments interconnected at their ends by corner connectors at least three of which have projecting body portions which are hinged together comprising:

(a) loading desiccant material into at least one of said frame segments;

(b) attaching respective projecting body portions of one corner connector to adjacent ends of the first and second frame segments to hingedly interconnect said first and second frame segments;

(c) attaching respective projecting body portions of a second corner connector to adjacent ends of the second and third frame segments to hingedly interconnect said second and third frame segments;

(d) attaching respective projecting body portions of a third corner connector to adjacent ends of the third and fourth frame segments to hingedly interconnect said third and fourth frame segments;

(e) moving said interconnected frame segments successively through a sealant applying station; including

(i) positioning said interconnected spacer frame segments in end to end alignment; and

(ii) moving said aligned spacer frame segments along a substantially linear path of travel extending through said sealant applying station;

(f) applying sealant material to at least one side of the spacer frame segments passing through said station;

(g) pivoting each spacer frame segment relative to the adjacent frame segment about the hinge of the interposed corner connector to form a substantially rectangular frame shape; and,

(h) securing adjacent ends of said frame segments against relative pivotal movement.

4,628,583

STRAIN TRANSDUCERS

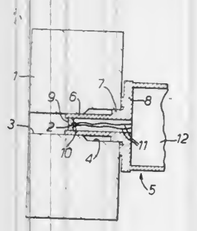
John D. Barnett, Norfolk, Great Britain, assignor to TRW Probe Electronics Co. Ltd, Gloucestershire, Great Britain

Filed May 18, 1984, Ser. No. 611,910

Claims priority, application United Kingdom, May 19, 1983, 8313834

Int. Cl.⁴ B23P *19/02;* **B25B** *23/14*

U.S. Cl. 29—525 **6 Claims**



1. A strain transducer for measuring strains at a location within a workpiece having a through bore which is substantially uniform and symmetrical about a bore axis, said strain transducer comprising:

a generally tubular plug-like member having a portion with a central bore and insertable into said workpiece bore in interference fit therewith at its distal end;

a disc located within and spaning the central bore of said portion of said plug-like member near said distal end, force in the radial plane of said disc effecting proportional deflection of said disc in the radial plane; and

at least one strain guage mounted on the disc for producing an electrical signal responsive to such distortion in the radial plane.

4,628,584

METHOD OF REMOVING FIBERS PROTRUDING INTO BORES

George B. Clark, Clayton, and Clayton K. Maidre, Pittsburg, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1985, Ser. No. 695,973

Int. Cl.⁴ B23P *13/04;* **B23B** *51/06*

U.S. Cl. 29—557 **18 Claims**

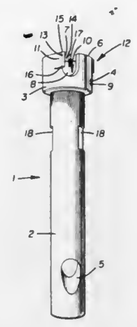
1. A method of trimming the wall surface of a generally cylindrical, first bore extending into a solid body, one or more portions of said surface being defined by appendages adhered to or integral with and extending from said body into said bore or across the mouths of one or more other bores intersecting said first bore, said method comprising:

(1) hardening or embrittling said appendages,

(2) advancing into said bore a rotating trimming tool having a generally tubular shank and a cutting head attached to an integral with said shank, said head having a cutting edge and being adapted to

a. convert said appendages to cuttings,

b. permit flow of a sweep fluid into said shank, and



c. deflect said cuttings into said flow,

(3) causing said fluid to flow into said tool and out through said shank at a sufficient velocity to carry out said cuttings.

4,628,585

APPARATUS FOR THE AUTOMATIC HANDLING OF ELECTRICAL COMPONENTS

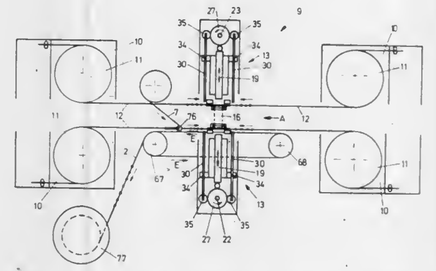
Georg Sillner, Buchenstrasse 23, 8411 Zeitlarn, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,678

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405971; Feb. 28, 1984, 3407234

Int. Cl.⁴ H05K *3/30*

U.S. Cl. 29—564.6 **19 Claims**



1. An apparatus for the automatic handling of electrical components of different types, each component having a component body and a plurality of lead wires extending parallel to each other to one side of said body, the apparatus comprising a first device for sequence formation in which said components are arranged in a predetermined sequence, which device includes

a plurality of magazines each having a supply belt which supports a supply of one of said types of components in radially taped form and which has perforation holes disposed between adjacent components supported thereon,

means for calling up components from the respective magazines in a program-controlled manner to corresponding loading positions,

intermittently driven conveyor means for receiving the called-up components in accordance with said sequence and for conveying the received components to a transfer

position at which the received components are transferred to a second device for further handling of those components,

cutting means at each loading position for cutting off the component at that loading position from the associated supply belt by cutting the associated belt transversely to the longitudinal direction thereof and through the center of the perforation hole between the component at that loading position and the following component supported on the same belt, whereby the cut-off component is supported by a corresponding cut-off belt piece, and

means at each loading position for transferring the cut-off component to a receiving portion of said conveyor means, said receiving portion having securing elements positioned in such a manner as to engage perforation hole areas in the belt piece on either side of the cut-off component and thereby secure the cut-off component by said hole areas to the receiving portion,

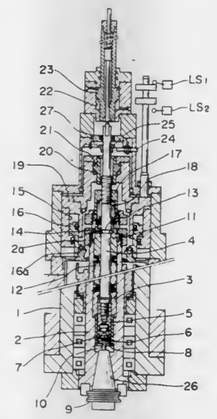
the apparatus being characterized in that the conveying direction of the cut-off components received on the conveyor means is in the axial direction of the lead wires of such received components and, in the area of each loading position, substantially in the plane of and transverse to the supply belt of the component called up to that position, and in that each cut-off belt piece is secured on the conveyor means in such an orientation that the cut-off belt piece is leading with the component body supported thereby trailing in the conveying direction.

4,628,586

TOOL CLAMPING DEVICE FOR MAIN SPINDLE

Takani Yoshimi, Gamagouri; Ryoichi Michisita, Okazaki, and Hitoshi Sasaki, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 3, 1985, Ser. No. 751,559
Claims priority, application Japan, Jul. 6, 1984, 59-139164
Int. Cl.⁴ B23C *5/26*; B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**



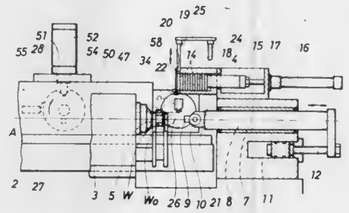
1. A tool clamping device for clamping a tool on a main spindle or releasing the same from the main spindle, comprising: a main spindle rotatably supported on a headstock; a push rod extended through the spindle hole of the main spindle so as to be axially slidable, a weak spring for urging such push rod rearward wherein said push rod is movable axially for fixing a tool to or releasing the same from the main spindle; a clamping spring for pressing the push rod rearward; a sleeve disposed contiguously with one end of the clamping spring so as to be movable relatively to the push rod; first interlocking means formed between the push rod and the sleeve so as to interlock the sleeve with the push rod when the sleeve moves in a direction to allow the expansion of the clamping spring and to release the sleeve from the push rod when the sleeve moves in a direction to compress the clamping spring; second interlocking means capable of being disengaged by the movement of the push rod in a direction to compress the clamping spring; a tool changing arm; and an unclamping cylinder disposed contiguously with the sleeve to move the sleeve against the resilient force of the clamping spring wherein the resilient force of the weak spring urging the push rod rearward is greater than a force that tends to cause the tool to fall off by itself from the main spindle and smaller than the tool pulling force of the tool changing arm and wherein the first interlocking means formed between the sleeve and the push rod further comprises an annular groove formed on a circumference of the push rod, a plurality of balls positioned in said annular groove, and a pressing member for pressing the balls resiliently against the engaging surface of the sleeve, the push rod being retained at a front limit position upon positioning of said balls in said annular groove, after said tool has been removed.

4,628,587

HONING STONE EXCHANGER FOR USE WITH SUPERFINISHING MACHINES

Kizo Kawaguchi, and Teruo Matsuda, both of Osaka, Japan, assignors to Osaka Seiki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,173
Claims priority, application Japan, Mar. 8, 1984, 59-44985; Oct. 3, 1984, 59-207522
Int. Cl.⁴ B23Q *3/155*; B24B *33/00*
U.S. Cl. 29—568 **12 Claims**



1. A superfinishing machine comprising:

drive means for rotating an annular workpiece around a first axis;

a honing stone holder, movable between a processing position and a honing stone feeding position, said honing stone holder including means for holding a honing stone which superfinishes one of an outer peripheral surface and an inner peripheral surface of the annular workpiece and for bringing the honing stone into contact with the one of the peripheral surfaces of the workpiece when said honing stone holder is in said processing position;

pressing means for pressing the honing stone against the one peripheral surface of the workpiece in a direction of a second axis intersecting said first axis at right angles, said pressing means including

a pressing lever for pressing the honing stone when said pressing lever is in a pressing position,

means, on said honing stone holder, for pushing said pressing lever in said direction of said second axis against the honing stone, said pressing lever being pivotally mounted to said pushing means so as to be pivotable about a lever axis paralleI to said second axis into and out of said pressing position, and

means for elastically urging said pressing lever pivotally about said lever axis toward said pressing position;

an oscillation means, including an oscillation shaft coupled to said honing stone holder, for oscillating said honing stone holder through said oscillation shaft around a third axis intersecting said first and second axes at right angles;

a crank means for transmitting power from a drive motor to said oscillation shaft to oscillate said oscillation shaft; and

a honing stone exchanger, including

fixing means for stopping oscillation of said oscillation shaft and fixing said shaft at a predetermined position,

moving means for moving said honing stone holder and said pressing means therewith, along said first axis between said processing position and said honing stone feeding position, and

honing stone feeding means, including a storage means for storing a plurality of reserve honing stones, for feeding a reserve honing stone from said storing means to said honing stone holder when said honing stone holder is in said honing stone feeding position;

said honing stone feeding means comprising

means, on said storage means in the path of said pressing lever when said honing stone holder and said pressing means are moved by said moving means from said processing position to said honing stone feeding position, for engaging said pressing lever when said honing stone holder and said pressing means are moved by said moving means from said processing position to said honing stone feeding position so as to pivot said pressing lever, against the urging of said elastically urging means, away from said pressing position, and

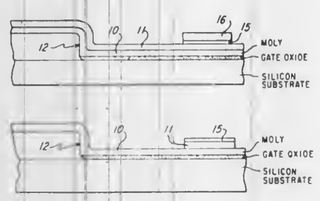
means including a press-out lever positioned so as to be aligned with the honing stone in said honing stone holder and a reserve holding stone in said storage means when said honing stone holder is in said honing stone feeding position, for pushing the reserve honing stone from said storage means into said honing stone holder so as to displace the holding stone therein.

4,628,588

MOLYBDENUM-METAL MASK FOR DEFINITION AND ETCH OF OXIDE-ENCAPSULATED METAL GATE

James M. McDavid, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 25, 1984, Ser. No. 624,081
Int. Cl.⁴ H01L *21/283, 21/308*
U.S. Cl. 29—571 **8 Claims**



5. In a method of making an MOS transistor device, the steps of:

applying a layer of conductive material to a face of a semiconductor body, said face of the semiconductor body having a substantially vertical step between two relatively flat surfaces, said layer extending across a step,

applying a layer of insulator over said layer of conductive material,

applying a thin molybdenum coating over said layer of insulator, said molybdenum coating being resistant to an etchant which etches said insulator,

applying a layer of photoresist over said molybdenum coating, exposing to light and developing the photoresist, to leave an area of said photoresist spaced from said step,

etching away said molybdenum coating using said area of photoresist as a mask, then removing said area of photoresist to leave an area of said molybdenum coating,

then etching said insulator using said area of molybdenum coating as a mask, to remove the uncovered insulator coating including filament areas at said step,

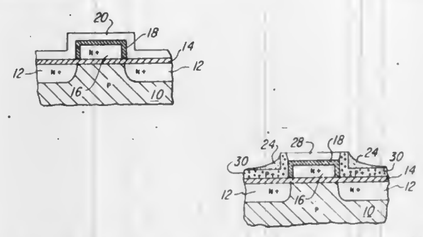
and thereafter etching said layer of conductive material.

4,628,589

METHOD FOR FABRICATING STACKED CMOS STRUCTURES

Ravishankar Sundaresan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,056
Int. Cl.⁴ H01L *21/385*
U.S. Cl. 29—571 **8 Claims**



1. A method for fabricating a self-aligned stacked CMOS structure, comprising the steps of:

(a) forming source and drain regions having a first conductivity type in a substrate having a second conductivity type;

(b) forming an insulated gate region on an upper surface of the substrate;

(c) forming a layer of polycrystalline silicon over the substrate and the gate region;

(d) forming doped regions adjacent the polycrystalline layer above the source and drain regions; and

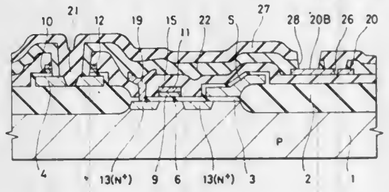
(e) causing dopant from the doped regions to diffuse into the polycrystalline layer, wherein doped polycrystalline regions are formed above the source and drain regions, and wherein polycrystalline above the gate region is not doped by diffusion from the doped regions.

4,628,590

METHOD OF MANUFACTURE OF A SEMICONDUCTOR DEVICE

Shinji Udo, Tachikawa, and Masanori Tazunoki, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,172
Claims priority, application Japan, Sep. 21, 1983, 58-172990
Int. Cl.⁴ H01L *21/66*
U.S. Cl. 29—575 **48 Claims**



1. A method of manufacturing a semiconductor device provided with a plurality of fuses formed on a semiconductor substrate, said semiconductor device also including at least one bonding pad over said substrate, comprising the steps of:

(a) forming a first passivation film over said semiconductor substrate except for at least part of each of said fuses and except for at least part of each of said at least one bonding pad;

(b) brining a first group of said fuses into a first state and a second group of said fuses different from said first group of said fuses into a second state, the electrical resistance of said fuses in said first state being much greater than that of those in said second state, the difference between said electrical resistances being provided by said part of each of said fuses not covered by said first passivation film; and

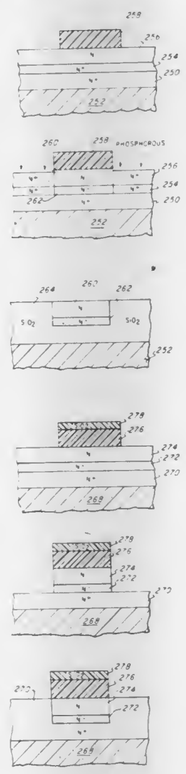
(c) forming a second passivation film over said semiconductor substrate so as to cover at least said part of each of the said fuses not covered by said first passivation film.

4,628,591

METHOD FOR OBTAINING FULL OXIDE ISOLATION OF EPITAXIAL ISLANDS IN SILICON UTILIZING SELECTIVE OXIDATION OF POROUS SILICON

Eldon J. Zorinsky, and David B. Spratt, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1984, Ser. No. 666,698
Int. Cl.⁴ H01L *21/306, 21/76*
U.S. Cl. 29—576 W **7 Claims**



1. A method for forming an isolated n type epitaxial island on an n type silicon chip, comprising the steps of:

(a) forming highly doped n type epitaxial silicon on said chip;

(b) forming moderately doped n type epitaxial silicon on said highly doped epitaxial silicon;

(c) selectively implanting ions in at least said moderately doped epitaxial silicon to selectively dope said moderately doped epitaxial silicon to a level approximately equal to the doping level of said highly doped epitaxial silicon, thereby creating an island of moderately doped epitaxial silicon surrounded at its sides and bottoms by highly doped epitaxial silicon;

(d) exposing the chip in an anodizing agent and voltage whereby porous silicon is selectively formed only in the highly doped epitaxial silicon; and

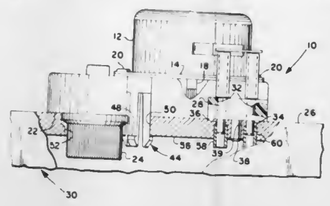
(e) oxidizing the porous silicon to form silicon dioxide in the porous silicon, thereby forming an isolated n type epitaxial island on the chip.

4,628,592

METHOD OF ASSEMBLING A MOTOR SPEED REDUCER TO A DEVICE TO BE DRIVEN

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 629,856, Jul. 11, 1984, abandoned. This application Apr. 3, 1986, Ser. No. 848,837
Int. Cl.⁴ H02K *15/00*
U.S. Cl. 29—596 **3 Claims**



1. A method of assembling a motor gear drive with device to be driven, comprising the steps of:

(a) providing a gear box with electrical terminal guide means and having a power output shaft extending from one side thereof and a power input shaft connection provided on the opposite side thereof;

(b) providing a motor having a motor shaft extending therefrom and a pair of electrical terminals extending therefrom in the direction of the motor shaft;

(c) inserting said motor shaft into said gear box and engaging said motor shaft with said power input connection and inserting said electrical terminals in the direction of said motor shaft into said guide means all in a common direction; and,

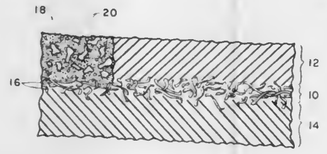
(d) inserting said power output shaft into engagement with a device to be driven and simultaneously in a common direction therewith, inserting said terminals into electrical power source connection on said device.

4,628,593

METHOD FOR FABRICATING BATTERY PLAQUE AND LOW SHEAR NICKEL ELECTRODE

David H. Fritts, Dayton, and John F. Leonard, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 559,170, Dec. 8, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 768,790
Int. Cl.⁴ H01M *4/26, 4/80*
U.S. Cl. 29—623.1 **14 Claims**



1. A method for fabricating a battery plaque which comprises the steps of:

(a) providing a sheet of electrically conductive felt;

(b) rolling said felt sheet to a desired thickness to provide a rolled sheet;

(c) applying a metal powder slurry to both sides of said rolled sheet; and

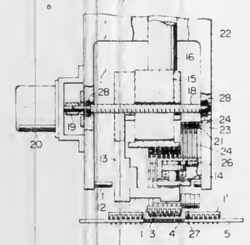
(d) sintering said metal powder in a reducing atmosphere, whereby the resulting sintered metal powder layers do not connect through the resulting rolled felt sheet layer and whereby there is substantially no attachment of the metal powder particles in said sintered layers to the strands in said felt layer, thereby allowing a degree of slippage between said felt layer and said sintered layers.

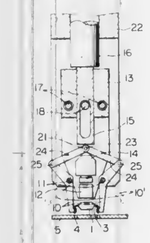
4,628,594

ELECTRONIC CIRCUIT ELEMENT INSERTION APPARATUS

Akio Yamagami, Hirakata, and Kazuhiko Narikiyo, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1985, Ser. No. 708,580
Claims priority, application Japan, Mar. 8, 1984, 59-44305
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—741 **5 Claims**





1. An apparatus for inserting into an electronic circuit board an electronic circuit element having a plurality of leads arranged in two rows in substantially the same direction comprising:

frame means including a plurality of pairs of opposing clamping members each pair of which can be opened and closed independently of the other pairs of clamping members to come toward and away from each other in the opposite direction;

slide means slidable in the same direction as an axis about which said plurality of pairs of clamping members are opened and closed;

abutment means supported by said slide means for abutting against a pair of clamping members selected from said plurality of pairs of clamping members to cause them to clamp said electronic circuit element;

pusher means for pushing said electronic circuit element, said pusher means being supported by said slide means to be movable both in the same direction as the sliding direction of said abutment means and in a direction perpendicular to said electronic circuit board; and

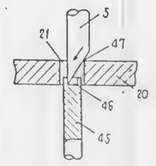
means for driving said pusher means.

4,628,595

AUTOMATIC INSERTING APPARATUS FOR ELECTRONIC PARTS

Takayuki Fujita, Hirakata; Hirotoshi Shigehara, Neyagawa; Shigetoshi Negishi, Suita; Takayoshi Kyotani, Hirakata, and Shozo Kadota, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00289, § 371 Date Feb. 7, 1985, § 102(e) Date Feb. 7, 1985, PCT Pub. No. WO84/05011, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 5, 1984, Ser. No. 705,471
Claims priority, application Japan, Jun. 7, 1983, 58-102065
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—741 **14 Claims**



1. An automatic inserting apparatus for automatically inserting lead wires of electronic parts, which are successively supplied, into inserting holes in a printed circuit board, which apparatus comprises:

a cutting mechanism for sharpening respective tips of lead wires of electronic parts by cutting respective tips of the lead wires of each electronic part;

a supply mechanism for successively supplying the electronic parts, having the sharpened lead wires, to a predetermined position with the sharpened lead wires oriented downwards towards a circuit board; and

a lead wire guide mechanism including a plurality of elongated lead wire guide pins and means disposed beneath the printed circuit board for moving said guide pins towards and away from the circuit board said guide pins having recesses at ends thereof facing the circuit board and said guide pins having diameters equal to or less than the diameters of the lead wires inserted in the circuit board, said guide pins when moved upwards penetrating through respective inserting holes in the circuit board to receive only the sharpened tips of the respective lead wires.

4,628,596

ELECTROLYTIC CELL WITH REDUCED INTER-ELECTRODE GAP

John E. Currey, 4720 Lower River Rd.; Colin S. McLarty, 419 Tryon Dr., both of Lewiston, N.Y. 14092, and Donald H. Porter, 89 Meadow La., Tonawanda, N.Y. 14223

Filed Dec. 29, 1976, Ser. No. 755,307
Int. Cl.⁴ H01R *43/00*; C25B *11/02, 13/08*; B21D *22/02, 22/00*; H01B *13/00*
U.S. Cl. 29—825 **5 Claims**



1. A method for fabricating an expanded anode wherein said anode is comprised of a pair of planar anode plates attached to an anode post, said pair of planar anode plates parallel to each other and separated by the diameter of the anode post, said method comprising expanding said anode by bending each plate, while attached to said anode post, to a position wherein the plates are substantially parallel to each other and the dis-

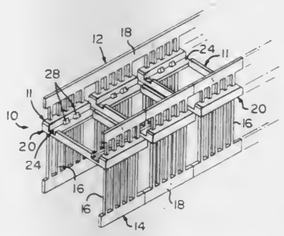
tance between said parallel portion of said plates is greater than the diameter of the anode post except where the plate is attached to said post.

4,628,597

METHOD OF MAKING AN ELECTRICAL CONNECTOR

Robert F. Meehan, 2126 Sycamore Dr., Harrisburg, Pa. 17112; William H. Rose, 6025 Bell Rd., Harrisburg, Pa. 17111, and David T. Shaffer, 4124 Ridgeview Rd., Harrisburg, Pa. 17112

Division of Ser. No. 555,257, Nov. 25, 1983, Pat. No. 4,530,552.
This application Mar. 14, 1985, Ser. No. 711,685
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—827 **5 Claims**



1. A method of making an electrical connector comprising the steps of:

forming first and second lead frames of electrical terminal posts extending from respective first and second carrier strips;

placing said first lead frames of a pair of said first carrier strips in a first mold in associated parallel spaced relationship;

molding first dielectric frame members to and between said associated first lead frames thereby forming first electrical terminal frame members;

placing said second lead frames of a pair of said second carrier strips in a second mold in associated parallel spaced relationship;

molding second dielectric frame members to and between said associated second lead frames thereby forming second electrical terminal frame members;

severing said first and second electrical terminal frame members from respective said pairs of said first and second carrier strips defining separate said electrical terminal posts extending from respective dielectric frame members in spaced parallel rows; and

securing said first and second electrical terminal frame members together thereby forming the electrical connector.

4,628,598

MECHANICAL LOCKING BETWEEN MULTI-LAYER PRINTED WIRING BOARD CONDUCTORS AND THROUGH-HOLE PLATING

Edward Taylor, Agoura Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1984, Ser. No. 657,097
Int. Cl.[4] H05K *3/42, 3/46*
U.S. Cl. 29—846 **2 Claims**

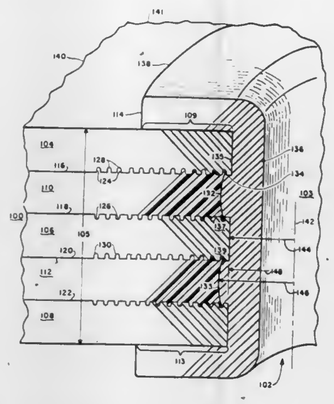
1. The method of forming soldering temperature resistant layer interconnecting through conductors in a printed wiring board having alternating layers of conductor material that are separated by insulating material comprising the steps of:

drilling holes through said alternating layer printed wiring board at through conductor locations thereof;

enlarging the diameter of said holes at the insulating layer hole depths thereof until regions of exposed conductor layer opening into said holes are formed;

roughening hole residing conductor surface areas in said exposed conductor layer region, said roughening including forming U-shaped cross section voids of depth and width at least one-tenth the conductor thickness on each said conductor lateral surface; and

filling said holes and said enlarged diameter regions at least partially be depositing therein additional conductive material, said conductive material also physically engaging portions of said roughened conductor surface area and said voids therein in temperature cycling resistant mechanical interlocking low electrical resistance continuity therewith.

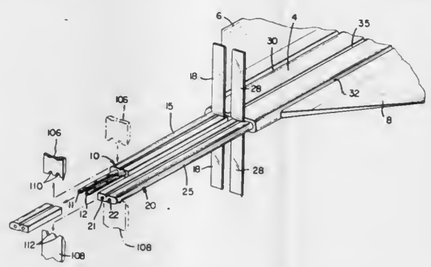


4,628,599

METHOD FOR STRIPPING INSULATION

Frank H. Bermier, Jr., Tempe, Ariz.; Glendon H. Schwalm, Seminole, Fla.; Donald F. Urgo, Tempe, Ariz.; Paul Vinson, Carefree, Ariz., and Darwin D. White, Peoria, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1985, Ser. No. 716,772
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—857 **11 Claims**



1. A method of preparing the ends of a flat shielded electrical cable for connection to grounded electrical components, the cable having a shield surrounding a plurality of conductors, the cable having insulation surrounding the shield and between the shield and the conductors, the method comprising the steps of:

axially slitting the insulation surrounding the shield and the shield along slit lines laterally spaced from the conductors, above and below the conductors to form separate shield strips above and below the conductors extending axially inward from an end of the cable; and

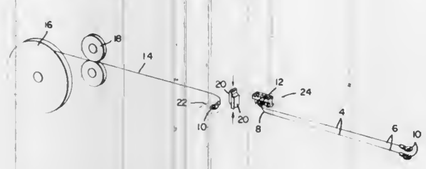
deploying the shield strips for access to the conductors, whereby the conductors can be attached to electrical components and the shield strips can be grounded.

4,628,600

METHOD AND APPARATUS FOR PRODUCING ELECTRICAL HARNESSES HAVING MULTI-CONTACT CONNECTORS AND DISCRETE WIRES

Geoffery M. Gordon, Bideford, England, and Edward J. Griffiths, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 23, 1985, Ser. No. 693,956
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—861 **7 Claims**



1. The method of manufacturing an electrical harness of the type comprising a plurality of discrete wires, each wire having a first end and a second end, the second end of each wire being connected to a terminal in a multi-contact electrical connector which has a plurality of terminals therein in side-by-side relationship in a row, the method comprising the steps of:

feeding wire from an endless source along a wire feed path,

cutting the wire in a cutting zone to produce a wire lead and first and second wire ends, the first end being the cut end of the wire extending from the source, the second end being the cut end of the lead,

moving the second end laterally of the feed path to a second wire connecting zone, connecting the second end to one terminal in a multi-contact electrical connector in the second connecting zone, and

repeating the feeding, cutting, moving, and connecting steps until wires have been connected to all of the terminals in the multi-contact connector in the second connecting zone.

5. Apparatus for connecting wires to terminals, the apparatus being of the type comprising a wire feeder for intermittently feeding wire from an endless source along a wire feed path, an upstream wire clamp and a downstream wire clamp on the feed path, the upstream clamp being upstream, relative to the direction of wire feed, from the downstream clamp, the clamps being normally open and in aligned positions so that the wire can be fed through the clamps, the clamps being closable onto the wire upon the cessation of wire feeding, a wire cutter between the wire clamps so that the fed wire can be cut and the upstream and downstream clamps will be in clamping engagement with an upstream wire end and a downstream wire respectively, an upstream wire connecting station and a downstream wire connecting station, the wire connecting stations being beside the wire feed path and proximate to the upstream and downstream wire clamps respectively, the wire clamps being shiftable by clamp shifters between their normal aligned positions and nonaligned positions in which the upstream and downstream wire ends are presented to the upstream and downstream wire connecting stations respective, the apparatus being an integrated machine having a supporting frame with the wire feeder, the wire clamps, the wire cutter and the clamp shifters all being disposed on the supporting frame and being clustered in an operating zone through which the wire feed path extends, the apparatus being characterized in that:

an applicator is provided at the downstream wire connecting station for inserting wires, one at a time, into wire-receiving slots in terminals which are in side-by-side relationship in a row in a multicontact electrical connector,

the applicator having an insertion zone, a connector support in the insertion zone, an insertion ram which is reciprocable towards and away from a terminal in a connector on the connector support, and a connector indexer for advancing a connector on the support by a distance equal to the spacing between adjacent terminals in the connector,

actuating means are provided for sequentially actuating the wire feeder, closing the wire clamps onto the fed wire, actuating the wire cutter, actuating the wire shifters to shift the wire clamps from their aligned positions to their nonaligned positions, reciprocating the insertion ram towards and away from a connector on the connector support, opening the downstream wire clamp, again actuating the wire shifters to thereby return the wire clamps to their aligned positions, and opening the upstream wire clamp,

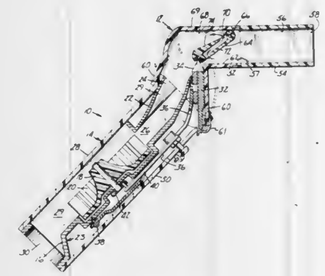
whereby during each operating cycle of the apparatus, a downstream wire end is inserted to one of the terminals in a connector on the connector support, and after a series of operating cycles, severed wires are connected to all of the terminals in the connector.

4,628,601

HAIR CUTTING APPLIANCE

Kevin D. Van Slooten, Rte. 2, Box 202, Hettinger, N. Dak. 58639

Filed Dec. 16, 1985, Ser. No. 809,211
Int. Cl.[4] B26B *19/44, 19/20*
U.S. Cl. 30—133 **8 Claims**



1. A hair cutting appliance for use with a means for drawing a vacuum, said appliance including:

A. a hair handling device including a tunnel providing a longitudinally extending hair handling passageway including an uncut hair passageway, said tunnel having a forward intake portion and a rearward exit portion, the uncut hair passageway being partially defined by mutually parallel top tunnel wall and bottom tunnel wall portions located between forward intake portion and the rearward exit portion of the tunnel, with a downstream edge of the bottom tunnel wall portion terminating intermediate the intake and exit portions of the hair handling passageway on a line normal to the longitudinal axis of the hair handling passageway;

B. a hair cutting shear fixedly positioned with respect to the hair handling device to have a plurality of its shear blade cutting teeth generally linearly disposed in a straight line parallel to and immediately adjacent the line of termination of the flat bottom tunnel wall portion, said cutting teeth extending from outside the hair handling passageway through the plane of the bottom tunnel wall portion into said passageway;

C. said hair cutting appliance having a body providing a first cut hair receiving port downstream of the line of the shear blade cutting teeth and open to the rearward exit portion of said tunnel and a second cut hair discharge port spaced from the first port, the appliance body being provided with a cut hair collecting passageway open between said ports;

D. means for attaching said means for drawing a vacuum to said cut hair discharge port;

E. wherein said hair handling device includes a hair deflector pivotally mounted at its first innermost end portion in the tunnel on an axis parallel to the linear line of the shear

blades and in adjacent relation to said top tunnel wall portion, said deflector means being partially defined by a forwardly facing deflector surface, a rearwardly facing deflector surface and a connecting surface extending between the forwardly and rearwardly facing surfaces at a second outermost end portion of the hair deflector, the deflector being movable between a first position wherein it lies in clearing relation to the line of cutting teeth of the shear blades and a second position wherein the deflector connecting surface and the outermost end portion of the forwardly facing surface of the deflector are in sufficiently close relationship with respect to the line of shear blades to cause uncut hair in the uncut hair passageway to be deflected into the operating path of the shear cutting blades; and

F. drive means to move said deflector between said first and second positions and to drive said shear when said means for drawing a vacuum is operable to draw air through said hair handling passageway and said cut hair collecting passageway.

4,628,602

PLIERS

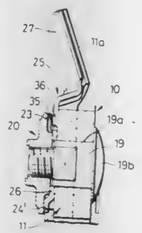
Jürgen Koltermann, Wuppertal, Fed. Rep. of Germany, assignor to Belzer-Dowidat GmbH Werkzeug-Union, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,788

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 8404922[U]

Int. Cl.⁴ B26B *13/00*

U.S. Cl. 30—261 **6 Claims**



1. Pliers comprising a pair of arms each having a front operating leg and a rear handle leg, a hole in each arm between said front operating and rear handle legs, means extending through said holes for pivotally connecting said arms to each other, a first of said arms being freely rotatable relative to said pivotal connecting means, means for nonrotatably coupling a second of said arms to said pivotal connecting means, means movable along said pivotal connecting means for axially urging said pair of arms into intimate relationship with each other, means between said second arm and said movable means for restraining said movable means against axial movement thereof along said pivotal means, said movable means is a nut threaded upon a threaded portion of said pivotal connecting means, said restraining means includes a clamping plate having a clamping portion and another portion sandwiched between said nut and said second arm, and said clamping plate another portion further includes first and second restraining means for respectively restraining movement between said nut and said clamping plate another portion and between said clamping plate another portion and said second arm.

4,628,603

HAND IMPLEMENT FOR SLICING FOODSTUFFS

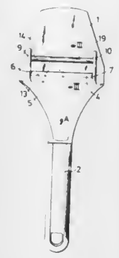
Per-Eric Frost, Mora, Sweden, assignor to Frosts Knivfabrik AB, Sweden

Filed Mar. 21, 1985, Ser. No. 714,200

Claims priority, application Sweden, Apr. 9, 1984, 8401967

Int. Cl.⁴ A47J *17/02;* **B26B** *3/03*

U.S. Cl. 30—280 **3 Claims**



1. A hand implement for slicing foodstuffs, such as cheese and root vegetables, comprising a substantially planar blade (**1**) having an elongated opening (**4**) from which there projects on the undersurface (**3**) of the blade an elongated metal cutting element (**5**) which is inclined towards the cutting or slicing direction, in which implement there is presented between the cutting edge (**11**) of the cutting element (**5**) and that long defining edge (**13**) of the opening (**4**) facing said cutting edge a free slot (**15**) through which sliced foodstuff (**18**) passes as it is cut, and in which a further free slot (**17**) over which the sliced foodstuff (**18**) passes is presented between the upper edge (**12**) of the inclined cutting element (**5**) remote from the cutting edge (**11**) thereof and the other long edge (**14**) of said elongated opening (**4**), characterized in that the blade (**1**) is resistant to bending and is manufactured from a plastics material in which the two end parts of the cutting element (**5**) are cast or moulded; and in that the said upper edge (**12**) of the cutting element lies above the upper surface (**8**) of the blade (**1**).

4,628,604

HANDHELD CIRCULAR SAW WITH BASEPLATE

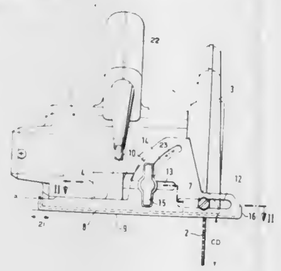
Rudolf Fuchs, Neuhausen, Fed. Rep. of Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 703,223

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404754

Int. Cl.⁴ B27B *9/02*

U.S. Cl. 30—390 **3 Claims**



1. A portable circular saw, comprising a baseplate, a protective blade guard, and a motor in a motor housing for driving a saw blade, means attaching said baseplate to said motor housing for adjustably sliding said baseplate in a direction perpendicular to a plane defined by said saw blade, means for locking said baseplate in a desired position adjustment, whereby said saw can cut kerfs in saw positions close to a wall extending in parallel to said saw blade, wherein said attaching means comprise tilt bracket means arranged perpendicularly to a contact surface of said baseplate, said tilt bracket means having longitudinal slot means for permitting said protective blade guard and said motor housing connected thereto to slide relative to said baseplate, wherein said locking means comprise at least one releasable locking member extending through said longitudinal slot means, wherein said tilt bracket means comprise arc-shaped slot means extending in at least one of said tilt bracket means to merge into the respective longitudinal slot means, and wherein said locking screw is located for also sliding in said arc-shaped tilting slot means in said tilt bracket means for achieving blade angling, and for sliding in one of said longitudinal slot means in said tilt bracket means to allow adjustment of said baseplate into a silhouette kerf sawing mode position.

4,628,605

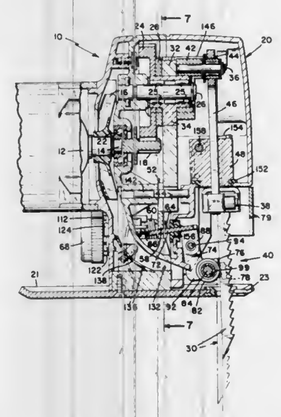
ORBITAL BAYONET SAW

Earl R. Clowers, Jackson, Tenn., assignor to Porter-Cable Corporation, Jackson, Tenn.

Filed Jun. 10, 1985, Ser. No. 742,986

Int. Cl.⁴ B27B *11/02, 19/09*

U.S. Cl. 30—393 **16 Claims**



1. A blade guide for a bayonet type saw including a housing, a motor within said housing, a driving means connected to the motor for producing an up and down motion in a saw blade connected to the driving means and an orbit producing means for causing said blade to orbit in a plane including said up and down blade motion;

said orbit producing means including a reciprocating lever member operatively connected to said motor and a blade guide which engages said lever and said blade, said blade guide comprising:

a neck member positioned within said body to engage said lever;

first and second parallel arms perpendicularly extending from said neck and each terminating in a flange, said flange on said first arm coplanar with said flange on said second arm and said plane of said flanges perpendicular to said neck and perpendicular to said arms;

a main rotating bearing positioned between said arms in the plane of said saw blade motion and engaging the back surface of said saw blade; and,

a pair of nip roller bearings affixed to said flanges and forming a nip substantially the width of a saw blade, said nip rollers engaging the opposite sides of said saw blade.

4,628,606

TRIMMER FOR DRY SHAVER

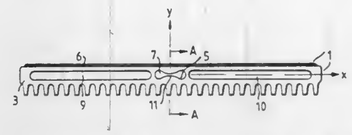
Peter Hilfinger, Bad Homburg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,201

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428487

Int. Cl.⁴ B26B *19/10*

U.S. Cl. 30—34.1 **8 Claims**



1. In a dry shaver having a housing, a trimmer comprising:

a cutting comb firmly fastened to the housing;

a substantially planar cutting blade cooperating with the cutting comb, said cutting blade including an aperture having a constricted portion;

a plastic injection-molded support member;

means for attaching said support member to said cutting blade for securely mounting said cutting blade to said support member and for forming a structural unit resistant to bending, said attaching means including an integrally, injection-molded portion of said support member protruding through said aperture of said cutting blade and also including a support strip integrally injection-molded with said support member, said cutting blade and said support member being reciprocally movable rectilinearly lengthwise with respect to the comb; and

biasing means for biasing said support member and said cutting blade against the cutting comb.

4,628,607

VIBRATION DRY SHAVING APPARATUS DRIVEN BY A BIPOLAR UNIPHASE SYNCHRONOUS MOTOR

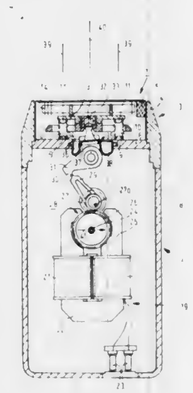
Leo Bertram, Stolberg, Fed. Rep. of Germany; Hugo Schemmann, Schaesberg, Netherlands, and Romuald Bukoschek, Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,720

Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417806

Int. Cl.⁴ B26B *19/12*

U.S. Cl. 30—43.92 **3 Claims**



1. A vibratory dry-shaving apparatus, which comprises a housing; a bipolar, uniphase, synchronous motor positioned within the housing and having a rotor and a stator; a shaving

head arranged on the housing and including a vibratory cutter part below a fixed cutter part; a wall separating the interior of the housing from the shaving head, said wall having a passage therethrough; a swing lever driven by said motor and engaging the vibratory cutter part to drive the latter, said swing lever extending through said passage; and an elastic sleeve surrounding the swing lever and sealing the passage between the edge thereof and the swing lever; said elastic sleeve being asymmetrically designed so that, in a final end position of the vibratory cutter part where the magnetic fields of the rotor and the stator are parallel, no force resulting from elastic deformation of the sleeve is exerted on the vibratory cutter part.

4,628,608

GUIDE DEVICE FOR HAND-HELD MACHINE TOOLS

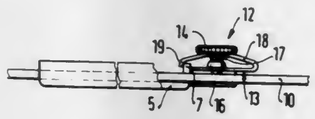
Gerhard Kuhlmann, Stuttgart, and Erwin Wolf, Weissach i.T., both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,910

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 8410794[U]

Int. Cl.⁴ B23D *51/04*

U.S. Cl. 30—373 **8 Claims**



1. A guide device for a hand-held machine tool, comprising a foot plate connected to the machine tool, and elongated guide rail, said foot plate having guide openings in which said guide rail is insertable and displaceable; and a clamping device for clamping said guide rail with said foot plate in an inserted position, said clamping device being supported immediately on said guide rail and being displaceable thereon, said clamping device including a clamping projection overlapping and engaging a portion of said foot plate to be clamped therewith, and clamping bolt for urging said projection to a clamping position said portion of said foot plate, said clamping device further including a clamp having two opposing tongues surrounding said guide rail, and a third tongue extended in the direction of elongation of said guide rail and provided with said projection, said clamping bolt being screwed into a middle portion of said clamp and urging said third tongue with said projection to the clamping position.

4,628,609

INCREMENTAL MEASURING AND MACHINE CONTROL SYSTEM

Heinz Rieder, St. Pantaleon, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF-Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

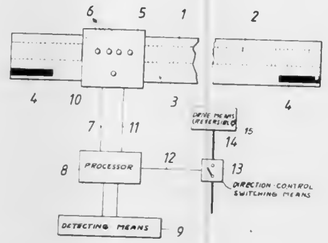
Filed Jul. 1, 1985, Ser. No. 750,899

Claims priority, application Austria, Jul. 6, 1984, 2175/84

Int. Cl.⁴ G01B *11/02*

U.S. Cl. 33—125 C **11 Claims**

1. An incremental measuring and control system for use with a machine, said system comprising:
- a rule provided with an incremental scale having a plurality of scale increments and at least one auxiliary track extending along said scale alongside the incremental scale and provided with marks;
- a scanning unit movable along said scale and including first scanning means for scanning said scale and said auxiliary track and for generating analog signals in response to the scanning of said scale and additional signals in response to the scanning of said marks;
- a processor for deriving digital signals from said analog signals;
- switching means for controlling operations of said machine;
- switch control means for controlling said switching means, said marks comprising control marks and at least one reference mark registering with a predetermined point of said scale, said switch control means comprising additional scanning means incorporated in said scanning unit and arranged to scan said auxiliary track and to control said switching means in response to the scanning of said control marks, said scanning unit being adapted to generate at least one reference signal in response to the scanning of said reference mark; and



detecting means for detecting said digital signals from said processor, said processor being arranged to control said detecting means in response to said reference signal said additional scanning means being arranged to generate said at least one reference signal in response to the scanning of said reference mark, and control signals in response to the scanning of said control marks, said processor having a control output connected to said switching means and a discriminator arranged to receive and distinguish between said at least one reference signal and said control signals and to deliver said control signals to said control output.

4,628,610

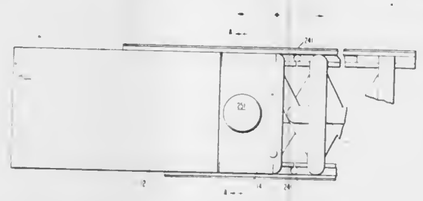
ADJUSTABLE RADIAL CURVE RADIUS SETTING SCALE

Richard R. Spinning, 2280 Clifton St., Sebring, Fla. 33870

Continuation-in-part of Ser. No. 736,727, May 22, 1985, Pat. No. 4,587,740, which is a continuation-in-part of Ser. No. 525,207, Aug. 22, 1983, Pat. No. 4,532,714, which is a continuation-in-part of Ser. No. 454,527, Dec. 30, 1982, abandoned. This application Feb. 26, 1986, Ser. No. 832,953

Int. Cl.⁴ B43L *13/20*

U.S. Cl. 33—177 **12 Claims**



1. An adjustable radial curve radius setting scale comprising:
- a supporting bar;
- a plurality of first level radial arms spaced apart and parallel;
- second and third level long chords attached to the supporting bar and to the first radial arms;
- a plurality of second level diagnoal braces attached to the supporting bar and to the radial arms;
- a plurality of third level diagnoal braces attached to the supporting bar and to the radial arms;
- a plurality of fourth level diagonal braces attached at their ends to the radial arms;

- a plurality of fifth and sixth level brace chords attached to the fourth level diagonal braces;
- a plurality of seventh level radial arms attached at their ends to the first radial arms; and
- at least one working edge secured between the first level and seventh level radial arms.

4,628,611

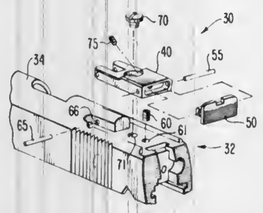
REAR GUN SIGHT

Mario F. Ruffino, 300 Beauregard Heights, Hampton, Va. 23669

Filed Sep. 6, 1984, Ser. No. 647,811

Int. Cl.⁴ F41G *1/16*

U.S. Cl. 33—254 **17 Claims**



1. A rear sight in combination with the rear portion of a gun frame or slide comprising:
- an elongated sight body having a pair of elongated, transversively spaced front legs, each leg having a forward sight body recoil shoulder for engaging the gun frame or slide;
- a sighting blade slidably attached to the rear of said sight body to permit windage adjustment of the sighting blade;
- a longitudinal elongated slot formed in the gun frame or slide and sized to accept the sight body so that at least a portion of the sight body is held within the slot, said elongated slot forming at its forward end a pair of frame recoil shoulders to engage the respective forward sight body recoil shoulders of said sight body;
- means for pivotably attaching said sight body to said gun frame to permit elevation adjustment of the sight body; and
- said sight body being fit within said elongated slot and said forward sight body recoil shoulders and said frame recoil shoulders engaging one another to bear the impact of the gun's recoil.

4,628,612

TILT ANGLE DETECTION DEVICE

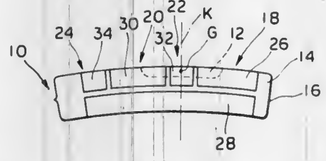
Nobuo Hori; Takashi Yokokura, both of Tokyo, and Fumio Ohtomo, Saitama, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,442

Claims priority, application Japan, Nov. 24, 1984, 59-248533

Int. Cl.⁴ G01C *9/06, 9/26*

U.S. Cl. 33—366 **24 Claims**



1. A level detector comprising:
- a first fluid;
- a second fluid immiscible with said first fluid and having a dielectric constant different from said first fluid dielectric constant;
- means for containing said first and second fluids;
- a first capacitor having said first and second fluids as dielectric material, the amount of said first fluid acting as dielectric material being related to the angle of said containing means;
- a second capacitor having said first and second fluids as dielectric material, the amount of said first fluid acting as dielectric material being related to the angle of said containing means in a manner inverse to said first capacitor;
- a third capacitor having said first and second fluids as dielectric material in a manner independent of the angle of said containing means;
- a fourth capacitor having only said second fluid as dielectric material; and
- means for generating a signal related to the angle of said containing means based upon the capacitance of said first, second, third, and fourth capacitors.

4,628,613

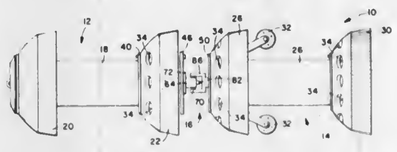
BEND DETECTOR FOR A PIPELINE PIG

Dwane O. Laymon, Tulsa, and James M. Berry, Owasso, both of Okla., assignors to Electronic Diggins Systems, Inc., Tulsa, Okla.

Filed Jan. 13, 1986, Ser. No. 818,219

Int. Cl.⁴ G01B *7/04, 7/28*

U.S. Cl. 33—544 **8 Claims**



1. A bend detector for use on a pipeline pig assembly; said pipeline pig assembly comprising a front pig element and a rear pig element pivotally connected to each other by said bend detector, said front pig element having a longitudinally disposed housing with means for driving said pipeline assembly by the flow of a fluid through a pipeline system, said rear pig element having a longitudinally disposed housing with means for axially supporting said housing in said pipeline system; means for determining the distance traversed by said pipeline pig assembly through said pipeline system; said bend detector comprising a universal joint having a pair of yoke members being pivotally interconnected to a central member so as to oscillate about a pair of mutually perpendicular axes lying in a plane generally perpendicular to the axis of the pipeline, each of said yoke members having a yoke and a collar, means for mounting each said collar to said front pig element and said rear pig element, respectively, said central member being provided with a substantially longitudinal bore for receiving a hollow sleeve, a central opening in each said collar thereby forming an axially aligned passageway with said hollow sleeve, a cable received in said passageway and having its rear end anchored to said mounting means on said rear pig element, the forward end of said cable connected to an actuator shaft for a stylus for recording a bend along said pipeline system, whereby when said pig assembly traverses a bend, said front pig element will pivot with respect to said rear pig element thereby pivoting said sleeve relative to said passageway and thereby exerting a pull on said cable causing said actuator shaft to move longitudinally rearward; thereby indicating the location and degree of said bend.

4,628,614

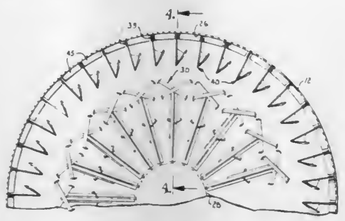
FLIGHTING FOR HORIZONTAL DRYERS

Stanley P. Thompson, 700 W. Laurent, Topeka, Kans. 66608

Division of Ser. No. 535,572, Sep. 26, 1983, Pat. No. 4,549,699. This application Jul. 17, 1985, Ser. No. 745,683

Int. Cl.[4] B02C *17/10*

U.S. Cl. 34—12 **8 Claims**



1. A drying drum coupled with a heat source and means for rotating the drum about its longitudinal axis, said drum being adapted for drying a material which is subject to being comminuted, said drum comprising:

an elongated hollow body disposed with its longitudinal axis in a generally horizontal plane and characterized by an inner surface of generally circular vertical cross section and having a material inlet and material outlet;

a plurality of material distributing vanes coupled with the body and spaced circumferentially around around and longitudinally along said surface, at least some of said vanes being formed from expanded metal;

a plurality of circumferentially spaced interference structures coupled with said drum at a location spaced radially inward from said material distributing vanes and spaced longitudinally along the length of the drum;

said interference structure being formed from means for presenting a plurality of sharp cutting surfaces whereby when said material gravitates onto said structure it is comminuted by striking said surfaces.

4,628,615

PROCESS AND INSTALLATION FOR THE HEAT TREATMENT OF CYLINDRICAL BODIES, ESPECIALLY PIPES

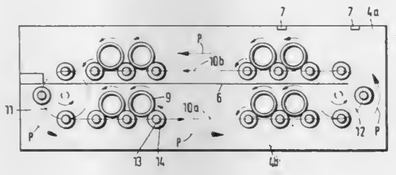
Gerardus M. C. Verheyden, P. O. Box 74, NL-6980 ab Doesburg, Netherlands

Filed Jul. 19, 1984, Ser. No. 632,450

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325944

Int. Cl.[4] F26B *3/00*

U.S. Cl. 34—24 **21 Claims**



1. A method for heat treating cylindrical bodies, which comprises the steps of positioning the cylindrical bodies parallel to one another, and transporting the parallel bodies through a plurality of successive temperature zones comprising at least a drying zone, a high temperature heating zone and a cooling zone to dry, heat and cool said bodies while being transported, the transporting step being performed while rotating said cylindrical bodies about their individual axes, the rotational velocity of bodies being transported through one zone being independent from their forward velocity and independent from the rotational and forward velocities of other bodies being simultaneously transported through the other temperature zones.

4,628,616

VAPOR TANK

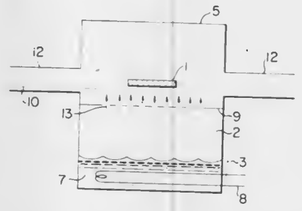
Mitugu Shirai; Hideaki Sasaki, both of Hadano; Sadatoshi Ueda, Chiba, and Akira Sawada, Fujisawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Sanki Engineering Co., Ltd., both of Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,872

Claims priority, application Japan, Nov. 16, 1983, 58-213945

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—78 **7 Claims**



1. A vapor tank for processing a product by heating the same through exposure to vapor, comprising:

a vapor chamber located in a lower portion of the tank and filled with vapor;

a heating chamber for processing the product by heating the same;

means for supporting the product during processing; and

a partition wall separating the heating chamber and the vapor chamber from each other and formed with openings of a dimension providing jet currents of saturated vapor in the vapor chamber therethrough from the lower portion of the tank toward the heating chamber, the jet currents impinging against the product located in the heating chamber to cooperatively envelop the product with the saturated vapor.

4,628,617

CRIMPED DRIER DRUM STRUCTURE

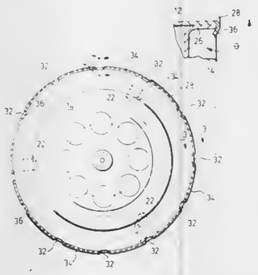
Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Weston, Canada

Filed Apr. 30, 1985, Ser. No. 729,042

Claims priority, application Canada, Jun. 20, 1984, 457041

Int. Cl.[4] F26B *11/02*

U.S. Cl. 34—108 **5 Claims**



1. A drum for a clothes drier comprising a cylindrical sleeve, a pair of opposed heads position one at each end of said sleeve, each of said heads being provided at its outer periphery with a substantially cylindrical axially extending seat terminating in an outwardly extending abutment means, said seat on each of said heads being received within its respective end of said sleeve and said abutment means limiting penetration of its respective head into said sleeve, axially extending tabs projecting from each end of said sleeve, each of said tabs being bent around its adjacent of said seats on its adjacent of said heads to provide the sole means for securing said heads to said sleeve.

4,628,618

APPARATUS IN A DRYING SECTION OF A PAPER MACHINE

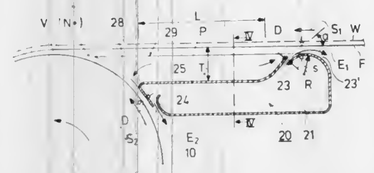
Raimo Virta, Turku, and Martti Salmivaara, Littoinen, both of Finland, assignors to Valmet OY, Finland

Filed Feb. 19, 1985, Ser. No. 702,621

Claims priority, application Finland, Mar. 2, 1984, 840856

Int. Cl.[4] F26B *13/08*

U.S. Cl. 34—116 **20 Claims**



1. In a drying section of a paper machine including at least one drying group wherein a web in contact with a supporting fabric runs from a drying cylinder in one line of drying cylinders to a drying cylinder in another line of drying cylinders, apparatus for preventing conditions tending to deteriorate the support contact between the web and the fabric including the generation of positive pressures in the narrowing gaps defined by the surfaces of the drying cylinders and the web supporting fabric as it approaches and/or moves away therefrom, comprising:

at least one blow box adapted to be connected to a source of blow gas, said blow box being situated adjacent to a respective run of the web supporting fabric and extending transversely thereto substantially over the width of the web, said blow box including at least two transversely extending blow gas discharge aperture means having respective widths and between which a substantially planar carrying surface is provided, said carrying surface being in opposed substantially parallel relationship to the web carrying fabric and spaced a first distance therefrom which is in the range of between about 10 to 30 times the width of at least one of said blow gas discharge aperture means, a space being defined between said carrying surface and the opposed web carrying fabric, at least one of said blow gas discharge aperture means being situtated proximate to the web carrying fabric and spaced a second distance therefrom, said first distance at which said carrying surface is spaced from said web carrying fabric being greater than said second distance at which said at least one blow gas discharge aperture means is spaced from said web carrying fabric, and wherein said blow gas discharge aperture means comprise means for directing blow gas away from said space defined between said carrying surface and opposed web carrying fabric to generate a negative pressure in said space.

4,628,619

DRYING PLANT FOR BROWN COALS OF HIGH WATER CONTENT

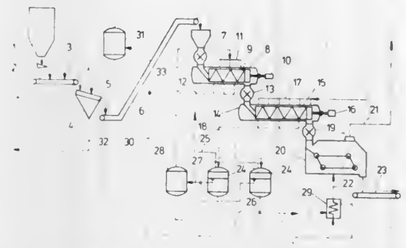
Alois Janusch, Leoben; Franz W. Mayer, Proleb, and Gero Tessmer, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Mar. 8, 1985, Ser. No. 709,820

Claims priority, application Austria, Mar. 21, 1984, 950/84

Int. Cl.[4] F26B *17/20*

U.S. Cl. 34—180 **6 Claims**



1. A drying plant for brown coals of high water content, in which plant the coal to be dried is preheated, is steamed by using steam under super-atmospheric pressure and is redried, characterized by the combination of the following parts:

(a) first conveyor means including a vibrating trough and means for spraying hot waste water over the coal on the vibrating trough,

(b) a vibrating wet sieve for receiving coal from the first conveyor means and for supplying residual steam to the coal on the sieve,

(c) second conveyor means including a steep conveyor belt for receiving sieved material from the wet sieve and for transporting the sieved material to a pressure lock,

(d) preheating means associated with said pressure lock for receiving material therefrom, said preheating means having connections for steam conduits, said preheating means and said pressure lock being equipped with infinitely variable drive means,

(e) a further pressure lock equipped with infinitely variable drive means for discharging the coal from the preheating means and for charging the coal into an autoclave designed for being supplied with steam, said preheating means having waste water discharge conduits connected thereto,

(f) a sieve drum arranged within the autoclave and comprising a rotational drive means and conveying elements,

(g) a further pressure lock for discharging the steamed material,

(h) a subsequent drying means for receiving steamed coal from said further pressure lock, said subsequent drying means including a connection for preheated gases such as steam, air or inert gases,

(i) means for transporting away the dry coal.

4,628,620

APPARATUS FOR CONTACT DRYING OR COOLING OF SHEETS AND THE LIKE

Gerhard Klemm, Am Rehwinkel 37, D-4800 Bielefeld 1, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,510

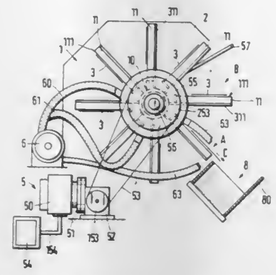
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439435; Feb. 25, 1985, 3506520

Int. Cl.[4] F26B *19/00, 3/34, 5/04, 13/30*

U.S. Cl. 34—236 **49 Claims**

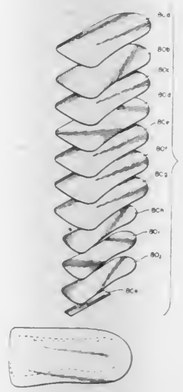
1. Apparatus for contact drying and/or cooling of sheet- or plate-like and other relatively thin objects, comprising a rotor; drive means for said rotor; and a plurality of suction chambers provided on and extending outwardly of said rotor, each of said chambers having a substantially plate-like object support-

ing member, and each of said supporting members having an outer surface provided with a plurality of suction openings



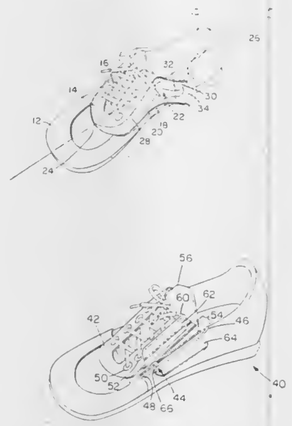
arranged to attract objects to and hold objects against the exterior of the respective supporting member.

4,628,621
ORTHOTIC FOR RUNNING
Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratories, Inc., Blaine, Wash.
Filed Apr. 3, 1985, Ser. No. 719,479
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—44 **8 Claims**



1. A substantially unitary orthotic insert adapted to be placed in an article of footwear, said insert having a longitudinal axis parallel to a lengthwise axis of a foot for which the insert is used, and a transverse axis, with the foot having a plantar surface, which has a calcaneal area, a metatarsal head area, and a mid-foot area, said insert comprising:
- a. a rear portion adapted to underlie and engage the plantar surface of the calcaneal area of the foot;
- b. a forward position adapted to underlie and engage the plantar surface of the metatarsal head area of the foot;
- c. an intermediate portion connecting to and extending between said rear and forward portions to engage the plantar surface of the mide-foot area of the foot;
- d. said insert having outside and inside edge portions adapted to be positioned adjacent an outside edge and an inside edge of the foot, respectively;
- e. said insert having a laminated structure comprising a plurality of vertically stacked layers bonded to one another to form a substantially unitary structure, said laminated structure comprising:
  - 1. a first laminate means comprising a layer having fibers which have a predominant orientation of alignment substantially aligned with the longitudinal axis, so as to provide greater resistance to bending moments along said longitudinal bending axis, and to provide less resistance to bending along the transverse axis;
  - 2. a second laminate means comprising at least one layer having fibers which have a predominant diagonal orientation of alignment, such that said alignment has a substantial longitudinal alignment component, and a transverse alignment component no greater than the longitudinal alignment component;
- f. said laminated structure being characterized in that said structure has an overall greater resistance to bending along said longitudinal axis, relative to said transverse axis.

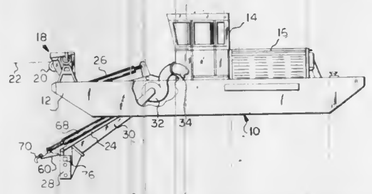
4,628,622
SHOE WITH FASTENABLE OPENING
George P. McBarron, Attleboro, Mass., assignor to Stride Rite International, Inc., Cambridge, Mass.
Continuation of Ser. No. 499,992, Jun. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 415,573, Sep. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 357,413, Mar. 12, 1982, abandoned. This application May 30, 1985, Ser. No. 739,559
Int. Cl.[4] A43B *11/00, 3/30*
U.S. Cl. 36—50 **12 Claims**



1. A child's lace shoe comprising an upper having:
a rim,
an eyestay,
a pair of edge portions defining a fastenable opening, said opening beginning at a point on said rim and extending forwardly and downwardly along said eyestay to a stop, the extent of said opening being sufficient so that, after adjustment, said shoe can be put on and taken off without readjusting the laces of said shoe,
a zipper including a pair of zipper elements affixed respectively to said edge portions to permit closure of said opening,
a fastenable covering element for covering at least a portion of said zipper when said zipper is closed, and
a tonque wide enough to extend beneath said zipper.

5. A child's lace shoe comprising an upper having
a rim,
a pair of overlapping edge portions defining a fastenable opening, said opening beginning at a point on said rim and extending forwardly and downwardly, the extent of said opening being sufficient so that, after adjustment, said shoe can be put on and taken off without readjusting the laces of said shoe, and
a pair of fastening elements affixed respectively to said overlapping edge portions, said fastening elements being arranged to mate at a plurality of points along said fastenable opening when pressed together and to unmate when pulled apart,
said edge portions being so arranged that the forces on said fastening elements, when mated, are predominantly in shear, when said shoe is worn,
each of said fastening elements comprising a main portion affixed to one of said overlapping edge portions, and a tail extending rearwardly along said rim,
said main portion being elongated in a direction generally parallel to the edge of said fastenable opening,
said tail extending in a direction transverse to the direction of said main portion.

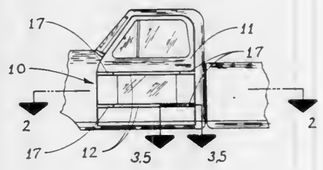
4,628,623
TURBIDITY CONTROL SYSTEM FOR DREDGE CUTTERHEADS
Troy M. Deal, 277 Trismen Ter., Orlando, Fla. 32802
Filed Mar. 11, 1985, Ser. No. 710,564
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—63 **15 Claims**



1. A method for controlling turbidity during dredging by a suction type dredge head having a closed configuration defined by rear, upper and side walls and having an open face and a suction outlet, a hood selectively movable with respect to the open face to vary the area thereof, and agitating means within the dredge head adjacent the head open face, comprising the steps of:
- (a) translating the dredge head in a direction toward the material being dredged wherein the dredged material approaches the head open face,
- (b) agitating the dredged material adjacent the head open face to loosen the dredged material to facilitate the disposal and pumping thereof through the head suction outlet,
- (c) sensing the turbidity existing adjacent the dredge head,
- (d) controlling the turbidity caused by the dredged material in accord with the sensing thereof by positioning the hood relative to the dredge head open face to vary the area of the open face to control the velocity of water movement into the dredge head open face to maintain the degree of turbidity adjacent the dredge head to a predetermined value, and
- (e) removing the agitated dredged material entering the dredge head open face through the head suction outlet.

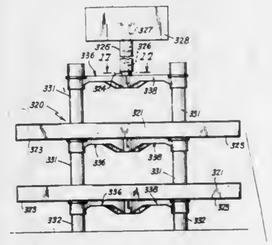
4,628,624
VEHICLE DOOR-MOUNTED SIGN HOLDER
Donald F. Gunn, P.O.Box 565, Arapahoe, Nebr. 68922
Filed Mar. 28, 1985, Ser. No. 716,998
Int. Cl.[4] G09F *21/04*
U.S. Cl. 40—591 **5 Claims**

1. A vehicle door-mounted signholder, comprising:
an upper elongated support member having a pocket portion directed downwards;
a lower elongated support member having a pocket portion directed upwards;
whereby the upper and lower edges of a sign may be held between said upper and lower support members;
two telescoping connector arms each having a slidable portion and an affixed portion, the affixed portion of each mounted to an end of said upper support member, said arms having their free ends bent inwardly so as to fit around the edge of a vehicle door;
two telescoping connector arms each having a slidable portion and an affixed portion, the affixed portion of each mounted to an end of said lower support member, said arms having their free ends bent inwardly so as to fit around the edge of a vehicle door;
wherein the affixed portions of the telescoping connector arms are longitudinally slotted;
wherein the slidable portions of the telescoping connector arms are of a width and thickness such that said sleeve portions will be expanded slightly in cross-section;



whereby said telescoping arms will be constrained to final position;
resilient spacer means affixed to the door-adjacent face of said support members;
wherein the total of the thickness of the wall of each one of the support members nearest the door forming a pocket portion and the depth of said spacer means is such that no part of a sign being held between said support members may come in contact with the door;
soft material affixed to the door-adjacent surface of said arms; and
means for maintaining the desired vertical position of the connector arms.

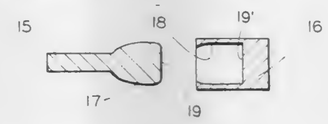
4,628,625
ADJUSTABLE KNOCKDOWN TRAY ASSEMBLY
James Hepp, 5 Fairview La., Glen Cove, N.Y. 11542
Division of Ser. No. 742,415, Jun. 7, 1985, Pat. No. 4,593,825. This application Mar. 18, 1986, Ser. No. 819,616
Int. Cl.[4] G09F *15/00*
U.S. Cl. 40—606 **5 Claims**



5. A cross-arm support structure for locating a sign post at the center thereof and a sign secured to the post, said cross-arm structure consisting of two load supporting members of the same length pivoted at their centers, one with a pin and the other with a boss and each having a double socket at the end to fit a vertical tubular support at the four end locations;
wire means adapted to fasten the sign post in vertical relation to the top one of the two channel members;
the center of the top of the two inverted channel members being provided with two holes to receive the spaced ends of the wire means;

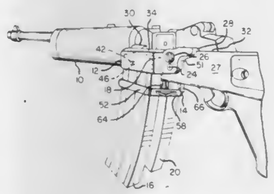
a tubular sign post having a nipple portion which is restricted to receive the open ends of the wire means;
means to secure a sign to said post; and
a sign.

4,628,626
SAFETY MECHANISM FOR FIREARMS
Raymond W. Brandt, 5828 Wheelock, Fort Wayne, Ind. 46815
Filed Jul. 13, 1984, Ser. No. 630,539
Int. Cl.[4] F41C *17/00*
U.S. Cl. 42—70.01 **15 Claims**



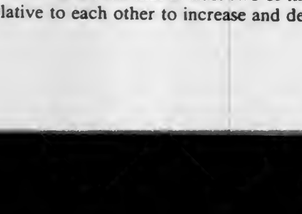
1. A safety mechanism for a firearm, the firearm including an element adapted to be moved between a safe position wherein the firearm cannot be discharged and an actuated position wherein the firearm is capable of being discharged, comprising:
a stop means including a pin attached to a ball;
means for engaging said stop means to limit movement of said stop means for a predetermined distance along a predetermined path including a socket for retaining said ball, said ball and said socket cooperating to maintain said pin in any of a plurality of selected positions along said predetermined path; and
means for attaching said stop means to the firearm in a position adjacent the element for actuating the firearm whereby said stop means is movable along said predetermined path between at least one position wherein the element cannot be actuated and at least one other position wherein the element can be actuated.

4,628,627
PROTECTIVE RETAINER FOR A MAGAZINE
David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302
Filed Nov. 19, 1985, Ser. No. 799,660
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **26 Claims**



1. A spare magazine holder for use with a repeating firearm of the type having a front end, a rear end, a pair of opposite sides and a magazine well located between said front and rear ends for receiving an upper end of a replaceable service magazine to hold a plurality of cartridges and feed them serially into position for being loaded into a firing chamber of the firearm, the spare magazine holder comprising:
(a) a magazine-receiving upper portion adapted to be mounted on a side of said firearm at a location laterally proximate said magazine well and at substantially the same longitudinal distance as said magazine well from said front and rear ends, said upper portion including means for receiving and holding an upper end of a spare magazine; and
(b) lower retainer means spaced downwardly apart from said upper portion and extending laterally between a spare magazine and a service magazine held in said magazine well, for connecting a lower portion of said spare magazine with a lower portion of said service magazine and holding said spare magazine alongside and oriented generally parallel with said service magazine, with said upper end of said spare magazine extending upwardly into said magazine-receiving upper portion, only so long as said service magazine is held in place in said magazine well, and for releasing said spare magazine from said upper portion upon release of said service magazine from said magazine well.

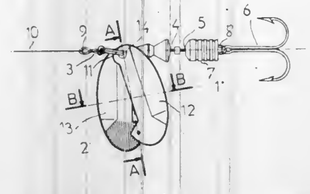
4,628,628
FISHING EQUIPMENT HOLDER
Carl T. Burgin, 438 Beacon Hill Dr., Longview, Wash. 98632; Gary A. Loomis, P.O. Box E, Woodland, Wash. 98674; Purl R. Enloe, deceased, late of Kelso, Wash., and by Shirley Enloe, administratrix, c/o Rte. 1, Box 200, Rainier, Oreg. 97048
Filed Apr. 19, 1984, Ser. No. 602,005
Int. Cl.[4] A01K *97/08, 97/10*
U.S. Cl. 43—26 **14 Claims**



1. A portable fishing equipment holder, comprising:
an elongate body portion; and,
fastening means for detachably fastening a plurality of fishing rods or similar items to the exterior of said body portion, said fastening means comprising:
(a) a plurality of brackets encompassing said body portion and extending outwardly therefrom;
(b) a plurality of notches formed in the outer margins of each bracket; and,
(c) a separate outer band means employed in conjunction with each bracket for resiliently retaining a fishing rod or similar item within said notches, said outer band means substantially encircling and frictionally engaging with the outer peripheral portion of said bracket, having end portions defining a gap slightly wider than the width of the widest of said notches, and being normally frictionally held in a selected angular position but being manually rotatable relative to said bracket to provide selective access only to one notch at a time.

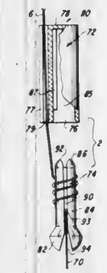
4,628,629
FISHING LURE HAVING A BLADE WITH A VARIABLE WATERFOIL SURFACE
Paul Rocchietta, and Henry Limouzin, both of Contes, France, assignors to Sheldons', Inc., Antigo, Wis.
Filed Jan. 16, 1985, Ser. No. 692,003
Claims priority, application France, Apr. 19, 1984, 84 06455
Int. Cl.[4] A01K *85/04*
U.S. Cl. 43—42.19 **14 Claims**

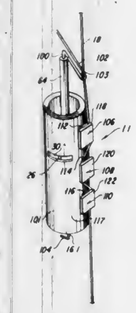
1. A fishing spoon comprising a blade having means for selectively varying the waterfoil surface thereof, the said means including at least two blade elements having longitudinal axes defining an aperture angle therebetween and attaching means for pivotably attaching at least one element to the remainder of the elements such that at least two of the elements may pivot relative to each other to increase and decrease the aperture angle defined by their longitudinal axes and thus to increase and decrease the waterfoil surface of the blade, the attaching means including a hole in each of those elements that



pivot relative to each other, and a stirrup extending through all such holes, the stirrup being pivotably attached to the remainder of the fishing spoon.

4,628,630
DEEP TROLLING RELEASE DEVICE
Edward A. Bohme, 5759 Larson Pl., West Vancouver, British Columbia, Canada (V7W 1S5)
Continuation-in-part of Ser. No. 532,370, Sep. 15, 1983, Pat. No. 4,565,026. This application Nov. 4, 1985, Ser. No. 794,435
Int. Cl.[4] A01K *91/06*
U.S. Cl. 43—43.12 **14 Claims**

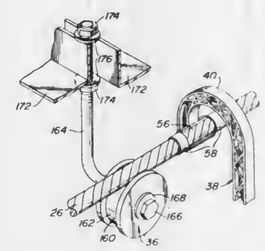




1. A deep trolling release device comprises:
a first member having a top, a bottom, a recess extending from the top towards the bottom, a passageway extending from the top to the bottom outside the recess, and spline means extending along the recess in the direction between the top and the bottom, and a second member having a tapering portion which tapers towards one end thereof and is shaped to wedge within the recess, the tapering portion having longitudinal grooves extending along opposite sides thereof, the grooves being sufficiently large to permit a fishing line to pass freely between the first and second members when the second member is wedged within the recess with one of the grooves fitting over the spline means.

11. A deep trolling device for releasably connecting a fishing line to a downrigger line, the device comprising:
(a) a hollow outer member having a top, a cylindrical side wall, an aperture in a side wall and a plurality of protrusions extending from the side wall about which the downrigger line can be wrapped;
(b) an inner member slidably received in the outer member, the inner member having a top;
(c) a pin or the inner member adjacent the aperture in the outer member and having a free end, the pin normally spanning the aperture for holding a connecting line extending about the pin; and
(d) release means for releasing the fishing line adjacent the top of the inner member including a lateral guide member capable of receiving the fishing line and maintaining the trolling device closely aligned therewith, said release means being capable of being struck by a weight slidably dropped down the downrigger line, the release means operatively engaging the inner member to displace the inner member downwardly when the release means is struck by the weight to move the free end of the pin across the aperture in the outer member and release the connecting line.

4,628,631
SPECIAL LOCKING CLIP WITH APPARATUS FOR CARRYING PLURAL PLANTS TO A WATERING STATION
Arie Van Wingerden, R.R. #1, Box 37A, Pipersville, Pa. 18947
Continuation-in-part of Ser. No. 590,404, Mar. 16, 1984, Pat. No. 4,547,992. This application Jul. 30, 1985, Ser. No. 760,523
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] A01G *9/00*
U.S. Cl. 47—17 **4 Claims**



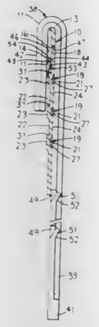
1. Hanger means for use in connection with a cable, said hanger means comprising a generally assymetrical C-shaped member having upper and lower legs which are interconnected by an intermediate section, said upper leg having a passageway therein, said hanger means being arranged to assume either a first orientation or a second orientation, said hanger means being arranged to support a plant thereon, with said hanger means being in said first orientation when said plant is supported thereon and being configured to automatically assume said second orientation when a plant is not supported thereon, said upper leg being arranged to contact sensor means when said hanger is in said first orientation, said lower leg forming a hook for suspending a plant therefrom, said hanger means further including a locking means removably connecting said hanger means to a cable which passes through said upper leg passageway.

4,628,632

EDGING STRIP

Daniel G. Zwier, 2435 Woodcliff La., Grand Rapids, Mich. 49506

Continuation-in-part of Ser. No. 567,026, Dec. 30, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 684,536
Int. Cl.⁴ A01G *1/00*
U.S. Cl. 47—33 **13 Claims**



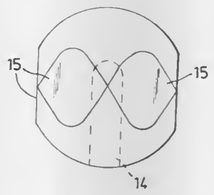
1. Edging useful in landscaping and other uses, comprising:
an elongated extruded aluminum strip having a generally uniform thickness, said strip, in vertical orientation thereof, having plural elongated grooves in one side thereof, extending lengthwise of said strip and being vertically spaced from one another, said strip further having plural ribs projecting outwardly from an opposite side of said strip and opposite said grooves at a vertical location on said opposite side coinciding with the location of said grooves, each said groove having a pair of vertically spaced sidewall surfaces and a vertically upright bottom wall surface, the lowermost sidewall surface of each groove having a wall surface that is flat and inclined to the horizontal and defining an acute angle with said bottom wall surface, each said rib having a side facing surface that is parallel to said bottom wall surface and an upwardly facing surface that is upwardly inclined and defining an acute angle to said side facing surface.

4,628,633

GERMINATION IMPROVING SEED CAPSULE AND METHOD OF PREPARING THE SAME

Lars G. Nilsson, Pl 1786, S-782 00 Malung, Sweden

PCT No. PCT/SE83/00211, § 371 Date Jan. 22, 1985, § 102(e) Date Jan. 22, 1985, PCT Pub. No. WO84/04651, PCT Pub. Date Dec. 6, 1984
PCT Filed May 26, 1983, Ser. No. 705,428
Int. Cl.⁴ A01C *1/06*
U.S. Cl. 47—57.6 **9 Claims**



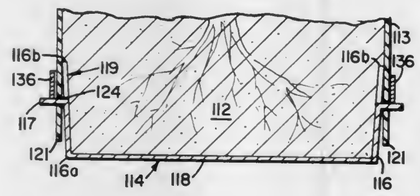
1. A method of preparing a seed capsule which when subjected to ambient moisture conditions will swell to form a loose, partially light transmitting structure enclosing the seed but easily penetrated by the germinating seed, comprising the steps of:
pre-compressing a material to form a plate thereof, the pressure substantially being exerted in at least one first direction generally parallel to the plate plane;
compressing the plate obtained in a second direction substantially normal to the plate plane into a sheet comprised of a layer of a plurality of generally spherical capsule bodies, each capsule having a central hexagonal peripheral portion, the hexagonal peripheral portions of adjacent capsule bodies being connected by thin material portions such that the capsule bodies are substantially hexagonally close-packed in said sheet thereof;
in said compressing step forming a radial recess in each capsule body extending substantially from the center thereof;
inserting a seed into each radial recess;
sealing each recess by a plug member;
separating the individual seed capsules from each other.

4,628,634

NURSERY STOCK CONTAINER

Oren B. Anderson, 589 Havana Rd., Owatonna, Minn. 55060

Continuation-in-part of Ser. No. 570,268, Jan. 12, 1984. This application Dec. 24, 1984, Ser. No. 686,027
Int. Cl.⁴ A01G *23/02*
U.S. Cl. 47—73 **27 Claims**



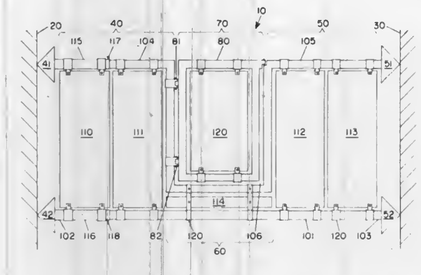
1. Removeable apparatus for containing the root ball of a plant, comprising:
(a) a rigid base (**114**) having a floor portion (**118**) and integral upwardly projecting support (**116**) and a plurality of integral circumferentially spaced tabs (**117**) projecting radially outwardly and with said floor portion (**118**), support (**116**) and plurality of tabs (**117**) being of unitary construction;
(b) a wall member (**113**) of flexible material, having a top edge, a bottom edge, and a pair of opposing side edges, each of said side edges extending between said top edge and said bottom edge;
(c) circumferentially spaced slots (**124**) in said wall member (**113**) proximate said wall member bottom edge for removably receiving said base tabs (**117**) in a manner which forms an enclosure with said wall member supported solely by said tabs;
(d) means for securing portions of said wall member side edges together whereby said tabs (**117**) extend from said slots and said support (**116**) is positioned within and supporting an area of said wall member adjacent said bottom edge and with said wall member bottom edge spaced from said floor portion;
(e) said tabs (**117**) are spaced above said floor portion (**118**) and said slots (**124**) are spaced above said wall member bottom edge (**121**) a distance less than a distance between said tabs (**117**) and said floor portion (**118**) and said base is configured for said base not to present an annular surface opposing said bottom edge in force transmitting relation.

4,628,635

ADJUSTABLE GATE

Susan Maillard, 47 Middle Line Ave., Medford, N.Y. 11765

Filed Jan. 23, 1985, Ser. No. 694,072
Int. Cl.⁴ E06B *3/68*
U.S. Cl. 49—55 **7 Claims**



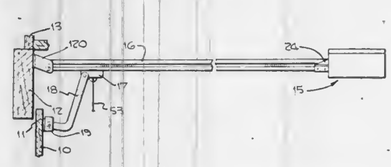
1. A gate adapted for use between opposing left and right vertical surfaces for obstructing passage therebetween, said gate comprising:
a substantially flat left section comprising at least one substantially rigid structural element;
first means connected to said left section for engaging the left vertical surface;
a substantially flat right section comprising at least one substantially rigid structural element;
second means connected to said right section for engaging the right vertical surface;
an intermediate section comprising at least one substantially rigid structural element, said intermediate section interconnecting a lower portion of said left and right sections;
said left, right and intermediate sections defining an opening between said left and right members and above said intermediate section;
a substantially flat door section comprising at least one substantially rigid structural element, said door being configured to fit within said opening;
third means for interconnecting said intermediate section and said door and for supporting said door within said opening;
wherein said left, right and intermediate sections comprise:
a lower, substantially horizontal rigid member having left and right ends engaging the first and second means, respectively;
an upper, substantially rigid member having left and right substantially horizontal portions, said portions having outer ends engaging the first and second means, respectively, and inner ends interconnected by a U-shaped portion defining the opening; and
one or more panels connected between said upper and lower members.

4,628,636

GARAGE DOOR OPERATOR MECHANISM

Roger J. Folger, Whittier, Calif., assignor to Holmes-Hally Industries, Inc., Los Angeles, Calif.

Filed May 18, 1984, Ser. No. 611,725
Int. Cl.⁴ E05F *15/00*
U.S. Cl. 49—199 **37 Claims**



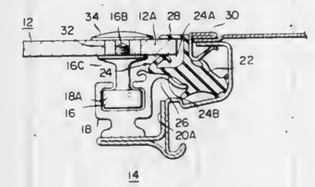
1. A remote control panel moving mechanism for moving a panel between a first and a second of two established positions, said mechanism comprising a frame with motor supports thereon, an electric motor on said frame having a drive shaft, a track in operative alignment with said drive shaft, a drive means in driven relationship with said drive shaft, a traveler in sliding relationship with said track and in driven relationship with said drive means, and a panel drive block in longitudinally moving relationship with said track and having an engagement with said traveler, said panel drive block having a range of travel corresponding to the range of travel of said panel between said first and second positions, an electronic circuit support mounted on said frame, said electronic circuit support including an electronic circuit and respective components for effecting starting, stopping and reversing operation of said electric motor, said starting component being responsive to remote control and a control shaft having an actuator in driven relationship with said electric motor, motor control means on said frame responsive to motion of said control shaft at said first and second positions of the panel and adapted to effect stopping of operation of said electric motor at said first and second positions, and means for adjusting the relationship between said motor control means and said actuator, said motor control means comprising a cam track element and a cam follower element, one of said elements being located on the control shaft and the other of said elements being located on the frame, said elements being adjustable relative to each other for establishing the location of said first and second positions of the panel.

4,628,637

CONSTRUCTION OF DOOR IN MOTOR VEHICLE

Hachiro Okada, and Kenzi Ono, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 27, 1985, Ser. No. 813,871
Claims priority, application Japan, Jan. 9, 1985, 60-1057[U]
Int. Cl.⁴ E05F *11/38*
U.S. Cl. 49—374 **20 Claims**



1. A construction of a door in a motor vehicle, comprising:
a guide piece secured to an end edge of a door glass and protruded into a compartment;
a guide member disposed adjacent said end edge of the door glass on the side of the compartment, for slidably guiding said guide piece in the direction of opening or closing of the door glass; and
a door glass weather strip having an inner seal lip secured to a door window frame adjacent said end edge of the door glass and being in contact with the side surface of said end edge of the door glass on the side of the compartment to seal between said end edge and the door window frame; wherein
a support portion extended to the side surface of said inner seal lip on the side of the compartment, for contacting said inner seal lip from the side of the compartment to support same is integrally formed on said guide member.

4,628,638

CANTILEVER-TYPE SLIDE GATE

Dennis J. Elko, and Ronald J. DiMedio, both of West Chester, Pa., assignors to International Gate Devices, Inc., Folsom, Pa.

Filed Jul. 19, 1985, Ser. No. 756,608
Int. Cl.[4] E05D *15/06*; E04G *3/00*
U.S. Cl. 49—426 **5 Claims**



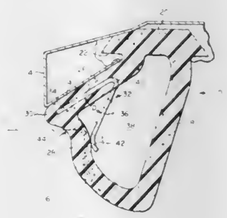
1. A retrofit assembly converting a generally rectangular frame assembly comprising peripheral pipe elements including an upper horizontal rail and fencing spanning the pipe elements for use as a gate assembly mounted adjacent a gate opening in a fence and actuatable between open and closed positions comprising an elongated channel member secured to the upper rail of the frame assembly in generally parallel alignment therewith, said channel member having an elongated slot formed therein also parallel to the upper rail of the frame assembly and defining a trackway having a downwardly depending slot in a lower face of the channel member, a longitudinally extending side face of said channel member having a configuration conforming generally to the contour of the upper rail of the gate, at least one bracket having a portion conforming to the contour of the upper rail and bolt means securing the channel member and bracket to the upper rail of said frame assembly and at least one truck having roller means mounted on a post comprising part of the fence assembly adjacent the gate opening engaging said trackway and facilitating movement of the gate assembly relative to the gate opening between open and closed positions.

4,628,639

WINDOW FRAME WEATHERSEAL FOR A MOTOR VEHICLE

Gary R. Lownsdale, Livonia, Mich., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,819
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—498 **9 Claims**



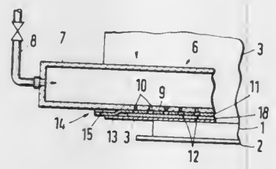
1. An elongate weatherseal comprising:
a generally triangular elongate resiliently deformable hollow body member having first, second and third sides;
means on said body member for mounting said body member to a support; and
a V-shaped window retaining member having a first arm secured to said first side, and a second arm extending into the hollow of said body member and having an end portion of said second arm closely spaced from said second side.

4,628,640

BELT SANDER APPARATUS

Hans-Peter Johannsen, Am Mühlrain 3, D-3559 Battenberg, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,782
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401462
Int. Cl.[4] B24B *21/08*
U.S. Cl. 51—141 **10 Claims**



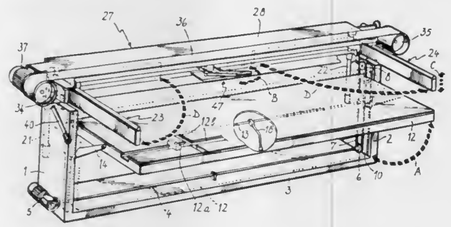
1. Apparatus for supporting a rotating endless sanding belt adapted to sand a workpiece in a central operating range spaced from lateral edges comprising a sliding contact supported adjacent and extending across said belt beyond said lateral edges and having air discharge perforations connected with a pressurized source for producing an air cushion between said sliding contact and said central operating range of said belt, the improvement of lateral sealing means on said sliding contact aligned with said lateral edges of said belt and extending the full extent of said sliding contact to provide lateral edge seals for said air cushion while producing uniform grinding pressure in said central operating range.

4,628,641

BELT SANDER WITH REDUCIBLE OVERALL DIMENSION FEATURES

Luigi Lazzari, Rimini, Italy, assignor to Mini Max s.r.l., Rimini, Italy

Filed Apr. 2, 1985, Ser. No. 719,099
Claims priority, application Italy, Apr. 6, 1984, 3417 A/84
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—135 R **7 Claims**



1. A belt sander comprising:
a frame including spaced end uprights of relatively small depth front to back;
a table for a workpiece;

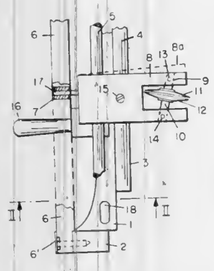
means attaching said table to said frame for vertical adjustment relative thereto;
means fastening said table to said attaching means for movement between a horizontal position projecting forward of said uprights and a vertical position substantially between said uprights;
a carriage extending between and across the upper ends of said uprights;
an endless sand belt trained over pulleys carried by the opposite ends of said carriage and having a run over and a run under said carriage;
power means carried by said carriage for driving one of said pulleys and thereby said belt;
means carried by said carriage for movement therealong parallel to said belt runs and having a pad interposed between said carriage and said belt under run for pressing a section of said under run against a workpiece therebelow;
guide means for said carriage secured to said uprights adjacent said upper ends thereof and projecting forward thereof for movement of said carriage therealong at right angles to said belt runs, said guide means being foldable to reduce the projecting dimensions thereof and thus reduce the front to rear depth of said sander substantially to that of said uprights.

4,628,642

DEVICE FOR SHARPENING CIRCULAR KNIVES

Jean Zantiotis, Taunusstrasse 45, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,496
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 8410918[U]
Int. Cl.[4] B24B *23/08*
U.S. Cl. 51—248 **12 Claims**



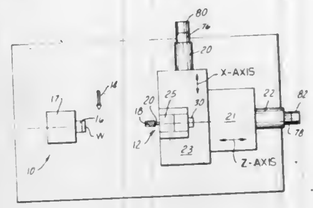
1. A device for sharpening circular knives while these knives are mounted on a driven shaft, comprising longitudinal frame means, guide means mounted on said frame means for defining a guide direction, slide means slidably mounted for a back and forth movement along said guide means, two symmetrical grinding disks for grinding said knives, two shafts arranged in axial alignment with each other for rotatably mounting said grinding disks on said slide means, whereby each shaft supports its respective grinding disk for rotation, ratchet type elongated engagement means mounted on said frame means, and pawl type stop means mounted on said slide means for locking said slide means into any one of a plurality of fixed positions along said elongated engagement means, said two axially aligned shafts holding said two grinding disks spaced from each other and in such a position that two knife edge surfaces can be ground simultaneously.

4,628,643

GRINDING WHEEL INFEED CONTROL METHOD

Richard H. Gile, North Clarendon; Robert W. Ludwig, Perkinsville; Steven P. Farrar, Springfield; Steven P. Farmer, North Springfield, and Eben C. Waterman, Springfield, all of Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 27, 1985, Ser. No. 802,147
Int. Cl.[4] B24B *49/16*
U.S. Cl. 51—325 **9 Claims**



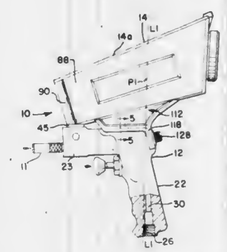
1. A method for grinding workparts in succession while accommodating progressive change in wheel sharpness comprising monitoring a first grinding parameter and calculating an average value of the first grinding parameter for each workpart in succession as sharpness of the grinding wheel progressively changes, and grinding the next successive workpart using a second grinding parameter determined from the calculated average of the monitored first grinding parameter of a preceding workpart.

4,628,644

ABRASIVE MATERIAL SPRAYING APPARATUS

Steven Somers, 230 N. Pershing, Mundelein, Ill. 60060

Continuation-in-part of Ser. No. 568,486, Jan. 5, 1984, abandoned. This application Aug. 6, 1984, Ser. No. 637,876
Int. Cl.[4] B24C *5/02*
U.S. Cl. 51—427 **23 Claims**



1. In a spray unit for delivering at a front end thereof a mixture of a pressurized carrier and an abrasive material or the like, said spray unit when oriented so as to spray said material horizontally therefrom comprising a main body having a gripping handle depending therefrom behind said front end, a mixing chamber in said main body, means for delivering the pressurized carrier to said mixing chamber, inlet passage means on said main body communicating with said mixing chamber for receiving abrasive material, and supply means for said abrasive material located on top of said body and above said handle for delivering abrasive material to said inlet passage means, said supply means including a container having an outlet in communication with said inlet passage means, the improvement wherein said container and a material supply compartment therein have a generally horizontally extending and elongated configuration extending substantially both forwardly and rearwardly of said handle so that the center of gravity of a filled container is relatively close to said main body, said container having a horizontal extent which is at

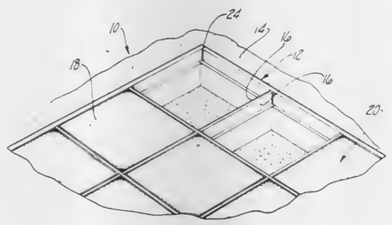
least twice its maximum vertical extent at any point along the length thereof, said container having an outer top wall surface which slopes downwardly and forwardly toward the front thereof to increase the field of vision of the user thereof.

4,628,645

PORTABLE DECK

Roman J. Tafelski, Jr., 6235 Schaefer Rd., Dearborn, Mich. 48216

Filed May 14, 1984, Ser. No. 610,315
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—169.1 **12 Claims**



1. A deck structure for forming a flooring surface by supporting patio stone blocks in a fixed position above a ground surface, said deck comprising;

a plurality of fixedly dimensioned patio stone blocks, and

a substantially horizontal frame defining a plurality of substantially vertically aligned openings, each opening dimensioned to receive a fixedly dimensioned patio stone, and including means for supporting a stone at one end of each opening, and

wherein said frame comprises at least three border planks defining a closed, polygonal border,

at least one stringer plank extending across said polygonal border, and

at least one cross plank having a length dimensioned to wholly fit intermediate a first plank of said at least one stringer plank and a next adjacent second plank selected from the group consisting of stringer planks and border planks, and means for securing said cross plank to said first plank and said second plank;

wherein said means for supporting comprises an elongated notch extending along the upper interior edge of each border plank and an elongated notch extending along both upper edges of each of said at least on stringer plank and each of said at least one cross plank, said notches defining a peripheral ledge extending around said openings.

4,628,646

COVER ARRANGEMENT FOR A SERVICING HOLE

Anton Eyerle, Stettinger Str. 14, D-8950 Kaufbeuren, Fed. Rep. of Germany

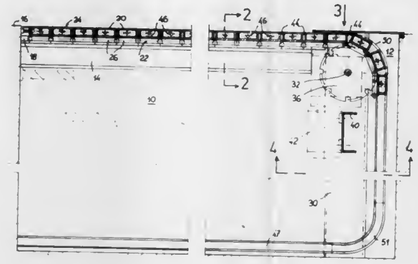
Filed Feb. 26, 1985, Ser. No. 705,737
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408080
Int. Cl.[4] E06B *9/08*
U.S. Cl. 52—169.7 **6 Claims**

1. A cover arrangement for covering and uncovering a servicing hole provided in the floor of an automotive service station, the hole being horizontally elongated and having vertical side surfaces, comprising:

a pair of rail ways extending along opposite sides of the servicing hole; a plurality of parallel, heavy loadable support members, the support members being pivotably connected with one another; and guide means provided at the opposite ends of at least some of the elongated support members for guiding the support members along the pair of rail ways;

each one of said pair of rail ways comprising horizontal upper and lower guide rails horizontally extending along opposite sides of the servicing hole, vertical guide rails vertically extending at one end of the servicing hole, and a pair of upper and lower arc-shaped guide rails each one connecting one of the vertical guide rails with one of the horizontal upper and lower guide rails respectively, the horizontal upper guide rail comprising a supporting rail undergripping the plurality of support members in a servicing hole covering position and a guide flange overgripping the guide means provided at the ends of at least some of said support members; said guide flange, said pair of upper and lower arc-shaped guide rails, said vertical guide rail and said horizontal lower guide rail forming a continuous guide surface; and

a pair of parallel chains longitudinally extending at the lower side of the plurality of support members in the servicing



hole covering position, each chain comprising a number of chain members equal with the number of support members, means for fastening each chain member between its ends at a bottom wall of one of the supporting members, links connecting said chain members with one another, each link arranged in a center plane between a pair of adjacent chain members; a transverse shaft; a pair of upper chain wheels fastened on the transverse shaft mounted for rotation within the servicing hole; and an electric motor operably connected to the transverse shaft for reversibly rotating the transverse shaft, said transverse shaft being arranged below the transition point between the guide flange on the upper one of the pair of upper and lower arc-shaped guide rails, the upper arc-shaped guide rail being curved coaxially with the transverse shaft, and the chain wheels being in driving engagement with the links of the pair of chains.

4,628,647

METHOD FOR MOUNTING A ROOF, FLOOR OR SIMILAR STRUCTURE AND A STRUCTURE ADAPTED TO BE MOUNTED ACCORDING TO THE METHOD

Axel B. R. Ericsson, Holmsund, Sweden, assignor to Profoment Utvecklings AB, Sweden

PCT No. PCT/SE82/00067, § 371 Date Nov. 16, 1982, § 102(e) Date Nov. 16, 1982, PCT Pub. No. WO82/03237, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 15, 1982, Ser. No. 448,991
Claims priority, application Sweden, Mar. 16, 1981, 8101651
Int. Cl.[4] E04B *1/74, 7/00*
U.S. Cl. 52—173 R **11 Claims**



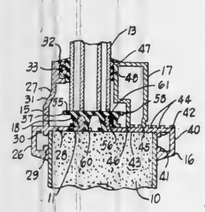
1. A pre-fabricated component structure for a permanent structure comprising a plurality of girders for a roof, floor or similar, the girders being interconnected at their lower edges by flexible sheet means, said flexible sheet means defining a predetermined spacing between the girders, each girder comprising an upper elongated member, a lower elongated member and spacer means interposed between said upper and lower members for spacing said upper and lower members from and generally parallel to each other, adjacent pairs of spaced girders and said flexible sheet means bounding an area for receiving heat insulating material, said flexible sheet means permitting the girders of said component structure to be pushed close together to form a compact unit by folding the flexible sheet means, whereby the component structure may be transported from the manufacturing place to a building site where the component structure is placed in its final position and the girders may be moved apart to their final position with the predetermined spacing between the girders.

4,628,648

FRAMING STRUCTURE

Rodney W. Winyard, Warren, Ohio, assignor to American Welding & Manufacturing Co., Niles, Ohio

Filed Dec. 19, 1984, Ser. No. 683,362
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—212 **5 Claims**



4. A window framing structure for mounting a window pane in an opening of a building member, said opening bounded by an edge surface connecting generally planar inner and outer surfaces of said building member, said structure being adapted to accommodate window panes of various thickness and comprising:

(a) first peripheral frame elements, each including:

(i) a first border section engageable against the outer surface of said building member adjacent said opening,

(ii) a second border section having a web integral with said first border section and a glazing material carrying portion adapted to be placed next to said glass pane, and

(iii) a flange integral with and projecting at right angles to a plane of said web to extend into said opening against said edge surface,

(b) means for connecting said first frame elements together to form a unitary, perimetrical frame,

(c) second peripheral frame elements, each including:

(i) a border section engageable against the inner surface of said building member adjacent said opening, and

(ii) a flange integral with and projecting from said border section to extend into said opening against the edge surface,

(iii) a plurality of parallel grooves extending lengthwise of said flange;

(d) means for connecting said second frame elements together to form a perimetrical frame,

(e) a lock-in molding element engageable with the flange of each of said second frame elements, each of said lock-in molding elements including:

(i) a glazing material carrying portion adapted to be placed next to said glass pane,

(ii) an edge engageable in a selected groove, whereby said molding elements can be adjusted toward and away from said second border sections to accommodate glass panes of different thicknesses, and,

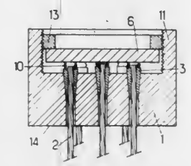
(f) a plurality of plastic clips adapted to be placed in locking engagement with said flanges to hold said frames against the inner and outer surfaces of said building member, said clips having surfaces which are placed in supporting engagement with the edges of said window pane spaced from flange engaging ridges of said plastic clips to cushion said window pane from contact with the flange of said first and second peripheral frame elements.

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CABLE ANCHORAGE DEVICES AND PROCESSES FOR FORMING SAME

Pierre Jartoux, Epernon, France, assignor to Freyssinet International, France

Filed Jun. 25, 1985, Ser. No. 748,467
Claims priority, application France, Jun. 27, 1985, 84 10158
Int. Cl.[4] E04C *3/10;* B25G *3/20;* F16B *2/00;* F16G *11/00*
U.S. Cl. 52—223 L **6 Claims**



1. Device for anchoring a cable with multiple strands (2) comprising a block (1) in which these strands are anchored individually by radially clamping about each strand a split truncated cone shaped jaw (3) surrounding this strand and housed in complementary recess (4) of the block characterized in that it comprises a single thrust member (6) disposed axially opposite the different jaws (3) and a plurality of spacers (10) each interposed axially between said member (6) and a jaw (3) about the strand end (2) clamped by this jaw, said spacers (10) being identical to each other, formed from a metal or an alloy whose deformation/stress characteristic has a long plastic flow plateau and dimensioned so that at the end of the thrust, deformation of each of them has reached, but not exceeded, the plastic flow stage thereof.

4,628,650

STRUCTURAL INSULATED PANEL SYSTEM

Bert A. Parker, 8708 Morrell, Independence, Mo. 64053

Filed Sep. 9, 1985, Ser. No. 774,224
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—265 **1 Claim**

1. A building, which comprises:

(a) a plurality of floor panels each including:

(1) an insulative core with upper and lower surfaces, longitudinally-extending opposite side edges, a longitudinally-extending intermediate channel and a layer at said upper surface having an overhang extending beyond said side edges;

(2) underlayment placed on said core upper surface;

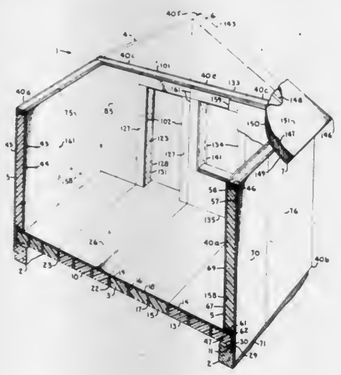
(3) at least a pair of said floor panels adjoining with respective side edges in opposed relation whereby a transition channel is formed between said side edges;

(b) a transition joist received in said floor panel transition channel;

(c) a pair of corner wall panels each having:

(1) a core with inner and outer surfaces; upper, lower and side edges; and a layer at said inner surface with an overhang extending beyond said core edges; and and intermediate channel extending in spaced relation between and parallel to said side edges;

(2) an intermediate stud located in said intermediate channel;
(3) an interior sheathing member attached to said core inner surface over said layer;
(4) an exterior sheathing member attached to said core outer surface and having an overhang extending beyond said core edges;
(5) a top plate channel formed by said core upper edge, said core layer overhang and said outer sheathing member overhang;
(6) a top plate positioned in said top plate channel;
(7) a bottom plate channel formed by said core lower edge, said core layer overhang and said outer sheathing member overhang;
(8) a bottom plate positioned in said bottom plate channel and attached to said underlayment;
(9) a wall transition channel formed by a respective core side edge, core layer overhang and outer sheathing member overhang;
(10) an edge stud channel formed by the other of said core side edges, said core layer overhang and said outer sheathing overhang;
(11) an edge stud positioned in said edge stud channel; and
(12) a corner stud attached to said edge stud and said outer sheathing member overhang;
(d) said edge studs and said corner studs forming a vertical



corner passage with said corner wall panels being connected together;
(e) a corner core member extending through said corner passage;
(f) a plurality of wall panels each having:
(1) a core with inner and outer surfaces; upper, lower and side edges; and a layer at said inner surface and having an overhang extending beyond said core edges;
(2) an interior sheathing member applied to said core inner surface over said layer;
(3) an exterior sheathing member applied to said core outer surface and having an overhang extending beyond said core edges;
(4) a top plate channel formed by said core upper edge, said core layer overhang and said outer sheathing member overhang;
(5) a top plate positioned in said top plate channel;
(6) a bottom plate channel formed by said core lower edge, said core layer overhang and said outer sheathing member overhang;
(7) a bottom plate positioned in said bottom plate channel; and
(8) a pair of wall transition channels each formed by a respective core side edge, core layer overhang and outer sheathing member overhang;
(g) a plurality of said wall panels being attached in adjoining relationship with said transition channels in opposed relationship and respective said core layers and outer sheathing members in abutting relationship and forming butt joints therebetween;
(h) a plurality of transition studs each positioned in a respective pair of opposing transition channels;
(i) at least one of said panels comprising a door panel with a transom section and a pair of jamb sections, said sections defining a door opening;
(j) at least one of said panels comprising a window panel with upper and lower transom sections and a pair of jamb sections, said sections defining a window opening;
(k) a plurality of roof panels each including:
(1) an insulative core with upper and lower surfaces, a pair of side edges and a layer at said lower surface and having an overhang extending beyond said side edges;
(2) an upper sheathing member attached to said upper core surface and having an overhang extending beyond said core side edges;
(3) a lower sheathing member applied to said core lower surface over said layer;
(4) a pair of roof panel transition channels formed by said core side edges, said layer overhang and said upper sheathing member overhang;
(l) a pair of said roof panels positioned together in adjoining relation with respective transition channels thereof positioned in opposed relation: and
(m) a transition rafter positioned in said opposed transition channels.

4,628,651

FIRE-RETARDANT WALL

Mário P. Morettin, Williamsville, and Richard A. Costolnick, Kenmore, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Aug. 1, 1985, Ser. No. 761,618
Int. Cl.⁴ E04B *1/00*
U.S. Cl. 52—283 **3 Claims**

1. A hollow wall comprising a plurality of spaced, parallel vertical sheet metal studs, wallboards affixed onto each side of said plurality of studs, septum panels disposed within each hollow formed by opposed wallboards and each pair of adjacent studs, and a pair of small strips of board extending through an approximately square opening in the sheet metal web of each of said studs, said opening having a width substantially equal to the thickness of the total of one of said septum panels and said pair of strips of boards, said small strips of board in each stud opening being disposed one on each side of said adjacent septum panels and providing stabilization for said septum panels, said septum panels and said strips of board all being boards of about ½ inch thickness having a gypsum core, said wallboards being gypsum wallboard of about ½ inch thickness and said opening in said stud being about 1½ inches wide.

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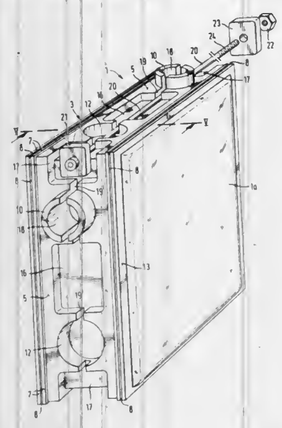
GLASS BRICK

Peter Wefels, Gelsenkirchen, Fed. Rep. of Germany, assignor to VEGLA, Vereinigte Glaswerke GmbH, Aachen, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 527,176
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233470; May 2, 1983, 3315942
Int. Cl.⁴ E04C *1/42*
U.S. Cl. 52—306 **14 Claims**

1. A glass construction block comprising a glass modular element,

a frame having an outer peripheral surface and two side surfaces, said frame surrounding said glass modular element, said outer peripheral surface having cylindrically shaped recesses and projections adapted for being plugged into frictional engagement with a similar and adjoining glass construction block,
said frame comprising shoulders extending outwardly near



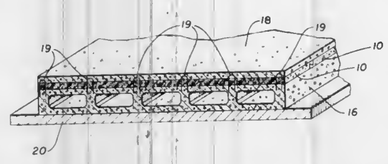
each side surface, and being adapted to abut the shoulders of said adjoining glass construction block, each shoulder including two longitudinal ledge-like embossments, and a groove formed between said embossments,
a space between the shoulders, adapted for the insertion of a reinforcement bar,
said frame being made of a synthetic material having a D Shore hardness from 70 to 85.

4,628,653

INSULATED CONCRETE PANEL

Richard C. Nash, Savage, Minn., assignor to Fabcon, Inc., Savage, Minn.

Continuation of Ser. No. 281,999, Jul. 10, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,544
Int. Cl.⁴ E04C *1/00*
U.S. Cl. 52—309.12 **12 Claims**



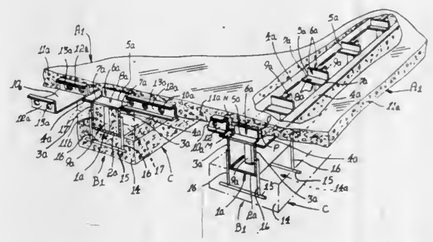
1. In a reinforced, precast, prestressed insulated concrete panel formed from a bottom uncured concrete layer, an upper uncured concrete layer and an insulating layer between said concrete layers comprised of a plurality of insulating sheets arrayed intermediate said concrete layers in an abutting relationship to one another, and staple means passing through said insulating sheets and partially into said bottom and upper concrete layers before heat accelerated curing and forming a bond therewith to lock said layers in fixed relationship after curing such that said panels are self-supporting, and improvement comprising:
insulating sheets dimensioned to span the width of said concrete panel and having a thickness sufficient to interpose a substantial barrier to the flow of heat between the concrete layers of said panel and said insulating sheets configured to have interlocking edges along oppposite edges thereof thereby forming an interlocked abutting insulating layer of adjacent sheet which prevents longitudinal separation and which substantially limit flow of heat through said edges by increasing the length of the heat transmission path and thereby reduce the possibility of stress cracks in the upper concrete layer aligned above said sheet edges caused by uneven transmission of heat during heat accelerated curing.

4,628,654

COMPOSITE FLOOR STRUCTURES

Justus A. T. Boswel, Pretoria, South Africa, assignor to Wesmer Konstruksie (Eiedoms) Beperk, Pretoria, South Africa

Filed Sep. 19, 1983, Ser. No. 533,761
Claims priority, application South Africa, Sep. 20, 1982, 82/6886; Nov. 22, 1982, 82/8590; Mar. 22, 1983, 83/1994
Int. Cl.⁴ E04B *5/18*
U.S. Cl. 52—319 **10 Claims**



1. A composite floor structure comprising a floor slab of compression resistant material; and at least one reinforced beam under the floor slab, the beam comprising:
permanent shuttering including an upwardly facing channel formation having an open-mouth portion and constructed of tension resistant material; and a plurality of transverse members spaced apart along a length of the channel formation and extending transversely to the channel formation across substantially an entire width of the open-mouth portion of the channel formation, each transverse member being fast with the channel formation near said open-mouth portion on opposite sides thereof and at least a part of at least some of the transverse members extending upwardly from the open-mouth portion of the channel formation into the overlying floor slab;
compression resistant material located in the channel formation and formed integrally with the compression resistant material of the floor slab; and at least one upright member connected to at least some of said transverse members and extending within said channel formation from a connection with a bottom web thereof.

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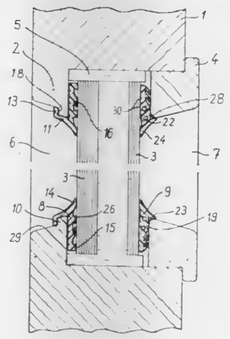
ARRANGEMENT FOR SEALING GLASS PANES IN WOODEN WINDOW OR DOOR LEAVES

Norbert Scheiderer, Austrasse 16, 8534 Wilhermsdorf, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,714
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344268
Int. Cl.⁴ E04B *1/62*
U.S. Cl. 52—397 **20 Claims**

1. An arrangement for sealing a glass pane in a wooden frame opening defined by a plurality of peripherally extending sections of said frame, at least one section comprising a glass rebate chamfer on an outside portion of said frame and at least another section comprising a glass retaining strip on an inside portion of the frame and serving as an inner boundary for said frame opening, said glass pane being disposed in said wooden frame opening between the glass rebate chamfer and said glass retaining strip and spaced from each of the rebate chamfer and

strip to define a first space between the glass rebate chamber and one side of the glass pane and a second space between an opposite side of the glass pane and said glass retaining strip, the improvement residing in that the frame includes a radially directed surface, serving as an outer boundary for said frame opening, peripherally bounding said glass rebate chamfer and extending outwardly therefrom in a direction away from said one side of the glass pane, said radially directed surface in cross section being a generally smooth surface excepting for its inner end portion adjacent said one side of the glass pane whereat said surface is stepped out of a plane containing said smooth surface to define a protruding web, said web having an inner portion which merges with a wall delimiting said glass rebate chamfer facing and generally parallel to said one side of said glass pane, said web protrusion from said radially directed



surface being small compared to an overall extend of the merged inner end of said web with said delimiting wall of the glass rebate chamfer, a first elastic strand seal in said first space and having a profile projection overlapping said web in form of a cap, said profile projection having an end face engaging a portion of said radially directed surface adjacent said web and being elastically pressed against a face of said stepped web remote from the glass pane, a second elastic strand seal in said second space having a sealing section having a convexity of essentially banana-shape in cross-section in its unmounted state and being disposed in said second space with its convexity toward the glass retaining trip so that when thus mounted pretensioning forces are applied by the second elastic strand seal against said opposite side of said glass pane for bracing said glass pane in said wooden frame.

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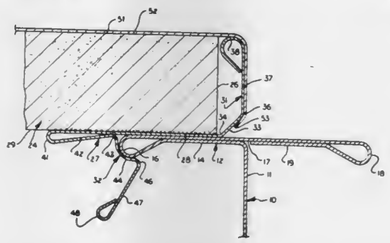
DEMOUNTABLE WALL PANEL

Robert J. Menchetti, North Olmsted; Robert H. Safran, Sheffield, and Gale E. Sauer, North Olmsted, all of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Apr. 22, 1985, Ser. No. 725,941

Int. Cl.⁴ E04B *2/56*

U.S. Cl. 52—481 **9 Claims**



1. A demountable wall panel for installation on studs having a predetermined modular spacing comprising wallboards having widths less than said modular spacing by varying amounts, a pair of separate mounting strips individually mounted and directly secured to said wall boards along the side edges of said wallboards, said mounting strips providing connector portions operable to connect said panels to said studs and a finish portion extending along and spaced from the associated of said side edges of said wallboard, and a facing sheet laminated to said wallboard and along said finish portion, said facing sheet bridging the space between said side edges of said wallboard and the associated of said finish portion and operating to conceal the presence of said space, said finish portions of said mounting strips being spaced from said side edges an amount which compensates for variations in wallboard width and providing said panels with a width equal to said modular spacing.

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CEILING AND WALL CONSTRUCTION

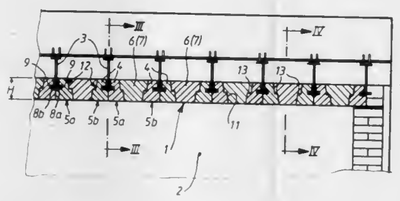
Bodo Ermer, Sendenhorst, and Dieter Mischorr, Beckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,780

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418195

Int. Cl.⁴ E04B *1/38;* **F23M** *5/06*

U.S. Cl. 52—509 **7 Claims**



1. A gas-tight lining construction for the ceiling and wall of a chamber exposed to high temperatures, said construction comprising spaced apart, parallel support members; a corresponding plurality of spaced apart, parallel rows of bearing bricks supported by said support members, each of said bearing bricks having on that side confronting an adjacent row a bearing surface profile; a plurality of quadrilateral, spaced apart central bricks interposed between two adjacent rows of said bearing bricks, each of said central bricks having a bearing surface profile on that side which confronts the adjacent row of bearing bricks and is supported by the bearing surface profile of such bearing bricks, each of said central bricks having on each of its other two sides a bearing surface profile supported by the bearing surface profile of the adjacent bearing brick; and a quadrilateral support brick accommodated in the space between each two adjacent central bricks, each side of each support brick which confronts a central brick having a bearing surface profile supporting the bearing surface profile of the adjacent central brick, each of said support bricks having on each of its other two sides a bearing surface profile supported by the bearing surface profile on the adjacent bearing brick, the confronting sides of said bearing bricks and said central bricks abutting one another and being complementally tapered, and the confronting sides of said central bricks and said support bricks abutting one another and being complementally tapered.

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SUPPORT PACK

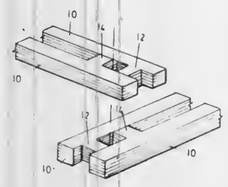
Jacobus P. Erasmus, Transvaal, South Africa, assignor to H L & H Timber Products (Proprietary) Limited, Transvaal, South Africa

Filed Jan. 17, 1985, Ser. No. 692,383

Claims priority, application South Africa, Jan. 18, 1984, 84/0363

Int. Cl.⁴ E04B *1/10;* **E04C** *1/04, 3/00;* **E21D** *15/00*

U.S. Cl. 52—561 **19 Claims**



1. A support pack including superimposed layers of elongated timber elements and two timber bricks attached in a spaced relationship to each elongated timber element, the grain direction of each timber brick is normal to the long axis of the elongated timber element, the layers being so arranged that the timber bricks on each timber element bear on an adjacent elongated timber element.

4,628,659

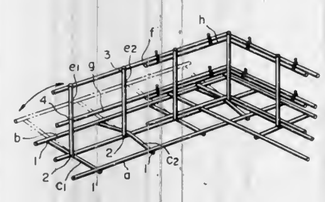
IRON REINFORCING ROD STRUCTURE FOR REINFORCING THE BASE OF BUILDINGS

Hayashi Akira, 2-7 5 Bancho Minami Sako, Tokushima Ken, Japan

Filed Jul. 19, 1985, Ser. No. 757,117

Int. Cl.⁴ E04H *12/18*

U.S. Cl. 52—646 **5 Claims**



1. A preassembled iron reinforcing rod structure for reinforcing a concrete base of a building comprising: a plurality of equally spaced apart lateral rods spot welded at opposite ends to a plurality of equally spaced parallel horizontal side rods; a plurality of vertically oriented equally spaced rotatable rods centrally supported between said parallel horizontal side rods by a horizontal support rod; and at least one lengthwise connecting rod spot welded to said vertical rods; and vertical rods being rotatable to a folded position substantially parallel to said side rods for transportation of said reinforcing rod structure to a construction site whereby the horizontal support rod is welded to the lateral rod after rotation into place.

4,628,660

CONSTRUCTION KIT FOR PRODUCING LIGHT-TUBE SYSTEMS FOR THREE-DIMENSIONAL FRAMEWORKS

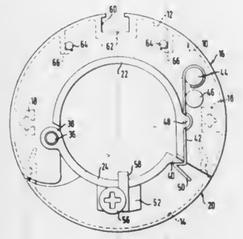
Guenter Kotzolt, Lagesche Strasse 74, Lemgo 1, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,394

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 8300417[U]

Int. Cl.⁴ E04H *12/00*

U.S. Cl. 52—648 **11 Claims**



1. A construction kit for producing lighting tube systems, comprising:

a plurality of lighting tube assemblies; and

at least one connecting piece for connecting together at least two of said lighting tube assemblies to produce a multi-dimensional framework, each connecting piece including at least one extension member, wherein each of said lighting tube assemblies comprises:

a lighting tube having a central longitudinal axis and having a first longitudinal tube shell portion and a second longitudinal tube shell portion for interlocking with the first tube shell portion;

a horseshoe-shaped end flange attached to each end of the first tube shell portion, said horseshoe-shaped end flange being adapted to slide onto an extension member of the connecting piece in a radial direction;

an arcuate closing flange and means for pivotally connecting one of said closing flanges with each horseshoe-shaped end flange; and means for locking each closing flange in a closed position forming a closed ring configuration with its connected horseshoe-shaped end flange, wherein the closed ring configuration surrounds one of said extension members and connects the first tube shell with the connecting piece.

4,628,661

SCORED METAL APPLIANCE FRAME

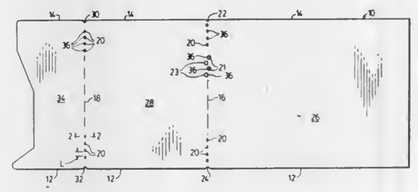
Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Weston, Canada

Filed Apr. 30, 1985, Ser. No. 729,041

Claims priority, application Canada, Sep. 6, 1984, 462513

Int. Cl.⁴ E04C *2/38*

U.S. Cl. 52—658 **14 Claims**



1. A frame work formed from a prescored substantially planer sheet of sheet metal, said frame work being adapted to be formed so that at least one panel thereof extends at an angle to an adjacent panel comprising a straight score line forming

the line of demarcation between said panels, said straight score line being formed of a plurality of spaced dimples pressed from said sheet metal, each of said dimples having a straight severed edge pressed from the plane of said sheet metal, said severed edges on said dimples being parallel and extending substantially along said straight score line, the remainder of said sheet metal along said score line and adjacent said straight edges of said dimples being substantially in tact, the length of said severed edges and number of said dimples and the spacing therebetween being coordinated so that said sheet metal may be manually folded on said score line provide an accurately positioned fold.

4,628,662

GRATING FOR USE AS A FLOOR ELEMENT IN A STABLE AND GRATING ASSEMBLY

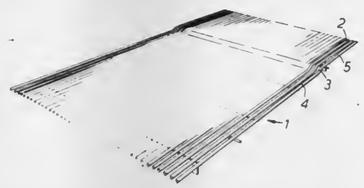
Antonius M. A. Nooyen, Kanveldweg 5, 5754 PM Deurne, Netherlands

Filed May 9, 1985, Ser. No. 732,519

Claims priority, application Netherlands, May 11, 1984, 8401516

Int. Cl.[4] A01K *1/00*; E04C *2/42*

U.S. Cl. 52—660 **7 Claims**



1. A grating for use as a floor element in a stable comprising a plurality of exposed elongate bars extending longitudinally in spaced-apart relation and interconnected by a transverse joint, said bars being sufficiently close together to enable an animal to walk thereon and being spaced apart to facilitate cleaning of the stable floor characterized in that a plurality of the bars are provided with a bend intermediate their ends to provide a profile as viewed from the side of the grating which has exposed elongate sections of said plurality of bars at two different levels, said bend providing a reaction surface against which an animal may push in getting up or lying down.

4,628,663

CLIP PUNCH DEVICE AND PACKAGING APPARATUS EQUIPPED THEREWITH

Thomas R. Stanley, Downers Grove, and David L. Wright, Oakwood, both of Ill., assignors to Teepak, Inc., Oak Brook, Ill.

Filed Jan. 18, 1984, Ser. No. 571,968

Int. Cl.[4] B65B *51/05*

U.S. Cl. 53—138 A **17 Claims**

1. A fluid actuated punch device comprising:

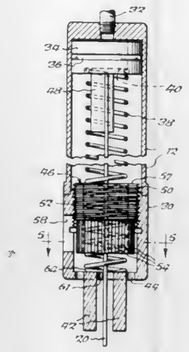
(a) a cylinder,

(b) a cylinder base mounted to the cylinder, said cylinder base having an interior threaded sidewall and an endwall defining a central opening,

(c) a piston for traversing the cylinder,

(d) a punch rod longitudinally extending through said cylinder and cylinder base and affixed to the piston, and

(e) a piston stop enclosed in said cylinder base, said stop comprising a cylindrical-shaped tubular body having interior and exterior surfaces and a central opening for said punch rod, at least a portion of the exterior surface of said stop being threaded for engaging with the interior threaded sidewall of the cylinder base for longitudinal



movement when rotated, said device including means for restricting rotational movement of the piston stop.

4,628,664

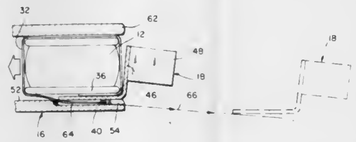
BOTTOM TUCK DEVICE FOR ICE CREAM SANDWICH WRAPPING MACHINE

Floyd W. Price, Freehold, N.J., assignor to Burry-Lu, Inc., Elizabeth, N.J.

Filed Nov. 18, 1985, Ser. No. 799,062

Int. Cl.[4] B65B *11/06, 49/08*

U.S. Cl. 53—232 **9 Claims**



1. Apparatus for wrapping an ice cream sandwich with a wrapper comprising:

elevator means for raising said ice cream sandwich upwardly from a supply position at which said ice cream sandwich is supplied to said elevator means to a wrapping position at which said wrapper extends over the top of and is draped along the sides of said ice cream sandwich, said elevator means including a platform having a supporting surface for supporting said ice cream sandwich;

a conveyor positioned adjacent said platform when the elevator means is moved to said wrapping position, said conveyor including a conveying surface substantially coplanar with said supporting surface when said elevator means is moved to said wrapping position, wherein said ice cream sandwich can be pushed from said supporting surface to said conveying surface, said conveying surface including at least one recessed section open at an end thereof adjacent said platform; and

shoe means movable in a direction toward and into abutment with said ice cream sandwich when the latter is supported on said supporting surface, said shoe means including rear tucker means for wrapping a rear bottom tuck panel of said wrapper underneath said cream sandwich as said shoe means travels in said direction toward said ice cream sandwich, and pusher means fixedly connected with said rear tucker means for pushing said ice cream sandwich from said supporting surface onto said conveying surface during continued movement in said direction toward and into abutment with said ice cream sandwich, said rear tucker means extending into said at least one recessed section during said continued movement.

4,628,665

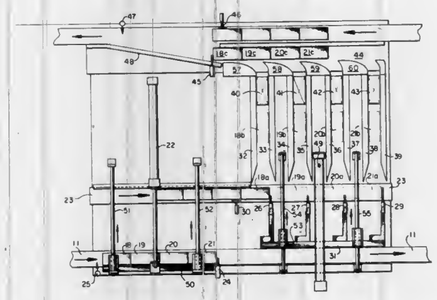
MODULAR INDEXING TABLE FOR A BOX LOADING SYSTEM

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,227

Int. Cl.[4] B65B *43/42*

U.S. Cl. 53—252 **13 Claims**



1. An indexing table for delivering boxes to and from box loading machines, comprising:

a main conveyor traversing said indexing table for transporting empty boxes along said indexing table;

an indexing conveyor parallel to said main conveyor for transporting empty boxes to a loading machine for said table;

a pusher for sequentially pushing groups of said boxes from said main line conveyor onto said indexing conveyor;

a plurality of loading machines along said indexing conveyor, one for each box in a group;

an indexer for aligning one box at each of said loading machines;

a full box conveyor parallel to said main and indexing conveyors, and on the opposite side of said loading machines, for transporting loading boxes from said machines along said table; and

means for merging loaded boxes from said machines on said table with a line of loaded boxes on said full box conveyor.

4,628,666

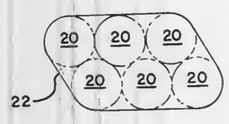
METHOD FOR FORMING A STABILIZED, SUBSTANTIALLY RECTANGULAR BUNDLE OF ROUND CONTAINERS

Peter Lems, Wilmette, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 15, 1985, Ser. No. 787,481

Int. Cl.[4] B65B *21/00*

U.S. Cl. 53—398 **2 Claims**



1. A method for packaging a plurality of substantially round containers in a substantially rectangular, stabilized row-and-column array, comprising:

coaxially disposing the containers into a contigous, compact configuration having a circumference less than that of the stablizied array;

positioning a stretchable, endless band about the periphery of the compact configuration, the band having an unstretched inner circumference less than that of the row-and-column array;

squaring the container configuration into a substantially rectangular row and column array thereby causing the positioned band to tension around the array; and

positioning a unitary loop matrix into contact with each of the containers constituting the squared configuration so as to cause the containers to spread apart, for stabilizing the squared configuration into the substantially rectangular bundle shape.

4,628,667

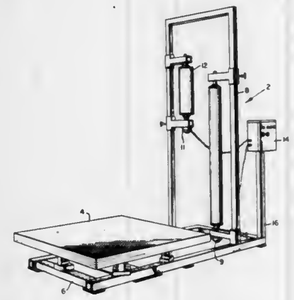
VARIABLE SPEED STRETCH WRAPPER

John R. Humphrey, and John G. Reed, both of Naples, Fla., assignors to International Packaging Machines, Inc., Naples, Fla.

Filed Feb. 19, 1981, Ser. No. 235,946

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—399 **21 Claims**



16. A method for wrapping a load in a unitary package, said process comprising the steps of:

placing a load to be wrapped on a rotatable support member;

mounting a rolled up sheet of stretchable material at a location adjacent to the support member on which a load is to be placed;

attaching a leading edge of the stretchable material from the rolled up sheet against the load to be wrapped;

rotating the rotatable support member with a load by driving the support member by a variable speed motor operating at a first speed so that such load as it is rotated with the support member draws off stretchable material from the rolled up sheet and a major portion of such rotatable movement being at a first higher speed;

subsequently rotating the support member at a second slower speed by driving the support member by the variable speed motor operating at a second slower speed during a portion of the last revolution of the support member prior to terminating the wrapping operation;

terminating the wrapping operation when the support member has reached its desired rest position; and,

braking the rotational movement of the support member only after the support means has been rotated a distance at the second slower speed when the support member reaches its rest position after a desired plurality of revolutions of the support member.

4,628,668

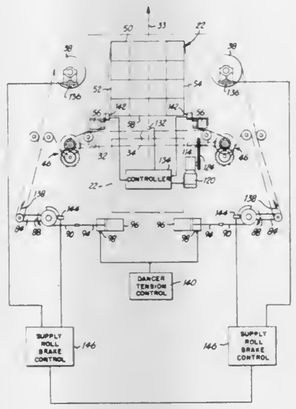
UNIT LOAD WRAPPING WITH CONTROLLED WRAP TENSIONING

Martin M. Wildmoser, Staten Island, N.Y., assignor to Bemis Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 368,912, Apr. 16, 1982, abandoned. This application Mar. 1, 1985, Ser. No. 707,522

Int. Cl.⁴ B65B *11/08*

U.S. Cl. 53—399 **13 Claims**



13. The method of wrapping a unit load at a wrapping station with a resiliently stretchable film wrap advanced along a feed path from a supply of such film wrap to the wrapping station, with the film wrap stretched and tensioned to a desired elongation and given tension, the method comprising the steps of:

passing the film wrap over a first tension roller located in the feed path between the supply and the wrapping station, the first tension roller having a first surface with which the film wrap is to be coupled for movement with the first tension roller;

thence, passing the film wrap over a second tension roller located in the feed path between the first tension roller and the wrapping station, the second tension roller having a second surface with which the film wrap is to be coupled for movement with the second tension roller;

placing a predetermined amount of tension in a portion of the film wrap located between the supply and the first tension roller to couple the film wrap with the first surface of the first tension roller; and

driving the tension rollers such that the surface speed of one of the first and second surfaces will be different from the surface speed of the other of the first and second surfaces by a predetermined amount so that the film wrap will be stretched and tensioned between the first and second surfaces to the desired elongation and given tension;

the step of placing a predetermined amount of tension in the portion of the film wrap located between the supply and the first tension roller including moving a tension-applying means into engagement with said portion of the film wrap with an essentially constant biasing force and controlling the biasing force so as to establish and maintain the predetermined amount of tension in said portion of the film wrap as the film wrap is stretched and tensioned between the first and second surfaces of the tension rollers to the desired elongation and given tension.

4,628,669

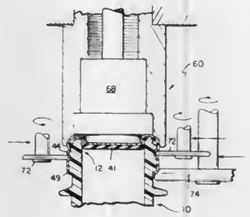
METHOD OF APPLYING ROLL-ON CLOSURES

Gene A. Herron, Smyrna; Gerhard E. B. Nickel, Kennesaw, and Alfred C. Alberghini, Dunwoody, all of Ga., assignors to Sewell Plastics Inc., Atlanta, Ga.

Division of Ser. No. 586,556, Mar. 5, 1984, abandoned. This application Jul. 19, 1985, Ser. No. 756,742

Int. Cl.⁴ B65B *55/02, 55/14, 7/28;* **B67B** *3/00*

U.S. Cl. 53—425 **4 Claims**



1. In the process of pasteurizing a carbonated beverage contained in a bottle, the bottle consisting essentially of a thermoplastic resin which is deformable when subjected to an elevated temperature equivalent to pasteurization, the bottle being formed to include a finish portion defining the mouth of the bottle, a method of maintaining the configuration of the finish of the bottle during exposure to the elevated temperature, the method comprising the sequential steps of:

providing a metal closure having a substantially flat top wall defining a continuous peripheral edge and a downwardly extending skirt depending from the peripheral edge of the top wall,

applying the closure to the bottle to cause the skirt to come into contact with the finish portion of the bottle to position the closure in place on the bottle without interlocking the skirt and the finish portion,

deforming the top wall of the applied closure to define a bottle mouth configuration-maintaining member extending downwardly a predetermined distance into the mouth of the bottle in spaced relation to the radially outwardly situated closure skirt, and

interengaging the skirt of the applied closure and the finish portion to hold the configuration-maintaining member within the mouth of the bottle to resist radially inward movement of the finish portion of the bottle during exposure of the bottle and closure assembly to the elevated pasteurization temperature and to retain the closure in place on the bottle, whereby the configuration of the finish portion of the bottle is maintained to prevent unwanted leakage from the bottle and closure assembly during pasteurization.

4,628,670

APPARATUS FOR PROCESSING TUBE FOR PACKAGE CONTAINERS

Yoshihito Kondo, Tokushima; Shigeru Wakabayashi, Naruto; Fumiyuki Iwano, and Kiyomi Yoshida, both of Tokushima, all of Japan, assignors to Shikoku Kakooki Co., Ltd., Tokushima, Japan

Filed Sep. 30, 1985, Ser. No. 781,857

Claims priority, application Japan, Oct. 12, 1984, 59-214795; Oct. 12, 1984, 59-214796; Oct. 12, 1984, 59-214797

Int. Cl.⁴ B65B *9/08*

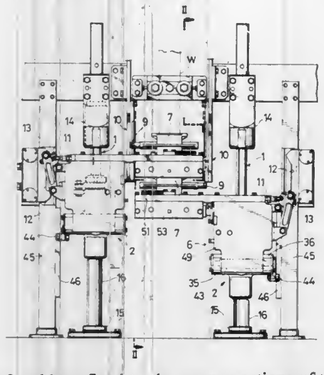
U.S. Cl. 53—551 **7 Claims**

1. A package container tube processing apparatus by which a vertical tube filled with contents is divided into lengths each corresponding to one container to form intermediate containers and which comprises:

a vertical rod movable upward and downward and reversibly rotatable,

a movable frame attached to the vertical rod and movable therewith upward and downward while permitting the reversible rotation of the vertical rod,

a pair of pressure arms supported at their lower portions by the movable frame so as to be pivotally movable about a pair of horizontal axes parallel to each other,



a pair of seal bars fixed to the upper portions of the pressure arms respectively and opposed to each other, and

conversion means for converting the forward-reverse rotation of the vertical rod to a pivotal motion of the two pressure arms to move the two seal bars toward or away from each other.

4,628,671

APPARATUS FOR PACKING PRODUCE, SUCH AS LETTUCE, BUNCHES OF CARROTS, ASPARAGUS, BANANAS AND THE LIKE

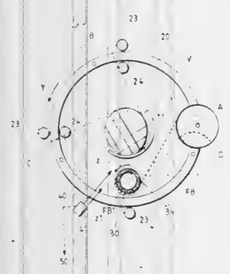
Werner Storm, and Volker Storm, both of Delle 8, 2000 Hamburg 65, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,474

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 8425616[U]

Int. Cl.⁴ B65B *13/04*

U.S. Cl. 53—588 **3 Claims**



1. Machine for packaging small articles, such as produce and the like, by enveloping the article with a strip of material, said machine comprising a support frame (**10**), spaced apart trays (**11, 111**) forming a gap (**12**) and which trays receive the end areas of an article (V) to be packaged, a ring (**20**) rotatable about an axis (**25**) parallel to the trays, a drive mechanism (**21**) for rotating said ring, said ring being located adjacent to said gap (**12**), said ring being guided between bearing and guide rollers (**23, 24**) and said ring carrying a laterally projecting, rod-like support (**26**) for a roll of strip material and said rod being parallel to the axis of rotation of said ring (**25**) and being rotatable with the rotary ring (**20**) about said gap (**12**), a holding device for said material between the article and the circular path of the support (**26**), said holding device being controllable forwards and backwards relative to a zone of wrapping, a cutting knife (**40**) adapted for separating the wrapping strip from the material strip portion surrounding the article to be packaged, drive means (**41**) for said knife, characterized in that the holding device for the free material strip end comprises two longitudinally aligned finger-like material strip end holding tubes (**30, 130**), positioned below the trays (**11, 111**) and within the rotary ring (**20**), vacuum producing means (**32**), hose lines (**31, 131**) connecting said tubes to said vacuum producing means (**32**), a controllable on-off valve (**33**) for said vacuum producing means, said tubes having facing ends provided with circumferentially distributed air intake ports (**34, 134**) and defining spindles (**36, 136**), said spindles being guided in fixed guides (**35, 135**), said tubes being connected to piston rods (**38, 138**) forming parts of two working cylinders (**37, 137**) for reciprocating and rotating said holding tubes, the tubes (**30, 130**) externally having thread-like guides constructed so and arranged that the rotary movements of the holding tubes (**30, 130**) oppose one another, control means (**50**) cooperable with the drive mechanism (**21**) for the rotary ring (**20**); the cylinders (**37, 137**), the on-off valve (**33**) and the drive mechanism (**41**) for the cutting knife (**40**), for enveloping the article to be packaged and the holding tubes by moving the material of the strip from an initial position through at least one revolution of a material strip roll on said support (**26**), the finger-like holding tubes (**30, 130**) are caused to be moved sufficiently far apart for the tube ends to be located on either side of the material strip, so that the material strip held taut by the material strip roll (**27**) is engaged on the article to be packaged, on further rotation of said ring, and again moving together the finger-like holding tubes (**30, 130**) below the enveloped article so that as the material strip roll (**27**) is again guided around said article, the material strip envelopes from the outside the closed holding tubes (**30, 130**) until the strip roll (**27**) has again reached its initial position, and for actuating said cutting means to cut the strip and separate the article to be packaged and already enveloped with the material strip and the enveloped holding tubes (**30, 130**) and thereby forming a new free end of the material strip of roll (**27**) again secured by said holding tubes (**30, 130**).

4,628,672

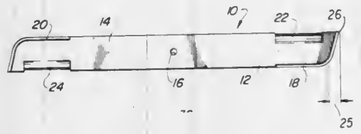
ROTARY CUTTER

Grover W. Jones, 1235 NW. Saltzman Rd., Portland, Oreg. 97229

Filed Jul. 1, 1985, Ser. No. 750,208

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—295 **7 Claims**



1. A rotary cutter blade having a pair of radially directed arms diametrically opposed and symmetrically fashioned at opposite sides of a central axis about which the blade rotates, each arm having leading and trailing edge portions and a radially outermost outer edge, characterized in that the outer edge extends from the leading edge portion to the trailing edge portion as a sharpened slicer edge for a minimum of radial distance equal to the maximum width of uncut vegetation encountered by the blade on each revolution, said slicer edge being limited to a radially outermost extremity of the blade having a dimension, measured radially of the blade, on the order of the maximum width of uncut vegetation encountered by the arms on each revolution of the blade as the blade is advanced through the vegetation in a plane parallel to the plane of blade rotation, each slicer edge being directed primarily rearwardly and radially outwardly and so configured that the angle measured between tangents to the arc of rotation of

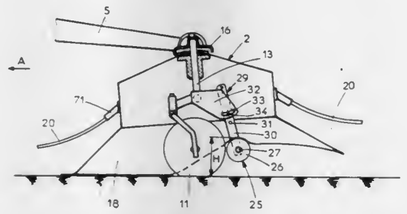
the blade at any point on the slicer edge presenting contact of the rotating slicer edge with an object encountered by the slicer edge and the respective tangents to the slicer edge at said point varies within a preselected range of angles.

4,628,673

HAYMAKING MACHINE FOR THE TEDDING

Jérôme Aron, Dossenheim-sur-Zinsel, France, assignor to Kuhn, S.A., Saverne, France

Filed Jun. 27, 1984, Ser. No. 624,942
Claims priority, application France, Jul. 19, 1983, 83 12036
Int. Cl.[4] A01D *84/00*
U.S. Cl. 56—370 **32 Claims**



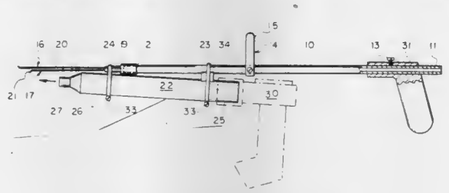
1. A haymaking machine comprising at least two drums; a flexible skirt on the lower part of each drum; spaced collectors on the periphery of said drums and means located at least partially under the skirts of said drums for raising cut fodder plants into a zone located between the drums so as to improve the hold on said plants by said collectors.

4,628,674

LEAF-HANDLING APPARATUS

Murray D. Dougan, 106 Lake Dr., Williamsburg, Va. 23185

Filed Nov. 22, 1985, Ser. No. 800,811
Int. Cl.[4] A01D *7/02*
U.S. Cl. 56—400.04 **9 Claims**



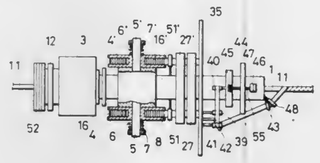
1. A leaf-handling apparatus comprising:
(a) an elongated straight rigid support shaft having upper and lower extremities,
(b) a first handle associated with said upper extremity, and a second handle slidably positionable upon said shaft,
(c) first and second fan-shaped sets of elongated flexible tines associated with the lower extremity of said shaft, said tines having curved tips, the tips of the tines of said first set being upwardly curved, and the tips of the tines of said second set being downwardly curved,
(d) an elongated rigid air conduit tube attached to said shaft therebelow and generally coextensive therewith and having upstream and downstream extremities, and
(e) nozzle means associated with said downstream extremity and positioned below said tines,
(f) said upstream extremity being configured to removably hold a blower of conventional design in a manner such that said blower will direct air through said tube to said nozzle means.

4,628,675

TAPE WINDING APPARATUS

Katsuji Sakamoto, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 15, 1984, Ser. No. 580,310
Claims priority, application Japan, Feb. 17, 1983, 58-25994
Int. Cl.[4] D07B *7/14;* **B65H** *59/18*
U.S. Cl. 57—3 **5 Claims**



1. In a tape winding apparatus including a rotatable spindle having an axial bore through which a core passes on which a tape is to be wound to produce a cable, and a reel carrying a roll of tape supported on said spindle for rotation about said core with the rotation of said spindle, the improvement comprising:
tension imparting means, provided between said reel and said core, for defining at least two areas therebetween, whereby a first tension of said tape nearer said reel is greater than a second tension of said tape nearer said core, whereby said second tension is not dependent on said first tension;
means for varying said second tension in accordance with said rotation of said spindle, said tension varying means comprising:
a differential gear box connected to said spindle and said tension imparting means and having first, second, and third shafts; and
a plurality of pulleys and belts for connecting one side of said differential gear box to said spindle, and for connecting another end of said differential gear box to said tension imparting means, whereby a difference in rotational speed between the rotation of said spindle and the rotation of said tension imparting means about said core is maintained substantially constant;
the improvement further comprising:
a wind barrier provided between said areas for preventing transfer of a wind created by rotation of said reel from one area to the other area.

4,628,676

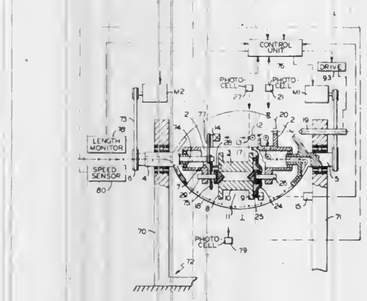
METHOD AND APPARATUS FOR LAYING STRANDED ROPE-LIKE MATERIAL ON A REEL

Werner Lepach, and Herbert Horn, both of Schwabach, Fed. Rep. of Germany, assignors to Maschinenfabrik Niehoff KG, Schwabach, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 817,883
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500949
Int. Cl.[4] D07B *3/10, 7/10;* **B65H** *54/02, 75/28*
U.S. Cl. 57—266 **24 Claims**

1. An apparatus for automatically laying stranded rope-type material on a reel having a sleeve with a longitudinal axis and a pair of flanges at opposite ends of said sleeve, comprising:
carrier means for holding the reel to enable rotation thereof about the longitudinal axis of the reel;
loading means for automatically conveying the reel to said carrier means prior to a winding operation and for automatically removing the reel from said carrier means upon the completion of said winding operation;
first drive means operatively coupled to said carrier means for rotating said reel about said longitudinal axis during said winding operation;

laying means including a shiftable laying roller for guiding a strand of material to the sleeve of said reel between the flanges thereof, said laying means further including a rotor yoke rotatable about said reel for feeding said strand to said laying roller during said winding operation;
second drive means operatively connected to said laying roller for reciprocating same along a path parallel to said longitudinal axis during said winding operation;
first sensor means for monitoring the amount of material wound on said reel;
second sensor means for detecting whether said laying roller is located at a preselected position along said path;
third sensor means for detecting whether said reel has a preselected angular orientation with respect to a throw-over point at which an end portion of said strand passes over a flange of said reel;
fourth sensor means for detecting whether said rotor yoke has a predetermined angular orientation;
unwinding means mounted to said loading means for automatically unwinding a predetermined length of said strand from said reel during removal of said reel from said carrier means by said loading means;
severing means, engageable with a section of said strand extending between said reel and said laying means upon a removal of said reel from said carrier means at a termination of said winding operation, for gripping said section and cutting said strand at a point along said section;
clamping means, disposable at an outer side of one of the



flanges of said reel upon a loading of said reel into said carrier means, for clamping a free end of said strand prior to and during said winding operation;
guiding means disposable at a rim of said one of said flanges for guiding said strand over said rim at the beginning of said winding operation; and
control means operatively connected to said first and said second drive means and to said first, said second, said third and said fourth sensor means for terminating said winding operation upon (a) the winding of a predetermined length of said strand on said reel, (b) the attainment of said preselected position by said laying roller, (c) the attainment of said preselected angular orientation of said reel with respect to said throw-over point and (d) the attainment of said predetermined angular orientation by said rotor yoke, said control means being operatively coupled to said loading means, said severing means and said clamping means for coordinating the operations thereof.

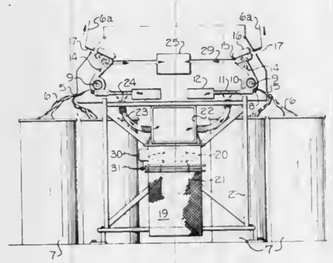
24. A method for automatically laying stranded rope-type material on a reel having a sleeve with a longitudinal axis and a pair of flanges at opposite ends of said sleeve, comprising the steps of:
conveying the reel to a carrier prior to a winding operation;
mounting the reel to said carrier to enable rotation of the reel about its longitudinal axis;
clamping a free end of said strand prior to and during said winding operation;
guiding said strand over a rim of one of the flanges of said reel at the beginning of said winding operation;
rotating said carrier and said reel about said longitudinal axis during said winding operation;
guiding a strand of material by means of a laying roller to the sleeve of said reel between the flanges thereof, said step of guiding including the step of rotating a rotor yoke about said reel to feed said strand to said laying roller during said winding operation;
reciprocating said laying roller along a path parallel to said longitudinal axis during said winding operation;
monitoring the amount of material wound about said reel during said winding operation;
detecting whether said laying roller is located at a preselected position along said path;
detecting whether said reel has a preselected angular orientation with respect to a throw-over point at which an end portion of said strand passes over a flange of said reel;
detecting whether said rotor yoke has a predetermined angular orientation;
terminating said winding operation upon (a) the winding of a predetermined length of said strand on said reel, (b) the attainment of said preselected position by said laying roller, (c) the attainment of said preselected angular orientation of said reel with respect to said throw-over point and (d) the attainment of said predetermined angular orientation by said rotor yoke;
removing said reel from said carrier upon the termination of said winding operation;
unwinding a predetermined length of said strand from said reel during removal of said reel from said carrier; and
gripping a section of said strand extending between said reel and said laying means upon a removal of said reel from said carrier means at a termination of said winding operation and cutting said strand at a point along said section, each of said steps being automatically performed.

4,628,677

FRICTION SPINNING

Nicholas J. Turner, Altrincham; Geoffrey A. Ogden, Rochdale, and Richard S. Bridge, Ramsbottom, all of England, assignors to Magnavac Air Systems Limited, Oldham, England

Filed Sep. 13, 1985, Ser. No. 775,618
Claims priority, application United Kingdom, Sep. 15, 1984, 8423362; Feb. 22, 1985, 8504600
Int. Cl.[4] D01H *11/00, 1/135, 7/885*
U.S. Cl. 57—301 **8 Claims**



1. A method of preventing the build up of dust and fly in a friction spinning machine having perforated friction rollers upon which yarns are formed and a suction device for drawing a large volume of air through the perforated friction rollers in producing the yarns, said method comprising introducing into the spinning machine a flow of pressurized clean, filtered air at a volume sufficient to supply the air required to be drawn through the perforated friction rollers for spinning and to provide a positive air pressure within the machine to prevent the ingress of dust and fly into the machine which could clog the perforated friction rollers and adversely affect the quality of the spun yarn.

3. A friction spinning machine comprising a series of yarn

spinning stations including perforated friction rollers upon which yarns are formed, a spinning machine housing enclosing said spinning stations, suction means cooperating with each of said spinning stations for drawing a large volume of air through the perforated friction rollers in producing the yarns, and means for introducing into the enclosed housing a flow of pressurized clean, filtered air at a volume sufficient to supply the air required to be drawn through the perforated friction rollers for spinning and to provide a positive air pressure within the machine to prevent the ingress of dust and fly into the machine which could clog the perforated friction rollers and adversely affect the quality of the spun yarn.

4,628,678

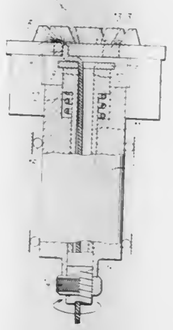
TWISTING MEMBER OF RINGLESS SPINNING APPARATUS

Valentin N. Tikhonov; Gennady V. Zhigalov; Abdurakhim Abduganiev, and Vladimir K. Dulnev, all of Tashkent, U.S.S.R., assignors to Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin, Tashkent, U.S.S.R.

Filed Sep. 25, 1985, Ser. No. 780,091

Int. Cl.[4] D01H *7/882*

U.S. Cl. 57—400 **2 Claims**



1. A twisting member of a ringless spinning apparatus, comprising:

a cylindrical housing having a peripheral side surface;

blades being accommodated on said peripheral side surface of said cylindrical housing;

a first disc being secured on said blades and having a passage extending through said first disc in an eccentric direction relative to an axis of rotation of said first disc, said passage advancing fibres of yarn through said first disc;

a spring-biased sleeve accommodated inside said housing in a coaxial direction relative to a longitudinal axis of said housing; and

a second disc having an axial passage extending through said second disc in a direction substantially parallel to said eccentric direction of said passage of said first disc, and said passage of said second disc advancing said fibres of said yarn through said second disc, said second disc being mounted on a first end of said sleeve in a coaxial position relative to said sleeve, whereby a first side of said second disc faces a first side of said first disc and said first side of said second disc and said first side of said first disc defining a gap and forming a means for gripping said fibres of said yarn.

4,628,679

METHOD AND APPARATUS FOR THE PRODUCTION OF A YARN BY OPEN-END FRICTION SPINNING

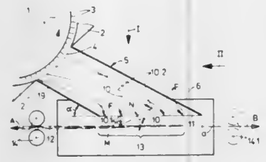
Herbert Stalder, Kollbrunn, and Josef Baumgartner, Sirnach, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Sep. 9, 1985, Ser. No. 773,998

Claims priority, application Switzerland, Sep. 25, 1984, 4579/84

Int. Cl.[4] D01H *7/892, 1/135*

U.S. Cl. 57—401 **20 Claims**



1. A method of spinning a yarn and the like by the open-end friction spinning principle, comprising the steps of:

separating fibres from a fibre sliver;

transferring said separated fibres in a freely floating condition by means of a pneumatic, fibre-transporting air stream to a moving perforated surface of a friction spinning means subjected to underpressure;

selecting a speed relationship between said pneumatic, fibre-transporting air stream and the speed of said moving perforated surface such that said step of transferring said separated fibres entails receiving leading ends of said separated fibres at said moving perforated surface of said friction spinning means and transporting said leading ends of said separated fibres substantially in peripheral direction on said moving perforated surface and that said step of transporting said leading ends of said separated fibres on said moving perforated surface of said friction spinning means entails further transferring trailing portions of said separated fibres to said moving perforated surface of said friction spinning means by said pneumatic, fibre-transporting air strem and receiving said trailing portions of said separated fibres at said moving perforated surface of said friction spinning means such that said transferred fibres assume a rearwardly inclined orientation on said moving perforated surface as viewed in the direction of movement of said moving perforated surface of said friction spinning means and as viewed in a predetermined withdrawal direction of a spun yarn;

transporting said transferred fibres by means of said moving perforated surface to a yarn formation position in which said transported fibres are formed into a spun yarn;

said step of transporting said transferred fibres entails delivering said fibres to said yarn formation position while lying on said moving perforated surface in substantially straightened configurations and simultaneously while lying in said rearwardly inclined orientation as viewed in said predetermined withdrawal direction of said spun yarn; and

finally withdrawing said spun yarn in said predetermined withdrawal direction.

11. An apparatus for spinning a yarn, comprising:

an opening roller of a type employed in open-end rotor spinning for separating fibres from a fibre sliver;

a moveable friction spinning means comprising a perforated surface;

means for drawing a pneumatic, fibre-transporting air stream through said perforated surface of said moveable friction spinning means;

a fibre feed passage situated between said opening roller and said perforated surface of said moveable friction spinning means for pneumatically transporting said separated fibres by said pneumatic fibre transporting air stream from said opening roller to said moving perforated surface of said movable friction spinning means during operation of the apparatus;

said fibre feed passage having an exit opening;

said exit opening having edges and longitudinal sides;

said longitudinal sides being arranged substantially transverse to a direction of movement of said moving perforated surface;

said fibre feed passage being so inclined in relation to said longitudinal sides of said exit opening that said separated fibres in said pneumatic, fibre transporting air stream are transported in a direction which is forwardly inclined at a predetermined angle of inclination relative to said longitudinal sides of said exit opening as viewed in a predetermined withdrawal direction of the spun yarn;

a suction passage defining a suction zone;

said suction passage having a lower wall;

said lower wall of said suction passage being arranged at a predetermined spacing from said exit opening as viewed in a direction of movement of said moving perforated surface of said moveable friction spinning means;

said lower wall forming a yarn formation position on said moveable friction spinning means;

said suction passage being arranged at said preforated surface of said moveable friction spinning means opposite to said fibre feed passage and said yarn formation position;

said fibre feed passage converging in a direction toward said exit opening in such manner that said pneumatic, fibre-transporting air stream is accelerated during operation of the apparatus;

said exit opening having a cross-section of a breadth of at most 2 mm and being so selected that air of said pneumatic, fibre-transporting air stream flowing through said exit opening during operation of the apparatus has a speed such that leading ends of said separated fibres caught in the region of said exit opening are diverted in a direction extending substantially normal to said cross-section of said exit opening; and

said fibre feed passage being so arranged that said separated fibres are taken up substantially freely by said moving perforated surface and without substantial diversion at said edges of said exit opening during operation of the apparatus.

4,628,680

SPINNING MACHINE WITH A PLURALITY OF SPINNING UNITS

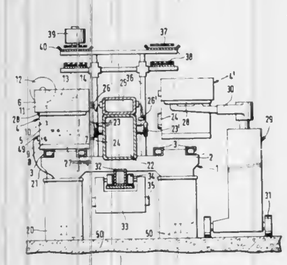
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,057

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434724

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—401 **32 Claims**



1. A spinning apparatus having at least one spinning unit arranged on a machine frame, said at least one spinning unit including drivable surface means for twisting fibers into yarn, a fiber feeding device, opening device means, yarn withdrawal means for withdrawing spun yarn from said drivable surface means and winding device means for winding said yarn onto a wind-up spool, drive means being provided for each of said drivable surface means, said fiber feeding device means, said opening device means, said yarn withdrawal means and said winding device means, comprising:

construction unit means selectively removable from said spinning apparatus,

said construction unit means including the drivable surface means, the opening device means, the yarn withdrawal means and the winding device means of said at least one spinning unit,

said construction unit means further including the drive means for the drivable surface means, the opening device means, the yarn withdrawal means and the winding device means of said at least one spinning uint, said drive means being independent of drive means for other spinning units when said construction unit is installed in said spinning apparatus.

4,628,681

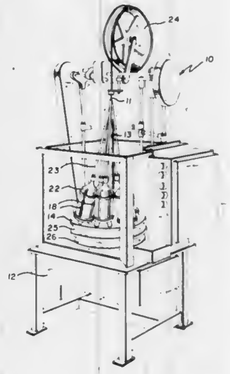
CABLING MACHINE

David C. Vanderpyl, Kingston, and Albert C. Rogler, North Situate, both of R.I., assignors to Mossberg Industries, Inc., Cumberland, R.I.

Filed Nov. 1, 1985, Ser. No. 794,169

Int. Cl.[4] D07B *3/06*

U.S. Cl. 57—59 **3 Claims**



1. Cabling machine for a plurality of fine strands, comprising

(a) a fixed base,

(b) a motor-driven vertical rotatable spindle,

(c) a disk like table extending horizontally from the spindle,

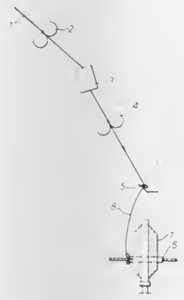
(d) a plurality of vertical shafts carried by the table with their axes concentric of the spindle, each shaft including a universal joint,

(e) a platen mounted on the upper end of each shaft, each platen being formed to carry an open-mouthed container of strand,

(f) a set of anti-friction pillars mounted on the table under each platen to hold the platen at all times at a preselected angle to the axis of the spindle, and

(g) differential means joining the spindle to the shafts, so that each platen rotates once about the axis of its shaft during each rotation of the spindle.

4,628,682
SPUN FIBRE YARN AND METHOD FOR ITS MANUFACTURE
Michel Buzano, and Michel Randon, both of Lyons, France, assignors to Rhone-Poulenc Fibres, Lyons, France
Filed Jul. 3, 1984, Ser. No. 627,541
Claims priority, application France, Jul. 4, 1983, 83 11216
Int. Cl.[4] D02G *3/34*
U.S. Cl. 57—206 9 Claims



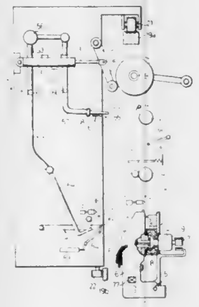
1. A spun-like interlaced twisted fiber yarn with interlaced plies, wherein in the spun yarn, the fibers have a spiral structure possessing open zones and closed zones, the cohesion factor of the spun yarn being less than **100**, the torsion factor of the spun yarn having a value of between 25 and 40% of the torsion factor normally found in the conventional spun yarn having the same count.

4,628,683
STEEL CORD TWISTING STRUCTURE
Luc Bourgois, Waregem-Desselgem, and Freddy Baillievier, Zwevegem, both of Belgium, assignors to N. V. Bekaert S.A., Zwevegem, Belgium
Filed Jun. 26, 1985, Ser. No. 748,987
Claims priority, application United Kingdom, Jul. 9, 1984, 8417485; Oct. 22, 1984, 8426654
Int. Cl.[4] D02G *3/48;* D07B *1/06*
U.S. Cl. 57—213 20 Claims



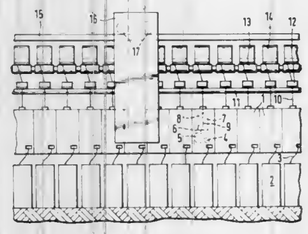
1. A rubber adherable steel cord adapted for reinforcement of resilient articles, in the form of a central bundle of steel wires surrounded by a circumferential layer of steel wires, helicoidally twisted around said central bundle, said central bundle having in transverse cross-section a core of adjacent wire cross-sections, surrounded by a ring of wire cross-section, the cord having a plurality of cord length sections in a close packed configuration, each close packed section being separated from one another by a cord length section in a non-close packed configuration; the wires of the central bundle including at least two, but no more than three hundred, position changes with respect to a longitudinal regular twist.

4,628,684
METHOD OF PIECING A YARN IN AN OPEN-END SPINNING MACHINE
Takayuki Morita; Akira Tanaka, both of Kariya; Takahiko Tsunekawa, and Hisao Amano, both of Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Filed Oct. 11, 1983, Ser. No. 540,824
Claims priority, application Japan, Oct. 13, 1982, 57-179475
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 4 Claims



1. A method of piecing a yarn in an open-end spinning machine, comprising the steps of:
(a) stopping said spinning machine, and stopping a yarn piecing machine in front of a spinning unit suffering a yarn breakage;
(i) then operating the sliver feed roller and combing roller of said spinning unit for a momentary predetermined time period to comb and shape the end of said sliver, and
(ii) stopping said sliver feed roller and combing roller;
(b) reversing the package on said spinning unit with a rewinding roller to rewind said broken yarn therefrom;
(c) cutting off said yarn to leave a yarn end having a predetermined length extending from said yarn package;
(d) moving said yarn end to a position upwardly of an outlet of the withdrawal tube in said spinning unit and starting the spinning rotor of said spinning unit;
(e) rewinding said rewinding roller again to feed said yarn end through said withdrawal tube to a fiber collecting surface of the spinning rotor in said spinning unit and starting a timer at a time determined by the time when said rewinding starts again, after adjusting the starting time of the timer according to the yarn count number of the yarn to be pieced;
(f) operating said sliver feed roller in response to said timer for supplying said sliver to said fiber collecting surface of said spinning rotor;
(g) piecing said yarn end to said sliver on said fiber collecting surface;
(h) continuously drawing said pieced yarn from said spinning rotor; and
(i) moving said pieced yarn to a position between a presser roller and a draw-off roller which are being rotated while drawing the pieced yarn from said spinning rotor.

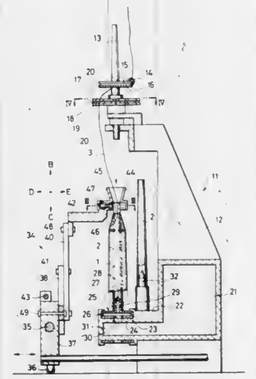
4,628,685
YARN PIECING ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, and Heinz Merkel, Gotthardt, Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of Goppingen, Fed. Rep. of Germany
Filed Mar. 22, 1985, Ser. No. 714,920
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410471
Int. Cl.[4] D01H *15/02, 1/135*
U.S. Cl. 57—263 35 Claims



1. Open-end friction spinning machine having at least one spinning unit comprising:
friction surface means for forming a yarn formation zone;
fiber supply means for supplying fibers to the yarn formation zone, said fiber supply means including fiber feed channel mouth means adjacent the friction surface means;
yarn withdrawing means for withdrawing formed yarn from the yarn formation zone;
yarn winding device means for winding the spun yarn onto a spool;
yarn end receiving and returning means for receiving a broken yarn end from the spool and returning same into the spinning unit for piecing with fibers fed by the fiber supply means;
piecing control means for controlling the feeding of fibers by the fiber supply means during piecing and for controlling the withdrawing of pieced yarn and winding the same onto the spool;
twist blocking means for receiving and holding the broken yarn end at a position located outside the region of the fiber feed channel mouth means, said position being displaced from the mouth means in a direction opposite the normal spinning withdrawal direction; and
friction effect means for subjecting an area of the broken yarn end located at the normal yarn withdrawal direction side of the twist blocking means to frictional effects of the surfaces of the friction surface means.

29. A method of piecing a yarn on a spinning machine of the type having at least one spinning unit comprising:
friction surface means for forming a yarn formation zone;
fiber supply means for supplying fibers to the yarn formation zone, said fiber supply means including fiber feed channel mouth means opening adjacent surface portions of the friction surface means;
yarn withdrawing means for withdrawing formed yarn from the yarn formation zone;
yarn winding device means for winding the spun yarn onto a spool;
yarn end receiving and returning means for receiving a broken yarn end from the spool and returning same into the spinning unit for piecing with fibers fed by the fiber supply means; and
piecing control means for controlling the feeding of fibers by the fiber supply means during piecing and for controlling the withdrawing of pieced yarn and winding the same onto the spool;
said method comprising the sequential steps of: returning a broken yarn end from the spool into the spinning unit to a position outside the region of the yarn formation zone, said position being displaced from the yarn formation zone in a direction opposite the normal spinning withdrawal direction;
holding the returned broken yarn end with twist blocking means at a position located outside the region of the fiber feed channel mouth means, said position being displaced from the mouth means in a direction opposite the normal spinning withdrawal direction, and applying the area of the broken yarn end located at the normal yarn withdrawal direction side of the twist blocking means against the friction outer circumferential surfaces of the friction means to thereby prepare a predetermined fiber beard in the broken yarn end which is suitable for piecing.

4,628,686
METHOD AND APPARATUS FOR DOFFING IN A SPINNING FRAME
Shoichi Tone, Kyoto, and Hiroshi Uchida, Oumihachiman, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Feb. 14, 1986, Ser. No. 829,529
Int. Cl.[4] D01H *9/04, 9/14, 1/38, 1/40*
U.S. Cl. 57—274 10 Claims



1. A doffing method in a spinning frame, characterized in that it comprises steps of holding a spinning bobbin after completion of winding with a holding member, removing the spinning bobbin from a spindle without bunch winds without cutting a yarn, fitting the spinning bobbin onto a bobbin conveying medium, cutting the yarn extending between the spindle and the spinning bobbin, and sucking air within the spinning bobbin to attract an end of the cut yarn adjacent the spinning bobbin into the spinning bobbin carried on the conveying medium.

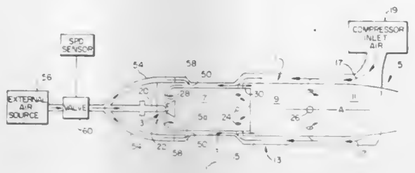
4. A doffing apparatus in a spinning frame including a spindle mounted on a spinning body of the spinning frame and a conveyor for transporting a conveying medium on which a spinning bobbin and an empty bobbin are erected and carried, characterized in that it comprises a cutter device mounted in a coaxial relationship with the spindle, a bobbin holding member including a yarn passing slit formed therein, said bobbin holding member being able to hold a spinning bobbin or an empty bobbin and to be moved holding them, a doffing mechanism for moving the bobbin holding member to transfer the spinning bobbin or the empty bobbin between the spindle and the conveying medium, and a sucking means for sucking a yarn end cut by the cutter device to insert the yarn end into the spinning bobbin.

4,628,687

GAS TURBINE COMBUSTOR WITH PNEUMATICALLY CONTROLLED FLOW DISTRIBUTION

Sigmunn Ström, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed May 15, 1984, Ser. No. 610,509
Int. Cl.[4] F02C *9/00*
U.S. Cl. 60—39.23 **12 Claims**



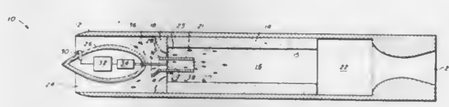
1. A combustor for a gas turbine comprising:
(a) a burner having an axis and defining an axial fluid-flow path between upstream and downstream ends thereof;
(b) a burner casing coaxially surrounding said burner and defining an annular conduit, said casing including a combustion gas inlet positioned proximate the burner downstream end, said conduit for conducting said inlet gas flow from the downstream end to the upstream end of said burner;
(c) means for introducing fuel into said burner proximate the upstream end thereof;
(d) first means for introducing a primary part of said inlet gas into said burner proximate the upstream end thereof to generate a combustible fuel-gas mixture; and
(e) restrictor means for introducing gas from a source external to said inlet gas flow into said annular conduit and for generating a pneumatic restriction to inlet gas flow to said first means when said turbine is operating at predetermined operating conditions.

4,628,688

SOLID FUEL RAMJET FLOW CONTROL DEVICE

James L. Keirsey, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1983, Ser. No. 527,158
Int. Cl.[4] F02K *7/10*
U.S. Cl. 60—251 **10 Claims**



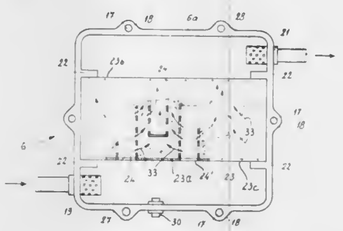
1. A device for controlling the generation of fuel combustion products in a solid fuel ramjet engine propelled missile comprising:
a combustor chamber containing the solid fuel for generating the fuel combustion products, and having an inlet for admitting air thereinto, and an outlet for discharging the fuel combustion products generated;
sensor means for sensing air mass flow entering the inlet;
means operatively associated with said combustor chamber for continuously varying the aerodynamic shear interaction between the solid fuel and the air admitted into said combustor chamber;
said means comprising a tube located coaxially in the air inlet extending into said combustor chamber and defining a first path for air flow into said chamber between said tube and air inlet inner surface directed along and in close proximity to the solid fuel, and a second path for air flow into said chamber through said tube directed away from the solid fuel and centrally through said chamber, said tube positionable between a first position for causing all of the air to flow along the first path and a second position for causing all of the air to flow along the second path for continuously varying the split of air flow therebetween; and,
a servomechanism electrically coupled to said sensor and mechanically connected to said tube for causing said tube to continuously translate and take positions in response to instantaneous air mass flow sensed by said sensor;
whereby the generation of the fuel combustion products is increased or decreased in response to changes in the sensed air mass flow.

4,628,689

INTERNAL COMBUSTION ENGINE EXHAUST SYSTEM

Charles Jourdan, "Mona Lisa" Residence, 52 Boulevard Berthie-Albrecht, Sainte-Maxime (Var), France

Filed Aug. 16, 1984, Ser. No. 641,438
Claims priority, application France, Aug. 18, 1983, 83 13686
Int. Cl.[4] F01N *7/08, 7/18, 3/02*
U.S. Cl. 60—295 **14 Claims**



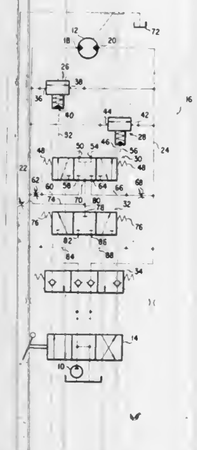
1. A muffler for an exhaust system of an internal combustion engine, the muffler comprising:
a molded housing body open along one side and a cover removably attached to said housing body, said cover and said housing body together defining a hollow housing composed of a material resistant to corrosion by exhaust gas and to elevated temperatures;
an inlet communicating with the interior of said housing and an outlet communicating with the interior of said housing;
formations in the housing body defining between the inlet and the outlet a seat;
a filter cartridge replaceably received in the seat of said housing and defining in the interior thereof an inlet compartment communicating with said inlet and an outlet compartment communicating with said outlet, said filter cartridge having a rigid thin shell and a permeable mass generally filling the shell and formed with passages communicating with said compartments at said sides for the acoustic damping of the exhaust gas, some of said passages opening only into one of the compartments and the other passages opening only into the other compartment; and
means for securing said cover over the open side of said housing and thereby laterally closing said compartments with the cover and holding the cartridge in the seat to subdivide the inlet compartment from the outlet compartment with the cartridge so that flow between them is only possible through said passages and through the material in said cartridge.

4,628,690

FLUID CIRCUIT FOR OPERATING A BIDIRECTIONAL HYDRAULIC MOTOR WITH A REDUCED SHOCK

Mitsuru Arai, Kamakura; Hideyori Sato, Funabashi, and Shoichiro Inatomi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,730
Claims priority, application Japan, Aug. 31, 1983, 58-133521[U]
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—464 **1 Claim**



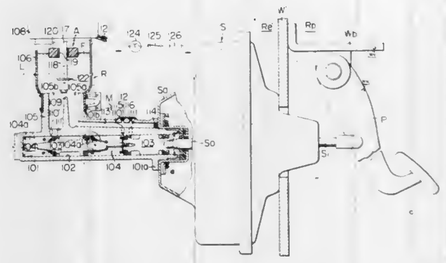
1. In a hydraulic circuit for operating a bidirectional hydraulic motor from a source of hydraulic fluid under pressure via a hand operated directional control valve, the hydraulic circuit including a first dual pressure relief valve connected between first and second main lines connecting the directional control valve to a pair of opposite fluid inlet/outlet ports of the bidirectional hydraulic motor, the first relief valve being normally conditioned to pass at a predetermined relatively low pressure the pressurized fluid from the first main line toward the second main line and to pass at a predetermined higher pressure then pressurized fluid from the second main line toward the first main line, the first relief valve being closed on pilot actuation to block communication between the first and second main lines, a second dual pressure relief valve also connected between the first and second main lines and normally conditioned to pass at the predetermined higher pressure the pressurized fluid from the first main line toward the second main line and to pass at the predetermined low pressure the pressurized fluid from the second main line toward the first main line, the second relief valve being closed on pilot actuation to block communication between the first and second main lines, and a timing valve responsive to a pressure differential between the first and second main lines for pilot actuating which ever of the first and second relief valves has been passing at the predetermined low pressure the pressurized fluid from that one of the main lines which as a higher pressure, the improvement comprising a pair of variable restrictors connected one between each main line and the timing valve for introducing a variable degree of delay in the pilot actuation and consequent closure of either of the first and second relief valves by the timing valve in response to the pressure differential between the first and second main lines, each of said variable restrictors being adjustable by means of a readily accessable adjusting member, whereby either of the main lines having a higher pressure can be held at the predetermined low pressure for a variable length of time.

4,628,691

TANDEM TYPE MASTER CYLINDER

Nobuaki Hachiro, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Division of Ser. No. 211,430, Nov. 28, 1980, abandoned. This application Jun. 21, 1984, Ser. No. 623,333
Claims priority, application Japan, Dec. 8, 1979, 54-159511; Dec. 18, 1979, 54-164597
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.[4] B60T *11/20*
U.S. Cl. 60—562 **9 Claims**



1. A tandem type master cylinder for a dual hydraulic brake system of an automobile comprising: a cylinder body mounted on a front wall of a compartment of an automobile, said cylinder body having a cylinder bore therein, first and second pistons slidable in said cylinder bore and disposed axially apart from each other to define front-side first and rear-side second hydraulic power chambers, independently from each other, in said cylinder bore; an auxiliary oil reservoir formed integrally with said cylinder body to extend substantially vertically upwards from an upper side of the cylinder body adjacent said front-side first power chamber, said auxiliary reservoir including a partition defining first and second reservoir chambers therein, said first reservoir chamber being in communication with said first power chamber through a first vent port and a first supply port provided in said cylinder body; said cylinder body having a side wall with an oil passage therein connecting said second reservoir chamber and said second power chamber via a second vent port and a second supply port provided in said side wall of the cylinder body; and a main oil reservoir adjacent said auxiliary reservoir and in communication with said first and second reservoir chambers, said front wall of said compartment having a mounting surface to which said cylinder body is secured, said cylinder body extending substantially horizontally in an engine compartment forwardly of the front wall of said compartment, said cylinder body having a rear end, said oil passage being constituted by a bore in said body extending from said second reservoir chamber to said rear end of said cylinder body in a forwardly, upwardly inclined relation, said oil passage being open at said rear end of said cylinder body, a plug closing the open end of said oil passage, said second supply and vent ports being constituted by bores formed from the outside in said body extending at an angle of intersection with respect to said oil passage, said oil passage having its open end positioned at one lateral side part of the rear end of said cylinder body and leading to a bottom of the second reservoir chamber.

4,628,692

SOLAR ENERGY POWER SYSTEM

John E. Pierce, 621 Carlton Dr., Augusta, Ga. 30909

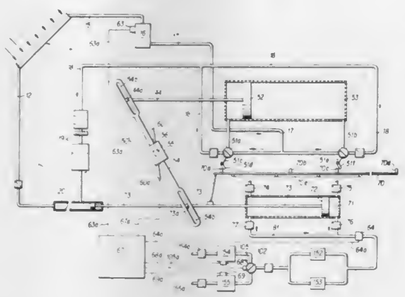
Continuation-in-part of Ser. No. 184,144, Sep. 4, 1980, abandoned, and a continuation-in-part of Ser. No. 567,694, Jan. 3, 1984, abandoned. This application Mar. 13, 1986, Ser. No. 839,141
Int. Cl.[4] F03G *7/02*
U.S. Cl. 60—641.8 **9 Claims**

1. An improved power system for use in converting solar

energy into storable energy, said improved system comprising, in combination:

(a) solar heat collector means operable for utilizing the sun's rays to heat a fluid medium and convert it from liquid to an expanded gas;

(b) energy conversion means operatively connected with said solar heat collector means for utilizing said expanded gas to compress a second gas; said energy conversion means comprising a motor means for receiving said expanded gas from said heat collector means, utilizing said gas to produce mechanical energy and then returning said gas to said solar collector; and compressor means operatively connected with said motor means to use said mechanical energy to increase the pressure of a second gas;



(c) control means operatively associated with said solar collector means and said energy conversion means to effect adjustment of the ratio of pressurization in said compressor means to the energy output of said motor means in response to pressure changes in said expanded gas in said solar collector means; and

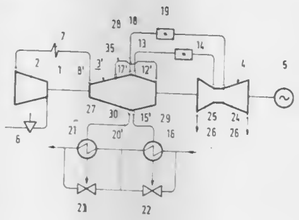
(d) storage means operatively connected with said energy conversion means for collecting and storing said pressurized second gas for subsequent use to operate a power driven unit.

4,628,693

CASING FOR DISTRICT HEATING TURBINE

Gilbert Riollet, Paris, France, assignor to Alsthom-Atlantique, Paris, France

Filed Feb. 28, 1985, Ser. No. 706,992
Claims priority, application France, Mar. 1, 1984, 84 03230
Int. Cl.[4] F01K *17/02*
U.S. Cl. 60—648 **4 Claims**



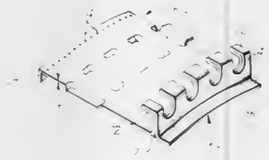
1. In a system designed for cogeneration of electric power and heat for district heating purposes including two district heating heat exchangers, (**16**, **21**), a steam turbine having IP and LP sections, said steam turbine further comprising a stator (**32**), a rotor (**31**) rotating internally of said stator (**32**), said stator including a casing, blades carried by said rotor (**31**) rotating in said stator (**32**), said casing having an inlet steam admission (**8'**) two exhausts (**12'** and **17'**) at different pressures p_1 and p_2 (p_2 p_1) feeding said LP section of the turbine, and two further exhausts (**15'**, **20'**) at pressures p_1 and p_2 feeding said two district heating heat exchangers (**16**, **21**), each of said heat exchangers providing substantially half of the heating output, the improvement wherein said IP section comprises a single flow section (**27**) and a double flow section (**28**), said double flow section (**28**) comprising two unsymmetrical partial flow section (**29**, **30**), means supplying steam to said single flow section (**27**) from the steam inlet (**8'**), means for splitting the exhaust from said single flow section (**27**) into parallel flows of substantially equal steam flow rates, and for supplying said parallel flows to the inlets of respective unsymmetrical partial flow section (**29**, **30**), and said flow-splitting point being located far enough from the two exhausts at pressure p_2 (**17'**, **20'**) so that changes in flow rates have little or no effect on the steam pressure at said flow-splitting point.

4,628,694

FABRICATED LINER ARTICLE AND METHOD

James S. Kelm, Milford; Arthur L. Ludwig; Harvey M. Maclin, both of Cincinnati; Steven K. Roggenkamp, and Thomas G. Wakeman, both of West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1983, Ser. No. 562,959
Int. Cl.[4] F02C *7/00*
U.S. Cl. 60—752 **7 Claims**



1. A fabricated sheet metal panel comprising:

a plate member having first and second oppositely facing surfaces bounded by a leading edge, a trailing edge and first and second opposing side edges;

said plate member further comprising an integral shoulder spaced from and extending substantially parallel to said trailing edge thereof;

said shoulder comprising substantially abutting, folded sections of said plate member and including a base extending from said first surface and a lip extending from an outer end of said base portion, said folded sections having abutting surfaces which comprise portions of said second surface of said plate member.

4,628,695

SOLID STATE RADIATIVE HEAT PUMP

Paul H. Berdahl, Oakland, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

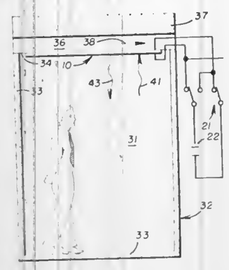
Filed Sep. 28, 1984, Ser. No. 655,500
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **35 Claims**

1. A solid state radiative heat pump comprising:

a thin film semiconductor having an active surface and a back surface and being capable of emitting an infrared radiation deficit from said active surface when a charge carrier deficit is present in said semiconductor,

enhancing means for enhancing transmission of infrared radiation through said active surface from inside said semiconductor to outside thereof and vice versa,

inhibiting means for inhibiting transmission of infrared radiation through said back surface of said semiconductor,



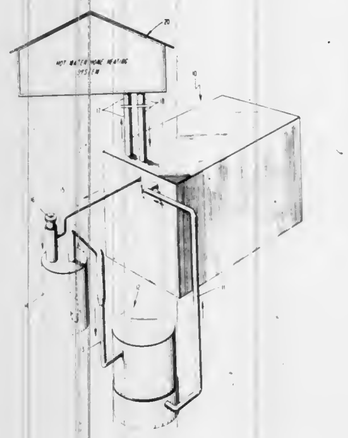
means for producing a deficit of charge carriers in said semiconductor.

4,628,696

HEAT GENERATING SYSTEM AND METHOD

Steven S. Rodgers, Hudson, N.Y., assignor to Lord & Sons, Inc., Del Haven, N.J.

Continuation-in-part of Ser. No. 385,961, Jun. 7, 1982, abandoned. This application Jun. 5, 1984, Ser. No. 617,588
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—79 **58 Claims**



1. A self-contained heating system comprising:

(a) closed circuit means containing a refrigerant,

(b) means-defining an enclosed heat transfer chamber which is closed with respect to ambient surroundings,

(c) said closed circuit means including a heat exchang portion, a heat collecting portion and compressor means,

(d) said heat exchange portion and said heat collecting portion being disposed within the enclosed heat transfer chamber,

(e) said heat exchange portion including means to superheat said refrigerant

(f) said heat collecting portion being effective to collect heat from the superheated refrigerant only from within the heat transfer chamber, and

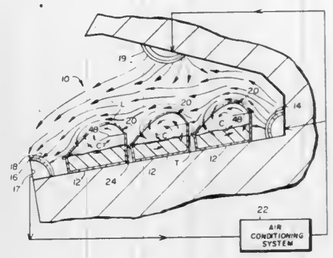
(g) means for removing heat from the heat exchange portion.

4,628,697

AIR-FLOW TEMPERATURE AND HUMIDITY MANAGEMENT FOR MAINTAINING FRESHNESS OF DELICATE PRODUCE

Anthony J. Bruck, and Stephen N. Hazen, both of Lake Helen, Fla., assignors to Convex Display Systems, Inc., Lake Helen, Fla.

Filed Sep. 20, 1985, Ser. No. 778,499
Int. Cl.[4] A47F *3/04*
U.S. Cl. 62—89 **12 Claims**



10. A method for improving the practice of air-flow, temperature and humidity management of produce for maintaining freshness thereof, comprising:

supporting at least one quantum of physically exposed produce on a surface bounded by an upstanding perimetrical wall;

blanketing said support surface with a blanket of cooler-than-ambient air flowing across said surface with a depth which is at least as thick as the greatest extent of said at least one quantum of produce above said surface;

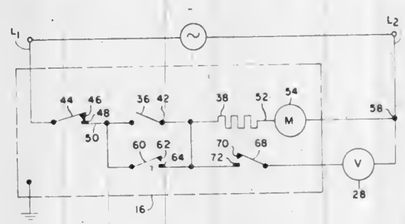
enclosing said at least one quantum of said produce, cooperatively with said support surface, by an open-ported dome but for providing open access to each so-enclosed quantum through an upwardly opening port through such dome, such port being at least generally round and of sufficient breadth as to permit inspection, manipulation and abstraction therethrough of produce from the respective quantum.

4,628,698

MAKING ICE IN A REFRIGERATOR

Thomas P. Needham, Burr Ridge, and Frank K. Karlovits, Arlington Ht., both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 9, 1985, Ser. No. 689,905
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—137 **8 Claims**



1. A system for making ice in a refrigerator comprising:

a. tray means for receiving water to permit ice to form therein, said tray means mounted for pivotal movement in said refrigerator for harvesting ice;

b. motor means including speed reducer means connected to said tray means and operable upon energization to pivot said tray means for harvesting ice;

c. fill valve means adapted for connection to a water line and operable upon energization to provide water flow to said tray means;

d. control circuit means operative, upon connection to a source of electrical power, to effect energization and de-energization of said motor means, said circuit means including;

i. thermally responsive switch means disposed to sense the temperature of the water in said tray means, said thermally responsive switch means being open circuit at temperatures above freezing and closing upon the sensed temperature dropping below freezing by a desired amount, said thermally responsive switch means series connected with said motor means,

ii. heater means disposed adjacent said thermally responsive means said heater means series connected with said motor means and effective to upon energization to cause heating of and opening of said thermally responsive switching means;

iii. shunt switch means by-passing said thermally responsive means;

iv. cut-off switch means series connected with said thermally responsive means, said heater means and said motor means, said cut-off switch means normally closed.

v. filling switch means operative upon actuation and deactuation to energize and de-energize said fill valve means for effecting and terminating water flow to said tray means;

vi. switch programmer means drivingly connected to said speed reducer means and operative to sequentially close said shunt switch means a first predetermined interval after said thermally responsive switch means closes and operative to maintain said shunt switch means closed for a predetermined cycle interval and further operative to close said filling switch means for a predetermined terminal portion of said cycle interval and further operative to open said shunt switch means and said filling switch means at the end of said cycle interval;

e. bin means disposed to receive and store harvested ice from said tray means; and,

f. ice sensing means drivingly connected to said speed reducer means and operative within a second predetermined interval after closing of said by-pass switching to detect the presence or absence of harvested ice in said bin means and means upon detection of the presence of harvested ice operative to open said cut-off switch means and in the absence of harvested ice operative to maintain said cut-off switch means normally closed.

4,628,699

ICE MAKER

Harold S. Mawby, Belding, and Duane H. Harris, Gowen, both of Mich., assignors to White Consolidated, Inc., Cleveland, Ohio

Filed Apr. 11, 1985, Ser. No. 722,135
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—137 **7 Claims**

1. An automatic ice cube maker for use in the freezer compartment of a domestic refrigerator comprising:

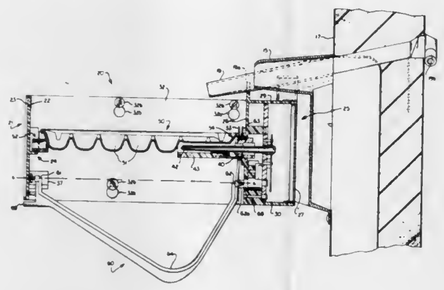
a housing having a generally open top and bottom defined by a front wall, a rear wall, and a pair of opposed sidewalls;

a compartmented ice tray having a top side constituted by a plurality of ice cube shaped pockets for receiving water to be frozen, the ice tray being horizontally mounted within the walls of the housing for movement between an upright ice making position and an inverted ice dumping position;

an electrically energized drive means connected to the ice tray for moving the ice tray between its upright and inverted positions;

a control circuit for energizing the drive means; and

a movable ice level sensing member located below the ice tray and pivotally mounted to the housing for oscillatory movement on a horizontal axis, the sensing member being engageable with the upper level of temporarily stored ice cubes accumulating at a generally fixed location below the ice maker, a portion of the sensing member moving towards and away from the ice tray as the raising and lowering of the level of stored ice cubes occurs, the sensing member actuating a switch means of the control circuit when the sensing member portion moves towards the ice tray to a predetermined position indicative of a maximum raised ice level wherein movement of the ice tray to its dumping position is inhibited by the control circuit



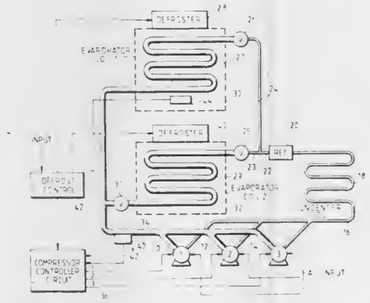
until the sensing member portion moves away from the ice tray to a position indicative of a lowered ice level, said ice level sensing member including an elongated fingerlike resilient projection extending generally radially from said horizontal axis, the distal end of said resilient projection engaging a portion of said housing so as to apply a biasing force to the sensing member at least when at said predetermined position indicative of the maximum raised ice level, said biasing force tending to move the said sensing member portion away from the ice tray toward a lowermost position.

4,628,700

TEMPERATURE OPTIMIZER CONTROL APPARATUS AND METHOD

Richard H. Alsenz, 1545 Industrial Blvd., Missouri City, Tex. 77459

Continuation of Ser. No. 458,914, Jan. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 257,113, Apr. 24, 1981, which is a continuation of Ser. No. 62,525, Jul. 31, 1979, abandoned. This application Feb. 27, 1985, Ser. No. 706,403
Int. Cl.[4] F25B *1/00*; F25D *21/06*
U.S. Cl. 62—152 **31 Claims**



17. Apparatus for controlling the system compressor capacity for a cooling system having a plurality of commonlypiped compressors coupled to a plurality of evaporator coils and

operated in accordance with control suction line pressure limits, comprising:

(a) a temperature sensor for measuring the temperature of the evaporator coil to be operated at the coldest temperature;

(b) a setpoint means for setting a desired operating temperature for the evaporator coil to be operated at the coldest temperature;

(c) a pressure level setting means responsive to said measured evaporator temperature and said desired operating temperature for dynamically adjusting an upper and a lower suction line pressure limit as a function of the difference between the desired temperature and the measured temperature, said pressure level setting means including,

(i) an integrator responsive to said measured evaporator temperature and said desired operating temperature for integrating the difference therebetween, and

(ii) a comparator reference voltage generator circuit responsive to the output voltage from said integrator for generating first and second reference voltages respectively representative of said upper and lower suction line pressure limits, said second reference voltage differing from said first reference voltage by a fixed amount, said integrator and said reference voltage generator circuit cooperating together to increase said upper and lower pressure limits when said measured temperature is less than said desired temperature, and to decrease said upper and lower pressure limits when said measured temperature is greater than said desired temperature; and

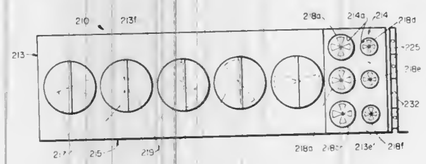
(d) a compressor controller circuit responsive to said variable upper and lower suction line pressure limits for cycling said compressors on and off in a sequence to select a combination of said compressors which produces the minimum system compressor capacity required to obtain the highest average operating suction line pressure between said variable upper and lower pressure limits which maintains the measured evaporator temperature at the desired operating temperature, said evaporator coil to be maintained at the coldest temperature including a defrost means having a lock-out switch coupled to said integrator for disabling said integrator when said lowest temperature evaporator coil switches to defrost operation.

4,628,701

NON-FLOODING REMOTE AIR COOLED CONDENSERS

Parker V. Phillips, Brantford; Ness Lakdawala, St. Lambert, and Michel Lecompte, Mont St. Hilaire, all of Canada, assignors to Hussmann Corporation, Bridgeton, Mo.

Continuation-in-part of Ser. No. 430,699, Sep. 30, 1982, Pat. No. 4,498,308. This application Feb. 8, 1985, Ser. No. 699,925
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] F25B *39/04*
U.S. Cl. 62—184 **19 Claims**



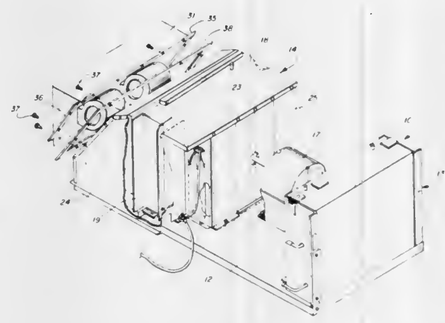
1. An outdoor air codled condenser assembly for a continuously operating refrigeration system having at least one refrigeration circuit and plural evaporator means adjusted to different varying load conditions, said condenser assembly including a condenser coil having a heat transfer surface for said refrigeration circuit, a condenser housing including a primary air flow chamber containing a primary section of said condenser coil and a separate secondary air flow chamber containing a section of said condenser coil, said condenser houwing having an open air inlet for the passage of ambient air across the primary and secondary section of said coil heat transfer surface and said primary and secondary chambers having primary and secondary outlets respectively, air flow control means associated with said primary chamber for effecting continuous air circulation through the primary section of said condenser coil, said air flow control means including selectively operable means for incrementally varying the volumetric air flow through said primary chamber and said primary section therein, air displacement means associated with said secondary chamber for effecting air flow therethrough, sensing means connected to the refrigerant outlet from said condenser coil to sense a predetermined condition of refrigerant in said condenser coil, control circuit means for monitoring said sensed refrigerant condition with respect to an established ideal condition set point value for said refrigeration system and for controlling said air flow control means of said primary outlet and said air displacement means of said secondary outlet to regulate the volume of air passing through the respective primary and secondary chambers of said condenser housing and said condenser coil heat transfer surfaces therein in response to changes in said refrigerant condition resulting from the heat rejection load in said condenser coil or the entering ambient air temperature in said condenser housing, whereby to substantially maintain said refrigeration system in constant operation at a preselected ideal condition set point value relative to the sensed refrigerant condition.

4,628,702

EXHAUST APPARATUS FOR RECREATIONAL VEHICLE AIR CONDITIONER

Bruce L. Boxum, Sedgwick, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Aug. 22, 1985, Ser. No. 768,063
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—244 **6 Claims**



1. In combination with a recreational vehicle air conditioner, the air conditioner including an evaporator coil, a condensor coil, a main housing enclosing the evaporator coil, and duct means communicating the evaporator coil with the interior of the vehicle, the improvement comprising exhaust apparatus comprising a blower housing mounted on the main housing adjacent an exhaust opening in the housing containing a blower and closure means on the blower housing for opening and closing the exhaust opening whereby the blower can draw air from the interior of the vehicle through the duct means and through the exhaust opening.

4,628,703

SELF OPERATIVE COOLING MECHANISM OF CAN

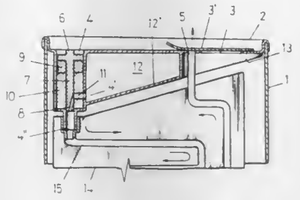
Ho Kim, 519-108 Yeunchi-dong, Sebaemoon-ku, Seoul, Rep. of Korea

Filed Jul. 29, 1985, Ser. No. 759,834

Claims priority, application Rep. of Korea, Jul. 10, 1984, 6557/1984

Int. Cl.⁴ F25D *3/10*

U.S. Cl. 62—294 **8 Claims**



1. A beverage container having therein means capable of cooling the contents of the container, said container having a top end panel with a beverage dispensing opening therein, said container having an internal baffle adjacent said top end panel dividing the interior of said container into a refrigerant compartment adjacent said top end panel and a beverage compartment below; said baffle being inclined with respect to said top end panel and downwardly away from said dispensing opening; a well opening through said top end panel and extending through said baffle at the deepest end of said refrigerant compartment; a refrigerant conduit in said beverage compartment having a first end communicating with the bottom of said well and a second end opening through said top end panel; said well being sealed from said refrigerant compartment except for an aperture communicating therewith adjacent said baffle; a valve element seated in said well normally sealing said aperture and moveable to connect said aperture with the end of said conduit to release refrigerant through said conduit for cooling the contents of said beverage compartment.

4,628,704

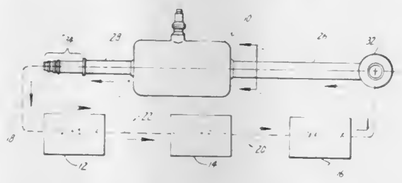
SURGE TANK FOR AIR-CONDITIONING COMPRESSOR

Robert D. Kilby, Orchard Lake, Mich., assignor to Michigan Special Products, Inc., Oxford, Mich.

Filed Sep. 6, 1983, Ser. No. 529,794

Int. Cl.⁴ F25D *19/00*

U.S. Cl. 62—296 **23 Claims**



1. In an automobile air-conditioning system of the type comprising a compressor, a condenser, and an evaporator connected in a closed refrigeration circuit by refrigerant lines, the improvement which comprises a surge tank in the line from the compressor to the condenser, said surge tank comprising a unitary cylindrical body defining a surge chamber space bounded by a sidewall and a pair of end walls, an inlet to communicate the surge chamber space to the compressor, and an outlet to communicate the surge chamber space to the condenser, and wherein both said end walls are formed by friction spinning to be integral with said sidewall whereby a one-piece body devoid of any circumferential seam is produced.

4,628,705

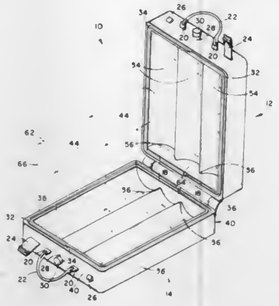
PORTABLE STORAGE CONTAINER

Thomas J. Nave, P.O. Box 2346, Bartlesville, Okla. 74005

Filed Aug. 8, 1984, Ser. No. 638,909

Int. Cl.⁴ F25D *3/08*

U.S. Cl. 62—457 **3 Claims**



1. A self-contained, portable, storage container styled in the form of a hollow attache case and characterized by an ability to maintain a plurality of objects contained therein at a desired cool temperature for relatively long periods of time comprising:

a pair of symmetrical container halves, each having an upper end, a lower end, two sides, and a plurality of internal recesses, so that in a closed position, the recesses of one half mate with recesses of the other half to form cavities of predetermined sizes and shapes which are adapted to receive said objects therein;

means for hingedly connecting the lower ends of the two halves together;

latch means for connecting the upper ends of the two halves together to hold them in closed position against each other;

each half having an outer wall and an inner wall spaced from the outer wall so as to form a chamber for receiving therein a freezable liquid;

said inner wall being connected to said outer wall along a plurality of spaced longitudinal ridges dividing said chamber into a plurality of longitudinal channels, each of said ridges being provided with a plurality of transverse passageways connecting said channels together so that freezable liquid can flow from one channel to the next adjacent channel; and

means for introducing a freezable liquid into each chamber;

wherein said latch means comprises a pair of protruding notches and a pair of snapping flaps, one notch and one flap being located at the upper end of each half in such a manner that the notch on one half is disposed opposite the snapping flap on the other half, each snapping flap being adapted to be received over the opposed notch on the opposite half to hold the two halves securely together in closed position.

4,628,706

PROCESS OF DEFROSTING AN EVAPORATOR OF A REFRIGERATION SYSTEM

Johann Neudorfer, Regau, Austria, assignor to Neura Elektronics Technische Anlagen Gesellschaft mbH, Vocklabruck, Austria

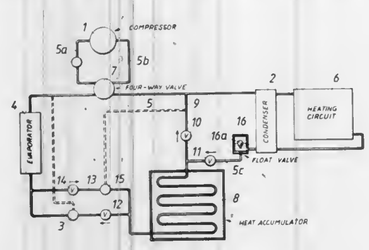
Filed Aug. 27, 1985, Ser. No. 769,866

Claims priority, application Austria, Sep. 4, 1984, 2823/84

Int. Cl.⁴ F25B *47/00*

U.S. Cl. 62—278 **5 Claims**

1. A system of defrosting an evaporator in a heat pump and refrigerating installation which comprises a closed circulating circuit for a refrigerant, the circuit including the evaporator, a compressor, a condenser, a heat accumulator, and throttle valve means for depressurizing the refrigerant between the evaporator and the heat accumulator, the circulating circuit being arranged for sequentially conducting the refrigerant, during a normal heating operation, from the compressor through the condenser, the heat accumulator, the throttle valve means and the evaporator back to the compressor, the refrigerant being condensed in the condenser, the heat accumulator extracting and accumulating heat from the condensed refrigerant to supercool the refrigerant and the supercooled, depressurized refrigerant flowing to the evaporator, and the



circulating circuit being arranged for reversing the flow of the refrigerant to conduct the refrigerant sequentially, during a defrosting operation, from the compressor through the evaporator, the throttle valve means, the heat accumulator and, by-passing the condenser, back to the compressor, the refrigerant being condensed in the evaporator to generate heat of condensation causing the evaporator to be defrosted and the accumulated heat in the heat accumulator causing the condensed, depressurized refrigerant to be evaporated in the heat accumulator before it is conducted back to the compressor without passing through the condenser.

4,628,707

AIR CONDITIONER

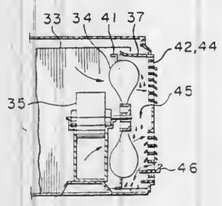
Kaneo Katayama, Yaizu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,392

Claims priority, application Japan, Nov. 27, 1984, 59-179619[U]

Int. Cl.⁴ F25B *47/00*

U.S. Cl. 62—280 **7 Claims**



1. An air conditioner comprising a box-like casing having an air-blowig outlet in its one side surface and an air-blowing fan facing said air-blowing outlet in said casing, said air-blowing fan being provided with a water-spattering ring for spattering drain water to a condenser, characterized by comprising a central member placed in said air-blowing outlet, a number of annular ribs coaxially arranged around said central member, a number of linear ribs radially extended from said central member so as to intersect said annular ribs, a passage for drain water which is formed in said central member to communicate the front side with the rear side, and a drain-water recovering dam member which is formed below said passage for drain water to feed drain water into the interior of said casing, wherein some linear ribs extending in the substantially upward and downward directions among said radially extended linear ribs project from levels of said coaxially arranged annular ribs, and some linear ribs extending in the substantially right and left directions are recessed from levels of said coaxially arranged annular ribs.

4,628,708

JEWELRY CHAIN ORGANIZER

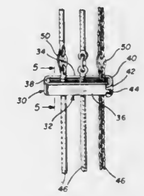
Alma T. Ivey, 7309 McCormack Dr., Hixson, Tenn. 37343

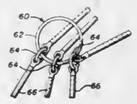
Division of Ser. No. 469,400, Feb. 24, 1983, Pat. No. 4,549,411.

This application Sep. 20, 1985, Ser. No. 778,258

Int. Cl.⁴ A44C *25/00*

U.S. Cl. 63—2 **2 Claims**





1. In combination, a plurality of flexible jewelry chains adapted to be oriented in encircling relation to the neck, wrist, arm or the like of a wearer, each chain including an openable fastener detachably connecting the ends of the chain together, said chains being free of each other and having a length rendering them sufficiently loose in their embrace of the member they are intended to encircle so that the chains have a tendency to become entangled by intertwining and the fasteners have a tendency to become misaligned and remotely spaced from one another about the member by moving in linear relation to each other, an organizer means for maintaining the plurality of said jewelry chains in predetermined relationship with the fasteners in adjacent, generally aligned relation, said organizer means comprising an elongated U-shaped spring clamp of one piece construction having opposed flat, generally parallel legs releasably and clampingly engaging all of the plurality of jewelry chains adjacent the fasteners without modifying the capability of independent use of such chains and without modifying the structural characteristics thereof, said legs releasably and clampingly engaging the jewelry chains reducing the tendency of the chains to become entangled by intertwining and preventing such misalignment and remote spacing of the fasteners by preventing relative linear movement of the chains by preventing displacement of the portions of the chains adjacent the fasteners that are releasably and clampingly engaged by the spring clamp, said legs being provided with an interior lining of resilient cushioning material and having flat inner opposed surfaces for frictionally engaging the chains without damage thereto and enabling clamping engagement with various sizes and shapes of chains, said legs being interconnected at one end thereof by a U-shaped bight portion and provided with a releasable latch structure at the other ends to enable opening and closing of the clamp.

4,628,709

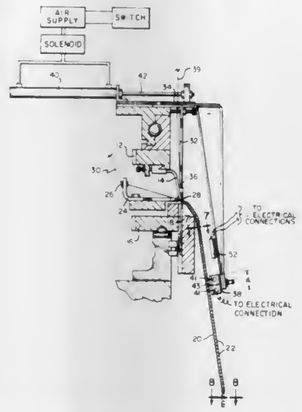
APPARATUS AND METHOD FOR PRODUCING KNITTED HOOK-TYPE FASTENER MATERIAL

Jurg Aeschbach, Manchester, N.H., and Edmund Rosa, Lowell, Mass., assignors to Actief N.V., Curacao, Netherlands

Continuation of Ser. No. 413,154, Aug. 30, 1982, abandoned, which is a division of Ser. No. 117,626, Feb. 1, 1980, abandoned, which is a continuation of Ser. No. 857,280, Dec. 5, 1977, abandoned. This application Mar. 18, 1985, Ser. No. 712,930

Int. Cl.⁴ D04B *9/12, 35/00*

U.S. Cl. 66—9 R **18 Claims**



1. A method of producing a weft knitted material having on one side a multiplicity of hook-like engaging elements suitable for repeated face-to-face engagement and disengagement with a material having a multiplicity of upstanding pile loop-like engaging elements, which includes a base knitted fabric, a plurality of upstanding hook-like engaging elements having substantially the same height, comprising:

(a) knitting by circular knitting techniques a base fabric layer of multifilamentary yarn material and simultaneously knitting about lancets, a sequential series of monofilamentary pile loop elements upstanding from said base fabric, said circular knitting causing said monofilamentary loop elements to move rotationally;

(b) applying predetermined downward forces to said fabric during the formation thereof;

(c) contacting the upper crest portions of said monofilamentary pile loop elements with a heated member by positioning the heated member in stationary relation adjacent the rotating monofilamentary loop elements after their formation, said heating member having a temperature sufficient to melt the crest portions of the loop elements such that substantially all said hook-like engaging elements are formed of a first monofilamentary member interknitted into and upstanding from said base fabric, and the relative rotary motion between the loop elements and the heated member resulting in the formation of a second melt formed engaging member positioned at the free end portion of said first upstanding monofilamentary member and extending generally transversely thereof, said second melt formed transverse members each being generally asymmetrically configured to have at least one end portion having a generally arcuate cross sectional configuration in a plane extending downwardly through said hook-like engaging element and an opposite tapered end portion of lesser average thickness than said arcuate end portion and being of greater flexibility than said arcuate end portion, such that the fabric may be placed in face-to-face relation with such mating loop-type material with the result that numerous engagements take place between the hook-like and loop-like elements, and separated by forces substantially normal to the interfacial plane of engagement, the asymmetric configurations of said hook-like engaging elements being such that the forces required to separate the hook-like elements from engaged loop-like elements in a direction from the arcuate end portions toward the generally tapered end portions are greater than the forces required to separate the hook-like elements in the opposite direction.

4,628,710

YARN-FEEDING APPARATUS AND METHOD FOR CONTROLLING IT

Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

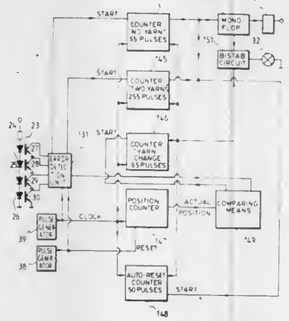
PCT No. PCT/EP84/00106, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/03906, PCT Pub. Date Oct. 11, 1984

PCT Filed Apr. 9, 1984, Ser. No. 680,337

Claims priority, application Sweden, Apr. 7, 1983, 8301934; May 20, 1983, 8302891; May 20, 1983, 8302892; Jul. 7, 1983, 8303895; Oct. 10, 1983, 8305547

Int. Cl.⁴ D04B *35/12, 35/16*

U.S. Cl. 66—132 T **16 Claims**



1. In a yarn feeding apparatus for the selective positive feeding of several yarns to a knitting machine, including sensor means for generating sensor signals,, the sensor signals representing the respective feeding condition or non-feeding condition of the yarns, and an error detection unit connected to the sensor means for turning off the knitting machine in response to predetermined sensor signal combinations representing a yarn breakage and/or a yarn over-feed and/or a yarn change fault, the improvement comprising wherein the error detection unit includes a working position sensing unit for generating actual position data representing the working position of the knitting machine, a logic circuit for deriving a yarn changing signal from the sensor signals, the yarn changing signal indicating the changing of yarns, and a memory means storing yarn changing position data which are dependent on the working position of the knitting machine when the yarn changing signal indicates the changing of yarns, wherein the error detection unit determines whether the actual position data fall within a data range when the yarn changing signal indicates the changing of yarns, the data range being defined by the stored position data, and wherein the error detection unit disables the turning off of the knitting machine in response to the predetermined sensor signal combination if the actual position data fall within the data range.

4,628,711

PROCESS FOR MANUFACTURING A PATTERNED WARP-KNITTED MATERIAL AND A WARP KNITTING MACHINE FOR ITS USE

Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

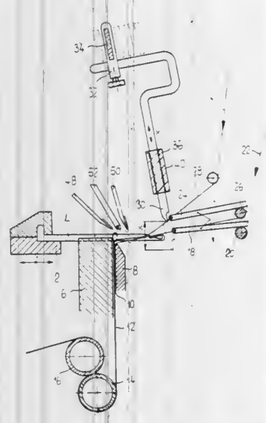
PCT No. PCT/CH85/00019, § 371 Date Dec. 19, 1985, § 102(e) Date Dec. 19, 1985, PCT Pub. No. WO85/04911, PCT Pub. Date Nov. 7, 1985

PCT Filed Feb. 6, 1985, Ser. No. 822,421

Claims priority, application Switzerland, Apr. 26, 1984, 2046/84

Int. Cl.⁴ D04B *23/00*

U.S. Cl. 66—204 **17 Claims**



1. A method for manufacturing a patterned warp knitted material in which at least one weft thread is inserted into the stitches of the warp stitch rows during the formation of the warp stitch rows from warp threads, and in which further a pattern thread is brought into the warp stitch rows to be patterned, the pattern thread being knitted into the stitches of the warp stitch rows on top of a section which is intended to carry a pattern and is inserted into the stitches of the warp stitch rows at the sections which are not intended to carry a pattern, characterized by feeding the pattern threads (**28**) in the same manner as the warp threads (**22**), and guiding the warp threads over at least two knitting needles (**4**,**4***a*,**4***b*) and preventing insertion of the pattern threads (**28**) into the knitting needles (**4**,**4***a*,**4***b*) at the sections (**80**) of the warp stitch rows (74_2 to 74_7) which are not to carry a pattern by means of controlled thread retainers (**30**,**30***a*,**30***b*,**56**).

4,628,712

APPARATUS AND METHOD FOR FEEDING TUBULAR TEXTILE FABRIC THROUGH A TREATMENT RANGE

Werner Strudel, Friedrichshafen, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

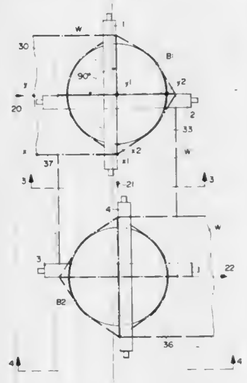
Filed Jul. 6, 1984, Ser. No. 628,664

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325590

Int. Cl.⁴ D06F *29/00*

U.S. Cl. 68—13 R **7 Claims**

1. An apparatus for feeding tubular textile fabric through a treatment range in a given feed advance direction, comprising feed-in means having a first longitudinal axis for passing the tubular textile fabric in a first flat shape into the treatment range in an inlet direction, discharge means having a second longitudinal axis for passing the tubular textile fabric in a second flat shape out of the treatment range in a discharge direction, cylindrical expander means having a third longitudinal axis, a first transition zone (**E1**) operatively positioned between said feed-in means and said cylindrical expander means, a second transition zone (**A1**) operatively positioned between said cylindrical expander means and said discharge means, said first transition zone (**E1**) expanding said first flat shape of the tubular textile fabric into a substantially cylindrical shape, said second transition zone contracting said cylindrical shape toward said discharge means for flattening the substantially cylindrical shape of the fabric back into said second flat shape as the fabric is travelling from said feed-in means to said discharge means, whereby points (x, y) on a line across said first flat shape must travel different distances through said first and second transition zones, thereby causing drafts in the fabric in said first and second transition zones, said feed-in means defining a feed-in first plane for the fabric upstream of said expander means as viewed in said feed advance direction, said discharge means defining a feed-out second plane for the fabric downstream of said expander means as viewed in the feed advance direction, said inlet direction extending perpendicularly to said first longitudinal axis, said discharge direction extending perpendicularly to said second longitudinal axis, said first and second longitudinal axes extending perpendicularly to said third longitudinal axis, said first and second longitudinal axes enclosing an angle around said third longitudinal axis of said expander means for twisting said inlet direction into said discharge direction for moving the tubular textile fabric out of said feed-in first plane into said feed-out second plane, whereby a longer draft in one transition zone is correlated with a shorter draft in the other transition zone and vice versa for substantially compensating by said twisting, said drafts caused in the fabric when it travels onto and off said expander means through said first and second transition zones respectively.



4,628,713

LOCK FOR VIDEO TAPE CASSETTES

Marino Cecchi, Lincolnshire, and Gregory J. Borucki, Hinsdale, both of Ill., assignors to Tape-Lock Company, Oak Brook, Ill.

Filed Mar. 29, 1985, Ser. No. 717,815

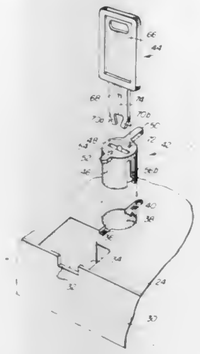
Int. Cl.⁴ E05B *73/00*

U.S. Cl. 70—58 **13 Claims**

1. Apparatus in combination with a (VHS) video tape cassette for preventing playing of said cassette, said cassette having a housing in which an elongate path is defined to accommodate travel of a cassette orienting pin on a tape deck of a video cassette recorder (VCR) upon movement of said cassette into the VCR in proper orientation, said apparatus comprising a lock attachable to said cassette housing to block said path and therefore travel of the VCR orienting pin therealong upon movement of said cassette into the VCR, whereby said lock prevents said cassette from being fully inserted into the VCR, and a key for said lock to detach said lock from said cassette housing to enable said cassette to be fully inserted into the VCR.

5. Apparatus in combination with a (VHS) video tape cas-

sette for preventing playing of said cassette, said cassette having a path defined along a lower surface of a housing thereof from a slot in a door of said cassette, through an opening, a first channel and a sensor LED transmission receptacle to a second channel, said path accommodating travel of a cassette orienting pin on a tape deck of a video cassette recorder (VCR) upon movement of said cassette fully into the VCR in proper orientation, said apparatus comprising a lock attachable to said cassette housing to block said path and to therefore block travel of the VCR orienting pin along said path upon movement of said cassette into the VCR, whereby said lock prevents said cassette from being fully inserted into the VCR, and a key for said lock to detach the same from said cassette housing to enable said cassette to be fully inserted into the VCR.

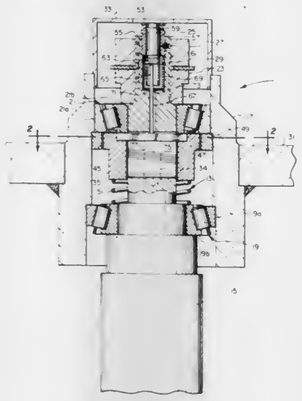


4,628,714

VEHICLE WHEEL LOCK

Elmer L. Batteas, Rte. 1, Box 150A, Brownwood, and Donald W. Hamlett, 127 Gorman St., Early, both of Tex. 76801

Filed Nov. 28, 1984, Ser. No. 675,961
Int. Cl.[4] B62H *5/14*
U.S. Cl. 70—226 **10 Claims**



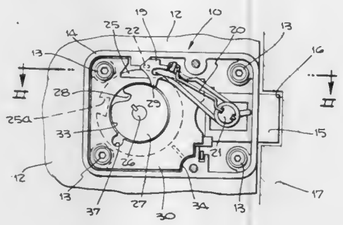
1. A vehicle wheel lock, which comprises:
a spindle having an axial passage formed therein;
a hub rotatably mounted on said spindle, said hub having formed therein an internal socket having at least one flat side;
a locking member nonrotatably mounted on said spindle within said hub, said locking member being nonrotatably engageable with said socket of said hub, said locking member being axially movable on said spindle between a locked position in engagement with said socket and an unlocked position with said locking member out of engagement with said socket;
spring means for urging said locking member toward said locked position;
and lock means for moving said locking member toward said unlocked position, said lock means including;
(a) a key-operable lock including a lock body mounted in said spindle passage and a rotating member mounted within said lock body, said rotating member being key-operable to rotate with respect to said lock body;
(b) a first screw-threaded member in said spindle passage connected to and rotatable with said rotating member of said key-operable lock; and,
(c) a second screw-threaded member threadedly engaged with said first screw-threaded member, said second screw-threaded member including an operator rod axially movably and nonrotatably mounted in said spindle passage to transmit force to said locking member to urge said locking member toward said unlocked position.

4,628,715

TUMBLER WHEEL ASSEMBLY SHIELD FOR COMBINATION LOCKS

Tim M. Uyeda, S. San Gabriel, and Klaus W. Gartner, Palos Verdes Estates, both of Calif., assignors to La Gard, Inc., Torrance, Calif.

Filed Mar. 1, 1985, Ser. No. 707,441
Int. Cl.[4] E05B *37/08*
U.S. Cl. 70—333 R **8 Claims**



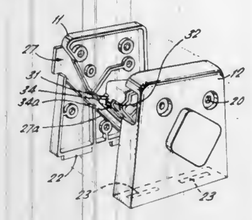
1. A combination lock security enhancing device for impeding unauthorized opening of a combination lock of the type having a lock housing, a plurality of tumbler wheels located within the housing and being rotatable by a lock dial associated spindle extending into the housing to cooperate with the tumbler wheels, and a fence lever for operating an associated bolt when the correct dialing of the lock combination aligns gates provided in the tumbler wheels with the fence lever, said device comprising the provision of: tumbler wheel assembly shielding means for covering a portion at least of the tumbler wheels in a location within said lock housing spaced rearwardly therein relative to said dial spindle and aperture means provided in said tumbler wheel assembly shielding means for facilitating passage of said spindle through said shielding means without disrupting its location within said lock housing in the event of an unauthorized effort to defeat the lock by the forcing of the spindle rearwardly out of the housing, wherein said tumbler wheel assembly shielding means further comprises:
a generally flat plate portion positioned generally parallel to and spaced from a rearward most tumbler wheel of said plurality of tumbler wheels and flange means extending from said plate portion generally around portions at least of said tumbler wheels to provide a shielding of both rearward and lateral portions of said plurality of tumbler wheels.

4,628,716

LOCK FOR CONTAINER LID

Thomas E. Palmer, Lytham St Annes, England, assignor to Glasdon Limited, England

Filed Jul. 26, 1985, Ser. No. 759,168
Claims priority, application United Kingdom, Jul. 27, 1984, 8419259
Int. Cl.[4] E05B *23/00*
U.S. Cl. 70—349 **11 Claims**



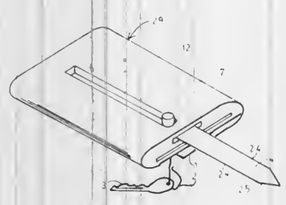
1. A lock having a projecting locking element to effect a locking action with a further component and being retractable in one direction to release the locking action, a key, means to guide the key to move in a second direction transverse to said first direction into engagement with the locking element, the locking element having a ramp thereon for engagement by the key and the key having at least two abutments spaced apart across the key to engage the locking element along lines of action spaced apart respectively in said one direction in which the locking element is movable, the abutments being staggered one behind the other in the second direction of insertion of the key into the lock, engagement of one abutment with the ramp on the locking engagement causes a first retraction of the locking element and engagement of a second abutment with the locking element causes a further retraction of the locking element to release the lock and blocking means being provided for the locking element between the lines of action of the two abutments with the locking element to prevent access to the locking element by a single member extending across the lines of action of the abutments of the key.

4,628,717

PROTECTIVE KEY HOLDER

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Filed Oct. 3, 1985, Ser. No. 783,675
Int. Cl.[4] A47G *29/10*; B26B *3/00*
U.S. Cl. 70—456 R **12 Claims**



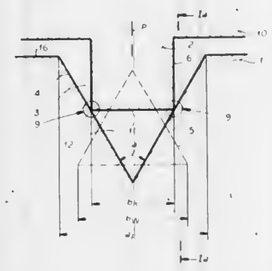
1. A protective keyholder, operable with one hand, for holding a plurality of keys in combination with a sliding blade knife that can be exposed for defensive use and sheathed for safety while a selected key is exposed ready for use in unlocking a lock, comprising:
a. a plurality of key clip means for holding individual keys;
b. a key clip means support means having a broad dimension across which said key clip means are linearly supported to facilitate selection of a particular key for exposed use;
c. a sliding knife blade having two opposed, substantially flat sides, two narrow edges, at least one of which is sharp, a pointed end and a base end, said base end including pushbutton engaging means;
d. pushbutton means engaging said base end of said blade for reversably sliding said blade between a first, sheathed position, and a second, exposed position, said pushbutton means including locking means for locking said blade in said first and second position, and said pushbutton means preventing said blade from detaching from said keyholder;
e. sheathing means enclosing said blade on said flat sides, said edges and said base when in sheathed position, said sheathing means providing two slot-shaped apertures, a first aperture through which said pointed end slidably passes to expose said blade in said exposed position and a second aperture through which said pushbutton means passes and along which it slides when exposing or sheathing said blade;
f. flexible cover means for reversibly enclosing said keys in a first, closed position and for providing access to said keys in a second, open position, said key clip support means disposed relative to said cover means to enable a selected key to be exposed while other keys are enclosed in said closed position; said sheathing means connected to said key clip support means with said broad dimension of said support means parallel to said flat sides of said knife blade, with said key clips on a first face of said support means and said sheathing means on an opposite second face of said support means to provide a combination whose dimensions exceed those of a keyholder without a knife by a minimal amount to provide a convenient and easily grasped unit and to dispose said blade and its pushbutton control so that they are operable by the same hand holding said exposed key for use in unlocking a lock; said sheathing means, said cover means, said enclosed keys and said support means in combination providing a grasping handle for defensive use of said blade when in exposed position.

4,628,718

METHOD OF ROLLING TO IMPART TRIANGULAR SECTION

Alfred Knauschner, Freiberg; Arno Hensel, Karl-Marx-Stadt, and Alfons Dobrindt, Magdeburg, all of German Democratic Rep., assignors to VEB Schwermaschinen-Bau Kombinat Ernst Thalmann, Magdeburg, German Democratic Rep.

Continuation of Ser. No. 676,184, Nov. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 379,891, May 19, 1982, abandoned. This application Feb. 13, 1986, Ser. No. 830,260
Int. Cl.[4] B21B *1/08*
U.S. Cl. 72—199 **2 Claims**



1. A method of operating a rolling apparatus comprising:
a grooved roll
rotatable about an axis,
having an outer roll surface, and
formed with a radially outwardly open groove having a pair of frustoconical and meeting groove flanks extend-

ing to the outer roll surface and spaced axially apart at the roll surface by a groove width; and

a ridged roll rotatable about an axis parallel to the axis of the grooved roll and formed with a ridge

engaging radially in the groove, and

having an at least partially cylindrical outer ridge surface centered on the respective axis and a pair of annular axially oppositely directed ridge faces flanking the ridge outer surface, the ridge outer surface forming the flanks of the groove a substantially triangular rolling opening extending perpendicular to a plane including the axes and having a maximum ridge width measured parallel to the axes which is smaller than the maximum groove width,

the method comprising the steps of:

rotating the rolls oppositely about the respective axes;

feeding to the opening in a direction perpendicular to the plane a substantially triangular-section workpiece having a maximum width measured parallel to the axes which is larger than the ridge width and smaller than said maximum groove width; and

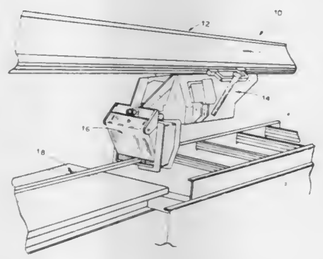
orienting the workpiece so the sectional shape of same is upside down compared to the sectional shape of the opening.

4,628,719

PULLER APPARATUS

Richard L. Best, Lowellville, Ohio, assignor to R. L. Best Company, Inc., Youngstown, Ohio

Filed Dec. 27, 1984, Ser. No. 686,841
Int. Cl.[4] B21C *35/02*
U.S. Cl. 72—257 **28 Claims**



1 A puller apparatus for pulling an extrusion profile as it emerges from an extruder, comprising:

a track extending away from the extruder in a direction parallel to the extrusion profile;

first and second rails formed on said track in a spaced-apart, opposed parallel relationship and each of said first and second rails extending parallel to said track;

first and second running surfaces formed on said first and second rails, respectively, for bearing a load, each of said running surfaces facing in an inclined upward and inward direction;

a puller carriage carried by said first and second wheels for rolling motion along said track;

a puller jaw mounted on said puller carriage for grasping and pulling the extrusion profile as it emerges from the extruder; and

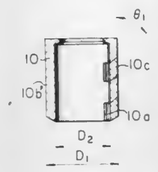
motive means for urging and translating said puller carriage along said track whereby said puller jaw grasps the extrusion profile and said carriage is translated along said track away from the extruder to pull the extrusion profile as it emerges from the extruder.

4,628,720

METHOD OF PRODUCTION OF CYLINDRICAL BODY

Tatsuhiro Tani; Hiroyuki Nagasawa; Rokuro Kikuchi; Tosio Tomite, and Hidemitsu Kobayashi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,157
Claims priority, application Japan, Jun. 20, 1983, 58-109142
Int. Cl.[4] B21D *39/02*
U.S. Cl. 72—368 **4 Claims**



1. A method of production of a cylindrical body comprising the steps of:

preparing a sheet of metal formed at opposite sides thereof with portions complementary to each other and adapted to fit one in the other;

rolling said metal sheet and fitting said complementary portions one in the other to form a cylindrical blank; and

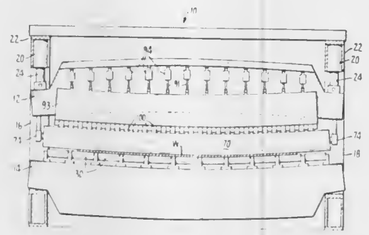
stretching at least one of inner and outer peripheral surfaces of the cylindrical blank in an axial direction while axially restraining at least a portion of said cylindrical blank and radially compressing a wall of said cylindrical blank in a manner to reduce thickness of the cylindrical blank over an entire periphery of the latter, thereby forming the cylindrical body in which said complementary portions are joined together in an intimately contacted manner by said stretching and compressing operation with at least a part of the contact surfaces between said complementary portions being deformed to have a predetermined taper angle below 90° with respect to said axial direction.

4,628,721

METHOD OF ROLL FORMING CYLINDRICAL PIPE

Calvin C. Williamson, Napa, Calif., assignor to Kaiser Steel Corporation, Fontana, Calif.

Division of Ser. No. 610,707, May 16, 1984. This application Jul. 9, 1985, Ser. No. 753,327
Int. Cl.[4] B21D *5/14*
U.S. Cl. 72—370 **3 Claims**



1. The method of rolling a section of metal plate into a cylindrical pipe section comprising the steps of:

pre-crimping the leading and trailing edges of said plate section to the final desired radius of said cylinder pipe section,

feeding the leading edge of said plate section into a forming mill that includes an overhead mandrel having a radius smaller than said final desired radius of said pipe section and a pair of circumferentially spaced, pivotally mounted, rotatably driven, bending roll assemblies,

clamping a pre-crimped edge of the plate between the mandrel and one of the bending roll assemblies,

bending the plate section between the mandrel and the pair of driven bending roll assemblies by applying sufficient pressure to the mandrel to cause the mandrel, the bending rolls, and a lower beam upon which they are supported to deflect downward along the length thereof until the lower support beam deflects sufficiently to resist downward forces acting on the bending roll supports so as to maintain a constant space between the mandrel and the bending roll assemblies while the forces exerted by the bending roll assemblies shift between those bending roll assemblies to assure that said plate section is uniformly bent along the length thereof to said desired final radius,

driving the bending roll assembly clamping the plate to the mandrel to advance the plate section into the forming mill, and

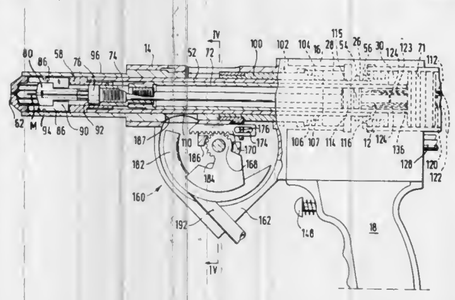
wrapping the plate to the curvature of the mandrel through pivotal action of the other of the two bending roll assemblies.

4,628,722

SETTING TOOL FOR RIVET WITH PULL-HEADED MANDREL

Dieter Mauer, Lollar, and Peter Potzas, Buseck, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Feb. 14, 1986, Ser. No. 830,150
Int. Cl.[4] B21D *31/00*
U.S. Cl. 72—391 **14 Claims**



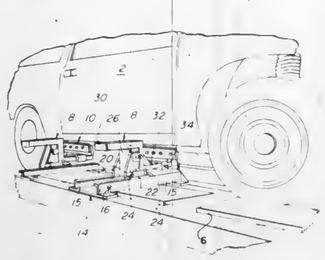
1. A blind-riveting tool comprising a housing, an abutment member having a rivet-engaging face at its forward end to engage the head of a rivet in a rivet-setting operation, and means reciprocable within the housing to pull the mandrel stem relative to the abutment member in the rivet-setting operation, the abutment member and mandrel-pulling means each comprising a plurality of rivet-assembly-engaging parts disposed about a common axis along which the mandrel will be pulled, which parts can be opened and closed relative to said axis to allow in their open condition the introduction therebetween of a mandrel with a pulling head, and in their closed condition the abutment member to engage the rivet head and the pulling means to engage the mandrel under its pulling head, said parts of the abutment member and pulling means being resiliently urged towards their open condition and arranged to be closed by the advance of a surrounding annular actuating element over said parts of the abutment member characterized in that said actuating element is mounted in said housing for reciprocation along said common axis behind a forwardly extending sleeve portion of said housing, the abutment member and mandrel-pulling means being also reciprocable along said axis between a rearward position behind said sleeve portion where they can be opened and closed and a forward position in which the rivet-engaging face of the abutment member is exposed for presentation of a rivet to a workpiece.

4,628,723

CLAMP SUPPORT

Ervin Buske, 1005 Market St., Gowrie, Iowa 50543

Filed Jul. 2, 1985, Ser. No. 751,206
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—422 **3 Claims**



1. A clamp support for securing a portion of a vehicle body onto a ramp comprising,

a base,

means for attaching the base onto a ramp,

an upwardly-open socket on said base,

a post removeably engaging in said socket and normally extending upwardly therefrom,

means for releaseably fastening the post in the socket,

a first arm extending outwardly from one side of said post,

a second arm extending oppositely outward from an opposite side of said post,

said post being reversible in said socket whereby to dispose either of said arms towards said portion of said vehicle body,

a sleeve slideably engaging over either of said arms,

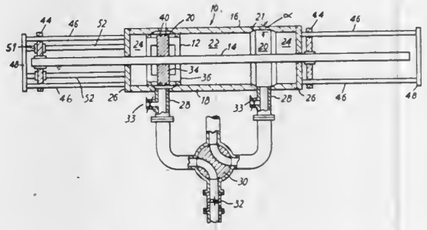
and a clamp on said sleeve, one of said arms being disposed at a relatively high level so that said clamp may be engaged onto the vehicle when the latter is jacked up from the ramp and the other arm being at a relatively low level so that the clamp may be engaged onto the vehicle when the latter is not jacked up from the ramp.

4,628,724

METER PROVERS

Robert Maurer, Middlesex, Great Britain, assignor to Skelton-hall Limited, Sheffield, England

PCT No. PCT/GB83/00047, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/02825, PCT Pub. Date Aug. 18, 1983
PCT Filed Feb. 16, 1983, Ser. No. 551,980
Claims priority, application United Kingdom, May 13, 1982, 8204529; Jun. 29, 1982, 8212883; Jun. 29, 1982, 8218825
Int. Cl.[4] G01F *25/00*
U.S. Cl. 73—3 **10 Claims**



1. A meter prover comprising a cylinder having a cylindrical proving bore and a cylindrical end chamber which is coaxial with the proving bore and of a larger diameter than that of the proving bore, the end chamber and the proving bore being

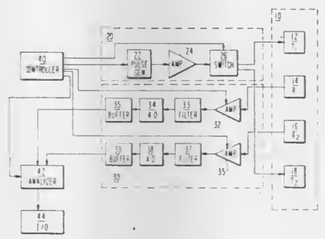
contiguous; a fluid port communicating with the end chamber for connection externally of the prover with a meter to be proved; a piston mounted in the cylinder for movement along the bore in sealed engagement therewith in synchronism with fluid flow through the prover in a proving run, the piston being receivable in said end chamber in a rest position, the axial dimension of the piston exceeding that of the end chamber such that in said rest position at least a portion of the piston remains in engagement with the proving bore, there being provided a continuously open passage extending between at least one aperture disposed in the circumference of the piston and an opening in the piston end face adjacent the proving bore, said at least one aperture lying within the end chamber in said rest position of the piston so that fluid may pass through the piston along said passage in the rest position.

4,628,725

APPARATUS AND METHOD FOR ANALYZING A FLUID THAT INCLUDES A LIQUID PHASE, CONTAINED IN A TUBULAR CONDUIT

Michel M. A. Gouilloud, Ridgefield, and Thomas J. Plona, New Milford, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,403
Int. Cl.⁴ G01N *29/02*
U.S. Cl. 73—19 **26 Claims**



1. An apparatus for use in measuring a characteristic of a fluid that includes a liquid phase, contained in a tubular conduit, comprising:

means for exciting acoustic energy in said conduit, the frequency of excitation being selected to avoid significant excitation of higher order modes in said conduit section;

means for detecting acoustic energy excited in said tubular conduit, whereby a detection signal is provided;

means coupled to said detection means for compensating said detection signal for a fast arrival, whereby a compensated signal is provided;

means coupled to said compensating means for determining a property of said detected acoustic energy from said compensated signal; and

means for determining a characteristic of said fluid from said property.

4,628,726

ANALYSIS OF ORGANIC COMPOUNDS IN BATHS USED IN THE MANUFACTURE OF PRINTED CIRCUIT BOARD USING NOVEL CHROMATOGRAPHIC METHODS

Kurt E. Heikkila, Shoreview; Rodney K. Williams, St. Paul, and Russell J. Pylkki, Minneapolis, all of Minn., assignors to ETD Technology, Inc., Shoreview, Minn.

Continuation-in-part of Ser. No. 594,558, Mar. 29, 1984. This application Oct. 24, 1985, Ser. No. 790,834
Int. Cl.⁴ G01N *31/08*; B01D *15/08*
U.S. Cl. 73—61.1 C **23 Claims**

1. An analytical method of determining the concentration of an organic analyte or mixtures thereof in a chemical bath, other than an acidic or base metal plating bath medium, used in the manufacture of printed circuit boards using an HPLC apparatus having components that maintain the stability, precision and accuracy of the analytical method which comprises:

(1) obtaining an HPLC apparatus having:

(a) a chromatographic column, containing a stationary phase and a support phase composition sufficient to resolve each organic analyte, having an inlet and an outlet;

(b) a detector means for measuring the relative concentration of each organic analyte, having an inlet and an outlet, wherein the chromatographic column outlet is attached in liquid communication to the detector inlet;

(c) a second column, having a packing comprising at least a support phase composition, and having an inlet and an outlet, wherein the second column outlet is connected in liquid communication with the chromatographic column inlet, wherein the second column support phase composition can substantially reduce the effect of the acidic or basic components of the sample on the reproducibility, precision or accuracy of the analysis;

(d) a sample introduction means having an inlet, an outlet and a sample introduction port, wherein the sample introduction means outlet is attached in liquid communication to the second column inlet; and



(e) a source of solvent under pressure attached in liquid communication to the sample introduction means inlet;

(2) passing a stream of solvent under pressure through the HPLC apparatus;

(3) applying a sample of the chemical bath to be analyzed into the stream of solvent under pressure at the sample introduction port;

(4) passing the chemical bath sample in the solvent through the second column wherein the column packing substantially reduces the effect of the acid or basic components of the sample, forming an innocuous analyte;

(5) passing the innocuous analyte in the stream of solvent into the chromatographic column, resolving the analyte components into detectable segments utilizing the interaction between the analyte and the stationary phase; and

(6) passing the detectable segments in the solvent into a detector that can produce a signal which as a result of the cooperation of the elements of the HPLC apparatus detector and the sample obtains a substantially linear relationship between the analyte concentration in the sample and the integration units produced from the signal.

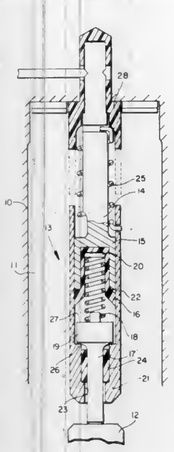
4,628,727

FUEL INJECTION NOZZLES

Robert B. Seaman, Cirencester, and Keith E. Horne, Cricklade, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 15, 1985, Ser. No. 798,371
Claims priority, application United Kingdom, Nov. 29, 1984, 8430150
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—119 A **12 Claims**

1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a valve member which is resiliently loaded into contact with a seating and which is movable away from the seating by the action of fuel under pressure to allow fuel flow from an inlet to an outlet, switch means for providing a signal indicative of when the valve member has been lifted from the seating, said switch means comprising a first member mounted on a fixed part of the nozzle, a second member which is coupled to and is moved towards the first member as the valve member of the nozzle is lifted from the seating, a third member movable relative to the first and second members, electrical contacts on said second and third members, resilient means acting on said third member to urge said contacts into engagement, and a damping chamber defined by at least two of said members acting to restrain the movement of the third member by said resiilient means, the arrangement being such that when the valve member is lifted from its seating the second member will move to separate said contacts, the movement of the third member being restrained by said damping chamber.

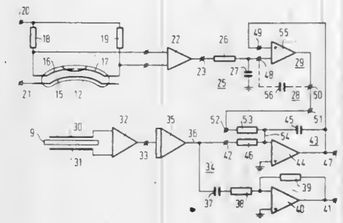


4,628,729

ARRANGEMENT FOR DETERMINING THE INSTANTANEOUS ANGULAR POSITION OF A MOVING OBJECT

Martinus L. G. Thoone, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,886
Claims priority, application Netherlands, Jul. 16, 1984, 8402241
Int. Cl.⁴ G01C *21/00*
U.S. Cl. 73—178 R **6 Claims**



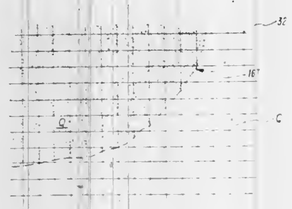
1. An apparatus for determining the instantaneous angular position of a moving object in which the angle between a reference plane in the object and a vertical plane coinciding with the direction of the force of gravity is determined, comprising: a rotational acceleration sensor arranged in the line of intersection of the two planes and connected to determine the high-frequency components in an angular signal proportional to the angle to be measured for feed to a first processing circuit comprising a first integrator connected to a first input of a second integrator having a second input and an output, a second sensor connected for determining the low-frequency components in the angular signal for feed to a second processing circuit which includes a low-pass filter, a summing circuit for summing the low-frequency and high-frequency components so that an output of the apparatus supplies the said angular signal, characterized in that the second sensor comprises an electrolytic levelling instrument and the second input of the second integrator is connected to an output of the second processing circuit, means connecting the output of the second integrator to the output of the apparatus and to a first input of a comparison circuit included in the second processing circuit, and means connecting a second input of the comparison circuit to the low-pass filter which is connected to the electrolytic levelling instrument.

4,628,728

METHOD FOR MEASURING THE VOLUMETRIC CAPACITY OF ANILOX ROLLS

Jefferson H. Taylor, and Eugene L. Green, Sr., both of Dallas, Tex., assignors to Wilson Engraving Company, Inc., Dallas, Tex.

Filed Feb. 21, 1986, Ser. No. 831,611
Int. Cl.⁴ G01F *17/00*
U.S. Cl. 73—149 **9 Claims**



1. A method for measuring the volumetric capacity of a transfer roller of the type having spaced cells formed in a transfer surface comprising the steps:

depositing a known volume of a liquid agent onto the transfer surface;

dispersing the liquid agent deposit into the cells of the transfer surface;

measuring the area of the spread deposit; and,

dividing the known volume of said deposit by the measured area.

4,628,730

EQUAL FLUID FLOW DISTRIBUTION SYSTEM AND MANIFOLD

James V. Maguire, 17001 Bluewater La., Huntington Beach, Calif. 92649

Filed Nov. 1, 1984, Ser. No. 667,431
Int. Cl.⁴ G01F *7/00*
U.S. Cl. 73—195 **10 Claims**

1. A fluid monitoring system for establishing accurate uniform metering of fluid flow comprising,

source means,

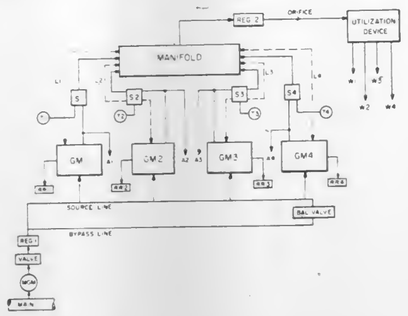
utilization means,

metering means for measuring fluid flow from said source means to said utilization means, and

manifold means connected to said metering means between said source means and said utilization means to equilibrate the fluid flow through said metering means,

said manifold means comprises an elongated tubular member having a plurality of inputs connected to said metering

means and at least one output connected to said utilization means,



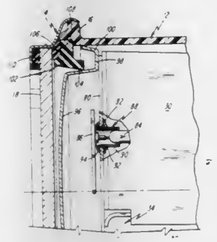
said inputs are disposed in the opposite ends of said tubular member and said output is disposed at the midpoint of one side of said tubular member.

4,628,731

FOG-RESISTANT GAUGE

Leonard H. Copeland, York, Pa., assignor to Datcon Instrument Company, East Petersburg, Pa.

Filed Jan. 13, 1986, Ser. No. 818,593
Int. Cl.[4] G01D *11/24, 11/26*
U.S. Cl. 73—431 **6 Claims**



1. In a gauge for indicating variable conditions including an outer case housing a movement, a dial and a needle pivotally coupled to the movement mounted therein for indicating said conditions and an outer lens mounted in sealing engagement with the outer case for viewing the dial and needle the anti-fogging improvement comprising:

an inner case disposed within the outer case surrounding the movement, said inner case having a vent so that the interior of the inner case is in communication with the interior of the outer case;

an inner lens disposed between and mutually spaced away from the outer lens and the dial, the periphery of the inner lens mounting baffle means surrounding said lens and abutting the inner surface of said outer case for restricting communication between the interior of the outer case and the space between said lens;

anti-fog coating means covering at least the inner surface of said outer lens.

4,628,732

CONNECTING DEVICE FOR MEASURING INSTRUMENTS

Veikko Mäkinen, Tampere, Finland, assignor to Valmet Oy, Tampere, Finland

Filed Oct. 3, 1985, Ser. No. 783,496
Int. Cl.[4] G01L *19/14*
U.S. Cl. 73—432.1 **20 Claims**



1. A connecting device for measuring instruments comprising:

a body member arranged to be attached to a member which defines a boundary surface of a process said body member defining an aperture therein;

a selector member having a measuring instrument affixed thereto, said selector member being movable with respect to said body member, said selector member having a hole therethrough;

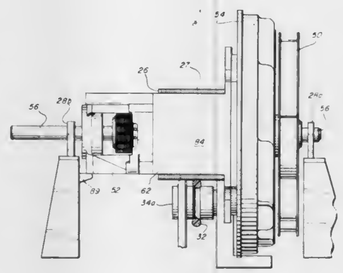
wherein said hole is adapted for communication with said aperture, said aperture being adapted for communication with the process for permitting passage of the measuring device through said hole and said aperture to measure characteristics of the process in the measuring position of said connecting device, and wherein said selector member comprises a closing surface for covering said aperture of said body and closing said aperture in the closed position of said connecting device.

4,628,733

METHOD AND APPARATUS FOR BALANCING A MOTOR-FAN SYSTEM

Arne M. Nystuen, Lincoln Township, Berrien County, and John M. Kuss, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 14, 1985, Ser. No. 691,210
Int. Cl.[4] G01M *1/16*
U.S. Cl. 73—462 **12 Claims**



1. Apparatus for detecting the degree of unbalance of a motor-fan system including a motor armature having a shaft and a fan fixed to the shaft of the armature, comprising:

a pair of spaced end brackets for rotatably supporting the armature shaft;

at least one motor bracket disposed between the end brackets including means for detachably mounting a set of field coils for the motor thereon, the motor bracket further including a recess therein having an opening which, when the set of field coils is detached from the motor bracket, exposes the armature; and

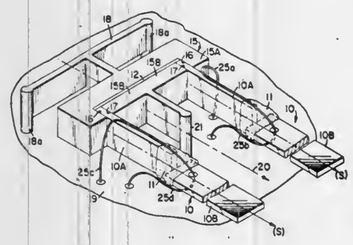
an unbalance detection unit including a pair of spaced bearings for rotatably supporting the armature shaft, means extending into the recess and engaging the armature for rotating the motor-fan system and means coupled to the spaced bearings for sensing the forces transmitted thereto by rotation of the motor-fan system.

4,628,734

ANGULAR RATE SENSOR APPARATUS

William S. Watson, Eau Claire, Wis., assignor to Watson Industries, Inc., Eau Claire, Wis.

Continuation-in-part of Ser. No. 341,229, Jan. 21, 1982, abandoned. This application May 25, 1984, Ser. No. 614,336
Int. Cl.[4] G01P *15/10*
U.S. Cl. 73—505 **28 Claims**



1. Improved angular rate sensor apparatus, comprising:

(a) a pair of matched vibratory piezoelectric angular rate sensor elements, each comprising a drive bender member having a drive resonance frequency and suitable for receiving an energizing drive signal and a sense bender member having a sense resonance frequency operatively connected for movement with said drive bender member and suitable for receiving an actuation stimulus;

(b) means for mounting said pair of angular rate sensor element in close proximity within a distance of 0.008 wavelengths of said drive resonance frequency, for physical vibration in direct opposition to one another about a nodal axis;

(c) drive means operatively connected with said drive bender members of said sensor elements for energizing said sensor elements in a first mode of operation for opposed oscillatory motion relative to one another about said nodal axis; wherein vibrational forces from said pair of elements cancel along said nodal axis such that transmission thereof through said mounting means is negligible and acoustic noise radiation from said apparatus is reduced;

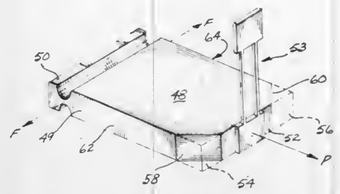
(d) sensing means independent from said drive means and operatively connected with at least one of said sense bender members for producing a sensed output signal in response to a received actuation stimulus, wherein said stimulus causes a change in movement of said one sense bender member from its first vibrational mode of operation.

4,628,735

VIBRATING BEAM ACCELEROMETER

Gordon S. Kirkpatrick, Renton, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 14, 1984, Ser. No. 681,564
Int. Cl.[4] G01P *15/10*
U.S. Cl. 73—517 AV **14 Claims**



1. An accelerometer, comprising:

a pendulum having first and second ends, the pendulum having a first axis extending between the first and second ends and being hingedly connected at the first end to a support along a second axis perpendicular to the first axis, the pendulum having a width dimension parallel to the second axis;

a force transducer comprising an oscillator and a dual beam force sensing element connected between the second end of the pendulum and the support, the point of connection of the force sensing element to the pendulum lying along the first axis, the force transducer being adapted for vibration over a predetermined operating range of beam vibration frequencies; and

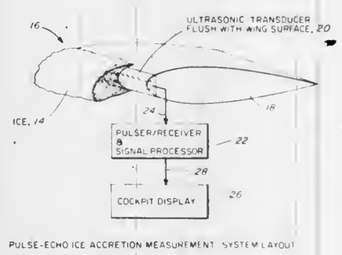
the second end of the pendulum being formed with a width that is smaller than the width of the pendulum adjacent the first end so as to cause the frequencies of pendulum vibration modes to lie outside the operating range.

4,628,736

METHOD AND APPARATUS FOR MEASUREMENT OF ICE THICKNESS EMPLOYING ULTRA-SONIC PULSE ECHO TECHNIQUE

Mark S. Kirby, West Midlands, England, and Robert J. Hansman, Jr., Scituate, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 14, 1985, Ser. No. 691,091
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—590 **17 Claims**



PULSE-ECHO ICE ACCRETION MEASUREMENT SYSTEM LAYOUT

1. An apparatus for measurement of the thickness of ice on an ice-accreting surface employing an ultra-sonic pulse echo technique, comprising:

an ice-accreting surface;

transducer means mounted at said surface for transmitting an ultra-sonic signal into said ice and for receiving a reflected signal; and

means for evaluating the time delay between transmission

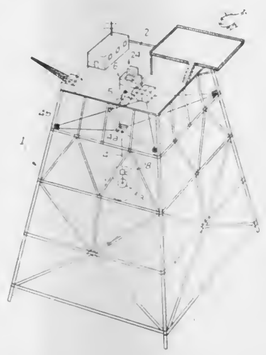
and reception of the ultra-sonic signal, the time delay indicative of the thickness of the ice.

4,628,737

METHOD AND DEVICE FOR LOCATING AND CHARACTERIZING FLAWS IN A KNOWN, SUBMERGED METAL STRUCTURE

Joël Charles, 27, Boulevard Grignan, 83100 Toulon; Lionel Gaudriot, Le Bourg, 69300 Lozanne, and Jean-Marc Parot, 30, Chemin de la Ronde, 69160 Tassin la Demi Lune, all of France

Filed Jan. 25, 1985, Ser. No. 694,989
Claims priority, application France, Jan. 26, 1984, 84 01426
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—624 **11 Claims**



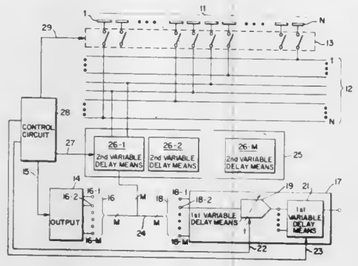
1. A method for locating and characterizing flaws in a known, submerged metal structure, said method consisting in:
placing a sound transmitting and receiving probe or antenna having a plurality of receiving transducers within acoustic range of a known, submerged metal structure;
emitting at least one ultrasonic pulse in the 30–150kHz frequency range;
picking up echo signals from n specular reflection points or highlights of the structure;
determining the angular coordinates of the reflection points by ordering the data concerning the arrival times of the various echoes at the sound probe's or antenna's various receiving transducers, according to various typical time sequences associated with wavefronts coming from n localized reflection points;
determining the theoretical coordinates of the various reflection points or highlights;
determining the position of said sound probe or antenna based upon said coordinate data;
displaying the pattern of said highlights;
comparing said pattern with the stored theoretical image of the structural area being inspected;
and revealing any lacking or additional reflection points compared with the structure's theoretical highlights or isotropic points.

4,628,738

ULTRASONIC IMAGING DEVICE

Christoph B. Burckhardt, Muttenz; Rainer Fehr, Reinach, and Peter Krummenacher, Gipf-Oberfrick, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 695,768, Jan. 28, 1985, abandoned. This application Feb. 19, 1986, Ser. No. 830,601
Claims priority, application Switzerland, Jan. 30, 1984, 416/84
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 **7 Claims**



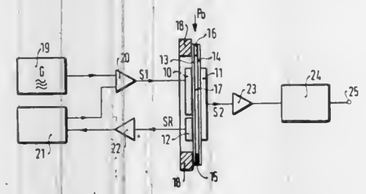
1. An improved transmitter/receiver device for an ultrasonic imaging unit for producing cross-sectional images of a body, said unit operating by the pulse echo method and being of the type comprising:
an array of transducer elements which are disposed side by side and which in response to transmission signals fed to the transducer elements directs ultrasonic pulses into the body along a plurality of beams, receives echoes of these pulses reflected by irregularities of the acoustical resistance within the body, and generates electrical echo signals in response to the received echoes and
first electrical connecting means for transmitting the transmission and the echo signals between the transducer elements and electrical connections in the transmitter/-receiver device, said connecting means either being in the form of permanent connections or connections which are adapted to be established in response to first control signals,
wherein the improvement comprises the further provision of:
(a) a transmission signal generator which, in response to second control signals, delivers, by way of a plurality of outputs, groups of selected transmission signals, said groups having predetermined positions in time, and each transmission signal of a group being delivered via a respective output of said generator,
(b) an echo signal processing circuit having a plurality of inputs and containing first variable delay means by means of which the echo signals reaching the inputs of the echo signal processing circuit can be selectively delayed in response to third control signals,
(c) an array of lines, each line connecting one output of the transmission signal generator to a respective input of the echo signal processing circuit,
(d) signal transmission means inserted between the array of lines and the first electrical connecting means, said signal transmission means containing second variable delay means by means of which the transmission signals and the echo signals can be selectively delayed in response to fourth control signals and
(e) second electrical connecting means by means of which the transmission signal generator, the first and the second delay means and, as required, the first elec- trical connecting means are adapted to be connected to a control circuit delivering the second, third, fourth and, if required, the first control signals.

4,628,739

DEVICE FOR MEASURING THE PRESSURE OF A GAS LIKE MEDIUM

Gerhard Brüggen, Stuttgart; Dieter Karr, Leonberg; Wolfgang Rottler, Markgröningen, and Ilan Brauer, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00114, § 371 Date Mar. 11, 1985, § 102(e) Date Mar. 11, 1985, PCT Pub. No. WO85/00425, PCT Pub. Date Jan. 31, 1985
PCT Filed May 19, 1984, Ser. No. 717,240
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324478
Int. Cl.[4] G01L *11/00*
U.S. Cl. 73—702 **8 Claims**



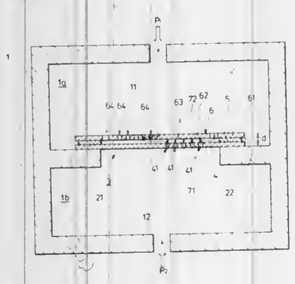
1. Device for measuring the pressure of a gas-like medium by means of a piezoelectric measuring device, comprising two piezoelectric oscillators (**10,11**) disposed opposite each other and spaced from each other to define a hollow space therebetween, said piezoelectric oscillators being arranged in a substantially closed system into which a gas to be measured is introduced and wherein a first oscillator (**10**) is excited and a second oscillator (**11**) is coupled to the first oscillator (**10**) by means of a gas buffer which is contained in said hollow space (**17**) between the oscillators (**10,11**) and causes said second oscillator (**11**) to oscillate passively; a conduit (**16**) connecting said hollow space with a remaining gas being measured (P_O); and a reaction oscillator (**12**) mechanically connected to the first oscillator (**10**) so that an exciting signal (**SR**) of said reaction oscillator is applied to and acts at least indirectly on the oscillators (**10,11**) and on an output signal (**S2**) of said second oscillator so as to compensate for aging and temperature influences in said closed system.

4,628,740

PRESSURE SENSOR

Toshitsugu Ueda; Fusao Kohsaka, and Yoshinobu Sugihara, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,909
Int. Cl.[4] G01L *9/04, 9/12, 13/06*
U.S. Cl. 73—705 **12 Claims**



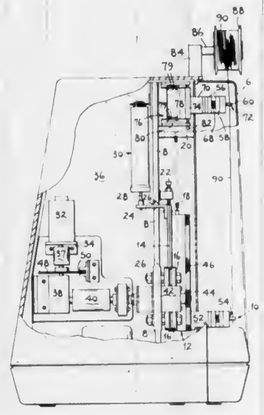
1. A pressure sensor comprising a fixed plate comprising slits through which pressure is introduced;
a movable plate disposed opposite to said fixed plate and being subjected to a first pressure and a second pressure;
a supporting member rotatably supporting said movable plate at two points on a straight line passing through the center of gravity of said movable plate;
wherein said first pressure is applied on one surface of said movable plate and said second pressure is introduced through said slits in said fixed plate and is impressed on the other side of said movable plate, thereby to rotate said movable plate in accordance with the difference between said first pressure and said second pressure; and
detecting means for detecting displacement or torque in said movable plate caused by said rotation of said movable plate, and for generating a signal indicative of said displacement or torque corresponding to said difference between said first pressure and said second pressure.

4,628,741

TENSILE TESTING MACHINE

Michael J. Cable, Maldon, England, assignor to Dynapert-Precima Limited, Colchester, England

Filed Aug. 14, 1985, Ser. No. 765,518
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—826 **12 Claims**



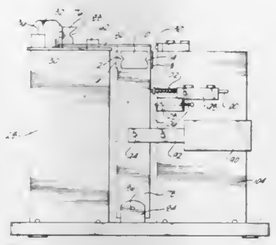
1. A testing machine for applying a load to a test specimen, said machine comprising:
a frame;
first means for clamping the test specimen, said first clamping means being secured to said frame;
second means for clamping the test specimen, said second clamping means being secured on a carriage moveable on said frame;
a motor, mounted on said frame and arranged to drive a pinion through a clutch;
a rack secured to the carriage and in engagement with said pinion so as to move said carriage associated with said second clamping means and thereby move said second clamping means away from said first clamping means; and
means, operative when said clutch is disengaged, for returning said carriage to an initial position in which said first and second clamping means are spaced apart by an initial predetermined spacing.

4,628,742

TENSILE STRENGTH TESTER FOR HAIR

Frank E. Golding, Hacienda Heights, Calif., assignor to Redken Laboratories, Canoga Park, Calif.

Filed May 20, 1985, Ser. No. 735,688
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—829 **13 Claims**



1. Apparatus for testing hair quality comprising:

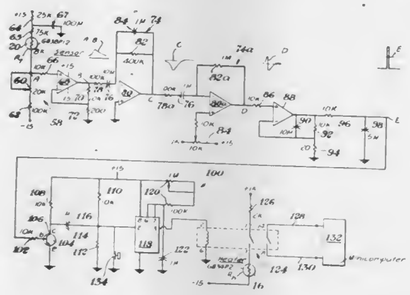
a frame, clamping means fixedly secured to the frame for holding the ends of a hair strand together to form a loop, a movable member engaging the loop, solenoid drive means for applying a force to the movable member away from the clamping means to stretch and elongate the loop, control means for increasing the force exerted by the solenoid at a controlled rate, means for measuring the force exerted by the moving member against the loop, means for measuring the change in position of the movable member relative to the frame, and means responsive to the force measuring means for deenergizing the solenoid means to return the movable member to its initial position relative to the clamping means in response to a decrease in the measured force.

4,628,743

APPARATUS AND METHOD FOR METERING SUB-10 CC/MINUTE LIQUID FLOW

Theodore E. Miller, Jr., and Hamish Small, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 280,668, Jul. 6, 1981, Pat. No. 4,532,811. This application Jun. 14, 1985, Ser. No. 738,125
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] G01F *1/68, 1/70;* G01P *5/18*
U.S. Cl. 73—861.05 **8 Claims**



1. A method of non-invasive liquid metering to determine the volumetric flow rate of small quantities of a flowing liquid passing through a small elongate channel having a volume corresponding to a calibrated cell volume (V_c) of about 0.5 cc or less, the method comprising the steps of:

(a) introducing a heat pulse into a flowing stream;

(b) detecting the heat pulse downstream with a temperature sensitive element to produce an electrical sensor output;

(c) electronically time differentiating the sensor output to reject slower ambient thermal drift and minimize response time in preparation for subsequent pulse detection, said time differentiating event producing an electrical signal which in magnitude is proportional to the second or a higher order time derivative of the sensor output;

(d) using the time differentiated sensor output to trigger a subsequent heat pulse upstream;

(e) repeatedly continuing steps (b), (c) and (d);

(f) measuring the time intervals between successive pulses; and

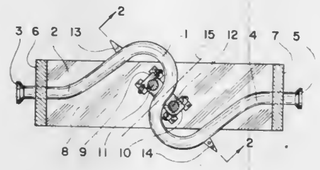
(g) determining the volumetric flow rate of the liquid through the elongate channel based on the measured time intervals between successive pulses.

4,628,744

S-TUBE CORIOLIS FORCE FLOW METER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Apr. 22, 1985, Ser. No. 725,986
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **4 Claims**



1. A flow rate measuring device comprising in combination:

(a) a support;

(b) a sinuous conduit secured to said support at two extremities of said sinuous conduit including a first smooth bend adjacent to one extremity of said sinuous conduit turning about a first direction; a second smooth bend adjacent to said first smooth bend turning about a second direction opposite to said first direction; a third smooth bend adjacent to said second smooth bend turning about said first direction; and a fourth smooth bend intermediate said third smooth bend and the other extremity of said sinuous conduit turning about said second direction, wherein the combination of said first and second smooth bends and the combination of said third and fourth bends are radially symmetric to one another and the common tangent line simultaneously tangential to said second and third smooth bends and passing through the midsection of said sinuous conduit substantially intersects the line connecting the two extremities of said sinuous conduit at an angle substantially less than ninety degrees;

(c) means for exerting oscillatory force to said sinuous conduit at said midsection of said sinuous conduit wherein said means vibrates said sinuous conduit in a direction transverse to the plane including said sinuous conduit, and thus creating oscillatory flexural movements of equal signs for the two halves of said sinuous conduit and creating oscillatory pivoting movements of opposite signs for said second and third smooth bends; and

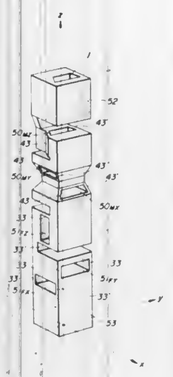
(d) a first means disposed substantially adjacent to one extremity of said second smooth bend connected to said first smooth bend, and a second means disposed substantially adjacent to one extremity of said third smooth bend connected to said fourth smooth bend for measuring oscillatory torsional motion of said sinuous conduit about an axis parallel to said common tangent line as a measure of mass flow rate of fluid moving through said sinuous conduit.

4,628,745

MULTI-AXIS LOAD SENSOR

Yotaro Hatamura, 12-11, Kohinata 2-chome, Bunkyo-ku, Tokyo 112, Japan

Filed Apr. 30, 1984, Ser. No. 605,212
Claims priority, application Japan, Sep. 14, 1983, 58-168385
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.04 **11 Claims**



1. A multi-axis load sensor adapted to be connected between a first rigid member and a second rigid member so as to detect the magnitude, direction and point of action of a force to be transmitted between the first and second rigid members, wherein said multi-axis load sensor comprises in combination:

a first radial plate structure having a standard axis, which extends in a prescribed direction and is adapted to detect a moment component to be produced about the standard axis by the force, wherein said first radial plate structure comprises at least one pair of plates having a thicknesswise dimension smaller than a widthwise dimension thereof and arranged radially with respect to a prescribed point; and

at least one parallel plate structure and at least one second radial plate structure of the same type as said first radial plate structure, wherein said parallel plate structure comprises at least one pair of plates having a thicknesswise dimension smaller than a widthwise dimension thereof and arranged parallel to each other, said parallel plate structure having a standard axis which extends in a prescribed direction and which is adapted to detect a force component to be produced in the direction of the standard axis by the force, and wherein the standard axes of said parallel plate structure and said second radial plate structure are neither coincident with nor parallel to the standard axis of said first radial plate structure.

4,628,746

DEVICE FOR DETERMINING THE TORQUE TRANSMITTED BETWEEN A SET OF CONICAL DISKS OF A CONTINUOUSLY VARIABLE TRANSMISSION AND THE SHAFT THEREOF

Jacobus H. M. van Rooij, Nuenen, Netherlands, assignor to Varicar B. V., Netherlands

Filed Feb. 1, 1985, Ser. No. 697,235
Claims priority, application Netherlands, Feb. 2, 1984, 8400324
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.34 **2 Claims**

1. Continuously variable transmission, comprising:

a shaft (**201**) carrying, by means of a roller bearing (**199**), a first conical disc (**206**) and a second conical disc (**208**), coupled to said shaft so as to be non-rotatable but movable in axial direction with respect to said shaft,

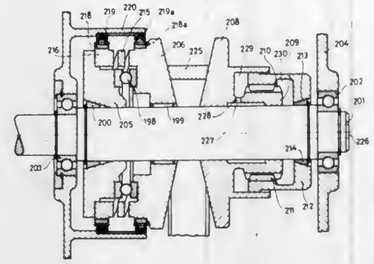
said first disc (**206**) being provided at its outer circumference with a first tooth ring (**218***a*),

and being connected to one end of a cylindrical torsion element (**215**) with circumferential incisions, the other end of said element being connected to a flange (**205**) fixed on said shaft (**201**),

a thrust roller bearing (**198**) interposed between said first conical disc (**206**) and said flange (**205**),

said flange carrying on its outer circumference a second tooth ring (**218**),

said first (**218***a*) and second (**218**) tooth ring each being



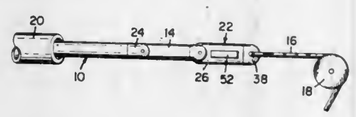
enclosed by an opposite first (**219***a*) and a second (**219**) stationary tooth ring respectively with U-shaped cross-section and provided with an electrical winding (**24**) of which the turns run in circumferential direction, said windings to be connected to an electrical circuit (**35**) for measuring the phase difference of the signals generated therein to obtain an output signal representing the twist of said cylindrical torsion element and thereby the torque transmitted by it.

4,628,747

METHOD AND APPARATUS FOR MEASURING TENSION

Gene C. Weitz, 4246 Bridgewood Ter., Vadnais Heights, Minn. 55110, and C. Robert Canavan, 700 Del Oro Dr., Safety Harbor, Fla. 33572

Filed Oct. 22, 1984, Ser. No. 663,665
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.44 **6 Claims**



1. An instrument for measuring the tension exerted upon a fiber optic cable having a cable head, during installation of the cable in a conduit in which it is to reside, comprising:

(a) a first instrument member securable to the cable head;

(b) a second instrument member securable to a pull line, coilable about a rotatable capstan, for drawing the cable through the conduit;

(c) a bridge member spanning said first and second instrument members and including a deformable, electrically resistive element, wherein resistivity of said element varies as it deforms in response to pressure exerted on the bridge member by the drawing of the pull line, in one direction, and the resistance of the fiber optic cable in an opposite direction;

(d) means for ascertaining measured changes in resistivity of said element resulting from deformation thereof, and converting said measurements to corresponding tension readings; and

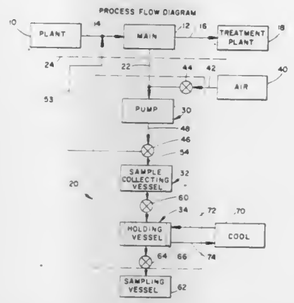
(e) means for preserving the maximum tension reading registered.

4,628,748

EFFLUENT SAMPLER

Michael J. Jogan, Solon; Kevin T. Kermode, Parma; Tom L. Romick, Mantua, and Ken L. Stephen, Seven Hills, all of Ohio, assignors to The Stouffer Corporation, Solon, Ohio

Filed Apr. 1, 1985, Ser. No. 718,730
Int. Cl.⁴ G01N *1/00*
U.S. Cl. 73—863.01 **36 Claims**



16. A fluid flow sampler for obtaining a fluid sample from a source, comprising:

first vessel means;

a liquid level sensing means projecting into said first vessel means;

pump means having an inlet and an outlet;

an electrical switch operatively connected to said pump means for energizing and deenergizing said pump means;

an inlet line fluidly connecting the source with the inlet of said pump means;

an outlet line fluidly connecting the outlet of said pump means with said first vessel means;

first valve means in said outlet line having a first position blocking fluid flow to said first vessel means and a second position permitting fluid flow through said outlet line to said first vessel means;

a branch line associated with said first valve means and fluidly connected with said outlet line when said first valve means are in said first position;

control means operatively connected to said liquid level sensing means and said electrical switch for energizing said pump means with said first valve means in said first position and maintaining said pump means energized when said valve means is in said second position until a predetermined amount of fluid sample enters said vessel means during a predetermined time and for thereafter denergizing said pump means; and

a second vessel means fluidly connected to said first vessel means by a first conduit, and second valve means fluidly connected in said first conduit and operated by said control means for permitting fluid flow from said first vessel means after said predetermined amount of fluid sample has been delivered to said first vessel means during said predetermined time.

4,628,749

METHOD AND APPARATUS FOR OBTAINING LIQUID SAMPLES

John A. Rafter, Jr., Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

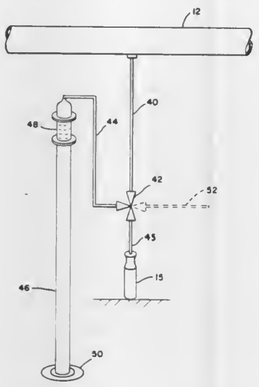
Continuation-in-part of Ser. No. 503,471, Jun. 13, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,323
Int. Cl.⁴ G01N *1/20*
U.S. Cl. 73—863.71 **14 Claims**

7. An apparatus for obtaining a fluid sample from a sampling location in a process system under positive pressure comprising:

a multi-port valve with one opening operably connected into the sampling location;

a seal leg line having an upper portion and a lower portion, said lower portion operably connected to a second opening of said multi-port valve;

a drain pipe line operably connected end-to-end to said upper portion of said seal leg line and extending downward to a drain, wherein said drain pipe line is a larger diameter pipe size than said seal leg line to prevent siphoning of fluid sample from the seal leg line down the drain pipe line;



a sample container; and

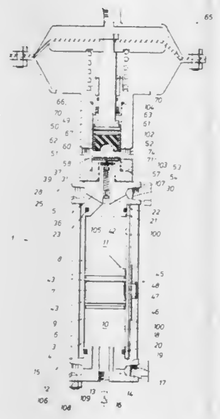
a sample line operably connected to a third opening of said multi-port valve and extending downward to said sample container.

4,628,750

INTEGRATED PUMP AND SAMPLE VESSEL

Brian H. Welker, Houston, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Sep. 27, 1984, Ser. No. 654,937
Int. Cl.⁴ G01N *1/14*
U.S. Cl. 73—864.63 **19 Claims**



1. An integrated pump and sample vessel comprising:

a body with a longitudinal bore therethrough;

a passage in said body allowing fluid to enter and exit said body;

a vessel for the storage of samples taken from said fluid;

check valve means located in said vessel to selectively enable the entry of fluid from said passage into said vessel;

an adapter for detachably mounting said vessel on said body, said adapter having a face exposed to said passage;

a resilient member located in said bore having a face with a cavity therein exposed to said passage;

a hollow sleeve confining said resilient member; and

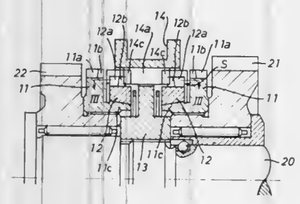
means for relatively moving said face of said resilient member in said passage into contact with said face of said adapter for trapping a sample of fluid in said cavity, said moving means resiliently collapsing said cavity which pumps sample past said check valve means and into said vessel.

4,628,751

GEAR SYNCHRONIZER FOR POWER TRANSMISSION

Kazuhito Ikemoto, and Yukio Terakura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 20, 1984, Ser. No. 673,514
Claims priority, application Japan, Nov. 29, 1983, 58-224875
Int. Cl.⁴ F16H *3/38*; F16D *11/00*
U.S. Cl. 74—339 **4 Claims**



1. In a synchronizer assembly comprising a gear member rotatable on a transmission shaft, an externally splined spline piece, with a conical portion formed at one side thereof, mounted on a hub portion of said gear member for rotating therewith, an externally splined synchronizer ring mounted on the conical portion of said spline piece for frictional engagement therewith, an externally splined hub member mounted on said shaft for rotation therewith, a clutch sleeve encircling said hub member and having an internally splined portion in continual engagement with the external splines of said hub member and axially shiftable toward and away from said spline piece to be engaged with the external splines of said synchronizer ring and said spline piece, and a plurality of circumferentially spaced strut keys assembled with the inner circumference of said clutch sleeve and loaded radially outwardly into engagement with said clutch sleeve to abut against and urge said synchronizer ring toward said spline piece in shifting operation of said clutch sleeve,

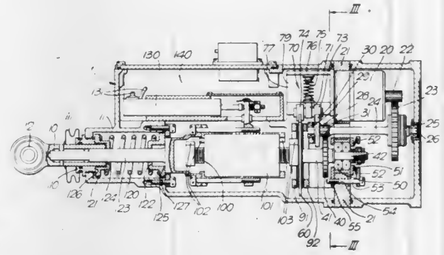
the improvement wherein the externally splined portion of said synchronizer ring is formed smalled in diameter than the externally splined portion of said spline piece, and wherein the internally splined portion of said clutch sleeve includes a first set of internal splines engageable with the external splines of said synchronizer ring and a second set of internal splines engageable with the external splines of said spline piece, the first set of internal splines being formed smaller in axial length and larger in radial length than the second set of internal splines and being arranged to be brought into engagement with an end surface of said spline piece in shifting operation of said clutch sleeve toward said spline piece.

4,628,752

ACTUATORS AND ACTUATOR ASSEMBLIES

William G. Paxton, Alstone, and Derek Wilkinson, Bishops Cleeve, both of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Mar. 15, 1985, Ser. No. 711,938
Claims priority, application United Kingdom, Mar. 22, 1984, 8407494
Int. Cl.⁴ F16H *57/10*
U.S. Cl. 74—411.5 **10 Claims**



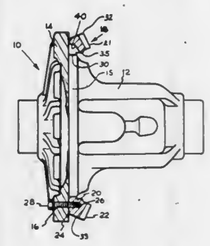
1. Actuator means comprising a housing, a linear actuator member, means for displacing the actuator member along its length relative to the housing between a first position and a second position, means for returning the said actuator member on failure of said actuator means to a third, predetermined position intermediate said first and second positions, and locking means for automatically locking said actuator member in said third predetermined position on failure of said actuator means, said locking means comprising a first rotatable locking member, means coupling said first rotatable locking member with said actuator member so that the locking member is rotated on linear displacement of the actuator member, a second locking member, and means mounting the second locking member to align with the first locking member and to engage therewith in locking engagement to prevent rotation of said first locking member and displacement of said actuator member in both directions only when said actuator member is in said third predetermined position.

4,628,753

LIGHTWEIGHT RING GEAR FOR A DIFFERENTIAL

Charles F. Heine, and Richard L. Pifer, both of Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 29, 1984, Ser. No. 676,739
Int. Cl.⁴ F16H *55/12, 1/14, 1/40*
U.S. Cl. 74—447 **7 Claims**

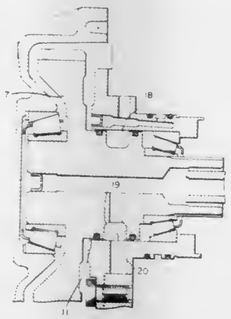


1. For use with a differential having an axis of rotation and including a cage having a radially extending mounting flange, an axially extending pilot flange, and a plurality of circumferentially spaced openings in the mounting flange, a lightweight ring gear comprising:

an annular body,

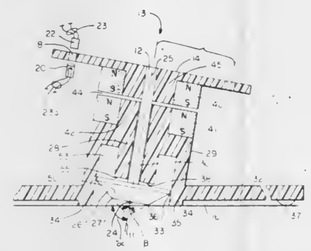
an annular radially extending back surface on said body adapted for positioning flush against said mounting flange,
an annular axially extending pilot surface on said body adapted for positioning flush against said pilot flange,
a frusto-conical front surface defining gear teeth,
a radially outer peripheral surface extending between said front surface and said back surface,
a radially inner peripheral surface extending between said front surface and said pilot surface,
a plurality of circumferentially spaced threaded holes extending from said back surface into said body for engagement by threaded fasteners extending through the openings in said mounting flange for fastening said ring gear to said mounting flange,
a plurality of circumferentially spaced cavities in said back surface, each of said cavities located between a different pair of said threaded holes and extending from said inner peripheral surface to said back surface, whereby an arcuate gap in said pilot flange is created by each of said cavities.

4,628,754
OUTPUT GEAR OF AUTOMATIC TRANSMISSION
Yasufumi Ideta, Sagamihara, and Shigeru Miida, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 12, 1984, Ser. No. 660,081
Claims priority, application Japan, Oct. 14, 1983, 58-190677
Int. Cl.[4] F16H *57/04, 57/02;* **F01M** *9/00*
U.S. Cl. 74—467 **10 Claims**



1. An automatic transmission for a front engine, front wheel drive vehicle, comprising:
a torque converter;
a main power train comprising a rotatory terminal member, said main power train being connected with said torque converter for transmitting a driving torque from said torque converter to said terminal member;
housing means enclosing said main power train, said housing means having a cylindrical bore and at least one oil feed passage opening in a clyindrical surface of said bore, and
an output gear rotatably supported by said housing means and connected detachably with said terminal member of said main power train for transmitting the driving torque from said main power train to front wheels of the vehicle, said main power train being placed between said torque converter and said output gear, said output gear having a hub which is splined detachably to said terminal member, and which is fitting in said bore of said housing means in such a manner that said hub can rotate in said bore, said hub having an annular groove formed on an outer cylindrical surface of said hub, said output gear being formed with lubricating means extending from said annular groove for conveying oil from said annular groove, said oil feed passage of said housing means opening into said annular groove for supplying oil into said lubricating means through said annular groove, said annular groove having sufficient depth and width within a range permitted by a strength of said hub to prevent a shortage of the oil supply through said annular groove to said lubricating means due to a centrifugal force of the oil rotating in said annular groove together with walls of said annular groove.

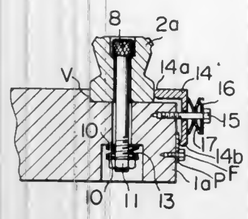
4,628,755
X-Y POSITION CONTROLLER HAVING AXIALLY-INCLINED TRANSDUCER MEMBERS
Jack S. Hawley, 1741 8th St., Berkeley, Calif. 94710
Filed Mar. 25, 1985, Ser. No. 715,396
Int. Cl.[4] G05G *9/00*
U.S. Cl. 74—471 XY **14 Claims**



1. In an X-Y position controller—i.e., a "mouse" (**10**)—having orthogonal transducer assemblies (**13X, 13Y**), each assembly sensing a component of mouse motion over a substantially planar surface (**16**), the assemblies being suitably supported on the mouse and each comprising a shaft (**12**) rotatable within a journal bearing (**28**), the shaft having affixed thereon a drive element (**26**) and a transducer element (**14**) with transducing indicia (**18**) located at a particular radial distance (r) from the shaft, the drive element being adapted to contact (**36**) the planar surface (**16**) and through an effective radius (R) to rotate the shaft upon a motion of the mouse having a component sensed by that assembly; the improvement comprising combination therewith of an inclined support (**29**) for at least one said bearing in said mouse, said support holding said bearing at a predetermined angle less than 90° yet non-parallel relative to said planar surface, resultant inclination of the transducer shaft thereby permitting said particular radial distance (r) of the transducing indicia to be at least as great as said effective radius (R) of the drive element.

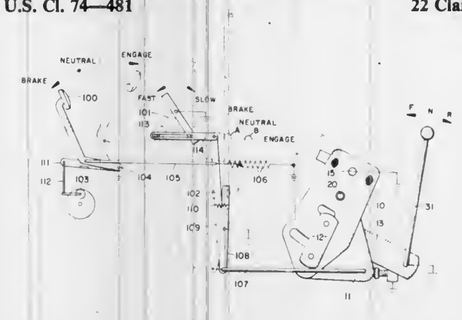
4,628,756
POSITIONING APPARATUS
Shinjiro Kimura, and Shigeru Toida, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 26, 1985, Ser. No. 727,568
Claims priority, application Japan, May 4, 1984, 59-88284
Int. Cl.[4] G05G *11/00;* **F16C** *29/06*
U.S. Cl. 74—479 **5 Claims**

1. An apparatus for accurately positioning a workpiece, the apparatus comprising: a stationary frame; at least one movable frame for carrying a workpiece to be positioned and to be movable on said stationary frame; driving means operatively connected to said movable frame for driving the latter; at least one guide track for guiding said movable frame, said guide track being secured to an associated frame by a plurality of tightening devices, each of said tightening devices is mounted through tightening force adjusting means so as to allow a relative movement between said guide track and associated



frame in accordance with any difference in an amount of thermal expansion thereof.

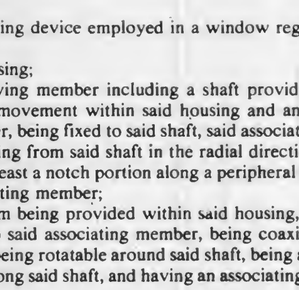
4,628,757
TRACTOR WHEEL DRIVE CONTROL
Juergen Kaesgen, Brunswick, Ohio, assignor to MTD Products Inc., Cleveland, Ohio
Filed Jun. 22, 1984, Ser. No. 623,407
Int. Cl.[4] G05G *11/00, 1/14*
U.S. Cl. 74—481 **22 Claims**



1. In a device having a uni-directional activating force for actuating a bi-directional control mechanism, an improved actuator comprising an activating plate, first means to operatively connect said activating plate at a first point to said bidirectional control mechanism, a connecting plate, second means to operatively transmit the uni-directional activating force to said connecting plate at a second point, and third means to select either a first alternative of pivotly connecting said connecting plate to said activating plate at a third point and also pivotly connecting said connecting plate to a fourth point, said fourth point being located substantially intermediate said second and third points, or to select a second alternative of fixedly connecting said connecting plate to said activating plate, said first alternative of said third means providing for one directional movement of said bi-directional control mechanism and said second alternative of said third means providing for the other directional movement of said bi-directional control mechanism for an equivalent uni-directional activating force.

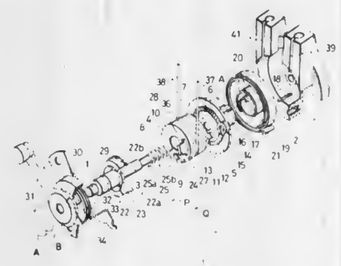
4,628,758
STEERING SHAFT JOINT
Naoki Yuzuriha, Zama; Taishiro Mochizuki; Toshinobu Kato, both of Takasaki, and Michio Shinohara, Musashino, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nippon Seiko Kabushiki Kaisha, Chiyoda, both of, Japan
Filed Dec. 14, 1984, Ser. No. 681,658
Claims priority, application Japan, Dec. 19, 1983, 58-194022[U]
Int. Cl.[4] B62D *3/00, 3/12;* **F16B** *3/00*
U.S. Cl. 74—498 **20 Claims**

1. A steering system comprising:
a steering shaft;
a steering gear having a rotatable input member provided with a serrated end;
a joint connecting said steering shaft to said input member and having a yoke connected to said input member, said yoke having a tubular portion formed with a slit extending axially through the length thereof and also having a part-cylindrical serrated inner wall at which it is coupled with said serrated end of said input member, said slit being



arranged to indicate a predetermined position of said steering shaft; and
a positioning member mounted on said input member and held in place by predetermined one of slots defined by serrations of said serrated end of said input member, said positioning member having a projection projecting radially outwardly of said input member, said projection being received in said slit and arranged to indicate a predetermined position of said input member.

4,628,759
DRIVING DEVICE EMPLOYED IN A WINDOW REGULATOR
Tetuo Kobayashi, Ikeda, and Shoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System Inc., Hyogo, Japan
Filed Nov. 8, 1984, Ser. No. 669,493
Claims priority, application Japan, Feb. 21, 1984, 59-32024; Feb. 21, 1984, 59-24043[U]
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 R **4 Claims**



1. A driving device employed in a window regulator comprising:
(a) a housing;
(b) a driving member including a shaft provided for rotational movement within said housing and an associating member, being fixed to said shaft, said associating member extending from said shaft in the radial direction and having at least a notch portion along a peripheral edge of said associating member;
(c) a drum being provided within said housing, being adjacent to said associating member, being coaxial with said shaft, being rotatable around said shaft, being axially movable along said shaft, and having an associating projection,

said associating projection being mounted on a first side surface of said drum facing to said associating member, being capable of associating with said notch portion with some play in the rotational direction, and having a first ratchet teeth on a second side surface of said drum opposite to said first side surface of said drum;

(d) a ratchet member being provided within said housing, being adjacent to said drum, being coaxial with said shaft, being rotatable around said shaft, and having a second ratchet teeth on a first side surface of said ratchet member facing to said drum, said second ratchet teeth being capable of being meshed with said first ratchet teeth;

(e) a spiral spring located between said ratchet member and said housing and urging said ratchet member in the direction of idling movement of said first ratchet teeth and said second ratchet teeth;

(f) an elastic member located between said drum and said associating member so as to urge said associating member in the rotational direction;

(g) a first wire having an end engaged with said drum and a second wire having an end engaged with said ratchet member; and

(h) a first pushing projection and a second pushing projection being mounted on both low sides of said associating projection, and being capable of being inserted between bottom surfaces of said associating member and said first side surface of the drum, respectively.

4,628,760

REMOTE CONTROL REARVIEW MIRROR AND PIVOT

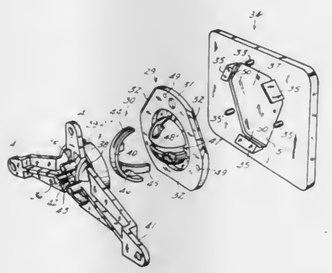
Chester R. Huddleston, Ripley, Miss., assignor to Harman Automotive, Inc., Detroit, Mich.

Filed Jan. 17, 1983, Ser. No. 458,198

The portion of the term of this patent subsequent to Feb. 16, 2003, has been disclaimed.

Int. Cl.[4] F16C *1/10*; F16D *1/12, 3/22*

U.S. Cl. 74—501 R **6 Claims**



1. An automotive rearview mirror pivot and mirror support structure comprising:

a hemispherical socketed receiver having a hemispherical keyway in the hemispherical face thereof;

a male mating hemispherical segment having a hemispherical keyway formed in the hemispherical face thereof and transversely positioned in respect to said keyway in said socketed receiver;

a hemispherical segment cross pivot element having a pair of integrated hemispherical arms in transverse directions, one of said hemispherical arms forming a key mating in said hemispherical keyway of said socketed receiver and one of said hemispherical arms mating in said keyway of said male hemispherical segment and said cross pivot element in compression relation between said hemispherical segment male element and said hemispherical socketed receiver element, one of said male and receiver elements having flange and guide means; and

a mirror case having detent projections and guide pins, said detent means resiliently and lockably engageable over said flange means and said pins extending through said guide means to locate and guide said case to firm engagement with said one of said male and receiver elements having said flange and guide means.

6. A cable operated remote control automotive rearview mirror and cross pivot support combination comprising:

an actuator having spring means therein and movable in a substantially stabilized limited universal manner;

a plurality of sheathed cables, said cables connected to said actuator and acted upon by said spring means and movable by said actuator, said sheaths of said cables bearing against said actuator in fixed buttress compression relation and said cables running from said actuator, said cables having ferrules attached near to the ends thereof leaving slight extending tails;

a hemispherical socketed receiver remote from said actuator and said socket including an arcuate keyway incised in said socketed receiver and said receiver having access openings and radial slots operably passing said cables therethrough and through which said cables are threaded and further including thrust buttresses bearing compressibly against said sheaths of said cables at the ends of said sheaths of said cables remote from said actuator;

a cross pivot having hemispherical transverse integral arms, one of said arms nesting in said keyway in said receiver;

a male hemispherical element including a flanged outer portion, said flanged outer portion including beveled detent sections and having guide openings therethrough and said hemispherical element including a first hemispherical keyway and a second hemispherical keyway transverse of the plane of said first mentioned keyway and mating with the other of said hemispherical arms of said cross pivot and said male hemispherical element including a central axial opening therethrough and through which said cables and their said ferrules are passed and said opening having connected radial slots for said cables, and having thrust buttresses transverse of said slots against which said ferrules rest under the tension in said cables;

a mirror case having integral extending resilient detent locks and pins, said pins through said guide openings in said male hemispherical element and said detent locks over said beveled detent sections of said flange of said male element whereby connection of said mirror case to said male hemispherical element is achieved and access to said tail ends of said cables is beneath said mirror case; and

a mirror shroud and pedestal to which said receiver is attached, adapted to be selectively connected to an automobile, said cables passing through said automobile, said mirror shroud and pedestal to connection with said male hemispherical element whereby cable movement at said actuator results in corresponding movement of said mirror case.

4,628,761

STEERING WHEEL

Minoru Niwa, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Aichi, Japan

Filed Jun. 10, 1985, Ser. No. 743,354

Claims priority, application Japan, Jun. 9, 1984, 59-118775

Int. Cl.[4] B62D *1/04*

U.S. Cl. 74—552 **4 Claims**

1. A steering wheel, comprising:

a central boss having a boss plate means provided thereon;

a steering ring disposed generally coaxially of said central boss, but axially forwardly thereof, this steering ring including an imaginary frontal plane disposed to be presented towards an automobile driver;

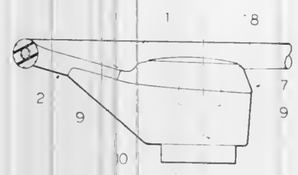
at least one generally radially extending spoke core member, each such spoke core member being secured at a radially inner end thereof to said boss plate means, and having a radially outer end juxtaposed with and effectively secured to said steering ring;

each said spoke core member declining from the proximity of said steering ring towards said boss plate firstly at a shallower angle of decline and then, from a site intermediate the radial-extent thereof, at a steeper angle of decline;

an impact energy absorber provided generally centrally on said boss plate means so as to extend axially forwardly therefrom;

cover pad means of covering over an axially forward side of said impact energy absorber in such a manner as to partially enclose said impact energy absorber and in such a manner as to present an exterior surface for a corresponding central portion of said steering wheel, this exterior surface being disposed so low that it does not extend forwardly of said frontal plane of said steering ring; and

cover means enclosing the remainder of said impact energy absorber and extending under said boss plate means into proximity with said boss.



4,628,762

VALVE-ACTUATING LEVER FOR INTERNAL-COMBUSTION ENGINES

Heinz Lemberger, Unterföhring, and Christoph Schausberger, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

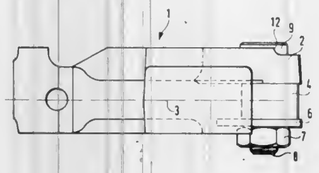
PCT No. PCT/EP82/00132, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/00185, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 24, 1982, Ser. No. 474,596

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125362

Int. Cl.[4] G05G *1/10*

U.S. Cl. 74—559 **20 Claims**



1. An elongated valve actuating lever having a central longitudinal axis along its length and a single end portion, the end portion of the valve actuating lever being offset to one side of said longitudinal axis and having a first side surface which is offset and in parallel with said longitudinal axis and displaced to the side thereof; a valve-clearance actuating element having an actuating surface portion for actuating a valve; said actuating surface portion being centrally aligned with said longitudinal central axis of the actuating lever; said actuating element being positioned adjacent the offset parallel side surface of the end portion; and means for cantileverly attaching the actuating element to said end portion adjacent the said one side surface.

4,628,763

BICYCLE PEDAL AND STIRRUP THEREFOR

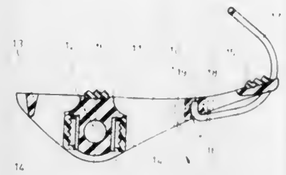
Hubert Konzorr, Froendenberg, Fed. Rep. of Germany, assignor to Union Sils, Van de Loo & Co. GmbH, Froendenberg, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,873

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 148; Oct. 19, 1983, 3337927

Int. Cl.[6] G05G *1/14*

U.S. Cl. 74—594.6 **8 Claims**



1. A pedal for bicycle including a stirrup for holding a foot which extends over a forward area of said foot when placed on an upper side of said pedal and said stirrup having ends which are connected with said pedal characterized in that said foot-holding stirrup extends around said pedal to an underside portion of the pedal and in that said stirrup ends of said foot-holding stirrup are bent upwardly and form pegs which are introduced into plug openings located on said underside portion of said pedal and said plug openings extending only partially through said pedal, the pegs and plug openings forming the sole means retaining said stirrup on said pedal further wherein said pedal is made of plastic, at least in a region thereof provided for the attachment of said foot-holding stirrup and in that each said peg is provided with at least one claw adapted to hook into a wall of the respective plug opening into which said peg is inserted, said at least one claw being adapted to hook the plastic material in the respective plug opening to aid in retaining each said peg therein.

4,628,764

DEVICE FOR DRIVING A MOVABLE MEMBER IN VEHICLE

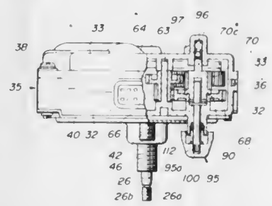
Kazuto Chisaka, Musashino; Masagoro Kushida, Atsugi; Yoshiro Nagayama, Isehara, and Masami Yamamoto, Machida, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Ichikoh Industries Limited, both of Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,480

Claims priority, application Japan, Sep. 13, 1984, 59-190513

Int. Cl.[4] F16H *57/00*

U.S. Cl. 74—625 **10 Claims**



1. A device for driving a movable member in a vehicle having a driving motor provided to be rotated in a predetermined direction, a reduction gear train for decelerating the rotating motion of the driving motor, transmitting means for transmitting the rotating motion to an output shaft to be coupled with the driven member, and a casing for enclosing the driving motor and the transmitting means, comprising: two adjacent gears in said reduction gear train being arranged rototable with respect to said casing and coaxially with each

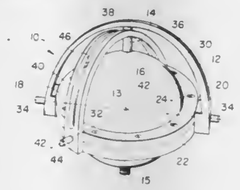
other, first gear of said gears being coupled with a gear of front stage disposed at said driving motor side, second gear of said gears being coupled with a gear of next stage disposed at said output shaft side, said second gear arranged axially movably with respect to said first gear; coupling means arranged to integrally rotate said both gears for coupling said second gear with said first gear; and manual rotating means arranged in relation to said second gear for axially moving said second gear with respect to said first gear to disengaged the coupling of said gears, and for providing a rotational force to said second gear.

4,628,765

SPHERICAL ROBOTIC WRIST JOINT

Robert Y. Dien, Northboro, Mass., and Ethan C. Luce, Scotia, N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,026
Int. Cl.[4] G05G *11/00*; F16H *37/06*
U.S. Cl. 74—665 A **7 Claims**



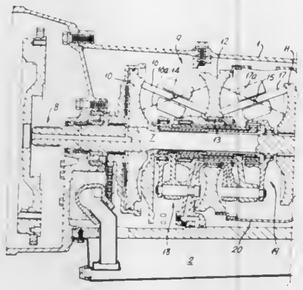
1. A mechanical wrist joint comprising:
a substantially spherical, groove-free member having an outer surface which is spherical and continuous, said outer surface having a geometric center;
a control pin extending radially from said outer surface;
a ring-shaped housing engaging said outer surface and permitting relative movement between said spherical member and said housing in any direction around said center, said housing lying in a plane containing said center, said housing having an inner annular spherical surface in sliding contact with said outer surface and having a center of curvature at said outer surface center;
an outer control yoke rotatably mounted to said housing at about a first axis and extending at least partly around said spherical member, said outer yoke having a first track defined therein, said pin movable in said track for rotation of said spherical member with motion of said pin in said first track; and
an inner control yoke rotatably mounted to said housing about a second axis which is perpendicular to said first axis, said inner yoke extending at least partly around said spherical member and including a second track defined therein, said pin movably engaged in said second track for rotation of said spherical member with motion of said pin in said second track, said second track extending through said inner control yoke and forming a slot therein; said inner and outer yokes each being substantially semi-circular and being pivotally mounted to said ring-shaped housing about said first and second perpendicular axes.

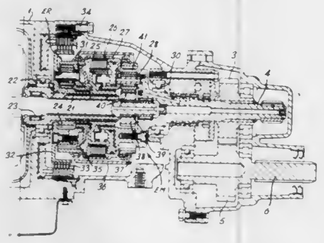
4,628,766

CONTINUOUSLY-VARIABLE RATIO TRANSMISSION

Forbes G. de Brie Perry, Charlbury, England, assignor to National Research Development Corp., London, England

Filed Nov. 19, 1984, Ser. No. 672,898
Claims priority, application United Kingdom, Nov. 17, 1983, 8330683
Int. Cl.[4] F16H *37/06, 15/00*
U.S. Cl. 74—691 **4 Claims**





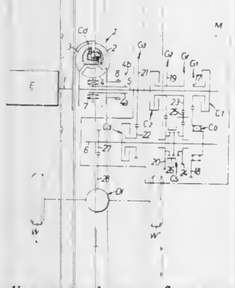
1. A continuously-variable ratio transmission capable of operating in first and second operating regimes and including:
first and second parts;
said first part comprising a variator, including a ratio-varying unit;
said variator having an input connectable to a prime mover, and an output;
said second part including gearing and having an input and an output, said second part input being connected both to said first part input and to said first part output;
a final output member of said transmission;
said second part output being connected to said final output member;
said gearing of said second part including first and second epicyclic combinations, to be referred to as a reversing epicyclic (ER) and a mixing epicyclic (EM) respectively, ER and EM each respectively comprising a sun member, a planet carrier and an annulus;
a common axis along which are disposed in sequence said input to and said output of said variator, said reversing epicyclic and then said mixing epicyclic followed by said final output member of said transmission;
a clutch;
said planet carrier of EM being connected to said final output member and also, by way of said clutch, to said sun of ER and also to said variator output;
said variator input being directly connected to said sun of EM;
said annulae of EM and ER being mounted in common;
a brake, said planet carrier of ER being directly connected to said brake;
whereby said transmission is capable of operating so that in said first regime said clutch is disengaged and said brake engaged, and the motion of said final output member reflects the motion of said planet carrier of EM in response to inputs from both said sun of EM and said sun of ER, and in said second regime said brake is disengaged and said clutch engaged and said final output member moves at the speed of said variator output, being connectable to said variator output by way of said clutch and said planet carrier of EM.

4,628,767

DIRECT-COUPLED CONTROL FOR A TORQUE CONVERTER INCLUDING A TWO STAGE SPEED RESPONSIVE VALVE CONTROL

Masao Nishikawa, Tokyo; Yoshimi Sakurai, Tanashi, and Takashi Aoki, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,910
Claims priority, application Japan, Oct. 22, 1983, 58-198032; Oct. 22, 1983, 58-198031
Int. Cl.[4] F16H *45/02*; B60K *41/22*
U.S. Cl. 74—731 **6 Claims**



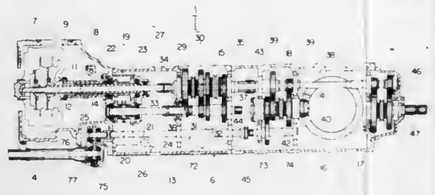
1. A direct-coupling control system for a torque converter in an automatic transmission in a vehicle, the torque converter including an input member provided with a pump rotor and an output member provided with a turbine rotor; the transmission further including a source of working oil pressure, a direct-coupling clutch interposed between the input and output members for mechanically coupling them together, the clutch including a hydraulic cylinder for actuation thereof, and an auxiliary transmission including a plurality of stages of gear trains for transmitting the torque of the output member to a drive wheel, each of the gear trains having a hydraulically operated friction element for actuation thereof, each friction element including a hydraulic cylinder;
said direct-coupling control system comprising means interposed between said hydraulic cylinder of said direct-coupling clutch and said source of working oil pressure for controlling coupling force of said direct-coupling clutch by controlling working oil pressure to said hydraulic cylinder of said clutch in a first stage and a second stage, said first stage being wherein said coupling force is relatively small when speed of the vehicle is not more than a predetermined value and said second stage being wherein said coupling force is relatively large when speed of the vehicles is not less than said predetermined value;
said means for controlling coupling force comprises an oil line connecting said source of working oil pressure to said hydraulic cylinder of the clutch,
a reduction valve in said oil line for closing said oil line when the working oil pressure of the clutch reaches a predetermined level, and
a vehicle speed response valve in said oil line in parallel with said reduction valve for opening said oil line when the speed of the vehicle exceeds said predetermined value.

4,628,768

TRACTOR TRANSMISSION

Takaho Omura, Izumisano; Yasuyuki Horii, Sakai; Taichi Fujiwara, Izumi, and Masaru Nakata, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 493,475, May 11, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,692
Claims priority, application Japan, May 21, 1982, 57-75151[U]
Int. Cl.[4] F16H *3/02*
U.S. Cl. 74—745 **4 Claims**



1. A transmission for a tractor including:
a transmission case comprising a clutch housing containing a clutch mechanism, a second transmission case, and a first transmission case removably attached from between said clutch housing and second transmission case;
a primary speed change mechanism housed in said first transmission case, said primary speed change mechanism being operatively connected through a speed change shaft to a secondary speed change mechanism housed in said second transmission case, said speed change shaft comprising a first shaft and a second shaft connected thereto by means of a first coupler, said first coupler arranged in the second transmission case forwardly of said secondary speed change mechanism;
a backward and forward switching mechanism operatively connected to said engine through the clutch mechanism and to said primary speed change mechanism through an intermediate shaft and adapted to be supported by a supporting member removably mounted in a forward portion of said first transmission case;
said intermediate shaft comprising a first intermediate shaft and a second intermediate shaft connected thereto by means of a second coupler, said second coupler arranged between said backward and forward switching and primary speed change mechanisms, said first intermediate shaft supported by said supporting member, said second intermediate shaft supported by the first transmission case and having a portion projecting into the second transmission case, said projecting portion being adapted to mount a reversing mechanism for operatively connecting said second intermediate shaft with said first shaft of said speed change shaft.

4,628,769

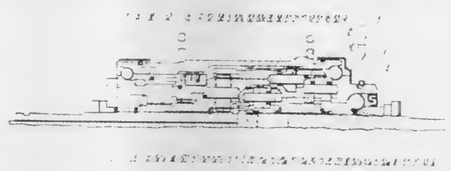
SPEED CHANGE HUB FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 28, 1984, Ser. No. 675,616
Claims priority, application Japan, Nov. 29, 1983, 58-225844
Int. Cl.[4] F16H *3/44*
U.S. Cl. 74—750 B **2 Claims**

2. A speed change hub for a bicycle, comprising:
a hub shaft, a hub shell supported rotatably relative to said hub shaft, a driving member supported by said hub shaft, a speed change gear mechanism for transmitting to said hub shell a driving force transmitted to said driving member, and a speed change operating means for operating said speed change gear mechanism, said speed change gear mechanism comprising a sun gear disposed on said hub shaft, a ring gear rotatable with said driving member

and having first transmitting members for transmitting said driving force to said hub shell, a gear frame having planetary gears engageable with inner teeth of said ring gear and said sun gear and having second transmitting members for transmitting said driving force to said hub shell, and a relay member rotating with said driving member, having third transmitting members for transmitting said driving force to said gear frame, supported axially slidably relative to said hub shell, and having a first clutch for controlling said first transmitting members to cause them to engage or disengage relative to said hub shell responsive to sliding motion of said relay member, said speed change operating means comprising an operating rod supported slidably relative to said hub shaft and an actuator in operative engagement with said rod, said actuator having a second clutch for controlling said third



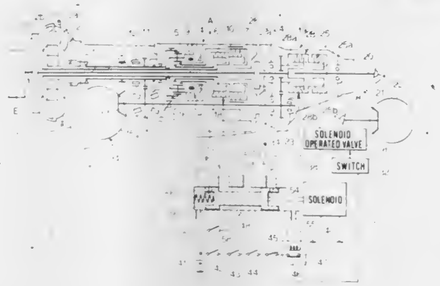
transmitting members to engage or disengage relative to said gear frame, a transmitting means disposed between said actuator and said relay member, said transmitting means for transmitting sliding motion of said actuator to said relay member responsive to said second clutch controlling said third transmitting members to disengage from said gear frame, so that after said third transmitting members disengage, said relay member slides to cause said first transmitting members to disengage from said hub shell by operation of said first clutch, said transmitting means comprising a first elastic member, and said speed change hub further comprising a second elastic member disposed between said relay member and said hub shaft, said second elastic member applying a bias force against said relay member in a direction substantially opposite to a bias force applied against said relay member by said first elastic member.

4,628,770

OVERDRIVE SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Masayuki Kodama, Hachiohji, and Kenichi Yamada, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,735
Claims priority, application Japan, Jul. 30, 1983, 58-139861
Int. Cl.⁴ F16H *3/74, 57/10, 47/08;* **B60K** *17/354*
U.S. Cl. 74—752 A **9 Claims**



1. In an overdrive system for a four-wheel drive vehicle having an automatic transmission, the transmission having an automatic transmission device and a torque converter for transmitting power of an engine to said automatic transmission device, the latter comprising a forward clutch and a planetary gear operatively connected to the forward clutch, the automatic transmission further comprising a main transmission system for transmitting an output of said automatic transmission device to main driving wheels, the overdrive system including an auxiliary transfer system having a transfer drive shaft for transmitting the output to auxiliary driving wheels through an auxiliary drive shaft, the automatic transmission including an oil pump operatively connected to a crankshaft of said engine by an oil pump drive shaft, the improvement of the overdrive system wherein:

the auxiliary transfer system comprises:

an extension of said oil pump drive shaft;

a drive gear secured to said transfer drive shaft;

a driven gear rotatably mounted on said extension of said oil pump drive shaft and engaged with said drive gear;

a first clutch means comprising a first engaging member secured to the driven gear and a second engaging member secured to the extension for coupling said driven gear with said extension upon engagement of said engaging members; and

a second clutch means comprising a third engaging member secured to the first engaging member and a fourth engaging member secured to the auxiliary drive shaft for coupling said driven gear with said auxiliary drive shaft upon engagement of said third and fourth engaging members for transmitting the output to the auxiliary driving wheels;

the overdrive system further comprises:

first means for disengaging said forward clutch in said automatic transmission device for disconnecting the latter;

second means for engaging said first clutch means by engaging said first and second engaging members at the same time as the disengaging of said forward clutch providing overdriving;

third means for engaging said second clutch means by engaging said third and fourth engaging members for establishing four-wheel driving at a time when said forward clutch is engaged; and

fourth means for inhibiting engagement of both of said first and second clutch means at the same time.

4,628,771

HYDRAULIC CLUTCH PRESSURE CONTROL FOR AN ELECTRONICALLY CONTROLLED TRANSMISSION

Dennis W. Person, Rockwood; Stanley L. Pierce, Northville, and Polung Liang, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 453,301, Dec. 27, 1982, Pat. No. 4,541,308.
This application Feb. 19, 1985, Ser. No. 689,205
Int. Cl.⁴ B60K *41/04*
U.S. Cl. 74—856 **11 Claims**

1. A system for changing drive ratios in an automatic transmission having gear elements for producing multiple drive ratios comprising:

a source of pressurized hydraulic fluid;

multiple clutches for connecting and holding elements of the gearing, whereby certain drive ratios are produced by selectively pressurizing pairs of said clutches and venting the unselected clutches, each clutch pair being uniquely associated with one drive ratio;

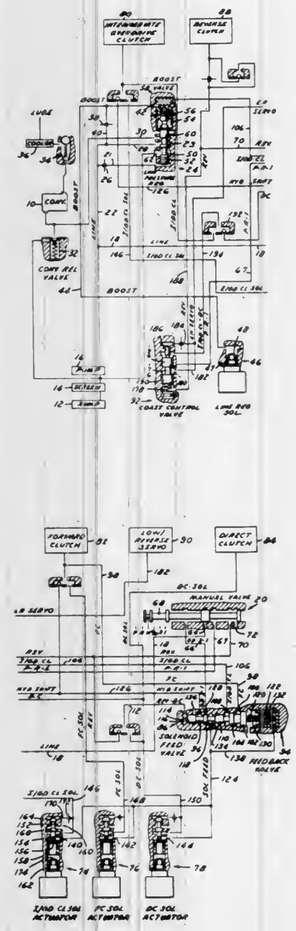
actuator valve means for selectively, concurrently pressurizing pairs of said clutches and for venting unselected clutches;

feedline valve means connected to the pressure source for comparing the sum of the pressures in the clutches to a predetermined pressure, for hydraulically connecting the pressure source to the actuator valve means if said pressure sum is equal to or less than said predetermined pressure, and for disconnecting the pressure soure from the actuator valve means and connecting the pressure source

to the clutches whose engagement produces a predetermined drive ratio;

coast control valve means for directing pressurized fluid to a clutch that is not a member of a clutch pair selectively and concurrently pressurized through operation of the actuator valve means and for venting said clutch;

wherein the feedline valve means includes a valve spool moveable between first and second states, having multiple differential pressure areas of substantially equal net size formed thereon each net differential area being arranged to move the spool to a first state; first and second outlet



feedlines to which the fluid pressure source is connected in accordance with the state of the valve spool, the first feedline being pressurized when the spool is in the first state, and second feedline being pressurized when the spool is in the second state; and feedback valve means communicating with the first feedline for producing on a pressure area a pressure force urging the valve spool to its second state against the effect of the pressure forces developed on the differential pressure areas of the valve spool, the size of the pressure area of the feedback valve means being substantially one net differential pressure area less than the net differential pressure areas of the valve spool.

4,628,772

BACK-UP DEVICE FOR AN ELECTRONIC CONTROL SYSTEM OF AN AUTOMATIC TRANSMISSION

Masao Nishikawa, Nerima, and Yoshimi Sakurai, Tanashi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 775,620
Claims priority, application Japan, Sep. 13, 1984, 59-190642
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—866 **6 Claims**



1. In an electronic control system of an automatic transmission in an automotive vehicle, said automatic transmission having at least two speed ratios including a first speed ratio for lower speed running of said vehicle and a second speed ratio for higher speed running of said vehicle, and forming part of a power transmission system connected between an engine of said vehicle and driving wheels of said vehicle, said electronic control system including a first frictionally engaging element hydraulically actuatable for establishing said first speed ratio, a second frictionally engaging element hydraulically actuatable for establishing said second speed ratio, an operating fluid source, selector valve means for selectively connecting said operating fluid source to said first and second frictionally engaging elements, said selector valve means being adapted to selectively assume a first position for establishing said first speed ratio and a second position for establishing said second speed ratio, electromagnetic valve means for driving said selector valve means to select said first position or said second position, and electronic control means for selectively energizing and deenergizing said electromagnetic valve means in accordance with a predetermined gear shifting manner responsive to an electrical signal indicative of the speed of said vehicle and an electrical signal indicative of output from said engine, the improvement comprising a back-up device comprising vehicle speed sensing means for generating an output signal having a value thereof increasing as the speed of said vehicle increases, and control means for causing said selector valve means to assume said second position irrespective of the operation of said electromagnetic valve means, when the value of said output signal from said vehicle speed sensing means exceeds a predetermined value.

4,628,773

METHOD AND APPARATUS FOR CONTROLLING HYDRAULICALLY-OPERATED CONTINUOUSLY VARIABLE TRANSMISSION OF BELT-AND-PULLEY TYPE

Hiroshi Itoh, Toyota; Shigeki Hiramatsu, Okazaki; Mitsuru Takada, and Tadashi Tamura, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 26, 1984, Ser. No. 665,367
Claims priority, application Japan, Oct. 28, 1983, 58-203130
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—867 **16 Claims**

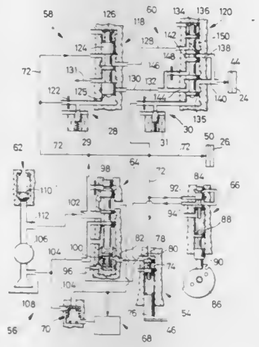
11. A hydraulic control system for controlling a speed ratio of a hydraulically-operated continuously variable transmission of a vehicle, having (1) an input shaft operatively connected to an engine of the vehicle (2) an output shaft operatively con-

nected to an engine of the vehicle, (3) a pair of variable-diameter pulleys mounted on the input and output shafts, respectively, (4) a transmission belt connecting the pair of variable-diameter pulleys, and (5) a pair of hydraulic cylinders for changing an effective diameter of the pair of pulleys, respectively, the hydraulic control system including a speed-ratio control valve assembly associated with one of said hydraulic cylinders, the control valve assembly being selectively placed in one of three states of operation consisting of a first state in which a pressurized fluid is fed to said one of the hydraulic cylinders, a second state in which the fluid is discharged from said one hydraulic cylinder, and a third state in which the feed or discharge flow of the fluid to or from said one hydraulic cylinder is restricted, wherein the improvement comprises:

detecting means for detecting an actual value of a variable to be controlled, such as a speed of the engine or a speed ratio of the transmission;

first determining means for determining a target value of said variable, based at least on a currently required output of the engine and according to a predetermined relation between said target value and said required output;

second determining means for determining a difference between said target value and said actual value of said variable to be controlled; and



control means for controlling the operation of said speed-ratio control valve assembly so that said difference is reduced;

said speed-ratio control valve assembly comprising a first and a second solenoid connected to said control means, said control means controlling both of said first and second solenoids to establish said third state,

said control means selectively controlling said first solenoid to select one of said first and second states, and selectively controlling said second solenoid to permit a flow of said fluid to or from said one of the hydraulic cylinders in said first or second state, or restrict said flow in said third state,

said control means establishing said first and third states in an alternate fashion while changing a ratio of an operating time in said first state to that in said third state, for controlling a rate of flow of said fluid into said one hydraulic cylinder in accordance with said difference, said control means establishing said second and third states in an alternate fashion while changing a ratio of an operating time in said second state to that in said third state in accordance with said difference, for controlling a rate of flow of said fluid from said one hydraulic cylinder,

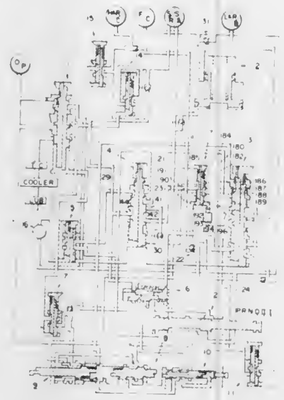
whereby the speed ratio of said continuously variable transmission is continuously varied by said one hydraulic cylinder under control of said speed-ratio control valve assembly.

4,628,774

TRANSMISSION CONTROL SYSTEM INCLUDING SELECT SHOCK SUPPRESSING ARRANGEMENT

Kazuyoshi Iwanaga, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 30, 1984, Ser. No. 574,729
Claims priority, application Japan, Feb. 2, 1983, 58-14593
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—867 **6 Claims**



1. In a control system for an automatic automotive transmission having first and second hydraulically operated engagement devices and wherein when said first engagement device is released and said second engagement device is engaged, a first predetermined gear ratio is established and when both of said first and second engagement members are engaged a gear ratio higher than said predetermined one is established,

a first hydraulic circuit via which hydraulic fluid is supplied to said first engagement device;

a manual selector valve fluidly interposed between said circuit and a source of hydraulic fluid under pressure, said manual selector valve being movable between a neutral position and a drive position wherein fluid communication between said source and said circuit is interrupted and established, respectively;

a delay disposed in said hydraulic circuit for limiting the rate at which hydraulic fluid can be supplied to said first engagement device;

a device for detecting an idling condition of an engine associated with said transmission; and

a by-pass valve operatively connected with said idling detecting device, said by-pass valve by-passing said delay when said idling detecting device detects said idling condition and said manual selecto valve is moved from said neutral position to said drive position to permit hydraulic fluid to be freely supplied to said first engagement device.

4,628,775

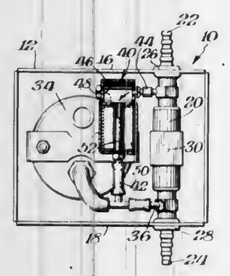
VACUUM MODULATOR CONTROL FOR AUTOMATIC TRANSMISSION OF RACING CARS

Ronale Re, Newark, Del., assignor to Tran-Saver, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 625,701, Jun. 28, 1984. This application Oct. 12, 1984, Ser. No. 660,079
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—863 **5 Claims**

1. In a multi-speed automatic transmission for race competition vehicles having transmission gears to shift from low to high to low in response to the acceleration and deceleration of the racing vehicle wherein a vacuum modulator control is mounted between a vacuum modulator and an intake manifold,

the improvement being said vacuum modulator control comprising a cylinder, a first port communicating with and extending away from said cylinder and communicating with the motor vacuum, a second port communicating with and extending away from said cylinder and communicating with the vacuum modulator line, adjustable valve means in said cylinder for controlling the amount of vacuum going to the transmission, said adjustable valve means including externally located adjusting means for controlling the adjustment of said valve means, a vacuum gauge for visually indicating the amount of vacuum actually going to the transmission, said vacuum gauge communicating with said cylinder on the transmission side thereof as distinct from the motor side to provide



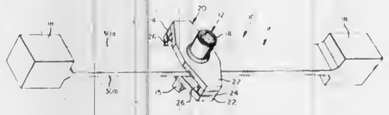
an absolute vacuum reading to the transmission, a by-pass valve being in selective communication with said cylinder for being operative during normal road usage and in an inactive condition during racing competition, a tube communicating with said cylinder between said second port and said valve means, said gauge communicating with said tube to permit said absolute vacuum reading from said gauge, a by-pass line communicating with said tube and communicating with said cylinder between said first port and said valve means, said by-pass valve being located for operation in said by-pass line, and said valve means being at least partially open during all conditions of use with said by-pass valve being selectively open and selectively closed.

4,628,776

ROTARY IMPACT LUG TOOL

Melverton R. Witbeck, 3867 Meadowlawn Loop, SE., No. 4, Salem, Oreg. 97301

Filed Oct. 7, 1985, Ser. No. 785,207
Int. Cl.⁴ B25B *19/00, 21/00*
U.S. Cl. 81—466 **3 Claims**



1. An impact tool for manually loosening axially rotating threaded members comprising:

a shaft means for transmitting torque axially to the threaded member;

an elongated rotary member mounted upon the shaft means for relative rotation in a plane normal to the shaft means, and having a predetermined moment of inertia; and

means for transferring the angular momentum of the rotary member to the shaft means including:

two plates, fixedly mounted on the shaft means in axially spaced-apart parallel relationship normal to the shaft on opposite sides of the rotary member; and

two stop blocks sandwiched between and connected to the plates on both axial sides of each block;

said stop blocks being located in radial positions substantially diametrically opposed about the shaft means for converting the angular momentum of the rotary member upon impact with the stop blocks into an angular impulse which is transmitted through the shaft means to the threaded member;

the rotary member having a predetermined width in said plane of rotation and a pair of parallel planar striking faces defining that width, and each stop block having two planar impact faces spaced angularly apart;

each impact face being in a parallel relationship with another impact face on the other stop block and spaced apart therefrom in a direction normal to the impact face a distance equal to said width of the rotary member;

each stop block having a predetermined depth in the radial direction from the shaft means and a predetermined width in the direction normal to that radial direction from the shaft means;

said axial sides of the stop blocks having an area defined by said width and depth, the width being greater than the depth, an axial side of each block being affixed to an adjoining one of said plates over substantially the entirety of said area so as to resist shearing forces exerted by impact of the rotary member against the stop blocks;

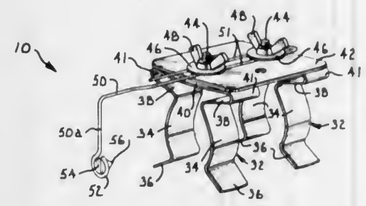
the stop blocks being formed of a first material having a first hardness and the rotary member being formed of a second material having a second hardness less than the first hardness, such that if the stop blocks are nearly but not exactly diametrically opposed, the rotary member material can deform slightly around the stop block it is striking first, so that eventually both stop blocks will be struck simultaneously.

4,628,777

TOOL FOR LUBRICATING TWO-PIECE DRIVE SHAFTS

David A. Guarr, 6130 Westgate, Shawnee, Kans. 66216

Filed Apr. 5, 1985, Ser. No. 720,302
Int. Cl.⁴ B25B *33/00*
U.S. Cl. 81—488 **12 Claims**



8. A tool for use in applying lubricant to a sealed spline connection which connects a vehicle drive shaft with a sliding yoke having a vent hole, said tool comprising:

a resilient spring arm having opposite ends;

means for releasably connecting one end of said spring arm with the yoke in a manner permitting the spring arm to slide lengthwise on the yoke;

releaseable means for securing said spring arm in place on the yoke at any selected location along the length thereof; and

a plug member on the other end of said spring arm for closing the vent hole when the spring arm is moved to and secured at said any selected location on the yoke, said spring arm normally holding the plug member in the vent hole to prevent lubricant from leaking therethrough when the lubricant is applied to the spline connection and said spring arm being yieldable to permit displacement of said plug member from the vent hole when the pressure at the spline connection exceeds a predetermined level.

4,628,778

INDUSTRIAL ROBOT

Seiichiro Nakashima, Hino; Shigemi Inagaki, Kokubunji; Susumu Ito, Hino; Yasuo Naito, Hino, and Kazuhisa Otsuka, Hino, all of Japan, assignors to Fanuc Ltd, Tokyo, Japan

Continuation of Ser. No. 534,771, Sep. 22, 1983, abandoned. This application Feb. 12, 1986, Ser. No. 833,533

Claims priority, application Japan, Sep. 22, 1982, 57-165550

Int. Cl.[4] B23B *15/00*

U.S. Cl. 82—2.5 7 Claims



1. An industrial robot mounted on a lathe having a spindle and a chuck for holding a workpiece to be machined by the lathe, comprising:

a traveling body transportable, from a position where it confronts the chuck, in either direction along an axis parallel to a longitudinal axis of the spindle;

a column, mounted on said traveling body, said column extending and retracting along an axis orthogonal to the axis traversed by said traveling body;

a first rotating mechanism mounted on a distal end of said column, having a rotary shaft, said first rotating mechanism for rotating the rotary shaft about an axis parallel to the axis of the spindle;

a second rotating mechanism mounted on the rotary shaft of said first rotating mechanism, for rotating the rotary shaft about an axis orthogonal to said axis parallel to the axis of the spindle, including an output shaft having a distal end and an extending and retracting member provided on the distal end of the output shaft for changing the length of the output shaft; and

means for gripping a workpiece machined by the lathe and for gripping a workpiece to be machined, mounted on said distal end of the output shaft, and being rotatable by said first rotating mechanism in a plane orthogonal to the axis of the spindle and rotatable by said second rotating mechanism about the longitudinal axis of the output shaft.

4,628,779

FEED APPARATUS FOR MACHINE TOOLS

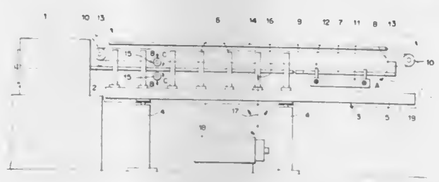
Alexandre Ed. Louis, Le Landeron, Switzerland, assignor to Societe de Vente et de Fabrication pour le Decolletage Lns SA, Orvin, Switzerland

Filed Mar. 15, 1985, Ser. No. 712,072

Claims priority, application Switzerland, Mar. 27, 1984, 1541/84

Int. Cl.[4] B23B *13/02*

U.S. Cl. 82—2.7 33 Claims



1. A feed apparatus for machine tools that work on successively supplied pieces of bar stock, each piece being rotatably driven at high speed by said machine tool and axially advanced in a forward direction toward said tool by a pusher having a rod with a front rotating head and a rear carrier, said feed apparatus comprising:

guide means for guiding said bar stock followed by said rod of said pusher, said guide means including a series of spaced, fixed bearing units each having a generally circular passage receiving an injection of oil from an oil inlet, the respective circular passages of the bearing units being axially aligned for the passage of said bar stock and said rod of said pusher therethrough and each receiving said injection of oil to constitute a non-rotary part of a hydrostatic bearing, a rotary part of the bearing unit being said bar stock itself;

said bearing units each comprising at least two components, at least one of which is a movable component and at least one of which is a relatively fixed component, each component including a concave wall forming a part of the circumference of said passage, each part forming an arc having a length not greater than a length on the order of half said circumference of said passage, said components having means for selectively moving said components away from one another to provide a lateral opening in said passage; and

control means cooperating with said components of said series of bearing units for successively, partially opening each bearing unit, at the moment when said carrier approaches said bearing unit but after said stock bar and a major portion of said rod have passed through said bearing unit, to form a lateral opening of a size just sufficient to allow said carrier to pass successively through each bearing unit, said control means further controlling said components in all said bearing units to move away from one another by a further amount sufficient to open a lateral access route for lateral introduction of a subsequent piece of said bar stock into said bearing units after advancement of said carrier through all said bearing units, said control means further controlling said components in all bearing units to close said components into end-to-end mutual contact so that their respective concave walls form said fixed part of a hydrostatic bearing for said subsequent bar stock.

4,628,780

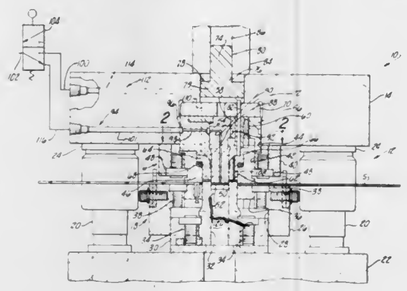
AIR EJECTOR SYSTEM

Charles D. Hicks, Warren, Mich., assignor to Rochez Bros., Inc., Warren, Mich.

Filed May 13, 1985, Ser. No. 733,039

Int. Cl.[4] B26F *1/14*

U.S. Cl. 83—99 5 Claims



1. An air ejector system for use in the reciprocating assembly of a stamping press to induce disengagement of a central slug and a coaxial stamped product, said assembly being mounted relative to a stationary die member for movement in a forward working direction toward said stationary die to blank and punch said product and for movement in a rearward retraction direction away from said die comprising, in combination: a carrier; a recess in the forward end of said carrier; a button die removably mounted in said recess; a punch removably mounted in said recess within said button die in axial alignment with said stationary die member, said punch having a cutting surface at its forward end, a cylindrical body portion extending rearwardly from said button die, and an axial air ejector passage extending from within said body portion to said cutting surface, a generally radial passage connecting said axial ejector passage with the exterior of said cylindrical body portion; a punch retainer mounted in said recess rearward of said button die and having a bore in which the cylindrical body portion of said punch is located; a backing plate mounted in said recess in contact with the rearward end of said punch retainer; and annular air passage contiguous to said retainer bore located in one of said punch body portion and said punch retainer in fluid communication with said radial passage in said punch; a first supply conduit connecting said annular air passage to a supply of compressed air external of said reciprocating assembly; valve means in said first supply conduit, opening during the forward stroke of said assembly, remaining open through the initial part of said retraction stroke, and closing during the retraction stroke of said assembly; an annular stamped product knockout surrounding said punch in the space between said punch and said button die, said knockout being axially slidable relative to said punch and said button die between a forward position in which its front end projects forwardly beyond the front ends of said punch and said button die and a rearward position in which its forward end is withdrawn rearwardly of said front ends, said knockout having an axial air ejector passage extending through said knockout; axial air passage means extending through said backing plate and said punch retainer for introducing air into the cavity between the rearward end of said knockout and the forward end of said punch retainer and bounded peripherally by said button die as it abuts against said punch retainer; a second supply conduit connecting said axially extending air passage means in said backing plate to a supply of compressed air external of said reciprocating assembly whereby as said assembly moves forward to punch and blank said stamped product, air passing through said axial punch ejector passage will shed a slug from said punch cutting surface and push it into an exit passage in said stationary die, and, when said assembly retracts rewardly air will continue passing through said axial punch ejector passage during the initial part of said retraction stroke to retain said slug in said exit passage, and air passing through said axial air ejector passage in said knockout will shed said stamped product from the front end of said knockout.

4,628,781

LUMBER MILL SYSTEM

Daniel S. Rowley, 4660 NW. Kiwanda Dr., Portland, Oreg. 97229

Filed Jul. 3, 1984, Ser. No. 627,451

Int. Cl.[4] B27B *7/02*

U.S. Cl. 83—371 22 Claims

1. A lumber mill system used in processing logs into lumber comprising:

endless conveyor means movable along a conveyor path and having a logitudinal centerline;

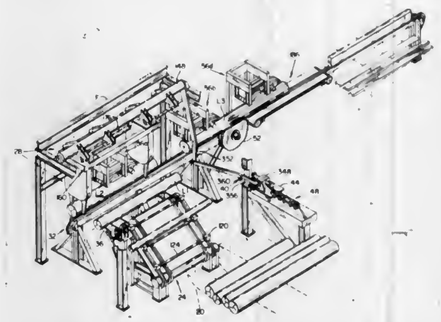
log loading means for loading logs one at a time onto said endless conveyor means, each said log having a longitudinal centerline;

control means for detecting the diameter of each log to be processed, determining from the detected diameter how much, if at all, the centerline of each log should be offset laterally from the centerline of said endless conveyor means for optimum processing of the log downstream, and responsively controlling said log loading means to load the log onto said endless conveyor means with the lateral offset determined for such log;

log holding means to facilitate holding the log on said endless conveyor means, said log holding means being vertically movable between a retracted position and a holding position in which said holding means contacts an upper surface of the log;

a sawing or chipping apparatus downstream of said log loading means, said log holding means including a plurality of separate endless tooth carrying means upstream of said sawing apparatus for supporting the log's upper surface; and

log infeed means for feeding logs one at a time to a log loading area proximate said log loading means, at least one



of said tooth carrying means being located laterally adjacent said log loading area with the remaining tooth carrying means being located downstream thereof, and further including separate log sensing means cooperating with each said tooth carrying means for sensing the approach of a log on said endless conveyor means and responsively actuating said tooth carrying means to move downwardly from its retracted position to its holding position to permit said tooth carrying means to contact the log's upper surface as the log travels beneath said tooth carrying means.

4,628,782

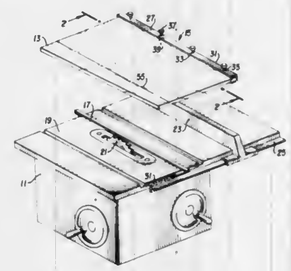
POWER TOOL GUIDE-CLAMP ASSEMBLY

Robert A. Park, 3717 Edinburgh Dr., Virginia Beach, Va. 23452

Filed Jan. 7, 1985, Ser. No. 689,208

Int. Cl.[4] B27B *27/02*

U.S. Cl. 83—442 14 Claims



1. A tool for enabling the cutting of an exceptionally straight line on a wooden board or the like to be used with a table cutter of a type having a flat table-surface on which a board to be cut rests, a cutting element positioned at said table-surface for cutting said board resting on said table-surface and a straight, vertically upwardly extending, table-surface guide at a position on said table-surface offset from said cutting element against which a first edge of said board is slid while said board is being cut, said tool comprising:

an elongated guide clamp for clamping onto a first edge portion of a board to be cut, said guide clamp having an elongated straight edge extending parallel with the location of said cut to be made to be slid along said table-sur-

face guide, said guide clamp being channel-shaped to receive said first edge of said board to be cut with a portion of said guide clamp extending above said board and a portion extending below said board, said guide clamp including clamping member means for clamping said board in said channel, the portion of said guide clamp extending below said board being flat and smooth on its bottom surface and having a certain thickness for resting on said table-surface to thereby support the first edge of said board to be cut a certain distance above said table surface, said elongated straight edge being positioned laterally beyond said first edge of said board so that said board can be slid across the surface of said table-surface to bring said straight edge into contact with said vertically-upwardly extending table-surface guide and slid across said table with said straight edge in contact with said table-surface guide so as to move said board parallel to said table-surface guide; and,

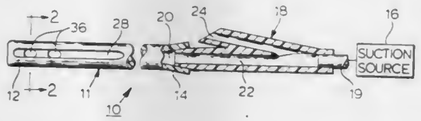
a separate shim means also having said certain thickness to be positioned independently from said guide clamp laterally intermediate said table-surface guide and said cutting element, between the table-surface and the bottom of said board, at a second, opposite, board edge portion to support the opposite edge portion of said board said certain distance above the table-surface to thereby hold said board level as it is being slid across the table-surface for cutting by said cutting element.

4,628,783

METHOD OF MAKING A GROOVED MEDICAL TUBE

Richard G. Brownell, Sr., Greenwich, and James L. Fehl, Ft. Edward, both of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Dec. 19, 1984, Ser. No. 683,532
Int. Cl.[4] B26G *9/00*
U.S. Cl. 83—862 **24 Claims**



1. A method of making a resilient flexible medical tube having a groove in the exterior surface of the wall of the tube and an opening through the bottom wall of the groove connecting the grove with the lumen of the tube comprising the steps of applying predetermined forces to a resilient flexible tube to expand a portion of the wall of the tube, skiving the expanded wall portion to remove an outer part of the wall thereof, removing the applied forces to thereby allow the expanded wall portion to return to its unexpanded condition and effect a groove having spaced opposed sidewalls and a bottom wall in the exterior surface of the wall of the tube where the outer part of the wall was removed, and forming a opening extending through that portion of the wall of the tube that forms the bottom wall of the groove to connect the groove with the lumen of the tube.

4,628,784

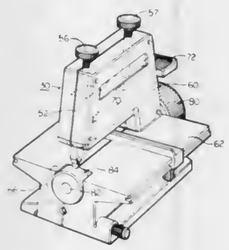
GLASS SCORING ASSEMBLY

Paul Gach, 1224 Woodbridge Dr., St. Clair Shores, Mich. 48080

Filed Nov. 26, 1984, Ser. No. 674,852
Int. Cl.[4] B26D *3/08;* **C03B** *33/10*
U.S. Cl. 83—881 **1 Claim**

1. In a glass-scoring machine comprising an arbor, means for supporting a glass workpiece, a pressure-adjustable spindle positioned within and supported by said arbor and adapted for engaging said glass sheet, means for transporting a glass workpiece relative to said spindle whereby a scoring means within said spindle effects a score pattern onto a glass sheet, the improvement comprising:

(a) an internally spring loaded spindle having an elongated body with means for mounting a glass scoring assembly on one end thereof and a cavity within the other end for housing a tensioning spring, said spring being aligned within the cavity in a plane coincident with the scoring means of the glass scoring assembly, the elongated body of said spindle substantially conforming to a guide channel within the arbor of said machine, thereby providing (1) controlled pressure on said glass scoring assembly and (2) enhanced precision bearing surface between said body and said channel so as to minimize side play and torsional movement of said spindle during the operation of said machine;



(b) a first means for adjustment of the position of the scoring means of the spindle relative to the glass workpiece, said first means including a lever for vertical displacement of the spindle relative to the workpiece and means for adjustment of such displacement so as to permit the scoring wheel of the scoring means to extend below the surface of the workpiece, upon completion of the scoring operation, without chipping of the edge of the workpiece upon the runoff thereof; and

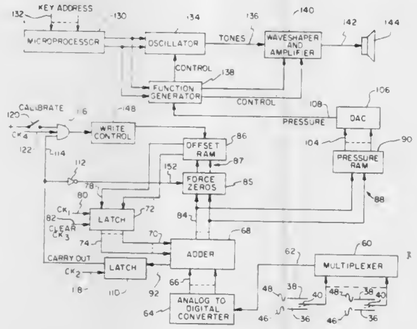
(c) a second means for adjustment of the pressure of the spindle relative to the glass workpiece, said second means including a compressible spring and spring tensioning means for adjustment of the compression on said spring.

4,628,785

METHOD AND APPARATUS FOR CALIBRATING A KEYBOARD

Donald F. Buchla, Berkeley, Calif., assignor to Kimball International, Inc., Jasper, Ind.

Continuation-in-part of Ser. No. 577,854, Feb. 7, 1984, Pat. No. 4,558,623. This application Jun. 18, 1985, Ser. No. 745,889
Int. Cl.[4] G10H *1/34*
U.S. Cl. 84—1.1 **14 Claims**



14. The method of playing and calibrating a keyboard system having a key actuatable fron a rest position to a nominally depressed reference position comprising:

depressing the key and producing an actual key output signal that varies as a function of the distance of depression of the key,

calibrating the system by depressing the key to the reference position and storing an offset value equal to the difference between the actual key output signal at the reference position to the key and an expected reference value of the key output signal at the reference position, and

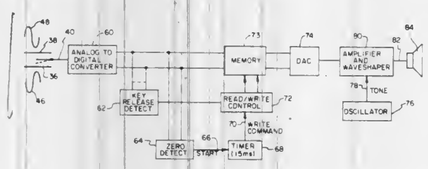
when the system is in an operate mode, combining the offset value with the actual key output signal to produce a calibrated resultant signal corresponding to the position of the key normalized to the reference position.

4,628,786

VELOCITY RESPONSIVE MUSICAL INSTRUMENT KEYBOARD

Donald F. Buchla, Berkeley, Calif., assignor to Kimball International, Inc., Jasper, Ind.

Continuation-in-part of Ser. No. 577,854, Feb. 7, 1984, Pat. No. 4,558,623. This application Jun. 18, 1985, Ser. No. 746,245
Int. Cl.[4] G10H *1/34*
U.S. Cl. 84—1.1 **10 Claims**



1. A keyboard system in a keyboard controlled musical instrument comprising:

a pair of spaced apart electrode members;

means for impressing respective alternating voltages on each of said electrodes for establishing an electric field between said electrodes which varies as a function of the distance from the first of said electrode members toward the second of said electrode members, said voltages being of opposite phase;

a movable pickup means positioned in said field between said electrode members and spaced therefrom, said pickup means having a voltage impressed thereon by said field that is a function of the distance of said pickup means from said first electrode member;

a depressible playing key;

means connecting said playing key to said pickup means to move said pickup means within said field toward or away from said first electrode member in accordance with the depression of said key;

means connected to said pickup means for sensing the voltage impressed thereon;

yieldable stop means for limiting the depression of said key to a nominally fully depressed key position, which occurs when said key first touches said stop means, said stop means permitting overtravel of said key past said fully depressed position against a yieldable resistance, the impressed voltage on said moveable pickup means increasing as a function of the amount of overtravel of said key;

clock means connected to said voltage sensing means for initiating a count when said voltage sensing means senses that said key is fully depressed; and

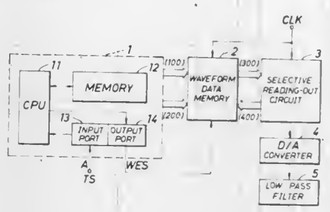
means connected to said voltage sensing means for controlling the quality of tones produced by said musical instrument in response to the amplitude of the detected voltage at the end of a predetermined count.

4,628,787

SOUND SOURCE APPARATUS

Yasuo Nozawa, Kawasaki, Japan, assignor to The Daiei, Inc., Kobe, Japan

Filed Oct. 29, 1984, Ser. No. 666,226
Claims priority, application Japan, Oct. 28, 1983, 58-200831
Int. Cl.[4] G10H *1/02, 1/06*
U.S. Cl. 84—1.2 **5 Claims**



1. A sound source apparatus for generating a musical sound corresponding closely to a predetermined sound waveform, said predetermined sound waveform being divided into a plurality of parts separated in time, and wherein each of said parts has a plurality of phase points also separated in time, said sound source apparatus comprising

a plurality of sound component pattern generators wherein the number of generators corresponds to the number of parts into which said predetermined sound wave has been divided, the waveform of the signal generated by each of said plurality of sound component pattern generators being derived from samples taken from a corresponding phase point of each part of said predetermined sound waveforms, the levels of the signals generated by each of said sound component pattern generators further varying with time in accordance with a predetermined pattern; and

a sound component picking circuit coupled to the outputs of said plurality of sound component generators, said sound component picking circuit repeatedly sweeping in rapid sequence the output of said plurality of sound component generators, the output of said sound component picking circuit constituting a musical sound having a desired pitch.

4,628,788

AUTOMATIC RHYTHM PERFORMING APPARATUS

Takeo Shibukawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 23, 1985, Ser. No. 693,689
Claims priority, application Japan, Jan. 28, 1984, 59-10585[U]; Jan. 28, 1984, 59-10586[U]; Jan. 28, 1984, 59-10587[U]
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **8 Claims**

1. An automatic rhythm performing apparatus comprising:

a rhythm pattern generator for repetitively generating

(i) a repetition period signal defining a repetition period,

(ii) a first rhythm pattern signal representing kinds and timings for rhythm tones to constitute a first rhythm pattern with said period, and

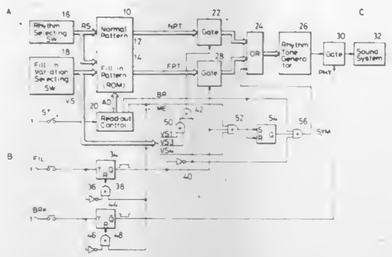
(iii) a second rhythm pattern signal representing kinds and timings for rhythm tones to constitute a second rhythm pattern with said period;

a rhythm tone generator for generating rhythm tone signals of said kinds and timings in response to said first and second rhythm pattern signals;

a rhythm control switch; and

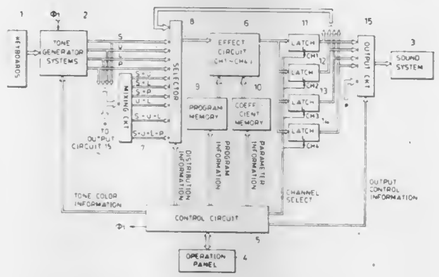
control means connected to said rhythm pattern generator, said rhythm tone generator and said rhythm control

switch for variably controlling the generation and duration of said rhythm tone signals according to the differ-



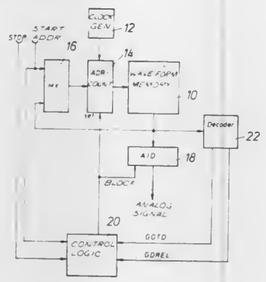
ences in actuation timings of said rhythm control switch with respect to said repetition period.

4,628,789
TONE EFFECT IMPARTING DEVICE
Junichi Fujimori, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed May 29, 1985, Ser. No. 738,872
Claims priority, application Japan, Jun. 1, 1984, 59-110683
Int. Cl.[4] G10H *1/043, 1/053*
U.S. Cl. 84—1.24 **11 Claims**



1. A tone effect imparting device comprising:
distribution means capable of receiving tone signals from plural tone generating systems and selectively distributing the respective tone signals to anyone or more of a plurality of effect imparting channels according to distribution information provided to said distribution means;
effect imparting means connected to said distribution means and comprising a plurality of said effect imparting channels, each of said effect imparting channels imparting a tone effect as assigned to the channel to a tone signal distributed thereto by said distribution means;
effect selection means for selecting tone effects to be imparted to tone signals of the respective tone generating systems with respect to each of said systems; and
effect assignment means for assigning, responsive to the selection by said effect selection means, the tone effect selected for each system to any of said effect imparting channels and the distribution information to said distribution means such that the distribution of the tone signals from the respective systems by said distribution means and the tone effects to be imparted to the respective channels in said effect imparting means are respectively controlled in accordance with the assignment by said effect assignment means.

4,628,790
CIRCUIT FOR AN ELECTRONIC MUSICAL INSTRUMENT
Christian J. Deforeit, Semur-en-Auxois, France, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany
Filed Sep. 3, 1985, Ser. No. 771,971
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432582
Int. Cl.[4] G10H *1/02, 7/00*
U.S. Cl. 84—1.26 **12 Claims**



1. In an electronic musical instrument, the instrument including a clock generator producing clock pulses at a variable rate commensurate with the frequencies of sounds to be generated, the instrument further including a waveform memory which is read in response to the clock generator output pulses, the memory storing digitized information commensurate with scanning values of at least two periods of a note including the release portion of the note, the instrument further including a digital-to-analog convertor for converting scanning values read from the memory into analog signals suitable for processing by succeeding circuits to produce audio frequency signals to be transduced into audible sound, the improvement comprising storing first command words at predetermined addresses in the waveform memory, said first command words controlling, when read-out, transmission of a first command signal to the clock generator to set the address from which scanning value information is read from the memory to an address in the release portion of the note having approximately the same scanning value as was read prior to the reading of a first command signal, and means for disabling the digital-to-analog convertor during the read-out of the first command words from the waveform memory.

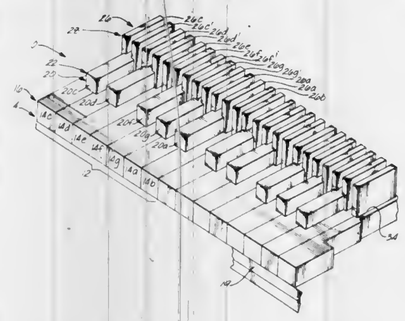
4,628,791
UMBRELLA MUSIC BOX ACCESSORY
Henri L. Phipps, Phipps Enterprises, 53 W. Fordham Rd., Bronx, N.Y. 10468
Filed Sep. 9, 1985, Ser. No. 774,157
Int. Cl.[4] G10F *1/06;* **A45B** *3/00*
U.S. Cl. 84—94 C **4 Claims**

1. In combination, a folding umbrella and a music box, the umbrella comprising a shaft portion, and upper slidable ring on the shaft portion, braces extending from the ring and supporting a canopy proximate the upper apex of the shaft portion, the music box comprising a special clamp secured to the shaft



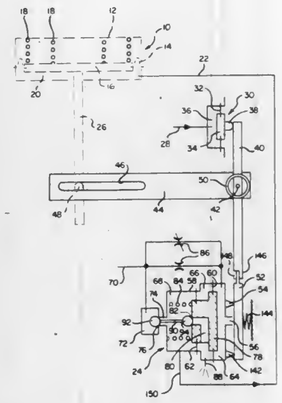
portion between the apex and the slidable ring, whereby the music box is operable upon sliding of the upper slidable ring.

4,628,792
MODIFIED MUSICAL INSTRUMENT KEYBOARD
Lawrence J. Keast, 1500 E. Locust St., Pasadena, Calif. 91106
Filed May 24, 1985, Ser. No. 738,034
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—451 **7 Claims**



1. A keyboard for a musical instrument including at least one series of keys the series of keys comprising:
seven wide keys at a first level each having a substantially flat top surface, each having a width and each coupled to means for producing a sound representing a respective pitch;
five intermediate width keys at a second level raised from the first level each having a substantially flat top surface, each having a width less than the width of a wide key, and each coupled to means for producing a sound representing a respective pitch arranged with respect to the wide keys wherein a first intermediate key is positioned between first and second wide keys, a second intermediate key is positioned between the second and a third wide key, a third intermediate key is positioned between a fourth and a fifth wide keys, a fourth intermediate key is positioned between the fifth and a sixth wide keys, and a fifth intermediate key is positioned between the sixth and a seventh wide keys;
and twelve narrow keys at a third level raised from the second level, each having a substantially flat top surface, each having a width less than the width of an intermediate width key, each having a length equal to the lengths of the other narrow keys and which is less than a length of the intermediate width keys, and each coupled to means for producing a respective pitch and wherein the narrow keys are arranged with respect to the wide and intermediate keys such that a narrow key comprises every other key.

4,628,793
PNEUMATIC POSITION CONTROLLER
Günther Roth, Solingen, Fed. Rep. of Germany, assignor to Sunvic Reglar GmbH, Solingen, Fed. Rep. of Germany
Filed Aug. 9, 1984, Ser. No. 639,223
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329944
Int. Cl.[4] F15B *13/16*
U.S. Cl. 91—374 **12 Claims**



1. Pneumatic position controller for controlling the position of pneumatic servomotor (**10**) to a value determined by a pneumatic command pressure, wherein
(a) the command pressure acts through a movable wall member (**30**) on a pivotably arranged balancing member (**40**) which controls an outlet nozzle (**56**) of a pneumatic amplifier through a baffle plate (**52**);
(b) the output of the pneumatic amplifier (**24**) is applied to the servomotor (**10**);
(c) a feedback lever (**44**) is arranged to be rotated about a pivot axis by the servomotor (**10**); and
(d) a spring arranged to be tensioned by torsion about said feedback lever pivot axis acts between the balancing member (**40**) and the feedback lever (**44**)
characterized in that
(e) the balancing member (**40**) is axially spaced from the feedback lever (**44**) with a pivot axis substantially coextensively aligned with the pivot axis of the feedback lever (**44**);
(f) the spring is a helical torsion spring (**50**) one end of which is affixed to the balancing member (**40**) and the other end of which is affixed to the feedback lever (**44**) to directly couple the helical spring torque tension from the feedback lever to the balancing member.

4,628,794
CONTROL-PINTLE FOR FLUID FLOW DEVICES
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan
Continuation of Ser. No. 421,677, Sep. 22, 1982, abandoned, which is a division of Ser. No. 109,577, Jan. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 910,809, May 30, 1978, abandoned. This application Feb. 25, 1985, Ser. No. 705,756
Int. Cl.[4] F01B *13/06*
U.S. Cl. 91—498 **1 Claim**

1. Control pintle in fluid flow devices which bear on the outer face of the control pintle a rotor which has working chambers and passages of a restricted cross-sectional area relative to the working chambers, while the control pintle includes channels and ports wherethrough the fluid flows in alternating alignement with the passages of the rotor,

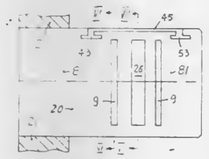
wherein pressure in fluid in the chambers of the rotor produces a force onto the bottom portion of the respective chamber directed toward the control pintle and wherein recesses are provided in the outer face of the control pintle to divide the outer face of the control pintle into different areas, as utilized in the former art;

wherein a pair of unloading recesses is provided on the outer face of the control body and communicated to unloading passages which port into a space under substantially low pressure, while sealing lands are provided between a high pressure port of the control body and the said pair of unloading recesses,

whereby one of said unloading recesses is axially distanced from the said control port in one axial direction and the other unloading recess of said pair of unloading recesses is distanced from said control port in the other axial direction parallel to the axis of said control pintle;

wherein the forces of fluid in the clearance between said outer face and the inner face of said rotor and between said control port and said unloading recesses act in a direction towards the said inner face of said rotor contrary and oppositionally to said force onto said bottom portion of said respective chamber, to

thereby maintain a desired distance of the said outer face





from the said inner face at the high-pressure zone of said control pintle and said rotor;

wherein said control pintle forms axially endwardly of said unloading recesses a pair of bearing face portions with axially extending fluid supply slots therein, while fluid supply passages are provided from a space under at least medial pressure to said supply slots in said pair of bearing face portions to create on said bearing face portions partially hydrodynamic pressure fields between said inner face and said outer face, when said rotor revolves slightly eccentric relative to the axis of said control pintle, while said unloading recesses peripherically extend substantially parallel to said port(s) and said supply slots extend in a direction perpendicular to said unloading recesses and substantially parallel to the axis of said control pintle with said slots extending through said outer face into said control pintle with the axial ends of said slots closed by the axial remainders of said bearing face portions, and,

wherein a supply passage is provided as a substantially axially extending groove along the top of the control pintle through the closing arch of the control pintle to extend into the respective supply slots for leading the respective pressure of the respective passage to the respective chamber of said working chambers into said respective supply slots.

4,628,795

PISTON OF A PRESSURE-MEDIUM ACTUATOR WITH A PISTON ROD OF ADJUSTABLE EFFECTIVE LENGTH

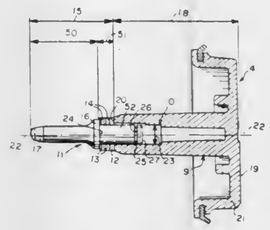
Jürgen Pickard, Wernau; Helmut Sandner, Neuhausen, and Klaus Lüttge, Fellbach, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,794

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404546

Int. Cl.⁴ F15B *15/24*

U.S. Cl. 92—13.41 **11 Claims**



1. An arrangement for actuating a brake-band in a transmission, the arrangement comprising:

a piston body,

an elongated guide shaft having a proximal end fixed to one side of the piston body and a distal end defining a first annular support surface, the guide shaft being formed to include an axial bore having an opening in the first annular support surface,

a piston rod including an outer end for engaging the transmission band, an inner end for reception in the axial bore, and a second annular support surface situated to confront the first annular support surface when the inner end of the piston rod is received in the axial bore of the elongated guide shaft,

a retaining means, positioned along the inner end of the piston rod, for retaining said inner end within the axial bore of the elongated guide shaft, and

spacer means, situated intermediate the first and second annular support surfaces, for separating said annular support surfaces to vary the effective length of the piston rod.

4,628,796

NITROGEN DIE CYLINDER

Bernard J. Wallis, 22315 Kean Ave., Dearborn, Mich. 48124

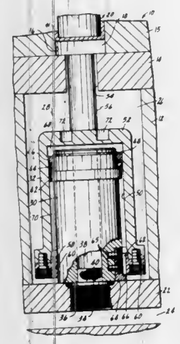
Filed Jun. 14, 1984, Ser. No. 620,680

Int. Cl.⁴ F01B *15/00*

U.S. Cl. 92—117 R **13 Claims**

1. In combination a die having a vertically movable member, a nitrogen manifold having a top wall spaced vertically below said movable die member, means extending vertically between the top wall of said manifold and said vertically movable die member and biasing said movable die member upwardly, said biasing means including a piston-cylinder assembly, the top wall of said manifold having a threaded port therein, said assembly including a vertically extending cylindrical post having a piston thereon adjacent its upper end and also having an axially extending passageway therethrough, the lower end of said post member being threaded into the threaded port on the top wall of the manifold and sealed therein, said assembly also including a cylindrical sleeve member having an axially extending bore therein, the lower end of said sleeve being open and the upper end of the sleeve being closed by an end wall, the open end of the sleeve member being telescoped over the free end of the post member so that the sleeve member is axially slideable vertically on the post member, said post member having at the free end portion thereof an annular bushing and an annular seal, said sleeve member also having an annular

bushing thereon adjacent its open end, said bushings guiding the sleeve member for axial sliding movement on the post member, said annular seal being in sealing engagement with the outer periphery of the post number and with the bore of said sleeve member, means fixed on and extending vertically upwardly from the top wall of said manifold, said last-mentioned means surrounding said post member and obstructing lateral access to the periphery of the post member adjacent the lower end thereof above the threaded connection with the manifold,



a key on one of said members and a keyway on the other member, said key and keyway being adapted to be interengaged when the sleeve member is telescoped substantially fully over said post member, said key and keyway interlocking the post and sleeve members against free relative rotation therebetween when interengaged and means on the exterior of the sleeve member adapted to be gripped by a turning tool for engaging and disengaging the threaded end of the post member with the threaded port in the manifold when the sleeve and post members are substantially fully telescoped.

4,628,797

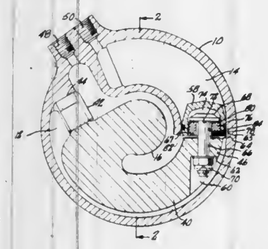
ROTARY ACTUATOR

Giles A. Kendall, Burbank, Calif., assignor to Menasco Inc, Burbank, Calif.

Filed Jul. 7, 1983, Ser. No. 512,101

Int. Cl.⁴ F01C *9/00*

U.S. Cl. 92—120 **14 Claims**



14. In a double acting, fluid driven rotary actuator having a housing and an annular chamber within said housing, the improvement comprising a single piston arm and attached piston head rotatable in either direction coaxially within said annular chamber, means for introducing a fluid pressure fore and aft of said piston head, and attachment means for attaching said piston head to said piston arm such that said piston head can move laterally relative to said piston arm and such that said piston head can move axially relative to said piston arm between first and second positions in response to said fluid pressure; and friction reduction means to be engaged in both the first position and the second position to reduce friction when said piston head moves laterally relative to said piston arm.

4,628,798

AIR HEATER AND DISTRIBUTOR UNIT

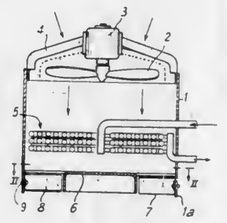
Claude Tagnon, 23, rue du Commandant Mouchotte, 94160 Saint-Mande, France

Continuation of Ser. No. 656,223, Oct. 1, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 838,182

Claims priority, application France, Oct. 4, 1983, 83 15767

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 98—31.6 **12 Claims**



1. An axially vertically disposed unit heater adapted to be located in a room having a floor, said heater comprising:

(a) an expansion enclosure comprising a substantially cylindrical tubular wall and an upper and a lower end, said upper and lower ends being open; and

(b) a motor-ventilator unit, said unit being mounted across said open upper end of said expansion enclosure and comprising means for blowing air downwardly through said expansion enclosure, a bottom in the form of a convex dome positioned substantially centrally and extending downwardly within said lower open end, an annular space defined between said convex bottom and said tubular wall of said expansion enclosure, and a plurality of adjustably orientable distribution fins positioned within said annular space, said dome having a diameter selected in direct proportion with the height of said heater unit above said floor, said diameter comprising means for defining the limits of the range of the speed of air exiting said heater through said annular space.

4,628,799

DUCT ATTACHMENT AND EXTENSION FOR AN AIR CONDITIONING UNIT

Richard D. Lang, Chittenango, and Floyd J. Frenia, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 8, 1985, Ser. No. 720,765

Int. Cl.⁴ F24F *13/02*

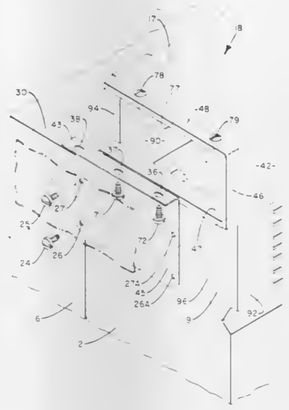
U.S. Cl. 98—40.19 **6 Claims**

1. An apparatus for attaching a fixed duct extension to the discharge opening of an air conditioning unit, the unit slidably inserted in and removed from a fixed through-the-wall sleeve, for supplying conditioned air to the space containing the unit and an adjacent space comprising:

a discharge plenum assembly adapted to be connected to the unit to encase the discharge opening, said discharge plenum assembly defining an air flow path for the conditioned air discharged from the unit and including a first housing member having a forward wall, a rear wall, and a pair of opposed side walls joining the front wall to said rear wall, and a second housing member having a top wall connected to a front wall, said top wall and said front wall fixedly attached to said rear wall and said forward wall respectively of said first housing member and forming a

duct outlet in one of said side walls, said top wall and said front wall of said second housing member and one of said pair of opposed side walls of said lower housing member having longitudinal flanges extending therefrom forming a C-like flange;

a bracket removably secured to the through the wall sleeve having an outwardly extending flange member at the top of said bracket; and



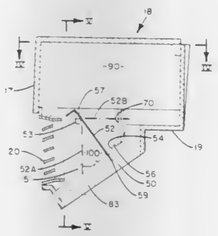
a duct extension means secured to said outwardly extending flange of said bracket near one end and to the wall of the adjacent space at the opposite end, said duct extension means having a collar at one end configured to engage with said C-like flange whereby said unit with said discharge plenum assembly attached thereto slidably engages with and disengages from the through-the-wall sleeve while said duct extension means is secured to said bracket.

4,628,800

BAFFLE ASSEMBLY FOR USE WITH A LATERAL DUCT OF AN AIR CONDITIONING SYSTEM

Richard D. Lang, Chittenango, and Cosimo Caronna, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 8, 1985, Ser. No. 721,029
Int. Cl.⁴ F24F *13/10*
U.S. Cl. 98—41.1 **7 Claims**



1. A device for directing the flow of a fluid which comprises:

a housing having an inlet and at least one outlet, said device defining a fluid flow path from said inlet to said outlet;

a pivotally mounted baffle located to obstruct the fluid flow path, said baffle including a first notch portion therein, said baffle being rotated between various positions to effect differing impediments to the fluid flow along said path;

means for securing said baffle in a plurality of preselected positions including an arcuate keeper member fixed across said inlet to engage said baffle such that said first notch portion of said baffle contact said keeper member to maintain said baffle in said preselected positions as said baffle moves along said arcuate keeper member; and

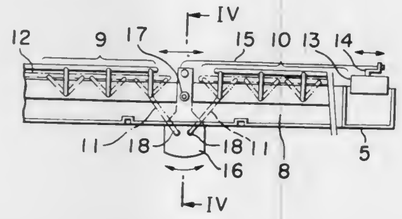
means for returning said baffle from a last position to a first position in said plurality of preselected positions including a camming surface fixedly mounted on said housing in coacting relation with said baffle when said baffle is moved beyond said last position, whereby said baffle moves out of engagement with said arcuate keeper member and moves to said first position.

4,628,801

WIND DIRECTION CHANGING DEVICE

Yasuhiko Hashimoto, Fujieda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,849
Claims priority, application Japan, May 25, 1984, 59-106249; Dec. 6, 1984, 59-258219
Int. Cl.⁴ F24F *13/15*
U.S. Cl. 98—40.3 **8 Claims**



1. An air conditioner including a blow off port for blowing air as air-conditioned and a wind direction changing device provided in said blow-off port to automatically change the direction of air flow, comprising:

(a) a plurality of juxtaposed wind direction changing plates pivotably mounted in said blow-off port in a freely rotatable manner,

(b) means connected to said wind direction changing plates for causing associated movement of said plates,

(c) transmitting means connected to one of said plurality of wind direction changing plates and pivotably mounted in said blow-off port in an oscillatable manner wherein oscillating movement of said transmitting means causes oscillation of said wind direction changing plates in a limited range,

(d) a motor disposed at an end part of said blow-off port and having a rotary shaft such that the direction of a longitudinal axis of said rotary shaft is substantially perpendicular to the direction of an air-flow from said blow-off port, and

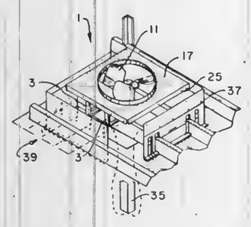
(e) means connected between said rotary shaft and said transmitting means for converting rotational motion of said rotary shaft into a reciprocating movement and which further comprises a sliding rod having a slot formed therein and a crank member having a first end thereof positioned in said slot and having a second end connected to said rotary shaft wherein said transmitting means further comprises an L-shaped member, said L-shaped member having a corner portion pivoted in a freely rotatable manner and opposite end portions thereof being respectively connected to said wind direction changing plate and said means for converting rotational motion.

4,628,802

WHOLE HOUSE FAN

Robert E. Steiner, and Chandrakant V. Savla, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 618,892, Jun. 8, 1984, abandoned, which is a division of Ser. No. 428,090, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 248,021, Mar. 26, 1981, Pat. No. 4,385,550. This application Feb. 18, 1986, Ser. No. 830,899
Int. Cl.⁴ F24F *7/06*
U.S. Cl. 98—42.1 **20 Claims**



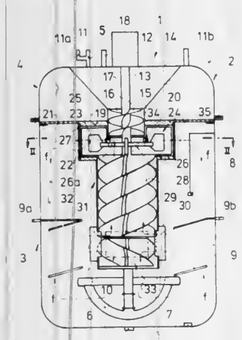
20. A method of installing a whole-house fan assembly in a ceiling without cutting joists in said ceiling, and without building a support frame around the periphery of said fan assembly for supporting said fan assembly, said fan assembly comprising a fan impeller rotatable about a vertical axis and a motor for driving said fan impeller, said ceiling being supported by a plurality of generally horizontal, parallel joists above said ceiling, said method comprising a step of cutting an opening in said ceiling to expose at least one of said joists, and a step of installing said assembly above said at least one exposed joist, said step of installing said assembly including a step of forming a skirt of sheet material around the periphery of said assembly and above said opening to define a vertical air path through said assembly, said skirt extending on both sides of said exposed joist into close propinquity to said ceiling without supporting said fan assembly, all of said steps being carried out without cutting said exposed joist and without building a support frame around the periphery of said fan assembly for supporting said fan assembly.

4,628,803

AUTOCLAVE FOR PROCESSING COCOA LIQUOR

Benito Bonora, Milan, and Ottorino Chiappa, Monza, both of Italy, assignors to Carle & Montanari S.p.A., Italy

Filed Mar. 11, 1985, Ser. No. 710,314
Claims priority, application Italy, Oct. 19, 1984, 23241 A/84
Int. Cl.⁴ B01F *7/16*
U.S. Cl. 99—348 **21 Claims**



1. In an autoclave for processing cocoa liquor, an arrangement comprising:

(a) a processing vessel having an inner circumferential wall bounding an interior;

(b) inlet means for admitting cocoa liquor into the vessel for processing;

(c) vacuum means for exhausting contaminants from within the vessel;

(d) thermal means in the vessel for thermally treating the cocoa liquor within the vessel;

(e) stirrer means for stirring the cocoa liquor, including a drive shaft within the vessel and extending along a longitudinal axis, and a drive exteriorly of the vessel and operative for turning the shaft;

(f) means for introducing a treatment fluid into the vessel for admixture with the cocoa liquor, said introducing means including conveying means on, and turnable with, the drive shaft, for conveying the treatment fluid along a flow path in one axial direction;

(g) moving means on, and turnable with, the drive shaft, for moving the cocoa liquor along a flow path in an opposite axial direction which is countercurrent to said one axial direction; and

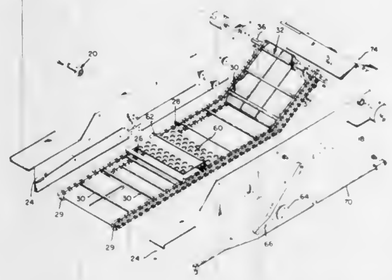
(h) dispersing means located in the flow paths of said conveying means and said moving means, and mounted on, and turnable with, the drive shaft, for mixing the treatment fluid and the cocoa liquor, and for dispersing the resultant mixture of treatment fluid and cocoa liquor under centrifugal action in free air in generally radially, outward directions toward the inner circumferential wall of the vessel and allowing the mixture to fall freely in the interior of the vessel under the influence of gravity in an umbrella-like dispersion pattern.

4,628,804

DOUGHNUT MAKING MACHINE FOR MOVING OBJECTS THROUGH A FRYING TANK

Thomas E. Belshaw; Frederick G. Woodworth, both of King County, and Wilbur D. Wilke, Snohomish County, all of Wash., assignors to Belshaw Bros., Inc., Seattle, Wash.

Filed Aug. 29, 1985, Ser. No. 770,849
Int. Cl.⁴ A47J *37/12*
U.S. Cl. 99—404 **7 Claims**



1. In a doughnut machine having a frying tank for holding hot liquid, a doughnut conveyor for moving doughnuts through the tank, conveyor drive means, and a flipper for inverting the doughnuts, the improvement comprising:

said doughnut conveyor including a horizontal main section, an inclined section, and a plurality of transverse pusher bars;

a separate elevator conveyor having an upper run parallel to said inclined section of said doughnut conveyor;

said conveyor drive means including a shaft, a set of doughnut conveyor sprockets fixed to said shaft, a set of elevator conveyor sprockets having a pitch different from said doughnut conveyor sprockets fixed to said shaft; and

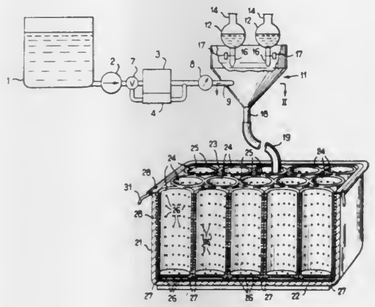
means for guiding said bars about said elevator conveyor sprockets while maintaining the bars in the pitch of the doughnut conveyor sprockets.

4,628,805

APPARATUS FOR PROCESSING CHEESE

Bernard Derode, 28, Boulevard d'Inkermann, 92200 Neuilly sur Seine, France

Continuation-in-part of Ser. No. 517,829, Jul. 27, 1983, Pat. No. 4,568,554. This application Jul. 24, 1985, Ser. No. 758,524
Claims priority, application France, Sep. 29, 1982, 82 16365
Int. Cl.[4] A23C *19/05*
U.S. Cl. 99—453 **19 Claims**



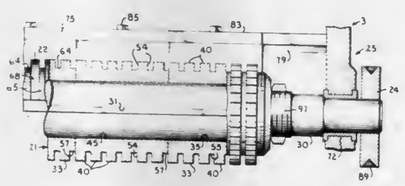
1. Apparatus for processing soft cheese comprising:
a plurality of tubular molds having perforations therein for allowing separation of whey from curd formed in the molds;
means for holding said molds in a liquid container during filling of said molds with a curd forming milk mixture and during curd formation in the molds, said means for holding said molds being constructed to hold the molds in an array with open spaces between the molds to allow whey to drain through said perforations following curd formation in the molds; and
a plurality of intermold elements configured to extend into and substantially fill the spaces between the molds during filling thereof to confine the curd forming milk mixture to the interior of the molds, said intermold elements being removable from said spaces after curd has been formed in the molds to permit drainage of whey through said perforations.

4,628,806

DESKINNING TOOTH ROLL APPARATUS

David P. Murphy, 3208 Pickett, St. Joseph, Mo. 64503

Filed Sep. 10, 1985, Ser. No. 774,568
Int. Cl.[4] A22C *17/12*
U.S. Cl. 99—486 **11 Claims**



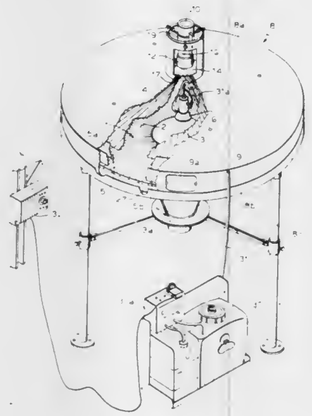
1. A deskinning toothed roll apparatus comprising:
(a) a rotatable shaft;
(b) a plurality of annular cylinders having an outer surface; each of said surfaces having a plurality of spaced circumferential grooves extending radially inwardly relative to said surface;
(c) said grooves spearating circumferential rows of teeth extending radially outward from the surface of a respective cylinder such that each cylinder has a plurality of circumferential rows of teeth thereon;
(d) said annular cylinders being slidably sleeved on said shaft; and
(e) locking means to releasably secure said cylinders to said shaft so that said cylinders rotate with said shaft.

4,628,807

DEVICE FOR THE WET TREATING OF SEED MATERIAL

Siegfried Dopp, Hamburg, Fed. Rep. of Germany, assignor to Mantis ULV - Sprühgeräte GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 697,115
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403069; Denmark, Feb. 10, 1984, 599/84
Int. Cl.[4] B02B *1/04, 5/00, 7/02*
U.S. Cl. 99—488 **12 Claims**



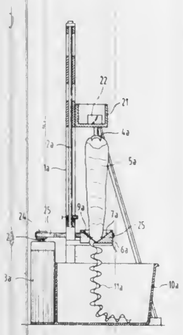
1. A device for the wet treating of seed material, such as grains, comprising a substantially rotation-symmetrical treating chamber including an inwardly sloping annular bottom wall, a central discharge opening surrounded by said bottom wall, an upper wall concentrically arranged above said bottom wall and sloping towards the periphery of the latter, said upper wall having an outer rim being spaced apart from the peirphery of the bottom wall to form therewith an annular gap for passing the seed material into the treating chamber; spraying means arranged in the treating chamber and being connected to a source of treating liquid; a gravity pipe having a downward outlet opening arranged concentrically above said upper wall to feed the seed material onto the latter; a dosing pipe surrounding said gravity pipe and being supported for limited coaxial displacement relative to the latter, said dosing pipe having an internal expansion of increased internal diameter including an internal annular bottom surface and a discharge opening disposed coaxially downstream of said outlet opening and having a diameter being at most slightly larger than said outlet opening; a deflecting surface disposed concentrically at a distance below said discharge opening; resilient energy storing means for urging said dosing pipe against the force of gravity into a rest position in which an annular clearance of predetermined breadth is established between said discharge opening and said deflecting surface; said energy storing means and the dimensions of said expansion being adjusted such that in operation the seed material loading said dosing pipe and its internal expansion automatically adjusts the breadth of said annular clearance to provide a constant weight flow rate of the seed material substantially independent of properties and density of the treated seed material.

4,628,808

CUTTING DEVICE

Nicola-Carlo Simon, Burghardtgasse 6/2, A-1200 Vienna, Austria

PCT No. PCT/EP84/00289, § 371 Date Apr. 15, 1985, § 102(e) Date Apr. 15, 1985, PCT Pub. No. WO85/01240, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 19, 1984, Ser. No. 737,349
Claims priority, application Austria, Sep. 20, 1983, 3348/83
Int. Cl.[4] A23N *7/00*
U.S. Cl. 99—538 **3 Claims**



1. A cutting device for fruits such as radishes, cucumbers, apples or the like, and for cheese and sausages, which includes a support for an item to be cut, a blade, having a cutting edge, extending substantially radially from a longitudinal axis of the item to be cut and affixed to a leading edge of said support, said support having an axis of rotation, a drive, specially an electric motor, for rotating the support around the axis of rotation thus spiral cutting the item to be cut, a vertical guide to move the item to be cut in a direction toward said blade, the item to be cut is non-rotatable and said support (**6**), rotated by said drive, is further provided with a funnel-shaped depression (funnel **7**) situated substantially in said axis of rotation for centering said item to be cut (**5**), said support (**6**) further includes a recess (**8**) for said blade (**9**), which recess starts from a point of passage of said axis of rotation and extends substantially radially, the cutting edge of said blade projecting above said funnel-shaped depression and defining an aperture (**12**) for discharging the item that has been cut in spiral form.

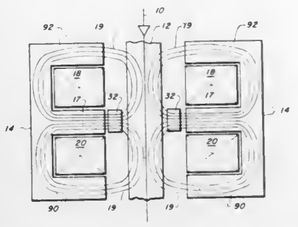
4,628,809

RADIAL ORIENTATION RARE EARTH-COBALT MAGNET RINGS

Dilip K. Das, Bedford; Kaplesh Kumar, Wellesley, and Ernest C. Wettstein, Acton, all of Mass., assignors to The Charles Stark Draper Laboratory, Cambridge, Mass.

Division of Ser. No. 248,798, Mar. 30, 1981, Pat. No. 4,533,407. This application Aug. 5, 1985, Ser. No. 762,708
Int. Cl.[4] B30B *15/14*
U.S. Cl. 100—208 **9 Claims**

1. A die press for forming radially-oriented compacted rings from rare earthtransition metal alloy powder, comprising:
a housing of ferromagnetic material, said housing having a first cylindrical channel therethrough, and also possessing two axially spaced annular recesses surrounding said first cylindrical channel, said recesses defining an annular partition of material of said housing therebetween;
two opposing plungers of nonmagnetic material, sized to fit within said first cylindrical channel from opposite ends thereof, said annular plunger each possessing a second cylindrical channel axially therethrough and an end which is insertable into said first cylindrical channel;
a cylindrical mandrel of ferromagnetic material, sized to fit within said second cylindrical channel;
two annular electromagnetic bucking coils, said bucking coils being located in said annular recesses in said housing, and producing a radially oriented magnetic field at said annular partition of said housing; and



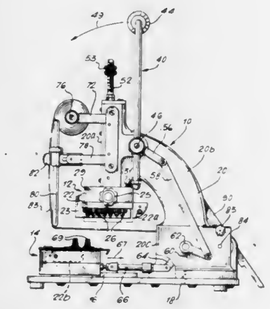
means for forcing the opposing ends of said annular plungers together within said housing.

4,628,810

PRINTING MACHINE

Wilson Chan, Hong Kong, Hong Kong, assignor to Space Lab (Hong Kong) Enterprises Ltd., Hong Kong

Filed Feb. 27, 1984, Ser. No. 584,210
Int. Cl.[4] B31F *1/07*
U.S. Cl. 101—27 **11 Claims**



1. A hot printing machine comprising:
a printing platten for supporting an item to be printed,
means for mounting said platten for reciprocal movement along a substantially horizontal first axis between a forward loading and unloading position and a rearward printing position,
a printing head reciprocally movable along a substantially vertical second axis, and capable of carrying a printing die,
heating means included in said head for heating a die carried by said head,
a handle mounted on the machine for pivotal movement about an axis substantially perpendicular to the plane containing said first and second axes,
link means for linking movement of said handle with movement of said printing head and with movement of said platten so that, before contact of said die with said item to be printed, said platten has been moved to its rearward printing position,
means for supporting a supply roll of printing foil forwardly of said second axis, and means for guiding said foil along a path substantially in the plane containing the first and second axes which passes beneath said heated die to a take-up mechanism so that when said die is pressed by said head against said item to be printed, the foil is sandwiched therebetween to give the printing effect required, and
a gear coupled to the take-up mechanism, and a rack urged against the gear, the rack and gear forming a ratchet by

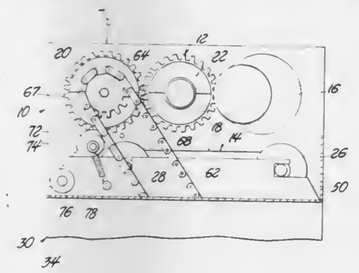
which the rack rotates the gear to draw a length of said foil along said path during movement thereof in one direction, and slides over the gear during movement thereof in the other direction, such reciprocal movement being coupled to the handle such that a length of foil is drawn along said path as the handle is pivoted in one direction, but not in the other.

4,628,811

CUP PRINTER INCLUDING AN ENDLESS BELT INK CARTRIDGE

Franklin R. Lozen, 22600 Sherwood, Warren, Mich. 48091

Filed Feb. 25, 1985, Ser. No. 705,221
Int. Cl.[4] B41F *17/28*
U.S. Cl. 101—38 R **13 Claims**



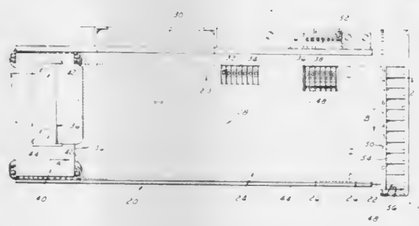
1. A cup printing assembly (10) comprising: ink transfer means (12) for forming an ink image from an ink reservoir (14) and transferring the ink image to a cup (16); and said assembly (10) characterized by including an absorbent continuous belt member (18) for being the sole means for storing the ink to be transferred therein, said ink transfer means (12) including a plurality of rollers (20,22,24) for transferring ink from said belt member (18) to the cup (16), said reservoir means (14) further including belt support means rotatably supporting said belt member (18) for transferring ink to at least one of said rollers (20) and drive means (30) for rotating said rollers (20,22,24) and said belt member (18) together, said belt support means (14) being a cartridge removably mounted in said assembly (10) to provide access to said belt member (18).

4,628,812

VARIABLE DATA IMPRINTER FOR CREDIT CARDS AND THE LIKE

James C. Fisk, 26 S. Oak Forest Dr., Asheville, N.C. 28803

Filed Oct. 19, 1984, Ser. No. 662,513
Int. Cl.[4] B41J *1/32*
U.S. Cl. 101—109 **25 Claims**



1. An apparatus for imprinting variable data on a document, the combination comprising:

a plurality of coaxially arranged type wheels each having an axial opening, a dog extending into said axial opening, and a succession of type faces on the wheel periphery;

support means for rotatably supporting the type wheels for contact with a document to be imprinted;

positioning means for rotatably positioning the type wheels, said positioning means extending through the axial openings of the type wheels to independently engage the dog of a selected type wheel;

index means for indexing the positioning means along the axis of the type wheels to successively engage and rotatably position selected wheels; and

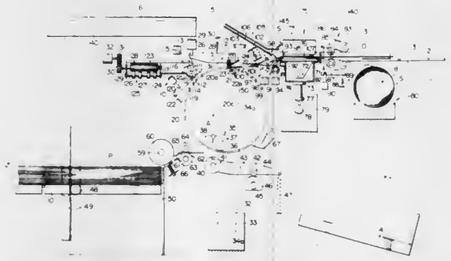
reset means to simultaneously reset the type wheels to a starting position said reset means extending through the axial opening of the type wheels for cooperating with the type wheel dogs.

4,628,813

STENCIL DUPLICATOR PROVIDING AUTOMATIC STENCIL PERFORMATION, CHARGING, PRINTING, AND DISPOSAL

Takanori Hasegawa, Tokyo; Shuntaro Yoshida, and Susumu Oshio, all of Tokyo, Japan, assignors to Riso Kagaku Corporation, Japan

Continuation of Ser. No. 544,723, Oct. 24, 1983, abandoned. This application Oct. 22, 1985, Ser. No. 789,367
Claims priority, application Japan, Nov. 26, 1982, 57-207216
Int. Cl.[4] B41L *13/06*
U.S. Cl. 101—116 **2 Claims**



1. Stencil duplicator comprising:

a rotary cylindrical printing drum having a cylindrical wall having an outer and an inner cylindrical surface and formed with multiple holes therethrough, said printing drum being mounted to be rotatable around a central axis thereof and further having a clamping means arranged along a generatrix of the cylindrical shape thereof for fastening a leading edge of a stencil strip to the outer cylindrical surface thereof along said generatrix;

a means for supporting a roll of the stencil strip to be rotatable around a central axis thereof arranged in parallel to said central axis of said printing drum so as to supply the stencil strip toward said printing drum;

a first driving means for selectively driving said printing drum in a rotational direction so as to take up the stencil stip from said roll and to lay said stencil strip around said printing drum starting from a leading edge thereof when the leading edge is fastened to said printing drum by said clamping means and so to perform printing with the stencil strip laid therearound;

a means for perforating said stencil strip, positioned between said printing drum and said roll supporting means, comprising a light transmitting plate, a flash light source which selectively irradiates light beams through said light transmitting plate, a pressure plate facing said light transmitting plate, a second driving means for selectively driving at least one of said light transmitting plate and said pressure plate toward and away from the other so that said light transmitting plate and said pressure plate may either be selectively pressed together or separated from one another, and a means for feeding an original sheet to be laid over the stencil strip, said stencil perforating means perforating said stencil strip according to black portions in an image of said original sheet over a predetermined rectangular area in each cycle of operation of pressing said light transmitting plate and said pressure plate together and flashing said flash light source, said rectangular area having a predetermined first dimension along a direction of feeding of said stencil strip;

a means for initially feeding the stencil strip from said roll toward said printing drum through a space between said light transmitting plate and said pressure plate so that the leading edge of the stencil strip is fed to said clamping means of said printing drum only when said printing drum is held at a stencil clamping base rotational position thereof;

a means for cutting said stencil strip to a predetermined length at the end of feeding thereof;

a means for supplying printing ink to the inner cylindrical surface of said printing drum;

a means for feeding printing sheets successively toward said printing drum and pressing each printing sheet toward the outer cylindrical surface of said printing drum so as to be printed by the ink conducted through said multiple holes from the inside to the outside of said printing drum and through perforated portions of said stencil strip wrapped around said printing drum; and

a control means for controlling said clamping means, said stencil strip feeding means, said first and second driving means, said flash light source and said stencil strip cutting means in a co-related manner such that, in a first stage of operation, said stencil strip feeding means is operated to feed the leading edge of the stencil strip toward said clamping means of said printing drum; in a second stage of operation in a first mode of operation, said first driving means is operated so as to drive said printing drum in said rotational direction so as to continue feeding and take up of the stencil strip for a predetermined length thereof which is smaller than said first dimension through the space between said light transmitting plate and said pressure plate while said second driving means is operated so as to separate said light transmitting plate and said pressure plate from one another, and in a second mode of operation said first driving means is operated so as to stop rotation of said printing drum and therefore the taking up of the stencil strip while said second driving means is operated so as to press said light transmitting plate and said pressure plate together and then switching on said light source, said first and second mode operations being repeated one after the other for predetermined times, respectively; in a third stage of operation, said stencil strip cutting means is operated so as to cut the stencil strip transversely at a position between said stencil strip perforating means and said printing drum and in a fourth stage of operation, subsequent to said third stage, said first driving means further drives said printing drum in a continuous rotating manner to perform printing by said printing drum while loaded with the perforated stencil sheet.

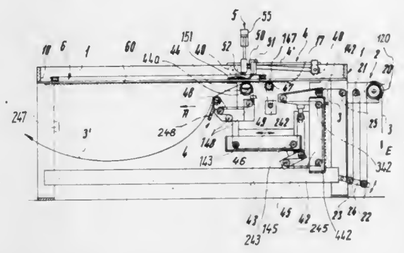
4,628,814

FLAT SCREEN PRINTING MACHINE

Gerhard Klemm, Am Rehwinkel 37, D-4800 Bielefeld, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,691
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334444
Int. Cl.[4] B41L *13/02, 13/16*
U.S. Cl. 101—123 **16 Claims**

1. In a machine for discontinuous screen printing on an elongated web of material, the combination of a support; a substantially flat stationary printing screen on said support, said screen having an upper side and an underside; a cylindrical counterpressure member adjacent to the underside of said screen means for positioning the web between said counterpressure member and said underside of said screen including means for advancing the web in a predetermined direction and along a predetermined path, said counterpressure member being reciprocable in and counter to said direction and said advancing means including said counterpressure member and a web stabilizing device located downstream of said counterpressure member in said direction, said counterpressure member comprising an air-permeable hollow rotary cylindrical shell and means for evacuating air from the shell so that the latter can attract the adjacent portion of the web and can secure the web and roll the web across the screen without slippage; means for intermittently rotating said shell so that the shell is held against rotation during movement of said counterpressure member in said direction and that the shell rotates during movement of said counterpressure member counter to said direction; means for reciprocating said counterpressure



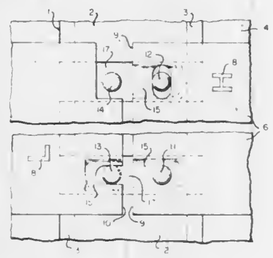
member along said underside of said screen, including a carriage for said counterpressure member and means for reciprocating said carriage relative to said screen; means for applying a printing medium to the web through said screen, including a plurality of discrete applicators, one of said applicators including means for supplying the printing medium to the upper side of the screen and another of said applicators including means for forcing the applied printing medium through the screen into contact with the web; means for securing said applying means to said carriage; and means for moving said applicators up and down relative to said carriage.

4,628,815

REVERSIBLE LOCKUP SYSTEM FOR MAGNETICALLY SECURABLE PRINTING PLATES

Eugene M. Van Kanegan, Elmhurst, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 15, 1985, Ser. No. 754,553
Int. Cl.[4] B41F *27/02, 27/12*
U.S. Cl. 101—415.1 **2 Claims**



1. In a printing cylinder for use with thin magnetically attractable printing plates, the combination comprising:

(a) a plate cylinder having a transverse slot formed across the width of said cylinder;

(b) a liner mounted in the transverse slot of said plate cylinder, said liner being insulating with respect to magnetic fields;

(c) a magnetic insert occupying not more than one inch of the arc of said plate cylinder circumference disposed within said liner across the width of said plate cylinder;

(d) at least two pairs of register pins mounted in and extend-

ing outwardly from said magnetic insert to provide register locations for a printing plate on said plate cylinder having;

(1) a first pair of said pins spaced laterally in the across-cylinder direction and used to provide register location of the leading end of a plate by said plate surrounding said first pair of pins;

(2) a second pair of said pins spaced laterally identically to said first pair but also spaced circumferentially from said first pair, said second pair of pins being used instead of said first pair of pins to provide register location of the leading edge of a plate by said plate surrounding said second pair of pins when plate cylinder rotation is reversed from the rotation associated with use of said first pair of pins; and

(e) a thin magnetically attractable non-extensible printing plate having:

(1) formed adjacent the leading edge thereof,

(i) a circular opening sized to closely receive one of said register pins;

(ii) a slotted opening sized to closely receive a separate register pin in the circumferential direction and to be free fitting in the lateral direction of said plate, and

(2) formed adjacent the trailing edge thereof

(i) a slotted opening having a width in the lateral direction of said plate which closely fits with one of said register pins; and

(ii) an open portion that is oversized in all directions with respect to its associated pin.

4,628,816

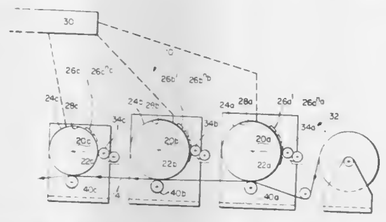
PRINTING APPARATUS

Albert J. Six, 22425 Santa Paula Ave., Cupertino, Calif. 95014

Filed Jun. 20, 1984, Ser. No. 622,693

Int. Cl.⁴ B41F *5/06, 5/16;* **B41L** *49/02*

U.S. Cl. 101—426 **12 Claims**



1. A printing apparatus (**10**) adapted for printing a plurality of imprints (**12**) onto a sheet (**14**) divided into a plurality of sequentially longitudinally spaced printing fields (**16**) having a selected field length, said printing fields (**16**) each being divided into a plurality of longitudinally and laterally spaced printing domains (**18**), comprising:

a plurality of spaced printing rolls (**20***a*–**20***f*) having peripheral cylindrical surfaces (**24***a*–**24***f*), each of said rolls (**20***a*–**20***f*) having image transfer regions (**26***a*^{1}–**26***f*^{n1}) adapted to print said imprints (**12**) onto each of said printing fields (**16**) on said sheet (**14**), said rolls (**20***a*–**20***f*) each having circumferences (**28***a*–**28***f*) which are different integral multiples of said field length and which are not integral multiples of one another, each of said cylindrical surfaces (**28***a*–**28***f*) having a subset of said image transfer regions (**26***a*^{1}–**26***f*^{n1}) positioned to print said imprints (**12**) on said printing fields (**16**), each of said subsets of said image transfer regions (**26***a*^{1}–**26***f*^{n1}) on each of said rolls (**20***a*–**20***f*) being positioned to print said imprints (**12**) on only a selected subset of said longitudinally and laterally spaced printing domains (**18**), said printing fields (**16**) having a null set intersection with one another and said selected subsets of said printing domains (**18**) having a null set intersection with one another;

means (**30**) for rotating said rolls (**20***a*–**20***f*) about said axes (**22***a*–**22***f*) at a velocity such that said cylindrical surfaces (**24***a*–**24***f*) have equal tangential velocities;

means (**32**) for transferring an image reproducing medium onto each of said image transfer regions (**26***a*^{1}–**26***f*^{n1});

means (**36**) for longitudinally moving said sheet (**14**) generally tangentially sequentially adjacent each of said cylindrical surfaces (**24***a*–**24***f*) at a velocity such that said sheet (**14**) and said cylindrical surfaces (**24***a*–**24***f*) have zero relative velocity difference; and

means (**40***a*–**40***f*) for transferring said image reproducing medium from said image transfer regions (**26***a*^{1}–**26***f*^{n1}) to said printing domains (**18**) on each of said printing fields (**16**) as said sheet (**14**) moves opposite said image transfer regions (**26***a*^{1}–**26***f*^{n1}).

4,628,817

METHOD OF AND ARRANGEMENT FOR AUTOMATIC ADJUSTMENT OF THE OPERATING MODE OF A SWITCHABLE PRINTING MACHINE

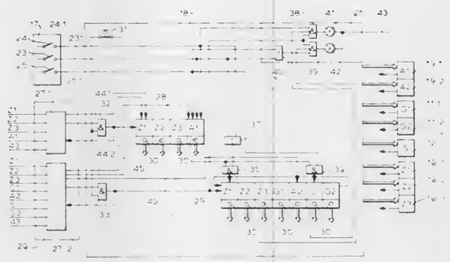
Hilmar Trinks; Gunter Peter, both of Radebeul; Volker Eichler, Weinboehla, and Winfried Buesse, Radebeul, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Sep. 4, 1985, Ser. No. 772,874

Claims priority, application German Democratic Rep., Sep. 5, 1984, 266992

Int. Cl.⁴ B41F *21/00, 33/16*

U.S. Cl. 101—426 **12 Claims**



1. A method of automatically adjusting a printing machine which is selectively operatable in a single-side printing mode and in a two-side printing mode, is changeable to different sheet formats, and includes a sheet turning drum, gripper systems and controls therefor, and a ring gear, comprising, during the adjustment from the single-side printing mode to the two-side printing mode and commencing from a first initial position, the succession of steps of adjusting the angular position of the sheet turning drum, adjusting the gripper system controls, and adjusting the angular position of the ring gear, including releasing the ring gear, angularly displacing the ring gear, and engaging the ring gear; during the adjustment from the two-side printing mode to the single-side printing mode and commencing from the first initial position, the succession of steps of adjusting the angular position of the ring gear, including releasing the ring gear, angularly displacing the ring gear, and engaging the ring gear, adjusting the gripper system controls, and adjusting the angular position of the sheet turning drum; and during the format change, commencing from the first initial position, the step of adjusting the angular position of the ring gear, including releasing the ring gear, angularly displacing the ring gear, and engaging the ring gear.

4,628,818

SHORT CIRCUIT SPRING FOR AN ELECTRICAL CONNECTOR

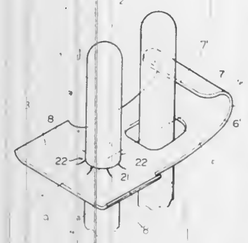
Karl E. Nilsson, Ottobrun, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH, Aschau a. Inn, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,757

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338929

Int. Cl.⁴ F42B *3/10*

U.S. Cl. 102—202.2 **9 Claims**



1. A short circuit spring for normally providing a short circuit between two electrical terminals of a first electrical connector, whereby said short circuit is established when the first connector is separated from a compatible second connector, comprising a leaf spring body having a substantially flat section at one end thereof and a curved section at the opposite end of said leaf spring body, said flat section having a first aperture located away from said curved section, said first aperture having such a size that one of said two electrical terminals fits snugly in an electrical contact making manner through said first aperture, and a second aperture in said flat section adjacent to said curved section, said second aperture having such a size that the other of said two electrical terminals passes through said second aperture and remains out of electrical contact with said flat section of said leaf spring body, said curved section forming a tongue which is bent back to normally contact said other electrical terminal under spring bias for maintaining said short circuit when said first and second connectors are separated, and for interrupting said short circuit when said first and second connectors are joined together, whereby said short circuit is reestablished upon separation of said first and second connectors.

4,628,819

DISINTEGRATING TAMPER MASS

Joseph E. Backofen, Jr., Herndon, Va.; James A. Petrousky, Port Tobacco, Md.; Donald J. Butz, Columbus, Ohio; David W. Holmes, Ellicott City; Ernest C. Faccini, Marbury, both of Md., and Arleigh E. McCree, Sylmar, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

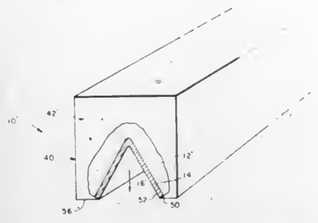
Filed Aug. 16, 1985, Ser. No. 766,219

Int. Cl.⁴ F42B *1/02*

U.S. Cl. 102—307 **12 Claims**

1. A blast confinement means for temporarily confining detonation products associated with a blast comprising:

a tamper mass associated with an explosive to enclose a portion of that explosive, said tamper mass including a particulate material and a binder means for binding particles in said particulate material together into a self-supporting structure which temporarily contains the products associated with detonation of the explosive for reducing the loss of such products and enables the detonation energy to be concentrated toward a target and then disintegrates into a multiplicity of low energy particles.



4,628,820

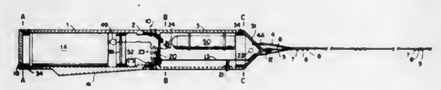
EXTENDED RANGE MINE

Theodore M. Williams, 1360 Keneki Pl., Hilo, Hi. 96720

Filed Jul. 1, 1985, Ser. No. 750,497

Int. Cl.⁴ F42B *22/00*

U.S. Cl. 102—411 **1 Claim**



1. An extended range mine having an aft closure and a cone shaped front closure; said mine having compartments therein for explosives, electrical equipment, ballast means and mine control means; a flexible appendage connected at one end to said cone shaped front closure and at its opposite end to a drogue chute, said appendage having ballast discharge means adjacent said drogue chute connection, bouyancy means, sensors and electrical conducting means; wherein upon deployment, said mine sinks to the ocean floor where ocean currents cause said drogue chute to extend said appendage to its full length and when sensors detect the presence of an enemy vessel, said mine control means causes said mine to blow ballast from said appendage and mine such that said mine and said appendage floats to the surface where it has the opportunity for said extended appendage to become entangled in a vessel's propulsion unit and thus explode said mine.

4,628,821

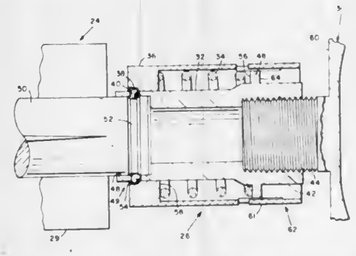
ACCELERATION ACTUATED KINETIC ENERGY PENETRATOR RETAINER

Jimmy M. Madderra, Huntsville, and James G. Williams, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1985, Ser. No. 752,275

Int. Cl.⁴ F42B *13/06*

U.S. Cl. 102—517 **6 Claims**



1. A retainer mechanism for releasably securing a kinetic energy penetrator to a rocket propelled missile comprising:

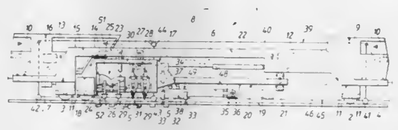
a. a support member having one end secured to said rocket propelled missile and extending therefrom, said support member having a recess at a second end thereof for support of said kinetic energy pentrator therein;
b. an annular member slidably mounted about said support member;
c. a plurality of balls carried between said penetrator and said annular member for securing the penetrator to the support member; and,
d. a spring mounted about said support member and within said annular slidable member, said spring having one end in engagement with said annular slidable member and a second end in engagement with said support member, said spring disposed for compression responsive to accelerations acting on said missile for release of said balls to effect release of said kinetic energy penetrator from said rocket propelled missile.

4,628,822

CONTINUOUSLY ADVANCING TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 7, 1984, Ser. No. 618,238
Claims priority, application Austria, Sep. 28, 1983, 3455/83
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] E01B *27/17*
U.S. Cl. 104—7.2 **6 Claims**



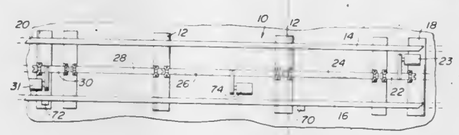
1. A continuously advancing machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast defining cribs between the successive ties, which comprises
(a) a machine frame supported on undercarriages for continuous movement in an operating direction,
(b) a power plant and operating control means including drive means for continuously advancing the machine frame along the track in the operating direction and brake means for stopping the advance of the machine frame, the power plant and the control means being carried by the machine frame,
(c) a tool carrier frame having a rear end supported on an undercarriage,
(d) tamping means mounted on the tool carrier frame immediately ahead of the undercarriage supporting the rear tool carrier frame end, in the operating direction, for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties,
(1) the tamping means at a fixed distance therefrom comprising a respective tamping tool assembly associated with each rail, each tamping tool assembly being vertically movably mounted on the tool carrier frame and including two pairs of vibratory and reciprocatory tamping tools spaced from each other in the operating direction so that each pair of tools is in vertical alignment with a respective one of two successive ones of the cribs whereby the tamping tools of each pair may be immersed in the respective cribs upon vertical downward movement of the tamping tool assembly, and the tools of each pair being pivotal in opposite directions for spreading towards a respective one of the ties defining the crib,
(e) track lifting and lining means associated with the two rails mounted on the tool carrier frame ahead of the tamping means in the operating direction and being arranged on the tool carrier frame between two of said undercarriages spaced in the direction of the track,
(f) track leveling and lining reference systems controlling the track lifting and lining means, and
(g) a longitudinally adjustable coupling pivotally connecting the tool carrier frame to the machine frame for driving the tool carrier synchronously with the intermittent tamping cycles.

4,628,823

VEHICLE SPEED CONTROL TRANSITION MODULE AND METHOD

Edmund L. Mangan, Bethlehem, and Barry Conklin, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Jun. 4, 1984, Ser. No. 617,216
Int. Cl.[4] B61B *13/00*
U.S. Cl. 104—166 **11 Claims**



5. Apparatus for automatically controlling the speed of a driverless vehicle comprising a stationary frame supporting first, second and third aligned drive tubes between tracks on said frame and which are adapted to support a driverless vehicle, means for independently driving said first, second and third drive tubes such that each tube, when driven, rotates about its longitudinal axis, sensor means disposed along the frame for actuation by a driverless vehicle, and said means for independently driving said drive tubes including variable speed drive means responsive to said sensor means for driving the second tube between first and second speeds.

9. Method of automatically controlling the speed of a driverless vehicle which travels along first, second and third aligned drive tubes by frictional contact therewith, including maintaining said first, second and third drive tubes out of mechanical engagement with each other at all times, sensing the location of the driverless vehicle, driving the first drive tube at a first speed, driving the third drive tube at a second speed, and varying the speed of the second drive tube from said first speed to said second speed based on the sensed location of the driverless vehicle while the vehicle is driven by contact with the second drive tube.

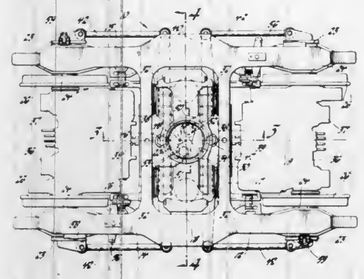
4,628,824

SELF STEERING RAILWAY TRUCK

David J. Goding, Willow Springs, and Mostafa Rassaian, Chicago, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1985, Ser. No. 705,330
Int. Cl.[4] B61F *05/38*
U.S. Cl. 105—168 **19 Claims**

1. A combination in a self steering railway truck of
a pair of longitudinally spaced rail engaging wheel and axle members each including a pair of wheels laterally connected by an axle,
a frame having a central longitudinal and vertical plane and carried near opposite ends by said axles,
yieldable retaining and suspension means supporting the frame on the axles and nominally urging said wheel and axle members into centered positions for motion along straight paths aligned with said central plane but permitting limited self-induced yawing of said members during movement along curved paths, and
force transmitting linkages, one connecting each of said wheel and axle members with said frame, each said linkage including a lateral steering beam and a pair of parallel connecting rods, each said steering beam having a center pivotally connected with said frame in said central plane and being free of any connection with an associated carbody except through said frame, and said connecting rods nominally extending in planes parallel with said central



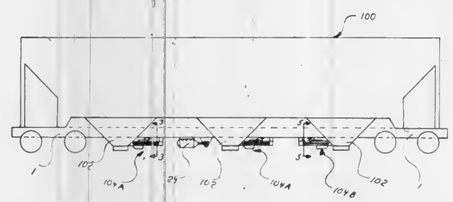
plane and pivotally connecting points on the steering beams laterally opposite and equidistant from their centers with points of the wheel and axle members longitudinally aligned with their connected steering beam points to carry longitudinal forces from the wheels to the truck frame without causing significant yaw forces in the wheel and axle members.

4,628,825

SLIDING GATE ACTUATING MECHANISM

Fred J. Taylor, Covington, and William I. Donnermeyer, Jr., Bellevue, both of Ky., assignors to American Autogate Corporation, Cincinnati, Ohio

Filed Jun. 27, 1984, Ser. No. 395,917
Int. Cl.[4] B61D *7/20, 7/28*
U.S. Cl. 105—289 **19 Claims**



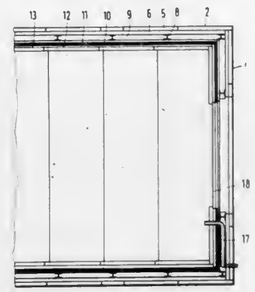
1. A hopper car, comprising:
a body;
a plurality of discharge chutes along the underside of said body;
a plurality of sliding gates for closing said discharge chutes;
means for shifting each of said sliding gates between a first position fully closing said discharge chutes and a second position fully opening said discharge chutes, wherein at least one of said sliding gates travels in the opposite direction from the other sliding gates when moving from said first to said second position;
a plurality of drive levers coupling said shifting means to said sliding gates;
and a single activating means, operative in a linear direction, for simultaneously shifting all of said sliding gates from said first to said second position.

4,628,826

WALK-IN SHELTER

Klaus Richter, Berlin, Fed. Rep. of Germany, assignor to Brandschutz GmbH, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,470
Claims priority, application Switzerland, Jul. 27, 1984, 3615/84
Int. Cl.[4] E05G *3/00*
U.S. Cl. 109—1.5 **11 Claims**



1. A walk-in shelter for protecting articles, such as data carriers, against undesired heat, radiation, gas and water action and against mechanical stressing comprising an enveloped enclosure defined by multilayer walls, each wall including:
(a) an outer layer **2** of sheet metal material **3** formed with reversely bent sections **4** on its inner side,
(b) a first layer of high-strength thermal insulating material **5** located at the inner side of said outer layer and received within said bent sections on said outer layer,
(c) a supporting frame of channel-shaped beams **8** spaced inwardly from said first layer,
(d) a second layer **6** of thermal insulating material engaged between said frame and said first layer and a third layer **9** of thermal insulating material received and retained within the channels of the beams of said frame,
(e) a fourth layer **10** of high-strength thermal insulating material located at the inner side of said frame,
(f) a layer **11** of plaster board material at the inner side of said fourth layer,
(g) a fifth layer **12** of high-strength thermal insulating material at the inner side of said layer of plaster board material,
(h) an inner layer **13** of sheet metal material **3** at the inner side of said fifth layer formed with reversely bent sections **4** on its inner side,
(i) a sixth layer of high-strength thermal insulating material **5** located at the inner side of said inner layer and received within said bent sections of said inner layer, and
(j) a covering layer **16** of wood, plaster board or the like engaged with the inner side of said sixth layer.

4,628,827

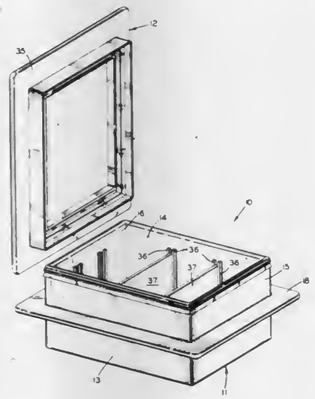
STORAGE VAULT FOR VALUABLES

R. Mark Litter, 1725 Sandusky County Rd. 41, Fremont, Ohio 43420

Filed Apr. 30, 1984, Ser. No. 605,232
Int. Cl.[4] E05G *1/00*; B65D *25/24*
U.S. Cl. 109—50 **8 Claims**

1. A storage vault for valuables adapted to be removably buried in the earth, comprising a container of a durable, moisture-impervious, non-magnetic material, a flange extending around the periphery of and projecting outwardly from said container and into the earth surrounding said vault to thereby anchor said vault in the earth and resist upward movement due to buoyant forces acting thereon, a lid of similar material for said container, and means releasably affixing said lid to said container continuously around the juncture of said container and lid for locking said lid in place and preventing entry of moisture into said container while said vault is embedded in the

earth, said container including pairs of upstanding side and end walls and a bottom wall, said means affixing said lid to said container comprising a continuous channel upon said lid for receiving the upper margins of said side and end walls, said lid including a flat cover extending over said container, said continuous channel being defined by spaced interior and exterior flanges depending from said flat cover, with said upper margins of said side and end walls being received between said interior and exterior flanges, a projection extending around the exterior periphery of said upper margins of said side and end walls having a downwardly and outwardly sloping upper



surface terminating in a lip, and a mating recess in said exterior flange for receiving said projection, said recess having a sloping face abutting said sloping upper surface and a bottom wall for engaging beneath said lip to hold said sloping face in engagement with said sloping upper surface whereby moisture is effectively prevented from passing between said abutting surface and face, a first gasket member extending around the exterior of said side and end walls of said container and a second gasket member extending around the outer face of said interior flange, whereby said first and second gasket members seal between said upper wall margins and said interior and exterior flanges within said continuous channel.

4,628,828

ASH HANDLING SYSTEMS FOR COMBUSTION EQUIPMENT

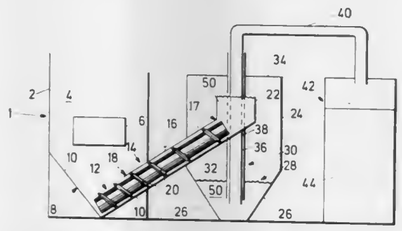
Roy D. Holtham, Upton-on-Severn; Anthony J. Falconer, Tibberton, and John F. G. Grainger, Tewkesbury, all of England, assignors to Coal Industry (Patents) Limited, England

Filed Nov. 6, 1984, Ser. No. 668,715

Claims priority, application United Kingdom, Dec. 2, 1983, 8332266

Int. Cl.⁴ F23J *1/00*

U.S. Cl. 110—165 R **14 Claims**



1. An ash handling system for use with combustion equipment including a conveyor and crusher, an inlet region to the conveyor and crusher adapted to receive ash from the combustion equipment located upstream thereof, an outlet region from the conveyor and crusher for the discharge of ash, a hopper having an inlet means at the base thereof registering with the outlet region of the conveyor and crusher, and outlet means of the hopper being located at the top thereof, so that in use ash within the hopper provides a seal to prevent the passage of air there through, a container enclosing the hopper and defining therein an ash receiving zone, and a pneumatic extraction means associated with the ash receiving zone.

4,628,829

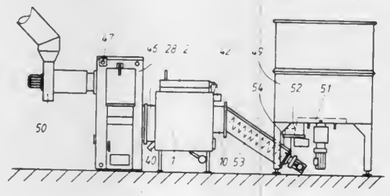
SOLID FUEL COMBUSTION ASSEMBLY

Günter Klaus, Hoyerbergweg 26, Lindau (B), Fed. Rep. of Germany (8990)

Filed Dec. 27, 1984, Ser. No. 686,715

Int. Cl.⁴ F23N *5/18*

U.S. Cl. 110—186 **9 Claims**



1. A combustion assembly, which comprises:

a bottom wall, side walls, a front wall, a rear wall and a top wall, said walls forming a combustion chamber, said bottom wall formed of a front bottom wall portion and a spaced-apart rear bottom wall portion disposed in a horizontal plane below a horizontal plane of said front bottom wall portion and including a grill disposed between said front and rear bottom wall portions, inner surfaces of said wall forming said combustion chamber being lined with a fire-resistant material of high heat capacity and including lava stones and clay, said front wall including conduit means for introducing a solid fuel material, said rear wall including a conduit for gaseous products of combustion, conduit means for introducing a primary stream of combustion supporting medium into said combustion chamber via said grill, said conduit means for introducing said primary stream of combustion supporting medium including an upper horizontal conduit portion, a vertical conduit portion and a lower horizontal conduit portion, said conduit portions being disposed in said side walls and imbedded in said fire-resistant material thereof, and conduit means for secondary stream of combustion supporting medium.

4,628,830

MICROWAVE DETECTION OF FUEL FLOW

Martin J. Kozlak, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 7, 1986, Ser. No. 826,948

Int. Cl.⁴ F23H *5/18*

U.S. Cl. 110—186 **12 Claims**

1. A method of determining the mass flow rate of moisture bearing pulverized fuel flowing through each outlet pipe flow path of a pulverizer, comprising the steps of:

(a) passing unpulverized, moisture bearing fuel to a pulverizer;

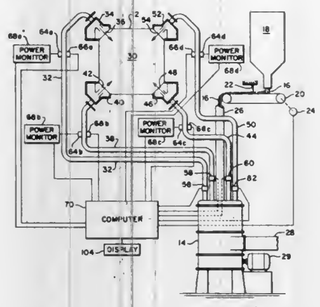
(b) monitoring the fuel flow rate of unpulverized fuel into the pulverizer;

(c) grinding the fuel in the pulverizer;

(d) supplying air to the pulverizer for partially drying the pulverized fuel and for transporting the pulverized fuel from the pulverizer;

(e) distributing the pulverized fuel in a transport air stream to a plurality of outlet pipe flow paths;

(f) transmitting microwave energy through each of the outlet pipe flow paths;



(g) monitoring the microwave energy absorbed by the moisture bearing pulverized fuel and transport air passing through each of the plurality of outlet pipe flow paths;

(h) evaluating the mass flow rate of moisture bearing pulverized fuel flowing through a pulverizer outlet pipe flow path in accordance with the relationship:

$$\dot{M}_i = \frac{(E_i)}{(\bar{E})} \frac{(M_t)}{(n)}$$

where,

n is the number of pulverizer outlet pipe flow paths, i ranges from 1 to n,

E_i is the microwave energy absorbed by the mass flow passing through the ith outlet pipe flow path,

$\bar{E}$ is the average energy absorbed per outlet pipe flow path

$$\bar{E} = \frac{1}{n} \sum_{i=1}^{n} E_i$$

M_t is the mass flow rate of unpulverized fuel into the pulverizer.

4,628,831

HEARTH AND PROCESS FOR FLUIDIZED-BED TREATMENT OF A FUEL

Serge L. Delessard, Fontenay-Sous/Bois; Roger M. Puff, Freyming-Merlebach; Jean C. Kita, Forbach, and Ange Virgilio, Cocheren, all of France, assignors to Charbonnages de France, Paris, France

PCT No. PCT/FR83/00013, § 371 Date Aug. 15, 1983, § 102(e) Date Aug. 15, 1983

Continuation of Ser. No. 537,375, Aug. 15, 1983, abandoned.

This PCT application Jan. 20, 1983, Ser. No. 726,963

Claims priority, application France, Jan. 20, 1982, 82 00815

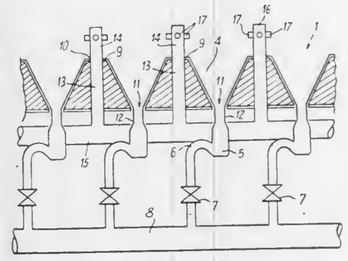
Int. Cl.⁴ F23G *5/00*

U.S. Cl. 110—245 **9 Claims**

4. Hearth for the fluidised-bed treatment of a fuel consisting of solid particles, comprising supply means for supplying the fuel to said hearth, a fixed lower grid means having gas passage channels for blowing a fluidisation and treatment gas, discharge means located above the grid for discharging the treated fuel, wherein the fluidisation and treatment gas is supplied as a result of the combination of a first fluid circuit and a second fluid circuit separate from one another, each said first and second fluid circuits having their own gas-supply source and both opening inside the fluidised bed, wherein

the first fluid circuit of fluidisation and treatment gas includes an assembly of first channels defining a vertical blowing direction, and plural cavities, each said channel opening into the bottom of a respective one of said cavities, said cavities located adjacent to one another and each including a widened area at the top terminating in an upper orifice, said cavities defining said grid means,

wherein the second fluid circuit includes plural second channels which pass through the grid means in gaps separating the cavities, each said second channel having an opening vertically spaced above the level of said grid means, and wherein the hearth further comprises plural covers, said second channels of the second circuit terminating above the grid means in upwardly open apertures underneath a



respective one of said covers, wherein the second channels of the second fluid circuit terminate above the grid means and define apertures directed in a transverse direction to the vertical blowing direction of the first channels of the first circuit,

wherein the total gas passage cross-section of the second channels of the second fluid circuit is at least equal to the total gas passage cross-section of the first channels of the first fluid circuit,

wherein the total cross-section of the upper orifices of the cavities is at least equal to the total cross-section of the second channels of the second fluid circuit.

4,628,832

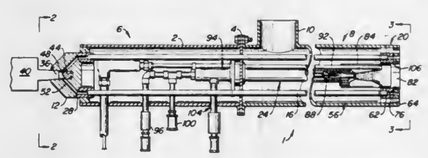
DUAL FUEL PILOT BURNER FOR A FURNACE

Ralph R. Vosper, Somerset, Calif., assignor to Coen Company, Inc., Burlingame, Calif.

Filed Jan. 29, 1986, Ser. No. 823,714

Int. Cl.⁴ F23C *1/10*

U.S. Cl. 110—261 **8 Claims**



1. A dual fuel burner for a furnace adapted to use pulverized, solid fuel having a relatively low volatility as the primary fuel, the burner comprising:

an elongated, tubular housing having upstream and downstream ends and a generally coaxially disposed ignition chamber terminating in a discharge opening at the downstram end of the housing;

a plurality of pulverized solid fuel carrying conduits surrounding the chamber, extending from the upstream end to the downstream end of the housing and terminating at conduit outlets surrounding the discharge opening for flowing the pulverized solid fuel through the conduits and discharging it into the furnace in close proximity to the discharge opening of the chamber;

means for directing a relatively high volatility fuel into the chamber;

means for igniting the high volatility fuel in the chamber so that a pilot flame issues through the discharge opening into the furnace;

first combustion air inlet means in fluid communication with the ignition chamber providing air for sustaining the pilot flame; and

second combustion air inlet means communicating with the downstream end of the housing providing at least a portion of the air required for the combustion of the pulverized solid fuel in the furnace;

a generally annular nozzle at the downstream end of the housing and including a central aperture defining the discharge opening and a plurality of pulverized fuel ejection ports in fluid communication with the conduit outlets for the discharge of the pulverized fuel therefrom into the furnace, whereby pulverized solid fuel from the conduit outlets surrounds the flame generated in the ignition chamber, is ignited thereby and is combusted with air from the second air inlet means;

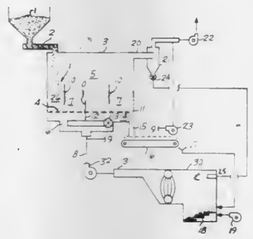
wherein at least a portion of the ignition chamber is concentrically disposed within and radially spaced from the central aperture of the nozzle, and wherein the second air inlet means is adapted to flow air through a space between the central aperture of the nozzle and the ignition chamber so that at least a portion of the air flow cools the ignition chamber to prevent an overheating thereof while raising the temperature of the air flow to facilitate the ignition of the pulverized solid fuel in the furnace.

4,628,833

FLUID BED HOG FUEL DRYER

Michael A. O'Hagan, Cupertino, and Richard D. Smith, Palo Alto, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 483,973, Apr. 11, 1983. This application Mar. 3, 1986, Ser. No. 835,822
Int. Cl.⁴ F23D *1/00*
U.S. Cl. 110—263 **16 Claims**



1. A fluidized bed dryer for drying wet wood waste of varying particle size without overdrying fines portions of said wastes and causing significant amounts of organic volatiles to distill therefrom, said dryer comprising:

a vessel having a porous floor through which an upward flowing gas passes fluidizing said wood waste to be dried, said floor dividing said vessel into upper and lower plenums;

baffle means for dividing said upper plenum adjacent said porous floor into a plurality of substantially horizontally adjacent drying zones for the wet wood waste, said baffles causing the coarsest portion of the wood waste in each zone to travel a circuitous path as it proceeds substantially horizontally through said dryer;

a means for feeding wet wood waste into a first drying zone in the upper plenum;

a first discharge means for collecting the fines portions of the dried wood waste entrained in said fluidizing gas, from said upper plenum, and for separating said dried wood fines from said gas for discharge from said vessel;

a second discharge means for discharging the dried coarsest portion from said upper plenum last drying zone from said vessel; and

a sealing means for dividing said lower plenum into a plurality of compartments wherein the fluidizing gas introduced into each compartment fluidizes the wood waste in the upper plenum drying zones coincident with said compartment, said gas in each compartment having just sufficient velocity to entrain the finest portion of the wood waste in each of said zones and discharge said wood waste fines from said vessel through said first discharge means just as said wood fines achieves a desired level of dryness,

whereupon the partially dried coarsest portion of wood remaining in each of such zones flows substantially horizontally into subsequent drying zones and is subjected to fluidizing compartments into which is introduced fluidizing gases having sufficient velocities to entrain and discharge the fines portion of the partially dried wood entering as it achieves the desired moisture content,

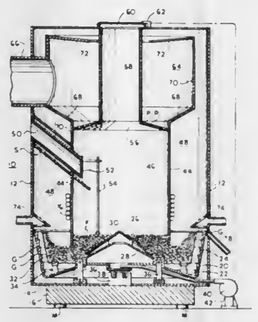
whereupon the last, coarsest portion of wood is discharged from said vessel from the last drying zone just as said coarse portion achieves the desired level of dryness.

4,628,834

VIBRATORY FLUIDIZED BED REACTOR

Alastair H. McKelvie, Derry Gally Rd., Kinnelon, N.J. 07405

Continuation-in-part of Ser. No. 311,468, Oct. 14, 1981, Pat. No. 4,384,535. This application May 11, 1983, Ser. No. 491,776
Int. Cl.⁴ F23D *1/00*
U.S. Cl. 110—263 **20 Claims**



1. Reactor apparatus for reacting a fluid stream in a fluidized bed of solid particles comprising

vibratory bed means including a pan holding a bed of said solid particles therein, vibratory motion generating means imparting vibratory motion to said pan so that said bed of particles in said pan are vibrated to cause fluidization thereof, and retaining means on said pan rising from the surface of said pan for retaining and preventing the discharge of at least certain ones of the fluidized solid particles within the bed of solid particles in said pan, and

means injecting said fluid stream into said fluidized bed of said solid particles.

4,628,835

WASTE FLUID INCINERATOR HAVING HEAT RECOVERY MEANS

Karl E. Wollner, Falkenweg, Fed. Rep. of Germany, assignor to Vapor Corporation, Chicago, Ill.

Filed Sep. 28, 1984, Ser. No. 656,084
Int. Cl.⁴ F23G *7/04*
U.S. Cl. 110—238 **6 Claims**

2. Apparatus for incinerating liquid wastes by interaction with combusting hydrocarbons, the improvement comprising;

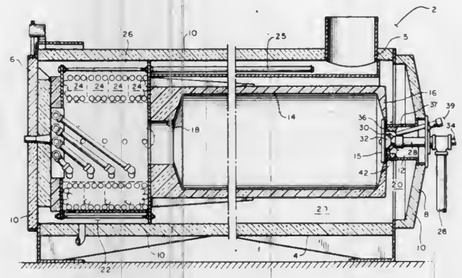
an essentially cylindrical combustion chamber having a predetermined length and diameter;

means admitting excess combustion air into said chamber;

means for admitting gaseous hydrocarbon fuel/air mixture for generating an outer envelope of combusting gases adjacent to said chamber cylindrical walls;

means admitting atomized liquid fuel for generating a central core of combusting hydrocarbons, essentially coaxial said outer envelope;

means injecting atomized liquid waste intermediate said envelope and central core;



means internal said chamber generating recirculating zones of said core and envelope combustion products, said zones further passing through said atomized liquid waste, for increasing liquid waste residence time in said chamber;

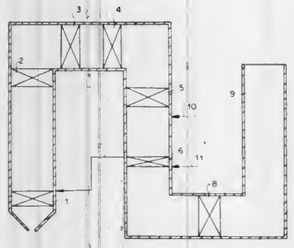
whereby liquid waste is heated to a predetermined temperature determined by said envelope and core for a predetermined time interval.

4,628,836

PROCESS FOR INHIBITING CORROSION AND MINIMIZING DEPOSITS IN AN AIR PREHEATER SYSTEM

Robert J. Littmann, Westfield, N.J., assignor to Waterscience, Inc., Somerville, N.J.

Filed Aug. 24, 1984, Ser. No. 644,312
Int. Cl.⁴ F23J *7/00*
U.S. Cl. 110—343 **27 Claims**



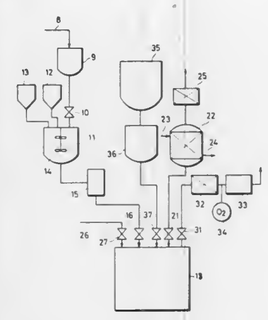
1. A process for inhibiting corrosion of metal surfaces and minimizing deposits in an air preheater system in which said metal surfaces are to be contacted with hot combustion gases and heat exchange is to be carried out between a cool air stream and said hot combustion gases comprising the step of supplying with the air to be preheated to the air-in side of said air preheater system a composition comprising a corrosion inhibiting amine or amine-substituted compound and a surfactant whereby said metal surfaces of said air preheater are thereby coated with said composition when they are contacted with said hot combustion gases.

4,628,837

METHOD AND APPARATUS FOR PROCESSING SPENT ION EXCHANGE RESIN

Kazuhide Mori; Shin Tamata; Makoto Kikuchi; Masami Matsuda, all of Hitachi, and Yoshiyuki Aoyama, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,992
Claims priority, application Japan, Dec. 9, 1983, 58-232478
Int. Cl.⁴ F23G *7/00*
U.S. Cl. 110—346 **15 Claims**



1. A method of processing spent ion exchange resin comprising:

(a) a step of adding a catalyst to said spent ion exchange resin wherein a transition metal is adsorbed in advance as a catalyst through ion exchange by the spent ion exchange resin when the ion exchange resin is a spent cation exchange resin, and an anionic atom group containing a transition metal is absorbed in advance as a catalyst through ion exchange by the ion exchange resin when the ion exchange resin is a spent anion exchange resin;

(b) a first separating step of pyrolyzing the catalyst containing spent ion exchange resin in an inert atmosphere wherein the ion exchange group of the catalyst containing spent ion exchange resin is decomposed and sulfur oxide and nitrogen oxide gases are separated; and

(c) a second separating step of pyrolyzing the catalyst containing spent ion exchange resin, which has passed through said first separating step, in an oxidizing atmosphere wherein the polymer backbone of the catalyst containing spent ion exchange resin is decomposed and carbon dioxide and water gases are separated from the spent ion exchange resin residue.

4,628,838

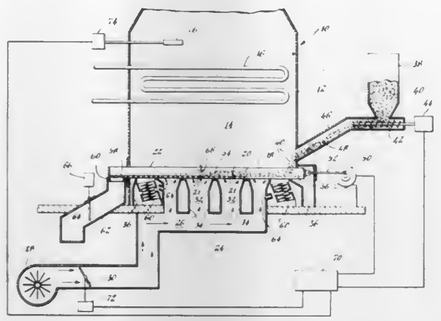
FLUIDIZED BED COMBUSTION METHOD

Richard E. Love, Darien, Conn., assignor to Peabody Engineering Corp., Stamford, Conn.

Filed Nov. 29, 1980, Ser. No. 208,254
Int. Cl.⁴ F23D *1/00*
U.S. Cl. 110—347 **2 Claims**

1. A process for fluidized bed combustion of particulate combustible material in a furnace comprising feeding the particulate combustible material to the furnace, imparting a turbulent fluidized bed motion to the particulate combustible material within the furnace through the use of a vibrating screen connected to means for vibrating said screen as the principal source of energy for imparting the turbulent fluidizing motion to said combustible material, feeding combustion air to the fluidized bed of combustible material, discharging products of combustion from the furnace, and causing the fluidized bed to

move in a substantially horizontal direction so that combustible material is conveyed from the location of feed to the furnace



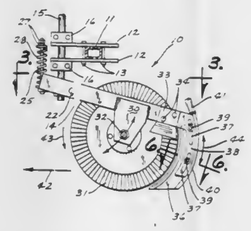
through a combustion stage in the furnace to the location of discharge for discharge as combustion products.

4,628,839
FERTILIZER APPLICATOR KNIFE ASSEMBLY
Delmar D. Edmisson, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc.
Filed Feb. 7, 1985, Ser. No. 699,169
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—7 **10 Claims**



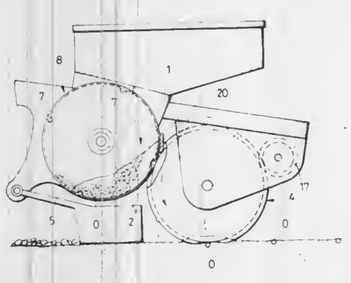
1. A fertilizer applicator assembly comprising:
an elongated blade shank having a concave leading edge and a convex trailing edge;
a fertilizer tube attached to said trailing edge; and
a wear insert welded to a portion of the leading edge, said wear insert including:
an arcuate, elongated insert shank portion having a leading edge and a trailing edge, said insert shank portion further including a pair of convergent side surfaces converging toward said leading edge and each rounded into said leading edge on a radius of between about one-eighth inch and about one-fourth inch;
a head carried on the lower end of said insert shank portion and flaring transversely to a thickness width about one and one-half to one and three-fourths the maximum lateral width of said insert shank portion, said head including a substantially flat lower surface; and
a generally triangularly shaped spur projecting downwardly and rearwardly from said head and insert shank portion from a location at the intersection of the trailing edge of the insert shank portion and said flat, lower surface, said spur being configured and positioned to hook under the forward lower end of said blade shank, and said spur having a transverse thickness of from about one-half to about three-fourths the transverse thickness of said head at the thickest portion of said head.

4,628,840
COMBINATION COULTER AND FERTILIZER KNIFE APPARATUS
Calvin L. Jacobson, Harlan, Iowa, assignor to Harlan Manufacturing Company, Harlan, Iowa
Filed Dec. 19, 1984, Ser. No. 683,398
Int. Cl.[4] A01C *23/00*
U.S. Cl. 111—7 **1 Claim**



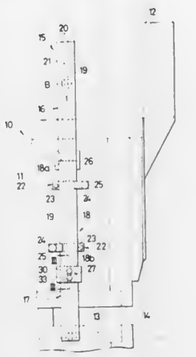
1. Apparatus for applying liquid fertilizer to the soil comprising:
a tool bar;
plate means for being laterally adjustably attached to said tool bar with respect to the forward movement of said tool bar;
an elongated rigid frame, said elongated rigid frame being straight from one end to the other end except for a downwardly depending portion on said other end;
means for pivotally attaching said frame to said plate means along a substantially vertical axis;
horizontal pivot means for pivotally attaching said frame to said vertical pivot means along a first substantially horizontal axis;
biasing means operatively connected to one end of said frame and to said vertical pivot means for biasing the other end of said frame member to a first lowered pivotal position thereof and permitting said frame to be pivoted to a second raised pivotal position thereof;
coulter means rotatably attached to an intermediate portion of said frame along a second substantially horizontal axis for cutting a slot in the soil, said coulter means including a substantially flat disc which rotates as it is forced through the soil;
fertilizer knife means attached to the other end of said frame for extending into said slot formed in the soil, the front edge of said fertilizer knife means being substantially of the same arcuate shape as an adjacent rear portion of said disc and being adjacent to and slightly spaced from said adjacent rear portion of said disc;
substantially vertically extending arcuately shaped slots disposed in the downwardly depending portion on said other end of said frame for adjustably receiving fasteners extending through openings in said fertilizer knife means for vertically adjusting the vertical position of said fertilizer knife means with respect to said other end of said frame;
scraper means attached to said frame between said other end and said intermediate portion thereof for scraping dirt from said disc as said disc rotates; and
conduit means leading from a source of liquid fertilizer, extending along the rear edge of said fertilizer knife means, and terminating in an outlet opening adjacent the lower rear edge of said fertilizer knife means for releasing the liquid fertilizer into said slot in the soil.

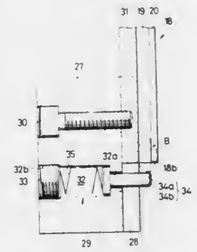
4,628,841
SINGLE GRAIN SOWING MACHINE
Hansherger Powilleit, Am hohlen Berg 4, 4000 Düsseldorf 12, Fed. Rep. of Germany
Filed Oct. 9, 1984, Ser. No. 658,807
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1983, 3335823; Oct. 10, 1983, 3336782
Int. Cl.[4] A01C *7/18*
U.S. Cl. 111—89 **23 Claims**



1. A single grain sowing machine comprising a housing, a seed container, a feeding wheel in the form of a disc rotatable within the housing about a substantially horizontal axis, said feeding wheel having a plurality of radially outwardly open cells spaced around its periphery that are also open on both sides of the cells, said feeding wheel and being of a thickness in the region of the cells no larger than the smaller diameter of the seed grains, said seed container delivering a plurality of seeds to a filling zone on one side of said feeding wheel, while the other side of the wheel is bounded by a wall of the housing whereby the cells receive individual seed grains at the filling zone, and rotation of the feeding wheel transports the seeds in the cells one at a time away from the filling zone to a transfer zone where the feeding wheel projects out of the housing, a sowing wheel also rotatable about a substantially horizontal axis transverse to the driving direction of the sowing machine that cooperates with the feeding wheel in the transfer zone to receive individual seed grains from the cells of the feeding wheel in an upper zone of the path of rotation of the sowing wheel and which discharges them into the soil in a lower zone, said sowing wheel being provided around its circumference with resilient clamping elements which define between each other a circumferentially extending gap that receives the peripherial portion of the feeding wheel in the transfer zone, said resilient elements exerting pressure toward each other to grip a seed in a cell of the feeding wheel as the wheels rotate and the feeding wheel passes through the gap to thereby remove the seeds one at a time from the cells, said clamping elements also being resilient in the radial direction so that as the sowing wheel rotates to the lower zone, the elements are pressed against the soil whereby the elements deform to release the seeds which are then pressed into the soil by the pressure of the sowing wheel.

4,628,842
DEVICE FOR PREVENTING FALL OF BUTTON PARTS FROM A CHUTE
Yukio Taga, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Mar. 19, 1986, Ser. No. 841,313
Claims priority, application Japan, Mar. 19, 1985, 60-39371[U]
Int. Cl.[4] D05B *3/22*
U.S. Cl. 112—113 **6 Claims**





1. In a button attaching machine having a support, a reservoir mounted on an upper portion of said support for containing a multiplicity of button parts, a terminal guide mounted on a lower portion of said support, and a chute assembly for conveying the button parts successively from said reservoir to said terminal guide, said chute assembly including an upper chute connected to said reservoir, a lower chute connected to said terminal guide, and an intermediate chute detachably mounted on said support and extending between said upper and lower chutes so as to define jointly therewith a combined, uninterrupted channel for receiving and transporting the button parts in succession, each of said upper, lower and intermediate chutes having through its entire length a pair of confronting flanges defining therebetween a longitudinal aperture communicating with said channel, and a blocking device for preventing the button parts from falling from said intermediate chute when the latter is detached, said blocking device comprising:
(a) a blocking member adapted to be supported by said intermediate chute adjacent to a lower end thereof, said blocking member being reciprocaly movable in a plane perpendicular to the longitudinal axis of said intermediate chute, said blocking member being normally held in engagement with said lower chute to retract away from said channel and, upon detachment of said intermediate chute, being movable into a blocking position where it is disposed below said channel and spaced from said lower end

of said intermediate chute by a distance which is small enough to block the passage of the button parts; and

(b) resilient means acting on said blocking member **34**; **39** for urging the latter toward said blocking position.

4,628,843

APPARATUS FOR FEEDING A CLOTH IN AN EMBROIDERY MACHINE

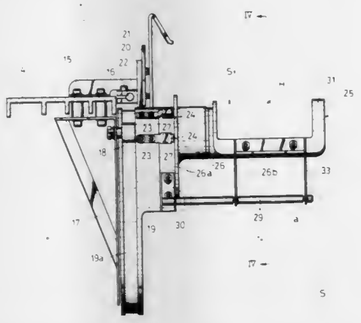
Ikuo Tajima, Nagoya, Japan, assignor to Tokai Kogyo Mishin Kabushiki Kaisha, Kasugai, Japan

Filed Feb. 6, 1986, Ser. No. 826,092

Claims priority, application Japan, Feb. 7, 1985, 60-23199; Mar. 9, 1985, 60-33925[U]

Int. Cl.⁴ D05B *21/00, 27/14*

U.S. Cl. 112—121.12 **4 Claims**



1. In an embroidery machine having a table and a plurality of heads disposed above said table in parallel relation to each other, each of said heads having a reciprocable needle for forming embroidery stitches on a cloth, said needle having an axis of rotation which is the origin of the X and Y axes of the Cartesian coordinates with respect to said table, apparatus for feeding a cloth comprising:

a transverse feed plate mounted on said table and movable in the direction of said Y axis;

a longitudinal feed plate mounted on said table in operative association with said transverse feed plate and individuallv movable in the direction of said X axis;

a holder secured to said transverse feed plate;

an interlocking bar operatively connected to said longitudinal feed plate for longitudinal movement therewith;

a driving ring mounted on said holder for rotation about a horiztontal axis disposed below the needle location and parallel to said Y axis;

a cloth gripping frame mounted on said driving ring for holding the embroidery area of the cloth in a substantially arcuate manner about the axis of rotation of said driving ring; and

means for converting longitudinal movement of said longitudinal feed plate into a rotational movement of said driving ring.

4,628,844

APPARATUS FOR TRANSPORTING FABRIC PIECES

Michael J. Hodges, High Wycombe, England, assignor to Detexomat Machinery Limited, Buckinghamshire, England

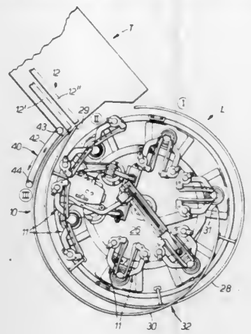
Continuation-in-part of Ser. No. 693,471, Jan. 22, 1985, abandoned. This application Apr. 17, 1985, Ser. No. 724,246

Claims priority, application United Kingdom, Apr. 17, 1984, 8409884

Int. Cl.⁴ D05B *33/00;* **D06G** *3/04*

U.S. Cl. 112—121.15 **25 Claims**

1. A method of conveying a garment having limp portions to a work station having separate receiving members each allotted to a respective one of the limp portions, the said portions being advanced separated from one another during their passage to the work station, wherein at least in their final approach to the work station, at least one limp portion is engaged



by endless loop conveying means and thereupon is positively advanced along said guide means in a controlled manner to its allotted receiving member.

4,628,845

ASSEMBLY CONSTRUCTION FOR SEWING MACHINE

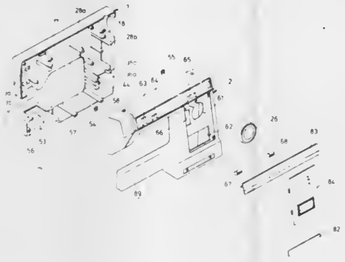
Kimikazu Matsuda, Kyoto, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Japan

Filed Dec. 5, 1985, Ser. No. 804,932

Claims priority, application Japan, Dec. 22, 1984, 59-271297

Int. Cl.⁴ D05B *73/02*

U.S. Cl. 112—259 **9 Claims**



1. A sewing machine comprising:

a sewing machine frame formed of a rear frame section (**1**) and a front cover (**2**) of resin which are joined together;

a plurality of driving mechanism components (**3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**), which are held by the rear frame section;

said rear frame section being opened in the front and having seats (**13**, **17**, **18**, **28**, **36**, **44**, **53**) for supporting said driving mechanism components;

a plurality of operating mechanism components (**26**, **32**, **67**, **68**, **87**), which are so installed that they appear outwardly of said front cover;

said front cover being opened in the rear and having a plurality of openings (**61**, **62**, **69**, **68**) for receiving said plurality of operating mechanism components and allowing them to appear in the outside; and

said plurality of operating mechanism components including first operating mechanism components and second operating mechanism components, said first operating mechanism components (**67**, **68**) being held by said front cover, said second operating mechanism components (**26**, **32**, **87**) being held by those of said driving mechanism components which are associated therewith.

4,628,846

METHOD FOR THE PRODUCTION OF A MULTI-DIRECTIONAL FIBROUS STRUCTURE AND DEVICE FOR CARRYING OUT SAID METHOD

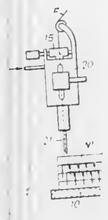
Michel Vives, Eysines, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed May 24, 1985, Ser. No. 738,161

Claims priority, application France, May 29, 1984, 84 08439

Int. Cl.⁴ A41C *1/14;* **A41D** *27/00, 27/06*

U.S. Cl. 112—262.1 **12 Claims**



1. A method for producing a three-dimensional multi-directional structure that includes superposed layers of fibrous material and reinforcing threads extending through said layers comprising the steps of:

superposing a plurality of individual layers of a fibrous material;

feeding at least one tubular needle, having a longitudinal passage with an outlet orifice opening at a forward end of the needle, with a thread inserted into said passage;

cyclically implanting reinforcing threads over the whole surface of the structure being produced by the steps of:

causing said needle to penetrate by said forward end through said superposed layers over a predetermined depth from a surface of the structure being produced and to withdraw to outside the structure, so as to drive the thread contained in said passage through the superposed layers during penetration of the needle and to leave a segment of thread implanted through said superposed layers over said depth inside the structure when the needle has been withdrawn to outside the structure;

displacing said needle relative to the structure over a step along said surface of the structure; and

performing at least once the sequence of operations which comprises superposing at least one additional layer of fibrous material over the previously superposed layers and performing said step of implanting reinforcing threads through said at least one additonal layer and at least the subjacent layer over the whole surface of the structure being produced.

4,628,847

APPARATUS FOR THREAD MONITORING

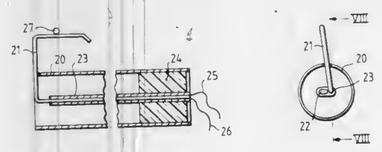
Ake Rydborn, Klöxhultsvägen 21, 343 00 Elmhult, Sweden

Filed May 9, 1983, Ser. No. 492,913

Claims priority, application Sweden, May 17, 1982, 8203077

Int. Cl.⁴ D05B *69/36*

U.S. Cl. 112—273 **2 Claims**



1. An apparatus for monitoring the underthread in sewing machines, comprising, signal generator device which is mounted in the path of the underthread and is operative to generate electric signals when the underthread is urged against the signal generator device, a signal monitoring circuit which is electrically connected to the signal generator device and is operable to shutdown the machine in response to a loss of said signals from said signal generator device,

said signal generator device having a resilient wire member with a movable portion which has a thread-contacting portion located in the path of the underthread so as to be contacted by the underthread during operation of the sewing machine, a piezoelectric rod connected to said resilient wire member and arranged to be bent in response to movement of said member by the underthread, said piezoelectric rod and said thread-contacting portion of the resilient wire member being spaced apart and being arranged so that some relative movement is permitted between the thread-contacting portion and the piezoelectric rod, said piezoelectric rod and said resilient wire member being elongated and having their longitudinal axes in mutually parallel relationship, and resilitent wire member having a section which is attached along its length to the piezoelectric rod so that said wire section and the piezoelectric rod will be bent together when the thread-contacting portion of the wire is actuated by a thread, said piezoelectric rod being operable to generate said electric signal when it is bent.

4,628,848

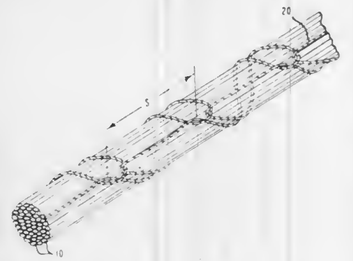
ELASTOMERIC YARN SUPPLY PACKAGE

John M. Culgan, Chadds Ford, Pa., and Leander A. Sherbeck, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 29, 1981, Ser. No. 288,026

Int. Cl.⁴ D05B *93/00*

U.S. Cl. 112—412 **4 Claims**



1. An elastomeric yarn supply package comprising a generally cylindrical bundle of substantially parallel, elastomeric strands held together by a nonelastomeric binding thread which forms a succession of connected chain stitches, each chain stitch encircling without penetrating the bundle and the succession of connected chain stitches extending along substantially the entire length of the bundle, the nonelastomeric thread being unravellable so that portions of the elastomeric strands can be free from each other and fed from the bundle to a textile machine.

4,628,849

STITCHED ASSEMBLY

Réjean Raiche, 1115 Gascon Street, Chambly, Province of Quebec, Canada J3L 2T8

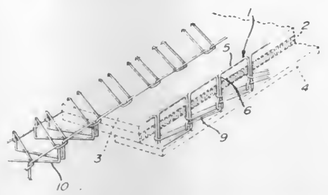
Filed Apr. 3, 1984, Ser. No. 596,502

Int. Cl.⁴ D05B *1/20;* **B23B** *7/08*

U.S. Cl. 112—414 **6 Claims**

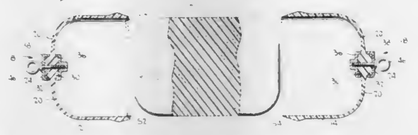
1. A stitched assembly comprising a gathered fabric, an ungathered fabric and a strip retained together by a single sewing machine gathering stitch; said gathered fabric being sandwiched between said strip and said ungathered fabric; said stitch being a chain stitch identified as Federal Standard Stitch 401 and including a needle thread and a looper thread, the

loops formed by said looper thread directly applied against said strip and retaining the latter against said gathered fabric,



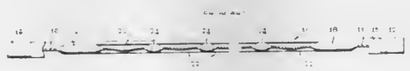
said gathered fabric being devoid of any gathering stitch other than said single sewing machine gathering stitch.

4,628,850
MARINE FENDER
John T. Day, Winfield; Robert O. Herder, Easton, and Robert B. McNatt, Annapolis, all of Md., assignors to Rubber Millers, Inc., Baltimore, Md.
Continuation-in-part of Ser. No. 352,255, Feb. 25, 1982, abandoned. This application Feb. 17, 1983, Ser. No. 467,241
Int. Cl.[4] B63B *59/02*
U.S. Cl. 114—219 **8 Claims**



1. A process for forming a marine fender comprising a unitary elastomeric shell having two ends and a cavity at each end thereof, mooring fittings fitted onto each of said cavities, and contained within said shell a solid, flexible foam bun, including the steps of separately molding two substantially equal halves for making up said elastomeric shell, each of said halves having an end cavity smaller in diameter than the diameter of said shell half, and each of said shell halves at the extreme of said other end having an enlarged section, the enlarged sections of the extreme ends of said two halves being molded to mate with the other of said end sections to form, when mated, a raised external center portion having a recessed area and a smooth internal center portion; inserting a solid foam bun into said shell halves whereby the said enlarged sections are mated together to provide a joinder with an external surface containing a recessed area extending across said joinder, and a smooth internal surface; securing a band mold around said enlarged sections including said recessed area; injecting a liquid elastomeric material compatible with or the same as the material of said polymeric shell into said recessed area, and curing said cast polymer to provide a unitary structure.

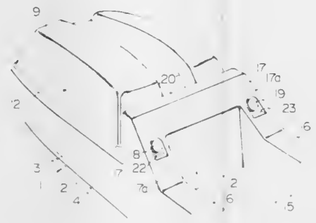
4,628,851
VIBRATION ISOLATION MODULE
James Appling, Canoga Park, Calif., assignor to Allied Corporation, Morristown, N.J.
Filed Dec. 24, 1984, Ser. No. 685,949
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—253 **10 Claims**



1. A vibration isolation module for connection between a towing vessel and an elongated towed sonar array including a stretchable internal strength member for carrying tensile loads, a termination member for connecting the module to the array, wiring for carrying electrical power and signals between the array and the towing vessel and an exterior hose-like jacket bonded to said termination member;

characterized in that the internal strength member comprises a braided strength member of aramid fiber rope fastened to said termination member and a plurality of damping elements carried within the strands of said strength member, said damping elements being formed of polyester polyurethane tubing, each of said damping elements being tapered at each end, a plurality of spacers spaced along the length of said strength member and attached thereto such that said damping elements are carried in said strength member between said spacers.

4,628,852
OPERATING MEMBER INSTALLATION FOR A SMALL-SIZED MARINE CRAFT
Hiroshi Nishida, Miki, and Seiichi Ino, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Dec. 27, 1984, Ser. No. 686,679
Claims priority, application Japan, Dec. 28, 1983, 58-202322[U]
Int. Cl.[4] B63B *35/86*
U.S. Cl. 114—270 **1 Claim**



1. An installation for an operating member for the engine of a small-sized marine craft comprising:

(a) a body composed of a hull constituting a lower portion of said body and a deck constituting an upper part thereof;

(b) a floor provided in an aft portion of said deck to allow a navigator to ride thereon in a standing position;

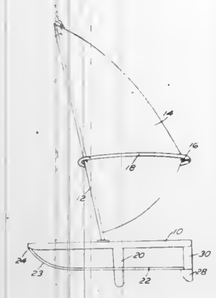
(c) fore and aft extending fins included in said deck respectively projecting upwards from both sides of said floor;

(d) an operating member for operating and controlling the engine of said craft; and

(e) riser means integrally formed with an upper portion of said deck comprising a pair of slanting surfaces each with a top edge and a base edge, said slanting surfaces each rising upwardly and extending forwardly toward said top edge from each of said fins, each of said slanting surfaces joined to a respective one of said fins along its base edge, and said riser means receiving said operating member to provide an installation for said operating member located so that a navigator in standing position can see and actuate the operating member.

4,628,853
RECREATIONAL WATERCRAFT
John G. Hoyt, 1 Harbor View Dr., Newport, R.I. 02840
Filed May 31, 1985, Ser. No. 740,188
Int. Cl.[4] B63B *1/16*
U.S. Cl. 114—274 **5 Claims**

5. A watercraft having a hull, a ski structure mounted beneath the hull, said ski having a substantially flat section with an upwardly curved frontal portion secured to one end of the hull and a runner portion spaced from the hull, arcuate hydrofoil sections affixed to the runner transversely of the hull, one section extending from the ski and affixed to one side of the



hull and the other section extending from the ski and affixed to the other side of the hull whereby the ski is supported in spaced relation to the hull.

4,628,854
SECURING INFLATABLE TUBES TO RIGID HULLS
Richard J. A. Harding, Rhiwlas Fach, Mountain Road, Trimsaran, Dyfed, South Wales, Great Britain
Filed Jun. 28, 1985, Ser. No. 749,830
Claims priority, application United Kingdom, Jun. 29, 1984, 84 16669
Int. Cl.[4] B63B *7/00*
U.S. Cl. 114—345 **9 Claims**



1. A boat comprising:

an inflatable tube having a generally longitudinal direction and an external surface;

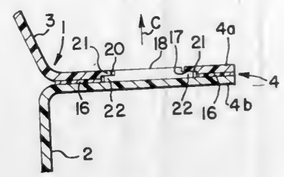
a plurality of flexible flanges on the external surface of said tube and extending longitudinally thereof;

a rigid hull having an edge portion formed with an upright portion and a rigid flange portion arranged substantially perpendicular to the upright portion, said upright portion being positioned between said flexible flanges of said tube and said rigid flange portion having an upper surface; and

clamping means arranged between said tube and said hull, said clamping means comprising elongate clamping strips and securing means, said securing means penetrating said upright portion of the hull and drawing said clamping strips together, thereby clamping said flexible flanges and said upright portion between said clamping strips;

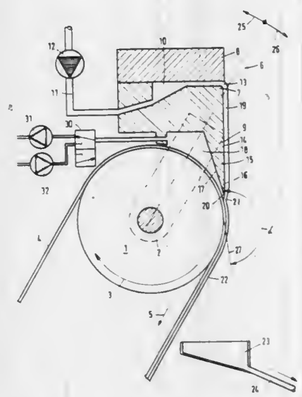
whereby the inflatable tube conforms generally with the shape of the upper surface of the rigid flange portion between the flexible flanges.

4,628,855
HULL NUMBER INDICATING APPARATUS
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Jan. 8, 1985, Ser. No. 689,660
Claims priority, application Japan, Jan. 18, 1984, 59-5522[U]
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—364 **2 Claims**



1. Apparatus for placing a marking on a hull of a small boat, comprising a first part of said hull, an opening formed in said first part, a marking plate having a face side and a back side and made of a material which may be imprinted by deformation such as punching and hot stamping, said plate being located closely adjacent said first part with at least a portion of said face side visible through said opening, the margin of said opening overlying the edge portion of said plate at least partially around the periphery of said plate, and a second part of said hull extending across at least a portion of said back side of said plate and secured to said first part, said hull comprising a deck and a hull, each of said deck and said hull including a marginal flange and said flanges being secured together, said first part and said second part being formed by said flanges.

4,628,856
COATING APPARATUS WITH TANGENTIAL SLIDE ALLOWING A VERTICAL AND FAST FLOW OF PHOTOGRAPHIC EMULSION
Peter K. Burgdorf, Erzhausen, Fed. Rep. of Germany, assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.
Filed Jun. 28, 1985, Ser. No. 752,175
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424884
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—50 **18 Claims**



1. An apparatus for the application of at least one layer of liquid coating material on a web support comprising a web supporting coating roll over which the web is driven, a coater within a housing having at least one exit slit for liquid coating material and a slide connected to at least one exit slit over which the liquid coating material flows down by gravity to a

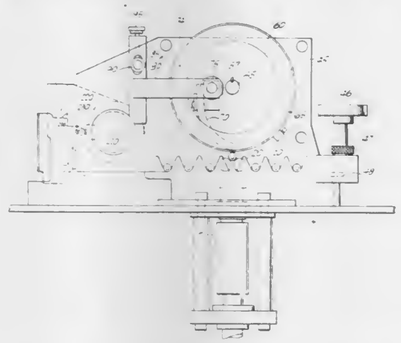
coating gap terminating at a point adjacent to the roll, and a pressure chamber placed in close proximity to the coating gap between the tip of the slide surface and the coating roll, the improvement wherein the coating gap is located at a point with respect to the coating roll such that the supported web is moving in a downwardly direction at that point and the material to be coated is also moving in a direction that includes a downwardly directed component, the pressure chamber being located above the coating gap, and a plane of the slide surface adjacent to the tip of the slide extends approximately parallel to a tangent to the coating roll at the gap.

4,628,857

ROTARY SCREEN PRINTING APPARATUS

A. Robert Coningsby, 4520 NE. 25 Ave., Fort Lauderdale, Fla. 33308

Filed Apr. 27, 1984, Ser. No. 604,466
Int. Cl.[4] B05C *3/00;* **B41F** *17/08;* **B41L** *13/08*
U.S. Cl. 118—406 **13 Claims**



1. A device for dispensing materials in creating patterns useful in printing, comprising:

a drum connected to said device and constructed for rotation about an axis having a hollow interior adapted to retain a supply of the material,

said drum daving an outer drum working surface;

said drum having an aperture communicating with said hollow interior of said drum;

a pattern making screen mounted across said aperture and substantially in the extended phantom surface of the external peripheral surface of said drum across said aperture and thereby being positioned in a working position in relationship to said drum working surface for creating the patterns, the external peripheral surface of said drum being imperforate except for said aperture;

connecting means for removably connecting said pattern making screen across said aperture in said extended phantom surface and to said drum;

a means for forcing said material through said pattern making screen, said means for forcing said material being positioned within said interior of said drum; and

said hollow interior constructed for maintaining a puddle of the material in contact with said means for forcing said material on the side of the direction of rotation.

4,628,858

WHEEL MASK

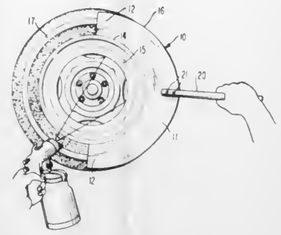
Michael L. King, P.O. Box 2051, Greenfield, Calif. 93927, and Paul A. King, 51201 Pine Canyon Rd. #21, King City, Calif. 93930

Filed Apr. 22, 1985, Ser. No. 710,087
Int. Cl.[4] B05C *21/00*
U.S. Cl. 118—504 **1 Claim**

1. A masking device for a tire mounted on a wheel rim, comprising, in combination:

a flexible, "U"-shaped member having two ends;

a substantially triangular shaped handle mounting member attached to said "U"-shaped member equidistant from said ends, and



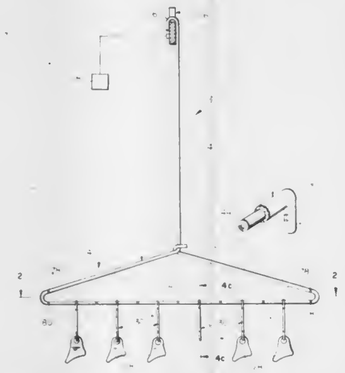
a handle attached to said handle mounting member, whereby when said handle is raised, the ends of the "U"-shaped member are deflected inward to fit said rim.

4,628,859

APPARATUS AND WORKPIECE FIXTURE FOR ELECTROSTATIC SPRAY COATING

Andrew D. Hines, 46 Fordham Trail, Hopatcong, N.J. 07843

Filed Apr. 15, 1985, Ser. No. 723,089
Int. Cl.[4] B05B *5/08*
U.S. Cl. 118—630 **17 Claims**



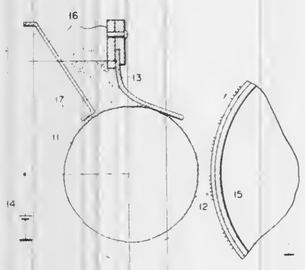
1. A fixture for supporting a workpiece during a coating operation, said fixture comprising a first conductive frame having at least one recessed contact surface thereon, a first conductive workpiece support having a workpiece retaining end and a resilient contact end, said resilient contact end constructed of a U-shaped member removably engaging said conductive frame and having a portion frictionally contacting said contact surface upon relative movement between said contact surface and said U-shaped member, whereby foreign material on said contact surface is removed to provide electrical continuity between said workpiece support and said frame, a second conductive frame having at least one recessed contact surface providing electrical continuity between a second conductive workpiece support and said second conductive frame, and a pair of brackets for removably attaching in electrical continuity said second conductive frame in spaced-apart relationship with said first conductive frame, each said bracket comprises a longitudinally extending strip having a plurality of keyhole-shaped openings therein, said keyhole-shaped openings removably engaging a respective portion of said first and second conductive frames.

4,628,860

DEVELOPING APPARATUS

Masahiro Hosoya, Yokohama; Tsutomu Uehara, Yokosuka, and Shinya Tomura, Yamato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 785,038, Oct. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,444, Sep. 28, 1984, abandoned. This application Feb. 21, 1986, Ser. No. 831,092
Claims priority, application Japan, Sep. 30, 1983, 58-182689; Sep. 30, 1983, 58-182743
Int. Cl.[4] G03G *15/06*
U.S. Cl. 118—649 **11 Claims**



1. A developing apparatus for developing a latent image formed on an image carrier by a non-magnetic developing agent consisting essentially of non-magnetic particles, said developing apparatus comprising:

(a) an image carrier;

(b) a developing agent carrier for carrying the non-magnetic developing agent thereon in the form of a layer, said developing agent carrier being disposed apart from said image carrier by a prescribed distance; and

(c) an elastic metal member formed of a metallic material and pressed against the surface of said developing agent carrier to apply the non-magnetic developing agent thereto, so that the non-magnetic developing agent is applied to the surface of said developing agent carrier by said elastic metal member to form a thin layer of the non-magnetic developing agent on the surface of said developing agent carrier;

(d) the thin layer of the non-magnetic developing agent being opposed to said image carrier to deposit the non-magnetic developing agent on the latent image on said image carrier, thereby developing the latent image;

(e) the thickness of the thin layer of the non-magnetic developing agent being smaller than the prescribed distance;

(f) said developing agent carrier having a surface which is opposed to said image carrier and the whole of which is roughened;

(g) said developing agent carrier being electrically connected to said elastic metal member;

(h) the relation among μt, μb, and μr is:

$$\mu t < \mu b < \mu r$$

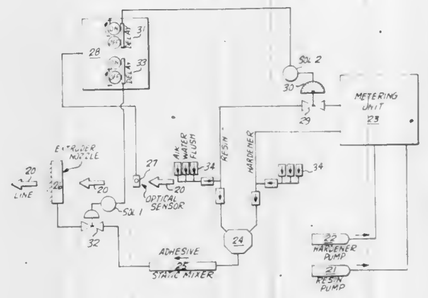
where the value μr is the friction coefficient between said developing agent carrier and the nonmagnetic developing agent, the value μt is the friction coefficient between the particles of the developing agent, and the value μb is the friction coefficient between said elastic metal member and the non-magnetic developing agent.

4,628,861

METERING AND PROPORTIONING SYSTEM FOR A TWO-COMPONENT LIQUID RESIN AND LIQUID HARDENER ADHESIVE

David K. Mitchell, Kent, Wash., assignor to Chembond Corporation, Springfield, Oreg.

Continuation of Ser. No. 506,272, Jun. 21, 1983, abandoned. This application Dec. 12, 1985, Ser. No. 807,946
Int. Cl.[4] B05B *13/00, 12/00*
U.S. Cl. 118—684 **1 Claim**



1. A control system for application of a two-component adhesive to a workpiece used in the manufacture of laminated wood structural members during movement of such workpiece in an operating line, comprising in combination

means for supplying a liquid resin under pressure,

means for supplying a liquid hardener under pressure,

metering means for separately receiving, proportioning and delivering such liquid resin and liquid hardener under pressure,

means for controlling delivery of metered liquid resin and liquid hardener under pressure as determined by supply pressure of such liquid resin and liquid hardener,

mixing means for receiving and mixing such liquid resin and liquid hardener as proportioned by such metering means and mixing such components to form a two-component adhesive for delivery from such mixing means under pressure as determined by the supply pressures of such liquid resin and liquid hardener,

extruder means for receiving such two-component adhesive including an extruder head with valve means for controlling discharge of such two-component adhesive,

means for controlling on-off operation of such extruder head valve means to control discharge of such two-component adhesive,

conveyor means for movement of a workpiece beneath such extruder means for application of such two-component adhesive, and

optical sensing means for detecting the presence of a workpiece beneath such extruder means,

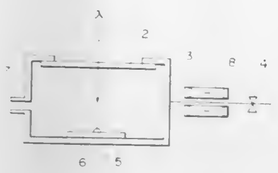
such sensor means having a dual output for controlling delivery of liquid resin and hardener from such metering means to such mixing means and for controlling on-off operation of such extruder head valve means for discharge and application of such two-component adhesive to such workpiece only during passage of such workpiece beneath such extruder means.

4,628,862

PHOTOCHEMICAL VAPOR DEPOSITION APPARATUS

Osamu Kamiya, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,411
Claims priority, application Japan, Mar. 30, 1984, 59-62960
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 118—724 **3 Claims**



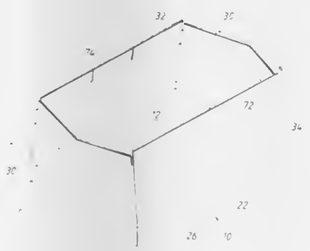
1. A photochemical vapor deposition apparatus which includes a reaction chamber, a means for introducing a starting gas for film formation into the reaction chamber and a means for irradiating the starting gas with a light of high energy to deposit a thin film on a substrate placed in the reaction chamber by utilizing the photochemical reaction, wherein the apparatus includes a means for heating in advance to high temperature the starting gas to be introduced into the reaction chamber.

4,628,863

DISPOSABLE CAT LITTER BOX

Larry L. Eichenauer, P.O. Box 43, Crosby, Tex. 77532

Filed Apr. 12, 1985, Ser. No. 722,806
Int. Cl.⁴ A01K *29/00*
U.S. Cl. 119—1 **16 Claims**



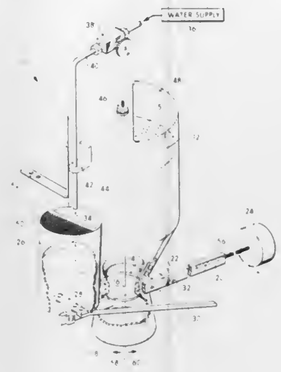
1. A disposable cat litter box, comprising:
(a) a sheet of corrugated paperboard material, the sheet folding into a generally rectangular, open topped box;
(b) said sheet including bottom members adapted for folding along a first transverse fold line extending across said sheet to form a bottom portion of said litter box;
(c) wall members extending from said first fold line and being adapted to be erected on folding perpendicular to said bottom portion;
(d) said wall members folding along vertically extending score lines formed in said sheet and connecting to form a generally rectangular open topped box;
(e) said wall members further including end flaps adapted for folding along a double fold line extending across said wall members, said double fold line enabling said end flaps to be folded and positioned in pianar contact with said wall member; and
(f) wherein said end flaps are extensions of said wall members joined along parallel short and long perforations formed in said sheet, said perforations being extensions of said vertical score lines.

4,628,864

AUTOMATIC FISH FEEDER

David C. Smeltzer, P.O. Box 133, Bellvue, Colo. 80512

Filed Apr. 4, 1985, Ser. No. 719,688
Int. Cl.⁴ A01K *5/02, 61/02*
U.S. Cl. 119—51 R **8 Claims**



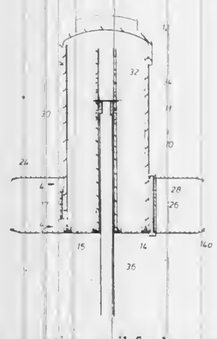
1. An automatic fish feeder comprising:
feed container means for maintaining a supply of feed and having an opening to allow said feed to flow from said feed container means;
feed dispenser and flow adjustment means for dispensing said feed and regulating the flow of said feed from said opening in said feed container means, said feed dispenser and flow adjustment means comprising:
substantially horizontally oriented feed plate means disposed substantially vertically below said opening in said feed container means for allowing said feed which flows from said feed container means to rest on an upper surface of said substantially horizontally oriented feed plate means, and for dispensing said feed in response to application of a vibrational movement of said feed plate means induced by components of said automatic fish feeder;
means for adjusting vertical position of said feed plate means relative to said opening in said feed container means to regulate said flow of said feed from said opening of said feed container means for various grain sizes and textures of said feed so as to control the amount of said feed resting on said upper surface of said substantially horizontally oriented feed plate means to be dispensed;
rotatable arm means pivotally connected to said fish feeder and operatively coupled to said feed container means and said feed plate means to couple said vibrational movement to said feed container means and said feed plate means;
water collector means disposed on a first end of said rotatable arm means for collecting water provided by a water supply to cause said rotatable arm to pivot in a first direction;
means for emptying said water collector means whenever said rotatable arm rotates in said first direction to a predetermined position;
counterbalance weight means disposed on a second end of said rotatable arm for causing said rotatable arm to rotate in a second direction after water is emptied from said water collector means;
means for halting rotation of said rotatable arm in said second direction to induce said vibrational movement in said automatic fish feeder for causing feed to be vibrated from said upper surface of said substantially horizonally oriented feed plate means and simultaneously causing said feed to be vibrated within said feed container means to cause said feed to settle within said feed container means and flow through said opening in said feed container means to cause said feed to rest on said upper surface of said substantially horizontally oriented feed plate means; and
means for adjusting the position of said counterbalance weight means on said rotatable arm means to vary the magnitude of said vibrational movement of said feed plate means and thereby regulate the amount of food dispensed from said substantially horizontally oriented feed plate means and simultaneously vary the frequency of distribution of said feed from said fish feeder by varying the amount of water required in said water collector means to offset said counterbalance weight means;
water supply control means for controlling the rate of flow of said water to said water collector means to further control said frequency of distribution of said feed from said fish feeder.

4,628,865

APPARATUS AND METHOD FOR A CONTINUOUSLY OPERATING QUAIL FEEDER

Valgene W. Lehmann, 629 W. Lee, Kingsville, Tex. 78363

Filed Mar. 14, 1985, Ser. No. 711,731
Int. Cl.⁴ A01K *39/01*
U.S. Cl. 119—51 R **6 Claims**



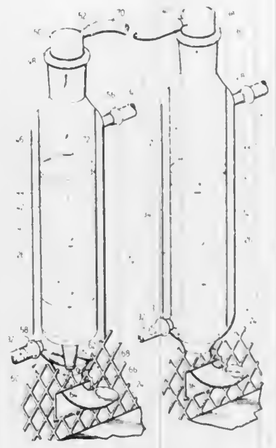
1. A continuously operating quail feeder, comprising:
a bin for feed having an opening through which quail secure the feed;
a ledge located under the opening to support the quail as it eats;
means located above the ledge for preventing larger animals, such as cattle and deer, from eating the feed; and
means for supporting the feeder above the ground, which means comprises:
a base having a portion for extending into the ground to support the base in an upright position;
a mounting sleeve attached to the bin and mounted on the base for vertical movement relative to the base to adjust the height of the bin above the ground;
means to hold the sleeve from such relative vertical movement when the bin is the desired distance from the ground; and
means for allowing the sleeve to rotate relative to the base so that pressure exerted on the bin, ledge or flange is dissipated by the rotational movement of the sleeve around the base.

4,628,866

SIMULTANEOUS MATCHED FEEDING APPARATUS

Yedy Israel, Willowdale; Betsavel Oporto, Etobicoke, and Alain Macdonald, Willowdale, all of Canada, assignors to Alcoholism & Drug Addiction Research Foundation, Toronto, Canada

Filed Jun. 21, 1984, Ser. No. 623,217
Int. Cl.⁴ A01K *7/06*
U.S. Cl. 119—51.5 **9 Claims**



1. A simultaneous matched feeding apparatus for administering different liquids to animals, said apparatus comprising:
a first vertically elongate tube defining a first chamber for normally retaining a first liquid, said first elongate tube including a first liquid delivery tube portion extending from a lower end of the first elongate tube to permit withdrawal of the first liquid;
at least one second vertically elongate tube defining a second chamber for normally retaining a second liquid, said second elongate tube including a second liquid delivery tube portion at its lower end comprising a funnel shaped portion having a spout from which the second liquid is dispensed, the second delivery tube portion having a reservoir tube positioned below said spout for receiving the second liquid, the reservoir tube being connected to the second food delivery tube portion and having an aperture therein adjacent or above the spout to prevent incidental withdrawal of the second liquid through the spout;
the first and second elongate tubes when respectively filled with the first and second liquids normally having respective air spaces above the first and second liquids; and
air passage tubing connecting the air spaces of the first and second elongate tubes whereby withdrawal of an amount of the first liquid from the first elongate tube changes the pressure of the air spaces causing a corresponding amount of liquid to be dispensed through the spout of the second elongate tube and into the reservoir tube.

4,628,867

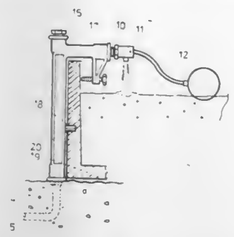
WATER SUPPLY TO WATERING TROUGHS

Peter H. Brougham, Tumby Bay, South Australia, Australia 5605, and Raymond B. Reynolds, Port Neil, South Australia, Australia 5604

Filed Feb. 16, 1984, Ser. No. 581,876
Claims priority, application Australia, Feb. 16, 1983, PF8064
Int. Cl.⁴ A01K *7/04*
U.S. Cl. 119—78 **4 Claims**

1. A riser for the supply of water to a watering trough, the riser being formed of a rigid material, the riser having a passage therethrough of greater cross sectional area than a supply hose to which it is to be attached, the riser having means for connec-

tion to said supply hose at its lower end, and at its upper end an extension to extend over the watering trough when attached thereto, a leg on said riser extending from the riser in the same direction as the said extension received by a recess in the outer



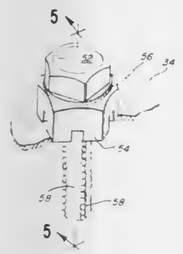
wall of the trough, a bracket depending from said extension, a clamping stud carried by said bracket for clamping said riser to said trough, and means on the end of said extension for regulating the supply of water to said trough.

4,628,868

NON-PLUGGING AIR DISTRIBUTION SYSTEM FOR SPENT BED COOLER

Robert L. Eaton, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 8, 1985, Ser. No. 699,716
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **12 Claims**



1. In a distribution system for fluidizing gas comprising threaded holes through plates wherein there is a pressure drop through at least a portion of such holes of at least 15 inches of a column of water, the improvement which comprises: restricting gas passage through said holes by means of a threaded bolt wherein in cooperation with said bolt there is a means for imposing a horizontal flow path as said fluidizing gas exits through said threaded holes, said means comprising nuts unthreaded spacers having opening in the bottom circumference comprising 10–80 vol. % of said means whereby a non-plugging distribution system for gas to a fluidized bed is achieved.

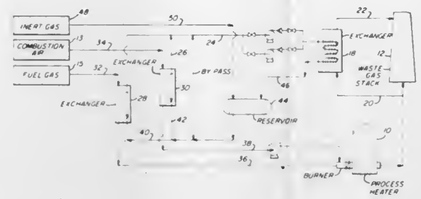
4,628,869

VARIABLE TEMPERATURE WASTE HEAT RECOVERY SYSTEM

Dale R. Symsek, Franklin Park Borough, and Nancy P. Regelin, Bethel Park, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1985, Ser. No. 697,173
Int. Cl.[4] F22B *33/00*
U.S. Cl. 122—20 B **5 Claims**

1. A waste gas recovery system for use with a process heater installation in which exhaust gases discharged from said installation are variable during each operating cycle, said system including a closed-loop heat transfer circuit through which a heat transfer liquid is circulated and having a first heat exchanger for extracting heat from said exhaust gases, a second heat exchanger adapted to pass a recipient fluid in heat transfer relation with said heat transfer liquid, and a reservoir for storing the heat transfer liquid circulated through said circuit, the improvement comprising said reservoir being operatively disposed in said heat transfer circuit intermediate the downstream end of said first heat exchanger and the upstream end of said second heat exchanger whereby heat transfer liquid



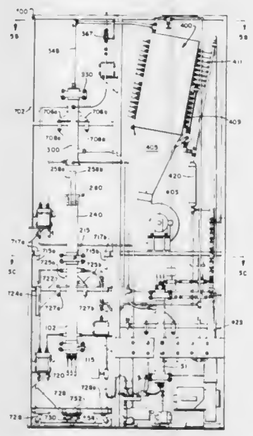
heated in said first heat exchanger is passed to said reservoir prior to being passed to said second heat exchanger and said reservoir containing an amount of heat transfer liquid in excess of that contained in the remainder of said heat transfer circuit whereby variations in the temperature of said heat transfer liquid exiting said first heat exchanger are damped prior to entry of said heat transfer liquid into said second heat exchanger.

4,628,870

MODEL STEAM GENERATOR HAVING MEANS TO FACILITATE INSPECTION OF SAMPLE TUBES

Robert Draper, Churchill Boro, and Donald G. Lorentz, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1984, Ser. No. 636,450
Int. Cl.[4] F22B *1/16*
U.S. Cl. 122—32 **24 Claims**



1. A model steam generator for monitoring the corrosion of the heat exchange tubes inside a large-scale steam generator by simulating the internal environment of the large-scale steam generator, comprising:

(a) a boiler vessel including a tubesheet which divides the interior of the vessel into a primary side and a secondary side;

(b) at least one sample heat exchange tube extending through the tubesheet into the secondary side of the boiler vessel for transferring heat from the primary side of the vessel to the secondary side, and

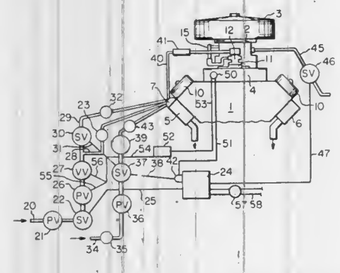
(c) a system for facilitating the inspection of the sample tube, including means for suspending said secondary side, means for detachably connecting the tubesheet and the primary side from the secondary side of the boiler vessel, and means for laterally and vertically moving the tubesheet and primary side into and out of a connectable position relative to the secondary side.

4,628,871

FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

James W. Glass, New Castle, Pa., assignor to V. G. C. Corporation, Pittsburgh, Pa.

Filed Nov. 8, 1985, Ser. No. 796,649
Int. Cl.[4] F02M *25/02*
U.S. Cl. 123—25 B **10 Claims**



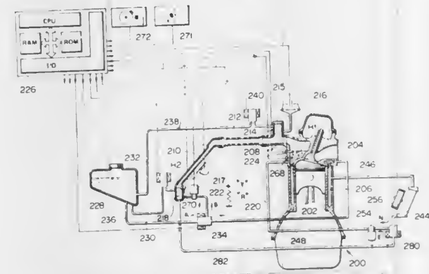
1. A fuel supply system for an internal combustion engine having an intake manifold, an exhaust manifold and a carburetor in communication with said intake manifold, said system including heat exchange means in said exhaust manifold, an adapter plate mounted on said intake manifold and supporting said carburetor, means in said adapter plate providing flow communication between said carburetor and said intake manifold, a metering valve mounted on said adapter plate and connecting means in said adapter plate connecting said metering valve and said means providing flow communication between said carburetor and said intake manifold, a main liquid fuel line having an inlet end adapted to be connected to a fuel pump, a pressure regulator in said fuel line, a solenoid valve in said fuel line downstream of said pressure regulator, a vacuum responsive pressure regulator in said fuel line downstream of said solenoid valve and a vacuum controlled needle valve in said fuel line downstream of said vacuum responsive pressure regulator, said main fuel line being split into a primary line and a secondary line downstream of said vacuum controlled needle valve, a solenoid valve in said secondary line, said primary line and said secondary line extending to said heat exchange means to supply liquid fuel to said heat exchange means to vaporize the liquid fuel, a water line adapted to be connected to a pump, a pressure regulator in said water line, a solenoid valve in said water line downstream of said pressure regulator and a fixed orifice restrictor in said water line downstream of said solenoid valve, said water line extending between said fixed orifice restrictor and said heat exchange means to supply water to said heat exchange means, a vacuum controlled switch in communication with said intake manifold, means electrically connecting said vacuum controlled switch with said solenoid valves in said secondary line and said water line and means providing a pressure connection between said vacuum controlled switch and said vacuum responsive pressure regulator and said vacuum controlled needle valve wherein said solenoid valves are opened when said vacuum in said intake manifold increases as said engine accelerates to permit additional liquid fuel and water to flow to said heat exchange means to be converted to hot fuel vapor and steam, a fuel vapor line connecting said heat exchange means and said metering valve whereby hot fuel vapor and steam flows through said fuel vapor line to said metering valve and through said connecting means in said adapter plate to mix with air flowing from said carburetor to said means in said adapter plate providing flow communication between said carburetor and said intake manifold, whereby a heated fuel vapor, steam and air mixture is provided to said intake manifold for combustion in the internal combustion engine.

4,628,872

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE INCLUDING COOLANT RETURN PUMP BACK-UP ARRANGEMENT

Naoki Ogawa, Yokohama, and Takao Kubozuka, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 784,174
Claims priority, application Japan, Sep. 29, 1984, 59-202948
Int. Cl.[4] F01P *3/22*
U.S. Cl. 123—41.27 **13 Claims**



1. In an automotive vehicle having a passenger compartment and an engine compartment:

an engine, said engine being disposed in said engine compartment and having structure which is subject to high heat flux;

a cooling system for removing heat from said engine; and

a passenger compartment heating arrangement incorported with said cooling system, said cooling system and said passenger heating arrangement comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and allowed to boil;

a radiator fluidly communicated with said coolant jacket, said radiator being arranged to receive gaseous coolant produced by the boiling of the liquid coolant in said coolant jacket and condense same to its liquid form;

means for returning liquid coolant from said radiator to said coolant jacket in a manner which maintains the level of coolant in said coolant jacket at a first predetermined level, said first predetermined level being selected to immerse said structure in a predetermined depth of liquid coolant, said liquid coolant returning means including:

a coolant return conduit which leads from the bottom of said radiator to said coolant jacket; and

a coolant return pump disposed in said coolant return conduit;

a cabin heater disposed in said passenger compartment, said cabin heater including a core through which coolant may pass;

a first heater conduit leading from said coolant jacket to the core of said heater;

a second heater conduit leading from the core of said heater to said coolant jacket;

a heater circulation pump disposed in said second heater conduit for circulating coolant from said coolant jacket through the core of said heater;

a switch-over valve disposed in said second conduit upstream of said circulation pump, said switch-over valve

having a first normal state wherein communication between the core of said heater and said coolant jacket is established and a second state wherein the communication between the core and the coolant jacket is interrupted and communication is established between said radiator and an auxiliary supply conduit which leads from said radiator to said switch-over valve;

a control circuit, said control circuit including means for sensing the load on said coolant return pump when energized and for switching said switch-over valve from said first normal position to said second position when the load on said coolant return pump is sensed as being outside of a predetermined range, and for operating said circulation pump in lieu of said coolant return pump.

4,628,873

MOTOR VEHICLE WITH INTAKE MANIFOLD SYSTEM

Rudolf Bitter, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1985, Ser. No. 749,061

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426266

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 M **5 Claims**



1. In a motor vehicle having a body and an internal combustion engine including a performance tuned intake manifold system comprising an enlarged plenum shared by a plurality of engine cylinders and a plurality of long air intake conduits extending individually between the plenum and intake ports connecting with the cylinders, the improvement wherein to provide room for the long intake conduits the plenum is rigidly mounted, independently of the engine, on a portion of the vehicle body spaced from the engine.

4,628,874

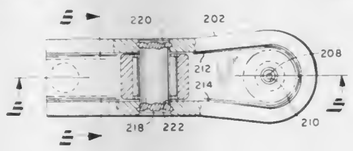
ROLLER FOLLOWER AXLE RETENTION

Bruce S. Barlow, Saginaw, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1985, Ser. No. 792,936

Int. Cl.[4] F01L *1/16;* **B21K** *1/20*

U.S. Cl. 123—90.5 **11 Claims**



1. A roller follower tappet for the valve gear of an internal combustion engine comprising:

(a) body means having an end defining a pair of axle supporting portions disposed in generally spaced parallel relationship, with each of said portions having an axle receiving aperture formed transversely therethrough;

(b) an annular recess formed about the inner periphery of each of said apertures intermediate the axial ends thereof;

(c) an axle having a roller thereon, said axle received through said apertures with said roller disposed to extend between said supporting portions with each end of said axle received in one of said portions;

(d) said axle having the material of the periphery of each end thereof deformed for contacting the wall of said aperture for positively retaining said axle in said body means.

7. A method of making a roller cam follower tappet comprising the steps of:

(a) forming a tappet body and providing certain portions thereof extending in spaced parallel arrangement and forming an aperture transversely in each of said portions;

(b) forming an annular recess in the periphery of each of said apertures;

(c) providing an axle with a roller thereon and disposing each end of said axle in one of said apertures;

(d) deforming the ends of said axle into contact with the inner periphery of said apertures.

4,628,875

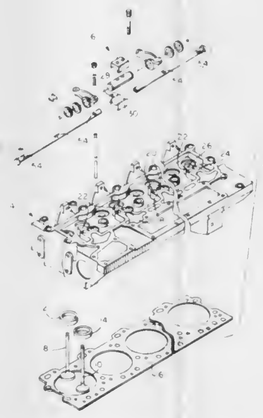
LUBRICANT SUPPLY RAIL

Larry Wells, and Karl Graham, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 28, 1985, Ser. No. 749,754

Int. Cl.[4] F01M *9/10*

U.S. Cl. 123—90.36 **18 Claims**



1. A lubricant supply rail for transferring lubricant from an internal combustion engine lubricant supply to a plurality of lubrication channels, each internally contained within one of a plurality of rocker arm support pedestals adapted to be mounted at spaced mounting locations on the engine cylinder head and including extension means for engaging the lubricant supply rail, said supply rail including conduit means for providing a direct fluid connection between a cylinder head lubricant outlet port and each of said rocker arm support pedestals when said conduit means is operatively positioned adjacent to both the cylinder head spaced mounting locations and the rocker arm support pedestal extension means, said conduit means including at least one lubricant inlet port and a plurality of spaced lubricant transfer bores, wherein said inlet port automatically aligns with said cylinder head outlet port and each of said transfer bores automatically aligns with one of said support pedestal lubrication channels when said conduit means is operatively positioned adjacent to both the cylinder head spaced mounting locations and the rocker arm support pedestal extension means to form a direct fluid connection for the flow of lubricant from the engine cylinder head outlet port through said conduit means to each of said rocker arm support pedestals.

4,628,876

ENGINE BALANCING SYSTEM

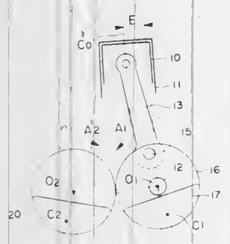
Tetsuzo Fujikawa, Kobe; Makizo Hirata; Shinichi Tamba, both of Kakogawa, and Akio Miguchi, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed May 14, 1985, Ser. No. 733,947

Claims priority, application Japan, May 16, 1984, 59-99302

Int. Cl.[4] F02B *75/06*

U.S. Cl. 123—192 B **3 Claims**



1. In a single-cylinder engine comprising a crank shaft, a crank web connected to the crank shaft, a connecting rod connected to the crank web through a crank pin, a cylinder, and a piston connected to the connecting rod to move in reciprocatory movement within the cylinder, an engine balancing system comprising:

a counter balancer supported by the crank web; and

a single primary balancer rotatably supported by a shaft extending parallel to said crank shaft, said single primary balancer being driven to rotate at a velocity equal to that of the counterbalancer in a direction opposite to a direction of rotation of the counterbalancer;

wherein a center line of the cylinder of the engine deviates from a center of rotation of the crank shaft toward the single primary balancer.

4,628,877

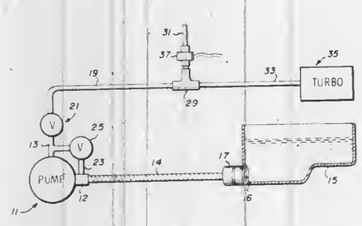
VEHICLE COLD START SYSTEM

Timothy B. Sundles, and M. Wayne Brown, both of San Jose, Calif., assignors to Lubrication Research, Inc., San Jose, Calif.

Filed Jul. 11, 1985, Ser. No. 754,008

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 S **6 Claims**



1. A system for improving lubrication of an internal-combustion engine having an ignition, starter motor, battery system and a mechanical-type oil pump, the system comprising:

an electrically operated oil pump for connection in liquid communication with an oil sump of an engine and havig an electrical motor;

first conduit means for connecting pressurized oil outlet of the oil pump to oil galleys of the engine to establish oil flow communications with said oil galleys;

electrical time-delay relay means for connection to the ignition and battery system of the engine and to said motor of the oil pump to energize motor for a predetermined time period after the ignition is initially turned on but before the starter motor is activated by allowing battery current of the battery system to flow through a contact internal of the relay means to energize said electrical motor and, after said firsr predetermined time period has lapsed, preventing the flow of current through said internal contact;

one-way valve means mounted to the oil pump to prevent back-flow of oil into the pressurized oil outlet; and

bypass means connecting the pressurized oil outlet of the oil pump to inlet of the pump when the one-way valve means is closed or flow from said pressurized oil outlet is restricted.

4,628,878

SPLASH LUBRICATING SYSTEM FOR AN ENGINE

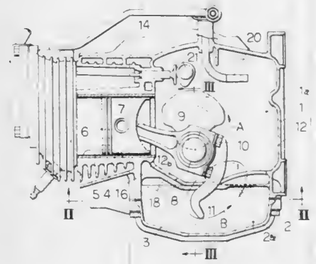
Keiichi Nakano; Yoshio Tani, and Tatsutoshi Umeda, all of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,462

Claims priority, application Japan, Oct. 5, 1984, 59-151592[U]

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 R **8 Claims**



1. A splash lubrication system for an engine comprising a crank case, a crank room formed in said crank case, an oil reserving room formed in a lower part of said crank case for lubricating oil, and an oil splasher extending from a big end of a connecting rod downward so as to splash oil from said oil reserving room to said crank room on its way from a front side to a back side along the lower part of its orbit, wherein improvement comprises:

a transverse partition substantially covering said oil reserving room, disposed at an upper space thereof, having an opening which allows said oil splasher to move therein, and three buffer plates covering front, right and left sides of said opening respectively for controlling oil level thereunder.

4,628,879

ENGINE INTAKE SYSTEM

Yorio Futakuchi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 614,798, May 29, 1984, abandoned, which is a division of Ser. No. 423,558, Sep. 27, 1982, Pat. No. 4,469,067. This application Mar. 19, 1986, Ser. No. 841,689

Claims priority, application Japan, Sep. 29, 1981, 56-154391[U]

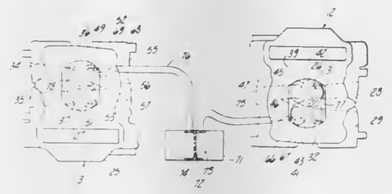
Int. Cl.[4] F02B *31/00*

U.S. Cl. 123—308 **11 Claims**

1. In an induction system for an internal combustion engine having a cylinder having a bore with a bore axis and a first intake port communicating with said cylinder, said first intake port having its center offset from said bore axis of said cylin-

der, a second intake port communicating with said cylinder at a point offset from said bore axis and spaced from said first point, said intake ports both lying substantially on one side of a first plane containing said bore axis and substantially on opposite sides of a second plane containing said bore axis and perpendicular to said first plane, a pair of exhaust ports lying on the other side of said first plane, said exhaust ports lying on opposite sides of said second plane, the improvement comprising an auxiliary intake port communicating with said cylinder only through said first intake port and offset from the center of said first intake port toward the periphery of said cylinder and means for generating a high velocity flow into said cylinder from said auxiliary intake port for effecting a swirl to the intake charge delivered to said cylinder from said auxiliary intake port.

7. In an induction system for a V type engine having a crankshaft and a separate cylinder head for each cylinder bank, said crankshaft defining a crankshaft axis along its length, each cylinder head forming a combustion chamber with the respective cylinder, a pair of intake ports formed in each cylinder head communicating with each combustion chamber on one



side of a respective first plane containing the axis of the respective cylinder bore and extending in a direction parallel to the crankshaft axis, the pair of intake ports of each cylinder head lying on the one side of said first plane adjacent the opposite cylinder head, intake valves for controlling the flow through said intake ports, said intake ports of each cylinder head being spaced from each other in the axial direction with respect to the crankshaft axis, an intake passage extending from a single inlet formed in a surface of each cylinder head adjacent the other cylinder head, each said intake passage extending from its single inlet through the respective cylinder head and terminating at both of said intake ports, a pair of exhaust ports in each of said cylinder heads communicating with the respective cylinder and lying on the opposite side of each said respective first plane, the improvement comprising at least one of said intake ports of one cylinder head being aligned in a second plane with at least one of the intake ports of the other cylinder head, said second plane being perpendicular to the axis of said crankshaft, said single inlets to the respective of said intake passages being aligned in said second plane, the remaining of said intake ports of said cylinder heads lying on opposite sides of said second plane with respect to each other.

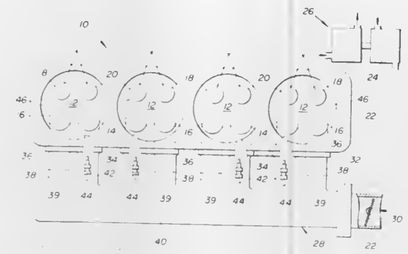
4,628,880

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING MULTIPLE INLET VALVES PER COMBUSTION CHAMBER

Shunichi Aoyama, Yokosuka; Hiroshi Fujii, and Manabu Kato, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 22, 1985, Ser. No. 714,976
Claims priority, application Japan, Mar. 30, 1984, 59-60918
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—432 **8 Claims**

1. In an internal combustion engine
a combustion chamber;
first and second inlet valves, said first inlet valve being arranged to open at a first predetermined timing prior the end of the exhaust phase of the engine, said second inlet valve being arranged to open essentially at the end of said exhaust phase;
a first induction conduit leading from a source of air to said first inlet valve;
a second induction conduit leading from said source of air to said second inlet valve;
an engine throttle valve operatively interposed between said source of air and said first and second induction conduits;



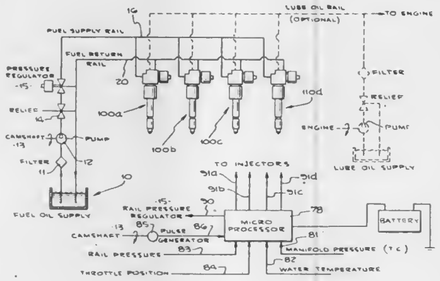
a flow control valve disposed in said first induction conduit for cutting off communication between said source of air and said first inlet valve when said engine is operating in a first mode and for permitting said communication when said engine is operating under a second mode; and
an air bleed formed only in said first induction conduit at a location downstream of and proximate said flow control valve for permitting a controlled amount of air to enter said first inlet conduit.

4,628,881

PRESSURE-CONTROLLED FUEL INJECTION FOR INTERNAL COMBUSTION ENGINES

Niels J. Beck; Michael A. Calkins; William E. Weseloh, and Robert L. Barkhimer, all of San Diego, Calif., assignors to BKM, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 418,688, Sep. 16, 1982, abandoned. This application Feb. 12, 1985, Ser. No. 700,692
Int. Cl.[4] F02M *47/02*
U.S. Cl. 123—447 **68 Claims**



1. The method of injecting fuel into a combustion chamber of an internal combustion engine, comprising the steps of:
(a) selecting an accumulator type fuel injector having a fuel input, and characterized by the fact that the withdrawal of applied pressure from its input initiates the injection of a fuel charge;
(b) placing said fuel injector in operative relation to the combustion chamber;
(c) selecting an electronically controlled three-way valve for selectively admitting fuel into said accumulator type fuel injector;
(d) coupling said valve to said injector;

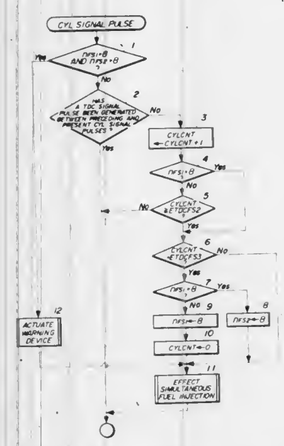
(e) coupling a source of liquid diesel fuel to said valve; and
(f) whenever it is desired to inject a fuel charge into the combustion chamber, applying an electronic control signal to said valve to open said valve for a selected period of time;
whereby at the end of said selected period of time when said valve closes to pressure and opens to vent, said accumulator type injector causes the injection of the fuel charge into the combustion chamber to be initiated; the termination of injection of the fuel charge being controlled by said accumulator type fuel injector and not by said valve or said electronic control signal.

4,628,882

FUEL SUPPLY CONTROL METHOD FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES DURING OCCURRENCE OF ABNORMALITY IN ENGINE ROTATIONAL ANGLE POSITION SENSING MEANS

Hidetoshi Sakurai, Kawagoe, and Masahiko Yakuwa, Fujimi, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 779,216
Claims priority, application Japan, Sep. 25, 1984, 59-198457
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—479 **6 Claims**



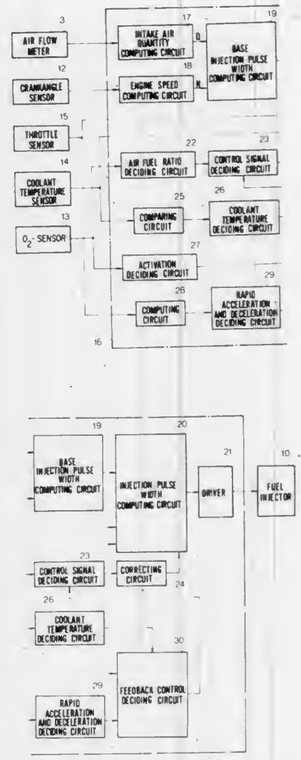
1. A method of injecting fuel into cylinders of a multi-cylinder internal combustion engine having cylinder-discriminating means for generating a pulse of a cylinder-discriminating signal each time a predetermined crank angle position of a particular one of said cylinders is assumed, and engine rotational angle sensing means for generating a pulse of a crank angle position signal each time a predetermined crank angle position of each of said cylinders is assumed, whereby a plurality of pulses of said crank angle position signal are generated between adjacent pulses of said cylinder-discriminating signal, in predetermined sequence starting with a predetermined cylinder corresponding to a first pulse of said crank angle position signal generated after each pulse of said cylinder-discriminating signal and in synchronism with pulses of said crank angle position signal, the method comprising the steps of:
determining whether or not a pulse of said crank angle position signal has been generated between an immediately preceding pulse and a present pulse of said cylinder-discriminating signal; and
when it is determined that no pulse of said crank angle position signal has been generated between said immediately preceding pulse and said present pulse of said cylinder-discriminating signal, effecting simultaneous fuel injections into all the cylinders of said engine upon generation of said present pulse of said cylinder-discriminating signal.

4,628,883

AIR-FUEL RATIO CONTROL SYSTEM

Ryuji Kataoka, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,901
Claims priority, application Japan, Apr. 16, 1984, 59-76823
Int. Cl.[4] F02M *51/00;* **F02D** *41/04, 41/14*
U.S. Cl. 123—489 **9 Claims**



5. In an air-fuel ratio control system for an internal combustion engine having an intake passage, fuel supply means for supplying fuel to cylinders of the engine through the intake passage in dependency on engine operating conditions, an exhaust passage from the engine, an O_2-sensor for detecting the concentration of oxygen in exhaust gases passing through the exhaust passage, an electronic feedback control circuit comprising a comparator for comparing an output signal of the O_2-sensor, control circuit means responsive to an output of the comparator to produce a control signal, and a driving circuit responsive to the control signal for driving the fuel supply means and for controlling air-fuel ratio in the intake passage to a value approximately equal to a stoichiometric air-fuel ratio, the improvement comprising
coolant temperature sensor means for producing a temperature signal dependent on temperature of coolant of the engine,
first detecting means for detecting rapid acceleration and deceleration respectively of the engine for producing an engine operation signal,
comparing means for comparing the temperature signal with

a temperature range between a lower temperature and a higher temperature, for producing a first signal when the coolant temperature is lower than the lower temperature and for producing a second signal when the coolant temperature is in said temperature range,

first means responsive to said first signal of said comparing means for producing a feedback control interrupting signal for rendering said electronic feedback control circuit inoperative, and

said first means responsive to the second signal and to the engine operation signal for producing said feedback control interrupting signal for rendering said electronic feedback control circuit inoperative.

4,628,884

METHOD FOR LAMBDA CONTROL IN AN INTERNAL COMBUSTION ENGINE

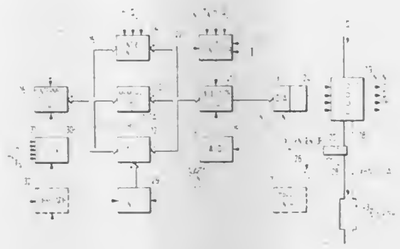
Hans P. Geering, Winterthur, Switzerland; Gerhard Heess, Tamm, and Helmut Schwarz, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 657,238, Oct. 3, 1984, abandoned. This application Dec. 24, 1985, Ser. No. 813,022

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336894

Int. Cl.⁴ F02D *41/32*

U.S. Cl. 123—489 **22 Claims**



1. Method for forming the air-fuel mixture for an internal combustion engine having a plurality of cylinders sequentially ejecting pulses of exhaust gas, the engine including an oxygen sensor subjected to said pulses of exhaust gas of the engine and being sensitive to the oxygen content of the extent gas to provide an output signal that is changeable from a high condition to a low condition; a signal processing unit for processing the output signals of the oxygen sensor; and, a storage unit for storing a characteristic field having characteristic field values for determining the quantity of fuel to be metered, the characteristic field being dependent upon at least one operating parameter of the internal combustion engine, the method comprising the steps of:

superimposing perturbations upon said characteristic field values (F_λ) that vary with time;

evaluating the output signals (U_λ) of the oxygen sensor as to their change with respect to the pertubation quantity;

correcting said characteristic field values to obtain an optimum air-fuel mixture; and,

causing said output signal to change between said conditions after the smallest possible time interval determined by the time which passes until the next one of said sequential pulses reaches said oxygen sensor.

4,628,885

CONTROL SYSTEM

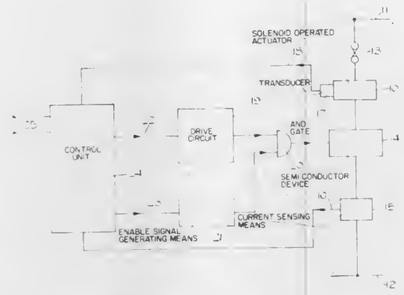
Alan P. Ogburn, Cirencester, and Ian J. Harvey, Cricklade, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 13, 1985, Ser. No. 701,213

Claims priority, application United Kingdom, Mar. 10, 1984, 8406331

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—490 **7 Claims**



1. An electronic control system for a solenoid operated actuator of a fuel system of an internal combustion engine comprising a semi-conductor device arranged in use to be connected in a series circuit with the solenoid of the actuator across a source of electric supply to control current flow in the solenoid, a feedback means for providing a feedback signal indicative of an operating parameter of said actuator, a drive circuit for said semi-conductor device, said drive circuit having a control signal input to which can be applied a control pulse, said drive circuit producing a series of pulses whereby the semi-conductor device will be switched on and off to control the current flow in said solenoid, an AND gate disposed intermediate said drive circuit and said semi-conductor device and which when an enable signal is applied thereto, passes said series of pulses to the semi-conductor device, enable signal generating means for generating said enable signal of predetermined time duration and an electronic control unit which receives said feedback signal and supplies said control pulse to the drive circuit and a trigger signal to said enable signal generating means, the control unit receiving other signals so that it can determine and control an amount of fuel to be supplied to the engine, the control unit acting in the event of an internal fault or in the event that said feedback signal falls outside prescribed limits, to discontinue supply at least of the trigger signal to said enable signal generating means whereby supply of said series of switching pulses to the semi-conductor device will be halted.

4,628,886

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Akito Onishi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1985, Ser. No. 760,555

Claims priority, application Japan, Dec. 5, 1984, 59-257070

Int. Cl.⁴ E02M *17/00*

U.S. Cl. 123—491 **5 Claims**

1. A fuel injection control system for an internal combustion engine, comprising:

starter means for initiating a start of said engine;

injector means for introducing fuel into said engine;

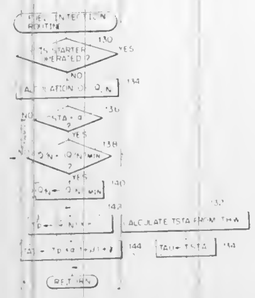
first detecting means for detecting air intake amount introduced into said engine;

second detecting means for detecting engine speed;

calculating means, connected to said first and second detecting means, for calculating a ratio of said air intake amount to said engine speed;

means for calculating an amount of fuel to be injected in accordance with said calculated ratio;

timer means for detecting a predetermined period from the start of said engine until stable idling is assured;



means for compensating said calculated amount of fuel to be not less than an amount corresponding to a predetermined limit value of a fuel-related parameter during said period; and

means for operating said injector means so that the compensated amount of fuel is injected into said engine.

4,628,887

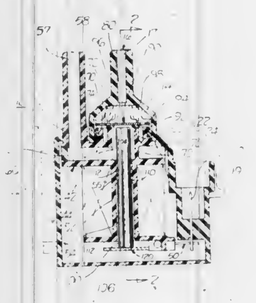
AUTOMATICALLY OPENING CANISTER PURGE SOLENOID VALVE

Ronald F. Mitchell, and John E. Cook, both of Chatham, Canada, assignors to Canadian Fram Limited, Chatham, Canada

Filed Feb. 28, 1985, Ser. No. 706,584

Int. Cl.⁴ F02M *33/02;* **G05D** *16/18*

U.S. Cl. 123—520 **17 Claims**



1. A canister purge valve comprising:

a housing including a vacuum port, a vacuum chamber connected to said vacuum port, and an opening remote from said vacuum port and said vacuum chamber;

an assembly comprising a carrier, said carrier including a passage formed within a cylindrical member thereof, and a coil wound about said member adapted to receive control signals, said assembly further comprising a member extending into said vacuum chamber including an end surface defining a valve seat and an axially directed first passage extending through said member, said valve seat positioned about said first passage, at least one other passage extending from said first passage and terminating at an inlet port, said inlet port extending through said opening in said housing, a ferro-magnetic metal stator received within said stepped bore and loosely received within said first passage, said stator including an end positioned proximate said valve seat;

a movable flat valve positioned within said vacuum chamber, said flat valve including a first surface supporting a ring of compliant material defining a sealing surface for seating upon said valve seat;

means for biasing said valve against said valve seat; and

means for providing a seal between said housing and said assembly proximate said vacuum chamber.

4,628,888

DEVICE AND METHOD FOR INJECTING FUEL INTO AN ENGINE, ASSISTED BY COMPRESSED AIR OR GAS

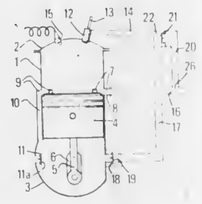
Pierre Duret, Paris, France, assignor to Institut Francais du Petrole; Automobiles Peugeot and Automobiles Citroen, all of, France

Filed Dec. 30, 1985, Ser. No. 814,882

Claims priority, application France, Dec. 28, 1984, 84 20059

Int. Cl.⁴ F02M *23/00*

U.S. Cl. 123—531 **21 Claims**



1. In an internal combustion engine comprising at least one pneumatic fuel injection member, at least one exhaust pipe and a pump crank case, a chamber is provided connecting said crank case to said injection member, said chamber forming an injection chamber, an auxiliary duct connecting said exhaust pipe to said injection chamber and said injection chamber comprising an obstruction member, such as a stop valve or non return valve, this member being located before the connection of said auxiliary duct to said injection chamber.

4,628,889

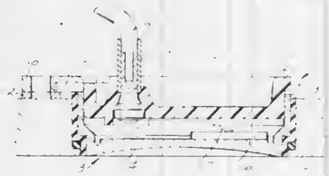
DEVICE TO PREHEAT A FUEL MIXTURE

Arie Van Der Ploeg, VA Wierden, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 22, 1985, Ser. No. 768,531

Int. Cl.⁴ F02M *31/00*

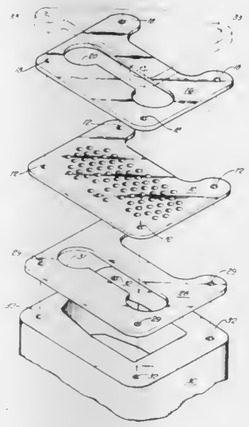
U.S. Cl. 123—549 **9 Claims**



1. A device to preheat fuel being furnished to an engine comprising a metal body to be mounted in a cavity in a wall of an intake manifold, the body having a bottom with an outer surface to be exposed to fuel in the intake manifold for heating the fuel and with an inner surface and having a side wall extending around the inner surface, means for securing the body to the intake manifold, an electrical resistance heater pill of a material of positive temperature coefficient of resistivity disposed in thermally conducting relation to the inner surface of the body bottom, and a contact bearer having a portion of electrical insulating material secured to the body holding an electrical conductor in resilient electrical contact with the

heater pill, characterized in that the body side wall cooperates with the inner surface of the bottom of the body for defining a body cavity, a plurality of detents are provided on the body side wall in spaced relation to each other, and the contact bearer has a configuration corresponding to the body cavity and has the electrical conductor secured thereto, the contact bearer having a configuration to be received within the body cavity and rotated under the detents for removably attaching the contact bearer in the body cavity with the electrical conductor in resilient electrical contact with the heater pill.

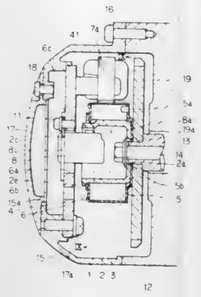
4,628,890
FUEL ATOMIZER
Winifer W. Freeman, 117 W. Mt. Vernon, Somerset, Ky. 42501
Filed Aug. 31, 1984, Ser. No. 645,869
Int. Cl.[4] F02M *29/04*
U.S. Cl. 123—593 **10 Claims**



1. A fuel atomizer for attachment to an internal combustion engine with a fuel injector and an intake manifold to provide atomization and dispersal of liquid fuel droplets entrained in an air-fuel mixture, comprising:
- a plate having a first surface and a second surface, said plate including a plurality of apertures having walls with longitudinal fluting extending in a direction from said first surface to said second surface of said plate;
- a mask element provided in direct contact with said first surface of said plate and disposed between said plate and said fuel injector to limit the fuel-air mixture to a predefined pattern of said apertures; and
- a gasket provided in direct contact with said second surface of said plate and disposed between said plate and said manifold to provide heat insulation from said engine;
- whereby swirling of the fuel-air mixture through the apertures is minimized and atomization by droplet explosion prior to combustion is maximized.

4,628,891
MAGNETO-GENERATOR FOR INTERNAL COMBUSTION ENGINE
Masahiro Asai, Hekinan, and Yasuhiro Hikimoto, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 8, 1985, Ser. No. 699,956
Claims priority, application Japan, Feb. 15, 1984, 59-27946; Mar. 27, 1984, 59-60136; Sep. 27, 1984, 59-203391
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—599 **22 Claims**

1. A magneto-generator for an internal combustion engine having a crankshaft, comprising:
- an iron cup fixedly mounted on said crankshaft of said internal combustion engine for rotation therewith and having the open end thereof faced outward in a direction away from said crankshaft;
- a permanent magnet mounted on the outer periphery of said iron cup for rotation therewith;
- a stator core located opposingly to said permanent magnet;



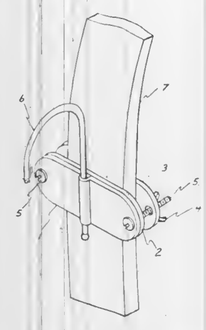
- a power-generating coil mounted on said stator core;
- a signal generator located substantially centrally in said iron cup and having at least one part thereof located in a position opposing the fore end of said crankshaft; and
- a timing portion provided on the inner periphery of said iron cup in a position opposing said signal generator.

4,628,892
BOW AND STRING SILENCER
Alan L. Windedahl, and Benedict M. Paczosa, both of Duncan, Nebr., assignors to Saunders Archery Co., Columbus, Nebr.
Filed Feb. 19, 1985, Ser. No. 702,882
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **11 Claims**



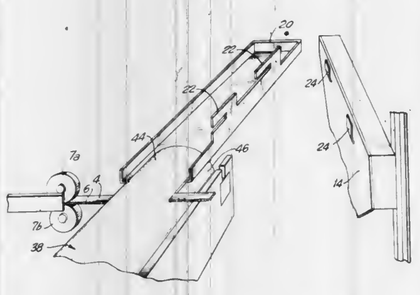
8. Archery apparatus comprising a bow of a type having a handle, flexible limbs attached to the handle and extending in opposite directions therefrom and a flexible string operatively connected at the ends thereof to the outer ends of said limbs whereby the string will have tension forces thereon due to forces applied thereto by the flexible limbs, said string having a somewhat centrally disposed nocking point thereon for receiving arrows thereon;
- an elastic member, said elastic member comprising a rubber tube;
- means for attaching one end of said elastic member to the string, said one end of the elastic member being attached to said string by said attaching means; and
- means for securing the other end of said elastic member to said one limb at a point intermediate the ends of said one limb, said other end of the elastic member being attached to said one limb by said securing means, said securing means comprising a connector base having an adhesive disposed thereon for attachment to said limb and a post attached to said connector base, said post being disposed in and frictionally held by said one end of said rubber tube, said securing means including means for allowing said post to pivot with respect to said connector base.

4,628,893
BOW HANGER
Robert B. Shaw, III, 92 Morrissee Ave., Wallington, N.J. 07057
Filed Mar. 1, 1985, Ser. No. 707,246
Int. Cl.[4] F41B *5/00;* **E04G** *5/06;* **A47B** *91/00*
U.S. Cl. 124—23 R **4 Claims**



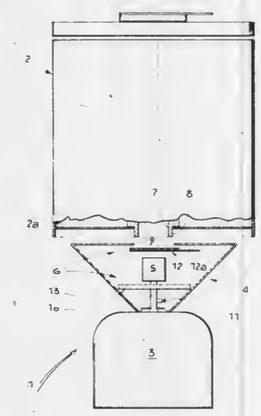
1. A bow hanger capable of being removably attachable to a bow limb for hanging a bow to a stationary object, said bow hanger comprising,
- first, second, and third plates wherein said first plate comprises an integrally formed groove portion extending along its width,
- hook means of rigid material having a first leg for engaging a stationary object and a second leg,
- fastening means adapted to fasten together said first and second plates wherein a passageway is formed between said groove portion and said second plate,
- said passageway adapted to receive said second leg for mounting said hook means between said first and second plates,
- said fastening means further adapted to fasten said third plate to said first and second plates wherein said second and third plates may firmly clamp either side of a bow limb.

4,628,894
CORE SLABBING APPARATUS
Ross W. Stewart, Dhahran, Saudi Arabia, assignor to Arabian American Oil Company, Dhahran, Saudi Arabia
Filed Dec. 1, 1983, Ser. No. 556,797
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 **13 Claims**



1. An apparatus for longitudinally dividing an elongated stratigraphic sample comprising a core, which can be enclosed within a tube, the core comprising friable, consolidated and unconsolidated core material, to thereby expose the interior of said core, said apparatus comprising
- cutting means connected to a frame and comprising a continuous circulating cutting edge oriented substantially in a horizontal plane,
- alignment means for positioning the longitudinal axis of said sample substantially parallel to the plane of said cutting edge,
- advancing means for bringing said sample and said cutting edge into contact with one another to thereby divide said sample into an upper section and a lower section,
- slab receiving means releasably connected to said frame immediately adjacent to the rear of, and co-planar with said cutting means for receiving and providing continuous and interrupted support for said upper section as said sample is divided, without deflecting said upper section from said lower section,
- wherein the physical integrity of the interior surfaces of said core which are thereby exposed are preserved.

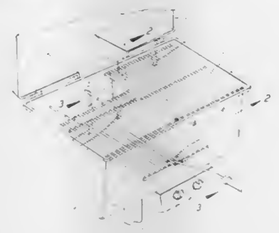
4,628,895
KILN AND AUTONOMOUS HEAT SOURCE PORTABLE INTEGRATED UNIT
Giovanni Santilli, Via S.Donato, 109, 61029 Urbino (Pesaro), Italy
Filed Dec. 19, 1984, Ser. No. 683,413
Claims priority, application Italy, Jan. 24, 1984, 3314 A/84
Int. Cl.[4] F24B *3/00;* **F27B** *3/02;* **F24C** *1/16*
U.S. Cl. 126—25 R **1 Claim**

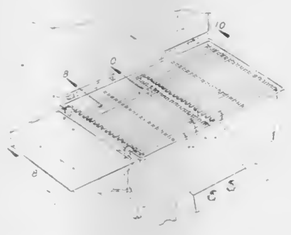


1. A portable integrated kiln and autonomous heat source unit, structured in a vertical sequence as combined elements, comprising:
- a can-shaped kiln having a bottom having a protruding annular end piece defining a firemouth;
- a portable gas cylinder or small gas bottle set under the kiln; and
- a support structure positioned vertically beneath said kiln and connected to said gas cylinder, said support having an opening at its top adapted to removably engage said protruding annular end piece so that the kiln and gas cylinder can each be carried separately or together as an integrated unit;
- a burner attached to said gas cylinder vertically facing said firemouth located under the opening in the support structure, the burner fed by fuel from said gas cylinder; and
- at least one heat insulating plate device connected to the support structure and set between the burner and the cylinder; and
- a second heat insulating plate device adapted to be posi-

tioned between the burner and the kiln firemouth when the desired kiln temperature has been reached and the kiln remains mounted on the support structure.

4,628,896
BARBECUE GRILL WITH HORIZONTALLY-SHIFTABLE GRID
William R. Baynes, Perry County, Ill., assignor to Turco, Inc., DuQuoin, Ill.
Filed Sep. 23, 1985, Ser. No. 778,693
Int. Cl.[4] A47J *37/04*
U.S. Cl. 126—25 R **20 Claims**

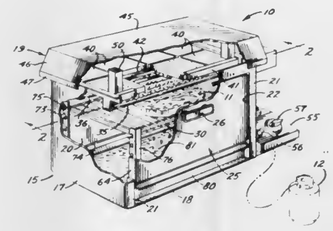




1. A barbecure grill which has a heating chamber, a grid on which food can be placed for cooking, and supporting means which hold said grid in assembled relation with said heating chamber throughout the time said barbecure drill is used to cook food, said supporting means being adapted to support said grid in a first position above said heating chamber to enable food thereof to be cooked by heat from said heating chamber, said supporting means also being adapted to support said grid in a second position wherein at least the greater part of said grid is displaced from said heating chamber, said supporting means confining said grid for movement along an essentially-straight line whenever said grid is moved from said first position to said second position and vice versa, and said suporting means having a portion thereof continuously overlying said heating chamber whether said grid is in said first or second position or is being moved from said first position to said second position and vice versa.

20. A barbecue grill that has a heating chamber, a grid on which food can be placed for cooking, a receptacle that is releasably securable to the heating chamber of said barbecue grill to receive and hold basting liquid, sauce or the like and that comprises a bottom and walls which form a liquid-holding space, and holding means that releasably engage a portion of said heating chamber to releasably hold said receptacle so said receptacle extends outwardly from said heating chamber, said grid being selectively disposable in a first position wherein it is over said heating chamber or in a second position wherein at least a portion thereof overlies said receptacle, said receptacle having one edge which is close to said heating chamber and having a second edge which is remote from said heating chamber, said bottom of said receptacle inclining, at least in part, away from said second edge of said receptacle to keep liquids from accumulating within said receptacle adjacent said second edge of said receptacle.

4,628,897
GAS BROILER
Peter S. Stanfa, Rochelle, and Phillip W. Foster, Lee, both of Ill., assignors to Broilway, Inc., Lee, Ill.
Filed Jun. 25, 1985, Ser. No. 748,491
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—41 R **21 Claims**



1. A gas broiler for cooking meat products and the like, said broiler comprising a box-like cabinet having a top and a bottom, having front and rear walls and having a pair of opposing side walls, an opening in the front wall of said cabinet, a door hinged to said cabinet and adapted to be swung between open and closed positions with respect to said opening, a generally horizontal rack located in said cabinet for supporting meat products, a gas-fired burner tube disposed in said cabinet and extending generally horizontally above said rack, said burner tube being operable when fired to produce an upwardly directed flame along substantially its entire length, ceramic burner blocks, means supporting said burner blocks within said cabinet in upwardly spaced relation from said burner tube, said burner blocks overlying substantially the entire area of said rack and absorbing the heat of said flame to radiate said heat downwardly toward said rack, apertures in said burner blocks and permitting products of combustion from said burner tube to pass upwardly through said burner blocks, said top being defined by a hood having a generally horizontal top wall overlying said burner blocks and having a peripheral skirt depending from said top wall, posts within said cabinet and supporting said top wall in upwardly spaced relation from said burner blocks whereby said top wall coacts with said burner blocks to define a chamber for products of combustion passing upwardly through the apertures in said burner blocks, said skirt having front and rear panels and opposing side panels extending downwardly around the upper end portions of said front, rear and side walls, respectively, in outwardly spaced relation therefrom to exhaust products of combustion out of said chamber and downwardly along the outer sides of said front, rear and side walls.

4,628,898
SECONDARY COMBUSTION SYSTEM FOR WOOD BURNING STOVE
Peter E. W. von Conta, Montgomery Center, Vt., assignor to Hearthstone Corporation, Morrisville, Vt.
Continuation-in-part of Ser. No. 584,082, Feb. 27, 1984, Pat. No. 4,553,526. This application Aug. 5, 1985, Ser. No. 762,266
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—58 **15 Claims**

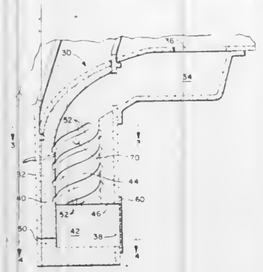
1. An improved secondary combustion system for combusting the exhaust gases exiting from a fire box in a wood burning stove comprising:

an insulated conduit defining an exhaust passageway leading from an intake opening to an exit opening;

screen means interposed across said exhaust passageway in the vicinity of said intake opening to impart a rapid acceleration to a gas stream entering said exhaust passageway;

rotation means to impart a rotation to the gas stream in a first portion of said exhaust passageway;

counter-rotation means to impart a counter-rotation to the gas stream in a second portion of said exhaust passageway;



deceleration means to decelerate the gas stream in the second portion of said exhaust passageway; and

secondary air means to inject a source of secondary air into said exhaust passageway.

4,628,899
HEATING APPARATUS AND METHOD AND DEVICE FOR PRODUCING THE HEATING APPARATUS
Lennart Eriksson, and Åke Polteg, both of Kalmar, Sweden, assignors to Cronspisen AB, Emmaboda, Sweden
PCT No. PCT/SE82/00338, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01614, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 20, 1982, Ser. No. 624,679
Int. Cl.[4] F24C *15/08*
U.S. Cl. 126—64 **5 Claims**



1. For a heating apparatus of the tiled stove-type having a return chamber section, a stove section providing a hearth, and a foot section, said stove section being formed by placing individual building blocks in a plurality of alternate horizontal courses arranged such that the vertical joints between blocks in one course are staggered with relation to the vertical joints between blocks in adjoining courses, the improvement comprising:

blocks for erecting said sections of said heating apparatus including:

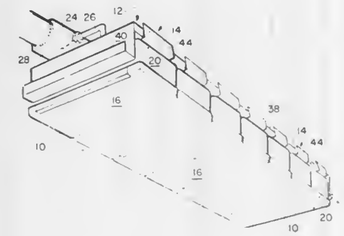
blocks for said stove section having cut-out portions to provide a central up flue gas passage extending from the hearth, two vertical down flue gas passages situated outside the central passage and two further vertical up flue gas passages also situated outside the central passage, the two down flue gas passages and the two further up flue gas passages being interconnected at their lower ends in a hearth plane,

a return block for said return chamber section having cut-out portions providing a return chamber interconnecting the upper ends of the central up flue gas passage and the two down flue gas passages for returning flue gasses to said stove section,

said blocks for said stove section including a plurality of rear blocks for forming the upper part of the stove section, said plurality of rear blocks being successively horizontally thickened to provide a portion of the central flue gas passage inclined forwardly course to course in an upward direction for deflecting the central flue gas path towards the front part of said stove section and into said return chamber, and

blocks for said return chamber section having cut-out portions to interconnect the two up flue gas passages in said return chamber section for leading flue gasses out to a chimney stack.

4,628,900
RADIANT HEATER
H. Chandler Arndt, 3000 Sharon Rd., Charlotte, N.C. 28211
Filed Oct. 30, 1985, Ser. No. 792,816
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 AC **5 Claims**



1. A gas-fired radiant heater comprising a housing having an open mouth, a burner face fitted in said open mouth of said housing, said housing and said face defining a plenum for containing and supplying a combustion gas to said face for passage therethrough to burn on the outwardly-facing surface thereof, and means for mounting said housing to support a structure having a pair of mounting rails extending in generally parallel spaced relation to one another with each said rail having a retaining edge portion, said mounting means including a pair of mounting legs extending from said housing in opposed facing relation to one another, one said leg having a hook portion adapted to hookingly engage said retaining edge portion of one said rail of said support structure and the other said leg including detent means formed adjacent the extending end thereof adapted to resiliently engage about said retaining edge portion of the other said rail of said support structure to releasably retain said mounting legs in frictional engagement with said support structure, whereby said heater may be readily installed on and removed from said support structure rapidly and without use of fasteners or tools.

4,628,901
ASH CATCHER FOR BARBECUE KETTLE
Jon D. Poulos, 1651 Mount Pleasant St., Northfield, Ill. 60093
Filed Feb. 24, 1986, Ser. No. 832,012
Int. Cl.[4] F23J *1/00*
U.S. Cl. 126—243 **9 Claims**

1. An ash catcher for a barbecue kettle with a generally hemispheroidal bottom extending around a vertical center axis, a plurality of downwardly diverging legs extending from the kettle bottom, a shelf supported between the lower portions of the legs and defining with said legs a trapezohedral space beneath the bottom, ash discharge and vent holes in the bottom between the legs being outwardly offset from the center axis, said ash catcher having:

an upwardly-narrowing tapered container body with an upper, ash-receiving opening, said body being shaped to

fit within said trapezohedral space when supported on said shelf, and a profile enabling it to be withdrawn sidewise between adjacent legs;

a plurality of ash-deflecting panels hingedly connected to the body around said ash-receiving opening;

said panels being pivotally movable between upper positions



immediately underlying the ash discharge and vent holes in the kettle bottom when the ash catcher is supported on the shelf, and lower positions to clear the kettle bottom when the ash catcher is withdrawn; and

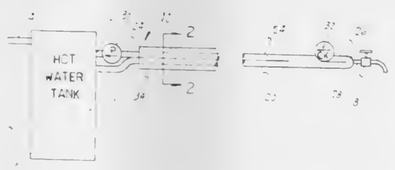
removable connecting means interconnecting the panels to hold them in their said upper positions during normal use of the kettle.

4,628,902

HOT WATER DISTRIBUTION SYSTEM

Cornelius J. Comber, 383 El Greco Dr., Osprey, Fla. 33559

Filed Jun. 3, 1985, Ser. No. 740,880
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—362 **8 Claims**



1. A hot water distribution system comprising a supply of hot water, a hot water circulation closed loop formed by a first pipe connected to an outlet of said supply of hot water and a return pipe connected to a return inlet of said supply of hot water, means for circulating hot water through said closed loop from said outlet to said return inlet, a hot water usage outlet connected by a substantially short line to said closed loop, and a one-way check valve connected in said loop for preventing water from being drawn from said return pipe upon dispensing hot water through said usage outlet, wherein said first pipe and said return pipe are disposed adjoining each other.

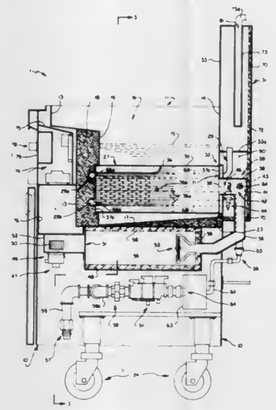
4,628,903

PULSE COMBUSTION DEEP FAT FRYER

Craig A. Farnsworth, Chagrin Falls; Robert L. Himmel, Cleveland, both of Ohio; Gerald W. Sank, Pasadena, and Keith A. Stanger, Glen Burnie, both of Md., assignors to Gas Research Institute, Chicago, Ill.

Filed May 15, 1985, Ser. No. 734,285
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—391 **22 Claims**

1. A deep fat fryer comprising an open-top vessel adapted to hold a quantity of cooking oil, a pulse combustion heater for heating the oil in said vessel and a cabinet structure for supporting the vessel and the heater, said cabinet structure including a front wall arranged for user access to the cooking oil and a remote back wall, said heater including a combustion chamber having an inlet and an outlet, said heater further including a mixer head connected to said inlet of said combustion chamber, means for supplying controlled air and fuel flows to said mixer head, an ignitor for initiating combustion, and a tailpipe connected at one end to said outlet of said combustion chamber for receiving combustion products and at the other end to an exhaust decoupler means for venting combustion products, said combustion chamber and tailpipe coacting to form a self-sustaining, resonant pulse combustor which self-exhausts combustion gases and self-feeds air and fuel, said vessel including a



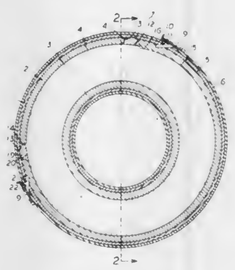
vessel wall for confining the oil, said combustion chamber being adapted to be immersed in the oil and having an imperforate wall portion providing heat exchange between combustion products passing through the combustion chamber and the oil, said tailpipe extending along an exterior side of said vessel wall and providing heat exchange between combustion products passing through the tailpipe and the oil, said combustion chamber inlet, mixer head and exhaust decoupler means being located adjacent said back wall of said cabinet, said exhaust decoupler means enclosing at least a portion of a vent pipe for minimizing the space requirements and noise levels of the fryer.

4,628,904

SOLAR CYLINDER

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Jul. 10, 1981, Ser. No. 282,041
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—417 **1 Claim**



1. A solar retention cylinder comprising in general a cylindrical glass chamber for the reception, temporary retention, and emission of the radiation of concentrated solar beams produced by primsmatic beam concentrators, and comprising in particular;

a hollow glass cylinder (1) of toroidal shape having an outside cylindrical wall (2), an inside cylindrical wall (3), and two parallel circular end walls (4) occupying basal cylindrical planes,

said outside wall, said inside wall and said end walls defining a toroidal retention chamber,

said toroidal chamber having interior surfaces which are aluminized to reflect light,

a receptor port (11) comprising a thin elongate rectangular cavity disposed at an angle in said outside wall, said receptor port serving as entry means of said concentrated solar beam into said toroidal chamber, said receptor port terminating in an end wall (10) which is perpendicular to said concentrated solar beam so as to transmit said beam into said outside wall without refraction,

a rotary receptor light valve (7) located in said outside wall in the line of projection of said concentrated solar beam, said light valve comprising an elongate half-rod of glass having a rounded cylindrical portion (13) and an opposed elongate face (12) extending the length of said half-rod, said rounded portion being mounted inside said outside wall in an elongate cylindrical receptacle (14) so as to revolve therein as means of emitting said concentrated solar beam into said toroidal chamber or as means of intercepting said concentrated solar beam,

a rotary emitter light valve (19) located in said outside wall, said light valve comprising an elongate half-rod of glass having a rounded cylindrical portion (13) and an opposed elongate face (12) extending the length of said half-rod, said rounded portion being mounted inside said outside wall in an elongate cylindrical receptacle (14) so as to revolve therein as means of emitting a concentrated beam from said toroidal chamber,

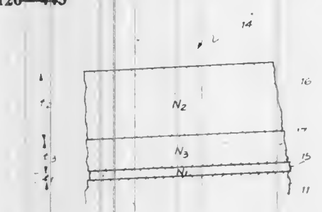
an emitter port (22) comprising a thin elongate rectangular cavity disposed at an angle in said outside wall in the line of projection of said concentrated beam emitted by said light valve, said emitter port serving as means of exit of said concentrated beam from said light valve, said emitter port terminating in an end wall (21) which is perpendicular to said concentrated beam so as to transmit said beam out of said outside wall without refraction.

4,628,905

SOLAR SELECTIVE SURFACE COATING

David R. Mills, Darling Point, Australia, assignor to University of Sydney, Sydney, Australia

Continuation of Ser. No. 537,288, Sep. 29, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,180
Claims priority, application Australia, Oct. 8, 1982, PF6254
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—443 **13 Claims**



1. A collector element for use in a solar collector system and which comprises an inner tube through which fluid can be passed, an outer glass tube enveloping at least a portion of the periphery of the inner tube and defining an evacuated space between the two tubes, and a solar selective surface coating deposited on the outer surface of the inner tube; the solar selective surface coating comprising three layers including an inner layer composed of a material which is reflective to radiation in the infra-red spectral range, an outer layer composed of a semiconductor material which is absorptive of energy in the solar energy spectral range and which is substantially transparent to infra-red radiation, and an intermediate layer composed of a dielectric material which is substantially transparent to infra-red radiation, the outer layer material being deposited to a thickness not less than 0.3 μm, the intermediate layer material being deposited to a thickness within the range of about 0.15 to 2.0 μm, the inner outer and intermediate layer materials having complex refractive indices $(n_1 - ik_1)$, $(n_2 - ik_2)$ and $(n_3 - ik_3)$ respectively and the materials being selected to satisfy the relationship

$$\left[\frac{(n_3 - ik_3) - (n_1 - ik_1)}{(n_3 - ik_3) + (n_1 - ik_1)}\right]^2 > \left[\frac{(n_2 - ik_2) - (n_1 - ik_1)}{(n_2 - ik_2) + (n_1 - ik_1)}\right]^2$$

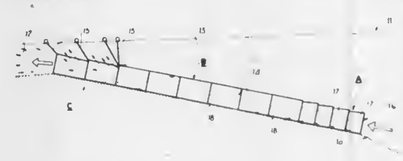
for normal incident radiation over at least a major portion of the infra-red spectral range, wherein n_1, n_2 and n_3 are the respective real refractive indices; k_1, k_2 and k_3 are the respective imaginary refractive indices, and i is $\sqrt{-1}$.

4,628,906

METHOD AND INSTALLATION FOR RAISING THE WATER TEMPERATURE IN INLAND BASINS

Leonardo Tonoli, Via Del Monte 14, Salo' (Brescia) 25087, Italy

Filed Dec. 10, 1984, Ser. No. 679,756
Claims priority, application Italy, Oct. 24, 1984, 5220 A/84
Int. Cl.[4] F24J *2/00, 2/42*
U.S. Cl. 126—452 **7 Claims**

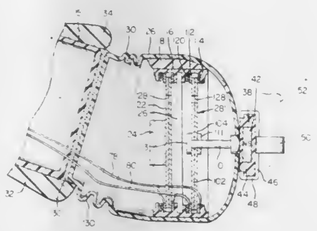


1. A method of increasing the thermic content and temperature of inland basin water in an inland basin having an outlet mouth and a plurality of water layers of different temperature therein above a basin bed thereof, lower water layers being cooler than a top water layer of the basin water and the outlet mouth being at a level above the basin bed for the usual outflow of the top water layer from the inland basin, comprising fixing a conduit to the basin bed which extends from a lower layer of the basin water to the top layer thereof and to the outlet mouth of the inland land basin, the conduit having a lower inlet opening for receiving basin water from the lower layer and an upper outlet opening for discharging basin water into the outlet mouth, fixing a vertical barrier around the conduit outlet and in the outlet mouth for retaining and damming basin water of the top water layer in the inland basin, the vertical barrier having an upper edge which is above the conduit outlet and conveying basin water from the lower layer to the top layer and to the outlet mouth through the conduit when the top layer is above the conduit outlet.

4. In combination with an inland water basin having an outlet mouth and a plurality of water layers of different temperature therein above a basin bed thereof, lower water layers being cooler than top water layers of the basin water and the outlet mouth being at a level above the basin bed for the usual outflow of the top water layer from the inland basin, an apparatus for increasing the thermic content and temperature of the basin water, comprising a fixed wall having an inverted U-shaped cross-section, anchored to the basin bed and forming a conduit having an inlet opening in one of the lower water levels, said conduit having a discharge at the top water layer and in the basin outlet mouth, at least one vertically extending barrier positioned around said discharge and across said outlet mouth for damming the top water layer to prevent the top water layer flowing out through said outlet mouth, a top edge of said vertical barrier being higher than said discharge of said

conduit whereby said colder water from said lower level enters through said inlet opening of said conduit, travels along said conduit and between said conduit and said basin bed, and out through said discharge.

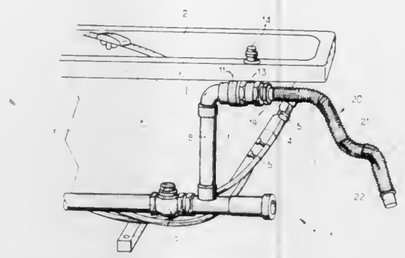
4,628,907
DIRECT CONTACT HEARING AID APPARATUS
John M. Epley, 6371 SE. Yamhill, Portland, Oreg. 97215
Filed Mar. 22, 1984, Ser. No. 592,236
Int. Cl.⁴ A61B *5/02;* **H04R** *25/00*
U.S. Cl. 128—1.6 **15 Claims**



1. Hearing aid apparatus adapted for mounting within the ear canal to provide direct coupling through the tympanic membrane, comprising:
an input transducer means for converting sound waves to electrical input signals of audio frequency;
amplifier means for amplifying said input signals applied to an input of said amplifier means to produce amplified electrical output signals at an ouput of said amplifier means;
D.C. voltage power supply means for said amplifier means including battery means;
an output transducer means for converting received signals corresponding to said output signals into mechanical movement of an output coupling element of said transducer means without the production of perceptible sound waves;
mounting means for removably mounting said output transducer means in the ear canal external to the tympanic membrane; and
support means for supporting said coupling element in engagement with a contact element mounted on the outer surface of the tympanic membrane by a clip means for attachment to the malleus bone of the ear by a pair of clamp arms extending through the tympanic membrane so that there is no air gap between said coupling element and the tympanic membrane, and to provide direct electromechanical coupling from the output transducer means to the ossicle bones within the ear through the tympanic membrane in response to the movement of said coupling element.

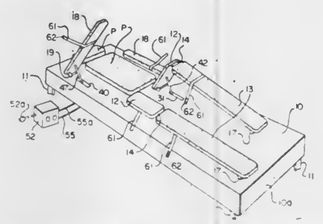
4,628,908
AIR INJECTION BATH FOR THERAPEUTIC USE
Robert J. Dupont, Paris, France, assignor to Techniques et Systems Elabores T.S.E., Paris, France
Filed Oct. 17, 1983, Ser. No. 542,335
Claims priority, application France, Oct. 18, 1982, 82 17417
Int. Cl.⁴ A61H *29/00*
U.S. Cl. 128—24.1 **8 Claims**

1. An air injection bath, said bath comprising:
a tub having a base with air injection nozzles disposed in said base, said air injection nozzles being supplied by a turbine;
heating and ozonising means being disposed in a box, said box having an electrical control system and being located outside the safety perimeter of the bath;
a pneumatic control grip connected to said box and being disposed near the user, said pneumatic control grip sending air pulses to said box for controlling various operations for air injection, heating of the injected air, ozone injection, the duration and speed of the air injected into the bath, and the starting and stopping of the complete facility;
control means for controlling the flow of air to the air injection nozzles, said control means including a bypass tube,



an adjustable control valve being substantially at the top-edge of the bath, and an elbow connecting said bypass tube to said adjustable control valve, wherein the amount of air entering the bypass tube, thus bypassing the air injection nozzles, is controlled by the adjustable control valve.

4,628,909
ALTERNATIVE HEALTH CARE MACHINE
Alvin M. Tietsworth, 1606 Swamp Rd., Furlong, Pa. 18925
Continuation-in-part of Ser. No. 450,181, Dec. 15, 1982, abandoned. This application Jul. 3, 1984, Ser. No. 627,402
Int. Cl.⁴ A61H *1/02*
U.S. Cl. 128—25 R **9 Claims**



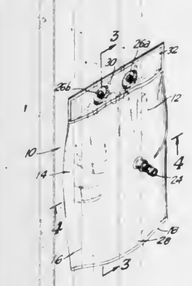
1. An alternative health care machine for synchronized exercising of the opposite arms and legs of a patient who is in a supine poition, the machine including a table on which the patient rests, the table having
a pair of first leg support members hingedly connected to a pair of second support members;
said pairs of first and second leg support members being in parallel relation and engaging the legs of said patient;
a pair arm support members engaging the forearms of said patient;
means for alternatively raising and lowering said arm support members and said leg support members, whereby said opposite arms and legs are exercised together in a cross crawl pattern; and
said means is motor driven and has torque limiting means.

4,628,910
MUSCLE EXERCISE AND REHABILITATION APPARATUS
Richard Krukowski, Chatham, N.J., assignor to Biodex Corporation, Shirley, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,493
Int. Cl.⁴ A63B *23/00*
U.S. Cl. 128—25 R **41 Claims**



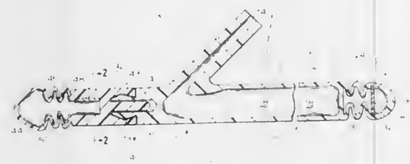
1. Apparatus for exercising and rehabilitating muscles in a limb of a user, comprising:
movable arm means against which a force can be applied;
sensing means for sensing said force applied to said arm means and for producing a load signal corresponding thereto;
tachometer means for producing a velocity signal corresponding to the velocity of said arm means;
servo motor means coupled to said arm means for moving said arm means in opposite directions for both flexion and extension, respectively, of said limb of said user during a single exercise; and
closed loop velocity servo feedback means for controlling said motor means in response to said load signal and said velocity signal to selectively move said arm means, with a constant torque or a regulated velocity, in opposite directions for both flexion and extension, respectively, of said limb.

4,628,911
ARM SUSPENSION MITT
Jerome L. Bornstein, Suite 131, Encino, Calif. 91316
Filed Apr. 17, 1985, Ser. No. 724,023
Int. Cl.⁴ A61F *5/40, 13/10, 5/37;* **A61B** *17/56*
U.S. Cl. 128—77 **9 Claims**



1. An arm suspension mitt usable during surgical procedures having means to enable continuous monitoring of blood circulation in the fingers, said means comprising:
an outer flexible portion;
an inner flexible portion, said outer and inner portions together defining a package having an open end for removably receiving a hand inserted into a space radially inward of said inner flexible portion, said inner flexible portion being undivided to provide space around each finger and between each finger to avoid constriction of the blood vessels of the fingers;
an inflatable chamber between said inner portion and said outer flexible portion, said inflatable chamber being sealed from the ambient atmosphere;
valve means in communication with said inflatable chamber for inflating said inflatable chamber to thus cause said inner flexible portion to collapse in a direction away from said outer flexible portion so as to conform said inner flexible portion around said hand within said space;
said mitt being see-through to permit visualization of the hand received therein.

4,628,912
ADJUSTABLE ROOT AND TIP EXTENDERS FOR THE STIFFENER CYLINDER OF A PENILE ERECTION DEVICE
Robert E. Fischell, 1027 McCeney Ave., Silver Spring, Md. 20901
Filed Aug. 20, 1984, Ser. No. 642,248
Int. Cl.⁴ A61F *5/00*
U.S. Cl. 128—79 **11 Claims**



1. A penile erection prosthesis adapted to be implanted in the corpus cavernosum of the penis comprising in combination:
a penile implant having a distal end and a proximal end;
a tip part at the distal end for location in the tip portion of the corpus cavernosum;
a root portion at the proximal end for location in the root portion of the corpus cavernosum;
an extension means forming part of at least one of the tip and root, which extension means allows continuous adjustment to any arbitrary length within predetermined limits, which length adjustment is independent of the flaccid or erect state of the prosthesis;
adjusting the extension means by adjusting the amount of fluid within at least one of the tip part and root part.

4,628,913
CERVICAL THORACIC ORTHOSIS
Max Lerman, Beverly Hills, Calif., assignor to United States Manufacturing Co., Pasadena, Calif.
Filed Jan. 13, 1984, Ser. No. 570,343
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.⁴ A61F *5/02*
U.S. Cl. 128—78 **12 Claims**

1. A cervical thoracic orthosis comprising:
a chest plate for overlying a patient's chest;
a back plate for overlying a patient's back;
an occipital support for supporting the occipital and neck region of the patient;
a rigid occipital support bar secured to the occipital support;
means for fastening the occipital support bar to the back plate for holding the occipital support in a fixed position against the occipital and neck region of the patient;
a chin support for supporting the chin and lower jaw region of the patient's head;
a rigid chin support bar secured to the chin support;
means for fastening the chin support bar to the chest plate

for holding the chin support in a fixed position against the chin and lower jaw region of the patient's head; and

means for fastening the chest plate and the back plate in a fixed position around the patient's upper torso for holding the occipital support and the chin support in their fixed positions;

the occipital support bar having a lower portion for providing a rigid means of support extending along the center of the patient's back to support the spinal column below the patient's neck,

the occipital support bar having an upper portion for extending along the upper cervical spine of the patient, said upper portion of the occipital support bar curving inwardly to conform to and provide a rigid means of support extending along the neck region of the patient, the top of the occipital support bar curving outwardly to conform to and provide a rigid means of support for the occipital region of the patient's head,



the occipital support having an upper portion shaped to conform to the occipital region of the patient's head and a lower portion extending downwardly therefrom and curved inwardly relative to said upper portion to conform to the back of the patient's neck region,

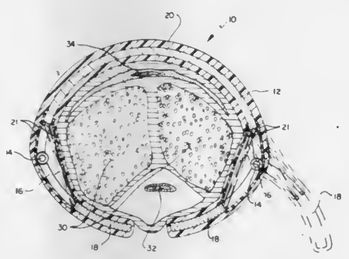
the upper portion of the occipital support bar being secured to the upper and lower portions of the occipital support to provide rigid support for portions of the occipital support in contact with the upper cervical spine of the patient along the neck and occipital regions of the patient.

4,628,914

THERAPEUTIC MALE GENITAL APPLIANCE

Carl E. Everson, 181 Wyleswood Dr., Berea, Ohio 44017

Filed Dec. 27, 1985, Ser. No. 813,850
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **12 Claims**



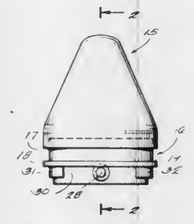
1. A therapeutic appliance for the penis of a man comprising a substantially semicylindrically curved plate section characterized as having a rigidity ranging from semi-rigid to rigid to which are attached by spring-loaded hinge means two additional plate sections characterized as having a rigidity ranging from semi-rigid to rigid, which additional sections operate cooperatively with the curved plate section to form a hollow cylinder to substantially but not completely enclose at least a portion of the length of the shaft of the penis.

4,628,915

MALE ORGAN CONDITIONER ACCESSORY

John L. Chaney, 156 Broad St., Box 592, Lake Geneva, Wis. 53147

Filed May 15, 1985, Ser. No. 734,074
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **7 Claims**



1. A device for disposing an elastic ring in a stretched condition on a cylindrical rigid sleeve so that the sleeve may be slipped over the penis and the ring slid off of the sleeve to contract on the penis and control blood flow to the penis for facilitating obtaining and maintaining penile erection, comprising:

a member having a conical part and a generally circular base part from which said conical part extends and a cylindrical part joined coaxially with said circular base part, said cylindrical part having an outside diameter smaller than the outside diameter of said base part such that an annular shoulder is defined on said conical part where said conical part joins said cylindrical part, said shoulder having an annular groove concentric to said cylindrical part,

a cylindrical rigid sleeve slidable onto said cylindrical part of said member, said sleeve having axially opposite ends one of which extends into said annular groove in said shoulder, and

releasable retaining means for retaining said sleeve on said cylindrical part to facilitate sliding said elastic ring over said conical part of said member and onto said sleeve,

release of said retaining means enabling said sleeve to be separated from said cylindrical part of said member with said elastic ring on it.

4,628,916

BRACES FOR PREVENTING INJURIES TO THE KNEE JOINT

Max Lerman, Beverly Hills, and Vick G. Bonessa, Arcadia, both of Calif., assignors to United States Manufacturing Co., Pasadena, Calif.

Continuation-in-part of Ser. No. 635,815, Jun. 30, 1984, abandoned. This application Jun. 13, 1985, Ser. No. 744,500
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **27 Claims**

1. A knee joint support comprising:

an upper support arm having a lower end,

a lower support arm having an upper end,

a first hinge bar pivotally secured to a lower portion of the upper support arm and to an upper portion of the lower support arm, and

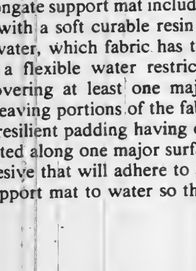
a second hinge bar pivotally secured to the lower portion of the upper support arm to pivot about an axis forward of the pivot axis between the first hinge bar and the upper support arm,

the second hinge bar being pivotally secured to the upper portion of the lower support arm to pivot about an axis between the pivot axis between the first hinge bar and the lower support arm,

the first and second hinge bars being positioned on opposite sides of the upper and lower support arms,

the first and second hinge bars allowing relative rotation of the upper and lower support arms about a polycentric axis while resisting forward or rearward sliding movement of each bar relative to the other,

the lower and upper ends of the upper and lower support arms, respectively, being positioned so they are spaced apart as the upper and lower support arms rotate though an angle formed by the two arms, the lower and upper ends of the upper and lower support arms rotating into contact with one another when relative rotation of the upper and lower arms reaches a substantially upright position between the two arms for resisting said relative rotation beyond the substantially upright position, the



hinge bars each having a widened central portion of sufficient width to overlap the space formed between the lower and upper ends of the support arms in their angular positions and to also overlap the contacting lower and upper ends of the support arms on said opposite sides of the support arms when the support arms rotate to said upright position of the two arms, for preventing an object entering the space formed between the ends of the support arms from being pinched by the contacting ends of the support arms as the arms rotate into their upright position,

the upper and lower support arms being adapted for mounting adjacent the upper and lower leg of a user with the first and second hinge bars adjacent the knee joint, so that the support arms resist forward or rear sliding movement of the user's upper leg relative to the lower leg, or vice versa, and so that the contact between the ends of the support arms resists rotation of the upper and lower leg beyond said substantially upright position.

4,628,917

COMBINATIONS OF MATERIALS AND METHOD FOR FORMING A SPLINT

Anthony J. Campagna, Jr., Roseville; Patricia A. Eull, St. Paul, and Katherine E. Reed, Grant Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

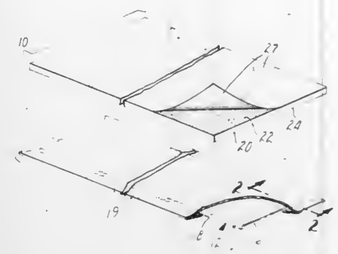
Filed Nov. 1, 1984, Ser. No. 667,271
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—90 **3 Claims**

1. A method for applying a splint or protective covering to a person comprising the steps of:

providing an elongate support mat including a flexible fabric impregnated with a soft curable resin that hardens upon exposure to water, which fabric has two opposite major surfaces and a flexible water restricting film disposed along and covering at least one major surface of said fabric while leaving portions of the fabric exposed, and a sheet of soft resilient padding having opposite major surfaces and coated along one major surface with a pressure sensitive adhesive that will adhere to a moist surface;

exposing the support mat to water so that water will enter the fabric through its exposed portions to initiate the hardening of the resin;

adhering the sheet of resilient padding to one major surface of the support mat after the exposing step to form a laminate;



positioning the dry surface of the padding opposite the support mat on the skin of the person;

attaching the laminate to the person to secure the splint or protective covering in place; and

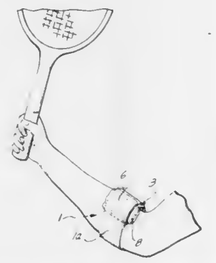
allowing the resin to harden.

4,628,918

PNEUMATIC ARM BAND FOR LOCALIZED ARM PRESSURE

Glenn W. Johnson, Jr., 10 Friar Tuck Cir., Summit, N.J. 07901

Continuation of Ser. No. 343,094, Jan. 27, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 712,745
Int. Cl.[4] A61F *5/04;* **A63B** *61/00*
U.S. Cl. 128—90 **11 Claims**



1. An arm band for alleviating the symptoms of tennis elbow, comprising:

an elongate strap member adapted to be circumferentially tensioned about the forearm of a tennis player in at least partial overlying relation to the extensor muscle thereof, and circumferentially limited means on said strap member for applying a uniform radially directed pressure to said extensor muscle,

wherein said circumferentially limited means comprises a pocket protruding inwardly toward said arm, said pocket being in engagement with said at least portion of said extensor muscle when said trap member is fitted about said forearm as aforesaid,

a semi-compressible pressure element disposed within said protruding pocket,

wherein said semi-compressible pressure element is an inflated air bag, and

wherein said pocket comprises a first layer and a second layer disposed coextensively with respect to each other longitudinally of said strap member between a pair of transverse seams, said first layer comprising a portion of the inner circumferential surface of said band so as to engage said at least portion of said extensor muscle when

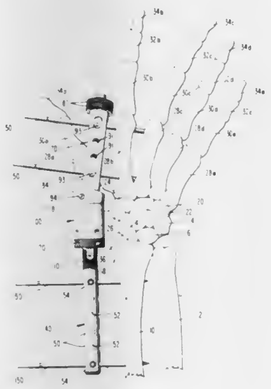
said strap is fitted about said forewarm as aforesaid, said first layer forming an asymetrical pockets, said pocket and said inflated air bag asymetrically protruding radially inwardly when the strap member is circumferentially tensioned about the forearm of said tennis player such that the pressure being applied by said inflated bag in said asymetrically protruding pocket is substantially greater in magnitude then the radially directed pressure applied to portions of the arm spaced from said extensor muscle and coextensive with said strap member when said member is circumferentially tensioned about said forearm as aforesaid.

4,628,919

DYNAMIC EXTERNAL FIXATOR AND METHOD OF USE

Terry A. Clyburn, 4006 Sue Ellen, Houston, Tex. 77087

Filed Sep. 9, 1983, Ser. No. 530,608
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 ZK **20 Claims**



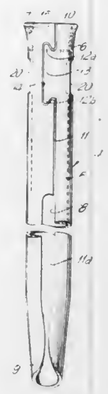
1. A dynamic external fixator comprising:
(a) a proximal leg portion including first means for retaining at least one bone fixation pin therein;
(b) a distal leg portion including second means for retaining at least one bone fixation pin therein said distal leg portion including adjusting means for allowing controllable elongation and contraction thereof, said second means forming a part of said adjusting means, said adjusting means comprising a cylinder and a piston slidably mounted in said cylinder, said piston including limit stop means for constraining motion of said piston with respect to said cylinder within predetermined limits;
(c) universal joint means connecting said proximal leg portion to said distal leg portion and facilitating substantially universal movement therebetween; and
(d) selectively positionable control means cooperating with said universal joint means, during a period of patent treatment, for selectively restricting the range of motion through which said universal joint means is free to move, said control means being infinitely adjustable from a position permitting unrestrained movement of said universal joint means to another position which substantially prevents movement of said universal joint means and thereby adjustably controlling the freedom of motion of said proximal leg portion with respect to said distal leg portion.

4,628,920

INTRAMEDULLARY NAIL

Robert Mathys, Jr., and Anton Cotting, both of Bettlach, Switzerland, assignors to Synthes Ltd., Paoli, Pa.

Continuation-in-part of Ser. No. 680,515, Dec. 11, 1984, abandoned. This application Mar. 29, 1985, Ser. No. 717,794
Claims priority, application Switzerland, Dec. 12, 1983, 6622/83; European Pat. Off., May 12, 1984, 84810592.0
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YZ **11 Claims**



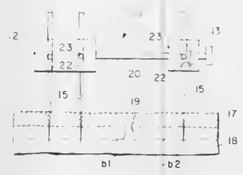
1. An intramedullary nail comprising a hollow body having a peripheral wall, a tip for insertion into a bone, a head adapted to receive a drive connection and a slot extending from said tip to said head, the slot having a section adjacent said head with a configuration locking together the edges of the body wall on opposite sides thereof to prevent spreading of the body.

4,628,921

UNILATERAL EXTERNAL FIXATION SYSTEM FOR SMALL BONES

Mauricio Rousso, 4/66 Lea Goldberg Street, Jerusalem 97 457, Israel

Filed Oct. 2, 1984, Ser. No. 656,926
Claims priority, application Israel, Oct. 3, 1983, 69888
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 Z **17 Claims**



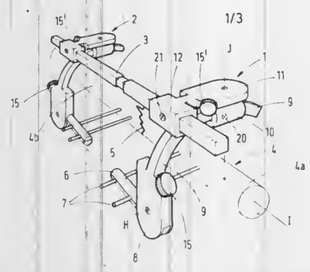
1. A versatile unilateral fixation system comprising:
a rod element;
first and second blocks, each block defining at least one aperture through which a wire is securable, the wire being adapted to have one end thereof secured within a hand bone, with the wires securable to the two blocks being secured in different hand organs;
means for releasably attaching the two blocks to said rod so that the wires attached to the blocks are at a preselected orientation, with the distance between said blocks on said rod being controllable by rotating said rod;
a first rod accommodating cavity located within the first block;
wherein said rod defines a first end with means for facilitating said rod rotation with said first block proximal to said first end, and the second block defining a longitudinal blind ended cavity through which a distal end of said block extends, and said means for releasably attaching comprises means for fixedly attaching said block to said rod, for at least partially releasing said block so that said rod is free to rotate within said blind ended cavity without being removable therefrom.

4,628,922

FRACTURE REDUCTION APPARATUS

Michael E. Dewar, London, England, assignor to University College London, London, England

Filed Sep. 27, 1985, Ser. No. 781,244
Claims priority, application United Kingdom, Sep. 28, 1984, 8424579
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 Z **6 Claims**



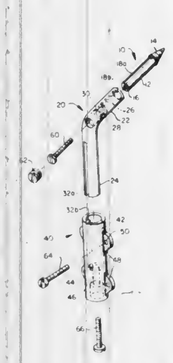
1. A fracture reduction apparatus comprising first holding means for holding first bone fixation means, second holding means for holding second bone fixation means, the first and second bone fixation means being located, in use, with the site of the fracture intermediate them, and means for rotating each of the said holding means about a respective set of three orthogonal axes, the three axes of each set intersecting one another at a respective point located in the bone, the two respective points being spaced from one another along the longitudinal axis of the bone.

4,628,923

AXIAL COMPRESSION DEVICE

Robert J. Medoff, 1896 Poplar Wood Cir. #1, Germantown, Tenn. 38138

Filed Nov. 28, 1983, Ser. No. 555,548
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YV **20 Claims**



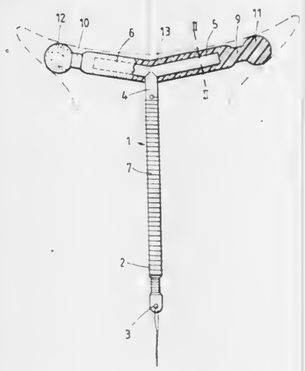
1. An axial compression device for the fixation of a fractured bone having a first bone fragment, a second bone fragment disposed transverse to the first bone fragment and a third bone fragment disposed longitudinally of the first bone fragment, comprising:
(a) first means constructed to be secured to said second bone fragment,
(b) second means, including a slide member cooperable with said first means, configured to receive a compression means for compressing said first and second bone fragments, and
(c) a retaining member constructed to be secured to said third bone fragment and having an axial engagement means extending threralong which is configured at one end to slidably engage a leg of said slide member and at an opposite end to receive another compression means for compressing said first and said third bone fragments longitudinally.

4,628,924

INTRAUTERINE CONTRACEPTIVE DEVICE

Hugo Cimber, Neufeldstrasse 134, 3012 Bern, Switzerland

Filed Jan. 17, 1984, Ser. No. 571,570
Claims priority, application Switzerland, Jan. 20, 1983, 323/83
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—130 **2 Claims**



1. An intrauterine contraceptive device of the type intended to be introduced into the uterus by means of a tube, having a supporting part with a proximal and a distal end, and having two branches joined to the proximal end of said supporting part in such a way that said branches spread apart from one another laterally upon ejection from said tube, wherein the improvement comprises;
(a) a substantially spherical occluding member made of a soft material and flexibly connected to the end of each of said branches remote from the point of junction thereof with said proximal end of said supporting part, said supporting part and said branches being made in one piece of a comparatively stiff but resilient material; and
(b) a connecting piece made of easily deformable, soft material and disposed between each said occluding member and the respective end of the associated one of said branches.

4,628,925

QUICK-RELEASE LIMB HOLDER APPARATUS

Marshall Witzel, Wilmette, Ill., assignor to Heelbo, Inc., Niles, Ill.

Filed Feb. 24, 1986, Ser. No. 832,576
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—133 **14 Claims**

1. A quick-release limb holder apparatus for releasable adjustable affixation about a patient's limb to secure the limb, as desired, to a fixed object to thus immobilize the limb and thus

the patient in a manner which simultaneously permits said patient to be freed from said apparatus instantaneously, without the complete disassembly of said quick-release limb holder apparatus and without requiring its readjustment upon reaffixation of said apparatus about said patient's limb, said quick-release limb holder apparatus comprising:

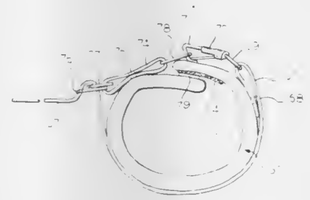
first strap means having a first end and a second end, said first end of said first strap means being capable of releasable securement to said fixed object, said first strap means serving to partially encircle said patient's limb;

adjustment means operably positioned about at least a portion of said first strap means to alternatively increase and decrease the length of said first strap means encircling said patient's limb and thus said first strap means fitment about said limb, thereby permitting said limb holder apparatus to conform to the encirclement of varied size limbs;

second strap means having a first end and a second end, said first end of said second strap means operably attached to said adjustment means positioned about said first strap means,

said second strap means further encircling said patient's limb;

quick-release coupling means including a first attachment member operably attached to said second end of said first strap means, a second attachment member operably attached to said second end of said second strap means, and



a detachable coupling member operably interposed between said first and second

attachment members,

said detachable coupling member capable of alternatively affixing and releasing the position of said first and second attachment members relative to one another to alternatively connect and disconnect said first strap means to said second strap means, to, in turn, alternatively complete and release the entire encirclement of said patient's limb, to alternatively permit and release the restraint of said patient's limb respectively, thereby quickly affixing and releasing said patient's limb from said apparatus in a facilitated manner without the need to release and readjust said adjustment means upon removal and reaffixation of said apparatus upon said patient's limb;

cuff means operably interposed between the limb of the patient and the inner facing surfaces of said first and second strap means, said adjustment means and said quick-release coupling means encircling said limb,

said cuff means serving to cushion and insulate said patient's limb from the constrictive forces exerted by said encircling first strap means, second strap means, adjustment means and quick-release coupling means upon said limb as said patient moves about to thereby minimize irritation and discomfort which would otherwise be inflicted upon said patient's limb by direct contact with said strap means.

4,628,926

CARBON DIOXIDE REBREATHING APPARATUS

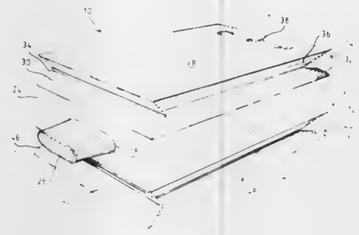
David T. Duncan, Knoxville; John McElligott, Oliver Springs; David M. Lipscomb, Knoxville, and Charles W. Williams, Powell, all of Tenn., assignors to Products for Health and Industry, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 454,036, Dec. 28, 1982, Pat. No. 4,508,116. This application Nov. 29, 1984, Ser. No. 676,516

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—203.28 **10 Claims**



1. A rebreathing device for increasing the carbon dioxide concentration of air inhaled by a user, which comprises:

a first rectangular prism-shaped chamber having a selected volume defined by enclosure walls, and having a first end and a further end, and provided with a mouthpiece communicating therewith at said first end;

a second rectangular prism-shaped chamber defined by enclosure walls and having a first end and a further end, said second chamber sharing a solid common partition wall with said first chamber, said partition wall provided at said first end of said second chamber with at least one restrictive opening of a first selected size communicating with said further end of said first chamber, said first selected size being small with respect to the surface area of said common partition wall, said second chamber provided proximate said further end with at least one restrictive opening of a second selected size communicating with the atmosphere surrounding said device; and

whereby said first and second chambers, and said opening in said common partition communicating between said chambers, produce an extended restricted flow path between said mouthpiece and said opening to the atmosphere thereby producing an accumulation of breath of a user with a corresponding accumulation of carbon dioxide in said device and in air inhaled by said user from said device.

4,628,927

REVERSIBLE FACE MASK WITH REPLACEABLE AIR FILTER INSERT

Russell G. Ward, 2050 S.W. 71st Ave., Portland, Oreg. 97225

Continuation-in-part of Ser. No. 555,342, Nov. 22, 1983, abandoned. This application Mar. 7, 1986, Ser. No. 837,423

Int. Cl.[4] A61B *7/00*

U.S. Cl. 128—206.17 **4 Claims**

1. An air filtering breathing mask for wear during adverse environmental conditions, said mask comprising,

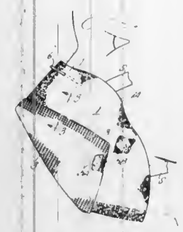
a main member of conical configuration and of semirigid construction which may be turned inside out to a reversed conical configuration during changing of a filter element, said mask main member having a continuous inner edge defining an opening, a frontal marginal area of the main member extending about said opening,

head attachment means on said main member,

a mesh member in place on said main member and overlying said frontal marginal area of the main member and extending across said opening,

means joining said mesh member and said main member along a course offset from said inner edge of the main member,

a filter element normally having one side overlapped by said mesh member and overlapped on its remaining side by said frontal marginal area of the main member to retain the filter element in place, and



said main member upon being turned inside out having its frontal marginal area displaced away from the marginal area of the filter element to expose same to facilitate grasping of the filter element with the fingertips and subsequently permitting unobstructed insertion of a replacement filter element.

4,628,928

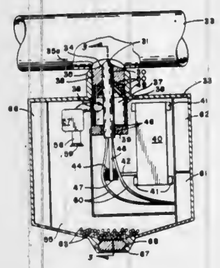
ROBOTIC IMPLANTABLE MEDICAL DEVICE AND/OR COMPONENT RESTORATION SYSTEM

DeWitt J. Lowell, Summit County, Utah, assignor to Medtronic, Inc., Medtronic, Minn.

Continuation-in-part of Ser. No. 406,197, Aug. 9, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,841

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—303 R **20 Claims**



1. In combination with a device adapted for at least partial implantation in a living body to perform a function with respect to such living body, and having a housing and a portion of such device extending from the housing through a hole therein into operative position in the body, such portion periodically needing servicing to maintain it in effective operating condition; positioning means for drawing said portion of the device that extends from the housing into the housing for periodic servicing and for reextending said portion into operating position in the body when servicing is complete; servicing means associated with said device and located within said housing for maintaining effective operation of the device, said servicing means including servicing fluid, means for contacting, during servicing, the portion of the device to be serviced with said servicing fluid, reservoir means within said housing for storing said servicing fluid between servicings of said device, and means within said housing for treating the servicing fluid between servicings to help maintain its effectiveness for servicing purposes; and means for exercising control of said servicing means and said positioning means so as to periodically carry out a servicing function with respect to said device.

4,628,929

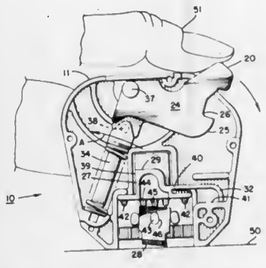
RETRACTABLE BLADE BLEEDING TIME DEVICE

Franklin S. Intengan; Zindel H. Heller, and Fred K. White, all of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 16, 1985, Ser. No. 766,878

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—314 **29 Claims**



1. A disposable device for making an incision in the skin such as in a human by a retracting blade member that selfretracts after the incision is completed for bleeding time determinations comprising:

a housing which inclues a blade opening;

hammer means pivotably positioned within the housing and including a cam surface;

selfretracting shuttle means supported within the housing and including a cam follower surface, the shuttle means operative to travel towards the skin by (i) the movement of the cam surface along the cam follower surface and (ii) the biasing force exerted on the shuttle means by a first spring means extending from the shuttle means;

blade means secured to the shuttle means and operative to extend through said opening out of said housing to make the incision and then selfretract into the housing; and

second spring means operative to exert a force on the hammer means to cause it (i) to travel along the cam follower surface to cause the shuttle means to travel towards said opening thereby causing the blade to travel out of the housing and make the incision and, (ii) to travel into a locked position to thereby secure the blade within the housing after the blade has retracted back into the housing due to force exerted by the first spring means.

4,628,930

SOOTHING COMFORT GIRDLE

Steven N. Williams, 1520 Dewberry #107, Lancaster, Tex. 75146

Filed Oct. 24, 1985, Ser. No. 790,936

Int. Cl.[4] A61F *7/00;* **H05B** *3/36*

U.S. Cl. 128—379 **4 Claims**

1. A girdle for use in preventing the discomfort of cramps due to a menstrual period, said girdle comprising:

a cotton cloth panty of a type having a front portion, a rear portion and interconnecting side portions;

means for forming a leg hole in a bottom portion of each side portion thereof;

means attached to the front and rear portions thereof for forming a crotch portion between the leg holes;

continuous elastic means connected to the extreme top portions of said front, rear and side portions for forming an access opening at the top of said girdle;

means for forming a battery holding compartment attached to said elastic means;

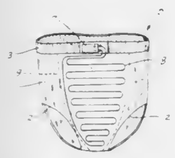
electrical heating means attached to the front of said front

portion for producing heat to prevent cramps during the menstrual cycle, said electrical heating means extending from said crotch portion to said elastic means;

an electric battery removably disposed in said battery holding compartment means;

means for electrically connecting said battery to said electrical heating means whereby the energy from said battery will generate heat in said electrical heating means;





a generally V-shaped basket weave cloth means having a higher R-value than said cotton cloth of which said front portion is constructed disposed over said electrical heating means for causing most of the heat from said heating means to flow through said cotton front panel rather than through said basket weave cloth whereby a person wearing the girdle will have the part of her anatomy which tends to cramp during menstrual periods heated to prevent such cramps.

4,628,931

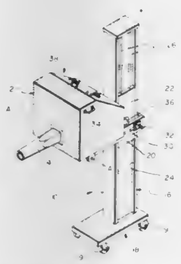
MEDICAL TREATMENT METHOD

Harold F. Barrett, Rte. 1, Box 262A, London, Ark. 72847

Continuation-in-part of Ser. No. 354,361, Mar. 3, 1982, Pat. No. 4,469,103. This application May 18, 1984, Ser. No. 611,974

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—399 **24 Claims**



1. A method of treating a condition in a living body comprising applying to an area of the body in which said condition is located infrared electromagnetic energy having a wavelength such that the energy is absorbed by body cells in said area, the energy being derived from a flowing gas that is applied externally to the body adjacent to said area, adjusting the temperature of the gas applied to the body to a value of approximately 108° F. or less so as to produce at said area an internal temperature within the normal temperature operating range of the body, the wavelength of the energy being determined by said internal temperature, and adjusting the amplitude of the energy, by adjusting the flow rate of the gas, to a value that is effective to treat said condition.

4,628,932

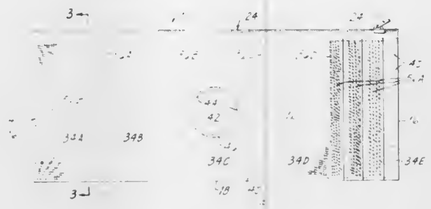
KNEE ICE PACK

Morris Tampa, P.O. Box 31346, St. Petersburg, Fla. 33733

Filed Jun. 11, 1984, Ser. No. 619,129

Int. Cl.[4] A61F *7/10*

U.S. Cl. 128—402 **3 Claims**



1. A knee pack for cooling the affected area of a knee with ice without also cooling the patella of the knee, comprising in combination:

a body member having a front sheet of material affixed to a back sheet of material defining an open-ended enclosure open along a top portion thereof, said body member being segmented into a left, center and right compartments each adapted to receive ice therein, said center compartment including a cut-out recess defined by affixed edges of said front and back sheets, said recess being centrally positioned within said center compartment for alignment with the patella of the knee to preclude the patella from being subjected to cooling effects of the ice;

closure fastener means affixed completely across the opened end of said body member to permit opening and closing thereof to gain access to each said compartments, said closure fastener means comprising a zipper; and

means for removably fastening said body member about the knee with said cut-out recess being aligned with the patella of the knee, said fastening means comprising male and female strips of fastener material affixed to said left and right compartments, respectively, of said body member to be in mating and transverse engagement with one another when said left and right compartments are overlapped with one another, whereby the knee ice pack is positioned about the knee by first aligning said cut-out recess with the patella of the knee and then overlapping said left and right side compartments to engage said male and female strips of said fastener material such that the cooling effects of the ice contained within said compartments are concentrated along the sides and back of the knee and are substantially precluded from cooling the patella of the knee.

4,628,933

METHOD AND APPARATUS FOR VISUAL PROSTHESIS

Robin P. Michelson, 886 Edgewood Rd., Redwood City, Calif. 94062

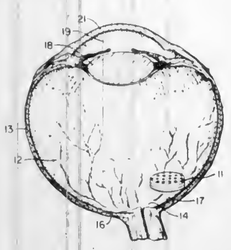
Filed Jul. 23, 1985, Ser. No. 758,609

Int. Cl.[4] A61N *1/36;* **A61F** *1/16*

U.S. Cl. 128—419 R **20 Claims**

1. A visual prosthesis for implantion in the eye in the optical pathway thereof, including a plurality of photosensitive elements disposed in an array at one surface of said prosthesis and oriented to receive light entering the eyeball, a plurality of electrode means extending from a second surface of the prosthesis and for contacting the visual neurons at the surface of

the retina of the eyeball, and means for transferring the output signals from said plurality of photosensitive elements to said



plurality of electrode means in a pattern corresponding to the illumination pattern of said photosensitive array.

4,628,934

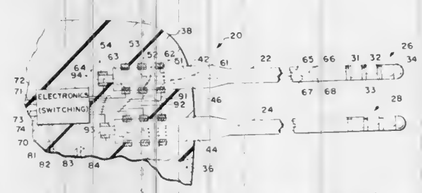
METHOD AND MEANS OF ELECTRODE SELECTION FOR PACEMAKER WITH MULTIELECTRODE LEADS

Peter J. Pohndorf, Miami Shores, and Edward A. Schroeppel, Miramar, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Aug. 7, 1984, Ser. No. 638,383

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **29 Claims**



1. A cardiac pacing system including: a cardiac pacer having a sealed case with pacer electronic circuitry therein including a pacer system ground, a neck, and at least one feedthrough passing through the sealed case into the neck; a pacing lead having a proximal end portion which is received in said neck, a distal end portion, at least two electrodes in the distal end portion and at least two spaced apart terminal connectors in said proximal end portion, said at least one feedthrough being connectable to said terminal connectors, electrode switching/selection circuit means external to the sealed case and connected to said at least one feedthrough between said pacer electronic circuitry and said at least two electrodes for selectively electrically connecting one or more of the electrodes in the pacing lead through said at least one feedthrough with the pacer electronic circuitry.

4,628,935

DEFIBRILLATOR ADAPTED FOR USE WITH ACCESSORY CASSETTES

Paul W. Jones, Issaquah; Rodney J. Merry, and Douglas T. Hakala, both of Bothell, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jan. 8, 1985, Ser. No. 689,746

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D **4 Claims**

1. A defibrillator, comprising:

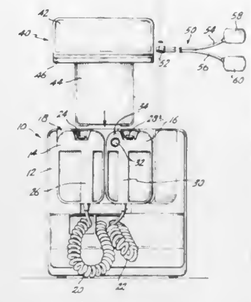
a body including a source of defibrillation energy;

a pair of electrodes, each electrode including an electrically conductive electrode element having a generally planar surface for application to a patient and through which a defibrillation shock may be delivered to the patient;

mounting means for mounting the electrodes to the body;

means for electrically connecting the source of defibrillation energy to the electrode elements;

an adapter for connecting an accessory electrode set to the defibrillator, the adapter comprising first and second contact sets and means for electrically connecting the first and second contact sets, the second contact set being adapted to make electrical connection to the accessory electrode set;



means for mounting the adapter to the body; and

contact means for electrically connecting the electrode elements to the first contact set of the adapter when both the electrodes and the adapter are mounted to the body, the contact means being mounted in the body and directly contacting the electrode elements when the electrodes are mounted to the body.

4,628,936

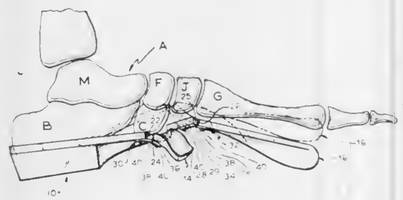
SEGMENTED TRIPLANAR ORTHOPEDIC APPLIANCE

Sheldon Langer; Justin Wernick, both of Woodbury, and R. Paul Jordan, Whitestone, all of N.Y., assignors to The Langer Biomechanics Group, Inc., Deer Park, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,250

Int. Cl.[4] A43B *7/16*

U.S. Cl. 128—614 **22 Claims**



1. A segmented triplanar orthopedic appliance for correctably realigning and repositioning specific anatomical segments of the human foot, comprising:

(a) a substantially rigid heel segment adapted to lie generally underneath the plantar aspect of the heel region of the foot;

(b) a substantially rigid medial segment adapted to extend longitudinally lengthwise of the foot and lie generally underneath the plantar aspect of at least the medial column of the foot;

(c) a substantially rigid lateral segment adapted to extend longitudinally lengthwise of the foot and lie generally underneath the plantar aspect of at least a portion of the lateral column of the foot;

(d) first substantially flexible means operatively connecting said heel segment and said medial segment; and

(e) second substantially flexible means operatively connecting said heel segment and said lateral segment;

said connecting means permitting independent limited

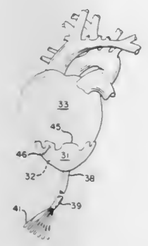
pivoting of said medial and lateral segments, respectively, relative to said heel segment, wherein said lateral segment is movable between first and second positions, said orthosis further comprising means for biasing said lateral segment from said second position towards said first position, said lateral segment in said first position acting on a common surface with said heel segment to reposition said heel segment for support of the cuboid and in said second position being disposed so as to not effect such repositioning of said heel segment, said lateral segment assuming said first position in response to said biasing means during pronation and said second position in response to and during supination.

4,628,937

MAPPING ELECTRODE ASSEMBLY

Stanley R. Hess, and Peter P. Tarjan, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Aug. 2, 1984, Ser. No. 637,159
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **7 Claims**



1. A conforming cardiac mapping electrode set assembly, comprising:

a pliable electrically insulative mounting cup having electrodes mounted therein, said electrodes being exposed on an electrically insulative administration surface of the pliable mounting cup for conforming contact with cardiac tissue, said pliable mounting cup having a shape that is variable between a concave orientation of the administration surface and a convex orientation of the administration surface;

a trunk portion generally centrally disposed with respect to said pliable mounting cup, said trunk portion having a cable depending therefrom;

an insulated wire connected to each said electrode, each said insulated wire passing through said generally centrally disposed trunk portion and through said cable, said insulated wires being insulated from each other; and

said electrodes of said pliable mounting cup being controllably movable with said pliable electrically insulative mounting cup to provide an array of electrodes on the electrically insulative administration surface that is conformable to a convex surface of the cardiac tissue and that is also conformable to a concave surface of the cardiac tissue.

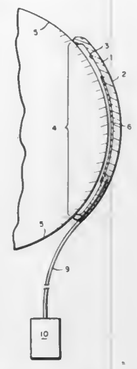
4,628,938

CONTINUOUS APPLANATION TONOMETER

David A. Lee, 35 Northampton St., Boston, Mass. 02118

Filed Dec. 9, 1985, Ser. No. 806,311
Int. Cl.[4] A61B *3/16*
U.S. Cl. 128—652 **18 Claims**

1. A tonometer for measuring intraocular pressure comprising a flexible contact lens having a convex and a concave side which includes an inflatable applanatmg chamber affixed to said concave side of said lens, a reservoir of a substantially noncompressible fluid connected to said applanating chamber, pump means for moving the noncompressible fluid between said reservoir and said applanating chamber, and pressure-



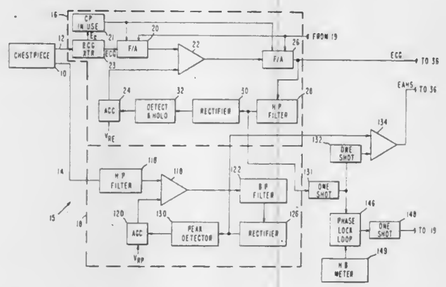
measuring means for measuring the fluid pressure in said applanating chamber when said chamber is fully inflated.

4,628,939

METHOD AND IMPROVED APPARATUS FOR ANALYZING HEART ACTIVITY

Michael J. Little, Tarzana, and Harry A. Dellamano, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 186,041, Sep. 11, 1980, Pat. No. 4,428,380.
This application Nov. 10, 1983, Ser. No. 550,350
Int. Cl.[4] A61B *4/00*
U.S. Cl. 128—696 **4 Claims**



1. Apparatus for producing and displaying an electrical signal indicative of the electrical energy characteristics of the heart, comprising:

(a) a pickup device having pickup electrodes adapted for contact with the skin of a patient and having an output circuit;

(b) an active circuit element coupled between one of said pickup electrodes and said output circuit and being in one state of electrical conduction when said pickup is not in contract with the skin of a patient and being in a different state of electrical conduction when said pickup electrodes are in contact with the skin of a patient;

(c) amplification and display means electrically coupled ot said output circuit for displaying the electical output of said pickup device; and

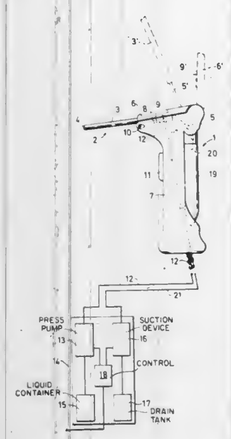
(d) control means responsive to the state of electrical conduction of said active element when said electrodes are in contact with the skin of a patient for lowering the frequency response of said amplification and display means.

4,628,940

DEVICE FOR SAMPLING CELLS FROM THE MUCOUS MEMBRANE OF THE CERVIX UTERI

Jan I. Näslund, Vassvägen 21,, S-141 39 Huddinge, Sweden

Filed Sep. 1, 1983, Ser. No. 528,691
Claims priority, application Sweden, Sep. 15, 1982, 8205272
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—750 **13 Claims**



1. A device for obtaining cell samples from the mucous membrane of the cervix uteri for the detection of cervical cancer comprising:

spray nozzle means (4) for applying, to the cervical mucous membrane, a plurality of liquid jets positively pressurized at a pressure between 5 and 15 bar to have sufficiently high kinetic energy to dislodge a diagnostically adequate sample of cells from the mucous membrane by the impact of the liquid on the mucous membrane;

a liquid supply pipe (3) connected to said spray nozzle means and connectable to a source of pressurized liquid;

a suction tube (5) opening adjacent said spray nozzle means for removing the liquid and dislodged cells; and

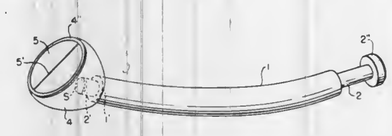
a collecting container (19) coupled to said suction tube for receiving the liquid and cells from said tube.

4,628,941

INSTRUMENT AND PROCESS FOR SAMPLING CERVICAL MUCUS AND THE LIKE

Harold Kosasky, 225 Woodland Rd., Chestnut Hill, Mass. 02167

Continuation of Ser. No. 597,682, Apr. 6, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,236
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—759 **3 Claims**



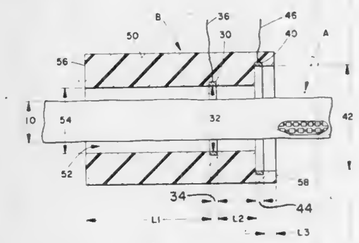
1. An instrument for insertion into the vagina for the removal of a sample of cervical mucus fluid, comprising, in combination, a cylindrical tube curved and shaped for insertion within the vagina; a plunger coaxially slidable within the tube, the plunger terminating at its inner end in a tip carrying a surface to which mucus will adhere on contact and terminating at its outer end in a grip that enables insertion and withdrawal of the plunger into and from the tube, the plunger further being flexible to conform to the curve of the tube in successive positions of insertion and withdrawal; a substantially hemispherical cup connected at its bottom to the inner end of the tube, the bottom of the cup having an opening in communication with an opening at the inner end of the tube to provide communication between the respective interiors of the cup and the tube; and a flexible cover disposed over the cup and secured over the rim of the cup, the cover being provided with slot means normally closed to prevent the introduction of vaginal fluids during insertion of the tube but adapted to open by the cover being pushed inward into the cup in response to insertion of the cup over the cervix, the rim of the cup being proportioned to receive and circumscribe the cervix such that the plunger tip may pass through the opened slot means for contacting the surface of the plunger tip with cervical mucus from the central region of the cervix, whereby the pulling outward of the plunger grip effects removal of the plunger and its mucus-covered tip surface from the tube for the testing of the mucus.

4,628,942

ASYMMETRIC SHIELDED TWO ELECTRODE CUFF

James D. Sweeney, and J. Thomas Mortimer, both of Cleveland Heights, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Oct. 11, 1984, Ser. No. 659,823
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—784 **2 Claims**



1. An electrode cuff for introducing unidirectionally propagated action potentials in a single direction on a nerve trunk, the cuff comprising:

a generally annular cathode defining a first passage therethrough of a first diameter;

a generally annular anode defining a second passage therethrough of a second diameter, the second diameter being 1.2 to 3.0 times as large as the first diameter such that the cathode is more proximate to the nerve trunk passing therethrough than the anode; and,

an insulating shield extending from a first end thereof to the cathode, from the cathode to the anode, and from the anode to a second end thereof, a distance between the cathode and the first end being at least twice a distance between the cathode and the anode.

4,628,943

BIPOLAR SCREW-IN PACKING LEAD ASSEMBLY

Sandra L. Miller, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jun. 21, 1985, Ser. No. 747,619
Int. Cl.[4] A61N *1/18*
U.S. Cl. 128—785 **10 Claims**

1. An endocardial bipolar lead assembly which is adapted to be placed in a body through a blood vessel and which is adapted to be mechanically secured to tissue of the body in an electrically conductive manner, said lead assembly comprising:

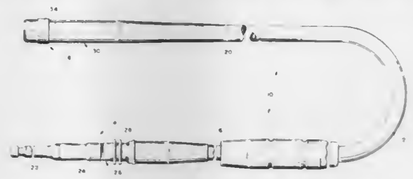
an insulated tubular sheath, said tubular sheath having a distal end and a proximal end;

first and second conductive means, said first conductive means having a distal end and a proximal end, said first

conductive means extending substantially the length of said tubular sheath, said second conductive means having a distal end and a proximal end, said second conductive means extending substantially the length of said tubular sheath and said first conductive means being insulated from said second conductive means;

an electrode assembly located at said distal end of said tubular sheath;

said distal electrode assembly comprising a ring cathode electrode and a tissue-attachment anode electrode member, said tissue-attachment anode electrode having a distal end and a proximal end, said distal end of said first conductive means being mechanically and electrically coupled to said proximal end of said tissue-attachment anode electrode member, said distal end of said second conductive means being electrically connected to said ring cathode electrode, said tissue-attachment anode electrode member being capable of mechanically securing said distal electrode assembly to tissue of a body with said tissue-attachment anode electrode member and said ring cathode



electrode adapted to be in direct electrical contact with tissue of the body;

a single finger-shaped proximal terminal electrode assembly including cathode terminal pin means mechanically coupled to said first conductive means, said terminal pin means being electrically isolated from said first conductive means, said terminal pin means being electrically coupled to said second conductive means, and an anode ring on said assembly insulated from said cathode terminal pin means and said second conductive means, said anode ring being electrically coupled to said first conductive means, said terminal pin means being adapted to be coupled to a cathode of an electrical power source and said anode ring being adapted to be coupled with an anode of the electrical power source, and

activating means including at least a portion of said single finger-shaped proximal terminal electrode assembly for mechanically activating said tissue-attachment anode electrode member for securing said distal electrode assembly to tissue.

4,628,944

CARDIAC PACING LEAD WITH BIODEGRADABLE FIXATION STRUCTURE

David C. MacGregor, and Stanley H. Saulson, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 631,019, Jul. 17, 1984, abandoned, which is a continuation of Ser. No. 347,007, Feb. 8, 1982, abandoned. This application Jan. 7, 1986, Ser. No. 817,790

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—785 **16 Claims**

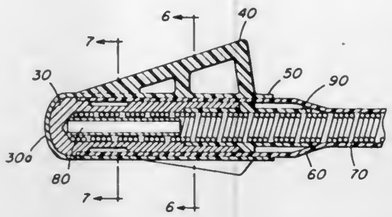
1. A pervenous cardiac pacing lead, which comprises:

an electrically insulating, flexible tubing having proximal and distal ends, said tubing being sized for pervenous introduction into the interior of a heart;

electrical conductor means within said tubing for carrying electrical current therein between said proximal and distal ends of said tubing;

electrically conductive tip means at said distal end and being in electrical contact with said conductor means for delivering electrical stimulation inside the heart, said tip means including means for enabling long term fixation in the heart; and

a plurality of non-tissue penetrating, flexible, biodegradable projections extending outwardly from the side of said



tubing for temporarily fixing the distal end of said tubing inside the heart, said biodegradable projections being absorbed over a period of time into blood or tissue of the body as said tip means becomes fixed in place.

4,628,945

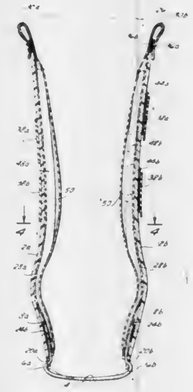
INFLATABLE ANKLE BRACE WITH POROUS COMPRESSIBLE FILLER

Glenn W. Johnson, Jr., 10 Friar Tuck Cir., Summit, N.J. 07901

Filed Jan. 25, 1985, Ser. No. 694,700

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 H **9 Claims**



1. Orthopedic apparatus comprising:

a base portion,

a pair of spaced apart sidewall portions hingedly attached to opposite sides of said base portion,

a pair of support members disposed coextensively with respect to said sidewall portions on opposite sides of said base portion in a confronting manner with respect to each other, at least one of said support members comprising an inflatable bladder, said inflatable bladder comprising a pair of plies of flexible material joined to one another along their common peripheral extents, and

compressible filler means in the form of a porous pad disposed interiorly within said inflatable bladder, said porous pad and the air entrapped therein serving as the primary means for inflating said inflatable bladder whereby compression of a portion of said bladder and a portion of said pad coextensive therewith in one region thereof causes air entrapped in said pad to displace to at least another region of said bladder remote from said one region to form a pressurized air layer within said bladder coextensive with said at least another region.

4,628,946

HARVESTING MACHINE INCLUDING CHOPPER MEANS

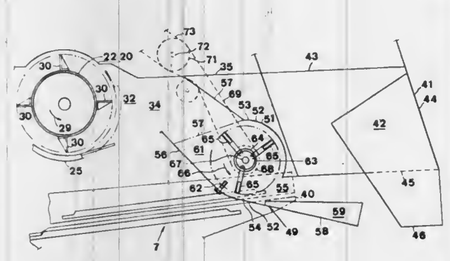
Cyriel R. J. De Busscher, Damme, and Francois Van Herpe, Houtem, both of Belgium, assignors to New Holland Inc., New Holland, Pa.

Filed Jun. 1, 1981, Ser. No. 269,103

Claims priority, application United Kingdom, Jun. 11, 1980, 8019118

Int. Cl.[4] A01F *29/00*

U.S. Cl. 130—27 R **21 Claims**



1. A harvesting machine comprising:

a threshing mechanism;

a transverse rotary separator mechanism operably connected with the threshing mechanism and having discharge outlets adjacent its opposite ends;

discharge channels in register with the discharge outlets of the separator mechanism and leading to a common straw hood;

the separator mechanism being arranged spirally to convey crop material received from the threshing mechanism toward each of its ends while submitting the crop material to a separating action and to forcefully eject crop material along a normal discharge path through said discharge outlets and through said discharge channels in the direction of the common straw hood;

chopper means associated with each discharge channel and positioned out of the normal path of the crop material through the respective discharge channel for chopping crop material ejected from said separator mechanism; and

first deflector means associated with each chopper means for selectively engaging the crop material moving along said normal discharge path and deflecting said crop material into the respective said chopper means, said first deflector means being selectively adjustable between a first position retracted from said normal path of the crop material such that said crop material continues to move along said normal discharge path toward said straw hood and a second position blocking said normal path for deflecting crop material from said normal path toward the associated chopper means.

4,628,947

PROCESS FOR MODIFYING THE FLAVOR CHARACTERISTICS OF BRIGHT TOBACCO

Dennis M. Driscoll, and Everett W. Southwick, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 5, 1985, Ser. No. 752,022

Int. Cl.[4] A24B *15/28*

U.S. Cl. 131—297 **9 Claims**

1. A method for modifying the smoke flavor characteristics of bright tobacco comprising the steps of:

treating said tobacco with liquid ammonia at a temperature of between about −80° C. to about 50° C. in an amount sufficient to obtain a liquid extract comprising ammonia and extracted tobacco components; and

applying said liquid extract to said treated tobacco.

4,628,948

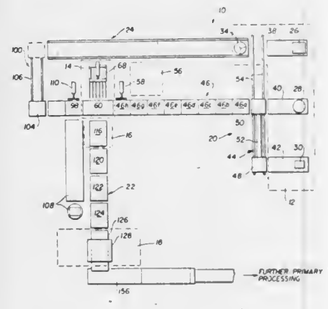
SYSTEM, APPARATUS, AND METHOD FOR PREPARING A QUANTITY OF TOBACCO FOR PRIMARY PROCESSING

Hoyt S. Beard, Winston-Salem, and Marvin G. Woempner, Thomasville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 6, 1983, Ser. No. 482,394

Int. Cl.[4] A24B *3/06, 3/16, 5/14*

U.S. Cl. 131—327 **21 Claims**



1. A system for preparing a quantity of tobacco for further primary processing, comprising:

a receiving station for storing tobacco masses for the system;

a proportioning station for proportioning from a tobacco mass received from the receiving station at least one predetermined portion for conditioning and a remant portion for return to the receiving station, and for advancing tobacco masses, predetermined portions and remnant portion received from the receiving station toward a conditioning station;

a conditioning station for applying conditioning fluid to those tobacco masses, predetermined portions and remnant portions advanced thereto from the proportioning station;

first conveyor means for conveying tobacco masses and remnant portions from the receiving station to the proportioning station;

second conveyor means for conveying those tobacco masses, predetermined portions and remnant portions for conditioning from the proportioning station to the conditioning station;

third conveyor means for conveying remant portions from the proportioning station to the receiving station; and

central control means for controlling the operation of each conveyor means and the operation of each station.

4,628,949

DENTAL CLEANING COMPACT

Albert B. Mas, and Christopher Mas, both of 43-29, 39th Pl., Sunnyside, L.I., N.Y. 11104

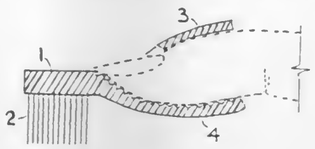
Filed May 14, 1985, Ser. No. 733,793

Int. Cl.[4] A45D *44/18*

U.S. Cl. 132—84 R **5 Claims**

1. A dental cleaning device comprising: a tapered tubular receptacle, integrally connected at its tapered end to one end of a toothbrush, said receptacle being formed of a lower panel of inflexible material, two side panels of elastic rubber and an upper panel of semi-flexible material; said upper panel having an aperture to accomodate the fingernail of a finger being inserted into the finger receptacle, and ridges being provided on the upper surface of the lower panel, whereby the side

panels exert a downward pull on the upper panel, which thereby presses the fingertip downward on the ridged surface



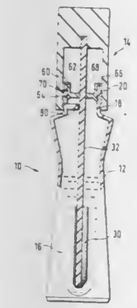
of the lower panel, thereby providing a firm grip by the finger receptacle on the finger tip.

4,628,950

CONTAINER FOR AN APPLICATOR MASS, PARTICULARLY FOR A TOILET PRODUCT OR A COSMETIC PRODUCT

Reiner Bitzer, Am Momartsberg 1a, D-6123 Bad König 2, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,716
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305669
Int. Cl.[4] A45D *34/04*
U.S. Cl. 132—88.7 **40 Claims**



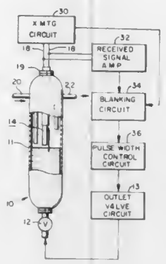
1. Container for a mass applicator, comprising:
a reservoir vessel (**12**) having an opening;
a closure (**14**) for said opening;
an applicator (**30**) having an axis and having a periphery radial that is disposed at varying distances from said axis within the same plane at right angles to said axis, said applicator being movable along said axis to selectively immerse said applicator in said vessel and to selectively withdraw said applicator through said opening of said vessel;
an applicator mass stripper (**80**) for engaging a peripheral portion of said applicator, said applicator mass stripper being disposed in said vessel at a position where said stripper can engage said applicator as said applicator is withdrawn through said opening, the angle between a predetermined point on said stripper and a predetermined point on said periphery with respect to said axis being changeable to vary the engagement between said applicator and applicator mass stripper; and
means, operationally connecting said applicator and said applicator mass stripper and providing at least one detent position between said applicator and applicator mass stripper, for providing at least one preselected angle between said predetermined point on said stripper and predetermined point on said periphery with respect to said axis.

4,628,951

LIQUID LEVEL DETECTION SYSTEM FOR HIGH TEMPERATURE OR PRESSURE ENVIRONMENTS

James H. Higgins, Chesapeake City; Woodford A. Bowe, Rising Sun, both of Md., and Robert Laragione, Christiana, Pa., assignors to Chemical Data Systems, Inc., Oxford, Pa.

Filed Jan. 3, 1984, Ser. No. 567,543
Int. Cl.[4] G05D *9/12;* **F16K** *31/02*
U.S. Cl. 137—2 **18 Claims**



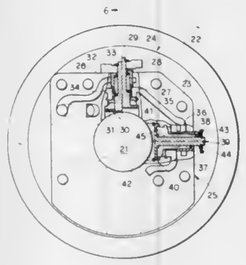
5. A method for detecting the level of a liquid body within an enclosure comprising:
(a) providing an electrically-energized vibrating probe within said enclosure capable of vibrating for an interval which begins following termination of the energization thereof,
(b) applying first electrical signals to said probe to cause it to vibrate within first predetermined time intervals in a predetermined range of frequencies,
(c) receiving second signals produced by said probe following energization thereof and within second predetermined time intervals which do not overlap said first time intervals, said second signals having a characteristic which correspond to a characteristic of said liquid and
(d) processing said second signals to produce third signals for operating a utilization circuit.

4,628,952

GOVERNOR VALVE ASSEMBLY

Kouichi Yamashita, Miyazaki; Toshiaki Ishiguro, Nagoya, and Kunio Morisawa, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kubushiki Kaisha, Toyota, both of, Japan

Filed Jul. 5, 1985, Ser. No. 751,988
Claims priority, application Japan, Jul. 12, 1984, 59-143203
Int. Cl.[4] G05D *13/10*
U.S. Cl. 137—54 **5 Claims**



1. A governor valve assembly for regulating hydraulic pressure by utilizing centrifugal force developed by a rotary shaft when the rotary shaft is rotated, comprising:
a governor assembly supported on the rotary shaft for co-rotation therewith;

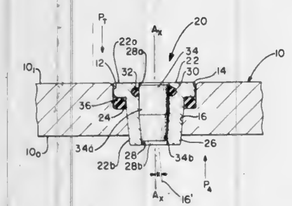
first governor valve means provided in said governor assembly and having;
(a) a first feed port for receiving hydraulic pressure from an external source,
(b) a first output port for delivering output hydraulic pressure,
(c) a first valve radially slidable under centrifugal force in said governor assembly for regulating hydraulic pressure between said first feed port and said first output port,
(d) a first shaft radially slidable interiorly of said first valve and cooperating with said first valve for regulating hydraulic pressure,
(e) a governor weight fastened to an outer end portion of said first shaft for facilitating production of a centrifugal force, and
(f) a first spring compressed radially between said first valve and said first shaft for applying a radially outwardly directed force upon said first valve;
second governor valve means provided in said governor assembly and having:
(g) a second feed port for receiving hydraulic pressure,
(h) a second output port for delivering output hydraulic pressure,
(i) a second radially extending shaft to be secured against radial movement to said governor assembly,
(j) a second valve radially slidable under centrifugal force in said governor assembly along said second shaft for regulating hydraulic pressure between said second feed port and said second output port, and
(k) a second spring compressed radially between said second valve and said second shaft for applying a radially outwardly directed force upon said second valve; and
a passageway communicating said first output port of the first governor valve means with said second feed port of the second governor valve means.

4,628,953

FUSIBLE PLUG SAFETY DEVICE FOR VENTING AIRCRAFT TIRES

Harold E. Correll, Uniontown; William P. Fulmer, Mogadore, and James P. Jones, Jr., Akron, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 11, 1985, Ser. No. 700,206
Int. Cl.[4] F16K *17/40*
U.S. Cl. 137—74 **12 Claims**



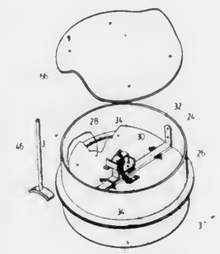
1. A fusible thermally responsive device for mounting in a bore which extends from the inside to the outside of a wheel to vent an overpressure condition caused by heat generated in an aircraft wheel and brake assembly comprising in combination:
a solid substantially rod-shaped length of a thermally responsive virgin eutectic alloy composition having a constant diameter for a portion of its length towards one end thereof and a locking taper for the remaining portion of its length at the opposite end;
a cylindrical carrier member received within the bore in the wheel and defining an axial bore through its lengthwise extent and having designated head and body portions, the head portion being of a greater diameter than the body portion and said axial bore adapted for receiving the rod-shaped virgin eutectic therein in a pressure-fit and locking relationship by reason of a portion of the bore length being of substantially the same diameter as the constant diameter portion of the eutectic while the remaining bore length is configured to substantially the same locking taper as the tapered portion of the eutectic;
a sealing means mounted in the bore of the carrier member to effect a sealing relationship between the constant diameter portions of the virgin eutectic and the carrier bore; and
a sealing means mounted about the body portion of the carrier member to effect a sealing relationship between the head portion of the carrier member and the bore in the wheel;
said device being mounted in the wheel bore by a locking relationship between the carrier member and the wheel bore and the rod-shaped length of virgin eutectic is locked in the carrier member bore in a direction from the inside towards the outside of the wheel.

4,628,954

MULTI-USE DAMPER

Lloyd G. Dayus, Mississauga, Canada, assignor to Rachels Industries, Inc., Memphis, Tenn.

Filed Mar. 28, 1985, Ser. No. 717,317
Int. Cl.[4] F16K *17/38, 31/53*
U.S. Cl. 137—75 **6 Claims**



1. An air control damper for use in association with an air supply and an air outlet and comprising:
a housing defining upstream and downstream portions, and a flow axis;
supply connection means on said upstream portion adapted for connection to said air supply;
a strut member mounted in a generally transverse manner across said housing;
a pair of damper panels having upstream and downstream sides and hingedly mounted on said strut member, and swingable between an upstream open position located in said upstream portion of said housing, and a generally transverse closed position obstructing said flow axis and defining a closure plane located between said upstream and downstream portions of said housing;
spring means engaging said damper panels and urging same to close;
adjustable movement means mounted on said strut member and located in said upstream portion of said housing, and,
a pair of attachment brackets on the upstream side of said damper panels having respective pivot openings; a pair of link openings on said adjustable movement means; a pair of fusible links pivotally connected between said respective pivot openings and said respective link openings, whereby to cause said panels to swing from one position to the other in response to said movement means.

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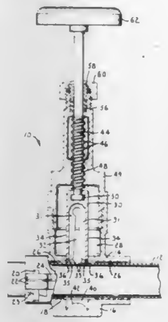
EXTERNALLY APPLIED VALVE FOR WATER LINES

Thomas D. Smith, 11228 Eastern St., Kansas City, Mo. 64134

Filed Nov. 15, 1985, Ser. No. 798,409

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—318 **2 Claims**



1. A valve for installation on a water pipe in a building while the pipe remains in service with water contained therein, said valve comprising:

a valve body having a pair of separable body sections applicable to the exterior of the water pipe and cooperating to surround the pipe when applied thereto in an assembled condition, said body presenting a flow passage aligned with the pipe and a valve chamber intersecting with the flow passage;

a pair of valve seats on the valve body located on opposite sides of said valve chamber;

means for securing said body sections on the pipe in said assembled condition;

seal means for sealing said body sections to the pipe and to one another;

a bifurcated gate valve element mounted in said valve chamber for reciprocating movement therein between open and closed positions to respectively open and close said flow passage, said gate valve element including a pair of gate sections each having a leading end and a trailing end, said gate sections being spaced apart between said leading and trailing ends and being flexible toward and away from one another;

a valve stem supported on said body for rotation;

means including a threaded connection for effecting movement of the valve element by threaded action between the open and closed positions in response to rotation of the stem in opposite directions;

a sharp edge on the leading end of each gate section for cutting through the pipe, each edge being disposed out of said flow passage in the open position of the valve element and acting to cut through the pipe adjacent the corresponding valve seat when said element is initially moved to the closed position after said body has been applied to the pipe in the assembled condition, thereby shearing a ring of scrap from the pipe;

a cavity in the valve body located to receive the leading ends of said gate sections in the closed position of the valve element and to receive and retain said ring of scrap in a crushed condition after same has been severed from the pipe by said edges; and

a camming surface on said valve body situated at a base end of said cavity at a location to be engaged by the leading ends of said gate sections as said valve element approaches the closed position thereof, said camming surface having a configuration that receives said scrap ring to force said leading ends away from one another by a camming action between said scrap ring and said leading ends to thereby press the gate sections against the valve seats in the closed position of the valve element.

4,628,956

FLOAT VALVE MECHANISM

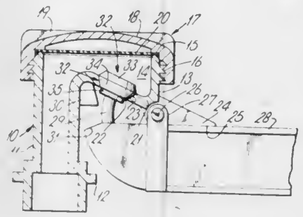
Charles G. Roberts, Richmond, and Philip E. Hynds, South Yardley, both of England, assignors to Vecone Development Corporation, London, England

Filed Nov. 13, 1985, Ser. No. 797,444

Claims priority, application United Kingdom, Nov. 14, 1984, 8428736

Int. Cl.[4] F16K *31/22, 33/00*

U.S. Cl. 137—404 **10 Claims**



1. A float valve mechanism for a cistern or tank, said mechanism comprising a valve housing defining a closed chamber having an inlet port adapted to be connected to an inlet pipe to the cistern or tank, an outlet port from the chamber having a conical valve seat surrounding the port, a valve member passing through the outlet port and having a valve head located within the chamber, a pivotally mounted lever, a float at one end of the lever remote from the chamber, means connecting the lever to the valve member to raise the head from the seat, when water or other liquid in the cistern or tank falls below a certain level, effective to allow liquid to flow from the chamber via the outlet port, the valve member being connected directly to the lever, whereby it may pivot integrally therewith along a path passing through said outlet port, a conical surface on said valve head adapted to engage the conical valve seat in a liquid tight manner, and a skirt portion integrally formed on said valve head and extending downwardly beyond the narrower end of the conical surface of said valve head, and having a diameter slightly less than the smallest diameter of said conical valve seat, whereby, as the valve moves toward its closed position, and as said skirt portion passes through the outlet port, it is effective to slow the flow of water or other liquid through said outlet port immediate prior to closing and thereby preve its water or other liquid hammering from occurring.

4,628,957

PRESSURE VALVE FOR FUEL INJECTION PUMP

Gerald Höfer, Weissach-Flacht, and Helmut Laufer, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

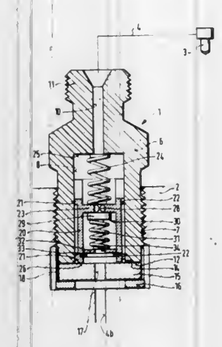
Filed Nov. 27, 1984, Ser. No. 675,332

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1983, 3344825

Int. Cl.[4] F16K *17/26*

U.S. Cl. 137—493.3 **4 Claims**

1. A pressure valve for use in a supply conduit between a work spaced of a fuel injection pump and a fuel injection valve of an internal combustion engine, comprising a connecting socket, an axial well formed in said socket and having a bottom and a cylindrical wall opening in an annular end face of the socket, an axial throughbore connecting said bottom of the well to a first part of the supply conduit leading to a fuel injection valve; an annular valve body insertable into a stepped bore in a second part of the supply conduit leading to a work space of a fuel injection pump; means for fastening said connecting socket in said stepped bore in a fixed position in which said annular end face of the socket firmly and sealingly engages a sealing face of said annular valve body; a tubular valve closing member movable in opposite axial directions in said well and including a partition provided with a central orifice; a resetting spring arranged between said bottom of the well and said partition to bias the valve closing member into a rest position in which said valve closing member sealingly engages said sealing face of the annular valve body; a throttling passage formed in said valve closing member opposite said cylindrical wall of the well; a check valve arranged in said valve closing



member between said partition and said annular valve body, said check valve being spring biased against said partition to close said central orifice and to direct a flow of fuel from the fuel injection pump through said throttling passage when said tubular valve closing member is displaced from said rest position thereof, said check valve opening said orifice by the action of backpressure fuel waves to pass from said first part of the supply conduit through said orifice and said valve closing member into said second part of the supply conduit.

4,628,958

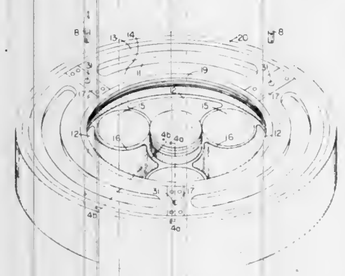
RING VALVE

Stanley Miller, 19300 NW. Gillihan Rd., Portland, Oreg. 97231

Filed Jul. 30, 1985, Ser. No. 760,497

Int. Cl.[4] F16K *15/08*

U.S. Cl. 137—512.15 **6 Claims**



1. A ring valve apparatus comprising:

a cylinder head;

an intake ring valve extending completely around the face of the cylinder head;

three valve holders for securing the intake ring valve to the cylinder head;

said valve ring having three segments capable of opening;

an exhaust ring valve extending completely around the face of the cylinder head;

said cylinder head having three cylinders each containing coil spring and plunger units to exert pressure against the exhaust valve;

three semi-circular intake port openings in an outer circle in said cylinder head;

three semi-circular exhaust port openings in an inner circle in said cylinder head;

an inner and outer valve seat encompassing the intake port openings;

said seats being fitted with O-rings;

detachable inner and outer valve seat units encompassing the exhaust port openings;

said detachable seats fitted with O-rings;

said detachable seats having threads for mating with corresponding threads in the cylinder head.

4,628,959

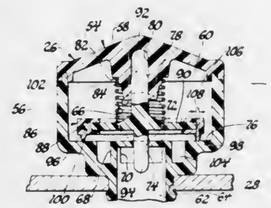
VACUUM CHECK VALVE

Donald L. Parker, Middletown, and Donald L. Heffner, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1985, Ser. No. 771,219

Int. Cl.[4] F16K *15/06*

U.S. Cl. 137—526 **5 Claims**



1. In a vacuum check valve assembly:

a housing having

a first housing section

and a second housing section,

said first and second housing sections being secured together to define a valve chamber,

said housing further having

an inlet for air flow into said valve chamber and an outlet for air flow out of said valve chamber,

said outlet being adapted to be connected to a vacuum source such as the intake of an internal combustion engine

and said inlet being adapted to be connected to a vacuum powered device such as a vacuum suspended power brake booster;

a poppet type check valve member received in said valve chamber, said check valve member comprising

a rigid valve member body having

a disc-like center section,

a first stem extending axially from one side of said center section and forming a first guided valve portion,

a second stem extending axially from the other side of said center section and forming a second guided valve portion,

an annular valve seal secured to the peripheral portion of said disc-like center section of said valve body,

one side of said annular valve seal having a valve seat-engageable surface;

said valve housing having

a recessed opening in one of said housing sections receiving said first guided valve portion therein for guided reciprocal movement,

a web in the other of said housing sections formed to extend into said valve chamber, said web having a center part in axial alignment with said inlet and with said recessed opening, said web center part having an opening formed axially therethrough and receiving said second guided valve portion therein for guided reciprocal movement,

an annular valve seat formed as a part of said other housing section and extending about said inlet toward said valve chamber, said annular valve seat being sealingly

engageable with said annular valve seal seat-engageable surface;

one of said valve seal and said valve seat having annular bead means formed thereon for engaging the other of said valve seal and said valve seat in sealing relation with minimal effective contact area;

and a valve spring in said valve chamber acting on said valve member and continually urging said valve seal toward sealing engagement of said valve seal with said valve seat;

said rigid valve member body providing reinforcement for said valve seal to insure planar sealing action with said valve seat;

said valve seal being a rubber-like material having a durometer of about 40 to 50 at about 70° F. and increasing in durometer with a decrease in ambient temperature to no more than about 60 to 70 durometer at about minus 20° F. so as to substantially eliminate cold weather sticking of said valve seal to said valve seat under cold weather conditions while maintaining good sealing characteristics;

said valve spring having a spring rate cooperating with the large effective area of said valve member in relation to the minimal effective contact area of the sealing engagement of said valve seal with said valve seat to permit a low pressure differential acting across said valve member to open said valve member relative to said valve seat and permit flow through said check valve assembly, said low pressure differential being about 1 inch of mercury differential pressure acting across said valve member;

said valve assembly when opening providing an average flow restriction therethrough on the order of about 2 to 4 inches of mercury at an average flow rate of about 500 cubic feet per hour.

4,628,960

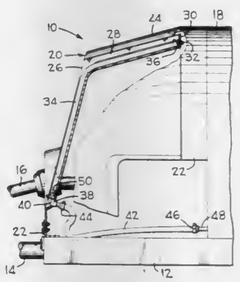
SPRAYER SIGHT GAUGE

Joseph W. Brickell, Jonesboro, Ark., and Edward A. Bellandi, San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 10, 1984, Ser. No. 649,458

Int. Cl.⁴ F16K *37/00*

U.S. Cl. 137—558 **6 Claims**



1. A sight gauge for use with a sprayer having a tank comprising:

a shroud covering the forward end of said tank and formed complementary to and contiguous with said tank;

said shroud having a rearwardly angled flat front surface and an upper adjoining conical section;

a continuous vertical channel formed in said surface and said section;

a clear plastic tube secured in said channel;

said channel having a depth at least equal to the outer diameter of said tube;

a flotable indicator freely moveable within said tube; and means communicating the lower end of said tube with said tank.

4,628,961

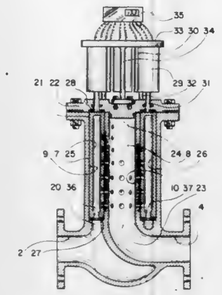
MULTIPLE ORIFICE STEPPER CONTROL VALVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Sep. 19, 1985, Ser. No. 777,753

Int. Cl.⁴ G05D *7/06*

U.S. Cl. 137—599 **19 Claims**



1. A multiple orifice stepper control valve comprising in combination:

(a) a valve body including a first port opening open to one extremity of said valve body and a second port opening open to the other extremity of said valve body;

(b) a structural extension included in said valve body intermediate said one and the other extremities, said structural extension including an annular cylindrical cavity with one extremity open to said first port opening and the other extremity opposite to said one extremity closed by a capping member, and further including an inner cylindrical cavity disposed substantially coaxially with respect to said annular cylindrical cavity wherein one extremity of said inner cylindrical cavity is open to said second port opening and the other extremity opposite to said one extremity is closed by a capping member;

(c) a plurality of orifices disposed through inner cylindrical wall of said annular cylindrical cavity separating said annular cylindrical cavity from said inner cylindrical cavity, said plurality of orifices disposed in a plurality of rows parallel to the central axis of said inner cylindrical cavity wherein each of said plurality of rows includes at least one of said orifices;

(d) a plurality of rotary closure members of tubular construction with one extremities open to said first port opening rotatably disposed and retained in a plurality of circular cylindrical seats distributed within said annular cylindrical cavity, respectively, each of said plurality of circular cylindrical seats including a first concave circular cylindrical seating surface included in inner cylindrical surface of said annular cylindrical cavity wherein each of said plurality of rows of said plurality of orifices is disposed substantially on the end of said first concave circular cylindrical seating surface closer to the one extremity of the valve body, and a second concave circular cylindrical seating surface included in outer cylindrical surface of said annular cylindrical cavity, each of said plurality of rotary closure members of tubular construction including at least one row of orifices wherein said at least one row of orifices includes at least one orifice disposed through tubular wall of said rotary closure member, the orifices included in said at least one row of orifices respectively lining up with the orifices disposed through said inner cylindrical wall at the end of the first concave circular cylindrical seating surface closer to the one extremity of the valve body when said each of said plurality of rotary closure members is rotated to open position;

(e) a plurality of rotary actuator rods respectively connected to the extremities of said plurality of rotary closure members opposite to said one extremities open to said first port opening and rotatably engaging and extending through a plurality of holes disposed through said capping member closing said the other extremity of said annular cylindrical cavity in a leak-proof manner;

whereby the rotation of different combinations of said plurality of rotary closure members to open position allows fluid medium flowing through said multiple orifice stepper control valve to flow at different flow rates wherein said flow rates can be varied from zero to a maximum flow rate.

4,628,962

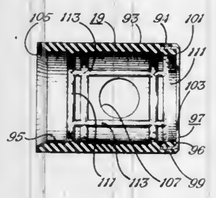
TUB-SHOWER DIVERTER VALVE

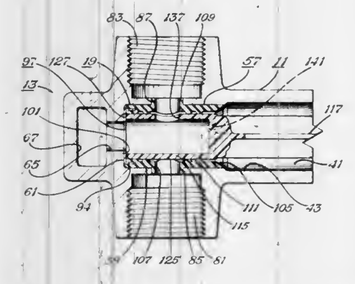
John J. Pezzarossi, Abilene, Tex., assignor to United States Brass Corporation, Plano, Tex.

Filed Jan. 6, 1986, Ser. No. 816,555

Int. Cl.⁴ F16K *11/085*

U.S. Cl. 137—625.47 **10 Claims**





1. In a tub-shower valve arrangement including a tub-shower diverter valve of the type utilizing a valve body having a cylindrical cavity which has a side wall and a rear end wall and an open front end and which cooperates with a valve stem cylindrical rotatable core portion, with the valve body having an inlet opening in said cylindrical cavity rear end wall and oppositely disposed tub and shower outlet openings merging with the cylindrical cavity side wall, and with said cylindrical rotatable core portion having a front end surface, a rear end surface and an internal opening communicating at all times with said valve body inlet opening and selectively with said valve body tub or shower outlet opening, the improvement comprising:

a. a seal sleeve made of elastomeric material and incorporating a metal insert;

i. said seal sleeve having cylindrical interior and exterior surfaces, an open front end portion and a rear end portion including a ring-shaped rear end surface;

ii. said metal insert having the shape of a shallow cup with a side wall flange portion and a bottom portion having a central opening;

iii. the side wall flange portion of said metal insert being imbedded in and bonded to the rear end portion of said seal sleeve with the bottom portion of the metal insert substantially abutting the seal sleeve rear end surface;

iv. said seal sleeve being matingly received by said cylindrical rotatable core portion with said metal insert adjacent said core portion rear end surface, and said seal sleeve having oppositely disposed outlet openings that are aligned with said valve body outlet openings,

v. said seal sleeve including said metal insert being sized so as to produce an interference fit between said seal sleeve at its metal insert end portion and said valve body cylindrical cavity, so that rotation of said rotatable core portion will not cause rotation of said seal sleeve.

4,628,963

REFRIGERANT COMPRESSOR DISCHARGE VALVE

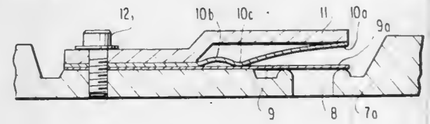
Koji Ishijima; Fumiaki Sano; Fumio Wada, and Kazutomo Asami, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,418

Claims priority, application Japan, Sep. 6, 1984, 59-186901

Int. Cl.⁴ F16K *15/16*

U.S. Cl. 137—857 **6 Claims**



1. A discharge valve for a refrigerant compressor including a compression chamber (A) defined by an end plate (*7a*) having a refrigerant discharge port (**8**), said discharge valve comprising:

(a) an elongate flexible valve plate (**9**) disposed on the end plate and having a freen end (*9a*) thereof disposed over the discharge port for opening and closing the port,

(b) an elongate leaf spring (**10**) superposed over the valve plate,

(c) an elongate holder member (**11**) superposed over the leaf spring,

(d) means (**12**) clamping overlying ends of the holder member, the leaf spring and the valve plate remote from the port to the end plate, the holder member being configured to define a space above the port in which the valve plate may undergo flexural opening and closing movements, and

(e) a linearity offsetting deformation defined in the leaf spring within said space and engaging the valve plate intermediate the clamped and free ends of the valve plate at a point spaced from the discharge port and lying between the discharge port and the clamped end of the valve plate to bias the valve plate towards the end plate and into a closed position while enabling unbiased flexing of said free end of the valve plate during initial opening of the port, there being no contact between the leaf spring and the valve plate proximate the free end of the valve plate and the discharge port, and the leaf spring being spaced from the valve plate intermediate the clamped end thereof and said point of engagement.

4,628,964

BACKGROUND DEVICE FOR SEPARATING MEMBER IN ACCUMULATOR CHAMBER

Nobuyuki Sugimura, and Kazuo Sugimura, both of 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

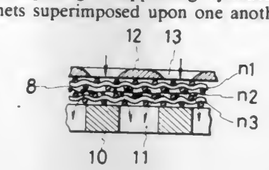
Filed May 8, 1985, Ser. No. 731,996

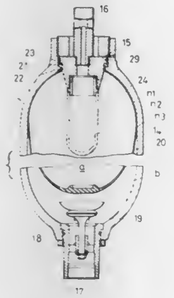
Int. Cl.⁴ F16L *55/04*

U.S. Cl. 138—30 **8 Claims**

1. An accumulator comprising a pressure vessel having a separating member therein and a protective device for preventing damage to the separating member, wherein the vessel has an axis and the separating member is generally arranged coaxially within the vessel so as to expand outwardly to rest against the vessel and collapse inwardly against the protective device,

said device comprising a supporting cylinder composed of plural wire nets superimposed upon one another so that the





positions of mesh of one wire net are displaced from those of mesh of adjacent wire nets.

4,628,965

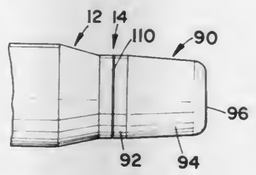
STAB-TYPE COUPLING

David P. Passerell, Geneva, Ohio, assignor to Perfection Corporation, Madison, Ohio

Continuation of Ser. No. 518,391, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 251,776, Apr. 7, 1981, abandoned. This application May 25, 1984, Ser. No. 614,319

Int. Cl.[4] F16L *47/00*

U.S. Cl. 138—89 **2 Claims**



2. A stab-type coupling for couplingly receiving a pipe end portion including:

a one piece, integral body and end cap of synthetic plastic material, the body defining a hollow receiving region therein and a first end area cylindrical pipe engaging inner surface dimensioned for receiving the pipe end portion;

an elongated hollow insert separate from said body, disposed within said receiving region, and having an open outer end portion located adjacent said first end area cylindrical pipe engaging inner surface, said open outer end portion of said insert and at least a longitudinal portion of said insert being receivable within the pipe end portion when such pipe is inserted into said body end area inner surface for establishing fluid flow communication between said insert and the pipe;

gripping means disposed within said receiving region surrounding a portion of said insert in a radially spaced relationship with said body and insert and dimensioned for externally gripping the pipe end portion;

the end cap being unitary with said body first end area, said cap including an annular sidewall unitary with and extending axially outward from said body first end area and radially spaced from said insert and a unitary end wall disposed generally transverse of said cap sidewall axially spaced from said insert, said cap sidewall and end wall defining a cup-shaped cap recess in which said insert outer end portion is receivable, such that the cap performs dual functions of (i) closing said receiving region to seal the interior of said coupling from receiving ambient dirt therein and from discharging fluids therefrom and (ii) covering said insert outer end portion to protect said insert outer end portion; and,

a cutting line integrally formed peripherally around the cap sidewall axially outward from the insert outer end portion to mark a location at which the cap end wall can be cut off without damaging the insert outer end portion, whereby the coupling may be buried in the ground for an extended duration before the cap end wall is cut off and the pipe end portion is couplingly received therein without dirt entering the coupling, without gas or fluids conveyed thereto leaking, and without damage to the insert.

4,628,966

SYNTHETIC RESIN PIPE FOR UNDERGROUND USE

Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

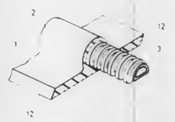
Filed Jan. 30, 1985, Ser. No. 696,557

Claims priority, application Japan, Aug. 9, 1984, 59-122687[U]

Int. Cl.[4] F16L *11/08*

U.S. Cl. 138—122 **6 Claims**





1. A pipe suitable for underground use, manufactured by the process of:

passing a corrugated reinforcing rib through an extrusion die used to extrude a band of material to form a main body of said pipe, and winding said band, including said rib, around a mandrel to form said pipe, said reinforcing rib comprising a corrugated pipe having a semicircular cross-section with a flat side disposed towards said main body of said pipe.

4,628,967

CLOTH DRAW-OFF APPARATUS FOR A WEAVING MACHINE

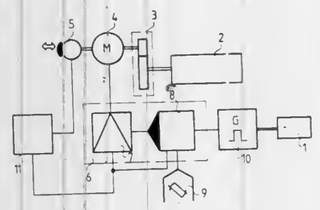
Gerhard Österle, Koblach, Austria, and Wilhelm Hutter, Roggwil, Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Aug. 12, 1985, Ser. No. 764,927

Claims priority, application Switzerland, Aug. 24, 1984, 4045/84

Int. Cl.[4] D03D *49/20*

U.S. Cl. 139—1 R **5 Claims**



1. A cloth draw-off apparatus for drawing-off cloth woven from warp threads and weft threads in a weaving machine containing a rotatable main shaft, said cloth draw-off apparatus comprising:

a cloth draw-off roll operatively connected with said main shaft of the weaving machine;

regulating means operatively connecting said cloth draw-off roll and said main shaft of said weaving machine;

said regulating means containing a controllable motor drivingly connected with said cloth draw-off roll;

said regulating means further containing a regulating circuit arrangement connected forwardly of said controllable motor in order to control weft thread density as a function of at least the rotational angular position of the weaving machine main shaft;

said regulating means containing a modulator;

said modulator being operatively connected with said controllable motor;

a pre-programmable programming stage operatively connected with said modulator and generating control commands;

an input device for pre-programming said programming stage;

said modulator receiving said control commands and transforming the control commands into control signals for controlling said controllable motor;

a pulse transmitter arranged at least at said main shaft of the weaving machine and generating pulses indicative of the rotational angular position of said main shaft of said weaving machine;

said pre-programmable programming stage being connected with said pulse transmitter and receiving therefrom said pulses indicative of said rotational angular position of said main shaft of the weaving machine;

a control circuit arrangement generating information signals indicative of the momentary functional state of the weaving machine; and

said pre-programmable programming stage being connected with said control circuit arrangement and receiving therefrom said information signals indicative of said momentary functional state of said weaving machine.

4,628,968

GUIDE FOR A WEFT-PICKING ELEMENT

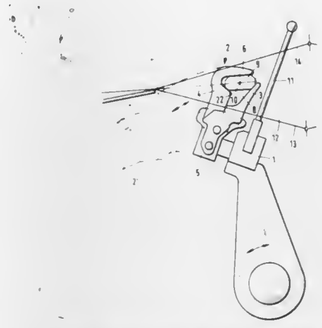
Franz Burer, Kollbrunn, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 4, 1985, Ser. No. 741,002

Claims priority, application European Pat. Off., Jun. 19, 1984, 84107018

Int. Cl.[4] D03D *49/60*

U.S. Cl. 139—188 R **3 Claims**



1. A guide for a weft-picking element of a weaving machine, said guide comprising a plurality of guide hooks and supports disposed in alternating sequentially disposed relation, each said guide hook and adjacent support defining a weft-picking element passage, each said support defining a single arm with a support surface for guiding the weft-picking element thereon and each said hook having a neck of widening shape to define a second support surface for guiding the weft-picking element thereon and a second surface to define a third support surface for guiding the weft-picking element thereon.

4,628,969

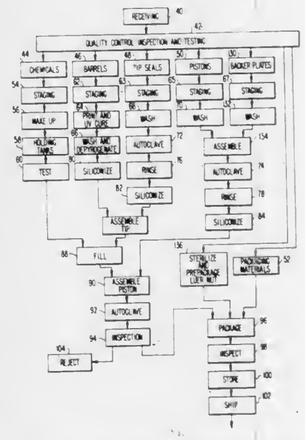
METHOD OF PRODUCING PREFILLED STERILE PLASTIC SYRINGES

Raymond W. Jurgens, Jr., Manchester, Mo.; Richard G. Johnson, Raleigh, N.C., and Leroy R. Nadler, Maryland Heights, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 20, 1985, Ser. No. 811,456

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **3 Claims**



1. A method of producing a prefilled, sterile plastic syringe

having a molded plastic barrel with an open end and a nozzle at the opposite end, a rubber tip seal closing the nozzle, and a rubber piston slidable in the barrel and sealing the open end of the barrel to retain a liquid therein; the method comprising the steps of:

washing the tip seal and piston to remove debris and other contaminants;

autoclaving the washed tip seal and piston to destroy various microbial contaminants;

rinsing the autoclaved tip seal and piston to remove loosened contaminants;

washing the barrel with a sequence of a multiplicity of jets of water to remove debris and pyrogens from the barrel;

applying an emulsified silicone lubricant to the tip seal and the piston x and an application of a fine mist of silicone lubricant to the barrel;

assembling the tip seal on the nozzle of the barrel;

filling the barrel through its open end with a desired quantity of liquid material;

assembling the piston in the open end of the barrel after the filling thereof to complete the enclosure and sealing of the syringe and its contents; and

autoclaving the assembled and sealed syringe to sterilize the plastic syringe and its contents, while maintaining a pressure on the outside surfaces of the syringe at least equal to the pressure of the syringe contents during autoclaving.

4,628,970

APPARATUS FOR REFILLING COMPRESSED-GAS BOTTLES

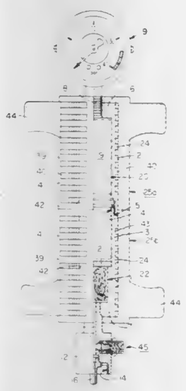
Marco Vasella, Zürich, Switzerland, assignor to Kothenberger GmbH & Co. Werkzeuge-Maschinen KG, Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,164

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342014; Oct. 15, 1984, 8430245[U]

Int. Cl.⁴ B01J *7/00*

U.S. Cl. 141—18 **7 Claims**



1. Apparatus comprising:

(a) a cartridge holder for a combustible jacket-less cartridge yielding oxygen in the burning state,

(b) a compressed-oxygen bottle with connection means for connecting said bottle to said cartridge holder thereby refilling said bottle,

(c) said cartridge holder accommodating the cartridge, from whose interior the oxygen can be transferred to the compressed-oxygen bottle, said cartridge holder surrounding the cartridge closely,

(d) said cartridge holder comprising a tubular pressure body, said cartridge holder having a counter-thread portion for the external screwing of the pressure body onto the compressed-oxygen bottle connection means and a compressed-oxygen passage for the transfer of the oxygen to the compressed-oxygen bottle,

(e) said cartridge holder including a heat guard on at least a portion of the length of said pressure body,

(f) said pressure body comprising cooling ribs on at least a portion of its length and having grooves therebetween, and

(g) said heat guard comprising a hollow body provided with ventilation openings and which is slipped onto said cooling ribs such that said ventilation openings communicate with said grooves between said cooling ribs, said heat guard comprising a plurality of coaxial rings and axis-parallel bridges joining said rings on the circumference thereof, said rings and said bridges surrounding said ventilation openings between said bridges and said rings.

4,628,971

APPARATUS FOR THE VOLUMETRIC DOSING OF POWDER

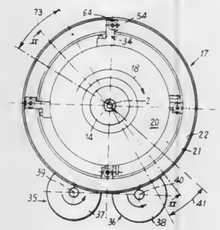
Jean Belot, Cusset, France, assignor to Manufacture de Machines du Haut-Rhin, Mulhouse, France

Filed Dec. 31, 1984, Ser. No. 688,019

Claims priority, application France, Dec. 29, 1983, 83 21004; European Pat. Off., Nov. 16, 1984, 84-402339.0

Int. Cl.⁴ B65B *1/04*

U.S. Cl. 141—67 **10 Claims**



1. Apparatus for the volumetric dosing of a powder and for introducing predetermined doses of the same into hollow objects, comprising:

a drum mounted for rotation about a vertical axis on a shaft,

means to drive the drum in continuous rotation in a predetermined direction, with respect to the shaft around the said axis,

means on the drum presenting an annular channel for the reception of powder, said channel being open at the top and presenting a shape of revolution around the said axis of rotation of the drum,

means for feeding the annular channel with powder and maintaining the powder at a constant level therein,

a predetermined number of receiving stations each for the reception of a hollow object occupying a position in which an opening thereof is directed upwardly and positioned on a predetermined vertical axis, the said stations being fixed on the drum with respect thereto and uniformly spaced annularly around the axis of rotation thereof, forming a ring about such axis and disposed closer to such axis than the annular channel,

a feeding post for feeding the receiving stations with objects occupying the said position, said feeding post being fixed with respect to the shaft,

a discharging post for discharging the objects from the receiving stations, such discharging post being fixed with respect to the shafts,

the same predetermined number of powder dispensing probes of known vacuum-drawing type carried in a movable manner upon the drum and disposed according to a predetermined orientation in which each presents to the bottom a powder-retaining dispensing orifice having a vertical axis, each of said probes being associated with a receiving station,

means for displacing each of the probes with respect to the drum separately and cyclically in synchronism with the rotation thereof with respect to the shaft, according to a fixed trajectory with respect to the drum and presenting the dispensing orifice of the probe in the hereinafter named successive positions following each other:

(a) a first lower position in which such orifice plunges into the annular channel, the probe then occupying an angular position with respect to the shaft, with reference to the axis of rotation of the drum, which is different from that of the means for feeding the annular channel with powder,

(b) a first upper position in which the orifice is disposed in line with and above the annular channel,

(c) a second upper position in which the orifice is disposed coaxially with the opening of an object occupying said position in the receiving station associated with said probe, said orifice and said opening being separated,

(d) a second lower position in which said orifice is disposed coaxially with the opening of such object and in communication therewith, the said receiving station being displaced from the object feeding post to the discharging post by reason of the rotation of the drum with respect to the shaft,

(e) then displaced back in the second upper position, and then

(f) displaced back in the first upper position,

and means at first to cause a sub-atmospheric pressure in said orifice in position (a) and from position (a) to position (d) thereof, and later to cut off said sub-atmospheric pressure in position (d) and from position (d) to position (a), during the rotation of the drum with respect to the shaft.

4,628,972

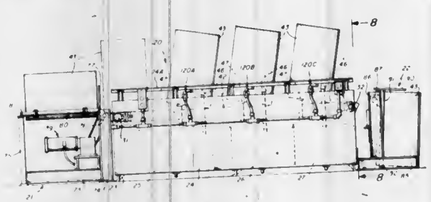
APPARATUS FOR RECONDITIONING DRUMS

Fernand LaRochelle, Portland, Me., assignor to H. Daniel Doane, Peaks Island, Me.

Continuation of Ser. No. 524,189, Aug. 18, 1983, abandoned. This application May 17, 1985, Ser. No. 735,124

Int. Cl.⁴ B67C *1/047*; B65B *43/60*; B08B *9/12*

U.S. Cl. 141—91 **16 Claims**



1. Apparatus for reconditioning the interiors of drums of the type having a bung in one end, a straight row of uniformly spaced stations, a drum conveyor having infeed and outfeed ends and provided with a series of V-shaped bung engaging and centering members spaced apart a distance equal to the spacing between the stations and extending transversely of the conveyor to an extent substantially greater than the diameter of the bungs with their apices trailing and in said path, said conveyor having a straight, horizontal path through said stations, a drum support in a fixed position at said infeed end of the conveyor for a drum supported thereby with its bung end downwardly and with the bung in that portion of the bung end which is to be the leading portion thereof when conveyed through said stations and substantially in the path of said members and in a position to be engaged and held centered by one of said members as said conveyor advances towards said outfeed end and then to be so connected to the conveyor as to be removed from the support thereby and advanced therewith through said stations with each centered bung in said path, means to effect a conveyor stop at each station for a predetermined dwell period with the bung of any conveyed drum in a predetermined position with respect thereto, means to effect the continued advance of said conveyor after a dwell interval whereby said conveyor is advanced by steps, a series of nozzles in a vertical plane inclusive of the path of the centered bungs, one nozzle for each station, means operable during a dwell interval to reciprocate each nozzle in a vertical plane inclusive of said predetermined bung positions between a first position below said conveyor directly below the appropriate one of said predetermined bung positions and a second raised position in which said nozzle extends upwardly through the bung hole of a drum if present at the station at which said nozzle is located, fluid delivery means, one for each station and connected to the nozzle thereof to deliver fluid therethrough if a drum is then present and means at each station operable to tilt a drum towards said outfeed conveyor end if present at that station during a dwell interval.

4,628,973

APPARATUS FOR SUPPLYING VOLUMETRIC METERING DEVICES, PARTICULARLY FOR MACHINES FOR PACKAGING INFUSION PRODUCTS

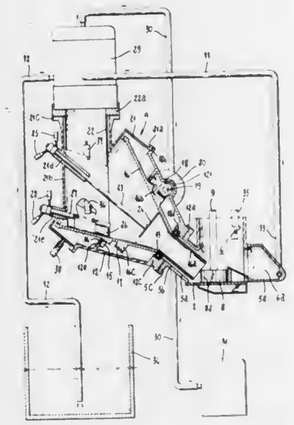
Alessandro Grazia, Crevalcore, Italy, assignor to IMA-Industria Macchine Automatiche-SpA, Ozzano Emilia, Italy

Filed Nov. 28, 1984, Ser. No. 675,964

Claims priority, application Italy, Nov. 28, 1983, 3640/A83

Int. Cl.⁴ B65B *1/16*

U.S. Cl. 141—94 **2 Claims**



1. An apparatus for supplying a metering device of a packaging machine with loose infusion product, the metering device having a metering chamber in which a metering drum rotates, which comprises:

a hollow fixed body facing inclined downwardly toward the metering device;

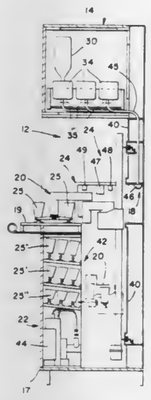
a hollow, funnel-shaped, frustoconical body supported for rotation within the fixed hollow body about an axis which is inclined downwardly and toward said chamber, said frustoconical body having a lower aperture smaller than an upper aperture and communicating with the metering chamber proximal to the metering drum;

a supply duct for the loose product to be metered supported vertically by the said hollow fixed body, in communication with the said hollow funnel-shaped frustoconical body in the region of its upper aperture;

shutter means supported by the hollow fixed body for the regulation of flow of the loose product to be metered along a lower inner surface of said hollow funnel-shaped frustoconical body at least in a region of its lower aperture communicating with the said metering chamber; and

variable speed gearing means for rotating said hollow, funnel-shaped, frustoconical body about said axis.

4,628,974
APPARATUS FOR AUTOMATED ASSEMBLY OF FLOWABLE MATERIALS
Ronald K. Meyer, 617 7th St., San Francisco, Calif. 94103
Filed Mar. 14, 1984, Ser. No. 589,542
Int. Cl.⁴ B67D *1/00, 5/56;* **B65B** *3/06*
U.S. Cl. 141—129 **17 Claims**



1. Apparatus for the automated assembly of flowable materials into a receptacle and delivery to a selected location comprising:

(a) an elongated substantially rectilinear arm of given length having a given axis of elongation;

(b) receptacle receiving and support means mounted on one end of said arm for rotation about a first axis extending transversely of said axis of elongation of said arm;

(c) shoulder means having the other end of said elongated arm mounted thereon for rotation about a second axis extending substantially parallel to said first axis transversely of said axis of elongation of said arm;

(d) carrier means mounting said shoulder means for selective rectilinear movement in a given plane substantially parallel to said first and second axes;

(e) support means mounting said carrier means for selective rectilinear movement in a given plane normal to said selective rectilinear movement of said shoulder means;

(f) first drive means for selectively rotating said receptacle receiving and support means about said first axis;

(g) second drive means for selectively rotating said elongated arm about said second axis;

(h) third drive means providing limited selective rectilinear movement of said shoulder means on said carrier means in said given plane;

(i) fourth drive means providing limited selective rectilinear movement of said carrier means on said support means in said given plane;

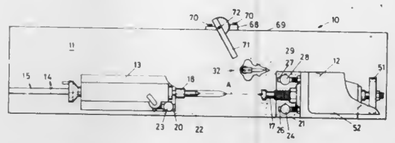
(j) storage structure for flowable materials positioned adjacent the limits of said selective rectilinear movements of said shoulder means and said carrier means established by said third and fourth drive means;

(k) a plurality of flowable material dispensing means positioned adjacent said given plane in spaced non-interfering relationship to said selective rectilinear movements of said shoulder means and said carrier means, said spacing of said dispensing means from said given plane being less than said given length of said elongated substantially rectilinear arm;

(l) means for conducting flowable materials from said storage structure to said dispensing means; and

(m) computer means providing integrated control of said first, second, third and fourth drive means in response to a given command.

4,628,975
COPY LATHE
Robert Horn, Torrensville, Australia, assignor to Leslie John Geyer, Seaview Downs, Australia, a part interest
Filed May 23, 1984, Ser. No. 613,504
Claims priority, application Australia, May 24, 1983, PF9509
Int. Cl.⁴ B23B *27/00*
U.S. Cl. 142—7 **7 Claims**



1. A copy lathe having a flat bed, surfaces defining a slot in said bed, a head stock on the bed, a tail stock on the bed, said slot surfaces comprising means for guiding said tail stock for movement along said bed, a shaft rotatable in the head stock and a sleeve in the tail stock both having a common turning axis,

template support means projecting from both said head stock and tail stock, having template support surfaces lying in a common plane above the bed, and clamp means co-operable with both said template support means operable to clamp a template thereto,

a tool holder having a flat base having a heel, a pair of laterally projecting protruberances on each side of the heel, and a toe, a post upstanding from the base, a forwardly extending tool retaining sleeve on the upper end of the post, the post having two flat faces extending vertically upwardly from the base and converging forwardly to intersect in an edge which constitutes a vertically extending follower guide, a tool in said tool retaining sleeve having a cutting point which is located vertically above said follower guide edge, locking means locking the tool in said sleeve, said toe being located forwardly of the follower guide for projecting beneath a template clamped to said support means when said follower guide engages the template, the tool holder being symmetrical about a central plane,

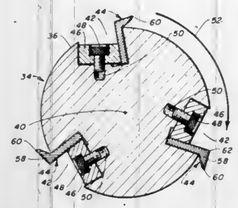
such that, when a cutting tool is located in the tool holder, reaction of downward pressure applied to the cutting tool when cutting a workpiece is within the area of the base under all conditions of use, and the toe and protruberances lie wholly below said common plane so as to be positionable beneath a template clamped to said support means, said lateral protruberances comprising means for spanning said guide slot during face turning.

4,628,976
WOOD SURFACING BLADE
Loring, David A., 5257 Radford Ave., #202, North Hollywood, Calif. 91607
Filed Jun. 20, 1985, Ser. No. 746,725
Int. Cl.⁴ B27G *13/00*
U.S. Cl. 144—241 **12 Claims**

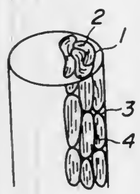
1. A surfacing blade for use in rotating machinery to surface finish wood wherein the wood is moved through the machinery along a path normal to and offset from the rotation axis of a rotating member containing said blade at its outer periphery to contact the wood, said blade being a unitary blade of an elongated piece of a hard, sharpenable material and comprising:

(a) a radial portion adapted to be carried horizontally by and extending radially outward from the rotating member in a plane parallel to the rotational axis of the rotating member; and,

(b) a cutting portion disposed along the outer edge of said radial portion to be rotated in a circular path as the rotating member rotates, said cutting portion being disposed substantially at right angles to said radial portion and having an elongated chisel-shaped cutting edge along the edge facing in the direction of rotation and disposed to contact wood passing by at an acute angle with respect to the surface of the wood such that as said blade rotates said cutting edge cuts an elongated arcuate segment from the surface of the wood at the point of contact.



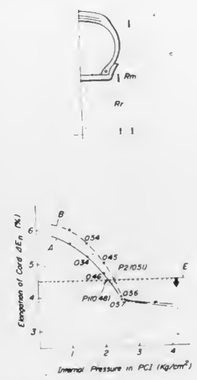
4,628,977
HIGH-DURABLE PNEUMATIC RADIAL TIRES
Takao Ogino, Tokorozawa; Yoichi Watanabe, Kodaira, and Shigehisa Sano, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 31, 1984, Ser. No. 666,935
Claims priority, application Japan, Mar. 1, 1984, 59-37230
Int. Cl.⁴ B60C *9/04, 9/18*
U.S. Cl. 152—451 **2 Claims**



1. A high-durable pneumatic radial tire comprising a tread portion, a pair of side portions extending from the tread portion, a pair of bead portions extending from the side portions, and a carcass reinforced with a belt embedded in the tread portion, in which steel cords are used in at least one of the carcass and the belt, characterized in that said steel cord is produced by twisting plural steel filaments each having a tensile strength of not less than 220 kgf/mm², whose metallic structure being a fine pearlite structure having an average value of interlamellar distance between cementites of 300–500 Å and an average sectional area of single pearlite crystal grain in filament section of not more than 20 μm^2.

4,628,978
PNEUMATIC RADIAL TIRES
Isamu Imai, Tokorozawa; Kazuo Oshima, Kodaira, and Norio Inada, Fuchu, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Continuation of Ser. No. 541,633, Oct. 13, 1983, abandoned.
This application Feb. 13, 1985, Ser. No. 700,344
Claims priority, application Japan, Oct. 21, 1982, 57-184816
Int. Cl.⁴ B60C *9/08;* **B29C** *71/00*
U.S. Cl. 152—556 **3 Claims**

1. A pneumatic radial tire comprising a carcass composed of at least one ply containing polyester fiber cords embedded in rubber, said polyester fiber cord having such micro properties as a fiber than an intrinsic viscosity is 0.75–0.97, a specific gravity is 1.365–1.398 and number of terminal carboxyl groups is not more than 20, and having such properties as a cord that a twist count NT defined by the following equation (1) is 0.4–0.6 and an elongation ΔE_n under a tension of 2 g/denier in the cord produced through a post-cure inflation holding an inner temperature of a shoulder portion at at least 95° C. under



an internal pressure P defined by the following equation (3) in accordance with a carcass tension coefficient α defined by the following equation (2) is not more than 4.5% and a sum of the elongation ΔE_n and heat shrinkage ΔS is not more than 8%:

$$NT = N \times \sqrt{0.139 \times D/2\rho} \times 10^{-3} \quad (1)$$

(wherein N is a twisting number per 10 cm of cord length, D is a total denier of cord and ρ is a specific gravity of fiber);

$$\alpha = \frac{2N'iR_m}{R_m^2 - R_r^2} \quad (2)$$

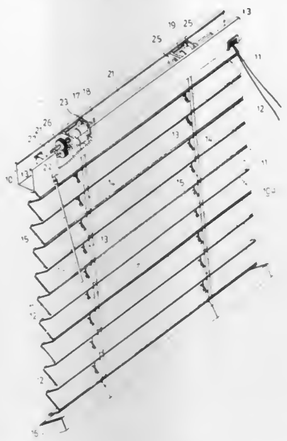
(wherein N' is number of carcass plies, i is a cord count of carcass ply in crown center (cords/cm), R_m is a maximum radius of carcass line (cm) and R_r is an average value of R_m and R_r representing a radius of a rim); and

$$0.5D.\alpha \times 10^{-3} \leqq P \leqq 2.5D.\alpha \times 10^{-3} \quad (3).$$

4,628,979
WINDOW BLIND
Pei-Shun Hsu, No. 373, Sec. 4, Yen Hai Road, Fu-Nan Tsun, Fu-Hsin Hsian, Chang-Hua Hsieng, Taiwan
Filed Jan. 18, 1985, Ser. No. 693,214
Int. Cl.⁴ E06B *9/26*
U.S. Cl. 160—115 **2 Claims**

1. A window blind having a long-shaped support, a shade constituted of a plurality horizontal slats suspended from said long-shaped support, and a mechanism for regulating said slats, wherein said mechanism comprises: at least one first roller and at least one second roller mounted for rotation about two parallel horizontal axes in said support; two gear members coaxially mounted with said first roller and second roller respectively and meshed with one another; means for driving one of said gears; at least one first regulating string attached to said first roller and extending downward on front and rear sides of said shade and having first cross-pieces attached thereto at regular intervals for regulating every other said slats; and at least one second regulating string attached to said second roller and extending downward on front and rear sides of said

shade and having second cross-pieces attached thereto at regular intervals and regualting said slats between said every other



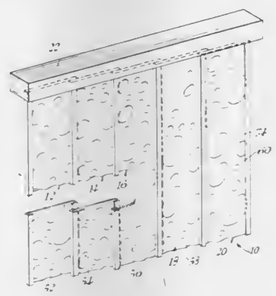
slats, said slats regulated by said first cross-pieces alternating with said slats regulated by said second cross-pieces.

4,628,980

LOUVER SYSTEM

James G. Le Houillier, Ft. Lauderdale, Fla., assignor to Profile Industries Corporation

Filed Nov. 14, 1980, Ser. No. 206,862
Int. Cl.⁴ E06B *9/36, 9/386*
U.S. Cl. 160—166 A **4 Claims**



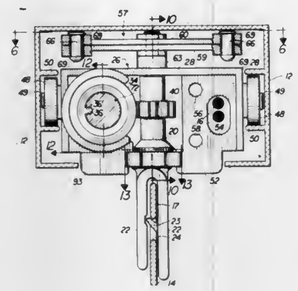
1. A louver system comprising a louver track system and a plurality of louvers, each said louver being held vertically by said track system and comprising an elongate, substantially rectangular, opaque main body portion having decorative panel holding means along each longitudinal edge for connecting an elongate, substantially rectangular decorative panel to said main body portion, each said panel holding means comprising a clear transparent generally C-shaped edge portion including a longitudinal edge portion attached to one of the longitudinal edges of said main body portion, a mid portion and an overlying inwardly facing portion, said mid portion connecting and separating said longitudinal edge portion and said inwardly facing portion, said C-shaped edge portion providing a notch sized to accept a longitudinal edge of said decorative panel.

4,628,981

VERTICAL BLIND ASSEMBLY

Piergiorgio Ciriaci, Hollywood, and Giovanni Acocella, Miami, both of Fla., assignors to Micro Molds Corporation, Miami, Fla.

Filed Apr. 8, 1985, Ser. No. 719,608
Int. Cl.⁴ E06B *9/36*
U.S. Cl. 160—176 R **16 Claims**



1. In a vertical blind assembly of the type including a head casing having an elongated configuration extending in overhanging relation along a given length; a plurality of vertical blinds each attached at its upper end to a holder and movably interconnected in depending relation to said head casing by a carrier means movably mounted to travel along a track formed on said head casing and structured for pivotal orientation of each vertical blind about its own longitudinal axis and collective travel of said plurality of blinds along the length of said head casing between an open, retracted position and a closed, outwardly extended position, the improvement comprising:

(a) each of said carrier means comprising a carrier frame having a one-piece open construction defined by oppositely disposed, open lateral faces on said carrier frame,

(b) a follower formed on opposite ends of said carrier frame and being disposed and configured for movable engagement with the track of said head casing and travel of said carrier frame along the length thereof,

(c) a first positioning means for moving said plurality of vertical blinds along the length of said head casing between said open position and said closed position and interconnected to consecutively disposed carrier frames and attached to an endmost carrier frame and extending outwardly therefrom in opposite directions, a portion of said first positioning means positioned exteriorly of said head casing for manipulation and activation thereof,

(d) a second positioning means extending along the length of said head casing in interconnected substantially driving relation to each of said carrier frames for angular orientation of each of said blinds about its own longitudinal axis,

(e) each of said carrier frames including a first recess and a second recess each having an open ended construction, said first and said second recesses disposed in adjacent and spaced, transverse relation to one another,

(f) said carrier means further comprising a first gear element rotatably disposed within said first recess and said holder rotatably disposed within said second recess, said holder including a second gear element connected thereto so as to rotate therewith and disposed in mating engagement with said first gear element through said open ended construction of said first recess,

(g) said open ended constructions of said first recess and said second recess cooperatively disposed and configured to respectively receive said first gear element and said holder therethrough and said open ended construction of each first and second recess further structured to define a removable, snap-fit connection with said first gear element and said holder respectively, whereby both said first gear element and said holder are removable from said carrier frame independent of one another,

(h) wherein said first gear element is connected in driven attachment with said second positioning means to cause rotation of said first gear element within said first recess and rotation of said holder and blind attached thereto, through mating engagement of said first gear element and second gear element,

(i) connecting means for movable attachment of each of said carrier frames to the next adjacent carrier frame and structured for movable, collective interconnection of said carrier frames along the length of said head casing, and

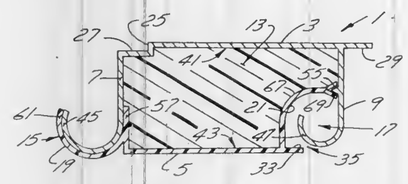
(j) said carrier means further comprising a stop means disposed and structured for limited rotation of each of said holders and attached vertical blinds about their own longitudinal axis through an arc of substantially 180°.

4,628,982

INSULATED CLOSURE PANEL

H. M. Robert Labelle, Cornwall, Canada, assignor to Martinray Industries Ltd., Cornwall, Canada

Filed Apr. 10, 1984, Ser. No. 593,818
Claims priority, application Canada, May 2, 1983, 427213
Int. Cl.⁴ E06B *9/386, 9/14*
U.S. Cl. 160—235 **7 Claims**



1. A closure panel comprising: a first metallic panel section having an outer wall and a pair of spaced-apart side walls extending generally transversely, and inwardly, from the outer wall, a curved male hinge section at the end of one of the side walls located outside of the side walls and opening outwardly, a curved female hinge section at the end of the other side wall, located between the side walls and opening outwardly; a second thermoplastic panel section having an inner wall, a curved male hinge section at one side of the inner wall extending past the inner wall and opening outwardly, a curved female hinge section at the other side of the inner wall extending past the inner wall and opening inwardly; the second panel section resiliently connected to the first panel section to define an enclosed space between the inner and outer walls, the female hinge section on the second panel section, and both of the side walls, with the male hinge section on the second panel section resiliently snapped over the male hinge section on the first panel section and with the female hinge section on the second panel section resiliently connected to the other side wall on the first panel section just outwardly of the female hinge section on the first panel section, the female hinge section on the second panel extending outwardly toward the outer wall of the first panel section and sideways to abut the other side wall of the first panel section,

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4,628,983

METHOD AND APPARATUS FOR MAKING HOLLOW SHEEL CORES WITH CONTROLLED GAS FLOW

Gary L. Myers, Gilead, and Don R. Jagger, Galion, both of Ohio, assignors to HPM Corporation, Mount Gilead, Ohio

Filed Jan. 29, 1985, Ser. No. 695,941
Int. Cl.⁴ B22C *13/08*
U.S. Cl. 164—7.1 **27 Claims**

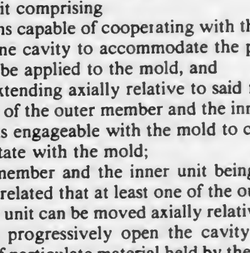
11. A method for making a hollow foundry core comprising: providing a hollow core box and pattern assembly, the walls of said pattern including apertures therein to permit a gas to pass through said walls;

providing inlet and outlet ports in the walls of said core box;

forming the space between the wall of said core box and said pattern into a plurality of enclosed sections;

investing said pattern with a sand and binder mixture through an investment opening;

sealing said investment opening;



admitting a catalyst gas into said core box assembly through said inlet port;

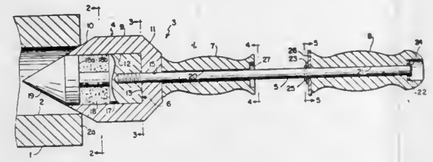
opening said outlet port to permit said gas to flow continuously from said inlet port to said outlet port through a laminar region inside said pattern and adjacent said pattern walls to cure the outer layer of said sand and binder mixture contained in said pattern.

4,628,984

METHOD AND APPARATUS FOR APPLYING A LAYER OF MATERIAL TO A CENTRIFUGAL CASTING MOLD

Charles H. Noble, 2307 Manassas Dr., Birmingham, Ala. 35213

Filed Nov. 27, 1985, Ser. No. 802,440
Int. Cl.⁴ B22C *13/00*
U.S. Cl. 164—33 **26 Claims**



1. In apparatus for establishing a layer of particulate material on at least a portion of the active surface of a rotatable centrifugal casting mold, the combination of

a hollow outer member having an outer surface and an inner surface,

the dimensions and shapes of the outer surface being such that at least a portion of the outer member can be inserted axially into the mold;

an inner unit comprising

first means capable of cooperating with the outer member to define cavity to accommodate the particulate material to be applied to the mold, and

a shaft extending axially relative to said first means;

at least one of the outer member and the inner unit comprising means engageable with the mold to cause the apparatus to rotate with the mold;

the outer member and the inner unit being so constructed and interrelated that at least one of the outer member and the inner unit can be moved axially relative to the other in order to progressively open the cavity to allow radial release of particulate material held by the cavity when the mold and the apparatus are rotating; and means for accomplishing such relative axial movement while the mold and the apparatus are rotating.

18. The method for establishing a layer of particulate mate-

rial on at least a portion of the active surface of a rotatable centrifugal casting mold, comprising

confining a quantity of the particulate material in a closed cavity with the particulate material in such condition as to be projectable under centrifugal force;

rotating the mold at a rate adequate to densify the layer of said particulate material when a layer of that material has been established on the active surface of the mold;

introducing the cavity into the mold and rotating the cavity at substantially the same rate as the mold, that rate being adequate to apply a substantial centrifugal force to the particulate material confined in the activity;

while continuing to rotate the mold and cavity at such rates, progressively opening the cavity to release the particulate material centrifugally from the cavity with the centrifugal force then applying the released particulate material to the active surface of the mold in the form of a layer; and

then withdrawing the cavity from the mold.

4,628,985

LITHIUM ALLOY CASTING

John E. Jacoby; Joseph T. Laemmle, and Mei-Yuan Tsai, all of Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1984, Ser. No. 679,133
Int. Cl.[4] B22C *3/00*
U.S. Cl. 164—72 **20 Claims**

1. A process for casting a lithium-containing alloy comprising:

casting the lithium-containing alloy through a mold; and

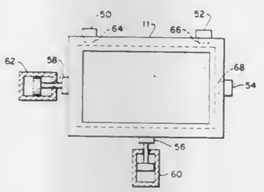
applying an alpha-olefin oligomer lubricant to the mold.

4,628,986

MOLDING REGISTER SYSTEM

Danald L. Southam, Brecksville, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 26, 1985, Ser. No. 716,294
Int. Cl.[4] B22C *9/00*
U.S. Cl. 164—159 **3 Claims**



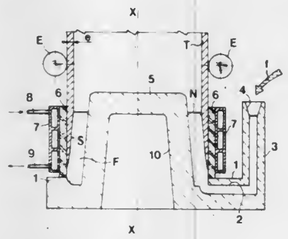
1. In a mold making apparatus in combination, first mold making means for making cope mold halves, said first mold making means including a four sided metal cope flask, a first pattern, first register means for accurately positioning the cope flask relative to the first pattern by moving the cope flask so that a first reference means on one side of the cope flask is snug against a first stop means, second register means for accurately positioning the cope flask relative to the first pattern by moving the cope flask so that a second reference means on an adjacent side of the cope flask is snug against a second stop means, means for thereafter filling the cope flask with sand and compacting it, second mold making means including a four sided metal drag flask, a second pattern, third register means for accurately positioning the drag flask relative to the second pattern by moving the drag flask so that a first reference means on one side of the drag flask is snug against a third stop means, fourth register means for accurately positioning the drag flask relative to the second pattern by moving the drag flask so that a second reference means on an adjacent side of the drag flask is snug against a fourth stop means, means for thereafter filling the drag flask with sand and compacting it, a closer station, means for moving the drag flask to the closer station and positioning it with its cavity side up, means for moving the cope flask to the closer station and positioning it on top of the drag flask so that the two cavities match, and fifth register means for accurately positioning the cope flask relative to the drag flask by moving the drag flask and the cope flask so that the first reference means of both are snug against a fifth stop means, and sixth register means for accurately positioning the cope flask relative to the drag flask by moving the drag flask and the cope flask so that the second reference means of both are snug against a sixth stop means, so that there is no parting line shift between the mold halves in the completed mold.

4,628,987

APPARATUS FOR CONTINUOUS VERTICAL CASTING OF IRON TUBE

Yves Gourmel, and Michel Pierrel, both of Pont A Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Dec. 28, 1984, Ser. No. 687,233
Claims priority, application France, Jan. 10, 1984, 84 00382
Int. Cl.[4] B22D *11/04, 18/06*
U.S. Cl. 164—254 **8 Claims**



1. An apparatus for the continuous vertical casting of iron tubes, comprising:

(a) a crucible defined by a refractory base portion (1) and a cylindrical die sleeve (6) upstanding therefrom,

(b) cooling means (7) surrounding the die sleeve,

(c) a truncated conical refractory member (5) coaxially disposed within the die sleeve, upstanding from the base portion with a larger diameter lower portion contiguous with said base portion, defining an annular volume within the crucible for containing a casting charge of molten iron (F), and having an upper surface extending higher than an upper edge of the die sleeve and above a level (N) of molten iron charged into the crucible, and

(d) feed conduit means (2, 3, 4; 26*a*, 26*b*) separate and distinct from the conical member and having an outlet mouth in open communication with a bottom portion of said annular volume for supplying molten iron to the crucible,

(e) said conical member serving to reduce the volume of molten iron chargeable into the crucible and the upper surface area of the molten iron to attendantly reduce the heat energy content of the molten iron and the escape of such heat energy from the upper surface of the molten iron by radiation.

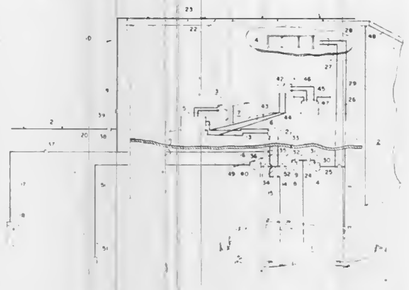
4,628,988

THERMOSTATICALLY CONTROLLED SOLAR HEATING AND COOLING SYSTEM

Trayan Yovanofski, 268 Hand Ave., Ormond Beach, Fla. 32074

Filed Dec. 9, 1983, Ser. No. 559,875
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—48.2 **2 Claims**

1. A solar heating and cooling system for simultaneously heating or cooling an ambient air system within a building, heating a hot water supply for domestic use within the building and heating or cooling a swimming pool adjacent the building comprising a building, a swimming pool as a primary water source, a solar connector connected to the swimming pool, a heat pump for controlling ambient air temperature within the building, an energy conservation unit connected to the heat pump and to the hot water supply for utilizing hot gases from the heat pump to heat water in the hot water supply, an air heat exchanger connected to the air system and to the heat pump for selectively heating or cooling air in the building, a water heat exchanger connected to a water source for selectively transferring heat between the heat pump and the water source, a well as a secondary water source connected to the water heat exchanger, a shallow return well for recycled well water, a



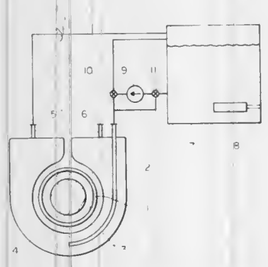
garden sprinkler, a rooftop sprinkler for the building selectively connected to the water heat exchanger, a pool pump and filter, a well pump, a pump for supplying pool water to the heat pump, water conduits interconnecting the pool with the water heat exchanger and the pool with the solar collector and valves within the conduits operating to selectively control the flow of water to effect summer and winter operating modes and valves selectively connecting the water heat exhenager with the primary or secondary water source that draw upon either the primary or the secondary water source.

4,628,989

DEVICE FOR HEAT RECOVERY

Robert Parker, Alamo; Thomas D. Ratzlaff, Menlo Park, and Dennis C. Siden, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 24, 1982, Ser. No. 381,494
Int. Cl.[4] B22B *31/00*; B30B *5/02, 15/34*; H05B *3/58*
U.S. Cl. 165—46 **14 Claims**



1. A device for recovering a heat recoverable article which comprises:

(a) a container impermeable to hot fluid which has a flexible surface that can be wrapped around the article;

(b) a closure means for holding opposite edge portions of the container to cause said surface to maintain the wrapped configuration;

(c) a conduit for introducing fluid directly to a region of the container substantially midway between said edge portions;

(d) means for supporting the weight of said fluid;

(e) means for venting the container at each of said opposite edge portions; and

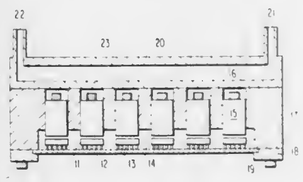
(f) means for maintaining a pressure within the container to thereby cause the flexible surface to conform to the changing size and shape of the heat-recoverable article as it recovers.

4,628,990

COOLING EQUIPMENT FOR AN INTEGRATED CIRCUIT CHIP

Takashi Hagihara, and Yuzi Kuramitsu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,278
Claims priority, application Japan, Aug. 17, 1984, 59-171059; May 28, 1985, 60-79540[U]
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—80.4 **4 Claims**



1. Cooling apparatus for heat generating electronic components mounted on a substrate, said apparatus comprising:

a hat assembly adapted to be fixed to said substrate, said hat assembly having therein a plurality of cavities adapted to slidably receive pistons therein, each of said cavities located opposite one of each of said electronic components;

pistons adapted to be slidably received in said cavities of said hat assembly and which when placed in said cavities have one surface which is generally parallel to the surface of said components;

means for adjusting the distance between said surfaces of the pistons and the components to a desired distance for heat transfer between the pistons and the components;

each piston having a longitudinal slot through the center thereof, a threaded hole at the center of said piston and a screw adapted to be driven into said hole such that the slit is expanded to cause frictional engagement at the outer surface of the piston with the walls of the cavity in which the piston is placed, thereby fixing the piston in a desired position in said cavity corresponding to said desired distance; and

cooling means attached to said hat assembly for removing heat therefrom.

4,628,991

WAFER SCALE INTEGRATED CIRCUIT TESTING CHUCK

Wen-Ting Hsiao, and Hubertus A. Everling, both of San Jose, Calif., assignors to Trilogy Computer Development Partners, Ltd., Cupertino, Calif.

Filed Nov. 26, 1984, Ser. No. 674,817
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 165—80.4 **13 Claims**

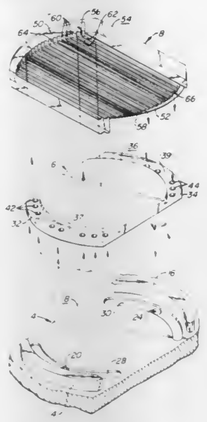
1. A heat sink for cooling a semiconductor device mounted thereto comprising:

a heat sink body having a flat upper surface upon which the semiconductor device is mounted;

said body defining a plurality of straight channels therein, the channels oriented parallel to the upper surface and having entrance and exit ends;

entrance and exit distribution networks fluidly coupled to the entrance and exit ends, said entrance and exit distribution networks arranged and adapted to achieve a desired flow of a fluid through the channels, said entrance distribution network comprising: a first entrance plenum formed in said heat sink body and fluidly coupled to said

entrance ends of said channels for distribution of the fluid to said channels; a second entrance plenum formed in said heat sink body; and a plurality of entrance distribution conduits fluidly coupling said first entrance plenum with said second entrance plenum; and



first means for directing the fluid to said second entrance plenum;

second means for directing the fluid from said exit distribution network.

4,628,992

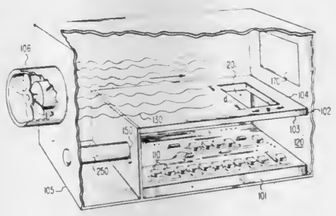
INDUCED FLOW HEAT EXCHANGER

Kevin J. Kennedy, Sea Girt, N.J., assignor to AT&T Information Systems, Morristown, N.J.

Filed Jan. 23, 1984, Ser. No. 572,996

Int. Cl.[4] F28F *13/06*

U.S. Cl. 165—123 **12 Claims**



1. Apparatus including

an electronic assembly which includes heat generating elements,

a heat conductive cooling plate disposed in a generally parallel direction relative to said electronic assembly, said cooling plate having first and second sides, said first side disposed adjacent to said electronic assembly and defining a gap between said plate and said assembly, and

means for generating a moving stream of cooling gas adjacent to said second side of said cooling plate,

wherein said cooling plate defines an aperture which permits communication between said gas stream and said gap,

whereby a convection current within said gap and gas flow out of said aperture is induced by passage of said gas stream over said aperture.

4,628,993

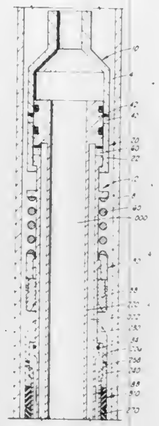
FOAM GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,115

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—51 **19 Claims**



10. A retrievable gravel packer for placing a gravel pack in a wellbore about a gravel screen disposed therebelow across a producing formation, comprising:

a mandrel assembly including first and second substantially concentric tubular mandrels extending from the upper end to the lower end thereof and closeable crossover means at the upper end of said assembly communicating the annulus between said first and second mandrels with said wellbore;

a housing assembly disposed about said mandrel assembly including a compressible packer element and packer compression means disposed on a packer saddle; and

a circulation assembly disposed at the lower end of said mandrel assembly including a circulation housing having circulation ports in the wall thereof and secured to said second mandrel, a circulation mandrel secured to said first mandrel and disposed within said circulation housing, said circulation mandrel having lateral circulation channels

therein extending from said circulation ports to the interior of said circulation mandrel, the bore thereof being in communication with the bore of said first mandrel, a selectively openable and closeable first valve means at the lower end of said circulation mandrel in communication with the bore thereof for preventing flow between the bore of said first mandrel and the area between said first and second mandrels, a selectively openable and closeable second valve means disposed within said circulation mandrel for preventing flow between said first mandrel bore and said circulation channels, and valve actuation means for selectively opening and closing said first and second valve means.

4,628,994

OIL WELLS

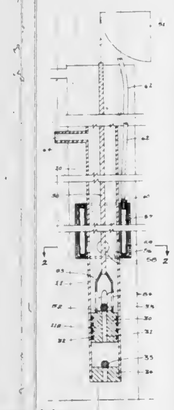
John E. T. Towner, and Geoffrey F. Towner, both of Victoria Park, Australia, assignors to Texaust Australia Limited, Canberra, Australia

Filed May 15, 1985, Ser. No. 734,187

Claims priority, application Australia, May 15, 1984, PG5002

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—68 **5 Claims**



1. An oil well comprising:

a production tubular;

a pump barrel connected to the lower end of said production tubular;

a pump plunger reciprocably positioned within said pump barrel;

a sucker rod string connected to said pump plunger for raising and lowering said pump plunger within said pump barrel;

an annular jacket concentrically mounted about said production tubular at a point just above said pump barrel, said jacket forming a chamber about said production tubular;

means for communicating the interior of said production tubular with the interior of said chamber;

an inflatable bladder means positioned within said chamber and adapted to occupy substantially the entire volume of said chamber when fully inflated; and

means for inflating said bladder means with a gas under pressure wherby fluids pumped by said pump plunger will act against said bladder means to compress said gas in said bladder means to allow a portion of said fluids to temporarily enter said chamber to thereby substantially reduce pressure surges arising from elastic deformation of a column of fluids.

4,628,995

GAUGE CARRIER

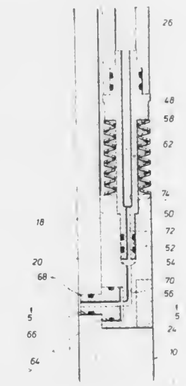
David E. Young, Seabrook, Tex., and Danny S. Sebastian, Denver, Colo., assignors to Panex Corporation, Sugar Land, Tex.

Filed Aug. 12, 1985, Ser. No. 764,560

Int. Cl.[4] E21B *47/06*

U.S. Cl. 166—113 **8 Claims**





2. An oilfield pressure gauge carrier for use, with a string of pipe having a central bore in a well bore which traverses earth formations and contains a liquid, and where the gauge carrier and a pressure gauge can be subjected to vertical shock forces in a well bore,

at least one pressure gauge having a pressure sensing transducer in a pressure gauge housing,

an elongated carrier body member adapted for coupling in a string of pipe, said body member having a central bore arranged for alignment with respect to a bore of a string of pipe, said carrier body member having an outer wall with at least one lengthwise extending recess in said outer wall, said recess having sufficient depth to accommodate an elongated pressure gauge housing within the recess;

means for securing said pressure gauge housing in said recess and for permitting movement of said pressure gauge housing in said recess relative to the lengthwise direction of the said recess;

spring means in said recess for applying a spring force to each end of said pressure gauge housing in said recess; and

independent force adjustment means in said recess cooper-

able with spring means for adjusting the force on said spring means to obtaining a desired spring force on the ends of said pressure gauge housing.

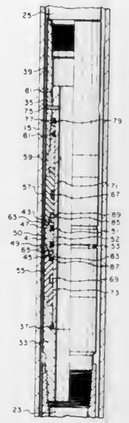
4,628,996
FULL OPENING CHECK VALVE
James F. Arnold, 950 Echo La., Suite 125, Houston, Tex. 77024
Filed Feb. 9, 1984, Ser. No. 578,477
Int. Cl.⁴ E21B *33/12*
U.S. Cl. 166—116 **24 Claims**



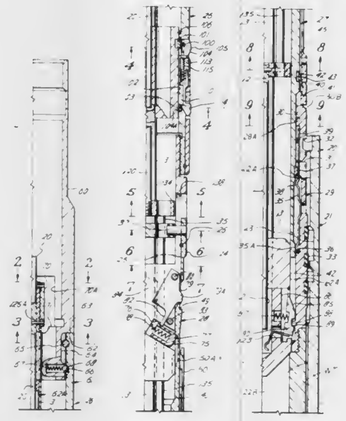
1. A check valve, which comprises:
a rigid tubular outer sleeve having a longitudinal bore therethrough and means at the ends thereof for interconnecting said outer sleeve with adjacent tubular members;
a collapsible tubular inner sleeve positioned longitudinally within said bore of said outer sleeve, said inner sleeve having a longitudinal bore for the substantially unobstructed flow of fluids in either direction therethrough, said inner sleeve in the collapsed position having a plurality of multiple, longitudinally spaced, concentric, overlapping inward folds;
means for resisting the action of inner sleeve collapsing forces developed responsive to normal flow velocity of fluids through said inner sleeve bore and for developing collapse of said inner sleeve in response to greater than normal flow velocity,
wherein said inner sleeve essentially plugs said bore during greater than normal flow velocity by longitudinally collapsing and forming a plurality of inward folds thereby obstructing fluid flow.

4,628,997
PACKOFF
John D. Schraub, Walker County, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Jun. 22, 1984, Ser. No. 623,803
Int. Cl.⁴ E21B *33/128, 23/06*
U.S. Cl. 166—196 **3 Claims**

1. A packoff, comprising:
a body;
a packoff mandrel, having one end telescopically received within the body;
an inelastic energizing ring, mounted around the packoff mandrel;
the energizing ring having an inner circumference, an outer circumference, upper and lower horizontal surfaces, and upper and lower tapered surfaces, such that the inner circumference of the energizing ring is wider than the outer circumference of the energizing ring;
a pair of elastomeric packing elements, mounted around the packoff mandrel, one on each side of the energizing ring, each packing element having a matching surface for engagement with one of the horizontal surfaces of the energizing ring and a matching surface for engagement with one of the tapered surfaces of the energizing ring; and
means for forcing the packing elements against the energizing ring, so that the tapered surfaces force the packing elements radially outward into sealing engagement with a circumscribing well conduit when the body is moved axially on the packoff mandrel.

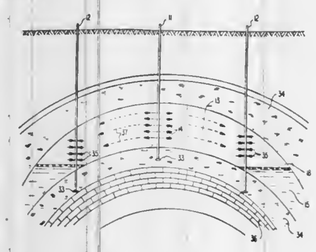


4,628,998
WELL APPARATUS
Neil H. Akkerman, Houston, Tex., assignor to AVA International Corp., Houston, Tex.
Continuation-in-part of Ser. No. 708,536, Mar. 5, 1985, which is a continuation of Ser. No. 536,278, Sep. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 489,827, Apr. 29, 1983, Pat. No. 4,522,259. This application May 6, 1985, Ser. No. 731,567
Int. Cl.⁴ E21B *23/02*
U.S. Cl. 166—237 **29 Claims**



1. For use in landing a well tool within a selected one of a plurality of vertically spaced landing nipples of a well conduit connected as part of a well string, wherein each nipple has a cylindrical bore of the same diameter as the others and a groove having an upwardly facing seat thereabout, well apparatus comprising
a wire line running tool,
a landing tool connectible to the running tool for raising and lowering therewith within the well string,
keys each having a downwardly facing shoulder and carried by the landing tool for radial movement between inner positions in which they move past the locking grooves and outer positions in which they may move upwardly through the nipples but in which they fit within the groove of any of the nipples to land the shoulders thereof on the seat of the groove, upon downward movement,
spring means carried by the landing tool for shifting between a first position urging the keys to their inner positions, as the landing tool is lowered within the conduit and until the keys are beneath the groove in a selected nipple, and a second position urging the keys to their outer positions, upon raising of the landing tool to lift the keys above the groove in the selected nipple,
sensing means carried by the landing tool and urged radially outwardly to a position to engage the bore of a nipple as the landing tool is lowered to move the keys into a position opposite the groove of the selected nipple, and
means on the landing tool which is responsive to movement of the sensing means into engagement with the bore and further lowering of the landing tool, following movement of the keys into the groove, for holding the keys within the locking groove of the selected nipple.

4,628,999
PROCESS EMPLOYING CO_2/CH GAS MIXTURES FOR SECONDARY EXPLOITATION OF OIL RESERVOIRS
László Kiss, 10 Kun Bela u, Nagykanizsa; Sándor Dolleschall, 21/B. Városkuti ut, Budapest XII; Ede Németh, 4, Kovacs K. ter, Zalaegerszeg; Janos Török, 1, Varsanyi I. u., Budapest II; György Tiszai, 25 Oswald J. u., Nagykanizsa, and Valér Balint, 46/b. Szakasits Á u., Budapest 1115, all of Hungary
Continuation-in-part of Ser. No. 563,881, Dec. 21, 1983, abandoned, which is a continuation of Ser. No. 1,373, Jan. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 880,171, Feb. 21, 1978, abandoned, which is a continuation of Ser. No. 776,968, Mar. 14, 1977, abandoned, which is a continuation of Ser. No. 602,795, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 368,887, Jun. 11, 1973, abandoned. This application Jan. 18, 1985, Ser. No. 692,840
Int. Cl.⁴ E21B *43/18, 43/20, 43/30*
U.S. Cl. 166—274 **7 Claims**



1. In a process for the secondary recovery of crude oil from subterranean reservoirs by injecting carbon dioxide-containing gas into the reservoir through at least one injection well penetrating into the reservoir until a desired volume of carbon dioxide has been added, injecting water through at least one injection well to force such carbon dioxide through the reservoir, and withdrawing oil through at least one production well at such a flow rate as to maintain a reservoir pressure of at least 100 atm. until the water breaks through into the production well, the improvement comprising diluting the carbon dioxide gas in the reservoir with from 5 to 35 vol. % of hydrocarbon gases at a reservoir pressure ranging from above 107 up to 250 atm.

4,629,000
OIL RECOVERY BY SURFACTANT-ALCOHOL WATERFLOODING
Billy G. Hurd, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 718,324, Apr. 1, 1985, abandoned, which is a continuation of Ser. No. 385,581, Jun. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 221,686, Dec. 30, 1980, abandoned. This application May 13, 1986, Ser. No. 862,207
Int. Cl.⁴ E21B *43/22*
U.S. Cl. 166—274 **8 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising preceding the aqueous fluid introduction with an oil slug consisting of oil, a preferentially oil-soluble alcohol of limited water solubility having from 5 to 7 carbon atoms and a preferentially oil-soluble anionic surfactant is within the range of 0.2–1.0, said surfactant characterized by one of the formulae

$$(R_1)_q\text{—Ar—O}(C_nH_{2n}O)_x\overset{R_3}{\underset{|}{R_2}}\text{—SO}_3M$$

and

$$(R_1)_q\text{—Ar—O}(C_nH_{2n}O)_x\text{—SO}_3M$$

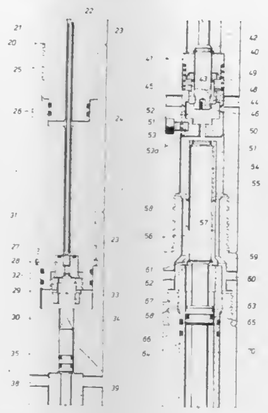
wherein the R_1 groups are the same or different and are straight or branched-chain aliphatic groups containing from 8 to 12 carbon atoms,
n is 2 or 3,
q is at least 2,
x is a number within the range of 1 to 20,
Ar is phenyl or naphthyl,
R_2 is a C_1 to C_4 alkyl group,
R_3 is a hydrogen, a hydroxy group or a methyl group, and
M is an alkali metal, ammonium, or substituted ammonium ion.

4,629,001
TUBING PRESSURE OPERATED INITIATOR FOR PERFORATING IN A WELL BOREHOLE
Carl B. Miller; Robert R. Luke, both of Houston; Michael L. Smith, Missouri City, and Larry L. Grigar, East Bernard, all of Tex., assignors to Halliburton Company, Duncan, Okla.
Filed May 28, 1985, Ser. No. 737,958
Int. Cl.⁴ E21B *43/116*
U.S. Cl. 166—297 **17 Claims**

1. A method of perforating a well below a packer comprising the steps of:
(a) positioning a perforating gun assembly on a tubing string at a specified depth in a well below a packer;
(b) selecting a pressure in excess of bottom hole pressure at which a perforating gun detonator means is operated;
(c) increasing the pressure below the packer by pumping a fluid through the tubing into the volume below said packer to a pressure level required for arming said perforating gun detonator means; and
(d) firing the perforating gun detonator means by then applying a reduced pressure below a specified level and wherein the steps of increasing the pressure below the packer means to at least that pressure required for arming said perforating gun detonator means and subsequently reducing the pressure below the packer means to less than

that required for firing of the perforating gun detonator means are performed sequentially in the stated order.

10. For use in detonating shaped charges in a tubing conveyed perforating gun assembly supported on a tubing string, an apparatus comprising pressure operated shaped charge detonating means, and means connecting said pressure operated means at the lower end of a tubing conveyed perforating gun assembly, said means including:



(a) high pressure operated means responsive to pressure in excess of a selected high pressure to form an armed position after the high pressure has been exceeded; and

(b) low pressure operated means responsive to pressure less than a selected low pressure below a selected low pressure to form a shaped charge detonation after said high pressure operated means forms the armed position.

4,629,002

EQUALIZING MEANS FOR A SUBSURFACE WELL SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Oct. 18, 1985, Ser. No. 789,234
Int. Cl.[4] E21B *34/12*
U.S. Cl. 166—324 **7 Claims**

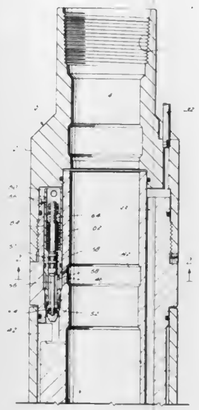
1. In combination with a subsurface well safety valve for controlling fluid flow through a well tubing and having a housing, a first valve being movable between an open and closed position for controlling flow through the housing, a flow tube telescopically movable in the housing for controlling the opening and closing of said first valve, and means for moving the flow tube for opening and closing the first valve, of an equalizing means for reducing the pressure differential across the first valve when opening said first valve comprising,

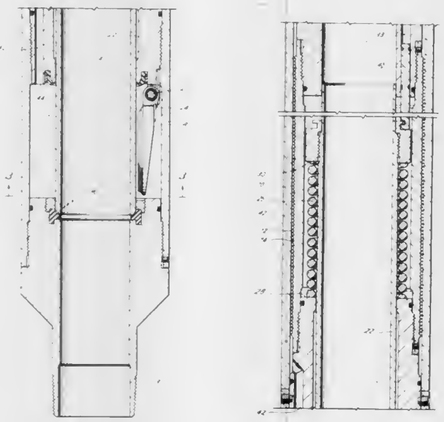
an equalizing line in communication with the inside of said housing between points below and above the first valve,

an equalizing valve in said line, said equalizing valve opening prior to the opening of the first valve,

a labyrinth passageway in said equalizing line upstream of the equalizing valve for providing pressure drops for controlling the velocity of the fluid flowing through the equalizing valve,

said equalizing line and valve are in the housing, and said housing includes an annular recess in communication





with the equalizing line for receiving a blanking plug for pumping cleaning fluid through the equalizing valve.

4,629,003

GUILELINELESS SUBSEA COMPLETION SYSTEM WITH HORIZONTAL FLOWLINE CONNECTION

Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079

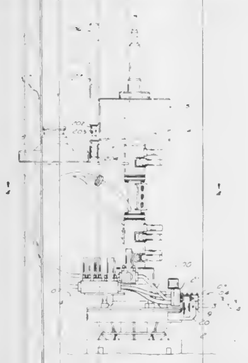
Filed Aug. 1, 1985, Ser. No. 761,514
Int. Cl.[4] E21B *43/013*
U.S. Cl. 166—341 **8 Claims**

2. In a subsea completion system for the production of oil or gas from subsurface formations or the injection of liquids or gases into subsurface formations, a wellhead and landing base system supporting casing and tubing in a well bore and having a flowline receiving structure attached; a christmas tree assembly of valves, tree flow loop portion, and fittings adapted to be lowered thru the ocean and landed on said wellhead and landing base system without the pre-orientation and guidance of guidelines from the surface of the water to the wellhead and landing base system and subsequently to be rotated to a preferred orientation; and flowlines along the sea floor, an invention comprising:

a subsea flowline connector comprising a sea floor flowline end connector and a tree flowline end connector,

said sea floor end connector being adapted for installation on the end of said flowlines before said flowlines are laid on the ocean floor and adapted for being landed in said flowline receiving structure portion of said wellhead and landing base system such that the ports therethrough which communicate with the bores of said flowlines and said flowlines are substantially horizontal and such that the minimum distance from the center of said wellhead and landing base system to said sea floor end connector is a first radial distance,

said tree flowline end connector being mounted in a first position on a said subsea christmas tree with is outermost



parts at a second radial distance from the centerline of said wellhead and landing base system and therefore from the centerline of said christmas tree which is less than said first radial distance and ports thru said tree flowline end connector which communicate with the bores of said tree flowline portion being substantially horizontal;

such that when said christmas tree is landed on and centralized by said wellhead and landing base system said tree flowline end connector will remain at a shorter radial distance from the centerline than said sea floor flowline end connector and therefore will not contact said sea floor flowline end connector if said christmas tree is landed in an orientation other than the preferred orientation relative to said wellhead and guide base system and is subsequently rotated to the preferred orientation to said wellhead and guide base system,

and further means are provided such that after said christmas tree is rotated to a preferred orientation said tree flowline end connection can be moved radially outwardly to a second position for connection with said seafloor flowline end connection.

4,629,004

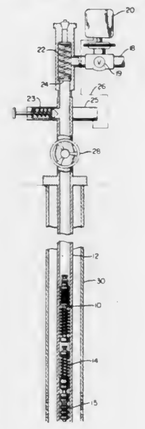
PLUNGER LIFT FOR CONTROLLING OIL AND GAS PRODUCTION

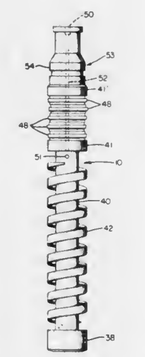
Billy W. Griffin, P.O. Box 31989, Aurora, Colo. 80041

Continuation-in-part of Ser. No. 623,377, Jun. 22, 1984, abandoned. This application Feb. 11, 1985, Ser. No. 700,032
Int. Cl.[4] F04B *47/12;* **E21B** *43/00*
U.S. Cl. 166—372 **14 Claims**

1. A plunger lift apparatus disposed in a well for slidable movement in response to variations in pressure, said apparatus comprising:

an integral, one-piece unit including a lower end portion, and a generally cylindrical, elongated shaft extending from said lower end portion and of a length which substantially defines the longitudinal extent of said apparatus, said shaft having an external, continuous and spirally extending coil integrally formed therewith, said spiral coil having an underside portion, said spiral coil being defined by at least one complete and continuous 360° revolution which extends about and along said shaft for a majority of said length of said shaft, and said spiral coil and a line perpendicular to the longitudinal extent of said shaft defining an oblique angle, wherein liquid located in the well, in response to pressure changes, moves upward along substantially the entire longitudinal extent of said underside portion of said spiral coil thereby imparting hydraulic forces to said spiral coil resulting in a rotational and upward movement of the entire apparatus.





11. A method for removing liquid located in a tubing string, comprising:

providing an integral, one-piece plunger including an upper end, a lower end, and a generally cylindrical, elongated shaft of a length which substantially defines the longitudinal extent of said plunger;

forming a spiral coil about said shaft, said sprial coil having an underside and including at least one continuous coil extending about said shaft for at least one 360° revolution and along said shaft for a majority of said length of said

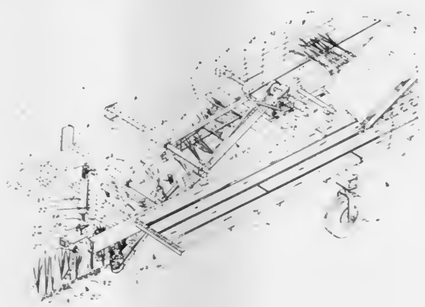
shaft, said spiral coil and a line perpendicular to the longitudinal extent of said shaft defining an oblique angle;
positioning said plunger in the tubing string;
causing liquid to continuously follow substantially the entire longitudinal extent of the underside of said spiral coil;
using the movement of the liquid along the underside of said spiral coil to spin the plunger; and
carrying the plunger upward using the spinning action of the plunger.

4,629,005

BULB, ROOT, AND LEAFY VEGETABLE HARVESTER

Clarence E. Hood, Jr.; Robert E. Williamson, both of Clemson, S.C., and Amikam Margolin, Rishon Le Zion, Israel, assignors to Clemson University, Clemson, S.C.

PCT No. PCT/US82/01508, § 371 Date Dec. 1, 1983, § 102(e) Date Dec. 1, 1983
PCT Filed Oct. 22, 1982, Ser. No. 619,458
Int. Cl.⁴ A01D *33/08, 31/00*
U.S. Cl. 171—20 **22 Claims**





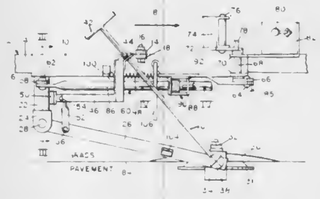
1. An improved mechanical harvester for bulb, root, and leafy vegetable products, comprising:
(a) means for preparing said products for removal from a row plant bed in which said products are growing;
(b) first conveyor means located rearwardly of said preparing means for engaging prepared ones of said products with a predetermined pressure sufficiently low to prevent damage thereto, lifting said prepared ones from said plant bed in an initial vertical disposition and transporting lifted ones of said products upwardly and rearwardly;
(c) product orienting means, located along said first conveyor means and rearwardly of said means for preparing, for orienting said lifted ones of said products from said vertical disposition thereof to a horizontal disposition while maintaining association of such products with said first conveyor means;
(d) soil removal means, located rearwardly of said means for preparing and forwardly of said orienting means, for imparting reciprocal horizontal motion to a member thereof coming into contact with lifted ones of said products so as to remove soil therefrom;
(e) support means located adjacent said product orienting means for supporting a formerly upper end of oriented ones of said products whenever same are oriented to said horizontal disposition; and
f second conveyor means, located adjacent an output end of said first conveyor means for receiving ones of said products therefrom, whereby said horizontally disposed ones are thereby freed from said first conveyor means and made accessible for further processing or packaging.

4,629,006

LAWN EDGER ATTACHMENT FOR TRACTORS

David L. Mullet, Hesston, and Elmer D. Voth, Newton, both of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Sep. 5, 1985, Ser. No. 772,732
Int. Cl.⁴ A01D *34/84*
U.S. Cl. 172—15 **11 Claims**



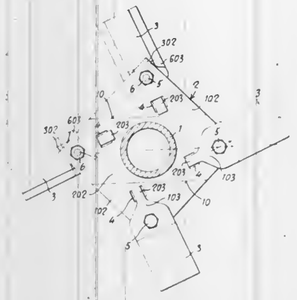
1. A lawn edger attachment for tractors comprising:
a. a base member,
b. means for attaching said base member rigidly but removably to said tractor,
c. an elongated boom universally pivoted at one end to said base member for both horizontal and vertical pivotal movement, and normally extending laterally outwardly from said tractor at an acute angle to the line of travel of the tractor,
d. a circular, generally planar cutting blade of concave-convex circular dish form disposed beneath the extended end of said boom in a generally vertical plane, being mounted on said boom both for rotation on its own horizonal axis and for rotation about a generally vertical axis relative to said boom, and
e. manual operating means operable to pivot said boom, whereby said boom may be pivoted horizontally to position said blade directly over the division line between a grass area and a paved area parallel to the line of travel of the tractor, and may be pivoted vertically to lower said blade into ground contact at said division line, and further pressed into penetrating relation with the ground, whereby to sever any grass and soil extending over said division line as the tractor is driven parallel to said division line, the convex face of said blade facing the grass side of said division line, whereby soil pressure exerted on said convex face during tractor movement will pivot said boom horizontally to maintain said blade against the pavement edge despite variations in the transverse spacing of the tractor from the division line, and will also pivot said blade on its vertical axis relative to the boom to maintain the plane of the blade parallel to the division line, said manual operating means being operable to turn said blade on its vertical axis, whereby the convex face of said blade may be turned to face the grass side of said division line regardless of side of said division line at which the tractor may be positioned.

4,629,007

ROTARY BLADE AGRICULTURAL IMPLEMENT

Luciano Pegoraro, Gambellara, Italy, assignor to Pegoraro S.p.A., Gambellara, Italy

Filed Feb. 14, 1985, Ser. No. 701,749
Claims priority, application Italy, Feb. 17, 1984, 12431 A/84
Int. Cl.⁴ A01B *33/10, 33/02*
U.S. Cl. 172—548 **11 Claims**



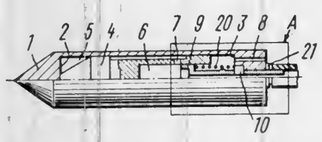
1. In agricultural implement suitable for use in a rotary cultivator, said implement comprising a plurality of blades fastened in a changeable manner to a blade-mounting plate secured to a rotatable shaft, the improvement wherein said blade-mounting plate comprises a plurality of blade fastening portions, at least one said blade fastening portions being inclined with respect to the axis of said rotatable shaft, each of said blade fastening portions of said blade-mounting plate being each provided with a locking opening, and wherein each of said blades is provided with a locking shank which is adapted to be inserted through said locking opening provided in the corresponding blade fastening portion of said plate, said blades and said blade fastening portions of said plate being further provided with a through hole for passage of a single bolt for securing each blade to said plate.

4,629,008

REVERSIBLE PERCUSSIVE ACTION MACHINE

Alexandr D. Kostylev; Vladimir D. Plavskikh; Alexei D. Terskov; Nikolai P. Chepurnoi, all of Novosibirsk; Mikhail J. Bondar, Odessa; Igor I. Reznikov, Odessa, and Vladimir I. Tarasenko, Odessa, all of U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Filed Jun. 5, 1984, Ser. No. 617,394
Claims priority, application U.S.S.R., Aug. 16, 1983, 3596851
Int. Cl.⁴ E21B *11/02*
U.S. Cl. 173—91 **4 Claims**



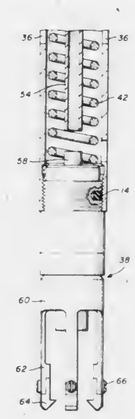
1. A reversible percussive action machine comprising: a housing; a hammer accommodated inside said housing and reciprocating within said housing by means of a pressurized fluid; a system for distributing said pressurized fluid to effect said reciprocations of said hammer to permit the hammer to deliver impacts on a head end of said housing to execute a forward percussive action of the machine and on a tail end of said housing to provide for a rearward percussive action of the machine; a fluid valving member of said fluid distribution system disposed in said housing and movably connected to said hammer, said fluid valving member having at least one recess on one side wall; a means for fixing said fluid valving member in a first position relative to said housing ensuring the forward percussive action of the machine and in a second position ensuring a rearward percussive action of the machine, said means having at least one cup-shaped insert moveably arranged relative to said fluid valving member and being equal in number to the number of said recesses in said side wall of said fluid valving member, said cup-shaped insert being mounted in a respective recess and having a depth dimension greater than a wall thickness measurement of said fluid valving member whereby a substantially integral bottom side of said insert facing a longitudinal center line of said housing and extending at least into a central passage of said fluid valving member is being acted upon by a force exerted by said pressurized fluid causing displacement of said insert along an axis of symmetry of said machine; a first stop of said means for fixing said fluid valving member in said machine attached to one end of said fluid valving member engaging said inserts; a second stop of said means for fixing said fluid valving member in said machine attached to a second end of said fluid valving member engaging said first stop; a spring-loaded element located in said cup-shaped inserts and positioning said inserts relative to said fluid valving member; and a compression spring located above said fluid valving member in said housing and used to axially spring-load said fluid valving member in said first position and said second position relative to said housing.

4,629,009

METHOD AND APPARATUS FOR FIRING BOREHOLE PERFORATING APPARATUS

Paul E. Whiting, Houston, and Gerald B. McClure, Sugarland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 10, 1984, Ser. No. 648,447
Int. Cl.⁴ E21B *43/116, 29/00*
U.S. Cl. 175—4.56 **12 Claims**



1. Apparatus adapted to be lowered into a borehole by means of a cable for firing a perforating gun disposed within said borehole, comprising:
an elongated housing member;
a first rod member having a first and second end disposed and longitudinally slidable within said housing member, the first end of said first rod member being coupled to said cable;
a second rod member having a first and second end disposed and longitudinally slidable within said housing member, the first end of said second rod member being detachable coupled to the second end of said first rod member;
means for decoupling said second rod member from said first rod member in response to the longitudinal movement of said first rod member; and

first biasing means disposed about at least a portion of said second rod member for exerting a force on said second rod member to cause downward longitudinal movement thereof when decoupled from said first rod member.

4,629,010

PROCESS AND DEVICE FOR SINKING WELLS

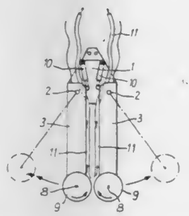
Claude Sourice, 38 Avenue de Beaumont, 60 260 Lamorlaye, France

Filed May 24, 1985, Ser. No. 737,440

Claims priority, application France, May 29, 1984, 84 08382; Mar. 20, 1985, 85 04126

Int. Cl.⁴ E21B *7/00*

U.S. Cl. 175—57 **15 Claims**



10. A process for sinking wells including providing a device having at least one pair of rotary digging heads whose axes of rotation are substantially horizontal and which are mounted on respective supports on an assembly for movement symmetrically in a vertical plane between a central position close to the axis of the well and a peripheral position adjoining the walls of the well, including providing means for raising and lowering the digging heads, wherein the digging heads are spaced apart so that the horizontal components of the reactions produced by their work cancel each other out reciprocally, and forming at least one trench starting from the position in which the heads are close together and progressively moving the heads apart symmetrically with respect to each other, the well being formed by digging out successive trenches.

4,629,011

METHOD AND APPARATUS FOR TAKING CORE SAMPLES FROM A SUBTERRANEAN WELL SIDE WALL

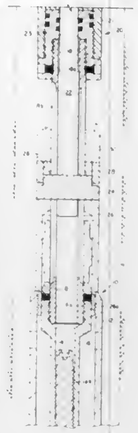
Paul A. Reinhardt, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

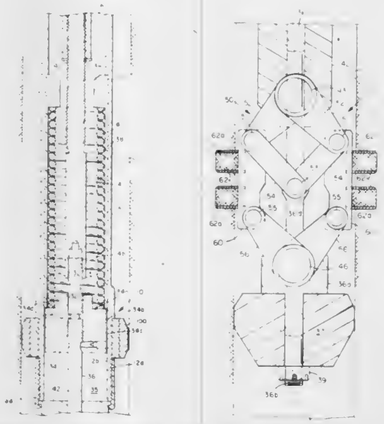
Filed Aug. 12, 1985, Ser. No. 764,613

Int. Cl.⁴ E21B *49/02*

U.S. Cl. 175—58 **19 Claims**

1. Apparatus for extracting core samples from the side wall of a subterranean well, comprising: an axial force generating apparatus including a hollow housing suspendable in the well in a fixed location; a force transmitting element projecting from said housing; means in said housing for generating an axially forced displacement of said force transmitting element; a stationary support structure depending from said hollow housing; an annular core forming element mounted immediate said support structure for radial movements relative to the well, the axis of said annular core forming element being radially disposed with respect to the axis of the well, and force translating means for transmitting a radial force to said annular core forming element by activation of said force transmitting





element sufficient to penetrate the well side wall to isolate a cylindrical core sample in said annular core forming element.

4,629,012

DRAINHOLE DRILLING ASSEMBLY

Frank J. Schuh, Plano, Tex., assignor to Atlantic Richfield Company, Plano, Tex.

Filed Jul. 8, 1985, Ser. No. 752,609

Int. Cl.⁴ E21B *7/08*

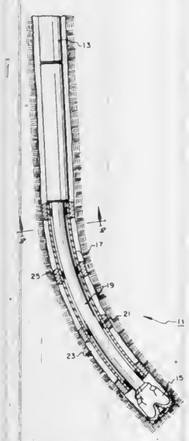
U.S. Cl. 175—75 **10 Claims**

1. In an assembly for drilling from the surface a borehole penetrating subterranean formations and including a curved borehole section to terminate in a predetermined horizontal stratum for forming a drainhole facilitating flow of subterranean fluids from the stratum, the assembly including:

a. a drilling motor means for rotating a drillbit means;

b. a drillbit means for drilling the subteranean formation to advance toward the stratum, the drillbit means being connected with said drilling motor means; the improvement comprising:

c. a non-rotating, pre-bent, stabilized, curved, outer rigid metallic case disposed intermediate said drilling motor means and said drillbit means and having in normal repose a first predetermined radius of curvature; and



d. a rigid tubular metallic shaft journalled for rotation within said curved rigid metallic case and connecting said drilling motor means with the said drillbit means so as to transfer torque from said drilling motor means to said drillbit means; said rigid metallic shaft being normally straight and forced interiorly of said curved rigid metallic case to become bent in the process and causing said curved rigid metallic case to have a second predetermined radius of curvature greater than said first predetermined radius of curvature; said rigid inner metallic shaft consisting essentially of a unitary, non-articulated member throughout said case; being forcibly flexed in rotation; and serving to transmit torque from said drilling motor means to said drillbit means.

4,629,013

DRIVE DEVICE FOR A DRILL BIT

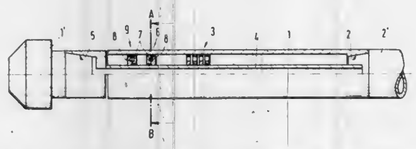
Volker Krüger, Celle, and Heinrich Daenicke, Wienhausen, both of Fed. Rep. of Germany, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Jun. 10, 1985, Ser. No. 742,686

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513124

Int. Cl.⁴ E21B *4/02;* **F16C** *17/04*

U.S. Cl. 175—107 **12 Claims**



1. A drive device for driving a drill bit for drilling bore holes in underground formations comprising:

a tubular housing having first and second ends;

a rotary drive means disposed within said tubular housing;

an output shaft arranged to be driven by said rotary drive means and extending from said second end of said housing;

means for connecting said output shaft to a drill bit;

means for connecting said first end of said tubular housing to a drill string;

said rotary drive means being arranged to be driven by fluid forced through said housing;

an axial bearing mounted on and between said housing and said output shaft for rotatably supporting said output shaft;

said axial bearing comprising a continuous bearing ring having a hard wear resistant bearing surface about the output shaft and a retaining ring connected to said housing and carrying a plurality of circumferentially spaced resilient arms and bearing segments having hard wear-resistant bearing surfaces for bearing contact with the bearing surface of said bearing ring;

each resilient arm having a fixed trailing end portion connected to the retaining ring,

a free leading end portion integral with and projecting circumferentially from the fixed end portion and into an aperture extending axially through the retaining ring between adjacent resilient arms and which supports a bearing segment thereon;

each resilient arm and bearing segment thereon being swivellingly mounted on the retaining ring and pivotable about a radial axis to provide for a space of gradually reducing depth from leading surfaces of and between the bearing surfaces of said bearing segments and of said bearing ring which converge in the direction of and during rotation of the bearing ring;

whereby relative rotation between the bearing segments and the bearing ring causes fluid to flow into the space between the gradually reduced converging bearing surfaces thereof to build up a hydrodynamic lubricating film therebetween.

4,629,014

DERRICK

Roger C. Swisher, Madla; Jens O. Flobak, Stavanger; Bjorn Eilertsen, Sola; Nikolai Jakobsen, Gol, and Jonny Gabrielsen, Sandnes, all of Norway, assignors to O.T.C. A/S, Sola, Norway

Filed Jan. 14, 1985, Ser. No. 691,009

Claims priority, application Norway, Feb. 24, 1984, 840705

Int. Cl.⁴ F21B *15/02, 15/00*

U.S. Cl. 175—220 **4 Claims**

1. A derrick for drilling and maintenance of oil and/or gas wells, especially intended for installation on marine platforms, comprising:

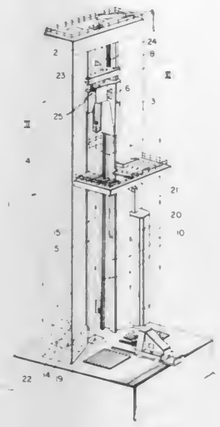
(a) a drilling machine (**18**) for a drilling string (**15**);

(b) a vertically movable hydraulic elevator (**6**);

(c) the drilling machine (**18**) being connected to the vertically movable elevator (**6**) driven by means of a plurality of hydraulic motors (**7**) mounted on said elevator for moving the elevator (**6**) and thereby the drilling machine (**18**) in a vertical direction;

(d) a portal-like derrick structure (**1**) formed by an upper traverse (**2**) and two spaced-apart, substantially parallel, upright derrick components (**3, 4**) which together define a space within which the elevator (**6**) is adapted to travel along a plurality of stationary, upright rack rails (**10**), the

rails being arranged in the derrick (1) and on the derrick components (3, 4);



(e) each motor (7) directly driving gear means engaging a respective rail (10).

4,629,015

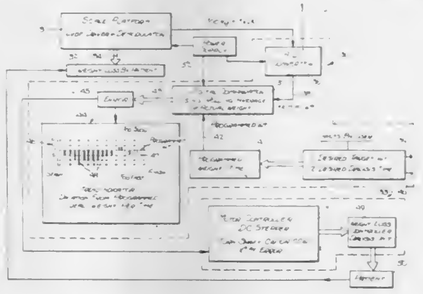
WEIGHT MONITORING SYSTEM

Peter Fried, and Burt L. Swersey, both of Scarsdale, N.Y., assignors to Cobe Asdt, Inc., Elmsford, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,833

Int. Cl.[4] G01G *23/22, 23/32, 19/00;* **A61M** *31/00*

U.S. Cl. 177—25 **16 Claims**



1. A weight monitoring system for a scale, said system comprising

first means for generating a signal corresponding to a weight change of a load on the scale over a period of time;

second means for generating a signal corresponding to the lapse of time within said period of time; and

a comparison means for comparing said first signal with said second signal over said period of time, said comparison means including a visual read-out means for displaying said signals, a first linear display for chronologically displaying an actual change in weight of the load at a given time in bar form and a second linear display parallel to and adjacent said first linear display for continuously displaying the elapsed time in bar form.

4,629,016

METHOD OF INITIALIZING A BALANCE WITH COUNTING SCALE AND BALANCE WITH COUNTING SCALE FOR CARRYING OUT THE METHOD

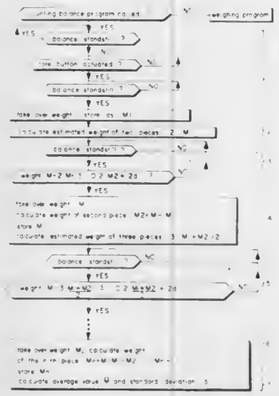
Erich Knothe, Bovenden; Christian Oldendorf, Göttingen, and Franz-Josef Melcher, Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Apr. 26, 1985, Ser. No. 727,423

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415962

Int. Cl.[4] G01G *19/22, 19/00*

U.S. Cl. 177—25 **9 Claims**



1. Method of initializing a balance with counting scale in which a given quantity of the pieces to be counted is placed on the balance in order to determine the individual weight, characterized in that the pieces are placed individually in the balance until the given quantity is reached and that the standstill of the balance is awaited after each placing for a piece, the counting scale calculates the average value and the standard deviation from the determined individual weights of the placed-on pieces and subsequently requests other pieces if the counting precision resulting from the resolution of the balance, the given quantity and the calculated standard deviation is worse than a given counting precision.

4,629,017

APPARATUS AND METHOD FOR PRODUCING WEIGHED BATCHES OF ALIGNED ELONGATED ARTICLES

David Shroyer, Aurora, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 376,515, May 10, 1982, Pat. No. 4,514,959. This application Mar. 19, 1985, Ser. No. 714,163

Int. Cl.[4] G01G *19/22;* **B65B** *57/00;* **B65G** *47/46*

U.S. Cl. 177—25 **20 Claims**

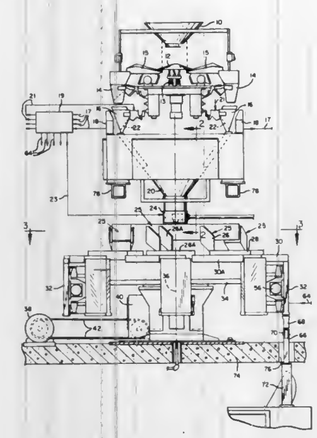
1. Apparatus for producing predetermined weight batches of elongated articles and for aligning the articles in said batches, comprising:

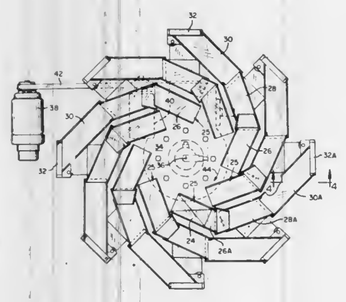
separator means for separating a plurality of elongated articles into groups of articles;

scale means for weighing each of said groups of articles;

selection means for selecting a combination of certain ones of said weighted groups to provide a combination of selected groups whose total weight is approximately equal to a predetermined weight, and for discharging said selected groups into a common container to form a batch of said articles, said batch being of said predetermined weight;

alignment means for aligning the articles in said weighted batch in an alignment container so that the longitudinal axes of said aligned articles are substantially parallel, said alignment means including a plurality of alignment systems each having an alignment container, and including gate means for feeding the weighted batches from said common container to different ones of said alignment systems; and





discharge means for discharging said aligned articles in a batch from said alignment container.

4,629,018

ELECTRICAL BALANCE WITH ACOUSTIC FEEDBACK SIGNAL FOR MANUAL DOSING OR MIXING

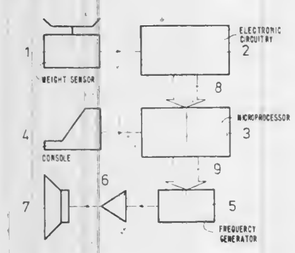
Karl J. Erb, Gossau, Switzerland, assignor to Mettler Instruments AG, Greifensee-Zurich, Switzerland

Filed May 6, 1985, Ser. No. 730,807

Claims priority, application Switzerland, May 8, 1984, 2255/84

Int. Cl.[4] G01G *23/18, 23/00*

U.S. Cl. 177—47 **11 Claims**



1. In a scale having means for generating an electric weight signal signifying the weight of a quantity being metered, and means for entering a desired weight signal signifying the desired weight of said quantity, the improvement comprising means for receiving said electrical weight signal and said desired weight signal and generating a control signal varying in dependence on the difference therebetween; and electrically controllable tone signal generating means connected to said control signal generating means for generating audible signals having at least one controllable characteristic varying in accordance with said control signal and reaching a limiting value when said control signal signifies a zero difference between said electrical weight signal and said desired weight signal.

4,629,019

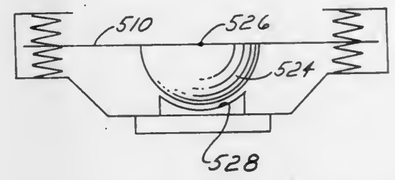
WEIGHT SCALE UTILIZING A CAPACITATIVE LOAD CELL

Richard H. Harrington, and Charles W. Krapf, both of Ann Arbor, Mich., assignors to Measuretek, Inc., Saline, Mich.

Continuation-in-part of Ser. No. 642,123, Aug. 17, 1984. This application Oct. 4, 1985, Ser. No. 784,858

Int. Cl.[4] G01G *3/14;* **H01G** *5/01, 7/00, 5/16*

U.S. Cl. 177—210 C **4 Claims**



1. A platform scale comprising a supporting structure, a platform on the supporting structure for movement relative to the supporting structure in response to a weight placed on the platform,

spring means supporting and connecting the platform to the supporting structure, said spring means permitting both linear and rotational movement of the platform relative to the supporting structure,

a variable capacitor comprising a portion of a substantially spherically convex surface affixed to the platform and having an electrically conductive surface, and adjacent thereto a substantially spherically concave surface affixed to the supporting structure and having an electrically conductive surface in opposition to the convex electrically conductive surface, wherein the center of the convex spherical surface is located substantially at the center of rotation of the platform,

electrical means connected to the variable capacitor, said electrical means configured to sense a changed capacitance in the variable capacitor and in response thereto to provide an electrical output changed in response to the changed capacitance, and

indication means connected to said electrical means and adapted to respond to the changed output with a changed display of information.

4,629,020

STEERABLE DEVICE FOR MOVING TRAILER TYPE VEHICLES

Brian Thurman, Sheffield, England, assignor to Craven Tasker (Sheffield) Limited, England

Filed May 29, 1985, Ser. No. 739,079

Claims priority, application United Kingdom, Apr. 19, 1985, 8510056

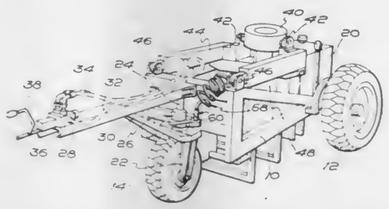
Int. Cl.[4] B62D *51/04*

U.S. Cl. 180—19.2 **3 Claims**

1. A pedestrian controlled steerable device comprising:

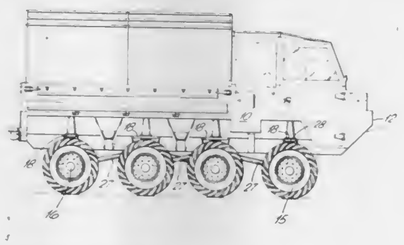
a frame provided with at least three wheels;

an engine;
a lift means for connecting the device to that part of a trailer type vehicle normally connected to the so-called fifth wheel connection of a tractor unit and for supporting the weight of the front end of the trailer, the lift means comprising a bearing sleeve having a central vertical aperture, a carrier, and a trunnion mounting means for trunnion mounting said bearing sleeve to one end of the carrier, the carrier being pivotally connected at its other end to the frame;
at least one hydraulic ram for lifting the carrier relative to the frame so that the aperture in the bearing sleeve is adapted to receive the usual coupling pin of the trailer and the bearing sleeve can then lift the front end of the trailer;
an air compressor driven by the engine;



a flexible connection provided with a quick-release adaptor for coupling the air compressor to the braking system of a trailer type vehicle for releasing its brakes;
a hydraulic pump driven by the engine and delivering oil under pressure to at least one hydraulic motor for driving at least one of the wheels;
a tiller for turning at least one steerable wheel of the at least three wheels;
valve means connected to the free end of the tiller; and
a manually operable lever for opening and closing the valve means to the flow of oil in opposite directions through flow and return pipes extending along the tiller, the lever being operable by a person steering the device to cause the at least one hydraulic motor to be driven in either direction so that the device is power driven in either a forward or reverse direction.

4,629,021
ALL-TERRAIN VEHICLE
Michael Somerton-Rayner, Ludgershall, United Kingdom, assignor to Esarco Limited, United Kingdom
Filed Jan. 30, 1985, Ser. No. 696,466
Int. Cl.[4] B62D *61/10*
U.S. Cl. 180—24 **5 Claims**



1. An all-terrain vehicle comprising:
a chassis;
four road wheel axles equally spaced along the chassis;
suspension means mounting said axles on said chassis;
wheels mounted adjacent both ends of each of said axles, the wheels on the foremost and the rearmost axles being steerably mounted;
propulsion and driving means including a single internal combustion engine and gearbox, and first and second transfer boxes both coupled to be driven by said engine through said gearbox;
said first transfer box driving the first and third axles and said second transfer box driving the second and fourth axles;
means for driving in the alternative all four wheels and only the center two wheels;
power-assisted steering gear means operatively connected to the steerably-mounted wheels of the foremost axle; and
steering coupling means extending between the steerably-mounted wheels on the foremost and rearmost axles so dimensioned that upon steering of the front wheels, the rear wheels perform castoring constrained to a smaller turning angle and a lower rate of angular movement than the front wheels.

4,629,022
HOODSCOOP AND METHOD FOR ATTACHING THE SAME
Mark Wayne, Southfield, Mich., and Terry Rutherford, Chattanooga, Tenn., assignors to Choo Choo Customs, Inc., Chattanooga, Tenn.
Filed May 18, 1984, Ser. No. 611,620
Int. Cl.[4] B62D *25/10*
U.S. Cl. 180—69.22 **14 Claims**

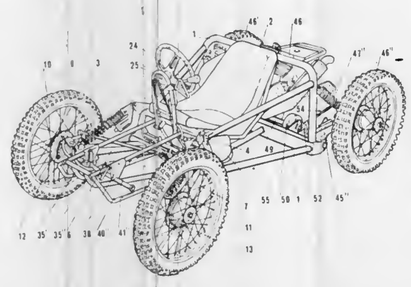


9. A hoodscoop assembly comprising:
a hood;
a hoodscoop disposed on said hood wherein said hoodscoop includes an inwardly disposed recess extending at least a portion about the periphery of said hoodscoop and having a preset depth;
means for reducing noise caused by vibration between said hoodscoop and said hood comprising
a noise-reductive tape, having a thickness and adhesive on both sides thereof, aligned with and disposed between said hood and said recess of said hoodscoop, each of said hood and said hoodscoop being sealingly engaged with said tape; and
means for fastening said hoodscoop to said hood disposed adjacent said tape wherein the thickness of said tape is greater than the depth of said recess so that said tape spaces said hoodscoop upwardly from said hood.

4,629,023
MOTOR VEHICLE, OR 'KART' WITH INDEPENDENT SUSPENSION ON ALL FOUR WHEELS, FOR OFF-HIGHWAY USE
Carlo Carpanelli, and Stefano Serenari, both of Bologna, Italy, assignors to GO PRO S.r.l., Bologna, Italy
Filed Aug. 27, 1985, Ser. No. 770,228
Int. Cl.[4] B62D *63/02, 1/18*; B60G *7/04*
U.S. Cl. 180—72 **6 Claims**

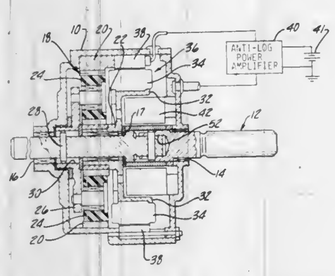
1. A motor vehicle intended for off-highway use comprising:
a rigid chassis and cockpit structure supporting a driver seat;
a pair of front steerable wheels and a pair of rear wheels, each wheel having a brake associated therewith;
a pair of fully independent front and rear suspension links, each suspension link being pivotally connected to said chassis at one end for vertical movement with respect to said chassis and having a respective wheel rotatably mounted at the other end, said suspension links being

overhung forward in the case of the two front steerable wheels and rearward in the case of the two rear wheels;
an engine mounted on a rear portion of said chassis and having and output shaft disposed transversely of said chassis;
a pair of independent transmission links connecting the output shaft to each of said rear wheels;
an upright, arched frame located centrally and forward of said driver seat to which a steering means, including a steering wheel, a gearshift lever, and a clutch lever are mounted;



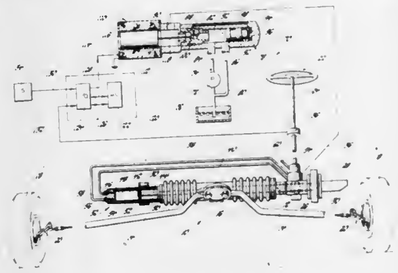
means connecting said front steerable wheels to said steering wheel;
a transverse bar, mounted to a forward portion of said chassis, having a front brake pedal, a rear brake pedal, and an accelerator pedal rotatably mounted thereon;
and flexible cable means operatively connecting said front brake pedal to said brakes associated with said front steerable wheels and said rear brake pedal to said brakes associated with said rear wheels.

4,629,024
ELECTRICAL POWER ASSISTED STEERING SYSTEM
James W. Buike, Union Lake, and Ambrose Tomala, Royal Oak, both of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 491,947, May 5, 1983, Pat. No. 4,530,413. This application Jul. 12, 1985, Ser. No. 754,565
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **31 Claims**



1. An improved electrically assisted power steering system for an automotive vehicle having an input member adapted to be connected to the vehicle's steering wheel, an output member adapted to be connected to the vehicle's steering mechanism, a torsion member connecting the input and output members, a torque sensor generating a torque signal having a first component indicative of the magnitude of the applied torque between the input and output members and a second component indicative of the direction of the applied torque, a power amplifier for activating an electric motor in response to the torque signal, and a gear train connecting the output of the electric motor with the output member, to assist the driver in turning the wheels of the vehicle, said improvement characterized by;
power amplifier means responsive to said first and second components of said torque signal for generating an amplified signal having a magnitude component which varies as a function of the first component and having a direction component indicative of said second component;
a low speed, high torque reversible electric motor for generating a rotary output having magnitude and direction indicative of said amplified signal; and
a gear train having an output to input gear ratio between 1:1 and 14:1 for transmitting the rotary output of the reversible electric motor to the output member.

4,629,025
FLOW REGULATED POWER ASSIST STEERING SYSTEM WITH EVASIVE MANEUVER CAPABILITY
Brian D. Brasier; Kenneth J. Hill, both of Saginaw, and John F. Yonker, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 22, 1985, Ser. No. 693,518
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—142 **8 Claims**



1. In a vehicle steering system including a steerable wheel, a handwheel for transmittting operator exerted steering force to the steerable wheel through a linkage mechanism, hydraulic cylinder means having a variable capacity cavity adapted to be pressurized with hydraulic fluid and an output member for exerting a power assist steering force on said steerable wheel through said linkage mechanism in relation to the fluid pressure in said cavity, a regulatatable flow source of hydraulic fluid, and valving means for directing hydraulic fluid from the source to the hydraulic cylinder cavity in relation to the magnitude and direction of operator exerted steering force such that the power assist steering force exerted by the hydraulic cylinder output member aids the operator exerted steering force, a method of regulating the flow of the source of hydraulic fluid, comprising the steps of:
developing a first flow command for said source in relation to the vehicle speed, such command being relatively high to provide a high level of power assist capability at low vehicle speeds and relatively low to provide a lower level of power assist capability at high vehicle speeds, thereby to effect energy savings and improved drivability at higher vehicle speeds;
developing a second flow command for said source as a function of the flow required to provide said lower level of power assist capability when the capacity of the hydraulic cylinder cavity is increased due to movement of the hydraulic cylinder output member in response to operator exerted steering force;
regulating the flow of the source of hydraulic fluid in accordance with the higher of the first and second flow commands such that the flow is increased from a relatively low vehicle speed related value substantially without

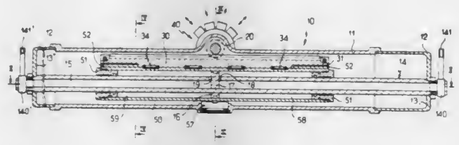
delay to quickly provide power assist capability at a level at least as great as said lower level when the second flow command increases at the onset of an evasive steering maneuver, but is decreased to said vehicle speed related value at a progressive rate when the second flow command decreases at the completion of the evasive maneuver.

4,629,026

COMPACT ASSISTED STEERING MECHANISM FOR A MOTOR VEHICLE

Jorge Estela Rosell, Barcelona, Spain, assignor to Bendiberica, S.A., Barcelona, Spain

Filed Nov. 5, 1984, Ser. No. 668,438
Claims priority, application Spain, Nov. 18, 1983, 527577
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—148 **9 Claims**



1. Assisted steering mechanism for a motor vehicle incorporating:

a fixed steering casing in which a cooperating assembly with a pinion and a rack is arranged, the pinion being intended to be joined to an input control component for controlling input to the mechanism;

an assistance assembly with fluid under pressure incorporating a fixed piston, firmly fixed to the casing by a hollow rod, and a movable cylinder coupled in an elastic manner with the rack and defining first and second pressure chambers on each side of the piston; and

distribution valve means capable of being actuated by the input control component so as to supply the first and second chambers selectively with fluid under pressure via fluid passages arranged in the hollow rod;

characterized in that the casing has a general tubular configuration with opposite end walls, the hollow rod being situated in the casing between the end walls, the rack being elastically mounted on the movable cylinder and incorporated in the casing;

the mechanism including an elastic support between the rack and the movable cylinder;

the rack being held at its ends by arches firmly fixed to the movable cylinder; and

each end of the rack including convex lateral walls and entering into a portion forming a channel of the arches.

4,629,027

AUTOMATIC SPEED CONTROLLER FOR USE OF A VEHICLE

Hiromichi Shigenobu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 10, 1985, Ser. No. 690,204
Claims priority, application Japan, Jan. 16, 1984, 59-6169
Int. Cl.[4] B60K *31/00*
U.S. Cl. 180—176 **20 Claims**

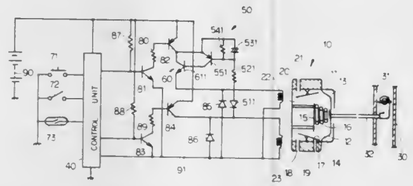
1. An automatic speed controller for use in a vehicle, which maintains an actual vehicle speed at a vehicle speed preset by an operator, comprising:

a throttle means for controlling an amount of fuel supplied to an engine;

an actuation means connected with the throttle means to actuate the throttle means, the actuation means including a first and a second valve means;

a control means for controlling the actuation means according to a difference between an actual vehicle speed and a preset vehicle speed and for adjusting the actual vehicle speed so that it approaches the preset vehicle speed, said control means including a first valve actuating means for actuating said first valve and a second valve actuating means for actuating said second valve, said control means periodically outputting a first signal to said first valve actuating means and continuously outputting a second signal to said second valve actuating means, whereby during regular operation of said control means said first valve actuating means receives said first signal, said first valve means being periodically actuated and said second valve actuating means receives said second signal, said second valve means being continuously actuated;

a detection means for receiving said first signal from said control means and for detecting if the control means is operating regularly, said detection means including a condensor means which is electrically connected to said first valve actuating means, whereby when said detection means receives said first signal, said condensor means is periodically charged and discharged and the detection



means determines that the control means is operating regularly, and when the detection means does not receive said first signal, said condensor means is not periodically charged and discharged and the detection means determines that the control means is not operating regularly, said detection means outputting a detect signal when said condensor means is not periodically charged and discharged; and

a cancel means for receiving said detect signal from said detect means and for cancelling said control of said actuation means by said control means when the detection means determines that the control means is not operating regularly, said cancel means being electrically connected to the detection means and said second valve actuating means, whereby when said cancel means receives said detect signal, said cancel means outputs a cancel signal to said second valve actuating means which does not actuate said second valve means, said non-actuating of said second valve means preventing said actuation means from actuating said throttle means.

4,629,028

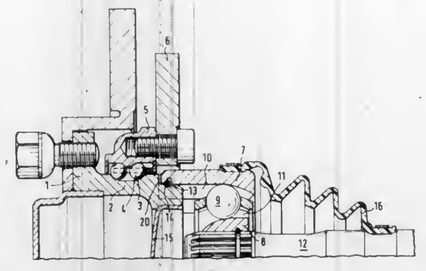
WHEEL ASSEMBLY WITH UNIVERSAL JOINT DRIVE

Werner Krude, Siegburg-Kaldauen, and Alfons Jordan, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,164
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132364
Int. Cl.[4] B60K *17/24*
U.S. Cl. 180—259 **4 Claims**

1. A wheel assembly for a motor vehicle comprising: a bearing assembly including an inner bearing ring and means for rotatively supporting a wheel; a universal joint including an outer joint member for driving said wheel; said inner bearing ring being fitted in rotative driving engagement within said outer joint member with an outer circumferential portion of said inner bearing ring being formed with a configuration generally corresponding with the configuration of an inner contour of said outer joint member to establish a form-fitted

connection therebetween providing rotative driving engagement in the circumferential direction; and securing means for



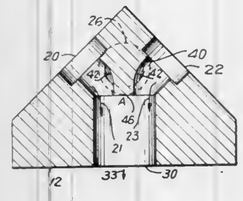
maintaining said inner bearing ring and said outer joint member axially fixed relative to each other.

4,629,029

MULTIPLE DRIVER MANIFOLD

David W. Gunness, Niles, Mich., assignor to Electro-Voice, Inc., Buchanan, Mich.

Filed Nov. 15, 1985, Ser. No. 798,794
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—144 **20 Claims**



1. A manifold for combining the outputs of a plurality of acoustic drivers, comprising:

a manifold housing having a plurality of entry ports for receiving sound from said drivers, and also having onlu one exit port for radiating sound generally axially through said only exit port, said housing having internal paths for directing sound from each of said entry ports to said exit port, a first pair of said entry ports having their respective axial sound-radiating directions substantially aimed at one another along a line generally perpendicular to the axial sound-radiating direction of the single exit port, the paths for the first pair of entry ports being partially defined by a sound reflecting plug within the housing interior.

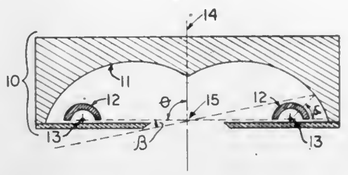
4,629,030

PHASE COHERENT ACOUSTIC TRANSDUCER

Michael W. Ferralli, 10580 East Lake Rd., North East, Pa. 16428

Filed Apr. 25, 1985, Ser. No. 727,014
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—155 **14 Claims**

1. An enclosure which comprises an acoustically reflective shell wherein said shell comprises at least a section that forms an elliptical structure that generates a continuum of ellipses when rotated about a straight line which lies in a plane of the elliptical structure, contains one focal point of the elliptical structure, and is oriented at any finite angle ϕ to the major axis of the elliptical structure, such that the resultant surface is that of a continuum of elliptical structures rotated about a focal point common to all the elliptical structures, but above said surface, being referred to as the common focal point, and such that the other focal points of the elliptical structure, being distinct from one another, form a curve, said curve being referred to as a distinct focal curve, and such that a single acoustic transducer may be located about this distinct focal curve so that acoustic radiation produced therefrom travels the



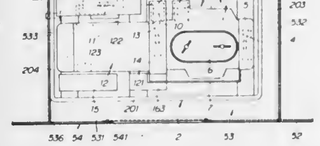
same pathlength from said transducer to the acoustically reflective shell and thence to the common focal point, and such that acoustical radiation emanating from said transducer, being in phase, arrives at the common focal point in phase.

4,629,031

SOUNDPROOF ENGINE-OPERATED MACHINE

Shoichi Kato, and Teisuke Tsukamoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,653
Claims priority, application Japan, Aug. 24, 1984, 59-128313[U]; Aug. 30, 1984, 59-131653[U]
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—204 **10 Claims**



1. A soundproof engine-operated machine comprising:

a floor having first and second air discharge holes;

a plurality of wall members cooperating with said floor in defining a container, one of said wall members having an air inlet for introducing air into said container;

a water-cooled engine disposed in said container;

a first cooling fn disposed in said container in front of said engine for delivering air from said air inlet toward said engine to cool said engine;

a machine unit disposed in said container operable by said water-cooled engine;

a radiator attached to said engine within said container;

a second cooling fan disposed in said container in front of said radiator for drawing air from behind said radiator therethrough;

an exhaust pipe connected to said engine and extending below said floor;

a muffler connected to a downstream portion of said exhaust pipe and disposed below said floor;

first means for guiding air from said engine around said exhaust pipe to cool said exhaust pipe and for discharging the air through said first air discharge hole; and

second means for discharging air from said radiator through said second air discharge hole to cool said muffler positioned below said second air discharge hole.

4,629,032

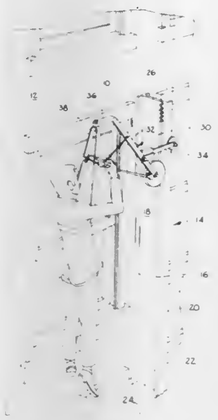
BUILDING WALL DESCENT DEVICE HAVING A MANUALLY OPERATED BRAKE MEANS

James A. Armstrong, 2055 Mills Ave., Cincinnati, Ohio 45212

Continuation-in-part of Ser. No. 534,307, Sep. 21, 1983, Pat. No. 4,520,895. This application Jun. 3, 1985, Ser. No. 740,314

Int. Cl.[4] A62B *1/20*

U.S. Cl. 182—9 **21 Claims**



1. Apparatus for descending in a controlled fashion along an exterior building wall having a vertical extending beam, provided with a longitudinal rack edge and a longitudinal smooth edge, said apparatus comprising: a support structure; a roller rotatably secured on said support structure, said roller designed to engage said smooth edge of said beam; a pinion gear rotatably secured to said support structure and designed to contact said rack edge of said beam; a brake means attached to said support structure for controlling the speed of rotation of said pinion gear, thereby controlling the rate of descent; and a sling means attached to said support structure for supporting the user; wherein said support structure includes an elongated bar, said pinion gear being rotatably mounted on said elongated bar by means of a shaft extending laterally from one end of said bar.

4,629,033

POSITIVE DISPLACEMENT PUMP UTILIZED IN LUBE OIL SYSTEM FOR TURBOMACHINERY

James H. Moore; Sidney J. Woodcock, both of Schenectady, and Charles R. Dumas, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,764

Int. Cl.[4] F01D *25/20;* **F01M** *1/02*

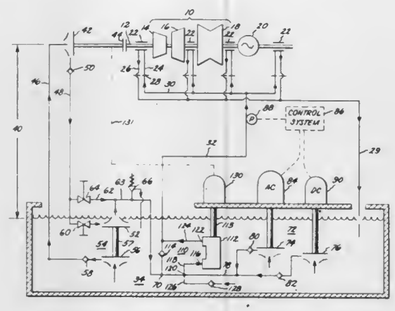
U.S. Cl. 184—6.3 **12 Claims**

1. In combination with a turbomachine having a central rotatable shaft and primary lubrication means having an output coupled to a supply line, the primary lubrication means for pumping lubricating oil from an oil reservoir against a predetermined head through the supply line to a plurality of bearings, the plurality of bearings for supporting and positioning said shaft, said primary lubrication means coupled to said shaft and for pumping oil against said predetermined head only when the rotational speed of said shaft exceeds a predetermined value, secondary lubrication means comprising:

a first check valve coupled to said supply line downstream the output of the primary lubrication means, the first check valve for preventing oil from flowing from said supply line into said oil reservoir;

a positive displacement pump having an oil input and an oil output fluidly connected to said supply line upstream and downsteam of said first check valve, respectively, whereby the combination of said first check valve and said positive displacement pump is disposed in series with the output of said primary lubrication means, such that oil from the output of said primary lubrication means flows through said first check valve and said positive displacement pump;

supply means fluidically coupled to the supply line between the output of the primary lubrication means and the oil input of the positive displacemenet pump and further fluidically coupled to the oil reservoir, the supply means



for permitting the drawing of oil from said oil reservoir into said supply line while prohibiting flow of oil through said supply means into said reservoir; and

driving means coupled to said shaft and to said positive displacement pump for operating said positive displacement pump whenever the shaft is rotating, whereby said positive displacement pump maintains a flow of oil to said plurality of bearings substantially proportional to the rotational speed of said shaft during all operating phases of said turbomachine.

4,629,034

ELEVATOR CONTROL APPARATUS

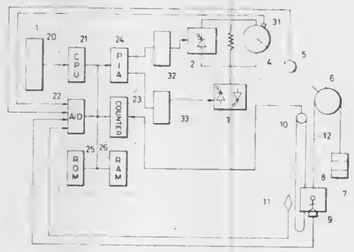
Hiromi Inaba, Katsuta; Hajime Nakashima, Hitachi; Hisakatsu Kiwaki, Katsuta; Akiteru Ueda, Toukai; Takeki Ando, Naka; Toshiaki Kurosawa, Katsuta, and Yoshio Sakai, Naka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,640

Claims priority, application Japan, Jul. 4, 1983, 58-121797

Int. Cl.[4] B66B *1/30*

U.S. Cl. 187—29 R **18 Claims**



1. An elevator control apparatus comprising:

a motor for driving an elevator cage which serves a plurality of floors;

torque adjusting means for varying the torque produced by said motor in accordance with a control command based on the difference between a velocity command and an actual velocity of the elevator cage, the velocity command being used to control the stopping of the elevator

cage over an entire time interval measured from a fixed time reference;

elevator supervisory means for observing generation of calls in the floors and the elevator cage to furnish a start command and to schedule a stopping floor in response to the observed call;

sensing means provided for detection of floor arrival control error fluctuating factors affecting the floor arrival control of the elevator cage; and

motor control means receiving the start command, information of the scheduled stopping floor and output of said sensing means and providing the control command to said torque adjusting means, said motor control means having a processing unit and a memory unit for storing a program to control the operation of the processing unit and one or more of control values and control element constants, in which

the memory unit stores a correction magnitude for modifying the control command in accordance with the floor arrival control error in the form of a correction magnitude table in which the floor arrival control error fluctuating factors are made parameters, and

the processing unit is programmed to execute the following steps:

(a) after appearance of the start command, taking in the predetermined floor arrival control error fluctuating factors from said sensing means;

(b) reading out the correction magnitude from an area of the correction magnitude table designated by the sensed floor arrival control error fluctuating factors as the parameters and generating the control command modified by the read-out correction magnitude;

(c) providing the modified control command to said torque adjusting means;

(d) on the basis of observation of the travel of the elevator cage, returning to the step (b) to repeat the above mentioned operation during the travel of the elevator cage and advancing to the next step (e) when the elevator cage stops;

(e) detecting the floor arrival control error resulting from the travel of the elevator cage;

(f) obtaining a renewed correction magnitude by amending, on the basis of the detected floor arrival control error, the correction magnitude which has been used in modification of the control command for the travel of the elevator cage of the present time; and

(g) rewriting the content of the area of the correction magnitude table designated in the step (b) by means of the renewed correction magnitude.

4,629,035

SPEED CONTROL APPARATUS FOR ELEVATOR

Tooru Tanahashi, Gifu; Toshiaki Ishii, Ichinomiya, and Shuzo Mitsui, Fujinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

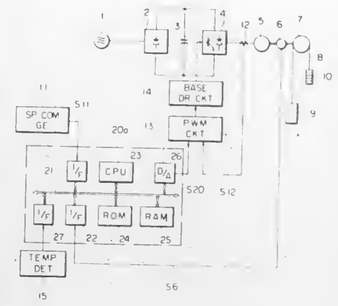
Filed Apr. 24, 1985, Ser. No. 726,772

Claims priority, application Japan, May 2, 1984, 59-88637

Int. Cl.[4] B66B *1/30*

U.S. Cl. 187—29 R **8 Claims**

1. In a speed control apparatus for an elevator having an inverter which supplies alternating current to an induction motor for driving a cage of the elevator, a current command calculating portion which calculates using a speed command and a speed detection signal of the induction motor and a resistance value signal of a rotor of the induction motor, to evaluate an instantaneous current command of the induction motor, and a pulse width modulation circuit which subjects the inverter to a pulse width modulation control by the use of the instantaneous current command of the current command calculating portion and an output current detection signal of the inverter; a speed control apparatus for an elevator comprising a temperature detector which detects an ambient temperature of the induction motor, and a resistance value calculating portion which calculates a resistance value of the rotor by the use of the temperature detection signal of said temperature detector and which supplies the calculated resistance value to



said current command calculating portion in order to evaluate the instantaneous current command.

4,629,036

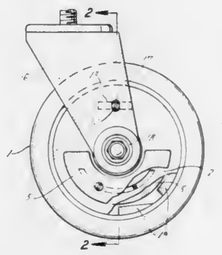
SHOPPING CART BRAKING WHEEL

Kim L. Choy, 735 28th Ave., San Mateo, Calif. 94403

Filed Aug. 13, 1984, Ser. No. 639,736

Int. Cl.[4] F16D *51/00*

U.S. Cl. 188—1.12 **12 Claims**



4. A wheel structure comprising:

a. an axle received by a mount;

c. a circular member having a concentric circular recess therein rotatably attached to said axle;

d. a circular insert, having a plurality of spaced teeth disposed radially inwardly, adapted for insertion into said recess;

e. a means for engaging said circular insert, comprising a first elongated member disposed for slidably engaging said mount, and a second elongated member fixedly attached to the first and disposed generally horizontally and transverse of said axle, having ends which are smaller than the space between said teeth and which conform to the shape of said teeth for releasably engaging the same.

4,629,037

SELF-RETRACTING BRAKE PAD ASSEMBLY FOR SPOT TYPE DISC BRAKES

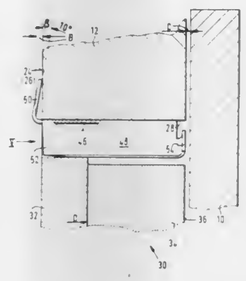
Hans-Georg Madzgalla, Koblenz, and Christian L. Schroeter, Sinzig, both of Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England

Filed Sep. 17, 1984, Ser. No. 651,331

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 8327272[U]

Int. Cl.⁴ F16D *55/02*

U.S. Cl. 188—71.8 **9 Claims**



1. A self-retracting brake pad assembly for spot type disc brakes, comprising

a brake surface adapted to be engaged with a brake disc,

a pair of lateral faces each having at least a portion engageable with brake carrier to transmit braking forces,

a recess in each of said lateral faces,

a pair of guide members each received in one of the recesses, and

a return spring connected to each guide member,

said recesses being located close to the middle of each of the two lateral faces,

each of said return springs comprising a spring arm which protrudes laterally from one end of each guide member for-engagement with a delimiting surface on the side of said carrier remote from said disc, said arms being elastically deformable upon limited movement of said guide member into a final position by an extent determining the brake clearance, and the guide members are frictionally received within the respective recesses and said receses are displaceable on the guide members in a direction normal to the brake surface only when overcoming frictional resistance greater than the return force of the corresponding spring arm in its final position.

4,629,038

DISC BRAKE WITH AUTOMATIC ADJUSTMENT

Pierre Pressaco, La Courneuve, and Jean-Paul Sauvee, Aubervilliers, both of France, assignors to Societe Anonyme D.B.A., Paris, France

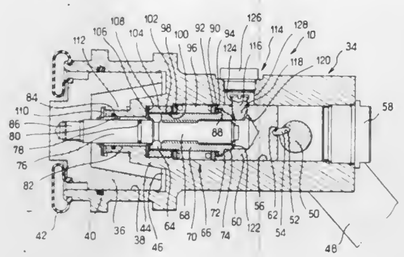
Filed May 15, 1985, Ser. No. 734,632

Claims priority, application France, May 23, 1984, 84 08052

Int. Cl.⁴ F16D *55/02*

U.S. Cl. 188—71.9 **9 Claims**

1. A disc brake with automatic adjustment of the type incorporating a caliper mounted to slide on a fixed support by means of at least one axial pillar, a brake actuator acting directly upon a first friction component and by reaction through the caliper upon a second friction component, the brake actuator including a mechanical control acting upon a hydraulic piston through an automatic adjustment device, the adjustment device formed by a screw-and-nut system having a pitch allowing reverse action and which is capable of being actuated by the hydraulic piston beyond a predetermined travel of the hydraulic piston, the adjustment device including a sleeve fixed firmly in rotation to the nut and cooperating with an annular control piston capable of moving in sealed manner relative to the screw and relative to the brake actuator, the control piston immobilizing the sleeve in rotation and in translation when hydraulic pressure acting upon the hydraulic piston reaches a predetermined pressure, characterized in that the screw-and-nut system is positioned between the mechanical control and the control piston and the brake actuator includes a device for manually resetting to zero which is capable of acting upon the nut of the screw-and-nut system in order to reset the automatic adjustment device to zero, the control piston separating in sealed manner a control chamber, into which the hydraulic pressure is admitted, from an intermediate chamber in which the screw-and-nut system is housed.



4,629,039

VEHICLE BRAKING CONTROL APPARATUS

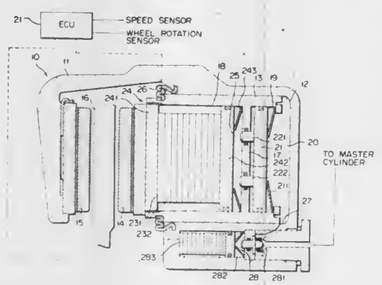
Yuzo Imoto, Kariya; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Okazaki, and Taro Tanaka, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd, Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Jan. 3, 1986, Ser. No. 816,051

Claims priority, application Japan, Jan. 17, 1985, 60-5041; Jan. 21, 1985, 60-7456; Jan. 21, 1985, 60-7457

Int. Cl.⁴ B60T *8/02;* **F16D** *55/08*

U.S. Cl. 188—72.1 **19 Claims**



1. A vehicle braking control apparatus, comprising:

a wheel cylinder, which is formed in a brake caliper and is provided for each wheel, and to which a fluid is supplied to exert a braking force;

a brake piston movably provided in and coaxial with said wheel cylinder to exert a braking force on the wheel in response to the pressure of the fluid in said wheel cylinder;

a control cylinder positioned coaxial with said brake piston;

a piezoelectric piston device, which is provided in said control cylinder and includes a plurality of laminated thin-plate piezoelectric elements, and which is expanded and contracted by the supply of voltage;

a hydraulic chamber, which is formed in said control cylinder by partitioning said control cylinder with said piezoelectric piston device, and the pressure which corresponds to the expansion and contraction of said piezoelectric piston device;

a displacement amplifying mechanism, which amplifies the expansion and contraction of said piezoelectric piston device in response to changes in the fluid pressure in said hydraulic chamber generated by the expansion and contraction of said piezoelectric piston device; and

a displacement member, which is driven by said displacement amplifying mechanism in response to changes in pressure in said hydraulic chamber to vary the braking force of said brake piston by the amount of movement of said displacement member.

4,629,040

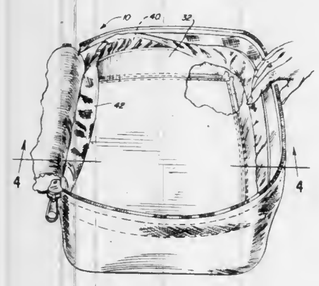
SOFT SADDLE BAG WITH RIGID REINFORCING INSERT

William L. Jones, Philo, Ill., assignor to Vetter Products, Inc., Rantoul, Ill.

Filed Sep. 12, 1984, Ser. No. 649,700

Int. Cl.⁴ A45C *13/00*

U.S. Cl. 190—102 **12 Claims**



1. A retainer for a substantially rigid insert in a luggage shell, said luggage shell having a bottom surface and a continuous inside surface defining storage space in conjunction with the bottom surface, said insert abutting the bottom surface with the insert in place in the shell and having a wall with an edge adjacent the wall surface, said retainer comprising:

a flexible strip; and

means mounting the strip on the wall surface so that the strip is biased against the wall surface with the insert in a first position and thereby maintains the insert in the shell and for twisting movement of the strip back and forth between the first position and a second position wherein the retainer is spaced away from the edge of the insert so that the insert can be placed in and removed from the luggage shell without deforming the insert.

4,629,041

ELECTRONMAGNETICALLY OPERATED FREE-WHEEL CONTROL DEVICE RESPONSIVE TO A BRAKE CONTROL AND TO A HIGH SPEED DETECTING MEANS TO PROVIDE A FREE-WHEEL OVERRIDE FUNCTION

André15 rue de Gastines Malherbe, Cedex 628, F-41500 Suevres, France

PCT No. PCT/FR83/00024, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO83/02985, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 4, 1983, Ser. No. 596,466

Claims priority, application France, Feb. 23, 1982, 82 02940

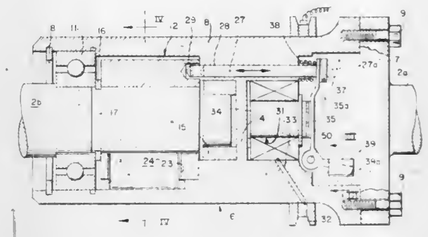
Int. Cl.⁴ B60K *41/20*

U.S. Cl. 192—2 **11 Claims**

1. A free-wheel control device for coupling a driven shaft and a driving shaft of a transmission for a vehicle having brake means for braking the vehicle and means for accelerating the vehicle, said control device comprising:

means for coupling the driving shaft to the driven shaft to drive the driven shaft in both a forward rotational direction and a backward rotational direction;

means, coupled to the brake means and to the acceleration means and responsive thereto, for uncoupling the driven and driving shafts from one another to permit free-wheeling of the driven shaft during a condition of a non-actuation of the brake means or actuation of the acceleration means; and



means for overriding the uncoupling means and for recoupling the driven and driving shafts to one another when the driven shaft exceeds a predetermined forward rotational speed or when the brake means are operated or when the driven shaft is driven in the backward rotational direction.

4,629,042

DRIVE ARRANGEMENT FOR A MOTOR VEHICLE

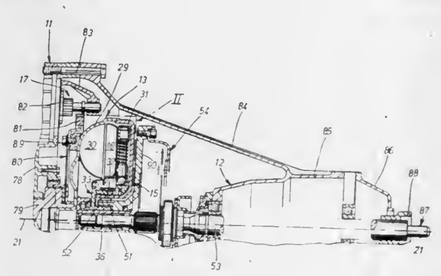
Hermann Gaus, Stuttgart; Gunter Jürgens, Waiblingen; Eberhard Frötschner, Gerlingen, and Winfried Rüb, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,513

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409692

Int. Cl.⁴ F16H *45/02*

U.S. Cl. 192—3.25 **28 Claims**



1. A drive arrangement for a motor vehicle having a hydrodynamic torque converter installed in a torque transmission path between a drive engine and a hand shift gearbox, said torque converter having a pump impeller and a turbine wheel arranged for relative rotation around a common axis and stop clutch means operating as a function of a rotational speed of said pump impeller and said turbine wheel for preventing relative rotation of said pump impeller and said turbine wheel, said stop clutch means comprising:

first seating means attached to said turbine wheel,

second seating means attached to said pump impeller, said second seating means being radially disposed between said common axis and said first seating means, and

flyweight means interlocking said first and second seating means when said turbine wheel and said pump impeller are at rest, said flyweight means moving radially outward into said first seating means for unlocking said first and

second seating means when said rotational speed reaches a preselected value.

4,629,043

ELECTRIC PARKING BRAKE SYSTEM FOR A VEHICLE

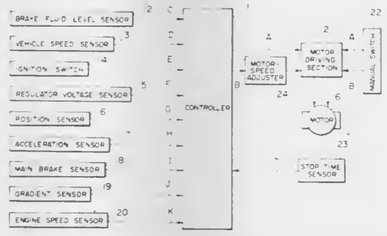
Masayoshi Matsuo; Kazuhiro Takagishi; Kouji Tobita, and Yukihiro Kanemaru, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 31, 1984, Ser. No. 575,663

Claims priority, application Japan, Jan. 31, 1983, 58-14755; Feb. 5, 1983, 58-17776; Feb. 5, 1983, 58-17777; Feb. 5, 1983, 58-17778; Feb. 9, 1983, 58-20363

Int. Cl.⁴ B60K *41/28*

U.S. Cl. 192—4 A **18 Claims**



1. An electric parking brake system for a vehicle comprising in combination:

a parking brake installed on a vehicle;

an electromagnetic means for controlling application and release of said parking brake;

a gradient sensor adapted to detect the gradient of the road on which the vehicle rests for sending out a signal indicative of the gradient detected;

a condition sensor adapted to detect the operating condition of the vehicle; and

a controller adapted to receive the signals from said condition sensor and said gradient sensor and to alternatively feed a brake-application command signal and a brake-release command to said electromagnetic means in accordance with the operating condition of the vehicle, at least one of the brake-applying operation and the brake-releasing operation of said electromagnetic means being variably controlled by said controller in accordance with the signal from said gradient sensor.

4,629,044

CLUTCH MECHANISM COMPRISING A FREEWHEELING UNIT DISENGAGEABLE IN THE DRIVING DIRECTION

Alexander Post, Neunkirchen; Clemens Nienhaus, and Klaus Kämpf, both of Lohmar, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH

Filed Nov. 8, 1985, Ser. No. 796,593

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447279; Aug. 9, 1985, 3528591

Int. Cl.⁴ F16D *41/02*

U.S. Cl. 192—28 **8 Claims**

1. A clutch mechanism having a freewheeling unit capable of disengagement in a driving direction thereof for freewheeling operation comprising:

a clutch hub having recesses formed therein;

a clutch sleeve having radial apertures circumferentially spaced thereabout corresponding to said recesses in said hub;

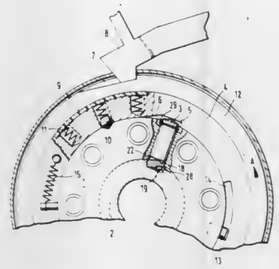
movable control pins received in said radial apertures;

locking catches in said recesses resiliently urging said control pins radially outwardly for effecting torque transmitting engagement between said clutch hub and said clutch sleeve;

first stop means limiting radially inwardly directed movement of said control pins;

a control ring having recesses formed therein and inclined faces and rotatably held on said clutch sleeve, said control pins being resilient used by said locking catches radially outwardly to engage in said recesses in said control ring in a torque transmitting position;

second stop means interposed between said clutch sleeve and said control ring limiting relative angular movement therebetween;



spring means acting in the circumferential direction interposed between said clutch sleeve and said control ring applying a spring force to hold said recesses in said control ring and said control pins in positions corresponding to each other; and

a retaining device adapted to hold said control ring against the force of said spring means to move said control pins radially inwardly against said locking catches to effect freewheeling operation.

4,629,045

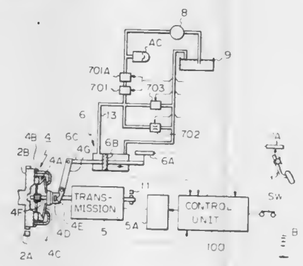
AUTOMATIC CLUTCH CONTROL SYSTEM

Hitoshi Kasai, Kawasaki; Noriaki Ogawa, Tokyo; Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa, and Makoto Uriuhara, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki and Isuzu Motors Limited, Tokyo, both of, Japan

Filed Nov. 26, 1984, Ser. No. 674,832

Int. Cl.⁴ B60K *41/28*

U.S. Cl. 192—0.052 **5 Claims**



1. An automatic clutch control system, comprising:

a clutch having a full clutch engagement point and a clutch contact point;

a clutch actuator for controlling a clutch stroke;

a plurality of solenoid valves for controlling said clutch actuator;

clutch stroke sensor means for measuring said clutch stroke and for detecting the full clutch engagement point and the clutch contact point in said clutch stroke;

control means, for feeding back a stroke signal detected by said clutch stroke sensor and for controlling the solenoid valves to control clutch engagement and disengagement, including learning control means, for storing the full clutch engagement point upon saturation of the stroke signal in a clutch engagement operation and storing a clutch contact point upon start of rotation of a transmission input shaft in a clutch engagement operation following a clutch disengagement operation and for judging a clutch operation range, for control of clutch engagement and disengagement, based on the full clutch engagement point and the clutch contact point.

4,629,046

FLUID FRICTION CLUTCH

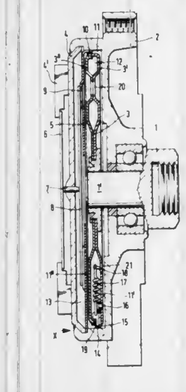
Hans Martin, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,553

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321616

Int. Cl.⁴ F16D *31/00*

U.S. Cl. 192—58 B **15 Claims**



1. A fluid friction clutch controlled as a function of temperature and rotational speed, comprising:

a driving primary member comprising a hollow drive disk and a drive member, said drive disk comprising a first reservoir chamber and an overflow orifice, said orifice positioned on the circumferential surface of said drive disk;

a driven secondary member surrounding said primary member and comprising a partition which defines a second reservoir chamber;

a working chamber disposed between said primary and secondary members, comprising pump means for controlling the flow of working fluid from said working chamber to said second reservoir;

a centrifugally actuated retaining body for regulating flow of a working fluid, and for directing the working fluid into the first reservoir chamber, wherein the retaining body is radially displaceable within the overflow orifice between a first position within said first reservoir chamber and a second position within said working chamber; and

valve means, located in said partition and being responsive to temperature, for controlling the flow of working fluid between said second reservoir chamber and said working chamber.

4,629,047

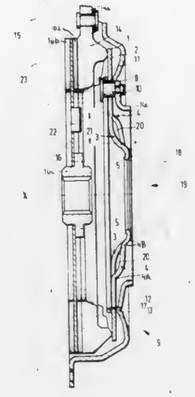
FRICTION CLUTCH AND AIR-FLOW PROMOTING DIAPHRAGM SPRING THEREFOR

Phong Lu, Wooster, Ohio, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,783

Int. Cl.⁴ F16D *13/44, 13/72*

U.S. Cl. 192—70.12 **28 Claims**



16. A friction clutch comprising a cover; a pair of spaced apart substantially annular seats on said cover; a diaphragm spring disposed between said seats and including an outer marginal portion disposed radially outwardly of said seats, an annulus of prongs having tips located radially inwardly of said seats and disposed at least substantially at the same level, as considered axially of the spring, and open slots alternating with said prongs and extending radially inwardly from said outer marginal portion, said prongs having intermediate portions disposed radially inwardly of said seats and radially outwardly of the respective tips, the intermediate portion of at least one of said prongs being axially offset in a single direction with reference to the intermediate portion of at least one neighboring prong; a pressure plate having a portion adjacent to the outer marginal portion of said spring; and release means movable axially of said spring to pivot the spring between said seats through the medium of said tips.

4,629,048

FRICTION CLUTCHES

Colin R. Draper, Leamington Spa; Steven Trotman, Snitterfield; Christopher M. Bowden, Leamington Spa, and Keith A. Turfrey, Kenilworth, all of England, assignors to Automotive Products plc, Leamington Spa, England

Continuation of Ser. No. 571,726, Jan. 18, 1984, abandoned. This application Jan. 14, 1986, Ser. No. 818,893

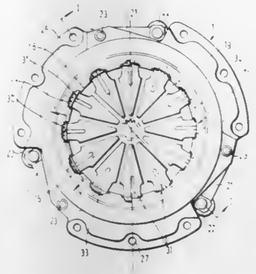
Claims priority, application United Kingdom, Jan. 19, 1983, 8301426

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—70.27 **3 Claims**

1. A friction clutch comprising a cover member, a pressure plate mounted with respect to the cover member and a diaphragm spring operative between the cover member and the pressure plate and arranged to urge the pressure plate towards and into frictional engagement with a driven plate, the diaphragm spring having an outer belville portion and fingers having outer and inner parts projecting inwardly from the belville portion and joined thereto by portions thereof defined as roots, an annular fulcrum line being defined on said diaphragm spring near the root of the fingers, mounting apertures for mounting said diaphragm spring to said cover defined between adjacent fingers adjacent the roots thereof, said apertures defining narrow root portions of said fingers therebe-

tween a continuous annular fulcrum ring pivotally mounting said diaphragm spring about its annular fulcrum line to said cover, said spring further comprising stiffening ribs extending



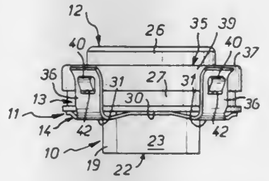
along the outer part of the fingers including said narrow root portions and extending across the fulcrum line, and the fulcrum ring for the spring comprising raised bridge portions providing clearance for the ribs at their intersection with the fulcrum line.

4,629,049

SUSTAINED SELF-CENTERING CLUTCH RELEASE BEARING FOR MOTOR VEHICLES

Philippe Lassiaz, Boulogne, France, assignor to Valeo, Paris, France

Filed Aug. 1, 1983, Ser. No. 519,199
Claims priority, application France, Aug. 3, 1982, 82 13557
Int. Cl.⁴ F16D *23/14*
U.S. Cl. 192—98 **9 Claims**



1. A self-centering clutch release bearing for sustained alignment for use with an automotive clutch; said clutch release bearing comprising an operating member, an annular bearing plate effectively bearing axially against the operating member for cooperation with an actuating member, a drive member adapted to coact with clutch release members, said drive member being mounted for limited transverse movement relative to said operating member, axial tabs joined to said annular bearing plate for securing said drive member axially to said operating member under the bias of axially acting resilient means, said axially acting resilient means being an integral part of said annular bearing plate, said annular bearing plate comprising at least one substantially planar bearing portion and said axially acting resilient means comprising at least one resilient portion of said annular bearing plate circumferentially spaced from said bearing portion.

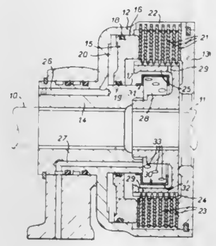
4,629,050

MULTIDISK CLUTCH FEATURING IMPROVED LUBRICATION AND COOLING

Carlo Valier, Pino Torinese, Italy, assignor to Valeo, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,480
Claims priority, application France, Dec. 27, 1983, 83 20828
Int. Cl.⁴ F16D *13/74*
U.S. Cl. 192—113 B **11 Claims**

1. Multidisk clutch comprising an external bell member adapted to be coupled to a driving shaft, an internal ring member concentric with said bell member and being adapted to be coupled to a driven shaft, a plurality of disk members disposed between said bell member and said ring member with certain of said disk members being constrained to rotate with said bell member and the remainder of said disk members being constrained to rotate with said ring member, liquid feed means adapted to feed a lubricating and cooling liquid into the interior of said ring member, a plurality of holes in said ring member for supplying said liquid to said disks, and a generally annular scoop member separate and distinct from and rotatably



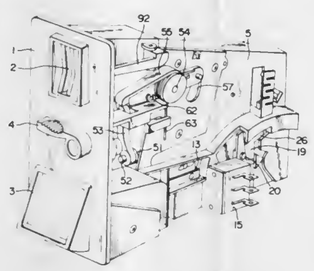
disposed within said ring member, said scoop member being constrained to rotate with a driving shaft relative to said ring member when said clutch is disengaged, said scoop member having a cylindrical peripheral wall disposed between said liquid feed means and said ring member, said peripheral wall having a dimension in the axial direction of the same order of magnitude as that of said ring member, and said peripheral wall having passages in it whereby liquid from said liquid feed means is fed centrifugally to said disk members via said holes in said ring member.

4,629,051

COIN SORTING DEVICE

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,758
Claims priority, application Japan, Mar. 3, 1984, 59-30109[U]; Mar. 3, 1984, 59-30110[U]; May 29, 1984, 59-107529; Jun. 7, 1984, 59-83645[U]; Oct. 2, 1984, 59-205613; Oct. 2, 1984, 59-148524[U]; Oct. 2, 1984, 59-148525[U]
Int. Cl.⁴ G07F *5/02, 3/02*; G07D *5/02, 5/10*
U.S. Cl. 194—261 **13 Claims**



1. A coin sorting device comprising:
a front plate provided with an opening for inserting a coin, a returning lever and a return opening;
a coin sorting passage defined between a stationary side plate and a movable side plate openably connected to the stationary side plate for receiving coins inserted through the coin inserting opening;
a coin diameter sorting cradle rotatably and removably supported on a pivot pin on one of the side plates of the coin sorting passage;

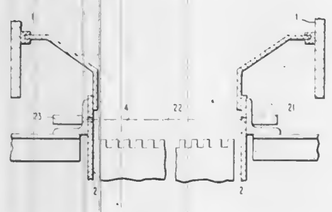
means arranged along the coin sorting passage for sorting the coins by their material;
a coin acceptance chute and a coin return chute defined between two chute side plates and bifurcating an outlet of the coin sorting passage;
a microswitch having a microswitch actuating arm extending into a lower end of the coin acceptance chute for producing a coin acceptance signal; and
a cancel mechanism including the returning lever and means for returning a non-acceptable coin from the coin sorting passage to the return chute;
the coin returning means having:
a transmitting lever pivoted at a midpoint pivot pin to the stationary side plate, the transmitting lever being provided at a first free end with a cancel pin; and
an interlocking lever mechanism for transmitting a vertically upward pushing force to a second free end of the transmitting lever by the rotational movement of the returning lever about its shaft;
the interlocking lever mechanism including;
a crank arm secured to an end portion of the returning lever shaft, a cancel slider being connected at its lower end to a crank pin on the crank arm and being engaged at its top end with a lower surface of the second free end of the transmitting lever; and
a returning spring for applying a downward pushing force to said second free end of the transmitting lever.

4,629,052

ESCALATOR WARNING SYSTEM

Shigeharu Kitamura, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 773,920
Claims priority, application Japan, Jan. 22, 1985, 60-9401
Int. Cl.⁴ B65G *43/00*
U.S. Cl. 198—323 **7 Claims**



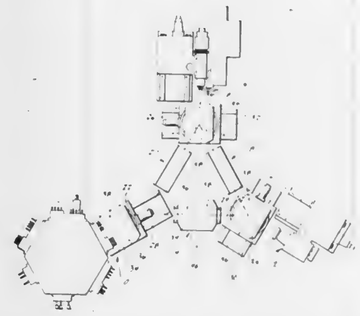
1. In a passenger escalator system including a driven chain (3) of steps (4) traversing a path including an inclined run flanked by upper and lower horizontal runs, each step including a horizontally maintained tread plate (5) and a generally vertically oriented riser plate (6) depending downwardly from a front edge thereof and slidable relative to a rear edge of a next adjacent tread plate as the chain of steps passes through transition zones between inclined and horizontal runs, means for alerting a passenger to a potentially hazardous disposition of a foot or passenger borne object too close to a riser plate, comprising:
(a) means (21) fixedly disposed at one side of the inclined run of the chain of steps for projecting an energy beam (22) transversely across the chain of steps, said projecting means being positioned such that the beam is repeatedly blocked by the moving steps, and when unblocked extends through a danger zone proximate apices of tread plate rear edges and adjacent riser plate lower edges,
(b) means (23) fixedly disposed at another, opposite side of the chain of steps for detecting the energy beam and generating a regular periodic pulse train in response to the blocking and unblocking of the beam by the moving steps,
(c) circuit means responsive to the pulse train for sensing a discontinuity in the periodicity thereof, and
(d) alarm means (24) responsive to the circuit means for alerting the passenger.

4,629,053

CLOSED LOOP MACHINING SYSTEM

Frank E. Dailey, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Continuation of Ser. No. 965,191, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 786,020, Apr. 8, 1977, abandoned. This application Apr. 1, 1981, Ser. No. 249,931
Int. Cl.⁴ B65G *37/00*
U.S. Cl. 198—346.1 **2 Claims**



1. A machining system comprising at least three stand alone numerically controlled machine tools in spaced relationship so that each is located at one of the vertices of a closed polygonal loop each of said machine tools being controlled by its own dedicated control circuit which is independent of the other machine tool controls in the system; a worktable rotatably supported by each of said machine tools for rotation about a vertical axis with each table operating under the control of the circuit dedicated to the machine by which said table is supported; a loading and unloading station; guide means on said landing and unloading station for slidably receiving workpiece supports; worktable guide means on each of said worktables for slidably receiving workpiece supports; a workpiece transfer slide for each of the machine tools of the system and for said loading and unloading station, each workpiece transfer slide lying along a separate one of the sides of said closed polygonal loop; guide means on each of said workpiece transfer slides for slidably receiving workpiece supports and mounted in position to cooperate with said worktable guide means as well as the guide means on said loading and unloading station; workpiece moving means in each of said workpiece transfer slides for sliding a workpiece support off of a worktable of one of said machine tools or off of the guide means of said loading and unloading station and onto the guide means of its associated transfer slide to move the workpiece support along said guide means across its associated transfer slide and off of its associated transfer slide onto the worktable of another machine tool for the performance of another machining operation or onto the loading and unloading station.

4,629,054

APPARATUS FOR SUPPLYING SLIDE FASTENER SLIDERS

Naoki Kondo, Runcorn, England, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,590
Claims priority, application Japan, Oct. 2, 1984, 59-149217[U]
Int. Cl.⁴ B65G *47/24*
U.S. Cl. 198—388 **7 Claims**

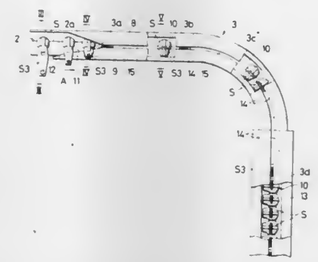
1. An apparatus for supplying slide fastener sliders successively to a slider-threading station in a slide-fastener finishing

machine, each of the sliders including a slider body having a pair of parallel wings, and a pull tab pivotally connected to one of the wings, said apparatus comprising:

(a) a reservoir adapted to be disposed above the slider-threading station for storing a number of sliders;

(b) a terminal guide adapted to be disposed contiguously to the slider-threading station for receiving the sliders one at a time for delivery to the slider-threading station;

(c) a rail extending from said reservoir for slidingly supporting the sliders therefrom in succession, with the wings of each slider body astride of said rail and also with the respective pull tab hanging from the slider body;



(d) a chute extending upwardly from said terminal guide and terminating in an upper end portion disposed adjacent to a free end portion of said rail for receiving the successive sliders therefrom, said upper end portion of said chute having a sloping edge engageable with the pull tab of each slider, as the latter slides forwardly on said free end portion of said rail, so as to progressively raise the pull tab until the latter lies perpendicularly to said one wing of each slider body, said chute having through its entire length a guide channel for passage therethrough of the slider bodies in succession, and a guide slit opening to and coextending with said guide channel for receiving the pull tab of each slider in such raised posture while the corresponding slider body is in said guide channel.

4,629,055

APPARATUS FOR ARRANGING CONTAINERS E.G. BOTTLES, VERTICALLY

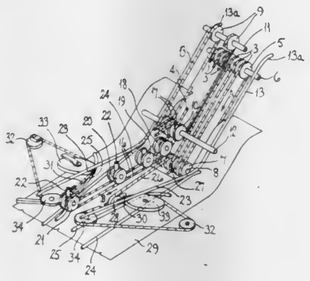
Franco Aiuola, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche (A.C.M.A.), Bologna, Italy

Filed Jan. 16, 1985, Ser. No. 691,778

Claims priority, application Italy, Jan. 24, 1984, 3317 A/84

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—400 **3 Claims**



1. Apparatus for arranging containers of a type such as bottles and the like, vertically, which comprises an entry unit having two sets of belts disposed one above the other and two lateral guides determining a path for the transport of containers lying transverse to the path on their sides, two sets of helically shaped guides disposed symmetrically in relation to a vertical longitudinal plane of the apparatus, two of said guides constituting an extension of said two lateral guides, and two belts disposed symmetrically to and adjacent to said plane and having lower branches intended, initially together with lower faces of the belts and then one or the other selectively with the side face of the belt, to engage the originally uppermost part of the wall of the container, the apparatus further comprising an auxiliary belt having an upper branch disposed underneath said two belts and in said plane, the upper branch of the auxiliary belt being arranged, in the operation of the apparatus, to travel at the same speed as the lower branches of said two belts and to cooperate with the lower branches to engage a container therebetween, and two subsidiary belts following the auxiliary belt disposed symmetrically in relation to said plane with substantially horizontal inwardly facing branches of the subsidiary belts being arranged, in the operation of the apparatus, to travel at the same speed as the lower branches of said two belts and to cooperate with the lower branches to engage a container, said inwardly facing branches being angularly disposed to the horizontal plane of said two belts, and inclined with respect to the horizontal plane of said two belts, the construction and arrangement being such that the container wall which is originally uppermost is continuously engaged by said lower branches, while the originally lower wall of the container is continuously engaged firstly by the upper branch of the auxiliary belt and then by the angularly disposed inwardly facing branch of one or selectively, the other of the subsidiary belts so that said subsidiary belts raise the containers vertically while being retained between said two belts and said auxiliary belt or said subsidiary belts.

4,629,056

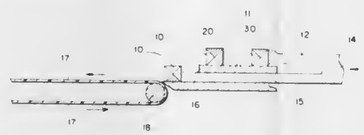
YEAST CAKE TUMBLER

William J. Simelunas, Glen Rock; Agostino J. Aquino, Paterson, and Nicholas Polifroni, Cliffside Park, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 1, 1984, Ser. No. 616,105

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—406 **12 Claims**



1. An apparatus for tumbling articles, comprising:

a reciprocating ram having a body portion and a horizontally extending upper arm and a horizontally extending lower arm intergrally connected to said body portion, said upper arm being cantilever supported from said body portion;

said upper arm having a vertical free edge which is adapted to contact and push articles;

said lower arm having a horizontal support surface terminating in a vertical free edge perpendicular to said lower arm support surface to form a sharp corner at said free edge, said free edge being adapted to contact and push articles;

said reciprocating ram moving along a single linear path; said linear path lying substantially in a horizontal plane;

a first shelf directly underlying the path of travel of said upper arm and directly overlying the path of travel of said lower arm; said first shelf having a horizontal support surface terminating in a vertical free end perpendicular to said shelf support surface to form a sharp corner at said free end;

a second shelf directly underlying the path of travel of said lower arm;

said first shelf and said second shelf each having a substantially horizontal planar upper surface adapted to support articles;

said upper arm and said lower arm being in a constant, fixed predetermined relationship through a full range of motion of said reciprocating ram during its travel along said single linear path;

said reciprocating ram having a forward stroke and a back stroke;

said first shelf and said second shelf each being fixed and spaced apart from one another a predetermined distance;

said first shelf having a length greater than the length of said upper arm at the forward most extent of said forward stroke and said upper arm having a length sufficient to cause a first article supported on said first shelf in front of said free edge of said upper arm to advance during said forward stroke through contact with a second article supported on said first shelf between said upper arm and the first article, to be positioned on said first shelf at the forward most extent of said forward stroke such that the center of gravity of the first article overlies said sharp corner of said first shelf to cause the first article to tumble over said free end under the action of gravity such that the first article tumbles forward over said free end of said first shelf;

the upper surface of said lower arm being spaced from a lower surface of said upper arm by a distance greater than a thickness of said first shelf;

said lower arm having a length relative to said first shelf such that at the rear most extent of said back stroke the center of gravity of an article supported on said lower arm is positioned to overlie said sharp corner of said lower arm to cause the article to tumble over said free edge under the action of gravity such that the article tumbles forward over said free edge of said lower arm without being in contact with said free end of said first shelf;

whereby an article supported on said first shelf can remain stationary when not in contact with said reciprocating ram, and is pushed by said reciprocating ram by the upper arm thereof during a forward stroke to a position near the first edge of said first shelf, so that a second said forward stroke of said reciprocating ram pushes the second article into contact with the first article to cause the first article to tumble over said free end of said first shelf through a predetermined rotation onto said lower arm, and further whereby during a second back stroke of said reciprocating ram said lower arm brings the first article backwards into contact with said free end of said first shelf such that the article remains stationary relative to said first shelf while said lower arm is withdrawn beneath the article such that at the rear most extent of said backstroke said reciprocating ram causes the first article to tumble through a second predetermined rotation over said free edge of said lower arm and onto said second shelf.

4,629,057

DISTRIBUTING DEVICE

Clemens J. Jensen, Dallas, and Wyman R. Westmoreland, Irving, both of Tex., assignors to Princeton Packaging, Inc., Dallas, Tex.

Filed Nov. 6, 1984, Ser. No. 668,865

Int. Cl.⁴ B65G *47/34*

U.S. Cl. 198—424 **10 Claims**

10. A distributing device for placing cakes of meat into a set of trays arranged in first and second rows comprising:

a frame,

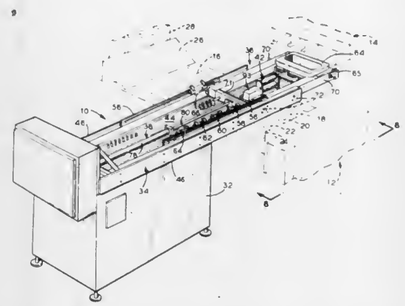
a carriage mounted on the frame for reciprocating movement therealong between a home position where a row of meat cakes is received to a meat drop position where the row of meat cakes is dropped into the trays,

a pair of trap doors mounted on the carriage for reciprocating movement therealong in opposite directions and arranged to receive the row of meat cakes in the home position and support the row of meat cakes while the carriage is transporting the row of meat cakes to the drop position,

a drive device connected to the carriage for reciprocating movement of the carriage relative to the frame to transport the carriage and the trap doors between home and drop positions,

a drive device carried by the carriage and connected to the trap doors for imparting reciprocating movement to the doors relative to the carriage, and

means for successively supplying the row of meat cakes to the doors while the carriage is in its home position and the doors are closed, moving the carriage to a meat drop



position where the doors are aligned with the first row of trays, opening the doors to drop the row of meat cakes into the first row of trays, closing the doors and returning the carriage to its home position, supplying another row of meat cakes to the doors, moving the carriage to a meat drop position where the doors are aligned with the second row of trays, opening the doors to drop the row of meat cakes into the second row of trays, and closing the doors and returning the carriage to its home position.

4,629,058

METHOD AND APPARATUS FOR TRANSPORTING LAYERS OF PAPER SHEETS TO PROCESSING MACHINES

Klaus Reissmann, and Friedhelm Herrig, both of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co,), Hamburg, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,961

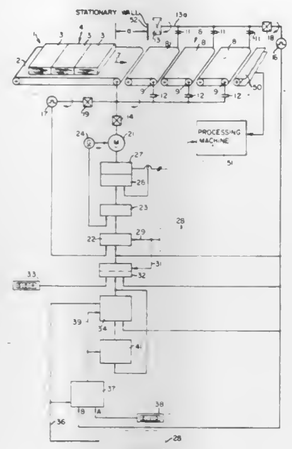
Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319247

Int. Cl.⁴ B65G *47/31*

U.S. Cl. 198—461 **7 Claims**

1. A method of delivering stacks of superimposed sheets to a processing machine, comprising the steps of advancing successive groups of normally abutting stacks by an intermittently driven first conveyor longitudinally along a first path in a predetermined direction and into a second path; conveying successive groups in said direction longitudinally along the second path by a plurality of continuously driven second conveyors; monitoring the speed of groups in each of the first and second paths and generating first and second signals respectively denoting the distances covered by the groups in the corresponding paths per unit of time; comparing the first and second signals and generating third signals denoting the differences between the first and second signals; and utilizing the third signals to drive the first conveyor so that the distance between the rearmost stack of the group in the second path and the foremost stack of the group in the first path is zero or a whole multiple of the length of a stack in said direction, and further comprising the step of reducing the intensity of one of said third signals when the distance between two successive groups exceeds a predetermined value, particularly as a result of removal of sheets prior to or during stacking, said reducing step including reducing the intensity of said one of said third signals by a value corresponding to the length or a whole

multiple of the length of a stack so that the preceding group of the two successive groups is transported at a corresponding



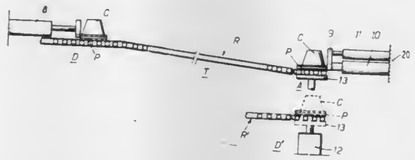
distance from the next-following group of the two successive groups.

4,629,059

LOAD HANDLING INSTALLATIONS

Fernand M. Allinquant, 10712 Barnwood La., Potomac, Md. 20854

Filed Oct. 24, 1984, Ser. No. 664,412
Claims priority, application France, Nov. 3, 1983, 83 17458
Int. Cl.[4] B65G *37/00, 13/075, 13/10*
U.S. Cl. 198—463.3 **3 Claims**



1. A computer- or coder-controlled load handling installation, such as roller conveyor equipment designed to transfer a load from a departure station from which the load sets off to an arrival station at which the load is stopped, comprising:

(a) a buffer assembly at said arrival station for smoothly stopped said load as the load reaches the arrival station, said buffer assembly including a fixed support and a yieldable stop plate adapted to be engaged by said load upon its arrival at said arrival station;

(b) a shock absorber including spring means and damping means and a position sensor associated with the shock absorber on which said stop plate is mounted,

wherein said shock absorber and said position sensor each includes a telescopic apparatus operatively involving a pneumatic spring device, and

wherein said buffer assembly is adapted to bring said load to a smooth stop, is responsive to the position of said stop plate detected by the position detector which emits a signal when said stop plate is in a predetermined position for disposal of said load; and

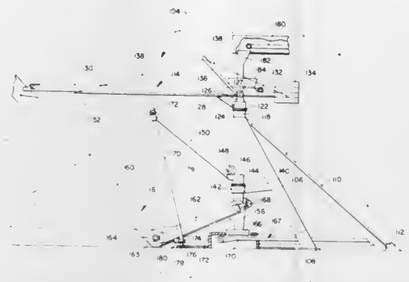
(c) load disposal means under the control of said position sensor for shifting said load from said arrival station of said conveyor to a second departure station of a further conveyor.

4,629,060

APPARATUS FOR HANDLING BULK MATERIAL

Hans J. Schlegel, 3601 84th Cir., N., Minneapolis, Minn. 55443, and Helmut Wolf, Sielkamp 52, 3300 Braunschweig, Fed. Rep. of Germany

Filed Aug. 14, 1984, Ser. No. 640,660
Int. Cl.[4] B65G *65/06*
U.S. Cl. 198—508 **43 Claims**



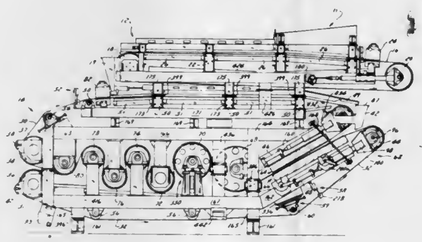
1. Apparatus for handling bulk material as located in a pile at a circular storage site therefor, comprising a support column located adjacent to said pile of bulk material, means for anchoring said support column in a fixed position, means for stacking said bulk material on said pile, said stacking means being mounted on the uppermost end of said support column and being wholly supported thereby, means for rotating said stacking means relative to said support column to enable said stacking means to stack said material in a substantially circular array at said storage site, means supported above said stacking means for feeding said material to be stacked thereto, said material being reclaimed from said pile in a reclaiming operation in a manner that provides for rotation of a member utilized for reclaiming about a vertical axis for reaching the array of material at said storage site, means for rotatably supporting the member utilized for reclaiming, said reclaimer supporting means being located such that the vertical axis thereof is not coincident with the longitudinal axis of said support column wherein said member utilized for reclaiming is rotatable about the vertical axis thereof through a range of 0° to about 310° without interference with said support column.

4,629,061

BELT STEERING CONTROL SYSTEM

Robert E. Crandall, Greendale, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Division of Ser. No. 540,461, Oct. 11, 1983, Pat. No. 4,544,061.
This application Apr. 22, 1985, Ser. No. 725,965
Int. Cl.[4] B65G *39/16*
U.S. Cl. 198—807 **2 Claims**



1. A belt steering control system for an apparatus having a frame and a plurality of rolls around which at least one belt passes, said system including a belt edge position sensor comprising:

a paddle arm biased lightly against the edge of said belt and having a paddle end and a pivot end;

a control shaft having an outwardly projecting end, a frame end and having a longitudinal axis, said shaft mounted in said frame to be rotatable about said axis, said pivot end of said paddle arm secured to said outwardly projecting end of said control shaft;

rotary drive transfer means mounted to said control shaft;

a rotary hydraulic valve having a rotary control shaft;

a disk having a central axial bore which engages said control shaft and a radial slot, said disk mounted on said frame to rotatably engage said rotary drive transfer means;

an elongate leaf spring having a base end and a disk end; said base end secured to said frame so that said disk end engages said slot in said disk end; and

spring adjusting means secured to said frame adjacent to said spring;

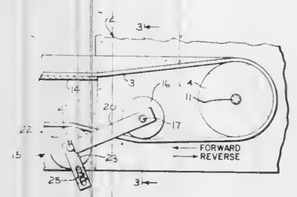
wherein lateral movement of said belt on said rolls is transmitted to said rotary hydraulic valve by means of said control arm, said rotary drive transfer means and said slotted disk is adjustably tensioned by said spring.

4,629,062

BELT TRAINER APPARATUS FOR A CONVEYOR

Charles R. Silverthorn, Eureka, and Marcus N. Allhands, Gridley, both of Ill., assignors to A. D. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Aug. 29, 1983, Ser. No. 527,295
Int. Cl.[4] B65G *23/44*
U.S. Cl. 198—813 **10 Claims**



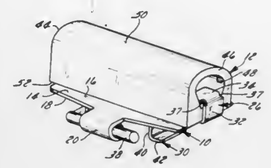
1. A conveyor, comprising a frame, an endless conveyor belt, a pair of rolls mounted on the frame to support the belt in endless travel in an upper conveying run and a lower return run, one of said rolls being a drive roll and the other of said rolls being an idler roll, reversible drive means operably connected to the drive roll for moving the belt in a forward and reverse direction, primary belt trainer means for aligning the belt in a forward direction of travel, reversal of the direction of travel of said drive means causing said belt to drift laterally in a direction toward a side edge of the belt, secondary belt trainer means separate from said primary belt trainer means and including a belt trainer member disposed in engagement with only one side edge of the lower surface of the return run of the belt, the opposite side edge of said return run being free of contact with said secondary belt trainer means, and adjustable means operably connected to said belt trainer member for varying the vertical position of said member and said one side edge relative to said frame to thereby vary the tension on said one side edge of the belt, adjustment of the vertical position of said member compensating for the normal lateral drift of said belt on reverse operation of said belt to achieve a substantially aligned condition for the belt, the construction being such that return of travel of the belt to a forward direction maintains said alignment of the belt without further adjustment.

4,629,063

CHAIN LINK FOR A PRODUCT CAPTURING CHAIN

Wasyly G. Hodlewsky, Greendale, and Roger H. Schroeder, Hartland, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Filed May 25, 1984, Ser. No. 614,003
Int. Cl.[4] B65G *17/06*
U.S. Cl. 198—853 **3 Claims**



1. A chain link for a product capturing chain, comprising:

a flat base portion having front and back surfaces, first and second ends, and leading and trailing edges;

hinge eyes projecting from said leading and trailing edges for connecting said link to the other similar links;

at least one guide shoe projecting from said back surface for supporting said link on a track;

a resilient, hollow, tubular gripping member approximately the same length as said flat base portion, having first and second ends and said inner and outer surfaces and including a flattened outer surface portion contacting said front surface of said flattened base;

first and second opposed retaining lips integral with said flat base portion and projecting from said first and second ends, each of said lips including a first portion substantially perpendicular to said flat base and a second portion substantially parallel to said flat base opposite said front surface, the opposed retaining lips each being wrapped around one of the ends of said hollow, tubular gripping member and projecting inside said gripping member for retaining it on said flat base portion.

4,629,064

COMPOUND FOOD STORAGE BAG

Juliane S. Barner, 10 Russell Ave., Kentfield, Calif. 94904

Filed Apr. 17, 1985, Ser. No. 724,069
Int. Cl.[4] B65D *81/26, 57/00*
U.S. Cl. 206—204 **1 Claim**



1. A food storage bag for storing moist fruits and vegetables in a manner minimizing bacterial growth and delaying the dehydration of stored food, comprising:

an outer bag portion comprised of water-impermeable plastic closable at the top thereof, and

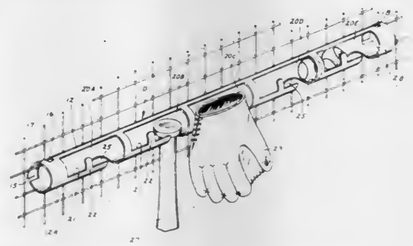
an absorbent inner bag portion comprised of non-dissolving paper toweling permanently attached to said outer bag portion,

said inner bag portion being attached half the height of said outer bag portion thereby enabling separate closure thereof,

said inner bag portion also being fractionally attached to the interior of said outer bag portion by a polka dot pattern so

that air pockets lie between said inner bag portion and said outer bag portion.

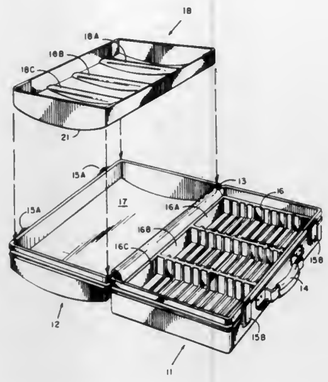
4,629,065
BASEBALL EQUIPMENT HOLDER
Donald L. Braaten, Box 384, Colfax, Wis. 54730
Continuation of Ser. No. 492,082, May 12, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 814,081
Int. Cl.[4] A63D *55/00*
U.S. Cl. 206—315.1 **25 Claims**



1. A baseball equipment holder comprising:
an elongate tubular, generally cylindrical housing having an interior diameter sufficient to accommodate a plurality of playing balls in side-by-side relationship and having at least one open end for insertion and withdrawal of balls;
means to connect the housing to upright structure with a longitudinal axis in generally horizontal orientation;
a plurality of longitudinally aligned side openings on a side of the housing that are horizontally facing when the housing is connected to upright structure, each side opening being partially defined by a lower edge;
a hanger member constituted as a circumferential extension of the housing extending from the lower edge of each opening into the opening for hanging a piece of baseball equipment;
a bottom opening associated with each side opening, being downwardly facing and of a transverse dimension sufficient to accommodate the shank of a baseball bat near the knob end thereof but restrict passage of the knob end, intersecting the side opening at a location wider than the knob end of a bat whereby a baseball bat can be retained in depending relationship by the bottom opening and inserted and removed by the side opening.

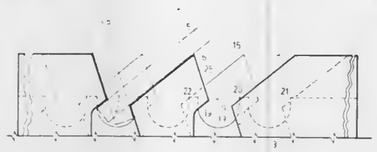
4,629,066
CASSETTE CARRYING CONTAINER
William A. Howard, Barrington, N.H., assignor to Savoy Leather Manufacturing Corporation, Haverhill, Mass.
Filed Mar. 18, 1985, Ser. No. 713,249
Int. Cl.[4] B65D *1/36, 1/48*
U.S. Cl. 206—387 **2 Claims**

1. In a cassette carrying case having a first portion formed with recesses for accommodating cassettes hingeably connected to a second portion of dome shape for covering the first portion, the improvement comprising,
a styrene plastic domed insert seated inside said second portion in mating engagement therewith.
said styrene plastic insert being formed with a plurality of generally parallel ribs for engagement with the tops of cassettes when seated in said recesses with said second portion over said first portion,



said ribs being generally perpendicular to the axis about which said first portion is hingeably connected to said second portion.

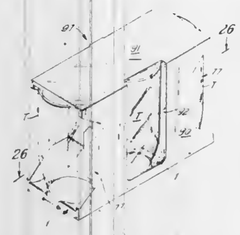
4,629,067
DISKETTE HOLDER
Patrick C. Pavlik; V. Matthew Pavlik, and Myrna L. Pavlik, all of 570 Westvale Drive, Waterloo, Ontario, Canada N2T 1K4
Filed Jun. 11, 1985, Ser. No. 743,495
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—425 **12 Claims**



1. A holder for rigid-case diskettes, comprising a platform having a plurality of lateral grooves in the upper surface thereof for receiving diskettes, and diskette support means associated with each said groove attached to or integral with said platform, said diskette support means comprising a front support face angled upwardly and forwardly from the area of the groove and an opposing rear support face angled upwardly and rearwardly from the area of the groove, at least one support face of a pair associated with a groove having an undercut portion disposed from the plane of the opposing support face by a distance not less than and substantially equal to the thickness of the diskette to be held for engaging said diskette between said undercut portion and said opposing support face, whereby diskettes may be held at either a forward angle against said front support face or a rearward angle against said rear support face and may be freely rotated therebetween as desired; and in which each said undercut portion is substantially parallel to the opposing support face.

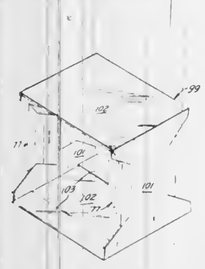
4,629,068
MODULAR DISPLAY PACKAGE
Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 639,902, Aug. 13, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 779,930
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—426 **4 Claims**

1. The combination of a modular display package for individual articles having rear, top, bottom and side wall assemblies and an article within the confines of said rear top, bottom and side wall assemblies with said side wall assemblies having cutouts extending inwardly toward said rear wall assembly, and a package sleeve for packaging a plurality of said modular display packages with portions of the individual articles exposed for inspection comprising a package blank having a top panel, a bottom panel, and a pair of side panels, package engaging lock means on said side panels, and one free edge of one



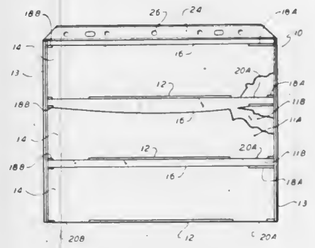
side panel being fastened to a free edge of said top or bottom panel to form said package sleeve, said package engaging lock means comprising a plurality of foldable retaining lock tabs on said side walls, said side walls having cutouts and said foldable retaining lock tabs being hingedly attached to and extending from said side walls at the cutouts, said retaining lock tabs cooperating with and foldable around the cutouts in the side wall panels of the modular display packages to hold the modular display packages securely in place within said sleeve.

4,629,069
MODULAR DISPLAY PACKAGE
Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 639,902, Aug. 13, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,777
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—426 **1 Claim**



1. The combination of a modular display package for individual articles having rear, top, bottom and side wall assemblies and an article interposed between said rear, top, bottom and side wall assemblies with each of said side wall assemblies having a cutout portion extending inwardly toward said rear wall assembly, and a package sleeve for packaging a plurality of said modular display packages with portions of the individual articles exposed for inspection comprising a package blank having a top panel, a bottom panel, and a pair of side panels, package engaging lock means on said side panels, and one free edge of one side panel being fastened to a free edge of said top or bottom panel to form said package sleeve, said package engaging lock means comprising a foldable retaining tab on each of said side walls, each of said side walls having a cutout and said foldable retaining tabs being hingedly attached to and extending from the cutouts in said side walls, said retaining tabs cooperating with and foldable around the cutouts in the side wall panels of the modular display packages to hold the modular display packages securely in place, said plurality of modular display packages comprising four modular display packages, two of which are positioned in side-by-side relationship to each other so that one sleeve retaining tab is foldable around a cutout in one modular display package side wall and another sleeve retaining tab is foldable around a cutout in another modular display package.

4,629,070
HOLDER FOR PHOTOGRAPHIC FILM STRIPS
Paul J. Roberg, 51 Surrey La., Tenafly, N.J. 07670
Filed Apr. 26, 1985, Ser. No. 727,870
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—455 **16 Claims**



1. A transparent holder for rectangularly elongated photographic items such as film strips, negatives and prints, comprising: two plies of transparent plastic films, one overlying the other and being attached to one another by peripheral bonding lines between said plies to define at least one rectangular retaining pocket having a first long dimension and a second short dimension for receipt of a photographic item of generally similar dimensions; said retaining pocket having two opposite closed ends extending along said short dimensions; a generally open accessible side extending along the long dimension, and a generally closed side opposite said open side; said open side being defined by an edge of at least one of said plies of film being unattached to the opposed plie at the central part of the long dimension, to thereby define a central opening, but with the plies of film defining said open side being attached together by a bond line extending from the end of the central opening for a short distance to the adjacent short closed end of said pocket, to thereby form a restraining lip at said one end of the open side of said pocket, whereby said photographic item can be readily inserted through the accessible open side into said pocket and the end of said item slidingly received beneath said restraining lip to prevent the inadvertent dislodging of said photographic item from within said restraining pocket.

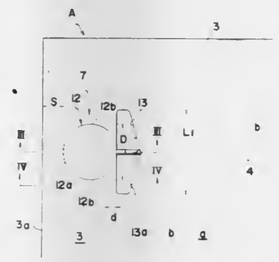
4,629,071
EASY-TO-OPEN BAG
Kanari Tani, 70 4-chome, Minamigaoka, Onojo-shi, Fukuoka, Japan
Filed Aug. 29, 1985, Ser. No. 770,566
Int. Cl.[4] B65D *27/38, 65/34*
U.S. Cl. 206—618 **8 Claims**

1. An easy-to-open synthetic resin bag comprising:
(a) a bag body made of a pair of opposed walls, each wall formed from a plurality of layers of synthetic resin film, said walls being sealed together by heat around the periphery thereof to form a sealed border region around an unbonded interior of the bag,
(b) a tear string heat-fused to the inside surface of one of said walls through the entire length thereof, said tear string including a core string and an outer heat-fusing layer fixedly and concentrically adhered to said core string, said tear string extending along a line corrsponding to a transverse opening to be formed in said bag, said tear string

having one end extending into said border region and fused in said border region between said two walls,

(c) a U-shaped score formed on said border region at a position disposed on said end of said tear string, said score including a round cut thereof spaced apart from an outer edge of said border region and a pair of side cuts symmetrically disposed at both sides of said tear string, said score having inner ends of said side cuts terminating in said border region at a location spaced outwardly of the unfused interior of said bag,

(d) an opening formed in said border region extending transverse to the length of said tear string and between the inside of said bag and the inner ends of said side cuts of



said score such that said tear string passes through the width of said opening, said opening being adjacent to, but slightly spaced from said inner ends of said side cuts of said score, said opening defining a pulling tab in said border region together with said U-shaped score, said opening having a length transverse to said tear string far greater than the distance between inner ends of said side cuts of said U-shaped score, said opening having an inner convergent edge closest to the interior of said bag and disposed on said tear string, said inner convergent edge making an angle α of less than 90° with said tear string measured from the opening edge toward the interior of said body.

4,629,072
APPARATUS FOR STORING AND DISPENSING STACKED ARTICLES
Jonathon A. Loew, Glenhead, N.Y., assignor to P.O.P. Displays, Inc., Long Island City, N.Y.
Filed Dec. 17, 1984, Ser. No. 682,086
Int. Cl.[4] A47F *7/28*
U.S. Cl. 211—59.3 **16 Claims**

1. Apparatus for storing and dispensing stacked articles, comprising:

a frame adapted to accommodate a plurality of stacked articles;

a platform situated in said frame adapted to support the stack of articles, said platform having upper and lower surfaces and four corner regions; and

means coupled to said platform for positioning the platform such that the uppermost article in the stack is positioned at a predetermined height and automatically elevating said platform and stack supported thereby upon removal of the uppermost article until the next article beneath it reaches said predetermined height, said positioning and elevating means including a drum rotatably mounted on said platform, a torsion spring situated over said drum, said torsion spring having a first end affixed to said platform and a second end fixed to said rotatable drum, first pulley means fixed to a first end of said drum, second pulley means fixed to a second end of said drum, a first pair of cable means, each having a first end affixed to said first pulley means, a second end adapted to be affixed to a respective upper region of said frame and a length portion engaging a respective corner region of said platform, and a second pair of cable means each having a first end affixed to said second pulley means, a second end adapted to be fixed to



a respective upper region of said frame and a length portion engaging a respective corner region of said platform.

4,629,073
BELT BUCKLE RACK
Walter R. Belden, 300 E. Proseer Rd., #25A, Cheyenne, Wyo. 82007
Filed May 8, 1985, Ser. No. 700,006
Int. Cl.[4] A47F *7/19*
U.S. Cl. 211—60.1 **6 Claims**



1. A belt buckle holder comprising:

a decorative head piece designed to be mounted on a support surface; and

a body piece comprised of a front and back element, each having a flat front and back surface;

said body piece being attached to said head piece and extending downward therefrom;

said front element overlying said back element;

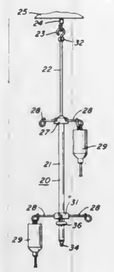
said front element having holes therethrough being exposed on said front element's flat front surface to receive tongues of belt buckles;

said back element being continuous behind said holes;

said head piece being comprised of wood a rigid material and said body piece being comprised of leather a flexible material;

said head piece having a mortised lower edge, said body piece engaging said mortised lower edge such that the back surfaces of said head piece and said body piece are in substantially the same plane.

4,629,074
INTRAVENOUS CONTAINER SUPPORT
Ellis I. Toder, 431 Militia Hill Rd., Fort Washington, Pa. 19034
Filed Aug. 6, 1984, Ser. No. 638,019
Int. Cl.[4] A47G *29/00*
U.S. Cl. 211—71 **18 Claims**



1. An elongated telescopic carrier device for suspending intravenous fluid containers or the like, comprising in combination,

(a) an elongated hollow tubular shell having upper and lower ends,

(b) an extension rod slidably disposed within said tubular shell with one end of said rod extending out of said upper end of said tubular shell and having means thereon for suspending said device and the other end of said rod being disposed within said tubular shell,

(c) retaining means preventing said extension rod from being completely withdrawn from said tubular shell,

(d) locking actuator means operatively coupled to said extension rod effective when actuated in a first way to release said extension rod for movement of the latter out of and into said tubular shell, and effective when actuated in a second way to lock said extension rod at least against movement out of said tubular shell,

(e) biasing means coupled directly to said extension rod for effectively constantly biasing said rod for movement into said tubular shell, and

(f) support means carried by said tubular shell for suspending fluid containers therefrom.

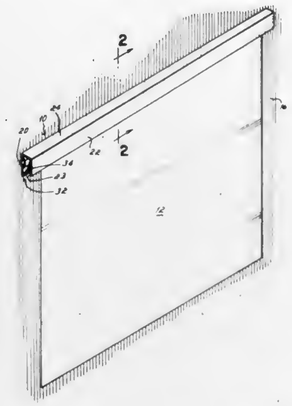
4,629,075
MOUNTING STRIP
James E. Hutten, Mason, Ohio, assignor to Ghent Manufacturing Inc., Lebanon, Ohio
Filed Aug. 29, 1985, Ser. No. 770,604
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—89 **6 Claims**

1. A mounting strip comprising:

a one-piece rigid plastic channel and flexible plastic tongue, said channel having a hardness substantially greater than the hardness of said tongue;

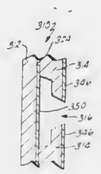
said channel being formed with an elongated bearing surface, and an elongated mounting surface spaced from said elongated bearing surface;

said tongue and said channel being co-extruded so that said tongue is integrally formed along said elongated mounting surface of said channel, said tongue having a clamping



surface engaging said elongated bearing surface of said channel for releasably clamping objects therebetween.

4,629,076
SLATBOARD
Douglas D. Amstutz, and Donald D. Kelemen, both of Muskegon, Mich., assignors to Amstore Corporation, Muskegon, Mich.
Division of Ser. No. 608,872, May 10, 1984, Pat. No. 4,591,051.
This application Mar. 17, 1986, Ser. No. 840,025
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—94 **4 Claims**



1. A decorative slatboard assembly comprising;

a baseboard including a supportive side;

a colored adhesive overlying substantially the entire supporting side of said baseboard; and

a plurality of elongated slats secured to said support side of said baseboard by means of said adhesive, said slats being arranged side-by-side to define a plurality of slots therebetween for receiving hanger hardware, said adhesive being visible between said slats to provide a desired decorative appearance.

4,629,077
SHELF SUPPORT SYSTEM
George W. Niblock, 1059 Upper State Rd., Chalfont, Pa. 18914
Filed Apr. 19, 1985, Ser. No. 725,269
Int. Cl.[4] A47B *47/00*
U.S. Cl. 211—187 **16 Claims**

1. A shelf support system to mount a shelf onto support posts,

said system including an inner insert member and an outer corner section,

said insert member having a cylindrical interior opening extending therethrough, means within said cylindrical

opening defining a radially inwardly projecting circumferential rib, said insert having an upper cylindrically shaped exterior portion and an integral radiused lower portion extending outwardly beyond said upper portion, said insert member including means defining an expansion slit extending along the full length thereof,

said corner section having upper and lower generally cylindrical sections having an upper cylindrical opening with a first diameter and a lower cylindrical opening with a second larger diameter, respectively, said upper cylindrical opening having the upper end thereof angled inwardly



so that the diameter of the opening at the upper end is substantially equal to, but not greater than the outer diameter of said insert member when on the post,

said first and second cylindrical openings being joined by a chambered surface, said first diameter being greater than the outer diameter of said insert member, said second diameter being greater than the outer diameter of said radiused portion of said insert member, whereby when said insert member is positioned on a support post, said corner section will slide thereover until said chamfered surface rests on said radiused portion and the upper end engages the outer diameter of said insert member.

4,629,078

CLOTHES DISPLAY RACK

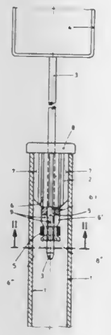
Bernd Korth, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Sep. 21, 1982, Ser. No. 421,015

Claims priority, application Switzerland, Oct. 30, 1981, 6961/81

Int. Cl.⁴ A47B *47/00*

U.S. Cl. 211—207 **6 Claims**



1. A clothes display rack comprising a height-adjustable carrier rod adapted for receiving placard-holding means on an upright support of the display rack and a device for securing the height-adjustable carrier rod, the device comprising, an elongated plug part having a substantially cylindrical upper portion and a lower end portion, said upper portion being adapted to be inserted tightly into a longitudinally directed central opening of the vertical support, said plug part having a central receiving bore for receiving said carrier rod and being provided with longitudinal clamping ribs on the surface thereof, the lower end portion of said plug part having a reduced diameter clamping zone in which said carrier rod is retainable in sliding engagement within said plug part.

4,629,079

TRANSPORT CARRIAGE

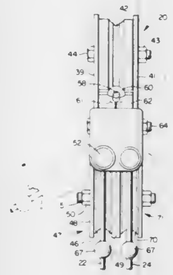
Penn A. Peters; Cleveland J. Biller, both of Morgantown, and David D. Johnson, Booth, all of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 530,829, Sep. 9, 1983, Pat. No. 4,500,004. This application Sep. 4, 1984, Ser. No. 646,730

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.⁴ B66C *17/06, 21/00;* **F42B** *13/16*

U.S. Cl. 212—98 **1 Claim**



1. A skyline logging system including a ground anchor, a crane having a vertically extending boom, a high line connected in tension to the anchor and the upper end of the boom, a carriage mounted to move along said high line, a plurality of identical load blocks pivotally mounted on said carriage below said high line and a separate load line means extending from each load block for supporting separate loads, each of said load blocks having an axis of rotation wherein the axes of rotation are coaxial,

the carriage including a pair of spaced apart plates, means for securing the plates in relative position with a circular track block and locking means mounted therebetween, said track block being free to rotate about its axis while engaging the high line and not engaging the locking means,

means secured to said high line for (1) preventing movement of said carriage away from said crane along said high line, (2) moving the locking means to locking position with respect to the track block and (3) simultaneously unlocking said load blocks,

means secured to each load line extending from said load blocks for (1) moving the locking means to locking position with respect to said load line and (2) simultaneously unlocking the track block to rotate,

each of said load blocks being circular and secured between a pair of plates, means for holding the pairs of plates associated with said load blocks in relatively stationary position with respect to each other while allowing each load block to rotate about the axis of its circular shape, each pair of plates associated with each load block being pivotally secured to said carriage with the axis of rotation of said pivotal security being substantially perpendicular to the axis of the associated circular shape.

4,629,080

CONTAINER SUCH AS A NURSING CONTAINER, HAVING FORMED ENCLOSURE CHAMBER FOR A DISPENSING MEMBER

Peter C. Carveth, Glen Ellyn, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,303

Int. Cl.⁴ A61J *9/00, 9/06, 9/08;* **B65D** *33/36*

U.S. Cl. 215—11 R **12 Claims**



1. A nursing container comprising:

(a) a first sheet;

(b) a second, diaphragm sheet sealed about at least a portion of its peripehry to said first sheet and to a third sheet, said second, diaphragm sheet being intermediate said first sheet and said third sheet;

(c) said first sheet and said third sheet sealed about their entire peripheries and forming the exterior wall of said container,

(d) nipple means including a base and a nipple, between said first and second sheets, said first and second sheets being secured to the periphery of said base at a base seal;

(e) said sheets defining a storage chamber on the base-side of said nipple means for storage of a substance to be delivered through said nipple;

(f) said sheets extending beyond said base seal, on the nipple-side of said nipple means, opposite said storage chamber, said sheets being secured together on the nipple-side of said nipple means to define an enclosure chamber for said nipple means, there being no communication between said storage chamber and said enclosure chamber at said base seal, said enclosure chamber enclosing said nipple means on said nipple-side, segregating said nipple means from the environment;

(g) said enclosure chamber being further defined by a manually breakable line of securement between said first sheet and said second, diaphragm sheet to selectively separate said first and second sheets on said nipple-side to open said enclosure chamber, providing access to said nipple.

4,629,081

CHILD RESISTANT CLOSURE AND CLOSURE AND CONTAINER ASSEMBLY

Kevin W. McLaren, Erith, England, assignor to Johnsen & Jorgensen (Plastics) Limited, England

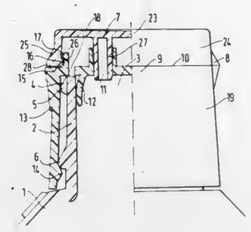
Filed Nov. 4, 1985, Ser. No. 794,515

Claims priority, application United Kingdom, Nov. 5, 1984, 8427925

Int. Cl.⁴ B65D *55/02;* **A61H** *1/00*

U.S. Cl. 215—206 **10 Claims**

1. A child resistant two part closure, for a container, comprising a top cap hingedly connected to an inner cap which is adapted to be semi-permanently positioned over the mouth of an associated container, the top cap and inner cap being provided with cooperating locking means for holding the top cap in a closed position, the container and inner cap being provided with cooperating relatively rotatable stop means for prevent-



ing release of said said locking means until the closure is rotatively displaced relatively to the container in a first operation into a predetermined position in which the stop means on the inner cap can be manipulated free of the stop means on the container in a second operation to release the locking means.

4,629,082

BOTTLE STOPPER

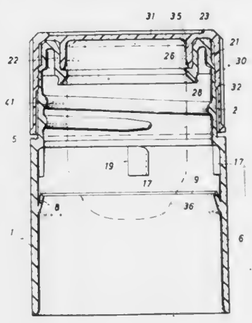
Antonio Badia Iniesta, Barcelona, Spain, assignor to Plastivit, S.A., Barcelona, Spain

Filed May 31, 1985, Ser. No. 740,174

Claims priority, application Spain, Jun. 6, 1984, 279.745[U]; Jun. 26, 1984, 280.195[U]

Int. Cl.⁴ B65D *41/34*

U.S. Cl. 215—252 **10 Claims**



1. A bottle stopper, of the type having a first portion adapted to fit the end portion of a bottle neck and attached over a weakened annular region to a tubular security portion to be retained on the neck, said tubular portion being provided on the inside thereof with retaining means adapted to engage at least one protuberance on the bottle neck to retain said tubular portion on the neck, wherein said first portion and said tubular security portion form an integral body of polyolefinic plastics material, said first portion comprises an inner wall and an outer wall which are generally cylindrical and coaxial, the inner wall being shorter than the outer wall and defining an upper opening, there being provided protuberances in the outer lateral surface of the outer wall and the inner wall having an inwardly directed elbow portion, with a resilient fin for engagement as a first sealing means with the end surface of the neck; and wherein said first portion is surrounded by a plastics material cap portion, comprising an end wall and a cylindrical skirt provided on the inside thereof with protuberances adapted to engage the protuberances of the outer wall, with an annular

wall having an outside diameter generally equal to the inside diameter of said inner wall extending from said end wall.

4,629,083

CLOSURE WITH RESILIENT SEALING DISC

Rodney M. Druitt, Collaroy, Australia, assignor to Bev-Cap Plastics Pty. Ltd., New South Wales, Australia

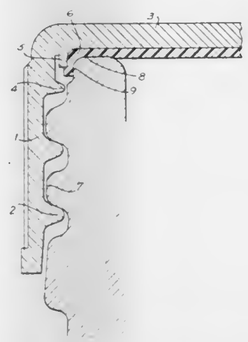
PCT No. PCT/AU84/00114, § 371 Date Feb. 21, 1985, § 102(e) Date Feb. 21, 1985, PCT Pub. No. WO85/00154, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 22, 1984, Ser. No. 713,399

Claims priority, application Australia, Jun. 23, 1983, 16165/83

Int. Cl.⁴ B65D *53/04*

U.S. Cl. 215—329 **7 Claims**



1. A thermoplastic closure system comprising a closure with an internally threaded skirt of the type adapted to receive a resilient sealing disc, a resilient sealing disc, the closure having a continuous annular flexible protrusion depending from the inside top wall adjacent the top wall/skirt intersection, spaced from the skirt and having its lower inside shoulder shaped so as to be capable of folding and drawing the periphery of said resilient sealing disc around a closure neck and down its outside side wall thus effecting a seal.

4,629,084

CLOSURE FOR CANNING GLASS CONTAINER WITH GLASS COVER

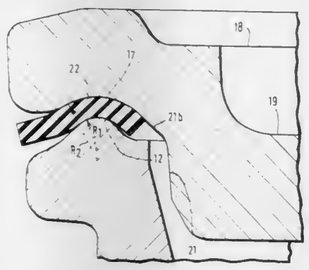
Franzjosef Hackelsberger, Wehrtalstr. 6, 7867 Wehr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 449,495, Dec. 13, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 685,771

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149558; May 18, 1982, 3218717

Int. Cl.⁴ B65D *53/04, 21/00*

U.S. Cl. 215—346 **8 Claims**



1. A closure for a canning glass container having an inner edge and provided with a glass cover, a rubber ring located between the canning glass container and the glass cover and removable in a radial direction by hand, and a clamp connecting the glass cover with the canning glass container only during canning so as to press the glass cover against the canning glass container with interposition of the rubber ring and removed from the container afterwards after a negative pressure is formed in the interior of the canning glass container, the closure comprising an upper circular rim formed in the canning glass container and provided with a sealing lip which extends upwardly from said upper rim and in its cross-section is formed as a considerably rounded convex wedge; a supporting rim formed in the glass cover opposite to said upper rim of the canning glass container and having a conave circular depression located opposite to said convex wedge, said rubber ring having a predetermined thickness, and said concave circular depression having a cross-section with a radius of curvature exceeding the radius of curvature of said convex wedge plus the thickness of said rubber ring so that a receiving space for the rubber ring between said convex wedge and said concave depression increases from a central vertical axis of said convex wedge and said concave depression in opposite directions, said convex wedge in said upper rim of the canning glass container being press-produced during production of the canning glass container and said concave depression in said supporting rim of the glass cover being press-produced during production of the glass cover, said convex wedge and said concave circular depression each having a surface with a circular line extending over an angle of approximately of 70°–110°.

4,629,085

FRAME STRUCTURE FOR ACCOMMODATING A PLURALITY OF CONTAINERS

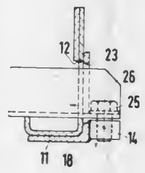
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard, Weitefeld, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 692,984

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 8401788[U]

Int. Cl.⁴ B60P *7/13;* **B65D** *19/44, 25/10*

U.S. Cl. 220—1.5 **13 Claims**



1. A frame structure for a plurality of containers, each container having foot portions formed with fork lift openings thereon, said frame structure including:

a bottom frame section having a plurality of parallel extending struts, pairs of said struts defining lateral boundary supports for receiving said foot portions of said containers, at least some of said struts having cut-out portions therethrough, and

locking means including anchoring elements adapted to be passed through respective ones of said cut-outs formed in the struts and through respective ones of said fork lift openings for engagement with said foot portions, wherein said anchoring elements are formed as bars adapted to pass through said struts forming said lateral boundary supports to engage the foot portions on one side of the struts and be secured in place at a location adjacent said struts.

4,629,086

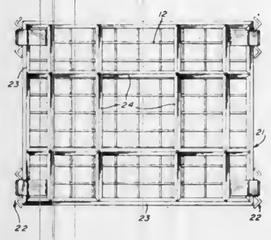
COLLAPSIBLE AND STACKABLE MATERIAL HANDLING CONTAINER

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Montreal East, Canada

Filed Oct. 2, 1985, Ser. No. 782,891

Int. Cl.⁴ B65D *7/20*

U.S. Cl. 220—7 **9 Claims**



1. A collapsible and stackable material handling container comprising a collapsible basket defined by a bottom support wall, a rear wall hinged along a bottom edge to a rear edge of said bottom wall, a pair of side walls each hinged at a vertical rear edge to a respective one of opposed vertical edges of said rear wall, and a front wall hinged along a bottom edge to a front edge of said bottom wall, the improvement comprising a support frame formed with said bottom wall for supporting said basket and a load positionable therein elevated from a support surface, said support frame having a rectangular frame defined by opposed pairs of parallel outer tubular members and intermediate tubular members extending between said outer tubular members all having sloped faces and secured thereto to form a structural frame, a leg member secured to a respective corner of said support frame and defining a hook flange, and a corner plate secured to said leg member and having a hook flange receiving channel in a top edge thereof, said corner plate having vertical structural ribs to strengthen the corner region of said container, said outer and intermediate tubular members being steel tubes of diamond-shape cross-section with an apex thereof oriented vertically in the direction of said bottom support wall to form outwardly sloping surfaces in the vertical plane, said bottom support wall being formed of transverse spaced-apart wire meshing welded to said support frame.

4,629,087

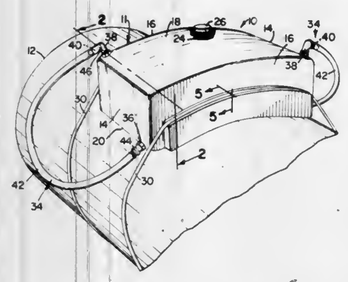
WATER CONTAINER

Dick Lenz, Hutchinson, Minn., assignor to AG Systems, Inc., Hutchinson, Minn.

Filed Nov. 2, 1984, Ser. No. 667,649

Int. Cl.⁴ B65D *6/00*

U.S. Cl. 220—85 S **6 Claims**



1. An auxiliary safety container for liquid for use with a chemical-containing primary container, said safety container having liquid readily available for flushing from a person any spilled chemical from said primary container, said auxiliary safety container comprising:

a. a housing having opposed side walls, opposed end walls and top and bottom walls defining an enclosed chamber, said bottom wall conforming generally to the adjacent surface of the primary container;

b. inlet means including a removable closure member formed in said top wall for providing access to said enclosed chamber;

c. means for attaching said housing to the primary container, said attaching means including a shoulder attached to said housing, said attaching means further including means for engaging said shoulder to secure said auxiliary container to the primary container, said attaching means still further including abutment means attached to said shoulder for discouraging accidental displacement of said securing means from said shoulder; and

d. liquid outlet means on each of said side walls for dispensing a liquid from said enclosed chamber to a position along the side of the primary container, said liquid outlet means including an outlet nipple mounted in said side wall adjacent one of said end walls and said bottom wall to extend laterally outwardly therefrom, a venting nipple mounted in said top wall adjacent the other of said end walls and said side wall and including an end portion extending in a direction generally the same as said outlet nipple and a flexible conduit extending between said outlet nipple and said venting nipple;

whereby said conduit may be readily pulled from said venting nipple to drain liquid from said outlet nipple through said conduit to flush said person.

4,629,088

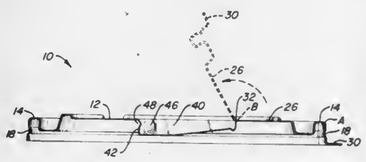
CONTAINER LID WITH DRINK-THROUGH OPENING

Ronald A. Durgin, Pleasanton, Calif., assignor to Handi-Kup Company, Corte Madera, Calif.

Filed Mar. 11, 1985, Ser. No. 710,648

Int. Cl.⁴ B65D *41/56*

U.S. Cl. 220—254 **1 Claim**



1. A beverage container lid comprising:

a lid surface having a peripheral sealing skirt for attachment of the lid to the rim of a beverage container;

a foldable flap formed in the lid by a pair of tear lines which are formed in the lid surface and extend radially outward from a hinge line to include a section of said sealing skirt and having ends displaced from said tear lines;

a recess formed in the lid surface and including two vertical side faces extending radially inward from the hinge line and a vertical end face extending between the side faces opposite the hinge line, whereby the foldable flap may be opened along the hinge line and inserted into the recess to allow access to the contents of the container, wherein the recess has a depth which increases in the direction away from the hinge line to a depth substantially equal to the height of the peripheral sealing skirt so that the foldable flap can lie substantially within the recess; and

at least one detent formed from each vertical side face for securing the opposite sides of the foldable flap when it is inserted into the recess and at least one transverse detent formed along the vertical end face of the recess for securing the sealing skirt of the foldable flap when it is inserted into the recess, wherein the sealing skirt of the foldable flap includes an indentation which mates with the trans-

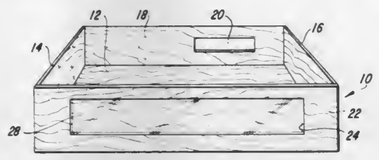
verse detent when the foldable flap is inserted into the recess.

4,629,089

PROTECTIVE DEVICE FOR CHILD-PROOFING A VCR

Vincent Federico, and Barbara Federico, both of 62 Mapleton Ave., Staten Island, N.Y. 10306

Filed Dec. 30, 1985, Ser. No. 814,265
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—334 **7 Claims**



1. Device for child-proofing an electrical or an electronic appliance having a first wall on which controls are mounted and a second wall to which wires and/or cables are connected against undesired tampering with the controls, comprising:

a. a panel for covering at least the controls on said first wall;

b. mounting means for movably mounting said panel between a first closed position for denying access to the controls and a second open position for providing access to the controls; and

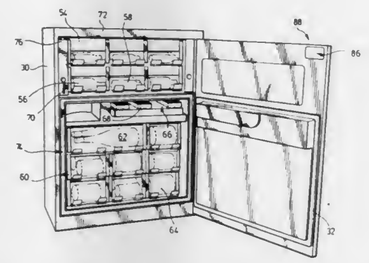
c. locking means for locking said panel in said closed position when access to the controls are to be denied, said panel being made from a material that is at least semi-rigid to prevent operation of the controls accessing same through said panel.

4,629,090

HOTEL ROOM BAR WITH OPTICAL SENSING SYSTEM

Frank Harris, St. Albans, and Lyn Roberts, London, both of England, assignors to Robobar Limited, Greenford, England

Filed Jan. 24, 1984, Ser. No. 573,843
Int. Cl.[4] G07F *11/00*
U.S. Cl. 221—7 **171 Claims**



1. A bar comprising at least one compartment, a plurality of removable magazines provided for mounting in the at least one compartment, fiber optics associated with the at least one bar compartment and each magazine for assisting to detect the removal of a magazine from the at least one bar compartment and the removal and/or movment of the contents of the magazine, the fiber optics comprising:

(a) optical fibers secured to each magazine and lenses secured to the optical fibers on each magazine -and-

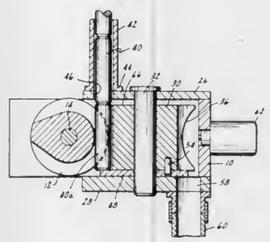
(b) lenses on the bar associated with the at least one compartment, some of the lenses on each magazine spaced from, and aligned with, some of the lenses on the same magazine for the transmission of light therebetween, and some of the lenses on each magazine spaced from, and aligned with, some of the lenses on the bar associated with the compartment for the transmission of light therebetween, the lenses of each magazine which are spaced from, and aligned with, other lenses of the same magazine for the transmission of light therebetween, being secured by optical fibers to lenses spaced from, and aligned with, lenses on the bar associated with the at least one compartment for transmission of light therebetween.

4,629,091

WORKPIECE ESCAPEMENT AND DIVIDER

Garfield R. Lunn, Amherstburg, Canada, assignor to Lamb Technicon Corp., Warren, Mich.

Filed Sep. 17, 1984, Ser. No. 651,463
Int. Cl.[4] G07F *11/00;* **B65G** *59/00, 47/26*
U.S. Cl. 221—12 **18 Claims**



1. An escapement and divider for workpieces of a predetermined size and shape comprising a body, a turret mounted on the body for rotation about a generally vertical axis, said turret having a plurality of work-receiving pockets thereon spaced circumferentially about said axis at regular intervals, said pockets being open at their upper ends, a workpiece hopper having a vertically downwardly extending outlet lying on the circle defined by said circumferentially spaced pockets such that when the upper end of a pocket registers with said outlet, a workpiece at said outlet gravitates into said pocket, said pockets being sized and shaped such that a workpiece disposed therein has a portion thereof projecting outwardly of the pocket, a worm gear journalled on said body for rotation about a generally horizontal axis, said worm gear having a thread of predetermined pitch and being disposed adjacent said turret such that said projecting portion of a workpiece in the pocket registering with said outlet is engaged by and between a pair of adjacent convolutions of said thread and forms a rotary driving connection between the worm gear and the turret, a motor for rotating the worm gear to thereby impart a rotary indexing motion to the turret in a workpiece advancing direction whenever a workpiece is disposed in a pocket which registers with said outlet, the circumferential spacing of said pockets being related to the pitch of the thread on the worm gear such that when the thread convolutions revolve out of contact with the workpiece in said one pocket the turret has been indexed to a position wherein the next successive upstream pocket on the turret is aligned with said outlet and means for discharging the advanced workpiece from a pocket after the turret has been indexed through a predetermined arc relative to said outlet.

4,629,092

COFFEE FILTER DISPENSER

Franklin W. English, Rte. 1, Box 403, Ben Wheeler, Tex. 75754

Filed Sep. 19, 1984, Ser. No. 652,069
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—247 **4 Claims**

1. An apparatus for singularly dispensing an uppermost cupuliform coffee filter from a stack of such coffee filters comprising:

a container having a plurality of walls which define an opening and which are disposed to receive the stack of cupuliform coffee filters with the planar bottom of said filters

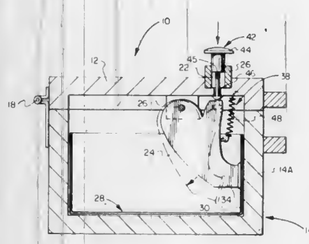
opposite the opening of the container and the stack of cupuliform coffee filters adjacent a first wall of said plurality of walls;

a lid hingedly connected to the container to selectively cover the opening;

a plunger arm pivotably connected to the underside of the lid and disposed to depend a filter engaging projection at the terminal end of the plunger arm in an arc of rotation lying in a plane which is substantially orthogonal to the first wall; said plunger arm further including:

an arcuate region between the pivotal connection to the lid and the filter engaging projection; and

a moment arm which projects from the plunger arm intermediate of the pivotal connection and the filter engaging projection;



means for automatically urging the filter engaging projection toward the first wall such that the filter engaging projection contacts the uppermost coffee filter;

means for selectively resetting the plunger arm by withdrawing it from the first wall whereby the means for automatically urging the filter engaging projection is overcome and the filter engaging means retreats to a position permitting closure of the lid; said resetting means comprising:

a button;

a sleeve defining an aperture through the lid;

a push rod slidably mounted through the sleeve, a first end of the push rod connected to the button and accessible on the exterior end of the lid and a second end of the push rod presented to contact the moment arm of the plunger arm.

4,629,093

PROPORTIONING DISPENSER FOR POWDERED PRODUCTS

Roger Le Molaire, Charpey, France, assignor to Societe a Responsabilite Limitee:Ateliers Durand et le Molaire Z.A., France

Filed Aug. 6, 1984, Ser. No. 637,753
Claims priority, application France, Sep. 13, 1983, 83 14734
Int. Cl.[4] B67D *5/32;* **B65D** *88/54;* **G01F** *11/10, 11/00*
U.S. Cl. 222—40 **20 Claims**

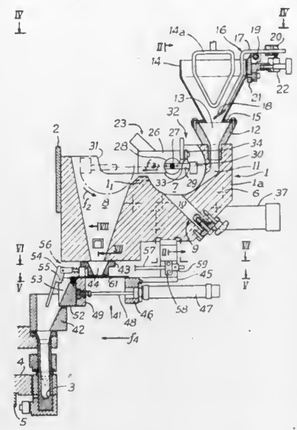
1. A proportioning dispenser for powdered products, comprising:

a main attaching and supporting body defining a filling chamber and a discharge chamber separated from one another by a ridge;

a feed hopper supplying powdered product to said filling chamber;

a proportioner operable to move cyclically between said filing chamber wherein it picks up a load of powdered product and said discharge chamber whereinto it dumps said load, said proportioner including a ladle mounted on a horizontal shaft of a rotary actuator, said rotary actuator being mounted on a carriage sliding on a slideway affixed to the outside of said main body and parallel thereto and connected to a reciprocating jack, said ladle being carried by said shaft and rotatably driven thereby alternatively within said discharge chamber and within said filling chamber, said filling chamber being provided with an adjustable blade for wiping off excess product from the loaded ladle top; and

a dispenser located beneath said discharge chamber and



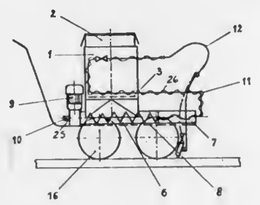
comprising a cup and means for moving said cup cyclically from a loading position vertically aligned with said discharge chamber and a discharge position vertically non-aligned with said discharge chamber.

4,629,094

ADHESIVE APPLICATOR

Hans-Günter Vogel, Eschborn; Kurt Müller, and Karl Gnewikow, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Fed. Rep. of Germany

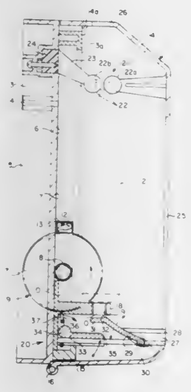
Continuation of Ser. No. 641,973, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 546,467, Oct. 28, 1983, abandoned, which is a continuation of Ser. No. 268,131, May 29, 1981, abandoned. This application Aug. 5, 1985, Ser. No. 762,695
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021541
Int. Cl.[4] A01C *15/00*
U.S. Cl. 222—82 **8 Claims**



1. An apparatus for applying adhesive or adhesive pastes in strips on construction or building surfaces comprising a heated hopper container mounted on a traveling positive displacement pump, a manifold at a pump outlet provided with a plurality of application nozzle openings, said application nozzles are mounted slidingly on a base and capable of being adjusted horizontally or vertically and individually or jointly, means for connecting a feed pipe originating at said pump to said application nozzles, said nozzles having rectangular cross-sections and being pressed elastically against said surface in a beveled orientation, said positive displacement pump having a wide intake cross-section and said hopper having a cylindrical upper section and a lower section conical in only one plane with a heatable screen grid in the transition point between said upper and lower hopper sections, said pump being at least partially

heated, a drive shaft of said pump being provided with a starting crank and a thermostatically controlled heating means and said hopper being provided with a closable by-pass connection for attachment to a flexible high pressure tube or hose with a single nozzle or multiple nozzle arrangement for treatment of practically inaccessible or steep surfaces.

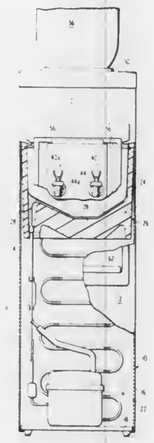
4,629,095
TOOTHPASTE DISPENSER
Allan L. Smith, C/-Hukerenui Post Office, Hukerenui, New Zealand
Filed Nov. 16, 1984, Ser. No. 672,363
Claims priority, application New Zealand, Nov. 23, 1983, 206373
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—96 **17 Claims**



1. A dispenser comprising:
a base;
mounting means for mounting an evacuable container for fluent material, said container having an outlet for said fluent material and said mounting means being mounted on said base for movement relative thereto;
a cog rotatably mounted on said mounting means;
a track on said base in a position to be operatively engaged by said cog in the operating position so that actuation of said cog successively advances said mounting means relative to said base;
evacuating means mounted in the path of movement of said container and engageable therewith to progressively collapse said container to eject fluent material therein through said outlet as said container is advanced with said mounting means; and
actuator means on said mounting means positioned adjacent said outlet and operable upon being actuated by an article onto which said fluent material is to be deposited to actuate said cog means;
so that actuation of said actuator means by said article causes an amount of said fluent material to be ejected from said container and deposited onto said article.

4,629,096
LIQUID DISPENSER WITH READILY REMOVABLE LIQUID CONTAINER
William L. Schroer, and Edward H. Donselman, both of Freeport, Ill., assignors to Elkay Manufacturing Company, Freeport, Ill.
Filed Dec. 27, 1984, Ser. No. 686,690
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—146.6 **18 Claims**

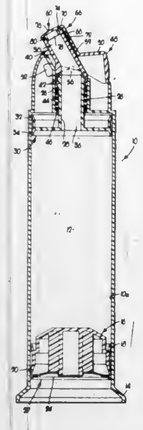
1. A liquid-dispensing apparatus having a drop-in/lift-out reservoir comprising:
a housing having an opening in a front vertical wall thereof and a removable top;
an insulated receptacle positioned within said housing;
a substantially horizontal cooling plate within a lower portion of said insulated receptacle;
a vertically removable liquid container adapted to be dropped into and lifted out of said insulated receptacle after removal of said top of the housing and providing a reservoir, the bottom of said container resting on and being in heat exchange relation with said cooling plate, liquid valve means integrally incorporated in a wall por-



tion of said liquid container and located to project through said front wall opening in said housing and accessible be a user with said liquid container located in said insulated receptacle; and
means in said housing for locating said liquid container in said insulated receptable;
said locating means comprising a generally arcuate opening located in a wall of said insulated receptacle and said container including a corresponding arcuate opening-engaging panel secured to the wall portion of said liquid container through which said valve means pass.

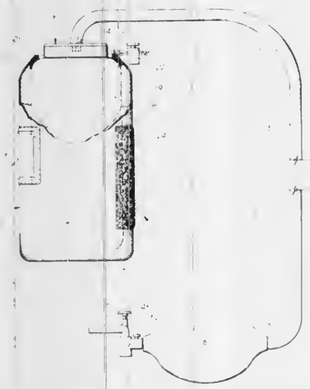
4,629,097
SNAP-ACTION ORIFICE SEALING PLUG FOR VISCOUS PRODUCT DISPENSER
David G. Moore, Lee's Summit, Mo., assignor to Realex Corporation, Kansas City, Mo.
Filed Feb. 22, 1985, Ser. No. 704,488
Int. Cl.[4] B67D *5/32, 5/42*
U.S. Cl. 222—153 **7 Claims**

1. In a dispensing pump having a discharge spout and a movable actuator adjacent the spout for operating the pump, the improvement comprising:
a closure for the end of said spout hingedly attached to said actuator for movement relative to the actuator between a closed position for closing the spout and an open position for opening the spout; and
toggle means operably coupled with said closure and the actuator for yieldably holding the closure in either of said selected positions,



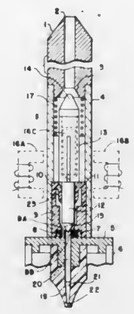
said closure including a plug configured to be matingly received within the spout when the closure is in said closed position thereof.

4,629,098
PORTABLE LIQUID DISPENSER
Douglas R. Eger, 96 Lakeview Village, Montgomery, Tex. 77356
Filed Oct. 15, 1984, Ser. No. 661,084
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—175 **27 Claims**



1. A person-carried or vehicle-carried portable liquid dispenser comprising;
a liquid container having a filling cap for receiving liquids,
a single flexible dispensing tube having two separate, longitudinally-extending, substantially parallel passages extending from end to end thereof,
said tube having one end attached to and opening into said filling cap and its other end extending therefrom,
a dispensing valve attached to the extended end of said dispensing tube for selectively dispensing liquid from said container,
pressurizing means secured on said dispensing tube in communication with one of said longitudinal passages for creating air pressure within said container, and
the other of said longitudinal passages interconnecting said dispensing valve and the interior of said container whereby operation of said dispensing valve permits flow of liquid from said container through said other longitudinal passage.

4,629,099
ESCAPEMENT DEVICE
J. Paul Jones, R.D. 1 Box 171-L, Glenmoore, Pa. 19343
Filed Aug. 27, 1985, Ser. No. 769,714
Int. Cl.[4] G01F *11/32*
U.S. Cl. 222—453 **3 Claims**



1. In an intervenous infusion system:
a drip chamber including a cap on the top thereof;
a connection spike;
an elongated, hollow escapement cylinder, the bottom end of which is connected to the cap of said drip chamber and the top end of which is connected to said spike to extend vertically upwardly when said drip chamber is mounted for use, the escapement cylinder having an interior capture shoulder;
elongated shuttle means inside of said escapement cylinder;
guide means on said shuttle engaging the inside wall of said escapement cylinder mounting the shuttle for reciprocating motion along the axis of the escapement cylinder;
conically shaped fluid intake plug means connected to and disposed at the top end of said shuttle;
first means on said cap formed with a cylindrically-shaped rim and a drip passageway to pass fluid, the rim and drip passageway being coaxial with the axis of said escapement cylinder;
a disc made of silicon rubber in said rim and having a flat top surface and a cylindrically shaped central aperture, the flat top surface being normal to the central aperture;
and the edge formed by the intersection of the top surface of the disc with the surface of the central aperture of the disc forming a sharp, circular fluid discharge valve seat means and the central aperture of the disc forming a fluid passageway coaxial with the axis of said escapement cylinder;
a cylindrically-shaped escapement foot mounted on said cap and engaging said rim and said escapement cylinder, the foot having a section extending over said disc to capture the same in said rim;
a reverse bend flexible seal made of silicon rubber mounted on said foot and engaging said capture shoulder;
second means on said spike formed with conically-shaped fluid intake valve seat means coaxial with the axis of said escapement cylinder to be engaged and disengaged by said fluid intake plug means;
a cylindrically shaped stem connected to the shuttle and extending coaxially with said axis;
a conical surface on the end of said stem and forming a fluid discharge plug means to engage with and discharge from said fluid discharge valve seal means;
said shuttle means being dimensioned to permit passage of fluid through said escapement cylinder as between said

fluid intake valve seat means and said fluid discharge valve seat means;

said reverse bend flexible seal extending between said escapement cylinder and said cylindrically shaped stem and having an annular lip extending in a direction toward said disc and making a sliding engagement with said cylindrically shaped stem;

drive means for moving said shuttle from a first position to a second position, the first position being below said second position:

(a) in the first position said fluid intake plug means being spaced away from said fluid intake valve seat means and said fluid discharge valve plug means engaging said fluid discharge valve seat means;

(b) in the second position said fluid intake plug means engaging said fluid intake valve seat means and said fluid discharge plug means being spaced away from said fluid discharge valve seat means, said disc, the interior of said foot, and said flexible seal forming a volumetric fluid measuring chamber;

when said shuttle is moving from said first position up to said second position:

(a) said flexible seal functioning to permit fluid to flow between said lip and said cylindrical stem and into said volumetric measuring chamber until said fluid intake plug means engages said fluid intake valve seat means;

when said shuttle is moving from said second position down to said first position:

(a) the pressure of the fluid in said volumetric measuring chamber being greater that the fluid pressure in the portion of the escapement cylinder above said flexible seal so that said lip is pressed against said cylindrical stem and fluid in said volumetric measuring chamber is pushed out of the volumetric measuring chamber until said fluid discharge plug means engages said fluid discharge seat means and said difference in pressure preventing fluid in the volumetric measuring chamber from flowing back up into the escapement cylinder above said seal; and

(b) the movement of said fluid intake plug means away from said fluid intake valve means permitting new fluid to flow into said escapement cylinder; and

check valve means connected to said cap and having an exit passage in series with said drip passageway, the check valve means functioning when the shuttle is moving from said second position down to said first position to permit fluid in the volumetric measuring chamber to flow into said drip chamber and functioning when said shuttle is moving from said first position up to said second position to stop any backflow of fluid into the volumetric chamber.

4,629,100

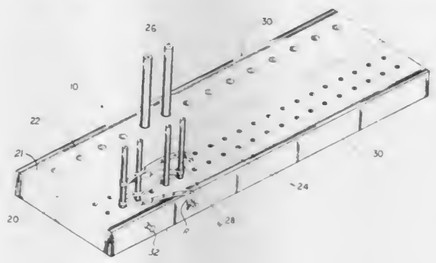
APPARATUS FOR TYING BOWS

Betty Owens, 3867 Gumtree Road, Winston-Salem, N.C. 27107

Filed Nov. 14, 1985, Ser. No. 797,822

Int. Cl.⁴ A41H *43/00*; D04D *7/10*

U.S. Cl. 223—46 **4 Claims**



1. An apparatus for making bows and similar ornamental objects from continuous lengths of ribbon-like material; said apparatus comprising:

(a) a base member having at least a top surface, and side walls;

(b) said top surface including a first plurality of apertures arranged in a prescribed pattern adjacent one edge thereof, and a second plurality of apertures arranged in a prescribed pattern adjacent the opposite edge thereof;

(c) said first plurality of apertures being of a first prescribed diameter, and said second plurality of apertures being of a second, smaller diameter;

(d) a first plurality of pegs having a diameter such that said pegs will removably fit in said first apertures, and a second plurality of pegs having a diameter such that said pegs will removably fit in said second apertures;

(e) said first and second plurality of pegs being positioned in selected ones of said first and second pluralities of apertures according to a prescribed pattern for making a desired bow;

(f) a strip of cork material extending the length of and adjacent one side wall of the base member; and

(g) anchor means releasably associated with said cork strip for holding at least one end of said ribbon material in place while the ribbon is being wound around said pegs; wherein the ribbon material is wound around two or more of said pegs a desired number of times before being tied off and removed to be arranged into a bow and whereby the differing diameter pegs permit variation in bow curvature when processing ribbons of varying width.

4,629,101

DISPLAY DEVICES FOR ARTICLES OF CLOTHING

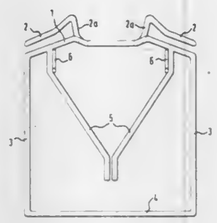
Robert J. Franklin, Buckinghamshire, England, assignor to Marks and Spencer p.l.c., United Kingdom

Filed Mar. 5, 1985, Ser. No. 708,293

Claims priority, application United Kingdom, Mar. 23, 1984, 8407556

Int. Cl.⁴ B65B *15/00*; B65D *57/00*

U.S. Cl. 223—66 **8 Claims**



1. A display device for garments comprising:

a first support element constructed of a transverse support having downwardly inclined upper surfaces extending towards opposite ends of said support, whereby said support is adapted to overlie the outer surface and to follow the contour of the shoulders of a garment;

a pair of second support elements arranged inclined downwardly and separately attached to the first support element inwardly of said downwardly inclined upper surfaces, whereby said second support elements are adapted to pass through a neck aperture of the garment so as to each be located in a shoulder zone and within the interior of the garment adjacent to one end of said first support element; and

a pair of retaining means mounted on either side of the center of said first support element to receive and retain an upwardly folded lower region of the garment.

4,629,102

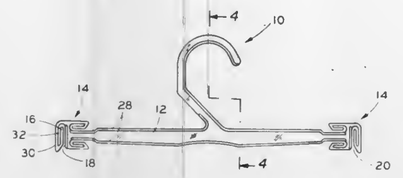
GARMENT HANGER WITH CLIP

Donald Tendrup, 32 Del Marie La., Nesconsett, N.Y. 11767, and Joseph DeVito, 7 Ingrid Ct., Hauppauge, N.Y. 11788

Filed Sep. 30, 1981, Ser. No. 307,014

Int. Cl.⁴ A47G *25/36, 25/48*

U.S. Cl. 223—85 **1 Claim**



1. In a hanger of plastic construction material and of the type having a centrally located hook for being suspended from a support, a body connected to the base of said hook oriented horizontally when used, and at each of the opposite ends of said body, plural garment-engaging grips molded integral therewith, at least one said garment-engaging grip comprising a vertically oriented wall surface of said hanger extending from a location adjacent the upper edge of said body to a location at the lower edge thereof, a U-shaped configuration molded therein so as to present a first downwardly extending resilient finger and a reverse direction upwardly extending second resilient finger spaced inwardly of said first finger, said second resilient finger being located in an adjacent clearance position from said wall surface for the entire vertical length thereof such that there is a first clearance space between one side of said second finger and said wall surface defining a garment-receiving slot therebetween and a second clearance space along said opposite side of said second finger for allowing transverse movement in said second finger in a direction away from said wall surface, said second resilient finger being movable in a direction transverse to and away from said wall surface by displacement into said second clearance space, and at least another said garment-engaging grip comprising a horizontally oriented wall surface of said hanger extending from a location adjacent an end edge of said body to a location inwardly thereof, a U-shaped configuration molded therein so as to present a first horizontally extending resilient finger and a reverse direction horizontal extending second resilient finger spaced inwardly of said first horizontally extending finger, said second horizontally extending finger being located in an adjacent clearance position from said horizontally oriented wall surface such that there is a first clearance space between one side of said second finger and said wall surface defining a garment-receiving slot therebetween and a second clearance space along said opposite side of said second finger for allowing transverse movement in said second finger in a direction away from said wall surface, said second resilient finger being movable in a direction transverse to and away from said wall surface by displacement into said second clearance space, whereby said second finger of each said garment-engaging grip is movable away from said wall surface into said second clearance space to provide an enlarged size to said garment-receiving slot for said entire length thereof incident to the insertion of a garment therein to an extent providing sufficient bulk for said second finger to remain in gripping engagement with said inserted garment and wherein said movement of said second finger caused by said bulk obviates stress in said construction material at the connecting juncture of each said grip with said hanger.

4,629,103

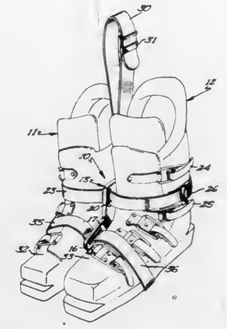
SKI BOOT CARRIER

Mervin C. Miller, 4204 Standish Ave. South, Minneapolis, Minn. 55407

Filed Jul. 29, 1985, Ser. No. 760,098

Int. Cl.⁴ A45F *3/14*

U.S. Cl. 224—250 **5 Claims**



1. An article carrier comprising:

(a) an elongated strap having a releasable buckle at one end thereof with the other end passing through said buckle;

(b) a panel of generally rectangular shape including a toe portion extending from a side of the panel, the toe portion defining a forward portion of the panel having a thickness at least greater than said strap in cross-section, said panel having a pair of slots formed at the front and rear thereof, and a forwardly extending toe slot formed in the forward area of said panel, all of said slots extending transversely through said panel and having a substantially vertical slot extending from the top to bottom of said panel with a thickness to accommodate at least two thicknesses of said strap; and

(c) said strap being formed in a loop with two thicknesses extending upwardly through said substantially vertical slot and carrying said releasable buckle above said vertical slot, said two thicknesses extending downwardly from said vertical slot and first extending divergently outwardly and secondly curving back towards, and joining each other, while passing through said forwardly extending toe slot.

4,629,104

BICYCLE RACK DESIGNED FOR ATTACHMENT TO THE LUGGAGE CARRIER OF A VEHICLE

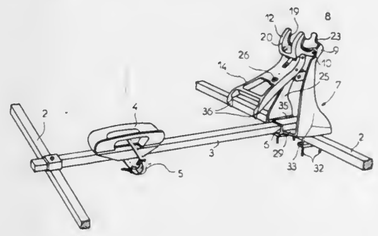
Bernard A. Jacquet, Lyon ler, France, assignor to Societe d'Exploitation des Etablissements Macroex, France

Filed Sep. 4, 1984, Ser. No. 646,437

Claims priority, application France, Sep. 12, 1983, 83 14814

Int. Cl.⁴ B60R *9/00*

U.S. Cl. 224—324 **5 Claims**



1. In combination with a bicycle of the type having a front

and rear wheel, a frame and a pedal crank assembly housing being a portion of said frame, and a bicycle rack for holding said bicycle in an upright position, the improvement comprising:

a longitudinal bar;

a cradle attached to said longitudinal bar and adapted to receive said front wheel of said bicycle; and

a frame bracket attached to said longitudinal bar and adapted to receive said pedal crank assembly housing of said bicycle, said frame bracket comprising a jaw with a generally upwardly facing curved surface, said upwardly facing curved surface being the portion of said frame bracket which is adapted to receive said pedal crank assembly housing of said bicycle, said jaw comprising:

a first member with a first arcuate surface and a second member with a second arcuate surface, said first and second members being hingedly connected to move between an open position in which said pedal crank assembly housing of said bicycle can be inserted in said jaw and a closed position in which said pedal crank assembly housing of said bicycle can be grasped by said jaw;

a lever hingedly connected to said first member at a first axis and hingedly connected to said second member at a second axis, said second axis being parallel to said first axis, said lever being movable to move said second member with respect to said first member between said open position and said closed position;

a connecting rod of adjustable length for connecting said lever to said first member, said connecting rod being hingedly connected to said first member to said first axis and being hingedly connected to said lever at a third axis, said third axis being parallel to said first axis;

means for adjusting said connecting rod, said means for adjusting said connecting rod being effective to vary the degree of closing of said second member with respect to said first member;

a luggage carrier having a bar;

two pairs of screws adapted to secure said frame bracket to said bar of said luggage carrier, said frame bracket further comprising a bottom member adapted to be positioned above said bar, said bottom member comprising holes to permit said screws to pass therethrough, said screws of each pair of screws being adapted to be positioned on opposite sides of said bar;

first plate means adapted to be positioned under said bar to receive said screws;

second plate means adapted to be positioned above said bar, said second plate means comprising holes for receiving the heads of said screws; and

said lever resting on said second plate means when it has been moved to said closed position with respect to said first member to prevent loosening of said screws when said lever is in said closed position.

4,629,105

APPARATUS FOR DRIVING A TAUT RIGID WIRE BETWEEN TWO GROOVED WHEELS

René E. Grenon, 21, rue Victor Hugo, 77181 Courtry, France

PCT No. PCT/FR84/00064, § 371 Date Nov. 13, 1984, § 102(e) Date Nov. 13, 1984, PCT Pub. No. WO84/03688, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 15, 1984, Ser. No. 682,356

Claims priority, application France, Mar. 16, 1983, 83 04305

Int. Cl.[4] B65H *51/10*

U.S. Cl. 226—186 **9 Claims**

1. Apparatus for driving rigid wire and comprising:

a frame (**1**),

a pressure wheel (**2**) mounted on said frame (**1**) to rotate freely,

an arm (**13**) mounted on said frame (**1**) to pivot freely and having a shaft (**12**),

a grooved wheel (**3**) mounted on said arm (**13**) about said shaft (**12**) for cooperating with said pressure wheel (**2**) for driving said rigid wire,

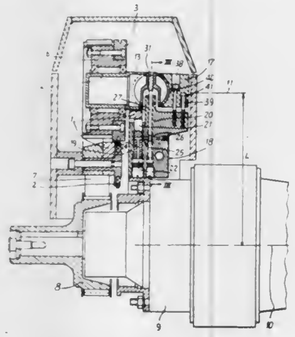
a driven pulley (**6**) having a geometrical axis (**11**) mounted on said shaft (**12**) and locked to rotate with said grooved wheel (**3**),

a motor unit (**9**) having a drive pulley (**8**) and a geometrical axis (**10**) mounted on said frame (**1**) and a fixed part,

a belt (**7**) connecting said drive pulley (**8**) with said driven pulley (**6**),

a resilient member (**23**) tending to press said two wheels (**2, 3**) against each other,

said apparatus including an articulated member pivotably mounted on said apparatus so as to be freely pivotable relative to said frame, said motor unit being mounted on



said articulated member, said apparatus further including actuator means comprising a piston slideably disposed in a cylinder with said piston being movable between said frame and said fixed part of said motor unit so that said piston will cause said wheels to be moved towards and away from each other, said actuator means including a flow passage connecting said piston to a slide valve having a slide which is movable between at least a first position where said valve is connected to a low pressure hydraulic fluid circuit and a second position where said valve is connected to a high pressure hydraulic fluid circuit, said slide having one end in constant engagement with said arm so that the position of said slide is determined by the relative distance between said geometrical axis of said driven pulley and said drive pulley.

4,629,106

ACTUATING MEANS FOR FASTENER DRIVING TOOL

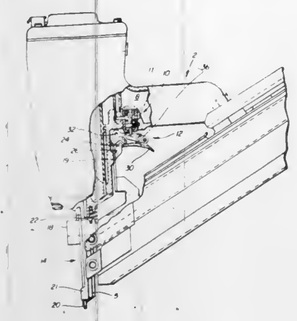
Frank C. Howard, Mt. Prospect, and Allan E. Kiefer, Fox River Grove, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed May 29, 1985, Ser. No. 737,780

Int. Cl.[4] B25C *1/00, 1/04, 5/00*

U.S. Cl. 227—8 **13 Claims**

1. A fastener driving tool including a portable housing, fluid pressure operated fastener driving means in said housing, a magazine secured to said housing and adapted to provide fasteners to be driven by said fastener driving means, means for controlling the operation of said fastener driving means, and a bottom trip assembly having a workpiece contacting member and activator contacting portion carried by said housing and movable between an operative position in engagement with the workpiece and an inoperative position when it is out of engagement with a workpiece; the improvement comprising an actuating means connected to said housing for regulating the operation of said control means, said actuating means including a trigger piyotally connected to said housing including an activator connected to said trigger and positioned to be engaged by said activator contacting portion when the bottom trip assembly is moved to its operative position and a lever pivotally connected to said trigger and positioned to be engaged by said activator and to operatively engage said control means; said lever, activator, and activator contacting portion being constructed and arranged, whereby sequential movement of



said activator contacting portion by a workpiece contacting member, activator, lever and trigger will engage said control means to fire said tool and operation of said trigger prior to engagement of said workpiece contacting member will be ineffective to fire said tool.

4,629,107

LIGATING INSTRUMENT

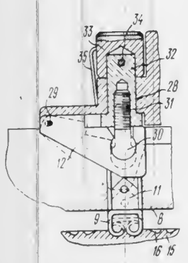
Vladimir M. Fedotov; Vladimir P. Kharchenko, both of Moscow; Iosif L. Lipovsky, Leningrad, and Tatyana L. Ivanova, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institute Meditsinskoi Tekhniki, Moscow, U.S.S.R.

Filed Jun. 5, 1984, Ser. No. 617,508

Claims priority, application U.S.S.R., Aug. 19, 1983, 364947

Int. Cl.[4] A61B *17/10*

U.S. Cl. 227—19 **2 Claims**



1. A ligating instrument comprising an anvil body; a staple driving body; a longitudinal groove formed by the lateral walls of said staple driving body; a staple magazine with staple pushers, which is accommodated in said longitudinal groove; said anvil body having an anvil for bending the ends of the staples as they are pushed out from the magazine and brought into engagement with said anvil; a wedge intended to interact with said staple pushers of said staple magazine, received in said longitudinal groove and having a tapered portion and a rear portion; guides mounted on the external sides of the lateral walls of said staple driving body; a carriage movably mounted in said guides; said wedge being mounted on said carriage; a detachable joint; a locking means; said detachable joint and said locking means serving to hold together said anvil body and said staple driving body; a means for adjusting the ligation spacing having a stationary axle mounted on said carriage transversel to the latter, and a movable support; said wedge being fitted with its tapered portion on said stationary axle, its rear portion being articulated to said movable support; and adjusting means on said carriage for moving said wedge and said movable support transversely to said guides to adjust the ligation spacing.

4,629,108

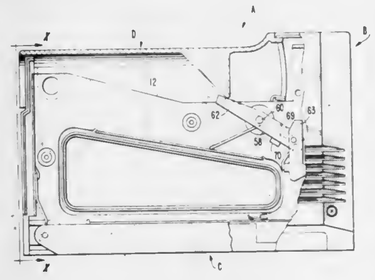
MECHANICAL STAPLER FRAME AND COVER ASSEMBLY

Alfred H. Judge, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.

Filed Feb. 22, 1985, Ser. No. 704,278

Int. Cl.[4] B25C *5/06, 5/11*

U.S. Cl. 227—132 **10 Claims**



1. A mechanical stapler having a lightweight frame and cover assembly, comprising:

a first stamped metallic frame having a first component support section and opposed end sections projecting substantially orthogonally from said first support section to provide first mating edges;

a second stamped metallic frame having a second component support section and opposed end sections projecting substantially orthogonally from said second support section to provide second mating edges, said second mating edges being disposed to engage said first mating edges when said first and second frames are placed in abutting relation;

said first and second support sections having a plurality of openings, selected ones of said openings having a tab extending therefrom, and predetermined ones of said openings in said first frame being aligned with predetermined ones of said openings in said second frame when said first and second frames are in abutting relation;

engaging means extending along said first and second mating edges for restricting sliding movement between said frames when said first and second frames are in abutting relation, said engaging means including edge projections and edge cut-outs, wherein said edge cut-outs are inserted within said edge projections when said first and second frames are in abutting relation;

a first plastic cover plate configured to receive and hold said first frame;

a second plastic cover plate configured to receive and hold said second frame, said first and second cover plates defining a clam shell housing to clamp said frames together; and

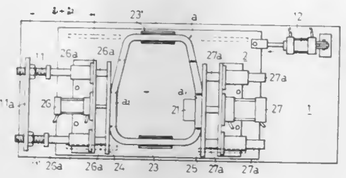
means for securing said first and second cover plates together and about first and second frames to hold said first and second frames when said frames are positioned in abutting relation.

4,629,109

JIG FOR WELDING FRAMES

Kazuyoshi Matsushita, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd, Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,737
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—49.1 **6 Claims**



1. A jig for welding a vehicle seat frame bent formed of a pipe into frame-like configuration, said jig comprising:

a bed plate;

a frame carrying plate movably mounted to said bed plate, said frame carrying plate being adapted for receiving and carrying said seat frame for movement along a given direction;

a pair of grasping members mounted on said frame carrying plate in a facing relationship for movement towards and away from each other along the movement direction of said frame carrying plate, thereby to supportingly grasp said seat frame on said frame carrying plate;

adjustable movement restriction means arranged at one end portion of said bed plate, said means being situated adjacent to one of said pair of grasping members, and adapted for adjustably restricting the movement of said frame carrying plate at the corresponding extremity to thereby define a first reference plane at one corresponding lateral bar section of said seat frame; and

a guide element arranged on said frame carrying plate and positioned in an opposite relation with said adjustable movement restriction means, said guide element being adapted for supportingly setting the position of said seat frame to thereby define a second reference plane at the other lateral bar section of said seat frame.

4,629,110

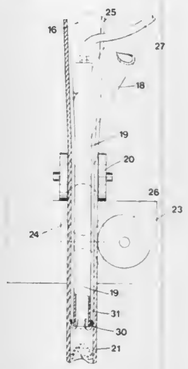
METHOD FOR MANUFACTURING POWDER-FILLED TUBULAR WELDING ELECTRODES AND A DEVICE FOR PERFORMING THE METHOD

Werner Holmgren, Västra Frölunda, and Kent Jisbrant, Göteborg, both of Sweden, assignors to Werner Holmgren, Vastra Frolunda, Sweden

Filed Sep. 24, 1985, Ser. No. 779,683
Claims priority, application Sweden, Oct. 3, 1984, 8404938
Int. Cl.[4] B23K *35/40*
U.S. Cl. 228—148 **4 Claims**

1. A method for manufacturing powder-filled tubular welding electrodes, made from a continuously fed metallic gutter, in which the powder is introduced through a powder conveyor, said powder conveyor having a filling conduit including a discharge end with at least a portion of said filling conduit and said discharge end being located within the gutter downstream of a welding station for welding the longitudinal edges of the gutter to form a tube, the improvement comprising introducing a pressurized gas into said filling conduit to accelerate the transfer of powder through said conduit and exhausting the pressurized gas through an exhaust passage provided between said filling conduit and said formed tube, locating an entrance to said exhaust passage immediately adjacent to said discharge end of said filling conduit, whereby blockage of said discharge outlet of said filling conduit will be effective to throttle the discharge of powder from said filling conduit.

3. A device for manufacturing powder-filled tubular welding electrodes where a said electrode is formed by first forming a metallic gutter which is continuously fed through shaping means and a welding station, said device comprising a powder conveyor means including a filling conduit having a discharge end, a pressurized gas supply means connected to said filling conduit at an end thereof remote from said discharge end, the length of said filling conduit being such that said remote portion of said filling conduit is positionable on one side of the



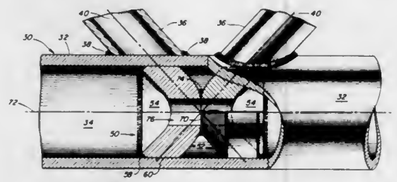
welding station with said discharge end of said filling conduit disposed on the opposite side of said filling station, said shaping means being effective to close said metallic gutter to form a closed tube and said filling conduit adjacent said discharge end thereof defining with the interior of said tube an exhaust passage for the pressurized air delivered from said discharge end of said filling conduit.

4,629,111

METHOD OF REINFORCING COMPLEX TUBULAR JOINTS

Mamdouh M. Salama, Ponca City, Okla., and Robert B. Pan, Calgary, Canada, assignors to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 437,605, Oct. 29, 1982, Pat. No. 4,543,008.
This application Oct. 24, 1984, Ser. No. 664,278
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—182 **4 Claims**



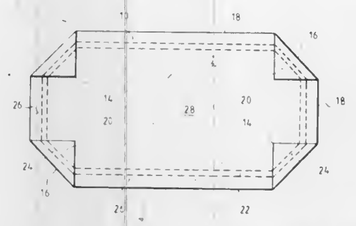
1. A method of reinforcing a complex joint of a tubular chord member having cylindrical inner and outer surfaces and a tubular bracing member having a longitudinal axis, the tubular bracing member being attached to the outer surface of the chord member, the method comprising locating a multicurvature reinforcing body internally of the chord member, the multicurvature reinforcing body having a pair of cylindrical surfaces of contact in abutment with the inner surface of the chord member, the multicurvature reinforcing body being located so that the longitudinal axis of the bracing member passes through both of the pair of cylindrical surfaces of contact of the multicurvature reinforcing body.

4,629,112

RECEPTACLE WITH FLANGE CLOSURE

Peter Stenzel, Herscheid, Fed. Rep. of Germany, assignor to Alcan Ohler GmbH, Plettenberg/Ohle, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 709,423
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408487
Int. Cl.[4] B65D *43/00*
U.S. Cl. 229—43 **4 Claims**



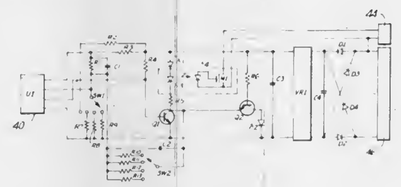
1. A receptacle comprising a tray and a cover removably secured thereto, said tray being substantially rectangular having four corners, a bottom wall, side walls adjacent thereto and an edge flange that surrounds and projects outwardly from the top edges of the side walls, said edge flange having beveled corners having a substantially straight edge in each of the four corners of the tray and said cover comprising a rectangular blank of foil material, the edges of which are substantially parallel to and extend out over the edge flange of the tray, each corner of the cover being folded inwardly over the top surface of the cover along a fold line parallel to but spaced outwardly from the beveled edge of the edge flange to form pull flaps, whereby the edges of the cover are rolled downwardly around and up under the edge flange on all sides of the tray to hold the cover in place.

4,629,113

FURNACE CONTROLLER

Randy L. Brandt, Orange; K. Herb Boswell, Mission Viejo, and Robert A. Pett, San Juan Capistrano, all of Calif., assignors to RHR, Inc., Anaheim, Calif.

Filed Oct. 5, 1984, Ser. No. 658,290
Int. Cl.[4] F24D *5/04*
U.S. Cl. 236—10 **1 Claim**



1. A furnace system which comprises:

a space heater having a burner means for burning fuel, an electrically operated fuel valve means associated with said burner means for supplying fuel to said burner means and a heat exchange means for conducting heat from said burner means through a plenum to a space;

said fuel valve means including an A/C operated solenoid for controlling fuel flow;

a heat probe means for sensing a first temperature and a second temperature, said first temperature greater than said second temperature, said heat probe means located in said plenum in a position to sense the temperature of air passing from said heat exchange means into said plenum;

a control means for setting said first and said second temperatures, said control means electrically associated with said heat probe means and including a first temperature setting means and a hysteresis means, said first temperature setting means for setting said first temperature at at least two different values, said hysteresis means for setting a temperature differential between said first temperature and said second temperature whereby said second temperature is dependent on said first temperature and said second temperature can be set at at least two different values for each of said values of said first temperature;

an optical coupled switch having an input circuit and an output circuit, said output circuit consisting of a MOSFET transistor and a photovoltaic element electrically connected together, said MOSFET transistor directly electrically connected in series to said fuel valve means solenoid without any other intervening electrical components being located between said MOSFET transistor and said solenoid whereby said MOSFET transistor directly controls the A/C current through said fuel valve means solenoid, said input circuit consisting of a light emitting diode electrically isolated from both said photovoltaic element and said MOSFET transistor, said optical coupled switch including a light path between said light emitting diode and said photovoltaic element for conducting light from said light emitting diode to said photovoltaic element, said light emitting diode electrically connected to said heat probe means so as to receive an electrical signal from said heat probe means and in response to said electrical signal said light emitting diode emitting light through said light path to said photovoltaic element;

a latch means for fixing said optical coupled switch in a first switch position in response to said first temperature to disrupt said A/C current flow to said fuel valve means solenoid and for fixing said optical coupled switch in a second switch position in response to said second temperature to restore said A/C current to said fuel valve means solenoid, said latch means electrically associated with both said heat probe means and said input circuit of said optical coupled switch;

a first indicator means for indicating when said switch is in said first position, said first indicator means in electrical association with said switch;

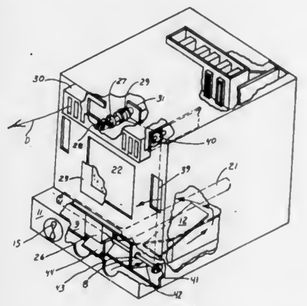
a buffer means for operating said switch means in response to said electrical signal from said heat probe means, said buffer means including a transistor electrically associated with said heat probe means and said optical couple switch.

4,629,114

HEATER DEVICE CONTROL

Hailey L. Baker, 3551 Todds Rd., Lexington, Ky. 40509

Filed Feb. 28, 1983, Ser. No. 424,160
Int. Cl.[4] F23N *5/04*
U.S. Cl. 236—11 **2 Claims**



1. A heating device including a combustion chamber for burning a selected fuel;

an outer casing surrounding a portion of said combustion chamber and defining a plenum chamber therebetween having an ambient air inlet and a heated air outlet to emit

air from said plenum chamber after said air has been heated by contact with said combustion chamber;

fan means to supply ambient air to said plenum chamber means air inlet;

conduit means having an inlet to receive air from said fan means and outlet communicating with said combustion chamber to supply combustion air to said combustion chamber;

combustion air flow control damper means located adjacent said conduit means to regulate air flow through said conduit means;

bi-metallic temperature sensing element means located in said outlet of said plenum chamber and connected to said damper means to attenuate flow of combustion air to said combustion chamber in response to change in temperature of air emitted through said plenum chamber means air outlet wherein said bi-metallic strip is mounted on shaft means journaled at opposite ends with one for rotation wherein one end of said bi-metallic strip is secured to said shaft means with said bi-metallic strip wrapped at least one time around said shaft means with the opposite end of said bi-metallic strip fixed to pulley means carried by said shaft means where said pulley means carries cord means which is fed out and withdrawn as said shaft is rotated by movement of said bi-metallic strip in response to said temperature change which moves said damper means in response to movement of said cord means wherein said shaft means further includes position adjustment means to adjust the position of said shaft means independent of the position of said bi-metallic strip.

4,629,115

ARRANGEMENT FOR MEASURING THE QUANTITY OF HEAT GIVEN OFF BY A HEATING BODY AND FOR CONTROLLING FLUID STREAM PASSING THROUGH THE HEATING BODY

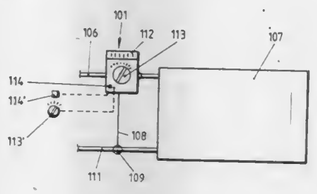
Heinz Lampert, Buchs, and Bruno Scheiwiller, Winterthur, both of Switzerland, assignors to MPE Produkt Plan AG, Zurich, Switzerland

Filed Feb. 15, 1985, Ser. No. 703,214

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405774; Feb. 17, 1984, 3405835; Feb. 17, 1984, 3405840

Int. Cl.⁴ G05D *23/00*

U.S. Cl. 236—36 **31 Claims**



1. An arrangement for measuring the quantity of heat given off by a heating body to a space and for simultaneously controlling a fluid stream which flows through the heating body and serves as a heat carrier, for the purpose of regulating of the space temperature, the arrangement comprising a volume stream regulator for allowing a constant fluid stream and having a regulating member; a signal generator; a control valve having a valve body; an on-off valve precontrolled by said signal generator via said control valve and switched by the energy of the fluid stream, for blocking or unblocking the fluid stream; a temperature sensor sensing the inlet and outlets to and from the heating body respectively; an electronic unit which determines the quantity of heat by integration of a temperature differential value converted into an electric value during opening times of said on-off valve, said regulating member of said volume stream regulator comprising a first diaphragm valve with a diaphragm and a further diaphragm valve with a diaphragm and arranged as a cascade to said first diaphragm valve in series with the latter; a housing for said diaphragm valves; a throttle with which said regulating member is associated; a bistable adjusting member associated with said control valve of said on-off valve; a holding member through which said adjusting member holds said valve body of said control valve in its end positions; and an electromagnetic switching member which requires only a minimal electrical energy and through which said bistable adjusting member is connected with said signal generator and said electronic unit.

4,629,116

POWER SAVING THERMAL CARRIER CIRCULATING PUMP PARTICULARLY FOR HEAT PUMP HEATING SYSTEMS

Karsten Laing, and Oliver Laing, both of Hofener Weg 37, 7148 Remseck a.N.2, Fed. Rep. of Germany

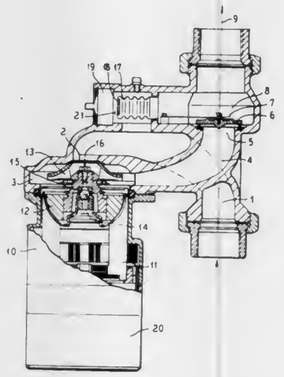
Continuation of Ser. No. 560,744, filed as PCT/DE83/00052, Nov. 23, 1983, abandoned.

This application Jan. 10, 1986, Ser. No. 817,778

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210641

Int. Cl.⁴ F24D *3/00*

U.S. Cl. 237—8 R **15 Claims**



1. In a circulating pump heating system having an electric motor driven circulating pump for a heating means utilizing a thermal carrier medium, and a means being provided for reducing power consumption of the motor, wherein the improvement comprises: means for periodic interruption of line voltage feed to the motor by electronic switch means such that switched-on and pause intervals follow one another to slow the motor but without stopping thereof; the switch means interrupting or starting current flow while preserving full amplitude of the voltage substantially at a zero-axis crossing of the voltage of the line feed; the motor having a rotor driving a pump wheel; the motor comprising a ball motor with a magnetically seated rotor; and means controlling the periodic interruption means for sensing one of the parameters temperature or pressure associated with controlling the heating system.

4,629,117

HEAT RECOVERY SYSTEM

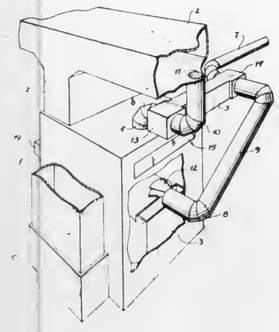
Martin L. Kasbohm, 149 Fleetwood Ter., Williamsville, N.Y. 14221

Filed Sep. 4, 1984, Ser. No. 646,778

Int. Cl.⁴ F24B *7/00*

U.S. Cl. 237—55 **6 Claims**

1. A retrofit unit for attachment to a hot air furnace system wherein said unit containing system comprises a fuel-burning hot air furnace with an air blower, a hot air duct, a cold air duct, a pipe for exhausting flue gas to the atmosphere and said retrofit unit, said retrofit unit comprising a gas to gas heat exchanger with low pressure drop and said heat exchanger having means connecting one side of said heat exchanger between said furnace flue gas outlet and the flue gas exhaust pipe so that substantially all of the flue gas passes through said heat exchanger and means connecting the other side of the heat



exchanger between the outlet of the furnace air blower and the hot air duct to provide that between about 15 and 30% of the blower discharge air passes through said heat exchanger, said retrofit unit adapted to function in combination with said existing air blower in said system.

4,629,118

RAIL INSULATING PAD ASSEMBLY

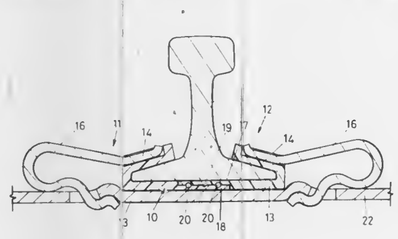
William F. Langman, Lonsdale, Australia, assignor to Omark Industries, Inc., Portland, Oreg.

Filed May 5, 1983, Ser. No. 491,930

Claims priority, application Australia, May 5, 1982, PF3859

Int. Cl.⁴ E01B *9/68*

U.S. Cl. 238—107 **8 Claims**



1. A two-piece rail insulating pad assembly for use in between the foot of a railroad rail and a rail sleeper extending transversely to the rail and preventing capillary mositure action comprising two insulating pad portions, each pad portion being a molding comprising an overlie portion of configuration to overlie the top surface of the rail foot, and a flange of length approximating the width of the sleeper and of such shape as to form a seat for said rail foot, the flanges of the respective pad portions so overlapping one another as to form an abutment interface zone between them, at least one of the flanges having at least one groove which opens into, and extends for the entire length of, the abutment interface zone to form a capillary path interruption aperture.

4,629,119

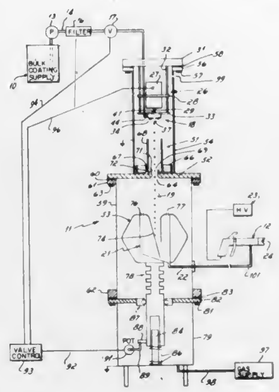
ELECTROSTATIC ISOLATION APPARATUS AND METHOD

Robert T. Plunkett, and Ion I. Inculet, both of London, Canada, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 26, 1984, Ser. No. 574,277

Int. Cl.⁴ B05B *5/00*

U.S. Cl. 239—63 **82 Claims**



55. An isolator for an electrostatic coating system comprising:

a housing;

a receptacle, having an opening in an upper portion thereof and mounted in the housing, for electrostatic coating material which is at a first electrical potential;

an outlet conduit communicating between the receptacle and the exterior of the housing for supplying electrostatic coating material from the receptacle for use by an electrostatic coating device;

droplet supply means for supplying droplets of coating material at a second electrostatic potential at a location spaced above said receptacle for downward flow into said opening in the upper portion of said receptacle, and

an electrostatic shield at an electrical potential substantially closer to said second potential than to said first potential, mounted between said droplet supply means and said receptacle opening to substantially electrostatically shield said droplet supply means from electrostatic potentials below said shield including the electrostatic potential of the coating material in said receptacle.

4,629,120

FRONT-ADJUSTING, SELF-CLEANING ATOMIZER NOZZLE

Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604

Filed Jan. 20, 1984, Ser. No. 572,704

Int. Cl.⁴ B05B *15/02*

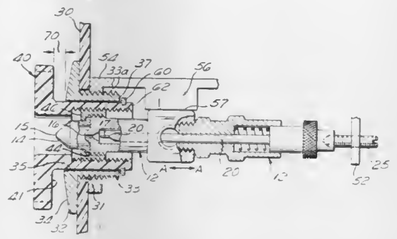
U.S. Cl. 239—117 **16 Claims**

1. In an atomizer nozzle comprising a nozzle body having an exit orifice, a needle valve extending generally coaxially within said nozzle body and having its exit end proximate to the exit orifice of said nozzle body, said needle valve and nozzle body being mounted for relative movement with respect to each other, said nozzle body means being normally biased to a normal position by a biasing means wherein said needle valve is upstream of said exit orifice of said nozzle body, to effect atomization in said normally biased position, and having air and water inlet means in communication with said nozzle body and said needle valve respectively, the improvement which comprises:

a first means for fixing said needle valve in a predetermined position; and

a positional control means provided adjacent the exit end of said nozzle body including:

a control knob means threadably engaged to said nozzle body, said control knob means, upon axially inward movement thereof, coaxially inwardly moving said nozzle body relative to said needle valve, against said biasing means, to a position wherein said needle valve extends into the exit orifice of said nozzle body for self-cleaning action;



said control knob means, upon rotation thereof, incrementally moving said nozzle body, against said biasing means, to a given predetermined, fixed position which is more proximate to, or distal from, said normal position with respect to said needle valve; and

a second means for constraining rotational movement of said nozzle body during said incremental movement of said nozzle body caused by said rotation of said control knob means.

4,629,121

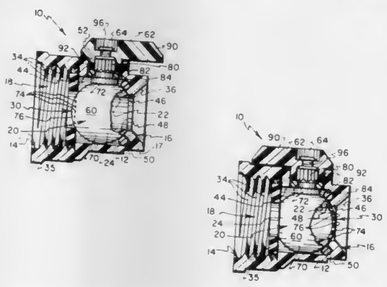
FLOW CONTROL NOZZLE AND SHUTOFF VALVE HAVING SCREEN-CARRYING PASSAGE IN ROTATABLE STEM

Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 398,145, Jul. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 461,872, Jan. 28, 1983, and a continuation-in-part of Ser. No. 461,873, Jan. 28, 1983. This application Mar. 11, 1985, Ser. No. 715,353

Int. Cl.⁴ B05B *15/02*

U.S. Cl. 239—119 **10 Claims**



1. A combined flow control, nozzle and shutoff valve unit, comprising:

(a) an elongate housing having spaced portions thereof that include structure which defines an inlet, an outlet, and a flow channel that extends through the housing to provide a generally linear flow path that communicates the inlet and the outlet, with the inlet being adapted for connection to a source of pressurized fluid;

(b) the housing further defining mounting formation means including a first hole formed through a portion of the housing for communicating with the flow channel at a location between the inlet and the outlet;

(c) flow control means including a flow control member having projecting formation means that is journaled in the first hole to provide for rotary movement of the flow control member relative to the housing about an imaginary axis of rotation that extends through the first hole and that intersects with the flow channel, with rotary movement of the flow control member relative to the housing about said axis being permitted among at least first, second and third control positions;

(d) the flow control member additionally having structure defining a generally spherical outer surface for extending across the flow channel at a location between the inlet and the outlet, with the generally spherical outer surface having a diameter as measured along the flow path that causes opposite side portions of the spherical outer surface to extend into close proximity with the inlet and the outlet;

(e) the flow control member further having an elongate flow passage extending substantially centrally therethrough and having opposed first and second end regions that open through opposite sides of the spherical outer surface, with the flow passage being oriented such that:

(i) when the flow control member is in the first control position, the flow passage is aligned with the flow channel to communicate the inlet and the outlet, the first end region is positioned near to and communicates with the inlet, and the second end region is positioned near to and communicates with the outlet;

(ii) when the flow control member is in the second control position, the flow passage is aligned with the flow channel to communicate the inlet and the outlet, the first end region is positioned near to and communicates with the outlet, and the second end region is positioned near to and communicates with the inlet; and,

(iii) when the flow control member is in the third control position, the flow passage is oriented to extend transversely with respect to the flow channel and does not communicate the inlet and the outlet;

(f) the flow passage being of substantially uniform diameter along its length except in the vicinity of the first end region wherein dispersion spray discharge means is provided including structure that defines a thin, outwardly convex wall that joins with the spherical outer surface in a substantially contiguous manner and that extends transversely across the flow passage to close the flow passage except for the provision of a multiplicity of relatively small diameter openings that are formed through the thin wall in an array that defines a screen-like structure, and with the second end region defining solid stream discharge means consisting of a single opening means that is substantially the same diameter as said uniform diameter of the flow passage;

(g) inlet seal means including a generally annular inlet seal:

(i) for establishing a seal between the housing inlet and the spherical outer surface of the flow control means;

(ii) for engaging the spherical outer surface to establish substantially leak-free communication between the inlet and the flow passage of the flow control means when the flow control means is in the first and second control positions; and,

(iii) for cooperating with the spherical outer suffface of the flow control member to shut off fluid flow from the inlet to the flow channel when the flow control member is in the third control position;

(h) outlet seal means including a generally annular outlet seal:

(i) for establishing a seal between the housing outlet and the spherical outer surface of the flow control means;

(ii) for engaging the spherical outer surface to establish substantially leak-free communication between the outlet and the flow passage of the flow control means when the flow control member is in the first and second control positions; and,

(iii) for cooperating with the spherical outer surface of the flow control member to shut off fluid flow from the flow channel through the outlet when the flow control member is in the third control position;

(i) the flow control member being operable when in its first control position to position the dispersion spay discharge means at a sufficient distance upstream from the outlet so that the dispersion spray discharge means provides substantially no deterrent to the establishment of a flow of pressurized fluid through the flow passage for discharge through the outlet as a solid-stream flow;

(j) the flow control member being operable when in its second control position to direct pressurized fluid that has been admitted to the flow passage through the inlet for discharge through the outlet as a dispersed spray of fluid; and,

(k) the inlet seal means and the outlet seal means engaging and cooperating with opposed side portions of the spherical outer surface when the flow control member is in the third control position to shut off fluid flow from the inlet to the outlet; and

(l) the housing defines an annular shoulder that is adjacent where the flow channel joins the inlet, the inlet includes structure defining an internally threaded region that extends adjacent the shoulder, the inlet seal is positioned within the internally threaded region adjacent the shoulder, and the internally threaded region, the shoulder and the inlet seal are configured to cooperate such that, when an externally threaded end region of a fluid supply conduit is threaded into the internally threaded region, said conduit is caused to compress radially outer portions of the annular inlet seal into engagement with the shoulder, and to compress radially inward portions of the inlet seal into sealing engagement with the spherical outer surface of the flow control member.

4,629,122

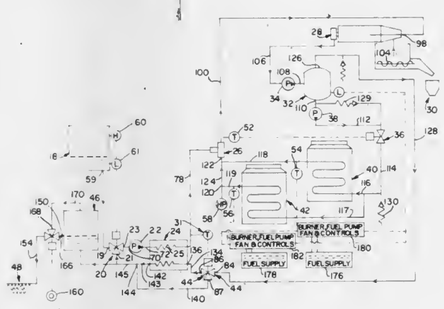
IN-FIELD FRACTIONATION PROCESS FOR GREEN VEGETATION CROPS

Randolph G. Fardal, Lisle; George B. Cicci, Burr Ridge, both of Ill., and Man K. Leung, Richmond, Calif., assignors to Navistar International Corporation, Chicago, Ill.

Filed Mar. 14, 1983, Ser. No. 474,773

Int. Cl.⁴ B05B *13/00;* **A01D** *43/00;* **A23J** *1/14*

U.S. Cl. 239—155 **10 Claims**



1. In a field-going machine for separating the green liquid fraction of a green vegetation crop into a leaf protein concentrate fraction and a brown liquid fraction, said field-going machine including:

(a) a mobile frame adapted for travel in the field,

(b) means mounted on said mobile frame for recirculating a portion of the brown liquid fraction and mixing said portion with an incoming green liquid fraction portion to cause coagulation,

(c) means mounted on said mobile frame for separating the resulting coagulum into a brown liquid fraction and a leaf protein concentrate fraction, and

(d) means mounted on said mobile frame for collecting the leaf protein concentrate fraction.

4,629,123

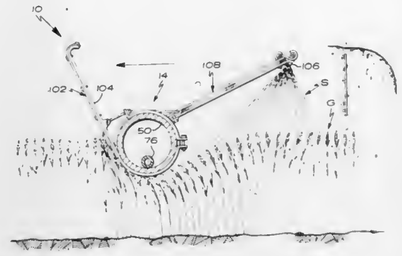
CROP SPRAYER

Norman S. Gorder, Rte. 1, Gary, Minn. 56545

Filed Oct. 17, 1983, Ser. No. 542,575

Int. Cl.⁴ B05B *1/20*

U.S. Cl. 239—159 **7 Claims**



2. A crop sprayer for spraying standing crops in a field with an agricultural liquid chemical spray, comprising:

a main frame having a front end, a rear end, and sides,

a pair of elongate rigid booms, each extending horizontally outwardly from one side of said frame and each having an inner end and an outer end, means pivotally connecting the inner end of each boom with one side of said frame to permit pivoting movement therebetween about a vertical axis, each boom being of generally circular cross-sectional configuration and having a diameter sufficiently great to prevent damage to the crops and to produce mechanical turbulence in the crops by causing the plants to wave back and forth when the boom is moved through the standing crops in a field,

a pair of ground-engaging wheels, each being connected to the outer end of one of said booms to support the same for travel over the surface of the ground, means for selectively adjusting the height of each wheel with respect to the surface of the ground,

a pair of adjusting mechanisms, each interconnecting the inner end portion of each boom with the main frame, and each being adjustable for varying the height of the inner end of each boom with respect to the surface of the ground, said adjusting mechanisms cooperating with said ground-engaging wheels to permit adjustment of the height of booms for crops at various stages of growth,

a plurality of spray nozzles, means rigidly attached to said booms and extending rearwardly and upwardly therefrom to position said spray nozzles above and behind said booms so that said nozzles spray the chemical into the mechanical turbulence in the crops caused by the movement of the booms across the crops to effectively cover the plants with the chemical spray,

a substantially imperforate wind deflector plate extending substantially the length of said boom and smoothly forwardly and upwardly from said boom and terminating above said nozzles, and means interconnecting the outer end portions of the boom with the main frame to hold the booms in outwardly extending horizontal relationship with the main frame during forward and reverse movement of the crop sprayer.

4,629,124

SHOWER

Walter F. Gruber, Stuttgart, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,268

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413552

Int. Cl.⁴ B05B *7/00*

U.S. Cl. 239—428.5 **13 Claims**

1. A shower provided with a housing, which terminates in a

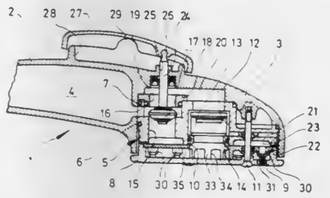
bell-shaped end part covered by a perforated plate, and with a change-over device for optional hard-jet or soft-jet operation and with a device which, in the soft-jet operation enriches the water with air,

(a) a water flow-diverting device (**17**; **117**) that diverts the inflowing water to one of two completely separated water paths;

(b) each water path incuding a water distribution chamber (**23**, **35**; **123**, **135**) which covers areas which are substantially parallel to the portions of the perforated plate (**8**, **108**);

(c) each water distribution chamber (**23**, **35**; **123**, **135**) being in communication with a separate set of fluid outlet ports (**31**, **32**; **131**, **132**) in said perforated plate (**8**; **108**);

(d) a device (**13**; **140**) for enriching the water with air being



arranged substantially centrally in the path of the water for the soft-jet operation at a point upstream of the soft-jet water distribution chamber (**35**; **135**) and occupies only a small area compared to the area of the perforated plate (**8**; **108**),

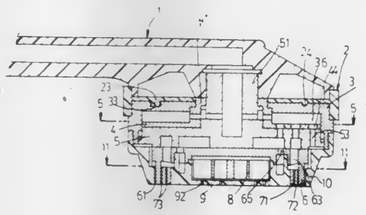
(e) a first of said two water distribution chambers (**35**; **135**) directly adjoining the perforated plate (**8**; **108**), and a second of said two water distribution chambers (**23**; **123**) being separated from the first water distribution chamber (**35**; **135**) by a chamber divider (**10**; **110**) and being located at a distance spaced from the perforated plate (**8**; **108**), and a plurality of flow sleeves (**31**; **130**) are provided which pass through the first water distribution chamber and establish a connection between said second water distribution chamber (**23**; **123**) and the outside of the perforated plate (**8**; **108**).

4,629,125

SPRAY NOZZLE

Fuyi Liu, Fl.4-1, No.49-1 Sec.2, Ho-Pin East Road, Taipei, Taiwan

Filed Aug. 27, 1984, Ser. No. 644,431
Int. Cl.[4] B05B *1/16*
U.S. Cl. 239—443 **1 Claim**



1. A spray nozzle for selectively producing five kinds of sprays including a steady coarse spray, a fine spray, a pulsating spray, a combination of a coarse spray and a pulsating spray, and a combination of a fine spray and a pulsating spray, comprising:

a hollow housing having an inlet portion and an outlet portion;

directing means, disposed between said inlet portion and said outlet portion of said housing, for defining a first path for said coarse spray, a second path for said fine spray, and a third path for said pulsating spray;

control means, operably provided on said housing with five resting positions each corresponding to one of said five sprays for selectively causing one of the five sprays, for controlling the selection of said sprays;

characterized in that said directing means comprises two slotted plates, including a fixed plate fixed in said housing and a movable plate rotatably mounted in said housing;

said fixed plate having three slots including a first slot, a second slot, and a third slot substantially located at the respective circumferences of three concentric circles and extending a length along the circumferences; the center of the three circles being substantially at the geometrical center of said fixed plate; said fixed plate being sealingly mounted in said housing so that a fluid from the inlet portion can pass through said fixed plate to the outlet portion only through said slots; the position of said slots on said fixed plate being relatively close to one another so that the connecting lines connecting the middle point of each slot and the common center of the circles intersect with one another at one angle from 0 degree to a small sharp angle;

said movable plate being provided with a fourth slot, a fifth slot and a sixth slot, being sealingly mounted in said housing in close contact with said fixed plate, and being allowed to rotate in a plane closely attached to said fixed plate so that a fluid from the inlet portion can pass only through said fixed and movable plates to the outlet portion of the housing through the overlapping zones of the slots on the fixed plate and the slots on the movable plate; said movable plate being a flat round plate with its three slots located at the circumferences of three concentric circles corresponding to the first-mentioned three circles; all of said circles having centers located on the same vertical line perpendicular to the two plates, the common center of the second-mentioned three circles being the geometrical center of the movable plate; the sizes and shapes of the three slots of said movable plate being respectively correspondent to one each of the three slots of said fixed plate; the three slots of said movable plate being circumferentially spaced relatively far away from one another so that the connecting lines interconnecting the middle point of each slot and the common center of the second-mentioned circles intersect with one another at a relatively large angle;

said fourth, fifth, and sixth slots of said movable plate being respectively in communication with flows passing through said first, second and third slots of said fixed plate, said movable plate being in mechanical connection with said control means so that when the control means is in its first, second, third, fourth and fifth resting positions, respectively, the corresponding overlapping of the slots of the plates is as follows:

(a) only the first slot of the fixed plate and the fourth slot of the movable plate are substantially overlapping;

(b) only the fourth slot of the movable plate is partially overlapping with the first slot of the fixed plate, and the sixth slot of the movable plate is partially overlapping with the third slot of the fixed plate;

(c) only the third slot of the fixed plate and the sixth slot of the movable plate are substantially overlapping;

(d) only the fifth slot of the movable plate is partially overlapping with the second slot of the fixed plate, and the sixth slot of the movable plate is partially overlapping with the third slot of the fixed plate;

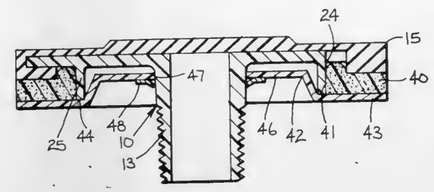
(e) only the second slot of the fixed plate and the fifth slot of the movable plate are substantially overlapping.

4,629,126

FLUID DIFFUSER

Paul R. Goudy, Jr., and William G. Weekley, both of Milwaukee, Wis., assignors to Autotrol Corporation, Milwaukee, Wis.

Filed Feb. 11, 1985, Ser. No. 700,606
Int. Cl.[4] B05B *1/32*
U.S. Cl. 239—452 **9 Claims**



1. A fluid diffuser, comprising:

a rigid disc having top and bottom faces and a central fluid inlet extending through said faces, a plurality of spaced rigid fingers projecting radially outwardly at the perimeter of the disc, said fingers having parallel sides that curve into the disc at their junction with the disc, and a cylindrical wall depending from the bottom face of the disc between the central inlet and the disc perimeter, said wall disposed at the junction of the fingers with the disc; and

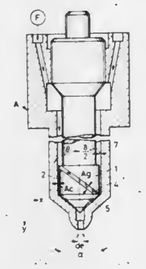
a flexible diaphragm including a flat, uninterrupted portion that overlays the top face of the disc and a rim portion that receives the ends of the fingers, the rim portion receiving less than the entire length of the fingers so that fluid passages are provided between adjacent fingers at the junction of the fingers with the disc.

4,629,127

INTERMITTENT SWIRL TYPE INJECTION VALVE

Kiyomi Kawamura; Akinori Saito; Masatoshi Yamada; Kenji Imai, and Masanobu Kimura, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 5, 1984, Ser. No. 647,557
Claims priority, application Japan, Sep. 5, 1983, 58-163004
Int. Cl.[4] B05B *1/34;* **F02M** *61/08*
U.S. Cl. 239—489 **7 Claims**



1. An intermittent swirl type injection valve comprising: a valve body; a valve needle slidably fitted in a valve hole in said valve body; a spray hole in said valve body merging with a valve seat provided at an end of said valve hole, said spray hole being shaped to receive a lower end of said valve needle; and tangential passages provided for swirling fuel when said valve needle leaves said valve seat to open said injection valve to spray fuel substantially conically through said spray hole, wherein said injection valve satisfied the following conditions:

$\alpha = 20°$ to $75°$,

$d_e = 0.3$ to 1.2 mm,

and

$$\frac{A_g \sin\theta}{(A_c + A_g \cos\theta)} \leqq 5.66 \ (A_c > 0),$$

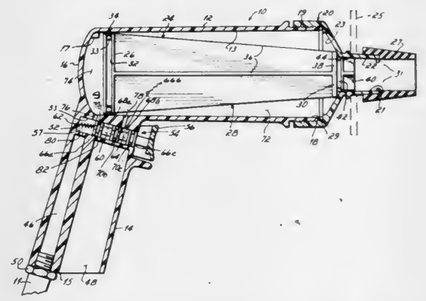
where α is the spray angle of fuel, d_e is the diameter of said spray hole, A_g is the area of the tangential passages, A_c is the area of a gap provided between a wall of said valve hole and a cylindrical surface of said valve needle for supplying fuel therethrough, and θ is the angle between a central axis of each tangential passage and a central axis of said valve needle.

4,629,128

APPARATUS FOR CLEANING CLOGGED DRAIN LINES

Bobby L. Lawrence, West Harrison, Ind., assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Jun. 17, 1985, Ser. No. 745,430
Int. Cl.[4] B05B *9/01*
U.S. Cl. 239—526 **12 Claims**



1. Apparatus for discharging a high pressure burst of fluid into a drain line to remove an obstruction therefrom, comprising:

a hollow housing having a first chamber formed with a fluid discharge opening at a forward end of said housing, and a second chamber disposed at a rearward end of said housing;

first valve means disposed within said first chamber at said forward end of the housing, said first valve means being movable between a closed and an open position, said first valve means sealing said fluid discharge opening in said closed position and unsealing said fluid discharge opening in said open position;

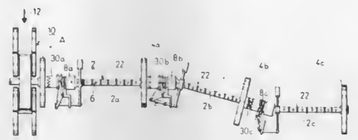
second valve means operatively communicating with said first and second chambers, said second valve means being movable between a first position and a second position;

said second valve means being operable in said first position to pass fluid under pressure into said first and second chambers, said first valve means being moved to said closed position with said first and second chambers pressurized to seal said fluid discharge opening;

said second valve means being operable in said second position to exhaust pressurized fluid from said second chamber while maintaining pressurized fluid in said first chamber; and

said first valve means being moved to said open position upon the exhaust of pressurized fluid from said second chamber to unseal said fluid discharge opening and release pressurized fluid from said first chamber therethrough and into a drain line.

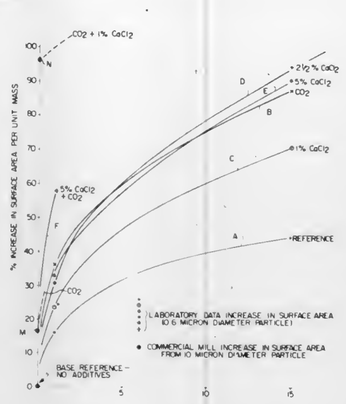
4,629,129
MOBILE WATER IRRIGATION APPARATUS
Isaac Rinkewich, 12 Fishman Maimon Street, Tel-Aviv, Israel
Filed Sep. 26, 1984, Ser. No. 654,847
Claims priority, application Israel, Aug. 7, 1984, 72605
Int. Cl.[4] B05B *3/12*
U.S. Cl. 239—733 **8 Claims**



1. Water irrigation apparatus comprising:
a water supply pipe divided into a plurality of sections each formed with a plurality of water outlets spaced along its length;
pivotal connections connecting the ends of each section to the ends of the adjacent sections to form a line of section articulated at their ends;
a wheel secured to each section for propelling the respective section over the ground;
and horizontal aligning means for each section effective to actuate or deactuate the propelling means of the respective section in response to the angle between it and the next adjacent section;
said horizontal aligning means for each section comprising a clutch normally coupling each wheel to its respective section but effective to decouple the wheel when the respective section is advanced ahead of said adjacent section;
each of said clutches including an actuator carried on the end of one section on one side of its pivotal connection with the next adjacent section, and engageable with a coupling-decoupling mechanism carried on the end of the adjacent section on the other side of said pivotal connection, and effective to be actuated by said actuator to couple or decouple the wheel of said to couple or decouple the wheel of said adjacent sections to its respective section: said actuator comprising an arm pivotably mounted on the end of said section and including a ground-engaging member for orienting said arm in a horizontal position and parallel to its respective section while the latter is propelled along the ground.

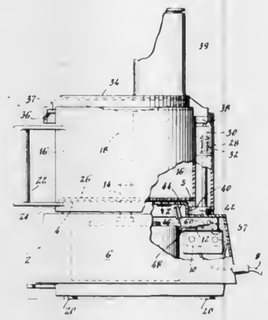
4,629,130
PROCESS FOR PRODUCING FINELY DIVIDED LIMESTONE
Preston L. Veltman, Severna Park, Md., assignor to A/S Niro Atomizer, Soeborg, Denmark
Filed Nov. 2, 1983, Ser. No. 548,126
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—16 **6 Claims**

1. A process for producing finely divided limestone products comprising the steps of:
(a) forming a slurry of limestone in an aqueous media;
(b) adding carbon dioxide from an external source to said slurry; and



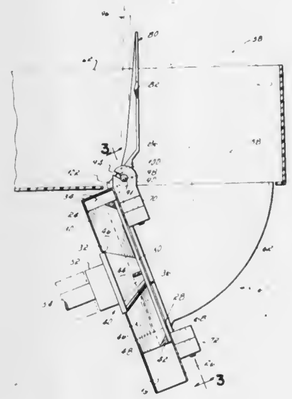
(c) abrasively grinding the limestone in said slurry in the presence of said carbon dioxide to produce said finely divided limestone products.

4,629,131
MAGNETIC SAFETY INTERLOCK FOR A FOOD PROCESSOR UTILIZING VERTICALLY ORIENTED, QUADRANT CODED MAGNETS
Allen F. Podell, Palo Alto, Calif., assignor to Cuisinarts, Inc., Greenwich, Conn.
Filed Feb. 25, 1981, Ser. No. 237,876
Int. Cl.[4] B02C *18/16*
U.S. Cl. 241—36 **19 Claims**



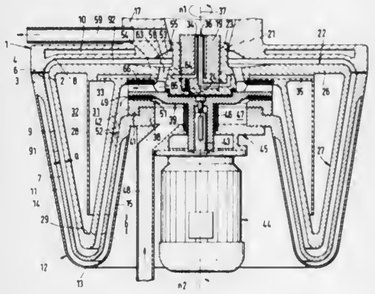
1. In a food processor of the type including tool drive means located in a base with control means for rendering the tool drive means inoperative unless said control means are actuated, said base having a turret shaped platform extending from its upper surface, a bowl having a downwardly extending skirt mountable on said base and rotatable relative to said turret, a removable cover rotatably mountable atop said bowl, a movable element mounted on said bowl and spring biased away from said base when said bowl is mounted on said base, means on said cover for driving said movable element towards said base when said cover is in a predetermined position relative to said bowl,
the improvement comprising a safety interlock apparatus including:
a first permanent magnet mounted to said movable element and movable therewith, said first permanent magnet having a plurality of North polarized magnetic pole faces and a plurality of South polarized magnetic pole faces, all of said pole faces being oriented in the same plane perpendicular to the upper surface of said base,
a second permanent magnet movably mounted within said base and coupled to said control means, said second permanent magnet having a second plurality of North polarized magnetic pole faces and havng a second plurality of South polarized magnetic all of said pole faces being oriented in a plane parallel to and closely spaced from the plane of orientation of said first permanent magnet,
each of said first and second permanent magnets having predetermined identical non-symmetrical pattern of said North and South polarized magnetic pole faces, each said pattern being non-symmetrical about mutually perpendicular axes in its respective plane such that said second permanent magnet is movable to actuate said control means by magnetic forces between said first and second permanent magnets only when said first permanent magnet is moved into alignment vertically and into registration laterally with said second magnet,
said first permanent magnet being mounted to said movable element such that said first permanent magnet is moved into alignment vertically with said second permanent magnet by said movable element only when said cover is in said predetermined position relative to said bowl and said first magnet is moved into registration laterally with said second magnet only when said bowl is rotated into a second predetermined position relative to said base,
whereby said control means are actuated only when said cover is in a first predetermined position relative to said bowl and said bowl is in a second predetermined position relative to said base.

4,629,132
SHREDDER ATTACHMENT FOR A FOOD PROCESSOR
Melvin E. Bricker, Cincinnati, Ohio, assignor to Bricker Products, Inc., Cincinnati, Ohio
Filed May 16, 1985, Ser. No. 734,909
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—37.5 **9 Claims**



1. In a food processor for shredding food product, a shredder attachment comprising:
a housing;
a slicer plate rotatable within said housing for slicing food product;
a feed chute operably and removably mounted to said housing for receiving and directing food product toward said slicer plate;
a pusher plate movable within said feed chute for urging food product toward said slicer plate;
handle means releasably connected to said pusher plate and rotatably and releasably connected to said feed chute for moving said pusher plate in one direction toward said housing to push food product within said feed chute against said slicer plate for slicing, and for selectively releasing said pusher plate from said feed chute for cleaning;
stop means on said handle means for restricting the range of movement of said pusher plate and said handle means in an opposite direction beyond a predetermined position when said feed chute is operably mounted on said housing; and
means preventing release of said handle means from said pusher plate when said handle means is in said predetermined position, and for permitting release of said handle means from said pusher plate upon removal of said feed chute from an operative position with respect to said housing.

4,629,133
MILL FOR FLOWABLE MATERIALS
Gerhard Bühler, Rheinfelden, Fed. Rep. of Germany, assignor to Fryma Maschinen AG, Rhinfelden, Switzerland
Continuation of Ser. No. 547,652, Oct. 31, 1983, abandoned.
This application Sep. 6, 1985, Ser. No. 773,103
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242436
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—46.11 **16 Claims**



1. In a mill for processing flowable material to be milled having a mill stator, a rotor within the stator in spaced relation thereto to form a central milling gap, milling media for flowing through said gap with the material to be milled at a certain rate, said milling media being distributed in the material to be milled, a rotor drive for driving the rotor at selected speeds, an inlet and an outlet for the material to be milled connected to the milling gap, a separator to separate the milling media from the material milled, and a milling media return for returning separated milling media to the milling gap, the improvement wherein the separator is upstream of the outlet and the milling media return comprises:
a separate centrifugal pump having an impeller centrally disposed between the stator and the rotor and rotatably mounted with respect to the stator and the rotor;
impeller drive means for driving said impeller at selected speeds; and
means for controlling the speed of said impeller drive means to selectively rotate said impeller at a speed different from the speed of the rotor to control the distribution of the milling media within the material being milled.

4,629,134

ROLL CRUSHER

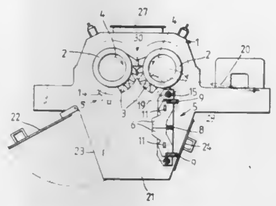
Engelbert Pennekamp, Ascheberg, Fed. Rep. of Germany, assignor to Hazemag Dr. E. Andreas GmbH & Co., Münster, Fed. Rep. of Germany

Continuation of Ser. No. 462,381, Jan. 31, 1983, abandoned. This application Mar. 29, 1985, Ser. No. 717,583

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203328

Int. Cl.⁴ B02L *13/20, 13/26*

U.S. Cl. 241—87.1 **17 Claims**



1. A comminuting machine, particularly a roll crusher, comprising a housing; two rotors mounted in said housing for rotation about substantially horizontal axes and having axially staggered circumferentially extending annuli of external teeth, the annuli of external teeth of one of said rotors alternating with the annuli of external teeth of the other of said rotors in the axial direction of said rotors, said rotors defining a nip and being arranged to rotate in opposite directions so that their teeth move from above toward, through and downwardly beyond said nip; a substantially flat grate having two sets of teeth, the teeth of one of said sets alternating with said annuli of teeth of one of said rotors and the teeth of the other of said sets alternating with the annuli of teeth of the other of said rotors; and mounting means provided on said housing and defining for said grate a pivot axis located at a level below one of said rotors, said grate being turnable in its entirely about said pivot axis between an operative position in which said sets of teeth extend from below between the annuli of teeth of the neighboring rotors in the region from said nip to the undersides of both rotors and an inoperative position in which said grate extends vertically downwardly from said pivot axis.

4,629,135

CYCLOIDAL SONIC MILL FOR COMMINUTING MATERIAL SUSPENDED IN LIQUID AND POWDERED MATERIAL

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Jan. 26, 1981, Ser. No. 228,225

Int. Cl.⁴ B02C *19/18*

U.S. Cl. 241—201 **15 Claims**

1. A sonic milling device comprising

an elastic member,

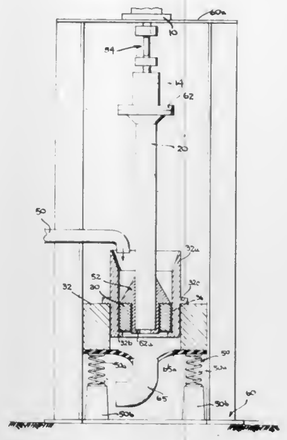
oscillator means for generating vibratory energy having a cycloidal force pattern which can be resolved into a pair of quadrature relative, lateral force vectors,

means for coupling said cyloidal force pattern energy in an orientation such as to cause rotary elastic vibration of said elastic member,

a first inertial mass member connected to said elastic member to receive the rotary cycloidal energy therefrom, said first inertial mass member having a predetermined working surface defining a figure of revolution,

a second inertial mass member having a predetermined working surface encircling and directly opposite the working surface of the first mass member, an annular gap having inlet and outlet portions being formed between said working surfaces, and

means for delivering work material to the inlet portion of said gap, said work material being simultaneously subjected to cyclic radial forces and shear forces in the annular gap between said working surfaces, said work material



being exited from the outlet portion of said gap after having passed therethrough.

4,629,136

DEMOUNTABLE TWO-PART REEL

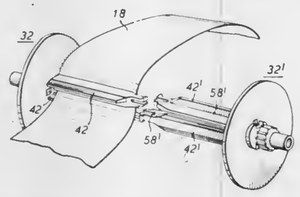
Leslie Vallance, Livingston, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1985, Ser. No. 716,769

Claims priority, application United Kingdom, Apr. 7, 1984, 8409050

Int. Cl.⁴ B65H *75/22*

U.S. Cl. 242—71.8 **29 Claims**



1. A reel comprising two sub-assemblies, each of said sub-assemblies including:

an end cheek;

a plurality of fingers coupled to said end cheek;

a first clip portion on the distal end of each of said plurality of fingers;

a first finger support portion on the distal end of each of said plurality of fingers; and

a plurality of second clip portions, corresponding in number to said plurality of fingers on said end cheek.

4,629,137

YARN SENSOR

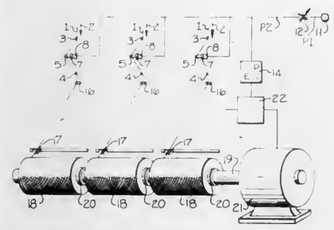
Heinz Schippers; Erich Lenk, and Hermann Bremer, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 719,209

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413275; Jun. 15, 1984, 3422308

Int. Cl.⁴ B65H *59/38, 59/04*

U.S. Cl. 242—45 **9 Claims**



1. A yarn winding apparatus for winding a plurality of running yarns onto respective take-up packages, and comprising

spindle means adapted for rotatably mounting a plurality of bobbin tubes,

a variable speed motor for operatively rotating said spindle means,

means for guiding a plurality of running yarns onto respective ones of the bobbin tubes to form wound take-up packages thereon, and

control means for varying the speed of operation of said variable speed motor in accordance with the mean value of the tensions of the yarns being wound onto said bobbin tubes, to thereby maintain the tensions of the running yarns within predetermined limits, said control means comprising a source of pressurized air, air supply line means connected to said source of compressed air, nozzle means associated with each of said running yarns and operatively connected to said air supply line means for detecting the tension in the running yarn and varying the pressure in said air supply line means in accordance with such tension.

4,629,138

APPARATUS FOR FEEDING AND DISCHARGING REELS FROM A MACHINE FOR WINDING VIDEO TAPE ON REELS OF A CASSETTE

Yoshiharu Kubo, Tokushima, Japan, assignor to Awa Engineering Co., Ltd., Tokushima, Japan

Continuation-in-part of Ser. No. 450,552, Dec. 16, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 622,057

Claims priority, application Japan, Dec. 30, 1981, 56-212039

Int. Cl.⁴ B65H *19/30*

U.S. Cl. 242—56 R **1 Claim**

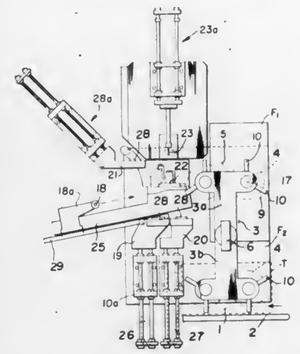
1. An apparatus for feeding the reels of a cassette to an apparatus for winding tape thereon and for discharging the reels with the tape wound thereon from the winding apparatus, the winding apparatus having winding means for winding tape on a pair of reels and a transfer means for transferring a pair of reels from a transfer position to a winding position in the winding apparatus and transferring a pair of reels from the winding position to the transfer position, said feeding and discharging apparatus comprising:

a feeding conveyor extending along the winding apparatus for carrying a tray on which a pair of empty reels is removably mounted;

a discharge conveyor extending parallel to said feeding conveyor for carrying a tray on which a pair of reels having tape wound thereon is mounted; and

a supply and discharge means having a feeding conveyor urging means for lifting a tray from said feeding conveyor to a first position raised above said feeding conveyor, a discharge conveyor urging means for receiving a tray at a second position raised above said discharge conveyor and beside said first position and lowering the tray onto said discharge conveyor;

a base movable laterally from a position laterally of said first position toward said second position for moving beneath a tray held by said feeding conveyor urging means and



supporting such tray, said base including clamping means for clamping a tray to said base;

pivoting means connected to said base for pivoting said base between said first position and a position in which said tray is vertical and in the transfer position; and

tray pushing means for, when a tray is on said base support and not clamped thereto, pushing the tray off the base and onto the discharge conveyor urging means in said second position.

4,629,139

WEB WINDING APPARATUS

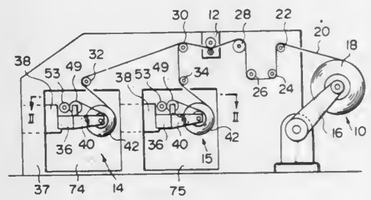
Akihiro Sanda; Nobuyuki Watabe, and Hiroki Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 14, 1985, Ser. No. 711,495

Claims priority, application Japan, Mar. 19, 1984, 59-53161

Int. Cl.⁴ B65H *35/02*

U.S. Cl. 242—56.4 **7 Claims**



1. A web winding apparatus for winding webs slit to a predetermined width, said web winding apparatus comprising a main body and at least one winder unit, said at least one winder unit comprising:

a winding driver;

a support beam detachably mounted to said main body;

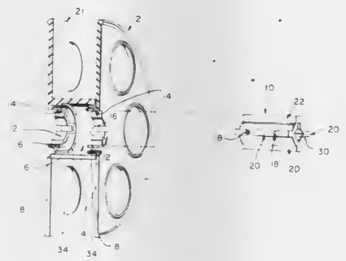
a plurality of pairs of arms and a plurality of reels for winding a slit web, each of said pairs of arms holding one of said plurality of reels from opposite sides thereof, said plurality of said pairs of arms being provided on said support beam at regular intervals; and

a plurality of winding tension generators provided on said support beam and detachably connected to said winding driver, said at least one winding driver thereby giving a winding tension to said reels.

4,629,140
FILM REEL ASSEMBLY

Steven B. LaCasse, 36 Sherman Pl., Clifton, N.J. 07011

Continuation of Ser. No. 668,610, Nov. 6, 1984, abandoned, which is a continuation of Ser. No. 549,692, Nov. 7, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,398
Int. Cl.[4] B65H *75/14*
U.S. Cl. 242—71.8 **9 Claims**

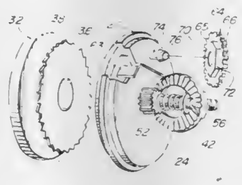


1. A film reel assembly comprising:
A. generally parallel positioned spaced apart reel flanges,
B. a cylindrical hollow hub extending between said flanges and having an axial slot for the leading end of a film strip.
C. a removable core member adapted to be positioned coaxially within said hub, supported by and between said flanges and having an axial bore for engaging a rotating axis,
D. each of said flanges defining a keyway for the frictional reception of said core member, said keyways axially aligned with each other and having cross-sectional configurations identical and dimensionally complementary to that of said core member, and
E. stop means disposed for communication between said core member and said keyways to releaseably retain said core member in position with said hub.

4,629,141
PUSH-ON DRAG KNOB

Dennis W. Darden, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 24, 1985, Ser. No. 758,252
Int. Cl.[4] A01K *89/01, 89/02*
U.S. Cl. 242—84.51 A **3 Claims**

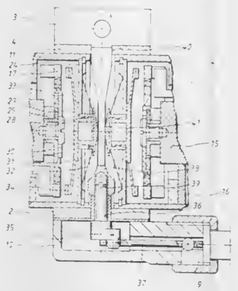


1. In a spin cast style fishing reel of the type having a line-carrying spool, a deck plate, a crank handle, means responsive to operation of the crank handle for directing line onto the spool, variable drag applying structure and a housing with a radially facing aperture therein, the improvement comprising:
a drag actuating knob for selectively varying the amount of spool drag;
means for snap-fitting the drag actuating knob to the deck plate in operative position thereon for rotation relative thereto;
said means for snap-fitting the knob comprises a projection integrally formed on the deck plate with a continuous shoulder formed on the outer portion thereof and facing the deck plate, a bore in the knob, at least two resilient deformable fins in said bore, and each fin having a shoulder seating surface facing away from the deck plate when in the assembled position in the reel, said projection extendable into the bore so that the fins are deformed upon contact with the shoulder on the projection and, upon the knob realizing a fully seated position, said deformable fins realizing an undeformed position with said continuous shoulder on the projection facing said shoulder seating surface to prevent separation of the knob from the projection,
whereby the knob can be assembled directly into its operative position by a simple press-fitting step without requiring the use of tools or separate fasteners.

4,629,142
SAFETY BELT WINDING DEVICE

Hubert Nöhren; Helmut Knofe, and Klaus Struck, all of Hamburg, Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,682
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418185
Int. Cl.[4] B60R *22/38*
U.S. Cl. 242—107.4 B **11 Claims**

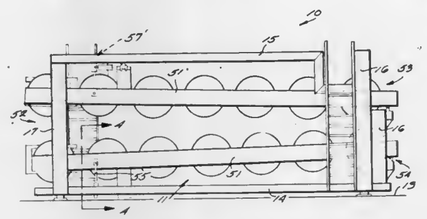


11. A safety belt winding device having a housing adapted to be mounted to a vehicle or craft, a reel rotatable mounted within the housing for winding and unwinding the belt, an inertially activated locking mechanism disposed within the housing and operatively coupled with the reel for preventing rotation of the reel in response to an acceleration in the rotational movement of the reel in a direction in which the belt is withdrawn from the reel, the locking mechanism including a control member mounted for rotation with the reel and to be rotationally displaced relative to the reel during reel acceleration to thereby activate the locking mechanism, a movable actuating element disposed exteriorly of the housing for activating the locking mechanism independently of accelerations of the reel, a transmission member extending into the housing and cooperating with the actuating element for transmitting movements of the actuating element to the interior of the housing, a switching member mounted to coaxially rotate with the control member and for movement by the transmission element into and out of engagement with the control member, and brake means cooperating with the switching member for imparting a force to the switching member which retards its rotation so that upon operating the actuating element to engage the switching member and the control member a relative rotational displacement between the reel and the control member takes place and the locking mechanism is activated to prevent a withdrawal of the belt from the reel.

4,629,143
ROTATING SLASHER CREEL

Everett Griffin, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 30, 1985, Ser. No. 771,043
Int. Cl.[4] B65H *49/18*
U.S. Cl. 242—131 **22 Claims**

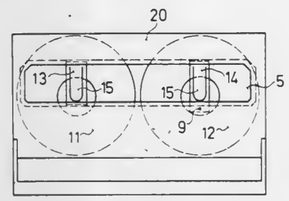


1. A creel assembly comprising:
first and second creels;
support frame means for supporting said first and second creels in side-by-side relationship, on a floor surface; and
air bearing means for lifting said supporting frame means off said floor surface and positioning said frame means for rotation about a vertical axis disposed at the center of said frame means.

4,629,144
TAPE CASSETTE HAVING ONE OR MORE PRESSURE SPRINGS, AND A PRESSURE SPRING FOR THIS PURPOSE

Klaus Schoettle, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,226
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 8418178[U]
Int. Cl.[4] G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—198 **12 Claims**

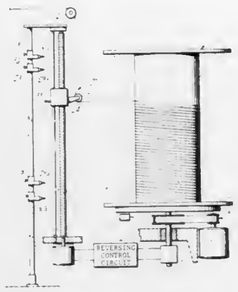


1. A tape cassette having a housing containing at least one tape reel and provided with window means comprising at least one opening defined by housing wall means and at least one transparent member received in said at least one opening and located over a central region of said at least one tape reel, and at least one pressure spring which exerts a spring force on said at least one tape reel, wherein the at least one spring includes a bent over portion embracing an edge of the, or a respective one of the, transparent member(s) and positioned in the said, or a respective one of the said, opening(s) in between said housing wall means defining the, or the respective, opening and the embraced edge of the transparent member to captively fasten the spring to the housing.

4,629,145
CONTROL OF TRAVERSING GUIDE IN STRAND WINDING APPARATUS

Randall C. Graham, Nashville, Tenn., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 28, 1986, Ser. No. 845,740
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R **7 Claims**



1. In an apparatus for winding strand onto a spool having end flanges. which apparatus comprises means for rotating a flanged spool about its central axis, a traversing guide arranged to travel back and forth along a path lengthwise of said spool and to guide strand onto said spool between the end flanges thereof, drive means arranged to move said traversing guide in forward and reverse directions lengthwise of said spool in response respectively to forward and reverse control signals supplied thereto, and control means coupled to said drive means for providing said drive means with alternate forward and reverse control signals to actuate said drive means to reverse the direction of travel of said traversing guide when it reaches either of two adjustably selected reversal points; the improvement wherein said control means comprise:
reference position detector means adjustably positioned along the path of travel of said traversing guide and operative to provide a reference position signal in response to each traversing movement in either direction of said traversing guide through either of two reference positions each located at a selected distance from a respective one of said reversal points whereby a first and then a second of said reference position signals are respectively produced each time said traversing guide passes either of said reference positions in opposite directions during its approach to and consequent return from a respective reversal point;
first bistable means having an output switchable between a switched-on and a switched-off state; said first bistable means being responsive to successive ones of said first and second reference position signals to switch its output from a switched-off state to a switched-on state whenever a first reference position signal is produced by said reference position detector and to switch its output from a switched-on state to a switched-off state whenever a consequent second reference position signal is produced by said reference position detector means;
spool revolution counting means comprising a preset counter coupled to said spool rotating means and having an input connected to the output of said first bistable means; said counter being responsive to switching of the output of said first bistable means to said switched-on state to initiate counting operation and to produce a count responsive to the number of revolutions of the spool until the count attains a selected preset value; said counter being reset from said preset value to a predetermined lower initial value and its counting operation being inhibited in response to switching of the output of said first bistable means to said switched-off state; said counter including switch means having first and second operating

states and being operative to switch from said first operating state to said second operating state when said counter counts to said preset value and to return to said first operating state when said counter is reset to said lower initial value;

second bistable means having an input connected to said counter switch means; said second bistable means having an output with first and second operating conditions which alternate upon successive switching of said counter switch means from said first operating state to said second operating state; and

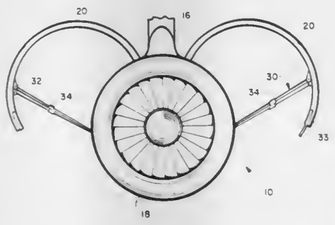
means responsive to the output of said second bistable means for producing said forward and reverse control signals in response to switching of the output of said second bistable means to respective first and second operating conditions.

4,629,146

HOLD OPEN ROD FOR HINGED SECTION OF NACELLE SYSTEM

Dennis E. Lymons, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jan. 30, 1985, Ser. No. 696,445
Int. Cl.[4] B64C *7/02*
U.S. Cl. 244—53 R **5 Claims**



1. In a nacelle system for an aircraft jet engine having a plurality of bifurcated sections which are hinged along a longitudinal upper spine and locked together along a longitudinal lower spine, a hold open rod adapted to be collapsible and stowed within the nacelle system during flight and to be extended and locked in a position to hold open a hinged nacelle system section to permit access to the jet engine or elements of the nacelle system as may be required on the ground, the hold open rod comprising:

a tubular member swivably connected at one end to a hinged portion of the nacelle system;

a rod member slidably positioned within the tubular member and swivably connected at one end to the jet engine, said rod member is provided with at least one annular relieved portion having at least one surface normal to the axis of the rod;

locking means secured to the tubular member which is provided with a latch member that selectively lockingly cooperates with the relieved portion of the rod member to lock the hold open rod in an open position for locking a hinged portion of the nacelle system in an open position;

said locking means requiring the hinged portion of the nacelle system to be more fully opened to permit the locking means to be unlocked and the rod member to be collapsed within the tubular member to permit the closing and locking of the hinged nacelle portion and stowing of the rod,

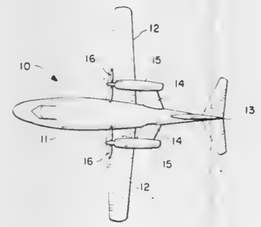
said latch member is swivably connected to the tubular member and is biased toward a locking engagement with the rod member and is provided at one end with an open ended prong having outwardly extending curvilinear arm members that are shaped to closely surround the relieved portion of the rod member in locking engagement and is selectively rotatable to an open position to permit telescoping of the rod member within the tubular member only when the hinged nacelle section is raised a predetermined distance said prong and integral arm members are provided with a central annular relieved portion which is shaped to closely surround the outer surface of the tubular member and to provide an inner shoulder having a lower surface adapted to engage the normal surface of the relieved area of the rod member when the latch member is in its locked position and the prong portion and integral arm members extend into the annular relieved portion of the rod member.

4,629,147

OVER-THE-WING PROPELLER

Joseph L. Johnson, Jr., Newport News, and E. Richard White, Seaford, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 661,478, Oct. 16, 1984, abandoned.
This application Mar. 26, 1986, Ser. No. 846,462
Int. Cl.[4] B64D *27/02*
U.S. Cl. 244—55 **7 Claims**



1. A system to improve aircraft lift-to-drag comprising:

an aircraft;

said aircraft having propellers mounted over the wing with the propeller tips passing in close proximity to the wing upper surface;

said propellers located in a fore and aft direction with respect to the wing in a region where the aerodynamic flow is accelerating or at maximum velocity and causing a change in flow field such that wing drag is decreased, wing lift is increased, and propeller thrust is increased, all simultaneously and over a broad range of flight conditions;

said propellers having engines, nacelles and pylons mounted outside the accelerated flow of the wing so as to reduce skin friction drag and form drag, and so as to avoid interference drag between wing and pylons and flow blockage over the wing.

4,629,148

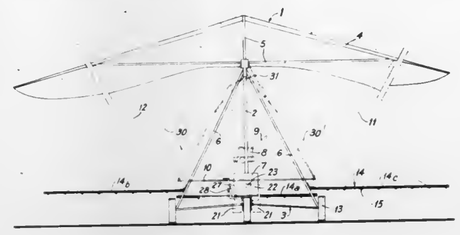
APPARATUS FOR AERIAL SCATTERING

Roland J. Y. Perinet, Route de Poitiers, Mirebeau, Vienne, France

Continuation of Ser. No. 529,006, Sep. 7, 1983, abandoned, which is a continuation of Ser. No. 352,162, Feb. 25, 1982, abandoned. This application Apr. 3, 1985, Ser. No. 718,210
Claims priority, application France, Mar. 6, 1981, 81 04491
Int. Cl.[4] B64D *1/18*
U.S. Cl. 244—136 **11 Claims**

3. Apparatus for aerial scattering or spreading, characterised in that it comprises a flying wing formed by an aerofoil **4** from which a frame **3** is suspended by means of a mast **2**, on which frame there is arranged in particular a cockpit and at least one engine **8** driving a propeller **9**, and a scattering device which is mounted on said flying wing and which comprises an elongated spraying or atomizer tube **14**, means for mounting said tube **14** to said flying wing in pendular manner, said pendular mounting means comprising means **16,18** carried by said frame

for providing a pivotal connection to said tube **14** mid-way between the ends thereof and gravity responsive means **20** operatively connected to said tube **14** adjacent said pivotal connection for maintaining said tube **14** in a substantially horizontal position during pivotal movement thereof relative to



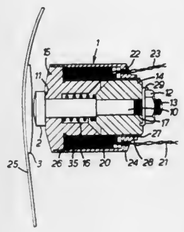
said frame, at least one tank **21** for the product to be scattered connected to a pump **22** driven by a motor **23**, the pump itself being connected to said tube, and means for controlling and/or regulating the flow and/or pressure of the product to be scattered.

4,629,149

METHOD OF AND APPARATUS FOR DE-ICING AN ELASTICALLY DEFORMABLE SHEET MEMBER

Oliver S. Carson, Belfast; George McMurtry, Bangor, and James E. Carrington, Lisburn, all of Northern Ireland, assignors to Short Brothers Limited, United Kingdom

PCT No. PCT/GB84/00292, § 371 Date Feb. 21, 1985, § 102(e) Date Apr. 8, 1985, PCT Pub. No. WO85/01028, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 21, 1984, Ser. No. 708,930
Claims priority, application United Kingdom, Aug. 24, 1983, 8322738
Int. Cl.[4] B64D *15/16, 15/00*
U.S. Cl. 244—134 R **13 Claims**



8. Apparatus for de-icing an exposed surface of a resilient sheet member that is attached to a support structure, the apparatus comprising

means connected to the support structure for applying a force transversely to an unsupported region of the sheet member;

means for controlling said force applying means to deliver a force that increases with time to deform the sheet member relatively slowly from a relaxed disposition to an elastically loaded maximum deflection disposition;

means to remove abruptly said force to allow the sheet member to oscillate freely at its natural frequency at a relatively fast rate of displacement and with decaying amplitude as the sheet member returns to the relaxed disposition for de-icing the sheet member; and

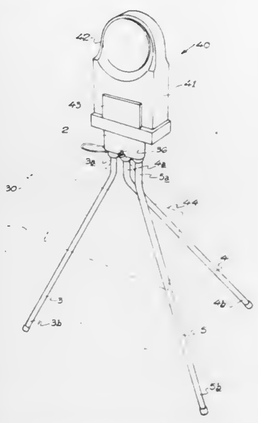
means for effecting said increasing force application and abrupt removal repeatedly for as long as de-icing is required.

4,629,150

TRIPOD SUPPORT

Brendan O'Callaghan, Bray, Ireland, assignor to Robin Rennicks, Mulhuddart, Ireland

Filed May 29, 1985, Ser. No. 739,081
Claims priority, application Ireland, May 29, 1984, 1340/84
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—167 **4 Claims**



1. A multi-legged support having open and closed positions, the support comprising:

a housing and at least threee legs which in use of the support in the open position extend downwardly and outwardly from the housing into contact with the ground;

at least two of the legs being rotatable relative to the housing about generally upright axes, referred to the in use open position of the support, to bring the support into the closed position wherein the legs are in a substantially parallel side-by-side relationship; and

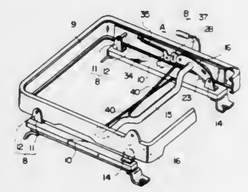
locking means for locking the legs in the open position and/or in the closed position, said locking means includes a respective multi-sided head non-rotatably fixed relative to an upper end of each rotatable leg and a removable housing cover which co-operates with the sides of each head to lock the head in a selected one of two angular positions corresponding respectively to the closed and open positions of the legs.

4,629,151

SEAT LIFTER

Takaichi Nishino, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,445
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—396 **2 Claims**



1. A seat lifter for a seat having a cushion frame for its seat cushion, said cushion frame being of a substantially channel

shaped in section, and a slide rail disposed below said cushion frame, said seat lifter comprising:

a rotary fulcrum defined on the forward portion of said cushion frame;

a link mechanism mounted on the rearward portion of said cushion frame, said link mechanism being adapted for causing said seat to rotate about said rotary fulcrum, and comprising a pair of arc-shaped links each being at one end thereof pivotally connected to said slide rail and at the end thereof pivotally connected to said cushion frame;

a lock mechanism arranged on said cushion frame in such a manner that the lock mechanism as a whole is disposed within the width of said cushion frame, said lock mechanism including:

a disc member having a plurality of teeth grooves formed on the outer periphery thereof, and

an offset pin projected from said disc eccentrically of the center of disc, said offset pin being slidably connected to one of said arc-shaped links; and

rotation latching means for locking and unlocking the rotation of said disc member, said rotation latching means as a whole being arranged within the width of said cushion frame, and including:

a stopper slidably supported on said cushion frame such that it is movable in the longitudinal direction of said cushion frame;

a crank pivotally supported on said cushion frame; said crank being at one end thereof movably connected to one end portion of said stopper; and

biasing means connected to the other end of said crank so as to bias said stopper in a direction wherein the other end portion of said stopper is engaged into one of said plurality of teeth grooves of said disc member; and

a lever fixedly connected to said crank at the pivot point of said crank.

4,629,152

HOLDING FIXTURE FOR RELEASABLY CONNECTING AT LEAST TWO WALL ELEMENTS

Heinrich Spilka, Schlosshoferstrasse 32, 2301 Grossenzersdorf, Austria

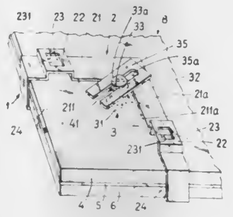
PCT No. PCT/AT84/00017, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04446, PCT Pub. Date Nov. 22, 1984

PCT Filed May 11, 1984, Ser. No. 697,587

Claims priority, application Austria, May 13, 1983, 1756/83

Int. Cl.⁴ A47F *7/14*

U.S. Cl. 248—488 **24 Claims**



1. A holding fixture releasably interconnecting at least two wall elements comprising at least a rear wall element having an opening and a front wall element, comprising:

at least one holding clamp comprising a projection grippingly extending around the margins at least of said rear wall element and said front wall element at a predetermined location of such wall elements in the operational position of said at least one holding clamp;

said at least one holding clamp, in the operational position thereof, extending substantially parallel to said rear wall element and at least partially engaging said rear wall element on a rear side thereof;

connecting means releasably and substantially force-lockingly connecting said at least one holding clamp with a rear side of said rear wall element in the operational position of said at least one holding clamp;

said connecting means comprising a holding pin which, in its operational position, traverses said opening of said rear wall element;

said holding pin comprising:

a bearing member;

a through-pass member extending away from said bearing member substantially at right angles thereto and passing through said opening in said rear wall element in said operational position of said holding pin;

a holding member following said through-pass member; and

said holding member, in said operational position of said holding pin, protruding above and being engageable with said holding clamp in said operational position of said holding pin.

4,629,153

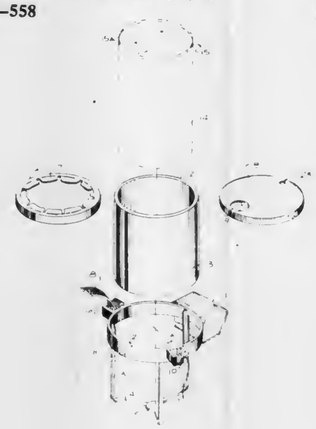
CONTAINER HOLDER DEVICE

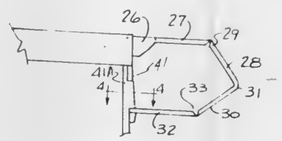
Alfred Marcum, 3012 Cedar Point Rd., Crestwood, Ky. 40014

Filed Dec. 13, 1984, Ser. No. 681,103

Int. Cl.⁴ A47C *7/70*

U.S. Cl. 248—558 **5 Claims**





1. A receptacle for holding a container including a ring member, leg member depending downwardly from said ring means with laterally extending segments connected at one end to said leg members and mutually connected at the other ends of each to form the receptacle, a foldable handle means having one end connected to said ring where the handle member is segmented so to allow said handle means to be inserted between the inner panel and the window of an automobile and includes handle fastener means carried adjacent the free end of said handle to attach said free end to one of said leg members to form a generally ring shaped handle and said handle fastener means includes dovetail means carried by said leg member and cooperative groove means in said free end to receive said dovetail means to form said handle ring.

4,629,154

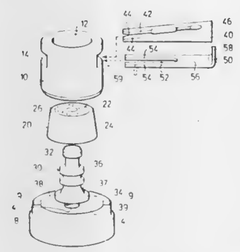
SHOCK ABSORBER

Nachman Kataczynski, Nethanya, Israel, assignor to Urdan Industries Ltd., Nethanya, Israel

Filed Jun. 20, 1985, Ser. No. 746,862

Int. Cl.⁴ F16F *7/00*

U.S. Cl. 248—610 **17 Claims**



1. A shock absorber mountable between first and second mounting members, comprising:

a shock absorbing body of resilient elastomeric material;

a rigid core extending through and fixedly embedded within said shock absorbing body;

said rigid core including a first end projecting from one side of the shock absorbing body for coupling same to said first mounting member, and a second end projecting from the opposite side of said shock absorbing body and formed with a flange for coupling to said second mounting member;

a sleeve adapted to be fixed to said second mounting member, said sleeve being formed with an axially-extending socket for receiving said shock absorbing body, and with a transversely extending opening at the flanged end of the rigid core;

and a coupling member receivable through said opening in the sleeve so as to engage a face of said flange and thereby to couple said rigid core to the sleeve and to the second mounting member, such that a force applied to said first mounting member in a first direction away from said second mounting member is transmitted to said second mounting member via said rigid core and coupling member, whereas a force applied to said first mounting member in the opposite direction, towards said second mounting member, is transmitted to said second mounting member via said rigid core and said shock absorbing body.

4,629,155

IN-SITU POST HOLE FORMING DEVICE

Fred P. Dula, Charlotte, N.C., assignor to Dula-Wright, Inc., Charlotte, N.C.

Filed Mar. 26, 1985, Ser. No. 716,360

Int. Cl.⁴ B28B *7/34*

U.S. Cl. 249—61 **14 Claims**

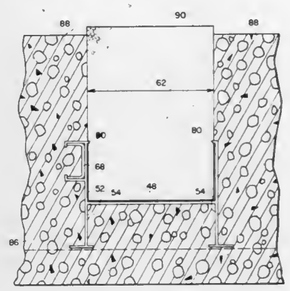
1. A device for forming a post-receiving cavity in a material during the solidification of the material of, said device comprising:

clamping means including:

first and second side wall means disposed in facing relationship to each other, each of said side wall means having a vertical extent;

resilient wall means extending between the first and second side wall means and interconnecting said first and second side wall means intermediate the vertical extents thereof to divide each side wall means into an upper end portion and a lower basal portion forming a base for said device;

wherein the resilient wall means is adapted to cause the upper end portions to move downwardly in response to application of inward lateral force to said lower basal portions and to cause the upper end portions to be maintained at a predetermined distance from each other in the absence of said inward lateral force being applied to said lower basal portions; and



post-receiving cavity form means formed of a material deformable by said upper end portions and having at least one dimension greater than or equal to said predetermined distance and being disposed between said upper end portions;

wherein the post-receiving cavity form means is disposed between said upper end portions so that said one dimension extends between and is deformingly engaged by said upper end portions to be biasingly retained therebetween.

4,629,156

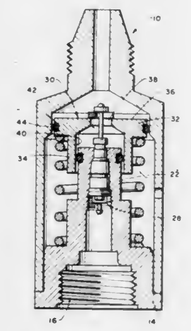
PRESSURE RELIEF AND SHUT-OFF VALVE

Thomas K. Anderson, Cherry Valley, and Carl E. Finley, Belvidere, both of Ill., assignors to Century Tool & Manufacturing Co., Cherry Valley, Ill.

Filed Aug. 3, 1984, Ser. No. 637,265

Int. Cl.⁴ F16K *31/12*

U.S. Cl. 251—60 **17 Claims**



1. A valve assembly comprising:

a stationary body part having an axial passage;

a valve core device with a gas flow path therethrough secured within said passage having an axially movable plunger pin with an attached valve member, said valve core device including a valve seat against which the valve menber is biased to close said flow path;

a poppet having a head portion from which extends an annular flange that sealingly engages with an upper portion of said body part, said head portion having a central orifice in communication with the axial passage and in-

cluding attachment means for engagement with the plunger pin; and,

a housing enclosing said poppet and valve core device having a vent and a connector portion with an opening in communication with said passage, said housing having an inner sealing surface for engagement with said poppet head to control access to said vent including a housing spring biasing the head into engagement with said inner sealing surface, said inner sealing surface having a longitudinal extent at least equal to the axial distance between said valve member and valve seat when said poppet is sealingly engaged with said inner sealing surface and said gas flow path is open.

4,629,157

REMOTE-CONTROL APPARATUS FOR OPENING OR CLOSING THE VALVE OF CONTAINERS OR THE LIKE

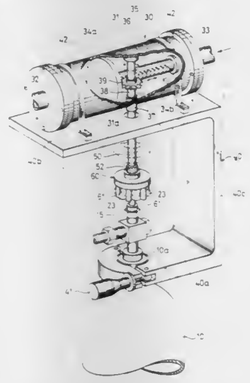
Yuji Tsuchiya, and Hiroshi Ando, both of Tokyo, Japan, assignors to Japan Oxygen Co., Ltd., Japan

Filed Nov. 30, 1984, Ser. No. 676,884

Claims priority, application Japan, Dec. 1, 1983, 58-185963[U]

Int. Cl.⁴ F16K *35/02*

U.S. Cl. 251—96 **2 Claims**



1. A remote-control apparatus for opening or closing a container which includes a valve operated by a valve wheel having notches formed in the peripheral edge thereof, said apparatus comprising:

(A) a rotary driving mechanism;

(B) an operable shaft driven by said driving mechanism;

(C) means for engaging said valve wheel mounted on said operable shaft, said engaging means having a through-hole for receiving said operable shaft, said through-hole having axially elongate grooves in the inner wall thereof;

(D) said operable shaft being further provided with axially elongate grooves to engage with the first-mentioned elongate grooves, and a collar to prevent disengagement of said engaging means from said operable shaft;

(E) said engaging means further having fingers extending therefrom to engage said notches;

(F) said engaging means being axially movable along said operable shaft.

4,629,158

DISPOSABLE MALE VALVE MEMBER

Henry Clayman, 12555 Biscayne Blvd., Miami, Fla. 33181

Filed Aug. 31, 1984, Ser. No. 646,215

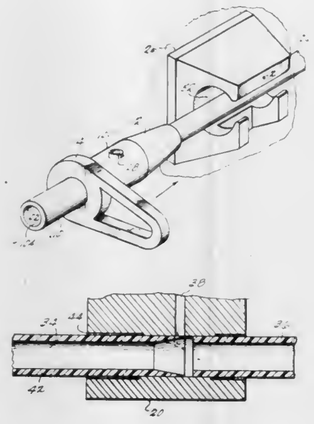
Int. Cl.⁴ F16K *51/00*

U.S. Cl. 251—148 **11 Claims**

1. A male valve member for cooperation with a female member to form a fluid coupling, said female member having a cooperating receptacle with a fluid flow opening to said receptacle comprising:

an element having a first bore extending therethrough from inlet to outlet and a second bore communicating said fluid flow opening with said first bore when said male member cooperates with said female member,

said element having a first part with an exterior surface at least partially tapering from one end to the other along the direction in which said first bore extends and with said second bore opening onto said exterior surface, and a stop



surface adjacent said one element end, said element being manually slidable in said receptacle along the direction in which said first bore extends and said stop surface contacts a corresponding surface of said female member to positively lock together said male and female members with said second bore communicating with said fluid flow opening, and

one-way valve means mounted for permitting fluid flow from said fluid flow opening to said first bore through said second bore and preventing fluid flow from said first bore through said second bore to said fluid flow opening.

4,629,159

VALVE-PROVIDED CONNECTING DEVICE

Kjell I. Wellenstam, Göteborg, Sweden, assignor to Astra Meditec AB, Molndal, Sweden

Filed Jun. 27, 1985, Ser. No. 749,889

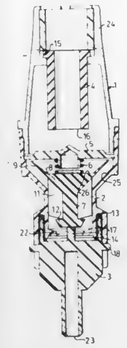
Claims priority, application Sweden, Jan. 8, 1985, 8500075

Int. Cl.⁴ F16K *37/28*

U.S. Cl. 251—149.6 **8 Claims**

1. A valve-provided connecting device to be connected with a liquid line intended to be connected to a patient for draining body liquids, comprising a drip chamber house, a connecting house placed downstream of the drip chamber house and designed for connection with a connector, characterized in that said connecting house contains a spring loaded, elastic valve body consisting of a conical upper sealing part which consists of two sections, one thin-walled upper section and one solid lower section, a guide part having first and second ends, fixed in a radial direction and moveable only in an axial direction said conical upper sealing part being mounted on said first end, and a solid, conical lower sealing part mounted on said

second end, wherein said thin wall upper section and said solid lower section on the conical upper sealing part respectively



form two independent sealing zones and said lower sealing part forms a third independent sealing zone.

4,629,160

SHUTOFF WEDGE FOR SHUTOFF VALVE

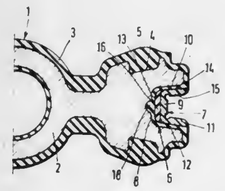
Walfried David, Maxdorf, Fed. Rep. of Germany, assignor to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 679,014

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345133

Int. Cl.⁴ F16K *3/314, 3/316*

U.S. Cl. 251—327 **14 Claims**



1. A shutoff wedge for a shutoff valve, comprising a row cast iron body with guiding grooves arranged to surround respective guiding strips of a valve housing, each of said guiding grooves having a bottom and two lateral walls; a rubber elastic jacket provided on said row cast iron body having sealing face portion arranged to lie elastically against seat faces of the valve housing; two U-shaped sliding shoes having sliding faces and composed of synthetic plastic material with good sliding properties, high wear resistance and sufficient temperature strength, the U-shaped sliding shoes being firmly inserted in said guiding grooves of said row cast iron body which is tightly surrounded by said rubber elastic jacket up to said sliding faces, each of said U-shaped sliding shoes being arranged in respective one of said guiding grooves so that a gap is formed between said bottom and said both lateral walls of each guiding groove, to form a hollow space between said sliding shoes and said guiding grooves; and a spraying mass which fills said remaining hollow space between said sliding shoes and said guiding grooves.

4,629,161

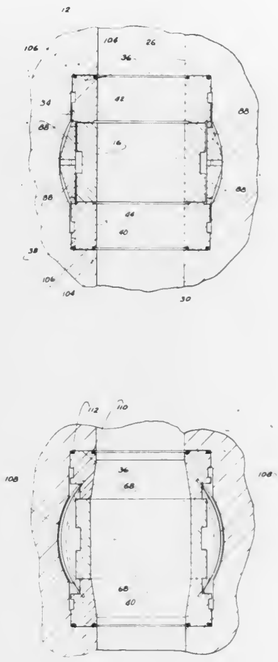
GATE VALVE

Taylor L. Jones; Paul D. Bunch, and Russell E. Stevens, all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed May 2, 1985, Ser. No. 729,622

Int. Cl.⁴ F16K *1/46*

U.S. Cl. 251—328 **4 Claims**



1. A gate valve comprising

a body having a chamber opening to the exterior of said body, a pair of passages extending through said body and opening into said chamber, a counterbore surrounding the opening of each of said passages into said chamber to provide a pair of body sealing surfaces facing into said chamber,

a pair of seating rings positioned one in each of said counterbores,

resilient sealing means associated with each of said seat rings for sealing against the body sealing surface of each seat ring,

a gate positioned in said chamber between said seat rings and movable therein to open and close flow between said passages,

a bonnet secured to said body in sealing relationship around the opening of said chamber from said body,

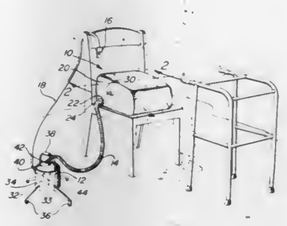
means for moving said gate between positions opening and closing said flow between said passages, and

a pair of wedge strips which extend along the sides of said gate between said seat rings,

each of said wedge strips have a pair of tapered surface to engage the tapered surfaces of its mating wedge strip,

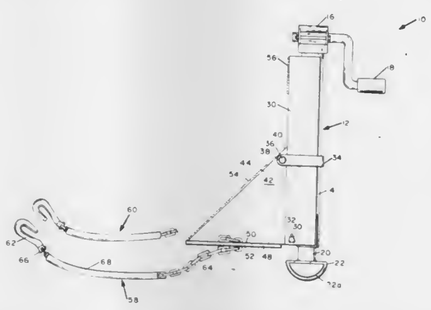
said tapered surfaces positioned so that relative movement of mating strips toward moving their ends to the same level cause said strips to be wedged apart which wedge the seat rings into engagement with their body sealing surfaces.

4,629,162
PNEUMATIC INVALID LIFT
Albert J. Porché, 4830 Marie, Corpus Christi, Tex. 78411
Filed May 2, 1985, Ser. No. 729,953
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 HP **9 Claims**



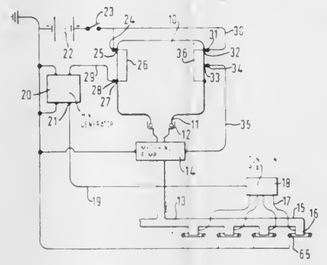
1. A pneumatic invalid lift comprising an inflatable air bag for placing on a seating surface, an air inlet in the bag, a small-section air bleed nozzle in the bag for permitting slow escape of air from the bag, a portable blower for the supply of relatively high volume, low-pressure compressed air, a hose connection between the blower outlet and said air inlet, and control means for operating the blower so as to selectably supply compressed air to the bag through said inlet whereby the bag is inflated and to terminate the supply of compressed air to the bag whereby the bag is gradually deflated by escape of air through the blower and through said nozzle, wherein the air inlet to the bag includes a fitting extending through an opening in a side wall of the bag, and an air distributor tube extending from said fitting along the bag interior adjacent a rear wall thereof for distributing incoming air substantially uniformly through the width of the bag.

4,629,163
JACK FOR CYLINDRICAL TANK
Timothy L. Miller, Holmesville, and Richard J. Ehmke, Blue Springs, both of Nebr., assignors to Dempster Industries, Inc., Beatrice, Nebr.
Filed Mar. 25, 1985, Ser. No. 715,456
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—133 R **1 Claim**



1. In combination, a jack with a tank support for elevating a cylindrical gas tank off the ground comprising:
a. jack assembly including a channel housing means, a crank handle rotatively supported at a top said channel housing means, a downwardly extending telescoping actuator tube means with an elongated foot secured within said channel housing means, and means actuating said actuator tube means in said channel housing means by rotation of said crank handle; and,
b. tank support means secured to a lower portion of said channel housing means, said tank support means including a flat angled surface for resting against and supporting one end of the tank, keyhole slot means on both sides of said tank support means for accepting and engaging chain links, and chain assemblies including a hook end, clevis pin, and a length of chain including a chafing protector over a portion of said chain for securing the hook end to feet of the tank and the other end portion of each of said chains secured in said keyhole means of said tank support means whereby said angled surface engages against said tank, said chains tension the feet of the tank to said tank support means and said jack raises an end of the tank above the ground by downward telescoping movement of said actuator tube thereby providing for lifting and resetting of the tank for maintenance.

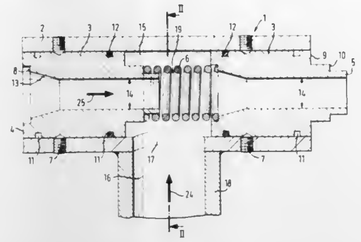
4,629,164
CONTAINER WITH MEMORY
John A. Sommerville, Cirencester, England, assignor to Imperial Chemical Industries, PLC, London, England
Filed Feb. 4, 1983, Ser. No. 463,892
Claims priority, application United Kingdom, Feb. 5, 1982, 8203395
The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.
Int. Cl.[4] A01G *27/00*
U.S. Cl. 239—69 **12 Claims**



1. A container comprising:
a body for holding material to be dispensed, and
at least one electrically-addressable memory device in which a record of the contents of said container is stored,
said record including electrically-alterable data defining the quantity of material held in said body, and
said memory being arranged to be addressed during dispensing of said material to effect alteration of said data to maintain in said record an updated definition of the quantity of said material remaining in said body.

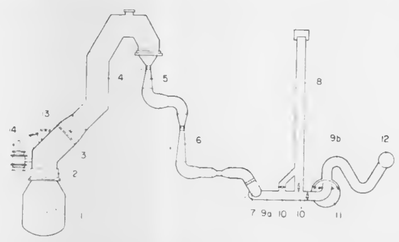
4,629,165
COOLING PIPE ARRANGEMENT FOR A COOLING SECTION FOR RAPID COOLING OF ROLLED WIRE OR BAR MATERIAL
Herbert Rothe, Baden-Baden, and Karl Haase, Kehl, both of Fed. Rep. of Germany, assignors to Badische Stahlwerke AG, Kehl, Fed. Rep. of Germany
Filed Nov. 9, 1984, Ser. No. 670,058
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342322
Int. Cl.[4] C21D *1/18*
U.S. Cl. 266—114 **10 Claims**

1. In a cooling pipe arrangement for rapid cooling of rolled wire on rolled bar material comprising a pipe portion in which are disposed two sleeve-like gripping elements between which an insert member having a gap as a through-flow opening for coolant is gripped, and an annular space which is defined by the insert member and a portion of the inside wall surface of the pipe portion and which communicates through a duct with



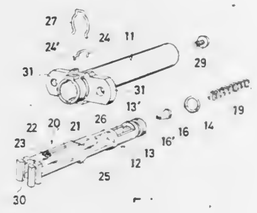
a connection for the coolant, the improvement wherein the insert member is formed by a coil spring, the gripping elements are fixed in the pipe portion, and means are provided for varying the length of the spring between the gripping elements.

4,629,166
EXHAUST-GAS TREATMENT SYSTEM FOR A SEALED-TYPE CONVERTER
Seishi Ogata, Kitakyushu; Keizi Arima, Sakai, and Masahiro Ohtsuki, Chiba, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Kawasaki Jukogy Kabushiki Kaisha, Kobe, both of, Japan
Filed Dec. 16, 1985, Ser. No. 809,412
Int. Cl.[4] C21C *5/38*
U.S. Cl. 266—158 **6 Claims**



1. An exhaust-gas treatment system for a sealed-type converter, said system having a hood for guiding converter exhaust gas and being provided with an emergency air admission valve device comprising: a valve box having at the upper part thereof a valve entrance for inflow of outside air; an air intake duct communicatively connecting the valve box and said hood; an annular valve seat formed below said valve entrance at the upper part of the valve box; a valve body which is capable of moving up and down within the valve box between an upper position of valve closure against the valve seat to close the valve entrance and a lower position of full valve opening; guide means for guiding the valve body in the up-and-down movement thereof; and valve body locking means functioning to normally hold the valve body in locked state at said upper position thereof and operating in an emergency to release the valve body thereby to permit the valve body to drop to said lower position thereof and thereby to admit outside air into the hood.

4,629,167
PISTON CYLINDER TYPE DAMPER
Shigeru Kimura, Kamakura, and Akira Mizusawa, Utsunomiya, both of Japan, assignors to Nifco, Inc., Yokohama, Japan
Filed Jul. 11, 1984, Ser. No. 629,761
Claims priority, application Japan, Jul. 14, 1983, 58-108225[U]
Int. Cl.[4] F16F *1/06*
U.S. Cl. 267—8 R **20 Claims**



1. A piston-cylinder type damper, comprising:
a cylinder connected to one of a main body and an openable object and having a bottom end wall and an open top end;
a piston, connected to the other one of said main body and said openable object, disposed within said cylinder through said open top end and provided at the end thereof which is disposed interiorly of said cylinder with a cylindrical hollow cavity portion;
coil spring means disposed within said cylinder between said interior end of said piston and said bottom end wall of said cylinder for resisting the inward movement of said piston into said cylinder when said openable object is moved from an open position to a closed position and for biasing said piston outwardly from said cylinder so as to cause said openable object to move from said closed position to said open position;
check valve type damping means disposed within said cylindrical hollow cavity portion of said piston for controlling the inward and outward movement of said piston relative to said cylinder, and therefore the closing and opening movement of said openable object; and
releasable locking means mounted upon said piston and cylinder for retaining said piston at said inward position relative to said cylinder against the biasing force of said biasing means, and thereby retaining said openable object at said closed position, when said releasable locking means is engaged, and for permitting said piston to move outwardly relative to said cylinder under the influence of said biasing means, and thereby permit said openable object to attain its open position, when said releasable locking means is disengaged, comprising a heart-shaped land area provided upon the outer surface portion of said piston, endless groove means defined within said outer surface portion of said piston and disposed about said heart-shaped land area of said piston, and a locking pin fixedly mounted upon said cylinder for disposition within said endless groove means of said piston and for cooperation with said heart-shaped land area so as to respectively permit relative movement of said piston with respect to said cylinder between said open and closed positions, and to retain said piston at said inward position and said openable object at said closed position.

4,629,168

BUSHING ASSEMBLY FOR AIR SUSPENSION

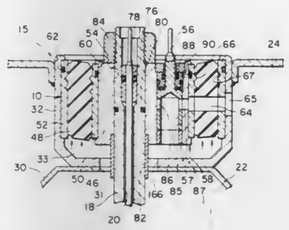
Shuuichi Buma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 3, 1985, Ser. No. 719,457

Claims priority, application Japan, Jul. 24, 1984, 59-111060[U]

Int. Cl.⁴ B60G *3/00*

U.S. Cl. 267—35 **9 Claims**



1. A bushing assembly for an air suspension assembly which is constituted to dispose an auxiliary air chamber above a main air chamber, the bushing assembly being interposed between a shock absorber and a housing for forming the air chambers and the bushing assembly working as a part of a partition disposed between the air chambers, the bushing assembly comprising:

a tubular rubber bushing on which the internal pressure in said main air chamber acts axially;

an inner tube fixed to an inner peripheral surface of said bushing and connected to said shock absorber and

an outer tube fixed to an outer peripheral surface of said bushing and connected to said housing;

wherein said bushing is compressed by said inner and outer tubes in at least an axial portion thereof when subjected to the internal pressure.

4,629,169

HYDROPNEUMATIC OLEOPNEUMATIC VEHICLE SUSPENSION ELEMENT

Alain Arnaud, Chatenay Malabry, and Thierry Bouiges, Paris, both of France, assignors to S.A.M.M. - Societe d'Applications des Machines Motrices, Issy Les Moulineaux, France

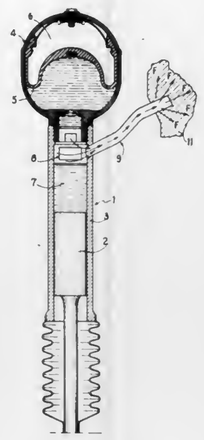
Filed Dec. 12, 1984, Ser. No. 680,692

Claims priority, application France, Dec. 14, 1983, 83 20063

Int. Cl.⁴ F16F *9/08*

U.S. Cl. 267—64.19 **9 Claims**

1. An oleopneumatic vehicle suspension element particularly adapted for use with a heavy vehicle, comprising: a cylinder, a piston movable in the cylinder, a gas accumulator connected to the cylinder and containing a flexible diaphragm separating a gas and a liquid within the accumultor, a liquid flow restricting shock absorber cartridge disposed between the piston and the diaphragm and within said liquid, and means for cooling the cartridge and thus said liquid to adjust a ground clearance of a vehicle, said means for cooling the cartridge comprising means defining a cold source, a caloduct comprising an onobstructed, elongate, bidirectionally traversable fluid conduit closed at opposite ends, one of said ends being connected to the shock absorber cartridge, which forms a hot source, and another of said ends being disposed in heat exchanging communication with said cold source, and a gas contained in said caloduct capable of evaporating upon contact with the cartridge, then naturally rising to said cold source where it is condensed, and then returning to the cartridge for repeated evaporation in a continuous cyclic manner, the cold source being disposed above the cartridge to implement the gravity return of the condensed gas, wherein the means defining said cold source is



on of a chassis of the vehicle and an external wall of the suspension device.

4,629,170

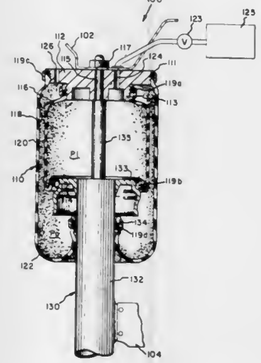
DUAL CHAMBER AIR SPRING

Ivan J. Warmuth, II, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 29, 1984, Ser. No. 626,365

Int. Cl.⁴ F16F *9/04*

U.S. Cl. 267—64.27 **11 Claims**



11. A suspension system comprising: a plurality of spring members; a plurality of unsprung members; and an air spring having a centerline fixedly connected at one end to sprung members and fixedly connected at the opposite end to the unsprung members, said air spring having an upper retainer a piston spaced axially away from the upper retainer, an inner gas impervious membrane sealingly attached to the retainer and to the piston to form an inner cavity, an outer gas impervious membrane of larger diameter than the inner membrane sealingly attached to the retainer and the piston such that the inner membrane is completely encased by the outer membrane, thus forming an outer cavity between the outer membrane and inner membrane, the outer membrane and inner membrane each forming a meniscus in axial cross section as the upper retainer axially approaches the piston, an effective diameter of each membrane equals twice the radial distance from: the air spring centerline to the point of the meniscus most axially distal the upper retainer, the effective diameter of the inner membrane being greater than the said effective diameter of the outer membrane, a means for introducing and exhausting gas pressure to at least one of said inner and outer cavities.

4,629,171

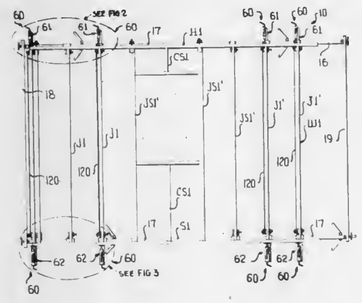
PORTABLE JIG FOR ASSEMBLING PREFABRICATED BUILDING STRUCTURES

Robert H. Judy, Clearwater, Fla., and Herman L. Judy, Alexandria, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 726,529, Aug. 5, 1985, abandoned. This application Apr. 2, 1986, Ser. No. 847,146

Int. Cl.⁴ B25B *11/02*

U.S. Cl. 269—37 **20 Claims**



1. A jig for assembling a prefabricated building wall or similar structure comprising means for supporting a plurality of first structural members in generally spaced parallel relationship to each other and at least one second structural member therewithin, generally normal to and in end-to-side engaging relationship to the first structural members; said supporting means including a relatively rigid frame including first and second spaced elongated generally parallel supporting members adjacent each of which is adapted to be supported one of the first structural members, means for forcing the first structural memebers toward each other to thereby tightly clamp the second structural member therebetween, said forcing means including first and second relatively spaced, opposing and aligned clamping members carried by said respective first and second supporting members with each being adapted to abuttingly engage an associated one of the first structural members; said clamping members normally setting-off therebetween a first clamping distance corresponding to the external distance between the first and second structural members, means for step-wise adjustably increasing the first distance to a second distance corresponding to the total of the first distance and the thickness of one of the first structural members, said step-wise adjusting means being defined by a rod of said first clamping member mounted for sliding movement between first and second clamping positions toward and away from said second clamping member by a fixed incremental distance corresponding to the thickness of the one of the first structural members thereby defining with the second clamping member said first and second distances, means for locking said rod at each of said first and second positions, said forcing means further including a flexible cable connected between said first and second clamping members, and means for tensioning said flexible cable to draw said clamping members into intimate tight clamping engagement with the first structural members in both the first and second clamping positions thereof.

4,629,172

IMAGE FORMING APPARATUS

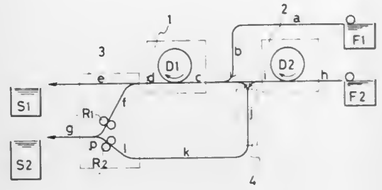
Toru Kameyama, Tokyo, and Junichi Asano, Hoya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,955

Claims priority, application Japan, Sep. 14, 1983, 58-168433

Int. Cl.⁴ B65H *5/26*

U.S. Cl. 271—9 **5 Claims**



1. An image forming apparatus comprising:

a first conveyance path for conveying a sheet;

first image formation means arranged upstream of said first conveyance path for forming an image on the sheet, said first image formation means sending out the image-formed sheets one by one to said first conveyance path at a shorter interval than a length of the sheet;

a second conveyance path provided separately from said first conveyance path for conveying a sheet;

second image formation means arranged upstream of said second conveyance path for forming an image on the sheet, said second image formation means sending out the image-formed sheets one by one to said second conveyance path at a shorter interval than a length of the sheet;

a junction where said first and second conveyance paths join;

a common conveyance path for conveying downstream from said junction the sheets having passed through said first and second conveyance paths;

first accelerating means provided on said first conveyance path between said first image formation means and said junction to accelerate the sheet conveyed thereto so as to enlarge said interval between two successive sheets to a length greater than the length of the sheet for further conveyance; and

second accelerating means provided on said second conveyance path between said second image formation means and said junction to accelerate the sheet conveyed thereto so as to enlarge said interval between two successive sheets to a length greater than the length of the sheet for further conveyance;

said sheets conveyed through said first and said second conveyance paths being alternately passed through said junction to be further conveyed through said common conveyance path in such a manner that the sheet conveyed through one of said first and second conveyance paths is located between two successive sheets conveyed through the other of said first and second conveyance paths.

4,629,173

SHEET REVERSE APPARATUS

Kiyoshi Hashimoto, Yokohama; Mitsuo Yamashita, Tokyo; Kiyoshi Tomimori, Yokohama, and Shinji Nakagawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 6, 1985, Ser. No. 795,548

Claims priority, application Japan, Nov. 13, 1984, 59-239638

Int. Cl.⁴ B65H *29/22*

U.S. Cl. 271—65 **16 Claims**

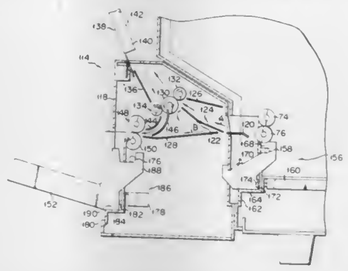
1. A sheet reverse apparatus for reversing the image surface

of a sheet discharged from an image forming apparatus having an output gear of a drive system, comprising:

mounting means for mounting said sheet reverse apparatus to said image forming apparatus;

an input gear for receiving driving power;

driving force transmission means which meshes with said output gear when said sheet reverse apparatus is mounted to said image forming apparatus to transmit a rotational force from said output gear to said input gear, said driving



force transmission means having one end pivotally supported at a rotating center of said input gear and including a swingable plate swingable around the rotating center, and the driving force transmission means itself serving to pivotally support, at its other end, a movable gear which is meshed with and rotatable around said input gear; and

spring means for biasing said swingable plate toward said output gear so as to mesh said movable gear with said output gear.

4,629,174

PAPER SHEET COLLECTING APPARATUS

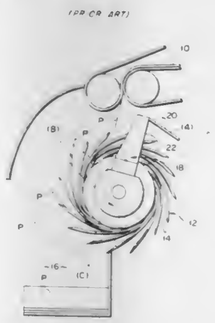
Yukinori Wakisaka, Kawagoe, and Toshiyuki Miyano, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 31, 1984, Ser. No. 615,906

Claims priority, application Japan, May 31, 1983, 58-96149

Int. Cl.[4] B65H *29/40, 31/32*

U.S. Cl. 271—186 **8 Claims**



1. A paper sheet for collecting appratus for collecting paper sheets successively fed from a conveying path into a collecting chamber, comprising:

a vane wheel rotatably disposed between the outlet of the conveying path and the inlet of the collecting chamber, said vane wheel including a drum-shaped frame and a plurality of vanes arranged on the outer peripheral surface of the frame along the circumference thereof;

first driving means for rotating the vane wheel on a fixed axis of rotation, whereby vane wheel holds each of the paper sheets from the conveying path between each two adjacent vanes thereof so that the paper sheets are guided into the collecting chamber as the vane wheel rotates;

separator means rotatable on the same axis of rotation of the vane wheel and movable in the radial direction of the vane wheel frame; and

second driving means adapted to hold the separator means in a radially inward position off the outlet of the conveying path at the time of collection of the paper sheets and, to rock the separator means through a predetermined angle, thereby causing the separator means to pass by the outlet of the conveying path, and then to move the separator means radially outward so that the paper sheets can be collected on the separator means at the time of distribution of the paper sheets,

said separator means including a rotating body rotating on the same axis of rotation of the vane wheel, a moving body attached to the rotating body so as to be able to reciprocate in the radial direction of the vane wheel, and at least one separator attached to the moving body, wherein

said moving body is formed of a rack, and said separator means further includes a pinion gear rotatably attached to the rotating body and in mesh with the rack, said rack being supported for reciprocation through the engagement with the pinion gear,

whereby the paper sheets are guided and collected into the collecting chamber by the vane wheel at the time of collection of the paper sheets, and the paper sheets fed from the conveying path are temporarily collected on the separator means by the vane wheel after the separator means passes by the outlet of the conveying path at the time of distribution of the paper sheets.

4,629,175

METHOD AND APPARATUS FOR THE STREAM FEEDING DELIVERY OF SHEET PRODUCTS

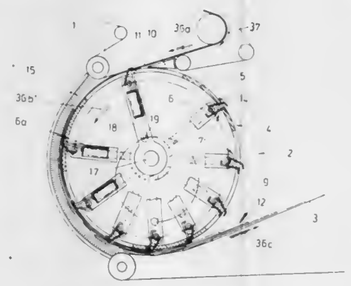
Emil Fischer, Ludwigshafen-Oggersheim, and Rudolf Stäb, Frankenthal, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,278

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404459

Int. Cl.[4] B65H *29/66, 29/06*

U.S. Cl. 271—202 **23 Claims**



1. A stream feeding apparatus for receiving sheet-like products from a supply device at a supply speed and delivering said products in the form of an overlapped feed stream to a delivery belt at a delivery speed that is lower than the supply speed, comprising

a cylindrically shaped drum having an outer wall defining a support means and a path of motion which at an uptake end thereof is aligned with a plane of motion of said products as defined by said supply device, said support means having a length in excess of the length of such product as measured in the direction of transport thereof and extending as far as said delivery belt,

grippers adapted to move generally parallel to said support means from said supply device to said delivery belt, said grippers being arranged in rows and displaceable relative to said support means,

means for pivoting said grippers relative to the outer wall of said drum so as to grip said products at said supply device and release same at said delivery belt,

gripper driving means for decelerating said grippers on moving parallel to said support means from generally the same speed as said supply device to generally the same speed as said delivery belt and releasing said products for further transport on said belt and then accelerating said grippers on moving from said delivery belt back to said supply device, and

means for driving said drum at a steady angular speed whose speed in complete revolutions in equal to the average angular speed of said grippers.

4,629,176

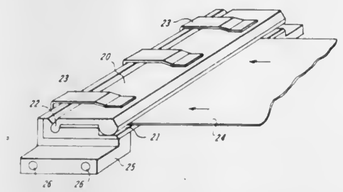
PAPER GRIPPER BAR

Theodorus M. Ceelen, Laverne, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1984, Ser. No. 679,428

Int. Cl.[4] B65H *29/02*

U.S. Cl. 271—204 **5 Claims**



1. A paper sheet gripper bar, for gripping a paper sheet, comprising:

an upper gripper and a lower gripper, each of said grippers extending the length of said sheet, and being fabricated from a single rigid piece of material, the rear edges of said grippers being shaped to interlock to form a hinge,

a plurality of springs, each spring exerting a force tending to close the space between the front edges of the grippers,

each of said springs comprising a flat piece of spring material bent into a shape which encircles the top, rear and bottom of said bar, and having a lower end further bent upward to grip the paper between said lower end and said upper gripper when the bar is closed on a paper.

4,629,177

PRESSURE ROLLER ARRANGEMENT FOR A PAPER TRANSPORT DEVICE

Gerardus J. H. Roddeman, and Paul Hoogerkamp, both of Almelo, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 714,231, Mar. 21, 1985, abandoned. This application Dec. 26, 1985, Ser. No. 814,576

Claims priority, application Netherlands, Dec. 7, 1984, 8403725

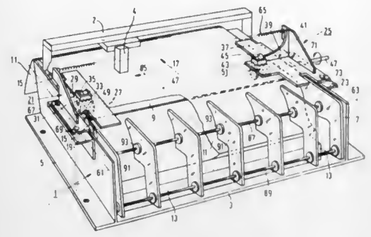
Int. Cl.[4] B65H *9/16*

U.S. Cl. 271—240 **9 Claims**

1. A device for transporting a flexible strip in a transport direction along a guide, comprising:

at least two conical pressure rollers, each being rotatable about its respective conical axis and being arranged with said axis transverse to said transport direction, the apices of the roller facing each other; at least at a respective area of pressure contact with the strips, each conical roller being made of an elastically deformable material, and

means for urging said rollers against a strip being transported, said means being arranged such that the force exerted by one pressure roller on the strip differs from the force exerted by the other pressure roller,



characterized in that said means comprises a single spring and at least one coupling member, said single spring applying different forces respectively on said pressure rollers via said at least one coupling member.

4,629,178

DOCUMENT CONVEYOR SYSTEM

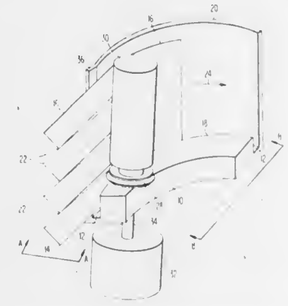
George M. Waddell, Carluke, Scotland, and Dennis Hall, Carshalton, United Kingdom, assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 27, 1984, Ser. No. 594,039

Claims priority, application United Kingdom, Nov. 15, 1983, 8330447

Int. Cl.[4] B65H *9/16*

U.S. Cl. 271—251 **44 Claims**



1. A document conveyor for the transportation of a document around a corner, said conveyor comprising:

a curved track for guiding an edge of a document in a curved path around said corner;

a driver for urging a document along said path;

a curved boundary adjacent to said track on the outside of said corner for supporting a document transversely to the surface of the document and to said path; and

a breaking cylinder, disposed in a spaced relationship to said boundary across the entrance to said conveyor, where

said breaking cylinder and said boundary are co-operable, upon a document entering said conveyor by passage therebetween, to open a fold or folds in the document lying in the direction of said path for the reduction of the mechanical strength imparted to the document transverse to the surface of the document by the fold or folds in the direction of said path, and where,

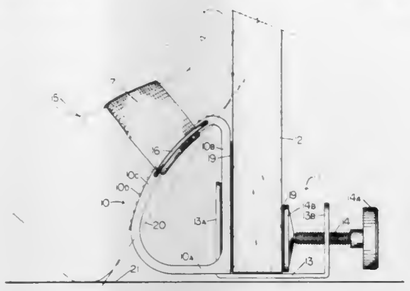
thereafter, said driver is operable to urge the document against said curved boundary for the document to be flattened against said curved boundary to be rendered flexible for the completion of said transportation around said corner.

4,629,179

FOOT HOLDING APPARATUS FOR USE IN PERFORMING SIT-UP EXERCISES

George Bizilia, 89 Strathmore Rd., Brighton, Mass. 02139

Filed Jul. 2, 1984, Ser. No. 627,119
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—93 5 Claims



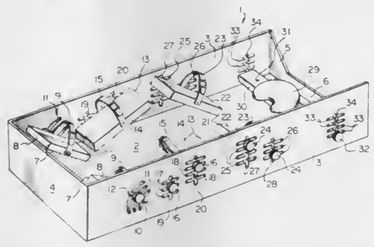
1. A device for use in performing sit-up exercises with the user lying on the floor adjacent to and at right angles to a door, said device including a first part provided with a forwardly disposed convex seat for lengthwise engagement by a substantial lengthwise portion of foot between but not including the ball and heel thereof and a rear wall engageable with a side of the door and disposed at an acute angle with reference to said seat, said first part also including means to overlie the instep of the foot and releasably hold said foot portion against the seat, and a second part attachable to the door, said second part including a front wall positionable in front of the rear wall of the first part, means operable to clamp the front wall of said second part and the rear wall of the first part against one side of the door and then holding said first part against movement relative thereto, said seat then disposed with its upper end close to the door and inclined forwardly and downwardly with its lower end close to the floor, the length of the seat and the spacing of its ends relative to the door and floor such that when said foot portion is secured to said seat, the ball portion of the foot and the toes thereof bear against the door and the heel thereof rests on the floor with the foot held substantially immovable during exercising.

4,629,180

EXERCISE DEVICE

Feyyaz Kaya, 17 James Street, Aylmer, Quebec, Canada J9H 4S7

Filed May 28, 1985, Ser. No. 738,388
Int. Cl.[4] A63B *71/12*
U.S. Cl. 272—93 2 Claims



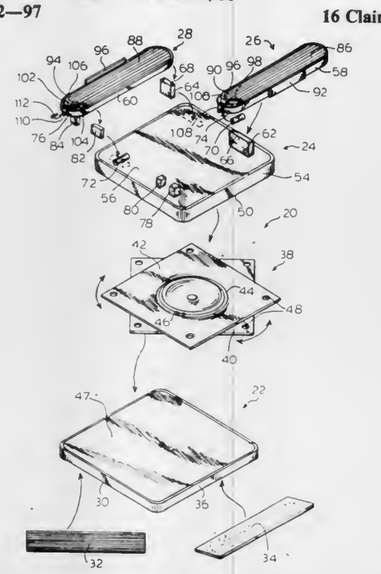
1. An exercise device comprising frame means; first and second footrest means mounted on said frame means for independent rotational and longitudinal adjustment on said frame means; first and second calf support means mounted on said frame means for independent rotational and longitudinal adjustment on said frame means; and first and second thigh support means mounted on said frame means for independent rotational and longitudinal adjustment on said frame means, whereby sit-ups can be performed with at least one foot, at least one calf or at least one thigh supported, so that an exerciser can exercise selected muscles depending on the portion of the anatomy being supported.

4,629,181

MULTI-DIRECTIONAL MOVEMENT LEG EXERCISER

Irwin M. Krive, 31 Slocum Ave., Port Washington, N.Y. 11050

Filed Jul. 21, 1983, Ser. No. 516,149
Int. Cl.[4] A63B *69/18*
U.S. Cl. 272—97 16 Claims



4. An exerciser comprising: a base, a turntable rotatably mounted on the base, foot support means on the turntable so as to be rotatable therewith, the foot support means being moveable with respect to the turntable upon application of a predetermined amount of foot pressure so as to permit canting thereof in two opposing directions and pivoting in a third direction thereby permitting the user to selectively move his feet when engaged with the foot support means in any one or in a combination of four directions of movement depending on the application of leg and foot pressure thereto and accordingly allowing the user to exercise in a desired manner, the canting movement being about a longitudinal axis of the foot support means corresponding to a longitudinal axis of a user's foot positioned on the foot support means so as to permit shifting of the relative elevation of the inside and outside edges of the foot and the pivoting movement being about a transverse axis of the foot support means corresponding to a transverse axis of a user's foot positioned on the foot support means so as to permit shifting of the relative elevation of the heel portion and toe portion of the user, the foot support means includes a pair of spaced foot supports to selectively support the feet of a user, each foot support adapted to be independently canted and pivoted with respect to the other foot support and the turntable, the foot support means is provided for facilitating canting of each support and includes a fulcrum member mounted on the turntable and engaging a receiving surface on the under surface of the foot support adjacent the portion of the foot support where the toe and ball portions of the foot of the user engages the foot support.

4,629,182

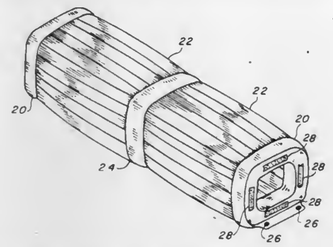
INFLATABLE TOY TUNNEL

Sandra B. Rader, and Steven J. Rader, both of 10336 Woodley Ave., Granada Hills, Calif. 91344

Filed Jun. 24, 1985, Ser. No. 747,701
Int. Cl.[4] A63B *71/02, 71/16*
U.S. Cl. 272—113 4 Claims

1. An inflatable toy tunnel comprising:

(a) a first and second quadrangularly shaped end each having an outside and inside wall with compressed air therebetween forming a collapsible structure;
(b) a plurality of longitudinal sections having an outside and inside wall with compressed air therebetween attached to said first and second end with communication therein;
(c) a plurality of quadrangularly shaped supports having an outside and inside wall with compressed air therebetween communicably abutting said longitudinal sections forming



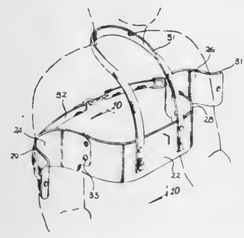
a segmented tunnel with a clear passageway therethrough, allowing entrance and egress for children at play;
(d) a plurality of ground attaching loops at the lower extremes of said tunnel for fastening to the surface upon which the tunnel is resting; and,
(e) connecting means on the exposed outside surface of said ends for attachment to a like structure for lengthening and the creation of an assembled matrix, said connecting means comprising continuous strips of hook and loop tape bonded to said ends with adhesive forming a removable and reusable joining system.

4,629,183

ARM SUPPORT DEVICE

Walter E. Perrine, North Hollywood, Calif., assignor to Weider Health and Fitness, Woodland Hills, Calif.

Filed Aug. 9, 1984, Ser. No. 639,249
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 16 Claims



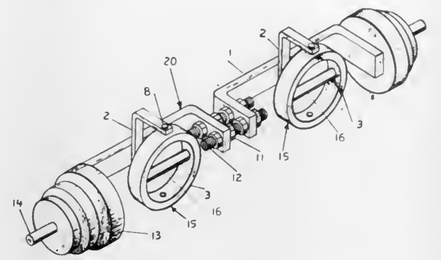
1. A yoke for supporting a user's arms in fixed positions, said yoke comprising:
a rigid contoured U-shaped body member for partially extending around the upper body of a user, said body member having a first and second end;
a first and second arm support member, each of said arm support members having a first portion for supporting a user's arms in a predetermined position, and a second portion adjacent a respective end of said U-shaped body members;
a harness means coupled to said body member for supporting said body member at a predetermined position on the user's body; and
a pivot means selectively pivotably coupling said second portions of said first and second arm support members to the respective one of said first and second ends of said body member for relative rotation therebetween about a substantially horizontal axis through an arc of sufficient length for positioning the arms of different users in a comfortable position for performing arm exercises.

4,629,184

EXERCISE APPARATUS EMPLOYED FOR PERFORMING TWO HANDED CURLING EXERCISES

Thomas V. Selkee, 2583 N. Sweetbriar Dr., Claremont, Calif. 91711

Filed Nov. 26, 1985, Ser. No. 801,840
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 9 Claims



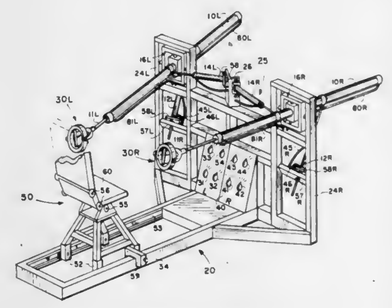
1. Weightlifting apparatus comprising:
a rigid frame means having a pair of outer ends with means thereon to removably support weights, a pair of generally U-shaped members, each having a pair of end portions connected by a bight portion. The U-shaped members being axially spaced apart and rotatably mounted between the outer ends of said frame means at said bight portions,
elongate handle member disposed between the end portions of each said U-shaped member, wherein the longitudinal axis of each said handle member transverses the bight portion of said U-shaped member, and means for rotatably mounting said handle members between the end portions of each of said U-shaped member, whereby said handle members rotate about vertical axes while said U-shaped members provide multi-axes hand movements.

4,629,185

UNIVERSAL HYDRAULIC EXERCISER

Michael J. Amann, 898 State Rd., 621 E., Lake Placid, Fla. 33852

Filed Jul. 11, 1985, Ser. No. 753,970
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 13 Claims



1. An exercise apparatus comprising:
a framework;
at least one gimbal assembly disposed in said framework;
a main hydraulic cylinder disposed in said gimbal assembly;
handle means attached to said main hydraulic cylinder for gripping by a user, said main hydraulic cylinder thereby movable vertically, horizontally with respect to said framework and longitudinally with respect to said main hydraulic cylinder by a user gripping said handle means,

said hydraulic cylinder providing resistance to said longitudinal movements;

a first auxiliary hydraulic cylinder attached in an essentially horizontal position between said framework and said main hydraulic cylinder for providing resistance to said horizontal movement;

a second auxiliary hydraulic cylinder attached in an essentially vertical position between said framework and said main hydraulic cylinder for providing resistance to said vertical movements; and

resistance control means for independently adjusting the resistance to said horizontal movement, said vertical movement, and said longitudinal movement.

4,629,186

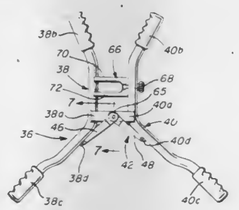
SPRING EXERCISE DEVICE

Silas B. Aldridge, P.O. Box 1207, Live Oak, Fla. 32060

Filed Apr. 16, 1985, Ser. No. 724,601

Int. Cl.[4] A63B *21/02*

U.S. Cl. 272—135 **18 Claims**



1. A resistance-type exerciser comprising pivotally interconnected arms having a pair of more closely spaced handle forming ends and a pair of less closely spaced handle forming ends and a caliper-type spring unit for replaceable receipt on the arms for urging respective ends of the arms away from one another, the spring unit comprising a pair mating limbs in the form of telescopic channel-section members, pin means pivotally interconnecting the limbs, and a spring connected between the limbs urging the limbs apart, wherein the limbs are receivable in respective pocket means formed on inner surfaces of the respective arms for retention therein through pressure exerted by the spring.

4,629,187

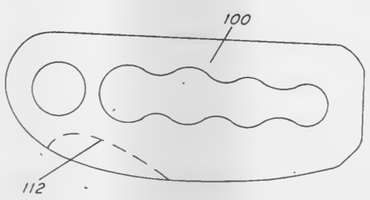
POOL STICK GUIDE

William A. Mirowski, 24941 Forest Dr., Lake Villa, Ill. 60046

Filed Mar. 18, 1985, Ser. No. 713,024

Int. Cl.[4] A63D *15/00*

U.S. Cl. 273—24 **16 Claims**



1. A pool stick guide adapted to be held between a player's fingers and thumb, comprising:

a guide plate having top and bottom surfaces of substantially rectangular shape, two short sides, two long sides and a thin cross section, one of the short sides of the top and bottom surfaces having a curved edge:

a first hole disposed near the curved short side of the guide plate and adapted to receive a pool stick; and

an elongated second hole located between the long sides of the top and bottom surfaces of the guide plate and extending substantially from said first hole toward the side opposite said curved short side, said elongated second hole having four slots adapted to receive up to four fingers, whereby said guide may be held between the player's fingers and thumb.

4,629,188

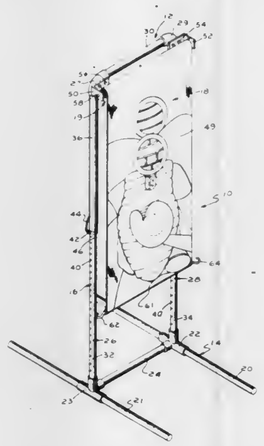
BASEBALL PITCHING TARGET WITH AN ADJUSTABLE STRIKE ZONE

Peter A. Mahieu, Box 186, Williamsburg, Mass. 01096

Filed Mar. 9, 1984, Ser. No. 588,061

Int. Cl.[4] A63D *69/40*

U.S. Cl. 273—26 A **9 Claims**



1. A baseball target device comprising:

a. a base:

b. a tubular frame extending substantially vertically therefrom;

c. said frame having a spring-loaded roller mechanism mounted across it in a substantially horizontal position, whereby the top of the roller defines the top level of a simulated strike zone for the device;

d. said frame having a pair of telescopic vertical legs whose overall length can be adjusted to raise or lower the height of the roller to conform to the actual top level of a particular batter's strike zone; and,

e. a target sheet attached to the roller for simulating the strike zone, said sheet having a width equal to that of any batter's strike zone, said sheet also having one end fixedly attached to the roller so that a midsection of the sheet is rollable upon the roller and a second, free end of the sheet is adapted to hang from it, whereby the unrolled portion of the sheet between the top of the roller and the sheet's free end defines the length of the simulated strike zone, the free end defines the lower level of the device's strike zone and the length of the simulated zone can be selectively varied by rolling or unrolling the sheet from the roller to simultaneously adjust both the length of the device's strike zone and its lower level to conform to the actual length and lower level of the batter's strike zone.

4,629,189

PHOTOELECTRIC PINFALL DETECTION SYSTEM

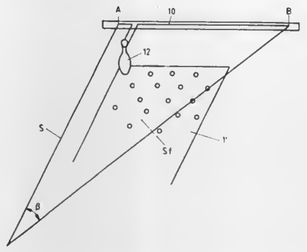
Vittorio Meniconi, J.C. Heerstrasse 17A, 8635 Oberdürnten, Switzerland

Filed Jan. 28, 1985, Ser. No. 695,448

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404865

Int. Cl.[4] A63D *5/00*

U.S. Cl. 273—54 E **34 Claims**



1. A photoelectric pinfall detection system comprising:

a radiation emitting means standing offset to the longitudinal axis of a bowling lane in a predetermined distance to the pins and being adapted to emit an electromagnetic signal beam which is focussed at least in one plane;

a receiving means including a receiving element adapted to receive said electromagnetic beam emitted by said radiation emitting means and to generate a first output signal in response to the receipt of said electromagnetic beam and a second output signal, if no electromagnetic beam is received;

said electromagnetic beam emitted by said emitting means and said receiving element included in said receiving means being movably arranged with reference to each other in such a way that the electromagnetic beam is interrupted by each standing pin and that such interruption is detected during said relative movement of said beam and said receiving element, and said receiving element generating said second output signal for a time interval corresponding to the duration of the electromagnetic beam interruption;

an electronic circuitry means connected to said radiation emitting means and said receiving means, said electronic circuitry means receiving said first and said second output signals from said receiving means and being adapted to process said received first and second output signals, wherein said electronic circuitry means includes means for summing the time intervals of electromagnetic beam interruption for each pin that is standing, and means for transforming said summed intervals into the number of fallen pins, and said electronic circuitry means further including display means to display the number and position of the fallen pins in response to said first and second output signals.

4,629,190

HOCKEY STICK HAVING ARCUATELY BENT SHAFT

Michael S. Borgen, 1029 W. Dwelle, Lake City, Minn. 55041

Filed Apr. 17, 1984, Ser. No. 601,302

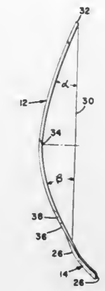
Int. Cl.[4] A63B *59/14*

U.S. Cl. 273—67 A **4 Claims**

1. A hockey stick, comprising:

a blade having a heel; and

a shaft having a top end and means for connecting a bottom end to said blade, said shaft having an arcuate bend between the top and bottom ends, said bend being in a plane substantially normal to said blade, said bend reaching its farthest point from a chord extending between the top end of said shaft and the heel of said blade at a location between 33⅓ percent and 70 percent of the length of the shaft as measured from the top end of said shaft, said shaft being substantially straight for a length of approximately 7 to 9 inches extending from the heel of said blade toward the top end of said shaft.



4,629,191

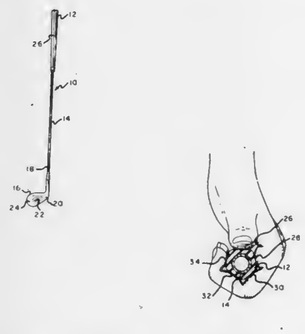
GOLF CLUB INCLUDING PENTAGONAL GRIP

Joseph J. Mancuso, 30 S. Woodbury Rd., Pitman, N.J. 08071

Filed Jul. 5, 1985, Ser. No. 751,956

Int. Cl.[4] A63B *53/14*

U.S. Cl. 273—81.4 **6 Claims**



1. In a golf club having a shaft with a club head extending laterally from the front surface of one end thereof, said head being connected at its heel to said front surface of said shaft and having a ball striking face between its heel and a toe remote from said shaft, a hand grip comprised of an elastomeric material secured coaxially to the other end of said shaft, said grip being comprised of five relatively flat gripping surfaces extending longitudinally of the grip along a major portion thereof, said five flat surfaces being substantially equally spaced around said grip such that the cross-sectional shape of the outer surface of said grip is a substantially regular pentagon throughout said major portion thereof and one of said flat gripping surfaces being on the front surface of said shaft.

4,629,192

INTERLOCKING PUZZLE BLOCKS

Franklin Nichols, 2510 S. Norfolk, Tulsa, Okla. 74114

Filed May 20, 1985, Ser. No. 735,614

Int. Cl.[4] A63F *9/04, 9/12;* **A63H** *33/08*

U.S. Cl. 273—156 **17 Claims**

1. A building or puzzle block comprising:

a body portion,

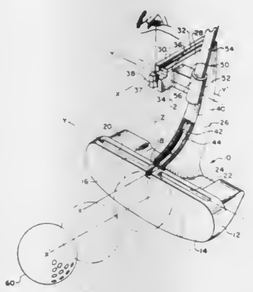
spheres attached to said body portion at selected corners thereof such that the center of each said sphere lies on an

extension of the respective corner defining edges of said body portion, and



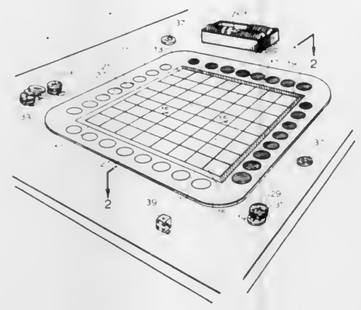
receiving sockets formed on corners of said member, other than those on which the spheres are attached, for interconnecting receipt of spheres on other blocks.

4,629,193
GOLF PUTTER HEAD
Martin J. Pierman, 3212 Eastlake Dr. N., Elkhart, Ind. 46514
Filed Nov. 7, 1985, Ser. No. 796,185
Int. Cl.[4] A63B *53/02, 53/04, 69/36*
U.S. Cl. 273—164 **16 Claims**



14. A golf putter head having an elongate side-to-side extending portion with a front face adapted to be positioned in a generally vertically extending plane, a riser portion extending upwardly and rearwardly from said elongate body portion, an upper tier member extending from an upper end of said riser portion forwardly toward said front face, and an arm extension extending from one side edge of said upper tier member along an axis generally parallel to the axis of said elongate body portion and which first mentioned axis is spaced forwardly of the connection of said upper tier member to said upper end of said riser portion whereby the center of gravity of said golf club head extends through said riser and through said body portion and intersects a Y' axis which includes at least a portion of said arm extension to which a golf club shaft is connected such that a moment force or torque force about either the axis of the shaft or the center-of-gravity axis is inhibited by the interconnection and arrangement of said arm extension, upper tier member, riser portion and body portion of said golf club head.

4,629,194
BOARD GAME APPARATUS
Louis A. Spero, and Anna L. Markisz-Spero, both of R.D. 1, Box 341, Lily Lake Rd., Highland, N.Y. 12528
Filed May 7, 1985, Ser. No. 731,370
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—236 **8 Claims**

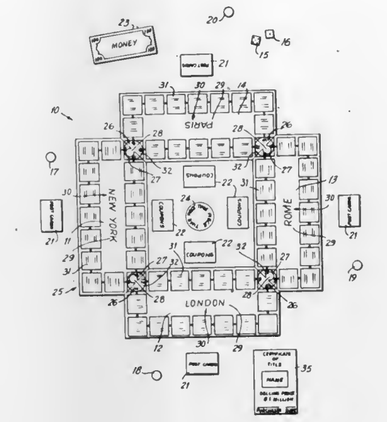


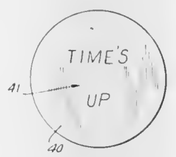
5. A game apparatus comprising:
a substantially flat surface;
a main playing area outlined on the flat surface, said main playing area being subdivided into a plurality of subareas forming rows of subareas;
a border surrounding the main playing area, substantially half of said border having a first designation and the other half of the border having another designation;
a plurality of spaces outside said border, each of said spaces being aligned with the subareas; and
two sets of charge discs, each set of charge discs having a separate designation and each charge disc of each set having a plus sign on one side and a minus sign on the other side and each set of charge discs having a mark on the plus side of one-half of the charge discs and a mark on the minus side of the other one-half of the charge discs.

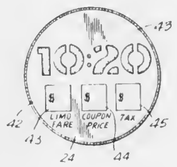
4,629,195
TRAVEL GAME ARRANGEMENT
Fred D. Charney, 575 Third St., Brooklyn, N.Y. 11215
Division of Ser. No. 483,762, Apr. 11, 1983, Pat. No. 4,484,749. This application Oct. 5, 1984, Ser. No. 658,302
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—254 **8 Claims**

1. A game comprising a gameboard carrying a plurality of playing zones arranged at least in one continuous endless path, at least one of said playing zones being a time zone; at least one playing piece for each player of the game; means for determining the number of said playing zones by which said playing pieces advance during a turn of the game; a plurality of time-indicating members bearing game-time indications that are numerically and consecutively arranged in a stack and individually revealed on advancement of one of said playing pieces to and landing on said time zone, said game-time indications

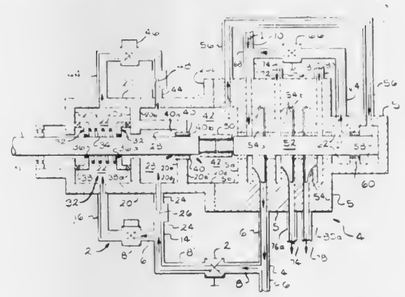
denoting the progress of the game toward its conclusion in dependence upon the number of such landings; and a terminating member insertable into any position in said stack of time-indicating members to indicate the end of the game.







4,629,196
COUPLER AND MANIFOLD ASSEMBLY WITH DIFFERENTIAL VACUUM SEAL MEANS
George W. Joniec, Lambertville, Mich., assignor to Process Alternatives & Combustion, Inc., Lambertville, Mich.
Filed Jul. 16, 1985, Ser. No. 755,458
Int. Cl.[4] F16J *15/34, 15/48*
U.S. Cl. 277—3 **15 Claims**

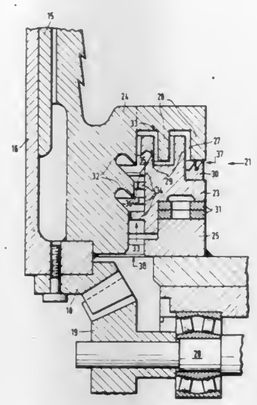


1. A coupler and manifold assembly for use between an external drive means and a circulating pump for an absorption chiller, comprising in combination:
(a) a sturdy housing comprising a plurality of chambers in communication with each other, wherein said chambers are capable of maintaining vacuums of equal or different magnitudes;
(b) a shaft extending through said housing, being capable of rotating when its one end is connected to said external drive means, and said shaft being capable of engaging and rotating impellars of said circulating pump when connected to said circulating pump at its other end;
(c) at least one double mechanical rotating seal mounted upon said shaft and positioned within said housing, whereby each said seal defines another chamber capable of maintaining its own vacuum against the entry of atmospheric pressure at one seal face and against the exit of its vacuum to one of said plurality of chambers at the other seal face;
(d) at least one bearing engaging said shaft and mounted within an opening in at least one interior wall of said housing which separates said plurality of chambers within said housing; to provide support for said shaft and to allow communication between said plurality of chambers;
(e) conduit to interconnect said plurality of chambers and to receive a fluid from the discharge side of said circulating pump, and to transport said fluid to said chamber defined by said seal and to said plurality of chambers within said housing, and to further transport said fluid back to the suction side of said circulating pump to complete a closed system;
(f) a tee connected to said conduit to direct a larger proportion of said circulating fluid to said chamber defined by said seal;
(g) a plurality of restrictive orifices positioned within said conduit to direct a smaller proportion of said circulating fluid leading to one of said plurality of chambers separated by said interior wall; and to provide restricted fluid flow from said chamber defined by said seal and to the other of said plurality of chambers separated by said interior wall; and
(h) a plurality of solenoid valves, positioned within said conduit and in electrical communication with said external drive means, to help seal the said vacuums concommitantly with and during shut down of said circulating pump,
whereby said coupler and manifold assembly provide a controlled and stabilized environment necessary for efficient operation of the absorption chiller, by inducing and maintaining differential vacuums across the said seal faces, under operating and static conditions, while providing lubrication and cooling to said circulating pump, and whereby said coupler and manifold assembly eliminate transfer of heat from said drive means to said absorption chiller, and eliminate destructive effects upon said external drive means by mechanical stress upon start-up and by abrasive and corrosive particulate contaminates circulating within said fluid during operation.

4,629,197
CONE CRUSHER LABYRINTH SEAL
Klaus Schütte, Cologne, and Helmut Stöckmann, Wesseling, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 9, 1985, Ser. No. 764,228
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429467
Int. Cl.[4] F16J *15/447, 15/40*
U.S. Cl. 277—53 **10 Claims**

1. In a cone crusher of the type in which a crushing cone is driven in a housing by an eccentric drive and in which a labyrinth seal includes an annular inner sealing member connected to and rotatable with the eccentric drive about an axis of rotation and an annular stationary outer sealing member connected to said housing, the improvement in the labyrinth seal comprising:
a first labyrinth portion extending vertically;
a second labyrinth portion extending horizontally;
said second labyrinth comprising a gap and said outer sealing member comprising a plurality of peripheral webs on said outer sealing member, the lowermost of said webs having a predetermined inner diameter which is less than the

diameter between the center line of said gap and the axis of rotation; and



each of said webs including at least one vertical opening therethrough offset from the like openings of the other webs.

4,629,198

OIL SCRAPER PISTON RING ASSEMBLY

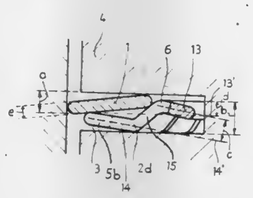
Martin Morsbach, Burscheid, and Bert Brauers, Blecher-Odenthal, both of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,227

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339708

Int. Cl.⁴ F16J *9/06, 9/20*

U.S. Cl. 277—139 **12 Claims**



1. In an oil scraper piston ring and piston assembly, said piston including a circumferential groove having opposite first and second side walls; an oil scraper ring received in said groove and being in circular contact with said first side wall; a spring ring received in said groove between said oil scraper ring and said second side wall; said spring ring having circumferentially distributed resilient tongues oriented alternatingly radially inwardly and radially outwardly; said spring ring having a first, radially inner annular part extending radially adjacent said oil scraper ring and contacting said second side wall; the improvement wherein said first part lying in a first plane and said second part lying in a second plane; said first and second planes being axially spaced from and are generally parallel to one another; said first part having a radially outer circumferential zone and said second part having a radially inner circumferential zone; further wherein said spring ring comprises a third annular part integrally interconnecting said radially outer circumferential zone of said first part with said radially inner circumferential zone of said second part; said third part being oriented at an oblique angle relative to said first and second planes and being engaged by a radially inner periphery of said oil scraper ring.

4,629,199

VORTEX GASKET WITH COMPOSITION FOR HIGH-TEMPERATURE AND HIGH-PRESSURE APPLICATION

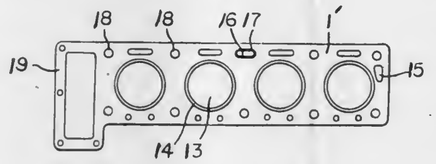
Tsutomu Yamamoto; Masaaki Ashizawa; Kazuo Nishimoto, and Yuji Sekiguchi, all of Yokohama, Japan, assignors to Nichias Corporation, Tokyo, Japan

Division of Ser. No. 261,051, May 6, 1981, Pat. No. 4,477,094. This application Sep. 4, 1984, Ser. No. 647,159

Claims priority, application Japan, May 6, 1980, 55-59681; May 27, 1980, 55-70370

Int. Cl.⁴ F16J *15/12;* **B32B** *19/02*

U.S. Cl. 277—204 **3 Claims**



1. A vortex gasket comprising a metal hoop spirally wound together with a filler material comprised mainly of vermiculite, wherein said filler material comprises a sheet having a composition of 40 to 80% by weight of thin flakes of expanded vermiculite, 1 to 30% by weight of fibers, 5 to 40% by weight of fine filling grains, and appropriate amounts of a binding agent and a vulcanizing agent.

4,629,200

NON-METALLIC PISTON RINGS WITH CONTROLLED EXPANSION PRESSURE

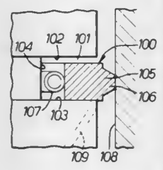
Brian L. Ruddy, Rugby, England, assignor to AE PLC, Warwickshire, England

Filed Aug. 6, 1984, Ser. No. 638,114

Claims priority, application United Kingdom, Aug. 4, 1983, 8321051

Int. Cl.⁴ F16J *9/26*

U.S. Cl. 277—216 **15 Claims**



1. An internal combustion engine including:
a sump;
at least one cylinder or liner,
a piston arranged within said cylinder or liner for reciprocation therein,
at least one piston ring groove provided on said piston,
a combined compression and oil control piston ring received within said at least one piston ring groove and made from a conformable non-metallic material,
said piston ring having an expansion pressure against the associated cylinder or liner of between 0.10 and 1.50 MN/m^2,
said at least one piston ring groove being provided with a plurality of apertures to drain into said sump oil scraped from said cylinder or liner by said piston ring.

4,629,201

LOCKING STRUCTURE OF A SEAT TO A FUEL TANK IN A STRADDLE TYPE VEHICLE

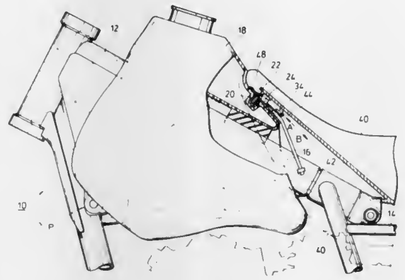
Kensuke Tsukiji, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1985, Ser. No. 776,288

Claims priority, application Japan, Sep. 17, 1984, 59-139336[U]

Int. Cl.⁴ B62K *11/04*

U.S. Cl. 280—5 A **2 Claims**



1. A locking structure for detachably locking a front portion of a seat to a fuel tank in a straddled type vehicle in which a fuel tank is disposed in front on said seat, comprising a fixed stay having a headed locking pin projected from its rear upper surface, an opening provided in its front portion and a peripheral portion projected upwards on the front and sides of said fixed stay and forming an angled opening toward the rear, said fixed stay being fixedly secured to said fuel tank by means of a bolt passing through said opening where said fixed stay is butted against the rear upper surface of said fuel tank, said headed locking pin projecting above said stay to a height not exceeding the top of said peripheral portions, and a bifurcated slide stay fixedly and integrally secured to a front lower surface of a bottom plate of said seat and having a bifurcated portion opening forwardly and engagable with said headed locking pin, whereby said bifurcated slide stay positons and locks the front portion of said seat by sliding forwardly as guided by said headed locking pin.

4,629,202

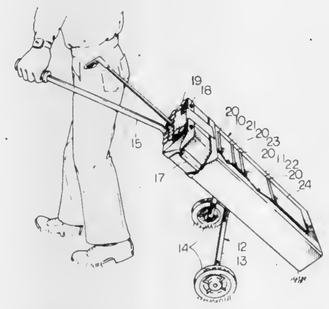
COMBINATION GOLF CART AND BAG

Veryl H. Nelson, 712 Rucker Ave., Everett, Wash. 98201, and Reid V. Nelson, 500 - 13th St., Snohomish, Wash. 98290

Continuation-in-part of Ser. No. 538,756, Dec. 12, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 728,809

Int. Cl.⁴ B62B *1/04*

U.S. Cl. 280—47.26 **3 Claims**



2. A combination golf cart and golf club bag for balanced and stable pulling on a golf course, and for complete self contained for hand carrying away from or to a golf course, for car trunk transport, and for compact storage and shipment, and for quick conversion from a pulling assembly to a carrying and storage assembly, comprising:

(a) a rectangular golf equipment bag of a length to receive golf club receiving tubes, to receive in turn a golf club set, having:

two diagonal wheel strut end receiving non circular inserts, located at the mid length of this bag at each terminus of the sides of one of the largest width sides of this rectangular bag, which side, upon the pulling of this bag over a golf course, is facing downwardly;

a top centered operating handle end receiving non circular straight insert, with a top entry inside the rectangular bag, adjacent the largest width side, which is facing downwardly during the pulling use of this bag over a golf course;

a full bottom of this bag;

a full level top of this bag having: circular shaped recesses adapted to receive golf club receiving tubes arranged in a U shaped pattern, with the base of the U being adjacent the largest width side, which is facing downwardly during the pulling use of this bag over a golf course; a non circular entry adapted to receive almost the entire length of an operating handle; and two non circular entries adapted to receive substantial portions of respective wheel struts;

fasteners arranged around this bag adjacent the full level top adapted to receive a flexible cover creating an additional enclosed volume above this full level top;

a handle arranged on the bag, adjacent these fasteners, and adapted to be gripped at one of the smallest width sides of this bag;

a compartment arranged within the bag below the handle and within the volume defined by the U shaped pattern of circular spaced recesses, which are adapted to receive and to position the golf club receiving tubes, having a securable access through one of the largest wide sides of this bag, which is facing upwardly, upon the pulling of this bag over a golf course, whereby golf balls, tees, and a flexible cover are stored during a golfing outing, with this flexible cover remaining ready for subsequent use to create an additional enclosed volume above this full level top of this bag into which other accessories needed by a golfer are selectively placed;

(b) an operating handle extending straight away from a hand gripping end for a major portion of the overall length of this operating handle, and then turning at an angle creating an end insertable within the top centered operating handle end receiving non circular straight insert of this bag, whereby, upon pulling the bag over a golf course, the operating handle extends out ahead of the bag, presenting the hand gripping end at the hand level of the golfer;

(c) a removable retaining pin adapted to insure the retention of this operating handle within this receiving insert during the pulling of this bag over a golf course;

(d) a pair of assemblies, each having: a wheel strut of non circular cross section, commencing in a straight top insertable end adapted for fitting into one of the two diagonal wheel strut end receiving non circular inserts of the bag, then continuing in an outwardly bias downwardly extending portion to increase the tracking width to gain transverse stability, and terminating in a straight bottom end having a receiving hole to position an axle; an axle for positioning in this receiving hole and extending radially outwardly from the wheel strut; a wheel for rotating about this axle; and a retaining means to keep the wheel, axle, and wheel strut in their operating positions; and

(e) a flexible cover for temporary storage in the compartment during the pulling of the bag over the golf course, and for placement above the bag and securement about the full level top, using the adjacent fasteners to provide

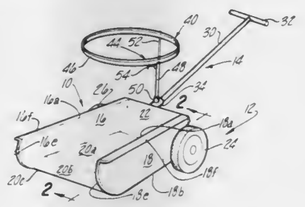
an additional enclosed volume above this full level top, within which the heads of golf clubs will be positioned, the handle in part will be positioned, and the wheels, axles, and adjacent wheel-strut ends will be positioned, when this combination golf cart and bag is to be carried away from or to a golf course.

4,629,203

YARD CADDY

Thomas Ballard, 25550 Mulberry, Southfield, Mich. 48034

Filed Aug. 21, 1984, Ser. No. 642,779
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—47.26 **3 Claims**



1. A utility cart comprising:

A. a generally rectangular body having bottom, side and rear panels and an open top and front;

B. wheel means adjacent the rear end of said body rollably engaging a support surface;

C. a rearwardly extending handle at the rear end of said body;

D. a rounded nose at the front end of said body normally slidably engaging the support surface but rollably engagable with the support surface in response to generally upward force applied to said handle to facilitate upward rolling pivotal movement of said cart about said nose;

E. the front end of each of said side panels being rounded to constitute said nose;

F. with said wheel means rollably engaging the support surface and the rounded front ends of said side panels slidably engaging the support surface, said bottom panel angling downwardly and forwardly and its front edge extending horizontally between the rounded front ends of said side panels at a level closely adjacent to but clearing the support surface, whereby when said cart is moved forwardly by a generally forward pushing force exerted on said handle, loose massed material such as snow disposed on the support surface will move upwardly over said bottom panel horizontal front edge and rearwardly into said cart, whereafter the material thus loaded into the cart may be dumped from the cart by a generally upward force exerted on said handle to rollably pivot said cart upwardly about is rounded nose to a generally vertical, dumping position.

4,629,204

METHOD FOR FIXING A MUD FLAP TO A MOTOR VEHICLE, A MUD FLAP AND A DEVICE FOR PERFORMING THE METHOD

Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,137
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321148
Int. Cl.[4] B62D *25/16*
U.S. Cl. 280—154.5 R **27 Claims**

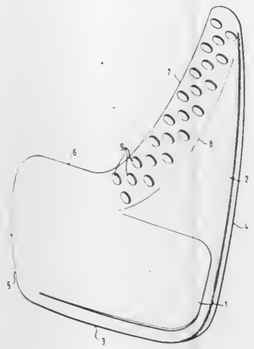
1. In a method for fixing a mud flap to a motor vehicle comprising

overlapping a portion of said mud flap with a portion of the motor vehicle body; and

screwing or clamping said overlapping portions of said mud flap and said motor vehicle body to one another;

the improvement comprising:

interposing a plurality of spacers of predetermined uniform height between said overlapping portions of said mud flap



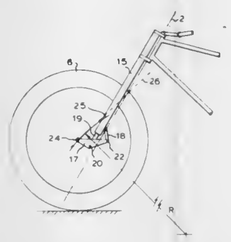
and said motor vehicle body, said spacers being spaced apart from one another and of such a height, as to form a plurality of gaps between said mud flap and said motor vehicle body, said gaps being too large to substantially retain water therein by capillary action.

4,629,205

MOTORCYCLE FRONT FORK ASSEMBLY

Terence A. Haynes, 20, Rectory Grove, Croydon, Surrey, England

PCT No. PCT/GB83/00179, § 371 Date Mar. 7, 1984, § 102(e) Date Mar. 7, 1984, PCT Pub. No. WO84/00526, PCT Pub. Date Feb. 16, 1984
PCT Filed Jul. 22, 1983, Ser. No. 595,570
Int. Cl.[4] B60K *21/02*
U.S. Cl. 280—277 **23 Claims**



1. A motorcycle having a rear suspension, a steering axis, and a front fork assembly comprising: substantially parallel fork legs, at least one of said legs being connected to a linkage comprising an axially movable telescopic member, said axially movable telescopic member being positioned to axially move within said at least one leg, and means for minimizing trail variation under pitching conditions, said means comprising:

a suspension link for linking a wheel spindle to at least one of said telescopic members; and

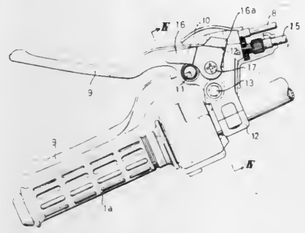
restraining means for restraining said wheel spindle along an arcuate path upon extension and compression of said telescopic member, said arcuate path being such that the means line through said arcuate path intersects the steering axis above said wheel spindle in a manner whereby trail variation under pitching conditions is minimized.

4,629,206

REVERSE DEVICE FOR A VEHICLE

Masaharu Omagari; Tsuneo Kazikawa, both of Saitama, and Takahumi Suzuki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 715,635
Claims priority, application Japan, Mar. 22, 1984, 59-53619
Int. Cl.[4] B60K *29/02*
U.S. Cl. 180—336 **2 Claims**



1. A lock-out control for a vehicle, comprising

a bracket fixed to the vehicle and having a mounting shaft;

a brake lever pivotly mounted to said bracket about said shaft;

a control lever pivotly mounted to said bracket about said shaft adjacent to said brake lever;

a pin slidably disposed in one of said brake lever and said control lever and a hole in the other of said brake lever and said control lever, said pin and said hole being aligned for engagement therebetween when said brake lever is in the off position;

a reverse gear lock-out; and

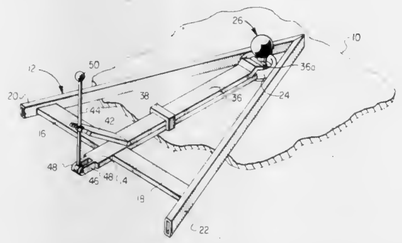
linkage between said control lever and said reverse gear lock-out.

4,629,207

ASSEMBLY FOR CONNECTION TO A BALL HITCH

Wilbur A. Shiflet, 318 W. 5th St., Tyler, Tex. 75071

Filed Nov. 5, 1985, Ser. No. 795,204
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—506 **14 Claims**



1. An assembly for connection to a ball hitch, said assembly comprising:

a first lever;

a ring connected to one end of said first lever and extending around said ball hitch;

a second lever mounted over said first lever in slidable engagement therewith, an end portion of said second lever engaging said ball hitch and said second lever defining a groove which extends over a portion of said ring, to lock said levers to said ball hitch, and

means for sliding said second lever in a direction away from said ring to release said groove from said ring portion and unlock said levers.

4,629,208

SAFETY SKI BINDING

Ernst Gertsch, Wengen, and Ulrich Gertsch, Matten, both of Switzerland, assignors to TMC Corporation, Baar/ Zug, Switzerland

Filed Apr. 28, 1972, Ser. No. 248,396
Claims priority, application Switzerland, May 4, 1971, 6576
Int. Cl.[4] A63C *9/081*
U.S. Cl. 280—618 **5 Claims**



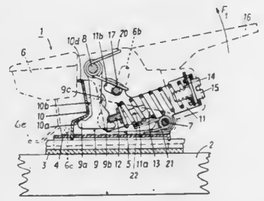
1. A safety ski binding for a ski, comprising a release plate having front and rear end regions and capable of being connected with the ski boot, resiliently yielding locking element means cooperating with the front and rear end regions of the release plate and rendering possible release of the release plate from the ski both upwards as well as laterally, pivot bearing means for rotatably mounting the release plate between its front and rear intermediate the toe and heel of the ski boot at the ski and enabling raising of the release plate from the ski, said locking element means and release plate having cooperating means enabling said locking element means to oppose lateral release of the release plate either only at the front or only at the rear, yet opposing upward release of the release plate both at the front and at the rear, said resiliently yielding locking element means which opposes lateral and upward release of the release plate having a common setting means for providing the same resilient setting for such associated resiliently yielding locking means, so that for a given setting of said common setting means there are effective different moments which respectively oppose the vertical release action and the lateral release action, said locking element means cooperating with the front and rear end of the release plate possesses a respective locking pin defining the cooperating means of said locking element means, and means for mounting each such pin to be pivotable to all sides.

4,629,209

SAFETY SKI BINDING

Bettstein Lorenz, Zistersdorf; Friedrich Leichtfried, Traiskirchen; Tibor Szasz, Vienna; Heinz Wittmann, Vienna, and Karl Stritzl, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 16, 1984, Ser. No. 580,904
Claims priority, application Austria, Feb. 16, 1983, 516/83; Feb. 16, 1983, 517/83; Sep. 27, 1983, 3432/83
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—626 **17 Claims**



1. In a heel holder of a safety ski binding having a sole holder means and first support means pivotally supporting said sole holder means for movement between opened opened and closed positions and about a transverse axle supported on a bearing block secured to a base plate, a first spring means for continually urging said sole holder means into said opened

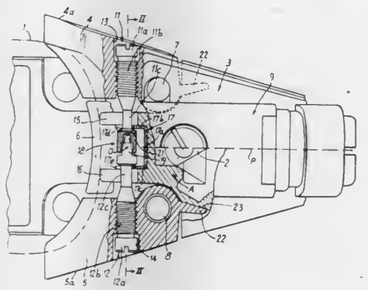
position wherein said first spring means is positioned between said bearing block and said sole holder means a locking rocker arm pivotally supported on said sole holder means for holding said sole holder means in said closed position, said locking rocker arm having on one side thereof a locking projection which, in said closed position, grips under a counterstop arranged on said bearing block and having, on the other side thereof, a locking notch into which is received a locking member, at least one spring for continually urging said locking member toward said locking rocker arm, said sole holder means including spring housing pivotally supported by said support means for movement between said opened and closed positions, and a sole holder, and a coupling means for moveably coupling said sole holder to said spring housing for movement between first and second relative positions, said one spring being supported in said spring housing, a release lever for facilitating a voluntary movement of said sole holder means between said closed and opened positions, said release lever being movably supported on said sole holder means and having a bolt which couples said release lever to said spring housing, the improvement comprising wherein a second spring means is supported on and oriented between said sole holder and said spring housing for effecting a movement of said sole holder in a first direction from said first position to said second position towards a stepping in position in response to a movement of said spring housing in an opposite direction toward said opened position so that the following phase of a voluntary release will cause a relative movement between said sole holder and said spring housing and a return of said locking member into said locking notch.

4,629,210

SAFETY BINDING

Jean-Pierre Boussemart, Choisy, and Dominique Vuarier, Annecy-le-Vieux, both of France, assignors to Salomon S.A., Annecy, France

Filed May 15, 1984, Ser. No. 610,426
Claims priority, application France, May 16, 1983, 83 08068
Int. Cl.⁴ A63C *9/22*
U.S. Cl. 280—634 **52 Claims**



46. An adjustment apparatus for a ski binding having first and second displaceable jaw elements adapted to be displaceably mounted on said ski and adapted to hold a boot on a ski, said apparatus comprising:

(a) first and second adjustment means for adjusting the displacement of said first and second jaw elements, respectively;

(b) means for connecting said first and second adjustment means to said first and second jaw elements, respectively, such that the longitudinal axes of said first and second adjustment means are pivoted with respect to an element attached to said ski in response to adjusting said displacement of said first and second jaw elements; and

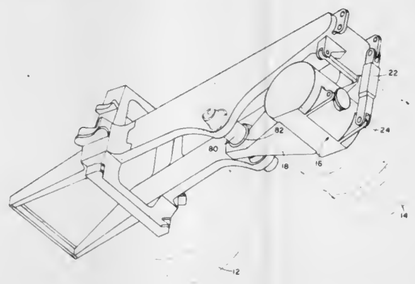
(c) coupling means for coupling said first and second adjustment means so that displacement of one of said jaw elements displaces the other of said jaw elements.

4,629,211

FRAME AND AXLE FOR HEAVY DUTY TRUCKS

Rodger L. Modglin, Kellyville; W. Ray Borthick, Glenpool, Okla., and Timothy W. Roberts, Tulsa, all of Okla., assignors to Unit Rig & Equipment Co., Tulsa, Okla.

Continuation of Ser. No. 646,687, Aug. 31, 1984, abandoned.
This application Mar. 31, 1986, Ser. No. 846,471
Int. Cl.⁴ B60G *7/00*
U.S. Cl. 280—688 **5 Claims**



1. A support structure for a heavy load carrying vehicle which comprises:

a frame upon which a load may be supported, said frame including a rigid structural cross-member spaced intermediate the ends of said frame;

a spherical inner bearing made an integral part of said cross-member and intermediate the ends thereof;

an axle box for supporting drive wheels;

a first support member rigidly connected to said axle box and having a concave outer bearing mating with said spherical inner bearing supporting part of the load, thrust and side forces;

a second support member connected to the side of said axle box opposite side from that to which said first support member is attached;

support means connecting said frame and said second support member.

4,629,212

VEHICLE SUSPENSION APPARATUS

Shozo Takizawa; Minoru Tatemoto; Akio Furumura; Tadashi Sugawara, all of Okazaki; Shigeo Kariya, Nagoya, and Kazuo Hiroshima, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,108
Claims priority, application Japan, Jun. 26, 1984, 59-94570
Int. Cl.⁴ B60G *11/26*
U.S. Cl. 280—707 **13 Claims**

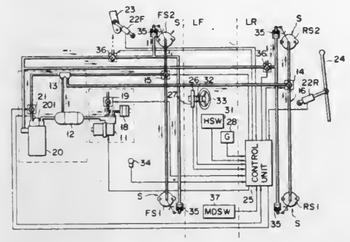
1. A vehicle suspension apparatus comprising:

a hard/soft switching unit for switching suspension units between a hard state and a soft state;

a vehicle velocity sensor for detecting a vehicle's velocity;

a switching velocity preset switch for presetting the switching velocity; and

control means for controlling said hard/soft switching unit so as to set said suspension units in the hard state and to store the vehicle's velocity detected by said vehicle velocity sensor as a subsequent switching velocity when said switching velocity preset switch is operated while said vehicle's velocity, detected by said vehicle velocity sensor, falls between the first preset velocity and a second preset velocity lower than the first preset velocity and said suspension units are set in the soft state.

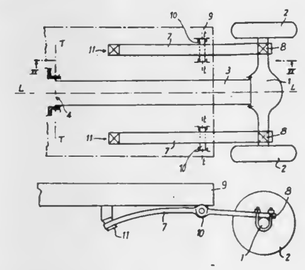


4,629,213

SUSPENSION SYSTEM FOR A SET OF VEHICLE WHEELS WITH RIGID AXLE

Jacques Aubry, Cabries; Michel Bonfils, St. Cannat, and Jean-Paul Merlet, Mimet, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 28, 1985, Ser. No. 717,152
Claims priority, application France, Apr. 3, 1984, 84 05245
Int. Cl.⁴ B60G *9/04, 11/44;* **B62D** *53/02*
U.S. Cl. 280—718 **4 Claims**



1. A suspension system for a set of vehicle wheels with rigid axle, comprising:

a longitudinal torsion tube made of a composite fiber-synthetic resin material, articulated at one of its ends on the chassis of the vehicle so as to be able to pivot about a transverse horizontal axis without possibility of rotating about its longitudinal axis and fast at its other end with said rigid axle and;

two longitudinal elastic blades made of a composite fiber-synthetic resin material which are disposed laterally each on one side of said torsion tube and of which each is fixed at one of its ends to said axle, is pivoted in its intermediate part on said chassis about a transverse axis and is in abutment at its other end against said chassis.

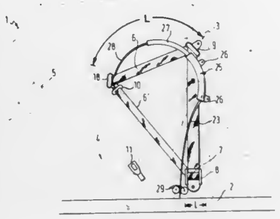
4,629,214

FEED DEVICE FOR A SAFETY BELT SYSTEM FOR MOTOR VEHICLES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa Feinstanzwerk, Alfdorf, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,642
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302356
Int. Cl.⁴ B60R *21/10;* **A62B** *35/02*
U.S. Cl. 280—808 **10 Claims**

1. A feed device for feeding a seat belt of a safety belt system of a vehicle into a predetermined position in front of a vehicle seat occupant, said safety belt system, comprising two interlockable parts for fixing the seat belt around the vehicle seat occupant, said feed device comprising a feed ram for moving said belt into said predetermined position and drive means for moving said feed ram in opposite directions, said feed ram comprising a fixed arcuate tubular ram receiver extending substantially vertically along the B post of the motor vehicle,



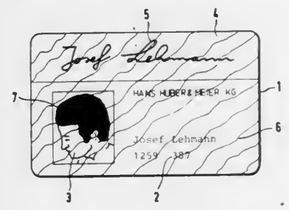
a plurality of arcuate members telescopically movable along an arc relative to each other between an extended position in which said feed ram holds the seat belt in said predetermined position and a retracted position in which major portions of said plurality of members are telescopically received within said tubular ram receiver, and means enabling said ram receiver to be fixed to the B post.

4,629,215

IDENTIFICATION CARD AND A METHOD OF PRODUCING SAME

Thomas Maurer, and Hans J. Holbein, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Fed. Rep. of Germany

Continuation of Ser. No. 330,816, Dec. 15, 1981, abandoned.
This application Aug. 1, 1984, Ser. No. 636,617
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048735
Int. Cl.⁴ B42D *15/00*
U.S. Cl. 283—94 **14 Claims**



1. An identification document comprising:

a base card;

identification information on said base card, said information being applied directly to said base card by a laser recorder;

a security pattern covering said base card in areas to be protected wherein said identification information is beneath the security pattern and visible without any auxiliary equipment;

colorants in said security pattern visibly unchangeable by the radiation of a laser recorder wherein said identification information is recorded through the security pattern without destroying said security pattern.

4,629,216

METHOD OF JOINING PREFABRICATED HEAT INSULATED PIPES AND A WELDING FITTING THEREFORE

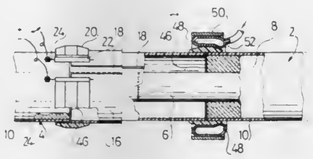
Hans N. Pedersen, Horsens, Denmark, assignor to I. C. Moller A/S, Fredericia, Denmark

Filed Jun. 22, 1983, Ser. No. 506,869

Claims priority, application Denmark, Jun. 29, 1982, 2911/82

Int. Cl.⁴ F16L *13/02*

U.S. Cl. 285—21 **8 Claims**



1. A method of joining prefabricated heat insulated pipes having an inner conductor pipe and an outer plastic mantle tube, particularly subterranean district heating pipes, the method comprising the steps of joining ends of the conductor pipes protruding from respective ends of the mantle tube, connecting the mantle tubes by an axially slit plastic connector sleeve the respective ends of the mantle tubes substantially flush therewith, providing a plastic welding strip with embedded electrical heating wires, laying each welding strip against an outside of the sleeve end and the respective mantle tube end along an annular joint therebetween with free ends of the welding strip being located mutually spaced and adjacent the axial split, actuating the heating wires for welding the welding strip across the annular joint, and effecting a sealing across both the axial split and a portion of the annular joint remaining between the ends of the welding strips.

4,629,217

PIPE COUPLING

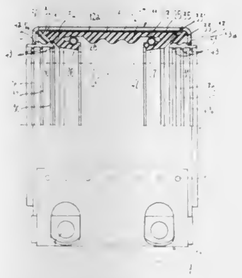
Immanuel Straub, c/o Straub Federnfabrik, Straubstrasse, 7323 Wangs, Switzerland

Filed May 20, 1986, Ser. No. 864,847

Claims priority, application Switzerland, Jun. 17, 1985, 2556/85

Int. Cl.⁴ F16L *17/04*

U.S. Cl. 285—112 **8 Claims**



1. A pipe coupling for coupling together pipe ends of pipes which are to be interconnected, comprising:

a housing having end faces and an inner wall and defining an axial direction;

means for clamping said housing about the pipe ends to be interconnected;

said housing being provided at said end faces with inwardly directed annular flanges each having an inner surface;

a sealing gasket enclosed in said housing and possessing a substantially C-shaped axial cross-sectional configuration;

said sealing gasket opening inwardly and having end faces;

respective substantially cylindrical clamping rings substantially enclosed within said housing and having an inner jacket surface defining an inner periphery and an outer jacket surface defining an outer periphery for supporting an associated one of said end faces of said sealing gasket;

each of said respective substantially cylindrical clamping rings being retained at said outer periphery and in said axial direction within said housing and being provided at said inner periphery with claws engaging with the pipe ends when said housing is clamped;

a respective substantially frustro-conical spring ring operatively associated with each said substantially cylindrical clamping ring;

a respective stop formed on the outer jacket surface of each of said respective substantially cylindrical clamping rings;

said outer jacket surfaces of said substantially cylindrical clamping rings being respectively braced on said inner surfaces of said annular flanges;

each said substantially cylindrical clamping ring being supported in relation to a fillet located between an associated one of said annular flanges and said inner wall of said housing by means of said associated frustro-conical spring ring and said stop of the related substantially cylindrical clamping ring;

said claws having substantially the shape of teeth formed on said inner jacket surfaces of said substantially cylindrical clamping rings and said teeth being inwardly directed;

said teeth having backs convexly arched away from a center region of said pipe coupling and having substantially flat front surfaces; and

said teeth having recesses located substantially directly before said substantially flat front surfaces into which extend said substantially flat front surfaces.

4,629,218

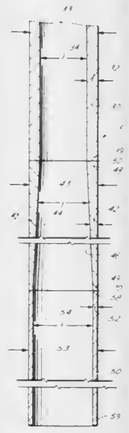
OILFIELD COIL TUBING

Jon D. Dubois, Houston, Tex., assignor to Quality Tubing, Incorporated, Houston, Tex.

Filed Jan. 29, 1985, Ser. No. 695,953

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—176 **34 Claims**



1. Well tubing for providing fluid communication between the surface and a preselected location in a well, comprising:

an elongated coilable cylindrical member having a length defined by a first end supportable at the surface of said well and a second end positionable at a preselected location in said well, said elongated cylindrical member being provided with a flow passageway to place said first end in fluid communication with said preselected location in said well;

said elongated cylindrical member having a substantially constant outer diameter along its entire said length and an inner diameter that increases smoothly from said first end to said second end; and

support means for supporting said elongated cylindrical member in said well solely by suspending said first end of said elongated cylindrical member, said cylindrical member being unsupported from immediately below said support means to said second end.

4,629,219

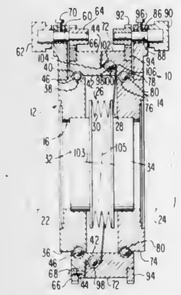
ADJUSTABLE CONNECTOR UNIT

Valentin Balter, San Francisco, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed May 17, 1985, Ser. No. 735,021

Int. Cl.⁴ F16L *27/00*

U.S. Cl. 285—184 **15 Claims**



1. A connector unit comprising:

a pair of spaced side members, each side member adapted to be coupled to a respective one of a pair of structural parts to be interconnected;

a ring for each side member, respectively, each ring being in at least partially surrounding relationship to the respective side member;

first ball means rotatably coupling each side member with its respective ring to allow the ring to rotate relative to the side member about a first axis; and

second ball means rotatably coupling the rings together to allow the rings to rotate relative to each other about a second axis at an angle with respect to the first axis of rotation of each ring relative to its corresponding side member, whereby rotation of one ring relative to the other member will cause the side member corresponding to the one ring to be moved to an angular position relative to the other side member.

4,629,220

METHOD AND APPARATUS FOR QUICK-COUPLING CONNECTING NIPPLE FOR PLASTIC PIPE

Juan C. Crusco, Houston, Tex., assignor to Cruway, Inc., Houston, Tex.

Filed Aug. 29, 1983, Ser. No. 527,186

Int. Cl.⁴ F16L *33/20*

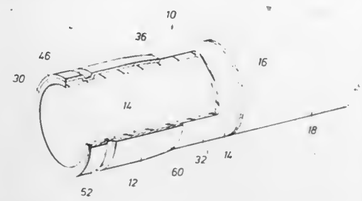
U.S. Cl. 285—238 **11 Claims**

1. A pipe structure adapted for connecting plastic pipe sections end to end, comprising:

a plastic pipe section having an annular groove disposed in the periphery of the pipe section at a longitudinal distance from the end of the pipe section, the groove being perpendicular to the axis of the pipe;

a rigid sleeve having an annular neck disposed about the inner periphery of the sleeve at a longitudinal distance from the first end of the sleeve substantially equal to the distance of the groove of the pipe section from the end of the pipe section; wherein

the sleeve is friction fitted about the pipe section with the neck of the sleeve disposed in the groove of the pipe section; and



the other end of the sleeve is crimped inwardly into the pipe surface so that the second end of the sleeve is substantially flush with the outer diameter of the pipe section while leaving an inner surface of the plastic pipe section free of obstruction.

4,629,221

PIPE CONNECTORS

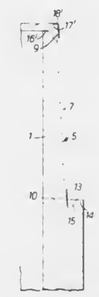
Norman Lumsden, and John D. McGugan, both of Aberdeen, Scotland, assignors to Hunting Oilfield Services (UK) Ltd., Aberdeen, Scotland

Filed Apr. 4, 1984, Ser. No. 596,526

Claims priority, application United Kingdom, Apr. 5, 1983, 8309248; Nov. 29, 1983, 8331839

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—328 **39 Claims**



1. A pipe connector comprising a tubular pin member having a generally frusto-conical outer peripheral surface having an inner axial end and a free outer axial end and a tubular box member having a generally frusto-conical inner peripheral surface having an inner axial end and a free outer axial end, said generally frusto-conical inner peripheral surface of said tubular box member corresponding to said frusto-conical outer peripheral surface of said pin member and overlying said outer peripheral surface of said pin member when the members are fully engaged together, said frusto-conical surfaces being provided with annular projections and grooves which are interengaged when said members are fully engaged together to axially lock said members together, wherein one of said members is provided with an annular projection extending around the inner end of said peripheral surface thereof and projecting in the direction of the free end of said one member, said projection having a first end surface portion which extends in a generally radial plane and a second end surface portion which faces said peripheral surface of said one member, wherein said free end of the other of said members has a first end surface

portion which extends in a generally radial plane and contacts said first end surface of said projection when said members are fully engaged together and a second end surface portion which faces and laterally contacts said second end surface portion of said projection when said members are fully engaged together, wherein said second surface portions of said members are constructed to be in force-fit abutment when said members are fully engaged together, and wherein said second surface portion of said other member is provided on an annular portion at the free end of said other member and can flex radially during engagement and disengagement of said members.

4,629,222

PIPE CONNECTOR

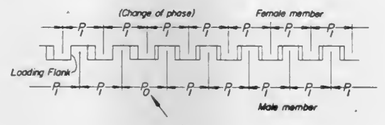
Geoffrey C. Dearden; Edward J. Speare, both of Bedford; Katsuo Ueno, Hertfordshire, all of England, and Donald N. Jones, Aberdeenshire, Scotland, assignors to Hunting Oilfield Services (UK) Limited, Aberdeen, Scotland and Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 28, 1984, Ser. No. 645,047

Claims priority, application United Kingdom, Aug. 31, 1983, 8323349

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—332.4 **19 Claims**



1. A pipe connector including a female member having an internal circumferential surface provided with a thread, and a male member having an external circumferential surface provided with a thread for threaded engagement with the thread of the female member, the male member being provided adjacent one end of the threaded surface thereof with an annular sealing surface which lies in a plane substantially perpendicular to a central axis of a connection of the male and female members, when the male and female members are fully engaged together, and which is brought under an axially directed force into sealing abutment with an annular sealing surface associated with the female member, which lies in a plane substantially perpendicular to the central axis of the connection of the male and female members, when the members are fully engaged together, wherein the threads of the members comprise an intermediate portion intermediate the ends of the threads, and one end portion extending between the intermediate portion and the one ends of the threads adjacent the sealing surfaces, wherein the intermediate and one end portions of the threads have the same pitch throughout their axial extents, but the relative phase of threads of the members changes between the intermediate portion and the one end portion such that, as the members are screwed together, on abutment of the sealing surfaces, part at least of one leading flank of the thread of one member abuts the corresponding part of the leading flank of the thread of the other member in the intermediate portion, and as the axial force on the sealing surfaces increases, the leading flanks of the threads of the members in the intermediate portion are progressively loaded and the leading flanks of the threads of the members in the one end portion are progressively brought into abutment and loaded.

4,629,223

PIPE CONNECTOR

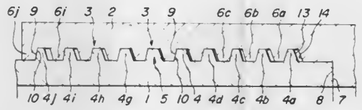
Geoffrey C. Dearden; Edward J. Speare, both of Bedford; Katsuo Ueno, Hertfordshire, all of England, and Donald N. Jones, Aberdeenshire, Scotland, assignors to Hunting Oilfield Services (UK) Limited, Aberdeen, Scotland and Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 31, 1984, Ser. No. 646,897

Claims priority, application United Kingdom, Sep. 6, 1983, 8323858

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—334 **22 Claims**



1. A pipe connector comprising a female member having an internal circumferential surface provided with a thread, and a male member having an external circumferential surface provided with a thread for threaded engagement with the thread of the female member, the male member being provided adjacent one end of the threaded surface thereof with an annular facing axially sealing surface which is, when the male and female members are fully engaged together with part of at least of one leading flank of each thread in load bearing abutment with a corresponding leading flank of the other thread, brought into abutment with an annular facing axially sealing surface associated with the female member under an axially directed force, wherein the pitches of the leading flanks of the threads are the same and constant throughout the axial extents of the threads and the axial thickness of the thread of at least one of the members in one end portion of the thread adjacent the sealing surfaces thereof is reduced relative to the axial thickness of the thread of the other member adjacent the end portion to increase the flexibility of the reduced thread.

4,629,224

TUBULAR CONNECTION

L. Steven Landriault, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 488,778, Apr. 26, 1983, abandoned.

This application Oct. 1, 1985, Ser. No. 783,055

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.[4] F16L *15/04*

U.S. Cl. 285—334 **7 Claims**

1. A tubular connection of pin and box members defining an axis comprising,

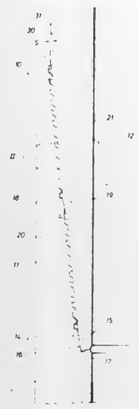
first and second pairs of interengaged threads on the respective members, the first pair of threads being axially spaced from the second pair of threads, the first and second pairs of theads provided on first and second taper angles with respect to the axis, the first pair of threads being radially stepped with respect to the second pair of threads,

a first pair of engaged sealing surfaces on the pin and box members disposed adjacent the end of the pin member,

a second pair of engaged sealing surfaces on the pin and box members disposed axially between the first and second pairs of threads, the first and second pairs of sealing surfaces being frusto-conical surfaces provided at steeper angles than either the first taper angle or the second taper angle,

engaged reverse angle torque shoulders, the torque shoulder on the pin member disposed on the end of the pin member,

the torque shoulder on the box member disposed on the interior end of the box member, and



wherein said threads are hooked threads having negative angle load flanks.

4,629,225

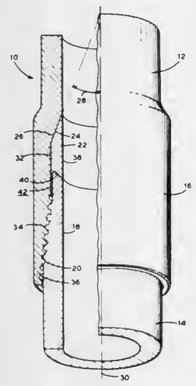
PIPE JOINT FOR CORROSION RESISTANT ALLOYS

James H. Rowsey, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Aug. 9, 1985, Ser. No. 764,095

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—334.1 **4 Claims**



1. A pipe joint union, the union comprising a first pipe made from a high strength, corrosion resistant alloy and having a cold worked expanded box end, the box end of the first pipe threadably engaging a pin end of a second pipe, the first and second pipes having a common axis of symmetry, the box end of the first pipe including an internal transition section of mostly larger internal diameter than the internal diameter of the first pipe, a sleeve disposed within the transition section, the internal diameter of the sleeve substantially equal to the internal diameter of the first and second pipes so as to present an essentially continuous, smooth internal surface therewith, the pin end of the second pipe having a first irregular edge, and the sleeve having a second irregular edge complimentary to the first irregular edge of the pin so as to sealingly mesh with the first irregular edge of the pin.

4,629,226

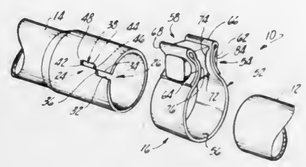
PIPE LAP JOINT WITH COLLAPSIBLE SEALING ZONE AND BAND CLAMP

Thomas R. Cassel, and Scott T. Cassel, both of Birmingham, Mich., assignors to BKS Company, Birmingham, Mich.

Filed Apr. 16, 1985, Ser. No. 723,910

Int. Cl.[4] F16L *13/14*

U.S. Cl. 285—382 **5 Claims**



1. In a coupling for a pipe lap joint of the type comprising: an inside pipe and an outside pipe in telescoping relationship to provide an overlap region on the end of each pipe, said overlap region on the outside pipe defining a circumferentially continuous area and at least one pair of axially extending slots, the first slot of each pair being disposed adjacent and through the end of said outer pipe and the second slot of each pair being spaced inwardly from the end of said outer pipe, a clamping band disposed around said outside pipe and covering said second slot, tightening means for clamping said band around said outside pipe to clamp the pipes together and collapse the overlap region of said outer pipe into close fitting engagement with said inner pipe to cause sealing engagement of said outer pipe with said inner pipe and with said band, the improvement wherein:

said first slot has sidewalls extending axially inwardly from the end of said outside pipe and terminates in a transverse inner end wall within said overlap region, said second slot is circumferentially offset from said first slot and has sidewalls extending axially inwardly from an outer end wall, the adjacent sidewalls of said slots being in substantial alignment with each other and said end walls being in substantial alignment with each other,

whereby said end walls of said slots are disposed in edge-to-edge engagement with each other when the overlap region of said outer pipe is collapsed into close fitting engagement with said inner pipe by clamping said band around said outside pipe.

4,629,227

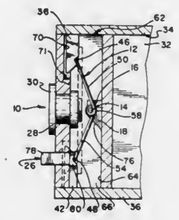
LATCHING MECHANISM

Steven G. Peterson, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Nov. 16, 1984, Ser. No. 672,572

Int. Cl.[4] E05C *19/06*

U.S. Cl. 292—19 **4 Claims**



1. A latching mechanism for selectively engaging a latch tab, comprising:

a retaining sleeve including a front wall and an opposed rear wall;

a latch member including a first latch arm having opposed ends, said first latch arm oriented generally parallel to said front wall, a first pair of opposed support rods for supporting respective opposed ends of said first latch arm, each of said first pair of support rods operably coupling said first latch arm to a respective one of a pair of coiled springs, said coiled springs axially aligned along a common spring axis, said spring axis being generally parallel to said first latch arm;

a latch member support shaft received through said coiled springs along said axis;

opposed, open faced support mounts operably coupled to said rear wall for receiving said support shaft, said coiled springs urging said first latch arm against said front wall and said shaft into said rear wall open faced mounts; and

a first latch arm release tab received through said front wall for selectively shifting said first latch arm away from said front wall, against the urging of said coiled springs.

4,629,228

PUSH-PULL DOOR LATCH

Neil L. Marko, Birmingham, Mich., and Bruce W. Mitton, Fayette, Ohio, assignors to Universal Industrial Products Co. (Div. of Core Industries, Inc.), Pioneer, Ohio

Filed Nov. 15, 1985, Ser. No. 798,330
Int. Cl.[4] E05C *1/12*
U.S. Cl. 292—165 **14 Claims**



4. In a door having a front edge and a pair of opposite sides and having an edge opening extending through the front edge and between the opposite sides and intersecting a side opening extending laterally through the side of the door, a latch operable in response to either a push action on a handle structure towards the side of the door or a pull action on the handle structure away from the side of the door, said door latch comprising:

a bolt assembly adapted to be supported in the door edge opening and including a bolt housing and a bolt supported in said bolt housing for reciprocable movement between a latched position and an unlatched position and spring means for normally biasing said bolt outwardly from the edge opening towards said latched position,

a guide member,

guide support means for supporting said guide member in the door side opening in line with said bolt assembly,

a slide member having a central section adapted to be slidably supported by said guide member, said slide member having an upper cam follower arm extending upwardly from said central section and a lower cam follower arm extending downwardly from said central section,

said spring means resiliently urging said slide member towards said bolt assembly,

bolt receiving means on said central section for receiving said bolt and permitting said bolt to move longitudinally relative to said central section,

a cam member, pivot means for laterally securing said cam member for pivotal movement about a laterally extending axis,

said cam member having an upwardly extending upper cam arm and a downwardly extending lower cam arm,

drive arm means engaged with said cam member for pivoting said cam member about said lateral axis,

a pinion member rotatably, drivingly engaged with said drive arm means, said pinion member having a gear portion, pinion support means for supporting said pinion member for rotation,

a handle structure, pivot means for pivotally supporting said handle structure for pivotal movement towards or away from the associated side of the door,

said handle structure having a driver member adapted to drivingly engage said gear portion of said pinion member,

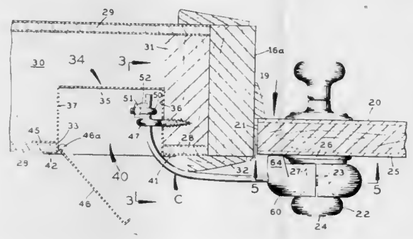
said handle structure adapted to pivot said driver member in opposite directions in response to a pulling or pushing action on said handle structure, said pinion member rotating in opposite directions for a pulling or pulling action on said handle structure and in turn similarly rotating said drive arm means in opposite directions whereby said cam drive arms will be pivoted to drivingly engage either said upper or said lower arms of said slide member depending upon the direction of rotation of said pinion member whereby said slide member will be moved rearwardly in response to such rotation in either direction to move said bolt rearwardly to its unlatched position.

4,629,229

DOOR LOCK DEVICE

Frank Correnti, 1740 S.W. 10th St., Boca Raton, Fla. 33432, and Thomas Dell 'Acqua, 2652 N.E. 3rd St., Pompano Beach, Fla. 33062

Filed Aug. 12, 1985, Ser. No. 764,719
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—246 **6 Claims**



1. A lock device for use on a door having a doorknob which extends out from the door and has a head on its outer end away from the door and a neck of smaller cross-section than the head extending from the head toward the door, said lock device comprising:

a flexible cable having elongated opposite legs and a loop joining said legs and forming one end of the cable;

means for retaining the cable at its opposite end from said loop;

a first sleeve receiving the cable at said loop and shaped and dimensioned to extend part-way around said neck of the doorknob between said head of the doorknob and the door after said loop is inserted over the head of the doorknob;

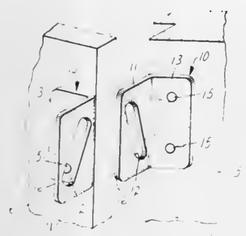
and a second sleeve on the cable between said first sleeve and said opposite end of the cable, said second sleeve having an opening slidably receiving both of said opposite legs of the cable and having two passageways connected to said opening and diverging from each other away from said opening and slidably passing individually said opposite legs of the cable, said second sleeve being slidable along the cable away from said opposite end to shorten said loop, said second sleeve being shaped and dimensioned to extend around the opposite side of the neck of the doorknob from said first sleeve.

4,629,230

CLOSURE FASTENER

Duane T. Tegg, Brooklyn Center, Minn., assignor to Satellite Industries, Inc., Minneapolis, Minn.

Filed Sep. 26, 1985, Ser. No. 780,633
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—281 **4 Claims**



1. A closure fastener comprising,

two rectangular plates,

means for attaching one of said plates to a fixed structure and for attaching the other of said plates to a movable structure to bring the plates to a generally juxtaposed parallel relationship,

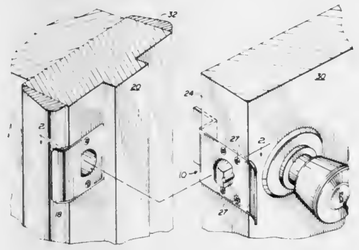
said plates each having a diagonally disposed slot with the slot in one plate disposed with the longitudinal axis of said slot disposed in an angular relationship to the diagonally disposed slot in the other plate when the plates are generally parallel, each said slot has a width sufficient to receive the shackle of a padlock fastening element.

4,629,231

SECURITY PLATE FOR A DOOR

Donald J. Bouchard, 3920 South Third Ave., Phoenix, Ariz. 85041

Filed Dec. 21, 1984, Ser. No. 684,571
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—346 **4 Claims**



1. An improved swingable door security plate assembly, the improved security plate assembly preventing the use of a credit card or the like from being used to retract a latch on the door, when the door is in a closed position, from a cooperating standard striker plate which is installed on a mating door jamb, the mating door jamb being equipped with a door stop, the latch being a portion of a latch set, the assembly comprising in combination:

a swingable door having a hinge set mounted on an edge thereof and having the latch set mounted on an opposite edge thereof;

a double ended security plate mounted on said opposite edge of said door over the latch, said double ended security plate further comprising:

a main body having hole means therethrough for clearing the latch;

a first end forming an "L" shape cross section with said main body, said "L" shape having a first leg thereof oriented approximately perpendicular to said main body, a second leg of said "L" shape being the main body, said first leg of said "L" shape being interposed between said door and said door stop when said door is in a closed position, said first and said second legs being connected at a corner of the door where said edge of the door and said face of the door meet;

wherein said first end further comprises: a third leg, said third leg being connected to the free end of said first leg, said third leg being approximately perpendicular to said first leg, and said third leg protrudes away from said door face, said third leg being in close proximity to said door stop when the door is in a closed position; and

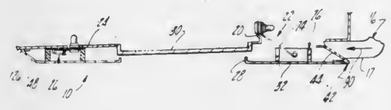
a second end having a curved shape, said curved shape having a curve to correspond to a shape of the striker plate, said curved shape being adjacent to the striker plate when said door is in a closed position.

4,629,232

SPRING MOUNTED MOLDING FOR A VEHICLE

William C. Zimlich, Rochester Hills; Julius P. Fraeyman, Warren, and Ronald C. Johnson, Rochester, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 13, 1985, Ser. No. 776,077
Int. Cl.[4] B60R *19/42*
U.S. Cl. 293—128 **5 Claims**



1. A spring mounted molding for a vehicle having a body and a bumper mounted on one of the forward and rearward ends thereof, energy absorbing structure mounting the bumper to the vehicle, said energy absorbing structure biasing the bumper to a normal position but permitting movement of the bumper towards the vehicle upon impact, said bumper having an end portion extending around a side of the vehicle body, said spring mounted molding comprising a relatively rigid element having an underside and an exterior side, spring means on the underside of the molding, said spring means being connected between the molding and the vehicle with the molding lying on the exterior of the vehicle body in alignment with, and adjacent to, said bumper end portion, said spring means biasing the molding closely adjacent to the vehicle body, the molding having a camming surface adjacent to the bumper end portion, the bumper end portion having a mating camming surface adapted to contact the molding camming surface and move to the underside of the molding when the bumper is moved towards the vehicle upon impact, with said molding moving away from the vehicle body against the action of said spring means, said spring means being effective to bias the molding back to its original position upon retraction of the bumper end portion; said spring means being fixedly anchored to one of the vehicle and molding and slidably anchored to the other of the

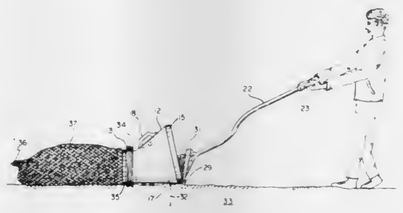
vehicle and molding, said spring means comprising a pair of spring mechanisms, one of said spring mechanisms being positioned remotely from said bumper end portion and being fixedly anchored to both the vehicle and molding, the other of said spring mechanisms being positioned between said one spring mechanism and the bumper end portion, said other of said spring mechanisms being fixedly anchored to one of the vehicle and molding and slidably anchored to the other of the vehicle and molding.

4,629,233

MATERIAL COMPACTING DEVICE

Dieter Pfisterer, Wyckoff, N.J., assignor to Pfisterer Environ, Inc., Wayne, N.J.

Filed Jul. 15, 1985, Ser. No. 754,968
Int. Cl.⁴ A01B *1/02*; B65D *67/12*
U.S. Cl. 294—1.1 **8 Claims**



1. A device for compacting and containing compactible material comprising:
(a) a directing element having a front funnel which converges into a rear conduit;
(b) a rake and plunger element having a handle and a rake member attached thereto for raking compactible material and plunging said material through said conduit;
(c) a netted material for containing said compactible material having a closed end and having an open end bunched over said rear conduit; and
(d) means for creating a resistance to compaction of said netted material on said conduit;
whereby compactible material forced through said rear conduit is introduced into said netted material and said bunched netted material feeds out from said conduit in response to the compaction force of the rake and plunger element against said compactible material until a netted container of compactible material of desired length is obtained.

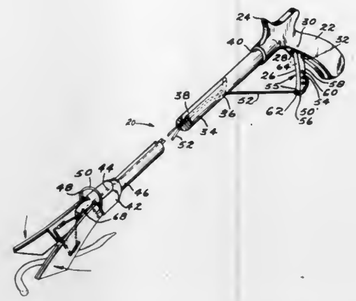
4,629,234

PICK-UP TOOL FOR GRASPING NIGHT CRAWLERS

Adam M. Sokolowski, W8405 Jansen Rd., Ladysmith, Wis. 54848

Filed Aug. 27, 1985, Ser. No. 769,729
Int. Cl.⁴ B25J *1/00*
U.S. Cl. 294—19.1 **23 Claims**

1. A pick-up tool for grasping night crawlers, comprising:
a handle;
an operating trigger defining a first end pivotally attached to said handle;
a shaft defining a first shaft opening and a first longitudinal opening in communication with said first shaft opening, said shaft attached at a first end thereof to said handle;
a jaws supporting member defining a second longitudinal opening therein, said shaft attached at a second end thereof to said member with said longitudinal openings in substantial alignment with each other;
jaw means movably attached to said member;
spring means attached to said jaw means for normally biasing said jaw means into an open position;
a cord attached to said jaw means and extending through said longitudinal openings and through said first shaft opening; and
means in operative relationship with said trigger and said



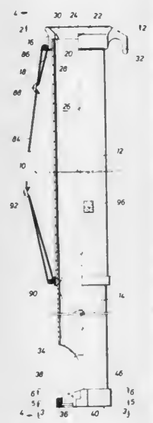
cord for holding said cord and for enabling adjustment of the position of said cord with respect to said trigger, said adjustment means including first and second trigger openings defined by said trigger.

4,629,235

RETRIEVER AND DISPENSER FOR DEFORMABLE BALLS

Dewitt M. Logue, P.O. Box 988, Longview, Tex. 75606

Continuation-in-part of Ser. No. 568,702, Jan. 6, 1984, Pat. No. 4,522,438. This application Jun. 10, 1985, Ser. No. 742,901
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.⁴ A63B *47/02*
U.S. Cl. 294—19.2 **21 Claims**



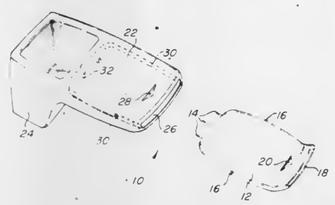
1. A retriever and dispenser for compressible balls such as tennis balls and the like comprising:
(a) an elongated tubular member having an internal substantially straight passage of slightly greater dimension than the diameter of the balls to be contained therein, said tubular member defining first and second extremities, said second extremity forming a dispensing opening in said tubular member oriented in transverse relation to the longitudinal axis of said elongated tubular member;
(b) retrieving means at said first extremity of said tubular member forming a ball retrieving opening through which balls enter said internal passage, said retrieving means forming restriction means at said ball retrieving opening requiring balls to be slightly deformed as the balls are forced past said restriction means and into said internal passage, said restriction means restraining balls from inadvertently falling from said retrieving opening when said tubular member is positioned vertically with said retrieving opening at the lower end thereof;
(c) a dispensing cap being releasably positioned at said second extremity of said tubular member and being reversibly positionable at open and closed positions substantially 180° apart relative to said tubular member, said dispensing cap forming a transverse wall supporting the lower ball when said tubular member is positioned vertically with said dispensing cap forming a transverse wall supporting the lower dispensing cap at the lower end thereof, said dispensing cap further defining a cylindrical wall portion forming a closure for said dispensing opening, said dispensing cap being positionable at said open position permitting dispensing of balls transversely of said substantially straight passage and through said dispensing opening and being positionable at said closed position where said wall portion sufficiently blocks said dispensing opening as to prevent dispensing of balls through said dispensing opening; and
(d) means restraining free transverse dispensing movement of said balls from said internal passage through said dispensing opening;
(e) means permitting manual access to the lowermost ball within said internal passage and facilitating manually induced dispensing of said balls past said restraining means and through said dispensing opening.

4,629,236

DEVICE FOR SEPARATING COFFEE FILTERS AND SHEATH THEREFOR

Richard P. Smith, Box 565, 117 NE Feist St., Linton, N. Dak. 58552

Filed Jul. 5, 1985, Ser. No. 751,958
Int. Cl.⁴ B25J *1/00*; B65G *59/02*
U.S. Cl. 294—61 **8 Claims**



1. A device comprising an instrument for separating a coffee filter from a pack of filters comprising a flat handle of substantially rectangular shape having one or more thin, tapered, and sharp piercing means secured at one end thereof, and a case or sheath for said handle in the form of a scoop or measuring receptacle, said piercing means being of at least such length, strength, shape and size as to allow penetration of the thickness of one filter at a time with the filter being lifted without undue tearing or cutting when breaking the suction and fiber adhesion of the top filter from the adjoining filter.

4,629,237

PARALLEL TYPE ROBOT CHUCK

Takeshi Ito, Nagano, Japan, assignor to Machine Engineering Co., Ltd., Nagano, Japan

Filed May 30, 1985, Ser. No. 739,261
Claims priority, application Japan, May 30, 1984, 59-110426; Sep. 19, 1984, 59-195968
Int. Cl.⁴ B25J *15/08*
U.S. Cl. 294—88 **8 Claims**

1. A parallel type chuck comprising:
a pressing member supported by a body slidably in a first direction;
a pair of slide pawls facing each other and openable/closable by movement in a direction crossing said first direction;
a spring for urging said slide pawls apart from one another;
a pair of action members rotatably supported by said body and abutting said pressing member and engaged with said pressing member and respective ones of said slide pawls for transmitting displacement of said pressing member to respective ones of said slide pawls; and

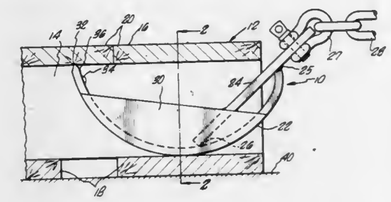
a pair of shafts provided on said body for guiding said slide pawls in corporation with respective fulcrums of said action members; and
each of said pawls having a reference portion upwardly projecting in a biased manner, two elongated holes, and a slot portion at a center portion for receiving corresponding ones of said action members;
said reference portion of one of said slide pawls, said action members, and said reference portion of the other one of said slide pawls being supported side by side on said shafts.

4,629,238

PALLET PULLER

Billy R. Woodruff, 228 4th St., McFarland, Calif. 93250

Filed Apr. 22, 1985, Ser. No. 725,333
Int. Cl.⁴ B66C *1/42*
U.S. Cl. 294—92 **13 Claims**



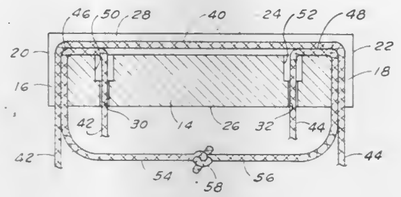
1. A pallet puller capable of engaging a loaded pallet having longitudinal ribs and a load-supporting panel connecting top surfaces of the ribs, the ribs resting directly on a surface supporting the pallet, the puller comprising:
(a) a bearing member having a cylindrically curved bottom surface;
(b) a blade member extending tangentially from the curved bottom surface of the bearing member for contacting the panel;
(c) a tongue member rigidly connected to the bearing member opposite the blade member for connecting a line; and
(d) means for preventing the blade member from extending above the panel when the panel comprises separated transverse planks, the blade member extending between the transverse planks,
wherein a horizontal force applied to the line produce an upward force component driving the blade member into engagement with the panel for movement of the pallet by the line to a desired location, and the bearing member functions as a skid against the surface supporting the pallet for facilitating the movement of the pallet.

4,629,239

ARTICLE CARRYING MEANS

David A. Pramuk, 912 Hunt Ave., St. Helena, Calif. 94574; James N. O'Shea, and Stephen E. O'Shea, both of 520 Corona Rd., Petaluma, Calif. 94952

Filed Aug. 22, 1985, Ser. No. 768,129
Int. Cl.[4] A45C *13/26*; B65D *7/00*
U.S. Cl. 294—153 8 Claims



1. Article carrying means comprising: a handle having an elongated body extending between first and second ends, means forming generally parallel first and second openings through the body of said handle between upper and lower sides thereof and generally parallel first and second slots in said respective first and second ends of said handle, a length of cord extending from said upper side of said handle through said first and second openings and forming a continuous first loop of said cord between said openings on said lower side of said handle, said first loop including first and second legs extending, respectively, from said first and second openings, said first loop being connected together at the end of said first loop to complete the loop, wherein said first loop is used to encircle an article to be carried with both said first and second legs of the loop disposed generally parallel to one another around the article, and an auxiliary loop of said cord for adjusting the length of said first loop, said auxiliary loop extending between said first and second openings on said upper side of said handle and said handle being movable relative to the cord extending through said openings such that, when said auxiliary loop is pulled relative to said handle, cord is drawn through said openings to shorten the length of said first loop on said lower side of said handle thereby facilitating the carrying of articles having a smaller girth, said end of said first loop being secured to said handle for carrying articles encircled by said first loop by hooking said end of said first loop lengthwise over said handle with said first leg engaged in said first slot and said second leg engaged in said second slot.

4,629,240

VEHICLE STABILIZING MEANS

Claude M. Dornier, Rte. 3, Box 240, Prairieville, La. 70769

Filed Jun. 20, 1985, Ser. No. 746,743
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S 2 Claims



1. An air foil assembly for use with a racing vehicle positioned and attached to the rear of said racing vehicle by a support structure, comprising:

(a) a flap pivotable from a horizontal plane by a positioning assembly, said flap extending between parallel vertical panels and a stop means protruding from at least one of said panels at a pre-determined position above said flap; and

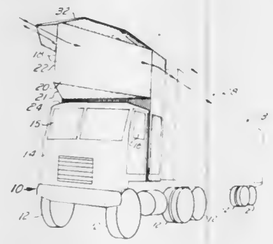
(b) a hydraulic cylinder assembly having a hydraulic cylinder fixedly attached to said support structure and operatively connected to the vehicle braking system to provide hydraulic pressure to said hydraulic cylinder, said hydraulic cylinder having its piston rod pivotally attached to a linking assembly connected to said support structure and operatively contacting said flap to cause said flap to pivot upward or downward upon movement of said piston rod.

4,629,241

ENERGY-SAVING AERODYNAMIC VEHICLE

Peter Gruich, Warren, Mich., assignor to Irving M. Weiner, Southfield, Mich., a part interest

Filed Jun. 4, 1984, Ser. No. 616,858
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S 10 Claims



1. An energy-saving vehicle, comprising:

a vehicle including a first aerodynamic means for urging the fluid through which the vehicle moves to flow along the sides of said vehicle;

said vehicle including an enclosure for a driver of said vehicle;

said first aerodynamic means having a forward most portion positioned forward of the forward most portion of said enclosure for said driver of said vehicle;

said first aerodynamic means having a rearward most portion posterior to the rearward most portion of said enclosure for a driver;

the forward most portion of said first aerodynamic means includes a vertical wedge having a first wall and a second wall converging towards the front end of the vehicle to a vertical edge positioned forward of the forward most position of said driver enclosure;

said first aerodynamic includes a visor, said visor spanning and extending exteriorly of said converging walls whereby said fluid is urged to flow only along the sides of said vehicle, and flow of said fluid over the top of said vehicle and under said vehicle is minimized; and

said first aerodynamic means defines an enclosed space.

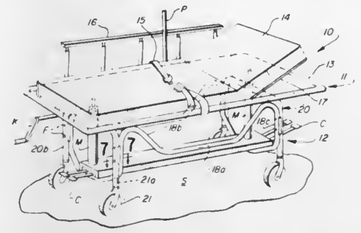
4,629,242

PATIENT TRANSPORTING VEHICLE

James E. Schrager, Flossmoor, Ill., assignor to Colson Equipment, Inc., Caruthersville, Mo.

Continuation of Ser. No. 518,383, Jul. 29, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 820,880
Int. Cl.[4] B60R *13/00*
U.S. Cl. 296—20 31 Claims

1. A vehicle for use in transporting a patient in a selected direction along a surface, comprising: a first member for subtending and supportingly engaging the patient at a predetermined elevation relative to the surface; and a second member supportingly engaging said first member, said second member including: a chassis having an elongated center section, first and second end segments disposed transversely of said center section and being integral with said center section, and a terminal portion extending between said center section and each said end segment; first and second depending end sections secured to said first and second end segments of said chassis, respectively; surface-engaging wheel means subtending and attached to said first and second depending end sections; and resilient shock-absorbing means secured between said first depending end section and first end segment and between said second depending end section and said second



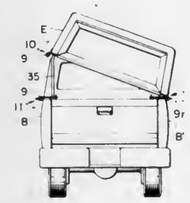
end segment, whereby said first and second depending end sections are disposed a spaced distance from said first and second end segments, respectively, and whereby external forces impacting on said wheel means while the vehicle is in motion are substantially absorbed by said resilient means and by flexure of the terminal portions.

4,629,243

HINGE ADAPTER KIT FOR OPEN-BED VEHICULAR ENCLOSURES

John D. Jensen, RR #1, Box 213, Tomah, Wis. 54660

Filed Apr. 1, 1985, Ser. No. 718,749
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 11 Claims



1. A hinge adapter kit suitable for use in combination with a top enclosure having a top portion, a left enclosure sidewall extending downwardly from the top portion, a left enclosure base defining the lower edge of the downwardly extending left enclosure sidewall; a right enclosure sidewall extending downwardly from the top portion and a right enclosure base defining the lower edge of the downwardly extending right enclosure sidewall, and an open bed having a bottom bed member, a left extending bed sidewall, a right upwardly extending bed sidewall, a left bed sidewall top rail and a right bed sidewall top rail respectively defining the upper edges of said left bed sidewall and said right bed sidewall which kit, when secured to the top enclosure and the open bed, permits selective access to either side of the open bed while affording means for readily detaching or attaching the top enclosure from the open bed, said hinge adapter kit comprising a right hinge assembly and a left hinge assembly:

(a) said right hinge assembly comprising a right enclosure support rail provided with means of securing the right enclosure support rail onto the right enclosure base of the top enclosure, a right sidewall bed rail provided with means of securing the right sidewall bed rail onto the right bed sidewall top rail, at least one right complemental shaft retaining member for housing a longitudinally slidable shaft therein with said right complemental shaft retaining member being rigidly mounted upon either the right enclosure support rail or the right sidewall bed rail, at least one right shaft mounting member rigidly mounted onto the opposite right enclosure support rail or right sidewall bed rail to the mount of said right complemental shaft retaining member, with said right shaft retaining member being adapted to house and secure a longitudinally slidable shaft therein and a right slidable shaft assembly housed and secured within said right shaft mounting member, said right slidable shaft assembly comprising at least two longitudinally aligned and adjacently positioned right shaft sub-units and at least one right shaft connector rigidly interconnecting said right shaft sub-units in longitudinal alignment and providing sufficient spacial clearance between the interconnected right sub-units to permit the interconnected right sub-units to longitudinally clear the right complemental shaft retaining member when the right shaft assembly is slidably adjusted to an unlatching position and to house and retain at least one of the right interconnected shaft sub-units within said complemental shaft retaining member when the shaft assembly is slidably adjusted to a latching position;

(b) said left hinge assembly comprising a left enclosure support rail provided with means of securing the left enclosure support rail onto the left enclosure base of the top enclosure, a left sidewall bed rail provided with means of securing the left sidewall bed rail onto the left bed sidewall top rail, at least one left complemental shaft retaining member for housing a longitudinally slidable shaft therein, with said left complemental shaft retaining member being rigidly mounted upon either the left enclosure support rail or the left sidewall bed rail, at least one left shaft mounting member rigidly mounted onto the opposite left enclosure support rail or left sidewall bed rail to the mount of said left complemental shaft retaining member with said left shaft retaining member being adapted to house and to secure a longitudinally slidable shaft therein and a left slidable shaft assembly housed and secured within said left shaft mounting member; said left slidable shaft assembly comprising at least two longitudinally aligned and adjacently positioned left shaft sub-units and at least one left shaft connector rigidly interconnecting said left shaft sub-units in longitudinal alignment and providing sufficient spacial clearance between the interconnected left sub-units to permit the interconnected left sub-units to longitudinally clear the left complemental shaft retaining member when the left shaft assembly is slidably adjusted to an unlatching position and to house and retain at least one of the left interconnected shaft sub-units within said complemental shaft retaining member when the shaft assembly is slidably adjusted to a latching position,

with said left hinge assembly and said right hinge assembly providing a hinge adapter kit which, when secured to said top enclosure and said open bed, permits selective access to either side of the open bed by slidably adjusting the shaft assembly to the unlatching position on the desired entry side of the open bed and thereby permit the complemental retaining member to vertically clear the spacial clearance between the interconnected shaft sub-units of the shaft assembly while maintaining the interconnected shaft sub-units of the shaft assembly on the opposite side of the open bed therefrom in the latching position and thereby allowing the top enclosure to axially pivot upon at least one of the interconnected shaft sub-units concurrently secured and housed within the complemental shaft retaining member and the shaft mounting member on the opposite side therefrom.

4,629,244

HINGE ASSEMBLY

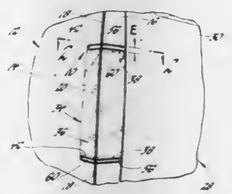
Roy F. Tiesler, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1985, Ser. No. 797,161
Int. Cl.[4] B60J *1/18*
U.S. Cl. 296—146 3 Claims

1. An improved hinge assembly for an automotive vehicle

having a body and a door pivotally mounted thereto so as to be opened and closed relative to said body, with said body and door having adjacent outer surfaces that are substantially flush when said door is closed, and a separate panel having an outer surface and side, said separate panel being mounted to said body and located so that said panel outer surface is substantially flush with said flush body and door outer surfaces and so that said panel side defines a spaced gap with said flush body and door outer surfaces, said improved hinge assembly serving to mount said door to said body as well as cooperatively providing an enhanced aesthetic appearance to said panel, body, and door outer surfaces, said hinge assembly comprising, in combination with said panel,

a stationary hinge member adapted to be secured to said body so as to hidden from view by said body outer surface,



a movable hinge member, said movable hinge member having an attachment portion adapted to be secured to said door so as to be hidden from view by said panel outer surface when said door is closed and pivot support pivotally joined to said stationary hinge member and adapted thereby to mount said door to said body, said pivot support being in the form of a plate located proximate to the side of said panel, with only an outer edge appearance surface of said pivot support plate being visible alongside said panel within said gap, said outer edge appearance surface further being sufficiently flush with said flush panel, body and door outer surfaces so as to appear to border the sides of said panel, thereby providing, in cooperation with said panel, body, and door outer surfaces, an enhanced aesthetic appearance.

4,629,245

FOLDING CHAIR

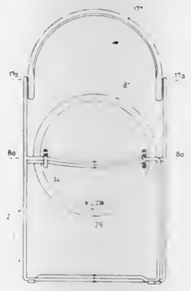
Valdimar Hardarson, Solheimar 27, 3 HD Reykjavik, Iceland

Filed Jun. 15, 1984, Ser. No. 621,065

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321585; Feb. 21, 1984, 3406189

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—16 **8 Claims**



1. A folding chair comprising a framework of two flat frames each of which has a pair of vertically spaced substantially horizontal crosspieces interconnected at thier ends by uprights, one of said uprights of one said frame having an extension that extends a substantial distance above the upper said crosspiece of said one frame, both of said uprights of said other frame having extensions that extend upwardly a substantial distance above said upper crosspiece of said other frame, said frames being interconnected at midportions of their crosspieces for swinging movement relative to each other about a vertical axis, a seat panel mounted for vertical swinging movement on one of said upper crosspieces and adapted to overly and rest on and be supported in a substantially horizontal position on the other of said crosspieces when said frames are swung to a position in which said extension of said one frame is equally spaced from said extensions of said other frame, and a back pivotally attached to upper ends of said extensions of said other frame for vertical swinging movement about a horizontal axis between an upper position in which said back lies in the plane of said other frame and a lowered use position in which said back is substantially horizontal, the back having thereon a circular-arc guide that slidably receives a slide element on the upper end of said extension of said one frame whereby said slide element is guided over a swivel angle of about 90° about said vertical axis during pivotal movement of said frames and back relative to each other.

4,629,246

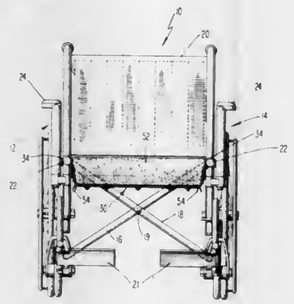
WHEELCHAIR SEAT

William Fulton, 154 Warren Dr., R.D. #2, Dallas, Pa. 18612

Filed Oct. 28, 1985, Ser. No. 792,143

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—44 **8 Claims**



1. In a collapsible wheelchair comprising a pair of interconnected wheeled side portions, and a seat mountable on said side portions and comprising a rigid base plate, padding means for an upper surface of said rigid base plate, and quick-release supporting means for removably supporting said rigid base plate on said side portions such that said rigid base plate is removable whenever said wheelchair is collapsed, said side portions each comprising a horizontal bar, said supporting means arranged to attach said rigid base plate to said bars such that said upper surface of said rigid base plate is disposed at a level lower than said bars whereby said padding means can be disposed on said rigid base plate without raising the occupant above a comfortable sitting level.

4,629,247

INFANT'S CHAIR

Ching-Tana Wu, No. 33, Lane 103, Han Sheng E. Road, Penchiao City, Taiwan

Continuation-in-part of Ser. No. 649,895, Sep. 12, 1984, abandoned. This application May 17, 1985, Ser. No. 735,339

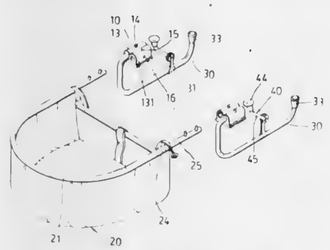
Int. Cl.[4] H47B *39/00*

U.S. Cl. 297—174 **5 Claims**

1. An infant's chair comprising:

an accommodating device for an infant having two arms projecting therefrom; and

two supporting members, each supporting member comprising a supporting rod having a first end placed on the top surface of a plate, and so bent that its second end of said supporting rod is abutting against the under surface of said plate; a connector including two tubes longitudinally juxtaposed, one of said tubes capable of engaging with said first end of said supporting rod, the other tube engaged with one of said arms of said accommodating device, so that the downward pressure applied on said arm will cause said connector to abut against the top surface of said plate, and cause said second end of said supporting rod to press in an opposite direction against the under surface of said plate; and an engaging means pivotally connected to said supporting rod, capable of adjusting its angle in relation to said supporting rod, according to the thickness of said plate, to tend upward to firmly engage with the under surface of said plate, said engaging means including a sucker to cling on to the under surface of said plate, a stationary wheel fastened on said supporting rod;



a rotating wheel pivotally connected to said stationary wheel; an engaging rod fastened on said rotating wheel at one end therof, and engaged with said sucker at the other end thereof; and a torsional spring provided between said stationary wheel and said rotating wheel, said accommodating device including a U-shaped frame and a flexible seat mounted on said U-shaped frame, each arm of said accommodating device further comprising a locking member for locking said arm with respect to said connector at a first locking position when said infant's chair is in use, and for locking said armk with respect to said connector at a second locking position when said infant's chair is not in use, wherein at said first locking position said U-shaped frame and said supporting members are on different planes, and at said second locking position said U-shaped frame and said supporting members are substantially on the same horizontal plane.

4,629,248

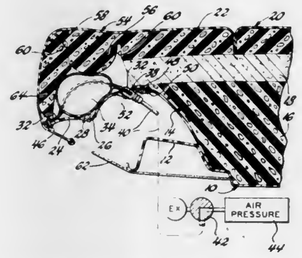
THIGH SUPPORT FOR VEHICLE SEATS

Gerald W. Mawbey, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 3, 1985, Ser. No. 740,482

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—284 **3 Claims**



1. In a vehicle seat, the combination comprising, a seat cushion support having a forward edge portion, a seat cushion support extension extending transversely of the forward edge portion of the cushion support, hinge means securing the support extension to the forward edge portion of the cushion support for movement between a lowered first position and a raised second position, an inflatable bladder including upper and lower layers having peripheral edge portions secured to each other to define a normally collapsed inflatable cavity, the bladder extending over and abutting the hinge means, the cushion support and the support extension, means securing a first peripheral edge portion of the bladder to the cushion support, means securing a second peripheral edge portion of the bladder to the support extension, a seat cushion extending over and abutting the upper layer of the bladder, and means for inflating the inflatable cavity of the bladder, inflation of the inflatable cavity of the bladder (1) moving the upper layer of the bladder upwardly to raise the seat cushion and provide support for the seat occupant's thighs, and (2) moving the second peripheral edge portion of the bladder toward the first peripheral edge portion to move the support extension from its lowered first position to its raised second position as the seat cushion is raised.

4,629,249

DEVICE FOR A RECLINING CHAIR

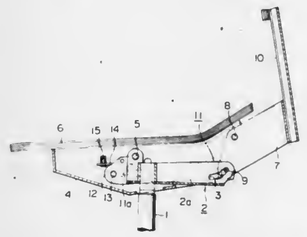
Tomoshige Yamaguchi, Yokohama, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed Jan. 14, 1985, Ser. No. 691,073

Claims priority, application Japan, Jan. 18, 1984, 59-4211[U]

Int. Cl.[4] A47C *1/032*

U.S. Cl. 297—300 **7 Claims**



1. A device for a reclining chair, comprising:

a base frame having two side panels being fixedly mounted at its front on the upper end part of a chair leg shaft, and extends backwards therefrom, in which guiding apertures are formed through on each rear end portion of both side panels, said apertures ascending upwards to the rear;

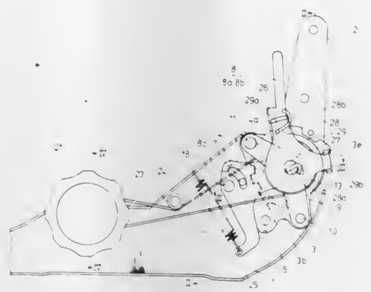
a seat frame which is pivotally mounted in its middle to the front portion of the base frame by a pivot shaft so as to rotate about the pivot shaft;

a back rest frame having front and rear ends and upper and lower portions, said back rest frame being pivotally mounted at its upper front end to the upper rear end of the seat frame by another pivot shaft so as to rotate about said another pivot shaft, and is provided with a sliding shaft transversely mounted at the lower front part of the back frame, and being inserted within and through the guiding apertures of the base frame; and

a gas-filled spring being operational for opening and closing, a front end of which is pivotally attached to the front part of the seat frame by a third pivot shaft so as to rotate about the pivot shaft, and a rear end of which is pivotally connected to the sliding shaft;

whereby when the seat is tilted back, the sliding shaft moves forward and down in said guiding apertures, and the back rest frame tilts back through a substantially greater angle than said seat to provide a comfortable resting position for the user; and whereby said gas spring intercouples said sliding shaft and said base frame to resiliently bias said seat and seat back to the desired angular orientation.

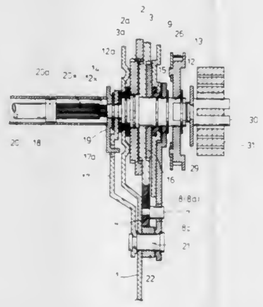
4,629,250
RECLINING ANGLE ADJUSTMENT DEVICE
Takeshi Tezuka; Akira Owada, and Naoaki Katsumoto, all of Kanagawa, Japan, assignors to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Fujisawa, Japan
Filed Apr. 29, 1985, Ser. No. 728,393
Claims priority, application Japan, May 9, 1984, 59-68196[U]
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—362 5 Claims



1. A reclining angle adjustment device comprising:
(a) an intermediate gear plate having an outer gear;
(b) a first arm;
(c) an angularly movable shaft having concentric and eccentric portions on which said intermediate gear plate and said first arm are angularly movably mounted, respectively;
(d) a second arm mounted on said angularly movable shaft and having an inner gear meshing with said outer gear of said intermediate gear plate;
(e) a release lever for unlocking said intermediate gear plate from said second arm for rough adjustment of a reclining angle;
(f) a control handle for turning said angularly movable shaft for fine adjustment of the reclining angle;
(g) a pin having a groove and being secured to said second arm by a pin bracket;
(h) a spiral spring having an inner end engaged in said groove, said spring producing at an outer end thereof a turning force for transmission to said intermediate gear plate; and
(i) a hook plate angularly movably mounted on said pin for transmitting said turning force of said spiral spring to said intermediate gear plate through the hook plate, said hook plate engaging said outer end of said spring and said intermediate gear plate, whereby the position at which the turning force is transmitted to said intermediate gear plate is located close to the plane in which said intermediate gear plate is angularly movable.

4,629,251
RECLINING ANGLE ADJUSTMENT DEVICE
Takeshi Tezuka, Fujisawa, Japan, assignor to Shiroki Kinzoku Kogyo Kabushiki Kaisha, Fujisawa, Japan
Filed Apr. 29, 1985, Ser. No. 728,580
Claims priority, application Japan, May 7, 1984, 59-66956
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—362 2 Claims

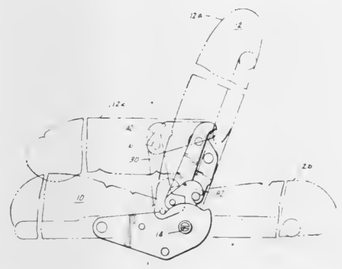
1. A reclining angle adjustment device comprising:
(a) a pair of lock mechanisms one of each connected to outer and inner sides of a reclining seat, each of said lock mechanisms including a first arm fixed to a seat cushion, a pawl angularly movably mounted on said first arm, a second arm fixed to a seat back and pivotally connected to said first arm by an angularly movable shaft, an intermediate gear plate mounted on said second arm with an outer gear and a rack for meshing with said pawl, a release lever rotatably mounted on said angularly movable shaft for releasing said pawl from said rack of said intermediate gear plate for rough adjustment of the angle of inclination of said second arm with respect to said first arm, a planetary gear mechanism and a control handle attached to said first arm for turning said second arm through said angularly movable shaft by rotation transmitting means and said planetary gear mechanism for producing fine adjustment of said angle of inclination;
(b) a pair of hook plates coupled respectively to said release levers of said lock mechanisms;
(c) a connecting pipe extending between and attached to said hook plates for transmitting motion between said release levers; and
(d) a connecting bar inserted through said connecting pipe and coupled to said angularly movable shaft of said lock



mechanisms for transmitting motion between said angularly movable shafts, said connecting bar including ends having serrated inner peripheral surfaces defining recesses, said angularly movable shafts including ends having serrated outer peripheral surfaces meshing with said serrated inner peripheral surface of said connecting bar, said hook plates having holes defined therein in alignment with said connecting pipe and said holes having a diameter smaller than the outside diameter of said ends of said connecting bar, wherein said first arm includes an inner gear engaged with said outer gear of the intermediate gear plate having said rack meshing with said pawl, said inner gear plate being rotatably and eccentrically mounted on said angularly movable shaft and said intermediate gear plate being concentrically mounted on said angularly movable shaft.

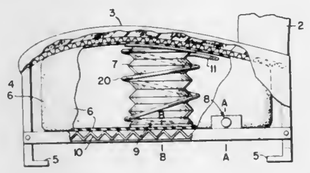
4,629,252
SEAT RECLINER
Timothy S. Myers, Warren, and William H. Jones, Utica, both of Mich., assignors to Ferro Manufacturing Corporation, Southfield, Mich.
Filed Apr. 12, 1984, Ser. No. 600,792
Int. Cl.[4] A47C *1/025*
U.S. Cl. 297—366 9 Claims

7. Connector structure for pivotally connecting the lower edge of a seat back to the rear edge of a seat comprising a seat support including a seat mount plate and a cover plate, a post fixed to said seat support to extend transversely therefrom, an elongated arm pivoted to said support for incremental adjustment about a first axis between an erect position in which said arm extends upwardly from its pivot and a reclining position in which said arm extends substantially horizontally rearwardly, an elongated hinge plate pivoted at one end thereof to said arm for movement about a second axis above said first axis, means for fixing said hinge plate to said arm comprising a latch cam pivotally connected to one of said arm and plate and releasable latch means connecting said latch cam to the other of said arm and plate, release means responsive to forward movement of said arm to a limiting substantially vertical position to release said latch means to provide for pivotal movement of said hinge plate and the seat back connected thereto relative to said arm about said second axis to position said seat back over said seat with the rear surface of said seat back providing a substantially horizontal support surface, said hinge plate having an abutment spaced substantially from the pivot connection between said arm and hinge plate, said latch cam being pivoted to said arm and having a hook engageable with said abutment to latch said hinge plate rigidly to said arm, said latch cam having a pin and said seat support having a camming slot interconnection in which said slot comprises an arcuate portion centered on said first axis positioned to retain said latch cam engaged with said



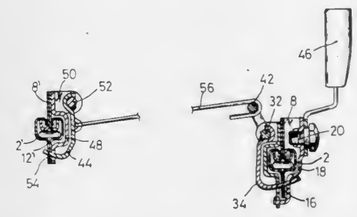
abutment as said arm, said hinge plate and the seat back connected thereto move between full reclining and substantially erect position about said first axis, and an inclined camming portion positioned to swing said cam latch to abutment releasing position as said arm completes its movement to substantially erect forward limited position, in which said arm has a arcuate section of locking rack teeth concentric with said first axis, a pawl pivoted between said plates, and having teeth cooperating with said rack teeth, a wedge cam pivoted between said plates and having a wedging and locking surface engaged with said pawl and urging said pawl toward said rack teeth, a handle pivoted to said seat support and operatively connected to said wedge cam, and resilient means connected between said cam and handle and said support to urge said pawl toward said section of rack teeth.

4,629,253
SEAT OCCUPANT-ACTIVATED UNDERSEAT SUPPORT AIR-CUSHION
Theodore M. Williams, 1360 Keneki Pl., Hilo, Hi. 96720
Filed Jan. 15, 1986, Ser. No. 818,959
Int. Cl.[4] A47C *1/00, 27/08*
U.S. Cl. 297—452 3 Claims



1. An occupant-activated underseat support air-cushion, comprising: a support base means, an air-cushion resting on said support base means and having an air-pump inflation means contained therein, said air-pump inflation means having a one-way inlet from a source means exterior the air-cushion and a one-way outlet extending into the air-cushion, said air-pump inflation means activated by the weight of an occupant riding on said seat such that a downward force causes the air-pump inflation means to expel air into the air-cushion thereby increasing the pressure therein so as to counter-act the downward force; said air-cushion further having an adjustable air-regulating means therein to enable an occupant to selectively adjust the pressure within said air-cushion.

4,629,254
MOTOR VEHICLE SEAT
Richard Stolper, Ginsheim-Gustavsburg; Theo Adler, Bensheim, and Lütz Küssmann, Trebur, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 4, 1985, Ser. No. 720,079
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414649
Int. Cl.[4] B60N *1/08*
U.S. Cl. 297—473 4 Claims

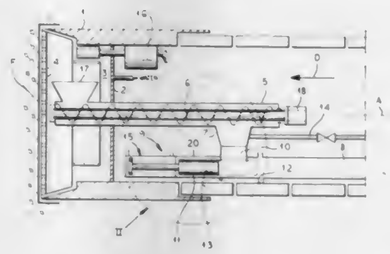


1. A vehicle seat adjuster adapted for mounting a seat belt on the seat for longitudinal fore and aft adjustment in unison with the seat comprising:
a lower track having mounting ends adapted for mounting on the vehicle floor and a central rectilinear extending track portion having a plurality of apertures spaced equidistant therealong;
an upper track adapted for mounting on the seat;
slide means acting between the upper and lower tracks;
a shackle having inboard and outboard halves suitably attached as by welding to the upper track on opposite inboard and outboard sides thereof, said shackle halves extending downwardly to embrace the lower track in closely spaced relation and being suitably attached to one another beneath the lower track as by welding, said shackle halves each having at least one aperture registering with each other and registering with the apertures of the lower track upon longitudinal fore and aft adjustment of the seat,
means mounting the seat belt on the outboard shackle halve;
and latch means pivotally mounted on the inboard shackle halve and having a pawl, said pawl being pivotable between a latched position in which the pawl extends through the apertures of both the shackle halves and the apertures of the lower track to latch the seat at a selected fore and aft position and to latch the seat belt mounting outboard shackle to the lower track, and an unlatched position in which the seat position and seat belt position is fore and aft adjustable along the lower track.

4,629,255
TUNNELING MACHINE
Siegmund Babendererde, Bad Vilbel, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany
Filed Feb. 4, 1985, Ser. No. 697,786
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403890
Int. Cl.[4] E21D *9/08, 9/12*
U.S. Cl. 299—33 4 Claims

1. A tunneling apparatus comprising:
a shield having a front end normally engaged horizontally in a longitudinal direction against a tunnel end face, the shield extending in the direction;

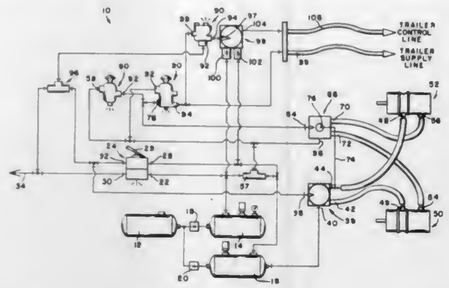
a digging tool at the front end of the shield and engageable longitudinally with the tunnel face;
drive means for displacing the tool and digging the tunnel face for forming a longitudinally extending tunnel;
a transverse pressure wall extending crosswise of the direction across the shield and forming a longitudinally forwardly open pressurizable chamber at the front end of the shield around the tool at the tunnel face;
means for pressurizing the chamber;
a conveyor tube longitudinally traversing the wall and having
a front end open ahead of the wall in the chamber and adapted to receive material freed from the tunnel face by the digging tool and
a rear end longitudinally behind the wall;
an auger in the tube;
drive means for rotating the auger and thereby displacing freed material back in the tube from its front end to its rear end;



a chute open upward into the rear end of the conveyor tube to receive material therefrom;
means including a conduit opening into the chute for admitting a conveyor fluid into the chute under pressure, whereby the conveyor fluid pushes the material back in the tube;
a pump tube extending longitudinally back from the chute;
a piston pump between the chute and the pump tube and comprising
a pump cylinder having an upwardly open side port into which the chute opens downward and a longitudinally backwardly open end connected to the pump tube, and
a piston displaceable toward and away from the cylinder end past the side port and completely blocking the side port when advanced to the cylinder end; and
means for operating the pump and thereby displacing material from the chute back in the pump tube.

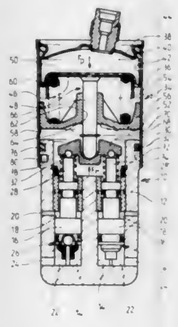
4,629,256
FLUID PRESSURE BRAKING SYSTEM
Richard C. Fannin, Grafton, Ohio, assignor to Allied Corporation, Morristown, N.J.
Filed May 6, 1985, Ser. No. 730,965
Int. Cl.[4] B60T *11/10*
U.S. Cl. 303—8 **9 Claims**

1. Fluid pressure braking system for tractor-trailer combination vehicle comprising a fluid pressure source on said tractor, a trailer supply line and a trailer control line communicating a portion of the fluid pressure braking system on the tractor with a portion of the fluid pressure braking system on the trailer, means for controlling communication to the trailer control line from said fluid pressure source, said means for controlling communication to the trailer control line including relay valve means having a supply port communicated to said fluid pressure source, a delivery port communicated to said trailer control line, and a control port, first operator-actuated valve means for controlling communication between said pressure source and the control port of the relay valve means, said relay valve means responding to pressure at said control port to communicate the supply and delivery ports of the relay valve means to therby communicate the trailer control line to said fluid pressure source, one-way check valve means for permitting fluid communication from said fluid pressure source into said supply port of the relay valve means but preventing communication in the reverse direction, and second operator-



actuated valve means for controlling communication to said trailer supply line, said means for controlling communication to the trailer control line including valve mechanism communicated to the control port of the relay valve means to terminate communication to said control port when the trailer supply line is vented.

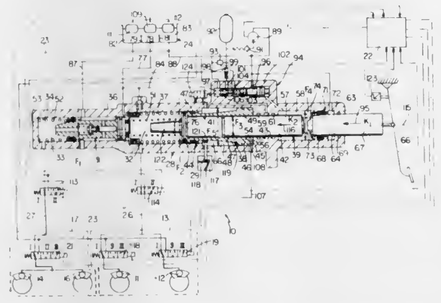
4,629,257
BRAKING CORRECTOR
Jean-Jacques Carre, Le Raincy, and Jean M. Cheron, Longperrier, both of France, assignors to Societe Anonyme D.B.A., Paris, France
Filed May 2, 1985, Ser. No. 729,845
Claims priority, application France, May 17, 1984, 84 07628
Int. Cl.[4] B60T *8/22*
U.S. Cl. 303—22 A **9 Claims**



1. A control device for a braking corrector capable of being interposed between a source of hydraulic pressure and a motor vehicle braking circuit, of the type incorporating a casing provided with at least one bore, a differential hydraulic piston sliding in the bore and defining therein a first pressure chamber and a second pressure chamber capable of being joined to a source of pressure and to the braking circuit, respectively, the hydraulic piston controlling the flow of a fluid under pressure between the chambers, the control device including a pilot piston for fluid capable of generating a pilot force upon the hydraulic piston so as to push the hydraulic piston in a direction in which the flow of fluid is established, the fluid under pressure generating a reaction force pushing the hydraulic piston in a direction in which the flow of fluid is interrupted, characterized in that the control device forms a sub-assembly capable of being mounted as a unit on the casing and which is

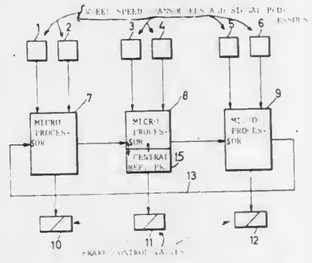
adjustable in mounted position, and in that the sub-assembly includes a fixed bulkhead supporting the force of a calibration spring and guiding a rod of the pilot piston, the control device including a cover attached to a tubular body, the cover retaining a rolling membrane of the pilot piston to ensure a seal between the body and attached cover and forming a pilot chamber between the membrane and cover.

4,629,258
HYDRAULIC DUAL CIRCUIT BRAKE SYSTEM FOR ROAD VEHICLES
Reinhard Resch, Stuttgart, and Hellmut Krohn, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Dec. 26, 1984, Ser. No. 686,477
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347618
Int. Cl.[4] B60T *17/18*
U.S. Cl. 303—92 **22 Claims**



1. In a combination hydraulic dual circuit brake system and anti-locking brake system that is of the type having a tandem master cylinder for controlling two vehicle brake circuits and including a plurality of output pressure chambers and a primary piston mounted for movement in the cylinder to produce a brake pressure buildup in at least one of the output pressure chambers and to define a working area, an auxiliary pressure source for providing an auxiliary output pressure at a predetermined level, and a proportional control valve means for supplying a control output pressure proportional to a force applied to a vehicle brake pedal, the proportional control valve means including a supply pressure input in fluid communication with the auxiliary pressure source and formed to include a pressure output, the control output pressure being usable to impinge the working area of the primary piston, wherein the improvement comprises
the tandem master cylinder includes a cylinder casing and is formed to include, in serial order, a secondary pressure bore stage, a primary pressure bore stage, a pre-pressure chamber, an auxiliary pressure bore stage, the primary piston includes a ring piston formed to include a central bore and a plunger mounted for movement in said central bore, the ring piston and the primary pressure bore stage cooperating to define a primary pressure output chamber, the ring piston including a first ring flange arranged in a pressure-tight displaceable manner in the primary pressure bore stage, a second ring flange axially spaced in relation to the first ring flange, and arranged in a pressure-tight displaceable manner in the auxiliary pressure bore stage, and a sleeve-shaped adaptor extending therebetween for joining the first and second ring flanges, the plunger including a driving flange in communication with the primary pressure chamber and biased against the first ring flange of the ring,
the cylinder casing includes a partition between the auxiliary pressure bore stage and the pre-pressure chamber, the partition, second ring flange, and cylinder casing cooperating to define an annular control pressure chamber, the partition being formed to include a bore through which the plunger is displaceable in a pressure-tight manner,
plunger means, responsive to actuation of the brake pedal, for generating a pressure in pre-pressure chamber for use as a reference pressure by the proportional control valve means,
means for coupling the control output pressure of the proportional control valve means to the annular control pressure chamber, and
means for activating the pressure control valve means of the anti-locking system to introduce the control pressure into the control pressure chamber to cause the control pressure to impinge the working surface of the primary piston, whereby a secondary brake circuit is changed over to dynamic pressure admission from static pressure admission by the control output pressure and a brake line for fluidly coupling the secondary pressure bore stage of the tandem master cylinder and the wheel brakes of the secondary brake circuit is blocked to disable static operation of said wheel brakes during operation of said anti-locking system.

4,629,259
METHOD AND SYSTEM TO OBTAIN A REFERENCE SIGNAL FOR A BRAKE CONTROLLING SYSTEM
Jürgen Bräuninger, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 26, 1985, Ser. No. 780,396
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435864
Int. Cl.[4] B60T *8/66*
U.S. Cl. 303—109 **9 Claims**



1. For application in a brake controlling system of a vehicle especially an anti-lock brake system having a plurality of individual microprocessors (**7, 8, 9; 20–25**), associated with respective wheels or axles of the vehicle, which microprocessors are connected to receive signals based on measured wheel speed signals and comparison of the wheel speed signals with a reference signal to respectively generate control signals used for brake pressure control, and reference microprocessor means (**15**) generating the speed reference signal;
a method of obtaining the reference signal which is representative of vehicle speed; utilizing the steps of:
generating at least two wheel speed signals representative of the rotary speed of corresponding wheels, or axles of the vehicle in the corresponding microprocessors;
generating, in the reference microprocessor means, the reference signal representative of vehicle speed;
modifying the reference signal to derive a modified reference signal, by determining one of several slopes and changing the reference signal thereby and applying said modified reference signal to the microprocesors (**7, 8, 9; 20–25**) to form said microprocessor reference signal, comprising, in accordance with the invention, the steps of:
generating, in each program cycle in each microprocessor (**7, 8, 9; 20–25**) a code number characterising one of the several slopes in dependance of the then pertaining operat-

ing condition of the wheel, or axle, with which the respective microprocessor is associated,

applying, in a ring connection (13; 26, 27) the code numbers generated by the respective individual microprocessors to the reference microprocessor means; storing, in the reference microprocessor means, a plurality of code numbers, in a predetermined priority sequence, each representative of a possible code number;

selecting in the reference microprocessor means out of the code numbers transmitted by the respective individual microprocessors, in the then current program cycle, that one of the code numbers which has the highest priority; computing a new reference signal dependant of the slope of the code number having the highest priority;

transmitting the so computed new reference signal over the ring connection to the individual microprocessors;

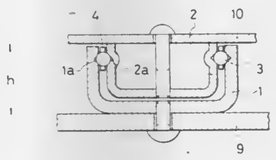
and utilizing, in the individual microprocessors, the so computed new reference signal as the reference signal for comparison with the individual wheel speed signals to effect control of the brake pressure of the respective wheels or axles with which the individual microprocesors are associated.

4,629,260

PIGGYBACK ROLLING-CONTACT BEARING ASSEMBLY

Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,684
Int. Cl.⁴ F16C *29/04*
U.S. Cl. 384—49 **7 Claims**



1. A rolling-contact bearing assembly comprising:

first guide means having a generally U-shaped cross section having a flat bottom wall and a pair of side walls extending from both sides of said flat bottom wall;

second guide means having a generally U-shaped cross section, having a flat bottom wall and a pair of side walls extending from both sides of said flat bottom wall, and arranged to substantially enclose said first guide means as oriented in the same direction;

rolling means interposed between siad first and second guide means for allowing a relative motion between said first and second guide means; and

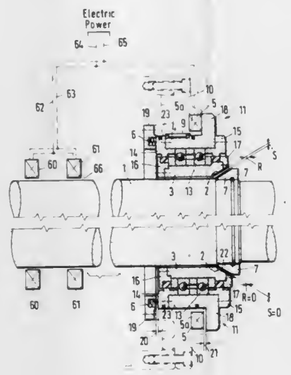
fixing means for fixing said first and second guide means to first and second desired objects, respectively, whereby said fixing means is provided at the flat bottom wall of each of said first and second guide means.

4,629,261

CENTERING AND SAFETY DEVICE FOR ROTORS SUPPORTED WITHOUT CONTACT

Albert Eiermann, Heddesheim; Dieter Glass, Sandhausen, and Richard Herrmann, deceased, late of Ilvesheim, all of Fed. Rep. of Germany (by Helga Herrmann, heiress), assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 430,803, Sep. 30, 1982, abandoned. This application Feb. 4, 1985, Ser. No. 698,235
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141841
Int. Cl.⁴ F16C *39/06*
U.S. Cl. 310—90.5 **10 Claims**



1. Centering and safety device for a rotor with a shaft supported by contactless bearings having bearing electro magnets, the device which comprises:

a centering and bearing collar with a first conical surface attached coaxially to the rotor shaft with the conical surface facing axially in a first direction,

a bearing sleeve disposed coaxially with the rotor shaft having a second conical centering and bearing surface facing said first conical surface, a sliding sleeve supported axially slidable in a stationary housing between an inactive position distal to said centering and bearing collar and an active position proximal to said centering and bearing collar, having an annular flange,

a metallic bearing interposed between said sliding sleeve and said bearing sleeve,

at least one electromagnet ring rigidly attached to said housing, said electromagnet ring electrically connected with said bearing electro magnets, and magnetically attracting said flange and drawing it axially into said inactive posisiton when said electromagnet ring is electrically energized, thereby creating in the inactive position a radial and an axial airgap between the second centering and bearing surface and the first conical surface,

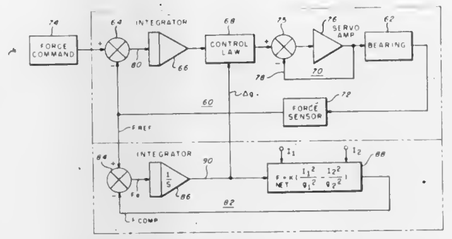
at least one spring interposed between said housing and said sliding sleeve, said spring for urging said sliding sleeve into said active position, in which said first and second conical surfaces engage one another when said bearing electromagnets and said electromagnet ring are de-energized, so that radial and axial air gaps become zero.

4,629,262

POSITION SENSOR FOR MAGNETIC SUSPENSION AND POINTING SYSTEM

Brian J. Hamilton, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,627
Int. Cl.⁴ F16C *39/06*
U.S. Cl. 310—90.5 **15 Claims**



1. In a magnetic bearing system for applying a predetermined force to an armature positioned for suspension in a magnetic field, of the type having a plurality of opposing coils energized by at least first and second currents for generating the magnetic field and spaced apart from the armature by an air gap, the suspension having means coupled to the armature for deriving a signal representative of an applied force, means for deriving signals representative of the first and second currents, and means for deriving a signal representative of the magnitude of the air gap, the improvement comprising:

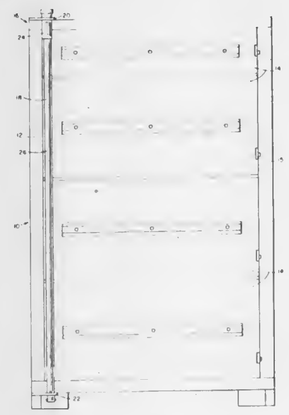
means responsive to said applied force signal and said current signals for deriving said signal representative of the magnitude of said air gap.

4,629,263

CABINET DRAWER BAR RETAINING MECHANISM

John G. Hendriks, 608 Martha, Decatur, Ala. 35601

Filed Oct. 4, 1984, Ser. No. 657,646
Int. Cl.⁴ E05B *65/46*
U.S. Cl. 312—216 **5 Claims**



1. A locking device for releasably securing a plurality of drawers in a cabinet; said locking device comprising:

a. a pair of upper and lower support brackets respectively secured to upper and lower surfaces of said cabinet, said upper support bracket having a pair of semi-circular openings therein joined by a connecting slot having a width smaller than the diameters of said semi-circular openings, said upper bracket having a groove adjacent one of said semi-circular openings, said lower bracket having a pair of spaced openings therein and each said opening having a groove adjacent thereto;

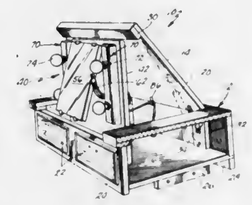
b. a rod supported in said brackets, said rod disposed for engagement with said drawers for retention thereof in secured relation, said rod being positioned in a first of said semi-circular openings of said upper bracket and a first of said pair of openings of said lower bracket for secured relation of said drawers and movable to a second of said semi-circular openings of said upper bracket and the second of said pair of spaced openings of said lower bracket for release of said drawers, said rod having a first protrusion adjacent an upper end of an upper section and a second protrusion adjacent a lower end of a lower smaller diameter section, said rod disposed for movement of said lower smaller diameter section through said connecting slot joining said semi-circular openings for emplacement of said rod in a desired semi-circular opening, said first protrusion being positioned below said upper bracket and said second protrusion being positioned below said lower bracket after insertion of said rod in said brackets to prevent said rod from being moved out of said brackets even under severe vibrations.

4,629,264

VANITY CABINET AND PANEL ASSEMBLY THEREFOR

Gary A. Culver, 2645 Oak Ridge Trail, Grand Rapids, Mich. 49505

Filed Dec. 5, 1984, Ser. No. 678,339
Int. Cl.⁴ A47B *81/00*
U.S. Cl. 312—223 **22 Claims**



1. A vanity cabinet comprising:

a bottom panel;

an upstanding rear panel support at the rear of said bottom panel;

a cover panel having an undersurface and front and rear portions;

a front support for said cover panel at the front of said bottom panel;

cover mounting means for pivotally mounting said cover panel to said rear panel for movement between raised and lowered positions in overlying relationship to said bottom panel;

a mirror;

a mirror panel means for supporting said mirror;

mirror mounting means for pivotally supporting said mirror and mirror panel means on the undersurface of said cover panel at a first position adjacent said front of said cover panel;

mirror hinge means for pivotally supporting said mirror and mirror panel means on said mirror mounting means to move said mirror and mirror panel means to different angular positions with respect to said mirror mounting means; said mirror mounting means including adjustment means for positioning and retaining said mirror and mirror panel means in essentially the same selected angular position with respect to said mirror mounting means unless reset regardless of whether said cover panel is raised or lowered;

a rigid support mounted in a fixed position on and extending outwardly from said mirror mounting means at a second

position spaced from said first position for supporting said mirror mounting means above said bottom panel when said cover is lowered and in an upright position when said cover panel is raised, said rigid support extending downwardly toward said bottom panel when said cover panel is lowered and extending along and over said bottom panel when said cover panel is raised, said rigid support having a length sufficient to space said mirror, mirror panel means and mirror mounting means above said bottom panel a distance sufficient to allow said mirror and mirror panel means to remain in said selected angular position whether said cover panel is raised or lowered;

bearing means mounted on said rigid support for engaging and movably supporting said mirror mounting means on and along said bottom panel between said rear panel and front support, said bearing means engaging said front support when said cover panel is raised to support said cover panel and said mirror mounting means in said upright position when said cover panel is raised;

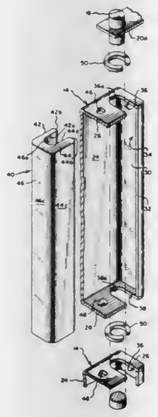
whereby when said cover panel is pivoted upwardly, said mirror, mirror panel means, mirror mounting means and rigid support will automatically pivot downwardly and outwardly away from said cover panel on said bearing means to position said mirror for unobstructed closeup viewing.

4,629,265

CABINET CONSTRUCTION

Richard J. Chester, Kennedy, N.Y., assignor to American Locker Group Incorporated, Jamestown, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,278
Int. Cl.⁴ E05D *7/10*
U.S. Cl. 312—329 **15 Claims**



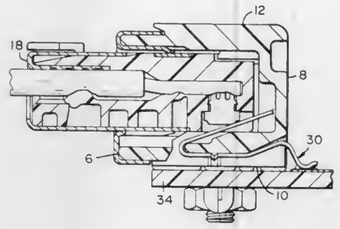
1. A cabinet construction comprising a frame defining at least one cabinet access opening; at least one door for closing said access opening; a hinge pin carried by said frame; and mounting means for removably mounting said door on said hinge pin for swinging movement between access opening closed and open positions, said mounting means including slot means on said door sized to slidably receive said hinge pin when said door is moved transversely thereof and retaining means attached to said door for releasably retaining said hinge pin within said slot means and cooperating therewith to support said door on said hinge pin for said swinging movement, said retaining means includes a bearing retainer snap-fit attached to said door and arranged to cooperate with said slot means to define a bearing surface rotatably supporting said door on said hinge pin.

4,629,266

ELECTRICAL DEVICE, SUCH AS AN ELECTRICAL CONNECTOR RECEPTACLE, FOR SURFACE MOUNTING ON A CIRCUIT BOARD

Michael A. Viselli, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 13, 1985, Ser. No. 744,845
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—17 LC **2 Claims**



1. An electrical connector receptacle or the like which is intended for mounting on a first circuit board surface, the receptacle comprising an insulating housing having a mating face, a rear face which is directed oppositely with respect to the mating face, oppositely facing first and second sidewalls and oppositely facing endwalls which extend from the mating face to the rear face, the first sidewall being opposed to the first circuit board surface when the receptacle is mounted on the circuit board, a plurality of conductors in the housing, the conductors having intermediate portions which extend from a location adjacent to the mating face and the first sidewall towards the rear face, the intermediate portions being in side-by-side parallel relationship, each of the conductors having one end which is beyond, and spaced from, the rear face, the one end having a contact zone thereon for contacting a circuit board conductor, the receptacle being characterized in that:

each of the conductors has a compliant spring end portion which extends from the contact zone to a location adjacent to the rear face of the housing, the spring end portion comprising a zig-zag portion extending from the contact zone towards the housing, the zig-zag portion being out of contact with the housing and being free for deflection, each of the zig-zag portions comprising a first leg which extends obliquely from the contact zone towards the rear face of the housing and a second leg which extends from the first leg towards the plane of the first sidewall of the housing,

the housing having a plurality of side-by-side recesses therein which extend inwardly from the first sidewall and inwardly from the rear face, the second leg of each zig-zag portion being within one of the recesses, the first leg of each zig-zag portion extending beyond the rear face, each recess having an inner end which extends obliquely from the rear face to the first sidewall, the second legs of the zig-zag portions being spaced from the inner ends of the recesses,

the contact zone being a bearing surface for engagement with a circuit board conductor on the first circuit board surface, the bearing surface being located beyond the plane of the first sidewall of the housing whereby,

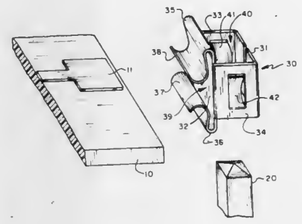
upon mounting the connector receptacle on a first concuit board surface and securing the receptacle to the circuit board, the bearing surfaces will be moved substantially to the plane of the first sidewall with minimal contact force being developed between the bearing surfaces and the circuit board conductors and after mounting and soldering of the bearing surfaces to circuit boards conductors, the zig-zag portions will serve as compliant springs which connect the contact zones of the conductors to the intermediate portions of the conductors.

4,629,267

CIRCUIT TERMINATING DEVICE

William E. Stepan, Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 660,346, Oct. 12, 1984, abandoned. This application Apr. 25, 1986, Ser. No. 856,862
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—17 M **4 Claims**



1. A circuit terminating device for mechanically retaining and electrically connecting a thick/thin film circuit to a printed wiring card, said thick/thin film circuit including at least a first termination pad located adjacent one edge of said thick/thin film circuit, and said printed wiring card including at least one interconnection post extending perpendicularly from a top surface of said printed wiring card, said circuit terminating device comprising:

a generally rectangular terminating body having a pair of planar sidewalls and a planar front and rear wall defining a hollow interconnection post receiving area therebetween, each of said sidewalls including a post spring member extending inwardly from a respective sidewall into said post receiving area, and said post receiving area arranged to accept substantially therein said interconnection post with each post spring member engaging and exerting a compressive force to respective and opposite sides of said interconnection post, mechanically retaining and electrically connecting said terminating body to said interconnection post;

a first substrate spring member including a first planar section extending from a top edge of said front wall and a second planar section oriented parallel to said front wall, said first and second sections joined by a first radial section, said first substrate spring member further including a second substantially larger radial section extending from said second section and said second radial section including a contact surface;

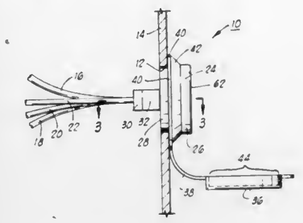
a second substrate spring member including a first planar section extending from a bottom edge of said front wall and a second planar section oriented parallel to said front wall, said first and second sections joined by a first radial section, said first substrate spring member further including a second substantially larger radial section extending from said second section and said second radial section including a contact surface located directly opposite of said first substrate spring member contact surface defining a substrate accepting area, said substrate accepting area arranged to compressively accept an edge of said substrate mechanically retaining said substrate to said terminating body, with one of said contact surfaces engaging said first termination pad electrically connecting said substrate to said terminating body.

4,629,268

TRAILER ELECTRICAL CONNECTOR

James W. Hiles, Tuttle, Okla., assignor to Del City Wire Co., Inc., Oklahoma City, Okla.

Filed Feb. 18, 1986, Ser. No. 830,343
Int. Cl.⁴ H01R *13/44*
U.S. Cl. 339—44 M **7 Claims**



1. A connector for retention in a bumper knock-out orifice to provide an electrical connection to a trailer apparatus, comprising:

plural lug members positioned in spaced alignment for inclusion as a group, each having an inner and an outer end;

plural insulated connector wires secured to respective plural lug member inner ends;

body means of unitarily molded formation for encapsulating said plural lug member group, said body means including a body front face that is essentially parallel to the plane of lug member outer ends and forming plural orifices for communication of said lug members to the exterior, and said body means including a mid-portion that has a periphery adapted for force-fit retention in said orifice; and

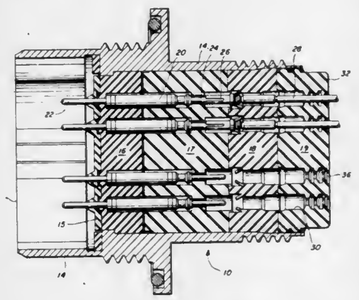
cap means to be removably secured over said body means front face and being retained by a strap and ring portion that is retentively affixed around said body means mid-portion.

4,629,269

ELECTRICAL CONNECTOR WITH ENVIRONMENTAL SEAL

William A. Kailus, North Riverside, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 82,491, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 845,187, Oct. 25, 1977, abandoned. This application Jun. 19, 1981, Ser. No. 275,411
Int. Cl.⁴ H01R *13/52*
U.S. Cl. 339—59 M **3 Claims**



1. In a conductor receiving assembly having a conductor receiving end for receiving, containing and coupling the extremity of a given length of at least one of a plurality of different conductors of substantially circular cross-section and including a contact member to an element contained within said

assembly, the minimum outside diameter and maximum outside diameter of any part of said given length of conductor not being less than a first diameter value and not in excess of a second larger diameter value respectively, a member for environmentally sealing said conductor receiving end prior to and following the insertion of a conductor through said conductor receiving end forwardly into said assembly, said member comprising:

an insert of elastic material such as an elastomer or the like affixed to said assembly and environmentally closing said conductor receiving end, said insert having at least one longitudinally extending pocket for forwardly receiving said given length of conductor;

said pocket extending from substantially the conductor receiving end of said conductor assembly forwardly through the insert for communicating with an element within said assembly remote from said conductor receiving end;

said pocket having at least one radially inwardly extending riser formed of said material defining a substantially circularly shaped constriction in said pocket, the diameter of said constriction being of a value less than said minimum diameter value by an amount which taken along with the elastic properties of said material will allow passage of said given length of conductor yet produce a gas seal between the outer surface of said conductor and the material defining said riser when said given length of said conductor is contained within said assembly;

said pocket having a substantially circular enlarged portion extending rearwardly from the rearward longitudinal extent of said riser to a given longitudinal position adjacent the conductor receiving end surface of said insert, the diameter of said enlarged portion at said given longitudinal position, being substantially larger than said second diameter value;

and a relatively thin membrane having a substantially uniform thickness over an area thereof equal to an area corresponding to said second diameter value affixed to said insert and sealingly closing said pocket at said given longitudinal position, said membrane being sufficiently thin to permit its puncturing when said conductor is inserted into said pocket, with the inner longitudinal displacement between the rearward longitudinal extent of said riser and said given longitudinal position of said membrane being such to define a space within said pocket sufficiently large to allow portions of said membrane, when punctured, to be contained therein and thereby prevented from being carried into portions of said pocket forward of the rearward longitudinal extent of said riser when said conductor is fully inserted into said assembly, said membrane being formed with a central section which is relatively thin compared to the surrounding membrane portions affixed to said insert so as to produce a central stress area tending to enforce puncturing of the membrane at its central portion without severing the membrane from the insert when punctured by said conductor.

4,629,270

ZERO INSERTION FORCE CARD EDGE CONNECTOR WITH FLEXIBLE FILM CIRCUITRY

Howard W. Andrews, Jr., Hershey; Clifford F. Bobb, Carlisle, both of Pa.; Robert F. Cobaugh, deceased, late of Elizabethtown, Pa. (by Jacqueline R. Cobaugh, executrix), and Attalee S. Taylor, Palmyra, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 630,923, Jul. 16, 1984, abandoned. This application Oct. 9, 1984, Ser. No. 658,943

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.[4] H01R *9/09*

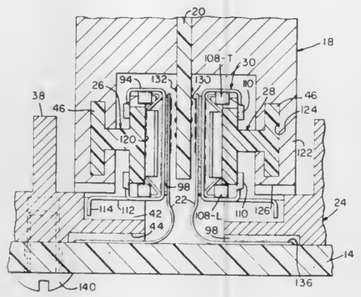
U.S. Cl. 339—75 MP **83 Claims**

1. A connector for electrically connecting the circuits on one side of a circuit card to circuits on a circuit board through circuits on a flexible film having some circuits thereon terminated to circuits on the board and further having at least one free side extending away from the board, comprising:

a. an elongated base member for mounting on a circuit board with a circuit card receiving space there alongside;

b. support means on the base member for supporting actuator means;

c. actuator means having cams thereon slidably mounted on the support means on the base member for longitudinal travel; and



d. a module having one surface for receiving a free side of a flexible film and one or more cam followers, the module being movably mounted so that the one surface faces the card receiving space and the one or more cam followers cooperate with the cams such that by moving the actuator means longitudinally, the module moves laterally towards and away from the card receiving space.

4,629,271

ELECTRICAL CONNECTOR FOR FLEXIBLE CIRCUIT BOARDS

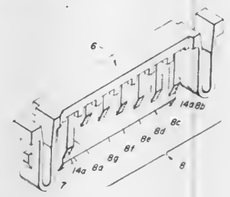
Yoshiyuki Awano, Kawasaki, Japan, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 628,699, Jul. 6, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 830,499

Claims priority, application Japan, Aug. 1, 1983, 58-118700[U]

Int. Cl.[4] H01R *9/07*

U.S. Cl. 339—75 MP **1 Claim**



1. An electrical connector for the purpose of terminating lead wires on flexible circuit boards consisting of a long and narrow, frame-shaped component formed of an electrical insulating material having insertion chambers set in a row in the direction of the length at equal intervals from each other, a resilient connecting component which is formed of a conductive resilient material that is inserted into and affixed in each insertion chamber and which holds the lead wires, a longitudinally extending pressure insertion component formed of an electrical insulating material having on one side surface a series of parallel dovetailing projections set like teeth of a comb in said pressure insertion component, said projections having lead in edges that fit into the insertion chambers of the frame-shaped component in positions corresponding to the insertion chambers and that hold the lead wires by affixing the resilient connecting component which holds the lead wire, the first and the last dovetailing projections of the series being substantially the same length which is longer than any of the other dovetailing projections of said series, said other dovetailing projections progressively descreasing in length so that the next longest projection is adjacent to said first projection and the shortest is adjacent the last projection, said first and last projections functioning as guides when the pressure insertion component is inserted into the frame-shaped component, and said other projections providing smooth insertion due to the sequential insertion of each of said other projections into its respective insertion chamber.

4,629,272

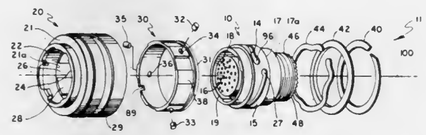
ELECTRICAL CONNECTOR ASSEMBLY WITH ANTI-ROTATION LATCH MECHANISM

William R. Mattingly, Santa Ana, and Roy Kroger, Norco, both of Calif., assignors to Matrix Science Corporation, Torrance, Calif.

Filed Apr. 4, 1985, Ser. No. 719,937

Int. Cl.[4] H01R *13/625*

U.S. Cl. 339—90 R **7 Claims**



1. An electrical connector assembly having a first member with a matrix of holes and a second member with a matrix of pins for being pressed into the matrix of holes, the connector aassembly comprising:

a cylindrical first shell defining a cylindrical passageway extending axially therethrough;

a shoulder band extending around the first shell, the shoulder band having disposed thereinto at least one helically shaped guideway;

a cylindrical drive sleeve having at least one cylindrical orifice extending radially therethrough, each cylindrical orifice radially aligned with one of the guideways;

a cylindrical roller rotatably positioned in each cylindrical orifice for extending through the orifice into engagement with the aligned guideway whereby rotational movement of the drive sleeve relative to the first shell causes the rollers to roll along the helical guideway for causing relative axial movement between the drive sleeve and the first shell for pressing the matrix of pins into the matrix of holes with increased mechanical advantage;

a coupling nut rotatably mated with the drive sleeve for causing the drive sleeve and coupling nut to rotate together;

a cylindrical second shell for insertion into the passageway of the first shell;

alignment means for aligning the drive sleeve and the first shell in a predefined fixed rotational orientation relative to each other when the second shell is not inserted relationship in the passageway, but enabling rotation of the drive sleeve relative to the first shell out of the predefined fixed rotational orientation when the second shell is positioned in the passageway.

4,629,273

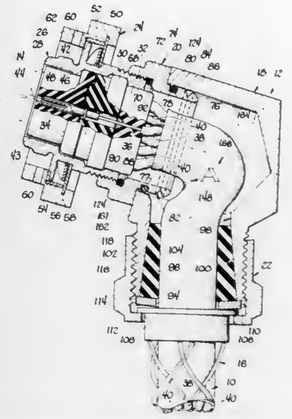
ELECTRICAL CABLE CONNECTOR ASSEMBLY

James L. Van Camp, 2490 Manila, Mt. Clemens, Mich. 48045

Continuation of Ser. No. 479,138, Mar. 28, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,370

Int. Cl.[4] H01R *4/00*

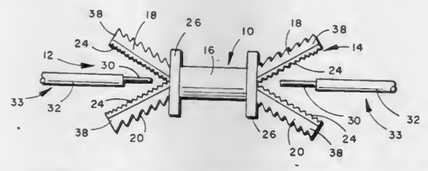
U.S. Cl. 339—94 M **15 Claims**



1. A cable connector assembly, comprising a unitary housing body, said housing body comprising a first housing body portion having a first functional end with a first opening formed therein, said housing body comprising a second housing body portion having a second functional end with a second opening formed therein, a passage means extending through said unitary housing body, said passage means comprising first and second passage portions in communication with each other, wherein said first passage portion extends through said first housing body portion as to operatively terminate in said first opening, wherein said second passage portion extends through said second housing body portion as to operatively terminate in said second opening, a continuous electrical cable member free of any discontinuity extending through said first and second passage portions and said first and second openings, said first and second openings being the only openings for said cable to extend therethrough, first retainer means for operatively securing a first portion of said continuous electrical cable member passing through said first opening to generally said first functional end, second retainer means for operatively securing a second portion of said continuous electrical cable member passing through said second opening to generally said second functional end, the respective axes of said first and second passage portions defining an included angle substantially greater than 90° and substantially less than 180°, wherein said second retainer means comprises a generally tubular member, wherein said tubular member is at least partially received within said second opening of said second functional end, wherein said continuous electrical cable member in passing through said second opening passes through said tubular member, and securing means for securing said tubular member to said second housing body portion, said securing means being carried by said second housing body portion in a manner as to be extending in a direction generally transverse to said second passage portion, said securing means also being effective to release said tubular member from said second housing body portion for enabling withdrawal of said tubular member therefrom while said securing means is still being carried by said second housing body portion, wherein said generally tubular member comprises cam surface means, wherein said securing means is effective upon being moved in said direction generally transverse to said second passage portion to operatively engage said cam surface means and urge said generally tubular member in a direction generally axially of said second passage portion as to thereby cause said tubular member to operatively

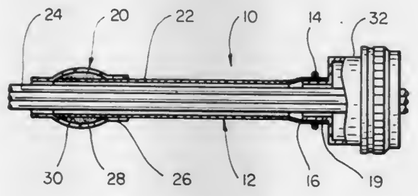
axially abut against said second functional end of said second housing body portion, wherein said cam surface means comprises an annular surface formed in and generally circumscribing said tubular member, wherein said annular surface comprises an annular camming surface portion generally circumscribing said tubular member, wherein said securing means comprises at least one threaded screw member operatively carried by said second housing body portion, wherein said at least one threaded screw member comprises an engagement portion effective to engage said camming surface portion and upon further threadable rotation of said at least one threaded screw member in a direction toward said camming surface portion further urge said tubular member operatively axially against said second functional end of said second housing body portion, and wherein said generally tubular member comprises a first threaded portion effective for connection to a second threaded portion of associated electrical terminal means situated externally of said unitary housing body.

4,629,274
ELECTRICAL CONNECTOR
Henry J. Pollock, 1726 6th St., Long Beach, Calif. 90802
Filed Oct. 1, 1985, Ser. No. 782,890
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—95 R **15 Claims**



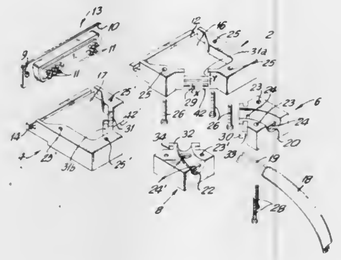
1. An electrical connector comprising an electrically insulating body, at least one pair of electrically insulating jaws diverging from said body and resiliently biased apart and having mutually facing surfaces and opposite back surfaces, wherein said back surfaces are configured with transverse sawteeth serrations sloping outwardly and away from said body, electrically conductive layers on said facing surfaces of said jaws defining transverse clamping serrations thereon, an annular clamping ring encircling said jaws and longitudinally moveable therealong in a direction away from said body to force said jaws toward each other, and an electrically conductive core within said body in electrical contact with said electrically conductive layers.

4,629,275
STRAIN-RELIEF ADAPTER FOR A CABLE OR HARNESS
Fred Maul, Milpitas, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed May 15, 1985, Ser. No. 734,635
Int. Cl.[4] H01R *13/56, 13/58*
U.S. Cl. 339—103 R **14 Claims**



1. Strain-relief adapter comprising:
a flexible, generally tubular body of braided nonmetallic filaments;
attachment means on one end of said tubular body for attaching said tubular body to a connector; and
a blocking sleeve on the other end of said tubular body for attaching said tubular body to a cable or harness, said blocking sleeve comprising a heat-shrinkable tube and an adhesive;
wherein said tubular body having a central portion, consisting only of said tubular body, extending between said attachment means and said blocking sleeve, said tubular body central portion providing strain relief and abrasion protection for a cable or harness.

4,629,276
MULTIDIRECTION CONNECTOR HOUSING
Donald M. Genaro, Hayworth, N.J.; Chris G. Johnson, New York, N.Y., and Alvin R. Tilley, Middletown, N.J., assignors to Henry Dreyfuss Associates, New York, N.Y.
Filed Sep. 10, 1985, Ser. No. 774,551
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—103 R **14 Claims**

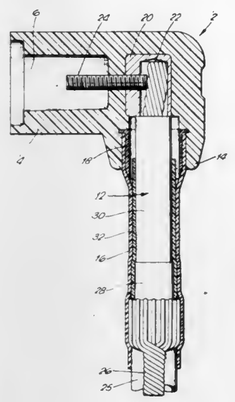


1. A a multidirection connector, comprising: a body portion, a strain relief portion, said body portion having an opening for receiving said strain relief portion and locking means internal to said body portion for locking said strain relief portion in at least four orientations within said opening, said strain relief portion being rotatable through 360° within said body portion, wherein said strain relief portion includes a cable passageway and wherein said body portion includes means for retaining a connector plug, and wherein the plane formed at the intersection of said body portion and said strain relief portion is at substantially 45° to the longitudinal axis of said body portion.

4,629,277
ELECTRICAL APPARATUS
Bodo Boettcher, Zorneding, and Werner Rupprecht, Tuerkenfield, both of Fed. Rep. of Germany, assignors to Raychem Corporation, Menlo Park, Calif.
Filed Sep. 20, 1984, Ser. No. 653,379
Claims priority, application United Kingdom, Sep. 22, 1983, 8325402
Int. Cl.[4] H01R *11/05*
U.S. Cl. 339—111 **10 Claims**

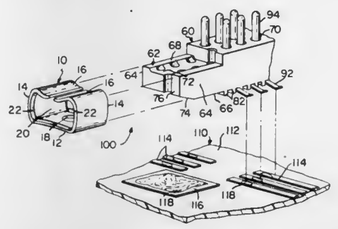
1. A connector arranged to connect a high voltage electric cable to electrial apparatus, the connector comprising an electrically insulating body having a first socket arranged to receive an electrical terminal of the apparatus, and a second socket arranged to receive a stripped end of the cable and comprising a non-recoverable portion which is integral with the first socket and a recoverable tubular end portion which is molded at one end thereof into the non-recoverable portion; and electrically conductive means arranged to provide a conductive path between the first and second sockets thereby, in

use, to provide electrical interconnection between the cable and the terminal of the apparatus, the electrically conductive



means being contained wholly within the insulating body of the connector.

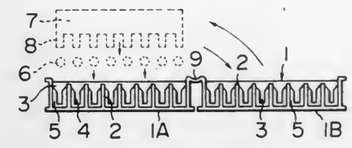
4,629,278
SURFACE MOUNTABLE CONNECTOR RETENTION MEANS AND METHOD
Jeffrey M. Norton, Loysville, and Shoji Yamada, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 15, 1985, Ser. No. 723,241
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—134 **34 Claims**



1. A retention means for securing an electrical connector to a printed circuit board comprising a clip having a board-proximate surface section, at least one side section extending upward from a respective lateral edge of said board-proximate surface section, and a resilient arm section extending inward from each said side section substantially parallel to and opposed from said board-proximate surface section, the bottom surface of said board-proximate surface section of said clip being adapted to be firmly securable by a joint to a cooperating surface portion of said board and capable of holding a cooperating flange of a connector engagingly and axially movably therewithin.

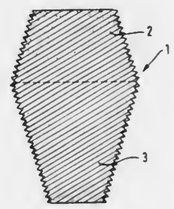
4,629,279
CONNECTOR HOUSING
Yasuo Nishikawa, Yokkaichi, Japan, assignor to Tokai Electric Wire Company Limited, Mie, Japan
Filed May 21, 1984, Ser. No. 612,358
Claims priority, application Japan, May 25, 1983, 58-79116[U]
Int. Cl.[4] H01R *13/514*
U.S. Cl. 339—210 M **4 Claims**

1. A connector housing divided by partition walls into a multiplicity of compartments arranged in a transversely extending single row, each of said compartments being sized for fitting a respective terminal therein, said terminals each defining a "U" shaped slot therein, said connector housing comprises a left-half portion and a right-half portion pivotably connected together through a hinge of a small thickness at adjacent edges of said portions, said portions defining open top ends at the tops of said compartments when said portions are in



an opened pivotal position, said portions being pivotal about an axis defined by said hinge which axis extends parallel to said compartments from said opened pivotal position to bring the two half portions into superimposed relation to arrange the compartments into two layers in a closed pivotal position wherein said open top ends of said compartments face each other when the portions are disposed in said superimposed relation.

4,629,280
JOINT THREADS CARBON ON GRAPHITE ELECTRODE
Jürgen Semmler, Donauwörth, and Günter Kraus, Ehekirchen, both of Fed. Rep. of Germany, assignors to Sigri GmbH, Meitingen, Fed. Rep. of Germany
Continuation of Ser. No. 625,719, Jun. 28, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 810,528
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324692
Int. Cl.[4] H01R *4/00*
U.S. Cl. 339—263 E **1 Claim**



1. Joint between sections of a carbon or graphite electrode, each said section having at its end face a tapered threaded socket with a double-conical threaded nipple with one cone half of the two cone halves of the threaded nipple shorter in height than the other cone half in the proportion of the heights of the shorter cone half to the longer cone half of 1:1.05 to 1:3 with the cone half having the smaller height being screwed firstly and the cone half having the greater height being screwed secondly into the sockets with the length of threaded engagement between the cone half of greater height and its respective socket greater than the length of threaded engagement between the cone half of smaller height and its respective socket providing contact areas about equal for both halves of the joint.

4,629,281

ELECTRIC CONNECTOR FOR COATED PRINTED CIRCUIT BOARDS

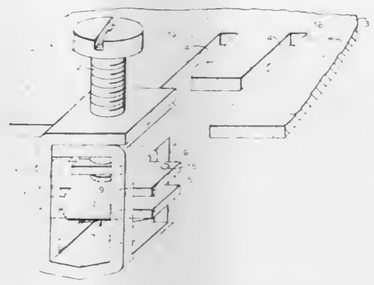
Peter Krüger, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 715,642

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412317

Int. Cl.⁴ H01R *4/36*

U.S. Cl. 339—272 R **13 Claims**



1. A connector for coated printed circuit boards, comprising a traction yoke; two contact plates positioned in said yoke; a connection plate-like portion connected with an upper one of said contact plates and located thereabove; and a clamping bolt; said contact plates with said connection portion being mechanically and electrically connected to each other so as to form a single unitary contact piece, said contact plates being arranged so that a printed circuit board is engageable at its edge between said plates and a lead can be inserted between a lower one of said contact plates and a bottom wall of said traction yoke, and said clamping bolt being rotatable so that during its rotation it is rotatably held in said connection portion of said contact piece, is supported on an upper contact plate of said contact piece, and draws said traction yoke towards said lower contact plate of said contact piece whereby said lead is clamped between said bottom wall of said yoke and said lower contact plate of said contact piece while said printed circuit board is clamped between said upper and lower contact plates of said contact piece.

4,629,282

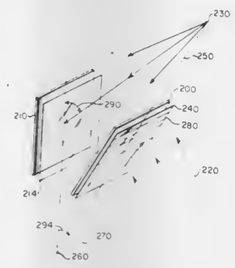
DIFFRACTIVE COLOR AND TEXTURE EFFECTS FOR THE GRAPHIC ARTS

Stephen P. McGrew, 1718 Columbus Pl., Santa Clara, Calif. 95051

Continuation-in-part of Ser. No. 203,563, Nov. 5, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 314,553

Int. Cl.⁴ G03H *1/20*

U.S. Cl. 350—3.7 **4 Claims**



1. A method of generating a diffractive pattern producing a predetermined color distribution for use in graphical compositions and decorative effects, comprising:

illuminating a random light diffuser with coherent light in a predetermined pattern of a substantial extent in one direction and a lesser extent in the direction perpendicular thereto;

interfering light diffused by said diffuser with a reference beam at a predetermined angle therefrom, said reference beam having a predetermined structure and being temporally coherent with respect to said coherent light; and

placing a photosensitive recording medium in the interference pattern formed by said diffused light and said reference beam to record said interference pattern, thereby forming a diffractive pattern which can widely diffuse light in said one direction and spectrally disperse light in said perpendicular direction.

4,629,283

OPTICAL FLAT BED SCANNING SYSTEM

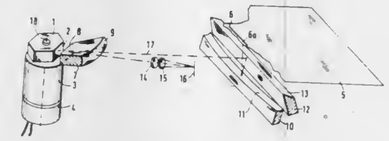
Michael Plaot, Eschborn, Fed. Rep. of Germany, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 31, 1985, Ser. No. 696,974

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404407

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.8 **6 Claims**



1. In an opto mechanical deflector employed to focus a parallel light beam onto a flat image plane, the deflector being of the type comprising at least one rotating scan mirror onto which the light beam impinges, is reflected and focused onto a flat image plane by reflection off a concave mirror positioned in proximity to the flat image plane, the improvement wherein a lens having a flat surface and a convex curved surface is positioned in the path of light reflected from the rotating scan mirror, between the scan mirror and the concave mirror, with the flat surface thereof facing the scan mirror and the curved surface facing the concave mirror and of a curvature such that the flat surface refracts the beam impinging thereon in a manner such that the beam exiting the lens is substantially perpendicular to the curved surface, whereby for a given resolution and line length the angle of deflection of the scan mirror is increased and the optical lever to the image plane shortened.

4,629,284

METHOD AND APPARATUS FOR CONNECTING OPTICAL FIBERS

Francois-Louis Malavieille, Paris, France, assignor to Alliance Technique Industrielle, Evry, France

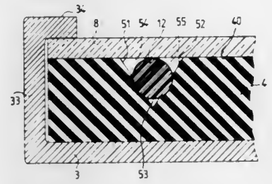
Filed Mar. 6, 1984, Ser. No. 586,748

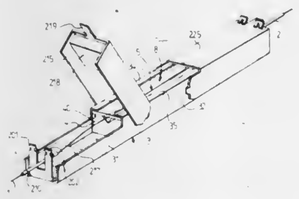
Claims priority, application France, Mar. 11, 1983, 83 04082; Apr. 20, 1983, 83 06499

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **34 Claims**

33. Apparatus for connecting optical fibers, the apparatus comprising firstly a support having at least one surface which is made of soft, elastically deformable material and which includes a groove with a groove defined wall in said surface suitable for receiving the ends of two optical fibers to be connected in end-to-end contact, and secondly a member which is kept bearing against the support surface and the groove-received ends of the optical fibers; the improvement wherein said member is rigid and comprises a polished bearing surface bearing against the said support surface and exerting a compression action on the said groove-received ends of the fibers, giving rise to radial reaction from the wall of the groove against the ends of the fibers, thus ensuring that the fibers are aligned, said apparatus including two clamps on opposed sides of the support for fixing the fibers relative to the support in a manner to ensure the fibers are urged towards each other to provide permanent axial thrust on the fibers and ensure that close contact is maintained over time between the end faces of





the fibers in the groove, each clamp comprising a block of soft material aligned with and longitudinally outward of said support surface groove, a stop outward of said block relative to said groove, said block of soft material, to the opposite side from said support, abutting axially against said stop, each clamp further comprising a hinged closure member including a second block of similar soft material which bears against the first-mentioned block in such a manner as to urge a fiber running between said blocks towards the groove in the support.

4,629,285

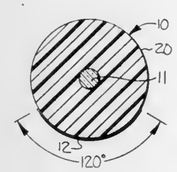
COLOR CODED OPTICAL FIBER WAVEGUIDES AND METHOD FOR COLORING SAME

R. Sykes Carter, and Earl M. Seagrave, both of Charlotte, N.C., assignors to Fusion UV Curing Systems Corporation, Rockville, Md.

Filed Feb. 21, 1984, Ser. No. 582,091

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **19 Claims**



1. A color coded optical fiber waveguide comprising an optical glass fiber, a protective coating surrounding the glass fiber, and an additional coating of colored UV cured ink applied to the protective coating and providing a visually distinguishable color identification code for the waveguide, said UV cured ink coating having a thickness of no more than about 20 percent of the waveguide diameter.

4,629,286

COATED OPTICAL FIBER CABLE STRUCTURE WHICH PREVENTS LONGITUDINAL CRACKS

Kenichi Fuse, and Yusei Shirasaka, both of Ichihara, Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

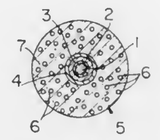
PCT No. PCT/JP83/00213, § 371 Date Jun. 5, 1984, § 102(e) Date Jun. 5, 1984, PCT Pub. No. WO84/00216, PCT Pub. Date Jan. 19, 1984

PCT Filed Jul. 5, 1983, Ser. No. 598,274

Claims priority, application Japan, Jul. 5, 1982, 57-101632[U]; Feb. 25, 1983, 58-26831[U]

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **1 Claim**



1. A coated optical fiber free of longitudinal cracks comprising:

(a) a core and a clad (**1**) around said core;

(b) a primary coated layer (**2**) and a silicon resin buffer layer (**3**) around the outer periphery of the optical fiber (**1**);

(c) a curable resin layer (**4**) around the outer periphery of the buffer layer (**3**);

(d) a reinforced thermosetting resin coated (**5**) around the outer periphery of the resin layer, said reinforced layer (**5**) including therein a multiplicity of elongated thin reinforcing fiber material (**6**) therein, said fiber material being selected from the group consisting of glass fiber, carbon fiber, aramide fiber, silica fiber, quartz fiber, and mixtures thereof, and, wherein the core has an outer diameter of between about 50 um to about 125 um, the reinforced resin layer has an outer diameter of between about 950 um to about 1 mm, and the buffer layer has a thickness of about 200 um or less with a Young's modulus of 30 kg/mm^2.

4,629,287

ULTRAVIOLET CURABLE BUFFER COATINGS FOR OPTICAL FIBER

Timothy E. Bishop, Des Plaines, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Feb. 25, 1985, Ser. No. 705,121

Int. Cl.⁴ G02B *6/00*; C08F *299/06*

U.S. Cl. 350—96.34 **16 Claims**

1. An ultraviolet curing liquid coating composition which, when cured with ultraviolet light in the presence of a photoinitiator sensitive to ultraviolet light, provides a buffer coating for optical glass fiber having adequate strength at room or expected elevated temperature and stability at such elevated temperature, at high index of refraction above 1.48, and a low tensile modulus which remains low to resist microbending difficulties down to around −60° C., said coating composition consisting essentially of a linear polyacrylate-terminated polyurethane oligomer in admixture with liquid linear aliphatic diacrylate in which the two acrylate groups are separated by a molecular weight of from 600 to 2500, said linear liquid diacrylate being present in an amount of from 5% to 50% of the composition and providing said coating composition with a viscosity suitable for coating application.

16. An optical glass fiber buffer coated with an ultraviolet-cured coating of the composition of claim 1.

4,629,288

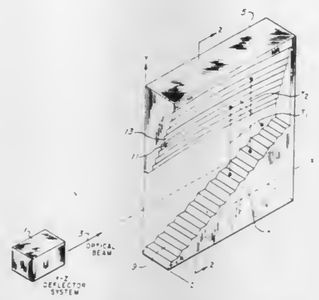
OPTICAL SPATIAL ADDRESS SYSTEM SUITABLE FOR FLAT PANEL DISPLAYS AND THE LIKE

Robert S. Wagers, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1983, Ser. No. 561,693

Int. Cl.⁴ G02B *27/14*

U.S. Cl. 350—171 **9 Claims**



1. An optical spatial address system, comprising:

(a) a source of a collimated light beam;

(b) deflection means to deflect said collimated light beam with two degrees of freedom; and

(c) light reflection means for directing said deflected light beam to a point in spaced defined by said deflection means, said reflection means including a member having a first set of light reflecting facets to reflect said deflected light beam from said source in a predetermined direction to a second set of light reflecting facets in said member to rereflect said deflected light beam to a predetermined location, said second set of facets disposed above said first set of facets and with increasing radius of curvature in a direction away from said first set of facets.

4,629,289

ELECTRIC CONTACT ARRANGEMENT FOR LIQUID CRYSTAL DISPLAY CELLS

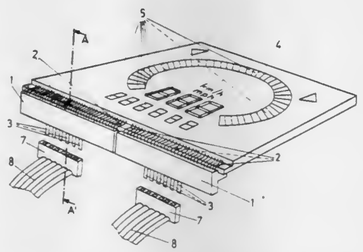
Peter Streit, Widen, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,316

Claims priority, application Switzerland, Mar. 31, 1983, 1792/83

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—336 **11 Claims**



1. An electric contact arrangement for a liquid crystal display cell having a liquid crystal display margin, an illumination zone, electrode segments and electrode tracks extending outwardly to edge surfaces of said liquid crystal display cell, comprising

at least one multipoint connector block provided at least at one of said edge surfaces of said liquid crystal display cell, said connector block being plugged into said edge surfaces,

a plurality of contacts extending from said one edge surface of said liquid crystal display cell into said multipoint connector block,

at least one integrated electronic circuit embedded in said connector block and connected to said plurality of contacts,

a plurality of external terminals connected to said electronic circuits within said connector block and extending from said connector block,

wherein said connector block extends along said edge surfaces for the length of the liquid crystal display margin and illumination zone, and

wherein said electronic circuits are located in the immediate vicinity of said plurality of contacts.

4,629,290

LIQUID CRYSTAL COMPOUNDS AND METHOD OF PREPARATION

Yoshio Shionozaki, and Hiroshi Mukai, both of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

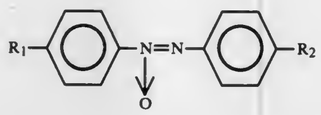
Filed Mar. 22, 1984, Ser. No. 592,497

Claims priority, application Japan, Mar. 22, 1983, 58-47737; Aug. 5, 1983, 58-122026

Int. Cl.⁴ G02F *1/13*; C09K *3/34*; C07C *105/00*

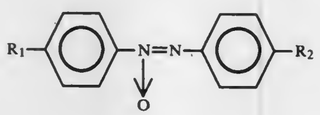
U.S. Cl. 350—350 R **20 Claims**

1. A substantially pure single position isomer of trans-4-4'-dialkyl-ONN-azoxybenzene having the general formula:



wherein R_1 and R_2 are straight-chain alkyl groups having from 1 to 10 carbon atoms and $R_1 \neq R_2$.

9. A liquid crystal display device, comprising two opposed substantially parallel substrates with liquid crystal electrodes selectively disposed on the interior surfaces thereof, liquid crystal composition in the space between the substrates, circuit means for generating signals to be selectively applied to the liquid crystal electrodes for rendering the liquid crystal composition between the electrodes visually distinguishable from the remaining liquid crystal composition, the liquid crystal composition comprising an effective amount of at least one substantially pure single position isomer of trans-4-4'-dialkyl-ONN-azoxybenzene having the general formula:



wherein R_1 and R_2 are straight-chain alkyl groups having from 1 to 10 carbon atoms and $R_1 \neq R_2$ for increasing the nematic temperature range of the liquid crystal composition.

4,629,291

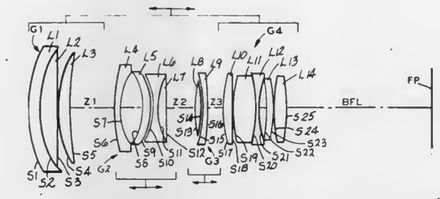
ZOOM LENS

Jacob Moskovich, Cincinnati, Ohio, assignor to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 189,591, Oct. 1, 1980, Pat. No. 4,462,664, which is a continuation-in-part of Ser. No. 82,010, Oct. 5, 1979, abandoned. This application Apr. 6, 1984, Ser. No. 597,539

Int. Cl.⁴ G02B *15/16*

U.S. Cl. 350—427 **10 Claims**



1. In a zoom lens having a range of equivalent focal lengths from a dimension below the diagonal of the image frame of the lens to substantially above, comprising from the object end, a first positive lens unit, a second negative lens unit, a third positive lens unit, and a fourth positive lens unit; at least two of said lens units being movable axially to vary the equivalent focal length of said lens, said second negative lens unit comprising from the object end a negative component, a positive component concave to the object end, and a negative doublet including a biconcave element and a positive element convex to the object end, said positive component being of substantially less optical power than said positive element of said doublet.

4,629,292

SMALL TELEPHOTO ZOOM LENS

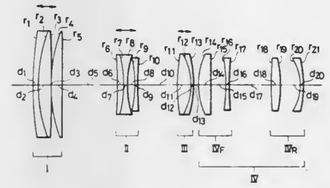
Yoshisato Fujioka, Higashikurume, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 566,436, Dec. 28, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 817,174

Claims priority, application Japan, Dec. 28, 1982, 57-227280

Int. Cl.⁴ G02B *9/64*

U.S. Cl. 350—427 **6 Claims**



1. A zoom lens comprising, in order from the object side, a magnification changing system which comprises a first group having a positive refractive power and being moved on the optical axis for focusing, a second group in the form of a variater having a negative refractive power and moving on the optical axis in zooming to principally convert the focal length and a third group in the form of a compensator having a positive refractive power to maintain constant an image plane varied by movement of the second group, and a fourth group in the form of a relay lens system next to said magnification changing system, said first group comprising a cemented converging lens composed of single lenses of opposite refractive powers disposed in order from the object side and a positive single lens, said second group comprising a cemented negative lens composed of a positive lens and a biconcave negative lens disposed in order from the object side and a negative single lens, said third group comprising a cemented converging lens component comprising a positive single lens and a negative single lens, said fourth group comprising a fourth group F composed, in order from the object side, a positive single lens with a strong convex surface directed towards the object and a negative single lens next thereto and a fourth group R composed of a positive single lens and a negative meniscus lens with a concave surface directed towards the object arranged in said order, characterized in that the zoom lens is satisfied with the following conditions:

$$1.2 < f_1/f_w < 1.7 \quad (1)$$

$$1.5 < f_4/f_w < 1.65 \quad (2)$$

$$1.1 < f_{4F}/f_4 < 1.8 \quad (3)$$

$$0 < f_{4R} \quad (4)$$

$$0.14 < d_{17}/f_4 < 0.26 \quad (5)$$

$$1 < r_{18}/|r_{19}| < 5 \quad (6)$$

where

f_w: shortest combined focal length

f_1: focal length of the first group

f_4: focal length of the fourth group

f_{4F}: focal length of the fourth group F

f_{4R}: focal length of the fourth group R

d_{17}: distance above axis between the fourth group F and the fourth group R

r_{18}: radius of curvature on the object side of the positive single lens of the fourth group R

r_{19}: radius of curvature on the image side of the positive single lens of the fourth group R.

4,629,293

ZOOM LENS SYSTEM

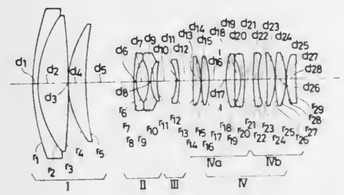
Shin-ichi Mihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,869

Claims priority, application Japan, Mar. 7, 1984, 59-41976

Int. Cl.⁴ G02B *15/14*

U.S. Cl. 350—427 **16 Claims**



1. A zoom lens system comprising a first lens group having a focusing function and positive power, a second lens group movable along the optical axis for zooming, and having a function to vary focal length of said zoom lens system and negative power, third lens group movable along the optical axis for zooming, and having a function mainly for maintaining image position constant and negative power, and a fourth lens group kept fixed and used as an relay lens, said fourth lens group consisting of a front subgroup comprising, in the order from the object side, at least three positive lens component and at least one negative lens component, and rear subgroup comprising two positive lens components, said zoom lens being so designed as to satisfy the following condition (1):

$$-0.15 < f_W/f_A < 0.5 \quad (1)$$

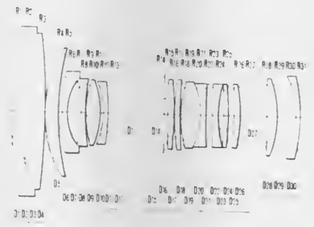
wherein the reference symbol f_W represents the shortest focal length of said zoom lens system and the reference symbol f_A

designates the total focal length of the system ranging from said first lens group to said front subgroup.

4,629,294
ZOOM LENS

Tsunefumi Tanaka, Kanagawa; Sadatoshi Takahashi; Nozomu Kitagishi, both of Tokyo; Keiji Ikemori, and Kikuo Momiyama, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,713
Claims priority, application Japan, Jul. 4, 1983, 58-122015
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 **4 Claims**

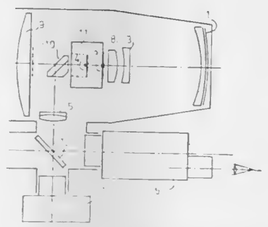


1. A zoom lens comprising,
from front to rear, a positive first lens component, a negative second lens component, a positive third lens component and a fourth lens component,
said first, third and fourth lens components being movable during zooming,
said zoom lens satisfying the following conditions:
$-3<\beta 3W<-0.2$
$-0.35<f3/f4<0.45$
$0.45<Z2/Z\leqq 1$
wherein $\beta 3W$ is the image magnification of said third lens component in the wide angle position, f3 and f4 are the focal lengths of said third and said fourth lens components respectively, Z is the zoom ratio of the entire system, and Z2 is that fraction of the zoom ratio which said second lens component assumes.

4,629,295
NIGHT VISION INSTRUMENT WITH ELECTRONIC IMAGE CONVERTER

Georg Vogl, Saltsjöbaden, Sweden, assignor to Simrad Optronics A/S, Oslo, Norway

PCT No. PCT/SE84/00254, § 371 Date Mar. 5, 1985, § 102(e) Date Mar. 5, 1985, PCT Pub. No. WO85/00433, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 6, 1984, Ser. No. 711,513
Claims priority, application Sweden, Jul. 7, 1983, 8303889
Int. Cl.[4] G02B *23/04, 23/05, 23/12*
U.S. Cl. 350—503 **3 Claims**

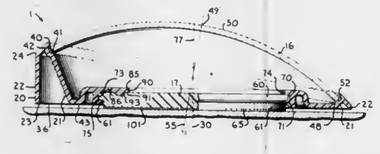


1. A night vision instrument having a first imaging system of field-glass type provided with a first entrance aperture at a front side end and an ocular at the other end for viewing a scene therethrough, and a second imaging system provided at its front end with a second entrance aperture larger than the first, and at the other end thereof a concave mirror for imaging light-rays from the scene, a light intensifier having an entrance surface for projecting a weak-light image thereto and an opposite exit surface for obtaining an intensified image of said weak-light image, and mirror means for projecting said intensified image into the ray-path of said first imaging system for viewing by said ocular of said first imaging system, wherein said concave mirror faces said entrance surface of said light intensifier, said exit surface thereof facing said second entrance aperture, and said mirror means catching said intensified image from the front side of said image intensifier.

4,629,296
ADJUSTABLE CONVEX MIRROR ASSEMBLY FOR A VEHICLE MIRROR

Russell L. White, Grandview, Mo., assignor to Peterson Manufacturing Company, Grandview, Mo.

Filed Apr. 13, 1984, Ser. No. 600,102
Int. Cl.[4] G02B *5/08, 5/10*
U.S. Cl. 350—624 **21 Claims**



1. An adjustable convex mirror assembly, adapted to be mounted on a motor vehicle, said assembly comprising:
(a) a housing;
(b) a mirror mounted on said housing;
(i) said mirror having a convex reflecting surface; and
(c) a swivel mechanism connected to and cooperating with said housing;
(i) said housing swivel mechanism having a substantially planar rear mounting surface for mounting said assembly on the vehicle;
(ii) said housing being rotatably connected to said swivel mechanism such that said housing has an axis-of-rotation associated therewith; said axis-of-rotation being generally perpendicular to said swivel mechanism rear mounting surface;
(iii) said mirror being asymmetrically positioned relative to said axis-of-rotation such that rotation of said housing results in movement of said convex mirror through a plurality of different reflective orientations;
(d) whereby rotation of said mirror housing permits selection of a field of view, as reflected by said convex mirror, to a viewer.

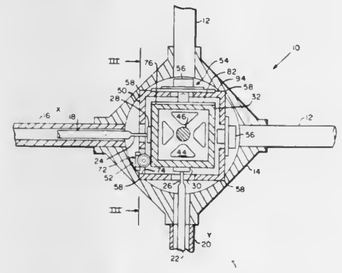
4,629,297
ACTIVE SECONDARY MIRROR MOUNT

Graham A. Horine, San Carlos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 24, 1985, Ser. No. 779,403
Int. Cl.[4] G02B *7/18, 5/10*
U.S. Cl. 350—632 **7 Claims**

1. An active secondary mirror mount for a telescope, said mount comprising:
a plurality of spider legs for holding said mount within said telescope;
a housing, said housing fixedly attached to said spider legs, said housing centered within a telescope tube of said telescope and having a void longitudinally therethrough;

an outer tube, said outer tube being square shaped and fixedly attached within said void to said housing;
an inner tube, said inner tube being square shaped and selectively positioned within said outer tube;
a pair of focus flexure retainers, said retainers being fore and aft, said retainers being fixedly attached to a fore and an aft end of said inner tube;
a pair of focus flexures, said focus flexures being aft and fore, said focus flexures fixedly held within said focus flexure retainers;
a linear focus actuator, said linear focus actuator fixedly attached to said aft focus flexure retainer, said linear actuator having an actuator shaft acting upon an aft sleeve held within said aft focus flexure;
a focus shaft, said focus shaft held within said aft sleeve, said focus shaft having an aft and a fore end;



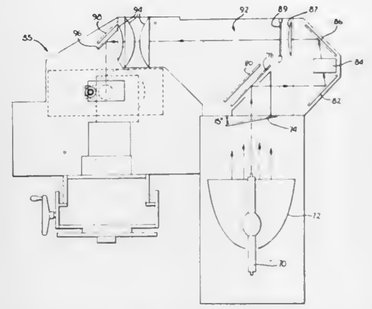
a secondary mirror holder, said secondary mirror holder fixedly attached to said fore end of said focus shaft, said fore end of said focus shaft passing through a fore sleeve of said fore focus flexure;
an X-axis actuating means for translating said inner tube;
a Y-axis actuating means for translating said inner tube;
roller flexures, said roller flexures connected to said outer tube and rotatably contacting said inner tube;
longitudinal flexures, said longitudinal flexures connected between said outer tube and said inner tube, said longitudinal flexures allowing limited relative movement between said outer and said inner tubes; and
distance sensing means, said distance sensing means for measuring the relative X-axis and Y-axis movement between said outer tube and said inner tube.

4,629,298
FLUX PROJECTOR FOR USE WITH COMPOSITE PHOTOGRAPHY

Donald Trumbull, Woodland Hills; Jonathan Erland; Stephen Fog, both of Los Angeles, and Paul Burke, Glendora, all of Calif., assignors to Apogee, Inc., Van Nuys, Calif.

Continuation of Ser. No. 637,613, Aug. 3, 1984, abandoned. This application Feb. 18, 1986, Ser. No. 830,446
Int. Cl.[4] G03B *21/26*
U.S. Cl. 353—30 **11 Claims**

1. A high power optical projector for generating and projecting light having narrow and specific spectral bands for use in composite photography comprising:
light generation means including a mercury-xenon discharge arc lamp for generating light having a plurality of narrow emission lines, said light generation means including a reflector surrounding said discharge lamp for focusing said light;
filtering means including a series of dichroic filters disposed in optical alignment with said light generation means for filtering out light falling outside a preselected range of wavelengths;
integrator means disposed in optical alignment with said filtering means for integrating said light and homogenizing said light such that the intensity of said light is substantially uniform across its projected field;
condensing means disposed in optical alignment with said homogenized light for condensing and tailoring the cross section of said beam such that said projected beam diverges at a preselected angle;
said integrator means matching the irradiance cone angle of

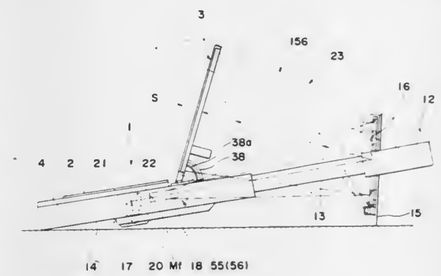


said discharge lamp reflector to the cone angle of said condensing means to provide maximum radiant transfer of said generated light;
beam splitter means in optical alignment with said condensed light and the viewing angle of a camera, such that said projected light and said camera are nodally coincident;
whereby light having desired wavelengths is projected.

4,629,299
MICROFORM-READER

Takeshi Okano, Nishinomiya; Sadaaki Nakaoka, Osaka, and Saichiro Ohashi, Otokuni, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1985, Ser. No. 769,917
Claims priority, application Japan, Aug. 28, 1984, 59-131160[U]
Int. Cl.[4] G03B *21/10*
U.S. Cl. 353—97 **2 Claims**



1. In a microform-reader in which an optical system is utilized for projecting on a screen a magnified reproduction of an image on a microfilm, said microform-reader comprising a casing; a moveable member supported by the casing for movement between retracted and extended positions; a viewing screen mounted on and supported by the casing for movement between folded and raised positions; an optical system for projecting the image onto the screen; a lamp for illuminating the image onto the screen; a reflecting mirror member supported for movement between laid-down and upright positions; and a foldable light-shielding hood provided for enclosing a space defined between the screen and the mirror member

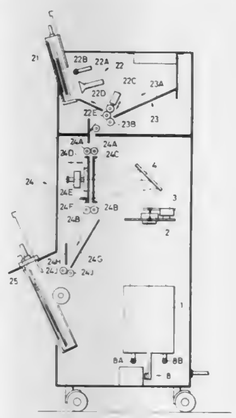
when said screen and said mirror member are held in the raised position and the upright position, respectively, the improvement wherein said foldable light-shielding hood comprises a generally rectangular hood body hinged at one end to the movable member for pivotal movement between closed and opened positions and a pair of generally sector-shaped, foldable side shields, each comprised of a plurality of side by side elongated foldable segments pivotally connected to said movable member for commonly pivoting about the pivot axis of the hood body, means extending along the length of the top and bottom edges of said folded side by side segments for effecting light sealing engagement between a bottom edge of one segment and the top edge of an adjacent segment and for causing automatically said segments for each side shield to unfold in sequence to assume a generally sector shape in response to the movement of the hood body from the closed position to the opened position thereby closing off a generally triangular opening delimited by the screen, the casing and the hood body.

4,629,300

SEPARATE-EXPOSURE PHOTOGRAPHING APPARATUS

Taizo Akimoto; Masahide Akisada; Takatoshi Seki; Norio Ookawa; Tatsuo Yoshino, and Yuji Takamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 477,461, Mar. 21, 1983, abandoned. This application Feb. 11, 1986, Ser. No. 828,579
Claims priority, application Japan, Mar. 21, 1982, 57-45305
Int. Cl.⁴ G03B *1/00, 29/00*
U.S. Cl. 354—76 **11 Claims**



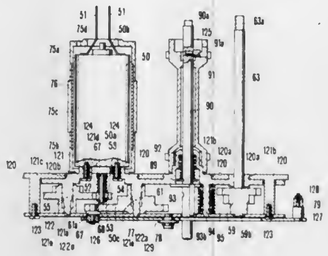
1. A separate-exposure photographing system comprising:
image display means for displaying an image to be photographed;
an optical system having a single mirror and a lens for projecting and focusing an image displayed on said image display means onto a film;
means to horizontally shift the position of said display unit and said optical system; and
a film feeder for vertically feeding film to be exposed by said optical system, comprising a film source magazine storing a number of film units, a temporary film storage member, means to remove film from said film source magazine, transfer it to said temporary film storage member,
a film exposure section receiving said projected and focus image from said optical system, means to supply a film unit from said magazine to said exposure section, a film unit receiver magazine to store exposed film units and means to transfer an exposed film unit from said exposure section to said receiver magazine.

4,629,301

CAMERA HAVING A MOTOR WINDING MECHANISM

Shosuke Haraguchi, Kanagawa, and Yoichi Tosaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 457,472, Jan. 12, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,183
Claims priority, application Japan, Jan. 20, 1982, 57-6999
Int. Cl.⁴ G03B *1/12*
U.S. Cl. 354—173.1 **2 Claims**



1. A camera having an electrically driven winding mechanism, comprising:
a camera body having a positioning part;
a first base plate which is positioned at said positioning part of said camera body and is fixed thereto, said first base plate having a motor mounting part and at least one shaft having a top end provided integrally therewith;
a second base plate spaced a distance from said first base plate attached to said camera body, said second base plate having at least one hole into which said top end of said shaft is inserted;
said shaft being arranged to accurately maintain the distance between said first base plate and said second base plate with said shaft being held against inclined displacement thereof by said insertion of said top end into said hole in said second base plate;
a driving motor which is mounted on said motor mounting part of the first base plate and is fixed thereto, said driving motor having a driving shaft which has at least a portion thereof located between said first base plate and said second base plate;
a first gear attached to said driving shaft; and
a second gear which is provided between said first base plate and said second base plate and at the same time at the shaft of said first base plate in a rotatable manner, said second gear being operatively associated with said first gear for transmitting the driving force of said driving motor.

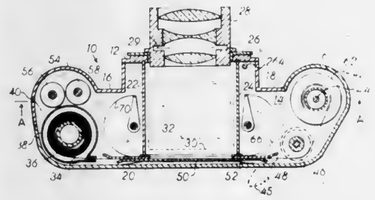
4,629,302

CAMERA WITH FOCAL PLANE SHUTTER APPARATUS

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Continuation of Ser. No. 438,815, Nov. 3, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,901
Int. Cl.⁴ G03B *9/28*
U.S. Cl. 354—242 **43 Claims**

1. A focal plane shutter apparatus for a camera, which camera has (a) a focal plane, (b) means for supporting a lens to form an image in the focal plane, (c) a generally flat member adjacent the focal plane having an exposure aperture therein which bounds the image-forming light path from a supported lens to a sensitive material supported at the focal plane, and further having a front surface facing the lens supporting means, and (d) a body structure which includes frame means for supporting said apparatus, said lens supporting means, and said member; comprising:
first and second flexible shutter blades for respectively uncovering and covering said aperture in sequence to make an exposure, each blade having a driven end and a free end opposite thereto for traversing a pre-travel distance, said aperture, and then a post-travel distance,
respective first and second shutter blade driving means bilaterally disposed in front of said member and adjacent the respective sides of said light path and supported by said frame means for limited rotation relative thereto,
respective shutter blade retaining means affixed on each of said driving means and extending radially therefrom, each retaining means having the driven end of the respective shutter blade rigidly affixed to the distal end thereof,
channel means for guiding and directing each of said blades in an arcuate path around their respective driving means and thence in a straight path across said aperture, said arcuate path having a radius generally equal to that of the distal ends of said blade retaining means,



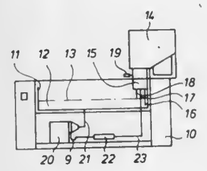
respective spring means for acting upon each of said driving means to first accelerate the respective shutter blade generally during said pre-travel of the free end of that blade, and then at least maintain the imparted velocity while the free end of that blade is traversing said aperture when making an exposure,
respective motion arresting means cooperating with each of said driving means to decelerate the respective shutter blade generally during said post-travel of the free end of that blade and smoothly stop all motion of the driving means and said respective blade,
winding means, operable after an exposure, for resetting said driving means and said spring means, and
respective latching and releasing means for each of said driving means.

4,629,303

PHOTOGRAPHIC PROCESSING APPARATUS

Ludovicus E. Vermarien, Kontich, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Nov. 12, 1985, Ser. No. 796,721
Claims priority, application European Pat. Off., Nov. 20, 1984, EP 84201671.9
Int. Cl.⁴ G03D *3/06*
U.S. Cl. 354—320 **9 Claims**



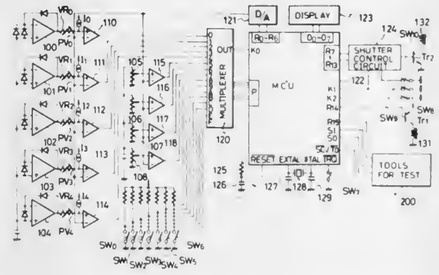
1. Photographic processing apparatus comprising a tray with means for transporting a photographic material through the tray, a holder for containing a supply of processing solution, pump means for maintaining a circulation of processing solution between said holder and said tray, and means for controlling the level of the liquid in the tray, characterized in that the holder for the processing solution is a disconnectable container which is arranged at a higher level than the one of the liquid in the tray and which is provided with a stop for closing a container opening that is turned downwardly as the container is fitted in place on the apparatus, said stop being provided with a first tube through which liquid can flow by gravity from said container into said tray, a second tube through which liquid can be pumped by said pump means upwardly into said container, a third tube extending downwardly from a position above that of the liquid in the container to the desired level of the liquid in the tray thereby to operate as a bird-fountain level control, and cock means by means of which the three tubes extending through the stop can be closed or opened.

4,629,304

TEST SYSTEM FOR CAMERA

Takashi Saegusa, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,225
Claims priority, application Japan, Sep. 20, 1983, 58-173662
Int. Cl.⁴ G03B *7/08, 7/091*
U.S. Cl. 354—432 **11 Claims**



1. A camera in which an object field is divided into a plural number of zones, the light on said respective zones is measured individually, and data corresponding to said outputs of the respective measurements are produced said camera comprising:
(a) means for storing said data;
(b) an input terminal for the input of a determined signal;
(c) means for generating a synchronizing signal;
(d) means for detecting the input of said determined signal to said input terminal and generating a detection signal when said input is detected;
(e) means for generating said data bit by bit serially in response to said detection signal and in synchronism with said synchronizing signal; and
(f) an output terminal electrically connected with said data generating means to output said data generated from said data generating means.

4,629,305

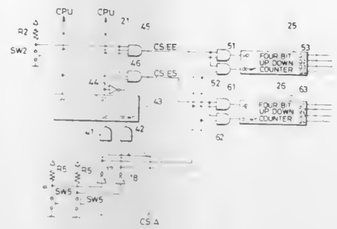
AUTOMATIC EXPOSURE CAMERA

Osamu Sato; Eiichi Tano, and Kiyoshi Negishi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,563
Claims priority, application Japan, Feb. 20, 1984, 59-29773
Int. Cl.⁴ G03B *7/097*
U.S. Cl. 354—442 **7 Claims**

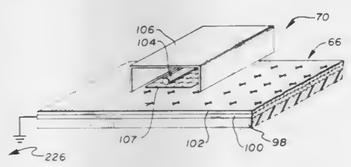
1. An automatic exposure camera, comprising:
an automatic/manual switch operated in association with a lens aperture ring to select one of an automatic aperture mode and a manual aperture mode for a lens of said camera;
a mode A counter responsive to said automatic/manual switch to be made active when the automatic aperture mode is selected by said automatic/manual switch;
a mode M counter responsive to said automatic/manual

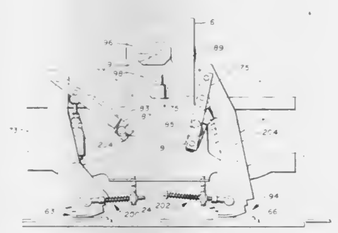
switch to be made active when the manual aperture mode is selected by said automatic/manual switch;
an up switch;
a down switch; and



means for selecting one of said mode A counter and mode M counter to count a signal from said up switch or down switch to set an exposure mode according to a count value thereof.

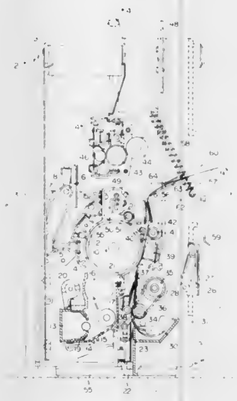
4,629,306
SYSTEM FOR FORMING PICTURE AND ALPHANUMERIC IMAGES ON THE SURFACE OF A PLASTIC CARD
Dennis J. Warwick, Richfield, Minn., assignor to Data Card Corporation, Minneapolis, Minn.
Filed Jul. 22, 1983, Ser. No. 516,548
Int. Cl.[4] G03G *21/00, 15/00*
U.S. Cl. 355—3 R **4 Claims**





1. In a system for applying data to a selected portion of a card including scanning means for scanning a modulated coherent light beam across an electrophotographic film to selectively expose the electrophotographic film which, after application of toner, forms a visible toner image on the film, image transfer means for bonding the visible image to the card, comprising:
platen means having an arcuate contact surface thereon and heater means for maintaining the contact surface of the platen means at an elevated temperature, the contact surface of the platen means constructed and arranged for applying sufficient heat and pressure to the film, toner image and card to fuse the toner image to the selected portion of the card as it is rolled across the selected portion of the card;
a linkage upon which the platen means is mounted including crank arm means connected at one end to a driven shaft rotatably mounted on a support frame;
film stripping means for applying a lifting force to the electrophotographic film adjacent the selected portion of the card after the toner image has been fused to the card and separating the film from the toner image and the card;
connecting link means having two ends pivotally connected at a first end thereof to the other end of the crank arm means;
rocker link means pivotally connected at one end to the support frame and pivotally connected at the other end thereof to the connecting link means between the first and second ends thereof, said crank arm means, connecting link means and rocker link means constructed and arranged for converting rotation of said driven shaft into a movement of the second end of the connecting link means over a closed path with at least a portion of the closed path being a substantially straight line; and
platen support arm means for supporting the platen means at one end thereof and having a longitudinal axis generally aligned with the radius of the curved platen surface, the platen support means pivotally coupled at the other end thereof to the second end of the connecting link means and constructed and arranged to roll the platen means across the selected portion of a card during the straight line portion of the path traced by the second end of the connecting link means and for withdrawing the platen means from the selected portion of the card during the remainder of path traced by the second end of the connecting link means.

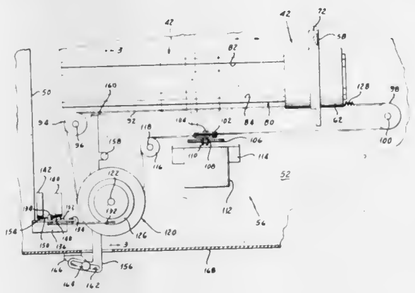
4,629,307
IMAGE FORMING APPARATUS WITH JAMMED PAPER ACCESS OPENING
Kiyoshi Miyai; Shuhei Uotani, both of Himeji, and Toyohiko Tsunemine, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jul. 1, 1985, Ser. No. 750,878
Claims priority, application Japan, Aug. 20, 1984, 59-172911
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



1. An image forming apparatus provided in a casing having relative to the operating position of said apparatus, top, bottom, front, back, and right and left side surfaces, said apparatus comprising:
a latent image holder;
a developing means which develops latent images formed on said latent image holder so as to form toner images thereon;
a transfer means for transferring said toner images formed on said latent image holder to a recording paper;

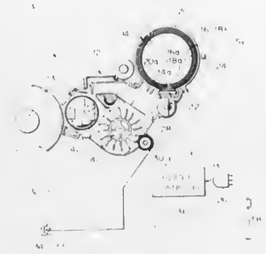
a fixing means for fixing onto said recording paper said toner images transferred to said recording paper by said transfer means, so that a portion along the bottom of said casing is used as a passing route for said recording paper, characterized in that
at the bottom of said casing an opening is formed having a larger length in the direction perpendicular to the passing direction of said recording paper than a width of said recording paper;
a handle(s) mounted on the front of said casing, said casing being adapted to be capable of standing on its back side, for permitting access to said opening in the bottom of said case for removal of jammed paper; and
guide means for said recording paper mounted within said casing above said opening, said guide means constituting a portion of said passing route and being rotatable toward said opening.

4,629,308
LENS AND SHUTTER POSITIONING MECHANISM FOR VARIABLE-MAGNIFICATION COPIER
Benzion Landa, Edmonton, Canada; Aron Shmaiser, Rishon-Le-zion, Israel, and Peter Feher, Johnson City, N.Y., assignors to Savin Corporation, Stamford, Conn.
Filed Jul. 6, 1984, Ser. No. 628,233
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—3 R **10 Claims**



1. Apparatus including in combination means forming an optical slit, a photosensitive member adapted to move past said slit, means including a movable optical element for forming an optical image of an original on said member, means for moving said optical element to a position corresponding to a desired magnification selected from a substantially continuous range, a cam, a follower having a region of contact with said cam, said cam being mounted for movement in a predetermined direction at said region of contact, said follower being mounted for movement into contact with said cam in a direction generally normal to said predetermined direction at said region of contact, said cam being so shaped that the displacement of said region of contact in said normal direction varies with the displacement of said cam in said predetermined direction, whereby movement of said cam in said predetermined direction produces a movement of said follower in said normal direction, means responsive to movement of said optical element for producing a proportional movement of said cam in said predetermined direction, and means controlled by said follower for adjusting the width of said slit.

4,629,309
DEVELOPER SUPPLY SYSTEM FOR DRY PROCESS ELECTROPHOTOGRAPHIC RECORDING APPARATUS
Moriyoshi Tsukano, Kawasaki, and Hisao Ishizu, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 26, 1984, Ser. No. 674,662
Claims priority, application Japan, Nov. 24, 1983, 58-181501[U]; Dec. 28, 1983, 58-248475
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—3 DD **9 Claims**

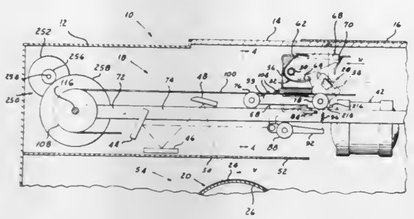


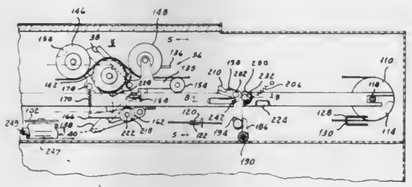
1. A developer replacing system in combination with a developing unit which uses a dual composition dry process developer made up of toner and carrier, comprising:
a developer outlet, developer discharging means having a conveying screw for discharging the developer from the developing unit through the developer outlet, a bottle located in a predetermined position adjacent to said developing unit and communicated with said developer outlet for receiving the discharged developer;
developer supplying means for supplying fresh carrier and fresh toner to the developing unit, comprising:
a toner cartridge for storing said toner and provided with a slot; a carrier cartridge for storing said carrier and provided with a slot; and cartridge casing means formed above and integrally with said developing unit for receiving said toner and carrier cartridges, said cartridge casing means having a slot which aligns with the received toner and carrier cartridge slots;
control means for controlling said developer discharging means and developer supplying means such that after the developer discharging means has discharged the developer from the developing unit, the developer supplying means supplies one of the toner and the carrier to the developing unit and, then, the other and
wherein the control means comprises a shutter for selectively opening the slot of the cartridge casing means to provide communication between an interior of any of the cartridges and an interior of the developing unit, a cartridge sensor for discriminating the carrier cartridge and the toner cartridge which are selectively loaded in the cartridge casing, a bottle sensor for sensing whether the bottle is placed in the predetermined position adjacent to the developing unit, and drive means for driving the shutter and screw in response to outputs of the cartridge sensor and bottle sensor.

4,629,310
OPTICAL SCANNING SYSTEM FOR VARIABLE-MAGNIFICATION COPIER
Benzion Landa, Edmonton, Canada; Oded Sagiv, Ramat-Gan; Aron Shmaiser, Rishon-Le-zion, both of Israel; Richard J. Bernhauer, Binghamton, and Peter Feher, Johnson City, both of N.Y., assignors to Savin Corporation, Stamford, Conn.
Filed Jul. 6, 1984, Ser. No. 628,239
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—8 **36 Claims**

1. An optical scanning system including in combination a first scanning element, means mounting said first element for

movement along a scanning path, a second scanning element, a pulley, means mounting said pulley on said second element for rotation relative thereto, means providing a surface for receiving said pulley to support said second scanning element for movement along said path, an elongated flexible member coupled to said first element, means for constraining a portion of the length of said flexible member into engagement with the periphery of said pulley, and means for tensioning said flexible member to move said elements along said path.





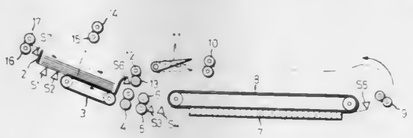
12. An optical scanning system including in combination a scanning element mounted for movement along a path, means for accelerating said element to a desired speed, a flywheel, means for driving said flywheel at a predetermined speed, and means operable only following the acceleration of said element to said desired speed for coupling said element to said flywheel.

4,629,311

AUTOMATIC DOCUMENT FEEDER

Tamaki Kaneko, Fujisawa, and Kunio Hibi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 7, 1984, Ser. No. 587,141
Claims priority, application Japan, Mar. 8, 1983, 58-36670
Int. Cl.⁴ G03G *15/04, 21/00*
U.S. Cl. 355—14 SH **2 Claims**



1. An automatic document feeder for an electrophotographic copying apparatus having a feeding tray for receiving a stack of document sheets with the first document sheet in a series to be copies being initially the lowermost sheet of the stack, feeding means for feeding to an exposing station one document sheet after another from the stack on the feeding tray starting with the lowermost document sheet, and returning means for returning the document sheets to the feeding tray and replacing the same as the uppermost document sheet on the feeding tray after they have been eposed at the exposing station,

wherein the improvement comprises:

a job sheet placed beneath the initial lowermost document sheet of the stack on the feeding tray and being the same size as the document sheets and having a sensed indicia portion thereon for distinguishing the job sheet from the document sheets and a control indicia portion for controlling a further operation of the document feeder and the copying apparatus;

sensing means located in a lower part of the feeding tray on which the stack of document sheets and the job sheet are placed for sensing the indicia portion of the job sheet; and

reading means located between the feeding means and the returning means for reading the control indicia portion on the job sheet;

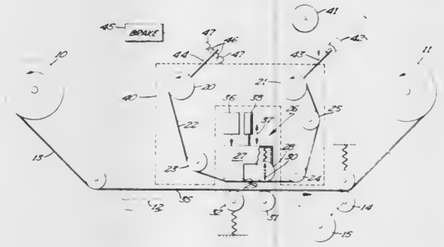
whereby said sensed indicia portion of said job sheet is sensed by said sensing means when it has been returned to the feeding tray and becomes located beneath the lowermost document sheet on the lower part of the feeding tray to thereby indicate completion of one series of copying, and said control indicia portion is read by said reading means to control a further operation of said document feeder and copying apparatus only when said sensed indicia portion is sensed by said sensing means.

4,629,312

THERMAL MARKING SYSTEM FOR PHOTOGRAPHIC MEDIA

Michael Pearce, Littleton, and D. Daniel Entingh, Denver, both of Colo., assignors to Lucht Engineering, Inc., Minneapolis, Minn.

Filed Oct. 2, 1985, Ser. No. 783,089
Int. Cl.⁴ G03B *29/00*
U.S. Cl. 355—29 **13 Claims**



1. In a photographic printer of the type wherein a web of photographic material is advanced to and from an exposure station by drive means and having means for selectively marking individual exposure areas of said photographic material, the improvement wherein said marking means comprises:

thermally activated marking tape means;

thermal print element means for selectively applying thermal energy to portions of said tape means; and

means establishing engagement between said photographic material and said tape means for driving said tape means past said thermal print element means on movement of said photographic material.

4,629,313

EXPOSURE APPARATUS

Akikazu Tanimoto, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 543,938, Oct. 20, 1983, abandoned.
This application Nov. 20, 1985, Ser. No. 800,094
Claims priority, application Japan, Oct. 22, 1982, 57-184443; Nov. 22, 1982, 57-204856; Mar. 7, 1983, 58-35737; Jul. 11, 1983, 58-125889; Jul. 22, 1983, 58-133691
Int. Cl.⁴ G03B *27/42*
U.S. Cl. 355—53 **25 Claims**

1. An exposure apparatus for producing ICs comprising:

(a) photoelectric converting means including a photosensitive surface formed with a plurality of elongated small openings extended in a first direction and arranged in a direction intersected said first direction, said converting means generating a light intensity signal corresponding to an intensity of a light passed through said plurality of small openings;

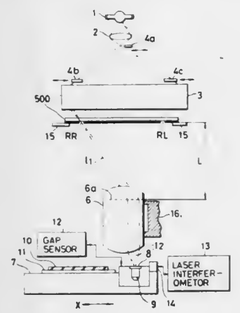
(b) a mask formed with a plurality of elongated marks extended in a second direction and arranged in a direction intersected said second direction;

(c) means for illuminating said mask;

(d) a focusing optical system for focusing an image of each of said marks on a given plane;

(e) means for arranging said photosensitive surface of said photoelectric converting means substantially perpendicular to an optical axis of said focusing optical system whereby said photoelectric converting means detects an intensity of a light from said mask through said focusing optical system;

(f) first moving means for moving the images of said plurality of marks and said photoelectric converting means relative to each other on a rectangular coordinate system



substantially perpendicular to the optical axis of said focusing optical system;

(g) second moving means for relatively moving the images of said plurality of marks and said photoelectric converting means in the direction of the optical axis of said focusing optical system;

(h) means for holding said mask in such a manner that said second direction in which the images of said plurality of marks extend substantially corresponds exactly with said first direction in which said plurality of small openings extend when said photosensitive surface substantially corresponds exactly with said given plane; and

(i) means whereby the images of said plurality of marks and said plurality of small openings are relatively moved by said first moving means at a plurality of relatively different positions of said photosensitive surface and said mark images in said optical axis direction of said focusing optical system so as to detect positions of said given plane in said optical axis direction of said focusing optical system in accordance with variations of said light intensity signal during said movements by said first moving means.

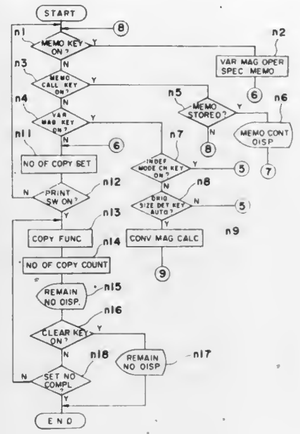
4,629,314

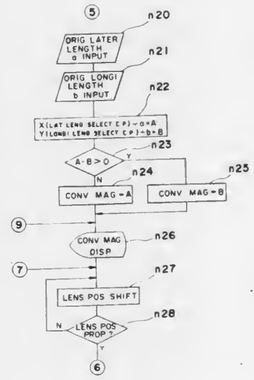
COPYING APPARATUS HAVING VARIABLE MAGNIFICATION OPERATION MEMORY FUNCTION

Shoichiro Yoshiura, Yamatokoriyama, and Haruyoshi Migita, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1985, Ser. No. 741,854
Claims priority, application Japan, Jun. 11, 1984, 59-121003
Int. Cl.⁴ G03B *27/52*
U.S. Cl. 355—55 **1 Claim**

1. A copying apparatus having a magnification converting function, which is so arranged that a ratio in length, of a lateral side to a longitudinal side is determined for a size of a definite shape copy paper sheet, and also, for a size of a definite or indefinite shape original document to be copied, said ratio being calculated so as to specify converted magnification from said calculation obtained, for copying said definite or indefinite shape original document onto said definite shape copy paper sheet on an enlarged or contracted scale, the improvement comprising:





memory means for storing variable magnification operation data of the original document size to be copied and for storing set copy paper sheet size and converted magnification; and

magnification converting means for effecting a magnification conversion based on said input and stored variable magnification operation data.

4,629,315

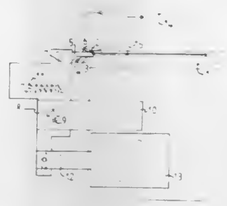
DEVICE FOR POSITIONING ORIGINALS IN SHEET FORM

Jan W. Bruggers, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Oct. 3, 1985, Ser. No. 783,947
Claims priority, application Netherlands, Oct. 10, 1984, 8403080
Int. Cl.⁴ G03B *27/62;* **B65H** *9/04*
U.S. Cl. 355—75 **4 Claims**

1. A device for positioning an original in sheet form on an

exposure table of a copying machine comprising a moveable ruler extending along an edge of the exposure table and a means for moving the ruler between a position in which an edge of the ruler extends upwardly from the exposure table to position and retain a sheet original arriving along the exposure table by its front edge and a position in which the sheet original is released so that it can be displaced in the direction of and



past the ruler, wherein the exposure table has a recessed part near the ruler such that the part of the ruler bearing the relevant retaining edge when in the position for retaining an original partly lies in the recessed part and so fits therein that the ruler lies against the upright wall of the recessed part directly adjoining the table surface and forms an edge which merges directly into the retaining edge projecting above the table surface.

4,629,316

ATTENUATION ACROSS OPTICAL FIBER SPLICE

Nelson M. Shen, San Jose, and Robert Zimmerman, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 25, 1983, Ser. No. 545,413
Int. Cl.[4] G01N *21/84*
U.S. Cl. 356—73.1 **16 Claims**



1. A method for determining attenuation across an optical fiber splice between a first fiber and a second fiber, comprising the steps of:

launching an optical signal into the first fiber;

positioning ends of the fibers in substantial axial alignment at a distance D_2 and measuring an optical power P_2 of an optical signal in the second fiber;

positioning the fiber ends in substantial axial alignment at a distance D_1 at which the fiber ends are positioned for splicing and measuring an optical power P_1 of an optical signal in the second fiber; and

calculating the attenuation from the formula

$$dB = 10 \log (P_1/RP_2)$$

wherein R is determined from P and P_R;

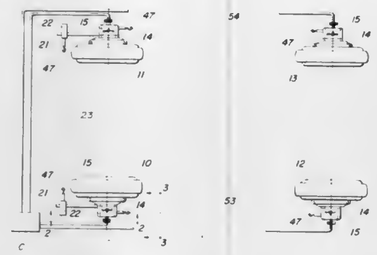
where P is an optical power of a second optical signal in a sample fiber and P_R is an optical power of the second optical signal in the sample fiber when two parts thereof are substantially axially aligned and are positioned at a distance D_3, the second signal being injected into the sample fiber, D_2 and D_3 being greater than D_1.

4,629,317

VEHICLE WHEEL ALIGNMENT APPARATUS

Daniel B. January, Bel-Ridge, and James R. Gender, Kirkwood, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Aug. 21, 1981, Ser. No. 294,830
Int. Cl.[4] G01B *5/275*
U.S. Cl. 356—155 **7 Claims**



1. A vehicle wheel alignment device, the device being carried on a vehicle wheel and comprising:

(a) first support means carried by the vehicle wheel in a position to represent an alignment characteristic of the wheel;

(b) second support means carried by and movable relative to said first support means about an axis such that said first and second support means are able to undergo relative angular displacement about said axis;

(c) windowed mask means carried by one of said support means;

(d) a pair of radiant energy beam receivers and a radiant energy beam emitter carried by different ones of said support means, and said receivers and emitter being on opposite sides of said windowed mask;

(e) baffle means between said mask and emitter and in position for shielding said receivers from ambient light; and

(f) means on said second support means adapted for retaining said second support means in a set position independent of the wheel and relative to the position of said first support means which represents the wheel alignment characteristic, the alignment characteristic of the wheel determining the alignment of the emitter beam axis relative to said pair of radiant energy receivers, and said windowed mask determining the relative exposure of each receiver of said pair of radiant energy receivers in response to the angular displacement between said first and second support means.

4,629,318

MEASURING DEVICE FOR DETERMINING CRACKS

Samir Malek, Schwanewede-Leuchtenburg, and Bernd Hofer, Lemwerder, both of Fed. Rep. of Germany, assignors to VFW GmbH, Bremen, Fed. Rep. of Germany

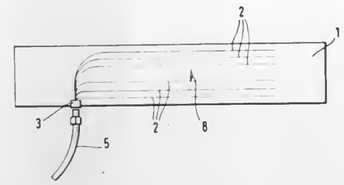
PCT No. PCT/DE82/00069, § 371 Date Oct. 22, 1982, § 102(e) Date Oct. 22, 1982, PCT Pub. No. WO82/03454, PCT Pub. Date Oct. 14, 1982
PCT Filed Feb. 25, 1982, Ser. No. 438,864
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111858; Oct. 26, 1981, 3142392; Feb. 25, 1982, 3206656
Int. Cl.[4] G01B *11/16*
U.S. Cl. 356—237 **15 Claims**

1. Measuring device for determining cracks in test objects by means of a crack detector which includes light conducting fibers comprising,

said fibers being pasted to the test object and having interruptions in similar levels;

photo detector means connected to ends of the fibers for producing a signal for indicating a crack in the case of occurrence of cracks;

the light conductive fibers as pasted upon the test object being supplied with light from a light coupler constructed for supplying the several fibers with light through the



interruptions and including a deflector that provides for scanning of the interruptions of the fibers; and

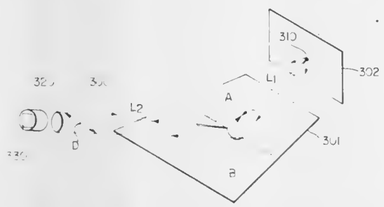
an evaluating circuit connected to the photo detector means for producing an indication of the crack progression.

4,629,319

PANEL SURFACE FLAW INSPECTION

Donald A. Clarke; Rodger L. Reynolds, both of Windsor, and Timothy R. Pryor, Tecumseh, all of Canada, assignors to Diffracto Ltd., Windsor, Canada

Filed Feb. 14, 1984, Ser. No. 579,971
Int. Cl.[4] G01N *21/88*
U.S. Cl. 356—237 **58 Claims**



1. A method of inspecting a surface comprising the steps of:

illuminating an extensive area of the surface by directing light onto the surface area in such a manner that light is reflected therefrom;

providing a retroreflective member comprising a large number of small retroreflective elements in a position such that light reflected from the extensive illuminated surface area impinges thereon, is then returned to the illuminated surface area, and is re-reflected therefrom;

imaging light re-reflected from the extensive illuminated surface area; and

detecting dark or bright areas in the imaged light, the dark or bright areas being indicative of a characteristic of the extensive illuminated surface area.

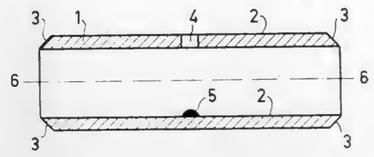
4,629,320

CUVETTE FOR THE ATOMIC ABSORPTION SPECTROMETRY

Bernhard Lersmacher, Aachen, Fed. Rep. of Germany, and Wilhelmus F. Knippenberg, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1983, Ser. No. 473,380
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208247
Int. Cl.[4] G01N *21/03*
U.S. Cl. 356—244 **5 Claims**

1. In a cuvette for atomic absorption spectroscopy comprising a basic hollow member of pyrolytic graphite, wherein said member has been treated at least exteriorly by a local mechani-



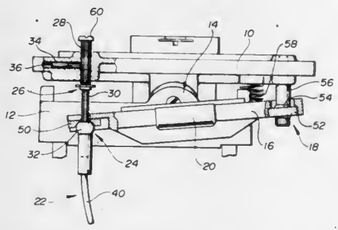
cal abrasion, the improvement comprising a final cuvette consisting of said treated member.

4,629,321

GRADE SETTING AND CALIBRATION ARRANGEMENT FOR LASER BEAM PROJECTION DEVICE

Edward E. Hart, Springfield, and Ted L. Teach, Dayton, both of Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 27, 1985, Ser. No. 781,095
Int. Cl.[4] G01C *9/00*
U.S. Cl. 356—248 **18 Claims**



1. An arrangement for use in a light beam projection device for controlling the orientation of a support frame associated with a light beam source, comprising:

a base frame,

a support frame,

a pivot means for pivotally mounting said support frame on said base frame,

level arms means, pivotally supported at one point by said support frame, for providing an electrical indication of orientation such that said level arm means may be moved to a reference orientation, and

positioning means, engaging said support frame and said level arm means at a point spaced from the point at which said level arm means is pivotally supported by said support frame, said positioning means including

a threaded shaft having a first threaded portion engaging said support frame,

means for resisting rotation of said shaft with respect to said support frame,

a nut contacting said level arm means and holding said level arm means in a selected orientation with respect to said support frame, said nut engaging a second threaded portion of said shaft having a different thread pitch than said first threaded portion, whereby rotation of said threaded shaft with respect to both said support frame and said level arm means results in fine adjustment in the relative position thereof for purposes of calibration, and

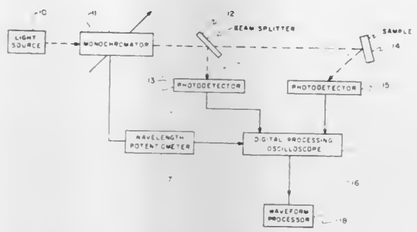
adjustment means for rotating said nut to produce coarse adjustment in the relative position of said support frame and said level arm means.

4,629,322

MATERIAL ANALYSIS USING REFLECTED LIGHT

John H. Pollard, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,893
Int. Cl.⁴ G01J *3/42*
U.S. Cl. 356—300 **1 Claim**



1. A method for quantitively dry testing a sample of ternary compound of the form $A_xB_{1-x}C$ which includes the steps of:

directing a variable wavelength light beam onto a surface of said compound;

varying the wavelength of said light beam in a predetermined manner;

detecting the reflectance of light from said surface as said wavelength is varied and plotting a graph thereof;

replotting said graph as a graph of reflectance versus photon energy of the light; and

determining the longest wavelength peak of said reflectance versus photon energy graph whereby the photon energy of said longest wavelength is designated E_1; and

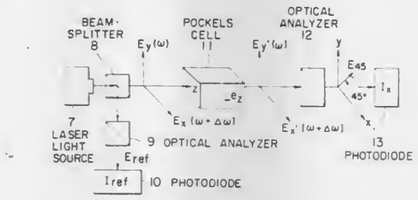
computing x from the equation $E_1=a+bx+cx^2$, wherein a, b, and c are predetermined constants for the compound.

4,629,323

BIREFRINGENCE TYPE MEASURING DEVICE

Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 18, 1983, Ser. No. 514,658
Claims priority, application Japan, Jul. 23, 1982, 57-127658
Int. Cl.⁴ G01N *21/21*
U.S. Cl. 356—365 **7 Claims**



1. A measuring device utilizing birefringence effect comprising:

means for producing laser light having two components of a first frequency and a second frequency, which are polarized in directions perpendicular to each other;

birefringence means comprising an electro-optical device provided to receive said laser light and to deliver an output laser light having first and second components, said components having a phase difference varied in accordance with an electric field to be measured;

an optical analyzer provided to receive the optical output of said birefringence means and to extract a component polarized in a predetermined direction;

a photoelectric converter for converting said extracted component of said light output into an electric signal having a frequency corresponding to a difference between said first and second frequencies and being phase modulated by said phase difference varied in accordance with the electric field to be measured;

means for extracting one portion of said laser light delivered from said laser light producing means, and for converting said one portion of laser light into a reference electric signal; and

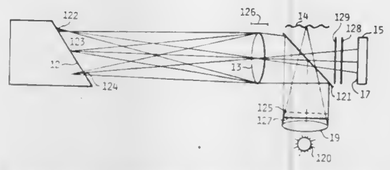
processing means for comparing said phase-modulated electric signal delivered from said photoelectric converter with said reference electric signal so as to produce an output representing said phase difference corresponding to the electric field.

4,629,324

ARRANGEMENT FOR MEASURING DEPTH BASED ON LENS FOCUSING

Howard Stern, Greenlawn, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,687
Int. Cl.⁴ G01B *11/24*
U.S. Cl. 356—376 **5 Claims**



1. A method of obtaining more than one three-dimensional measurement point on an object, which may be devoid of surface detail, without moving the object or measurement optics comprising the steps of: projecting a pattern of light with a projector from a light source; imaging reflected light from said pattern with a lens on a light sensitive detection surface; said image being sharply focused within a narrow object plane; calibrating by a computer the image of each unique location of the sharply focused narrow object plane; storing the calibration data in a memory; adjusting said object plane focal distance by said lens to intersect the surface of an object to be measured at an intersection, said intersection containing more than one detectable point on said object; processing the received image by said computer to determine in-focus regions; and converting said in-focus region information by said computer into three-dimensional measurement information from said calibration data.

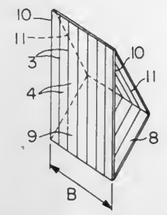
4,629,325

LEADING MARK INDICATOR

Lars A. Bergkvist, Själevad, and Ivan Forsen, Sidensjö , both of Sweden, assignors to Inogon Licens AB, Själevad, Sweden

PCT No. PCT/SE82/00270, § 371 Date May 3, 1983, § 102(e) Date May 3, 1983, PCT Pub. No. WO83/01106, PCT Pub. Date Mar. 31, 1983
PCT Filed Aug. 25, 1982, Ser. No. 495,357
Claims priority, application Sweden, Sep. 16, 1981, 8105509
Int. Cl.⁴ G01C *5/00, 21/00;* G02B *27/60*
U.S. Cl. 356—399 **4 Claims**

1. An instrument for indicating a definite direction comprising, a front screen and a rear screen located behind the front screen, a plurality of opaque lines on said screens, said lines having the same width in both screens and being separated by transparent interstices to produce an interference moire pattern when the instrument is viewed by an observer, the spacing distance between the lines on one screen being different than the spacing distance between the lines on the other screen, the transparent interstices within each screen having the same width, at least one of said screens being bent generally centrally to form an obtuse angle, said bend dividing said screen in two screen portions, said two screen portions each being non-parallel to said other screen, the number of opaque lines on one screen being one more than the number of opaque lines on the other screen, wherein in the screen having one more opaque line the width of a transparent interstice plus the width of an opaque line is greater than or about equal to 1.5 times the width



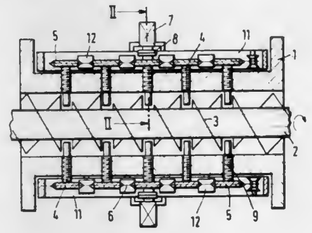
of the opaque line but less than about 1.9 times the width of the opaque line, said screens being positioned laterally generally symmetrically in relation to each other, and a central opaque line of one screen laterally generally symmetrically overlapping a central transparent interstice of the other screen, whereby when the instrument is viewed in a plane perpendicular to said screens one interference band only is observed.

4,629,326

PIN-BARREL EXTRUDER HAVING ADJUSTABLE PINS

Felipe Huls, Pattensen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,158
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506424
Int. Cl.⁴ B29B *1/06;* B01F *7/08*
U.S. Cl. 366—80 **7 Claims**



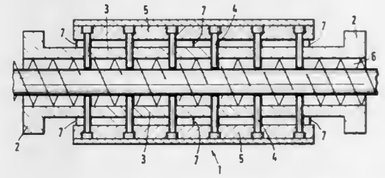
1. A pin-barrel extruder suitable for processing rubber, or thermoplastics materials, for removing liquids from liquid-solid mixtures and for pulping wood substances, comprising hollow cylindrical barrel means, said barrel means comprising a radially inner surface and a radially outer surface, screw means rotatable in said hollow cylindrical barrel means, said screw means comprising a core portion and at least one flight portion helically disposed around said core portion, said at least one flight portion being discontinuous, said barrel means defining radially directed throughbores extending from said radially outer surface to said radially inner surface, said throughbores being distributed both around the periphery of said barrel at substantially uniform intervals and in axially aligned rows along the length of said barrel, pin means disposed in said throughbores, said pin means including opposed first and second end regions, said first end region of said pin means being directed radially inwardly towards the longitudinal axis of said core of said screw means and projecting into said hollow cylindrical barrel means to adjacent said core through said discontinuous portions of said at least one flight, and adjusting means for adjusting the depth of penetration of said pin means into said hollow cylindrical barrel means, wherein said adjusting means comprises sprocket or chain wheel means non-rotatably mounted on said second end region of said pin means and wherein each said pin means includes a threaded portion threadably locatable in said barrel, said adjusting means further including at least one chain drive means driving at least two of said chain wheels or sprockets so as to cause rotation of said pins thereby causing adjustment of the depth of penetration of said pins into said barrel.

4,629,327

PIN-BARREL EXTRUDER HAVING ADJUSTABLE PINS

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,159
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3502910
Int. Cl.⁴ B29B *1/06;* B01F *7/08*
U.S. Cl. 366—80 **3 Claims**



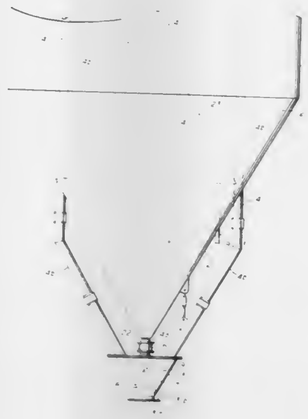
1. A pin-barrel extruder suitable for processing rubber, thermoplastics materials and the like, comprising hollow cylindrical barrel means, said barrel means comprising a radially inner surface and a radially outer surface, screw means rotatable in said hollow cylindrical barrel means, said screw means comprising a core portion and at least one flight portion helically disposed around said core portion, said at least one flight portion being discontinuous, said barrel means defining radially directed throughbores extending from said radially outer surface to said radially inner surface, said throughbores being distributed both around the periphery of said barrel at substantially uniform intervals and in axially aligned rows along the length of said barrel, pin means disposed in said throughbores, each said pin means defining first and second end regions, said first end region being directed radially inwardly towards the longitudinal axis of said core of said screw means and projecting into said hollow cylindrical barrel means to adjacent said core through said discontinuous portions of said at least one flight, and adjusting means for adjusting the depth of penetration of said pin means into said hollow cylindrical barrel means acting on said second end region of said pins wherein said adjusting means comprises rail or bar means detachably affixed to said second end region of at least two said pins in a said axially aligned row with said rail or bar means being disposed radially outwardly of said radially outer surface of said extruder barrel and extending parallel to the longitudinal axis of the barrel and actuating means for said adjustment means acting on said bar or rail means to cause said bar or rail means to be displaced relative to said barrel in the direction of the longitudinal axis of said pins detachably affixed thereto.

4,629,328

GRAVITY BLENDING APPARATUS AND METHODS OF GRAVITY BLENDING

William F. Revelt, Bay City; John B. Prows, Orange, both of Tex.; Fred M. Thomson, Wilmington, Del., and Hugh E. Avery, Hitchcock, Tex., assignors to Allied Industries, Inc., Houston, Tex.

Filed Aug. 29, 1985, Ser. No. 770,735
Int. Cl.[4] B01F *5/00*
U.S. Cl. 366—177 **10 Claims**



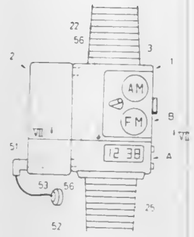
1. A gravity blender apparatus comprising:
bin means operable to store a mass of particulate material;
collecting chamber means disposed generally beneath said bin means;
a plurality of conduits extending between and communicating with each of said bin means and collecting chamber means and operable to convey particulate material from said mass to said collecting chamber means, with said plurality of conduits including
a central conduit located generally centrally of said collecting chamber means,
a vertically adjustable lower terminus extending from said central conduit into said collecting chamber means, and
adjusting means operable to adjust the elevation of said lower terminus within the interior of said collecting chamber means,
inverted cone blending means located within said collecting chamber means and having an upwardly facing apex positioned beneath said lower terminus of said central conduit, with
the distance between said lower terminus and said apex being operable to be varied by said operation of said adjusting means; and
venting means providing gas communication directly between the underside of said inverted cone blending means and a zone of reduced pressure generally above particulate material within said collecting chamber means, with said venting means including a vent conduit intersecting a lower wall portion of said inverted cone blending means and providing a gas transmission path extending from the underside of said inverted cone blending means and operable to communicate with the exterior of said collecting chamber means.

4,629,329

ELECTRONIC WRISTWATCH

Katsuhiko Komiyama, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,215
Claims priority, application Japan, Apr. 26, 1984, 59-84984
Int. Cl.[4] G04B *47/00*
U.S. Cl. 368—10 **13 Claims**



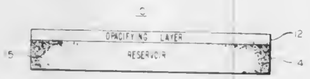
1. An electronic wristwatch, comprising:
a main unit including,
an electronic timekeeping unit,
first battery means for powering said electronic timekeeping unit, and
a secondary electronic unit to perform at least one function other than timekeeping;
an auxiliary unit including a second battery means for powering said secondary electronic unit;
coupling means for detachably physically coupling said auxiliary unit and said main unit; and
terminal means for electrically connecting said secondary electronic unit to said second battery means.

4,629,330

COLOR-CHANGE INDICATOR

Larry D. Nichols, Arlington, Mass., assignor to Moleculon Research Company, Cambridge, Mass.

Filed Mar. 14, 1985, Ser. No. 711,634
Int. Cl.[4] G04F *1/00*; G01K *1/02*
U.S. Cl. 368—89 **34 Claims**



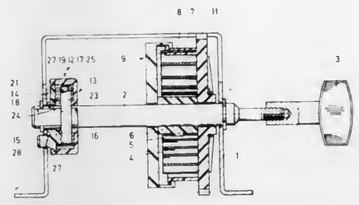
1. A color-change indicator comprising:
a liquid having a predetermined index of refraction and rate of evaporation;
a reservoir for holding said liquid; and
an opacifying layer of microporous material having an index of refraction approximately the same as that of the liquid, said opacifying layer overlying the reservoir and having an open-cell network of pores for absorbing the liquid from the reservoir, and said opacifying layer being in a first scattering condition for incident radiation when said liquid occupies said opacifying layer and in a second scattering condition when said liquid is depleted from said opacifying layer.

4,629,331

WINDABLE CLOCKWORK FOR A METRONOME

Fritz Härle, Isny, Fed. Rep. of Germany, assignor to Rudolph Wittner GmbH & Co., Isny, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 786,055
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440264
Int. Cl.[4] G04B *5/00*
U.S. Cl. 368—147 **3 Claims**



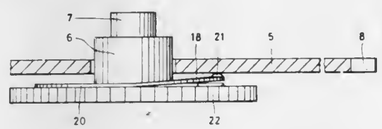
1. A windable clockwork for a metronome including a clockwork frame, a stem rotatably connected with the frame, a spiral spring connected with the stem, a housing enclosing the spring, and a blocking mechanism for preventing the stem and spring from reverse motion during winding of the clockwork, the blocking mechanism comprising
(a) a pair of blocking members formed of synthetic plastic material, one of said blocking members including a boss for connecting said one member with the stem and the other of said blocking members including pin means for stationarily connecting said other member with the frame; and
(b) interlocking detent means for rotatably connecting said blocking members in coaxial relation;
(c) said blocking members including
(1) a locking disc, including
(i) an integral peripheral wall housing portion; and
(ii) at least two radially inwardly directed teeth defining stops in said peripheral wall portion; and
(2) a spring disc arranged within said locking disc peripheral wall housing and including radially outwardly directed resilient tongue means arranged adjacent said locking disc teeth, said tongue means gliding past said stops during rotation of the stem in one direction and abutting one of said stops to arrest rotation of the stem in the opposite direction.

4,629,332

TIMEPIECE WITH A QUARTZ WATCH MOVEMENT AND AN ELECTRICALLY CONTROLLED SOUND GENERATOR

Paolo Spadini, 26, quai Gustave-Ador, CH-1207 Genève, and Willy Meier, Fontaines, both of Switzerland, assignors to Paolo Spadini, Switzerland

Filed Jan. 14, 1985, Ser. No. 691,012
Claims priority, application Switzerland, Jan. 14, 1984, 162/84
Int. Cl.[4] G04C *21/16*
U.S. Cl. 368—252 **7 Claims**



1. A timepiece with a quartz watch movement and an electrically controlled sound generator comprising:
an analogous time display means including a dial and an hour hand;
an electrical circuit for energizing the sound generator;
a switch arranged to close said electrical circuit at a predetermined time;
an indicator displaying on said dial a time at which said switch will close said circuit,
said switch including
a first contact pole being rotatably driven about a fixed axis at the same speed as said hour hand;
and a second contact pole rotatable about said fixed axis in synchronism with said indicator and being manually adjustable to any predetermined angular position around said fixed axis, one of said two contact poles consisting of a spot formed in an insulating area having a plane circular ring shape and being perpendicular to and coaxial with said fixed axis,
a second one of said two contact poles being formed at an end of a helicoidal spring arm, thereby permanently pressing said second contact pole in a direction parallel to said fixed axis against said insulating area with a substantially constant force.

4,629,333

CHILLED MIRROR HYGROMETER WITH PERFORMANCE MONITORING

Victor J. Dosoretz, Waban, and Stanley Ronchinsky, Newton Center, both of Mass., assignors to EG&G, Inc., Waltham, Mass.

Filed Oct. 19, 1984, Ser. No. 663,002
Int. Cl.[4] G01N *25/02*
U.S. Cl. 374—20 **6 Claims**



1. In a chilled mirror hygrometer comprising a radiation source, means for reflecting radiation from said source, thermoelectric means regulating the temperature of said reflecting means for alternately forming and evaporating condensation on said reflecting means, first photodetector means for providing a first d.c. signal indicative of radiation from said source in the absence of condensation on said reflecting means, second photodetector means for providing a second d.c. signal indicative of radiation from said source scattered by condensation on said reflecting means, the improvement comprising means responsive to the in phase sum of said d.c. signals from said first and second photodetectors means for providing an output signal indicative of reflectivity of said reflecting means, whereby reflectivity of the reflecting means may be sensed during operation of said chilled mirror hygrometer.

4,629,334

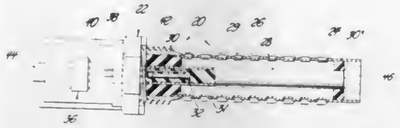
ENGINE AND TRANSMISSION OIL DEGRADATION AND TEMPERATURE MONITOR

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Apr. 16, 1985, Ser. No. 723,809
Int. Cl.[4] G01N *25/00, 33/28*
U.S. Cl. 374—103 **21 Claims**

1. An oil monitor assembly (**20**) comprising; support means (**22**) for removable attachment to an oil reservoir, an outer first electrode (**24, 24'**) extending from said support means (**22**) for immersion in oil in the reservoir, said first electrode (**24, 24'**) being tubular and having perforations (**26, 26'**) spaced circum-

ferentially therebout and axially therealong, an inner second electrode (**28**) extending from said support means (**22**) coaxially within and spaced (**29**) from said first electrode (**24, 24'**),



and electrical insulation means (**30, 30'**) spacing said second electrode (**28**) within said first electrode (**24, 24'**), said second electrode (**28**) being tubular, and including temperature sensing means (RTS-32) disposed within said second electrode (**28**).

4,629,335

INDICATOR TUBE COMBINED WITH A TEMPERATURE GAUGE

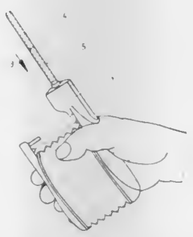
Wolfgang Eckstein, Sereetz, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 475,477

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217832

Int. Cl.⁴ G01K *3/00*

U.S. Cl. 374—142 **3 Claims**



1. An indicator device comprising a hollow transparent gas indicator tube having breakable ends which are breakable for the flow of a gas through said tube in a gas flow direction, a temperature measuring layer within said tube through which said flow passes and which changes color in accordance with temperature variations of said gas, a gas measuring layer adjacent said temperature-measuring layer giving an indication of another property of said gas arranged in said tube after said temperature measuring layer in the gas flow direction through which said gas flow passes said temperature- measuring layer providing an indication of the temperature of the gas to be measured by said gas-measuring layer, said indications being displayed at directly adjacent locations on said tube.

4,629,336

ELECTRONIC CLINICAL THERMOMETER, AND METHOD OF MEASURING BODY TEMPERATURE

Hideo Ishizaka, Fujinomiya, Japan, assignor to Terumo Corp., Tokyo, Japan

Continuation of Ser. No. 504,236, Jun. 14, 1983, Pat. No. 4,541,734. This application Jun. 24, 1985, Ser. No. 748,663

Claims priority, application Japan, Jun. 24, 1982, 57-108893; Jun. 24, 1982, 57-108894

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ G01K *7/00, 7/24*

U.S. Cl. 374—169 **20 Claims**

1. An electronic clinical thermometer for measuring the temperature of a subject, which comprises:

means for sensing body temperature at a prescribed part of a body of a subject whose temperature is to be measured;

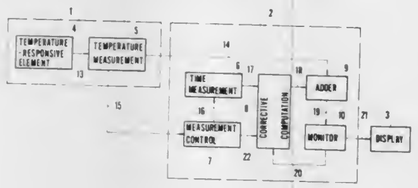
arithmetic means coupled to said temperature sensing means for predicting a final, stable temperature based on the sensed body temperature at a prescribed body part, said arithmetic means selectively executing a selected temperature prediction function out of a plurality of temperature prediction functions conforming with measurement conditions of the subject whose temperature is to be measured, in which temperature prediction functions elapsed measurement time is a variable, each of said temperature prediction functions prescribing a temperature change up to a final, stable temperature;

display means coupled to said arithmetic means for displaying the predicted temperature; and

control means for clocking elapsed measurement time and for controlling said temperature sensing means and said arithmetic means at sampling instants;

said arithmetic means including:

(a) first setting means for selectively setting one of said plurality of temperature prediction functions;



(b) means for obtaining a final, stable temperature at least twice in accordance with a time series, at the sampling instants determined by said control means, based on said set temperature prediction function and body temperature sensed by said temperature sensing means;

(c) means for comparing a final, stable temperature last obtained by said obtaining means with a final, stable temperature obtained at a previous sampling instant, and for obtaining the difference between said two final temperatures;

(d) second setting means for setting a new and different temperature prediction function from said plurality of temperature prediction functions when said difference falls outside prescribed limits to enable said obtaining means to obtain a final, stable temperature at least twice in accordance with said time series based on said new temperature prediction function; and

(e) means for supplying said display means with a signal indicative of that final, stable temperature obtained by said obtaining means which results in said difference falling within said prescribed limits.

4,629,337

BALL SPLINE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tanagawa, Setagaya-Ku, Tokyo, Japan

Continuation of Ser. No. 536,274, Sep. 27, 1983, abandoned. This application Feb. 13, 1986, Ser. No. 829,551

Claims priority, application Japan, Jan. 29, 1983, 58-12140

Int. Cl.⁴ F16C *29/06*

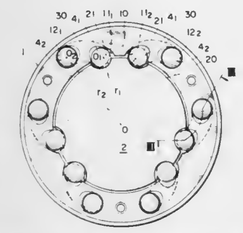
U.S. Cl. 384—43 **4 Claims**

1. In a ball spline bearing comprising:

an axially extending outer sleeve having a circumferential solid part surrounding a hollow center region with said solid circumferential part having an inner peripheral surface facing the hollow center region, said outer sleeve having a plurality of partition banks formed in the inner peripheral surface thereof at a predetermined circumferential pitch and extending in the axial direction thereof, said outer sleeve being provided at the opposite sides of each of said partition banks with a pair of axially extending load-carrying ball grooves, said outer sleeve further having a plurality of axially extending unloaded ball passages formed in the solid part thereof;

a spline shaft having an outer peripheral surface received by the hollow of said outer sleeve and provided in the outer peripheral surface thereof with a plurality of load-carrying ball grooves, said load-carrying ball grooves in said outer sleeve and said load-carrying ball grooves in said spline shaft opposing to each other to form therebetween load-carrying ball passages;

a pair of side covers attached to both open ends of said outer sleeve, each said side cover having an inner surface adjacent said sleeve with each inner surface being provided with a plurality of ball turning grooves which interconnected said load-carrying ball passages to corresponding unloaded ball passages so that said outer sleeve, said spline shaft and said side covers in cooperation form a plurality of ball recirculation passages; and



a plurality of ball trains each comprising a multiplicity of balls disposed in and adapted to recirculate through the corresponding ball recirculation passage

the improvement wherein said unloaded ball passages in said outer sleeve are circumferentially spaced apart from the related load-carrying ball passages so as to be disposed near the tangential lines on the inner peripheral surface of said outer sleeve passing the axes of the related load-carrying ball passages; the difference between the radial distance from the axis of said outer sleeve to the axis of each of said unloaded ball passages and the radial distance from the axis of said outer sleeve to the axis of each of said load-carrying ball passages is less than the diameter of each ball; and said ball turning grooves in said side covers are each curved so as to provide a smooth turning of balls which move from said load-carrying ball passages to said unloaded ball passages or vice versa.

4,629,338

SEAL AND BEARING APPARATUS FOR BITS

Rodolfo M. Ippolito, Euless, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 31, 1986, Ser. No. 846,390

Int. Cl.⁴ E21B *10/22*

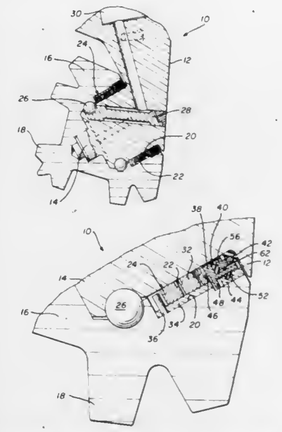
U.S. Cl. 384—94 **43 Claims**

1. In an improved bit for drilling well bores and the like, wherein the bit includes an arm member having a journal bearing pin projecting therefrom and a cutter member having a bore larger than the pin for receiving the pin and forming a seal and bearing space therebetween, the improvement comprising seal and bearing means located in the space for rotatably supporting the cutter member on the pin, said seal and bearing means including:

a helical spring bearing member located in the space and encircling the pin member; and,

annular seal means located in said space between the helical spring bearing member and the arm member, said helical spring bearing member and annular seal means having an unstressed axial length parallel to the pin that is greater than the length of the seal and bearing space provided therein, whereby said helical spring bearing member is compressed into said space and exerts a force on said seal means urging said seal means into sealing engagement with said arm member.

35. In an improved bit for drilling well bores and the like, wherein the bit includes an arm member having a journal bearing pin projecting therefrom and a cutter member having a bore larger than the pin for receiving the pin and forming a seal and bearing space therebetween, the improvement comprising seal and bearing means located in the space for rotatably supporting the cutter member on the pin, said seal and bearing means including:



a metallic bearing member located in the space and encircling the pin member; and,

annular metallic seal means located in said space between the metallic bearing member and the arm member, said metallic bearing member and annular metallic seal means having an unstressed length parallel to the pin that is greater than the length of the seal and bearing space provided therein, whereby said metallic bearing member is compressed into said space and exerts a force on said metallic seal means urging said metallic seal means into sealing engagement with said arm member.

4,629,339

ROLLER BEARING

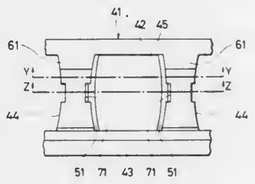
Nozomu Morinaga, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,715, Jan. 10, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 815,286

Claims priority, application Japan, Jan. 21, 1983, 58-6094[U]; Nov. 2, 1983, 58-169227[U]; **Nov. 4, 1983, 58-170029**[U]

Int. Cl.⁴ F16C *33/56, 33/36, 33/48*

U.S. Cl. 384—576 **14 Claims**



1. A double-row self-aligning roller bearing including:

an inner race having first and second outer race tracks on an outer periphery thereof;

an outer race having an inner race track on an inner periph-

ery thereof, the inner race track being opposed to said first and second outer race tracks of the inner race and radially distant therefrom;

a first row of rollers disposed between the first outer race track of the inner race and the inner race track of the outer race, each roller having a barrel-shaped rolling surface;

a second row of rollers disposed between the second outer race track of the inner race and the inner race track of the outer race, each roller having a barrel-shaped rolling surface;

a first annular retainer for retaining said first row of barrel-shaped rollers;

a second annular retainer for retaining said second row of barrel-shaped rollers;

and being characterized in that:

said first annular retainer is formed of a single-piece, unitary, integral structure of synthetic resin and comprises first and second annular portions axially apart from each other, and cross bars integrally connecting said first and second annular portions and disposed circumferentially equidistantly to form pockets for receiving respectively the first row of barrel-shaped rollers therein, side surfaces of each cross bar being concave axially and radially corresponding to the barrel-shaped rolling surfaces of the corresponding rollers.

4,629,340

ROLLER BEARING ASSEMBLY

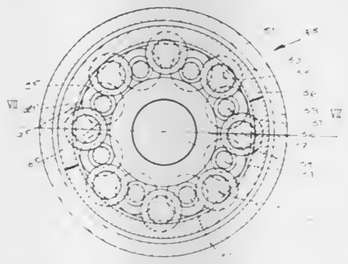
Richard R. Provost, 827, 3ième Avenue, Pointe-aux-Trembles, Montreal, Quebec, Canada H1B 4P4, and Claude Provost, 43 Place Montmorency, Laval des Rapides, Quebec, Canada H7N 1T4

Filed Aug. 12, 1985, Ser. No. 764,726

Claims priority, application Canada, Nov. 20, 1984, 468248

Int. Cl.[4] F16C *19/40, 19/50*

U.S. Cl. 384—554 **2 Claims**



1. A roller bearing assembly comprising an inner race having an outer cylindrical riding track; an outer race, coaxial with said inner race, having an inner cylindrical riding track facing said outer riding track of said inner race; a series of rollers mounted between said riding tracks; wherein each of said rollers has at least two cylindrical riding surfaces of different radii, the cylindrical riding surface of longer radius exclusively contacting said outer race riding track while the cylindrical riding surface of smaller radius exclusively contacts said inner race riding track; wherein the radius of said riding track of said outer race equals the sum of the radius of the riding track of the inner race plus said longer and smaller radii of said riding surfaces of said rollers; wherein the ratio of the radius of said riding track of said outer race over the radius of said riding track of said inner race equals the ratio of said longer radius over said shorter radius; wherein between each of said rollers is positioned at least one spacing roller having a cylindrical surface of contact of such a diameter that it prevents said riding surfaces of longer radius of two neighboring rollers to come into mutual contact, and at least one crown having one cylindrical surface of contact; wherein each of said spacing rollers at once contacts one riding surface of each corresponding rollers and said surface of contact of said crown, said crown being intended to keep said spacing rollers against their corresponding rollers and being exclusively in contact with said spacing rollers; wherein each of said rollers of said assembly is provided in a portion of one of its riding surface with a circumferential groove of small depth, said groove having a flat bottom and radial faces connecting said bottom and said riding surface, and receiving said cylindrical surface of contact of corresponding spacing rollers; and wherein said cylindrical surface of contact of said spacing rollers is bordered by radial faces diverging from each other, with respect to the center of rotation of said spacing rollers, while said radial faces of said groove of said rollers of said assembly are diverging from each other, with respect to the center of rotation of said roller, to whereby avoid friction therebetween.

4,629,341

METHOD FOR CONTROLLING PRINTING POSITION ON A TYPEWRITER FOR UNDERLINING

Gerhard Brinkmann, Schortens, and Claus Bordasch, Wilhelmshaven, both of Fed. Rep. of Germany, assignors to Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,560

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411849

Int. Cl.[4] B41J *29/32*

U.S. Cl. 400—17 **5 Claims**

1. A method for controlling the typing position of a processor-controlled typewriter or similar machine for automatically underlining a text section whose characters can be stored in a memory where the beginning of the text section to be underlined is marked by entering an underline command and the end of said text section is marked by entering an underline end command, said underlining being performed upon entry of said underline end command, said method comprising the steps of:

storing, after the entry of an underline command, in a first register the horizontal position of the next character to be typed in the current text;

activating a memory search after the entry of an underline end command, said memory search searching for the last character typed in the current text, and upon finding the last character, storing its horizontal position in a second register;

setting the typing position to one of the stored horizontal positions;

producing underlining by automatic stepwise advance of the printing position to the other stored horizontal position;

and setting the printing position to the horizontal position following the underlining.

4,629,342

DOT-MATRIX PRINTER WITH PATTERN CHECKING AND PATTERN CORRECTING MEANS

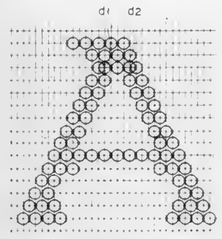
Ippei Futaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 16, 1984, Ser. No. 672,493

Claims priority, application Japan, Nov. 30, 1983, 58-225739

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—121 **4 Claims**



1. A dot-matrix printer comprising:

buffer memory means adapted for storing a dot character pattern including a plurality of dot pattern data which has been input through an external unit, and a character code corresponding to the dot character pattern;

pattern-correcting means for receiving from said buffer memory means first and second adjacent dot pattern data from the same line of said dot character pattern in a printing direction, and for selectively erasing a dot from one of said first and second dot pattern data when said data from said one of said first and second dot pattern data is adjacent a dot from the other of said first and second dot pattern data;

register means for storing the corrected data produced by said pattern-correcting means;

pattern-checking means for comparing the data stored in said register with data representing said first dot pattern data, and for generating, when the data stored in said register is different from said first dot pattern data, a check signal indicating contact between any two adjacent dots of said first dot pattern data which are arranged in said printing direction;

control means for detecting, upon receipt of said check signal from said pattern-checking means, when any two adjacent dots of said first dot pattern data which are arranged in said printing direction are in contact, and then causing said pattern-correcting means to transfer the data from said register means to said buffer memory means; and

printing means for printing a dot character pattern read from said character memory means is accordance with printing data input through said external device.

4,629,343

MATRIX PRINTING DEVICE

Francesco Bernardis, Chiaverano, and Carlo Motta, Borgofranco, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 15, 1984, Ser. No. 661,212

Claims priority, application Italy, Oct. 14, 1983, 68064 A/83

Int. Cl.[4] B41J *3/04*

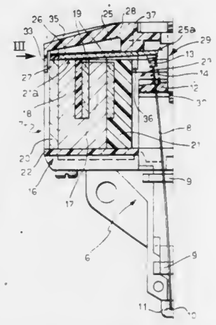
U.S. Cl. 400—124 **8 Claims**

1. A matrix printing device comprising: a housing body which can effect a translational movement relative to a printing surface in use; a plurality of wires slidable in the housing body and each having one end for acting on the print surface as a result of a thrust exerted on its other end, a plurality of oscillating operating members for exerting a thrust on a respective wire, and electromagnetic excitation circuits for selectively oscillating each of said operating members from a rest position to a position of thrusting the respective wire,

wherein the improvement consists in said device further including a single resilient support element to which the operating members are fixed, the position of fixing of each operating member to the support element and the resilient properties of the support element determining, respectively, the path of oscillation of the operating member and the degree of resilient force returning said member to its rest position, wherein said resilient support element includes an annular band and a plurality of appendages extending radially from the band, each of said appendages constituting a support for the fixing of a respective operating member,

said matrix printing device further comprising a substantially annular retaining mass incorporating said excitation circuits and having a flat end face, the operating members constitute movable armatures of their respective excitation circuits and being distributed in a radial configuration on said flat end face of the retaining mass, and wherein:

each operating member is fixed to the resilient support element by that face of the operating member which is opposite the retaining mass;



a spacer element having a thickness slightly less than the thickness of the operating members is provided between the retaining mass and the annular band of the support element, and

pressure means are associated with said housing body, which act on the annular band of the support element to thrust the support element and the spacer element against said end face of the retaining mass and cause, as a result of the difference in thickness between the spacer element and the operating members, the resilient deformation of the support element and the consequent orientation of the operating members into a rest position in which the end of each operating member opposite the support element is at a certain distance from said flat end face and is selectively returnable towards said face to achieve said thrust on the corresponding wire by the activation of the corresponding excitation circuit.

4,629,344

DOT MATRIX PRINT HEAD WITH AN ADJUSTABLE PRINT NEEDLE GUIDE

Harald Niebel, Senden, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesselschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,531

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412856

Int. Cl.[3] B41J *3/12*

U.S. Cl. 400—124 **8 Claims**

1. A dot matrix print head having

a housing;

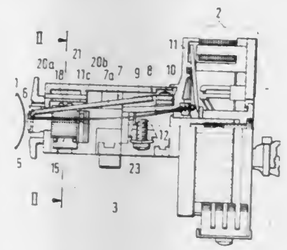
a print needle drive unit mounted in said housing;

a plurality of print needles operatively connected to said print needle drive unit and extending therefrom in a first

direction which, during printing, is a movement toward a print platen, the improvement of providing an adjustable front end support for the needles comprising:

a guide support extending generally in said first direction, one end of said guide support being pivotally mounted in said housing by means of a play-free joint for pivoting on an axis transverse to said direction an opposite end of said guide support carrying a guide orifice for front ends of said plurality of print needles;

an electromagnet mounted in said housing to one side of said guide support and said plurality of print needles; and



an armature bridge supported in said housing in a play-free swivel bearing extending crossways to said guide support, said armature bridge having two spaced projections, one on either side of said play-free swivel bearing, bearing against said guide support, said armature bridge as pivotally movable about said play-free swivel bearing, for pivoting on an axis in said first direction and being movable therewith between a first and a second position in response to actuation of said electromagnet, the pivotal movement of said armature bridge causing corresponding pivotal movement of said guide support about play-free joint between a first and a second position.

4,629,345

PRINTER CARTRIDGE AND CARTRIDGE RETAINING MEANS

Masayuki Suzaki, Fujisawa, and Tetuo Kanno, Atsugi, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

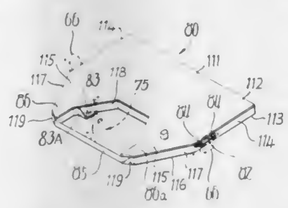
Continuation of Ser. No. 404,987, Aug. 4, 1982, Pat. No. 4,512,674, which is a division of Ser. No. 201,375, Oct. 27, 1980, abandoned. This application Oct. 3, 1984, Ser. No. 657,131

Claims priority, application Japan, Oct. 30, 1979, 54-150421[U]

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **10 Claims**



1. A ribbon cartridge for a printing device comprising:

a main body portion having upper and lower main body surfaces and first and second main body sidewalls extending between said upper and lower main body surfaces;

first and second legs integrally formed with and extending from said main body portion to form a rigid substantially U-shaped cartridge, wherein each of said first and second legs further comprises upper and lower leg surfaces, an outer leg sidewall extending between said upper and lower leg surfaces on the outside of said U-shape and an inner leg sidewall extending between said upper and lower leg surfaces on the inside of said U-shape;

first and second openings respectively disposed in the ends of said first and second legs remote from said main body portion, wherein a ribbon extends between said first and second openings to define a ribbon plane;

first and second retaining lugs respectively fixed on said first and second main body sidewalls at equal distances from said ribbon plane as measured normal to said ribbon plane, said first and second retaining lugs being disposed such that said ribbon may be carried into and out of a print position by pivoting said cartridge about an axis having a predetermined location fixed with respect to said first and second retaining lugs such that motion of said first and second legs during said pivoting carries said ribbon extending therebetween into and out of said print position; and

a single engaging member fixed on said inner leg sidewall of said first leg, said engaging member being disposed such that, when said cartridge is pivoted as above recited, said engaging member may comprise means for controlling the travel of said ribbon into and out of said print position.

4,629,346

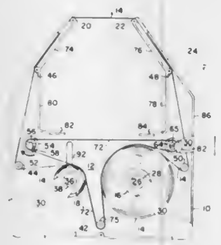
PRINTER RIBBON CASSETTE

Tyrone N. Surti, Rte. 8, Box 8115, Manchester, Tenn. 37355

Filed Apr. 22, 1985, Ser. No. 725,931

Int. Cl.⁴ B41J *35/28*

U.S. Cl. 400—208 **1 Claim**



1. A ribbon cassette for a printer including a drive member adapted to rotate in a single direction and comprising:

a case having an internal storage cavity generally defined by broad opposite face sides, first, top and second, bottom, opposite sides, and third and fourth opposite sides and first and second spaced guides supported by said case and being located along a line generally parallel with, said first, top, side of said cavity;

firat and second spools positioned within said cavity and a ribbon extending between said guides and being wound on said spools, said ribbon defining a ribbon path extending from one of said spools to the other of said spools, said ribbon path extending across the top region of said first spool in an outward direction toward said third side, and from the top region of said second spool in an outward direction toward said fourth side, wherein said top region of said spools is the region facing said first, top, side of said cavity;

first and second spaced drive rollers within said cavity, said first drive roller having a drive member adapted to be driven from said printer through one said broad side of said case, and said second drive roller having a drive member adapted to be driven from said printer through an opposite said broad side of said case;

an idler roller positioned inward of said spools and generally along a line which is perpendicular to a line between the axes of said spools and on an opposite side of the line between the axes of said spools than is the line between said spaced guides;

a first guide roller positioned in the path of said ribbon between said first spool and said first guide and a second guide roller positioned in the path of said ribbon between said second spool and said second guide, said first guide roller being positioned to define said ribbon path so that the ribbon passes outwardly of said first drive roller and then inwardly toward said first spool as said ribbon is being wound on said first spool, said second guide roller being positioned to define said ribbon path so that the ribbon passes outwardly of said second drive roller and then inwardly toward said second spool as said ribbon is being wound on said second spool;

said first spool being positioned between said first drive roller and said idler roller, and said second spool being positioned between said second drive roller and said idler roller;

a belt extending around said drive rollers and said idler roller and engaging said ribbon wound on said spools, whereby said belt, and thereby said ribbon, is alternately drivable by one of said drive rollers;

wherein drive in said single direction of said printer of said first drive roller, and the resulting drive of said first spool by said belt, drives said first spool in an unwinding direction, and the drive of said second drive roller by said printer in said single direction drives said belt and said second spool in an unwinding direction; and

wherein said belt and said ribbon separate at points on the periphery of said spools so as to form discrete angles of separation, the angle formed at said first spool generally opening toward said third side and the angle formed at said second spool generally opening toward said fourth side.

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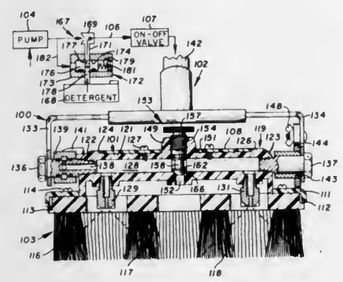
FLUID AND BRUSH CLEANING APPARATUS

Harold A. Poppitz, 12502 Xenwood Ave. South, Savage, Minn. 55378

Continuation-in-part of Ser. No. 521,989, Aug. 11, 1983, abandoned. This application Dec. 24, 1984, Ser. No. 685,897

Int. Cl.⁴ A46B *11/00, 11/06*

U.S. Cl. 401—42 **34 Claims**



1. A fluid and brush cleaning apparatus comprising: housing means having a top wall and a continuous sidewall joined to the top wall to define a housing interior with a housing opening positionable in facing relationship to a surface to be cleaned; a manifold assembly including a manifold block mounted to the housing means and located in the housing interior, said housing top wall and sidewall have a first mounting opening and a second mounting opening opposite the first mounting opening; said manifold block having a first shoulder at one end thereof, and a second shoulder at the opposite end thereof, said first and second shoulders being positionable in the first and second mounting openings of the housing top wall and sidewall to mount the manifold block with respect to the housing means, said manifold block having an elongate manifold chamber for accommodating fluid under pressure and a port open to the manifold chamber and the housing interior to allow the fluid in the chamber to flow into the housing interior and valve means mounted on the manifold block selectively operable to open and close said port whereby when the valve means is open the pressure of the fluid in the chamber is reduced and when the valve means is closed the pressure in the chamber is increased, a plurality of spray nozzles mounted on the manifold block, each nozzle having a spray orifice in communication with the manifold chamber and directed toward the housing opening, said nozzles being spaced apart and adapted to provide a continuous curtain of spray fluid across the housing interior toward the housing openings; means securing the manifold block to said top wall; a scrub assembly mounted on the housing means providing an outer brush array in substantially continuous surrounding relationship to said opening of the housing means, and an inner brush array having one portion located on one side of said spray nozzles and another portion located on the opposite side of said spray nozzles; a handle assembly connected to the manifold assembly for manual manipulation of the cleaning apparatus; and means to add detergent to the fluid when the valve means is open comprising a container for storing detergent, means to draw detergent from the container and mix the detergent with the fluid, and a valve operable in response to low fluid pressure to allow detergent to flow to the means to draw detergent from the container and operable in response to high fluid pressure to stop detergent flow to the means to draw detergent from the container.

4,629,348

WRITING INSTRUMENT WITH SEALING CAP AND ADDITIONAL REARWARD SEAL

Yasuyuki Hashimoto, Hyogo, and Kazuo Shimizu, Osaka, both of Japan, assignors to Ancos Co., Ltd., Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,787

Claims priority, application Japan, Jan. 27, 1983, 58-10507[U]; Mar. 8, 1983, 58-32280[U]; Aug. 4, 1983, 58-141856

Int. Cl.⁴ B43K *9/00, 7/12*

U.S. Cl. 401—107 **20 Claims**



1. A writing instrument comprising a body composed of a front barrel (**401**) and a rear barrel (**435**) which are relatively rotatable, a writing member (**416**) housed in said body and having a front writing tip (**420**), a transmission mechanism disposed between said body and said writing member (**416**) for moving said writing member (**416**) back and forth in response to relative rotation of said front and rear barrels (**401**), (**435**), an inner tube (**404**) mounted in said front barrel (**401**) and having an opening (**406**) defined in a distal end thereof, a sealing body (**409**) pivotally attached to said inner tube (**404**) and positioned adjacent to said opening (**406**) for opening and closing said opening (**406**), said sealing body having a protrusion formed on a rear side thereof, said protrusion having a groove formed therein for receiving said writing tip of said writing member, said protrusion guiding said sealing body so as to fit substantially precisely into said opening when said writing member is in a sealed position, said groove being smaller than a diameter of a tapered front end portion of said writing member just behind said writing tip, said groove being sufficiently deep to prevent said writing tip from contacting said sealing body when said writing member abuts against said protrusion, bias means for normally urging said sealing body (**409**) to close said opening (**406**), means for pushing aside said sealing body (**409**) to open said opening (**406**) against a force tending to close the latter while preventing said writing tip (**420**) from contacting said sealing body (**409**) when said writing member (**416**) advances, and seal means for providing a seal between said body

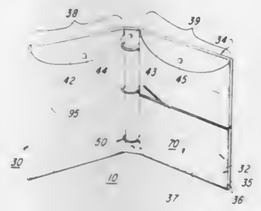
and said writing member (**416**) at a position behind said sealing body (**409**).

4,629,349

FLEXIBLE TRANSPARENT NOTEBOOK AND THE LIKE

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 11, 1984, Ser. No. 629,918
Int. Cl.⁴ B42F *3/00*; B42D *3/00*
U.S. Cl. 402—74 **21 Claims**



1. A holder for paper sheets and the like, comprising first interior and second (exterior) noncongruent cover sheets, joined along outer edges and bottom edge to define an interior pocket extending continuouly from outer edge to outer edge with an opening at the upper edge of said holder, said cover sheets being folded to meet at an inner face wherein they provide front and rear covers.

21. The method of storing items which comprises the steps of:

(a) joining an exterior cover sheet to an interior cover sheet to provide a cover member with a storage pocket for items between said interior and exterior cover sheets, one of the cover sheets having a side that extends beyond the corresponding side of the other cover sheet;

(b) folding said cover member along an axis in the face of said interior cover sheet to permit the storage of items between the folds of said interior cover sheet; and

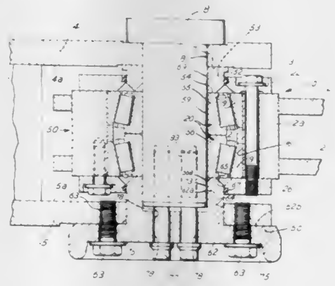
(c) folding at least a part of the extended cover sheet with respect to the interior cover sheet to permit the sealing of items in that part of said storage compartment between said interior and exterior cover sheets or provide an additional storage pocket.

4,629,350

TOLERANCE COMPENSATING JOINT

Robert L. Siewert, Benton Harbor, and Edmund K. Varnelis, St. Joseph, both of Mich., assignors to Lark Equipment Company, South Bend, Ind.

Filed Dec. 14, 1984, Ser. No. 681,725
Int. Cl.⁴ F16C *11/00*
U.S. Cl. 403—11 **4 Claims**



1. A joint for connecting together two frame members of a machine for relative movement,

one of said frame members including a bifurcated portion having spaced apart resilient flanges, and a pair of aligned openings in said flanges,

the said two flanges spaced apart a nominal distance between the inner confronting surfaces of said flanges,

the other said frame member located in part between said flanges and having an opening therethrough, comprising

a pin extending into said three openings,

a bearing assembly around said pin, and

screw connection means for causing said flanges to flex during assembly of said joint,

said screw connection means comprising a retainer cap seated in one of the openings in one of said resilient flanges and secured by cap bolts threaded into one of said flanges through openings in said retainer cap,

a portion of said retainer cap extending axially along said pin and abutting said bearing assembly, and

a spacer between said bearing assembly and the other said flange,

the flanges flexing toward each other if the initial spacing between the flanges is greater than a nominal amount, and

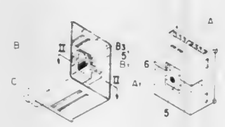
the flanges flexing away from each other if the initial spacing between the flanges is less than the nominal amount.

4,629,351

FITTING INDICATING MECHANISM IN SCREW TYPE CONNECTOR HOUSINGS

Shinichi Kato, Atsugi; Yoji Saito, and Hiroshi Umemoto, both of Gotenba, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Yazaki Corporation, Tokyo, both of, Japan

Filed Jun. 13, 1984, Ser. No. 620,303
Claims priority, application Japan, Jun. 17, 1983, 58-107728
Int. Cl.⁴ F16B *31/02*
U.S. Cl. 403—27 **4 Claims**





1. A fitting indicating mechanism in screw type connector housings comprising:

a first connector housing having an engaging portion;

a second connector housing having cavity means for receiving said engaging portion therewithin;

a tubular body on said second connector having a bore contiguous to said cavity means and a plurality of flexible support arms extending into said bore in a direction away from said first connector housing; and

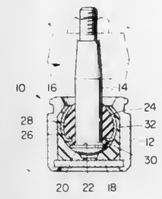
an indicator rod held to extend within said cavity means and said bore, said indicator rod being biased toward the first connector housing such that said flexible support arms cover the indicator rod when fitting engagement of the first and second connector housings is not completed but pushes open said flexible support arms upon completion of fitting engagement thereof, such that said indicator rod is exposed outwardly of the flexible arms.

4,629,352

RESILIENT BALL AND SOCKET JOINT ASSEMBLY AND METHOD OF MANUFACTURE

Akira Nemoto, Toyohashi, Japan, assignor to Mushashi Seimitsu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 31, 1985, Ser. No. 761,040
Claims priority, application Japan, Aug. 10, 1984, 59-168713
Int. Cl.⁴ F16C *11/06*
U.S. Cl. 403—128 **12 Claims**



1. A resilient ball and socket joint construction, comprising

(a) a housing having an open end and another end;

(b) a ball stud extending into the housing through the open end thereof and having a greater diameter portion than the remainder of the ball stud, greater diameter portion being located within the housing, the greater diameter portion providing an annular shoulder at one axial end thereof;

(c) a sphere-segmental shell disposed within the housing and coaxially surrounding the ball stud with a spacing therebetween, the shell having an inturned annular rim in the form of a flange at one axial end thereof in an opposed relation to the shoulder of the ball stud;

(d) a one-piece elastomeric bushing filling the space between the ball stud and the shell and a gap between the shoulder of the ball stud and the inturned rim of the shell, the bushing substantially integrally joining the ball stud and the shell; and

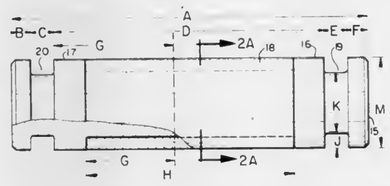
(e) a bearing within the housing supporting the ball stud so as to allow angular displacement thereof relative to the housing.

4,629,353

MANGANESE STEEL SHROUD FOR PIN

James E. Burke, Philadelphia, Pa., assignor to Wescott Steel, Inc., Trevose, Pa.

Filed Mar. 8, 1985, Ser. No. 709,456
Int. Cl.⁴ F16C *11/06*; F16D *1/12*
U.S. Cl. 403—154 **14 Claims**



1. A pin for a bushing for a high wear, high abrasion, heavy loading joint comprising:

a core of high strength, hardened alloy steel, said pin having a preformed uniform, reduced diameter groove between larger diameter end sections at the extremities of said core; and

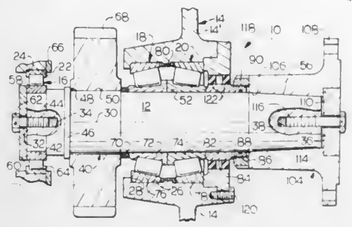
a tubular shroud of austenitic manganese steel in said groove.

4,629,354

TAPERED SHAFT RETENTION APPARATUS

John D. Freese, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Oct. 18, 1985, Ser. No. 789,263
Int. Cl.⁴ F16D *1/12*
U.S. Cl. 403—261 **7 Claims**



5. In a tapered shaft retention apparatus of the type including a shaft having an inner shoulder, cylindrical surface means, a smooth outer conically tapered surface, and an annular member mounted on the cylindrical surface means, the improvement comprising:

an internally tapered hub mounted on the conically tapered surface with a preselected fit for transmitting torque between the shaft and the hub free of positive drive keying therebetween; and

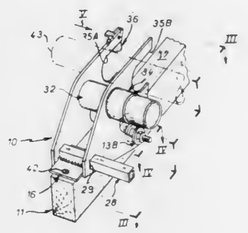
adjustment means for maintaining the annular member in a preselected axial location between the shoulder and the hub, the adjustment means including a sleeve mounted on the cylindrical surface means in abutment with the annular member and an adjustment nut screwthreadably connected to the sleeve in abutment with the hub.

4,629,355

DEVICE FOR ATTACHING A SCAFFOLDING BRACKET TO A FRAME MEMBER, AND FIXING ASSEMBLY FOR IMPLEMENTING SAME

Michel Goubaud, Ancenis, France, assignor to Dimos Batiment Distribution de Materiel Outillage et Securite pour le Batiment, Ancenis, France

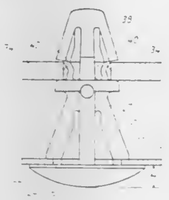
Filed Mar. 26, 1985, Ser. No. 716,157
Claims priority, application France, Apr. 3, 1984, 84 05217
Int. Cl.⁴ B25G *3/36*; E04G *7/00*
U.S. Cl. 403—389 **20 Claims**



1. Device for attaching a scaffolding bracket to a frame member having side surfaces and an edge such as a rafter, said device comprising two flanges adapted to be disposed one on each side of a frame member, fixing means for fastening said flanges to a frame member, and attachment means associated with said flanges for enabling a scaffolding bracket to be coupled to said flanges, wherein said fixing means comprise a clamping spindle member adapted to be mounted on a frame member and two grooved rollers engaged on said clamping spindle member so as to lie on opposite sides of a frame mem-

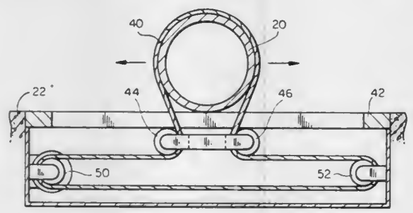
ber against frame member side surface, a bearing member connected to each one of said flanges and engageable with a frame member edge such that said flanges are adapted to bear against a frame member edge through said bearing member, and each of said flanges having, spaced from said bearing member, an edge defining a keyhole slot, each of said keyhole slots having seated therein a respective one of said grooved rollers, with the edges of said flanges defining said keyhole slots being engaged in the grooves on the respective rollers.

4,629,356
SECURING UNIT
Yoshitoki Hayashi, Aichi, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed Jun. 29, 1983, Ser. No. 508,913
Claims priority, application Japan, Jul. 14, 1982, 57-106564[U]
Int. Cl.⁴ F16B *21/08*
U.S. Cl. 403—408.1 **7 Claims**



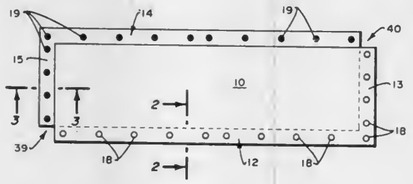
1. A securing unit for holding two substrates at a fixed interval, a first one of said substrates having a rectangular aperture therethrough and the second one of said substrates having a circular aperture therethrough in alignment with the rectangular aperture in the first substrate, said securing unit comprising:
(a) a resilient reverse detention member having a working surface which, in use, bears resiliently against a first side of a first one of the two substrates;
(b) a first linkage member which extends in a first direction from said resilient reverse detention member, said first linkage member being perpendicular to the working surface of said resilient reverse detention member and, in use, extending through the rectangular aperture in the first substrate;
(c) a support base having a working surface which is sized, shaped, and positioned to make planar abutting contact with a first side of the second one of the two substrates, said support base being sized and shaped to pass through the rectangular aperture in the first substrate but not through the circular aperture in the second substrate;
(d) at least two resilient detent leg members which extend from said first linkage member towards said resilient reverse detention member, each of said at least two resilient detent leg members having an abutment surface which is sized, shaped, and positioned to make planar abutting contact with a second side, opposite to the first side, of the first substrate and an extension having a planar outer surface, said extension extending into the rectangular aperture in the first substrate and the planar outer surface of said extension being sized, shaped, and positioned to make planar abutting contact with a planar side surface of the rectangular aperture in the first substrate, said at least two resilient detent leg members being tapered inwardly in the first direction and being resiliently inwardly deformable by camming contact with the periphery of the rectangular aperture in the first substrate as said at least two resilient detent leg members pass through the rectangular aperture;
(e) a second linkage member which extends in the first direction from said support base, said second linkage member being perpendicular to the working surface of said support base;
(f) at least two resilient reverse detent leg members which extend in the first direction from said support base, each of said at least two resilient reverse detent leg members having an abutment surface which is sized, shaped, and positioned to bear against a second side, opposite to the first side, of the second substrate, said at least two resilient reverse detent leg members being tapered inwardly in the first direction and being resiliently inwardly deformable by camming contact with the periphery of the circular aperture in the second substrate as said at least two resilient reverse detent leg members pass through the circular aperture; and
(g) a head portion, said second linkage member and said at least two resilient reverse detent leg members being attached to said head portion and said head portion being sized and shaped to pass through both the rectangular aperture in the first substrate and the circular aperture in the second substrate.

4,629,357
MOVABLE BARRIER
Willard H. Wattenburg, and Eric J. Wattenburg, both of Box 316, Greenville, Calif. 95947
Filed May 14, 1984, Ser. No. 609,710
Int. Cl.⁴ E01F *15/00*
U.S. Cl. 404—6 **7 Claims**



1. A movable traffic barrier for dividing adjacent lines of traffic in a roadway comprising a plurality of hollow cylindrical barrier sections laid end to end along said roadway and projecting above the roadway by their full height, raceways in said roadway perpendicular to the longitudinal axis of said barrier, a cable passing through each of said raceways and over a portion of said barrier, and means for moving said cable to rotate and move said barrier.

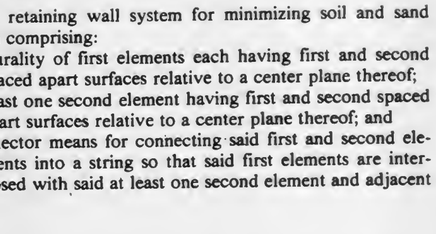
4,629,358
PREFABRICATED PANELS FOR RAPID RUNWAY REPAIR AND EXPEDIENT AIRFIELD SURFACING
Preston S. Springston, Oxnard, and Richard L. Claxton, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 17, 1984, Ser. No. 631,954
Int. Cl.⁴ E01C *5/20, 11/02*
U.S. Cl. 404—35 **13 Claims**



1. Prefabricated plastic-composite portable panels, a plurality of which are jointed together to form expedient airfield surfacing and rapid runway repair, each panel comprising:
a. a plurality of substantially rectangular fiberglass plies impregnated, saturated and bonded together with a thermosetting polyester resin to form a substantially thin, flat, non-porous, laminar structure having low weight and shipping cube;
b. two adjoining edges about the perimeter of said laminar structure being recessed from the bottom to form adjoining upper lips along one side and one end thereof;
c. the remaining two adjoining edges about the perimeter of said laminar structure being recessed from the top to form adjoining lower lips along the opposite side and opposite end thereof;
d. the depth to which said laminar structure edges are recessed to form lips about the entire perimeter thereof being substantially the same such that two diagonally opposite corners of said laminer structure are removed in the areas where said upper lips would otherwise intersect with said lower lips, thus allowing for the overlapping of said upper and lower lips about the edges of said laminar structure with respective lower and upper lips of other like laminer structures when placed adjacent thereto for joining therewith;
e. the perimeter areas of said laminar structure being reinforced with high-modulus, high-tensile-strength fiber material such that both the upper and lower surfaces of said lips about the entire perimeter of said panels are reinforced for maximizing the load capacity of the laminar structure and increasing panel joint flexural strength and stiffness; a portion of said high-modulus, high-tensile-strength fiber material reinforcing the lower side of said upper lip and a portion of said high-modulus, high-tensile-strength fiber material reinforcing the upper side of said lower lip extending into and being sandwiched between two of said plurality of fiberglass plies which form said laminar structure; said laminar structure being constructed slightly thicker about the top edges by the addition of fiberglass plies along the perimeter thereof in the areas where the laminar structure is reinforced with high-modulus, high-tensile-strength fiber material for stiffening the panel edges to obtain higher load capacity and to prevent excessive deflection at joints between joined like adjacent laminar structres due to rolling aircraft wheel type loads;
f. fastening means being provided at spaced intervals along the upper and lower lips of said laminar panel, said fastening means being operable for securely joining said laminar panel with like panels when positioned adjacent thereto; said fastening means comprising flush-mounted upper bushings secured along said upper lip, and lower bushings which are flush-mounted with and secured along said lower lip; said upper and lower bushings being positioned to align with and be bolted together with respective lower and upper bushings in adjacently placed like laminar structures; said upper and lower bushings being adhesively bonded in place;
wherein a plurality of said prefabricated panels when jointed together form lightweight airfield surfacing of high flexural strength and high structural capacity.

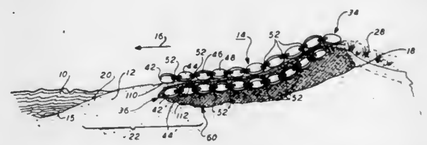
4,629,359
POWER TROWEL
Amitava Sengupta, Hartford, Wis., assignor to Wacker Corporation, Milwaukee, Wis.
Filed May 31, 1985, Ser. No. 739,691
Int. Cl.¹ E01C *19/42, 19/44*
U.S. Cl. 404—112 **3 Claims**

1. A power trowel for concrete finishing, comprising a chassis having a gear box and a prime mover, a plurality of blades which support the entire weight of the chassis by their engagement with a surface to be finished and which are driven by the prime mover through the gear box for substantially edgewise rotation about a vertical axis which is in fixed relation to the chassis, and an elongated handle that normally projects obliquely upward and rearward from the chassis and provides for control of the blades, said power trowel being characterized by:
A. said gear box and said prime mover being arranged to dispose the center of gravity of the chassis in forwardly spaced relation to said vertical axis;
B. cooperating connection means on the chassis and on the handle defining a horizontal pivot axis about which the handle is swingable up and down relative to the chassis and which is spaced behind said vertical axis;
C. rigid means fixed on the chassis and on the handle, respectively, defining opposing force transmitting surfaces,
(1) said force transmitting surface on the handle facing



substantially upward and being in forwardly spaced relation to said pivot axis, and
(2) said force transmitting surface on the chassis facing substantially downward;
D. a resiliently compressible shock absorber fixed on one of said force transmitting surfaces to be compressively engaged by the other one; and
E. cooperating abutment means on the chassis and on the handle, spaced from said pivot axis, arranged to define a limit of upward movement of the rear end of the handle relative to the chassis at which said shock absorber is under compressive preload but to permit downward movement of the rear end of the handle from said limit whereby compressive force on the shock absorber is increased.

4,629,360
RETAINING WALL SYSTEM
Frank G. Cacossa, and Kenneth F. Cacossa, both of Livingston, N.J., assignors to Frank Cacossa Development Corporation, Livingston, N.J.
Continuation of Ser. No. 427,990, Sep. 29, 1982, abandoned. This application May 15, 1985, Ser. No. 734,767
Int. Cl.⁴ E02B *3/12, 3/14, 3/06*
U.S. Cl. 405—16 **31 Claims**



1. A retaining wall system for minimizing soil and sand erosion comprising:
a plurality of first elements each having first and second spaced apart surfaces relative to a center plane thereof;
at least one second element having first and second spaced apart surfaces relative to a center plane thereof; and
connector means for connecting said first and second elements into a string so that said first elements are interposed with said at least one second element and adjacent

first and second elements are spaced from each other, with adjacent first and second elements having their center planes disposed transversely relative to each other and so that, when said string is placed on a flat surface, the first spaced apart surface of one of said first elements is at an angle acute to said flat surface and the second spaced apart surface of said one of said first elements is at an angle obtuse to said flat surface, while the first spaced apart surface of said adjacent at least one second element is at an angle obtuse to said flat surface and the second spaced apart surface of said at least one second element is at an angle acute to said flat surface, wherein said connector means comprises a plurality of link devices each including a first member configured to be pivotally secured to one of said first or second elements, and a second member configured to be pivotally secured to an adjacent said element, said first member and the associated said second member of each of said link devices being fixedly secured together.

4,629,361

INTEGRATED TUBAL BY-PASS FISHWAY

Richard J. Zimmerman, P.O. Box 472, Saluda, Va. 23149

Filed Dec. 7, 1983, Ser. No. 558,967
Int. Cl.[4] E02B *8/08*
U.S. Cl. 405—83 **6 Claims**



1. A fishway in a stream of water having an obstruction across it, comprising a conduit extending past the obstruction below and generally parallel to the surface of the stream, openings at opposite ends of the conduit at least one of said openings being positioned on the upstream side of the obstruction beyond the backwater caused by the obstruction, and other of said openings being positioned downstream of the obstruction where there is relatively little local turbulence, whereby fish may enter the conduit with said openings being located a sufficient distance above and below the obstruction so as to permit fish to enter or exit the system into the natural flow of the stream and swim through said conduit past the obstruction, and said conduit having translucent walls, thereby permitting natural light passing through the water to illuminate the water within said conduit and thus encourage fish to swim through it.

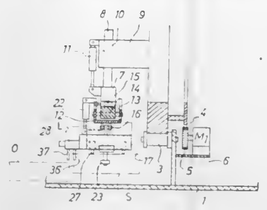
4,629,362

SHIELD TUNNELING MACHINE

Norio Kainuma, Tokyo; Takashi Sakuraya, Higashiyamato; Akira Tanaka, Yokohama, and Yoshio Yanagi, Chofu, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., both of Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 758,704
Claims priority, application Japan, Jun. 7, 1984, 59-115559; Jun. 7, 1984, 59-115560; Jun. 7, 1984, 59-11552
Int. Cl.[4] E21D *9/06, 11/08*
U.S. Cl. 405—146 **3 Claims**

1. In a shield tunneling machine comprising a revolving ring adapted to rotate along an inner wall surface of a shield frame, thereby moving a segment to the inner surface of a tunnel, and a lifting beam adapted to move radially of said revolving ring, the improvement comprising a base balancer mounted on said lifting beam and movable in an axial direction of said shield frame, an end balancer mounted on said base balancer through a ball-and-socket joint, posture-adjustment cylinders for causing said end balancer to swing about said ball-and-socket joint,



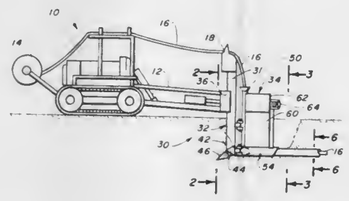
and a segment holding member extending outwardly of said end balancer.

4,629,363

CONTINUOUS CONDUIT LAYING APPARATUS

Timothy M. Rose, 891 Mariposa Dr., and J. Ken Rose, 430 Geo. Wash. Blvd., both of Yuba City, Calif. 95991

Filed Nov. 2, 1984, Ser. No. 667,780
Int. Cl.[4] E02D *29/10;* **E02F** *5/10;* **F16L** *1/00*
U.S. Cl. 405—155 **5 Claims**



1. A continuous concrete encased conduit laying apparatus for laying fiber optic interducts comprising:
gouging means adapted to be attached to the rear of a tractor and extending downward into the ground for creating a cavity as said gouging means is moved thorugh the ground by the tractor;
said gouging means further comprising:
an elongate vertical rigid bar having a leading edge, a trailing edge, and means for securing said bar to the tractor;
said bar having a cutting edge formed along the leading edge of said bar below the ground;
conical shaped first expander means secured to said bar below said cutting edge for forming a cavity in the ground as said gouging means is moved through the ground;
a detachable wedge pivotally attached at the bottom of said rigid bar for assisting in gouging the ground;
conduit laying means pivotally attached to said gouging means for laying a continuous concrete encased conduit in a cavity created by said gouging means;
said conduit laying means further comprising:
vertical guide tube means pivotally attached to the trailing edge of said gouging means for guiding the conduit as it is being laid in the cavity created by said gouging means;
an open-ended cylindrical member having a bevelled edge at its open end, and a wedge cutting face at its closed end, said cylindrical member forming the base of said conduit laying means for assiting in forming a cavity in the ground as the apparatus is moved through the ground by the tractor;
elongate chute means rigidly attached to said guide tube means for transferring concrete to said cylindrical member;
hopper means positioned on the top of said chute means for holding an amount of concrete as it is being fed through said chute means to said cylindrical member;
an inverted V-shaped bar positioned within said open-ended cylindrical member, said bar being positioned lengthwise

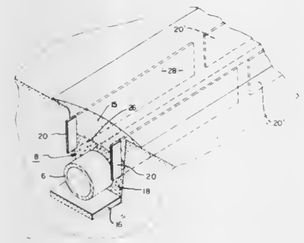
and having one end attached to said vertical guide tube means.

4,629,364

METHOD AND SYSTEM FOR RELIEVING PIPELINE STRESS DUE TO FROST ACTION

Francis H. Sayles, Lebanon, N.H.; William T. Black, Irvine, Calif., and Earl P. Ellis, Eagle River, Ak., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1985, Ser. No. 758,891
Int. Cl.[4] F16L *57/00;* **E03B** *7/10*
U.S. Cl. 405—157 **15 Claims**



1. A system for relieving frost-heaving stresses in a pipeline for transporting a product having a temperature less than 32° F. where said pipeline passes through frost-susceptible soil beneath its surface, said system comprising:
means for supporting said pipeline in a trench through said soil so that the top of said pipeline is substantially below the soil surface;
a pair of soil-shear separators each comprising a relatively thin, elongated plate, said separators being spaced laterally relative to each side of said pipeline and extending longitudinally along said pipeline in parallel relation to its longitudinal axis, and said separators extending transversely upward substantially beyond the top of said pipeline; and,
support means for supporting each of said shear separators with a lower edge of said separators adjacent to said pipeline and an upper edge of said separators within a backfill portion of said soil lying in said trench above the top of said pipeline, said shear separators extending upward into said backfill portion so as to define therebetween a separable mass of backfill soil lying over said pipeline, and said shear separators being positioned in said trench so as to cause said separable mass to move upward relative to laterally adjacent soil in response to upward movement of said pipeline due to the formation of a body of ice beneath said pipeline.

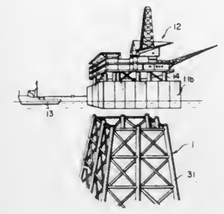
4,629,365

METHOD OF INSTALLING OFFSHORE PLATFORM

Tsuneaki Kuriiwa, Chiba, Japan, assignor to Sankyu Inc., Fukuoka, Japan

Filed Jun. 25, 1985, Ser. No. 748,680
Claims priority, application Japan, Sep. 11, 1984, 59-189898
Int. Cl.[4] E02B *17/00;* **E02D** *5/74, 25/00*
U.S. Cl. 405—204 **1 Claim**

1. In a method of installing a superstructure of an offshore platform on the top portion of a jacket with the top portion positioned at a predetermined depth below the sea level, said superstructure having a floating body for floating on the sea and being completed in a fabrication yard and transported to the area of the sea where said jacket has been erected and then sunk by pouring the sea water into said floating body to be installed on said jacket, a method of fixing said jacket to the seabed comprising the steps of:
attaching a removable extension to the top of said jacket so that said jacket has a height sufficient to project above the sea level;
erecting and positioning said jacket at a desired position of the seabed in such a manner that said extension projects above the sea level;



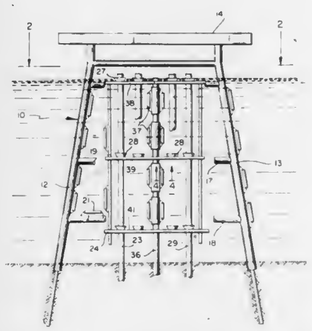
piling said jacket by driving piles from above the sea level; and
cutting off said extension after piling said jacket so that the top portion of said jacket is brought to a position below the sea level.

4,629,366

OFFSHORE MARINE STRUCTURE WITH CORROSION PROTECTION

David A. Rutherford, New Orleans, La.; Brian D. Barr, Florence, Ala., and Douglas W. Rommelmann, Carlyle, Ill., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,255
Int. Cl.[4] E02B *17/00;* **C23F** *13/00*
U.S. Cl. 405—211 **10 Claims**



1. In a marine structure having a deck and a rotatable drill string for drilling wellbores into the floor of a body of water,
a jacket comprised of corrodible metallic members including support legs which are mutually interconnected with cross braces, and which jacket rests on the said floor and supports said deck above the water's surface,
a drilling template incorporated into said jacket to accommodate drilling conductors for guiding said rotatable drill string which is lowered from the deck to form a vertical wellbore,
said drilling template including vertically aligned elongated conductor guides arranged in a horizontal pattern to define a drill conductor array comprised of external conductors, which encompass at least one internal conductor,
a cathodic protection system protecting said corrodible metallic members of said marine stucture comprising a first sacrificial anode system disposed on discrete submerged jacket members to afford corrosion protection to

said jacket members as well as to submerged sections of the drill conductor array, and

other sacrificial anodes removably carried on said at least one internal conductor to supplement the cathodic protection afforded by said first sacrificial anodes.

4,629,367

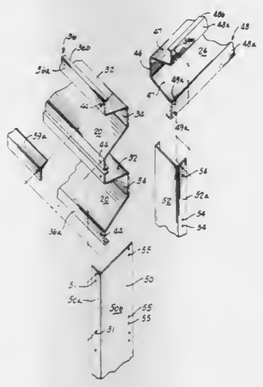
RETAINING WALL

Donald M. Lepley, Youngstown, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Jul. 12, 1984, Ser. No. 630,081

Int. Cl.[4] E02D *29/02*

U.S. Cl. 405—284 **10 Claims**



1. A retaining wall for retaining earth or the like having at least one bin-type unit, the unit comprising:

(a) front and rear wall sections spaced apart by spacing means, said wall sections and spacing means defining a volume for receiving anchoring material;

(b) at least one of said front and rear wall sections including a plurality of longitudinal stringers, arranged in a side by side relationship and each extending between and fastened to a pair of upright members;

(c) each stringer being channel like in cross section and including a web defining a force receiving region and a pair of legs extending outwardly from said web, each of said legs defining an angle greater than 90° with respect to a plane defined by said force receiving region;

(d) each leg terminating in an angled flange, each flange being defined by a first portion extending outwardly from its associated leg in a direction away from a transverse center plane of said stringer, each flange further including a second portion extending from said first portion in a plane that intersects the plane defined by said force receiving region;

(e) each of said second flange portions defining an abutment surface for abuttably engaging an abutment surface defined by an adjacent stringer;

(f) said force receiving region of said stringer being adapted to receive forces generated by the anchoring material placed in said bin and operative to urge the legs of a stringer towards abutting engagement with the legs of adjacent stringers to enhance the soil retention at interfaces between abutting second flange portions of adjacent stringers.

4,629,368

SHIELD SUPPORTS SUITABLE FOR USE IN MINES

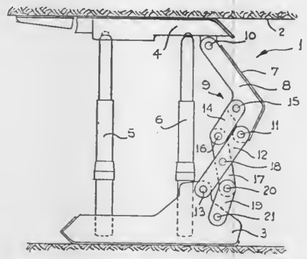
Nigel Hill, Pershore, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Feb. 5, 1985, Ser. No. 698,602

Claims priority, application United Kingdom, Feb. 14, 1984, 03793/84

Int. Cl.[4] E21D *15/44, 19/00*

U.S. Cl. 405—296 **6 Claims**



1. A shield support, suitable for use in mines, comprising a floor-engaging structure, a roof-engageable canopy, extendible and contractible prop means interconnecting said floor-engaging structure and said canopy for adjustment of the spacing of said canopy from said floor-engaging structure, and a shield assembly, said shield assembly including a shield element pivotally-connected to said canopy proximate the rearward end portion of said canopy and a pivotal guide linkage having first, second, third and fourth elements, each having first and second ends, wherein:

said first end of the first element of said linkage is pivotally connected directly to said floor-engaging structure;

said second end of the first element is pivotally connected directly to said shield element;

a position intermediate said first and second ends of said second element of said linkage is pivotally connected directly to a position intermediate said first and second ends of said first element;

said first end of said second element is pivotally connected directly to said first end of said third element;

said second end of said third element is pivotally connected directly to said floor-engaging structure at a position spaced from said first end of said first element;

said first end of said fourth element is pivotally connected directly to said second end of the second element;

said second end of said fourth element is pivotally connected directly to said shield element at a position spaced from said second end of said first element.

4,629,369

MANIPULATOR TRANSPORTER

William C. Cox, Kirkland; Gordon Cox, Mississauga, and George Leskin, deceased, late of Brantford, all of Canada (Mimi Leskien, administratrix), assignors to Canadian Patents and Development Limited and Societe Canadienne des Brevets et d'Exploitation Limitee, both of Ottawa, Canada

Filed Oct. 29, 1984, Ser. No. 666,057

Claims priority, application Canada, Nov. 8, 1983, 440617

Int. Cl.[4] E21F *13/02*

U.S. Cl. 405—303 **8 Claims**

1. A manipulator transporter comprising:

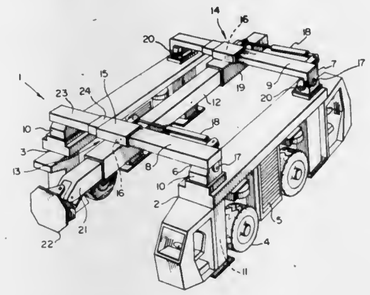
a pair of spaced side frames having ground traversing means;

front and rear interconnecting members for interconnecting said side frames, said interconnecting members each having a transverse horizontal member, and a pair of spaced depending members slideably connected to a respective side frame;

means for raising and lowering each interconnecting member relative to the side frame;

a manipulator boom for manipulating an object attached thereto;

a pair of boom connecting means one each for connecting the boom to each of the two horizontal members, both of said boom connecting means comprising pivot means allowing the boom to pivot about a vertical axis with respect to the horizontal member, at least one of said boom connecting means comprising a follower for traversing the horizontal member;



pivot means allowing the boom to pivot about a horizontal axis parallel with the horizontal member;

actuator means associated with each of the front and rear of the boom operative to position the respective front and rear portion of the boom laterally along the horizontal member; and

longitudinal sliding means for accommodating variations in the distance between the boom connecting means resulting from pivotal motion of the boom.

4,629,370

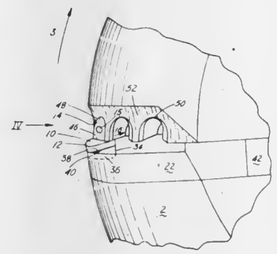
SPROCKET CUTTER AND METHOD OF ASSEMBLING

Douglas E. Torgent, and Robert N. Mitchell, both of Raleigh, N.C., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 358,911, Mar. 17, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 602,196

Int. Cl.[4] B26D *1/12*

U.S. Cl. 407—29 **8 Claims**



1. A sprocket cutter comprising: a cutter body having a plurality of pockets along its periphery and a plurality of wedge recesses facing said periphery within each pocket; an array of inserts disposed within each of said pockets, each of said inserts having a cutting portion; and a plurality of wedges equal in number to the umber of inserts and wedge recesses, each of said wedges interposed between each of said inserts and each of said wedge recesses so that as each of said wedges is moved inwardly into its corresponding wedge recess, each of said inserts capable of being securely clamped between its corresponding wedge and said pocket, each of said inserts capable of being positioned so that said cutting portion of each insert extends beyond the periphery of said cutter body, each of said inserts aligned for cutting a segment of the sprocket contour as said cutter body rotates with adjacent segments of the sprocket contour being cut by inserts located in different pockets, and a plurality of cartridges corresponding to the number of cutter body pockets for insertion into each of said pockets, each of said cartridges having an insert receiving portion and a rear portion, said cartridges being interposed in each pocket between said array of inserts and said pocket so that each of said inserts abuts said insert receiving portion and is securely clamped thereon by said wedges.

4,629,371

THROW-AWAY INSERT

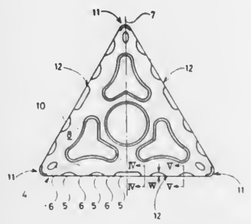
Jun Maeda, and Yoshikatsu Mori, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 19, 1985, Ser. No. 725,210

Claims priority, application Japan, May 7, 1984, 59-66815[U]

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—114 **5 Claims**



1. A throw-away insert comprising an insert body having noses and an outer periphery, a cutting edge formed along said outer periphery and between adjacent noses of said insert body, a concave rake surface (8) extending from said cutting edges toward the center of said insert body, a plurality of raised portions formed on said rake surface and nearer to the center so that they do not contact the cutting edges, and a plurality of lands (5) disposed at intervals (6) directly along said cutting edge, said lands (5) extending directly from said cutting edge to said rake surface, said lands (5) being spaced a predetermined distance from each other by said intervals, said lands (5) having a width inwardly from said cutting edge, which width varies along the respective cutting edges, said concave rake surface (8) reaching directly to said cutting edge at said intervals and directly to said lands (5) outside said intervals (6).

4,629,372

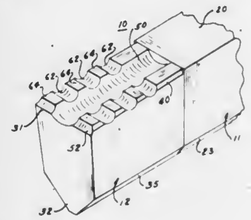
CHIP-CONTROLLING INSERT

Mark F. Huston, Canal Fulton, Ohio, assignor to Manchester Tool Company, Akron, Ohio

Continuation of Ser. No. 503,458, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 230,229, Feb. 2, 1981, abandoned. This application May 3, 1985, Ser. No. 731,325

Int. Cl.[4] B23B *27/22;* B26D *1/00*

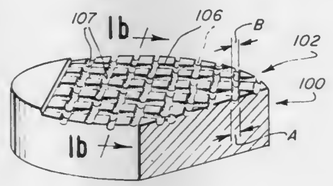
U.S. Cl. 407—116 **12 Claims**



1. A cutoff tool comprising:

an elongated body portion;
a carbide tip at the front of said elongated body portion;
a top surface formed on said tip;
said top surface of said tip having a channel located in a central longitudinal plane of the elongated body portion;
a chip-forming shelf in said tip extending the full width of said tip from said top surface forward and downward to a depth above the bottom of said channel and defining with said channel a first cutting edge, said channel extending the full extent of the shelf in the longitudinal direction of the elongated body portion;
a front surface formed on said tip extending downward and rearward from said first cutting edge;
a pair of side walls extending rearward from said front surface and converging in a direction away from said top surface; and
a generally V-shaped bottom extending downward from said pair of side walls and rearward from said front surface.

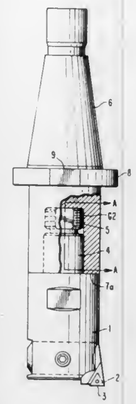
4,629,373
POLYCRYSTALLINE DIAMOND BODY WITH ENHANCED SURFACE IRREGULARITIES
David R. Hall, Provo, Utah, assignor to Megadiamond Industries, Inc., Provo, Utah
Filed Jun. 22, 1983, Ser. No. 506,725
Int. Cl.⁴ B23B *27/14*
U.S. Cl. 407—118 **1 Claim**



1. A polycrystalline diamond body having a preformed exposed attachment surface having attachment enhancing surface irregularities and adapted to be attached to holding means, said attachment surface irregularities being in the form of interwoven channels across said surface, said interwoven channels comprising a first plurality of undulating channels running in a first direction and a second plurality of undulating channels running in a second direction which is generally transverse to said first direction.

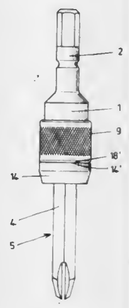
4,629,374
BORING TOOL WITH CUTTING EDGE ADJUSTMENT FOR WITHDRAWAL CLEARANCE
Willy Berner, Rupperswil, Switzerland, assignor to Urma AG, Rupperswil, Switzerland
Filed Mar. 6, 1985, Ser. No. 708,787
Claims priority, application Switzerland, Mar. 16, 1984, 1356/84
Int. Cl.⁴ B23B *31/04*
U.S. Cl. 408—186 **7 Claims**

1. A boring tool comprising
a head having a radially protruding cutting bit at one end and a threaded portion and a first stop face at the other end;
an adaptor having a threaded portion and a second stop face at one end and means at the other end for connection to a rotatable machine member;
a threaded connection member having first and second threaded portions having threads of different pitches, said first threaded portion being threadedly engageable with said threaded portion at said other end of said head and said second threaded portion of said connection member being threadedly engageable with said threaded portion of said adaptor so that said head and adaptor can be joined by said connection member with said stop faces abutting; and



adjustable means for selectably limiting the extent of threaded engagement of said first threaded portion and said head to thereby select the angular position of said cutting bit relative to said adaptor when said head and adaptor are joined and said stop faces abut.

4,629,375
CHUCK FOR TOOL SHANKS, PARTICULARLY SCREWDRIVER BITS
Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Wera Werk Hermann Werner GmbH & Co., Wuppertal, Fed. Rep. of Germany
Filed Aug. 20, 1984, Ser. No. 642,027
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330486
Int. Cl.⁴ B23B *31/22*
U.S. Cl. 408—239 R **20 Claims**



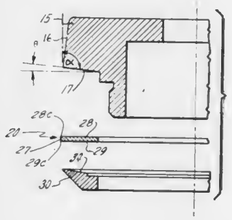
1. A chuck for non-circular ends of tool shanks, particularly screwdriver bits, comprising
a bushing, said bushing forming a chamber corresponding in cross-section to that of said non-circular ends of the tool shanks respectively removably insertable therein, said bushing having a free end having an edge,
a spring-biased sleeve displaceably mounted on said bushing in a direction of insertion of said shanks against spring-action for movement into a release position,
a wing operatively engageable with said sleeve and displaceably mounted with respect to said bushing so as to be moveable in the direction of insertion of said shanks against the spring-action for movement into the release position,
a ball mounted in said wing,
said free end of said bushing on a side of the wing opposite said sleeve forms an annular region of continuous cross-section,
an end ring attached to said bushing surrounding said edge of said bushing, said wing, and said annular region, said end ring has an inner wall and a clamping surface which narrows down in wedge-shape towards said free end of the bushing on the inner wall of said ring,
said ball operatively engaging said clamping surface and a respective of said shanks inserted in said chamber in a clamping position,
said wing and said sleeve are two separate parts.

4,629,376
ROADWAY FOR DUAL-MODE VEHICLES
Bernhard Kluge, Ostfildern; Herbert Mehren, and Hans Sack, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Oct. 15, 1984, Ser. No. 661,217
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337257
Int. Cl.⁴ E01B *25/28*; E01C *1/02*
U.S. Cl. 404—1 **12 Claims**



1. Roadway arrangement for dual-mode vehicles comprising:
a trackbound roadway section including a pair of adjacently arranged first and second trackbound roadways configured for two-way traffic in respective opposite directions,
a non-trackbound roadway aection including a pair of adjacently arranged first and second non-trackbound roadways, configured for two-way traffic in respective opposite directions,
and a transition roadway section includwng a first transition roadway interposed between the first non-trackbound roadway and the first trackbound roadway for carrying traffic in the direction from the first non-trackbound roadway towards the first trackbound roadway, and a second transition roadway interposed between the second non-trackbound roadway and the second trackbound roadway for carrying traffic in the direction from the second trackbound roadway towards the second non-trackbound roadway,
wherein said first transition roadway travels a bulging course such that, in the traffic travel direction, the distance between the first and second transition roadways first increases and then decreases as the inlet to the first trackbound roadway is approached,
wherein guide track means extends into said first transition roadway,
whereby said bulging course provides adequate space in the transverse direction between the first and second transition roadways such that said dual-mode vehicles can merge into said first trackbound roadway from said first non-trackbound roadway, without projecting into the second trackbound roadway.

4,629,377
DISPOSABLE DISK CUTTER
Erich Tlaker, Springfield, Vt.; Aaron Erisman, Charlestown, N.H., and Donald Whitney, N. Springfield, Vt., assignors to Fellows Corporation, North Springfield, Vt.
Filed Jul. 30, 1985, Ser. No. 760,697
Int. Cl.⁴ B23F *21/28*
U.S. Cl. 409—35 **20 Claims**



13. A method for using a flexible annular cutting disk including a series of circumferential teeth for forming gears from gear blanks, said method comprising the steps of:
clamping said cutting disk between a cutting back and a retainer in a first orientation such that a first axial face of said cutting disk abuts said retainer and a second axial face of said cutting disk abuts said cutter back, said cutter back having a mounting surface in the form of an annular section of a shallow cone and said retainer being generally circular and coaxial with said cutter back and having a mounting surface complementary to the mounting surface of said cutter back,
while said cutting disk is clamped in said first orientation, urging said cutting disk against one of said gear blanks to chip said gear blank and thereby shape gear teeth,
later clamping said disk between said cutter back and said retainer in a second orientation such that said first axial face of said disk abuts said cutter back and said second axial face of said disk abuts said retainer, and
while said cutting disk is clamped in said second orientation, urging said cutting disk against one of said gear blanks to chip said gear blank and thereby shape gear teeth.

4,629,378
MELTABLE MATRIX CHUCKING MACHINING CENTER AND PROCESS USING
John T. Parsons, 205 Wellington, Traverse City, Mich. 49684
Filed Aug. 27, 1984, Ser. No. 644,611
Int. Cl.⁴ B23C *1/00*
U.S. Cl. 409—131 **12 Claims**

1. A two-stage process for chucking and machining, relative to parallel, precisely-spaced planes of reference, a metal blank having two generally opposite principal surfaces and having width, between forward and rear edges, greater than its thickness between said principal surfaces, comprising, in its first stage, the steps of
coating at least the greater part of the first of such principal surfaces with an adhesive,
supporting the blank with said coated principal surface

presented downward and so positioned that at least its greater part is spaced above and adjacent to the fillable surface of a meltable matrix chuck having means to locate a first plane of reference,

applying damming means against at least the forward and rear edges of the blank, whereby to contain melted matrix material when filled beneath said first principal surface,

chucking the blank by filling molten matrix material upon the fillable surface of said chuck, to said first principal surface between said forward and rear edge damming means, and causing said matrix material to harden and adhere to said adhesive-coated surface,

removing said damming means,

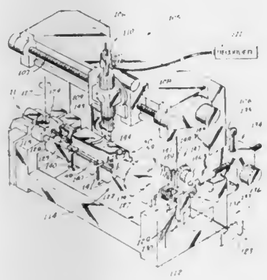
locating and securing the said chuck, relative to its said plane-of-reference locating means, in a machine tool,

machining the upward-presented second principal surface of the blank according to a machining program predetermined relative to such first plane of reference,

while so machining, moving the chuck in reversing arcuate movements about an axis remote from the chucked blank and generally perpendicular to such first plane of reference, and

without removing the blank from said chuck, making and recording, relative to such first plane of reference, a programmed series of inspection readings of the principal surface so newly machined,

and in its second stage, comprising the steps of coating at least the major part of said newly-machined principal surface with an adhesive,



inverting, relative to and in registration with said first chuck, a second meltable matrix chuck having means to locate a second plane of reference, and so positioning it that the greater part of its fillable surface is spaced from and adjacent to said newly-machined principal surface and its plane-of-reference locating means is parallel to that of the first chuck and at a precise chosen spacing therefrom, whereby to correlate a subsequent machining program with that program above mentioned,

applying damming means between said second chuck and at least the forward and rear edges of the blank,

then, with said first chuck inverted to present said newly-machined surface downward, further chucking said blank by filling molten matrix material to said newly-machined surface upon the fillable surface of said second chuck between said forward and rear edge damming means, and causing said matrix material to harden and adhere to said newly-machined surface while maintaining hard such material in said first chuck,

then reversing the positions of both chucks and melting away such first chuck material while maintaining hard such material in the second chuck,

removing said damming means,

locating and securing the said second chuck relative to its said plane-of-reference locator means in such machine tool,

machining the upwardly-presented first principal surface of said blank relative to such second plane of reference according to such subsequent machining program,

while so machining, moving said second chuck in reversing arcuate movements about the said generally perpendicular axis,

without removing the blank from said chuck, making and recording, relative to such second plane of reference, a programmed series of inspection readings of the principal surface so newly machined, and

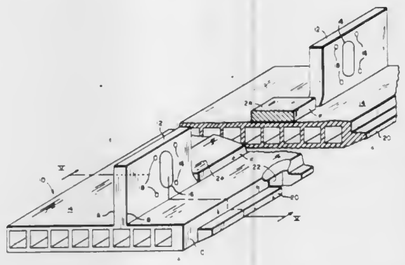
then melting away such matrix material therefrom, whereby to release the blank so machined and inspected.

4,629,379

ADAPTER PALLET SYSTEM

Foster R. Harris, Nashua, N.H., and Martin S. Traister, Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1984, Ser. No. 680,611
Int. Cl.⁴ B60P *7/13*
U.S. Cl. 410—77 **4 Claims**



1. An adapter pallet system for interfacing an ISO container with a DoD 463L configured carrier, wherein said ISO container has corner fittings, each of said corner fittings extending a preselected distance beyond the body of said ISO container, and each of said corner fittings having a locking cavity therein, said adapter pallet system comprising a pair of adapters for engaging opposite sides of said body of said ISO container, wherein each of said adapters includes:

a base, said base having a substantially horizontal surface thereon;

an element extending outwardly from said base for engaging a restraint rail on said DoD 463L configured carrier;

a pair of spaced apart flanges extending perpendicular to said surface of said base, each of said flanges having a cavity therein, said cavity being positioned along an axis above and parallel to said base; and

a shim plate, said shim plate being of a predetermined thickness above said surface of said base and interposed between said pair of flanges, said predetermined thickness of said shim plate being substantially equal to said preselected distance each of said corner fittings extends beyond the body of said ISO container;

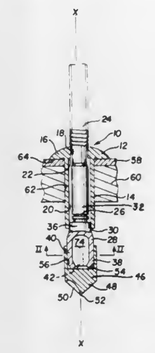
whereby means can be inserted through each of said cavities within said flanges of each of said adapters and through each of said locking cavities in said corner fittings of said ISO container, respectively, in order to lock said adapters to said ISO container.

4,629,380

BLIND SETTING RIVET

Ronald W. Gunkel, Lower Burrell, and James R. Morran, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 817,974
Int. Cl.⁴ F16B *13/06, 13/04*
U.S. Cl. 411—29 **7 Claims**



1. In a blind setting rivet assembly the combination comprising:

a rivet having an axially elongated sleeve portion and an enlarged head portion adjacent one axial end of said sleeve portion;

an open ended bore extending within said rivet coaxially through said head and sleeve portions;

a rivet setting member adapted to be received within said bore;

said setting member including an axially elongated shank portion adapted to extend within said bore and a mandrel adapted to be located axially outward of the axial end of said sleeve portion opposite said one end thereof;

said mandrel including means cooperable with said sleeve portion to deform said sleeve portion upon drawing of said mandrel axially thereinto for setting said rivet;

a drilling cap means adapted to be releasably affixed to said mandrel for rotary driving of said drilling cap by said mandrel; and

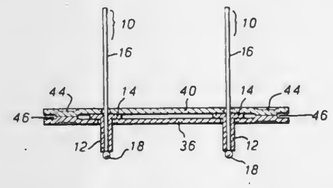
said drilling cap means including ejection means cooperable with said sleeve portion for ejection of said drilling cap from said mandrel during said drawing of said mandrel axially into said sleeve portion.

4,629,381

TAMPER-PROOF RIVET ASSEMBLY

Victor E. Bateman, Crawley, United Kingdom, assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1985, Ser. No. 709,944
Claims priority, application United Kingdom, Mar. 13, 1984, 8406481
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—34 **19 Claims**



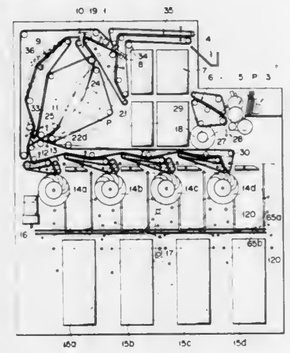
1. A rivet assembly comprising: a rivet; a base plate comprising a base plate hole having a diameter at least equal to that of a barrel of said rivet and lesser than that of a flange of said rivet for accepting the through-passage of said barrel of said rivet for said flange to abut said base plate with an inserted portion of said barrel protruberant from said base plate; and a top plate comprising a top plate hole having a diameter at least equal to the diameter of a traction pin of said rivet for the passage therethrough of said traction pin for said top plate to abut said base plate with said flange intermediate therebetween, said top plate thereafter being affixed to said base plate; whereby said assembly is operable to attach together first and second plates by introduction of said protuberant portion of said barrel through first and second aligned holes respectively through-penetrative of said first and second plates and by subsequent extraction and fracture of said traction pin through said top plate hole.

4,629,382

SHEET COLLECTING APPARATUS

Akito Ueshin, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 28, 1983, Ser. No. 555,545
Claims priority, application Japan, Nov. 30, 1982, 57-209692
Int. Cl.⁴ B65H *31/30*
U.S. Cl. 414—48 **17 Claims**



1. A collecting apparatus for collecting paper sheets, comprising:

a plurality of collecting means each having side walls defining therebetween a collecting chamber, said collecting chamber having an insertion port on an upper side thereof and a dispensing port on a lower side thereof, said each collecting chamber being arranged to receive sorted paper sheets through said insertion port;

shutter means disposed to cover said dispensing ports of all of said plurality of collecting chambers and movable between a first position where all of said dispensing ports are closed and a second position where all of said dispensing ports are open, said shutter means including a first partition plate which covers one part of each of said dispensing ports in the first position and which uncovers said one part in the second position, and a second partition plate which covers the other part of each of said dispensing ports in the first position and which uncovers said the other part in the second position, the paper sheets stacked in said each collecting chamber being disposed on the first and second partition plates when said shutter means is located in the first position and the paper sheets stacked in said each collecting chamber being dispensed outside said collecting chamber from the corresponding dispensing port when said shutter means is located in the second position; and

driving means for moving said first and second partition plates between said first and second positions in a horizontal direction,

wherein each said side wall includes an indented lower

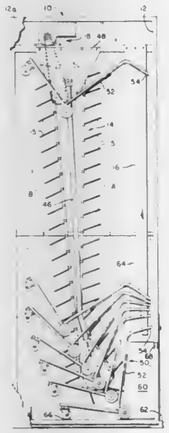
portion, and wherein each said first and second partition plates correspond in shape to said indented lower portion so as to be registrable with a respective said side wall.

4,629,383

VERTICALLY STACKABLE LUGGAGE CART VENDING MACHINE

Jack Buss, 660 S. 305th St., Federal Way, Wash. 98003

Filed Jan. 16, 1984, Ser. No. 570,856
Int. Cl.[4] B65G *57/30*; E04H *6/14*
U.S. Cl. 414—93 **2 Claims**



1. A system for vertically storing and dispensing handcarts wherein each said cart, oriented in a load-carrying position, comprises a horizontal, wheeled platform means for supporting a load, a substantially vertical frame means for vertically supporting said load and supporting a substantially horizontal handlebar means, said system comprising:

a vertically oriented, reversibly rotatable conveyor assembly for defining a vertical path of travel of said carts;

a series of vanes extending from said conveyor assembly, each vane engaging an engaging means of said cart adjacent said vane;

a substantially vertical, stationary bar means for slidably engaging and guiding said handlebar of said cart vertically;

engaging means fixed to said vertical support means of each cart, which is engageable by said conveyor vanes, while said handlebar engages said vertical bar when said cart is wheeled adjacent said conveying vanes;

drive means for rotating said conveyor means; and

actuating means for engaging said drive means to dispense one cart at a time or load one cart,

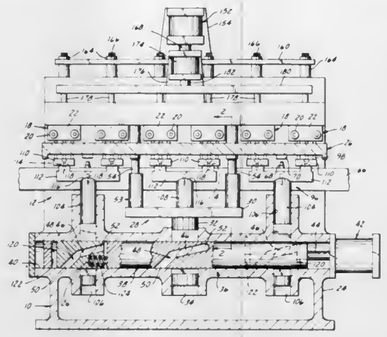
whereby actuating said conveyor advances said vane into engaging contact with said cart vertical support-engaging means, lifting said cart from its load-carrying position, and sliding said cart handlebar vertially upward along said guide bar means, simultaneously causing said cart to rotate into a substantially horizontal, nestable position, suitable for nesting with carts engaged by subsequent vane means, and actuating said conveyor in the opposite direction dispenses a cart by disengaging said cart from said vane and said handlebar of said cart is free of said vertical bar guide means.

4,629,384

TRANSFER AND LOCATOR OF WORKPIECES FOR A GANG MACHINE

James G. Beshke, Birmingham, and Mark C. Tomlinson, Warren, both of Mich., assignors to Lamb Technicon Corp., Warren, Mich.

Filed Oct. 22, 1985, Ser. No. 790,233
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 414—222 **14 Claims**



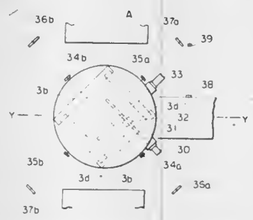
1. For a machine in which substantially the same machining operation is performed on each of a plurality of workpieces at the same time, an apparatus for transferring and locating the workpieces comprising, at least one pallet constructed and arranged to receive and carry in spaced-apart relation a plurality of workpieces which are substantially the same, at least one retainer carried by the pallet for each workpiece received thereon, each said retainer being constructed and arranged to receive and permit a workpiece to be shifted within predetermined limits in at least two directions at a right angle to each other relative to the pallet, at least one locator for each workpiece carried by the pallet, each said locator being carried by the machine and constructed and arranged to accurately locate a workpiece in the machine independently of all other workpieces in the machine and the pallet so that a machining operation can be performed on each of the workpieces, a lift carried by the machine and constructed and arranged to move all the workpieces carried by the pallet to a first position wherein each workpiece engages at least one of said locators carried by the machine and to a second position spaced from said first position wherein all of such workpieces are disengaged from all of such associated locators and received on the pallet by their associated retainers carried by the pallet.

4,629,385

TIRE SUPPLYING APPARATUS

Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 6, 1983, Ser. No. 511,092
Claims priority, application Japan, Jul. 6, 1982, 57-117417
Int. Cl.[4] B65H *5/08*
U.S. Cl. 414—226 **1 Claim**



1. A green tire supplying apparatus for supplying a green tire to a selected position with respect to a vulcanizing press, the selected position having a center corresponding to a center of a green tire to be supplied to the selected position, comprising:

a self-propelled green tire wagon for carrying a green tire; and

green tire unloading means mounted on said wagon for transferring a green tire from said wagon to the selected position;

said green tire unloading means comprising an arm which is movable with respect to said wagon, a green tire holding device for holding a green tire, said holding device having a plurality of pawls movable to engage and disengage from a green tire, said pawls having a center of operation corresponding to a center of a green tire to be held by said holding device, said green tire unloading means also comprising automatic aligning means connected between said arm and said holding device for moving said center of operation in two perpendicular radial directions with respect to said arm so as to bring said center of operation into correlation with the center of the selected position;

said automatic aligning mass comprising a first disc element fixed to said arm, a second disc element, first rail means connected between dais first and second disc elements for movement of said second disc element on said first disc element in a first radial direction, a plate fixed to said holding device, second rail means connected between said plate and said second disc element for movement of said plate on said second disc element in a second radial direction which is perpendicular to said first radial direction, brake means engageable between said first disc element, said second disc element and said plate, for maintaining a relative radial position there-between, drive means connected between said first disc element, said second disc element and said plate for driving said second disc element in said first radial direction and for driving said plate in said second radial direction and sensing means connected to said drive means for activating said drive means to drive said second disc element and said plate to bring said center of operation of said holding device to the center of the selected position;

said sensing means comprising four reflectors mounted at a position surrounding the center of the selected position to which a green tire is to be transferred, two transmitting-/receiving devices connected to said plate and located so as to respectively face two of said reflectors that are on opposite sides of the center of the selected position when said center of operation of said pawls of said holding device is in the vicinity of the center of the selected position, and two transmitting/receiving devices connected to said second disc element and located so as to respectively face a remaining two of said reflectors when said center of operation is in the vicinity of the center of the selected position, said drive means being activateable by signals from said transmitting/receiving devices to cause movement along said first and second radial directions until each of said transmitting/receiving devices are at equal distances from their respective reflectors;

said first rail means comprising a pair of spaced apart bearings rails connected to said first disc element, said second disc element having a pair of spaced apart rails engaged respectively with said bearing rails of said first disc element and extending in said first radial direction, said second rail means comprising a second pair of bearing rails connected to said second disc element, and a second pair of rails engaged respectively with said second pair of bearing rails of said second disc element and extending in said second radial direction, said second pair of rails being connected to said plate, each of said bearing rails being movable along their respective rails;

said drive means including a first servo-motor connected to said second disc element and having a screw rod rotatable thereby, a nut connected to said plate and threadably receiving said screw rod, rotation of said screw rod causing relative movement between said second disc element and said plate in said second radial direction;

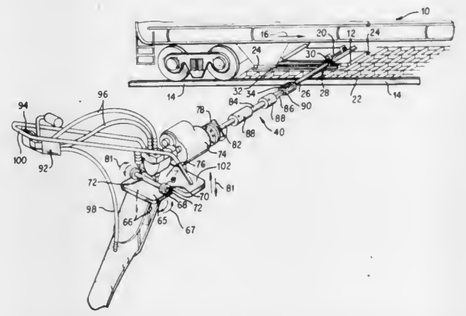
said brake means includes a pneumatic inflatable spring connected to said first disc element and inflatable to engage said second disc element.

4,629,386

RAILROAD HOPPER CAR DOOR OPENER

Melvin L. Tullos, Houston, Tex., assignor to Port of Houston Authority, Houston, Tex.

Filed Nov. 26, 1985, Ser. No. 801,800
Int. Cl.[4] B65G *67/24*
U.S. Cl. 414—376 **7 Claims**



1. A railroad hopper car door opener for engaging a hopper car door socket and opening a railroad hopper car door including:

a first horizontally extending elongated member having a curve formed therein mounted to rotate about a vertical axis;

a second horizontally extending elongated member having a curve formed therein pivotably coupled to the first horizontally extending elongated member;

a third horizontally extending elongated member for engaging the hopper car door socket; and

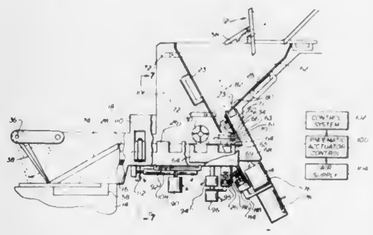
means for coupling the third horizontally extending elongated member to the second horizontaly extending elongated member and for rotating the third horizontally extending elongated member to open the hopper car door.

4,629,387

DIP TUBE LOADING/UNLOADING APPARATUS

Ben S. Stillman, Cupertino, and Barry J. Boricchio, Campbell, both of Calif., assignors to Adcotech Corporation, Milpitas, Calif.

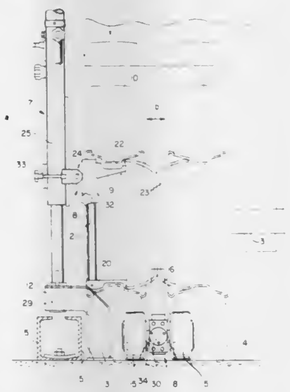
Continuation-in-part of Ser. No. 612,035, May 18, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,544
Int. Cl.[4] B65G *65/23*
U.S. Cl. 414—404 **27 Claims**



1. Apparatus for loading/unloading DIP container tubes, comprising:

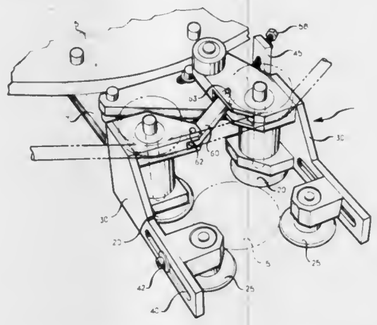
input hopper means for receiving a plurality of DIP container tubes and including metering means for discharging said tubes therefrom one at a time;
means forming an orientation station including orienting means opperative to detect the orientation of a tube and to rotate said tube about its longitudinal axis into a predetermined orientation such that DIPs contained therein, or to be contained therein, will be similarly oriented;
means forming a tube load/unload station and including inclining means for orienting a tube in a predetermined inclined position such that DIPs may be caused to move through the tube under the influence of gravity;
output hopper means for receiving tubes after they have been loaded or unloaded; and
tube moving means for moving a tube from said input hopper means to said orientation station and then to said load/unload station and then to said output hopper means.

4,629,388
TOWING AID FOR VEHICLES
Bernd Riemer, and Herbert Mehren, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Feb. 7, 1985, Ser. No. 699,270
Int. Cl.⁴ B60P *3/12*
U.S. Cl. 414—427 **13 Claims**



1. A towing apparatus for a vehicle having wheels guided between a pair of parallel rails comprising:
mobile support means for supporting hub means of said vehicle during a towing operation;
said mobile support means comprising narrow elongate bridge means extending parallel to a towing direction during said towing operation, seat mounting means attached to said bridge means for positively abutting said hub means, and first roller means rotatably mounted at a forward end of said bridge means and second roller means rotatably mounted at a rearward end of said bridge means for enabling said mobile support means to move along a surface with said vehicle during said towing operation, said seat mounting means interposed between said first and second roller means,
stationary lifting means for temporarily lifting said vehicle to allow said mobile support means to be positioned under said vehicle hub means, said stationary lift means being removable after positioning said mobile support means and prior to said towing operation;
said stationary lifting means comprising horizontal cross bar means, vertically disposed angular support means attached to each end of said cross bar for supporting said cross bar adjacent one of said wheels and above one rail of said pair of rails in a non-contact relationship with said one rail, jacking means disposed on said cross bar for lifting said vehicle, and attachment means for attaching said jacking means to said vehicle.

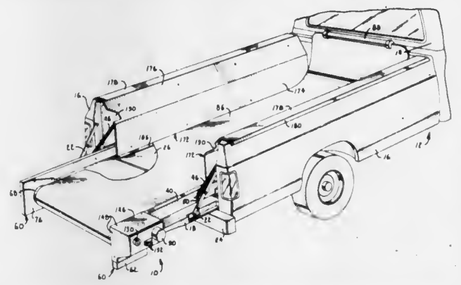
4,629,389
MEANS FOR HOLDING AND ROTATING CONTAINERS TRAVELING AROUND A TURRET PERIPHERY
Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 511,124, Jul. 6, 1983, abandoned. This application Sep. 6, 1985, Ser. No. 774,371
The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.
Int. Cl.⁴ B65C *9/04*
U.S. Cl. 414—433 **3 Claims**



1. A machine for rotating containers around a turret periphery, there being adjustable jaw means for holding and rotating the containers on a line of travel around the turret periphery, the jaw means being so constructed and arranged that the upper portion of the container is held and rotated between a pair of periphery rollers and a pair of outer idler rollers, a periphery member connecting the periphery rollers and there being an arm between each periphery roller and each idler roller, each idler roller being adjustably connected to each arm, means for adjustably connecting each idler roller to each arm, means for permitting the distance between the arms to be adjusted to accommodate different container sizes and to permit the distance between the periphery rollers to be adjusted to accommodate different container sizes, the distance between the arms being easily adjusted to accommodate different bottle sizes and the distance between the periphery rollers being easily adjusted to accommodate different bottle sizes without using arms of different sizes, each of the containers having an original center line on the line of travel for the container as the container travels around the turret periphery, the center line of another container having a different diameter size being the same as the original center line after adjusting the jaw means to hold and rotate the container.

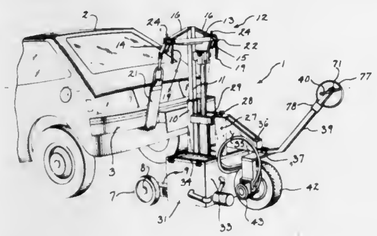
4,629,390
TRUCK BED UNLOADER
Donald D. Burke, 9719 N. Flora, Kansas City, Mo. 64155
Filed Oct. 31, 1984, Ser. No. 666,999
Int. Cl.⁴ B60P *1/38*
U.S. Cl. 414—527 **14 Claims**

1. Apparatus for unloading materials from a vehicle bed having a back end, opposite sides, and a tailgate hinged to the bed for movement between open and closed positions, said apparatus comprising:
a frame including a pair of generally parallel frame arms each having a front end and a back end;
means for connecting said front ends of the arms with the vehicle bed on opposite sides thereof in a manner permitting the frame to pivot about a substantially horizontal pivot axis between an operating position wherein the arms extend horizontally beyond the the back end of the bed and a storage position wherein the arms extend upwardly with said back ends located above the bed, said pivot axis being located adjacent the back end of the bed and substantially level with the bed to permit the arms to extend along the tailgate when the frame is in the storage position and the tailgate is in the closed position;
a drum mounted for rotation in extension between said back ends of the arms;
a flexible sheet wound on said drum and having an unwound condition wherein the sheet extends from the drum along the vehicle bed to receive materials loaded therein when said frame is in the operating position;
means for effecting rotation of said drum in a direction to wind said sheet thereon, whereby materials on the sheet



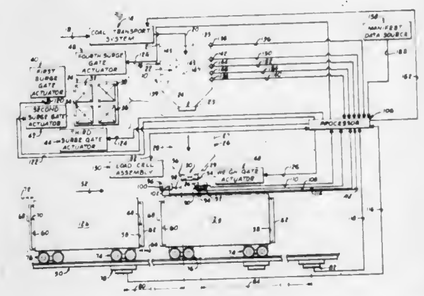
are conveyed rearwardly in the vehicle bed and unloaded from the back end thereof as the sheet is wound on the drum;
a wiper blade for wiping material from the surface of said sheet on which materials are conveyed;
means for mounting said wiper blade on said frame for movement generally toward and away from said drum at a location beyond the bed so that material wiped from the sheet by said wiper blade falls out of the bed;
resilient means for urging said wiper blade toward the drum to maintain said wiper blade against said sheet to effect wiping thereof as the sheet is wound onto the drum; and
means for wiping the surface of said sheet opposite the surface on which materials are received, said wiping means acting to wipe the sheet as same is wound on the drum.

4,629,391
POWERED LIFTER
Melvin A. Soyk, 4610 Hwy. 33 W., West Bend, Wis. 53095, and Dean E. Mitchell, 3494 Lake Dr., Hartford, Wis. 53027
Filed Oct. 9, 1984, Ser. No. 658,526
Int. Cl.⁴ B60P *3/12*
U.S. Cl. 414—563 **17 Claims**



1. A powered lift truck for lifting and transporting loads, comprising:
a rear frame;
a pair of rear wheels rotatably mounted on opposite sides of said rear frame;
an upstanding stationary mast member mounted on said rear frame;
a vertically movable mast member telescopically received within said stationary mast member, said vertically movable mast member defining a longitudinal axis and including a free upper end;
a load support carriage mounted on said movable mast member for vertical movement therewith, said carriage rotatably mounted on the free upper end of said vertically movable mast member for rotational movement only in a horizontal plane about an axis parallel to and coincident with the longitudinal axis of said verticaly movable mast member;
hydraulic lifting means mounted on said rear frame and operatively connected to said movable mast member for raising and lowering a load, said hydraulic lifting means includes an upstanding fluid actuated lift cylinder disposed parallel to and forwardly of said mast members;
a front frame pivotally connected to said rear frame;
a drive wheel rotatably mounted on said front frame;
hydraulic drive means on said front frame for driving said drive wheel;
a steering arm pivotally connected to said front frame for pivoting said front frame relative to said rear frame for steering the truck;
said rear frame is T-shaped and includes a first laterally extending channel member, and a second channel member extending forwardly from the center of said first channel member, an both said stationary mast member and said cylinder are mounted on said second channel member; and
a cabinet on said rear frame, said cabinet includes a bottom wall, a pair of opposite side walls, and upright rear and front walls, said rear wall extending along the length of said first channel member and affixed to both said first channel member and said stationary mast member to aid in preventing sagging of said first channel member, and said bottom wall is affixed to said first channel member and said second channel member to aid in preventing lateral movement of said second channel member.

4,629,392
SYSTEM FOR BATCH LOADING COAL INTO RAILROAD CARS
John A. L. Campbell; Carl L. Baldwin; David J. Foley, all of Oklahoma City, Okla., and Michael R. McHann, Memphis, Tenn., assignors to Kerr-McGee Coal Corporation, Oklahoma City, Okla.
Filed Jul. 16, 1984, Ser. No. 631,278
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.⁴ B65G *67/22*
U.S. Cl. 414—786 **17 Claims**



1. A method for loading particles into a plurality of railroad cars wherein a control weight of a railroad car loaded with particles is established and wherein particles are discharged

through a discharge end of a weigh bin and wherein a weigh gate assembly is connected to the discharge end of the weigh bin having an opened and a closed position, the particles being dischargable through the discharge end of the weigh bin in an opened position of the weigh gate assembly and the particles being prevented from being discharged from the weigh bin in a closed position of the weigh gate assembly, the railroad cars continuously moving under the weigh bin in a direction of travel, the method comprising the steps of:

weighing each railroad car prior to loading particles in the railroad car to determine an unfilled weight of each railroad car;

comparing the unfilled weight of each railroad car with the control weight to determine an unfilled differential weight for each railroad car and storing the unfilled differential weight of each railroad car along with an associated car identification determined sequentially prior to loading and uniquely identifying the particular railroad car associated with each unfilled differential weight;

loading particles into the weigh bin prior to unloading the particles from the weigh bin into the railroad cars;

weighing the weigh bin as the particles are being loaded into the weigh bin and terminating the loading of particles into the weigh bin when a weight of particles has been loaded into the weigh bin about equal to and less than the unfilled differential weight associated with the railroad car to be loaded with that unfilled differential weight of particles.

4,629,393

METHOD OF OPERATING MULTISTAGE HYDRAULIC MACHINERY

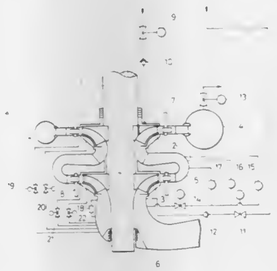
Takao Kuwabara, and Akihiro Sakayori, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1985, Ser. No. 735,752

Claims priority, application Japan, May 21, 1984, 59-100543; Jul. 27, 1984, 59-158255

Int. Cl.⁴ F01D *17/00*

U.S. Cl. 415—1 **14 Claims**



1. A method of operating a multistage hydraulic machine which has a movable guide vane provided in each of the stages and is arranged such that it is possible to individually supply compressed air to a runner chamber in each of the stages as well as to individually detect the water level in the runner chamber in each of the stages, said method comprising the steps of, in a water level depressing operation: supplying compressed air in a state wherein the movable guide vane in the maximum-pressure stage is totally closed, while the respective movable guide vanes in the remaining stages are opened; totally closing said movable guide vanes in the stages other than the maximum-pressure stage after detecting the fact that the water in the runner chamber at least in the minimum-pressure stage (the minimum-pressure stage alone or a plurality of stages including the minimum-pressure stage) has once been expelled; and while individually detecting the water level in each of the runner chambers, individually replenishing compressed air in response to said water level detection, thereby individually controlling the water level in each of said runner chambers.

4,629,394

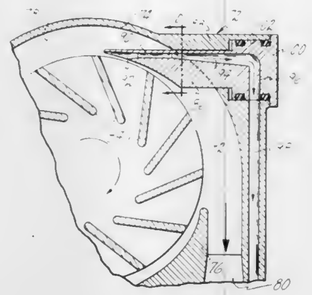
CENTRIFUGAL PUMP HAVING LOW FLOW DIFFUSER

Frank A. Leachman, Jr., Bristol, Conn., assignor to Chandler Evans Inc, West Hartford, Conn.

Filed Jul. 25, 1983, Ser. No. 516,848

Int. Cl.⁴ F04D *15/00, 27/00*

U.S. Cl. 415—38 **8 Claims**



1. An improved centrifugal fuel pumping system for a gas turbine engine adapted to fulfill starting and low flow engine operation requirements of the type comprising:

a housing having an inlet, a pumping cavity in fluid communication with the inlet, a collector adapted to receive flow from the pumping cavity and a diffuser adapted to receive flow from the collector; and an impeller mounted for rotation within the pumping cavity; wherein the improvement comprises:

the housing having a projecting portion extending into the collector, the projecting portion having an inlet opening on the leading edge thereof closely adjacent the outer periphery of the impeller for recovering a portion of the high velocity impeller discharge flow;

a low flow diffuser in parallel flow relationship with the first mentioned diffuser located in the housing and in communication with the inlet opening for receiving flow therefrom;

a low flow discharge conduit in fluid communication with the low flow diffuser for receiving flow therefrom;

a common discharge conduit in fluid communication with the first mentioned diffuser and the low flow discharge conduit for carrying the total flow from both of the diffusers to the engine during starting, normal and low flow engine operation; and

check valve means for preventing flow from the low flow diffuser from entering the first mentioned diffuser during the starting and low flow operation when the pressure in the first mentioned diffuser is less than the pressure in the common discharge conduit and for allowing flow from the first mentioned diffuser to enter the common discharge conduit when the pressure in the first mentioned diffuser is greater than the pressure in the common discharge conduit.

4,629,395

FLUID-POWERED ROTARY MOTOR

Mohamed E. Mohsin, Alkrington, England, assignor to National Research Development Corp., London, England

Filed May 21, 1984, Ser. No. 612,124

Claims priority, application United Kingdom, May 25, 1983, 8314522

Int. Cl.⁴ F01D *1/18*

U.S. Cl. 415—75 **1 Claim**

1. A fluid powered rotary motor, comprising:

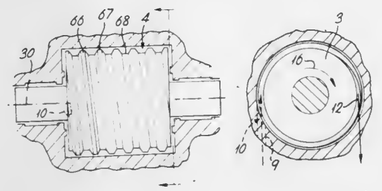
a first and rotary member, adapted to rotate about an axis of rotation, presenting opposite first and second axial ends and formed with a helical thread;

a second member;

said first and second members and said thread defining between them a narrow helical clearance coaxial with said axis and extending in a spiral from said first to said second axial end of said first member with a first sense of rotation relative to said axis;

a source of pressurized fluid;

at least one inlet to said helical clearance, disposed tangentially relative to said clearance and located at said first axial end of said first member, said inlet being connected to said source whereby fluid entering said clearance through said inlet from said source does so with a second sense of rotation relative to said axis;



at least one outlet from said helical clearance, disposed tangentially relative to said axis and located at said second axial end of said first member, whereby fluid leaving said helical clearance by way of said outlet does so with a third sense of rotation relative to said axis;

said first, second and third senses of rotation relative to said axis being the same, whereby fluid passing through said motor between said inlet and said outlet travels down said helical clearance and in so doing causes said rotary member to rotate by reason of the hydrodynamic viscous drag exerted upon it by said fluid.

4,629,396

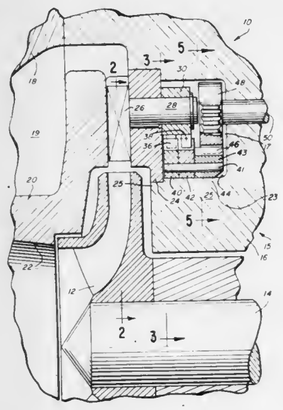
ADJUSTABLE STATOR MECHANISM FOR HIGH PRESSURE RADIAL TURBINES AND THE LIKE

Jorge A. Lorett, Beaumaris, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 17, 1984, Ser. No. 661,546

Int. Cl.⁴ B63H *1/06*

U.S. Cl. 415—164 **7 Claims**



1. A radial turbine, compressor or pump and the like comprising:

a housing;

a rotatable shaft;

a fluid inlet and a fluid outlet in said housing;

a stator through which said fluid flows in said housing;

a fluid rotor connected to said shaft in said housing;

a plurality of diffuser vanes in said stator whose disposition may be modulated to control the fluid flow through said stator, each diffuser vane being generally radially oriented and pivotable about an axis which is spacially maintained in a fixed relationship relative to the rotatable shaft and extends parallel thereto; and

operative means providing a substantially clearance free, self-locking mechanism modulating the disposition of said diffuser vanes, said operative means comprising a plurality of circumferentially arranged vane control links, each link being connected to a diffuser vane and each link being pivotable about the fixed pivotable axis of the respective diffuser vane and having a pair of spaced, radially directed cam followers, cam means including a pair of cam rings having circumferential cam surfaces engaged by said followers, and means to move said cam means relative to said followers to pivot each diffuser vane about its fixed axis and change the radial position thereof.

4,629,397

STRUCTURAL COMPONENT FOR USE UNDER HIGH THERMAL LOAD CONDITIONS

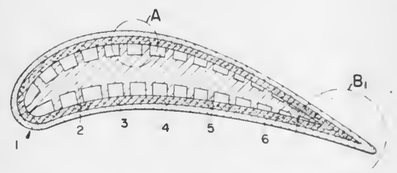
Klaus Schweitzer, Niederpoecking, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 627,291

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327218

Int. Cl.⁴ F01D *5/18;* **B32B** *7/00*

U.S. Cl. 416—96 R **16 Claims**



1. A structural component for use under high thermal load conditions, comprising a supporting metal core, unobstructed cooling ducts integrally formed in the surface of said metal core for guiding a cooling medium inside said cooling ducts, lands in the surface of said metal core for separating said cooling ducts from one another, a first heat conducting layer (**4**) of a metal felt covering said lands and ducts for enclosing said metal core, said metal felt layer providing for an effective heat conduction all around said metal core, means securing said metal felt to said lands of said metal core, and a second outer layer (**6**) of ceramic material intimately bonded to said first layer (**4**) of metal felt, said metal felt layer spacing said ceramic layer from said lands for guiding said cooling medium uniformly into heat exchange contact with the entire inner surface of said ceramic material of said second layer (**6**) which encloses said structural component as a heat insulating ceramic layer, whereby any heat from said heat insulating layer is conducted efficiently into said cooling ducts for a uniform cooling avoiding thermal stress in said ceramic material.

4,629,398

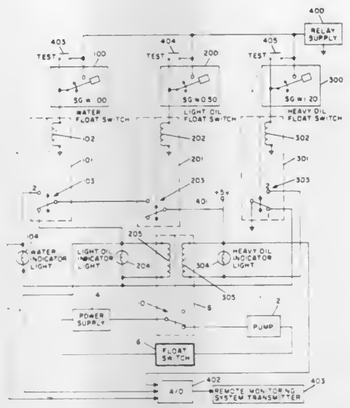
OIL DETECTING SWITCH FOR CONTROLLING A PUMP

Irving W. Cahalan, Huntington Station, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed May 7, 1985, Ser. No. 731,636

Int. Cl.[4] F04B *49/00*; G08B *21/00*

U.S. Cl. 417—1 **18 Claims**



1. An apparatus for controlling a pump located in a chamber when certain fluids are present in the chamber, said apparatus comprising:

control means for normally permitting pump operation and for inhibiting pump operation when said control means is activated;

first detection means comprising a first float switch for detecting the presence in the chamber of a first fluid having a specific gravity equal to or greater than a first specific gravity, and activation means including a first relay, said activation means responsive to the first detection means and activating said pump upon detection of the first fluid by the first detection means, said first detection means controlling power supplied to said first relay;

second detection means comprising a second float switch for detecting the presence in the chamber of a second fluid having a specific gravity equal to or greater than a second specific gravity, and a bypass relay, responsive to the second detection means, for bypassing said activation means and for activating said control means to inhibit said pump operation upon detection of the second fluid, the second specific gravity being greater than the first specific gravity.

4,629,399

AGGREGATE FOR DELIVERING FUEL FROM A FUEL SUPPLY TANK TO AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Karl-Heinz Friebe, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

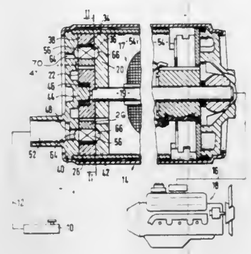
Filed Jan. 17, 1985, Ser. No. 692,925

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437021

Int. Cl.[4] F04C *2/26, 11/00*

U.S. Cl. 417—201 **12 Claims**

1. An aggregate for delivering fluid medium, particularly fuel, from a fuel supply tank to an internal combustion engine of a motor vehicle, comprising a drive motor having a shaft; a fuel inlet opening and a fuel outlet opening; and fuel-pump means including a gear pump having an inlet and including a disc-shaped inner rotor mounted on said shaft and having a peripheral surface formed with a first toothing and a ring-shaped outer rotor surrounding said inner rotor and having a recess formed with a second toothing which is in mesh with said first toothing, and a regenerative-type pump formed by a plurality of fuel conveying members provided on at least one of said rotors of said gear pump, said fuel inlet opening being



directed to said one of said rotors upstream of the inlet of said gear pump, said regenerative-type pump being coupled to said gear pump as seen in a direction of fuel delivery such that fuel from said regenerative type pump is delivered to said gear Pump whereby a compact two-stage pump is formed.

4,629,400

HYDRAULIC PUMP WITH PISTONS AND CONTROLLED SUCTION VALVES

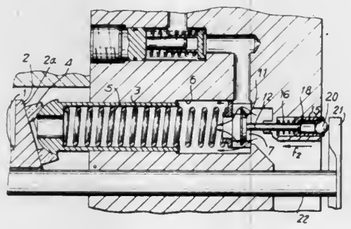
Louis-Claude Porel, Rambervillers, France, assignor to Hydro Rene Leduc, France

Continuation-in-part of Ser. No. 209,220, Nov. 21, 1981, Pat. No. 4,486,152. This application Nov. 29, 1984, Ser. No. 676,002

Claims priority, application France, Nov. 26, 1979, 79 29037; Apr. 30, 1980, 80 09780; Oct. 19, 1984, 84 16051

Int. Cl.[4] F04B *1/26, 1/18, 39/08*

U.S. Cl. 417—270 **5 Claims**



1. A hydraulic pump, which comprises:

a pump housing, the pump housing defining a cylinder and an orifice communicating with the cylinder;

at least one first piston reciprocatingly movable within the cylinder;

a rotatable driving shaft;

means coupled to the driving shaft and the first piston for imparting a reciprocating movement to the first piston in response to rotation of the driving shaft;

valve means for controlling the flow of hydraulic fluid into the cylinder, the valve means including a valve having a valve stem rigidly attached thereto, the valve being selectively positionable in the orifice in an open and closed position, the valve stem including an abutment, the valve means further including a hollow second piston, at least a portion of the valve stem being received by the hollow second piston and slidable therein, the hollow second piston being adapted to engage the abutment to effect movement of the valve from the open position to the closed position, the valve means further including biasing means for biasing the valve in a normally closed position, the biasing means including a spring exerting a force on the second piston to cause the second piston to engage the abutment of the valve stem; and

movable cam means coupled to the driving shaft and engagable with the valve means for effecting the disengagement of the second piston by overcoming the force exerted by the spring on the second piston to allow the valve to slidably move within the hollow second piston from the closed position to the open position.

4,629,401

RADIAL PISTON PUMP

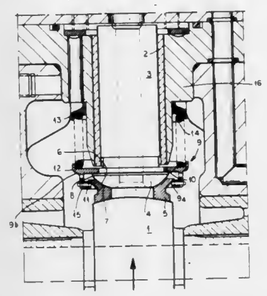
Walter Grote, Sprockhövel, Fed. Rep. of Germany, assignor to Hauhinco Maschinenfabrik G. Hausherr, Jochums GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Jun. 28, 1985, Ser. No. 750,531

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424862

Int. Cl.[4] F04B *1/04*; F16J *1/10*

U.S. Cl. 417—273 **6 Claims**



1. In a radial piston pump having at least one radial cylinder, a piston reciprocable in said cylinder and an eccentric element for reciprocating said piston, the improvement which comprises:

a piston head formed on said piston and formed with an outwardly projecting shoulder having a convex surface;

a shoe having a concave seat receiving said surface in bearing contact therewith and another surface bearing upon said eccentric;

an annular flange connection engaging behind said head and said concave seat for retaining said convex surface in said seat, said flange connection having an annular lip extending away from said eccentric; and

a spring received within said lip and bearing upon said flange in the direction of said eccentric, said flange connection comprising a first annular portion formed with said lip and anothr annular portion spaced from said first portion and engaging said seat.

4,629,402

VALVE ASSEMBLY

Dennis L. Marshala, Midwest City, Okla., assignor to Lift Technology, Inc., Oklahoma City, Okla.

Filed Nov. 19, 1984, Ser. No. 672,809

Int. Cl.[4] F04B *19/04, 21/06*

U.S. Cl. 417—456 **4 Claims**

1. In a subsurface pump actuated by a reciprocatable sucker rod for producing well liquids from a subsurface reservoir involving a piston adapted to reciprocate within a cylinder immersed in said reservoir, said piston being provided with a traveling valve, the improvement which comprises valve means connected to said sucker rod for lifting a body of fluid during upstrokes of said sucker rod, said valve means comprising:

a barrel assembly having an internal bore and comprising:

a lower barrel member; and

an upper barrel assembly connected to the lower barrel and having a beveled seating surface with at least one fluid port therethrough;

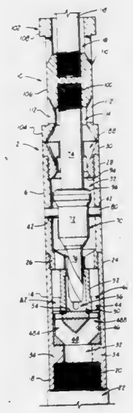
an actuator member reciprocatingly supported in the lower barrel and having an upper seating surface sealingly engageable with the beveled seating surface of the upper barrel in the upstroke position of the actuator member, the actuator member reciprocated by the sucker rod between upstroke and downstroke positions;

connector means for connecting the actuator member to the sucker rod, the connector means comprising a middle rod connector having a plurality of fluid ports which effect upward jetting of the lifted reservoir liquids so that particulate matter is caused to be agitated above the valve means; and

fluid port means supported by the lower barrel of the barrel assembly for alternately opening and closing the internal bore to fluid flow, the fluid port means comprising:

a first ported member adhesively bonded to, and supported by, the lower barrel member for stationary attachment thereto, the first ported member having at one fluid port therethrough; and

a second ported member rotatingly supported on the first ported member and having a number of fluid ports



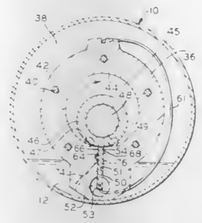
therethrough equal to and alignable with the fluid ports of the first ported member in an open position thereof and disalignable with the fluid ports of the first ported member in a closed position thereof, the actuator member operably connected to the second ported member so that the second ported member is rotated to the open position on the downstroke of the actuator member and rotated to the closed position on the upstroke thereof to effectuate lifting of the reservoir liquids on the upstroke, the actuator member having a body portion, shank rod portion extensive upward from the body portion and a downwardly extending screw rod, the shank rod portion connected to the middle rod connector for reciprocation by the middle rod connector, the second ported member having a gear bore engageable by the screw rod such that upstroke and downstroke reciprocation of the screw rod effects rotation of the second ported member between the open and closed positions thereof, the body portion having a longitudinally extending guide slot therethrough, and the valve means further comprising a guide pin extensive through the guide slot and supported by the barrel assembly so that the actuator member is restricted to reciprocation movement.

4,629,403

ROTARY COMPRESSOR WITH VANE SLOT PRESSURE GROOVE

Mark W. Wood, Britton, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 25, 1985, Ser. No. 791,295
Int. Cl.⁴ F04C *18/00, 29/02;* **B23P** *13/04*
U.S. Cl. 418—1 **12 Claims**



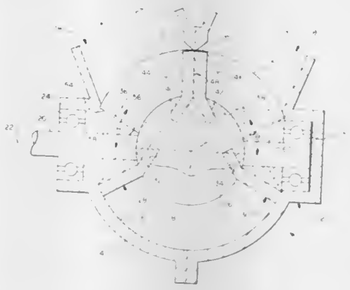
1. The method for providing a lateral biasing force on only the suction side of a sliding vane of a rotary hermetic compressor, said compressor including a housing, an oil sump in said housing, a cylinder having a bore and a vane slot therein, a vane slidably received in said slot, said vane having a suction side and a discharge side, an end plate and bearing respectively disposed adjacent opposite end faces of said cylinder, means in said bore for compressing a gas therein, said vane and said compressing means dividing said bore into respective high and low pressure chambers, said method comprising:
providing a first groove in a wall of said vane slot on the suction side of said vane;
discharging high pressure gas from said bore into said housing, thereby exerting pressure on the oil in said oil sump;
directly connecting said groove to said sump with a passage, whereby oil is supplied to only said groove from said sump by the relative pressure difference between said housing and said groove, said oil providing a biasing force on only the suction side of said vane.

4,629,404

NUTATING DISC TYPE FLUID DEVICE

Charles Raymond, 1715 Mountain View Ave., Petaluma, Calif. 94952

Filed Jun. 20, 1985, Ser. No. 747,052
Int. Cl.⁴ F01C *1/063*
U.S. Cl. 418—49 **15 Claims**



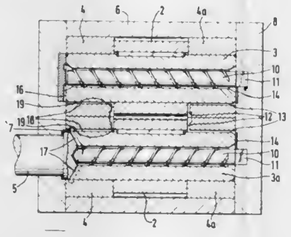
1. A fluid device for use as a fluid pump or motor comprising the combination of a stator housing having an outer wall with an interior spherical surface which partially defines a chamber, a shaft extending through the chamber and mounted for rotation about a central axis, the shaft including an enlarged ball portion having a spherical surface concentric within the chamber, stator cones positioned about the shaft at opposite sides of the ball portion with the apexes of the cones extending toward the center of the chamber, a nutating disc having an outer circular edge conforming with the spherical surface of the housing, means for mounting the disc for rotation on the ball portion about an axis which extends through the center of the chamber and inclines at an acute angle with the central axis, said disc being formed of an elastomeric material which resiliently deforms to pass solid objects contained in the fluid and to accomodate slot width requirements during the nutating movement, a divider plate carried by the housing and extending radially into one side of the chamber with the inner edge of the divider shaped in conformance with the outer surface of the ball portion, and means forming a slot through one side of the disc with the divider plate slidably fitted in the slot.

4,629,405

GEAR PUMP HAVING AN AUTOMATIC LUBRICATOR

Geza Hidasi, Bobingen, and Karl Zill, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1980, Ser. No. 175,646
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932464
Int. Cl.⁴ F04C *2/18, 15/00;* **F16N** *13/20;* **F16C** *33/10*
U.S. Cl. 418—102 **6 Claims**



1. A self-lubricating gear pump having at least several shafts with bearings for the shafts, a flow passageway extending through the pump from the inlet to the outlet thereof, lubrication means constructed and arranged to lubricate the bearings of the pump with the medium being conveyed by the pump, the lubrication means including delivery channels connecting the pump flow passageway with the bearings and separate discharge channels connecting the bearings to the flow passageway, and conveying means disposed between the delivery and discharge channels coaxially positioned in the shafts and movable relative thereto, the conveying means communicating with the delivery and discharge channels for causing a portion of the medium being conveyed by the pump to flow through the channels to lubricate the bearings.

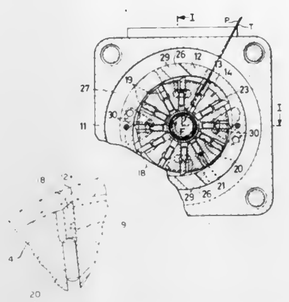
4,629,406

VOLUMETRIC VANE PUMP FOR FLUID-HYDRAULIC DRIVE

Paolo Tantardini, Milan, Italy, assignor to Atos Oleodinamica S.p.A., Milan, Italy

Filed Feb. 7, 1985, Ser. No. 699,246
Claims priority, application Italy, Feb. 10, 1984, 20811/84[U]
Int. Cl.⁴ F04C *2/00*
U.S. Cl. 418—268 **7 Claims**

1. A volumetric vane pump for fluid-hydraulic drive comprising a body having a stator cavity containing a stator, a rotor mounted for rotation about an axis within said stator, said rotor carrying a plurality of generally radially disposed blades, said blades being each slidably received in an associated slot of said rotor, each blade having a longitudinal plane disposed generally radially relative to said rotor, a bore positioned radially of and opening into each slot, a piston in each bore for urging each associated blade radially outwardly against an inner annular surface of said stator, each bore and piston having a diameter greater than the thickness and width of its associated respective blade and slot, said blade and slot having



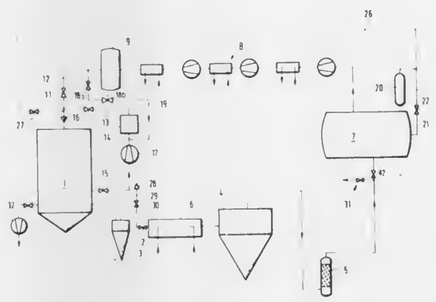
essentially the same width, each piston having an axis passing through said rotor axis, said rotor being rotatable in a predetermined direction of rotation, and each said piston axis being in lagging relationship to its associated blade longitudinal plane relative to the direction of rotor rotation.

4,629,407

APPARATUS FOR THE MANUFACTURE OF METAL POWDER BY ATOMIZATION FROM A NOZZLE WITH NOBLE GAS OR NITROGEN

Heinrich Amlinger, Niddatal, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,570
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423597
Int. Cl.⁴ B22F *9/08*
U.S. Cl. 425—7 **9 Claims**



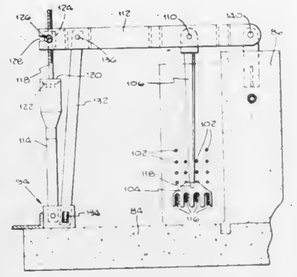
1. Apparatus for the production of metal powder by atomization by noble gas or nitrogen, comprising an atomization tower, a gas recycling system and a gas cleaning system, wherein the gas cleaning system has a cleaning apparatus and is disposed together with a pumping blower in a branch duct connected parallel to the atomization tower and a duct supplies the tower with gas and is connected to the branch duct through a second duct equipped with a valve, in such a manner that the second duct leads to a point between the pumping blower and the cleaning apparatus.

4,629,408

PORTABLE CONCRETE BEAM HARPING SYSTEM

Anthony S. Giron, Diamond Bar, and Andrew T. Curd, Valencia, both of Calif., assignors to Arctic Equipment Rental, Inc., Diamond Bar, Calif.

Filed Sep. 6, 1985, Ser. No. 773,425
Int. Cl.⁴ B28B *23/06*
U.S. Cl. 425—111 **21 Claims**



1. A portable system for making precast, harped reinforced concrete beams comprising:
a set of inverted T-shaped sections of concrete, most of said sections being more than 20 feet long, said sections having aligned, spaced holes extending from end to end of each section;
means including tensioned cables passing freely through said aligned spaced holes for holding said T-shaped sections together and aligned with one another to form a portable bed;
means for providing beam forms on either side of the center of said T-shaped sections;
means for supporting and aligning a series of steel strands to pass through the lower half of each beam to be cast with the strands extending substantially from one end of the portable bed to the other, and said supporting means including means for providing steel strand roller supports along the length of the beam forms, between the intended ends of successive beams;
means for depressing and harping said strands substantially at the center of each intended beam; and
said depressing means including a fixed pivot member mounted on the central wall of one of said T-shaped sections, a lever pivotally mounted to alternatively extend on either side of said central wall, means mechanically coupled to an intermediate point along said lever for engaging said steel strands, and means for engaging the outer end of said lever and pulling it down toward the exposed outer edge of one side of said T-shaped concrete section to substantially depress said steel strands and harp them;
whereby light weight, harped, pre-stressed concrete beams may be formed at the job site.

4,629,409

ROTATIONAL MOLDING APPARATUS HAVING ROBOT TO OPEN, CLOSE, CHARGE AND CLEAN MOLDS

Yasuta Satoh, Tokyo; Hiroshi Tsuchihashi, Funabashi, and Saburo Tani, Tokyo, all of Japan, assignors to Takara Co., Ltd., Tokyo, Japan

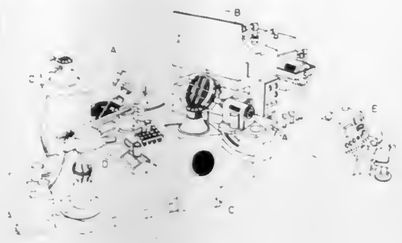
Filed Jun. 27, 1985, Ser. No. 749,578
Claims priority, application Japan, Oct. 17, 1984, 59-216271
Int. Cl.⁴ B29C *41/06, 39/24, 39/36*
U.S. Cl. 425—139 **11 Claims**

1. A machine for molding a synthetic resin doll automatically comprising: at least one mold;
a robot mechanism having a unit for opening and closing a cover of said mold, a unit for releasing a molding from the

mold, a unit for detecting a molding release and cleaning the mold and a unit for charging a raw material into the mold in a solid state;

a heating mechanism having a heating furnace;

a cooling mechanism having a cooling chamber;



a mold holding mechanism having a moving unit for moving the mold from the robot mechanism to the heating mechanism, from the heating mechanism to the cooling mechanism, and from the cooling mechanism to the robot mechanism, which is adapted to rotate around its own axis and to revolve around the mold holding mechanism; and control means to make the machine run automatically.

4,629,410

DUAL-HOPPER INJECTION UNIT FOR INJECTION MOLDING MACHINE

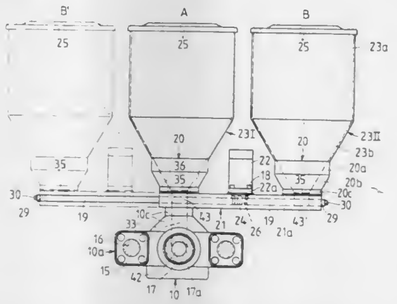
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,126

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228161

Int. Cl.[4] B29C *45/18*

U.S. Cl. 425—145 **9 Claims**



1. A structure supporting dual raw material hoppers on the injection unit of an injection molding machine for the selective supply of granulate raw material from either hopper into the plastification cylinder of the injection unit, the hopper supporting structure comprising in combination:

a mounting hub associated with a rearward portion of the plastification cylinder of the injection unit, the mounting hub having an upwardly facing mounting face surrounding a charge chute in the form of a bore leading from the mounting face into the plastification cylinder;

an elongated transverse guide plate attached to the mounting face of the plastification cylinder so as to extend laterally outwardly on both sides of the plastification cylinder, the guide plate having a central bore forming an extension of said charge chute;

a hopper base assembly with a discharge opening forming part of each raw material hopper;

a hopper carriage adapted for the attachment thereto of the two hopper base assemblies and for a supporting the two hoppers at a fixed distance from each other, the hopper carriage being supported and guided on the transverse guide plate, for the execution of translational movements of the hopper carriage along the guide plate over a distance which is equal to the distance between the discharge openings of the two hopper base assemblies, so that either of the two hoppers is alternatingly movable from a lateral waiting position into an operating position in which the discharge opening of its hopper base assembly is aligned with the cental bore of the guide plate and the charge chute, for gravity flow of raw material from the hopper into the plastification cylinder; and

translation drive means associated with the hopper carriage and the transverse guide plate for the mechanized execution of the translational movements of the hopper carriage.

4,629,411

APPARATUS FOR THE SEPARATION OF ADMIXTURES FROM CONTAMINATED THERMOPLASTIC MATERIALS

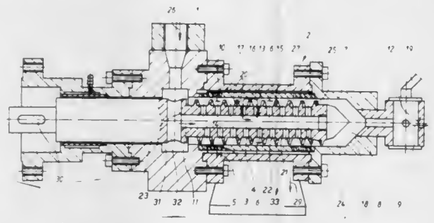
Eberhard Bücheler, Am Bord 1, Radolfzell 17, Fed. Rep. of Germany 7760

Filed Jun. 18, 1984, Ser. No. 621,466

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332278

Int. Cl.[4] B29C *47/68*

U.S. Cl. 425—197 **9 Claims**



1. An apparatus to separate admixtures from molten contaminated thermoplastic materials comprising:

(a) a housing;

(b) an extruder having a discharge flange and extending through an outside wall of said housing, said extruder plastifies said contaminated thermoplastic materials;

(c) a pressure chamber located within said housing and having one end attached to said discharge flange of said extruder and a second end attached to a first exit outlet of the housing, said pressure chamber pressurizes said plastified contaminated thermoplastic materials as they pass through said chamber from said extruder toward said first exit outlet;

(d) a distributor screw located inside said pressure chamber and having one end attached to said discharge flange of said extruder, said distributor screw having a central retaining chamber used to receive said contaminated thermoplastic materials from said discharge flange and a plurality of return flow holes to circulate said thermoplastic materials from said retaining chamber around said distributor screw and back into said retaining chamber, resulting in the purification of said contaminated thermoplastic materials; and

(e) a screening element having a plurality of screen holes and located inside said pressure chamber around said distributor screw, and said screening element forming an annular chamber with said distributor screw, said annular chamber communicating with said retaining chamber of said distributor screw and pressing said contaminated thermoplastic materials travelling from said discharge flange of said extruder into the annular chamber to separate said admixtures from said thermoplastic materials and subsequently pass the admixtures from said annular chamber to said exit outlet, said screen holes of said screening element transporting purified thermoplastic materials from said annular chamber to a second outlet exit.

4,629,412

HOT ISOSTATIC PRESSING APPARATUS

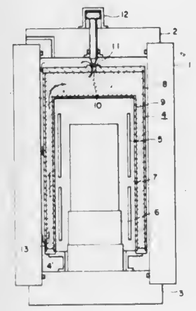
Yoichi Inoue, Ashiya, and Takahiko Ishii, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 9, 1984, Ser. No. 639,065

Claims priority, application Japan, Aug. 11, 1983, 58-125126[U]

Int. Cl.[4] B22F *3/12*

U.S. Cl. 425—405 H **5 Claims**



1. A hot isostatic pressing apparatus, comprising:

a high pressure vessel having an upper and lower cover defining a high pressure chamber;

a heat insulating layer positioned within said high pressure chamber of said vessel;

a heater disposed inside said high pressure chamber wherein said heat insulating layer further comprises at least an inner and outer inverted cup-like casing and a layer of insulation positioned between said inner and outer casing, the outer casing being metallic wherein an upper passage means formed in the upper surface of the outer casing;

valve means positioned in said upper passage means so as to open and close said passage;

means mounted on said upper cover for opening and closing said valve means wherein said outer casing includes a lower gas passage means for providing communication from said lower gas passage means through said insulation and through said upper passage means; and

means for hermetically sealing and interconnecting a lower end portion of said inner casing to said lower end portion of said outer casing.

4,629,413

LOW NO_x PREMIX BURNER

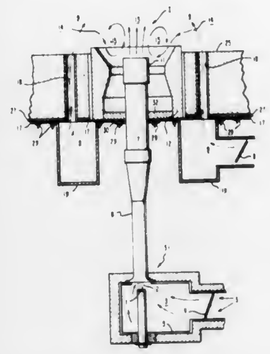
Herbert D. Michelson, Fort Lee, and James P. Stumbar, Berkeley Heights, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 10, 1984, Ser. No. 648,494

Int. Cl.[4] F23M *3/00*

U.S. Cl. 431—9 **17 Claims**

1. A premixing burner for the combustion of fuel gas and air with reduced NO_x production, said burner having a primary air-fuel gas combustion assembly and a secondary air combustion assembly, the primary air-fuel gas combustion assembly comprising a burner tube and a burner tile spaced from and surrounding the downstream end of said tube, the burner tube having a mixer connected to an extension tube and a burner tip mounted on the downstream end of said extension tube, the said mixer having inlets for fuel gas and primary air and adapted to mix said fuel and primary air prior to combustion at predetermined ratios, said burner tip having ports for passage of the gas from the extension tube, the burner tube and burner tile being adapted to support and stabilize a substoichiometric initial flame resulting from the combustion of the gases passing through the burner tip, said initial flame having a base in the region formed by said burner tile and burner tip, said secondary air combustion assembly comprising multiple secondary air ports and secondary air inlet means therefor, said secondary air ports being spaced radially from said burner tile and circumferentially from each other, the radial spacing being a sufficient



distance to permit secondary air streams from the ports to react with the flame of the premixed gas substantially downstream of the burner tip, the circumferential spacing between ports being a sufficient distance to permit furnace flue gas to re-circulate to the base of the initial flame in amounts at least sufficient to achieve lower temperatures in the initial flame and to move the secondary air streams away from the initial flame, the primary air-fuel gas ratios including the range of about 25-65% of the stoichiometric air requirement of the fuel gas, the burner being adapted for a total air requirement of up to about 120 mol % of the stoichiometric air requirement of the fuel gas.

4,629,414

HOT GAS GENERATING BURNER

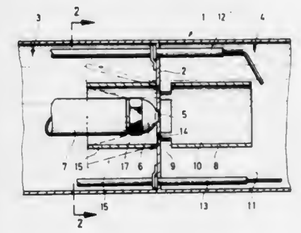
Winfried Buschulte, Neuenstadt; Erich Adis, Heilbron-Neckargartach, and Manfred Bader, Neuenstadt, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,824

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430010

Int. Cl.[4] F23D *13/40*

U.S. Cl. 431—46 **24 Claims**



1. A hot-gas generating burner comprising: a nozzle from which a fuel jet outflows and enters a mixing tube, an orifice plate surrounding the outlet of the nozzle, a casing divided into an upstream precombustion chamber containing the nozzle and

a downstream combustion chamber containing the mixing tube, the orifice plate having a central passage for the fuel jet that outflows from the nozzle and a number of openings surrounding the passage, through which openings combustion air flows from the precombustion chamber into the mixing tube, wherein the openings are located within a surface which is defined by a projection of the clear cross-sectional area of the mixing tube onto the orifice plate, the spacing between the peripheries of the neighbouring openings amounting to at least 50% of the opening diameter and the openings in the orifice plate being associated, in the direction of flow, with at least one air duct which, at least in the area of the radially externally disposed edges of the openings, extends smoothly into the openings.

4,629,415

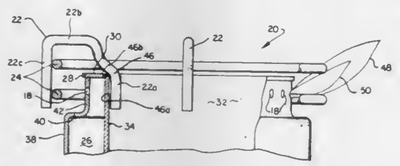
FLAME INSERT

Douglas W. DeWerth, and William G. Sterbik, both of Cleveland, Ohio, assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 512,328, Jul. 11, 1983, Pat. No. 4,525,141. This application Jun. 24, 1985, Ser. No. 747,995

Int. Cl.⁴ F23D *14/12*

U.S. Cl. 431—347 **25 Claims**



1. A flame insert for reducing the NO_x emissions of a burner including a burner head having an array of burner ports from which flames extend during combustion, said flame insert comprising a rigid framework provided by a plurality of disjuncted support members connected to a plurality of elongate members, each of said elongate members comprising a ring member and each of said support members comprising a ring engaging portion securing the ring members together and a burner head engaging portion for mounting said insert to the burner head and positioning said ring members adjacent said burner ports in a predetermined flame engaging position, said ring members being operable in said predetermined position to engage flames extending from the burner ports during combustion and to reduce the peak flame temperature by radiating heat energy away from the flames.

4,629,416

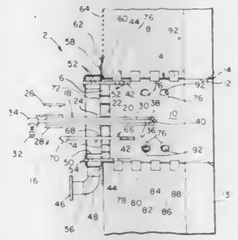
BLUFF BODY REGISTER

James T. Voorheis, Essex Fells, N.J., assignor to Voorheis Industries, Inc., Fairfield, N.J.

Filed Jun. 11, 1985, Ser. No. 743,468

Int. Cl.⁴ F23D *14/02*

U.S. Cl. 431—352 **16 Claims**



1. A burner assembly comprising:
register means having an annular wall;
a plurality of transverse bluff body element means circumferentially spaced about said annular wall in a plurality of axially spaced rows for supplying air to said register means;
means for supplying a combustible material to said register means; and
a plurality of substantially circular bluff body barrier means positioned substantially centrally within said bluff body element means for enhancing mixing of said combustible material and said air within said register means.

4,629,417

PROCESS AND FURNACE FOR REHEATING SLABS, BILLETS, BLOOMS AND THE LIKE

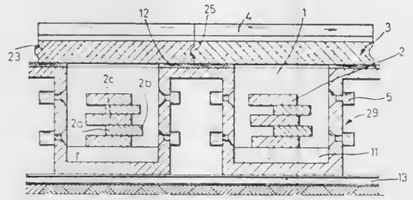
Heinrich Patalon, Bochum, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,776

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442707

Int. Cl.⁴ F27D *5/00*; F26B *3/00*; F23M *7/00*; F27B *9/02*

U.S. Cl. 432—5 **19 Claims**



18. A furnace, particularly a reheating furnace for slabs, billets, blooms and analogous metallic objects, comprising a casing defining a plurality of discrete open-top heating chambers; means for individually maintaining each of said chambers at a selected tenperature, including burners in said casing; a mobile roof disposed above and movable into sealing engagement with said casing as well as to positions in which the tops of said chambers are exposed; mats of fibrous insulating material between said roof and said casing; and elevator means for delivering objects from above into selected chambers and for lifting heated objects out of the respective chambers.

4,629,418

PROCESS AND FURNACE FOR REHEATING METALLIC OBJECTS

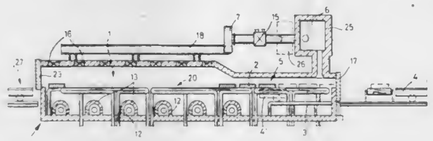
Heinrich Patalon, Bochum, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,777

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440048

Int. Cl.⁴ F27D *3/00*; C21B *1/00*; F27B *9/00*

U.S. Cl. 432—11 **18 Claims**



1. A process for heating blooms, billets, slabs and analogous metallic objects to a predetermined temperature in a reheating furnace wherein the objects are contacted by a heated gaseous fluid with attendant cooling of the fluid, comprising the steps of transporting the objects through the furnace; withdrawing the cooled fluid from the furnace; establishing and maintaining a mixing chamber; admitting into the mixing chamber variable quantities of the withdrawn cooled fluid; admitting into the mixing chamber a freshly heated gaseous fluid which is mixed with the admitted quantities of cooled fluid; maintaining the temperature of the resulting mixture at a value which is at least close to said predetermined temperature; and causing such mixture to contact the objects in the furnace.

4,629,419

CALCINATION METHOD AND APPARATUS

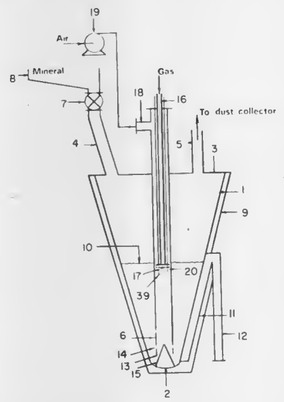
Arthur G. T. Ward, Wilford, and Christopher Todd-Davies, Nottingham, both of England, assignors to BPB Industries Public Limited Company, London

Continuation of Ser. No. 95,814, Nov. 19, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,347

Claims priority, application United Kingdom, Jan. 8, 1979, 7900593

Int. Cl.⁴ F27B *14/00*

U.S. Cl. 432—13 **7 Claims**



1. An apparatus for calcining granular or powdered mineral, especially hydrated calcium sulphate, the portion of said apparatus in which the powdered mineral is placed and in which the actual calcining takes place comprising a vessel having a top, bottom and side wall or walls, said vessel at said top having a larger cross-sectional area than at said botom, said cross-sectional area continually decreasing from said top to said bottom, said side wall or walls sloping inwardly continually from said top to said bottom, said vessel being arranged so that said powdered mineral being calcined rests on said bottom and said side wall or walls, and a downwardly extending heating tube mounted in said vessel connectable at an upper portion to a gas source and opening at a lower portion into the interior of said vessel adjacent to the bottom thereof, whereby in use hot gas issuing from the lower portion of the heating tube mixes with and heats substantially all the contents of said vessel, said bottom being of small cross-sectional area compared to the cross-sectional area of the upper region of said vessel to insure that gas issuing from said tube agitates the granular calcium sulphate across the entire bottom of said vessel, said vessel being free of any grid or grate to insure free flow of the calcining mixture.

7. A method of calcining a granular or powdered mineral, especially hydrated calcium sulphate, the actual calcining taking place in a vessel having a top, bottom and side wall or walls, said vessel having a larger cross-sectional area at said top than at said bottom and continually decreasing in cross-sectional area from said top to said bottom, said side wall or walls sloping inwardly from said top to said bottom, which comprises continuously introducing the mineral into said vessel, continuously introducing hot gas through the vessel into direct contact with the mineral in the region of the bottom of the vessel whereby the mineral in the bottom region is agitated and heated and the heating and agitation extend from the bottom region through substantially all the mineral in the vessel, and continuously withdrawing calcined mineral from the vessel preferably by means of a weir or overflow device.

4,629,420

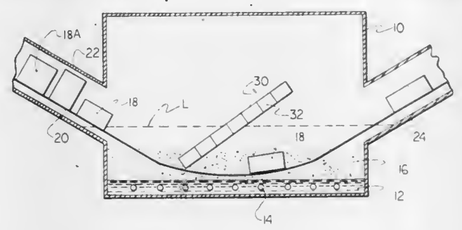
VAPOR LEVEL CONTROL FOR VAPOR PROCESSING SYSTEM

Gerald E. Waldron, Foxboro, Mass., assignor to Dynapert-HTC Corp., Farmington, Conn.

Filed Mar. 26, 1986, Ser. No. 844,393

Int. Cl.⁴ F27D *21/00*

U.S. Cl. 432—32 **4 Claims**



1. A vapor processing system comprising:
a vessel for containing a processing vapor,
heater means for heating an electronic fluid contained within said vessel to establish a saturated vapor zone, said heater means having a variable output,
means for conveying work product to the saturated vapor zone,
means for defining a selected saturated vapor zone level for work product delivered to the vapor zone including
selectively setable means for generating a signal representative of the actual temperature at one of at least a plurality of spaced locations,
selectively setable means for generating a signal representative of the desired temperature at the selected location for a saturated vapor zone having a level selected for the work product being conveyed to the saturated vapor zone,
means for generating data concerning product to be processed, and
means operating on said data for setting said means for generating a signal representative of the actual temperature and for setting said means for generating a signal representative of the desired temperature at the selected location, and
means for comparing the generated signals representative of the actual and desired temperatures at the selected location and for varying the output of said heater means to change the actual sensed temperature to the desired temperature so that the actual saturated vapor zone level will conform to the desired saturated vapor zone level.

4,629,421

GAS AND SOLID PARTICULATE MATERIAL HEAT EXCHANGER

Alan J. Kreisberg, and Jay Warshawsky, both of Allentown, Pa., assignors to Fuller Company, Bethlehem, Pa.

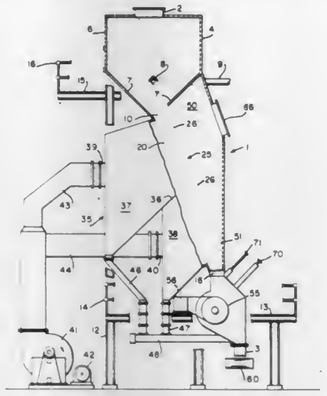
Filed Nov. 18, 1985, Ser. No. 799,071

Int. Cl.⁴ F27D *15/02, 1/08*; F26B *19/00, 17/12*

U.S. Cl. 432—77 **14 Claims**

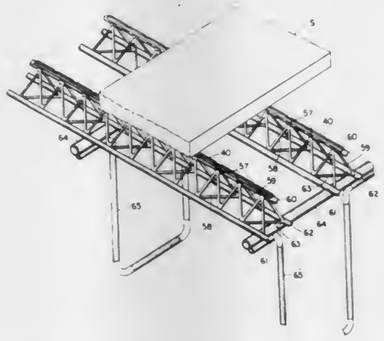
14. Apparatus for carrying out heat exchange between a gas and solid particulate material comprising a casing having an upper inlet for particulate material and a lower outlet for particulate material; a lower grate mounted in said casing extending from said upper inlet to said lower outlet for supporting a bed of particulate material for movement from the inlet to the outlet along the lower grate; means defining an upper grate mounted in said casing and spaced from said lower

grate including a plurality of generally vertically oriented slats, each spaced from and positioned below a preceding slat in the direction from said inlet toward said outlet for defining the top of the bed of material while permitting the bed of material to expand; said casing including an inlet for gas on one side of the casing and an outlet for gas on the other side of the casing



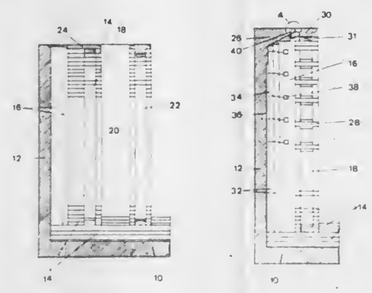
whereby gas flows from said inlet through said lower grate, the bed of material and through the upper grate to the outlet for gas for carrying out heat exchange between the gas and the solid particulate material, each of said slats is perforated to permit gas and fine material to pass therethrough while retaining the bed of material on the lower grate.

4,629,422
FRAME APPARATUS FOR SUPPORTING WORKPIECES IN A REHEAT FURNACE
Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.
Filed Sep. 23, 1985, Ser. No. 778,628
Int. Cl.⁴ F27D *3/02*
U.S. Cl. 432—234 **15 Claims**



1. A frame apparatus for supporting workpieces in a reheat furnace having walls adapted to radiate heat to workpieces, said frame apparatus including the combination of:
rail means extending along the path of travel of the workpieces in the furnace for engaging the underside faces of the workpieces,
a tubular top cord member for carrying said rail means,
a plurality of tubular lower cord members generally parallel and spaced below said tubular top cord member,
tubular web members extending angularly between joints which intersect with said top and lower cord members to form a lattice structure having triangular open spaces for passage of radiation to heat the underside faces of workpieces along either side of said rail means, and
means for supplying coolant to said top and lower cord members and said tubular web members.

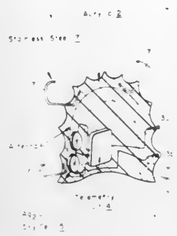
4,629,423
SIDEWALL INSULATION OF A CHAMBER TYPE FURNACE FOR BAKING CARBON BLOCKS
Willem Venus, Spykenisse, Netherlands, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Jan. 14, 1986, Ser. No. 818,697
Claims priority, application Switzerland, Jan. 30, 1985, 407/85
Int. Cl.⁴ F27D *1/00*
U.S. Cl. 432—247 **13 Claims**



1. A chamber open-ring type furnace for baking carbon blocks having an outer wall defining a chamber divided into a plurality of firing shafts, the improvement which comprises insulation in the region between the outermost firing shaft and the outer wall, said insulation comprising at least one layer of refractory foamed bricks abutting the outermost firing shaft and at least one layer of insulating bricks made of a material selected from the group consisting of moler stone and calcium silicate abutting the insulating refractory foamed bricks and the outer wall, said outer wall having a projection which projects over said insulation at a spaced distance therefrom wherein the space between the projection and said insulation is filled with a compressible refractory insulating material and sealing means for sealing between the projection and the outermost firing shaft.

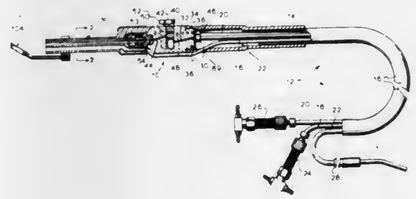
4,629,424
INTRAORAL AMBIENT SENSING DEVICE
Imants R. Lauks, Sewell, and Samuel L. Yankell, Moorestown, both of N.J., assignors to Integrated Ionics, Inc., Princeton, N.J.
Filed Aug. 30, 1984, Ser. No. 645,940
Int. Cl.⁴ A61C *3/00*
U.S. Cl. 433—6 **16 Claims**

1. A dental assembly useful for the measurement of parametric changes throughout the oral cavity comprising:
a Hawley appliance;
a sensor assembly mounted on said Hawley appliance comprising one or more sensors having means for measuring parametric changes throughout the oral cavity and which provide an electrical output signal in response to said changes in one or more of the intraoral parameters;
a lead to each sensor;
means mounted on said Hawley appliance for transmitting said electrical output signal from the oral cavity using only a modulated radio frequency carrier; and



means for hermetically sealing said sensor assembly, said lead and said transmitting means.

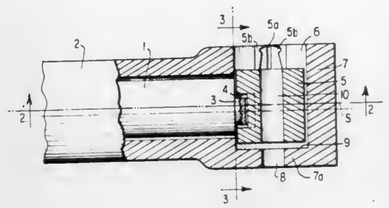
4,629,425
DENTAL MIRROR
Steven G. Detsch, 4840 Casa Bonita Ct., Bonita, Calif. 92002
Filed Jan. 16, 1985, Ser. No. 691,980
Int. Cl.⁴ A61C *3/00*
U.S. Cl. 433—31 **12 Claims**



1. Mirror apparatus for examining body cavities including a handle member and a mirror having a reflecting surface associated with said handle member wherein the improvement comprises multiple media mirror cleaning means connected to said handle member and located with respect to said mirror for causing a flow of at least three types of mirror reflecting surface cleaning media to pass over the reflecting surface of said mirror for cleaning said mirror reflecting surface, said multiple media cleaning means comprising means for manually selectively causing air, water or a combination of air and water to pass over the reflecting surface of said mirror, and fiber optic light means associated with the handle member of said mirror apparatus for causing light to be directed to said mirror, said fiber optic light means including a flexible fiber optic portion having a portion located in said handle member and a rigid disconnectable fiber optic portion including means for permitting said rigid disconnectable fiber optic portion to be manually disconnected and reconnected to said flexible fiber optic portion, said mirror being removable from and slidably operatively mounted on said disconnectable fiber optic portion.

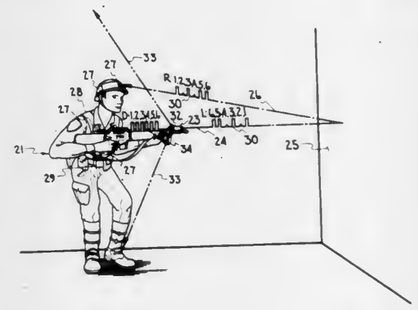
4,629,426
ENDODONTIC APPLIANCE
Guy Levy, 49, rue Croix de Regnier, F-13004 Marseille, France
Filed Apr. 15, 1985, Ser. No. 723,625
Claims priority, application France, Apr. 20, 1984, 84 06446
Int. Cl.⁴ A61C *1/07, 3/03*
U.S. Cl. 433—118 **11 Claims**

1. Endodontic treatment apparatus composed of an endodontic treatment instrument in the form of a file having, on its outer surface, a spiral crest, in combination with a drive head, said drive head comprising: a support body provided with a passage; instrument support means having a longitudinal axis and mounted in said passage to undergo movement relative to said body in the direction of said longitudinal axis; drive means for producing alternating movement forces in the direction of said longitudinal axis; and means coupling said drive means to said instrument support means for causing said support means to undergo, in the direction of said longitudinal axis, alternating movements having an amplitude which varies over a selected range as a function of the resistance to longitudinal



movement experienced by the instrument, which amplitude has a minimum value corresponding substantially to the pitch of the spiral crest of said file, said instrument support means constituting means for supporting said endodontic treatment instrument in a manner to cause said instrument to move with said instrument support means in the direction of said longitudinal axis and to have a freedon of rotation about said longitudinal axis and relative to said support body.

4,629,427
LASER OPERATED SMALL ARMS TRANSMITTER WITH NEAR FIELD REFLECTION INHIBIT
Lawrence J. Gallagher, Arcadia, Calif., assignor to Loral Electro-Optical Systems, Inc., Pasadena, Calif.
Filed Nov. 8, 1985, Ser. No. 796,654
Int. Cl.⁴ F41F *27/00*
U.S. Cl. 434—22 **2 Claims**



1. A laser operated small arms transmitter attachable to the barrel of a gun for producing a coded laser beam simulating the trajectory of a projectile comprising:
a laser optical means including hit code pulse generating means and an internal power source means and an internal power source means whereby said laser optical means produces a beam simulating a projectile directed toward a photodetector target system;
a light emitting diode optical means including a second inhibit code pulse generating means whereby a hit code inhibiting wide angle beam, synchronous with said hit code pulses, is produced and directed towards the photodetector target system worn by the shooter of the gun.

4,629,428

COLOR PRINTING PROCESS AND EQUIPMENT

Gordon L. P. Phillips, 243, Cyncoed Road, Cardiff, Glamorgan, United Kingdom

Filed Mar. 16, 1984, Ser. No. 590,370
Claims priority, application United Kingdom, Mar. 18, 1983, 8307290
Int. Cl.⁴ G09B *19/00*
U.S. Cl. 434—98 **18 Claims**



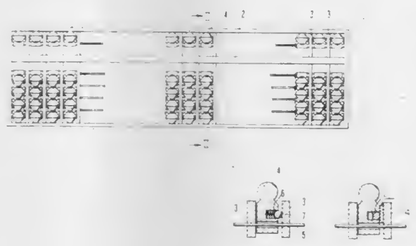
1. A colour matching device for use in process colour printing, comprising a plurality of small printed process colour areas, each representing a different reference "tint" for use in the final colour printing, the said printed areas being arranged in identifiable groups, and all the printed areas in each group being printed by means of selected process colours, each at a uniform selected percentage density within the said group, and each printed area being individually identifiable.

4,629,429

ABACUS WITH EACH COUNTER HELD IN POSITION BY FRICTION OR MAGNETIC ATTRACTION

Tsuyoshi Horie, 7-15, Iwamoto-cho 3-chome,, Chiyoda-ku, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,675
Int. Cl.⁴ G06C *1/00*
U.S. Cl. 434—203 **2 Claims**



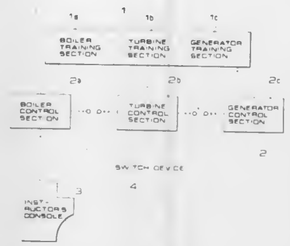
1. An abacus comprising:
vertically extending partition walls along which a specific number of counters can be slid, each counter representing a digit or a specific number of digits, each counter being shaped like a doll having a spherical head and a stem, the head protruding above the body of the abacus;
shafts extending horizontally through the partition walls and also through the stems of the counters such that the counters are pivotally mounted to the shafts in side-by-side relation to each other;
compressed springs each mounted in a hole formed in each stem of the counters, the hole horizontally extending partially through the stem; and
small balls attached to the springs;
whereby the side portion of each counter that is not in contact with the small ball is pressed against the opposed partition wall by the biasing force of the springs to maintain the counters at their present positions.

4,629,430

PLANT OPERATOR TRAINING SIMULATOR

Fumio Sakamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1985, Ser. No. 689,224
Claims priority, application Japan, May 23, 1984, 59-104230
Int. Cl.⁴ G09B *25/02*
U.S. Cl. 434—219 **2 Claims**



1. An operator training simulator for training operators of a thermal power plant, comprising:
a trainer's console producing signals in correspondence to an arbitrary state of process of a thermal power plant as set up by a trainer;
a computer including a boiler control section, a turbine control section and a generator control section all for performing predetermined computation of simulation of operation of respective power plant sections in response to the signals produced on said trainer's console;
a training equipment including a boiler training section, a turbine training section and a generator training section connected to the respective control sections of said computer and adapted to display the state of a respective boiler plant section, a turbine plant section and a generator plant section obtained as a result of computation by said computer, said equipment being capable of varying the state of process by sending operating signals produced in correspondence to actions taken by trainees back to said computer; and
a switch device having (1) a disconnecting mode for functionally dividing the boiler control section, the turbine control section and the generator control section of said computer so that the control sections concurrently operate independently of each other as if three independent power plants are operated in response to the respective training sections, and also having (2) a connecting mode for linking the boiler control section, the turbine control section and the generator control section of said computer so that the control sections operate interactively as if a single unitary power plant is operated in response to the training sections.

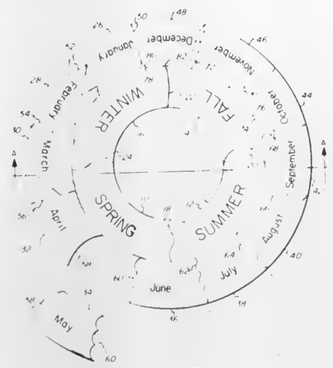
4,629,431

GAME FOR TEACHING TIME CONCEPTS

Susan Sanders, 21 S. Brooklyn Ave., Wellsville, N.Y. 14895

Filed Oct. 24, 1985, Ser. No. 790,851
Int. Cl.⁴ G09B *19/12*
U.S. Cl. 434—304 **22 Claims**

1. An educational game to aid in learning time concepts which game comprises;
a plurality of discreetly configured puzzle pieces having means for assembly to form a structure;
a first continuous band of interlocking pieces, each piece of said band bearing indicia designating a different one of the seasons of the year;
a second continuous band of interlocking pieces, each piece of said second band bearing inidica designating a different one of the calendar months;
said pieces forming said first and second bands being adapted to be assembled in interlocking relationship only when positioned in the correct sequence of calendar months and seasons and the correct alignment of calendar months in the second band with corresponding seasons in the first band.

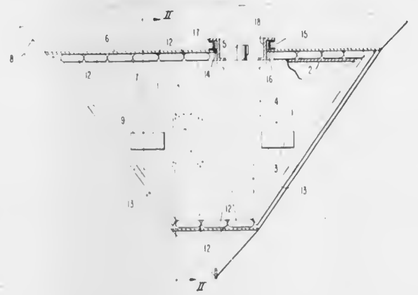


4,629,432

ELASTICALLY SUPPORTED THRUSTER STRUCTURE

Arnfinn Dyrkorn, Molde, and Leiv R. Standal, Vestnes, both of Norway, assignors to Brödr. Brunvoll Motorfabrikk A/S, Molde, Norway

PCT No. PCT/NO84/00006, § 371 Date Aug. 28, 1984, § 102(e) Date Aug. 28, 1984, PCT Pub. No. WO84/03078, PCT Pub. Date Aug. 16, 1984
PCT Filed Feb. 1, 1984, Ser. No. 645,744
Claims priority, application Norway, Feb. 4, 1983, 830384
Int. Cl.⁴ B63H *21/30*
U.S. Cl. 440—52 **4 Claims**



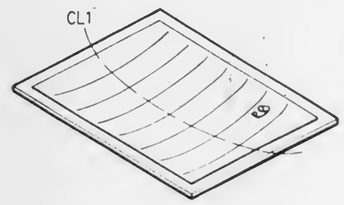
1. In an elastically supported propeller thruster installation for propulsion and/or steering of a ship, particularly a thruster in which a propeller operates in an open tunnel through the hull of the ship, said installation being of the type including an outer tunnel tube rigidly secured to the hull structure of the ship, an inner tunnel tube, a propeller unit rigidly supported in said inner tunnel tube, connection means for elastically supporting said inner tunnel tube coaxially within said outer tunnel tube with an annulus therebetween, and compressible sound absorbing means within said annulus for reducing the transmission of pressure pulses through said annulus to said outer tunnel tubes, the improvement wherein:
said sound absorbing means comprises a plurality of gas filled cushions loosely positioned and confined in said annulus without connection to said inner or outer tunnel tube, said cushions being formed of elastomer material and having thin walls; and
said annulus has opposite ends which are unsealed and open to the surrounding water.

4,629,433

INFLATABLE ARTICLES AND METHOD OF MAKING SAME

Sidney H. Magid, 4th Floor, No. 10, Lane 12, Alley 5, Jen Ai Road, Sec. 4, Taipe, Taiwan

Continuation-in-part of Ser. No. 426,998, Sep. 29, 1984, abandoned, which is a continuation of Ser. No. 176,247, Aug. 7, 1980, abandoned. This application Jun. 22, 1984, Ser. No. 624,900
Int. Cl.⁴ B63C *9/04*
U.S. Cl. 441—40 **10 Claims**



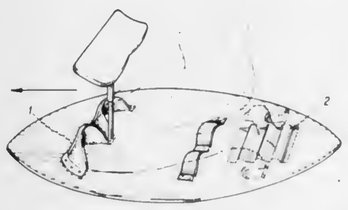
1. An inflatable article made of air impervious thermoplastic sheet materials, comprising: at least one inflatable unit having an inflating valve provided thereon and having normally ruffled portions located outside of air enclosing seals wherein there is located on at least one selected portion a stabilizing seal adjacent to an air enclosing seal to provide an essentially flat and unruffled constant length seal which remains as such whether said article is inflated or deflated and which permits a center line through said inflatable unit to shorten and lengthen upon inflation and deflation, respectively, without causing said selected portion to ruffle upon inflation and which does not permit said article to lay flat upon deflation.

4,629,434

WATER GLIDING BOARD

F. Javier Monreal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Filed Nov. 19, 1984, Ser. No. 672,813
Int. Cl.⁴ A63C *15/00*
U.S. Cl. 441—65 **5 Claims**



1. A water gliding board capable of supporting a rider in several positions and of traveling in several directions comprising:
a pair of soft elastic knee shells attached along the upper surface of said board shaped to receive the knees of said rider when in a low kneeling position and traveling in a first direction;
a support means having an upper surface elevated above said upper surface of said board for supporting the knee of said

rider when in a high kneeling position and traveling in said first direction, said upper surface of the support means further supports the buttocks of said rider when in a sitting position and traveling in a second direction opposite to said first direction;

a first foot receiving means for engaging the feet of said rider when in a standing position and traveling in either said first direction or said second direction, said first foot receiving means being located on said board to engage the feet of said rider also in the said high kneeling position traveling in the said first direction;

a second foot receiving means being located on the said board to engage the feet of said rider when in said low kneeling position; and

a third foot receiving means being located on said board to engage the feet of said rider when in said sitting position.

4,629,435

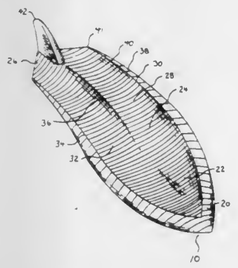
WATER SKI CONSTRUCTION

Ian C. Pitcairn, 12045 Edgewater Dr., Lake Park, Fla. 33410

Filed Sep. 18, 1985, Ser. No. 777,193

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—68 **8 Claims**



1. A water ski construction, comprising:

(a) an elongated element having an upper and lower surface, said lower surface divided, in the longitudinal direction, into a fore zone, a mid-zone, and an aft-zone, the lower surface thereof adapted to contact water,

(b) said fore zone defining a single concave surface in the nature of an arrow-like depression, the point of the arrow of said depression directed along the major axis of said ski and in the direction of intended travel thereof,

(c) said mid-zone defining first and second concave longitudinal channels separated by a sharp edge of arcuate intersection between said first and second channels, said channels and said edge extending throughout said mid-zone and into said aft-zone, said mid-zone further including a surface which defines and frames the outer periphery of both said fore- and mid-zones of said elongated element and, thereby, the outer transverse extent of said longitudinal channels, said transverse extent defining the minor axis of the ski,

(d) said aft-zone including said pair of concave channels, absent said mid-zone surfaces,

(e) the aft-zone tapered transversely inward to reduce, at its end, to zero the transverse width of the ski, and

(f) the radial depth of said longitudinal channels progressively deepening at the mid-zone and lessening at said aft-zone as well as at the single concave surface of said fore-zone,

whereby the above-defined contour of the lower surface operates to afford enhanced control and maneuverability of the ski.

4,629,436

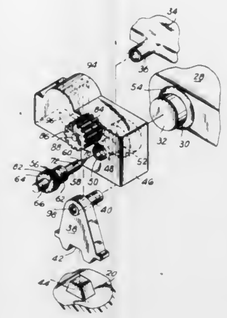
PERSONAL FLOTATION ASSISTANCE DEVICE

James F. Stewart, 325 Shore Rd., Greenwich, Conn. 06830, and Milton P. Chernack, West Hempstead, N.Y., assignors to James F. Stewart, Greenwich, Conn.

Filed Aug. 2, 1985, Ser. No. 762,145

Int. Cl.[4] B63C *9/16*

U.S. Cl. 441—93 **32 Claims**



1. A portable lifesaving device securable to a user's body for providing flotation assistance to the body, comprising:

a housing securable to the body and having an open end;

a cover on said housing adapted for user-effected movement relative thereto between a first position closing said open end and a second position in which said housing end is substantially open;

reservoir means in said housing for containing a supply of pressurized fluid;

pin means in said housing;

gear means operable by said movement of the cover from said first to said second position for moving relatively together said pin means and said reservoir means to cause said pin means to puncture said reservoir means and thereby release the pressurized fluid contained therein;

inflatable envelope means in said housing in an initially collapsed condition;

said pin means being disposed exteriorly of said inflatable envelope means; and

passage means between said reservoir means and said envelope means for communicating the pressurized fluid therebetween so that, when the reservoir means is punctured by said pin means, the pressurized fluid released from the reservoir means is communicated to and inflates said envelope means, causing the initially collapsed envelope means to expand outwardly through said open housing end for providing flotation assistance to the user's body to which said housing is secured.

4,629,437

RAPID-START FLUORESCENT LAMP INTEGRATED CIRCUIT BREAKER STRUCTURE AND MANUFACTURE

William J. Roche, Essex, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 28, 1985, Ser. No. 717,192

Int. Cl.[4] H01J *9/12*

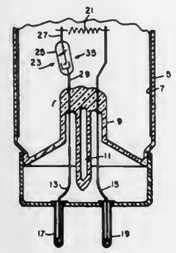
U.S. Cl. 445—26 **4 Claims**

1. An integrated circuit breaker and rapid-start fluorescent lamp manufacturing process comprising the steps of:

preparing an elongated tubular glass envelope having a phosphor-coated inner wall surface;

forming a pair of end members each having an electrical lead sealed therein and passing therethrough, an electrode directly connected to said electrical lead, an outwardly extending exhaust tube, and an integral circuit breaker, said circuit breaker having a first lead directly connecting said electrode, a second lead sealed in said end member and passing therethrough with one of said circuit breaker leads having an end formed to provide a pair of spaced upstanding members, and a bimetal strip connecting the other of said circuit breaker leads and extending between said upstanding members at a given range of temperatures, contacting one of said upstanding members at temperatures below and contacting the other one of said upstanding members at temperatures above said given range of temperatures;

sealing said end members into opposite ends of said glass envelope;



heating said glass envelope in an amount sufficient to cause said bimetal strip to contact said other one of said upstanding members;

exhausting said glass envelope;

heating said electrodes by way of said circuit breaker and electrical leads;

dispensing a fill gas and mercury within said envelope; and

pinching off said exhaust tubes of said envelope to provide a rapid-start fluorescent lamp having a circuit breaker formed for applying energy to an electrode from an external source.

4,629,438

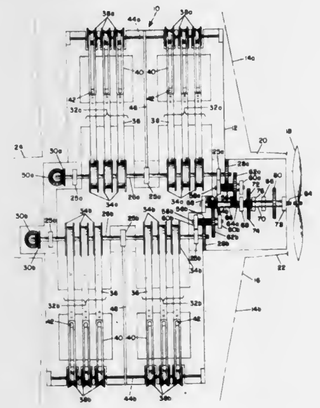
RUBBER BAND POWERED MOTOR FOR MODEL AIRPLANE

Leonard G. McAneny, 455 Garfield Ave., Mineola, N.Y. 11501

Filed Aug. 16, 1985, Ser. No. 766,894

Int. Cl.[4] A63H *27/02*

U.S. Cl. 446—58 **6 Claims**



1. A rubber band powered motor for a model airplane having a propeller and an airframe with a central body, a front end, a rear end, and wings extending from the central body, comprising:

first and second drive shafts mounted to said airframe and positioned in parallel relation within said central body, each drive shaft having a front end and a rear end associated with said front and rear ends of said air frame, respectively;

first and second rubber band motor means mounted to said airframe, extending from and perpendicular to said first and second drive shafts, respectively, on opposite sides thereof;

front gear means mounted to said airframe for connecting said drive shafts to said propeller; and

rear gear means mounted to said airframe for providing a positive drive to said drive shafts for winding said rubber band motor means so as upon release of said shafts, to cause said front gear means to incrementally turn the propeller, thereby accelerating said airplane into and through the air.

4,629,439

MUSIC BOX TOY

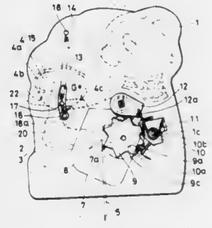
Yoshio Kitamura, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Nov. 28, 1983, Ser. No. 555,725

Claims priority, application Japan, Feb. 25, 1983, 58-25815[U]

Int. Cl.[4] A63H *3/28, 3/20*

U.S. Cl. 446—300 **4 Claims**



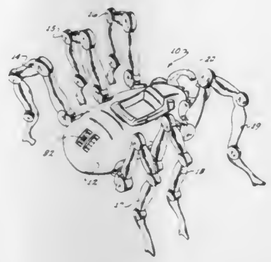
1. A music box toy comprising a casing, a music box housed in said casing, means mounted in said toy for driving the music box thereof, including a power spring, means on said toy accessible from the exterior of said casing for winding said power spring, means provided in said casing for converting a rotational driving force derived from said power spring into a reciprocating driving force acting in a plane parallel to a front surface of said casing, a stationary toy member provided on said front surface of said casing, a toy member provided on said front surface of said casing mounted in a predetermined, movable relation to said stationary toy member, said movable toy member including a first member and a second member, said first member being operatively connected at a portion of said stationary toy member to said converting means to reciprocate said first member along an arc of a circle having a center at that portion of said stationary toy member and said second member being relatively rotatably supported by said first member, and means for restricting the rotation of said second member relative to said first member within a predetermined angle during a reciprocating movement of said first member.

4,629,440

ANIMATED TOY

Michael T. McKittrick, Jr., Torrance, and Nicholas DeAnda, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 8, 1985, Ser. No. 752,861
Int. Cl.[4] A63H *3/22*
U.S. Cl. 446—356 **16 Claims**



1. In an animated toy, the combination comprising:
a body member;
a plurality of leg means pivotably coupled to said body member, each of said leg means having an extension thereof within said body member, said leg means and said body member being configured to provide ball and socket means for allowing pivotal movement of said leg means;
a plurality of cam follower means within said body, each of said cam follower means being in engagement with the end of an extension of one of said leg means and each of said cam follower means having first and second cam follower portions;
a drive mechanism; and
a plurality of double sided cam members coupled for rotation by said drive mechanism with each cam on each side having first and second cam portions for coaction with said first and second cam follower portions of an engaging cam follower means for enabling synchronized phased movement of said leg means for enabling propulsion of said toy.

4,629,441

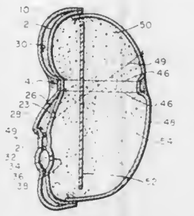
FABRIC DOLL FACE WITH STUFFED FEATURE, AND METHOD

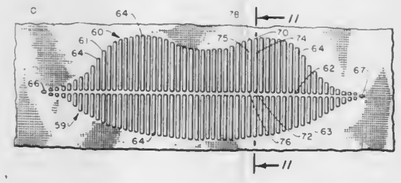
Mary J. Cahill, 6929 Marlborough Ave., Goleta, Calif. 93117

Filed May 16, 1984, Ser. No. 610,959
Int. Cl.[4] A63H *3/02, 3/36*
U.S. Cl. 446—372 **12 Claims**

1. The method of creating a fabric doll face comprising:
(a) attaching a front piece of fabric to a rear piece of fabric with an adhesive between the pieces, the adhesive being in at least one pattern, which is at least partially closed, for outlining a desired feature of the face of the doll and creating a cavity within the pattern of the adhesive between the two pieces of fabric;
(b) pushing soft material into the cavity to push against the front piece of fabric to create the feature;
(c) stitching the two pieces of fabric together at at least one location adjacent the feature;
(d) forming another feature having mutually spaced sides on the front piece and a cavity between the pieces and between the sides by making a series of satin stitches through the front and rear pieces of fabric on the front piece of fabric sufficient to define the surface of the other feature and the outline of the associated cavity; and
(e) filling the other feature cavity by inserting soft material beneath the satin stitches between the front and rear pieces of cloth.

12. A fabric doll face comprising:
(a) a front piece of fabric and a rear piece of fabric, an adhesive between the front and rear pieces attaching at least respective portions thereof together, the adhesive being in at least one pattern, which comprises a line that is at least partially closed for outlining a desired feature of the face of the doll and creating a cavity within the pattern of the adhesive between the two pieces of fabric;
(b) soft material in the cavity pushing against the front piece of fabric to create a bulge in the front piece of fabric in the shape of the feature;
(c) attaching means between the front and rear pieces of





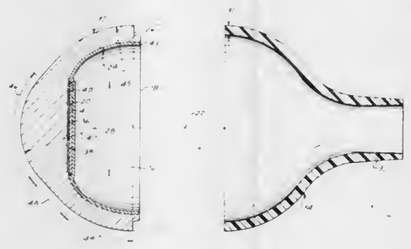
fabric for holding the pieces together at at least two locations adjacent the feature;
(d) attaching means along the peripheries of the front and rear pieces of fabric for attaching the peripheries together; and
(e) additional soft material between the two pieces of fabric at locations away from the feature and from the attaching means creating at least one additional bulge in the front piece of fabric representing a three-dimensional contour of the face.

4,629,442

ARTIFICIAL EYE FOR DOLL

Harvey W. Samo, Maplewood, N.J., assignor to Margon Corporation, Rahway, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,333
Int. Cl.[4] A63H *3/38*
U.S. Cl. 446—389 **20 Claims**



1. An artificial eye for toys comprising:
a first half comprising a generally spherical front surface generated around a longitudinal axis, said generally spherical front surface comprising a first spherical segment having a first radius and a second spherical segment having a second radius smaller than said first radius, and a conical segment positioned between said first and second spherical segments, said spherical and conical segments being concentric about a common axis, said conical segment tangentially joining both said spherical segments, a protrusion being formed extending forwardly of said first spherical segment and simulating the cornea of an eye;
a flat surface to the rear of said generally spherical front surface, the flat surface being intersected by said axis and being a portion of a plane passing through said generally spherically front surface;
eye portions including an iris and a pupil printed on said flat surface, said first half being at least in part transparent, allowing said eye portions to be visible through said second spherical segment.

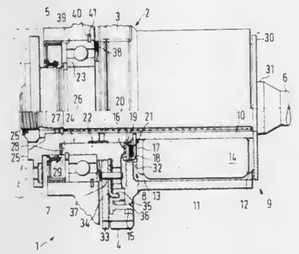
19. An artificial eye for toys comprising:
an anterior portion formed as a unitary element of a material selected from the group consisting of molded transparent plastic, cast clear glass, and pressed clear glass, said anterior portion comprising a generally spherical outer surface and a concave inner surface, both surfaces being generated around a common longitudinal axis, there being a flat surface formed integrally with said concave inner surface and centered on said longitudinal axis, the plane of said flat surface transecting said anterior portion;
eye portions printed on said flat surface, said eye portions comprising at least a pupil and a surrounding an iris;
a slot formed in said generally spherical front surface, said slot being adapted to receive an artificial eyelash;
a second portion which is adapted to join said anterior portion to the rear of said generally spherical outer surface at a smooth annular joint; and
a white surface surrounding said iris and comprising at least a portion of said anterior portion.

4,629,443

INSTALLATION FOR DAMPING TORSIONAL VIBRATIONS IN A GEAR DRIVE, ESPECIALLY BETWEEN THE CRANKSHAFT AND AN OUTPUT SHAFT OF INTERNAL COMBUSTION ENGINES

Rolf Bördner, Emling; Heinz Hege, Munich; Wolfgang Nehse, Haag, and Thomas Ochott, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,021
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334562
Int. Cl.[4] F16D *3/14;* **F16F** *15/12*
U.S. Cl. 464—74 **29 Claims**



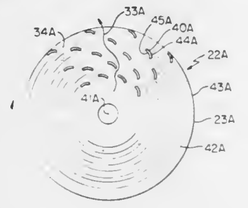
1. An installation for damping torsional vibrations in a gear drive, comprising an output shaft, a gear wheel, at least two drive paths between the gear wheel and the output shaft comprising friction clutch means operatively connecting the gear wheel with the output shaft in a force-locking connection and an elastic coupling means operatively connecting the gear wheel with the output shaft in an elastic rotary connection in parallel with the friction clutch means, the elastic coupling means including an inner coupling half and an outer coupling half each having webs as rotary abutments for interposed elastic elements, the outer coupling half being rigidly connected with the gear wheel, the friction clutch means being arranged between end faces of the gear wheel and of the webs of the outer coupling half, the friction clutch means including an entrainment member coodinated end-face to the webs of the outer coupling half, a thrust ring and a friction ring facing the end face of the gear wheel as well as a cup spring arranged between the entrainment means and the thrust ring, said cup spring being prestressed preliminary during the axial assembly of the gear wheel and the outer coupling half.

4,629,444

BELT PULLEY AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 383,856, Jun. 1, 1982, Pat. No. 4,555,239.
This application Sep. 20, 1985, Ser. No. 778,455
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.[4] F16H *57/04*
U.S. Cl. 474—93 **5 Claims**



1. In a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about the axis of said hub, said pulley having opposed sides, said pulley having vane means extending outwardly from at least one of said sides thereof, the improvement wherein said vane means comprise a plurality of spaced apart curved vanes of substantially the same size and shape and disposed in a plurality of circular arrays that are generally concentrically disposed relative to each other about said axis on said one side of said pulley for acting on fluid adjacent said pulley to tend to cool said pulley with said fluid, said curved vanes in each circular array each being disposed substantially evenly between an adjacent pair of curved vanes in the circular array adjacent thereto whereby the number of curved vanes in each circular array is the same, each curved vane having a convex side and a concave side, said concave side of each curved vane generally facing said axis, each curved vane being substantially nonsymmetric about a radial line intersecting its midpoint, said convex side of each curved vane generally facing in the direction of said peripheral groove.

4,629,445

APPARATUS FOR FOLDING REAR PORTION OF CASE BLANK

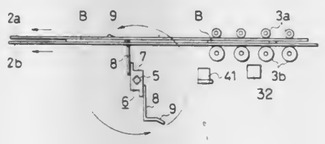
Daigoro Toriyama, Nagareyama, Japan, assignor to Tanabe Machinery Co., Ltd., Tokyo, Japan

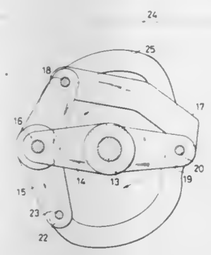
Filed Aug. 14, 1984, Ser. No. 640,597
Int. Cl.[4] B31B *1/00*
U.S. Cl. 493—10 **6 Claims**

1. An apparatus for folding a rear portion of an advancing case blank along a predetermined folding line comprising:
a frame;
a rotation shaft rotatably supported by said frame;
a claw means secured to said rotation shaft, said claw means rotatable by said rotation shaft for folding a rear portion of an advancing case blank on said frame;
a cam mechanism attached to said rotation shaft for causing

the angular speed of said claw means to change through a rotation of 180°, said cam mechanism including a link mechanism and a cam supported on said frame, said cam having a cam groove therein which has a configuration which causes said claw means to have a high angular speed for folding the rear portion of an advancing case blank followed by a low angular speed for sinking said claw means below the path of a case blank after the blank has been folded and moved away from the claw means, said link mechanism comprising a cam follower which is slidable in said cam groove, a first link connected at one end to an intermediate portion of a second link, said cam follower projecting from one end of said second link, a third link connected at one end thereof to the other end of said second link and a fourth link connected at one end thereof to the other end of said third link, said other end of said fourth link connected to said rotation shaft;

driving means connected to said cam mechanism, said driving means including a drive shaft which is rotated at a





constant angular speed and is connected to the other end of said first link;

a pneumatically actuated clutch and a pneumatically actuated brake connected to said driving means for causing rotation of said rotation shaft and stopping rotation of said rotation shaft, respectively;

electromagnetically actuated valve means connected to said pneumatically actuated clutch and said pneumatically actuated brake for causing operation of said pneumatically actuated clutch and said pneumatically actuated brake; and

an electric circuit means operatively connected to said electromagnetically actuated valve means and operatively connected to sensor means for detecting an advancing case blank, said electric circuit means causing rotation of said claw means in snychronism with the advancing speed of a case blank, said electric circuit means compensating for the rise time of said electromagnetically actuated valve means by providing increased pulse numbers to be counted in said electric circuit means.

4,629,446

APPARATUS FOR ERECTING FOLDING BOXES

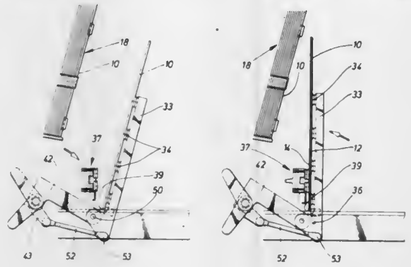
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., (GmbH & Co.), Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,419

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429761

Int. Cl.⁴ B31B *1/80*

U.S. Cl. 493—317 **9 Claims**



1. Apparatus for erecting flat folding boxes each of which has a front wall, a rear wall, two side walls and folding tabs adjoining the latter, said apparatus comprising:

a magazine defined by means for holding a substantially horizontal stack of a plurality of said flat boxes disposed in substantially vertical planes;

a substantially horizontal discharge path, disposed below said magazine, defined by means for discharging erected boxes;

a single pivotable and translatable elongated gripper arm means (**33**) having an initial position at or below said horizontal discharge path and having first suction means (**34**) for engaging and holding the front wall of a first flat box in said magazine;

stationary holder means (**37**) carrying second suction means (**38**) for holding a side wall of said flat box and being disposed between said magazine and said discharge path;

link means, including two guide rods (**42, 43**) and coupled to one end of said gripper arm means, for pivoting said gripper arm means upwardly out of said initial position so that said first suction means (**34**) engages and holds the front wall of a first flat box in said magazine, for translating said gripper arm means vertically downward until a lower folding edge of said first flat box is supported on said discharge path (**32**), and for then pivoting said gripper arm means until the held box abuts said stationary holder means and said second suction means holds a side wall of said flat box, and for then pivoting said gripper arm means downwardly toward said initial position so that said flat box is erected.

4,629,447

METHOD AND APPARATUS FOR PRODUCING LIDS FOR CONTAINERS WITH FOLDED CORNER TEAR TABS

Peter Stenzel, Herscheid, Fed. Rep. of Germany, assignor to Alcan Ohler GmbH, Plettenberg/Ohle, Fed. Rep. of Germany

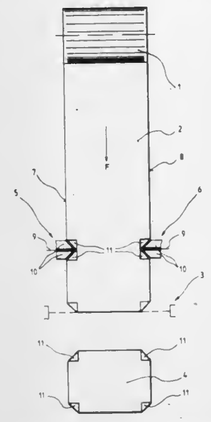
Filed Mar. 7, 1985, Ser. No. 709,581

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408488

Int. Cl.⁴ B31B *1/14, 9/90*

U.S. Cl. 493—356 **32 Claims**

7. A device for producing rectangular foil lids for containers from an elongated foil web having tear tabs at the corners of the lids for removing the lids from the containers comprising a frame, at least one cutting device located at a first work station on the frame for making a traverse cut in at least one of the two longitudinal edges of web, at least one folding tool also located at the same edge and at the same longitudinal location as the cutting device as the first work station and movable back and forth in a plane substantially perpendicular to the longitudinal edges of the web between a starting position located to one side of the plane of the web and an end position located on the other side of the web, said folding tool having two angled folding edges coming together to form a V-shape oriented toward the web, said edges intersecting at an imaginary point



in the plane of the cut made by the cutting device, whereby movement of the tool from its starting position toward its end position folds the areas of the foil lying on either side of the cut back on themselves to form the tabs, and a cut-off device located at a second work station for cutting the foil web with folded tabs along and in continuation of the cut into discrete lengths.

4,629,448

HOSE SET FOR EXTRACORPOREAL TREATMENT OF BLOOD AND SIMILAR LIQUIDS

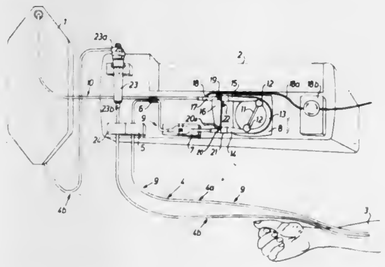
Per-Oloy A. V. Carlsson, Sosdala; Rolf E. Karlberg, Verberod, and Thore E. Falkvall, Helsingborg, all of Sweden, assignors to Gambro Lundia AB, Sweden

Filed Sep. 7, 1983, Ser. No. 530,081

Claims priority, application Sweden, Sep. 10, 1982, 8205159

Int. Cl.⁴ A61M *37/00*

U.S. Cl. 604—4 **10 Claims**



1. A tube set adapted for use with a fluid treatment apparatus, said tube set including an inlet portion, an outlet portion, and a pump segment adapted for use with a tube pump mounted on a control unit of the fluid treatment apparatus, said pump segment including an inlet end for receiving fluid from said inlet portion of said tube set and an outlet end for delivering fluid into said outlet portion of said tube set, said tube set further including a spacer member adapted to rigidly position said inlet end and said outlet end of said pump segment a predetermined distance apart and to facilitate fluid connection of said inlet end and said outlet end of said pump segment to said inlet portion and said outlet portion of said tube set, respectively, said spacer member including a first end corresponding with said inlet end of said pump segment, a second end corresponding with said outlet end of said pump segment, and a bridging portion connecting said first and second ends of said spacer member, said bridging portion being substantially planar and being sized and shaped so as to facilitate movement of said spacer member relative to said control unit, said first end of said spacer member including a first tubular conduit including first and second coupling means for coupling said first tubular conduit to said inlet end of said pump segment and said inlet portion of said tube set, respectively, and said second end of said spacer member including a second tubular conduit including third and fourth coupling members for coupling said second tubular conduit to said outlet end of said pump segment and said outlet portion of said tube set, respectively, whereby said fluid can flow through said first tubular conduit between said inlet end of said pump segment and said inlet portion of said tube set and through said second tubular conduit between said outlet end of said pump segment and said outlet portion of said tube set.

4,629,449

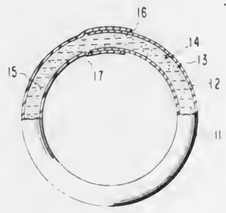
VAGINAL DISPENSER FOR DISPENSING BENEFICIAL HORMONE

Patrick S. Wong, Hayward, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 402,953, Jul. 29, 1982, abandoned. This application Mar. 21, 1985, Ser. No. 714,421

Int. Cl.⁴ A61M *31/00*

U.S. Cl. 604—55 **6 Claims**



5. A method for relieving the symptoms associated with menopausal, perimenopausal and post-menopausal periods in a woman having said periods and in need of estrogen therapy, which method comprises:

(a) placing in the vagina of a menopausal, perimenopausal and postmenopausal woman a dispenser adapted and sized for easy placing and comfortable retention in the vagina, the dispenser comprising:

(1) body means for housing an estrogen, which body means comprises a vaginally acceptable composition that is essentially-free of deleterious action on the vaginal environment; and,

(2) means in the dispenser for dispensing the estrogen from the dispenser over a prolonged period of time; and

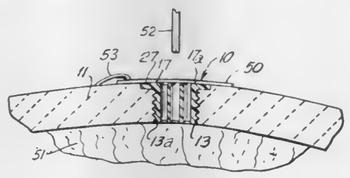
(b) dispensing into the vagina from the dispenser the estrogen in a therapeutically effective amount for relieving the symptoms associated with menopausal perimenopausal and postmenopausal period in said woman.

4,629,450
CATHETER INTRODUCING INSTRUMENT
Tatsuo Suzuki, Yokohama, and Atsushi Matsumoto, Fuji, both of Japan, assignors to Terumo Corporation, Tokyo, Japan
Filed May 6, 1985, Ser. No. 731,082
Claims priority, application Japan, May 9, 1984, 59-90890
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—164 **9 Claims**



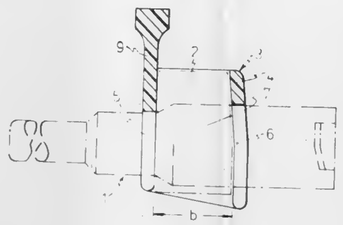
1. An instrument for introducing a catheter into a blood vessel, comprising:
an inner needle portion including an inner needle having a tip formed to include a cutting edge; and
a dilator portion including a hollow dilator having a rounded or tapered tip, for enabling said inner neddle to be passed therethrough until the cutting edge of said inner needle projects from the rounded tip of said dilator;
said dilator comprising a primary insertion portion having a length of at least 15 mm and a wall thickness of 0.05 mm to 0.3 mm;
a secondary insertion portion having a length of at least 15 mm, an outer diameter of between 1.3 to 3.0 times that of said primary insertion portion, and a wall thickness of at least 0.3 mm; and
an intermediate tapered segment smoothly interconnecting said primary and said secondary insertion portions;
wherein operations of puncture and widening of subcutaneous tissue and blood vessel walls prior to insertion of a catheter can be performed with simultaneous advancement of said inner needle and said dilator through the body of a patient.

4,629,451
STEREOTAXIC ARRAY PLUG
Arthur Winters, Short Hills, and Casper S. Molee, Bloomfield, both of N.J., assignors to Victory Engineering Corp., Springfield, N.J.
Filed Sep. 23, 1985, Ser. No. 779,170
Int. Cl.⁴ A61M *5/32;* **A61B** *17/36*
U.S. Cl. 604—175 **11 Claims**



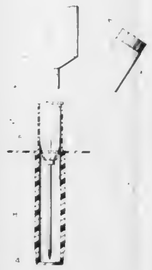
1. A stereotaxic array plug adapted for threading into a threaded opening made in a skull comprising:
a shaped body formed of a biocompatible material; said body having a top section; a bottom section a central opening extending therethrough for introducing devices for treating the brain;
a plurality of satellite through openings about said central opening;
radiopaque markings on said top section of said body, but not obliterating said openings; and
threads in said bottom section for screwing into said opening in the skull.

4,629,452
ARRANGEMENT IN A CATHETER UNIT WITH ATTACHMENT WINGS, FOR INFUSION CANNULAS
Harry U. Wahlberg, Helsingboro, and Kálmán Csiki, Landskrona, both of Sweden, assignors to Viggo AB, Helsingborg, Sweden
Filed Aug. 15, 1984, Ser. No. 640,903
Claims priority, application Sweden, Aug. 29, 1983, 8304657
Int. Cl.⁴ A61N *5/00*
U.S. Cl. 604—177 **12 Claims**



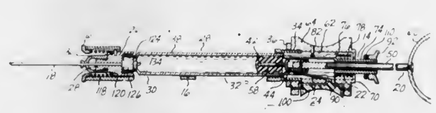
1. A catheter unit including a puncture unit, said catheter unit being in contact and associated with the puncture unit, the said puncture unit having a thumb grip to facilitate use of the catheter unit, said catheter unit consisting of an elongated body (7) and a means for mounting an infusion cannula, there being provided over said catheter body a sleeve formed of a central portion, a U-shaped front wall and a U-shaped rear wall, said front wall and said rear wall having arc shaped gates in each somewhat larger than the diameter of the catheter to permit the sleeve to fit over said catheter in a sliding fit, said gates having parallel fixed legs extending tangentially to said arc, the wings of said catheter being folded up and under the sleeve portion, the sleeve being open underneath.

4,629,453
HYPODERMIC NEEDLE PROTECTION DEVICE
Tim M. Cooper, 1196 Kotenberg, San José , Calif. 95125
Filed Aug. 19, 1985, Ser. No. 766,713
Int. Cl.⁴ A61M *5/32*
U.S. Cl. 604—192 **4 Claims**



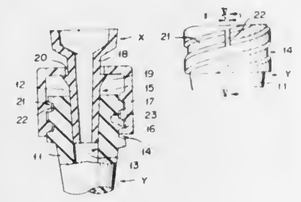
1. A protective device for receiving and storing a hypodermic needle therein, the needle having an upper portion formed with an annular lip, comprising: a substantially tubular housing having a cylindrical side wall, an end wall forming a first closed end, and a second opposite open end for slidably receiving the hypodermic needle with a relatively snug fit therebetween, such that the end of the needle is spaced from the closed end of the tubular housing, and such that the lip on the upper portion of the needle is spaced axially from the open end of the tubular housing, thereby facilitating sliding removal of the needle from the tubular housing, an annular flange formed integrally on the cylindrical side wall in a position substantially closer to the second open end than to the first closed end, whereby the cylindrical side wall of the tubular housing has an upper minor portion above the annular flange and a lower major portion below the annular flange; a substantially cylindrical cover having a top portion and further having a bottom open end formed therein, wherein the cover may be slidably received over the upper minor portion of the cylindrical side wall of the tubular housing with a relatively snug fit therebetween, and wherein the bottom open end of the cover abuts against the annular flange on the cylindrical side wall of the housing.

4,629,454
HYPODERMIC SYRINGE
Dale C. Grier, 10850 Slater Ave. NE., Kirkland, Wash. 98033
Filed Mar. 29, 1985, Ser. No. 717,535
Int. Cl.⁴ A61M *5/315*
U.S. Cl. 604—229 **25 Claims**



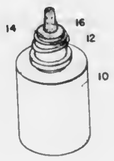
1. A self-injecting hypodermic syringe of a type for handling a cartridge which is attachable to a needle at its forward end and which includes a piston at its rearward end, said syringe comprising:
a finger-grip body having a forward end and a rearward end, an annular sidewall defining an axial bushing chamber within said body and an outer grip portion adapted to be gripped between two fingers of a user, a radial opening in said sidewll, and an end wall at the rearward end of said body, including a central opening;
a syringe barrel having a rearward end connected to the forward end of said body, a forward end, and a cartridge receiving chamber between said ends;
a tubular bushing slidably received within said bushing chamber, and movable between a rearward position and a forward position in said bushing chamber, said bushing including a forward cartridge contacting end, and a rearwardly directed should means spaced axially from said end wall;
a compression spring within said bushing chamber having a forward end in contact with said shoulder means and a rearward end in contact with said end wall, said compression spring normally biasing said bushing into its forward position, and said spring being compressed when the bushing is in its rearward position;
said bushing carrying a leaf spring at a side location, said leaf spring having a fixed end connected to the bushing and a free end, said leaf spring extending axially of the bushing and normally extending radially outwardly as it extends from its fixed end to its free end, said leaf spring carrying a radially outwardly directed lock element;
said lock element being positioned such that upon a rearward movement of the bushing within the body, to compress the spring, the lock element will engage the radial opening, to in that manner lock the bushing in position relative to the body, and hold the spring in a compressed condition while so locked, said bushing being in its rearward position when the lock element is in the radial opening;
trigger means carried by said finger-grip body, operable to be moved radially inwardly by finger pressure, and including operator means positioned such that when the trigger is so moved the operator means will contact the leaf spring and move the lock element radially inwardly of the body, to in that manner disengage it from the radial opening, to free the compression spring so that the spring energy within the compression spring can act to propel the bushing, the cartridge and the needle axially forwardly relative to the finger-grip body; and
a plunger including a plunger rod which extends axially through said bushing and includes a forward end contactable with a piston within a cartridge, and a rearward end including means for receiving thumb pressure for moving the plunger rod forwardly against the piston within the cartridge, for moving the piston forwardly within the cartridge.

4,629,455
MEDICAL INSTRUMENT
Michio Kanno, Saitama, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,588
Claims priority, application Japan, Feb. 9, 1984, 59-16119
Int. Cl.⁴ A61M *25/00;* **F16L** *19/02*
U.S. Cl. 604—241 **21 Claims**



1. A connector comprising
a female member including a female taper portion;
a male member including a male taper portion tightly accommodated in said female member;
a ring member encircling the tapered portion of said male member;
one of said ring member and said female member having a ridge for cooperating with a threaded, helical groove on the other of said ring member and said female member to tighten the male member into the female member as the ring is turned and thereby screwed onto the female member; and
an element integral with said other of said ring member and said female member, traversing at least part of the width of said groove and extending into said groove from at least one wall of said groove so as to frictionally grip said ridge as the ring is turned to screw the ring onto the female member, said element having a thickness such that the element can yield laterally to an engaging force of the ridge.

4,629,456
TARGET RING FOR AN EYE DROPPER BOTTLE
David L. Edwards, 3844 S. Atlanta Pl., Tulsa, Okla. 74105
Filed Sep. 18, 1981, Ser. No. 303,421
Int. Cl.⁴ A61M *33/04*
U.S. Cl. 604—300 **4 Claims**



1. A target ring in combination with a conventional eye

dropper bottle having an upper conical nozzle adjacent to a neck portion of said bottle and having a central orifice extending through said nozzle to be in communication with the interior of said bottle, and wherein said bottle is made from transparent or opaque material; comprising a target ring of contrasting color with respect to the color of the bottle, applied to at least a portion of said nozzle wherein said ring is outwardly concentric to said orifice thereby positioning said orifice in the center of said target ring.

4,629,457

ABSORBENT FACING AND METHOD FOR MAKING THE SAME

Irving S. Ness, Hilton Head Island, S.C., assignor to Chicopee, New Brunswick, N.J.

Division of Ser. No. 579,939, Feb. 14, 1984, abandoned, and a continuation-in-part of Ser. No. 507,906, Jun. 27, 1983, abandoned, which is a continuation of Ser. No. 917,696, Jun. 21, 1978, abandoned. This application Oct. 2, 1985, Ser. No. 783,289

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—382 **15 Claims**



1. Process for producing an absorbent facing material, which process comprises:

(a) superimposing a thin polymer film and a first web comprising absorbent fibers, to form a second web having said thin polymer film on one face and said first web on the other face;

(b) heating said second web to a temperature such that said polymer film is formable;

(c) while said second web is so heated, simultaneously applying shearing and compressive forces to said second web to form said polymer film into a coating on said first web, said coating comprising a fine pattern of continuous areas which lie between and interconnect discontinuous areas, wherein the polymer in the continuous areas comprises an at least substantially continuous coating on the surface of said first web, and wherein most of the polymer in the discontinuous areas is coated on individual fibers underlying said discontinuous areas; and

(d) cooling the coated web thus formed to cool said polymer below its forming temperature.

4,629,458

REINFORCING STRUCTURE FOR CARDIOVASCULAR GRAFT

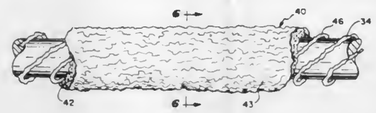
Leonard Pinchuk, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Feb. 26, 1985, Ser. No. 705,782

Int. Cl.⁴ A61F *2/06*

U.S. Cl. 623—1 **42 Claims**

1. A reinforced graft particularly adapted for cardiovascular use, said graft comprising: a tubular structure having a central lumen and comprising collagenous tissue having a generally tubular shape and a single monofilament wound in a coil with spacing between the turns of the coil to permit the tubular structure to be bent without crimping, the turns having "radial compliance", i.e., the turns going from one pitch to another pitch during bending, and said monofilament having a smaller single monofilament painted thereon in an overlapping manner to form a textured mesh-type surface with random interstices



into which tissue can grow, said coiled monofilament being situated externally of said lumen.

4,629,459

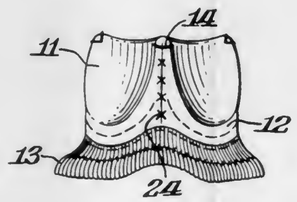
ALTERNATE STENT COVERING FOR TISSUE VALVES

Marian I. Ionescu, Leeds, England; Jay A. Lenker, Laguna Beach, and Philip S. Yang, Irvine, both of Calif., assignors to Shiley Inc., Irvine, Calif.

Filed Dec. 28, 1983, Ser. No. 566,133

Int. Cl.⁴ A61F *2/24*

U.S. Cl. 623—2 **24 Claims**



1. A prosthetic heart valve comprising:

a stent having an annular base and a plurality of legs extending upwardly from said base;

a valve element circumscribing said stent and attached thereto, said valving element comprising a number of cooperating valve leaflets equal to the number of said legs; and, for the purpose of avoiding abrasion damage caused by the rubbing of said leaflets over said stent,

a layer of biologically-compatible material secured to said stent and positioned between said stent and said leaflets, said layer having a smooth, non-abrasive outer surface and covering all of the surfaces of said stent that, in the absence of said layer, would contact the mobile portions of said leaflets during the normal function of the valve.

4,629,460

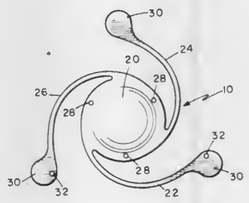
INTRAOCULAR LENS

Robert L. Dyer, 4067 Park Blvd., San Diego, Calif. 92103

Filed Jun. 25, 1984, Ser. No. 624,196

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **11 Claims**



1. An intraocular insert suitable for use as an artificial lens implant in the anterior chamber of a human eye, the anterior

chamber having a circumferentially extending groove between the scleral spur and the iris of the eye, the insert comprising:

an optic sized to focus light through the pupil of the eye and having a generally round peripheral edge with a first radius of curvature and defining a frontal plane which intersects the entire peripheral edge of the optic;

three identically shaped haptics integrally formed with and extending at an acute angle from the peripheral edge of the optic at three circumferentially equi-distant spaced locations around the optic, each haptic having an inward second radius of curvature larger than the first radius of curvature and extending at an angle relative to the front plane for overlying the iris when inserted into the eye; and

three generally flat, rounded pods, each connected to the distal end of a corresponding one of the haptics and positioned on the radially outward side of the corresponding haptic in a plane generally parallel to the frontal plane so that upon radially inwardly compressing the haptics, the insert can be implanted into the anterior chamber of the eye and the pods will overlie the iris with portions of the outer edges thereof seated in the groove between the scleral spur and the iris to thereby firmly position the optic over the pupil of the eye.

4,629,461

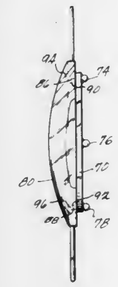
POSTERIOR CHAMBER INTRA-OCULAR LENS

Henry Clayman, 12555 Biscayne Blvd., Miami, Fla. 33181, and James R. Longacre, 3621 Littledale Rd., Kensington, Md. 20895

Filed Nov. 5, 1984, Ser. No. 668,151

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **15 Claims**



1. A posterior chamber intra-ocular lens for implantation in the eye comprising:

a lens body having a central optical portion and an anterior and posterior surface; and

a ring detachably fixed to the posterior surface of said lens body to extend about said central optical portion and having a plurality of separated and unconnected protrusions extending outwardly and rearwardly from said ring to contact the posterior capsule without puncturing the posterior capsule and space the capsule from the rest of said lens body and to permit fluid circulation between the rear surface of said central optic and the posterior capsule.

4,629,462

INTRAOCULAR LENS WITH COILED HAPTICS

Fred T. Feaster, 800 8th Ave., Suite 234, Fort Worth, Tex. 76104

Filed Jul. 13, 1984, Ser. No. 630,879

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **26 Claims**

1. An intraocular lens suitable for use as an artificial lens implant in the human eye, comprising:

a lens body having first and second position fixation members extending from opposite sides of the periphery of said lens body,

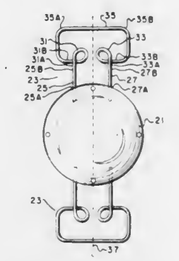
each of said position fixation members comprising a stem portion having first and second ends, a coil portion having first and second ends, and a peripheral portion extending to a position such that it may engage the tissue of the eye,

each of said coil portions being located between said lens body and the peripheral portion of its position fixation member,

said first end of each of said stem portions being joined to said lens body,

said second end of each of said stem portions being joined to said first end of its associated coil portion,

said first and second ends of each of said coil portions cross each other as seen in a plane generally perpendicular to the axis to said lens body,



each of said second ends of each of said coil portions being coupled to the peripheral portion of its position fixation member by way of a transverse portion which is generally transverse to a second plane coinciding with and passing through the axis of said lens body and through said peripheral portions of said first and second position fixation members such that when pressure is applied to said peripheral portions of said position fixation members towards said lens body, pressure is applied to said coil portions by way of said transverse portions to provide for flexibility of said position fixation members.

4,629,463

CONNECTION OF TUBULAR BONE ENDS

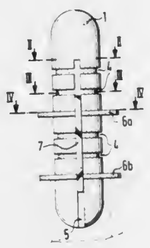
Hans Grundei, Lübeck, and Thomas Biehl, Munich, both of Fed. Rep. of Germany, assignors to S & G Implants GmbH, Lubeck, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,256

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432928

Int. Cl.⁴ A61F *2/28*

U.S. Cl. 623—16 **5 Claims**



1. A connection for the end of a tubular bone which has been cut in an operation said connection comprising a cylindrical metal pin on which is provided comprising a longitudinal groove and several spaced annular grooves, of which at least one annular groove receives a stop surface for the bone end and the longitudinal groove receives a longitudinal flange

connected to the stop surface and having a surface projecting from the longitudinal groove.

4,629,464

POROUS HYDROXYAPATITE MATERIAL FOR ARTIFICIAL BONE SUBSTITUTE

Susumu Takata; Shoichi Wakabayashi, both of Tokyo; Hiroyasu Noma, Mitaka, and Tatsuya Wakatsuki, Tokyo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

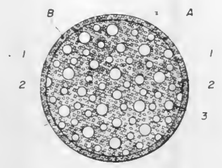
Filed Aug. 29, 1985, Ser. No. 770,722

Claims priority, application Japan, Sep. 25, 1984, 59-200129; Sep. 25, 1984, 59-200130; Sep. 25, 1984, 59-200131

Int. Cl.⁴ C07C *61/06*

U.S. Cl. 623—16 **7 Claims**

1. A sintered microporous hydroxyapatite material in a granular form composed of granules each having a diameter in the range from 0.1 to 2.0 mm and an open pore structure of



micropores with a pore diameter distribution in the range from 0.01 to 0.10 mm and a porosity in the range from 20 to 50%.

4,629,465

PROCESS FOR EXHAUST DYEING A TEXTILE FIBER MATERIAL: CONTROLLED ADDITION OF DYE OR ELECTROLYTE

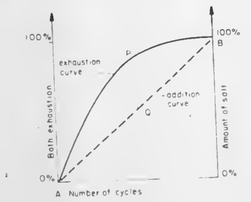
Rolf Hasler, Bottmingen, Switzerland, and Francis Palacin, Riedisheim, France, assignors to Sandoz Ltd., Basel, Switzerland

Filed Oct. 1, 1984, Ser. No. 656,615

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335828

Int. Cl.⁴ D06B *23/28;* **D06P** *3/60*

U.S. Cl. 8—400 **21 Claims**



1. In a process in which a textile fiber substrate is exhaust dyed with an effective amount of a direct, reactive or sulfur dyestuff in a dyebath which also contains an effective amount of electrolyte selected from the group consisting of salts and agents having an alkaline action, the improvement which comprises adding the effective amount of said dyestuff or said electrolyte, or the effective amounts of said dyestuff and said electrolyte simultaneously or one after the other, to the dyebath in specified quantities metered, per cycle of the dyeing machine, according to a linear or exponential function such as to give a substantially linear exhaustion of the dyebath.

4,629,466

OXIDATION HAIR DYES COMPRISING BIS-(2,4-DIAMINOPHENYL)-ALKANES AS COUPLING COMPONENTS

David Rose, Hilden, and Edgar Lieske, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthasen, Fed. Rep. of Germany

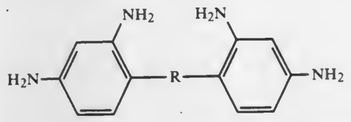
Filed Feb. 10, 1983, Ser. No. 465,666

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235615

Int. Cl.⁴ A61K *7/13;* **C07C** *87/52*

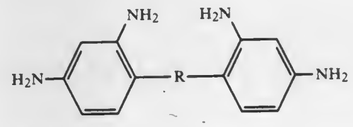
U.S. Cl. 8—408 **9 Claims**

1. A composition of the developer-coupler type for the dyeing of the hair, consisting essentially of at least one compound of the formula



wherein R represents an alkylene having 3 or 4 carbon atoms, or a salt thereof with an inorganic or organic acid, as coupling component, and, as developer component, one or more of the conventional developer components used in oxidation dyes.

9. A compound of the formula



wherein R represents an alkylene having 3 or 4 carbon atoms.

4,629,467

USE OF P-UREIDOALKYLAMINO-NITROBENZENE DERIVATIVES IN HAIR DYEING COMPOSITIONS AND NEW P-UREIDOALKYLAMINO-NITROBENZENE DERIVATIVES

Thomas Clausen, Alsbach, and Eugen Konrad, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP85/00012, § 371 Date Aug. 14, 1985, § 102(e) Date Aug. 14, 1985; PCT Pub. No. WO85/03223, PCT Pub. Date Aug. 1, 1985

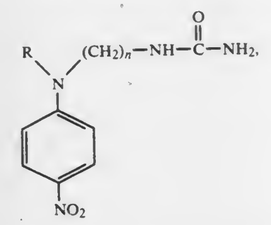
PCT Filed Jan. 16, 1985, Ser. No. 767,277

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402519

Int. Cl.⁴ A61K *7/13;* **C07C** *127/19;* **D06P** *1/19, 3/14*

U.S. Cl. 8—414 **6 Claims**

1. Process to dye hair comprising applying thereto an effective amount of a 1-ureido alkyl amino-4-nitrobenzene compound of the general formula I



(I)

wherein R represents hydrogen or a hydroxy alkyl residue with 2 to 4 carbon atoms and n a whole number of 2 to 4 as a dye in hair dye compositions.

4,629,468

PROCESS FOR TREATING CELLULOSIC FIBRE MATERIAL

Helmut Engelhard, Dormagen; Dieter Feuser, Cologne; Udo Hendricks, Odenthal, and Ergun Tamer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

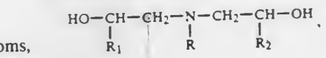
Filed Apr. 18, 1985, Ser. No. 724,385

Claims priority, application Fed. Rep. of Germany, May 5, 1984, 3416693

Int. Cl.⁴ D06P *5/02*

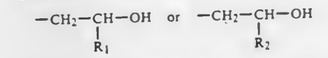
U.S. Cl. 8—442 **20 Claims**

1. A process for treating cellulose textile before dyeing or printing said textile with direct or reactive dyestuffs to improve color yield comprising impregnating or printing said textile with an aqueous liquor containing 0.1–2% by weight of the textile of quaternized polyethers obtained by self condensation of N-2-hydroxyalkylamines of the formula



in which

R_1 and R_2, independently of each other, denote hydrogen or a C_1-C_4-alkyl radical and R denotes a C_1-C_{18}-alkyl, cycloalkyl, aralkyl or aryl radical or one of the hydroxyalkyl groups



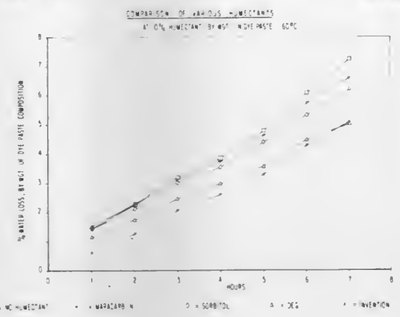
with the proviso that the amount of N-2-hydroxyalkylamines in which R stands for a hydroxyalkyl group accounts for no more than 20 percent by weight of the hydroxyalkylamines used, and subsequent quaternization.

4,629,469

HUMECTANT COMPOSITION DERIVED FROM KRAFT BLACK LIQUOR

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,860
Int. Cl.[4] C09B *67/00*
U.S. Cl. 8—557 **14 Claims**



1. A method of producing a chemical composition suited for use as a humectant in dyestuff and similar formulations comprising the steps of:

(a) oxidizing the black liquor residue of a kraft pulping process;

(b) methylolating the lignin components of the oxidized liquor residue;

(c) adding sulfur dioxide to the methylolated lignin containing oxidized lignin residue to adjust the pH of the residue to a pH range of between about 2 to 10;

(d) adding equal molar quantities of formaldehyde to the amount of any residual sodium sulfite in the residue;

(e) heating the resultant residue under sufficient conditions to sulfomethylate the lignin components of the residue; and

(f) concentrating the residue to a solids content of between about 50% to 70% and adjusting the pH to about 7.5.

4,629,470

PROCESS FOR DYEING SMOOTH-DRY CELLULOSIC FABRIC

Robert J. Harper, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 18, 1985, Ser. No. 789,212
Int. Cl.[4] C09B *67/00*
U.S. Cl. 8—585 **18 Claims**

1. A process for dyeing a smooth-dry cellulose fabric comprising:

(a) padding a cellulose containing fabric with an aqueous finishing solution comprising sufficient concentrations of: N-methylol crosslinking agent, acid catalyst and choline quaternary compound to impart smooth-dry performance and dye receptivity properties to the fabric;

(b) drying and curing the cellulose containing fabric for sufficient time and at sufficient temperature to interact the component of the finish with the fabric; and then,

(c) dyeing the fabric with a cellulosic dye.

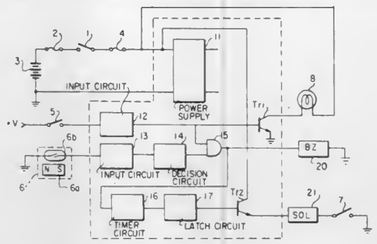
4,629,471

OPERATIONAL CONDITION CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Norimitsu Kurihara, Wako; Hiroshi Gotoh, Asaka, and Junichi Miyake, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,389
Claims priority, application Japan, Dec. 5, 1984, 59-255744
Int. Cl.[4] F02B *77/08*
U.S. Cl. 123—198 DB **14 Claims**

1. An operational condition control device for an internal combustion engine for operating an alarm means when the engine temperature exceeds a predetermined temperature, said operational condition control device comprising a vehicle stop sensor means for detecting a stopped condition of a vehicle, a temperature sensor means for detecting engine temperature,



and a drive circuit means coupled to the outputs of said stop sensor means and said temperature sensor means for receiving signals from said sensors and operating said alarm means when the vehicle is in the stopped condition, and said engine temperature exceeds the predetermined temperature.

4,629,472

METHOD AND APPARATUS FOR IMPROVING COMBUSTION, THERMAL EFFICIENCY AND REDUCING EMISSIONS BY TREATING FUEL

William M. Haney, III, Westport, and James C. Sullivan, Southport, both of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 746,551, Jun. 19, 1985, abandoned, which is a continuation of Ser. No. 516,094, Jul. 22, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 810,076
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **16 Claims**

1. A method of improving the combustion of fuel in a chamber by treating the fuel to form a suspension comprising:

(a) mixing with such fuel a quantity of emulsifying liquid to form a stable suspension; and

(b) adding a small amount of precious metal catalyst so that such metal is present in such suspension prior to its introduction into such chamber.

4,629,473

RESILIENT ABRASIVE POLISHING PRODUCT

John O. Ruid, Clifton Park, and Edgar A. Stein, North Greenbush, both of N.Y., assignors to Norton Company, Worcester, Mass.

Filed Jun. 26, 1985, Ser. No. 749,068
Int. Cl.[4] B24D *11/02*
U.S. Cl. 51—295 **14 Claims**

1. A coated abrasive product having a 25% compression force value between 135 and 1400 kilopascals, comprising:

(a) a primary backing;

(b) a resilient backing layer of reticulated open cell foam, said foam layer having a 50% compression force value between 3 and 62 kilopascals and openings in the surface thereof and being adhered on one major surface to said primary backing; and

(c) a layer of size-graded abraisve grain having an average size not greater than one half the average size of the openings in said resilient backing, said abrasive grain being distributed substantially uniformly over the major surface of said resilient backing opposite said primary backing, including the portions of such surface which are recesses from the outer envelope of the surface, and being adhered thereto by an elastomeric maker adhesive.

4,629,474

THERMALLY FORMED FILTER

Donald I. Thornton, Warwick, R.I., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 6, 1985, Ser. No. 772,987
Int. Cl.[4] B01D *39/04*
U.S. Cl. 264—109 **5 Claims**



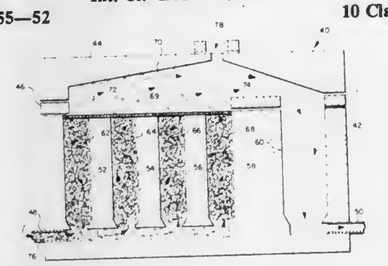
1. Method of forming a fluid filter comprising the steps of forming a nonwoven batt comprising a randomly arrayed mixture of the thermoplastic fibers and fibers which are not thermoplastic, dividing the batt into at least two sections, molding said batt sections into the desired shape of a fluid filter, and heating said batt sections during molding at a predetermined temperature while applying a predetermined pressure to said batt sufficient to soften said thermoplastic fibers and partially fuse said fibers into a filter structure having sufficient stiffness to be structurally self-supporting while retaining sufficient permeability to permit the fluid to be filtered to pass therethrough, each of said batt sections being molded at different temperatures and/or pressures to form an article of greater density and lower permeability and an article of lesser density and greater permeability, and assembling said articles to form a filter having a density and permeability gradient.

4,629,475

LIQUID DEBUBBLING APPARATUS AND METHOD

Donald J. McArdle, Belmont; Robert H. Russell, Framingham Centre, both of Mass., and Donald G. Scott, Derry, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 149,465, May 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 124,760, Feb. 26, 1980, abandoned, which is a continuation of Ser. No. 969,983, Dec. 15, 1978, abandoned. This application Dec. 2, 1981, Ser. No. 326,583
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—52 **10 Claims**



10. A method of removing bubbles of gas from a liquid in a hollow housing having an inlet, an outlet, a gas vent projecting through said housing, bubble coalescing baffle structure and a cavity portion internal of said housing located above said baffle between said gas vent and said baffle structure, said method comprising:

locating said vent in said housing in a position that is laterally displaced downstream from the direction of liquid flow at the highest point of said cavity portion;

introducing said liquid into said inlet;

directing said liquid in a generally upward direction through said bubble coalescing baffle structure such that at least a portion of said liquid contact said gas vent;

venting coalesced bubbles rising from said baffle stucture through said gas vent;

substantially reversing the generally upward direction of said liquid with its generally upward moving, coalesced, increased buoyancy bubbles after said liquid exits from said baffle structure to thereby enhance gas bubble/liquid separation; and

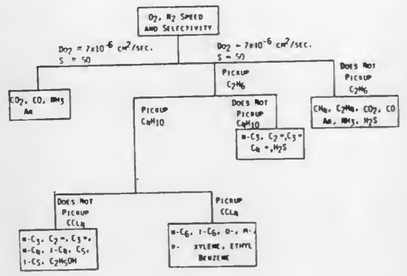
directing said liquid, whose direction has been reversed, out through said outlet.

4,629,476

CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Coraopolis, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Division of Ser. No. 475,796, Mar. 16, 1983, Pat. No. 4,528,281. This application Mar. 7, 1985, Ser. No. 709,265
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—68 **14 Claims**



1. A process for separating gas mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes, comprising passing gas through a molecular sieve comprising a carbonaceous substrate selected from the group consisting of molecular sieve carbon; calcined char and calcined agglomerated char selected from the group consisting of coconut, peach pits, walnut shells, babassu nut shells, and cherry pits; oxidized and devolatilized agglomerated coal; and calcined agglomerated coal; impregnated with an organic polymer having a molecular weight of at least 400, as determined by vapor phase osmometry, or with an inorganic polymer at a dosage of at least 0.001 weight percent (based on the substrate weight) up to a maximum dosage which still allows the resulting sieve to separate gas mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes.

4,629,477

COAGULATING COMPOSITIONS CONTAINING A CYANAMIDE COMPONENT FOR COAGULATING LACQUERS, WAXES AND COATING COMPOSITIONS

Juergen Geke, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 716,800
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412763
Int. Cl.[4] B01D *21/01;* **B03D** *3/02;* **C02F** *1/54, 1/56*
U.S. Cl. 55—85 **7 Claims**

1. A coagulating composition for coagulating lacquers, waxes and coating compositions consisting essentially of

(a) from 1% to 80% by weight of a cyanamide component selected from the group consisting of cyanamide, dicyanodiamide, calcium cyanamide and mixtures thereof,

(b) from 1% to 95% by weight of a sodium aluminum layers silicate selected from the group consisting of montmorillonite, bentonite and mixtures thereof,

(c) from 2% to 5% by weight of ethers selected from the group consisting of mixed formals having the formula

$$R^1—O—(AO)_m—CH_2—(OB)_n—O—R^2$$

wherein R^1 is an alkyl of a fatty alcohol containing from 8 to 22 carbon atoms, R^2 is a C_1-C_5-aklyl, A and B are ethylene or isopropylene, and m and n are integers from 1 to 4, mixed ethers having the formula

$$R^3—O—(AO)_p—R^4$$

wherein R^3 and R^4 are alkyls of fatty alcohols containing from 4 to 14 carbon atoms, A has the above meaning, and p is an integer of from 6 to 30, and mixtures thereof.

7. A coagulating composition for coagulating lacquers, waxes and coating compositions consisting essentially of

(a) a cyanamide component selected from the group consisting of cyanamide, dicyanodiamide, calcium cyanamide and mixtures thereof in an amount of from 5% to 15% by weight,

(b) viscosity controlling calcium and/or magnesium compounds in an amount of from 30% to 50% by weight,

(c) a polyethylene imine cationically modified by methylation or protonation and having molecular weights in the range of from 5×10^4 to 5×10^7D, in an amount of from 1% to 4% by weight,

(d) sodium aluminum layer silicates selected from the group consisting of montmorillonite, bentonite and mixtures thereof, in an amount of from 10% to 30% by weight,

(e) inorganic and/or organic acids or acid salts thereof in an amount of from 5% to 25% by weight, and

(f) ethers selected from the group consisting of mixed formals having the formula

$$R^1—O—(AO)_m—CH_2—(OB)_n—O—R^2$$

wherein R^1 is an alkyl of a fatty alcohol containing from 8 to 22 carbon atoms, R^2 is a C_1-C_5-alkyl, A and B are ethylene or isopropylene, and m and n are integers from 1 to 4, mixed ethers having the formula

$$R^3—O—(AO)_p—R^4$$

wherein R^3 and R^4 are alkyls of fatty alcohols containing from 4 to 14 carbon atoms, A has the above meaning, and p is an integer of from 6 to 30, and mixtures thereof, in an amount of from 2% to 5% by weight, and

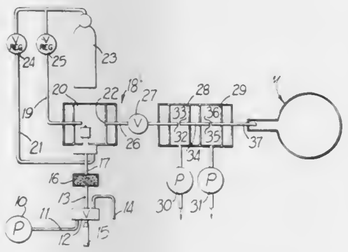
(g) alkali metal silicates and/or phosphates in an amount of from 0 to 10% by weight.

4,629,478

MONODISPERSE AEROSOL GENERATOR

Richard F. Browner, Atlanta, Ga., and Ross C. Willoughby, Wilmington, Del., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 22, 1984, Ser. No. 623,711
Int. Cl.⁴ B01F *3/04*; B01D *59/44*
U.S. Cl. 55—257 R **21 Claims**



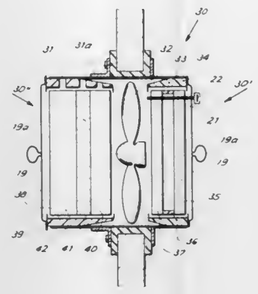
16. A system for generating a monodisperse aerosol, which comprises means for supplying liquid to a nozzle at a rate sufficient to produce a stable jet of liquid having a velocity such that monodisperse droplet breakup of the jet occurs in the absence of outside disturbances, and dispersing means for entraining said droplets just after the point of droplet formation in a high velocity flow of gaseous medium so as to retain the monodisperse nature thereof.

4,629,479

MULTIPLE FILTER UNIT

Maria C. Cantoni, Rome, Italy, assignor to Ital Idee s.r.l., Rome, Italy

Filed May 14, 1985, Ser. No. 733,801
Claims priority, application Italy, May 15, 1984, 48201 A/84
Int. Cl.⁴ B01D *39/00, 46/00*
U.S. Cl. 55—274 **21 Claims**



1. A multiple filter unit for motor vehicle ventilation and air conditioning systems, for introduction and stable insertion as a complete interchangeable unit into an air intake duct in motor vehicles, said filter unit comprising:

a substantially rigid casing having a cross-sectional shape corresponding to that of the intake duct into which it is inserted, and of slightly smaller cross-sectional dimensions;

an outer, rearwardly tapering covering of elastic, flexible material on said casing to enable said casing to be forced into and retained in said duct;

a series of filter elements constituted by mechanical and chemical filters disposed in a predetermined order for substantially complete filtration and purification of the air;

means for gripping and extracting the filter unit, said gripping means connected to the casing; and

means for checking the state of efficiency of the filter unit.

13. A multiple filter unit for closed environments, said filter unit comprising:

a rigid outer casing of a suitable cross-section for fitting into seats provided on a fixed structure, said casing including a flange with passage holes for screws for its fixing to the fixed structure, and including seal gaskets;

a filter unit assembly divided into two separate parts each contained in a rigid inner casing;

a low-speed electric fan disposed between the two filter units for creating the suction necessary for operation of the filter unit assembly, said two filter units forming an entire filter unit assembly.

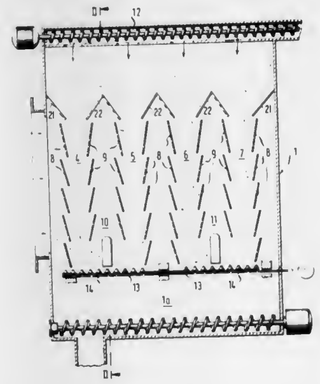
4,629,480

STRATIFIED BULK MATERIAL FILTER

Adolf Margraf, Am Schleplingsbach 46, 3060 Stadthagen, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,281
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426959
Int. Cl.⁴ B01D *46/00*
U.S. Cl. 55—282 **6 Claims**

1. In a crude gas filter having layers of granulated bulk material, the filter comprising a housing provided with a crude gas inlet and a purified gas outlet, and being subdivided by a partition into a crude gas spaced and a purified gas space, a plurality of vertical bulk material layers disposed in said crude gas space, said layers feedable from the top of said crude gas space and closed off and the bottom thereof, gas permeable members defining the bulk material layers on opposite sides thereof so as to form a crude gas flow arrival space on one side of the bulk material layers and a purified gas flow departure space on the opposite side thereof, loose bulk material of the layers being formed in slopes at the gas permeable members, means for supplying or replenishing bulk material to the bulk material layers and means for extraction of bulk material from the bulk material layers, which means communicate with the bottom of the bulk material layers, the improvement which comprises said gas permeable members forming the crude gas flow arrival sides of the bulk material layers are provided with perforations having a diameter larger than the diameter of the bulk material grains and the bulk material slopes are formed from within the perforations, and said gas permeable members forming the purified gas flow departure sides are so formed that no bulk material passes therethrough into the purified gas flow departure space, means for providing a cyclic flushing compressed gas counterflow for flushing and cleansing the



bulk mterial layers in a flow direction contrary to that of the crude gas, said flushing gas counterflow providing means comprising a source of compressed gas, a distributor pipe for compressed gas connected to the compressed gas source and projecting into the purified gas space, at least one nozzle communicating with said distributor pipe and spaces so as to facilitate a brief cyclic counterflow flushing and cleansing of the bulk material layers at the crude gas flow arrival sides and a simultaneous lateral removal or sideways extraction of charged or exhausted bulk material of the bulk material slopes at the crude gas flow arrival sides, and said bulk material extraction means comprising a bottom extraction grid acting briefly and simultaneously with said flushing gas counterflow providing means for bottom removal of the bulk material, so that, as bulk material is removed at the bottom, the bulk material layers are thereby placed in motion from the top towards the bottom.

4,629,481

LOW PRESSURE DROP MODULAR CENTRIFUGAL MOISTURE SEPARATOR

John D. Echols, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

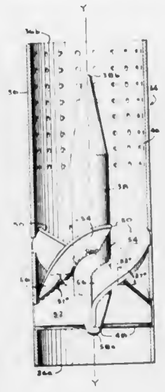
Filed Jan. 18, 1985, Ser. No. 692,812
Int. Cl.⁴ B01D *45/12*
U.S. Cl. 55—348 **15 Claims**

1. A modular separating unit for separating a liquid from a gas-liquid mixture, comprising:

an annular riser tube having an inlet end and an outlet end, said riser tube being perforated by parallel rows of spaced-apart holes adjacent said outlet end;

a hub having upper and lower ends, an axis, and a cylindrical portion between said upper and lower ends coaxial with said riser tube and located therewithin;

a plurality of blades mounted between said cylindrical portion of said hub and said riser tube below the holes in said riser tube, said blades being spaced at substantially equal intervals about the axis of said hub, each of said blades having a leading edge and a trailing edge, a leading surface adjacent said leading edge, a trailing surface adjacent said trailing edge, and a transition surface intermediate said leading and trailing edge surfaces, said leading edge and said leading surface being disposed substantially adjacent said inlet end of said riser tube and contained in a plane parallel to the flow direction of the gas-liquid mixture, said trailing edge and said trailing surface being contained in a plane which is at an angle of approximately



37° to a plane perpendicular to the axis of said hub, the projections of said leading edge of one of said blades and said trailing edge of an adjacent one of said blades onto a plane perpendicular to the axis of said hub forming an angle of approximately 22.5° therebetween;

an orifice ring coaxial with and adjacent to said outlet end of said riser tube, the outer diameter of said orifice ring being smaller than the inner diameter of said riser tube; and

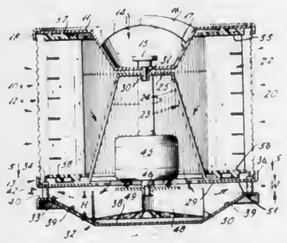
an annular downcomer tube coaxial with and surrounding said riser tube, the inner diameter of said downcomer tube being greater than the outer diameter of said riser tube.

4,629,482

HEPA ROOM AIR PURIFIER

George B. Davis, Frederick, Md., assignor to Enviracaire Corporation, Hagerstown, Md.

Filed Aug. 5, 1985, Ser. No. 762,345
Int. Cl.⁴ B01D *46/52*
U.S. Cl. 55—385 A **20 Claims**



1. A portable air purification apparatus comprising a housing including a base portion and cover means, said base portion including an air deflectin means and a plate means mounted in spaced relationship to said air deflection means so as to create a substantially continuous air exhaust opening therebetween, a centrifugal fan means disposed between said plate means and said air deflection means and being mounted so as to direct air

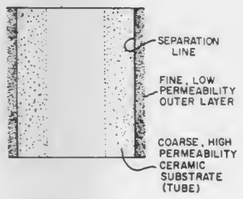
radially outwardly therefrom through said air exhaust opening, at least one opening through said plate means to permit air flow therethrough to said centrifugal fan means, motor means carried by said base portion and extending upwardly with respect to said opening in said plate means, said motor means having drive shaft means for driving said centrifugal fan means, air filter means mounted between said base portion and said cover means so that air is drawn therethrough toward said centrifugal fan means, and means for securing said cover means relative to said base means to thereby retain said air filter means therebetween.

4,629,483

CERAMIC FILTER WITH PLURAL LAYERS OF DIFFERENT POROSITY

Robert J. Stanton, Walworth, N.Y., assignor to Refractron Corp., Newark, N.Y.

Filed Jan. 6, 1986, Ser. No. 816,523
Int. Cl.[4] B01D *39/06*
U.S. Cl. 55—487 **11 Claims**



1. A ceramic filter comprising a substrate layer of ceramic material of a first porosity and a second layer of ceramic material of a second porosity different from said first porosity formed on said substrate layer to define a monolithic structure having in cross-section a distinct line separating said layers by compressing a first plastic mass of ceramic particles of a first particle size mixed with a binder to form said substrate, applying and compressing together with said formed substrate layer a second plastic mass of ceramic particles of a second particle size mixed with a binder to form a composite body of said substrate layer and said second layer, and firing said composite body until it becomes hard.

4,629,484

PROCESS FOR SEPARATING HYDROGEN AND METHANE FROM AN ETHYLENE RICH STREAM

Henry Z. Kister, Huntington Beach, Calif., assignor to C F Braun & Co., Alhambra, Calif.

Continuation of Ser. No. 528,363, Aug. 31, 1983, abandoned.
This application Jun. 20, 1985, Ser. No. 746,943
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—29 **21 Claims**



1. A process for separating hydrogen and methane from a gas mixture containing hydrocarbons heavier than methane, said process comprising the steps of:

providing the option of precluding the need to utilize an external methane refrigeration circuit by,

passing the mixture through a plurality of chilling stages;

collecting at least one chilling stage bottoms portion from at least one of the plurality of chilling stages;

passing at least one chilling stage bottoms portion to a hydrogen stripper;

collecting a hydrogen stripper overheads portion containing most of the hydrogen entering the hydrogen stripper;

collecting a hydrogen stripper bottoms portion containing most of the methane and at least ninety-nine mole percent of the hydrocarbons heavier than methane passed to the hydrogen stripper;

passing the hydrogen stripper bottoms portion to a fractionation zone;

collecting a fractionation zone bottoms portion comprising at least ninety-nine mole percent of the hydrocarbons heavier than methane entering the fractionation zone and no more than one percent of the methane entering the fractionation zone;

collecting a fractionation zone overheads portion comprising mostly methane; and

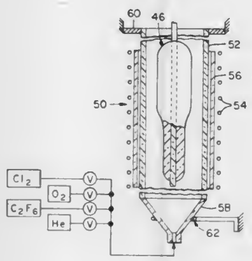
separating a hydrogen stream from at least one of the plurality of chilling stages operated at a temperature lower than −140° C.

4,629,485

METHOD OF MAKING FLUORINE DOPED OPTICAL PREFORM AND FIBER AND RESULTANT ARTICLES

George E. Berkey, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,786
Int. Cl.[4] C03B *37/014*
U.S. Cl. 65—3.11 **14 Claims**



1. A method of forming a glass article at least a portion of which is doped with fluorine, comprising the steps of

forming a glass preform at least a portion of which is porous and contains interstices,

inserting said preform into a consolidation furnace having a muffle formed of a high silica content glass,

flowing over the surface of said porous portion a gas comprising fluorine, a portion of said gas diffusing inwardly through the interstices of said preform, and

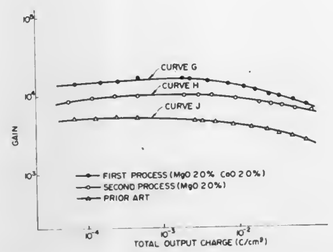
heating said porous preform to a temperature within the consolidation temperature range for a time sufficient to cause said fluorine to diffuse into the surfaces of said interstices and to cause the porous portion of said preform to fuse and form a fluorine-doped dense glass.

4,629,486

PROCESS OF HOW TO FABRICATE THE MICROCHANNEL PLATE

Toshiyuki Uchiyama; Takeo Sugawara; Chiyoshi Okuyama, and Yoshihiko Mizushima, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 18, 1985, Ser. No. 798,933
Claims priority, application Japan, Dec. 11, 1984, 59-261436
Int. Cl.[4] F16C *1/06*
U.S. Cl. 65—3.15 **2 Claims**



1. A process of how to fabricate the microchannel plate consists of:

sintering the surfaces of the glass fibres bound to form a bundle of said glass fibers, each consisting of a glass core which can be dissolved by acid and a glass cladding covering said glass core, which cannot be dissolved by acid;

forming a plate-like structure of said glass fiber bundle by slicing said glass fiber bundle along the direction perpendicular to the optical axis thereof;

dipping said structure into an acid solution so as to dissolve said glass cores which can be dissolved by acid;

activating the inner surfaces of said microchannel plate, which are formed by dissolving said glass cores which can be dissolved by acid; and

forming a pair of electrodes at both ends of the plate-like structure;

wherein said glass cladding which cannot be dissolved solved by acid should contain the followings:

Silicon di-oxide (SiO_2)	35 to 50 weight percents
Sodium oxide (Na_2O)	1 to 3 weight percents
Potassium oxide (K_2O)	1 to 5 weight percents
Lithium oxide (Li_2O)	0 to 2 weight percents
Magnesium oxide (MgO)	1 to 5 weight percents
Lead oxide (PbO)	30 to 55 weight percents
Zirconium di-oxide (ZrO_2)	0.5 to 7 weight percents.

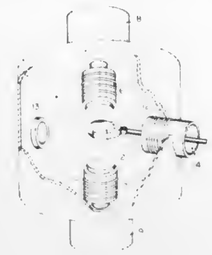
4,629,487

MOLDING METHOD FOR PRODUCING OPTICAL GLASS ELEMENT

Hideto Monji, Katano; Masaki Aoki, Minou; Hideo Torii, Higashiosaka, and Hideyuki Okinaka, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 16, 1985, Ser. No. 734,651
Claims priority, application Japan, May 17, 1984, 59-99059; Jun. 8, 1984, 59-118478; Jun. 13, 1984, 59-121344; Jun. 13, 1984, 59-121345; Jun. 13, 1984, 59-121346
Int. Cl.[4] C03B *40/00*
U.S. Cl. 65—26 **12 Claims**

1. In a method for producing an optical glass element which comprises subjecting optical glass in a mold to heat and pressure, the improvement wherein the mold is one obtained by



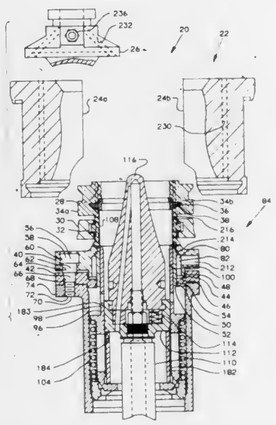
coating a compound material of metal and ceramic with a thin film of a platinum group metal alloy.

4,629,488

COOLING SYSTEM FOR NECK RING AND PARISON MOLD

Wilbur O. Doud; Robert E. Davis, and Fred R. Sawyer, all of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 683,450, Dec. 19, 1984, abandoned.
This application Mar. 3, 1986, Ser. No. 839,166
Int. Cl.[4] C03B *11/12*
U.S. Cl. 65—83 **22 Claims**



1. A molding surface assembly for formation of a glass parison comprising a receiver having a first array of internal passageways, molding body having a parison forming portion defining a mold cavity for said glass parison and a finish molding portion adapted to form the finish of the parison, said finish molding portion having a second array of internal passageways spaced substantially closer to the inner surface of said finish molding portion than to the outside surface of the finish molding portion, said first and second internal arrays of passageways being in substantial alignment with one another, and said first array having a cross sectional area smaller than the second array.

4,629,489

METHOD OF MANUFACTURING PRESSED LENSES

Shinichiro Hirota, and Tetsuro Izumitani, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,050

Claims priority, application Japan, Jul. 9, 1984, 59-140548; Aug. 16, 1984, 59-170019

Int. Cl.[4] C03B *23/00*

U.S. Cl. 65—102 **23 Claims**



1. A method of manufacturing a pressed lens, comprising the steps of:

inserting a preform into a pressing mold having a first mold and a second mold disposed within a sleeve, at least one of said first and second molds being slidable within said sleeve;

pressing said first and second molds together while said preform is at a temperature corresponding to a preform viscosity of $10^{8.5}-10^{10.5}$ poise, said pressing being performed by a pressing rod pressing against said first and second molds, said pressing rod being separable from said first and second molds;

withdrawing pressure applied in said pressing step while maintaining a resulting molding within said pressing mold in contact with said first mold and said second mold by separating said pressing rod from said first and second molds;

cooling said molding while said molding contacts said first mold and said second mold; and

removing said molding from said first mold and said second mold after said molding reaches a temperature having a corresponding viscosity not smaller than $10^{11.5}$ poise.

4,629,490

PHOSPHONOMETHYLCYLHYDROXAMIC ACID AND HERBICIDALLY ACTIVE SALTS THEREOF, AND THEIR USE IN HERBICIDAL COMPOSITIONS

Rudolph C. Thummel, Courgenay; Hanspeter Fischer, Bottmingen, and Ludwig Maier, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

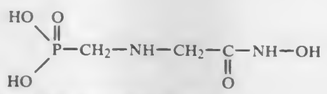
Continuation of Ser. No. 514,072, Jul. 15, 1983, abandoned, which is a division of Ser. No. 255,411, Apr. 20, 1981, Pat. No. 4,414,158. This application Oct. 24, 1984, Ser. No. 664,105

Claims priority, application Switzerland, Apr. 29, 1980, 3302/80

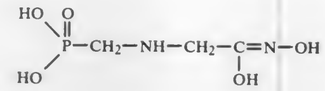
Int. Cl.[4] A01N *57/28*

U.S. Cl. 71—86 **10 Claims**

1. A herbicidal composition comprising (1) a herbicidally effective amount of an N-phosphonomethylglycylhydroxamic acid of the formula



and/or of the tautomeric formula



in the form of the free acid, the mono-, di- or tri-sodium salt, the copper salt, the isopropylammonium salt, the tetrabutylammonium salt, the 4-pyrrolidinium-pyridinium salt, the 1-methyl-4,4′-bipyridinium salt, the dimethylbenzylammonium salt, the dimethyldodecylammonium salt, or of a hydrohalide, and (2) a carrier.

4,629,491

OXIDIZED SULFUR DERIVATIVES OF DIAMINOPHOSPHINYL COMPOUNDS AS UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

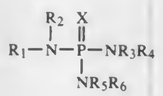
Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, both of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 20, 1983, Ser. No. 563,347

Int. Cl.[4] A01N *57/26;* **A61K** *31/66;* **C07F** *9/02*

U.S. Cl. 71—87 **26 Claims**

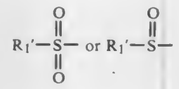
1. A urease inhibiting composition comprising a carrier and a urease inhibiting effective amount of one or more compounds of the formula:



wherein:

X is oxygen or sulfur;

R_1 is



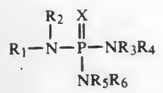
wherein;

R_1' is amino or substituted or unsubstituted alkyl, aryl wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl groups; and

R_2 is hydrogen, or substituted or unsubstituted alkyl or aryl wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl groups; and

R_3, R_4, R_5 and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon

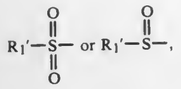
16. An fertilizer composition which comprises a carrier, urea and/or one or more urea precursor compounds capable of forming urea in situ when subjected to the use conditions of the composition, and a urease inhibiting effective amount of one or more compounds of the formula:



wherein:

X is oxygen or sulfur;

R_1 is



wherein

R_1' is amino or substituted or unsubstituted alkyl or aryl wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl;

R_2 is hydrogen, or substituted or unsubstituted alkyl or aryl wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl; above; and

R_3, R_4, R_5 and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon atoms.

4,629,492

SUBSTITUTED OXIRANE COMPOUNDS

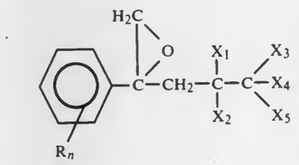
R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 665,221

Int. Cl.[4] A01N *43/20;* **C07D** *303/08*

U.S. Cl. 71—88 **25 Claims**

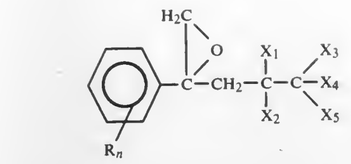
1. A compound of the formula



(I)

wherein n is an integer from 0 to 5; R independently represents halogen or $—CF_3$; and X_1, X_2, X_3, X_4, and X_5 each independently represent halogen.

15. A method for controlling undesirable plants which comprises applying to the locus of said plants a herbicidally effective amount of a substituted oxirane compound corresponding to the formula:



(I)

where R independently represents halogen or CF_3; n is an integer from 0 to 5; and X_1, X_2, X_3, X_4, and X_5 independently represent halogen.

4,629,493

HETEROCYCLIC ETHER TYPE PHENOXY FATTY ACID DERIVATIVES AND HERBICIDAL COMPOSITION

Yasukazu Ura; Gozyo Sakata; Kenzi Makino; Yasuo Kawamura, all of Funabashi; Yuzi Kawamura, Shiraoka; Takasi Ikai, Shiraoka, and Tosihiko Oguti, Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

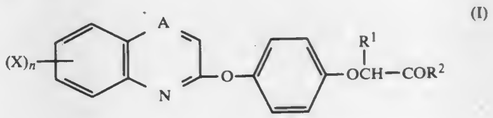
Filed Jan. 29, 1980, Ser. No. 116,381

Claims priority, application Japan, Feb. 22, 1979, 54-20164

Int. Cl.[4] C07D *241/44, 215/22;* **A01N** *43/60, 43/42*

U.S. Cl. 71—92 **17 Claims**

1. Heterocyclic ether type phenoxy fatty acid derivatives having the formula



(I)

wherein A represents —N—; X represents halogen; n is 0, 1 or 2; R^1 represents hydrogen or lower alkyl; R^2 represents —OH; —O—alkyl, —OM, wherein M is lower alkyl ammonium, ethanolammonium, lower alkyl ethanolammonium, alkali metal or alkaline earth metal;



;

—O—lower alkenyl; —O—benzyl; —O—lower alkylalkoxy; —O—phenyl; —O—cyclohexyl; —O—halogenoalkyl; —O—lower alkynyl or —O—cyanoalkyl; and R^3 and R^4 respectively represent hydrogen or lower alkyl.

9. A method for controlling the growth of undesired vegitation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,629,494

HERBICIDAL SULFONAMIDES

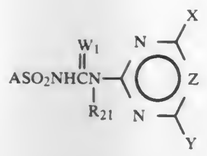
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 543,835, Oct. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 434,038, Oct. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 328,018, Dec. 7, 1981, abandoned. This application Apr. 15, 1985, Ser. No. 723,450

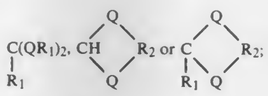
Int. Cl.[4] A01N *43/08, 43/10, 43/54, 43/66;* **C07D** *239/69, 251/12*

U.S. Cl. 71—92 **65 Claims**

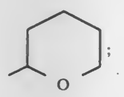
1. A compound of the formula:



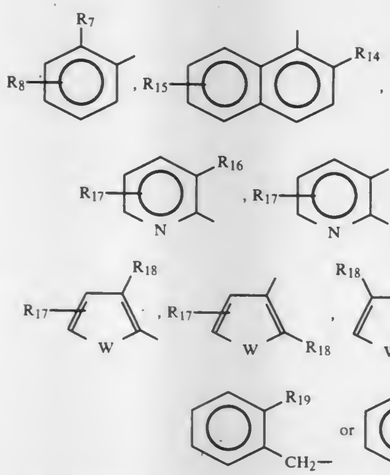
wherein
X is CH_3, OCH_3, Cl, C_2H_5 or OC_2H_5;
Z is CH;
Y is CH_2OR, $CH(QR_1)_2$,



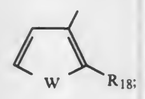
R is $C(0)R_3$, CO_2R_4, $C(0)NR_5R_6$ or



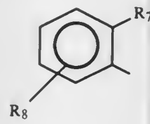
R_1 is C_1–C_2 alkyl;
R_2 is $—CH_2CH_2—$, $—CH(CH_3)CH_2—$ or $—CH_2CH_2CH_2—$;
R_3 is C_1–C_3 alkyl;
R_4 is C_1–C_3 alkyl;
R_5 is H or CH_3;
R_6 is C_1–C_3 alkyl;
Q is O or S;
A is



R_7 is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, I, Br, NO_2, CF_3, CO_2R_9, $SO_2NR_{10}R_{11}$, $SO_2N(OCH_3)CH_3$, OSO_2R_{12}, $S(O)_nR_{13}$, LCF_3, $LCHF_2$, LCF_2CF_2H, CH_2Cl, $CHCl_2$, CH_2OCH_3 or $CH_2OCH_2CH_3$;
R_8 is H, F, Cl, Br, CF_3, NO_2, C_1–C_3 alkyl C_1–C_3 alkoxy, OCF_2H or SCF_2H;
R_9 is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH=CH_2$;
R_{10} and R_{11} are independently C_1–C_3 alkyl;
R_{12} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, $CH_2CH_2CH_2OCH_3$ or C_1–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br;
R_{13} is C_1–C_4 alkyl or $CH_2CH=CH_2$;
n is 0 or 2;
L is O, S or SO_2;
R_{14} is H, CH_3, OCH_3, F, Cl, Br, NO_2, $SO_2N(CH_3)_2$, OSO_2R_1 or $S(O)_nR_1$;
R_{15} is H, Cl, Br, CH_3, OCH_3 or NO_2;
R_{16} is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, CF_3, CO_2R_9, $SO_2NR_{10}R_{11}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{13}$;
R_{17} is H, F, Cl, Br, CH_3 or OCH_3;
W is O or S;
W_1 is O or S;
R_{18} is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, NO_2, CO_2R_9, $SO_2NR_{10}R_{11}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{13}$;
R_{19} is Cl, NO_2, CF_3, CO_2R_9, $SO_2N(OCH_3)CH_3$, $SO_2NR_{10}R_{11}$, OSO_2R_{12}, $S(O)_nR_{13}$, C_1–C_3 alkyl, or C_1–C_3 alkoxy optionally substituted with 1–5 atoms of Cl or F;
R_{20} is Cl, NO_2, CF_3, CO_2R_9, $SO_2N(OCH_3)CH_3$, C_1–C_3 alkyl, OSO_2R_{12} or C_1–C_3 alkoxy optionally substituted with 1–5 atoms of Cl or F;
R_{21} is H or CH_3;
and their agriculturally suitable salts; provided that
(1) the total number of carbon atoms of R_{10} and R_{11} is less than or equal to 4;
(2) when W is O, then R_{18} is H, Cl, Br, CH_3 or CO_2R_9;
(3) when W is O and R_{18} is H, Cl, Br, or CH_3, then A is

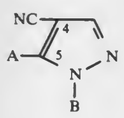


and
(4) when W_1 is S, then R_{21} is H and A is



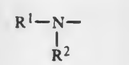
4,629,495
HERBICIDAL 5-AMINO-4-CYANO-1-PHENYLPYRAZOLES
Leslie R. Hatton, Chelmsford; Edgar W. Parnell, Hornchurch, and David A. Roberts, Bedford, all of England, assignors to May & Baker Limited, Essex, England
Filed Jul. 13, 1983, Ser. No. 513,464
Claims priority, application United Kingdom, Jul. 15, 1982, 8220611; Jul. 15, 1982, 8220612
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] A01N *43/56;* **C07D** *231/38*
U.S. Cl. 71—92 **25 Claims**

1. An N-phenylpyrazole derivative of the formula:



II

wherein
A represents a group of the formula:

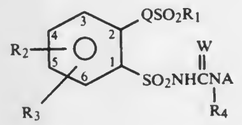


III

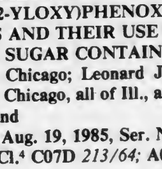
wherein

4,629,496
HERBICIDAL O-ALKYLSULFONYLOXY- AND O-ALKYLSULFONYLAMINOBENZENESULFONAMIDES
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 544,429, Oct. 21, 1983, Pat. No. 4,534,789, which is a continuation-in-part of Ser. No. 262,813, May 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,344, Jul. 11, 1980, abandoned. This application May 3, 1985, Ser. No. 730,065
Int. Cl.[4] A01N *43/54, 43/72;* **C07D** *491/048, 491/052*
U.S. Cl. 71—92 **21 Claims**

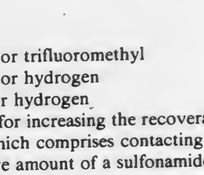
1. A compound of the formula:



where
W is O or S;
Q is O or NR_5;
R_1 is C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, $CH_2CH_2OCH_3$, $CH_2CH_2CH_2OCH_3$ or



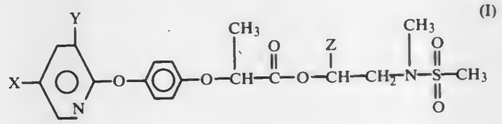
R_2 is H. F, Cl, Br, OCH_3, NO_2, CF_3 or C_1–C_2 alkyl;
R_3 is H, F, Cl, Br or CH_3;
R_4 is H, CH_3 or OCH_3;
R_5 is C_1–C_4 alkyl;
R_6 and R_7 are independently H, F, Cl, Br, CH_3, CF_3, NO_2 or OCH_3;
A is



n is 1 or 2;
X_1 is O or CH_2; and
Y_1 is H, CH_3, OCH_3 or Cl;
and provided that:
(1) when W is S, then R_4 is H; and
(2) when R_4 is OCH_3, when Q is O.

4,629,497
CERTAIN 1-(N-METHYLSULFONAMIDO)-PROP-2-YL 2-/4-(PYRID-2-YLOXY)PHENOXY/-PROPIONATE DERIVATIVES AND THEIR USE FOR INCREASING RECOVERABLE SUGAR CONTAINED IN SUGAR CANE
Louis G. Nickell, Chicago; Leonard J. Stach, Riverside, and Takeo Hokama, Chicago, all of Ill., assignors to Sandoz Ltd., Basel, Switzerland
Filed Aug. 19, 1985, Ser. No. 766,731
Int. Cl.[4] C07D *213/64;* **A01N** *43/40*
U.S. Cl. 71—94 **16 Claims**

1. A Compound of the formula:

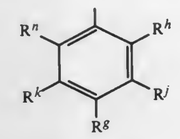


(I)

wherein
X is chlorine or trifluoromethyl
Y is chlorine or hydrogen
Z is methyl or hydrogen

8. A method for increasing the recoverable sugar contained in sugarcane which comprises contacting the sugarcane plant with an effective amount of a sulfonamide of claim 1.

R^1 represents a straight- or branched-chain unsubstituted alkyl group of 1 to 8 carbon atoms
or R^1 represents a straight - or branched-chain unsubstituted alkenyl or alkynyl group of 2 to 8 carbon atoms
and R^2 represents a hydrogen atom or a straight- or branched-chain unsubstituted alkyl group of 1 to 8 carbon atoms or a straight- or branched-chain unsubstituted alkenyl or alkynyl group of 2 to 8 carbon atoms
and
B represents a group of the formula:



(V)

wherein R^g represents a fluorine, chlorine or bromine atom, a straight- or branched-chain alkyl group of from 1 to 4 carbon atoms unsubstituted or substituted by one or more halogen atoms or a stragight- or branched-chain alkenyl or alkynyl group of from 2 or 4 carbon atoms, R^h represents a fluorine, chlorine or bromine atom or a nitro, methyl or ethyl group and R^j, R^k and R^n, which may be the same or different, each represent a hydrogen, fluorine, chlorine or bromine atom or a nitro, methyl or ethyl group or R^h and R^j each represent a chlorine atom and R^g and R^k and R^n each represent a hydrogen atom.

14. A method of controlling the growth of weeds at a locus which comprises applying to the locus a herbicidally effective amount of an N-phenylpyrazole derivative to formula II depicted in claim **1**, wherein A and B are as defined in claim **1**, in a herbicidal composition which comprises a herbicidally effective amount of the aforesaid N-phenylpyrazole derivative in association with one or more compatible herbicidally-acceptable diluents or carriers and/or surface-active agents.

4,629,498

NOVEL PHENOXYPHENOXYALKANOYLTHIOAMIDES AS HERBICIDES

Otto Rohr, Therwil, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

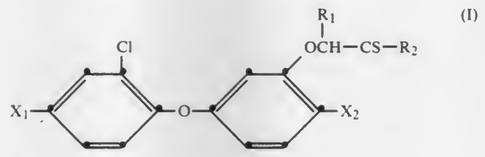
Continuation of Ser. No. 462,259, Jan. 31, 1983. This application May 2, 1985, Ser. No. 729,891

Claims priority, application Switzerland, Feb. 12, 1982, 886/82

Int. Cl.[4] C07C *153/05;* A01N *31/00*

U.S. Cl. 71—98 12 Claims

1. A phenoxyphenoxyalkanoylthioamide of the formula I



(I)

wherein X_1 is chlorine or trifluoromethyl, X_2 is chlorine, R_1 is C_1-C_4alkyl, and R_2 is the amino group or the dimethylamidino group.

4,629,499

HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Raymond A. Felix, Richmond, and Joanna K. Hsu, Sunnyvale, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

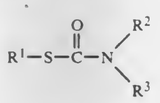
Continuation of Ser. No. 398,059, Jul. 14, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,830

Int. Cl.[4] A01N *25/22*

U.S. Cl. 71—100 9 Claims

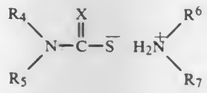
1. An herbicidal composition consisting essentially of

(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which R^1, R^2, and R^3 are independently C_1-C_6 alkyl; and

(b) an amount of an allyl amine salt of thiocarbamic acid compound sufficient to extend the soil life of said thiolcarbamate, said allyl amine salt compound having the formula



wherein

R_4 and R_5 are independently selected from the group consisting of allyl, and lower alkyl groups having from about 1 to about 6 carbon atoms;

R_6 and R_7 are independently selected from the group consisting of allyl, and lower alkyl groups having from about 1 to about 6 carbon atoms, and

X is sulfur wherein at least one of R_4 and R_5, and at least one of R_6 and R_7 is an allyl group, and wherein the ratio of (a) to (b) ranges from about 3:4 to about 6:4 by weight.

4,629,500

USE OF NOVEL ROTARY TUBULAR KILN

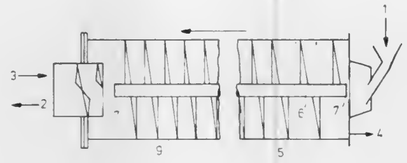
Helmut Janz, Viersen; Fritz Rodi, Moers; Alfred Soppe, Issum, and Jakob Rademachers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,469

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328709

Int. Cl.[4] C21B *13/08*

U.S. Cl. 75—0.5 BA 4 Claims



1. In a process for carrying out a gas-solid reaction wherein solids are contacted with a gas, the improvement comprising: providing a rotary tubular kiln having two ends, an outer tube, a central tube sealed at both ends and running the length of the kiln and a spiral between the central and outer tubes and fixed to the central tube and outer tube; feeding the solids into one end of the kiln between the central and outer tubes; providing lifting blades on the inner periphery of the outer tube within the spiral and terminating at an inner edge spaced apart from the central tube to lift the solids during rotation of the outer tube; feeding gas into the rotary kiln between the central and outer tubes; and rotating the outer tube, inner tube, spiral and blades to convey the solids via the spiral to the other end of the kiln.

4,629,501

METHOD FOR MANUFACTURE OF ANTIMONY OF HIGH PURITY

Mitsugi Kubota, and Hiroshi Kakemizu, both of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,252

Claims priority, application Japan, Oct. 31, 1984, 59-229594

Int. Cl.[4] C22B *30/02*

U.S. Cl. 75—69 7 Claims

1. A method of manufacturing high purity antimony which comprises the steps of

(a) preparing a first aqueous solution of antimony chloride, containing low-boiling components

(b) heating said first aqueous solution of antimony chloride to less than 200° C. to remove low-boiling components therefrom,

(c) further heating said first aqueous solution of antimony chloride to between 200° C. and 230° C. to distill antimony chloride therefrom,

(d) recovering the antimony chloride distilled from said first aqueous solution in step (c),

(e) adding pure water to the antimony chloride recovered in step (d) to provide a second aqueous solution of antimony chloride, said water being added in an amount of 10% by weight of said recovered antimony chloride,

(f) passing said second aqueous solution of antimony chloride into a reducing container,

(g) passing a stream of hydrogen through said reducing container at a temperature exceeding 800° C. so that the antimony chloride in said second aqueous solution of antimony chloride injected therein will react with said hydrogen to produce high purity antimony, and

(h) recovering said high purity antimony.

4,629,502

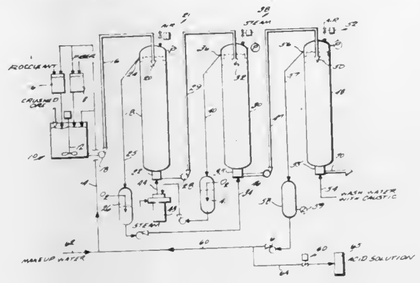
PRESSURIZED REACTION OF REFRACTORY ORES WITH HEAT RECOVERY

Michael I. Sherman; Carl L. Elmore, both of Glens Falls, N.Y., and Robert J. Brison, Golden, Colo., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,733

Int. Cl.[4] C01G *7/00;* C22B *11/04*

U.S. Cl. 75—118 R 11 Claims



1. A method of recovering gold from a particlized gold bearing refractory ore, comprising the steps of continuously:

(a) Mixing the particlized refractory gold ore with a liquid heated above ambient temperature to form a heated liquid slurry, and mixing the particlized ore with a flocculating material and fibers so as to lock the particlized ore in a stable network in the slurry;

(b) continously passing the slurry in a flow path;

(c) oxidizing oxidizable constituents of the ore in the slurry, to break metal-sulphur bonds, while in said flow path, at super-atmospheric pressure and temperature above 212° F.;

(d) washing the ore in the slurry with a wash water to remove products of oxidation, including sulphuric acid, therefrom;

(e) recovering heat from the slurry, including by removing spent wash water from the slurry and utilizing the spent wash water as heated liquid in step (a); and

(f) subsequently effecting cyanide leaching of the washed, oxidized, particlized refractory gold ore, to effect recovery of gold therefrom.

4,629,503

PROCESS FOR THE RECOVERY OF TUNGSTEN IN A PURE FORM FROM TUNGSTEN-CONTAINING MATERIALS

Moshe Fruchter, Haifa, and Anutza Moscovici, Rehovot, both of Israel, assignors to RAMOT - University Authority for Applied Research and Industrial Development, Tel-Aviv, Israel

Filed Apr. 17, 1985, Ser. No. 723,879

Int. Cl.[4] C01G *41/00*

U.S. Cl. 75—121 14 Claims

1. A process for the recovery of tungsten from tungsten-containing materials which comprises the steps of

(i) admixing the tungsten-containing material with a melt at a temperature of between 680° C. and 750° C., said melt consisting of a salt selected from the group consisting of sodium nitrate, sodium nitrite and mixtures thereof in a substantially stoichiometrical amount to the tungsten constituent of said tungsten-containing material to disintegrate said tungsten-containing material and to form sodium tungstate, cooling said melt, and leaching said cooled melt with water to obtain an aqueous solution of sodium tungstate;

(ii) admixing a solution of calcium chloride with said aqueous solution of sodium tungstate at a temperature of between 40° C. and 95° C. to form a calcium tungstate prcipitate and separating said calcium tungstate;

(iii) admixing said calcium tungstate with a preheated concentrated hydrochloric acid solution to form a tungstic acid precipitate and a $CaCl_2$ solution having a concentration of between 80 g/l and 180 g/l free HCl and separating said tungstic acid precipitate and obtaining tungstic acid which is substantially free of calcium ions; and

(iv) calcining said tungstic acid to convert it to tungstic oxide and reducing said tungstic oxide to form metallic tungsten.

4,629,504

STEEL MATERIALS FOR WELDED STRUCTURES

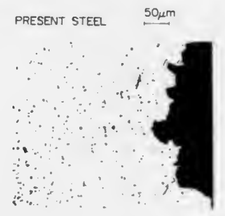
Makoto Koike, Tokyo; Hiroyuki Honma; Shoichi Matsuda, both of Kanagawa; Masana Imagunbai, Chiba; Masazumi Hirai, Chiba, and Fukuyoshi Yamaguchi, Chiba, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

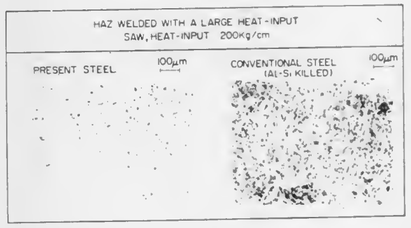
Filed Sep. 26, 1985, Ser. No. 780,632

Claims priority, application Japan, Sep. 28, 1984, 59-203099

Int. Cl.[4] C22C *38/14*

U.S. Cl. 420—38 14 Claims





1. A process for producing weldable structural steel materials which are characterized by a fine bainite microstructure and show excellent toughness in the HAZ, which comprises adding titanium to a molten steel containing not more than 0.020% of dissolved oxygen and not more than 0.007% of aluminum to deoxide the molten steel, and casting the molten steel thus deoxidized, the cast product thus obtained containing:

C: 0.001 to 0.300%

Mn: 0.4 to 2.0%

P: 0.025% max.

S: 0.025% max.

Al: 0.007% max.

Ti: 0.003 to 0.050%

O: 0.0010 to 0.0100%

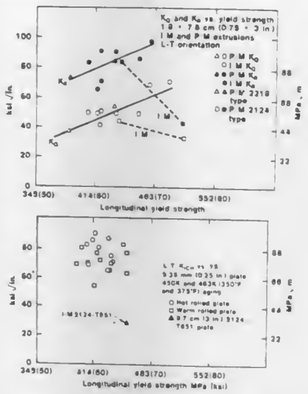
Balance: iron and unavoidable impurities and containing 0.002 to 0.100% of oxide inclusion having a complex grain phase composed of one or more Ti oxides having a particle size of not larger than 10 μm.

4,629,505

ALUMINUM BASE ALLOY POWDER METALLURGY PROCESS AND PRODUCT

Henry G. Paris, San Diego, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 2, 1985, Ser. No. 718,861
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—228 **7 Claims**



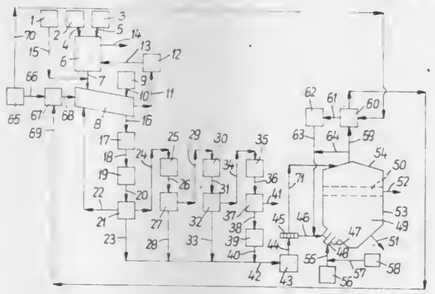
1. A metallurgical method including cooling molten aluminum particles and consolidating resulting solidified particles into a multi-particle body, wherein the improvement comprises provision in the particles of an elemental composition consisting essentially of 3–4.5 wt % Cu, 1.25–2.25 wt % Mg, up to 0.5 wt % Mn, and greater than 0.15% of a metal which diffuses in the aluminum solid state at a rate less than that of Mn, the body being based on an average particle size (APD) of about 15 micrometers, whereby, in 1.9×7.6 cm extrusions, toughness increases with increasing strength and toughness K_r values above 100 MPa·m$^{\frac{1}{2}}$ at longitudinal yield strengths above 450 MPa may be achieved.

4,629,506

PROCESS FOR THE PRODUCTION OF FERROCHROMIUM

Klaus Ulrich, Heiligenhaus; Wilhelm Janssen, Muelheim; Dieter Neuschuetz; Thomas Hoster, both of Essen; Hermann Doerr, Muelheim, and Dietrich Radke, Ratingen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschraenkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,322
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347686; Aug. 30, 1984, 3431854
Int. Cl.[4] C22C *33/00*
U.S. Cl. 75—10.63 **20 Claims**



1. Process for the production of ferrochromium with a carbon content of from 0.02 to 10 weight % from iron-containing chromium ore by heating a mixture of chromium ore, solid carbon-containing fuel and slag-forming constituents in a rotary kiln and subsequently melting ferrochromium from the reaction product that is removed from the rotary kiln and cooled down, comprising:

(a) forming a mixture of chromium ore, coal and slag-forming constituents, in which the ore-coal ratio is from 1:0.4 to 1:2, the slag-forming constituents being CaO, MgO, Al_2O_3 and SiO_2, and originating from the ore and coal and if necessary being added as flux in the form of at least one separate slag-forming constituent of CaO, MgO, Al_2O_3, or SiO_2 in such a quantity, that in the final slag including the constituents of the ore and coal and the added fluxes a $(CaO+MgO)/Al_2O_3+SiO_2)$ ratio exists of from 1:1.4 to 1:10, and the Al_2O_3/SiO_2 ratio amounts to 1:0.5 to 1:5;

(b) heating the mixture in the rotary kiln from 20 to 240 minutes in a CO-containing atmosphere at temperatures of from 1480° to 1580° C. to form a reaction product and removing the reaction product from the rotary kiln;

(c) crushing the reaction product removed from the rotary kiln to a particle size of less than 25 mm;

(d) separating the crushed reaction product by density separation and/or magnetic separation into a coal-containing fraction which is reintroduced into the rotary kiln, at least one metal-containing slag-rich fraction and an alloy fraction to be delivered to a melting furnace; and

(e) melting the alloy fraction in a melting furnace at temperatures of from 1600° to 1700° C.

4,629,507

WATER GLASS-BASED INORGANIC MATERIAL AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Fukushima, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 503,434, Jun. 13, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 788,677
Claims priority, application Japan, Jun. 11, 1982, 57-100891; Jul. 26, 1982, 57-130141; Jul. 26, 1982, 57-130142
Int. Cl.[4] C09D *1/02*; C09J *1/02*
U.S. Cl. 106—74 **28 Claims**

1. An inorganic material produced by preparing a coagulant by allowing porous particles of sepiolite to be impregnated with or to adsorb polyvalent ions capable of coagulating water glass; and

adding the coagulant to water glass;

thereby allowing the polyvalent ions to gradually release from the coagulant and thus allowing the polyvalent ions and a solid content of the water glass to thoroughly react;

wherein said polyvalent ions are selected from the group consisting of Mg, Al, Ca and Ba ions.

4,629,508

PROCESS FOR FORMING HYDRATED CALCIUM SILICATE PRODUCTS

Clifford W. Cain, Jr., Bailey; Phillip C. Martin, Conifer, and Steven R. Martinez, Denver, all of Colo., assignors to Manville Corporation, Denver, Colo.

Filed Mar. 17, 1986, Ser. No. 840,341
Int. Cl.[4] C04B *7/00, 2/02, 7/34*; C01B *33/24*
U.S. Cl. 106—85 **8 Claims**

1. A process for the formation of shaped hydrated calcium silicate objects which comprises the steps of:

(a) forming an aqueous slurry comprising perlite, a calcium salt, selected from the group of consisting of hydrated and unhydrated calcium sulfate, calcium nitrate, calcium chloride and calcium acetate and a source of calcium hydroxide wherein: (i) said source of calcium hydroxide is one selected from the group consisting of quicklime, slaked lime, acetylene residuum and carbide residuum; (ii) the mole ratio of calcium hydroxide to silica provided by said perlite in said slurry is in the range of 0.5:1 to 3.0:1; and (iii) the mole ratio of said calcium salt to the total amount of potassium and sodium oxides present in the perlite is in the range of about 0.5:1 to 1.2:1;

(b) heating said slurry in a pressure vessel in the presence of saturated steam at a pressure of at least 75 psig for a period of at least one-half hour to form agglomerates of hydrated calcium silicate crystals;

(c) adding water in every instance to the slurry containing said agglomerates of hydrated calcium silicate crystals in said pressure vessel in an amount sufficient to replace the calculated amount of steam to be lost during the subsequent venting of the pressure vessel in step 1(d);

(d) venting the steam pressure vessel after said addition of water is complete to gradually reduce the steam pressure within the vessel to a pressure not exceeding 50 psig;

(e) removing the slurry from said vessel; and

(f) forming said slurry into the desired shape and then drying it to obtain said shaped objects.

4,629,509

IMMOBILIZATION OF LEAD AND CADMIUM IN FLY ASH

Mark J. O'Hara, Mount Prospect, and Peter Urban, Northbrook, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 24, 1985, Ser. No. 748,367
Int. Cl.[4] C04B *7/34*
U.S. Cl. 106—118 **8 Claims**

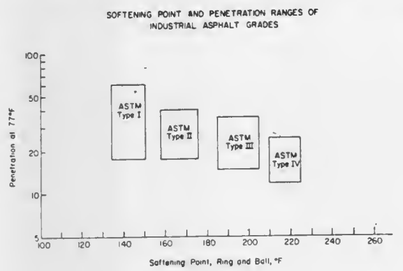
1. A method of immobilizing cadmium and lead in a dry solid residue obtained from the burning of solid wastes comprising mixing said residue with an amount sufficient to reduce the leaching of cadmium to a level less than about 1 ppm and of lead to a level less than about 5 ppm of approximately equimolar proportions of lime and an aqueous solution of a soluble inorganic salt supplying sulfide.

4,629,510

METHOD FOR PRODUCING INDUSTRIAL ASPHALTS WITHOUT AIR-BLOWING USING ZINC CHLORIDE

Judson E. Goodrich, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1984, Ser. No. 672,432
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—273 R **10 Claims**



1. A one-step method of producing an industrial asphalt from a bituminous material consisting essentially of mixing together without air-blowing either before, during, or after said mixing:

(a) a feed material consisting essentially of a bituminous material having a viscosity of at least 50 centistokes at 350 degrees Fahrenheit and wherein the feed material forms a single phase when mixed with 5 weight percent zinc chloride; and

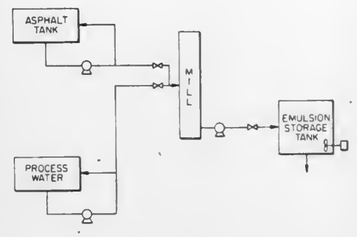
(b) from about 0.1 to 20.0 percent by weight of zinc chloride, said mixing being done at a temperature in the range of 351 to 600 degrees Fahrenheit, wherein the softening point of the feed is increased by 10 to 120 degrees Fahrenheit and the penetration is decreased by 5 to 80 dmm.

4,629,511

HIGH FLOAT AND RAPID SETTING ANIONIC BITUMINOUS EMULSIONS

Eugene J. Vanderzanden, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 7, 1985, Ser. No. 698,994
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—277 **5 Claims**



1. A high float and rapid setting bituminous emulsion comprising:

(a) from about 50 to about 75 parts by weight of asphalt;

(b) from about 0.01 to about 1.0 parts by weight of a carboxylic acid salt;

(c) from about 0.2 to about 15 parts by weight of carboxylic acid esters;

(d) sufficient base to provide said emulsion with a pH greater than about 9; and

(e) sufficient water to make the total of (a), (b), (c), (d) and (e), equal 100 parts by weight.

4,629,512

LEAFING ALUMINUM PIGMENTS OF IMPROVED QUALITY

Tom Kondis, 842 Stevendale Dr., Pittsburgh, Pa. 15221

Filed Mar. 7, 1985, Ser. No. 709,401
Int. Cl.[4] C09C *1/62*; C04B *14/00*
U.S. Cl. 106—290 **20 Claims**

1. A process for producing leafing pigments which comprises milling aluminum particles in the presence of a liquid hydrocarbon, milling lubricant, a coupling agent and water.

4,629,513

PREPARATION OF TRANSPARENT GOLDEN YELLOW, THERMALLY STABLE TWO-PHASE PIGMENTS OF THE GENERAL FORMULA $XZNO.ZNFE_2O_4$

Werner Ostertag, Gruenstadt; Roland Bauer, Bensberg-Refrath, and Gustav Bock, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,701
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411215
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—292 **3 Claims**

1. A process for the preparation of a transparent, golden yellow, thermally stable two-phase pigment of the formula $xZnO.ZnFe_2O_4$, where x is from 0.5 to 1.5, which comprises: suspending iron oxide yellow particles in an aqueous solution containing zinc ions; adjusting the pH of the solution to from 7–10 to precipitate zinc hydroxide, and thereafter heating the pigments at a temperature above 200° C. either before or after the pigments are isolated from the aqueous phase.

4,629,514

METHOD OF PRODUCING II-V COMPOUND SEMICONDUCTORS

Toshikazu Suda, Yokohama, Japan, assignor to Shinanokenshi Co., Ltd., Nagano, Japan

Filed Mar. 5, 1985, Ser. No. 708,406
Claims priority, application Japan, Mar. 8, 1984, 59-45307
Int. Cl.⁴ H01L *21/38*
U.S. Cl. 148—1.5 **6 Claims**

1. A method of producing II-V compound semiconductor crystals or thin films comprising adding atomic hydrogen or a halogen in atomic form to a II-V compound semiconductor, filling the atom vacancies therein with said atomic hydrogen or said halogen in atomic form and reducing the intrinsic defect level density of said II-V compound semiconductor.

4,629,515

SUPERCONDUCTIVE MATERIALS AND PROCESS FOR THE PRODUCTION THEREOF

Mitsuyuki Imaizumi, and Kiyoshi Yoshizaki, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00144, § 371 Date Dec. 30, 1982, § 102(e) Date Dec. 30, 1982, PCT Pub. No. WO82/03941, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 28, 1982, Ser. No. 456,085
Claims priority, application Japan, Apr. 30, 1981, 56-065763; Jun. 1, 1981, 56-84061
Int. Cl.⁴ H01L *39/24*
U.S. Cl. 148—11.5 F **10 Claims**

1. A process for producing a superconductor which comprises the steps of:
(1) fabricating a combination of any one of niobium and vanadium and an easily deformable metal into one piece and working it to produce a composite metallic material;
(2) heat treating the composite metallic material in the presence of a low melting point component comprising a substance to form a superconductive substance with said any one of niobium and vanadium to form a superconductive substance;
(3) chemically dissolving and removing non-superconductive substances contained in the composite metallic material to form a powdery superconductive substance;
(4) placing the powdery superconductive substance in a tube or jacket to form a composite and working the composite into a shape useful as a superconductor.

4,629,516

PROCESS FOR STRENGTHENING LEAD-ANTIMONY ALLOYS

Michael Myers, Westfield, N.J., assignor to ASARCO Incorporated, New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,630
Int. Cl.⁴ C22F *1/12*
U.S. Cl. 148—11.5 R **30 Claims**

1. A process for strengthening a lead-antimony alloy comprising, by weight, about 0.5%-6% antimony, about 0.002%-1% arsenic, the balance essentially lead, comprising:
(a) working the alloy by rolling to produce a structure containing soluble antimony in the form of antimony-rich eutectic phase bands;
(b) heating the alloy at an elevated-temperature for a sufficient time to provide an alloy having a recrystallized structure which strengthens on aging and which structure contains greater than 50% of the soluble antimony in the antimony-rich eutectic phase bands and less than 50% of the soluble antimony being dissolved in the lead; and
(c) quenching the alloy.

4,629,517

HIGH STRENGTH AND CORROSION RESISTANT ALUMINUM ARTICLE AND METHOD

Bernard W. Lifka, New Kensington; William G. Truckner, Avonmore, and Ralph W. Rogers, Jr., New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 453,480, Dec. 27, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,482
Int. Cl.⁴ C22F *1/04*
U.S. Cl. 148—12.7 A **16 Claims**



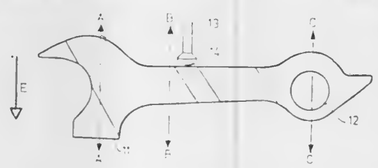
10. A process for forming a shaped aluminum article characterized by a yield strength of over 414 MPa (60 ksi) and good resistance to corrosion which comprises:
(a) providing an aluminum base alloy consisting essentially of 6.5 to 7.5 wt. % zinc, 2.4 to 3.0 wt. % magnesium, 0.0 to 0.8 wt. % copper. 0.01 to 0.18 wt. % zirconium, and a maximum of other alloying ingredients and/or impurities not exceeding 0.15 wt. % with each of said other alloying ingredients and/or impurities not exceeding 0.5 wt. % with the balance consisting essentially of aluminum;
(b) forming a shaped article from said alloy;
(c) solution heat treating said shaped article;
(d) quenching said heat treated article in air; and
(e) aging said heat treated and air quenched article to a T76 temper.

4,629,518

CARBURIZATION AND HEAT TREATMENT PROCESS FOR A MACHINE PART

Dan B. Larsen, Jarfalla, Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,867
Claims priority, application Sweden, Feb. 14, 1984, 84007814
Int. Cl.⁴ C21D *1/74*
U.S. Cl. 148—16.5 **6 Claims**



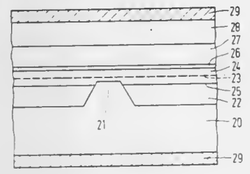
1. A carburization and heat treatment process of a machine part for example a print hammer, characterized by the steps of;
a first carburization of the surface of a partly preformed blank of the machine part to a selected first depth of carbon penetration needed for one or more first surfaces of said machine part,
at least a first machining after the first carburization step of the partly preformed blank to desired sizes required to form said machine part thereby substantially completely removing the carburization of selected portions of the carburized surface of said partly preformed blank to form second surfaces of said machine part,
a second carburization after said at least first machining step of said machined part to a desired second depth of carbon penetration needed for said second surfaces of said machine part,
said first depth of carbon penetration being greater than said second depth of carbon penetration, and
a final heat treatment of said carburized and machined part.

4,629,519

FORMING MAGNESIUM-DOPED GROUP III-V SEMICONDUCTOR LAYERS BY LIQUID PHASE EPITAXY

Theodorus G. J. van Oirschot, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,372
Claims priority, application Netherlands, Oct. 4, 1984, 8403017
Int. Cl.⁴ H01L *21/208*
U.S. Cl. 148—171 **3 Claims**



1. A method of manufacturing a semiconductor device, in which a magnesium doped epitaxial layer of a compound of elements from the group II and group V of the periodic table of elements is deposited on a surface of a semiconductor body by bringing said surface into contact with a saturated solution of said compound and magnesium, characterized in that the magnesium is added to the solution in the form of a compound selected from the group consisting of magnesium silicide, magnesium germanide and magnesium stannide.

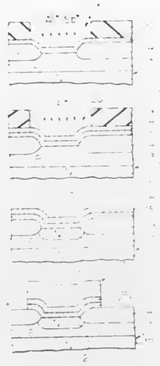
4,629,520

METHOD OF FORMING SHALLOW N-TYPE REGION WITH ARSENIC OR ANTIMONY AND PHOSPHORUS

Katsunobu Ueno, and Osamu Hataishi, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 14, 1984, Ser. No. 640,577
Claims priority, application Japan, Aug. 30, 1983, 58-159949
Int. Cl.⁴ H01L *21/385, 21/425*
U.S. Cl. 148—188 **8 Claims**

1. A method of forming a shallow n-type region in a silicon semiconductor substrate of a semiconductor device comprising the steps of:
(a) forming a first film containing one of arsenic and antimony on said silicon semiconductor substrate;
(b) forming a second film containing phosphorus on said first film; and
(c) diffusing the phosphorus and the one of arsenic and antimony into said silicon semiconductor substrate out of



said first and second films by heat-treatment at a temperature between 950° C. and 1050° C.

4,629,521

NICKEL BASE ALLOY

Gernant E. Maurer, New Hartford; William J. Boesch, Utica, both of N.Y., and Jean M. Theret, Versailles, France, assignors to Special Metals Corporation, New Hartford, N.Y. and Societe National d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Dec. 10, 1984, Ser. No. 679,725
Int. Cl.⁴ C22C *19/05*
U.S. Cl. 148—410 **17 Claims**

1. A gamma prime strengthened nickel-base alloy consisting essentially of, by weight, from 14 to 18% chromium, from 0.3 to 3.0% molybdenum, from 4 to 8% tungsten, from 0.3 to 0.7% vanadium, up to 0.05% tantalum, up to 0.05% columbium, from 3.5 to 5.5% aluminum, from 1 to 4% titanium, from 3 to 7% cobalt, up to 2% iron, from 0.01 to 0.05% carbon, from 0.035 to 0.1% boron, up to 0.1% zirconium, up to 0.01% nitrogen, up to 0.5% copper, up to 0.12% manganese, up to 3% of elements from the group consisting of rhenium and ruthenium, up to 0.2% of rare earth elements that will now lower the incipient melting temperature below the solvus temperature of the gamma prime present in the alloy, up to 0.15% of elements from the group consisting of magnesium, calcium, strontium and barium, up to 0.1% hafnium, balance essentially nickel; said boron content being greater than said carbon content; said alloy being substantially free of sigma and other undesirable topologically close-packed phases; said alloy having an Md value at or below 0.967 calculated in accordance with the following equation:

$$\overline{Md}=0.717(M_{Ni})+0.777(M_{Co})+2.271(M_{Ti})+1.900-(M_{Al})+1.655(M_{W})+1.550(-M_{Mo})+1.142(M_{Cr})+1.543(M_{V})+2.944(M_{Zr}).$$

4,629,522

SEALING COMMUNICATION CABLE

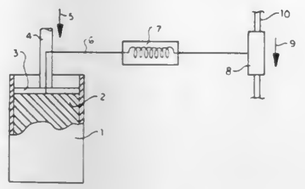
Wolfram Klebl, Isernhagen; Karl-Heinz Marx, Garbsen; Arnold Vogts, Isernhagen; Friedrich Schatz, and Guenter Titze, both of Langenhagen, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,411
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422020
Int. Cl.⁴ H01B *13/32*
U.S. Cl. 156—48 **5 Claims**

5. In a method of forcing a normally highly viscous sealing material into the cavities of a communications cable, wherein the sealing material being located in a container is pressurized

and heated to lower its viscosity, and pumped out of the container for delivery to a chamber for application to the cable, the method comprising:

progressively heating the sealing material by means of elec-



trical heating elements projecting from a pressure plate so as to penetrate into the highly viscous sealing material so that heating is effective in the interior thereof, and pumping the liquified sealing material out of the container to the chamber through a tube.

4,629,523

PROCESS AND APPARATUS FOR PRODUCING MINERAL FIBER BOARDS

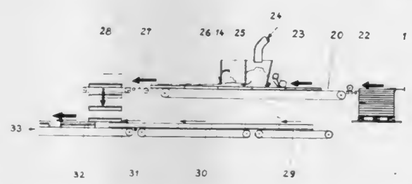
Anton Wetterwald, Solothurn, Switzerland; Jacques Abrassart; Max Moreau, both of Dour, Belgium, and Stanislas Dallemagne, Mons, Belgium, assignors to Fibraconsult Management und Beratungs AG, Solothurn, Switzerland

Filed Feb. 9, 1983, Ser. No. 465,352

Claims priority, application European Pat. Off., Feb. 10, 1982, 82100965.1

Int. Cl.⁴ B27N *3/00*

U.S. Cl. 156—62.8 **13 Claims**



1. A process for producing a composite mineral fiber board having fibers oriented in generally perpendicular directions for preferred strength characteristics, comprising:

forming a first mineral fiber board layer having fibers in a first predominant directional orientation and an upper surface;

conveying the first layer to and through an application station in a direction perpendicular to the directional orientation of the fibers in the first layer; applying to the upper surface of the first layer, a second layer of a slurry or paste-like moist mass containing fibers as the first layer passes through the application station such that fibers in the second layer have a second predominant directional orientation which is substantially perpendicular to the first directional orientation of the fibers in the first layer;

placing each composite board in a convex mold before drying; and

drying the resulting product in the convex mold to evaporate moisture and to form a flat composite board having improved characteristics.

4,629,524

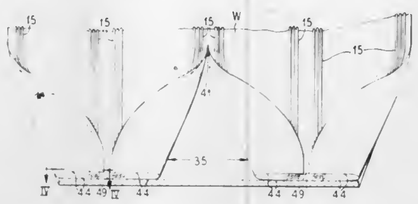
MAKING RECLOSABLE BAG MATERIAL

Steven Ausnit, New York, N.Y., assignor to Minigrip Incorporated, Orangeburg, N.Y.

Filed Apr. 17, 1985, Ser. No. 724,170

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—66 **20 Claims**



1. A method of making reclosable bag material, comprising:

continuously running a continuous length of preformed flat bag wall web of multibag width spread out to its full width along flat stationary supporting surface means;

joining into corunning assembled relation with the web on the surface means a plurality of continuous length spaced parallel preformed extruded resiliently flexible fastener profile strips, and in the assembly engaging base surfaces on said strips in face-to-face relation with the web;

both of said web and said fastener profile strips being in a fully set condition so that in said joining they will not of themselves bond together;

guiding the strips to retain their longitudinal running positions on the web; and

applying bonding fusion energy by way of opening means in said surface means and through said web toward the base surface of each of said strips and thereby simultaneously bonding all of said strips to said web in the continuous running of the assembled web and strips.

4,629,525

METHOD AND APPARATUS FOR PREPARING A HIGH STRENGTH SHEET MATERIAL

Ole-Bendt Rasmussen, Forchwaldstrasse 23, Walchwil/Zug, Switzerland CH 6318

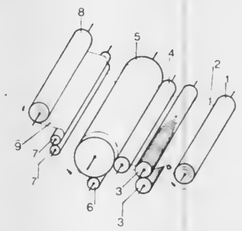
PCT No. PCT/DK83/00038, § 371 Date Nov. 18, 1983, § 102(e) Date Nov. 18, 1983, PCT Pub. No. WO83/03381, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 25, 1983, Ser. No. 557,125

Claims priority, application Denmark, Mar. 26, 1982, 1398/82

Int. Cl.⁴ B32B *31/14*

U.S. Cl. 156—84 **32 Claims**



1. In a method of preparing a high strength sheet material comprising forming a laminate comprising at least two layers of a thermoplastic polymer material, each layer having a fibrillar grain structure providing a predominant direction of splittability in each said layer, the layers being bonded to one another with the said predominant directions of splittability generally transverse to each other, and biaxially orienting the molecules of said layers by stretching the layers in separate substantially

uniaxial steps, the transverse stretching being effected by applying pressure to the surface of the laminate along plural lines extending substantially in the longitudinal direction of the laminate to deflect the same into a transversely sinuous configuration, the improvement comprising subjecting the biaxially oriented laminate to a heat treatment while allowing at least 7% shrinkage of the laminate to take place in at least its transverse direction, said laminate being introduced to said heat treatment while in said sinuous configuration with the crest on one side of said configuration being heated more rapidly than the remainder of said laminate.

4,629,526

METHOD OF AND MEANS FOR REPLACING CORRUGATING ROLLS IN A SINGLE FACER

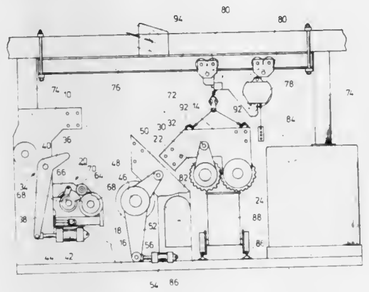
Kousaku Kanda, Aichi, Japan, assignor to Isowa Industry Company, Ltd., Nagoya, Japan

Filed Aug. 13, 1984, Ser. No. 640,127

Claims priority, application Japan, Aug. 23, 1983, 58-154363

Int. Cl.⁴ B31F *1/28;* F16M *7/00*

U.S. Cl. 156—210 **20 Claims**



1. A method for replacing corrugating rolls within a corrugating machine, comprising the steps of:

providing said corrugating machine with a main frame;

rotatably mounting a first set of corrugating rolls within a first cassette frame;

detachably mounting said first cassette frame, and said first set of corrugating rolls mounted therewithin, upon said main frame;

moving a second cassette frame, with a second set of corrugating rolls rotatably mounted therewithin, within the vicinity of said main frame;

detaching said first cassette frame, with said first set of corrugating rolls mounted therewithin, from said main frame; and

detachably mounting said second cassette frame, with said second set of corrugating rolls mounted therewithin, upon said main frame.

4,629,527

METHOD AND UNIT FOR MOUNTING AN ARRAY OF MIRRORS OF THE SSM ("SECOND SURFACE MIRROR") TYPE ON A PANEL OF A SPACECRAFT

Francesco Livi, Rivoli, and Dario Boggiatto, Torino, both of Italy, assignors to Aeritalia-Societa Aerospaziale Italiana-per Azioni, Italy

Filed Nov. 21, 1985, Ser. No. 800,236

Claims priority, application Italy, Nov. 23, 1984, 68171 A/84

Int. Cl.⁴ B32R *31/00;* B23P *'19/00;* B25B *11/00*

U.S. Cl. 156—285 **9 Claims**

1. Method for mounting an array of mirrors of the SSM ("Second Surface Mirror") type on a panel (6) of a spacecraft, including the following operations:

providing a fixed support structure (1) for the panel (6);

mounting the panel (6) on the support structure (1);

providing a mirror transferring tool (13) having a mirror support plane (16) provided with a series of ribs (17) which define a plurality of support areas (18) for the mirrors, each support area (18) having at least one hole (19) communicating with an internal cavity in the tool;

connecting the internal cavity to a low-pressure source;

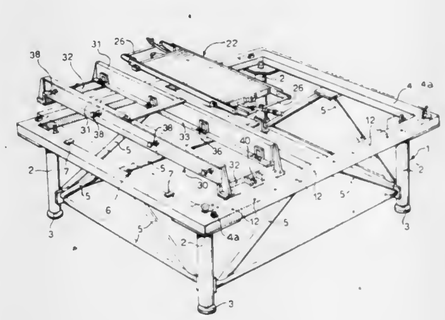
placing the mirrors on the respective support areas (18) of the transferring tool (13) with their surfaces intended to adhere to the panel (6) in contact with the transferring tool (13);

providing a loading tool (22) having a mirror support plane (25) with a plurality of holes (25*a*) communicating with an internal cavity in the loading tool;

mounting the loading tool (22) above the transferring tool (13) with the respective support planes (25, 16) facing each other;

breaking the connection between the cavity in the transferring tool (13) and the low-pressure source and connecting the cavity in the loading tool (22) with a low-pressure source so as to transfer the mirrors from the transferring tool (13) to the loading tool (22);

applying a layer of electrically conductive adhesive to the surface of the panel (6) intended to receive the mirrors;



mounting an auxiliary frame (30) on the support structure (1) for supporting the loading tool (22) above the adhesive-covered surface of the panel (6);

placing the loading tool (22) on the auxiliary frame (30) with the series of mirrors carried by the loading tool (22) facing the adhesive-covered surface of the panel;

providing resilient means between the auxiliary frame (30) and the loading tool (22) for biassing the loading tool (22) to a raised position in which the mirrors carried by the loading tool are slightly spaced from the adhesive-covered surface of the panel (6);

lowering the loading tool (22) against the action of the resilient means into a position in which the mirrors are in contact with the layer of adhesive on the surface of the panel (6), and holding the loading tool (22) in the lowered position;

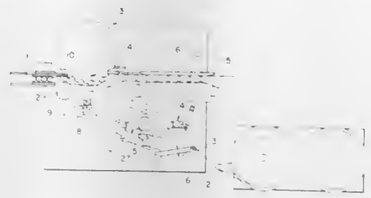
breaking the connection between the cavity of the loading tool and the low-pressure source and connecting the cavity to a source of a pressurised fluid so as to detach the mirrors from the loading tool (22) and effect their adhesion to the panel (6).

4,629,528

LABELING MACHINE

Hideo Tanaka, Kanazawa; Toshiaki Naka, Tatsunokuchimachi; Shiaru Muranaka, and Yoshikazu Miyashita, both of Kanazawa, all of Japan, assignors to Shibuya Kogyo Co., Ltd., Ishikawa, Japan

Filed Feb. 21, 1984, Ser. No. 582,116
Claims priority, application Japan, Feb. 24, 1983, 58-29887
Int. Cl.[4] B65C *9/18, 9/44*
U.S. Cl. 156—351 **14 Claims**



1. A labeling machine for labeling containers one by one comprising:

container transporting means for transporting containers to be labeled along a predetermined container transportation path;

supplying means for supplying a label sheet of continuous length from a storage intermittently over a predetermined length;

rotary cutting means for cutting said label sheet of continuous length thereby producing a cut sheet of label of desired length;

application means for affixing said cut sheet of label to one of said containers;

first driving source for driving at least said container transporting means;

second driving source, independent of said first driving source, for driving said supplying means;

a first detector for producing output signals upon detecting a registration mark provided on said label sheet of continuous length; and

a controller responsive to said output signals supplied from said first detector comprising an adjustable circuit means integral therewith for counting a given predetermined distance from said registration mark to a severing position where said label may be cut, said controller being adapted for stopping the operation of said supplying means upon counting of a predetermined count thereby providing said cut sheet of label of desired length when cut by said cutting means.

4,629,529

METHOD AND MACHINE FOR CONVOLUTE OR SPIRAL WINDING OF COMPOSITE MATERIALS

Leo Kadunce, Morrisville, Pa., assignor to Steeltin Can Corporation, Baltimore, Md.

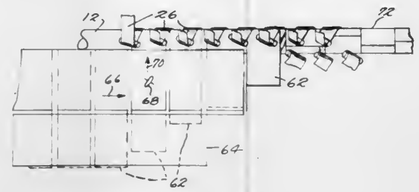
Filed Oct. 22, 1984, Ser. No. 663,211
Int. Cl.[4] B05D *3/08*
U.S. Cl. 156—428 **20 Claims**

1. An apparatus for forming a cylindrical body from a substantially flat, flexible sheet material comprising:

mandrel means having a longitudinal axis and a peripheral surface,

means for feeding the sheet material to said mandrel means with the sheet material having a leading edge and a trailing edge and with the leading edge oriented in a seleoted manner relative to said longitudinal axis of said mandrel means,

endless belt means with said belt means having means for guiding said belt means along a selected path extending from a belt drive means to a selected portion of said mandrel means and for guiding said belt means along a substantially spiral path along a selected portion of the longitudinal axis of said mandrel means where said belt means is in contact with the surface of said mandrel means through a partial spiral wrap of less than 360 degrees about said mandrel means, said substantially spiral path of said belt means including a gap for receiving sheet material from the feeding means so that a sheet material fed to



said mandrel means at a selected angle with respect to said longitudinal axis will be engaged by said belt means and formed into a cylindrical body on said mandrel means;

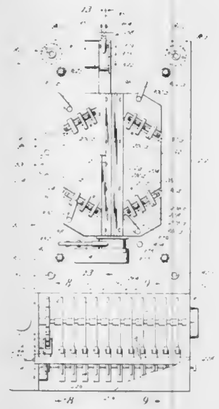
said sheet material being a rectangular blank having a straight leading edge, said means for feeding including transport means for feeding the blank to said gap substantially transverse to the longitudinal axis of said mandrel.

4,629,530

APPARATUS FOR WELDING OF CONTINUOUS LOOP RIBBON

Paul E. Becking, 13795 Vista Dorada, Salinas, Calif. 93908

Continuation of Ser. No. 475,235, Mar. 14, 1983, abandoned.
This application Aug. 30, 1984, Ser. No. 646,038
Int. Cl.[4] B65H *69/02*
U.S. Cl. 156—502 **9 Claims**



1. A welding apparatus for adjoining two ribbon ends by means of a narrow angular weld bead, comprising:

a plate;

first and second ribbon guide means for positioning a first ribbon end on said plate, said first and second ribbon guide means defining a first ribbon alignment path;

third and fourth ribbon guide means for positioning a second ribbon end on said plate in criss-cross configuration with respect to said first alignment path, said third and fourth ribbon guide means defining a second ribbon alignment path;

means on said plate for clamping the two ribbon ends within said guide means, said clamping means including

a clamp disposed adjacent to each said guide means, and

a plurality of means for causing said clamp to engage the ribbon end, one said causing means for each said clamp, said causing means being disposed along said first and second alignment paths;

first anvil means on said plate beneath the crossed ribbon ends, said first anvil means including a substantially horizontal surface extending substantially the length of said first anvil means for use in welding the ribbon ends and a substantially vertical surface defining a scissor-blade edge in combination with said horizontal surface;

means for welding the crossed ribbon ends; and

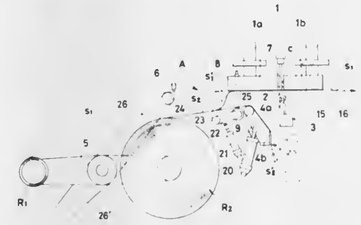
means forming a part of said apparatus and being apart from said welding means for cutting the crossed ribbon ends after the ribbon ends have been adjoined by said welding means, said cutting means including a cutting blade cooperatively engaging the scissor-blade edge on said first anvil means to sever the adjoined ribbon ends along the weld bead without repositioning the adjoined ribbon ends.

4,629,531

APPARATUS FOR JOINING SHEET ENDS

Hiroshi Kataoka, 3686 Samukawacho, Iyo-Mishima-shi, Ehime-ken, Japan

Filed Dec. 27, 1984, Ser. No. 686,887
Claims priority, application Japan, Dec. 28, 1983, 58-199382
Int. Cl.[4] B65H *19/18, 19/20*
U.S. Cl. 156—504 **9 Claims**



1. An apparatus for cutting the trailing end of a preceding sheet which is unwound and separated from a supply roll and runs on a sheet path and joining to the cut end of the preceding sheet the leading end of the following sheet which is unwound from another supply roll, said apparatus comprising:

(a) an upstream suction box and a downstream suction box disposed above and adjacent to the sheet path, said suction boxes being separated by an interval and being provided with vacuumizing means for sucking the preceding sheet to the lower sides of said suction boxes;

(b) a sheet cutter disposed below the interval between said suction boxes for cutting the preceding sheet which has been sucked to the lower sides of said suction boxes;

(c) said downstream suction box holding in position the trailing end of the preceding sheet cut by said sheet cutter and said upstream suction box holding in position a waste portion of the cut preceding sheet; and

(d) a movable receiving table disposed below the sheet path, said movable receiving table:

(i) having a support face for holding in position the leading end of the following sheet;

(ii) being movable between a lower position at which a space is left for allowing the waste portion of the cut preceding sheet to fall and the following sheet is set in advance on said support face and an upper position at which the leading end of the following sheet set on said support face is joined to the trailing end of the cut preceding sheet on the sheet path;

(iii) being on standby at its lower position before the waste portion of the cut preceding sheet falls from the sheet path; and,

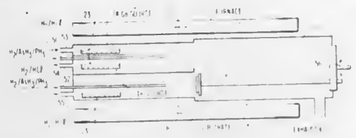
(iv) when the waste portion of the cut preceding sheet has fallen, moving to said upper position for joining the two sheet ends.

4,629,532

METHOD OF GROWING INGAASP ON INP SUBSTRATE WITH CORRUGATION

Tomoo Yanase, and Ikuo Mito, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,329
Claims priority, application Japan, Jul. 28, 1983, 58-137988
Int. Cl.[4] C30B *25/02*
U.S. Cl. 156—612 **9 Claims**



1. A method of growing an InGaAsP layer on an InP substrate having a periodic corrugation on a surface thereof, comprising the steps of heating the InP substrate up to a growth temperature in the range of 650° C. to 700° C. while holding said InP substrate in an atmosphere which contains at least phosphine and arsine in a sufficient amount, and for a sufficient duration of time such as to form an arsenic absorbed InP substrate, and subsequently causing crystal growth of InGaAsP on said arsenic absorbed InP substrate.

4,629,533

ISOLATION OF 3-METHYL-1-BUTENE FROM A HYDROCARBON STREAM

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 31, 1985, Ser. No. 697,091
Int. Cl.[4] B01D *3/40*
U.S. Cl. 203—51 **8 Claims**

1. A process for recovering 3-methyl-1-butene from a hydrocarbon stream containing 3-methyl-1-butene and compounds which form azeotropes with 3-methyl-1-butene comprising: extractive distillation of said hydrocarbon stream with a solvent mixture comprising dimethylformamide and sulfolane said solvent mixture present in an amount ranging from about 0.1 to about 20 times the weight of said hydrocarbon stream, where said dimethylformamide in the dimethylformamide/Sulfolane solvent mixture is present in an amount ranging from about 30 weight percent to about 70 weight percent based on the weight of said mixture, thereby separating insolubles containing said 3-methyl-1-butene as the overhead product stream from the bottoms product containing soluble compounds, the compounds that form azeotropes with 3-methyl-1-butene and the solvent mixture and thereafter recovering said 3-methyl-1-butene from said insolubles.

4,629,534

FRACTIONAL DISTILLATION APPARATUS AND METHOD

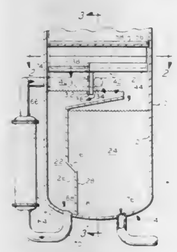
Emory L. Ezell, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1985, Ser. No. 722,649
Int. Cl.[4] B01D *3/32*
U.S. Cl. 203—98 **24 Claims**

1. In an apparatus for the fractional distillation of liquids of the type which includes a vertical hollow shell having a bottom end and an interior surface; at least a bottom tray within said shell; at least one downcomer associated with said bottom tray for guiding fluid downwardly therefrom; a surge baffle plate, having an upper edge, mounted within said shell and extending upwardly from said shell bottom end to said upper edge so as to divide a bottom portion of the shell interior into

a first region and a second region; a reboiler capable of heating fluids introduced thereto and discharging heated fluids; first outlet means in communication with said first region through which liquids in said first region can be withdrawn and introduced to said reboiler; and a second outlet means in communication with said second region through which liquids in said second region can be withdrawn as bottoms product; the improvement comprising:

a substantially vertical separation baffle plate mounted within said shell, said separation baffle plate having an upper edge and a lower edge, and also having first and second opposing surfaces each of which extend from said separation baffle lower edge to said separation baffle upper edge, wherein said separation baffle lower edge is positioned substantially entirely in said first region and vertically below said surge baffle plate upper edge so as to extend into said first region, and wherein said separation baffle plate upper edge is positioned vertically above said surge baffle plate upper edge;



at least one seal pan for receiving liquid flowing from said downcomer, said seal pan comprising a bottom wall directly overlying at least a portion of said separation baffle plate upper edge and being closely adjacent thereto, said seal pan also comprising at least one side wall generally perpendicular to said separation baffle plate and having an upper edge at least a portion of which defines an overflow weir, said side wall extending generally vertically from said bottom wall to said side wall upper edge, and wherein said side wall is structured to direct substantially all liquid overflowing said side wall weir to a third region defined between said first surface and the shell interior surface, said overflowing liquid then flowing into said first region;.

a shell inlet means for receiving therethrough heated fluids discharged from said reboiler, said inlet means being vertically spaced above said surge baffle plate upper edge and below said seal pan, said inlet means being positioned closely adjacent to and in fluid communication with a fourth region defined between said separation baffle plate second surface and said shell interior surface.

4,629,535

METHOD FOR DETECTING AN AIR-FUEL RATIO

Yoshishige Oyama, and Minoru Osuga, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,750

Claims priority, application Japan, Feb. 17, 1984, 59-27138

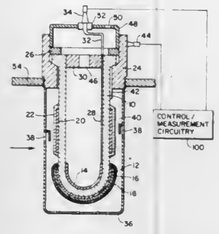
Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—1 T **6 Claims**

1. A method of detecting an air-fuel ratio in an air-fuel ratio detector comprising an oxygen ion conductive solid electrolyte, first and second electrodes provided on respective sides of the solid electrolyte, and a diffusion resistor provided on the first electrode and exposed to a gas to be measured, the method comprising the steps of:

first supplying a current from the first electrode to the second electrode for a first predetermined time so as to feed a predetermined amount of oxygen from the second electrode to the first electrode through the solid electrolyte regardless of the rich to lean air fuel ratios of the gas to be measured;

second supplying a current from the second electrode to the first electrode for a second predetermined time so as to withdraw oxygen from the first electrode to the second electrode through the solid electrolyte regardless of air-fuel ratios from rich to lean of the gas to be measured;



detecting a signal during said second current supplying step representing an amount of oxygen withdrawn from the first electrode to the second electrode through the solid electrolyte until a partial pressure of the oxygen at the interface between the first electrode and the diffusion resistor reaches substantially zero and

determining the air fuel ratio of the gas to be measured based on a predetermined relationship between the signal obtained in said detecting step and the air-fuel ratios.

4,629,536

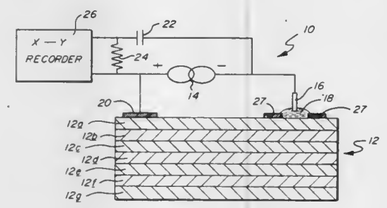
MULTILAYER DEPTH PROFILE METHOD

Alan M. Kadin, Troy, and Robert W. Burkhardt, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 12, 1985, Ser. No. 710,924

Int. Cl.⁴ G01N *27/20*

U.S. Cl. 204—1 T **31 Claims**



1. A method of determining whether degradation of an anodizable multilayer structure has occurred comprising:

(a) applying an electrolytic anodizing voltage at constant current through a plurality of layers of said structure over a predetermined surface area of said structure to anodize said layers;

(b) monitoring the change of the anodization voltage or a time derivative thereof as a function of time under a first set of conditions as the anodization progresses through said layers;

(c) comparing the modulation of the anodization voltage or a time derivative thereof from Step (b) to the anodization voltage or time derivative thereof during anodization at constant current under similar conditions through a reference multilayer structure, similar to said anodizable multilayer structure and known to have no degradation, to determine whether degradation has occurred.

4,629,537

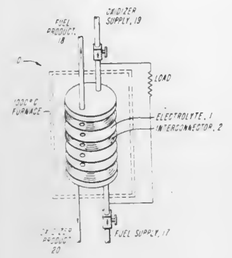
COMPACT, LIGHT-WEIGHT, SOLID-OXIDE ELECTROCHEMICAL CONVERTER

Michael S. Hsu, Roundhill Rd., Lincoln, Mass. 01773

Filed May 17, 1985, Ser. No. 735,441

Int. Cl.⁴ C25D *5/02;* **C25B** *9/00;* **B05D** *5/12;* **H01M** *8/10*

U.S. Cl. 204—15 **27 Claims**



21. A method of forming an interconnector plate for use in an electrochemical convertor, the interconnector plate serving to provide electrical connection between an oxidizer electrode of a first electrolyte disposed on one side of the interconnector plate and a fuel electrode of a second electrolyte disposed on the other side of the interconnector plate, the plate also serving to isolate and distribute separate reactant gases over the oxidizer and fuel electrodes of the first and second electrolytes, the method comprising

(a) forming a flat plate from a metal chosen from the group of platinum and nickel alloys the thickness of the plate ranging from about 25 to about 250 microns in the case of platinum alloys and from about 100 to about 1000 microns in the case of nickel alloys;

(b) defining a corrugated pattern of ridges and grooves on one side of the plate to permit the isolation and distribution of a first reactant gas on the one side;

(c) defining a complementary corrugated pattern of ridges and grooves on the other side of the plate to permit the isolation and distribution of a second reactant gas on the other side; and

(d) providing holes for introduction of the first reactant gas onto the one side and for the introduction of the second reactant gas onto the other side.

23. The method of claim 21 wherein the corrugated patterns are defined by electrodeposition.

4,629,538

METHOD FOR ELECTROPLATING DEEP POCKETED ARTICLES

Carl A. Meisterlin, Long Beach, Calif., assignor to La Shea Corporation, Carlsbad, Calif.

Filed Nov. 7, 1985, Ser. No. 795,895

Int. Cl.⁴ C25D *7/04*

U.S. Cl. 204—26 **10 Claims**

1. A method for plating an article having a number of storage pockets formed therein, said method including the step of forming a partially open grid pattern in the bottom of each of said pockets for permitting the fluid communication of a plating material between the interior and exterior of said pockets by way of said grid pattern.

4,629,539

METAL LAYER PATTERNING METHOD

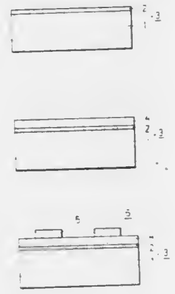
Yuji Imai, Chiba, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,403

Claims priority, application Japan, Jul. 8, 1982, 57-118887; Nov. 30, 1982, 57-210466; Nov. 30, 1982, 57-210467; Nov. 30, 1982, 57-210468; Nov. 30, 1982, 57-210469; Nov. 30, 1982, 57-210470; Nov. 30, 1982, 57-210471; Nov. 30, 1982, 57-210472; Nov. 30, 1982, 57-210473; Dec. 20, 1982, 57-223551; Dec. 20, 1982, 57-223552; Dec. 20, 1982, 57-223553

Int. Cl.⁴ C25F *3/14*

U.S. Cl. 204—129.65 **18 Claims**



1. A metal layer patterning method comprising the steps of:

forming a metal layer to be patterned on an insulating substrate;

forming a mask layer of a desired pattern on the metal layer; and

subjecting the metal layer to electrolytic etching by an electrolyte through the mask layer to form a patterned metal layer;

wherein the metal layer to be patterned is formed of an aluminum-silicon alloy;

wherein the electrolyte is a basic aqueous solution including a solute consisting principally of phosphoric acid;

wherein a DC constant-current source is connected between the metal layer and an electrode corresponding thereto;

wherein the temperature of the electrolyte is set to a constant value Te(°C.) and the density of current flowing across the metal layer to the electrolyte is set to a constant value larger than a value Je(mA/cm²) given by

$$Te = a \times Je + b$$

a=2.09 (1±0.1)

b=17.5 (1±0.1) ; and

wherein the electrolytic etching is carried out until voltage between the metal layer and the electrode increases suddenly.

4,629,540

PROCESS FOR THE PREPARATION OF POLYANILINES, POLYANILINES OBTAINED ACCORDING TO THIS PROCESS AND THEIR USES IN THE PRODUCTION OF ELECTROCHEMICAL GENERATORS

Eugène Genieès, St. Egreve; Gérard Pierre, Eybens; Christian Santier, Grenoble, and Constantin Tsintavis, St. Martin d'Héres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

PCT No. PCT/FR84/00124, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04528, PCT Pub. Date Nov. 22, 1984

PCT Filed May 4, 1984, Ser. No. 698,183

Claims priority, application France, May 6, 1983, 83 07958

Int. Cl.⁴ C25C *1/00;* **H01M** *4/60*

U.S. Cl. 204—59 R **7 Claims**

1. A process for the synthesis of a polyaniline, comprising:

(a) mixing aniline, p-aminodiphenylamine or derivative thereof and a super acid in the liquid phase containing fluoride ions; and

(b) electrochemically oxidizing the reaction mixture, thereby preparing said polyaniline.

4,629,541

PROCESS FOR THE ELECTROSYNTHESIS OF KETONES

Marie-Odile Moingeon, Villabe, and Jacques Chaussard, Paris, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Mar. 28, 1986, Ser. No. 845,328

Claims priority, application France, Mar. 29, 1985, 85 04742

Int. Cl.⁴ C25B *1/26, 1/02*

U.S. Cl. 204—59 R **15 Claims**

1. Process for the electrosynthesis of ketones comprising electrochemically reducing organic halides in the presence of organic acid derivatives in an electrolysis cell fitted with electrodes in an organic solvent medium containing a supporting electrolyte, wherein a sacrificial anode comprising a metal chosen from the group consisting of magnesium, aluminium, zinc and their alloys is used, and wherein said organic acid derivatives are organic acid anhydrides.

4,629,542

PROCESS FOR PREPARING 3-EXOMETHYLENECEPHAM DERIVATIVES

Sigeru Torii; Hideo Tanaka, both of Okayama; Michio Sasaoka, Tokushima, and Yutaka Kameyama, Okayama, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

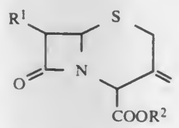
Filed Mar. 4, 1985, Ser. No. 707,767

Claims priority, application Japan, Mar. 6, 1984, 59-43535

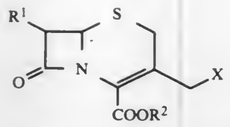
Int. Cl.⁴ C25B *3/00*

U.S. Cl. 204—72 **14 Claims**

1. A process for preparing 3-exomethylenecepham derivatives represented by the formula



wherein R_1 is arylacetylamino, aryloxyacetylamino, heterocyclic acetylamino or imido, and R_2 is a protective group for the carboxyl which protective group combined with the carboxyl group forms an ester, the process comprising selecting a 3-halomethylcephem compound represented by the formula



wherein R^1 and R^2 are as defined above, and X is a halogen atom, and electrolyzing the selected compound in a mixture of a hydrophilic organic solvent and water.

4,629,543

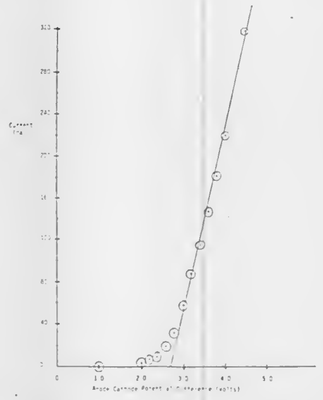
METHOD OF PREPARING MERCURY WITH AN ARBITRARY ISOTOPIC DISTRIBUTION

Mark W. Grossman, Belmont, and William A. George, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 31, 1985, Ser. No. 815,147

Int. Cl.⁴ C25C *1/00*

U.S. Cl. 204—105 R **17 Claims**



1. In a method for preparing quantities of mercury with a predetermined, arbitrary isotopic distribution, which comprises:

(a) forming an electrolyte solution, said electrolyte solution being comprised of glacial acetic acid and H_2O;

(b) dissolving a plurality of isotopes of HgO in said electrolyte solution; said plurality of isotopes being sufficient to supply the quantity and type of mercuric ions necessary to produce upon electrolyte reduction and plating said elemental mercury with a predetermined isotopic distribution;

(c) placing an anode and a cathode into the electrolyte solution;

(d) applying an electric voltage across the anode and cathode, said electric voltage creating an electric current from the anode through the electrolyte solution to the cathode, whereby mercuric ions are reduced and elemental Hg is plated onto said cathode.

(e) continuing to apply the electric voltage to said anode and cathode until the reduction of mercuric ions is completed; and

(f) recovering said elemental mercury having the predetermined arbitrary isotopic distribution.

4,629,544

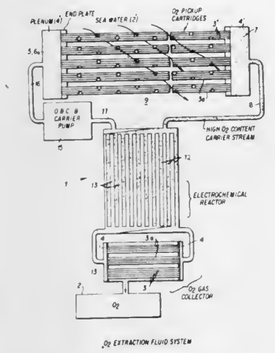
APPARATUS AND METHOD FOR REVERSIBLY REMOVING LIGANDS FROM CARRIERS

Joseph Bonaventura; Celia Bonaventura, both of Beaufort, and C. William Anderson, Durham, all of N.C., assignors to Aquanautics Corporation, San Francisco, Calif.

Filed Sep. 24, 1984, Ser. No. 653,729

Int. Cl.⁴ C25B *1/02*

U.S. Cl. 204—131 **19 Claims**



1. A method for reversibly removing a ligand from a ligand carrier, which comprises:

(a) contacting a fluid containing a binding-state ligand carrier to which said ligand is bound with a first electrochemical electrode wherein said binding-state ligand carrier undergoes a redox reaction to form a nonbinding-state ligand carrier and free ligand;

(b) removing free ligand from the fluid obtained in step (a);

(c) contacting the fluid obtained from step (b) containing said nonbinding-state ligand carrier with a second electrochemical electrode wherein said nonbinding-state ligand carrier undergoes a redox reaction to reform said binding-state ligand carrier;

(d) contacting the fluid obtained from step (c) containing said binding-state ligand carrier with a ligand source, whereby said ligand binds to said binding-state ligand carrier; and

(e) repeating steps (a)-(d),

wherein said first electrode and said second electrode comprise parallel plates of polytetrafluoroethylene or carbon covered with a thin layer of gold or platinum.

4,629,545

ELECTRODIALYTIC WATER SPLITTER AND PROCESS FOR REMOVAL OF SO_2 FROM GASES CONTAINING SAME AND FOR RECOVERY OF SO_2 AND NAOH

Krishnamurthy N. Mani, Denville, and Frederick P. Chlanda, Rockaway, both of N.J., assignors to Allied Corporation, Morris Township, N.J.

Continuation of Ser. No. 639,611, Aug. 10, 1984, abandoned, which is a continuation of Ser. No. 490,944, May 2, 1983, abandoned. This application Sep. 10, 1985, Ser. No. 775,937

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—182.4 **19 Claims**

1. A process which comprises the steps of:

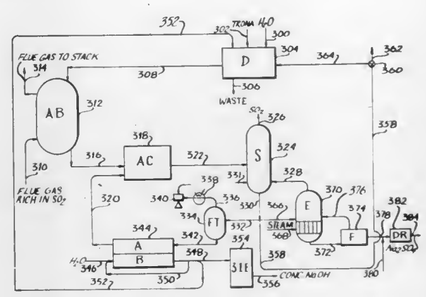
(a) contacting a gas comprising SO_2 with a reactant comprising Na_2CO_3, $NaHCO_3$, or mixtures thereof for a time sufficient to form a reaction mixture comprising sodium sulfite and sodium sulfate, and a gas depleted in SO_2;

(b) contacting said reaction mixture with a hydrogen ion-enriched aqueous sodium sulfate solution for a time to produce an acidified aqueous solution comprising sodium sulfate and aqueous SO_2;

separating said acidified solution into an aqueous solution comprising said sodium sulfate and gaseous SO_2;

(d) recovering said gaseous SO_2;

(e) introducing at least a portion of said aqueous solution substantially free of SO_2 and comprising sodium sulfate, and a liquid comprising water to an electrodialytic water splitter;



(f) passing direct current through said electrodialytic water splitter to produce a hydrogen ion-enriched aqueous sodium sulfate-containing solution and a hydroxide ion-enriched aqueous solution;

(g) withdrawing the hydrogen ion-enriched sodium sulfate-containing solution from the electrodialytic water splitter; and

(h) withdrawing the hydroxide ion-enriched aqueous solution from the electrodialytic water splitter.

4,629,546

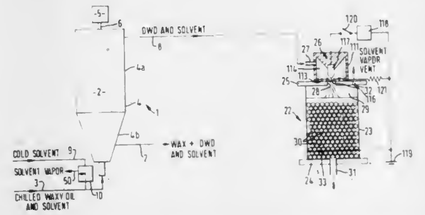
METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION OF DISPERSED PHASE FROM A CONTINUOUS LIQUID PHASE

Douglas G. Ryan, Rockaway, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 11, 1985, Ser. No. 722,164

Int. Cl.⁴ B03C *5/00;* **B04B** *5/10*

U.S. Cl. 204—188 **38 Claims**



8. A method of treating a hydrocarbon oil mixture boiling in the lubricating oil range and containing wax particles, for separating wax particles from the oil mixture, comprising the steps of:

centrifuging the oil mixture to be treated in a centrifugal separation device, for separating a quantity of the wax particles from the oil mixture;

introducing free excess charge which is net unipolar into the oil mixture, whereby charge transfers to wax particles in the oil mixture; and

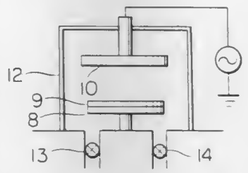
collecting charged wax particles, for separation from the oil mixture.

4,629,547

PROCESS FOR FORMING PROTECTIVE FILM OF ORGANIC POLYMER AND BORON

Yoshinori Honda; Makoto Kitoo, and Yuuichi Kokaku, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,918
Claims priority, application Japan, Nov. 16, 1983, 58-214017
Int. Cl.[4] C23C *14/12, 14/18*
U.S. Cl. 204—192.15 20 Claims



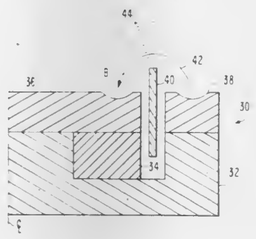
1. A process for forming a protective film which comprises conducting sputtering between an electrode provided with a substrate on which a protective film is to be formed and an electrode provided with a target consisting of at least one organic polymer and at least one boron compound in a vacuum chamber filled with a small amount of an inert gas, thereby forming a protective film containing the organic polymer and the boron compound together on the substrate, said protective film having an improved coefficient of friction as compared with that of a film of the organic polymer itself.

4,629,548

PLANAR PENNING MAGNETRON SPUTTERING DEVICE

John C. Helmer, Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 3, 1985, Ser. No. 719,182
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 6 Claims



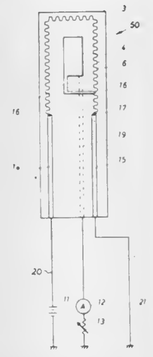
1. A magnetron sputter coating source comprising:
a first cathode means supporting a first sputter target having a first outer sputter surface;
a second cathode means supporting a second sputter target having a second outer sputter surface concentric with said first outer sputter surface;
an anode formed as a ring concentric with said first outer sputter surface and located radially between said first outer sputter surface and said second outer sputter surface, said ring defining a circularly tangential outer plane, said circularly tangential outer plane being further outward than any point on said first or said second outer sputter surfaces; and
means for imposing a magnetic field on said first and said second sputter targets.

4,629,549

OXYGEN SENSOR

Takao Kojima; Yutaka Nakayama; Hiroyuki Ishiguro, and Tetsusyo Yamada, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jul. 2, 1985, Ser. No. 751,269
Claims priority, application Japan, Jul. 17, 1984, 59-148282
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—406 10 Claims



1. An oxygen sensor comprising:
(a) a solid electrolyte plate (**3, 103**) with oxygen ion conductive property, said solid electrolyte plate (**3, 103**) having a front surface and a rear surface;
(b) a first electrode (**4, 104**) and a second electrode (**5, 105**) formed respectively on the front and the rear surfaces of said solid electrolyte plate (**3, 103**);
(c) a heater unit (**6, 106**) formed on the front surface of said solid electrolyte plate (**3, 103**), said heater unit (**6, 106**) having a first end and a second end;
(d) a lead wire (**16, 216**) electrically connecting said first electrode (**4, 104**) to said heater unit (**6, 106**) intermediate the ends of said heater unit (**6, 106**);
(e) an external power source (**11, 113**) for supplying voltage between said first electrode (**4, 104**) and said second electrode (**5, 105**) through said heater unit (**6, 106**) and said lead wire (**16, 216**) so that a controlled pumping current flows between said first electrode (**4, 104**) and said second electrode (**5, 105**); and
(f) an oxygen diffusion limiting means (**8, 108**) in fluid communication with said second electrode (**5, 105**),
whereby oxygen from ambient gases to be measured is pumped from said oxygen diffusion limiting means (**8, 108**) through said solid electrolyte plate (**3, 103**).

4,629,550

CATALYTIC REFORMING OF GASOLINE FEEDSTOCKS

Werner Döhler, Marl-Polsum; Alfons Jankowski, Essen, and Albert Fehrer, Voerde, all of Fed. Rep. of Germany, assignors to Veba Oel Entwicklungs-Gesellschaft mbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,785
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434919
Int. Cl.[4] C10G *35/04*
U.S. Cl. 208—134 4 Claims

1. In a process for the catalytic reforming of mineral oil-derived feedstocks comprising the cracking of said feedstocks under elevated temperature and pressure in the presence of a catalyst, wherein the improvement comprises adding to said feedstock to be reformed a product obtained from coal with reformer feed specification, selected from the group consisting of refined light coal oil, light oil derived from coal middle oil refining, gasoline derived from hydrocracking of coal hydrogenation processes in liquid phase at elevated temperature and elevated pressure in the presence of gaseous hydrogen, and introducing the mixture of said mineral oil-derived feedstock and product obtained from coal directly into the reformer.

4,629,551

PLATINUM-, RHENIUM-, INDIUM-CONTAINING CATALYSTS FOR CONVERSION OF HYDROCARBONS

George J. Antos, Bartlett, and Li Wang, Westmont, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 703,071, Feb. 19, 1985, Pat. No. 4,594,334.
This application Sep. 30, 1985, Ser. No. 781,553
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—139 11 Claims

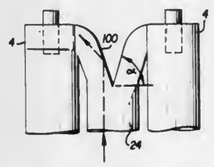
1. A process for the catalytic reforming of naphtha-boiling range charge stock at reforming conditions with a catalytic composite comprising:
(a) a refractory inorganic oxide;
(b) a first uniform dispersion of a platinum component and a rhenium component;
(c) a second dispersion of an indium component thereover;
(d) a halogen component; and
(e) a sulfur component.

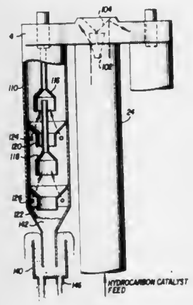
4,629,552

FCC CATALYST SEPARATION METHOD

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 18, 1984, Ser. No. 632,084
Int. Cl.[4] C10G *11/18;* B01J *8/24*
U.S. Cl. 208—161 5 Claims





1. A method of fluid catalytic cracking of a hydrocarbon feed comprising the steps of:
passing a mixture, as a suspension, of said hydrocarbon feed and catalyst particles through a riser conversion zone having a diameter and contained within a reactor vessel and cracking said hydrocarbon feed in the riser conversion zone;
passing said mixture through a deflection zone in which said mixture is physically deflected, by contact with a wedge-shaped deflection means located at a downstream end and integrally connected to said riser conversion zone, from said means for deflecting towards an inlet to a separation zone; and
passing said deflected mixture through said separation zone inlet into said separation zone, wherein said separation zone is located outside said riser conversion zone.

4,629,553

HYDROFINING PROCESS

Carl W. Hudson, and Gerald E. Markley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 31, 1985, Ser. No. 760,834
Int. Cl.[4] C10G *65/04*
U.S. Cl. 208—212 18 Claims

1. In a hydrofining process wherein hydrogen, and a feed characterized as an admixture of hydrocarbons which contains organic sulfur, or organic nitrogen, or both, having a high end point boiling below about 370° C. and a low end boiling point above about 150° C., and contains up to about 2 weight percent sulfur, and up to about 500 ppm nitrogen, is contacted over a hydrofining catalyst and hydrofined at hydrofining conditions inclusive of an initial temperature ranging between about 275° C. and about 450° C., and the temperature gradually raised during the operation to maintain catalyst activity, deterioration of said feed occurring as manifested by increased discoloration of the reaction product mixture, and
sulfur as hydrogen sulfide, or nitrogen as ammonia, or both, are separated from the hydrofined reaction product,
the improvement wherein said hydrofined product from which sulfur, or nitrogen, or both, have been removed is contacted as a feed, in the presence of hydrogen, over a catalyst comprised of elemental iron and one or more alkali or alkaline-earth metals components at a temperature ranging from about 225° C. to about 430° C. and hydrogen partial pressure ranging from about 0 psig to about 1000 psig sufficient to reduce the discoloration of said feed, and increase the length of the operating cycle.

4,629,554

COAL LIQUEFACTION WITH COAL TAR SOLVENT

Srikant Gir, Memphis, Tenn., and Donald E. Rhodes, Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 19, 1985, Ser. No. 777,549
Int. Cl.[4] C10G *1/00, 1/06*
U.S. Cl. 208—415 15 Claims

1. A method of liquefying coal, comprising:
mixing solid coal with a process solvent comprising coal tar material which has been at least partially hydrogenated under conditions which selectively hydrogenate aromatic coal tar components to hydroaromatics and which preserve the integrity of organonitrogen coal tar components, to produce a coal-solvent slurry;
treating the coal-solvent slurry under coal-liquefying conditions in a liquefaction zone to produce a solution containing coal liquefaction products; and
recovering coal liquefaction products from the solution.

4,629,555

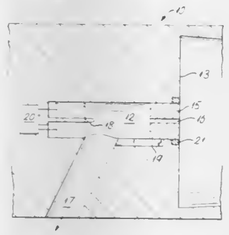
CYCLONE SEPARATOR

Derek A. Colman, 19 Osprey Close, Lordswood, Southampton SO1 8EX, and Martin T. Thew, 7 Court Close, Bitterne, Southampton SO2 5EJ, both of England

Continuation of Ser. No. 434,183, Oct. 14, 1982, abandoned.
This application Jan. 24, 1985, Ser. No. 694,491
Claims priority, application United Kingdom, Oct. 16, 1981, 8131203
Int. Cl.[4] B04C *5/13;* F15D *1/00*
U.S. Cl. 209—144 10 Claims

5. A method of classifying a stream of material according to

density and/or size, the stream being subject to changes in composition, the method comprising passing the stream into an inlet of a cyclone separator having a body within which separation takes place, an underflow outlet for receiving denser and/or larger material and an overflow outlet from the body for receiving lighter and/or smaller material, said body having a smooth internal wall with said overflow outlet being formed in said smooth internal wall, there being an abrupt transition from the body to the outlet substantially in the plane of said internal wall, an overflow outlet passageway in a first position, housing a movable member which is movable during use of the cyclone separator, and which can alter the cross-sectional area of the overflow outlet in the plane of said internal wall while



preserving an abrupt transition from the body to the outlet, said movable member comprising a plug in a first position having a sliding fit in the overflow outlet and being slidable between a first position, in which the end of the plug lies flush with the said internal wall, and a second position in which the end of the plug is substantially withdrawn from the overflow outlet passageway into a recessed area, the plug having an aperture the axis of which is parallel to that of the overflow outlet, and

said method further comprising sliding said apertured plug between said first and second positions to alter the cross sectional area of the overflow outlet in response to said changes of composition in said stream.

4,629,556

PURIFICATION OF KAOLIN CLAY BY FROTH FLOTATION USING HYDROXAMATE COLLECTORS

Roe-Hoan Yoon, Blacksburg, Va., and Thomas M. Hilderbrand, Grovetown, Ga., assignors to Thiele Kaolin Company, Sandersville, Ga.

Filed Nov. 29, 1984, Ser. No. 676,477
Int. Cl.⁴ B03D *1/12*
U.S. Cl. 209—166 **11 Claims**

1. In a method for removing anatase impurities from a kaolin clay wherein the impure clay in aqueous suspension is first conditioned by treatment with a collector in an amount sufficient for promoting flotation of said impurities and then subjected to froth flotation for removal of said impurities for said clay,

the improvement comprising using as said collector a compound having the formula



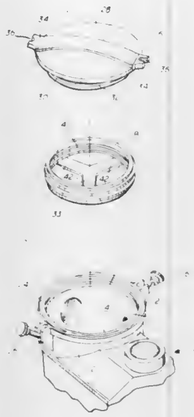
wherein R is an alkyl, aryl, or alkylaryl group having 4-28 carbon atoms and M is hydrogen, an alkali metal, or an alkaline earth metal, said suspension having a pH above 6.

4,629,557

PUMP TEST RING, COVER AND STRAINER AND METHOD OF PROVIDING A PRESSURE-TESTABLE PUMP

Samuel Tobias, Edison, N.J., assignor to Hayward Industries, Inc., Elizabeth, N.J.

Filed Jul. 16, 1985, Ser. No. 755,476
Int. Cl.⁴ B01D *35/14, 35/28*
U.S. Cl. 210—90 **22 Claims**



1. A test ring for a pump which includes a strainer, comprising first attaching means for threadedly and removably attaching said test ring to a housing of said strainer and second attaching means for threadedly and removably attaching said test ring to a cover of said strainer, said first and second attaching means cooperating to enable said test ring to threadedly attach said strainer cover to said strainer housing when said pump is to be used in a pressure-testable mode in which said strainer cover must withstand relatively high positive pressure and to enable said test ring to be removed from said strainer housing and said strainer cover when said pump is to be used in a nonpressure-testable mode in which said strainer cover is not subjected to high positive pressure.

4,629,558

OIL AND FUEL FILTER

Lawrence K. Garritty, 429 N. East Rd., Hillcrest, Australia 5086

Continuation of Ser. No. 630,962, Jul. 16, 1984, abandoned, which is a continuation of Ser. No. 494,781, May 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 370,357, Apr. 21, 1982, abandoned. This application Jan. 21, 1986, Ser. No. 820,818
Claims priority, application Australia, Jan. 10, 1979, PF7308; Jul. 7, 1980, 54423/80
Int. Cl.⁴ B01D *27/10, 35/06*
U.S. Cl. 210—130 **21 Claims**

1. A disposable oil filter particularly for an internal combustion engine, said filter comprising:

a casing;

a filter element in said casing;

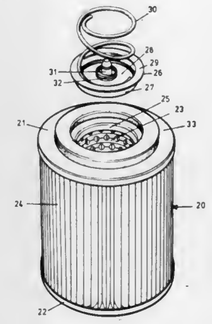
an inlet and an outlet both at one end of said casing, said filter element having a metal end cap at each end of the filter element connected by an internal metal sleeve connected to said outlet;

a lid closing said opening in said end cap opposite to said outlet, said lid having a base, a periphally upstanding wall extending from said base and a radial flange connected with said wall;

a spring acting between said lid and the casing, said spring having one end bearing against said base and said wall and having the other end bearing against the top wall of said casing; and

a non-magnetic bypass valve situated in said lid characterized by a high energy product magnetic means on said end cap opposite said outlet;

said magnetic means surrounding said lid to thereby magnetize said end cap and at least the upper portion of said sleeve to attract and retain magnetic particles both on



itself, said end cap and on said sleeve, together with collecting or agglomerating slightly magnetic material in said oil which particles are disposed of when said filter is replaced and disposed;

said bypass valve closing an aperture in said lid, and said bypass valve including a flange sealing on the surface of said lid opposite to said spring; and

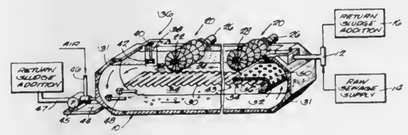
valve spring means acting on the opposite side of said lid to maintain the valve in a closed position.

4,629,559

VERTICAL LOOPED REACTOR TANK WITH DELAYED AIR RELEASE FEATURE

George W. Smith, Mukwonago, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Jun. 12, 1985, Ser. No. 743,847
Int. Cl.⁴ C02F *3/12*
U.S. Cl. 210—150 **18 Claims**



1. In an activated sludge wastewater treatment apparatus comprising:

an elongated confining means having end walls comprised of a sewage inlet end and a sewage outflow end, side walls, and an interior chamber capable of containing a given liquid level;

horizontally disposed gas-impermeable first baffle means substantially coextensive with said confining means, yet spaced apart from the end walls thereof to provide flow passages between said baffle means and end walls; said first baffle means being positioned within said interior chamber below said liquid level;

said confining means and said first baffle means defining a plurality of serially interconnecting passageways that establish an elongated endless vertical flow circuit for providing complete mixing of sewage matter within said confining means;

means applying raw sewage and recycled sludge to said interior chamber, said recycled sludge supplying a population of microscopic biota to said circulating liquid in said chamber;

an aeration means positioned in at least one of said passageways for introducing air and flow-inducing energy to sewage matter within said interior chamber; and means for removing treated sewage from said interior chamber;

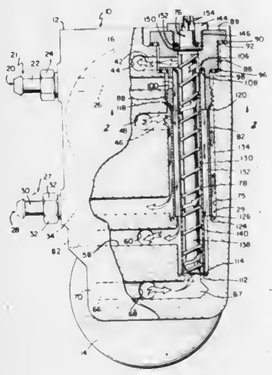
wherein the improvement comprises at least one secondary horizontally-disposed, gas permeable baffle means substantially coextensive with said side walls of said confining means and constructed and arranged near said sewage inlet end between said first baffle means and the surface of said liquid in said confining means to capture air bubbles retained by said first baffle means, and delay the escape of said bubbles to said surface of said liquid by fragmenting said bubbles to increase their absorption into the liquid and eventual metabolism by said circulating biota.

4,629,560

FUEL FILTER HEAT REGENERATOR

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Continuation of Ser. No. 546,994, Oct. 31, 1983, abandoned. This application Aug. 27, 1985, Ser. No. 769,767
Int. Cl.⁴ B01D *35/18*
U.S. Cl. 210—184 **26 Claims**



1. A fuel line heating system for a vehicle having a fuel line including an upstream portion and a downstream portion, a first fuel treatment element, and a second fuel treatment element, each fuel treatment element having an inlet port and an outlet port, the fuel line heating system comprising

first passageway means for conducting fuel from the upstream portion of the fuel line to the inlet port of the first fuel treatment element,

second passageway means for conducting fuel from the outlet port of the first fuel treatment element to the inlet port of the second fuel treatment element,

heater means for heating fuel conducted through the second passageway means, and

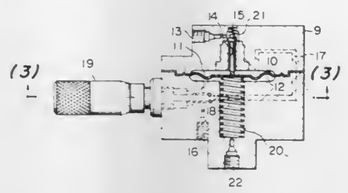
third passageway means for conducting fuel from the outlet port of the second fuel treatment element to the downstream portion of the fuel line, the first passageway means being situated adjacent to both of the second and third passageway means in heat transferring relation causing fuel conducted through the first passageway means to be warmed prior to being introduced from the first passageway means into the first fuel treatment element due to exposure to heat energy transferred from the fuel that is conducted through the second and third passageway means and heated during exposure to the heater means.

4,629,561

LIQUID CHROMATOGRAPH WITH FLOW CONTROLLER

Kozo Shirato, Omiya; Kazuo Hiraizumi, Narashino; Akio Kaneko, Omiya, and Akihiko Nagai, Kawaguchi, all of Japan, assignors to ERMA Optical Works, Ltd., Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,398
Claims priority, application Japan, Nov. 30, 1984, 59-254317
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **1 Claim**



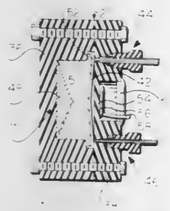
1. In a liquid chromatograph which includes a solvent tank, a pump, a sample injection element, a column, a detector, and conduits for successively connecting said solvent tank, said sample injection element, said column and said detector together, said detector including a sample solution inlet and a reference solution inlet and said column being connected between said pump and said sample solution inlet of said detector, the improvement wherein said liquid chromatograph includes a flow controller connected in parallel with said column between said pump and said reference solution inlet of said detector, said flow controller comprising a fluid inlet, a fluid outlet, an internal chamber, a diaphragm in said internal chamber dividing said internal chamber into an upper chamber and a lower chamber, an inlet passage connecting said upper chamber with said fluid inlet, an adjustment valve positioned in said inlet passage and connected to said diaphragm, an adjustment passage connecting said upper chamber with both said lower chamber and said fluid outlet, a needle valve capable of closing off said adjustment passage, a micrometer head to adjust said needle valve, and a compression spring positioned inside said lower chamber to bias said diaphragm toward the upper chamber.

4,629,562

PULSE DAMPENER

Paul W. Kercher, Furnace, Pa., assignor to Scientific Systems, Inc., State College, Pa.

Filed Aug. 6, 1985, Ser. No. 762,943
Int. Cl.[4] B01D *15/08;* **F16L** *55/04*
U.S. Cl. 210—198.2 **18 Claims**



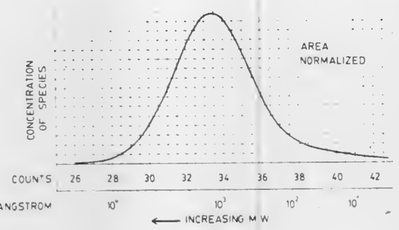
1. A pulse dampener for use with a reciprocating pump in a chromatography system to minimize the effects of the pulsations of the liquid delivered to the chromatography column, said dampener comprising:
inlet and outlet ports for a liquid vehicle;
a body defining a cavity;
a closure member extending across the cavity enclosing the cavity; and
a unitized plug positioned within the cavity of said body, the unitized plug having at least two portions having different compressibility characteristics.

4,629,563

ASYMMETRIC MEMBRANES

Wolfgang J. Wrasidlo, La Jolla, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 130,566, Mar. 4, 1980, abandoned. This application Aug. 11, 1981, Ser. No. 291,927
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.34 **23 Claims**



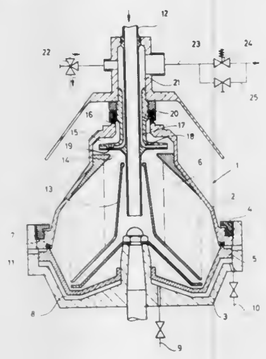
1. An asymmetric integral polymer membrane having a bulk porosity greater than seventy percent, a skin face an an opposite face comprising:
A. A porous skin having skin pores with an average diameter of from about 0.003 to about 3.0 microns; and
B. A porous support comprising a substantially continuous reticular mass of a thress-dimensional network defining interconnecting flow channels communicating with said skin pores and with said opposite face, said flow channels defining support pores having diameters generally increasing gradually in size from said skin to said opposite face, to an average diameter of from about 10 to about 20,000 times the diameter of said skin pores, and said support being substantially free of voids materially larger in diameter than said gradually increasing support pores.

4,629,564

CENTRIFUGAL SEPARATOR WITH ANNULAR SEALING MEANS ARRANGED AROUND THE ROTOR OUTLET FOR SEPARATED LIQUID

Oskar Pinato, Vedano Al Lambro, Italy, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed Feb. 21, 1985, Ser. No. 704,019
Claims priority, application Sweden, Mar. 1, 1984, 8401142
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—512.3 **10 Claims**



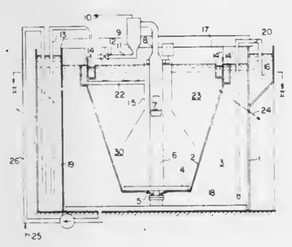
1. A centrifugal separator comprising a rotor (1) mounted for rotation about an axis and defining a separation chamber (6), a central inlet for liquid to be centrifugally treated and a central outlet for a separated liquid, the rotor also defining a central outlet chamber (15) and an overflow outlet (14) by which the separation chamber (6) communicates with said outlet chamber (15), a stationary device for receiving liquid separated in the rotor, annular sealing means (16) arranged around said central outlet between the rotor (1) and said stationary device, and a stationary outlet member (17) defining at least one outlet channel (18) extending from a level in the outlet chamber (15) radially outside the overflow outlet (14) to said central outlet of the rotor (1), said outlet member (17) being operable to pass liquid leaving the outlet chamber (15) via said outlet chamber (18) substantially in contact with the sealing means (16), there being a return passage (20) for returning to the outlet chamber (15) part of said liquid leaving through the outlet channel (18), and means (22) for supplying liquid to said outlet chamber (15) by way of said stationary receiving device and independently of said separation chamber (6).

4,629,565

PROCESS FOR THE BIOLOGICAL TREATMENT OF SEWAGE

Walter Hell, Kaltenleutgeben, and Bruno Hillinger, Hinterbruhl, both of Austria, assignors to Waagner-Biro AG, Austria

PCT No. PCT/AT84/00015, § 371 Date Jan. 2, 1985, § 102(e) Date Jan. 2, 1985, PCT Pub. No. WO84/04295, PCT Pub. Date Nov. 8, 1984
PCT Filed May 7, 1984, Ser. No. 697,586
Claims priority, application Austria, May 5, 1983, 1651/83
Int. Cl.[4] C02F *3/12*
U.S. Cl. 210—607 **6 Claims**



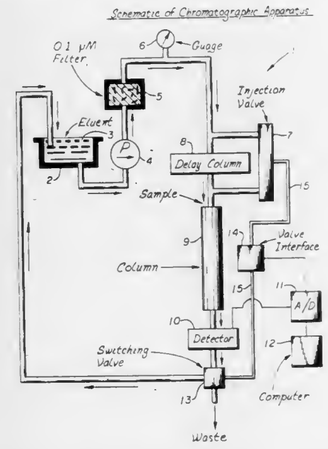
1. Method for the treatment of sewage to separate clear liquid from sewage sludge, said method comprising the steps of
separating a flow of sludge from said sewage into a first flow constituting a sludge portion to be further treated, and a second flow constituting excess sludge,
aerating said first flow,
directing the thus-aerated first flow into an activator basin arranged concentrically in an outer basin, the activator basin having a conically-shaped basin concentrically arranged therein,
separating liquid from said aerated first flow in the activator basin to form a more concentrated sludge in the activator basin,
aerating the thus-separated liquid and mixing the same with additional first flow of sludge for further treatment,
directing the more concentrated sludge from the activator basin to the conically-shaped basin concentrically arranged therein and subjecting the same to settling therein, thereby forming clear liquid and further concentrated sludge,
separating the thus-formed clear liquid, and
removing the thus-formed further concentrated sludge.

4,629,566

METHOD FOR CHARACTERIZING THE MOLECULAR WEIGHT AND MOLECULAR WEIGHT DISTRIBUTION OF ULTRA-HIGH MOLECULAR WEIGHT WATER SOLUBLE POLYMERS

Robert K. Prud'homme, Trenton, N.J.; Frederick W. Stanley, Jr., and Martin W. Langhorst, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 523,818, Aug. 15, 1983, Pat. No. 4,532,043. This application May 24, 1985, Ser. No. 738,204
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] B01D *15/08*
U.S. Cl. 110—635 **6 Claims**



1. A liquid chromatographic method for characterizing water soluble polymers by molecular weight and molecular weight distribution based on apparent size which comprises:
(a) adding to an aqueous eluent a sample of a detectable ultra-high molecular weight polymer in a solution concentration between the detectable limit and an upper limit below the concentration at which the elution of the polymer is detrimentally influenced by concentration, the sample added being dissolved in a primarily aqueous diluent not incompatible with the eluent, the added sample volume being not greater than that volume which would detrimentally influence the chromatography;
(b) passing the combined eluent and sample at a low flow rate which does not influence the elution position of the sample through a porous body composed of a packed bed of impenetrable particles whereby the apparent size fractions of the polymer sample are separated by flow chromatography;
(c) detecting the amount of the eluting apparent size fractions of the polymer species; and
(d) using the data of step (c) to characterize the molecular weight and molecular weight distribution of the detected water soluble polymer.

4,629,567

ALPHA-1-ANTIPROTEASE PURIFICATION

Alex J. Bollen, Itterbeek, Belgium; Paul Chuchana, Bordeaux, France, and Marc Hoylaerts, Kessel-Lo, Belgium, assignors to SmithKline-RIT, Belgium

Filed Mar. 7, 1986, Ser. No. 836,868
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—635 **2 Claims**

1. A process for purifying alpha-1-antitrypsin from an impure solution thereof which comprises:

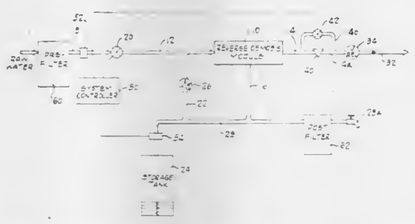
(1) contacting the solution with an ion exchange adsorbent, and eluting the alpha-1-antitrypsin therefrom;
(2) contacting the eluate from (1) with a thiol-disulfide exchange adsorbent and eluting the alpha-1-antitrypsin therefrom;
(3) contacting the eluate from (2) with heparin bound to a solid carrier;
(4) contacting the effluent from (3) with a zinc-chelate adsorbent and eluting the alpha-1-antitrypsin therefrom;
(5) contacting the eluate from (4) with an ion exchange adsorbent and eluting the alpha-1-antitrypsin therefrom.

4,629,568

FLUID TREATMENT SYSTEM

George S. Ellis, III, Chardon, Ohio, assignor to Kinetico, Inc., Newbury, Ohio

Filed Sep. 26, 1983, Ser. No. 535,996
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 34 Claims



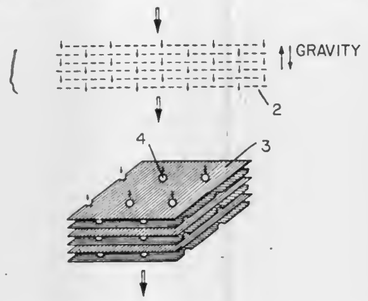
26. Apparatus for purifying a solvent such as water by reverse osmosis, comprising:
(a) a substantially cylindrical housing having an end cover defining an inlet for water to be treated, an outlet for permeate, and an outlet for waste;
(b) a reverse osmosis module disposed axially within said housing, said module comprising:
(i) an input tube disposed axially with respect to said housing;
(ii) a perforate collector tube surrounding said input tube and defining a permeate collection region between the inside of said collection tube and the outside of said input tube;
(iii) a reverse osmosis membrane disposed around said collector tube and extending into abutting engagement with an inside wall of said module;
(c) an intermediate housing member disposed intermediate said end cover and said reverse osmosis module, said intermediate housing member defining a plurality of fluid passages;
(d) a system controller including structure defined by said end cover and said intermediate member for slidably supporting a valving member for movement between on and off positions;
(e) a flushing accumulator defined by a tubular elastomeric member clamped around said reverse osmosis module, the region on one side of said member defining a permeate receiving chamber and a region defined on another side of said member forming a precharge chamber;
(f) said valving member of said system controller defining a valve element for controlling the communication of said inlet with said input to said reverse osmosis module and further defining a valve portion for controlling the communication of said plurality of fluid passages with said reverse osmosis module and said flushing acumulator.

4,629,569

PROCESS AND DEVICE FOR THE SEPARATION OF IMPURITIES FROM LIQUIDS

Rolf D. Gimbel, Reuterstrasse 6, D-7505 Ettlingen, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 606,600
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316540
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 9 Claims



7. Process for separating turbidities from liquids which uses permeation layers, said process comprising
providing a filter device including a plurality of spaced serially arranged permeable membrane layers with macroholes, and
carrying out the filter regeneration by short time cross-wise flushing of the filter device with a superimposed upward or downward flow through the filter device.

4,629,570

REMOVAL OF IRON FROM CHELANT SOLUTIONS

Weldon C. Kennedy, Jr., Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation of Ser. No. 319,518, Nov. 9, 1981, abandoned. This application Jul. 18, 1985, Ser. No. 756,914
Int. Cl.[4] C02F *1/54*
U.S. Cl. 210—666 17 Claims

1. A process for removing iron and copper ions from an aqueous liquid containing dissolved iron and copper in the form of a soluble chelate with an alkylenepolyamine polyacetic acid and/or soluble chelating salts of said acid, said process comprising the steps of:
(a) adjusting the pH of said aqueous liquid to a pH of at least about 12.5,
(b) adding sufficient quantities of a soluble calcium salt to facilitate growth of insoluble colloidal iron hydroxide particles,
(c) adding an alkali metal N,N-dimethyl - or N,N-diethyldithiocarbamate to the aqueous relative to copper dissolved in said aqueous fluid, and forming a solid precipitate containing said iron and copper, and
(d) separating said precipitate from said aqueous liquid.

4,629,571

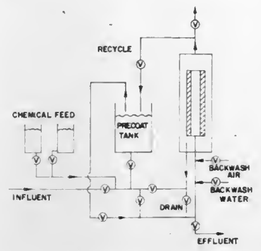
DEOXYGENATION AND PURIFICATION OF LIQUIDS

Eli Salem, Deal, N.J., and Robert Kunin, Yardley, Pa., assignors to The Graver Company, Union, N.J.

Filed Sep. 11, 1985, Ser. No. 774,939
Int. Cl.[4] C02F *1/70, 1/72;* B01D *37/02*
U.S. Cl. 210—668 44 Claims

1. A method for removing oxygen from a liquid comprising the steps of:
(a) adding hydrazine to a liquid containing dissolved oxygen; and
(b) passing the liquid through a porous support means having a precoat layer applied thereto comprising a mixture of filter aid material and powdered activated carbon,

wherein the filter aid material comprises about 25 to 80 percent by weight of the precoat layer, based on the dry weight of the mixture, to catalyze a reaction between the



dissolved oxygen and the hydrazine whereby oxygen is removed from the liquid.

4,629,572

PAINT DETACKIFICATION METHOD

Christopher R. Leitz, Devon; Joel S. Jordon, Drexel Hill, and Michael S. Dalton, Pittsburgh, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 27, 1986, Ser. No. 834,261
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—714 6 Claims

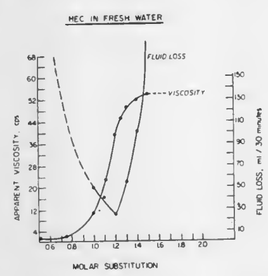
1. A process for detackifying spray booth wastes comprised of oil-based coating particles which are substantially free of insoluble pigments and fillers which have been collected in a water wash stream and clarifying the waste-containing water wash stream comprising
(1) adding to and maintaining in the water wash stream (a) at least about 5 ppm of at least one water-dispersible polymeric condensation reaction product of at least one polyfunctional compound selected from ureas and amino triazines and at least one aldehyde, and (b) at least about 10 ppm of at least one water-swellable clay,
(2) removing the detackified coating particle wastes from the water wash stream.

4,629,573

USE OF LOW M.S. HYDROXYETHYL CELLULOSE FOR FLUID LOSS CONTROL IN OIL WELL APPLICATIONS

Russell H. Raines, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 527,481, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 79,883, Sep. 28, 1979, abandoned. This application Aug. 19, 1985, Ser. No. 766,693
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.51 6 Claims



1. In a method of conducting a drilling operation for the recovery of gas and/or oil from a porous subterranean formation wherein a water-base drilling fluid is circulated in a well penetrating the subterranean formation, such fluid circulation being characterized by an undesirable loss of said drilling fluid into the surrounding porous formation, the improvement for minimizing fluid loss into said formation, which comprises employing a drilling fluid containing an effective amount of hydroxyethyl cellulose having a molar substitution value of from about 1.1 to about 1.6, and wherein said drilling fluid is substantially free of bridging particles capable of preventing fluid loss from the well into the porous formation.

4,629,574

READY-TO-USE FABRIC SOFTENER CONCENTRATE

Hans Nuesslein, Langenfeld; Rolf Puchta, Haan, and Theodor Voelkel, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 5, 1984, Ser. No. 597,142
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314677
Int. Cl.[4] D06M *13/46*
U.S. Cl. 252—8.8 28 Claims

1. A ready-to-use, aqueous, free-flowing fabric softener concentrate consisting essentially of:
(a) about 30–70% by weight of at least one fabric softening cationic quaternary ammonium compound;
(b) about 0.43 to 23.33% by weight of at least one C_{8-20} fatty acid or alkali metal salt thereof;
(c) glycerol solvent;
(d) a compatible, water-miscible organic solvent which is at least one C_{1-4} alkanol or C_{1-6} alkylene diol; and
(e) water solvent;
wherein the ratio by weight of the sum of solvent components (c), (d), and (e) to fabric softening component (a) is about 1:0.5–6; all percentages by weight being based upon the total weight of said concentrate.

4,629,575

WELL DRILLING AND PRODUCTION FLUIDS EMPLOYING PARENCHYMAL CELL CELLULOSE

Michael K. Weibel, West Redding, Conn., assignor to SBP, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 414,931, Sep. 3, 1982, abandoned. This application Jul. 6, 1983, Ser. No. 511,393
Int. Cl.[4] C09K *7/02, 3/00;* C08L *1/00*
U.S. Cl. 252—8.551 15 Claims

1. A method of drilling a well comprising circulating through the well being drilled a fluid comprising parenchymal cell cellulose.

4,629,576

METHOD FOR IMPROVING FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES USING BORATED 1,2-ALKANEDIOLS

Vernon R. Small, Jr., Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

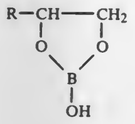
Continuation of Ser. No. 636,186, Jul. 31, 1984, Pat. No. 4,563,293, which is a continuation of Ser. No. 520,789, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 289,422, Aug. 3, 1981, abandoned. This application Oct. 21, 1985, Ser. No. 789,806
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.
Int. Cl.[4] C10M *141/02, 141/12*
U.S. Cl. 252—32.7 E 1 Claim

1. A lubricating oil composition comprising:
(a) a major amount of an oil of lubricating viscosity; and
(b) an amount of each of the following:
(1) about 1 to 20% by weight of an alkenyl succinimide or alkenyl succinate or mixtures thereof;
(2) about 0.1 to 4% by weight of a Group II metal salt of a dihydrocarbyl dithiophosphoric acid;
(3) about 0.3 to 10% by weight of a neutral or overbased

alkali or alkaline earth metal hydrocarbyl sulfonate or mixtures thereof;

(4) about 0.2 to 27% by weight of a neutral or overbased alkali or alkaline earth metal, alkylated phenate, or mixtures thereof; and

(5) about 0.1 to 5% by weight of a mixture of a borated long-chain 1,2-alkane diol friction modifier of the formula:



wherein R in said mixture is alkyl containing from 13 to 16 carbon atoms.

4,629,577

METHOD FOR IMPROVING FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 17, 1985, Ser. No. 745,661

Int. Cl.⁴ C10M *129/26*

U.S. Cl. 252—32.7 E **10 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and 0.1 to 4 weight percent of a borated alkyl catechol and an effective amount of an alkenyl succinimide to stabilize the borated alkyl catechol against hydrolysis

7. A lubricating oil composition comprising

(a) a major amount of an oil of lubricating viscosity; and

(b) an amount of each of the following:

1. from 2% to 20% by weight of an alkenyl succinimide;
2. from 0.1% to 4% by weight of a borated alkyl catechol;
3. from 0.1% to 4% by weight of a Group II metal salt of a dihydrocarbyl dithiophosphoric acid;
4. from 0.3% to 10% by weight of a neutral or overbased alkali or alkaline earth metal hydrocarbyl sulfonate or mixtues thereof;
5. from 0.2% to 27% by weight of a neutral or overbased alkali or alkaline earth metal phenate, or mixtures thereof; and

wherein the ratio of the alkenyl succinimide to the borated alkyl catechol ranges from 3:1 to 16:1.

4,629,578

SUCCINIMIDE COMPLEXES OF BORATED ALKYL CATECHOLS AND LUBRICATING OIL COMPOSITIONS CONTAINING SAME

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 17, 1985, Ser. No. 745,565

Int. Cl.⁴ C10M *129/26*

U.S. Cl. 252—32.7 E **10 Claims**

1. A composition comprising a complex prepared by reacting a borated alkyl catechol and an oil soluble alkyl or alkenyl succinimide wherein the weight precent ratio of the alkyl or alkenyl succinimide to the borated alkyl catechol ranges from 3:1 to 16:1.

6. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and an effective amount to reduce friction of a complex prepared by reacting a borated alkyl catechol and an oil soluble alkyl or alkenyl succinimide wherein the weight percent ratio of the alkyl or alkenyl succinimide to the borated alkyl catechol ranges from 3:1 to 16:1.

4,629,579

BORON DERIVATIVES

Peter J. Jessup, Santa Ana; Richard A. Holstedt, Whittier, and Kenneth Baron, Diamond Bar, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

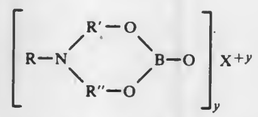
Division of Ser. No. 158,981, Jun. 12, 1980, abandoned. This application Dec. 7, 1984, Ser. No. 679,286

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ C10M *105/08*

U.S. Cl. 252—33.6 **17 Claims**

1. A compound having the formula:



wherein R is an aryl, alkyl, alkylaryl or arylalkyl radical having 1 to about 24 carbon atoms, R′ and R″ are independently selected from the group consisting of aryl, alkylaryl or arylalkyl radicals having from about 6 to about 20 carbon atoms, y is an integer of 1 to 4, and X is a metal selected from the group consisting of transition metals having an atomic number from 21 to 30, Group IVA metals and mixtures thereof.

9. A process comprising: (1) reacting a primary amine with an alkene oxide or epoxide to produce a dialkoxylated amine; (2) reacting the dialkoxylated amine with boric acid to produce a boron-containing compound; and (3) reacting with boron-containing compound with a metal selected from the group consisting of transition metals having an atomic number from 21 to 30, Group IV-A metals and mixtures thereof.

4,629,580

BORON-CONTAINING HETEROCYCLIC COMPOUNDS AND LUBRICATING OIL CONTAINING SAME

Richard A. Holstedt, Whittier; Kenneth Baron, Diamond Bar, and Peter J. Jessup, Santa Ana, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 525,718, Aug. 23, 1983, abandoned, Ser. No. 525,691, Aug. 23, 1983, abandoned, Ser. No. 525,719, Aug. 23, 1983, abandoned, Ser. No. 679,286, Dec. 7, 1984, Ser. No. 418,196, Sep. 15, 1982, Pat. No. 4,511,516, Ser. No. 482,941, Apr. 7, 1983, Ser. No. 476,513, Mar. 1, 1983, Pat. No. 4,533,480, Ser. No. 329,385, Dec. 10, 1981, and Ser. No. 525,720, Aug. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 329,385, Ser. No. 319,073, Nov. 9, 1981, Pat. No. 4,410,436, Ser. No. 329,384, Dec. 10, 1981, Pat. No. 4,427,560, Ser. No. 333,998, Dec. 23, 1981, Pat. No. 4,412,928, Ser. No. 434,602, Oct. 15, 1982, Pat. No. 4,490,265, and Ser. No. 476,513, said Ser. No. 525,718, is a continuation-in-part of Ser. No. 158,981, Jun. 12, 1980, abandoned, Ser. No. 158,828, Jun. 12, 1980, Pat. No. 4,400,284, and Ser. No. 418,196, which is a continuation-in-part of Ser. No. 158,981, and Ser. No. 158,828, said Ser. No. 679,286, is a division of Ser. No. 158,981, said Ser. No. 482,941, is a division of Ser. No. 158,828. This application Jan. 29, 1985, Ser. No. 696,006

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.⁴ C10M *1/20, 1/32, 1/54*

U.S. Cl. 252—49.6 **9 Claims**

1. A compound comprising the reaction product of a primary amine or ammonia and an aromatic oxide, subsequently or concurrently reacted with a boric acid, wherein the primary amine or ammonia, the aromatic oxide, and the boric acid react at about a 1:2:1 molar ratio.

7. A lubricating composition comprising a major amount of a lubricating oil containing the compound of claim **1**, **2**, **4**, or **5** in a concentration from about 0.1 to about 15 weight percent of the composition.

4,629,581

CYCLOHEXANECARBONITRILES

Arthur Boller, Binningen, Martin Petrzilka, Kaiseraugst, and Martin Schadt, Seltisberg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

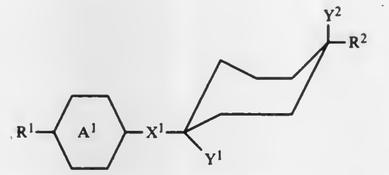
Filed Jun. 26, 1985, Ser. No. 749,160

Claims priority, application Switzerland, Jun. 29, 1984, 3152/84; Apr. 17, 1985, 1638/85

Int. Cl.⁴ C09K *3/34*; C07C *121/46*

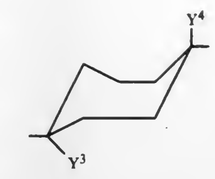
U.S. Cl. 252—299.63 **39 Claims**

1. A compound of the fomrula



I

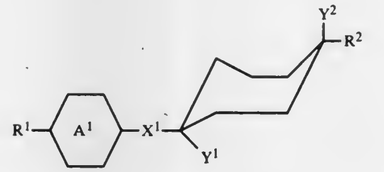
wherein X^1 is a single covalent bond, $—CH_2CH_2—$, —COO—, —OOC— or 1,4-phenylene; one of Y^1 and Y^2 is hydrogen and the other is cyano; R^2 is trans-1-alkenyl, cis-2-alkenyl, trans-3-alkenyl, 4-alkenyl or alkyl; R^1 is $R^{11}—A^4—A^5—$; A^4 and A^5 independently of each other are a single covalent bond, 1,4-phenylene or trans-1,4-cyclohexylene; R^{11} is trans-1-alkenyl, cis-2-alkenyl, trans-3-alkenyl, 4-alkenyl, trans-2-alkenyloxy, 3-alkenyloxy or, when R^2 is alkenyl, R^{11} also can be alkyl or alkoxy; ring A^1 is 1,4-phenylene or a group of the formula



II

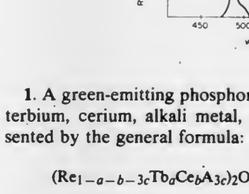
and Y^3 and Y^4 are hydrogen or, when X^1 is $—CH_2CH_2—$, —COO— or —OOC—, one of Y^3 and Y^4 also can be cyano.

38. A liquid crystalline mixture comprising at least two components at least one of which is a compound of the formula



I

wherein X^1 is a single covalent bond, $—CH_2CH_2—$, —COO—, —OOC— or 1,4-phenylene; one of Y^1 and Y^2 is hydrogen and the other is cyano; R^2 is trans-1-alkenyl, cis-2-alkenyl, trans-3-alkenyl, 4-alkenyl or alkyl; R^1 is $R^{11}—A^4—A^5—$; A^4 and A^5 independently of each other are a single covalent bond, 1,4-phenylene or trans-1,4-cyclohexylene; R^{11} is trans-1-alkenyl, cis-2-alkenyl, trans-3-alkenyl, 4-alkenyl, trans-2-alkenyloxy, 3-alkenyloxy or, when R^2 is alkenyl, R^{11} also can be alkyl or alkoxy; ring A^1 is 1,4-phenylene or a group of the formula



II

4,629,582

GREEN-EMITTING PHOSPHOR

Kenji Terashima, Chigasaki; Yoshio Kimura, Yokohama; Masao Asada, Yokohama, and Satoshi Sugano, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

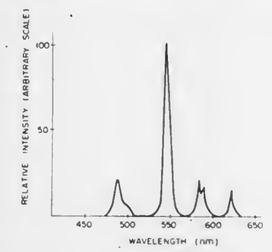
PCT No. PCT/JP82/00229, § 371 Date Feb. 14, 1983, § 102(e) Date Feb. 14, 1983, PCT Pub. No. WO82/04438, PCT Pub. Date Dec. 23, 1982

Continuation of Ser. No. 466,354, Feb. 14, 1983, abandoned. This PCT application Jun. 16, 1982, Ser. No. 693,317

Claims priority, application Japan, Jun. 16, 1981, 56-91555

Int. Cl.⁴ C09K *11/08*

U.S. Cl. 252—301.4 P **2 Claims**



1. A green-emitting phosphor consisting of rare earth metal, terbium, cerium, alkali metal, phosphate and silicate, represented by the general formula:

$$(Re_{1-a-b-3c}Tb_aCe_bA_{3c})_2O_3.mP_2O_5.nSiO_2$$

wherein Re is one member selected from the group consisting of yttrium, lanthanum, and gadolinium or mixtures thereof; A is one member selected from the group consisting of lithium (Li), sodium (Na), potassium (K), rubidium (Rb), and cesium (Cs) or mixtures thereof; and wherein $a>0$, $b>0$, $c>0$, $0<a+b+3c<1$, $1\times10^{-5}\leqq c\leqq 5\times10^{-2}$, and $m\geqq 0.75$ and $n\geqq 0.04$, and the sum of m and $\frac{1}{2}$n equals about 1.

4,629,583

PHOSPHORESCENT POLYMER-CONTAINING COMPOSITIONS AND ARTICLES MADE THEREFROM

Peter J. Goguen, Fitchburg, Mass., assignor to Jones and Vining, Incorporated, Leominster, Mass.

Filed Jun. 11, 1985, Ser. No. 743,528

Int. Cl.⁴ C09K *11/02*; A43B *13/00*; B29B *7/00*; B29C *45/00*

U.S. Cl. 252—301.35 **8 Claims**

1. A phosphorescent shoe sole made in whole or in part from a composition comprising

(a) about 25–75% by weight of an elastomeric polymer selected from the group consisting of styrenic block copolymers suitable for making footwear, footwear soles, and other footwear parts;

(b) about 20–50% by weight of a processing oil selected from the group consisting of napthenic hydrocarbon oils suitable for use as polymer plasticizers and extenders and mixtures thereof;

(c) about 0.005–1% by weight of a stabilizer selected from the group consisting of hydroxybenzoate ester ultraviolet stabilizers, hindered phenolic anti-oxidant compounds, thioesters or carboxylic acids, and mixtures thereof; and
(d) about 3–30% by weight of a phosphorescent compound, capable of imparting phosphorescent properties to said composition and articles made therefrom.

4,629,584
COMPOSITION OF HEAT-SENSITIVE ELECTROSENSITIVE SUBSTANCES AND A PANEL HEATER MADE THEREFROM
Shigeyuki Yasuda, 1-5-11, Imaike, Chigusa-ku, Nagoya, Japan
Filed Sep. 11, 1984, Ser. No. 649,535
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 **2 Claims**

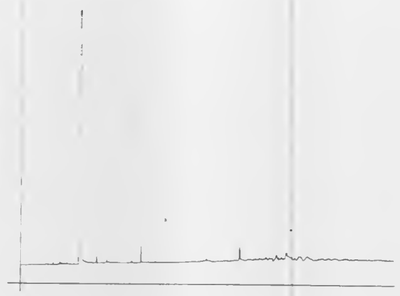


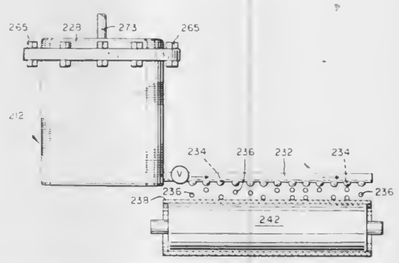
1. A heat-sensitive electroresistive composite which exhibits an abrupt change in electric resistance with increasing temperature, which consists of:
organic compounds containing a plural number of alkylene oxides as the unit structure in their molecules selected from the group consisting of straight chain polyalkylene oxide and its derivatives or cyclic ether compounds; and
fine splinters of carbon in the form of powder, fiber, or whisker.

4,629,585
ANTISTATIC FOAMED POLYMER COMPOSITION
Wendell J. McCracken, South Bend, and Roger C. Schmidt, Mishawaka, both of Ind., assignors to Uniroyal Plastics Company, Inc., Middlebury, Conn.
Filed Jun. 27, 1984, Ser. No. 624,899
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 **12 Claims**

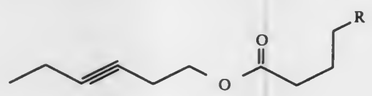
1. A foamable antistatic polymer composition comprising:
(a) at least one thermoplastic polymer selected from the group consisting of polyethylene, polypropylene, polyacrylonitrile, polyacetate, poly(acrylic acid), poly(acrylic acid anhydride), polyacrylate, poly(vinyl chloride) and ABS and EPDM graft polymers thereof;
(b) at least one elastomeric polymer selected from the group consisting of natural rubber, butadiene rubber, poly(-butadiene-styrene), EPDM, butyl rubber, poly(butadiene-acrylonitrile) and chlorinated polyethylene;
(c) conductive carbon black having a BET surface area of at least 500 m^2/gram; and
(d) a blowing agent;
wherein the weight ratio of component (a) to component (b) is between 80:20 and 10:90; and
wherein component (c) comprises between 5 and 25 weight percent of the total weight of components (a), (b), (c) and (d); and
wherein component (d) comprises between 2 and 20 weight percent of the total weight of components (a), (b), (c) and (d).

4,629,586
HEXYNYL ALKANOATES AND ORGANOLEPTIC USES THEREOF
Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel; Michael J. Zampino, North Bergen; Manfred H. Vock, Locust, and Kevin P. Miller, Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 679,386, Dec. 7, 1984, Pat. No. 4,539,209.
This application Jun. 7, 1985, Ser. No. 742,301
Int. Cl.[4] A61K *7/46;* **C11B** *9/00*
U.S. Cl. 252—522 R **8 Claims**





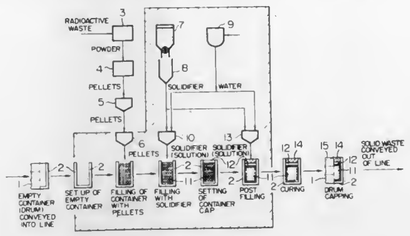
1. A hexynyl alkanoate defined according to the structure:



wherein R represents hydrogen or ethyl.

4,629,587
SOLIDIFYING DISPOSAL SYSTEM FOR RADIOACTIVE WASTE
Keishi Monden; Ryozo Kikkawa, and Susumu Horiuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 28, 1983, Ser. No. 536,444
Claims priority, application Japan, Sep. 29, 1982, 57-170171
Int. Cl.[4] G21F *9/16, 5/00*
U.S. Cl. 252—628 **7 Claims**

1. A radioactive waste disposal system for filling a thin-walled container of an inorganic material with radioactive waste and solidifying said waste by a solidifier, said system comprising: a table for mounting said container; a filling cap disposed just above said table; lifting/lowering means for causing a relative movement between said table and said filling cap until the lower peripheral edge of said filling cap is contacted by the upper peripheral edge of said container; supplying means for supplying said radioactive waste and said solidifier to said filling cap such that, when the filling cap is held in contact with said container, said container is filled with said radioactive waste, said solidifier is than poured into said container and thereafter said solidifier is poured for post-filling after and above a capping of said container; and a capping



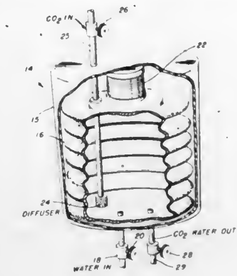
means for capping said container on said table with a cap made of an inorganic material when said filling cap is spaced from said container after filling said container with said radioactive waste and said solidifier.

4,629,588
METHOD FOR REFINING GLYCERIDE OILS USING AMORPHOUS SILICA
William A. Welsh, Fulton, and Yves O. Parent, Sykesville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.
Filed Dec. 7, 1984, Ser. No. 679,348
Int. Cl.[4] C09F *5/10*
U.S. Cl. 260—428 **18 Claims**

1. A process for the removal of trace contaminants, which are phospholipids and associated metal ions, from glyceride oils by adsorbing said trace contaminants onto amorphous silica to yield glyceride oils having 15.0 ppm or less of phosphorus present as phospholipids, comprising:
(a) selecting a glyceride oil with a phosphorus content in excess of about 1.0 ppm,
(b) selecting an adsorbent consisting of an amorphous silica which has an effective average pore diameter of greater than 60 Angstroms,
(c) contacting the glyceride oil of step (a) and the adsorbent of step (b),
(d) allowing said trace contaminants to be adsorbed onto said adsorbent, and
(e) separating the resulting phospholipid- and metal ion-depleted glyceride oil from the adsorbent.

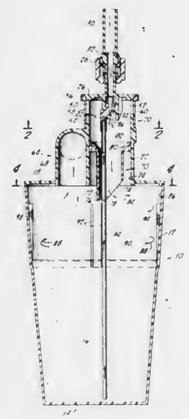
4,629,589
BEVERAGE DISPENSER SYSTEM SUITABLE FOR USE IN OUTER SPACE
Ashis S. Gupta, Marietta; Richard H. Heenan, Atlanta; William S. Credle, Jr.; Robert W. Burke, II, both of Stone Mountain, and Albert J. Cahen, Jr., Roswell, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 22, 1984, Ser. No. 623,125
Int. Cl.[4] B01D *47/00*
U.S. Cl. 261—34.1 **7 Claims**

4. A carbonator for producing carbonated water in a container without forming a gaseous phase therein comprising:
(a) a generally cylindrical carbonation chamber having a central section and an outer, annular section in fluid communication therwith;
(b) water supply means for introducing water to be carbonated into said central section;
(c) rotary impeller means in said central section for creating a centrifugal force which propels said water into said outer annular section;
(d) means for introducing carbon dioxide gas into said outer annular section to carbonate the water therein; and



(e) means for dispensing the carbonated water from the outer annular section.

4,629,590
NEBULIZER
James T. Bagwell, Orange, Calif., assignor to CIMCO, Costa Mesa, Calif.
Filed Oct. 15, 1984, Ser. No. 661,149
Int. Cl.[4] B01F *3/04;* **A61M** *11/02*
U.S. Cl. 261—78.2 **21 Claims**



5. A nebulizer for producing a stream of moisturized gas for inhalation therapy comprising
a closed container having a liquid in a lower portion and having a circular upper portion above the liquid,
mixing means secured to said container for producing a stream comprising a mixture of gas having liquid from said container lower portion entrained therein,
means for projecting said stream at an acute angle to the upper portion of said container so as to flow in a generally horizontal circumferential swirling path around the inner surface of said upper portion,
elongated substantially vertically extending baffle means on said inner surface extending across said path for removing liquid droplets from said stream, and
means for discharging said mixture from said container.

17. A nebulizer for producing a stream of moisturized gas for inhalation therapy comprising
a container for confining a quantity of liquid,
mixing means secured to said container for providing a stream comprising a mixture of gas having liquid from said container entrained therein, said mixing means having a

plurality of apertures including an input port adapted to receive a flow of oxygen, and an air admitting aperture for receiving ambient air to be mixed with said oxygen in said mixing means,

adjusting means for adjustably closing said air admitting aperture,

a removable sealing plug positioned in said air admitting aperture for completely sealing said aperture, whereby said nebulizer may be completely sealed by sealing said plurality of apertures in the nebulizer, and whereby said nebulizer may be operated with said air admitting aperture completely sealed to provide a flow of moisturized oxygen that is free of air, and

means for maintaining said sealing plug in said air admitting aperture comprising an elastic ring secured to said plug and extending around said mixer body.

21. A nebulizer for producing a stream of a mixture of gas and liquid for inhalation therapy comprising

a container confining a body of liquid,

mixing means connected with said container for mixing gas with liquid in said container,

a discharge fitting connected with said container for discharging a liquid gas mixture from the container, and

heater means detachably connected with said discharge fitting for heating the discharged mixture and removing liquid droplets therefrom, said heater means comprising,

a heater input fitting adapted to be connected to said discharge fitting, a heater output fitting adapted to be coupled to an inhalation therapy conduit,

a heater chamber connected to and between said heater input and output fittings, and having a diameter greater than the diameter of said heater input fitting to cause decreased velocity of said mixture and increased removal of liquid droplets in said chamber

means for increasing velocity of the mixture entering said heater chamber and for trapping liquid droplets, said last mentioned means comprising baffle means at said input fitting for decreasing the effective area of said input fitting, and

means for heating a gas-liquid mixture within said heater chamber.

4,629,591

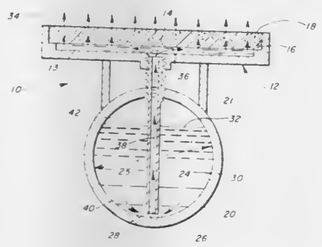
GAS DIFFUSER AND ACCOMPANYING PIPING SYSTEM

Robert H. Forsyth, Englewood, Colo., assignor to A. R. Wilfley & Sons, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 638,776, Aug. 8, 1984, abandoned. This application Aug. 8, 1985, Ser. No. 763,621

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—122 **6 Claims**



1. A combination of a plurality of gas diffusers and accompanying piping system for diffusing gas from a source of pressurized gas into a body of liquid in which said diffusers and piping system are submerged, which comprises:

a plurality of gas diffusers and associated piping systems, each of said diffusers and associated piping systems comprising:

(a) a chamber forming a gas plenum having an inlet opening at its lower end and a larger outlet opening at its upper end;

(b) a porous member closing the larger opening in said plenum;

(c) a length of gas supply pipe associated with said gas plenum, said length of pipe being positioned below said plenum for connection in series with other similar lengths of gas supply pipe, each of said lengths of supply pipe having a transverse opening at its inlet end for introduction of gas to be piped to and into its associated gas plenum and a transverse opening at its outlet end; and

(d) a combination diffuser inlet tube and supply pipe drainer stem extending generally vertically downward from said inlet opening of the gas plenum into said supply pipe to a location closely adjacent to the bottom wall of said supply pipe, with at least part of the bottom end of the combination diffuser inlet tube and supply pipe drainer stem being spaced from said bottom wall, the greatest vertical distance between any point on the bottom end of said combination diffuser inlet tube and supply pipe drainer stem and said bottom wall of the gas supply pipe being no more than about 10 percent of the inside diameter of said supply pipe,

the total cross-sectional area of the gap between said bottom end and said bottom wall being large enough (i) to accommodate the free flow from said supply pipe into said combination inlet tube and drainer stem of liquid having the predetermined viscosity of the body of liquid into which gas is to be dispersed by said diffuser, and (ii) to accommodate the flow of gas from said supply pipe into said drainer stem, and from there into said gas plenum and out its said porous member, at the desired gas flow rate at which said diffuser is designed to be used;

means for interconnecting in series said lengths of supply pipe in said plurality of gas diffusers and associated gas supply pipes;

means for introducing pressurized gas from said source into the first length of gas supply pipe in said series, adjacent said inlet opening thereof; and

closure means for said outlet end of the last length of gas supply pipe in said series,

said combination inlet tubes and drainer stems (i) providing an outlet for unwanted accumulated liquid when said diffusers and associated lengths of gas supply pipes are operated under normal operating pressure, and (ii) being at all times the sole outlet from said lengths of gas supply pipe, in addition to the transverse openings at each end thereof, for either gases or liquids,

whereby unwanted accumulated liquid can be expelled from said lengths of supply pipe through said combination inlet tubes and drainer stems and out the porous members of said gas plenums when gas is first introduced into said lengths of supply pipe, and thereafter gas can flow from each length of supply pipe into its associated gas plenum and out through said porous members into the body of liquid being treated.

4,629,592

METHOD AND APPARATUS UTILIZING INFLATABLE MEMBRANE FORM FOR CONSTRUCTION OF CONCRETE SHELL BUILDING

Horrall Harrington, 613 Berlin Rd., Pittsburgh, Pa. 15221, and Phillip J. Vittore, 1306 W. Noyes, Arlington Heights, Ill. 60005

Filed Jan. 22, 1986, Ser. No. 821,287

Int. Cl.⁴ B28B *7/32*; **E04G** *11/04*

U.S. Cl. 264—32 **11 Claims**

1. A form assembly for use in constructing a concrete shell for a building of the kind comprising a base wall enclosing the perimeter of a building space and a concrete shell covering that building space, the form assembly comprising:

a membrane form support aligned with and extending along the top of the inner face of the base wall, the form support affording an elongated groove formation facing inwardly of the wall toward the building space, the groove formation including, in sequence starting at its inner surface, a substantially horizontal shelf of width **W1** constituting a minor fraction of the base wall thickness, a recess of height **H1** and width **W2**, and a vertical wall segment of height **H2**, with **W1>W2**;

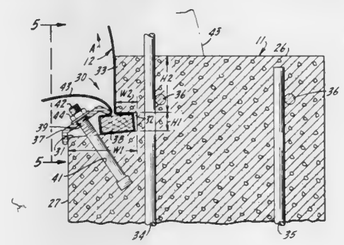
an inflatable membrane form covering the building space;

a multiplicity of elongated rail members each having a height **H3** slightly smaller than **H1** and a width **W3** such that **W1>W3>W2**, each rail member wrapped in a segment of the edge portion of the membrane form with the rail member supported on the shelf and inserted into the recess;

a multiplicity of elongated metal retainer plates;

and retainer plate mounting means, affixed to the part of the form support affording the shelf, for mounting the metal retainer plates on that part of the form support with each retainer plate engaging an outer segment of the edge portion of the membrane form wrapped around a rail member to anchor the rail members and the edge portion of the membrane form to the form support.

7. The method of installing an inflatable membrane form for construction of a building of the kind comprising a base wall



enclosing the perimeter of a building space and a concrete shell covering that building space, comprising:

A. erecting a base wall with a groove formation formed as an integral part of the top of the inner face of the base wall, facing inwardly of the wall toward the building space, the groove formation including, in sequence starting at the inner surface of the wall, a substantially horizontal shelf of width **W1** constituting a minor fraction of the base wall thickness, a recess of height **H1** and width **W2**, and a vertical wall segment of height **H2**, with **W1>W2**;

B. affixing retainer plate mounting means to the part of the base wall affording the shelf;

C. covering the building space with an inflatable membrane form in deflated condition;

D. wrapping the edge portion of the membrane form in a multiplicity of elongated rail members each having a height **H3** slightly smaller than **H1** and a width **W3**, such that **W1>W3>W2**;

E. inserting each wrapped rail member into the recess in the groove formation;

F. utilizing the retainer plate mounting means to mount a multiplicity of metal retainer plates on the part of the base wall affording the shelf, with each retainer plate engaging an outer segment of the edge portion of the membrane form wrapped around a rail member to anchor the rail members and the edge portion of the membrane form to the base wall; and

G. thereafter inflating the membrane form.

4,629,593

PROCESS FOR PRODUCING POLYCRYSTALLINE, TRANSLUCENT SINTERED TUBES

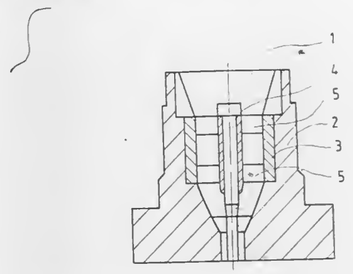
Heinrich Groh, Lauf, and Reinhold Gradl, Rueckersdorf, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,176

Claims priority, application European Pat. Off., Aug. 26, 1983, 83108397

Int. Cl.⁴ C04B *35/64*

U.S. Cl. 264—63 **14 Claims**



1. A process for producing polycrystalline, translucent sintered tubes, comprising the steps of:

(a) preparing a water-soluble paste-like plasticizer mixture comprising:

(1) an adhesive selected from the group consisting of polyvinyl alcohol adhesives, low-viscosity, weakly-swelling methylcellulose adhesives, and mixtures thereof,

(2) at least one lubricant selected from the group consisting of fats and oils,

(3) glycerol, and

(4) a wetting agent;

(b) mixing the plasticizer mixture from step (a) with aluminum oxide powder and water to form a homogeneous plasticizer mass;

(c) cold forming the plasticized mass in an extrusion press to produce an unfired tubular body having a glossy surface and a density from about 50 to about 70% of the theoretical density of aluminum oxide; and

(d) firing the extruded tubular body to a polycrystalline, translucent sintered tube.

4,629,594

METHOD OF PRODUCING SHAPED PARTS

Edmund Munk, Oberstenfeld, Fed. Rep. of Germany, assignor to Werzalit-Werke J. F. Werz KG, Oberstenfeld, Fed. Rep. of Germany

Division of Ser. No. 573,561, Jan. 26, 1984, Pat. No. 4,544,344. This application Mar. 26, 1985, Ser. No. 716,233

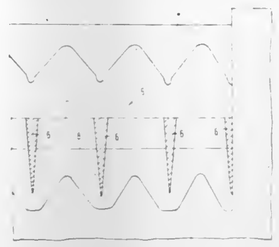
Claims priority, application European Pat. Off., Feb. 5, 1983, 83101104

Int. Cl.⁴ B29C *43/04*

U.S. Cl. 264—69 **3 Claims**

1. A method of producing shaped parts from a non-swellable mixture of fibers with a heat-hardenable synthetic plastic, comprising the steps of providing upper and lower pressing tools movable between an open position in which they are spaced from one another and a space therebetween is filled with said mixture and a closed position in which they are located close to one another and said mixture is pressed therebetween; providing a pressing mass divider and introducing said divider into said space before a filling step and dividing the mixture by said pressing mass divider during filling of the

mixture into said space; and removing said pressing mass divider from said space between the upper and lower pressing



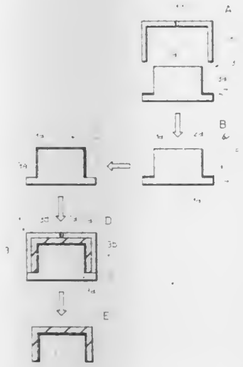
tools before said upper and lower pressing tools are moved to said closed position and said mixture is pressed.

4,629,595

METHOD OF MAKING A PLASTIC CASING WITH A CONDUCTIVE FILM

Tosikazu Ito, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Obu, Japan

Filed Feb. 28, 1985, Ser. No. 706,551
Claims priority, application Japan, Mar. 12, 1984. 59-45876
Int. Cl.⁴ B29D *9/00*
U.S. Cl. 264—104 **11 Claims**



1. A method of making a plastic casing with a conductive film in a mold set having a movable mold half and a fixed mold half, each defining a respective mold surface, wherein when the movable mold half and the fixed mold half are closed, a cavity for forming a plastic casing is defined between the mold halves, comprisig the steps of:
(a) coating removably at least one of the mold surfaces facing the cavity with a conductive coating material containing a coarse conductive powder and a thermoplastic resin binder dissolved in a solvent;
(b) drying the coated conductive material with heat to form a solidified film having a rugged surface;
(c) closing the movable mold half and the fixed mold half;
(d) injecting a fluidized thermoplastic material under pressure into the cavity between the mold halves to form a casing in contact with said conductive coating;
(e) applying additional pressure to the injected thermoplastic material to plasticize and compress the solidified film of conductive material due to the pressure and heat of the injected thermoplastic material, said additional pressure and said heat being sufficient to sever the binder which thereby causes the particles of coarse conductive powder to be densely collected into point-to-point and/or surface-to-surface contact and to anchor the solidified film to the surface of the thus molded casing;
(f) releasing the movable mold half from the fixed mold half and
(g) removing the plastic casing with the conductive film from the mold set.

4,629,596

NON DELAMINATING REGRIND

Paul M. Coffman, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 2, 1984, Ser. No. 606,050
Int. Cl.⁴ B29C *63/00*; B32B *27/08, 31/30*
U.S. Cl. 264—171 **9 Claims**

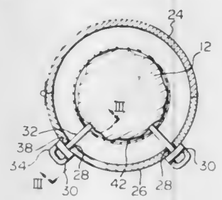
1. A regrind composition comprising:
from about 50% by weight to about 93% by weight polypropylene, from about 2% by weight to about 40% by weight ethylenevinyl alcohol, from about 5% by weight to about 40% by weight adhesive, and from about 20% by weight to about 95% by weight inorganic mineral filler of the total amount of said ethylenevinyl alcohol, said polypropylene and said adhesive to prevent delamination.
9. A method for making a formed article, comprising the steps of:
regrinding scrap sheet which contains polypropylene, ethylvinyl alcohol and adhesive;
adding to said scrap sheet regrind an inorganic mineral filler which will disperse with said regrind in an amount sufficient to prevent delamination between layers of said sheet from which said formed article is made;
coextruding said filler containing regrind with ethylenevinyl alcohol, adhesive, and polypropylene into a coextruded sheet; and
forming the desired article from said coextruded sheet.

4,629,597

FORMING OF CABLE SPLICE CLOSURES

Leonard J. Charlebois, Kanata; Allan P. Brown, Ottawa, and James R. Scott, Ashton, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1985, Ser. No. 752,750
Int. Cl.⁴ B29C *39/18*; H01B *13/32*; H01R *43/00*
U.S. Cl. 264—278 **3 Claims**



1. A method of forming an encapsulation around a sealed splice region between two cables comprising:
disposing the cables within a mold to locate the splice region therein, the splice region having a tie means secured to it, then inserting at least two hook members through sufficiently large apertures in the mold;
turning the hook members (a) to engage the mold on inner and outer surfaces to retain them in a fixed position in relation to the mold cavity and (b) to engage the tie means at two circumferentially spaced positions around the splice region so as to secure the hook members to the splice region and hold the splice region disposed in a desired position within the cavity and spaced from the mold parts;
filling the mold cavity with molten encapsulation material; and

removing the hook members from the mold with the encapsulating material still in a flowable condition.

4,629,598

METHOD FOR FORMING PLASTIC BOTTLE WITH INTEGRAL HANDLE

Mortimer S. Thompson, Arlington, Mass., assignor to Tri-Tech Systems International, Inc., West Springfield, Mass.

Division of Ser. No. 458,369, Jan. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 237,081, Feb. 23, 1981, Pat. No. 4,372,454, which is a division of Ser. No. 28,886, Apr. 10, 1979, Pat. No. 4,280,859, which is a continuation of Ser. No. 877,603, Feb. 14, 1978, abandoned. This application Aug. 23, 1984, Ser. No. 643,653
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.⁴ B29C *49/06, 49/12*
U.S. Cl. 264—537 **4 Claims**



1. A method for forming a plastic bottle, comprising:
forming a preform from plastic having a neck of the finished bottle, an expandable portion below the neck, and an integral handle including a ring which is integral with and extends about the lower end of the neck, and a projection which extends outwardly and downwardly from the ring adapted to be relatively close to the center of gravity of the finished bottle to facilitate lifting, carrying and pouring and for distributing the stresses resulting therefrom about said ring,
placing the preform in means for expansion and holding said ring by such means to properly locate and restrict the movement of the preform therewithin, and
expanding the portion below the ring to a breadth substantially greater than the breadth of the neck to thereby form the body of the plastic bottle.

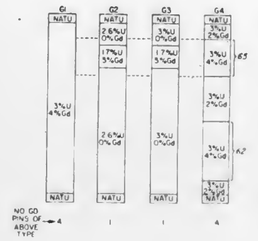
4,629,599

BURNABLE ABSORBER ARRANGEMENT FOR FUEL BUNDLE

Russell L. Crowther, Saratoga, and Dennis B. Townsend, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 619,499, Jun. 11, 1984, abandoned, which is a continuation of Ser. No. 360,389, Mar. 22, 1982, abandoned. This application Nov. 18, 1985, Ser. No. 799,333
Int. Cl.⁴ G21C *7/04*
U.S. Cl. 376—212 **17 Claims**

1. In a boiling water reactor core whose operation is characterized by a substantial proportion of steam voids with concomitantly reduced moderation toward the top of said core when said reactor is in its hot operating condition, said reduced moderation leading to slower burnup and greater conversion ratio in an upper core region so that when said reactor is in its cold shut down condition the resulting relatively increased moderation in said upper core region is accompanied by a reactivity profile that peaks in said upper core region, a fuel assembly comprising:
a component of fissile material distributed over a substantial axial extent of said fuel assembly; and
a component of neutron absorbing material having an axial distribution characterized by an enhancement in an axial zone of said fuel assembly, designated the cold shutdown control zone, corresponding to at least a portion of the axial region of said core when the cold shutdown reactivity peaks, the aggregate amount of neutron absorbing material in said cold shutdown zone of said fuel assembly being greater than the aggregate amount of neutron absorbing material in the axial zones of said fuel assembly



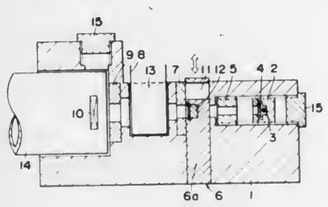
immediately above and immediately below said cold shutdown control zone whereby the cold shutdown reactivity peak is reduced relative to the cold shutdown reactivity in said zones immediately above and immediately below said cold shutdown control zone, said cold shutdown zone having an axial extent measured from the bottom of the fuel assembly in the range between 68–88 percent of the height of said fissile material in said fuel assembly.

4,629,600

METHOD AND APPARATUS FOR MEASURING URANIUM ISOTOPE ENRICHMENT

Nobuharu Ishiguro, Yokohama, and Akira Kurosawa, Hitachi, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,915
Claims priority, application Japan, Apr. 13, 1983, 58-64750
Int. Cl.⁴ G21C *17/06*
U.S. Cl. 376—257 **8 Claims**



1. A method for measuring uranium isotope enrichment including the steps of irradiating photons of an energy lower than the uranium K-edge energy and other photons of an energy higher than that energy onto a sample containing uranium to determine the concentration of uranium in the sample from the respective intensities of the photons which penetrate the sample, measuring an intensity of gamma rays emitted from the sample due to the alpha decay of uranium-235 in the sample, and obtaining a value of uranium isotope enrichment from the measured intensity of gamma rays emitted from the uranium-235 in the sample and the concentration of uranium in the sample, characterized in that the photons irradiated onto the sample are produced by an interaction of a sealed radiation source of cobalt-57 with an uranium foil, and that a piece of highly-enriched uranium metal is disposed in the vicinity of the sample so as to separately measure intensities of gamma rays emitted from the highly-enriched uranium metal at the time of

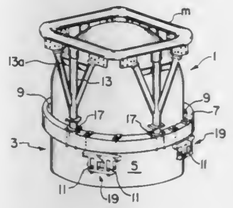
no sample present and at the time of the sample being present, and a self-absorption correction factor of gamma rays in the sample is obtained from the function of the intensity of gamma rays at the time of no sample present and of the intensity of gamma rays at the time of the sample being present, thereby correcting the measured intensity of gamma rays emitted from the uranium-235 in the sample.

4,629,601

STIRRUP-TYPE SUPPORT STRUCTURE FOR NUCLEAR POWER PLANT PRESSURIZER VALVES

Ronald M. Blaushild, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,073
Int. Cl.⁴ G21C *15/18*
U.S. Cl. 376—463 **12 Claims**



1. A support structure for supporting a pressurizer safety and relief valve system of a pressurized water reactor, said system being mounted on columnar supports above a pressurizer vessel comprising:

a ring girder surrounding the pressurizer wall and spaced therefrom;

a plurality of pairs of spaced lugs extending outwardly from the pressurizer wall and affixed thereto at a position below said ring girder; and

frames for supporting said ring girder on said lugs; with said columnar supports being supported by the ring girder at a location spaced from said supporting frames.

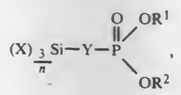
4,629,602

PHOSPHOSILICONE/SILICATE COPOLYMERS AND THEIR USE AS CORROSION INHIBITORS AND SILICATE STABILIZERS IN ANTIFREEZES

Charalampos Gousetis; Knut Oppenlaender, both of Ludwigshafen; Gert Liebold, Edingen-Neckarhausen, and Klaus Pfitzner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 30, 1985, Ser. No. 793,086
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440194
Int. Cl.⁴ C09K *5/00*; C08G *77/22*
U.S. Cl. 422—7 **10 Claims**

3. A radiator antifreeze based on glycol, containing from 500 to 5000 ppm, based on the said antifreeze, of an organosilane/-silicate copolymer which is obtained by reacting an organic phosphosilicon compound of the formula I



(I)

where Y is a divalent aliphatic or cycloaliphatic radical of 1 to 10 carbon atoms or a phenylenealkylene group of 7 to 10 carbon atoms and n can be 1 or 2, and when n is 1, X is an OR^3 group in which R^3 is a straight-chain, branched or cyclic alkyl group of 1 to 13 carbon atoms which may be interrupted by oxygen atoms or is acyl of not more than 9 carbon atoms, and R^1 and R^2 are identical or different and are each a straight-chain, branched or cyclic alkyl group of 1 to 13 carbon atoms which may be interrupted by oxygen atoms, or is an aryl or aralkyl group of not more than 20 carbon atoms, and when n is 2, X is oxygen and R^1 is an alkali metal and R^2 has the above meanings, with a silicate of the formula

$$(MO)_qSiO_{\frac{4-q}{2}} \qquad (II)$$

where M is an alkali metal and q is from 0.4 to 4, in a weight ratio of from 1:1 to 1:10.

4,629,603

METHOD OF INHIBITING COLD END CORROSION IN BOILERS

Mark W. Salihar, Berwyn, Ill.; Gary G. Engstrom, Kenosha, Wis., and Donald P. Gauwitz, McHenry, Ill., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,157
Int. Cl.⁴ C23F *11/00, 11/02*
U.S. Cl. 422—9 **12 Claims**

1. In a method of reducing corrosion and inhibiting fouling of metal surfaces in contact with sulfur trioxide-containing combustion gases in a furnace system by adding at least one liquid acid gas neutralizing agent, the improvement comprising a step of adding a liquid borate to the combustion gases which are at a temperature of about 250° to about 1000° F. as the at least one acid gas neutralizing agent in an amount effective to form, upon evaporation of the at least one liquid acid gas neutralizing agent added, solids which are friable so that any deposit thereof on said metal surfaces can be easily removed.

4,629,604

MULTI-AROMA CARTRIDGE PLAYER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 477,353, Mar. 21, 1983, which is a continuation-in-part of Ser. No. 412,080, Aug. 27, 1982. This application Dec. 2, 1983, Ser. No. 557,250
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.⁴ A61L *9/03*; G03B *21/50*
U.S. Cl. 422—124 **9 Claims**

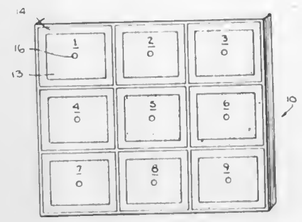
1. An aroma generator kit comprising:

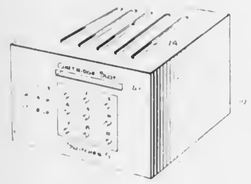
(A) a replaceable cartridge having a planar array of like frame assemblies held within a multi-section framework, each assembly being formed by a pad of absorbent air-pervious material held at its peripheral edge between two frames of said multi-section framework, said two frames of each said assembly defining an open central zone exposing a central area of said pad, said central area being impregnated with a liquid fragrance wherein each said assembly carries a different liquid fragrance;

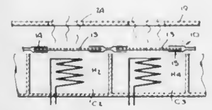
(B) a case having a top wall, side walls, an open top multi-cell honeycomb structure contained within said case, a slot in one of said side walls for receiving said cartridge and for positioning said cartridge within said case above said honeycomb structure, each cell of said honeycomb structure being provided with a selectively activated heater, and vent means within one of said case walls at a position above said slot whereby when said cartridge is received in said slot the open top of each of said cells is in registration with a respective assembly of said cartridge and a confined air region is formed within each cell below its respective assembly; and

(C) switching means associated with said case for selectively activating each of said heaters, whereby when a heater of an individual cell is activated the confined air region within said individual cell is heated resulting in a positive air pressure within said individual cell which forces air

through the central area of the respective assembly thereby volatilizing the liquid fragrance of the respective







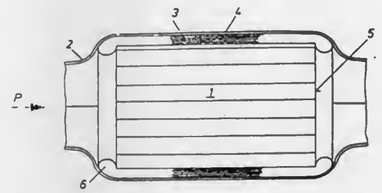
assembly to produce an aromatic vapor which is discharged through said vent means.

4,629,605

DEVICE FOR CATALYTICALLY PURIFYING EXHAUST GASES FOR A COMBUSTION ENGINE

Enrique Santiago, Diedorf, Fed. Rep. of Germany, assignor to Zeuna-Staerker GmbH & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 438,795, Nov. 3, 1982, abandoned, which is a continuation of Ser. No. 261,160, Apr. 30, 1981, abandoned. This application Apr. 24, 1985, Ser. No. 726,275
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1979, 2935470
Int. Cl.⁴ B01J *8/00, 35/04*
U.S. Cl. 422—179 **4 Claims**



1. In a device for catalytically purifying internal combustion engine exhaust gases comprising a monolithic catalyzer body having an axial length through which exhaust gases can pass, said body being elastically supported inside a metal housing by elastic supporting means such that an annular space is located between said body and an interior surface of the housing, said elastic supporting means being an annular packing located at least partially within said annular space and forming a gas-tight seal which substantially prevents the flow of exhaust gases around the catalyzer body and through the annular space, the improvement comprising;

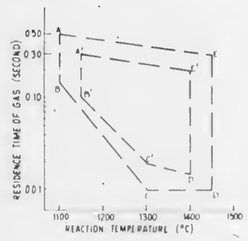
said elastic supporting means being comprised of a plurality of layers substantially completely comprised of metal-wire meshwork and a plurality of layers substantially completely comprised of a non-combustible ceramic fiber material, said layers of metal-wire meshwork extending substantially the entire axial length of the catalyzer, said meshwork layers and fiber layers being alternately wrapped annularly around the catalyzer body and at least partially overlapping one another, said layers of ceramic material being wrapped around the catalyzer body in the form of strips, said housing, catalyzer body and elastic supporting means being arranged and constructed such that during assembly said layers are compressed between the catalyzer body and the interior surface of the housing to such an extent that said compression substantially alone causes the fiber material and metal-wire meshwork to substantially completely mutually penetrate each other in at least an axial section of the metal-wire meshwork thereby to form a gas-tight seal in the annular space to substantially prevent the flow of exhaust gases around the catalyzer body through the annular space.

4,629,606

RECOVERY OF TUNGSTEN COMPOUNDS

Yoshiyuki Imagire, Musashino; Teruhiko Hirabayashi, Tokyo; Nobuo Nonaka, Tokorozawa; Toshifumi Kitagawa, Kawaguchi; Yasukazu Murakami, Matsudo; Iwao Abe; Shinzo Uda, both of Ohtake; Osamu Ohshima, Yamaguchi, and Etsuo Takemoto, Ohnomachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,402
Claims priority, application Japan, Jul. 18, 1984, 59-149079
Int. Cl.⁴ C01G *41/00*
U.S. Cl. 423—53 **6 Claims**



1. A process for recovering a tungsten compound which is soluble in water, from a waste liquor containing the tungsten compound and high boiling organic compounds that can be burned at a temperature of from 1100° to 1450° C., which comprises the steps of: feeding air and said waste liquor to a nozzle associated with a reaction furnace, spraying a mixture of the air and said waste liquor from said nozzle into said reaction furnace so that the volume ratio of the amount of air fed into said reaction furnace to the ideal amount of air that is required to burn said waste liquor completely is at least 1.05/1, and effecting high intensity, self-combustion of said waste liquor in said reaction furnace at a high temperature and for a short residence time that fall within the closed pentagonal region defined by straight lines connecting the points A, B, C, D and E in the attached FIG. 1, and then, at the end of said residence time, immediately discharging the high temperature gaseous product of said combustion step from said furnace and quenching it by directly contacting it with water whereby the

tungsten compound is dissolved in the water to form an aqueous solution, and thereby recovering the tungsten compound.

4,629,607

PROCESS OF PRODUCING SYNTHETIC RUTILE FROM TITANIFEROUS PRODUCT HAVING A HIGH REDUCED TITANIUM OXIDE CONTENT

Michel Gueguin, 22 Chemin Dusous Bois, Tracy, Canada J3R 2Y5

Filed Dec. 27, 1984, Ser. No. 686,993
Int. Cl.[4] C01G *23/07*
U.S. Cl. 423—74 **19 Claims**

1. An improved fluid bed process for producing a synthetic rutile from a titaniferous iron material containing reduced titanium oxide, the process including the selective chlorination of iron metal contained in the titaniferous iron material, said improvement comprising:

(a) preheating the titaniferous iron material, up to a temperature of at least 700° C., by contacting it with a heated gas substantially void of free oxygen;

(b) feeding the preheated titaniferous iron material to a fluid bed at a temperature of at least 900° C. and maintaining the material in motion in the bed by a flow of gas containing nitrogen and chlorine;

(c) removing solid synthetic rutile and gaseous chlorinated iron from the fluid bed.

4,629,608

PROCESS FOR THE REMOVAL OF H_2S FROM GEOTHERMAL STEAM AND THE CONVERSION TO SULFUR

Robert D. Lampton, Jr., and Thomas M. Hopkins, II, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1985, Ser. No. 748,292
Int. Cl.[4] C01B *17/04*; F03G *7/00*
U.S. Cl. 423—226 **9 Claims**

1. A process for removing H_2S from a geothermal fluid stream containing H_2S which comprises

(A) contacting said H_2S stream in a first reaction zone with an aqueous solution at a pH range suitable for removing H_2S wherein said solution contains

(1) an effective amount of at least one ferric chelate, and

(2) an effective amount of one or more water soluble cationic polymeric catalysts

whereby the conversion of H_2S to free sulfur is accelerated in the presence of said polymeric catalyst and said ferric chelate is reduced to ferrous chelate,

(B) contacting said solution containing ferrous chelate in a second reaction zone with an oxygen containing gas stream whereby said ferrous chelate is reoxidized to form a ferric chelate containing solution, and

(C) recirculating said ferric chelate containing solution back to said first reaction zone.

4,629,609

PROCESS OF REMOVING SO_x AND NO_x FROM WASTE GASES

Heinrich Frühbuss, Hubert-Reissnerstr. 5a, 8032 Gräfelfing, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 674,018
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342500
Int. Cl.[4] B01J *8/00*; C01B *21/00, 17/00*
U.S. Cl. 423—239 **7 Claims**

1. Process of removing So_x and NO_x from waste gases which comprises the steps of and in sequence

(1) removing substantially all of the SO_x present in the gas by contacting said waste gas with an adsorptive coke having an adsorptive capacity for SO_2 of above 40 g SO_2 per kg of coke,

(2) introducing NH_3 into the gas now substantially free of SO_x,

(3) subjecting the NH_3 containing gas to contact with a catalyst having an adsorptive capacity for SO_2 of below 10 g per kg of catalyst containing as effective ingredient at least one member of the group of aluminum, copper, cobalt, nickel, iron and vanadium oxide supported on coke for reducing the NO_x to N_2, and

(4) recovering the SO_x and NO_x free gas.

4,629,610

HYDROGEN FLUORIDE RECOVERY PROCESS

David D. Friese, Concord, and Mark A. Van Dort, Pleasant Hill, both of Calif., assignors to Dow Chemical Co., Midland, Mich.

Filed May 10, 1985, Ser. No. 732,532
Int. Cl.[4] C01B *7/19*
U.S. Cl. 423—240 **10 Claims**

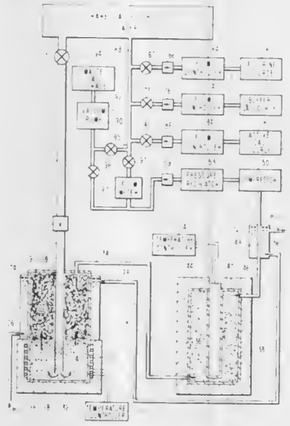
1. A process for recovering hydrogen fluoride from waste stream gases containing hydrogen fluoride which comprises contacting said waste stream with a scrubbing agent comprising a chlorinated pyridine.

4,629,611

GAS PURIFIER FOR RARE-GAS FLUORIDE LASERS

Bunsen Fan, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,121
Int. Cl.[4] C01B *7/00, 9/08*
U.S. Cl. 423—240 **6 Claims**



1. A closed-cycle gas purification method for rare-gas fluorine mixtures, comprising the steps of:

contacting a gas mixture comprising a rare gas and fluorine with titanium at a temperature above 150 degrees C. to convert fluorine in said gas mixture to titanium tetrafluoride vapor, said titanium possibly also containing silicon impurity which simultaneously becomes converted to silicon tetrafluoride vapor;

removing said titanium tetrafluoride vapor from said gas mixture by condensation;

after removing said tetrafluoride vapor from said gas mixture, removing any silicon tetrafluoride vapor from said gas mixture by contacting said gas mixture with an alkaline earth oxide to convert any silicon tetrafluoride to an alkaline earth difluoride and silicon dioxide; and

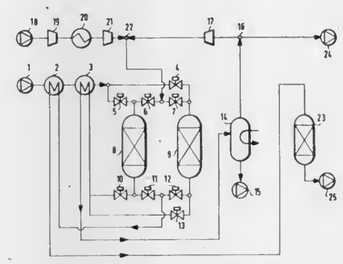
removing residual contaminants from said gas mixture by contacting said gas mixture with a metal getter at a temperature above 600 degrees C.

4,629,612

REACTION MASS, METHOD FOR THE MANUFACTURE THEREOF AND USE THEREOF

Willem J. J. van der Wal, Utrecht, and John W. Geus, Bilthoven, both of Netherlands, assignors to VEG-Gasinstituut N.V., Apeldoorn, Netherlands

Filed Jul. 26, 1983, Ser. No. 517,367
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228481
Int. Cl.[4] C01B *2/10*; B01D *53/54*
U.S. Cl. 423—244 **8 Claims**



1. Process for conducting the shift reaction of carbon monoxide with steam to form carbon dioxide and hydrogen at elevated temperatures comprising passing carbon monoxide and steam through a reaction mass which includes

(a) mixed oxides of iron with one or more metals from the group consisting of zinc, cobalt and of metals of groups IV to VII of the periodical table of the elements,

(b) the content of iron oxide in the mixed oxide being less than 100 atomic percent and more than 10 atomic percent, based on the total quantity of atoms of the metals in the mixed oxide,

(c) the mixed oxide being on a thermostable oxidic carrier carrier which has a specific surface area of more than 10 m^2 per g,

(d) the mixed oxide being present on the carrier in a quantity of at least 5 wt.%, calculated as elemental metals of the mixed oxides forming the active component and based on the weight of the carrier,

(e) at least 20 wt.% of the mixed oxide on the carrier being in finely divided form with a particle size of less than 40 nm.

2. Process for removing sulfur compounds from gases which comprises passing a sulfur compound-containing gas through a reaction mass comprising

(a) mixed oxides of iron with one or more metals from the group consisting of zinc, cobalt and of metals of groups IV to VII of the periodical table of the elements,

(b) the content of iron oxide in the mixed oxide being less than 100 atomic percent and more than 10 atomic percent, based on the total quantity of atoms of the metals in the mixed oxide,

(c) the mixed oxide being on a thermostable oxidic carrier which has a specific surface area of more than 20 m^2 per g,

(d) the mixed oxide being present on the carrier in a quantity of at least 5 wt.% calculated as elemental metals of the mixed oxides forming the active component and based on the weight of the carrier,

(e) at least 20 wt.% of the mixed oxide on the carrier being in finely divided form with a particle size of less than 40 nm.

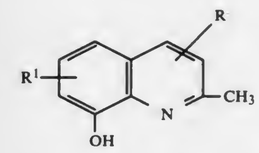
4,629,613

STABILIZED SOLUTIONS OF HYDROXYLAMINE OR ITS SALTS IN WATER OR ALCOHOLS, AND THEIR PREPARATION

Otto-Alfred Grosskinsky; Elmar Frommer; Josef Ritz, all of Ludwigshafen; Erwin Thomas, Freinsheim, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,071
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345734
Int. Cl.[4] C01B *21/20*
U.S. Cl. 423—265 **4 Claims**

1. An oxygen-free stabilized solution of hydroxylamine or its salts in water or an alcohol which is stable over a prolonged period which contains an 8-hydroxyquinaldine of the formula I



I

where R and R^1 are each hydrogen, hydroxyl, C_1–C_4-alkoxy or C_1–C_4-alkyl.

4,629,614

PROCESS FOR DECONTAMINATING PHOSPHORIC ACID

Günther Schimmel, and Reinhard Gradl, both of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,507
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442142
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 R **6 Claims**

1. In a process for removal of residual impurities as arsenic, fluorine and organic contaminants from wet-process phosphoric acid prepurified by liquid/liquid extraction with an organic solvent as extractant the improvement comprising the steps:

(a) freeing the prepurified acid from residual extractant by stripping with steam or hot gas;

(b) contacting then the stripped acid with dialkyldithiophosphoric acid ester and a fine particulate adsorbent with the resultant formation of a dispersion;

(c) separating solid matter from the dispersion;

(d) and treating the remaining liquid phase simultaneously with steam and hydrogen peroxide and thereby removing fluorine and organic contaminants in a single step from the said liquid phase.

4,629,615

COUNTER-ROTATIONAL FLOW IN A CARBON BLACK REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 391,896, Jun. 24, 1982, Pat. No. 4,501,720.
This application Sep. 17, 1984, Ser. No. 633,769
Int. Cl.[4] C09C *1/48, 1/50*
U.S. Cl. 423—456 **7 Claims**

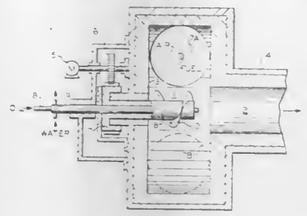
1. A method for producing carbon black employing a carbon black reactor which comprises

(a) a cylindrical precombustion zone;

(b) a combustion gas introduction means located so as to tangentially introduce combustion gas into said cylindrical precombustion zone; and

(c) cylindrical reaction zone in open communication with said cylindrical precombustion zone, wherein the axis of rotation of said cylindrical reaction zone and the axis of rotation of said cylindrical precombustion zone are substantially collinear, said method comprising

tangentially introducing a combustion gas into the cylindrical precombustion zone of said carbon black reactor to create a spiralling flow and subjecting a portion of said spiralling flow



to a counter-rotational force within said cylindrical precombustion zone; wherein said counter-rotational force is created by a helix-shaped fin positioned at least partially within said cylindrical precombustion zone; wherein the axis of rotation of said helix-shaped fin and the axis of rotation of said cylindrical precombustion zone are substantially collinear; and wherein said helix-shaped fin is rotated about its axis by a motorized means thereby facilitating the creation of said counter-rotational force.

4,629,616

BASIC CHROMIUM ALUMINUM SULFATES AND THEIR PREPARATION

Werner Ostertag, Gruenstadt; Henning Wienand, Neulussheim; Dietrich Lach, Friedelsheim, and Erwin Hahn, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,769

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 3310270

Int. Cl.⁴ C01B *17/96;* **C01G** *37/14;* **C14C** *9/00*

U.S. Cl. 423—544 **3 Claims**

1. A process for the preparation of water-soluble basic chromium aluminum sulfate based tanning agent having a high rate of solubility at room temperature of the formula

$$Cr_xAl_{2-x}(OH)_{2y}(SO_4)_{3-y}\cdot nH_2O$$

where

x is from 0.1 to 1.9,

y is from 0.01 to 2 and

n is from 4 to 24,

which process comprises

(a) using chromium (III)-containing waste sulfuric acid as a starting material,

(b) concentrating said acid to a water content of 20–50% by weight,

(c) adding to the acid (b) an aluminum compound selected from the group comprising aluminum oxide and/or aluminum oxide hydroxide and/or aluminum hydroxide in an amount which is not less than 0.01 mole above the stoichiometric amount required for the formation of the sulfate of the formula $M_2(SO_4)_3$ where M is Al or Cr,

(d) reacting the mixture at a temperature of from 100° to 200° C.,

(e) converting the molten product to droplet form and solidifying the droplets in free fall.

4,629,617

METHOD FOR THE PREPARATION OF HYDROGEN SULFIDE

Karl Voigt, Rodenbach; Reinhold Reck, Maintal; Friedrich Bittner, Bad Soden, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,074

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437010

Int. Cl.⁴ C01B *17/16*

U.S. Cl. 423—563 **15 Claims**

1. A method for the preparation of hydrogen sulfide from its respective elements consisting essentially of separately charging sulfur and hydrogen through two coaxially oriented pipes to a reaction zone wherein the sulfur is charged to the reaction zone through inner pipe means and the hydrogen is charged to the reaction zone through outer pipe means and conducting a flame reaction at a temperature in the range of 650° to 1300° C. by simultaneously blending and converting the hydrogen and sulfur in a diffusion flame at the point of introduction of said sulfur and hydrogen into the reaction zone, in the absence of a catalyst, to thereby form a reaction product consisting essentially of H_2S, and subsequently quickly cooling the reaction mixture.

4,629,618

BOEHMITE

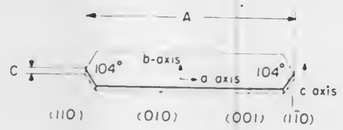
Yasuo Oguri, Belmont, Mass.; Junji Saito, Yokohama, and Naoto Kijima, Machida, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 641,722, Aug. 17, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 840,543

Claims priority, application Japan, Aug. 23, 1983, 58-153466

Int. Cl.⁴ C01F *7/02*

U.S. Cl. 423—625 **2 Claims**



1. A boehmite having an orthorhombic crystal form in which the length in the direction of the a-axis of the crystal is about 18,000 Å, the length of the direction of the c-axis of the crystal is about 800 Å, and the ratio of the length of the a-axis to the length of the c-axis is about 22.5, prepared by the process comprising:

hydrothermally treating an aqueous slurry of gibbsite in the presence of calcium hydroxide and polyvinyl alcohol.

4,629,619

MEMBRANE-COATED SUSTAINED-RELEASE TABLETS AND METHOD

Ake R. Lindahl, Skurup, and Stig A. B. Erlandsson, Malmo, both of Sweden, assignors to AB Ferrosan, Malmo, Sweden

Division of Ser. No. 647,928, Sep. 5, 1984, Pat. No. 4,557,925, which is a continuation of Ser. No. 396,391, Jul. 8, 1982, abandoned. This application Sep. 19, 1985, Ser. No. 777,956

Int. Cl.⁴ A61K *9/28, 9/32*

U.S. Cl. 424—15 **19 Claims**

1. Method of producing a sustained-release coated pharmaceutical tablet comprising a drug-containing tablet and a coating or membrane surrounding the same, wherein the coating or membrane is water-insoluble and insoluble in gastrointestinal fluids and consists essentially of a terpolymer of polyvinylchloride, polyvinylacetate and polyvinylalcohol and a water-soluble pore-creating substance, the said pore-creating substance being randomly distributed in said terpolymer coating, said pore-creating substance being present in amount of one part to 35 parts for each one to ten parts of terpolymer, said coated tablet exhibiting a substantially constant dissolution rate during a major portion of its dissolution time when exposed to gastrointestinal fluids, comprising the steps of providing said terpolymer and dissolving the said terpolymer in a solvent, preparing a suspension or solution of the pore-creating substance, providing a pharmaceutical tablet, combining the suspension or solution of pore-creating substance and solvent solution of the terpolymer to form a coating fluid, applying the coating fluid in the form of a solution or suspension to the tablet, and drying the coating fluid on the tablet to provide a terpolymer-coated tablet having water-soluble pore-creating substance randomly distributed within the coating or membrane, wherein the terpolymer contains about 80 to 95% weight per weight of polyvinylchloride, 0.5 to 19% weight per weight of polyvinylacetate, and 0.5 to 10% weight per weight of polyvinylalcohol.

4,629,620

MEMBRANE-COATED SUSTAINED-RELEASE TABLETS AND METHOD

Ake R. Lindahl, Skurup, and Stig A. B. Erlandsson, Malmo, both of Sweden, assignors to AB Ferrosan, Malmo, Sweden

Continuation of Ser. No. 647,928, Sep. 5, 1984, Pat. No. 4,557,925, which is a continuation of Ser. No. 396,391, Jul. 8, 1982, abandoned. This application Sep. 19, 1985, Ser. No. 777,957

Int. Cl.⁴ A61K *9/28, 9/32*

U.S. Cl. 424—15 **17 Claims**

1. Method of administering a drug for sustained-release purposes comprising the step of orally administering the drug in the form of a sustained-release coated pharmaceutical tablet thereof comprising the drug-containing tablet and a coating or membrane surrounding the same, wherein the coating or membrane is water-insoluble and insoluble in gastrointestinal fluids and consists essentially of a terpolymer of polyvinylchloride, polyvinylacetate, and polyvinylalcohol and a water-soluble pore-creating substance, the said pore-creating substance being randomly distributed in said terpolymer coating, said pore-creating substance being present in amount of one part to 35 parts for each one to ten parts of terpolymer, said coated tablet exhibiting a substantially constant dissolution rate during a major portion of its dissolution time when exposed to gastrointestinal fluids, wherein the terpolymer contains about 80 to 95% weight per weight of polyvinylchloride, 0.5 to 19% weight per weight of polyvinylacetate, and 0.5 to 10% weight per weight of polyvinylalcohol.

4,629,621

ERODIBLE MATRIX FOR SUSTAINED RELEASE BIOACTIVE COMPOSITION

Wallace C. Snipes, Pine Grove Mills, Pa., assignor to Zetachron, Inc., State College, Pa.

Filed Jul. 23, 1984, Ser. No. 633,604

Int. Cl.⁴ A61J *3/10*

U.S. Cl. 424—19 **83 Claims**

1. A composition erodible by an aqueous liquid comprising

5 to 95% by weight of a polyethylene glycol having a molecular weight of from about 1000 to about 20,000, and

95 to 5% by weight of an erosion rate modifier which is an amphiphilic compound insoluble in said aqueous liquid, the molecular structure of said amphiphilic compound having a lipophilic portion and a hydrophilic portion.

4,629,622

SEALED LEAD-ACID BATTERY

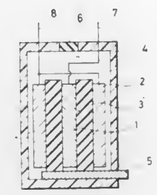
Kunio Yonezu, and Kenji Asai, both of Kyoto, Japan, assignors to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jul. 23, 1985, Ser. No. 758,009

Claims priority, application Japan, Jul. 27, 1984, 59-158199; Aug. 24, 1984, 59-177156; Aug. 24, 1984, 59-177157

Int. Cl.⁴ H01M *10/06*

U.S. Cl. 429—57 **11 Claims**



1. A sealed lead-acid battery of the gas recombination type comprising: positive and negative plates and separators therebetween; an immobilized electrolyte substantially completely retained within said plates and separators; a container holding said positive and negative plates and said electrolyte; and means for supplying a lower part of said positive and negative plates with water formed by reaction of phase change of substances within said container, said means providing a greater amount of water to the lower part of the positive and negative plates than to upper parts of the plates.

4,629,623

HYALURONATE-POLY (ETHYLENE OXIDE) COMPOSITIONS AND COSMETIC FORMULATIONS THEREOF

Endre A. Balazs, Riverdale, and Adolf Leshchiner, Brooklyn, both of N.Y., assignors to Biomatrix, Inc., Ridgefield, N.J.

Filed Jun. 11, 1984, Ser. No. 619,534

Int. Cl.⁴ A61K *31/74, 7/06, 7/15*

U.S. Cl. 424—78 **4 Claims**

1. In a water based viscoelastic composition comprising a mixture of a hyaluronate and a polymer in water, the improvement wherein the hyaluronate has a molecular weight of about 1–5 million and the polymer is a water-soluble poly(ehylene oxide), which is a linear homopolymer of ethylene oxide having a molecular weight of about 1–5 million; the concentration of each component of the mixture being about 0.01% to about 2% and the ratio by weight of the hyaluronate to the poly-(ethylene oxide) being about 1:50 to 100:1.

4,629,624

INERT MATRIX BASED ON POLYCAPROLACTONE FOR THE ORAL ADMINISTRATION OF A DRUG, AND METHOD FOR THE PREPARATION OF THE GALENIC FORM COMPRISING THIS MATRIX

Hervé Grouiller, and Fabien Christ, both of Dijon, France, assignors to Laboratoire d'Hygiene et de Dietetique (L.H.D.), Paris, France

Filed Dec. 26, 1984, Ser. No. 686,214

Claims priority, application France, Jan. 2, 1984, 84 00015

Int. Cl.⁴ A61K *31/74*

U.S. Cl. 424—78 **18 Claims**

1. An inert polycaprolactone matrix for the oral administration of a drug, in which matrix, which has adjustable porosity and hardness, the polycaprolactone which it contains has a molecular weight of between about 2000 and 70,000, is in the form of agglomerated grains having an average diameter of between 50 and 500 μm and has a degree of crystallinity of at least 75%.

4,629,625

HUMAN NUTRITIONAL COMPOSITIONS CONTAINING TAURINE AND VITAMINS AND/OR MINERALS

Gerald E. Gaull, 420 E. 51st St., Apt. 5-B, New York, N.Y. 10022

Filed Aug. 29, 1984, Ser. No. 645,446
Int. Cl.⁴ A61K *31/34, 33/26, 33/30*
U.S. Cl. 424—145 **5 Claims**

1. A vitamin composition in the form of a capsule or tablet consisting essentially of about 0.1–10 parts by weight or moles of vitamin A, about 0.01–10 parts by weight or moles of an iron compound, about 0.01–10 parts by weight or moles of vitamin C, about 0.01–30 parts by weight or moles taurine, about 0–80 parts by weight or moles of vitamin E, and about 0–30 parts by weight or moles of a zinc compound.

4,629,626

HYDROTHERMALLY TREATED PRODUCT OF COMPOUND HAVING HYDROTALCITE-LIKE CRYSTAL STRUCTURE COMPOSITION THEREOF, AND USE THEREOF

Shigeo Miyata, and Hitoshi Anabuki, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,244
Claims priority, application Japan, Jun. 27, 1983, 58-114364
The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.
Int. Cl.⁴ A61K *31/26, 31/295*
U.S. Cl. 424—147 **12 Claims**

1. A hydrothermally treated product of a compound having a hydrotalcite-like crystal structure and represented by the following formula (I)

$$(Fe^{2+},Mg^{2+})_x(Al^{3+},Fe^{3+})_2(OH)_{2x+6-nz}(A^{n-})_z \cdot mH_2O \quad (I)$$

wherein A^{n-} represents an anion having a valence of n, Mg^{2+} is within the range of $0 \leqq Mg^{2+} < x$, Fe^{3+} is within the range of $0 \leqq Fe^{3+} < 2$, x is a number represented by $1 \leqq x < 20$, z is a number represented by $0 < z < 3$, and m is a number represented by $0 \leqq m < 20$,

the product being formed by the thermal treatment of the compound of formula (I) at a temperature of about 100° C. to about 200° C. in an aqueous medium.

4,629,627

ANTIVIRAL SUBSTANCE AND THE MANUFACTURING METHOD THEREOF

Chiyokichi Iizuka, 121 Shimizu Nodashi, Chibaken, Japan

Continuation of Ser. No. 254,657, Apr. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 109,199, Dec. 27, 1979, abandoned. This application Jul. 26, 1983, Ser. No. 517,328
Claims priority, application Japan, Dec. 29, 1978, 53-162087
Int. Cl.⁴ A61K *35/78*
U.S. Cl. 424—195.1 **4 Claims**

1. A method of treating viral hepatitis which comprises orally administering to patients having viral hepatitis an antiviral effective amount of a mixture of nitrogen-containing polysaccharides of 3,000 to 10,000 molecular weight and cytokinin, primarily consisting of zeatin-related substances as obtained from the nutrient medium and tissue medium of *Lentinus edodes*.

4,629,628

WAFERS AND PROCESSES FOR THEIR MANUFACTURE

Giuseppe Negro, Stadtallendorf, Fed. Rep. of Germany, assignor to Ferrero oHG mbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 99,234, Nov. 30, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 283,083
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929496
Int. Cl.⁴ A21D *13/00, 8/00*
U.S. Cl. 426—138 **2 Claims**

1. Wafers with a smooth dense surface and a cell-like internal structure for use as filled wafers, consisting of two or more wafer sheets, prepared by a process comprising the steps of:

A. Producing a batter by employing the following ingredients in the approximate indicated amounts per each 1 kg. of batter:

(a) Introducing 1 g. of cooking salt, 0.4 g. of sodium bicarbonate and 0.4 g. of ammonium bicarbonate and also 0.6 g. of magnesium hydroxide/carbonate and 12 g. of sugar into 560 g. of water by stirring these constituents for one minute, 16.5 g. of soya flour being added at the same time;

(b) Dispersing 322 g. of wheat flour, 20 g. of rye flour, 16.5 g. of whole milk powder, 10 g. of wheat starch and 15 g. of cocoa powder in the aqueous solution according to A(a);

(c) Adding 24 g. of groundnut oil and 1.5 g. of lecithin as an emulsifier for the oil; and

(d) Beating the batter in a beater for ten minutes;

wherein the concentration of the sugar is about 1.2% by weight of the batter and the concentration of milk solids is at least about 1.65% by weight of the batter;

B. Applying the batter in metered amounts to wafer irons having upper and lower irons;

The lower wafer iron being heated to a temperature of 170° C.; and

(b) The upper wafer iron being heated to a temperature of 160° C.;

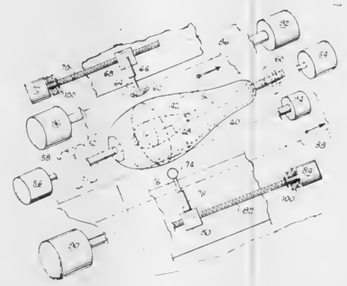
C. Baking the batter in the wafer iron for a period of 2.5 to 3 minutes to a wafer thickness of 2.5 to 3 mm.

4,629,629

METHOD FOR PROCESSING AVOCADOS

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Sep. 3, 1985, Ser. No. 772,161
Int. Cl.⁴ A23L *1/212*
U.S. Cl. 426—482 **27 Claims**



1. A method of removing the pulp of a stemmed, ripe, whole avocado comprising the steps of:

supporting the avocado for motion in one general direction along a travel path from a feeding station to an operating station;

positioning the avocado in said operating station so as to orient the avocado general axis of symmetry substantially in line with an axis of rotation around which the avocado will be caused to rotate during subsequent steps of the operation;

engaging a plurality of pins in the avocado so as to contact the avocado seed through firstly the skin and then the pulp;

pushing toward one another two shaped prongs rotating in opposite directions about the avocado axis into the avocado until the prong tips engage the seed along its axis of symmetry;

retracting the pins;

spinning unidirectionally the assembly of prongs and avocado;

advancing a paring tool toward the spinning avocado;

causing the paring tool to follow the contour of the avocado from one prong to the other, thereby removing the skin;

retracting the paring tool;

advancing a flesh cutter toward the avocado;

causing the flesh cutter to remove a layer of pulp along and around the avocado surface, the flesh cutter being actuated for motion to-and-fro between the prongs until substantially all of the pulp is removed;

retracting the flesh cutter;

stopping the rotation of the prongs;

pushing a plurality of pointed pads against the seed;

rotating the prongs, each one in a direction reverse from that which it followed during the engagement step, whereby both prongs are caused to disengage and free the seed simultaneously;

fully retracting the prongs;

retracting the holding pads; and

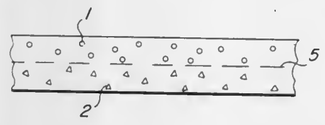
letting the seed freely fall into a collecting chute.

4,629,630

CHECK PAPER THAT IS PROTECTED AGAINST FORGERY AND TAMPERING

Ludwig Devrient, Vaterstetten, Fed. Rep. of Germany, assignor to GAO Gesellschaft Fuer Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 376,681, May 10, 1982, Pat. No. 4,496,961, which is a continuation of Ser. No. 217,422, Dec. 17, 1980, abandoned. This application Apr. 30, 1984, Ser. No. 605,107
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951486
Int. Cl.⁴ B44F *1/12*
U.S. Cl. 427—7 **18 Claims**



1. A method, for producing check paper which is resistant to tampering or forgery comprising the steps of:

producing a first web of paper pulp and producing a second web of paper pulp utilizing a double-sieve paper machine and adding micro encapsulated leuco ink and color acceptor to the paper prior to joining said webs,

forming a sheet of paper from the paper material of the first and second webs of the double-sieve machine by joining said first and second webs such that the micro encapsulated leuco ink and the color acceptor are present together only in a region of interface of the two webs.

4,629,631

SURFACE TREATMENT OF METALS

Geoffrey Dearnaley, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 9, 1985, Ser. No. 773,816
Claims priority, application United Kingdom, Sep. 14, 1984, 8423255
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **7 Claims**



1. A method of modifying the properties of a surface of a metal body, wherein there is included the operations of implanting into the said surface ions of a material capable of occupying interstitial sites in the crystal lattice of the body, so as to harden initially the said surface, depositing onto the hardened surface a layer of a reactive metal, and subjecting the deposited layer to bombardment with a reactive ion species capable of reacting with the said reactive metal to provide a hard, wear resisting compound, the energy of the reactive ions species initially being such as to cause radiation enhanced diffusion of the metal layer into the substrate and then reduced so as to implant the reactive ion species into the metallic layer to form the said hard, wear resisting compound.

4,629,632

PRODUCTION OF MAGNETIC RECORDING MEDIA

Werner Balz, Limburgerhof; Jenoe Kovacs, Hessheim; Hilmar Lechner, Frankenthal; Dieter Schaefer, Lindenberg, and Ingolf Buethe, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,235
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427683
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—54.1 **7 Claims**

1. A process for the production of a layer-type magnetic recording medium by applying a dispersion of a magnetically anisotropic material in a binder solution onto a flexible plastic base provided with an adhesion-promoting intermediate layer and then solidifying the magnetic layer, wherein the adhesion-promoting intermediate layer is obtained by applying a radiation-curable aqueous dispersion essentially consisting of

(A) from 20 to 80% by weight of water and

(B) from 80 to 20% by weight of one or more prepolymers which are dispersed in (A), contain from 0.01 to 1.0 mole of polymerizable C—C double bonds per 100 g of prepolymer and have a mean molecular weight of not less than 350 and a viscosity of 600 cP at 23° C.,

with the proviso that the sum of the percentages stated under (A) and (B) is 100, and furthermore

(C) from 0.1 to 10% by weight, based on (B), of a polyvinyl alcohol having a residual acetate content of less than 35 mol % and/or a vinyl-pyrrolidone/vinyl ester compolymer having a vinyl ester content of less than 35% by weight and

(D) from 0.5 to 10% by weight, based on the sum of (A) and (B), of one or more photoinitiators

onto the flexible plastic base, drying the layer and then cross-linking it with UV light before the dispersion of the magnetic material is applied to the intermediate layer.

4,629,633

COMPOSITION AND METHOD FOR PROTECTION OF LIQUID SURFACE FROM HEAT- AND MASS-TRANSFER IN LIQUID GAS SYSTEM

Anatoly A. Bespalov, Chelyabinsk; Talgat Z. Khuramshin, Moscow; Nikolai A. Bespalov; Andrei N. Efimov, both of Chelyabinsk; Marina S. Vilesova; Lev E. Gendlin, both of Leningrad; Vladimir I. Lukhovitsky, and Vladimir V. Polikarpov, both of Kaluzhskaya, all of U.S.S.R., assignors to Chelyabinsky Politekhnichesky Institut Imeni Lininskogo Komsomola, Chelyabinsk, U.S.S.R.

Filed Mar. 20, 1985, Ser. No. 714,007
Int. Cl.⁴ B01J *1/18;* **B05D** *5/00;* **B65D** *88/40*
U.S. Cl. 427—154 **4 Claims**

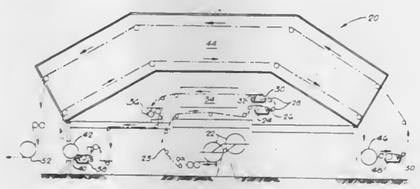
1. A method for protection of the liquid surface from heat- and mass-transfer in the liquid-gas system comprising application, onto the surface of the protected liquid, of a mixture comprising a crosslinked polymer limitedly swelling in said liquid in an amount of from 0.1 to 2 kg per m^2 of the liquid surface with a neutral filler to the protected liquid and having density lower than the density of the protected liquid at a mass ratio of the polymer to the filler ranging from 1:1 to 1:10, upon contacting the liquid the polymer swells with the formation of a continuous gel-like covering which hinders the heat- and mass-transfer.

4,629,634

ADHESIVE AND SEALANT SHEET MATERIAL AND METHOD

Raymond T. Coughlan, Darien, and Suzette M. Bojarski, Tinley Park, both of Ill., assignors to Daubert Coated Products Inc., Chicago, Ill.

Division of Ser. No. 604,044, Apr. 26, 1984, Pat. No. 4,533,600. This application Jun. 3, 1985, Ser. No. 740,865
Int. Cl.⁴ B65H *54/02*
U.S. Cl. 427—179 **7 Claims**



1. A continuous method of preparing a low cost sheet material adapted for use as a substrate on which to cast sealants or adhesives, comprising: providing a source of a highly calendered, smooth grade kraft paper in sheet form; moving the kraft paper sheet to a first coating station where a coating of a resin composition consisting essentially of an elastomer modified vinyl polymer is applied to one major surface area of the kraft paper sheet; reversing the direction of travel of the kraft paper sheet and moving it to a second coating station where a coating of said resin composition is applied to the other major surface of the kraft paper sheet; passing the thusly coated sheet through a first drying station to dry the resin composition coatings; moving the dried resin composition coated kraft paper sheet to a third coating station where a film of a silicone release agent is applied to one of the dried resin composition coatings; passing the silicone release agent coated sheet through a second drying station to dry and cure the film of the silicone release agent; moving the kraft paper sheet to a fourth coating station and applying a film of a silicone release agent to the other dried resin composition coating; passing the sheet through said second drying station to dry and cure the film of silicone release agent applied at said fourth coating station; and forming the thusly multiple coated kraft paper sheet into a roll.

4,629,635

PROCESS FOR DEPOSITING A LOW RESISTIVITY TUNGSTEN SILICON COMPOSITE FILM ON A SUBSTRATE

Daniel L. Brors, Los Altos Hills, Calif., assignor to Genus, Inc., Mountain View, Calif.

Filed Mar. 16, 1984, Ser. No. 590,117
Int. Cl.⁴ C23C *16/42*
U.S. Cl. 427—255.2 **6 Claims**



1. In a chemical vapor deposition reactor having a vacuum housing, a process for depositing a composite film on a substrate comprising the steps of:
   a. plasma etching the substrate;
   b. after step a., depositing a first layer of WSi_x over the substrate, with x being greater than or equal to 2; and
   c. depositing over the first layer a second layer of a tungsten and silicon complex having a percentage of silicon of less than 5% by weight.

4,629,636

PROCESS FOR TREATING PLASTICS WITH ALKALINE PERMANGANATE SOLUTIONS

Constantine I. Courduvelis, Orange, and Anthony R. Del Gobbo, Watertown, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Division of Ser. No. 618,281, Jun. 7, 1984, Pat. No. 4,592,852. This application Oct. 28, 1985, Ser. No. 791,804
Int. Cl.⁴ C23C *18/22*
U.S. Cl. 427—444 **10 Claims**

1. In a process for treating plastics to improve the adhesion of electroless metal plating to the plastic wherein the plastic is contacted with an alkaline permanganate solution for an effective time at an elevated temperature to improve the adhesion, the improvement comprising:
   adding to the solution a secondary oxidant compound capable of oxidizing manganate ion to permanganate ion and controlling at desired intervals the ratio of permanganate ion concentration to the sum of the permanganate and manganate ion concentration at a level above about 0.5 by adding, as needed, an effective amount of the secondary oxidant to the solution.

4,629,637

COATED OPTICALLY ISOTROPIC OR MONOAXIALLY FILM OF PLASTIC

Werner Waldenrath, Cologne; Hans-Leo Weber, Rommerskirchen, and Uwe Claussen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,386
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415104
Int. Cl.⁴ C09K *19/00, 3/34;* **B44F** *1/00*
U.S. Cl. 428—1 **6 Claims**

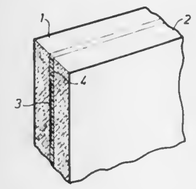
1. An optically isotropic or monoaxial film of a polymer selected from the group consisting of polyaryl sulphone, a polyacrylate, polymethacrylate, polycarbonate or of a mixture or copolymer containing such polymer, the film being coated with a product formed by hardening under electron beams a mixture of (a) a prepolymer and (b) a (meth)acrylic acid ester of a polyhydric aliphatic alcohol and/or N-vinylpyrrolidone, the prepolymer (a) containing two to five (meth)acryloyl groups and being derived from a polyether or polyurethane.

4,629,638

METHOD FOR THE MANUFACTURE OF SHEETLIKE OR WEBLIKE MATERIAL PROVIDED WITH MARKINGS BECOMING APPARENT IN TRANSMITTED LIGHT

Ingvar Nilsson, Akarp, Sweden, assignor to Suecia Antiqua Limited, London, England

Filed Sep. 28, 1984, Ser. No. 655,716
Int. Cl.⁴ B41M *3/10*
U.S. Cl. 428—29 **12 Claims**



1. A method of manufacturing paper provided with markings which become visible upon transmission of light through said paper, comprising the steps of:
   providing a first roll of paper material in the form of a first web;
   providing a second roll of paper material in the form of a second web;
   marking at least one of the first and second webs with the markings;
   arranging the first and second webs in facing relationship to each other;
   providing the markings in an area defined between said first and second webs;
   extruding a layer of molten plastic material on one of the first and second webs; and
   compressing the first and second webs with the plastic material therebetween to each other so as to provide a laminated paper web with the marking therebetween.

4,629,639

COMPOSITIONS COMPRISING PROPYLENE POLYMER-E/VA COPOLYMER-POLYTERPENE RESIN

Bennie M. Lucas, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Dec. 23, 1985, Ser. No. 812,582
Int. Cl.⁴ C08L *23/10, 23/08, 45/00*
U.S. Cl. 428—35 **14 Claims**

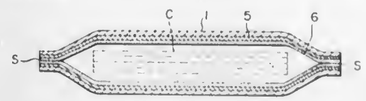
1. A polymer composition adapted for the manufacture of heat-sealable and sterlizable films, sealed containers or bottles comprised of:
   (a) from about 10 to about 98 wt % of a propylene polymer selected from the group consisting of propylene homopolymer, a random copolymer of propylene and ethylene containing from about 0.5 to about 6 wt % polymerized ethylene, or a mixture of said homopolymer or copolymer;
   (b) from about 1 to about 50 wt % of an ethylene-vinyl acetate copolymer;
   (c) from about 0 to about 60 wt % of a synthetic rubber; and
   (d) from about 0.01 to about 1.5 wt % based on the total weight of (a), (b) and (c) of a polyterpene resin.

4,629,640

PACKAGING MATERIALS FOR PHOTOSENSITIVE MATERIALS

Mutsuo Akao, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1985, Ser. No. 691,634
Claims priority, application Japan, Jan. 19, 1984, 59-6250
Int. Cl.⁴ B32B *15/08, 27/06;* **C09J** *7/02*
U.S. Cl. 428—35 **17 Claims**



1. A packaging material for photosensitive materials comprising an at least double-layer laminated film formed by laminating a light-shielding layer and a metallizing film wherein:
   (a) said metallizing film comprising a flexible sheet having a thickness of 5 to 120 microns and a thin metal layer having a thickness of 55 to 1200 angstroms,
   (b) said light-shielding layer comprises a polyethylenic polymer and 0.3% by weight or more of a light-shielding material, said polyethylenic polymer containing 45% by weight or more of a low-pressure linear low-density polyethylene (L-LDPE), and
   (c) said laminated film has a moisture permeability of 15 $g/m^2/24$ hours or less (at 40° C. and 90% RH).

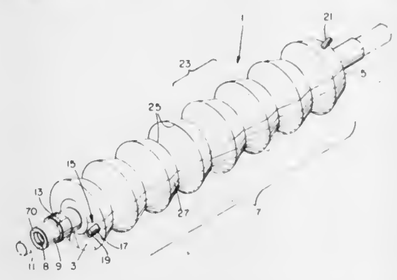
2. The packaging material as defined in claim 1, wherein said laminated film is formed into a bag by bag-making.

4,629,641

VENTILATED BOOT

Dale W. Paullin, 1446 State Rte. 60, Ashland, Ohio 44805

Continuation-in-part of Ser. No. 633,953, Jul. 24, 1984, abandoned, Continuation-in-part of Ser. No. 633,952, Jul. 24, 1984, which is a continuation-in-part of Ser. No. 627,092, Jul. 2, 1984, abandoned. This application Oct. 30, 1984, Ser. No. 666,497
Int. Cl.⁴ B32B *3/26*
U.S. Cl. 428—36 **6 Claims**



1. An elastomeric boot for protecting an object from environmental influences, said boot comprising:
   a flexible tubular enclosure having opposing ends and having an interior for containing an object with variable dimensions and for protecting said object from environmental influences external to said enclosure;
   tubular attachment means extending from at least one of said ends for securing said enclosure to said object;
   a circumferential ridge on the inside of said tubular attachment means for engaging and securing with said object;
   expansion means extending from and between said ends for varying the distance between said ends in response to changes in the dimensions of said object;
   air exchange means for allowing influx of ambient air into the enclosure or eflux of interior air from the enclosure in

response to an air pressure differential between the air inside the enclosure and air outside the enclosure comprising at least two tubular projections integrally formed with the boot and communicating with the interior of the enclosure; and

water or dirt exclusion means for excluding water or dirt from the enclosure through the air exchange means comprising an end portion of said projection having a cross sectional area substantially smaller than the cross sectional area of the tubular projection, one of said projections being proximate one end of said enclosure and another of said projections being proximate the opposing end of said enclosure.

4,629,642

DIMENSIONALLY STABLE CARPET TILES HAVING GREIGE GOOD ADHERED TO WET-LAID COMPOSITE SHEET

John M. Kernstock, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1985, Ser. No. 776,299
Int. Cl.[4] D03D *27/00*
U.S. Cl. 428—95 **8 Claims**

1. A dimensionally stable carpet tile having a greige good adhered to an aqueous wet-laid composite sheet comprising a dimensionally stable reinforcing fiber in an amount sufficient to provide less than a 0.10 percent dimensional change of said carpet tile on an Aachen Test.

4,629,643

MICROAPERTURED POLYMERIC WEB EXHIBITING SOFT AND SILKY TACTILE IMPRESSION

John J. Curro, and E. Kelly Linman, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 31, 1985, Ser. No. 740,125
Int. Cl.[4] B32B *3/24, 3/26*
U.S. Cl. 428—131 **8 Claims**



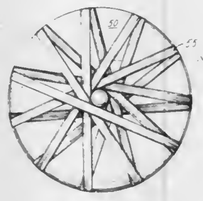
1. A microapertured polymeric web exhibiting a soft and silky tactile impression on at least one surface thereof, said silky feeling surface of said web exhibiting a pattern of discrete volcano-like surface aberrations which are not individually discernible to the normal naked eye when the perpendicular distance between said web and the observer's eye is at least about 12 inches, the density of said surface aberrations being at least about 3,600 per square inch, the center-to-center distance between adjacent surface aberrations not exceeding about 25 mils, each of said surface aberrations having its amplitude oriented substantially perpendicular to the surface in which said surface aberration originates and exhibiting a maximum cross-sectional dimension not exceeding about 20 mils, as measured perpendicular to its amplitude, the end of each of said surface aberrations further including at least one microaperture substantially coincidental with its point of maximum amplitude, said microaperture exhibiting a multiplicty of thin, irregularly shaped petals about its periphery, said microaperture further creating a discontinuity which reduces the resistance to compression and shear of each of said surface aberrations as well as the degree of contact with the observer's skin, whereby the tactile impression of said web is pereived as generally soft and silky.

4,629,644

FILAMENT WOUND STRUCTURE HAVING FILAMENT WOUND REINFORCING RINGS FOR USE AS A TORQUE DRIVE

David G. Matuska, Stratford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1985, Ser. No. 781,605
Int. Cl.[4] B64C *27/52*
U.S. Cl. 428—137 **18 Claims**



1. A fiber reinforced resin matrix composite structure, particularly adapted for use as a torque drive diaphragm in a rotary wing aircraft hub, comprising a circular diaphragm having a rim, said rim having an attachment means, said diaphragm having at least one reinforcing ring and a central attachment means on the diaphragm, wherein the structure comprises:

a resin matrix;

fibers, wound with sufficient tension substantially tangentially to said central attachment means in a multiple circuit pattern to form a diaphragm having a rim and a rim attachment means:

reinforcing fibers wound with sufficient tension in an essentially circumferential manner to reinforce the rim section of said structure, and at least one reinforcing ring formed from wound fibers, the center of said ring concentric with the diaphragm,

wherein the structure is cured by molding at sufficient heat and pressure such that the diaphragm section of the structure remains essentially uniplanar when subjected to stresses induced by temperature changes, and the structure is resistant to buckling under torque loads.

9. A fiber reinforced resin matrix composite structure, particularly adapted for use as a flexible torque drive coupling, comprising a hollow disc having a first substantially flat diaphragm side and a second substantially flat diaphragm side, each diaphragm side having a central attachment means and each diaphragm side having at least one reinforcing ring concentric with the axial central axis of the disc, said disc having a peripheral rim joining said diaphragm sides, wherein the structure comprises:

a resin matrix;

fiber, wound with sufficient tension substantially tangentially to the central attachment means in a multiple circuit pattern to form the disc;

fiber wound with sufficient tension in an essentially circumferential manner to reinforce the peripheral rim of said structure; and,

fiber wound with sufficient tension in a substantially circular manner to form reinforcing rings on or in the diaphragm sides and concentric therewith,

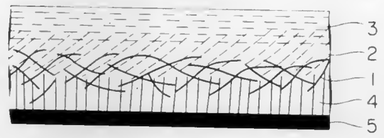
the structure being cured by molding with sufficient heat and pressure such that the diaphragm sides of the structure remain essentially uniplanar when subjected to stresses induced by temperature changes, and the structure is resistant to buckling under torque loads.

4,629,645

MOLD INHIBITIVE COATED FILM WITH POWDER COATING MATERIAL USED

Tetsuhiko Inoue, 2-37-8, Mukohgaoka, Bunkyo-ku, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,796
Claims priority, application Japan, Feb. 7, 1983, 58-17410
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—141 **15 Claims**



1. An adhesive sheet material to control mold fungi for application to a surface of a wall, floor, ceiling and the like, comprising:

a flexible fibrous support having thickness of from 10μ to 300μ;

an adhesive layer containing a mold fungicide, on one side of said support;

a layer of a liquid paint containing a mold fungicide, on the other side of said support; and

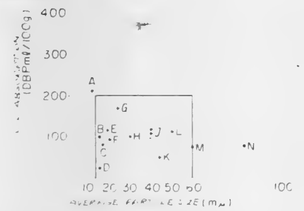
a layer of a powder coating containing a mold fungicide, formed over said layer of the liquid paint.

4,629,646

MAGNETIC RECORDING MEDIUM

Toshiaki Ide; Tohru Shimozawa, both of Saku, and Masaharu Nishimatsu, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,779
Claims priority, application Japan, Jul. 31, 1984, 59-158867
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—143 **6 Claims**



1. A magnetic recording medium comprising a non-magnetic substrate, a magnetic recording layer formed on one side of the substrate and a back coating layer formed on the other side of the substrate, characterized in that the back coating layer contains carbon black having an ash content of at most 0.05%, a specific surface area of from 20 to 350 m^2/g, an oil absorption of at most 200 ml/100 g and an average particle size of from 13 to 60 mμm.

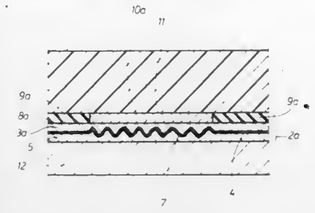
4,629,647

EMBOSSING FOILS WHICH CAN BE WRITTEN UPON

Helfried Sander, Nuremberg, Fed. Rep. of Germany, assignor to Leonhard Kurz GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,794
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422908
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—172 **15 Claims**

1. An embossing foil comprising a backing foil having first and second surfaces, and on said first surface of said backing foil a transfer layer means which is releasable therefrom, said transfer layer means including a layer of lacquer which is adapted to be written upon thereby to constitute a signing layer, and which after removal of said backing foil is adapted to form the exposed surface of the embossing foil, the transfer layer means on the side of said signing layer remote from said backing foil further including a diffraction layer comprised, at



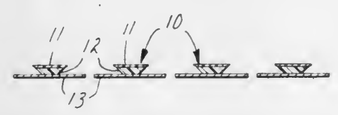
least in part, of a protective lacquer, and having a portion thereof configured to provide a diffraction effect structure, said signing layer being of a configuration adapted to permit said diffraction effect structure to be recognisable from said exposed surface of the embossing foil.

4,629,648

EXTRUDED CAULK STRIP

Chris A. Minick, Stillwater, and Gerald E. Mueller, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Oct. 1, 1985, Ser. No. 782,359
Int. Cl.[4] B32B *25/08, 31/30*
U.S. Cl. 428—189 **11 Claims**



1. Extruded caulk strip comprising

an elongate strip having opposed major surfaces and opposed side edges formed of substantially amorphous, nontacky, conformable, thermoplastic, film-forming polymeric material; and

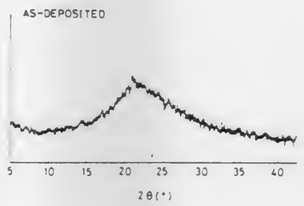
a self-supporting, elongated, deformable, continuous, tacky caulk body in melt fusion contact with one major surface of said strip, extending the entire length of said strip, and having side edges within said opposed side edges of said strip whereby no more than about 1 mm of said strip surface is exposed on either side of the caulk body.

4,629,649

INFORMATION RECORDING MEDIUM AND METHOD

Yukio Osaka; Takeshi Imura, and Toshio Nakashita, all of Higashi-Hiroshima, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,303
Claims priority, application Japan, Dec. 28, 1984, 59-275373
Int. Cl.[4] B32B *15/04;* G01D *15/34*
U.S. Cl. 428—209 3 Claims



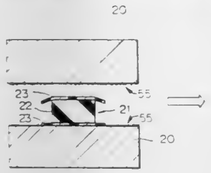
1. An information recording medium comprising a substrate and a recording layer formed thereon consisting essentially of germanium and tin in an atomic ratio of Sn/(Ge+Sn) of 0.05 to 0.95.

4,629,650

PROCESS FOR PRODUCING MOLDED THERMOPLASTIC RESIN

Hiroshi Kataoka, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1983, Ser. No. 565,868
Claims priority, application Japan, Dec. 30, 1982, 57-234239; Dec. 30, 1982, 57-234240; Jul. 5, 1983, 58-121005
Int. Cl.[4] B32B *7/06;* B29C *43/20, 65/76, 67/22*
U.S. Cl. 428—213 16 Claims



1. A process for compression molding a thermoplastic resin comprising the steps of:
(a) providing at least one removably thermoplastic resin skin between a thermoplastic core resin to be molded and the surface of a mold or die;
(b) dispersing a lubricant between said removable skin or skins and said mold or die; and
(c) molding said thermoplastic core resin in the presence of said removalbe skin or skins and said lubricant by compression molding at a temperature equal to or greater than the glass transition temperature of said thermoplastic core resin such that the following conditions are met:
(i) said removable skin or skins have a flowability greater than the flowability of said thermoplastic core resin;
(ii) said removable skin or skins are about 1/10 or less as thick as said thermoplastic core resin; and
(iii) sufficient force is applied to said removable skin or skins and said thermplastic core resin during molding to achieve substantially uniform plug flow in said thermoplastic core resin.

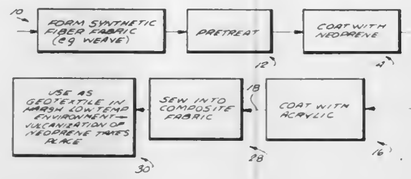
14. A molded article made by the process of claim 1.

4,629,651

TWO PHASE HARDY FABRIC FINISH

Delbert A. Davis, Kernersville, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 14, 1985, Ser. No. 797,849
Int. Cl.[4] B05D *1/36;* B32B *7/00, 7/08, 27/32*
U.S. Cl. 428—247 20 Claims



1. A finished fabric suitable for harsh weather, low temperature, abrading environments, comprising:
a fabric of synthetic material, with a generally open construction;
a first fabric finish for said fabric comprising a vulcanizable cross-linkable polymer having a highly crystalline structure; and
a second finish comprising an ablative coating for said first polymer, said second finish also having a highly crystalline structure;
said second finish constructed so as to completely wear away only after the vulcanizable polymer of the first finish has vulcanized.

4,629,652

PRODUCTION OF AEROGELS ON A SUPPORT

Emery J. Carlson, Chatham, and John N. Armor, Hanover Township, Morris County, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 1, 1984, Ser. No. 656,820
Int. Cl.[4] B32B *9/00;* B05D *1/12*
U.S. Cl. 428—304.4 7 Claims

5. A product comprising:
(a) a support material; and
(b) an aerogel adhering, in the absence of a bonding medium, to at least a portion of the support material, the bulk density of the adhering aerogel being substantially the same in the final form of the product as the bulk density of the aerogel upon formation thereof.

4,629,653

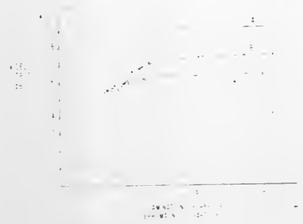
MAGNETIC RECORDING MEDIUM HAVING LAMINATED HEXAGONAL FERRITE PLATELETS

Takamitsu Asai; Masaaki Fujiyama; Minoru Kanazawa, and Nobuo Aoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1984, Ser. No. 677,407
Claims priority, application Japan, Dec. 1, 1983, 58-227436
Int. Cl.[4] G11B *5/714*
U.S. Cl. 428—328 14 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer consisting essentially of hexagonal crystallized ferrite platelets having a tabular shape and having an axis of easy magnetization in a direction vertical to the table of the ferrite platelets and a binder, wherein said ferromagnetic platelets have a table

diameter/table thickness ratio of 2 or more, a table diameter of from 0.01 to 10 μm, and the lamination degree of the magnetic



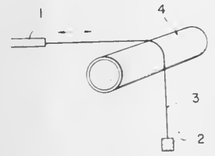
platelets in the magnetic layer in a cross-section thereof is 2 or more.

4,629,654

VINYLIDENE FLUORIDE RESIN MONOFILAMENT AND PROCESS FOR PRODUCING THE SAME

Tohru Sasaki; Hiroyuki Endoh, both of Iwaki, and Seiichi Oohira, Kitaibaragi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,802
Claims priority, application Japan, Apr. 28, 1984, 59-86764
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—373 4 Claims



1. A vinylidene fluoride resin monofilament comprising a vinylidene fluoride resin at least in the surface layer thereof, said monofilament having a birefringence at the surface of 25×10^{-3} or less and an average birefringence in a section perpendicular to the axis thereof of 33×10^{-3} or greater.

4,629,655

SIZE COMPOSITION

James C. Winters; Robert A. Mooth, and Frank T. Orthoefer, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jun. 27, 1985, Ser. No. 749,918
Int. Cl.[4] D21D *3/00*
U.S. Cl. 428—402 22 Claims

1. A solid product containing an intimate mixture comprising:
(a) a cationic polymer suitable for functioning as a size retention aid in a paper-making process; and,
(b) a size suitable for sizing a substrate in a paper-making process.

2. The product of claim 1 in the form of a flake.

4,629,656

ION EXCHANGE INORGANIC FILMS MADE UP OF LAYERED STRUCTURE INSOLUBLE ACID SALTS OR TETRAVALENT METALS AND/OR THEIR DERIVATIVES, AND PROCESS FOR THE PREPARATION OF SAME

Giulio Alberti, and Umberto Costantino, both of Perugia, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation of Ser. No. 485,342, Apr. 15, 1983, abandoned.
This application May 13, 1985, Ser. No. 733,407
Claims priority, application Italy, May 17, 1982, 48437 A/82
Int. Cl.[4] C01B *25/00;* C08K *1/02*
U.S. Cl. 428—411.1 8 Claims

1. A process for preparing compact inorganic ion-exchange films formed by an aggregation of very thin lamellae of α- or γ-layered phosphates or phosphonates of tetravalent metals of the general formula

$$M(RPO_3)_2{\cdot}nH_2O$$

where M is selected from the group consisting of Zr, Ti and Sn; R is selected from the group consisting of —OH, —CH_2COOH and —C_2H_4COOH; and n is 1 or 2, comprising the following steps:
(a) providing crystals of said α- or γ-layered phosphates or phosphonates;
(b) exfoliating said layered crystals into lamellae sufficiently thin to give a colloidal suspension in water by intercalating polar organic molecules or organic ions into the interlayer region of said layered crystals, said polar organic molecules or organic ions being selected from the group consisting of methylamine, ethylamine, and propylamine, said intercalation being carried out to a degree of about one mole of methylamine or ethylamine or about one-half mole of propylamine per mole of phosphate or phosphonate, said intercalation further being carried out in water while stirring;
(c) depositing a layer of the resulting colloidal suspension of lamellae onto a solid surface; and
(d) drying said layer to form a compact film of an inorganic ion exchanger.

8. A compact inorganic film made in accordance with the process of claim 1.

4,629,657

BIAXIALLY ORIENTED POLYPROPYLENE FILM CONSTRUCTION FOR SPECIAL LAMINATION

Sujan C. Gulati, Schaumburg, and Edward C. Enderle, Bartlett, both of Ill., assignors to Enron Chemical Company, Rolling Meadows, Ill.

Filed Dec. 13, 1982, Ser. No. 449,165
Int. Cl.[4] B32B *27/00, 15/08*
U.S. Cl. 428—461 8 Claims

1. A film construction formed by a one step thermal lamination process, comprising:
(a) A base layer of biaxially oriented polypropylene,
(b) A top layer of a copolymer of ethylene and an unsaturated carboxylic acid, and
(c) A bottom layer selected from the group consisting of copolymers of ethylene and an unsaturated carboxylic acid, copolymers of ethylene and propylene, copolymers of ethylene and vinyl acetate, and ionomers of ethylene and methacrylic acid,
wherein one of the layers are coated with an adhesive material.

4,629,658

POLYOLEFIN COMPOSITIONS AND LAMINATED ARTICLE

Bennie M. Lucas, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Division of Ser. No. 812,582, Dec. 23, 1985. This application Jun. 6, 1986, Ser. No. 871,239

Int. Cl.[4] B32B *27/08, 27/06, 25/18, 25/00*

U.S. Cl. 428—520 4 Claims

1. A composite film comprising a first layer produced from a resin comprised of:

(a) from about 10 to about 50 wt % of a propylene polymer selected from the group consisting of propylene homopolymer, a random copolymer of propylene and ethylene containing from about 0.5 to about 6 wt % polymerized ethylene, or a mixture of said homopolymer or copolymer;

(b) from about 10 to about 60 wt % of an ethylene-vinyl acetate copolymer;

(c) from about 10 to about 60 wt % of a synthetic rubber; and

(d) from about 0.01 to about 1.5 wt % based on the total weight of (a), (b) and (c) of a polyterpene resin,

and a second layer conextruded with the first layer and comprised of the propylene polymer of component (a).

4,629,659

CORROSION RESISTANT SURFACE-TREATED STEEL STRIP AND PROCESS FOR MAKING

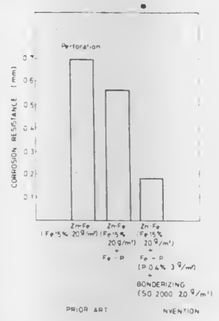
Kazuaki Kyono; Shigeo Kurokawa; Hajime Kimura, and Toshio Irie, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 14, 1984, Ser. No. 609,751

Claims priority, application Japan, May 14, 1983, 58-84585; Feb. 23, 1984, 59-33304; Feb. 23, 1984, 59-33305

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—659 11 Claims



1. An Fe-P/Zn or Zn alloy double layer plated steel strip adapted for phosphate treatment, comprising

a steel strip,

a lower layer of zinc or a zinc alloy deposited on at least one surface of the steel strip, and

an upper layer consisting essentially of 0.0003 to 15% by weight of phosphorus, balance essentially iron, electrodeposited at a current density of from more than 20 to 200 A/dm^2 on said lower layer to a build-up of at least 0.5 g/m^2, said Fe-P layer ensuring the formation of fine crystals of phosphophyllite having an average size of up to about 5 μm after a subsequent phosphate treatment.

4,629,660

PERPENDICULAR MAGNETIC-RECORDING MEDIUM

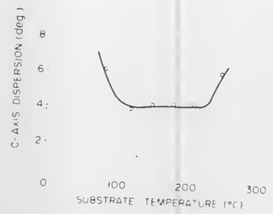
Masayuki Sagoi, and Reiji Nishikawa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 12, 1984, Ser. No. 588,881

Claims priority, application Japan, Mar. 28, 1983, 58-51978

Int. Cl.[4] H01F *0/26*

U.S. Cl. 428—678 8 Claims



1. A perpendicular magnetic-recording medium, comprising:

a disc substrate;

an amorphous alloy layer of nickel (Ni) and phosphorus (P) which is formed on said disc substrate and whose surface is smoothed with high precision, said amorphous alloy layer containing 5–25 atomic percent of phosphorus; and

a ferromagnetic Co-Cr based perpendicular magnetic-recording layer formed on the smoothed surface of said amorphous alloy layer.

4,629,661

CUTTING INSERT AND METHOD OF MAKING THE SAME

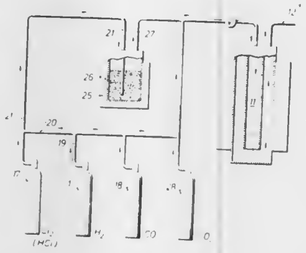
Lars H. Hillert, Nacka; Jan N. Lindström, Norsborg, and Anders G. Thelin, Vällingby, all of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Continuation of Ser. No. 531,736, Sep. 13, 1983, abandoned. This application Jun. 18, 1985, Ser. No. 736,772

Claims priority, application Sweden, Sep. 15, 1982, 8205274

Int. Cl.[4] C09J *1/00;* B22F *3/14, 7/08*

U.S. Cl. 428—698 13 Claims



1. A cutting insert comprising:

(a) a ceramic substrate comprised of a material selected from the group consisting of:

(i) ceramic oxide and

(ii) ceramic oxide mixed with at least one member selected from the group consisting of hard carbides, nitrides and binder metal;

(b) at least one thin intermediate layer covering the substrate and comprised of at least one member selected from the group consisting of at least one hard boride of the subgroups of the III–V groups of the periodic table and hard yttrium compounds; and

(c) at least one thin surface layer of ceramic oxide wherein said layers are deposited from a gaseous phase and have a mean grain size smaller than that of the substrate.

4,629,662

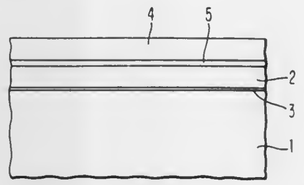
BONDING METAL TO CERAMIC LIKE MATERIALS

James M. Brownlow, Crompond, and Thomas S. Plaskett, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,076

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—432 12 Claims



1. In the attachment of an external metal to an oxide ceramic through the use of an intermediate metal oxide layer the improvement comprising imparting to the intermediate metal oxide layer the combined properties of formation of an oxygen-metal bond to said ceramic and an ionic difusion type bond with said external metal by providing in said intermediate metal oxide layer a metal from the group of Fe, Mn, Ti and the 33 Ni 67 V combination, providing as said oxide ceramic at least one member of the group of glasses, quartz, SiO_2, Al_2O_3 and combinations thereof and providing as said external metal at least one member of the group of Cu, Ni, Fe, Ti, Mo and alloys thereof.

4,629,663

REMOVABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Francis W. Brown, West St. Paul, and Louis E. Winslow, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 29, 1984, Ser. No. 666,269

Int. Cl.[4] C09J *7/02*

U.S. Cl. 428—343 6 Claims

1. Pressure-sensitive adhesive tape comprising a self-substaining backing sheet carrying a layer of pressure-sensitive adhesive comprising a copolymer of monomers comprising

(a) from 95 to 99.8 parts by weight of at least one terminally unsaturated vinyl monomer, 60 to 100 weight percent of said monomer being selected from the class of nontertiary alkyl acrylates wherein each alkyl group has at least half of its carbon atoms in a single chain and the average length of the alkyl chain is at least 4 and not more than 12, and

(b) from 0.2 to 5 parts by weight of at least one vinyl-unsaturated homopolymerizable emulsifier monomer which is a surfactant having both a hydrophobic and a hydrophilic moiety, contains at least 5 but no more than 40 carbon atoms, and is water-dispersible, the total parts by weight (a) plus (b) being 100, wherein the improvement comprises:

the emulsifer monomer is a monovalent salt of a styrene sulfonate and wherein the adhesive layer contains up to 1.5% external emulsifier by weight,

whereby the tape not only has an adhesive value of at least about 40 N/dm and a cohesive value of at least 100 minutes but also can be cleanly removed from a melamine test surface after one hour at 150? C.

4,629,664

LIQUID FUEL CELL

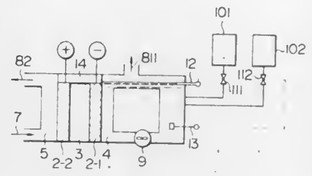
Tsutomu Tsukui, Hitachi; Saburo Yasukawa; Toshio Shimizu, both of Katsuta; Ryota Doi, Ibaraki; Motoo Yamaguchi, and Shuzou Iwaasa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,888

Claims priority, application Japan, Oct. 31, 1984, 59-229277; Apr. 10, 1985, 60-74264

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—23 11 Claims



1. A liquid fuel cell having a circulation system for a fuel mixture comprising fuel and water, which comprises a first tank containing water or a water-rich fuel mixture comprising water and fuel, a second tank containing fuel or a fuel-rich mixture comprising water and fuel, a first detector for detecting the liquid level of the fuel mixture in the circulation system, a second detector for detecting a fuel concentration of the fuel mixture in the circulation system, or an output from the fuel cell, or a load current of the fuel cell, a valve means for controlling flow of the water or the water-rich mixture in the first tank to the circulation system in accordance with the output from the first detector, and a valve means for controlling flow of the fuel or the fuel-rich mixture in the second tank to the circulation system in accordance with the output from the second detector.

4,629,665

CYLINDRICAL BATTERY

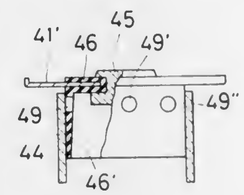
Setsuo Matsuo, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 27, 1984, Ser. No. 574,560

Claims priority, application Japan, Feb. 7, 1983, 58-17132[U]; Jun. 3, 1983, 58-85533[U]; Jul. 13, 1983, 58-109159[U]

Int. Cl.[4] H01M *2/02, 2/12*

U.S. Cl. 429—164 6 Claims



1. A cylindrical battery comprising:

a battery case for providing a battery terminal of a first polarity;

a cylindrical first polarity electrode having a hollow zone therein, said first polarity electrode being disposed within said battery case and electrically coupled thereto;

an electrolyte disposed within said battery case; and

a second polarity member being disposed within said hollow zone, said second polarity member comprising an assembly of a second polarity terminal, a lead plate, a second polarity electrode electrically coupled to said terminal via said lead plate, a cylindrical gas porous separator envelop-

ing said second polarity electrode and having a top opening with an inside peripheral surface extending past an end of said second polarity electrode and an annular insulating packing means having an annular descending wall disposed upon said separator top opening inside peripheral surface;

wherein said annular descending wall includes permanently open unobstructed apertures within a region where said annular descending wall is disposed on said separator inside peripheral surface for the release of gas from said second polarity member during battery assembly.

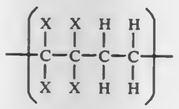
4,629,666

SEPARATORS FOR ELECTROCHEMICAL CELLS

Carl R. Schlaikjer, Winchester, Mass., assignor to Duracell Inc., Bethel, Conn.

Filed Nov. 22, 1985, Ser. No. 800,857
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **12 Claims**

1. An electrochemical cell comprising a container having two electrically isolated terminals; the container having therein an anode connected to one terminal, a cathode connected to the other terminal, a fluid electrolyte, an ionizable solute dissolved in said electrolyte, and a separator positioned between and in contact with the anode and the cathode; wherein the separator is characterized by being a substantially continuous microporous film comprising a polymer that is a copolymer of ethylene and a fully halogenated analogue of ethylene having the following formula:



where the X's are halogens.

4,629,667

WHITE REFLECTIVE COATING

John F. Kistner, Oakdale, and Donald R. Hotchkiss, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 29, 1985, Ser. No. 717,530
Int. Cl.[4] G03C *1/96, 1/86, 9/00*
U.S. Cl. 430—11 **10 Claims**

1. An autostereographic print comprising a lenticular element having a lenticular front surface and a non-lenticular back surface, secured to said non-lenticular back surface one surface of a transparent optical element having at least two perspective images, and secured to the other surface of said optical element a backing layer comprising the dried and crosslinked product of a composition comprising by weight:

0.1 to 52% of a white pigment

0.25 to 12% of a water-soluble, crosslinkable, synthetic polymeric binder,

0.05 to 6% of a water-soluble crosslinking agent comprising a melamine-formaldehyde water-soluble resin for said water-soluble crosslinkable binder, and

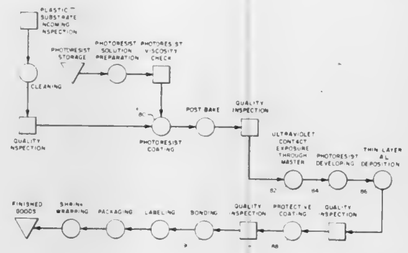
30 to 80% water.

4,629,668

OPTICALLY READ RECORDING MEDIUM AND METHOD FOR MAKING SAME

Alan B. Hamersley, Orange; Michael W. Goff, La Mirada; Vinai K. Thummalapally, Anaheim; Thomas M. Whitworth, Huntington Beach, and Ramchandra R. Nomula, Irvine, all of Calif., assignors to Quixote Corporation, Chicago, Ill.

Filed Mar. 12, 1985, Ser. No. 710,919
Int. Cl.[4] G01G *15/34*
U.S. Cl. 430—11 **10 Claims**



1. An information recording medium adapted for use with a reading beam, said medium comprising:

a substrate having first and second sides;

a layer of photoresist on the first side of the substrate, said layer of photoresist defining an array of depressions therein, said depressions having a selected depth and distributed in a pattern indicative of selected stored information; and

a reflecting layer deposited on the layer of photoresist;

both the substrate and the layer of photoresist adapted to transmit the reading beam such that a portion of the reading beam incident on the second side of the substrate is reflected out of the substrate by the reflecting layer, both in a first region comprising the depressions and in a second region between the depressions;

the selected depth of the depressions chosen to provide destructive interference between (a) the portion of the reading beam reflected out of the substrate by the reflecting layer in the first region and (b) the portion of the reading beam reflected out of the substrate by the reflecting layer in the second region.

4,629,669

METHOD OF FORMING SUPERIMPOSED COLOR IMAGES

Hisashi Shoji; Satoshi Haneda, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jan. 28, 1985, Ser. No. 695,488
Claims priority, application Japan, Jan. 30, 1984, 59-13462; Jan. 30, 1984, 59-13463; Jan. 30, 1984, 59-13465; Apr. 12, 1984, 59-71888
Int. Cl.[4] G03G *13/09*
U.S. Cl. 430—47 **26 Claims**

1. In a method of forming an image comprising the steps of forming an electrostatic latent image on an image retainer, flying magnetic toner particles retained on a developer feeding carrier toward said image retainer under an oscillating electric field produced between said image retainer and said developer feeding carrier, repeating the steps of the above to superpose a plurality of toner images on said image retainer by using different colored toner particles in every step, the improvement wherein a magnetic attracting force, acting between said toner particles and a magnetic forming means provided in said developer feeding carrier, of each step is smaller than the magnetic attracting force of the previous step.

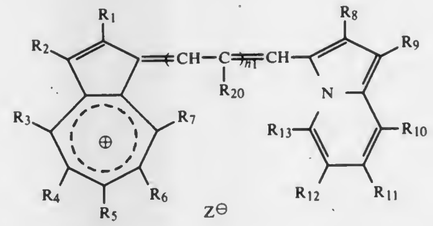
4,629,670

PHOTOCONDUCTIVE FILM OF AZULENIUM SALT AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

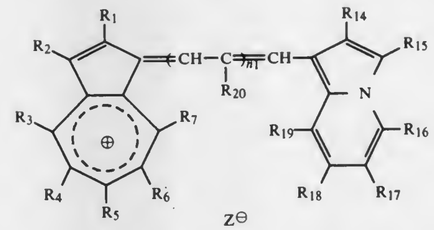
Kazuharu Katagiri, Tama; Yoshihiro Oguchi, Yokohama; Takeshi Ohtake, Fujisawa; Kozo Arao, Tokyo, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,570
Claims priority, application Japan, Jun. 12, 1984, 59-120128; Jun. 30, 1984, 59-134117; Jun. 30, 1984, 59-134118; Jun. 30, 1984, 59-134120; Jun. 30, 1984, 59-134121; Jun. 30, 1984, 59-134122
Int. Cl.[4] G03G *5/00, 5/09, 5/14*
U.S. Cl. 430—58 **20 Claims**

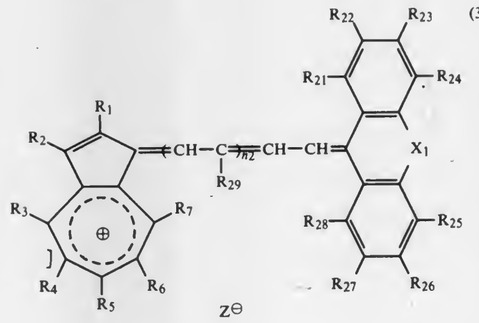
3. An electrophotographic photosensitive member which comprises an electroconductive substrate and an photoconductive film comprising at least one of the azulenium salt compounds represented by the formulae (1)-(9) as shown below;



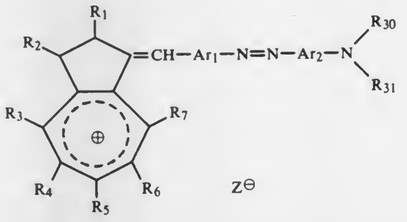
(1)



(2)

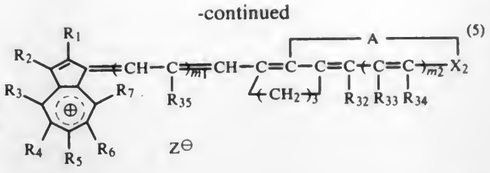


(3)

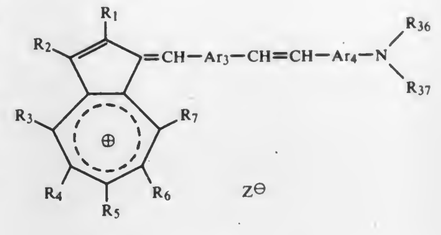


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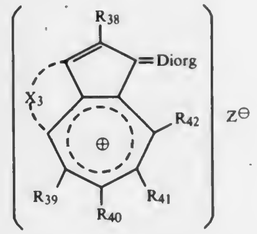
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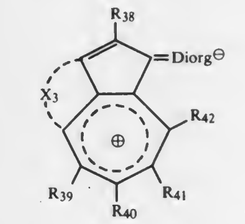
(5)



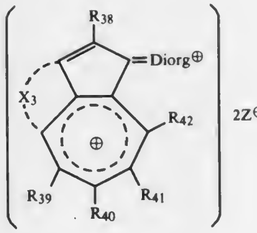
(6)



(7)



(8)



(9)

wherein

each of R_1, R_2, R_3, R_4, R_5, R_6, and R_7 is hydrogen, halogen, or an organic monovalent residue and at least one of the combinations (R_1 and R_2), (R_2 and R_3), (R_3 and R_4), (R_4 and R_5), (R_5 and R_6), and (R_6 and R_7) may form a substituted or unsubstituted condensed ring;

each of R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, and R_{19} is hydrogen, halogen, alkyl, alkoxy substituted or unsubstituted aryl, substituted or unsubstituted aralkyl, nitro, or acyl, and at least one of the combinations ($R_8$and R_9), (R_9 and R_{10}), (R_{10} and R_{11}), (R_{11} and R_{12}), (R_{12} and R_{13}), (R_{14} and R_{15}), (R_{15} and R_{16}), (R_{16} and R_{17}), (R_{17} and R_{18}), and (R_{18} and R_{19}) may form a substituted or unsubstituted condensed ring;

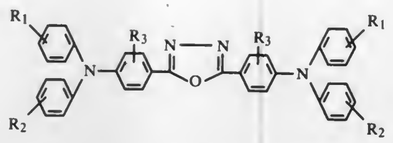
R_{20} is hydrogen, nitro, alkyl, or aryl;

n_1 is 0, 1, or 2;
each of R_{21}, R_{22}, R_{23}, R_{24}, R_{25}, R_{26}, R_{27}, and R_{28} is hydrogen, halogen, alkyl, alkoxy, hydroxyl, substituted or unsubstituted aryl, substituted or unsubstituted aralkyl, or nitro, and at least one of the combinations (R_{21} and R_{22}), (R_{22} and R_{23}), (R_{23} and R_{24}), (R_{25} and R_{26}), (R_{26} and R_{27}), and (R_{27} and R_{28}) may form a substituted or unsubstituted aromatic ring;
X_1 is oxygen, sulfur, or selenium;
R_{39} is hydrogen, nitro, cyano, alkyl, or aryl; n_2 is 0, 1, or 2;
each of R_{30} and R_{31} is substituted or unsubstituted alkyl, aryl, or aralkyl, and R_{30} and R_{31} may be joined together with the nitrogen atom to which they are attached to form a ring;
each of Ar_1 and Ar_2 is substituted or unsubstituted arylene;
each of R_{32}, R_{33}, and R_{34} is hydrogen, alkyl, alkoxy, substituted or unsubstituted aryl, substituted or unsubstituted styryl, substituted or unsubstituted 4-phenyl-1,3-butadienyl, or a substituted or unsubstituted heterocyclic ring group, and the combination (R_{32} and R_{33}) or (R_{33} and R_{34}) may form a substituted or unsubstituted benzene ring;
R_{35} is a hydrogen, nitro. alkyl, or aryl;
X_2 is oxygen, sulfur, or selenium;
A is an atomic group necessary to complete pyran, thiapyran, selenapyran, benzopyran, benzothiapyran, benzoselenapyrane, naphthopyrane, naphthothiapyran, or naphthoselenapyran which may be substituted;
m_1 is 0, 1, or 2;
m_2 is 0 or 1;
each of R_{36} and R_{37} is substituted or unsubstituted alkyl, aryl, or aralkyl, and R_{36} and R_{37} may be joined together with the nitrogen atom to which they are attached to form a ring;
each of Ar_3 and Ar_4 is substituted or unsubstituted arylene;
each of R_{38}, R_{39}, R_{40}, R_{41}, and R_{42} is hydrogen, halogen, or an organic monovalent residue;
X_3 is an atomic group necessary to form a substituted or unsubstituted 5-, 6-, or 7-membered aromatic ring;
at least one of the combinations (R_{38} and an aromatic ring formed by X_3), (an aromatic ring formed by X_3 and R_{39}), (R_{39} and R_{40}), (R_{40} and R_{41}), and (R_{41} and R_{42}) may form a substituted or unsubstituted aromatic ring, heterocyclic ring or aliphatic ring;
Diorg is an organic divalent residue linked with a double bond;
$Z^{\ominus}$ is an anionic residue.

9. An electrophotographic photosensitive member according to claim **3** in which the photoconductive film is used as a charge generation layer and a charge transport layer is provided.

4,629,671
CHARGE-TRANSPORTING COMPOUNDS AND PHOTOCONDUCTIVE ELEMENTS PROVIDED WITH SUCH CHARGE-TRANSPORTING COMPOUNDS
Roelof H. Everhardus, Lomm; Wilhelmus J. Bouts, Reuver, and Johannes J. M. Brands, Arcen, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands
Filed Aug. 6, 1985, Ser. No. 762,925
Claims priority, application Netherlands, Sep. 5, 1984, 8402705
Int. Cl.⁴ G03G *5/14*
U.S. Cl. 430—59 **6 Claims**

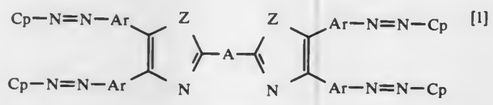
1. A photoconductive element comprising a support and one or more layers, containing together a "transparent and substantially colorless" charge-generating compound and a charge-transporting compound which is homogeneously distributed in a binder, wherein the charge-transporting compound is of the general formula:



wherein R1, R2, and R3, individually, represent a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms.

4,629,672
LIGHT-SENSITIVE COMPOSITION HAVING A TETRAKISAZO COMPOUND
Naonori Makino; Kenji Sano; Seiji Horie, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 13, 1985, Ser. No. 797,553
Claims priority, application Japan, Nov. 13, 1984, 59-239217
Int. Cl.⁴ G03G *5/06, 5/14*
U.S. Cl. 430—76 **15 Claims**

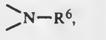
1. A light-sensitive composition containing at least one of tetrakisazo compounds having the following general formula [1]:



[1]

wherein Cp represents a coupler residue; A is a single bond,

in which n is an integer of from 1 to 3, or a divalent aromatic organic residue, and B^1 and B^2 each represents a hydrogen atom or an electron attractive group; Z represents



—O—, —S— or —Se—, in which R^6 represents a hydrogen atom, a substituted or unsubstituted lower alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted aryloxycarbonyl group or a substituted or unsubstituted acyl group; and Ar represents a substituted or unsubstituted divalent aromatic carbon ring group or a substituted or unsubstituted divalent heterocyclic aromatic ring group.

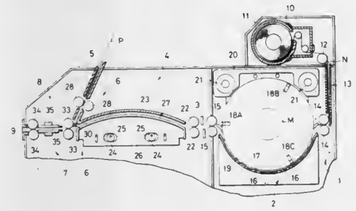
4,629,673
RESIN-COATED CARRIER FOR USE IN TWO-COMPONENT ELECTROPHOTOGRAPHIC DEVELOPERS
Shigenobu Osawa; Tamotsu Murakami; Takashi Mizuma, all of Kawasaki, and Katsuhide Sano, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jun. 4, 1985, Ser. No. 741,116
Claims priority, application Japan, Jun. 5, 1984, 59-114914
Int. Cl.⁴ G03G *9/10*
U.S. Cl. 430—108 **14 Claims**

1. A carrier for use in a two-component electrophotographic developer which comprises a core particle comprising porous magnetite coated with a resin film, said core particle being the reaction product of a process which includes the step of burning iron oxide at a temperature of from about 700° to about 800° C.

4,629,674
ELECTROPHOTOGRAPHIC PROCESS INCLUDING CONTROLLING APPLIED CURRENT VALUES
Toru Nakazawa, Sennan, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Jun. 28, 1984, Ser. No. 625,536
Claims priority, application Japan, Jun. 30, 1983, 58-117092
Int. Cl.⁴ G03G *13/16*
U.S. Cl. 430—125 **5 Claims**

1. In an electrophotographic process including providing an organic photoconductive photosensitive layer capable of being charged at both positive and negative polarities, performing a copying operation cycle by pre-charging said layer or removing electric charge therefrom by direct current corona discharge, main charging said layer by direct current corona discharge of a polarity opposite to that of said pre-charging, imagewise exposing the thus charged layer to form an electrostatic image, developing said electrostatic image with toner to form a toner image, transferring said toner image to a copy sheet, cleaning said layer to remove therefrom residual toner remaining after said transferring, and repeating said operations to provide a stable surface potential in the second and subsequent cycles of a copying operation, the improvement comprising:
conducting said main charging at a saturated applied current sufficient to maintain said layer at a surface potential saturated at an absolute value of 500 to 700 volts; and
conducting said pre-charging or electric charge removal at an applied current which is 40 to 90% of said saturated applied current of said main charging.

4,629,675
PROCESS FOR THERMAL DEVELOPMENT AND TRANSFER
Nobumitsu Takehara; Kazuhiko Yanagihara; Masahiro Ohnishi; Isamu Hatanaka, and Shigeo Harada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 2, 1984, Ser. No. 596,193
Claims priority, application Japan, Mar. 31, 1983, 58-55906
Int. Cl.⁴ G03C *5/54;* **G03D** *9/00, 5/00*
U.S. Cl. 430—203 **4 Claims**



1. In a process for thermal development and transfer comprising steps of exposing to light a photosensitive material containing silver halide layers and a hydrophilic dye to form a pigment pattern defining a particular image, said pigment being transferable when heated; bringing said material into intimate contact with an image receiving material having a pigment fixing layer; and heating said photosensitive and image receiving materials to transfer said pigment of said pigment fixing layer, the improvement which comprises;
supplying an aqueous pigment diffusion assistant to an area between said photsensitive and image receiving materials in such a manner that it can spread along a line along which said materials contact one another, and can assist the transfer of said pigment; and
wherein said aqueous diffusion assistant is supplied through a pipe disposed between said materials and extending transversely thereof, said pipe having a single outlet opening located at a point approximately in the middle of its length such that said aqueous diffusion assistant is supplied from said opening one drop at a time to a point approximately in the middle of the width of said materials, each said drop spreading to form a bead between said materials.

4,629,676
IMAGE FORMING METHOD
Yoshihide Hayakawa, Tokyo; Masato Satomura, and Kozo Sato, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Filed Sep. 12, 1985, Ser. No. 775,273
Claims priority, application Japan, Sep. 12, 1984, 59-191353; Sep. 18, 1984, 59-195407
Int. Cl.⁴ G03C *1/40, 5/54;* **G03F** *7/00*
U.S. Cl. 430—203 **19 Claims**

10. An image forming method which comprises forming a latent image by imagewise exposing a recording material including a light-sensitive silver salt, a reducing agent, a polymerizable compound having at least one carbon-carbon unsaturated bond, a binder, and a first color component capable of causing a coloration reaction with a second color component, on a support; subjecting said recording material to a substantially uniform heating at about 80° C. or more under conditions substantially not containing water to form a polymeric compound in areas where a latent image of the light-sensitive silver salt has formed; and reacting the first color component present in areas where the polymeric compound has not been formed with a second color component to form color in a receiving element containing the second color component.

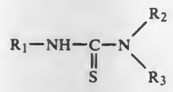
4,629,677
ELEMENT FOR DIFFUSION TRANSFER WITH STRIPPING LAYER OF CROSSLINKED POLYMER FROM ETHENICALLY UNSATURATED CARBOXYLIC ACID OR SALT THEREOF
Kazunobu Katoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 13, 1985, Ser. No. 744,342
Claims priority, application Japan, Jun. 14, 1984, 59-122759
Int. Cl.⁴ G03C *1/40, 5/54, 1/90*
U.S. Cl. 430—215 **21 Claims**

1. A photographic film unit, comprising:
a light-sensitive element containing a first support having coated thereon at least one light-sensitive silver halide emulsion layer, and
an image-receiving element comprising a second support having thereon at least one image-receiving layer and a stripping layer composed of a copolymer containing more than 40 mol percent of a monomer unit derived from an ethylenically unsaturated carboxylic acid or salt thereof which is at least partially crosslinked,
wherein said stripping layer is positioned between the light-sensitive silver halide emulsion layer and the image-receiving layer.

4,629,678
INTERNAL LATENT IMAGE-TYPE DIRECT POSITIVE SILVER HALIDE LIGHT-SENSITIVE MATERIAL
Ashita Murai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 29, 1984, Ser. No. 665,872
Claims priority, application Japan, Oct. 31, 1983, 58-204593
Int. Cl.⁴ G03C *1/34*
U.S. Cl. 430—230 **20 Claims**

1. An internal latent image-type direct positive silver halide light-sensitive material comprising a support having at least one photographic emulsion layer coated thereon, wherein said photographic emulsion layer contains internal latent image-type direct positive silver halide grains, the surfaces of which

are chemically sensitized, wherein a stabilizing compound represented by the general formula (I) is added as a finish additive to the photographic emulsion layer, at least one hydrophilic colloid layer adjacent to the photographic emulsion layer,



(I)

wherein:

R_1 is a saturated or unsaturated aliphatic radical, an aromatic radical, a nitrogen atom-containing 5- or 6-membered heterocyclic radical, or an acyl group;

R_2 is a hydrogen atom, a saturated or unsaturated aliphatic radical, or an aromatic radical;

R_3 is the same as defined for R_1 or R_2;

R_2 and R_3 may combine together to form a heterocyclic ring; and

R_1 to R_3 and the heterocyclic ring formed from R_2 and R_3 may be substituted, provided that when R_2 is an aromatic radical, the substituent does not include a group with hydrazine or its derivative linked thereto.

4,629,679

TETRAZOLE COMPOUND-CONTAINING PHOTOPOLYMERIZABLE RESIN COMPOSITION

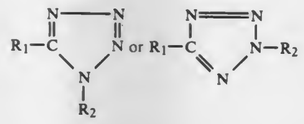
Hiroyuki Uchida, Ootake, and Jun Nakauchi, Tokyo, both of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Continuation of Ser. No. 700,764, Feb. 12, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 834,148

Int. Cl.[4] G03C *1/94, 1/68*

U.S. Cl. 430—281 **9 Claims**

1. A photopolymerizable resin composition comprising (a) 40% to 85% by weight, based on the total weight of the photopolymerizable resin composition, of a thermoplastic polymer as a binder, (b) 25% to 50% by weight, based on the total weight of the photopolymerizable resin composition, of a cross-linkable monomer having at least one ethylenically unsaturated group in the molecule, (c) 0.5% to 10% by weight, based on the total weight of the thermoplastic polymer (a) and the cross-linkable monomer (b), of a photopolymerization initiator, and (d) 0.005% to 1% by weight, based on the total weight of the thermoplastic polymer (a) and the cross-linkable monomer (b), of a tetrazole compound represented by the formula:



wherein R_1 is hydrogen, a halogen, or a methyl, ethyl, phenyl, carboxyl, amino, dimethylamino, diethylamino, methoxy, ethoxy, or sulfonic acid group; and R_2 is hydrogen or a methyl, ethyl, phenyl, or amino group.

4,629,680

PHOTOPOLYMERIZABLE MATERIALS CAPABLE OF BEING DEVELOPED BY A WEAK ALKALINE AQUEOUS SOLUTION

Masayuki Iwasaki; Minoru Maeda; Fumiaki Shinozaki, all of Shizuoka, and Kazuo Maemoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1985, Ser. No. 695,503

Claims priority, application Japan, Jan. 30, 1984, 59-14820; Jun. 5, 1984, 59-114736

Int. Cl.[4] G03C *1/68;* **C08F** *8/00*

U.S. Cl. 430—288 **13 Claims**

1. A photopolymerizable composition characterized by being used as a photoresist in the form of a storable sheet or roll on a peelable film support consisting essentially of an addition polymerizable unsaturated compound having at least two ethylenically unsaturated double bonds in the molecule, a photopolymerization initiator, and a binder, said binder being a copolymer composed of at least one recurring unit of group (A), at least one recurring unit of group (B), and at least one recurring unit of group (C), and having a weight average molecule weight of 5,000 to 5,000,000, wherein

(A) is an alkyl methacrylate, benzyl methacrylate or an alkyl substituted benzyl methacrylate unit having a glass transition point of the homopolymer of higher than 50° C. and said alkyl methacrylate or alkyl substituted benzyl methacrylate having an alkyl group having from 3 to 10 carbon atoms,

(B) is an acrylate unit having a glass transition point of the homopolymer of lower than 110° C. and having a alkyl group having from 1 to 6 carbon atoms, and

(C) is an α,β-ethylenically unsaturated carboxylic acid unit, and wherein

the content of the component of group (A) is from 5 to 70 mol%, the content of the component of group (B) is from 5 to 70 mol%, and the counter of the component of group (C) is from 20 to 60 mol%, provided that the total content of the components of groups (A), (B) and (C) is 100 mol%.

4,629,681

METHOD OF MANUFACTURING MULTILAYER CIRCUIT BOARD

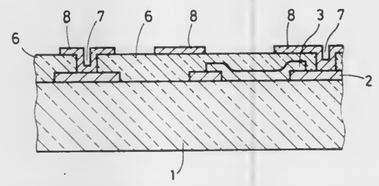
Mitsuyuki Takada; Yoshiyuki Morihiro, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,781

Claims priority, application Japan, Nov. 25, 1983, 58-222336

Int. Cl.[4] G03C *5/00;* **B05D** *5/12*

U.S. Cl. 430—314 **7 Claims**



1. A method of manufacturing a multilayer circuit board comprising the steps of:

providing a substrate,

forming a plurality of portions of a first thick film conductor layer on said substrate with a predetermined pattern,

forming a thick film resistor to be connected to the portions of said first conductor layer by forming and firing a thick film,

forming an insulating layer of a photosensitive polyimide resin over said first conductor layer and said resistor,

providing through holes in said insulating layer by applying patterning thereto with a mask so that said first conductor layer may be partially exposed,

forming a second conductor layer on said insulating layer by applying plating onto said insulating layer and by etching said plated layer with a predetermined pattern,

wherein said step of forming said second conductor layer further comprises the steps of:

forming a first plating layer on the whole surface of said sbustrate by applying electroless plating, said first plating layer being in contact with portions of the first conductor layer,

forming a second plating layer on the whole surface of said first plating layer by applying electroplating, and

etching said first plated layer and said second plated layer with a predetermined pattern.

4,629,682

RECORDING MATERIAL FOR COLOR PHOTOGRAPHY

David G. Leppard, Marly, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Canada

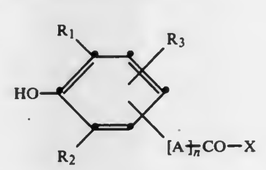
Continuation-in-part of Ser. No. 559,433, Dec. 8, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 717,096

Claims priority, application Switzerland, Dec. 8, 1982, 7142/82

Int. Cl.[4] G03C *1/40, 1/84*

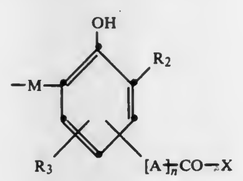
U.S. Cl. 430—372 **17 Claims**

1. A recording material for colour photography, which contains in at least one photosensitive silver halide emulsion layer, one intermediate layer and/or one protective layer, a light stabilising amount of at least one polyalkylpiperidine compound as a stabiliser, wherein the polyalkylpiperidine compound is of the formula I

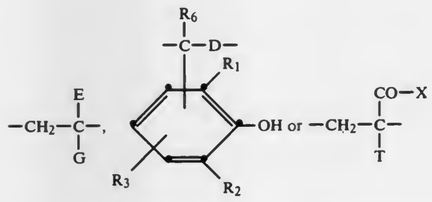


(I)

in which n is 0 or 1, R_1 is hydrogen, C_1-C_8-alkyl, C_5-C_8-cycloalkyl, phenyl, C_7-C_{14}-aralkyl, C_7-C_{14}-alkaryl or a group



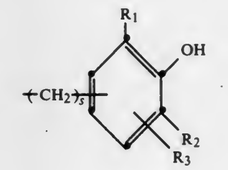
R_2 is C_1-C_8-alkyl, C_5-C_8-cycloalkyl, phenyl, C_7-C_{14}-aralkyl, C_7-C_{14}-alkaryl and R_3 is hydrogen or methyl, M is a direct bond, —S—, —S—S—, —S(O)—, —S(O)$_2$— or —CH(R_4)—, in which R_4 is hydrogen or C_1-C_8-alkyl, A is a group —CH_2—, —CH_2—CH(R_5)—,



in which R_5 is hydrogen, methyl, ethyl, phenoxymethyl or phenyl, R_6 is hydrogen, C_1-C_{12}-alkyl, C_5-C_8-cycloalkyl, phenyl or benzyl, E is —CN or a group —$COOR_7$, —COR_8, —SO_2R_8, —P(O)(OR_9)$_2$ or —CHO, in which R_7 is C_1-C_4-alkyl, R_8 is C_1-C_{12}-alkyl, C_7-C_{14}-alkaryl or phenyl and R_9 is C_1-C_{18}-alkyl, phenyl or allyl, G is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-alkenyl, C_3-C_4-alkinyl, C_3-C_{12}-cycloalkyl, C_6-C_{18}-alkylcycloalkyl, C_6-C_{14}-cycloalkylalkyl, C_7-C_{14}-aralkyl, C_7-C_{14}-alkaryl or phenyl or C_1-C_{18}-alkyl which is substituted by phenoxy, C_7-C_{10}-alkylphenoxy, benzyloxy, cyclohexyloxy, cyano, —$COOR_{10}$, —$OCOR_{11}$ or —P(O)(OR_{12})$_2$, in which R_{10} is C_1-C_{18}-alkyl, C_3-C_{12}-cycloalkyl or a group of the formula II

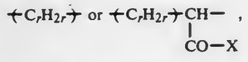
$$-C_aH_{2a}-CO-X \qquad (II)$$

in which a is an integer of from 1 to 6, R_{11} is C_1-C_{18}-alkyl, C_3-C_{12}-cycloalkyl, phenyl, C_7-C_9-phenylalkyl or a group of the formula III

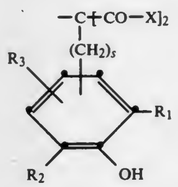


(III)

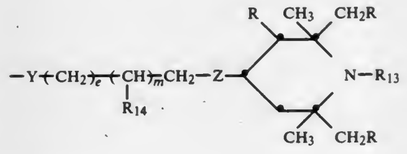
in which s is 0, 1 or 2, and R_{12} is C_1-C_8-alkyl, allyl or phenyl, or G is C_2-C_{18}-alkyl which is interrupted by —O—, —S—, —SO— or —SO_2—, or is a group of the formula III, or, if E is a group —COR_8, G and R_8 together are tri- or tetra-methylene which is unsubstituted or substituted by hydroxyl or oxo, D is a group



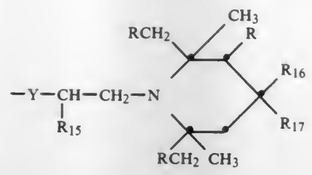
in which r is 0 or an integer of from 1 to 12, T is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-alkenyl, C_3-C_4-alkinyl, C_3-C_{12}-cycloalkyl, C_6-C_{18}-alkylcycloalkyl, C_6-C_{14}-cycloalkylalkyl, C_7-C_{14}-aralkyl, C_7-C_{14}-alkaryl, phenyl, cyano or a group —COR_8, —SO_2R_8 or —P(O)(OR_9)$_2$, a group of the formula III or a group of the formula



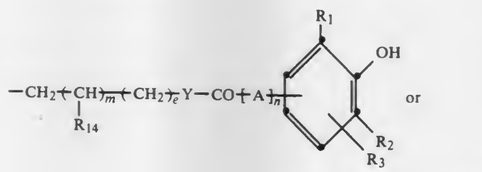
or T is C_1-C_{18}-alkyl which is interrupted by —O—, —S—, —SO— or —SO_2—, X is a group of the formula

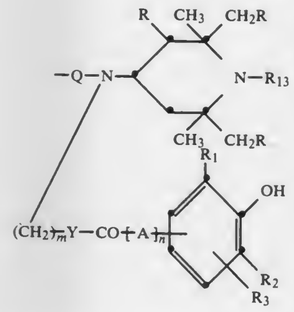


or of the formula

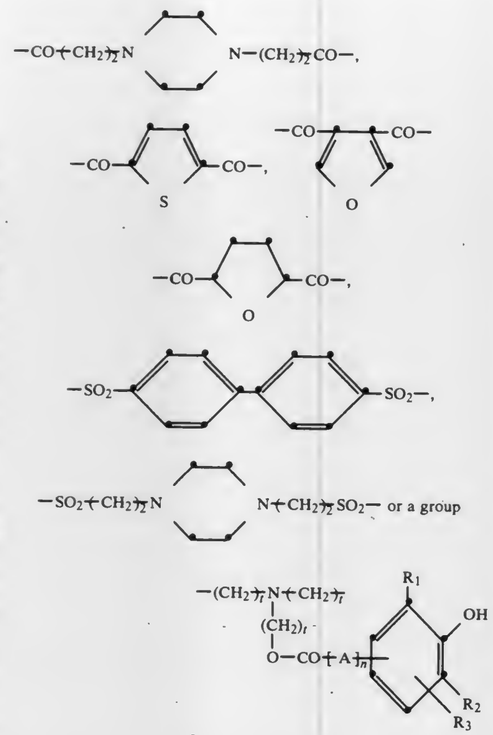


in which e is an integer of from 1 to 5, m is 0 or 1, R is hydrogen or methyl, R_{13} is hydroxyl, C_1-C_{12}-alkyl, C_3-C_6-alkenylmethyl, C_3-C_4-alkinylmethyl, C_7-C_{14}-aralkyl or glycidyl, or C_1-C_4-alkyl which is substituted by halogen, cyano, $-COOR_{18}$ or $-CON(R_{19})(R_{20})$, or a group $-COR_{21}$, $-COOR_{18}$ or $-CON(R_{19})-(R_{20})$, a group $-CH_2-CH(R_{22})-OR_{23}$, $-SOR_{24}$, $-SO_2R_{24}$, $-OR_{18}$ or $-OCOR_{21}$, in which R_{18} is C_1-C_{12}-alkyl, allyl, cyclohexyl or benzyl, R_{19} is C_1-C_{12}-alkyl, allyl, cyclohexyl, benzyl, phenyl or C_7-C_{10}-alkylphenyl and R_{20} is hydrogen, C_1-C_{12}-alkyl, allyl, cyclohexyl or benzyl, or R_{19} and R_{20}, together with the N atom to which they are bonded, are a 5-membered or 6-membered heterocyclic ring, R_{21} is hydrogen, C_1-C_{12}-alkyl, C_2-C_6-alkenyl, chloromethyl, C_5-C_8-cycloalkyl, C_7-C_{14}-aralkyl, phenyl or C_7-C_{10}-alkylphenyl, or phenyl, phenylmethyl or phenylethyl which is substituted by 1 or 2 C_1-C_4-alkyl groups and 1 hydroxyl group, R_{22} is hydrogen, C_1-C_4-alkyl, C_3-C_4-alkoxyalkyl, phenyl or phenoxymethyl, R_{23} is hydrogen, C_1-C_{12}-alkyl or a group $-COR_{21}$ or $-CON(R_{19})(R_{20})$ and R_{24} is C_1-C_{12}-alkyl, phenyl or C_7-C_{10}-alkylphenyl, Y is —O— or $-N(R_{25})-$, in which R_{25} is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-alkenyl, C_3-C_{12}-cycloalkyl, phenyl, C_7-C_{14}-aralkyl, C_7-C_{14}-alkaryl, C_2-C_{11}-alkoxyalkyl or a group of the formula IV, Z is —O— or $-N(R_{26})-$, in which R_{26} is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-alkenyl, C_3-C_{12}-cycloalkyl, phenyl, C_7-C_{14}-alkaryl, C_7-C_{14}-aralkyl, C_2-C_{11}-alkoxyalkyl or a group $-COR_{27}$, $-COOR_{28}$, $-CON(R_{29})(R_{30})$, $-CH_2-CH(R_{31})-OR_{32}$, $-SOR_{33}$ or $-SO_2R_{33}$, in which R_{27} has one of the meanings given for R_{21} or is a heterocyclic ring, R_{28} has one of the meanings given for R_{18}, R_{29} has one of the meanings given for R_{19}, R_{30} has one of the meanings given for R_{20}, R_{31} has one of the meanings given for R_{22}, R_{32} has one of the meanings given for R_{23} and R_{33} has one of the meanings given for R_{24}, or R_{26} is one of the groups

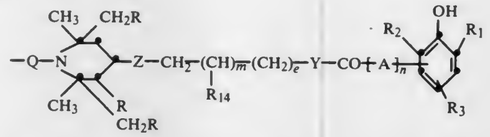




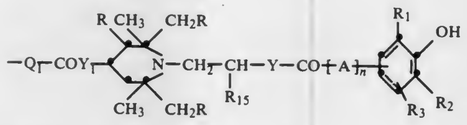
Q is a group $-C_bH_{2b}-$, in which b is an integer of from 2 to 12, C_4-C_8-alkenylene, C_5-C_{12}-cycloalkylene, phenylene, xylylene bitolylene, a group $-CO-C_rH_{2r}-CO-$,



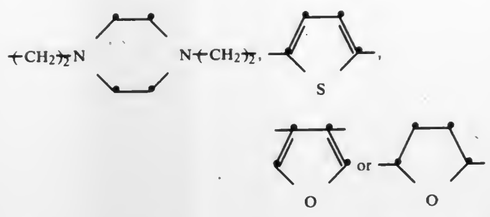
in which t is 0 or an integer of from 1 to 5, or R_{13} is a group of the formula



and R_{14} is hydrogen, C_1-C_{18}-alkyl, C_7-C_{23}-phenoxyalkyl, phenyl, C_7-C_{14}-aralkyl or C_2-C_{11}-alkoxyalkyl, R_{15} is hydrogen, methyl, ethyl, phenyl or phenoxymethyl, R_{16} is hydrogen, $-OR_{34}$, $-OCOR_{35}$, $-N(R_{36})-COR_{35}$, $-OSO_2R_{35}$ or $-N(R_{36})-SO_2R_{35}$, in which R_{34} is hydrogen, C_1-C_{12}-alkyl, allyl, or benzyl, R_{35} is hydrogen, C_1-C_{12}-alkyl, C_2-C_6-alkenyl, chloromethyl, C_5-C_8-cycloalkyl, C_7-C_9-phenylalkyl, C_7-C_{10}-alkylphenyl, phenyl or a group



in which Y_1 has one of the meanings given for Y, Q_1 is a group $-C_rH_{2r}-$, C_2-C_8-alkenylene, C_5-C_{12}-cycloalkylene, phenylene, xylylene, bitolylene or a group



and R_{36} is hydrogen, C_1-C_{12}-alkyl, C_5-C_8-cycloalkyl or benzyl, and R_{17} is hydrogen, cyano, $-COOR_{18}$, $-CONH_2$, $-CON-(R_{19})(R_{20})$ or $-CH_2NHR_{37}$, in which R_{37} is a group $-COR_{21}$ $-COOR_{18}$, $-CON(R_{19})(R_{20})$, $-CH_2-CH(R_{22})-OR_{23}$, $-SOR_{24}$ or $-SO_2R_{24}$, the radicals and symbols mentioned repeatedly always being as first defined.

17. Process for the preparation of photographic colour-forming agents by imagewise exposure and colour development of a recording material for colour photography according to claim **1**.

4,629,683

PROCESSING SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH BLOCKED AGENT AND HYDROXYLAMINE

Isamu Itoh; Mitsunori Ono; Keiji Mihayashi; Seiji Ichijima, and Hidetoshi Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1984, Ser. No. 602,645

Claims priority, application Japan, Apr. 22, 1983, 58-71883

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

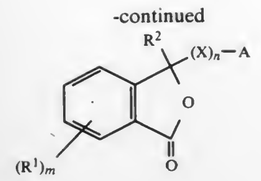
Int. Cl.[4] **G03C** *1/40, 5/26, 5/30, 5/38*

U.S. Cl. 430—390 **14 Claims**

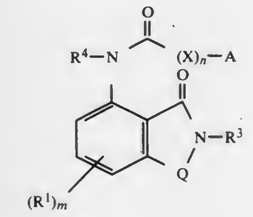
1. A method of processing an imagewise exposed silver halide photographic material, which comprises processing under alkaline conditions, in the presence of a hydroxylamine, an imagewise exposed photographic material containing a light-sensitive silver halide emulsion layer which contains a blocked photographic agent capable of non-imagewise releasing in exposed and non-exposed areas of said light-sensitive silver halide emulsion layer a photographically useful agent by ring cleavage of a 4- to 7-membered ring containing at least one carbonyl group, said blocked photographic agent being a compound represented by the following general formulae (I) to (V):

-continued

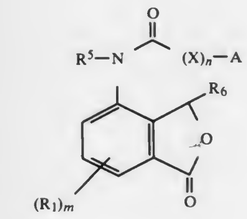
(III)



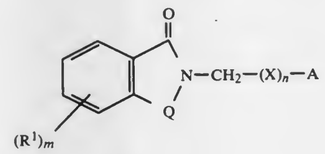
(IV)



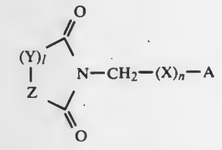
(V)



(I)



(II)



wherein A represents a photographically useful group which is connected to the blocking group through a hetero atom thereof; Q represents —CO— or $-SO_2-$; X represents a divalent timing group connected to the imidomethyl group through an oxygen atom thereof; R^1 represents a substituent on the phenyl nucleus selected from the group consisting of a halogen atom, an alkyl group, an aryl group, an alkenyl group, an alkoxy group, an aryloxy group, an alkylsulfonyl group, an arylsulfonyl group, a secondary or tertiary amino group, a ureido group, an aminosulfonamido group, a carbamoyl group, a sulfamoyl group, a carbonamido group, a sulfunamido group, a carbamate group, an oxycarbonyl group, an acyloxy group, a carbonate group, an acyl group, a carboxy group, a sulfo group, a cyano group and a nitro group; m represents 0 or an integer of 1 to 4; n represents 0 or 1; Z represents $-CR^7R^8-$, —O—, —S— or $-NR^9-$; Y represents the nonmetal atoms necessary to form a 5- to 7-membered ring; l represents 0 or 1; R^7, R^8 and R^9 each represents a substituent selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, an alkyl group, an aryl group, an alkoxy group and an aryloxy group; R^2 represents a substituent selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group; R^3 and R^4 each represents a substituent on the nitrogen atom selected from the group consisting of an alkyl group, an aryl group, an alicyclic group and a heterocyclic ring residue; R^5 represents a substituent selected from the group consisting of an alkyl group, an aryl group, an alicyclic group and a heterocyclic ring residue; and R^6 represents a substituent selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group.

4,629,684

HEAT DEVELOPABLE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL WITH DEVELOPMENT ACCELERATOR

Kozo Sato; Yoshiharu Yabuki; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1985, Ser. No. 775,291
Claims priority, application Japan, Sep. 14, 1984, 59-193468
Int. Cl.[4] G03C *1/40, 5/54*
U.S. Cl. 430—559 3 Claims

1. A heat developable color photographic light-sensitive material comprising a support having thereon a dye image forming compound and at least one layer containing a compound represented by the formula:

$$R—C\equiv C—M_{1/k}$$

wherein R represents an unsubstituted or substituted group selected from an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group and a heterocyclic group; M represents a hydrogen atom or a transition metal atom; and k is an integer of 1 to 3, wherein a silver halide emulsion is present as a light-sensitive substance.

4,629,685

PROCESS FOR IRRADIATING POLYIMIDES

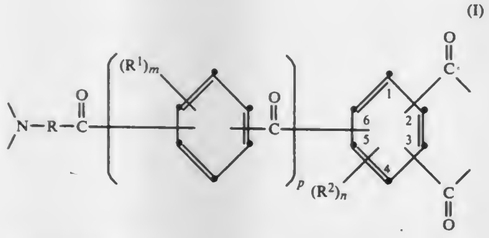
Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,591
Claims priority, application Switzerland, Nov. 16, 1984, 5487/84
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—583 16 Claims

1. A process for the production of a protective film or photographic relief image which comprises

irradiating a coated material, directly or through a photomask, said coated material being a layer of a polyimide applied to the surface of a carrier material, the polyimide being a homopolyimide or copolyimide which contains structural elements of aromatic aminodicarboxylic acids and has an intrinsic viscosity of at least 0.1 dl/g, measured at 25° C. in a solution of 0.5% by weight of polyimide in N-methylpyrrolidone, which contains recurring structural elements of the formula I

(I)



in which R^1 and R^2 are halogen, nitro, aryl, aryloxy, alkyl or alkoxy, m is 0 or a number from 1 to 4, n is 0 or a number from 1 to 3 and p is 0, 1 or 2, the free carbonyl groups are bonded in the ortho-position relative to one another and R is a divalent aromatic radical which is substituted by at least one alkyl group or aralkyl group, and

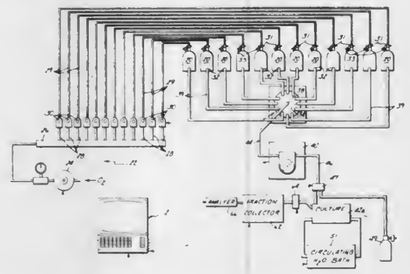
developing the material.

4,629,686

APPARATUS FOR DELIVERING A CONTROLLED DOSAGE OF A CHEMICAL SUBSTANCE

Micheal L. Gruenberg, Chicago, Ill., assignor to Endotronics, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 350,135, Feb. 19, 1982, abandoned. This application Jun. 14, 1982, Ser. No. 388,136
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] A01N *1/02*; C12M *1/36, 3/00*
U.S. Cl. 435—1 20 Claims



1. An apparatus for delivering a controlled dosage of a chemical substance to a cell culture, the apparatus comprising:

a plurality of vessels, each vessel containing a different known concentration of the same chemical substance;

valving means having a plurality of inlet and a single outlet and having means for selectively connecting in fluid communication a preselected inlet to the single outlet;

first conduit means for fluidly connecting each vessel to a corresponding inlet of the valving means;

cell culture means for containing a cell culture, said cell culture means being in fluid connection with the outlet of the valving means and having an initial concentration of the chemical substance;

second conduit means for fluidly connecting the single outlet of the valving means to the cell culture means;

means for providing a transport force to the chemical substance in a flow controlled manner for delivering the chemical substance to the cell culture means and being in fluid communication with the outlet of the valving means and the cell culture means; and

control means for controlling the valving means having means for providing input signals and means for providing signals indicative of a desired program of administration such that a preselected inlet is fluidly connected to the outlet for presenting a first preselected known concentration of the chemical substance to the cell culture means, and for controlling the means for providing a transport force to the chemical substance to effect a selected rate of delivery, including means for controlling the concentration of the chemical substance in the cell culture means according to the program of administration corresponding to the equation

$$C_{(t)} = C_s + (C_i - C_s)e^{-\frac{Rt}{V}}$$

wherein

t=integration time interval

V=volume of fluid within the cell culture means in which the chemical substance is being delivered

R=the rate of delivery of the chemical substance to the cell culture means

C_i=the initial concentration level of the chemical substance in the integration time interval within the cell culture means

$C_{(t)}$=the final concentration of the chemical substance in the integration time interval within the cell culture means

C_s=the concentration of the chemical substance being delivered in the integration time interval from the vessels into the cell culture means

wherein the means for controlling the concentration selects values of R/V and C_s such that the concentration change between C_i and $C_{(t)}$ is linear and the control means for controlling the valving means selectively switches among the vessels to choose C_s for each integration time interval in response to the desired program of administration.

4,629,687

POSITIVE SELECTION SORTING OF CELLS

Melvin S. Schindler, Okemos, and John F. Holland, Lansing, both of Mich., assignors to Board of Trustees of Michigan State University, East Lansing, Mich.

Filed Jul. 29, 1982, Ser. No. 403,154
Int. Cl.[4] C12N *5/00*; C12M *1/34*; C12Q *1/00*
U.S. Cl. 435—4 8 Claims

1. A method for automatically sorting anchorage dependent cells by selective destruction of unwanted cells in situ comprising:

(a) culturing a heterogeneous population of anchorage dependent cells on a support surface;

(b) identifying wanted and unwanted cells by:

(i) focussing a focussed radiant energy beam at a non-lethal energy level upon each cell, thereby eliciting a distinguishable response;

(ii) monitoring the response with a discriminating means;

(iii) determining the wanted from unwanted cells with a control means;

(iv) selectively altering the intensity of a focussed radiant energy beam to a lethal energy level thereby destroying unwanted cells;

(v) directing the movement of said lethal and said non-lethal beam means in relationship to said surface with an automatic coordinating means so as to impact all cells in a motion coordinated with said discriminating means and automatically adjusting said lethal means to destroy said unwanted cells.

4,629,688

HOMOGENEOUS SPECIFIC BINDING ASSAY METHOD

Robert C. Bolguslaski, Elkhart; Robert J. Carrico, Bremen, both of Ind., and James E. Christner, Ann Arbor, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation of Ser. No. 667,996, Mar. 18, 1976, abandoned, which is a continuation-in-part of Ser, No. 572,008, Apr. 28, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,836
Int. Cl.[4] G01N *33/54, 33/58*; C12N *11/00*
U.S. Cl. 435—7 42 Claims

32. A method for determining a ligand in a medium suspected of containing the ligand which comprises:

combining in an aqueous solution said medium and a reagent which is a conjugate of a specific binding partner for the ligand and a low molecular weight label compound having a bond enzymatically cleavable to produce a product distinguishable by a detectable signal and said enzymatic cleavage being substantially altered by binding of said reagent to said ligand;

adding an enzyme capable of cleavage of said enzyamtically cleavable bond; and

analyzing for the effect of said medium an enzymatic cleavage of said bond by measuring said detectable signal.

4,629,689

BINDING ASSAY WITH AMPLIFIED READ-OUT AND GAS-PHASE DETECTION

Steven E. Diamond, Springfield, N.J., and Francis J. Regina, Brooklyn, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 29, 1984, Ser. No. 645,202
Int. Cl.[4] G01N *33/53, 33/542*
U.S. Cl. 435—7 30 Claims

1. A method for the determination of a target selective binding pair member in a biological fluid sample comprising the steps:

(a) performing a specific reaction for the target selective binding pair member in the biological fluid sample to form a first liquid phase;

(b) providing a reaction moderating enzymatic moiety bound to a binding pair member in the first liquid phase, the concentration or activity of the reaction moderating enzymatic moiety being a function of the amount of target selective binding pair member participating in the specific binding reaction;

(c) providing in contact with the first phase, a precursor convertible by chemical reaction moderated by the reaction moderating enzymatic moiety into a detectable moiety in a volatile form;

(d) transferring into a gaseous phase the detectable moiety formed from the precursor;

(e) concentrating the detectable moiety relative to other components of the first phase; and

(f) detecting the detectable moiety which has been concentrated and transferred into the gaseous phase.

4,629,690

HOMOGENEOUS ENZYME SPECIFIC BINDING ASSAY ON NON-POROUS SURFACE

Litai Weng, Mountain View; Ian Gibbons, Palo Alto, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 303,326, Sep. 18, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,987
The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.
Int. Cl.[4] G01N *33/543*
U.S. Cl. 435—7 16 Claims

1. An assay method for determining the presence in a sample of an analyte which is a member of a specific binding pair (msbp) consisting of ligand and its homologous receptor;

said method employing:

(a) a continuous aqueous medium;

(b) a solid non-porous surface which is in contact with said medium and to which is conjugated a msbp and a first enzyme;

(c) a signal producing system capable of producing a measurable signal, the level of said signal being affected by the concentration of said analyte in said medium, said signal producing system including at least a second enzyme and a substrate for one of said first and second enzymes;

(d) said second enzyme being conjugated to a msbp to provide a msbp-enzyme-conjugate, wherein the amount of msbp-enzyme-conjugate bound to solid surface is related to the amount of analyte in said aqueous medium;

wherein the two enzymes are related by the product of one being the substrate of the other;

said method comprising:

combining with said solid surface to which said msbp and said first enzyme are conjugated an aqueous medium comprising, (a) said sample; (b) said msbp-enzyme-conjugate; (c) the homologous member of said specific binding pair, when the analyte, msbp-enzyme-conjugate and msbp bound to the surface are the same msbp, and

(e) substrate for at least one of said enzymes and any remaining members of said signal producing system,

with the provision that when the analyte is a first receptor,

said member of said pair conjugated to said solid surface can be the homologous ligand or receptor for said first receptor and said member of said enzyme conjugate can be receptor for said first receptor or the homologous ligand respectively; and

determining the level of said signal in said aqueous assay medium as compared to an assay medium having a known amount of analyte.

4,629,691

TRICYCLIC ANTIDEPRESSANT CONJUGATES WITH ANTIGENS AND ENZYMES

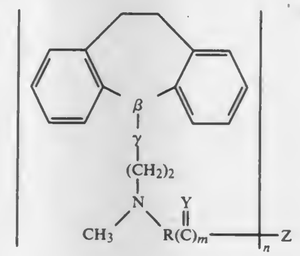
Christine G. Collins; Marcel R. Pirio, both of San Jose, and Prithipal Singh, Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 518,905, Sep. 1, 1983, abandoned. This application Aug. 12, 1983, Ser. No. 522,887

Int. Cl.⁴ G01N *53/00;* **C12N** *9/96*

U.S. Cl. 435—7 **20 Claims**

1. A compound of the formula:



wherein:

β-γ is N-CH_2 or C═CH;

Y is an oxygen or sulfur atom or imino;

R is a linking group of from 3 to 10 atoms other than hydrogen comprising carbon, nitrogen, oxygen and sulfur containing an alkylene or alkenylene chain of at least 3 carbon atoms linked to the nitrogen atom of the annular side chain; when Z is an enzyme, R is a linking group of 4 to 10 atoms other than hydrogen having a chain of at least 4 atoms;

m is 0 to 1, being 1 when Z is other than poly(amino acid);

Z is a hydrogen atom, oxy, an activated ester capable of amide formation with amino groups of a poly(amino acid) in an aqueous medium, or an antigenic poly(amino acid) or enzyme, with the proviso that, if β-γ is C═CH, m is 1, Y is oxygen, and Z is an antigenic poly(amino) acid, then Z is bonded to the carbonyl group by an amide linkage; and

n is 1 when Z is other than a poly(amino acid) and is otherwise a number on the average between 1 and the molecular weight of Z divided by 500.

18. A method for determining the total amount of tricyclic antidepressants present in a sample suspected of containing such tricyclic antidepressants, which comprises:

(a) combining the sample, an antibody produced in response to the compound of the formula of claim 1 wherein Z is an antigenic poly(amino acid) which binds to said compounds, or a compound of the formula of claim 1 wherein Z is an enzyme,

(b) incubating the combination; and

(c) determining the enzyme activity of the sample and comparing the enzyme activity with the enzyme activity of an assay medium having a known amount of tricyclic antidepressants.

4,629,692

IMMUNOASSAY FOR NONENZYMATICALLY GLUCOSYLATED PROTEINS AND PROTEIN FRAGMENTS AN INDEX OF GLYCEMIA

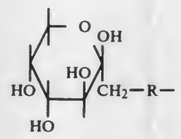
Kenneth J. Dean, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 6, 1982, Ser. No. 446,868

Int. Cl.⁴ G01N *53/00, 33/543*

U.S. Cl. 435—7 **47 Claims**

1. An antibody which binds specifically to a glucosylated peptide residue comprising Amadori-rearranged glucose and being of the formula:



wherein R is a bond, —NH—, or a lysyl residue where the rearranged glucose moiety is coupled to its ε-amino group.

4,629,693

SENSITIVITY IN FLUORESCENCE ASSAYS IN ICTERIC SAMPLES

Pyare Khanna, San Jose, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 27, 1984, Ser. No. 593,761

Int. Cl.⁴ G01N *33/53, 21/64;* **C12Q** *1/00, 1/32*

U.S. Cl. 435—7 **10 Claims**

1. In an enzyme immunoassay method for the determination of an analyte in an icteric blood sample suspected of containing said analyte, said method comprising combining in an assay medium said sample and assay reagents and irradiating said medium, said method involving the production or oxidation of NADH or NADPH in said medium and employing fluorescent detection of NADH or NADPH wherein a change in fluorescence is related to the amount of analyte in said sample, the improvement which comprises irradiating said medium containing said sample and said assay reagents with light below 400 nm to excite NADH or NADPH produced or oxidized in said assay medium and detecting the fluorescence of NADH or NADPH at a wavelength at or above 500 nm.

6. In an enzyme immunoassay method for the determination of an analyte in an icteric blood sample suspected of containing said analyte, said method comprising combining in an assay medium said sample and assay reagents and irradiating said medium, said method involving employing in said assay medium an enzyme, a substrate for said enzyme, and employing NAD or NADP as a cofactor for said enzyme, said method involving production of the reduced form of NAD or NADP in said medium and employing detection of the reduced form of NAD or NADP in said medium by measuring the light emitted by said reduced form of NAD or NADP, the improvement which comprises irradiating said assay medium containing said sample and said assay reagents suspected of containing said reduced form of NAD or NADP with light below about 400 nm and measuring the light emitted by said reduced form at a wavelength at or above 500 nm.

4,629,694

DETECTING AND DISTINGUISHING BETWEEN PLASMINOGEN ACTIVATORS

Peter C. Harpel, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 12, 1983, Ser. No. 513,184

Int. Cl.⁴ G01N *33/53;* **C12Q** *1/56;* **C12N** *1/72, 1/68*

U.S. Cl. 435—7 **9 Claims**

1. A method of determining plasminogen activator induced fibrinolytic activity in human blood which comprises:

(a) providing plasma samples from freshly drawn blood comprising a first sample which is unclotted and a second sample which has been clotted;

(b) determining the level of plasmin-naturally occurring plasmin inhibitor complex in both the unclotted and clotted samples first proximate the time of establishment of the samples and again after a time delay sufficient to allow plasminogen activator present in the sample to convert a significant portion of the plasminogen present in the samples to plasmin; and

(c) comparing the levels of the plasmin-naturally occurring plasmin inhibitor complex in both the unclotted and clotted plasma samples to identify tissue-type plasminogen activator or urokinase-type plasminogen activator contributions to fibrinolytic activity.

4,629,695

PEPTIDE DERIVATIVES AND USE THEREOF AS SUBSTRATES FOR QUANTITATIVELY ASSAYING ENZYMES

Lars G. Svendsen, Reinach BL, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed Jun. 1, 1984, Ser. No. 616,257

Claims priority, application Switzerland, Jun. 3, 1983, 3051/83; Jul. 5, 1984, 2214/84

Int. Cl.⁴ C12Q *1/44*

U.S. Cl. 435—19 **9 Claims**

1. Peptide derivatives of formula:

wherein

R^1 is a chromogenic amino group which is substituted with an aromatic or heterocyclic radical and which is capable of being split off by enzymatic hydrolysis with formation of a colored or fluorescent compound;

R^2 is hydrogen,

a straight or branched alkanoyl group having 2 to 6 carbon atoms,

a cyclohexylcarbonyl group,

an ω-carboxyl, ω-methoxycarbonyl or ω-ethoxycarbonyl-alkanoyl group having 2 to 4 carbon atoms in the alkanoyl group,

a straight or branched alkoxycarbonyl group having 1 to 4 carbon atoms in the alkoxy group,

an alkylsulfonyl group having 1 to 2 carbon atoms in the alkyl group, a phenyl- or p-toluyl-sulfonyl group,

an unsubstituted or substituted benzoyl group, or

a benzyloxycarbonyl group the nucleus of which is unsubstituted or substituted;

R^3 is a benzyl group the nucleus of which is unsubstituted or substituted;

X is a glycyl or alanyl group; and

Y is a single bond or a group of formula

wherein R^4 is a benzyl, phenyl, cyclohexyl, cyclohexylmethyl, 4-hydroxybenzyl or 4-hydroxycyclohexylmethyl group and m is zero, the amino acid represented by Y having L- or D-configuration; or hydrogen and m is zero, 1 or 2; and salts thereof with mineral or organic acids.

4,629,696

PROCESS FOR THE SELECTIVE PRODUCTION OF REDUCED OXYGEN SPECIES

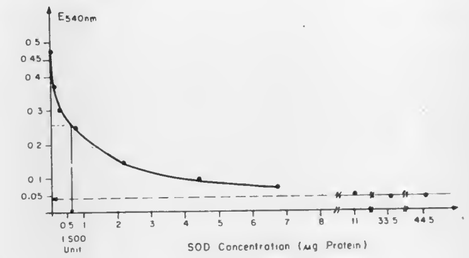
Erich Elstner, Grobenzell, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,445

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236388

Int. Cl.⁴ C12Q *1/32*

U.S. Cl. 435—25 **29 Claims**



1. A process for the selective production of the reduced oxygen species superoxide, hydrogen peroxide or hydroxyl radicals, comprising reducing oxygen with NAD(P)H in the presence of an NAD(P)H-dependent, non-autoxidizable diaphorase and an autoxidizable redox partner.

4,629,697

TEST SYSTEM AND PROCEDURE FOR THE DETERMINATION OF NAD (P) H

Berthold Limbach, Seeheim, and Roland Helger, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,866

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247894

Int. Cl.⁴ C12Q *1/32, 1/62*

U.S. Cl. 435—26 **20 Claims**

1. A test system useful for providing an extended range of measurement for the determination of NADH, NADPH, NAD^+ or $NADP^+$, or of a substrate or enzyme which reacts with the formation or consumption of NADH or NADPH, comprising effective amounts of at least two redox indicators which, independently of each other, act as electron acceptors with respect to NAD(P)H and which each have different electrochemical potentials.

15. A method for the determination of NADH, NADPH, NAD^+ or $NADP^+$ in an aqueous sample solution, comprising treating the sample solution with at least two system compatible redox substances which act, independently of one another, as electron acceptors with respect to NADH or NADPH and which have different electrochemical potentials, whereby there are sequentially formed corresponding, different end products, and analytically measuring each end product.

4,629,698

PLASMA EXPANDER BASED ON STARCH

Ernst Nitsch, Linz; Hubert P. Ferber, Ansfelden, and Siegfried Mühlböck, Linz, all of Austria, assignors to Laevosan-Gesellschaft mbH & Co. KG Chemisch-Pharmazeutische Industrie, Linz, Austria

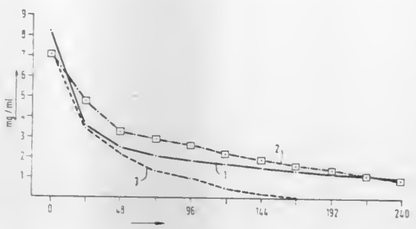
Filed Jan. 11, 1985, Ser. No. 690,674

Int. Cl.⁴ C12P *19/14, 19/22, 19/16*

U.S. Cl. 435—95 **14 Claims**

1. In a process for the preparation of a starch-based plasma expander by a combination of hydrolytic decomposition of an

amylopectin-rich starch to a definite molecular weight and partial etherification to a definite molar substitution, said etherification being accomplished either before or after said hydrolysis, the improvement wherein said hydrolytic decomposition



comprises hydrolysis with alpha-amylase, beta-amylase or pullulanase to a molecular weight of 40,000 to 1,000,000 Dalton and said etherification being carried out to a molar substitution of from 0.1 to 0.8.

4,629,699

PROCESS FOR THE PREPARATION OF OLIGOSACCHARIDE FRACTIONS BY DEGRADATION OF HEPARIN

Pietro Bianchini, Corlo, Italy, assignor to Opocrin S.p.A., Pacinotti-Corlo, Italy

Filed Feb. 23, 1984, Ser. No. 582,933
Claims priority, application Italy, Mar. 8, 1983, 40021 A/83
Int. Cl.⁴ C12P *19/04, 19/26;* **C07H** *37/00*
U.S. Cl. 435—101 **3 Claims**

1. A process for the preparation of oligosaccharide fractions of molecular weight between 3000 and 6000 Daltons of anticoagulant activity, 20-30% of the activity of heparin and by the U.S. Patent method and anti XaCo APTT 0.6 of the value for heparin, by degradation of heparin, which consists of incubating an aqueous heparin solution containing from 5 to 20 g of heparin per liter in the presence of from 4 to 50 m.moles/l of ascorbic acid, from 0.4 to 2.5 m.moles/l of cupric acetate, and of from 50 to 300 m.moles/l of hydrogen peroxide at a temperature between 40° and 50° C. for 20-24 hours and maintaining the pH at a value between 7.5 and 8 by means of sodium acetate.

4,629,700

SELECTIVE CONVERSION OF CYANO COMPOUNDS TO AMIDES AND CARBOXYLIC ACIDS

William D. Prevatt, Downers Grove; Cavit Akin, Naperville, and April J. Evans, Glen Ellyn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 30, 1983, Ser. No. 556,625
Int. Cl.⁴ C12P *13/00, 13/02;* **C12N** *9/78, 1/20*
U.S. Cl. 435—128 **16 Claims**

1. A process for producing aromatic compounds having at least one cyano group and one amide group or carboxyl group which process comprises subjecting aromatic polynitrile compounds containing no carboxyl groups to the action of one or more Rhodococcus microorganisms selected from the group of Rhodococcus microorganisms consisting of BZN 6, accession number ATCC 39,484; BZN 34, accession number ATCC 39,485; BZN 37, accession number ATCC 39,486; BZN 121, accession number ATCC 39,487; BZN 251, accession number ATCC 39,488; BZN 310, accession number ATCC 39,489; BZN 322, accession number ATCC 39,490; BZN 422, accession number ATCC 39,491; BZN 762, accession number ATCC 39,492, which have a nitrilase system capable of hydrolyzing one cyano group of the polynitrile.

4,629,701

PROCESS FOR PREPARING OPTICALLY ACTIVE CARBOXYLIC ACIDS AND ANTIPODE ESTERS THEREOF

Akihiro Sakimae, Ohtake; Yuri Kagawa, Hiroshima; Ryozo Numazawa, Ohtake, and Hisao Onishi, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 627,093
Claims priority, application Japan, Jul. 4, 1983, 58-120281; Jul. 4, 1983, 58-120282; Aug. 1, 1983, 58-139478; Oct. 27, 1983, 58-199943; Dec. 28, 1983, 58-245784
Int. Cl.⁴ C12P *11/00;* **C07P** *41/00*
U.S. Cl. 435—130 **7 Claims**

1. A process for preparing an optically active carboxylic acid represented by the formula (I):

$$R_1-COS-(CH_2)_n-\underset{\displaystyle R_2}{\underset{|}{CH}}-COOH \qquad (I)$$

wherein R_1 is C_{1-6} alkyl, benzyl or phenyl; R_2 is C_{1-6} alkyl group; and n is 1 or 2, which comprises allowing a source containing an enzyme or microorganism capable of asymmetrically hydrolyzing an ester bond to act on an ester represented by the formula (II):

$$R_1-COS-(CH_2)_n-\underset{\displaystyle R_2}{\underset{|}{CH}}-COO-R_3 \qquad (II)$$

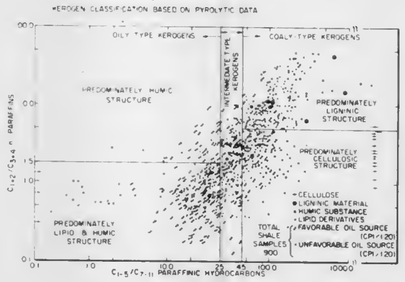
wherein R_1, R_2 and n have the same meanings as those mentioned above; and R_3 is C_{1-6} alkyl group, said source being selected from an enzyme, cultured liquid and cells or treated cells of microoganisms.

4,629,702

METHOD FOR CLASSIFYING THE SEDIMENTARY KEROGEN FOR OIL SOURCE

Mark J. Fan, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,643
Int. Cl.⁴ G01N *30/00*
U.S. Cl. 436—32 **8 Claims**



1. A method for classifying kerogenous materials by pyrolyzing a sample containing said material and analyzing the pyrolysis gas by gas chromatography comprising:

(a) pyrolyzing a weighed sample of a crushed raw material of unknown kerogenous content under an inert gas atmosphere at a temperature of from about 250° C. to about 350° C. for about 20 minutes;

(b) determining the ratio of C_1–C_5 hydrocarbons contained in said pyrolysis gas to C_7–C_{11} hydrocarbons;

(c) differentiating said ratios into groups containing a ratio of less than about 25, a ratio of about 25 to about 45, and a ratio of from greater than about 45; and

(d) classifying said kerogenous materials according to the three group ratios expressed in step (c) above.

5. A method for subclassifying lipid, humic, cellulosic and ligninic kerogenous materials by pyrolyzing a sample containing said material and analyzing the pyrolysis gas by gas chromatography comprising:

(a) pyrolyzing a weighed sample of a crushed raw material of unknown kerogenous content under an inert gas atmosphere at a temperature of from about 250° C. to about 350° C. for about 20 minutes;

(b) determining the ratio of C_1+C_2 hydrocarbons contained in said pyrolysis gas to C_3+C_4 hydrocarbons;

(c) differentiating said ratios into groups containing ratios less than 1.50, and ratios between 1.50 and 5.0, and ratios greater than 5.0; and

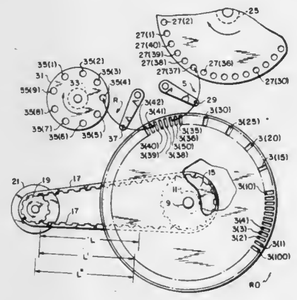
(d) classifying said kerogenous materials according to the group ratios expressed in step (c) above which provide a basis for reconstruction or projection of the generative characteristics of kerogens.

4,629,703

AUTOMATED ANALYTICAL SYSTEM

Kenneth F. Uffenheimer, Mahopac, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Division of Ser. No. 296,760, Aug. 27, 1981, abandoned. This application Jan. 14, 1983, Ser. No. 458,071
Int. Cl.⁴ G01N *31/22, 35/04*
U.S. Cl. 436—45 **17 Claims**



1. A method for effecting multiple colorimetric measurements of a liquid sample contained in a selected cuvette carried on a bidirectionally rotatable cuvette tray supporting a plurality of cuvettes, each cuvette being provided with opposing transparent walls to define a sight passageway for the reading of liquid sample contained therein at a read-out station, which method comprises:

(1) locating a selected cuvette in a liquid dispensing station and dispensing liquid therein;

(2) rotating said cuvette tray in a first direction and stopping the rotation of the tray to locate said selected cuvette at a read-out station;

(3) colorimetrically measuring said liquid in said selected cuvette at said read-out station to generate a first signal;

(4) rotating said cuvette tray in a second and opposite direction;

(5) repositioning said selected cuvette at said read-out station by rotating said cuvette tray in said first direction and stopping the rotation to locate said cuvette at said read-out station, wherein by using the same section of the drive system said cuvette is thereby accurately repositioned at said read-out station in order that the same portion of said opposing transparent walls define said sight passageway;

(6) colorimetrically measuring the liquid in said selected cuvette following the repositioning of said selected cuvette at said read-out station to generate a second signal; and

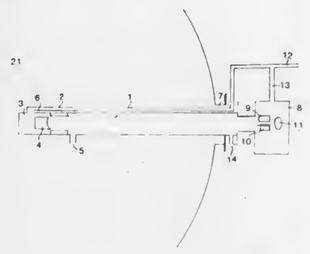
(7) storing said first and second signals.

4,629,704

METHOD FOR ASSAYING SULPHUR TRIOXIDE

Sven G. Wennlid, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE84/00088, § 371 Date Oct. 26, 1984, § 102(e) Date Oct. 26, 1984, PCT Pub. No. WO84/03770, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 12, 1984, Ser. No. 672,255
Claims priority, application Sweden, Mar. 18, 1983, 8301488
Int. Cl.⁴ G01N *33/00*
U.S. Cl. 436—119 **3 Claims**



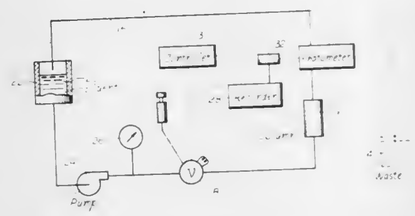
1. A method for assaying a gas containing mist-forming sulphur trioxide, comprising drawing the gas to be assayed into a closed space; contracting said gas with air having at least about 15 g of H_2O per m^3 which reacts with the sulphur trioxide to form a mist; and measuring the extent to which the mist extinguishes light.

4,629,705

INDIRECT-PHOTOMETRIC CHROMATOGRAPHY DONE IN AND WITH A VARIABLE CAPACITY WEAKLY BASIC OR ACIDIC ION EXCHANGE COLUMN

Hernan J. Cortes, and Timothy S. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1984, Ser. No. 615,985
Int. Cl.⁴ G01N *31/08, 21/00*
U.S. Cl. 436—161 **13 Claims**



1. In the method for the chromatographic analysis of transparent sample ions in a solution of photometrically monitorable liquid effluent wherein:

sample is contacted with a flow-through ion exchange medium, and an elution through said ion exchange medium is performed using a liquid eluent which contains photometrically detectable monitor/displacing ions that effectually displace sample ions off the involved ion exchange medium so as to eventually cause displaced sample ions to appear in the effluent from the ion exchange medium;

there is utilized an eluent containing said monitor/displacing ions which are photometrically detectable in said effluent

and which are of the same charge but not necessarily the same valence as the sample ions to be detected;

said effluent is photometrically monitored and the concentration of transparent sample ions of interest eluting from the ion exchange medium is indirectly quantitated based on the fluctuation(s) caused by same in the effluent response as produced by the appearance of the transparent sample ions in the effluent causing a concurrent and proportional dip in the concentration of the observed monitor/displacing ions in the effluent;

wherein the improvement comprises:

using a pH dependent variable capacity ion exchange medium that is weakly basic in nature when anions are to be detected and determined from said sample making contact with said medium and using a weakly acidic ion exchange medium when cations are so involved; and

using an eluent, the pH of which controls the capacity of the ion exchange medium to a capacity within the range encompassed on the lower end, by the condition which produces overloading and on the upper end, by a capacity which is not greater than about 50 percent of the maximum potential ion exchange capacity of the ion exchange medium whereby the pH of the eluent controls the capacity of the ion exchange medium without detrimentally affecting efficiency of separation.

4,629,706

METHOD FOR DETERMINING ALLERGIC SENSITIVITY

Michael D. Hammond, Postcombe, and William J. A. Taylor, Windsor, both of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 344,478, Feb. 1, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,722

Int. Cl.⁴ G01N *33/49*

U.S. Cl. 436—513 **6 Claims**

1. A method for determining the allergic sensitivity of a mammal which comprises the steps of contacting a sample of blood from said mammal with an allergen in the presence of a blood clotting inhibitor, measuring the time required for hemostasis of said sample, contacting a sample of blood from said mammal with a clotting inhibitor in the absence of said allergen and measuring the time required for hemostasis in said sample, and determining the difference in time required for hemostasis whereby the sensitivity to said allergen is determined.

4,629,707

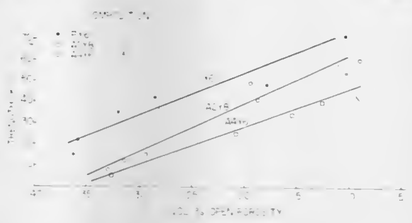
HIGH STRENGTH, LOW MASS POROUS SILICON NITRIDE BASED ARTICLES

Robert W. Wolfe, Wysox, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 21, 1986, Ser. No. 820,333

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 501—97 **2 Claims**



1. An article made of silicon nitride based material, said material consisting essentially of in percent by weight about 6% yttrium oxide, and the balance silicon nitride, said article having an open porosity of from about 37% by volume at which level of porosity the strength of said article is about 15 ksi, to an open porosity of about 10% by volume at which level of porosity the strength of said article is about 72 ksi.

4,629,708

MOULDING

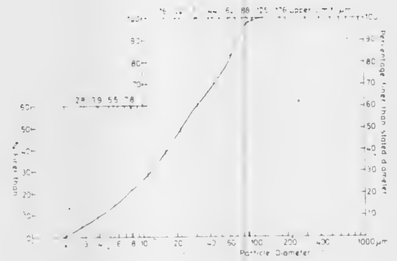
Kevin Alexander, Stoke-on-Trent, and Howard J. Farr, Northampton, both of England, assignors to Doulton Industrial Products Limited, Stone, England

Filed May 17, 1984, Ser. No. 611,492

Claims priority, application United Kingdom, May 20, 1983, 8314089

Int. Cl.⁴ C04B *35/02*

U.S. Cl. 501—123 **11 Claims**



1. A refractory body comprising a composition containing a water-soluble salt chosen from the class consisting of sodium chloride, potassium chloride and sodium metasilicate, and a calcium silicate, the calcium silicate being present in an amount of at least 45%, by weight, based on the total weight of calcium silicate and water-soluble salt, the water-soluble salt and the calcium silicate having the following particle size distribution:

100% by weight of the particles have a size of 750 μm or less;

90% by weight of the particles have a size of 8–600 μm;

80% by weight of the particles have a size of 5.5–500 μm;

70% by weight of the particles have a size of 4–400 μm;

60% by weight of the particles have a size of 2.8–350 μm.

50% by weight of the particles have a size of 2.0–280 μm;

40% by weight of the particles have a size of 1.6–220 μm;

30% by weight of the particles have a size of 1.0–180 μm;

20% by weight of the particles have a size of 0.3–160 μm;

10% by weight of the particles have a size of 0.1–125 μm.

4,629,709

NON-NOBLE METAL CATALYTIC MICROAGGREGATES, A METHOD FOR THEIR PREPARATION AND THEIR APPLICATION IN THE CATALYSIS OF THE PHOTOREDUCTION OF WATER

Jacqueline Belloni Cofler, Palaiseau; Jean-Louis Marignier, Meudon; Marie-Odile Delcourt Euverte, Magny-Les-Hameaux, and Michèle Minana Lourseau, Rambouillet, all of France, assignors to Centre National de La Recherche Scientifique, France

Filed Jun. 13, 1985, Ser. No. 744,445

Claims priority, application France, Jun. 13, 1984, 84 09196

Int. Cl.⁴ B01J *37/34*

U.S. Cl. 502—5 **17 Claims**

1. A non-noble metal microaggregate composition comprising a monodisperse phase of non-noble metal microaggregates in a liquid or solid medium, said microaggregates having a size which is uniformly less than 5 nm.

8. A method for the preparation of a non-noble metal microaggregate composition in homogeneous dispersed phases by irradiation of a metal salt, or a mixture of salts, by means of an ionizing radiation source, comprising dissolving a non-noble metal salt or a mixture of metal salts, wherein at least one is a non-noble metal, in a suitable solvent, in the presence of an oxidizing radical scavenger, and a surfactant and/or a support, and then carrying out irradiation.

17. A catalyst for the photoreduction of water into hydrogen characterized in that it is composed of the metal microaggregate composition of any one of claims 1 or 2.

4,629,710

RESIN CATALYSTS AND METHOD OF PREPARATION

Lawrence A. Smith, Jr., P.O. Box 34687, Houston, Tex. 77243

Filed Dec. 20, 1984, Ser. No. 684,964

Int. Cl.⁴ B01J *37/30, 31/10;* **C07C** *1/20, 29/04*

U.S. Cl. 502—11 **9 Claims**

1. A process for preparing a solid catalyst composition comprising:

(a) contacting a solid resin of a macroporous matrix of polyvinyl aromatic compound crosslinked with a divinyl compound and having thereon from about 3 to 5 milli equivalents of sulfonic acid groups per gram of dry resin with an aqueous solution containing metal ions of Al, Fe, Zn, Cu, Ni or mixtures thereof to neutralize from 70 to 90% of the sulfonic acid groups present, and

(b) thereafter contacting said solid resin with an aqueous solution containing alkali metal or alkaline earth metal ions of Group 1*a* or 2*a* of the Periodic Table of element or mixtures thereof, to neutralize the free sulfonic acid groups remaining in said resin after step (a).

2. The process according to claim 1 wherein said alkali metal, alkaline earth metal or mixtures thereof is Li, Na, K, Mg, Ca, Sr, Ba or mixtures thereof.

3. The process according to claim 2 wherein said alkali metal, alkaline earth metal or mixtures thereof is Na, K, Mg, Ca or mixtures thereof.

4,629,711

PROCESS FOR PURIFYING AND RECOVERING CONTAMINATED CATALYST SOLUTION OBTAINED IN THE CARBONYLATION OF METHYL ACETATE AND/OR DIMETHYLETHER

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,222

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1985, 3515396

Int. Cl.⁴ B01J *31/40, 38/68;* **C07C** *51/56;* **C01G** *55/00*

U.S. Cl. 502—24 **6 Claims**

1. A process for purifying and recovering catalyst solution contaminated during the carbonylation of at least one substance selected from the group consisting of methyl acetate and dimethylether, containing carbonyl complexes of rhodium, quaternary heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants as well as acetic acid, acetic anhydride and ethylidene diacetate, which comprises: subjecting the contaminated catalyst solution, in a first processing stage, to extraction with a dialkylether having from 1–4 carbon atoms and thereby freeing it from its organic contaminants, from acetic acid, acetic anhydride and ethylidene diacetate, and separating the ether phase from a precipitated promoter-containing catalyst complex; treating the ether phase, in a second processing stage, with iodine or methyl iodide, separating a further portion of precipitated promoter-containing catalyst complex and uniting it with the purified catalyst complex coming from the first processing stage; separating the ether phase into its constituents by distilling it, using recovered dialkylether again in the extraction of the first processing stage, preparing fresh catalyst solution from the recovered mixture of acetic acid, acetic anhydride and ethylidene diacetate and united purified catalyst complex, and expelling the organic contaminants retained in the residue of the ether phase distillation; and distillatively freeing the purified catalyst solution from residual dialkyl ether.

2. A process as claimed in claim 1, wherein the catalyst solution is extracted with the dialkylether and the ether phase is treated with iodine or methyl iodide at temperatures of 20°–140° C. and under pressures of 1–30 bars.

3. A process as claimed in claim 1, wherein 0.5–20 parts by weight dialkylether is used per part by weight contaminated catalyst solution.

4,629,712

DELAMINATED CLAY MATERIALS

Thomas J. Pinnavaia, East Lansing, Mich., and Rasik H. Raythatha, Tennille, Ga., assignors to Michigan State University, East Lansing, Mich.

Filed Aug. 17, 1984, Ser. No. 641,912

Int. Cl.⁴ B01J *21/16*

U.S. Cl. 502—63 **20 Claims**

11. A process for preparing a delaminated smectite clay composition, comprising:

(a) preparing an aqueous slurry of a trioctahedral clay mineral having an average particle size smaller than about 500 angstroms and a lath-shape and/or platety-shape morphology;

(b) reacting said clay mineral with a polymeric cationic hydroxy metal complex;

(c) removing unreacted metal complex from said clay-metal complex reaction mixture; and

(d) recovering reacted clay solid by drying.

15. A delaminated smectite clay composition comprising a delaminated trioctahedral smectite clay having a substantially delaminated interlayer structure with a face-to-edge and edge-to-edge association of the clay layers and an inorganic metal oxide intercalated between the clay layers which composition exhibits a combination of macro-, meso- and micro-porosity.

19. The composition according to claim 15, wherein said metal oxide intercalated between clay layers contains aluminum, zirconium or mixtures of the same.

4,629,713

FINELY POROUS CLAY FORMED PREPONDERANTLY OF SPECTITE TYPE MINERAL AND METHOD FOR MANUFACTURE OF SAID CLAY

Kenzi Suzuki; Shozo Iida; Hiroshi Sakami, and Kaoru Kawase, all of Nagoya, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,765

Claims priority, application Japan, Jan. 20, 1984, 59-9256; Feb. 8, 1984, 59-22522; Mar. 19, 1984, 59-52675; Mar. 27, 1984, 59-58668; Apr. 2, 1984, 59-65581; Apr. 11, 1984, 59-73269

Int. Cl.⁴ B01J *21/16, 20/12*

U.S. Cl. 502—84 **3 Claims**

1. A method for the manufacture of finely porous clay, comprising the steps of (a) mixing a smectite type minerals, (b) a water-soluble polymer selected from the group consisting of starch, konjak, agar, grated yam, gum arabic, glue, gelatine, polyethylene oxide, polyvinyl alcohol, polyacrylic acid derivatives, polyvinyl sulfonic acid derivatives, and carboxycellulose derivatives, (c) one member selected from the group consisting of silica sol and water glass, (d) at least one cation selected from the elements of groups IB to VIII in the periodic table of elements, and (e) water, thereby obtaining a mixture having said water-soluble polymer and formed silica gel interposed between crystal layers of said smectite type mineral, with intervals between said crystal layers widened by said water-soluble polymer, and then removing all or most of said water-

soluble polymer from said mixture and forming crystal layers separated by intervals of not less than 20Å.

4,629,714

INTERMETALLIC COMPOUNDS AND CATALYTIC USE THEREOF

Javan Shelly, Reading, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,495

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—113 **21 Claims**

1. An intermetallic compound comprising the product of the sequential reaction of product (A), compound (B) and compound (C) wherein:

(A) is the product of reaction between a polymeric transition metal oxide alkoxide and a reducing metal having a higher oxidation potential than said transition metal, said polymeric transition metal oxide alkoxide being the product of the controlled partial hydrolysis of a transition metal alkoxide;

(B) is a first halide activator selected from the group consisting of an alkyl aluminum halide, a silicon halide, an alkyl silicon halide, a titanium halide, a boron halide and an alkyl boron halide;

(C) is a second halide activator selected from the group consisting of an alkyl aluminum halide, a silicon halide, and alkyl silicon halide, a titanium halide, a boron halide and an alkyl boron halide.

4,629,715

PURIFICATION OF TEREPHTHALIC ACID TO RELATIVELY LOW LEVELS OF 4-CARBOXYBENZALDEHYDE AND CATALYST THEREFOR

Hobe Schroeder, Warrenville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 7, 1985, Ser. No. 785,321

Int. Cl.[4] B01J *23/44, 23/46;* **C07C** *51/42*

U.S. Cl. 502—185 **17 Claims**

1. A method for purification of relatively impure terephthalic acid containing up to about 10,000 parts per million, by weight, of 4-carboxybenzaldehyde which comprises the steps of:

passing an aqueous solution of said impure terephthalic acid, at a temperature of about 100° C. to about 350° C. and at a pressure sufficient to maintain the solution in liquid phase, through a particulate catalyst bed and in the presence of hydrogen; said particulate catalyst bed being a layered bed that includes a primary catalyst layer constituted by palladium supported on an active carbon carrier and a secondary catalyst layer constituted by rhodium supported on an active carbon carrier, and said aqueous solution being first passed through the primary layer of the catalyst bed and then through the secondary layer of the catalyst bed; and

thereafter cooling the hydrogenated aqueous solution to effect separation of relatively pure terephthalic acid from said solution by crystallization.

4,629,716

PROCESS FOR PRODUCING NARROW-PORE CATALYST SUPPORTS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 15, 1985, Ser. No. 722,918

Int. Cl.[4] B01J *27/14, 27/24, 27/053, 27/125*

U.S. Cl. 502—208 **12 Claims**

1. A process for the preparation of narrow-pore alumina supports having surface areas above about 300 m^2/g, at least about 80% of the pore diameters less than about 50 Å, a crush strength greater than about 20 lbs. and containing an amount of phosphorus in the range from about 0.1% to about 4.5% by weight, which process comprises:

(a) concurrently titrating at a pH in the range between about 5.5 and about 10.0 an aqueous solution of an acid aluminum salt and a phosphorus-containing compound with an aqueous solution of a basic aluminum compound, thereby forming a precipitate,

(b) aging the precipitate at a temperature in the range between about 20° C. and about 90° C. for at least 15 minutes at a pH in the range between about 9.0 to about 11.0,

(c) washing the precipitate,

(d) drying the precipitate, and

(e) calcining the precipitate at a temperature ranging from about 300° C. to about 900° C.

4,629,717

PHOSPHORUS-MODIFIED ALUMINA COMPOSITE, METHOD OF MANUFACTURE AND USE THEREOF

Tai-Hsiang Chao, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 11, 1985, Ser. No. 743,349

Int. Cl.[4] B01J *27/14, 27/188, 27/19, 27/185*

U.S. Cl. 502—208 **19 Claims**

1. A catalytic composite having low cracking activity comprising an amorphous phosphorus-modified alumina hydrogen having a molar ratio on an elemental basis of phosphorus to aluminum of from about 1:1 to 1:100 and having a surface area of from about 140 to 450 m^2/g said hydrogel being formed by the gelation of a homogeneous hydrosol having an aluminum to chloride compound weight ratio of from about 0.70:1 to 1.5:1.

4,629,718

ALKALI PROMOTED MANGANESE OXIDE COMPOSITIONS CONTAINING SILICA AND/OR ALKALINE EARTH OXIDES

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield; John A. Sofranko, Malvern; Howard P. Withers, Douglassville, all of Pa.; E. William Breder, Jr., Oak Forest, Ill.; Marvin F. L. Johnson, Homewood, Ill., and John A. Jaecker, Homewood, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,654, Apr. 16, 1984, Pat. No. 4,567,611, Ser. No. 600,656, Apr. 16, 1984, Pat. No. 4,523,049, Ser. No. 600,655, Apr. 16, 1984, abandoned, Ser. No. 600,916, Apr. 16, 1984, Ser. No. 600,924, Apr. 16, 1984, Pat. No. 4,547,608, and Ser. No. 600,925, Apr. 16, 1984, Pat. No. 4,544,786, said Ser. No. 600,654, is a continuation-in-part of Ser. No. 522,937, Aug. 12, 1983, Pat. No. 4,499,322, and Ser. No. 522,936, Aug. 12, 1983, Pat. No. 4,485,374, said Ser. No. 600,916, is a continuation-in-part of Ser. No. 522,925, Aug. 12, 1983, Pat. No. 4,443,649, which is a continuation-in-part of Ser. No. 412,667, Aug. 30, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,118

Int. Cl.[4] B01J *23/34, 21/08*

U.S. Cl. 502—241 **36 Claims**

1. A catalyst composition comprising:

(a) Mn-containing oxides,

(b) at least one alkali metal or compound thereof, and

(c) at least one member of the group consisting of oxides of Si, and mixed oxides of Si and at least one alkaline earth metal,

wherein the amount of Mn present is within the range of about 1 to 40 wt. % based on the combined weight of Mn and component (c), said composition being substantially free of catalytically effective iron.

11. A catalyst composition comprising Mn-containing oxides, at least one alkali metal or compound thereof, and at least one member of the group consisting of oxides of Ca, Sr, and Ba, said composition satisfying the formula:

$$MnA_aB_bO_x$$

wherein A is at least one alkali metal, B is at least one member of the group consisting of Ca, Sr and Ba and wherein a is within the range of about 0.01 to 10, b is within the range of about 0.1 to 100, and x is the number of oxygen atoms required by the valence states of the other elements.

4,629,719

OLEFIN DISPROPORTIONATION CATALYST

Simon G. Kukes, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 207,565, Nov. 17, 1980. This application Dec. 7, 1984, Ser. No. 679,344

Int. Cl.[4] B01J *21/08, 23/00*

U.S. Cl. 502—242 **6 Claims**

1. A composition comprising the product produced by contacting a refractory oxide containing molybdenum oxide with a promoting amount of a combination of elemental magnesium and elemental tin, said elemental tin being employed in an amount in the range of about 1 to about 10 weight percent of the combined weights of said molybdenum oxide and said refractory oxide prior to the addition of the elemental metals and said elemental magnesium being employed in an amount in the range of about 0.5 to 20 weight percent of the combined weights of said molybdenum oxide and said refractory prior to the addition of the elemental metals.

4,629,720

SUBSTANCE FOR REVERSIBLY ABSORBING AND DESORBING HYDROGEN

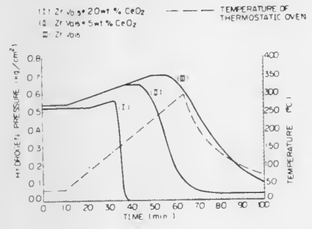
Jo Suzuki; Masaaki Abe; Tamotu Yamaguchi, and Shotaro Terazawa, all of Tokyo, Japan, assignors to Suzuki Shokan Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1985, Ser. No. 801,707

Claims priority, application Japan, Dec. 4, 1984, 59-256126

Int. Cl.[4] C01B *6/00, 6/24*

U.S. Cl. 502—400 **9 Claims**



1. A substance for reversibly absorbing and desorbing hydrogen, comprising a complex dispersing 0.8–20% by weight of one or more than two oxides selected from La, Ce, Nd, Pr, Sm and Eu into ZrV_x ($0.01 \leqq x \leqq 0.7$).

4,629,721

PROCESS FOR PREPARING DESULFURIZING AND DENITRATING AGENTS

Tutomu Ueno, Sapporo, Japan, assignor to The Hokkaido Electric Power Co., Inc., Japan

Filed Mar. 12, 1986, Ser. No. 838,662

Claims priority, application Japan, Mar. 13, 1985, 60-51247; Oct. 25, 1985, 60-237195

Int. Cl.[4] B01J *20/04, 20/08, 20/10*

U.S. Cl. 502—411 **2 Claims**

1. A process for preparing a desulfurizing and denitrating agent, which comprises providing as first raw material(s) one or more materials capable of yielding calcium oxide and calcium sulfate, providing as second raw material(s) one or more materials capable of yielding silicon dioxide and aluminum oxide, mixing the first raw material(s) or a mixture of the first raw material(s) and either fractional or whole portion(s) of the second raw material(s) with water, and then subjecting the resultant aqueous mixture to wet-air aging at room temperature or to steam aging.

4,629,722

METHOD OF INHIBITING THE ONSET OF ACUTE RADIATION SYNDROME

Edgar E. Ribi, Hamilton, Mont., assignor to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Filed Jul. 12, 1984, Ser. No. 630,013

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—2 **5 Claims**

1. A method of inhibiting the onset of acute radiation syndrome in a warm-blooded animal which arises from exposure of said warm-blooded animal to a whole body dose of at least 100 rads of x-radiation comprising administering to said warm-blooded animal prior to exposure to said X-radiation an effective amount of a composition consisting of:

(a) refined detoxified endotoxin containing no detectable 2-keto-3-deoxyoctanoate and having between about 350 and 475 nmoles/mg of phosphorus and between about 1700 and 2000 nmoles/mg of fatty acids; and

(b) a pharmaceutically acceptable carrier.

4,629,723

POTENT THYMOPENTIN ANALOGS

Gideon Goldstein, Short Hills; George Heavner, Flemington; Daniel Kroon, and Tapan Audhya, both of Bridgewater, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 27, 1984, Ser. No. 625,344

Int. Cl.[4] A61K *37/43;* **C07K** *7/06*

U.S. Cl. 514—17 **14 Claims**

1. A peptide having the formula:

$$R\text{-}V\text{-}W\text{-}X\text{-}Y\text{-}Z\text{-}R^1$$

or a pharmaceutically-acceptable acid- or base-addition salt thereof, wherein:

R is H, loweralkyl, formyl or loweralkanoyl;

V is ARG or D-ARG;

W is LYS, D-LYS, PRO, dehydro-PRO, or AIB;

X is ASP, D-ASP, GLU, or D-GLU;

Y is VAL, LYS, LEU, ILE, GLU, ALA, GLN, D-VAL, D-LYS, D-LEU, D-ILE, D-GLU, D-ALA, or D-GLN;

Z is PHE, HIS, TRP, D-PHE, D-HIS, or D-TRP;

R^1 is OH or NR^2R^3; and

R^2 and R^3 are each independently selected from H or loweralkyl;

provided that when W is LYS, X is D-ASP, GLU, or D-GLU, and Y is VAL, Z is other than PHE.

4,629,724

AMINO ACID ESTER AND AMIDE RENIN INHIBITORS

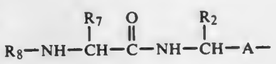
Denis E. Ryono, Princeton, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,714

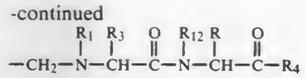
Int. Cl.[4] A61K *37/43;* **C07K** *7/02, 5/08*

U.S. Cl. 514—18 **21 Claims**

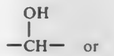
1. A compound of the formula



-continued



including a pharmaceutically acceptable salt thereof wherein:
A is

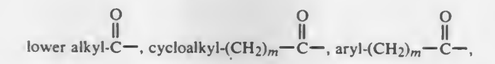


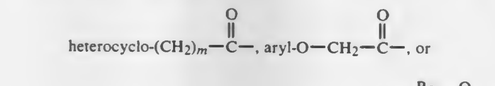
R_4 is —O—lower alkyl, —O—$(CH_2)_m$—aryl, —OH, —O—$(CH_2)_m$—heterocyclo, or

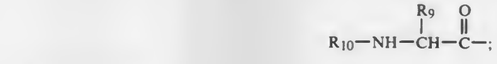


R_5 is hydrogen, lower alkyl, —$(CH_2)_m$—aryl, or —$(CH_2)_m$—heterocyclo;
R_8 is hydrogen,

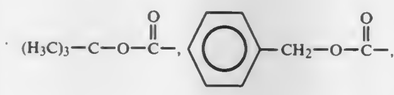


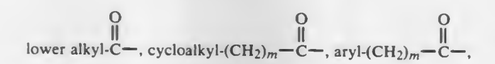


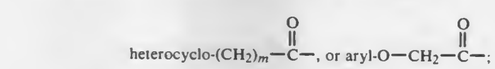




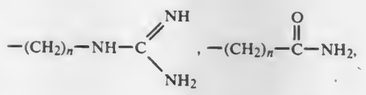
R_{10} is hydrogen,

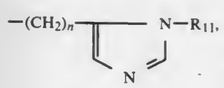






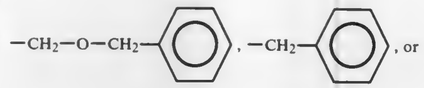
R, R_2, R_3, R_7 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl, —$(CH_2)_n$—aryl, —$(CH_2)_n$—heterocyclo, —$(CH_2)_n$—OH, —$(CH_2)_n$—NH_2, —$(CH_2)_n$—SH, —$(CH_2)_n$—S—lower alkyl, —$(CH_2)_2$—S—$(CH_2)_2$—NH_2,

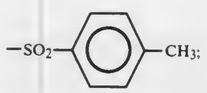




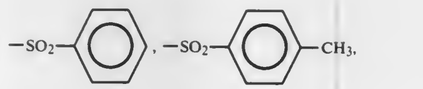
and —$(CH_2)_n$—cycloalkyl;

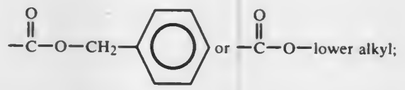
n is an integer from 1 to 4;
R_{11} is





R_1 is hydrogen, lower alkyl, —$(CH_2)_n$—aryl, —$(CH_2)_n$—cycloalkyl,





R_{12} is hydrogen, lower alkyl, —$(CH_2)_n$—aryl, or —$(CH_2)_n$—cycloalkyl;
the term lower alkyl refers to straight or branched chain radicals having up to seven carbon atoms;
the term cycloalkyl refers to saturated rings of 4 to 7 carbon atoms;
the term halogen refers to Cl, Br, and F;
the term halo substituted lower alkyl refers to such lower alkyl groups in which one or more hydrogens have been replaced by Cl, Br, or F groups;
the term aryl refers to phenyl, 1-naphthyl, 2-naphthyl, mono substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, halogen, hydroxy, amino, —NH—alkyl wherein alkyl is of 1 to 4 carbons, or —N(alkyl)$_2$ wherein alkyl is of 1 to 4 carbons, di or tri substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substituents are methyl, methoxy, methylthio, halogen, or hydroxy; and
the term heterocyclo refers to fully saturated or unsaturated monocyclic rings of 5 or 6 atoms containing one or two O and S atoms and/or one to four N atoms provided that the total number of hetero atoms in the ring is 4 or less and bicyclic rings wherein the five or six membered ring containing O, S and N atoms as defined above is fused to a benzene ring.

4,629,725

METHOD FOR INHIBITING INCREASE IN BLOOD SUGAR CONTENT

Yasutake Hiji, c/o Tottori University School of Medicine 86, Nishi-machi, Yonago-shi, Tottori-ken, Japan

Continuation-in-part of Ser. No. 545,335, Oct. 25, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 712,507
Claims priority, application Japan, Oct. 25, 1982, 57-187037
Int. Cl.[4] A61K *31/715*
U.S. Cl. 514—60 **1 Claim**

1. A method of inhibiting the increase in blood sugar content which usually arises from the intake of foodstuff containing sucrose, starch and mixtures thereof, comprising adding pullulan to said foodstuff in a weight ratio of pullulan to sucrose, starch and mixtures thereof in the range of 1:400 to 1:20.

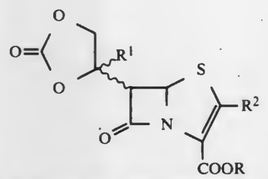
4,629,726

PENEM CARBOXYLIC ACIDS

Shoichiro Uyeo, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 632,854
Claims priority, application Japan, Jul. 27, 1983, 58-138127
Int. Cl.[4] C07D *499/00;* **A61K** *31/425*
U.S. Cl. 514—195 **5 Claims**

1. A 2-substituted or unsubstituted-6-(2-oxo-1,3-dioxolan-4-yl)-2-penem-3-carboxylic acid derivative of the formula (Ia):



(Ia)

wherein R is hydrogen, sodium, potassium, diphenylmethyl, p-methoxybenzyl, acetoxymethyl, 1-(ethoxycarbonyloxy)ethyl, pivaloyloxymethyl, or p-nitrobenzyl, R^1 is methyl, and R^2 is hydrogen, methyl, chloromethyl, hydroxymethyl, acetoxymethyl, tri-lower alkoxysilyloxymethyl, thiadiazolylthiomethyl or tetrazolylthiomethyl the last two of said groups being unsubstituted or substituted by methyl, carbamoylmethyl, hydroxyethyl, or amino.

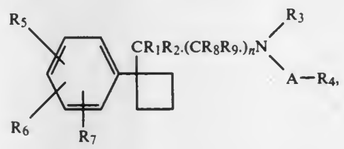
4,629,727

THERAPEUTIC AGENTS

Antonin Kozlik, Clifton, and Wilfred H. Wells, Radcliffe-on-Trent, both of England, assignors to The Boots Company PLC, England

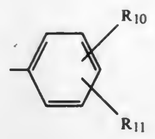
Filed Sep. 28, 1983, Ser. No. 536,669
Claims priority, application United Kingdom, Sep. 30, 1982, 8227898; Sep. 30, 1982, 8227901
Int. Cl.[4] A61K *31/135;* **C07C** *87/455*
U.S. Cl. 514—237 **40 Claims**

1. A compound of the Formula I:



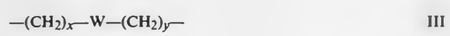
I

a pharmaceutically acceptable salt thereof or a hydrate of a pharmaceutically acceptable salt in which n=0 or 1;
when n=0, R_1 is H, straight or branched chain alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylmethyl in which the cycloalkyl group contains 3 to 7 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, a heterocyclic ring selected from the group consisting of furyl, thienyl, pyrrolyl, pyridyl, tetrahydrofuryl, tetrahydrothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, triazolyl, tetrazolyl, dithianyl and thiazolyl, said heterocyclic ring being unsubstituted or substituted by one or more alkyl groups of 1 to 3 carbon atoms, one or more halo groups, one or more alkoxy groups of 1 to 3 carbon atoms or one or more trifluoromethyl groups, or a group of the Formula II:



II

when n=1, R_1 is H or alkyl of 1 to 3 carbon atoms;
R_2 is H or alkyl of 1 to 3 carbon atoms;
R_2 is H or alkyl of 1 to 3 carbon atoms;
R_3 is H or straight or branched chain alkyl of 1 to 4 carbon atoms;
A is a group of the Formula III:



III

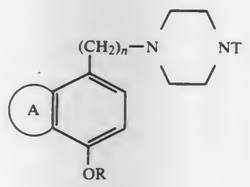
in which W is an oxygen atom or a group of the Formula —S(O)$_m$— in which m is 0, 1 or 2, a group of the Formula —$CR_{12}R_{13}$—, cycloalkylidene of 3 to 6 carbon atoms or a cycloalkylene of 3 to 6 carbon atoms; x is 0 or an integer from 1 to 5; y is 0 or an integer from 1 to 5 with the proviso that when W is an oxygen atom or a group of the Formula S(O)$_m$, x and y are both integers from 1 to 5; R_{12} and R_{13} are the same or different and each is H, alkyl of 1 to 3 carbon atoms, hydroxy, methoxy or benzyl;
R_4 is phenyl unsubstituted or substituted by one or more halo, hydroxy, alkoxy of 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms, a heterocyclic ring selected from the group consisting of furyl, thienyl, pyrrolyl, pyridyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolinyl, piperidyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, imidazolidinyl, imidazolinyl, pyrazolidinyl, pyrazolinyl, triazolyl, tetrazolyl, thiazolyl, isoxazolyl, morpholinyl, thiomorpholinyl, tetrahydro and dihydro derivatives of thiazolyl or isoxazolyl, cyano, carbamoyl of the Formula —$CONR_{14}R_{15}$ in which R_{14} and R_{15} are the same or different and each is H or alkyl of 1 to 3 carbon atoms or R_{14} and R_{15} together with the nitrogen atom to which they are attached form a heterocyclic ring of 4- to 6-ring members, alkoxycarbonyl of the Formula —$COOR_{16}$ in which R_{16} is alkyl of 1 to 3 carbon atoms, amido of the Formula —$N(R_{17})COR_{18}$ in which R_{17} and R_{18} are the same or different and each is alkyl of 1 to 4 carbon atoms or R_{17} and R_{18} together with the nitrogen atom and carbonyl group to which they are attached form a 5- or 6-member heterocyclic ring, acyloxy of the Formula —$OCOR_{19}$— in which R_{19} is alkyl of 1 to 3 carbon atoms, thiol, or a group of the Formula —OR_{20}, —SR_{20}, —SOR_{20} or —SO_2R_{20} in which R_{20} is straight or branched chain alkyl of 1 to 4 carbon atoms or phenyl unsubstituted or substituted by halo, hydroxy, alkoxy or 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms;
R_5, R_6 and R_7 are the same or different and each is H, halo, trifluoromethyl, hydroxy, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or alkylthio of 1 to 3 carbon atoms, or phenyl or R_5 and R_6, together with the carbon atoms to which they are attached, form a second benzene ring which is unsubstituted or substituted by halo, alkyl or 1 to 3 carbon atoms, or alkoxy of 1 to 3 carbon atoms, or the substituents on the second benzene ring together with the carbon atoms to which they are attached form a further benzene ring;
R_8 and R_9 are the same or different and each is H or alkyl of 1 to 3 carbon atoms; and R_{10} and R_{11} are the same or different and each is H, halo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms.

4,629,728
ANTIHYPOXEMIC 5-(4-SUBSTITUTED PIPERAZINYL)ALKYL-8-SUBSTITUTED QUINOLINES

Gilbert Regnier, Chatenay Malabry; Claude Guillonneau, Clamart, and Jean Lepagnol, Chatou, all of France, assignors to ADIR S.A.R.L., Neuilly-sur-Seine, France

Filed Dec. 26, 1984, Ser. No. 686,247
Claims priority, application France, Jan. 4, 1984, 84 00058
Int. Cl.[4] A61K *31/495;* C07D *401/06*
U.S. Cl. 514—252 12 Claims

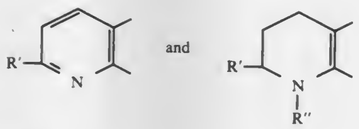
1. A compound selected from the group consisting of: quinoline compounds of the formula:



in which:



is selected from the group consisting of:



in which:

R′ is selected from the group consisting of hydrogen and methyl;

R and R″, which are the same or different, are each selected from the group consisting of:

hydrogen,

(C_1-C_5)alkyl,

(C_1-C_5)acyl, halo (C_1-C_5)acyl and amino-(C_1-C_5)acyl,

(C_1-C_3)alkylsulfonyl and

diethylphosphonyl;

n is an integer selected from 1 to 4 inclusive; and

T is selected from the group consisting of:

phenyl, halophenyl, trifluoromethylphenyl, hydroxyphenyl [(C_1-C_5)alkyl]-phenyl and [(C_1-C_5)alkoxy]-phenyl; and

five- and six-membered heterocyclic radicals having one or two atoms selected from nitrogen and sulfur and these radicals substituted by a radical selected from the groups consisting of (C_1-C_5)alkyl and (C_1-C_5)alkoxy; and

physiologically tolerable acid addition salts thereof.

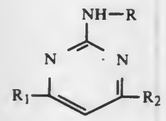
12. A method for treating a living animal body afflicted with disorders connected with hypoxemia or energic metabolic insufficiency especially during cerebral aging, comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said conditions.

4,629,729
ENDOWED WITH ANTI-VIRAL ACTIVITY 2-ALKYLAMINO-4,6-DIHALO PYRIMIDINES

Daniele Gatti, Via Sacco & Vanzetti, 3, 27020 Travacò Siccomario, Italy

Continuation of Ser. No. 598,922, Apr. 10, 1984, abandoned.
This application Aug. 8, 1985, Ser. No. 763,767
Claims priority, application Italy, May 6, 1983, 20960 A/83
Int. Cl.[4] A61K *31/505;* C07D *239/02*
U.S. Cl. 514—275 10 Claims

6. A method for treating an animal infected with a virus, wherein the virus is Picorna virus, polio virus, coxsackie virus, ECHO virus, herpes virus or pox virus, which comprises administering to the animal a pyrimidine compound of the formula:



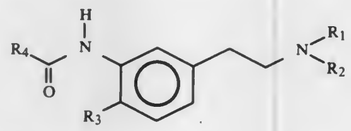
wherein R is an alkyl group having 1 to 6 carbon atoms, and R_1 and R_2, individually selected, are Cl, Br or I, in an amount effective to treat the infection.

4,629,730
METHOD FOR TREATING INTRAOCULAR HYPERTENSION

Robin D. Clark, Palo Alto, and L. David Waterbury, San Mateo, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 11, 1985, Ser. No. 722,038
Int. Cl.[4] A61K *31/445, 31/40, 31/17, 31/16*
U.S. Cl. 514—331 9 Claims

1. A method of treating elevated intraocular pressure in a mammal, which method comprises administering directly to the eye of a mammal in need thereof a therapeutically effective amount of a compound of formula I



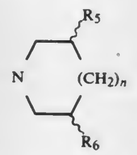
(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein

R_1 is alkyl of two to four carbon atoms; and

R_2 is alkyl of three or four carbon atoms; or

R_1 and R_2 taken together with N form



wherein n is 0, 1, or 2 and R_5 and R_6 are each independently lower alkyl or hydro;

R_3 is hydro or hydroxy; and

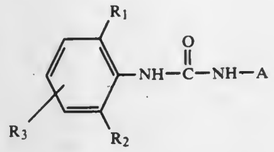
R_4 is hydro, lower alkyl, amino, or lower alkylamino.

4,629,731
ANTICONVULSANT N-(2,6-DISUBSTITUTED AROMATIC)-N′-PYRIDINYL UREAS

Sandra J. Lobbestael, Dexter; Ivan C. Nordin, Holland, both of Mich., and Robert Fleming, Milford, Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 525,512, Aug. 22, 1983, abandoned.
This application Apr. 30, 1985, Ser. No. 728,155
Int. Cl.[4] C07D *213/75;* A61K *31/44*
U.S. Cl. 514—353 13 Claims

1. A compound of the formula



wherein A is 4-pyridinyl; R_1 and R_2 are independently halogen, lower alkyl, lower alkoxy, or nitro, and R_3 is hydrogen, halogen, lower alkyl, lower alkoxy, or nitro, or a pharmaceutically acceptable acid addition salt thereof.

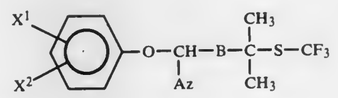
12. An anticonvulsant composition consisting essentially of an effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,629,732
FUNGICIDALLY ACTIVE 3-SUBSTITUTED 1-AZOLYL-3-METHYL-1-PHENOXY-BUTAN-2-ONES AND -OLS

Udo Kraatz, Leverkusen; Erich Klauke, Odenthal; Gerhard Jager, Leverkusen; Karl H. Buchel, Burscheid; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 370,754, Apr. 22, 1982, abandoned.
This application Apr. 17, 1984, Ser. No. 600,581
Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119390
Int. Cl.[4] A01N *43/50, 43/653;* C07D *233/60, 249/08*
U.S. Cl. 514—383 9 Claims

1. A 3-substituted 1-azolyl-3-methyl-1-phenoxy-butan-2-one or -ol of the formula



in which

Az represents 1,2,4-triazol-1-yl or imidazol-1-yl,

B represents the keto group or the CH(OH) group,

X^1 represents hydrogen, fluorine, chlorine, methyl or phenyl, and

X^2 represents hydrogen or chlorine,

or a physiologically tolerated acid addition salt or metal salt complex thereof.

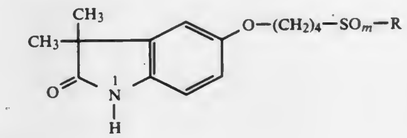
8. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,629,733
INDOLINONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Erich Müller; Josef Nickl; Josef Roch, and Berthold Narr, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Continuation of Ser. No. 319,913, Nov. 10, 1981, abandoned.
This application Jul. 27, 1984, Ser. No. 625,020
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042632
Int. Cl.[4] A61K *31/40;* C07D *209/34*
U.S. Cl. 514—418 7 Claims

1. A compound of the formula



wherein

R is phenyl, 4-chlorophenyl, 4-tert.butylphenyl, 4-methoxyphenyl, 4-(2′-fluorophenyl)-phenyl, 4-cyclohexylphenyl, 3,4-dichlorophenyl, 3,4-dimethoxyphenyl, 3,5-dibromo-4-amino-phenyl, 3,5-dichloro-4-hydroxy-phenyl, 3,5-di-tert-.butyl-4-hydroxyphenyl, naphthyl-(2), or 6,7-dimethoxynaphthyl-(2) and

m is 0, 1 or 2.

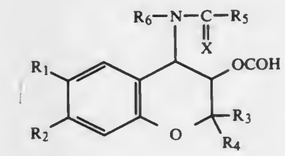
6. A pharmaceutical composition for the prophylaxis or treatment of thrombo-embolic diseases or for the treatment of arteriosclerosis which consists essentially of inert, pharmacologically acceptable carrier and an effective amount of a compound of claim 1.

4,629,734
BENZOPYRANS

Valerie A. Ashwood, Essex, England, assignor to Beecham Group p.l.c., England

Filed May 16, 1984, Ser. No. 610,624
Claims priority, application United Kingdom, May 18, 1983, 8313679
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/35;* C07D *311/68, 311/70*
U.S. Cl. 514—456 9 Claims

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-7} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or one of R_1 and R_2 is

nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

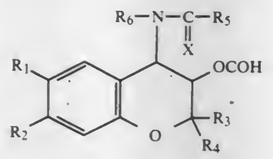
one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

R_6 is hydrogen or methyl and R_5 is hydrogen;

X is oxygen or sulphur; and

the R_6NCXR_5 and OCOH moieties are trans, or, when one or the other of R_1 and R_2 is an amino group, a pharmaceutically acceptable salt thereof.

9. A method of treatment of hypertension in mammals including man, which comprises administering to the suffering mammal an anti-hypertensive effective amount of a compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

R_6 is hydrogen or C_{1-6} alkyl and R_5 is hydrogen, C_{1-6} alkyl optionally substituted by hydroxy, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl or carboxy, C_{1-2} alkyl substituted by halogen, or C_{2-6} alkenyl;

X is oxygen or sulphur; and

the R_6NCXR_5 and OCOH moieties are trans, or, when one or the other of R_1 and R_2 is an amino group, a pharmaceutically acceptable salt thereof.

4,629,735

COMPOSITIONS CONTAINING SUBSTITUTED AMINOBENZOATES AND USE THEREOF AS INHIBITORS OF LIPOXYGENASE

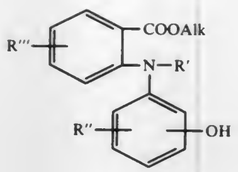
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 512,843, Jul. 11, 1983, Pat. No. 4,515,980. This application Jan. 16, 1985, Ser. No. 691,823

Int. Cl.⁴ A61K *31/24*

U.S. Cl. 514—535 **8 Claims**

1. A composition for inhibiting lipoxygenase activity which comprises a compound of the formula



wherein:

R′ is hydrogen or lower-alkyl;

R″ is hydrogen, lower-alkyl or halo;

R‴ is hydrogen, lower-alkyl, or lower-alkoxy; and

Alk is lower-alkyl together with one or more pharmaceutically acceptable excipients or diluents.

4,629,736

FATTY ACID DERIVATIVES AND PROCESS OF PRODUCING THEM

Shin-ichi Tsukamoto; Yoshinobu Nagano, both of Tokyo, and Kimio Katsuda, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 656,165

Claims priority, application Japan, Sep. 30, 1983, 58-182000; Jul. 24, 1984, 59-153430

Int. Cl.⁴ C07C *103/52;* **A61K** *37/02*

U.S. Cl. 514—563 **10 Claims**

1. A fatty acid derivative selected from the group consisting of:

N-[3-(3,6-Dioxahexanoyloxy)octadecanoyl]-L-phenylalanine,

N-[3-(3,6-Dioxahexanoyloxy)octadecanoyl]-L-serine,

N-[3-(3,6,9-Trioxapentadecanoyloxy)octadecanoyl]-L-phenylalanine,

N-[3-(3,6,9,12-Tetraoxahexadecanoyloxy)octadecanoyl]-L-phenylalanine, and

(S)-3-(3,6-Dioxahexadecanamide)-3-(3-oxatridecylcarbamoyl)propionic acid.

4,629,737

SECONDARY AMINES AND USE IN PHARMACEUTICAL COMPOSITIONS

Barrie C. C. Cantello, Redhill, England, assignor to Beecham Group p.l.c., England

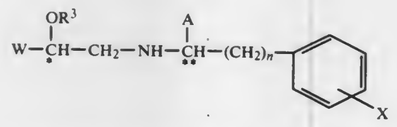
Filed Jul. 14, 1983, Ser. No. 513,869

Claims priority, application United Kingdom, Jul. 16, 1982, 8220645; Oct. 7, 1982, 8228753; Dec. 15, 1982, 8235672

Int. Cl.⁴ C07C *101/16, 101/447;* **A61K** *31/215, 31/195*

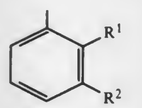
U.S. Cl. 514—564 **27 Claims**

1. A compound of the formula (I):



(I)

a pharmaceutically acceptable salt, ester, or amide thereof in which W is an optionally substituted phenyl group of the formula:



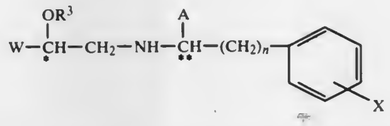
wherein R^1 is hydrogen or fluoro; R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, halo or trifluoromethyl; or W is phenoxymethyl;

R^3 is alkyl of 1 to 12 carbon atoms;

A is hydrogen or methyl;

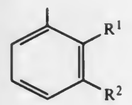
and X is —T—Z—CO_2H in the para- or meta-position with respect to the —$(CH_2)_n$ group, wherein T is O, S, —NH or —N—R^7 in which R^7 is alkyl of 1 to 6 carbon atoms, Z is straight chain alkylene of 1 to 10 carbon atoms on branched chain alkylene of up to 10 carbon atoms, said alkylene moieties optionally containing a carbon-carbon double bond and n is 1 or 2.

10. A pharmaceutical composition useful for treating hyperglycaemia and obesity in human and non-human animals which comprises a therapeutically effective amount of a compound of the formula (I):



(I)

a pharmaceutically acceptable salt thereof, a pharmaceutically acceptable ester thereof, or a pharmaceutically acceptable amide thereof in which W is an optionally substituted phenyl group of the Formula:



wherein R^1 is hydrogen or fluoro; R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, halo or trifluoromethyl; or W is phenoxymethyl, R^3 is alkyl of 1 to 12 carbon atoms;

A is hydrogen or methyl;

and X is —T—Z—CO_2H in the para- or meta-position with respect to the —$(CH_2)_n$ group, wherein T is O, S, —NH or —N—R^7 in which R^7 is alkyl of 1 to 6 carbon atoms, Z is straight chain alkylene of 1 to 10 carbon atoms or branched chain alkylene of up to 10 carbon atoms, said alkylene moieties optionally containing a carbon-carbon double bond and n is 1 or 2, in combination with a pharmaceutically acceptable carrier.

4,629,738

NON-CLASSICAL TOPICAL TREATMENT FOR GLAUCOMA

Charles F. Barfknecht, and Ronald D. Schoenwald, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

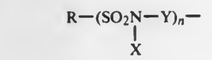
Filed Jun. 25, 1984, Ser. No. 624,261

Int. Cl.⁴ A61K *31/18*

U.S. Cl. 514—603 **8 Claims**

1. A topical composition for eye drop treatment of glaucoma, comprising:

a small but intraocular eye pressure reducing effective amount of a non-classical carbonic anhydrase inhibitor of the formula:



wherein

R is selected from the group consisting of phenyl and 4-substituted phenyl wherein the substituent is selected from the group consisting of chloro, nitro, fluoro, hydroxy, hydroxyethoxy, methoxy and ethoxy; and

X is selected from the group consisting of hydrogen and hydroxyl; and

Y is selected from the group consisting of C_1 to C_6 alkyl and hydrogen, and if either X or Y is hydrogen, the other is not hydrogen; and

n is either 1 or 2; and

from about 0.01% by weight to about 0.10% by weight of a wetting agent, from about 0.004% by weight to about 0.02% by weight of an anti-bacterial agent; and

an isotonic inert, non-irritating and nontoxic topical ophthalmic carrier having a pH within the range of about 4.0 to about 8.0.

4,629,739

SUBSTITUTED SULFONAMIDOBENZAMIDES AND METHOD OF TREATING ARRHYTHMIAS

David D. Davey, Succasunna, N.J.; William C. Lumma, Jr., Pennsburg, Pa., and Ronald A. Wohl, Morris Plains, N.J., assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 591,649, Mar. 20, 1984, Pat. No. 4,544,654. This application Sep. 23, 1985, Ser. No. 778,657

Claims priority, application European Pat. Off., Feb. 2, 1985, 85101112.2

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ A61K *31/18, 31/535;* **C07C** *143/75, 143/80*

U.S. Cl. 514—605 **17 Claims**

1. A compound according to the formula:



wherein

R = lower alkyl, cycloalkyl, cycloalkylloweralkyl, benzyl, or benzyl substituted by halogen, loweralkyl, loweralkoxy, or lower alkyl substituted by hydroxy, lower alkoxy, carbamoyl, N-loweralkylcarbamoyl, N,N-diloweralkylcarbamoyl and sulfamoyl;

X, X_1 = hydrogen and halogen;

R_1 = hydrogen, loweralkyl, unsaturated loweralkyl, loweralkoxyloweralkyl, or collectively with R_2 is an alkylene chain forming an azetidine, pyrrolidine, piperidine, or hexahydroazepine ring, or collectively with R_3 is a bond or an alkylene chain forming an azetidine, pyrrolidine, piperidine or a hexahydroazepine ring;

R_2 = hydrogen, loweralkyl or collectively with R_3 is a bond or an alkylene chain to form a saturated carbocyclic ring of from 4 to 8 ring carbon atoms;

R_3, R_4 = hydrogen, loweralkyl or collectively is an alkylene chain forming a saturated carbocyclic ring of from 4 to 6 ring carbon atoms;

R_5, R_6 = hydrogen, C_5–C_{10} straight or branched chain alkyl, C_3–C_6 cycloalkyl, cycloalkyl(lower)-alkyl, or loweralkyl substituted by phenyl which may be substituted by up to 3 substituents selected from hydroxy or methoxy groups;

n = 0, 1, 2;

with the provisos that:

(a) One of R_5 and R_6 must be hydrogen, but both cannot be hydrogen,

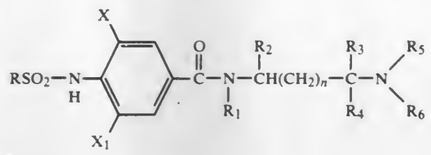
(b) when R_1 is unsaturated loweralkyl, the unsaturation cannot be alpha to the nitrogen atom,

(c) when one of R_5 or R_6 is lower alkyl substituted by phenyl or substituted phenyl then said phenyl or substituted phenyl cannot be α to the nitrogen atom.

or a pharmaceutically acceptable salt thereof.

9. The method of treating arrhythmias in a mammalian subject in need thereof comprising administering to said sub-

ject an antiarrhythmically effective dose of a compound according to the formula:



wherein

R=lower alkyl, cycloalkyl, cycloalkylloweralkyl, benzyl, or benzyl substituted by halogen, loweralkyl, loweralkoxy, or lower alkyl substituted by hydroxy, lower alkoxy, carbamoyl, N-loweralkylcarbamoyl, N,N-diloweralkylcarbamoyl and sulfamoyl:

X,X_1=hydrogen and halogen;

R_1=hydrogen, loweralkyl, unsaturated loweralkyl, loweralkoxyloweralkyl, or collectively with R_2 is an alkylene chain forming an axetidine, pyrrolidine, piperidine, or hexahydroazepine ring, or collectively with R_3 is a bond or an alkylene chain forming an azetidine, pyrrolidine, piperidine or a hexahydroazepine ring;

R_2=hydrogen, loweralkyl or collectively with R_3 is a bond or an alkylene chain to form a saturated carbocyclic ring of from 4 to 8 ring carbon atoms;

R_3,R_4=hydrogen, loweralkyl or collectively is an alkylene chain forming a saturated carbocyclic ring of from 4 to 6 ring carbon atoms;

R_5,R_6=hydrogen, C_5–C_{10} straight or branched chain alkyl, C_3-C_6 cycloalkyl, cycloalkyl(lower)alkyl, or loweralkyl substituted by phenyl which may be substituted by up to 3 substituents selected from hydroxy or methoxy groups;

n=0, 1, 2;

with the provisos that:

(a) One of R_5 and R_6 must be hydrogen, but both cannot be hydrogen,

(b) when R_1 is unsaturated loweralkyl, the unsaturation cannot be alpha to the nitrogen atom.

or a pharmaceutically acceptable salt thereof;

4,629,740

ANTICONVULSANT AGENTS

David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 10, 1984, Ser. No. 598,569

Int. Cl.⁴ A61K *31/165;* **C07C** *103/22, 103/28*

U.S. Cl. 514—620 **9 Claims**

1. A compound selected from (R)-4-amino-N-(1-phenylethyl)benzamide and (S)-4-amino-N-(1-phenylethyl)-benzamide or a pharmaceutically acceptable salt thereof.

4. A method for treating or preventing convulsions in mammals in need of such treatment which comprises administering to said mammal an effective amount of a compound of claim **1**.

4,629,741

CHROMIUM OXIDE IN ION EXCHANGE RESINS AND USE TO REMOVE MULTIVALENT METAL CATIONS FROM SOLUTIONS OF AT LEAST 1% SALINITY

Alvin F. Beale, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 576,092, Feb. 1, 1984, Pat. No. 4,569,765, which is a division of Ser. No. 403,887, Jul. 30, 1982, Pat. No. 4,446,252, which is a division of Ser. No. 248,656, Mar. 27, 1981, Pat. No. 4,366,261. This application Oct. 21, 1985, Ser. No. 789,973

Int. Cl.⁴ B01J *39/20*

U.S. Cl. 521—28 **13 Claims**

1. A method for preparing an aqueous solution containing polyvalent metal cations for use in a process wherein the polyvalent metal cations are to be removed by ion exchange using a composite comprising an anion exchange resin having incorporated therein hydrous chromium III oxide conforming substantially to the empirical formula $Cr_2O_3.nH_2O$ where nH_2O signifies waters of hydration, said method comprising

adding to said aqueous solution an amount of inorganic ammonium and/or alkali metal salt to convert said aqueous solution to a saline solution of at least about 1% salinity, said amount providing at least as many moles of said salt as there are moles of polyvalent metal cations to be removed from the aqueous solution.

4,629,742

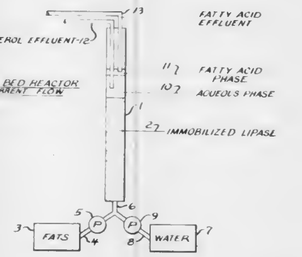
HYDROLYSIS OF FATS

Catherine D. Brady, Downers Grove; Lincoln D. Metcalfe, Lagrange; Dale R. Slaboszewski, Joliet, and Dieter Frank, Naperville, all of Ill., assignors to Akzo America Inc., New York, N.Y.

Filed Jan. 27, 1986, Ser. No. 823,114

Int. Cl.⁴ C08J *9/36*

U.S. Cl. 521—55 **38 Claims**



1. A composition comprising lipase immobilized by adsorption from aqueous solution on a microporous structure comprising a synthetic hydrophobic thermoplastic aliphatic olefin polymer selected from the group consisting of aliphatic olefinic polymers, oxidation polymers, ionic polymers and blends thereof, said structure not being pretreated prior to said adsorption or being pretreated only by wetting with a polar water miscible organic solvent in which said polymer is insoluble and which does not deactivate said lipase.

4,629,743

PROCESS FOR PREPARING HIGH BULK DENSITY VINYL RESINS

Paul O. Hong, King of Prussia, Pa., assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 736,161, May 20, 1985, Pat. No. 4,607,058. This application Apr. 4, 1986, Ser. No. 848,191

Int. Cl.⁴ C08J *9/22*

U.S. Cl. 521—57 **3 Claims**

1. A porous spherical polyvinyl chloride resin in particulate form, obtained from by aqueous suspension polymerization and having a shape factor greater than about 0.9 wherein the outside surface of said resin particles consists of at least one hydroxypropyl methyl cellulose having a viscosity as measured as a 2% solution in water at 20° C. according to ASTM D 2363, of from about 4000 cps to about 75,000 cps, wherein said porous resin has a bulk density greater than about 0.58 g/cc and a DOP porosity greater than about 0.06 cc/g.

4,629,744

METHOD FOR PRODUCING A RESPONSE MEMBRANE FOR USE IN A CHLORIDE ION SELECTIVE ELECTRODE

Hiroaki Uematsu; Takeshi Kohno, and Takeshi Miyazaki, all of Kyoto, Japan, assignors to Horibe, Ltd., Kyoto, Japan

Filed Mar. 20, 1985, Ser. No. 714,082

Claims priority, application Japan, Mar. 23, 1984, 59-56778

Int. Cl.⁴ C08J *9/28*

U.S. Cl. 521—62 **11 Claims**



1. A method for producing a response membrane for use in a chloride ion selective electrode comprising preparing a mixture of an epoxy resin, a vinyl chloride resin, one or more solvents, 0.4 to 30% by weight of a quaternary ammonium salt, based upon the weight of the mixture, as a responsive substance for detecting chloride ions, and a hardening agent for setting said epoxy resin, wherein said epoxy resin and said vinyl chloride resin is used at a ratio of 8:1 to 1:2 by weight, placing the mixture in a shallow vessel and evaporating the solvents to form a membrane, and hardening the membrane by maintaining it at a temperature of 45° C. for 20 days or more to produce the response membrane.

4,629,745

EXPANDABLE POLYETHERIMIDE COMPOSITIONS AND FOAMED MATERIALS OBTAINED THEREFROM

Tsuneo Hoki, and Yutaka Matsuki, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1985, Ser. No. 800,195

Claims priority, application Japan, Nov. 22, 1984, 59-247579; Jul. 25, 1985, 60-162973

Int. Cl.⁴ C08J *9/14*

U.S. Cl. 521—87 **7 Claims**

1. An expandable polyetherimide composition comprising (A) polyetherimide and (B) a blowing agent containing in the said agent at least 10% by weight of a volatile organic foaming component having a solubility parameter $[\delta_c]$ satisfying the following equation

$$\delta_p - 1.14 \leqq \delta_c \leqq \delta_p + 1.14$$

wherein δ_p is the solubility parameter of the polyetherimide, a dielectric constant of not less than 15, and a boiling point at normal pressure of not higher than 80° C.

4,629,746

RADIOPAQUE DENTAL MATERIALS

Rudolf J. Michl, Schaan; Volker M. Rheinberger, Vaduz, and Gilbert Ott, Schaan, all of Liechtenstein, assignors to Etablissement Dentaire Ivoclar, Schaan, Liechtenstein

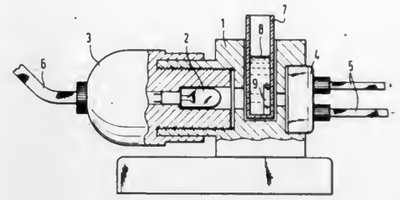
Filed Jun. 21, 1985, Ser. No. 747,176

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502594

Int. Cl.⁴ A61K *6/08*

U.S. Cl. 523—117 **14 Claims**

1. In radiopaque dental material compositions composed of an organic matrix of a polymerizable vinyl compound inorganic filler and radiopaque component; the improvement consisting essentially of, as the radiopaque component, from 1 to 50 wt. %, based on the total weight of the composition, of a



rare earth metal fluoride, or mixtures of such fluorides, wherein said metal has an atomic number of from 57 to 71.

4,629,747

MICROBIOCIDAL ANIONIC SEQUESTERANTS WITH POLYVALENT METAL CATIONS FOR PERMEABILITY CORRECTION PROCESS

Yulin Wu, and Naim A. Mumallah, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 629,153, Feb. 9, 1984, Pat. No. 4,552,217. This application Jul. 9, 1985, Ser. No. 753,097

Int. Cl.⁴ C08K *5/09*

U.S. Cl. 523—130 **2 Claims**

1. A composition comprising a gelable aqueous solution of at least one crosslinkable water soluble polymer and at least one biocidal sequestered polyvalent metal cation wherein said biocidal sequestered polyvalent metal cation is prepared by contacting a polyvalent metal in zero valent oxidation state with at least one biocidal sequestering agent in the presence of aqueous hydrochloric acid wherein said polyvalent metal cation is selected from the group consisting of Al^{+3}, Ti^{+4}, Zn^{+2}, Sn^{+4}, Cr^{+3}, Zr^{+4} and mixtures; wherein said water soluble polymer is selected from the group consisting of biopolysaccharides, cellulose ethers, acrylamide-based polymers, partially hydrolyzed polyacrylamides, polystyrene sulfonates, lignosulfonates, methylolated polyacrylamides and mixtures; and wherein said biocidal sequestering agent is selected from the group consisting of:

(a) propionic acid, butyric acid and valeric acid and the corresponding water soluble carboxylate salts;

(b) 2,2-dichloropropionic acid; 2,2-dibromopropionic acid; trifluoroacetic acid; tribromoacetic acid; trichloroacetic acid; 2,2-dibromobutyric acid; 2,2-dichlorovaleric acid; 3-nitropropionic acid; triiodoacetic acid; 3(2,2,2-trichloroethoxy)propionic acid; 4-nitro-2-chlorobutyric acid; 2-bromo-2-nitropropionic acid; and 2-nitroacetic acid and the corresponding water soluble carboxylate salts; and

(c) 2,4-dihydroxyphenyl acetic acid; 2,4-dichlorophenyl acetic acid; 3(2′,4′-dibromophenoxy) propionic acid; 3(3′, 5′-dinitrophenoxy) propionic acid; 3-phenyl-2,3-dibromopropionic acid; 3,5-dinitrosalicylic acid; 3(3′-bromo-4′-nitrophenyl)propionic acid; 3(3′, 4′-dihydroxyphenyl) propionic acid and the corresponding water soluble carboxylate salts and

(d) adipic acid and water soluble adipate salts.

4,629,748

ERASABLE BALL-POINT PEN INK

Tamotsu Miyajima; Noriatsu Tanaka, both of Kanagawa, and Nobuto Saito, Gunma, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,807

Int. Cl.⁴ C09D *5/00, 11/00*

U.S. Cl. 523—161 **19 Claims**

1. An erasable ball-point pen ink comprising:

a rubber component in an amount ranging from about 10% to about 28% of the total weight of the ink;

a volatile solvent having a boiling point of 60°–170° C. in an amount ranging from about 20% to about 40% of the total weight of the ink;

a pigment having a particle size of 0.002 micron to 5 microns in an amount ranging from about 12% to about 35% of the total weight of the ink; and

a nonvolatile solvent having a boiling point of about 300° C. or above which is selected from the group consisting of petroleum lubricating oils, dioctyl phthalate, dioctyl adipate and dibutyl phthalate in an amount ranging from about 17% to about 38% of the total weight of the ink;

said ink further containing at least one dispersant that is liquid at room temperature and completely soluble in said volatile solvent and which is selected from the group consisting of alkyl phosphate esters, amines and oxyethylene-oxypropylene block copolymers in an amount ranging from about 0.2% to about 6% of the total weight of the ink.

4,629,749

CLARITY OF LOW DENSITY POLYETHYLENE COMPOSITIONS CONTAINING ANTI-BLOCK AGENTS BY ADDITION OF POLYETHYLENE GLYCOL

Frank T. Kitchel, Hanover Park; R. Sven Solvik, Barrington, and Michael L. Opacich, Hoffman Estates, all of Ill., assignors to Enron Chemical Company, Rolling Meadows, Ill.

Filed Jul. 24, 1985, Ser. No. 758,392
Int. Cl.[4] C08K *9/00*
U.S. Cl. 523—200 **5 Claims**

1. In a method for forming polyethylene films which comprises incorporating an anti-blocking agent into polyethylene resin and then forming a film from this blend, the improvement which comprises treating the anti-blocking agent with polyethylene glycol prior to addition of the anti-blocking agent to the polyethylene resin such that sufficient polyethylene glycol is deposited on said anti-blocking agent that the weight ratio of polyethylene glycol to said anti-blocking agent is at least about 1:30 in the final polyethylene blend and no more than 1,000 parts per million of the total film content.

4,629,750

FLAME RETARDED POLYESTER RESIN WITH IMPROVED IMPACT STRENGTH

Leonard R. Hepp, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 25, 1985, Ser. No. 705,445
Int. Cl.[4] C08K *3/16, 3/22;* **C08L** *67/02*
U.S. Cl. 523—201 **4 Claims**

1. A thermoplastic molding composition comprising:

(a) poly(1,4-butylene terephthalate) resin;

(b) A flame retarding amount of halogenated aromatic flame retardant;

(c) an effective amount of antimony compound synergist;

(d) a reinforcing amount of filament glass;

(e) an impact modifying amount of organic impact modifier; and

(f) about 0.01 to about 2.0 parts by weight of cuprous iodide for each 60 parts by weight resin and halogenated aromatic flame retardant.

2. The molding composition of claim **1** wherein said organic impact modifier is a core-shell organic impact modifier.

3. The molding composition of claim **2** wherein said core-shell organic impact modifier has a rubbery core based on butadiene or n-butylacrylate and a shell based on methylmethacrylate alone or in combination with styrene.

4,629,751

GEL-RESISTANT BUBBLE-FILLED WALL REPAIR COMPOUND

Richard L. Montgomery, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1985, Ser. No. 724,460
Int. Cl.[4] C08J *9/32*
U.S. Cl. 523—219 **13 Claims**

1. Gel-resistant composition especially suited for patching or repairing plaster, gypsum board panels and the like comprising a blend of glass microbubbles formed from a composition that includes trivalent boron, high molecular weight polyhydroxy compound binder, water, and a low molecular weight polyhydoxy compound in which at least two of the hydroxyl groups are attached to carbon atoms that are separated by one or more intervening carbon atoms.

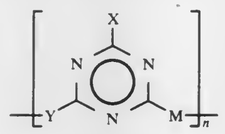
4,629,752

SUBSTITUTED OXO-PIPERAZINYL-TRIAZINES AND UV LIGHT STABILIZED COMPOSITIONS

Robert W. Layer, Cuyahoga Falls; John T. Lai, Broadview Heights, and Pyong N. Son, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 22, 1985, Ser. No. 757,717
Int. Cl.[4] C08K *5/34;* **C07D** *251/70, 251/52, 401/14*
U.S. Cl. 524—100 **20 Claims**

1. A class of compounds comprising polysubstituted piperzinones distally linked to a triazine nucleus ("PIP-T"), and bis compounds and oligomers of said PIP-T compounds represented by the structural formula



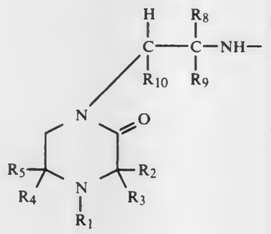
(I)

wherein,

n is an integer in the range from 1 to about 10,

said compound having functional end groups selected from H, OH and Cl when n is greater than 1;

X is a substituent having the following formula (II):



(II)

wherein,

R_2, R_3, R_4 and R_5 independently represent C_1–C_{24} alkyl and polymethylene having from 4 to about 7 C atoms which are cyclizable forming a spiro cycloalkylene substituent with the C atom of the piperazinone ring,

R_1 represents hydrogen or oxygen, C_1–C_{24} alkyl, C_1–C_{12} hydroxyalkyl, benzyl, allyl, and C_1–C_{12} haloalkyl;

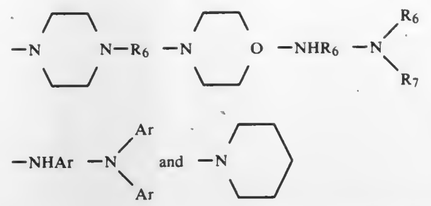
R_8 and R_9 independently represent C_1–C_{24} alkyl, and polymethylene having from 4 to about 7 C atoms which are cyclizable;

R_{10} represents H, C_1–C_6 alkyl and phenyl;

Y may be the same as X or M;

M may be Z or Z′, wherein

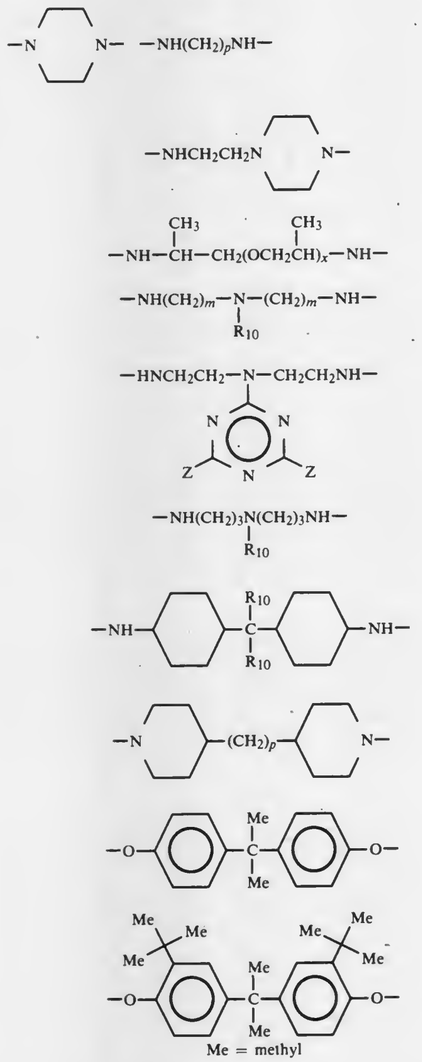
Z represents a radical selected from the group consisting of Cl, OH,



R_6, R_7 represent alkyl having from 2 to about 24 carbon atoms; and C_4–C_7 cycloalkyl;

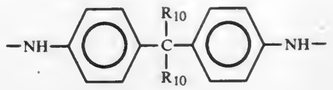
Ar represents aryl;

Z′ represents a radical selected from the group consisting of



Me = methyl

-continued



p represents an integer in the range from 2 to about 20;

x represents an integer in the range from 1 to about 50;

m represents an integer in the range from 2 to about 4 and, when n=1, Y and M may be the same as X.

4,629,753

WATER DISPERSED RUST INHIBITIVE COATING COMPOSITIONS

Robert E. Quinn, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 578,303, Feb. 9, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 801,641
Int. Cl.[4] C08K *3/26, 3/30, 5/04, 5/09*
U.S. Cl. 524—394 **65 Claims**

1. A non-asphaltic, non-mastic type coating composition comprising an effective amount of water and dispersed within said water

(A) a film forming amount of a film forming organic polymer and

(B) a non-Newtonian colloidal disperse system comprising (1) solid metal containing colloidal particles, (2) a liquid dispersing agent and (3) an organic compound the molecules of which contain a hydrophobic portion and at least one polar substituent,

wherein said non-Newtonian colloidal disperse system is characterized by having a neutralization base number of about 7.0 or less and is present in an amount sufficient to inhibit rust formation on the substrate to which said coating composition is applied.

2. The composition of claim **1** wherein said film forming organic polymer (A) ranges from about 10.0 to about 65.0 weight percent and the non-Newtonian colloidal disperse system (B) ranges from 1.0 to about 20.0 weight percent said percentages based on the total weight of the composition.

3. The composition of claim **2** wherein the film forming organic polymer (A) is an organic polymer selected from the group consisting of polyolefin resins, acrylic resins, polyester resins and polyurethanes and wherein the non-Newtonian colloidal disperse system comprises (1) solid metal containing particles selected from the group consisting of alkali and alkaline earth metal salts, (2) a disperse medium selected from the group consisting of inert organic liquids and low molecular weight liquid polymers and (3) an organic compound selected from the group consisting of alkali and alkaline earth metal salts of oil soluble organic acids.

4,629,754

PIGMENTABLE COMPOSITION OF MATTER COMPRISING A MINERAL LUBRICATING OIL EXTRACT AND MODIFIED PETROLEUM AND/OR COUMARONE-INDENE RESIN

Johannes L. M. Syrier; Willem C. Vonk, and Gerrit van Gooswilligen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 23, 1985, Ser. No. 778,943
Claims priority, application United Kingdom, Oct. 15, 1984, 8426007
Int. Cl.[4] C08K *5/09, 3/26, 5/01;* **C08L** *95/00*
U.S. Cl. 524—394 **7 Claims**

1. A pigmentable composition of matter, useful as a binder agent, consisting essentially of the combination of:

(a) from about 30 to about 99 wt% of a mineral lubricating oil extract;

(b) from about 70 to about 1 wt% of a modified resin selected from the group consisting of petroleum resins de-

rived from polymerization of unsaturated compounds present in pyrolytically cracked hydrocarbonaceous material and coumarone-indene resins derived from polymerization of unsaturated compounds present in coal tar distillates, wherein either of said resins is modified by the addition of at least one moiety selected from the group consisting of carboxylic acid moieties, carboxylic acid anhydride moieties and hydroxyl moieties; and

(c) a C_{10}–C_{40} lithium salt of a hydroxy fatty acid constituting the remainder of the composition wherein said mineral lubricating oil and said modified resin are present in total weight percent combination of less than 100%.

4,629,755

RADICAL POLYMERIZING COMPOSITION AND ANAEROBIC LIQUID GASKET COMPOSED THEREOF

Kunio Kanaoka, Sakaido; Takanori Okamoto, Nakatodo, and Hideaki Matsuda, Marugame, all of Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

Filed Apr. 4, 1986, Ser. No. 848,692

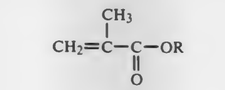
Claims priority, application Japan, Apr. 5, 1985, 60-71027; Jun. 12, 1985, 60-126227

Int. Cl.⁴ C08F *220/12, 220/20;* **C08K** *3/32, 3/34*

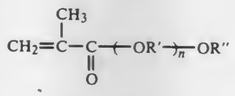
U.S. Cl. 524—415 **14 Claims**

8. An anaerobic liquid gasket comprising

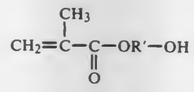
(a) 100 parts by weight of a monomethacrylic acid ester mixture composed of (a) 20 to 95% by weight of the methacrylic acid ester(s) represented by following general formula (1) and/or general formula (2) and 80 to 5% by weight of the methacrylic acid ester(s) represented by general formula (3) and/or general formula (4)



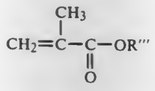
(1)



(2)



(3)



(4)

wherein, R represents an alkyl group having 6 to 13 carbon atoms; R′ represents an alkylene group having 2 to 4 carbon atoms or a halogenated alkylene group; R″ represents an alkyl group having 1 to 4 carbon atoms; R‴ represents a phenyl group, a benzyl group, a phenoxethyl group, a cyclohexyl group, or a tetrahydrofurfuryl group

(b) 0.01 to 10 parts by weight of an organic peroxide,

(c) 10 to 50 parts by weight of a filler,

(d) 0.2 to 10 parts by weight of an anaerobic curing accelerator, and

(e) 0.002 to 1 part by weight of a stabilizer.

4,629,756

HEAT REFLECTIVE POLYMER BLENDS

Dewey L. Kerbow, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 4, 1985, Ser. No. 794,398

Int. Cl.⁴ C08K *3/08*

U.S. Cl. 524—440 **7 Claims**

1. A composition comprising

(a) a thermoplastic tetrafluoroethylene copolymer of film-forming molecular weight and

(b) 0.5 to 10 percent by weight, based on weight of copolymer and copper flake, of copper flake having a number average particle size of between 2 and 250 micrometers and an aspect ratio greater than 4:1.

4,629,757

CATIONIC RUBBER LATICES, A PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF

Heinz Esser, Burscheid, and Horst Krechlok, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 678,168

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345786

Int. Cl.⁴ C08J *3/00*

U.S. Cl. 524—457 **1 Claim**

1. A process for the production of an improved cationic latex by changing an anionic latex by means of a cationic emulsifier, comprising mixing the latex with an amphoteric emulsifier before addition of the cationic emulsifier.

4,629,758

ADHESIVE FOR RUBBER COMPOUNDS

Yasuyoshi Kawaguchi, and Michio Ishii, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 28, 1985, Ser. No. 737,860

Claims priority, application Japan, May 28, 1984, 59-107683

Int. Cl.⁴ C08K *3/04*

U.S. Cl. 524—495 **8 Claims**

1. An adhesive for a rubber compound, comprising a water-in-oil emulsion containing

(a) 100 parts by weight of a rubber selected from the group consisting of natural rubber, polyisoprene rubber, polybutadiene rubber, styrene-butadiene rubber, isobutylene-isoprene rubber and halogenated isobutylene-isoprene rubber,

(b) at least about 30 parts by weight of a carbon black having an iodine adsorption value of at least about 40 mg/g,

(c) at least about 0.5 parts by weight, on an elemental zinc basis, of a zinc compound,

(d) about 3 to about 30 parts by weight of a tackifier having an average molecular weight of between about 1,000 to about 10,000,

(e) about 200 to about 400 parts by weight of organic solvent having a boiling point of about 150° C. or less,

(f) at least about 2 parts by weight of a nonionic surfactant having an HLB value of more than about 2.0 and less than about 8.0, and

(g) water in an amount of at most about three times the total volume of the volume of said rubber (a), said carbon black (b), said zinc compound (c), said tackifier (d), said organic solvent (e) plus said nonionic surfactant (f).

4,629,759

FLAME RETARDANT POLYETHERIMIDE-POLYCARBONATE BLENDS

John A. Rock, Becket, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 28, 1985, Ser. No. 791,875

Int. Cl.⁴ C08L *79/08*

U.S. Cl. 525—66 **21 Claims**

1. A flame retartant polymeric blend comprising in admixture (a) a polyetherimide, (b) an aromatic thermoplastic polycarbonate and (c) a flame retarding amount of a flame retarding modifier selected from the group consisting of brominated polystyrene and a combination of brominated polystyrene and an acrylic rubber composite interpolymer.

4,629,760

COMPOSITION OF POLYCARBONATE, POLYESTER, ACRYLATE ELASTOMERIC COPOLYMER AND A PHENOXY RESIN

Ping Y. Liu, Naperville, Ill., and Harold F. Giles, Jr., Cheshire, Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 1, 1985, Ser. No. 793,967

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—67 **20 Claims**

1. A composition comprising

a. a major amount of an aromatic polycarbonate;

b. a minor quantity of a polyester selected from polyalkylene terephthalate and polycycloalkylene terephthalate, isophthalate or a mixture of the isophthalate and terephthalate;

c. a minor quantity of an elastomeric acrylate copolymer with a second order transition temperature, Tg, of less than −10° C. and phenoxy resin effective to significantly maintain the impact strength and ductility at break after exposing a stressed part to brake fluid comprising alcohols and ethers.

4,629,761

THERMOPLASTIC COMPOSITIONS OF MULTI-BLOCK COPOLYESTER ELASTOMER AND CHLOROSULFONATED POLYETHYLENE

James R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1985, Ser. No. 731,792

Int. Cl.⁴ C08L *67/02, 23/34*

U.S. Cl. 525—92 **14 Claims**

1. A thermoplastic composition comprising about 10–80 parts by weight total polymers of a multi-block copolyester elastomer having a melting point of from about 100°–200° C. and about 20–90 parts by weight total polymers of a crosslinked chlorosulfonated polyethylene elastomer wherein crosslinking takes place during mixing and shearing or the crosslinked elastomer is crosslinked and ground into small particles, said crosslinked elastomer being dispersed in said copolyester elastomer, said chlorosulfonated polyethylene elastomer being crosslinked to an extent such that not more than about 45% by weight of said elastomer is extractable with toluene at 25° C.

4,629,762

POLYMER MODIFIED POLYPHENOL COMPOSITIONS AND THERMOSETTABLE RESINS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

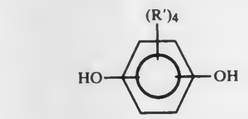
Division of Ser. No. 747,632, Jun. 24, 1985. This application Mar. 24, 1986, Ser. No. 843,524

Int. Cl.⁴ C08F *8/00*

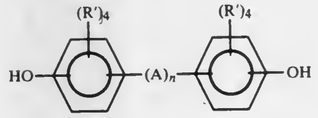
U.S. Cl. 525—109 **9 Claims**

1. An advanced epoxy resin composition comprising the product resulting from reacting (I) at least one epoxy resin having an average of more than one 1,2-epoxide group per molecule with (II) a composition which comprises

(A) a polyphenol represented by the formulas

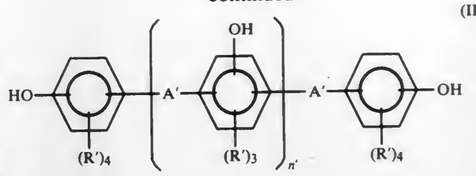


(I)

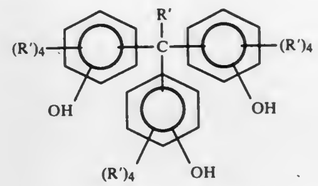


(II)

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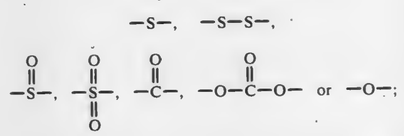


(III)

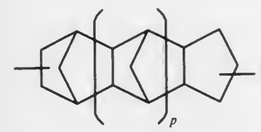


(IV)

wherein each A is independently a divalent hydrocarbon group having from 1 to about 12 carbon atoms,



each A′ is a divalent hydrocarbon group having from 1 to about 3 carbon atoms or a

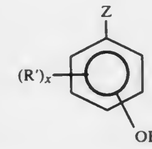


group;

each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; p has a value of from zero to about 10; n has a value of zero or 1 and n′ has a value from about 0.001 to about 6; and

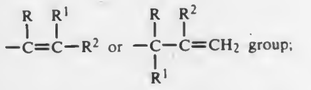
(B) a polymer resulting from copolymerizing

(1) alkenylphenol or a mixture of alkenylphenols represented by the formula



(V)

wherein Z is a



each R, R^1 and R^2 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group

having from 1 to about 10 carbon atoms, chlorine or bromine; x has a value of 4; and

(2) a polymerizable ethylenically unsaturated monomer or mixture of such monomers; wherein component (A) is present in quantities of from about 10 to about 99 percent by weight (% bw); component (B-1) is present in quantities of from about 0.1 to about 50% bw; component (B-2) is present in a quantity of from about 1 to about 50% bw and wherein the amount of the individual components is based upon the combined weight of components (A) and (B); and wherein the components (I) and (II) are employed in quantities which provide from about 0.01 to about 0.99 mole of aromatic hydroxyl groups per mole of epoxide groups.

4,629,763

POLYMER MODIFIED POLYPHENOL COMPOSITIONS AND THERMOSETTABLE RESINS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 747,632, Jun. 24, 1985. This application Mar. 24, 1986, Ser. No. 843,522

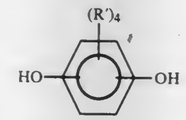
Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—132 **5 Claims**

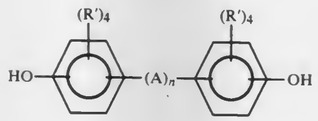
1. A process for preparing a polymer modified cyanate composition which comprises reacting

(I) a composition comprising

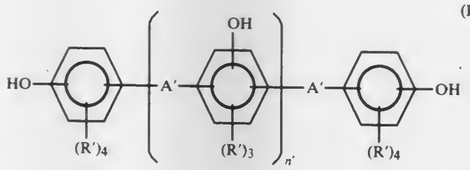
(A) a polyphenol represented by the formulas



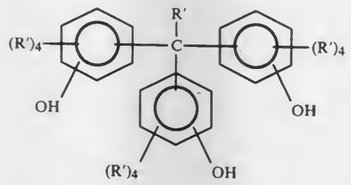
(I)



(II)

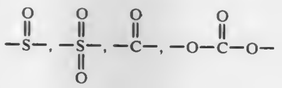


(III)

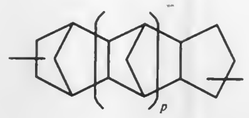


(IV)

wherein each A is independently a divalent hydrocarbon group having from 1 to about 12 carbon atoms, —S—, —S—S—,



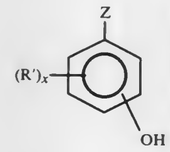
or —O—; each A′ is a divalent hydrocarbon group having from 1 to about 3 carbon atoms or a



group; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; p has a value of from zero to about 10; n has a value of zero or 1 and n′ has a value from about 0.001 to about 6; and

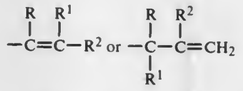
(B) a polymer resulting from copolymerizing

(1) an alkenylphenol or a mixture of alkenylphenols represented by the formula



(V)

wherein Z is a



group; each R, R^1 and R^2 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; x has a value of 4; and

(2) a polymerizable ethylenically unsaturated monomer or mixture of such monomers; wherein component (A) is present in quantities of from about 10 to about 99, percent by weight (% bw); component (B-1) is present in quantities of from about 0.1 to about 50, % bw; component (B-2) is present in a quantity of from about 1 to about 50, % bw and wherein the amount of the individual components is based upon the combined weight of components (A) and (B); with

(II) a cyanogen halide in the presence of

(III) a stoichiometric quantity of a suitable base; and

wherein components (I) and (II) are present in quantities which provide from about 1 to about 1.2 moles of component (II) per phenolic hydroxyl group present in component (I).

4,629,764

POLYMER MODIFIED POLYPHENOL COMPOSITIONS AND THERMOSETTABLE RESINS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

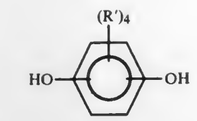
Division of Ser. No. 747,632, Jun. 24, 1985. This application Mar. 24, 1986, Ser. No. 843,523

Int. Cl.[4] C08F *8/00*

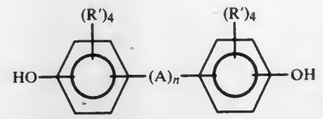
U.S. Cl. 525—132 **15 Claims**

1. A polymer modified epoxy resin composition which results from dehydrohalogenating the reaction product of an excess of epihalohydrin with a composition which comprises

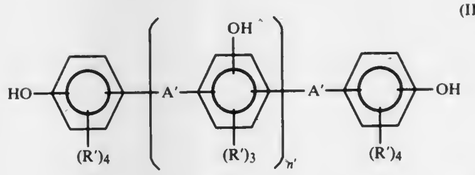
(A) a polyphenol represented by the formulas



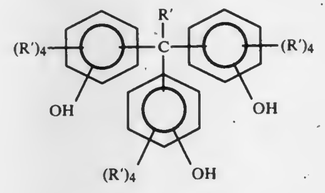
(I)



(II)

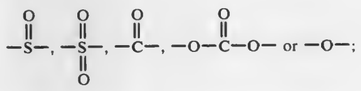


(III)

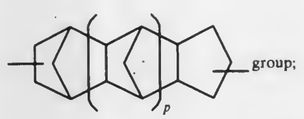


(IV)

wherein each A is independently a divalent hydrocarbon group having from 1 to about 12 carbon atoms, —S—, —S—S—,



each A′ is a divalent hydrocarbon group having from 1 to about 3 carbon atoms or a

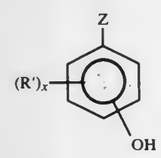


group;

each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; p has a value of from zero to about 10; n has a value of zero or 1 and n′ has a value from about 0.001 to about 6; and

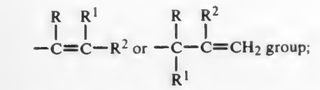
(B) a polymer resulting from copolymerizing

(1) an alkenylphenol or a mixture of alkenylphenols represented by the formula



(V)

wherein Z is a



each R, R^1 and R^2 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each R′ is independently hydrogen, an aliphatic or aromatic hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, chlorine or bromine; x has a value of 4; and

(2) a polymerizable ethylenically unsaturated monomer or mixture of such monomers;

wherein component (A) is present in quantities of from about 10 to about 99 percent by weight (% bw); component (B-1)is present in quantities of from about 0.1 to about 50% bw; component (B-2) is present in a quantity of from about 1 to about 50% bw and wherein the amount of the individual components is based upon the combined weight of components (A) and (B).

4,629,765

METHOD AND COMPOSITION FOR IMPROVED MELT PROCESSABILITY AND IMPACT PROPERTIES OF CHLORINATED POLY(VINYL CHLORIDE)

Dana S. Garcia, North Royalton, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 28, 1985, Ser. No. 770,167

Int. Cl.[4] C08L *27/06, 71/02*

U.S. Cl. 525—187 **10 Claims**

1. A composition of matter consisting essentially of chlorinated poly(vinyl chloride) having a chlorine content of between about 64% and 71% by weight and poly(ethylene oxide), the poly(ethylene oxide) comprising at least 5% by weight of the composition and not exceeding about 20% by weight of the chlorinated poly(vinyl chloride).

4,629,766

PRODUCTION OF HYDROFINED HYDROCARBON RESINS

Alberto Malatesta; Bernard Bossaert, both of Brussels, Belgium, and Jacques Mourand, Notre Dame-de-Gravenchon, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 451,777, Dec. 21, 1982, abandoned. This application Jun. 13, 1985, Ser. No. 744,871

Claims priority, application United Kingdom, Dec. 21, 1981, 8138412

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—222 **6 Claims**

1. A process for the hydrogenation of petroleum resins in which resin is subjected to catalytic hydrogenation using a hydrogenation catalyst comprising sulfided nickel-tungsten on a gamma-alumina support having a fresh catalyst surface area ranging from 120 to 300 m^2/g and containing from 2 to 10% by weight nickel and from 10 to 25% by weight tungsten respectively wherein the hydrogenation is effected at a temperature in the range 250° to 330° C. and at a hydrogen pressure of 150 to 200 atmOspheres.

4,629,767

HYDROGENATION PROCESS AND CATALYST

Yen-Shin Shyr; Rex L. Bobsein, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jul. 12, 1985, Ser. No. 754,387

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—339 **7 Claims**

1. A process for the hydrogenation of olefin polymers which comprises contacting olefin polymer in solution with hydrogen

in a fixed bed of a heterogeneous metal hydrogenation catalyst in which (1) the catalyst particulate support has surface area of about 100–160 m^2/g as measured by the BET/N_2 method (ASTM D 3037) and pore volume as measured by absorption of dibutylphthalate (ASTM D 3493) of about 1.5 to about 2.5 cc/gram (2) the metal is incorporated into the support by impregnation with a non-aqueous solution of a suitable hydrogenation metal or hydrogenation metal compound and, (3) the impregnated catalyst is subsequently reduced and activated by contacting with hydrogen at a temperature in the range of about 150° to about 500° C. to produce a catalyst containing about 2 to about 40 percent by weight metal which is active for hydrogenation of olefin polymers.

4,629,768

THERMALLY STABLE POLYURETHANE ELASTOMERS CONTAINING GLYCOSIDE POLYOLS AND A METHOD OF PRODUCING THEM

Robert C. Hire, Dayville, and John E. Puig, Wallingford, both of Conn., assignors to Olin Corporation, Chesire, Conn.

Filed May 2, 1986, Ser. No. 858,982

Int. Cl.[4] C08G *18/32*

U.S. Cl. 525—458 **13 Claims**

1. A polyurethane elastomer comprising the reaction product of at least one polyisocyanate with at least two polyether polyols, wherein one of said polyether polyols contains at least one glycoside moiety, said elastomer being essentially free of cellular structure.

4,629,769

4,4,6-TRIMETHYLHEXAHYDROPYRIMIDINE AS AN EPOXY CURING AGENT

Harold G. Waddill, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,598

Int. Cl.[4] C08G *59/50*

U.S. Cl. 525—504 **3 Claims**

1. An epoxy resin composition comprising:
(A) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule, and
(B) an effective curing amount of 4,4,6-trimethylhexahydropyrimidine.

4,629,770

THERMOSETTABLE POLYSTYRYLPYRAZINE POLYMERS TERMINATED WITH ETHYLENICALLY UNSATURATED GROUPS AND CURED PRODUCTS THEREFROM

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 23, 1985, Ser. No. 726,555

Int. Cl.[4] C08L *61/34*

U.S. Cl. 525—517 **35 Claims**

1. A thermosettable product which results from reacting at a temperature of from about 50° C. to about 220° C.
(A) a pyrazine compound containing at least two substituent groups which have at least one hydrogen atom attached to a carbon atom which is attached to the ring or mixture of such pyrazines;
(B) at least one material having at least two aldehyde groups; and
(C) at least one of
(1) a nitrogen containing aromatic heterocyclic compound containing at least one hydrogen atom attached to a carbon atom attached to the ring and a polymerizable unsaturated group;
(2) an aldehyde containing at least one polymerizable unsaturated group; or
(3) a combination thereof;
and wherein components (A), (B) and (C) are employed in quantities which provide a molar ratio of components (B):(C):(A) of from about 0.25:0.25:1 to about 4:4:1.

4,629,771

PROCESS FOR POLYMERIZING OLEFINS WITH A SPRAY-DRIED CATALYST

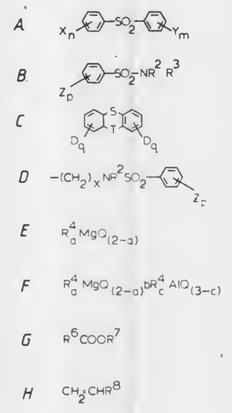
John P. Candlin, Aston; Anthony D. Caunt, Welwyn Garden City; John W. Kelland, Luton, and Peter L. Law, Great Shelford, all of England, assignors to Imperial Chemical Industries, plc, London, England

Division of Ser. No. 242,528, Mar. 11, 1981, Pat. No. 4,424,138. This application Aug. 22, 1983, Ser. No. 525,482

Claims priority, application United Kingdom, Mar. 24, 1980, 8009838; Dec. 18, 1981, 8105020

Int. Cl.[4] C08F *4/64, 10/00*

U.S. Cl. 526—125 **9 Claims**



1. An olefin polymerisation process wherein at least one olefin monomer is contacted, under polymerisation conditions, with a polymerisation catalyst comprising:
(1) a transition metal composition; and
(2) an organic compound of aluminum or of a metal of Group IIA of the Periodic Table or a complex of an organic compound of a metal of Group IA or Group IIA of the Periodic Table with an organic aluminum compound wherein the transition metal composition which is component (1) of the polymerisation catalyst is the product obtained by forming a suspension from an inert liquid medium, particles of at least one solid material and a material which assists in the agglomeration of the solid particles, wherein the solid material is, or contains, a titanium halide selected from the group consisting of titanium trichloride, a solid titanium trichloride containing material and a product of contacting titanium tetrachloride with a support which is silica, alumina, magnesia, a mixture or complex of two or more thereof, or magnesium chloride, and the material which assists in the agglomeration of the solid particles is dissolved in the inert liquid medium, spray-drying the suspension and collecting a spray-dried solid material.

4,629,772

METHOD OF POLYMERIZING VINYL CHLORIDE

Bjerke Odd, Sundsvall, Sweden, assignor to Norsk Hydro A.S., Oslo, Norway

Continuation of Ser. No. 213,247, Dec. 5, 1980, abandoned. This application Mar. 25, 1985, Ser. No. 715,265

Claims priority, application Sweden, Dec. 6, 1979, 7910079

Int. Cl.[4] C08F *2/22*

U.S. Cl. 526—201 **8 Claims**

1. In the polymerization of vinyl chloride or vinyl chloride and up to 20 percent by weight, based on the vinyl chloride, of a copolymerizable monomer, the improvement which comprises providing a stable monomer emulsion during the polymerization by

(a) preparing a pre-emulsion in water of droplets of a substance that is a solvent for vinyl chloride and has a very low water solubility by homogenizing a mixture of water, an emulsifier and said substance,
(b) adding vinyl chloride or vinyl chloride and up to 20 percent by weight, based on the vinyl chloride, of copolymerizable monomer in order to swell said droplets
(c) subjecting the emulsion of monomer-swollen droplets and water to polymerizing conditions in the presence of a free radical forming initiator,
(d) said polymerization being carried out in the presence of 0.03–30% by weight of added polymer latex in order to stabilize said emulsion during the polymerization,
(e) said added polymer latex being added before the conversion has reached 80%, and
(f) said added polymer latex being introduced under such conditions that the pre-emulsion of step (a) has no possibility of swelling the added polymer latex to any substantial extent.

4,629,773

IMIDYLCOMPOUNDS, POLYMERS THEREFROM, AND USE OF THE POLYMERS

Beat Müller, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

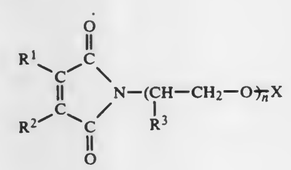
Division of Ser. No. 405,472, Aug. 5, 1982, Pat. No. 4,532,332. This application Apr. 18, 1985, Ser. No. 724,426

Claims priority, application Switzerland, Aug. 17, 1981, 5303/81

Int. Cl.[4] C08F *22/40*

U.S. Cl. 526—262 **8 Claims**

1. A photosensitive, crosslinkable homopolymer, having a molecular weight of 1000 to 1,000,000, as measured by the viscosity of a 0.5% by weight solution in methyl cellosolve at 25° C., prepared by the polymerization of an imidyl compound of formula I



wherein
R^1 and R^2 independently of one another are C_1–C_4-alkyl, or R^1 and R^2 together are tetramethylene,
R^3 is a hydrogen atom or normal C_1–C_4-alkyl,
n is a number from 2 to 30, and
X is —CO—CR^4=CH_2, in which R^4 is a hydrogen atom or methyl.

4,629,774

POST-TREATMENT OF SYNTHETIC FIBER FABRICS

Kazuo Sato; Masahiro Komori, both of Kyoto, and Sumio Goto, Moriyama, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Sep. 3, 1985, Ser. No. 771,758

Claims priority, application Japan, Sep. 10, 1984, 59-189319

Int. Cl.[4] C08G *18/02, 18/48;* D06M *13/42*

U.S. Cl. 527—301 **10 Claims**

1. A composition for use in post-treating synthetic fiber fabrics comprising an aqueous solution or dispersion of a thermally reactive, blocked isocyanate group-containing polysaccharide produced by (a) reacting a C_1–C_4 hydroxyalkylated natural polysaccharide with a polyisocyanate compound to form a urethane polymer having at least one free isocyanate group and then blocking the free isocyanate group with a blocking agent, or (b) by reacting said C_1–C_4 hydroxyalkylated natural polysaccharide with a polyisocyanate compound having at least one blocked isocyanate group blocked with said blocking agent.

4,629,775

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai; Takeo Inoue, and Koji Yokoo, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,164

Claims priority, application Japan, Jul. 24, 1984, 59-153554

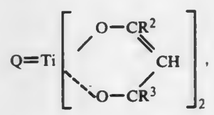
Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—17 **4 Claims**

1. A room temperature-curable organopolysiloxane composition which comprises:
(a) 100 parts by weight of a diorganopolysiloxane having a viscosity in the range from 100 to 1,000,000 centistokes at 25° C. and terminated at both molecular chain ends each with a silanolic hydroxy group;
(b) from 1 to 20 parts by weight of an alkoxysilane or an alkoxy-containing organopolysiloxane having at least three alkoxy groups directly bonded to the silicon atom or atoms in a molecule, the other organic group or groups bonded to the silicon atom or atoms being each a monovalent hydrocarbon group;
(c) from 0.05 to 10 parts by weight of an organosilicon compound having, in a molecule, at least one organosilicon-containing group represented by the general formula

$$(R^1O)_{3-n}(Me)_nSi—C_3H_6—S—CO—NH—,$$

in which Me is a methyl group, R^1 is a methyl or an ethyl group and n is zero or 1; and
(d) from 0.1 to 10 parts by weight of a titanium chelate compound represented by the general formula



in which Q is a divalent organosilicon-containing group, R^2 is an alkyl group having 1 to 3 carbon atoms and R^3 is the same as R^2 or R^2O.

4,629,776

PROCESS FOR THE PREPARATION OF POLYAMIDE FROM OMEGA-AMINONITRILE UTILIZING AN OXYGENATED SULFUR COMPOUND AS CATALYST

Benedict S. Curatolo, Maple Heights; Robert C. Sentman, Macedonia, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 16, 1985, Ser. No. 809,601

Int. Cl.[4] C08G *69/00*

U.S. Cl. 528—313 **16 Claims**

1. A process for the production of a polyamide comprising contacting, at an elevated temperature, at least one omega-aminonitrile, water and a catalytic amount of an oxygen containing sulfur compound.

4,629,777

POLYIMIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

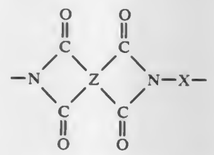
Filed May 10, 1984, Ser. No. 608,755

Claims priority, application Switzerland, May 18, 1983, 2690/83; Oct. 12, 1983, 5571/83

Int. Cl.[4] C08G *69/26*

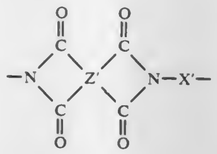
U.S. Cl. 528—353 **29 Claims**

1. A homopolyimide or copolyimide of at least one aromatic tetracarboxylic acid and at least one aromatic diamine, which essentially consists of 5 to 100 mol % of at least one structural element of the formula I



(I)

and 95–0 mol % of at least one structural element of the formula II



(II)

wherein Z is an unsubstituted tetravalent aromatic radical to which in each case two carbonyl groups are bonded in the ortho- or peri-position, X is the divalent radical of an aromatic diamine, Z′ has the same meaning as Z, or is a different tetravalent organic radical to Z, and X′ is the divalent radical of an organic diamine which differs from X, wherein the aromatic radical of X is substituted in the two ortho-positions relative to at least one N atom by alkyl, cycloalkyl, alkoxy, alkoxyalkyl or aralkyl, or wherein two adjacent C atoms of the aromatic radical are substituted by alkylene.

4,629,778

POLY(P-PHENYLENE SULFIDE) FILM AND PROCESS FOR PRODUCTION THEREOF

Toshinori Sugie, Takaishi; Fumihiro Kobata, Izumi, and Takashi Kawamura, Urawa, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

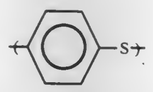
Continuation-in-part of Ser. No. 694,500, Jan. 25, 1985, abandoned, which is a continuation of Ser. No. 495,824, May 18, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,312

Claims priority, application Japan, May 20, 1982, 57-85293; May 25, 1982, 57-87246; May 31, 1982, 57-91382; Jul. 6, 1982, 57-117498

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—388 **24 Claims**

1. A biaxially oriented crystalline poly(p-phenylene sulfide) film wherein said polymer contains at least 90 mole % of recurring units of the formula



and has a melt viscosity of at least 0.12 dl/g and when said film is heat-treated at 270° C. for 10 minutes under relaxation and then stretched at 23° C. at a rate of 200%/min., its tensile strength, stress at 5% stretch and elongation show a percent retention of at least 60%, at least 80%, and 80 to 120%, respectively, based on these properties of the same film which has been stretched under said conditions without the heat-treatment.

4,629,779

LOW VISCOSITY ADDUCTS OF A POLYCAPROLACTONE POLYOL AND A POLYEPOXIDE

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 27, 1983, Ser. No. 546,113

Int. Cl.[4] C08G *59/00, 59/68, 65/04*

U.S. Cl. 528—408 **44 Claims**

1. An adduct of a polycaprolactone polyol and a polyepoxide comprising the reaction product of at least one polycaprolactone polyol and a polyepoxide containing two or more epoxy groups per molecule in a molar ratio of polycaprolactone polyol to polyepoxide of from about 2:1 to about 3:1, said adduct having an extreme content of less than about 0.10 percent and a viscosity of less than about 3700 centistokes at 54.5° C.

21. A process for preparing a low viscosity adduct of a polycaprolactone polyol and a polyepoxide which process comprises reacting at least one polycaprolactone polyol and a polyepoxide containing two or more epoxy groups per molecule in the presence of a sulfonic acid catalyst or derivative thereof at a temperature of from about 80° C. to about 225° C., said polycaprolactone polyol, polyepoxide and sulfonic acid catalyst or derivative thereof being employed in an amount at least sufficient to effect substantially complete reaction of the epoxy groups of the polyepoxide to give an oxirane content of less than about 0 10 percent and in a sufficiently short period of time of less than about 6 hours whereby to minimize the formation of a high viscosity product.

4,629,780

POLYMER LAYER RECOVERY FROM A MULTILAYERED CHIP MATERIAL

James D. Schoenhard, 104 W. Knox St., Morrison, Ill. 61270

Continuation-in-part of Ser. No. 776,256, Sep. 16, 1985, abandoned. This application Nov. 27, 1985, Ser. No. 802,791

Int. Cl.[4] C08J *11/22*

U.S. Cl. 528—488 **31 Claims**

1. A process for recovering polyester from a layered chip material having at least one polyester layer, said process comprising the steps of:

preparing an aqueous solution having, for each liter of water, at least 0.2 pounds of potassium chloride, 0.2 liter of sodium hypochlorite, and 0.2 liter saturated potassium hydroxide;

heating the aqueous solution containing the layered chip material to approximately 80° Centigrade;

contacting the layered chip material with the aqueous solution until the polyester layer begins to separate from the layered chip material;

agitating the aqueous solution containing the layered chip material; and

recovering the polyester layer from the aqueous solution.

4,629,781

CHEMICAL PROCESS FOR PREPARING L 17392 (DEGLUCOTEICOPLANIN) AND ITS SALTS

Paolo Strazzolini, Fiume Veneto; Adriano Malabarba, and Bruno Cavalleri, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

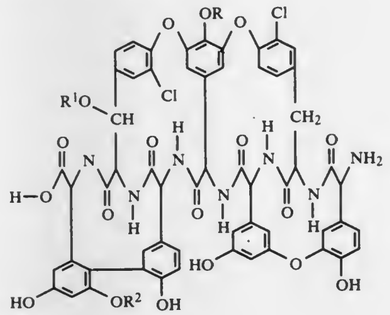
Filed Dec. 11, 1984, Ser. No. 680,435

Claims priority, application United Kingdom, Dec. 16, 1983, 8333624; Jun. 13, 1984, 8415091

Int. Cl.[4] C07K *5/12*

U.S. Cl. 530—317 **19 Claims**

1. A process for transforming a teicoplanin compound or a teicoplanin-like compound into deglucoteicoplanin and its salts with bases and acids characterized in that a substance selected from teicoplanin complex, any further purified preparation thereof, teicoplanin factor A_2, teicoplanin factor A_3, each of the main components of teicoplanin factor A_2, a teicoplanin-like compound of the formula



wherein

R is hydrogen,

R^1 is hydrogen or a N-acetyl-D-glucosamine group,

R^2 is hydrogen or a D-mannose group with the proviso that R, R^1, and R^2 cannot be simultaneously hydrogen, and a mixture of two or more of any of the above substances in any proportion is submitted to controlled strong acid hydrolysis

wherein the controlled strong acid hydrolysis conditions are provided by employing (a) an organic protic solvent selected from aliphatic acids and alpha-halogenated aliphatic acids which at the reaction temperature are liquids, aliphatic and cycloaliphatic alkanols which at the reaction temperature are liquids slightly mixable with water, phenyl substituted lower alkanols wherein the phenyl moiety may optionally carry (C_1-C_4) alkyl, (C_1-C_4) alkoxy or halo groups which ar the reaction temeprature are liquids slightly mixable with water, and betapolyhalogenated lower alkanols, which at the reaction temperature are liquids, (b) a strong acid compatible with the solvent selected from strong mineral acids, strong organic acids and strong acid cation exchanger resins in the hydrogen form, and (c) a reaction temperature between about 20° C. and about 100° C.

4,629,782

CRYSTALLINE FORM OF N-ACETYLMURAMYL-L-α-AMINOBUTYRYL-D-ISO-GLUTAMINE

Tai W. Chan, Palo Alto, and Allyn R. Becker, Half Moon Bay, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 21, 1984, Ser. No. 684,753

Int. Cl.[4] C07K *9/00*

U.S. Cl. 530—322 **2 Claims**

1. Crystalline N-acetylmuramyl-L-α-aminobutyryl-D-iso-glutamine monohydrate.

4,629,783

SYNTHETIC ANTIGEN FOR THE DETECTION OF AIDS-RELATED DISEASE

Wesley L. Cosand, Bothell, Wash., assignor to Genetic Systems Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 728,052, Apr. 29, 1985, abandoned. This application Aug. 19, 1985, Ser. No. 767,303

Int. Cl.[4] C07K *7/10, 17/00*

U.S. Cl. 530—324 **7 Claims**

1. A peptide of the formula:

(I)

Y-Asp-Cys-Lys-Thr-Ile-Leu-Lys-Ala-Leu-Gly-Pro-Ala-Ala-Thr-Leu-Glu-Glu-Met-Met-Thr-Ala-Cys-X,

where X is OH or NH_2, and Y, if present, is an amino acid added to facilitate coupling, N-terminal acetylated I, and I linked to a peptide or protein of at least 5,000 molecular weight, which peptide or protein does not normally bind to antibodies present in a human host.

4,629,784

SYNTHESIS OF CYCLOPROPANE AMINO ACIDS

Charles H. Stammer, Athens, Ga., assignor to The University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation of Ser. No. 523,808, Aug. 16, 1983, abandoned. This application Dec. 5, 1984, Ser. No. 677,901

Int. Cl.[4] C07K *5/08, 5/10, 7/06*

U.S. Cl. 530—328 **29 Claims**

1. A peptide resistant to enzymatic cleavage selected from the group consisting of:

∇Met-Leu-Phe,

Met-∇Leu-Phe,

pGln-His-∇Pro-NH_2,

pGln-∇His-Pro-NH_2,

∇pGln-His-Pro-NH_2,

∇Tyr-Gly-Phe-Leu,

∇Tyr-D-Ala-Gly-Phe-Leu,

∇Tyr-D-Ala-Gly-Phe-Met,

Tyr-Gly-Gly-Phe-∇Leu,

Tyr-D-Ala-Gly-Phe-∇Leu,

∇Tyr-D-Ala-Gly-Phe-∇Leu,

Tyr-Gly-Gly-Phe-∇Met,

Tyr-D-Ala-Gly-Phe-∇Met,

∇Tyr-D-Ala-Gly-Phe-∇Met,

∇Tyr-Gly-Gly-Phe-∇Met,

∇Tyr-Gly-Gly-Phe-∇Leu,

Ile-His-Pro-Phe-∇His-Leu,

Pro-Phe-His-∇Leu-Leu-Val-Tyr,

Pro-Phe-His-Leu-∇Leu-Val-Tyr,

Asp-Arg-Val-Tyr-Ile-∇His-Pro-Phe,

Asp-Arg-Val-∇Tyr-Ile-His-Pro-Phe,

Asp-Arg-∇Val-Tyr-Ile-His-Pro-Phe,

Asp-∇Arg-Val-Tyr-Ile-His-Pro-Phe,

∇Asp-Arg-Val-Tyr-Ile-His-Pro-Phe,

Asp-Arg-Val-∇Tyr-Ile-∇His-Pro-Phe,

Sar-Arg-Val-∇Tyr-Ile-His-Pro-Phe,

Sar-Arg-Val-Tyr-Ile-∇His-Pro-Phe, and

Sar-Arg-Val-∇Tyr-Ile-∇His-Pro-Phe.

4,629,785

EXTRACTION OF NUTRITIOUS MATERIALS FROM ACIDIC SLUDGE WASTE SOLIDS BY ADSORPTION

Thomas F. McCaffery, III, 412 Milford Dr., Broomall, Pa. 19008

Continuation of Ser. No. 540,993, Oct. 11, 1983, which is a continuation of Ser. No. 165,084, Jul. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 887,871, Mar. 20, 1978, abandoned, which is a continuation of Ser. No. 672,349, Mar. 31, 1976, abandoned. This application Apr. 4, 1985, Ser. No. 719,637

Int. Cl.[4] C07K *3/18*

U.S. Cl. 530—415 **20 Claims**

1. A process for extracting nutritious material from waste

sludge having a water phase and comprising finely divided solids in said water phase, said solids including microorganisms which are a source of proteinaceous material, said process comprising treating said microorganism to effect the release of said proteinaceous material into the water phase of said sludge, subjecting said sludge containing said proteinaceous material in said water phase to a resinous adsorbent material in an uncharged state, extracting said proteinaceous material from said water phase by adsorbing and maintaining it on said adsorbant material irrespective of any charge possessed by the proteinaceous material, said adsorption being effected in the absence of transfer of mass from said absorbent material to said water phase, and separating said proteinaceous material from said absorbent material, said separation being effected in the absence of transfer of mass from said water phase to said absorbent material, and wherein the sludge which is subjected to said absorbent material is acidic.

4,629,786

C-20- AND C-23 MODIFIED MACROLIDE DERIVATIVES

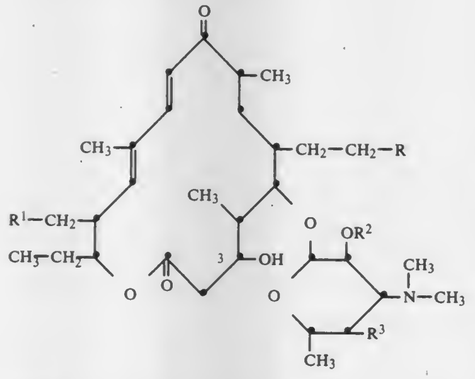
Manuel Debono, and Herbert A. Kirst, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 470,833, Feb. 28, 1983, abandoned. This application May 25, 1984, Ser. No. 614,343

Int. Cl.[4] C07H *17/08*

U.S. Cl. 536—7.1 **23 Claims**

1. A compound of the formula

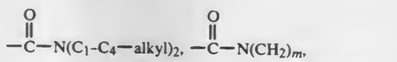


wherein

R is a saturated or unsaturated secondary amino group of the formula



in which the nitrogen atom is part of an otherwise carbocyclic ring system selected from a monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein one or more of the carbon atoms may be substituted by C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 alkoxy, C_1–C_4 alkoxycarbonyl, hydroxyl, C_1–C_4 alkanoyloxy, halo, halo-C_1–C_4 alkyl, $—N(C_1—C_4—alkyl)_2$, $—N(CH_2)_m$,



cyano, ethylenedioxy, benzyl, phenyl, or phenyl substituted by from 1 to 3 substituents selected from nitro, halo, C_1–C_4-alkyl, C_1–C_4 alkoxy, hydroxy, amino, or mono- or di-(C_1–C_4 alkyl)amino; and

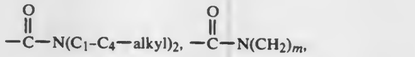
m is an integer from 4 through 7;

R^1 is

(i) —OAr, —O—tetrahydrofuranyl, —O—tetrahydropyranyl, $—SR^5$, azido, $—NR^6R^7$, or N-phthalimido;

(ii) a saturated or unsaturated secondary amino group of the formula

in which the nitrogen atom is part of an otherwise carbocyclic ring system selected from a monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein one or more of the carbon atoms may be substituted by C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 alkoxy, C_1–C_4 alkoxycarbonyl, hydroxyl, C_1–C_4 alkanoyloxy, halo, halo-C_1–C_4 alkyl, $—N(C_1—C_4—alkyl)_2$, $—N(CH_2)_m$,

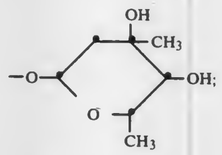


cyano, ethylenedioxy, benzyl, phenyl, or phenyl substituted by from 1 to 3 substituents selected from nitro, halo, C_1–C_4-alkyl, C_1–C_4 alkoxy, hydroxy, amino, or mono- or di-(C_1–C_4 alkyl) amino; or

(iii) a monocyclic saturated or unsaturated nitrogen-containing heterocyclic ring bonded through the nitrogen atom, said ring having (1) from 5 to 7 ring atoms which include up to 3 additional hetero-atoms selected from nitrogen, oxygen and sulfur, and (2) up to 3 substituent groups selected from methyl, ethyl and phenyl;

R^2 is hydrogen; C_1–C_5-alkanoyl which may have from one to three halo substituents; or benzoyl, phenylacetyl or phenylpropionyl which may have from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl substituents;

R^3 is hydrogen; hydroxy; C_1–C_5-alkanoyloxy which may have from one to three halo substituents; benzoyloxy, phenylacetoxy or phenylpropionyloxy which may have from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl substituents; or



(mycarosyloxy)

Ar is

(i) phenyl, phenyl having from one to five halo, methoxyl or C_1–C_4-alkyl or from one to two nitro, amino, methylamino, ethylamino, dimethylamino, diethylamino, C_4–C_{10}-methyleneamino, azido, hydroxy, hydroxymethyl, aminomethyl, (methylamino)methyl, (ethylamino)methyl, (dimethylamino)methyl, (diethylamino)methyl, (C_4–C_{10}-methyleneamino)methyl, formyl, acetyl, benzoyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, N-methylcarboxamido, N,N-dimethylcarboxamido, cyano, phenyl, phenoxy or benzyl substituents, or naphthyl;

(ii) a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, indolyl, isoquinolinyl, quinolinyl, quinazolinyl, cinnolinyl, quinoxalinyl, phthalazinyl benzotriazolyl, benzoxazolyl, benzimidazolyl, carbazolyl, or acridinyl which may have a C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy (or the keto tautomer) or phenyl substituent;

(iii) C_1–C_5-alkanoyl which may have from one to three halo substituents; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl, phenylsulfonyl or phenylthioacetyl which may have from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl substituents; methanesulfonyl; or trifluoromethanesulfonyl;

R^5 is C_1–C_4-alkyl which may have one or more fluoro or chloro substituents; cyclohexyl; phenyl, benzyl or phenethyl which may have from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl substituents; or a heteroaryl group selected from imidazolyl, pyrazolyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazinyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, oxadiazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thienyl and furanyl which may have a C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy (or the keto tautomer) or phenyl substituent;

R^6 is hydrogen, C_1–C_6-alkyl which may have one or more fluoro or chloro substituents, phenyl, benzyl, phenethyl or C_3–C_8-cycloalkyl; and

R^7 is an R^6 group or C_1–C_5-alkanoyl which may have from one to three halo substituents; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl which may have from one to five halo or methyl of from one to two methoxy, nitro or hydroxyl substituents; or alkoxycarbonyl; one to two methoxy, nitro or hydroxyl substituents; or alkoxycarbonyl;

provided that (1) when R^1 is $—NHR^6$, R^2 must be hydrogen, R^3 must be hydrogen, hydroxy or mycarosyloxy, and Ar cannot be a type (iii) substituent; and (2) when R^2 is hydrogen, R^3 must be hydrogen, hydroxy or mycarosyloxy; and the acid addition salts thereof.

4,629,787

SUBSTITUTED CAPROLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

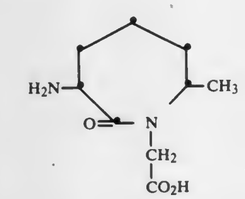
Elbert E. Harris; Arthur A. Patchett, both of Westfield, and Eugene D. Thorsett, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 282,580, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 179,305, Aug. 18, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,749

Int. Cl.[4] C07D *223/10;* **A61K** *31/55*

U.S. Cl. 540—528 **3 Claims**

1. The compound:



and the lower alkyl and benzyl esters thereof.

4,629,788

TRIPHENDIOXAZINE REACTIVE DYESTUFFS

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

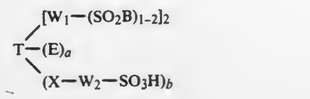
Filed Sep. 20, 1984, Ser. No. 652,784

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336844; Dec. 7, 1983, 3344253; Feb. 11, 1984, 3404855

Int. Cl.[4] C09B *19/00, 19/02*

U.S. Cl. 544—76 **10 Claims**

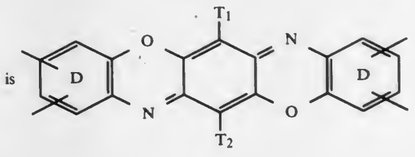
1. A triphendioxazine dyestuff of the formula (I)



(1)

wherein

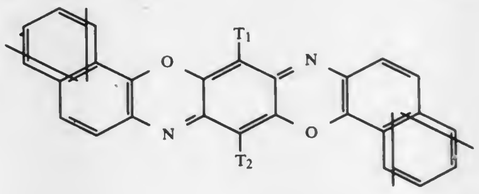
T is



(1a)

or

T is



(1b)

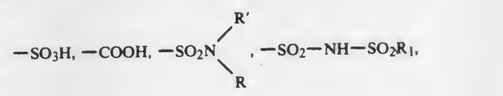
wherein

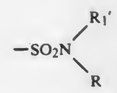
T=(1a) or (1b) and wherein the benzene rings D and the naphthalene rings in T may be further substituted by Cl, Br, CH_3, C_2H_5, OCH_3, OC_2H_5 or COOH and wherein T_1 and T_2 are each: H, Cl, Br, F, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, phenyl substituted by Cl, CH_3, C_2H_5, OCH_3 or OC_2H_5 or phenoxy or phenoxy substituted by Cl, CH_3, C_2H_5, OCH_3 or OC_2H_5,

B=—CH=CH_2 or $—CH_2CH_2—Z$

Z=OSO_3H, Cl, $S_2O_3H_2$, $OCOCH_3$, OPO_3H_2, $N^{(+)}(CH_3)_3$

E=





wherein

R′=

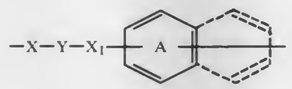


R=H, C_1–C_4-alkyl, C_1–C_4-alkyl substituted with OH, OCH_3, COOH or SO_3H

R_1=CH_3, C_6H_5,

R_1′=phenyl, sulfophenyl, disulfophenyl

W_1=direct bond or bridge member which is free of heterocyclic groups and is bonded to an aromatically carbocyclic C-atom in T, SO_2B being bonded to a C-atom in W_1 or if W_1 is a direct bond to an aromatically carbocyclic C-atom in T,
X=O, NR or S, wherein R is defined as above,
W_2=aliphatic, araliphatic or aromatically carbocyclic bridge member
a=0–2
b=0–2 wherein $a+b=0$ or 2, wherein if $a+b=0$,
W_1 has at least one anionic group conferring watersolubility or two SO_2B-groups are bonded to W_1,
and wherein if E is SO_3H and a=2, W_1 represents W_3=



with
Y=direct bond or C_1–C_6-alkylene which is optionally substituted and/or optionally interrupted by heteroatoms;
X as defined above;
X_1=direct bond, O or NR and R as defined above and wherein the benzene or naphthalene nuclei A can be substituted by Cl, Br, CH_3, C_2H_5, OCH_3, OC_2H_5, COOH, SO_3H, SO_2NH or SO_2NHCH_3, or
W_3=—X—Y_1=with
Y_1=C_2–C_6-alkylene, optionally interrupted by heteroatoms and X as defined above.

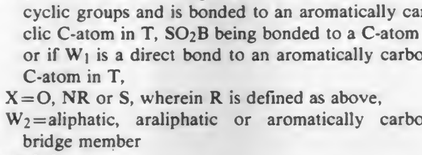
4,629,789

ALKYL SUBSTITUTED PYRIDAZINONES AND PHARMACEUTICAL COMPOSITIONS

James Gainer, Worsley, England, and Richard Göschke, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 22, 1985, Ser. No. 789,995
Claims priority, application United Kingdom, Oct. 23, 1984, 8426804
Int. Cl.[4] C07D *413/10*
U.S. Cl. 544—114 **5 Claims**

1. Pyridazinones of the general formula I



I

in which R_1 is cyano, and R_2 is C_1–C_4 alkyl; the tautomeric forms and salts thereof, as their racemic mixtures or as the individual optically-active forms.

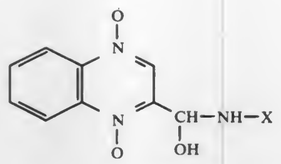
4,629,790

QUINOXALINE ADDUCTS USEFUL AS ANTHELMINTICS

Vernon V. Young, and David R. Bright, both of Terre Haute, Ind., assignors to ANGUS Chemical Company, Northbrook, Ill.

Continuation of Ser. No. 329,446, Dec. 10, 1981, abandoned, which is a division of Ser. No. 176,168, Aug. 7, 1980, Pat. No. 4,348,389. This application Mar. 25, 1985, Ser. No. 716,506
Int. Cl.[4] C07D *417/12, 403/12, 241/52*
U.S. Cl. 544—226 **6 Claims**

1. A compound of the formula



wherein X is 2-nitrophenyl, 4-arsonophenyl, 4-sulfamylphenyl, 4-(2-thiazolylaminosulfonyl)phenyl, or 4-(4,6-dimethyl-2-pyrimidinylaminosulfonyl)phenyl.

4,629,791

NOVEL 3-HALO-2-HYDROXYALKYL CARBAMATES

Joseph W. Hanafin, Framingham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1984, Ser. No. 639,174
Int. Cl.[4] C07C *125/06*
U.S. Cl. 544—387 **17 Claims**

1. A compound which comprises one or more 3-halo-2-hydroxyalkyl carbamate moieties wherein the carbamate nitrogen is tertiary.

4,629,792

CHROMATOGRAPHIC SEPARATION OF TROPICAMIDE O-β-D-GLUCURONIDE DIASTEREOMERS

Walter C. Herlihy, Cambridge, and Thomas H. Fraser, Newtonville, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Division of Ser. No. 575,521, Jan. 31, 1984, Pat. No. 4,588,686, which is a division of Ser. No. 381,528, May 24, 1982, Pat. No. 4,443,608. This application Sep. 9, 1985, Ser. No. 773,714
Int. Cl.[4] C07H *15/26;* **B01D** *15/08*
U.S. Cl. 546—268 **2 Claims**

1. A process for separating ammonium (+)-tropicamide O-β-d-glucuronic acid from ammonium (+),(−)-tropicamide O-β-D-glucuronic acid which comprises subjecting ammonium (+),(−)-tropicamide O-β-D-glucuronic acid to reversed phase liquid chromatography, and isolating ammonium (+)-tropicamide O-β-D-glucuronic acid free of ammonium (−)-tropicamide O-β-D-glucuronic acid.

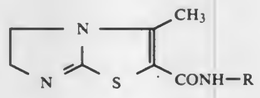
4,629,793

2,3-DI-SUBSTITUTED-5,6-DIHYDROIMIDAZO [2,1-B] THIAZOLE, ITS SALTS, PRODUCTION THEREOF AND ANTI-INFLAMMATORY AGENT CONTAINING THE SAME

Kazuo Nishio, Saitama; Isao Chiyomaru, Shizuoka; Katsuo Anma, Saitama; Kazuko Yamamoto, Shizuoka; Hiroshi Ohno, Shizuoka, and Noriyasu Takayanagi, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka and Kumiai Chemical Industry Co., Ltd., Tokyo, both of, Japan

Division of Ser. No. 600,011, Apr. 13, 1984, Pat. No. 4,556,669, which is a continuation of Ser. No. 367,600, Apr. 12, 1982, abandoned. This application Jun. 5, 1985, Ser. No. 741,616
Claims priority, application Japan, Apr. 10, 1981, 56-54166
Int. Cl.[4] C07D *513/14*
U.S. Cl. 548—154 **15 Claims**

1. A compound of the formula



wherein R is chloro tolyl, dichlorophenyl, ethoxyphenyl,

methoxychlorophenyl, trichlorophenyl or dimethoxychlorophenyl, or a pharmaceutically acceptable salt thereof.

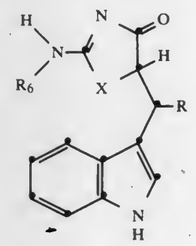
4,629,794

ANTIBACTERIAL 2-AMINO-OXAZOLINONES AND PROCESS THEREFOR

John P. Dirlam, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

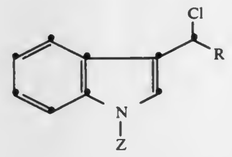
Division of Ser. No. 697,818, Feb. 4, 1985, Pat. No. 4,584,385, which is a continuation-in-part of Ser. No. 592,328, Mar. 22, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 824,391
Int. Cl.[4] C07D *263/08;* **A61K** *31/42*
U.S. Cl. 548—225 **4 Claims**

1. A process for the production of a compound of the formula:



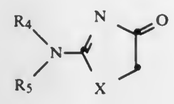
II

which comprises:
(a) contacting a compound of the formula:



III

with at least 2 equivalents of an anion derived from a compound of the formula:



IV

wherein
X is O, S or CH_2;
R is hydrogen or methyl
R_4 and R_5 are alkyl having from about 1–4 carbon atoms;
Z is CO_2CH_2Ph or $CO_2C(CH_3)_3$; and Ph is phenyl; and
(b) further contacting the resulting intermediate with an amine of the formula R_6NH_2
wherein
R_6 is alkyl having from 1–4 carbon atoms; C_3–C_6 cycloalkyl or mono-substituted alkyl having from about 2–4 carbon atoms wherein said substituent is selected halogen, hydroxy, lower alkoxy, lower thioalkyl, or alkenyl or alkyl of 2–4 carbon atom side-chain.

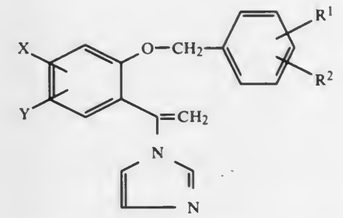
4,629,795

PROCESS FOR PREPARING IMIDAZOLE DERIVATIVES

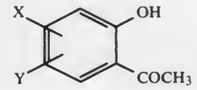
Yoshinori Hamada, Hyogo; Shoji Shinomoto, Osaka; Isamu Yamada, Osaka, and Haruo Koike, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 2, 1985, Ser. No. 729,869
Claims priority, application Japan, May 25, 1984, 59-107237; May 25, 1984, 59-107238
Int. Cl.[4] C07D *233/54*
U.S. Cl. 548—341 **6 Claims**

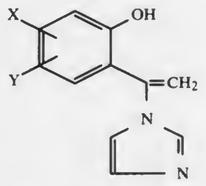
1. A process for preparing a compound of the formula:



wherein R^1 is halogen and R^2, X, and Y are each hydrogen or halogen,
which comprises reacting a compound of the formula:



wherein X and Y each have the same meaning as defined above, with a 1-halosulfinyl-1H-imidazole in the presence of a base, and heating and/or treating with an acid the resulting mixture to give a compound of the formula:



wherein X and Y each have the same meaning as defined above and then reacting the latter with mono- or di-(halo-substituted)benzyl halogenide in a solvent containing dimethylsulfoxide in the presence of an alkali metal hydroxide.

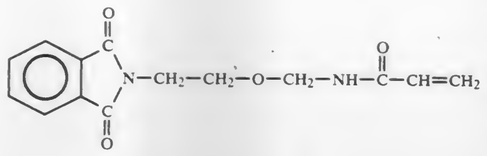
4,629,796

N-[[2-(1,3-DIHYDRO-1,3-DIOXO-2H-ISOINDOL-Z-YL)ETHOXY]METHYL]-Z-PROPENAMIDE

Richard A. Markle, Columbus, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 459,778, Jan. 21, 1983, Pat. No. 4,536,582. This application May 29, 1985, Ser. No. 738,740
Int. Cl.[4] C07D *209/48*
U.S. Cl. 548—477 **1 Claim**

1. A monomer having the following general formula:



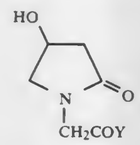
4,629,797

PROCESS FOR THE PREPARATION OF PYRROLIDONE DERIVATIVES

Mario Pinza, and Ugo C. Pfeiffer, both of Milan, Italy, assignors to I.S.F. Societa per Azioni, Milan, Italy

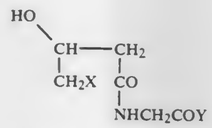
Filed Mar. 29, 1985, Ser. No. 718,242
Claims priority, application Italy, Apr. 2, 1984, 20358 A/84
Int. Cl.[4] C07D *207/273*
U.S. Cl. 548—544 8 Claims

1. A process for preparing a compound of structure (1):



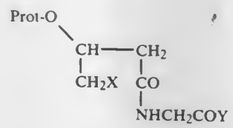
(1)

in which Y is NR^1R^2 or OR where R^1 and R^2, which can be the same or different, are hydrogen or $C_{1\text{-}3}$ alkyl and R is $C_{1\text{-}3}$ alkyl, which comprises protecting the hydroxy group of a compound of structure (2):



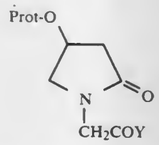
(2)

wherein X is chloro or bromo and Y is as defined above with a protecting group which is stable under basic conditions and removeable under acidic conditions, to give a compound of structure (3)



(3)

in which Prot is a hydroxy-protecting group which is stable under basic conditions and removeable under acidic conditions, cyclising the compound of structure (3) in the presence of a strong non-nucleophilic base formed from an alkali metal to give a compound of structure (4)



(4)

in which Prot is a hydroxy-protecting group which is stable under basic conditions and removeable under acidic conditions and Y is $-NR^1R^2$ or OR, removing the group Prot under acidic conditions, and optionally reacting the product in which Y is OR with an amine of formula HNR^1R^2.

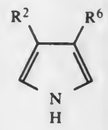
4,629,798

ELECTRICALLY CONDUCTIVE PYRROLE POLYMERS AND PROCESS OF PREPARING THE SAME

Lee Traynor, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 486,161, Apr. 18, 1983. This application Aug. 19, 1985, Ser. No. 767,209
Int. Cl.[4] C07D *207/30, 401/12*
U.S. Cl. 548—562 6 Claims

1. A substituted pyrrole having the structure



wherein,

R^2 is selected from the group consisting of hydroxyphenyl, and an acyclic ether selected from the group consisting of (i) polyalkoxy represented by the structure CH_3—$(OCH_2CH_2)_{n'}$- wherein n' is an integer in the range from 1 to 20; and (ii) R^4—O—R^5 wherein R^4 is a linking group selected from phenylene, benzylene, alkylene having from 1 to about 24 carbon atoms, and cycloalkylene having from 3 to 7 ring carbon atoms; and

R^5 is selected from the group consisting of phenyl, benzyl, alkyl having from 1 to about 24 carbon atoms, and cycloalkyl having from 3 to 7 ring carbon atoms; and,

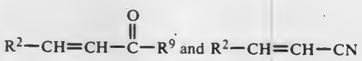
R^6 is selected from the group consisting of (i) carboxylate, namely,

wherein R^7 represents alkyl having from 1 to about 24 carbon atoms; (ii) nitrile, namely, —CN; and, (iii) acyl, namely,



wherein R^8 represents alkyl having from 1 to about 24 carbon atoms, phenyl or polyalkoxy having from 4 to about 40 carbon atoms.

6. A method for preparing an ether-substituted pyrrole comprising reacting a non-Michael acceptor selected from the group consisting of esters, ketones and nitriles having the structures:



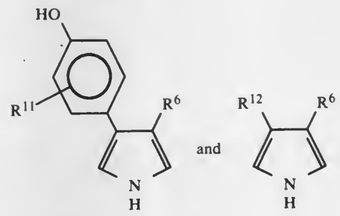
(IV)

wherein,

R^9 is selected from the group consisting of alkyl having from 1 to about 24 carbon atoms, alkoxy having from 2 to about 24 carbon atoms, phenyl or benzyl each of which optionally may be substituted, cycloalkyl having from 3 to about 7 carbon atoms, and heteroaryl which may be substituted; and,

R^2 is selected from the group consisting of hydroxyphenyl which may be ring-substituted, and, an acyclic ether selected from the group consisting of (i) alkoxy represented by $—OR^3$, wherein R^3 represents alkyl having from 1 to about 12 carbon atoms, alkoxyalkyl having from 2 to about 24 carbon atoms, phenyl which may be substituted,

benzyl or substituted benzyl, heteroaryl or substituted heteroaryl; (ii) polyalkoxy represented by the structure CH_3-$(OCH_2CH_2)_{n'}$ wherein n' is an integer in the range from 1 to about 20; and (iii) R^4—O—R^5 wherein either R^4 or R^5 is a linking group selected from phenyl and benzyl, each of which may be substituted, alkyl having from 1 to about 24 carbon atoms, and cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted; with, tosylmethylisocyanide, optionally in the presence of a solvent, at a temperature and pressure sufficient to form a hydroxyphenyl-substituted or an ether-substituted pyrrole directly without substituting the pyrrole ring in the 2- and 5-positions, said hydroxyphenyl-substituted and ether-substituted pyrroles having the structures:



wherein,

R^6 is selected from the group consisting of (i) carboxylate,

wherein R^7 represents alkyl having from 1 to about 24 carbon atoms; (ii) nitrile, —CN; and, (iii) acyl,



wherein R^8 represents alkyl having from 1 to about 24 carbon atoms, phenyl or polyalkoxy having from 4 to about 40 carbon atoms;

R^{11} is a ring-substituent selected from the group consisting of lower alkyl having from 1 to about 6 carbon atoms, chlorine and bromine;

R^{12} is selected from an acyclic ether selected from the group consisting of (i) alkoxy represented by $—OR^3$, wherein R^3 represents alkyl having from 1 to about 12 carbon atoms, alkoxyalkyl having from 2 to about 24 carbon atoms, phenyl which may be substituted, benzyl or substituted benzyl, heteroaryl or substituted heteroaryl; (ii) polyalkoxy represented by the structure CH_3-$(OCH_2CH_2)_{n'}$ wherein n' is an integer in the range from 1 to about 20; and (iii) R^4—O—R^5 wherein either R^4 or R^5 is a linking group selected from phenyl and benzyl, each of which may be substituted, alkyl having from 1 to about 24 carbon atoms, and cycloalkyl having from 3 to about 7 ring carbon atoms one or more of which may be substituted; and,

R^7 or R^8 may, in addition, be hydroxyphenyl having a R^{11} ring substituent.

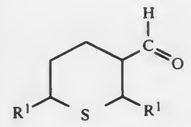
4,629,799

PREPARATION OF 3-FORMYLTETRAHYDROTHIOPYRANS

Norbert Goetz, Worms; Dieter Jahn, Edingen-Neckarhausen; Gernot Reissenweber, Boehl-Iggelheim, and Heinz Eckhardt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

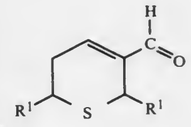
Filed Sep. 10, 1984, Ser. No. 648,877
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333678
Int. Cl.[4] C07D *335/02*
U.S. Cl. 549—13 20 Claims

1. A process for the preparation of a 3-formyltetrahydrothiopyran of the formula



I

where the individual radicals R^1 are each hydrogen or an aliphatic radical, which comprises: hydrogenating a 3-formyl-5,6-dihydro-2H-thiopyran of the formula



II

where R^1 has the above meanings, in the presence of a catalyst containing nickel, cobalt, platinum, copper and/or silver.

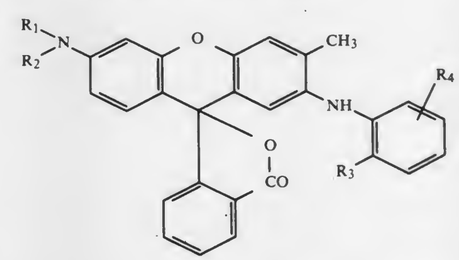
4,629,800

FLUORAN COMPOUNDS

Naoki Yonese, Nishinomiya; Masayuki Omatsu, Yao, and Mitsuru Kondo, Kawabe, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 706,885
Claims priority, application Japan, Mar. 9, 1984, 59-45797; Mar. 10, 1984, 59-46353; Mar. 12, 1984, 59-47951
Int. Cl.[4] C07D *407/04*
U.S. Cl. 549—226 2 Claims

1. A fluoran compound of the formula:



wherein R_1 is propyl or butyl, R_2 is an alkyl of from one to four carbon atoms, R_3 is methyl or ethyl, and R_4 is hydrogen or methyl.

4,629,801

PREPARATION OF HYDROGENOSILANES

Gerard Soula, Meyzieu, and Jean-Luc Lepage, Sainte Foy Les Lyon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Feb. 4, 1986, Ser. No. 825,818
Claims priority, application France, Feb. 4, 1985, 85 01486
Int. Cl.⁴ C07F *7/08*
U.S. Cl. 556—466 **15 Claims**

1. A process for the preparation of a hydrogenosilane, comprising reducing a halogenosilane with an alkali or alkaline earth metal hydride in the presence of a catalytically effective amount of a sequestering agent having the general formula:

$$N\{CHR_1-CHR_2-O\{CHR_3-CHR_4-O\}_nR_5\}_3 \quad (I)$$

wherein n ranges from 0 to 10, R_1, R_2, R_3 and R_4, which may be identical or different, are each hydrogen or an alkyl radical having from 1 to 4 carbon atoms, and R_5 is an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a $-C_mH_{2m}-\phi$ or $C_mH_{2m+1}-\phi-$ radical, wherein m ranges from 1 to 12 and ϕ is phenyl.

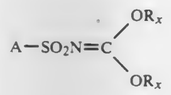
4,629,802

SULFONYL CARBONOIMIDATES

Haukur Kristinsson, Bottmingen, and Werner Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

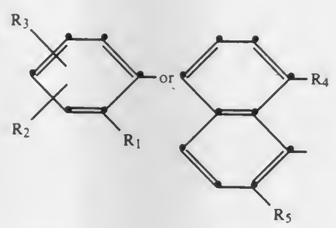
Division of Ser. No. 542,312, Oct. 14, 1983, Pat. No. 4,521,597. This application Mar. 1, 1985, Ser. No. 707,358
Claims priority, application Switzerland, Oct. 25, 1982, 6202/82
Int. Cl.⁴ C07C *119/20*
U.S. Cl. 558—7 **5 Claims**

1. A sulfonylimido carbonic acid diester of the formula



in which

A is a radical of the formula



R_1 is halogen, nitro, trifluoromethyl, C_1-C_5-alkoxy, $-COR_7$, $-S(O)_m-C_1$-C_5-alkyl, or XR_{11}
R_2 is hydrogen,
R_3 is hydrogen,
R_4 is hydrogen, halogen, nitro, C_1-C_5-alkyl or methoxy,
R_5 is hydrogen, fluorine, chlorine, bromine, nitro, C_1-C_5-alkyl or C_1-C_5-alkoxy,
R_7 is hydrogen, C_1-C_5-alkyl or $-NR_8R_9$,
R_8 is hydrogen, C_1-C_5-alkyl or C_3-C_5-alkenyl,
R_9 is hydrogen, C_1-C_5-alkyl or C_3-C_5-alkenyl,
R_{11} is C_1-C_5-alkyl which is substituted by halogen, C_1-C_5-alkoxy, or it is C_2-C_5-alkenyl which is unsubstituted or substituted by one of the above radicals,
Rx is C_1-C_5-alkyl,
X is oxygen or $-S(O)_m-$ and
m is zero, one or two.

4,629,803

CONTINUOUS PHOSPHORYLATION PROCESS

Tawny R. Hall, and Harry M. Smith, both of St. Albans, W. Va., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 467,008, Feb. 16, 1983, abandoned. This application Jul. 12, 1984, Ser. No. 630,143
Int. Cl.⁴ C07F *9/09*
U.S. Cl. 558—92 **4 Claims**

1. A continuous process for producing aliphatic phosphates in a non-oxidizing atmosphere characterized by:
a. continuously introducing a 20 to 30 weight percent solution of an alkali metal alkoxide into a reactor at a rate of 2 to 30 gallons per minute;
b. continuously introducing phosphorus oxychloride into the reaction zone under ratio control;
c. reacting the alkali metal alkoxide with the phosphorus oxychloride while maintaining the reaction mixture at 40° C. to 60° C.;
d. continuously controlling the reaction yield;
e. continuously removing reaction products from the reactor; and
f. washing the crude phosphate reaction product with water to stop the reaction and remove sodium chloride.

4,629,804

PROCESS FOR PREPARATION OF URETHANES

John H. Grate; David R. Hamm, both of Mountain View, Calif., and Donald H. Valentine, Jr., Ridgefield, Conn., assignors to Catalytica Associates, Mountain View, Calif.

Continuation-in-part of Ser. No. 532,784, Sep. 16, 1983, Pat. No. 4,600,793, and a continuation-in-part of Ser. No. 532,785, Sep. 16, 1983, Pat. No. 4,603,216. This application Mar. 4, 1985, Ser. No. 707,885
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.⁴ C07C *125/065, 125/073, 125/077*
U.S. Cl. 560—24 **26 Claims**

1. A process for converting a nitrogen-containing organic compound, selected from the group consisting of nitro, nitroso, azo, and azoxy compounds, into the corresponding urethane, by reacting a solution comprising said nitrogen-containing organic compound and methanol with carbon monoxide, which comprises contacting said solution with carbon monoxide, in the presence of a catalyst comprising ruthenium at conditions sufficient to convert said nitrogen-containing organic compound into the said corresponding urethane.

12. A process for converting a nitro-containing organic compound into the corresponding urethane, by reacting a solution comprising said nitro-containing organic compound and methanol with carbon monoxide, which comprises the steps of:
(a) providing a primary amine in said solution,
(b) contacting the solution of step (a) with carbon monoxide, in the presence of a catalyst comprising ruthenium at conditions sufficient to convert said nitrogen-containing organic compound into the said corresponding urethane.

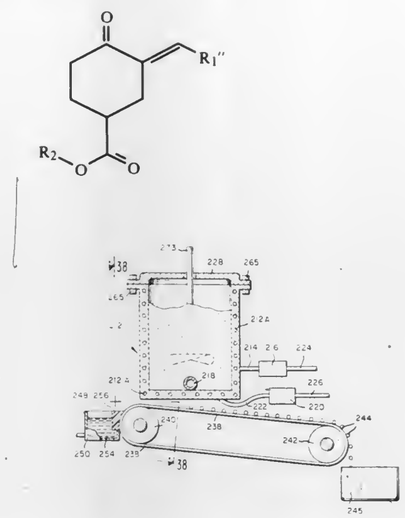
4,629,805

ALKYL SUBSTITUTED AND UNSUBSTITUTED PARA-CARBOALKOXY CYCLOHEXANONES AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; Wilhelmus J. Wiegers, Red Bank; Robert P. Belko, Woodbridge, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 563,801, Dec. 21, 1983, Pat. No. 4,537,704. This application Apr. 23, 1985, Ser. No. 726,603
Int. Cl.⁴ C07C *69/757*; C11B *9/00*
U.S. Cl. 560—126 **7 Claims**

1. A substituted cyclohexanone carboxylic acid ester defined according to the structure:



wherein R_2 is selected from the group consisting of methyl and ethyl;
wherein R_1'' represents C_3-C_6 alkyl.

4,629,806

VAPOR STATE FORMATION OF DIESTERS OF OXALIC ACID

Thomas C. Cleveland, Dunbar; James E. Deitzler, South Charleston; Arthur R. Doumaux, Jr., Charleston; Joseph P. Henry, South Charleston; John M. Hurt, St. Albans; Louis A. Kapicak, and Bernard C. Ream, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 227,793, Jan. 23, 1981, abandoned. This application Mar. 12, 1981, Ser. No. 239,763
Int. Cl.⁴ C07C *67/36*
U.S. Cl. 560—204 **26 Claims**

1. A vapor state process for the preparation of diesters of oxalic acid which comprises:
(a) contacting a nitrogen oxide and a saturated monohydric aliphatic alcohol containing 1 to about 8 carbon atoms in the vapor state in a nitrite forming reaction zone at a temperature between about 10° C. and about 300° C., for a sufficient time to form an ester of nitrous acid; and
(b) maintaining the ester of nitrous acid in the vapor state and contacting said ester of nitrous acid, free of deleterious amounts of water, with carbon monoxide in the vapor state in an oxalate forming reaction zone at a temperature of between about 50° C. and about 200° C., over a supported palladium catalyst containing metallic palladium or a salt thereof for a period of time sufficient to produce the diester of oxalic acid and recovering the diester of oxalic acid from the oxalate forming reaction zone.

4,629,807

SELECTIVE SYNTHESIS OF ALIPHATIC DICARBOXYLIC ACID ESTERS USING PALLADIUM-PHOSPHINE OR PALLADIUM-ARSINE CATALYSTS

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 6, 1986, Ser. No. 826,642
Int. Cl.⁴ C07C *67/38, 51/14*
U.S. Cl. 560—204 **19 Claims**

1. A process for producing aliphatic dicarboxylic acids and esters by reacting nonconjugated, alpha, omega-aliphatic dienes ranging in carbon content from C_5 to C_{13} and carbon monoxide in the presence of a palladium-phosphine or a palladium-arsine catalyst at a pressure of at least 50 psig and a temperature of 25° C. to 200° C.

3. The process of claim 1 wherein the products of said reaction are dicarboxylic acid esters and the process is conducted in the presence of a monohydric alcohol coreactant.

4,629,808

PROCESS FOR HYDROLYZING NITRILES

K. Pushpananda A. Senaratne, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 20, 1985, Ser. No. 746,768
Int. Cl.⁴ C07C *63/34*
U.S. Cl. 562—467 **10 Claims**

1. A process which comprises reacting a 6-alkoxy-5-trifluoromethyl-1-cyanonaphthalene with an aqueous alcoholic base under moderate pressure at a temperature of about 115°–130° C. so as to form a 6-alkoxy-5-trifluoromethyl-1-naphthoic acid.

4,629,809

PROCESS FOR SELECTIVELY PREPARING ACETIC ACID BY CARBONYLATION OF METHANOL IN THE PRESENCE OF A NOVEL IODIDE-FREE CATALYST SYSTEM

Steven H. Vanderpool, New Braunfels; Jiang-Jen Lin, Round Rock, and Roger G. Duranleau, Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 21, 1983, Ser. No. 515,749
Int. Cl.⁴ C07C *51/12, 53/08*
U.S. Cl. 562—519 **1 Claim**

1. A process for the preparation of acetic acid by carbonylation of methanol which comprises
(a) contacting methanol and carbon monoxide in the presence of an iodide-free soluble catalyst system consisting essentially of a ruthenium-containing compound, a quaternary phosphonium salt, a cobalt-containing compound and an inorganic or organic acid selected from the group consisting of methane-sulfonic acid, trifluoromethanesulfonic acid, sulfuric acid and NAFION ®, or an iodide-free solid support catalyst system consisting essentially of a ruthenium-containing compound on an inert support and trifluoromethane sulfonic acid,
(b) heating the resulting reaction mixture to a temperature of at least 150° C. and a pressure of about 500 psi to 8000 psi until substantial formation of the desired acid and
(c) isolating said acetic acid contained therein.

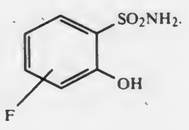
4,629,810

PHENYL SULFONAMIDES

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

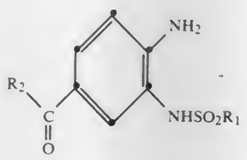
Division of Ser. No. 417,743, Sep. 13, 1982, Pat. No. 4,510,325, which is a division of Ser. No. 282,847, Jul. 13, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,481
Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81
Int. Cl.⁴ C07C *143/78*
U.S. Cl. 564—89 **2 Claims**

1. A compound of the formula



4,629,811
3-SULFONYLAMINO-4-AMINOBENZOPHENONE DERIVATIVES
Samuel J. Dominianni, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Division of Ser. No. 373,945, May 3, 1982, Pat. No. 4,483,986.
This application Aug. 27, 1984, Ser. No. 644,588
Int. Cl.⁴ C07C *143/74, 143/77*
U.S. Cl. 564—99 **4 Claims**

1. A compound of the formula II



II

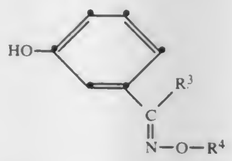
wherein
R_1 is C_1-C_5 alkyl or C_{3-7} cycloalkyl and
R_2 is phenyl or phenyl substituted by C_1-C_4 alkyl, C_1-C_4 alkoxy, chloro, bromo, iodo, or trifluoromethyl.

4,629,812
METHOD FOR PRODUCING N,N'-BIS-SALICYLOYL HYDRAZINE
Wolfgang von Gentzkow, Kleinsendelbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Aug. 18, 1981, Ser. No. 294,032
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033383
Int. Cl.⁴ C07C *103/20*
U.S. Cl. 564—134 **4 Claims**

1. In a method for producing N, N'-bis-salicyloyl hydrazine by a catalytic reaction of salicylic-acid alkyl esters with hydrazine or salicylic-acid hydrazide, the improvement comprising heating said hydrazine or salicylic-acid hydrazide to temperatures of up to about 150° C. with a 1- to 10-times excess of salicylic-acid alkyl ester in the presence of a halogenide, hydroxide or oxide of boron, aluminum or zinc.

4,629,813
HYDROXYPHENYLOXIME ETHERS
Hermann Rempfler, Ettingen, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 14, 1985, Ser. No. 733,821
Int. Cl.⁴ C07C *131/00, 103/29, 101/00;* **C07D** *211/72*
U.S. Cl. 564—256 **3 Claims**

1. An oxime ether of formula IV

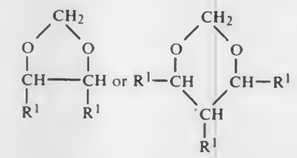


(IV)

wherein
R^3 is C_1-C_4alkyl and
R^4 is C_1-C_4alkyl, C_1-C_4cyanoalkyl, C_3-C_5alkenyl, C_3-C_5haloalkenyl, C_3-C_5alkynyl, or C_1-C_4alkyl which is substituted by C_1-C_4alkoxy, halogen, C_1-C_4alkoxycarbonyl, C_1-C_4alkylaminocarbonyl or di(C_1-C_4)alkylaminocarbonyl.

4,629,814
PROCESS FOR PREPARING BIS-BROMOALKYL ETHERS
Michael P. James, Mont Clare, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Aug. 27, 1985, Ser. No. 770,032
Int. Cl.⁴ C07C *41/01, 43/02, 43/225*
U.S. Cl. 568—645 **5 Claims**

1. A process for preparing a compound of the formula $CHR^1Br—(CHR^1)_n—OCH_2Br$ where n is one or two and each R^1 is the same or different hydrogen; (C_1-C_4)alkyl; or unsubstituted or substituted phenyl having one to three of the same or different halo, (C_1-C_4)alkyl, or (C_1-C_4)alkoxy which comprises:
reacting thionyl bromide with a compound selected from



where R^1 is as defined above.

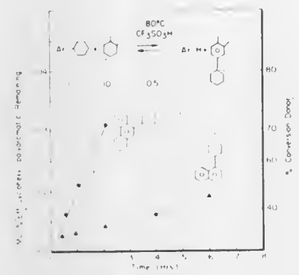
4,629,815
ISOMERIZATION/REARRANGEMENT OF POLYCHLOROBENZENES
Gérard Soula, Meyzieu, France, assignor to Rhone-Poulenc Industries, Paris, France
Filed Jun. 23, 1981, Ser. No. 276,481
Claims priority, application France, Jul. 1, 1980, 80 14607; May 12, 1981, 81 09392
Int. Cl.⁴ C07C *21/24*
U.S. Cl. 570—202 **27 Claims**

1. A process for the isomerization/rearrangement of polychlorobenzenes, comprising reacting (i) at least one tetrachlorobenzene, or at least one tetrachlorobenzene in admixture with at least one trichlorobenzene, pentachlorobenzene and/or hexachlorobenzene, or (ii) pentachlorobenzene, or pentachlorobenzene in admixture with at least one trichlorobenzene and/or hexachlorobenzene, or (iii) hexachlorobenzene, or hexachlorobenzene in admixture with at least one trichlorobenzene and/or dichlorobenzene, with at least one alkali metal amide, or at least one alkali metal alcoholate, or admixture thereof, said reaction being conducted in the presence of an agent which complexes the cation of the amide, alcoholate, or admixture thereof.

4,629,816
PROCESS FOR THE PRODUCTION OF 2,3-DICHLOROBUTADIENE-(1,3)
Josef Heinrich, Langenfeld; Rudolf Casper, Leverkusen, and Manfred Beck, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Mar. 1, 1983, Ser. No. 471,183
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208796
Int. Cl.⁴ C07C *17/34*
U.S. Cl. 570—229 **10 Claims**

1. A process for the production of 2,3-dichlorobutadiene-(1,3) by the dehydrochlorination of 2,3,4-trichlorobutene-1 with an aqueous solution of an alkali metal hydroxide in the presence of at least one phase transfer catalyst, at least one inhibitor and oxygen, characterised in that the aqueous solution of an alkali metal hydroxide is last added to the mixture of the 2,3,4-trichlorobutene-1, the phase transfer catalyst, the inhibitor and optionally water, and the reaction is carried out at from −10° to +60° C. under an inert gas which contains from 0.1 to 8% by volume of oxygen.

4,629,817
TRANSFER OF CYCLOALKYL GROUPS BY TRANSALKYLATION OF AROMATICS
Malvina Farcasiu, Flemington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed May 6, 1985, Ser. No. 730,962
Int. Cl.⁴ C07C *5/22*
U.S. Cl. 585—470 **3 Claims**



1. A process for transferring alkyl groups from donor compounds to acceptor compounds by a transalkylation reaction, said donor compounds being aromatic compounds having said alkyl groups substituted on aromatic rings thereof, said acceptor compounds being aromatic compounds not having said alkyl groups substituted on aromatic rings thereof, said process comprising contacting sufficient amounts of said donor and acceptor compounds and a catalytically effective amount of a Bronsted acid catalyst at a sufficient transalkylating temperature, whereby essentially all of said alkyl groups which are transferred are cycloalkyl groups, said transfer taking place essentially without isomerization of the saturated ring of the cycloalkyl group.

4,629,818
AROMATIZATION CATALYST FOR A REFINERY OFF GAS STREAM
George T. Burress, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 726,193, Apr. 22, 1985, abandoned.
This application Nov. 4, 1985, Ser. No. 794,328
Int. Cl.⁴ C07C *12/02*
U.S. Cl. 585—517 **12 Claims**

1. A process for converting a feedstock to aromatic compounds, said feedstock comprising one or more of ethylene, propylene and propane, said process comprising contacting said feedstock under sufficient aromatization conditions with an aromatization catalyst, said aromatization catalyst comprising (i) a zeolite having the structure of ZSM-5 or ZSM-11, (ii) gallium and (iii) thorium.

4,629,819
NOVEL HYBRID CORN PLANT
Marvin F. Lindsey, Boone, Iowa, assignor to DeKalb-Pfizer Genetics, DeKalb, Ill.
Filed Apr. 26, 1985, Ser. No. 727,632
Int. Cl.⁴ A01H *1/02*
U.S. Cl. 800—1 **3 Claims**

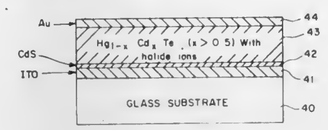
1. F_1 generation hybrid corn plant DK 524.

4,629,820

THIN FILM HETEROJUNCTION PHOTOVOLTAIC DEVICES

Bulent M. Basol, Los Angeles; Eric S. Tseng, Torrance, and Dennis S. Lo, South Gate, all of Calif., assignors to Standard Oil Commercial Development Company, Cleveland, Ohio and BP Solar International Ltd., London, England

Division of Ser. No. 576,559, Feb. 3, 1984, Pat. No. 4,548,681.
This application Sep. 17, 1985, Ser. No. 762,474
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—255 **5 Claims**



1. A solar cell comprising at least one layer of polycrystalline cadmium-rich $Hg_{1-x}Cd_xTe$ ($x>0.5$) containing halide atoms, as an active solar energy absorbing layer.

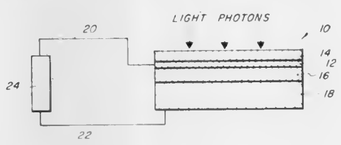
3. The solar cell of claim 1 wherein one surface of said at least one layer of cadmium-rich $Hg_{1-x}Cd_xTe$ forms a Schottky barrier with a conductive metal layer; and the opposing surface of said at least one layer of cadmium-rich $Hg_{1-x}Cd_xTe$ contacts a layer of a semiconductor material.

4,629,821

PHOTOVOLTAIC CELL

Irena Y. Bronstein-Bonte, Newton, and Alan B. Fischer, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 641,306, Aug. 16, 1984, abandoned. This application Sep. 13, 1985, Ser. No. 775,676
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—257 **12 Claims**



1. In a product comprising a photovoltaic cell including a luminescent dye which will absorb radiation at a wavelength to which the cell is not significantly responsive and emit radiation at a higher wavelength at which it is responsive;

the improvement wherein said dye comprises a lepidopterene.

4,629,822

ELECTRICAL BUSHING

Yukio Kitamura, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1986, Ser. No. 841,263
Claims priority, application Japan, Mar. 27, 1985, 60-46289[U]
Int. Cl.[4] H01B *17/26*
U.S. Cl. 174—12 BH **3 Claims**

1. An electrical bushing comprising;

a hollow electrically insulating tube;

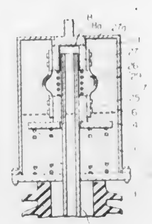
a central conductor extending through said hollow insulating tube and supported at opposite ends of said insulating tube, at least one end of said central conductor being axially movable relative to said insulating tube;

a stationary terminal element secured to and electrically connected to the movable end of said central conductor;

a movable terminal element axially movable relative to said stationary terminal element;

an expansion chamber housing for defining therein an expansion chamber, said expansion chamber housing being hermetically attached to said insulating tube at the end thereof corresponding to the movable end of said central conductor to enclose the movable end of the conductor;

an electrically conductive terminal cap hermetically secured to and extending through said expansion chamber housing, said terminal cap being axially aligned with said central conductor; and



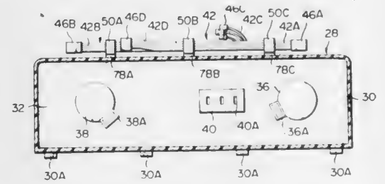
resilient connecting means for electrically connecting said stationary terminal element to said movable terminal element while allowing an axial movement of said movable terminal element relative to said stationary terminal element and for axially biasing said movable terminal element against said terminal cap to establish an electrical contact therebetween.

4,629,823

HOUSING FOR AN ELECTRIC APPARATUS WITH LEAD WIRES AND A DIE APPARATUS FOR MOLDING THE SAME

Mitsuji Fushiya, Toki; Shoichi Imanishi, Yokohama, and Takeo Shiga, Kakamigahara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 16, 1983, Ser. No. 495,131
Claims priority, application Japan, May 29, 1982, 57-91982
Int. Cl.[4] H05K *7/02*
U.S. Cl. 174—52 R **5 Claims**



1. A housing for mounting therein an electric apparatus, said housing comprising:

a main body including a portion made of synthetic resin, said main body portion being located inside said main body;

electrical connection means contained within said housing for interconnecting the electric apparatus, said electrical connection means including:

(a) a plurality of retaining portion made of sythetic resin and integrally formed to extend into the housing from said main body portion, said plurality of retaining portions being arranged at intervals of said main body portion and being fixed to the main body portion in a flexible manner; and

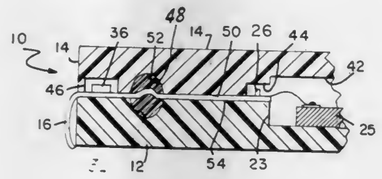
(b) a plurality of electrical wires held within said plurality of retaining portions.

4,629,824

IC PACKAGE SEALING TECHNIQUE

Thomas G. Gilder, Jr., Warren, and Raymond D. O'Dean, Dover, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 24, 1984, Ser. No. 686,567
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 FP **4 Claims**



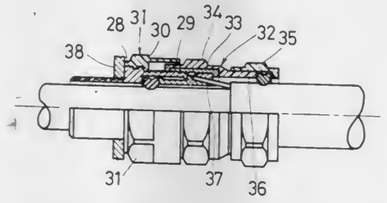
1. An integrated circuit package comprising: an electrically insulating substrate having a portion formed to receive an integrated circuit chip and a plurality of electrically conductive, relatively rigid, metal lead-in connectors; said lead-in connectors having a first end adjacent said portion and a second end remote from said first end; a cover formed to be accommodated by said substrate, said cover having an inner surface and an outer surface; a circumferential sealant groove formed in said inner surface; a deformable sealant in said groove; and a sealant penetrator formed on each of said lead-ins intermediate the ends thereof and in alignment with said sealant.

4,629,825

ELECTRICAL CABLE GLAND EMBODYING SEALING ARRANGEMENT

Franz Lackinger, Krugersdorp, South Africa, assignor to Westward Investments Limited, Hong Kong, Hong Kong

Filed Nov. 5, 1984, Ser. No. 668,215
Claims priority, application South Africa, Nov. 11, 1983, 83/8414
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—65 SS **4 Claims**



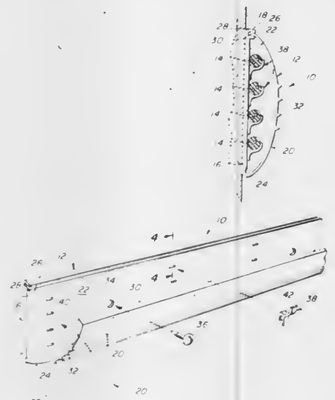
1. An electrical cable gland comprising a first part having an internally screw-threaded socket or thimble and a second part defining an externally screw-threaded sleeve or differential nut co-operating with the screw-thread of the socket or thimble, said first and second parts having operatively associated therewith co-operating parts of an armor clamp arrangement, the first and second parts each having an electrically conductive inner part to be operatively electrically connected to electrically conductive armoring of an armored electrical cable via the armor clamp arrangement and a body of electrically insulating material moulded onto the outside of the first and second parts, a portion at one end of said bodies forming a tubular skirt extending from either the first or the second parts to co-operate sealingly with a circular external sealing surface of the other of such first and second parts, an outer seal at one end of the cable gland being the end through which an armored zone of a cable may operatively enter the gland, and an externally screw threaded sleeve or tubular portion of electrically conductive material at the other end to operatively accomodate an unarmored zone of an electrical cable to be passed therethrough, such sleeve or tubular portion to be operatively electrically connected to the armoring of a cable by way of the conductive part of the first or second parts, or both, the operative cable gland with the sleeve or tubular part to be connected to a connection box presenting a substantially unbroken electrically insulating external surface.

4,629,826

ALL PURPOSE WIRE CONCEALER

Junior A. Thomas, 55-30 98th Pl., Apt. 4-D, Flushing, N.Y. 11368

Filed Aug. 21, 1985, Ser. No. 767,829
Int. Cl.[4] H02G *3/04, 3/26*
U.S. Cl. 174—99 R **4 Claims**



1. An all purpose wire concealer, comprising, in combination, a tubular, elongated, one piece molding member for covering a plurality of electric wires when extending therethrough, said molding member comprising an elongated base and an elongated cover pivotally connected together along one longitudinal edge and detachably connectable along an opposite longitudinal edge, a plurality of spaced apart longitudinal and transverse rows of individual slots in said elongated base, and a plurality of hooks removably mounted into selective slots and defining channels within said molding member of variably selective spacing to accommodate differing wire sizes, each channel being adapted to receive a single electric wire therein, whereby when electric wires are placed in the channels, they will be separated from each other.

4,629,827

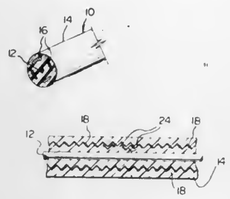
CABLES HAVING INSULATING JACKETS

Gordon D. Baxter, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 565,631, Dec. 27, 1983, Pat. No. 4,568,507. This application Oct. 28, 1985, Ser. No. 791,814
Int. Cl.[4] H01B *7/22*
U.S. Cl. 174—102 D **2 Claims**

1. A cable having a cable core surrounded by an insulating jacket with at least one longitudinally extending tensile tape member embedded therein, the tape member formed from succeeding lengths of tensile tape with each length having end

portions and the end portions overlap from one length to another, and at each overlap position, one end portion has



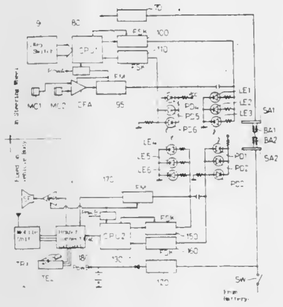
projections interengaged with corresponding identations in the other end portion.

4,629,828

SIGNAL TRANSMISSION APPARATUS FOR STEERING OPERATION BOARD

Kazuyuki Umebayashi, Tokyo, Japan, assignor to Aisin Seiki Kabushikikaisha, Japan

Filed Aug. 12, 1983, Ser. No. 522,757
Claims priority, application Japan, Aug. 17, 1982, 57-142535
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.[4] H04M *1/23*
U.S. Cl. 379—56 **12 Claims**



1. A signal transmission apparatus for a steering operation board comprising:

a steering operation board composed of at least one acoustic-electric conversion means, a first modulation means adapted to modulate a signal from said acoustic-electric conversion means, an input key switch means, and a second modulation means adapted to modulate a signal in accordance with operation of said switch means, said operation board being equipped on or near a steering wheel;

a road-vehicle control unit composed of a first demodulation means adapted to demodulate a signal modulated by said first modulation means, a second demodulation means adapted to demodulate a signal modulated by said second modulation means, a radio signal transmission means for emitting an electromagnetic wave modulated with an audio signal, a second acoustic-electric conversion means, a connection switching means adapted to selectively apply a signal from said first demodulation means and a signal from said second acoustic-electric conversion means to said radio signal transmission means, and a switching control means adapted to control said connection switching means in accordance with a signal from said second demodulation means, said control unit being equipped at a fixed position on the vehicle body mechanically separated from said steering operation board; and

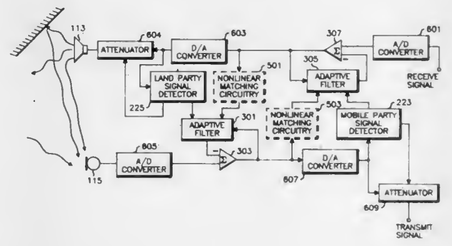
a light signal transmission means composed of a light emitting means adapted to convert an electric signal from said steering operation board to a light beam, and a light receiving means adapted to receive the light beam from said light emitting means and then apply an electric signal in accordance with the intensity of the light beam to said road-vehicle control unit.

4,629,829

FULL DUPLEX SPEAKERPHONE FOR RADIO AND LANDLINE TELEPHONES

Larry C. Puhl, Sleepy Hollow, and Richard J. Vilmur, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1984, Ser. No. 681,540
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—58 **24 Claims**



1. Hands-free telephone circuitry for providing cancellation of undesired signal coupling, including a speaker transducing a modified first signal produced from a first signal received from a communications channel and a microphone transducing a second signal for modification and transmissing as a modified second signal on a communication channel simultaneous with the first signal, comprising:

means for detecting the modified first signal;

a first adaptive filter having coefficient determining means enabled by said modified first signal detecting means;

means including said first adaptive filter for substracting at least a portion of the modified first signal from the second signal, thereby producing the modified second signal with coupling from the modified first signal essentially cancelled;

means for detecting the modified second signal;

a second adaptive filter having coefficient determining means enabled by said modified second signal detecting means; and

means including said second adaptive filter for substracting at least a portion of the modified second signal from the first signal, thereby producing the modified first signal with coupling from the modified second signal essentially cancelled.

4,629,830

TELECOMMUNICATIONS SYSTEM, PARTICULARLY A TELEPHONE EXCHANGE SYSTEM, HAVING OVERLOAD PROTECTED SEQUENTIAL LOGIC SYSTEMS

Georg Daisenberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,610
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311972
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] H04M *15/10*
U.S. Cl. 340—825.03 **2 Claims**

1. A telecommunications system comprising:

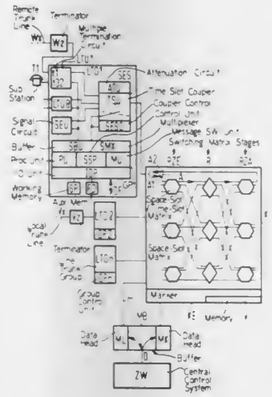
a plurality of lines and trunks, arranged in groups, for connection to subscriber stations and for carrying call infor-

mation including initial switching identifiers and subsequent selection characters announced by said initial switching identifiers;

a central information-processing-sequential logic system having a limited call-handling capability with respect to its information-processing capacity;

a switching network connected to said central information-processing system;

a plurality of partially-centralized information-processing sequential logic systems each connected to a respective line/trunk group and to said central information-processing sequential logic system via said switching network, and each operable to receive, intermediately store and transmit call information to said central information-processing system for processing to set up calls between calling and called subscriber stations, each call being set up in



sections which may have different information-processing traffic load indicated by the initial switching identifiers;

traffic load measuring means connected to each of said partially-centralized information-processing sequential logic systems and responsive to said initial switching identifiers to produce weighted control signals representing the information-processing traffic load; and

a plurality of cyclically-deincremented counting means each connected to respective partially-centralized information-processing sequential logic system and to said traffic load measuring means, each of said counting means incremented by said control signals in accordance with their weighting and operable to produce and transmit an overload signal, for a time interval defined by the weighting, to the respective partially-centralized device upon reaching a predetermined count representing a traffic load limiting value.

4,629,831

SERIES CONNECTED INTERCEPTOR

William J. Curtin; Stephen Soto, both of Madison, and Steven Krueger, Windsor, all of Wis., assignors to Amtel Communications, Inc., McFarland, Wis.

Filed Feb. 13, 1984, Ser. No. 579,530

Int. Cl.[4] H04M *3/50, 3/54*

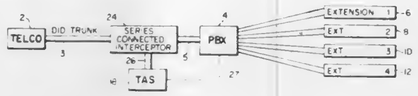
U.S. Cl. 379—213 **44 Claims**

1. An interceptor for interconnection between a telephone central office and a PBX system, said interceptor comprising:

(a) first connecting means for connecting said interceptor to an incoming telephone line from the telephone central office, said first connecting means acting as a source port;

(b) a second connecting means for connecting said interceptor to a PBX, said second connecting means acting as a sink port;

(c) means for enabling said interceptor to dial any of several telephone extensions coupled to the PBX when an incoming call for one of said extensions is received by said interceptor from the incoming line connected to said first connecting means;



(d) timing means for determining if such dialed telephone extension has gone unanswered for a preselected period of time; and

(e) detection means for detecting if the dialed telephone extension is answered.

4,629,832

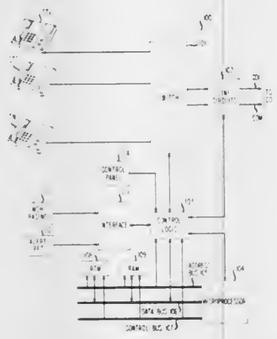
COMMUNICATION SYSTEM ADMINISTRATION METHOD AND CIRCUITRY

Robert A. Carson, Indianapolis, Ind.; Mary S. Petrick, Jamesburg, N.J.; Lee A. Vallone, Red Bank, N.J., and John D. Walker, Middletown, N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Sep. 10, 1984, Ser. No. 649,118

Int. Cl.[4] G05B *23/02;* **H04M** *3/22*

U.S. Cl. 340—825.07 **20 Claims**



16. In a communication system including a common controller unit connected to a plurality of communication apparatuses for controlling communicating over a plurality of communication facilities, a method of administrating communication connections between said apparatuses and said facilities, said method comprising the steps of:

initiating administration at apparatus selected by a user input,

disabling communications to said selected apparatus when said apparatus becomes idle,

changing the connection of said selected apparatus to a facility selected by said user input, and

enabling communications to said selected apparatus after said changing step is completed.

4,629,833

ELECTRIC HEARING AID

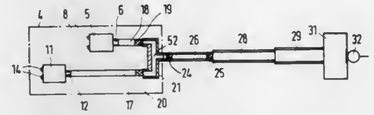
Reinhard Kern; Gerhard Krauss, both of Nuremberg, and Helmut Schlosser, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,339

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224614

Int. Cl.[4] H04R *25/00, 1/24, 1/28, 1/38*

U.S. Cl. 381—68.2 **23 Claims**



1. A hearing aid with acoustic signal pickup means, amplification means, and sound reproduction means, said sound reproduction means comprising two sound sources, a common acoustic transmission channel, and sound transmission channels coupling the sound sources with said common acoustic transmission channel, said sound sources each being constructed for supplying acoustic frequency components covering a frequency range of sound to be supplied to the ear of the user, said sound reproduction means providing different sound transmission properties for the respective sound transmission channels such that a selected individually adapted differential transmission of the acoustic frequency components results via the respective sound transmission channels and such that relative amplitudes of the acoustic frequency components result at the common acoustic transmission channel representing a resultant frequency response specifically conformed to the individual hearing impairment of the user in spite of high gain operation of the amplification means, said two sound sources comprising respective earpiece receivers of the same type, said sound transmission channels having respective different lengths such that the phase of sound transmission for selected frequencies along one transmission channel changes by at least 180° compared to the phase of sound transmission for the same selected frequencies along the other transmission channel within the frequency range of acoustic frequency components supplied by said earpiece receivers.

4,629,834

APPARATUS AND METHOD FOR VIBRATORY SIGNAL DETECTION

Terrence C. Waggoner; James A. Simmons, both of Eugene; Marvin K. Perry, Springfield, and Richard H. Tromel, Eugene, all of Oreg., assignors to Bio-Dynamics Research & Development Corporation, Eugene, Oreg.

Filed Oct. 31, 1984, Ser. No. 666,654

Int. Cl.[4] H04R *1/10, 3/00;* **H03F** *21/00;* **H04B** *1/00*

U.S. Cl. 381—68.2 **8 Claims**

3. Apparatus for enhancing human hearing, comprising:

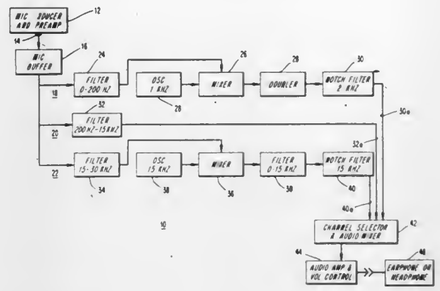
first transducer means for receiving airborne sound waves having frequencies extending in a range from below the lower frequency limit of human hearing to above the upper frequency limit of human hearing and for producing electrical signals responsive to said received sound waves;

a high-pass filter connected to the output of said first transducer means and having a cut-off frequency which passes frequencies above the upper frequency limit of human hearing;

a band-pass filter connected to the output of said first transducer means and having an upper cut-off frequency substantially equal to the cut-off frequency of said high-pass filter and a lower cut-off frequency above the lower frequency limit of human hearing;

an oscillator;

a mixer connected to the outputs of said oscillator and said high-pass filter and producing an output signal having a frequency within the range of human hearing which is equal to the difference between the output signal frequencies of said oscillator and said high-pass filter;



an earphone;

and means for amplifying the outputs of said band pass filter and said mixer and for selectively connecting said band-pass filter and mixer outputs to said earphone.

4,629,835

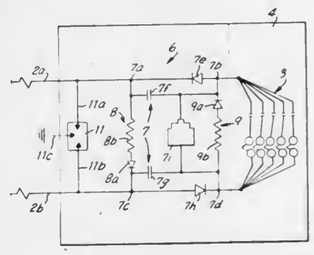
FAULT ISOLATING APPARATUS SYSTEM AND METHOD

Brian L. Miller, Natick, Mass., assignor to New England Telephone and Telegraph Company, Boston, Mass.

Filed Dec. 26, 1984, Ser. No. 686,253

Int. Cl.[4] H04B *3/46*

U.S. Cl. 379—29 **19 Claims**



11. A fault isolator for connection between a subscriber loop including tip and ring lines and a subscriber location, said fault isolator comprising:

first and second ports, said first port being adapted to be connected to the end of said ring line adjacent said surscriber location and said second port being adapted to be connected to said subscriber location;

first circuit means connected between said first and second ports and adapted to allow passage of current from said second to first port and block passage of current from said first to second port;

third and fourth ports, said third port being adapted to be connected to said tip line adjacent said subscriber location and said fourth port being adapted to be connected to said subscriber location;

second circuit means connected between said third and fourth ports and adapted to allow passage of current from said third to said fourth port and block passage of current from fourth to said third port;

third circuit means connected between said first and second ports and adapted to allow passage of low frequency current below a preselected frequency from said first to second port and from second to first port;

fourth circuit means connected between said third and fourth ports and adapted to allow passage of low frequency current below said preselected frequency from said third to fourth port and from said fourth to third port;

fifth circuit means connected between said first port and said third port and adapted to allow passage of current from said first to third port and to block passage of current from said third to first port;

and sixth circuit means connected between said second port and said fourth port and adapted to allow passage of current from said fourth to said second port and to block passage of current from said second to said fourth port.

4,629,836

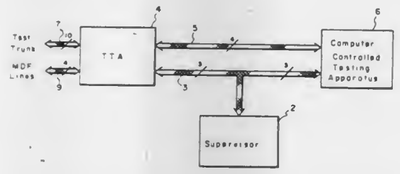
METHOD AND APPARATUS FOR ACCESSING COMMUNICATION SYSTEMS

Richard L. Walsworth, Pittsford, N.Y., assignor to TII Computer Systems, Inc., Copiague

Filed Aug. 29, 1984, Ser. No. 645,875

Int. Cl.⁴ H04B *3/46*

U.S. Cl. 379—12 **10 Claims**



1. Apparatus for accessing communication lines comprising:

a signal line,

central processing means,

a memory in which is stored a program for controlling said central processing means,

first coupling means responsive to signals from said central processing means for coupling said communication lines to said signal line,

means responsive to signals from said central processing means for generating dialing signals,

means for connecting said dialing signals to said signal line,

means responsive to signals from said central processing means for detecting signals received on said signal line from said communication lines, and

second coupling means responsive to signals from said central processing means for coupling said signal line to a testing means not controlled by said central processing unit whereby communication lines accessed by said apparatus are connected to said testing means.

4,629,837

INTERLOCK ARRANGEMENT FOR RADIOPAGER SWITCHES

Peter B. Carr, Harpenden, England, assignor to STC plc, London, England

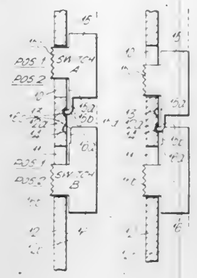
Filed Sep. 18, 1985, Ser. No. 777,413

Claims priority, application United Kingdom, Sep. 18, 1984, 8423582

Int. Cl.⁴ H01H *9/26;* **H04B** *1/44*

U.S. Cl. 200—50 C **7 Claims**

1. A hand-held battery-powered radio receiver having a pair of manually-operable slide switches to switch the receiver between a "memory" mode of operation enabling the receiver to store incoming messages in a memory, an "alert" mode of operation providing an indication that there is an incoming message, and a "battery-off" mode, wherein one of the manually-operable slide switches is operable to switch the receiver into either one of the "memory" and "alert" modes, as desired by the user, and the other manually-operable slide switch is operable to switch on and off power from the battery supply, wherein the slide switches each have a slide actuator member, the slide actuator members being formed with cooperating overlapping interlock portions such that a situation in which



the first switch is in a position for "memory" mode and the second switch is in a position in which the power is switched off is prevented.

4,629,838

SENSITIVE CONSTANT CONTACT PRESSURE MICROSWITCH

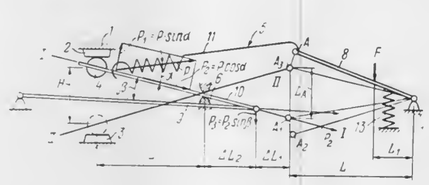
Vyacheslav G. Mironenko, Moscow; Alexandr P. Poltorak, Donetsk; Vitaly I. Schutsky, Moscow; Vladimir A. Kosovtsev, Kharkov; Fedor P. Chaly, Kharkov; Vladislav F. Zagubeljuk, Kharkov, and Nikolai I. Filatov, Kizlyar, all of U.S.S.R., assignors to Tekhnologichesky Institut Vzryvozashischennogo I Rudnichnogo Elektrooborudovania, Donetsk, U.S.S.R.

PCT No. PCT/SU82/00006, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO83/02848, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 9, 1982, Ser. No. 541,334

Int. Cl.⁴ H01H *21/42*

U.S. Cl. 200—67 D **3 Claims**



1. A microswitch comprising an insulating base; stationary contacts secured on said insulating base; a four-link system of levers which includes a plurality of links connected in series with each other including an actuating link, two middle links one of which is a contact link and the other of which is an intermediate link, a support link, said actuating link and said support link being mounted for rocking on said insulating base; a movable contact on one of said middle links which serves as said contact link for alternately interacting with said stationary contacts; and limit stop means for holding one of said middle links in the end positions in the direction of said movable contacts, said movable contact being disposed on the end of said contact link connected with said intermediate link, and said limit stop means being mounted close to the place of connection of one of said middle links with said support link, whereby the microswitch exhibits high sensitivity and constant contact pressure, and being further characterized in that said limit stop means is located between said movable contact and the place of connection of said contact link with said support link.

4,629,839

HIGH CURRENT SWITCH CONTACTS

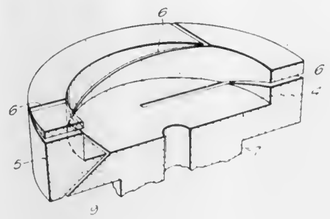
Leslie T. Falkingham, 25 Lullington Garth, Borehamwood, Hertfordshire, United Kingdom

Filed Aug. 2, 1984, Ser. No. 636,904

Claims priority, application United Kingdom, Aug. 9, 1983, 8321368

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **11 Claims**



1. A contact for high current electrical switch devices consisting of a generally cup-shaped electrically conducting member having an axis of symmetry, a base, means for electrically connecting the contact to a support conductor on one side of the base, and an annular rim portion surrounding the symmetry axis and upstanding from the opposite side of the base: wherein the improvement comprises, the member having a plurality of substantially straight slots so formed therein as to cause an arc formed upon separation of the member with another like member to be immediately and rapidly rotated circumferentially about the symmetry axis, each slot passing through at least part of the annular upstanding rim portion adjacent the base in a generally helical direction and, from its junction with the base, continuing partly across the base in a chordal direction and in an orientation such that, at said opposite side of the base, the distance between the inner end of the slot and the annular rim portion measured along the slot, is greater than the distance between the inner end of the slot and the annular rim portion in a direction at right angles thereto.

4,629,840

DEVICE FOR QUENCHING AN ELECTRIC ARC

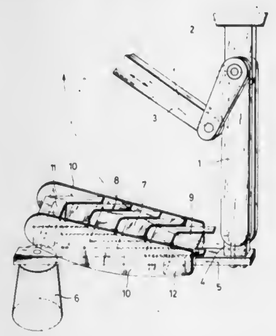
Rolf Dirks, Willich, and Wolfgang Peblken, Kempen, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Inergietechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 720,148

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412566

Int. Cl.⁴ H01H *33/10*

U.S. Cl. 200—147 R **5 Claims**



1. In an arc quenching device for a switch of an electrically operated apparatus, including wall means defining a quenching chamber filled with sulfur hexafluoride or a mixture containing sulfur hexafluoride, at least one stationary contact member and at least one movable contact element cooperating with said stationary contact member and insertable into said quenching chamber, and a plurality of quenching plates arranged in said chamber and cooperating with said movable contact element, said quenching plates being electrically insulated from each other and from said contact members, the improvement comprising said quenching plates being made of sheet steel, said wall means being made of electrically-insulating material, said quenching plates being inserted into said chamber such that they all extend parallel to the direction of movement of said movable contact element, which at least partially coincides with a direction of magnetic field of an electric arc being quenched.

4,629,841

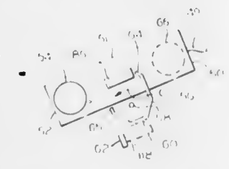
ATTITUDE CONTROLLED FLOAT SWITCH

Richard Riback, Highland Park; Brian Lau, Chicago, and Paul Gergets, Oak Lawn, all of Ill., assignors to Expert Corporation, Chicago, Ill.

Filed Sep. 24, 1984, Ser. No. 654,301

Int. Cl.⁴ H01H *35/18*

U.S. Cl. 200—153 A **17 Claims**



1. A float switch having a distal end and a proximal end, tether means for limiting movement of the proximal end, the distal end being free to float on a surface of a liquid, race means extending within said float switch between said distal and proximal ends, a ball free to roll through said race means, switch means operated by said ball responsive to its rolling through said race means, safety means for maintaining a synchronism between the position of said ball and the operation of said switch means, a ball cage pivoted to rotate between either of two positions responsive to the rolling of said ball within said race, wherein said safety means is a spring biased lever arm which normally engages said ball cage and prevents its movement, said lever arm having a part which is pushed aside by the movement of said rolling ball at a time when said ball cage should pivot, whereby the ball and cage movements are synchronized.

4,629,842

ELECTRIC CONTACTOR FOR PNEUMATIC SERVOMOTOR FOR BRAKING

Pascal Picot, Bonneuil-sur-Marne, and Pierre Pressaco, La Courneuve, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Mar. 18, 1985, Ser. No. 713,229

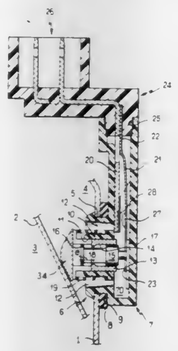
Claims priority, application France, Mar. 21, 1984, 84 04389

Int. Cl.⁴ B60Q *1/44;* **H01H** *3/48*

U.S. Cl. 200—153 V **6 Claims**

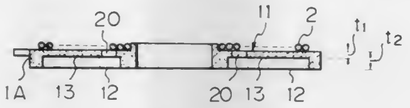
1. In a braking assistance pneumatic servomotor having a casing divided internally into a front chamber and a rear chamber by a movable wall capable of being displaced from a rest position close to a rear wall of said casing, an electric switch actuator device intended to be joined to an electric warning circuit and including a first body portion sealingly engaged in an opening in the rear wall of the casing and a second body portion outside the casing and enclosing at least one pair of metallic electrical contacts actuatable by a follower slideably

mounted in a bore in the first body portion, the follower biased by a spring in a direction away from the first body portion so as to bear in contact engagement with the movable wall when the movable wall is approximately in the rest position, characterized in that the device comprises a fixed contact blade and a movable contact blade associated with the pair of contacts, the movable contact blade having resilient means for biasing the movable contact blade away from the fixed contact blade in a direction opposite the direction the follower is biased by the spring, the movable contact blade coupled to a plunger slideably mounted in the follower, the plunger having a shoulder



for cooperating in driving engagement with an abutment part of the follower when the follower moves away from the first body portion under the biasing force of the spring, the movement of the follower bringing the movable contact blade into contact with the fixed contact blade and against the biasing force of said resilient means, the contact blades arranged in a closed cavity formed in the second body portion which communicates freely with the rear chamber of the servomotor through fluid passages formed in the first body portion, and the passages formed around a central portion of the first body portion in which is formed said bore.

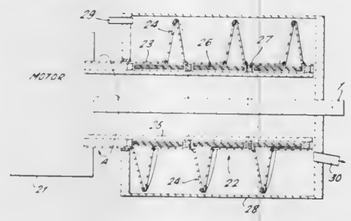
4,629,843
INDUCTION COOKING APPARATUS HAVING A FERRITE COIL SUPPORT
Namio Kato, and Tadao Takeda, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Apr. 3, 1985, Ser. No. 719,376
Claims priority, application Japan, Apr. 11, 1984, 59-53207[U]; Apr. 11, 1984, 59-53208[U]; Apr. 16, 1984, 59-56477[U]; Apr. 16, 1984, 59-56476[U]; Apr. 28, 1984, 59-86747; Apr. 28, 1984, 59-86748
Int. Cl.⁴ H05B *6/12*
U.S. Cl. 219—10.49 R **21 Claims**



1. An induction cooking apparatus comprising a casing, a coil support mounted in the casing, an induction coil located on an upper plane of the coil support and being energized by high frequency power, and an insulation plate covering in the casing to provide a support for a load; characterized in that

said coil support is essentially a flat disc made of a mixture of heat-resistive insulation resin and ferrite powder so that the weight ratio of ferrite powder to mixture is in the range between 75% and 85%; and wherein said coil support has a non-uniform permeability so that the permeability at a center portion is essentially less than that at an outer portion.

4,629,844
INDUCTION HEATER HAVING AN ALTERNATING CURRENT CONDUCTOR
John T. Griffith, Clwyd; Carlos Lopez-Cacicedo, and Stephen M. L. Hamblyn, both of Chester, all of United Kingdom, assignors to The Electricity Council, London, England
Filed Aug. 28, 1985, Ser. No. 770,133
Claims priority, application United Kingdom, Aug. 28, 1984, 8421762
Int. Cl.⁴ H05B *6/10*
U.S. Cl. 219—10.49 R **12 Claims**



1. An induction heater having an alternating current carrying conductor extending along an axis, a core means substantially encircling said axis to guide magnetic flux resulting from said alternating current, and a heating element for contacting and transferring heat to material to be heated, the heating element comprising an electrically conducting closed loop encircling magnetic flux in the core means and being heated by electrical current induced thereby.

4,629,845
ELECTRICAL APPLIANCE PROGRAMMING
Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 490,269, May 2, 1983, Pat. No. 4,523,062. This application Jan. 16, 1985, Ser. No. 691,781
Int. Cl.⁴ H05B *6/68;* **H01H** *43/00*
U.S. Cl. 219—10.55 B **3 Claims**



1. Control system for a microwave oven comprising:

(a) a timing means operable upon connection to a source of power to rotate at a substantially constant rate;

(b) magnetron means operable, upon connection to a source of power, to effect microwave radiation for cooking;

(c) first switch means series connected with said magnetron means and operative upon actuation to connect said magnetron means to power circuit means;

(d) second switch means series connected with said timer means and operative for connecting said timer means and said first switch means to said power source;

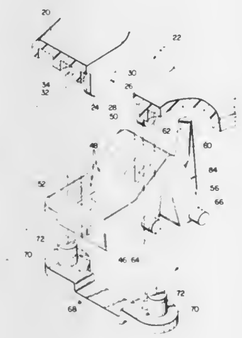
(e) main rotary cam means including;

(i) timing cam means and first cam follower means operative to affect actuation of said second switch means;

(ii) defrost cam means and second cam follower means operative to effect actuation of said first switch means, said defrost cam means operative upon advancement to effect sequentially varying periods of actuation of said first switch means;

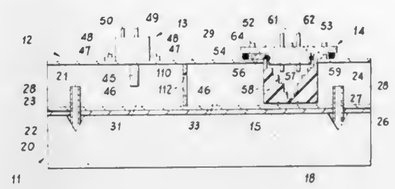
(iii) advance means connected to said timing means and operative to advance said defrost and timing cam means at a preselected one of at least two rates, wherein said timing cam track is operative to maintain said second switch means closed for a given time interval and said defrost cam means is operative to effect cycling of said first switch means at predetermined subintervals of said given time interval, wherein said timing cam means and said defrost cam means are advanced together at said one of said preselected rates.

4,629,846
SWITCH ASSEMBLY FOR MICROWAVE OVEN TURNTABLE
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 9, 1985, Ser. No. 785,921
Int. Cl.⁴ H05B *6/78*
U.S. Cl. 219—10.55 F **10 Claims**



1. A microwave oven turntable comprising a base component, a platform component rotatably mounted thereupon to rotate about a central vertical axis, and a switch assembly, said switch assembly comprising: said rotatable platform having a downward peripheral rim flange, and an annular concentric ring of gear teeth spaced along a side of said rim flange facing inward toward said central vertical axis; said base having switch support means extending outward beyond said platform and beneath said rim flange; a V-shaped rocker body pivotally mounted to said switch support means outward of said rim flange and aligned to selectively pivot toward and away from said rim flange; and said rocker body having a finger projection directed toward and extending under said platform rim flange and engaging said inward facing annular gear ring thereof; whereby said selective pivoting of said rocker body rotating said finger projection in and out of meshing engagement with said gear ring.

4,629,847
RESONATOR DEVICE FOR A MICROWAVE HEAT APPLICATOR
Paul W. Gics, 92 Merriman Rd., Sewickley Hights, Pa. 15143
Filed Nov. 7, 1985, Ser. No. 795,784
Int. Cl.⁴ H05B *6/70*
U.S. Cl. 219—10.55 A **10 Claims**



1. A microwave energy resonator device having particular utility for heating material by microwave energy with being provided microwave energy from a microwave energy source, comprising:

elongate housing means having an elongate slot dimensioned for receiving the material to be heated;

an elongate center wall mounted within said housing means and having an elongate free edge portion proximate with said slot;

first antenna means connected to said center wall for coupling microwave energy from the microwave energy source to said center wall;

second antenna means connected to said center wall for transmitting microwave energy outside said housing means,

whereby said microwave energy device with being provided microwave energy affects a duals function of an energy resonator and a microwave energy transmission means.

4,629,848
POWER AND TIME CONTROLLED HIGH FREQUENCY HEATING APPLIANCE
Seiki Yokozeki, Yamatokoriyama, and Jun Nomura, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP82/00149, § 371 Date Dec. 20, 1983, § 102(e) Date Dec. 20, 1983, PCT Pub. No. WO83/03889, PCT Pub. Date Nov. 10, 1983
Continuation of Ser. No. 574,091, Dec. 20, 1983, abandoned. This PCT application Apr. 30, 1982, Ser. No. 819,009
Int. Cl.⁴ H05B *6/68*
U.S. Cl. 219—10.55 B **2 Claims**

1. A high frequency heating apparatus comprising a heating compartment to keep food to be heated, a high frequency oscillator for heating the food by radiating high frequency waves into said heating compartment, a control circuit unit possessing a program function and containing a microcomputer for controlling an output of high frequency oscillator, selection keys for selecting a major classification of the food and for feeding this classification information into said control circuit unit, and a weight-key for feeding the weight of the food into said control circuit unit, wherein said control circuit unit includes a determination means for determining a minor classification of the food based on the major classification of the food from said selection keys and the weight of the food from said weight key and also includes a setting means for setting the output of the waves from said oscillator and a heating time T based on the minor classification from the determination means and the weight from said weight key, and wherein said heating time T is determined from the following formula, assuming that the constants set in accordance with the minor classification from said determination means are a and b and the weight of the food is W:

$T=a+bW$.

4,629,849

MICROWAVE HEATING DEVICE HAVING A ROTARY REFLECTOR MEANS IN A HEATING CHAMBER

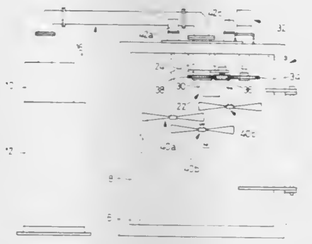
Isao Mizutani, Nagoya, and Tsunezo Takeuchi, Aichi, both of Japan, assignors to NGK Insulators Ltd., Japan

Filed Jun. 25, 1985, Ser. No. 748,621

Claims priority, application Japan, Jun. 28, 1984, 59-97616[U]; Jun. 28, 1984, 59-97617[U]; Jun. 28, 1984, 59-97618[U]

Int. Cl.⁴ H05B *6/72*

U.S. Cl. 219—10.55 F **7 Claims**



1. A microwave heating device for heating a material, comprising:

a microwave oscillator for producing microwave radiation for heating said material;

a heating room;

an outer waveguide for channeling the microwave radiation from said microwave oscillator into said heating room, said outer waveguide having a first end which is in communication with said heating room; and

a rotary reflector comprising a cylindrical inner waveguide projecting from said first end of the outer waveguide into said heating room to receive the microwave radiation from the outer waveguide and for reflecting the microwave radiation, and further comprising drive means for rotating said inner waveguide to cause irregular reflection of the microwave radiation, said inner waveguide including a proximal section disposed adjacent to said first end of the outer waveguide and a distal section extending from said proximal section remote from said first end of the outer waveguide, said distal section being inclined at an angle relative to a longitudinal axis of said proximal section, said inner waveguide being rotated by said drive means about said longitudinal axis of the proximal section, whereby the microwave radiation is distributed from said distal section of the inner waveguide in varying directions about said longitudinal axis.

4,629,850

HEATING APPARATUS HAVING A SELECTIVELY MOVABLE HEATER

Takeshi Tanabe, HigashiOsaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,977

Claims priority, application Japan, Oct. 5, 1984, 59-151654[U]

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 B **9 Claims**

1. A heating apparatus comprising:

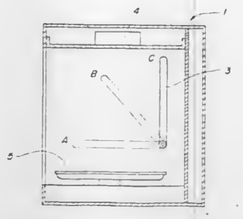
a heating cavity;

selectively movable heater means for heating an object, said heater means being movable to a position within said heating cavity;

detection means for detecting the position of said heater means and producing a signal representative thereof;

memory means for storing the signal produced by said detecting means;

control means for introducing and recalling data, including said signal, from said memory means; and



heater moving means, responsive to the position detected by said detection means and the data recalled from said memory means by said control means for selectively moving the heater means so as to set the heater means at a position defined by the signal output from the memory means.

4,629,851

APPARATUS FOR HEATING A LAYER OF DIELECTRIC MATERIAL USING RADIO FREQUENCY WAVES

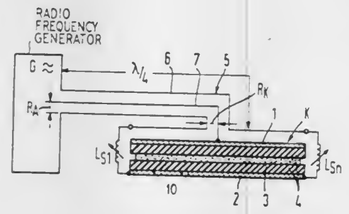
Johannes Holle, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,459

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434605

Int. Cl.⁴ H05B *6/48*

U.S. Cl. 219—10.81 **17 Claims**



1. Apparatus for heating a dielectric layer, comprising:

first and second electrodes for receiving the dielectric layer therebetween and therewith forming a load;

a radio frequency generator producing a predetermined voltage at a predetermined frequency;

a coaxial cable including an inner conductor for connecting said generator to said first electrode and an outer conductor for connecting said generator to said second electrode;

at least one inductor connecting said outer conductor to said second electrode;

a series resonant circuit including the capacitance of said electrodes, said conductors of said coaxial cable and said radio frequency generator, and a parallel resonant circuit having a resonant frequency equal to the resonant frequency of said series resonant circuit effective for the output of said radio frequency generator, said resonant frequency defined by the inductance L_S connected in series with the capacitance C_K of the load, the resonant frequency defining said predetermined frequency of said radio frequency generator; and

said cable having a length L defined by the relationship $L=\lambda/4+\lambda/2$, where λ is the wavelength and m=0 1, 2, 3 . . . etc., and a characteristic impedance Z selected such that the value of the operating resistance R_A of said generator is defined by the relationship Z^2/R_K, where R_K is the resistance of the load.

4,629,852

REGULATOR CIRCUIT FOR CONTROL OF HEAT OUTPUT OF A HEATING ELEMENT

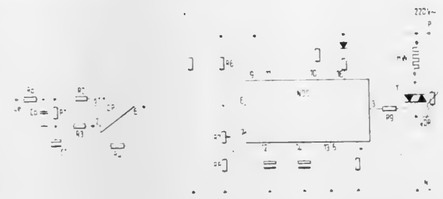
Wolfram K. Andre, Aichwald, Fed. Rep. of Germany, assignor to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,658

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305376

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—497 **22 Claims**



1. Process for controlling the heat output of a heating element supplied with electrical power pulses switched on and off by a semiconductor switch energized by a zero crossing switch having a regulator means for control of periodical oscillations whereby the number of power supply pulses transmitted to control said heat output of said heating element is variable, comprising the steps of:

deriving a sensor voltage (U1, U2) from a temperature sensing means, said sensor voltage (U1, U2) inversely proportional to a temperature-time curve (F1, F2) derived from said sensed temperature over time;

deriving a secondary control voltage (ΔU1, ΔU2) from said sensor voltage, dependent upon the slope of said sensor voltage measured over time;

combining said secondary control voltage (ΔU1, ΔU2) with said sensor voltage (U1, U2) at said zero crossing switch to regulate said periodical oscillations by subtracting said secondary control voltage (ΔU1, ΔU2) from said sensor voltage (U1, U2) in a heating phase and adding said secondary control voltage (ΔU1, ΔU2) to said sensor voltage (U1, U2) in a non-heating phase whereby the number of said power supply pulses transmitted to control said heating element in said heating phase causes said heating element to shut off at lower temperatures due to said secondary control voltage (ΔU1, ΔU2) and to shut off at higher temperatures in said non-heating phase due to said secondary control voltage (ΔU1, ΔU2);

supplying a threshold voltage to said zero crossing switch (NDS);

triggering said zero crossing switch (NDS) to energize said semiconductor switch (T) when said threshold voltage is exceeded by said sensor voltage (U1, U2) combined with said secondary control voltage (ΔU1,ΔU2); and

blocking said zero crossing switch (NDS) to prevent energization of said semiconductor switch (T) when said threshold voltage is lower than said sensor voltage (U1, U2) combined with said secondary control voltage (ΔU1,ΔU2).

4,629,853

APPARATUS FOR THE INTERNAL WELDING OF PIPES

Erik S. Yttergren, Fjugesta; Urban R. A. Strand, Finnerödja; Karl U. H. Jansson, and Karl-Erik Knipström, both of Laxa, all of Sweden, assignors to ESAB Aktiebolag, Gothenburg, Sweden

Filed Feb. 22, 1985, Ser. No. 704,467

Claims priority, application Sweden, Feb. 24, 1984, 8401018

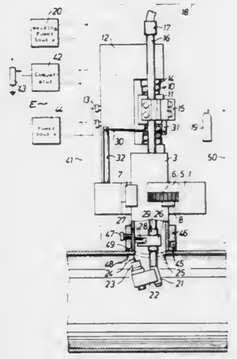
Int. Cl.⁴ B23K *9/12*

U.S. Cl. 219—60 A **19 Claims**

1. In an apparatus for the internal welding of an edge joint between a straight first pipe with a wall of known thickness and a central longitudinal axis, and a second pipe which together with said first pipe forms a pipe branch having an edge joint, said first pipe having a cross section which is smaller than the cross section of said second pipe, said apparatus including a nozzle holder for being introduced into said first pipe and capable of being displaced along said central, longitudinal axis of said first pipe, said nozzle holder projecting into said second pipe, in use, and including an electrode having an axis and a tip, said axis of said electrode forming, in operation, an acute angle with said central, longitudinal axis of said first pipe, said nozzle holder and said electrode being rotatable in use about said central, longitudinal axis of said first pipe, the combination of:

positioning means connected to and supporting said electrode and operative with an inside wall of said first pipe for automatically positioning of said electrode in relation to its radial gap to the edge joint;

means for continuously generating a first signal corresponding to an actual gap in the direction of said central longitudinal axis between said tip of said electrode and said edge joint;



reference means for generating a second signal representing a desired gap between said tip of said electrode and said edge joint in the direction of said central, longitudinal axis of said first pipe;

comparator means for comparing said first signal with said second signal and for generating a fault signal corresponding to a difference between said first and said second signals, and

motor means responsive to said fault signal for providing axial displacement of said electrode in a direction of said central, longitudinal axis of said first pipe to reduce said fault signal, whereby said electrode tip accurately tracks said edge joint even in the event of said first pipe being non-circular, and even with said first pipe and said second pipe being disposed at an angle which would result in an oblong edge joint lying on a substantially nonplanar surface.

4,629,854

TW-ELECTROEROSION WITH MEANS FOR REGULATING FLUSHING LIQUID IN CUTTING SLOT

Kiyoshi Inoue, Tokyo, and Akihiko Shimizu, Kanagawa, both of Japan, assignors to Inoue-Japax Research Incorporated and Japax Incorporated, both of Kanagawaken, Japan

Filed Feb. 14, 1984, Ser. No. 580,099

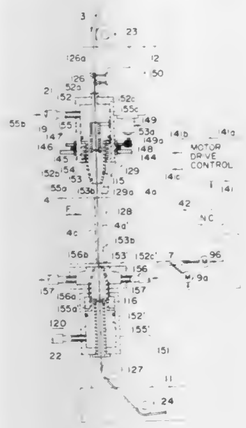
Claims priority, application Japan, Feb. 15, 1983, 58-22185; Mar. 18, 1983, 58-45806; Mar. 31, 1983, 58-53983

Int. Cl.⁴ B23H *7/02, 7/36*

U.S. Cl. 219—69 D **40 Claims**

21. In an apparatus for electroerosively cutting an electrically conductive workpiece with a continuous wire electrode, having means for axially transporting the wire electrode continuously through the workpiece while defining a cutting zone therewith flushed with a liquid medium, power supply means

for electrically energizing said traveling wire electrode and said workpiece to electroerosively remove material from the workpiece across the liquid flushed cutting zone and cutting feed means for relatively displacing the workpiece and the traveling wire electrode transversely to the latter along a prescribed cutting path, thereby progressively forming a cutting slot behind the wire electrode advancing along said path in the workpiece to produce therein a contour defined by said cutting slot, the improvement which comprises:



an elongate element in said cutting slot; and

means for positioning said elongate element in said slot immediately behind said wire electrode advancing in said slot and substantially in parallel with said advancing wire electrode during a course of the relative displacement of said wire electrode and said workpiece along said path whereby said elongate element controls flow of said liquid in said zone.

4,629,855

ELECTROEROSIVE CUTTING METHOD AND APPARATUS WITH A BAR-SUPPORTED ELECTRODE TAPE

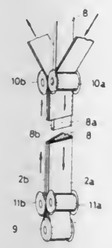
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed Dec. 18, 1984, Ser. No. 682,842

Claims priority, application Japan, Dec. 19, 1983, 58-237958; Dec. 21, 1983, 58-239824

Int. Cl.⁴ B23H *7/10*

U.S. Cl. 219—69 W **10 Claims**



5. An apparatus for cutting an electrically conductive workpiece with an electrode tape, comprising:

a tape dispensing means;

a tape takeup means;

means for advancing the electrode tape from the dispensing means towards the takeup means;

a tape guiding system comprising a rigid, straight bar having a V-shaped cross section and an elongated length greater than the thickness of said workpiece, said bar defining two opposed planar side surfaces extending parallel to its longitudinal axis and being disposed to extend through the workpiece from one side to the other side thereof, and means for placing portions of said advancing tape respectively into longitudinal engagement with the opposed surfaces of said bar, said system guiding the advancing tape in a continuous tape travel path from the dispensing means through the workpiece to the take-up means to form a continually renewing V-shaped elongated electrode machining surface in spaced juxtaposition with a fluid-flushed machining gap extending through the workpiece; and

means for relatively displacing said bar and the workpiece in a plane transverse machining to said longitudinal axis while an electroerosive machining current is passed between said renewing electrode face and the workpiece across the machining gap to advance erosive material removal in the workpiece.

4,629,856

TRAVELING-WIRE BACKING SUPPORT EDM METHOD AND APPARATUS

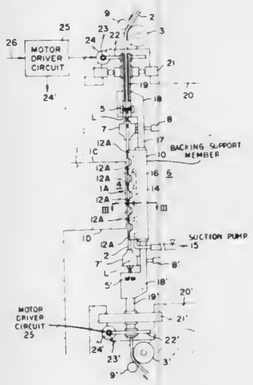
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed Nov. 4, 1983, Ser. No. 549,187

Claims priority, application Japan, Nov. 8, 1982, 57-194695

Int. Cl.⁴ B23H *7/06, 7/36*

U.S. Cl. 219—69 W **8 Claims**



3. A traveling-wire EDM apparatus, comprising:

a pair of wire-positioning guide members for establishing a straight-line path therebetween to be traveled axially by an electrode wire in spaced-juxtaposition with a contour of a conductive workpiece straddled by said guide members which are located on opposite sides of said workpiece;

means for effecting a relative displacement between the workpiece and the guide members to translationally advance the traveling wire, generally tangentially along the workpiece contour while electrical discharges are effected in a cutting zone flushed with a machining fluid between the traveling wire and the conductive workpiece contour to cut a precision contour therein with a depth of cut being at most substantially equal to the diameter of the electrode wire whereby a fluctuating machining pressure caused between the traveling wire and an instantaneous area of contour being cut tends to force the traveling wire to undulate and laterally remove away from said straight-line path in an essentially unilateral open space flanking said contour being cut;

a rotary mechanism having an element carried thereon which has rigid wire-supporting surfaces that are elongated substantially in parallel to said straight line path but transvese to the workpiece between the wire-positioning guide members disposed at opposite sides of the workpiece, and disposed in bearing contact with the traveling wire at least partly in said cutting zone whereby undulations in the traveling wire are minimized, said mechanism being rotatable about its axis of rotation coinciding with said straight-line path; and

means for rotating said mechanism about said rotary axis to orient said element so as to oppose said wire-supporting surfaces with said instantaneous area of contour being cut and to avoid a collision of said element with the workpiece.

4,629,857

STUD-WELDING DEVICE

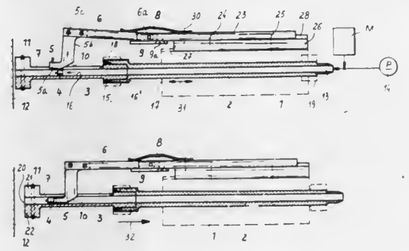
Wolfgang Gauger, Menden, Fed. Rep. of Germany, assignor to Obo Bettermann Org., Menden, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,858

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1984, 3408930

Int. Cl.⁴ B23K *9/20*

U.S. Cl. 219—98 **10 Claims**



1. A stud-welding apparatus comprising:

a housing;

a tubular chuck connected to a feed tube and axially shiftable on said housing, said chuck having a bore traversable by a stud which is of constant diameter over its length traversed by a stud;

a detent mounted on said housing and swingable on a pivot fixed relative to said housing and defining a pivot axis for said detent which is located outwardly of said chuck, said chuck having a lateral opening through which an end of said detent projects into said chuck;

means for feeding a stud through said tube and into said chuck past said detent, thereby deflecting said detent and enabling said detent to return to an original position in said chuck while said chuck is in an advanced position having a chuck mouth spaced from said detent, said end of said detent reaching into said chuck behind said stud;

means for retracting said chuck to bring said stud into engagement with said detent in the original position thereof and for thereafter again advancing said chuck to carry said stud away from said detent and out of electrical contact therewith, and to weld said stud onto a workpiece; and

means for setting an axial stroke of said chuck relative to said original position of said detent.

4,629,858

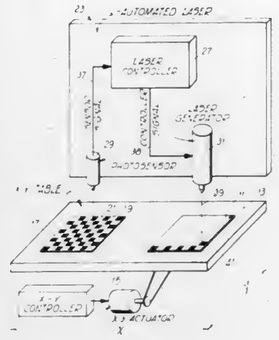
METHOD FOR ENGRAVING CARPET AND CARPET SO ENGRAVED

Joseph H. Kyle, LaGrange, Ga., assignor to Interface Flooring Systems, Inc., LaGrange, Ga.

Filed Dec. 12, 1983, Ser. No. 560,930

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LJ **6 Claims**



1. A method for engraving carpet, comprising the steps of:

(a) providing a section of carpet;

(b) moistening the section of carpet with water;

(c) providing a laser generator;

(d) orienting the laser generator so that its beam will impinge upon the section of carpet;

(e) allowing the laser beam to impinge upon the section of carpet according to a predetermined timing sequence; and

(f) moving the section of carpet relative to the laser beam according to a predetermined pattern.

4,629,859

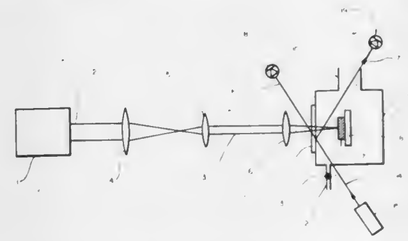
ENHANCED EVAPORATION FROM A LASER-HEATED TARGET

K. Virupaksha Reddy, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 12, 1985, Ser. No. 722,808

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LM **20 Claims**



1. A method for evaporating material from a target which comprises the steps of:

(a) cooling a target and condensing a layer of substantially inert gas on said cooled target to produce a coated target; and

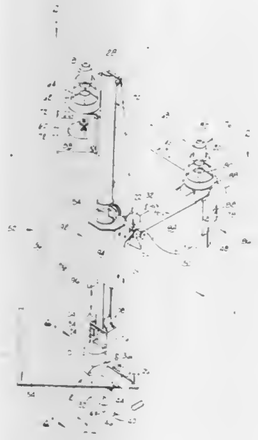
(b) irradiating said coated target with coherent light of a wavelength which is absorbed by the target, wherein the intensity of said light is effective to evaporate material from said target.

4,629,860

ROBOTIC APPARATUS AND METHOD FOR AUTOMATICALLY MOVING A TOOL THROUGH THREE DIMENSIONS AND MANUALLY TO AN EXTENDED POSITION

Torsten H. Lindbom, 1849 Kedron Cir., Fort Collins, Colo. 80524

Filed Oct. 30, 1984, Ser. No. 666,505
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—125.1 16 Claims



1. Apparatus wherein a tool is moved through a three-dimensional space and along a predetermined path in response to signals and in which the tool is also movable to an extended position so that the tool can perform work on an object comprising:

(a) a fixed base;

(b) a plurality of interconnected elements having one end connected to said base and terminating at another end;

(c) means responsive to said signals to move said interconnected elements and to move said another end through three dimensions to a desired location;

(d) a tool assembly attached to said another end;

(e) a tool holder attached to said tool assembly;

(f) a tool mounted in said tool holder;

(g) means responsive to said signals to move said tool assembly to adjust a first angular relationship between said tool and said object;

(h) means responsive to said signals to move said tool holder to adjust a second angular relationship between said tool and said object;

(i) extending means connected to said tool assembly for permitting extended movement of said tool wherein said extending means includes a first position in which said first and second angular relationships are adjusted and a second position in which said tool is moved to an extended position in order to access a relatively more remote work area;

(j) arm means operably connected to said extending means; and

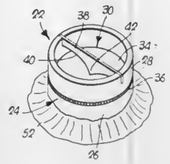
(k) shaft means connected to said arm means, said shaft means being at a fixed, predetermined angle relative to said arm means, said angle being selected to optimize the extension of said tool when said extending means is in said second position.

4,629,861

METHOD OF AFFIXING AN ALUMINUM RUPTURE DISC ASSEMBLY TO AN ALUMINUM CASTING

Donald R. Hibler, Sr., Bates City, Mo., assignor to Fike Metal Products Corporation, Blue Springs, Mo.

Filed Dec. 13, 1985, Ser. No. 808,850
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—137 R 20 Claims



1. In a method of affixing an aluminum rupture disc assembly to a 356 alloy heat-treated aluminum sand casting body having an aperture and comprising the steps of:

providing a tubular aluminum alloy rupture disc support member having a tubular passage;

mounting an aluminum alloy rupture disc across the tubular passage through the support member;

securing the rupture disc to the support member;

positioning the support member on the aluminum alloy body within the aperture in disposition causing the rupture disc to seal the aperture; and

securing the support member to the aluminum alloy body without adversely affecting the physical and chemical characteristics of the body, the support member or the disc,

said disc being of annealed aluminum of relatively thin stock and having a silicon content substantially less than that of the 356 aluminum alloy,

said support member also having a silicon content substantially less than that of the 356 aluminum alloy,

the securing of the support member to the aluminum alloy body being accomplished by welding wherein a fillet is generated for joining the support member to the body in surrounding relationship to the latter at the zone of merger of the support member with the aluminum alloy body,

said fillet being of aluminum alloy having a silicon content significantly greater than that of the 356 aluminum alloy.

4,629,862

SAMPLE HEATER FOR USE IN MICROSCOPES

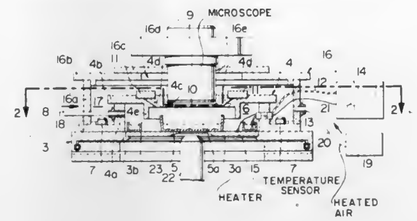
Hisao Kitagawa; Yasuo Inoue; Tadafumi Fujihara; Itaru Endo, and Yoshihiro Shimada, all of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Nov. 15, 1984, Ser. No. 671,732
Claims priority, application Japan, Mar. 28, 1984, 59-44814[U]; Mar. 28, 1984, 59-44815[U]; Mar. 29, 1984, 59-45643[U]; Mar. 29, 1984, 59-61770[U]; Apr. 2, 1984, 59-48228[U]
Int. Cl.[4] H05B *3/22;* G02B *21/30*
U.S. Cl. 219—200 24 Claims

1. A heater for a microscope, comprising:

a platform for supporting thereon a sample container and means for heating at least part of the platform;

a first heater box connected to said platform and forming a first space which surrounds said sample container;



a second heater box, said first heater box being located in said second box and forming therewith a second space which surrounds said first heater box; and

heater means for heating said second space.

4,629,863

MOUTHPIECE FOR HAIRDRYER

Jose Giordano, 4, Av. Mousquines, Lausanne, Switzerland 1005

PCT No. PCT/CH81/00005, § 371 Date Oct. 6, 1981, § 102(e) Date Oct. 6, 1981, PCT Pub. No. WO81/02246, PCT Pub. Date Aug. 20, 1981
PCT Filed Jan. 19, 1981, Ser. No. 309,894
Claims priority, application Switzerland, Feb. 13, 1980, 1157/80
Int. Cl.[4] A45D *20/12;* F24H *3/00;* B05B *1/28*
U.S. Cl. 219—373 3 Claims



1. A nozzle attachment for a hand-held hair dryer comprising:

a body portion for connection with a hand-held hair dryer air outlet, said body portion having a forward end outlet opening for drying air,

means for protecting a subject whose hair is being treated by directing drying air issuing from said outlet opening around the periphery of a cylindrical hair curling brush and away from the scalp of said subject including:

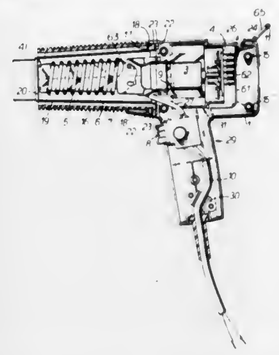
a forwardly extending arcuate drying air deflector integral at its rear end with the forward end of said body portion adjacent to one side of said outlet opening, said deflector extending forwardly of and curved transversely across said outlet opening in an arcuate path approximating a half circle permitting said cylindrical hair curling brush being placed above and across said deflector within the space encompassed by the arcuate deflector to curl hair while the deflector directs drying air issuing from the outlet opening away from the scalp of said subject.

4,629,864

HOT AIR GUN

Peter H. Wilson, Stockton-on-Tee, United Kingdom, assignor to Black & Decker, Inc., Newark, Del.

Filed Mar. 8, 1984, Ser. No. 587,704
Claims priority, application United Kingdom, Dec. 23, 1983, 8334366
Int. Cl.[4] F24H *3/00;* H05B *1/00*
U.S. Cl. 219—374 14 Claims



1. A hot air gun capable of stripping paint and comprising:

a clam-shell housing defining a cavity,

an electric motor disposed in said cavity,

a fan in said cavity drivingly connected to the electric motor,

heating means comprising a former and a helical heating element mounted on the former, said heating element projecting from said housing downstream of the fan,

an inner tubular member generally coaxially surrounding the helical heating element and having opposed first and second ends, said second end being securely clamped within said clam-shell housing, and the first end projecting from the housing and defining an air outlet, and

an outer tubular member having opposed first and second ends, said second and being separately clamped by said clam-shell housing, and the first end projecting from the casing in coaxial relation to the inner tubular member,

wherein the inner and outer clamped tubular members are circumferentially spaced thereby defining an annular air flow path therebetween.

4,629,865

ELECTRIC OVEN WITH IMPROVED BROILER

George Freedman, Wayland; Robert F. Bowen, Burlington, and Kenneth W. Dudley, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 23, 1985, Ser. No. 694,192
Int. Cl.[4] F24C *7/06*
U.S. Cl. 219—405 18 Claims

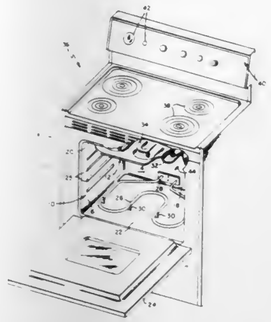
1. An electric oven, comprising;

an oven cavity;

a contoured metal concentrator having a serpentine-shaped downwardly facing trough;

a rod-like sheathed electric resistive broiling element having a section substantially conforming to the shape of said serpentine trough, said section having a diameter substantially smaller than the entrance to said trough, said section

being recessed within said trough and connected thereto wherein a portion of the energy radiated from said broil-



ing element in an upward or sideward direction is reflected to a downward direction; and

means for activating said broiling element.

4,629,866

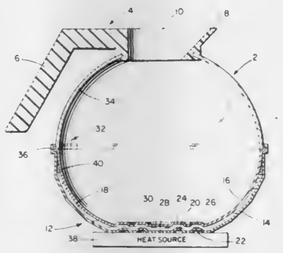
METHOD AND DEVICE FOR TRANSFERRING HEAT THROUGH A DOUBLE WALLED CONTAINER

Rudy Proctor, Costa Mesa, Calif., assignor to R & P Company, Los Angeles, Calif.

Filed Oct. 10, 1984, Ser. No. 659,458

Int. Cl.[4] A47G *23/04*

U.S. Cl. 219—439 **19 Claims**



1. A device for transferring heat from a heating source to the contents of an article, said device comprising:

heat transfer means including

an outer wall adapted to be heated by a heat source located externally of said heat transfer means, said heat source having a temperature above 212° F. and an exterior surface of said outer wall being substantially exposed to the atmosphere;

an inner wall secured to said outer wall;

sealed cavity defined between said inner wall and said outer wall;

a heat transfer liquid located in said sealed cavity for absorbing heat from said heat source through said outer wall and for transferring heat at a temperature above 212° F. through said inner wall to the contents of said article to heat the contents of said article to a temperature below 212° F., said heat transfer liquid filling substantially all of the sealed cavity;

a remaining portion of said cavity, other than a portion filed with said heat transfer liquid, includes a vacuum; and

an upper edge of said heat transfer means defines a sealing means for sealing said heat transfer means to said article.

4,629,867

HEATED ROTATABLE ROLL ARRANGEMENT

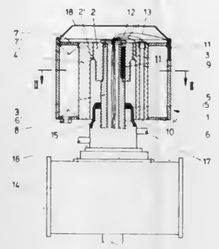
Josef Baumgartinger, Ungenach; Ernst Rauch, Aurach a. Hongar; Haio Harms, Gmunden, and Adalbert Wimmer, Vöcklabruck, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Mar. 25, 1985, Ser. No. 715,398

Claims priority, application Austria, Mar. 29, 1984, 1061/84

Int. Cl.[4] H05B *3/02*; **B21B** *27/06*

U.S. Cl. 219—469 **9 Claims**



1. In a heated roll arrangement for thermally treating formed products, of the type including a driven hollow shaft, a hollow roll body of circular-ring shaped cross-section closed on all sides having a cylindrical inner part and a cylindrical outer shell and defining a cavity adapted to contain a heat transfer medium therein, electric heating elements, electric power supply lines for heating said heating elements, temperature probes and electric wires for said temperature probes, said power supply lines and said electric wires being led through said hollow shaft, the improvement wherein

said hollow roll body is mounted on a hub secured at one end of said hollow shaft, said hub providing limited heat transmission from said hollow roll body to the hollow shaft,

said heat transfer medium is contained in said cavity in the hollow roll body and is selected from the group consisting of at least one saline compound, at least one low-melting metal and at least one low-melting metal alloy,

said heating elements are provided in said cylindrical inner part of said hollow roll body and evenly distributed therein, and

said temperature probes are arranged both in said cylindrical inner part and in said cylindrical outer shell of said hollow roll body.

4,629,868

HEATING PAD, PARTICULARLY FOR VEHICLE SEATS

Bo Svensson, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden

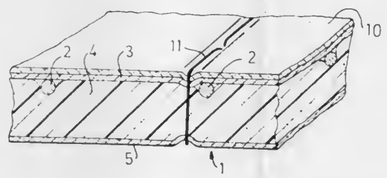
PCT No. PCT/SE84/00319, § 371 Date May 28, 1985, § 102(e) Date May 28, 1985, PCT Pub. No. WO85/01632, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 28, 1984, Ser. No. 740,062

Claims priority, application Sweden, Sep. 28, 1983, 8305245-6

Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—528 **8 Claims**



1. Heating pad comprising at least one electrically insulated heating wire (2) laid in loops between a first covering layer (3) and an intermediate layer (4) joined to said first covering layer, on its opposite side the intermediate layer being joined to a second covering layer (5), the heating wire being laid out in its intended pattern on the intermediate layer without being secured to the intermediate layer, said intermediate layer being of soft material and having a thickness at least twice as great as the diameter of the wire, the elasticity of the intermediate layer being such that the heating wire is kept resiliently impressed to such a depth in the intermediate layer by the first covering layer that the first covering layer has a smooth appearance, the heating wire being free to displace elastically sideways in the heating pad, said heating wire having a hard insulation on the surface thereof, the heating wire being thus enabled to be moved elastically to one side without being damaged by a sharp object penetrating the heating pad.

4,629,869

SELF-LIMITING HEATER AND RESISTANCE MATERIAL

Wolfgang A. Bronnvall, Hallandsgatan 10, S-25252 Helsingborg, Sweden

PCT No. PCT/SE83/00382, § 371 Date Jul. 12, 1984, § 102(e) Date Jul. 12, 1984, PCT Pub. No. WO84/02048, PCT Pub. Date May 24, 1984

PCT Filed Nov. 8, 1983, Ser. No. 631,550

Claims priority, application Sweden, Nov. 12, 1982, 8206442

Int. Cl.[4] H05B *3/10*

U.S. Cl. 219—553 **19 Claims**



1. A self-limiting electrical heating device comprising an electrical resistance material the resistivity of which is changed by more than a power of 10 within a predetermined, narrow temperature interval and which is arranged between electrical conductors connectable to a voltage source, the conductors and the resistance material being enclosed in an electrically insulating cover, characterized in that the electrical resistance material comprises (1) an electrically relatively non-conducting, crystalline, monomeric substance which melts at about the predetermined narrow temperature interval and which constitutes the outer phase, (2) particles of at least one electrically conducting material distributed in the non-conducting material, (3) at least one non-conducting particulate filler said filler being insoluble in the non-conducting material and having a considerably higher melting point than the non-conducting material, similarly distributed in the non-conducting material, whereby the weight ratio between the components (1) and (3) is from 10:90 to 90:10.

4,629,870

TAMPER PROOF ODOMETER

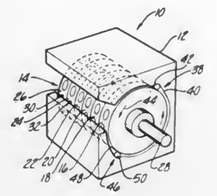
Gerald F. Lewis, 710 S. U.S. 23, Harrisville, Mich. 48740

Filed Aug. 28, 1985, Ser. No. 770,262

Int. Cl.[4] G01C *22/00*

U.S. Cl. 235—96 **5 Claims**

1. An odometer comprising: a plurality of alignedf digit wheels mounted on a common shaft for rotation to display a count, each wheel movable at a decimal ratio of the other wheels; a digit viewing window displaying one digit of each wheel; marking means adjacent the two highest order wheels for leaving an indicia on these wheels as they are advanced past said viewing window; and means associated with one of the lower order wheels for preventing rotation of that digit wheel in a direction to decrement the displayed count, including a cam-shaped groove continguous to the periphery of said one of the lower order digit wheels and a ball contained therein which permits free movement in an incrementing direction, but



which moves in said cam-shaped groove to lock said wheel against movement in the decrementing direction.

4,629,871

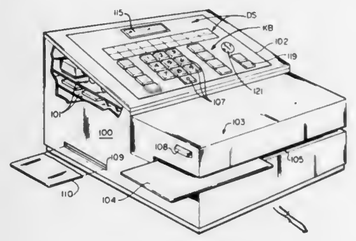
ELECTRONIC POSTAGE METER SYSTEM SETTABLE BY MEANS OF A REMOTELY GENERATED INPUT DEVICE

Albert W. Scribner, Darien, and Frank T. Check, Jr., Orange, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 28, 1979, Ser. No. 108,261

Int. Cl.[4] G06F *5/10*

U.S. Cl. 235—375 **4 Claims**



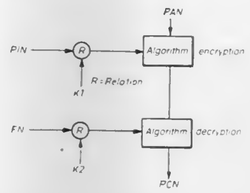
1. In a microprocessor controlled postal meter system having a postal meter with a postage printer and an accounting means for maintaining an accurate record of account of an amount chargeable, a central memory, and a data entry means for entering data into said meter system, the improvement being a method of recharging said meter system comprising the steps of: generating a truly random sequence of comginations, combining said combinations with fixed chargeable amounts of postage in accordance with a predetermined pattern to form a sequence of charging combinations, storing said charging combinations in said meter system central memory in a non-alterable manner, storing said charging combinations in a central postal authority computer bank, issuing upon request a further unique charging combination from said central postal authority computer bank encompassing both a postal meter identification and a charging combination representing a specific desired postal amount, entering said further unique charging combination onto said data entry means, inserting said data entry means into a postal meter system, said central memory recognizing said unique charging combination relative to said postal meter system, decoding therefrom the encoded postal amount, entering same in said accounting means.

4,629,872

METHOD AND APPARATUS FOR VERIFYING PERSONAL IDENTIFICATION NUMBERS AND CHECKING STORED NUMBER SERIES IN IDENTIFICATION MEDIA

Björn I. C. Hällberg, Linköping, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 16, 1984, Ser. No. 672,578
Claims priority, application Sweden, Nov. 17, 1983, 8306349
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **9 Claims**



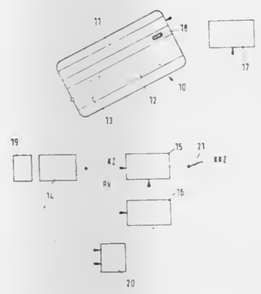
1. A method of verifying a personal identification number (PIN) and checking a number series put onto an idenfication medium, containing information readable by machine in the form of a card and account number (PAN) and permanent information in the form of a permanently inscribed number (FN), said method including encryption of the read card or account number with an algorithm defined by a first key, the first key being formed by a relation between the personal identification number (PIN) and first key number, encryption of a personal check number (PCN) with an algorithm defined by a second key, and comparison of the thus coded card or account number with the coded personal check number (PCN), characterized in that the second key is formed by a relation between the permanent number (FN) and a second key number (K2).

4,629,873

METHOD AND MEANS FOR PRODUCING AND ANALYZING SECRET IDENTIFYING CODE MARKS IN MACHINE-SCANNED DATA CARRIERS

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Strasse 36, D-7730 Villingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 369,212, Apr. 16, 1982, abandoned, and a continuation of Ser. No. 158,446, Jun. 11, 1980, abandoned.
This application Feb. 10, 1984, Ser. No. 578,602
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924325
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—380 **4 Claims**



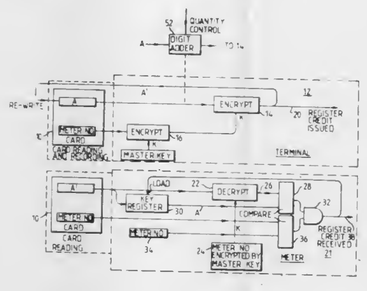
1. A data carrier comprising a sheet, magnetic storage media on said sheet, a punch tape embedded in the sheet and concealed from visual viewing, said tape including a first set of data representing identifier information and a second set of data representing instructions for processing said identifier information, an identifying mark on the sheet, said mark having a measurable property which is related to the identifier information, and said magnetic media having data stored thereon related to the identifier information.

4,629,874

PREPAYMENT METERING SYSTEM

Peter C. Pugsley, Middlesex, and Rowland A. G. Dunkley, Bedford, both of England, assignors to The De La Rue Company PLC, Maidenhead, England

Filed Dec. 26, 1984, Ser. No. 686,794
Claims priority, application United Kingdom, Jan. 12, 1984, 8400809
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **15 Claims**



1. A prepayment metering system for use with a card having a recording medium of the kind permitting recording and erasure of information, the system comprising a terminal station having:
- means for receiving the card;
- means for reading a first number (A) recorded on the card;
- encryption means utilising the first number (A) to obtain a second number (A');
- and recording means for recording the second number on the card in place of the first number;
- and further comprising a meter having:
- means for receiving the card;
- means for reading the said second number (A') from the card;
- a store in which is stored a number, obtained from the card during its previous insertion in the meter, and which is, or is derived from, the first number (A) stored on the card at the time of its previous insertion;
- means for carrying out a comparison step involving a complementary decryption process or the same encryption process and utilising the second number (A') read from the card and the first number (A) derived from the store in the meter;
- means for registering a credit if the comparison is successful;
- and means for replacing the number in the meter store by a new number which is, or is derived from, the number (A') read from the card, in preparation for the next card insertion.

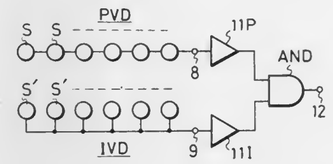
4,629,875

VERIFYING DEVICE FOR A KEY CARD

Saburo Uemura, Yokohama, Japan, assignor to Macome Corporation, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,307
Claims priority, application Japan, Dec. 3, 1982, 57-212174
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—450 **2 Claims**

1. A verifying device for a key card, said key card having at least first and second magnetic signals recorded at first and second locations thereon, comprising:
- a set card having at least third and fourth magnetic signals recorded at third and fourth locations thereon;
- at least a first saturable core disposed within an influence of said first and third magnetic signals;
- at least a second saturable core disposed within an influence of said second and fourth magnetic signals;
- a first winding on said first saturable core;
- a second winding on said second saturable core;
- an oscillator supplying an oscillating signal in parallel to said first and second windings;
- a first switching element controlled by said oscillating signal through said first winding;
- a second switching element controlled by said oscillating signal through said second winding;



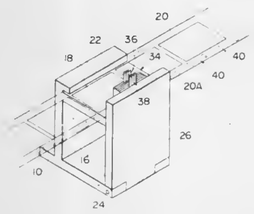
- a parallel coincidence output of said first and second switching elements;
- said first saturable core having a saturation magnetic field greater than a magnetic field available from said first and third magnetic signals acting along and less than a magnetic field available from said first and third magnetic signals acting together; and
- said second saturable core having a saturation magnetic field greater than a magnetic field available from said second and fourth magnetic signals acting alone and less than a magnetic field available from said second and fourth magnetic signals acting together, whereby a coincidence output condition of said parallel coincidence output is achieved only when said first magnetic signal corresponds with said third magnetic signal and said second magnetic signal corresponds with said fourth magnetic signal.

4,629,876

BAR CODE READER

Kazufumi Kubota; Seiichi Yamazaki, and Yoshiyuki Monma, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1984, Ser. No. 680,020
Claims priority, application Japan, Feb. 27, 1984, 59-035644
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—473 **22 Claims**



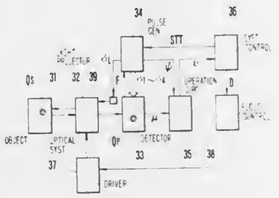
1. A bar code reader for reading a bar code formed on a portion of a moving object subjected to detection of information near one side end surface thereof, comprising:
- (a) a movable member abutting against said side end surface of said moving object so as to follow any change in position of said side end surface of said object;
- (b) a sensor head secured to said movable member so as to move with said movable member; and
- (c) a bundle of optical fibers secured to said sensor head such as to oppose said bar code on said object in order to read said bar code,
- whereby said optical fiber bundle follows any movement of the position of said bar code caused by a change in position of said side end surface of said object, thereby allowing correct reading of said bar code.

4,629,877

PHOTO-ELECTRIC CONVERSION DEVICE

Yuichi Sato; Tokuichi Tsunekawa; Takashi Kawabata, and Susumu Matsumura, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha

Filed Apr. 3, 1984, Ser. No, 596,268
Claims priority, application Japan, Apr. 4, 1983, 58-59601
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **5 Claims**



1. A photo-electric conversion element comprising:
- light emitting means for continuously repeating light emission;
- a photo-electric conversion part for receiving light generated by said light emitting means and light reflected from ambient light;
- a first storage part for storing information which has been photo-electrically converted at the photo-electric conversion part when the light emitting means emits light;
- a second storage part for storing information which has been photo-electrically converted at the photo-electric conversion part when the light emitting means does not emit light;
- a gate part for transferring the information which has been photo-electrically converted at the photo-electric conversion part to the first and second storage parts; and
- means for generating pulses which control an operation of the gate part, said pulse generating means producing pulses to control an opening and closing of the gate part for changing over the transfer of the photo-electrically converted information from the photo-electric conversion part at a time of light emission to the first storage part and to the second storage part for every light emitting cycle of the light emitting means.

4,629,878

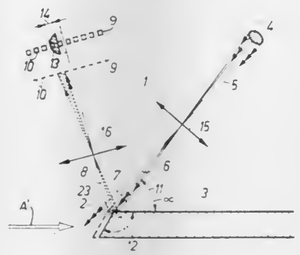
OPTICAL APPARATUS FOR CONTROLLING A TOOL

Jean-Pierre Blanc, Morges; Francis Carrard, Lonay, and Claude Devenoges, Morges, all of Switzerland, assignors to Ateliers de Constructions Mecaniques de Vevey S.A., Switzerland

Filed Feb. 7, 1984, Ser. No. 577,895
Claims priority, application Switzerland, Feb. 11, 1983, 774/83
Int. Cl.[4] G05B *1/00*
U.S. Cl. 250—202 **10 Claims**

1. Optical apparatus (1) for detecting the position of a reference line (2) formed by the edge of a sheet, respectively of a metal sheet of a copying template, or of the edge of a line of sufficient width drawn on a support, the optical apparatus (1)

carried by an arm and comprising a light emitter (**4**), this emitter producing a light ray (**5**) which travels a first incident axis (**6**) to fall in the shape of a spot (**7**) on a point of said reference line where it is diffused and spreads out in various directions, particularly in that of a second axis of diffused light (**8**) connecting this point to a receiver (**9**) whose surface consists of a large number of cells (**10**), each being sensitive to the radiation received and producing an electric signal as a function of said spot brightness, the group of the signals received by the receiver supplying data entering into an electric apparatus acting on the elements that carry the optical apparatus so that the spot of light (**7**) falling on the reference line (**2**) whose path can be rectilinear or curvilinear, follows the reference line during the advance of the operation in progress, by keeping the arrangement of the reference line (**2**) and of the optical apparatus (**1**) equal to an instruction value which can be suited to the nature of the operation in progress, the movements of the optical apparatus (**7**) controlling the concomitant movements of a tool so that this tool follows a path homologous to the reference line (**2**), characterized in that: the position (**19**) in relation to the receiver (**9**) of the bright spot (**13**) diffused on the receiver by the spot (**7**) falling on the reference line (**2**), constitutes an adjustment signal used to keep at a desired value the instruction for the distance between the optical apparatus and the reference line, and in that the width (**14**) of the bright spot (**13**) falling on the receiver (**9**) constitutes an adjustment signal used for the control of the transverse movements of the optical apparatus (**7**) in relation to the reference line (**2**).



4,629,879

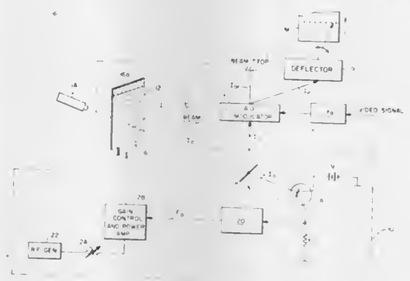
LIGHT BEAM INTENSITY CONTROLLING APPARATUS

Roger E. Baldwin, Hilton, and Nea-Yea Woo, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,453

Int. Cl.⁴ G01J *1/32;* **G01R** *27/02*

U.S. Cl. 250—205 **4 Claims**



1. Beam intensity controlling apparatus for producing a relatively constant intensity light beam which may be applied as an input to a utilization device, comprising:

(a) an acoustooptic cell for receiving an input light beam and producing a zero-order beam and a diffracted light beam in response to an input RF signal, changes in the amplitude of said RF signal causing intensity changes in the diffracted and zero-order beams;

(b) means for producing an error signal which is a function of the high-frequency variations and the low-frequency variations of the zero-order beam from a desired constant intensity level; and

(c) adjustable means being responsive to said error signal for controlling the amplitude of said RF signal to change the intensity of the zero-order beam toward said desired constant intensity level.

4,629,880

GATE BIAS GENERATING CIRCUIT FOR FIELD EFFECT TRANSISTORS

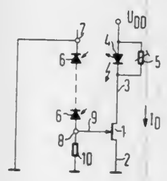
Walter Zimmermann, Dorfen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 591,307

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311489

Int. Cl.⁴ G01J *1/32*

U.S. Cl. 250—205 **20 Claims**



1. A circuit for generating a gate bias voltage, a source current and a drain current, and hence, an operating point, for at least one field effect transistor (FET), which requires a channel current above a predetermined value, the circuit comprising:

(a) at least one electrically operated light source connected in series with said at least one transistor so that at least a part of said channel current flows through said light source, said light source radiating light energy when the part of said channel current flowing through said light source exceeds a predetermined threshold;

(b) a least one photocell connected to the gate of the at least one transistor, for receiving said light energy and for generating a dc voltage in response thereto, said voltage applied to the gate of said at least one FET in such a manner that the applied gate voltage counteracts said channel current; and

(c) an electrical device connected in parallel with said at least one electrically operated light source for the adjustment of the channel current and the part of said channel current flowing through said light source.

4,629,881

POWER SUPPLY FOR AN INTENSIFIED NIGHT SIGHT

Raymond J. Fairbend, Thornton Heath, England; Richard T. Holmshaw, Cadier en Keer, Netherlands, and Colin H. Petley, Epsom, England, assignors to U.S. Philips Corp., New York, N.Y.

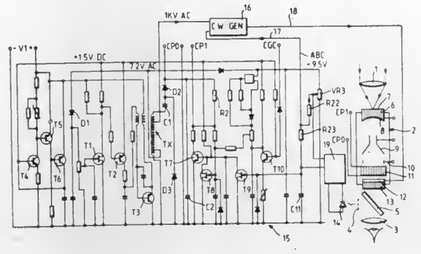
Filed Mar. 20, 1985, Ser. No. 713,959

Claims priority, application United Kingdom, Mar. 23, 1984, 8407622

Int. Cl.⁴ H01J *31/50, 40/14*

U.S. Cl. 250—213 VT **3 Claims**

1. A power supply for an image intensifier sight comprising an image intensifier having an image input photocathode and an electron luminescent output image screen which receives an electron current derived from said photocathode, a graticule injection system for superposing a graticule upon the output image screen, and a light source for illuminating said graticule, said power supply being characterised in that means are provided for deriving a signal from said electron current and related to the brightness of the output image screen, and in that means are provided for controlling the brightness of the light source in response to said signal to automatically maintain the ratio between the output image screen brightness and the graticule brightness substantially constant.



4,629,882

IMAGE POSITION DETECTOR

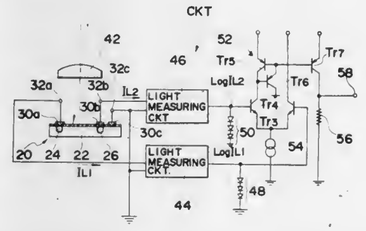
Motonobu Matsuda, Kawachinagano, and Toru Matsui, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 362,033, Mar. 25, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,579

Claims priority, application Japan, Mar. 26, 1981, 56-44818

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 J **22 Claims**



13. A semiconductor detector assembly adapted for use in an image position detecting system comprising:

a semiconductor member having a base member of a first semiconductor material and having an operative planar surface and a discrete reference area made of a second semiconductor material and provided within said base member, to partially appear in said operative surface, said discrete reference material extending from said planar surface substantially perpendicularly into said base member, any overlapping of said respective discrete reference area and said base material occurring only in said discrete reference area to form a junction of said first and second semiconductor materials under a part of said operative surface, said base member and said reference area generating in response to radiation energy incident upon said operative surface, an electrical current which exponentially varies with the incident position of said radiation energy relative to said reference area;

first and second electrodes provided on said reference area and said base member respectively to output said electrical current;

means for positioning the radiation energy representative of an object in a discrete pattern that is less than the entire operative surface of the base member;

means connected to said first and second electrodes for measuring said electrical current; and

means for determining the position of the object in response to the measured electrical current.

4,629,883

PROTECTIVE DEVICE FOR MOVABLE SHELVES

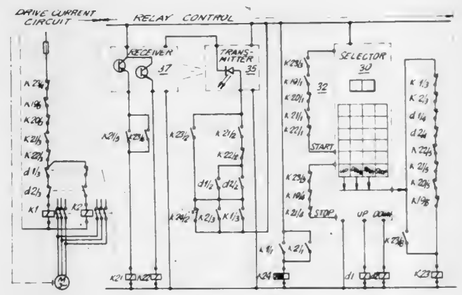
Edgar Geiger, Kötz, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne, Günzburg/Donau, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,282

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312191

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—221 **1 Claim**



1. Protective device for use with movable mechanical shelves or similar devices, such as paternoster shelves, where the shelves are arranged to be guided along a path of movement to a removal opening, including at least one light barrier and a circuit for checking the removal opening, said at least one light barrier comprising a light transmitter and a separate light receiver aligned parallel to one of the upper and lower edges of the removal opening, wherein the improvement comprises an electrical current circuit for said protective device, an electromechanical relay control and several switches arranged so that the electrical current circuit is closed by the electromechanical relay control and said several switches until the required shelf is positioned in the removable opening or the light barrier is interrupted, such as by an intervening hand placed in the removal opening and the light transmitter (**35**) is switched off from the current, a relay having two outputs and respective relays (**K 21, K 22**) for switching off the current to said light transmitter and said light receiver (**37**), one of said respective relays operates as a contact closing the device and the other said respective relay operates as a contact opening device, two switches (**K 21/3, K 22/3**) doubly interrupt the electrical current circuit and tube switches (**K 21/5, K 22/5**) for closing a test current circuit, a selector (**30**) having a selector key whereby after pressing the selector key the light transmitter (**35**) switches to the bright condition via a starting relay (**K 23**) and an associated switch (**k 23/2**) and the bright condition afforded permits a start signal to return to the selector (**30**) only when an intact light barrier and relay control through said receiver is effective by changing the circuit conditions of said relays (**K 21, K22**) and switches (**K 21/1, K 22/1**) associated with said relays (**K 21, K22**) and shelf directional relays (**d 1, d 2**) connected to said electrical current circuit for releasing a directional order of movement of the shelves to the electrical current circuit.

4,629,884

ELECTROMAGNETIC RADIATION CIRCUIT ELEMENT INSENSITIVE TO EXTERNAL RADIATION

Arne Bergström, Drottninghamnsv. 72, 13146 Nacka, Sweden

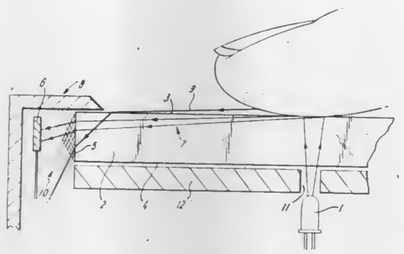
PCT No. PCT/SE84/00031, § 371 Date Oct. 3, 1984, § 102(e) Date Oct. 3, 1984, PCT Pub. No. WO84/03186, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 1, 1984, Ser. No. 667,481

Claims priority, application United Kingdom, Feb. 3, 1983, 8302997

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 250—227 **8 Claims**



1. An electromagnetic radiation circuit element insensitive to external radiation comprising a radiation propagating unit having a touching surface and a further surface extending at a side of said touching surface, a radiation source arranged to direct radiation into said unit towards said touching surface and a radiation detector facing said side surface, an identifiable change being produced in the radiation which reaches the detector from the radiation source through changes in the conditions for total internal reflection in said touching surface when the touching surface of the unit is touched by an actuating object, wherein external radiation entering said unit through said touching surface can leave said unit at said side surface thereof but in a manner substantially insufficient to effect actuation of said detector thereby due to refraction of said external radiation at a surface of the radiation propagating unit.

4,629,885

SCANNING APPARATUS

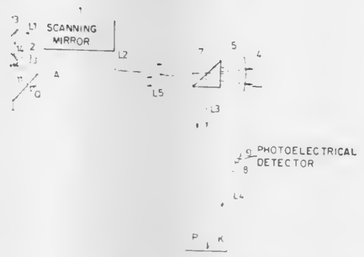
Nils G. Asemyr, Onsala, Sweden, assignor to Semyre Electronics AB, Frolunda, Sweden

Filed Jan. 31, 1984, Ser. No. 575,582

Claims priority, application Sweden, Jan. 31, 1983, 8300480

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—235 **6 Claims**



1. Scanning apparatus with large resolution capacity for scanning a picture plane (K) having small details which are to be detected, the apparatus including a light source (1) for transmitting a substantial parallel, narrow light beam (L1) directed toward a movable scanning mirror (4), said light beam following an optical ray path including a diverging lens (2) and a positive lens (5) for scanning said picture plane as a sweeping light dot along a repetitive sweeping line, characterized in that said diverging lens (2) is disposed at an optic axis common to said positive lens (5) and to said movable scanning mirror (4), also a beam divider (7) is arranged at said optic axis, said beam divider (7) and said positive lens (5) being inserted between said diverging lens (2) and said scanning mirror (4), and said positive lens (5) being arranged between said beam divider (7) and said scanning mirror (4) to transfer the light beam (L2) directed onto said scanning mirror as well as the light beam (L3, L5) reflected from said scanning mirror through both said positive lens (5) and said beam divider (7), said beam divider (7) directing the reflected light onto said picture plane (K).

4,629,886

HIGH RESOLUTION DIGITAL DIFFRACTION GRATING SCALE ENCODER

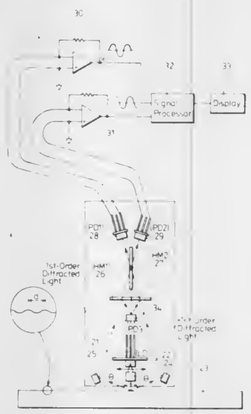
Koji Akiyama, and Hideto Iwaoka, both of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,511

Claims priority, application Japan, Mar. 23, 1983, 58-48187; Jul. 21, 1983, 58-133138

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—237 G **9 Claims**



1. An optical scale reader comprising

a light source for radiating a beam of coherent light on a reflective scale to produce at least two light beams which are diffracted and reflected by said scale;

a half mirror for mixing the at least two defracted and reflected light beams for interference with each other;

an optical system for causing said at least two diffracted and reflected light beams to impinge on said half mirror at particular angles of incidence so that a first interfering light beam leaving said half mirror on one side thereof is caused to be 90° out of phase with a second interfering light beam leaving the other side of said half mirror;

a first photodetector for detecting said first interfering light beam leaving said half mirror and for producing a first electric signal in response thereto;

a second photodetector for detecting said second interfering light beam leaving said half mirror and for producing a second electrical signal in response thereto; and

signal processor means for processing said first and second electrical signals to generate a signal indicative of a distance moved by said scale.

4,629,887

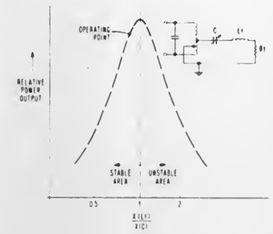
PLASMA EXCITATION SYSTEM

John A. Bernier, Lexington, Mass., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 473,386, Mar. 8, 1983. This application Jan. 9, 1985, Ser. No. 690,363

Int. Cl.⁴ H01S *1/00*

U.S. Cl. 250—251 **9 Claims**



1. A radio frequency exciter apparatus for producing an inductively coupled plasma to excite an analytic sample, comprising:

(a) radio frequency generator means for producing electrical power of selected radio frequency, said generator means having power output tuning means, comprised of at least one output tuning inductor means and a tuning capacitor means connected in parallel therewith, for determining said generator radio frequency, said tuning inductor means having a series connection of a first portion, a second, center, portion and a third portion;

(b) a separate plasma load circuit connected to said generator means and comprised of a work coil means and a series connected, impedance matching capacitor, wherein said plasma load circuit is directly connected to said output inductor, said work coil means produces an inductively coupled plasma and said impedance matching capacitor means is used to substantially balance the combined inductive reactances of said work coil means and plasma; and

(c) control means for controlling the power input into said plasma load circuit to stabilize said plasma and reduce fluctuations thereof;

(d) wherein said output tuning inductor means first portion is connected between a first side of said tuning capacitor means and said direct connection to the plasma load circuit, and said center portion is connected between said direct connection to the plasma load ground and a second side of said tuning capacitor means, said connections comprising means for automatically compensating for changing load impedance by shifting the frequency of said generator means.

4,629,888

WELL LOGGING TOOL FOR HOT WELL BORES

Piero Wolk, 1717 Brittmore, Houston, Tex. 77043

Filed Oct. 18, 1985, Ser. No. 788,951

Int. Cl.⁴ G01V *5/00*

U.S. Cl. 250—256 **14 Claims**

1. Apparatus incorporated into a well-logging tool for insulating enclosed electronic devices against heat damaging temperatures when used in deep hot well bores, comprising:

(a) a first vacuum chamber insulating means defined by

(1) the outer casing of a section of the well-logging tool formed into a first bulkhead at its lower end;

(2) an inner casing disposed to

(i) define a first annular chamber within said outer casing,

(ii) be formed into a second bulkhead at its lower end in spaced apart relation from said first bulkhead, and

(iii) be connected in sealed relationship at its upper end with the upper said end of said outer casing;

(3) a shock and stabilizing means mounted between said first bulkhead and said second bulkhead;

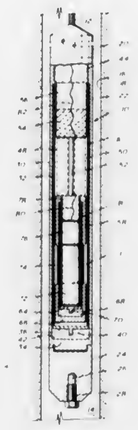
(b) said first vacuum chamber defining a components chamber insulated by said first vacuum chamber to shield its contents against the temperature in a well bore;

(c) a second vacuum chamber mounted within said components chamber and defined by

(1) an outer tube formed into a third bulkhead at its lower end;

(2) an inner tube disposed to

(i) define a second annular chamber within said outer tube,



(ii) be formed into a fourth bulkhead at its lower end in spaced apart relation from said third bulkhead, and

(iii) be connected at its upper end in sealed relation with the upper end of said outer tube;

(3) a shock and stabilizing means mounted between said third bulkhead and said fourth bulkhead;

(d) said second vacuum chamber defining a detection chamber insulated by said second vacuum chamber to shield its contents against the temperature within said components chamber.

4,629,889

POTENTIAL ANALYZER

Hideo Todokoro, Tokyo, and Satoru Fukuhara, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,083

Claims priority, application Japan, Jun. 24, 1983, 58-112719

Int. Cl.⁴ G01N *23/00*

U.S. Cl. 250—310 **6 Claims**

1. A potential analyzer for analyzing a potential at a surface of a specimen comprising:

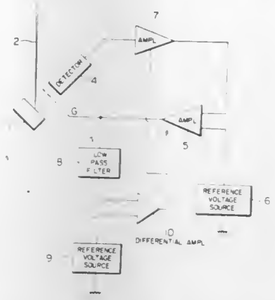
detector means for detecting secondary electrons emitted from the specimen by radiating a primary electron beam thereto;

retarding grid means, disposed between said detector means and said specimen, for controlling a detection amount of said secondary electrons;

circuit means for applying a voltage to said retarding grid means to maintain an output of said detector means at a constant value; and

setting circuit means for setting the gain of said detector means so as to allow an operating range of the voltage to said retarding grid means to be within a specified value;

wherein said setting circuit means includes a low pass filter circuit for detecting a variation in the voltage of said



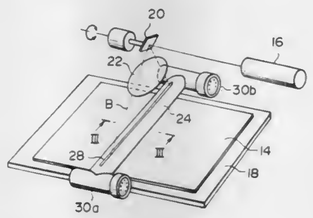
retarding grid means to set the gain of said detector means on the basis of said detected variation.

4,629,890

RADIATION IMAGE READ-OUT APPARATUS

Chiaki Goto, and Masaru Noguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,237
Claims priority, application Japan, Nov. 19, 1983, 58-217114
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 250—327.2 **8 Claims**



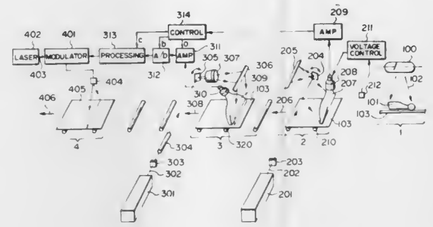
1. A radiation image read-out apparatus for scanning a stimulable phosphor carrying a radiation image stored therein by stimulating rays which cause the stimulable phosphor to emit light in proportion to the radiation energy stored, and photoelectrically detecting the emitted light by a photodetector via a light guide member, wherein the improvement comprises a hollow tubular-shaped light guide member positioned in face-to-face relation to said stimulable phosphor so that the longitudinal direction of said light guide member coincides with the scanning direction of said stimulating rays, said photodetector secured to at least one end face of said light guide member, said light guide member provided with a slit extending in said longitudinal direction, said slit positioned for passing said stimulating rays therethrough and for introducing the light, which is emitted by said stimulable phosphor when said stimulable phosphor is scanned by said stimulating rays, into said light guide member.

4,629,891

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Nobuyoshi Nakajima; Yuuma Adachi, and Toshitaka Agano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1985, Ser. No. 774,688
Claims priority, application Japan, Sep. 13, 1984, 59-192098
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image read-out method in which, prior to final read-out for exposing a stimulable phosphor sheet carrying a radiation image of an object stored therein to stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the stored radiation energy, photoelectrically detecting the emitted light to obtain an electric image signal for reproducing a visible image, preliminary read-out for approximately detecting the radiation image stored in the stimulable phosphor sheet is conducted by use of stimulating rays of a level lower than the level of stimulating rays used in the final read-out, read-out conditions in the final read-out and/or image processing conditions are adjusted on the basis of the information obtained by the preliminary read-out, and the final read-out is conducted by use of the adjusted conditions,

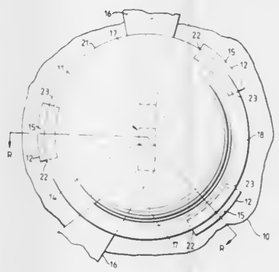
wherein the improvement comprises changing the light detection range of a light detection means in the preliminary read-out in accordance with image recording conditions for said radiation image.

4,629,892

OPTICALLY IMMERSED DETECTOR ASSEMBLY

Ian C. Carmichael, Malvern; David J. Wilson, Malvern Link, and Anthony B. Dean, Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 6, 1983, Ser. No. 558,589
Claims priority, application United Kingdom, Dec. 22, 1982, 8236446
Int. Cl.⁴ G02F *1/01*
U.S. Cl. 250—353 **6 Claims**



1. A detector assembly including:

(1) a substrate,
(2) a semiconductor detector mounted on the substrate,
(3) lens contact pads disposed radially of the detector and made from the same semi-conducting material as the detector, and
(4) a convex optical immersion lens mounted on the contact pads and spaced apart from the detector by a distance not greater than one tenth of a wavelength of the radiation for which the detector is designed.

4,629,893

DEVICE FOR DETACHABLY SECURING A COLLIMATOR TO A RADIATION DETECTOR

George J. Hanz, Bloomingdale, Ill.; Guenter Jung, Roettenbach, and Michael Pflaum, Aisch, both of Fed. Rep. of Germany, assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 29, 1985, Ser. No. 717,762
Int. Cl.⁴ G01T *1/20*
U.S. Cl. 250—363 S **19 Claims**



1. A device for detachably securing a collimator to a radiation detector, comprising:
(a) a first annular groove means secured to the radiation detector;
(b) a second annular groove means secured to the collimator;
(c) a split ring having a first and second ring ends, said ring being received in the first annular groove means; and
(d) a ring diameter control system, including
(d1) a first lever system having two ends;
(d2) a second lever system having two ends; and
(d3) a rotating hub being rotatably secured to the detector head;

wherein the first lever system is rotatably mounted with one end linked to the first ring end and with the other end linked to the rotating hub, and wherein the second lever system is rotatably mounted with one end linked to the second ring end and with the other end linked to the rotating hub, such that rotation of the rotating hub moves the first and second lever systems in opposite directions thereby moving the first and second ring ends between a first position, in which the split ring is positioned only in the first annular groove means, and a second position, in which the split ring is located in both the first annular groove means and the second annular groove means, thus attaching the collimator to the radiation detector.

4,629,894

DEVICE FOR MEASURING NUCLEAR RADIATION, AND GAMMA OR SCINTILLATION CAMERA COMPRISING SUCH A DEVICE

Pierre H. Lelong, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1984, Ser. No. 649,321
Claims priority, application France, Sep. 16, 1983, 83 14773
Int. Cl.⁴ G01T *1/20*
U.S. Cl. 250—363 R **11 Claims**

1. A device for measuring nuclear radiation which comprises a scintillator for detecting of radiation quanta which is optically coupled to a photo-detector for converting the scintillations produced by the radiation quanta into current pulses, and which also comprises a pulse discrimination circuit for the processing of the current pulses, characterized in that the pulse discrimination circuit comprises pulse edge detection means for the detection of a leading edge of a current pulse, integration means for integrating the current pulses as a function of time, time measuring means for measuring a period of time t between a leading edge and a subsequent leading edge of a next pulse, said integration and time measuring means receiving control signals which are derived at least from the detection of a leading edge of a current pulse, storage means for the storage of correction factors which can be selected by way of the measurement value of the integration period t, arithmetic means for determining from the correction factor and from the current pulse integrated over the period t:

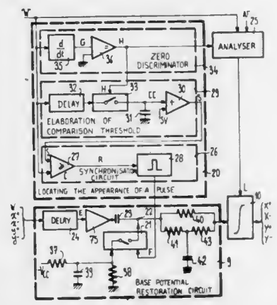
(a) an extrapolated value of the current pulse integrated over the period t, said extrapolated value being a measure of the time integral of the entire current pulse;
(b) a correction value which corresponds to the integrated value of the current pulse after the period t; and also storage means for the storage of the correction value, the arithmetic means determining the difference between the correction value and a directly subsequent current pulse, integrated over the time, in order to determine an extrapolated value and a correction value from the difference thus obtained and from the integration period used for said directly subsequent current pulse.

4,629,895

METHOD FOR PROCESSING THE PULSES SUPPLIED BY A GAMMA CAMERA AND A GAMMA CAMERA EMPLOYING THIS METHOD

Corinne Mestais, Massy; René Gauthier, Antony, and Georges Roux, Limours, all of France, assignors to Informatek - Sopha Medical, Les Ulis, France

Filed May 21, 1984, Ser. No. 612,146
Claims priority, application France, May 27, 1983, 83 08824
Int. Cl.⁴ G01T *1/164*
U.S. Cl. 250—369 **18 Claims**



1. A gamma camera provided with a pulse processing device comprising collimator means for collimation of a gamma radiation which is to be measured on a scintillator crystal, network means including a network of photomultipler tubes for detection of the scintillations emitted by the scintillator and for amplifcation of the electrical contributions resulting from this detection, array means including an array of matrices of resistors for balancing and summating the electrical contributions and for the generation of balanced pulses, stage means including integrators for measuring with respect to a base potential the balanced pulses applied to said integrators by capacitive coupling, means for restoring the said base potential prior to each measurement, in the absence of the pulses, the means for restoring comprises a set of networks each formed by a delay line and by a capacitor arranged in series with the dealy line, these networks being inserted in each case between a resistor matrix and a corresponding integrator, the terminal of the capacitor connected to the integrator being placed at the base potential under the action of a synchronising relay, controlled

by means for locating the appearance of the pulses and the period of delay imposed by the said delay line being substantially greater than or equal to the period of restoration of this base potential, the means for locating the appearance of the pulses comprise, within a synchronising circuit, a comparator supplied at its inputs with balanced pulses and a comparison threshold and delivering a logic signal for actuation of the synchronising relay when the balanced pulses exceed this comparison threshold, and means for assuring that the comparison threshold is the sum of a true comparison threshold and of a direct interference component affecting the balanced pulses which are fed to the comparator of the synchronising circuit.

4,629,896

APPARATUS FOR MONITORING THE INTENSITY OF A UV SOURCE

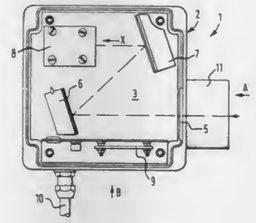
John D. Bridgen, Staines, England, assignor to Hanovia Limited, Berkshire, England

Filed Feb. 17, 1984, Ser. No. 581,073

Claims priority, application United Kingdom, Feb. 23, 1983, 8305030

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—372 **7 Claims**



1. Apparatus for monitoring the intensity of a UV source, comprising:

(i) an optical detection unit which detects UV radiation and converts that radiation into an electrical signal which is comparable to the intensity of UV radiation detected;

(ii) a device which is adapted to indicate the intensity of UV radiation from the source dependent on the electrical signal from the optical detection unit;

(iii) said optical detection unit and said device being operatively connected whereby the intensity of the UV radiation is monitored;

(iv) said optical detection unit comprising:

(a) aperture means which transmits part of the UV radiation incident on it and emitted by the source;

(b) an optical system which collects and receives that part of the UV radiation and directs it along a desired path; and

(c) a converter arranged on the path to receive the UV radiation and convert it into an electrical signal which corresponds with the intensity of the UV radiation so that the intensity can be monitored; and

(v) said optical system comprising two metal reflectors which provide a diverging beam along the path.

4,629,897

AUTOMATIC HIGH INSULATION SWITCH

Marc Lemonnier, Les Ulis; Denis Petermann, Paris; Daniel Le Fur, Les Ulis, and Stephan Metgert, Villebon-Sur-Yvette, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

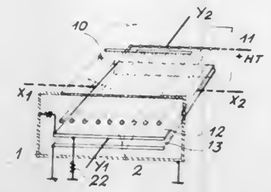
Filed Feb. 28, 1983, Ser. No. 470,448

Claims priority, application France, Mar. 1, 1982, 82 03344

Int. Cl.⁴ G01T *1/00*

U.S. Cl. 250—385 **8 Claims**

1. A proportional detector to detect ionizing radiations for two-dimension localization comprising: anodes formed of a network of parallel conducting wires, means holding the anodes at a high positive voltage in an ionization chamber having a conductive case a gaseous atmosphere in the conductive case (1) forming the cathode and operating under avalanche conditions, a two-dimension continuous resistive collector (12) located between the anode wires (2) and the cathode (1) thus



forming an RC delay line on which the localization of an electron avalanche produced in the vicinity of an anoide wire is affected by electrostatic induction, the reading of the data concerning the propagation time of the electric pulse thus generated by induction on the collector being effected at the periphery thereof on at least two points on the axes of symmetry of the network of anode wires.

4,629,898

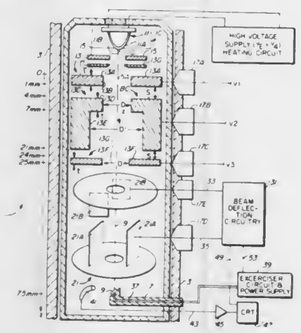
ELECTRON AND ION BEAM APPARATUS AND PASSIVATION MILLING

Jonathan H. Orloff, Portland, and Lynwood W. Swanson, McMinnville, both of Oreg., assignors to Oregon Graduate Center, Beaverton, Oreg.

Continuation-in-part of Ser. No. 308,125, Oct. 2, 1981, Pat. No. 4,426,582, which is a continuation of Ser. No. 113,806, Jan. 21, 1980, abandoned. This application Oct. 13, 1983, Ser. No. 541,719

Int. Cl.⁴ H01J *3/18*

U.S. Cl. 250—396 R **9 Claims**



1. An apparatus for producing a high current beam of electrons along an axis and focusing said beam onto a small target spot, said apparatus comprising in combination:

(a) pointed emitter means for emitting said beam along said axis, said beam having an angular intensity of up to approximately 10^{-3} amperes per steradian;

(b) an electrostatic lens system spaced from and disposed about said axis beneath said pointed emitter means for focusing said beam onto said target spot, said electrostatic lens system including

(i) a first lens element conducting a first voltage and including a first disc having therein a first aperture through which said beam passes, said first aperture being circular and centered about said axis;

(ii) a second lens element conducting a second voltage and including a second aperture through which said beam passes after it leaves said first aperture, said second lens element being spaced from and disposed beneath said first lens element,

said second aperture having an upper portion which is circular, and is centered about said axis, and has a first diameter,

said second aperture having a lower portion which is approximately cylindrical, and is centered about said axis, and has a second diameter, and has a predetermined thickness in the direction of said axis, said second diameter being substantially greater than said first diameter,

said second diameter being approximately 1.3 times as great as said predetermined thickness, and

(iii) a third lens element located entirely below said second aperture and conducting a third voltage and having a third aperture through which said beam passes only after it leaves said second aperture, said third aperture being circular and centered about said axis,

said second lens element producing an approximately constant rate of reduction in the magnitude of the potential along said axis in said lower portion of said second aperture in order to reduce the chromatic aberration caused by said electrostatic lens system.

4,629,899

DEFLECTION LENS SYSTEM FOR GENERATING A BEAM OF NEUTRAL PARTICLES OF VARIABLE CROSS SECTION

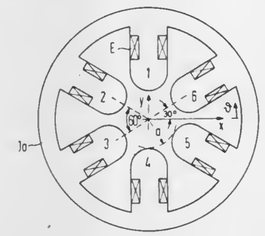
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 512,531, Jul. 11, 1982, abandoned. This application Jan. 8, 1986, Ser. No. 817,167

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235068

Int. Cl.⁴ G21K *1/08;* **H05H** *3/00*

U.S. Cl. 250—396 ML **8 Claims**



1. An apparatus having a lens system for generating a shaped beam of neutral particles with variable beam cross-section, said lens system comprising a plurality of magnetic multipole lenses disposed sequentially in the radiation propagation direction, each multipole lens having a plurality of pole shoes disposed about a central axis with excitation windings generating at least one dipole field for aligning the magnetic dipole moments of the neutral particles, at least one quadripole field for deflecting the beam of neutral particles, and at least one hexapole field for focusing the beam of neutral particles in the lens system.

4,629,900

RADIATION IMAGE READ-OUT METHOD

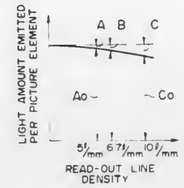
Kazuo Horikawa; Hirosi Tanaka, and Tokukazu Saito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 4, 1985, Ser. No. 697,803

Claims priority, application Japan, Feb. 2, 1984, 59-17516

Int. Cl.⁴ H05B *33/00*

U.S. Cl. 250—484.1 **6 Claims**



1. A radiation image read-out method wherein preliminary read-out by scanning a stimulable phosphor sheet carrying a radiation image of an object stored therein by stimulating rays of a level lower than the level of the stimulating rays used in final read-out so as to approximately detect the image information stored in the stimualble phosphor sheet on the basis of light emitted by the stimulable phosphor sheet during the scanning is conducted prior to the final read-out for scanning the stimulable phosphor sheet by the stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the radiation energy stored and detecting the emitted light by a photoelectric read-out means to obtain an electric image signal, read-out conditions for the final read-out and/or image processing conditions for use in image processing of the electric image signal obtained by the final read-out are adjusted on the basis of the image information obtained by the preliminary read-out,

the radiation image read-out method comprising the steps of:

(i) detecting in advance the read-out line density of the stimulating rays in the final read-out, and

(ii) correcting the read-out conditions and/or the image processing conditions, which are adjusted on the basis of the image information obtained by the preliminary read-out, in accordance with the read-out line density in the final read-out.

4,629,901

PHOTO COUPLER WITH STATIC INDUCTION TRANSISTOR TYPE DETECTOR

Jun-ichi Nishizawa, Sendai, Japan, assignor to Semiconductor Research Foundation, Japan

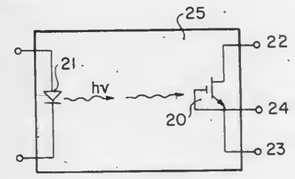
PCT No. PCT/JP82/00456, § 371 Date Jul. 29, 1983, § 102(e) Date Jul. 29, 1983, PCT Pub. No. WO83/02039, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 30, 1982, Ser. No. 519,779

Claims priority, application Japan, Nov. 30, 1981, 56-192415

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 250—551 **9 Claims**



1. A photocoupler comprising a light-emitting element, a static induction transistor forming a photodetector for detecting light from the light-emitting element, an insulating material

between said light-emitting element and said static induction transistor which permits passage therethough of light from the light-emitting element to the static induction transistor, and a unitary package for housing the light-emitting element, the static induction transistor and the insulating material as a unitary structure, the static induction transistor having a source, a drain and a gate and exhibiting an unsaturable current-voltage characteristic following the exponential function law with respect to a gate potential and a drain-source voltage thereof, the static induction transistor having a channel with a short channel length and being substantially depleted, a potential barrier height in the channel varying with the gate potential and the drain-source voltage.

4,629,902

DEVICE FOR MEASURING WEB TENSION

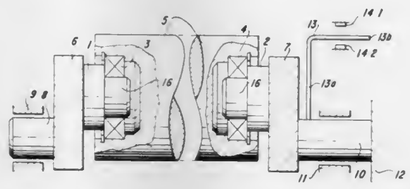
Dietrich Hank; Kerstin Hauer, and Friedrich Richter, all of Leipzig, German Democratic Rep., assignors to Veb Kombinant Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Apr. 18, 1985, Ser. No. 724,785

Claims priority, application German Democratic Rep., Aug. 20, 1984, 266415

Int. Cl.[4] G01V 9/04; G01L 5/04

U.S. Cl. 250—559 **5 Claims**



1. A device for measuring web tension of a continually transported material web engaged with and moved on an outer surface of a web guiding roller, comprising means for supporting said roller for rotation; and measuring means connected to said supporting means and measuring the web tension, said supporting means including two eccentrics positioned at two sides of said roller and supporting said roller for rotation, one of said eccentrics having a first supporting pin and a first bearing in which said first supporting pin is friction-free supported and rotated, the other of said eccentrics having a second supporting pin having an end rigidly clamped in a machine frame, said one eccentric and the other eccentric being positioned in respect to said roller so that the amount of eccentricity defined therebetween is smaller, equal or not substantially greater than a radius of said roller, said measuring means including a measurement translating lever and a contactless measurement receiver, said lever having one end rigidly connected to said second supporting pin for detecting an elastic twisting thereof proportional to the web tension being measured, and a second end cooperating with said receiver, said receiver being adjustably rigidly connectable to the machine frame.

4,629,903

METHOD OF MONITORING A CATALYST FEED AND APPARATUS FOR IMPLEMENTING THE METHOD

Thomas J. Giacobbe, Skillman; Richard H. Leitman, East Brunswich, and Walter Terebecky, Sayerville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,967

Int. Cl.[4] G01N 15/06, 15/07

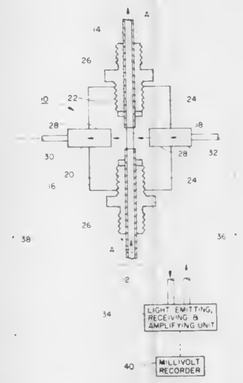
U.S. Cl. 250—573 **6 Claims**

1. An apparatus for continuously moinitoring the feed of a substantially opaque catalyst employed in a gas-phase linear low density polyethylene process system through the electro-optical scanning of an intermittent flow of the catalyst; comprising:

(a) conduit means having an intermittent flow of said catalyst from said process system conveyed therethough, said conduit means including a generally transparent flow section having catalyst inlet and outlet flow means communicating with said system;

(b) electro-optical means for scanning the passage of said catalyst through said transparent conduit flow section, said electro-optical means including:

(i) at least one light-transmitting means for transmitting a light beam through said transparent flow section in a direction generally transverse to the flow of said catalyst through said flow section, said light-transmitting means comrprising light-conductive optic fibers; light-emitting means continually emitting light being connected to one end of one of said optic fibers for generating said light beam, the other end of said optic fiber being oriented to face towards the transparent flow section;



(ii) at least one light-receiving means for receiving the light transmitted through said transparent flow section from said light-transmitting means;

(c) and means connected to said light-receiving means for registering disruptions in the light transmitted through said transparent flow section indicative of predetermined intermittent flows of said catalyst through said process system.

4,629,904

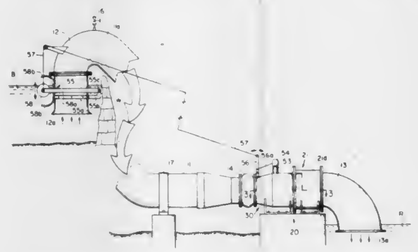
MICRO-HYDROELECTRIC POWER PLANT

Agustin Rojo, Jr., Terrazas de Tintillo #16, Guaynabo, P.R. 00657, and Jorge Leiseca, Condominio Costa Azul, Apt. 11A Taft St., #2, Santurce, P.R. 00907

Filed Mar. 21, 1984, Ser. No. 591,952

Int. Cl.[4] F03B 13/08

U.S. Cl. 290—52 **21 Claims**



1. A hydroelectric power plant comprising a penstock located in a stream diverting water therethrough from an intake basin located at a predetermined height above an outlet basin, a hydro turbine incorporated in a lower portion of the penstock having a rotor driven by the flow of water through the penstock, a closed hydraulic system through which hydraulic fluid circulates, said system comprising a variable displacement pump having a flow control, a hydraulic motor, an electric generator driven by said motor, drive and gearing means interposed between said turbine rotor and pump for driving the latter in a range of RMP between 1000 and 1800, said pump and flow control maintaining the input flow of hydraulic fluid to said motor at a constant volume whereby said motor and generator are driven at a predetermined RPM at all acceptable load conditions placed on said generator, said pump and flow control being mounted in close proximity to said turbine, and said hydraulic motor and generator being located remote from said turbine and pump with said hydraulic fluid conduits extending therebetween.

4,629,905

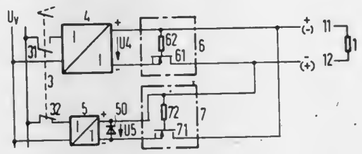
CIRCUIT ARRANGEMENT COMPRISING TWO FEED CIRCUITS CONNECTABLE TO A LOAD HAVING MUTUALLY OPPOSITE POLING

Heinz Kraicar, Poecking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,143

Int. Cl.[4] H02J 7/00

U.S. Cl. 307—72 **15 Claims**



4. A circuit arrangement comprising:

first and second feed circuits for connection to a load with mutually opposite polarity;

a feed control device connected to and operable to alternately activate said feed circuit;

each of said feed circuits including a pair of output leads, said leads connected together to form a common pair of leads for connection to the load;

a transistor including a control electrode for receiving control signals for rendering the same conductive and nonconductive and a control conduction path connected in series with one of the leads of one of said pairs of leads, said transistor rendered conductive during activation and operation of the respective feed circuit and inhibited during operation of the other feed circuit; and

switch means connected in series with a lead of the other pair of leads and operated to be conductive when said transistor is inhibited.

4,629,906

BIAS SHARING AN ELECTRONIC SWITCH AND AN ACTIVE DEVICE

Samuel T. Heffner, Hurst, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1985, Ser. No. 730,896

Int. Cl.[4] H02J 5/00

U.S. Cl. 307—80 **13 Claims**

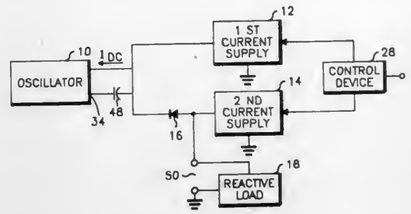
1. A circuit arrangement for selectively coupling energy at an active device to a terminal set comprising:

(a) electronic switch means coupled to the active device;

(b) means for coupling the terminal set to said electronic switch means;

(c) first current supply means for supplying DC current to the active device;

(d) second current supply means for supplying DC current to the active device through said electronic switch means



to cause the energy at the active device to be connected to the terminal set and to DC bias both the active device and said electronic switch means; and

(e) control means for selectively actuating said first and second current supply means.

4,629,907

DEVICE FOR MONITORING THE FUNCTION OF ELECTRONIC EQUIPMENT, IN PARTICULAR MICROPROCESSORS

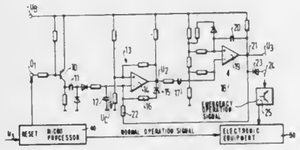
Wolfgang Kosak, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

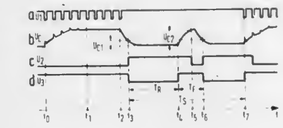
Continuation of Ser. No. 515,429, Jul. 20, 1983. This application Mar. 12, 1986, Ser. No. 839,816

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227546; Jun. 21, 1983, 3322242

Int. Cl.[4] F02D 31/00; H03K 5/22

U.S. Cl. 307—265 **15 Claims**





1. An apparatus for monitoring a series of control pulses generated by a microprocessor, said microprocessor producing a normal operation signal for controlling electronic equipment during a normal operation mode, and for controlling said electronic equipment in an emergency operation mode comprising,

a capacitive means connected to receive at its input said control pulses from the microprocessor,

a threshold circuit means having its inputs connected to outputs of the capacitive means to receive said control pulses and an output connected to a control means,

said threshold circuit means being adapted to generate a periodic signal having two phases of differing durations in periodic sequence upon said control pulses failing to be received, thus indicating a failure of said microprocessor to supply said normal operation signal,

said control means serving to control said differing durations of said periodic signal to provide a reset phase (TR) and an active phase (TF) and to produce a duration of said reset phase longer than a duration of said active phase,

the reset phase of said periodic signal serving to reset said microprocessor and to block said electronic equipment, and the active phase of said periodic signal serving to restart the microprocessor and to control said electronic equipment,

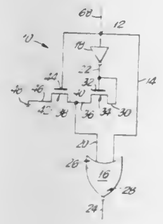
whereby said apparatus takes over control of the electronic equipment from the microprocessor during the emergency operation mode.

4,629,908

MOS MONOSTABLE MULTIVIBRATOR

Ronald S. Ethe, Commack, and Steven Burstein, Smithtown, both of N.Y., assignors to Standard Microsystems Corp., Hauppauge, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,480
Int. Cl.⁴ H03K *3/355*
U.S. Cl. 307—273 **12 Claims**



1. A monostable multivibrator for outputting a pulse of predetermined duration in response to an input pulse of arbitrary duration comprising:

a. a single logic gate having first and second inputs, said first input being connected to said system to receive said input pulse of arbitrary duration;

b. delay means for supplying a signal to said second input of said logic gate, said signal being delayed with respect to said input pulse and logically inverted with respect thereto, said logic gate outputting a pulse of predetermined duration in response to said input pulse and said signal; and

c. an enhancement mode MOSFET electrically connected to the output of said delay means for electrically isolating said delay means from said second input during a substantial portion of the delay period between said input pulse and said delayed signal and electrically coupling and delay means to said second input of said logic gate after the delay period is substantially ended.

4,629,909

FLIP-FLOP FOR STORING DATA ON BOTH LEADING AND TRAILING EDGES OF CLOCK SIGNAL

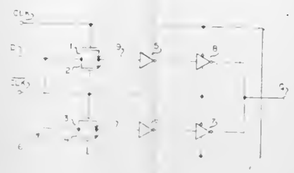
Kelly B. Cameron, Moscow, Id., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 19, 1984, Ser. No. 662,747
Int. Cl.⁴ H03K *3/356*
U.S. Cl. 307—279 **5 Claims**

1. A flip-flop having a data input terminal for receiving a data input signal, a data output terminal for providing data output signals, and a clock input terminal for receiving a clock input signal, comprising:

first storage means coupled to said data input terminal and having an output lead connected to said output terminal, wherein said first storage means stores said data input signal when said clock input signal is at a first level and provides said stored data input signal on said output lead while said clock input signal is at a second level; and

second storage means coupled to said data input terminal and having an output lead connected to said output terminal, wherein said second storage means stores said data input signal when said clock signal is at said second level and provides said stored data input signal on said output lead when said clock signal is at said first level.

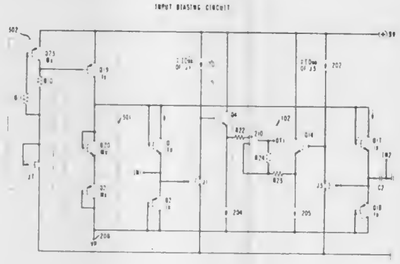


4,629,910

HIGH INPUT IMPEDANCE CIRCUIT

Scott H. Early, Indianapolis, Ind., and Roger L. Minear, Wyomissing, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 626,430, Jun. 29, 1984, abandoned, which is a division of Ser. No. 370,498, Apr. 21, 1982, Pat. No. 4,473,794. This application Oct. 21, 1985, Ser. No. 788,525
Int. Cl.⁴ H03K *3/33, 5/08, 17/687*
U.S. Cl. 307—317 R **9 Claims**



1. A high impedance input coupling circuit for biasing a unipolar transistor having a gate electrode, a drain electrode and a source electrode, the high impedance input coupling circuit providing bias for the gate electrode of the unipolar transistor and comprising:

a first diode string including at least a first and a second diode serially connected between a constant current source and a voltage reference source, the common connection of the first and second diodes also being commonly connected to the gate electrode; and

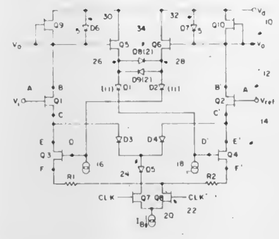
a second diode string including at least a third and a fourth diode serially connected between the constant current source and the voltage reference source and in parallel with the first diode string, and having an additive low resistance current path therewith, input to the high impedance input coupling circuit and to the gate of the unipolar transistor being provided at the common connection of the first and second diodes and at the drain electrode, the drain electrode being connected directly to a common ground potential, the combination of the first and second diode strings providing a high value resistance to small-signal variations presented across the gate electrode and drain electrode of the unipolar transistor.

4,629,911

LATCHING COMPARATOR

Linda K. Bebernes, and Frederick G. Weiss, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 15, 1985, Ser. No. 711,884
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—362 **10 Claims**



1. A comparator comprising:

a latching differential amplifier having inverting and non-inverting inputs and outputs;

an input differential amplifier having inverting and non-inverting outputs proportional to the difference between an applied input voltage and an applied reference voltage for receiving an input and for driving the latching amplifier, said input amplifier being connected to the latching amplifier such that a bias current passing through the input amplifier may pass through the latching amplifier, said input amplifier outputs being coupled to the latching amplifier inputs to provide positive feedback;

means for switching the bias current passing through the input amplifier such that it does not also pass through the latching amplifier; and

means to limit a voltage difference between said inverting and non-inverting inputs of said latching differential amplifier.

4,629,912

SCHOTTKY SHUNT INTEGRATED INJECTION

James M. Early, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corp., Sunnyvale, Calif.

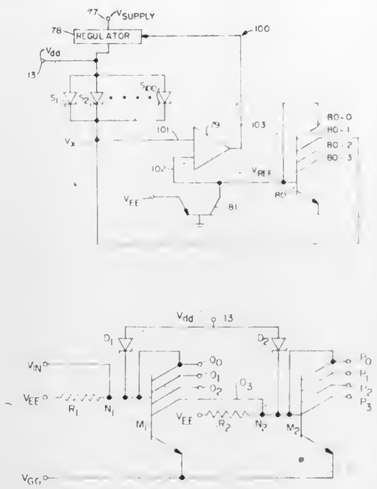
Continuation of Ser. No. 665,266, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 545,703, Oct. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 345,257, Feb. 2, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,992
Int. Cl.⁴ H03K *19/091, 19/013, 19/003;* **H01L** *29/04*
U.S. Cl. 307—459 **35 Claims**

1. An integrated injection logic circuit comprising:

means for providing an injection current;

a switching transistor having a base coupled to said means for providing an injection current and serving as an input node, and having at least one collector serving as an output node, and a collector connected to said base; and

additional means coupled to said base for clamping the logic swing at said base to a predetermined range determined by geometric ratios of components in the layout of the integrated circuit which ratios are independent of process variations.

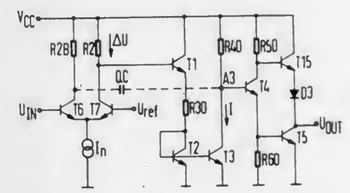


4,629,913

CIRCUIT ARRANGEMENT FOR CONVERTING ECL-LOGIC SIGNALS TO TTL-LOGIC SIGNALS

Alexander Lechner, Faak, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,863
Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217512
Int. Cl.⁴ H03K *19/092, 19/086, 19/013, 17/04*
U.S. Cl. 307—475 **9 Claims**



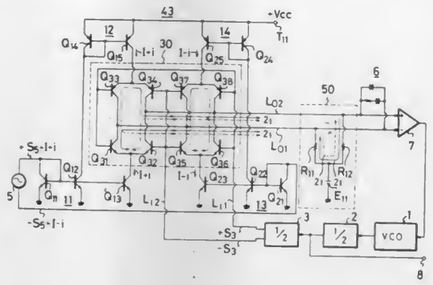
1. Circuit arrangement for level conversion of ECL-logic levels having an emitter-coupled current switch having an input addressable by ECL-logic levels and having an inverting and a non-inverting output, and a TTL-logic output stage, comprising a voltage-controlled current source formed as a current mirror with transistor diode and having an input addressable by the non-inverting output of the current switch, and the curent switch having the inverting output connected via a capacitor to the input of the TTL-logic stage.

4,629,914

PHASE COMPARING CIRCUIT

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,503
Claims priority, application Japan, May 25, 1983, 58-92065
Int. Cl.⁴ H03L *7/00*; H03K *5/26*
U.S. Cl. 307—510 **14 Claims**



1. A phase comparing circuit for generating a control signal representative of the difference in phase between an input signal and a pilot signal, the circuit comprising:

converting means responsive to the pilot signal for converting the pilot signal into a first reference signal and a second reference signal of opposite polarity to said first reference signal;

a voltage source;

base signal generating means connected to said voltage source for providing first and second base signals having a predetermined DC level substantially the same as a DC level of said reference signals;

phase-difference signal generating means connected to the converting means and the base signal generating means and operable in response to the input signal for alternately providing first and second current paths connecting said first base signal and said second reference signal to cancel DC components therefrom and for alternately providing third and fourth current paths connecting said second base signal and the first reference signal to cancel DC components therefrom, said first and third current paths and said second and fourth current paths being provided together; and

voltage deriving circuit means connected to the phase-difference signal generating means and including a control signal current path connecting said first and third current paths with said second and fourth current paths and having two control signal output terminals, two series-connected resistors between said control signal output terminals, and a bias terminal between said resistors for accepting a bias potential.

4,629,915

FREQUENCY DISCRIMINATION CIRCUIT

Yutaka Suzuki, and Yuji Kato, both of Zama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 18, 1984, Ser. No. 621,715
Claims priority, application Japan, Jun. 20, 1983, 58-110708
Int. Cl.⁴ H03K *9/06*
U.S. Cl. 307—522 **7 Claims**

1. A frequency discrimination circuit comprising:

a monostable circuit having an input into which a pulsed input signal is fed and having an output, said monostable circuit producing output pulses in response to pulses of said input signal, said monostable circuit having a variable time constant and each said output pulse having a pulse width determined by said time constant;

a D-type flip-flop having a data input connected to the output of the monostable circuit and having a clock input connected to receive said pulsed input signal so that said D-type flip-flop produces a first output signal when the pulse width of said output pulses is greater than that of said pulsed input signal and a second output when said pulse width of said output pulses is less than that of said pulsed input signal; and

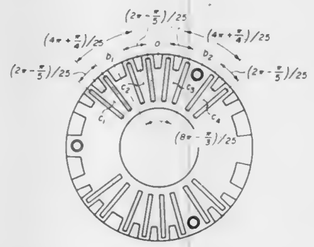
means for modifying said time constant of the monostable circuit in response to said flip-flop output signals.

4,629,916

METHOD AND APPARATUS FOR HARMONICS SUPPRESSION IN MOTOR SYSTEMS

Claude Oudet, Besancon, France, assignor to Portescap, La Chaux-De-Fonds, Switzerland

Continuation-in-part of Ser. No. 530,585, Aug. 3, 1983, Pat. No. 4,518,883. This application Mar. 20, 1985, Ser. No. 713,853
Claims priority, application Switzerland, Dec. 4, 1981, 7766/81
Int. Cl.⁴ H02K *21/12, 37/00*
U.S. Cl. 310—49 R **31 Claims**



1. A system for microstepping motor control comprising:

circuit means for providing multi-phase signals proportioned to provide a plurality of step values for motor positioning between 0 and 2 electrical degrees;

drive circuit means for providing poly phase energizing currents for the motor corresponding to said step values;

a stepper motor including

at least two phase windings connected to receive said energizing currents proportioned according to said step values,

a plurality of pole pieces associated with each of said windings and providing a motor air gap,

magnetic circuits for coupling said windings to said pole pieces,

a rotor in said air gap being positionable in accordance with said proportioned energizing currents applied to said windings;

each of said plurality of pole pieces being divided into at least one pair of substantially identical symmetrical groupings,

the plane of symmetry of one grouping of a pair being shifted relative to the other grouping of the pair by an angle π/h electrical degrees, wherein h is a harmonic being suppressed.

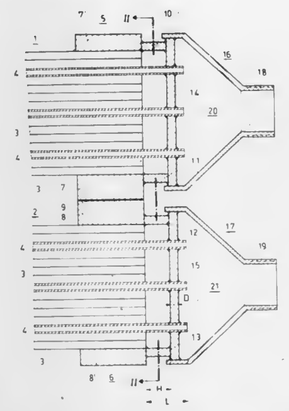
4,629,917

CONNECTING DEVICE FOR THE STATOR WINDING RODS OF ELECTRICAL MACHINES

Ernst Brem, Schlieren, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Aug. 26, 1985, Ser. No. 769,062
Claims priority, application Switzerland, Sep. 7, 1984, 4272/84
Int. Cl.⁴ H02K *9/00*
U.S. Cl. 310—59 **12 Claims**

1. A connecting device for an electrical machine comprising a plurality of stator winding rods having rod ends in which hollow conductors and solid conductors are held together by a metallic yoke which, on the one hand, is connected to a chamber for cooling liquid and, on the other hand, is connected to the hollow conductors and the solid conductors, in which device the hollow conductors protrude from the metallic yoke and are led into the chamber and are fastened, in such a way that the liquid cannot leak, into a brazing plate which is fastened to the end of the metallic yoke where the hollow conductors emerge, characterised in that:



(a) the metallic yoke at least partially encloses the rod ends and is brazed to the rod ends;

(b) the hollow conductors are led on in a straight line;

(c) at least one distance piece is disposed between the brazing plate and the metallic yoke and is fastened to both the brazing plate and to the metallic yoke; and

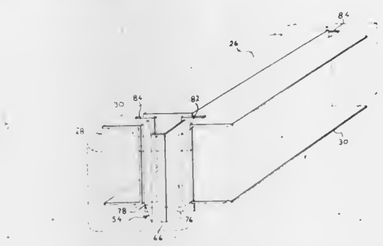
(d) the chamber is directly connected to the brazing plate in such a way that the liquid cannot leak.

4,629,918

SPACER TO PREVENT COIL SHIFT

Eugene B. Amendola, and Kenneth R. Reynolds, both of Erie, Pa., assignors to General Electric Company, Salem, Va.

Filed Sep. 26, 1985, Ser. No. 780,502
Int. Cl.⁴ H02K *3/34, 1/32*
U.S. Cl. 310—65 **20 Claims**



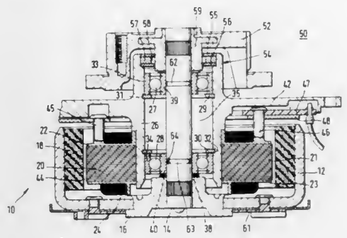
1. Apparatus for positioning a winding with respect to a core for preventing shifting of the winding with respect to the core, said apparatus comprising a spacer formed of a relatively stiff sheet material having electrical insulating characteristics, said spacer being generally rectangular in configuration with at least one bend line, said spacer being bent along said bend line to form a V-shape having first and second legs and a vertex defined by said bend line, whereby said spacer is positionable between the core and the winding such that each leg of the V-shape spacer operates against said vertex to define a predetermined distance between the core and the winding.

4,629,919

DIRECT DRIVE MOTOR

Alfred Merkle, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co., St. Georgen, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,525
Claims priority, application Switzerland, Jan. 11, 1982, 122/82
Int. Cl.⁴ H02K *5/00*
U.S. Cl. 310—90 **11 Claims**



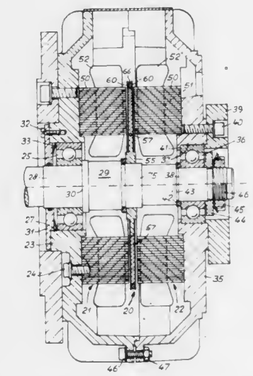
1. In a direct drive motor, particularly for disk storage drives and spindle drives having a rotor shaft rotatably mounted in a bearing support means by means of two axially spaced bearings, each having an inner ring and an outer ring, the outer rings being fixed with respect to the bearing support means, the improvement comprising the inner ring (**39**) of a first of the bearings (**27**) being connected to the rotor shaft (**14**) in a fixed manner and the inner ring (**40**) of the second of the bearings (**28**) being connected to the rotor shaft in a friction fit manner, preventing radial and relative rotative movements between the inner rings and the rotor shaft (**14**) while permitting relative axial movement between the inner ring (**40**) of the second of the bearings and the rotor shaft (**14**).

4,629,920

ALTERNATING CURRENT SYNCHRONOUS SERVOMOTOR

Jaun Hermann, CH-8105, Switzerland, assignor to Mavilor Systéme SA, Fribourg, Switzerland

PCT No. PCT/CH84/00154, § 371 Date Jun. 27, 1985, § 102(e) Date Jun. 27, 1985, PCT Pub. No. WO85/01619, PCT Pub. Date Apr. 11, 1985
PCT Filed Sep. 26, 1984, Ser. No. 740,906
Claims priority, application Switzerland, Oct. 3, 1983, 5374/83
Int. Cl.⁴ H02K *21/12*
U.S. Cl. 310—156 **11 Claims**



1. Alternating-current-synchonous-servomotor having a

disk-shaped rotor (**20**) which is located between two stator halves (**21, 22**) of which each is provided with a bearing (**25, 36**) for a shaft (**29**) supporting the rotor and comprise each a magnet iron part (**507** having a plurality of radial grooves (**51**) and an electrical coil (**52**) having leads inserted in the radial grooves, which rotor (**20**) comprises an even number of flat permanent magnets part (**57**) having magnet field lines extending parallel to the shaft (**29**), which permanent magnet parts (**57**) form an annular like series including interstices (**59**) extending around a hub (**55**) supported on the shaft and of a magnetically unconductive material and have flat sides acting as magnetic pole surfaces (N, S) which extend in parallel planes to which the axis of the shaft (**29**) extend perpenticularly and are serially alternating north and south poles, and whereby the interstices (**59**) between adjacent permanent magnet parts (**57**) diverge radially towards the outside, characterized in that the outer periphery of the hub (**55**) comprises flat planes (**55** A) extending along the sides of a regular polygon and edges (**55** B) located therebetween, and the permanent magnet pieces (**57**) have flat limiting surfaces (**57** A) located radially inwards, which are supported each on one of the flat peripheral planes (**55** A) of the hub (**55**), and in that a bandage (**66**) extending in the circumferential direction of the motor (**50**) and made of a magnetically non-conductive material are located around radially outwards located limiting planes (**57** B) of the permanent magnet pieces (**57**), by means of which bandage (**66**) the permanent magnet pieces are held in abutment with the hub (**55**) and accordingly are connected form-locked to the hub (**55**) and rotationally locked therewith, and that the adjoining permanent magnet pieces (**57**) have mutually facing limiting planes (**57** C, **57** D), which contact each other practically at the edges (**55** B) between the flat peripheral planes (**56**) of the hub (**55**) and diverse relative to the direction of a radial groove (**51**) of the magnet iron part (**50**) of one of the stator halves (**21, 22**) which is aligned with the location of contact (**55** B) oppositely inclined against the radially outer circumference of the rotor (**20**).

4,629,921

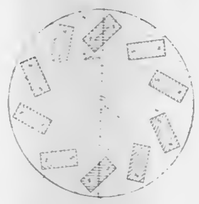
DYNAMOELECTRIC MACHINE ROTOR

John S. Gavaletz, 86 Hermann Ave., Carteret, N.J. 07008

Continuation-in-part of Ser. No. 418,227, Sep. 14, 1982, abandoned. This application May 16, 1985, Ser. No. 734,881

Int. Cl.⁴ H02K *21/12*

U.S. Cl. 310—156 **3 Claims**



1. A dynamoelectric machine rotor comprising:

a circular flywheel comprised of non-magnetic material rotatable about a centrally located axle, and

a plurality of magnets secured in the plane of said flywheel and oriented such that the N-pole of each magnet is directed outwardly toward the perimeter of the flywheel, the magnets being of even number and equally spaced radially around the entire circumference of the flywheel, each magnet further being oriented at a 45° angle to the diameter which passes through the exact center of the magnet.

4,629,922

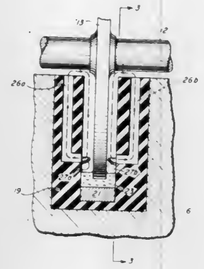
GAS RECIRCULATOR FOR ACYCLIC MACHINES

Thomas F. Balsa, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1985, Ser. No. 737,753

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—178 **6 Claims**



1. A gas recirculator for an acyclic machine including a stator, rotor, liquid metal collector contiguously encircling the periphery of the rotor, and cover gas filling the interstices therebetween, comprising: an insulator liner secured to the stator and encircling the collector, said liner having bifurcated sides extending radially inward forming gaps on either side of the rotor for receiving the gas, and a radial passage formed in each of said sides communicating with respective ones of the gaps at regions of the gas adjacent to the axis of the rotor and adjacent to the collector; and means secured to the sides of said insulator adjacent to the collector and extending into each of said gaps for diverting the radially outward flow of gas into said passages.

4,629,923

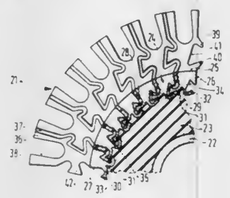
COMMUTATOR FOR DYNAMO ELECTRIC MACHINES

Anton Holzhauer, Sigmaringendorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 764,316

Int. Cl.⁴ H02K *13/04*

U.S. Cl. 310—234 **15 Claims**



1. Commutator for a dynamo electric machine, having

an annular insulator body (**3,23,45**);

a plurality of commutator segments (**4, 24 46**) disposed around the circumference of said insulator body, each of the segments having attachment means formed thereon to attach the segments to the insulator body (**3,23,45**), neighboring segments being spaced from each other and defining an insulating gap (**13, 28, 53**) therebetween, in which gap insulating material is located,

wherein, in accordance with the invention,

the attachment means of the segments (**4, 24, 46**) comprises first and second leg portions (**5,6; 29,32,30,33; 47,48,50,51**) integral with the respective segments,

the second leg portion (**6; 29; 47**) extending circumferentially towards the first leg portion (**5; 30; 48**) of a neighboring segment, overlapping said neighboring first leg portion, at least in part, thereby hooking over said neighboring segment and forming therewith an interlocking fit at least in a direction radial with respect to an axis of said annular insulator body,

the first leg portion of a segment being spaced from the second leg portion of the neighboring segment by said gap (**13, 28, 53**);

said interlocking commutator segments and the insulation material therebetween forming an endless chain in which the segments are, at least radially, interlocked to place the insulating material in the gap under compression as a result of centrifugal forces generated during commutator rotation, and to secure the segments (**4, 24, 26**) in position on the insulator body (**3, 23, 45**).

4,629,924

MULTIPHASE MOTOR WITH MAGNETIZED ROTOR HAVING N/2 PAIRS OF POLES AT ITS PERIPHERY

Michel Grosjean, 1, rue des Narcisses, CH-2504 Bienne, Switzerland

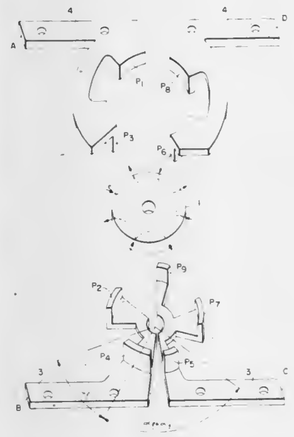
PCT No. PCT/CH84/00120, § 371 Date Mar. 28, 1985, § 102(e) Date Mar. 28, 1985, PCT Pub. No. WO85/00706, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 30, 1984, Ser. No. 720,414

Claims priority, application Switzerland, Jul. 28, 1983, 4130/83

Int. Cl.⁴ H02K *37/00*

U.S. Cl. 310—257 **3 Claims**



1. A multiphase motor with magnetized rotor having N/2 pairs of rotor poles at its periphery,

wherein said rotor poles result from magnetization flux lines of the rotor which are contained in a plane perpendicular to the axis of rotation of said rotor, and wherein said rotor poles are regularly distributed at the rotor periphery and have alternate opposite polarity,

wherein the rotor is surrounded by a stator the poles of which are concentric to the rotor, said stator being formed with m phases, wherein m=N/2n, n being a positive integer, and m being a positive integer greater than 1,

wherein every phase comprises two polar pieces interpositioned one in the other one and separated therefrom by a sinuous air-gap,

wherein, for m−1 phases as well as for a first polar piece of the remaining phase, the stator poles of every polar piece, being n=N/2m in number, are full and separated from one another by an angular interval at least approximately twice as large as that between the adjacent rotor poles at the periphery of the rotor, and (N/2m)−1 stator poles of a second polar piece of the remaining phase are full,

wherein the m remaining stator poles of said second polar piece are fractional, the sum of their arcs being at least approximately equal to the arc of a full stator pole,

wherein the phases are displaced with respect to one another, wherein the polar pieces of every phase are magnetically connected to one another by a core and wherein at least one coil is wound around every core.

4,629,925

PIEZOELECTRIC COAXIAL CABLE

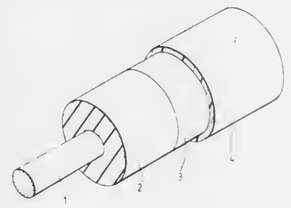
Michael Booth, Swindon, and Richard J. Penneck, Lechlade, both of England, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 20, 1984, Ser. No. 673,460

Claims priority, application United Kingdom, Nov. 22, 1983, 8331156

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—330 **7 Claims**



1. A piezoelectric coaxial cable, which comprises a central electrical conductor and an intermediate piezoelectric layer, the central conductor and the intermediate layer having been axially stretched and the intermediate layer having been radially polarized to render it piezoelectric, and the intermediate layer having an internal radius that is about 0.33 times its external radius.

4,629,926

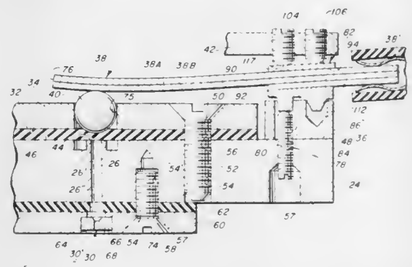
MOUNTING FOR PIEZOELECTRIC BENDER OF FLUID CONTROL DEVICE

Burton L. Siegal, Skokie, Ill., assignor to Kiwi Coders Corporation, Skokie, Ill.

Filed Oct. 21, 1985, Ser. No. 775,617

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—331 **13 Claims**



1. In a piezoelectrically operated fluid control device including at least one piezoelectric bender element having a free end and a fixed end, a valve body, the valve body having at least one chamber communicating to a source of fluid under pressure and a valve seat therein, a deformable membrane over the valve seat operable to change the condition of communication to the source of fluid via the valve seat and membrane deforming means isolated from the fluid and placed over the membrane below the free end of the bender element engaged there-

with, the improvement comprising means for mounting the fixed end of the bender element onto the valve body including means defining a fulcrum for pivoting the bender element at its fixed end, means for clamping the fixed end of the bender element to the valve body, means cooperable with said clamping means for adjusting the deflection of the free end of the bender element and means for establishing electrical connection to said bender element.

4,629,927

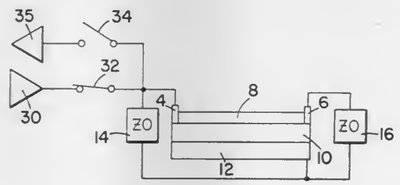
ACOUSTICAL WAVE AIMER

Arthur J. Samodovitz, 1 Lakeshore Dr., Apt. A-4, Farmington, Conn. 06032

Continuation of Ser. No. 380,104, May 20, 1982, abandoned. This application Nov. 22, 1983, Ser. No. 536,337

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—334 **31 Claims**



1. A piezoelectric transducer comprising:
a piezoelectric element with opposite faces,
a resistive electrode attaching to one face,
an electrode attaching to the other face, said electrodes and piezoelectric element having a characteristic impedance, and
a circuit terminating said electrodes and piezoelectric element with approximately said characteristic impedance.

4,629,928

ELECTRODE TERMINAL STRUCTURE FOR A PIEZOELECTRIC POLYMER

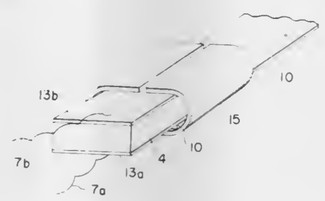
Akira Hamada, and Hisao Takahashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,680

Claims priority, application Japan, May 11, 1984, 59-67720[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—365 **10 Claims**



1. An electrode terminal structure for a piezoelectric element comprising:
a piezoelectric film element comprising a polymer piezoelectric film having opposite first and second side surfaces and first and second electrode films respectively formed on said first and second side surfaces of the polymer piezoelectric film,
a first conductor plate, an insulating plate and a second conductor plate disposed successively on said first electrode film and in the neighborhood of a periphery of the piezoelectric film element to form a stacked structure, and
a continuous double-layered conductor plate sandwiching therebetween the stacked structure,
the continuous double-layered conductor plate and the stacked structure sandwiched therebetween being pressure-bonded to each other to form an integral electrode terminal structure.

4,629,929

METAL VAPOR DISCHARGE LAMP

Masato Saito; Ryo Suzuki, both of Kamakura; Keiji Watanabe, Chigasaki, and Michihiro Tsuchihashi, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

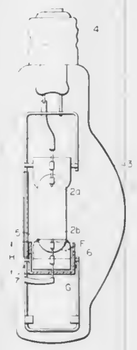
PCT No. PCT/JP83/00034, § 371 Date Sep. 26, 1983, § 102(e) Date Sep. 26, 1983, PCT Pub. No. WO83/02851, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 7, 1983, Ser. No. 540,430

Claims priority, application Japan, Feb. 10, 1982, 57-20599; Jan. 19, 1983, 58-6891

Int. Cl.⁴ H01J *61/30*

U.S. Cl. 313—25 **11 Claims**



1. A metal vapor discharge lamp comprising: a vertically oriented outer tube having an inert gas filling the interior; a vertically oriented generally tubular arc tube disposed within the interior of said outer tube and having a discharge space in the interior thereof; a pair of electrodes in said discharge space; at least one rare gas filling said discharge space and mercury contained within said discharge space; and a lower visible light transmissive and infrared light reflective covering member having a bottom sufficiently completely closed to substantially prevent flow of the inert gas therethrough and surrounding at least the lower end part of the tube wall of said arc tube and the bottom end of said arc tube and slightly spaced from the tube wall of said arc tube for retaining the inert gas within the outer tube around the lower end part of said arc tube for substantially completely blocking flow of the inert gas past the bottom end and lower part of said arc tube for preventing cooling of the vicinity of the lower end of the arc tube due to convection of the inert gas.

4,629,930

PLASMA ION SOURCE

Noriyuki Sakudo, Ohme; Osami Okada, Chofu; Susumu Ozasa, Kashiwa; Katsumi Tokiguchi, Machida; Hidemi Koike, Tokorozawa; Shunroku Taya, Mito; Mitsunori Komatsumoto, and Mitsuo Komatsu, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

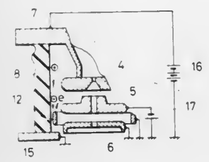
Filed Jul. 27, 1983, Ser. No. 517,696

Claims priority, application Japan, Jul. 30, 1982, 57-131930

Int. Cl.⁴ H05H *19/00*

U.S. Cl. 313—359.1 **5 Claims**

1. A plasma ion source comprising a discharge chamber in which a plasma is produced by plasma generation means, an acceleration electrode disposed adjacent to said discharge chamber to extract ions from the produced plasma, a deceleration electrode disposed adjacent to said acceleration electrode in order to decelerate the extracted ions, a ground electrode disposed adjacent to said deceleration electrode and through which the extracted ions pass to be extracted as an ion beam, a container made of an insulator surrounding said discharge chamber and the respective electrodes, and discharge preventing means, including a shield ring electrode of ground potential



disposed in a vicinity of said deceleration electrode and along an inner wall surface of said insulator container, for preventing any discharge from arising across said deceleration electrode and said ground electrode by reducing the flow of charged particles developed due to surface current flowing along the inner wall surface of said insulator container and preventing the charged particles from entering a space between said deceleration electrode and said ground electrode, thereby enabling a high voltage of at least 50 kV to be applied to said acceleration electrode and enabling extraction of a high energy ion beam.

4,629,931

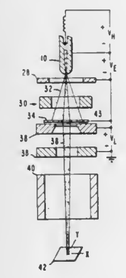
LIQUID METAL ION SOURCE

William M. Clark, Jr., Thousand Oaks, Calif.; Charles M. McKenna, Boxford, Mass., and William L. Johnson, Pasadena, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,466

Int. Cl.⁴ H01J *1/05*

U.S. Cl. 313—362.1 **4 Claims**



1. A liquid metal ion source, comprising:
emission means for emitting positively charged ions of a species; and
source means for supplying the species to be emitted to said emission means, said species being contained in an alloy selected from the group consisting of $(Pb_{0.7-1.0}\ Au_{0.3-0})_{0.7-0.99}\ (As+Sb)_{0.3-0.01}$ and $Pb_{0.20-0.30}\ Au_{0.45-0.55}\ (As+Sb)_{0.20-0.30}$.

4,629,932

COLOR PICTURE TUBE HAVING A SHADOW MASK WITH A COALING LAYER

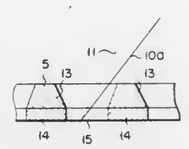
Kiyoshi Tokita, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 19, 1984, Ser. No. 672,951

Claims priority, application Japan, Nov. 18, 1983, 58-216002; Jan. 12, 1984, 59-2613; Mar. 16, 1984, 59-49172; Apr. 23, 1984, 59-80216

Int. Cl.⁴ H01J *29/07*

U.S. Cl. 313—402 **12 Claims**



1. A color picture tube comprising:
a phosphor screen;
a shadow mask disposed near and facing said screen and having a main surface with a plurality of apertures; and
electron guns for emitting electron beams passing through said apertures to bombard said screen and thereby selectively illuminating phosphors;
said main surface of said shadow mask on the side of said electron guns being provided with a coating layer consisting of a material having an electrical conductivity of from 10^{-12} to $10^{-5}\ \Omega^{-1}m^{-1}$ at a temperature ranging from normal temperature to 200° C.

4,629,933

CATHODE-RAY TUBE HAVING AN ELECTRON GUN WITH AN ASTIGMATIC FOCUSING GRID

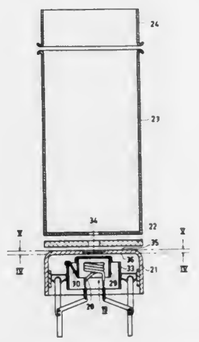
Jan Bijma, and Jan Gerritsen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1984, Ser. No. 603,056

Claims priority, application Netherlands, May 6, 1983, 8301601

Int. Cl.⁴ H01J *29/62, 29/50*

U.S. Cl. 313—414 **8 Claims**



1. A cathode ray tube comprising an envelope containing a display screen and an electron gun for producing an electron beam and focusing it onto a spot on the display screen for deflection in two perpendicular directions to form a raster, said electron gun comprising an arrangement of elements disposed along an axis of the electron gun, said arrangement successively including a cathode, a first grid and a second grid, said

grids each having a part perpendicular to the electron gun axis and including an aperture for passing the electron beam;

characterized in that the aperture in the first grid comprises first and second elongate portions formed in opposite sides of the part perpendicular to the electron gun axis,

the first portion being formed in the side of the part nearest the cathode and being elongate in one of the deflection directions, and the second portion being formed in the side of the part nearest the second grid and being elongate in the other deflection direction,

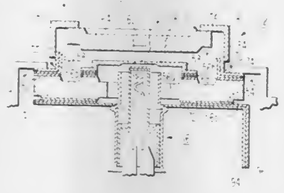
the length, width and depth of the first and second portions being chosen to effect astigmatic focusing of the electron beam in respective first and second directions to a single cross-over point near the second grid, the length of the first portion being no larger than the width of the second portion, said single cross-over existing over the operating range of the electron beam current.

4,629,934

MULTIBEAM ELECTRON GUN HAVING MEANS FOR POSITIONING A SCREEN GRID ELECTRODE

Andrew K. Wright, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1985, Ser. No. 769,978
Int. Cl.⁴ H01J *29/50, 29/82*
U.S. Cl. 313—417 **3 Claims**



1. In a multibeam electron gun for a cathode-ray tube comprising a plurality of cathode assemblies and at least two spaced, successive electrodes having aligned apertures therethrough for passage of a plurality of electron beams, said cathode assemblies and said electrodes being individually held in position from a common ceramic member, said ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, said electrodes being attached to said first major surface and said cathode assemblies being attached to said second major surface, wherein the improvement comprises

a transition member attached to said metallized pattern on said first major surface of said ceramic member, said transition member including a substantially flat first part and a second part electrically isolated from said first part, said second part having a flat portion and two upright portions substantially perpendicular to said flat portion and substantially parallel to each other,

one of the electrodes being attached to said first part of said transition member, and

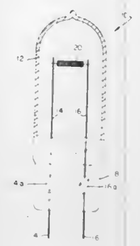
a plurality of support members being disposed between the other electrode and the upright portions of the second part of said transition members, whereby the other electrode can be positioned laterally and longitudinally with respect to the one electrode and secured in alignment therewith.

4,629,935

TUNGSTEN-HALOGEN LAMP WITH ORGANIC AND INORGANIC GETTERS

James P. Keenan, Reading, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,362
Int. Cl.⁴ H01K *1/50, 1/54*
U.S. Cl. 313—579 **6 Claims**



1. A tungsten-halogen incandescent lamp comprising:

a light transmitting, hermetically sealed envelope;

a pair of lead-in wires press sealed in said envelope and extending internally and externally of said envelope;

a tungsten filament attached between the internal ends of said lead-in wires;

a fill gas within said envelope comprising an inert gas and a halogen or halide; and

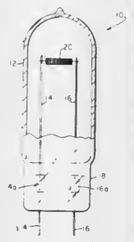
means for gettering oxygen contained in said envelope, said gettering means comprising an organic getter in combination with an inorganic getter, said organic getter comprising methyl bromide and said inorganic getter comprising phosphine, wherein the carbon to phosphorus mass ratio is from about 4:1 to about 1:1.

4,629,936

TUNGSTEN-HALOGEN LAMP WITH MEANS FOR REDUCING FILAMENT EMBRITTLEMENT

Thomas G. Weld, Swampscott, and Mark D. Beschle, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,361
Int. Cl.⁴ H01K *1/50, 1/54*
U.S. Cl. 313—579 **4 Claims**



1. A tungsten-halogen incandescent lamp comprising;

a light transmitting, hermetically sealed envelope;

a pair of lead-in wires press sealed in said envelope and extending internally and externally of said envelope;

a tungsten filament, attached between the internal ends of said lead-in wires, having a wire diameter of about 0.005 inch or less;

a fill gas within said envelope comprising an inert gas and a halogen or halide; and

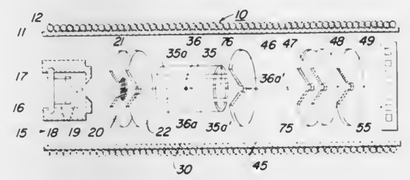
means for substantially reducing filament embrittlement located within said envelope, said filament embrittlement reducing means comprising substances X and Y, said substances having an X to Y mass ratio in the range of about 30:1 to about 1:1., wherein said substance X is a phosphorus based compound that includes phosphine and said substance Y is a carbon-containing compound that includes methyl bromide.

4,629,937

COMPACT ELECTRON GUN FOR EMITTING HIGH CURRENT SHORT DURATION PULSES

Santosh K. Srivastava, and Murtadha A. Khakoo, both of La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Feb. 2, 1984, Ser. No. 576,148
Int. Cl.⁴ H01J *23/16, 29/96*
U.S. Cl. 315—3 **13 Claims**



1. A portable, compact low voltage electron gun for emitting a high current subnanosecond duration pulse, said gun including an electron emitting area at one end of said gun on a longitudinal beam axis, an electron collecting area at the other end of said gun and also located on said longitudinal beam axis, a beam deflecting area on said beam axis and located between the emitting and collecting areas, said gun comprising:

said electron beam deflecting area having low capacity beam deflection plates and a beam barrier positioned between the beam deflection plates and adjacent to the electron collecting area, said barrier having an electron passing sweep aperture on said longitudinal electron beam axis for the gun;

means at said electron emitting area responsive to application of a finite duration voltage for emitting a highly concentrated bunch of electrons in a low electron voltage beam;

first means including a low voltage source connected to said beam deflection plates for biasing said electron bunch into said electron beam barrier;

a source of direct current;

an electromagnetic field creating and electron beam collimating means connected to said direct current source with said electromagnetic means being continuous and substantially surrounding the entire length of said gun, including said beam emitting, deflecting and collecting areas for constricting said emitted electron bunch into a highly collimated low electron voltage beam along said beam axis and throughout said entire length of said gun;

second means including said low voltage source connected to said beam deflection plates operative during said finite duration and responsive essentially to a low valued step voltage for sweeping said electron bunch across said sweep aperture; and

an output circuit for emitting a full width half maximum pulse, W (ns) expressed as:

$$W = \frac{2 \cdot V_o \cdot d \cdot \tau_o \sqrt{a^2 + \delta^2}}{L \cdot l \cdot V_1}$$

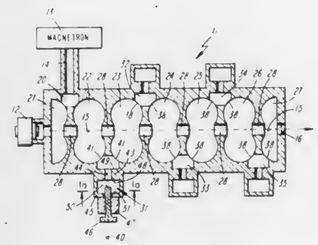
wherein V_0 is the energy (eV) of the collimated and constricted electrons in the deflection area, d (cm) is the separation distance between said deflection plates, τ_o (nS) is the rise time of said step voltage, a (cm) is the widest dimension of the collimated and constricted beam bunch, δ (cm) is the widest dimension of the sweep aperture, L (cm) is the distance of the sweep aperture from the center of the deflector plates, l (cm) is the length of the deflector plates along said longitudinal beam axis, and V_1 (volts) is the step amplitude of the low valued step voltage.

4,629,938

STANDING WAVE LINEAR ACCELERATOR HAVING NON-RESONANT SIDE CAVITY

Kenneth Whitham, San Diego, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 29, 1985, Ser. No. 717,351
Int. Cl.⁴ H01J *25/00*
U.S. Cl. 315—5.41 **11 Claims**



1. A method of operating a linear charged particle beam accelerator having: plural cascaded standing wave electromagnetically coupled main cavities with approximately the same resonant frequency, and side cavities, adjacent ones of the main cavities being electromagnetically coupled to a common side cavity, comprising the steps of injecting a beam of the particles into the main cavities so the beam travels longitudinally through the cascaded cavities, exciting the cavities with an electromagnetic wave having a frequency that is approximately resonant with the resonant frequency of the main cavities so that there is normally a fixed phase shift of the electromagnetic energy in adjacent main cavities, adjusting the resonant frequency of the side cavity so it is not resonant with the electromagnetic wave, and so that a side cavity adjacent said one side cavity is resonant with the electromagnetic wave, the non-resonant one side cavity causing: (a) a change in the normal fixed phase shift of the main cavities adjacent said one side cavity, and (b) a decrease in electric field strength in cavities electromagnetically downstream of said one side cavity relative to the electric field strength in cavities electromagnetically upstream of said one side cavity.

4,629,939

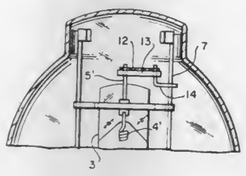
DISCHARGE LAMP WITH AUTOMATIC SHUT OFF

Stephen W. Jaworowicz, Horseheads, N.Y., and John F. Hall, Nutley, N.J., assignors to North American Philips Lighting Corporation, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,519
Int. Cl.⁴ H01J *7/44*
U.S. Cl. 315—73 **11 Claims**

1. A discharge lamp comprising a hermetic outer envelope which is opaque to short wavelength ultraviolet radiation, an arc tube disposed within and enclosed by said outer envelope, said arc tube and said outer envelope defining an interior space therebetween which is substantially devoid of oxygen, a pair of spaced apart electrodes arranged at opposite ends of said arc tube, a pair of electrical leads each connected to a respective one of said electrodes and extending through said arc tube into said interior space, means arranged on the exterior of said outer envelope for connecting the lamp to a source of electrical power, a pair of conductor means disposed in said interior space and each electrically connecting a respective one of said leads to said connecting means, one of said conductor means

including a carbon element connected in series between the associated electrical lead and said connecting means, a non-conductive cylindrical rod, means for supporting said non-conductive rod in said interior space and means for securing said carbon element to said non-conductive rod so as to protect said carbon element from breakage due to shocks and vibration during handling and the like, said carbon element being formed



of a length of pencil lead comprised of graphite and having dimensions such that during operation of the lamp electrical current passing therethrough maintains said carbon element at a temperature such that upon breakage of said outer envelope and exposure of said element to air, said carbon element oxidizes and ruptures thereby extinguishing the lamp by interrupting the electrical path between said connecting means and said associated electrode.

4,629,940

PLASMA EMISSION SOURCE

Peter H. Gagne, Brookfield, and Peter J. Morrisroe, New Fairfield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1984, Ser. No. 585,807
Int. Cl.[4] H05B *31/26;* **H03H** *7/38*
U.S. Cl. 315—111.51 **1 Claim**

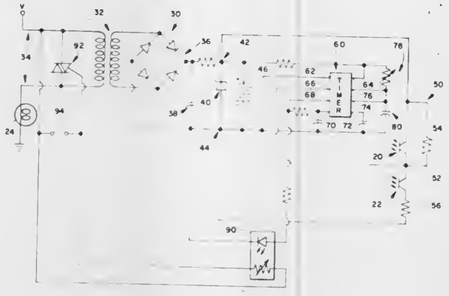
1. A plasma emission source, said source comprising:
a radio-frequency power generator, including an oscillator for generating a radio-frequency signal; and
means for amplifing said radio-frequency signal;
a plasma torch, said torch having an RF load coil associated therewith, said coil receiving RF power from said generator; said plasma torch including: a glass chamber having an inlet for gas for forming a plasma and an inlet for a sample mixture which mixture is atomized in said plasma;
means for automatically and continuously maximizing the RF power transferred from said generator to said load coil, said means including: means for continuously monitoring the impedence match between said generator and said coil, said monitoring means producing a signal indicative of an impedance mismatch; and means responsive to said signal, for automatically matching the impedance of said generator and said coil;
said continuously monitoring means including: a dual phase detector network, said dual phase detector network having a series phase detector and a shunt phase detector, said series phase detector producing a series mismatch signal and said shunt phase detector producing a shunt mismatch signal;
said automatic matching means including: a variable impedance network; and a control unit, said control unit being responsive to said signal and controlling the impedance of said variable impedance network;
said variable impedance network including: a series variable impedance network; and a shunt variable impedance network;
said control unit including: a series variable impedance network control motor, said series control motor being responsive to said series detector signal; and a shunt variable impedance network control motor, said shunt control motor being responsive to said shunt detector signal;
said series variable impedance network including two serially connected variable capacitors in parallel with a fixed capacitor; and said shunt variable impedance network including two parallel connected variable capacitors; and
said series and said shunt variable capacitors being air dielectric capacitors.

4,629,941

DIFFERENTIAL ILLUMINATION SENSITIVE SWITCHING CIRCUIT

Edward H. Ellis, and Marilyn S. Ellis, both of 4022 Wandsworth Rd., South Euclid, Ohio 44121

Filed Jan. 7, 1985, Ser. No. 689,315
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—153 **13 Claims**



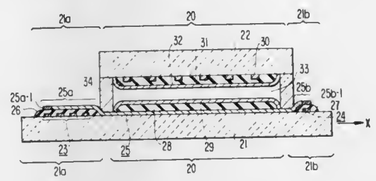
1. For combination with existing A.C. electrical wiring of a building, which wiring includes a wall switch box that has an A.C. power lead that is connected with a source of electrical power and a controlled lead that is connected with wiring that runs from the switch box through walls of the building to a light fixture further wiring in the walls of the building connects the light fixture with ground; a differential illumination switching circuit comprising:
a transformer having a primary winding connecting across the power and controlled leads;
a triac connected in parallel with the primary winding across the power and control leads, whereby the light fixture is connected between the parallel connected triac and primary winding and ground;
a D.C. power supply circuit connected with a secondary winding of the transformer for providing D.C. electric power, the D.C. power supply circuit having a high potential output and a low potential output;
a first light sensitive solid state device operatively connected between the high potential output and a bridge junction;
a first resistor operatively connected in parallel with the first light sensitive device between the high potential output and the bridge junction;
a second light sensitive solid state device operatively connected between the bridge junction and the low potential output;
a timing means for producing a timer output signal of a selected duration on a timer output in response to receiving a low potential signal on a trigger input, the trigger input being operatively connected with the bridge junction;
an electrical isolation means operatively connected with the timing means to be gated to a conductive state by the timer output signal, the isolation means being operatively connected between the power lead and a gate of the triac, such that the triac oscillates between conductive and non-conductive states with each cycle of A.C. power, whereby (i) during one portion of each A.C. cycle, the triac shorts the primary winding and conducts A.C. power to the light fixture and (ii) during another portion of each A.C. cycle, the triac is non-conductive permitting the A.C. power to flow through the primary winding to provide electric power to the D.C. power supply circuit, the first and second light sensitive solid state devices, and the timing means.

4,629,942

GAS DISCHARGE DISPLAY PANEL HAVING CAPACITIVELY COUPLED, MULTIPLEX WIRING FOR DISPLAY ELECTRODES

Kenji Horio, Kobe; Akira Otsuka, Akashi, and Tsuyoshi Tanioka, Musashino, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 21, 1985, Ser. No. 767,874
Claims priority, application Japan, Aug. 31, 1984, 59-182078
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—169.4 **15 Claims**



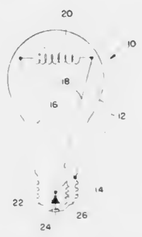
1. A multiplex wiring circuit for the display electrodes of a gas discharge display panel, comprising:
a substrate having a display area in a central portion thereof and first and second peripheral portions extending beyond first and second, opposite edges of said display area;
a plurality of display electrodes formed on said substrate and extending across said display area portion thereof in generally parallel relationship, and in a predetermined direction generally traversing said first and second opposite edges of said display area, said plurality of display electrodes being arranged in a plurality of successive groups of a first predetermined number, and each said group comprising a plurality of successive display electrodes of a second predetermined number;
a first plurality of coupling electrodes respectively corresponding to said display electrodes, a first plurality of driving electrodes of said second predetermined number and respectively corresponding to said plurality of successive display electrodes of each of said successive groups thereof, and an insulating layer intervening between said first pluralities of coupling and driving electrodes, said first pluralities of coupling and driving electrodes and said intervening insulating layer being formed on said first peripheral portion of said substrate;
said first plurality of driving electrode being arranged in generally parallel relationship, and extending transversely of said predetermined direction;
said first plurality of coupling electrodes being arranged in a plurality of successive groups of said first predetermined number, corresponding to said successive groups of successive display electrodes, with each said group comprising a plurality of successive coupling electrodes of said second predetermined number, the corresponding said successive coupling electrodes of said successive groups being positioned in alignment with and capacitively coupled through said intervening insulating layer to said respectively corresponding driving electrodes of said first plurality thereof;
a second plurality of coupling electrodes respectively corresponding to said plurality of display electrodes, a second plurality of driving electrodes of said first predetermined number and respectively corresponding to said successive groups of said display electrodes, and an insulating layer intervening between said second pluralities of coupling and driving electrodes, said second pluralities of coupling and driving electrodes and said insulating layer being formed on said second peripheral portion of said substrate;
said second plurality of driving electrodes being disposed in generally aligned relationship in a direction traversing said predetermined direction and in positions corresponding to the respective said plurality of successive groups of said display electrodes;
said second plurality of coupling electrodes being disposed in generally aligned relationship in a direction traversing said predetermined direction with the coupling electrodes respectively associated with said successive display electrodes of each successive group thereof disposed in alignment with and capacitively coupled through said intervening insulating layer to the respectively corresponding driving electrode of said second plurality thereof;
first means individually connecting said display electrodes from said first edge of said display area to said respectively corresponding first coupling electrodes; and
second means individually connecting said display electrodes from said second edge of said display area to said respectively corresponding second coupling electrodes.

4,629,943

LONG LIFE TRAFFIC CONTROL LAMP AND SOCKET INSERT

Emiliano Ponce, Jr., 3715 Maple Rd., Alderwood Manor, Wash. 98037

Filed Jun. 1, 1984, Ser. No. 616,492
Int. Cl.[4] H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—200 R **13 Claims**



1. A long-life incandescent traffic control lamp for use with a traffic controller having a conflict monitor, the traffic controller having a first state during which alternating current drive power is supplied to the lamp for illumination and a second state during which the drive power to the lamp has been removed, comprising a sealed glass envelope having an illuminable filament disposed therein and electrically connected between a lamp base and a lamp center contact, said electrical connection of said filament between said base and said center contact being through a diode, said diode being bridged by a resistive element, said resistive element having a resistance sufficiently high to provide at least a low-current electric circuit bypass of said diode during the second state of the traffic controller when the drive power to the lamp has been removed to prevent the conflict monitor from falsely tripping, while providing substantially no illuminating lamp drive current to said filament during the first state of the traffic

controller when the drive power has been supplied to the lamp for illumination, whereby said diode rectifies the lamp drive current to said filament to improve lamp life when the drive power is supplied while said resistive element provides a low-current electrical bypass of said diode to avoid indication of an error condition by the conflict monitor when the drive power is removed.

4,629,944

STARTER CIRCUIT FOR A FLUORESCENT TUBE LAMP

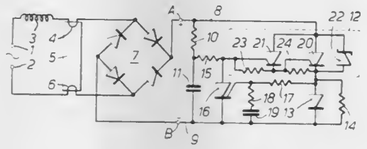
Michael J. Maytum, Bedfordshire; Anthony Lear, Huntingdon; Stephen W. Byatt, Bedford, and Richard A. A. Rodrigues, Yealmpton, all of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 29, 1984, Ser. No. 584,586

Claims priority, application United Kingdom, Mar. 3, 1983, 8305878

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—207 **12 Claims**



1. A starter circuit for an a.c. energized fluorescent tube lamp having cathode with heaters and an inductive ballast impedance in which in use the circuit is connected between the cathode heaters of the tube itself and presents a low impedance enabling the heaters to be energized during part of the starting procedure and a high impedance whilst the tube is running, the circuit including a thyristor having a gate and having an anode and a cathode forming a controlled current path for connection between the cathode heaters and the transition from low impedance to high impedance of that path occurs when the cyclically varying current through the controlled path falls below the holding current of the thyristor, wherein the thyristor is so constructed as to have a low resistance connected between its gate and its cathode so as to require a high holding current and the circuit is such that in use the inductive ballast impedance stores energy corresponding substantially to the passage of the high holding current through it at the instant of the transition from low impedance to high impedance so that the energy is converted to a high voltage striking pulse which is applied to the tube and voltage limiting means being connected in parallel with the controlled current path of the thyristor to restrict the voltage of the pulse generated by the inductive ballast impedance and thereby extend the duration of the pulse.

4,629,945

METHOD AND APPARATUS FOR STARTING LOW WATTAGE HIGH INTENSITY DISCHARGE LAMPS

Charles N. Fallier, Jr., Westford, and Joseph M. Proud, Wellesley Hills, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 27, 1984, Ser. No. 686,979

Int. Cl.⁴ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—207 **3 Claims**

1. A light source comprising:

(a) a high intensity discharge lamp including a discharge tube having first and second electrodes sealed therein at opposite ends and an envelope enclosing a fill material which emits light during discharge;

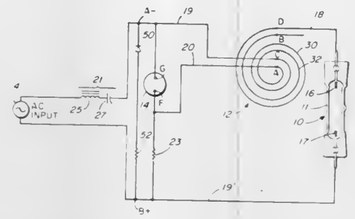
(b) a ballast means for providing an output A.C. voltage across first and second terminals equal to or substantially greater than the voltage into said ballast means, adapted to be conductively coupled to a source of AC voltage;

(c) a spark gap switch having first and second electrodes and a resistor coupled in series across the output terminals of said ballast means such that the first electrode of the spark gap means is conductively coupled to the first output terminal of said ballast means;

(d) a starting circuit including:

(i) a spiral line pulse generator including two conductors insulated from each other and formed together in a spiral configuration having a plurality of turns;

(ii) said spiral line pulse generator having a first one of said conductors conductively coupled at a first end to the



second electrode of said spark gap and a second end left non-conductively coupled, and the second one of said conductors having a first end conductively coupled to the first electrode of said spark gap, and a second end conductively coupled to said first electrode of the discharge lamp;

(iii) and a diode and resistor coupled in series at one end to the first electrode of the spark gap and at the remaining end to the second electrode of the discharge lamp and second terminal of the ballast means.

4,629,946

NEON SIGN CONTROL DEVICE

Shintetsu Amano; Hajime Okada; Teruyuki Yakuda; Isao Hori, and Yoshinori Mizuhata, all of Gifu, Japan, assignors to Kabushiki Kaisha Sanyo Denki Seisakusho, Gifu, Japan

Filed Apr. 1, 1985, Ser. No. 718,320

Claims priority, application Japan, Apr. 4, 1986, 59-68124; Nov. 14, 1984, 59-173435[U]; Nov. 16, 1984, 59-174488[U]

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—219 **25 Claims**



1. A neon sign control device for controlling the ON and OFF condition of neon tubes connected across a secondary winding of a neon transformer in a transformer housing disposed near said neon tubes, A.C. power being supplied from an A.C. power source to a primary winding of said neon transformer through a pair of power lines, said control device comprising:

a control unit including a bidirectional semiconductor switching element having a pair of power terminals and a gate terminanl, said switching element being rendered ON when a trigger signal is supplied to said gate terminal, and a trigger circuit connected between said gate terminal and

one of said pair of power terminals of said bidirectional semiconductor switching element for generating and supplying, in response to a control signal provided to an input terminal of said trigger circuit, the trigger signal to said gate terminal of said bidirectional semiconductor switching element;

a control signal generator for generating said control signal and supplying it to said trigger circuit of said control unit through a control signal transmission line; and

a connector box having installed therein said control unit, said connector box being detachably mounted on said transformer housing, said pair of power lines being led into said connector box, one of said power lines being connected to one of said power terminals of said bidirectional semiconductor switching element, and the other of said power terminals and the other of said power lines being detachably connected with terminals of said primary winding through connector means.

4,629,947

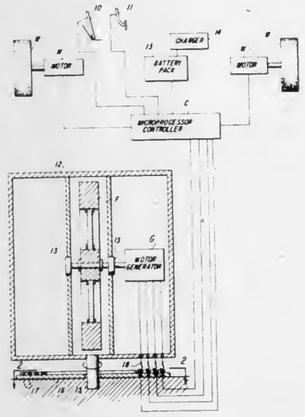
ELECTRIC VEHICLE DRIVE SYSTEM

Julius G. Hammerslag, 27011 Calle Esperanza, San Juan Capistrano, Calif. 92678, and Gary R. Hammerslag, 6202 W. Oceanfront, Newport Beach, Calif. 92663

Filed Apr. 3, 1985, Ser. No. 719,605

Int. Cl.⁴ H02K *7/02*

U.S. Cl. 318—161 **3 Claims**



1. An electric vehicle drive system, comprising: a vehicle drive wheel, a reversible electric motor-brake connected with said wheel, a battery source of stored electrical energy in circuit with said motor, controller means in said circuit, a motor-generator in circuit with said controller means, a flywheel connected in drive relation with said controller means, accelerator and brake means in circuit with said controller means, said controller means being operable to control current flow between said battery source and said motor generator and said motor-brake to limit the current supplied to said motor-brake from said battery source in response to the current demand to drive said drive wheel and to supply current from said motor-generator to said drive wheel, and mounting means supporting said flywheel for angular movement on an axis transverse to the axis of rotation of said flywheel, said mounting means supporting said flywheel on a horizontal axis and being angularly moveable on a vertical axis.

4,629,948

ELECTRIC MOTOR AND TACHOMETRIC GENERATOR UNIT

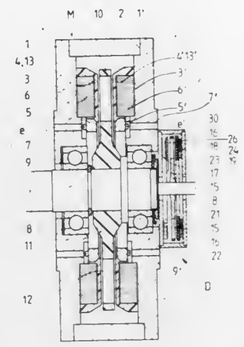
Giampiero Tassinario, Calenzano/Firenze, Italy, assignor to Mavilor Systemes S.A., Switzerland

Filed Apr. 4, 1985, Ser. No. 719,830

Claims priority, application Switzerland, Apr. 11, 1984, 1813/84

Int. Cl.⁴ H02K *23/00*

U.S. Cl. 318—254 **11 Claims**



1. An electric motor and generator comprising:

a motor shaft;

a motor rotor secured to said shaft and having a plurality of first permanent magnets;

a fixed motor armature with an armature winding, said winding cooperating with said motor rotor to turn said shaft when an armature current is applied to said winding;

a generator rotor axially spaced from said motor rotor and secured to said motor shaft and including a disc with a plurality of second permanent magnets having magnetic axes parallel to said motor shaft;

a fixed generator armature with a generator winding cooperating said second permanent magnets to generate tachometric signals, said generator winding having a number of poles and a configuration corresponding to the number of poles and configuration of the rotor armature winding;

fixed magnetic sensor means for detecting positions of said second permanent magnets and for generating sensor signals corresponding to said positions; and

control means for commutating the armature current to the motor armature and for controlling the tachometric signals from said generator winding; said motor and generator windings having no commutators and brushes.

4,629,949

APPARATUS FOR DRIVING A TURNTABLE OF A DISC PLAYER SYSTEM

Hitoshi Senso, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,307

Claims priority, application Japan, Nov. 1, 1983, 58-169554[U]

Int. Cl.⁴ H02P *3/10*

U.S. Cl. 318—257 **3 Claims**

1. An apparatus for driving a turntable of a disc player system comprising:

a spindle motor for driving said turntable, having a rotor;

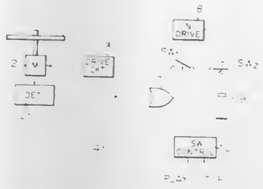
a first drive voltage source of a first drive voltage which drives said spindle motor in a normal direction;

a second drive voltage source of a second drive voltage which drives said spindle motor in a reverse direction;

a detection means for detecting the direction of rotation of said rotor of spindle motor including detection elements disposed around an axis of rotation of said rotor and gen-

erating a reverse direction rotation detection signal when at least a reverse direction rotation of said rotor for a predetermined rotation angle, which is smaller than an angular distance between adjacent two of said detection elements, is detected; and

a voltage supply control means responsive to said reverse direction rotation detection signal from said detection means, a play command signal and a stop command signal



and connected between said spindle motor and said first and second sources, for selectively supplying said first drive voltage to said spindle motor in response to said play command signal, selectively supplying said second drive voltage to said spindle motor upon reception of said stop command signal, and stopping the supply of said second drive voltage to put the spindle motor into a free running state when said reverse direction rotation detection signal is supplied from said detection means.

4,629,950

VARIABLE AUTOMATIC FORWARD/REVERSE CONTROL DEVICE FOR BABY CART

Huang C. Ching, 320, Nan Chon Village, San Sung Hsiung, Tainan Hsian, Taiwan

Filed Sep. 27, 1985, Ser. No. 780,827
Int. Cl.[4] H02P *1/22*
U.S. Cl. 318—285 **5 Claims**



1. A variable automatic forward/reverse control device for a baby cart comprising:

a power source to provide connected control units with power;

a junction point or state converter comprising two-set normal closed and two-set normal opened junction points or states;

a first switch to control the power source applied to a drive motor through the junction point or state converter; and

a second switch to control the power source applied to a timer for timing On/Off in line with the preset time on a timing adjuster so as to control the power source On/Off of the junction point or state converter; whereby

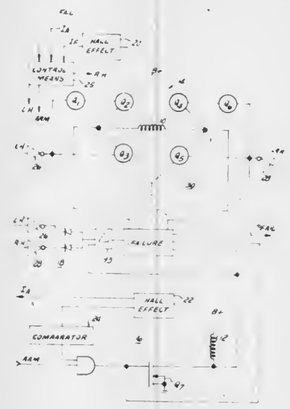
when the first switch is closed, the power source is applied to the motor through the two-set normal closed junction points of the junction point or state converter so as to make the motor rotate in one direction; when the second switch is closed, the timer is communicated with the power source for timing On/Off, the junction point or state converter converts junction point, i.e. the two-set normal closed junction points are opened, and another two-set normal opened junction points are closed; then the power source is applied to the motor but the polarity of power is in an opposite state, so the motor rotates reversely; in so doing, when the first and second switches are closed simultaneously, the motor has to automatically rotate to-and-fro forwardly and reversely in line with the preset time of the timer; and when the On/Off time of the timer is adjusted to be very short, the baby cart is under the downward pressure of weight of both baby and cart per se, and the wheels of the cart are locked by pinch plates, said cart vibrating in situ because the time cycle of converting the forward and reverse rotation of the motor for a while alternately is shorter.

4,629,951

CONTROL SYSTEM FOR REVERSING THE ROTATION OF A FIELD WOUND MOTOR

Robert E. Weber, and Ralph W. Carp, both of Newport News, Va., assignors to Allied Corporation, Morris County, N.J.

Filed Sep. 26, 1985, Ser. No. 780,492
Int. Cl.[4] H02P *1/22*
U.S. Cl. 318—300 **4 Claims**



1. A control system for reversing the rotation of a field wound motor comprising:

a field winding;

an armature winding;

control means for generating clockwise or counterclockwise field control signals to energize said field winding to select the rotation of the motor and an armature control signal to energize said armature winding;

field power driver means electrically connected in a bridge circuit with said field winding and responsive to said field control signals for controlling the direction of the flow of current through said field winding, said field power driver means including means for generating a current signal indicating the direction of actual current flowing through said field winding;

armature power driver means electrically connected to said armature winding and responsive to said armature control signal for energizing said armature winding for controlling the flow of current through said armature winding and including means connected to said armature winding for generating a current signal indicating current flowing through said armature winding; and

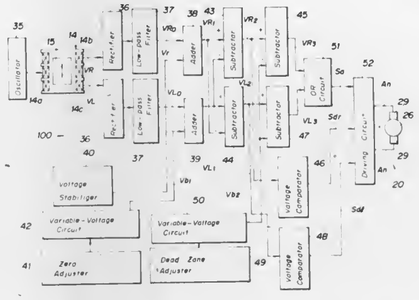
exclusive OR failure detection means for generating a signal in response to a logical combination of said field control signals, said armature control signal, said current signal from said field power driver means and said current signal from said armature power driver means to indicate proper concurrence of said signals.

4,629,952

DRIVING CONTROL METHOD AND CIRCUIT FOR ELECTROMAGNETIC SERVO DEVICES

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,703
Claims priority, application Japan, Aug. 16, 1984, 59-170812
Int. Cl.[4] G05B *11/10*
U.S. Cl. 318—432 **12 Claims**



7. In an electromagnetic servo device (**200**) including:

an input shaft (**1**);

an output shaft (**4**);

an electric motor (**20**) for providing said output shaft (**4**) with auxiliary torque;

torque detection means (**13**) for detecting input torque acting on said input shaft (**1**); and

a driving control circuit (**100**; **300**) for generating a torque magnitude signal (Sa) and a torque direction signal (Sdr, Sdl; Sdr', Sdl') on the basis of an output signal (VR, VL; VR_2, VL_2) from said torque detection means (**13**) to send to said electric motor (**20**) a driving current (An) of such a magnitude and of such a polarity as desirous in accordance with both said torque magnitude signal (Sa) and said torque direction signal (Sdr, Sdl; Sdr', Sdl'),

an improvement comprising:

said driving control circuit (**100**, **300**) having dead zone control means (**45**, **47**, **49**, **50**) for setting the width of a dead zone (DZ_1) of said torque magnitude signal (Sa) wider than that of a dead zone (DZ_2) of said torque direction signal (Sdr, Sdl; Sdr', Sdl').

4,629,953

CONTROL CIRCUIT FOR SLIDING ROOF DEVICES

Toshihiro Inoue; Kazuhiro Ozawa, and Yoshinobu Kimura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1985, Ser. No. 785,477
Claims priority, application Japan, Oct. 9, 1984, 59-212262
Int. Cl.[4] B60J *7/05*
U.S. Cl. 318—468 **4 Claims**

1. In a control circuit (**50**) for a sliding roof device (**100**) having:

a roof panel (**2**) adapted to open and close a roof opening (**3***a*) defined by an opened part (**3**) of a roof (**1**) and to be selectively adjustable between a close position thereof, a tilt-up position thereof, and an open position thereof;

panel transfer means (**11**, **12**, **13***b*, **31**, **33**, **34**, **7**, **21**) for moving said roof panel between said close position and said open position;

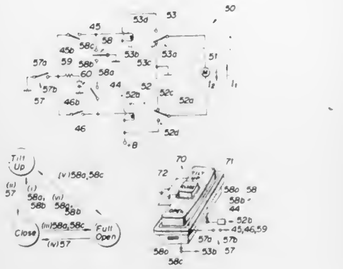
panel tilt-up means (**11**, **12**, **13***a*, **32**, **33**, **34**, **7**, **21**) for moving said roof panel between said close position and said tilt-up position; and

reversible electric motor means (**51**) for driving said panel transfer means and said panel tilt-up means,

said control circuit including:

first operation switch means (**58**) for actuating said motor means to thereby have said roof panel moved from said close position to said tilt-up position and from said close position to said open position; and

second operation switch means (**57**) for actuating said motor means to thereby have said roof panel moved from said tilt-up position and said open position to said close position,



an improvement comprising:

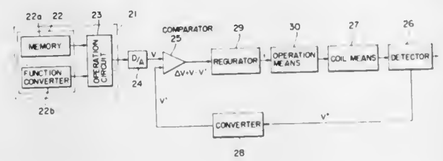
said first operation switch means (**58**) being adapted for a single continuous operation thereof for actuating said motor means to thereby have said roof panel continuously moved from said tilt-up position to said open position and from said open position to said tilt-up position.

4,629,954

CLOSED LOOP CONTROL METHOD FOR HYDRAULIC APPARATUS

Hideo Banzai, Mishima; Goh Ikeda, and Nobukatsu Omura, both of Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,622
Claims priority, application Japan, May 26, 1983, 58-93144
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **2 Claims**



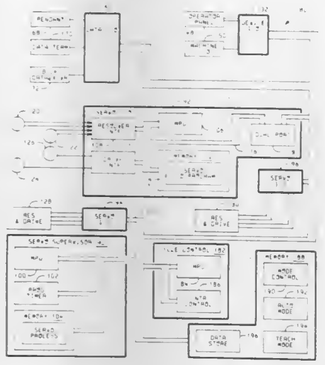
1. A closed loop control method for hydraulic apparatus comprising the steps of: (a) detecting at least one of speed and pressure of an actuator of said hydraulic apparatus, (b) comparing a detected value from step (a) with a desired value preliminarily set regarding at least one of speed and pressure of the actuator, (c) serving a difference value obtained by step (b) to act on a drive mechanism for controlling the actuator thereby to control an input current for the driving mechanism, and (d) presetting a non-linear function D=f(A) between a desired value A and an effective value D regarding at least one of speed and pressure of the actuator in an opened loop control, a value regarding a quantity of electricity to be applied to a valve of the drive mechanism being operated upon and outputted as a non-linear function f(A) with respect to the desired value A so that a non-linear function D'=f(A) is established between an effective value D' and the desired value A in the closed loop control.

4,629,955

METHOD AND APPARATUS FOR MACHINE CONTROL

Daniel B. French, 10130 Duncan Dr., Florence, Ky. 41042, and Michael A. Steinmetz, 655 Wilfert Dr., Cincinnati, Ohio 45245

Filed Sep. 4, 1985, Ser. No. 772,292
Int. Cl.[4] G05B *11/32*
U.S. Cl. 318—625 9 Claims



1. A method for controlling two servo mechanisms associated with driving means for effecting parallel motion of distal ends of a rigid machine member, the machine member motion being defined relative to a single axis of motion of the machine and being effected in response to a machine member motion command signal, each servo mechanism responding to a gain signal, a command signal, and an actual position signal to produce a drive command signal for controlling the velocity of the driving means, the method comprising the steps of:

(a) periodically producing an actual position signal for each servo mechanism representing the actual position of the associated driving means relative to the axis of motion of the machine member;

(b) producing an actual position difference signal in response to the actual position signals of both servo mechanisms, the actual position difference signal representing the difference between the actual positions of the driving means; and

(c) producing a modified gain signal in response to the actual position difference signal, the modified gain signal representing a gain value of a selected servo mechanism required to reduce the magnitude of the actual position difference signal.

4,629,956

SYSTEM FOR CONTROLLING MOTORS FOR SYNCHRONOUS OPERATION

Ryoichiro Nozawa, Tokyo; Yoichi Amemiya, and Hideaki Kawamura, both of Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 433,622, Oct. 8, 1982. This application Dec. 13, 1985, Ser. No. 808,811
Claims priority, application Japan, Oct. 9, 1981, 56-161241
Int. Cl.[4] G05B *11/32*
U.S. Cl. 318—625 3 Claims

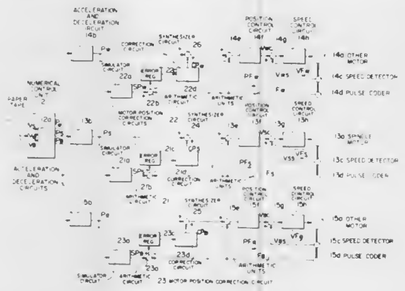
1. A system for controlling motors including a reference motor, such that the motors rotate at command speeds in synchronism and have respective rotational positions, said system comprising:

numerical control means, operatively connected to receive commanded speeds of rotation, for generating as positional commands synchronized distributed pulse trains having frequencies corresponding to the commanded speeds of rotation for respective ones of the motors;

positional control feedback circuits, operatively connected to respective ones of said motors and to receive respective ones of said positional command pulse trains, for producing speed command outputs in accordance with respective ones of said positional command pulse trains and said respective rotational positions;

speed control feedback circuits, operatively connected between respective ones of said positional control feedback circuits and respective ones of said motors, for controlling the speed of the motors based on said speed command outputs and said speeds of rotation of the motors;

detector means, operatively connected to said respective ones of the motors, for generating feedback pulses corresponding to the rotational positions of the respective motors each time the respective motors rotate through a predetermined angular interval and for applying these



signals to said position control feedback circuits as said respective rotational positions;

simulator circuit means, operatively connected to receive respective ones of said positional command pulse trains, for simulating the characteristics of respective positional and speed control feedback in combination with corresponding ones of said motors, and for generating pulses responsive to said simulations; and

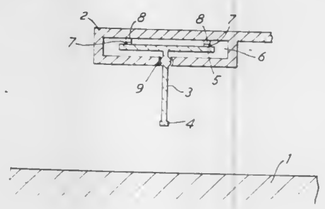
correction circuit means, operatively connected to said corresponding ones of said motors, to said positional and said speed control feedback circuits and to said simulator circuit means, for correcting the rotational positions of the motors in response to differences between the feedback pulses and the pulses generated by said simulator circuit means.

4,629,957

SENSING APPARATUS

Peter E. Walters, London, and Anthony M. Williams, Iver, both of England, assignors to EMI Limited, Hayes, England

Filed Mar. 22, 1985, Ser. No. 714,922
Claims priority, application United Kingdom, Mar. 27, 1984, 8407847
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—662 10 Claims



1. An apparatus for sensing contact with an article, the apparatus comprising a support member, a probe displaceable with respect to the support member and to a reference position in response to contact with an article, and three or more pressure sensitive capacitative transducers arranged in spaced apart relationship between the support member and the probe,

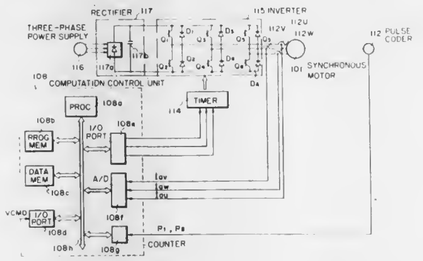
wherein each said pressure sensitive capacitative transducer includes an elastomeric dielectric material and is capable of producing a detectable electrical signal in response to a displacement of the probe from the reference position.

4,629,958

SYNCHRONOUS MOTOR CONTROL SYSTEM

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachiojo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP83/00439, § 371 Date Aug. 17, 1984, § 102(e) Date Aug. 17, 1984, PCT Pub. No. WO84/02619, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 16, 1983, Ser. No. 642,664
Claims priority, application Japan, Dec. 29, 1982, 57-228507
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—723 4 Claims



1. A synchronous motor control system for controlling a synchronous motor, comprising:

a sensor for sensing a rotational angle of the synchronous motor and for generating a position signal;

sinusoidal value generating means, coupled to said sensor, for generating a sinusoidal value corresponding to the position signal;

computing control means, coupled to said sinusoidal value generating means, for multiplying an effective value current command by the sinusoidal value generated by said sinusoidal value generating means to produce three-phase current commands, for obtaining actual phase currents for the synchronous motor, and for computing digital three-phase AC signals based on the actual phase currents and the three-phase current commands; and

synchronous motor drive means, coupled to said computing control means, for applying the digital three-phase AC signals to an armature winding of the synchronous motor as a current command value, said computing control means determining the actual velocity of the synchronous motor based on the position signal, and compensating the sensed rotational angle of the synchronous motor by advancing the rotational angle in proportion to the actual velocity of the synchronous motor, so that the sinusoidal value generated by said sinusoidal value generating means corresponds to the advanced rotational angle.

4,629,959

METHOD AND APPARATUS FOR CONTROLLING PWM INVERTER

Toshiaki Okuyama, Ibaraki, and Hiroshi Nagase, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 528,149, Aug. 31, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 766,686
Claims priority, application Japan, Sep. 3, 1982, 57-152622
Int. Cl.[4] H02P *7/42*
U.S. Cl. 318—727 8 Claims

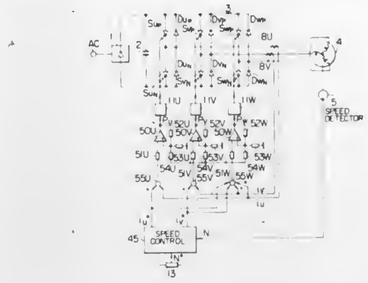
1. A PWM inverter control method comprising the steps of:

driving a polyphase AC motor with a PWM inverter;

generating current command pattern signals for commanding output currents for individual phases of the PWM inverter;

detecting output currents for the individual phases of the PWM inverter and providing output current signals indicative thereof;

generating PWM pulse signals in a pulse width modulation means according to the magnitude and polarity of current



errors between the current command pattern signals and the output current signals for the individual phase;

generating a neutral voltage signal indicative of a neutral voltage of the output of the PWM inverter; and

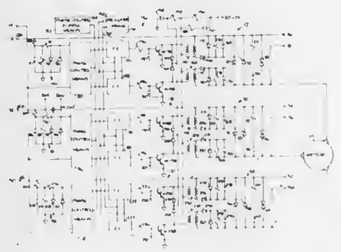
applying the neutral voltage signal to the pulse width modulation means so that the neutral voltage signal is added to the current errors for the individual phases.

4,629,960

INDUCTION MOTOR CONTROLLER

David A. Welsh, Largo, and Denis O. Rehse, St. Petersburg, both of Fla., assignors to Energy Motor Control, Inc., St. Petersburg, Fla.

Filed Dec. 11, 1984, Ser. No. 680,395
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—729 9 Claims



1. A motor control apparatus for a 3-phase induction motor comprising in combination:

a first control means connected in series with a first supply line;

a first voltage sensing means connected across said first control means for sensing the back emf across said first control means when said first control means is open;

a first crossover reference means connected to the input of said first control means;

a second control means connected in series with a second supply line;

a second voltage sensing means connected across said second control means for sensing the back emf across said second control means when said second control means is open;

a second crossover reference means connected to the input of said second control means;

a third control means connected in series with a third supply line;
a third voltage sensing means connected across said third control means for sensing the back emf across said third control means when said third control means is open;
a third crossover reference means connected to the input of said third control means;
a summing amplifier for summing the output of said first voltage sensing means, said second voltage sensing means and said third voltage sensing means;
a power supply means for developing a reference voltage signal representative of line voltage;
a first comparator means for comparing the output of said summing amplifier with said reference voltage signal for developing a voltage control signal wherein said reference voltage signal is conducted to said first comparator means through a pair of reverse-connected diodes;
current sensing means associated with a supply line for sensing current drawn by the motor;
rectifier means connected to said current sensing means for developing a current signal representative of current drawn by the motor;
limiting means for limiting the magnitude of said current signal and for producing a current control signal;
a first voltage divider connected across positive and negative voltage sources for producing a minimum voltage reference signal;
a second comparator means for comparing said voltage control signal with said current control signal and with said minimum voltage reference signal for developing a phase control signal;
a first phase control means for comparing said phase control signal with the output of said first crossover reference means;
a second phase control means for comparing said phase control signal with the output of said second crossover reference means;
a third phase control means for comparing said phase control signal with the output of said third crossover reference means;
a first driver means for accepting the output of said first phase control means and for controlling said first control means;
a second driver means for accepting the output of said second phase control means and for controlling said second control means;
a third driver means for accepting the output of said third phase control means and for controlling said third control means;
starting control means for providing a soft start for the motor;
a second voltage divider;
a third comparator means for comparing the output of said second voltage divider with the output of said rectifier means for producing said current signal; and
oscillator means for excitation of said first driver means, said second driver means and said third driver means.

4,629,961

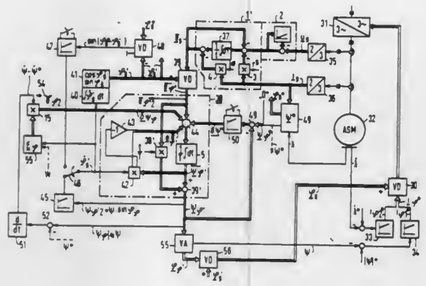
METHOD AND APPARATUS FOR STABILIZING THE LOCUS OF A VECTOR FORMED BY INTEGRATION

Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,485
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418573
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—803 **17 Claims**

1. A method for stabilizing the locus of a model vector mapping, as a metering or controlling quantity of a machine, a vectorial physical quantity of said machine,

wherein measured values of the machine defining an input vector and correction signals defined by a correction vector are fed into an integration circuit for vectorial integration containing at least one integrator and the integral of a sum vector defined by the input vector and the correction vector is formed at the output of the integration circuit and fed, as said model vector, to a control circuit of the machine,



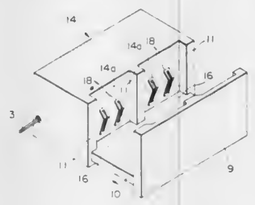
the method comprising presetting a determined angle of the correction vector with respect to the model vector and a magnitude of the correction vector which is derived from a volatile quantity of the model vector, said volatile quantity mapping a physical quantity becoming zero in the steady state of the vectorial physical quantity.

4,629,962

BATTERY CHARGING DEVICE

Koji Arakawa, Kawagoe, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Jun. 26, 1985, Ser. No. 748,826
Claims priority, application Japan, Jun. 26, 1984, 59-94469[U]
Int. Cl.[4] H01M *10/46*
U.S. Cl. 320—2 **3 Claims**



1. A battery charging device adapted for charging a battery having a pair of connecting terminals provided on and exposed at the outer surface thereof, comprising:

a drawer-like closure member provided to be movable between a first position where said closure member is disposed in close contact with or adjacent to one side wall of the device body wherein said closure member is retracted with respect to said body and said device is reduced in size, and a second position where the closure member is spaced apart from said one side wall, so that the device is enlarged in size, wherein when said closure member is made to assume said second position, at least one opening is defined between said closure member and said one side wall so that the battery can be inserted and held therein; and

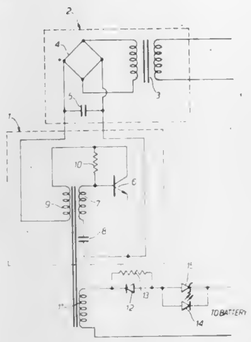
at least one pair of connecting terminals provided on said one side wall and adapted, when the battery is inserted and held in said opening, to be disposed in electrical contact with the connecting terminals of the battery so that the latter can be charged.

4,629,963

DRY CELL BATTERY RE-ACTIVATOR

Neil Morris, Worsley, United Kingdom, assignor to Re-Gen Products Limited, England

Filed Oct. 31, 1984, Ser. No. 666,970
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—3 **5 Claims**



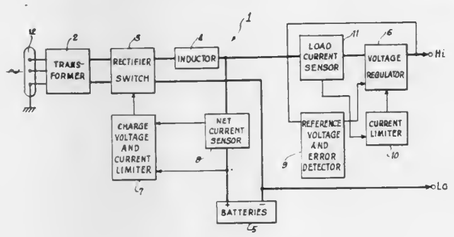
1. A dry cell battery reactivator comprising first and second inductively-coupled circuits, said first circuit including a free running oscillator having a frequency of operation which is determined by said second circuit, said second circuit comprising a tank circuit including inductance means and effective capacitance comprised of at least one cell to be reactivated.

4,629,964

BATTERY POWER SOURCE

Newton E. Ball, 5229 Rimpark La., San Diego, Calif. 92124

Filed Sep. 28, 1983, Ser. No. 536,752
Int. Cl.[4] H02J *7/04, 9/00*
U.S. Cl. 320—14 **15 Claims**



1. A low voltage DC power-supply for an electronic circuit load which comprises:

at least one battery;

means for regulating the voltage delivered from said battery to said load; and

means for charging said battery from AC line power source comprising:

means for controlling the charging voltage applied to said battery in function of the net current flowing in and out of said battery;

switchable means for rectifying the AC line power;

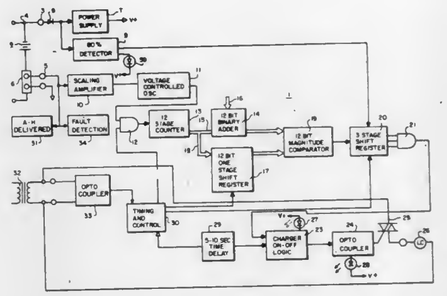
means for detecting the full-cycle zero-axis crossing time of the AC line power; and means for switching said means for rectifying at said zero-axis crossing time.

4,629,965

BATTERY CHARGER TERMINATION CIRCUIT

William H. Fallon, Cleveland, and William R. Schober, Avon Lake, both of Ohio, assignors to General Battery Corporation, Reading, Pa.

Filed Feb. 26, 1985, Ser. No. 705,685
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—39 **17 Claims**



9. In an apparatus for charging a storage battery wherein the battery is initially charged at a maximum rate of current which tapers in magnitude until the battery attains a pre-selected voltage, and is thereafter charged at a reduced rate of current which tapers in magnitude during finishing portions of said charging, the improvement which further comprises:

(a) means for monitoring the current delivered to the battery during said charging, thereby developing data defining a curve representative of current delivered to the battery over time, said current monitoring means comprising:

(i) shunt means placed in series electrical connection with said battery, to develop an analog signal indicative of current delivered to the battery; and

(ii) means coupled to said shunt means for converting said analog signal to a digital signal;

(b) means for monitoring the slope of said curve during charging, said slope monitoring means comprising:

(i) counter means coupled to said current monitoring means, for producing a digital representation proportional to the output of said current monitoring means;

(ii) shift register means coupled to said counter means and adapted to store data representative of the current being delivered to said battery;

(iii) outer means coupled to said counter means and adapted to develop data representative of the current being delivered to said battery and an offset representative of a selected slope value; and

(iv) comparison means coupled to said shift register means and said outer means, for comparing data stored in said shift register means with offset data developed in said outer means; and

(c) means for terminating said charging in accordance with the slope of said curve.

4,629,966

DUAL CURRENT LIMITING VOLTAGE REGULATOR

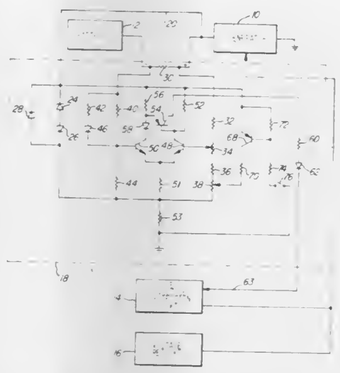
Chester Quantz, Valley Mills, Tex., assignor to Electro-Tech, Inc., Westland, Mich.

Filed Nov. 13, 1984, Ser. No. 670,167
Int. Cl.[4] H02P *9/30;* **H02J** *7/14*
U.S. Cl. 322—25 **1 Claim**

1. The current sensing control device for producing a control signal for application to a overvoltage protection circuit for a generator comprising:

resistor means adapted to be connected between said generator and a load to be protected for developing a voltage representing generator output current;

a proportional control means including first and second proportionally and complementally conducting transistors, first means connecting one side of said resistor means to the first of said complemental transistors to establish a bias therefor, second means including at least a first voltage forming circuit element connecting the other side of said resistor means to the second of said complemental transistors to provide a variable bias to said second transistor to cause said second transistor to conduct increasingly from a first threshold value over a predetermined range;



a third proportionally conducting transistor connected between said first and second transistors for developing a control signal which varies in magnitude according to the relative conductances of said first and second transistors;

means connecting the control signal to an overvoltage protection circuit;

a second voltage forming circuit element; and

switch means for selectively connecting said second voltage forming circuit element in and out of circuit with said first voltage forming circuit element to vary the threshold point of conductance of said second transistor.

4,629,967

GENERATOR VOLTAGE REGULATOR

Richard J. Voss, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1985, Ser. No. 727,557

Int. Cl.[4] H02J *7/16*

U.S. Cl. 322—28 **8 Claims**



2. A voltage regulating system for a generator that has a field winding and an output winding that supplies charging voltage to a storage battery comprising, means connecting said output winding and said battery, a first semiconductor switch connected with said field winding and output winding for controlling field current, a voltage sensing circuit connected across said battery having a first junction for developing a battery voltage at said first junction that varies with the voltage across the battery, a reference voltage developing circuit having a second junction connected with said output winding for developing a reference voltage at said second junction, voltage comparator means connected to said junctions for biasing said first semiconductor switch conductive when said reference voltage exceeds said battery voltage and nonconductive when battery voltage exceeds the reference voltage, said reference voltage developing circuit comprising a second semiconductor switch, a transistor having a base-emitter circuit which has a temperature responsive characteristic and voltage divider circuit elements that are so connected to each other and to said second semiconductor switch as to provide a temperature compensated mode of operation wherein the voltage of said second junction varies with temperature or a flat compensated mode of operation wherein the voltage at said second junction does not vary substantially with changes in temperature, said mode of operation being dependent upon the conductive or nonconductive state of said second semiconductor switch, said transistor being biased nonconductive when said regulator is in said flat compensated mode and being biased conductive when the regulator is in the temperature compensated mode, the conductive or nonconductive state of said second semiconductor switch being controlled by whether or not a conductor connected to the control electrode of said second semiconductor switch is connected to or disconnected from said output winding, said reference voltage developing circuit being connected to said output winding while said regulator is in either said temperature compensated mode or said flat compensated mode.

4,629,968

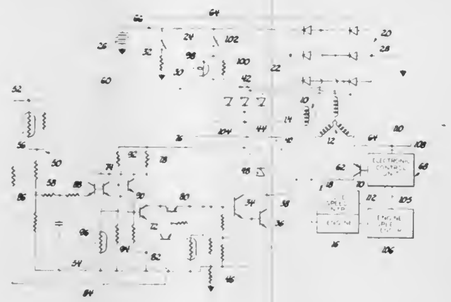
ALTERNATOR LOAD CONTROL SYSTEM

Kenneth R. Butts, Grosse Pointe Woods, and Joseph L. Wanamaker, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1985, Ser. No. 768,677

Int. Cl.[4] H02P *9/10*

U.S. Cl. 322—29 **7 Claims**



1. The method of controlling the field current of an alternating current generator that has an output winding and a field winding wherein the output winding feeds the electrical loads on a motor vehicle and wherein the generator is driven by the engine of the vehicle and for controlling the amount of fuel-air mixture supplied to the engine, the steps comprising, determining whether engine speed is above or below a predetermined value, when engine speed is above said predetermined value continuously energizing said field winding for a time period that corresponds to the time that the output voltage of said output winding is below a desired regulated value and maintaining said field winding deenergized for a time period that corresponds to the time that output voltage of the output winding is above the desired regulated value, when engine speed is below said predetermined value causing said field winding to be alternately energized and deenergized when the output voltage of the output winding is below said desired regulated value and such that the time periods of field energization progressively increase, and while said engine speed is below said predetermined value increasing the fuel-air mixture supplied to the engine each time a time period of field energization increases.

4,629,969

APPARATUS FOR GENERATING A SIGNAL INDICATIVE OF A FAULT OCCURRING IN AN ELECTRIC CIRCUIT CONNECTED TO AN AC NETWORK

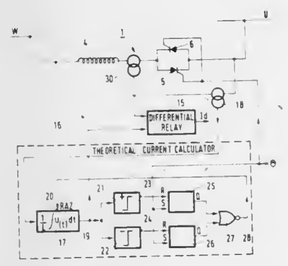
Patrick Charles, Mareil sur Mauldre, France, assignor to Cgee Alsthom, Perret, France

Filed May 7, 1985, Ser. No. 731,251

Claims priority, application France, May 10, 1984, 84 07208

Int. Cl.[4] H02J *3/18*

U.S. Cl. 323—210 **2 Claims**



1. Apparatus for generating a signal indicative of a fault occurring in an AC electric circuit connected to an AC network, said AC circuit being constituted by first and second terminals for connection to said AC network and a series connection extending therebetween, said series connection including at least an inductance winding and a two-way static switch having thyristors controlled by firing pulses θ, and the capacitive impedance and the resistive impedance of said AC circuit being negligible relative to its inductive impedance L, the apparatus comprising:

a differential relay receiving first and second input signals which are different images of the current flowing through said AC circuit, said differential relay providing an output signal indicative of a fault when said input image signals are unequal;

a current transformer having a primary winding connected in said AC circuit and having a secondary winding connected to provide said first image signal which is thus a real image of the current actually flowing through said AC circuit;

a voltage transformer having a primary winding connected to receive the driving voltage across said first and second terminals of said AC circuit and having a secondary winding to provide a signal u which is an image of said driving voltage; and

a current image signal generator circuit connected to receive said voltage image signal u and said thyristor firing pulses θ, and comprising means to generate a theoretical image signal representative of the current which said driving voltage would drive through an inductance impedance L connected in series with thyristors fired by said firing pulses θ in the absence of faults in said inductance winding and in said static switch, and means for applying said theoretical image signal to said differential relay as said second input signal thereto, and said voltage and current transformers being scaled so that said real and theoretical image signals as applied to said differential relay are both to the same scale.

4,629,970

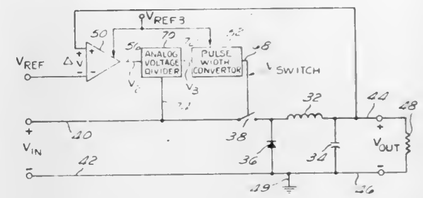
SWITCHING CONVERTOR FOR GENERATING A CONSTANT MAGNITUDE DC OUTPUT VOLTAGE FROM A DC INPUT VOLTAGE HAVING A VARYING MAGNITUDE

Jan H. Johansson, Bålsta, Sweden, assignor to Telefonaktiebolaget L.M. Ericsson, Stockholm, Sweden

Filed Jan. 30, 1985, Ser. No. 696,307

Int. Cl.[4] G05F *5/00*

U.S. Cl. 323—285 **6 Claims**



1. A switching voltage convertor having a switch which is periodically opened and closed to control the application of an input voltage to an output circuit, said output circuit providing an output voltage having a magnitude proportional to the magnitude of the input voltage in a ratio dependent on the duty cycle of the closing of said switch, comprising:

an error circuit which provides an error output signal proportional to the difference between said output voltage and a constant reference voltage;

a divider circuit which provides a first control signal which is proportional to the ratio of said error output signal to said input voltage; and

a pulse width convertor circuit which provides a second control signal to drive said switch with a duty cycle proportional to the magnitude of said first control signal.

4,629,971

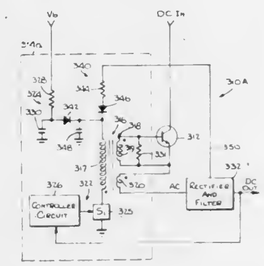
SWITCH MODE CONVERTER AND IMPROVED PRIMARY SWITCH DRIVE THEREFOR

Glenn D. Kirk, El Toro, Calif., assignor to Mai Basic Four, Inc., New York, N.Y.

Filed Apr. 11, 1985, Ser. No. 722,071

Int. Cl.[4] H03K *17/00*

U.S. Cl. 323—289 **21 Claims**



1. A switching circuit comprising a first switch and controller means for switching the first switch on and off:

the first switch having a first input adapted to be coupled to an input voltage, a second input, and an ouput and being switchable between on and off states for respectively coupling and decoupling the input voltage at the first input to the output in response to signals supplied by the controller means to the second input;

the controller means comprising:

a transformer having a primary winding and a secondary winding, the secondary winding being coupled to the

second input of the first switch and supplying said signals to the second input of the first switch;

first current supplying means coupled to the primary winding of the transformer for supplying current to the transformer primary winding;

second current supplying means coupled to the output of the first switch and to the primary winding of the transformer for supplying current to the transformer primary winding from the input voltage when it is coupled to the output of the first switch in the on state of the switch; and

switch means coupled to the primary winding of the transformer for selectively permitting and preventing current flow through the transformer primary winding;

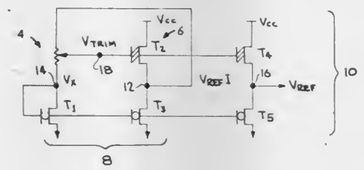
the transformer and the first and second current supplying means cooperating to switch the first switch from the on state to the off state when the switch means permits current to flow through the transformer primary winding and to maintain the first switch in the off state while current is permitted to flow in the transformer primary winding, and to switch the first switch back to the on state when the switch means prevents current from flowing through the transformer primary winding and to maintain the first switch in the on state while current is prevented from flowing, the second current supplying means supplying current to the transformer primary winding when the first switch is in the on state during only an initial portion of the time in which current is permitted to flow in the transformer primary winding effective to cause the transformer to switch the first switch from the on state to the off state, and the first current supplying means supplying current at least after said initial portion of the time during which current is permitted to flow in the transformer primary winding effective to cause the transformer to maintain the first switch in the off state and to enable the transformer to switch the first switch back to the on state when current is next permitted to flow in the transformer primary winding.

4,629,972

TEMPERATURE INSENSITIVE REFERENCE VOLTAGE CIRCUIT

Michael S. Briner, San Jose, and Paul I. Suciu, Saratoga, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 11, 1985, Ser. No. 700,360
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—314 **15 Claims**



1. In a circuit having a means for generating a voltage level and an electrical ground reference, a device for providing an operating temperature insensitive reference potential comprising:

source follower means, coupled to said voltage generating means and having an output node, for attenuating variations in said voltage level;

feedback means, coupled to said source follower means, for biasing said source follower means; and

current mirror means, coupled to said feedback means and said source follower means, for compensating temperature variation induced changes in operating characteristics of said source follower means,

whereby said reference potential at said node is insensitive to operating temperature variations.

4,629,973

CURRENT STABILIZING CIRCUIT OPERABLE AT LOW POWER SUPPLY VOLTAGES

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,344
Claims priority, application Netherlands, Jul. 11, 1983, 8302458
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—316 **3 Claims**



1. A current stabilizing circuit comprising first and second common terminals, and first and second circuits arranged in parallel between said first and second common terminals, the first circuit being formed by the series arrangement of the collector-emitter path of a first transistor of a first conductivity type and the collector-emitter path of a second transistor of a second conductivity type, the second circuit being formed by the series arrangement of the collector-emitter path of a third transistor of the first conductivity type, the collector-emitter path of a fourth transistor of the second conductivity type and a resistor, a first differential amplifier having a first and a second input and an output, the first and third transistors having commonly-connected control electrodes and the second and fourth transistors having commonly-connected control electrodes which are driven by an output of said first differential amplifier, the first input of said first differential amplifier being coupled to the first circuit between the first and second transistors, and a second differential amplifier having a first and a second input and an output, the commonly-connected control electrodes of the first and third transistors being driven by an output of said second differential amplifier, the first input of said second differential amplifier being coupled to the second circuit between the third and fourth transistors, a voltage divider having a tap and being provided between the first and second common terminals and the second inputs of the first and second differential amplifiers being coupled to said tap of the voltage divider.

4,629,974

ACTIVE CURRENT TRANSFORMER

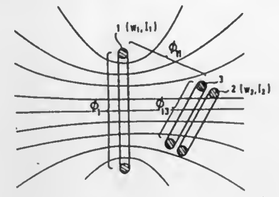
Richard Friedl, Brunswick, Fed. Rep. of Germany, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

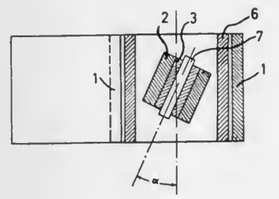
PCT No. PCT/EP84/00126, § 371 Date Dec. 11, 1984, § 102(e) Date Dec. 11, 1984, PCT Pub. No. WO84/04849, PCT Pub. Date Dec. 6, 1984
Continuation of Ser. No. 682,000, Dec. 11, 1984, abandoned. This PCT application Apr. 27, 1984, Ser. No. 841,008
Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3318749
Int. Cl.[4] H01F *40/06*
U.S. Cl. 323—357 **14 Claims**

1. A current transformer comprising a primary winding conducting a current to be measured (I_1) and having W_1 turns; a secondary winding conducting a measuring current (I_2) and having W_2 turns;

a detector winding substantially rigidly coupled to said secondary winding and providing an induced voltage;

an amplifier receiving current induced in said detector winding for varying current I_2 in said secondary winding; said induced voltage of said detector winding creating in said





secondary winding a current having a magnetic flux which compensates the magnetic flux permeating said detector winding, said transformer providing a large current transforming ratio

$$\frac{I_1}{I_2} = \frac{1}{K} \quad \frac{W_2}{W_1}$$

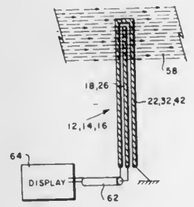
by said detector winding picking up a magnetic partial flux ϕ_{13} of total magnetic flux ϕ_1 produced by said primary winding whereby the coupling factor K, which is determined by the ratio of said partial flux ϕ_{13} to said total flux ϕ_1, is considerably smaller than one.

4,629,975

COAXIAL PROBE FOR MEASURING THE CURRENT DENSITY PROFILE OF INTENSE ELECTRON BEAMS

Ralph Fiorito, Bethesda, and Michael Raleigh, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1984, Ser. No. 640,178
Int. Cl.[4] G01N *27/00*; G01K *1/08*
U.S. Cl. 324—71.3 **11 Claims**



1. A coaxial electric probe for mapping the radial current density profile of a high energy and high current electron beam generated in an associated accelerator tube, said coaxial electric probe comprising:

an input sensor configured so as to eliminate capacitive coupling between the electron beam and said input sensor and reduce the effects of radio frequency (RF) fields, due to noise generated by the electron beam, when said input sensor is inserted and then scanned radially therein, the input sensor comprising:

an inner sensor tip configured to be cylindrical with a predetermined diameter uniformly formed from one end thereof, along its length, to an integral but larger inner sensor tip shoulder at its other end;

an outer sensor tip shield configured to be cylindrical with predetermined inner and outer diameters uniformly formed from one end thereof, along its length, to an integral but larger outer sensor tip shield shoulder at its other end, said outer sensor tip shield being coaxially disposed about said inner sensor tip so as to form a uniform gap therearound along their lengths a predetermined distance so as to form substantially an open ended but shielded coaxial transmission line of a predetermined impedance;

an interface support connector configured so as to support said input sensor and form an electrical connection therebetween, the inner interface conductor having an integrally formed inner interface conductor shoulder support sleeve at one end thereof, said inner interface conductor being configured to be cylindrical with a predetermiend diameter substantially uniformly formed, along its length, from the one end to the other end thereof, said inner sensor tip of said input sensor being mechanically supported and electrically connected to said inner interface conductor via an interference fit joint formed between said inner sensor tip shoulder of said inner sensor tip and said inner interface conductor shoulder support sleeve of said inner interface conductor; and

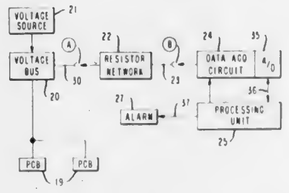
an output support connector configured so as to support said interface support connector and form an electrical connection between, the outer interface conductor having an integrally formed outer interface conductor shoulder support sleeve at one end thereof, said outer interface conductor being configured to be cylindrical with predetermined inner and outer diameters substantially uniformly formed, along its length, from the one end to the other end thereof, said outer sensor tip shield of said input sensor being mechanically supported and electrically connected to said outer interface conductor via an interference fit joint formed between said outer sensor tip shield shoulder of said outer sensor tip shield and said outer interface conductor shoulder support sleeve, said outer interface conductor being coaxially disposed about said inner interface conductor thereby forming a larger uniform gap therearound.

4,629,976

METHOD AND CIRCUIT FOR EVALUATING AN ANALOG VOLTAGE

Mark G. Pipkorn, Minneapolis, Minn., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 28, 1985, Ser. No. 706,696
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—73 PC **7 Claims**



1. A method for detecting a fault in a voltage distribution bus which is normally supplied with a line voltage level by a voltage supply and which is connected to an electrical element utilizing the line voltage comprising the steps of;

connecting a test circuit to the voltage distribution bus;

supplying a current to the test circuit;
sensing a first voltage level representing the voltage drop of the test circuit;
adding a first resistor in series with the test circuit;
sensing a second voltage level representing the voltage drop across the test circuit and first resistor;
adding a second resistor in series with the test circuit and removing the first resistor from the circuit;
sensing a third voltage level representing the voltage drop of the circuit including the second resistor;
comparing the second voltage level with the third voltage level; and
generating a first signal actuating an alarm indicating a failure of the voltage supply when the second voltage drop is greater than the third voltage drop.

4,629,977

METHOD AND APPARATUS FOR MEASURING THE RESONANT FREQUENCY OF A HIGH Q RESONATOR

James D. English, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 3, 1985, Ser. No. 740,365
Int. Cl.[4] G01R *23/00*
U.S. Cl. 324—81 **12 Claims**



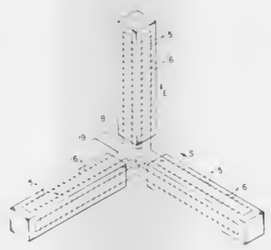
1. A circuit for accurately measuring the resonant frequency of a resonator, said circuit comprising:
terminal means for receiving a drive signal the frequency of which is offset from the expected resonant frequency;
gate means for distributing said drive signal to the resonator for a preselected period of time and then decoupling it therefrom; and
period counter means for counting the period of the signal from the resonator after the gate means has decoupled the drive signal from the resonator.

4,629,978

DIPOLE ANTENNA

Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,323
Int. Cl.[4] G01R *5/22, 21/02*
U.S. Cl. 324—95 **8 Claims**



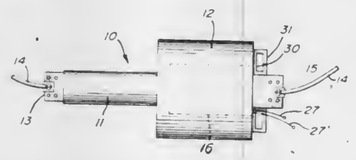
1. An antenna responsive to a particular range of frequencies, comprising
mutually orthogonal antenna assemblies, each including an array of resistive thermocouples extending along a substantially longitudinal axis,
a conductive element of discrete length connected between each of said thermocouples and extending transverse to the respective array,
the spacing between said conductive elements being approximately one-half wavelength at the mid-frequency of said particular range of frequencies.

4,629,979

APPARATUS FOR SENSING AND MEASURING A CURRENT ON POWER TRANSMISSION LINE

Gilles Missout, St. Bruno, and Marcel Déry, Varennes, both of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Aug. 31, 1983, Ser. No. 528,063
Int. Cl.[4] G01R *1/20;* **H05K** *9/00;* **H01C** *5/00*
U.S. Cl. 324—126 **12 Claims**



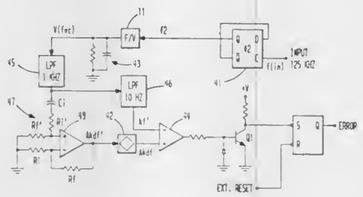
1. An apparatus for sensing and measuring a DC or AC current on a power circuit, said apparatus comprising a shunt element constructed from a metal having a relatively stable resistance value and very small error over an operating temperature range of said shunt, said shunt element further having an input connection electrically connectable to said power circuit, a conductive housing connected directly to said shunt element and in series therewith for conducting said current from said shunt, said conductive housing having an output connection connectable to said power circuit for conducting current flowing through said shunt back to said power circuit; said housing defining a chamber, an electronic circuit means contained in said chamber and connected to an input tap and an output tap of said shunt element for sensing and measuring DC or AC current flowing through said shunt element; said housing shielding said electronic circuit means from thermal effects of said shunt element, the magnetic field effect of the measured current, and environmental electrostatic interference; said housing having a surface dimension sufficient to increase the heat dissipation caused by the current flowing through the shunt whereby said electronic circuit means is subjected to reduced temperatures much more inferior than the temperatures of said shunt element.

4,629,980

TESTING LIMITS OF SPEED VARIATIONS IN MOTORS

Wayne A. Overby, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1985, Ser. No. 737,981
Int. Cl.[4] G01P *3/48*
U.S. Cl. 324—166 **5 Claims**



1. The combination comprising:
means for turning a shaft at a given rotational speed;
means coupled to said shaft for supplying a voltage proportional to the rotational speed of the shaft;

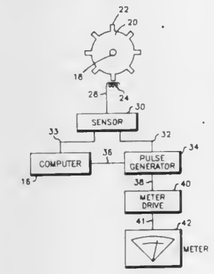
means for extracting from said speed-proportional voltage a component value representative of the given rotational speed including any variations of said speed-proportional voltage not caused by speed variations;
means responsive to said supplying means for amplifying changes in said speed-proportional voltage caused by speed variations by an amount equal to the reciprocal of predetermined speed tolerances; and
means responsive to said extracting means and to said amplifying means for supplying an output signal when amplified changes in the speed-proportional voltage exceed the component value extracted from said speed-proportional voltage.

4,629,981

METER OVERDRIVE PROTECTION CIRCUIT

William J. Barbiaux, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 622,026, Jun. 18, 1984, abandoned.
This application Mar. 24, 1986, Ser. No. 842,380
Int. Cl.[4] G01P *3/48, 3/54, 23/02*
U.S. Cl. 324—166 **1 Claim**



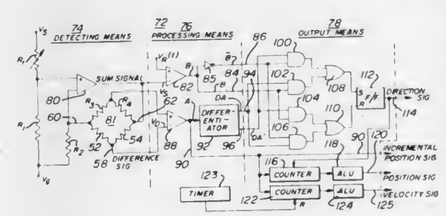
1. A meter drive circuit for use with:
a meter having a needle; and
a source of pulses, each of said pulses corresponding to rotation of a shaft located in a particular operating environment, said meter drive circuit comprising:
(A) a pulse generator having at least one internal register for storing binary coded data and further having a programming input, a triggering input operably connected to receive said pulses from said source of pulses, and an output, said pulse generator being selectively operable in either of at least two operating modes, wherein:
(i) one of said operating modes comprises a pulse generating mode that provides a meter drive pulse having a fixed width at said output upon receipt of a pulse at said triggering input, said fixed width being determined, at least in part, by said binary coded data; and
(ii) another of said operating modes comprises a fixed duty cycle mode that provides a signal at said output having a fixed duty cycle regardless of what signals are received at said triggering input;
(B) a microcomputer having modest storage and retrieval capabilities, said microcomputer having:
(i) an input connected to receive a signal related to said pulses from said source of pulses; and
(ii) an output operably connected to said programming input of said pulse generator:
(a) for allowing said microcomputer to store said binary coded data in said internal register of said pulse generator; and
(b) for allowing said microcomputer to control the operating mode said pulse generator;
wherein said microcomputer provides binary coded data relating to said particular operating environment to said pulse generator to thereby calibrate said pulse generator, and wherein said microcomputer monitors said input from said source of pulses and causes said pulse generator to operate in said fixed duty cycle mode when said signal as supplied to said input to said microcomputer at least equals a preselected frequency; and
(C) a meter drive that receives the output of said pulse generator and that causes said needle of said meter to deflect in response thereto.

4,629,982

APPARATUS FOR DETECTING MOTION AND DIRECTION USING MAGNETORESISTIVE SENSORS PRODUCING SUM AND DIFFERENCE SIGNALS

Walter G. Kieslich, Blue Bell, Pa., assignor to Transducer Systems, Inc., Kulpsville, Pa.

Filed Jul. 1, 1983, Ser. No. 510,285
Int. Cl.[4] G01B *7/14;* **G08B** *21/00;* **H01L** *43/00*
U.S. Cl. 324—208 **25 Claims**



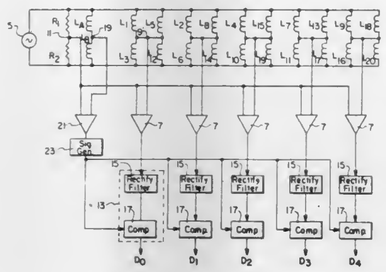
1. A motion sensing means comprising a detecting means including first and second spaced sensing elements each providing a respective output signal, the sensing elements being connected for concurrently producing a sum signal and a difference signal of their respective output signals, a member movable relative to the detecting means having a cyclically varying characteristic proximate to the sensing elements for being sensed by the detecting means, processing means deriving the sum signal and the difference signal from the sensing element and providing processed sum and difference signals, and output means receiving the processed sum and difference signals from the processing means and delivering an output signal responsive to the direction of motion of the member, the sensing elements have a spacing of less than one-half of the wavelength of the varying characteristic of the member for providing their respective output signals, the first and second elements of the detecting means each have first and second ends and are connected in series by having the first ends joined together and the second ends unjoined to each other, the detecting means includes stabilizing means for providing a substantially constant current through the series connected elements, and the processing means derives the sum signal of the detecting means from the unjoined ends of the sensing elements and derives the difference signal of the elements from the joined ends of the sensing elements, the detecting means includes a pair of series connected resistors and the sensing elements of the detecting means are connected across the pair of series resistors in a bridge circuit having first and second pairs of oppositely arranged junctions for respectively providing the sum and difference output signals, and the stabilizing means includes a negative feedback circuit for providing substantially constant current through the series connected elements and the series connected resistors of the bridge circuit.

4,629,983

DIGITAL ROD POSITION DETECTOR SYSTEM

Dirk J. Boomgaard, Monroeville, and James A. Neuner, Richland Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1984, Ser. No. 657,423
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—208 **15 Claims**



1. Apparatus for detecting the location of an end of an elongated, longitudinally movable member, comprising:

a plurality of spaced, discrete electrical coils through which said elongated member passes sequentially in moving longitudinally and in so doing, varies the inductance of each coil as it passes therethrough;

means connecting said plurality of coils in sets with each set including first and second groups of equal numbers of said coils connected in parallel, with the two groups of coils connected in series at a common node, with none of the coils in any given set being adjacent to any other coil in the set, and with the number of sets equal at least to the number of coils in a set;

a pair of impedances connected in series at a common node;

an alternating current source connected across said sets of coils and said pair of impedances; and

output signal generating means connected between the common node of said pair of impedances and the common nodes of each of said sets of coils with the ratio of the impedances of the pair of impedances being the same as the ratio of the impedance of each coil in the first group to the impedance of each coil in the second group of each set, said output signal generating means being responsive to the successive change in impedance in each coil resulting from penetration of the coil by the end of said elongated member to generate output signals representative of the position of the end of said elongated member relative to said coils.

4,629,984

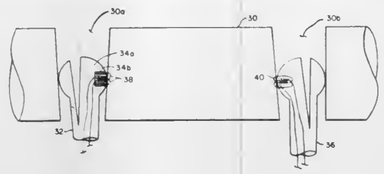
FERROMAGNETIC EDDY CURRENT PROBE APPARATUS

Joseph J. Scalese, 5531 Laird Rd., Loomis, Calif. 95650

Filed Feb. 26, 1985, Ser. No. 705,835
Int. Cl.[4] G01N *27/72;* **G01R** *33/12*
U.S. Cl. 324—228 **8 Claims**

1. A ferromagnetic eddy current probe apparatus comprising in combination:

a first probe means comprised of a metal material, said first probe means having a spherical portion at one end and a externally threaded portion at the other end, said first probe means containing a hole extending along its central axis, said spherical portion of said first probe means containing a shallow opening which communicates with said hole, said shallow opening enclosed by walls that are formed in said metal material of said first probe means, a magnetic coil means is positioned within said shallow opening, said magnetic coil means is surrounded by a shield means which is positioned between said magnetic coil means and the walls of said shallow opening, said magnetic coil means including coil lead wires which extend into said hole and exit at said thread portion of said first probe means, said first probe means including an expansion slot extending longitudinally through said spherical portion, said shallow opening is extended to communicate with said expansion slot of said first probe



means in order to increase probe sensitivity, said expansion slot having a predetermined thickness, and,

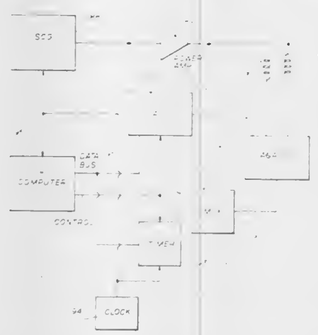
a second probe means comprised of a non-metallic material, said second probe means having an internally threaded portion at one end to mate with said externally threaded portion of said first probe means, said second probe means accepting said coil lead wires to provide access to an excitation means.

4,629,985

METHOD AND APPARATUS FOR MEASURING DEFECTS IN TUBULAR MEMBERS

Stylianos Papadimitriou, and Clive C. Lam, both of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

Filed Apr. 11, 1984, Ser. No. 599,226
Int. Cl.[4] G01N *27/82;* **G01R** *33/12*
U.S. Cl. 324—232 **20 Claims**



1. An apparatus for determining the extent of the axially extending defects in a tubular element during travel of the tubular element relative to a well head of a subterrranean well, comprising:

a clock;

a saturating drive coil disposed around the tubular element for inducing a saturated magnetic field in the element;

generator means responsive to the clock for generating two phase displaced regularly fluctuating driving fields for inducing driven fields in the element;

detector means extending axially along the element over a distance greater than the diameter of the tubular element and responsive to changes in the driven fields in the element for generating analog signals respectively corresponding to the driven fields, whereby axially extending defects in the tubular element produce variations in the driven fields and the corresponding analog signals;

analog to digital means for determining the intensity and polarity of the analog signals;

a timer responsive to the clock for actuating the analog to digital means at regular intervals; and

computing means responsive to the generator means and the analog to digital means for detecting variations in the phase displacement between the driving and the driven fields, whereby the extent of axially extending defects in the tubular element is determined at the well head.

4,629,986

NUCLEAR MAGNETIC LOGGINS

Hugh Clow, Maidenhead; William S. Percival, and Peter E. Walters, both of London, all of England, assignors to National Research Development Corp., London, England

Filed May 24, 1984, Ser. No. 613,402
Claims priority, application United Kingdom, Jun. 9, 1983, 8315866
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—303 **5 Claims**



1. A probe for use in nuclear magnetic logging, the probe being of elongated form suitable for lowering down a borehole with its longitudinal axis extending vertically, and incorporating a pair of similar cylindrical permanent magnets disposed with their axes substantially coincident with said longitudinal axis and separated by a gap extending between like poles of the two magnets, a solenoid disposed about the centre of said gap coaxial with the magnets, and a core of magnetic material disposed within the solenoid.

4,629,987

METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANT MEASUREMENT OF FLOW VELOCITY

James D. King; Erroll S. Riewerts, and William L. Rollwitz, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Sep. 8, 1983, Ser. No. 530,411
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—306 **21 Claims**

1. Flow velocity measuring apparatus for use with a pipe made of non-ferrous material wherein flowing material entrains n element of interest subject to nuclear magnetic resonance (NMR), and wherein the apparatus comprises:

(a) shaped magnet means forming a magnetic field across a pipe, the field having a gradient therein;

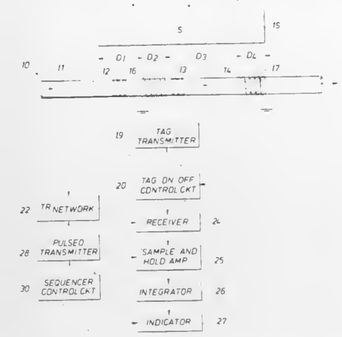
(b) a tag transmitter for forming RF pulses;

(c) a tag coil connected to said tag transmitter and positioned to impress a first RF pulses field acting on the flowing element;

(d) wherein the RF field and magnetic field cooperate to change the flowing element to a disturbed state compared with an aligned state achieved by the magnetic field;

(e) a downstream located interrogation coil for detecting the aligned or disturbed states of the flowing element;

(f) NMR interrogation circuit means connected to said interrogation coil for obtaining NMR response indicative of



the flowing element time of travel between said tag coil and said interrogation coil; and

(g) wherein said magnet means forms the field gradient in the region of said tag coil to define a magnetic field intensity interacting with the RF pulse to achieve a specified NMR response limited in length along the pipe by the field gradient.

4,629,988

METHOD OF IMAGING BY DEPTH-RESOLVED SURFACE COIL SPECTROSCOPY

Paul A. Bottomley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,941
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **36 Claims**



1. A method for obtaining spatially resolved nuclear magnetic resonance chemical shift spectra from a selected substantially disk-shaped volume portion of a sample, the volume portion having at least one end plane, comprising the steps of:

(a) providing a static magnetic field in a first direction through at least the selected sample volume;

(b) providing a single surface coil having at least one conductor lying substantially in a real plane positioned substantially parallel to the end plane of the selected sample volume to be imaged;

(c) exciting at least the selected sample volume with a pulsed radio-frequency (RF) magnetic field applied in a second direction substantially perpendicular to the first direction;

(d) providing, at least during the presence of the (RF) field pulse, a magnetic field gradient of a predetermined magnitude G_D and in a direction substantially perpendicular to the surface coil plane;

(e) adjusting the frequency of the RF field, for the preselected magnitude G_D of the magnetic field gradient, to selectively excite the nuclei in the selected sample volume at a predetermined distance D from the surface coil plane;
(f) adjusting the duration of the RF field pulse, for the preselected magnitude G_D of the magnetic field gradient, to selectively excite the nuclei in a predetermined thickness T of the sample volume; and
(g) receiving, with the surface coil, the response signal emitted from the nuclei in the selectively-excited sample volume, for obtaining imaging information therefrom.

4,629,989

PATIENT ALIGNMENT SYSTEM FOR NMR STUDIES

Mark E. Riehl, Waukesha, and Robert J. Dobberstein, West Allis, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 10, 1983, Ser. No. 550,704
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **10 Claims**



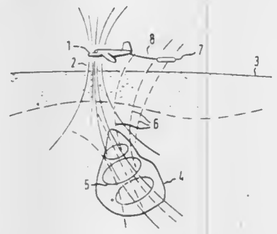
1. A patient alignment system useful with an NMR system for acquiring NMR data in the course of a scan of a predetermined volume of a patient, the NMR system including a magnet for producing a polarizing magnetic field within a magnet bore sized for receiving the patient volume, and a patient transport system in general longitudinal alignment with the magnet bore capable of positioning the patient volume for scanning in an advanced position in the active region of the magnetic field centered approximately at the isocenter and for retrieving the patient volume to a staged position substantially out of the active region of the magnetic field, the patient alignment system comprising:
- a first assembly including at least one energy source capable of projecting in use a first visible pattern on the surface of a patient;
- first means for detecting the position of the patient transport system when said first visible pattern is aligned with a patient anatomical reference point in the staged position prior to performing the NMR scan;
- a second assembly including at least one energy source means capable of projecting in use a second visible pattern lying substantially in a horizontal plane on a surface of a patient, said second assembly including means for varying in use within a predetermined range the vertical position relative to the horizontal plane of said second visible pattern with respect to a fixed reference point;
- second means for detecting the position of said second visible pattern on the patient surface; and
- control means in signal communication with said first and second means for detecting, said control means being responsive to the position of at least one of the first and second visible patterns for controlling at least one parameter used for altering at least one of NMR data acquisition, image reconstruction and display.

4,629,990

METHOD AND APPARATUS FOR CORRECTING THE RELATIVE MOTION OF A TRANSMITTER AND A RECEIVER IN AIRBORNE ELECTROMAGNETIC PROSPECTING

Alexander P. L. M. Zandee, Rijswijk, Netherlands, assignor to Shell Internationale Research Maatschappij, B.V., Netherlands

Filed Nov. 28, 1983, Ser. No. 555,704
Claims priority, application United Kingdom, Dec. 17, 1982, 8235950
Int. Cl.[4] G01V *3/165, 3/16*
U.S. Cl. 324—330 **10 Claims**



4. An airborne electromagnetic inductive survey apparatus for mounting with a survey aircraft and a receiver towed behind the aircraft, including:
- continuous transmitting means mounted with the survey aircraft for continuously transmitting primary electromagnetic signals having a frequency spectrum extending from high frequency to low frequency or direct current;
- continuous receiving means mounted with the receiver towed behind the aircraft for continuously receiving composite signals produced by the transmitted primary signals and secondary signals which are generated by eddy currents induced in the earth by the primary signals, the low frequency or direct current component of the primary signals being substantially incapable of generating receivable secondary signals; and
- means for cross-correlating the composite received signals with the transmitted primary signals to compensate for relative motion between the receiving means and the transmitting means.

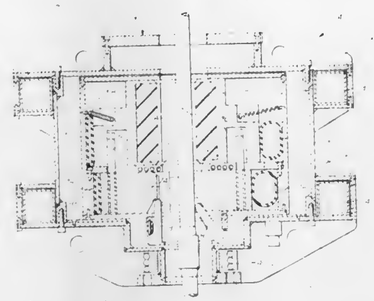
4,629,991

METHODS AND APPARATUS FOR DETECTING TUBULAR DEFECTS HAVING A PLURALITY OF EXPANDABLE ARCUATE SEGMENTS

Walter R. Wheeler, Friendswood, Tex., assignor to PA Incorporated, Houston, Tex.

Filed Apr. 11, 1984, Ser. No. 599,197
Int. Cl.[4] G01N *27/72;* **G01R** *33/12*
U.S. Cl. 324—232 **24 Claims**

1. An expandable tubular trip tool for use on a surface rig in measuring defects in tubular sections interconnected by end couplings to form continuous tubular string as the tubular sections travel relative to the wellhead of a subterranean well, comprising:
- a detection head comprising a plurality of arcuate segments and including means for monitoring the condition of each tubular section, each segment being transversely shiftable from a first position adjacent to the exterior of the tubular sections to a second retracted position spaced outwardly from the first position;
- means for mounting the tubular trip tool at the wellhead with the detection head segments surrounding the tubular sections;
- means for biasing the detection head segments toward the second position;
- means for detecting movement of a component traveling with the tubular section toward the detection head and having an exterior surface radially outwardly from an end coupling traveling through the detection head; and



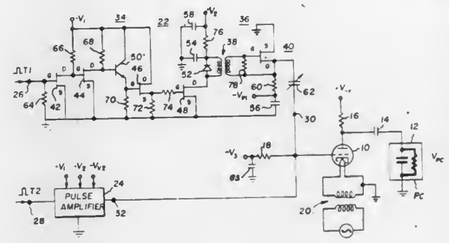
- means for expanding the detection head segments upon detection of the component having the exterior surface radially outwardly from the end coupling and for retaining the detection head in the first position when the end couplings move through the detection head.

4,629,993

POCKELS CELL DRIVER

Marcel A. Bouvier, Aix En Provence, France, and Philippe Bado, Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,394
Int. Cl.[4] H03K *4/02, 4/08, 17/56*
U.S. Cl. 328—67 **10 Claims**



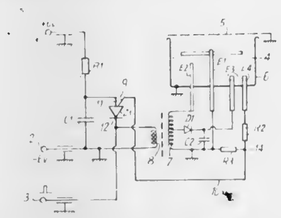
1. In a Pockels cell driver circuit wherein a Pockels cell is charged via a vacuum tube having a grid to increase the voltage across the cell in a plurality of steps having a selected delay between each of said steps, the improvement comprising a plurality of pulse amplifiers, each of said amplifiers having an input for a separate one of a plurality of trigger pulses having said selected delay between of said trigger pulses, and each of said amplifiers having an output connected to the grid of said tube for applying amplified pulses corresponding to said trigger pulses which are applied to the input thereof to enable said cell to charge to each of said voltage steps.

4,629,992

DEVICE FOR DETECTING THE IONIZATION LEVEL OF A GAS MIXTURE CONTROLLED BY ELECTRIC ARC

Jean-Claude Nudelmont, Douville, France, assignor to P.G.E.P. Professional General Electronic Products, France

Continuation of PCT FR83/00125, Jun. 17. 1983 published as WO84/00074, Jan. 5, 1984. This application Feb. 17, 1984, Ser. No. 581,054
Claims priority, application France, Jun. 17, 1982, 82 10592
Int. Cl.[4] G01N *27/68*
U.S. Cl. 324—464 **12 Claims**



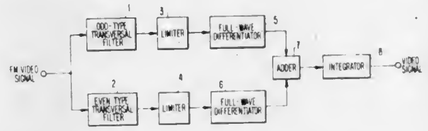
1. A device for detecting an ionization level of a gaseous medium in a chamber, comprising:
- a first pair of electrodes in said chamber;
- a charging circuit for producing electric arcs at a predetermined frequency between said electrodes connected to said first pair of electrodes;
- a second pair of electrodes in said chamber; and
- a feedback circuit connected to said charging circuit, said feedback circuit including means for varying said predetermined frequency at which said charging circuit produces said electric arc, said feedback circuit also being connected to said second pair electrodes, and responsive to a conductivity value of said gaseous medium in said chamber between said second pair electrodes.

4,629,994

FM DEMODULATOR

Masafumi Shimotashiro, Neyagawa, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 11, 1985, Ser. No. 743,369
Claims priority, application Japan, Jun. 15, 1984, 59-123054; Jun. 20, 1984, 59-127026; Jun. 20, 1984, 59-127025; Dec. 12, 1984, 59-262110
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—110 **9 Claims**



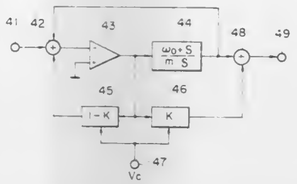
1. An FM signal demodulator comprising:
- a phase shifting means for producing from an input FM signal two FM signals which are different in phase by 90° from each other;
- a means for detecting phase information of said FM signal from said two FM signals, said phase information detecting means including a means for producing a signal having a frequency which is at least quadrupled with respect to a carrier frequency of said FM signal, and a means for producing from said frequency-quadrupled signal a demodulated signal which is substantially identical with an original signal.

4,629,995

VARIABLE EMPHASIS CIRCUIT

Masayuki Katakura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,974
Claims priority, application Japan, Oct. 19, 1984, 59-218238
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—149 **6 Claims**



1. A variable emphasis circuit receiving an input signal and having a variable frequency characteristic controlled by a control signal supplied thereto, said variable emphasis circuit comprising:

an operational amplifier having at least an inverting input and an output producing an output signal;

integrating circuit means supplied with the output signal of said operational amplifier for producing an output signal and having a transfer function of $T(S)=(\omega_O+S)/(m\cdot S)$, where ω_O is a zero angular frequency, m is a coefficient of said transfer function and S is a transform variable;

dividing circuit means supplied with the output signal of said operational amplifier for dividing the same into first and second divided output signals, said control signal being supplied to said dividing circuit means for controlling a dividing ratio thereof;

first adder means for adding said input signal, the output signal of said integrating circuit means and said first divided output signal of said dividing circuit means, and producing an output signal supplied to the inverting input of said operational amplifier; and

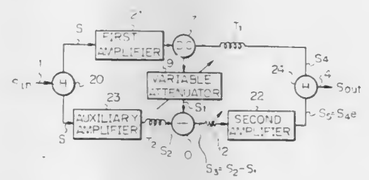
second adder means for adding the output signal of said integrating circuit means and said second divided output signal of said dividing circuit means, and having an output for generating an output signal of said variable emphasis circuit.

4,629,996

FEED-FORWARD MICROWAVE POWER AMPLIFIER WITH DIFFERENCE SIGNAL DISTORTION CANCELLATION CIRCUIT

Tatsuo Watanabe, Tokyo, and Kiyohiko Suzuki, Kanagawa, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,849
Claims priority, application Japan, Nov. 15, 1983, 58-213299
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—151 **5 Claims**



1. A feed-forward microwave power amplifier with difference signal distortion cancellation circuit, comprising:

an input terminal;

an output terminal;

divider means in operable connection with said input terminal for dividing a signal input at said input terminal into a pair of divided signals with equal level S with each other;

first amplifier means in operable connection with said divider means for amplifying one of said divided signals and providing an output signal having a level S_4;

means in operable connection with said first amplifier means for providing a signal having a level S_1 which is a part of an output of said first amplifier means;

means in operable connection with said divider means for providing a signal having a level S_2 from the other of said divided signals output from said divider means;

subtraction means for providing a difference signal corresponding to the difference between levels S_2 and S_1;

second amplifier means in operable connection with said subtraction means and having the same power capacity as that of said first amplifier means, for amplifying said difference signal and outputting a signal having a level of S_4e, where e is a constant value during small signal operation;

3 dB coupler means in operable connection with said first amplifier means and said second amplifier means for coupling said output signal having said level S_4 from said first amplifier means and said output signal having said level S_4e from said second amplifier means and providing a coupled power output signal to said output terminal; and

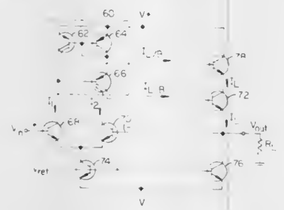
adjusting means for adjusting said level S_1 and said level S_2 so that said level S_2 is higher than said level S_1 and said value e is in the range between 0.2 and 0.5.

4,629,997

AMPLIFIER ACTIVE LOAD

James R. Kuo, Cupertino, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Mar. 25, 1985, Ser. No. 715,848
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 **8 Claims**



1. In an amplifier having a pair of first and second emitter-coupled transistors, each having a base, an emitter and a collector, a current source for providing substantially equal currents to each of two legs of said current source, a first leg being coupled to the collector of said first emitter-coupled transistor and a second leg being coupled to said second transistor, and a third output transistor having a base coupled to the collector of said second emitter-coupled transistor and a collector coupled to a supply voltage, the improvement comprising:

a fourth transistor having a collector and an emitter coupled between said supply voltage and said third output transistor, a base of said fourth transistor being coupled to said first leg;

so that current flowing through the bases of said third and fourth transistors are substantially equal and currents flowing through the collectors of said first and second transistors are substantially equal.

4,629,998

VARIABLE GAIN EQUALIZER WITH A MIRROR CIRCUIT HAVING OPPOSITE PHASE RELATIONSHIP BETWEEN INPUT AND OUTPUT CURRENTS

Nobuo Fujiwara, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 313,706, Oct. 21, 1981, abandoned.
This application Nov. 2, 1984, Ser. No. 667,394
Claims priority, application Japan, Oct. 23, 1980, 55-148557; Oct. 23, 1980, 55-165733
Int. Cl.[4] H03F *3/04;* **H03G** *3/20*
U.S. Cl. 330—304 **7 Claims**



1. A variable gain equalizer comprising:

an equalizing network including an impedance element coupled between an input terminal to which an input voltage is applied and an output terminal;

a potentiometer having first and second mutually complementarily variable resistance portions divided by a slidable tap having an inherent contact resistance connected to a reference potential, said first and second resistance portions being coupled in said equalizing network in series with said impedance element; and

circuit means for causing an input alternating current to flow as a function of said input voltage in said contact resistance through said first resistance portion and causing an output alternating current of equal amplitude, but opposite phase, to said input alternating current to flow in said contact resistance through said second resistance portion and said impedance element to generate at said output terminal an output voltage proportional to said output alternating current.

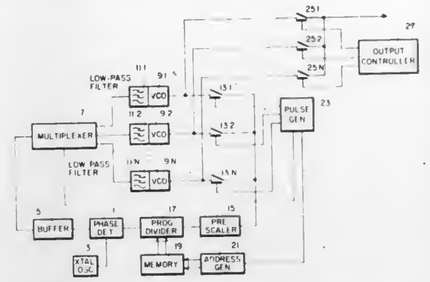
4,629,999

PHASE-LOCKED LOOP CAPABLE OF GENERATING A PLURALITY OF STABLE FREQUENCY SIGNALS

Douglas J. Hatch, Chittenango, and Jeffrey L. Cox, Syracuse, both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,956
Int. Cl.[4] H03B *7/00*
U.S. Cl. 331—1 R **8 Claims**

1. A phase-locked loop having a phase sensitive detector, a fixed frequency oscillator coupled to a first input of said phase sensitive detector, and variable oscillator means coupled to an output of said phase sensitive detector, said variable oscillator means having at least one output at which a stable frequency signal may be obtained, which output is coupled to a second input of said phase sensitive detector; characterized in that said variable oscillator means comprises N variable oscillators having N respective outputs, where N is an integer greater than 1; said phase-locked loop further comprising first means for alternatively coupling the output of said phase sensitive detector to said N variable oscillators, means coupled to the second input of said phase sensitive detector for determining, respectively, the frequency of the signal at each of said N variable oscillator outputs, and second means for alternatively coupling said N variable oscillator outputs to said frequency



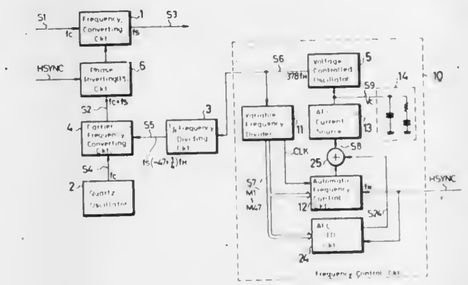
determining means in synchronism with said first coupling means.

4,630,000

APPARATUS FOR CONTROLLING THE FREQUENCY OF A VOLTAGE CONTROLLED OSCILLATOR

Akihiro Kikuchi, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,094
Claims priority, application Japan, Sep. 21, 1983, 58-174777; Sep. 21, 1983, 58-174778
Int. Cl.[4] H03L *7/08;* **H04N** *5/04*
U.S. Cl. 331—11 **5 Claims**



1. An apparatus for controlling the frequency of a voltage controlled oscillator in response to a horizontal synchronizing signal of a video signal comprising:

frequency-divider means for dividing the frequency of the output of said oscillator and establishing a plurality of successive time windows;

control means for phase-comparing the output of said frequency-divider means with said horizontal synchronizing signal and controlling the frequency of said oscillator in response to the result of said phase-comparison, said control means comprising means for forming a control signal by using an error signal having a first signal level and a second signal level in response to the phase difference between said horizontal synchronizing signal and the output of said oscillator; and

means for forming a correcting signal to be added to said error signal when the phase of said horizontal synchronizing signal is beyond a predetermined range;

said error signal assuming said first signal level in synchronism with said horizontal synchronizing signal and thereafter assuming one of said first and second signal levels in each successive time window as necessary to form said control signal so that it controls the frequency of said oscillator in accordance with the frequency of said horizontal synchronizing signal.

4,630,001

ELECTRICAL OSCILLATORS HAVING AUTOMATIC TUNING ARRANGEMENTS

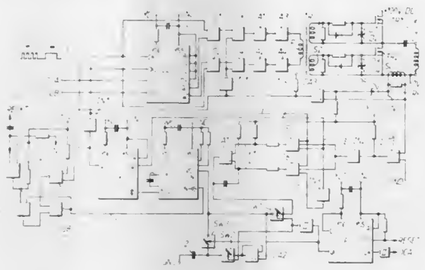
Robert Komorowski, Fareham, and Harpal Punia, Southampton, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Mar. 21, 1985, Ser. No. 714,494

Claims priority, application United Kingdom, Mar. 21, 1984, 8407277

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—34 **3 Claims**



1. An electrical oscillator for supplying a reactive load circuit, comprising an automatic tuning arrangement for varying the output frequency of the oscillator in dependence upon changes in the resonant frequency of the load, in which load current frequency or phase sensing means is coupled to the load circuit and provides an electrical signal which is fed, in combination with other signals dependent upon the oscillator output frequency, to gating means which includes a pair of AND gates to both of which are applied input signals of frequencies which are divisions of the oscillator frequency as said other signals, as well as said electrical signal at the load current frequency, some of these input signals applied to one of the gates being inverted relative to those input signals applied to the other gate whereby the gates provide respective positive and negative voltage pulse outputs which cause a steady voltage output from a differential amplifier to vary to bring about a change in oscillator output frequency to correct for any change in the resonant frequency of the load circuit.

4,630,002

VERY HIGH FREQUENCY OSCILLATOR WITH GYROMAGNETIC RESONATORS

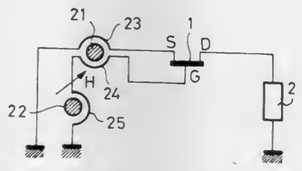
René Leiba, Pantin, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 4, 1985, Ser. No. 784,603

Claims priority, application France, Oct. 26, 1984, 84 16374

Int. Cl.⁴ H03B *5/18*

U.S. Cl. 331—96 **6 Claims**



1. A very high frequency oscillator having a field effect transistor, whereof the source is connected to a first gyromagnetic resonator dipole, the gate is connected to a second gyromagnetic resonator dipole and the drain is connected to a load impedence, the two gyromagnetic resonators being simultaneously regulatable by the same electrical means, wherein the first resonator is doubly coupled by a first electrical conductor connected to the transistor source and by a second electrical conductor connected to the transistor gate, the second electrical conductor being also doubly coupled to the second resonator.

4,630,003

FET OSCILLATOR EXHIBITING NEGATIVE RESISTANCE DUE TO HIGH IMPEDANCE AT THE SOURCE OF AN FET THEREOF

Hideki Torizuka, Kawasaki; Tomohide Soejima, and Shigekazu Hori, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 458,940, Jan. 18, 1983, Pat. No. 4,547,750.

This application Aug. 19, 1985, Ser. No. 767,025

Claims priority, application Japan, Jan. 20, 1982, 57-5886

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.⁴ H03B *7/12*

U.S. Cl. 331—99 **6 Claims**



1. An FET (field-effect transistor) oscillator exhibiting negative resistance due to a high impedance at the source of the FET thereof, comprising:

a negative resistance circuit including a strip line of predetermined length, a biasing circuit, a resistor and a field effect transistor, said field effect transistor having a drain which is biased through said biasing circuit and a source which is connected to one end of said strip line via said resistor, the other end of said strip line being grounded, thereby providing a negative resistance between the gate and drain of said field effect transistor, and

a resonant circuit connected to said negative resistance circuit for determining the oscillation frequency of said oscillator.

4,630,004

DIELECTRIC RESONATOR STABILIZED MICROSTRIP OSCILLATOR

Edward C. Niehenke, Baltimore, and Patrick A. Green, Pasadena, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1985, Ser. No. 721,834

Int. Cl.⁴ H03B *5/00*

U.S. Cl. 331—107 SL **4 Claims**

1. A dielectric resonator stabilized microstrip oscillator comprising:

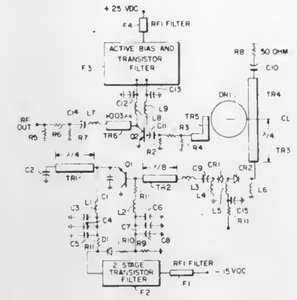
an oscillator transistor having a base, a collector and an emitter and bias means, including bias feeds to said oscillator transistor emitter and base through bias inductors for high isolation to RF and including capacitance means connected between said bias feeds and ground to effect low impedance at selected RF and low frequency ranges,

a noise reduction circuit comprised of a transmission line and a capacitor connected in series between said oscillator transistor emitter and ground said transmission line being ¼ wavelength long at operating frequency and having a characteristic impedance of 25 ohms,

a load,

a main oscillator line connecting said oscillator transistor base to said load,

a dielectric resonator, and



an output circuit, said output circuit being coupled to said main oscillator line through said dielectric resonator.

4,630,005

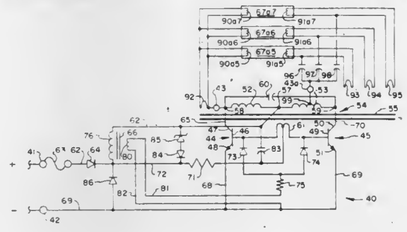
ELECTRONIC INVERTER, PARTICULARLY FOR USE AS BALLAST

John C. Clegg, and Ariel R. Davis, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 373,994, May 3, 1982, Pat. No. 4,508,998, which is a continuation of Ser. No. 161,914, May 23, 1980, abandoned. This application Oct. 1, 1984, Ser. No. 656,358

Int. Cl.⁴ H05B *41/29*

U.S. Cl. 331—113 A **5 Claims**



1. An inverter circuit comprising two transistors connected push-pull, a transformer having input windings connected to the collectors of said transistors, and three feedback windings, two of said feedback windings being relatively high volume connected together at one end and connected at each other end through relatively slow diodes to the bases of said transistors, the third said feedback winding being relatively low voltage connected to the bases of said transistors, each such slow diode being capable of conducting backwards long enough to remove substantially all stored charge from the base of the transistor to which it is connected with the peak reverse voltage applied to the base of each of said transistors being only that of said low voltage feedback winding.

4,630,006

CURRENT-TUNED TRANSISTOR OSCILLATOR

Keith V. Anderson, P.O. Box 800, Black Hawk, S. Dak. 57718

Filed May 31, 1985, Ser. No. 739,613

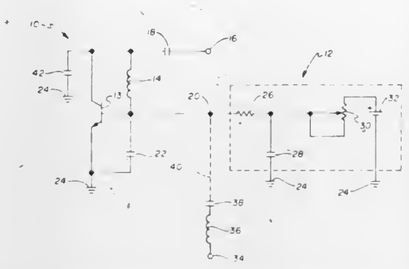
Int. Cl.⁴ H03B *5/12*

U.S. Cl. 331—117 R **23 Claims**

14. A current-tuned oscillator circuit comprising:

a bipolar junction transistor having base-emitter and base-collector pn junctions and having base, collector, and emitter terminals;

means operably coupled to said transistor for biasing said transistor to operate in the forward-active region, said biasing means comprising a current source, whereby bias current is provided through said base-emitter pn junction in the forward direction presenting diffusion capacitance across said base-emitter pn junction, said biasing means further operably coupling said current source to said collector terminal for presenting a collector bias voltage at said collector terminal and a zero bias voltage across said base-collector pn junction, said collector bias voltage established solely by said current source;



reactive network means for coupling a signal from said collector terminal to said base terminal, said coupled signal being shifted 180 degrees in phase at an oscillation frequency determined by said diffusion capacitance; and

means for varying said diffusion capacitance by varying said bias current through said base-emitter pn junction.

4,630,007

DELTA MODULATED SIGNAL SAMPLING RATE CONVERTER USING DIGITAL MEANS

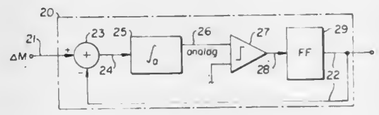
Roger Lagadec, Ruemlang, Switzerland, assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed Jun. 10, 1985, Ser. No. 742,883

Claims priority, application Switzerland, Jun. 12, 1984, 2831/84

Int. Cl.⁴ H03C *3/00*

U.S. Cl. 332—1 **23 Claims**



1. A method for converting a first delta modulated signal with a first bit rate into a second delta modulated signal with a second bit rate comprising:

providing a difference signal by subtractively combining a first and a second digital signal, wherein the first digital signal is, or is derived from, the first delta modulated signal and wherein the second digital signal is, or is derived from, the second delta modulated signal; and

deriving the second delta modulated signal from the difference signal.

4,630,008

DIRECT FM CRYSTAL-CONTROLLED OSCILLATOR

Richard W. Weeks, 2679 Kennedy Ave., Laramie, Wyo. 82070

Filed Mar. 29, 1985, Ser. No. 717,533

Int. Cl.⁴ H03C *3/22*

U.S. Cl. 332—167 **9 Claims**

1. A direct frequency modulation crystal-controlled oscillator circuit having an operating frequency and which receives a modulation signal and outputs a frequency linearly related to the modulation signal and in which the number of components in the circuit is reduced by the use of the same components to

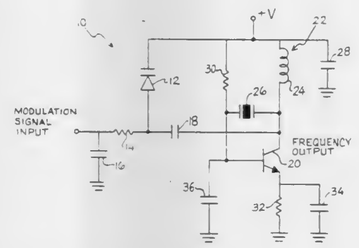
achieve both the desired oscillation and the desired modulation, comprising:

an inductor having an impedance used in compensating for non-linearity in the circuit in order to provide an output frequency linearly related to the modulation signal;

voltage variable capacitive means in parallel electrical communication with said inductor and being responsive to the modulation signal applied to the oscillator circuit, said voltage variable capacitive means being selected having a capacitance for use both in modulating the oscillator circuit operating frequency during frequency modulation operation and for acting as a capacitive element to provide proper oscillator operation;

a crystal having a reactance and continuously operating in its anti-resonant mode; and

transistor means having a collector, a base and an emitter, said transistor means acting as a current source and being electrically connected to said inductor, said voltage variable capacitive means being electrically connected between said collector and said emitter of said transistor means, and said crystal being electrically connected between said transistor base and collector.



9. In a method for providing direct frequency modulation in a circuit utilizing a crystal and for providing a linear relationship between an inputted modulation signal and an outputted frequency, a process for reducing the number of the circuit components comprising:

selecting an inductor having a known magnitude of inductance;

locating a capacitor in parallel with said inductor;

varying capacitors in parallel with said inductor to obtain values of frequency depending upon the value of the capacitance of the capacitors;

providing a number of graphs illustrating the relationship between voltage and capacitance for a plurality of voltage variable capacitive means;

comparing said plurality of graphs associated with said plurality of voltage variable capacitive means with the obtained values of capacitance and frequency;

selecting a voltage variable capacitive means for providing a linear relationship between an inputted modulation signal and an outputted frequency based on the comparing; and

providing a circuit using said selected inductor, said selected voltage variable capacitive means, and a capacitance value that was used in said varying step.

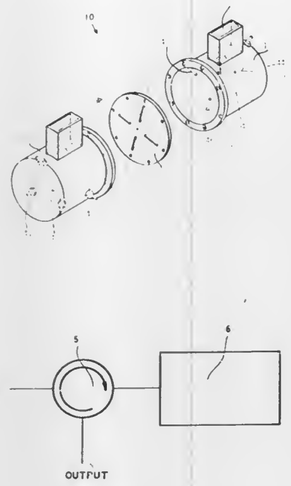
4,630,009

CASCADE WAVEGUIDE TRIPLE-MODE FILTERS USEABLE AS A GROUP DELAY EQUALIZER

Wai-Cheung Tang, Kitchener, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed Jan. 24, 1984, Ser. No. 573,462
Int. Cl.[4] H01P *1/208;* **H04B** *3/14*
U.S. Cl. 333—28 R **24 Claims**

1. A bandpass filter comprising a plurality of cascade waveguide cavities, each cavity having two ends that are parallel to one another, said filter having an input and an output, with at least two adjacent cavities mounted end to end relative to one another and resonating at their resonant frequency in three independent orthogonal modes, at least one of said modes being non-identical to the other two modes, with an inter-cavity coupling iris located between adjacent three mode cavities that are mounted end to end relative to one another,



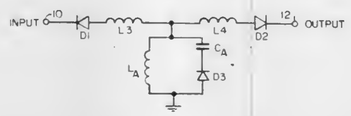
each iris containing an aperture that is able to independently control three inter-cavity couplings simultaneously, when said filter is operated in a suitable propagation mode for input and output coupling, to produce an elliptic function response.

4,630,010

LOW PASS T-SECTION DIGITAL PHASE SHIFTER APPARATUS

Binboga S. Yarman, Cengelköy/Istanbul, Turkey, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1985, Ser. No. 767,578
Int. Cl.[4] H03H *7/20*
U.S. Cl. 333—139 **2 Claims**



1. A low pass T-section digital phase shifter apparatus comprising in combination:

a first inductor means serially connected to a first diode means, the anode of said first diode means connected to one end of said first inductor means, the cathode of said first diode means forming an input terminal for an input signal, said first diode means having a first and second state,

a second inductor means serially connected to a second diode means, the anode of said second diode means connected to one end of said second inductor means, the cathode of said second diode means forming an output terminal, the other end of said first and second inductor means being connected to each other to form a first common junction, said second diode means having a first and second state, and

a shunt circuit comprising a third inductor means in parallel with first capacitor means which is in series with a third diode means, one end of said third inductor means connected to one end of said first capacitor means to form a first junction, said first junction connected to said common junction between said first and second inductor means, the other end of said third inductor means connected to one end of said third diode means to form a second junction, said second junction connected to ground, said third diode means having a first and second state, said first, second and third diodes means are identical, said first state of said first, second and third diode means is the forward-biased state and said second state of said first, second and third diode means is the reverse-biased state, said first, second and third diode means in said second state each respectively comprise a capacitance, C_D and a reverse resistance, R_r, and when said first, second and third diode means are in said second state said first and second inductor means respectively resonates with said first and second diode means capacitance, C_D to provide a short circuit path to an input RF signal, said first and second diode means capacitance, C_D is defined according to the following equation:

$$C_D = \frac{1}{L};$$

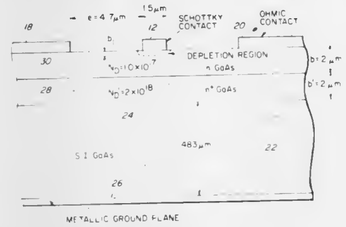
where L is the inductance of said first and second inductor means.

4,630,011

MICROWAVE AND MILLIMETER WAVE PHASE SHIFTER

Robert E. Neidert, Fairfax Station, and Clifford M. Krowne, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1985, Ser. No. 808,697
Int. Cl.[4] H01P *1/18, 1/185*
U.S. Cl. 333—164 **15 Claims**



1. A variable phase shifter based on the slow-wave effect for operation in the millimeter wave region, comprising:

a semiconductor substrate which is thick enough to provide mechanical suport, said semiconductor substrate having a first and second faces;

a highly doped semiconductor layer, for example n^+ doped, disposed on said first face of said semiconductor substrate for operation as a first ground plane;

a moderately doped semiconductor layer, with the doping concentration being much lower than said highly doped semiconductor layer, for example n doped, and being sufficient to facilitate the slow wave effect, disposed on top of said highly doped layer, said moderately doped layer having a thickness to permit only one mode at millimeter wave frequencies fo propagate, while suppressing higher order millimeter wave modes;

a Schottky metal microstrip with first and second ends disposed on top of a portion of said moderately doped layer;

means for electrically connecting said highly doped layer to ground electrical potential; and

means for providing an electrical bias voltage between said Schottky metal microstrip and said highly doped layer;

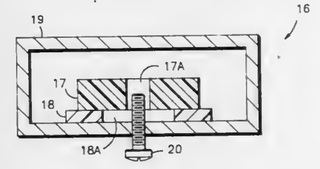
wherein the propagating phase velocity of millimeter waves propagating along said Schottky metal microstrip can be varied in accordance with said bias voltage to obtain a desired phase shift between said first and second ends of said Schottky metal microstrip.

4,630,012

RING SHAPED DIELECTRIC RESONATOR WITH ADJUSTABLE TUNING SCREW EXTENDING UPWARDLY INTO RING OPENING

Ronald D. Fuller, and Benny W. Lowe, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,943
Int. Cl.[4] H01P *7/10*
U.S. Cl. 333—235 **1 Claim**



1. A method of tuning a dielectric resonator having a fundamental response signal, and a spurious response signal, said method comprising the steps of:

providing a dielectric resonator symmetrically disposed about a central axis thereof, said dielectric resonator defining an opening therethrough symmetrically disposed about said axis and coaxial therewith;

providing a mounting means for supporting said resonator, said mounting means having a first surface perpendicular to said axis, a second surface parallel to and opposite from said first surface, and said mounting means being radially disposed about said axis, said mounting means defining an opening therethrough coaxial with said axis, and said first surface of said mounting means being coupled to said resonator;

providing a ground plane having a first surface perpendicular to said axis, said ground plane defining an opening therethrough coaxial with said axis, and said first surface of said ground plane being coupled to said second surface of said mounting means;

providing a tuning means for tuning the frequency of said fundamental signal and having a de minimis effect on the frequency of said spurious signal of said dielectric resonator, said tuning means being disposed coaxial with said axis and being adjustably coupled to said ground plane, said tuning means extending through the opening of said ground plane and being adjustably extendable through the openings of said mounting means and said resonator;

inserting said tuning means through said ground plane and into the openings of said mounting means and said resonator, said tuning means perturbing an electric field of said resonator; and

adjusting said tuning means thereby setting the frequency of said fundamental signal of said dielectric resonator to provide a desired resonance.

4,630,013

CURRENT CONTROLLED VARIABLE INDUCTOR

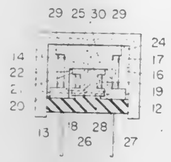
Noboru Takada, Sakado, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,058

Claims priority, application Japan, Jan. 30, 1984, 59-14822; Apr. 28, 1984, 59-64129[U]; Apr. 28, 1984, 59-64130[U]; Nov. 21, 1984, 59-176987[U]; Nov. 22, 1984, 59-177626[U]

Int. Cl.[4] H03J *3/20;* **H01F** *21/08*

U.S. Cl. 334—12 **14 Claims**



1. A current controlled variable inductor comprising:

(a) a first core provided with a winding portion having a hollow portion inwardly thereof;

(b) a second core adapted to be inserted into said hollow portion of the first core, said second core having a winding portion arranged in parallel with said winding portion of said first core in the inserted condition thereof;

(c) a third core which is pot-shaped and accommodates said first core so that said winding portion of said first core is perpendicular to a bottom surface of said third core, and

(d) a control coil wound on a said winding portion of one of said first core and said second core, a tuning coil wound on a said winding portion of the other one of said first core and said second core, both said control coil and said tuning coil being arranged such that a magnetic path produced by the coil wound on said first core extends mainly throughout the winding portion of said first, second and third cores, a magnetic path produced by the coil wound on said second core extends mainly throughout the winding portion of said first and second cores, and a magnetic flux density in said winding portion of said second core where both of said magnetic paths overlap is varied in response to a current flowing through thee control coil, whereby an effective permeability of said second core is controlled to produce changes in inductance of said tuning coil.

4,630,014

CURRENT LIMITING CIRCUIT BREAKER STATIONARY CONTACT ASSEMBLY WITH INTEGRAL MAGNETIC ACTIVATING MEANS

David P. McClellan, Snellville, Ga.; John M. Brown, Jr., Westminster, Md., and Robert E. Black, Ellenwood, Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Apr. 1, 1985, Ser. No. 718,693

Int. Cl.[4] H03J *3/04*

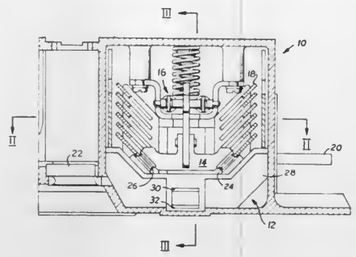
U.S. Cl. 335—16 **16 Claims**

1. A current limiting circuit breaker, comprising:

a stationary contact assembly having first and second contact arms electrically insulated one from the other and a magnetic element which creates a magnetic field in response to current flow thorugh said contact arm;

a movable contact assembly controllably movable between an open position at which the contact assemblies are spaced one from the other a preselected distance and a closed position at which the contact assemblies abut one another creating a path for current to flow from the first stationary contact arm in a first direction to the movable contact assembly in a second, opposite direction and through the second stationary contact in the first direction creating a two-loop current path which produces two magnetic blow open forces from a single current; and

an armature assembly connected to the movable contact assembly and having an armature arm extending from the armature assembly in the vicinity of the magnetic element,



said magnetic element attracting said armature arm in response to current flow of a preselected magnitude through said stationary contact assembly thereby decreasing the magnetic blow open force required to move the movable contact assembly from the closed position to the open position.

4,630,015

GROUND FAULT CIRCUIT INTERRUPTER

Paul D. Gernhardt, Northport, and Ferdinand E. Orbeta, Kew Gardens, both of N.Y., assignors to Slater Electric, Inc., Glen Cove, N.Y.

Filed Jan. 10, 1985, Ser. No. 690,119

Int. Cl.[4] H01H *73/00*

U.S. Cl. 335—18 **19 Claims**

11. A ground fault circuit interrupter in a power distribution system comprising:

an electromagnetic coil means having a moveable core;

at least two pairs of contacts, one contact of each pair being stationary and the other contact of each pair being disposed on a deflectable member, said deflectable members normally biasing said contacts in a closed position;

means for applying the operating force of said electromagnetic coil means to directly open said contacts by moving said deflectable members; and

means for detecting the occurrence of a ground fault in said power distribution system in order to actuate said electromagnetic coil means.

4,630,016

ELECTROMAGNETIC RELAY

Shigetoshi Yuzawa, and Muneo Nakata, both of Iida, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 28, 1985, Ser. No. 750,109

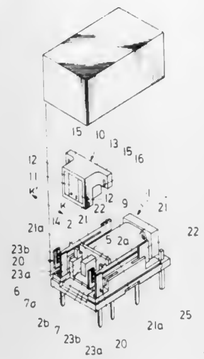
Claims priority, application Japan, Jun. 30, 1984, 59-99049[U]

Int. Cl.[4] H01H *51/22*

U.S. Cl. 335—81 **2 Claims**

1. In an electromagnetic relay which comprises an electromagnet portion having a rod-like iron core around which a coil

is wound, a movable block including a movable base on which a pair of movable iron pieces are mounted, with a permanent magnet being held therebetween, and adapted to be movable in a direction intersecting at right angles with a longitudinal direction of the iron core by disposing the movable iron pieces to confront magnetized faces at opposite sides of said iron core,



and contact mechanisms to be driven for opening and closing based on the movement of said movable block, the improvement comprising movable contact pieces of the contact mechanisms fitted into grooves formed in arm portions of said movable base, small projections formed on said movable contact pieces, and recesses which are formed in said grooves and in which said small projections are fitted.

4,630,017

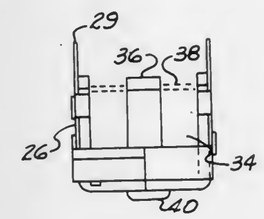
MAGNETIC STRUCTURE FOR CALIBRATING A CIRCUIT BREAKER

John W. Young, Lilburn, Ga., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Oct. 1, 1984, Ser. No. 656,230

Int. Cl.[4] H01H *77/06*

U.S. Cl. 335—42 **5 Claims**



1. A circuit breaker operable between an open position and a closed position comprising:

a housing;

a trip lever mounted on the housing and operable to open the circuit breaker;

a yoke frame mounted on the housing;

an armature pivotally mounted on one of the yoke frame and housing and movable between a first position at which the armature is free of contact with the trip lever and a second position at which the armature is in operable contact with the trip lever;

an adjustment screw;

a coil spring having one end connected to the armature and the other end connected to the adjustment screw, said spring biasing the armature away from the trip lever;

a coil mounted on the yoke frame for creating a magnetic field for moving the armature from the first position to the second position to trip the circuit breaker in response to current flow of a preselected magnitude through the coil; and

an adjustable core for the coil for precisely controlling the current magnitude at which the armature operates the trip lever.

4,630,018

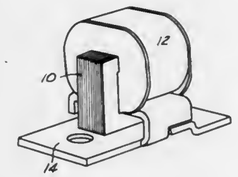
MOLDED CASE CIRCUIT BREAKER CURRENT TRANSFORMER WITH SPIRAL BUS

William E. May, Lawrenceville; Ronald W. McKinney, Grayson, and James S. Wells, Atlanta, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Nov. 8, 1985, Ser. No. 796,562

Int. Cl.[4] H01F *17/06, 27/30*

U.S. Cl. 336—175 **8 Claims**



1. A circuit breaker current transformer having a width, comprising:

a core having a window with an axis in a plane;

a winding encoiled about the core defining the transformer width; and

a bus having a first conducting portion with an end and first and second sides, a second conducting portion with an end and first and second sides and a connecting member having a first and a second connecting portion with one connecting portion being connected to the first side of the first conducting portion and the other connecting portion being connected to the second side of the second conducting portion forming a current path from the end of the first conducting portion to the first side of the first conducting portion, one connecting portion, the connecting member, the other connecting portion, the second side of the second conducting portion and to the end of the second conducting portion, said bus extending through the core window forming a spiral about the core without increasing said transformer width, said ends of said first and second conducting portions extending on opposite sides of said plane on only one side of said core and extending beyond lateral ends of said core, said conducting portions each having a longitudinal axis which is parallel to the plane of said core effectively rotating the core by about 90 degrees.

4,630,019

MOLDED CASE CIRCUIT BREAKER WITH CALIBRATION ADJUSTING MEANS FOR A BIMETAL

Alfred E. Maier, Beaver Falls, and James R. Farley, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1984, Ser. No. 655,952

Int. Cl.[4] H01H *71/16*

U.S. Cl. 337—70 **10 Claims**

1. An electrical circuit breaker comprising;

a first electrical contact,

a second electrical contact,

spring-powered operating means for moving said first and second electrical contacts into engagement and out of engagement, and

trip means for actuating said operating means comprising;

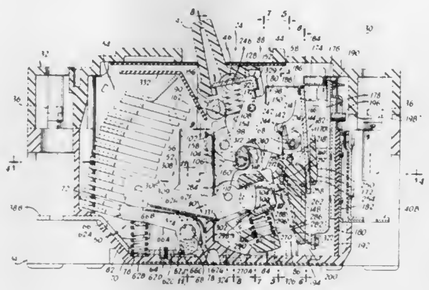
a trip bar rotatably mounted within said circuit breaker,

a thermally actuated bimetal having a portion thereof mov-

able about a pivot point toward and away from said trip bar in response to predetermined overload conditions,

a formed intermediate control lever physically distinct from said bimetal for adjusting the position of the movable portion of said bimetal relative to said trip bar, said intermediate control lever being mechanically coupled to said bimetal at a location adjacent said pivot point, and

a rotatable calibration adjustment component for adjusting the spatial disposition of said intermediate control lever in



said circuit breaker, said calibration adjustment component having a threaded portion that is in threadable engagement with a stationary part of said trip means and said calibration adjustment component also being of such length that an end thereof engages said intermediate control lever at a location remote from said pivot point so that rotation of said calibration adjustment component causes said intermediate control lever to pivot and thereby adjust the spatial disposition of the movable portion of said bimetal relative to said trip bar.

4,630,020

PROTECTIVE CIRCUIT BREAKER (I)

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Mar. 19, 1985, Ser. No. 713,619
Int. Cl.[4] H01H *71/04, 71/16*
U.S. Cl. 337—79 **2 Claims**

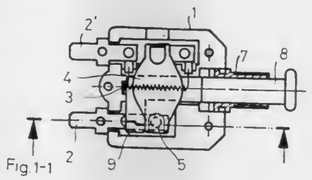


Fig. 1-1

1. In a circuit breaker having a manually-resettable button adapted to be extended when the breaker is tripped by an overload condition in the circuit, the improvement which comprises an indicating lamp, respective first contact elements in the breaker and connected to the circuit, and respective second contact elements carried by the button and connected to the lamp, wherein the respective first and second contact elements are engaged when the button is extended to thereby energize the lamp, wherein the first contact elements have an incline therebetween, and wherein the second contact elements have an incline therebetween of greater extent than the incline between the first contact elements, thereby assuring good electrical engagement between the first and second contact elements when the breaker is tripped.

4,630,021

LOW COST TIME DELAY RELAY ASSEMBLY

Ronald W. Brown, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1985, Ser. No. 811,124
Int. Cl.[4] H01H *61/01, 37/04*
U.S. Cl. 337—113 **10 Claims**



1. A time delay relay having improved response time comprising a two piece housing, the two pieces being identical to each other and formed of a moldable electrically insulative material and being adapted to suspend a thermostatic switch in a cavity with minimal heat loss from the switch to the housing, each piece comprising a shell formed with a plurality of grooves and a recess all open from a single direction, the shell having a top wall with an aperture defined in the top wall and being open in the single direction, two opposed side walls forming with back, top and bottom walls a recess, the side walls having a free distal end portion having an edge surface, each edge surface having a terminal receiving groove extending along the edge surface and through one of the top and bottom walls and being open from the said single direction, each side wall having a notch formed adjacent the bottom wall so that the terminal receiving groove is in communication with the recess, first and second shelves extending from the back and side walls into the recess, the edge surface of one of the side walls formed with a joining groove open from the said single direction and the edge surface of the other side wall formed with a joining rib,

a first elongated generally flat terminal received in one of the terminal receiving grooves of one shell, the terminal having a finger bent back upon itself and being received through the notch in its respective side wall and having a free distal end portion disposed between the first and second shelves,

a second elongated generally flat terminal received in the other of the terminal receiving grooves of the one shell, the second terminal having a finger extending through the notch in its respective side wall and having a free distal end portion disposed in the recess,

a thermostatic switch having an upper and a lower end, a cup shaped metallic cap member mounted on the lower end of the switch housing and having a bottom surface and a cylindrical outer peripheral surface projecting radially beyond the switch housing, a resistive heater element having opposed contact surfaces, one contact surface electrically connected to the bottom surface of the cap member,

the switch being disposed in the recess of the one shell with the cap member received between and held by the shelves and the upper end of the switch extending through the aperture in the top wall, the distal end portion of the finger of the first terminal in contact with the cap member and the distal end portion of the finger of the second terminal in contact with the other contact surface of the heater element,

the first and second terminals and the thermostatic switch all extending out of the recess of the shell, and

the other shell received over the first shell with the joining ribs received in the joining grooves, the first terminal received in the other terminal receiving groove of the other shell and the second terminal received in the said one terminal receiving groove of the other shell, the two

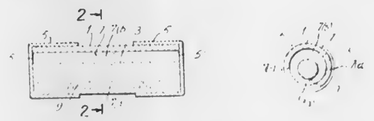
shells being bonded together to form a unitary housing with the recess of each shell combining to form a switch cavity, the switch and terminals captured between the shells.

4,630,022

ELECTRIC FUSE FOR HIGH VOLTAGE CIRCUIT

Yasutada Yuza, Namiki, Japan, assignor to S.O.C. Corporation, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,506
Claims priority, application Japan, Feb. 14, 1984, 59-24320
Int. Cl.[4] H01H *85/38*
U.S. Cl. 337—282 **4 Claims**



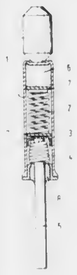
1. An electric fuse comprising a tubular casing made of an electrically insulative material, an insulative cylindrical body member disposed within said tubular casing in an eccentric and offset position relative to the major axis of said tubular casing, said insulative cylindrical member defining an annular space with said tubular casing, said annular space being non-uniform in width and having, when viewed in cross-section, its widest portion on one side of the tubular member and its narrowest portion on the opposite side of said tubular member, metal caps at each end of said tubular casing and a fusible element stretched in said generally narrower portion of said annular space and secured at both ends to said metal caps.

4,630,023

ELECTRICAL FUSE

Klaus Gawron, Aachen, Fed. Rep. of Germany; Simon Jonker, Ba Eindhoven, Netherlands; Johann Schröder, Aachen, Fed. Rep. of Germany, and Henk V. De Weerdt, Ah Sittard, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1985, Ser. No. 743,242
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422528
Int. Cl.[4] H01H *37/76*
U.S. Cl. 337—407 **6 Claims**



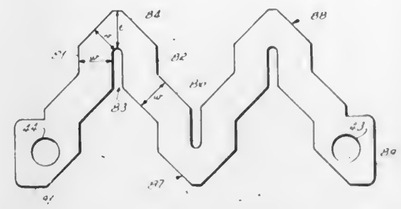
1. An electric fuse comprising a closed housing enclosing a liquifiable fuse body and a spring mechanism, said spring mechanism supporting said fuse body and serving to interrupt an electric contact upon liquification of said fuse body, characterized in that said fuse body comprises a saturated dicarboxylic acid selected from the group consisting of adipinic acid, pimelinic acid, suberic acid, heptanodicarboxylic acid and sebacinic acid.

4,630,024

GRID RESISTOR AND IMPROVED GRID ELEMENT THEREFOR

David W. Allen, Elsmere, Ky., assignor to Post-Glover Resistors, Inc., Erlanger, Ky.

Filed Sep. 28, 1984, Ser. No. 655,933
Int. Cl.[4] H01C *1/08*
U.S. Cl. 338—58 **23 Claims**



1. A resistor box for an electric motor-driven transit vehicle comprising:

a frame sized to be received within an envelope of available space on the vehicle;

a plurality of grid resistor elements electrically connected in series mounted in the frame and electrically isolated therefrom to form a grid resistor assembly having a current-carrying capacity suitable for an electric motor-driven transit vehicle;

each said element comprising a flat strip having side portions of predetermined width, a loop end tip portion, and strip areas between said side portions and said tip portion being of lesser width than said side portions;

means for establishing electrical connections to selected grid resistor elements of the plurality of grid resistor elements; and

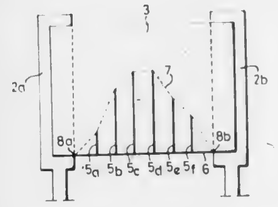
means for mounting the frame on an electric motor-driven transit vehicle.

4,630,025

SMALL-SIZED PRECISION HIGH-VOLTAGE RESISTOR IN THICK-FILM TECHNOLOGY

Joël Bourolleau, Toulouse, France, assignor to Renix Electronique, Toulouse, France

Filed Apr. 10, 1985, Ser. No. 721,780
Claims priority, application France, Apr. 10, 1984, 84 05621
Int. Cl.[4] H01C *1/012, 10/00*
U.S. Cl. 338—309 **5 Claims**



1. A precision high-voltage resistor comprising:

a plane substrate of insulating material

a resistive film deposited by silk-screening on said plane substrate of an approximately rectangular shape; and

a conductive film in the form of two parallel strips extending along two opposite edges of the resistive film and constituting terminals electrically connected to one another by said resistive film, wherein the resistive film has rectilinear cuts made in its thickness, down to the insulating substrate, parallel to said opposite edges from a third edge of the resistive film, characterized in that the rectilinear cuts

are evenly spaced along the third edge and have lengths that are longer the closer they are to the center of the third edge and wherein the ends opposite the third edge of the rectilinear cuts defining from the intersections of the third edge with the terminals, a contour exhibits an apex in its center part.

4,630,026

ELEVATOR POSITION INDICATING SYSTEM

Michael D. Lewis, East Moline, Ill., assignor to Montgomery Elevator Company, Moline, Ill.

Filed Mar. 29, 1983, Ser. No. 480,024
Int. Cl.[4] B66B *3/02*
U.S. Cl. 340—21 **13 Claims**



1. In an elevator system having an elevator control for controlling the movement of an elevator car and means for sensing the position of the elevator car, a position indicating system comprising:

a display;

means for actuating the display to generate an indication of a character in response to display codes;

a memory having memory locations storing a plurality of sets of display codes and further including first and second look up tables;

means in the elevator control associated with the sensing means for generating a multi-bit word representing elevator position;

means for serially transmitting the multi-bit word to the position indicator including clock and data lines connected between the elevator control and the position indicator wherein the multi-bit word is transmitted one bit at a time over the data line simultaneously with the clock pulse over the clock line;

a serial to parallel converter coupled to the data and clock lines for reconstructing the multi-bit word at a multi-bit output of the converter; and

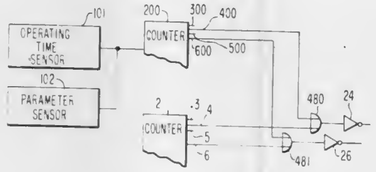
means for accessing the memory in accordance with the multi-bit word such that a particular character is indicated by the display for a particular sensed elevator car position wherein the first look up table is addressed by the reconstructed multi-bit word and generates a character code representing the character to be displayed and wherein the second look up table is addressed by the character code to generate a set of display codes.

4,630,027

SERVICE-INTERVAL DISPLAY FOR MOTOR VEHICLES

Heinz Muhlberger, Eching; Erwin Starmuhler, Munich; Walter Weishaupt, Munich; Peter Flohr, Munich, and Fritz Bourauel, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,763
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 31041744
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 F **14 Claims**



1. A service-interval display for an engine comprising

means for generating a first set of signals in response to fuel consumption,

accumulating means for accumulating a value representing fuel consumed in response to receipt of said first set of signals,

indicating means responsive to said accumulating means for generating a second set of signals to indicate when said accumulated value exceeds a predetermined value representing maximum total fuel consumption thereby to indicate a service interval for said engine which is dependent on engine load, and

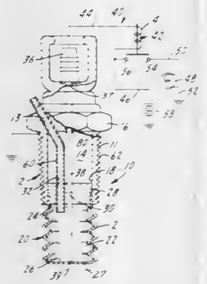
means for modifying the time of occurrence of said second set of signals in accordance with the value of at least one additional parameter.

4,630,028

PRESSURE-BIASED, TEMPERATURE SENSOR

Robert R. Kelly, Hoffman Estates, and Morley S. Smith, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 30, 1985, Ser. No. 728,737
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—60 **12 Claims**



1. A pressure-biased, temperature sensor means to monitor a fluid system comprising:

a housing defining a chamber having a closed end and an opposite open end, an expandable bellows with a fluid therein, a reference conductor means and a conducting terminal on said closed end;

an insulator means positioned between said conducting terminal and said housing closed end;

said bellows having a sidewall, an open end and a lower wall opposite said open end, said bellows secured to said housing at the open end thereof with said housing and bellows open ends coinciding;

said reference conductor means being insulated from said housing and defining a terminus and an opposite end;

said reference conductor opposite end contacting said conducting terminal and said terminus being in proximity to said bellows lower wall with said reference conductor extending therebetween through said bellows, said chamber, housing closed end and said insulator means;

conductive contact means communicating with said bellows wall;

a signal circuit including a signal means and a source of electrical energy connected between said conducting terminal of said housing and said bellows lower wall;

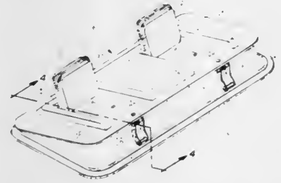
the improvement comprising said fluid containing bellows contacting the fluid of a fluid system and being expandable in response to changes in pressure and/or temperature in said fluid system below a predetermined pressure level or above a predetermined temperature level to energize said signal means.

4,630,029

DISPLAY SYSTEMS

Walter Hayward, 1805 Ponderosa Pl., Lovcland, Colo. 80537

Filed Jan. 22, 1985, Ser. No. 693,020
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—87 **6 Claims**



1. For use on a vehicle having a generally flat roof in which is defined the wall of an opening through the roof into the interior of the vehicle, a display system comprising:

a hollow frame, of a size and shape matching the wall of said opening, mountable to said wall around said opening;

a generally-flat panel having a size and shape matching the size and shape of said frame to overlie said frame and close said opening;

means for hingedly securing one edge portion of said panel to a matching portion of said frame;

adjustable means connecting another portion of said panel to another portion of said frame and operable to swing said panel about said securing means between a first position in which said panel is latched in closure of said opening and a second position in which said panel is tilted upwardly away from said roof;

at least one display device having a length and width substantially larger than its thickness and positionable to lie with a major surface substantially against the upper surface of said panel to visually present a shallow profile above said panel;

means for hingedly coupling one margin of said device to said upper surface of said panel;

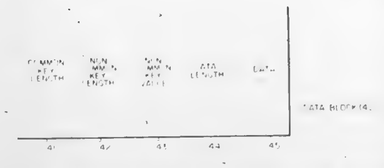
and means carried by said panel and operable from within the interior of said vehicle for swinging said device between a first position lying atop said panel and a second position in which said device stands upright on said panel.

4,630,030

COMPRESSION OF DATA FOR STORAGE

Roland W. Roy, Chelmsford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 28, 1984, Ser. No. 625,877
Int. Cl.[4] H03K *13/22*
U.S. Cl. 340—347 DD **13 Claims**



1. In a computer system, a bit string representing an integer value belonging to a given range comprising:

a first field containing a first bit code representing a first integer value which is the result of subtracting a second integer value associated with the given range from the integer value to be represented; and

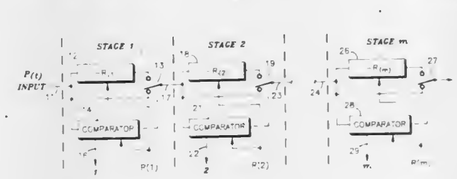
a second field containing a second bit code identifying the number of bits in the first bit code and the second integer value.

4,630,031

PULSE-WIDTH DISCRIMINATING A/D CONVERTER

Eric L. Upton, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,445
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**



1. An A/D converter having a plurality of stages for converting an analog signal to a digital signal, each of said states having an analog input, a reset input, a digital output and an analog output, a stage of said A/D converter comprising:

a delay loop of a predetermined length for delaying said analog signal a predetermined amount of time equivalent to said predetermined length of said delay loop and creating a delayed signal, said delay loop having a first end and a second end, said first end being coupled to said analog input of said stage of said A/D converter;

combining means for combining said analog signal with said delayed signal creating a combined signal, said combining means including a first logic gate having a first input, a second input and an output, said first input being coupled to said first end of said delay loop and said second input being coupled to said second end of said delay loop;

selecting means for selecting one of said delayed signal and said combining signal and for providing said digital signal, said selecting means including a flip-flop having a first input, a second input, a first output and a second output, said first input being coupled to said output of said combining means, said second input being coupled to said reset input of said stage and said first output being coupled to said digital output of said stage; and

gate means for passing one of said delayed signal and a portion of said delayed signal, said gate means comprising a multiplexer including first and second gates having a

first input, a second input, a third input, a fourth input and first and second outputs and said multiplexer further including a second logic gate having first and second inputs coupled to the first and second outputs of said first and second gates, respectively, and an output, said gate means being controlled by said selecting means to allow one of said delayed signal and said combined signal to pass through said gate means, said first input of said gate means being coupled to a first output of said selecting means, said second input of said gate means being coupled to said output of said combining means through a second delay gate, said third input of said gate means being coupled to said second end of said delay loop through a first delay gate, said fourth input of said gate means being coupled to said second output of said selecting means and said output of said second logic gate coupled to said analog output of said stage.

4,630,032

APPARATUS FOR DECODING ERROR-CORRECTING CODES

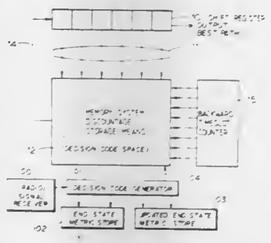
John A. Gordon, Hatfield, and Graham K. King, Sandridge, both of United Kingdom, assignors to British Telecommunications, Great Britain

Filed Jun. 1, 1984, Ser. No. 616,180

Claims priority, application United Kingdom, Jun. 3, 1983, 8315363

Int. Cl.⁴ H03M *5/00*

U.S. Cl. 340—347 DD **12 Claims**



1. A method of recovering data from convolutionally encoded signals received as a sequence of coded symbols within successive time slots, which method comprises the steps of:

(I) generating a decision code for each end state of the coded symbols in each time slot, wherein each of said decision codes identifies one step of a retrograde path, said step defining an end state in the previous time slot;

(II) storing all of said decision codes in decision storage means, each of said codes being stored in a storage location addressable by the end state and time slot of a given code;

(III) retrieving a path from said decision storage means wherein the path is generated by stepwise retrograde search through the stored decision codes, wherein each step comprises accessing the decision storage means using as addresses the identity of a time slot and an end state in the time slot to retrieve a decision code;

(IV) generating the identity of the predecessor end state from the retrieved code and the address used to retrieve it and also generating the identity of the previous-time slot, whereby repetition of said step from each time slot to its preceding time slot generates the path; and

(V) outputting the end of said path as the recovered data.

4,630,033

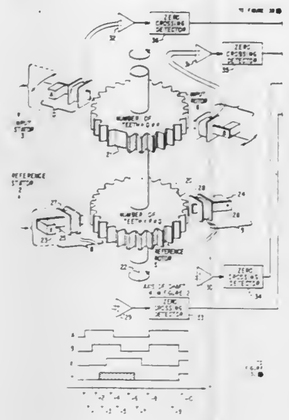
METHOD AND APPARATUS FOR MEASURING PHASE

Alan J. Baker, Everett, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 25, 1983, Ser. No. 479,043

Int. Cl.⁴ H03M *1/24*

U.S. Cl. 340—347 P **31 Claims**



1. A method of measuring the phase between a first signal having P-many cycles in a length of time L and a second signal having Q-many cycles in an equal length of time, the method comprising the steps of:

selecting a point in time as a reference;

selecting a feature occurring in each cycle of the first signal;

measuring relative to the reference P-many consecutive times of occurrence of the selected feature in the first signal;

averaging the measured P-many times of occurrence for the first signal to produce an average time of occurrence representing a single first equivalent feature;

selecting a feature occurring in each cycle of the second signal;

measuring relative to the reference Q-many consecutive times of occurrence of the selected feature in the second signal;

averaging the measured Q-many times of occurrence for the second signal to produce an average time of occurrence representing a single second equivalent feature;

expressing the difference between the times of the first and second equivalent features as a fractional portion of the time L; and

converting the fractional portion to a quantity expressed in a desired unit of measure.

4,630,034

SAMPLING FREQUENCY CONVERTING APPARATUS

Hiroshi Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 444,915

Claims priority, application Japan, Nov. 27, 1981, 56-190312

Int. Cl.⁴ H03K *13/24*

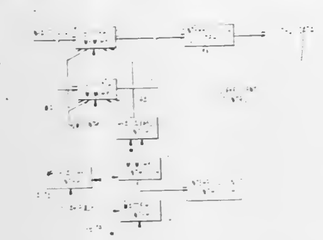
U.S. Cl. 340—347 DD **3 Claims**

1. A sampling frequency converting apparatus for converting an input signal sampled by a first sampling signal at a first frequency f_A into an output digital signal sampled by a second sampling signal at second frequency f_B, the relationship between f_A and f_B being $f_A/f_B = M/N$ (M, N: integer), said apparatus comprising:

first and second memory means;

means responsive to a first signal at said first frequency f_A for producing a write-address by incrementing an initial value of said address by one M times to store M datum of said input data signal in said first memory means, said value of said write-address means being cleared after said M increments by a clearing signal, said write-address means switching to store a subsequent M datum of said input data signal in said second memory means;

means responsive to a second signal at said second frequency f_B for producing a read-address by incrementing an initial value of said address by one N times to read the said M



datum of said stored digitial signal from said second memory means, said value of said read-address means being cleared after said N increments by said clearing signal, said read-address means switching to read a subsequent M datum of said input data signal from said first memory means; and

means for interpolating the data signal read from said first and second memory means, said interpolating means having N interpolation coefficients.

4,630,035

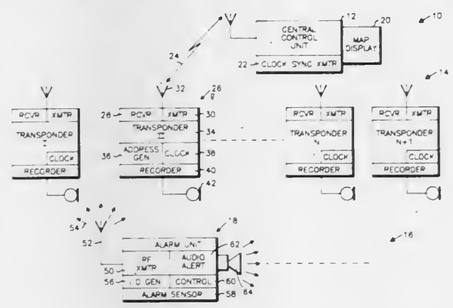
ALARM SYSTEM HAVING ALARM TRANSMITTER INDENTIFICATION CODES AND ACOUSTIC RANGING

John I. Stahl, Coral Springs; Burton J. Fischel, Plantation, and Frank J. Will, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1985, Ser. No. 688,834

Int. Cl.⁴ G08B *1/08*

U.S. Cl. 340—539 **19 Claims**



1. An alarm system for sensing an alarm condition within a relevant alarm area and locating the relevant alarm area comprising:

at least one portable alarm means for sensing an alarm condition and adapted to transmit a primary radio frequency alarm signal including an identification code upon sensing said alarm condition, said at least one portable alarm means also being adapted to transmit a secondary audio alarm signal upon sensing said alarm condition;

a plurality of transponders, at least some of said transponders being location within receiving range of said primary and secondary alarm signals, each said transponder being assigned an address code and including receiving means for receiving said primary and secondary alarm signals, recording means for recording the time of receipt of said primary alarm signal and the time of receipt of said secondary alarm signal, and transmitting means for transmitting at least said address code and indicia of the time interval between the times of receipt of the primary and secondary alarm signals by each transponder within said receiving range; and

control means for receiving signals from one or more of said transponders and for locating said relevant alarm area based upon said transponder address codes and said time intervals, said time intervals indicating the distances between a particular alarm means and respective transponders.

4,630,036

EARLY WARNING OF MARINE COOLING SYSTEM FAILURE

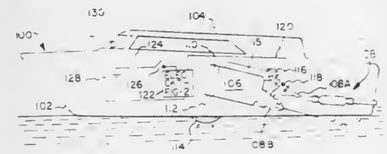
John R. Ford, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Continuation-in-part of Ser. No. 461,081, Jan. 26, 1983. This application May 23, 1983, Ser. No. 497,384

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.⁴ G08B *21/00, 23/00;* H05B *6/06*

U.S. Cl. 340—622 **11 Claims**



1. In a marine cooling system wherein cooling water is drawn from the body of water supporting a watercraft utilizing a marine engine, said water being drawn through a water inlet, circulated to cool said engine, and discharged back to said body of water through an exhaust conduit of said engine, an early warning system for detecting the failure of said marine cooling system comprising:

a temperature sensing element presenting an electrical resistance which varies with temperature supported within said exhaust conduit, said sensing element being cooled by said water as it is discharged through said exhaust conduit to provide a connection to ground potential through the resistance of said sensing element thereby defining a resistance ground signal having a low resistance value during proper operation of said cooling system and rapidly rising in temperature to provide an increased resistance value upon failure of said cooling system;

circuit means connected to said sensing element for generating an alarm signal in response to a resistance ground signal having an increased resistance value exceeding a selected resistance value; and

alarm means responsive to said alarm signal for warning the operator of said watercraft of impending engine overheating.

4,630,037

SMOKING VIOLATION DETECTOR

Victor Escamilla, Jr., Galveston, Tex., assignor to Roy P. Gaspard, Texas City and Daniel Escamilla, Galveston, both of, Tex., part interest to each

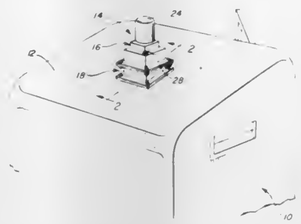
Filed Jul. 16, 1984, Ser. No. 630,986

Int. Cl.⁴ G08B *17/10*

U.S. Cl. 340—628 **1 Claim**

1. A portable industrial toilet cabin having a roof opening, a smoke-sensitive smoking violation detection and alarm unit mounted on the exterior of the roof over said opening for emitting an alarm signal in response to smoke emanating from

within the cabin, and security means for preventing an occupant of the cabin from tampering with said unit, wherein the alarm unit comprises signal emitter means externally of the cabin for signalling the presence of smoke within the cabin to personnel outside the cabin, and sensing means for activating



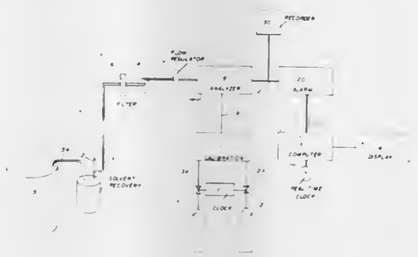
said emitter means responsive to the presence of smoke in the cabin, wherein the roof of the cabin is inclined and the alarm unit is mounted in horizontal disposition by a wedge-shaped tubular adapter extending from the roof around the opening, and wherein the adapter includes a security screen outside of the cabin constituting the security means.

4,630,038

VAPOR CONCENTRATION CONTROL

Mark A. Jordan, 9802 Tiverton Way, Louisville, Ky. 40222

Filed May 1, 1984, Ser. No. 605,875
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—632 **6 Claims**



1. An arrangement for monitoring the concentration of a selected component in a gas stream including:

(a) a source of said selected component which supplies a stream of gas containing said selected component;

(b) sampling means to continuously receive a sample of said gas stream;

(c) analyzer means to receive said gas stream and analyze said gas stream to determine the concentration of said selected component and provide a first electrical signal proportional to the concentration of said component in said gas stream;

(d) reference signal generator means adapted to generate second reference electrical and third reference electrical signals including adjust means to selectively adjust the value of said second and third reference electrical signals;

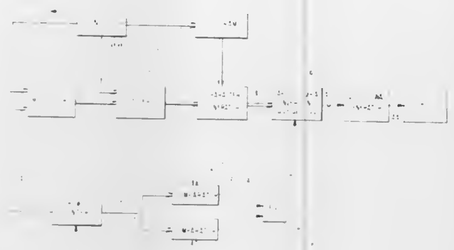
(e) first comparator means to receive said first electrical signal and said second reference electrical signal and provide a first comparator output signal to actuate a first alarm if said first electrical signal exceeds said second reference electrical signal, and second comparator means to compare said first electrical signal with said third reference electrical signal and provide second comparator output signal to actuate a second alarm if said first electrical signal exceeds said third reference electrical signal.

4,630,039

DISPLAY PROCESSING APPARATUS

Yasuhei Shimada, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,676
Claims priority, application Japan, Sep. 21, 1981, 56-149157
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—731 **5 Claims**



1. A display processing apparatus, comprising:

a memory for storing at least one pattern information; a display device for displaying a pattern in accordance with a display unit;

coupling means for coupling an output of said memory as said display input to said display device;

an address generator circuit for applying an address to an address input of said memory for reading the pattern information out of said memory, said address generator circuit having a controller for providing first and second predetermined values, a multiplier for multiplying an address by said first predetermined value and an adder for adding an output of said multiplier to said second predetermined value; and output of said adder being applied to said address input of said memory; and

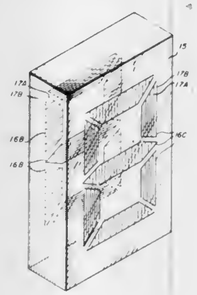
a display control circuit coupled to said coupling means for generating a first timing signal indicating a display start position and a second timing signal indicating a display end position and for controlling transmission of information read out of said memory to said display device in accordance with said first and second timing signals.

4,630,040

VARIABLE COLOR ELECTROOPTIC DISPLAY

Gene H. Haertling, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1983, Ser. No. 481,102
Int. Cl.[4] G09G *3/16*
U.S. Cl. 340—763 **33 Claims**



1. A method for creating selectable indicia of a first color and a second background color comprising the steps of:

polarizing light emitted from a light source by means of a first polarizer;

phase retarding selected portions of the polarized light exiting the first polarizer by applying a transverse electric field to selected areas on a substantially transparent uniaxial ferroelectric ceramic plate disposed in optical series with the first polarizer, said selected areas defining said indicia;

polarizing the light which exits from the ferroelectric ceramic plate by means of a second polarizer; and

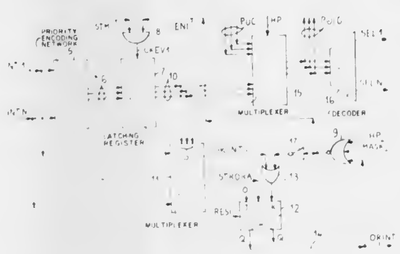
providing additional phase retardation to light which exits from the first polarizer before said light strikes the second polarizer to provide a color bias, the additional phase retardation controlling the background color of the display and the combination of said additional phase retardation and the selected phase retarded portions of light controlling the color of the indicia.

4,630,041

ENHANCED RELIABILITY INTERRUPT CONTROL APPARATUS

Angelo Casamatta, Cornaredo, and Walter Fossati, Muggio', both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Jan. 9, 1984, Ser. No. 569,127
Claims priority, application Italy, Jan. 31, 1983, 19347 A/83
Int. Cl.[4] H04Q *1/00*; G06F *3/04*
U.S. Cl. 340—825.5 **3 Claims**



1. An interrupt control apparatus for acknowledging on a priority basis and validating one among several possible asynchronous interrupt requests (INT1, INTN) comprising:

a priority encoding network receiving on its input terminals said interrupt requests and providing on its output terminals a code representative of the highest priority interrupt amoung those present simultaneously on its input terminals;

a latching register receiving on its input terminals said code, said register being cyclically enabled to load said code; and,

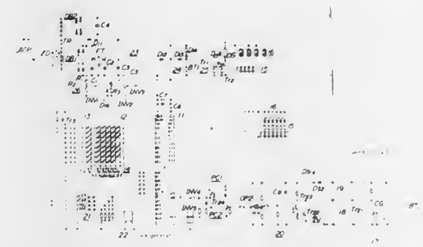
a selection circuit receiving on its data input terminals said interrupt and on its selection input terminals said code as output from said register, said selection circuit selecting that one among several said interrupts which is represented by said code, said selection circuit providing on its output terminal a validation signal at a first logic level when said selected interrupt is really present and an invalidation signal at a second logic level when said selected interrupt is not present.

4,630,042

WIRED COMMODITY VENDING SYSTEM

Kikuo Kawasaki; Tomomi Sano, and Hitoshi Yamamoto, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 439,186, Nov. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 261,194, filed as PCT JP80/00201, Aug. 29, 1980, published as WO81/00635, Mar. 5, 1981, 102(e) date Apr. 22, 1981, abandoned. This application May 23, 1985, Ser. No. 737,071
Claims priority, application Japan, Aug. 29, 1979, 54-109020
Int. Cl.[4] H04Q *9/00*; H04J *3/02*; G07F *11/00*
U.S. Cl. 340—825.35 **15 Claims**



1. A wired commodity vending system, including a plurality of slave stations, each having a vending machine including an outer door which can be opened so that a desired number of commodities can be taken from the vending machine, an inner door which can be opened for supplementing commodities taken from the vending machine, a commodity rack for holding a plurality of different kinds of commodities and having a matrix of sensors for sensing a presence or absence of commodities held in said rack and control contacts for controlling said vending machine, and a controller for forming and storing commodity sales data, said slave stations being connected in common to a master station which manages said slave stations through data transmission lines, and respective commodity sales data for said vending machines being processed by said master station, said system comprising:

(a) means for enabling said controller to operate responsive to closing of said outer door to form and store said commodity sales data;

(b) means for transmitting address data from said master station to address a selected addressed slave station and for transmitting command data including control instruction data from said master station to said addressed slave station;

(c) means for provisionally transmitting to said master station commodity sales data stored in an addressed slave station and for retransmitting to said master station control instruction data previously transmitted to said addressed slave station from said master station in response to command data including control instruction data transmitted from said master station to said addressed slave station, an address of said addressed slave station being designated by said master station;

(d) means for transmitting said command data again from said master station to said addressed slave station subsequent to reception of said commodity sales data and said retransmitted control instruction data by said master station;

(e) means for retransmitting commodity sales data and operating status data formed by said controller after said vending machine is operated in accordance with said control instruction data to said master station from said addressed slave station which has received said control instruction data; and

(f) means provided in said master station for processing said commodity sales data after said master station confirms a predetermined correspondence between repeatedly re-

ceived said control instruction data and said operating status data and between provisionally transmitted sales commodity data and retransmitted sales commodity data.

4,630,043

VEHICLE DATA ACQUISTION AND DASHBOARD DISPLAY SYSTEM

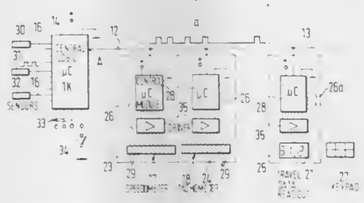
Georg Haubner, Berg; Hans Petermann, Nüremberg, and Hartmut Zöbl, Fürth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,855

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305579

Int. Cl.⁴ H04Q *9/14;* **G01D** *3/10;* **G08B** *19/00;* **G06F** *15/20*

U.S. Cl. 340—825.57 **15 Claims**



1. A system for optical display of condition and performance information in a motor vehicle comprising

a plurality of sets of electro-optical display elements; (**29**);

a respective control module (**26**) connected to each set of display elements; (**29**)

a single central control logic (**14**); and

a single central data line (**13**) from said central control logic (**14**) to said respective control modules (**26**),

said central logic (**14**) being connected to sensors (**30, 31, 32**) for the condition and performance information and processing and transmitting the measured values of said information as clocked trains of serial digital signals a over said data line (**13**) through said control modules (**26**) to said display elements (**29**),

wherein said central logic (**14**) places on the data line (**13**) clocked trains of binary-coded numbers, represented by pulse intervals of varying lengths, which correspond to addresses of specific display control modules (**26**) and to the values measured by the sensors,

each control module (**26**) includes means for counting pulses and a decoding means,

said counting means including means responsive to an address portion of a pulse train, coded for its respective control module, for enabling said decoding means in said module, and

said decoding means translating a value portion of said binary-coded number into 0- and 1-signals for controlling individual display elements (**29**).

4,630,044

PROGRAMMABLE INDUCTIVELY COUPLED TRANSPONDER

Rudolf Polzer, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,745

Claims priority, application European Pat. Off., Dec. 23, 1982, 82111965.8

Int. Cl.⁴ H04Q *9/14, 7/00*

U.S. Cl. 340—825.72 **15 Claims**

1. An automatic information transmission system for a mobile object comprising a response unit arranged to be carried along with the mobile object, and an interrogation unit arranged to be disposed alongside the path of movement of the mobile object for movement of said response unit past said interrogation unit, said interrogation unit comprising: means for emitting a carrier signal at a first frequency; and means for receiving a signal at a second frequency different from the first frequency, and said response unit comprising: electric circuit components including memory means for storing information relating to the mobile object, and signal generator means connected to said memory means for generating a signal at the second frequency and continaing the stored information; signal receiving means for receiving the carrier signal at the first frequency emitted by said emitting means of said interrogation unit; emitting means connected to said signal generator means for emitting the signal generated thereby; a transmitting-



/receiving antenna consisting of a single induction coil and forming part of both said signal receiving means and said emitting means of said response unit, said signal receiving means of said response unit comprising a first resonant circuit tuned to the first frequency and including at least part of said coil, and said emitting means of said response unit comprising a second resonant circuit to the second frequency and including at least part of said coil; and energy conversion means connected between said signal receiving means of said response unit and said circuit components for deriving operating power for said circuit components from the carrier signal at the first frequency received by said signal receiving means of said response unit.

4,630,045

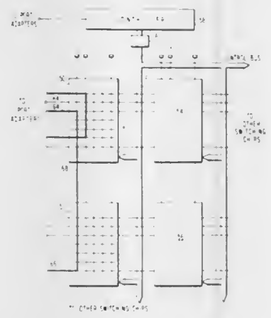
CONTROLLER FOR A CROSS-POINT SWITCHING MATRIX

Christos J. Georgiou, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,653

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.79 **10 Claims**



1. A controller for a physical switching array for connecting, resulting from a first type request, source data lines requesting connection to a requested destination data line and for disconnecting, resulting from a second type request, a source data line from its connected data line, comprising:

means for supplying a connection request for a connection to be changed across a physical switching array of crosspoints, said connection request not being necessarily honored;

first means for receiving said request and comprising separate means, operating in parallel, for providing intermediate information on (1) whether said request is of said first or of second type and (2) a present status of said switching array;

second means for receiving and processing said intermediate information from said first means and generating control signals for said switching array; and

logic circuitry for controlling said second means as it processes a first request and for simultaneously controlling said first means as it operates on a later accepted second request, whereby said control signals cause said switching array to connect said source data line to the requested destination data line or to disconnect said source data line from its connected data line.

4,630,046

BROADBAND SWITCHING NETWORK IN MATRIX FORM

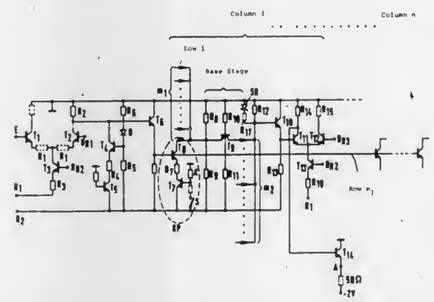
Hans-Martin Rein, Witten, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 688,161

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400217

Int. Cl.⁴ H04Q *9/00;* **H04J** *3/02*

U.S. Cl. 340—825.93 **10 Claims**



1. A broadband switching network in matrix form composed of a plurality of rows and a plurality of columns, and comprising: a plurality of crosspoint switching circuits each having an input and an output and each associated with a respective row and a respective column; a plurality of input circuits each associated with a respective row and connected to the input of each said switching circuit associated with the respective row; and a plurality of output circuits each associated with a respective column and connected to the output of each said switching circuit associated with the respective column, wherein each said crosspoint switching circuit comprises a first transistor connected in common emitter configuration and control means connected for applying to the emitter of said first transistor a potential controlling the switching state of said crosspoint switching circuit, each said input circuit and output circuit is a decoupling circuit, and said network further comprises: a plurality of load resistors each associated with a respective column and each connected to that one of said output circuits associated with the respective column; and a plurality of self-blocking stages each comprising a second transistor connected in common base configuration and each connected in series between the output of at least one said switching circuit and that one of said load resistors associated with the same column as said at least one switching circuit.

4,630,047

CAPACITIVE-TYPE POSITION AND REFERENCE ANGULAR ROTATION DETECTING APPARATUS

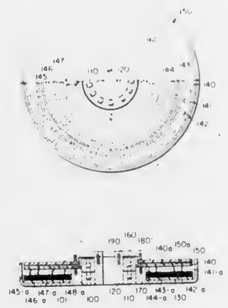
Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 358,903, Mar. 17, 1982, Pat. No. 4,499,465. This application Oct. 31, 1984, Ser. No. 666,821

Claims priority, application Japan, Mar. 18, 1981, 56-40051; May 25, 1981, 56-78872; May 27, 1981, 56-80585; Jun. 5, 1981, 56-86507

Int. Cl.⁴ G08C *19/10*

U.S. Cl. 340—870.37 **8 Claims**



1. A capacitor type rotation detection apparatus comprising:

a first plate having a plurality of electrode pieces of a first input electrode and a plurality of electrode pieces of a second input electrode arranged along a circumference at respective equally given intervals and contiguously intermeshed, said first input electrode pieces forming a first input reference angular position detection electrode comprising a set of said first input electrode pieces selected at respective different intervals and further forming a first input rotational position detection electrode comprising a set of said first input electrode pieces other than said first input reference angular position detection electrode pieces, and said second input electrode pieces forming a second input reference angular position detection electrode comprising a set of said second input electrode pieces each thereof being positioned adjacent to one of said first input reference angular position detection electrode pieces on one side thereof and further forming a second input rotational position detection electrode comprising a set of said second input electrode pieces other than said second input reference angular position detection electrode pieces, and an input ring-shaped electrode;

a second plate having an output electrode arranged to face said first and second input reference angular position detection electrodes and an output ring-shaped electrode connected to said output electrode and arranged to face said input ring-shaped electrode;

a first periodic signal supply circuit for supplying two periodic signals of opposite phase to said first and second input reference angular position detection electrodes, respectively, at a predetermined period;

a second periodic signal supply circuit for supplying two periodic signals of opposite phase and having a period different from the period of said periodic signals supplied to said first and second input reference angular position detection electrodes to said first and second input rotational position detection electrodes; and

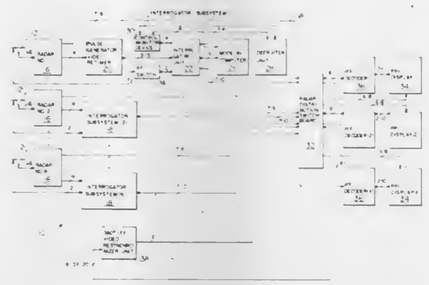
a detecting circuit for detecting a rotational position and a reference angular position of said second plate in accordance with periodic signals appearing at said output electrode.

4,630,048

THREE HUNDRED AND SIXTY DEGREE IFF VIDEO RESYNCHRONIZER UNIT

Patrick O. Callahan, Jr., Lusby, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1982, Ser. No. 392,962
Int. Cl.[4] G01S *13/78*
U.S. Cl. 342—45 **16 Claims**



1. A 360° IFF video resynchronizer for storing and processing IFF data (returns) from an associated IFF system having multiple radar(s) for recalling the IFF data at a different pulse repetition frequency (PRF) and at a different antenna RPM than the associated IFF system, comprising:

a video resynchronizer input device operatively connected to the associated IFF system for formatting IFF composite video, initiating trigger, terminating trigger, mode tag and synchro information (pertinent data) for all IFF returns, in the fashion of range, code, mode and azimuth information;

an input computer operatively connected to said video resynchronizer input device for storing the range, code, mode and azimuth information for each IFF interrogation in a memory thereof, the memory being formatted in such a manner that the azimuth information points to predetermined locations therein, successive words in memory containing the range and code (entry) for each IFF return of that interrogation;

an output computer operatively connected to said input computer for storing the range, code mode and azimuth information for each IFF interrogation in a memory thereof, the memory being formatted in such a manner that the azimuth information points to predetermined locations therein, successive words in memory containing the range and code (entry) for each IFF return of that interrogation, said output computer generating for a particular azimuth 360° retimed IFF composite video, and retimed mode tags in a digital format; and

a digital-to-composite IFF video converter operatively connected to the associated IFF system and said output computer for converting the range, code and mode in the digital format into a retimed IFF composite video format for subsequent display on an associated PPI/display unit and/or decoder.

4,630,049

DIGITAL-TO-COMPOSITE IFF VIDEO CONVERTER

Patrick O. Callahan, Jr., Lusby, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1982, Ser. No. 392,963
Int. Cl.[4] G01S *13/78*
U.S. Cl. 342—45 **5 Claims**

1. A converter for processing IFF returns, from an asociated radar(s), the IFF returns being in a digital format of range, mode, and code information after processing by an associated digital computer, into an IFF composite video format for displaying on a PPI/display unit and/or decoder, comprising:

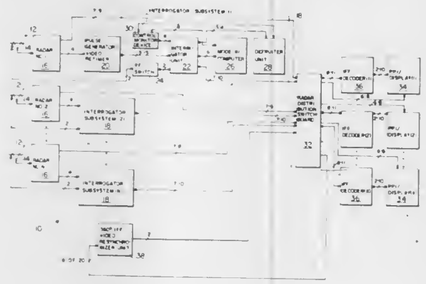
a synchro-to-digital converter operatively connected to radar antennas of the associated radar(s) for converting azimuth information therefrom into addresses which point to particular locations in the memory of the associated computer in which all of the IFF returns are stored for 360° of IFF operation;

means for storing the range and code information (an entry) from the associated computer and outputting it on a first-in-first out basis;

a range comparator operatively connected to said means for storing for comparing the range of an IFF return with a predetermined offset range;

a first IFF word generator operatively connected to said means for storing and said range comparator for performing parallel to serial conversion with reload capability prior to the complete outputting of a digital signal;

a second IFF word generator operatively connected to said means for storing and said range comparator for performing parallel to serial conversion with reload capability prior to the complete outputting of a digital signal;



clock means including a synchronous clock for generating a first set of clock pulses in response to an initiating trigger, and an IFF pulse spacing synchronous clock being operatively connected to said first and second IFF word generators for providing second and third sets of clock pulses, respectively, so as to deliver the appropriate pulse spacing clocks for the proper operation of said first and second IFF word generators, said clock means being started by the initiating trigger and being halted by a terminating trigger from the associated radar(s);

a range counter operatively connected to said range comparator and being cleared by the initiating trigger or by a trigger from the associated computer and being driven by the first set of clock pulses for counting the number of clock cycles;

a range offset generator operatively connected between said range comparator and said range counter for generating the predetermined offset range; and

logic means operatively connected to said range comparator, said first IFF word generator, said second IFF digital word generator, and said clock means such that multiple IFF composite video trains corresponding to the IFF returns are interleaved one with the other.

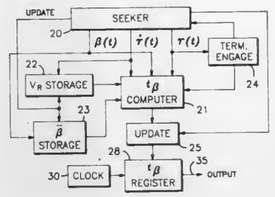
4,630,050

DUAL PURPOSE GUIDANCE SYSTEM FOR A GUIDED MISSILE

Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1983, Ser. No. 562,934
Int. Cl.[4] F42B *15/02*; F42C *13/04*
U.S. Cl. 342—62 **8 Claims**

1. A guidance system for a guided missile comprising a transceiver with first means coupled thereto for providing guidance control signals to the missile during a seeking portion of flight and second means coupled to said transceiver and said first means for calculating optimum initiation time based on a



stored estimate of the time required for the target to reach a reference plane and providing a signal indicative of the occurrence of said optimum initiation time.

4,630,051

IMAGING DOPPLER INTERFEROMETER

Gene W. Adams, Richmond, Utah, and John W. Brosnahan, Longmont, Colo., assignors to Holodyne Ltd., 1986, Longmont, Colo.

Filed Mar. 1, 1985, Ser. No. 707,498
Int. Cl.[4] G01S *13/89, 13/52, 13/06*
U.S. Cl. 342—133 **47 Claims**

1. The process for providing locational information of a plurality of targets comprising the steps of:

detecting temporal pulses received from said plurality of targets substantially simultaneously by at least three independent sensors;

producing complex voltage temporal functions V(t) separately for each of said independent sensors;

separately transforming said complex voltage temporal functions V(t) to doppler frequency functions V(w) which vary with a separate doppler frequency (w) of each target, said separate doppler frequency of each target generated as a result of an independent velocity of each target of said plurality of targets relative to said independent sensors and independent of velocity of other targets of said plurality of targets;

generating phase values $\phi(w)$ from said doppler frequency functions V(w) indicating a plurality of scattering points;

performing scattering point analysis to identify and distinguish said plurality of targets from noise and simultaneously locate said plurality of targets by separating each target according to said separate doppler frequency for each target and by determining a common locational source of said temporal pulses returned from each target comprising the steps of:

generating phase difference functions $\Delta\phi(w)$ from the difference between said phase values $\phi(w)$ for a plurality of pairs of said independent sensors;

comparing said phase difference functions $\Delta\phi(w)$ at corresponding doppler frequencies;

analyzing said phase difference functions $\Delta\phi(w)$ as a function of spatial separation of said plurality of pairs of said independent sensors; and,

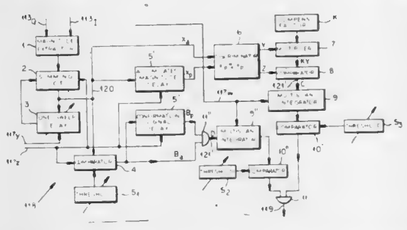
identifying each target at said corresponding doppler frequencies by interferometrically determining a common locational source of said temporal pulses from analysis of said phase difference functions $\Delta\phi(w)$ as a function of spatial separation of said plurality of pairs of said independent sensors.

4,630,052

SUPPRESSOR OF SECOND-TIME-AROUND CLUTTER ECHOES FOR MTI PULSE RADAR PROVIDED WITH POWER OSCILLATOR

Gaspare Galati, and Ennio Giaccari, both of Rome, Italy, assignors to Selenia-Industrie Elettrotechniche Associate S.p.A., Rome, Italy

Filed May 4, 1984, Ser. No. 607,204
Claims priority, application Italy, May 4, 1983, 48219 A/83
Int. Cl.[4] G01S *7/28*
U.S. Cl. 342—159 **6 Claims**



4. In a pulse radar with a transmitting section including a power oscillator triggerable to generate output carrier-wave pulses, rotating antenna means of fixed angular beamwidth coupled to said transmitting section for radiating said pulses at the beginning of respective range sweeps and intercepting echoes thereof reflected by outlying objects,

timing means for triggering said power oscillator to generate said outgoing pulses with two different predetermined repetition frequencies in alternate scanning intervals, said scanning intervals being all of the same length with consequent variation of the number of range sweeps fron one scanning interval to the next, and a receiving section coupled to said antenna means for coherently detecting said echoes to determine Doppler speeds of reflecting objects and delivering corresponding output signals to a digital processing stage after elimination of first-time-around echoes in said receiving section, a scan by said antenna means of an arc corresponding to said beamwidth encompassing a multiplicity of said range sweeps,

the combination therewith of a device for suppressing second-time-around clutter echoes, said device comprising:

summing means connected to the output of said receiving section in parallel with said processing stage for accumulating the magnitudes of echoes received in a group of consecutive range sweeps occurring in a predetermined scanning interval, the combined number of range sweeps of any two adjoining scanning intervals being fixed and not greater than said multiplicity;

first delay means connected to said summing means for retarding the accumulated echo magnitudes of any given group by a period equal to the scanning interval containing the given group;

comparison means connected to output of said summing means for detecting correlation between the accumulated echo magnitudes of a current group and of an immediately preceding group, with emission of a confirmation signal upon detection of such correlation;

first integrating means connected to said comparison means for adding up enabling signals recurring in a predeter-

mined number of consecutive returns to the same antenna position;

inhibiting means controlled by said first integrating means for blocking the output of said processing stage in said antenna position upon the sum of said enabling signals at least equaling a first determined threshold;

weighting means inserted between the inputs of said comparison means and the output of said summing means respectively connected thereto for relatively adjusting the resulting echo-magnitude accumulations to compensate for the different number of range sweeps in said current and immediately preceding groups,

wherein said weighting means comprise discriminating means for finding the smaller one of said magnitude accumulations and an arithmetic means for multiplying the smaller echo magnitude accumulation by a compensatory factor; and

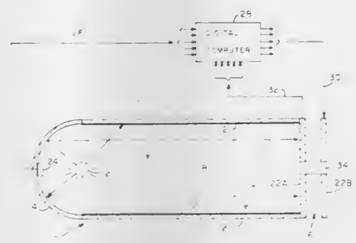
second integrating means being coupled to said weighting means and to said inhibiting means for blocking the output of said processing stage in said antenna position upon the sum of said confirmation signals at least equaling a second predetermined threshold.

4,630,053

ELECTRONICALLY CONTROLLED ARRAY FOR SIMULATION OF PASSIVE TARGET/BACKGROUND SIGNATURES AT MILLIMETER WAVELENGTHS

Augustus H. Green, Jr., and Gustaf J. Rast, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1984, Ser. No. 675,916
Int. Cl.[4] G01S *7/40*
U.S. Cl. 342—376 **11 Claims**



1. An electronically controlled noise generator comprising: a source of noise emission in the millimeter frequency bands, means for converting the noise emission to a plane wavefront output wave of transmitted energy having a plurality of individually controllable wave portions, and means for controlling the transmitted output wave such that said individually controllable portions of the wave have variable intensity of radiation for providing a transmitted wave of noise energy, and said means for converting being disposed for directing said plane wavefront toward said means for controlling.

4,630,054

RADAR DETECTION AND SIGNAL PROCESSING CIRCUIT

Glen D. Martinson, Oakville, Canada, assignor to B.E.L.-Tronics Limited, Mississauga, Canada

Filed Apr. 27, 1984, Ser. No. 604,953
Claims priority, application Canada, Jan. 6, 1984, 444843
Int. Cl.[4] G01S *7/36*
U.S. Cl. 342—20 **17 Claims**

1. A radar detection and signal processing circuit having a microwave frequency receiving antenna and a local oscillator where signals from each are fed into a first mixer, and in the presence of a signal being received by said antenna an intermediate frequency signal is fed from said first mixer to a second mixer together with a signal from a swept frequency oscillator, where the output from said second mixer is fed to a band pass filter so that for each sweep of said swept frequency oscillator a pair of signals of substantially predetermined time spacing appears at the output of band pass filter, and further comprising:

a detector for frequency modulated intermediate frequency signals at the output of said band pass filter, said detector having at least a first output signal that is fed to two pairs of complimentary paired comparators, the outputs of which are set to low and high threshold levels;

where the first pair of complimentary comparators has a low threshold level output, and said output is examined by a microprocessor against a clock which divides each sweep period of said swept frequency oscillator into a plurality of time cells; there being storage means for storing low



threshold detection incidence information, so that the incidence of detected low threshold signals at a level above said low threshold level in a pair of spaced time cells over a first given number of consecutive sweeps causes an alarm;

and the second pair of complimentary comparators has a high threshold level output, and said output is examined by said microprocessor against said clock and plurality of time cells; there being storage means for storing high threshold detection incidence information, so that the incidence of detected high threshold signals at a level above said high threshold level in a pair of spaced time cells over a second given number of consecutive sweeps causes an alarm;

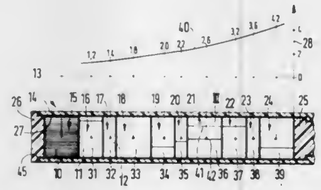
and said first given number is greater than said second given number.

4,630,055

DIPOLE ARRANGEMENT IN A SHEATH

Peter Wessel, Brussels, Belgium, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 14, 1983, Ser. No. 504,225
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222584
Int. Cl.[4] G01S *7/38*
U.S. Cl. 343—12 **8 Claims**



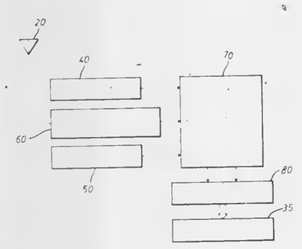
1. A dipole arrangement comprising a sheath having a polished inner surface; segments of ejectable dipoles sequentially arranged within said sheath; and smooth thin metal enveloping said segments in a reducing number of windings, said dipoles of said enveloped segments being centripetally pretensioned.

4,630,056

CONTROL SYSTEM FOR ANTENNA OF RECEIVING EQUIPMENT INSTALLED ON MOVING BODY

Takashi Noguchi, and Shinzo Totani, both of Kariya, Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Apr. 5, 1984, Ser. No. 597,094
Claims priority, application Japan, Apr. 11, 1983, 58-63495
Int. Cl.[4] H04B *7/185*; H01Q *3/00*; B64C *17/06*
U.S. Cl. 342—357 **10 Claims**



1. A control system for controlling an antenna mounted on a moving body such as a vehicle and rotatable to directly receive a transmitting signal from a geostationary satellite in space so as to apply it to a receiving equipment on said moving body, the control system comprising:

antenna direction means for monitoring a direction of said antenna;

detection means for detecting a level of transmitting signal received by said antenna;

body direction means for producing a first signal indicative of a difference between a standard direction and a movement direction of said body;

processing means, responsive to said body direction means, antenna direction means and detection means, for (1) producing a second signal indicative of a difference between the movement direction of said moving body and said direction of said antenna monitored by said antenna direction means, (2) determining a difference between the movement direction of said moving body and a predetermined direction of said satellite defined by its position in accordance with a value of the first signal on a basis of a predetermined difference between the standard direction and the direction of said satellite, said third means producing a third signal indicative of the determined difference (3) determining whether or not the level of the received transmitting signal from said detection means is lower than a predetermined level and if so, producing a first command signal and if not, producing a second command signal, (4) in response to said first command signal, determining an adjustment angle for rotation of the antenna in accordance with values of the second and third signals and for producing a rough control signal indicative of the determined adjustment angle, (5) in response to the second command signal, determining whether or not a rate of change of the received transmitting signal is within a predetermined range and if not, producing a fine control signal; and

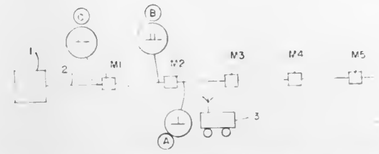
drive means responsive to the rough control signal for effecting rotation of said antenna to coarsely adjust the direction of said antenna to the direction of said satellite, said drive means being further responsive to the fine control signal to effect fine adjustment of the direction of said antenna to the direction of said satellite.

4,630,057

VEHICLE LOCATION SYSTEM

David J. R. Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 25, 1984, Ser. No. 654,083
Int. Cl.[4] H04R *7/185*; B66B *3/02*
U.S. Cl. 342—358 **20 Claims**



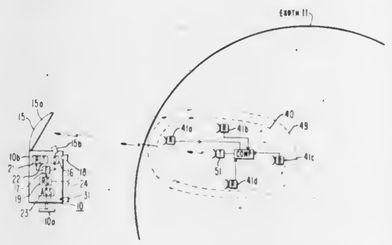
1. A radio location system comprising a fixed base radio station, a radio propagation guiding means following a linear route, mobile radio station means for travelling such linear route, static marker means included in the propagation guiding means and arranged to apply discrete and time-sequential modifications constituting individual interruptions to a radio signal being transmitted through the guiding means in such manner that the position of a mobile radio station may be determined by reference to the numer of such discrete time-sequential modifications thereby imparted to a radio signal transmitted between the fixed base station and the said mobile station.

4,630,058

SATELLITE COMMUNICATION SYSTEM

Irving Brown, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1982, Ser. No. 352,882
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 342—359 **6 Claims**



1. A method of maintaining a geosynchronous satellite communication radiation pattern of a first signal, transmitted from a communication satellite antenna, positioned so that it covers a predetermined area on earth including multiple ground stations comprising:

radiating a beacon signal from a second satellite antenna in a beam pattern which covers an area substantially larger than and including all of said predetermined area;

sensing at each of a plurality of said ground stations located in and distributed about the periphery of the predetermined area the ratio between the received beacon signal and the received first signal to provide ground station sensor signals proportional to said ratios;

comparing with one another only said sensor signals produced by said peripheral ground stations to sense the error, if any, in the position of said communications radiation pattern relative to said predetermined area; and

changing the attitude of said satellite in response to said error signal to correct for said pattern error.

4,630,059

FOUR-PORT NETWORK COUPLING ARRANGEMENT FOR MICROWAVE ANTENNAS EMPLOYING MONOPULSE TRACKING

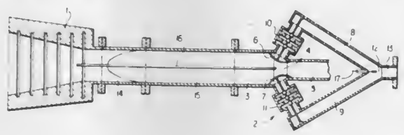
Günter Mörz, Ludwigsburg, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,491

Claims priority, application European Pat. Off., Jun. 18, 1983, 83105973.8

Int. Cl.⁴ H01Q *21/06, 21/24;* **H04B** *7/10*

U.S. Cl. 343—362 **8 Claims**



1. A four-port network and coupling arrangement for a microwave antenna associated with four communication signal paths corresponding respectively to two polarizations in each of two different frequency bands, and providing a higher order mode signal useable for monopulse tracking of the antenna, said network and coupling arrangment comprising in combination:

a microwave antenna feed horn;

a four-port network means for separating said signal paths, said network means including an input waveguide in which the signals of both frequency bands and both polarizations are able to propagate and which has one end connected to said antenna feed horn and its other end connected to a further waveguide section having a branching arrangement for separating the frequency bands, said branching arrangement including two orthogonally arranged pairs of oppositely disposed coupling elements with each element leading to one end of a respective waveguide arm and with each pair being associated with a respective one of the two polarizations of one of said frequency bands, and first and second hybrid means, each connected to the other ends of the two said arms for a respective pair of said elements, for each providing the communication signal for a respective one polarization direction of said one frequency band at a respective output; and

means for coupling at least one higher order mode signal, which mode is able to exist in the throat of said antenna feed horn but is not able to propagate through said input waveguide due to its dimensions, to said arms of said branching arrangement, said means including a conductor disposed along the longitudinal axis of said input waveguide and extending from the region of said throat of said feed horn to the vicinity of said coupling elements, whereby signals of said higher order mode are conducted along said conductor, are coupled together with the communication signals of said one frequency band to said arms of said branching arrangement, are separated from said communication signals of said one frequency band in the respective said hybrid means and appear at a second output of the respective said hybrid means.

4,630,060

VERTICAL ANTENNA WITH DECOUPLING SECTIONS FOR MULTIBAND OPERATION

Donald R. Newcomb, Lockhart, Tex., assignor to Butternut Electronics Co., Lockhart, Tex.

Filed Oct. 12, 1983, Ser. No. 541,062

Int. Cl.⁴ H01Q *9/14*

U.S. Cl. 343—722 **6 Claims**

1. Vertical antenna resonating on eight predetermined segments of the high-frequency spectrum comprising:

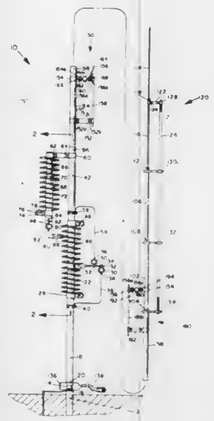
a. first inductor-capacitor means vertically supported and comprising an eighty/seventy-five meter section including an eighty/seventy-five meter inductor and capacitor connected in parallel across the top of said section, said inductor adjusting the center frequency of operation;

b. second inductor-capacitor means vertically connected to said first inductor-capacitor means and comprising a forty-meter section including a forty-meter inductor and capacitor connected in parallel across the top of said section, said inductor adjusting the center frequency of operation, and said inductors and capacitors connecting at a common point on an insulator between said sections;

c. vertical radiating means connected to said second inductor-capacitor means by an insulator post, said vertical radiating means comprising first, second, third, fourth, fifth, and sixth vertical radiating sectional elements secured to each of the other respective elements;

d. third inductor-capacitor means vertically supported and comprising a thirty-meter inductor and capacitor connected in series between said forty-meter inductor and said vertical radiating element;

e. stub means connected to a top portion of said vertical radiating means, spaced a fraction of a wavelength therefrom and extending parallel downwardly therefrom, said



stub means substantially one-quarter wavelength of fifteen meters;

f. first decoupling means connected to a mid-portion of said vertical radiating means and including a parallel inductor-capacitor section for decoupling at seventeen meters;

g. second decoupling means connected to said vertical radiating means and above said first decoupling means spaced therefrom, and including a parallel inductor-capacitor circuit for decoupling at twelve meters; and

h. an impedance matching coil connected across said first inductor-capacitor means and ground, a coaxial cable transmission line impedance matching section connected across said impedance matching coil, and said vertical antenna having a height in the range of twenty-five to twenty-six feet whereby a coaxial cable transmission line connected to said first inductor-capacitor means and ground, and the entire vertical radiating length of said vertical antenna is active on five of said eight high-frequency spectrum segments and said stub means decouples said vertical radiating means above said stub means thereby yielding a quarter wave vertical radiating means on the frequency corresponding to the length of said stub means.

4,630,061

ANTENNA WITH UNBALANCED FEED

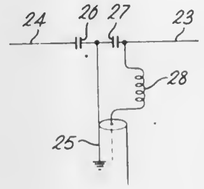
Maurice C. Hately, Aberdeen, Scotland, assignor to National Research Development Corp., London, England

Filed Jun. 15, 1984, Ser. No. 620,927

Claims priority, application United Kingdom, Jun. 17, 1983, 8316510

Int. Cl.⁴ H01Q *1/50, 9/16*

U.S. Cl. 343—749 **10 Claims**



1. An antenna for connection to an unbalanced feeder comprising

a conductive structure which is resonant at the centre frequency of a predetermined operating band, the structure having first and second elongated conductor portions, each of said first and second elongated conductor portions having a first end, said first end of said first conductor portion being disposed adjacent said first end of said second conductor portion,

a pair of capacitors connected in series between said first end of said first conductor portion and said first end of said second conductor portion and positioned adjacent to said first ends with the connection between said capacitors forming a connecting point for he 'common' connection of an unbalanced feeder, each said capacitor having a capacitive reactance at said centre frequency providing a phase shift of several tens of degrees between applied voltage and a current, and

an inductor having one end connected to said first end of one of said first and second conductor portions, the other end of said inductor forming a connecting point for the 'live' connection of an unbalanced feeder, and said inductor having an inductive reactance at said centre frequency which compensates for said phase shift to present a substantially resistive impedance between said feeder connecting points at said centre frequency.

4,630,062

HORN ANTENNA WITH WIDE FLARE ANGLE

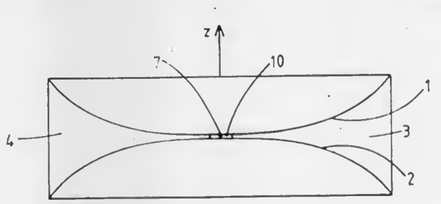
Richard J. Dewey, Reigate, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 414,089, Sep. 1, 1982, abandoned. This application Jul. 1, 1985, Ser. No. 750,654

Claims priority, application United Kingdom, Sep. 7, 1981, 8127037; Jul. 14, 1982, 8220384

Int. Cl.⁴ H01Q *13/06*

U.S. Cl. 343—786 **8 Claims**



1. A horn antenna comprising a feed element, first and second spaced-apart conductive surfaces cooperating to define an inwardly-disposed gap at which the feed element is situated and an outwardly-disposed aperture, and first and second planar conductive surfaces defining a predetermined flare angle, the antenna being configured with respect to a cylindrical coordinate system having z, ϕ and r axes such that:

(a) projections of the first and second spaced-apart conductive surfaces onto a plane defined by the r, ϕ axes form coextensive sectors of a circle covering the predetermined flare angle and are bounded by said first and second planar conductive surfaces, each of which lies in a respective plane defined by the r, z axes;

(b) intersections of the first and second spaced-apart conductive surfaces with any plane defined by the r, z axes form first and second curves symmetrically disposed on opposite sides of the r, ϕ plane, separated by a predetermined distance at the gap, and diverging with distance from the z-axis until terminating at the aperture; and

(c) said feed element comprises a line source extending along the z-axis and having a width which is small in comparison to wavelengths corresponding to frequencies at which the antenna is intended to operate;

said feed element, spaced-apart conductive surfaces and planar conductive surfaces cooperating to launch and propagate to said aperture a substantially pure lowest order circumferential mode having its electric field in a direction parallel to the z axis and having magnetic field components in only the r and ϕ directions.

4,630,063

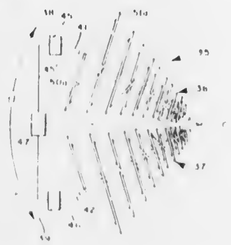
LOG-PERIODIC ANTENNA

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 538,353, Oct. 3, 1983, Pat. No. 4,506,268, which is a continuation of Ser. No. 309,874, Oct. 9, 1981, abandoned. This application Oct. 9, 1984, Ser. No. 659,054

Int. Cl.⁴ H01Q *11/10*

U.S. Cl. 343—792.5 **5 Claims**



1. A log-periodic antenna comprising:

first and second adjacent arrays of generally triangularly shaped radiating elements arranged in a frequency independent manner and in E-planes, each of said arrays having a first coplanar set of elements and a second coplanar set of elements, each of said sets of elements having an axis, the elements of each set having lengths and interelement spacings decreasing axially from a maximum at one end to a minimum at the other end in increments at a predetermined ratio, adjacent elements of each set extending on opposite sides of the axis of the set; and

balanced shielded feed means for energizing elements of said arrays;

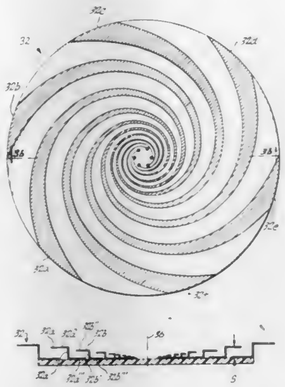
each element of a first set having a length equal to the length of a corresponding element of the associated second set and being axially spaced from said other end by the same distance as said corresponding element, elements of equal length of associated first and second sets extending in opposite directions.

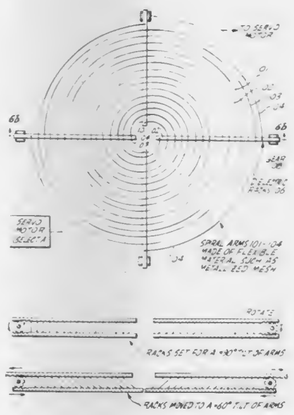
4,630,064

SPIRAL ANTENNA WITH SELECTABLE IMPEDANCE

George S. Andrews, Kent; Thomas L. Blakney, Bellevue; Douglas D. Connell, Seattle; Bernard J. Lamberty, Kent, and James R. Lee, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,485
Int. Cl.[4] H01Q *1/36*
U.S. Cl. 343—895 14 Claims





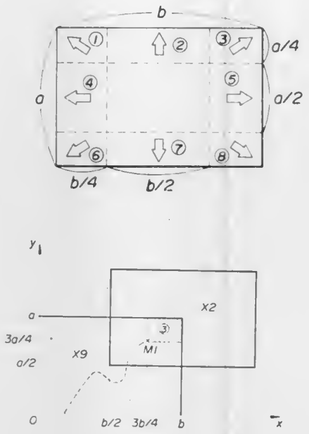
1. A monopulse antenna system comprising a multi-arm spiral antenna having at least three spiral arms arranged in a coaxial, interwound array so as to define an antenna axis, and a mode forming network having a predetermined feed impedance Z_i coupled to a feed input of the antenna at the innermost ends of said arms, each of said arms including at least two noncoplanar surface regions that are opposed, proximate and generally parallel to surface regions of radially inward and radially outward adjacent arms such that the opposed, proximate and parallel surface regions of such adjacent arms form an inter-arm capacitance which in part determines the input impedance Z to said antenna, said arm surface regions being dimensioned and spaced in said opposed, proximate and generally parallel relationship such that said inter-arm capacitance is substantially constant with radius from the innermost ends to the outermost ends of said arms, and so as to cause the input impedance Z of the antenna to assume a value that approaches said predetermined impedance Z_i of said mode forming network.

4,630,065

CURRENT LOCATION INDICATION APPARATUS FOR USE IN AN AUTOMOTIVE VEHICLE

Akira Ichikawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,358
Claims priority, application Japan, May 17, 1982, 57-82730; May 17, 1982, 57-82731
Int. Cl.[4] G08G *1/12*
U.S. Cl. 340—995 2 Claims



1. A current location indicating apparatus for use in an automotive vehicle wherein a current location of said automotive vehicle in terms of two-dimensional coordinates is obtained arithmetically by signal processing means on the basis of a signal to detect a current travel distance of said vehicle and a signal to detect a current direction of travel taken by said vehicle so that the current location of said vehicle may be visually indicated on a display screen on the basis of the thus-obtained locational data which varies from time to time, which comprises:

microfilm means including a plurality of fractioned area maps with a part of the areas thereof overlapped with each other;

access means for accessing each of said plurality of area maps;

means for photographically picking-up images of said area maps as read-out by said image pick-up means; and

wherein a desired area map is presented on said display screen in accordance with the graphic information of each of said area maps as read-out by said image pick-up means, and wherein when the current locational point of said vehicle comes near the edge of the area of display of an area map currently on the display as the vehicle proceeds in its travel, another related area map with a part overlapped with the previous one is switched to on the display under the control of said signal processing means.

4,630,066

SIGNAL QUANTIZER

Mark G. Butz, Cincinnati, Ohio, and William J. Zacharias, Villa Hills, Ky., assignors to General Electric Company, Cincinnati, Ohio

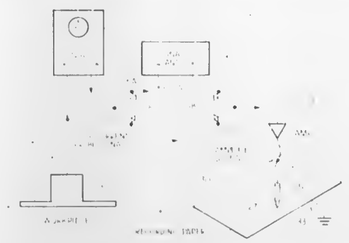
Continuation of Ser. No. 404,728, Aug. 3, 1982, abandoned. This application Oct. 31, 1984, Ser. No. 665,519
Int. Cl.[4] G01D *9/00, 15/10*
U.S. Cl. 346—33 EC 1 Claim

1. In a system which generates an analog signal indicative of

the surface condition of an object and which, using an electrode pen, produces burn marks on a record which vary along a color spectrum ranging from light to dark, the improvement comprising:

(a) a signal quantizer for processing the analog signal which includes

(i) means for establishing a plurality of signal thresholds,



(ii) means for identifying the largest signal threshold reached by the analog signal, and

(iii) means for

A. amplifying the signal threshold identified in (a)(ii) and

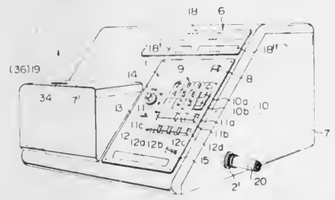
B. transmitting the amplified signal to the electrode pen for quantizing the burn marks.

4,630,067

BAR CODE PRINTER

Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 231,363, Feb. 3, 1981, Pat. No. 4,440,248. This application Sep. 13, 1983, Ser. No. 531,744
Claims priority, application Japan, Feb. 9, 1980, 55-15102; Feb. 9, 1980, 55-15103; Feb. 19, 1980, 55-19861; Feb. 20, 1980, 55-21729; Jul. 18, 1980, 55-98880; Jul. 18, 1980, 55-98881; Oct. 4, 1980, 55-138891
Int. Cl.[4] G01D *15/10;* G01G *23/38;* G06K *3/12*
U.S. Cl. 346—76 PH 5 Claims



1. A bar code printer for printing bar code on bar code labels, comprising:

an input unit for entering required input data and developing an input signal of a prescribed form;

a signal control system means operatively responsive to the entry of said required input data via said input unit for developing control signals in response thereto;

bar code printing systems means operatively responsive to the control signals from said signal control system means; and

an indicating system operatively responsive to the control signals from said signal control system means;

said bar code printing system means including a plurality of heating elements aligned to constitute a printing head for contacting a heat sensitive color indicating surface on said labels, said heating elements being heated in accordance with prescribed conduction information present with said control signals from said signal control system means when said printing head is in contact with said color indicating surface of said labels thereby printing said bar code on said bar code labels, the arrangement being that the labels and printing head are adapted to be moved relatively in the direction in which the bars of the bar code are to extend, and wherein the heating of the heating elements, contact time between heating elements and label and/or feed of relative movement between labels are/is controlled so as to produce bars in the bar code each of substantially constant width.

4,630,068

HIGH SPEED THERMAL PRINTING CIRCUIT

J. Robert Ims, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 30, 1985, Ser. No. 782,665
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 8 Claims



1. A thermal head drive circuit with an input connected to a source of printing data, and an output connected to a thermal head including individually actuable and heatable heater elements for printing successive lines on thermally sensitive paper, comprising:

means comparing the amplitude of each of said printing data with a first predetermined value to provide a first plurality of first signals corresponding to each of said printing data when said amplitude is equal to or greater than said first predetermined value;

means applying each of said first plurality of first signals to its respective heater, and providing a predetermined duration of electrical energy to each of said heating elements;

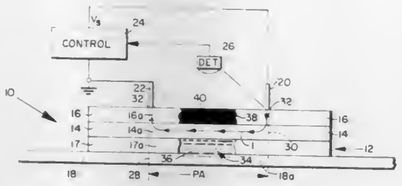
means changing said first predetermined value to a second predetermined value of lesser amplitude than said first predetermined value, said comparing means providing a second plurality of first signals from said comparing means, and said applying means providing said second plurality of first signals to said heating elements;

said changing means providing successively smaller predetermined values to said comparing means to provide a succession of pluralities of first signals from said comparing means, said applying means successively applying said pluralities of first signals to said heating element.

4,630,069
COLOR THERMAL TRANSFER RECORDING SYSTEM AND RIBBON

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 24, 1985, Ser. No. 737,507
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 23 Claims

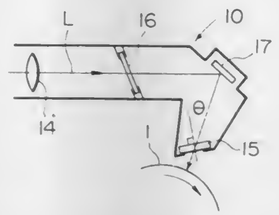


16. A color thermal transfer ribbon comprising:
a multi-stripe thermally transferable ink layer including a plurality of different color parallel ink stripes;
a thermally sensitive indicator layer; and
a resistive layer for generating heat in response to electrical current flow therein, said resistive layer being located between and in thermally conductive relation to both said ink and indicator layers so that heat selectively generated in a section of said resistive layer aligned with a selected one of said ink stripes flows to both said selected stripe and a corresponding section of said indicator layer also aligned with said selected ink stripe for activating ink in said selected stripe to effect ink transfer and for activating said corresponding section of said indicator layer to form therein an optically detectable indicator mark that is proportional to ink transfer from said selected strip, said ribbon being configured such that electrical signals applied to a selected stripe portion of said indicator layer between a pair of spaced apart electrodes in contact therewith causes generation of heat in said selected stripe portion of said ribbon between said pair of electrodes and said selected stripe portion of said indicator layer functions to indicate while said pair of electrodes are in contact therewith.

4,630,070
LASER BEAM RECORDING APPARATUS

Yasushi Sato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 598,913, Apr. 10, 1984, abandoned.
This application Apr. 7, 1986, Ser. No. 848,859
Claims priority, application Japan, Apr. 18, 1983, 58-68033
Int. Cl.[4] G01D *9/42*; G03B *4/00*
U.S. Cl. 346—108 12 Claims



1. A laser beam recording apparatus, comprising:
a photosensitive member movable in a first direction along an endless path;
means for producing a laser beam modulated in accordance with image information to be recorded;
means for moving the laser beam in a second direction to scan said photosensitive member across a predetermined width and expose said photosensitive member to a laser beam wherein said moving laser beam traces an optical path; and
a member transparent to the laser beam disposed in a portion of the optical path extending between said photosensitive member and said moving means so that no member transparent to the laser beam disposed in that portion of the optical path comes between said transparent member and said photosensitive member, said transparent member being inclined to avoid a zero angle of incidence with the laser beam over the entire scan width that the laser beam is incident on said transparent member.

4,630,071
XY RECORDER

Yoshio Nakazawa, Fujisawa, Japan, assignor to Graphtec Kabushiki Kaisha, Fujisawa, Japan

Filed Nov. 5, 1985, Ser. No. 795,470
Claims priority, application Japan, Jan. 30, 1985, 60-15697
Int. Cl.[4] G01D *15/28*
U.S. Cl. 346—136 4 Claims

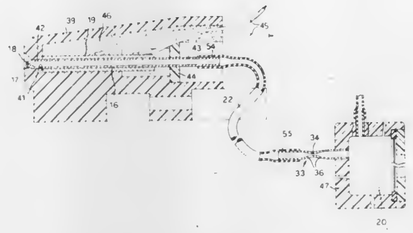


1. An XY recorder comprising a paper-feed roll, means for moving a recording paper drawn out from said paper-feed roll in an X direction perpendicular to the axis of said paper-feed roll, pinching the, paper on a platen between drive rollers and pinch rollers, means for moving a recording stylus in Y direction which is orthogonal to the X direction, and control means for controlling said means for moving a recording paper and said means for moving a recording stylus, characterized in that;
said control means controls the paper movement in several different modes, including at least a paper draw out mode, a paper alignment mode, and a recording mode,
in said paper draw out mode, a length of the recording paper including a predetermined number of recording sections, is drawn out from said paper-feed roll,
in said paper alignment mode, the paper is allowed to slip on said platen by a tension from said paper-feed roll when said pinch rollers are intermittently disengaged from said drive rollers, and
in said recording mode, the paper movement in a recording section of the paper is controlled in accordance with one function, and the stylus movement is controlled with another function.

4,630,072
JET PRINTING APPARATUS

Alessandro Scardovi, Ivrea; Adriano Fetta, Castellamonte, and Aldo Chiaro, Caluso, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 22, 1985, Ser. No. 693,161
Claims priority, application Italy, Jan. 20, 1984, 67055 A/84
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 14 Claims

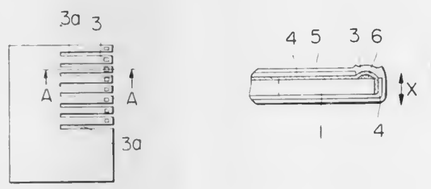


1. A selective ink jet printing apparatus comprising an ink reservoir, a duct terminated at one end by a nozzle, and a piezoelectric transducer selectively operable to generate a pressure pulse causing a droplet of ink to be expelled through said nozzle, said duct comprising a first tube of substantially rigid material carrying said nozzle at one end thereof, said transducer being coupled to said first tube, said pressure pulse generating a pressure wave which propagates toward the other end of said first tube, said duct also comprising a second tube of viscostatic material having a first end section connected to said other end of the first tube and having a diameter so dimensioned as to prevent reflections of the pressure wave coming from the first tube in said first end section, wherein the improvement comprises a third tube of substantially rigid material connected between said ink reservoir and the other end section of said second tube, the connecting section of said third tube having a diameter so dimensioned as to prevent reflections of the pressure wave coming from said second tube, said third tube including an hour-glass shaped passage to form a hydraulic resistance for damping the resonance of said duct at frequencies lower than a cut-off frequency of said resistance defined as the highest frequency to which said third tube operates as a hydraulic resistance and does not manifest an inertance, said second tube having a length so dimensioned as to damp the resonance of the duct for frequencies higher than said cut-off frequency.

4,630,073
THERMAL HEAD

Kenichiro Hashimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,275
Claims priority, application Japan, Jul. 14, 1983, 58-126901
Int. Cl.[4] G01D *10/15*
U.S. Cl. 346—76 PH 6 Claims

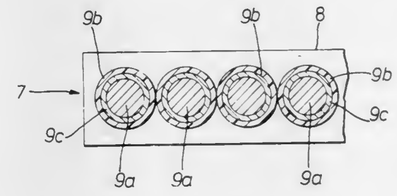


1. A thermal head comprising:
a resilient substrate having two major surfaces separated by the thickness of said substrate;
a plurality of elongated slits extending through said substrate from one major surface to the other; and
heat generating resistive means on one of said major surfaces between said elongated slits for recording on a recording medium facing such major surface,
whereby the material composition of said resilient substrate and the length of said elongated slits are such that the heat generating resistive means are supported by said resilient substrate for independent movement relative to each other.

4,630,074
MULTIPLE-STYLUS ELECTRODE FOR DISCHARGE PRINTING

Tamotsu Horinouchi; Takayoshi Ishikawa; Tsugutoshi Tanaka, and Masahiro Ono, all of Kanagawa, Japan, assignors to Nippon Aleph Co. Ltd., Yokohama, Japan and Gestetner International Limited, England

Filed Mar. 13, 1985, Ser. No. 711,165
Claims priority, application Japan, Mar. 14, 1984, 59-48548
Int. Cl.[4] G01D *15/16, 15/06;* H05B *1/00*
U.S. Cl. 346—139 C 4 Claims

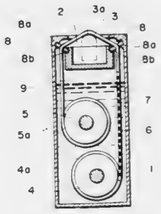


1. An electrode for discharge printing in accordance with an applied electrical signal comprising
(a) a multiple-stylus electrode body formed of an insulating material consisting mainly of a resin having a thermal deforming temperature at least 200° C.; and
(b) several electrode elements each composed of an elongate core of a high melting point material coated with a borosiloxane resin, wherein the electrode elements are arranged in a parallel array and each has a first end moulded within said electrode body, and a second end projecting from said electrode body and laterally spaced from the second ends of the other electrode elements.

4,630,075
CASSETTE-TYPE PRINTING HEAD

Keiichi Hori, Tokyo, Japan, assignor to Elm Co. Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 732,172
Claims priority, application Japan, May 29, 1984, 59-107544
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 13 Claims

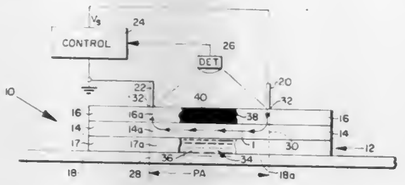


1. A cassette-type printing head comprising in combination:

4,630,069
COLOR THERMAL TRANSFER RECORDING SYSTEM AND RIBBON

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 24, 1985, Ser. No. 737,507
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 23 Claims

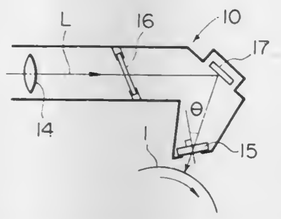


16. A color thermal transfer ribbon comprising:
a multi-stripe thermally transferable ink layer including a plurality of different color parallel ink stripes;
a thermally sensitive indicator layer; and
a resistive layer for generating heat in response to electrical current flow therein, said resistive layer being located between and in thermally conductive relation to both said ink and indicator layers so that heat selectively generated in a section of said resistive layer aligned with a selected one of said ink stripes flows to both said selected stripe and a corresponding section of said indicator layer also aligned with said selected ink stripe for activating ink in said selected stripe to effect ink transfer and for activating said corresponding section of said indicator layer to form therein an optically detectable indicator mark that is proportional to ink transfer from said selected strip, said ribbon being configured such that electrical signals applied to a selected stripe portion of said indicator layer between a pair of spaced apart electrodes in contact therewith causes generation of heat in said selected stripe portion of said ribbon between said pair of electrodes and said selected stripe portion of said indicator layer functions to indicate while said pair of electrodes are in contact therewith.

4,630,070
LASER BEAM RECORDING APPARATUS

Yasushi Sato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 598,913, Apr. 10, 1984, abandoned.
This application Apr. 7, 1986, Ser. No. 848,859
Claims priority, application Japan, Apr. 18, 1983, 58-68033
Int. Cl.[4] G01D *9/42;* G03B *4/00*
U.S. Cl. 346—108 12 Claims

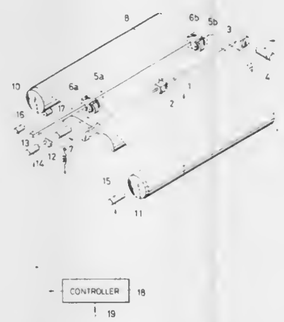


1. A laser beam recording apparatus, comprising:
a photosensitive member movable in a first direction along an endless path;
means for producing a laser beam modulated in accordance with image information to be recorded;
means for moving the laser beam in a second direction to scan said photosensitive member across a predetermined width and expose said photosensitive member to a laser beam wherein said moving laser beam traces an optical path; and
a member transparent to the laser beam disposed in a portion of the optical path extending between said photosensitive member and said moving means so that no member transparent to the laser beam disposed in that portion of the optical path comes between said transparent member and said photosensitive member, said transparent member being inclined to avoid a zero angle of incidence with the laser beam over the entire scan width that the laser beam is incident on said transparent member.

4,630,071
XY RECORDER

Yoshio Nakazawa, Fujisawa, Japan, assignor to Graphtec Kabushiki Kaisha, Fujisawa, Japan

Filed Nov. 5, 1985, Ser. No. 795,470
Claims priority, application Japan, Jan. 30, 1985, 60-15697
Int. Cl.[4] G01D *15/28*
U.S. Cl. 346—136 4 Claims

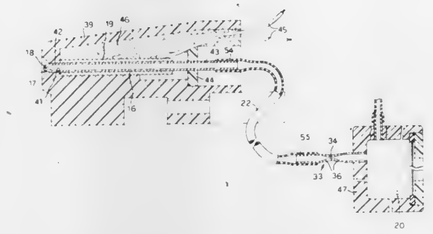


1. An XY recorder comprising a paper-feed roll, means for moving a recording paper drawn out from said paper-feed roll in an X direction perpendicular to the axis of said paper-feed roll, pinching the, paper on a platen between drive rollers and pinch rollers, means for moving a recording stylus in Y direction which is orthogonal to the X direction, and control means for controlling said means for moving a recording paper and said means for moving a recording stylus, characterized in that;
said control means controls the paper movement in several different modes, including at least a paper draw out mode, a paper alignment mode, and a recording mode,
in said paper draw out mode, a length of the recording paper including a predetermined number of recording sections, is drawn out from said paper-feed roll,
in said paper alignment mode, the paper is allowed to slip on said platen by a tension from said paper-feed roll when said pinch rollers are intermittently disengaged from said drive rollers, and
in said recording mode, the paper movement in a recording section of the paper is controlled in accordance with one function, and the stylus movement is controlled with another function.

4,630,072
JET PRINTING APPARATUS

Alessandro Scardovi, Ivrea; Adriano Fetta, Castellamonte, and Aldo Chiaro, Caluso, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 22, 1985, Ser. No. 693,161
Claims priority, application Italy, Jan. 20, 1984, 67055 A/84
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 14 Claims

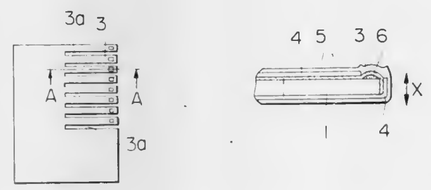


1. A selective ink jet printing apparatus comprising an ink reservoir, a duct terminated at one end by a nozzle, and a piezoelectric transducer selectively operable to generate a pressure pulse causing a droplet of ink to be expelled through said nozzle, said duct comprising a first tube of substantially rigid material carrying said nozzle at one end thereof, said transducer being coupled to said first tube, said pressure pulse generating a pressure wave which propagates toward the other end of said first tube, said duct also comprising a second tube of viscostatic material having a first end section connected to said other end of the first tube and having a diameter so dimensioned as to prevent reflections of the pressure wave coming from the first tube in said first end section, wherein the improvement comprises a third tube of substantially rigid material connected between said ink reservoir and the other end section of said second tube, the connecting section of said third tube having a diameter so dimensioned as to prevent reflections of the pressure wave coming from said second tube, said third tube including an hour-glass shaped passage to form a hydraulic resistance for damping the resonance of said duct at frequencies lower than a cut-off frequency of said resistance defined as the highest frequency to which said third tube operates as a hydraulic resistance and does not manifest an inertance, said second tube having a length so dimensioned as to damp the resonance of the duct for frequencies higher than said cut-off frequency.

4,630,073
THERMAL HEAD

Kenichiro Hashimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,275
Claims priority, application Japan, Jul. 14, 1983, 58-126901
Int. Cl.[4] G01D *10/15*
U.S. Cl. 346—76 PH 6 Claims

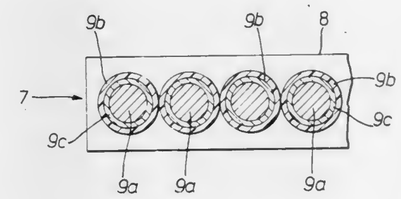


1. A thermal head comprising:
a resilient substrate having two major surfaces separated by the thickness of said substrate;
a plurality of elongated slits extending through said substrate from one major surface to the other; and
heat generating resistive means on one of said major surfaces between said elongated slits for recording on a recording medium facing such major surface,
whereby the material composition of said resilient substrate and the length of said elongated slits are such that the heat generating resistive means are supported by said resilient substrate for independent movement relative to each other.

4,630,074
MULTIPLE-STYLUS ELECTRODE FOR DISCHARGE PRINTING

Tamotsu Horinouchi; Takayoshi Ishikawa; Tsugutoshi Tanaka, and Masahiro Ono, all of Kanagawa, Japan, assignors to Nippon Aleph Co. Ltd., Yokohama, Japan and Gestetner International Limited, England

Filed Mar. 13, 1985, Ser. No. 711,165
Claims priority, application Japan, Mar. 14, 1984, 59-48548
Int. Cl.[4] G01D *15/16, 15/06;* H05B *1/00*
U.S. Cl. 346—139 C 4 Claims

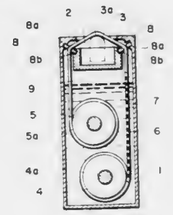


1. An electrode for discharge printing in accordance with an applied electrical signal comprising
(a) a multiple-stylus electrode body formed of an insulating material consisting mainly of a resin having a thermal deforming temperature at least 200° C.; and
(b) several electrode elements each composed of an elongate core of a high melting point material coated with a borosiloxane resin, wherein the electrode elements are arranged in a parallel array and each has a first end moulded within said electrode body, and a second end projecting from said electrode body and laterally spaced from the second ends of the other electrode elements.

4,630,075
CASSETTE-TYPE PRINTING HEAD

Keiichi Hori, Tokyo, Japan, assignor to Elm Co. Ltd., Tokyo, Japan

Filed May 7, 1985, Ser. No. 732,172
Claims priority, application Japan, May 29, 1984, 59-107544
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 13 Claims



1. A cassette-type printing head comprising in combination:

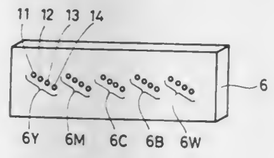
a casing member; at least one pulley member which is rotatably positioned in said casing member; a film member which is movably contacted with a heating surface of a thermal head and which is movably guided by said pulley in said casing member, with portions of said film member being provided with a plurality of small holes; a recording ink which is stored in said casing member, with said pulley and film member immersed in said recording ink, said small holes of said film member adapted to accept ink therein; said pulley adaped to move said film member with its ink-filled holes across said heating surface of said thermal head; said heating surface of said thermal head adapted to jet bubbles of said ink in said holes of said film member onto a recording medium.

4,630,076

INK-ON-DEMAND COLOR INK JET SYSTEM PRINTER

Hisashi Yoshimura, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1983, Ser. No. 561,793
Claims priority, application Japan, Dec. 23, 1982, 57-232219
Int. Cl.[4] G01D *15/18;* **H04N** *1/46*
U.S. Cl. 346—140 R **4 Claims**



1. A color ink jet system printer comprising:
a carriage;
a record receiving member; and
shift means for shifting at least one of said carriage and record receiving member in the lateral direction while the actual printing operation is conducted, said carriage comprising:
a printer head including at least four orifices for emitting ink droplets of three primary colors and white ink droplets, said at least four orifices being aligned in said lateral direction with a predetermined distance therebetween;
ink liquid supply means for supplying ink liquid of said three primary colors and white ink liquid to said at least four orifices, respectively;
said four orifices are aligned in an order so that said white ink droplets are deposited on printed dots on said record receiving member printed by at least one of said ink droplets of three primary colors; and
said at least four orifices providing means for depositing the ink droplets in a manner so that the printed dots are enlarged in size by bleeding and thereby produce a light color image.

4,630,077

SERIAL PRINTHEAD INK SUPPLY

Pierangelo Berruti, Chivasso; Roberto Guelfo, Montanaro; Alessandro Crotti, Strambino: Ennio A. Pozzo, Borgofranco, and Roberto Realis Luc, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Dec. 26, 1984, Ser. No. 686,484
Claims priority, application Italy, Dec. 27, 1983, 68355 A/83
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **8 Claims**

1. An ink jet printing head comprising a container formed of electrically insulating material for an electrically conductive ink, an electrode in contact with said ink, a capilary nozzle provided on said container for the selective emission of ink droplets, and a counterelectrode provided on a portion of the outer surface of said container adjacent said nozzle, the emission of droplets of ink being caused by an electrical voltage pulse between said electrode and said counterelectrode so as to cause vaporization of a portion of ink in a section of the nozzle, wherein said container includes:
a rigid shell carrying said nozzle,
a flexible diaphragm tightly connected to said shell to provide a closed chamber for said ink, a rigid cover tightly conencted to said shell and said diaphragm so as to form with said shell a rigid external casing and to form with said diaphragm a space separate from said chamber and free of ink, and



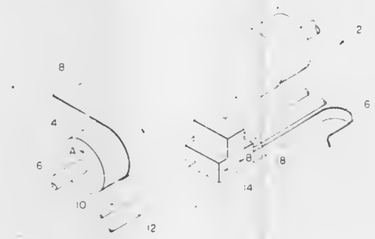
an opening on said cover to permit said diaphragm to maintain said chamber during the printing process constantly under atmospheric pressure,
the edge of the diaphragm being of increased thickness and being provided with a plurality of openings capable of engaging a corresponding plurality of projections on the edge of the shell of the container, said projections being welded to the edge of the cover by pressure and ultrasonic welding.

4,630,078

LIQUID RECORDING HEAD

Kenjiro Watanabe, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,661
Claims priority, application Japan, Mar. 30, 1984, 59-60578; Mar. 30, 1984, 59-60579
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **8 Claims**



1. A liquid ejection recording head adapted to be mounted to a liquid ejection recording apparatus, said head comprising:
orifices for discharging liquid as flying droplets;
an energy generating member for generating energy utilized to form said droplets;
electrical contacts, disposed on the same side of said head as said orifices, for inputting an electrical signal to said energy generating member; and
mounting means for mounting said head to said liquid ejection recording apparatus, said mounting means being arranged such that all of said electrical contacts are disposed above said orifices when said head is mounted on said liquid ejection recording apparatus.

4,630,079

PRESSURE SENSITIVE COPYING PAPER

Takao Kosaka, Himeji; Mamoru Ishiguro, and Hideaki Senoh, both of Takasago, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

PCT No. PCT/JP85/00211, § 371 Date Dec. 20, 1985, § 102(e) Date Dec. 20, 1985, PCT Pub. No. WO85/04841, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 17, 1985, Ser. No. 823,508
Claims priority, application Japan, Apr. 21, 1984, 59-80842; Dec. 21, 1984, 59-271500
Int. Cl.[4] B41M *5/22*
U.S. Cl. 346—207 **2 Claims**

1. A pressure sensitive copying paper comprising a sheet having on a support a coating layer containing finely divided cellulose powder (a) and microcapsules of mononucleus (b) containing an oily solution of an electron donative colorless or light-colored dye, using an amino resin as film material and having a volume-average particle diameter of 5–10 microns (μm) and a film thickness of 0.08–0.30 microns (μm) as calculated from the formula (1):

$$\text{Film thickness } (\mu m) = \frac{DM}{6R}\left\{1 + \frac{(2m_2 - m_3)n}{2m_1}\right\} \quad (1)$$

(wherein D is average particle size (diameter, μm) of microcapsules, R is the amount (weight parts) of core material used, M is the amount (weight parts) of amino compound used as wall film material, n is the molar ratio of formaldehyde used (molecular weight m_2) to amino compound (molecular weight m_1), and m_3 is molecular weight of water); and a sheet having on a support a coating layer containing an electron acceptant solid-state acid material which is reacted on contact with said dye to form a color.

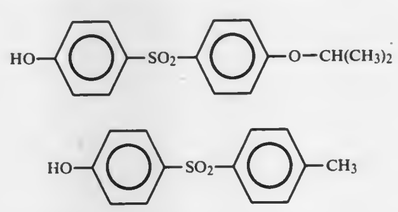
4,630,080

HEAT-SENSITIVE RECORDING SHEET

Toshimi Satake; Yoshihide Kimura; Toshiaki Minami, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,991
Claims priority, application Japan, Nov. 16, 1984, 59-242142; Dec. 20, 1984, 59-269542
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—209 **7 Claims**

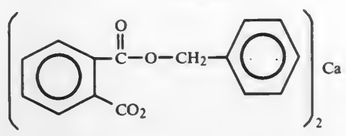
1. A heat-sensitive recording sheet which comprises a support and a heat sensitive color-developing layer on at least one surface of said support, said heat-sensitive color layer containing a basic color-less dye and an organic developer as main components, characterized by comprising both calcium monobenzyl phthalate of the following general formula (III) as stabilizer and at least a compound selected from the group consisting of 4-isopropoxy-4′-hydroxy diphenylsulfone of the following general formula (I) and 4-methyl-4′-hydroxy diphenylsulfone of the following general formula (II) as said organic developer in said heat-sensitive coloring layer:



(I)

(II)

-continued



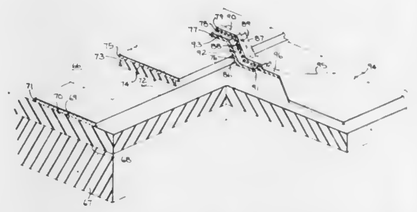
(III)

4,630,081

MOMOM TUNNEL EMISSION TRANSISTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1984, Ser. No. 683,705
Int. Cl.[4] H01L *49/02*
U.S. Cl. 357—6 **15 Claims**



1. An MOMOM tunnel emission transistor of the type having an emitter, a base and a collector, comprising:
a first generally horizontal insulator layer;
a first generally horizontal metal layer on said first insulator layer;
a second generally horizontal insulator layer on said first metal layer;
a second generally horizontal metal layer on said second insulator layer;
said first and second metal layers being stacked as a mesa structure having a generally vertical side exposing the edges of said first and second metal layers;
a first generally vertical oxide layer on said exposed edge of one of said first and second metal layers;
a third metal layer having a generally vertical portion extending along said side of said mesa over said first oxide layer;
a second generally vertical oxide layer on said portion of said third metal layer; and
a fourth metal layer having a generally vertical portion on said second oxide layer.

4,630,082

SEMICONDUCTOR DEVICE WITH MULTI-ELECTRODE CONSTRUCTION EQUIVALENT TO VARIABLE CAPACITANCE DIODE

Takamasa Sakai, Koriyama, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 377,835, May 13, 1982, abandoned, which is a continuation of Ser. No. 129,750, Mar. 12, 1980, abandoned. This application Jan. 22, 1986, Ser. No. 820,837
Claims priority, application Japan, Mar. 12, 1979, 54-28539
Int. Cl.[4] H01L *29/92*
U.S. Cl. 357—14 **1 Claim**

1. A semiconductor device with a multielectrode construction and having a variable capacitance, said device comprising:
a semiconductor single crystal bulk having a first conductivity;
a first group of depletion control regions aligned along and formed in one surface of said bulk, each of said first group of control regions having a second conductivity opposite

to said first conductivity, and respectively forming a first group of p-n junction regions in said bulk;

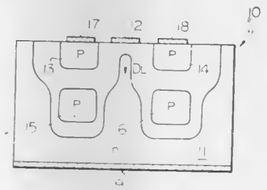
an ohmic electrode formed on another surface of said bulk, opposite to said one surface of said bulk;

a depletion layer within said bulk;

a second group of depletion control regions aligned in the thickness direction of the bulk from said one surface, each of said second group of depletion control regions having said second conductivity and respectively forming a second group of small p-n junction regions in said bulk;

a plurality of control electrodes formed on said one surface of said bulk, each of said control electrodes being operatively coupled to said first and second groups of the depletion control regions which are aligned in the thickness direction of said bulk wherein each of said electrodes receive a voltage signal from external bias means;

a capacitance read-out electrode formed on said one surface



of the bulk and positioned at a substantially intermediate point among said plurality of control electrodes;

a capacitance read-out region formed in a portion of said bulk immediately beneath said capacitance read-out electrodes; and

a plurality of depletion layers each of said depletion layers spreading from the environs of each of said first and second groups of depletion control regions wherein said depletion layers spread throughout said bulk when said voltage signal from said external bias means is applied between said control electrodes and said ohmic electrodes so that said depletion control regions are each reversed-bias whereby said depletion layers overlap and whereby a wide change of said depletion layers in the thickness direction of said bulk, which is caused by said overlapped depletion layers, is detected in said capacitance read-out region and is read-out through said capacitance read-out electrode as a change in capacitance of said device.

4,630,083

LIGHT-EMITTING SEMICONDUCTOR DEVICE

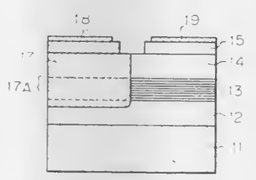
Shigenobu Yamakoshi, Ebina, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 12, 1983, Ser. No. 522,569

Claims priority, application Japan, Aug. 12, 1982, 57-140301

Int. Cl.⁴ H01L *33/00;* **H01S** *3/19*

U.S. Cl. 357—17 **9 Claims**



1. A light emitting semiconductor device having a semi-insulating semiconductor substrate, comprising:

a first clad layer of N-type AlGaAs formed on the semiconductor substrate;

an N-type laminated active layer formed on said first clad layer comprising GaAs ultrathin layers and AlGaAs ultrathin layers alternately formed on top of each other, said AlGaAs ultrathin layers having a larger band gap than said GaAs ultrathin layers, each of said ultrathin layers having a thickness which is less than the de Broglie wavelength of an electron wave;

a second clad layer of N-type AlGaAs formed on said active layer;

a P-type region formed by introducing zinc from the top of said second clad layer into a portion of said first clad layer so that a mixture region of said GaAs and said AlGaAs ultrathin layers, is formed, said mixture region including AlGaAs having an amount of Al less than that of said AlGaAs ultrathin layers and forming a heterojunction with said GaAs ultrathin layers and having a larger band gap than said GaAs ultrathin layers;

a first electrode formed on said second clad layer; and

a second electrode formed on said P-type region.

4,630,084

VERTICAL MIS-FIELD EFFECT TRANSISTOR WITH LOW FORWARD RESISTANCE

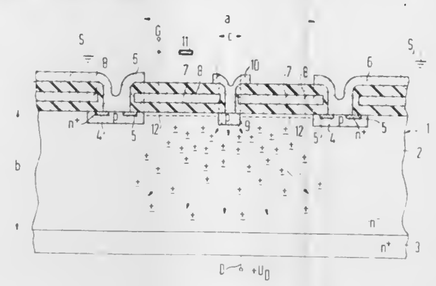
Jenö Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 340,749, Jan. 19, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,792

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1981, 3103444

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **6 Claims**



1. MIS-FET, comprising a semiconductor substrate of a given first conductivity type having first and second surfaces, at least one channel zone of a second conductivity type opposite said first conductivity type embedded in said first surface of said substrate, a source zone of said first conductivity type embedded in said channel zone a source contact connected to the source zone, a drain zone having a surface and adjoining said first surface of said substrate, a drain electrode connected to said second surface of said substrate, an insulating layer disposed on said first surface of said substrate, at least one gate electrode disposed on part of said insulating layer, at least one further zone of said second conductivity type embedded in the surface of said drain zone and a further zone contact being connected to said at least one further zone, and said gate electrode covering part of said further zone and said part of said drain zone emerging to said first surface of said substrate, means for applying a first voltage of opposite polarity of the majority carriers of the drain zone to the drain electrode, a reference voltage of opposite polarity of said first voltage to the source contact and a gate voltage of the same polarity as the first voltage to the gate electrode, and wherein said further zone contact is electrically connected to said at least one gate electrode for injecting charge carriers of the same polarity as the first voltage into said drain zone.

4,630,085

ERASABLE, PROGRAMMABLE READ-ONLY MEMORY DEVICE

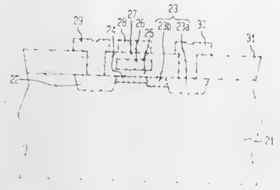
Shoji Koyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,332

Claims priority, application Japan, Feb. 28, 1984, 59-36504

Int. Cl.⁴ H01L *29/78;* **G11C** *11/40*

U.S. Cl. 357—23.5 **3 Claims**



1. An erasable, programmable read-only memory device comprising a plurality of erasable, programmable read-only memory cells of channel injection type formed in a semiconductor substrate of one conductivity type in a matrix shape, a plurality of bit lines extending on one major surface of said substrate, and a plurality of address lines extending on said one major surface of said substrate, each of said cells including a first impurity region of the opposite conductivity type formed in said substrate, a second impurity region of the opposite conductivity type formed in said substrate and electrically connected to the corresponding bit line, a channel region positioned between said first and second impurity regions, a floating gate electrode formed on said channel region via a first gate insulating film, and a control gate electrode formed on the floating gate electrode via a second gate insulating film and electrically connected to the corresponding address line, said second impurity region being so constituted that the intensity of electric field near said channel region in a depletion layer formed between said second impurity region and said substrate is weaker than that in a depletion layer formed between said first impurity region and said substrate when an inversed voltage of a predetermined level against said substrate is applied to said first and second impurity region, respectively, said device further comprising a first means for applying voltages to said first and second impurity regions and said control gate electrode of a selected cell such that electric channel current flows in one direction between said first and second regions of said selected cell in writing operation, and a second means for applying voltage to said first and second impurity regions and said control gate electrode of a selected cell such that electric channel current may flow in the opposite direction between said first and second impurity regions in reading operation.

4,630,086

NONVOLATILE MNOS MEMORY

Nobuyuki Sato, Tokorozawa; Kyotake Uchiumi; Shinji Nabetani, both of Tokyo, and Ken Uchida, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., Japan

Filed Sep. 23, 1983, Ser. No. 535,233

Claims priority, application Japan, Sep. 24, 1982, 57-164910

Int. Cl.⁴ H01L *29/78, 27/02, 29/34*

U.S. Cl. 357—23.5 **14 Claims**

1. A nonvolatile memory having a field effect transistor for use as a memory element, said field effect transistor comprising:

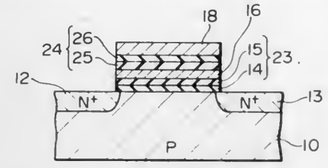
(a) a semiconductor body which includes at least one first semiconductor region of a first conductivity type;

(b) an insulator film which is formed on an area of said first semiconductor region, and which is comprised of a first insulator film and a second insulator film formed thereon, wherein said first insulator film is silicon dioxide film and said second insulator film is silicon nitride film;

(c) a first gate electrode which is formed on said insulator film;

(d) a second gate electrode which is formed over said first gate electrode;

(e) an inter-layer insulator film which is disposed between said first and second gate electrodes, wherein said inter-layer insulator film is comprised of a silicon nitride film of a first inter-layer insulator film and a silicon dioxide film of a second inter-layer insulator film formed thereon; and



(f) semiconductor regions of a second conductivity type which are formed within the first semiconductor region, and which are disposed on opposite sides of said area of said first semiconductor region over which said first and second electrodes are formed, wherein said first inter-layer insulator film and said second insulator film have substantially equal thickness, while said second inter-layer insulator film and said first insulator film have substantially equal thickness.

4,630,087

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

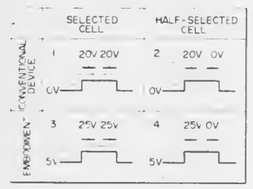
Masaki Momodomi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1984, Ser. No. 613,059

Claims priority, application Japan, Sep. 30, 1983, 58-180512

Int. Cl.⁴ H01L *29/78, 27/10*

U.S. Cl. 357—23.5 **5 Claims**



1. A nonvolatile semiconductor memory device having a plurality of memory cells of a MOSFET structure which are arranged in a matrix form, each memory cell being formed on a semiconductor substrate and having a floating gate electrically insulated from any other component, first and second control gates capacitively coupled to said floating gate, and an erase gate for exchanging carriers with said floating gate by a tunnel effect, said first and second control gates capacitively coupled to said floating gates by means of respective capacitances CCF1 and CCF2, said floating gate capacitively coupled to said substrate by means of a capacitance CS, wherein the sum of CCF1 and CCF2 is substantially greater than CFS, said first and second control gates of the respective memory cells being commonly connected as a plurality of column control lines and a plurality of row control lines extending along orthogonal directions, respectively, said erase gates of the respective memory cells being connected as a source control line common for all bits or in units of a plurality of blocks, writing being performed such that a high voltage is applied to selected row and column control lines of said row and column control lines, a first low voltage is applied to nonselected row

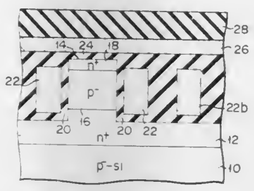
and column lines thereof, and a second low voltage is applied to said source control line, erasing being performed such that a low voltage is applied to selected row and column control lines, a first high voltage is applied to nonselected row and column control lines, and a second high voltage is applied to said source control line, wherein said nonvolatile semiconductor memory device comprises circuit means for selecting at least one of a writing mode, wherein the second low voltage applied to said source control line is higher than the first low voltage applied to said nonselected row and column control lines, and an erasing mode, wherein the first high voltage applied to said nonselected row and column control lines is higher than the second high voltage applied to said source control line.

4,630,088

MOS DYNAMIC RAM

Mitsugi Ogura, and Masaki Momodomi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 3, 1985, Ser. No. 719,450
Claims priority, application Japan, Sep. 11, 1984, 59-190002
Int. Cl.⁴ H01L *29/78, 27/02, 29/06;* **G11C** *11/24*
U.S. Cl. 357—23.6 **27 Claims**



1. A MOS dynamic RAM constructed by integrated memory cells each having a MOSFET and a MOS capacitor comprising:
a semiconductor substrate of a first conductivity type in which recesses and projections are periodically formed;
a source region of a second conductivity type formed in an upper surface of each of said projections;
a drain region of the second conductivity type formed in a bottom portion of each of said projections;
a channel region of the first conductivity type sandwiched between said source and drain regions;
a gate insulating film formed on a side wall of each of said projections between said source and drain region;
a gate electrode formed on said gate insulating film, said MOSFET being constituted by said source, drain, and channel regions, said gate insulating film and said gate electrode;
a first insulating film formed on said source region;
a first electrode of said MOS capacitor formed on said first insulating film, said MOS capacitor being constituted by said source region, said first insulating film and said first electrode, said source region serving as a second electrode of said MOS capacitor, said gate electrode serving as a word line, and said first electrode of said MOS capacitor serving as a bit line.

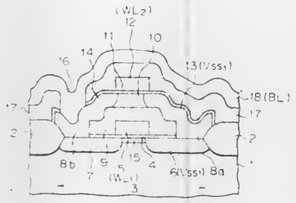
4,630,089

SEMICONDUCTOR MEMORY DEVICE

Nobuo Sasaki, Kawasaki, and Yasuo Suzuki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1984, Ser. No. 654,701
Claims priority, application Japan, Sep. 27, 1983, 58-178473
Int. Cl.⁴ H01L *29/78, 27/02, 29/04;* **G11C** *17/00*
U.S. Cl. 357—23.7 **6 Claims**

1. A semiconductor memory device comprising:
a first MIS transisor having source and drain regions formed in a substrate and a first gate electrode provided on the substrate through an insulating layer;
a semiconductor layer provided on the first MIS transistor through the insulating layer and being in contact with the source and drain regions of the first MIS transistor;
a second MIS transistor having a second gate electrode provided on the semiconductor layer and having source and drain regions formed in the semiconductor layer and being in contact with the source and drain regions of the



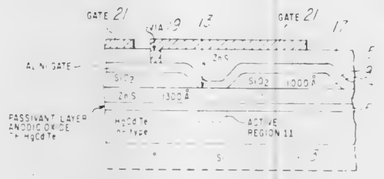
first MIS transistor and having a gate electrode provided on the semiconductor layer through an insulating layer; and
a bit line being in contact with the source or drain region of the second MIS transistor and extended on the second MIS transistor;
each gate electrode of the first and the second MIS transistors being connected with different word lines respectively.

4,630,090

MERCURY CADMIUM TELLURIDE INFRARED FOCAL PLANE DEVICES HAVING STEP INSULATOR AND PROCESS FOR MAKING SAME

Arturo Simmons, Garland, and Michael A. Kinch, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 25, 1984, Ser. No. 654,604
Int. Cl.⁴ H01L *29/78, 29/161*
U.S. Cl. 357—24 **12 Claims**



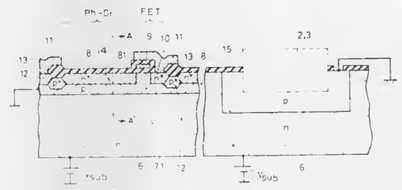
1. A charge transfer device which comprises, in combination:
(a) a semiconductor substrate of predetermined conductivity type;
(b) an oxide layer on said substrate having a predetermined amount of fixed charge opposite to said predetermined conductivity type;
(c) a first insulating layer of relatively high dielectric constant disposed over a surface of said oxide layer;
(d) a second insulating layer of relatively low dielectric constant selectively disposed over portions of said first insulating layer to expose regions of said first insulating layer therethrough; and
(e) a first electrically conductive layer disposed over said second insulating layer and following the contour onto the exposed regions of said first insulating layer.

4,630,091

SOLID STATE IMAGING APPARATUS

Takao Kuroda, Ibaraki; Shigenori Matsumoto, Takatsuki; Kenju Horii, Ohtsu, and Takahiro Yamada, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation and Matsushita Electric Industrial Co., Ltd., both of Kadoma, Japan

Filed Apr. 19, 1984, Ser. No. 601,928
Claims priority, application Japan, Apr. 22, 1983, 58-71914
Int. Cl.⁴ H01L *27/14, 31/00*
U.S. Cl. 357—30 **7 Claims**



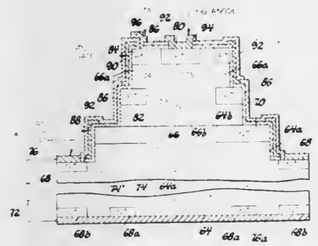
1. In a solid state imaging apparatus the improvements comprising:
a semiconductor substrate of one conductivity type,
a first region which is provided on a principal surface of said substrate, doped with an impurity to make the other conductivity type and has a set of photoelectric transducing elements therein,
characterized in that
a second region, which is provided on said principal surface of said substrate being isolated from said first region and doped with said impurity to make said other conductivity type, contains signal-charge reading-out means therein, and
depth from said principal surface to a junction defining a bottom of said second region is deeper than the depth from said principal surface of a junction defining a bottom of said first region at a part immediately under said photoelectric transducing elements.

4,630,092

INSULATED GATE-CONTROLLED THYRISTOR

Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 617,106, Jun. 4, 1984. This application Nov. 2, 1984, Ser. No. 667,845
Int. Cl.⁴ H01L *29/72, 27/06, 29/08, 29/06*
U.S. Cl. 357—38 **4 Claims**



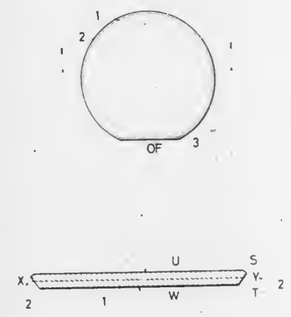
1. A gate-controlled thyristor that not only has an IGFET for turn-on but also an IGFET and a variable resistance effect for turn-off, the thyristor comprising:
a semiconductor body containing integrated bipolar PNP and NPN transistors that form a thyristor;
the PNP transistor base region having a portion overlapped, in a direction parallel to the direction of electron current flow in the PNP transistor base region, by a region of opposite conductivity type semiconductive material that is not contiguous of the PNP transistor collector or emitter regions, for producing a PN junction space charge region effect that restricts electron flow through the PNP transistor base region;
an insulated gate electrode on said body, extending from emitter to collector regions of the NPN transistor, so as to form an integral enhancement type n-channel IGFET electrically in parallel with the NPN transistor emitter and collector regions;
an electrode on the PNP transistor emitter region, for applying an electrical potential thereto;
an electrode on the NPN transistor emitter region, for applying a second electrical potential thereto that is lower than the electrical potential applied to the PNP transistor emitter region; and
means for applying a third electrical potential, that is lower than the electrical potential applied to the NPN transistor emitter region, to the opposite conductivity type region in the PNP transistor base region, effective to produce a space charge region in the overlapped portion of the PNP transistor base region that will inhibit electron current flow therethrough;
whereby, after the aforesaid electrode potentials are applied to said emitter region electrodes, an electrical potential that is higher than the NPN transistor emitter potential can be applied to the gate electrode of the IGFET to turn on the thyristor, and thereafter the third electrical potential can be applied to the opposite conductivity type region of the PNP transistor base region to turn off the thyristor.

4,630,093

WAFER OF SEMICONDUCTORS

Jun Yamaguchi, and Osamu Shikatani, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 20, 1984, Ser. No. 673,400
Claims priority, application Japan, Nov. 24, 1983, 58-181254[U]
Int. Cl.⁴ H01L *29/06*
U.S. Cl. 357—55 **4 Claims**



1. A semiconductor wafer comprising:
a group III–V compound crystal having a front and rear surface and an asymmetric peripheral edge, said edge being asymmetric with regard to a middle plane parallel to and equidistant from said front surface and said rear surface, wherein the structure of said wafer permits easy determination of said front surface.

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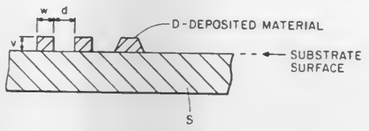
USE OF METALLIC GLASSES FOR FABRICATION OF STRUCTURES WITH SUBMICRON DIMENSIONS

John D. Wiley, and John H. Perepezko, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 181,988, Aug. 28, 1980, abandoned. This application Mar. 8, 1985, Ser. No. 709,836

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—67 **15 Claims**



1. Patterned structures in contact with semiconductor regions having physical, geometric features of submicron dimension formed of amorphous metals having submicron feature sizes characterized by etching behavior sufficient to allow delineation of sharp edges and smooth flat flanks and without grain boundaries or other microscopic inhomogeneities which could cause anisotropic or locally enhanced etching.

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PACKAGED SEMICONDUCTOR DEVICE STRUCTURE INCLUDING GETTER MATERIAL FOR DECREASING GAS FROM A PROTECTIVE ORGANIC COVERING

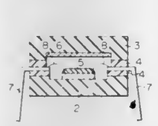
Kanji Otsuka, Higashiyamato; Kunizou Sahara, Kodaira; Masao Sekibata, Kunitachi; Kazumichi Mitsusada, Kodaira, and Katsumi Ogiue, Tokyo, all of Japan, assignors to VLSI Technology Research Association, Kanagawa, Japan

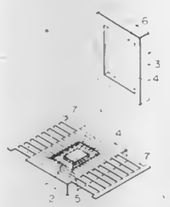
Continuation of Ser. No. 248,827, Mar. 30, 1984, abandoned. This application Jun. 29, 1984, Ser. No. 626,200

Claims priority, application Japan, Mar. 31, 1980, 55-40505

Int. Cl.[4] H01L *23/10, 23/04, 23/16, 23/30*

U.S. Cl. 357—78 **11 Claims**





1. A packaged semiconductor device structure comprising:
a ceramic base portion having lower and upper surfaces;
a semiconductor chip fixed on a first area of said upper surface of the base portion and having a memory circuit;
an organic shielding material formed on at least a part of the surface of said semiconductor chip for shielding the semiconductor chip from alpha-particles radiated from said ceramic cap portion; and
a ceramic cap portion having lower and upper surfaces and hermetically connected at an area of its lower surface to a second area of the upper surface of the base portion with a low melting point glass material, said second area surrounding said first area, said ceramic cap and base portions forming a hollow space in which said semiconductor chip is located, the hermetic connection being formed at a temperature at which the organic material can decompose and produce a gas, whereby the gas pressure in the hollow space can increase to thereby lower the mechanical strength of the connection and adversely affect metallization connections of the semiconductor chip;
wherein a getter material is disposed in said hollow space at a portion of said hollow space surrounding said semiconductor chip covered with said organic shielding material, for gettering said gas produced in said portion of the hollow space by said organic shielding material at a temperature which occurs when the cap portion is connected to the base portion with said low melting point glass material, thereby preventing increase of gas pressure in the hollow space and the resultant lowering of the mechanical strength of the connection, and thereby preventing an adverse effect on the metallization connections of the semiconductor chip due to said gas.

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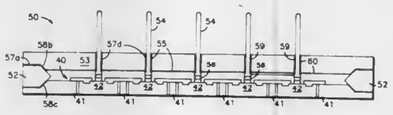
HIGH DENSITY IC MODULE ASSEMBLY

James E. Drye, Mesa, Ariz.; Jack A. Schroeder, Austin, Tex., and Vern H. Winchell, II, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1984, Ser. No. 615,499

Int. Cl.[4] H01L *23/12, 23/18, 23/40*

U.S. Cl. 357—81 **11 Claims**



1. A self-supporting monolithic electronic assembly comprising multiple integrated circuit chips, rigid plate means containing multiple through-holes for receiving and supporting said multiple chips, glassy joining means for holding said multiple chips only by their sides in said multiple through-holes to form said monolithic assembly, and monolithic interconnection means running over said glassy joining means and between said multiple integrated circuit chips for electrically interconnecting said chips.

4,630,097

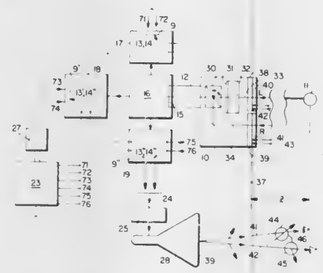
2D/3D COMPATIBLE POLARIZED COLOR TV SYSTEM

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Filed Aug. 16, 1983, Ser. No. 523,705

Int. Cl.[4] H04N *15/00, 13/00, 13/02*

U.S. Cl. 358—3 **10 Claims**



1. A 2D-3D compatible color TV transmitting and receiving system, comprising a 3 color tube video camera, a 3D optical converter having right and left lenses, said lenses receiving right and left images from horizontally spaced vantage points,

said converter placing right and left color images as adjacent image pairs on each of said color tubes, a first means for selecting right and left color pixel signals alternately from corresponding points on each of said image pairs in each of said color tubes, a receiver for displaying said signals, a transmission link, transmitting said right and left color pixel signals to the said receiver via said link, adjacent light emitting color pixels on said receiver, said alternate right and left pixel signals successively and alternately controlling the light emitted by the said adjacent color pixels, and a second means to alternately transmit and block light from the said adjacent right and left color pixels, whereby the light from the said right color pixels comprising said right image is transmitted only to the right eye of an observer, and whereby the light from the said left color pixels comprising the said left image is transmitted only to the left eye of the said observer, said right and left images being fused by the observer to appear as a spacial 3D-TV color image.

4,630,098

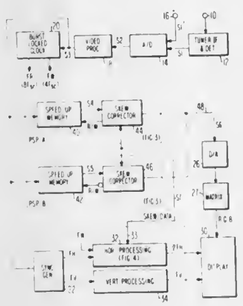
PROGRESSIVE SCAN DISPLAY SYSTEM WITH CORRECTION FOR NON-STANDARD SIGNALS

Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 761,214

Int. Cl.[4] H04N *5/95*

U.S. Cl. 358—11 **12 Claims**



1. In a progressive scan display system of the type comprising:
(a) signal source means for providing a video input signal of a given line rate, a read clock signal and a write clock signal, said clock signals tending to exhibit skew when said video input signal is of non-standard form;
(b) video speed-up memory means coupled to said signal source means for storing a horizontal line of said video input signal during a write cycle of said memory means and for recovering the stored line during each of first and second read cycles of said memory means to provide a video output signal of double said given line rate;
(c) display means coupled to said memory means and synchronized therewith for displaying said video output signal; and
(d) skew corrector means for generating read and write clock skew indicator signals and for imparting an effective delay to said video output signal as a direct function of said read clock skew indicator signal and as an inverse function of said write clock skew indicator signal during each said read cycle of said memory means for reducing visible artifacts on said display means due to skew of said clock signals;
the improvement, wherein said skew corrector means comprises:
(e) first means coupled to said signal source means for driving said read and write clock skew indicator signals from said write clock signal and said video input signal; and
(f) second means in said skew corrector means for doubling the value of the derived read clock skew indicating signal for each said read cycle of said memory means and for subtracting therefrom the value of said write clock skew indicating signal of the preceeding write cycle of said memory means to form a control signal for controlling the effective delay imparted to said video output signal.

4,630,099

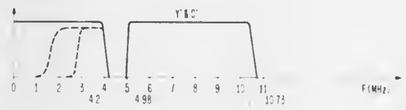
TIME MULTIPLEXING CHROMINANCE INFORMATION FOR COMPATIBLE HIGH-DEFINITION TELEVISION

Theodore S. Rzeszewski, Lombard, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 16, 1984, Ser. No. 571,183

Int. Cl.[4] H04N *11/06*

U.S. Cl. 358—12 **16 Claims**



1. A system for decoding high-definition chrominance information of a high-definition baseband video signal having a first baseband signal including low-frequency chrominance information and second baseband signal including high-frequency chrominance information compressed into the horizontal retrace interval of said second baseband signal, said system comprises
means for decoding said low-frequency chrominance information;
means for gating said compressed high-frequency chrominance information from said second baseband signal;
means for expanding the gated compressed high-frequency chrominance information; and
means for adding the decoded low-frequency chrominance information and the expanded high-frequency chrominance information to produce said high-definition chrominance information.

4,630,100

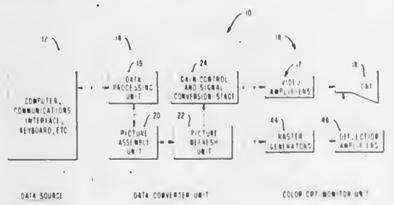
COLOR VIDEO DRIVE CIRCUIT

James R. DelSignore, II, Trumansburg; Paul Sheehan, Ithaca, both of N.Y., and Robert H. Friedman, Mount Laurel, N.J., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 2, 1984, Ser. No. 637,082

Int. Cl.[4] H04N *9/64*

U.S. Cl. 358—21 R **7 Claims**



1. In a color video CRT display system, said display system being of the type having circuitry which provides color picture information in the form of a serial digital input signal having a plurality of logic levels for one of the primary additive video colors, the improvement wherein said display system includes a gain control and signal conversion stage con-

nected for receiving said serial digital input signal and for providing a serial output signal for control of a video amplifier associated with said one of said colors, wherein said stage comprises:

(a) Output terminal means for output of the serial output signal for control of the video amplifier, said serial output signal being characterized by an "on" signal voltage level and a "black" signal voltage level;

(b) Capacitor means coupled to said output terminal means for storing a charge at a voltage level which defines said "on" signal voltage level;

(c) Voltage follower means responsive to a disproportion between a reference voltage and the capacitor voltage across said capacitor means, for charging said capacitor means when said capacitor voltage is less than a level defined by said referenced voltage; and

(d) Modulator means for switching the potential at said output terminal means between said "on" signal voltage level and said "black" signal voltage level, with said potential being switched according to the logic level of said serial digital input signal.

4,630,101

CHROMAKEY SIGNAL PRODUCING APPARATUS

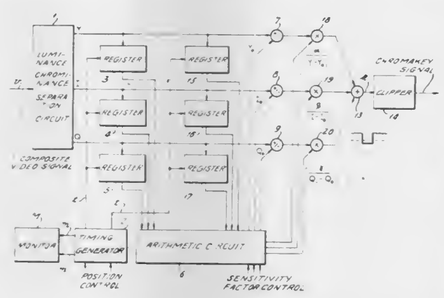
Masao Inaba, and Hiroshi Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Oct. 18, 1983, Ser. No. 543,111

Claims priority, application Japan, Oct. 18, 1982, 57-182344

Int. Cl.[4] H04N *9/74*

U.S. Cl. 358—22 **6 Claims**



1. A chromakey signal producing apparatus, comprising:

means for extracting Y, I and Q components from an input composite video signal;

means for computing a first difference signal by computing a first difference between at least one of said Y, I and Q components extracted by said extracting means and a corresponding one of Y, I and Q components of a first reference signal; and for computing a second difference between said one of Y, I and Q components of said first reference signal and a corresponding one of Y, I, and Q components of a second reference signal; and

means for producing a chromakey signal by controlling the level of said first difference signal in accordance with said second difference.

4,630,102

DIGITAL CHROMA OVERLOAD SYSTEM

Robert A. Wargo, Ringoes, and Leopold A. Harwood, Bridgewater, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 10, 1984, Ser. No. 659,452

Int. Cl.[4] H04N *9/64*

U.S. Cl. 358—27 **14 Claims**

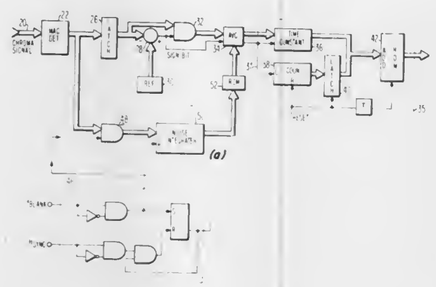
1. In apparatus for processing a video signal including a chrominance signal component, chrominance signal overload detection apparatus comprising:

a source of chrominance signal;

means coupled to said source for detecting the magnitude of the chrominance signal;

means for comparing the magnitudes of the chrominance signal against a predetermined magnitude value for generating a control signal for said chrominance magnitude exceeding said predetermined magnitude;

means responsive to said control signal for coupling chrominance signal magnitudes exceeding said predetermined



magnitude from said means for detecting the magnitude of the chrominance signal to a first output port;

means coupled to said source, for detecting noise magnitudes and generating a further control signal, the value of which corresponds to the relative value of said noise; and

means responsive to said further control signal and coupled to said first output port for averaging chrominance magnitudes occurring thereat over a period determined by said further control signal.

4,630,103

BLANKING SIGNAL MIXING CIRCUIT

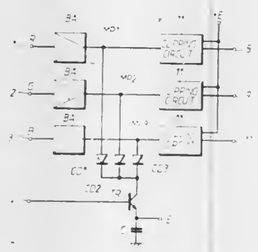
Junichi Yamanaka, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,571

Claims priority, application Japan, Oct. 17, 1983, 58-159322[U]

Int. Cl.[4] H04N *9/67*

U.S. Cl. 358—33 **6 Claims**



1. A mixing circuit for mixing a blanking signal with each of a plurality of picture signals applied in parallel to the mixing circuit comprising:

a plurality of input means for receiving said picture signals in parallel;

switching means connected to a common connection between a power source and each of said input means which is rendered conductive by the blanking signal coordinated with said picture signals; and

means for preventing leakage of any of said picture signals into other picture signals through said common connection.

4,630,104

CIRCUIT ARRANGEMENT FOR REMOVING NOISE OF A COLOR VIDEO SIGNAL

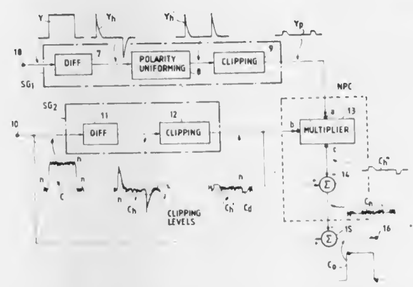
Shintaro Nakagaki, Fujisawa, and Takashi Kuriyama, Tokyo, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Continuation-in-part of Ser. No. 596,552, Apr. 4, 1984. This application Jun. 22, 1984, Ser. No. 623,348

Claims priority, application Japan, Jun. 24, 1983, 58-113859

Int. Cl.[4] H04N *9/64*

U.S. Cl. 358—36 **11 Claims**



1. A circuit arrangement for removing noise included in a color video signal including a luminance signal and a chroma signal, comprising:

(a) first means responsive to said luminance signal of said video signal for generating a first signal indicative of the contour lines of images of a picture which is represented by said video signal;

(b) second means responsive to said chroma signal of said video signal for generating a second signal including noise of said chroma signal, and a signal component having an amplitude substantially equal to the peak to peak value of said noise of said chroma signal;

(c) a switching circuit responsive to said first and second signals and having a d.c. voltage source so that switching between said second signal and a d.c. voltage from said d.c. voltage source is effected in response to said first signal for producing a third signal including only said noise of said second signal; and

(d) a subtractor responsive to said chroma signal and said third signal for producing an output color video signal indicative of the difference between said chroma signal and said noise of said third signal.

4,630,105

SYMMETRIC COLOR ENCODING SHIFT PATTERN FOR A SOLID-STATE IMAGER CAMERA AND DECODING SCHEME THEREFOR

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1984, Ser. No. 636,378

Int. Cl.[4] H04N *9/077, 9/07*

U.S. Cl. 358—44 **18 Claims**

1. A color-encoding filter for a color camera, comprising:

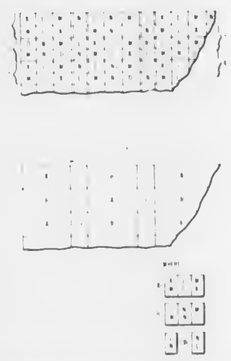
a plurality of rows of color filter elements, each row having a sequence of color filter elements which repeats after a predetermined number P of elements, wherein P is greater than or equal to eight (8), each of said rows of the color filter elements being shifted in the row direction by at least two elements from the preceding row such that combination of vertically aligned filter elements from adjacent rows provides a sequence of at least two independent color combinations, said color combination sequence being repeated after a number of combinations equal to said predetermined number P and having like color combinations symmetrically disposed about one color combination of said color combination sequence.

12. A camera including an imager having discrete collection sites arranged in television lines for collecting charges generated in response to energy received from a scene, means for developing an image-representative signal in response to a readout of television lines of said charges generated by said imager, a decoder for decoding said image-representative signal, and a color-encoding filter including a plurality of rows of color filter elements interposed between said scene and said imager collection sites, through which said energy received from said scene must pass respective pairs of adjacent rows of said color-encoding filter being optically aligned with corresponding ones of said television lines of collection sites of said imager such that blocks of filter elements having the same colorimetric content as each other appear spaced apart from each other in each of said television lines but appear adjacent one another in pairs of adjacent television lines; said decoder comprising:

delay means having an input coupled to receive said image-representative signal and an output for providing a delayed image-representative signal;

first switch means having an input coupled to the input of said delay means to receive an undelayed image-representative signal, and having an output;

second switch means having an input coupled to the output of said delay means to receive said delayed information-representative signal delayed from said undelayed information-representative signal by a predetermined amount, and having an output;



signal combining means having first and second inputs coupled to outputs of said first and second switch means, respectively, and a common output for combining signals provided at its inputs;

switch signal generating means for generating a first switch signal for controlling the conduction of said first switch means and a second switch signal for controlling the conduction of said second switch means, said first and second switch means being rendered conductive by said first and second switch signals, respectively, for selectively and repeatedly passing those portions of said undelayed and delayed signals, respectively, to said combining means which are representative of energy received from said scene which passed through said blocks of said color-encoding filter which have the same colorimetric content as each other;

frequency selective filter means coupled to the common output of said combining means and having a first frequency selective path for providing a first continuous chroma signal and a second frequency selective path for providing a second continuous chroma signal; and

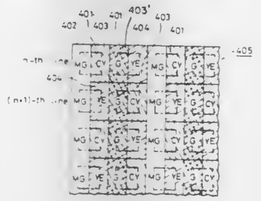
a color matrix having first and second inputs for respectively receiving said first and second continuous chroma signals for matrixing said chroma signals for providing first and second color signals representative of first and second color components of said scene.

4,630,106

COLOR SOLID-STATE IMAGER WITH COLOR FILTER HAVING AN OVERLAPPING SEGMENTED FILTER ARRANGEMENT

Atsushi Morimura, Moriguchi, and Hiromichi Tanaka, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 4, 1983, Ser. No. 463,666
Claims priority, application Japan, Feb. 15, 1982, 57-22325; Apr. 28, 1982, 57-72103
Int. Cl.[4] H04N *9/077, 9/07*
U.S. Cl. 358—44 **6 Claims**



1. A solid-state color imaging apparatus comprising:

a solid-state image sensor comprising a plurality of picture elements regularly disposed in a two-dimensional pattern comprising a plurality of horizontal lines, each line having a plurality of picture elements disposed in repetition at a predetermined pitch, said picture elements converting incident light into an output signal which corresponds to the amount of said incident light at a predetermined time and each of said elements outputting said output signal in order when scanned; and

a color filter comprising a plurality of filter elements disposed in regular repetition in horizontal lines and in vertical columns, including first horizontal lines in which first equivalent filter elements for transmitting at least a first color light and second equivalent filter elements for transmitting at least a second color light are alternately and sequentially disposed, and second horizontal lines in which third equivalent filter elements for transmitting at least said second color light and fourth equivalent filter elements for transmitting at least a third color light are alternately and sequentially disposed;

said first horizontal lines and said second horizontal lines being alternately and sequentially disposed in a vertical direction thereby forming a two-dimensional mosaic filter pattern; wherein

said filter elements are selected such that the mean value of the output signals of two neighboring picture elements in horizontal lines of said solid-state image sensor under said first horizontal lines of said color filter and the mean value of the output signals of two neighboring picture elements in horizontal lines of said solid-state image sensor under said second horizontal lines of said color filter are substantially equal, said mean values of said output signals containing modulated color-difference components which are determined by the transmitting characteristics of said filter elements and which represent different combinations of at least two of said color lights;

in said first horizontal lines, said first equivalent filter elements each covering one of said plurality of picture elements of said solid-state image sensor and each being divided into two segments wherein one of the segments is covered with a first type of filter element and the other segment is covered with a second type of filter element, thereby forming a plurality of first segmented filter elements, and said second equivalent filter elements each covering one of said plurality of picture elements of said solid-state image sensor and each being wholly covered with a third type of filter element and half of each of said second equivalent filter elements being further covered with said second type of filter element, thereby forming a plurality of second segmented filter elements, the above filter disposition being repeated in said first horizontal lines; and

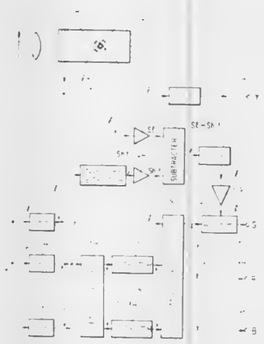
in said second horizontal lines, said third equivalent filter elements being disposed immediately adjacent to corresponding ones of said first equivalent picture elements in said first horizontal lines with each of said third equivalent filter elements covering one of said plurality of picture elements of said solid-state image sensor and each being divided into two segments wherein one of the segments is covered with said first type of filter element and the other segment is covered with said third type of filter element, thereby forming a plurality of third segmented filter elements, and said fourth equivalent filter elements each covering one of said plurality of picture elements of said solid-state image sensor and each being wholly covered with said second type of filter element and half of each of said fourth equivalent filter elements being further covered with said third type of filter element, thereby forming a plurality of fourth segmented filter elements, the above filter disposition being repeated in said second horizontal lines.

4,630,107

COLOR VIDEO SIGNAL PROCESSING DEVICE FOR ENHANCING AT LEAST ONE OF A PLURALITY OF PRIMARY COLOR SIGNAL COMPONENTS OUTPUT FROM A COLOR IMAGE PICKUP APPARATUS

Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Fujisawa, and Takashi Kuriyama, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Apr. 10, 1984, Ser. No. 598,642
Claims priority, application Japan, Apr. 13, 1983, 58-65002
Int. Cl.[4] H04N *9/083, 9/07, 9/73*
U.S. Cl. 358—47 **7 Claims**



1. A color video signal processing device for enhancing at least one of a plurality of primary color signal components output from a color image pickup apparatus having a photoelectric transducer section and a color stripe filter and producing a multiplex color signal, said multiplex color signal including a low frequency range signal containing first, second and third primary color signal components corresponding to additive primary colors, and a high frequency range signal having a carrier with a frequency dependent upon a pattern of arrangement of color stripes in the color stripe filter, said carrier being amplitude-modulated by said first and second primary color signal components which are predetermined by colors of the color stripes constituting the color stripe filter, said high frequency range signal containing a fundamental component and a harmonic component, said processing device comprising:

terminal means for receiving the multiplex color signal;

first separating means connected to said terminal means for separating the low frequency range signal out of the multiplex color signal;

second separating means connected to said terminal means for separating the high frequency range signal out of the multiplex color signal;

envelope detector means for detecting an envelope of the fundamental component of the high frequency range signal separated by said second separating means and generating an envelope detection output signal;

subtractor means for generating a difference signal containing said third primary color signal component by subtracting the envelope detection output signal generated by said envelope detector means from the low frequency range signal separated by said first separating means;

signal level setting means for respectively setting levels of said low frequency range signal separated by said first separating means and said envelope detection output signal generated by said envelope detector means to predetermined levels relative to each other such that when white light is incident to the color image pickup apparatus, said third primary color signal component contained in the difference signal generated by the subtracter means which is absent in the high frequency range signal is generated by said subtracter means with a predetermined polarity and an enhanced amplitude;

third separating means for selectively separating the third primary color signal component contained in the difference signal generated by the subtracter means; and

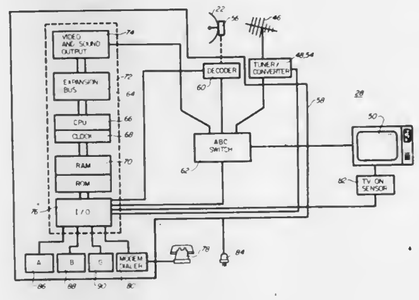
adder means for adding an output signal of said third separating means to the third primary color signal component contained in the low frequency range signal separated by said first separating means to enhance said third primary color signal component in amplitude.

4,630,108

PREPROGRAMMED OVER-THE-AIR MARKETING RESEARCH SYSTEM

Earl R. Gomersall, Inverness, Ill., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed Mar. 26, 1984, Ser. No. 593,596
Int. Cl.[4] H04N *17/04;* **H04H** *9/00*
U.S. Cl. 358—84 **57 Claims**



1. A marketing research system comprising

a plurality of cooperating households in a test area,

each of said households including a television receiver and normal television signal receiving means for delivering normal television signals including regularly scheduled programming to each household,

special television signal transmission means for providing a special television signal including substitute programming to said households, said special television signal transmission means comprising a satellite, and

means for controlling said television receiver in each of said households to display either said regularly scheduled programming or said substitute programming, at least one of said households having a special television signal receiving means for receiving said special television signal over-the-air from said satellite.

21. A marketing research system comprising

a plurality of cooperating households in a test area,

each of said households including a television receiver and normal television signal receiving means for delivering normal television signals including regularly scheduled programming to each household,

special television signal transmission means for delivering a special television signal including substitute programming over-the-air to said households, said special television signal transmission means comprising a low power microwave transmitter that transmits said special television signal in the frequency range of from approximately 2.500 to approximately 2.686 gigahertz, at least one of said households having a special television signal receiving means for receiving said special television signal over-the-air said low power microwave transmitter, and

control means for automatically controlling said television receiver in each of said households to enable the display of either said regularly scheduled programming or said substitute programming.

34. A system for monitoring the television programming displayed in households comprising

a plurality of cooperating households, each cooperating household having a television receiver for displaying television programming,

each of at least some of said households having muting means for reducing the volume of the sound from said television receiver in said household when said muting means is placed in a "on" condition, said muting means in an "off" condition having substantially no effect upon the volume of sound from said television receiver, and muting monitoring means for monitoring the "on" condition or the "off" condition of said muting means and

means for storing for subsequent analysis the condition of said muting means as monitored by said muting monitoring means.

36. A marketing research system comprising

a plurality of cooperating households in a test area,

each of said households including a television receiver and normal television signal receiving means for delivering normal television signals including regularly scheduled programming to each household,

means for delivering a special television signal including substitute programming to said households,

control means in each of said households for automatically enabling said television receiver in each of said households to display either said regularly scheduled programming or said substitute programming and

means remotely disposed from said households for enabling each control means in each of said households to automatically enable the display on said television receiver in each of said households of either said regularly scheduled programming or, at one or more selected times during a broadcast period, said substitute programming, said remotely disposed enabling means having a telephone number associated therewith,

each of said households further including means for establishing a telephonic connection between said control means and said remotely disposed enabling means,

said special television signal including said telephone number of said remotely disposed enabling means to enable said control means after a power failure to contact said remotely disposed enabling means.

41. A marketing research system comprising

a plurality of cooperating households in a test area,

each of said households including a television receiver and normal television signal receiving means for delivering normal television signals including regularly scheduled programming to each household,

means for delivering a special television signal including substitute programming to said households, said special television signal including a time of day signal,

computer means in each of said households for automatically enabling said television receiver in each of said households

to display either said regularly scheduled programming or said substitute programming and

means for enabling said time of day signal to be available to said computer means in each of said households for use by said computer means in the event of a power failure.

4,630,109

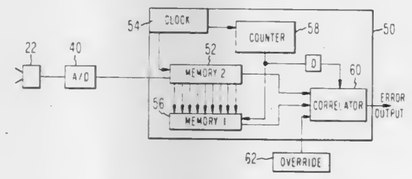
VEHICLE TRACKING SYSTEM

Russell R. Barton, Hamilton Township, Mercer County, N.J., assignor to Standard Telephones & Cables Public Limited Company, London, England

Filed Feb. 28, 1985, Ser. No. 706,952

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—103 **6 Claims**



1. A vehicle tracking system for determining the lateral position of a vehicle relative to a desired roadway path including substantially parallel thereto an optically distinct feature comprising, in combination:

scanning means functionally attached to said vehicle for optically scanning, at a known rate, a path having a component transverse the intended direction of travel of said vehicle at time spaced intervals as said vehicle travels along said roadway, said scan means producing a signal corresponding to the reflection of the scanned path;

means concurrently storing said signals resulting from said time spaced scans including the signal portion corresponding to said optically distinct feature; and

means responsive to said stored signals from successive scans for producing signals indicative of the time deviation of said signal portion resulting from successive scans for thereby determining the amount of lateral displacement of said vehicle relative to said optically distinct feature.

4,630,110

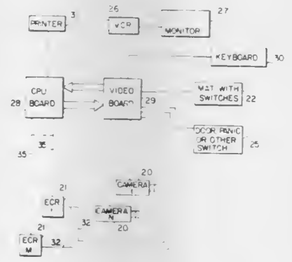
SURVEILLANCE SYSTEM

Roger E. Cotton, Snellville, and Eugene H. Lowe, Doraville, both of Ga., assignors to Supervision Control Systems, Inc., Norcross, Ga.

Filed Feb. 15, 1984, Ser. No. 583,045

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—108 **13 Claims**



1. In a surveillance system including a plurality of cameras for providing video signals corresponding to images of a monitored device, at least one video signal recording device selectively operable for recording said video signals in response to a record signal, event detection means for producing a plurality of event signals in response to selective operation of said monitored device; an improved controller comprising in combination:

timer means connected to said event detection means for measuring a selected predetermined time interval in response to said event detection means providing a first one of said plurality of event signals, and for providing said record signal in response to termination of said predetermined time interval during which said event detection means failed to provide a second particular one of said plurality of event signals.

4,630,111

IMAGE DISTORTION CORRECTION SYSTEM FOR ELECTRO-OPTIC SENSORS

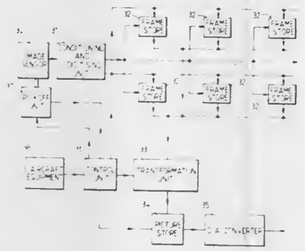
William Blain; Alexander McKeand, and William H. McKendrick, all of Edinburgh, Scotland, assignors to Ferranti plc, Cheshire, England

Filed Oct. 30, 1984, Ser. No. 666,374

Claims priority, application United Kingdom, Nov. 4, 1983, 8329459

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—109 **6 Claims**



1. An image correction system for providing a view of a scene scanned by an electro-optic framing sensor, which includes control means operable to cause the sensor to scan the scene in a number of separate frames each of which is viewed at a different viewing angle relative to a set of datum axes, pickoff means associated with the sensor to produce signals representing the viewing angle of each frame, storage means operable to store the image information derived from each of same frames, circuit means operable to transform the image information contained in each storage means so as to remove distortions caused by the different viewing angles, and a picture store operable to store the transformed image information from each frame of the scan such that the contents of the picture store represent a view of the scene from a predetermined viewing angle.

4,630,112

DESCRAMBLING APPARATUS FOR A TELEVISION SIGNAL

Jun Yamada; Takeshi Murakami; Akitsuna Yuhara; Norio Hosaka, and Yuji Fujita, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,237

Claims priority, application Japan, Nov. 24, 1982, 57-204636

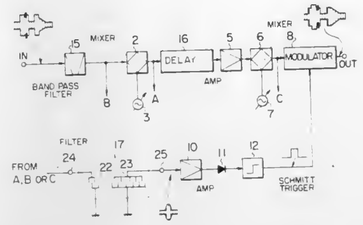
Int. Cl.[4] H04N *7/167, 7/16;* **H04K** *1/00*

U.S. Cl. 358—120 **4 Claims**

1. An apparatus for descrambling a scrambled television signal in which the scrambling has been effected by modifying a cyclically generated signal section to have a particular multi-level shape, comprising:

input means for inputting the scrambled television signal;

filter means, connected to said input means, for generating a response signal only when each level of a multi-level portion of a waveform having said particular shape of said cyclically generated signal section of the scrambled television signal received from said input means is detected; and



conversion means for converting the scrambled signal in response to said response signal of said filter means into a descrambled television signal.

4,630,113

BASEBAND CATV DECODER WITH STEREO BYPASS

Michael E. Long, Western Springs, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 11, 1984, Ser. No. 649,396

Int. Cl.[4] H04N *7/16, 7/10*

U.S. Cl. 358—121 **8 Claims**



1. A CATV decoder of the type including a tuner for developing a video signal and a continuous 4.5 MHz audio signal, a video processor for decoding the video signal, an audio path having an audio detector for producing baseband audio, an oscillator regenerating the continuous 4.5 MHz audio signal and a modulator for modulating the decoded video signal and regenerated 4.5 MHz audio signal onto a carrier, the improvement comprising:

a shunt path around said audio path for passing said continuous 4.5 MHz audio signal directly to the modulator; and

means for selectively activating said shunt path and said audio path.

4,630,114

METHOD FOR DETERMINING THE DISPLACEMENT OF MOVING OBJECTS IN IMAGE SEQUENCES AND ARRANGEMENT AS WELL AS USES FOR IMPLEMENTING THE METHOD

Hans C. Bergmann, Neu-Isenburg, and Hans-Georg Musmann, Salzgitter-Bad, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

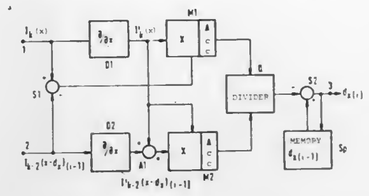
Filed Mar. 5, 1985, Ser. No. 708,457

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408016

Int. Cl.[4] H04N *7/137*

U.S. Cl. 358—136 **5 Claims**

1. In a method for determining, in a system having a transmitting end and a receiving end, displacements of image features occurring between successively transmitted image sequences, which method includes: determining, at the receiving end, peak values of pixel correlation between successively transmitted image sequences; deriving representations of estimated displacement values from the peak values of pixel correlation; and producing representations of optimized displacement values by a recursion operation which includes recursively deriving a correction value and adding the correction



value to an existing estimated displacement value to form a new estimated value, the improvement wherein said step of deriving a correction value comprises performing a mathematical division operation in which the dividend is a selected function of pixel values in successive image sequences and the divisor is proportional to the average of a first value resulting from crosscorrelation of successively transmitted image sequences and a second value resulting from autocorrelation of the currently received image sequence.

4,630,115

CATHODE RAY TUBE DISPLAY DEVICE

Cyril Hilsum, Middlesex, England, assignor to The General Electric Company, p.l.c., England

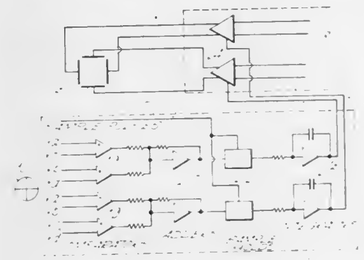
PCT No. PCT/GB84/00156, § 371 Date Dec. 10, 1984, § 102(e) Date Dec. 10, 1984, PCT Pub. No. WO84/04642, PCT Pub. Date Nov. 22, 1984

PCT Filed May 9, 1984, Ser. No. 681,994

Claims priority, application United Kingdom, May 9, 1983, 8312732

Int. Cl.[4] H04N *17/00*

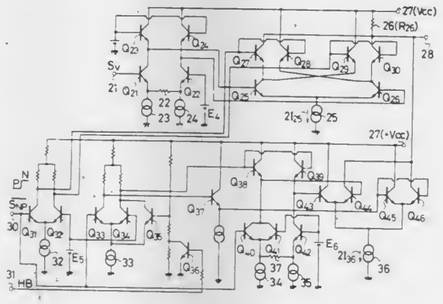
U.S. Cl. 358—139 **9 Claims**



1. A cathode ray tube (CRT) display device comprising a cathode ray tube (**1**) including electron gun means (**2**), control means (**8**) for periodically operating the CRT to direct a beam of electrons produced by the electron gun means (**2**) onto a target (**9**), sensor means (**5,10**) for producing an output signal dependent on the deviation of the position of impact of the beam on the target from a desired position on the target and correction means (**24**) for utilizing said output signal to reduce said deviation, characterized in that said sensor means comprises: sensing means (**10**) having a plurality of discrete sensing areas each responsive to the impact of said electron beam on a different area of the target; first circuit means (**19,20**) responsive to the output of said sensing means to produce an output indicative of the direction only of the deviation of said position of impact of said electron beam on said target from said desired

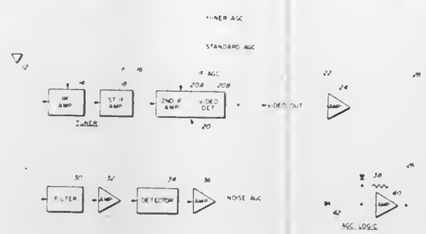
position on said target, storage means (**22**) for storing said output of said first circuit means and second circuit means (**23**) for integrating said stored output to produce said output signal.

4,630,116
VIDEO SIGNAL INVERTING CIRCUIT
Toshiaki Isogawa, Atsugi; Ryuji Shiono, Machida; Tsutomu Niimura, Hiratsuka; Joichi Sato, and Mitsuru Sato, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 10, 1984, Ser. No. 579,107
Claims priority, application Japan, Feb. 16, 1983, 58-23995
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **3 Claims**



1. A video inverting and non-inverting circuit operable in response to a switching signal to provide respective posi-mode and nega-mode wherein the pedestal levels of output signals are equal in the posi-mode and nega-mode, comprising, an input terminal to which an input video signal is connected, a first pair of transistors (**Q21, Q22**) differentially connected and said input terminal connected to the base of one of said first pair of differential connected transistors, a second pair of differentially connected transistors (**Q25, Q26**) with the bases of each connected to one of said first pair of differential transistors (**Q21, Q22**), a third pair of differentially connected transistors (**Q27, Q28**) connected to said second pair of differentially connected transistors (**Q25, Q26**), an output terminal connected to one (**Q27**) of said third pair of differentially connected transistors to receive the video signal in the posi-mode, a fourth pair of differentially connected transistors (**Q29, Q30**) connected to said second pair of differentially connected transistors (**25, Q26**), said output terminal connected to one (**Q30**) of said fourth pair of differentially connected transistors (**Q29, Q30**) to receive the video signal in the nega-mode, a switching terminal to which a switching signal is supplied, a fifth pair of differentially connected transistors (**Q31, Q32**) with one transistor (**Q31**) connected to said switching terminal such that said one transistor (**Q31**) is off during the posi-mode and on during the nega-mode and the other transistor (**Q32**) is on during the posi-mode and off during the nega-mode and said one transistor (**Q31**) connected to said third pair of differential transistors (**Q27, Q28**), a sixth pair of transistors (**Q33, Q34**) coupled to said switching terminal and to said other of said fifth pair of transistors (**Q32**) and to a source of horizontal blanking signal, a seventh pair of differentially connected transistors (**Q45, Q46**) coupled to one (**Q33**) of said sixth pair of transistors (**Q33, Q34**) and to said output terminal and conductive in the posi-mode and are non-conductive during the negi-mode, an eighth pair of differentially connected transistors (**Q43, Q44**) coupled to the other (**Q34**) of said sixth pair of transistors (**Q33,Q34**) and to said output terminal, and a reference voltage coupled to said eight pair of transistors.

4,630,117
AUTOMATIC GAIN CONTROL SYSTEM
James S. Parker, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.
Filed May 30, 1985, Ser. No. 739,358
Int. Cl.[4] H04N *5/52*
U.S. Cl. 358—174 **6 Claims**



. 1. In a television receiver having a variable gain tuner including an adjustable gain RF amplifier for receiving a video information signal, an IF amplifier connected to an output terminal of the tuner and including a variable gain amplifier with an internal automatic gain control loop for providing a constant amplitude composite video output signal, the composite video signal including video information and noise, an improved automatic gain control system for the tuner comprising:

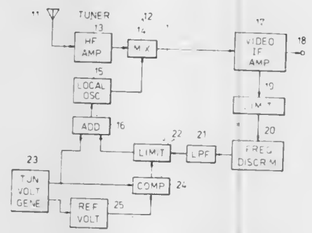
first means for monitoring the amplitude of the signal applied to the IF amplifier;

second means for monitoring the amplitude of the noise component of the composite vodeo signal;

means for selecting the largest one of the signals monitored by said first and second means; and

means for coupling said selected signal to the tuner for adjusting the gain thereof to provide improved signal to noise ratio.

4,630,118
AUTOMATIC FREQUENCY CONTROL CIRCUIT FOR A TELEVISION SIGNAL RECEIVING APPARATUS
Tomohiro Suzuki, Fuchu, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed May 21, 1984, Ser. No. 612,620
Claims priority, application Japan, May 23, 1983, 58-90503
Int. Cl.[4] H04N *5/50*
U.S. Cl. 358—195.1 **6 Claims**



1. An automatic frequency control circuit for a television signal receiving apparatus, said television signal receiving apparatus comprising a tuner having a local oscillator and a mixer for mixing a received high-frequency video signal and an output local oscillation frequency signal of said local oscillator to frequency-convert the received high-frequency television signal to an intermediate frequency signal, and a tuning voltage generating circuit for generating a tuning voltage responsive to a desired receiving channel which is selected so as to apply the

tuning voltage to said local oscillator of said tuner, said automatic frequency control circuit comprising:

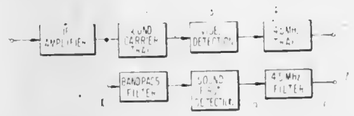
frequency discriminating means for frequency-discriminating an output intermediate frequency signal of said tuner;

a lowpass filter supplied with an output signal of said frequency discriminating means;

limiter means supplied with an output signal of said lowpass filter, for limiting the voltage level of said output signal of said lowpass filter depending on the desired receiving channel, said local oscillator receiving an output signal of said limiter means, said limiter means performing a limiting operation in each receiving band when receiving a channel in which a change in the local oscillation frequency is large with respect to a change in the tuning voltage; and

means for producing a predetermined signal having a predetermined time width responsive to a selection of the desired receiving channel, said predetermined signal being supplied to said limiter means so that said limiter means limits the voltage level of the output signal of said lowpass filter for a duration of said predetermined time width when the desired receiving channel is selected.

4,630,119
SOUND DETECTING CIRCUIT
Kazuhiko Okuno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 23, 1983, Ser. No. 535,094
Claims priority, application Japan, Oct. 6, 1982, 57-177023
Int. Cl.[4] H04N *5/62*
U.S. Cl. 358—198 **4 Claims**



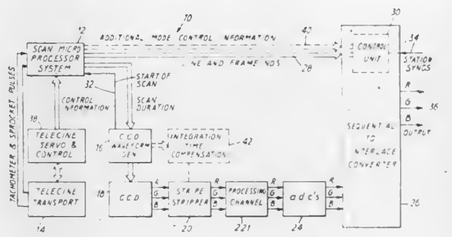
1. A sound detecting apparatus for a television system, comprising:

an intermediate frequency amplifier (**2**) amplifying to a predetermined level in a first IF output signal a sound carrier signal at a sound carrier frequency and a picture carrier signal at a picture carrier frequency, said sound and picture carrier frequencies being respective intermediate frequencies;

a differential amplifier (**10**) receiving said first IF output signal and including amplifying means for amplifying into a second IF output signal a portion of said first IF output signal at said picture carrier frequency at a first gain level, a portion of said first IF output signal at said sound carrier frequency at a second gain level higher than said first gain level, and a portion of said first IF output signal at frequencies between said picture carrier frequency and said sound carrier frequency at third gain levels lower than said first gain level; and

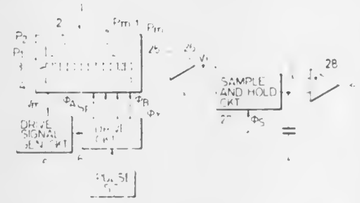
a detector (**9**) receiving said second IF output signal and outputting signals including a beat signal at a difference frequency which is the difference between said sound carrier frequency and said picture carrier frequency.

4,630,120
TELECINE MACHINES
Ian Childs, Sutton, England, assignor to British Broadcasting Corporation, London, England
PCT No. PCT/GB83/00095, § 371 Date Nov. 30, 1983, § 102(e) Date Nov. 30, 1983, PCT Pub. No. WO83/03513, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 29, 1983, Ser. No. 563,399
Claims priority, application United Kingdom, Mar. 30, 1982, 8209327
Int. Cl.[4] H04N *9/11*
U.S. Cl. 358—214 **51 Claims**



1. Telecine apparatus comprising a film transport mechanism for moving a film at a nominally constant speed and including a motor driving a capstan around which the film passes, scan means for line-by-line scanning of a film to provide a raster-scanned electrical output signal representative of a film image, scan control means having an output connected to the scan means to control the scan, and a film speed measuring device coupled to the capstan provide an outside representative of the instantaneous film speed, characterised by compensating means connecting the output of the film speed measuring device to an input of the scan control means such that the timing of the line scanned by the scan means is varied to compensate for fluctuations in the film speed.

4,630,121
AUTOMATIC FOCUS DETECTING CIRCUIT
Koji Suzuki; Masahiro Kawasaki, and Harumi Aoki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Filed Feb. 24, 1984, Ser. No. 583,499
Claims priority, application Japan, Feb. 24, 1983, 58-28615
Int. Cl.[4] H04N *3/26*
U.S. Cl. 358—227 **4 Claims**



1. A detecting circuit comprising:

an array of photoelectric elements, at least one of said photoelectric elements being shielded from light to obtain a photoelectric output corresponding to a dark current component;

a scanning circuit for scanning said photoelectric elements in a predetermined order to sequentially transfer out charges accumulated in said photoelectric elements to provide photoelectric outputs, wherein said scanning circuit comprises a pulse oscillator for supplying a continuous stream

of clock pulses, a drive circuit for applying activating pulses to said photoelectric elements in a predetermined sequence in response to said clock pulses produced by said pulse oscillator, and drive signal generating means for initiating operation of said drive circuit in response to an instantaneous intensity of light exceeding a predetermined level striking said drive signal generating means;

a sample-and-hold circuit connected to an output of said scanning circuit, said sample-and-hold circuit receiving as an input said photoelectric output of said at least one photoelectric element shielded from light; and

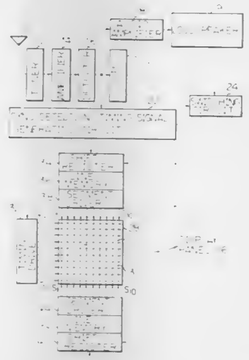
a subtraction circuit having one input coupled to an output of said subtraction circuit for receiving the sampled-and-held photoelectric output corresponding to said dark current component and a photoelectric output other than said photoelectric output from said array corresponding to said current component and subtracting said photoelectric output corresponding to said dark current component from said photoelectric output other than said photoelectric output corresponding to said dark current.

4,630,122

TELEVISION RECEIVER WITH LIQUID CRYSTAL MATRIX DISPLAY PANEL

Shigeru Morokawa, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,172
Claims priority, application Japan, Mar. 26, 1983, 58-051327
Int. Cl.⁴ H04N *5/70, 3/14*
U.S. Cl. 358—241 **22 Claims**



15. A television receiver, comprising:

circuit means for deriving television video signals and timing control signals from a broadcast television signal;

a liquid crystal matrix display panel formed with drive electrodes comprising a plurality of segment electrodes and a plurality of timing electrodes, respectively mutually opposed, with a matrix array of liquid crystal display elements being formed thereby at respective intersections of said segment and timing electrodes;

drive circuit means for generating, from said video signals and timing control signals, segment drive signals and timing drive signals to be applied to said segment electrodes and timing electrodes respectively;

said liquid crystal matrix display panel being divided into a plurality of regions each comprising a set of liquid crystal display elements driven by a specific set of said drive electrodes independently of the drive electrodes of the other ones of said regions, with the drive electrodes of each of said regions being electrically isolated from the drive electrodes of all other ones of said regions;

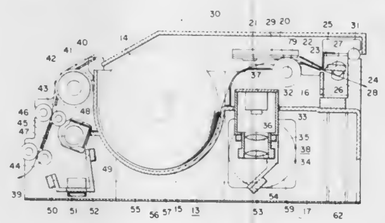
said drive means being controlled by said timing control signals for successively setting each of said regions in a drive phase operating status in which said segment and timing drive signals are applied to said segment and timing electrodes of that region, and a rest phase operating status in which the potential applied between the segment electrodes and timing electrodes of said display elements of said region is maintained substantially equal to zero, with said regions successively entering said rest phase and drive phase in a time-sharing manner.

4,630,123

COMPACT FACSIMILE MACHINE

Shigeru Kadomatsu, deceased, late of Yokohama, Japan (by Tamie Kadomatsu, Nozomi Kadomatsu, heirs), assignor to Ricoh Company, Ltd., Japan

Filed Feb. 10, 1984, Ser. No. 579,216
Claims priority, application Japan, Feb. 10, 1983, 58-19693; Feb. 10, 1983, 58-19694
Int. Cl.⁴ H04N *1/00, 1/04, 1/10*
U.S. Cl. 358—256 **19 Claims**



1. A housing of an integral structure for use in a facsimile machine, comprising:

a pair of side walls held upright in parallel and spaced apart from each other over a predetermined distance;

a rounded horizontal wall extending horizontally between said pair of side walls with its concave surface directed upward; and

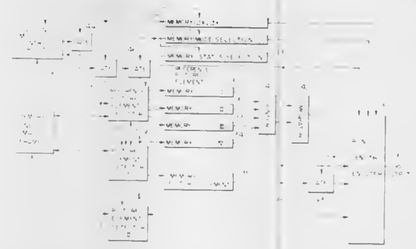
a flat horizontal wall arranged side by side with said rounded horizontal wall, extending horizontally between said pair of side walls and from one side of said rounded horizontal wall substantially to one end of said pair of side walls.

4,630,124

QUALITY SELECTABLE FACSIMILE IMAGE CODING SYSTEM

Toshiaki Endoh, Tanashi, and Yasuhiro Yamazaki, Hiratsuka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kasiha, Tokyo, Japan

Filed Dec. 11, 1984, Ser. No. 680,298
Claims priority, application Japan, Dec. 15, 1983, 58-235023
Int. Cl.⁴ H04N *1/417*
U.S. Cl. 358—260 **2 Claims**



1. A facsimile signal coding system, comprising:

initial encoding means for detecting, from picture elements forming a facsimile picture signal, picture elements at intervals of ΔX picture elements on every ΔYth line and for encoding the detected picture elements;

encoding means of mode 1 associated with the initial encoding means for encoding, by referring to four reference picture elements of the picture elements encoded by the initial encoding means, a picture element surrounded by the four reference picture elements and lying centrally thereof;

encoding means of mode 2 associated with the initial encoding means and the encoding means of mode 1 for encoding, by referring to four picture elements encoded by the initial encoding means and the encoding means of mode 1, a picture element surrounded by the four picture elements lying above, below, left and right the instant picture element to be encoded; and

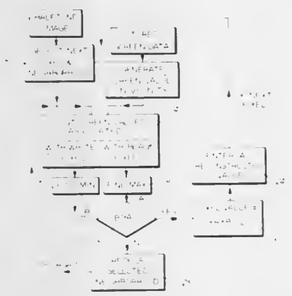
means associated with the initial encoding means, the encoding of mode 1 and encoding means of mode 2 to control them so that the initial encoding and the encoding of mode 1 and 2 are effected using 2^n (where n is an integer) as an initial value of each of the ΔX and ΔY and thereafter the encoding operation of mode 1 and mode 2 are repeated with the values of the ΔX and ΔY reduced by half up to obtaining a condition where n is equal to one.

4,630,125

UNSCREENING OF STORED DIGITAL HALFTONE IMAGES

Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 500,128
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—280 **19 Claims**



10. In a process wherein a continuous tone greyscale image has been converted to a halftone image by comparing the continuous tone pixel greyscale values to a periodic screen pattern of values to convert each greyscale value to a black or white spot, the method of inverting the halftone image spots back to the continuous tone pixel greyscale values comprising the steps of:

(1) isolating a spot of the halftone image with a corresponding neighborhood of surrounding spots,

(2) finding the maximum and minimum screen values of the screen patterns to produce the black and white spots in the corresponding neighborhood, and

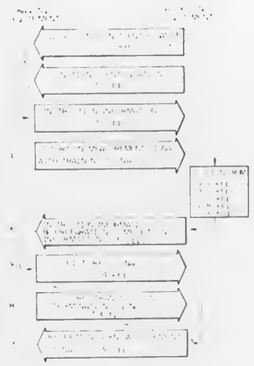
(3) comparing these maximum and minimum screen values to invert the isolated spot back to a continuous greyscale value.

4,630,126

METHOD OF SIGNAL TRANSMISSION WITH SELECTED SIGNAL TRANSMISSION RATE

Takashi Kaku, Tama; Ryoji Okita; Masayoshi Inoue, both of Kawasaki, and Shozo Kudo, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki and Ricoh Company, Ltd., Tokyo, both of, Japan

Filed Aug. 30, 1984, Ser. No. 645,729
Claims priority, application Japan, Aug. 30, 1983, 58-158221
Int. Cl.⁴ H04N *1/40, 1/52, 1/17*
U.S. Cl. 358—280 **7 Claims**



1. A method for transmitting a signal with a signal transmission rate selected from a plurality of signal transmission rates comprising the steps of:

predetermining a plurality of distortion allowance ranges in correspondence with the ranges of signal transmission rate;

transmitting a distortion measurement signal from a transmitting equipment to a line;

receiving said distortion measurement signal from said line, deciding selected values based on said received distortion measurement signal and producing a decided distortion signal;

obtaining a difference between said received distortion measurement signal and said decided distortion signal;

measuring the distortion amount in said obtained difference, at the line, on the basis of the variation in said transmitted distortion measurement signal received by the line;

deciding a distortion allowance range to which said measured distortion amount belongs on the basis of the result of said measurement of the distortion amount, either at the line, or at the transmitting equipment on the basis of the measured distortion amount transmitted from the line; and

starting the signal transmission with a transmission rate corresponding to the result of said decision of distortion allowance range.

4,630,127

CHARACTER AND PICTURE INFORMATION READING APPARATUS

Jyoichi Fuwa, Atsugi, Japan, assignor to Ricoh Company, Ltd., Kyo, Japan

Filed Mar. 8, 1985, Ser. No. 710,301
Claims priority, application Japan, Mar. 19, 1984, 59-52911
Int. Cl.⁴ H04N *1/04*
U.S. Cl. 358—285 **8 Claims**

1. A character and picture information reading apparatus comprising:

a document glass plate transparent in at least a part thereof;

a first illumination lamp arranged in a position opposite to a document with said document glass plate therebetween;

first light receiving means for reading an image of the document placed on said document glass plate;

second light receiving means arranged near said first light receiving means with a light receiving surface thereof being directed substantially in the same direction as that of said first light receiving means;

an optical system for guiding a light from the document to said first light receiving means and said second light receiving means;

a scan mechanism for scanning at least either one of said document glass plate and said optical system;

a second illumination lamp arranged on the back side of the



document placed on said document glass plate with the optical axis thereof being directed toward said document glass plate, and having a length larger than a predetermined value at least in one direction of scan of the direction; and

electronic control means for reading an output signal from said first light receiving means to read image information of the document, and deciding at least one of position and size of the document based on an output level from said second light receiving means and a position of said scan mechanism.

4,630,128

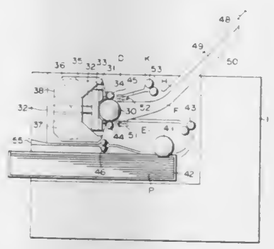
COLOR IMAGE FORMING APPARATUS WITH INTERRUPTION CONTROL

Masami Gokita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 10, 1984, Ser. No. 639,343

Int. Cl.⁴ G03G *15/00;* **H04N** *1/27*

U.S. Cl. 358—296 **5 Claims**



1. A color image forming apparatus with interruption control, comprising:

a color specifying section, which can selectively specify one color or a combination of colors from a plurality of prepared colors for image formation;

an image data outputting section for outputting data for image formation;

a supply section for supplying a medium on which an image is formed;

an image forming section for moving said medium, which is supplied from said supply section, back and forth the number of times corresponding to the color and the number of colors specified by said color specifying section and for forming said image data from said image data outputting section on said medium with one or more colors specified by said color specifying section;

first and second temporary storage sections, provided on input and output sides of said image forming section for temporarily and selectively storing said medium when said medium is moved back and forth by said image forming section;

a discharge section for discharging said medium on which the image forming operation has been completed by said image forming section;

first control means for outputting specified control signals necessary for the normal operation of said medium in relation to said supply section, image forming section, first and second temporary storage sections, and the discharge section, and for recognizing the current position information of said medium based on said control signals;

interruption command section which includes at least a stop command section;

second control means for discriminating whether said medium is in said supply section, image forming section, first or second temporary storage section, or in said discharge section, by receiving the current position information of said medium from said first control means which has received the interrupt command from said interrupt command section; and

third control means for receiving the discrimination result from said second control means and selectively supplying a suitable interruption processing signal to said supply section, image forming section, first or second temporary storage section, and discharge section as required for each interruption processing of said medium corresponding to the discrimination result.

4,630,129

IMAGE OUTPUT APPARATUS FOR PRINTING AN IMAGE AND COMPARING IMAGE WITH ORIGINAL

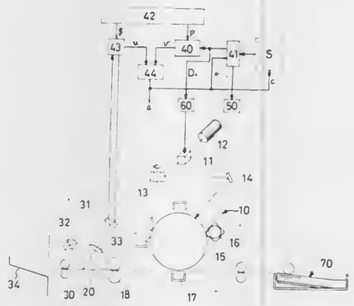
Kiyoshi Hayashi, and Yoshihiro Kawahara, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1984, Ser. No. 644,678

Claims priority, application Japan, Aug. 27, 1983, 58-158886; Aug. 27, 1983, 58-158887; Aug. 27, 1983, 58-158888

Int. Cl.⁴ H04N *1/21, 1/23;* **G01D** *15/06*

U.S. Cl. 358—296 **3 Claims**



1. An image output apparatus for printing an image of an original document and for comparing such printed image with the original document, said apparatus comprising:

means for supplying information representative of the original document, said supplying means comprising means for generating signals in the form of coded print data of the original document;

a printing unit operable in response to said information from said supplying means for printing an image of the original document on a sheet of paper supplied from a paper feeding device;

image sensor means for sensing said image and for providing information representative thereof, said sensor means comprising means for generating output codes of said image; and

means for comparing said information from said image sensor means with said information from said supplying means, said comparing means comprising comparator circuit means for comparing said coded print data with said output codes;

a switching means and a storage means, said switching means being operatively connected between said means for supplying information and said printing unit and controlled by said means for comparing, wherein when said means for comparing determines that said information from said image sensor means differs from said information from said supplying means, then said switching means transfers said information from said supplying means to said storage means instead of said printing unit.

4,630,130

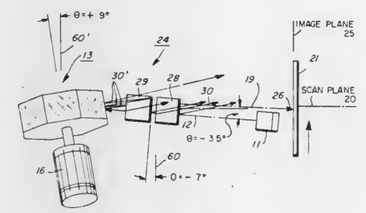
SCANNING SYSTEM FOR CONTROLLING STRAY BEAMS CAUSED BY UNDESIRABLE OPTICAL REFLECTIONS

Michael A. Parisi, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 21, 1985, Ser. No. 789,860

Int. Cl.⁴ H04N *1/04;* **G03G** *15/04;* **G02B** *26/10*

U.S. Cl. 358—300 **10 Claims**



8. In a scanning system having an optical system with tangentially offset optical elements for exposing a recording member line by line in along an image plane which said optical system elements comprise:

(a) a high intensity imaging beam, the axis of said imaging beam being set at a first predetermined small angle with respect to the plane normal to said image plane at said recording member;

(b) a rotatable scanning element for sweeping said imaging beam across said recording member, the axis of said scanning element being set at a second predetermined small angle with respect to said normal plane;

(c) lens means for focusing said imaging beam onto said scanning element and said recording member, the axis of said lens means being set at a third predetermined small angle with respect to said normal plane whereby a small sagittal offset alignment is introduced into said tangentially offset optical alignment to cause any stationary and moving satellite beams to separate from said imaging beam,

the axis of said scanning element being set in a direction opposite to the direction in which the axes of said imaging beam and said lens means are set to obviate any scan line bow caused by said sagittally offset alignment.

9. A method for neutralizing stray beams which create undesirable reflections on the photoreceptor of a raster output scanner, the scanner having an optical system of the type where an input beam is scanned by a rotating scanning element to provide a scanning beam which passes through a lens means to said photoreceptor to write images on said photoreceptor along an image plane, the input beam and the scanning beam being at a slight angle to and on opposite sides of a scan plane normal to the image plane so that said input and scanning beams are sagittally offset from one another, comprising the steps of:

(a) tilting the axis of said lens means through a first predetermined negative angle with respect to said scan plane; and

(b) tilting the axis of said scanning element through a second predetermined positive angle with respect to said scan plane;

tilting of said lens means and said scanning element enhancing divergence of said stray beams from said input and scanning beams for interception and blocking while tilting of said lens means and said scanning element in opposing directions negating scan line bow at said photoreceptor.

4,630,131

RECORDING SIGNAL GENERATION SYSTEM FOR COLOR VIDEO SIGNAL

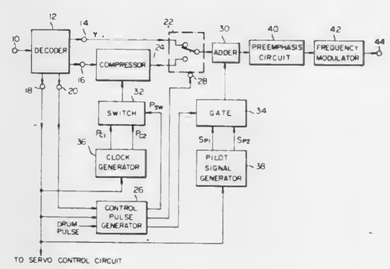
Yutaka Ichinoi, Yokohama; Naomichi Nishimoto, Tokyo, and Yoshihiko Ota, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 6, 1984, Ser. No. 577,119

Claims priority, application Japan, Feb. 9, 1983, 58-20461

Int. Cl.⁴ H04N *9/493, 9/499*

U.S. Cl. 358—310 **8 Claims**



1. A recording signal generation system for a color video signal having horizontal scan periods each of which has an effective horizontal scan period and a horizontal blanking period arranged serially on a time axis, a luminance signal being positioned in the effective horizontal scan period, said system comprising:

first signal generator means for separating an input composite color video signal to generate the luminance signal and line sequential signal of two color difference signals which has a duration equal to the effective horizontal scan period;

second signal generator means for generating compressed color signals by compressing the line sequential signal with respect to the time axis by a predetermined ratio;

third signal generator means for positioning the compressed color signals in the horizontal blanking period and time-division multiplexing the luminance signal and the compressed color signals to generate a time-division multiplex signal of the luminance signal and the compressed color signals;

fourth signal generator means for generating a plurality of burst pilot signals having different frequencies superposed on the luminance signal plus the two color difference signals in the horizontal blanking period and which alternate with each other at an interval of one horizontal scan period;

fifth signal generator means for superposing the burst pilot signals on the time-division multiplex signal; and

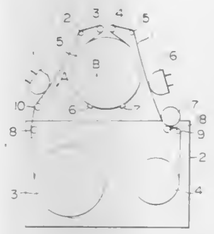
sixth signal generator means for generating a recording signal by frequency modulating a carrier having a predetermined frequency by the superposed signal.

4,630,132

VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

Toshimichi Terada, Chigasaki; Noboru Kojima, Yokohama, and Akira Shibata, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,086
Claims priority, application Japan, Dec. 8, 1982, 57-214007; Dec. 9, 1982, 57-214677
Int. Cl.⁴ H04N *9/493, 5/78*
U.S. Cl. 358—310 **9 Claims**



1. A video signal recording/reproducing apparatus of helical-scan type, in which a video signal is recorded on a magnetic tape in successive tracks which are inclined to the longitudinal direction of the tape, comprising:

a rotary cylinder around which said magnetic tape travels by more than 180 degrees of rotation angle of the cylinder along a helical path and means for rotating said cylinder in synchronism with the field period of said video signal;

a pair of magnetic heads disposed on said rotary cylinder so as to trace said recording tracks on said magnetic tape as said cylinder rotates, said heads having gaps whose azimuth angles which are different from each other, said magnetic heads being disposed at an interval of other than 180 degrees of the rotation angle of the rotary cylinder;

first means for converting the video signal during a head rotation period into a video signal having a time period corresponding to the period during which said magnetic tape is scanned by said magnetic heads for each rotation of said rotary cylinder; and

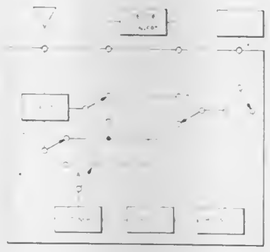
second means for applying the converted video signal to said magnetic heads for recording on said magnetic tape.

4,630,133

VCR WITH TOTAL RECORD/VIEW FLEXIBILITY

Michael E. Long, Western Springs, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 450,824, Dec. 20, 1982, abandoned. This application Mar. 14, 1985, Ser. No. 711,698
Int. Cl.⁴ H04N *5/782*
U.S. Cl. 358—335 **2 Claims**



1. A video system comprising:

a television receiver having a signal input;

a decoder means having an input and an output;

an antenna/cable source of multichannel signals, including a channel having an encoded signal; and

a VCR having a first terminal connected to said source of multichannel signals, a second and a third terminal connected to the input and the output of said decoding means, respectively, and a fourth terminal connected to the signal input of said television receiver, said VCR including:

a two-way signal splitter having an input, connected to said first terminal, and first and second outputs;

recording means including a television signal tuner, a signal recording device and an RF modulator, said recording means having an input terminal and an output terminal; and

switching apparatus comprising first, second, third, fourth and fifth switch means;

said first switch means for establishing a conductive path from said first output of said splitter to said input of said decoding means or to said second and fourth switch means;

said second switch means for establishing a conductive path from said second output of said splitter to said first switch means and said fourth switch means or to said third switch means;

said third switch means for establishing a conductive path from the input of said recording means to said second switch means or to said output of said decoder means and said fourth switch means;

said fourth switch means for establishing a connection to the output of said decoder means and said third switch means or to said first and said second switch means; and

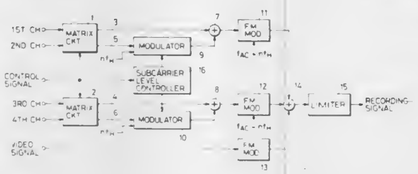
said fifth switch means for establishing a conductive path between said signal input of said television receiver and the output of said recording means or to said fourth switch means.

4,630,134

SYSTEM FOR RECORDING AND REPRODUCING MULTIPLEX INFORMATION

Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,717
Claims priority, application Japan, Oct. 30, 1982, 57-191110; Oct. 30, 1982, 57-191112
Int. Cl.⁴ H04N *5/76*
U.S. Cl. 358—343 **17 Claims**



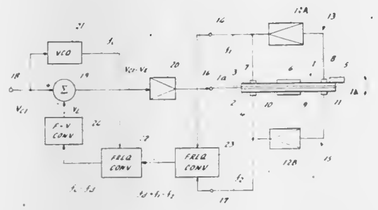
1. A method for recording and reproducing multiplex information, comprising the steps of: for recording, modulating two subcarriers of the same frequency with two respective subchannel signals; adding the modulated signals to two main channel signals to produce two respective sum signals; frequency modulating two main carriers of different frequencies with the two sum signals; and recording information on a storage medium corresponding to the frequency-modulated signals; and, for reproduction, extracting and separating in frequency the main carriers, detecting the separated main carriers with separate frequency detecting means; and applying a selected one of two detected outputs from the frequency detecting means at a time to a common subchannel demodulating means.

4,630,135

VIDEO HEAD POSITION CONTROL

Fumiaki Sato, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 12, 1984, Ser. No. 599,293
Claims priority, application Japan, Apr. 14, 1983, 58-66009
Int. Cl.⁴ G11B *21/10*
U.S. Cl. 360—10.2 **14 Claims**



1. Apparatus for controlling position of a video head, comprising:

(a) a bimorph element having first and second piezoelectric elements, where said bimorph element is secured to a rotary cylinder of a video taype recorder and is arranged to bend, in a direction normal to the plane of rotation of said rotary cylinder, in receipt of a voltage, said video head being carried by said bimorph element to be moved together with the bending thereof;

(b) a first set of input and output surface acoustic wave transducers provided on an exposed surface of said first piezoelectric element;

(c) a first amplifier whose input and output terminals are respectively connected to said input and output transducers on said first piezoelectric element so as to constitute a first surface acoustic wave oscillator;

(d) a second set of input and output surface acoustic wave transducers provided on an exposed surface of said second piezoelectric element;

(e) a second amplifier whose input and output terminals are respectively connected to said input and output transducers on said second piezoelectric element so as to constitute a second surface acoustic wave oscillator;

(f) first means responsive to oscillating frequency signals from said first and second surface acoustic wave oscillators for producing a frequency difference signal indicative of frequency difference between said oscillating frequency signals;

(g) second means responsive to said frequency difference signal and to a control voltage generated by said video tape recorder in accordance with a selected operating mode, for producing an error signal indicative of the difference between a desired position and an actual position of said video head, said second means comprising a frequency-to-voltage converter responsive to said frequency difference signal;

(h) third means responsive to said error signal and to said control voltage for correcting said control voltage by said error signal; and

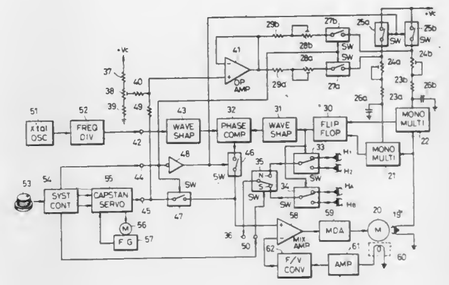
(i) fourth means responsive to an output signal from said third means for driving said bimorph element.

4,630,136

REPRODUCED SIGNAL SWITCHING CIRCUIT FOR REPRODUCING APPARATUS HAVING ROTARY HEADS FOR SPECIAL REPRODUCTION

Yukio Ogawa, Tokyo, and Koji Matsumura, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 20, 1984, Ser. No. 652,523
Claims priority, application Japan, Sep. 26, 1983, 58-177529
Int. Cl.⁴ H04N *5/783*
U.S. Cl. 360—10.3 **7 Claims**



1. A reproduced signal switching circuit for a reproducing apparatus, said reproducing apparatus having a rotary body provided with rotary heads for normal reproduction and rotary heads for special reproduction, said rotary heads for special reproduction being provided at positions on said rotary body separated from the respective rotary heads for normal reproduction by a predetermined angle, said special reproduction being a reproduction which is carried out with a tape moving speed which is different from a tape moving speed employed during the normal reproduction, and rotation detecting means for producing a pickup pulse responsive to the rotation of said rotary body when said rotary heads assume predetermined angular positions, said reproduced signal switching circuit comprising:

a switching circuit for switching output signals of said rotary heads for special reproduction so as to obtain a continuous reproduced signal;

switching signal producing means for producing a switching signal responsive to the output pickup pulse of said rotation detecting means, and for applying the switching signal to said switching circuit so as to switch said switching circuit; and

voltage supplying means for supplying a voltage which is in accordance with a tape moving speed to said switching signal producing means during the special reproduction,

said switching signal producing means comprising time constant circuits for starting charging operations responsive to said pickup pulse, and a circuit for producing a switching signal having a polarity which changes when charged voltages in said time constant circuits reach a predetermined voltage,

said voltage supplying means supplying the voltage to be charged to said time constant circuits.

4,630,137

TAPE TIMER APPARATUS FOR VIDEO TAPE RECORDER

Toru Sekiguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 21, 1983, Ser. No. 544,428
Claims priority, application Japan, Oct. 22, 1982, 57-185626
Int. Cl.⁴ G11B *27/10*
U.S. Cl. 360—13 **3 Claims**

1. A tape timer apparatus for producing a tape time corresponding to a running tape amount, said apparatus being incorporated in a video tape recorder, comprising:

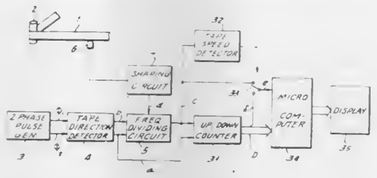
means responsive to running of a tape located in said video

tape recorder for producing frame pulses, the interval between two said frame pulses corresponding to a frame period in a running tape;

means responsive to the running of said tape for producing a tape direction signal indicating the direction said tape is running;

an up/down counter for counting up or down, as determined by said tape direction signal, in response to each said frame pulse to produce counted data;

means for producing a selection signal having a first state when the frequency of said frame pulse is below a predetermined frequency and having a second state when the frequency of said frame pulse exceeds said predetermined frequency;



means for producing a single frequency divided pulse each time a plurality of said frame pulses are produced;

means responsive to said selection signal for selecting one of said frame pulses and said frequency divided pulse and delivering said selected pulse as an interruption demand; and

means responsive to said counted data and said interruption demand pulse for computing said tape time.

4,630,138

CONTROL APPARATUS FOR CONTROLLING RECORDING OF A SCENE FOR USE IN IMAGE RECORDING SYSTEM

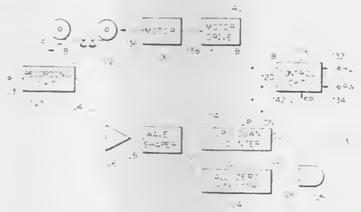
Mikio Utsugi, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 25, 1984, Ser. No. 624,335

Claims priority, application Japan, Jun. 29, 1983, 58-115942

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—33.1 **9 Claims**



1. Apparatus for controlling recording of a scene for use in a television camera for recording video signals representative of a sequence of image frames on a magnetic recording medium in a recording period, comprising:

first magnetic recording means for recording the video signals on the recording medium;

control means for sequentially changing the relative position of said first magnetic recording means with respect to said recording medium; and

storing means for developing and storing tracking information related to a point on the recording medium that corresponds to the start of the sequence of image frames recorded during the recording period;

said control means including restoring means, responsive to a signal that instructs re-recording for restoring the relative position of said magnetic recording means with respect to said recording medium to a point on said recording medium corresponding to the start of the sequence of the image frames in accordance with the tracking information stored by said storing means.

4,630,139

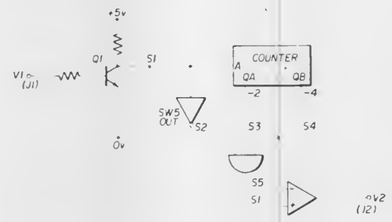
DATA SYNCHRONIZATION

John D. Dickens, Melbourne, Australia, assignor to The Commonwealth of Australia, Australia

Continuation-in-part of Ser. No. 573,921, Jan. 12, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 795,320

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—46 **14 Claims**



1. A method of analyzing data containing an event of interest wherein the data is recorded on a first number of channels and is then played back for analysis using a computer system having the ability to accept a second number of channels, and wherein said computer system second number of channels is smaller than said first number of recording channels, comprising the steps of producing a recording signal having a constant frequency of pulses, overlaying timing pulses on said recording signal at a predetermined multiple of said recording pulses, simultaneously recording the data to be analyzed with said recording and timing pulses, determining the location of the event of interest in the data including determining the number of said recording pulses from the timing pulse next preceding the recorded event of interest in the data to the beginning of said event of interest in the data, playing said recorded data into said computer system sufficient times that all of the recorded channels are analyzed by said computer system, and producing a triggering pulse to activate said computer system on each successive playback of said data at the same instant during each said playback, whereby the output analysis from said computer system is equivalent to that which would be produced if said computer system had the ability to analyze all of said larger number of recording channels simultaneously.

4,630,140

DATA RECORDING/REPRODUCING APPARATUS

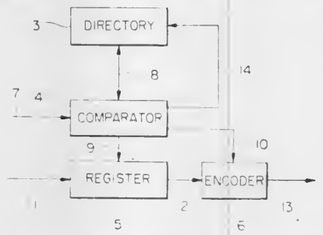
Tatuo Sugimura, Kyoto; Isao Satoh, Osaka; Makoto Ichinose, Osaka, and Yuzuru Kuroki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 5, 1984, Ser. No. 597,232

Claims priority, application Japan, Apr. 8, 1983, 58-62438

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—49 **3 Claims**



1. A data recording/reproducing apparatus comprising:

means for recording/reproducing data with respect to a recording medium which has data recording tracks divided into a plurality of sectors, each of said plurality of sectors having an address section and a data section, said address section having a prerecorded first address signal which represents a corresponding sector; means for adding, in an interleaved manner, in a recording mode, a second address signal to data to be recorded, the second address signal representing an address of a sector included in said plurality of sectors and being recorded with said data in a respective data section; and means for detecting the second address signal added to the recorded data.

4,630,141

TAPE CASSETTE NON-ERASE MECHANISM

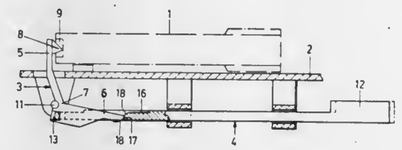
Jürgen Schulze, Nuremberg, Fed. Rep. of Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland. Stiftung & Co. KG, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,099

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435683

Int. Cl.⁴ G11B *15/04, 19/04*

U.S. Cl. 360—60 **6 Claims**



1. A device for use in a tape recording device to prevent the undesired erasing of magnetic tape contained in a cassette having a recess portion for indicating erasing or non-erasing of the tape, said device comprising:

toggle means pivotal about an axis comprising first shank means for scanning a recess in a tape cassette and second shank means for transmitting the position of the first shank means;

a slide member coupled to a desired activator with said slide member engageable with the second shank; and

said toggle means being in an unbiased state and engageable with the slide member and pivotal in such a manner that when the recess is open and accessed by the first shank means said toggle means is pivoted thereby positioning said second shank means to engage and stop the movement of said slide member towards said toggle means and thereby preventing undesired erasing of the magnetic tape, and alternatively when the recess is closed said toggle means is positioned such that said second shank means allows the movement of said side member toward said toggle means.

4,630,142

APPARATUS FOR REPRODUCING A DIGITAL SIGNAL

Toshiyuki Tani; Yoshizumi Inazawa, both of Kanagawa; Toshihiko Takahashi, Chiba, and Shigeyuki Satomura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,518

Claims priority, application Japan, Nov. 2, 1984, 59-232077; Jul. 3, 1985, 60-146268

Int. Cl.⁴ G11B *5/52*

U.S. Cl. 360—70 **7 Claims**

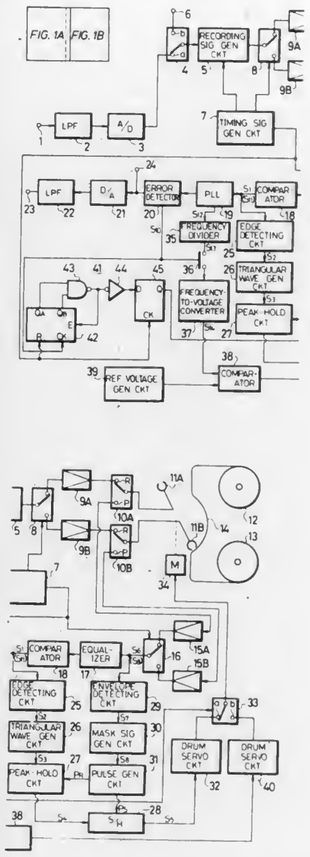
1. Apparatus for reproducing digital signals recorded on a recording tape; said apparatus comprising:

a rotary drum about which a recording tape can be trained;

rotary head means mounted in said drum;

transport means for transporting said tape over said drum and rotating said head means so that a relative speed is established between said head means and said tape and said head means scans said tape and generates reproduced digital signals in response to digital signals recorded on said tape;

mode-control means for controlling said transport means so that said tape is transported over said drum at an absolute tape speed that can be varied; and



servo means responsive to variations in said absolute tape speed for adjusting said transport means so that said head means acquires a rotary speed such that said relative speed is restored to and maintained at a substantially constant value, notwithstanding changes in said absolute tape speed effected under the control of said mode-control means.

4,630,143

MAGNETIC RECORDING AND REPRODUCING DEVICE

Hiromi Juso, Gose; Kengo Sudoh, and Yukihiko Haikawa, both of Higashihiroshima, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 25, 1985, Ser. No. 748,486

Int. Cl.⁴ G11B *5/86*

U.S. Cl. 360—72.2 **5 Claims**

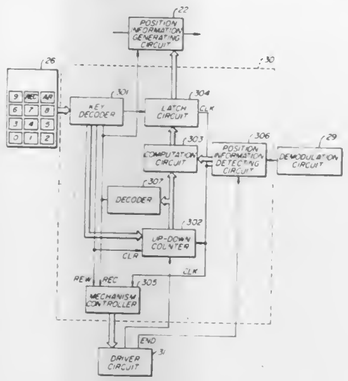
3. A magnetic recording and reproducing device adapted to record on a magnetic tape both a primary information such as audio signals and a position information indicating the position of said primary information, said device comprising

reproducing-storing means for reproducing and storing a position information which is already recorded,

detecting means for detecting the distance traveled by a magnetic tape from the position corresponding to said

position information reproduced and stored by said reproducing-storing means,

counting means for obtaining a new position information by counting up or down from said stored position information according to said distance traveled by said tape, and



recording means for recording on said tape a new position information according to said new position information when a new primary information is recorded.

4,630,144

TRACKING CONTROL APPARATUS

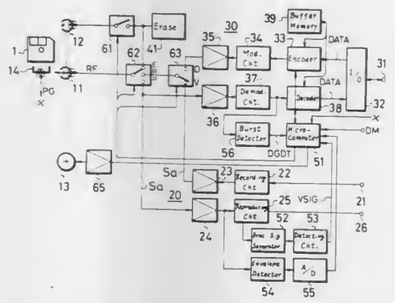
Ken Kutaragi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,400

Claims priority, application Japan, Aug. 22, 1984, 59-174362; Nov. 21, 1984, 59-246550

Int. Cl.[4] G11B *21/10, 21/08*

U.S. Cl. 360—77 **7 Claims**



1. Apparatus for recording or reproducing both digital and analog signals on or from respective substantially concentric recording tracks on a rotating disc, with only digital or analog signals being recorded in any one of said tracks; said apparatus comprising:

transducer means mounted in substantially contacting relation to said disc for recording or reproducing said digital and analog signals on or from said respective tracks;

motor means coupled to said transducer means for moving said transducer means radially with respect to said disc;

track status store means for storing track identifying information for each of said recording tracks and producing a track classifying signal corresponding thereto;

level detecting means for detecting levels of signals reproduced from said tracks and producing a level indicating signal corresponding thereto; and

control means jointly responsive to said track classifying signal and said level indicating signal for controlling said motor means for positioning said transducer means in closed-loop servo tracking relation to a given track on the basis of said level indicating signal when said track classifying signal indicates that said given track or at least one track adjacent thereto contains an analog signal and for otherwise effecting open-loop positioning of said transducer means regardless of said level indicating signal.

4,630,145

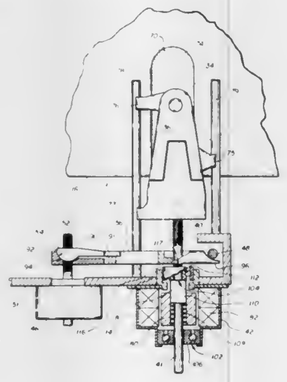
FINE POSITIONING APPARATUS FOR FLOPPY DISK DRIVE

Herbert E. Thompson, Los Gatos, and Duane C. Meulners, San Jose, both of Calif., assignors to Drivetec, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 348,831, Feb. 16, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,768

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **16 Claims**



1. Apparatus for positioning a read/write head over a rotating disk of magnetic or other data storage media comprising:

a first stepper motor means having a first rotor and a first stator;

a first lead screw means driveably coupled to said first rotor for moving a read/write head moveably mounted on at least one rail disposed parallel to the longitudinal axis of said first lead screw means, said movement being inwardly and outwardly relative to the center of the disk in unitary steps of coarse increments;

a second stepper motor means having a second rotor and a second stator;

a second lead screw means coupled to said second rotor for causing movement of said read/write head in unitary steps of fine increment;

first journalling means connected to said first lead screw means;

a lead screw follower connected to said second lead screw means;

means forming a pivot point located such that said first lead screw means is positioned between said second lead screw means and said pivot point; and

an elongated lever arm having a first end portion engaging said second lead screw follower, an intermediate portion engaging said journalling means, and a second end portion bearing against said pivot point, whereby said read/write head is directly moved by actuation of said first stepper motor means as it rotates said first lead screw means and is indirectly moved by actuation of said second stepper motor means which through rotation of said second lead screw means causes pivoting movement of said lever arm about said pivot point which in turn causes incremental axial translation of said first lead screw means and consequent incremental movement of said read/write head.

4,630,146

ROTARY HEAD TYPE REPRODUCING APPARATUS

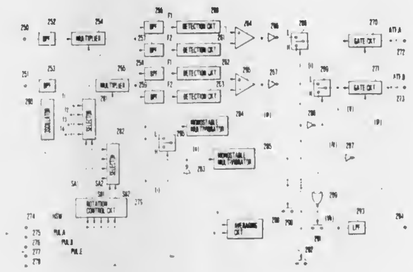
Nobutoshi Takayama, Kanagawa; Hiroo Edakubo; Susumu Kozuki, both of Tokyo; Masahiro Takei, and Kenichi Nagasawa, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,091

Claims priority, application Japan, Mar. 13, 1984, 59-48584; Mar. 17, 1984, 59-51752; Mar. 17, 1984, 59-51753; Mar. 21, 1984, 59-53952; Mar. 22, 1984, 59-55328

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **30 Claims**



1. A rotary head type reproducing apparatus arranged to reproduce, with a plurality of rotary heads, an information signal from a record bearing medium having many recording tracks which are formed in parallel to each other with the information signal recorded therein ahd with a plurality of different pilot signals of different frequencies also recorded one by one in each of the recording tracks, comprising:

(a) reference signal generating means for simultaneously generating a plurality of reference signals of different frequencies;

(b) a plurality of separating means arranged to separate pilot signal components included in the reproduced signals produced from said plurality of heads individually for each of the heads; and

(c) a plurality of detecting means for detecting the tracking errors of said heads by using said reference signals generated by said generating means and signals produced from said plurality of separating means.

4,630,147

MAGNETIC HEAD POSITION DETERMINING MECHANISM

Yasuo Nagase, Tokyo, Japan, assignor to Anritsu Electric Company Limited, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,302

Claims priority, application Japan, Nov. 16, 1982, 57-199790

Int. Cl.[4] G11B *21/08, 5/55*

U.S. Cl. 360—78 **2 Claims**

1. A magnetic head position-determining mechanism comprising:

a magnetic head position-determining reference member;

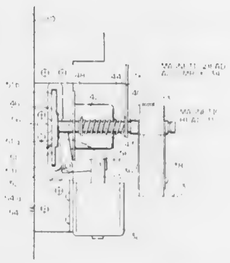
a magnetic head assembly provided with a fixedly mounted magnetic head and a positioning portion, said positioning portion being superimposed and generally aligned with said reference member, said magnetic head assembly being movable in a direction toward and away from said reference member;

pressurizing means coupled to said magnetic head assembly to urge said magnetic head assembly toward said reference member;

a rotatably mounted stepped disk having a plurality of steps of different thicknesses with any one of said steps always disposed between said magnetic head assembly and said reference member such that when said magnetic head assembly moves in said direction toward said reference member, said positioning portion of said magnetic head assembly engages said stepped disk so that the latter is thereby pressure-engaged between said position portion and said reference member as said pressure means urges said magnetic head assembly toward said reference member;

first actuating means coupled to said magnetic head assembly to move said magnetic head assembly away from said reference member, thereby to separate said positioning portion from said stepped disk;

second actuating means to rotate said stepped disk during the operation of said first actuating means to such an



extent as to set the predetermined step of said stepped disk between said positioning portion said said reference member; and

control means for controlling said first and second actuating means for activating said first actuating means so as to remove said magnetic head assembly in said direction away from said reference member and out of contact with said stepped disk, for activating said second actuating means during said interim, thereby causing the designated step of said stepped disk to be disposed between said positioning portion and said reference member, and thereafter for de-activating said first actuating means, such that said pressurizing means moves said positioning portion into contact with the prescribed step of said stepped disk disposed between said positioning portion and said reference member.

4,630,148

MAGNETIC-TAPE-CASSETTE APPARATUS WITH IMPROVED FUNCTION SWITCHING MECHANISM

Armin Deutsch, and Henricus M. Ruyten, both of Wetzlar, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,800

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312135; Netherlands, Apr. 11, 1983, 8301266

Int. Cl.[4] G11B *15/44, 15/02*

U.S. Cl. 360—93 **12 Claims**

1. In a magnetic-tape-cassette apparatus having a winding spindle rotatably mounted to a frame for driving a tape reel in a cassette inserted in the apparatus, and a head mounting plate which is moveable toward the cassette, a switching mechanism for switching the apparatus from one operating function to another, comprising

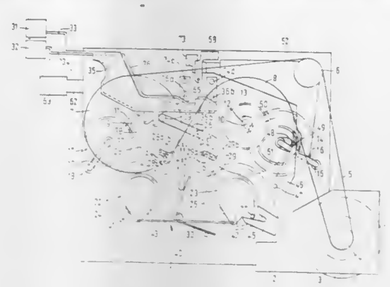
a switching member,

a switching wheel having a guideway and means for driving the switching wheel continuously during operation of the apparatus, said guideway actuating said switching member during tape stoppage,

detection means, coupled at least to said winding spindle, for controlling the engagement of the switching member with the switching wheel during tape transport, and

a connecting member arranged to be moveable by said switching member in a given direction, for switching the apparatus to another operating function,

characterized by comprising means for coupling the connecting member to said plate for positioning said plate,



a latching mechanism for latching said head plate in a latched position resulting from movement of the plate towards the cassette, and

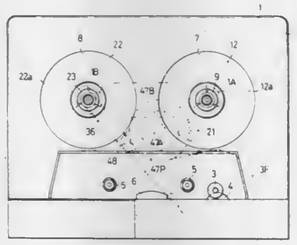
means for releasing the latching mechanism in response to actuation of said connecting member under control of the switching member, and for moving said plate away from the cassette toward a withdrawn position.

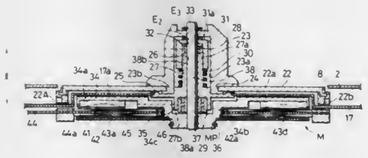
4,630,149

COMPACT CASSETTE TAPE PLAYER WITH CAPSTAN DRIVE MOTOR UNDER SPINDLE

Mitsuru Ida, Koshigaya, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,011
Claims priority, application Japan, Feb. 10, 1983, 57-21204
Int. Cl.[4] G11B *15/00, 15/26, 15/32*
U.S. Cl. 360—96.4 **4 Claims**





1. In an apparatus for reproducing signals recorded on a tape as the latter is moved at a constant speed from one another of two reels on which the tape is wound, said apparatus including two rotary spindle means arranged with their axes parallel and spaced from each other and adapted to have said two reels respectively mounted thereon, a rotatable capstan disposed to be engageable with the tape between said reels and being fixed to a flywheel, and a pinch roller for pressing the tape against said capstan which thereby drives the tape during a reproducing operation of the apparatus; a drive device comprising:

a motor including a shaft, a rotor secured to an end portion of said shaft and extending radially outward therefrom, a stator disposed in confronting relation to said rotor and being spaced from the latter in the direction of the axis of said shaft, said rotor being rotated at a constant rotational speed relative to said stator during said reproducing operation, and motor pulley means fixed relative to said shaft;

bearing means disposed, at least in part, within one of said spindle means, a portion of said shaft remote from said end portion having the rotor secured thereon extending axially into said one spindle means and being rotatably supported by said bearing means in the latter with said rotor and stator being axially remote from the reel mounted on said one spindle means;

an endless belt extending around said motor pulley means and said flywheel for driving said capstan at a constant rotational speed in response to the rotation of said rotor; and

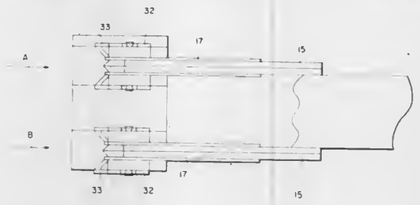
transmission means driven by said belt and including frictional coupling means through which the other of said spindle means is rotated from said motor shaft for take-up of the tape on the reel mounted on said other spindle means during said reproducing operation.

4,630,150

OPTICAL TOOL FOR ALIGNING TRANSDUCER HEAD ASSEMBLIES

David W. Collins, Rochester; Joel S. Johnson, Plainview; Laurence J. Schmidt, Rochester; Michael M. Siverling, Rochester, and William S. Wentink, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,891
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97 **13 Claims**



1. A magnetic disk transducer gap alignment apparatus for simulating the head positioning of a disk drive and for aligning opposed transducer heads which are to be positioned in such disk drive in operative confronting relation to the disk surfaces comprising:

a tool body;

a tool mounted on said tool body, having major surfaces separated by a distance which positions opposed transducer heads at a like distance of separation as occurs during operation in a disk drive being simulated;

said tool having a core to which a layer of glass is bonded on each major surface and which presents a pair of intersecting, reflecting surfaces over which said layers of glass extend; and

a grid formed on a surface of each of said glass layers which overlies each said respective reflecting surface with such grids being aligned with respect to the disk drive being simulated by said alignment apparatus;

whereby opposed transducer heads positioned against said tool glass surfaces can be observed using the reflective surfaces and adjusted to present transducer gaps at predetermined positions by adjusting the alignment of said gaps with respect to the confronting grid.

9. A transducer head gap alignment apparatus for positioning a transducer gap in a predetermined, operating position comprising:

a tool body; and

a tool that has a core to which is adhered a generally planar layer of transparent material and is mounted on said tool body to present an upper surface of said transparent material layer at the operation position of the transducer gap to be aligned;

said tool having a reflective surface adjacent a lower, opposite surface of said transparent layer, said reflective surface being inclined to the plane of the transparent layer upper surface and a grid formed on said transparent material which overlies said reflective surface,

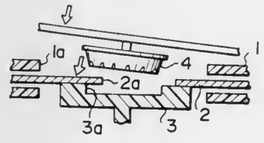
wherby a transducer gap positioned against said tool glass surface can be observed using the reflective surface and adjusted to present the transducer at a predetermined, operating position by adjusting the alignment of said gap with respect to the confronting grid.

4,630,151

FLEXIBLE MAGNETIC DISK DRIVING APPARATUS WITH LUBRICATED SURFACES

Yasutoshi Okuzawa, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1984, Ser. No. 591,457
Claims priority, application Japan, Apr. 1, 1983, 58-48721[U]
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] G11B *5/016, 23/00, 25/00*
U.S. Cl. 360—99 **6 Claims**



1. An apparatus for driving a flexible magnetic disk, comprising an upper positioning member and a lower positioning member for positioning a flexible magnetic disk sheet of the flexible magnetic disk by engagement with a circular hole at the center of said flexible magnetic disk sheet, wherein the improvemeht comprises a Teflon coating applied to surfaces of said upper positioning member and said lower positioning member, thereby decreasing coefficients of friction of said surfaces with respect to said flexible magnetic disk sheet, Teflon is a registered trademark for polytetraflouroethylene.

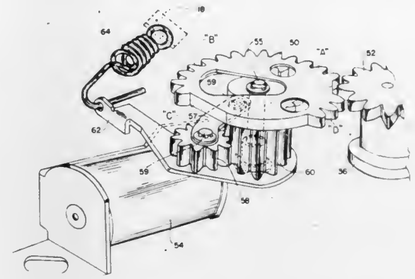
4,630,152

MECHANICAL DRIVE MECHANISM FOR THE RECORD/PLAYBACK HEAD AND PINCH ROLLER OF A CASSETTE-TYPE TELEPHONE ANSWERING MACHINE

Richard B. Kilstofte, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Continuation of Ser. No. 572,835, Jan. 23, 1984, abandoned. This application May 28, 1985, Ser. No. 738,277
Int. Cl.[4] G11B *5/54, 21/22;* **F16H** *55/17*
U.S. Cl. 360—105 **5 Claims**

1. A mechanism for selectively moving a carriage from a standby position to an operative position, said mechanism including: a supporting frame; a drive motor mounted on said frame; a drive gear rotatably mounted on said frame; means coupling said drive gear to said drive motor to cause said drive gear to be rotatably driven thereby; a function gear mounted on said supporting frame for rotation about an axis displaced from the axis of rotation of said drive gear, said- function gear having teeth extending partially around the periphery thereof in position to be engaged by said drive gear for selected angular positions of said-function gear, said function gear being disengaged from said drive gear for other angular positions thereof; an arm movable pivotally about the axis of rotation of said function gear; means coupling the distal end of said arm to said carriage; a third gear rotatably mounted about the axis of rotation of said function gear coaxially with said function gear



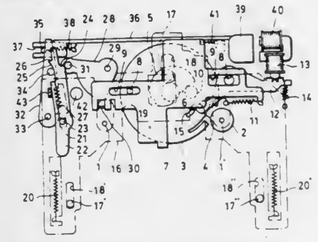
and affixed to said function gear; a fourth gear rotatably mounted on said arm in position to be driven by said function gear; and a crank link having one end pivotally mounted on said frame and having its other end eccentrically coupled to said fourth gear to cause said arm to move angularly in a reciprocal manner as said fourth gear rotates.

4,630,153

MAGNETIC TAPE DEVICE

Yukio Ito; Kazuki Takai, and Satoshi Takagi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 394,281, Jul. 1, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 695,166
Int. Cl.[4] G11B *5/54, 21/22*
U.S. Cl. 360—105 **1 Claim**



1. In a magnetic tape device including a cam (**5**), an operating member (**16**) driven by said cam to move a head (**19**) thereon to an operative position against a tape, and a changeover member (**7**) for linking said cam and said operating member, linkage means (**22, 28, 32, 36**) operatively connecting said changeover member to said operating member and moving said operating member in response to movement of said changeover member to an operative position, an electromagnetic plunger (**40**) cooperating with said linkage means for holding said operating member and said linkage means in an operative position with said head against said tape, spring means for moving said linkage means to a released position upon being released from said plunger, and biasing means (**20**) on said operating member for moving said operating member to an inoperative position when said linkage means is released from said electromagnetic plunger thereby moving said head thereon to an inoperative position.

4,630,154

HEAD PROTECTION MECHANISM FOR DISK DRIVE

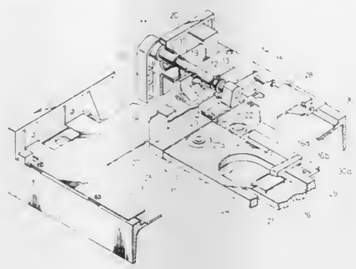
Yukiya Shiraishi, and Takeshi Yamashita, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 3, 1984, Ser. No. 677,183

Claims priority, application Japan, Dec. 2, 1983, 58-186642[U]

Int. Cl.⁴ G11B *5/54, 5/012, 5/016, 21/22*

U.S. Cl. 360—105 **5 Claims**



1. A head protection mechanism for preventing a magnetic head in a magnetic disk drive from being lowered to its disk media engagement position when a disk is not present in a disk receiving region inside the disk drive, comprising:

spring means linked to said head for urging said head upwards away from said media engagement position;

a rotable cam means linked to said head for forcing said head downwards toward said media engagement position when the cam means is rotated to a first position and for allowing said head to be urged away by said spring means when the cam means is rotated to a second position;

a rotable pivot to which said cam means is fixed, the pivot having a protection arm extending therefrom such that a free end portion of the protection arm swings to describe an arc about the pviot when said cam is rotated between said first and second positions; and

a protection cam pivotally mounted to said disk drive and having a generally L-shaped cross section comprising of a first leg swingable into and out of said disk receiving region of the disk drive such that when a disk is loaded into said disk receiving region, the first leg swings at least partly out of the disk receiving region, and a second leg swingable into and out of the swinging path of the protection arm such that the second leg swings into and blocks a blockable portion of the swinging path of the protection arm when the first leg has swung fully into said disk receiving region;

said protection arm extending from said pivot at an angle relative to said cam means such that said cam means is in said second position when said protection arm is in the blockable portion of its swinging path.

4,630,155

MAGNETIC HEAD SHIFTING MEANS FOR FLEXIBLE DISK MEMORY SYSTEM

Tadashi Hasegawa; Yoshiharu Kobayashi; Akira Iwamoto, and Yoshihisa Tedaka, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,457

Claims priority, application Japan, Aug. 23, 1982, 57-145701

Int. Cl.⁴ G11B *5/55, 21/08, 5/54, 21/22*

U.S. Cl. 360—106 **4 Claims**

1. A magnetic head shifting means for memory system including a flexible disk, said means comprising:

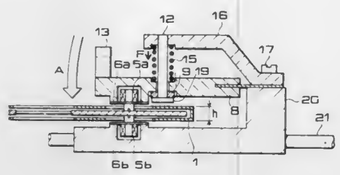
(a) a carriage movable in a radial direction of said flexible disk and supporting either of a pair of magnetic heads, said magnetic heads facing each other with said flexible disk therebetween;

(b) an arm, one end of which is joined to said carriage and another end of which carries the other of said magnetic heads;

(c) a coiled spring for applying a prescribed pressure to said arm;

(d) a spring-loaded member for holding said coiled spring; and

(e) a shackling means extending from said spring-loaded member to said arm for restricting movement of said arm



due to pressing of said coiled spring, said shackling means including a shackle rod the upper end of which is secured to said spring-loaded member, and the lower end of which is provided with an abutment portion and a cushioning material contacting with said arm in the recording/reproducing position, whereby a damping effect is provided in the direction that said head comes into contact with said flexible disk so that movable parts may be directly damped.

4,630,156

FLEXIBLE MAGNETIC DISC INCLUDING HUB STRUCTURE

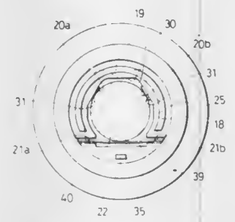
Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,780

Claims priority, application Japan, Feb. 10, 1983, 58-18575[U]; Mar. 4, 1983, 58-31442[U]

Int. Cl.⁴ G11B *23/03, 5/016;* **G01D** *15/24, 15/26*

U.S. Cl. 360—133 **20 Claims**



1. A flexible magnetic disc adapted for mounting on a drive spindle of a recording and/or reproducing apparatus, comprising:

a flexible magnetic sheet member having a circular periphery;

an elongate resilient member; and

a hub structure secured to said sheet member at the center of the latter and having a bore extending axially therethrough for receiving the drive spindle, said hub structure being an annular body of synthetic resin molded material including metal means defining a pair of positioning surfaces projecting into said bore at locations spaced apart about a central axis of said bore and a pair of seat means projecting into said bore at locations spaced apart about the axis of said bore and in opposing relationship with said pair of positioning surfaces, said pair of seat means including a corresponding pair of recesses adapted for receiving respective ends of said elongate resilient member and, said elongate resilient member also projecting into said bore at a side of the latter in opposing relationship with said pair of positioning surfaces when said ends of said elongate resilient member are seated in respective ones of said pair of recesses, and being engageable with the drive spindle therein for securely seating the drive spindle against said pair of positioning surfaces, and whereby said structure mitigates disc deformations in an operational mode.

4,630,157

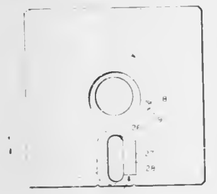
CLEANING DISKETTE FOR FLEXIBLE DISK DRIVE TRANSDUCERS

Howard T. Bond, Santa Clara, Calif., assignor to Garlic Technologies, Inc., Morgan Hill, Calif.

Filed Feb. 9, 1984, Ser. No. 578,347

Int. Cl.⁴ G11B *5/41, 23/03*

U.S. Cl. 360—128 **4 Claims**



1. A flexible cleaning disk for use in cleaning the transducers in a single sided flexible disk drive and a double sided flexible disk drive, said cleaning disk comprising:

a jacket having a central drive aperture and a pair of interior access apertures;

a flexible cleaning medium rotatably positioned within said jacket; and

a removable protective membrane having a tab portion adhered to the outer surface of said jacket adjacent one of said access apertures and a main body portion positioned within, but not secured to, the interior of said jacket between said cleaning medium and said one of said access apertures to normally cover said one of said apertures, said membrane having a thickness substantially less than the thickness of the material which forms said jacket.

4,630,158

VERTICALLY LOADING HEAD MODULE FOR MAGNETIC DISK DRIVE

John L. Spash, Harvard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 8, 1983, Ser. No. 483,340

Int. Cl.⁴ G11B *5/60, 21/20*

U.S. Cl. 360—103 **16 Claims**

1. A transducer module comprising:

a housing having a tubular wall terminating at one end with an opening, said housing having two slots positioned longitudinally on said wall at diametrically opposed locations;

a transducer slider;

a suspension diaphragm having inner and outer frames coupled to form a flexible gimbal, said inner frame having a bridge spanning a central inner frame opening and having a dimple in its center, said suspension diaphragm being positioned across said housing opening and being attached to said housing at two diametrically opposed places in proximity of said housing opening,

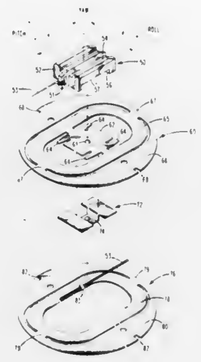
said slider being connected to said bridge on the surface facing said housing opening;

a suspension pickup member connected to said bridge on the surface opposite said slider;

a load diaphragm having inner and outer frames coupled to form a flexible gimbal having a central window, said load diaphragm being attached, at a predetermined distance from said suspension diaphragm, to said housing at two diametrically opposed places on said housing;

a load transfer plate disposed across said load diaphragm window and attached to said load diaphragm inner frame, said transfer plate having on one surface a tab adapted to be inserted in said suspension pickup member and on an opposite surface a load pickup member;

an unload diaphragm having an outer frame and a pair of



inner legs, said unload diaphragm being attached at a predetermined distance from said load diaphragm to two diametrically opposed places on said housing; and

an unload beam disposed on said unload diaphragm outer frame and secured to said inner legs, said unload beam having a central tab adapted to be inerted in said load pickup member, said unload beam having its two opposite ends protruding from said housing wall through said two slots.

4,630,159

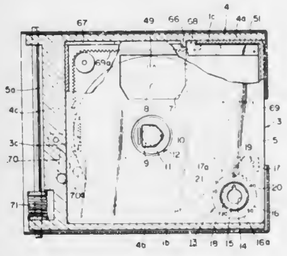
MAGNETIC DISC RECORDING AND/OR REPRODUCING APPARATUS

Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 389,277, Jun. 17, 1982, Pat. No. 4,536,813. This application Jul. 18, 1985, Ser. No. 742,018

Int. Cl.⁴ G11B *5/012, 5/55, 21/08*

U.S. Cl. 360—133 **13 Claims**



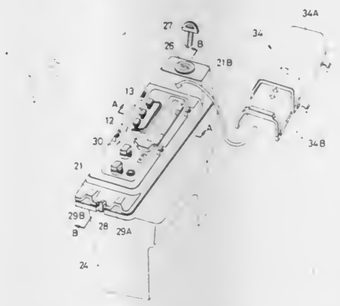
1. A magnetic disc cartridge of the type having a jacket for containing a rotatable magnetic disc therein, said disc having a hub member for receiving a drive member to rotate said disc to record information in circular tracks on said disc and comprising an opening in said jacket through which said hub member is accessed; and externally accessible indicator means provided on said jacket and adapted to be incrementally turned for

indicating the number of tracks in which information has been recorded.

4,630,160
DEVICE FOR INSTALLING ELECTRONIC EQUIPMENT ON A VEHICLE

Masato Murayama, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,197
Claims priority, application Japan, Sep. 19, 1981, 56-148256; Sep. 19, 1981, 56-148262; Mar. 30, 1982, 57-45271[U]; Mar. 31, 1982, 57-46302[U]
Int. Cl.⁴ G11B *00/00*; A47B *81/06*
U.S. Cl. 360—137 **34 Claims**

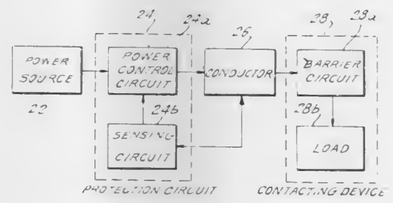


1. A device for detachably mounting an audio-type electronic console on a motorcycle, said device having a double-box like structure for protecting the audio-type electronic console from environmental exposure experienced on a motorcycle, comprising:
a substantially box shaped inner case for containing the electronic console therein; and
a substantially box shaped outer case slightly larger than said inner case and fixed to a front cowl of the motorcycle, said inner case being detachably mounted within said outer case.

4,630,161
PROTECTION TECHNIQUE FOR EXPOSED CONDUCTOR

John R. Seitz, New London Township, Chester County, Pa., assignor to American Antigravity Co., Inc., Great Neck, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,431
Int. Cl.⁴ H02H *3/00*
U.S. Cl. 361—42 **12 Claims**

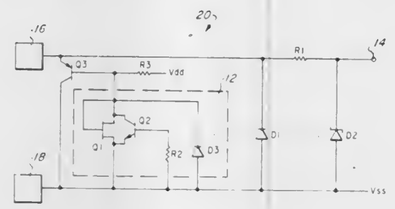


1. A protection device comprising:
power control means for controlling a flow of power from a power source to a conductor, the power control means being normally operable for periodically interrupting the flow of power; and
sensing means connected to the conductor for sensing whether an object is contacting the conductor while the flow of power is interrupted and for providing a contact signal to the power control means when the object is sensed; the power control means being further operable for restoring the flow of power after a momentary interruption if the contact signal is not provided by the sensing means and for maintaining the interruption of the flow of power if the contact signal is provided for protecting against the conduction of power to the object.

4,630,162
ESD INPUT PROTECTION CIRCUIT

Kenneth M. Bell, Windom, and William H. Giolma, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1984, Ser. No. 636,191
Int. Cl.⁴ H02H *9/00*
U.S. Cl. 361—56 **11 Claims**

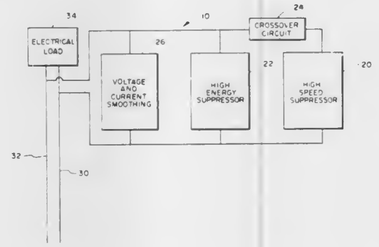


1. An electrostatic discharge protection circuit for an integrated circuit input, the integrated circuit being driven by a supply voltage source, comprising:
clamp means for providing a current path to a predetermined reference voltage when the voltage at the input exceeds a preselected value; and
switch means responsive to and controlled by said supply voltage source for providing a current path from the input to said clamp means when the input voltage exceeds the voltage of said supply voltage source.

4,630,163
METHOD AND APPARATUS FOR A TRANSIENT-SUPPRESSION NETWORK

Howard C. Cooper, Kaysville; Carl M. Rasmussen, Fruit Heights, and Perry N. Law, Kaysville, all of Utah, assignors to EFI Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 414,390, Sep. 2, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,998
Int. Cl.⁴ H02H *3/20*
U.S. Cl. 361—56 **39 Claims**

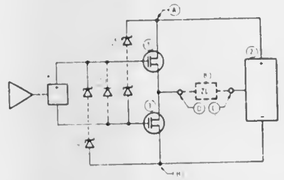


1. An electrical circuit which suppress electrical transients on an AC power-supply line including a transient voltage and a transient current, said circuit comprising:
first means for clamping said transient voltage to a predetermined, safe level in less than one nanosecond;
second means for clamping said transient voltage to a predetermined, safe level and for dissipating higher levels of energy not capable of dissipation by said first means;
means, connected in series with said first clamping means, for proportionally and non-interruptively limiting said transient current so as to protect said first clamping means from said higher levels of energy; and
filter means, connected to said first and second means, selected so as to filter harmonic voltage and current caused by clamping said transient voltage by either of said first and second clamping means.

4,630,164
PROTECTIVE CIRCUIT FOR COMPLEMENTARY FIELD-EFFECT TRANSISTORS

Bengt G. Olsson, Galärvägen 13, Saltsjö-Boo S-13200, Sweden

Filed Feb. 27, 1985, Ser. No. 706,111
Claims priority, application Sweden, Feb. 27, 1984, 8401092
Int. Cl.⁴ H02H *9/04*
U.S. Cl. 361—91 **7 Claims**



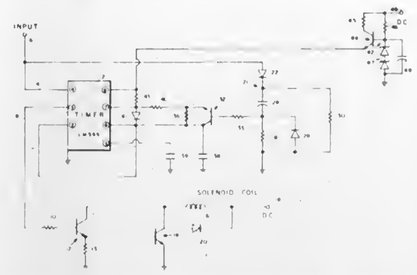
1. In a power amplifier circuit with complementary field-effect transistors including an N-channel transistor, the drain of which is operatively connected to the positive pole of a voltage source, and the source of which is connected to an output terminal of the amplifier and to the source of a P-channel transistor, the drain of said P-channel transistor being connected to the negative pole of said voltage source, the gates of said N-channel and P-channel transistors being connected to a substantially constant bias voltage source defining the zero voltage level of said amplifier, the improvement comprising:
zener diode means for protecting said field-effect transistors from overvoltages and over currents at operating voltages lower than or equal to the maximum permissible operating voltages of said transistors including,
a first zener diode having a cathode connected to the gate of said N-channel transistor and an anode connected to the drain of said P-channel transistor, and
a second zener diode having an anode connected to the gate of said P-channel transistor, and a cathode connected to the drain of the N-channel transistor.

4,630,165
D.C. POWER CONTROL FOR D.C. SOLENOID ACTUATORS

Anthony D'Onofrio, West Hartford, Conn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 10, 1985, Ser. No. 786,377
Int. Cl.⁴ H01H *47/22*
U.S. Cl. 361—154 **14 Claims**

1. A D.C. power control circuit comprising
means for selectively providing a sequence of high frequency current pulses,
circuit means for applying the pulses to a D.C. operated electromagnetic solenoid and

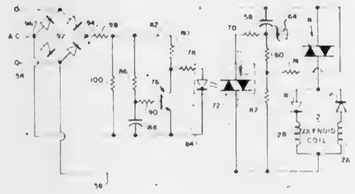


means for reducing the number of pulses applied to the solenoid after an initial full number of pulse applications during a predetermined time interval.

4,630,166
A.C. POWER CONTROL FOR D.C. SOLENOID ACTUATORS

Anthony D'Onofrio, West Hartford, Conn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 17, 1985, Ser. No. 791,171
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—205 **16 Claims**



16. A method of supplying A.C. power to a solenoid operated D.C. valve including the steps of rectifying the A.C. power, initially applying the full wave of the rectified A.C. power to the solenoid operator of the D.C. valve and after a predetermined time interval reducing the phase angle of the rectified A.C. power to a less than 180° portion of each A.C. rectified wave.

4,630,167
STATIC CHARGE NEUTRALIZING SYSTEM AND METHOD

Richard Huggins, Cupertino, Calif., assignor to Cybergen Systems, Inc., Santa Clara, Calif.

Filed Mar. 11, 1985, Ser. No. 710,570
Int. Cl.⁴ H05F *3/06*
U.S. Cl. 361—213 **13 Claims**

1. A system for neutralizing a static charge on a work surface comprising negative ion discharge means, positive ion discharge means, negative and positive power supplies respectively coupled to said negative and positive ion discharge means, control means for alternately operating said negative and positive ion discharge means, means for detecting the static voltage at said surface, and means responsive to said

detected voltage for operating said control means to switch between operation of said negative and positive ion discharge



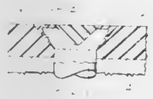
means substantially at a rate inversely proportional to the static voltage detected.

4,630,168

LIGHTNING PROTECTION FASTENER

James Hunt, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 16, 1985, Ser. No. 809,930
Int. Cl.[4] H05F *1/02*
U.S. Cl. 361—218 **8 Claims**





1. In an aircraft. the combination of:

a first structure with an external skin made from a plastic material;

a second structure; and

at least one fastener for attaching the first structure to the second structure;

said fastener comprising a shaft and a head, each of which is made from a metal that is more electrically conductive than said plastic material and that has sufficient strength to carry loads of a predetermined magnitude; and a cap of dielectric material secured to and covering a top portion of the head to prevent lightning strikes from attaching to the fastener;

said external skin having a countersink hole therein for receiving the head and the cap of the fastener; and

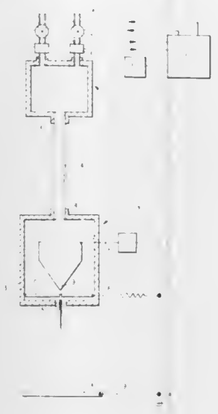
said cap being shaped and dimensioned and having sufficient resilience to essentially fill gaps between said top portion of the head and inner sidewall portions of the countersink hole, and to form, along with the external surface of said external skin, an aerodynamic surface which is sufficiently continuous to receive and maintain a crack-free coat of paint having a uniform thickness.

4,630,169

CHARGE INJECTION DEVICE

Arnold J. Kelly, Princeton Junction, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 4, 1984, Ser. No. 647,174
Int. Cl.[4] B05B *5/00*
U.S. Cl. 361—225 **21 Claims**



1. Charge injection apparatus which comprises:

(a) a charge injector having a high potential electrode with a pointed tip for injecting charge into a first fluid to be charged and an exit orifice, downstream of the pointed electrode, through which the charged fluid issues as a jet;

(b) means for combining with said first-mentioned fluid a second fluid which is of sufficient volatility that it volatilizes, on emerging from said exit orifice, to form a blanket of vapor enveloping the charged first fluid issuing from said exit orifice, the dielectric strength of the vapor of said volatilized second fluid being such as to oppose any tendency to dielectric breakdown occurring; and

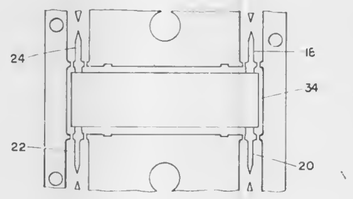
(c) a source of said second fluid, said source being connected to said fluid combining means for supplying said second fluid thereto.

4,630,170

DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Eugene Kask, deceased, late of Willimantic, Conn. (by Ester M. Kask, executrix); William A. Watson, and Jorge M. Hernandez, both of Mesa, Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed Mar. 13, 1985, Ser. No. 711,393
Int. Cl.[4] H01G *1/14, 7/00, 9/00*
U.S. Cl. 361—306 **38 Claims**



1. The method of making a capacitor, including the steps of: removing unwanted material from a strip of electrically

conductive material to define a first conductor having first active lead connected thereto and to define second, third and fourth leads isolated from said first conductor, said first, second, third and fourth leads being in the same plane;

placing a capacitor element on said first conductor, said capacitor element having first and second conductive end surfaces, with said first conductive end surface being in electrical contact with said first conductor, said capacitor element substantially covering said first conductor and partially covering said first and second leads;

placing a second conductor on said capacitor element with said second conductive end thereof being in electrical contact with said second conductor;

forming an electrical and mechanical connection between said second conductor and said third lead;

bonding the above elements to form an assembly; and

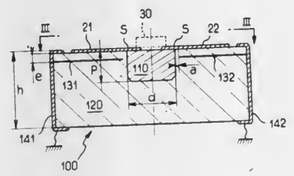
encapsulating said assembly to enclose and seal all of said assembly other than a portion of said first, second, third and fourth leads.

4,630,171

SUPPORT FOR A HIGH-SPEED COMPONENT, IN PARTICULAR A MICROWAVE FREQUENCY COMPONENT, THE SUPPORT INCLUDING INCORPORATED DECOUPLING MEMBERS

Jacques Dubuisson, and Pascal Le Gal, both of Paris, France, assignors to Eurofarad-EFD, Paris, France

Filed Nov. 23, 1984, Ser. No. 674,387
Claims priority, application France, Nov. 22, 1983, 83 18571
Int. Cl.[4] H01G *4/10, 7/00;* H05K *1/16*
U.S. Cl. 361—321 **11 Claims**



1. A support (**100**) for a high-speed component (**30**), in particular a microwave frequency component, in the form of a sintered block constituted by a stack of high dielectric constant ceramic sheets suitable for receiving surface metallization (**21–24**) for constituting connections to the terminals of a component supported by the support;

characterized in that the support comprises a central zone (**110**) which emerges at the surface of the support and which extends over substantially the same area as supported component (**30**), said central zone being formed by a material having a low dielectric constant;

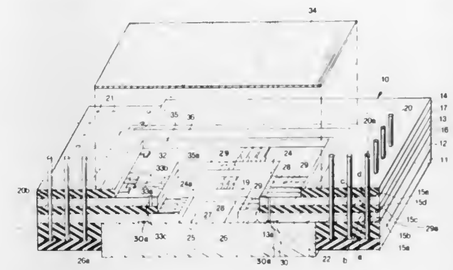
and in that the support is provided, outside the central zone and peripheral thereto, with at least one internal layer of metallization (**131, 132**) underneath the surface of the support and at shallow depth (e), said metallization being formed by a conductive pattern carried by one of the sheets of the stack and connected to a ground connection (**141, 142**), the internal metallization (**131; 132**) being opposite at least one part of the surface metallization (**21; 22**) in order to constitute therewith a decoupling capacitor for connection to at least one of the terminals of a component carried by the support.

4,630,172

SEMICONDUCTOR CHIP CARRIER PACKAGE WITH A HEAT SINK

Gary L. Stenerson, Santa Cruz, and Thomas J. Miller, Santa Clara, both of Calif., assignors to Printed Circuits International, Santa Clara, Calif.

Filed Mar. 9, 1983, Ser. No. 473,482
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **11 Claims**



1. A semiconductor chip carrier and contact array package comprising:

(a) a first dielectric layer;

(b) an aperture in said layer;

(c) chip connection means, having one or more wire bond layers for connecting chip contacts thereto, said chip connection means being bonded to a surface of said dielectric layer, said chip connection means including multiple discrete metallization patterns on said one or more wire bond layers;

(d) a chip-holding recess in said chip connection means;

(e) a base of heat-conductive material extending across said aperture and below said chip connection means;

(f) said base lying at least in part across said recess and extending through said dielectric layer aperture such that the base is exposed to ambient;

(g) an integrated circuit chip mounted in said recess in heat-conductive contact with said base, said chip having chip contacts connected to said metallization patterns;

(h) a contact array of pin contacts extending to and in electrical contact with particular ones of said multiple metallization patterns and extending perpendicularly from said chip connection means, said contact array pin contacts extending outboard of said recess; and

in which said chip connection means comprises at least two wire bond layers having connective pads at multilevels within the carrier to electrically connect said contact array thereto, said pads being electrically connected to chip leads extending from the mounted chip.

4,630,173

Patent Not Issued For This Number

4,630,174

CIRCUIT PACKAGE WITH EXTERNAL CIRCUIT BOARD AND CONNECTION

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Filed Oct. 31, 1983, Ser. No. 546,990
The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—388 **1 Claim**

1. A circuit package comprising:

an electrically insulating thermally conductive substrate

having a top surface and a bottom surface;

an electrically insulating housing covering said substrate and having a top wall spaced above said top surface of said substrate and having sidewalls depending downwardly from said top wall to said substrate to enclose and define a cavity bounded on the top by said top wall and on the sides by said sidewalls and on the bottom by said top surface of said said substrate;

circuit means, including power conditioning components and lead frame means, mounted on said top surface of said substrate, said lead frame means integrally extending away from said top surface of said substrate through said cavity and integrally externally of said housing beyond said top wall of said housing;

a printed circuit board external to said housing and extending laterally across the exterior of said top wall of said housing and connected to portions of said integrally extending lead frame means external to said housing, to thus provide a continuous electrical link from said circuit means on said substrate to said external printed circuit



board without intermediate junctions between discrete connectors;

wherein said external printed circuit board has apertures therethrough, and said lead frame means includes portions extending through said apertures;

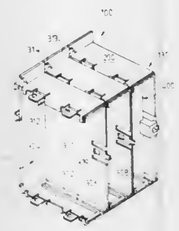
wherein said lead frame means includes other external portions bent laterally across said top wall of said housing and beneath said external printed circuit board;

and comprising terminal connection means including retaining means in said top wall of said housing below said laterally bent other external portions of said lead frame means and below said printed circuit board, said terminal connection means including attachment means extending through said printed circuit board, through said laterally bent other external portions of said lead frame means and into a recess in said top wall of said housing to engage said retaining means to clamp said printed circuit board and said laterally bent other external portions of said lead frame means into engagement.

4,630,175
ELECTRONIC CARD HOLDING CELL-LIKE STRUCTURE

Gérard Lerude, Antibes, and Christine Roux, Le Rouret, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 7, 1985, Ser. No. 699,098
Claims priority, application France, Feb. 8, 1984, 84 01916
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] H05K *5/02*
U.S. Cl. 361—424 **22 Claims**



1. An electronic card holding cell-like structure formed by assembling together at least two modular electronic card supporting and protecting cells, said modular cells each comprising a flat element or blank having two parallel edge portions, a front edge portion and a rear edge portion, a bottom extending perpendicularly to said blank from said rear edge portion and two lateral sides extending perpendicularly to said blank respectively from said two lateral edge portions, said lateral sides having guide means for the cards forming two respective lateral slides parallel to the blank and said lateral sides of the modular cell each comprise a first longitudinal edge portion adjacent the blank and a second longitudinal edge portion opposite the first one, these longitudinal edge portions comprising respectively complementary fixing means so as to allow fixing of two adjacent modular cells by assembly of the first longitudinal edge portions of the lateral sides of the first cell on the second longitudinal edge portions of the lateral sides of the second modular cell.

4,630,176
POLYOXOMETALATE-MODIFIED CARBON ELECTRODES AND USES THEREFOR

Edward A. Cuellar, Shaker Heights, and Michael J. Desmond, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 22, 1985, Ser. No. 801,111
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—433 **20 Claims**

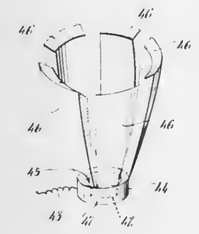


9. An electric double layer capacitor comprising a housing, at least one pair of spaced activated carbon electrodes in the housing, an electrolyte in contact with said electrodes, and an ionically conductive separator interposed between said electrodes and in contact therewith, the electrodes comprising activated carbon having a polyoxometalate compound stabilized on the activated carbon surface by a compound capable of generating at least one ionic site.

4,630,177
LIGHT-CONDUCTIVE DEVICE FOR ILLUMINATING CENTRIPETALLY VIEWED THREE-DIMENSIONAL OBJECTS

Henry Von Kohorn, 22 Perkins Rd., Greenwich, Conn. 06830, and David Von Kohorn, 1926 Menalto Ave., Menlo Park, Calif. 94025

Filed Oct. 15, 1984, Ser. No. 660,906
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 **5 Claims**



1. Apparatus for supporting and centripetally illuminating three-dimensional objects, comprising:

support means for the object to be illuminated,

an elongated, light conductive means extending vertically above said support means and disposed around said object,

said light conductive means having a lower end surface adapted to receive light, and

an upper end surface adapted to emit light in the direction of said object,

said light conductive means being a non-fibrous, self-supporting casting wherein said upper end surface comprises areas capable of being individually configured thereby enabling the projection of light of different intensities, colors and concentrations against selected surfaces of said object,

a light source disposed below and proximate to said object, so that the light path between said light source and said object does not exceed 15 centimeters, said light source being enclosed in a light chamber disposed below said object, and having an optical interface with the lower end surface of said light conductive means, and

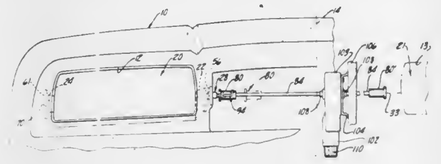
light shielding means covering said light chamber for preventing light in said light chamber from being directly visible while permitting light to issue from said light chamber through said optical interface and light receiving lower end surface upwardly into said light conductive means, so as to project light centripetally from said light emitting end surface towards the object to be illuminated.

4,630,178
ARTICULATED COUPLING ASSEMBLY FOR VEHICLE HEADLAMP DOORS

Donald A. Mugford, East Detroit, and Daniel D. Vivian, Bloomfield Hills, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 13, 1985, Ser. No. 808,771
Int. Cl.[4] B60Q *1/00, 11/00*
U.S. Cl. 362—64 **4 Claims**

1. In combination with a vehicle having a body, a pair of right and left openings formed in the forward end of said body on opposite sides of the longitudinal axis of said body, a headlamp assembly including a housing fixedly located in each of the openings, a closure for each opening, each said closure supported by inboard and outboard pivot means for pivotal movement about a transverse axis and arranged to pivot from a first position wherein said closure conceals its associated opening to a second position wherein each said headlamp assembly is exposed to project one or more beams of light forwardly of said body, a polygonal cross section torsion bar aligned on said transverse axis and extending between said right and left openings, motor means operative to rotate said torsion bar, each said inboard pivot means in the form of a pivot pin extending inboard from its associated closure, journal means in the housing pivotally supporting said pivot pin for rotation about said transverse axis, fastener means on the outboard end of each said pivot pin for removably connecting said pivot pin to its associated housing, the improvement comprising an articulated coupling interconnecting each said pivot pin to one end of said torsion bar, each said coupling including a



ball portion formed on the inboard end of each said pivot pin, each said ball portion being received in an axially extending socket formed in the outboard end of a spool member, a pair of diametrically opposed apertures in said spool member extending into said socket and aligned on a cross axis which intersects the principal axis of said spool member at a right angle, said spool member having an polygonal cross sectioned axial passage extending between its socket and the inboard end of said spool member, a diametrical slot in said ball portion, pin means extending through said socket aligned apertures and said slot such that with said pin means aligned on said slot principal axis said spool member adapted for limited axial and universal movement of said spool member relative to said ball portion, said motor means operative upon rotating said bar revolving each said spool member and its associated pivot pin thereby causing the right and left closures to be moved between their first and second positions.

4,630,179
RETRACTABLE LAMP STRUCTURE

Kazuyoshi Yukimoto, Kariya; Kenichi Fukura, Toyota; Eiji Hiramatsu, Nukata, and Akira Nishimura, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 25, 1985, Ser. No. 704,777
Claims priority, application Japan, Mar. 29, 1984, 59-62043
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—66 **7 Claims**

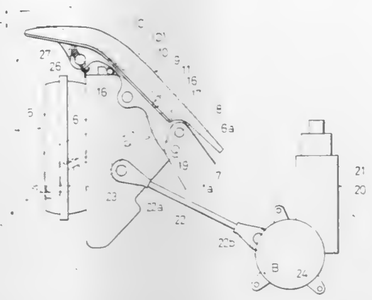
1. A retractable lamp, comprising:

a housing having an opening formed therein and a support;

a lamp pivotally held by a first single hinge defining a first axis to be extended out of and retracted into said housing, said first axis being at a fixed location on said support;

a lampcover pivotally held by a second single hinge defining a second axis to open and close said opening of said housing for exposing and retracting said lamp, said second axis

being at a fixed location on said support, said second hinge being located below said first hinge; and



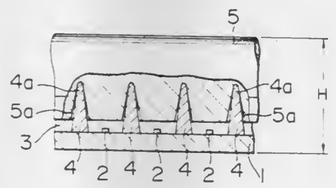
swing means connected to said housing for moving said lamp and said lampcover, whereby said lamp and said lampcover move simultaneously on the respective axes.

4,630,180

LIGHT EMITTING DIODE ARRAY

Katsuo Muraki, Yokosuka; Kiyokazu Honda, Zushi, and Takaki Watanabe, Imabari, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Harison Electric Company Limited, Imabari, both of, Japan

Filed Jun. 7, 1985, Ser. No. 742,511
Claims priority, application Japan, Jun. 11, 1984, 59-85548[U]
Int. Cl.⁴ F21S *1/00*
U.S. Cl. 362—223 **7 Claims**



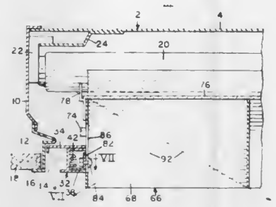
1. A light emitting diode array comprising:
(a) a base,
(b) a plurality of light emitting diode pellets arranged on said base,
(c) an outer frame member having one opening portion fastened to said base so as to surround said light emitting diode pellets,
(d) a lens having at least one recessed portion provided so as to cover the other opening portion of said outer frame member, and
(e) at least one partition member provided between said base and said recessed portion of said lens so as to partition said plurality of light emitting diode pellets in an arrangement direction, one end portion of said partition member positioned at the side of said lens being inserted into said recessed portion,
(f) said partition member being non-light transmitting, whereby off-axis radiation emitted by one of said pellets which would otherwise be transmitted through said lens in said arrangement direction towards an adjacent section of said lens overlying an adjacent pellet will be prevented from being so transmitted, resulting in more clearly defined image boundaries when selected pellets are energized while others are not.

4,630,181

FLUORESCENT LIGHTING FIXTURE

Elmer E. Fain, Carthage, and Charles O. Sutton, Diamond, both of Mo., assignors to H. E. Williams, Inc., Carthage, Mo.

Filed Jul. 15, 1985, Ser. No. 755,165
Int. Cl.⁴ F21V *7/00, 17/02*
U.S. Cl. 362—235 **2 Claims**



1. A lighting fixture comprising:
a. a fixture housing having a hollow interior and being open at its bottom,
b. a plurality of fluorescent lamp tubes disposed in horizontal, parallel relation in an upper portion of the hollow interior of said housing,
c. a louver assembly mounted in and covering the open bottom of said housing, said assembly defining a horizontal area and comprising spaced longitudinal louvers extending parallel to said lamp tubes and transverse louvers extending at right angles to said longitudinal louvers to divide the horizontal area of the assembly into vertically open cells, each longitudinal row of said cells being centered beneath one of the lamp tubes, the individual louvers being disposed in vertical planes and being of substantial vertical width to restrict light passing downwardly through said cells directly from said lamps to a primary area of relatively bright illumination directly beneath said fixture,
d. a plurality of non-transparent but translucent light-diffusing panels each covering one of the longitudinal rows of said cells, said panels being of any desired color, and said longitudinal louvers extending well above said panels to inhibit light from any one of said lamp tubes from reaching any panel not directly therebeneath, and
e. means rendering said lower assembly vertically adjustable in said housing to vary the vertical spacing thereof from the lamp, whereby horizontal size of said primary area of relatively bright illumination may be varied.

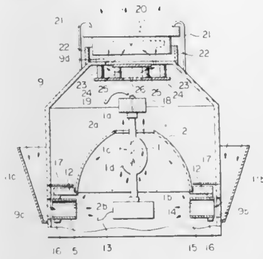
4,630,182

ILLUMINATING SYSTEM

Akihiko Moroi, Fujisawa; Hiroshi Tanaka, Yokohama, and Shinya Hatanaka, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,405
Claims priority, application Japan, Mar. 6, 1984, 59-42471
Int. Cl.⁴ F21V *29/00*
U.S. Cl. 362—294 **4 Claims**

1. An illuminating system comprising:
a light-emitting lamp;
a reflecting optical member provided with a reflecting face surrounding a space around said lamp and further provided at one end with a light-emitting aperture for emitting the light of said lamp through said reflecting face to the exterior of the reflecting optical member and at the other end with another aperture for passing a part of said lamp, said reflecting optical member having an optical axis passing through said light-emitting aperture and said another aperture, and the diameter of said light-emitting aperture being larger than the diameter of said another aperture;
a case member for accommodating said lamp and said reflecting optical member for separating the interior of said case member from the exterior thereof, provided with at least an intake hole and an exhaust hole for communicating the exterior with the interior of said case member, said intake hole being provided near said light-emitting aperture and said exhaust hole being provided at a position facing said another aperture;
air guide means provided inside said case member for connecting said intake hole with an air flow path passing through said light-emitting aperture and said another aperture, said air guide means having a tubular member disposed in a radial direction relative to said optical axis between said intake hole and the periphery of said light-emitting aperture; and
an air fan provided at said exhaust hole for generating an air flow from said intake hole to said exhaust hole through said tubular member and said air flow path.

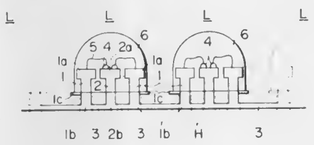


4,630,183

LIGHT EMITTING DIODE LAMP AND METHOD FOR PRODUCING THEREOF

Teizo Fujita, Ibaraki, Japan, assignor to Izumi Denki Corporation, Osaka, Japan

Filed Oct. 20, 1982, Ser. No. 435,591
Claims priority, application Japan, Oct. 23, 1981, 56-170403
Int. Cl.⁴ F21V *3/00*
U.S. Cl. 362—311 **13 Claims**



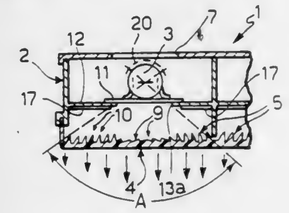
1. A light emitting diode lamp comprising:
(A) a light emitting diode assembly unit including,
(a) at least three spaced apart conductive means, one of said conductive means being central to the remaining two conductive means, and two remaining conducive means having radially extending portions at their lower end portions;
(b) at least one light emitting diode element electrically connected between one of the outer of said conductive means and the central of said conductive means at their upper end portions;
(c) a molding of a light-transmissible material which embeds said light emitting diode element and the upper portions of said conductive means, leaving lower end portions of said conductive means exposed;
(B) a lamp cap or base assembly unit including,
(d) a substantially cylindrical cap or base member having openings at its axially opposite end portions, said light emitting diode assembly unit being attached to said cap or base unit so as to seal one of the opposite openings of said cap or base member with the exposed lower end portion of said remaining two conductive means, said remaining two conductive means electrically connected at said radially extending portions to the rim of said remaining opening of said cap or base member; and
(e) an electrical contact means supported by an electrical insulating member which seals the other opening of said cap or base member and insulates said contact means from said cap or base member, the exposed lower end portion of the central conductive means being electrically connected to said contact means.

4,630,184

MOTOR VEHICLE LAMP, AND A LIGHT UNIT FOR MOTOR VEHICLES INCORPORATING SUCH LAMPS

Giorgio Ferrero, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

PCT No. PCT/EP85/00166, § 371 Date Dec. 16, 1985, § 102(e) Date Dec. 16, 1985, PCT Pub. No. WO85/04944, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 15, 1985, Ser. No. 817,947
Claims priority, application Italy, Apr. 16, 1984, 67384 A/84
Int. Cl.⁴ F21V *11/00, 9/16*
U.S. Cl. 362—351 **6 Claims**



1. Motor vehicle lamp comprising
a body (2),
a bulb (3) within the body (2),
a transparent glass (4) having a prismatic internal surface (5) for received light rays emitted by the bulb (3) and focusing them outwardly into a beam having predetermined characteristics,
a coloured filter (11) located between the bulb (3) and the transparent glass (4),
characterised in that the prismatic internal surface (5) of the transparent glass (4) includes diffusing lenses (13, 15) for scattering light rays passing through the transparent glass (4) from the exterior in all directions within the body (2) of the lamp, and in that the lamp further includes an internal reflective wall (17) for reflecting the light rays scattered within the body (1) of the lamp over the entire internal surface (5) of the transparent glass (4), so as to prevent the coloured filter (11) from being visible from the exterior when the bulb (3) is off and the lamp is illuminated from the exterior.

4,630,185

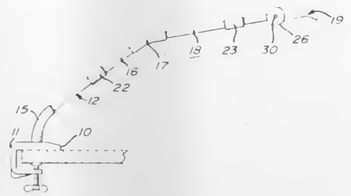
MECHANICAL ARM WITH TWO LINK MEMBERS

Anthony S. Copeland, 220 Lazard Avenue, Montreal, Quebec, Canada H3R 1N9

Filed Oct. 30, 1985, Ser. No. 793,103
Int. Cl.⁴ F21M *3/18*
U.S. Cl. 362—427 **12 Claims**

1. A mechanical arm comprising a fixed end base and a free end portion with a pair of spaced apart separate link members therebetween, each link member being substantially the same and each having a first goose neck portion with a rotatable connection to the fixed end base, a first rigid rod between the first goose neck portion and a second goose neck portion, and a second rigid rod between the second goose neck portion and

a rotatable connection to the free end portion, a first flexible spacer between the first rigid rods in the pair of link members



and a second flexible spacer between the second rigid rods in the pair of link members.

4,630,186

POWER SOURCE CIRCUIT

Sinji Kudo, Yokohama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,668
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—19 **4 Claims**



1. A switching power source circuit for intermittently switching a current at a primary winding of a transformer in accordance with repeated switching of a first bipolar transistor having its collector connected to said primary winding and its emitter connected to ground through a first resistor, and having a first diode and first capacitor connected to a secondary winding so as to rectify and smooth a voltage induced at said secondary winding of transformer, obtaining an output voltage therefrom, comprising:

a period determining circuit having a timing resistor and a series timing capacitor and connected between a first end of a feedback winding of said transformer and ground, the other end of said feedback winding being connected to the base of said first bipolar transistor, said timing capacitor being charged with a polarity so as to reverse bias said first bipolar transistor when said first bipolar transistor is turned on and thereafter being discharged to turn off said first bipolar transistor by means of a charge voltage of said timing capacitor;

a turn-off circuit having a second capacitor with one end connected to receive a voltage induced by said feedback winding through a second diode connected to said first end of said feedback winding, the other end of said second capacitor being connected to the base of said first bipolar transistor, and for applying the second capacitor charge voltage as a reverse bias voltage directly between the base and an emitter of said first bipolar transistor through a second transistor having its collector connected to the emitter of said first transistor and its emitter connected to said one end of said second capacitor, its base being connected to sense a voltage at the collector of a third transistor having a load resistor connected to said one end of said second capacitor, the emitter of said third transistor being connected to ground and the base thereof being connected to the ungrounded end of said first resistor connected between the emitter of the first bipolar transistor and ground through a second resistor and a capacitor in parallel therewith to sense when the voltage across the first resistor reaches a predetermined level wherein said second resistor is chosen to set positive feedback gain and said parallel capacitor increases the frequency of positive feedback; and

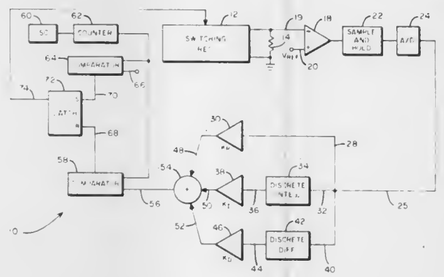
a voltage correction circuit having a third capacitor connected to receive a signal from an auxiliary winding through a third diode and applying the signal received by said third capacitor to said first end of said feedback winding through a third resistor and applying said signal received by said third capacitor to said base of said third transistor through a variable impedance device having an impedance adjusted according the output voltage to control said predetermined level.

4,630,187

POWER CONVERTER WITH DUTY RATIO QUANTIZATION

Christopher P. Henze, Eagan, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,684
Int. Cl.[4] H02M *1/14*; G05B *11/42*
U.S. Cl. 363—41 **14 Claims**



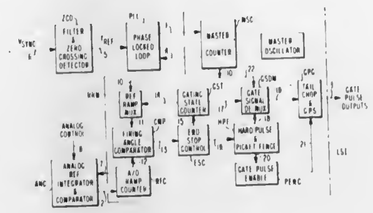
1. A power converter comprising a D.C. switching regulator and control means for regulating the duty cycle of said switching regulator comprising circuit means for sensing and comparing the output of said switching regulator with a reference and for developing an analog signal representative of the difference between said output and said reference, analog-to-digital conversion means coupled to said circuit means for producing first digital signals that are proportional to said analog signal during a measurement interval, integrating means coupled to said analog-to-digital conversion means for producing second digital signals that are proportional to the addition of said first digital signals during said measurement interval and the summation of said first digital signals obtained during preceding measurement intervals, and differentiating means coupled to said analog-to-digital conversion means for producing third digital signals that are proportional to the substration of said first digital signals obtained during the immediately preceding measurement interval from said first digital signals of said measurement interval, summation means for summing said first, second and third digital signals into error signals, timing means for producing a repetitive train of timing pulses, counter means for counting said timing pulses, comparison means coupled to said summation means and said counter means for producing an output when a comparison occurs and duty-cycle control means coupled to said comparison means and to said switching regulator for controlling the duty-cycle of said switching regulator in quantized steps in accordance with the value of said error signals associated with each of said measurement intervals.

4,630,188

MULTI-ZONE RAMP SYSTEM FOR DIGITAL PULSE GENERATOR AND LARGE SCALE INTEGRATED CHIP EMBODYING THE SAME

Kenneth E. Daggett, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1985, Ser. No. 793,037
Int. Cl.[4] H02M *7/155*
U.S. Cl. 363—129 **17 Claims**



1. In a digital gate pulse generator for equidistant and sequential firing of a plurality of static switches arranged in a sequence across a multi-phase AC power supply; including a ramp generator for providing a plurality of individual ramps matching in number and order said sequence of static switches; a reference count representing a desired firing angle; and a comparator responsive to said reference count and a ramp count on one individual ramp for firing a corresponding static switch at said firing angle; the combination of:

a master counter for recurrently counting through a ramp zone representing in electrical degrees the phase shift between two successive individual ramps to derive an instantaneous ramp zone count;

a delay counter responsive to said master counter for assuming successive states, each representing a segment of the complete cycle of said AC power supply, said segment representing a number of electrical degrees equal to said phase shift;

a state counter responsive to static switch firing for assuming successive states, each representing one state of said firing sequence;

logic means responsive to said delay counter and to said state counter for generating a logic count characterizing a corresponding one of said ramp zones;

said instantaneous ramp zone count being combined with said logic count for providing an intantaneous ramp count on an operative individual ramp and within a corresponding ramp zone.

4,630,189

SYSTEM FOR DETERMINING ABNORMAL PLANT OPERATION BASED ON WHITENESS INDEXES

Kazunori Ohmori, Fuchu, and Kensuke Kawai, Higashi-Murayama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 8, 1984, Ser. No. 618,713
Claims priority, application Japan, Jun. 10, 1983, 58-102736
Int. Cl.[4] G05B *13/04*
U.S. Cl. 364—150 **16 Claims**

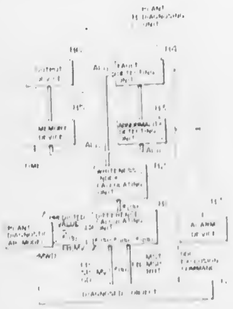
1. A method for diagnosing a thermal power plant system including a thermal power plant, provided with an automatic power plant control system receiving feedback signals of state variables of the plant and performing PID control, a control model formed of a mathematical model representing the combination of the plant and the automatic power plant control system, and a direct digital control system utilizing the control model and controlling the plant to conduct an optimum control, the automatic power plant control system and the direct digital control system conducting control complementarily, said method comprising the steps of:

providing a plant diagnostic model formed of a mathematical model representing the combination of the plant, the automatic power plant control system, the control model and the direct digital control system,

determining predicted values of the plant variables, by means of the plant diagnostic model,

determining a difference between the predicted value of each of the plant variables and the actual value of the same plant variable,

storing the determined difference successively thereby to provide a time series of the differences which have been successively determined,



determining whiteness indexes used for testing the whiteness level of the time series of the differences in accordance with the time series of the differences,

judging whether or not any of the plant variables is abnormal in accordance with the whiteness indexes,

judging whether or not any of the manipulated variables is faulty in accordance with the whiteness indexes and the result of judgement as to abnormality, and

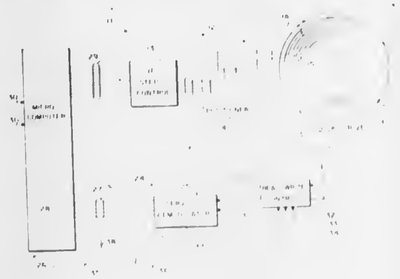
outputting an alarm when an abnormality or a fault is detected.

4,630,190

SERVO CONTROL APPARATUS FOR A DISK DRIVE

Ben Alaimo, Campbell, and Robert F. Couse, Saratoga, both of Calif., assignors to SyQuest Technology, Fremont, Calif.

Filed Feb. 21, 1984, Ser. No. 581,702
Int. Cl.[4] G11B *21/10*; G05B *15/02*
U.S. Cl. 364—167 **8 Claims**



1. A servo control apparatus for controlling a servo means for positioning a head that reads data on a data storage medium having a plurality of concentric circular data storage tracks, each of the concentric circular data storage tracks having a centerline, the data storage medium being secured on a rotatable drive, the servo control apparatus comprising:

reference track formed on one of the plurality of concentric circular data storage tracks, said reference track having a

plurality of bursts of reference data spaced around said reference track;

said bursts of reference data containing data indicating the position of the head relative to the centerline of said reference track as the head reads said reference data on said bursts;

decode means in communication with the head for decoding said reference data as said head reads said bursts to generate a plurality of reference counts representing the position of the head relative to the centerline of said reference track as the head reads said reference data on said plurality of bursts;

computer means in communication with said decode means for storing said plurality of reference counts, for calculating a runout factor from said plurality of reference counts indicating the deviation of the centerline of said reference track from the head as the head reads said plurality of bursts spaced around said reference track and for generating a runout signal from said runout factor;

wherein said computer means incudes:

(a) means for summing said plurality of reference counts;

(b) means for adding the value of about four to the sum of the plurality of reference counts, and for dividing the resultant value by the value of about eight to determine the offset count;

(c) means for rounding the offset count down to the lower integer and determining if the offset count is about zero;

(d) means for determining if the absolute value of any reference count is greater than the value of about three;

(e) means for generating a runout factor equal to a first reference count of said plurality of reference counts responsive to the offset count being about zero and the absolute value of each reference count being less than the value of three; and

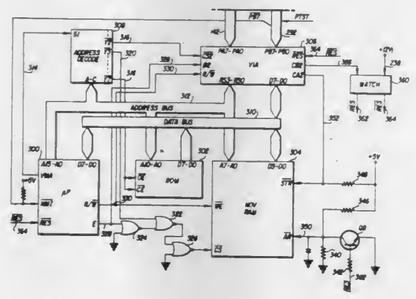
control means in communication with said computer means and with the servo means for causing the servo means to position the head in response to said runout signal so that the head is positioned to reduct the deviation of the centerlines of the plurality of concentric circular data storage tracks from the head as the rotatable drive turns the data storage medium for reading by the head.

4,630,191

AUTOMATIC BALER WITH OPERATOR CONTROLLED DIAGNOSTICS

Richard P. Strosser, Akron, Pa., assignor to New Holland, Inc., New Holland, Pa.

Filed Apr. 13, 1984, Ser. No. 599,908
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—186 **14 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 49 Pages)



9. In a baling machine having motor means providing power to drive elements of said baling machine to perform at least one operation during a baling cycle, the improvement comprising:

a first plurality of switches manually operable by an operator to produce output signals for controlling operation of said baling machine;

a second plurality of switches for sensing events occurring during a baling cycle and produced output signals indicating said events;

a plurality of output indicators for indicating to an operator the progress of a baling cycle and operations to be performed by him;

memory means;

an interface adapter having input terminals connected to said first and said second plurality of switches for receiving said output signals and output terminals connected to said output indicators and said motor means;

a microprocessor;

memory means for storing a program;

bus means interconnecting said microprocessor, said memory means and said interface adapter;

said microprocessor being normally responsive to said program to sample said input terminals and selectively apply output signals to said interface output terminals to energize said motor means and indicate to the operator the progress of a baling cycle;

a diagnostic program stored in said memory means;

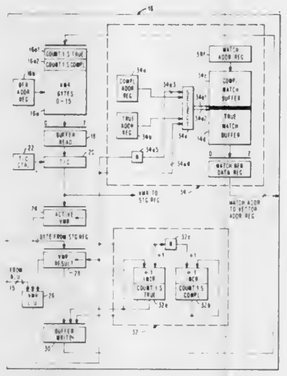
said microprocessor being responsive to actuation of one switch of said first plurality of switches to initiate execution of said diagnostic routine to successively actuate said indicators sequentially, each indicator being actuated for a predetermined period of time.

4,630,192

APPARATUS FOR EXECUTING AN INSTRUCTION AND FOR SIMULTANEOUSLY GENERATING AND STORING RELATED INFORMATION

Edward R. Wassel, Endwell, and Gerald J. Watkins, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1983, Ser. No. 495,563
Int. Cl.[4] G06F *12/04, 7/38*
U.S. Cl. 364—200 **4 Claims**



1. A computer system, comprising:

execution means for executing instructions and generating a set of results in response to the execution of said instructions, said set of results including binary digits;

first storing means responding to said set of results for storing said set of results therein; and

counting means responding to said set of results for maintaining a count, during the generation of said set of results by said execution means, of the number of identical ones of said binary digits the identical binary digits comprising binary one digits and binary zero digits, which comprise said set of results;

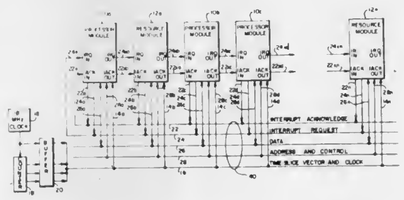
second storing means responding to said set of results for storing a first set of addresses therein, during the generation of said set of results by said execution means, which are the locations within said first storing means wherein said binary one digits are stored; and third storing means responding to said set of results for storing a second set of addresses therein, during the generation of said set of results by said execution means, which are the locations within said first storing means wherein said binary zero digits are stored.

4,630,193

TIME MULTIPLEXED PROCESSOR BUS

Bryan Kris, Warminster, Pa., assignor to Textron, Inc., Horsham, Pa.

PCT No. PCT/US81/00542, § 371 Date Sep. 23, 1982, § 102(e) Date Sep. 23, 1982, PCT Pub. No. WO82/03931, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 27, 1981, Ser. No. 428,488
Int. Cl.[4] G06F *13/42*
U.S. Cl. 364—200 **8 Claims**



1. A synchronous data processing system comprising:

N processor modules, each processor module including a processor and interface circuitry connected with the processor;

at least one resource module available for access by the processor modules;

a signal global microprocessor bus system commonly shared by the resource module and each of the processor modules, the resource module and the interface circuitry of each of the processor modules being connected in parallel to the bus system to enable communication among the processor modules and between the processor modules and the resource module; and

system timing means connected with the bus system for dividing a predetermined bus cycle time period into N equal time slices, each processor module being granted access to the global bus for a single time slice during each bus cycle time period;

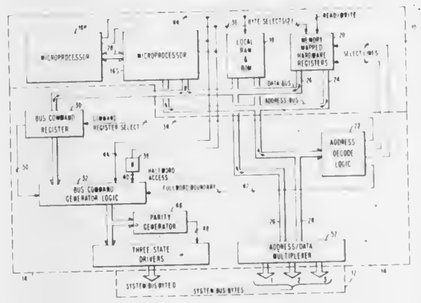
the interface circuitry of each processor module being configured to permit each processor to execute data received from a resource module directly as an instruction and being configured to enable each processor module to communicate information in signle word messages during the processor module's respective time slice so that the length of communication among any two of the processor modules and between any processor module and the resource module does not inhibit access by any other processor module to the resource module and to either of said two processor modules.

4,630,194

APPARATUS FOR EXPEDITING SUB-UNIT AND MEMORY COMMUNICATIONS IN A MICROPROCESSOR IMPLEMENTED DATA PROCESSING SYSTEM HAVING A MULTIBYTE SYSTEM BUS THAT UTILIZES A BUS COMMAND BYTE

Burton L. Oliver, Nanticoke, and David C. Preston, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,501
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **8 Claims**



1. Apparatus for generating a system bus command byte from a processing unit of a microprocessor implemented data processing system in response to a set of informaion, said set of information including a set of preliminary bus command bytes having predetermined command significant bits and a set control information, said control information being supplied by said microprocessor and said bus command bytes being supplied by a storage means and representing clues relating to the type of operation to be performed by a mainframe computer, said microprocessing unit interfacing with a multibyte width system bus of said mainframe computer which requires said bus command byte, said microprocessor being incapable of supplying said bus command byte, said apparatus comprising:

storage means for storing said set of preliminary bus command byte therein;

bus command register means connected to said storage means for storing one of said set of preliminary bus command bytes therein;

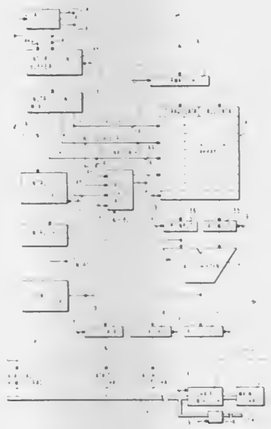
decoding means, connected to said microprocessor, said storage means and said bus command register means for receiving a storage address of the preliminary bus command byte to be stored in said bus command register means and for gating said preliminary bus command byte from said storage means into said bus command register means in response thereto, and

logic circuit means, connected to an output of said bus command register means and said microprocessor and responsive to the preliminary bus command byte stored in said bus command register means and to said control information supplied from said microprocessor for changing at least one of the command significant bits of said preliminary bus command byte in accordance with said control information thereby developing said system bus command byte required by said multibyte width system bus, said logic circuit means placing said system bus command byte on said system bus.

4,630,195
DATA PROCESSING SYSTEM WITH CPU REGISTER TO REGISTER DATA TRANSFERS OVERLAPPED WITH DATA TRANSFER TO AND FROM MAIN STORAGE

Phillip D. Hester, Austin, and William M. Johnson, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1984, Ser. No. 615,984
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 6 Claims



1. In a data processing system including a CPU, at least one external unit requiring data from or providing data to said CPU and an I/O bus for the transfer of said data between said CPU and external unit, said CPU comprising:

means for executing a sequence of instructions including a first instruction;

means connected to the executing means for transferring data to or from said external unit over said bus during synchronized CPU time cycles,

means connected to the executing means for storing data in a plurality of registers within said CPU,

means connected to the transferring means and storing means for internally transferring data within said CPU registers concurrently during the transfer of data to or from the external unit, and

control means connected to the executing means, transferring means and storing means for controlling the transfer of data wherein the transfer of data between CPU registers coincides with the transfer of data to or from the external unit, said control means further including means for

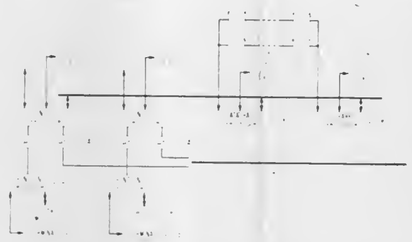
determining when data required for execution of a first of a sequence of instructions in said CPU has not been stored in one or more of the CPU registers as required by the first instruction and

delaying the execution of the first instruction until such data is stored in the one or more registers while permitting the execution of other instructions of said sequence that do not require any data resulting from the execution of said first instruction.

4,630,196
STORE AND FORWARD FACILITY FOR USE IN MULTIPROCESSING ENVIRONMENT

Joseph A. Bednar, Jr., Middletown; Richard L. Bennett, Lincroft; Charbak R. Dutt, Howell, and Michael K. Stafford, Red Bank, all of N.J., assignors to AT&T Information Systems, Inc., Holmdel, N.J.

Filed Apr. 13, 1983, Ser. No. 484,474
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 16 Claims



1. A store and forward communications system for transferring messages from an originating computer process to a destination computer process comprising

means for creating a message file in response to instructions from said originating computer process,

means for delivering a message to said destination computer process,

means for transferring information in said message file to said means for delivering

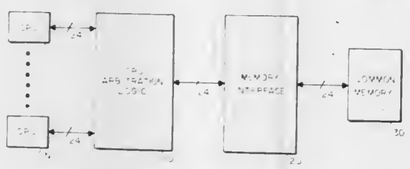
characterized in that said means for delivering includes means for creating said destination computer process from a destination program, means for notifying said means for creating said destination computer process that a message is available for delivery to said destination computer process, and

means responsive to a release request from said destination computer process for generating a confirmation message to be transferred and delivered to a computer process specified by said originating computer process.

4,630,197
ANTI-MUTILATION CIRCUIT FOR PROTECTING DYNAMIC MEMORY

Muhammad I. Khera, Glendale, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Apr. 6, 1984, Ser. No. 597,625
Int. Cl.[4] G06F *13/16*
U.S. Cl. 364—200 10 Claims



1. An anti-mutilation circuit for protecting dynamic common memory for a memory access cycle in a distributed processing system comprising:

a plurality of CPU means each providing address and data for accessing said common memory and each said CPU means operating to asynchronously generate a select signal for requesting access to said common memory;

arbitration means connected to each of said plurality of CPU means, said arbitration means being operated in response to a plurality of said select signals to provide a signal granting access of said common memory to one particular CPU means;

memory interface means connected between said arbitration means and said common memory and being operated to control said access of said common memory by said one particular CPU means;

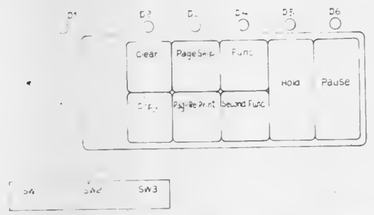
a plurality of request indicating means, each said request indicating means connected to a corresponding CPU means, to said memory interface means and to said arbitration means, each said request indicating means being operated in response to said select signal of said corresponding CPU means and in response to said access granting signal of said arbitration means to generate a request signal indicating which particular CPU means is to access said common memory; and

storage means connected to said arbitration means, to said plurality of request indicating means, to said memory interface means and to said common memory, said storage means being operated in response to one said request signal to retain said address and data of said one particular CPU means for said common memory access cycle.

4,630,198
INTELLIGENT STAND-ALONE PRINTFILE BUFFER WITH PAGING CONTROL

Houng I-Yuan, Computer Age, Ltd., Box 227, Nobleton, Ontario, Canada LOG 1NO

Filed Feb. 21, 1984, Ser. No. 582,170
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 5 Claims



1. A stand-alone file buffer comprising, in combination:

an import port adapted to receive data from a computer;

a user memory adapted to store data received via said input port;

an output port adapted to supply data stored in said user memory to a utilization device;

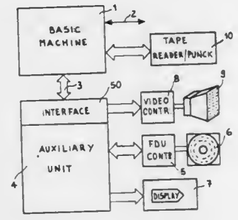
control means for establishing page definition information, said page definition information including an operator selectable line-per-page value; and

means for scanning the data in said user memory to locate page boundaries within said data in accordance with said page definition information, said means for scanning including means for counting lines of print within said data and means for establishing each of said page boundaries when the lines counted by said counting means equals said line-per-page value.

4,630,199
MESSAGE TRANSMISSION, RECEPTION AND PROCESSING APPARATUS FOR A TELEPRINTING STATION

Mario Lorenzi, Ivrea; Umberto Ratti, Turin, and Arturo Severini, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 273,615, Jun. 15, 1981, abandoned.
This application Mar. 20, 1984, Ser. No. 591,246
Claims priority, application Italy, Jun. 16, 1980, 67933 A/80
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 12 Claims



1. A message transmission, reception and processing apparatus, said apparatus comprising:

a first parallel bus;

a keyboard connected to said first parallel bus for generating message characters and commands for commanding said apparatus;

a printer connected to said first parallel bus for printing messages received from a telegraphic line and messages transmitted on said line;

a line interfacing unit connected to said first parallel bus and to said telegraphic line for coupling message characters and commands from said first parallel bus to said telegraphic line when said apparatus is in a message transmitting mode and for coupling message characters and commands from said telegraphic line to said first parallel bus when said apparatus is in a message receiving mode;

a first central processing unit connected to said first parallel bus for controlling the operation of said keyboard, said printer and said line interfacing unit;

a second parallel bus operatively isolated from said first parallel bus;

a memory unit connected to said second parallel bus for storing messages in a plurality of selectable zones;

display means connected to said second parallel bus for displaying at least part of a message stored in a selected one of said plurality of zones in said memory means;

a second central processing unit operating independently of said first central processing unit and connected to said second parallel bus for controlling the operation of said memory means and said display means;

a bus interfacing unit connected to said first parallel bus and to said second parallel bus, said bus interfacing unit including memory means for storing message characters and commands received from one of said buses for transmission to the other of said buses;

logic means connected to said first parallel bus and to said second parallel bus for controlling the operation of said bus interfacing unit, said logic means being controlled by said first central processing unit to cause said memory means of said bus interfacing unit to store message characters and commands received from said first parallel bus and to interrupt the operation of said second central processing unit, wherein said second central processing unit is caused to immediately receive the message characters and commands stored in said memory means of said bus interfacing unit;

said logic means being further controlled by said second central processing unit to cause said memory means of

said bus interfacing unit to store message characters and commands received from said second parallel bus and to provide a signal to said first central processing unit that message characters and commands are stored in said memory means of said bus interface unit, wherein said first central processing unit subsequently receives the message characters and commands stored in said memory means of said bus interface unit, and

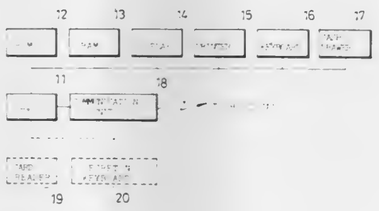
wherein said memory means of said bus interfacing unit comprises first and second registers, said first register being controlled by said logic means to temporarily store in sequence commands to be executed by said second central processing unit and message characters to be processed by said second central processing unit according to said commands, said second register being controlled by said logic means to temporarily store in sequence a series of message characters fetched from said memory unit, said first central processing unit periodically reading the contents of said second register.

4,630,200

ELECTRONIC CASH REGISTER CAPABLE OF PERFORMING CASH-DISPENSING TRANSACTIONS

Kenichi Ohmae, Yokohama; Kazuma Tateisi, Kyoto; Yoshitsugu Shinohara, Shiga, and Shinichiro Mizuno, Ibaraki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 29, 1984, Ser. No. 584,790
Claims priority, application Japan, Mar. 1, 1983, 58-34025
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 364—405 **10 Claims**



1. A cashing system comprising a control center and an electronic cash register connected to the control center by a communication channel, the control center comprising:

means for receiving data from and transmitting data to said electronic cash register;

a customer file for storing cash dispensing data in corresponding relation to individual customer identifying data; and

means for receiving a cash dispensing operation request from said electronic cash register, a cash dispensing operation being one where a customer receives cash from said cash register with the amount thereof being chargeable to a customer's account, means for determining whether or not a cash dispensing operation should be permitted, and means for transmitting a cashing permission instruction to said cash register if a cash dispensing operation is permitted, the electronic cash register comprising:

a cash drawer;

means for performing and recording a sales transaction;

a keyboard for performing and recording a sales transaction;

a keyboard having a cashing key for selecting a cash dispensing operation in which cash is dispensable from said drawer to said customer with the amount thereof being chargeable to the customer's account, and numerical keys for entering a cash dispensing sum involved in the cash dispensing operation;

input means for entering customer identifying data;

means for transmitting data concerning a request for a cash dispensing operation, including customer data and a cash dispensing sum, to said control center; and

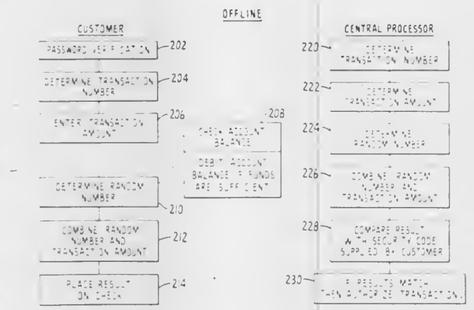
drawer control means for making said drawer operable in response to a cashing permission instruction received from said control center.

4,630,201

ON-LINE AND OFF-LINE TRANSACTION SECURITY SYSTEM USING A CODE GENERATED FROM A TRANSATION PARAMETER AND A RANDOM NUMBER

Peter White, Berkeley, Calif., assignor to International Security Note & Computer Corporation, Panama City, Panama

Filed Feb. 14, 1984, Ser. No. 580,003
Int. Cl.⁴ G06F *15/30, 7/58;* **H04L** *9/02*
U.S. Cl. 364—408 **17 Claims**



1. A security method for use in a transaction system which includes a central processor and a portable transaction device both having an internal memory, said security method for use in both on-line and off-line modes and comprising the steps of:

generating a sequence of transaction numbers;

generating a list of random numbers each of which is assigned to one of said transaction number thereby defining a table;

storing said table at both the central processor and in the portable transaction device;

assigning one of said transaction numbers to each transaction; and thereafter, during a transaction,

generating a security code, at either said central processor or said portable transaction device, said security code being derived by combining data representative of a transaction parameter and the random number listed in said table that is associated with the particular transaction number assigned to the present transaction; and

supplying the transaction parameter, transaction number and associated security code to the central processor or portable transaction device which did not initally generate the security code and verifying the transaction utilizing the received transaction parameter, security code and the random number associated with the received transaction number.

3. A security method as recited in claim 1 wherein the security code is generated at the portable transaction device and verified at the central processor.

4. A security method as recited in claim 3 wherein the transaction numbers are successive check numbers and further including the step of placing the security code generated by the portable transaction device on the check.

9. A security method as recited in claim 1 further including the steps of:

establishing an on-line connection between the portable transaction device and the central processor;

generating a random offset number at the central processor;

supplying the offset number to the portable transaction device; and

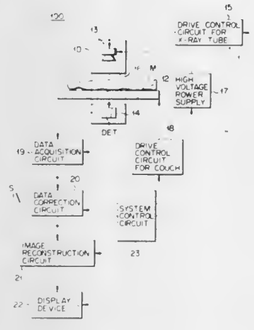
incrementing the list of available random numbers stored in the portable transaction device and the central processor based on said offset number thereby altering the assignment of random numbers to transaction numbers.

4,630,202

COMPUTERIZED TOMOGRAPHIC APPARATUS UTILIZING A RADIATION SOURCE

Issei Mori, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 14, 1983, Ser. No. 561,072
Claims priority, application Japan, Dec. 16, 1982, 57-221349
Int. Cl.⁴ G06F *15/42*
U.S. Cl. 364—414 **2 Claims**



1. A computerized tomographic scanner for obtaining images of multi-planar slices of an object comprising:

a radiation source for continuously rotating fan-shaped radiation rays irradiated toward a slice of the object;

radiation detector means having a plurality of elements for converting said radiation rays into an electrical signal proportional to an intensity thereof, and for detecting said fan-shaped radiation rays, penetrated through the slice of the object by said elements disposed opposite to said radiation source with respect to the object, to produce projection data representative of the profile of said intensities of said fan-shaped radiation rays penetrated through the slice at a rotation angle of said fan-shaped radiation rays;

object support means for continuously transporting said object so that said fan-shaped rays successively intersect said multi-planar slices of said object whereby helical scanning is effected by the continuous transportation of said object support means and movement between said radiation source and said radiation detector means;

correcting means for receiving said projection data for rotation angles larger than 360°, and smoothing said projection data of corresponding rotation angles for different scan slices to produce corrected projection data including smoother projection data for said corresponding rotation angles; and

reconstruct means for reconstructing said image of the slice from said corrected projection data.

4,630,203

CONTOUR RADIOGRAPHY: A SYSTEM FOR DETERMINING 3-DIMENSIONAL CONTOURS OF AN OBJECT FROM ITS 2-DIMENSIONAL IMAGES

Thomas Szirtes, 9 Fourwinds Drive, Unit 910, Downsview, Ontario, M3J 2S8, Canada

Filed Dec. 27, 1983, Ser. No. 565,932
Int. Cl.⁴ G01B *11/24;* **G06F** *15/42*
U.S. Cl. 364—414 **16 Claims**

1. Apparatus for the determination of the three-dimensional coordinates of a contour of an object, the images of the contour being identifiable, the apparatus comprising:

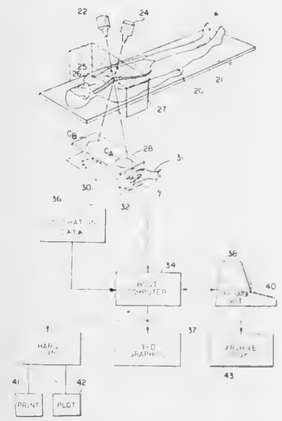
radiation means for emitting radiation from at least two spaced locations;

film means for exposure to said radiation, the film means being exposed to said radiation means in said at least two spaced locations whereby at least a first and a second two-dimensional image of the contour are formed on the film means at spaced locations;

calibration means for determining the spatial coordinates of the radiation means;

means for determining the two-dimensional coordinates of said first and second two-dimensional images of the contour;

processing means for processing said two-dimensional coordinates of said first and second images in which a point is selected on one of said first and second images and is



correlated with a point on the other of said first and second images;

correspondence means for performing said correlation in which an algorithm is used to determine a minimum value for the length of the normal transversal drawn between skew rays of radiation from said two spaced locations, which skew rays connect the two spaced locations to respective points on said first and second images, said minimum value thereby defining a corresponding pair of two-dimensional coordinates for each three-dimensional coordinate, which three-dimensional coordinate represents a point on the identifiable contour of the object, whereby corresponding coordinates on said first and second images are identified and processed in pairs, each processed coordinate pair and the spatial coordinates of the radiation means providing the three-dimensional coordinates of a point on the identifiable contour.

4,630,204

HIGH RESOLUTION ECG WAVEFORM PROCESSOR

David W. Mortara, Glendale, Wis., assignor to Mortara Instrument Inc., Milwaukee, Wis.

Filed Feb. 21, 1984, Ser. No. 582,225
Int. Cl.⁴ A61B *5/04;* **G06F** *15/42*
U.S. Cl. 364—417 **20 Claims**

1. An apparatus for averaging a plurality of electrocardiographic waveforms having P, Q, R, S, and T-segments to form a

means for sampling said plurality of electrocardiographic waveforms periodically and for generating a sequence of input data samples indicating the amplitude of the electrocardiographic waveforms at each sampled time;

means for selectively filtering a first frequency spectrum

from said input data samples to produce first filtered data samples, said first frequency spectrum corresponding to the major signal frequency components of the QRS-segments of the waveforms;

means for detecting heartbeat waveforms from said input data samples corresponding to said first filtered data samples;

means for selectively filtering a second frequency spectrum from said input data samples to produce second filtered data samples, said second frequency spectrum having a greater bandwidth than said first frequency spectrum to include major signal frequencies of the P, Q, R, S, and T-segments of the waveforms;

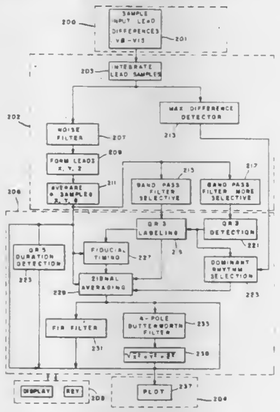
means for classifying heartbeat waveforms from said input data samples into different heartbeat types corresponding to said second filtered data samples and said detected heartbeat waveforms;

means for identifying representative heartbeat waveforms from said input data samples corresponding to at least one type of said classified heartbeat waveforms; and

means for averaging said representative heartbeat waveforms into the composite heartbeat waveform.

11. An apparatus for sampling a plurality of electrocardiographic waveform indicative of corresponding potentials from surface electrodes placed on a living body comprising:

means for sampling the plurality of waveforms periodically and for generating data samples indicating the amplitude of the waveforms at each sampled time;



said data samples containing parallel sample values for each electrode for each cycle of the sampling period;

means for filtering high frequency noise from said data samples such that high frequency signals in excess of one half the sampling rate are attenuated;

means for averaging the parallel sample values of each electrode to generate electrode sample values corresponding to a waveform from a single electrode; and

means for differencing corresponding electrode sample values to generate a heartbeat waveform representative of an electrocardiographic potential through one axis of the body.

17. A method for averaging a plurality of electrocardiographic heartbeat waveforms, having a QRS-segment and formatted as sucessive digital samples in a data stream, into an average heartbeat representation, said method comprising the steps of:

filtering said samples with a first band pass filter having a frequency pass band related to the major signal frequency components of the QRS-segment of an electrocardiographic heartbeat waveform, said first bandpass filter forming a set of detection samples corresponding to each of said digital samples;

filtering each of said samples with a second bandpass filter having a frequency pass band related to the major signal frequency components of the QRS complex of an electrocardiographic beat waveform but wider than the pass band of the first bandpass filter, said second bandpass filter forming a set of classification samples corresponding to each of said digital samples;

forming a template of template sample values corresponding to said sample values from said detection samples and said classification samples;

calculating a ratio for each sample value as the absolute value of the difference between a sample value and the corresponding template sample value divided by the absolute value of the sum of the sample value and the corresponding template sample value;

comparing said calculated ratios to determine the minimum ratio; and

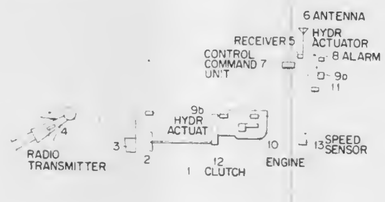
identifying the digital sample value at which the minimum ratio for a heartbeat waveform occurs.

4,630,205

SYSTEM FOR AUTOMATICALLY CONTROLLING NAVIGATION

Hideo Otaka, Tochigi, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,714
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424 **4 Claims**



1. A system for automatically controlling navigation of a ship, comprising a radio transmitter attached to the body of a sole crew member, a radio receiver installed on board the ship so as to receive a signal transmitted by said radio transmitter, and a control command unit connected with the output side of said radio receiver so as to control the prime mover of the ship to thereby stop the prime mover of the ship if the crew member falls overboard, wherein said radio transmitter transmits a radio signal while the crew member is on board the ship and stops or attenuates the signal if the crew member falls overboard, said radio receiver transmits an output signal to said control command unit when the generation of the signal by said transmitter is stopped or when the signal is attenuated, and wherein said control command unit is provided with means to receive an output signal from said radio receiver, if the crew member falls overboard, to thereby decelerate the prime mover of the ship, compute the time which passes from the time when the crew member fell overboard to the time when the prime mover of the ship has been decelerated and control the power line and the steering system of the ship in accordance with the computed time so that the ship moves ahead or astern or turns at a low speed to a position near the crew member and then stops.

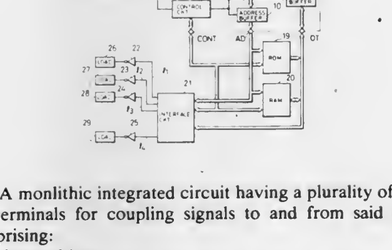
4,630,206

METHOD OF FUEL INJECTION INTO ENGINE

Matsuo Amamo, and Takao Sasayama, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,525
Claims priority, application Japan, May 31, 1983, 58-95034
Int. Cl.[4] F02B *3/00*
U.S. Cl. 364—431.07 **3 Claims**

1. A method of controlling an engine including the steps of sampling instantaneous flow rates of intake air supplied to the engine a plurality of times during each intake stroke, computing the quantity of intake air to be supplied to the engine in an intake stroke on the basis of the sampled instantaneous intake air flow rates, computing the quantity of injected fuel on the basis of the computed intake air quantity, and injecting the computed quantity of fuel to the engine, wherein said step of computing the injected fuel quantity includes computing the



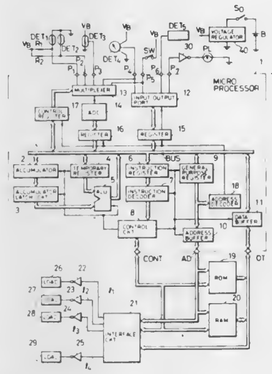
ratio between the instantaneous intake air flow rate sampled at a reference timing in the preceding intake stroke and that sampled at a reference timing in the present intake stroke and correcting the quantity of intake air to be supplied in the present intake stroke on the basis of said computed ratio, and wherein said quantity of injected fuel is computed on the basis of said corrected quantity of intake air.

4,630,207

MONOLITHIC INTEGRATED CIRCUIT HAVING COMMON EXTERNAL TERMINAL FOR ANALOG AND DIGITAL SIGNALS AND DIGITAL SYSTEM USING THE SAME

Shirou Baba, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 231,923, Feb. 5, 1981, Pat. No. 4,451,981. This application Mar. 8, 1984, Ser. No. 587,524
Claims priority, application Japan, Feb. 20, 1980, 55-18986
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] G05B *11/01;* **G06F** *15/00*
U.S. Cl. 364—431.12 **14 Claims**



1. A monlithic integrated circuit having a plurality of external terminals for coupling signals to and from said circuit comprising:

an internal bus;

a digital signal input circuit having at least one digital signal input node coupled to one or more of said plurality of external terminals and at least one output node;

an analog signal input circuit having at least one analog signal input node and at least one output node coupled to said internal bus;

first switching means for transmitting to said analog signal input node an analog signal from at least one of said external terminals coupled to said digital signal input circuit;

second switching means for selectively coupling said output node of said digital signal input circuit to said internal bus;

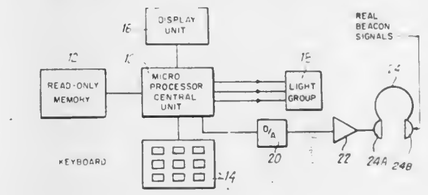
control means for controlling the switching states of the first and second switching means.

4,630,208

IDENTIFICATION OF BEACONS

Guy Le Pechon, 2 allee des Troenes, F-92330 Sceaux, France

Filed Dec. 14, 1983, Ser. No. 561,451
Claims priority, application France, Jan. 6, 1983, 83 00120
Int. Cl.[4] G01C *21/00;* **G06F** *15/50*
U.S. Cl. 364—443 **11 Claims**



1. Apparatus for aiding a navigator to identify a light pattern such as of a beacon, particularly for navigation purposes, comprising

memory means containing data relating to light beacons of a region including data on the light patterns of beacons;

means to call up and simulate the light pattern of a particular beacon from said memory means; and

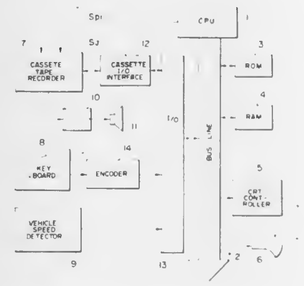
means to enable comparison of the light patterns from a beacon with the data on simulated light patterns called up from said memory means.

4,630,209

AUDIO/VISUAL DISPLAY SYSTEM FOR MULTIPLE MAPS

Takao Saito, and Masakazu Moriyama, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 14, 1982, Ser. No. 388,170
Claims priority, application Japan, Jul. 1, 1981, 56-102757
Int. Cl.[4] G06F *15/50;* **G08G** *1/12*
U.S. Cl. 364—444 **7 Claims**



1. A system for selectively producing visual and audio information relating to at least one geographical map, comprising:

a magnetic tape disposed in a standard cassette enclosure,

said tape having serially stored thereon (a) digital signals representing images of plural distinct geographical maps, (b) digital signals representing an image of predetermined designations of each of said maps, and (c) analog signals representing sounds associated with said images, said analog signals being physically stored on said tape in proximity to the digital signals representing images associated therewith;

means for automatically locating a first position on said tape at which said digital signals representing said image of said predetermined designations are stored, and for automatically locating a second position on said tape at which said digital signals representing the image of a selected geographical map are stored;

means for reading said digital signals representing said image of said predetermined designations from said tape beginning at said first located position, and for reading said digital signals representing the image of said selected map and said analog signals representing sounds associated with the image of said selected map from said tape beginning at said second located position;

means for visually displaying the image of said predetermined designations in response to said digital signals read by said reading means, and for visually displaying the image of said selected map in response to said digital signals read by said reading means;

means for generating sounds in response to said analog signals read by said reading means; and

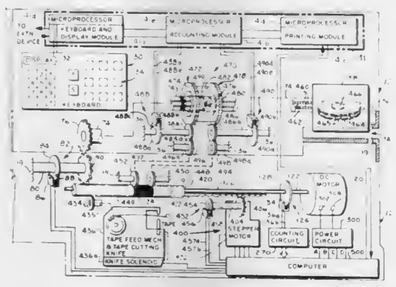
control means for selecting one of said predetermined designations in response to the image of said predetermined designations produced by said display means, and for controlling said locating means to locate the position on said tape at which said digital signals representing the image of the geographical map designated by said selected designation are stored.

4,630,210

MICROPROCESSOR CONTROLLED D.C. MOTOR FOR CONTROLLING A LOAD

Edilberto I. Salazar, Brookfield, and Wallace Kirschner, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,695
Int. Cl.[4] G06F *15/20;* **H02P** *5/06;* **H02K** *37/00*
U.S. Cl. 364—464 **25 Claims**



1. Apparatus for controlling the velocity of a portion of a load in accordance with a trapazoidal-shaped velocity versus time profile, comprising:

(a) a d.c. motor including an output shaft for driving the load;

(b) means for sensing angular displacement of the motor output shaft;

(c) microprocessor comprising

i. clock means for generating successive sampling time periods,

ii. means for providing first counts respectively representative of successive desired angular displacements of the motor output shaft during successive sampling time periods to cause the load portion to be moved in accordance with a predetermined trapezoidal-shaped velocity versus time profile,

iii. means responsive to the sensing means for providing second counts respectively representative of actual angular displacements of the motor output shaft during successive sampling time periods, and

iv. means for compensating for the difference between the first and second counts during each successive sampling time period and generating a pulse width modulated control signal for controlling the d.c. motor, the motor control signal causing the actual angular displacement of the motor output shaft to substantially match the desired angular displacement of the motor output shaft during successive sampling time periods, whereby the load portion is moved substantially in accordance with the predetermined trapezoidal-shaped velocity versus time profile; and

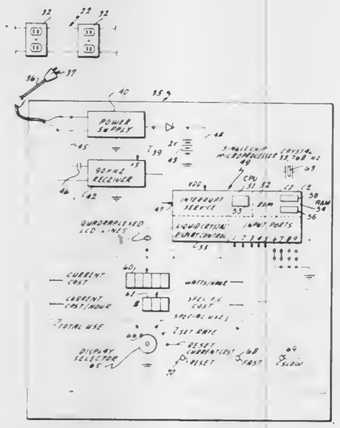
(d) signal amplifying means for operably coupling the motor control signal to the d.c. motor.

4,630,211

WATT-HOUR METER DISPLAY FOR INFORMING CONSUMER OF ENERGY CONSUMPTION

Charles D. Pettis, P.O. Box 23, Batesville, Tex. 78829

Filed Apr. 23, 1984, Ser. No. 602,696
Int. Cl.[4] G01R *19/00, 21/133*
U.S. Cl. 364—464 **10 Claims**



5. A system associated with an electric meter for displaying real time data for a consumer regarding consumption of electricity for a special use in a home having a.c. supply lines with a plurality of outlets, said system comprising:

a detector means for sensing on the order of 200 equally spaced marks on the circumference of a surface of a rotating disk within said electric meter and for generating meter signals corresponding thereto;

means for applying said meter signals as high frequency electrical signals on the a.c. supply lines;

means capable of being plugged into any outlet of said a.c. supply lines for receiving said high frequency signals and generating digital meter pulses;

a clock means for generating digital time pulses representative of real time;

a microprocessor means including a first counting means for counting said digital meter pulses and a second counting means for counting said digital time pulses to define successive fixed time periods, each fixed time period being on the order of 5 seconds in duration;

a display selector for controlling data being displayed by said microprocessor means on said display means and including a total use display setting and a special use display setting;

said display selector when being set to the total use display setting controlling said microprocessor means to count the digital meter pulses received in a fixed time period when consumption of electricity is stabilized on the a.c. supply lines and to calculate and store an amount of watts corresponding to said stabilized consumption during said fixed time period;

said microprocessor means being thereafter responsive to said display selector being set to the special use display setting and starting with a first fixed time period that the specal use begins to count the digital meter pulses received during each fixed time period to calculate an amount of increment of watts represented thereby and subtract the stored amount of watts corresponding to said stabilized consumption for a fixed time period, thereby providing only an amount of watts consumed by said special use during each said fixed time period; and

said microprocessor means responsive to the amount of watts used by the special use during each said fixed time period to calculate the incremental cost of the electricity and add it to a previous cost so far accumulated to obtain a real time specific cost and to further calculate a real time watts per hour usage of said special use; and

a display means;

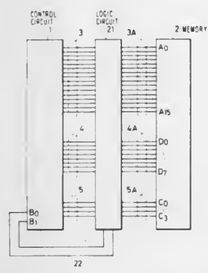
said microprocessor means including means to update the display of said real time specific cost and real time watts per hour usage on said display means each said fixed time period whereby the consumer is kept informed of the specific cost and the real time watts per hour rate of the electricity being consumed during said special use.

4,630,212

SEWING MACHINE WITH MEMORY INPUT RECONFIGURATION BASED ON TYPE OF MEMORY BEING USED

Katsunori Shigeta, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,925
Claims priority, application Japan, Nov. 29, 1982, 57-208783
Int. Cl.[4] D05B *19/00*
U.S. Cl. 364—470 **5 Claims**



1. An apparatus for controlling a sewing machine, comprising:

(a) a semiconductor memory device having sewing pattern data and an identification code related to a type of said semiconductor memory device stored therein;

(b) a control circuit for reading the sewing pattern data from said semiconductor memory device to control the sewing machine for effecting a predetermined sewing operation, said control circuit including connector lines for reading the sewing pattern data from said semiconductor memory device; and

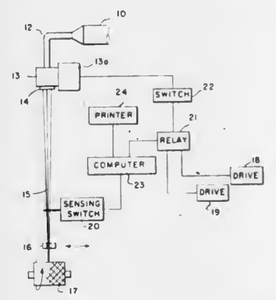
(c) a switching circuit for automatically switching connections of said connector lines dependent on the type of said semiconductor memory device by reading said identification code from said semiconductor memory device to determine the type thereof and for effecting logic connections of said connector lines suitable for said type of said semiconductor memory device.

4,630,213

METHOD OF REDUCING THROUGHPUT OF SPINNING PUMPS

Lester P. Stagg, Jr., and William T. Windley, both of Seaford, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 537,480, Sep. 30, 1983, abandoned. This application May 3, 1985, Ser. No. 730,066
Int. Cl.[4] B29C *31/04, 47/92;* **G06F** *3/14*
U.S. Cl. 364—470 **1 Claim**



1. A method for reducing throughput of one or more spinning pumps in a multiposition spinning machine having a spinning pump at each position in response to yarn interruption signals from a spinning position wherein said spinning pumps are driven by individual electric motors energized from a common source supplying a set frequency and voltage, said method comprising: transmitting said signals to a microprocessor; scanning said multiposition spinning machine to determine the number of yarn interruption signals occurring at any given time; comparing the number of yarn interruptions to a predetermined number; and reducing the frequency and voltage supplied to the electric motor driving the spinning pump supplying the position signalling a yarn interruption by connecting said motor to an alternate source supplying a frequency and voltage lower than the common source supplying said set voltage and said set frequency to reduce the speed of the spinning pump when the yarn interruption signals do not exceed said predetermined number.

4,630,214

JIG GRINDER WITH AUTOMATIC RECIPROCATION AND OUTFEED CONTROL

Kevin S. Barney, Monroe; Theodore J. Langevin, Seymour; Harold W. Lawson, Jr., Shelton, and Dennis A. Winski, Fairfield, all of Conn., assignors to Moore Special Tool Co., Ltd., Bridgeport, Conn.

Filed Apr. 13, 1984, Ser. No. 600,286
Int. Cl.[4] G06F *15/20;* **B24B** *49/00;* **B23Q** *5/10;* **G05B** *19/18*
U.S. Cl. 364—474 **14 Claims**

4. In a machine tool having:

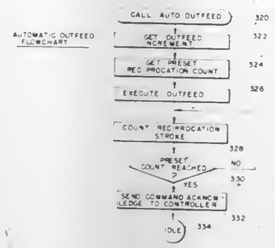
a spindle;

a tool coupled to said spindle;

means for outfeeding said tool from the longitudinal axis of said spindle in a direction away from said longitudinal axis; and

means for longitudinally reciprocating said spindle, the improvement comprising:

means operatively associated with said outfeeding means for automatically actuating said outfeed means to effect an



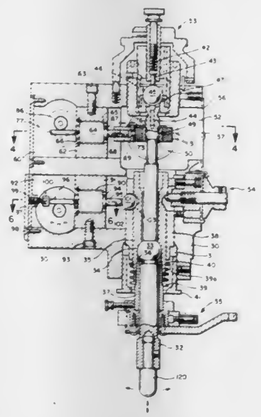
outfeed of a preset distance increment when said spindle completes a predefined number of reciprocation strokes.

4,630,215

MACHINE TOOL TRACER ASSEMBLY AND CONTROL SYSTEM

Merrill E. Graham, Jr., P.O. Box 545, Tehachapi, Calif. 93561

Filed Oct. 31, 1983, Ser. No. 547,375
Int. Cl.⁴ G05B *19/00*
U.S. Cl. 364—474 **21 Claims**



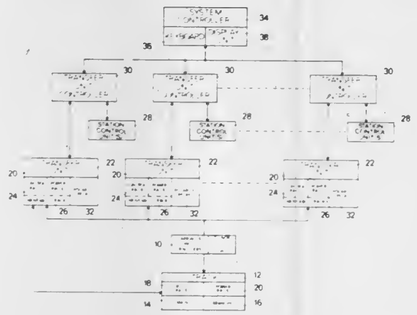
1. A tracing stylus assembly for controlling the operation of an electrically controlled machine tool, comprising a housing adapted to be mounted on a machine tool; a stylus member mounted in said housing, one end of which extends from the housing and is adapted to be held by a user and manipulated to trace a pattern, the stylus member being movable in said housing in transverse planes which correspond to the transverse planes of relative movement between the material being machined and the machining implement; means for converting the movement of the stylus member in each plane into electrical signals representative of the amount and direction of movement of the stylus in each plane, such signals being a separate voltage signal for each plane of movement with the polarity of the signal indicating the direction of movement in such plane and the amplitude of the signal indicating the amount of movement; a first differential amplifier for each plane of movement connected to receive the signals from the stylus representing movement of the stylus in one direction in that plane and to produce an output representative of a difference between that input and a first reference signal; a second differential amplifier for each plane of movement connected to receive the signals from the stylus representing movement of the stylus in the opposite direction in that plane and to produce an output representative of the difference between that input and a second reference signal; and a third differential amplifier for each plane of movement connected to produce a signal representative of the difference in the outputs of the first and second differential amplifiers, the output signal from the third differential amplifier being the signal representative of the movement of the stylus in either direction in that plane from its adjusted zero position, adjustment of at least one of the reference signals adjusting the zero output position of the stylus in that plane.

4,630,216

METHOD AND APPARATUS FOR CONTROLLING AND MONITORING MOVEMENT OF MATERIAL-TRANSPORTING CARRIAGES

Tommy N. Tyler, Broomfield, and John W. Harvey, Aurora, both of Colo., assignors to Translogic Corporation, Denver, Colo.

Filed Jun. 5, 1984, Ser. No. 617,348
Int. Cl.⁴ G06F *15/46;* **B62D** *1/24;* **B65J** *47/10*
U.S. Cl. 364—478 **38 Claims**



1. A method for controlling movement of one or more carriages along a track using digital circuitry, comprising:
- providing a plurality of carriages and a track along which said carriages can move;
- providing each of said carriages with an identifier different from the identifiers of the other of said plurality of carriages;
- selecting a receiving address for one of said carriages located at a sending address;
- moving said one carriage along the track from said sending address;
- determining the path to be taken by said one carriage using the identifier of said one carriage; and
- controlling the movement of said one carriage, including monitoring the position of said one carriage along the track as said one carriage moves towards its receiving address so that a fault relating to said carriage not reaching its receiving address is known and the approximate location of said carriage can be determined.

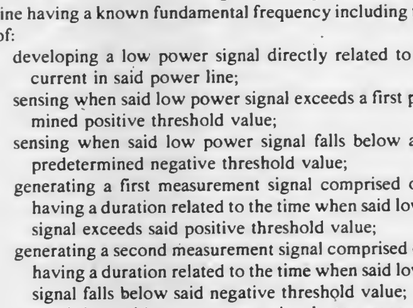
4,630,217

SIGNAL SYNTHESIZER SYSTEM

Larry J. Smith, and William M. Spaulding, Sr., both of Everett, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 26, 1984, Ser. No. 635,312
Int. Cl.⁴ G06F *15/20, 15/31;* **H03B** *19/00*
U.S. Cl. 364—480 **47 Claims**

1. A signal synthesizer system comprising:
- common frequency reference means for providing a frequency reference;
- first signal source means combined with the common frequency reference means for providing a desired first signal output;
- second signal source means combined with the common frequency reference means for providing a desired second signal output; and



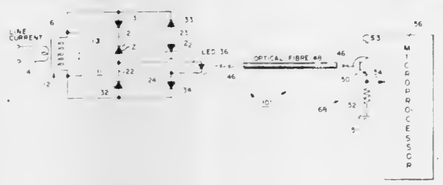
common controller means coupled to the first and second signal source means for providing a predetermined relationship between the first and second signal outputs.

4,630,218

CURRENT MEASURING APPARATUS

James R. Hurley, Brookfield, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 487,801, Apr. 22, 1983, abandoned.
This application Sep. 10, 1985, Ser. No. 774,397
Int. Cl.⁴ G01R *19/00, 19/65, 19/30*
U.S. Cl. 364—481 **21 Claims**



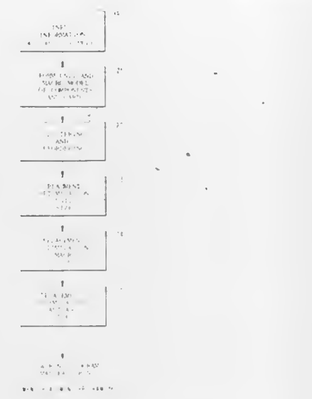
1. A method for measuring alternating current in a power line having a known fundamental frequency including the steps of:
- developing a low power signal directly related to the line current in said power line;
- sensing when said low power signal exceeds a first predetermined positive threshold value;
- sensing when said low power signal falls below a second predetermined negative threshold value;
- generating a first measurement signal comprised of pulses having a duration related to the time when said low power signal exceeds said positive threshold value;
- generating a second measurement signal comprised of pulses having a duration related to the time when said low power signal falls below said negative threshold value;
- transmitting said measurement signals to processing circuitry; and,
- processing said measurement signals to determine parameters of said low power signal thereby to determine the current flowing in said power line.

4,630,219

ELEMENT PLACEMENT METHOD

Angela DiGiacomo, San Jose, Calif., and Kantilal H. Khokhani, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,855
Int. Cl.⁴ G06F *15/60*
U.S. Cl. 364—488 **45 Claims**



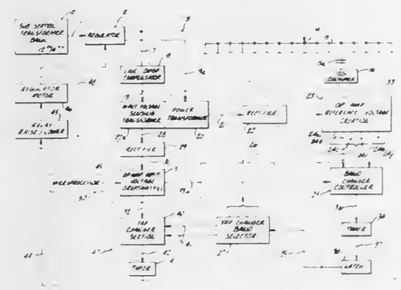
10. A method of assigning a plurality of different size elements having a predetermined relationship thereamong to element positions in an array of element positions, comprising the steps of:
- forming a plurality of indentical unit size elements each corresponding to one of said plurality of different size elements;
- assigning said unit size elements to element positions in said array of element positions in accordance with said predetermined relationship;
- replacing said assigned unit size elements with said corresponding different size elements; and
- rearranging the assigned different size element positions in said array of element positions to accommodate the exact sizes of said different size elements.

4,630,220

VOLTAGE CONTROLLER

Roger I. Peckinpaugh, Newhall, Calif., assignor to Southern California Edison Company, Rosemead, Calif.

Filed Mar. 6, 1984, Ser. No. 586,852
Int. Cl.⁴ H02J *1/00;* **G01R** *19/00*
U.S. Cl. 364—492 **35 Claims**



1. A control device for creating a controlled output signal comprising means for monitoring an input voltage signal to said device, means for defining at least two bands, said bands

being overlapping, means for establishing reference signals to define at least an upper limit and a lower limit respectively of at least two bands, said bands constituting an upper band and a lower band, means for selecting the appropriate band thereby normally restraining the input voltage signal in said effective bandwidth, and means for generating an output signal regulated by said effective bandwidth.

4,630,221
ZONE CONDITION CONTROLLER AND METHOD OF USING SAME

Terry A. Heckenbach, Middlebury, and Henry A. Gleason, III, Goshen, both of Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 505,224, Jun. 17, 1983. This application Jul. 9, 1984, Ser. No. 629,086
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[4] G06F *15/20;* **F24F** *3/00*
U.S. Cl. 364—505 **7 Claims**



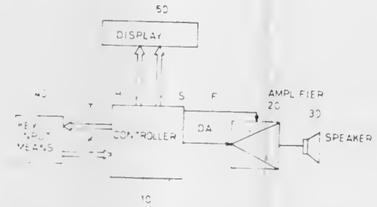
1. A method for controlling an environmental condition within a zone including:
generating a plurality of signals representative of the status of a plurality of signalling devices;
converting selected of said status signals to digital data signals and directing said data signals and unconverted status signals to computing means;
performing algorithmic decisional functions relative to said signals received at said computing means;
transmitting digital output signals from said computing means along a communication bus for reception by a plurality of uniquely, digitally addressable load devices coupled to said communication bus and adapted to effect control of a condition of a zone, and;
periodically receiving at said computing means digital input signals transmitted from at least one of said load devices.

4,630,222
ONE CHIP INTEGRATED CIRCUIT FOR ELECTRONIC APPARATUS WITH MEANS FOR GENERATING SOUND MESSAGES

Hideo Yoshida, Kashihara, and Hisao Kunita, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1982, Ser. No. 435,254
Claims priority, application Japan, Oct. 22, 1981, 56-169750
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 **4 Claims**

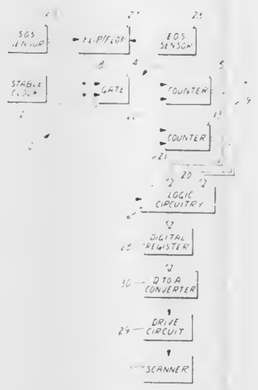
1. An electronic apparatus for performing a primary function and a synthesized sound generating function, said apparatus comprising:
a single chip integrated circuit including;
input control means for controlling input data developed externally of said single chip integrated circuit;
calculation control means, operatively connected to said input control means, for handling said input data and for performing said primary function and said synthesized sound generation function;
a single read only memory storing and providing to said calculation control means a primary control program for controlling said primary function, a synthesis control program for controlling said synthesized sound generating function and sound data used by said calculation control means to synthesize desired sounds;
random access memory means for storing and providing to said calculation control means data used by said calculation control means in performing said primary function and said synthesized sound generation function; and
main program counter means, responsive to control by said calculation control means, for addressing locations in said read only memory containing said primary control program and synthesis control program to provide said programs to said calculation control means; and
data counter means, responsive to control by said calculation control means, for addressing locations in said read only memory containing said sound data to provide said sound data to said calculation control means.



4,630,223
SCANNER AMPLITUDE STABILIZATION SYSTEM

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 5, 1984, Ser. No. 586,204
Int. Cl.[4] G01D *15/14;* **G06K** *15/12*
U.S. Cl. 364—518 **8 Claims**

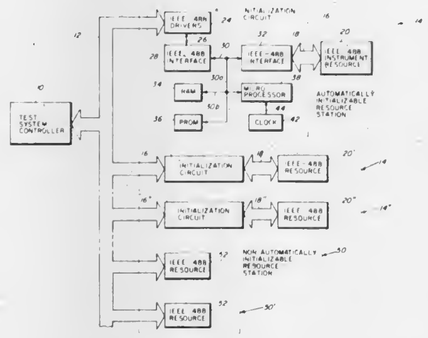


1. Circuitry for controlling the amplitude of a self-resonant scanner operated to define a scan path including:
first means for measuring the time interval for the scanner to complete a number of full cycle movements;
second means for measuring the time interval for the scanner to move a number of times between a first fixed point to a second fixed point in the scan path; and
logic means connected for receiving the time interval measurements from said first and second means for determining whether such time interval measurements indicate the scanner operating amplitude differs from the desired amplitude and providing digital information based on any such difference that is usable for the production of an analog signal for controlling the amplitude of the scanner to reduce such difference.

4,630,224
AUTOMATION INITIALIZATION OF RECONFIGURABLE ON-LINE AUTOMATIC TEST SYSTEM

Larry C. Sollman, Bloomington, Ind., assignor to The United States of America as Represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 601,872
Int. Cl.[4] G01R *15/12;* **G06F** *11/00*
U.S. Cl. 364—550 **3 Claims**

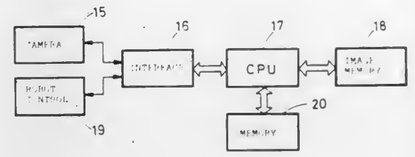


1. A reconfigurable, automatically initializable test system comprising:
test system controller means for transmitting and receiving data signals;
a test system bus connected to said controller means for conveying said data signals;
a plurality of automatic initialization resource stations connected to said test system bus, each of said stations comprising a test resource having a unique identifier, an initialization circuit connected to said test system bus, and an instrument bus for connecting said resource to said initialization circuit;
said initialization circuit comprising interface means, memory means coupled by said interface means to said system bus interface means, for storing said unique identifier of the associated resource, and microprocessor means connected to said memory means and responsive to said data signals for providing said identifier to said controller means;
said controller means being responsive to said identifier to assign a predetermined address to each said resource station for retention in said memory means, whereby said resource stations and said controller means are thereafter cooperative to effect a predetermined test program; and
said controller means and said initialization circuits being cooperable to perform character by character address searching by a successive-approximation routine that progressively eliminates resources from a listening mode as individual identifier characters are determined until the entire unique identifier of a given resource is obtained, the searching being repeated for each of the automatic initialization resources of the system.

4,630,225
SYSTEM FOR DETECTING ORIENTATION OF ARTICLES

Atushi Hisano, Nagaokakyo, Japan, assignor to Omron Tateisi Electronic Co., Kyoto, Japan

Filed Sep. 28, 1983, Ser. No. 536,508
Claims priority, application Japan, Sep. 29, 1982, 57-172039
Int. Cl.[4] G01B *11/02, 11/03;* **G06K** *9/28*
U.S. Cl. 364—559 **7 Claims**

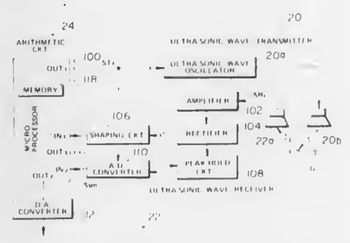


1. A system for detecting the orientation of an article comprising:
memory means for storing data relating to distances between each one of a plurality of feature points of the article and each of the others of said plurality of feature points;
a camera for picking up an image of the article to give image data,
means, electrically connected to said camera, for obtaining from the image data data relating to the distances of at least two of the feature points of the article from other feature points,
means, operatively connected to said memory means and said obtaining means, for identifying said at least two feature points by checking the data relating to the distances of said at least two feature points from other feature points with reference to the stored data relating to the distances between each one of a plurality of feature points and the other feature points, and
means, operatively connected to said identifying means, for determining the orientation of the article based on a direction through said at least two identified feature points.

4,630,226
ULTRA-SONIC DISTANCE SENSOR SYSTEM AND METHOD WITH CORRECTION FEATURE FOR SENSOR VALUE

Haruto Tanaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 14, 1984, Ser. No. 650,705
Claims priority, application Japan, Sep. 19, 1983, 58-172686
Int. Cl.[4] G01S *9/06, 11/00*
U.S. Cl. 364—561 **10 Claims**



1. An ultra-sonic distance sensor comprising:
an ultra-sonic wave transmitter for transmitting ultra-sonic waves of a given frequency toward an object at regular intervals;
an ultra-sonic receiver for receiving ultrasonic waves reflected by the object and producing a receiver signal having a value indicative of the amplitude of the received ultra-sonic waves;

first means for measuring the elapsed time between transmitting of the ultra-sonic waves by said transmitter and reception of ultra-sonic waves having an amplitude greater than a predetermined level, said first means producing an elapsed-time-indicative signal having a value representative of the measured elapsed time;

second means for detecting the rising characteristics of the receiver signal and deriving a correction value for said elapsed-time-indicative signal value on the basis of the detected rising characteristics of the receiver signal; and

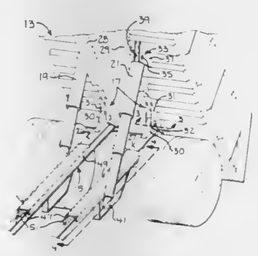
third means for modifying said elapsed-time-indicative signal value in accordance with said correction value, deriving a distance value indicative of the distance to said object based on the modified-elapsed-time indicative signal value, and producing a distance-value-indicative signal representative of the derived distance value.

4,630,227

APPARATUS AND METHOD FOR ON-BOARD MEASURING OF THE LOAD CARRIED BY A TRUCK BODY

LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61614

Filed Apr. 27, 1984, Ser. No. 604,739
Int. Cl.[4] G01G *19/08*; G06F *15/20*
U.S. Cl. 364—567 **13 Claims**



1. An apparatus for sensing an indication of the weight of a load carried by a truck body which is pivotally mounted on a truck frame, said apparatus comprising:

a truck frame including a hinge assembly;

a truck body pivotally mounted to said truck frame at said hinge assembly, said truck body being pivotally movable on said frame between a lowered position and a raised position;

a substantial length of the surface of said truck frame serving as a support surface for said truck body in its lowered position;

at least one fluid-filled tubing assembly mounted on said substantial length of the surface of said truck frame and forming a continuous interface between said substantial length and a mating portion of said truck body, thereby transferring at least a portion of the weight of said truck body to said frame in a substantially even and continuous distribution along said substantial length; and

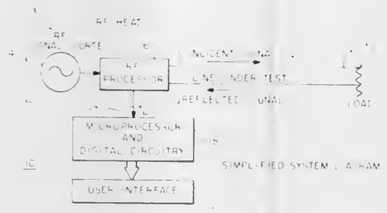
a pressure sensor assembly in communication with the fluid in said at least one fluid-filled tubing for providing a pressure measurement indicative of the weight of the truck body and its load transferred to said frame along said interface.

4,630,228

TRANSMISSION LINE ANALYZER FOR AUTOMATICALLY IDENTIFYING THE SEVERITIES AND LOCATIONS OF MULTIPLE MISMATCHES

Zoltan Tarczy-Hornoch, Berkeley; Asad M. Madni, and Joseph Fala, both of Los Angeles, all of Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed Jun. 28, 1982, Ser. No. 392,459
Int. Cl.[4] G06G *7/19*; H04B *3/46*
U.S. Cl. 364—576 **5 Claims**



1. A transmission line analyzer for automatically sensing at least the location of discontinuities in said transmission line to be tested comprising:

means for sweeping a radio frequency signal over a predetermined bandwidth for a predetermined one sweep time and connectable to said line to be tested;

frequency domain reflectometer means for providing a complex, composite, time-varying signal which is a swept frequency interference pattern containing said location information;

fast fourier transform means for automatically processing said complex signal to determine spectral peaks;

means for converting said spectral peaks to said location of said discontinuities;

means for changing said one sweep time to another sweep time;

means for storing spectral peaks for each said sweep time;

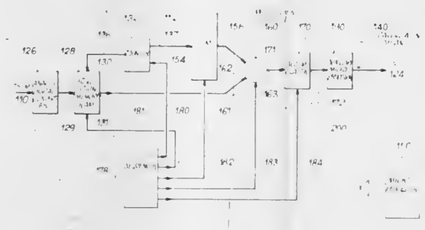
and means for rejecting all spectral peaks that do not have a matching peak for each sweep time.

4,630,229

CIRCUIT FOR THE FAST CALCULATION OF THE DISCRETE FOURIER TRANSFORM OF A SIGNAL

Jean-Pierre D'Hondt, Tournai, Belgium, assignor to Intercontrole Societe Anonyme, Rungis, France

Filed Feb. 18, 1983, Ser. No. 467,761
Claims priority, application Belgium, Feb. 23, 1982, 0/207387
Int. Cl.[4] G06F *7/34, 15/35*
U.S. Cl. 364—726 **4 Claims**



1. A circuit for the rapid calculation of the real and imaginary parts of the h first harmonics, h being 3 at most, of a signal supplied by a measuring device, particularly a non-destructive eddy-current testing device, said circuit comprising:

an analog-digital converter having an input receiving the signal to be processed and an output supplying digital samples,

a random access, acquisition memory having a data input connected to the output of the converter, an addressing input and a data output,

means for calculating the discrete Fourier transform having an input connected to the output of the acquisition memory and an output supplying the real part and the imaginary part of the harmonics of the signal, said means for calculating the discrete Fourier transform comprising:

a programmable read-only, coefficient memory having an addressing input and a data input, said coefficient memory being subdivided into h blocks, the kth block, with k integer between 1 and h, containing the coefficients sin $2\pi nk/N$ and cos $2\pi nk/N$, in which N is the number of samples contained in the acquisition memory and in which n assumes all the values ranging from 0 to N-1,

a counter having two outputs carrying two sets of addresses, the first output being connected to the addressing input of the acquisition memory and the second to the addressing input of the coefficient memory, said addresses respectively corresponding to the samples of the acquisition memory and to the coefficients of a coefficient memory block,

a multiplier circuit having two inputs, one connected to the output of the acquisition memory, the other connected to the output of the coefficient memory, and an output,

an accumulator circuit having an input connected to the output of the multiplier circuit and an output carrying the sought real and imaginary parts,

a sequencer circuit able to transmit pulses to the counter, to control the reading of the samples in the acquisition memory and, simultaneously, the reading in the first block of the coefficient memory of the coefficients cos $2\pi n/N$, and then to against control the reading of the samples in the acquisition memory and simultaneously the reading in the first block of the coefficient memory of coefficients sin $2\pi n/N$ and, for each reading of the sample and a coefficient, to control the multiplier and then the accumulator and then reiterate the controlling and reading with the second block of the coefficient memory and so on up to the last block.

4,630,230

SOLID STATE STORAGE DEVICE

James W. Sundet, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Filed Apr. 25, 1983, Ser. No. 488,114
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **10 Claims**

1. A high capacity, high bandwidth solid state storage system comprising:

a plurlity of storage sections each including RAM organized into a plurality of addressable memory locations for storing data, said system configured to include up to a maximum of s storage sections, where s is an integer greater than one;

each of said storage sections including addressing means for referencing said memory locations in said RAM so that data may be read or written simultaneously in each of said sections;

each of said sections including a pipeline input register for holding a word of data to be stored in the section, each of said input pipeline registers connected to said RAM so that when said RAM is referenced by said addressing means the respective words of data in said input registers are written into the respective sections in the referenced memory locations simultanuously;

means for connecting all of said input registers to provide a one-word wide data input pipeline between said storage sections, said data input pipeline having an input for receiving words to be stored in said sections;

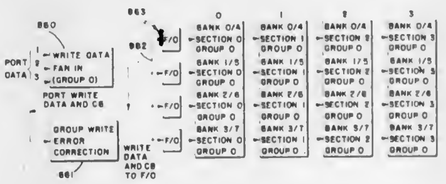
input port means for receiving data words from an input data bus and supplying said data words to said input of said data input pipeline in synchrony with a first high bandwidth clock signal; and

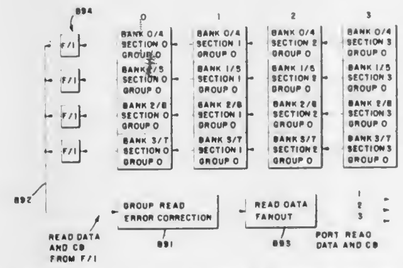
write control means connected to said input pipeline registers for,

(a) causing said input registers to synchronously pass data words from one to another along said data input pipeline from section to section away from said input port means at the rate of said first clock signal;

(b) causing said addressing means to reference said RAM every n clock periods of said first clock signal, where n is an integer equal to the maximum number s of said storage sections in a fully configured system, so that the data words in said input registers during said reference are captured and written into said storage sections, each of the individual storage sections storing the data word held in its corresponding input register whereby up to s words of data may be stored every n clock periods of said first clock signal; and

(c) causing said input port means to supply w words every n clock periods of said first clock signal, where w is an integer equal to the number of sections configured in said system, said w words supplied so that they are captured simultaneously in said sections during said reference;





each of said sections including a pipeline output register, each of said output registers for holding a data word and connected to said RAM so that when said RAM is referenced by said addressing means the words in the referenced memory locations are transferred into the respective output registers;

means for connecting all of said output registers to provide a one-word wide data output pipeline between said storage sections, said data output pipeline having an output for outputting words retrieved from said sections;

output port means for receiving data words from said data output pipeline and conveying the received words to an output data bus in synchrony with a second high bandwidth clock signal;

read control means connected to said output registers for,

(a) causing said output registers to synchronously pass data words from one to another along said data output pipeline from section to section towards said output port means at the rate of said second clock signal;

(b) causing said addressing means to reference said RAM every n clock periods of said second clock signal so that data is captured in said output registers simultaneously from said storage sections during said reference, each of

the individual storage sections providing a data word to its corresponding output register whereby up to s words of data may be read every n clock periods of said second clock signal; and

said output port means conveying w words to said output data bus every n periods of said second clock signal.

4,630,231

CONTROL PROGRAM SIGNAL DEMODULATING DEVICE

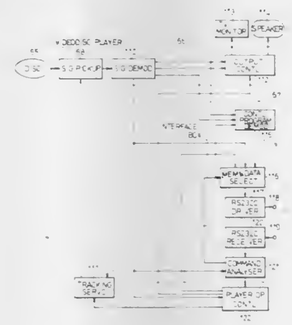
Atsumi Hirata, Fujisawa; Shunichi Shichijo, Sagamihara; Toyotaka Machida, Kashiwa; Kenji Kaneko, and Tatsuya Shinyagaito, both of Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jan. 27, 1984, Ser. No. 574,520

Claims priority, application Japan, Jan. 31, 1983, 58-13946

Int. Cl.[4] G06F *3/00;* **G11B** *7/00*

U.S. Cl. 364—900 **10 Claims**



1. A control program signal demodulating device suitable for an interactive operation of a player for playing a rotary recording medium and an external control device which is coupled to said player so that said external control device controls an operation of said player depending on an external instruction and depending on a control program which is loaded into said external control device, said control program including input and output commands and internal processing commands of said external control device, said rotary recording medium comprising track turns which are recorded with at least a control program signal, a video signal and an address signal, said player comprising a pickup reproducing element for scanning said track turns so as to reproduce recorded signals from said rotary recording medium and a controller for controlling a reproducing track position of said pickup reproducing element and for producing a status data signal which indicates an operating state of said player, said address signal indicating a track turn which is being scanned by said pickup reproducing element, said control program signal demodulating device comprising:

a control program demodulator for demodulating said control program signal which is reproduced from said rotary recording medium, the demodulated control program signal indicating said control program;

memory means for at least temporarily storing the demodulated output signal of said control program demodulator, said status data signal and said address signal and for producing the stored signals;

selecting means for selecting one of the signals which are produced by said memory means;

interface means for transmitting the signal which is selected by said selecting means to said external control device, and for receiving at least one control command which is produced by said external control device depending on said external instruction and said control program; and

a command analyser for decoding said at least one control command received by said interface means, and for supplying a signal to said controller so as to control the operation of said player and supplying a transmission request signal to said selecting means so as to determine which one of the signals produced by said memory means is selected by said selecting means,

said control program demodulator comprising wave-shaping means for wave-shaping the reproduced control program signal, first and second flip-flops coupled in series so that an output signal of said wave-shaping means is applied to an input terminal of said first flip-flop and an output signal of said first flip-flop is applied to an input terminal of said second flip-flop, said first and second flip-flops respectively having a clock terminal applied with the horizontal synchronizing signal of the reproduced video signal, and comparing means for comparing the output signal of said first flip-flop and an output signal of said second flip-flop and for producing an output signal which has a level depending on whether or not the output signals of said first and second flip-flops are equal to each other.

4,630,232

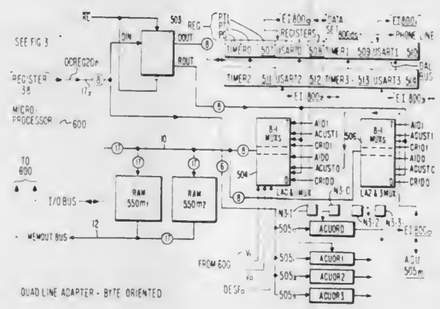
READ WRITE SYSTEM FOR MULTIPLE LINE ADAPTER ORGANIZATION

Richard A. Loskorn, Dana Point, and Lyle O. Jevons, Jr., Mission Viejo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 386,410, Jun. 8, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 594,441

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 **3 Claims**



1. In a data-comm subsystem wherein a line support processor controls data transfer operations between a host computer and line adapters connected to remote terminals, and said line support processor includes a microprocessor means and said plurality of line adapters where each line adapter has addressable USART registers and Timer registers, and said microprocessor means includes an I/O bus means having discrete bit-lines connected to said line adapters via a multiplexor means and includes first and second output control registers connected to said line adapters via a bus-controller transceiver means and data bus means, a Read/Write system for communicating with selected ones of said USART and Timer registers, the combination comprising:

(a) said microprocessor means for executing data transfer instructions from said host computer and including:

(a1) a microprocessor for generating (i) address data for selecting one of said USART or Timer registers, and (ii) control data to select a particular line adapter and an associated particular group of multiplexors from said multiplexor means, and including:

(a1a) means to read data from or to write data into a selected one of said USART or Timer registers in said selected line adapter;

(a1b) said first and second output control registers for holding said control data and said address data for conveyance to said line adapters and to said multiplexor means;

(a2) said I/O bus means having a plurality of discrete bit-lines for conveying data from each multiplexor of said selected associated particular group of multiplexors, to said microprocessor, said I/O bus means including:

(a2a) a first series of connection means for carrying a service request signal from each one of said line adapters via a gating means to separate bit lines of said I/O bus means for conveyance to said microprocessor;

(a2b) a second series of connection means for carrying output signals from said each multiplexor of said selected associated particular group of multiplexors along each separate bit line of said plurality of bit lines;

(b) said plurality of line adapters each connected for data transfer to/from a remote data terminal and connected for data transfers from said microprocessor via said bus controller-transceiver means, and connected for data transfers from a selected line adapter to said microprocessor via said bus controller-transceiver means and said selected associated particular group of multiplexors by way of said I/O bus means, and wherein each of said line adapters includes:

(b1) a plurality of said Timer-registers for receiving and holding data for regulating the time sequence of data transfer operations to/from said remote data terminal;

(b2) a plurality of said USART registers for receiving and holding data to control data transfer operations to/from said selected line adapter;

(b3) means for generating said service request signal to said microprocessor via an said associated gating means;

(b4) means for activating an identifier input to said associated group of multiplexors to identify to said microprocessor which line adapter is requesting service and which Timer or USART register in that line adapter is to be written into or read from by said microprocessor;

(c) said multiplexor means forming said plurality of groups of multiplexors wherein each said group is associated with each one of said line adapters for receiving output data from said selected line adapter for conveyance to said microprocessor, and wherein said multiplexor means includes:

(c1) said data bus means from said selected line adapter for conveying line-adapter output data via said bus-controller transceiver to said selected associated group of multiplexors;

(c2) a plurality of data input means for each group of said multiplexors including:

(c2a) an identifier input to identify the functional type of its said associated line adapter;

(c2b) an input from said gating means to indicate whether a said USART register or Timer register, of the said associated line adapter, is requesting service of said microprocessor;

(d) line adapter selection means for selecting a line adapter and its said associated group of multiplexors and its associated gating means, said selection means including:

(d1) designate logic means activated by said microprocessor means for selecting a particular line adapter and for enabling said selected associated group of multiplexors;

(d2) component select logic means for selecting said Timer registers or said USART registers in said selected line adapter for enabling said address data from said microprocessor to select a particular register;

(e) said bus controller-transceiver means connected to receive said control and address data from said microprocessor for conveyance to said line adapters and including:

(e1) means to receive data from said selected line adapter for transfer to said selected associated group of multiplexors;

(f) said plurality of gating means wherein each one of said gating means is associated with each one of said line adapters and functions to generate said service request signal to said microprocessor for the particular line adapter needing service;

(g) said host computer connected to said microprocessor and initiating data transfer commands to said microprocessor means.

4,630,233

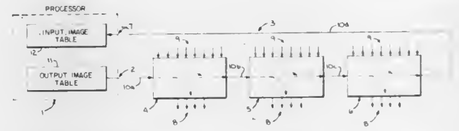
I/O SCANNER FOR AN INDUSTRIAL CONTROL

Robert C. Weppler, Warrensville Heights, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 25, 1984, Ser. No. 624,383

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—900 **7 Claims**



1. An input/output system for an industrial control system which comprises:

a control processor having memory means for storing an input image table and an output image table, and having a serial output port for transmitting data from the output image table to a first serial data link and having a serial input port for receiving input data from a second serial data link and storing it in the input image table; and

a plurality of I/O modules, each having a serial input port and a serial output port, the I/O modules being connected in series, and the input port of the first I/O module being connected to the first serial data link and the serial output port of the last I/O module being connected to the second serial data link to form a serial I/O ring, and wherein each I/O module includes:

(a) an output latch for applying output data received at the I/O module's serial input port to a set of output terminals;

(b) an input latch for applying input data received at a set of I/O module input terminals to the I/O module's serial output port; and

(c) control means for directing input data from the input latch to the I/O module's serial output port, directing output data received at the I/O module's serial input port to the I/O module's serial output port, and directing output data received at the I/O module's serial input port to the output latch.

4,630,234

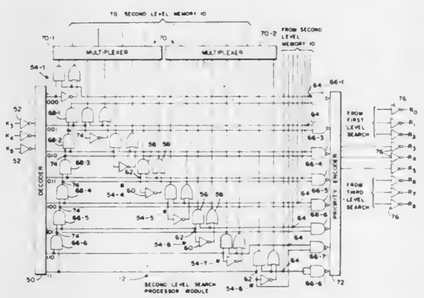
LINKED LIST SEARCH PROCESSOR

James R. Holly, San Diego, Calif., assignor to GTI Corporation, San Diego, Calif.

Filed Apr. 11, 1983, Ser. No. 483,545

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—900 **10 Claims**



1. A high speed search processor for rapidly searching a

plurality of data items which are listed in order of magnitude and for identifying a location in the list at which to insert a new data entry depending upon the magnitude of the new data entry relative to the magnitudes of the data items in the list, said search processor having at least one search level, said search level comprising:

memory means in which to store information representative of the data items in the list and into which the new data entry is to be encoded, and

search means interconnected with said memory means for accessing the information stored therein, said search means receiving from an input register an input signal which is representative of both the magnitude of the new data entry and the location in the list at which said new data entry is to be inserted and supplying an output signal which is representative of a particular data item in the list having either the largest magnitude of any data item in the list, such that the magnitude of said particular data item is less than the magnitude of the new data entry to be inserted into the list of the smallest magnitude of any data item in the list, such that the magnitude of said particular data item is greater then the magnitude of the new data entry to be inserted into the list,

said search means including:

a plurality of setting and clearing stages for setting or clearing respective bits of information stored in said memory means, each setting and clearing stage connected between output terminal means of said memory means to receive a bit of information stored therein and input terminal means of said memory means to supply thereto a signal by which to set or clear said bit depending upon the logic level thereof.

decoder means connected to receive from said input register the input signal to said search means and to supply decoder output signals to said plurality of setting and clearing stages, which output signals are representative of said input signal so that a particular one of said setting and clearing stages can be activated for setting or clearing a respective bit of information depending upon the output signals from said decoder means and the logic level of said bit of information, and

masking means interconnected with said decoder means and said memory means for masking certain bits of information in said memory means depending upon the output signals supplied by said decoder means.

4,630,235

KEY-WORD RETRIEVAL ELECTRONIC TRANSLATOR

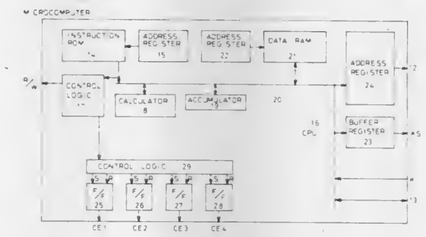
Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Shigenobu Yanagiuchi, Tenri, and Hidehiko Yamamoto, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 630,356, Jul. 16, 1984, abandoned, which is a continuation of Ser. No. 357,090, Mar. 11, 1982, abandoned. This application Feb. 13, 1986, Ser. No. 829,473

Claims priority, application Japan, Mar. 13, 1981, 56-37408

Int. Cl.⁴ G06F *15/14*

U.S. Cl. 364—900 **6 Claims**



1. An improved electronic translator wherein an arrangement of words in a source language is retrieved from a memory contained therein along with a translation of said arrangement of words in a target language different from said source language, said translator comprising:

input means for serially entering two or more key words thought by a user to be contained within at least one stored arrangement of words in said source language;

memory means for storing a plurality of stored arrangements of words in said source language and an associated plurality of stored arrangement of words in said target language, each one of said plurality of stored arrangements of words in said source language being associated with its translation as a stored arrangement of words in said target language;

access means, responsive to said input means, for searching the plurality of stored arrangements of words in said source language to locate a word therein corresponding to a said key word;

termination means, responsive to the completed entry of each one of said two or more key words by said input means, for indicating that said entry of each said key word is completed and for immediately enabling said access means to search said plurality of stored arrangements of words to identify a word therein corresponding to said key word before a succeeding said key word is entered;

said access means, upon entry of two or more key words contained within said memory means as determined by the search of said access means enabled by said translation means, recalling from said memory means a said stored arrangement of words in said source language containing said two or more key words entered into said input means as a selected source arrangement and recalling its said translation as selected translation arrangement, and

means, responsive to the recall of said selected source arrangement and said selected translation sentence by said access means, for indicating said selected source arrangement and said selected translation arrangement to the user of said translator.

4,630,236

CASSETTE-TYPE MAGNETIC BUBBLE MEMORY

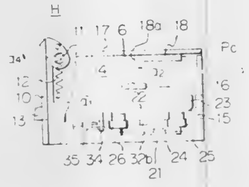
Toshiaki Sukeda, and Satoru Imai, both of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 6, 1983, Ser. No. 529,638

Claims priority, application Japan, Sep. 10, 1982, 57-157773; Sep. 10, 1982, 57-157774; Sep. 10, 1982, 57-157775; Sep. 10, 1982, 57-157776

Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—1 **8 Claims**



1. A cassette-type magnetic bubble memory comprising:

a magnetic bubble cassette including a first connector and a case for containing a magnetic bubble device, said magnetic bubble device including a magnetic bubble chip, a driving coil, and a bias magnet; and

a cassette holder having a cassette storing pocket with an inlet thereto and a second connector, for holding said magnetic bubble cassette with said first and second connectors connected to each other, said cassette holder further comprising:

an ejection mechanism for discharging the magnetic bubble cassette from said cassette storing pocket;

an ejection button for controlling the ejection mechanism, said ejection button having a stem;

a lid provided in front of said inlet of the cassette storing pocket, said lid being formed of a size for closing said inlet of the cassette storing pocket and for concealing said ejection button when said lid is closed;

means for detecting the position of the lid to generate a respective detection signal: and

a slider for sliding forward and backward with said cassette mounted thereon, said slider having a stopping member for driving said cassette in a respective cassette ejection direction, and a lever interposed as a leverage member of the ejection mechanism between said stem of the ejection button and the slider, wherein said lever transmits an operation force applied to the ejection button via said slider to the cassette.

4,630,237

READ-ONLY MEMORY AND METHOD OF MANUFACTURING THE SAME

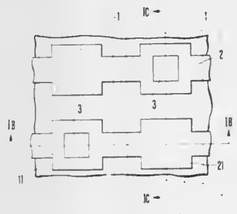
Kenji Miura, Isehara; Shigeru Nakajima, Chigasaki; Kazushige Minegishi, Atsugi; Toshifumi Somatani; Takashi Morie, both of Zama, and Tatsuo Baba, Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 759,009

Claims priority, application Japan, Jul. 28, 1984, 59/157955

Int. Cl.⁴ G11C *11/40, 13/00*

U.S. Cl. 365—104 **9 Claims**



1. A read-only memory comprising memory cells each having a vertical metal oxide semiconductor field effect transistor and a bit line, said vertical metal oxide semiconductor field effect transistor having a gate electrode serving as a word line, a source and a drain, said source and said drain being constituted by first and second diffusion layers, and a vertical channel region between said source and said drain, said gate electrode being formed on a side wall of a trench, said trench havig side wall surfaces substantially perpendicular to a major surface of a semiconductor substrate of a first conductivity type and a interconnecting bottom surface substantially perpendicular to said side wall surfaces, said first and second diffusion layers being of a second conductivity type formed in an upper portion of said semiconductor substrate and in a bottom of said trench, respectively, said bit lines being formed in a predetermined pattern, one of said first and second diffusion layers being connected to said bit line through a contact hole and the other of said first and second diffusion layers being used as a common current line.

4,630,238

SEMICONDUCTOR MEMORY DEVICE

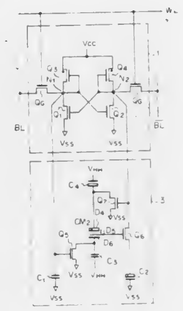
Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 9, 1984, Ser. No. 659,191

Claims priority, application Japan, Oct. 14, 1983, 58-191039; Feb. 28, 1984, 59-035116; Mar. 2, 1984, 59-038827; Mar. 2, 1984, 59-038828; Mar. 2, 1984, 59-038829; Mar. 2, 1984, 59-038830; Mar. 2, 1984, 59-038831; Mar. 2, 1984, 59-038832

Int. Cl.⁴ G11C *11/34*

U.S. Cl. 365—185 **25 Claims**



24. A semiconductor memory device having a volatile memory cell and a nonvolatile memory cell co-acting with said volatile memory cell, wherein said nonvolatile memory cell comprises a capacitor unit consisting of two series-connected tunnel capacitors, a series circuit of a first capacitor and a depletion-type or enhancement-type transistor connected between the common node of said two tunnel capacitors and a high-voltage control power source terminal, a transistor, the gate of which is connected to said common node, and a switch means for controlling the potential of the gate of said depletion or enhancement-type transistor in response to data memorized in said volatile memory.

4,630,239

CHIP SELECT SPEED-UP CIRCUIT FOR A MEMORY

Paul A. Reed, and Stephen T. Flannagan, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,638

Int. Cl.⁴ Q11C *11/40*

U.S. Cl. 365—189 **12 Claims**

8. A memory circuit which is enabled in response to an occurrence of a chip select signal, comprising:

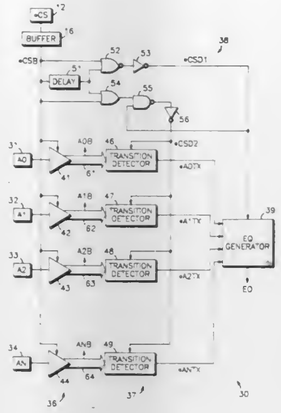
input means for receiving an address signal and providing an output responsive thereto when enabled by an occurrence of the chip select signal, and providing the output at a predetermined state when disabled by the chip select signal;

transition detection means, coupled to the input means, for detecting a transition of the address signal and providing an output pulse in response thereto;

an equalization pulse generator means, having a first input for receiving the output pulse and a second input for receiving a delayed chip select signal, for generating an equalization pulse in response to receiving the output pulse or the delayed chip select signal;

control means, coupled to the transition detection means and the equalization pulse generator means, for preventing the transition detection means from providing the output pulse for at least a predetermined time delay following an

occurrence of the chip select signal and for providing the delayed chip select signal for at least the predetermined



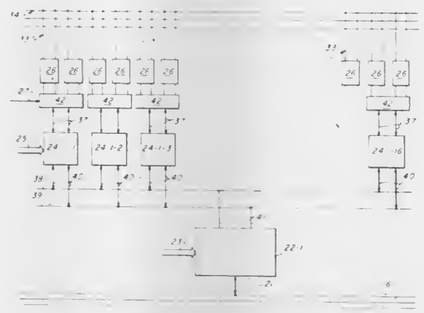
time delay following an occurrence of the chip select signal.

4,630,240

DYNAMIC MEMORY WITH INTERMEDIATE COLUMN DERODE

Ken A. Poteet, Houston, and Shuen C. Chang, Sugarland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1984, Ser. No. 626,791
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **30 Claims**



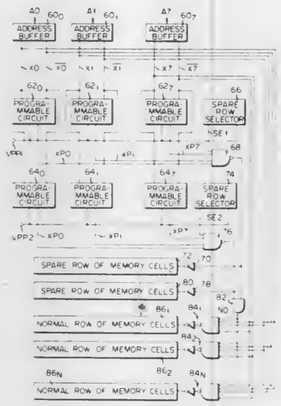
1. A semiconductor read/write memory device comprising:
an array of rows and columns of read/write memory cells, with a plurality of differential sense amplifiers connected to columns of the array, each said sense amplifier having a pair of sense nodes, each sense node connected to a column,
a plurality of intermediate input/output buffer and decode means coupled between said sense nodes of said sense amplifiers and data I/O terminal means, to write data to both of said sense nodes of a differential sense amplifier but to read data from only one of said sense nodes of a differential sense amplifier.

4,630,241

METHOD OF PROGRAMMING FOR PROGRAMMABLE CIRCUIT IN REDUNDANCY CIRCUIT SYSTEM

Noboru Kobayashi, Yokohama, and Satoshi Konishi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 20, 1983, Ser. No. 563,504
Claims priority, application Japan, Dec. 28, 1982, 57-227427
Int. Cl.[4] G11C *29/00;* **G06F** *11/00*
U.S. Cl. 365—200 **4 Claims**



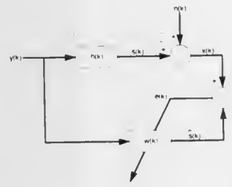
1. A redundancy memory device comprising:
normal memory cells;
a spare memory cell;
address buffer means for receiving and storing an address signal;
a normal memory decoder, connected between the address buffer means and the normal memory cells, for enabling the normal memory cell which is specified by the address signal stored in the address buffer means;
programmable means, connected to the address buffer means and having fuse elements whose number is equal to the number of bits of said address signal, for storing an address of a faulty normal memory cell in the combination of blown-out and non-blown-out fuse elements of said fuse elements, and for producing a detection signal when the address signal specifying the faulty normal memory cell is supplied;
fuse blowing means for sequentially blowing at least one of said fuses at a time by supplying a fuse blowing signal to said fuses, said fuse blowing signal being produced according to the address signal specifying the faulty normal memory cell wherein said fuse blowing means comprises a shift register, having output terminals whose number is equal to the number of bits of said address signal, for sequentially outputting output signals from the respective bits of output terminals in succession, a latch for latching said address signal specifying the faulty address signal, and AND gates, which are respectively connected to said fuse elements, for logically multiplying the output of each bit from the shift register and latch circuit;
an additional spare cell;
spare row selectors each of which is provided for each of the spare memory cells and each of which has a fuse element, the fuse element being blown out when the corresponding spare memory cell is used as the faulty normal memory cell, and the spare row selectors producing the selection signal when the fuse element is blown out;
decoder controller means, connected to the programmable means, the spare row selectors, the normal memory decoder, and the spare memory cell, for disabling the normal memory decoder and enabling the spare memory cell in response to the detection signal produced from said programmable means and the selection signal produced from said spare row selectors.

4,630,242

ADAPTIVE AND NON-ADAPTIVE METHOD FOR ESTIMATING THE EARTH'S REFLECTION SEQUENCE

William J. Done, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 30, 1982, Ser. No. 363,721
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—73 **15 Claims**



1. A method for estimating the reflection sequence of the earth from a seismic reflection trace generated by a swept frequency vibrator, including the steps of:
forming an initial estimate of the reflection sequence from a model of the earth;
forming an estimated seismic reflection trace from the initial estimate of the reflection sequence from the model of the earth by convolving the initial estimate of the reflection sequence of the earth with a pilot signal of the swept frequency vibrator;
generating an error signal representative of the difference between an uncorrelated seismic reflection trace and the initial estimated seismic reflection trace; and
revising the estimate of the reflection sequence of the earth by minimizing the error signal.

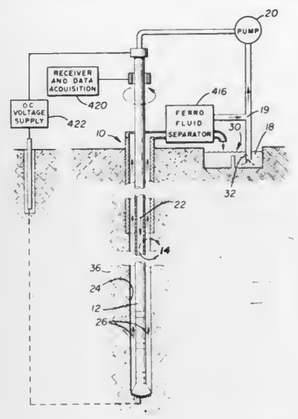
4,630,243

APPARATUS AND METHOD FOR LOGGING WELLS WHILE DRILLING

Norman C. MacLeod, Sunnyvale, Calif., assignor to MacLeod Laboratories, Inc., San Jose, Calif.

Filed Mar. 21, 1983, Ser. No. 477,262
Int. Cl.[4] G01V *1/40, 3/18*
U.S. Cl. 367—82 **10 Claims**

1. Measurement while drilling apparatus for detecting and communicating information relative to down-hole parameters and/or characteristics of the earth strata via an electrically conductive drill string composed of a plurality of lengths of metallic pipe connected end-to-end in series and through which a drilling fluid is caused to flow and then return to the surface through the well cavity formed between the exterior wall of the drill string and the interior wall of the well, comprising;
DC voltage supply means for establishing a unidirectional biasing current passing through the electrically conductive drill string, the drill bit and the surrounding earth strata, said biasing current causing a magnetic field to be developed about said drill string;
ferro-fluid means disposed within said drilling fluid and including a colloidal suspension of ferro-magnetic particles cotaed with a non-conductive coating, said ferror-fluid means being carried by said drilling fluid through said well cavity wherein said ferro-magnetic particles are caused by said magnetic field to migrate toward the outer surface of said drill string and to form an insulative coating thereon;
down-hole module means for detecting down-hole parameters and/or characteristics of the surrounding earth strata



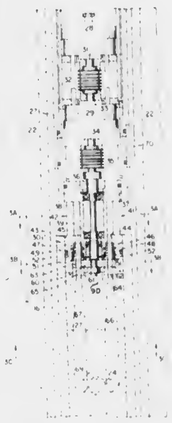
and for developing a communicative current flow commensurate therewith in said conductive drill string; and
communication means coupled to said drill string at a point remote from said module means for receiving said communicative current flow.

4,630,244

ROTARY ACTING SHEAR VALVE FOR DRILLING FLUID TELEMETRY SYSTEMS

Michael L. Larronde, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,324
Int. Cl.[4] H04H *9/00;* **E21B** *34/10*
U.S. Cl. 367—84 **11 Claims**



1. Valve apparatus useful in a borehole drilling fluid telemetry system for transmitting data pulses from one end of a pipe string to another by imparting pressure pulses to a drilling fluid circulating down the pipe string, through a drilling member and up the annulus between the pipe string and borehole wall, whereby the valve is operated in the drilling fluid flow path to

modulate the flow of the drilling fluid and thereby impart detectable pressure pulses to the drilling fluid, comprising:

a housing disposable within said drill string, adapted for the flow of drilling fluid therearound and formed with a passage therethrough for selectable flow communication between said drill string and said borehole annulus;

a shear valve mounted within said housing across said passage and comprising a valve seat and rotational gate member having alignable seat and gate openings formed therethrough, said gate opening being movable in an arc into and out of axial alignment with said seat opening; and

valve actuation means for coupling to said gate for rotationally moving said gate opening through an arc relative to said seat opening to open said passage and generate a pressure pulse, said valve actuation means comprising a first solenoid and cam means coupled thereto for translating the non-linear, axial forces of said solenoid into generally linear, rotational forces for rotating said valve gate.

4,630,245

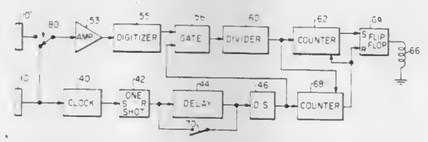
NON-CONTACTING LIQUID LEVEL DETECTION SYSTEM

Naim Dam, Oakland Gardens, N.Y., assignor to Introtek Corporation, Deer Park, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,242

Int. Cl.[4] G01F *23/28;* G08B *21/00*

U.S. Cl. 367—93 **20 Claims**



1. A non-contacting liquid sensing system comprising:

transducer means for mounting on the exterior of the wall of a vessel containing a liquid,

means for supplying a burst of electrical energy to said transducer means to cause it to vibrate to produce a burst of sonic energy which is transmitted through the wall of said vessel upon which said transducer is mounted into its interior for transmission across the interior of said vessel to an opposing surface in the presence of a liquid at the location on the vessel interior across which the sonic energy is being transmitted and being attenuated in the absence of a liquid, and

transducer means mounted on the exterior of the wall of the vessel for receiving sonic energy incident upon said opposing surface and passing through said wall and for converting said received sonic energy into electrical signal.

4,630,246

SEISMIC-ACOUSTIC LOW-FLYING AIRCRAFT DETECTOR

Robert J. Fogler, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 22, 1984, Ser. No. 623,586

Int. Cl.[4] H04B *1/10;* G01S *3/82;* G08B *19/00, 13/26*

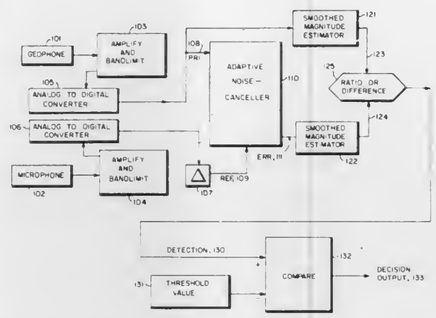
U.S. Cl. 367—135 **12 Claims**

1. A seismic-acoustic detection system for sensing the presence of low-flying aircraft which comprises:

first sensing means for detecting a seismic signal generated by low-flying aircraft and outputting a primary signal response thereto;

second sensing means for detecting an acoustic signal generated by said low-flying aircraft and outputting a reference signal response thereto;

an adaptive noise canceller receiving said primary signal from said first sensing means and said reference signal from said second sensing means and generating a correlation signal, which indicates any correlation between the primary signal and the reference signal, said correlation being a correspondence in amplitudes and peaks which indicate a reciprocal relationship between the primary signal and the reference signal; and



a signal processing means which receives the correlation signal from said adaptive noise canceller and generates a detection signal therefrom which indicates a presence of low-flying aircraft when the correlation signal indicates significant correlation between the primary and reference signals, said detection signal, otherwise indicating an absence of low-flying aircraft.

4,630,247

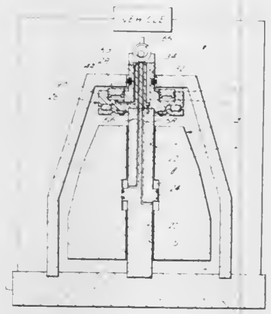
VIBRATOR THERMAL-STRESS DIFFERENTIAL COMPENSATOR

Marek L. Rozycki, Panorama City, Calif., assignor to Litton Resources Systems, Inc., Alvin, Tex.

Filed Oct. 12, 1984, Ser. No. 660,527

Int. Cl.[4] G01V *1/04;* H04R *11/00*

U.S. Cl. 367—189 **6 Claims**



1. An apparatus for preventing thermally-induced stresses in a seismic vibrator actuator assembly including a ground-contacting baseplate, a linear actuator having first and second piston shafts, each having a free end; the free end of said first piston shaft being secured to said baseplate, and a housing having walls, fastened to said baseplate for supporting and enclosing the linear actuator, the first and second piston shafts being formed from a metal that is dissimilar to that from which said housing is formed, and means for supporting said baseplate from a transport unit, comprising:

an expandable clamping means coupled to the free end of said second piston shaft; and

means for expanding said clamping means to wedge said clamping means rigidly between the free end of said second piston shaft and a wall of said housing under a substantially-constant clamping force.

4,630,248

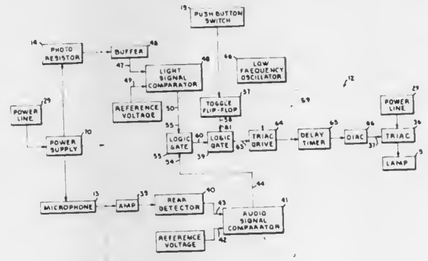
SOUND ACTIVATED LAMP ARRANGEMENT

Robert J. Scott, 68A Lake Tapawingo, Blue Springs, Mo. 64015

Filed Oct. 19, 1983, Ser. No. 543,510

Int. Cl.[4] G08B *13/22;* H01H *36/00;* H05B *37/02*

U.S. Cl. 367—197 **10 Claims**



1. A lamp arrangement for the illumination of a lamp bulb fron an electrical power line in response to a sound signal from an alarm device and comprising:

(a) a standard lamp socket assembly including:

(1) a lamp bulb socket adapted to receive a bulb base of a lamp bulb therein;

(2) a power cord to connect said lamp lamp socket to an electrical power line; and

(3) a lamp switch connected between said power cord and said lamp socket to complete or break a circuit therebetween, said lamp switch including a lamp switch operator which is placed to complete a circuit between said power cord and said lamp socket;

(b) a lamp switch cover received on said socket assembly in covering relation to said lamp switch operator to prevent access thereto;

(c) a lamp control module having a module bulb base received in and connected with said lamp socket and having a module bulb socket similar to said lamp socket;

(d) a lamp bulb received in said module socket;

(e) a microphone positioned on said module;

(f) lamp control means positioned in said module and having said microphone, said module bulb base, and said module bulb socket connected thereto; said circuit means being capable to assuming one of only two states including an armed state in which said circuit means is caused to operatively interconnect said module bulb base with said module socket to illuminate said bulb only in response to the reception by said microphone of a sound signal from an alarm device and an ON state in which said circuit means is caused to operatively interconnect said module bulb base with said module socket to illuminate said bulb regardless of whether said microphone receives a sound signal; and

(g) lamp control switch means positioned on said module, connected to said circuit means, and selectively operable to switch said circuit means between said armed state and said ON state.

4,630,249

METHOD OF RECORDING INFORMATION IN A MAGNETO-OPTICAL RECORD CARRIER, APPARATUS FOR CARRYING OUT THE METHOD, AND MAGNETO-OPTICAL RECORD CARRIER FOR USE IN AN APPARATUS FOR CARRYING OUT THE METHOD

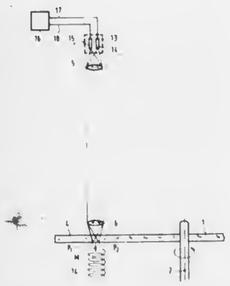
Josephus J. M. Braat, and Marino G. Carasso, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,342

Claims priority, application Netherlands, Sep. 26, 1983, 8303281

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—13 **13 Claims**



1. A method of recording information in a plurality of generally parallel, elongated tracks on a magneto-optical record carrier, said method comprising the steps of exposing the record carrier to a magnetic field of a predetermined direction, directing two light beams at two locations on the record carrier which are spaced from each other in a direction transverse to the track direction by a distance substantially equal to n.d, where n is an integer equal to or greater than one and d is the distance between centers of two adjacent tracks, so that each beam is incident on a respective one of two tracks, producing relative movement between said beams and said record carrier so that each of said beams travels along a respective one of said tracks, with one of said beams erasing information previously recorded in the track associated therewith, and at the same time that said previously recorded information is being erased, recording information in the other track of said two tracks with the other of said beams.

4,630,250

METHOD AND APPARATUS FOR SEARCHING AN ADDRESS SIGNAL ON VIDEO AND/OR AUDIO DISC

Tadao Nonomura, Tokorozawa, Japan, assignor to Pioneer Video Corporation, Tokyo, Japan

Continuation of Ser. No. 433,423, Oct. 8, 1982, abandoned. This application Jul. 9, 1985, Ser. No. 754,185

Claims priority, application Japan, Oct. 9, 1981, 56-161249

Int. Cl.[4] G11B *27/10, 21/10*

U.S. Cl. 369—32 **13 Claims**

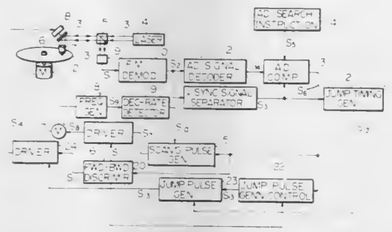
1. In a video and/or audio disc player including a turntable to have carried thereon a video and/or audio disc to be played back, pickup means to pick up information signals recorded on said disc and containing address signals, a coarse tracking control means operative to coarsely vary the positions of the turntable and the pickup means relative to each other in a radial direction of the disc, and fine tracking control means operative to minutely vary said positions; means for positioning said pickup means at a desired address, comprising:

means for separating an address signal from the information signal picked up by said pickup means;

means for detecting a deceleration rate of movement of said pickup means relative to said turntable;

means for comparing the latest address signal with said desired address and producing an address error signal

representative of the difference between the desired address and an address represented by said address signal;
means for producing a first drive signal which varies in magnitude to drive said coarse tracking control means to move the pickup means relative to the turntable in a direction and over a distance to lessen said difference and at a speed varying in predetermined relationship to the absolute value of said difference, said speed decreasing at a deceleration rate which increases as said absolute value decreases within a predetermined range;



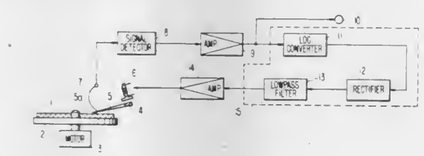
means for driving said coarse tracking control means in accordance with said first drive signal;
means for modifying said first drive signal so as to reduce the driving force of said pickup means in predetermined relationship to the detected deceleration rate; and
means for interrupting said first drive signal and for supplying a second drive signal effective to drive said fine tracking control means when said absolute value is reduced to the lower limit of said predetermined range.

4,630,251

VIDEO DISC REPRODUCING APPARATUS

Masao Tomita, Neyagawa; Akihiro Takeuchi, Ikoma, and Akio Hashima, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 7, 1983, Ser. No. 472,473
Claims priority, application Japan, Mar. 12, 1982, 57-39819; Mar. 15, 1982, 57-41269
Int. Cl.[4] G11B *9/07, 21/02*
U.S. Cl. 369—43 **3 Claims**



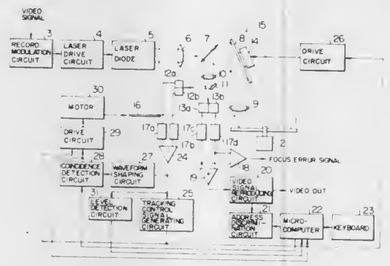
1. A video disc reproducing apparatus comprising:
a pickup means for detecting an information recorded on a recording disc as a variation in electrostatic capacity, said pickup means having a pickup needle;
a pickup needle pressure control means which controls the needle pressure of said pickup needle;
an automatic gain control means which generates a control signal used for maintaining an output signal of said apparatus so as to be constant,
wherein said automatic gain control means comprises: a rectifier for rectifying said output signal of said apparatus; a reference voltage source for generating a reference signal; a differential amplifier for generating an error signal between an output signal of said rectifier and said reference signal; an exponential conversion means for converting said error signal to an exponential error signal; and a variable gain amplifier for controlling said output signal of said apparatus according to said exponential error signal, said error signal controlling the needle pressure of said pickup needle.

4,630,252

CONTROL APPARATUS FOR OPTICAL DISC PLAYER FOR LOCATING BLANK TRACKS

Yoshio Miura; Tooru Fujishima, both of Yokohama; Masuo Oku, Kamakura; Yoshimichi Kudo, Yokohama; Chiharu Takayama, and Tooru Kawashima, both of Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 564,902
Claims priority, application Japan, Dec. 24, 1982, 57-226263
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **6 Claims**



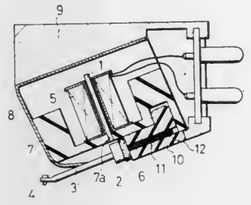
1. A control apparatus for an optical disc player comprising:
a light source for emitting a light beam;
a disc-shaped information recording medium having information tracks formed thereon for the recording of information signals, said light beam from said light source being irradiated on the information tracks of the recording medium for reflection therefrom as an optical signal, an information track having no recorded information signal more intensively reflecting the irradiated light beam than a track having an information signal recorded thereon.
an optical system including a plurality of optical lenses and a plurality of tracking members for introducing said light beam from said light source onto said disc-shaped recording medium;
a pair of photodiodes receiving said optical signal of the reflected light beam from said recording medium and converting said optical signal into a pair of electrical signals;
a subtraction circuit for receiving said pair of electrical signals from said photodiodes, and for producing a difference signal indicative of the difference therebetween;
tracking control means responsive to the difference signal from said subtraction circuit for driving said tracking members of said optical system and for correctly positioning said light beam from said light source onto an information track of said recording medium;
optical system movement means including a motor and a drive circuit for driving the motor and for moving said optical system in a radial direction of said disc-shaped recording medium;
detecting means for detecting an information track having no recorded information signal, said detection means including a signal level detection circuit for receiving the difference signal from said subtraction circuit and for producing an output signal when the amplitude of the difference signal exceeds a predetermined value, said predetermined value being set at an intermediate value between the amplitude of a first difference signal obtained from the light beam reflected from an information track having an recorded information signal and the amplitude of a second difference signal obtained from an information track having a recorded information signal, said detection means stopping the movement of said movement means in response to the output of said level detection circuit.

4,630,253

ELECTROMAGNETIC PICKUP CARTRIDGE HAVING ELONGATE CORE ELEMENTS

Tetsuya Iwata, Koide, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 971,482, Dec. 20, 1978, abandoned.
This application Apr. 11, 1980, Ser. No. 139,421
Claims priority, application Japan, Dec. 23, 1977, 52-156022
Int. Cl.[4] H04R *11/12*
U.S. Cl. 369—136 **2 Claims**



1. An electromagnetic pickup cartridge for converting mechanical vibrations induced from the undulating side walls of a stereophonic recording groove into respective electric output signals, comprising:
an armature magnetized axially and providing a magnetic field generally uniform around its rim portion;
a cantilevered arm extending coaxially from said armature and carrying at its free end portion a stylus adapted to ride within said recording groove to thereby vibrate said armature correspondingly; and
means including coils wound about respective core elements each consisting essentially of an elongate bar having its longitudinal axis extending generally orthogonally through the lines of force of said magnetic field while said armature is at rest for providing respective output signals in response to a varying longitudinal component of the magnetic flux produced through said core elements as said armature is vibrated, each said core elements having only a single face is proximity to said armature.

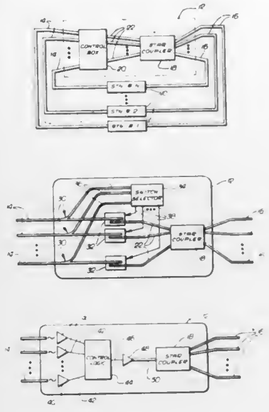
4,630,254

CONTROLLED STAR NETWORK

Chong-Wei Tseng, Santa Monica, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 26, 1984, Ser. No. 665,324
Int. Cl.[4] H04J *15/00;* **H04B** *9/00*
U.S. Cl. 370—1 **15 Claims**

1. A controlled star coupler communications network, comprising:
a plurality of transmitting and receiving stations;
an equal plurality of incoming transmission channels from the stations;
selection means for choosing one of the incoming channels for broadcast;
an equal plurality of outgoing transmission channels for transmission of messages to the respective stations; and
a star coupler for distributing the message received on the selected incoming channel to all of the outgoing channels; and wherein the selection means includes means for determining whether the star coupler is busy broadcasting a message, and queueing means, for queueing any incoming



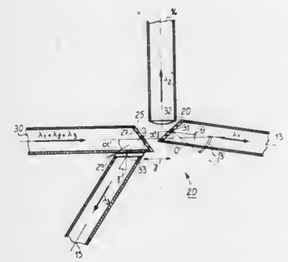
messages by channel identity for later selection when the star coupler is already broadcasting a prior message.

4,630,255

OPTICAL MULTIPLEXER-DEMULTIPLEXER FOR USE WITH OPTICAL FIBER WAVELENGTHS

Mohamed Gouali, and Georges Folcke, both of Paris, France, assignors to Lignes Telegraphiques et Telephoniques L.T.T., Conflans Sainte Honorine, France

Filed Dec. 31, 1984, Ser. No. 687,897
Claims priority, application France, Jan. 3, 1984, 84 00035
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **10 Claims**



1. A wavelength multiplexer for a unidirectional link comprising a link optical fiber for transmitting an optical signal including at least three multiplexed wavelengths and having an inlet face and an outlet face and at least three intermediate optical fibers disposed adjacent the inlet face of the link fiber and each having an inlet face and an outlet face for emitting a wavelength, wherein the inlet face of the link fiber and the outlet face of the first intermediate fiber transmitting an optical signal at a first wavelength are each chamfered at a given angle and are coupled to each other in such a manner that the respective longitudinal axes of the link fiber and the first intermediate fiber are distinct, wherein the outlet face of a second intermediate fiber transmitting an optical signal at a second wavelength is coupled to the chamfered face of the first intermediate optical fiber on which a first interference filter is disposed, said filter being designed to transmit the optical signal at the first wavelength and to reflect the optical signal at the second wavelength, each of said signals being intended to penetrate into the link fiber via its chamfered face, wherein the outlet

face of a third intermediate fiber transmitting an optical signal at a third wavelength is applied to the cylindrical wall of the link fiber by optical means having a refractive index matching that of each of these two fibers, and wherein a second interference filter is disposed on the chamfered face of the link fiber and is designed to transmit the optical signals at the first and second wavelengths from the output of the first filter and to reflect optical signals at the third wavelength, thereby multiplexing three wavelengths in the link fiber.

4,630,256

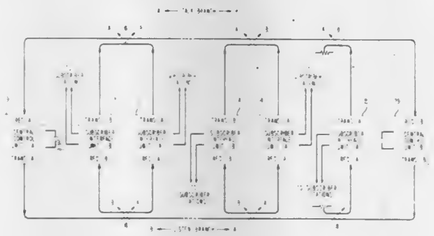
BIDIRECTIONAL DUAL NETWORK

Andres Albanese, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 357,772, Mar. 12, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,941

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—3 **8 Claims**



1. A communication system, comprising:
a first network, including at least two station units;
a second network, including at least two station units;
means for allocating the resources of said first and second networks;
a communication pathway over which said station units are capable of communicating with each other and with said means; and
wherein said first and second networks are capable of simultaneous operation, and at any point along said pathway common to said station units, signals between the station units of said first network propagate in a direction opposite to that of the signals between the station units of said second network, the latter signals being unrelated to the former signals.

4,630,257

DUPLEX SPEECH TRANSMISSION METHOD AND A SYSTEM THEREFOR

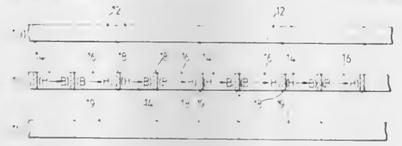
Philip D. White, Woking, England, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,732

Claims priority, application United Kingdom, Dec. 9, 1983, 8332951

Int. Cl.⁴ H04J *3/00*

U.S. Cl. 370—29 **8 Claims**



(PRIOR ART)

1. A method of duplex speech transmission wherein a limited bandwidth transmission channel is divided into a plurality of successive time slots, alternate time slots being allocated to speech from each of two parties; segments of speech are digitised and stored at a higher mean bit rate if only one party is speaking at any instant, each higher mean bit rate digitised speech segment being transmitted within the duration of two successive time slots; and segments of speech are digitised and stored at a lower mean bit rate if both parties are speaking in successive time slots, packets of such lower mean bit rate digitised speech segments from both parties being time-compressed and applied to the transmission channel during respective alternate time slots.

4,630,258

PACKET SWITCHED MULTIPORT MEMORY NXM SWITCH NODE AND PROCESSING METHOD

Robert J. McMillen, Long Beach, and Andrew Rosman, Los Alamitos, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 18, 1984, Ser. No. 661,996

Int. Cl.⁴ H04Q *11/04;* **H04J** *3/24*

U.S. Cl. 370—60 **12 Claims**



1. A packet switching node which processes applied data packets containing routing tag signals indicative of the output port destination to which said data packets are to be applied, said packet switching node comprising:
a plurality of input ports;
a plurality of output ports;
a multiport memory coupled between said input and output ports, said memory having a predetermined number of memory locations available for storage of said data packets applied to each of said input ports; and
control logic coupled to said input and output ports and said multiport memory for controlling the storage of data packets in said memory and the routing thereof to said output ports in accordance with said routing tag signals.

4,630,259

LOCKUP DETECTION AND RECOVERY IN A PACKET SWITCHING NETWORK

Mikiel L. Larson, St. Charles; Wing N. Toy, Glen Ellyn, and Avinash K. Vaidya, Naperville, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

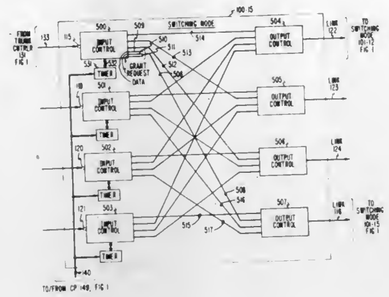
Filed Nov. 14, 1984, Ser. No. 671,468

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **16 Claims**

1. A packet switching node comprising:
a plurality of input terminals;
a plurality if output terminals;
means responsive to receipt of a packet on one of said input terminals for generating a timer start signal;
timer means responsive to said timer start signal for transmitting a timer completion signal after a predetermined amount of time;
means responsive to address information in said packet for selecting one of said output terminals;

means responsive to said timer completion signal for discarding said packet; and



means responsive to an idle condition of said selected output terminal for communicating said packet to said selected output terminal.

4,630,260

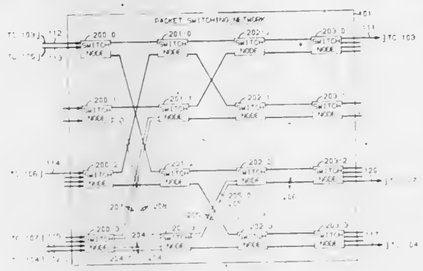
SELF-ROUTING MULTIPATH PACKET SWITCHING NETWORK WITH SEQUENTIAL DELIVERY OF PACKETS

Wing N. Toy, Glen Ellyn, and Avinash K. Vaidya, Naperville, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1985, Ser. No. 749,567

Int. Cl.⁴ H04Q *11/04;* **H04J** *3/24*

U.S. Cl. 370—60 **17 Claims**



1. A self-routing packet switching network for communicating packets each comprising address routing information from network input ports to network output ports, said network comprising:
a plurality of switching stages;
a plurality of inter-stage links interconnecting said stages;
each of said inter-stage links comprising a plurality of sublinks;
each of said stages comprising a plurality of switch nodes;
one of said switch nodes responsive to one of said packets received via an upstream one of said links for communicating one of said packets to the downstream stage via one of said sublinks of a downstream one of said links designated by said address routing information contained within said one of said packets; and
said one of said switch nodes comprises means responsive to a later one of said packets from said upstream one of said links and said later one of said packets' routing information designating said one of said downstream links for sequencing said later one of said packets via said downstream one of said links so that said one of said packets arrives at the downstream node connected to said downstream one of said links before said later one of said packets.

4,630,261

INTEGRATED BUFFER MANAGEMENT AND SIGNALING TECHNIQUE

David R. Irvin, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,788

Int. Cl.⁴ H04J *3/17, 3/16;* **H04Q** *3/00*

U.S. Cl. 370—81 **10 Claims**



1. In a time assignment speech interpolation communication system a method for concentrating a plurality of users channels onto a common communication channel comprising the steps of:
(a) providing a common buffer for buffering the information generated from each of the user's channels;
(b) classifying the buffered information with at least a two-tiered priority scheme with one of said tiered priority scheme being designated for identifying supervisory signaling data and another one of said tiered-priority scheme being designated for identifying non-supervisory signaling data; and
(c) transferring the buffered information to the common communication channel with supervisory signaling data having a high priority and being a first class of data to be transmitted on the common communication channel followed by low priority non-signaling data whereby the entire channel capacity is available for transmitting low priority non-signaling data in the absence of supervisory signaling data from said common buffer.

4,630,262

METHOD AND SYSTEM FOR TRANSMITTING DIGITIZED VOICE SIGNALS AS PACKETS OF BITS

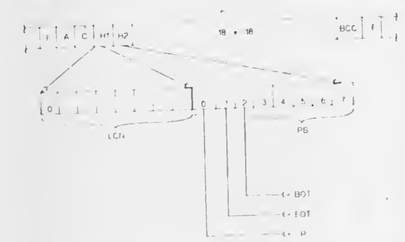
Paul Callens; Claude Galand; Claude Gergaud, all of Cagnes-Sur-Mer; Philippe Noailly, Saint-Laurent-du-Var, and Pierre Secondo, Saint Jeannet, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 20, 1985, Ser. No. 736,187

Claims priority, application European Pat. Off., May 23, 1984, 84430015.2

Int. Cl.⁴ H04J *3/17, 3/24*

U.S. Cl. 370—81 **24 Claims**



1. A method of transmitting voice signals generated by source terminals through a digital transmission network, in the

form of packets of bits, characterized in that it includes, for each active source, the steps of:

dividing the signal from said source into segments of predetermined duration, said segments being digitally coded;

performing a so-called activity detection to detect segments corresponding to pauses of said sources; and,

assembling bits derived from said coding in the form of packets, each packet containing bits from at least one voice signal segment and at least one header (H2) comprising in particular a parity bit whose value is changed subsequent to detection of a so-called long pause whose duration exceeds a predetermined time interval, and bits indicating a sequence number (PS);

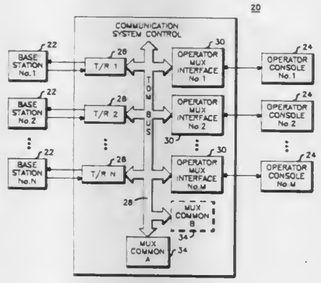
each of said packets of bits being intended to be transmitted through said digital transmission network subject to a condition related to said activity detection being satisfied.

4,630,263

TIME-DIVISION MULTIPLEX COMMUNICATIONS CONTROL SYSTEM

Greg M. Townsend, Palatine; James A. Henderson, Jr., Streamwood; Russell A. Marten, Schaumburg, all of Ill., and Daniel C. Scavezze, Wapole, Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,692
Int. Cl.[4] H04J *3/02, 3/16*
U.S. Cl. 370—85 **11 Claims**



1. A communications control center system for bi-directional audio and data transfer on a TDM bus coupled between a plurality of nodes comprising:

(a) means for receiving analog audio signals from each of a plurality of sources coupled to the respective nodes, said receiving means including means for converting said analog audio signal to a digital audio signal;

(b) time-division multiplex means coupled to each of the respective nodes for sending said digital audio signals to designated sources and for defining recurrent time slots with one of said recurrent time slots corresponding to each of the respective nodes and at least one recurrent time slot being uniquely dedicated for data transfer between each of the respective nodes;

(c) outputting means at each of said respective nodes coupled to said time-division multiplex means for removing said digital audio signal from said time slot and means for converting said digital audio signal to analog audio signal; and

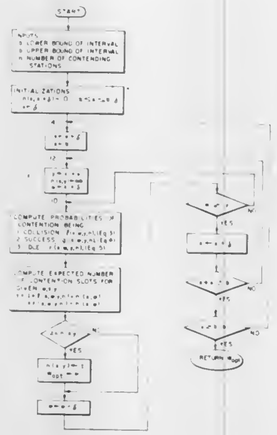
(d) means for controlling data transfer on said dedicated data slot, wherein said means for controlling data transfer on said dedicated data slot including means for sequentially polling the plurality of nodes, means for receiving a data request signal from a requesting node, means for granting control of said dedicated slot and means for simultaneously disabling said means for sequentially polling for a predetermined period of time, means for enabling said means for sequentially polling at the next slot following said requesting node whereby each of the nodes is provided equal access to said dedicated data slot.

4,630,264

EFFICIENT CONTENTION-RESOLUTION PROTOCOL FOR LOCAL MULTIACCESS NETWORKS

Benjamin W. Wah, 1109 Cumberland Ave., and Jie-Yong Juang, 32-7 Hilltop Dr., both of West Lafayette, Ind. 47906

Filed Sep. 21, 1984, Ser. No. 652,645
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85 **54 Claims**



1. In a data communication system having a common bus with time division multiplexing and a plurality of stations coupled to the bus, a bus contention resolution process for resolving which station is permitted to transmit data onto the bus during a given time slot, comprising the steps of

(a) each station wishing to contend for the bus to transmit data during the time slot generating a contention parameter;

(b) each station generating a window boundary, w, as a function of: an interval lower boundary, lb, an interval upper boundary, ub; an estimated number, n, of contending stations; and a distribution function, F, of the contention parameters;

(c) each station generating a window having boundaries w and one of lb and ub;

(d) each station wishing to contend for the bus comparing its contention parameter to the window and contending for the bus by transmitting to the bus when its contention parameter falls within the window;

(e) each station sensing the status of the bus;

(f) each station adjusting its window in response to the bus status it sensed indicating the bus was idle or a collision occurred and repeating steps d-f until only one contending station is isolated as having successfully contended for the bus; and

(g) the isolated station transmitting data in the time slot.

4,630,265

METHOD AND APPARATUS FOR SELECTING FOR USE BETWEEN DATA BUSES IN A REDUNDANT BUS COMMUNICATION SYSTEM

Daniel W. Sexton, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Sep. 26, 1984, Ser. No. 654,588
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85 **25 Claims**

1. In a communications system including a plurality of communication devices connected to a plurality of common buses to which identical data is concurrently applied for transmission between the communications devices, a method of determining which of said buses should be utilized for data reception by an individual device comprising the steps:

(a) examining each of said buses for the existence of transmitted data;

(b) establishing a first period of time beginning at the time data exists on any of said buses;

(c) determining each of said buses on which data existed during said first period of time; and,



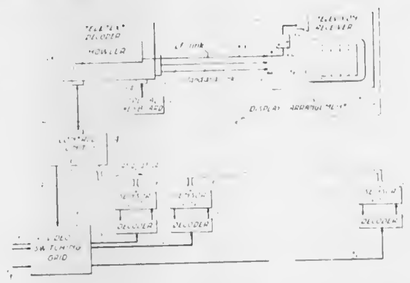
(d) selecting the bus to use for data reception from those determined to have had data during said first period of time based upon an algorithm including the step of remaining connected to the bus last connected to unless that bus did not show the existence of data during said first period of time.

4,630,266

EQUIPMENT FOR MEASURING DIGITAL CHANNELS MULTIPLEXED BY PACKETS IN A SIGNAL PARTICULARLY ANALOG

Georges Deparis, Arcueil; Jacques Duverne, Villevaude, and Philippe Meillan, Montrouge, all of France, assignors to The Establissement Public Telediffusion de France, Paris, France

PCT No. PCT/FR83/00060, § 371 Date Dec. 1, 1983, § 102(e) Date Dec. 1, 1983, PCT Pub. No. WO83/03515, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 29, 1983, Ser. No. 567,863
Claims priority, application France, Mar. 29, 1983, 82 05326
Int. Cl.[4] H04J *3/00, 6/00;* **H04B** *17/00*
U.S. Cl. 370—94 **17 Claims**



1. Equipment for measuring digital channels (VN) multiplexed by packets in a signal particularly analog (SV), said signal having constant time intervals (T_L) each including a packet (P), each packet (P) being made up of a heading (ET) including the address (I) of the respective digital channel (VN) and a data block (BD) composed of words (octets) having a predetermined number of bits, characterized in that it comprises in combination for a respective digital channel (VN), means (2) for detecting the address (I) of the respective digital channel in the packets of the signal (SV) and means (340) for counting the number (NPAQ) of received packets included in the respective digital channel (VN) in response to the detected addresses of the respective digital channel over a predetermined time (cycle time), control means (4, 50) each for assigning address detecting means (2) to one of the digital channels, and means (5) for displaying said number of packets received after said predetermined time, at least one word (IC) in the heading of each packet comprising an information portion and a redundancy portion derived from the information portion using a predetermined code, said equipment being further characterized by comprising in combination with the address detecting means (2) for one respective digital channel (VN), means (21, 342) for decoding the redundancy portion in said word (IC) of the heading for each packet received from the respective digital channel (VN), means (341) for counting the number of erroneous received packets in response to the decoded redundancy portions not corresponding to the information portions of said words (IC) in the headings of received packets from the digital channel throughout said predetermined time, and means (5) for displaying said number of erroneous received packets after said predetermined time.

4,630,267

PROGRAMMABLE TIMING AND SYNCHRONIZATION CIRCUIT FOR A TDMA COMMUNICATIONS CONTROLLER

Michel L. Costes, Cagnes/Mer, France, and Gene D. Hodge, Brookville, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 564,859, Dec. 23, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,409
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—104 **12 Claims**



1. A programmable timing circuit, comprising:

a period memory for storing the value of the duration of intervals to be timed;

a final instant memory for storing values of the final instant for each of said intervals;

a local time counter for outputting values of instants of local time;

an adder having an augend input connected to an output of said period memory and an addend input connected to an output of said counter and a sum output connected to a data input of said final instant memory, for adding a duration value output from said period memory to an instant value output from said counter and outputting their sum as a final instant of said duration value therein, said sum being input to said final instant memory;

a comparator having a first input connected to an output from said final instant memory and a second input connected to an output from said counter, for comparing said final instant values with said local time instant values and outputting a timing signal when the values are equivalent.

4,630,268

COMMUNICATION CIRCUIT LOOPBACK TEST APPARATUS

Stephan M. Rodenbaugh, Allen, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 30, 1984, Ser. No. 646,384
Int. Cl.[4] H04B *3/46*
U.S. Cl. 371—22 **10 Claims**

1. The method of testing a communication link including at least a transmitter, a remote receiver and a plurality of interme-

diate repeater stages for localizing the section of the communication link having transmission problems, comprising the steps of:

interrupting the flow of information from transmitter to remote receiver with a "null" signal for a time sufficient to cause all intermediate receiver stages to reset to an initialized condition;

transmitting N−1 pulses of predetermined length and of a frequency distinguishable from the frequency of data signal;

detecting the frequency of signals received after initialization and setting each receiver stage to a data or test condition in accordance with the frequency of the detected signal;



receiving transmitted pulses at each intermediate receiver stage in succession and transmitting one less pulse than received when more than two pulses are received;

altering the signal path conditions, in the intermediate receiver stage receiving only two pulses, to a loopback configuration;

transmitting a test signal from the transmitter through said looped communication link to said remote receiver and back when that looped communication is operational; and

clearing the communication link by transmitting a null signal for initializing each intermediate receiver and returning same to normal signal transmission conditions between said transmitter and said remote receiver when testing is completed.

4,630,269

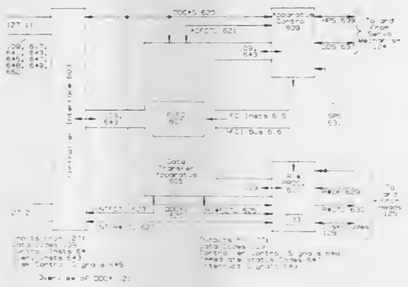
METHODS FOR DIAGNOSING MALFUNCTIONS IN A DISK DRIVE

Edward Gershenson, Woodbridge, Conn.; Louis A. Lemone, Stow, Mass., and Mark C. Lippitt, Lee, N.H., assignors to Data General Corporation, Westboro, Mass.

Filed May 16, 1983, Ser. No. 495,213

Int. Cl.⁴ G01R *31/28;* **G06F** *11/00*

U.S. Cl. 371—24 **4 Claims**



1. In a disk drive having a disk for storing disk codes, a head for reading said disk codes from said disk and writing them to said disk, and disk drive control apparatus including

(1) apparatus control, including means for providing test patterns of data codes, means for receiving translated test patterns of data codes and means for comparing said test patterns with said translated test patterns,

(2) a read-write processor, responsive to said apparatus control, including means for translating data codes to disk codes and means for translating disk codes to data codes,

(3) data transfer means connected between said apparatus control and said read-write processor, and

(4) diagnostic data path means, connected to said read-write processor, for receiving said disk codes from the output of said read-write processor and providing them to the input of said read-write processor,

the method of diagnosing failures in said disk drive control apparatus comprising the steps of:

(1) generating a test pattern of said data codes,

(2) transferring a copy of said test pattern to said read-write processor,

(3) translating said test pattern to create translated disk codes,

(4) translating said translated disk codes to create a translated test pattern of said data codes,

(5) transferring said translated test pattern to said apparatus control, and

(6) comparing said test pattern generated in step (1) with said translated test pattern to determine whether said test pattern is identical with said translated test pattern.

4,630,270

METHOD FOR IDENTIFYING A FAULTY CELL IN A CHAIN OF CELLS FORMING A SHIFT REGISTER

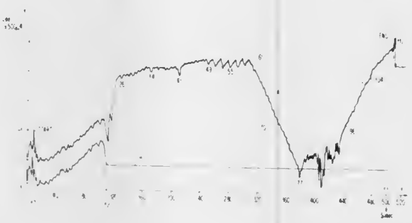
Dominique A. Petit, Corbeil-Essonnes, and Marc P. Du Pasquier, Evry, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1984, Ser. No. 671,832

Claims priority, application European Pat. Off., Dec. 28, 1983, 834300436

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—29 **5 Claims**



1. A method of identifying the rank of a faulty cell in a chain of cells forming a shift register in a functional element, each cell comprising a pair of latches having data inputs, data outputs, and clock inputs, each cell being associated with a combinatorial logic block, comprising the steps of:

placing said faulty functional element in a static mode of operation and applying a square pulse representing a data bit to a data input;

observing the resulting output waveform representing variations of current supplied to said functional element that occur during propagation of the square pulse along the chain until it reaches the output thereof; and

detecting any absence of said variations, said absence indicating a faulty condition of the cell just loaded with said data bit, wherein the relative time of occurrence of said absence of variations is related to the rank of said faulty cell in said chain of cells.

4,630,271

ERROR CORRECTION METHOD AND APPARATUS FOR DATA BROADCASTING SYSTEM

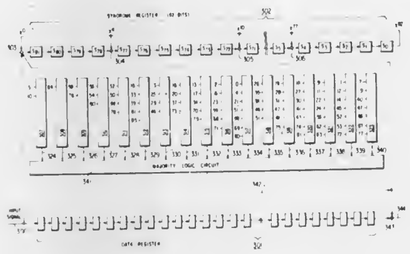
Osamu Yamada, Tokyo, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,573

Claims priority, application Japan, Jan. 20, 1983, 58-6579; Mar. 31, 1983, 58-54002; Sep. 2, 1983, 58-160523; Oct. 25, 1983, 58-198363

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37 **20 Claims**



1. In a broadcasting system for broadcasting character information in packets having data signal portions of predetermined length, an error correction method for correcting errors included in the broadcasted character information, comprising the steps of:

selecting a random multi-error correcting code having a block length that is at least as great as the length of the data signal portion of a packet, and shortening the block length if necessary to fit in the data signal portion of the packet;

forming character code signals from said character information;

alloting said character code signals sequentially into a plurality of packets, each packet including an allotted character code signal and parity bits determined in accordance with said multi-error correcting code;

broadcasting said allotted character code signals and respective parity bits in the data signal portions in the sequence of said packets;

receiving the broadcast data signal;

multiplying the received data signal portions by a matrix having a predetermined column all consisting of ones to reproduce the character code signal; and

decoding the character information from the reproduced character code signal.

4,630,272

ENCODING METHOD FOR ERROR CORRECTION

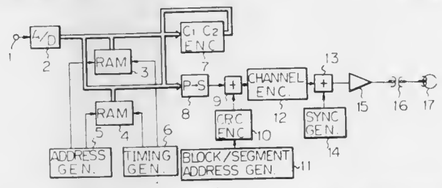
Tadashi Fukami; Kentaro Odaka, and Shinya Ozaki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,537

Claims priority, application Japan, Apr. 30, 1983, 58-77260

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37 **19 Claims**



1. An encoding method for error correction of digital information data, said encoding method comprising the steps of:

arranging said digital information data in a plurality of blocks each including a plurality of symbols;

generating first redundancy data from first respective groups of digital information data constituting symbols which exist in two adjacent only blocks of said plurality of blocks in a first direction in said blocks of digital information data;

generating second redundancy data from second respective groups of digital information data constituting symbols which are included in said plurality of blocks in a second direction in said blocks of digital information data;

forming first code sequences for first error detection from said first digital information data groups and said first redundancy data;

forming second code sequences for second error detection from said second digital information data group and said second redundancy code;

transmitting blocks including at least one of said digital information data and said first redundancy data; and

transmitting blocks including said second redundancy data.

4,630,273

LASER DEVICE

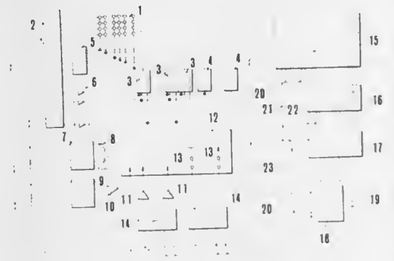
Hitoshi Inoue, Kanagawa; Norihiro Suenaga, Tokyo; Nobuyuki Suenaga, Kanagawa; Seiji Sugiyama, Kanagawa, and Michihiro Kaneda, Kanagawa, all of Japan, assignors to Nippon Infrared Industries, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 416,062, Sep. 8, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 814,157

Claims priority, application Japan, Sep. 11, 1981, 56-143337

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—9 **2 Claims**



1. A medical laser device having a control system for controlling the laser device to emit a desired laser irradiation for a medical treatment, said control system comprising:

a group of switches each of which when actuated represent individual operational parameters of a pulse ocsillation mode, presetting of the individual operational parameters forms an irradiation mode which includes, laser output, irrdiation time, pulse length and repetition period;

means for converting the preset individual operational condition parameters input through said actuated switches into an electrical signal and for converting said electrical signal to a designation of an address in a memory;

said memory stores at different addresses, combinations of said individual operational condition parameters, said stored combinations defining different specific laser irradiation modes; and

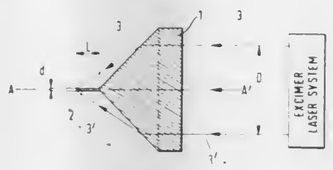
control means for retrieving from said memory a specific laser irradiation mode, corresponding to the address provided by said converting means, and for generating a control signal for driving the laser device in response to said individual operational condition parameters defining the specific laser irradiation mode.

4,630,274

METHOD AND APPARATUS FOR GENERATING SHORT INTENSIVE PULSES OF ELECTROMAGNETIC RADIATION IN THE WAVELENGTH RANGE BELOW ABOUT 100 NM

Fritz P. Schäfer, Goettingen, Fed. Rep. of Germany, assignor to Max-Planck-Geselschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,615
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342531
Int. Cl.⁴ H01S *3/10*
U.S. Cl. 372—9 **10 Claims**



1. Apparatus for generating short duration pulses of high intensity electromagnetic radiation in a wavelength range of approximately 100 to 0.01 nanometers emanating from a source of predetermined volume, comprising:

an input laser emitting laser radiation pulses of given irradiation intensity and energy, each of said radiation pulses having a given maximum cross-sectional dimension D, and a duration of less than one picosecond;

an optical focusing system for focusing each laser radiation pulse into a predetermined focal volume, at the focus of the optical system, said focal volume having dimensions substantially smaller than the maximum laser pulse dimension D, to irradiate said focal volume at a substantially higher irradiation intensity than said given irradiation intensity;

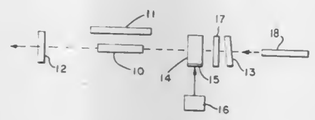
and a target, having a volume approximating said predetermined focal volume, positioned at the focus of said optical system, the target comprising a material which generates a hot plasma emitting radiation in said wavelength range when irradiated at said higher intensity.

4,630,275

CONTROLLED SLOW Q-SWITCH

William R. Rapoport, Ventura, Calif., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 10, 1984, Ser. No. 680,030
Int. Cl.⁴ H01S *3/117*
U.S. Cl. 372—13 **9 Claims**



1. A slowly Q-switched laser comprising:

(a) an optical resonator having reflector means at either end;

(b) a laser medium disposed within the resonator;

(c) means for exciting the laser medium to emit coherent radiation;

(d) an acousto-optical Q-switch mounted between the laser medium and the reflector at one end of the resonator; and

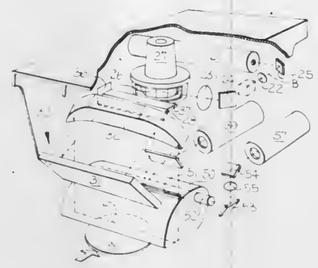
(e) means for applying to the Q-switch a control signal having a staircase-shaped time dependence which reduces the losses in said resonator in a plurality of steps, thereby producing a series of laser pulses.

4,630,276

COMPACT LASER SCANNING SYSTEM

Kevin E. Moran, Belmont, N.C., assignor to Aeronca Electronics, Inc., Charlotte, N.C.

Filed Oct. 9, 1984, Ser. No. 658,603
Int. Cl.⁴ H01S *3/111, 3/123*
U.S. Cl. 372—15 **13 Claims**



1. A laser scanning system comprising

(a) a laser source for producing a laser light beam;

(b) a polygonal mirror positioned for receiving and reflecting the laser beam, said polygonal mirror being mounted for rotation so as to cause the laser beam to scan along an arcuate path of travel in a predetermined plane;

(c) a target positioned for receiving the scanned beam; and

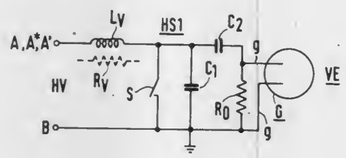
(d) a folded optical cell interposed between the scanning means and the target, said cell including a pair of mirrors mounted in opposed spaced apart relation and including respective reflective surfaces so oriented with respect to one another as to cause the scanned beam to be reflected from each of the reflective surfaces a plurality of times in its course of travel from said polygonal mirror to said target to thereby significantly increase the overall effective length of travel of the laser beam between the polygonal mirror and the target.

4,630,277

EXCITATION CIRCUIT FOR LASER SYSTEMS, ESPECIALLY FOR TE-HIGH ENERGY LASERS, WITH ADJUSTMENT OF PREIONIZATION

Hans-Jürgen Cirkel; Reinhard Müler, both of Erlangen, and Elmar Müller-Horsche, Bayreuth, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,265
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314157
Int. Cl.⁴ H01S *3/00*
U.S. Cl. 372—38 **18 Claims**



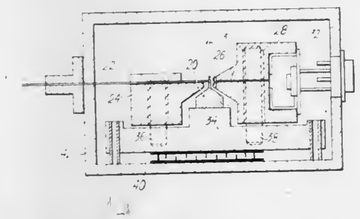
1. In a laser system, an excitation circuit excitable by a maximally homogeneous, arc-free capacitor discharge in a gas space of a laser head between at least two mutually spaced-apart laser electrodes, the excitation circuit comprising at least one fast acting high-voltage switch activatable via a pulse-forming network connected thereto for generating high-voltage pulses at the laser electrodes; first and second stripline capacitors connected to said pulse-forming network and said high-voltage switch; a preionization device connected to the laser electrodes and having a plurality of members of at least one of groups of members consisting of surface discharge gap members and preionization rod members, together with auxiliary circuits connected thereto, said auxiliary circuits being connected to said pulse-forming network for providing all auxiliary voltages and currents for operating said preionization device, said auxiliary circuits being connected, in addition to ground potential of the excitation circuit, to at least one of three discrete circuit points of which one point is connected to a high-voltage input of said pulse-forming network, a second point is connected to a high-voltage branching point of said high-voltage switch and one of said stripline capacitors, and a third point is connected directly to the laser electrodes having high potential, for controlling the instant of onset of the laser gas discharge and the time relationship between applying a high-voltage pulse to the laser electrodes and applying a firing pulse to poles of said preionization device.

4,630,278

INFRARED LIGHT SOURCE INCORPORATING A SEMICONDUCTOR LASER ASSOCIATED WITH MODE SELECTION AND POWER CONTROL MEANS

René Auffret, Kernu-Louannec, 22700 Perros-Guirec; René Le Marer, Kerougant Bras, 22730 Tregastel, and Yvon Sorel, Kernu-Louannec, 22700 Perros-Guirec, all of France

Filed Jul. 20, 1984, Ser. No. 632,729
Claims priority, application France, Jul. 25, 1983, 83 12249
Int. Cl.⁴ H01S *3/18*
U.S. Cl. 372—43 **4 Claims**



1. A light source comprising:

(a) a semiconductor laser with a front face and a rear face, said faces being separated by a distance L, said laser emitting a first beam through said front face and a second beam through said rear face,

(b) a roof-shaped mount having a ridge for supporting said laser, said laser being supported such that said first and second beams are transversely directed with respect to a longitudinal axis of said ridge,

(c) a first support having at least one bore,

(d) a first optical fiber having an input face, said first optical fiber being affixed to said first support such that said input face confronts said front face of said laser,

(e) a second support having at least one bore,

(f) a mode selection means arranged to confront said rear face of said laser, said mode selection means being affixed to said second support such that the distance l separating said mode selection means and said rear face is on the order of L, said mode selection means comprising a partially transmissive concave mirror,

(g) a second optical fiber having an input face and an output face, said second optical fiber being affixed to said second support such that said input face is located behind said mirror,

(h) a photodetector having a photodetecting surface, said photodetector being affixed to said second support such that said photodetecting surface confronts said output face of said second optical fiber,

(i) a base plate having a longitudinal axis disposed substantially parallel to the directions of said first and second beams and to said first and second optical fibers, said roof-shaped mount, said first support and said second support being mounted on said base plate, said base plate having a plurality of calibrated anchoring rods arranged to engage the bores of said first and second supports, and

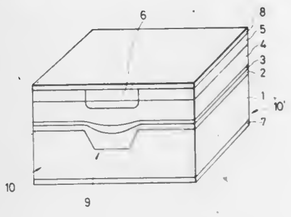
(j) a bonding material for affixing said rods in said support bores.

4,630,279

BURIED HETEROJUNCTION LASER

Takashi Kajimura, Hachioji; Takao Kuroda, Kokubunji; Yasutoshi Kashiwada, Nishitama; Naoki Chinone, Hachioji, and Kunio Aiki, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,908
Claims priority, application Japan, Feb. 3, 1982, 57-14986
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **19 Claims**



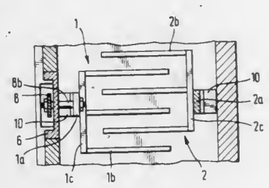
1. A semiconductor laser device comprising an optical confinement region having a center, a first cladding layer in surface contact with a first face of an active layer and a second cladding layer in surface contact with a second surface of the active layer which is opposed to the first surface, said layers being disposed on a semiconductor substrate, said first and second cladding layers having refractive indices smaller than the refractive index of said active layer and having forbidden bandgaps greater than the forbidden bandgap of said active layer, and the conductivity types of the first and second cladding layers being opposite each other, said active layer having a smooth change of thickness thereof in two directions parallel to a junction surface of said optical confinement region and the thickness of the active layer becoming a maximum substantially at the center of the optical confinement region, and said first and second cladding layers having different refractive indices.

4,630,280

ELECTRODE ARRANGEMENT

Franz Günthner, Mainz-Lerchenberg, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,248
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418292
Int. Cl.⁴ C03B *5/027*
U.S. Cl. 373—41 **12 Claims**



1. An electrode arrangement for glass crucible furnaces, the arrangement comprising:

a plurality of planar electrode members arrayed to form separate electrodes, each having a plurality of plates;

at least two connecting elements for mounting the electrode plates wherein each connecting element and the electrode plates mounted thereon form an electrode, the connecting elements extending parallel with respect to one another and in spaced relation to one another with the electrode plates projecting from the connecting elements and being mounted thereon in spaced relation with one another and with the electrode plates mounted on one connecting element being staggered with respect to the electrode plates mounted on an adjacent connecting element and projecting between the electrode plates on the adjacent connecting element, and

means for supporting the connecting elements in a glass crucible furnace.

4,630,281

ARC FURNACE WITH VARIABLE CAPACITY

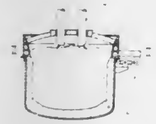
Katsunori Nakao, Kamakura, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

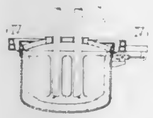
Filed Jun. 26, 1985, Ser. No. 748,825

Claims priority, application Japan, Jul. 5, 1984, 59-101959[U]

Int. Cl.[4] F27B *14/08;* **F27D** *1/00*

U.S. Cl. 373—71 **1 Claim**





1. In a steel-making arc furnace comprising a furnace body and a roof and wherein scrap is charged from above, the improvement comprising a ring-shaped top wall portion disposed at the top of said body and divided into a plurality of circumferential sections, and means for selectively driving said circumferential sections horizontally and radially outwardly into an inoperative position so that said roof can be directly placed on said furnace body, and horizontally and radially inwardly into an operative position so that said roof can be placed on said furnace body via said ring-shaped top wall portion, whereby the capacity of the furnance is variable.

4,630,282

FREQUENCY-HOPPING DIGITAL DATA LINK

William A. Landers, and Lynn J. Hawkey, both of Florissant, Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 18, 1984, Ser. No. 611,764

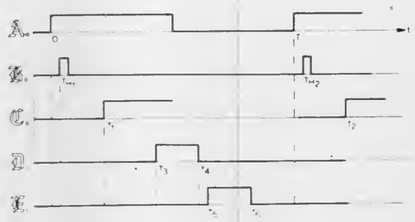
Int. Cl.[4] H04L *9/02*

U.S. Cl. 375—1 **2 Claims**

1. In an AM radio system capable of changing its frequency at regular intervals in a known manner which includes a timing information supply means describing first timing intervals when the frequency is constant at a given frequency and second timing intervals when the frequency transitions between the first intervals, the improvement comprising:

a digital data uplink/downlink controller comprising;

a programmable microprocessor control means having as one input timing information received from the timing information supply in the AM radio system to mark transition points between the first and second timing intervals, having as a second input digital data information received from an external source wherein the microprocessor is programmed to allow reception of an uplink FM digital data radio message by the radio system only during a first fixed sub-interval of the first timing interval and is further programmed to allow the transmission of a downlink FM digital data radio message of the digital data received from the second input



to the microprocessor only during a second fixed sub-interval of the first timing interval such that the first and second sub-intervals are separated from each other and from the ends of the first timing interval by fixed amounts of time sufficient to allow for effective radio communication, and

means to place FM digital data upon the AM radio system transmitted downlink signal and to remove FM digital data from the AM radio system received uplink signal.

4,630,283

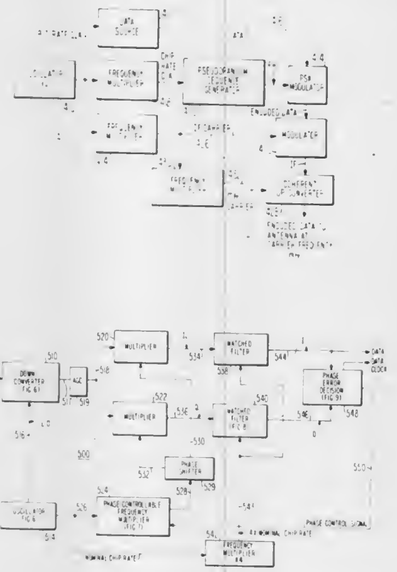
FAST ACQUISITION BURST MODE SPREAD SPECTRUM COMMUNICATIONS SYSTEM WITH PILOT CARRIER

Leonard N. Schiff, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 17, 1985, Ser. No. 755,921

Int. Cl.[4] H03D *3/24;* **H04B** *1/06*

U.S. Cl. 375—1 **20 Claims**



1. A spread spectrum communications arrangement for

communicating among a plurality of transmitter-receiver pairs by bursts of data in the form of pseudorandom sequence encoded data bits, comprising:

a transmission path subject to undesirable phase or frequency effects such that the frequency of a signal passing therethrough experiences a frequency offset;

a pilot signal generator coupled to a sending end of said transmission path for generating a pilot signal having a pilot frequency and for applying said pilot signal to said sending end;

a source of data to be transmitted;

transmitting means coupled to said source of data and including first clock generating means for producing a first clock signal having a nominal frequency which is an integer submultiple of said pilot frequency for clocking said source of data to produce clocked data at a frequency which is a second integer multiple of said frequency of said first clock signal, and including a modulator coupled to said source of data for PSK modulating said clocked data with a pseudorandom sequence having a chip frequency which is a third integer multiple of said frequency of said first clock signal to produce an encoded data signal, and including up-conversion means coupled to said first clock signal generating means and to said modulator for frequency-converting said encoded data signal to a transmitting frequency to produce an encoded transmitting frequency signal, and also including transmitting means coupled to said up-conversion means for coupling said encoded transmitting frequency signal to said sending end of said transmission path whereby said transmission path offsets said pilot frequency and said transmitting frequency to produce a frequency offset pilot signal and a frequency offset encoded data signal;

a receiver coupled to a receiving end of said transmission path for receiving said frequency offset pilot signal and said frequency offset encoded data signal, said receiver including downconversion means, quadrature detection means, matched filtering means and downconversion reference phase correction means;

said downconversion means comprising a second clock signal generator for generating a second clock signal having a second clock frequency which is a fourth integer submultiple of said pilot frequency, a downconverter coupled to said second clock signal generator and to said receiving end of said transmission path for receiving said offset pilot signal and said offset encoded data signal for mixing said offset pilot signal and said offset encoded data signal with a signal derived from said second clock signal to produce an intermediate frequency pilot signal having a pilot intermediate frequency and an intermediate frequency data signal having a data intermediate frequency in such a manner as to make said intermediate frequency pilot signal equal to a fifth integer multiple of said second clock signal, thereby setting the offset between said fifth integer multiple of said second clock signal and said data intermediate frequency at a frequency equal to the offset between said pilot frequency and said transmitting frequency;

said quadrature detection means comprising phase controllable demodulating signal generating means coupled to said second clock signal generator for generating a demodulation signal at a demodulation frequency which is a sixth integer multiple of said second clock frequency which is nominally equal to said data intermediate frequency and also comprising mixing means coupled to said demodulating signal generating means and to said downconversion means for demodulating said intermediate frequency data signal to form mutually quadrature undecoded I and Q components of demodulated data signal;

said matched filtering means being coupled to receive said undecoded I and Q components for generating decoded I and Q signals having amplitudes which are together representative of the phase angle between said demodulating signal and said intermediate frequency data signal; and

said downconversion reference phase correction means is coupled to said matched filtering means and to said controllable demodulation signal generating means for generating from said decoded I and Q signals a phase control signal representative of said phase difference between said demodulating signal and said intermediate frequency data signal and for applying said control signal to said demodulating signal generating means for closing a control loop for correcting said phase difference between said demodulating signal and said intermediate frequency data signal.

14. A method for receiving spread-spectrum encoded data signals which have been upconverted to a particular frequency range and which are associated with a pilot carrier, comprising the steps of:

generating a local oscillator signal;

downconverting said spread-spectrum encoded data signals and said pilot signal by mixing said spread-spectrum data signals and said pilot signal to an intermediate frequency range by use of said local oscillator signal to produce an encoded IF data signal and an IF pilot signal;

generating a reference frequency signal;

controlling the frequency of said local oscillator signal in such a fashion that said IF pilot signal is locked to said reference frequency signal whereby said encoded IF data signals are associated with an IF carrier having an IF carrier frequency;

generating mutually quadrature demodulating signals at a frequency near said IF carrier frequency;

separately mixing each of said mutually quadrature demodulating signals with said encoded IF data signals to produce inphase and quadrature components of demodulated encoded data signals;

match-filtering said inphase and quadrature components of said encoded data signals to produce decoded inphase and decoded quadrature signals, respectively, the amplitudes of which are related to the phase angle between said demodulating signals and said IF carrier;

evaluating the amplitudes said decoded inphase and decoded quadrature signals to generate a control signal representative of said phase differences between said demodulating signals and said IF carrier; and

controlling the phase of said mutually quadrature demodulating signals with said control signal in a manner selected to reduce said phase differences between at least one of said demodulating signals and said IF carrier.

4,630,284

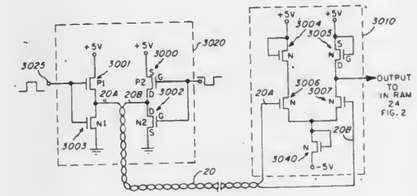
LOW POWER LINE DRIVING DIGITAL TRANSMISSION SYSTEM

Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1984, Ser. No. 687,537

Int. Cl.[4] H04B *3/20, 3/50*

U.S. Cl. 375—36 **5 Claims**



1. Apparatus for transmitting electrical signals from a transmitter end to a receiver end over a pair of conductors having a characteristic impedance of Z_0 comprising:

(a) a differential receiver at the receiver end comprising a pair of like conductivity transistor pairs having source, drain and gate electrodes with the gate electrode of one

transistor in one transistor pair coupled to one of said conductors at the receiver end and the gate electrode of one of the other of said transistors in the other transistor pair coupled to the other one of said conductors at the receiver end and means for differentially switching a current source to one or the other of said transistor pairs and a differential driver at the transmitter end comprising a pair of opposite conductivity transistor pairs having source, drain and gate electrodes with the source electrodes of the positive conductivity transistors coupled to a source of positive D.C. voltage and the source electrodes of the negative conductivity transistors coupled to ground or negative D.C. voltage while the gate electrodes are driven differentially and the drain electrodes of one transistor pair are coupled to one conductor of said pair of conductors while the drain electrodes of the other transistor pair is coupled to the other conductor of said pair of conductors at the transmitter end; and

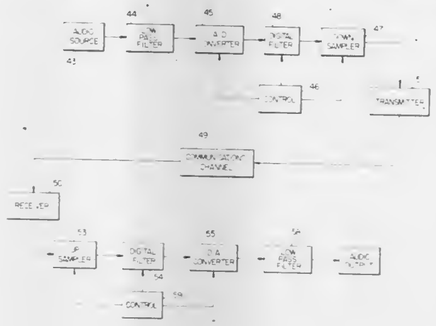
(b) the source impedance of said differential driver being substantially equal to said characteristic impedance Z_0 and the input impedance of said differential receiver being sufficiently high as to present an effective open circuit to received signals.

4,630,285

METHOD FOR REDUCING GROUP DELAY DISTORTION

James W. Dyer, Laurel, and Raymond R. Watkins, Ellicott City, both of Md., assignors to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Mar. 18, 1985, Ser. No. 712,934
Int. Cl.⁴ H04L *27/00*
U.S. Cl. 375—37 **6 Claims**



1. A process for reducing group delay distortion in an analog signal communication, comprising:

(a) filtering a first analog signal, a predetermined portion of which comprises a signal of interest, with a low pass filter having a cutoff frequency substantially greater than the signal of interest, said frequency being at least that necessary to preclude group delay distortion in said signal of interest;

(b) converting said filtered analog signal to digital form at a rate equal to or greater than two times the filtered signal bandwidth;

(c) filtering said digital signal with a digital filter having a cutoff frequency substantially equal to the signal of interest;

(d) down sampling said filtered digital signal to a transmission sample rate approximately equal to twice the bandwidth of the signal of interest;

(e) up sampling said down sampled signal to a rate equal to or greater than two times the transmission sample rate;

(f) filtering said up sampled signal with a digital filter having a cutoff frequency substantially equal to the signal of interest;

(g) digital-to-analog converting said filtered up sampled signal to produce a second analog signal; and

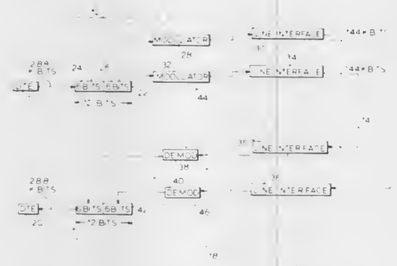
(h) filtering said second analog signal with an analog low pass filter having a cutoff frequency substantially greater than the signal of interest, said frequency being at least that necessary to preclude group delay distortion in said signal of interest.

4,630,286

DEVICE FOR SYNCHRONIZATION OF MULTIPLE TELEPHONE CIRCUITS

William L. Betts, St. Petersburg, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Oct. 10, 1984, Ser. No. 659,289
Int. Cl.⁴ H04L *27/02, 7/02*
U.S. Cl. 375—39 **11 Claims**



1. A system for exchanging high speed data signals over two low speed data channels comprising:

a. transmitter means coupled to said data channels for receiving a high speed data stream from data transmission equipment and including:

1. partitioning means for partitioning said high speed data stream into a first and a second low speed data stream;
2. a first modulator section coupled to said partitioning means for generating a first stream of modulated signals each said modulated signals having angular components corresponding to said first low speed data stream for transmission over a first of said low speed data channels;
3. a second modulator section coupled to said partitioning means for generating a second stream of modulated signals corresponding to said second low speed data stream, for transmission over a second of said low speed data channels; and
4. transmitter phase shifting means for selectively shifting the phase of said first low speed data stream in a first predetermined pattern; and

b. receiver means coupled to said data channels for receiving said first and second streams of modulated signals and including:

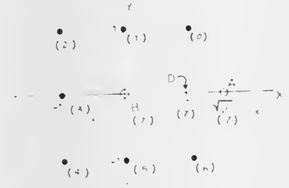
1. a first demodulator for generating a first output data stream corresponding to said first stream of modulated signals;
2. a second demodulator for generating a second output data stream corresponding to said second stream of modulated signals;
3. delay detecting means for detecting a differential delay between said first and second streams of modulated signals,
4. delay means for causing one of said first and second output data streams to be delayed in accordance with said differential delay; and
5. receiver phase shifting means for selectively shifting the phase of said first output data stream in a second predetermined pattern complementary to said first predetermined pattern;
6. phase monitoring means for monitoring the angular components of said first output data stream to generate a phase error signal when said angular components deviate from a preset criteria; and
7. combining means for generating a combined output data stream from said first and second output data streams.

4,630,287

SECONDARY CHANNEL SIGNALLING IN A QAM DATA POINT CONSTELLATION

Thomas Armstrong, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Continuation-in-part of Ser. No. 565,523, Dec. 28, 1983, abandoned, which is a continuation of Ser. No. 299,660, Sep. 8, 1981, abandoned. This application Jun. 25, 1985, Ser. No. 748,748
Int. Cl.⁴ H04J *7/00;* **H04L** *5/12*
U.S. Cl. 375—39 **5 Claims**



1. A method of adding a secondary channel to a QAM signal mapped in the complex plane with data points assuming normal positions on concentric rings comprising the steps of:

(a) locating a pair of positions in the mapped complex plane (A and B) such that one-half the sum of the square of the distances to such positions from the origin ($A^2+B^2/2$) is no greater than the square of the distance from the origin to the position of the furthest mapped data point;

(b) assigning a binary "1" to the existence of a data point at one of said pair of positions and a binary "0" to the existence of a date point at the other of said pair of positions;

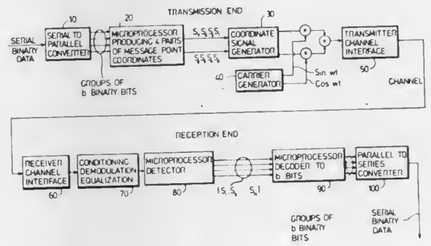
(c) shifting a single data point from a normal position to assume either of said pair of positions to define said secondary channel, the other data points being kept at their normal positions.

4,630,288

DATA TRANSMISSION WITH BLOCK CODING

Fred M. Longstaff, Islington, and Gordon R. Lang, Bolton, both of Canada, assignors to Motorola Canada Limited, North York, Canada

Continuation-in-part of Ser. No. 563,976, Dec. 21, 1983. This application Feb. 27, 1984, Ser. No. 584,235
Int. Cl.⁴ H04L *23/02*
U.S. Cl. 375—39 **14 Claims**



9. Method of encoding binary data in blocks of b bits into a block of eight signals for transmission modulated on a carrier; comprising;

detecting said block of b bits,

for each block of b bits, determining a number N identifying such block,

for each number N, determining a set of eight values S1, S2 . . . S8 identifying the number N,

where the eight values are each selected from positive, negative and zero integral values; the eight values identifying each number N are all even integrals or all odd integrals and the sum of the last mentioned eight values is 0 modulo 4,

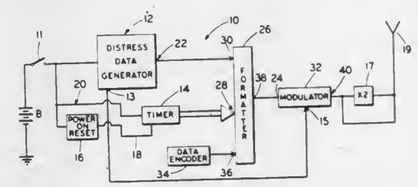
modulating a carrier in accord with the said eight values.

4,630,289

EMERGENCY LOCATOR TRANSMITTER INCIDENT TIME CORRELATOR

Paul E. Wren, 240 Berrywood Drive, Severna Park, Md. 21146

Filed Dec. 21, 1979, Ser. No. 106,309
Int. Cl.⁴ H04N *1/02*
U.S. Cl. 375—71 **15 Claims**



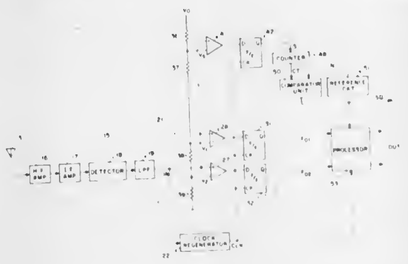
1. In a distress signal transmitter of a type wherein following a distress incident a characteristic distress signal is transmitted on a predetermined carrier frequency, the improvement comprising: means for generating a start signal at the start of a distress transmission, means for generating a time for transmission signal initiated by said start signal; and means for combining said time signal with said distress signal.

4,630,290

SQUELCH SIGNAL GENERATOR CAPABLE OF GENERATING A SQUELCH SIGNAL WITH A HIGH RELIABILITY

Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 16, 1984, Ser. No. 672,346
Claims priority, application Japan, Nov. 18, 1983, 58-217456; Nov. 18, 1983, 58-217457
Int. Cl.⁴ H04B *1/10*
U.S. Cl. 375—104 **4 Claims**



1. A squelch signal generator responsive to an input signal which has an input level and which input signal is classifiable into a desired or an undesired signal, said generator generating a squelch signal when said input signal is classifiable as said undesired signal, said input signal displaying on an oscilloscope

an eye pattern having an eye group when said input signal is classied as said desired signal, said eye group appearing at a predetermined period and being specified by a pair of cross-points of a high and a low level at each time instant which is defined by said predetermined period, said squelch signal generator comprising:

first threshold signal producing means for producing a first threshold signal of a first threshold level which is preselected outside of a predetermined one of said high and said low levels;

first comparing means responsive to said input signal and said first threshold signal for comparing said input level with said first threshold level to produce a first resultant signal when said input level exceeds said first threshold level outside of said eye group;

clock generating means responsive to said input signal for generating a sequence of clock pulses at said each time instant appearing at every predetermined period; and

processing means coupled to said first comparing means and responsive to said clock sequence for successively processing said first resultant signal at said time instant to discriminate between said desired and said undesired signals and to produce said squelch signal in response to a discrimination of said undesired signal.

4,630,291

EXTERNALLY SYNCHRONIZED TIMEBASE

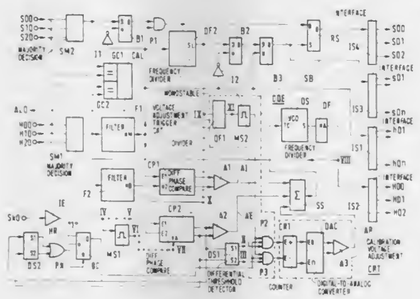
André Lankar, Paris, and Alain Lalanne, Asnieres, both of France, assignors to Compagnie Industrielle des Telecommunicat., Paris, France

Filed May 25, 1984, Ser. No. 613,985

Claims priority, application France, May 27, 1983, 83 08774

Int. Cl.[4] H04L *7/04*; H03L *7/00*

U.S. Cl. 375—107 **5 Claims**



1. A multi-generator externally synchronized timebase including a plurality of generators each generating first clock signals and individual output synchronization signals, each generator in said timebase comprising:

a voltage-controlled oscillator (OS) for generating a first clock signal (HA) in accordance with a control input;

a first voter (SM1) for deriving a majority clock signal from the individual first clock signals (Hij) respectively generated in each generator of said timebase;

a second voter (SM2) for deriving an output synchronization signal (SL) from the individual output synchronization signals (Sij) respectively generated in each generator of said timebase;

a first differential phase comparator (CP2) having a first input for receiving an external synchronization signal (Sk0) and a second input for receiving the derived output synchronization signal (SL);

a second differential phase comparator (CP1) having a first input for receiving said derived majority clock signal and a second input for receiving an output signal (HA or HB) from said voltage controlled oscillator;

a calibration circuit including a threshold detector (DS1) connected to an output of said first differential phase comparator (CP2), a first trigger circuit (CDE) responsive to said derived output synchronization signal (SL) and to outputs of said threshold detector for providing trigger circuit outputs, and a calibration voltage adjustment circuit (CRT) receiving said trigger circuit outputs and providing a calibration voltage adjustment circuit output; and

a summing circuit (SS) having a first input receiving said calibration voltage adjustment circuit output, a second input receiving an output of said first differential phase comparator circuit and a third input receiving an output of said second differential phase comparator circuit, said summing circuit providing an output to said control input of said voltage controlled oscillator.

4,630,292

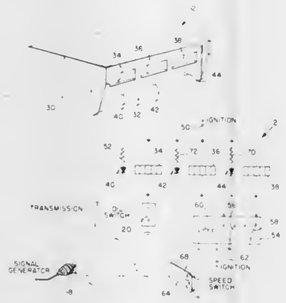
FUEL TAX REBATE RECORDER

Ronald A. Juricich, 9220 Bayshore Dr., Silverdale, Wash. 98383, and Ralph V. Sleeman, 17102 Meridian Ave. South, No. 70, Puyallup, Wash. 98373

Filed Aug. 13, 1984, Ser. No. 639,735

Int. Cl.[4] G07C *5/04*

U.S. Cl. 377—20 **8 Claims**



1. A fuel tax rebate recorder for motor vehicles, comprising:

a first signal generator producing a motor running indication when the motor of said vehicle is running;

a second signal generator producing a vehicle moving indication when said vehicle is moving faster than a predetermined velocity, said second signal generator including a speedometer generator coupled to the drive train of said vehicle, said speedometer generator producing an electrical signal having a characteristic that is proportional to the speed of said vehicle, said second signal generator further including a sensing device receiving the signal produced by said speedometer generator, said sensing device being triggered responsive to said speedometer generator indicating a speed exceeding a predetermined value, said sensing device producing said vehicle moving indication as said sensing device is triggered; and

timer means for separately recording at least two out of three time parameters, said time parameters being the period of time that said first signal generator is producing said motor running indication, the period of time that said second signal generator is producing said vehicle moving indication above said predetermined velocity, and the period of time that said first signal generator is producing said motor running indication but said vehicle is moving below said predetermined velocity, said vehicle moving time indications above and below said predetermined velocity being incremented alternatively.

4,630,293

MILEAGE TOTALIZER WITH NON VOLATILE MEMORY

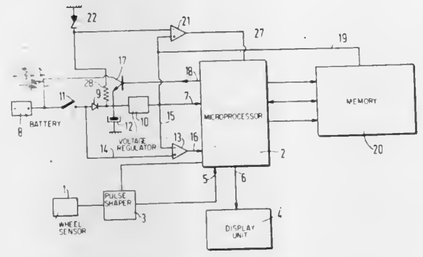
Georges Dubuisson, Orgeval, and Tan Duc Huynh, Noisiel, both of France, assignors to e.d. Veglia, Paris Cédex, France

Filed Aug. 24, 1984, Ser. No. 643,825

Claims priority, application France, Aug. 24, 1983, 83 13646

Int. Cl.[4] G01B *7/00*

U.S. Cl. 377—24 **4 Claims**



1. A motor vehicle mileage totalizer, comprising:

a wheel sensor means for providing mileage distance data;

a nonvolatile memory;

a microprocessor, responsive to said mileage distance data and said nonvolatile memory, for calculating total distance D_T and partial distance D_P traveled and providing D_T and D_P data;

means for supplying electric power to said microprocessor;

switch means for turning on and turning off power to said microprocessor;

display means, responsive to said microprocessor, for displaying at least one of total distance D_T and partial distance D_P; and

means, responsive to said switch means for transferring successive partial distance data D'_P, D''_P, D'''_P. . . , to said nonvolatile memory, each successive time said switch means turns off power to said microprocessor, each of said successive partial distance data being located in adjacent memory cells of said memory, said means for transferring being further responsive to said switch means in the on condition, for transferring data from said memory to said microprocessor, said microprocessor further including means for summing all successive partial distance data D'_P, D''_P, D'''_P. . . contained in said nonvolatile memory with an intermediate total distance data D_I and providing a new intermediate total distance data for recording in said memory.

4,630,294

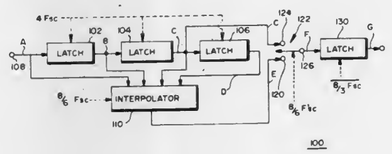
DIGITAL SAMPLE RATE REDUCTION SYSTEM

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 17, 1985, Ser. No. 755,759

Int. Cl.[4] H03K *21/00*

U.S. Cl. 377—48 **8 Claims**



1. A digital sample rate reduction apparatus for converting an input sample sequence with a given sample rate to an output sample sequence occurring at a rate that is two-thirds of the input sample rate and in which one-half of the samples are interpolated samples and the remaining half are original input samples; said sample rate reduction apparatus comprising:

latching means through which said input sample sequence is clocked in response to the application of a first clock signal synchronous to and having the same rate as said input sample sequence;

means including an interpolating means coupled to said latching means and driven by a second clock signal occurring at one-third of said input sample rate, for producing at the output thereof a sequence of interpolated samples occurring at one-half of said output sample rate; and

means including a switching means selectively coupled to said interpolating means and said latching means; said switching means being driven by a third clock signal occurring at one-third of said input sample rate for producing at the output thereof said output sample sequence occurring at two-thirds of said input sample rate, and in which one half of the samples are interpolated samples and the balance half are unaltered input samples.

4,630,295

LOW POWER CONSUMPTION CMOS SHIFT REGISTER

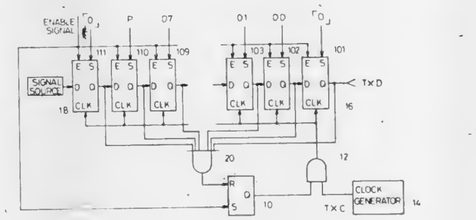
Setsufumi Kamuro, Yamatokoriyama; Takaaki Hirano, and Mikiro Okada, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1984, Ser. No. 633,989

Claims priority, application Japan, Aug. 5, 1983, 58-144252

Int. Cl.[4] G11C *19/00, 7/00*

U.S. Cl. 377—81 **4 Claims**



1. A CMOS shift register system for minimizing power consumption, comprising:

a CMOS shift register;

detection means for providing a first signal when data meant for transfer exists in said CMOS shift register and a second signal when said shift register is full, said shift register being full being indicative that said shift register does not contain data that are to be transferred;

transfer clock generation means for providing a clock signal so as to transfer data in said CMOS shift register; and

means for applying said clock signal to said CMOS shift register only in response to said first signal of said detection means and inhibiting further clock signal application in response to said second signal so that power consumption is minimized.

4,630,296

METHOD OF GENERATING LAYER IMAGES

Paul Haaker, Hamburg; Erhard Klotz, Halstenbek; Reiner Koppe, Hamburg; Rolf Linde, Haseldorf, and Holger Möller, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 537,930, Sep. 30, 1983. This application Jul. 16, 1985, Ser. No. 755,552

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237572

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—2 **10 Claims**

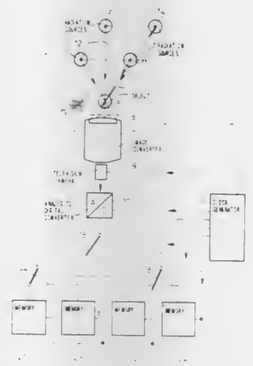
1. A method of generating an image of a layer of an object,

said image being made up of a plurality of layer-image points, said method comprising the steps of:

irradiating the object from a plurality of radiation source positions to generate separate single-shadow images of the object, each single-shadow image being made up of a plurality of shadow-image points, each shadow-image point having an image value representing an amount of radiation absorbed by the object; and

generating the layer-image points from the single-shadow images to form the image of the layer;

characterized in that an image value of each layer-image point is generated by:



selecting one shadow-image point from each shadow image, each selected shadow-image point being geometrically associated with the layer-image point, said shadow-image points forming a set of shadow-image points associated with the layer-image point;

comparing the image values of the shadow-image points in the set of shadow-image points to determine the image value corresponding to the lowest amount of radiation absorbed by the object; and

assigning an image value to the layer-image point, the image value being proportional to the image value of the shadow-image point corresponding to the lowest amount of radiation absorbed by the object.

4,630,297

CASSETTE WITH INTENSIFYING SCREENS FOR USE WITH RADIOGRAPHIC FILM

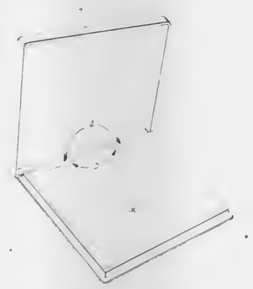
Gianfranco Lerma, Ferrania/Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 2, 1980, Ser. No. 193,381

Claims priority, application Italy, Oct. 15, 1979, 50567 A/79

Int. Cl.[4] G03B *42/04*

U.S. Cl. 378—185 **10 Claims**



1. In a cassette comprising a base lid element and an upper element hinged along their rear edge and opposed intensifying screens fixed, in the interior of said cassette, to said base lid element and to said upper element of the cassette, for use with a radiographic film situated between and in close contact with said screens, the improvement consisting of providing the screen of said base lid element with a zone of non-contact along only one edge chosen from its front and rear edges, and providing said upper screen with a zone of non-contact along the other edge of its front and rear edges, said zones of non-contact comprising areas of one screen having larger distances between an edge of the screen and an edge of the cassette than the opposed screen from the same edge of the cassette.

4,630,298

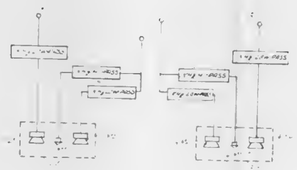
METHOD AND APPARATUS FOR REPRODUCING SOUND HAVING A REALISTIC AMBIENT FIELD AND ACOUSTIC IMAGE

Matthew S. Polk, 305 Tuscany Rd., Baltimore, Md. 21210, and Colin B. Campbell, 3600 Elkader Rd., Baltimore, Md. 21218

Filed May 30, 1985, Ser. No. 739,452

Int. Cl.[4] H04R *5/00*

U.S. Cl. 381—1 **9 Claims**



1. In a stereophonic sound reproduction system having a left channel output and a right channel output, apparatus for reproducing sound having a realistic ambient field and acoustic image comprising:

a right main speaker and a left main speaker disposed respectively at right and left main speaker locations equidistantly spaced from a listening location, the listening location being a place in space for accommodating a listener's head facing the main speakers and having a right ear location and a left ear location along an ear axis, with the right and left ear locations separated along the ear axis by a maximum interaural sound distance of Δt_{max} and the listening location being defined as the point on the ear axis equidistant to the right and left ears;

a right sub-speaker and a left sub-speaker disposed respectively at right and left sub-speaker locations equidistantly spaced from the listening location;

the right main speaker being separated from the right ear location by a sound distance t and being separated from the left ear by a sound distance $t+\Delta t$ where Δt is the interaural sound distance spacing with respect to the right main speaker between the right ear location and the left ear location;

the right sub-speaker being separated from the right ear location by a sound distance $t+\Delta t'$ where $\Delta t'$ is the sound distance spacing with respect to the right ear location between the right main speaker location and right sub-speaker location;

the left main speaker being separated from the left ear location by a sound distance t and being separated from the right ear location by a sound distance $t+\Delta t$ where Δt is the interaural sound distance with respect to the left main speaker between the left and right ear locations;

the left sub-speaker being separated from the left ear location by a sound distance $t+\Delta t'$ where $\Delta t'$ is the sound distance spacing with respect to the left ear location between the left main speaker location and left sub-speaker location;

each of said left and right main speakers comprising a driver and a tweeter, and wherein each of said main speaker tweeters are positioned physically further from the listening location than the main speaker drivers, each of said left and right sub-speakers consisting of only a driver which is positioned further from the listening location than the main speaker tweeter, cross-over networks for providing transition between the main speaker drivers and tweeters;

means coupling the right and left channel outputs, respectively, to said right and left main speakers;

means connected to the right and left channel outputs for developing a left channel minus right channel signal and a right channel minus left channel signal;

means coupling said left channel minus right channel signal to said left sub-speaker and said right channel minus left channel signal to said right sub-speaker;

means limiting the acoustic output of said subspeakers to frequencies below approximately 1 kHz;

whereby sound reproduced by said apparatus as perceived by a listener whose head is located generally at the listening location has a realistic acoustic field and enhanced acoustic image.

4,630,299

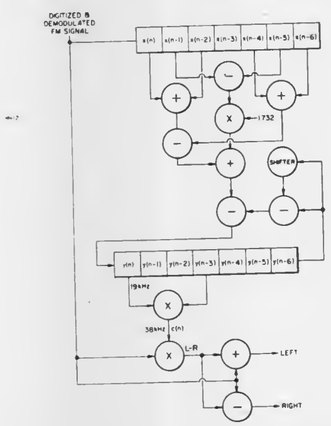
DIGITAL CIRCUIT FOR DECODING DIGITIZED, DEMODULATED FM STEREO SIGNALS

Kenneth B. Welles, II, Schenectady; Sharbel E. Noujaim, Clifton Park, and Jerome J. Tiemann, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,123

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—4 **5 Claims**



1. A digital circuit for decoding a demodulated and digitized FM stereo signal comprising at least stereo carrier, L+R, and L−R signals into digitized left and right channel components, said circuit comprising:

a digital filter for receiving said digitized FM stereo signal as an input sequence x(nT) and generating an output sequence y(nT), said filter having a z-transform transfer function substantially equal to

$$H(z) = H\frac{(z^2+1)(z^2-1)(z^2+\sqrt{3}z+1)}{z^6+(1-2^{2-N})}$$

where N is a real number greater than 2 and H is a scale factor, said filter operating a sampling rate with period T corresponding to a sampling rate which is substantially equal to 228 kHz;

a first digital multiplier circuit for forming the product of the output of said filter at time nT, y(nT), with the output of said filter at time (n−3)T, y(nT−3T), so as to form a digitized representation of the stereo carrier signal, c(nT); and

a second digital multiplier circuit for forming the product of the input to said filter at time nT, x(nT), with the output of said first digital multiplier at time nT, c(nT), so as to form a digitized representation of the L−R signal.

4,630,300

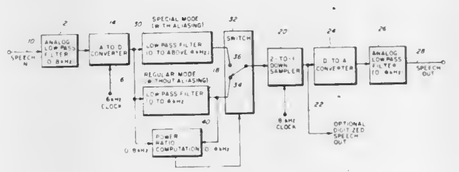
FRONT-END PROCESSOR FOR NARROWBAND TRANSMISSION

George S. Kang, Silver Spring, Md.; Stephanie S. Everett, Alexandria, Va., and Alexander F. Thornhill, Accokeek, Md., assignors to United States of America as represented by the Secretary of the Navy

Filed Oct. 5, 1983, Ser. No. 539,214

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—31 **18 Claims**



1. A front-end processor for a narrowband voice transmission system with a given passband comprising:

input means for receiving an electrical signal representing a voice signal;

means for comparing a parameter such as the voltage or power of the electrical voice signals from said input means to the same parameter of the electrical voice signals within said passband and generating a control signal; and

means for spreading the spectra of a portion of the electrical voice signals above said passband into said voice transmission system passband in accordance with said control signal if the total of the measured parameter of the signal taken from said input means to the same measured parameter of the signal within said passband has at least a predetermined ratio.

4,630,301

VOICE ACTIVATED ECHO GENERATOR

G. Burnell Hohl, Norwalk, Conn., and Martin Calvin, Livingston, N.J., assignors to Well Made Toy Manufacturing Corp., Long Island City, N.Y.

Filed Jun. 4, 1985, Ser. No. 741,286

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—36 **4 Claims**

1. A voice-activated echo generator circuit for use in an electronic toy comprising:

(a) microphone means for producing an analog audio signal in response to sound received thereby

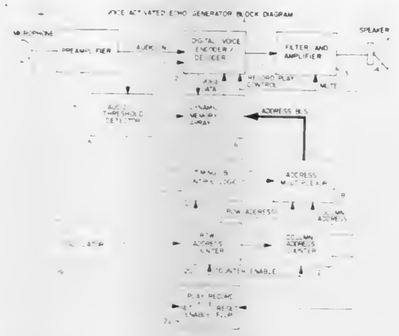
(b) threshold detection means responsive to said analog audio signal for initiating a record/playback cycle, said record/playback cycle comprising a distinct record interval automatically followed by a distinct playback interval,

(c) means, active during said record interval, for digitally coding said analog audio signal received during said record interval,

(d) memory means for storing said digitally coded audio signal formed during said record interval,

(e) means for automatically initiating said playback interval at the end of said record interval,

(f) means active during said playback interval, for reading said digitally coded audio signal out of said memory



means and for decoding said digitally coded audio signal back into analog audio form, and

(g) loudspeaker means for broadcasting said analog audio signal to provide an automatic echo of said received sound.

4,630,302

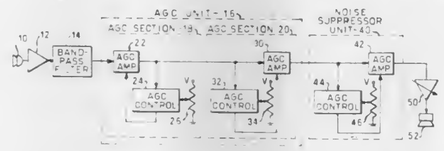
HEARING AID METHOD AND APPARATUS

Karl D. Kryter, Bodega Bay, Calif., assignor to Acousis Company, Bodega Bay, Calif.

Filed Aug. 2, 1985, Ser. No. 762,309

Int. Cl.⁴ H04B *1/10*

U.S. Cl. 381—57 **14 Claims**



1. A method of aiding hearing by reducing the level of background noise signals between speech signal segments of an input signal, comprising

reducing the long-time average intensity level of input signal segments that are above a predetermined long-time average level with substantially linear gain over a predetermined range of short-time averaged level segments of the input signal,

amplifying those long-time averaged segments of the input signal that are not reduced in level to increase the long-time averaged level thereof to said predetermined long-time averaged level,

following the above adjustments to temporal segments of the input signal, reducing the signal level when the long-timed averaged level segments thereof exceed a predetermined level below said predetermined long-time average level for reducing the level of background noise signals between speech signal segments.

4,630,303

SPEAKER SYSTEM HAVING A MOVABLE HIGH RANGE UNIT

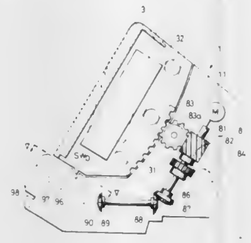
Toshihiro Tanno, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,279

Claims priority, application Japan, Oct. 3, 1983, 58-153614[U]

Int. Cl.⁴ H04R *1/02*

U.S. Cl. 381—87 **10 Claims**



1. A speaker system for automotive car stereo sets, including a high range unit for propagating sound in a sound propagation direction, a low range unit, a body for receiving the high range unit and the low range unit, said speaker system comprising:

means responsive to a driving force for moving said high range unit with respect to said body in a direction transverse to said sound propagation direction with a slant angle thereof being changed, and

means for selectively providing said driving force to said moving means to thereby move said high range unit.

4,630,304

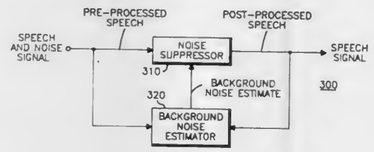
AUTOMATIC BACKGROUND NOISE ESTIMATOR FOR A NOISE SUPPRESSION SYSTEM

David E. Borth, Palatine; Ira A. Gerson, Hoffman Estates, and Richard J. Vilmur, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,572

Int. Cl.⁴ H04B *15/00*

U.S. Cl. 381—94 **33 Claims**



1. An improved background noise estimator adapted for use with a noise suppression system wherein the background noise from a noisy pre-processed input signal is attenuated by spectral gain modification to produce a noise-suppressed post-processed output signal, said background noise estimator comprising:

noise estimation means for generating and storing an estimate of the background noise power spectral density of the pre-processed signal; and

noise detection means for periodically detecting the minima of the post-processed signal energy, and for controlling said noise estimation means in response thereto such that said background noise estimate is updated only during said minima.

4,630,305

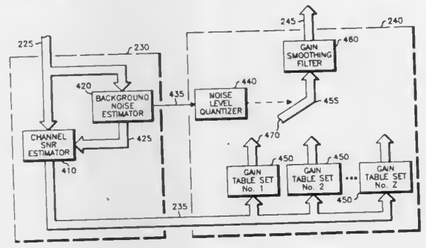
AUTOMATIC GAIN SELECTOR FOR A NOISE SUPPRESSION SYSTEM

David E. Borth, Palatine; Ira A. Gerson, Hoffman Estates; Philip J. Smanski, and Richard J. Vilmur, both of Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,941

Int. Cl.⁴ H04B *15/00*

U.S. Cl. 381—94 **42 Claims**



1. An improved noise suppression system for attenuating the background noise from a noisy input signal to produce a noise-suppressed output signal, said noise suppression system comprising:

means for separating the input signal into a plurality of pre-processed signals representative of selected frequency channels;

means for modifying an operating parameter of each of said plurality of pre-processed signals provided by said signal separating means to provide a plurality of post-processed signals; and

means responsive to said plurality of pre-processed signals for generating a modification signal having a selected modification value for each channel for application to said modifying means to enable the operating parameter to be modified, said modification signal generated by automatically selecting a modification value for each channel from one of a plurality of sets of modification values for that channel.

4,630,306

APPARATUS AND METHODS FOR CODING AND STORING RASTER SCAN IMAGES

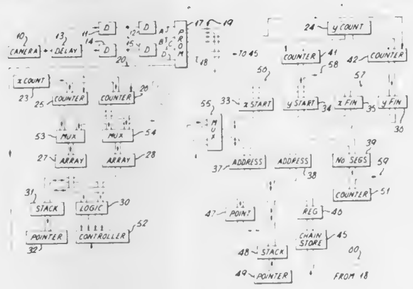
Geoffrey A. W. West, and Walter J. Hill, both of London, England, assignors to National Research Development Corp., London, England

Filed Apr. 17, 1984, Ser. No. 601,340

Claims priority, application United Kingdom, Apr. 29, 1983, 8311813

Int. Cl.⁴ G06K *9/48*

U.S. Cl. 382—21 **4 Claims**



1. Apparatus for use in coding and storing raster scan images, comprising

means for scanning images in a series of raster lines,

detecting means for detecting discontinuities as they occur in a raster scan line and for deriving both respective position signals representative of the positions in the line of the discontinuities and respective segment signals representing directions of segments of boundaries formed by discontinuities in the line, each segment direction including a positive or negative polarity determined by the direction of a boundary of which that segment forms part, the positive direction being a predetermined direction of traverse around a shape which is enclosed by the boundary,

a first store coupled to the detection means for storing chains of the segment signals in which the chains represent respective discontinuities in an image being scanned, the contents of the first store forming, when a scan is complete, part of a coded and stored version of an image scanned,

logic means for determining when a new discontinuity not connected to previously-detected discontinuities is detected,

means coupled to the logic means for allocating identifying signals for the said chains when a said new discontinuity is detected, and

a second store with address input coupled to the said detection means and a content input coupled to the said means for allocating identifying signals, the second store having first and second arrays of storage locations, one location in each said array for each pixel in a scan line, the first and second arrays being used, in operation, to store for each line and for an interval of one line period, the identifying signals of chains having a segment starting and finishing, respectively, as determined by the positive direction, at locations corresponding to the line positions of the starting and finishing segments,

the logic means being coupled to read the second store as each point in said raster scan line is scanned at the location relating to the corresponding point in the previous said raster scan line, and the logic means causing the first store to store segment signals representing each new segment either as an end of a new chain if no chain identifying signal is stored at the location read, or as a further segment signal in an existing chain if the identifying signal of the existing chain is found at the location read.

4,630,307

SIGNAL PROCESSING METHOD AND APPARATUS FOR SAMPLED IMAGE SIGNALS

David R. Cok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 10, 1984, Ser. No. 649,001

Int. Cl.⁴ G06K *9/46*

U.S. Cl. 382—25 **2 Claims**

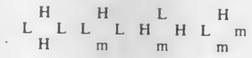
1. A signal processing method for producing interpolated signal values between sampled signal values in a sampled image signal produced by a checkerboard sampling pattern characterized by:

providing a plurality of different interpolation routines for producing interpolated signal values that complete a respective plurality of known geometrical image features, including edges, stripes and corners, the geometrical features being detected by the values of the four nearest neighboring samples such that the patterns:

```
  H   L   H   m   m   L
H L L H H L H L m m L H
  H   L   m   m   m   m
```

their rotations and mirror images are detected as edges, the patterns;





their rotations and mirror images are detected as stripes, and the pattern



its rotations and mirror images are detected as a corner, where
m is the mean value of the four nearest neighboring samples,
H indicates a sample value greater than the mean,
L indicates a sample value less than the mean; and
the interpolation routine for edge features comprises producing the median value of the four nearest neighboring samples; the interpolation routine for the stripe feature comprises producing the value of the clip function

$$X = \overline{\underset{C}{CLIP^{B}}}(M-(S-M))$$

where:
X is the interpolated value,
$A \geqq B \geqq C \geqq D$ are the values of the four nearest neighboring samples in rank order,
M is the median value of the four nearest neighboring samples,
S is the mean value of the eight next nearest neighboring samples; and

$$CLIP_{k}^{j}(i) = j \text{ if } j \leqq i$$
$$i \text{ if } k \leqq i \leqq j$$
$$k \text{ if } i \leqq k;$$

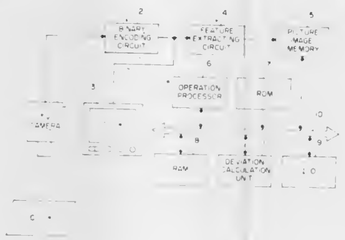
the interpolation routine for corner features comprises producing the value of the clip function

$$X = \overline{\underset{C}{CLIP^{B}}}(M-(S'-M))$$

where:
S' is the mean value of the four next nearest neighboring samples that straddle the boundary between the light and dark members of the four nearest neighboring samples;

detecting which of the known geometrical image features is represented by a neighborhood of sample values; and
applying the interpolation routine appropriate for completing the detected feature to the neighboring sample values to produce the interpolated signal value.

4,630,308
CHARACTER READER
Yasuo Hongo, Tokyo, Japan, assignor to Fuji Electric Corporate Research & Development Ltd. and Fuji Electric Company Ltd., both of Kawasaki, Japan
Filed Jul. 20, 1984, Ser. No. 633,114
Claims priority, application Japan, Aug. 4, 1983, 58-141858
Int. Cl.⁴ G06K *9/56*
U.S. Cl. 382—27 **5 Claims**



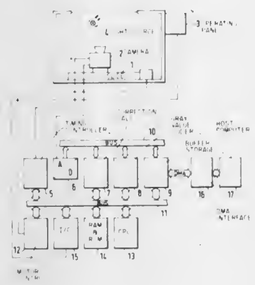
1. A pattern recognition apparatus comprising:
(a) means for scanning an unknown pattern and providing a video signal corresponding to an image of the unknown pattern;
(b) binary encoding means for dividing the image into an array of pixel elements and converting the video signals into binary values using a threshold level, each of the binary values corrsponding to a respective one of the pixel elements;
(c) feature extracting means for converting the binary vlaues corresponding to the pixel elements into segments corresponding to the image, each segment being a horizontal series of pixel elements having a first binary value;
(d) memory means for storing the segments corresponding to the image and data representing a pluraltiy of standard patterns K, the data representing each one of the standard patterns comprising:
(i) a standard bit matrix $B_S^K(i,j)$ derived by dividing an image of the standard pattern into a specified array of meshes, each one of the meshes corresponding to a respective element of the matrix $B_S^K(i,j)$, each element of the matrix having the first or a second binary value depending respectively upon whether or not a portion of the standard pattern is present in the corresponding mesh, the matrix $B_S^K(i,j)$ being reducible to a corresponding cluster expression matrix having mask elements, blank elements, and transformation elements of a transformation chain,
(ii) a mask bit matrix $B_M^K(i,j)$ having elements corresponding to respectivel ones of the meshes of the specified array, each element of the matrix $B_M^K(i,j)$ having the second or the first binary value depending respectively upon whether or not the element is a mask element,
(iii) transformation bit matrices D_1, D_2, D_3, D_4, D_5, D_6, D_7 and D_8 each having elements of a first binary value if the elements of D_1 to D_8 correspond respectively to a present transformation element at the left end of a horizontal transformation chain, at the lower left end of a diagonal transformation chain, at the lower end of a vertical transformation chain, at the lower right end of a diagonal transformation chain, at the right end of a horizontal transformation chain, at the upper right end of a diagonal transformation chain, and at the upper end

of a vertical transformation chain, at the upper left end of a diagonal transformation chain;
e. operating means for performing preprogrammed operations on the data stored in the memory means incldluing:
(i) means for comparing a width and a height of the unknown pattern with the width and height of a search frame,
(ii) means for dividing the image of the unknown pattern into the specified array of meshes and deriving a bit matrix B(i,j) of the image having elements corresponding to reapective ones of the meshes of the specified array, each element of the matrix B(i,j) having the first or the second binary value depending respectively upon whether or not a portion of the unknown pattern is present in the corresponding mesh,
(iii) means for matching the unknown pattern to one of the standard patterns by computing the deviation $D^K(B)$ between the unknown pattern and each one of the standard patterns, the deviation $D^K(B)$ being computed by performing a prescribed operation on at least a corresponding block of the matrix B(i,j) and the matrices $B_S^K(i,j)$, $B_M^K(i,j)$, D_1 to D_8, representing each one of the standard patterns wherein the prescribed operation is defined as

$$D^K(B) = \sum_{i=1}^{M}\sum_{j=1}^{N}[B_S^K(i,j) \oplus \{B_M^K(i,j) \cdot D^K(B(i,j))\}],$$

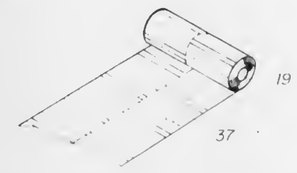
where D^K is a transformation matrix operator comprising transformation bit matrices D_1 to D_8 for the standard pattern K.

4,630,309
METHOD AND APPARATUS FOR AUTOMATIC DIGITIZING OF CONTOUR LINES
Peter Karow, Hamburg, Fed. Rep. of Germany, assignor to URW Unternehmensberatung Karow Rubow Weber GmbH, Hamburg, Fed. Rep. of Germany
Filed Jun. 29, 1984, Ser. No. 626,106
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1983, 3324012
Int. Cl.⁴ G06K *9/36, 9/48*
U.S. Cl. 382—56 **8 Claims**



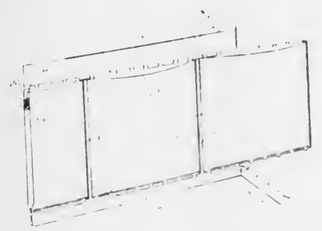
1. A method for automatically digitizing the contours of line graphics, letters and the like of a master utilizing microprocessors and microstorage comprising the steps of:
scanning for initial acquisition and digitally storing the image information from the master;
converting the image information into vector data by utilizing said microprocessors and microstorage;
subjecting the vector data to shape recognition which classifies said vector data as straight line, curve line and corner image elements;
spline fitting said image elements to produce contact points between each said image elements which have the same continuity in both the course of the element, the steepness of the element and the curvature of the element;
selecting a predetermined amount of coordinate pairs of said contact points in accordance with a predetermined degree of sensitivity, the selected coordinate pairs representative of the contour of said master.

4,630,310
OFF-SET MEANS FOR REMOVING BAGS FROM CONNECTED PLURAL ROWS
Franklin P. Winesett, P.O. Box 999, San Andreas, Calif. 95249
Filed Mar. 1, 1985, Ser. No. 707,389
Int. Cl.⁴ B65D *30/00*
U.S. Cl. 383—37 **1 Claim**



1. A plurality of article retaining bags on a roll each bag comprising an interior an opening allowing access to the interior, first and second opposing panels, side seal joining at least a portion of the opposing panels at the bottom of each bag, a lip extending from the opening formed from excess material on the front panel, a flap which is a portion of the second panel doubled over itself and tacked in proximity to the side seals adjacent to the opening to the interior, said plurality of bags being oriented as an uninterrupted joined series of bags of indeterminate length, the openings being transverse to the length of said series, and the plurality of bags being adapted to storage in rolls wherein said roll of bags includes a series of bags comprised of at least two rows of bags, side by side wherein said rows comprise bags which are separable, one from another, by perforations between the bottm seal of one bag and the lip of the preceding bag and wherein said rows are staggered such that the perforations do not extend entirely across the rows.

4,630,311
ZIPPER-LOCK BAG CHAIN WITH TEARABLE STRIP INTERCONNECTION MEANS
Per Bentson, Suffern, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,085
Int. Cl.⁴ B65D *30/00*
U.S. Cl. 383—37 **17 Claims**



1. A chain of laterally interconnected bags comprising in combination:
a plurality of bags formed of a plastic film each having releasably interlocking rib and groove elements on confronting inner faces at the bag tops, immediately below and along upstanding pullaport flange means and each bag

being closed by a side seam at each side edge and positioned in spaced side-by-side relationship to form a chain, said rib and groove elements having opposite ends at said side seams and spaced from the ends of the rib and groove elements of the adjacent bags;

strip material detachably connected to said flange means of the bags to form the chain and removable from the flange means for separating individual bags from the chain;

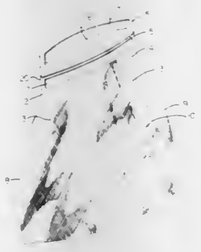
and each bag in the chain being fully separated from each adjacent bag by a line of separation which extends along and between said side seams and past said ends of said rib and groove elements and through said pullapart flange means all the way to said strip of material, so that when said strip of material is removed, the bags will automatically separate from one another at said pullapart flange means and the separated ends of the rib and groove elements and at least throughout the major extent of said separation below said rib and groove means.

4,630,312

LAUNDRY BAG FOR NYLON HOSIERY AND THE LIKE

Elisabeth M. L. Milstein, 355 Colorado Blvd., Denver, Colo. 80206

Filed Feb. 20, 1981, Ser. No. 236,533
Int. Cl.⁴ B65D *30/06, 30/28, 33/16, 85/18*
U.S. Cl. 383—86 **2 Claims**



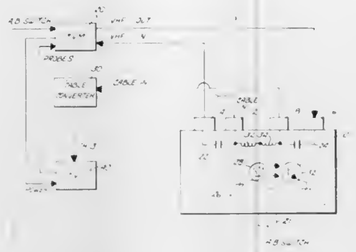
1. An article carrier adaptable for use in washing and drying delicate fabrics, such as, nylon hose and the like, comprising in combination a rectangular panel of open mesh material folded upon itself in a lengthwise direction to define a lower closed end (**11**), an upper open end (**12**) and opposite sides (**18** and **19**), the mesh material at said upper end being gathered and folded together in a direction transversely of the length to define longitudinally extending folds (**13**) and to form a container (**10**) of generally trapezoidal configuration, a first edge (**14**) of said upper open end having a band (**15**) provided with hook portions (**17**) attached thereto and a second edge (**14'**) of said upper open end having a band (**15'**) provided with thistle portions (**17'**) affixed thereto and projecting from said second edge, said bands (**15**) and (**15'**) being stretch-stitched to said upper edges (**14**) and (**14'**), respectively, said band (**15**) and hook portion (**17**) being foldable in a first direction over said band (**15'**) and thistle portion (**17'**) and releasably engageable therewith solely by application of pressure, said band (**15**) and hook portion (**17**) further foldable in a direction away from said band (**15'**), thistle portion (**17'**) thereon and said upper open end (**12**) to fully expose said upper open end, said bands (**15, 15'**) defining an opening substantially coextensive with said upper open end (**12**) when said band (**15**) is folded away from said band (**15'**).

4,630,313

CABLE SENSOR FOR SENSING A DC SIGNAL FROM A CABLE HEADEND

Joseph A. Damoci, Beltsville, Md., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 8, 1985, Ser. No. 763,748
Int. Cl.⁴ H04B *17/00;* **H04H** *9/00;* **H04N** *7/10*
U.S. Cl. 455—2 **4 Claims**



1. A sensor for sensing a DC signal transmitted from a cable headend and signalling the presence of the DC signal to a cable tv ratings monitor while isolating the tv monitor from the DC signal, said monitor having a VHF input, VHF output and a A/B switch, said sensor comprising:

a cable input for receiving cable TV signals;

an output coupled to the VHF input of the monitor;

a capacitor means for coupling the cable input to said output for providing an RF connection and DC isolation between the cable input and said output;

an input coupled to receive the VHF output of the monitor;

a converter output;

a capacitor means for coupling the input which is coupled to receive the VHF output of the monitor to the converter output for providing an RF connection and DC isolation between said input and the converter output;

inductor means for connecting the cable input to the converter output for providing a DC connection and RF choke between the cable input and converter output; and

DC sense means, connected to said inductor means, for sensing the presence of a DC signal and signalling such presence to said cable tv monitor A/B switch while isolating the A/B switch from said DC signal.

4,630,314

METEOR BURST COMMUNICATION SYSTEM

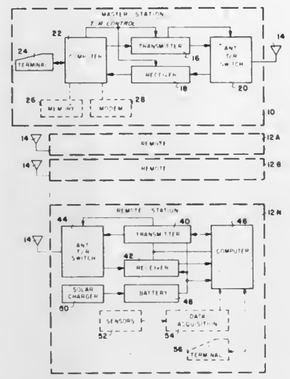
Dale K. Smith, King County, Wash., assignor to Meteor Communications Corporation, Inc., Kent, Wash.

Filed Sep. 27, 1982, Ser. No. 424,605
Int. Cl.⁴ H04B *1/38*
U.S. Cl. 455—52 **24 Claims**

1. A system for communicating between a master station and a plurality of remote stations, comprising:

a master station processing unit selectively generating a digital probe signal, a master station transmitter generating an RF probing signal corresponding to said digital probe signal, and a master station receiver adapted to detect RF signals; and

a remote station receiver for each of said remote station, said remote station receiver detecting said RF probing signal when a meteor trail is present at the proper location and providing an enabling signal in response thereto indicative of the existence of a communication path between said master station and the respective remote station, a data generating device for each remote station providing respective digital data signals indicative of information generated at such remote station, processing means for each remote station determining in response to said RF probing signal whether, based upon factors specific to each remote station, said remote station should respond independently of any information contained in said RF probing signal that prompts a response from an identified remote station and for generating a trigger signal in response to a determination to respond, a transmitter for



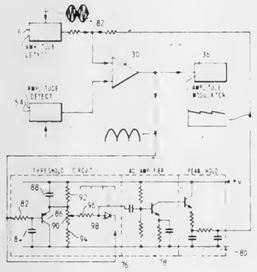
each remote station generating an RF reply signal for such remote station in response to said trigger signal, and a modulator connected to said data generating device and said transmitter for encoding said RF reply singals with said digital data signals.

4,630,315

POLAR LOOP TRANSMITTER

Stephen W. Watkinson, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,448
Claims priority, application United Kingdom, Nov. 21, 1983, 8330975
Int. Cl.⁴ H04B *1/04*
U.S. Cl. 455—109 **5 Claims**



1. In a polar loop transmitter for generating an amplitude modulated signal which includes an amplitude modulator for modulating a carrier signal, a differential amplifier supplying an output d.c. voltage for controlling said modulator having a first input for receiving a modulating signal, and a second input receiving a detected envelope signal in said transmitter, a negative feedback circuit for maintaining said differential amplifier output d.c. voltage at a level which will avoid clipping of said amplitude modulated signal, comprising:

means connected to said differential amplifier for detecting voltage spikes of a like polarity indicating said envelope signal is being driven through zero level;

means for generating a threshold voltage proportional to said differential amplifier output d.c. voltage; and

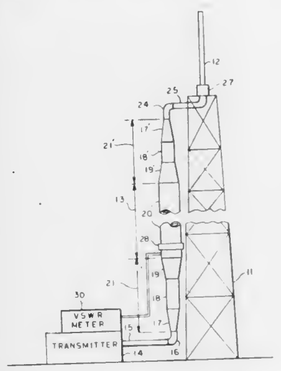
means for generating a negative feedback signal for controlling said differential amplifier when said voltage spikes exceed said threshold voltage, said negative feedback signal modifying said differential amplifier output d.c. voltage in a direction to minimize said voltage spikes.

4,630,316

TRANSITION BETWEEN RECTANGULAR AND RELATIVELY LARGE CIRCULAR WAVEGUIDE FOR A UHF BROADCAST ANTENNA

Thomas J. Vaughan, Box 440, Rye Beach, N.H. 03871

Continuation of Ser. No. 449,734, Dec. 14, 1982, abandoned.
This application Apr. 12, 1983, Ser. No. 484,220
Int. Cl.⁴ H04B *1/02*
U.S. Cl. 455—129 **9 Claims**



1. In a high power antenna system for UHF TV frequency (F) broadcast wherein a radiating antenna is located at the top of a tower structure many hundreds of feet high and a transmitter is located at the bottom of the tower, a relatively large diameter circular waveguide transmission line of diameter D1 is provided for conducting the UHF power from the transmitter up the tower to the antenna and the UHF power is fed to said circular waveguide transmission line from said transmitter by an input rectangular waveguide transmission line, and there is transmission line means between said input rectangular and said circular waveguide transmission lines for insuring that wave propagation in said circular waveguide transmission line is substantially totally in the dominant **TE11** mode at the frequency F, although F is above the cut off frequency of the **TM01** mode therein, the improvement comprising,

(a) wave propagation in said input rectangular waveguide transmission line is substantially totally in the dominant **TE10** mode therein at the frequency F,

(b) a section of relatively small diameter circular waveguide of diameter Ds that has an input end and an output end, said diameter Ds being such that F is below the cutoff frequency of the **TM01** mode in said small diameter circular waveguide section,

(c) a tapered transition section having a rectangular waveguide cross section at the input end thereof that connects to and matches said input rectangular waveguide transmission line from said transmitter and has a circular waveguide cross section at the output end thereof that connects to and matches said circular waveguide section of diameter Ds and

(d) a tapered circular waveguide section having an input end of diameter Ds connected to the output end of said circular waveguide section of diameter Ds and an output end of diameter **D1** connected to the input end of said circular waveguide transmission line of diameter **D1**,

(e) all of said connections being substantially matched,

(f) whereby the propagation mode of waves launched into said circular waveguide transmission line from said input rectangular waveguide through said sections is substantially totally in the dominant **TE11** mode at the frequency F, although F is above the cut off frequency of the **TM01** mode therein and resonance of said dominant **TE11** mode therein is avoided.

DESIGN PATENTS

GRANTED DEC. 16, 1986

ERRATA

For CLASS	See PATENT NO.
D29-010	287,181
D11-218	287,187

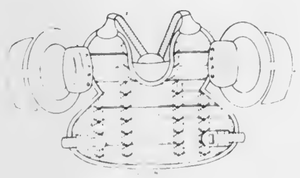
DESIGNS

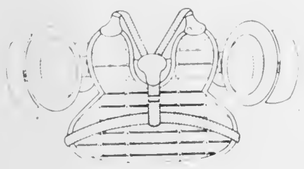
DECEMBER 16, 1986

287,180
BRASSIERE
Flavia DiTullio, New York, N.Y., assignor to Bali Company, Winston-Salem, N.C.
Filed Apr. 4, 1984, Ser. No. 596,673
Term of patent 14 years
U.S. Cl. D2—24



287,181
CHEST PROTECTOR
Charles Parsons, Jr., 501 Morse, Schaumburg, Ill. 60193
Filed Nov. 7, 1983, Ser. No. 548,916
Term of patent 14 years
U.S. Cl. D29—10

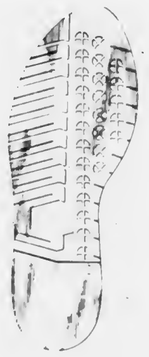




287,182
SHOE SOLE
Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Feb. 13, 1985, Ser. No. 701,176
Term of patent 14 years
U.S. Cl. D2—320



287,183
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Jul. 2, 1984, Ser. No. 627,018
Term of patent 14 years
U.S. Cl. D2—320



287,184
SHOE SOLE
Carlo G. Sironi, Varese, Italy, assignor to Vibram S.p.A., Italy
Filed Jul. 16, 1984, Ser. No. 631,060
Term of patent 14 years
U.S. Cl. D2—320



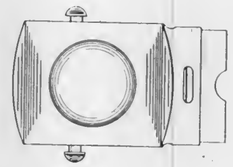
287,185
SHOE SOLE
Carlo G. Sironi, Varese, Italy, assignor to Vibram S.p.A., Italy
Filed Jul. 16, 1984, Ser. No. 631,161
Term of patent 14 years
U.S. Cl. D2—320



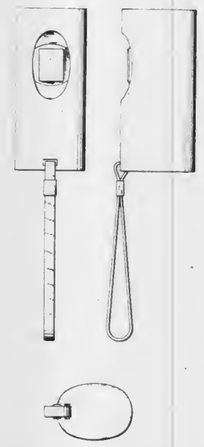
287,186
SHOE HEEL
Carlo G. Sironi, Varese, Italy, assignor to Vibram S.p.A., Italy
Filed Jul. 16, 1984, Ser. No. 631,165
Term of patent 14 years
U.S. Cl. D2—323



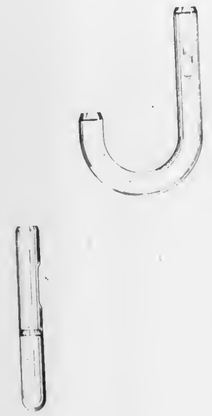
287,187
BELT BUCKLE OR SIMILAR ARTICLE
Craig W. Olson, W. Main St., P.O. Box 235, Fontana on Geneva Lake, Wis. 53125
Filed Feb. 17, 1984, Ser. No. 581,039
Term of patent 14 years
U.S. Cl. D11—218



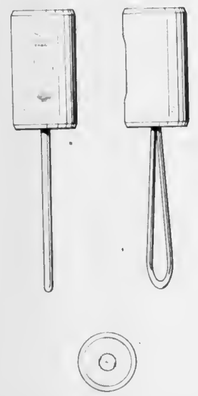
287,188
UMBRELLA HANDLE
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,580
Term of patent 14 years
U.S. Cl. D3—12



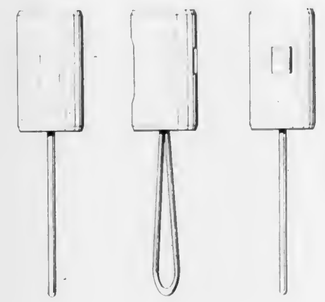
287,189
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 2, 1984, Ser. No. 667,593
Term of patent 14 years
U.S. Cl. D3—12



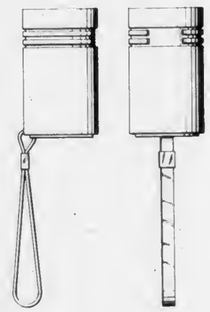
287,190
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 2, 1984, Ser. No. 667,596
Term of patent 14 years
U.S. Cl. D3—12



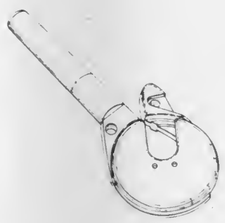
287,191
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,008
Term of patent 14 years
U.S. Cl. D3—12



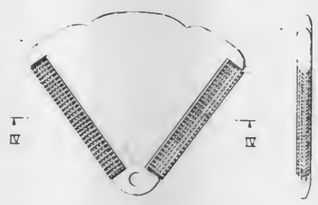
287,192
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,206
Term of patent 14 years
U.S. Cl. D3—12



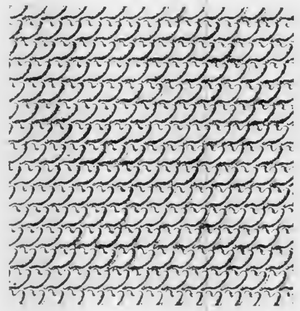
287,193
THREADING DEVICE
Alan W. Tupper, Castle Combe, England, assignor to Latchways Limited, London, England
Filed Jan. 4, 1984, Ser. No. 568,065
Claims priority, application United Kingdom, Jul. 13, 1983, 1014072
Term of patent 14 years
U.S. Cl. D3—18



287,194
FABRIC CURRYCOMB
Nobuhiko Suzuki, Post No. 432, 2114-18, Tomitsuka-cho, Hamamatsu City, Shizuoka Prefecture, Japan
Filed Jul. 23, 1984, Ser. No. 633,698
Term of patent 14 years
U.S. Cl. D4—120



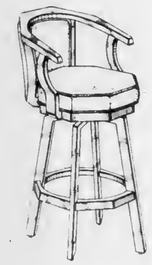
287,195
EMBOSSED CLOTH
Tomas Billgren, Molnlycke, Sweden, assignor to Molnlycke Aktiebolag, Goteborg, Sweden
Filed Mar. 6, 1984, Ser. No. 586,789
Term of patent 14 years
U.S. Cl. D5—53



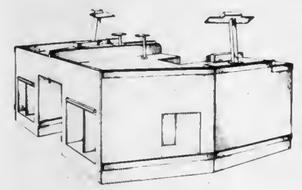
287,196
COLLAPSIBLE HIGH CHAIR
Simon C. Ryder-Smith, London, England, assignor to Bobsin Limited, London, England
Filed Jun. 18, 1984, Ser. No. 621,496
Claims priority, application United Kingdom, Dec. 19, 1983, 1016938
Term of patent 14 years
U.S. Cl. D6—339

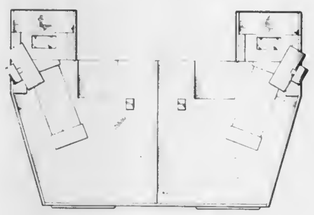


287,197
BAR STOOL
Vladimir W. Zakharov, Baldwin Park, Calif., assignor to Mikhail Darafeev, Inc., Baldwin Park, Calif.
Filed Feb. 22, 1985, Ser. No. 704,259
The portion of the term of this patent subsequent to Nov. 4, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—360

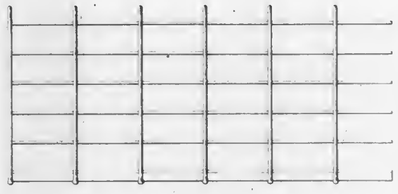


287,198
DOUBLE CHECKSTAND
Robert T. Richins, Boise, Id., assignor to Waremart, Inc., Boise, Id.
Filed Apr. 5, 1982, Ser. No. 365,150
The portion of the term of this patent subsequent to Apr. 13, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—402



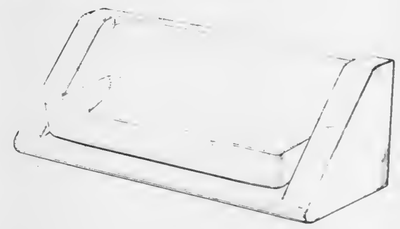


287,199
SHELF UNIT
Afra Bianchi Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S., Treviso, Italy
Filed Sep. 30, 1983, Ser. No. 537,792
Claims priority, application Italy, Apr. 1, 1983, 21345B/83
Term of patent 14 years
U.S. Cl. D6—479

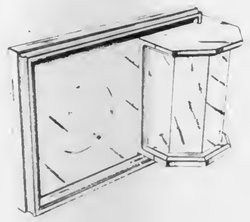




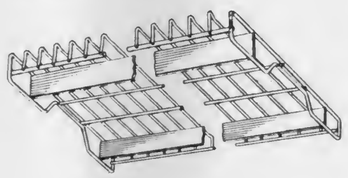
287,200
WALL MOUNTED SHELF
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jun. 26, 1984, Ser. No. 624,768
Claims priority, application Italy, Dec. 29, 1986, 24058B/83
Term of patent 14 years
U.S. Cl. D6—574

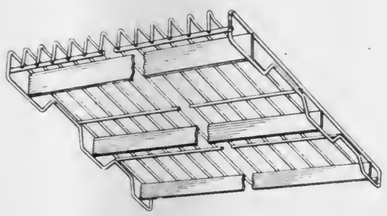


287,201
COMBINED PLATE AND FIGURINE DISPLAY UNIT
Bill R. Franklin, Whittier, and Ernest Fernandez, Anaheim, both of Calif., assignors to BKF Industries, Inc., Anaheim, Calif.
Filed Mar. 16, 1984, Ser. No. 590,342
Term of patent 14 years
U.S. Cl. D6—559

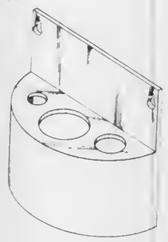


287,202
WIRE SUPPORT SHELF
Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Quebec, Canada
Filed Apr. 20, 1984, Ser. No. 602,365
Term of patent 14 years
U.S. Cl. D6—566

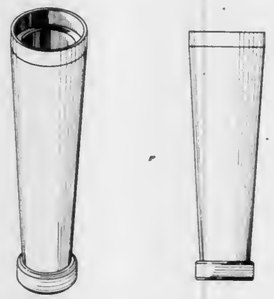




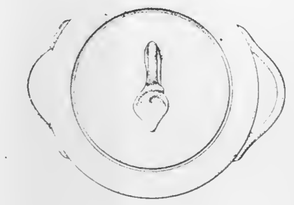
287,203
COMBINED DRYER AND CURLING IRON HOLDER
Randall D. Jenkins, R.R. #3, Box 300, and Aaron Wann, 308 S. O'Neil, both of Frankfort, Ind. 46041
Filed Mar. 22, 1984, Ser. No. 592,278
Term of patent 14 years
U.S. Cl. D6—573



287,204
GOBLET
James R. Bierlein, 4234 Derbyshire Ct., Salt Lake City, Utah 84123, and James F. Williams, 1630 Honeybear La., Dunedin, Fla. 33528
Filed Aug. 6, 1984, Ser. No. 638,209
Term of patent 14 years
U.S. Cl. D7—11



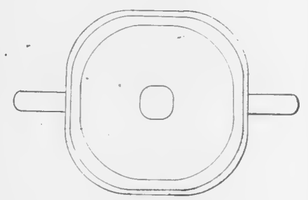
287,205
SUGAR BOWL
Helene Uglow, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 31, 1984, Ser. No. 687,750
Term of patent 14 years
U.S. Cl. D7—17





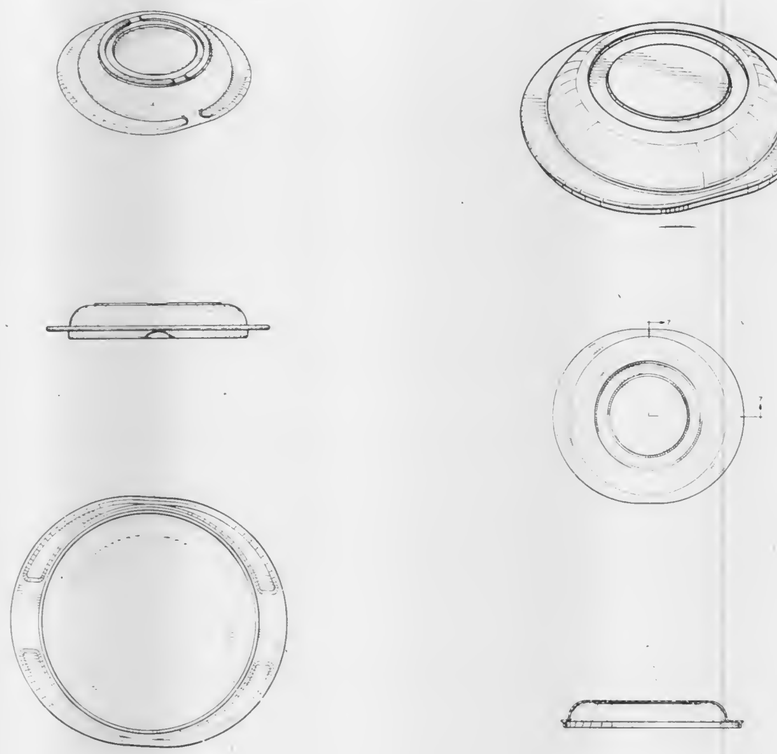
287,206
SUGAR BOWL
Katsuhiro Ohtake, Mie-Ken, Japan, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Oct. 11, 1984, Ser. No. 659,623
Term of patent 14 years
U.S. Cl. D7—18



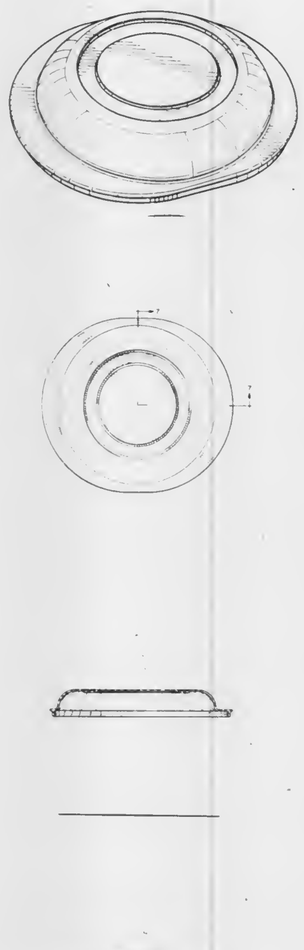




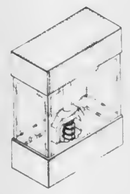
287,207
CASSEROLE DISH COVER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,672
Term of patent 14 years
U.S. Cl. D7—40



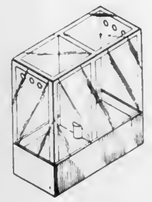
287,208
CASSEROLE DISH COVER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,675
Term of patent 14 years
U.S. Cl. D7—40



287,209
CONDIMENT MILL
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Aug. 29, 1984, Ser. No. 645,411
Term of patent 14 years
U.S. Cl. D7—53



287,210
TWO-COMPARTMENT CONDIMENT DISPENSER
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Sep. 4, 1984, Ser. No. 647,366
Term of patent 14 years
U.S. Cl. D7—57



287,211
INSULATED CONTAINER ASSEMBLY
Paul Weiss, Frauenfeld, Switzerland, assignor to AG Sigg, Aluminium- und Metallwarenfabrik
Filed Apr. 10, 1984, Ser. No. 598,690
Claims priority, application Hague, Jan. 19, 1984, 4973
Term of patent 14 years
U.S. Cl. D7—77



287,212
BEVERAGE MAKING MACHINE
Donald L. Daugherty, Sherman, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed May 21, 1984, Ser. No. 612,339
Term of patent 14 years
U.S. Cl. D7—309



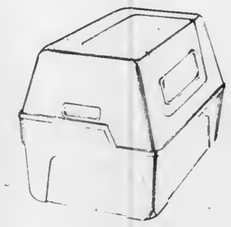
287,213
COFFEE POT
Pietro Fornara, Vercelli, Italy, assignor to Sambonet S.p.A., Vercelli, Italy
Filed Aug. 17, 1984, Ser. No. 641,755
Claims priority, application Italy, Feb. 17, 1984, 20899B/84
Term of patent 14 years
U.S. Cl. D7—317

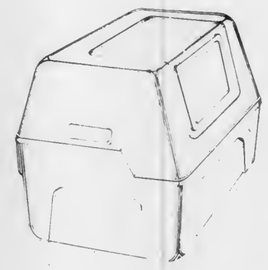




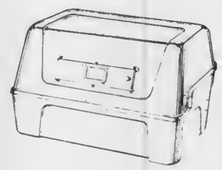


287,214
COOKING GRILL WITH A WINDOW AND AN ILLUMINATION PANEL
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Jul. 30, 1984, Ser. No. 635,621
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—332





287,215
COOKING GRILL WITH A SLIDABLE WINDOW
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Jul. 30, 1984, Ser. No. 635,640
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—332



287,216
HANDLE FOR KITCHEN UTENSILS
Friedrich W. Usbeck, Frauenbergstrasse 33, D-3550 Marburg-/Lahn 1, Fed. Rep. of Germany
Filed Sep. 24, 1984, Ser. No. 653,530
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 16 MR 335
Term of patent 14 years
U.S. Cl. D7—395



287,217
CUP MOUNTED DISPOSABLE COFFEE OR TEA FILTER
Edward D. Napier, 45 Faraday Drive, Scarborough, Ontario, Canada M1H 2R9
Filed Feb. 13, 1984, Ser. No. 579,541
Claims priority, application Canada, Jan. 19, 1984, 19-01-84-1
Term of patent 14 years
U.S. Cl. D7—400





287,218
HEAD UNIT FOR A POST HOLE DIGGER
William E. Portz, Anderson, S.C., assignor to USM Corporation, Farmington, Conn.
Filed Aug. 8, 1984, Ser. No. 638,842
Term of patent 14 years
U.S. Cl. D8—7



287,219
PUSH-ROD FOR RETRIEVING TOOL
Raymond A. Smith, P.O. Box 239, Welcome, N.C. 27374
Filed May 18, 1984, Ser. No. 611,866
Term of patent 14 years
U.S. Cl. D8—14



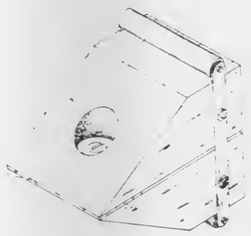
287,220
TOP OPENER
Nathan D. Hoskins, 6 Maywood Dr., Jackson, Tenn. 38301
Filed May 15, 1984, Ser. No. 610,562
Term of patent 14 years
U.S. Cl. D8—39



287,221
PORTABLE PRESS
David M. Hansen, Doylestown, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.
Filed Oct. 11, 1983, Ser. No. 540,294
Term of patent 14 years
U.S. Cl. D8—61

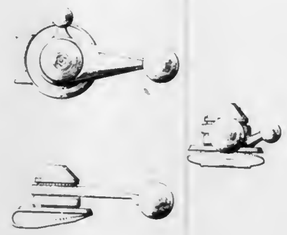


287,222
ARROWHEAD SHARPENER
Ernest R. Cooley, Rte. 4, Box 272, and Robert A. Kriss, Rte. 4, Box 277, both of Bay Minette, Ala. 36507
Filed Mar. 26, 1984, Ser. No. 593,316
Term of patent 14 years
U.S. Cl. D8—91

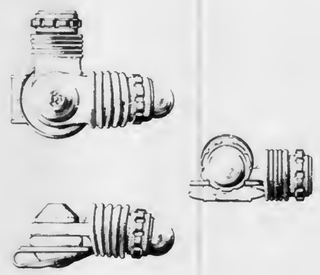


287,223
CONNECTOR PLATE FOR TRUSSES OR THE LIKE
Buddy R. Paul, Fort Worth, Tex., assignor to Clary Corporation, Grand Prairie, Tex.
Filed Apr. 30, 1984, Ser. No. 605,116
Term of patent 14 years
U.S. Cl. D8—389

287,224
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,677
Term of patent 14 years
U.S. Cl. D8—395



287,225
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,679
Term of patent 14 years
U.S. Cl. D8—395



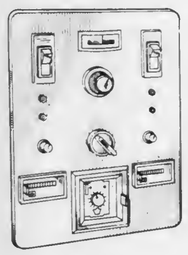
287,226
BOTTLE
Gerard E. Lyons, 637 Maclaren Drive, Burlington, Ontario, Canada L7N 2Z3
Filed Jun. 25, 1984, Ser. No. 624,127
Term of patent 14 years
U.S. Cl. D9—370



287,227
BOTTLE
Guy A. Turnbull, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Aug. 4, 1983, Ser. No. 520,398
Term of patent 14 years
U.S. Cl. D9—36



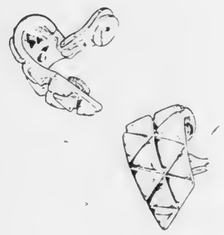
287,228
CONTROL PANEL FOR MONITORING THE CONCENTRATION OF DISSOLVED METAL IN A PLATING SOLUTION
Charles L. Newton, Clearwater, Fla., assignor to Shipley Company Inc., Newton, Mass.
Filed Mar. 7, 1984, Ser. No. 586,980
Term of patent 14 years
U.S. Cl. D10—81



287,229
WATCHBAND
Edward L. Hallman, 3 Hobson Ct., Columbus, Ga. 31907, and Arthur E. Hallman, Jr., Rte. 1, Box 778, Bristol, Tenn. 37620
Filed Nov. 13, 1984, Ser. No. 670,275
Term of patent 14 years
U.S. Cl. D11—5



287,230
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation, S.A., Vaduz, Liechtenstein
Filed Oct. 9, 1984, Ser. No. 658,638
Claims priority, application Italy, Apr. 9, 1984, 35714/84[U]
Term of patent 14 years
U.S. Cl. D11—40



287,231
EARRING
Eddie Copeland, 2269 68th Ave., Sacramento, Calif. 95822
Filed Oct. 15, 1984, Ser. No. 660,849
Term of patent 14 years
U.S. Cl. D11—42

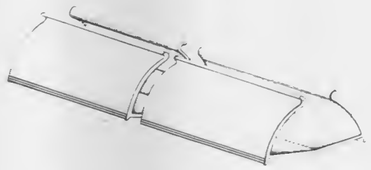


287,232
DIAMOND
Mitsugi Ishida, 72-81 113th St., Forest Hills, N.Y. 11375
Filed Mar. 21, 1984, Ser. No. 591,916
Term of patent 14 years
U.S. Cl. D11—90

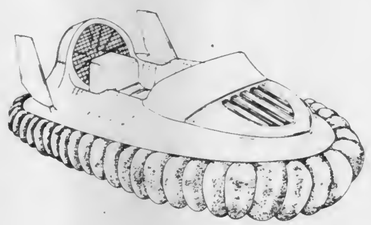




287,233
HYDROPONIC TROUGH
Kenneth R. Foote, Mahtomedi; William M. Miller, Maplewood, and Eion G. Scott, St. Paul, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.
Filed Apr. 11, 1984, Ser. No. 599,103
Term of patent 14 years
U.S. Cl. D11—156



287,234
HOVERCRAFT
Louis Chia, Singapore, Singapore, assignor to Space Boats Inc., Toronto, Canada
Filed Sep. 24, 1984, Ser. No. 653,282
Term of patent 14 years
U.S. Cl. D12—5



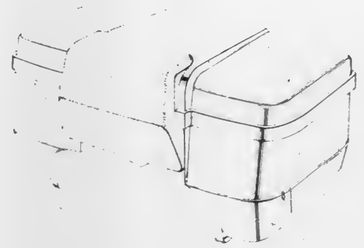
287,235
AUTOMOBILE
Werner Breitschwerdt, Stuttgart; Friedrich van Winsen, Kirchheim, and Bruno Sacco, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed May 1, 1984, Ser. No. 605,923
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, MR 5702
Term of patent 14 years
U.S. Cl. D12—91



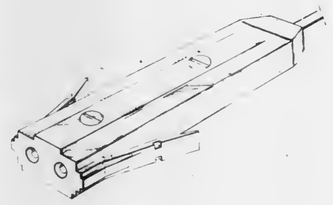
287,236
VEHICLE TIRE
Toshio Yonekura, Kishiwada, and Kotaro Tsutsumi, Izumi, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 14, 1984, Ser. No. 610,143
Claims priority, application Japan, Feb. 13, 1984, 59-4996
Term of patent 14 years
U.S. Cl. D12—140



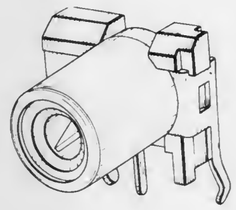
287,237
LUGGAGE CASE FOR MOTORCYCLES
Karl-Heinz Abe, Steinebach, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Mar. 21, 1984, Ser. No. 591,826
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, MR 13577
Term of patent 14 years
U.S. Cl. D12—158



287,238
ELECTRICAL CONNECTOR PLUG
John C. Challans, Kislingbury, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Jan. 17, 1984, Ser. No. 571,445
Claims priority, application United Kingdom, Jul. 20, 1983, 1014239
Term of patent 14 years
U.S. Cl. D13—24



287,239
ELECTRICAL JACK
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed Apr. 13, 1984, Ser. No. 600,057
Claims priority, application Japan, Nov. 14, 1983, 58-49535
Term of patent 14 years
U.S. Cl. D13—24



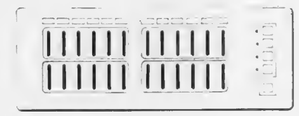
287,240
ELECTRICAL CONNECTOR INCLUDING INSULATION DISPLACING CONTACTS
Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Mar. 14, 1983, Ser. No. 474,848
Term of patent 14 years
U.S. Cl. D13—24



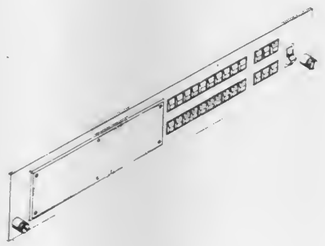
287,241
ELECTRIC PLUG
Shih S. Mow, No. 164-14, Lane Ching Chin, Ching Shi Li, Ping-Tung, Taiwan
Filed Sep. 27, 1984, Ser. No. 654,951
Term of patent 14 years
U.S. Cl. D13—28



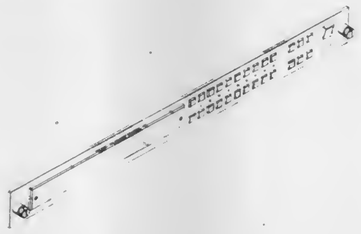
287,242
FACE PLATE FOR LIGHTING CONTROL
Zalman A. Liss, Allentown; Joel S. Spira, Coopersburg, and David G. Luchaco, Macungie, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Division of Ser. No. 524,546, Aug. 19, 1983. This application Jan. 29, 1986, Ser. No. 823,766
Term of patent 14 years
U.S. Cl. D13—35



287,243
FRONT PANEL FOR ELECTRONIC INSTRUMENT
Michael R. Tope, Orange, Calif., assignor to Kode, Inc., Anaheim, Calif.
Filed Feb. 9, 1984, Ser. No. 578,479
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—40



287,244
FRONT PANEL FOR ELECTRONIC INSTRUMENT
Michael R. Tope, Orange, Calif., assignor to Kode, Inc., Anaheim, Calif.
Filed Feb. 9, 1984, Ser. No. 578,480
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—40

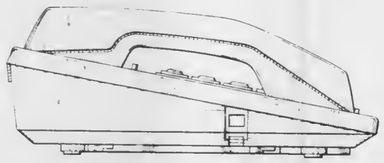


287,245
TELEPHONE SET
Bruno Todeschini, Localita la Buca, Via Garibaldi, I 55045 Pietrasanta, Province of Lucca, Italy
Filed Dec. 5, 1984, Ser. No. 678,506
Claims priority, application Italy, Jun. 25, 1984, 22393/84[U]
Term of patent 14 years
U.S. Cl. D14—53

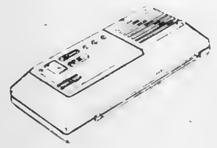


287,246
TELEPHONE STATION SET
Wilbert C. Brown, Fairfield, and Philip B. Saba, Trumbull, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Jun. 4, 1984, Ser. No. 617,172
Term of patent 14 years
U.S. Cl. D14—58





287,247
BASE UNIT FOR A CORDLESS TELEPHONE OR SIMILAR ARTICLE
Koji Anno, Tokyo, Japan, assignor to Anno Associates Inc., Tokyo and Suntron Industrial Company, Ltd., Yokohama, both of, Japan
Filed Oct. 29, 1984, Ser. No. 665,925
Term of patent 14 years
U.S. Cl. D14—60



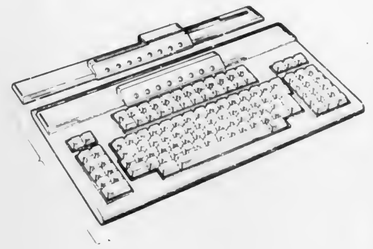


287,248
TELEPHONE HANDSET
Kenneth L. Reichenstein, 269-32P Grand Central Pkwy., Floral Park, N.Y. 11005
Filed Sep. 27, 1984, Ser. No. 655,105
Term of patent 14 years
U.S. Cl. D14—63





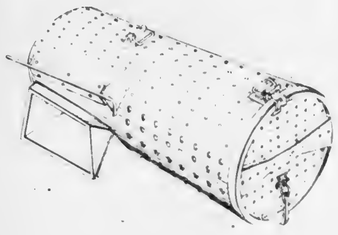
287,249
KEYBOARD
Per O. R. Lindhé , Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Mar. 2, 1983, Ser. No. 471,464
Claims priority, application Sweden, Sep. 14, 1982, 82-2207
Term of patent 14 years
U.S. Cl. D14—100



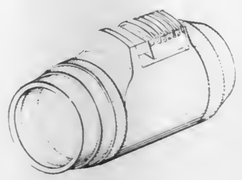
287,250
DATA COMMUNICATION TERMINAL
Daniel Mas, Paris; Roland Eckert, Cormeilles en Vexin, and Lucien Savignat, Chaumont en Vexin, all of France, assignors to Thomson CSF Telephone, Colombes, France
Filed Jan. 9, 1984, Ser. No. 569,398
Claims priority, application France, Jul. 13, 1983, 832666
Term of patent 14 years
U.S. Cl. D14—101



287,251
GRASS CATCHER
Vincent DiPaolo, 424 Maren St., West Hempstead, N.Y. 11552
Filed Oct. 23, 1984, Ser. No. 663,989
Term of patent 14 years
U.S. Cl. D15—17



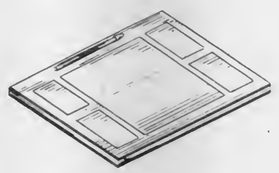
287,252
COMBINED RIFLESCOPE EYEPIECE HOUSING AND SWITCH ASSEMBLY
Claus O. Huckenbeck, Bear Valley, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Dec. 30, 1983, Ser. No. 567,044
Term of patent 14 years
U.S. Cl. D16—132



287,253
MEMORY CARD FOR ELECTRONIC CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 25, 1984, Ser. No. 654,756
Claims priority, application Japan, Mar. 29, 1984, 59-12853
Term of patent 14 years
U.S. Cl. D18—12



287,254
COMBINED BOOK WITH ERASABLE COVER AND DETACHABLE PEN
Rex Story, 3741 S. 16th, Lincoln, Nebr. 68502
Filed Apr. 18, 1984, Ser. No. 601,618
Term of patent 14 years
U.S. Cl. D19—26



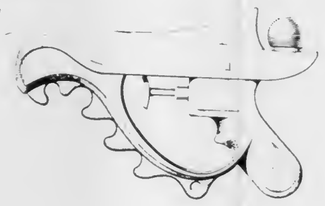
287,255
VIDEO CONTROL SWITCHING DEVICE
Albert Watson, Jr., 31 DeKalb Ave., Plainfield, N.J. 07063
Filed Jun. 22, 1984, Ser. No. 623,572
Term of patent 14 years
U.S. Cl. D21—48



287,256
TOY HELICOPTER
Lawrence T. Jones, Los Angeles; R. Stephen Lee, Westlake Village; Paul J. Ishikawa, Hermosa Beach, and Ashley G. Howden, Los Angeles, all of Calif., assignors to California R & D Center, Culver City, Calif.
Filed Feb. 6, 1985, Ser. No. 698,567
Term of patent 14 years
U.S. Cl. D21—90



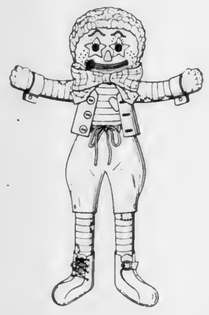
287,257
TOY GUN
Francis M. L. Barthropp, 4371 Marine Dr., West Vancouver, British Columbia, Canada V7V 1P3
Filed Aug. 15, 1984, Ser. No. 641,005
Term of patent 14 years
U.S. Cl. D21—147



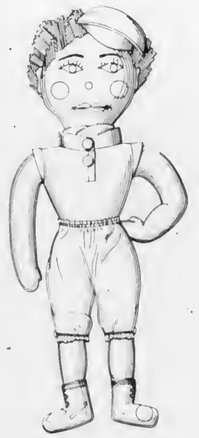
287,258
RECONFIGURABLE TOY ROBOT
Masaki Maruyama, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,598
Claims priority, application Japan, Jan. 31, 1984, 59-3047
Term of patent 14 years
U.S. Cl. D21—150



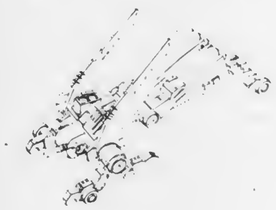
287,259
TRAINING DOLL
Mary L. Maiden-Nessel, 3072 Sunflower St., Thousand Oaks, Calif. 91360
Continuation-in-part of Ser. No. 595,319, Mar. 30, 1984. This application Jul. 17, 1984, Ser. No. 631,153
Term of patent 14 years
U.S. Cl. D21—173



287,260
DOLL
Jeannie W. Nixon, 6448 Peggy Dr., Goshen, Ohio 45122
Filed Jun. 26, 1984, Ser. No. 624,699
Term of patent 14 years
U.S. Cl. D21—184

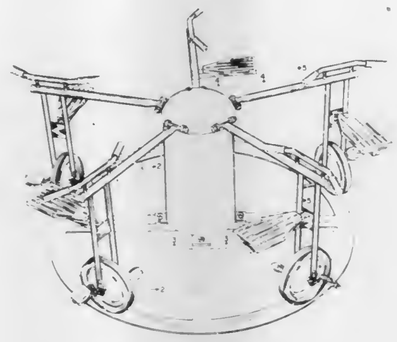


287,261
RECONFIGURABLE INSECT TOY
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1984, Ser. No. 643,262
Term of patent 14 years
U.S. Cl. D21—185





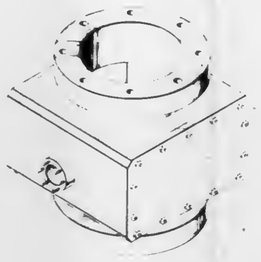
287,262
PLAYGROUND MERRY-GO-ROUND
David W. McNutt, P.O. Box 302, and Denny W. Morris, P.O. Box 342, both of Falkville, Ala. 35622
Filed Apr. 6, 1984, Ser. No. 597,725
Term of patent 14 years
U.S. Cl. D21—249



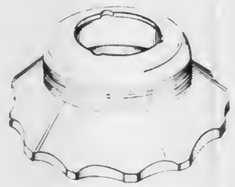
287,263
FLY TYING VISE
Satoru Kojima, Nagano, and Kouji Koshida, Saitama, both of Japan, assignors to Smith, Ltd.; Machine Engineering Co., Ltd. and Coret & Company, Ltd., all of, Japan
Filed May 16, 1984, Ser. No. 610,915
Term of patent 14 years
U.S. Cl. D22—149



287,264
SIDE DOOR CASING SPOOL FOR AN OILWELL CASING
Marion Rinaldo, 3378 C-½ Rd., Palisade, Colo. 81526, and William J. Crouch, 5108 Alcova Rte., Box 9, Casper, Wyo. 82604
Filed Apr. 25, 1983, Ser. No. 488,063
Term of patent 14 years
U.S. Cl. D23—1



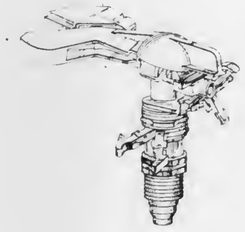
287,265
NECK RING FOR A GAS CYLINDER
Joseph W. Edwards, Wayne, Pa., assignor to MG Industries, Valley Forge, Pa.
Filed Aug. 6, 1984, Ser. No. 637,961
Term of patent 14 years
U.S. Cl. D23—2



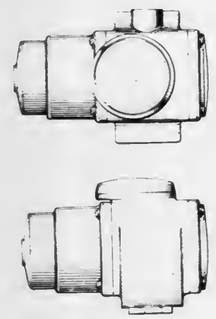
287,266
NOZZLE BODY AND A HOUSING FOR A HAND SPRAY GUN
George J. Knetl, Westchester, and Ronald R. Scotchmur, Schiller Park, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.
Filed Apr. 30, 1984, Ser. No. 605,176
Term of patent 14 years
U.S. Cl. D23—17



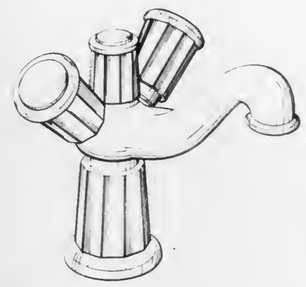
287,267
IMPACT DRIVE SPRINKLER
Kenneth W. Premo, Fullerton, and Billy J. Hobbs, Jr., Upland, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Feb. 7, 1985, Ser. No. 681,547
Term of patent 14 years
U.S. Cl. D23—17



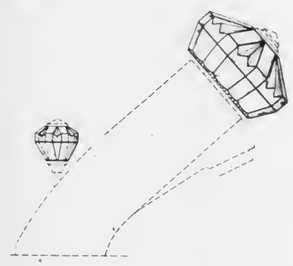
287,268
HYDRAULIC OR PNEUMATIC ACTUATOR UNIT FOR VALVES
Bruno Hilpert, Diessenhofen, and Bruno Hunziker, Schaffhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland
Filed Mar. 19, 1984, Ser. No. 590,725
Claims priority, application Hague, Sep. 19, 1983, DM/002880
Term of patent 14 years
U.S. Cl. D23—19



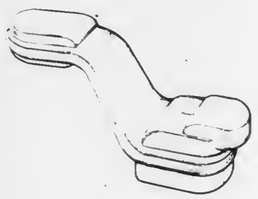
287,269
FAUCET
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,384
Claims priority, application Italy, Dec. 6, 1983, 23771[U]
Term of patent 14 years
U.S. Cl. D23—25



287,270
CRYSTAL KNOB SET FOR PLUMBING FAUCETS AND FIXTURES
Holly K. Yost, Studio City, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Filed Oct. 18, 1984, Ser. No. 663,472
Term of patent 14 years
U.S. Cl. D23—28



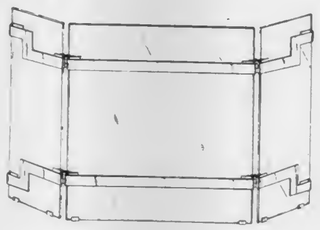
287,271
FAUCET SPOUT
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,375
Claims priority, application Italy, May 12, 1983, 21805[U]
Term of patent 14 years
U.S. Cl. D23—32



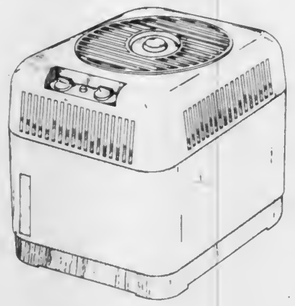
287,272
FAUCET SPOUT
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,380
Claims priority, application Italy, Sep. 29, 1983, 23110[U]
Term of patent 14 years
U.S. Cl. D23—32



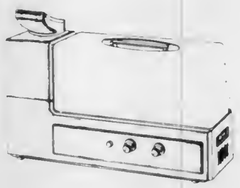
287,273
FIREPLACE SCREEN
Joseph J. Catania, Cheshire; Angelo Gaudino, Wallingford; Russell DeTuzzi, Huntington, and Maxwell Gardner, Wallingford, all of Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Aug. 1, 1984, Ser. No. 636,855
Term of patent 14 years
U.S. Cl. D23—138.3



287,274
HUMIDIFIER
George C. Crowley, Glenview, and Donald N. Jursich, Chicago, both of Ill., assignors to Sunbeam Corporation, Oak Brook, Ill.
Filed Sep. 10, 1984, Ser. No. 649,913
Term of patent 14 years
U.S. Cl. D23—146



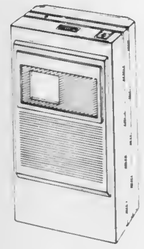
287,275
HUMIDIFIER
Tsutomu Uchida, Sanjyo, Japan, assignor to Uchida Manufacturing Co. Ltd., Sanjyo, Japan
Filed Nov. 26, 1984, Ser. No. 674,746
Term of patent 14 years
U.S. Cl. D23—146



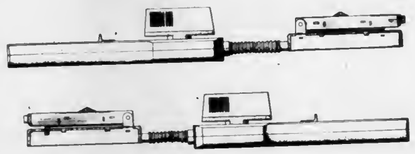
287,276
FAN PLATE
John F. Little, Jr., Amarillo, Tex., assignor to West Texas Stitch 'N Time, Inc., Amarillo, Tex.
Filed Jul. 25, 1984, Ser. No. 634,405
Term of patent 14 years
U.S. Cl. D23—163



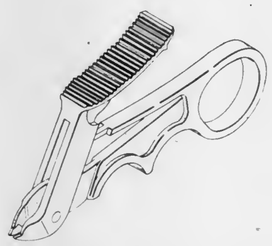
287,277
PORTABLE INFUSION PUMP
Mikio Kosako, and Hiroshi Nishibori, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 28, 1984, Ser. No. 584,468
Claims priority, application Japan, Sep. 2, 1983, 58-38439
Term of patent 14 years
U.S. Cl. D24—17



287,278
FLEXIBLE SURGICAL STAPLER
Lawrence E. Spreckelmeier, Cincinnati, Ohio, assignor to Senmed, Inc., Cincinnati, Ohio
Filed Feb. 21, 1984, Ser. No. 581,681
Term of patent 14 years
U.S. Cl. D24—26



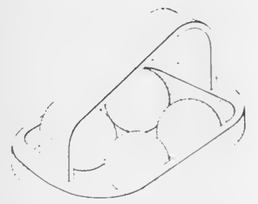
287,279
SURGICAL STAPLE REMOVER
Casimir M. Lazickas, East Aurora, N.Y., assignor to Pelco, Inc., Annapolis, Md.
Filed Nov. 7, 1984, Ser. No. 668,981
Term of patent 14 years
U.S. Cl. D24—27

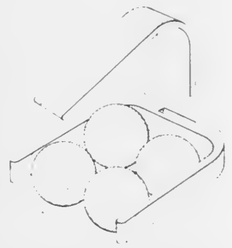


287,280
HEARING AID
Christian Topholm, V rlose, Denmark, assignor to Topholm & Westermann I/S, Varlose, Denmark
Filed Nov. 10, 1983, Ser. No. 550,541
The portion of the term of this patent subsequent to Jan. 13, 2001, has been disclaimed
Claims priority, application Denmark, May 16, 1983, M.A.1983/470
Term of patent 14 years
U.S. Cl. D24—35



287,281
COMBINED BODY AND FOOT MASSAGER
William E. Lancellotti, 371 Broadway, Providence, R.I. 02903
Filed Jan. 16, 1984, Ser. No. 571,353
Term of patent 14 years
U.S. Cl. D24—36

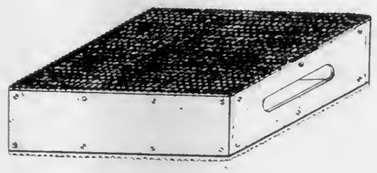




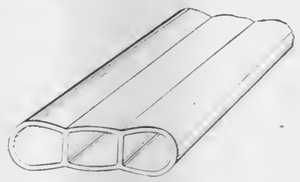
287,282
INCONTINENCE GUARD FOR MALES
Maj I. Ternström, Gothenburg, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Dec. 20, 1983, Ser. No. 563,510
Claims priority, application Sweden, Jun. 27, 1983, 83-1736
Term of patent 14 years
U.S. Cl. D24—50



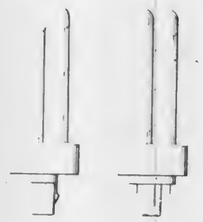
287,283
PORTABLE HALF-STEP STAIRWAY UNIT
Paul R. Johnson, 46 Hudson St., Milton, Mass. 02186
Filed Sep. 21, 1983, Ser. No. 534,338
Term of patent 14 years
U.S. Cl. D25—69



287,284
FRAME MEMBER FOR TRELLISES
Michel Pavy, Wattignies, France, assignor to Nortene, Lille, France
Filed Sep. 1, 1983, Ser. No. 528,433
Claims priority, application France, Mar. 4, 1983, 83.0832
Term of patent 14 years
U.S. Cl. D25—71



287,285
FLUORESCENT LAMP
Mitsuyuki Futatsugi, Yokohama; Toshiharu Fujita, Kanagawa, and Kiyoshi Iwasawa, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 29, 1984, Ser. No. 645,293
Claims priority, application Japan, Feb. 29, 1984, 59-7473
Term of patent 14 years
U.S. Cl. D26—3



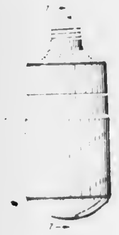
287,286
FLUORESCENT LAMP
Masakatsu Suzuki, Kamakura; Fuminobu Takizawa, and Hitoshi Yamazaki, both of Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1984, Ser. No. 632,110
Claims priority, application Japan, Jan. 18, 1984, 59-1179; Jun. 29, 1984, 59-26773; Jun. 29, 1984, 59-26774
Term of patent 14 years
U.S. Cl. D26—3



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FLUORESCENT LAMP
Mitsuyuki Futatsugi, Yokohama; Toshiharu Fujita, Kanagawa, and Kiyoshi Iwasawa, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1984, Ser. No. 632,118
Claims priority, application Japan, Jan. 18, 1984, 59-1174; Jun. 29, 1984, 59-26777; Jul. 4, 1984, 59-27680; Jul. 4, 1984, 59-27681
Term of patent 14 years
U.S. Cl. D26—3



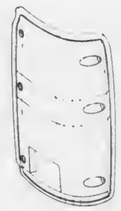
287,288
FLUORESCENT LAMP
Toshiharu Fujita, Kanagawa; Yoshihiro Domon, and Masakatsu Suzuki, both of Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 15, 1984, Ser. No. 661,159
Claims priority, application Japan, Apr. 27, 1984, 59-17364; Apr. 27, 1984, 59-17365
Term of patent 14 years
U.S. Cl. D26—3



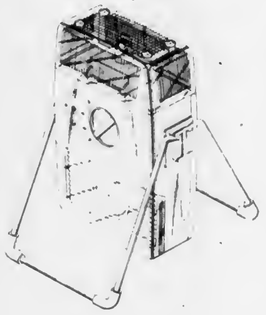
287,289
CLEARANCE LAMP FOR AN AUTOMOBILE
Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, Japan, assignors to Toyoto Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,511
Term of patent 14 years
U.S. Cl. D26—28



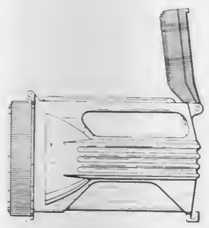
287,290
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,510
Term of patent 14 years
U.S. Cl. D26—35



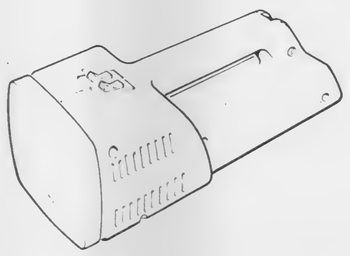
287,291
COMBINED PORTABLE LANTERN AND WARNING LAMP
Kwong Y. Wan, Kowloon, Hong Kong, assignor to Chung Ah Manufacturing Company Limited, Kowloon, Hong Kong
Filed Dec. 1, 1983, Ser. No. 556,959
Claims priority, application United Kingdom, Jun. 9, 1983, 1013462
Term of patent 14 years
U.S. Cl. D26—38



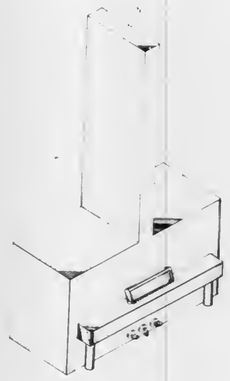
287,292
COMBINED SPOTLIGHT AND EMERGENCY BLINKING LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jul. 11, 1984, Ser. No. 629,798
Claims priority, application United Kingdom, Jan. 19, 1984, 1 017 425
Term of patent 14 years
U.S. Cl. D26—38



287,293
COMBINED LAMP AND AIR PUMP
Shaw-Wei Wang, 7-4 750 South Tun Hua Rd., Taipei, Taiwan
Filed Apr. 2, 1984, Ser. No. 595,652
Term of patent 14 years
U.S. Cl. D26—38



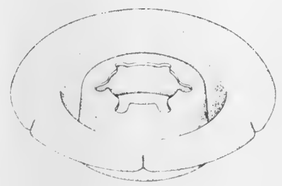
287,294
LAMP BASE
Clarence Williams, 2660 Dwight, Memphis, Tenn. 38114
Filed Jun. 25, 1984, Ser. No. 624,459
Term of patent 14 years
U.S. Cl. D26—93



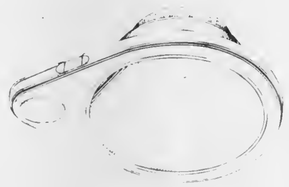
287,295
DECORATIVE NIGHT LAMP
Sebastian F. Marino, 900 NE. 6th St., Hallandale, Fla. 33009
Filed Dec. 7, 1984, Ser. No. 679,219
Term of patent 14 years
U.S. Cl. D26—98



287,296
ASHTRAY
Iwao Yasuda, No. 1300, Someya, Omiya, Saitama, Japan
Filed Nov. 1, 1984, Ser. No. 667,861
Claims priority, application Japan, May 8, 1984, 59-18529
Term of patent 14 years
U.S. Cl. D27—8

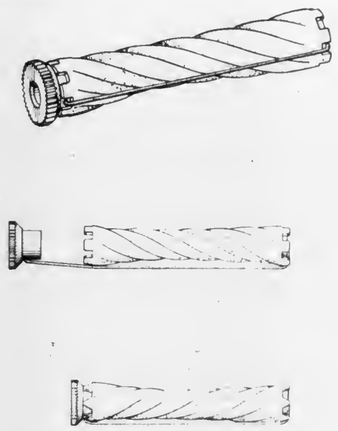


287,297
DRYER FOR HAIR OR THE LIKE
Mary J. Reid, Sheboygan, and John W. Seaman, Sheboygan Falls, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Sep. 28, 1984, Ser. No. 655,450
Term of patent 14 years
U.S. Cl. D28—12

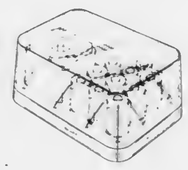


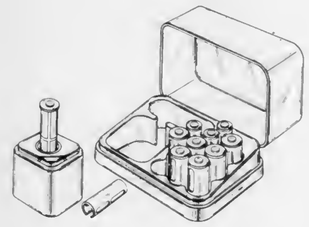


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ROD FOR HAIRDRESSING OR SIMILAR ARTICLE
Katashi Kibe; Masami Nakanishi; Youtarou Sunamoto, and Hideo Miyamori, all of Kitakyushu, Japan, assignors to Cosmo Co., Ltd., Oita, Japan
Filed Sep. 21, 1984, Ser. No. 653,447
Term of patent 14 years
U.S. Cl. D28—37



287,299
HAIR SETTER
Masafumi Yamagami; Yukiko Ito, and Keiko Matoba, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 11, 1984, Ser. No. 659,884
Term of patent 14 years
U.S. Cl. D28—38





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF DECEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Nielsen Company: *See*—
Gomersall, Earl R., 4,630,108, Cl. 358-84.000.

A. D. Smith Harvestore Products, Inc.: *See*—
Silverthorn, Charles R.; and Allhands, Marcus N., 4,629,062, Cl. 198-813.000.

A. E. Staley Manufacturing Company: *See*—
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A. R. Wilfley & Sons, Inc.: *See*—
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A/S Kongsberg Vapenfabrikk: *See*—
Strom, Sigmunn, 4,628,687, Cl. 60-39.230.

A/S Niro Atomizer: *See*—
Veltman, Preston L., 4,629,130, Cl. 241-16.000.

AB Ferrosan: *See*—
Lindahl, Ake R.; and Erlandsson, Stig A. B., 4,629,619, Cl. 424-15.000.
Lindahl, Ake R.; and Erlandsson, Stig A. B., 4,629,620, Cl. 424-15.000.

Abduganiev, Abdurakhim: *See*—
Tikhonov, Valentin N.; Zhigalov, Gennady V.; Abduganiev, Abdurakhim; and Dulnev, Vladimir K., 4,628,678, Cl. 57-400.000.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Coin sorting device. 4,629,051, Cl. 194-261.000.

Abe, Iwao: *See*—
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Abe, Masaaki: *See*—
Suzuki, Jo; Abe, Masaaki; Yamaguchi, Tamotu; and Terazawa, Shotaro, 4,629,720, Cl. 502-400.000.

Abrassart, Jacques: *See*—
Wetterwald, Anton; Abrassart, Jacques; Moreau, Max; and Dallemagne, Stanislas, 4,629,523, Cl. 156-62.800.

Acocella, Giovanni: *See*—
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Acousis Company: *See*—
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Adachi, Yuuma: *See*—
Nakajima, Nobuyoshi; Adachi, Yuuma; and Agano, Toshitaka, 4,629,891, Cl. 250-327.200.

Adams, Gene W.; and Brosnahan, John W., to Holodyne Ltd., 1986. Imaging doppler interferometer. 4,630,051, Cl. 342-133.000.

Adams Hard-Facing Company, Inc.: *See*—
Edmisson, Delmar D., 4,628,839, Cl. 111-7.000.

Adcotech Corporation: *See*—
Stillman, Ben S.; and Boricchio, Barry J., 4,629,387, Cl. 414-404.000.

ADIR S.A.R.L.: *See*—
Regnier, Gilbert; Guillonneau, Claude; and Lepagnol, Jean, 4,629,728, Cl. 514-252.000.

Adis, Erich: *See*—
Buschulte, Winfried; Adis, Erich; and Bader, Manfred, 4,629,414, Cl. 431-46.000.

Adler, Theo: *See*—
Stolper, Richard; Adler, Theo; and Kussmann, Lutz, 4,629,254, Cl. 297-473.000.

Advanced Micro Devices, Inc.: *See*—
Briner, Michael S.; and Suciu, Paul I., 4,629,972, Cl. 323-314.000.

AE PLC: *See*—
Ruddy, Brian L., 4,629,200, Cl. 277-216.000.

Aeritalia-Societa Aerospaziale Italiana-per Azioni: *See*—
Livi, Francesco; and Boggiatto, Dario, 4,629,527, Cl. 156-285.000.

Aeronca Electronics, Inc.: *See*—
Moran, Kevin E., 4,630,276, Cl. 372-15.000.

Aeschbach, Jurg; and Rosa, Edmund, to Actief N.V. Apparatus and method for producing knitted hook-type fastener material. 4,628,709, Cl. 66-9.00R.

AG Systems, Inc.: *See*—
Lenz, Dick, 4,629,087, Cl. 220-85.00S.

Agano, Toshitaka: *See*—
Nakajima, Nobuyoshi; Adachi, Yuuma; and Agano, Toshitaka, 4,629,891, Cl. 250-327.200.

Agency of Industrial Science and Technology: *See*—
Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, 4,629,713, Cl. 502-84.000.

AGFA-Gevaert N.V.: *See*—
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Aisin Seiki Kabushiki Kaisha: *See*—
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Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, 4,630,179, Cl. 362-66.000.

Aisin Seiki Kabushikikaisha: *See*—
Umebayashi, Kazuyuki, 4,629,828, Cl. 379-56.000.

Aiuola, Franco, to Azionaria Costruzioni Macchine Automatiche (A.C.M.A.). Apparatus for arranging containers e.g. bottles, vertically. 4,629,055, Cl. 198-400.000.

Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Packaging materials for photosensitive materials. 4,629,640, Cl. 428-35.000.

Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, to Fuji Photo Film Co., Ltd. Separate-exposure photographing apparatus. 4,629,300, Cl. 354-76.000.

Akin, Cavit: *See*—
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Akira, Hayashi. Iron reinforcing rod structure for reinforcing the base of buildings. 4,628,659, Cl. 52-646.000.

Akisada, Masahide: *See*—
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Akkerman, Neil H., to AVA International Corp. Well apparatus. 4,628,998, Cl. 166-237.000.

Aktiebolaget IRO: *See*—
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Aktiengesellschaft Adolph Saurer: *See*—
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Alaimo, Ben; and Couse, Robert F., to SyQuest Technology. Servo control apparatus for a disk drive. 4,630,190, Cl. 364-167.000.

Albanese, Andres, to AT&T Bell Laboratories. Bidirectional dual network. 4,630,256, Cl. 370-3.000.

Alberghini, Alfred C.: *See*—
Herron, Gene A.; Nickel, Gerhard E. B.; and Alberghini, Alfred C., 4,628,669, Cl. 53-425.000.

Albert-Frankenthal AG: *See*—
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Alberti, Giulio; and Costantino, Umberto, to Consiglio Nazionale Delle Ricerche. Ion exchange inorganic films made up of layered structure insoluble acid salts or tetravalent metals and/or their derivatives, and process for the preparation of same. 4,629,656, Cl. 428-411.100.

Alcan Ohler GmbH: *See*—
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Alcoholism & Drug Addiction Research Foundation: *See*—
Israel, Yedy; Oporto, Betsavel; and Macdonald, Alain, 4,628,866, Cl. 119-51.500.

Aldridge, Silas B. Spring exercise device. 4,629,186, Cl. 272-135.000.

Alexander, Kevin; and Farr, Howard J., to Doulton Industrial Products Limited. Moulding. 4,629,708, Cl. 501-123.000.

Alfa-Laval Separation AB: *See*—
Pinato, Oskar, 4,629,564, Cl. 210-512.300.

Allen-Bradley Company, Inc.: *See*—
Weppler, Robert C., 4,630,233, Cl. 364-900.000.

Allen, David W., to Post-Glover Resistors, Inc. Grid resistor and improved grid element therefor. 4,630,024, Cl. 338-58.000.

Allhands, Marcus N.: *See*—
Silverthorn, Charles R.; and Allhands, Marcus N., 4,629,062, Cl. 198-813.000.

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Allied Corporation: *See*—
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Buike, James W.; and Tomala, Ambrose, 4,629,024, Cl. 180-79.100.
Carlson, Emery J.; and Armor, John N., 4,629,652, Cl. 428-304.400.
Diamond, Steven E.; and Regina, Francis J., 4,629,689, Cl. 435-7.000.

Fannin, Richard C., 4,629,256, Cl. 303-8.000.
Kailus, William A., 4,629,269, Cl. 339-59.00M.
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,629,545, Cl. 204-182.400.
O'Hara, Mark J.; and Urban, Peter, 4,629,509, Cl. 106-118.000.
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Allied Industries, Inc.: *See—*
Revelt, William F.; Prows, John B.; Thomson, Fred M.; and Avery, Hugh E., 4,629,328, Cl. 366-177.000.

Allinquant, Fernand M. Load handling installations. 4,629,059, Cl. 198-463.300.

Alps Electric Co., Ltd.: *See—*
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Shiraishi, Yukiya; and Yamashita, Takeshi, 4,630,154, Cl. 360-105.000.

Alsenz, Richard H. Temperature optimizer control apparatus and method. 4,628,700, Cl. 62-152.000.

Alsthom-Atlantique: *See—*
Riollet, Gilbert, 4,628,693, Cl. 60-648.000.

Aluminum Company of America: *See—*
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ALZA Corporation: *See—*
Wong, Patrick S., 4,629,449, Cl. 604-55.000.

Amamo, Matsuo; and Sasayama, Takao, to Hitachi, Ltd. Method of fuel injection into engine. 4,630,206, Cl. 364-431.070.

Amann, Michael J. Universal hydraulic exerciser. 4,629,185, Cl. 272-130.000.

Amano, Hisao: *See—*
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Amano, Shintetsu; Okada, Hajime; Yakuda, Teruyuki; Hori, Isao; and Mizuhata, Yoshinori, to Kabushiki Kaisha Sanyo Denki Seisakusho. Neon sign control device. 4,629,946, Cl. 315-219.000.

Amemiya, Yoichi: *See—*
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Amendola, Eugene B.; and Reynolds, Kenneth R., to General Electric Company. Spacer to prevent coil shift. 4,629,918, Cl. 310-65.000.

American Antigravity Co., Inc.: *See—*
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Taylor, Fred J.; and Donnermeyer, William I., Jr., 4,628,825, Cl. 105-289.000.

American Hospital Supply Corporation: *See—*
Intengan, Franklin S.; Heller, Zindel H.; and White, Fred K., 4,628,929, Cl. 128-314.000.

American Locker Group Incorporated: *See—*
Chester, Richard J., 4,629,265, Cl. 312-329.000.

American Microsystems, Inc.: *See—*
Cameron, Kelly B., 4,629,909, Cl. 307-279.000.

American Welding & Manufacturing Co.: *See—*
Winyard, Rodney W., 4,628,648, Cl. 52-212.000.

Amlinger, Heinrich, to Leybold-Heraeus GmbH. Apparatus for the manufacture of metal powder by atomization from a nozzle with noble gas or nitrogen. 4,629,407, Cl. 425-7.000.

Amoco Corporation: *See—*
Done, William J., 4,630,242, Cl. 367-73.000.
Schroeder, Hobe, 4,629,715, Cl. 502-185.000.

AMP Incorporated: *See—*
Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased; and Taylor, Attalee S., 4,629,270, Cl. 339-75.0MP.
Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., 4,628,599, Cl. 29-857.000.
Gordon, Geoffery M.; and Griffiths, Edward J., 4,628,600, Cl. 29-861.000.
Norton, Jeffrey M.; and Yamada, Shoji, 4,629,278, Cl. 339-134.000.
Viselli, Michael A., 4,629,266, Cl. 339-17.0LC.

Amstore Corporation: *See—*
Amstutz, Douglas D.; and Kelemen, Donald D., 4,629,076, Cl. 211-94.000.

Amstutz, Douglas D.; and Kelemen, Donald D., to Amstore Corporation. Slatboard. 4,629,076, Cl. 211-94.000.

Amtel Communications, Inc.: *See—*
Curtin, William J.; Soto, Stephen; and Krueger, Steven, 4,629,831, Cl. 379-213.000.

Anabuki, Hitoshi: *See—*
Miyata; Shigeo; and Anabuki, Hitoshi, 4,629,626, Cl. 424-147.000.

Anchor Hocking Corporation: *See—*
Pugh, Richard E., 4,629,068, Cl. 206-426.000.
Pugh, Richard E., 4,629,069, Cl. 206-426.000.

Ancos Co., Ltd.: *See—*
Hashimoto, Yasuyuki; and Shimizu, Kazuo, 4,629,348, Cl. 401-107.000.

Anderson, C. William: *See—*
Bonaventura, Joseph; Bonaventura, Celia; and Anderson, C. William, 4,629,544, Cl. 204-131.000.

Anderson, Keith V. Current-tuned transistor oscillator. 4,630,006, Cl. 331-117.00R.

Anderson, Oren B. Nursery stock container. 4,628,634, Cl. 47-73.000.

Anderson, Thomas K.; and Finley, Carl E., to Century Tool & Manufacturing Co. Pressure relief and shut-off valve. 4,629,156, Cl. 251-60.000.

Ando, Hiroshi: *See—*
Tsuchiya, Yuji; and Ando, Hiroshi, 4,629,157, Cl. 251-96.000.

Ando, Takeki: *See—*
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.

Andre, Wolfram K., to Kurt Wolf & Co. KG. Regulator circuit for control of heat output of a heating element. 4,629,852, Cl. 219-497.000.

Andrews, George S.; Blakney, Thomas L.; Connell, Douglas D.; Lamberty, Bernard J.; and Lee, James R., to Boeing Company, The. Spiral antenna with selectable impedance. 4,630,064, Cl. 343-895.000.

Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased (by Cobaugh, Jacqueline R., executrix); and Taylor, Attalee S., to AMP Incorporated. Zero insertion force card edge connector with flexible film circuitry. 4,629,270, Cl. 339-75.0MP.

ANGUS Chemical Company: *See—*
Young, Vernon V.; and Bright, David R., 4,629,790, Cl. 544-226.000.

Anma, Katsuo: *See—*
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.

Anritsu Electric Company Limited: *See—*
Nagase, Yasuo, 4,630,147, Cl. 360-78.000.

ANT Nachrichtentechnik GmbH: *See—*
Bergmann, Hans C.; and Musmann, Hans-Georg, 4,630,114, Cl. 358-136.000.
Morz, Gunter, 4,630,059, Cl. 343-362.000.
Polzer, Rudolf, 4,630,044, Cl. 340-825.720.
Rein, Hans-Martin, 4,630,046, Cl. 340-825.930.

Antos, George J.; and Wang, Li, to UOP Inc. Platinum-, rhenium-, indium-containing catalysts for conversion of hydrocarbons. 4,629,551, Cl. 208-139.000.

Aoki, Harumi: *See—*
Suzuki, Koji; Kawasaki, Masahiro; and Aoki, Harumi, 4,630,121, Cl. 358-227.000.

Aoki, Masaki: *See—*
Monji, Hideto; Aoki, Masaki; Torii, Hideo; and Okinaka, Hideyuki, 4,629,487, Cl. 65-26.000.

Aoki, Nobuo: *See—*
Asai, Takamitsu; Fujiyama, Masaaki; Kanazawa, Minoru; and Aoki, Nobuo, 4,629,653, Cl. 428-328.000.

Aoki, Takashi: *See—*
Nishikawa, Masao; Sakurai, Yoshimi; and Aoki, Takashi, 4,628,767, Cl. 74-731.000.

Aoyama, Shunichi; Fujii, Hiroshi; and Kato, Manabu, to Nissan Motor Co., Ltd. Induction system for internal combustion engine having multiple inlet valves per combustion chamber. 4,628,880, Cl. 123-432.000.

Aoyama, Yoshiyuki: *See—*
Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, 4,628,837, Cl. 110-346.000.

Apogee, Inc.: *See—*
Trumbull, Donald; Erland, Jonathan; Fog, Stephen; and Burke, Paul, 4,629,298, Cl. 353-30.000.

Appling, James, to Allied Corporation. Vibration isolation module. 4,628,851, Cl. 114-253.000.

Aquanautics Corporation: *See—*
Bonaventura, Joseph; Bonaventura, Celia; and Anderson, C. William, 4,629,544, Cl. 204-131.000.

Aquino, Agostino J.: *See—*
Simelunas, William J.; Aquino, Agostino J.; and Polifroni, Nicholas, 4,629,056, Cl. 198-406.000.

Arabian American Oil Company: *See—*
Stewart, Ross W., 4,628,894, Cl. 125-21.000.

Arai, Masatoshi; Inoue, Takeo; and Yokoo, Koji, to Shin-Etsu Chemical Co., Ltd. Room temperature-curable organopolysiloxane composition. 4,629,775, Cl. 528-17.000.

Arai, Mitsuru; Sato, Hideyori; and Inatomi, Shoichiro, to Kabushiki Kaisha Komatsu Seisakusho. Fluid circuit for operating a bidirectional hydraulic motor with a reduced shock. 4,628,690, Cl. 60-464.000.

Arakawa, Hideki, to Fujitsu Limited. Semiconductor memory device. 4,630,238, Cl. 365-185.000.

Arakawa, Koji, to Toko, Inc. Battery charging device. 4,629,962, Cl. 320-2.000.

Arao, Kozo: *See—*
Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, 4,629,670, Cl. 430-58.000.

Arctic Equipment Rental, Inc.: *See—*
Giron, Anthony S.; and Curd, Andrew T., 4,629,408, Cl. 425-111.000.

Arenhold, Knut. Method for fixing a mud flap to a motor vehicle, a mud flap and a device for performing the method. 4,629,204, Cl. 280-154.50R.

Arima, Keizi: *See—*
Ogata, Seishi; Arima, Keizi; and Ohtsuki, Masahiro, 4,629,166, Cl. 266-158.000.

Armor, John N.: *See—*
Carlson, Emery J.; and Armor, John N., 4,629,652, Cl. 428-304.400.

Armstrong, James A. Building wall descent device having a manually operated brake means. 4,629,032, Cl. 182-9.000.

Armstrong, Thomas, to Paradyne Corporation. Secondary channel signalling in a QAM data point constellation. 4,630,287, Cl. 375-39.000.

Arnaud, Alain; and Bouiges, Thierry, to S.A.M.M. - Societe d'Applications des Machines Motrices. Hydropneumatic oleopneumatic vehicle suspension element. 4,629,169, Cl. 267-64.190.

Arndt, H. Chandler. Radiant heater. 4,628,900, Cl. 126-92.0AC.

Arnold, James F. Full opening check valve. 4,628,996, Cl. 166-116.000.

Aron, Jerome, to Kuhn, S.A. Haymaking machine for the tedding. 4,628,673, Cl. 56-370.000.

Asada, Masao: *See—*
Terashima, Kenji; Kimura, Yoshio; Asada, Masao; and Sugano, Satoshi, 4,629,582, Cl. 252-301.40P.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hoki, Tsuneo; and Matsuki, Yutaka, 4,629,745, Cl. 521-87.000.
Kataoka, Hiroshi, 4,629,650, Cl. 428-213.000.

Asahi Kogaku Kogyo K.K.: *See—*
Sato, Osamu; Tano, Eiichi; and Negishi, Kiyoshi, 4,629,305, Cl. 354-442.000.
Suzuki, Koji; Kawasaki, Masahiro; and Aoki, Harumi, 4,630,121, Cl. 358-227.000.

Asahi Seiko Kabushiki Kaisha: *See—*
Abe, Hiroshi, 4,629,051, Cl. 194-261.000.

Asai, Kenji: *See—*
Yonezu, Kunio; and Asai, Kenji, 4,629,622, Cl. 429-57.000.

Asai, Masahiro; and Hikimoto, Yasuhiro, to Nippondenso Co., Ltd. Magneto-generator for internal combustion engine. 4,628,891, Cl. 123-599.000.

Asai, Takamitsu; Fujiyama, Masaaki; Kanazawa, Minoru; and Aoki, Nobuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium having laminated hexagonal ferrite platelets. 4,629,653, Cl. 428-328.000.

Asami, Kazutomo: *See—*
Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; and Asami, Kazutomo, 4,628,963, Cl. 137-857.000.

Asano, Junichi: *See—*
Kameyama, Toru; and Asano, Junichi, 4,629,172, Cl. 271-9.000.

ASARCO Incorporated: *See—*
Myers, Michael, 4,629,516, Cl. 148-11.50R.

Asemyr, Nils G., to Semyre Electronics AB. Scanning apparatus. 4,629,885, Cl. 250-235.000.

Ashizawa, Masaaki: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,629,199, Cl. 277-204.000.

Ashland Oil, Inc.: *See—*
Eaton, Robert L., 4,628,868, Cl. 122-4.00D.

Ashwood, Valerie A., to Beecham Group p.l.c. Benzopyrans. 4,629,734, Cl. 514-456.000.

Aslan, Edward E., to Narda Microwave Corporation, The. Dipole antenna. 4,629,978, Cl. 324-95.000.

Astra Meditec AB: *See—*
Wellenstam, Kjell I., 4,629,159, Cl. 251-149.600.

AT&T Bell Laboratories: *See—*
Albanese, Andres, 4,630,256, Cl. 370-3.000.
Early, Scott H.; and Minear, Roger L., 4,629,910, Cl. 307-317.00R.
Larson, Mikiel L.; Toy, Wing N.; and Vaidya, Avinash K., 4,630,259, Cl. 370-60.000.
Rzeszewski, Theodore S., 4,630,099, Cl. 358-12.000.
Toy, Wing N.; and Vaidya, Avinash K., 4,630,260, Cl. 370-60.000.

AT&T Information Systems: *See—*
Kennedy, Kevin J., 4,628,992, Cl. 165-123.000.

AT&T Information Systems, Inc.: *See—*
Bednar, Joseph A., Jr.; Bennett, Richard L.; Dutt, Charbak R.; and Stafford, Michael K., 4,630,196, Cl. 364-200.000.
Carson, Robert A.; Petrick, Mary S.; Vallone, Lee A.; and Walker, John D., 4,629,832, Cl. 340-825.070.

Ateliers de Constructions Mecaniques de Vevey S.A.: *See—*
Blanc, Jean-Pierre; Carrard, Francis; and Devenoges, Claude, 4,629,878, Cl. 250-202.000.

Atimichuk, Stan W. Convertible bed chair. 4,628,551, Cl. 5-12.00R.

Atlantic Richfield Company: *See—*
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., 4,629,718, Cl. 502-241.000.
Leitz, Christopher R.; Jordon, Joel S.; and Dalton, Michael S., 4,629,572, Cl. 210-714.000.
Schuh, Frank J., 4,629,012, Cl. 175-75.000.

Atos Oleodinamica S.p.A.: *See—*
Tantardini, Paolo, 4,629,406, Cl. 418-268.000.

Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, to Societe Nationale Industrielle Aerospatiale. Suspension system for a set of vehicle wheels with rigid axle. 4,629,213, Cl. 280-718.000.

Audhya, Tapan: *See—*
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,629,723, Cl. 514-17.000.

Auffret, Rene ; Le Marer, Rene ; and Sorel, Yvon. Infrared light source incorporating a semiconductor laser associated with mode selection and power control means. 4,630,278, Cl. 372-43.000.

Ausnit, Steven, to Minigrip Incorporated. Making reclosable bag material. 4,629,524, Cl. 156-66.000.

Autoflug GmbH: *See—*
Nohren, Hubert; Knofe, Helmut; and Struck, Klaus, 4,629,142, Cl. 242-107.40B.

Automobiles Citroen: *See—*
Duret, Pierre, 4,628,888, Cl. 123-531.000.

Automobiles Peugeot: *See—*
Duret, Pierre, 4,628,888, Cl. 123-531.000.

Automotive Products plc: *See—*
Draper, Colin R.; Trotman, Steven; Bowden, Christopher M.; and Turfrey, Keith A., 4,629,048, Cl. 192-70.270.

Autopart Sweden AB: *See—*
Svensson, Bo, 4,629,868, Cl. 219-528.000.

Autotrol Corporation: *See—*
Goudy, Paul R., Jr.; and Weekley, William G., 4,629,126, Cl. 239-452.000.

AVA International Corp.: *See—*
Akkerman, Neil H., 4,628,998, Cl. 166-237.000.

Avery, Hugh E.: *See—*
Revelt, William F.; Prows, John B.; Thomson, Fred M.; and Avery, Hugh E., 4,629,328, Cl. 366-177.000.

Awa Engineering Co., Ltd.: *See—*
Kubo, Yoshiharu, 4,629,138, Cl. 242-56.00R.

Awano, Yoshiyuki, to Du Pont de Nemours, E. I., and Company. Electrical connector for flexible circuit boards. 4,629,271, Cl. 339-75.0MP.

Azionaria Costruzioni Macchine Automatiche (A.C.M.A.): *See—*
Aiuola, Franco, 4,629,055, Cl. 198-400.000.

B.E.L.-Tronics Limited: *See—*
Martinson, Glen D., 4,630,054, Cl. 342-20.000.

B. F. Goodrich Company, The: *See—*
Garcia, Dana S., 4,629,765, Cl. 525-187.000.
Hong, Paul O., 4,629,743, Cl. 521-57.000.
Layer, Robert W.; Lai, John T.; and Son, Pyong N., 4,629,752, Cl. 524-100.000.
Traynor, Lee, 4,629,798, Cl. 548-562.000.

Baba, Shirou, to Hitachi, Ltd. Monolithic integrated circuit having common external terminal for analog and digital signals and digital system using the same. 4,630,207, Cl. 364-431.120.

Baba, Tatsuo: *See—*
Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, 4,630,237, Cl. 365-104.000.

Babendererde, Siegmund, to Hochtief Aktiengesellschaft vorm. Gebr. Helfmann. Tunneling machine. 4,629,255, Cl. 299-33.000.

Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, David J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., to United States of America, Navy. Disintegrating tamper mass. 4,628,819, Cl. 102-307.000.

Bader, Manfred: *See—*
Buschulte, Winfried; Adis, Erich; and Bader, Manfred, 4,629,414, Cl. 431-46.000.

Badia Iniesta, Antonio, to Plastivit, S.A. Bottle stopper. 4,629,082, Cl. 215-252.000.

Badische Stahlwerke AG: *See—*
Rothe, Herbert; and Haase, Karl, 4,629,165, Cl. 266-114.000.

Bado, Philippe: *See—*
Bouvier, Marcel A.; and Bado, Philippe, 4,629,993, Cl. 328-67.000.

Bagwell, James T., to CIMCO. Nebulizer. 4,629,590, Cl. 261-78.200.

Bailey, Denis M., to Sterling Drug Inc. Compositions containing substituted aminobenzoates and use thereof as inhibitors of lipoxygenase. 4,629,735, Cl. 514-535.000.

Baillievier, Freddy: *See—*
Bourgois, Luc; and Baillievier, Freddy, 4,628,683, Cl. 57-213.000.

Baker, Alan J., to Hewlett-Packard Company. Method and apparatus for measuring phase. 4,630,033, Cl. 340-347.00P.

Baker, Hailey L. Heater device control. 4,629,114, Cl. 236-11.000.

Baker Oil Tools, Inc.: *See—*
Reinhardt, Paul A., 4,629,011, Cl. 175-58.000.

Baker, Walter D. Apparatus for containment of oral secretions. 4,628,547, Cl. 4-259.000.

Balazs, Endre A.; and Leshchiner, Adolf, to Biomatrix, Inc. Hyaluronate-poly (ethylene oxide) compositions and cosmetic formulations thereof. 4,629,623, Cl. 424-78.000.

Baldwin, Carl L.: *See—*
Campbell, John A. L.; Baldwin, Carl L.; Foley, David J.; and McHann, Michael R., 4,629,392, Cl. 414-786.000.

Baldwin, Roger E.; and Woo, Nea-Yea, to Eastman Kodak Company. Light beam intensity controlling apparatus. 4,629,879, Cl. 250-205.000.

Balint, Valer: *See—*
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer, 4,628,999, Cl. 166-274.000.

Ball Corporation: *See—*
Doud, Wilbur O.; Davis, Robert E.; and Sawyer, Fred R., 4,629,488, Cl. 65-83.000.

Ball, Newton E. Battery power source. 4,629,964, Cl. 320-14.000.

Ballard, Thomas. Yard caddy. 4,629,203, Cl. 280-47.260.

Balsa, Thomas F., to United States of America, Navy. Gas recirculator for acyclic machines. 4,629,922, Cl. 310-178.000.

Balter, Valentin, to Huntington Mechanical Laboratories, Inc. Adjustable connector unit. 4,629,219, Cl. 285-184.000.

Balz, Werner; Kovacs, Jenoe; Lechner, Hilmar; Schaefer, Dieter; and Buethe, Ingolf, to BASF Aktiengesellschaft. Production of magnetic recording media. 4,629,632, Cl. 427-54.100.

Banks, Robert L.: *See*—
Kukes, Simon G.; and Banks, Robert L., 4,629,719, Cl. 502-242.000.

Banzai, Hideo; Ikeda, Goh,; and Omura, Nobukatsu, to Toshiba Kikai Kabushiki Kaisha. Closed loop control method for hydraulic apparatus. 4,629,954, Cl. 318-561.000.

Barbiaux, William J., to Motorola, Inc. Meter overdrive protection circuit. 4,629,981, Cl. 324-166.000.

Barfknecht, Charles F.; and Schoenwald, Ronald D., to University of Iowa Research Foundation. Non-classical topical treatment for glaucoma. 4,629,738, Cl. 514-603.000.

Barkhimer, Robert L.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., 4,628,881, Cl. 123-447.000.

Barlow, Bruce S., to Eaton Corporation. Roller follower axle retention. 4,628,874, Cl. 123-90.500.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Schippers, Heinz; Lenk, Erich; and Bremer, Hermann, 4,629,137, Cl. 242-45.000.

Barner, Juliane S. Compound food storage bag. 4,629,064, Cl. 206-204.000.

Barnett, John D., to TRW Probe Electronics Co. Ltd. Strain transducers. 4,628,583, Cl. 29-525.000.

Barney, Kevin S.; Langevin, Theodore J.; Lawson, Harold W., Jr.; and Winski, Dennis A., to Moore Special Tool Co., Ltd. Jig grinder with automatic reciprocation and outfeed control. 4,630,214, Cl. 364-474.000.

Baron, Kenneth: *See*—
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., 4,629,580, Cl. 252-49.600.
Jessup, Peter J.; Holstedt, Richard A.; and Baron, Kenneth, 4,629,579, Cl. 252-33.600.

Barr, Brian D.: *See*—
Rutherford, David A.; Barr, Brian D.; and Rommelmann, Douglas W., 4,629,366, Cl. 405-211.000.

Barrett, Harold F. Medical treatment method. 4,628,931, Cl. 128-399.000.

Barton, Russell R., to Standard Telephones & Cables Public Limited Company. Vehicle tracking system. 4,630,109, Cl. 358-103.000.

BASF Aktiengesellschaft: *See*—
Balz, Werner; Kovacs, Jenoe; Lechner, Hilmar; Schaefer, Dieter; and Buethe, Ingolf, 4,629,632, Cl. 427-54.100.
Goetz, Norbert; Jahn, Dieter; Reissenweber, Gernot; and Eckhardt, Heinz, 4,629,799, Cl. 549-13.000.
Gousetis, Charalampos; Oppenlaender, Knut; Liebold, Gert; and Pfitzner, Klaus, 4,629,602, Cl. 422-7.000.
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,629,613, Cl. 423-265.000.
Ostertag, Werner; Bauer, Roland; and Bock, Gustav, 4,629,513, Cl. 106-292.000.
Ostertag, Werner; Wienand, Henning; Lach, Dietrich; and Hahn, Erwin, 4,629,616, Cl. 423-544.000.
Schoettle, Klaus, 4,629,144, Cl. 242-198.000.

Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., to Standard Oil Commercial Development Company; and BP Solar International Ltd. Thin film heterojunction photovoltaic devices. 4,629,820, Cl. 136-255.000.

Bateman, Victor E., to Burroughs Corporation. Tamper-proof rivet assembly. 4,629,381, Cl. 411-34.000.

Batteas, Elmer L.; and Hamlett, Donald W. Vehicle wheel lock. 4,628,714, Cl. 70-226.000.

Bauer, Roland: *See*—
Ostertag, Werner; Bauer, Roland; and Bock, Gustav, 4,629,513, Cl. 106-292.000.

Baugh, Benton F. Guilelineless subsea completion system with horizontal flowline-connection. 4,629,003, Cl. 166-341.000.

Baumgartinger, Josef; Rauch, Ernst; Harms, Haio; and Wimmer, Adalbert, to Lenzing Aktiengesellschaft. Heated rotatable roll arrangement. 4,629,867, Cl. 219-469.000.

Baumgartner, Josef: *See*—
Stalder, Herbert; and Baumgartner, Josef, 4,628,679, Cl. 57-401.000.

Baxter, Gordon D., to Northern Telecom Limited. Cables having insulating jackets. 4,629,827, Cl. 174-102.00D.

Baxter Travenol Laboratories, Inc.: *See*—
Carveth, Peter C., 4,629,080, Cl. 215-11.00R.

Bayer Aktiengesellschaft: *See*—
Engelhard, Helmut; Feuser, Dieter; Hendricks, Udo; and Tamer, Ergun, 4,629,468, Cl. 8-442.000.
Esser, Heinz; and Krechlok, Horst, 4,629,757, Cl. 524-457.000.
Heinrich, Josef; Casper, Rudolf; and Beck, Manfred, 4,629,816, Cl. 570-229.000.
Jager, Horst, 4,629,788, Cl. 544-76.000.
Janz, Helmut; Rodi, Fritz; Soppe, Alfred; and Rademachers, Jakob, 4,629,500, Cl. 75-0.5BA.
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.
Waldenrath, Werner; Weber, Hans-Leo; and Claussen, Uwe, 4,629,637, Cl. 428-1.000.

Bayerische Motoren Werke Aktiengeselischaft: *See*—
Bordner, Rolf; Hege, Heinz; Nehse, Wolfgang; and Ochott, Thomas, 4,629,443, Cl. 464-74.000.
Lemberger, Heinz; and Schausberger, Christoph, 4,628,762, Cl. 74-559.000.
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,630,027, Cl. 340-52.00F.

Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH: *See*—
Nilsson, Karl E., 4,628,818, Cl. 102-202.200.

Baynes, William R., to Turco, Inc. Barbecue grill with horizontally-shiftable grid. 4,628,896, Cl. 126-25.00R.

BBC Brown, Boveri & Company Limited: *See*—
Brem, Ernst, 4,629,917, Cl. 310-59.000.

Beale, Alvin F., Jr., to Dow Chemical Company, The. Chromium oxide in ion exchange resins and use to remove multivalent metal cations from solutions of at least 1% salinity. 4,629,741, Cl. 521-28.000.

Beard, Hoyt S.; and Woempner, Marvin G., to R. J. Reynolds Tobacco Company. System, apparatus, and method for preparing a quantity of tobacco for primary processing. 4,628,948, Cl. 131-327.000.

Bebernes, Linda K.; and Weiss, Frederick G., to Tektronix, Inc. Latching comparator. 4,629,911, Cl. 307-362.000.

Beck, Manfred: *See*—
Heinrich, Josef; Casper, Rudolf; and Beck, Manfred, 4,629,816, Cl. 570-229.000.

Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., to BKM, Inc. Pressure-controlled fuel injection for internal combustion engines. 4,628,881, Cl. 123-447.000.

Becker, Allyn R.: *See*—
Chan, Tai W.; and Becker, Allyn R., 4,629,782, Cl. 530-322.000.

Becking, Paul E. Apparatus for welding of continuous loop ribbon. 4,629,530, Cl. 156-502.000.

Bednar, Joseph A., Jr.; Bennett, Richard L.; Dutt, Charbak R.; and Stafford, Michael K., to AT&T Information Systems, Inc. Store and forward facility for use in multiprocessing environment. 4,630,196, Cl. 364-200.000.

Beecham Group p.l.c.: *See*—
Ashwood, Valerie A., 4,629,734, Cl. 514-456.000.
Cantello, Barrie C. C., 4,629,737, Cl. 514-564.000.

Belden, Walter R. Belt buckle rack. 4,629,073, Cl. 211-60.100.

Belko, Robert P.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,629,805, Cl. 560-126.000.

Bell, Kenneth M.; and Giolma, William H., to Texas Instruments Incorporated. ESD input protection circuit. 4,630,162, Cl. 361-56.000.

Bellandi, Edward A.: *See*—
Brickell, Joseph W.; and Bellandi, Edward A., 4,628,960, Cl. 137-558.000.

Belloni Cofler, Jacqueline; Marignier, Jean-Louis; Delcourt Euverte, Marie-Odile; and Minana Lourseau, Michele, to Centre Nationai de La Recherche Scientifique. Non-noble metal catalytic microaggregates, a method for their preparation and their application in the catalysis of the photoreduction of water. 4,629,709, Cl. 502-5.000.

Belot, Jean, to Manufacture de Machines du Haut-Rhin. Apparatus for the volumetric dosing of powder. 4,628,971, Cl. 141-67.000.

Belshaw Bros., Inc.: *See*—
Belshaw, Thomas E.; Woodworth, Frederick G.; and Wilke, Wilbur D., 4,628,804, Cl. 99-404.000.
Belshaw, Thomas E.; Woodworth, Frederick G.; and Wilke, Wilbur D., to Belshaw Bros., Inc. Doughnut making machine for moving objects through a frying tank. 4,628,804, Cl. 99-404.000.

Belzer-Dowidat GmbH Werkzeug-Union: *See*—
Koltermann, Jurgen, 4,628,602, Cl. 30-261.000.

Bemis Company, Inc.: *See*—
Wildmoser, Martin M., 4,628,668, Cl. 53-399.000.

Bendiberica, S.A.: *See*—
Estela Rosell, Jorge, 4,629,026, Cl. 180-148.000.

Bennett, Richard L.: *See*—
Bednar, Joseph A., Jr.; Bennett, Richard L.; Dutt, Charbak R.; and Stafford, Michael K., 4,630,196, Cl. 364-200.000.

Bentson, Per, to Minigrip, Inc. Zipper-lock bag chain with tearable strip interconnection means. 4,630,311, Cl. 383-37.000.

Berdahl, Paul H., to United States of America, Energy. Solid state radiative heat pump. 4,628,695, Cl. 62-3.000.

Bergkvist, Lars A.; and Forsen, Ivan, to Inogon Licens AB. Leading mark indicator. 4,629,325, Cl. 356-399.000.

Bergmann, Hans C.; and Musmann, Hans-Georg, to ANT Nachrichtentechnik GmbH. Method for determining the displacement of moving objects in image sequences and arrangement as well as uses for implementing the method. 4,630,114, Cl. 358-136.000.

Bergstrom, Arne. Electromagnetic radiation circuit element insensitive to external radiation. 4,629,884, Cl. 250-227.000.

Berkey, George E., to Corning Glass Works. Method of making fluorine doped optical preform and fiber and resultant articles. 4,629,485, Cl. 65-3.110.

Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., to AMP Incorporated. Method for stripping insulation. 4,628,599, Cl. 29-857.000.

Bernardis, Francesco; and Motta, Carlo, to Ing. C. Olivetti & C., S.p.A. Matrix printing device. 4,629,343, Cl. 400-124.000.

Berner, Willy, to Urma AG. Boring tool with cutting edge adjustment for withdrawal clearance. 4,629,374, Cl. 408-186.000.

Bernhauer, Richard J.: *See*—
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, 4,629,310, Cl. 355-8.000.

Bernier, John A., to Allied Corporation. Plasma excitation system. 4,629,887, Cl. 250-251.000.

Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, to Ing. C. Olivetti & C., S.p.A. Serial printhead ink supply. 4,630,077, Cl. 346-140.00R.

Berry, James M.: *See*—
Laymon, Dwane O.; and Berry, James M., 4,628,613, Cl. 33-544.000.

Bertelsen, John C.: *See*—
Kiapperich, Gary, 4,628,566, Cl. 15-300.00A.

Bertram, Leo; Schemmann, Hugo; and Bukoschek, Romuald, to U.S. Philips Corporation. Vibration dry shaving apparatus driven by a bipolar uniphase synchronous motor. 4,628,607, Cl. 30-43.920.

Beschle, Mark D.: *See*—
Weld, Thomas G.; and Beschle, Mark D., 4,629,936, Cl. 313-579.000.

Beshke, James G.; and Tomlinson, Mark C., to Lamb Technicon Corp. Transfer and locator of workpieces for a gang machine. 4,629,384, Cl. 414-222.000.

Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., to Chelyabinsky Politekhnichesky Institut Imeni Lininskogo Komsomola. Composition and method for protection of liquid surface from heat- and mass-transfer in liquid gas system. 4,629,633, Cl. 427-154.000.

Bespalov, Nikolai A.: *See*—
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A., Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

Best, Richard L., to R. L. Best Company, Inc. Puller apparatus. 4,628,719, Cl. 72-257.000.

Betts, William L., to Paradyne Corporation. Device for synchronization of multiple telephone circuits. 4,630,286, Cl. 375-39.000.

Bev-Cap Plastics Pty. Ltd.: *See*—
Druitt, Rodney M., 4,629,083, Cl. 215-329.000.

Bhagat, Jayant K., to General Motors Corporation. Insulated gate-controlled thyristor. 4,630,092, Cl. 357-38.000.

Bianchini, Pietro, to Opocrin S.p.A. Process for the preparation of oligosaccharide fractions by degradation of heparin. 4,629,699, Cl. 435-101.000.

Biehl, Thomas: *See*—
Grundei, Hans; and Biehl, Thomas, 4,629,463, Cl. 623-16.000.

Bijma, Jan; and Gerritsen, Jan, to U.S. Philips Corporation. Cathode-ray tube having an electron gun with an astigmatic focusing grid. 4,629,933, Cl. 313-414.000.

Biller, Cleveland J.: *See*—
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,629,079, Cl. 212-98.000.

Bio-Dynamics Research & Development Corporation: *See*—
Waggoner, Terrence C.; Simmons, James A.; Perry, Marvin K.; and Tromel, Richard H., 4,629,834, Cl. 381-68.200.

Biodex Corporation: *See*—
Krukowski, Richard, 4,628,910, Cl. 128-25.00R.

Biomatrix, Inc.: *See*—
Balazs, Endre A.; and Leshchiner, Adolf, 4,629,623, Cl. 424-78.000.

Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable buffer coatings for optical fiber. 4,629,287, Cl. 350-96.340.

Bitter, Rudolf, to General Motors Corporation. Motor vehicle with intake manifold system. 4,628,873, Cl. 123-52.00M.

Bittner, Friedrich: *See*—
Voigt, Karl; Reck, Reinhold; Bittner, Friedrich; and Kleinschmit, Peter, 4,629,617, Cl. 423-563.000.

Bitzer, Reiner. Container for an applicator mass, particularly for a toilet product or a cosmetic product. 4,628,950, Cl. 132-88.700.

Bizilia, George. Foot holding apparatus for use in performing sit-up exercises. 4,629,179, Cl. 272-93.000.

BKM, Inc.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., 4,628,881, Cl. 123-447.000.

BKS Company: *See*—
Cassel, Thomas R.; and Cassel, Scott T., 4,629,226, Cl. 285-382.000.

Black & Decker, Inc.: *See*—
Judge, Alfred H., 4,629,108, Cl. 227-132.000.
Wilson, Peter H., 4,629,864, Cl. 219-374.000.

Black, Robert E.: *See*—
McClellan, David P.; Brown, John M., Jr.; and Black, Robert E., 4,630,014, Cl. 335-16.000.

Black, William T.: *See*—
Sayles, Francis H.; Black, William T.; and Ellis, Earl P., 4,629,364, Cl. 405-157.000.

Blackman, Daniel J.: *See*—
Blackman, Lionel H., 4,628,556, Cl. 5-424.000.

Blackman, Lionel H., to Blackman, Daniel J., a part interest. Tilt-prevention mechanism for adjustable bed. 4,628,556, Cl. 5-424.000.

Blain, William; McKeand, Alexander; and McKendrick, William H., to Ferranti plc. Image distortion correction system for electro-optic sensors. 4,630,111, Cl. 358-109.000.

Blakney, Thomas L.: *See*—
Andrews, George S.; Blakney, Thomas L.; Connell, Douglas D.; Lamberty, Bernard J.; and Lee, James R., 4,630,064, Cl. 343-895.000.

Blanc, Jean-Pierre; Carrard, Francis; and Devenoges, Claude, to Ateliers de Constructions Mecaniques de Vevey S.A. Optical apparatus for controlling a tool. 4,629,878, Cl. 250-202.000.

Blaschke, Felix, to Siemens Aktiengesellschaft. Method and apparatus for stabilizing the locus of a vector formed by integration. 4,629,961, Cl. 318-803.000.

Blaushild, Ronald M., to Westinghouse Electric Corp. Stirrup-type support structure for nuclear power plant pressurizer valves. 4,629,601, Cl. 376-463.000.

Blum, Alvin S. Protective key holder. 4,628,717, Cl. 70-456.00R.

Bobb, Clifford F.: *See*—
Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased; and Taylor, Attalee S., 4,629,270, Cl. 339-75.0MP.

Bobsein, Rex L.: *See*—
Shyr, Yen-Shin; Bobsein, Rex L.; and Johnson, Marvin M., 4,629,767, Cl. 525-339.000.

BOC Group, Inc., The: *See*—
Buttitta, Anthony D.; and Garden, Douglas D., 4,628,553, Cl. 5-62.000.

Bock, Gustav: *See*—
Ostertag, Werner; Bauer, Roland; and Bock, Gustav, 4,629,513, Cl. 106-292.000.

Boden, Richard M.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,629,805, Cl. 560-126.000.

Bodine, Albert G. Cycloidal sonic mill for comminuting material suspended in liquid and powdered material. 4,629,135, Cl. 241-201.000.

Boehringer Mannheim GmbH: *See*—
Elstner, Erich, 4,629,696, Cl. 435-25.000.

Boeing Company, The: *See*—
Andrews, George S.; Blakney, Thomas L.; Connell, Douglas D.; Lamberty, Bernard J.; and Lee, James R., 4,630,064, Cl. 343-895.000.
Hunt, James, 4,630,168, Cl. 361-218.000.

Boesch, William J.: *See*—
Maurer, Gernant E.; Boesch, William J.; and Theret, Jean M., 4,629,521, Cl. 148-410.000.

Boettcher, Bodo; and Rupprecht, Werner, to Raychem Corporation. Electrical apparatus. 4,629,277, Cl. 339-111.000.

Boggiatto, Dario: *See*—
Livi, Francesco; and Boggiatto, Dario, 4,629,527, Cl. 156-285.000.

Bohme, Edward A. Deep trolling release device. 4,628,630, Cl. 43-43.120.

Bojarski, Suzette M.: *See*—
Coughlan, Raymond T.; and Bojarski, Suzette M., 4,629,634, Cl. 427-179.000.

Bolguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., to Miles Laboratories, Inc. Homogeneous specific binding assay method. 4,629,688, Cl. 435-7.000.

Boliden Aktiebolag: *See*—
Wennlid, Sven G., 4,629,704, Cl. 436-119.000.

Bollen, Alex J.; Chuchana, Paul; and Hoylaerts, Marc, to SmithKline-RIT. Alpha-1-antiprotease purification. 4,629,567, Cl. 210-635.000.

Bonaventura, Celia: *See*—
Bonaventura, Joseph; Bonaventura, Celia; and Anderson, C. William, 4,629,544, Cl. 204-131.000.

Bonaventura, Joseph; Bonaventura, Celia; and Anderson, C. William, to Aquanautics Corporation. Apparatus and method for reversibly removing ligands from carriers. 4,629,544, Cl. 204-131.000.

Bond, Howard T., to Garlic Technologies, Inc. Cleaning diskette for flexible disk drive transducers. 4,630,157, Cl. 360-128.000.

Bondar, Mikhail J.: *See*—
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.

Bonessa, Vick G.: *See*—
Lerman, Max; and Bonessa, Vick G., 4,628,916, Cl. 128-80.00C.

Bonfils, Michel: *See*—
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,629,213, Cl. 280-718.000.

Bonora, Benito; and Chiappa, Ottorino, to Carle & Montanari S.p.A. Autoclave for processing cocoa liquor. 4,628,803, Cl. 99-348.000.

Boomgaard, Dirk J.; and Neuner, James A., to Westinghouse Electric Corp. Digital rod position detector system. 4,629,983, Cl. 324-208.000.

Booth, Michael; and Penneck, Richard J., to Raychem Corporation. Piezoelectric coaxial cable. 4,629,925, Cl. 310-330.000.

Boots Company PLC, The: *See*—
Kozlik, Antonin; and Wells, Wilfred H., 4,629,727, Cl. 514-237.000.

Bopp & Reuther GmbH: *See*—
David, Walfried, 4,629,160, Cl. 251-327.000.

Bordasch, Claus: *See*—
Brinkmann, Gerhard; and Bordasch, Claus, 4,629,341, Cl. 400-17.000.

Bordner, Rolf; Hege, Heinz; Nehse, Wolfgang; and Ochott, Thomas, to Bayerische Motoren Werke Aktiengesellschaft. Installation for damping torsional vibrations in a gear drive, especially between the crankshaft and an output shaft of internal combustion engines. 4,629,443, Cl. 464-74.000.

Borg-Warner Corporation: *See*—
Kelly, Robert R.; and Smith, Morley S., 4,630,028, Cl. 340-60.000.
Lorett, Jorge A., 4,629,396, Cl. 415-164.000.

Borgen, Michael S. Hockey stick having arcuately bent shaft. 4,629,190, Cl. 273-67.00A.

Boricchio, Barry J.: *See*—
Stillman, Ben S.; and Boricchio, Barry J., 4,629,387, Cl. 414-404.000.

Bornstein, Jerome L. Arm suspension mitt. 4,628,911, Cl. 128-77.000.

Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., to Motorola, Inc. Automatic background noise estimator for a noise suppression system. 4,630,304, Cl. 381-94.000.

Borth, David E.; Gerson, Ira A.; Smanski, Philip J.; and Vilmur, Richard J., to Motorola, Inc. Automatic gain selector for a noise suppression system. 4,630,305, Cl. 381-94.000.

Borthick, W. Ray: *See—*
Modglin, Rodger L.; Borthick, W. Ray; and Roberts, Timothy W., 4,629,211, Cl. 280-688.000.

Borucki, Gregory J.: *See—*
Cecchi, Marino; and Borucki, Gregory J., 4,628,713, Cl. 70-58.000.

Bossaert, Bernard: *See—*
Malatesta, Alberto; Bossaert, Bernard; and Mourand, Jacques, 4,629,766, Cl. 525-222.000.

Boswel, Justus A. T., to Wesmer Konstruksie (Eiedoms) Beperk. Composite floor structures. 4,628,654, Cl. 52-319.000.

Boswell, K. Herb: *See—*
Brandt, Randy L.; Boswell, K. Herb; and Pett, Robert A., 4,629,113, Cl. 236-10.000.

Bottomley, Paul A., to General Electric Company. Method of imaging by depth-resolved surface coil spectroscopy. 4,629,988, Cl. 324-309.000.

Bouchard, Donald J. Security plate for a door. 4,629,231, Cl. 292-346.000.

Bouiges, Thierry: *See—*
Arnaud, Alain; and Bouiges, Thierry, 4,629,169, Cl. 267-64.190.

Bourauel, Fritz: *See—*
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,630,027, Cl. 340-52.00F.

Bourgois, Luc; and Baillievier, Freddy, to N. V. Bekaert S.A. Steel cord twisting structure. 4,628,683, Cl. 57-213.000.

Bourolleau, Joel, to Renix Electronique. Small-sized precision high-voltage resistor in thick-film technology. 4,630,025, Cl. 338-309.000.

Boussemart, Jean-Pierre; and Vuarier, Dominique, to Salomon S.A. Safety binding. 4,629,210, Cl. 280-634.000.

Bouts, Wilhelmus J.: *See—*
Everhardus, Roelof H.; Bouts, Wilhelmus J.; and Brands, Johannes J. M., 4,629,671, Cl. 430-59.000.

Bouvier, Marcel A.; and Bado, Philippe, to University of Rochester, The. Pockels cell driver. 4,629,993, Cl. 328-67.000.

Bowden, Christopher M.: *See—*
Draper, Colin R.; Trotman, Steven; Bowden, Christopher M.; and Turfrey, Keith A., 4,629,048, Cl. 192-70.270.

Bowe, Woodford A.: *See—*
Higgins, James H; Bowe, Woodford A.; and Laragione, Robert, 4,628,951, Cl. 137-2.000.

Bowen, Robert F.: *See—*
Freedman, George; Bowen, Robert F.; and Dudley, Kenneth W., 4,629,865, Cl. 219-405.000.

Boxum, Bruce L., to Coleman Company, Inc., The. Exhaust apparatus for recreational vehicle air conditioner. 4,628,702, Cl. 62-244.000.

BP Solar International Ltd.: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., 4,629,820, Cl. 136-255.000.

BPB Industries Public Limited Company: *See—*
Ward, Arthur G. T.; and Todd-Davies, Christopher, 4,629,419, Cl. 432-13.000.

Braat, Josephus J. M.; and Carasso, Marino G., to U.S. Philips Corporation. Method of recording information in a magneto-optical record carrier, apparatus for carrying out the method, and magneto-optical record carrier for use in an apparatus for carrying out the method. 4,630,249, Cl. 369-13.000.

Braaten, Donald L. Baseball equipment holder. 4,629,065, Cl. 206-315.100.

Brady, Catherine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, to Akzo America Inc. Hydrolysis of fats. 4,629,742, Cl. 521-55.000.

Brandes, Wilhelm: *See—*
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.

Brands, Johannes J. M.: *See—*
Everhardus, Roelof H.; Bouts, Wilhelmus J.; and Brands, Johannes J. M., 4,629,671, Cl. 430-59.000.

Brandschutz GmbH: *See—*
Richter, Klaus, 4,628,826, Cl. 109-1.500.

Brandt, Randy L.; Boswell, K. Herb; and Pett, Robert A., to RHR, Inc. Furnace controller. 4,629,113, Cl. 236-10.000.

Brandt, Raymond W. Safety mechanism for firearms. 4,628,626, Cl. 42-70.010.

Brasier, Brian D.; Hill, Kenneth J.; and Yonker, John F., to General Motors Corporation. Flow regulated power assist steering system with evasive maneuver capability. 4,629,025, Cl. 180-142.000.

Brauer, Ilan: *See—*
Bruggen, Gerhard; Karr, Dieter; Rottler, Wolfgang; and Brauer, Ilan, 4,628,739, Cl. 73-702.000.

Brauers, Bert: *See—*
Morsbach, Martin; and Brauers, Bert, 4,629,198, Cl. 277-139.000.

Braun Aktiengesellschaft: *See—*
Hilfinger, Peter, 4,628,606, Cl. 30-34.100.

Brauninger, Jurgen, to Robert Bosch GmbH. Method and system to obtain a reference signal for a brake controlling system. 4,629,259, Cl. 303-109.000.

Breder, E. William, Jr.: *See—*
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., 4,629,718, Cl. 502-241.000.

Brem, Ernst, to BBC Brown, Boveri & Company Limited. Connecting device for the stator winding rods of electrical machines. 4,629,917, Cl. 310-59.000.

Bremer, Hermann: *See—*
Schippers, Heinz; Lenk, Erich; and Bremer, Hermann, 4,629,137, Cl. 242-45.000.

Brickell, Joseph W.; and Bellandi, Edward A., to FMC Corporation. Sprayer sight gauge. 4,628,960, Cl. 137-558.000.

Bricker, Melvin E., to Bricker Products, Inc. Shredder attachment for a food processor. 4,629,132, Cl. 241-37.500.

Bricker Products, Inc.: *See—*
Bricker, Melvin E., 4,629,132, Cl. 241-37.500.

Bricmont & Associates, Inc.: *See—*
Bricmont, Francis H., 4,629,422, Cl. 432-234.000.

Bricmont, Francis H., to Bricmont & Associates, Inc. Frame apparatus for supporting workpieces in a reheat furnace. 4,629,422, Cl. 432-234.000.

Bridge, Richard S.: *See—*
Turner, Nicholas J.; Ogden, Geoffrey A.; and Bridge, Richard S., 4,628,677, Cl. 57-301.000.

Bridgen, John D., to Hanovia Limited. Apparatus for monitoring the intensity of a UV source. 4,629,896, Cl. 250-372.000.

Bridgestone Corporation: *See—*
Kawaguchi, Yasuyoshi; and Ishii, Michio, 4,629,758, Cl. 524-495.000.
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, 4,628,977, Cl. 152-451.000.

Bridgestone Tire Company Limited: *See—*
Imai, Isamu; Oshima, Kazuo; and Inada, Norio, 4,628,978, Cl. 152-556.000.

Brigham Young University: *See—*
Clegg, John C.; and Davis, Ariel R., 4,630,005, Cl. 331-113.00A.

Bright, David R.: *See—*
Young, Vernon V.; and Bright, David R., 4,629,790, Cl. 544-226.000.

Bright, John K.: *See—*
Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W., 4,628,560, Cl. 14-2.400.

Briner, Michael S.; and Suciu, Paul I., to Advanced Micro Devices, Inc. Temperature insensitive reference voltage circuit. 4,629,972, Cl. 323-314.000.

Brinkmann, Gerhard; and Bordasch, Claus, to Olympia Aktiengesellschaft. Method for controlling printing position on a typewriter for underlining. 4,629,341, Cl. 400-17.000.

Brison, Robert J.: *See—*
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., 4,629,502, Cl. 75-118.00R.

British Broadcasting Corporation: *See—*
Childs, Ian, 4,630,120, Cl. 358-214.000.

British Telecommunications: *See—*
Gordon, John A.; and King, Graham K., 4,630,032, Cl. 340-347.0DD.

Brockhaus, Ernst; and Tolle, Karl-Heinz, to Ed. Scharwachter GmbH & Co, KG. Door hinge assembly for motor vehicles enabling dismounting and remounting of the door during assembly. 4,628,567, Cl. 16-267.000.

Brodr. Brunvoll Motorfabrikk A/S: *See—*
Dyrkorn, Arnfinn; and Standal, Leiv R., 4,629,432, Cl. 440-52.000.

Broilway, Inc.: *See—*
Stanfa, Peter S.; and Foster, Phillip W., 4,628,897, Cl. 126-41.00R.

Bronnvall, Wolfgang A. Self-limiting heater and resistance material. 4,629,869, Cl. 219-553.000.

Bronstein-Bonte, Irena Y.; and Fischer, Alan B., to Polaroid Corporation. Photovoltaic cell. 4,629,821, Cl. 136-257.000.

Brors, Daniel L., to Genus, Inc. Process for depositing a low resistivity tungsten silicon composite film on a substrate. 4,629,635, Cl. 427-255.200.

Brosnahan, John W.: *See—*
Adams, Gene W.; and Brosnahan, John W., 4,630,051, Cl. 342-133.000.

Brougham, Peter H.; and Reynolds, Raymond B. Water supply to watering troughs. 4,628,867, Cl. 119-78.000.

Brown, Allan P.: *See—*
Charlebois, Leonard J.; Brown, Allan P.; and Scott, James R., 4,629,597, Cl. 264-278.000.

Brown, Boveri & Cie AG: *See—*
Eiermann, Albert; Glass, Dieter; and Herrmann, Richard, deceased, 4,629,261, Cl. 310-90.500.

Brown, Dennis N., to Northwest Podiatric Laboratories, Inc. Orthotic for running. 4,628,621, Cl. 36-44.000.

Brown, Francis W.; and Winslow, Louis E., to Minnesota Mining and Manufacturing Company. Removable pressure-sensitive adhesive tape. 4,629,663, Cl. 428-343.000.

Brown, Irving, to RCA Corporation. Satellite communication system. 4,630,058, Cl. 342-359.000.

Brown, John M., Jr.: *See—*
McClellan, David P.; Brown, John M., Jr.; and Black, Robert E., 4,630,014, Cl. 335-16.000.

Brown, M. Wayne: *See—*
Sundles, Timothy B.; and Brown, M. Wayne, 4,628,877, Cl. 123-196.00S.

Brown, Ronald W., to Texas Instruments Incorporated. Low cost time delay relay assembly. 4,630,021, Cl. 337-113.000.

Brownell, Richard G., Sr.; and Fehl, James L., to Sherwood Medical Company. Method of making a grooved medical tube. 4,628,783, Cl. 83-862.000.

Browner, Richard F.; and Willoughby, Ross C., to Georgia Tech Research Corporation. Monodisperse aerosol generator. 4,629,478, Cl. 55-257.00R.

Brownlow, James M.; and Plaskett, Thomas S., to International Business Machines Corporation. Bonding metal to ceramic like materials. 4,629,662, Cl. 428-432.000.

Bruck, Anthony J.; and Hazen, Stephen N., to Convex Display Systems, Inc. Air-flow temperature and humidity management for maintaining freshness of delicate produce. 4,628,697, Cl. 62-89.000.

Bruggen, Gerhard; Karr, Dieter; Rottler, Wolfgang; and Brauer, Ilan, to Robert Bosch GmbH. Device for measuring the pressure of a gas like medium. 4,628,739, Cl. 73-702.000.

Bruggers, Jan W., to Oce-Nederland B.V. Device for positioning originals in sheet form. 4,629,315, Cl. 355-75.000.

Brunswick Corporation: *See—*
Darden, Dennis W., 4,629,141, Cl. 242-84.51A.
Wrasidlo, Wolfgang J., 4,629,563, Cl. 210-500.340.

Buchel, Karl H.: *See—*
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.

Bucheler, Eberhard. Apparatus for the separation of admixtures from contaminated thermoplastic materials. 4,629,411, Cl. 425-197.000.

Buchla, Donald F., to Kimball International, Inc. Method and apparatus for calibrating a keyboard. 4,628,785, Cl. 84-1.100.

Buchla, Donald F., to Kimball International, Inc. Velocity responsive musical instrument keyboard. 4,628,786, Cl. 84-1.100.

Buesse, Winfried: *See—*
Trinks, Hilmar; Peter, Gunter; Eichler, Volker; and Buesse, Winfried, 4,628,817, Cl. 101-426.000.

Buethe, Ingolf: *See—*
Balz, Werner; Kovacs, Jenoe; Lechner, Hilmar; Schaefer, Dieter; and Buethe, Ingolf, 4,629,632, Cl. 427-54.100.

Buhler, Gerhard, to Fryma Maschinen AG. Mill for flowable materials. 4,629,133, Cl. 241-46.110.

Buike, James W.; and Tomala, Ambrose, to Allied Corporation. Electrical power assisted steering system. 4,629,024, Cl. 180-79.100.

Bukoschek, Romuald: *See—*
Bertram, Leo; Schemmann, Hugo; and Bukoschek, Romuald, 4,628,607, Cl. 30-43.920.

Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Bushing assembly for air suspension. 4,629,168, Cl. 267-35.000.

Bunch, Paul D.: *See—*
Jones, Taylor L.; Bunch, Paul D.; and Stevens, Russell E., 4,629,161, Cl. 251-328.000.

Burckhardt, Christoph B.; Fehr, Rainer; and Krummenacher, Peter, to Hoffmann-La Roche Inc. Ultrasonic imaging device. 4,628,738, Cl. 73-626.000.

Burer, Franz, to Sulzer Brothers Limited. Guide for a weft-picking element. 4,628,968, Cl. 139-188.00R.

Burgdorf, Peter K., to Du Pont de Nemours, E. I., and Company. Coating apparatus with tangential slide allowing a vertical and fast flow of photographic emulsion. 4,628,856, Cl. 118-50.000.

Burgin, Carl T.; Loomis, Gary A.; Enloe, Purl R., deceased; and by Enloe, Shirley, administratrix. Fishing equipment holder. 4,628,628, Cl. 43-26.000.

Burke, Donald D. Truck bed unloader. 4,629,390, Cl. 414-527.000.

Burke, James E., to Wescott Steel, Inc. Manganese steel shroud for pin. 4,629,353, Cl. 403-154.000.

Burke, Paul: *See—*
Trumbull, Donald; Erland, Jonathan; Fog, Stephen; and Burke, Paul, 4,629,298, Cl. 353-30.000.

Burke, Robert W., II: *See—*
Gupta, Ashis S.; Heenan, Richard H.; Credle, William S., Jr.; Burke, Robert W., II; and Cahen, Albert J., Jr., 4,629,589, Cl. 261-34.100.

Burkhardt, Robert W.: *See—*
Kadin, Alan M.; and Burkhardt, Robert W., 4,629,536, Cl. 204-1.00T.

Burlington Industries, Inc.: *See—*
Davis, Delbert A., 4,629,651, Cl. 428-247.000.
Griffin, Everett, 4,629,143, Cl. 242-131.000.

Burress, George T., to Mobil Oil Corporation. Aromatization catalyst for a refinery off gas stream. 4,629,818, Cl. 585-517.000.

Burroughs Corporation: *See—*
Bateman, Victor E., 4,629,381, Cl. 411-34.000.
Loskorn, Richard A.; and Jevons, Lyle O., Jr., 4,630,232, Cl. 364-900.000.
Vallance, Leslie, 4,629,136, Cl. 242-71.800.
Waddell, George M.; and Hall, Dennis, 4,629,178, Cl. 271-251.000.

Burry-Lu, Inc.: *See—*
Price, Floyd W., 4,628,664, Cl. 53-232.000.

Burstein, Steven: *See—*
Ethe, Ronald S.; and Burstein, Steven, 4,629,908, Cl. 307-273.000.

Buschulte, Winfried; Adis, Erich; and Bader, Manfred, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Hot gas generating burner. 4,629,414, Cl. 431-46.000.

Buske, Ervin. Clamp support. 4,628,723, Cl. 72-422.000.

Buss, Jack. Vertically stackable luggage cart vending machine. 4,629,383, Cl. 414-93.000.

Butternut Electronics Co.: *See—*
Newcomb, Donald R., 4,630,060, Cl. 343-722.000.

Buttitta, Anthony D.; and Garden, Douglas D., to BOC Group, Inc., The. Infant bed hydraulic tilt mechanism. 4,628,553, Cl. 5-62.000.

Butts, Kenneth R.; and Wanamaker, Joseph L., to General Motors Corporation. Alternator load control system. 4,629,968, Cl. 322-29.000.

Butz, Donald J.: *See—*
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.

Butz, Mark G.; and Zacharias, William J., to General Electric Company. Signal quantizer. 4,630,066, Cl. 346-33.0EC.

Buzano, Michel; and Randon, Michel, to Rhone-Poulenc Fibres. Spun fibre yarn and method for its manufacture. 4,628,682, Cl. 57-206.000.

Byatt, Stephen W.: *See—*
Maytum, Michael J.; Lear, Anthony; Byatt, Stephen W.; and Rodrigues, Richard A. A., 4,629,944, Cl. 315-207.000.

C. A. Weidmuller GmbH & Co.: *See—*
Kruger, Peter, 4,629,281, Cl. 339-272.00R.

C F Braun & Co.: *See—*
Kister, Henry Z., 4,629,484, Cl. 62-29.000.

Cable, Michael J., to Dynapert-Precima Limited. Tensile testing machine. 4,628,741, Cl. 73-826.000.

Cacossa, Frank G.; and Cacossa, Kenneth F., to Frank Cacossa Development Corporation. Retaining wall system. 4,629,360, Cl. 405-16.000.

Cacossa, Kenneth F.: *See—*
Cacossa, Frank G.; and Cacossa, Kenneth F., 4,629,360, Cl. 405-16.000.

Cahalan, Irving W., to Hazeltine Corporation. Oil detecting switch for controlling a pump. 4,629,398, Cl. 417-1.000.

Cahen, Albert J., Jr.: *See—*
Gupta, Ashis S.; Heenan, Richard H.; Credle, William S., Jr.; Burke, Robert W., II; and Cahen, Albert J., Jr., 4,629,589, Cl. 261-34.100.

Cahill, Mary J. Fabric doll face with stuffed feature, and method. 4,629,441, Cl. 446-372.000.

Cain, Clifford W., Jr.; Martin, Phillip C.; and Martinez, Steven R., to Manville Corporation. Process for forming hydrated calcium silicate products. 4,629,508, Cl. 106-85.000.

Calgon Carbon Corporation: *See—*
Sutt, Robert F., Jr., 4,629,476, Cl. 55-68.000.

California Institute of Technology: *See—*
Srivastava, Santosh K.; and Khakoo, Murtadha A., 4,629,937, Cl. 315-3.000.

Calkins, Michael A.: *See—*
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., 4,628,881, Cl. 123-447.000.

Callahan, Patrick O., Jr., to United States of America, Navy. Three hundred and sixty degree IFF video resynchronizer unit. 4,630,048, Cl. 342-45.000.

Callahan, Patrick O., Jr., to United States of America, Navy. Digital-to-composite IFF video converter. 4,630,049, Cl. 342-45.000.

Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, to International Business Machines Corp. Method and system for transmitting digitized voice signals as packets of bits. 4,630,262, Cl. 370-81.000.

Calviello, Joseph A., to Eaton Corporation. MOMOM tunnel emission transistor. 4,630,081, Cl. 357-6.000.

Calvin, Martin: *See—*
Hohl, G. Burnell; and Calvin, Martin, 4,630,301, Cl. 381-36.000.

Camco, Incorporated: *See—*
Pringle, Ronald E., 4,629,002, Cl. 166-324.000.
St. Louis, Robert M., 4,628,617, Cl. 34-108.000.
St. Louis, Robert M., 4,628.661, Cl. 52-658.000.

Cameron Iron Works, Inc.: *See—*
Jones, Taylor L.; Bunch, Paul D.; and Stevens, Russell E., 4,629,161, Cl. 251-328.000.

Cameron, Kelly B., to American Microsystems, Inc. Flip-flop for storing data on both leading and trailing edges of clock signal. 4,629,909, Cl. 307-279.000.

Campagna, Anthony J., Jr.; Eull, Patricia A.; and Reed, Katherine E., to Minnesota Mining and Manufacturing Company. Combinations of materials and method for forming a splint. 4,628,917, Cl. 128-90.000.

Campbell, Colin B.: *See—*
Polk, Matthew S.; and Campbell, Colin B., 4,630,298, Cl. 381-1.000.

Campbell, John A. L.; Baldwin, Carl L.; Foley, David J.; and McHann, Michael R., to Kerr-McGee Coal Corporation. System for batch loading coal into railroad cars. 4,629,392, Cl. 414-786.000.

Canadian Fram Limited: *See—*
Mitchell, Ronald F.; and Cook, John E., 4,628,887, Cl. 123-520.000.

Canadian Patents and Development Limited: *See—*
Cox, William C.; Cox, Gordon; and Leskin, George, deceased, 4,629,369, Cl. 405-303.000.

Canavan, C. Robert: *See—*
Weitz, Gene C.; and Canavan, C. Robert, 4,628,747, Cl. 73-862.440.

Candlin, John P.; Caunt, Anthony D.; Kelland, John W.; and Law, Peter L., to Imperial Chemical Industries, plc. Process for polymerizing olefins with a spray-dried catalyst. 4,629,771, Cl. 526-125.000.

Canon Kabushiki Kaisha: *See—*
Haraguchi, Shosuke; and Tosaka, Yoichi, 4,629,301, Cl. 354-173.100.
Hashimoto, Kenichiro, 4,630,073, Cl. 346-76.0PH.
Kameyama, Toru; and Asano, Junichi, 4,629,172, Cl. 271-9.000.
Kamiya, Osamu, 4,628,862, Cl. 118-724.000.
Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, 4,629,670, Cl. 430-58.000.
Sato, Yasushi, 4,630,070, Cl. 346-108.000.

Sato, Yuichi; Tsunekawa, Tokuichi; Kawabata, Takashi; and Matsumura, Susumu, 4,629,877, Cl. 250-201.000.
Takayama, Nobutoshi; Edakubo, Hiroo; Kozuki, Susumu; Takei, Masahiro; and Nagasawa, Kenichi, 4,630,146, Cl. 360-77.000.
Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, 4,629,294, Cl. 350-427.000.
Watanabe, Kenjiro, 4,630,078, Cl. 346-140.00R.

Cantar Corporation: *See—*
Lazar, Stanley, 4,628,549, Cl. 4-498.000.

Cantello, Barrie C. C., to Beecham Group p.l.c. Secondary amines and use in pharmaceutical compositions. 4,629,737, Cl. 514-564.000.

Cantoni, Maria C., to Ital Idee s.r.l. Multiple filter unit. 4,629,479, Cl. 55-274.000.

Capelle, Gerd, to Hermann Berstorff Maschinenbau GmbH. Pin-barrel extruder having adjustable pins. 4,629,327, Cl. 366-80.000.

Carasso, Marino G.: *See—*
Braat, Josephus J. M.; and Carasso, Marino G., 4,630,249, Cl. 369-13.000.

Cari-All Inc.: *See—*
Trubiano, Antoine, 4,629,086, Cl. 220-7.000.

Carle & Montanari S.p.A.: *See—*
Bonora, Benito; and Chiappa, Ottorino, 4,628,803, Cl. 99-348.000.

Carlson, Emery J.; and Armor, John N., to Allied Corporation. Production of aerogels on a support. 4,629,652, Cl. 428-304.400.

Carlsson, Per-Oloy A. V.; Karlberg, Rolf E.; and Falkvall, Thore E., to Gambro Lundia AB. Hose set for extracorporeal treatment of blood and similar liquids. 4,629,448, Cl. 604-4.000.

Carmichael, Ian C.; Wilson, David J.; and Dean, Anthony B., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Optically immersed detector assembly. 4,629,892, Cl. 250-353.000.

Caronna, Cosimo: *See—*
Lang, Richard D.; and Caronna, Cosimo, 4,628,800, Cl. 98-41.100.

Carp, Ralph W.: *See—*
Weber, Robert E.; and Carp, Ralph W., 4,629,951, Cl. 318-300.000.

Carpanelli, Carlo; and Serenari, Stefano, to GO PRO S.r.l. Motor vehicle, or 'kart' with independent suspension on all four wheels, for off-highway use. 4,629,023, Cl. 180-72.000.

Carr, Peter B., to STC plc. Interlock arrangement for radiopager switches. 4,629,837, Cl. 200-50.00C.

Carrard, Francis: *See—*
Blanc, Jean-Pierre; Carrard, Francis; and Devenoges, Claude, 4,629,878, Cl. 250-202.000.

Carre, Jean-Jacques; and Cheron, Jean M., to Societe Anonyme D.B.A. Braking corrector. 4,629,257, Cl. 303-22.00A.

Carrico, Robert J.: *See—*
Bolguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,629,688, Cl. 435-7.000.

Carrier Corporation: *See—*
Lang, Richard D.; and Frenia, Floyd J., 4,628,799, Cl. 98-40.190.
Lang, Richard D.; and Caronna, Cosimo, 4,628,800, Cl. 98-41.100.

Carrington, James E.: *See—*
Carson, Oliver S.; McMurtry, George; and Carrington, James E., 4,629,149, Cl. 244-134.00R.

Carson, Oliver S.; McMurtry, George; and Carrington, James E., to Short Brothers Limited. Method of and apparatus for de-icing an elastically deformable sheet member. 4,629,149, Cl. 244-134.00R.

Carson, Robert A.; Petrick, Mary S.; Vallone, Lee A.; and Walker, John D., to AT&T Information Systems Inc. Communication system administration method and circuitry. 4,629,832, Cl. 340-825.070.

Carter, R. Sykes; and Seagrave, Earl M., to Fusion UV Curing Systems Corporation. Color coded optical fiber waveguides and method for coloring same. 4,629,285, Cl. 350-96.230.

Carveth, Peter C., to Baxter Travenol Laboratories, Inc. Container such as a nursing container, having formed enclosure chamber for a dispensing member. 4,629,080, Cl. 215-11.00R.

Casamatta, Angelo; and Fossati, Walter, to Honeywell Information Systems Italia. Enhanced reliability interrupt control apparatus. 4,630,041, Cl. 340-825.500.

Case Western Reserve University: *See—*
Sweeney, James D.; and Mortimer, J. Thomas, 4,628,942, Cl. 128-784.000.

Casper, Rudolf: *See—*
Heinrich, Josef; Casper, Rudolf; and Beck, Manfred, 4,629,816, Cl. 570-229.000.

Cassel, Scott T.: *See—*
Cassel, Thomas R.; and Cassel, Scott T., 4,629,226, Cl. 285-382.000.

Cassel, Thomas R.; and Cassel, Scott T., to BKS Company. Pipe lap joint with collapsible sealing zone and band clamp. 4,629,226, Cl. 285-382.000.

Catalytica Associates: *See—*
Grate, John H.; Hamm, David R.; and Valentine, Donald H., Jr., 4,629,804, Cl. 560-24.000.

Caterpillar Inc.: *See—*
Freese, John D., 4,629,354, Cl. 403-261.000.

Caunt, Anthony D.: *See—*
Candlin, John P.; Caunt, Anthony D.; Kelland, John W.; and Law, Peter L., 4,629,771, Cl. 526-125.000.

Cavalleri, Bruno: *See—*
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,629,781, Cl. 530-317.000.

Cecchi, Marino; and Borucki, Gregory J., to Tape-Lock Company. Lock for video tape cassettes. 4,628,713, Cl. 70-58.000.

Ceelen, Theodorus M., to Xerox Corporation. Paper gripper bar. 4,629,176, Cl. 271-204.000.

Centre National de La Recherche Scientifique: *See—*
Belloni Cofler, Jacqueline; Marignier, Jean-Louis; Delcourt Euverte, Marie-Odile; and Minana Lourseau, Michele, 4,629,709, Cl. 502-5.000.
Lemonnier, Marc; Petermann, Denis; Le Fur, Daniel; and Metgert, Stephan, 4,629,897, Cl. 250-385.000.

Century Tool & Manufacturing Co.: *See—*
Anderson, Thomas K.; and Finley, Carl E., 4,629,156, Cl. 251-60.000.

Cgee Alsthom: *See—*
Charles, Patrick, 4,629,969, Cl. 323-210.000.

Chaly, Fedor P.: *See—*
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.

Chan, Tai W.; and Becker, Allyn R., to Syntex (U.S.A.) Inc. Crystalline form of N-acetylmuramyl-L-α-aminobutyryl-D-isoglutamine. 4,629,782, Cl. 530-322.000.

Chan, Wilson, to Space Lab (Hong Kong) Enterprises Ltd. Printing machine. 4,628,810, Cl. 101-27.000.

Chandler Evans Inc: *See—*
Leachman, Frank A., Jr., 4,629,394, Cl. 415-38.000.

Chaney, John L. Male organ conditioner accessory. 4,628,915, Cl. 128-79.000.

Chang, Shih-Ho. Clip structure. 4,628,572, Cl. 24-67.110.

Chang, Shuen C.: *See—*
Poteet, Ken A.; and Chang, Shuen C., 4,630,240, Cl. 365-189.000.

Chao, Tai-Hsiang, to UOP Inc. Phosphorus-modified alumina composite, method of manufacture and use thereof. 4,629,717, Cl. 502-208.000.

Charbonnages de France: *See—*
Delessard, Serge L.; Puff, Roger M.; Kita, Jean C.; and Virgilio, Ange, 4,628,831, Cl. 110-245.000.

Charlebois, Leonard J.; Brown, Allan P.; and Scott, James R., to Northern Telecom Limited. Forming of cable splice closures. 4,629,597, Cl. 264-278.000.

Charles, Joel; Gaudriot, Lionel; and Parot, Jean-Marc. Method and device for locating and characterizing flaws in a known, submerged metal structure. 4,628,737, Cl. 73-624.000.

Charles, Patrick, to Cgee Alsthom. Apparatus for generating a signal indicative of a fault occurring in an electric circuit connected to an AC network. 4,629,969, Cl. 323-210.000.

Charles Stark Draper Laboratory, The: *See—*
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., 4,628,809, Cl. 100-208.000.

Charney, Fred D Travel game arrangement. 4,629,195, Cl. 273-254.000.

Chaussard, Jacques: *See—*
Moingeon, Marie-Odile; and Chaussard, Jacques, 4,629,541, Cl. 204-59.00R.

Check, Frank T., Jr.: *See—*
Scribner, Albert W.; and Check, Frank T., Jr., 4,629,871, Cl. 235-375.000.

Chelyabinsky Politekhnichesky Institut Imeni Lininskogo Komsomola: *See—*
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

Chembond Corporation: *See—*
Mitchell, David K., 4,628,861, Cl. 118-684.000.

Chemical Data Systems, Inc.: *See—*
Higgins, James H.; Bowe, Woodford A.; and Laragione, Robert, 4,628,951, Cl. 137-2.000.

Cheng, Paul J., to Phillips Petroleum Company. Counter-rotational flow in a carbon black reactor. 4,629,615, Cl. 423-456.000.

Chepurnoi, Nikolai P.: *See—*
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.

Chernack, Milton P.: *See—*
Stewart, James F.; and Chernack, Milton P., 4,629,436, Cl. 441-93.000.

Cheron, Jean M.: *See—*
Carre, Jean-Jacques; and Cheron, Jean M., 4,629,257, Cl. 303-22.00A.

Chester, Richard J., to American Locker Group Incorporated. Cabinet construction. 4,629,265, Cl. 312-329.000.

Chevron Research Company: *See—*
Goodrich, Judson E., 4,629,510, Cl. 106-273.00R.
Liston, Thomas V., 4,629,577, Cl. 252-32.70E.
Liston, Thomas V., 4,629,578, Cl. 252-32.70E.
Rafter, John A., Jr., 4,628,749, Cl. 73-863.710.
Small, Vernon R., Jr., 4,629,576, Cl. 252-32.70E.
Vanderzanden, Eugene J., 4,629,511, Cl. 106-277.000.

Chiappa, Ottorino: *See—*
Bonora, Benito; and Chiappa, Ottorino, 4,628,803, Cl. 99-348.000.

Chiaro, Aldo: *See—*
Scardovi, Alessandro; Fetta, Adriano; and Chiaro, Aldo, 4,630,072, Cl. 346-140.00R.

Chicopee: *See—*
Ness, Irving S., 4,629,457, Cl. 604-382.000.

Childs, Ian, to British Broadcasting Corporation. Telecine machines. 4,630,120, Cl. 358-214.000.

Ching, Huang C. Variable automatic forward/reverse control device for baby cart. 4,629,950, Cl. 318-285.000.

Chinone, Naoki: *See—*
Kajimura, Takashi; Kuroda, Takao; Kashiwada, Yasutoshi; Chinone, Naoki; and Aiki, Kunio, 4,630,279, Cl. 372-45.000.

Chisaka, Kazuto; Kushida, Masagoro; Nagayama, Yoshiro; and Yamamoto, Masami, to Honda Giken Kogyo Kabushiki Kaisha; and Ichikoh Industries Limited. Device for driving a movable member in vehicle. 4,628,764, Cl. 74-625.000.

Chiyomaru, Isao: *See—*
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.

Chlanda, Frederick P.: *See—*
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,629,545, Cl. 204-182.400.

Choo Choo Customs, Inc.: *See—*
Wayne, Mark; and Rutherford, Terry, 4,629,022, Cl. 180-69.220.

Choy, Kim L. Shopping cart braking wheel. 4,629,036, Cl. 188-1.120.

Christ, Fabien: *See—*
Grouiller, Herve ; and Christ, Fabien, 4,629,624, Cl. 424-78.000.

Christner, James E.: *See—*
Bolguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,629,688, Cl. 435-7.000.

Chrysler Corporation: *See—*
Zimlich, William C.; Fraeyman, Julius P.; and Johnson, Ronald C., 4,629,232, Cl. 293-128.000.

Chrysler Motors Corporation: *See—*
Mugford, Donald A.; and Vivian, Daniel D., 4,630,178, Cl. 362-64.000.

Chuchana, Paul: *See—*
Bollen, Alex J.; Chuchana, Paul; and Hoylaerts, Marc, 4,629,567, Cl. 210-635.000.

Ciba-Geigy AG: *See—*
Leppard, David G.; and Rody, Jean, 4,629,682, Cl. 430-372.000.

Ciba-Geigy Corporation: *See—*
Gainer, James; and Goschke, Richard, 4,629,789, Cl. 544-114.000.
Kristinsson, Haukur; and Topfl, Werner, 4,629,802, Cl. 558-7.000.
Meyer, Willy; and Fory, Werner, 4,629,810, Cl. 564-89.000.
Muller, Beat, 4,629,773, Cl. 526-262.000.
Pfeifer, Josef, 4,629,685, Cl. 430-583.000.
Pfeifer, Josef, 4,629,777, Cl. 528-353.000.
Rempfler, Hermann; and Pissiotas, Georg, 4,629,813, Cl. 564-256.000.
Rohr, Otto; and Pissiotas, Georg, 4,629,498, Cl. 71-98.000.
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,629,490, Cl. 71-86.000.

Cicci, George B.: *See—*
Fardal, Randolph G.; Cicci, George B.; and Leung, Man K., 4,629,122, Cl. 239-155.000.

Cimber, Hugo. Intrauterine contraceptive device. 4,628,924, Cl. 128-130.000.

CIMCO: *See—*
Bagwell, James T., 4,629,590, Cl. 261-78.200.

Ciriaci, Piergiorgio; and Acocella, Giovanni, to Micro Molds Corporation. Vertical blind assembly. 4,628,981, Cl. 160-176.00R.

Cirkel, Hans-Jurgen; Muller, Reinhard; and Muller-Horsche, Elmar, to Kraftwerk Union Aktiengesellschaft. Excitation circuit for laser systems, especially for TE-high energy lasers, with adjustment of preionization. 4,630,277, Cl. 372-38.000.

Citizen Watch Co., Ltd.: *See—*
Komiyama, Katsuhiko, 4,629,329, Cl. 368-10.000.
Morokawa, Shigeru, 4,630,122, Cl. 358-241.000.

Clarion Co., Ltd.: *See—*
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,630,153, Cl. 360-105.000.
Sakai, Takamasa, 4,630,082, Cl. 357-14.000.

Clark, George B.; and Maidre, Clayton K., to Dow Chemical Company, The. Method of removing fibers protruding into bores. 4,628,584, Cl. 29-557.000.

Clark, Robin D.; and Waterbury, L. David, to Syntex (U.S.A.) Inc. Method for treating intraocular hypertension. 4,629,730, Cl. 514-331.000.

Clark, William M., Jr.; McKenna, Charles M.; and Johnson, William L., to Hughes Aircraft Company. Liquid metal ion source. 4,629,931, Cl. 313-362.100.

Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., to Diffracto Ltd. Panel surface flaw inspection. 4,629,319, Cl. 356-237.000.

Clausen, Thomas; and Konrad, Eugen, to Wella Aktiengesellschaft. Use of p-ureidoalkylamino-nitrobenzene derivatives in hair dyeing compositions and new p-ureidoalkylamino-nitrobenzene derivatives. 4,629,467, Cl. 8-414.000.

Claussen, Uwe: *See—*
Waldenrath, Werner; Weber, Hans-Leo; and Claussen, Uwe, 4,629,637, Cl. 428-1.000.

Claxton, Richard L.: *See—*
Springston, Preston S.; and Claxton, Richard L., 4,629,358, Cl. 404-35.000.

Clayman, Henry. Disposable male valve member. 4,629,158, Cl. 251-148.000.

Clayman, Henry; and Longacre, James R. Posterior chamber intra-ocular lens. 4,629,461, Cl. 623-6.000.

Clegg, John C.; and Davis, Ariel R., to Brigham Young University. Electronic inverter, particularly for use as ballast. 4,630,005, Cl. 331-113.00A.

Clegg, John E. Solar cylinder. 4,628,904, Cl. 126-417.000.

Clemson University: *See—*
Hood, Clarence E., Jr.; Williamson, Robert E.; and Margolin, Amikam, 4,629,005, Cl. 171-20.000.

Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., to Union Carbide Corporation. Vapor state formation of diesters of oxalic acid. 4,629,806, Cl. 560-204.000.

Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W., to Fastspan, Inc., by said Merton Clevett, Robert Lowdermilk, and John Bright. Expandable portable bridge structure. 4,628,560, Cl. 14-2.400.

Clow, Hugh; Percival, William S.; and Walters, Peter E., to National Research Development Corp. Nuclear magnetic loggins. 4,629,986, Cl. 324-303.000.

Clowers, Earl R., to Porter-Cable Corporation. Orbital bayonet saw. 4,628,605, Cl. 30-393.000.

Clyburn, Terry A. Dynamic external fixator and method of use. 4,628,919, Cl. 128-92.0ZK.

Coal Industry (Patents) Limited: *See—*
Holtham, Roy D.; Falconer, Anthony J.; and Grainger, John F. G., 4,628,828, Cl. 110-165.00R.
Martin, David J. R., 4,630,057, Cl. 342-358.000.

Cobaugh, Jacqueline R., executrix: *See—*
Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased; and Taylor, Attalee S., 4,629,270, Cl. 339-75.0MP.

Cobaugh, Robert F., deceased: *See—*
Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased; and Taylor, Attalee S., 4,629,270, Cl. 339-75.0MP.

Cobe Asdt, Inc.: *See—*
Fried, Peter; and Swersey, Burt L., 4,629,015, Cl. 177-25.000.

Coca-Cola Company, The: *See—*
Gupta, Ashis S.; Heenan, Richard H.; Credle, William S., Jr.; Burke, Robert W., II; and Cahen, Albert J., Jr., 4,629,589, Cl. 261-34.100.

Coen Company, Inc.: *See—*
Vosper, Ralph R., 4,628,832, Cl. 110-261.000.

Coffey, Gerald P.: *See—*
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,629,776, Cl. 528-313.000.

Coffman, Paul M., to Shell Oil Company. Non delaminating regrind. 4,629,596, Cl. 264-171.000.

Cok, David R., to Eastman Kodak Company. Signal processing method and apparatus for sampled image signals. 4,630,307, Cl. 382-25.000.

Coleman Company, Inc., The: *See—*
Boxum, Bruce L., 4,628,702. Cl. 62-244.000.

Coll, William V., Jr.: *See—*
Klufas, Oleg; Soldan, Calvin H.; and Coll, William V., Jr., 4,628,575, Cl. 29-156.80R.

Collins, Christine G.; Pirio, Marcel R.; and Singh, Prithipal, to Syntex (U.S.A.) Inc. Tricyclic antidepressant conjugates with antigens and enzymes. 4,629,691, Cl. 435-7.000.

Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., to International Business Machines Corporation. Optical tool for aligning transducer head assemblies. 4,630,150, Cl. 360-97.000.

Colman, Derek A.; and Thew, Martin T. Cyclone separator. 4,629,555, Cl. 209-144.000.

Colson Equipment, Inc.: *See—*
Schrager, James E., 4,629,242, Cl. 296-20.000.

Com Dev Ltd.: *See—*
Tang, Wai-Cheung, 4,630,009, Cl. 333-28.00R.

Comber, Cornelius J. Hot water distribution system. 4,628,902, Cl. 126-362.000.

Combustion Engineering, Inc.: *See—*
Kozlak, Martin J., 4,628,830, Cl. 110-186.000.
Southam, Danald L., 4,628,986, Cl. 164-159.000.

Commissariat a l'Energie Atomique: *See—*
Geniees, Eugene; Pierre, Gerard; Santier, Christian; and Tsintavis, Constantin, 4,629,540, Cl. 204-59.00R.

Commonwealth of Australia, The: *See—*
Dickens, John D., 4,630,139, Cl. 360-46.000.

Compagnie Industrielle des Telecommunicat.: *See—*
Lankar, Andre ; and Lalanne, Alain, 4,630,291, Cl. 375-107.000.

Coningsby, A. Robert. Rotary screen printing apparatus. 4,628,857, Cl. 118-406.000.

Conklin, Barry: *See—*
Mangan, Edmund L.; and Conklin, Barry, 4,628,823, Cl. 104-166.000.

Connell, Douglas D.: *See—*
Andrews, George S.; Blakney, Thomas L.; Connell, Douglas D.; Lamberty, Bernard J.; and Lee, James R., 4,630,064, Cl. 343-895.000.

Conoco Inc.: *See—*
Salama, Mamdouh M.; and Pan, Robert B., 4,629,111, Cl. 228-182.000.

Consiglio Nazionale Delle Ricerche: *See—*
Alberti, Giulio; and Costantino, Umberto, 4,629,656, Cl. 428-411.100.

Control Data Corporation: *See—*
Damoci, Joseph A., 4,630,313, Cl. 455-2.000.

Convex Display Systems, Inc.: *See—*
Bruck, Anthony J.; and Hazen, Stephen N., 4,628,697, Cl. 62-89.000.

Cook, John E.: *See—*
Mitchell, Ronald F.; and Cook, John E., 4,628,887, Cl. 123-520.000.

Cooper, Howard C.; Rasmussen, Carl M.; and Law, Perry N., to EFI Corporation. Method and apparatus for a transient-suppression network. 4,630,163, Cl. 361-56.000.
Cooper Industries, Inc.: *See—*
Hurley, James R., 4,630,218, Cl. 364-481.000.
Cooper, Tim M. Hypodermic needle protection device. 4,629,453, Cl. 604-192.000.
Cooperman, Michael, to GTE Laboratories Incorporated. Low power line driving digital transmission system. 4,630,284, Cl. 375-36.000.
Copeland, Anthony S. Mechanical arm with two link members. 4,630,185, Cl. 362-427.000.
Copeland, Leonard H., to Datcon Instrument Company. Fog-resistant gauge. 4,628,731, Cl. 73-431.000.
Copp, Roy A. Collapsible support used during colonic irrigation. 4,628,554, Cl. 5-90.000.
Cordis Corporation: *See—*
Hess, Stanley R.; and Tarjan, Peter P., 4,628,937, Cl. 128-642.000.
MacGregor, David C.; and Saulson, Stanley H., 4,628,944, Cl. 128-785.000.
Miller, Sandra L., 4,628,943, Cl. 128-785.000.
Pinchuk, Leonard, 4,629,458, Cl. 623-1.000.
Pohndorf, Peter J.; and Schroeppel, Edward A., 4,628,934, Cl. 128-419.0PG.
Cornell Research Foundation, Inc.: *See—*
Harpel, Peter C., 4,629,694, Cl. 435-7.000.
Corning Glass Works: *See—*
Berkey, George E., 4,629,485, Cl. 65-3.110.
Correll, Harold E.; Fulmer, William P.; and Jones, James P., Jr., to Goodyear Aerospace Corporation. Fusible plug safety device for venting aircraft tires. 4,628,953, Cl. 137-74.000.
Correnti, Frank; and Dell 'Acqua, Thomas. Door lock device. 4,629,229, Cl. 292-246.000.
Cortes, Hernan J.; and Stevens, Timothy S., to Dow Chemical Company, The. Indirect-photometric chromatography done in and with a variable capacity weakly basic or acidic ion exchange column. 4,629,705, Cl. 436-161.000.
Cosand, Wesley L., to Genetic Systems Corporation. Synthetic antigen for the detection of AIDS-related disease. 4,629,783, Cl. 530-324.000.
Costantino, Umberto: *See—*
Alberti, Giulio; and Costantino, Umberto, 4,629,656, Cl. 428-411.100.
Costes, Michel L.; and Hodge, Gene D., to International Business Machines Corporation. Programmable timing and synchronization circuit for a TDMA communications controller. 4,630,267, Cl. 370-104.000.
Costolnick, Richard A.: *See—*
Morettin, Mario P.; and Costolnick, Richard A., 4,628,651, Cl. 52-283.000.
Cotting, Anton: *See—*
Mathys, Robert, Jr.; and Cotting, Anton, 4,628,920, Cl. 128-92.0YZ.
Cotton, Roger E.; and Lowe, Eugene H., to Supervision Control Systems, Inc. Surveillance system. 4,630,110, Cl. 358-108.000.
Coughlan, Raymond T.; and Bojarski, Suzette M., to Daubert Coated Products Inc. Adhesive and sealant sheet material and method. 4,629,634, Cl. 427-179.000.
Coulter, Clifford S.: *See—*
Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W., 4,628,560, Cl. 14-2.400.
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., to Enthone, Incorporated. Process for treating plastics with alkaline permanganate solutions. 4,629,636, Cl. 427-444.000.
Couse, Robert F.: *See—*
Alaimo, Ben; and Couse, Robert F., 4,630,190, Cl. 364-167.000.
Cox, Gordon: *See—*
Cox, William C.; Cox, Gordon; and Leskin, George, deceased, 4,629,369, Cl. 405-303.000.
Cox, Jeffrey L.: *See—*
Hatch, Douglas J.; and Cox, Jeffrey L., 4,629,999, Cl. 331-1.00R.
Cox, William C.; Cox, Gordon; and Leskin, George, deceased (Leskien, Mimi, administratrix), to Canadian Patents and Development Limited; and Societe Canadienne des Brevets et d'Exploitation Limitee. Manipulator transporter. 4,629,369, Cl. 405-303.000.
Crandall, Robert E.; to Rexnord Inc. Belt steering control system. 4,629,061, Cl. 198-807.000.
Craven Tasker (Sheffield) Limited: *See—*
Thurman, Brian, 4,629,020, Cl. 180-19.200.
Cray Research, Inc.: *See—*
Sundet, James W., 4,630,230, Cl. 364-900.000.
Credle, William S., Jr.: *See—*
Gupta, Ashis S.; Heenan, Richard H.; Credle, William S., Jr.; Burke, Robert W., II; and Cahen, Albert J., Jr., 4,629,589, Cl. 261-34.100.
Cronspisen AB: *See—*
Eriksson, Lennart; and Polteg, Åke, 4,628,899, Cl. 126-64.000.
Crotti, Alessandro: *See—*
Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, 4,630,077, Cl. 346-140.00R.
Crowther, Russell L.; and Townsend, Dennis B., to General Electric Company. Burnable absorber arrangement for fuel bundle. 4,629,599, Cl. 376-212.000.
Crusco, Juan C., to Cruway, Inc. Method and apparatus for quick-coupling connecting nipple for plastic pipe. 4,629,220, Cl. 285-238.000.
Cruway, Inc.: *See—*
Crusco, Juan C., 4,629,220, Cl. 285-238.000.
Csiki, Kalman: *See—*
Wahlberg, Harry U.; and Csiki, Kalman, 4,629,452, Cl. 604-177.000.
Cuellar, Edward A.; and Desmond, Michael J., to Standard Oil Company, The. Polyoxometalate-modified carbon electrodes and uses therefor. 4,630,176, Cl. 361-433.000.
Cuisinarts, Inc.: *See—*
Podell, Allen F., 4,629,131, Cl. 241-36.000.
Culgan, John M.; and Sherbeck, Leander A., to Du Pont de Nemours, E. I., and Company. Elastomeric yarn supply package. 4,628,848, Cl. 112-412.000.
Culver, Gary A. Vanity cabinet and panel assembly therefor. 4,629,264, Cl. 312-223.000.
Cummins Engine Company, Inc.: *See—*
Wells, Larry; and Graham, Karl, 4,628,875, Cl. 123-90.360.
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., to Standard Oil Company, The. Process for the preparation of polyamide from omega-aminonitrile utilizing an oxygenated sulfur compound as catalyst. 4,629,776, Cl. 528-313.000.
Curd, Andrew T.: *See—*
Giron, Anthony S.; and Curd, Andrew T., 4,629,408, Cl. 425-111.000.
Currey, John E.; McLarty, Colin S.; and Porter, Donald H. Electrolytic cell with reduced inter-electrode gap. 4,628,596, Cl. 29-825.000.
Curro, John J.; and Linman, E. Kelly, to Procter & Gamble Company, The. Microapertured polymeric web exhibiting soft and silky tactile impression. 4,629,643, Cl. 428-131.000.
Curtin, William J.; Soto, Stephen; and Krueger, Steven, to Amtel Communications, Inc. Series connected interceptor. 4,629,831, Cl. 379-213.000.
Cybergen Systems, Inc.: *See—*
Huggins, Richard, 4,630,167, Cl. 361-213.000.
Daenicke, Heinrich: *See—*
Kruger, Volker; and Daenicke, Heinrich, 4,629,013, Cl. 175-107.000.
Daggett, Kenneth E., to Westinghouse Electric Corp. Multi-zone ramp system for digital pulse generator and large scale integrated chip embodying the same. 4,630,188, Cl. 363-129.000.
Dahlgren, Paul, executor: *See—*
Dahlgren, Stan, deceased; and Dahlgren, Paul, executor, 4,628,577, Cl. 29-281.100.
Dahlgren, Stan, deceased; and by Dahlgren, Paul, executor. Assembly fixture for stair stringer weldments and the like. 4,628,577, Cl. 29-281.100.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Sato, Kazuo; Komori, Masahiro; and Goto, Sumio, 4,629,774, Cl. 527-301.000.
Daicel Chemical Industries, Ltd.: *See—*
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.
Daiei, Inc., The: *See—*
Nozawa, Yasuo, 4,628,787, Cl. 84-1.200.
Dailey, Frank E., to Kearney & Trecker Corporation. Closed loop machining system. 4,629,053, Cl. 198-346.100.
Daimler-Benz Aktiengesellschaft: *See—*
Gaus, Hermann; Jurgens, Gunter; Frotschner, Eberhard; and Rub, Winfried, 4,629,042, Cl. 192-3.250.
Kluge, Bernhard; Mehren, Herbert; and Sack, Hans, 4,629,376, Cl. 404-1.000.
Pickard, Jurgen; Sandner, Helmut; and Luttge, Klaus, 4,628,795, Cl. 92-13.410.
Resch, Reinhard; and Krohn, Hellmut, 4,629,258, Cl. 303-92.000.
Riemer, Bernd; and Mehren, Herbert, 4,629,388, Cl. 414-427.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Sugie, Toshinori; Kobata, Fumihiro; and Kawamura, Takashi, 4,629,778, Cl. 528-388.000.
Daisenberger, Georg, to Siemens Aktiengesellschaft. Telecommunications system, particularly a telephone exchange system, having overload protected sequential logic systems. 4,629,830, Cl. 340-825.030.
Dallemagne, Stanislas: *See—*
Wetterwald, Anton; Abrassart, Jacques; Moreau, Max; and Dallemagne, Stanislas, 4,629,523, Cl. 156-62.800.
Dalton, Michael S.: *See—*
Leitz, Christopher R.; Jordon, Joel S.; and Dalton, Michael S., 4,629,572, Cl. 210-714.000.
Dam, Naim, to Introtek Corporation. Non-contacting liquid level detection system. 4,630,245, Cl. 367-93.000.
Damoci, Joseph A., to Control Data Corporation. Cable sensor for sensing a DC signal from a cable headend. 4,630,313, Cl. 455-2.000.
Dana Corporation: *See—*
Heine, Charles F.; and Pifer, Richard L., 4,628,753, Cl. 74-447.000.
Darden, Dennis W., to Brunswick Corporation. Push-on drag knob. 4,629,141, Cl. 242-84.51A.
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., to Charles Stark Draper Laboratory, The. Radial orientation rare earth-cobalt magnet rings. 4,628,809, Cl. 100-208.000.
Data Card Corporation: *See—*
Warwick, Dennis J., 4,629,306, Cl. 355-3.00R.
Data General Corporation: *See—*
Gershenson, Edward; Lemone, Louis A.; and Lippitt, Mark C., 4,630,269, Cl. 371-24.000.
Datcon Instrument Company: *See—*
Copeland, Leonard H., 4,628,731, Cl. 73-431.000.

Daubert Coated Products Inc.: *See—*
Coughlan, Raymond T.; and Bojarski, Suzette M., 4,629,634, Cl. 427-179.000.
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., to Schering A.G. Substituted sulfonamidobenzamides and method of treating arrhythmias. 4,629,739, Cl. 514-605.000.
David, Constant V. Method for processing avocados. 4,629,629, Cl. 426-482.000.
David, Walfried, to Bopp & Reuther GmbH. Shutoff wedge for shutoff valve. 4,629,160, Cl. 251-327.000.
Davis, Ariel R.: *See—*
Clegg, John C.; and Davis, Ariel R., 4,630,005, Cl. 331-113.00A.
Davis, Delbert A., to Burlington Industries, Inc. Two phase hardy fabric finish. 4,629,651, Cl. 428-247.000.
Davis, George B., to Enviracaire Corporation. HEPA room air purifier. 4,629,482, Cl. 55-385.00A.
Davis, Robert E.: *See—*
Doud, Wilbur O.; Davis, Robert E.; and Sawyer, Fred R., 4,629,488, Cl. 65-83.000.
Day, John T.; Herder, Robert O.; and McNatt, Robert B., to Rubber Millers, Inc. Marine fender. 4,628,850, Cl. 114-219.000.
Dayco Corporation: *See—*
Miranti, Joseph P., Jr., 4,629,444, Cl. 474-93.000.
Dayus, Lloyd G., to Rachels Industries, Inc. Multi-use damper. 4,628,954, Cl. 137-75.000.
De Dietrich (USA), Inc.: *See—*
Lerman, Michael J., 4,628,574, Cl. 29-156.80R.
De La Rue Company PLC, The: *See—*
Pugsley, Peter C.; and Dunkley, Rowland A. G., 4,629,874, Cl. 235-380.000.
Deal, Troy M. Turbidity control system for dredge cutterheads. 4,628,623, Cl. 37-63.000.
Dean, Anthony B.: *See—*
Carmichael, Ian C.; Wilson, David J.; and Dean, Anthony B., 4,629,892, Cl. 250-353.000.
Dean, Kenneth J., to Miles Laboratories, Inc. Immunoassay for nonenzymatically glucosylated proteins and protein fragments an index of glycemia. 4,629,692, Cl. 435-7.000.
DeAnda, Nicholas: *See—*
McKittrick, Michael T., Jr.; and DeAnda, Nicholas, 4,629,440, Cl. 446-356.000.
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N. Pipe connector. 4,629,222, Cl. 285-332.400.
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., to Hunting Oilfield Services (UK) Limited; and Kawasaki Steel Corporation. Pipe connector. 4,629,223, Cl. 285-334.000.
Dearnaley, Geoffrey, to United Kingdom Atomic Energy Authority. Surface treatment of metals. 4,629,631, Cl. 427-38.000.
Debono, Manuel; and Kirst, Herbert A., to Eli Lilly and Company. C-20- and C-23 modified macrolide derivatives. 4,629,786, Cl. 536-7.100.
de Brie Perry, Forbes G., to National Research Development Corp. Continuously-variable ratio transmission. 4,628,766, Cl. 74-691.000.
De Busscher, Cyriel R. J.; and Van Herpe, Francois, to New Holland Inc. Harvesting machine including chopper means. 4,628,946, Cl. 130-27.00R.
Deforeit, Christian J., to Matth. Hohner AG. Circuit for an electronic musical instrument. 4,628,790, Cl. 84-1.260.
Degussa AG: *See—*
Voigt, Karl; Reck, Reinhold; Bittner, Friedrich; and Kleinschmit, Peter, 4,629,617, Cl. 423-563.000.
Deitzler, James E.: *See—*
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.
DeKalb-Pfizer Genetics: *See—*
Lindsey, Marvin F., 4,629,819, Cl. 800-1.000.
Del City Wire Co., Inc.: *See—*
Hiles, James W., 4,629,268, Cl. 339-44.00M.
Delcourt Euverte, Marie-Odile: *See—*
Belloni Cofler, Jacqueline; Marignier, Jean-Louis; Delcourt Euverte, Marie-Odile; and Minana Lourseau, Michele, 4,629,709, Cl. 502-5.000.
Delessard, Serge L.; Puff, Roger M.; Kita, Jean C.; and Virgilio, Ange, to Charbonnages de France. Hearth and process for fluidized-bed treatment of a fuel. 4,628,831, Cl. 110-245.000.
Del Gobbo, Anthony R.: *See—*
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., 4,629,636, Cl. 427-444.000.
Dell 'Acqua, Thomas: *See—*
Correnti, Frank; and Dell 'Acqua, Thomas, 4,629,229, Cl. 292-246.000.
Dellamano, Harry A.: *See—*
Little, Michael J.; and Dellamano, Harry A., 4,628,939, Cl. 128-696.000.
DelSignore, James R., II; Sheehan, Paul; and Friedman, Robert H., to NCR Corporation. Color video drive circuit. 4,630,100, Cl. 358-21.00R.
Dempster Industries, Inc.: *See—*
Miller, Timothy L.; and Ehmke, Richard J., 4,629,163, Cl. 254-133.00R.
Dennison Manufacturing Company: *See—*
Pitts, Warren R., 4,629,349, Cl. 402-74.000.
Deparis, Georges; Duverne, Jacques; and Meillan, Philippe, to Etablissement Public Telediffusion de France, The. Equipment for measuring digital channels multiplexed by packets in a signal particularly analog. 4,630,266, Cl. 370-94.000.
Derode, Bernard. Apparatus for processing cheese. 4,628,805, Cl. 99-453.000.
Dery, Marcel: *See—*
Missout, Gilles; and Dery, Marcel, 4,629,979, Cl. 324-126.000.
Desmond, Michael J.: *See—*
Cuellar, Edward A.; and Desmond, Michael J., 4,630,176, Cl. 361-433.000.
DeSoto, Inc.: *See—*
Bishop, Timothy E., 4,629,287, Cl. 350-96.340.
Detexomat Machinery Limited: *See—*
Hodges, Michael J., 4,628,844, Cl. 112-121.150.
Detsch, Steven G. Dental mirror. 4,629,425, Cl. 433-31.000.
Deutsch, Armin; and Ruyten, Henricus, to U.S. Philips Corporation. Magnetic-tape-cassette apparatus with improved function switching mechanism. 4,630,148, Cl. 360-93.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Buschulte, Winfried; Adis, Erich; and Bader, Manfred, 4,629,414, Cl. 431-46.000.
Devenoges, Claude: *See—*
Blanc, Jean-Pierre; Carrard, Francis; and Devenoges, Claude, 4,629,878, Cl. 250-202.000.
DeVito, Joseph: *See—*
Tendrup, Donald; and DeVito, Joseph, 4,629,102, Cl. 223-85.000.
Devrient, Ludwig, to GAO Gesellschaft Fuer Automation und Organisation mbH. Check paper that is protected against forgery and tampering. 4,629,630, Cl. 427-7.000.
Dewar, Michael E., to University College London. Fracture reduction apparatus. 4,628,922, Cl. 128-92.00Z.
De Weerdt, Henk V.: *See—*
Gawron, Klaus; Jonker, Simon; Schroder, Johann; and De Weerdt, Henk V., 4,630,023, Cl. 337-407.000.
DeWerth, Douglas W.; and Sterbik, William G., to Gas Research Institute. Flame insert. 4,629,415, Cl. 431-347.000.
Dewey, Richard J., to U.S. Philips Corporation. Horn antenna with wide flare angle. 4,630,062, Cl. 343-786.000.
D'Hondt, Jean-Pierre, to Intercontrole Societe Anonyme. Circuit for the fast calculation of the discrete Fourier transform of a signal. 4,630,229, Cl. 364-726.000.
Diamond, Harvey E. Front-adjusting, self-cleaning atomizer nozzle. 4,629,120, Cl. 239-117.000.
Diamond, Steven E.; and Regina, Francis J., to Allied Corporation. Binding assay with amplified read-out and gas-phase detection. 4,629,689, Cl. 435-7.000.
Dickens, John D., to Commonwealth of Australia, The. Data synchronization. 4,630,139, Cl. 360-46.000.
Didier Engineering GmbH: *See—*
Patalon, Heinrich, 4,629,417, Cl. 432-5.000.
Patalon, Heinrich, 4,629,418, Cl. 432-11.000.
Diehl GmbH & Co.: *See—*
Wessel, Peter, 4,630,055, Cl. 343-12.000.
Dien, Robert Y.; and Luce, Ethan C., to Rensselaer Polytechnic Institute. Spherical robotic wrist joint. 4,628,765, Cl. 74-665.00A.
Diffracto Ltd.: *See—*
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,629,319, Cl. 356-237.000.
DiGiacomo, Angela; and Khokhani, Kantilal H., to International Business Machines Corporation. Element placement method. 4,630,219, Cl. 364-488.000.
Digital Equipment Corporation: *See—*
Spash, John L., 4,630,158, Cl. 360-103.000.
Dilling, Peter, to Westvaco Corporation. Humectant composition derived from kraft black liquor. 4,629,469, Cl. 8-557.000.
Dilyard, Richard D., to Rubbermaid Incorporated. Switch assembly for microwave oven turntable. 4,629,846, Cl. 219-10.55F.
DiMedio, Ronald J.: *See—*
Elko, Dennis J.; and DiMedio, Ronald J., 4,628,638, Cl. 49-426.000.
Dimos Batiment Distribution de Materiel Outillage et Securite pour le Batiment: *See—*
Goubaud, Michel, 4,629,355, Cl. 403-389.000.
Dirks, Rolf; and Pehlken, Wolfgang, to Felten & Guilleaume Inergietechnik GmbH. Device for quenching an electric arc. 4,629,840, Cl. 200-147.00R.
Dirlam, John P., to Pfizer Inc. Antibacterial 2-amino-oxazolinones and process therefor. 4,629,794, Cl. 548-225.000.
Doane, H. Daniel: *See—*
LaRochelle, Fernand, 4,628,972, Cl. 141-91.000.
Dobberstein, Robert J.: *See—*
Riehl, Mark E.; and Dobberstein, Robert J., 4,629,989, Cl. 324-318.000.
Dobrindt, Alfons: *See—*
Knauschner, Alfred; Hensel, Arno; and Dobrindt, Alfons, 4,628,718, Cl. 72-199.000.
Dr. Karl Thomae GmbH: *See—*
Muller, Erich; Nickl, Josef; Roch, Josef; and Narr, Berthold, 4,629,733, Cl. 514-418.000.
Doerr, Hermann: *See—*
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.
Dohler, Werner; Jankowski, Alfons; and Fehrer, Albert, to Veba Oel Entwicklungs-Gesellschaft mbH. Catalytic reforming of gasoline feedstocks. 4,629,550, Cl. 208-134.000.

Doi, Ryota: *See—*
Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, 4,629,664, Cl. 429-23.000.

Dolby Laboratories Licensing Corporation: *See—*
Lagadec, Roger, 4,630,007, Cl. 332-1.000.

Dolleschall, Sandor: *See—*
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer, 4,628,999, Cl. 166-274.000.

Dominianni, Samuel J., to Eli Lilly and Company. 3-sulfonylamino-4-aminobenzophenone derivatives. 4,629,811, Cl. 564-99.000.

Done, William J., to Amoco Corporation. Adaptive and non-adaptive method for estimating the earth's reflection sequence. 4,630,242, Cl. 367-73.000.

Donn Incorporated: *See—*
Menchetti, Robert J.; Safran, Robert H.; and Sauer, Gale E., 4,628,656, Cl. 52-481.000.

Donnermeyer, William I., Jr.: *See—*
Taylor, Fred J.; and Donnermeyer, William I., Jr., 4,628,825, Cl. 105-289.000.

D'Onofrio, Anthony, to Honeywell Inc. D.C. power control for D.C. solenoid actuators. 4,630,165, Cl. 361-154.000.

D'Onofrio, Anthony, to Honeywell Inc. A.C. power control for D.C. solenoid actuators. 4,630,166, Cl. 361-205.000.

Donselman, Edward H.: *See—*
Schroer, William L.; and Donselman, Edward H., 4,629,096, Cl. 222-146.600.

Dopp, Siegfried, to Mantis ULV - Spruhgerate GmbH. Device for the wet treating of seed material. 4,628,807, Cl. 99-488.000.

Dornier. Claude M. Vehicle stabilizing means. 4,629,240, Cl. 296-1.00S.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Ishiguro, Nobuharu; and Kurosawa, Akira, 4,629,600, Cl. 376-257.000.

Dosoretz, Victor J.; and Ronchinsky, Stanley, to EG&G, Inc. Chilled mirror hygrometer with performance monitoring. 4,629,333, Cl. 374-20.000.

Doud, Wilbur O.; Davis, Robert E.; and Sawyer, Fred R., to Ball Corporation. Cooling system for neck ring and parison mold. 4,629,488, Cl. 65-83.000.

Dougan, Murray D. Leaf-handling apparatus. 4,628,674, Cl. 56-400.040.

Doulton Industrial Products Limited: *See—*
Alexander, Kevin; and Farr, Howard J., 4,629,708, Cl. 501-123.000.

Doumaux, Arthur R., Jr.: *See—*
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.

Dow Chemical Company, The: *See—*
Beale, Alvin F., Jr., 4,629,741, Cl. 521-28.000.
Clark, George B.; and Maidre, Clayton K., 4,628,584, Cl. 29-557.000.
Cortes, Hernan J.; and Stevens, Timothy S., 4,629,705, Cl. 436-161.000.
Friese, David D.; and Van Dort, Mark A., 4,629,610, Cl. 423-240.000.
Hanafin, Joseph W., 4,629,791, Cl. 544-387.000.
Hefner, Robert E., Jr., 4,629,762, Cl. 525-109.000.
Hefner, Robert E., Jr., 4,629,763, Cl. 525-132.000.
Hefner, Robert E., Jr., 4,629,764, Cl. 525-132.000.
Kernstock, John M., 4,629,642, Cl. 428-95.000.
Lampton, Robert D., Jr.; and Hopkins, Thomas M., II, 4,629,608, Cl. 423-226.000.
Miller, Theodore E., Jr.; and Small, Hamish, 4,628,743, Cl. 73-861.050.
Pews, R. Garth, 4,629,492, Cl. 71-88.000.
Prud'homme, Robert K.; Stanley, Frederick W., Jr.; and Langhorst, Martin W., 4,629,566, Cl. 110-635.000.
Treybig, Duane S., 4,629,770, Cl. 525-517.000.

Dowell Schlumberger Incorporated: *See—*
Kennedy, Weldon C., Jr., 4,629,570, Cl. 210-666.000.

Dowty Mining Equipment Limited: *See—*
Hill, Nigel, 4,629,368, Cl. 405-296.000.

Dragerwerk Aktiengesellschaft: *See—*
Eckstein, Wolfgang, 4,629,335, Cl. 374-142.000.

Drake, Charles A., to Phillips Petroleum Company. Isolation of 3-methyl-1-butene from a hydrocarbon stream. 4,629,533, Cl. 203-51.000.

Draper, Colin R.; Trotman, Steven; Bowden, Christopher M.; and Turfrey, Keith A., to Automotive Products plc. Friction clutches. 4,629,048, Cl. 192-70.270.

Draper, Robert; and Lorentz, Donald G., to Westinghouse Electric Corp. Model steam generator having means to facilitate inspection of sample tubes. 4,628,870, Cl. 122-32.000.

Dresser Industries, Inc.: *See—*
Ippolito, Rodolfo M., 4,629,338, Cl. 384-94.000.
Whiting, Paul E.; and McClure, Gerald B., 4,629,009, Cl. 175-4.560.

Driscoll, Dennis M.; and Southwick, Everett W., to Philip Morris Incorporated. Process for modifying the flavor characteristics of bright tobacco. 4,628,947, Cl. 131-297.000.

Drivetec, Inc.: *See—*
Thompson, Herbert E.; and Meulners, Duane C., 4,630,145, Cl. 360-77.000.

Druitt, Rodney M., to Bev-Cap Plastics Pty. Ltd. Closure with resilient sealing disc. 4,629,083, Cl. 215-329.000.

Drye, James E.; Schroeder, Jack A.; and Winchell, Vern H., II, to Motorola, Inc. High density IC module assembly. 4,630,096, Cl. 357-81.000.

Dubois, Jon D., to Quality Tubing, Incorporated. Oilfield coil tubing. 4,629,218, Cl. 285-176.000.

Dubuisson, Georges; and Huynh, Tan Duc, to e.d. Veglia. Mileage totalizer with non volatile memory. 4,630,293, Cl. 377-24.000.

Dubuisson, Jacques; and Le Gal, Pascal, to Eurofarad-EFD. Support for a high-speed component, in particular a microwave frequency component, the support including incorporated decoupling members. 4,630,171, Cl. 361-321.000.

Dudley, Kenneth W.: *See—*
Freedman, George; Bowen, Robert F.; and Dudley, Kenneth W., 4,629,865, Cl. 219-405.000.

Dula, Fred P., to Dula-Wright, Inc. In-situ post hole forming device. 4,629,155, Cl. 249-61.000.

Dula-Wright, Inc.: *See—*
Dula, Fred P., 4,629,155, Cl. 249-61.000.

Dulnev, Vladimir K.: *See—*
Tikhonov, Valentin N.; Zhigalov, Gennady V.; Abduganiev, Abdurakhim; and Dulnev, Vladimir K., 4,628,678, Cl. 57-400.000.

Dumas, Charles R.: *See—*
Moore, James H.; Woodcock, Sidney J.; and Dumas, Charles R., 4,629,033, Cl. 184-6.300.

Duncan, David T.; McElligott, John; Lipscomb, David M.; and Williams, Charles W., to Products for Health and Industry, Inc. Carbon dioxide rebreathing apparatus. 4,628,926, Cl. 128-203.280.

Dunkley, Rowland A. G.: *See—*
Pugsley, Peter C.; and Dunkley, Rowland A. G., 4,629,874, Cl. 235-380.000.

Du Pasquier, Marc P.: *See—*
Petit, Dominique A.; and Du Pasquier, Marc P., 4,630,270, Cl. 371-29.000.

Du Pont de Nemours, E. I., and Company: *See—*
Awano, Yoshiyuki, 4,629,271, Cl. 339-75.0MP.
Burgdorf, Peter K., 4,628,856, Cl. 118-50.000.
Culgan, John M.; and Sherbeck, Leander A., 4,628,848, Cl. 112-412.000.
Judy, Robert H.; and Judy, Herman L., 4,629,171, Cl. 269-37.000.
Kerbow, Dewey L., 4,629,756, Cl. 524-440.000.
Reap, James J., 4,629,496, Cl. 71-92.000.
Shapiro, Rafael, 4,629,494, Cl. 71-92.000.
Stagg, Lester P., Jr.; and Windley, William T., 4,630,213, Cl. 364-470.000.
Wolfe, James R., Jr., 4,629,761, Cl. 525-92.000.

Dupont, Robert J., to Techniques et Systems Elabores T.S.E. Air injection bath for therapeutic use. 4,628,908, Cl. 128-24.100.

Duracell Inc.: *See—*
Schlaikjer, Carl R., 4,629,666, Cl. 429-194.000.

Duranleau, Roger G.: *See—*
Vanderpool, Steven H.; Lin, Jiang-Jen; and Duranleau, Roger G., 4,629,809, Cl. 562-519.000.

Duret, Pierre, to Institut Francais du Petrole; Automobiles Peugeot; and Automobiles Citroen. Device and method for injecting fuel into an engine, assisted by compressed air or gas. 4,628,888, Cl. 123-531.000.

Durgin, Ronald A., to Handi-Kup Company. Container lid with drink-through opening. 4,629,088, Cl. 220-254.000.

Dutt, Charbak R.: *See—*
Bednar, Joseph A., Jr.; Bennett, Richard L.; Dutt, Charbak R.; and Stafford, Michael K., 4,630,196, Cl. 364-200.000.

Duverne, Jacques: *See—*
Deparis, Georges; Duverne, Jacques; and Meillan, Philippe, 4,630,266, Cl. 370-94.000.

Dyer, James W.; and Watkins, Raymond R., to United States of America, National Security Agency. Method for reducing group delay distortion. 4,630,285, Cl. 375-37.000.

Dyer, Robert L. Intraocular lens. 4,629,460, Cl. 623-6.000.

Dynapert-HTC Corp.: *See—*
Waldron, Gerald E., 4,629,420, Cl. 432-32.000.

Dynapert-Precima Limited: *See—*
Cable, Michael J., 4,628,741, Cl. 73-826.000.

Dyrkorn, Arnfinn; and Standal, Leiv R., to Brodr. Brunvoll Motorfabrikk A/S. Elastically supported thruster structure. 4,629,432, Cl. 440-52.000.

E.C.H. Will (GmbH & Co.): *See—*
Reissmann, Klaus; and Herrig, Friedhelm, 4,629,058, Cl. 198-461.000.

e.d. Veglia: *See—*
Dubuisson, Georges; and Huynh, Tan Duc, 4,630,293, Cl. 377-24.000.

E. F. Johnson Company: *See—*
Peterson, Steven G., 4,629,227, Cl. 292-19.000.

E. R. Squibb & Sons, Inc.: *See—*
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,629,724, Cl. 514-18.000.

Eagle-Picher Industries, Inc.: *See—*
Markle, Richard A., 4,629,796, Cl. 548-477.000.

Early, James M., to Fairchild Camera and Instrument Corp. Schottky shunt integrated injection. 4,629,912, Cl. 307-459.000.

Early, Scott H.; and Minear, Roger L., to AT&T Bell Laboratories. High input impedance circuit. 4,629,910, Cl. 307-317.00R.

Eastman Kodak Company: *See—*
Baldwin, Roger E.; and Woo, Nea-Yea, 4,629,879, Cl. 250-205.000.
Cok, David R., 4,630,307, Cl. 382-25.000.

Eaton Corporation: *See—*
Barlow, Bruce S., 4,628,874, Cl. 123-90.500.
Calviello, Joseph A., 4,630,081; Cl. 357-6.000.
Mahon, Joseph J., 4,628,592, Cl. 29-596.000.

Mahon, Joseph J., 4,629,845, Cl. 219-10.55B.
Needham, Thomas P.; and Karlovits, Frank K., 4,628,698, Cl. 62-137.000.

Eaton, Robert L., to Ashland Oil, Inc. Non-plugging air distribution system for spent bed cooler. 4,628,868, Cl. 122-4.00D.

Echols, John D., to Westinghouse Electric Corp. Low pressure drop modular centrifugal moisture separator. 4,629,481, Cl. 55-348.000.

Eckhardt, Heinz: *See—*
Goetz, Norbert; Jahn, Dieter; Reissenweber, Gernot; and Eckhardt, Heinz, 4,629,799, Cl. 549-13.000.

Eckstein, Wolfgang, to Dragerwerk Aktiengesellschaft. Indicator tube combined with a temperature gauge. 4,629,335, Cl. 374-142.000.

Ed. Scharwachter GmbH & Co, KG.: *See—*
Brockhaus, Ernst; and Tolle, Karl-Heinz, 4,628,567, Cl. 16-267.000.

Edakubo, Hiroo: *See—*
Takayama, Nobutoshi; Edakubo, Hiroo; Kozuki, Susumu; Takei, Masahiro; and Nagasawa, Kenichi, 4,630,146, Cl. 360-77.000.

Edmisson, Delmar D., to Adams Hard-Facing Company, Inc. Fertilizer applicator knife assembly. 4,628,839, Cl. 111-7.000.

Edwards, David L. Target ring for an eye dropper bottle. 4,629,456, Cl. 604-300.000.

EFI Corporation: *See—*
Cooper, Howard C.; Rasmussen, Carl M.; and Law, Perry N., 4,630,163, Cl. 361-56.000.

Efimov, Andrei N.: *See—*
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

EG&G, Inc.: *See—*
Dosoretz, Victor J.; and Ronchinsky, Stanley, 4,629,333, Cl. 374-20.000.

Eger, Douglas R. Portable liquid dispenser. 4,629,098, Cl. 222-175.000.

Ehmke, Richard J.: *See—*
Miller, Timothy L ; and Ehmke, Richard J., 4,629,163, Cl. 254-133.00R.

Eichenauer, Larry L. Disposable cat litter box. 4,628,863, Cl. 119-1.000.

Eichler, Volker: *See—*
Trinks, Hilmar; Peter, Gunter; Eichler, Volker; and Buesse, Winfried, 4,628,817, Cl. 101-426.000.

Eickmann, Karl. Control-pintle for fluid flow devices. 4,628,794, Cl. 91-498.000.

Eiermann, Albert; Glass, Dieter; and Herrmann, Richard, deceased (by Herrmann, Helga, heiress), to Brown, Boveri & Cie AG. Centering and safety device for rotors supported without contact. 4,629,261, Cl. 310-90.500.

Eilertsen, Bjorn: *See—*
Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, 4,629,014, Cl. 175-220.000.

El Paso Products Company: *See—*
Lucas, Bennie M., 4,629,639, Cl. 428-35.000.
Lucas, Bennie M., 4,629,658, Cl. 428-520.000.

Electricity Council, The: *See—*
Griffith, John T.; Lopez-Cacicedo, Carlos; and Hamblyn, Stephen M. L., 4,629,844, Cl. 219-10.49R.

Electro-Tech, Inc.: *See—*
Quantz, Chester, 4,629,966, Cl. 322-25.000.

Electro-Voice, Inc.: *See—*
Gunness, David W., 4,629,029, Cl. 181-144.000.

Electronic Diggins Systems, Inc.: *See—*
Laymon, Dwane O.; and Berry, James M., 4,628,613, Cl. 33-544.000.

Eli Lilly and Company: *See—*
Debono, Manuel; and Kirst, Herbert A., 4,629,786, Cl. 536-7.100.
Dominianni, Samuel J., 4,629,811, Cl. 564-99.000.
Robertson, David W., 4,629,740, Cl. 514-620.000.

Elkay Manufacturing Company: *See—*
Schroer, William L.; and Donselman, Edward H., 4,629,096, Cl. 222-146.600.

Elko, Dennis J.; and DiMedio, Ronald J., to International Gate Devices, Inc. Cantilever-type slide gate. 4,628,638, Cl. 49-426.000.

Ellis, Earl P.: *See—*
Sayles, Francis H.; Black, William T.; and Ellis, Earl P., 4,629,364, Cl. 405-157.000.

Ellis, Edward H.; and Ellis, Marilyn S. Differential illumination sensitive switching circuit. 4,629,941, Cl. 315-153.000.

Ellis, George S., III, to Kinetico, Inc. Fluid treatment system. 4,629,568, Cl. 210-636.000.

Ellis, Marilyn S.: *See—*
Ellis, Edward H.; and Ellis, Marilyn S., 4,629,941, Cl. 315-153.000.

Elm Co. Ltd.: *See—*
Hori, Keiichi, 4,630,075, Cl. 346-140.00R.

Elmore, Carl L.: *See—*
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., 4,629,502, Cl. 75-118.00R.

Elstner, Erich, to Boehringer Mannheim GmbH. Process for the selective production of reduced oxygen species. 4,629,696, Cl. 435-25.000.

Emerson Electric Co.: *See—*
Steiner, Robert E.; and Savla, Chandrakant V., 4,628,802, Cl. 98-42.100.

EMI Limited: *See—*
Walters, Peter E.; and Williams, Anthony M., 4,629,957, Cl. 318-662.000.

Enderle, Edward C.: *See—*
Gulati, Sujan C.; and Enderle, Edward C., 4,629,657, Cl. 428-461.000.

Endo, Itaru: *See—*
Kitagawa, Hisao; Inoue, Yasuo; Fujihara, Tadafumi; Endo, Itaru; and Shimada, Yoshihiro, 4,629,862, Cl. 219-200.000.

Endoh, Hiroyuki: *See—*
Sasaki, Tohru; Endoh, Hiroyuki; and Oohira, Seiichi, 4,629,654, Cl. 428-373.000.

Endoh, Toshiaki; and Yamazaki, Yasuhiro, to Kokusai Denshin Denwa Kabushiki Kasiha. Quality selectable facsimile image coding system. 4,630,124, Cl. 358-260.000.

Endotronics, Inc.: *See—*
Gruenberg, Micheal L., 4,629,686, Cl. 435-1.000.

Energy Conversion Devices, Inc.: *See—*
Kadin, Alan M.; and Burkhardt, Robert W., 4,629,536, Cl. 204-1.00T.

Energy Motor Control, Inc.: *See—*
Welsh, David A.; and Rehse, Denis O., 4,629,960, Cl. 318-729.000.

Engelhard, Helmut; Feuser, Dieter; Hendricks, Udo; and Tamer, Ergun, to Bayer Aktiengesellschaft. Process for treating cellulosic fibre material. 4,629,468, Cl. 8-442.000.

English, Franklin W. Coffee filter dispenser. 4,629,092, Cl. 221-247.000.

English, James D., to Tektronix, Inc. Method and apparatus for measuring the resonant frequency of a high Q resonator. 4,629,977, Cl. 324-81.000.

Engstrom, Gary G.: *See—*
Salihar, Mark W.; Engstrom, Gary G.; and Gauwitz, Donald P., 4,629,603, Cl. 422-9.000.

Enloe, Purl R., deceased: *See—*
Burgin, Carl T.; Loomis, Gary A.; Enloe, Purl R., deceased; and Enloe, Shirley, administratrix, 4,628,628, Cl. 43-26.000.

Enloe, Shirley, administratrix: *See—*
Burgin, Carl T.; Loomis, Gary A.; Enloe, Purl R., deceased; and Enloe, Shirley, administratrix, 4,628,628, Cl. 43-26.000.

Enron Chemical Company: *See—*
Gulati, Sujan C.; and Enderle, Edward C., 4,629,657, Cl. 428-461.000.
Kitchel, Frank T.; Solvik, R. Sven; and Opacich, Michael L., 4,629,749, Cl. 523-200.000.

Enthone, Incorporated: *See—*
Courduvelis, Constantine I.; and Del Gobbo, Anthony R., 4,629,636, Cl. 427-444.000.

Entingh, D. Daniel: *See—*
Pearce, Michael; and Entingh, D. Daniel, 4,629,312, Cl. 355-29.000.

Enviracaire Corporation: *See—*
Davis, George B., 4,629,482, Cl. 55-385.00A.

Envirex Inc.: *See—*
Smith, George W., 4,629,559, Cl. 210-150.000.

Epley, John M. Direct contact hearing aid apparatus. 4,628,907, Cl. 128-1.600.

Erasmus, Jacobus P., to H L & H Timber Products (Proprietary) Limited. Support pack. 4,628,658, Cl. 52-561.000.

Erb, Karl J., to Mettler Instruments AG. Electrical balance with acoustic feedback signal for manual dosing or mixing. 4,629,018, Cl. 177-47.000.

Erickson, Joyce A. Server gauntlet. 4,628,544, Cl. 2-158.000.

Ericsson, Axel B. R., to Profoment Utvecklings AB. Method for mounting a roof, floor or similar structure and a structure adapted to be mounted according to the method. 4,628,647, Cl. 52-173.00R.

Eriksson, Lennart; and Polteg, Ake, to Cronspisen AB. Heating apparatus and method and device for producing the heating apparatus. 4,628,899, Cl. 126-64.000.

Erisman, Aaron: *See—*
Tlaker, Erich; Erisman, Aaron; and Whitney, Donald, 4,629,377, Cl. 409-35.000.

Erland, Jonathan: *See—*
Trumbull, Donald; Erland, Jonathan; Fog, Stephen; and Burke, Paul, 4,629,298, Cl. 353-30.000.

Erlandsson, Stig A. B.: *See—*
Lindahl, Ake R.; and Erlandsson, Stig A. B., 4,629,619, Cl. 424-15.000.
Lindahl, Ake R.; and Erlandsson, Stig A. B., 4,629,620, Cl. 424-15.000.

Erlichman, Irving, to Polaroid Corporation. Color thermal transfer recording system and ribbon. 4,630,069, Cl. 346-76.0PH.

ERMA Optical Works, Ltd.: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kaneko, Akio; and Nagai, Akihiko, 4,629,561, Cl. 210-198.200.

Ermer, Bodo; and Mischorr, Dieter, to Krupp Polysius AG. Ceiling and wall construction. 4,628,657, Cl. 52-509.000.

Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for purifying and recovering contaminated catalyst solution obtained in the carbonylation of methyl acetate and/or dimethylether. 4,629,711, Cl. 502-24.000.

ESAB Aktiebolag: *See—*
Yttergren, Erik S.; Strand, Urban R. A.; Jansson, Karl U. H.; and Knipstrom, Karl-Erik, 4,629,853, Cl. 219-60.00A.

Esarco Limited: *See—*
Somerton-Rayner, Michael, 4,629,021, Cl. 180-24.000.

Escamilla, Daniel: *See—*
Escamilla, Victor, Jr., 4,630,037, Cl. 340-628.000.

Escamilla, Victor, Jr., to Gaspard, Roy P.; and Escamilla, Daniel, part interest to each. Smoking violation detector. 4,630,037, Cl. 340-628.000.

Esser, Heinz; and Krechlok, Horst, to Bayer Aktiengesellschaft. Cationic rubber latices, a process for the production thereof and the use thereof. 4,629,757, Cl. 524-457.000.

Essex Group, Inc.: *See—*
Graham, Randall C., 4,629,145, Cl. 242-158.00R.
Etablissement Public Telediffusion de France, The: *See—*
Deparis, Georges; Duverne, Jacques; and Meillan, Philippe, 4,630,266, Cl. 370-94.000.
Estela Rosell, Jorge, to Bendiberica, S.A. Compact assisted steering mechanism for a motor vehicle. 4,629,026, Cl. 180-148.000.
Etablissement Dentaire Ivoclar: *See—*
Michl, Rudolf J.; Rheinberger, Volker M.; and Ott, Gilbert, 4,629,746, Cl. 523-117.000.
ETD Technology, Inc.: *See—*
Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,628,726, Cl. 73-61.10C.
Ethe, Ronald S.; and Burstein, Steven, to Standard Microsystems Corp. MOS monostable multivibrator. 4,629,908, Cl. 307-273.000.
Ethyl Corporation: *See—*
Senaratne, K. Pushpananda A., 4,629,808, Cl. 562-467.000.
Eull, Patricia A.: *See—*
Campagna, Anthony J., Jr.; Eull, Patricia A.; and Reed, Katherine E., 4,628,917, Cl. 128-90.000.
Eurofarad-EFD: *See—*
Dubuisson, Jacques; and Le Gal, Pascal, 4,630,171, Cl. 361-321.000.
Evans, April J.: *See—*
Prevatt, William D.; Akin, Cavit; and Evans, April J., 4,629,700, Cl. 435-128.000.
Everett, Stephanie S.: *See—*
Kang, George S.; Everett, Stephanie S.; and Thornhill, Alexander F., 4,630,300, Cl. 381-31.000.
Everhardus, Roelof H.; Bouts, Wilhelmus J.; and Brands, Johannes J. M., to Oce-Nederland B.V. Charge-transporting compounds and photoconductive elements provided with such charge-transporting compounds. 4,629,671, Cl. 430-59.000.
Everling, Hubertus A.: *See—*
Hsiao, Wen-Ting; and Everling, Hubertus A., 4,628,991, Cl. 165-80.400.
Everson, Carl E. Therapeutic male genital appliance. 4,628,914, Cl. 128-79.000.
Ex-Cell-O Corporation: *See—*
Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., 4,628,643, Cl. 51-325.000.
Excel Industries, Inc.: *See—*
Mullet, David L.; and Voth, Elmer D., 4,629,006, Cl. 172-15.000.
Expert Corporation: *See—*
Riback, Richard; Lau, Brian; and Gergets, Paul, 4,629,841, Cl. 200-153.00A.
Exxon Research and Engineering Company: *See—*
Hudson, Carl W.; and Markley, Gerald E., 4,629,553, Cl. 208-212.000.
Kelly, Arnold J., 4,630,169, Cl. 361-225.000.
Malatesta, Alberto; Bossaert, Bernard; and Mourand, Jacques, 4,629,766, Cl. 525-222.000.
Michelson, Herbert D.; and Stumbar, James P., 4,629,413, Cl. 431-9.000.
Ryan, Douglas G., 4,629,546, Cl. 204-188.000.
Eyerle, Anton. Cover arrangement for a servicing hole. 4,628,646, Cl. 52-169.700.
Ezell, Emory L., to Phillips Petroleum Company. Fractional distillation apparatus and method. 4,629,534, Cl. 203-98.000.
Fabcon, Inc.: *See—*
Nash, Richard C., 4,628,653, Cl. 52-309.120.
Faccini, Ernest C.: *See—*
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.
Fain, Elmer E.; and Sutton, Charles O., to H. E. Williams, Inc. Fluorescent lighting fixture. 4,630,181, Cl. 362-235.000.
Fairbend, Raymond J.; Holmshaw, Richard T.; and Petley, Colin H., to U.S. Philips Corp. Power supply for an intensified night sight. 4,629,881, Cl. 250-213.0VT.
Fairchild Camera and Instrument Corp.: *See—*
Early, James M., 4,629,912, Cl. 307-459.000.
Fairchild Semiconductor Corporation: *See—*
Kuo, James R., 4,629,997, Cl. 330-257.000.
Fala, Joseph: *See—*
Tarczy-Hornoch, Zoltan; Madni, Asad M.; and Fala, Joseph, 4,630,228, Cl. 364-576.000.
Falconer, Anthony J.: *See—*
Holtham, Roy D.; Falconer, Anthony J.; and Grainger, John F. G., 4,628,828, Cl. 110-165.00R.
Falkingham, Leslie T. High current switch contacts. 4,629,839, Cl. 200-144.00B.
Falkvall, Thore E.: *See—*
Carlsson, Per-Oloy A. V.; Karlberg, Rolf E.; and Falkvall, Thore E., 4,629,448, Cl. 604-4.000.
Fallier, Charles N., Jr.; and Proud, Joseph M., to GTE Laboratories Incorporated. Method and apparatus for starting low wattage high intensity discharge lamps. 4,629,945, Cl. 315-207.000.
Fallon, William H.; and Schober, William R., to General Battery Corporation. Battery charger termination circuit. 4,629,965, Cl. 320-39.000.
Fan, Bunsen, to International Business Machines Corporation. Gas purifier for rare-gas fluoride lasers. 4,629,611, Cl. 423-240.000.
Fan, Mark J., to Mobil Oil Corporation. Method for classifying the sedimentary kerogen for oil source. 4,629,702, Cl. 436-32.000.
Fannin, Richard C., to Allied Corporation. Fluid pressure braking system. 4,629,256, Cl. 303-8.000.
Fanuc Ltd: *See—*
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,629,958, Cl. 318-723.000.
Nakashima, Seiichiro; Inagaki, Shigemi; Ito, Susumu; Naito, Yasuo; and Otsuka, Kazuhisa, 4,628,778, Cl. 82-2.500.
Nozawa, Ryoichiro; Amemiya, Yoichi; and Kawamura, Hideaki, 4,629,956, Cl. 318-625.000.
Farcasiu, Malvina, to Mobil Oil Corporation. Transfer of cycloalkyl groups by transalkylation of aromatics. 4,629,817, Cl. 585-470.000.
Fardal, Randolph G.; Cicci, George B.; and Leung, Man K., to Navistar International Corporation. In-field fractionation process for green vegetation crops. 4,629,122, Cl. 239-155.000.
Farley, James R.: *See—*
Maier, Alfred E.; and Farley, James R., 4,630,019, Cl. 337-70.000.
Farmer, Steven P.: *See—*
Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., 4,628,643, Cl. 51-325.000.
Farnsworth, Craig A.; Himmel, Robert L.; Sank, Gerald W.; and Stanger, Keith A., to Gas Research Institute. Pulse combustion deep fat fryer. 4,628,903, Cl. 126-391.000.
Farr, Howard J.: *See—*
Alexander, Kevin; and Farr, Howard J., 4,629,708, Cl. 501-123.000.
Farrar, Steven P.: *See—*
Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., 4,628,643, Cl. 51-325.000.
Fastspan, Inc.: *See—*
Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W. (said Merton Clevett, Robert Lowdermilk, and John Bright assors. to), 4,628,560, Cl. 14-2.400.
Feaster, Fred T. Intraocular lens with coiled haptics. 4,629,462, Cl. 623-6.000.
Federico, Barbara: *See—*
Federico, Vincent; and Federico, Barbara, 4,629,089, Cl. 220-334.000.
Federico, Vincent; and Federico, Barbara. Protective device for child-proofing a VCR. 4,629,089, Cl. 220-334.000.
Fedotov, Vladimir M.; Kharchenko, Vladimir P.; Lipovsky, Iosif L.; and Ivanova, Tatyana L., to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institute Meditsinskoi Tekhniki. Ligating instrument. 4,629,107, Cl. 227-19.000.
Feher, Peter: *See—*
Landa, Benzion; Shmaiser, Aron; and Feher, Peter, 4,629,308, Cl. 355-3.00R.
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, 4,629,310, Cl. 355-8.000.
Fehl, James L.: *See—*
Brownell, Richard G., Sr.; and Fehl, James L., 4,628,783, Cl. 83-862.000.
Fehr, Rainer: *See—*
Burckhardt, Christoph B.; Fehr, Rainer; and Krummenacher, Peter, 4,628,738, Cl. 73-626.000.
Fehrer, Albert: *See—*
Dohler, Werner; Jankowski, Alfons; and Fehrer, Albert, 4,629,550, Cl. 208-134.000.
Felix, Raymond A.; and Hsu, Joanna K., to Stauffer Chemical Company. Herbicide compositions of extended soil life. 4,629,499, Cl. 71-100.000.
Fellows Corporation: *See—*
Tlaker, Erich; Erisman, Aaron; and Whitney, Donald, 4,629,377, Cl. 409-35.000.
Felten & Guilleaume Inergietechnik GmbH: *See—*
Dirks, Rolf; and Pehlken, Wolfgang, 4,629,840, Cl. 200-147.00R.
Ferber, Hubert P.: *See—*
Nitsch, Ernst; Ferber, Hubert P.; and Muhlbock, Siegfried, 4,629,698, Cl. 435-95.000.
Ferralli, Michael W. Phase coherent acoustic transducer. 4,629,030, Cl. 181-155.000.
Ferranti plc: *See—*
Blain, William; McKeand, Alexander; and McKendrick, William H., 4,630,111, Cl. 358-109.000.
Ferrero, Giorgio, to Fiat Auto S.p.A. Motor vehicle lamp, and a light unit for motor vehicles incorporating such lamps. 4,630,184, Cl. 362-351.000.
Ferrero oHG mbH: *See—*
Negro, Giuseppe, 4,629,628, Cl. 426-138.000.
Ferro Manufacturing Corporation: *See—*
Myers, Timothy S.; and Jones, William H., 4,629,252, Cl. 297-366.000.
Fetta, Adriano: *See—*
Scardovi, Alessandro; Fetta, Adriano; and Chiaro, Aldo, 4,630,072, Cl. 346-140.00R.
Feuser, Dieter: *See—*
Engelhard, Helmut; Feuser, Dieter; Hendricks, Udo; and Tamer, Ergun, 4,629,468, Cl. 8-442.000.
Fiat Auto S.p.A.: *See—*
Ferrero, Giorgio, 4,630,184, Cl. 362-351.000.
Fibraconsult Management und Beratungs AG: *See—*
Wetterwald, Anton; Abrassart, Jacques; Moreau, Max; and Dallemagne, Stanislas, 4,629,523, Cl. 156-62.800.
Fike Metal Products Corporation: *See—*
Hibler, Donald R., Sr., 4,629,861, Cl. 219-137.00R.
Filatov, Nikolai I.: *See—*
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.

Finley, Carl E.: *See—*
Anderson, Thomas K.; and Finley, Carl E., 4,629,156, Cl. 251-60.000.
Fiorito, Ralph; and Raleigh, Michael, to United States of America, Navy. Coaxial probe for measuring the current density profile of intense electron beams. 4,629,975, Cl. 324-71.300.
Fischel, Burton J.: *See—*
Stahl, John I.; Fischel, Burton J.; and Will, Frank J., 4,630,035, Cl. 340-539.000.
Fischell, Robert E. Adjustable root and tip extenders for the stiffener cylinder of a penile erection device. 4,628,912, Cl. 128-79.000.
Fischer, Alan B.: *See—*
Bronstein-Bonte, Irena Y.; and Fischer, Alan B., 4,629,821, Cl. 136-257.000.
Fischer, Emil; and Stab, Rudolf, to Albert-Frankenthal AG. Method and apparatus for the stream feeding delivery of sheet products. 4,629,175, Cl. 271-202.000.
Fischer, Hanspeter: *See—*
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,629,490, Cl. 71-86.000.
Fisk, James C. Variable data imprinter for credit cards and the like. 4,628,812, Cl. 101-109.000.
Flannagan, Stephen T.: *See—*
Reed, Paul A.; and Flannagan, Stephen T., 4,630,239, Cl. 365-189.000.
Fleming, Robert: *See—*
Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, 4,629,731, Cl. 514-353.000.
Fling, Russell T., to RCA Corporation. Progressive scan display system with correction for non-standard signals. 4,630,098, Cl. 358-11.000.
Flobak, Jens O.: *See—*
Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, 4,629,014, Cl. 175-220.000.
Flohr, Peter: *See—*
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,630,027, Cl. 340-52.00F.
Flou S.p.A.: *See—*
Magistretti, Vico, 4,628,552, Cl. 5-52.000.
FMC Corporation: *See—*
Brickell, Joseph W.; and Bellandi, Edward A., 4,628,960, Cl. 137-558.000.
Hall, Tawny R.; and Smith, Harry M., 4,629,803, Cl. 558-92.000.
Focke & Co., (GmbH & Co.): *See—*
Focke, Heinz, 4,629,446, Cl. 493-317.000.
Focke, Heinz, to Focke & Co., (GmbH & Co.). Apparatus for erecting folding boxes. 4,629,446, Cl. 493-317.000.
Fog, Stephen: *See—*
Trumbull, Donald; Erland, Jonathan; Fog, Stephen; and Burke, Paul, 4,629,298, Cl. 353-30.000.
Fogler, Robert J., to United States of America, Air Force. Seismic-acoustic low-flying aircraft detector. 4,630,246, Cl. 367-135.000.
Fohl, Artur, to TRW Repa Feinstanzwerk. Feed device for a safety belt system for motor vehicles. 4,629,214, Cl. 280-808.000.
Folcke, Georges: *See—*
Gouali, Mohamed; and Folcke, Georges, 4,630,255, Cl. 370-3.000.
Foley, David J.: *See—*
Campbell, John A. L.; Baldwin, Carl L.; Foley, David J.; and McHann, Michael R., 4,629,392, Cl. 414-786.000.
Folger, Roger J., to Holmes-Hally Industries, Inc. Garage door operator mechanism. 4,628,636, Cl. 49-199.000.
Ford, John R., to Vernay Laboratories, Inc. Early warning of marine cooling system failure. 4,630,036, Cl. 340-622.000.
Ford Motor Company: *See—*
Giachino, Joseph M.; and Kress, James W., 4,628,576, Cl. 29-157.10R.
Person, Dennis W.; Pierce, Stanley L.; and Liang, Polung, 4,628,771, Cl. 74-856.000.
Forsen, Ivan: *See—*
Bergkvist, Lars A.; and Forsen, Ivan, 4,629,325, Cl. 356-399.000.
Forster, Peter. Innerspring mattress. 4,628,555, Cl. 5-247.000.
Forsyth, Robert H., to A. R. Wilfley & Sons, Inc. Gas diffuser and accompanying piping system. 4,629,591, Cl. 261-122.000.
Fory, Werner: *See—*
Meyer, Willy; and Fory, Werner, 4,629,810, Cl. 564-89.000.
Fossati, Walter: *See—*
Casamatta, Angelo; and Fossati, Walter, 4,630,041, Cl. 340-825.500.
Foster, Phillip W.: *See—*
Stanfa, Peter S.; and Foster, Phillip W., 4,628,897, Cl. 126-41.00R.
Fraeyman, Julius P.: *See—*
Zimlich, William C.; Fraeyman, Julius P.; and Johnson, Ronald C., 4,629,232, Cl. 293-128.000.
Frank Cacossa Development Corporation: *See—*
Cacossa, Frank G.; and Cacossa, Kenneth F., 4,629,360, Cl. 405-16.000.
Frank, Dieter: *See—*
Brady, Catherine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,629,742, Cl. 521-55.000.
Franklin, Robert J., to Marks and Spencer p.l.c. Display devices for articles of clothing. 4,629,101, Cl. 223-66.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,628,822, Cl. 104-7.200.
Fraser, Thomas H.: *See—*
Herlihy, Walter C.; and Fraser, Thomas H., 4,629,792, Cl. 546-268.000.
Freedman, George; Bowen, Robert F.; and Dudley, Kenneth W., to Raytheon Company. Electric oven with improved broiler. 4,629,865, Cl. 219-405.000.
Freeman, Winifer W. Fuel atomizer. 4,628,890, Cl. 123-593.000.
Freese, John D., to Caterpillar Inc. Tapered shaft retention apparatus. 4,629,354, Cl. 403-261.000.
French, Daniel B.; and Steinmetz, Michael A. Method and apparatus for machine control. 4,629,955, Cl. 318-625.000.
Frenia, Floyd J.: *See—*
Lang, Richard D.; and Frenia, Floyd J., 4,628,799, Cl. 98-40.190.
Frenzel, Bertram: *See—*
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.
Freyssinet International: *See—*
Jartoux, Pierre, 4,628,649, Cl. 52-223.00L.
Friebe, Karl-Heinz, to Robert Bosch GmbH. Aggregate for delivering fuel from a fuel supply tank to an internal combustion engine of a motor vehicle. 4,629,399, Cl. 417-201.000.
Fried. Krupp Gesellschaft mit beschraenkter Haftung: *See—*
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.
Fried, Peter; and Swersey, Burt L., to Cobe Asdt, Inc. Weight monitoring system. 4,629,015, Cl. 177-25.000.
Friedl, Richard, to LGZ Landis & Gyr Zug AG. Active current transformer. 4,629,974, Cl. 323-357.000.
Friedman, Robert H.: *See—*
DelSignore, James R., II; Sheehan, Paul; and Friedman, Robert H., 4,630,100, Cl. 358-21.00R.
Friese, David D.; and Van Dort, Mark A., to Dow Chemical Co. Hydrogen fluoride recovery process. 4,629,610, Cl. 423-240.000.
Fritts, David H.; and Leonard, John F., to United States of America, Air Force. Method for fabricating battery plaque and low shear nickel electrode. 4,628,593, Cl. 29-623.100.
Frohberger, Paul-Ernst: *See—*
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.
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Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,629,613, Cl. 423-265.000.
Frost, Per-Eric, to Frosts Knivfabrik AB. Hand implement for slicing foodstuffs. 4,628,603, Cl. 30-280.000.
Frosts Knivfabrik AB: *See—*
Frost, Per-Eric, 4,628,603, Cl. 30-280.000.
Frotschner, Eberhard: *See—*
Gaus, Hermann; Jurgens, Gunter; Frotschner, Eberhard; and Rub, Winfried, 4,629,042, Cl. 192-3.250.
Fruchter, Moshe; and Moscovici, Anutza, to RAMOT - University Authority for Applied Research and Industrial Development. Process for the recovery of tungsten in a pure form from tungsten-containing materials. 4,629,503, Cl. 75-121.000.
Fruhbuss, Heinrich. Process of removing SO_x and NO_x from waste gases. 4,629,609, Cl. 423-239.000.
Fryma Maschinen AG: *See—*
Buhler, Gerhard, 4,629,133, Cl. 241-46.110.
Fuchs, Rudolf, to Karl M. Reich Maschinenfabrik GmbH. Handheld circular saw with baseplate. 4,628,604, Cl. 30-390.000.
Fuel Tech, Inc.: *See—*
Haney, William M., III; and Sullivan, James C., 4,629,472, Cl. 44-51.000.
Fuji Electric Company Ltd.: *See—*
Hongo, Yasuo, 4,630,308, Cl. 382-27.000.
Kawasaki, Kikuo; Sano, Tomomi; and Yamamoto, Hitoshi, 4,630,042, Cl. 340-825.350.
Fuji Electric Corporate Research & Development Ltd.: *See—*
Hongo, Yasuo, 4,630,308, Cl. 382-27.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kataoka, Ryuji, 4,628,883, Cl. 123-489.000.
Kodama, Masayuki; and Yamada, Kenichi. 4,628,770, Cl. 74-752.00A.
Fuji Photo Film Co., Ltd.: *See—*
Akao, Mutsuo, 4,629,640, Cl. 428-35.000.
Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,629,300, Cl. 354-76.000.
Asai, Takamitsu; Fujiyama, Masaaki; Kanazawa, Minoru; and Aoki, Nobuo, 4,629,653, Cl. 428-328.000.
Goto, Chiaki; and Noguchi, Masaru, 4,629,890, Cl. 250-327.200.
Hayakawa, Yoshihide; Satomura, Masato; and Sato, Kozo, 4,629,676, Cl. 430-203.000.
Horikawa, Kazuo; Tanaka, Hirosi; and Saito, Tokukazu, 4,629,900, Cl. 250-484.100.
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,629,683, Cl. 430-390.000.
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Mamoto, Kazuo, 4,629,680, Cl. 430-288.000.
Katoh, Kazunobu, 4,629,677, Cl. 430-215.000.
Kubota, Kazufumi; Yamazaki, Seiichi; and Monma, Yoshiyuki, 4,629,876, Cl. 235-473.000.
Makino, Naonori; Sano, Kenji; Horie, Seiji; and Sato, Hideo, 4,629,672, Cl. 430-76.000.
Murai, Ashita, 4,629,678, Cl. 430-230.000.
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Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, 4,629,299, Cl. 353-97.000.
Okuzawa, Yasutoshi, 4,630,151, Cl. 360-99.000.
Sanda, Akihiro; Watabe, Nobuyuki; and Sato, Hiroki, 4,629,139, Cl. 242-56.400.
Sato, Kozo; Yabuki, Yoshiharu; Kawata, Ken; and Hirai, Hiroyuki, 4,629,684, Cl. 430-559.000.
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; Hatanaka, Isamu; and Harada, Shigeo, 4,629,675, Cl. 430-203.000.
Utsugi, Mikio; and Fukuda, Masahiro, 4,630,138, Cl. 360-33.100.

Fujihara, Tadafumi: *See—*
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Fujii, Hiroshi: *See—*
Aoyama, Shunichi; Fujii, Hiroshi; and Kato, Manabu, 4,628,880, Cl. 123-432.000.

Fujikawa, Tetsuzo; Hirata, Makizo; Tamba, Shinichi; and Miguchi, Akio, to Kawasaki Jukogyo Kabushiki Kaisha. Engine balancing system. 4,628,876, Cl. 123-192.00B.

Fujimori, Junichi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone effect imparting device. 4,628,789, Cl. 84-1.240.

Fujimura, Fumio: *See—*
Satake, Toshimi; Kimura, Yoshihide; Minami, Toshiaki; and Fujimura, Fumio, 4,630,080, Cl. 346-209.000.

Fujioka, Yoshisato, to Ricoh Company, Ltd. Small telephoto zoom lens. 4,629,292, Cl. 350-427.000.

Fujishima, Tooru: *See—*
Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.

Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, to Matsushita Electric Industrial Co., Ltd. Automatic inserting apparatus for electronic parts. 4,628,595, Cl. 29-741.000.

Fujita, Teizo, to Izumi Denki Corporation. Light emitting diode lamp and method for producing thereof. 4,630,183, Cl. 362-311.000.

Fujita, Yuji: *See—*
Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, 4,630,112, Cl. 358-120.000.

Fujitsu Limited: *See—*
Arakawa, Hideki, 4,630,238, Cl. 365-185.000.
Horio, Kenji; Otsuka, Akira; and Tanioka, Tsuyoshi, 4,629,942, Cl. 315-169.400.
Kaku, Takashi; Okita, Ryoji; Inoue, Masayoshi; and Kudo, Shozo, 4,630,126, Cl. 358-280.000.
Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,629,045, Cl. 192-0.052.
Sasaki, Nobuo; and Suzuki, Yasuo, 4,630,089, Cl. 357-23.700.
Sukeda, Toshiaki; and Imai, Satoru, 4,630,236, Cl. 365-1.000.
Ueno, Katsunobu; and Hataishi, Osamu, 4,629,520, Cl. 148-188.000.
Yamakoshi, Shigenobu, 4,630,083, Cl. 357-17.000.

Fujiwara, Nobuo, to Victor Company of Japan, Limited. Variable gain equalizer with a mirror circuit having opposite phase relationship between input and output currents. 4,629,998, Cl. 330-304.000.

Fujiwara, Taichi: *See—*
Omura, Takaho; Horii, Yasuyuki; Fujiwara, Taichi; and Nakata, Masaru, 4,628,768, Cl 74-745.000.

Fujiyama, Masaaki: *See—*
Asai, Takamitsu; Fujiyama, Masaaki; Kanazawa, Minoru; and Aoki, Nobuo, 4,629,653, Cl. 428-328.000.

Fukami, Tadashi; Odaka, Kentaro; and Ozaki, Shinya, to Sony Corporation. Encoding method for error correction. 4,630,272, Cl. 371-37.000.

Fukuda, Masahiro: *See—*
Utsugi, Mikio; and Fukuda, Masahiro, 4,630,138, Cl. 360-33.100.

Fukuhara, Satoru: *See—*
Todokoro, Hideo; and Fukuhara, Satoru, 4,629,889, Cl. 250-310.000.

Fukura, Kenichi: *See—*
Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, 4,630,179, Cl. 362-66.000.

Fukushima, Yoshiaki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Water glass-based inorganic material and process for producing the same. 4,629,507, Cl. 106-74.000.

Fuller Company: *See—*
Kreisberg, Alan J.; and Warshawsky, Jay, 4,629,421, Cl. 432-77.000.

Fuller, Ronald D.; and Lowe, Benny W., to Motorola, Inc. Ring shaped dielectric resonator with adjustable tuning screw extending upwardly into ring opening. 4,630,012, Cl. 333-235.000.

Fulmer, William P.: *See—*
Correll, Harold E.; Fulmer, William P.; and Jones, James P., Jr., 4,628,953, Cl. 137-74.000.

Fulton, William. Wheelchair seat. 4,629,246, Cl. 297-44.000.

Funakoshi, Akira: *See—*
Hamada, Akira; Ohira, Keiichi; and Funakoshi, Akira, 4,628,573, Cl. 29-25.350.

Funck, Herbert. Bonding press for shoes. 4,628,559, Cl. 12-33.000.

Furukawa Electric Co., Ltd.: *See—*
Fuse, Kenichi; and Shirasaka, Yusei, 4,629,286, Cl. 350-96.230.

Furumura, Akio: *See—*
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,629,212, Cl. 280-707.000.

Fuse, Kenichi; and Shirasaka, Yusei, to Furukawa Electric Co., Ltd. Coated optical fiber cable structure which prevents longitudinal cracks. 4,629,286, Cl. 350-96.230.

Fushiya, Mitsuji; Imanishi, Shoichi; and Shiga, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Housing for an electric apparatus with lead wires and a die apparatus for molding the same. 4,629,823, Cl. 174-52.00R.

Fusion UV Curing Systems Corporation: *See—*
Carter, R. Sykes; and Seagrave, Earl M., 4,629,285, Cl. 350-96.230.

Futaki, Ippei, to Kabushiki Kaisha Toshiba. Dot-matrix printer with pattern checking and pattern correcting means. 4,629,342, Cl. 400-121.000.

Futakuchi, Yorio, to Yamaha Hatsudoki Kabushiki Kaisha. Engine intake system. 4,628,879, Cl. 123-308.000.

Fuwa, Jyoichi, to Ricoh Company, Ltd. Character and picture information reading apparatus. 4,630,127, Cl. 358-285.000.

Gabrielsen, Jonny: *See—*
Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, 4,629,014, Cl. 175-220.000.

Gach, Paul. Glass scoring assembly. 4,628,784, Cl. 83-881.000.

Gagliardi, Eugene D., Jr., to Southdown Meat Company, Inc. Method of butchering a side of lamb and cuts resulting therefrom. 4,628,569, Cl. 17-52.000.

Gagne, Peter H.; and Morrisroe, Peter J., to Perkin-Elmer Corporation, The. Plasma emission source. 4,629,940, Cl. 315-111.510.

Gainer, James; and Goschke, Richard, to Ciba-Geigy Corporation. Alkyl substituted pyridazinones and pharmaceutical compositions. 4,629,789, Cl. 544-114.000.

Galand, Claude: *See—*
Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, 4,630,262, Cl. 370-81.000.

Galati, Gaspare; and Giaccari, Ennio, to Selenia-Industrie Elettrotechniche Associate S.p.A. Suppressor of second-time-around clutter echoes for MTI pulse radar provided with power oscillator. 4,630,052, Cl. 342-159.000.

Gallagher, Lawrence J., to Loral Electro-Optical Systems, Inc. Laser operated small arms transmitter with near field reflection inhibit. 4,629,427, Cl. 434-22.000.

Gambro Lundia AB: *See—*
Carlsson, Per-Olov A. V.; Karlberg, Rolf E.; and Falkvall, Thore E., 4,629,448, Cl. 604-4.000.

GAO Gesellschaft Fuer Automation und Organisation mbH: *See—*
Devrient, Ludwig, 4,629,630, Cl. 427-7.000.
Maurer, Thomas; and Holbein, Hans J., 4,629,215, Cl. 283-94.000.

Garcia, Dana S., to B. F. Goodrich Company, The. Method and composition for improved melt processability and impact properties of chlorinated poly(vinyl chloride). 4,629,765, Cl. 525-187.000.

Garden, Douglas D.: *See—*
Buttitta, Anthony D.; and Garden, Douglas D., 4,628,553, Cl. 5-62.000.

Garlic Technologies, Inc.: *See—*
Bond, Howard T., 4,630,157, Cl. 360-128.000.

Garrett Corporation, The: *See—*
O'Hagan, Michael A.; and Smith, Richard D., 4,628,833, Cl. 110-263.000.

Garritty, Lawrence K. Oil and fuel filter. 4,629,558, Cl. 210-130.000.

Gartner, Klaus W.: *See—*
Uyeda, Tim M.; and Gartner, Klaus W., 4,628,715, Cl. 70-333.00R.

Gas Research Institute: *See—*
DeWerth, Douglas W.; and Sterbik, William G., 4,629,415, Cl. 431-347.000.
Farnsworth, Craig A.; Himmel, Robert L.; Sank, Gerald W.; and Stanger, Keith A., 4,628,903, Cl. 126-391.000.

Gaspard, Roy P.: *See—*
Escamilla, Victor, Jr., 4,630,037, Cl. 340-628.000.

Gates, Joseph M.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.

Gatti, Daniele. Endowed with anti-viral activity 2-alkylamino-4,6-dihalo pyrimidines. 4,629,729, Cl. 514-275.000.

Gaudriot, Lionel: *See—*
Charles, Joel; Gaudriot, Lionel; and Parot, Jean-Marc, 4,628,737, Cl. 73-624.000.

Gauger, Wolfgang, to Obo Bettermann Org. Stud-welding device. 4,629,857, Cl. 219-98.000.

Gaull, Gerald E. Human nutritional compositions containing taurine and vitamins and/or minerals. 4,629,625, Cl. 424-145.000.

Gaus, Hermann; Jurgens, Gunter; Frotschner, Eberhard; and Rub, Winfried, to Daimler-Benz Aktiengesellschaft. Drive arrangement for a motor vehicle. 4,629,042, Cl. 192-3.250.

Gauthier, Rene : *See—*
Mestais, Corinne; Gauthier, Rene ; and Roux, Georges, 4,629,895, Cl. 250-369.000.

Gauwitz, Donald P.: *See—*
Salihar, Mark W.; Engstrom, Gary G.; and Gauwitz, Donald P., 4,629,603, Cl. 422-9.000.

Gavaletz, John S. Dynamoelectric machine rotor. 4,629,921, Cl. 310-156.000.

Gawron, Klaus; Jonker, Simon; Schroder, Johann; and De Weerdt, Henk V., to U.S. Philips Corporation. Electrical fuse. 4,630,023, Cl. 337-407.000.

Geering, Hans P.; Heess, Gerhard; and Schwarz, Helmut, to Robert Bosch GmbH. Method for Lambda control in an internal combustion engine. 4,628,884, Cl. 123-489.000.

Gehrmann, Klaus: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,629,711, Cl. 502-24.000.

Geiger, Edgar, to Karl Mengele & Sohne. Protective device for movable shelves. 4,629,883, Cl. 250-221.000.

Geke, Juergen, to Henkel Kommanditgesellschaft auf Aktien. Coagulating compositions containing a cyanamide component for coagulating lacquers, waxes and coating compositions. 4,629,477, Cl. 55-85.000.

Genaro, Donald M.; Johnson, Chris G.; and Tilley, Alvin R., to Henry Dreyfuss Associates. Multidirection connector housing. 4,629,276, Cl. 339-103.00R.

Gender, James R.: *See—*
January, Daniel B.; and Gender, James R., 4,629,317, Cl. 356-155.000.

Gendlin, Lev E.: *See—*
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

General Battery Corporation: *See—*
Fallon, William H.; and Schober, William R., 4,629,965, Cl. 320-39.000.

General Electric Company: *See—*
Amendola, Eugene B.; and Reynolds, Kenneth R., 4,629,918, Cl. 310-65.000.
Bottomley, Paul A., 4,629,988, Cl. 324-309.000.
Butz, Mark G.; and Zacharias, William J., 4,630,066, Cl. 346-33.0EC.
Crowther, Russell L.; and Townsend, Dennis B., 4,629,599, Cl. 376-212.000.
Hepp, Leonard R., 4,629,750, Cl. 523-201.000.
Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., 4,628,694, Cl. 60-752.000.
Klufas, Oleg; Soldan, Calvin H.; and Coll, William V., Jr., 4,628,575, Cl. 29-156.80R.
Liu, Ping Y.; and Giles, Harold F., Jr., 4,629,760, Cl. 525-67.000.
Moore, James H.; Woodcock, Sidney J.; and Dumas, Charles R., 4,629,033, Cl. 184-6.300.
Parker, James S., 4,630,117, Cl. 358-174.000.
Riehl, Mark E., and Dobberstein, Robert J., 4,629,989, Cl. 324-318.000.
Rock, John A., 4,629,759, Cl. 525-66.000.
Sexton, Daniel W., 4,630,265, Cl. 370-85.000.
Welles, Kenneth B., II; Noujaim, Sharbel E.; and Tiemann, Jerome J., 4,630,299, Cl. 381-4.000.

General Electric Company, p.l.c., The: *See—*
Hilsum, Cyril, 4,630,115, Cl. 358-139.000.

General Motors Corporation: *See—*
Bhagat, Jayant K., 4,630,092, Cl. 357-38.000.
Bitter, Rudolf, 4,628,873, Cl. 123-52.00M.
Brasier, Brian D.; Hill, Kenneth J.; and Yonker, John F., 4,629,025, Cl. 180-142.000.
Butts, Kenneth R.; and Wanamaker, Joseph L., 4,629,968, Cl. 322-29.000.
Goding, David J.; and Rassaian, Mostafa, 4,628,824, Cl. 105-168.000.
Lee, Michael C.; Raubinger, Daniel F.; and Swanney, Peter L., 4,628,568, Cl. 16-337.000.
Mawbey, Gerald W., 4,629,248, Cl. 297-284.000.
Parker, Donald L.; and Heffner, Donald L., 4,628,959, Cl. 137-526.000.
Stolper, Richard; Adler, Theo; and Kussmann, Lutz, 4,629,254, Cl. 297-473.000.
Tiesler, Roy F., 4,629,244, Cl. 296-146.000.
Voss, Richard J., 4,629,967, Cl. 322-28.000.

Genetic Systems Corporation: *See—*
Cosand, Wesley L., 4,629,783, Cl. 530-324.000.

Geniees, Eugene; Pierre, Gerard; Santier, Christian; and Tsintavis, Constantin, to Commissariat a l'Energie Atomique. Process for the preparation of polyanilines, polyanilines obtained according to this process and their uses in the production of electrochemical generators. 4,629,540, Cl. 204-59.00R.

Genus, Inc.: *See—*
Brors, Daniel L., 4,629,635, Cl. 427-255.200.

George, William A.: *See—*
Grossman, Mark W.; and George, William A., 4,629,543, Cl. 204-105.00R.

Georgia Tech Research Corporation: *See—*
Browner, Richard F.; and Willoughby, Ross C., 4,629,478, Cl. 55-257.00R.

Georgiou, Christos J., to International Business Machines Corporation. Controller for a cross-point switching matrix. 4,630,045, Cl. 340-825.790.

Gergaud, Claude: *See—*
Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, 4,630,262, Cl. 370-81.000.

Gergets, Paul: *See—*
Riback, Richard; Lau, Brian; and Gergets, Paul, 4,629,841, Cl. 200-153.00A.

Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard. Frame structure for accommodating a plurality of containers. 4,629,085, Cl. 220-1.500.

Gernhardt, Paul D.; and Orbeta, Ferdinand E., to Slater Electric, Inc. Ground fault circuit interrupter. 4,630,015, Cl. 335-18.000.

Gerritsen, Jan: *See—*
Bijma, Jan; and Gerritsen, Jan, 4,629,933, Cl. 313-414.000.

Gershenson, Edward; Lemone, Louis A.; and Lippitt, Mark C., to Data General Corporation. Methods for diagnosing malfunctions in a disk drive. 4,630,269, Cl. 371-24.000.

Gerson, Ira A.: *See—*
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,630,304, Cl. 381-94.000.
Borth, David E.; Gerson, Ira A.; Smanski, Philip J.; and Vilmur, Richard J., 4,630,305, Cl. 381-94.000.

Gertsch, Ernst; and Gertsch, Ulrich, to TMC Corporation. Safety ski binding. 4,629,208, Cl. 280-618.000.

Gertsch, Ulrich: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 4,629,208, Cl. 280-618.000.

Gestetner International Limited: *See—*
Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, 4,630,074, Cl. 346-139.00C.

Geus, John W.: *See—*
van der Wal, Willem J. J.; and Geus, John W., 4,629,612, Cl. 423-244.000.

Geyer, Leslie John: *See—*
Horn, Robert, 4,628,975, Cl. 142-7.000.

Ghent Manufacturing Inc.: *See—*
Hutten, James E., 4,629,075, Cl. 211-89.000.

Giaccari, Ennio: *See—*
Galati, Gaspare; and Giaccari, Ennio, 4,630,052, Cl. 342-159.000.

Giachino, Joseph M.; and Kress, James W., to Ford Motor Company. Method for fabricating a silicon valve. 4,628,576, Cl. 29-157.10R.

Giacobbe, Thomas J.; Leitman, Richard H.; and Terebecky, Walter, to Mobil Oil Corporation. Method of monitoring a catalyst feed and apparatus for implementing the method. 4,629,903, Cl. 250-573.000.

Gibbons, Ian: *See—*
Weng, Litai; Gibbons, Ian; and Ullman, Edwin F., 4,629,690, Cl. 435-7.000.

Gics, Paul W. Resonator device for a microwave heat applicator. 4,629,847, Cl. 219-10.55A.

Gilder, Thomas G., Jr.; and O'Dean, Raymond D., to GTE Products Corporation. IC package sealing technique. 4,629,824, Cl. 174-52.0FP.

Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., to Ex-Cell-O Corporation. Grinding wheel infeed control method. 4,628,643, Cl. 51-325.000.

Giles, Harold F., Jr.: *See—*
Liu, Ping Y.; and Giles, Harold F., Jr., 4,629,760, Cl. 525-67.000.

Gimbel, Rolf D. Process and device for the separation of impurities from liquids. 4,629,569, Cl. 210-636.000.

Giolma, William H.: *See—*
Bell, Kenneth M.; and Giolma, William H., 4,630,162, Cl. 361-56.000.

Giordano, Jose. Mouthpiece for hairdryer. 4,629,863, Cl. 219-373.000.

Gir, Srikant; and Rhodes, Donald E., to Kerr-McGee Corporation. Coal liquefaction with coal tar solvent. 4,629,554, Cl. 208-415.000.

Giron, Anthony S.; and Curd, Andrew T., to Arctic Equipment Rental, Inc. Portable concrete beam harping system. 4,629,408, Cl. 425-111.000.

Gjertsen, Robert K.; and Wilson, John F., to Westinghouse Electric Corp. Apparatus and method for preassembling a top nozzle subassembly for a nuclear reactor fuel assembly. 4,628,581, Cl. 29-428.000.

Glasdon Limited: *See—*
Palmer, Thomas E., 4,628,716, Cl. 70-349.000.

Glass, Dieter: *See—*
Eiermann, Albert; Glass, Dieter; and Herrmann, Richard, deceased, 4,629,261, Cl. 310-90.500.

Glass Equipment Development, Inc.: *See—*
Leopold, Edmund A., 4,628,582, Cl. 29-451.000.

Glass, James W., to V. G. C. Corporation. Fuel supply system for an internal combustion engine. 4,628,871, Cl. 123-25.00B.

Gleason, Henry A., III: *See—*
Heckenbach, Terry A.; and Gleason, Henry A., III, 4,630,221, Cl. 364-505.000.

Gnewikow, Karl: *See—*
Vogel, Hans-Gunter; Muller, Kurt; and Gnewikow, Karl, 4,629,094, Cl. 222-82.000.

GO PRO S.r.l.: *See—*
Carpanelli, Carlo; and Serenari, Stefano, 4,629,023, Cl. 180-72.000.

Goding, David J.; and Rassaian, Mostafa, to General Motors Corporation. Self steering railway truck. 4,628,824, Cl. 105-168.000.

Goetz, Norbert; Jahn, Dieter; Reissenweber, Gernot; and Eckhardt, Heinz, to BASF Aktiengesellschaft. Preparation of 3-formyltetrahydrothiopyrans. 4,629,799, Cl. 549-13.000.

Goetze AG: *See—*
Morsbach, Martin; and Brauers, Bert, 4,629,198, Cl. 277-139.000.

Goff, Michael W.: *See—*
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., 4,629,668, Cl. 430-11.000.

Goguen, Peter J., to Jones and Vining, Incorporated. Phosphorescent polymer-containing compositions and articles made therefrom. 4,629,583, Cl. 252-301.350.

Gokita, Masami, to Kabushiki Kaisha Toshiba. Color image forming apparatus with interruption control. 4,630,128, Cl. 358-296.000.

Golding, Frank E., to Redken Laboratories. Tensile strength tester for hair. 4,628,742, Cl. 73-829.000.

Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, to Ortho Pharmaceutical Corporation. Potent thymopentin analogs. 4,629,723, Cl. 514-17.000.

Gomersall, Earl R., to A. C. Nielsen Company. Preprogrammed over-the-air marketing research system. 4,630,108, Cl. 358-84.000.
Goodrich, Judson E., to Chevron Research Company. Method for producing industrial asphalts without air-blowing using zinc chloride. 4,629,510, Cl. 106-273.00R.
Goodyear Aerospace Corporation: *See—*
Correll, Harold E.; Fulmer, William P.; and Jones, James P., Jr., 4,628,953, Cl. 137-74.000.
Goodyear Tire & Rubber Company, The: *See—*
Warmuth, Ivan J., II, 4,629,170, Cl. 267-64.270.
Gorder, Norman S. Crop sprayer. 4,629,123, Cl. 239-159.000.
Gordon, Geoffery M.; and Griffiths, Edward J., to AMP Incorporated. Method and apparatus for producing electrical harnesses having multi-contact connectors and discrete wires. 4,628,600, Cl. 29-861.000.
Gordon, John A.; and King, Graham K., to British Telecommunications. Apparatus for decoding error-correcting codes. 4,630,032, Cl. 340-347.0DD.
Goschke, Richard: *See—*
Gainer, James; and Goschke, Richard, 4,629,789, Cl. 544-114.000.
Goto, Chiaki; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,629,890, Cl. 250-327.200.
Goto, Sumio: *See—*
Sato, Kazuo; Komori, Masahiro; and Goto, Sumio, 4,629,774, Cl. 527-301.000.
Gotoh, Hiroshi: *See—*
Kurihara, Norimitsu; Gotoh, Hiroshi; and Miyake, Junichi, 4,629,471, Cl. 123-198.0DB.
Gouali, Mohamed; and Folcke, Georges, to Lignes Telegraphiques et Telephoniques L.T.T. Optical multiplexer-demultiplexer for use with optical fiber wavelengths. 4,630,255, Cl. 370-3.000.
Goubaud, Michel, to Dimos Batiment Distribution de Materiel Outillage et Securite pour le Batiment. Device for attaching a scaffolding bracket to a frame member, and fixing assembly for implementing same. 4,629,355, Cl. 403-389.000.
Goudy, Paul R., Jr.; and Weekley, William G., to Autotrol Corporation. Fluid diffuser. 4,629,126, Cl. 239-452.000.
Gouilloud, Michel M. A.; and Plona, Thomas J., to Schlumberger Technology Corporation. Apparatus and method for analyzing a fluid that includes a liquid phase, contained in a tubular conduit. 4,628,725, Cl. 73-19.000.
Gourmel, Yves; and Pierrel, Michel, to Pont-a-Mousson S.A. Apparatus for continuous vertical casting of iron tube. 4,628,987, Cl. 164-254.000.
Gousetis, Charalampos; Oppenlaender, Knut; Liebold, Gert; and Pfitzner, Klaus, to BASF Aktiengesellschaft. Phosphosilicone/silicate copolymers and their use as corrosion inhibitors and silicate stabilizers in antifreezes. 4,629,602, Cl. 422-7.000.
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., to Hughes Aircraft Company. Method for using kitting parts carousel system. 4,628,580, Cl. 29-428.000.
Gradl, Reinhard: *See—*
Schimmel, Gunther; and Gradl, Reinhard, 4,629,614, Cl. 423-321.00R.
Gradl, Reinhold: *See—*
Groh, Heinrich; and Gradl, Reinhold, 4,629,593, Cl. 264-63.000.
Graham, Karl: *See—*
Wells, Larry; and Graham, Karl, 4,628,875, Cl. 123-90.360.
Graham, Merrill E., Jr. Machine tool tracer assembly and control system. 4,630,215, Cl. 364-474.000.
Graham, Randall C., to Essex Group, Inc. Control of traversing guide in strand winding apparatus. 4,629,145, Cl. 242-158.00R.
Grainger, John F. G.: *See—*
Holtham, Roy D.; Falconer, Anthony J.; and Grainger, John F. G., 4,628,828, Cl. 110-165.00R.
Graphtec Kabushiki Kaisha: *See—*
Nakazawa, Yoshio, 4,630,071, Cl. 346-136.000.
Grate, John H.; Hamm, David R.; and Valentine, Donald H., Jr., to Catalytica Associates. Process for preparation of urethanes. 4,629,804, Cl. 560-24.000.
Graver Company, The: *See—*
Salem, Eli; and Kunin, Robert, 4,629,571, Cl. 210-668.000.
Grazia, Alessandro, to IMA-Industria Macchine Automatiche-SpA. Apparatus for supplying volumetric metering devices, particularly for machines for packaging infusion products. 4,628,973, Cl. 141-94.000.
Green, Augustus H., Jr.; and Rast, Gustaf J., Jr., to United States of America, Army. Electronically controlled array for simulation of passive target/background signatures at millimeter wavelengths. 4,630,053, Cl. 342-376.000.
Green, Eugene L., Sr.: *See—*
Taylor, Jefferson H.; and Green, Eugene L., Sr., 4,628,728, Cl. 73-149.000.
Green, Patrick A.: *See—*
Niehenke, Edward C.; and Green, Patrick A., 4,630,004, Cl. 331-107.0SL.
Grenon, Rene E. Apparatus for driving a taut rigid wire between two grooved wheels. 4,629,105, Cl. 226-186.000.
Grenzendorfer, Dietmar: *See—*
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.
Grier, Dale C. Hypodermic syringe. 4,629,454, Cl. 604-229.000.
Griffin, Billy W. Plunger lift for controlling oil and gas production. 4,629,004, Cl. 166-372.000.
Griffin, Everett, to Burlington Industries, Inc. Rotating slasher creel. 4,629,143, Cl. 242-131.000.
Griffith, John T.; Lopez-Cacicedo, Carlos; and Hamblyn, Stephen M. L., to Electricity Council, The. Induction heater having an alternating current conductor. 4,629,844, Cl. 219-10.49R.
Griffiths, Edward J.: *See—*
Gordon, Geoffery M.; and Griffiths, Edward J., 4,628,600, Cl. 29-861.000.
Grigar, Larry L.: *See—*
Miller, Carl B.; Luke, Robert R.; Smith, Michael L.; and Grigar, Larry L., 4,629,001, Cl. 166-297.000.
Groh, Heinrich; and Gradl, Reinhold, to Hoechst CeramTec Aktiengesellschaft. Process for producing polycrystalline, translucent sintered tubes. 4,629,593, Cl. 264-63.000.
Grosjean, Michel. Multiphase motor with magnetized rotor having N/2 pairs of poles at its periphery. 4,629,924, Cl. 310-257.000.
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Stabilized solutions of hydroxylamine or its salts in water or alcohols, and their preparation. 4,629,613, Cl. 423-265.000.
Grossman, Mark W.; and George, William A., to GTE Products Corporation. Method of preparing mercury with an arbitrary isotopic distribution. 4,629,543, Cl. 204-105.00R.
Grote, Walter, to Hauhinco Maschinenfabrik G. Hausherr, Jochums GmbH & Co. KG. Radial piston pump. 4,629,401, Cl. 417-273.000.
Grouiller, Herve ; and Christ, Fabien, to Laboratoire d'Hygiene et de Dietetique (L.H.D.). Inert matrix based on polycaprolactone for the oral administration of a drug, and method for the preparation of the galenic form comprising this matrix. 4,629,624, Cl. 424-78.000.
Gruber, Walter F., to Hansa Metallwerke AG. Shower. 4,629,124, Cl. 239-428.500.
Gruenberg, Micheal L., to Endotronics, Inc. Apparatus for delivering a controlled dosage of a chemical substance. 4,629,686, Cl. 435-1.000.
Gruich, Peter, to Weiner, Irving M., a part interest. Energy-saving aerodynamic vehicle. 4,629,241, Cl. 296-1.00S.
Grundei, Hans; and Biehl, Thomas, to S & G Implants GmbH. Connection of tubular bone ends. 4,629,463, Cl. 623-16.000.
Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland. Stiftung & Co. KG: *See—*
Schulze, Jurgen, 4,630,141, Cl. 360-60.000.
Gruppo Lepetit S.p.A.: *See—*
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,629,781, Cl. 530-317.000.
GTE Communication Systems Corporation: *See—*
Khera, Muhammad I., 4,630,197, Cl. 364-200.000.
Stepan, William E., 4,629,267, Cl. 339-17.00M.
GTE Laboratories Incorporated: *See—*
Cooperman, Michael, 4,630,284, Cl. 375-36.000.
Fallier, Charles N., Jr.; and Proud, Joseph M., 4,629,945, Cl. 315-207.000.
GTE Products Corporation: *See—*
Gilder, Thomas G., Jr.; and O'Dean, Raymond D., 4,629,824, Cl. 174-52.0FP.
Grossman, Mark W.; and George, William A., 4,629,543, Cl. 204-105.00R.
Keenan, James P., 4,629,935, Cl. 313-579.000.
Kuo, Samuel C., 4,630,063, Cl. 343-792.500.
Roche, William J., 4,629,437, Cl. 445-26.000.
Weld, Thomas G.; and Beschle, Mark D., 4,629,936, Cl. 313-579.000.
Wolfe, Robert W., 4,629,707, Cl. 501-97.000.
GTI Corporation: *See—*
Holly, James R., 4,630,234, Cl. 364-900.000.
Guarr, David A. Tool for lubricating two-piece drive shafts. 4,628,777, Cl. 81-488.000.
Gueguin, Michel. Process of producing synthetic rutile from titaniferous product having a high reduced titanium oxide content. 4,629,607, Cl. 423-74.000.
Guelfo, Roberto: *See—*
Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, 4,630,077, Cl. 346-140.00R.
Guillonneau, Claude: *See—*
Regnier, Gilbert; Guillonneau, Claude; and Lepagnol, Jean, 4,629,728, Cl. 514-252.000.
Gulati, Sujan C.; and Enderle, Edward C., to Enron Chemical Company. Biaxially oriented polypropylene film construction for special lamination. 4,629,657, Cl. 428-461.000.
Gunkel, Ronald W.; and Morran, James R., to Aluminum Company of America. Blind setting rivet. 4,629,380, Cl. 411-29.000.
Gunn, Donald F. Vehicle door-mounted sign holder. 4,628,624, Cl. 40-591.000.
Gunness, David W., to Electro-Voice, Inc. Multiple driver manifold. 4,629,029, Cl. 181-144.000.
Gunthner, Franz, to Schott Glaswerke. Electrode arrangement. 4,630,280, Cl. 373-41.000.
Gupta, Ashis S.; Heenan, Richard H.; Credle, William S., Jr.; Burke, Robert W., II; and Cahen, Albert J., Jr., to Coca-Cola Company, The. Beverage dispenser system suitable for use in outer space. 4,629,589, Cl. 261-34.100.
Gwinn, Rick A.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
H. E. Williams, Inc.: *See—*
Fain, Elmer E.; and Sutton, Charles O., 4,630,181, Cl. 362-235.000.
H L & H Timber Products (Proprietary) Limited: *See—*
Erasmus, Jacobus P., 4,628,658, Cl. 52-561.000.
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, to U.S. Philips Corporation. Method of generating layer images. 4,630,296, Cl. 378-2.000.
Haase, Karl: *See—*
Rothe, Herbert; and Haase, Karl, 4,629,165, Cl. 266-114.000.
Hachiro, Nobuaki, to Nissin Kogyo Kabushiki Kaisha. Tandem type master cylinder. 4,628,691, Cl. 60-562.000.
Hackelsberger, Franzjosef. Closure for canning glass container with glass cover. 4,629,084, Cl. 215-346.000.
Haddad, James H.; and Owen, Hartley, to Mobil Oil Corporation. FCC catalyst separation method. 4,629,552, Cl. 208-161.000.
Haertling, Gene H., to Motorola, Inc. Variable color electrooptic display. 4,630,040, Cl. 340-763.000.
Hagenbuch, LeRoy G. Apparatus and method for on-board measuring of the load carried by a truck body. 4,630,227, Cl. 364-567.000.
Hagihara, Takashi; and Kuramitsu, Yuzi, to NEC Corporation. Cooling equipment for an integrated circuit chip. 4,628,990, Cl. 165-80.400.
Hahn, Erwin: *See—*
Ostertag, Werner; Wienand, Henning; Lach, Dietrich; and Hahn, Erwin, 4,629,616, Cl. 423-544.000.
Haikawa, Yukihiko: *See—*
Juso, Hiromi; Sudoh, Kengo; and Haikawa, Yukihiko, 4,630,143, Cl. 360-72.200.
Hakala, Douglas T.: *See—*
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Hall, David R., to Megadiamond Industries, Inc. Polycrystalline diamond body with enhanced surface irregularities. 4,629,373, Cl. 407-118.000.
Hall, Dennis: *See—*
Waddell, George M.; and Hall, Dennis, 4,629,178, Cl. 271-251.000.
Hall, John F.: *See—*
Jaworowicz, Stephen W.; and Hall, John F., 4,629,939, Cl. 315-73.000.
Hall, Tawny R.; and Smith, Harry M., to FMC Corporation. Continuous phosphorylation process. 4,629,803, Cl. 558-92.000.
Hallberg, Björn I. C., to Telefonaktiebolaget LM Ericsson. Method and apparatus for verifying personal identification numbers and checking stored number series in identification media. 4,629,872, Cl. 235-380.000.
Halliburton Company: *See—*
Miller, Carl B.; Luke, Robert R.; Smith, Michael L.; and Grigar, Larry L., 4,629,001, Cl. 166-297.000.
Zunkel, Gary D., 4,628,993, Cl. 166-51.000.
Hamada, Akira; Ohira, Keiichi; and Funakoshi, Akira, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing array-type ultrasonic probe. 4,628,573, Cl. 29-25.350.
Hamada, Akira; and Takahashi, Hisao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Electrode terminal structure for a piezoelectric polymer. 4,629,928, Cl. 310-365.000.
Hamada, Yoshinori; Shinomoto, Shoji; Yamada, Isamu; and Koike, Haruo, to Shionogi & Co., Ltd. Process for preparing imidazole derivatives. 4,629,795, Cl. 548-341.000.
Hamamatsu Photonics Kabushiki Kaisha: *See—*
Uchiyama, Toshiyuki; Sugawara, Takeo; Okuyama, Chiyoshi; and Mizushima, Yoshihiko, 4,629,486, Cl. 65-3.150.
Hamblyn, Stephen M. L.: *See—*
Griffith, John T.; Lopez-Cacicedo, Carlos; and Hamblyn, Stephen M. L., 4,629,844, Cl. 219-10.49R.
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., to Quixote Corporation. Optically read recording medium and method for making same. 4,629,668, Cl. 430-11.000.
Hamilton, Brian J., to Sperry Corporation. Position sensor for magnetic suspension and pointing system. 4,629,262, Cl. 310-90.500.
Hamlett, Donald W.: *See—*
Batteas, Elmer L.; and Hamlett, Donald W., 4,628,714, Cl. 70-226.000.
Hamm, David R.: *See—*
Grate, John H.; Hamm, David R.; and Valentine, Donald H., Jr., 4,629,804, Cl. 560-24.000.
Hammerslag, Gary R.: *See—*
Hammerslag, Julius G.; and Hammerslag, Gary R., 4,629,947, Cl. 318-161.000.
Hammerslag, Julius G.; and Hammerslag, Gary R. Electric vehicle drive system. 4,629,947, Cl. 318-161.000.
Hammond, Michael D.; and Taylor, William J. A., to Miles Laboratories, Inc. Method for determining allergic sensitivity. 4,629,706, Cl. 436-513.000.
Hanafin, Joseph W., to Dow Chemical Company, The. Novel 3-halo-2-hydroxyalkyl carbamates. 4,629,791, Cl. 544-387.000.
Handi-Kup Company: *See—*
Durgin, Ronald A., 4,629,088, Cl. 220-254.000.
Haneda, Satoshi: *See—*
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,629,669, Cl. 430-47.000.
Haney, William M., III; and Sullivan, James C., to Fuel Tech, Inc. Method and apparatus for improving combustion, thermal efficiency and reducing emissions by treating fuel. 4,629,472, Cl. 44-51.000.
Hank, Dietrich; Hauer, Kerstin; and Richter, Friedrich, to Veb Kombinant Polygraph "Werner Lamberz" Leipzig. Device for measuring web tension. 4,629,902, Cl. 250-559.000.
Hanovia Limited: *See—*
Bridgen, John D., 4,629,896, Cl. 250-372.000.
Hansa Metallwerke AG: *See—*
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Hansman, Robert J., Jr.: *See—*
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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, to Siemens Gammasonics, Inc. Device for detachably securing a collimator to a radiation detector. 4,629,893, Cl. 250-363.00S.
Harada, Shigeo: *See—*
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; Hatanaka, Isamu; and Harada, Shigeo, 4,629,675, Cl. 430-203.000.
Haraguchi, Shosuke; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera having a motor winding mechanism. 4,629,301, Cl. 354-173.100.
Hardarson, Valdimar. Folding chair. 4,629,245, Cl. 297-16.000.
Harding, Richard J. A. Securing inflatable tubes to rigid hulls. 4,628,854, Cl. 114-345.000.
Harison Electric Company Limited: *See—*
Muraki, Katsuo; Honda, Kiyokazu; and Watanabe, Takaki, 4,630,180, Cl. 362-223.000.
Harlan Manufacturing Company: *See—*
Jacobson, Calvin L., 4,628,840, Cl. 111-7.000.
Harle, Fritz, to Rudolph Wittner GmbH & Co. Windable clockwork for a metronome. 4,629,331, Cl. 368-147.000.
Harman Automotive, Inc.: *See—*
Huddleston, Chester R., 4,628,760, Cl. 74-501.00R.
Harms, Haio: *See—*
Baumgartinger, Josef; Rauch, Ernst; Harms, Haio; and Wimmer, Adalbert, 4,629,867, Cl. 219-469.000.
Harpel, Peter C., to Cornell Research Foundation, Inc. Detecting and distinguishing between plasminogen activators. 4,629,694, Cl. 435-7.000.
Harper, Robert J., Jr., to United States of America, Agriculture. Process for dyeing smooth-dry cellulosic fabric. 4,629,470, Cl. 8-585.000.
Harrington, Horrall; and Vittore, Phillip J. Method and apparatus utilizing inflatable membrane form for construction of concrete shell building. 4,629,592, Cl. 264-32.000.
Harrington, Richard H.; and Krapf, Charles W., to Measuretek, Inc. Weight scale utilizing a capacitative load cell. 4,629,019, Cl. 177-210.00C.
Harris, Duane H.: *See—*
Mawby, Harold S.; and Harris, Duane H., 4,628,699, Cl. 62-137.000.
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., to Merck & Co., Inc. Substituted caprolactam derivatives as antihypertensives. 4,629,787, Cl. 540-528.000.
Harris, Foster R.; and Traister, Martin S., to United States of America, Air Force. Adapter pallet system. 4,629,379, Cl. 410-77.000.
Harris, Frank; and Roberts, Lyn, to Robobar Limited. Hotel room bar with optical sensing system. 4,629,090, Cl. 221-7.000.
Harris, Robert S., to Stant Inc. Fuel filter heat regenerator. 4,629,560, Cl. 210-184.000.
Hart, Edward E.; and Teach, Ted L., to Spectra-Physics, Inc. Grade setting and calibration arrangement for laser beam projection device. 4,629,321, Cl. 356-248.000.
Harvey, Ian J.: *See—*
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Harvey, John W.: *See—*
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Harwood, Leopold A.: *See—*
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Hasegawa, Tadashi; Kobayashi, Yoshiharu; Iwamoto, Akira; and Tedaka, Yoshihisa, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head shifting means for flexible disk memory system. 4,630,155, Cl. 360-106.000.
Hasegawa, Takanori; Yoshida, Shuntaro; and Oshio, Susumu, to Riso Kagaku Corporation. Stencil duplicator providing automatic stencil performation, charging, printing, and disposal. 4,628,813, Cl. 101-116.000.
Hashima, Akio: *See—*
Tomita, Masao; Takeuchi, Akihiro; and Hashima, Akio, 4,630,251, Cl. 369-43.000.
Hashimoto, Kenichiro, to Canon Kabushiki Kaisha. Thermal head. 4,630,073, Cl. 346-76.0PH.
Hashimoto, Kiyoshi; Yamashita, Mitsuo; Tomimori, Kiyoshi; and Nakagawa, Shinji, to Kabushiki Kaisha Toshiba. Sheet reverse apparatus. 4,629,173, Cl. 271-65.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Yamamoto, Hidehiko, to Sharp Kabushiki Kaisha. Key-word retrieval electronic translator. 4,630,235, Cl. 364-900.000.
Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Wind direction changing device. 4,628,801, Cl. 98-40.300.
Hashimoto, Yasuyuki; and Shimizu, Kazuo, to Ancos Co., Ltd. Writing instrument with sealing cap and additional rearward seal. 4,629,348, Cl. 401-107.000.
Hasler, Rolf; and Palacin, Francis, to Sandoz Ltd. Process for exhaust dyeing a textile fiber material: controlled addition of dye or electrolyte. 4,629,465, Cl. 8-400.000.
Hataishi, Osamu: *See—*
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Hatamura, Yotaro. Multi-axis load sensor. 4,628,745, Cl. 73-862.040.

Hatanaka, Isamu: *See—*
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Hatanaka, Shinya: *See—*
Moroi, Akihiko; Tanaka, Hiroshi; and Hatanaka, Shinya, 4,630,182, Cl. 362-294.000.

Hatch, Douglas J.; and Cox, Jeffrey L., to North American Philips Corp. Phase-locked loop capable of generating a plurality of stable frequency signals. 4,629,999, Cl. 331-1.00R.

Hately, Maurice C., to National Research Development Corp. Antenna with unbalanced feed. 4,630,061, Cl. 343-749.000.

Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., to May & Baker Limited. Herbicidal 5-amino-4-cyano-1-phenylpyrazoles. 4,629,495, Cl. 71-92.000.

Hattori, Toshihiro: *See—*
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Hattori, Yoshiyuki: *See—*
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Haubner, Georg; Petermann, Hans; and Zobl, Hartmut, to Robert Bosch GmbH. Vehicle data acquistion and dashboard display system. 4,630,043, Cl. 340-825.570.

Hauer, Kerstin: *See—*
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Hauhinco Maschinenfabrik G. Hausherr, Jochums GmbH & Co. KG: *See—*
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Hawkey, Lynn J.: *See—*
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Hawley, Jack S. X-Y position controller having axially-inclined transducer members. 4,628,755, Cl. 74-471.0XY.

Hayakawa, Yoshihide; Satomura, Masato; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Image forming method. 4,629,676, Cl. 430-203.000.

Hayashi, Kiyoshi; and Kawahara, Yoshihiro, to Mita Industrial Co., Ltd. Image output apparatus for printing an image and comparing image with original. 4,630,129, Cl. 358-296.000.

Hayashi, Yoshitoki, to Kitagawa Industries Co., Ltd. Securing unit. 4,629,356, Cl. 403-408.100.

Haynes, Terence A. Motorcycle front fork assembly. 4,629,205, Cl. 280-277.000.

Hayward Industries, Inc.: *See—*
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Hayward, Walter. Display systems. 4,630,029, Cl. 340-87.000.

Hazeltine Corporation: *See—*
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Heavner, George: *See—*
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Heckenbach, Terry A.; and Gleason, Henry A., III, to Johnson Service Company. Zone condition controller and method of using same. 4,630,221, Cl. 364-505.000.

Heelbo, Inc.: *See—*
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Heffner, Samuel T., to Motorola, Inc. Bias sharing an electronic switch and an active device. 4,629,906, Cl. 307-80.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymer modified polyphenol compositions and thermosettable resins thereof. 4,629,762, Cl. 525-109.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymer modified polyphenol compositions and thermosettable resins thereof. 4,629,763, Cl. 525-132.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymer modified polyphenol compositions and thermosettable resins thereof. 4,629,764, Cl. 525-132.000.

Hege, Heinz: *See—*
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Hehl, Karl. Dual-hopper injection unit for injection molding machine. 4,629,410, Cl. 425-145.000.

Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., to ETD Technology, Inc. Analysis of organic compounds in baths used in the manufacture of printed circuit board using novel chromatographic methods. 4,628,726, Cl. 73-61.10C.

Heine, Charles F.; and Pifer, Richard L., to Dana Corporation. Lightweight ring gear for a differential. 4,628,753, Cl. 74-447.000.

Heinrich, Josef; Casper, Rudolf; and Beck, Manfred, to Bayer Aktiengesellschaft. Process for the production of 2,3-dichlorobutadiene-(1,3). 4,629,816, Cl. 570-229.000.

Helger, Roland: *See—*
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Hell, Walter; and Hillinger, Bruno, to Waagner-Biro AG. Process for the biological treatment of sewage. 4,629,565, Cl. 210-607.000.

Heller, Zindel H.: *See—*
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Hendricks, Udo: *See—*
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Hendrickson, Larry L.: *See—*
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Hendriks, John G. Cabinet drawer bar retaining mechanism. 4,629,263, Cl. 312-216.000.

Hengesbach, Robert W. Flow control nozzle and shutoff valve having screen-carrying passage in rotatable stem. 4,629,121, Cl. 239-119.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
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Henry Dreyfuss Associates: *See—*
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Henry, Joseph P.: *See—*
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Hensel, Arno: *See—*
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Henze, Christopher P., to Sperry Corporation. Power converter with duty ratio quantization. 4,630,187, Cl. 363-41.000.

Hepp, James. Adjustable knockdown tray assembly. 4,628,625, Cl. 40-606.000.

Hepp, Leonard R., to General Electric Company. Flame retarded polyester resin with improved impact strength. 4,629,750, Cl. 523-201.000.

Herder, Robert O.: *See—*
Day, John T.; Herder, Robert O.; and McNatt, Robert B., 4,628,850, Cl. 114-219.000.

Herlihy, Walter C.; and Fraser, Thomas H., to Repligen Corporation. Chromatographic separation of tropicamide O-β-D-glucuronide diastereomers. 4,629,792, Cl. 546-268.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Capelle, Gerd, 4,629,327, Cl. 366-80.000.
Huls, Felipe, 4,629,326, Cl. 366-80.000.

Hermann, Jaun, to Mavilor Systeme SA. Alternating current synchronous servomotor. 4,629,920, Cl. 310-156.000.

Hernandez, Ignacio: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.

Hernandez, Jorge M.: *See—*
Kask, Eugene, deceased; Watson, William A.; and Hernandez, Jorge M., 4,630,179, Cl. 361-306.000.

Herrig, Friedhelm: *See—*
Reissmann, Klaus; and Herrig, Friedhelm, 4,629,058, Cl. 198-461.000.

Herrington, Fox J., to Mobil Oil Corporation. Modular indexing table for a box loading system. 4,628,665, Cl. 53-252.000.

Herrmann, Helga, heiress: *See—*
Eiermann, Albert; Glass, Dieter; and Herrmann, Richard, deceased, 4,629,261, Cl. 310-90.500.

Herrmann, Richard, deceased: *See—*
Eiermann, Albert; Glass, Dieter; and Herrmann, Richard, deceased, 4,629,261, Cl. 310-90.500.

Herron, Gene A.; Nickel, Gerhard E. B.; and Alberghini, Alfred C., to Sewell Plastics Inc. Method of applying roll-on closures. 4,628,669, Cl. 53-425.000.

Hess, Stanley R.; and Tarjan, Peter P., to Cordis Corporation. Mapping electrode assembly. 4,628,937, Cl. 128-642.000.

Hester, Phillip D.; and Johnson, William M., to International Business Machines Corporation. Data processing system with CPU register to register data transfers overlapped with data transfer to and from main storage. 4,630,195, Cl. 364-200.000.

Hewlett-Packard Company: *See—*
Baker, Alan J., 4,630,033, Cl. 340-347.00P.
Smith, Larry J.; and Spaulding, William M., Sr., 4,630,217, Cl. 364-480.000.

Hibi, Kunio: *See—*
Kaneko, Tamaki; and Hibi, Kunio, 4,629,311, Cl. 355-14.0SH.

Hibler, Donald R., Sr., to Fike Metal Products Corporation. Method of affixing an aluminum rupture disc assembly to an aluminum casting. 4,629,861, Cl. 219-137.00R.

Hicks, Charles D., to Rochez Bros., Inc. Air ejector system. 4,628,780, Cl. 83-99.000.

Hidasi, Geza; and Zill, Karl, to Hoechst Aktiengesellschaft. Gear pump having an automatic lubricator. 4,629,405, Cl. 418-102.000.

Higgins, James H.; Bowe, Woodford A.; and Laragione, Robert, to Chemical Data Systems, Inc. Liquid level detection system for high temperature or pressure environments. 4,628,951, Cl. 137-2.000.

Hiji, Yasutake. Method for inhibiting increase in blood sugar content. 4,629,725, Cl. 514-60.000.

Hikimoto, Yasuhiro: *See—*
Asai, Masahiro; and Hikimoto, Yasuhiro, 4,628,891, Cl. 123-599.000.

Hilderbrand, Thomas M.: *See—*
Yoon, Roe-Hoan; and Hilderbrand, Thomas M., 4,629,556, Cl. 209-166.000.

Hiles, James W., to Del City Wire Co., Inc. Trailer electrical connector. 4,629,268, Cl. 339-44.00M.

Hilfinger, Peter, to Braun Aktiengesellschaft. Trimmer for dry shaver. 4,628,606, Cl. 30-34.100.

Hill, Kenneth J.: *See—*
Brasier, Brian D.; Hill, Kenneth J.; and Yonker, John F., 4,629,025, Cl. 180-142.000.

Hill, Nigel, to Dowty Mining Equipment Limited. Shield supports suitable for use in mines. 4,629,368, Cl. 405-296.000.

Hill, Walter J.: *See—*
West, Geoffrey A. W.; and Hill, Walter J., 4,630,306, Cl. 382-21.000.

Hillert, Lars H.; Lindstrom, Jan N.; and Thelin, Anders G., to Santrade Limited. Cutting insert and method of making the same. 4,629,661, Cl. 428-698.000.

Hillinger, Bruno: *See—*
Hell, Walter; and Hillinger, Bruno, 4,629,565, Cl. 210-607.000.

Hilsum, Cyril, to General Electric Company, p.l.c., The. Cathode ray tube display device. 4,630,115, Cl. 358-139.000.

Himmel, Robert L.: *See—*
Farnsworth, Craig A.; Himmel, Robert L.; Sank, Gerald W.; and Stanger, Keith A., 4,628,903, Cl. 126-391.000.

Hines, Andrew D. Apparatus and workpiece fixture for electrostatic spray coating. 4,628,859, Cl. 118-630.000.

Hirabayashi, Teruhiko: *See—*
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Hirai, Hiroyuki: *See—*
Sato, Kozo; Yabuki, Yoshiharu; Kawata, Ken; and Hirai, Hiroyuki, 4,629,684, Cl. 430-559.000.

Hirai, Masazumi: *See—*
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.

Hirai, Shoichi: *See—*
Kobayashi, Tetuo; and Hirai, Shoichi, 4,628,759, Cl. 74-501.50R.

Hiraizumi, Kazuo: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kaneko, Akio; and Nagai, Akihiko, 4,629,561, Cl. 210-198.200.

Hiramatsu, Eiji: *See—*
Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, 4,630,179, Cl. 362-66.000.

Hiramatsu, Shigeki: *See—*
Itoh, Hiroshi; Hiramatsu, Shigeki; Takada, Mitsuru; and Tamura, Tadashi, 4,628,773, Cl. 74-867.000.

Hirano, Takaaki: *See—*
Kamuro, Setsufumi; Hirano, Takaaki; and Okada, Mikiro, 4,630,295, Cl. 377-81.000.

Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, to Victor Company of Japan, Ltd. Control program signal demodulating device. 4,630,231, Cl. 364-900.000.

Hirata, Makizo: *See—*
Fujikawa, Tetsuzo; Hirata, Makizo; Tamba, Shinichi; and Miguchi, Akio, 4,628,876, Cl. 123-192.00B.

Hiratsuka, Seiichiro: *See—*
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,629,669, Cl. 430-47.000.

Hire, Robert C.; and Puig, John E., to Olin Corporation. Thermally stable polyurethane elastomers containing glycoside polyols and a method of producing them. 4,629,768, Cl. 525-458.000.

Hiroshima, Kazuo: *See—*
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,629,212, Cl. 280-707.000.

Hirota, Shinichiro; and Izumitani, Tetsuro, to Hoya Corporation. Method of manufacturing pressed lenses. 4,629,489, Cl. 65-102.000.

Hisano, Atushi, to Omron Tateisi Electronic Co. System for detecting orientation of articles. 4,630,225, Cl. 364-559.000.

Hitachi, Ltd.: *See—*
Amamo, Matsuo; and Sasayama, Takao, 4,630,206, Cl. 364-431.070.
Baba, Shirou, 4,630,207, Cl. 364-431.120.
Honda, Yoshinori; Kitoo, Makoto; and Kokaku, Yuuichi, 4,629,547, Cl. 204-192.150.
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.

Kajimura, Takashi; Kuroda, Takao; Kashiwada, Yasutoshi; Chinone, Naoki; and Aiki, Kunio, 4,630,279, Cl. 372-45.000.

Kimura, Shinjiro; and Toida, Shigeru, 4,628,756, Cl. 74-479.000.

Kuwabara, Takao; and Sakayori, Akihiro, 4,629,393, Cl. 415-1.000.

Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.

Monden, Keishi; Kikkawa, Ryozo; and Horiuchi, Susumu, 4,629,587, Cl. 252-628.000.

Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, 4,628,837, Cl. 110-346.000.

Okuyama, Toshiaki; and Nagase, Hiroshi, 4,629,959, Cl. 318-727.000.

Oyama, Yoshishige; and Osuga, Minoru, 4,629,535, Cl. 204-1.00T.

Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.

Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, 4,630,086, Cl. 357-23.500.

Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, 4,628,616, Cl. 34-78.000.

Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, 4,628,720, Cl. 72-368.000.

Terada, Toshimichi; Kojima, Noboru; and Shibata, Akira, 4,630,132, Cl. 358-310.000.

Todokoro, Hideo; and Fukuhara, Satoru, 4,629,889, Cl. 250-310.000.

Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, 4,629,664, Cl. 429-23.000.

Udo, Shinji; and Tazunoki, Masanori, 4,628,590, Cl. 29-575.000.

Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, 4,630,112, Cl. 358-120.000.

Hitachi Microcomputer Engineering Ltd.: *See—*
Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, 4,630,086, Cl. 357-23.500.
Udo, Shinji; and Tazunoki, Masanori, 4,628,590, Cl. 29-575.000.

Hitachi Sanki Engineering Co., Ltd.: *See—*
Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, 4,628,616, Cl. 34-78.000.

Hochstein, Peter A. Engine and transmission oil degradation and temperature monitor. 4,629,334, Cl. 374-103.000.

Hochtief Aktiengesellschaft vorm. Gebr. Helfmann: *See—*
Babendererde, Siegmund, 4,629,255, Cl. 299-33.000.

Hodge, Gene D.: *See—*
Costes, Michel L.; and Hodge, Gene D., 4,630,267, Cl. 370-104.000.

Hodges, Michael J., to Detexomat Machinery Limited. Apparatus for transporting fabric pieces. 4,628,844, Cl. 112-121.150.

Hodlewsky, Wasyly G.; and Schroeder, Roger H., to Rexnord Inc. Chain link for a product capturing chain. 4,629,063, Cl. 198-853.000.

Hoechst Aktiengesellschaft: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,629,711, Cl. 502-24.000.
Hidasi, Geza; and Zill, Karl, 4,629,405, Cl. 418-102.000.
Schimmel, Gunther; and Gradl, Reinhard, 4,629,614, Cl. 423-321.00R.

Hoechst CeramTec Aktiengesellschaft: *See—*
Groh, Heinrich; and Gradl, Reinhold, 4,629,593, Cl. 264-63.000.

Hofer, Bernd: *See—*
Malek, Samir; and Hofer, Bernd, 4,629,318, Cl. 356-237.000.

Hofer, Gerald; and Laufer, Helmut, to Robert Bosch GmbH. Pressure valve for fuel injection pump. 4,628,957, Cl. 137-493.300.

Hoffmann-La Roche Inc.: *See—*
Burckhardt, Christoph B.; Fehr, Rainer; and Krummenacher, Peter, 4,628,738, Cl. 73-626.000.
Petrzilka, Martin; and Schadt, Martin, 4,629,581, Cl. 252-299.630.

Hohl, G. Burnell; and Calvin, Martin, to Well Made Toy Manufacturing Corp. Voice activated echo generator. 4,630,301, Cl. 381-36.000.

Hokama, Takeo: *See—*
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,629,497, Cl. 71-94.000.

Hoki, Tsuneo; and Matsuki, Yutaka, to Asahi Kasei Kogyo Kabushiki Kaisha. Expandable polyetherimide compositions and foamed materials obtained therefrom. 4,629,745, Cl. 521-87.000.

Hokkaido Electric Power Co., Inc., The: *See—*
Ueno, Tutomu, 4,629,721, Cl. 502-411.000.

Holbein, Hans J.: *See—*
Maurer, Thomas; and Holbein, Hans J., 4,629,215, Cl. 283-94.000.

Holland, John F.: *See—*
Schindler, Melvin S.; and Holland, John F., 4,629,687, Cl. 435-4.000.

Holle, Johannes, to Siemens Aktiengesellschaft. Apparatus for heating a layer of dielectric material using radio frequency waves. 4,629,851, Cl. 219-10.810.

Holly, James R., to GTI Corporation. Linked list search processor. 4,630,234, Cl. 364-900.000.

Holmes, David W.: *See—*
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.

Holmes-Hally Industries, Inc.: *See—*
Folger, Roger J., 4,628,636, Cl. 49-199.000.

Holmgren, Werner; and Jisbrant, Kent, to Werner Holmgren. Method for manufacturing powder-filled tubular welding electrodes and a device for performing the method. 4,629,110, Cl. 228-148.000.

Holmshaw, Richard T.: *See—*
Fairbend, Raymond J.; Holmshaw, Richard T.; and Petley, Colin H., 4,629,881, Cl. 250-213.0VT.

Holodyne Ltd., 1986: *See—*
Adams, Gene W.; and Brosnahan, John W., 4,630,051, Cl. 342-133.000.

Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., to Union Oil Company of California. Boron-containing heterocyclic compounds and lubricating oil containing same. 4,629,580, Cl. 252-49.600.

Holstedt, Richard A.: *See—*
Jessup, Peter J.; Holstedt, Richard A.; and Baron, Kenneth, 4,629,579, Cl. 252-33.600.

Holtham, Roy D.; Falconer, Anthony J.; and Grainger, John F. G., to Coal Industry (Patents) Limited. Ash handling systems for combustion equipment. 4,628,828, Cl. 110-165.00R.

Holzhauer, Anton, to Robert Bosch GmbH. Commutator for dynamo electric machines. 4,629,923, Cl. 310-234.000.

Honda Giken Kogyo K.K.: *See—*
Sakurai, Hidetoshi; and Yakuwa, Masahiko, 4,628,882, Cl. 123-479.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Chisaka, Kazuto; Kushida, Masagoro; Nagayama, Yoshiro; and Yamamoto, Masami, 4,628,764, Cl. 74-625.000.
Ichikawa, Akira, 4,630,065, Cl. 340-995.000.
Inoue, Toshihiro; Ozawa, Kazuhiro; and Kimura, Yoshinobu, 4,629,953, Cl. 318-468.000.
Kato, Shoichi; and Tsukamoto, Teisuke, 4,629,031, Cl. 181-204.000.
Kurihara, Norimitsu; Gotoh, Hiroshi; and Miyake, Junichi, 4,629,471, Cl. 123-198.0DB.
Murayama, Masato, 4,630,160, Cl. 360-137.000.
Nishikawa, Masao; Sakurai, Yoshimi; and Aoki, Takashi, 4,628,767, Cl. 74-731.000.
Nishikawa, Masao; and Sakurai, Yoshimi, 4,628,772, Cl. 74-866.000.
Omagari, Masaharu; Kazikawa, Tsuneo; and Suzuki, Takahumi, 4,629,206, Cl. 180-336.000.
Shimizu, Yasuo, 4,629,952, Cl. 318-432.000.
Tsukiji, Kensuke, 4,629,201, Cl. 280-5.00A.

Honda, Kiyokazu: *See—*
Muraki, Katsuo; Honda, Kiyokazu; and Watanabe, Takaki, 4,630,180, Cl. 362-223.000.

Honda, Yoshinori; Kitoo, Makoto; and Kokaku, Yuuichi, to Hitachi, Ltd. Process for forming protective film of organic polymer and boron. 4,629,547, Cl. 204-192.150.

Honeywell Inc.: *See—*
D'Onofrio, Anthony, 4,630,165, Cl. 361-154.000.
D'Onofrio, Anthony, 4,630,166, Cl. 361-205.000.

Honeywell Information Systems Italia: *See—*
Casamatta, Angelo; and Fossati, Walter, 4,630,041, Cl. 340-825.500.

Hong, Paul O., to B.F. Goodrich Company, The. Process for preparing high bulk density vinyl resins. 4,629,743, Cl. 521-57.000.

Hongo, Yasuo, to Fuji Electric Corporate Research & Development Ltd.; and Fuji Electric Company Ltd. Character reader. 4,630,308, Cl. 382-27.000.

Honma, Hiroyuki: *See—*
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.

Hood, Clarence E., Jr.; Williamson, Robert E.; and Margolin, Amikam, to Clemson University. Bulb, root, and leafy vegetable harvester. 4,629,005, Cl. 171-20.000.

Hoogerkamp, Paul: *See—*
Roddeman, Gerardus J. H.; and Hoogerkamp, Paul, 4,629,177, Cl. 271-240.000.

Hopkins, Thomas M., II: *See—*
Lampton, Robert D., Jr.; and Hopkins, Thomas M., II, 4,629,608, Cl. 423-226.000.

Hori, Isao: *See—*
Amano, Shintetsu; Okada, Hajime; Yakuda, Teruyuki; Hori, Isao; and Mizuhata, Yoshinori, 4,629,946, Cl. 315-219.000.

Hori, Keiichi, to Elm Co. Ltd. Cassette-type printing head. 4,630,075, Cl. 346-140.00R.

Hori, Nobuo; Yokokura, Takashi; and Ohtomo, Fumio, to Tokyo Kogaku Kikai Kabushiki Kaisha. Tilt angle detection device. 4,628,612, Cl. 33-366.000.

Hori, Shigekazu: *See—*
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,630,003, Cl. 331-99.000.

Horibe, Ltd.: *See—*
Uematsu, Hiroaki; Kohno, Takeshi; and Miyazaki, Takeshi, 4,629,744, Cl. 521-62.000.

Horie, Seiji: *See—*
Makino, Naonori; Sano, Kenji; Horie, Seiji; and Sato, Hideo, 4,629,672, Cl. 430-76.000.

Horie, Tsuyoshi. Abacus with each counter held in position by friction or magnetic attraction. 4,629,429, Cl. 434-203.000.

Horii, Kenju: *See—*
Kuroda, Takao; Matsumoto, Shigenori; Horii, Kenju; and Yamada, Takahiro, 4,630,091, Cl. 357-30.000.

Horii, Yasuyuki: *See—*
Omura, Takaho; Horii, Yasuyuki; Fujiwara, Taichi; and Nakata, Masaru, 4,628,768, Cl. 74-745.000.

Horikawa, Kazuo; Tanaka, Hirosi; and Saito, Tokukazu, to Fuji Photo Film Co., Ltd. Radiation image read-out method. 4,629,900, Cl. 250-484.100.

Horine, Graham A., to United States of America, Air Force. Active secondary mirror mount. 4,629,297, Cl. 350-632.000.

Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, to Nippon Aleph Co. Ltd.; and Gestetner International Limited. Multiple-stylus electrode for discharge printing. 4,630,074, Cl. 346-139.00C.

Horio, Kenji; Otsuka, Akira; and Tanioka, Tsuyoshi, to Fujitsu Limited. Gas discharge display panel having capacitively coupled, multiplex wiring for display electrodes. 4,629,942, Cl. 315-169.400.

Horiuchi, Susumu: *See—*
Monden, Keishi; Kikkawa, Ryozo; and Horiuchi, Susumu, 4,629,587, Cl. 252-628.000.

Horn, Herbert: *See—*
Lepach, Werner; and Horn, Herbert, 4,628,676, Cl. 57-266.000.

Horn, Robert, to Geyer, Leslie John, a part interest. Copy lathe. 4,628,975, Cl. 142-7.000.

Horne, Keith E.: *See—*
Seaman, Robert B.; and Horne, Keith E., 4,628,727, Cl. 73-119.00A.

Hosaka, Norio: *See—*
Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, 4,630,112, Cl. 358-120.000.

Hosoya, Masahiro; Uehara, Tsutomu; and Tomura, Shinya, to Kabushiki Kaisha Toshiba. Developing apparatus. 4,628,860, Cl. 118-649.000.

Hoster, Thomas: *See—*
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.

Hotchkiss, Donald R.: *See—*
Kistner, John F.; and Hotchkiss, Donald R., 4,629,667, Cl. 430-11.000.

Howard, Frank C.; and Kiefer, Allan E., to Signode Corporation. Actuating means for fastener driving tool. 4,629,106, Cl. 227-8.000.

Howard, William A., to Savoy Leather Manufacturing Corporation. Cassette carrying container. 4,629,066, Cl. 206-387.000.

Hoya Corporation: *See—*
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Hoylaerts, Marc: *See—*
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Hoyt, John G. Recreational watercraft. 4,628,853, Cl. 114-274.000.

HPM Corporation: *See—*
Myers, Gary L.; and Jagger, Don R., 4,628,983, Cl. 164-7.100.

Hsiao, Wen-Ting; and Everling, Hubertus A., to Trilogy Computer Development Partners, Ltd. Wafer scale integrated circuit testing chuck. 4,628,991, Cl. 165-80.400.

Hsu, Joanna K.: *See—*
Felix, Raymond A.; and Hsu, Joanna K., 4,629,499, Cl. 71-100.000.

Hsu, Michael S. Compact, light-weight, solid-oxide electrochemical converter. 4,629,537, Cl. 204-15.000.

Hsu, Pei-Shun. Window blind. 4,628,979, Cl. 160-115.000.

Huddleston, Chester R., to Harman Automotive, Inc. Remote control rearview mirror and pivot. 4,628,760, Cl. 74-501.00R.

Hudson, Carl W.; and Markley, Gerald E., to Exxon Research and Engineering Company. Hydrofining process. 4,629,553, Cl. 208-212.000.

Huggins, Richard, to Cybergen Systems, Inc. Static charge neutralizing system and method. 4,630,167, Cl. 361-213.000.

Hughes Aircraft Company: *See—*
Clark, William M., Jr.; McKenna, Charles M.; and Johnson, William L., 4,629,931, Cl. 313-362.100.
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
Little, Michael J.; and Dellamano, Harry A., 4,628,939, Cl. 128-696.000.
McMillen, Robert J.; and Rosman, Andrew, 4,630,258, Cl. 370-60.000.

Hughes Tool Company: *See—*
Schraub, John D., 4,628,997, Cl. 166-196.000.

Huls, Felipe, to Hermann Berstorff Maschinenbau GmbH. Pin-barrel extruder having adjustable pins. 4,629,326, Cl. 366-80.000.

Humphrey, John R.; and Reed, John G., to International Packaging Machines, Inc. Variable speed stretch wrapper. 4,628,667, Cl. 53-399.000.

Hunt, James, to Boeing Company, The. Lightning protection fastener. 4,630,168, Cl. 361-218.000.

Hunt, William J. Combination cap and baseball glove. 4,628,543, Cl. 2-19.000.

Hunter Engineering Company: *See—*
January, Daniel B.; and Gender, James R., 4,629,317, Cl. 356-155.000.

Hunting Oilfield Services (UK) Limited: *See—*
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,223, Cl. 285-334.000.
Lumsden, Norman; and McGugan, John D., 4,629,221, Cl. 285-328.000.

Huntington Mechanical Laboratories, Inc.: *See—*
Balter, Valentin, 4,629,219, Cl. 285-184.000.

Hurd, Billy G., to Mobil Oil Corporation. Oil recovery by surfactant-alcohol waterflooding. 4,629,000, Cl. 166-274.000.

Hurley, James R., to Cooper Industries, Inc. Current measuring apparatus. 4,630,218, Cl. 364-481.000.

Hurt, John M.: *See—*
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.

Hussmann Corporation: *See—*
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, 4,628,701, Cl. 62-184.000.

Huston, Mark F., to Manchester Tool Company. Chip-controlling insert. 4,629,372, Cl. 407-116.000.

Hutten, James E., to Ghent Manufacturing Inc. Mounting strip. 4,629,075, Cl. 211-89.000.

Hutter, Wilhelm: *See—*
Osterle, Gerhard; and Hutter, Wilhelm, 4,628,967, Cl. 139-1.00R.

Huynh, Tan Duc: *See—*
Dubuisson, Georges; and Huynh, Tan Duc, 4,630,293, Cl. 377-24.000.

Hydril Company: *See—*
Landriault, L. Steven, 4,629,224, Cl. 285-334.000.

Hydro-Quebec: *See—*
Missout, Gilles; and Dery, Marcel, 4,629,979, Cl. 324-126.000.

Hydro Rene Leduc: *See—*
Porel, Louis-Claude, 4,629,400, Cl. 417-270.000.

Hynds, Philip E.: *See—*
Roberts, Charles G.; and Hynds, Philip E., 4,628,956, Cl. 137-404.000.

I. C. Moller A/S: *See—*
Pedersen, Hans N., 4,629,216, Cl. 285-21.000.

I.S.F. Societa per Azioni: *See—*
Pinza, Mario; and Pfeiffer, Ugo C., 4,629,797, Cl. 548-544.000.

I-Yuan, Houng. Intelligent stand-alone printfile buffer with paging control. 4,630,198, Cl. 364-200.000.

Ichijima, Seiji: *See—*
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,629,683, Cl. 430-390.000.

Ichikawa, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Current location indication apparatus for use in an automotive vehicle. 4,630,065, Cl. 340-995.000.

Ichikoh Industries Limited: *See—*
Chisaka, Kazuto; Kushida, Masagoro; Nagayama, Yoshiro; and Yamamoto, Masami, 4,628,764, Cl. 74-625.000.

Ichinoi, Yutaka; Nishimoto, Naomichi; and Ota, Yoshihiko, to Victor Company of Japan, Limited. Recording signal generation system for color video signal. 4,630,131, Cl. 358-310.000.

Ichinose, Makoto: *See—*
Sugimura, Tatuo; Satoh, Isao; Ichinose, Makoto; and Kuroki, Yuzuru, 4,630,140, Cl. 360-49.000.

Ida, Mitsuru, to Sony Corporation. Compact cassette tape player with capstan drive motor under spindle. 4,630,149, Cl. 360-96.400.

Ide, Kazutaka: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Ide, Toshiaki; Shimozawa, Tohru; and Nishimatsu, Masaharu, to TDK Corporation. Magnetic recording medium. 4,629,646, Cl. 428-143.000.

Ideta, Yasufumi; and Miida, Shigeru, to Nissan Motor Company, Limited. Output gear of automatic transmission. 4,628,754, Cl. 74-467.000.

Iida, Masami: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Iida, Shozo: *See—*
Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, 4,629,713, Cl. 502-84.000.

Iizuka, Chiyokichi. Antiviral substance and the manufacturing method thereof. 4,629,627, Cl. 424-195.100.

Ikai, Takasi: *See—*
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

Ikeda, Goh: *See—*
Banzai, Hideo; Ikeda, Goh; and Omura, Nobukatsu, 4,629,954, Cl. 318-561.000.

Ikemori, Keiji: *See—*
Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, 4,629,294, Cl. 350-427.000.

Ikemoto, Kazuhito; and Terakura, Yukio, to Toyota Jidosha Kabushiki Kaisha. Gear synchronizer for power transmission. 4,628,751, Cl. 74-339.000.

Illinois Tool Works Inc.: *See—*
Lems, Peter, 4,628,666, Cl. 53-398.000.

IMA-Industria Macchine Automatiche-SpA: *See—*
Grazia, Alessandro, 4,628,973, Cl. 141-94.000.

Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, to Daicel Chemical Industries, Ltd. Recovery of tungsten compounds. 4,629,606, Cl. 423-53.000.

Imagunbai, Masana: *See—*
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.

Imai, Isamu; Oshima, Kazuo; and Inada, Norio, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,628,978, Cl. 152-556.000.

Imai, Kenji: *See—*
Kawamura, Kiyomi; Saito, Akinori; Yamada, Masatoshi; Imai, Kenji; and Kimura, Masanobu, 4,629,127, Cl. 239-489.000.

Imai, Satoru: *See—*
Sukeda, Toshiaki; and Imai, Satoru, 4,630,236, Cl. 365-1.000.

Imai, Yuji, to TDK Corporation. Metal layer patterning method. 4,629,539, Cl. 204-129.650.

Imaizumi, Mitsuyuki; and Yoshizaki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Superconductive materials and process for the production thereof. 4,629,515, Cl. 148-11.50F.

Imanishi, Shoichi: *See—*
Fushiya, Mitsuji; Imanishi, Shoichi; and Shiga, Takeo, 4,629,823, Cl. 174-52.00R.

Imoto, Yuzo; Hattori, Yoshiyuki; Takei, Toshihiro; and Tanaka, Taro, to Nippondenso Co., Ltd; and Nippon Soken, Inc. Vehicle braking control apparatus. 4,629,039, Cl. 188-72.100.

Imperial Chemical Industries, plc: *See—*
Candlin, John P.; Caunt, Anthony D.; Kelland, John W.; and Law, Peter L., 4,629,771, Cl. 526-125.000.
Sommerville, John A., 4,629,164, Cl. 239-69.000.

Ims, J. Robert, to Raytheon Company. High speed thermal printing circuit. 4,630,068, Cl. 346-76.0PH.

Imura, Takeshi: *See—*
Osaka, Yukio; Imura, Takeshi; and Nakashita, Toshio, 4,629,649, Cl. 428-209.000.

Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, to Hitachi, Ltd. Elevator control apparatus. 4,629,034, Cl. 187-29.00R.

Inaba, Masao; and Takahashi, Hiroshi, to NEC Corporation. Chromakey signal producing apparatus. 4,630,101, Cl. 358-22.000.

Inada, Norio: *See—*
Imai, Isamu; Oshima, Kazuo; and Inada, Norio, 4,628,978, Cl. 152-556.000.

Inagaki, Shigemi: *See—*
Nakashima, Seiichiro; Inagaki, Shigemi; Ito, Susumu; Naito, Yasuo; and Otsuka, Kazuhisa, 4,628,778, Cl. 82-2.500.

Inatomi, Shoichiro: *See—*
Arai, Mitsuru; Sato, Hideyori; and Inatomi, Shoichiro, 4,628,690, Cl. 60-464.000.

Inazawa, Yoshizumi: *See—*
Tani, Toshiyuki; Inazawa, Yoshizumi; Takahashi, Toshihiko; and Satomura, Shigeyuki, 4,630,142, Cl. 360-70.000.

Inco Alloys International, Inc.: *See—*
Rowsey, James H., 4,629,225, Cl. 285-334.100.

Inculet, Ion I.: *See—*
Plunkett, Robert T.; and Inculet, Ion I., 4,629,119, Cl. 239-63.000.

Informatek - Sopha Medical: *See—*
Mestais, Corinne; Gauthier, Rene ; and Roux, Georges, 4,629,895, Cl. 250-369.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bernardis, Francesco; and Motta, Carlo, 4,629,343, Cl. 400-124.000.
Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, 4,630,077, Cl. 346-140.00R.
Lorenzi, Mario; Ratti, Umberto; and Severini, Arturo, 4,630,199, Cl. 364-200.000.
Scardovi, Alessandro; Fetta, Adriano; and Chiaro, Aldo, 4,630,072, Cl. 346-140.00R.

Ino, Seiichi: *See—*
Nishida, Hiroshi; and Ino, Seiichi, 4,628,852, Cl. 114-270.000.

Inogon Licens AB: *See—*
Bergkvist, Lars A.; and Forsen, Ivan, 4,629,325, Cl. 356-399.000.

Inoue, Hitoshi; Suenaga, Norihiro; Suenaga, Nobuyuki; Sugiyama, Seiji; and Kaneda, Michihiro, to Nippon Infrared Industries, Co., Ltd. Laser device. 4,630,273, Cl. 372-9.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,629,854, Cl. 219-69.00D.
Inoue, Kiyoshi, 4,629,855, Cl. 219-69.00W.
Inoue, Kiyoshi, 4,629,856, Cl. 219-69.00W.

Inoue, Kiyoshi; and Shimizu, Akihiko, to Inoue-Japax Research Incorporated; and Japax Incorporated. TW-electroerosion with means for regulating flushing liquid in cutting slot. 4,629,854, Cl. 219-69.00D.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Electroerosive cutting method and apparatus with a bar-supported electrode tape. 4,629,855, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire backing support EDM method and apparatus. 4,629,856, Cl. 219-69.00W.

Inoue, Masayoshi: *See—*
Kaku, Takashi; Okita, Ryoji; Inoue, Masayoshi; and Kudo, Shozo, 4,630,126, Cl. 358-280.000.

Inoue, Takeo: *See—*
Arai, Masatoshi; Inoue, Takeo; and Yokoo, Koji, 4,629,775, Cl. 528-17.000.

Inoue, Tetsuhiko. Mold inhibitive coated film with powder coating material used. 4,629,645, Cl. 428-141.000.

Inoue, Toshihiro; Ozawa, Kazuhiro; and Kimura, Yoshinobu, to Honda Giken Kogyo Kabushiki Kaisha. Control circuit for sliding roof devices. 4,629,953, Cl. 318-468.000.

Inoue, Yasuo: *See—*
Kitagawa, Hisao; Inoue, Yasuo; Fujihara, Tadafumi; Endo, Itaru; and Shimada, Yoshihiro, 4,629,862, Cl. 219-200.000.

Inoue, Yoichi; and Ishii, Takahiko, to Kabushiki Kaisha Kobe Seiko Sho. Hot isostatic pressing apparatus. 4,629,412, Cl. 425-405.00H.

Institut Francais du Petrole: *See—*
Duret, Pierre, 4,628,888, Cl. 123-531.000.

Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.
Integrated Ionics, Inc.: *See*—
Lauks, Imants R.; and Yankell, Samuel L., 4,629,424, Cl. 433-6.000.
Intengan, Franklin S.: Heller, Zindel H.; and White, Fred K., to American Hospital Supply Corporation. Retractable blade bleeding time device. 4,628,929, Cl. 128-314.000.
Intercontrole Societe Anonyme: *See*—
D'Hondt, Jean-Pierre, 4,630,229, Cl. 364-726.000.
Interface Flooring Systems, Inc.: *See*—
Kyle, Joseph H., 4,629,858, Cl. 219-121.0LJ.
International Business Machines Corporation: *See*—
Brownlow, James M.; and Plaskett, Thomas S., 4,629,662, Cl. 428-432.000.
Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, 4,630,262, Cl. 370-81.000.
Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., 4,630,150, Cl. 360-97.000.
Costes, Michel L.; and Hodge, Gene D., 4,630,267, Cl. 370-104.000.
DiGiacomo, Angela; and Khokhani, Kantilal H., 4,630,219, Cl. 364-488.000.
Fan, Bunsen, 4,629,611, Cl. 423-240.000.
Georgiou, Christos J., 4,630,045, Cl. 340-825.790.
Hester, Phillip D.; and Johnson, William M., 4,630,195, Cl. 364-200.000.
Irvin, David R., 4,630,261, Cl. 370-81.000.
Larsen, Dan B., 4,629,518, Cl. 148-16.500.
Oliver, Burton L.; and Preston, David C., 4,630,194, Cl. 364-200.000.
Overby, Wayne A., 4,629,980, Cl. 324-166.000.
Petit, Dominique A.; and Du Pasquier, Marc P., 4,630,270, Cl. 371-29.000.
Wassel, Edward R.; and Watkins, Gerald J., 4,630,192, Cl. 364-200.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,629,805, Cl. 560-126.000.
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,629,586, Cl. 252-522.00R.
International Gate Devices, Inc.: *See*—
Elko, Dennis J.; and DiMedio, Ronald J., 4,628,638, Cl. 49-426.000.
International Packaging Machines, Inc.: *See*—
Humphrey, John R.; and Reed, John G., 4,628,667, Cl. 53-399.000.
International Security Note & Computer Corporation: *See*—
White, Peter, 4,630,201, Cl. 364-408.000.
Introtek Corporation: *See*—
Dam, Naim, 4,630,245, Cl. 367-93.000.
Ionescu, Marian I.; Lenker, Jay A.; and Yang, Philip S., to Shiley Inc. Alternate stent covering for tissue valves. 4,629,459, Cl. 623-2.000.
Ippolito, Rodolfo M., to Dresser Industries, Inc. Seal and bearing apparatus for bits. 4,629,338, Cl. 384-94.000.
Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Tire supplying apparatus. 4,629,385, Cl. 414-226.000.
Irie, Toshio: *See*—
Kyono, Kazuaki; Kurokawa, Shigeo; Kimura, Hajime; and Irie, Toshio, 4,629,659, Cl. 428-659.000.
Irvin, David R., to International Business Machines Corp. Integrated buffer management and signaling technique. 4,630,261, Cl. 370-81.000.
Ishiguro, Hiroyuki: *See*—
Kojima, Takao; Nakayama, Yutaka; Ishiguro, Hiroyuki; and Yamada, Tetsusyo, 4,629,549, Cl. 204-406.000.
Ishiguro, Mamoru: *See*—
Kosaka, Takao; Ishiguro, Mamoru; and Senoh, Hideaki, 4,630,079, Cl. 346-207.000.
Ishiguro, Nobuharu; and Kurosawa, Akira, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method and apparatus for measuring uranium isotope enrichment. 4,629,600, Cl. 376-257.000.
Ishiguro, Toshiaki: *See*—
Yamashita, Kouichi; Ishiguro, Toshiaki; and Morisawa, Kunio, 4,628,952, Cl. 137-54.000.
Ishihara, Masaki: *See*—
Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,629,045, Cl. 192-0.052.
Ishii, Michio: *See*—
Kawaguchi, Yasuyoshi; and Ishii, Michio, 4,629,758, Cl. 524-495.000.
Ishii, Takahiko: *See*—
Inoue, Yoichi; and Ishii, Takahiko, 4,629,412, Cl. 425-405.00H.
Ishii, Toshiaki: *See*—
Tanahashi, Tooru; Ishii, Toshiaki; and Mitsui, Shuzo, 4,629,035, Cl. 187-29.00R.
Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; and Asami, Kazutomo, to Mitsubishi Denki Kabushiki Kaisha. Refrigerant compressor discharge valve. 4,628,963, Cl. 137-857.000.
Ishikawa, Takayoshi: *See*—
Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, 4,630,074, Cl. 346-139.00C.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, 4,629,362, Cl. 405-146.000.
Nakao, Katsunori, 4,630,281, Cl. 373-71.000.
Ishizaka, Hideo, to Terumo Corp. Electronic clinical thermometer, and method of measuring body temperature. 4,629,336, Cl. 374-169.000.
Ishizu, Hisao: *See*—
Tsukano, Moriyoshi; and Ishizu, Hisao, 4,629,309, Cl. 355-3.0DD.
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, to Sony Corporation. Video signal inverting circuit. 4,630,116, Cl. 358-160.000.
Isowa Industry Company, Ltd.: *See*—
Kanda, Kousaku, 4,629,526, Cl. 156-210.000.
Israel, Yedy; Oporto, Betsavel; and Macdonald, Alain, to Alcoholism & Drug Addiction Research Foundation. Simultaneous matched feeding apparatus. 4,628,866, Cl. 119-51.500.
Isuzu Motors Limited: *See*—
Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,629,045, Cl. 192-0.052.
Ital Idee s.r.l.: *See*—
Cantoni, Maria C., 4,629,479, Cl. 55-274.000.
Ito, Susumu: *See*—
Nakashima, Seiichiro; Inagaki, Shigemi; Ito, Susumu; Naito, Yasuo; and Otsuka, Kazuhisa, 4,628,778, Cl. 82-2.500.
Ito, Takeshi, to Machine Engineering Co., Ltd. Parallel type robot chuck. 4,629,237, Cl. 294-88.000.
Ito, Tosikazu, to Tokai Kogyo Kabushiki Kaisha. Method of making a plastic casing with a conductive film. 4,629,595, Cl. 264-104.000.
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, to Clarion Co., Ltd. Magnetic tape device. 4,630,153, Cl. 360-105.000.
Itoh, Hiroshi; Hiramatsu, Shigeki; Takada, Mitsuru; and Tamura, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling hydraulically-operated continuously variable transmission of belt-and-pulley type. 4,628,773, Cl. 74-867.000.
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Processing silver halide photographic material with blocked agent and hydroxylamine. 4,629,683, Cl. 430-390.000.
Ivanova, Tatyana L.: *See*—
Fedotov, Vladimir M.; Kharchenko, Vladimir P.; Lipovsky, Iosif I.; and Ivanova, Tatyana L., 4,629,107, Cl. 227-19.000.
Ivey, Alma T. Jewelry chain organizer. 4,628,708, Cl. 63-2.000.
Iwaasa, Shuzou: *See*—
Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, 4,629,664, Cl. 429-23.000.
Iwamoto, Akira: *See*—
Hasegawa, Tadashi; Kobayashi, Yoshiharu; Iwamoto, Akira; and Tedaka, Yoshihisa, 4,630,155, Cl. 360-106.000.
Iwanaga, Kazuyoshi, to Nissan Motor Company, Limited. Transmission control system including select shock suppressing arrangement. 4,628,774, Cl. 74-867.000.
Iwano, Fumiyuki: *See*—
Kondo, Yoshihito; Wakabayashi, Shigeru; Iwano, Fumiyuki; and Yoshida, Kiyomi, 4,628,670, Cl. 53-551.000.
Iwaoka, Hideto: *See*—
Akiyama, Koji; and Iwaoka, Hideto, 4,629,886, Cl. 250-237.00G.
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Maemoto, Kazuo, to Fuji Photo Film Co., Ltd. Photopolymerizable materials capable of being developed by a weak alkaline aqueous solution. 4,629,680, Cl. 430-288.000.
Iwata, Tetsuya, to Alps Electric Co., Ltd. Electromagnetic pickup cartridge having elongate core elements. 4,630,253, Cl. 369-136.000.
Izumi Denki Corporation: *See*—
Fujita, Teizo. 4,630,183, Cl. 362-311.000.
Izumitani, Tetsuro: *See*—
Hirota, Shinichiro; and Izumitani, Tetsuro, 4,629,489, Cl. 65-102.000.
Jacobson, Calvin L., to Harlan Manufacturing Company. Combination coulter and fertilizer knife apparatus. 4,628,840, Cl. 111-7.000.
Jacobsson, Kurt A. G., to Aktiebolaget IRO. Yarn-feeding apparatus and method for controlling it. 4,628,710, Cl. 66-132.00T.
Jacoby, John E.; Laemmle, Joseph T.; and Tsai, Mei-Yuan, to Aluminum Company of America. Lithium alloy casting. 4,628,985, Cl. 164-72.000.
Jacquet, Bernard A., to Societe d'Exploitation des Establissements Macroex. Bicycle rack designed for attachment to the luggage carrier of a vehicle. 4,629,104, Cl. 224-324.000.
Jaecker, John A.: *See*—
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., 4,629,718, Cl. 502-241.000.
Jager, Gerhard: *See*—
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.
Jager, Horst, to Bayer Aktiengesellschaft. Triphendioxazine reactive dyestuffs. 4,629,788, Cl. 544-76.000.
Jagger, Don R.: *See*—
Myers, Gary L.; and Jagger, Don R., 4,628,983, Cl. 164-7.100.
Jahn, Dieter: *See*—
Goetz, Norbert; Jahn, Dieter; Reissenweber, Gernot; and Eckhardt, Heinz, 4,629,799, Cl. 549-13.000.
Jakobsen, Nikolai: *See*—
Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, 4,629,014, Cl. 175-220.000.
James, Michael P., to Rohm and Haas Company. Process for preparing bis-bromoalkyl ethers. 4,629,814, Cl. 568-645.000.

Jankowski, Alfons: *See*—
Dohler, Werner; Jankowski, Alfons; and Fehrer, Albert, 4,629,550, Cl. 208-134.000.
Janssen, Wilhelm: *See*—
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.
Jansson, Karl U. H.: *See*—
Yttergren, Erik S.; Strand, Urban R. A.; Jansson, Karl U. H.; and Knipstrom, Karl-Erik, 4,629,853, Cl. 219-60.00A.
January, Daniel B.; and Gender, James R., to Hunter Engineering Company. Vehicle wheel alignment apparatus. 4,629,317, Cl. 356-155.000.
Janusch, Alois; Mayer, Franz W.; and Tessmer, Gero, to Voest-Alpine Aktiengesellschaft. Drying plant for brown coals of high water content. 4,628,619, Cl. 34-180.000.
Janz, Helmut; Rodi, Fritz; Soppe, Alfred; and Rademachers, Jakob, to Bayer Aktiengesellschaft. Use of novel rotary tubular kiln. 4,629,500, Cl. 75-0.5BA.
Japan Oxygen Co., Ltd.: *See*—
Tsuchiya, Yuji; and Ando, Hiroshi, 4,629,157, Cl. 251-96.000.
Japan Storage Battery Company Limited: *See*—
Yonezu, Kunio; and Asai, Kenji, 4,629,622, Cl. 429-57.000.
Japax Incorporated: *See*—
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,629,854, Cl. 219-69.00D.
Jartoux, Pierre, to Freyssinet International. Cable anchorage devices and processes for forming same. 4,628,649, Cl. 52-223.00L.
Jaworowicz, Stephen W.; and Hall, John F., to North American Philips Lighting Corporation. Discharge lamp with automatic shut off. 4,629,939, Cl. 315-73.000.
Jean Walterscheid GmbH: *See*—
Post, Alexander; Nienhaus, Clemens; and Kampf, Klaus, 4,629,044, Cl. 192-28.000.
Jensen, Clemens J.; and Westmoreland, Wyman R., to Princeton Packaging, Inc. Distributing device. 4,629,057, Cl. 198-424.000.
Jensen, John D. Hinge adapter kit for open-bed vehicular enclosures. 4,629,243, Cl. 296-100.000.
Jessup, Peter J.; Holstedt, Richard A.; and Baron, Kenneth, to Union Oil Company of California. Boron derivatives. 4,629,579, Cl. 252-33.600.
Jessup, Peter J.: *See*—
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., 4,629,580, Cl. 252-49.600.
Jevons, Lyle O., Jr.: *See*—
Loskorn, Richard A.; and Jevons, Lyle O., Jr., 4,630,232, Cl. 364-900.000.
Jisbrant, Kent: *See*—
Holmgren, Werner; and Jisbrant, Kent, 4,629,110, Cl. 228-148.000.
Jogan, Michael J.; Kermode, Kevin T.; Romick, Tom L.; and Stephen, Ken L., to Stouffer Corporation, The. Effluent sampler. 4,628,748, Cl. 73-863.010.
Johannsen, Hans-Peter. Belt sander apparatus. 4,628,640, Cl. 51-141.000.
Johansson, Jan H., to Telefonaktiebolaget L.M. Ericsson. Switching convertor for generating a constant magnitude dc output voltage from a dc input voltage having a varying magnitude. 4,629,970, Cl. 323-285.000.
Johnsen & Jorgensen (Plastics) Limited: *See*—
McLaren, Kevin W., 4,629,081, Cl. 215-206.000.
Johnson, Chris G.: *See*—
Genaro, Donald M.; Johnson, Chris G.; and Tilley, Alvin R., 4,629,276, Cl. 339-103.00R.
Johnson, David A. Protective retainer for a magazine. 4,628,627, Cl. 42-90.000.
Johnson, David D.: *See*—
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,629,079, Cl. 212-98.000.
Johnson, Glenn W., Jr. Pneumatic arm band for localized arm pressure. 4,628,918, Cl. 128-90.000.
Johnson, Glenn W., Jr. Inflatable ankle brace with porous compressible filler. 4,628,945, Cl. 128-80.00H.
Johnson, Joel S.: *See*—
Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., 4,630,150, Cl. 360-97.000.
Johnson, Joseph L., Jr.; and White, E. Richard, to United States of America, National Aeronautics and Space Administration. Over-the-wing propeller. 4,629,147, Cl. 244-55.000.
Johnson, Marvin F. L.: *See*—
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., 4,629,718, Cl. 502-241.000.
Johnson, Marvin M.: *See*—
Shyr, Yen-Shin; Bobsein, Rex L.; and Johnson, Marvin M., 4,629,767, Cl. 525-339.000.
Johnson, Richard G.: *See*—
Jurgens, Raymond W., Jr.; Johnson, Richard G.; and Nadler, Leroy R., 4,628,969, Cl. 141-1.000.
Johnson, Robert H., to Motorola, Inc. Dual purpose guidance system for a guided missile. 4,630,050, Cl. 342-62.000.
Johnson, Ronald C.: *See*—
Zimlich, William C.; Fraeyman, Julius P.; and Johnson, Ronald C., 4,629,232, Cl. 293-128.000.
Johnson Service Company: *See*—
Heckenbach, Terry A.; and Gleason, Henry A., III, 4,630,221, Cl. 364-505.000.
Johnson, William L.: *See*—
Clark, William M., Jr.; McKenna, Charles M.; and Johnson, William L., 4,629,931, Cl. 313-362.100.
Johnson, William M.: *See*—
Hester, Phillip D.; and Johnson, William M., 4,630,195, Cl. 364-200.000.
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., to Atlantic Richfield Company. Alkali promoted manganese oxide compositions containing silica and/or alkaline earth oxides. 4,629,718, Cl. 502-241.000.
Jones, Donald N.: *See*—
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,222, Cl. 285-332.400.
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,223, Cl. 285-334.000.
Jones, Grover W. Rotary cutter. 4,628,672, Cl. 56-295.000.
Jones, J. Paul. Escapement device. 4,629,099, Cl. 222-453.000.
Jones, James P., Jr.: *See*—
Correll, Harold E.; Fulmer, William P.; and Jones, James P., Jr., 4,628,953, Cl. 137-74.000.
Jones, Paul W.; Merry, Rodney J.; and Hakala, Douglas T., to Physio-Control Corporation. Defibrillator adapted for use with accessory cassettes. 4,628,935, Cl. 128-419.00D.
Jones, Taylor L.; Bunch, Paul D.; and Stevens, Russell E., to Cameron Iron Works, Inc. Gate valve. 4,629,161, Cl. 251-328.000.
Jones and Vining, Incorporated: *See*—
Goguen, Peter J., 4,629,583, Cl. 252-301.350.
Jones, William H.: *See*—
Myers, Timothy S.; and Jones, William H., 4,629,252, Cl. 297-366.000.
Jones, William L., to Vetter Products, Inc. Soft saddle bag with rigid reinforcing insert. 4,629,040, Cl. 190-102.000.
Joniec, George W., to Process Alternatives & Combustion, Inc. Coupler and manifold assembly with differential vacuum seal means. 4,629,196, Cl. 277-3.000.
Jonker, Simon: *See*—
Gawron, Klaus; Jonker, Simon; Schroder, Johann; and De Weerdt, Henk V., 4,630,023, Cl. 337-407.000.
Jordan, Alfons: *See*—
Krude, Werner; and Jordan, Alfons, 4,629,028, Cl. 180-259.000.
Jordan, Mark A. Vapor concentration control. 4,630,038, Cl. 340-632.000.
Jordan, R. Paul: *See*—
Langer, Sheldon; Wernick, Justin; and Jordan, R. Paul, 4,628,936, Cl. 128-614.000.
Jordon, Joel S.: *See*—
Leitz, Christopher R.; Jordon, Joel S.; and Dalton, Michael S., 4,629,572, Cl. 210-714.000.
Jourdan, Charles. Internal combustion engine exhaust system. 4,628,689, Cl. 60-295.000.
Juang, Jie-Young: *See*—
Wah, Benjamin W.; and Juang, Jie-Young, 4,630,264, Cl. 370-85.000.
Judge, Alfred H., to Black & Decker, Inc. Mechanical stapler frame and cover assembly. 4,629,108, Cl. 227-132.000.
Judy, Herman L.: *See*—
Judy, Robert H.; and Judy, Herman L., 4,629,171, Cl. 269-37.000.
Judy, Robert H.; and Judy, Herman L., to Du Pont de Nemours, E. I., and Company. Portable jig for assembling prefabricated building structures. 4,629,171, Cl. 269-37.000.
Jujo Paper Co., Ltd.: *See*—
Satake, Toshimi; Kimura, Yoshihide; Minami, Toshiaki; and Fujimura, Fumio, 4,630,080, Cl. 346-209.000.
Jung, Guenter: *See*—
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,629,893, Cl. 250-363.00S.
Jurgens, Gunter: *See*—
Gaus, Hermann; Jurgens, Gunter; Frotschner, Eberhard; and Rub, Winfried, 4,629,042, Cl. 192-3.250.
Jurgens, Raymond W., Jr.; Johnson, Richard G.; and Nadler, Leroy R., to Mallinckrodt, Inc. Method of producing prefilled sterile plastic syringes. 4,628,969, Cl. 141-1.000.
Juricich, Ronald A.; and Sleeman, Ralph V. Fuel tax rebate recorder. 4,630,292, Cl. 377-20.000.
Juso, Hiromi; Sudoh, Kengo; and Haikawa, Yukihiko, to Sharp Kabushiki Kaisha. Magnetic recording and reproducing device. 4,630,143, Cl. 360-72.200.
Kabelmetal Electro GmbH: *See*—
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, 4,629,522, Cl. 156-48.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Inoue, Yoichi; and Ishii, Takahiko, 4,629,412, Cl. 425-405.00H.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Arai, Mitsuru; Sato, Hideyori; and Inatomi, Shoichiro, 4,628,690, Cl. 60-464.000.
Otaka, Hideo, 4,630,205, Cl. 364-424.000.
Yajima, Toshio, 4,628,578, Cl. 29-407.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Kitamura, Yoshio, 4,629,439, Cl. 446-300.000.
Kabushiki Kaisha Sanyo Denki Seisakusho: *See*—
Amano, Shintetsu; Okada, Hajime; Yakuda, Teruyuki; Hori, Isao; and Mizuhata, Yoshinori, 4,629,946, Cl. 315-219.000.
Kabushiki Kaisha Toshiba: *See*—
Futaki, Ippei, 4,629,342, Cl. 400-121.000.
Gokita, Masami, 4,630,128, Cl. 358-296.000.

Hashimoto, Kiyoshi; Yamashita, Mitsuo; Tomimori, Kiyoshi; and Nakagawa, Shinji, 4,629,173, Cl. 271-65.000.
Hosoya, Masahiro; Uehara, Tsutomu; and Tomura, Shinya, 4,628,860, Cl. 118-649.000.
Momodomi, Masaki, 4,630,087, Cl. 357-23.500.
Muraki, Katsuo; Honda, Kiyokazu; and Watanabe, Takaki, 4,630,180, Cl. 362-223.000.
Ogura, Mitsugi; and Momodomi, Masaki, 4,630,088, Cl. 357-23.600.
Ohmori, Kazunori; and Kawai, Kensuke, 4,630,189, Cl. 364-150.000.
Osawa, Shigenobu; Murakami, Tamotsu; Mizuma, Takashi; and Sano, Katsuhide, 4,629,673, Cl. 430-108.000.
Tokita, Kiyoshi, 4,629,932, Cl. 313-402.000.
Wakisaka, Yukinori; and Miyano, Toshiyuki, 4,629,174, Cl. 271-186.000.
Yamanaka, Junichi, 4,630,103, Cl. 358-33.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Morita, Takayuki; Tanaka, Akira; Tsunekawa, Takahiko; and Amano, Hisao, 4,628,684, Cl. 57-263.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Fukushima, Yoshiaki, 4,629,507, Cl. 106-74.000.
Kawamura, Kiyomi; Saito, Akinori; Yamada, Masatoshi; Imai, Kenji; and Kimura, Masanobu, 4,629,127, Cl. 239-489.000.

Kadin, Alan M.; and Burkhardt, Robert W., to Energy Conversion Devices, Inc. Multilayer depth profile method. 4,629,536, Cl. 204-1.00T.

Kadomatsu, Shigenari: *See*—
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Kadomatsu, Shigeru, deceased (by Kadomatsu, Tamie, Nozomi Kadomatsu, heirs), to Ricoh Company, Ltd. Compact facsimile machine. 4,630,123, Cl. 358-256.000.

Kadomatsu, Tamie, Nozomi Kadomatsu, heirs: *See*—
Kadomatsu, Shigeru, deceased, 4,630,123, Cl. 358-256.000.

Kadota, Shozo: *See*—
Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, 4,628,595, Cl. 29-741.000.

Kadunce, Leo, to Steeltin Can Corporation. Method and machine for convolute or spiral winding of composite materials. 4,629,529, Cl. 156-428.000.

Kaesgen, Juergen, to MTD Products Inc. Tractor wheel drive control. 4,628,757, Cl. 74-481.000.

Kagawa, Yuri: *See*—
Sakimae, Akihiro; Kagawa, Yuri; Numazawa, Ryozo; and Onishi, Hisao, 4,629,701, Cl. 435-130.000.

Kage, Kouzou, to NEC Corporation. Squelch signal generator capable of generating a squelch signal with a high reliability. 4,630,290, Cl. 375-104.000.

Kailus, William A., to Allied Corporation. Electrical connector with environmental seal. 4,629,269, Cl. 339-59.00M.

Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Tokyo Electric Power Co., Inc., The. Shield tunneling machine. 4,629,362, Cl. 405-146.000.

Kaiser Steel Corporation: *See*—
Williamson, Calvin C., 4,628,721, Cl. 72-370.000.

Kajimura, Takashi; Kuroda, Takao; Kashiwada, Yasutoshi; Chinone, Naoki; and Aiki, Kunio, to Hitachi, Ltd. Buried heterojunction laser. 4,630,279, Cl. 372-45.000.

Kakemizu, Hiroshi: *See*—
Kubota, Mitsugi; and Kakemizu, Hiroshi, 4,629,501, Cl. 75-69.000.

Kaku, Takashi; Okita, Ryoji; Inoue, Masayoshi; and Kudo, Shozo, to Fujitsu Limited; and Ricoh Company, Ltd. Method of signal transmission with selected signal transmission rate. 4,630,126, Cl. 358-280.000.

Kameyama, Toru; and Asano, Junichi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,629,172, Cl. 271-9.000.

Kameyama, Yutaka: *See*—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Kameyama, Yutaka, 4,629,542, Cl. 204-72.000.

Kamiya, Osamu, to Canon Kabushiki Kaisha. Photochemical vapor deposition apparatus. 4,628,862, Cl. 118-724.000.

Kampf, Klaus: *See*—
Post, Alexander; Nienhaus, Clemens; and Kampf, Klaus, 4,629,044, Cl. 192-28.000.

Kamuro, Setsufumi; Hirano, Takaaki; and Okada, Mikiro, to Sharp Kabushiki Kaisha. Low power consumption CMOS shift register. 4,630,295, Cl. 377-81.000.

Kamyr, Inc.: *See*—
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., 4,629,502, Cl. 75-118.00R.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. System for recording and reproducing multiplex information. 4,630,134, Cl. 358-343.000.

Kanao, Shiro. Synthetic resin pipe for underground use. 4,628,966, Cl. 138-122.000.

Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Radical polymerizing composition and anaerobic liquid gasket composed thereof. 4,629,755, Cl. 524-415.000.

Kanazawa, Minoru: *See*—
Asai, Takamitsu; Fujiyama, Masaaki; Kanazawa, Minoru; and Aoki, Nobuo, 4,629,653, Cl. 428-328.000.

Kanda, Kousaku, to Isowa Industry Company, Ltd. Method of and means for replacing corrugating rolls in a single facer. 4,629,526, Cl. 156-210.000.

Kaneda, Michihiro: *See*—
Inoue, Hitoshi; Suenaga, Norihiro; Suenaga, Nobuyuki; Sugiyama, Seiji; and Kaneda, Michihiro, 4,630,273, Cl. 372-9.000.

Kaneko, Akio: *See*—
Shirato, Kozo; Hiraizumi, Kazuo; Kaneko, Akio; and Nagai, Akihiko, 4,629,561, Cl. 210-198.200.

Kaneko, Kenji: *See*—
Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, 4,630,231, Cl. 364-900.000.

Kaneko, Tamaki; and Hibi, Kunio, to Ricoh Company, Ltd. Automatic document feeder. 4,629,311, Cl. 355-14.0SH.

Kanemaru, Yukihiro: *See*—
Matsuo, Masayoshi; Takagishi, Kazuhiro; Tobita, Kouji; and Kanemaru, Yukihiro, 4,629,043, Cl. 192-4.00A.

Kang, George S.; Everett, Stephanie S.; and Thornhill, Alexander F., to United States of America, Navy. Front-end processor for narrowband transmission. 4,630,300, Cl. 381-31.000.

Kanno, Michio, to Terumo Kabushiki Kaisha. Medical instrument. 4,629,455, Cl. 604-241.000.

Kanno, Tetuo: *See*—
Suzaki, Masayuki; and Kanno, Tetuo, 4,629,345, Cl. 400-208.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Yonese, Naoki; Omatsu, Masayuki; and Kondo, Mitsuru, 4,629,800, Cl. 549-226.000.

Kapicak, Louis A.: *See*—
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.

Kariya, Shigeo: *See*—
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,629,212, Cl. 280-707.000.

Karl M. Reich Maschinenfabrik GmbH: *See*—
Fuchs, Rudolf, 4,628,604, Cl. 30-390.000.

Karl Mengele & Sohne: *See*—
Geiger, Edgar, 4,629,883, Cl. 250-221.000.

Karlberg, Rolf E.: *See*—
Carlsson, Per-Oloy A. V.; Karlberg, Rolf E.; and Falkvall, Thore E., 4,629,448, Cl. 604-4.000.

Karlovits, Frank K.: *See*—
Needham, Thomas P.; and Karlovits, Frank K., 4,628,698, Cl. 62-137.000.

Karow, Peter, to URW Unternehmensberatung Karow Rubow Weber GmbH. Method and apparatus for automatic digitizing of contour lines. 4,630,309, Cl. 382-56.000.

Karr, Dieter: *See*—
Bruggen, Gerhard; Karr, Dieter; Rottler, Wolfgang; and Brauer, Ilan, 4,628,739, Cl. 73-702.000.

Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, to Fujitsu Limited; and Isuzu Motors Limited. Automatic clutch control system. 4,629,045, Cl. 192-0.052.

Kasai, Naomi, to Nippon Thompson Co., Ltd. Piggyback rolling-contact bearing assembly. 4,629,260, Cl. 384-49.000.

Kasbohm, Martin L. Heat recovery system. 4,629,117, Cl. 237-55.000.

Kashiwada, Yasutoshi: *See*—
Kajimura, Takashi; Kuroda, Takao; Kashiwada, Yasutoshi; Chinone, Naoki; and Aiki, Kunio, 4,630,279, Cl. 372-45.000.

Kask, Ester M., executrix: *See*—
Kask, Eugene, deceased; Watson, William A.; and Hernandez, Jorge M., 4,630,170, Cl. 361-306.000.

Kask, Eugene, deceased (by Kask, Ester M., executrix); Watson, William A.; and Hernandez, Jorge M., to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,630,170, Cl. 361-306.000.

Kataczynski, Nachman, to Urdan Industries Ltd. Shock absorber. 4,629,154, Cl. 248-610.000.

Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Photoconductive film of azulenium salt and electrophotographic photosensitive member. 4,629,670, Cl. 430-58.000.

Katakura, Masayuki, to Sony Corporation. Variable emphasis circuit. 4,629,995, Cl. 330-149.000.

Katamune, Tetsuhiro: *See*—
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Kataoka, Hiroshi. Apparatus for joining sheet ends. 4,629,531, Cl. 156-504.000.

Kataoka, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing molded thermoplastic resin. 4,629,650, Cl. 428-213.000.

Kataoka, Ryuji, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system. 4,628,883, Cl. 123-489.000.

Katayama, Kaneo, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner. 4,628,707, Cl. 62-280.000.

Kato, Manabu: *See*—
Aoyama, Shunichi; Fujii, Hiroshi; and Kato, Manabu, 4,628,880, Cl. 123-432.000.

Kato, Namio; and Takeda, Tadao, to TDK Corporation. Induction cooking apparatus having a ferrite coil support. 4,629,843, Cl. 219-10.49R.

Kato, Shinichi; Saito, Yoji; and Umemoto, Hiroshi, to Nissan Motor Co., Ltd.; and Yazaki Corporation. Fitting indicating mechanism in screw type connector housings. 4,629,351, Cl. 403-27.000.

Kato, Shoichi; and Tsukamoto, Teisuke, to Honda Giken Kogyo Kabushiki Kaisha. Soundproof engine-operated machine. 4,629,031, Cl. 181-204.000.

Kato, Toshinobu: *See*—
Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, 4,628,758, Cl. 74-498.000.

Kato, Yuji: *See*—
Suzuki, Yutaka; and Kato, Yuji, 4,629,915, Cl. 307-522.000.

Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Element for diffusion transfer with stripping layer of crosslinked polymer from ethenically unsaturated carboxylic acid or salt thereof. 4,629,677, Cl. 430-215.000.

Katsuda, Kimio: *See*—
Tsukamoto, Shin-ichi; Nagano, Yoshinobu; and Katsuda, Kimio, 4,629,736, Cl. 514-563.000.

Katsumoto, Naoaki: *See*—
Tezuka, Takeshi; Owada, Akira; and Katsumoto, Naoaki, 4,629,250, Cl. 297-362.000.

Kauffman, Lexie A. Commode lid locking device. 4,628,546, Cl. 4-253.000.

Kaufman, Lance R. Circuit package with external circuit board and connection. 4,630,174, Cl. 361-388.000.

Kawabata, Takashi: *See*—
Sato, Yuichi; Tsunekawa, Tokuichi; Kawabata, Takashi; and Matsumura, Susumu, 4,629,877, Cl. 250-201.000.

Kawaguchi, Kizo; and Matsuda, Teruo, to Osaka Seiki Kabushiki Kaisha. Honing stone exchanger for use with superfinishing machines. 4,628,587, Cl. 29-568.000.

Kawaguchi, Yasuyoshi; and Ishii, Michio, to Bridgestone Corporation. Adhesive for rubber compounds. 4,629,758, Cl. 524-495.000.

Kawahara, Yoshihiro: *See*—
Hayashi, Kiyoshi; and Kawahara, Yoshihiro, 4,630,129, Cl. 358-296.000.

Kawai, Kensuke: *See*—
Ohmori, Kazunori; and Kawai, Kensuke, 4,630,189, Cl. 364-150.000.

Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; Amemiya, Yoichi; and Kawamura, Hideaki, 4,629,956, Cl. 318-625.000.

Kawamura, Kiyomi; Saito, Akinori; Yamada, Masatoshi; Imai, Kenji; and Kimura, Masanobu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Intermittent swirl type injection valve. 4,629,127, Cl. 239-489.000.

Kawamura, Takashi: *See*—
Sugie, Toshinori; Kobata, Fumihiro; and Kawamura, Takashi, 4,629,778, Cl. 528-388.000.

Kawamura, Yasuo: *See*—
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

Kawamura, Yuzi: *See*—
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

Kawasaki Jukogy Kabushiki Kaisha: *See*—
Ogata, Seishi; Arima, Keizi; and Ohtsuki, Masahiro, 4,629,166, Cl. 266-158.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; Tamba, Shinichi; and Miguchi, Akio, 4,628,876, Cl. 123-192.00B.
Nishida, Hiroshi; and Ino, Seiichi, 4,628,852, Cl. 114-270.000.
Nishida, Hiroshi, 4,628,855, Cl. 114-364.000.

Kawasaki, Kikuo; Sano, Tomomi; and Yamamoto, Hitoshi, to Fuji Electric Co., Ltd. Wired commodity vending system. 4,630,042, Cl. 340-825.350.

Kawasaki, Masahiro: *See*—
Suzuki, Koji; Kawasaki, Masahiro; and Aoki, Harumi, 4,630,121, Cl. 358-227.000.

Kawasaki Steel Corporation: *See*—
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,223, Cl. 285-334.000.
Kyono, Kazuaki; Kurokawa, Shigeo; Kimura, Hajime; and Irie, Toshio, 4,629,659, Cl. 428-659.000.

Kawase, Kaoru: *See*—
Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, 4,629,713, Cl. 502-84.000.

Kawashima, Tooru: *See*—
Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.

Kawata, Ken: *See*—
Sato, Kozo; Yabuki, Yoshiharu; Kawata, Ken; and Hirai, Hiroyuki, 4,629,684, Cl. 430-559.000.

Kaya, Feyyaz. Exercise device. 4,629,180, Cl. 272-93.000.

Kazikawa, Tsuneo: *See*—
Omagari, Masaharu; Kazikawa, Tsuneo; and Suzuki, Takahumi, 4,629,206, Cl. 180-336.000.

Kearney & Trecker Corporation: *See*—
Dailey, Frank E., 4,629,053, Cl. 198-346.100.

Keast, Lawrence J. Modified musical instrument keyboard. 4,628,792, Cl. 84-451.000.

Keenan, James P., to GTE Products Corporation. Tungsten-halogen lamp with organic and inorganic getters. 4,629,935, Cl. 313-579.000.

Keirsey, James L., to United States of America, Navy. Solid fuel ramjet flow control device. 4,628,688, Cl. 60-251.000.

Kelemen, Donald D.: *See*—
Amstutz, Douglas D.; and Kelemen, Donald D., 4,629,076, Cl. 211-94.000.

Kelland, John W.: *See*—
Candlin, John P.; Caunt, Anthony D.; Kelland, John W.; and Law, Peter L., 4,629,771, Cl. 526-125.000.

Kelly, Arnold J., to Exxon Research and Engineering Company. Charge injection device. 4,630,169, Cl. 361-225.000.

Kelly, Robert R.; and Smith, Morley S., to Borg-Warner Corporation. Pressure-biased, temperature sensor. 4,630,028, Cl. 340-60.000.

Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., to General Electric Company. Fabricated liner article and method. 4,628,694, Cl. 60-752.000.

Kemp, Richard A., to Shell Oil Company. Process for producing narrow-pore catalyst supports. 4,629,716, Cl. 502-208.000.

Kendall, Giles A., to Menasco Inc. Rotary actuator. 4,628,797, Cl. 92-120.000.

Kennametal Inc.: *See*—
Torgent, Douglas E.; and Mitchell, Robert N., 4,629,370, Cl. 407-29.000.

Kennedy, Kevin J., to AT&T Information Systems. Induced flow heat exchanger. 4,628,992, Cl. 165-123.000.

Kennedy, Weldon C., Jr., to Dowell Schlumberger Incorporated. Removal of iron from chelant solutions. 4,629,570, Cl. 210-666.000.

Kerbow, Dewey L., to Du Pont de Nemours, E. I., and Company. Heat reflective polymer blends. 4,629,756, Cl. 524-440.000.

Kercher, Paul W., to Scientific Systems, Inc. Pulse dampener. 4,629,562, Cl. 210-198.200.

Kermode, Kevin T.: *See*—
Jogan, Michael J.; Kermode, Kevin T.; Romick, Tom L.; and Stephen, Ken L., 4,628,748, Cl. 73-863.010.

Kern, Reinhard; Krauss, Gerhard; and Schlosser, Helmut, to Siemens Aktiengesellschaft. Electric hearing aid. 4,629,833, Cl. 381-68.200.

Kernstock, John M., to Dow Chemical Company, The. Dimensionally stable carpet tiles having greige good adhered to wet-laid composite sheet. 4,629,642, Cl. 428-95.000.

Kerr-McGee Coal Corporation: *See*—
Campbell, John A. L.; Baldwin, Carl L.; Foley, David J.; and McHann, Michael R., 4,629,392, Cl. 414-786.000.

Kerr-McGee Corporation: *See*—
Gir, Srikant; and Rhodes, Donald E., 4,629,554, Cl. 208-415.000.

Khakoo, Murtadha A.: *See*—
Srivastava, Santosh K.; and Khakoo, Murtadha A., 4,629,937, Cl. 315-3.000.

Khanna, Pyare, to Syntex (U.S.A.) Inc. Sensitivity in fluorescence assays in icteric samples. 4,629,693, Cl. 435-7.000.

Kharchenko, Vladimir P.: *See*—
Fedotov, Vladimir M.; Kharchenko, Vladimir P.; Lipovsky, Iosif L.; and Ivanova, Tatyana L., 4,629,107, Cl. 227-19.000.

Khera, Muhammad I., to GTE Communication Systems Corporation. Anti-mutilation circuit for protecting dynamic memory. 4,630,197, Cl. 364-200.000.

Khokhani, Kantilal H.: *See*—
DiGiacomo, Angela; and Khokhani, Kantilal H., 4,630,219, Cl. 364-488.000.

Khuramshin, Talgat Z.: *See*—
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

Kiefer, Allan E.: *See*—
Howard, Frank C.; and Kiefer, Allan E., 4,629,106, Cl. 227-8.000.

Kieslich, Walter G., to Transducer Systems, Inc. Apparatus for detecting motion and direction using magnetoresistive sensors producing sum and difference signals. 4,629,982, Cl. 324-208.000.

Kijima, Naoto: *See*—
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,629,618, Cl. 423-625.000.

Kikkawa, Ryozo: *See*—
Monden, Keishi; Kikkawa, Ryozo; and Horiuchi, Susumu, 4,629,587, Cl. 252-628.000.

Kikuchi, Akihiro, to Sony Corporation. Apparatus for controlling the frequency of a voltage controlled oscillator. 4,630,000, Cl. 331-11.000.

Kikuchi, Makoto: *See*—
Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, 4,628,837, Cl. 110-346.000.

Kikuchi, Rokuro: *See*—
Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, 4,628,720, Cl. 72-368.000.

Kilby, Robert D., to Michigan Special Products, Inc. Surge tank for air-conditioning compressor. 4,628,704, Cl. 62-296.000.

Kilstofte, Richard B., to T.A.D. Avanti, Inc. Mechanical drive mechanism for the record/playback head and pinch roller of a cassette-type telephone answering machine. 4,630,152, Cl. 360-105.000.

Kim, Ho. Self operative cooling mechanism of can. 4,628,703, Cl. 62-294.000.

Kimball International, Inc.: *See*—
Buchla, Donald F., 4,628,785, Cl. 84-1.100.
Buchla, Donald F., 4,628,786, Cl. 84-1.100.

Kimura, Hajime: *See*—
Kyono, Kazuaki; Kurokawa, Shigeo; Kimura, Hajime; and Irie, Toshio, 4,629,659, Cl. 428-659.000.

Kimura, Masanobu: *See*—
Kawamura, Kiyomi; Saito, Akinori; Yamada, Masatoshi; Imai, Kenji; and Kimura, Masanobu, 4,629,127, Cl. 239-489.000.

Kimura, Shigeru; and Mizusawa, Akira, to Nifco, Inc. Piston cylinder type damper. 4,629,167, Cl. 267-8.00R.
Kimura, Shinjiro; and Toida, Shigeru, to Hitachi, Ltd. Positioning apparatus. 4,628,756, Cl. 74-479.000.
Kimura, Yoshihide: *See*—
Satake, Toshimi; Kimura, Yoshihide; Minami, Toshiaki; and Fujimura, Fumio, 4,630,080, Cl. 346-209.000.
Kimura, Yoshinobu: *See*—
Inoue, Toshihiro; Ozawa, Kazuhiro; and Kimura, Yoshinobu, 4,629,953, Cl. 318-468.000.
Kimura, Yoshio: *See*—
Terashima, Kenji; Kimura, Yoshio; Asada, Masao; and Sugano, Satoshi, 4,629,582, Cl. 252-301.40P.
Kinch, Michael A.: *See*—
Simmons, Arturo; and Kinch, Michael A., 4,630,090, Cl. 357-24.000.
Kinetico, Inc.: *See*—
Ellis, George S., III, 4,629,568, Cl. 210-636.000.
King, Graham K.: *See*—
Gordon, John A.; and King, Graham K., 4,630,032, Cl. 340-347.0DD.
King, James D.; Riewerts, Erroll S.; and Rollwitz, William L., to Southwest Research Institute. Method and apparatus for nuclear magnetic resonant measurement of flow velocity. 4,629,987, Cl. 324-306.000.
King, Michael L.; and King, Paul A. Wheel mask. 4,628,858, Cl. 118-504.000.
King, Paul A.: *See*—
King, Michael L.; and King, Paul A., 4,628,858, Cl. 118-504.000.
Kirby, Mark S.; and Hansman, Robert J., Jr., to Massachusetts Institute of Technology. Method and apparatus for measurement of ice thickness employing ultra-sonic pulse echo technique. 4,628,736, Cl. 73-590.000.
Kirk, Glenn D., to Mai Basic Four, Inc. Switch mode converter and improved primary switch drive therefor. 4,629,971, Cl. 323-289.000.
Kirkpatrick, Gordon S., to Sundstrand Data Control, Inc. Vibrating beam accelerometer. 4,628,735, Cl. 73-517.0AV.
Kirschner, Wallace: *See*—
Salazar, Edilberto I.; and Kirschner, Wallace, 4,630,210, Cl. 364-464.000.
Kirst, Herbert A.: *See*—
Debono, Manuel; and Kirst, Herbert A., 4,629,786, Cl. 536-7.100.
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer. Process employing CO_2/CH gas mixtures for secondary exploitation of oil reservoirs. 4,628,999, Cl. 166-274.000.
Kister, Henry Z., to C F Braun & Co. Process for separating hydrogen and methane from an ethylene rich stream. 4,629,484, Cl. 62-29.000.
Kistner, John F.; and Hotchkiss, Donald R., to Minnesota Mining and Manufacturing Company. White reflective coating. 4,629,667, Cl. 430-11.000.
Kita, Jean C.: *See*—
Delessard, Serge L.; Puff, Roger M.; Kita, Jean C.; and Virgilio, Ange, 4,628,831, Cl. 110-245.000.
Kitagawa, Hisao; Inoue, Yasuo; Fujihara, Tadafumi; Endo, Itaru; and Shimada, Yoshihiro, to Olympus Optical Company Ltd. Sample heater for use in microscopes. 4,629,862, Cl. 219-200.000.
Kitagawa Industries Co., Ltd.: *See*—
Hayashi, Yoshitoki, 4,629,356, Cl. 403-408.100.
Kitagawa, Toshifumi: *See*—
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.
Kitagishi, Nozomu: *See*—
Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, 4,629,294, Cl. 350-427.000.
Kitamura, Shigeharu, to Mitsubishi Denki Kabushiki Kaisha. Escalator warning system. 4,629,052, Cl. 198-323.000.
Kitamura, Yoshio, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box toy. 4,629,439, Cl. 446-300.000.
Kitamura, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Electrical bushing. 4,629,822, Cl. 174-12.0BH.
Kitchel, Frank T.; Solvik, R. Sven; and Opacich, Michael L., to Enron Chemical Company. Clarity of low density polyethylene compositions containing anti-block agents by addition of polyethylene glycol. 4,629,749, Cl. 523-200.000.
Kitoo, Makoto: *See*—
Honda, Yoshinori; Kitoo, Makoto; and Kokaku, Yuuichi, 4,629,547, Cl. 204-192.150.
Kiwaki, Hisakatsu: *See*—
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.
Kiwi Coders Corporation: *See*—
Siegal, Burton L., 4,629,926, Cl. 310-331.000.
Klapperich, Gary, to Bertelsen, John C. Filtering system for paper handling machines. 4,628,566, Cl. 15-300.00A.
Klauke, Erich: *See*—
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,629,732, Cl. 514-383.000.
Klaus, Gunter. Solid fuel combustion assembly. 4,628,829, Cl. 110-186.000.
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, to Kabelmetal Electro GmbH. Sealing communication cable. 4,629,522, Cl. 156-48.000.
Kleinschmit, Peter: *See*—
Voigt, Karl; Reck, Reinhold; Bittner, Friedrich; and Kleinschmit, Peter, 4,629,617, Cl. 423-563.000.
Klemm, Gerhard. Apparatus for contact drying or cooling of sheets and the like. 4,628,620, Cl. 34-236.000.
Klemm, Gerhard. Flat screen printing machine. 4,628,814, Cl. 101-123.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Schutte, Klaus; and Stockmann, Helmut, 4,629,197, Cl. 277-53.000.
Klotz, Erhard: *See*—
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, 4,630,296, Cl. 378-2.000.
Klufas, Oleg; Soldan, Calvin H.; and Coll, William V., Jr., to General Electric Company. Method and apparatus for welding turbine rotor shafts. 4,628,575, Cl. 29-156.80R.
Kluge, Bernhard; Mehren, Herbert; and Sack, Hans, to Daimler-Benz Aktiengesellschaft. Roadway for dual-mode vehicles. 4,629,376, Cl. 404-1.000.
Knauschner, Alfred; Hensel, Arno; and Dobrindt, Alfons, to VEB Schwermaschinen-Bau Kombinat Ernst Thalmann. Method of rolling to impart triangular section. 4,628,718, Cl. 72-199.000.
Knifton, John F., to Texaco Inc. Selective synthesis of aliphatic dicarboxylic acid esters using palladium-phosphine or palladium-arsine catalysts. 4,629,807, Cl. 560-204.000.
Knippenberg, Wilhelmus F.: *See*—
Lersmacher, Bernhard; and Knippenberg, Wilhelmus F., 4,629,320, Cl. 356-244.000.
Knipstrom, Karl-Erik: *See*—
Yttergren, Erik S.; Strand, Urban R. A.; Jansson, Karl U. H.; and Knipstrom, Karl-Erik, 4,629,853, Cl. 219-60.00A.
Knofe, Helmut: *See*—
Nohren, Hubert; Knofe, Helmut; and Struck, Klaus, 4,629,142, Cl. 242-107.40B.
Knop, Karl H., to RCA Corporation. Symmetric color encoding shift pattern for a solid-state imager camera and decoding scheme therefor. 4,630,105, Cl. 358-44.000.
Knothe, Erich; Oldendorf, Christian; and Melcher, Franz-Josef, to Sartorius GmbH. Method of initializing a balance with counting scale and balance with counting scale for carrying out the method. 4,629,016, Cl. 177-25.000.
Kobata, Fumihiro: *See*—
Sugie, Toshinori; Kobata, Fumihiro; and Kawamura, Takashi, 4,629,778, Cl. 528-388.000.
Kobayashi, Hidemitsu: *See*—
Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, 4,628,720, Cl. 72-368.000.
Kobayashi, Hidetoshi: *See*—
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,629,683, Cl. 430-390.000.
Kobayashi, Masaaki: *See*—
Shimotashiro, Masafumi; and Kobayashi, Masaaki, 4,629,994, Cl. 329-110.000.
Kobayashi, Noboru; and Konishi, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of programming for programmable circuit in redundancy circuit system. 4,630,241, Cl. 365-200.000.
Kobayashi, Tetuo; and Hirai, Shoichi, to Nippon Cable System Inc. Driving device employed in a window regulator. 4,628,759, Cl. 74-501.50R.
Kobayashi, Yoshiharu: *See*—
Hasegawa, Tadashi; Kobayashi, Yoshiharu; Iwamoto, Akira; and Tedaka, Yoshihisa, 4,630,155, Cl. 360-106.000.
Kodama, Masayuki; and Yamada, Kenichi, to Fuji Jukogyo Kabushiki Kaisha. Overdrive system for a four-wheel drive vehicle. 4,628,770, Cl. 74-752.00A.
Kohno, Takeshi: *See*—
Uematsu, Hiroaki; Kohno, Takeshi; and Miyazaki, Takeshi, 4,629,744, Cl. 521-62.000.
Kohsaka, Fusao: *See*—
Ueda, Toshitsugu; Kohsaka, Fusao; and Sugihara, Yoshinobu, 4,628,740, Cl. 73-705.000.
Koike, Haruo: *See*—
Hamada, Yoshinori; Shinomoto, Shoji; Yamada, Isamu; and Koike, Haruo, 4,629,795, Cl. 548-341.000.
Koike, Hidemi: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, to Nippon Steel Corporation. Steel materials for welded structures. 4,629,504, Cl. 420-38.000.
Kojima, Noboru: *See*—
Terada, Toshimichi; Kojima, Noboru; and Shibata, Akira, 4,630,132, Cl. 358-310.000.
Kojima, Takao; Nakayama, Yutaka; Ishiguro, Hiroyuki; and Yamada, Tetsusyo, to NGK Spark Plug Co., Ltd. Oxygen sensor. 4,629,549, Cl. 204-406.000.
Kokaku, Yuuichi: *See*—
Honda, Yoshinori; Kitoo, Makoto; and Kokaku, Yuuichi, 4,629,547, Cl. 204-192.150.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Watanabe, Tatsuo; and Suzuki, Kiyohiko, 4,629,996, Cl. 330-151.000.

Kokusai Denshin Denwa Kabushiki Kasiha: *See*—
Endoh, Toshiaki; and Yamazaki, Yasuhiro, 4,630,124, Cl. 358-260.000.
Koleske, Joseph V., to Union Carbide Corporation. Low viscosity adducts of a polycaprolactone polyol and a polyepoxide. 4,629,779, Cl. 528-408.000.
Koltermann, Jurgen, to Belzer-Dowidat GmbH Werkzeug-Union. Pliers. 4,628,602, Cl. 30-261.000.
Komatsu, Mitsuo: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.
Komatsumoto, Mitsunori: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.
Komiyama, Katsuhiko, to Citizen Watch Co., Ltd. Electronic wristwatch. 4,629,329, Cl. 368-10.000.
Komori, Masahiro: *See*—
Sato, Kazuo; Komori, Masahiro; and Goto, Sumio, 4,629,774, Cl. 527-301.000.
Komorowski, Robert; and Punia, Harpal, to Plessey Overseas Limited. Electrical oscillators having automatic tuning arrangements. 4,630,001, Cl. 331-34.000.
Kondis, Tom. Leafing aluminum pigments of improved quality. 4,629,512, Cl. 106-290.000.
Kondo, Mitsuru: *See*—
Yonese, Naoki; Omatsu, Masayuki; and Kondo, Mitsuru, 4,629,800, Cl. 549-226.000.
Kondo, Naoki, to Yoshida Kogyo K.K. Apparatus for supplying slide fastener sliders. 4,629,054, Cl. 198-388.000.
Kondo, Yoshihito; Wakabayashi, Shigeru; Iwano, Fumiyuki; and Yoshida, Kiyomi, to Shikoku Kakooki Co., Ltd. Apparatus for processing tube for package containers. 4,628,670, Cl. 53-551.000.
Konishi, Satoshi: *See*—
Kobayashi, Noboru; and Konishi, Satoshi, 4,630,241, Cl. 365-200.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,629,669, Cl. 430-47.000.
Konrad, Eugen: *See*—
Clausen, Thomas; and Konrad, Eugen, 4,629,467, Cl. 8-414.000.
Kontz, Robert F., to Owens-Illinois, Inc. Means for holding and rotating containers traveling around a turret periphery. 4,629,389, Cl. 414-433.000.
Konzorr, Hubert, to Union Sils, Van de Loo & Co. GmbH. Bicycle pedal and stirrup therefor. 4,628,763, Cl. 74-594.600.
Koppe, Reiner: *See*—
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, 4,630,296, Cl. 378-2.000.
Korth, Bernd, to Protoned B.V. Clothes display rack. 4,629,078, Cl. 211-207.000.
Kosak, Wolfgang, to Robert Bosch GmbH. Device for monitoring the function of electronic equipment, in particular microprocessors. 4,629,907, Cl. 307-265.000.
Kosaka, Takao; Ishiguro, Mamoru; and Senoh, Hideaki, to Mitsubishi Paper Mills, Ltd. Pressure sensitive copying paper. 4,630,079, Cl. 346-207.000.
Kosasky, Harold. Instrument and process for sampling cervical mucus and the like. 4,628,941, Cl. 128-759.000.
Kosovtsev, Vladimir A.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Reversible percussive action machine. 4,629,008, Cl. 173-91.000.
Kothenberger GmbH & Co. Werkzeuge-Maschinen KG: *See*—
Vasella, Marco, 4,628,970, Cl. 141-18.000.
Kotzolt, Guenter. Construction kit for producing light-tube systems for three-dimensional frameworks. 4,628,660, Cl. 52-648.000.
Kovacs, Jenoe: *See*—
Balz, Werner; Kovacs, Jenoe; Lechner, Hilmar; Schaefer, Dieter; and Buethe, Ingolf, 4,629,632, Cl. 427-54.100.
Koyama, Shoji, to NEC Corporation. Erasable, programmable read-only memory device. 4,630,085, Cl. 357-23.500.
Kozlak, Martin J., to Combustion Engineering, Inc. Microwave detection of fuel flow. 4,628,830, Cl. 110-186.000.
Kozlik, Antonin; and Wells, Wilfred H., to Boots Company PLC, The. Therapeutic agents. 4,629,727, Cl. 514-237.000.
Kozuki, Susumu: *See*—
Takayama, Nobutoshi; Edakubo, Hiroo; Kozuki, Susumu; Takei, Masahiro; and Nagasawa, Kenichi, 4,630,146, Cl. 360-77.000.
Kraatz, Udo; Klauke, Erich; Jager, Gerhard; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidally active 3-substituted 1-azolyl-3-methyl-1-phenoxy-butan-2-ones and -ols. 4,629,732, Cl. 514-383.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Cirkel, Hans-Jurgen; Muller, Reinhard; and Muller-Horsche, Elmar, 4,630,277, Cl. 372-38.000.
Kraicar, Heinz, to Siemens Aktiengesellschaft. Circuit arrangement comprising two feed circuits connectable to a load having mutually opposite poling. 4,629,905, Cl. 307-72.000.
Kramer, John H. Paint can rim and lid scraper. 4,628,563, Cl. 15-105.000.
Krapf, Charles W.: *See*—
Harrington, Richard H.; and Krapf, Charles W., 4,629,019, Cl. 177-210.00C.
Kraus, Gunter: *See*—
Semmler, Jurgen; and Kraus, Gunter, 4,629,280, Cl. 339-263.00E.
Krauss, Gerhard: *See*—
Kern, Reinhard; Krauss, Gerhard; and Schlosser, Helmut, 4,629,833, Cl. 381-68.200.
Krechlok, Horst: *See*—
Esser, Heinz; and Krechlok, Horst, 4,629,757, Cl. 524-457.000.
Kreisberg, Alan J.; and Warshawsky, Jay, to Fuller Company. Gas and solid particulate material heat exchanger. 4,629,421, Cl. 432-77.000.
Kress, James W.: *See*—
Giachino, Joseph M.; and Kress, James W., 4,628,576, Cl. 29-157.10R.
Kris, Bryan, to Textron, Inc. Time multiplexed processor bus. 4,630,193, Cl. 364-200.000.
Kristinsson, Haukur; and Topfl, Werner, to Ciba-Geigy Corporation. Sulfonyl carbonoimidates. 4,629,802, Cl. 558-7.000.
Krive, Irwin M. Multi-directional movement leg exerciser. 4,629,181, Cl. 272-97.000.
Kroger, Roy: *See*—
Mattingly, William R.; and Kroger, Roy, 4,629,272, Cl. 339-90.00R.
Krohn, Hellmut: *See*—
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Kroon, Daniel: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,629,723, Cl. 514-17.000.
Krowne, Clifford M.: *See*—
Neidert, Robert E.; and Krowne, Clifford M., 4,630,011, Cl. 333-164.000.
Krude, Werner; and Jordan, Alfons, to Uni-Cardan Aktiengesellschaft. Wheel assembly with universal joint drive. 4,629,028, Cl. 180-259.000.
Krueger, Steven: *See*—
Curtin, William J.; Soto, Stephen; and Krueger, Steven, 4,629,831, Cl. 379-213.000.
Kruger, Peter, to C. A. Weidmuller GmbH & Co. Electric connector for coated printed circuit boards. 4,629,281, Cl. 339-272.00R.
Kruger, Volker; and Daenicke, Heinrich, to Norton Christensen, Inc. Drive device for a drill bit. 4,629,013, Cl. 175-107.000.
Krukowski, Richard, to Biodex Corporation. Muscle exercise and rehabilitation apparatus. 4,628,910, Cl. 128-25.00R.
Krummenacher, Peter: *See*—
Burckhardt, Christoph B.; Fehr, Rainer; and Krummenacher, Peter, 4,628,738, Cl. 73-626.000.
Krupp Polysius AG: *See*—
Ermer, Bodo; and Mischorr, Dieter, 4,628,657, Cl. 52-509.000.
Kryter, Karl D., to Acousis Company. Hearing aid method and apparatus. 4,630,302, Cl. 381-57.000.
Kubo, Yoshiharu, to Awa Engineering Co., Ltd. Apparatus for feeding and discharging reels from a machine for winding video tape on reels of a cassette. 4,629,138, Cl. 242-56.00R.
Kubota, Kazufumi; Yamazaki, Seiichi; and Monma, Yoshiyuki, to Fuji Photo Film Co., Ltd. Bar code reader. 4,629,876, Cl. 235-473.000.
Kubota Ltd.: *See*—
Nakano, Keiichi; Tani, Yoshio; and Umeda, Tatsutoshi, 4,628,878, Cl. 123-196.00R.
Omura, Takaho; Horii, Yasuyuki; Fujiwara, Taichi; and Nakata, Masaru, 4,628,768, Cl. 74-745.000.
Kubota, Mitsugi; and Kakemizu, Hiroshi, to Sumitomo Metal Mining Company Limited. Method for manufacture of antimony of high purity. 4,629,501, Cl. 75-69.000.
Kubozuka, Takao: *See*—
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Kudo, Shozo: *See*—
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Kudo, Sinji, to Stanley Electric Co., Ltd. Power source circuit. 4,630,186, Cl. 363-19.000.
Kudo, Yoshimichi: *See*—
Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.
Kuhlmann, Gerhard; and Wolf, Erwin, to Robert Bosch GmbH. Guide device for hand-held machine tools. 4,628,608, Cl. 30-373.000.
Kuhlmann, Robert E.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
Kuhn, S.A.: *See*—
Aron, Jerome, 4,628,673, Cl. 56-370.000.
Kukes, Simon G.; and Banks, Robert L., to Phillips Petroleum Company. Olefin disproportionation catalyst. 4,629,719, Cl. 502-242.000.
Kumar, Kaplesh: *See*—
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., 4,628,809, Cl. 100-208.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.
Kunin, Robert: *See*—
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Kunita, Hisao: *See—*
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Kuo, James R., to Fairchild Semiconductor Corporation. Amplifier active load. 4,629,997, Cl. 330-257.000.
Kuo, Samuel C., to GTE Products Corporation. Log-periodic antenna. 4,630,063, Cl. 343-792.500.
Kurakake, Mitsuo; and Sakamoto, Keiji, to Fanuc Ltd. Synchronous motor control system. 4,629,958, Cl. 318-723.000.
Kuramitsu, Yuzi: *See—*
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Hamada, Akira; and Takahashi, Hisao, 4,629,928, Cl. 310-365.000.
Sasaki, Tohru; Endoh, Hiroyuki; and Oohira, Seiichi, 4,629,654, Cl. 428-373.000.
Kurihara, Norimitsu; Gotoh, Hiroshi; and Miyake, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Operational condition control device for an internal combustion engine. 4,629,471, Cl. 123-198.0DB.
Kuriiwa, Tsuneaki, to Sankyu Inc. Method of installing offshore platform. 4,629,365, Cl. 405-204.000.
Kuriyama, Takashi: *See—*
Nakagaki, Shintaro; and Kuriyama, Takashi, 4,630,104, Cl. 358-36.000.
Takanashi, Itsuo; Nakagaki, Shintaro; and Kuriyama, Takashi, 4,630,107, Cl. 358-47.000.
Kuroda, Takao; Matsumoto, Shigenori; Horii, Kenju; and Yamada, Takahiro, to Matsushita Electronics Corporation; and Matsushita Electric Industrial Co., Ltd. Solid state imaging apparatus. 4,630,091, Cl. 357-30.000.
Kuroda, Takao: *See—*
Kajimura, Takashi; Kuroda, Takao; Kashiwada, Yasutoshi; Chinone, Naoki; and Aiki, Kunio, 4,630,279, Cl. 372-45.000.
Kurokawa, Shigeo: *See—*
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Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, to Toto Ltd. Device and method of moving and controlling the position of a slidable body such as used for body cleansing. 4,628,548, Cl. 4-420.400.
Kurosawa, Toshiaki: *See—*
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.
Kurt Wolf & Co. KG: *See—*
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Kushida, Masagoro: *See—*
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Kushniryk, Delvin J., to Universal Ramps Limited. Telescopic ramp. 4,628,561, Cl. 14-69.500.
Kuss, John M.: *See—*
Nystuen, Arne M.; and Kuss, John M., 4,628,733, Cl. 73-462.000.
Kussmann, Lutz: *See—*
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Kutaragi, Ken, to Sony Corporation. Tracking control apparatus. 4,630,144, Cl. 360-77.000.
Kuwabara, Takao; and Sakayori, Akihiro, to Hitachi, Ltd. Method of operating multistage hydraulic machinery. 4,629,393, Cl. 415-1.000.
Kyle, Joseph H., to Interface Flooring Systems, Inc. Method for engraving carpet and carpet so engraved. 4,629,858, Cl. 219-121.0LJ.
Kyono, Kazuaki; Kurokawa, Shigeo; Kimura, Hajime; and Irie, Toshio, to Kawasaki Steel Corporation. Corrosion resistant surface-treated steel strip and process for making. 4,629,659, Cl. 428-659.000.
Kyotani, Takayoshi: *See—*
Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, 4,628,595, Cl. 29-741.000.
Kyowa Chemical Industry Co., Ltd.: *See—*
Miyata, Shigeo; and Anabuki, Hitoshi, 4,629,626, Cl. 424-147.000.
La Gard, Inc.: *See—*
Uyeda, Tim M.; and Gartner, Klaus W., 4,628,715, Cl. 70-333.00R.
La Shea Corporation: *See—*
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La Telemecanique Electrique: *See—*
Lerude, Gerard; and Roux, Christine, 4,630,175, Cl. 361-424.000.
Labelle, H. M. Robert, to Martinray Industries Ltd. Insulated closure panel. 4,628,982, Cl. 160-235.000.
Laboratoire d'Hygiene et de Dietetique (L.H.D.): *See—*
Grouiller, Herve ; and Christ, Fabien, 4,629,624, Cl. 424-78.000.
LaCasse, Steven B. Film reel assembly. 4,629,140, Cl. 242-71.800.
Lach, Dietrich: *See—*
Ostertag, Werner; Wienand, Henning; Lach, Dietrich; and Hahn, Erwin, 4,629,616, Cl. 423-544.000.
Lackinger, Franz, to Westward Investments Limited. Electrical cable gland embodying sealing arrangement. 4,629,825, Cl. 174-65.0SS.
Laemmle, Joseph T.: *See—*
Jacoby, John E.; Laemmle, Joseph T.; and Tsai, Mei-Yuan, 4,628,985, Cl. 164-72.000.
Laevosan-Gesellschaft mbH & Co. KG Chemisch-Pharmazeutische Industrie: *See—*
Nitsch, Ernst; Ferber, Hubert P.; and Muhlbock, Siegfried, 4,629,698, Cl. 435-95.000.
Lagadec, Roger, to Dolby Laboratories Licensing Corporation. Delta modulated signal sampling rate converter using digital means. 4,630,007, Cl. 332-1.000.
Lai, John T.: *See—*
Layer, Robert W.; Lai, John T.; and Son, Pyong N., 4,629,752, Cl. 524-100.000.
Laing, Karsten; and Laing, Oliver. Power saving thermal carrier circulating pump particularly for heat pump heating systems. 4,629,116, Cl. 237-8.00R.
Laing, Oliver: *See—*
Laing, Karsten; and Laing, Oliver, 4,629,116, Cl. 237-8.00R.
Lakdawala, Ness: *See—*
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Lalanne, Alain: *See—*
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Lam, Clive C.: *See—*
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Lamb Technicon Corp.: *See—*
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Lamb-Weston, Inc.: *See—*
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Lamberty, Bernard J.: *See—*
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Lampert, Heinz; and Scheiwiller, Bruno, to MPE Produkt Plan AG. Arrangement for measuring the quantity of heat given off by a heating body and for controlling fluid stream passing through the heating body. 4,629,115, Cl. 236-36.000.
Lampton, Robert D., Jr.; and Hopkins, Thomas M., II, to Dow Chemical Company, The. Process for the removal of H_2S from geothermal steam and the conversion to sulfur. 4,629,608, Cl. 423-226.000.
Landa, Benzion; Shmaiser, Aron; and Feher, Peter, to Savin Corporation. Lens and shutter positioning mechanism for variable-magnification copier. 4,629,308, Cl. 355-3.00R.
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, to Savin Corporation. Optical scanning system for variable-magnification copier. 4,629,310, Cl. 355-8.000.
Landers, William A.; and Hawkey, Lynn J., to McDonnell Douglas Corporation. Frequency-hopping digital data link. 4,630,282, Cl. 375-1.000.
Landriault, L. Steven, to Hydril Company. Tubular connection. 4,629,224, Cl. 285-334.000.
Lang, Gordon R.: *See—*
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Lang, Richard D.; and Frenia, Floyd J., to Carrier Corporation. Duct attachment and extension for an air conditioning unit. 4,628,799, Cl. 98-40.190.
Lang, Richard D.; and Caronna, Cosimo, to Carrier Corporation. Baffle assembly for use with a lateral duct of an air conditioning system. 4,628,800, Cl. 98-41.100.
Langer Biomechanics Group, Inc., The: *See—*
Langer, Sheldon; Wernick, Justin; and Jordan, R. Paul, 4,628,936, Cl. 128-614.000.
Langer, Sheldon; Wernick, Justin; and Jordan, R. Paul, to Langer Biomechanics Group, Inc., The. Segmented triplanar orthopedic appliance. 4,628,936, Cl. 128-614.000.
Langevin, Theodore J.: *See—*
Barney, Kevin S.; Langevin, Theodore J.; Lawson, Harold W., Jr.; and Winski, Dennis A., 4,630,214, Cl. 364-474.000.
Langhorst, Martin W.: *See—*
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Langman, William F., to Omark Industries, Inc. Rail insulating pad assembly. 4,629,118, Cl. 238-107.000.
Lankar, Andre ; and Lalanne, Alain, to Compagnie Industrielle des Telecommunicat. Externally synchronized timebase. 4,630,291, Cl. 375-107.000.
Laragione, Robert: *See—*
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Lark Equipment Company: *See—*
Siewert, Robert L.; and Varnelis, Edmund K., 4,629,350, Cl. 403-11.000.
LaRochelle, Fernand, to Doane, H. Daniel. Apparatus for reconditioning drums. 4,628,972, Cl. 141-91.000.
Larronde, Michael L., to NL Industries, Inc. Rotary acting shear valve for drilling fluid telemetry systems. 4,630,244, Cl. 367-84.000.
Larsen, Dan B., to International Business Machines Corporation. Carburization and heat treatment process for a machine part. 4,629,518, Cl. 148-16.500.
Larson, Mikiel L.; Toy, Wing N.; and Vaidya, Avinash K., to AT&T Bell Laboratories. Lockup detection and recovery in a packet switching network. 4,630,259, Cl. 370-60.000.

Lassiaz, Philippe, to Valeo. Sustained self-centering clutch release bearing for motor vehicles. 4,629,049, Cl. 192-98.000.
Lau, Brian: *See—*
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Lauks, Imants R.; and Yankell, Samuel L., to Integrated Ionics, Inc. Intraoral ambient sensing device. 4,629,424, Cl. 433-6.000.
Law, Perry N.: *See—*
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Law, Peter L.: *See—*
Candlin, John P.; Caunt, Anthony D.; Kelland, John W.; and Law, Peter L., 4,629,771, Cl. 526-125.000.
Lawrence, Bobby L., to Scott & Fetzer Company, The. Apparatus for cleaning clogged drain lines. 4,629,128, Cl. 239-526.000.
Lawson, Harold W., Jr.: *See—*
Barney, Kevin S.; Langevin, Theodore J.; Lawson, Harold W., Jr.; and Winski, Dennis A., 4,630,214, Cl. 364-474.000.
Layer, Robert W.; Lai, John T.; and Son, Pyong N., to B. F. Goodrich Company, The. Substituted oxo-piperazinyl-triazines and UV light stabilized compositions. 4,629,752, Cl. 524-100.000.
Laymon, Dwane O.; and Berry, James M., to Electronic Diggins Systems, Inc. Bend detector for a pipeline pig. 4,628,613, Cl. 33-544.000.
Lazar, Stanley, to Cantar Corporation. Floatable sheet material and method of making. 4,628,549, Cl. 4-498.000.
Lazzari, Luigi, to Mini Max s.r.l. Belt sander with reducible overall dimension features. 4,628,641, Cl. 51-135.00R.
Leachman, Frank A., Jr., to Chandler Evans Inc. Centrifugal pump having low flow diffuser. 4,629,394, Cl. 415-38.000.
Lear, Anthony: *See—*
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Lechner, Alexander, to Siemens Aktiengesellschaft. Circuit arrangement for converting ECL-logic signals to TTL-logic signals. 4,629,913, Cl. 307-475.000.
Lechner, Hilmar: *See—*
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Lecompte, Michel: *See—*
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Lee, David A. Continuous applanation tonometer. 4,628,938, Cl. 128-652.000.
Lee, James R.: *See—*
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Lee, Michael C.; Raubinger, Daniel F.; and Swanney, Peter L., to General Motors Corporation. Friction type hold open mechanism. 4,628,568, Cl. 16-337.000.
Le Fur, Daniel: *See—*
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Le Gal, Pascal: *See—*
Dubuisson, Jacques; and Le Gal, Pascal, 4,630,171, Cl. 361-321.000.
Lehmann, Valgene W. Apparatus and method for a continuously operating quail feeder. 4,628,865, Cl. 119-51.00R.
Le Houillier, James G., to Profile Industries Corporation. Louver system. 4,628,980, Cl. 160-166.00A.
Leiba, Rene , to Thomson-CSF. Very high frequency oscillator with gyromagnetic resonators. 4,630,002, Cl. 331-96.000.
Leichtfried, Friedrich: *See—*
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Giacobbe, Thomas J.; Leitman, Richard H.; and Terebecky, Walter, 4,629,903, Cl. 250-573.000.
Leitz, Christopher R.; Jordon, Joel S.; and Dalton, Michael S., to Atlantic Richfield Company. Paint detackification method. 4,629,572, Cl. 210-714.000.
Lelong, Pierre H., to U.S. Philips Corporation. Device for measuring nuclear radiation, and gamma or scintillation camera comprising such a device. 4,629,894, Cl. 250-363.00R.
Le Marer, Rene : *See—*
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Lemberger, Heinz; and Schausberger, Christoph, to Bayerische Motoren Werke Aktiengesellschaft. Valve-actuating lever for internal-combustion engines. 4,628,762, Cl. 74-559.000.
Le Molaire, Roger, to Societe a Responsabilite Limitee:Ateliers Durand et le Molaire Z.A. Proportioning dispenser for powdered products. 4,629,093, Cl. 222-40.000.
Lemone, Louis A.: *See—*
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Lemonnier, Marc; Petermann, Denis; Le Fur, Daniel; and Metgert, Stephan, to Centre National de la Recherche Scientifique. Automatic high insulation switch. 4,629,897, Cl. 250-385.000.
Lems, Peter, to Illinois Tool Works Inc. Method for forming a stabilized, substantially rectangular bundle of round containers. 4,628,666, Cl. 53-398.000.
Lenk, Erich: *See—*
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Lenker, Jay A.: *See—*
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Lenz, Dick, to AG Systems, Inc. Water container. 4,629,087, Cl. 220-85.00S.
Lenzing Aktiengesellschaft: *See—*
Baumgartinger, Josef; Rauch, Ernst; Harms, Haio; and Wimmer, Adalbert, 4,629,867, Cl. 219-469.000.
Leonard, John F.: *See—*
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Leonard, John J.: *See—*
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Leonhard Kurz GmbH & Co.: *See—*
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Leopold, Edmund A., to Glass Equipment Development, Inc. Method of making spacer frame for an insulating glass panel. 4,628,582, Cl. 29-451.000.
Lepach, Werner; and Horn, Herbert, to Maschinenfabrik Niehoff KG. Method and apparatus for laying stranded rope-like material on a reel. 4,628,676, Cl. 57-266.000.
Lepage, Jean-Luc: *See—*
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Lepagnol, Jean: *See—*
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Le Pechon, Guy. Identification of beacons. 4,630,208, Cl. 364-443.000.
Lepley, Donald M., to Republic Steel Corporation. Retaining wall. 4,629,367, Cl. 405-284.000.
Leppard, David G.; and Rody, Jean, to Ciba-Geigy AG. Recording material for color photography. 4,629,682, Cl. 430-372.000.
Lerma, Gianfranco, to Minnesota Mining and Manufacturing Company. Cassette with intensifying screens for use with radiographic film. 4,630,297, Cl. 378-185.000.
Lerman, Max, to United States Manufacturing Co. Cervical thoracic orthosis. 4,628,913, Cl. 128-78.000.
Lerman, Max; and Bonessa, Vick G., to United States Manufacturing Co. Braces for preventing injuries to the knee joint. 4,628,916, Cl. 128-80.00C.
Lerman, Michael J., to De Dietrich (USA), Inc. Method for constructing an impeller assembly and shaft having interference fit. 4,628,574, Cl. 29-156.80R.
Lersmacher, Bernhard; and Knippenberg, Wilhelmus F., to U.S. Philips Corporation. Cuvette for the atomic absorption spectrometry. 4,629,320, Cl. 356-244.000.
Lerude, Gerard; and Roux, Christine, to La Telemecanique Electrique. Electronic card holding cell-like structure. 4,630,175, Cl. 361-424.000.
Leshchiner, Adolf: *See—*
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Leskien, Mimi, administratrix: *See—*
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Cox, William C.; Cox, Gordon; and Leskin, George, deceased, 4,629,369, Cl. 405-303.000.
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Levy, Guy. Endodontic appliance. 4,629,426, Cl. 433-118.000.
Lew, Hyok S. S-tube Coriolis force flow meter. 4,628,744, Cl. 73-861.380.
Lew, Hyok S. Multiple orifice stepper control valve. 4,628,961, Cl. 137-599.000.
Lewis, Gerald F. Tamper proof odometer. 4,629,870, Cl. 235-96.000.
Lewis, Michael D., to Montgomery Elevator Company. Elevator position indicating system. 4,630,026, Cl. 340-21.000.
Leybold-Heraeus GmbH: *See—*
Amlinger, Heinrich, 4,629,407, Cl. 425-7.000.
LGZ Landis & Gyr Zug AG: *See—*
Friedl, Richard, 4,629,974, Cl. 323-357.000.
Liang, Polung: *See—*
Person, Dennis W.; Pierce, Stanley L.; and Liang, Polung, 4,628,771, Cl. 74-856.000.
Liebold, Gert: *See—*
Gousetis, Charalampos; Oppenlaender, Knut; Liebold, Gert; and Pfitzner, Klaus, 4,629,602, Cl. 422-7.000.
Lieser, Karl, to Wera Werk Hermann Werner GmbH & Co. Chuck for tool shanks, particularly screwdriver bits. 4,629,375, Cl. 408-239.00R.
Lieske, Edgar: *See—*
Rose, David; and Lieske, Edgar, 4,629,466, Cl. 8-408.000.
Lifka, Bernard W.; Truckner, William G.; and Rogers, Ralph W., Jr., to Aluminum Company of America. High strength and corrosion resistant aluminum article and method. 4,629,517, Cl. 148-12.70A.
Lift Technology, Inc.: *See—*
Marshala, Dennis L., 4,629,402, Cl. 417-456.000.
Lignes Telegraphiques et Telephoniques L.T.T.: *See—*
Gouali, Mohamed; and Folcke, Georges, 4,630,255, Cl. 370-3.000.
Limbach, Berthold; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Test system and procedure for the determination of NAD (P) H. 4,629,697, Cl. 435-26.000.

Limouzin, Henry: *See—*
Rocchietta, Paul; and Limouzin, Henry, 4,628,629, Cl. 43-42.190.

Lin, Jiang-Jen: *See—*
Vanderpool, Steven H.; Lin, Jiang-Jen; and Duranleau, Roger G., 4,629,809, Cl. 562-519.000.

Lindahl, Ake R.; and Erlandsson, Stig A. B., to AB Ferrosan. Membrane-coated sustained-release tablets and method. 4,629,619, Cl. 424-15.000.

Lindahl, Ake R.; and Erlandsson, Stig A. B., to AB Ferrosan. Membrane-coated sustained-release tablets and method. 4,629,620, Cl. 424-15.000.

Lindauer Dornier Gesellschaft mbH: *See—*
Strudel, Werner, 4,628,712, Cl. 68-13.00R.

Lindbom, Torsten H. Robotic apparatus and method for automatically moving a tool through three dimensions and manually to an extended position. 4,629,860, Cl. 219-125.100.

Linde, Rolf: *See—*
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, 4,630,296, Cl. 378-2.000.

Lindsey, Marvin F., to DeKalb-Pfizer Genetics. Novel hybrid corn plant. 4,629,819, Cl. 800-1.000.

Lindstrom, Jan N.: *See—*
Hillert, Lars H.; Lindstrom, Jan N.; and Thelin, Anders G., 4,629,661, Cl. 428-698.000.

Linman, E. Kelly: *See—*
Curro, John J.; and Linman, E. Kelly, 4,629,643, Cl. 428-131.000.

Lipovsky, Iosif L.: *See—*
Fedotov, Vladimir M.; Kharchenko, Vladimir P.; Lipovsky, Iosif L.; and Ivanova, Tatyana L., 4,629,107, Cl. 227-19.000.

Lippitt, Mark C.: *See—*
Gershenson, Edward; Lemone, Louis A.; and Lippitt, Mark C., 4,630,269, Cl. 371-24.000.

Lipscomb, David M.: *See—*
Duncan, David T.; McElligott, John; Lipscomb, David M.; and Williams, Charles W., 4,628,926, Cl. 128-203.280.

Liston, Thomas V., to Chevron Research Company. Method for improving fuel economy of internal combustion engines. 4,629,577, Cl. 252-32.70E.

Liston, Thomas V., to Chevron Research Company. Succinimide complexes of borated alkyl catechols and lubricating oil compositions containing same. 4,629,578, Cl. 252-32.70E.

Litter, R. Mark. Storage vault for valuables. 4,628,827, Cl. 109-50.000.

Little, Michael J.; and Dellamano, Harry A., to Hughes Aircraft Company. Method and improved apparatus for analyzing heart activity. 4,628,939, Cl. 128-696.000.

Littmann, Robert J., to Waterscience, Inc. Process for inhibiting corrosion and minimizing deposits in an air preheater system. 4,628,836, Cl. 110-343.000.

Litton Resources Systems, Inc.: *See—*
Rozycki, Marek L., 4,630,247, Cl. 367-189.000.

Liu, Fuyi. Spray nozzle. 4,629,125, Cl. 239-443.000.

Liu, Ping Y.; and Giles, Harold F., Jr., to General Electric Company. Composition of polycarbonate, polyester, acrylate elastomeric copolymer and a phenoxy resin. 4,629,760, Cl. 525-67.000.

Livi, Francesco; and Boggiatto, Dario, to Aeritalia-Societa Aerospaziale Italiana-per Azioni. Method and unit for mounting an array of mirrors of the SSM ("Second Surface Mirror") type on a panel of a spacecraft. 4,629,527, Cl. 156-285.000.

Lo, Dennis S.: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., 4,629,820, Cl. 136-255.000.

Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, to Warner-Lambert Company. Anticonvulsant N-(2,6-disubstituted aromatic)-n'-pyridinyl ureas. 4,629,731, Cl. 514-353.000.

Loew, Jonathon A., to P.O.P. Displays, Inc. Apparatus for storing and dispensing stacked articles. 4,629,072, Cl. 211-59.300.

Logue, Dewitt M. Retriever and dispenser for deformable balls. 4,629,235, Cl. 294-19.200.

Long, Michael E., to Zenith Electronics Corporation. Baseband CATV decoder with stereo bypass. 4,630,113, Cl. 358-121.000.

Long, Michael E., to Zenith Electronics Corporation. VCR with total record/view flexibility. 4,630,133, Cl. 358-335.000.

Longacre, James R.: *See—*
Clayman, Henry; and Longacre, James R., 4,629,461, Cl. 623-6.000.

Longstaff, Fred M.; and Lang, Gordon R., to Motorola Canada Limited. Data transmission with block coding. 4,630,288, Cl. 375-39.000.

Loomis, Gary A.: *See—*
Burgin, Carl T.; Loomis, Gary A.; Enloe, Purl R., deceased; and Enloe, Shirley, administratrix, 4,628,628, Cl. 43-26.000.

Lopez-Cacicedo, Carlos: *See—*
Griffith, John T.; Lopez-Cacicedo, Carlos; and Hamblyn, Stephen M. L., 4,629,844, Cl. 219-10.49R.

Loral Electro-Optical Systems, Inc.: *See—*
Gallagher, Lawrence J., 4,629,427, Cl. 434-22.000.

Lord & Sons, Inc.: *See—*
Rodgers, Steven S., 4,628,696, Cl. 62-79.000.

Lorentz, Donald G.: *See—*
Draper, Robert; and Lorentz, Donald G., 4,628,870, Cl. 122-32.000.

Lorenz, Bettstein; Leichtfried, Friedrich; Szasz, Tibor; Wittmann, Heinz; and Stritzl, Karl, to TMC Corporation. Safety ski binding. 4,629,209, Cl. 280-626.000.

Lorenzi, Mario; Ratti, Umberto; and Severini, Arturo, to Ing. C. Olivetti & C., S.p.A. Message transmission, reception and processing apparatus for a teleprinting station. 4,630,199, Cl. 364-200.000.

Lorett, Jorge A., to Borg-Warner Corporation. Adjustable stator mechanism for high pressure radial turbines and the like. 4,629,396, Cl. 415-164.000.

Loring, David A. Wood surfacing blade. 4,628,976, Cl. 144-241.000.

Lork, Winfried: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,629,711, Cl. 502-24.000.

Loskorn, Richard A.; and Jevons, Lyle O., Jr., to Burroughs Corporation. Read write system for multiple line adapter organization. 4,630,232, Cl. 364-900.000.

Louis, Alexandre E., to Societe de Vente et de Fabrication pour le Decolletage Lns SA. Feed apparatus for machine tools. 4,628,779, Cl. 82-2.700.

Love, Richard E., to Peabody Engineering Corp. Fluidized bed combustion method. 4,628,838, Cl. 110-347.000.

Lowdermilk, Robert H.: *See—*
Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W., 4,628,560, Cl. 14-2.400.

Lowe, Benny W.: *See—*
Fuller, Ronald D.; and Lowe, Benny W., 4,630,012, Cl. 333-235.000.

Lowe, Eugene H.: *See—*
Cotton, Roger E.; and Lowe, Eugene H., 4,630,110, Cl. 358-108.000.

Lowell, DeWitt J., to Medtronic, Inc. Robotic implantable medical device and/or component restoration system. 4,628,928, Cl. 128-303.00R.

Lownsdale, Gary R., to Schlegel Corporation. Window frame weatherseal for a motor vehicle. 4,628,639, Cl. 49-498.000.

Lozen, Franklin R. Cup printer including an endless belt ink cartridge. 4,628,811, Cl. 101-38.00R.

Lu, Phong, to LuK Lamellen und Kupplungsbau GmbH. Friction clutch and air-flow promoting diaphragm spring therefor. 4,629,047, Cl. 192-70.120.

Lubrication Research, Inc.: *See—*
Sundles, Timothy B.; and Brown, M. Wayne, 4,628,877, Cl. 123-196.00S.

Lubrizol Corporation, The: *See—*
Quinn, Robert E., 4,629,753, Cl. 524-394.000.

Lucas, Bennie M., to El Paso Products Company. Compositions comprising propylene polymer-E/VA copolymer-polyterpene resin. 4,629,639, Cl. 428-35.000.

Lucas, Bennie M., to El Paso Products Company. Polyolefin compositions and laminated article. 4,629,658, Cl. 428-520.000.

Lucas Industries public limited company: *See—*
Madzgalla, Hans-Georg; and Schroeter, Christian L., 4,629,037, Cl. 188-71.800.
Ogburn, Alan P.; and Harvey, Ian J., 4,628,885, Cl. 123-490.000.
Seaman, Robert B.; and Horne, Keith E., 4,628,727, Cl. 73-119.00A.

Luce, Ethan C.: *See—*
Dien, Robert Y.; and Luce, Ethan C., 4,628,765, Cl. 74-665.00A.

Lucht Engineering, Inc.: *See—*
Pearce, Michael; and Entingh, D. Daniel, 4,629,312, Cl. 355-29.000.

Ludwig, Arthur L.: *See—*
Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., 4,628,694, Cl. 60-752.000.

Ludwig, Robert W.: *See—*
Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., 4,628,643, Cl. 51-325.000.

LuK Lamellen und Kupplungsbau GmbH: *See—*
Lu, Phong, 4,629,047, Cl. 192-70.120.

Luke, Robert R.: *See—*
Miller, Carl B.; Luke, Robert R.; Smith, Michael L.; and Grigar, Larry L., 4,629,001, Cl. 166-297.000.

Lukhovitsky, Vladimir I.: *See—*
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

Lumma, William C., Jr.: *See—*
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., 4,629,739, Cl. 514-605.000.

Lumsden, Norman; and McGugan, John D., to Hunting Oilfield Services (UK) Ltd. Pipe connectors. 4,629,221, Cl. 285-328.000.

Lunn, Garfield R., to Lamb Technicon Corp. Workpiece escapement and divider. 4,629,091, Cl. 221-12.000.

Lutheran Hospital Foundation, Inc.: *See—*
Murphy, Michael E., 4,628,557, Cl. 5-446.000.

Luttge, Klaus: *See—*
Pickard, Jurgen; Sandner, Helmut; and Luttge, Klaus, 4,628,795, Cl. 92-13.410.

Lymons, Dennis E., to Rohr Industries, Inc. Hold open rod for hinged section of nacelle system. 4,629,146, Cl. 244-53.00R.

Macdonald, Alain: *See—*
Israel, Yedy; Oporto, Betsavel; and Macdonald, Alain, 4,628,866, Cl. 119-51.500.

MacGregor, David C.; and Saulson, Stanley H., to Cordis Corporation. Cardiac pacing lead with biodegradable fixation structure. 4,628,944, Cl. 128-785.000.

Machida, Toyotaka: *See—*
Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, 4,630,231, Cl. 364-900.000.

Machine Engineering Co., Ltd.: *See—*
Ito, Takeshi, 4,629,237, Cl. 294-88.000.

MacLeod Laboratories, Inc.: *See—*
MacLeod, Norman C., 4,630,243, Cl. 367-82.000.

MacLeod, Norman C., to MacLeod Laboratories, Inc. Apparatus and method for logging wells while drilling. 4,630,243, Cl. 367-82.000.

Maclin, Harvey M.: *See—*
Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., 4,628,694, Cl. 60-752.000.

Macome Corporation: *See—*
Uemura, Saburo, 4,629,875, Cl. 235-450.000.

Madderra, Jimmy M.; and Williams, James G., to United States of America, Army. Acceleration actuated kinetic energy penetrator retainer. 4,628,821, Cl. 102-517.000.

Madni, Asad M.: *See—*
Tarczy-Hornoch, Zoltan; Madni, Asad M.; and Fala, Joseph, 4,630,228, Cl. 364-576.000.

Madzgalla, Hans-Georg; and Schroeter, Christian L., to Lucas Industries public limited company. Self-retracting brake pad assembly for spot type disc brakes. 4,629,037, Cl. 188-71.800.

Maeda, Jun; and Mori, Yoshikatsu, to Sumitomo Electric Industries, Ltd. Throw-away insert. 4,629,371, Cl. 407-114.000.

Maeda, Minoru: *See—*
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Maemoto, Kazuo, 4,629,680, Cl. 430-288.000.

Maemoto, Kazuo: *See—*
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Maemoto, Kazuo, 4,629,680, Cl. 430-288.000.

Magel, Matthias: *See—*
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.

Magid, Sidney H. Inflatable articles and method of making same. 4,629,433, Cl. 441-40.000.

Magistretti, Vico, to Flou S.p.A. Adjustable back and arm structure for bed heads, sofas and the like. 4,628,552, Cl. 5-52.000.

Magnavac Air Systems Limited: *See—*
Turner, Nicholas J.; Ogden, Geoffrey A.; and Bridge, Richard S., 4,628,677, Cl. 57-301.000.

Maguire, James V. Equal fluid flow distribution system and manifold. 4,628,730, Cl. 73-195.000.

Mahieu, Peter A. Baseball pitching target with an adjustable strike zone. 4,629,188, Cl. 273-26.00A.

Mahon, Joseph J., to Eaton Corporation. Method of assembling a motor speed reducer to a device to be driven. 4,628,592, Cl. 29-596.000.

Mahon, Joseph J., to Eaton Corporation. Electrical appliance programming. 4,629,845, Cl. 219-10.55B.

Mai Basic Four, Inc.: *See—*
Kirk, Glenn D., 4,629,971, Cl. 323-289.000.

Maidre, Clayton K.: *See—*
Clark, George B.; and Maidre, Clayton K., 4,628,584, Cl. 29-557.000.

Maier, Alfred E.; and Farley, James R., to Westinghouse Electric Corp. Molded case circuit breaker with calibration adjusting means for a bimetal. 4,630,019, Cl. 337-70.000.

Maier, Ludwig: *See—*
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,629,490, Cl. 71-86.000.

Maillard, Susan. Adjustable gate. 4,628,635, Cl. 49-55.000.

Makinen, Veikko, to Valmet Oy. Connecting device for measuring instruments. 4,628,732, Cl. 73-432.100.

Makino, Kenzi: *See—*
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

Makino, Naonori; Sano, Kenji; Horie, Seiji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Light-sensitive composition having a tetrakisazo compound. 4,629,672, Cl. 430-76.000.

Malabarba, Adriano: *See—*
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, 4,629,781, Cl. 530-317.000.

Malatesta, Alberto; Bossaert, Bernard; and Mourand, Jacques, to Exxon Research & Engineering Co. Production of hydrofined hydrocarbon resins. 4,629,766, Cl. 525-222.000.

Malavieille, Francois-Louis, to Alliance Technique Industrielle. Method and apparatus for connecting optical fibers. 4,629,284, Cl. 350-96.210.

Malek, Samir; and Hofer, Bernd, to VFW GmbH. Measuring device for determining cracks. 4,629,318, Cl. 356-237.000.

Malherbe, Andre. Electronmagnetically operated free-wheel control device responsive to a brake control and to a high speed detecting means to provide a free-wheel override function. 4,629,041, Cl. 192-2.000.

Mallinckrodt, Inc.: *See—*
Jurgens, Raymond W., Jr.; Johnson, Richard G.; and Nadler, Leroy R., 4,628,969, Cl. 141-1.000.

Manchester Tool Company: *See—*
Huston, Mark F., 4,629,372, Cl. 407-116.000.

Mancuso, Joseph J. Golf club including pentagonal grip. 4,629,191, Cl. 273-81.400.

Mangan, Edmund L.; and Conklin, Barry, to SI Handling Systems, Inc. Vehicle speed control transition module and method. 4,628,823, Cl. 104-166.000.

Mani, Krishnamurthy N.; and Chlanda, Frederick P., to Allied Corporation. Electrodialytic water splitter and process for removal of SO_2 from gases containing same and for recovery of SO_2 and NaOH. 4,629,545, Cl. 204-182.400.

Mannesmann Aktiengesselschaft: *See—*
Niebel, Harald, 4,629,344, Cl. 400-124.000.

Mantis ULV - Spruhgerate GmbH: *See—*
Dopp, Siegfried, 4,628,807, Cl. 99-488.000.

Manufacture de Machines du Haut-Rhin: *See—*
Belot, Jean, 4,628,971, Cl. 141-67.000.

Manville Corporation: *See—*
Cain, Clifford W., Jr.; Martin, Phillip C.; and Martinez, Steven R., 4,629,508, Cl. 106-85.000.

Marcum, Alfred. Container holder device. 4,629,153, Cl. 248-558.000.

Margolin, Amikam: *See—*
Hood, Clarence E., Jr.; Williamson, Robert E.; and Margolin, Amikam, 4,629,005, Cl. 171-20.000.

Margon Corporation: *See—*
Samo, Harvey W., 4,629,442, Cl. 446-389.000.

Margraf, Adolf. Stratified bulk material filter. 4,629,480, Cl. 55-282.000.

Marignier, Jean-Louis: *See—*
Belloni Cofler, Jacqueline; Marignier, Jean-Louis; Delcourt Euverte, Marie-Odile; and Minana Lourseau, Michele, 4,629,709, Cl. 502-5.000.

Markisz-Spero, Anna L.: *See—*
Spero, Louis A.; and Markisz-Spero, Anna L., 4,629,194, Cl. 273-236.000.

Markle, Richard A., to Eagle-Picher Industries, Inc. N-[[2-(1,3-dihydro-1,3-dioxo-2H-isoindol-Z-yl)ethoxy]methyl]-Z-propenamide. 4,629,796, Cl. 548-477.000.

Markley, Gerald E.: *See—*
Hudson, Carl W.; and Markley, Gerald E., 4,629,553, Cl. 208-212.000.

Marko, Neil L.; and Mitton, Bruce W., to Universal Industrial Products Co. (Div. of Core Industries, Inc.). Push-pull door latch. 4,629,228, Cl. 292-165.000.

Marks, Alvin M. 2D/3D compatible polarized color TV system. 4,630,097, Cl. 358-3.000.

Marks and Spencer p.l.c.: *See—*
Franklin, Robert J., 4,629,101, Cl. 223-66.000.

Marshala, Dennis L., to Lift Technology, Inc. Valve assembly. 4,629,402, Cl. 417-456.000.

Marten, Russell A.: *See—*
Townsend, Greg M.; Henderson, James A., Jr.; Marten, Russell A.; and Scavezze, Daniel C., 4,630,263, Cl. 370-85.000.

Martin, David J. R., to Coal Industry (Patents) Limited. Vehicle location system. 4,630,057, Cl. 342-358.000.

Martin, Hans, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,629,046, Cl. 192-58.00B.

Martin, Phillip C.: *See—*
Cain, Clifford W., Jr.; Martin, Phillip C.; and Martinez, Steven R., 4,629,508, Cl. 106-85.000.

Martinez, Steven R.: *See—*
Cain, Clifford W., Jr.; Martin, Phillip C.; and Martinez, Steven R., 4,629,508, Cl. 106-85.000.

Martinray Industries Ltd.: *See—*
Labelle, H. M. Robert, 4,628,982, Cl. 160-235.000.

Martinson, Glen D., to B.E.L.-Tronics Limited. Radar detection and signal processing circuit. 4,630,054, Cl. 342-20.000.

Maruzen Sewing Machine Co., Ltd.: *See—*
Matsuda, Kimikazu, 4,628,845, Cl. 112-259.000.

Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, to VEB Kombinat Textima. Method for production of a non-woven fabric. 4,628,571, Cl. 19-304.000.

Marx, Karl-Heinz: *See—*
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, 4,629,522, Cl. 156-48.000.

Mas, Albert B.; and Mas, Christopher. Dental cleaning compact. 4,628,949, Cl. 132-84.00R.

Mas, Christopher: *See—*
Mas, Albert B.; and Mas, Christopher, 4,628,949, Cl. 132-84.00R.

Maschinenfabrik Niehoff KG: *See—*
Lepach, Werner; and Horn, Herbert, 4,628,676, Cl. 57-266.000.

Massachusetts Institute of Technology: *See—*
Kirby, Mark S.; and Hansman, Robert J., Jr., 4,628,736, Cl. 73-590.000.

Mathys, Robert, Jr.; and Cotting, Anton, to Synthes Ltd. Intramedullary nail. 4,628,920, Cl. 128-92.0YZ.

Matrix Science Corporation: *See—*
Mattingly, William R.; and Kroger, Roy, 4,629,272, Cl. 339-90.00R.

Matsuda, Hideaki: *See—*
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,629,755, Cl. 524-415.000.

Matsuda, Kimikazu, to Maruzen Sewing Machine Co., Ltd. Assembly construction for sewing machine. 4,628,845, Cl. 112-259.000.

Matsuda, Masami: *See—*
Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, 4,628,837, Cl. 110-346.000.

Matsuda, Motonobu; and Matsui, Toru, to Minolta Camera Kabushiki Kaisha. Image position detector. 4,629,882, Cl. 250-211.00J.

Matsuda, Shoichi: *See—*
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.

Matsuda, Teruo: *See—*
Kawaguchi, Kizo; and Matsuda, Teruo, 4,628,587, Cl. 29-568.000.

Matsui, Toru: *See—*
Matsuda, Motonobu; and Matsui, Toru, 4,629,882, Cl. 250-211.00J.

Matsuki, Yutaka: *See—*
Hoki, Tsuneo; and Matsuki, Yutaka, 4,629,745, Cl. 521-87.000.
Matsumoto, Atsushi: *See—*
Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,629,450, Cl. 604-164.000.
Matsumoto, Mitsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Birefringence type measuring device. 4,629,323, Cl. 356-365.000.
Matsumoto, Shigenori: *See—*
Kuroda, Takao; Matsumoto, Shigenori; Horii, Kenju; and Yamada, Takahiro, 4,630,091, Cl. 357-30.000.
Matsumura, Koji: *See—*
Ogawa, Yukio; and Matsumura, Koji, 4,630,136, Cl. 360-10.300.
Matsumura, Susumu: *See—*
Sato, Yuichi; Tsunekawa, Tokuichi; Kawabata, Takashi; and Matsumura, Susumu, 4,629,877, Cl. 250-201.000.
Matsuo, Masayoshi; Takagishi, Kazuhiro; Tobita, Kouji; and Kanemaru, Yukihiro, to Mazda Motor Corporation. Electric parking brake system for a vehicle. 4,629,043, Cl. 192-4.00A.
Matsuo, Setsuo, to Sanyo Electric Co., Ltd. Cylindrical battery. 4,629,665, Cl. 429-164.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, 4,628,595, Cl. 29-741.000.
Kuroda, Takao; Matsumoto, Shigenori; Horii, Kenju; and Yamada, Takahiro, 4,630,091, Cl. 357-30.000.
Monji, Hideto; Aoki, Masaki; Torii, Hideo; and Okinaka, Hideyuki, 4,629,487, Cl. 65-26.000.
Morimura, Atsushi; and Tanaka, Hiromichi, 4,630,106, Cl. 358-44.000.
Shimotashiro, Masafumi; and Kobayashi, Masaaki, 4,629,994, Cl. 329-110.000.
Sugimura, Tatuo; Satoh, Isao; Ichinose, Makoto; and Kuroki, Yuzuru, 4,630,140, Cl. 360-49.000.
Tomita, Masao; Takeuchi, Akihiro; and Hashima, Akio, 4,630,251, Cl. 369-43.000.
Yamagami, Akio; and Narikiyo, Kazuhiko, 4,628,594, Cl. 29-741.000.
Yokozeki, Seiki; and Nomura, Jun, 4,629,848, Cl. 219-10.55B.
Matsushita Electronics Corporation: *See—*
Kuroda, Takao; Matsumoto, Shigenori; Horii, Kenju; and Yamada, Takahiro, 4,630,091, Cl. 357-30.000.
Matsushita, Kazuyoshi, to Tachikawa Spring Co. Ltd. Jig for welding frames. 4,629,109, Cl. 228-49.100.
Mattel, Inc.: *See—*
McKittrick, Michael T., Jr.; and DeAnda, Nicholas, 4,629,440, Cl. 446-356.000.
Matth. Hohner AG: *See—*
Deforeit, Christian J., 4,628,790, Cl. 84-1.260.
Mattingly, William R.; and Kroger, Roy, to Matrix Science Corporation. Electrical connector assembly with anti-rotation latch mechanism. 4,629,272, Cl. 339-90.00R.
Matuska, David G., to United Technologies Corporation. Filament wound structure having filament wound reinforcing rings for use as a torque drive. 4,629,644, Cl. 428-137.000.
Mauer, Dieter; and Potzas, Peter, to USM Corporation. Setting tool for rivet with pull-headed mandrel. 4,628,722, Cl. 72-391.000.
Maul, Fred, to Raychem Corporation. Strain-relief adapter for a cable or harness. 4,629,275, Cl. 339-103.00R.
Maurer, Gernant E.; Boesch, William J.; and Theret, Jean M., to Special Metals Corporation; and Societe National d'Etude et de Construction de Moteurs d'Aviation. Nickel base alloy. 4,629,521, Cl. 148-410.000.
Maurer, Robert, to Skeltonhall Limited. Meter provers. 4,628,724, Cl. 73-3.000.
Maurer, Thomas; and Holbein, Hans J., to GAO Gesellschaft fuer Automation und Organisation mbH. Identification card and a method of producing same. 4,629,215, Cl. 283-94.000.
Mavilor Systeme SA: *See—*
Hermann, Jaun, 4,629,920, Cl. 310-156.000.
Mavilor Systemes S.A.: *See—*
Tassinario, Giampiero, 4,629,948, Cl. 318-254.000.
Mawbey, Gerald W., to General Motors Corporation. Thigh support for vehicle seats. 4,629,248, Cl. 297-284.000.
Mawby, Harold S.; and Harris, Duane H., to White Consolidated, Inc. Ice maker. 4,628,699, Cl. 62-137.000.
Max-Planck-Geselschaft zur Foerderung der Wissenschaften e.V.: *See—*
Schafer, Fritz P., 4,630,274, Cl. 372-9.000.
May & Baker Limited: *See—*
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,629,495, Cl. 71-92.000.
May, William E.; McKinney, Ronald W.; and Wells, James S., to Siemens Energy & Automation, Inc. Molded case circuit breaker current transformer with spiral bus. 4,630,018, Cl. 336-175.000.
Mayer, Franz W.: *See—*
Janusch, Alois; Mayer, Franz W.; and Tessmer, Gero, 4,628,619, Cl. 34-180.000.
Maytum, Michael J.; Lear, Anthony; Byatt, Stephen W.; and Rodrigues, Richard A. A., to Texas Instruments Incorporated. Starter circuit for a fluorescent tube lamp. 4,629,944, Cl. 315-207.000.
Mazda Motor Corporation: *See—*
Matsuo, Masayoshi; Takagishi, Kazuhiro; Tobita, Kouji; and Kanemaru, Yukihiro, 4,629,043, Cl. 192-4.00A.
McAneny, Leonard G. Rubber band powered motor for model airplane. 4,629,438, Cl. 446-58.000.
McArdle, Donald J.; Russell, Robert H.; and Scott, Donald G., to Polaroid Corporation. Liquid debubbling apparatus and method. 4,629,475, Cl. 55-52.000.
McBarron, George P., to Stride Rite International, Inc. Shoe with fastenable opening. 4,628,622, Cl. 36-50.000.
McCaffery, Thomas F., III. Extraction of nutritious materials from acidic sludge waste solids by adsorption. 4,629,785, Cl. 530-415.000.
McClellan, David P.; Brown, John M., Jr.; and Black, Robert E., to Siemens Energy & Automation, Inc. Current limiting circuit breaker stationary contact assembly with integral magnetic activating means. 4,630,014, Cl. 335-16.000.
McClure, Gerald B.: *See—*
Whiting, Paul E.; and McClure, Gerald B., 4,629,009, Cl. 175-4.560.
McCracken, Wendell J.; and Schmidt, Roger C., to Uniroyal Plastics Company, Inc. Antistatic foamed polymer composition. 4,629,585, Cl. 252-511.000.
McCree, Arleigh E.: *See—*
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.
McDavid, James M., to Texas Instruments Incorporated. Molybdenum-metal mask for definition and etch of oxide-encapsulated metal gate. 4,628,588, Cl. 29-571.000.
McDonnell Douglas Corporation: *See—*
Landers, William A.; and Hawkey, Lynn J., 4,630,282, Cl. 375-1.000.
McElligott, John: *See—*
Duncan, David T.; McElligott, John; Lipscomb, David M.; and Williams, Charles W., 4,628,926, Cl. 128-203.280.
McGrew, Stephen P. Diffractive color and texture effects for the graphic arts. 4,629,282, Cl. 350-3.700.
McGugan, John D.: *See—*
Lumsden, Norman; and McGugan, John D., 4,629,221, Cl. 285-328.000.
McHann, Michael R.: *See—*
Campbell, John A. L.; Baldwin, Carl L.; Foley, David J.; and McHann, Michael R., 4,629,392, Cl. 414-786.000.
McKeand, Alexander: *See—*
Blain, William; McKeand, Alexander; and McKendrick, William H., 4,630,111, Cl. 358-109.000.
McKelvie, Alastair H. Vibratory fluidized bed reactor. 4,628,834, Cl. 110-263.000.
McKendrick, William H.: *See—*
Blain, William; McKeand, Alexander; and McKendrick, William H., 4,630,111, Cl. 358-109.000.
McKenna, Charles M.: *See—*
Clark, William M., Jr.; McKenna, Charles M.; and Johnson, William L., 4,629,931, Cl. 313-362.100.
McKinney, Ronald W.: *See—*
May, William E.; McKinney, Ronald W.; and Wells, James S., 4,630,018, Cl. 336-175.000.
McKittrick, Michael T., Jr.; and DeAnda, Nicholas, to Mattel, Inc. Animated toy. 4,629,440, Cl. 446-356.000.
McLaren, Kevin W., to Johnsen & Jorgensen (Plastics) Limited. Child resistant closure and closure and container assembly. 4,629,081, Cl. 215-206.000.
McLarty, Colin S.: *See—*
Currey, John E.; McLarty, Colin S.; and Porter, Donald H., 4,628,596, Cl. 29-825.000.
McMillen, Robert J.; and Rosman, Andrew, to Hughes Aircraft Company. Packet switched multiport memory NXM switch node and processing method. 4,630,258, Cl. 370-60.000.
McMurtry, George: *See—*
Carson, Oliver S.; McMurtry, George; and Carrington, James E., 4,629,149, Cl. 244-134.00R.
McNatt, Robert B.: *See—*
Day, John T.; Herder, Robert O.; and McNatt, Robert B., 4,628,850, Cl. 114-219.000.
Measuretek, Inc.: *See—*
Harrington, Richard H.; and Krapf, Charles W., 4,629,019, Cl. 177-210.00C.
Medoff, Robert J. Axial compression device. 4,628,923, Cl. 128-92.0YV.
Medtronic, Inc.: *See—*
Lowell, DeWitt J., 4,628,928, Cl. 128-303.00R.
Meehan, Robert F.; Rose, William H.; and Shaffer, David T. Method of making an electrical connector. 4,628,597, Cl. 29-827.000.
Megadiamond Industries, Inc.: *See—*
Hall, David R., 4,629,373, Cl. 407-118.000.
Mehren, Herbert: *See—*
Kluge, Bernhard; Mehren, Herbert; and Sack, Hans, 4,629,376, Cl. 404-1.000.
Riemer, Bernd; and Mehren, Herbert, 4,629,388, Cl. 414-427.000.
Meier, Willy: *See—*
Spadini, Paolo; and Meier, Willy, 4,629,332, Cl. 368-252.000.
Meillan, Philippe: *See—*
Deparis, Georges; Duverne, Jacques; and Meillan, Philippe, 4,630,266, Cl. 370-94.000.
Meistcrlin, Carl A., to La Shea Corporation. Method for electroplating deep pocketed articles. 4,629,538, Cl. 204-26.000.
Melcher, Franz-Josef: *See—*
Knothe, Erich; Oldendorf, Christian; and Melcher, Franz-Josef, 4,629,016, Cl. 177-25.000.
Melton, Tommy W.: *See—*
Clevett, Merton L.; Lowdermilk, Robert H.; Bright, John K.; Coulter, Clifford S.; and Melton, Tommy W., 4,628,560, Cl. 14-2.400.

Menasco Inc: *See—*
Kendall, Giles A., 4,628,797, Cl. 92-120.000.
Menchetti, Robert J.; Safran, Robert H.; and Sauer, Gale E., to Donn Incorporated. Demountable wall panel. 4,628,656, Cl. 52-481.000.
Meniconi, Vittorio. Photoelectric pinfall detection system. 4,629,189, Cl. 273-54.00E.
Merck & Co., Inc.: *See—*
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,629,787, Cl. 540-528.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Limbach, Berthold; and Helger, Roland, 4,629,697, Cl. 435-26.000.
Merkel, Heinz: *See—*
Stahlecker, Fritz; and Merkel, Heinz, 4,628,685, Cl. 57-263.000.
Merkle, Alfred, to Papst-Motoren GmbH & Co. Direct drive motor. 4,629,919, Cl. 310-90.000.
Merlet, Jean-Paul: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,629,213, Cl. 280-718.000.
Merry, Rodney J.: *See—*
Jones, Paul W.; Merry, Rodney J.; and Hakala, Douglas T., 4,628,935, Cl. 128-419.00D.
Mestais, Corinne; Gauthier, Rene ; and Roux, Georges, to Informatek - Sopha Medical. Method for processing the pulses supplied by a gamma camera and a gamma camera employing this method. 4,629,895, Cl. 250-369.000.
Metcalfe, Lincoln D.: *See—*
Brady, Catherine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,629,742, Cl. 521-55.000.
Meteor Communications Corporation, Inc.: *See—*
Smith, Dale K., 4,630,314, Cl. 455-52.000.
Metgert, Stephan: *See—*
Lemonnier, Marc; Petermann, Denis; Le Fur, Daniel; and Metgert, Stephan, 4,629,897, Cl. 250-385.000.
Mettler Instruments AG: *See—*
Erb, Karl J., 4,629,018, Cl. 177-47.000.
Metzler & Co. AG: *See—*
Metzler, Herbert, 4,628,545, Cl. 2-265.000.
Metzler, Herbert, to Metzler & Co. AG. Apparel article having zipper connection and its method for fabricating. 4,628,545, Cl. 2-265.000.
Meulners, Duane C.: *See—*
Thompson, Herbert E.; and Meulners, Duane C., 4,630,145, Cl. 360-77.000.
Meyer, Ronald K. Apparatus for automated assembly of flowable materials. 4,628,974, Cl. 141-129.000.
Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. Phenyl sulfonamides. 4,629,810, Cl. 564-89.000.
Michelson, Herbert D.; and Stumbar, James P., to Exxon Research & Engineering Co. Low NO_x premix burner. 4,629,413, Cl. 431-9.000.
Michelson, Robin P. Method and apparatus for visual prosthesis. 4,628,933, Cl. 128-419.00R.
Michigan Special Products, Inc.: *See—*
Kilby, Robert D., 4,628,704, Cl. 62-296.000.
Michigan State University: *See—*
Pinnavaia, Thomas J.; and Raythatha, Rasik H., 4,629,712, Cl. 502-63.000.
Schindler, Melvin S.; and Holland, John F., 4,629,687, Cl. 435-4.000.
Michisita, Ryoichi: *See—*
Yoshimi, Takani; Michisita, Ryoichi; and Sasaki, Hitoshi, 4,628,586, Cl. 29-568.000.
Michl, Rudolf J.; Rheinberger, Volker M.; and Ott, Gilbert, to Etablissement Dentaire Ivoclar. Radiopaque dental materials. 4,629,746, Cl. 523-117.000.
Micro Molds Corporation: *See—*
Ciriaci, Piergiorgio; and Accocella, Giovanni, 4,628,981, Cl. 160-176.00R.
Migita, Haruyoshi: *See—*
Yoshiura, Shoichiro; and Migita, Haruyoshi, 4,629,314, Cl. 355-55.000.
Miguchi, Akio: *See—*
Fujikawa, Tetsuzo; Hirata, Makizo; Tamba, Shinichi; and Miguchi, Akio, 4,628,876, Cl. 123-192.00B.
Mihara, Shin-ichi, to Olympus Optical Co., Ltd. Zoom lens system. 4,629,293, Cl. 350-427.000.
Mihayashi, Keiji: *See—*
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,629,683, Cl. 430-390.000.
Miida, Shigeru: *See—*
Ideta, Yasufumi; and Miida, Shigeru, 4,628,754, Cl. 74-467.000.
Miles Laboratories, Inc.: *See—*
Bolguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,629,688, Cl. 435-7.000.
Dean, Kenneth J., 4,629,692, Cl. 435-7.000.
Hammond, Michael D.; and Taylor, William J. A., 4,629,706, Cl. 436-513.000.
Miller, Brian L., to New England Telephone and Telegraph Company. Fault isolating apparatus system and method. 4,629,835, Cl. 379-29.000.
Miller, Carl B.; Luke, Robert R.; Smith, Michael L.; and Grigar, Larry L., to Halliburton Company. Tubing pressure operated initiator for perforating in a well borehole. 4,629,001, Cl. 166-297.000.
Miller, Kevin P.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,629,586, Cl. 252-522.00R.
Miller, Mervin C. Ski boot carrier. 4,629,103, Cl. 224-250.000.
Miller, Sandra L., to Cordis Corporation. Bipolar screw-in-packing lead assembly. 4,628,943, Cl. 128-785.000.
Miller, Stanley. Ring valve. 4,628,958, Cl. 137-512.150.
Miller, Theodore E., Jr.; and Small, Hamish, to Dow Chemical Company, The. Apparatus and method for metering sub-10 cc/minute liquid flow. 4,628,743, Cl. 73-861.050.
Miller, Thomas J.: *See—*
Stenerson, Gary L.; and Miller, Thomas J., 4,630,172, Cl. 361-386.000.
Miller, Timothy L.; and Ehmke, Richard J., to Dempster Industries, Inc. Jack for cylindrical tank. 4,629,163, Cl. 254-133.00R.
Mills, David R., to University of Sydney. Solar selective surface coating. 4,628,905, Cl. 126-443.000.
Milstein, Elisabeth M. L. Laundry bag for nylon hosiery and the like. 4,630,312, Cl. 383-86.000.
Minami, Toshiaki: *See—*
Satake, Toshimi; Kimura, Yoshihide; Minami, Toshiaki; and Fujiinura, Fumio, 4,630,080, Cl. 346-209.000.
Minana Lourseau, Michele: *See—*
Belloni Cofler, Jacqueline; Marignier, Jean-Louis; Delcourt Euverte, Marie-Odile; and Minana Lourseau, Michele, 4,629,709, Cl. 502-5.000.
Minear, Roger L.: *See—*
Early, Scott H.; and Minear, Roger L., 4,629,910, Cl. 307-317.00R.
Minegishi, Kazushige: *See—*
Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, 4,630,237, Cl. 365-104.000.
Mini Max s.r.l.: *See—*
Lazzari, Luigi, 4,628,641, Cl. 51-135.00R.
Minick, Chris A.; and Mueller, Gerald E., to Minnesota Mining and Manufacturing Co. Extruded caulk strip. 4,629,648, Cl. 428-189.000.
Minigrip Incorporated: *See—*
Ausnit, Steven, 4,629,524, Cl. 156-66.000.
Bentson, Per, 4,630,311, Cl. 383-37.000.
Ministry of International Trade and Industry: *See—*
Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, 4,629,713, Cl. 502-84.000.
Minnesota Mining and Manufacturing Company: *See—*
Brown, Francis W.; and Winslow, Louis E., 4,629,663, Cl. 428-343.000.
Campagna, Anthony J., Jr.; Eull, Patricia A.; and Reed, Katherine E., 4,628,917, Cl. 128-90.000.
Kistner, John F.; and Hotchkiss, Donald R., 4,629,667, Cl. 430-11.000.
Lerma, Gianfranco, 4,630,297, Cl. 378-185.000.
Minick, Chris A.; and Mueller, Gerald E., 4,629,648, Cl. 428-189.000.
Montgomery, Richard L., 4,629,751, Cl. 523-219.000.
Schoon, David J., 4,630,223, Cl. 364-518.000.
Minolta Camera Kabushiki Kaisha: *See—*
Matsuda, Motonobu; and Matsui, Toru, 4,629,882, Cl. 250-211.00J.
Miranti, Joseph P., Jr., to Dayco Corporation. Belt pulley and method of making the same. 4,629,444, Cl. 474-93.000.
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubelljuk, Vladislav F.; and Filatov, Nikolai I., to Tekhnologichesky Institut Vzryvozashischennogo I Rudnichnogo Elektrooborudovania. Sensitive constant contact pressure microswitch. 4,629,838, Cl. 200-67.00D.
Mirowski, William A. Pool stick guide. 4,629,187, Cl. 273-24.000.
Mischorr, Dieter: *See—*
Ermer, Bodo; and Mischorr, Dieter, 4,628,657, Cl. 52-509.000.
Missout, Gilles; and Dery, Marcel, to Hydro-Quebec. Apparatus for sensing and measuring a current on power transmission line. 4,629,979, Cl. 324-126.000.
Mita Industrial Co., Ltd.: *See—*
Hayashi, Kiyoshi; and Kawahara, Yoshihiro, 4,630,129, Cl. 358-296.000.
Nakazawa, Toru, 4,629,674, Cl. 430-125.000.
Mitchell, David K., to Chembond Corporation. Metering and proportioning system for a two-component liquid resin and liquid hardener adhesive. 4,628,861, Cl. 118-684.000.
Mitchell, Dean E.: *See—*
Soyk, Melvin A.; and Mitchell, Dean E., 4,629,391, Cl. 414-563.000.
Mitchell, Robert N.: *See—*
Torgent, Douglas E.; and Mitchell, Robert N., 4,629,370, Cl. 407-29.000.
Mitchell, Ronald F.; and Cook, John E., to Canadian Fram Limited. Automatically opening canister purge solenoid valve. 4,628,887, Cl. 123-520.000.
Mito, Ikuo: *See—*
Yanase, Tomoo; and Mito, Ikuo, 4,629,532, Cl. 156-612.000.
Mitsubishi Chemical Industries Ltd.: *See—*
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,629,618, Cl. 423-625.000.
Mitsubishi Denki K.K.: *See—*
Shigeta, Katsunori, 4,630,212, Cl. 364-470.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Hasegawa, Tadashi; Kobayashi, Yoshiharu; Iwamoto, Akira; and Tedaka, Yoshihisa, 4,630,155, Cl. 360-106.000.
Hashimoto, Yasuhiko, 4,628,801, Cl. 98-40.300.
Imaizumi, Mitsuyuki; and Yoshizaki, Kiyoshi, 4,629,515, Cl. 148-11.50F.
Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; and Asami, Kazutomo, 4,628,963, Cl. 137-857.000.
Katayama, Kaneo, 4,628,707, Cl. 62-280.000.

Kitamura, Shigeharu, 4,629,052, Cl. 198-323.000.
Kitamura, Yukio, 4,629,822, Cl. 174-12.0BH.
Okuno, Kazuhiko, 4,630,119, Cl. 358-198.000.
Saito, Masato; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,629,929, Cl. 313-25.000.
Sakamoto, Fumio, 4,629,430, Cl. 434-219.000.
Takada, Mitsuyuki; Morihiro, Yoshiyuki; and Takasago, Hayato, 4,629,681, Cl. 430-314.000.
Tanahashi, Tooru; Ishii, Toshiaki; and Mitsui, Shuzo, 4,629,035, Cl. 187-29.00R.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,629,212, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Irie, Nobuhiko, 4,629,385, Cl. 414-226.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Kosaka, Takao; Ishiguro, Mamoru; and Senoh, Hideaki, 4,630,079, Cl. 346-207.000.

Mitsubishi Rayon Company, Limited: *See—*
Sakimae, Akihiro; Kagawa, Yuri; Numazawa, Ryozo; and Onishi, Hisao, 4,629,701, Cl. 435-130.000.
Uchida, Hiroyuki; and Nakauchi, Jun, 4,629,679, Cl. 430-281.000.

Mitsui, Shuzo: *See—*
Tanahashi, Tooru; Ishii, Toshiaki; and Mitsui, Shuzo, 4,629,035, Cl. 187-29.00R.

Mitsusada, Kazumichi: *See—*
Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, 4,630,095, Cl. 357-78.000.

Mitton, Bruce W.: *See—*
Marko, Neil L.; and Mitton, Bruce W., 4,629,228, Cl. 292-165.000.

Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, to Nippon Telegraph & Telephone. Read-only memory and method of manufacturing the same. 4,630,237, Cl. 365-104.000.

Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, to Hitachi, Ltd. Control apparatus for optical disc player for locating blank tracks. 4,630,252, Cl. 369-44.000.

Miyai, Kiyoshi; Uotani, Shuhei; and Tsunemine, Toyohiko, to Sanyo Electric Co., Ltd. Image forming apparatus with jammed paper access opening. 4,629,307, Cl. 355-3.00R.

Miyajima, Tamotsu; Tanaka, Noriatsu; and Saito, Nobuto, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Erasable ball-point pen ink. 4,629,748, Cl. 523-161.000.

Miyake, Junichi: *See—*
Kurihara, Norimitsu; Gotoh, Hiroshi; and Miyake, Junichi, 4,629,471, Cl. 123-198.0DB.

Miyano, Toshiyuki: *See—*
Wakisaka, Yukinori; and Miyano, Toshiyuki, 4,629,174, Cl. 271-186.000.

Miyashita, Yoshikazu: *See—*
Tanaka, Hideo; Naka, Toshiaki; Muranaka, Shiaru; and Miyashita, Yoshikazu, 4,629,528, Cl. 156-351.000.

Miyata, Shigeo; and Anabuki, Hitoshi, to Kyowa Chemical Industry Co., Ltd. Hydrothermally treated product of compound having hydrotalcite-like crystal structure composition thereof, and use thereof. 4,629,626, Cl. 424-147.000.

Miyazaki, Takeshi: *See—*
Uematsu, Hiroaki; Kohno, Takeshi; and Miyazaki, Takeshi, 4,629,744, Cl. 521-62.000.

Mizuhata, Yoshinori: *See—*
Amano, Shintetsu; Okada, Hajime; Yakuda, Teruyuki; Hori, Isao; and Mizuhata, Yoshinori, 4,629,946, Cl. 315-219.000.

Mizuma, Takashi: *See—*
Osawa, Shigenobu; Murakami, Tamotsu; Mizuma, Takashi; and Sano, Katsuhide, 4,629,673, Cl. 430-108.000.

Mizuno, Shinichiro: *See—*
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Mizuno, Shinichiro, 4,630,200, Cl. 364-405.000.

Mizusawa, Akira: *See—*
Kimura, Shigeru; and Mizusawa, Akira, 4,629,167, Cl. 267-8.00R.

Mizushima, Yoshihiko: *See—*
Uchiyama, Toshiyuki; Sugawara, Takeo; Okuyama, Chiyoshi; and Mizushima, Yoshihiko, 4,629,486, Cl. 65-3.150.

Mizutani, Isao; and Takeuchi, Tsunezo, to NGK Insulators Ltd. Microwave heating device having a rotary reflector means in a heating chamber. 4,629,849, Cl. 219-10.55F.

Mobil Oil Corporation: *See—*
Burress, George T., 4,629,818, Cl. 585-517.000.
Fan, Mark J., 4,629,702, Cl. 436-32.000.
Farcasiu, Malvina, 4,629,817, Cl. 585-470.000.
Giacobbe, Thomas J.; Leitman, Richard H.; and Terebecky, Walter, 4,629,903, Cl. 250-573.000.
Haddad, James H.; and Owen, Hartley, 4,629,552, Cl. 208-161.000.
Herrington, Fox J., 4,628,665, Cl. 53-252.000.
Hurd, Billy G., 4,629,000, Cl. 166-274.000.

Mochizuki, Taishiro: *See—*
Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, 4,628,758, Cl. 74-498.000.

Modglin, Rodger L.; Borthick, W. Ray; and Roberts, Timothy W., to Unit Rig & Equipment Co. Frame and axle for heavy duty trucks. 4,629,211, Cl. 280-688.000.

Mohsin, Mohamed E., to National Research Development Corp. Fluid-powered rotary motor. 4,629,395, Cl. 415-75.000.

Moingeon, Marie-Odile; and Chaussard, Jacques, to Societe Nationale des Poudres et Explosifs. Process for the electrosynthesis of ketones. 4,629,541, Cl. 204-59.00R.

Moleculon Research Company: *See—*
Nichols, Larry D., 4,629,330, Cl. 368-89.000.

Molee, Casper S.: *See—*
Winters, Arthur; and Molee, Casper S., 4,629,451, Cl. 604-175.000.

Moller, Holger: *See—*
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, 4,630,296, Cl. 378-2.000.

Momiyama, Kikuo: *See—*
Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, 4,629,294, Cl. 350-427.000.

Momodomi, Masaki, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device. 4,630,087, Cl. 357-23.500.

Momodomi, Masaki: *See—*
Ogura, Mitsugi; and Momodomi, Masaki, 4,630,088, Cl. 357-23.600.

Monden, Keishi; Kikkawa, Ryozo; and Horiuchi, Susumu, to Hitachi, Ltd. Solidifying disposal system for radioactive waste. 4,629,587, Cl. 252-628.000.

Monji, Hideto; Aoki, Masaki; Torii, Hideo; and Okinaka, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Molding method for producing optical glass element. 4,629,487, Cl. 65-26.000.

Monma, Yoshiyuki: *See—*
Kubota, Kazufumi; Yamazaki, Seiichi; and Monma, Yoshiyuki, 4,629,876, Cl. 235-473.000.

Monreal, F. Javier. Water gliding board. 4,629,434, Cl. 441-65.000.

Montgomery Elevator Company: *See—*
Lewis, Michael D., 4,630,026, Cl. 340-21.000.

Montgomery, Richard L., to Minnesota Mining and Manufacturing Company. Gel-resistant bubble-filled wall repair compound. 4,629,751, Cl. 523-219.000.

Mookherjee, Braja D.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,629,586, Cl. 252-522.00R.

Moore, David G., to Realex Corporation. Snap-action orifice sealing plug for viscous product dispenser. 4,629,097, Cl. 222-153.000.

Moore, James H.; Woodcock, Sidney J.; and Dumas, Charles R., to General Electric Company. Positive displacement pump utilized in lube oil system for turbomachinery. 4,629,033, Cl. 184-6.300.

Moore Special Tool Co., Ltd.: *See—*
Barney, Kevin S.; Langevin, Theodore J.; Lawson, Harold W., Jr.; and Winski, Dennis A., 4,630,214, Cl. 364-474.000.

Mooth, Robert A.: *See—*
Winters, James C.; Mooth, Robert A.; and Orthoefer, Frank T., 4,629,655, Cl. 428-402.000.

Moran, Kevin E., to Aeronca Electronics, Inc. Compact laser scanning system. 4,630,276, Cl. 372-15.000.

Moreau, Max: *See—*
Wetterwald, Anton; Abrassart, Jacques; Moreau, Max; and Dallemagne, Stanislas, 4,629,523, Cl. 156-62.800.

Morettin, Mario P.; and Costolnick, Richard A., to National Gypsum Company. Fire-retardant wall. 4,628,651, Cl. 52-283.000.

Mori, Issei, to Tokyo Shibaura Denki Kabushiki Kaisha. Computerized tomographic apparatus utilizing a radiation source. 4,630,202, Cl. 364-414.000.

Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, to Hitachi, Ltd. Method and apparatus for processing spent ion exchange resin. 4,628,837, Cl. 110-346.000.

Mori, Yoshikatsu: *See—*
Maeda, Jun; and Mori, Yoshikatsu, 4,629,371, Cl. 407-114.000.

Morie, Takashi: *See—*
Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, 4,630,237, Cl. 365-104.000.

Morihiro, Yoshiyuki: *See—*
Takada, Mitsuyuki; Morihiro, Yoshiyuki; and Takasago, Hayato, 4,629,681, Cl. 430-314.000.

Morimoto, Masafumi: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Yamamoto, Hidehiko, 4,630,235, Cl. 364-900.000.

Morimura, Atsushi; and Tanaka, Hiromichi, to Matsushita Electric Industrial Co., Ltd. Color solid-state imager with color filter having an overlapping segmented filter arrangement. 4,630,106, Cl. 358-44.000.

Morinaga, Nozomu, to Nippon Seiko Kabushiki Kaisha. Roller bearing. 4,629,339, Cl. 384-576.000.

Morisawa, Kunio: *See—*
Yamashita, Kouichi; Ishiguro, Toshiaki; and Morisawa, Kunio, 4,628,952, Cl. 137-54.000.

Morita, Takayuki; Tanaka, Akira; Tsunekawa, Takahiko; and Amano, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of piecing a yarn in an open-end spinning machine. 4,628,684, Cl. 57-263.000.

Moriyama, Masakazu: *See—*
Saito, Takao; and Moriyama, Masakazu, 4,630,209, Cl. 364-444.000.

Moroi, Akihiko; Tanaka, Hiroshi; and Hatanaka, Shinya, to Nippon Kogaku K. K. Illuminating system. 4,630,182, Cl. 362-294.000.

Moroi, Motoki: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Morokawa, Shigeru, to Citizen Watch Co., Ltd. Television receiver with liquid crystal matrix display panel. 4,630,122, Cl. 358-241.000.

Morran, James R.: *See—*
Gunkel, Ronald W.; and Morran, James R., 4,629,380, Cl. 411-29.000.

Morris, Neil, to Re-Gen Products Limited. Dry cell battery re-activator. 4,629,963, Cl. 320-3.000.

Morrisroe, Peter J.: *See—*
Gagne, Peter H.; and Morrisroe, Peter J., 4,629,940, Cl. 315-111.510.

Morsbach, Martin; and Brauers, Bert, to Goetze AG. Oil scraper piston ring assembly. 4,629,198, Cl. 277-139.000.

Mortara, David W., to Mortara Instrument Inc. High resolution ECG waveform processor. 4,630,204, Cl. 364-417.000.

Mortara Instrument Inc.: *See—*
Mortara, David W., 4,630,204, Cl. 364-417.000.

Mortimer, J. Thomas: *See—*
Sweeney, James D.; and Mortimer, J. Thomas, 4,628,942, Cl. 128-784.000.

Morz, Gunter, to ANT Nachrichtentechnik GmbH. Four-port network coupling arrangement for microwave antennas employing monopulse tracking. 4,630,059, Cl. 343-362.000.

Moscovici, Anutza: *See—*
Fruchter, Moshe; and Moscovici, Anutza, 4,629,503, Cl. 75-121.000.

Moskovich, Jacob, to Vivitar Corporation. Zoom lens. 4,629,291, Cl. 350-427.000.

Mossberg Industries, Inc.: *See—*
Vanderpyl, David C.; and Rogler, Albert C., 4,628,681, Cl. 57-59.000.

Motorola Canada Limited: *See—*
Longstaff, Fred M.; and Lang, Gordon R., 4,630,288, Cl. 375-39.000.

Motorola, Inc.: *See—*
Barbiaux, William J., 4,629,981, Cl. 324-166.000.
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,630,304, Cl. 381-94.000.
Borth, David E.; Gerson, Ira A.; Smanski, Philip J.; and Vilmur, Richard J., 4,630,305, Cl. 381-94.000.
Drye, James E.; Schroeder, Jack A.; and Winchell, Vern H., II, 4,630,096, Cl. 357-81.000.
Fuller, Ronald D.; and Lowe, Benny W., 4,630,012, Cl. 333-235.000.
Haertling, Gene H., 4,630,040, Cl. 340-763.000.
Heffner, Samuel T., 4,629,906, Cl. 307-80.000.
Johnson, Robert H., 4,630,050, Cl. 342-62.000.
Puhl, Larry C.; and Vilmur, Richard J., 4,629,829, Cl. 379-58.000.
Reed, Paul A.; and Flannagan, Stephen T., 4,630,239, Cl. 365-189.000.
Stahl, John I.; Fischel, Burton J.; and Will, Frank J., 4,630,035, Cl. 340-539.000.
Townsend, Greg M.; Henderson, James A., Jr.; Marten, Russell A.; and Scavezze, Daniel C., 4,630,263, Cl. 370-85.000.
Upton, Eric L., 4,630,031, Cl. 340-347.0AD.

Motta, Carlo: *See—*
Bernardis, Francesco; and Motta, Carlo, 4,629,343, Cl. 400-124.000.

Mourand, Jacques: *See—*
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MPE Produkt Plan AG: *See—*
Lampert, Heinz; and Scheiwiller, Bruno, 4,629,115, Cl. 236-36.000.

MTD Products Inc.: *See—*
Kaesgen, Juergen, 4,628,757, Cl. 74-481.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See—*
Schweitzer, Klaus, 4,629,397, Cl. 416-96.00R.

Mueller, Gerald E.: *See—*
Minick, Chris A.; and Mueller, Gerald E., 4,629,648, Cl. 428-189.000.

Mugford, Donald A.; and Vivian, Daniel D., to Chrysler Motors Corporation. Articulated coupling assembly for vehicle headlamp doors. 4,630,178, Cl. 362-64.000.

Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, to Bayerische Motoren Werke A.G. Service-interval display for motor vehicles. 4,630,027, Cl. 340-52.00F.

Muhlbock, Siegfried: *See—*
Nitsch, Ernst; Ferber, Hubert P.; and Muhlbock, Siegfried, 4,629,698, Cl. 435-95.000.

Mukai, Hiroshi: *See—*
Shionozaki, Yoshio; and Mukai, Hiroshi, 4,629,290, Cl. 350-350.00R.

Muller, Beat, to Ciba-Geigy Corporation. Imidylcompounds, polymers therefrom, and use of the polymers. 4,629,773, Cl. 526-262.000.

Muller, Erich; Nickl, Josef; Roch, Josef; and Narr, Berthold, to Dr. Karl Thomae GmbH. Indolinones and pharmaceutical compositions containing same. 4,629,733, Cl. 514-418.000.

Muller-Horsche, Elmar: *See—*
Cirkel, Hans-Jurgen; Muller, Reinhard; and Muller-Horsche, Elmar, 4,630,277, Cl. 372-38.000.

Muller, Kurt: *See—*
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Muller, Reinhard: *See—*
Cirkel, Hans-Jurgen; Muller, Reinhard; and Muller-Horsche, Elmar, 4,630,277, Cl. 372-38.000.

Mullet, David L.; and Voth, Elmer D., to Excel Industries, Inc. Lawn edger attachment for tractors. 4,629,006, Cl. 172-15.000.

Mumallah, Naim A.: *See—*
Wu, Yulin; and Mumallah, Naim A., 4,629,747, Cl. 523-130.000.

Munk, Edmund, to Werzalit-Werke J. F. Werz KG. Method of producing shaped parts. 4,629,594, Cl. 264-69.000.

Murai, Ashita, to Fuji Photo Film Co., Ltd. Internal latent image-type direct positive silver halide light-sensitive material. 4,629,678, Cl. 430-230.000.

Murakami, Takeshi: *See—*
Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, 4,630,112, Cl. 358-120.000.

Murakami, Tamotsu: *See—*
Osawa, Shigenobu; Murakami, Tamotsu; Mizuma, Takashi; and Sano, Katsuhide, 4,629,673, Cl. 430-108.000.

Murakami, Yasukazu: *See—*
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Muraki, Katsuo; Honda, Kiyokazu; and Watanabe, Takaki, to Kabushiki Kaisha Toshiba; and Harison Electric Company Limited. Light emitting diode array. 4,630,180, Cl. 362-223.000.

Muranaka, Shiaru: *See—*
Tanaka, Hideo; Naka, Toshiaki; Muranaka, Shiaru; and Miyashita, Yoshikazu, 4,629,528, Cl. 156-351.000.

Murata Kikai Kabushiki Kaisha: *See—*
Tone, Shoichi; and Uchida, Hiroshi, 4,628,686, Cl. 57-274.000.

Murayama, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Device for installing electronic equipment on a vehicle. 4,630,160, Cl. 360-137.000.

Murphy, David P. Deskinning tooth roll apparatus. 4,628,806, Cl. 99-486.000.

Murphy, Michael E., to Lutheran Hospital Foundation, Inc. Adjustable hospital mattress with removable inserts. 4,628,557, Cl. 5-446.000.

Mushashi Seimitsu Kogyo Kabushiki Kaisha: *See—*
Nemoto, Akira, 4,629,352, Cl. 403-128.000.

Musmann, Hans-Georg: *See—*
Bergmann, Hans C.; and Musmann, Hans-Georg, 4,630,114, Cl. 358-136.000.

Myers, Gary L.; and Jagger, Don R., to HPM Corporation. Method and apparatus for making hollow sheel cores with controlled gas flow. 4,628,983, Cl. 164-7.100.

Myers, Michael, to ASARCO Incorporated. Process for strengthening lead-antimony alloys. 4,629,516, Cl. 148-11.50R.

Myers, Timothy S.; and Jones, William H., to Ferro Manufacturing Corporation. Seat recliner. 4,629,252, Cl. 297-366.000.

N. V. Bekaert S.A.: *See—*
Bourgois, Luc; and Baillievier, Freddy, 4,628,683, Cl. 57-213.000.

Nabetani, Shinji: *See—*
Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, 4,630,086, Cl. 357-23.500.

Nabisco Brands, Inc.: *See—*
Simelunas, William J.; Aquino, Agostino J.; and Polifroni, Nicholas, 4,629,056, Cl. 198-406.000.

Nadler, Leroy R.: *See—*
Jurgens, Raymond W., Jr.; Johnson, Richard G.; and Nadler, Leroy R., 4,628,969, Cl. 141-1.000.

Nagai, Akihiko: *See—*
Shirato, Kozo; Hiraizumi, Kazuo; Kaneko, Akio; and Nagai, Akihiko, 4,629,561, Cl. 210-198.200.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed change hub for a bicycle. 4,628,769, Cl. 74-750.00B.

Nagano, Yoshinobu: *See—*
Tsukamoto, Shin-ichi; Nagano, Yoshinobu; and Katsuda, Kimio, 4,629,736, Cl. 514-563.000.

Nagasawa, Hiroyuki: *See—*
Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, 4,628,720, Cl. 72-368.000.

Nagasawa, Kenichi: *See—*
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Nagase, Hiroshi: *See—*
Okuyama, Toshiaki; and Nagase, Hiroshi, 4,629,959, Cl. 318-727.000.

Nagase, Yasuo, to Anritsu Electric Company Limited. Magnetic head position determining mechanism. 4,630,147, Cl. 360-78.000.

Nagayama, Yoshiro: *See—*
Chisaka, Kazuto; Kushida, Masagoro; Nagayama, Yoshiro; and Yamamoto, Masami, 4,628,764, Cl. 74-625.000.

Naito, Yasuo: *See—*
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Naka, Toshiaki: *See—*
Tanaka, Hideo; Naka, Toshiaki; Muranaka, Shiaru; and Miyashita, Yoshikazu, 4,629,528, Cl. 156-351.000.

Nakagaki, Shintaro; and Kuriyama, Takashi, to Victor Company of Japan, Ltd. Circuit arrangement for removing noise of a color video signal. 4,630,104, Cl. 358-36.000.

Nakagaki, Shintaro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; and Kuriyama, Takashi, 4,630,107, Cl. 358-47.000.

Nakagawa, Shinji: *See—*
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Nakajima, Nobuyoshi; Adachi, Yuuma; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,629,891, Cl. 250-327.200.

Nakajima, Shigeru: *See—*
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Nakano, Keiichi; Tani, Yoshio; and Umeda, Tatsutoshi, to Kubota Ltd. Splash lubricating system for an engine. 4,628,878, Cl. 123-196.00R.

Nakao, Katsunori, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Arc furnace with variable capacity. 4,630,281, Cl. 373-71.000.

Nakaoka, Sadaaki: *See—*
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Nakashima, Hajime: *See—*
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Nakashima, Seiichiro; Inagaki, Shigemi; Ito, Susumu; Naito, Yasuo; and Otsuka, Kazuhisa, to Fanuc Ltd. Industrial robot. 4,628,778, Cl. 82-2.500.

Nakashita, Toshio: *See—*
Osaka, Yukio; Imura, Takeshi; and Nakashita, Toshio, 4,629,649, Cl. 428-209.000.

Nakata, Masaru: *See—*
Omura, Takaho; Horii, Yasuyuki; Fujiwara, Taichi; and Nakata, Masaru, 4,628,768, Cl. 74-745.000.

Nakata, Muneo: *See—*
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Nakauchi, Jun: *See—*
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Nakayama, Yutaka: *See—*
Kojima, Takao; Nakayama, Yutaka; Ishiguro, Hiroyuki; and Yamada, Tetsusyo, 4,629,549, Cl. 204-406.000.

Nakazawa, Toru, to Mita Industrial Co., Ltd. Electrophotographic process including controlling applied current values. 4,629,674, Cl. 430-125.000.

Nakazawa, Yoshio, to Graphtec Kabushiki Kaisha. XY recorder. 4,630,071, Cl. 346-136.000.

Narda Microwave Corporation, The: *See—*
Aslan, Edward E., 4,629,978, Cl. 324-95.000.

Narikiyo, Kazuhiko: *See—*
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Narr, Berthold: *See—*
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Nash, Richard C., to Fabcon, Inc. Insulated concrete panel. 4,628,653, Cl. 52-309.120.

Naslund, Jan I. Device for sampling cells from the mucous membrane of the cervix uteri. 4,628,940, Cl. 128-750.000.

National Distillers and Chemical Corporation: *See—*
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National Gypsum Company: *See—*
Morettin, Mario P.; and Costolnick, Richard A., 4,628,651, Cl. 52-283.000.

National Research Development Corp.: *See—*
Clow, Hugh; Percival, William S.; and Walters, Peter E., 4,629,986, Cl. 324-303.000.
de Brie Perry, Forbes G., 4,628,766, Cl. 74-691.000.
Hately, Maurice C., 4,630,061, Cl. 343-749.000.
Mohsin, Mohamed E., 4,629,395, Cl. 415-75.000.
West, Geoffrey A. W.; and Hill, Walter J., 4,630,306, Cl. 382-21.000.

Nave, Thomas J. Portable storage container. 4,628,705, Cl. 62-457.000.

Navistar International Corporation: *See—*
Fardal, Randolph G.; Cicci, George B.; and Leung, Man K., 4,629,122, Cl. 239-155.000.

NCR Corporation: *See—*
DelSignore, James R., II; Sheehan, Paul; and Friedman, Robert H., 4,630,100, Cl. 358-21.00R.
Pipkorn, Mark G., 4,629,976, Cl. 324-73.0PC.

NEC Corporation: *See—*
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Inaba, Masao; and Takahashi, Hiroshi, 4,630,101, Cl. 358-22.000.
Kage, Kouzou, 4,630,290, Cl. 375-104.000.
Koyama, Shoji, 4,630,085, Cl. 357-23.500.
Sekiguchi, Toru, 4,630,137, Cl. 360-13.000.
Yanase, Tomoo; and Mito, Ikuo, 4,629,532, Cl. 156-612.000.

Needham, Thomas P.; and Karlovits, Frank K., to Eaton Corporation. Making ice in a refrigerator. 4,628,698, Cl. 62-137.000.

Negishi, Kiyoshi: *See—*
Sato, Osamu; Tano, Eiichi; and Negishi, Kiyoshi, 4,629,305, Cl. 354-442.000.

Negishi, Shigetoshi: *See—*
Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, 4,628,595, Cl. 29-741.000.

Negro, Giuseppe, to Ferrero oHG mbH. Wafers and processes for their manufacture. 4,629,628, Cl. 426-138.000.

Nehse, Wolfgang: *See—*
Bordner, Rolf; Hege, Heinz; Nehse, Wolfgang; and Ochott, Thomas, 4,629,443, Cl. 464-74.000.

Neidert, Robert E.; and Krowne, Clifford M., to United States of America, Navy. Microwave and millimeter wave phase shifter. 4,630,011, Cl. 333-164.000.

Nelson, Reid V.: *See—*
Nelson, Veryl H.; and Nelson, Reid V., 4,629,202, Cl. 280-47.260.

Nelson, Veryl H.; and Nelson, Reid V. Combination golf cart and bag. 4,629,202, Cl. 280-47.260.

Nemeth, Ede: *See—*
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer, 4,628,999, Cl. 166-274.000.

Nemoto, Akira, to Mushashi Seimitsu Kogyo Kabushiki Kaisha. Resilient ball and socket joint assembly and method of manufacture. 4,629,352, Cl. 403-128.000.

Ness, Irving S., to Chicopee. Absorbent facing and method for making the same. 4,629,457, Cl. 604-382.000.

Neudorfer, Johann, to Neura Elektronics Technische Anlagen Gesellschaft mbH. Process of defrosting an evaporator of a refrigeration system. 4,628,706, Cl. 62-278.000.

Neuner, James A.: *See—*
Boomgaard, Dirk J.; and Neuner, James A., 4,629,983, Cl. 324-208.000.

Neura Elektronics Technische Anlagen Gesellschaft mbH: *See—*
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Neuschuetz, Dieter: *See—*
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.

New England Telephone and Telegraph Company: *See—*
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New Holland Inc.: *See—*
De Busscher, Cyriel R. J.; and Van Herpe, Francois, 4,628,946, Cl. 130-27.00R.
Strosser, Richard P., 4,630,191, Cl. 364-186.000.

Newcomb, Donald R., to Butternut Electronics Co. Vertical antenna with decoupling sections for multiband operation. 4,630,060, Cl. 343-722.000.

NGK Insulators Ltd.: *See—*
Mizutani, Isao; and Takeuchi, Tsunezo, 4,629,849, Cl. 219-10.55F.

NGK Spark Plug Co., Ltd.: *See—*
Kojima, Takao; Nakayama, Yutaka; Ishiguro, Hiroyuki; and Yamada, Tetsusyo, 4,629,549, Cl. 204-406.000.

Niblock, George W. Shelf support system. 4,629,077, Cl. 211-187.000.

Nichias Corporation: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,629,199, Cl. 277-204.000.

Nichols, Franklin. Interlocking puzzle blocks. 4,629,192, Cl. 273-156.000.

Nichols, Larry D., to Moleculon Research Company. Color-change indicator. 4,629,330, Cl. 368-89.000.

Nickel, Gerhard E. B.: *See—*
Herron, Gene A.; Nickel, Gerhard E. B.; and Alberghini, Alfred C., 4,628,669, Cl. 53-425.000.

Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, to Sandoz Ltd. Certain 1-(N-methylsulfonamido)-prop-2-yl 2-/4-(pyrid-2-yloxy)phenoxy/-propionate derivatives and their use for increasing recoverable sugar contained in sugar cane. 4,629,497, Cl. 71-94.000.

Nickl, Josef: *See—*
Muller, Erich; Nickl, Josef; Roch, Josef; and Narr, Berthold, 4,629,733, Cl. 514-418.000.

Niebel, Harald, to Mannesmann Aktiengesselschaft. Dot matrix print head with an adjustable print needle guide. 4,629,344, Cl. 400-124.000.

Niehenke, Edward C.; and Green, Patrick A., to United States of America, Air Force. Dielectric resonator stabilized microstrip oscillator. 4,630,004, Cl. 331-107.0SL.

Nienhaus, Clemens: *See—*
Post, Alexander; Nienhaus, Clemens; and Kampf, Klaus, 4,629,044, Cl. 192-28.000.

Nifco, Inc.: *See—*
Kimura, Shigeru; and Mizusawa, Akira, 4,629,167, Cl. 267-8.00R.

Niimura, Tsutomu: *See—*
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, 4,630,116, Cl. 358-160.000.

Niki, Shigeru: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Nilsson, Ingvar, to Suecia Antiqua Limited. Method for the manufacture of sheetlike or weblike material provided with markings becoming apparent in transmitted light. 4,629,638, Cl. 428-29.000.

Nilsson, Karl E., to Bayern-Chemie Gesellschaft fuer flugchemische Antriebe mbH. Short circuit spring for an electrical connector. 4,628,818, Cl. 102-202.200.

Nilsson, Lars G. Germination improving seed capsule and method of preparing the same. 4,628,633, Cl. 47-57.600.

Nippon Aleph Co. Ltd.: *See—*
Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, 4,630,074, Cl. 346-139.00C.

Nippon Cable System Inc.: *See—*
Kobayashi, Tetuo; and Hirai, Shoichi, 4,628,759, Cl. 74-501.50R.

Nippon Electric Co., Ltd.: *See—*
Shimada, Yasuhei, 4,630,039, Cl. 340-731.000.
Takahashi, Hiroshi, 4,630,034, Cl. 340-347.0DD.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Fujimori, Junichi, 4,628,789, Cl. 84-1.240.
Shibukawa, Takeo, 4,628,788, Cl. 84-1.030.

Nippon Hoso Kyokai: *See—*
Yamada, Osamu, 4,630,271, Cl. 371-37.000.

Nippon Infrared Industries, Co., Ltd.: *See—*
Inoue, Hitoshi; Suenaga, Norihiro; Suenaga, Nobuyuki; Sugiyama, Seiji; and Kaneda, Michihiro, 4,630,273, Cl. 372-9.000.

Nippon Kogaku K. K.: *See—*
Moroi, Akihiko; Tanaka, Hiroshi; and Hatanaka, Shinya, 4,630,182, Cl. 362-294.000.
Saegusa, Takashi, 4,629,304, Cl. 354-432.000.

Nippon Kogaku K.K.: *See—*
Tanimoto, Akikazu, 4,629,313, Cl. 355-53.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Morinaga, Nozomu, 4,629,339, Cl. 384-576.000.
Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, 4,628,758, Cl. 74-498.000.

Nippon Soken, Inc.: *See—*
Imoto, Yuzo; Hattori, Yoshiyuki; Takei, Toshihiro; and Tanaka, Taro, 4,629,039, Cl. 188-72.100.
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,630,047, Cl. 340-870.370.

Nippon Steel Corporation: *See—*
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.
Ogata, Seishi; Arima, Keizi; and Ohtsuki, Masahiro, 4,629,166, Cl. 266-158.000.

Nippon Telegraph & Telephone: *See—*
Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, 4,630,237, Cl. 365-104.000.

Nippon Thompson Co., Ltd.: *See—*
Kasai, Naomi, 4,629,260, Cl. 384-49.000.

Nippondenso Co., Ltd.: *See—*
Asai, Masahiro; and Hikimoto, Yasuhiro, 4,628,891, Cl. 123-599.000.
Noguchi, Takashi; and Totani, Shinzo, 4,630,056, Cl. 342-357.000.

Nippondenso Co., Ltd: *See—*
Imoto, Yuzo; Hattori, Yoshiyuki; Takei, Toshihiro; and Tanaka, Taro, 4,629,039, Cl. 188-72.100.

Nishida, Hiroshi; and Ino, Seiichi, to Kawasaki Jukogyo Kabushiki Kaisha. Operating member installation for a small-sized marine craft. 4,628,852, Cl. 114-270.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Hull number indicating apparatus. 4,628,855, Cl. 114-364.000.

Nishikawa, Masao; Sakurai, Yoshimi; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Direct-coupled control for a torque converter including a two stage speed responsive valve control. 4,628,767, Cl. 74-731.000.

Nishikawa, Masao; and Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Back-up device for an electronic control system of an automatic transmission. 4,628,772, Cl. 74-866.000.

Nishikawa, Reiji: *See—*
Sagoi, Masayuki; and Nishikawa, Reiji, 4,629,660, Cl. 428-678.000.

Nishikawa, Yasuo, to Tokai Electric Wire Company Limited. Connector housing. 4,629,279, Cl. 339-210.00M.

Nishimatsu, Masaharu: *See—*
Ide, Toshiaki; Shimozawa, Tohru; and Nishimatsu, Masaharu, 4,629,646, Cl. 428-143.000.

Nishimoto, Kazuo: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,629,199, Cl. 277-204.000.

Nishimoto, Naomichi: *See—*
Ichinoi, Yutaka; Nishimoto, Naomichi; and Ota, Yoshihiko, 4,630,131, Cl. 358-310.000.

Nishimura, Akira: *See—*
Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, 4,630,179, Cl. 362-66.000.

Nishino, Takaichi, to Tachikawa Spring Co., Ltd. Seat lifter. 4,629,151, Cl. 248-396.000.

Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, to Toyo Jozo Kabushiki Kaisha; and Kumiai Chemical Industry Co., Ltd. 2,3-di-substituted-5,6-dihydroimidazo [2,1-b] thiazole, its salts, production thereof and anti-inflammatory agent containing the same. 4,629,793, Cl. 548-154.000.

Nishizawa, Jun-ichi, to Semiconductor Research Foundation. Photo coupler with static induction transistor type detector. 4,629,901, Cl. 250-551.000.

Nissan Chemical Industries Ltd.: *See—*
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

Nissan Motor Co., Ltd.: *See—*
Aoyama, Shunichi; Fujii, Hiroshi; and Kato, Manabu, 4,628,880, Cl. 123-432.000.
Ideta, Yasufumi; and Miida, Shigeru, 4,628,754, Cl. 74-467.000.
Iwanaga, Kazuyoshi, 4,628,774, Cl. 74-867.000.
Kato, Shinichi; Saito, Yoji; and Umemoto, Hiroshi, 4,629,351, Cl. 403-27.000.
Ogawa, Naoki; and Kubozuka, Takao, 4,628,872, Cl. 123-41.270.
Suzuki, Yutaka; and Kato, Yuji, 4,629,915, Cl. 307-522.000.
Tanaka, Haruto, 4,630,226, Cl. 364-561.000.
Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, 4,628,758, Cl. 74-498.000.

Nissin Kogyo Kabushiki Kaisha: *See—*
Hachiro, Nobuaki, 4,628,691, Cl. 60-562.000.

Nitsch, Ernst; Ferber, Hubert P.; and Muhlbock, Siegfried, to Laevosan-Gesellschaft mbH & Co. KG Chemisch-Pharmazeutische Industrie. Plasma expander based on starch. 4,629,698, Cl. 435-95.000.

Niwa, Minoru, to Toyoda Gosei Co., Ltd. Steering wheel. 4,628,761, Cl. 74-552.000.

NL Industries, Inc.: *See—*
Larronde, Michael L., 4,630,244, Cl. 367-84.000.

Noailly, Philippe: *See—*
Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, 4,630,262, Cl. 370-81.000.

Noble, Charles H. Method and apparatus for applying a layer of material to a centrifugal casting mold. 4,628,984, Cl. 164-33.000.

Noguchi, Masaru: *See—*
Goto, Chiaki; and Noguchi, Masaru, 4,629,890, Cl. 250-327.200.

Noguchi, Takashi; and Totani, Shinzo, to Nippondenso Co. Ltd. Control system for antenna of receiving equipment installed on moving body. 4,630,056, Cl. 342-357.000.

Nohren, Hubert; Knofe, Helmut; and Struck, Klaus, to Autoflug GmbH. Safety belt winding device. 4,629,142, Cl. 242-107.40B.

Noma, Hiroyasu: *See—*
Takata, Susumu; Wakabayashi, Shoichi; Noma, Hiroyasu; and Wakatsuki, Tatsuya, 4,629,464, Cl. 623-16.000.

Nomula, Ramchandra R.: *See—*
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., 4,629,668, Cl. 430-11.000.

Nomura, Jun: *See—*
Yokozeki, Seiki; and Nomura, Jun, 4,629,848, Cl. 219-10.55B.

Nonaka, Nobuo: *See—*
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Nonomura, Tadao, to Pioneer Video Corporation. Method and apparatus for searching an address signal on video and/or audio disc. 4,630,250, Cl. 369-32.000.

Nooyen, Antonius M. A. Grating for use as a floor element in a stable and grating assembly. 4,628,662, Cl. 52-660.000.

Nordin, Ivan C.: *See—*
Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, 4,629,731, Cl. 514-353.000.

Nordischer Maschinenbau Rud.: *See—*
Wenzel, Werner, 4,628,570, Cl. 17-62.000.

Nordson Corporation: *See—*
Plunkett, Robert T.; and Inculet, Ion I., 4,629,119, Cl. 239-63.000.

Norsk Hydro A.S.: *See—*
Odd, Bjerke, 4,629,772, Cl. 526-201.000.

North American Philips Corp.: *See—*
Hatch, Douglas J.; and Cox, Jeffrey L., 4,629,999, Cl. 331-1.00R.

North American Philips Lighting Corporation: *See—*
Jaworowicz, Stephen W.; and Hall, John F., 4,629,939, Cl. 315-73.000.

Northern Telecom Limited: *See—*
Baxter, Gordon D., 4,629,827, Cl. 174-102.00D.
Charlebois, Leonard J.; Brown, Allan P.; and Scott, James R., 4,629,597, Cl. 264-278.000.

Northwest Podiatric Laboratories, Inc.: *See—*
Brown, Dennis N., 4,628,621, Cl. 36-44.000.

Norton Christensen, Inc.: *See—*
Kruger, Volker; and Daenicke, Heinrich, 4,629,013, Cl. 175-107.000.

Norton Company: *See—*
Ruid, John O.; and Stein, Edgar A., 4,629,473, Cl. 51-295.000.

Norton, Jeffrey M.; and Yamada, Shoji, to AMP Incorporated. Surface mountable connector retention means and method. 4,629,278, Cl. 339-134.000.

Noujaim, Sharbel E.: *See—*
Welles, Kenneth B., II; Noujaim, Sharbel E.; and Tiemann, Jerome J., 4,630,299, Cl. 381-4.000.

Nozawa, Ryoichiro; Amemiya, Yoichi; and Kawamura, Hideaki, to Fanuc Ltd. System for controlling motors for synchronous operation. 4,629,956, Cl. 318-625.000.

Nozawa, Yasuo, to Daiei, Inc., The. Sound source apparatus. 4,628,787, Cl. 84-1.200.

Nudelmont, Jean-Claude, to P.G.E.P. Professional General Electronic Products. Device for detecting the ionization level of a gas mixture controlled by electric arc. 4,629,992, Cl. 324-464.000.

Nuesslein, Hans; Puchta, Rolf; and Voelkel, Theodor, to Henkel Kommanditgesellschaft auf Aktien. Ready-to-use fabric softener concentrate. 4,629,574, Cl. 252-8.800.

Numazawa, Ryozo: *See—*
Sakimae, Akihiro; Kagawa, Yuri; Numazawa, Ryozo; and Onishi, Hisao, 4,629,701, Cl. 435-130.000.

Nystuen, Arne M.; and Kuss, John M., to Whirlpool Corporation. Method and apparatus for balancing a motor-fan system. 4,628,733, Cl. 73-462.000.

O.T.C. A/S: *See—*
Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, 4,629,014, Cl. 175-220.000.

Obo Bettermann Org.: *See—*
Gauger, Wolfgang, 4,629,857, Cl. 219-98.000.

O'Callaghan, Brendan, to Rennicks, Robin. Tripod support. 4,629,150, Cl. 248-167.000.

Oce-Nederland B.V.: *See—*
Bruggers, Jan W., 4,629,315, Cl. 355-75.000.
Everhardus, Roelof H.; Bouts, Wilhelmus J.; and Brands, Johannes J. M., 4,629,671, Cl. 430-59.000.

Ochott, Thomas: *See—*
Bordner, Rolf; Hege, Heinz; Nehse, Wolfgang; and Ochott, Thomas, 4,629,443, Cl. 464-74.000.

Odaka, Kentaro: *See*—
Fukami, Tadashi; Odaka, Kentaro; and Ozaki, Shinya, 4,630,272, Cl. 371-37.000.

Odd, Bjerke, to Norsk Hydro A.S. Method of polymerizing vinyl chloride. 4,629,772, Cl. 526-201.000.

O'Dean, Raymond D.: *See*—
Gilder, Thomas G., Jr.; and O'Dean, Raymond D., 4,629,824, Cl. 174-52.0FP.

Offermann, Peter: *See*—
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.

Ogata, Seishi; Arima, Keizi; and Ohtsuki, Masahiro, to Nippon Steel Corporation; and Kawasaki Jukogy Kabushiki Kaisha. Exhaust-gas treatment system for a sealed-type converter. 4,629,166, Cl. 266-158.000.

Ogawa, Naoki; and Kubozuka, Takao, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like including coolant return pump back-up arrangement. 4,628,872, Cl. 123-41.270.

Ogawa, Noriaki: *See*—
Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,629,045, Cl. 192-0.052.

Ogawa, Yukio; and Matsumura, Koji, to Victor Company of Japan, Ltd. Reproduced signal switching circuit for reproducing apparatus having rotary heads for special reproduction. 4,630,136, Cl. 360-10.300.

Ogburn, Alan P.; and Harvey, Ian J., to Lucas Industries Public Limited Company. Control system. 4,628,885, Cl. 123-490.000.

Ogden, Geoffrey A.: *See*—
Turner, Nicholas J.; Ogden, Geoffrey A.; and Bridge, Richard S., 4,628,677, Cl. 57-301.000.

Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, to Bridgestone Corporation. High-durable pneumatic radial tires. 4,628,977, Cl. 152-451.000.

Ogiue, Katsumi: *See*—
Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, 4,630,095, Cl. 357-78.000.

Oguchi, Yoshihiro: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, 4,629,670, Cl. 430-58.000.

Ogura, Mitsugi; and Momodomi, Masaki, to Kabushiki Kaisha Toshiba. MOS dynamic ram. 4,630,088, Cl. 357-23.600.

Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, to Mitsubishi Chemical Industries Ltd. Boehmite. 4,629,618, Cl. 423-625.000.

Oguti, Tosihiko: *See*—
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.

O'Hagan, Michael A.; and Smith, Richard D., to Garrett Corporation, The. Fluid bed hog fuel dryer. 4,628,833, Cl. 110-263.000.

O'Hara, Mark J.; and Urban, Peter, to Allied Corporation. Immobilization of lead and cadmium in fly ash. 4,629,509, Cl. 106-118.000.

Ohashi, Saichiro: *See*—
Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, 4,629,299, Cl. 353-97.000.

Ohira, Keiichi: *See*—
Hamada, Akira; Ohira, Keiichi; and Funakoshi, Akira, 4,628,573, Cl. 29-25.350.

Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Mizuno, Shinichiro, to Omron Tateisi Electronics Co. Electronic cash register capable of performing cash-dispensing transactions. 4,630,200, Cl. 364-405.000.

Ohmori, Kazunori; and Kawai, Kensuke, to Kabushiki Kaisha Toshiba. System for determining abnormal plant operation based on whiteness indexes. 4,630,189, Cl. 364-150.000.

Ohnishi, Masahiro: *See*—
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; Hatanaka, Isamu; and Harada, Shigeo, 4,629,675, Cl. 430-203.000.

Ohno, Hiroshi: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.

Ohshima, Osamu: *See*—
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Ohtake, Takeshi: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, 4,629,670, Cl. 430-58.000.

Ohtomo, Fumio: *See*—
Hori, Nobuo; Yokokura, Takashi; and Ohtomo, Fumio, 4,628,612, Cl. 33-366.000.

Ohtsuki, Masahiro: *See*—
Ogata, Seishi; Arima, Keizi; and Ohtsuki, Masahiro, 4,629,166, Cl. 266-158.000.

Okada, Hachiro; and Ono, Kenzi, to Toyota Jidosha Kabushiki Kaisha. Construction of door in motor vehicle. 4,628,637, Cl. 49-374.000.

Okada, Hajime: *See*—
Amano, Shintetsu; Okada, Hajime; Yakuda, Teruyuki; Hori, Isao; and Mizuhata, Yoshinori, 4,629,946, Cl. 315-219.000.

Okada, Mikiro: *See*—
Kamuro, Setsufumi; Hirano, Takaaki; and Okada, Mikiro, 4,630,295, Cl. 377-81.000.

Okada, Osami: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.

Okamoto, Takanori: *See*—
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,629,755, Cl. 524-415.000.

Okamura Corporation: *See*—
Yamaguchi, Tomoshige, 4,629,249, Cl. 297-300.000.

Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, to Fuji Photo Film Co., Ltd. Microform-reader. 4,629,299, Cl. 353-97.000.

Okanobu, Taiwa, to Sony Corporation. Phase comparing circuit. 4,629,914, Cl. 307-510.000.

Okinaka, Hideyuki: *See*—
Monji, Hideto; Aoki, Masaki; Torii, Hideo; and Okinaka, Hideyuki, 4,629,487, Cl. 65-26.000.

Okita, Ryoji: *See*—
Kaku, Takashi; Okita, Ryoji; Inoue, Masayoshi; and Kudo, Shozo, 4,630,126, Cl. 358-280.000.

Oku, Masuo: *See*—
Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.

Okuno, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Sound detecting circuit. 4,630,119, Cl. 358-198.000.

Okura Kogyo Kabushiki Kaisha: *See*—
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,629,755, Cl 524-415.000.

Okuyama, Chiyoshi: *See*—
Uchiyama, Toshiyuki; Sugawara, Takeo; Okuyama, Chiyoshi; and Mizushima, Yoshihiko, 4,629,486, Cl. 65-3.150.

Okuyama, Toshiaki; and Nagase, Hiroshi, to Hitachi, Ltd. Method and apparatus for controlling PWM inverter. 4,629,959, Cl. 318-727.000.

Okuzawa, Yasutoshi, to Fuji Photo Film Co., Ltd. Flexible magnetic disk driving apparatus with lubricated surfaces. 4,630,151, Cl. 360-99.000.

Oldendorf, Christian: *See*—
Knothe, Erich; Oldendorf, Christian; and Melcher, Franz-Josef, 4,629,016, Cl. 177-25.000.

Olin Corporation: *See*—
Hire, Robert C.; and Puig, John E., 4,629,768, Cl. 525-458.000.

Oliver, Burton L.; and Preston, David C., to International Business Machines Corporation. Apparatus for expediting sub-unit and memory communications in a microprocessor implemented data processing system having a multibyte system bus that utilizes a bus command byte. 4,630,194, Cl. 364-200.000.

Olsson, Bengt G. Protective circuit for complementary field-effect transistors. 4,630,164, Cl. 361-91.000.

Olympia Aktiengesellschaft: *See*—
Brinkmann, Gerhard; and Bordasch, Claus, 4,629,341, Cl. 400-17.000.

Olympus Optical Company Ltd.: *See*—
Kitagawa, Hisao; Inoue, Yasuo; Fujihara, Tadafumi; Endo, Itaru; and Shimada, Yoshihiro, 4,629,862, Cl. 219-200.000.
Mihara, Shin-ichi, 4,629,293, Cl. 350-427.000.

Omagari, Masaharu; Kazikawa, Tsuneo; and Suzuki, Takahumi, to Honda Giken Kogyo Kabushiki Kaisha. Reverse device for a vehicle. 4,629,206, Cl. 180-336.000.

Omark Industries, Inc.: *See*—
Langman, William F., 4,629,118, Cl. 238-107.000.

Omatsu, Masayuki: *See*—
Yonese, Naoki; Omatsu, Masayuki; and Kondo, Mitsuru, 4,629,800, Cl. 549-226.000.

Omron Tateisi Electronic Co.: *See*—
Hisano, Atushi, 4,630,225, Cl. 364-559.000.

Omron Tateisi Electronics Co.: *See*—
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Mizuno, Shinichiro, 4,630,200, Cl. 364-405.000.
Yuzawa, Shigetoshi; and Nakata, Muneo, 4,630,016, Cl. 335-81.000.

Omura, Nobukatsu: *See*—
Banzai, Hideo; Ikeda, Goh; and Omura, Nobukatsu, 4,629,954, Cl. 318-561.000.

Omura, Takaho; Horii, Yasuyuki; Fujiwara, Taichi; and Nakata, Masaru, to Kubota, Ltd. Tractor transmission. 4,628,768, Cl. 74-745.000.

Onishi, Akito, to Toyota Jidosha Kabushiki Kaisha. Fuel injection system for internal combustion engine. 4,628,886, Cl. 123-491.000.

Onishi, Hisao: *See*—
Sakimae, Akihiro; Kagawa, Yuri; Numazawa, Ryozo; and Onishi, Hisao, 4,629,701, Cl. 435-130.000.

Ono, Kenzi: *See*—
Okada, Hachiro; and Ono, Kenzi, 4,628,637, Cl. 49-374.000.

Ono, Masahiro: *See*—
Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, 4,630,074, Cl. 346-139.00C.

Ono, Mitsunori: *See*—
Itoh, Isamu; Ono, Mitsunori; Mihayashi, Keiji; Ichijima, Seiji; and Kobayashi, Hidetoshi, 4,629,683, Cl. 430-390.000.

Oohira, Seiichi: *See*—
Sasaki, Tohru; Endoh, Hiroyuki; and Oohira, Seiichi, 4,629,654, Cl. 428-373.000.

Ookawa, Norio: *See*—
Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,629,300, Cl. 354-76.000.

Opacich, Michael L.: *See*—
Kitchel, Frank T.; Solvik, R. Sven; and Opacich, Michael L., 4,629,749, Cl. 523-200.000.

Opocrin S.p.A.: *See*—
Bianchini, Pietro, 4,629,699, Cl. 435-101.000.

Oporto, Betsavel: *See*—
Israel, Yedy; Oporto, Betsavel; and Macdonald, Alain, 4,628,866, Cl. 119-51.500.

Oppenlaender, Knut: *See*—
Gousetis, Charalampos; Oppenlaender, Knut; Liebold, Gert; and Pfitzner, Klaus, 4,629,602, Cl. 422-7.000.

Orbeta, Ferdinand E.: *See*—
Gernhardt, Paul D.; and Orbeta, Ferdinand E., 4,630,015, Cl. 335-18.000.

Oregon Graduate Center: *See*—
Orloff, Jonathan H.; and Swanson, Lynwood W., 4,629,898, Cl. 250-396.00R.

Orloff, Jonathan H.; and Swanson, Lynwood W., to Oregon Graduate Center. Electron and ion beam apparatus and passivation milling. 4,629,898, Cl. 250-396.00R.

Ortho Pharmaceutical Corporation: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,629,723, Cl. 514-17.000.

Orthoefer, Frank T.: *See*—
Winters, James C.; Mooth, Robert A.; and Orthoefer, Frank T., 4,629,655, Cl. 428-402.000.

Osaka Seiki Kabushiki Kaisha: *See*—
Kawaguchi, Kizo; and Matsuda, Teruo, 4,628,587, Cl. 29-568.000.

Osaka, Yukio; Imura, Takeshi; and Nakashita, Toshio, to TDK Corporation. Information recording medium and method. 4,629,649, Cl. 428-209.000.

Osawa, Shigenobu; Murakami, Tamotsu; Mizuma, Takashi; and Sano, Katsuhide, to Kabushiki Kaisha Toshiba. Resin-coated carrier for use in two-component electrophotographic developers. 4,629,673, Cl. 430-108.000.

O'Shea, James N.: *See*—
Pramuk, David A.; O'Shea, James N.; and O'Shea, Stephen E., 4,629,239, Cl. 294-153.000.

O'Shea, Stephen E.: *See*—
Pramuk, David A.; O'Shea, James N.; and O'Shea, Stephen E., 4,629,239, Cl. 294-153.000.

Oshima, Kazuo: *See*—
Imai, Isamu; Oshima, Kazuo; and Inada, Norio, 4,628,978, Cl. 152-556.000.

Oshio, Susumu: *See*—
Hasegawa, Takanori; Yoshida, Shuntaro; and Oshio, Susumu, 4,628,813, Cl. 101-116.000.

Osterle, Gerhard; and Hutter, Wilhelm, to Aktiengesellschaft Adolph Saurer. Cloth draw-off apparatus for a weaving machine. 4,628,967, Cl. 139-1.00R.

Ostertag, Werner; Bauer, Roland; and Bock, Gustav, to BASF Aktiengesellschaft. Preparation of transparent golden yellow, thermally stable two-phase pigments of the general formula $xZnO.ZnFe_2O_4$. 4,629,513, Cl. 106-292.000.

Ostertag, Werner; Wienand, Henning; Lach, Dietrich; and Hahn, Erwin, to BASF Aktiengesellschaft. Basic chromium aluminum sulfates and their preparation. 4,629,616, Cl. 423-544.000.

Osuga, Minoru: *See*—
Oyama, Yoshishige; and Osuga, Minoru, 4,629,535, Cl. 204-1.00T.

Ota, Yoshihiko: *See*—
Ichinoi, Yutaka; Nishimoto, Naomichi; and Ota, Yoshihiko, 4,630,131, Cl. 358-310.000.

Otaka, Hideo, to Kabushiki Kaisha Komatsu Seisakusho. System for automatically controlling navigation. 4,630,205, Cl. 364-424.000.

Otsuka, Akira: *See*—
Horio, Kenji; Otsuka, Akira; and Tanioka, Tsuyoshi, 4,629,942, Cl. 315-169.400.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Kameyama, Yutaka, 4,629,542, Cl. 204-72.000.

Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, to VLSI Technology Research Association. Packaged semiconductor device structure including getter material for decreasing gas from a protective organic covering. 4,630,095, Cl. 357-78.000.

Otsuka, Kazuhisa: *See*—
Nakashima, Seiichiro; Inagaki, Shigemi; Ito, Susumu; Naito, Yasuo; and Otsuka, Kazuhisa, 4,628,778, Cl. 82-2.500.

Ott, Gilbert: *See*—
Michl, Rudolf J.; Rheinberger, Volker M.; and Ott, Gilbert, 4,629,746, Cl. 523-117.000.

Oudet, Claude, to Portescap. Method and apparatus for harmonics suppression in motor systems. 4,629,916, Cl. 310-49.00R.

Overby, Wayne A., to International Business Machines Corporation. Testing limits of speed variations in motors. 4,629,980, Cl. 324-166.000.

Owada, Akira: *See*—
Tezuka, Takeshi; Owada, Akira; and Katsumoto, Naoaki, 4,629,250, Cl. 297-362.000.

Owen, Hartley: *See*—
Haddad, James H.; and Owen, Hartley, 4,629,552, Cl. 208-161.000.

Owens, Betty. Apparatus for tying bows. 4,629,100, Cl. 223-46.000.

Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,629,389, Cl. 414-433.000.

Oyama, Yoshishige; and Osuga, Minoru, to Hitachi, Ltd. Method for detecting an air-fuel ratio. 4,629,535, Cl. 204-1.00T.

Ozaki, Shinya: *See*—
Fukami, Tadashi; Odaka, Kentaro; and Ozaki, Shinya, 4,630,272, Cl. 371-37.000.

Ozasa, Susumu: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.

Ozawa, Kazuhiro: *See*—
Inoue, Toshihiro; Ozawa, Kazuhiro; and Kimura, Yoshinobu, 4,629,953, Cl. 318-468.000.

P.G.E.P. Professional General Electronic Products: *See*—
Nudelmont, Jean-Claude, 4,629,992, Cl. 324-464.000.

P.O.P. Displays, Inc.: *See*—
Loew, Jonathon A., 4,629,072, Cl. 211-59.300.

PA Incorporated: *See*—
Papadimitriou, Stylianos; and Lam, Clive C., 4,629,985, Cl. 324-232.000.
Wheeler, Walter R., 4,629,991, Cl. 324-232.000.

Paczosa, Benedict M.: *See*—
Windedahl, Alan L.; and Paczosa, Benedict M., 4,628,892, Cl. 124-23.00R.

Palacin, Francis: *See*—
Hasler, Rolf; and Palacin, Francis, 4,629,465, Cl. 8-400.000.

Palmer, Thomas E., to Glasdon Limited. Lock for container lid. 4,628,716, Cl. 70-349.000.

Pan, Robert B.: *See*—
Salama, Mamdouh M.; and Pan, Robert B., 4,629,111, Cl. 228-182.000.

Panex Corporation: *See*—
Young, David E.; and Sebastian, Danny S., 4,628,995, Cl. 166-113.000.

Papadimitriou, Stylianos; and Lam, Clive C., to PA Incorporated. Method and apparatus for measuring defects in tubular members. 4,629,985, Cl. 324-232.000.

Papst-Motoren GmbH & Co.: *See*—
Merkle, Alfred, 4,629,919, Cl. 310-90.000.

Paradyne Corporation: *See*—
Armstrong, Thomas, 4,630,287, Cl. 375-39.000.
Betts, William L., 4,630,286, Cl. 375-39.000.

Parent, Yves O.: *See*—
Welsh, William A.; and Parent, Yves O., 4,629,588, Cl. 260-428.000.

Paris, Henry G., to Aluminum Company of America. Aluminum base alloy powder metallurgy process and product. 4,629,505, Cl. 75-228.000.

Parisi, Michael A., to Xerox Corporation. Scanning system for controlling stray beams caused by undesirable optical reflections. 4,630,130, Cl. 358-300.000.

Park, Robert A. Power tool guide-clamp assembly. 4,628,782, Cl. 83-442.000.

Parker, Bert A. Structural insulated panel system. 4,628,650, Cl. 52-265.000.

Parker, Donald L.; and Heffner, Donald L., to General Motors Corporation. Vacuum check valve. 4,628,959, Cl. 137-526.000.

Parker, James S., to General Electric Company. Automatic gain control system. 4,630,117, Cl. 358-174.000.

Parker, Robert; Ratzlaff, Thomas D.; and Siden, Dennis C., to Raychem Corporation. Device for heat recovery. 4,628,989, Cl. 165-46.000.

Parnell, Edgar W.: *See*—
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,629,495, Cl. 71-92.000.

Parot, Jean-Marc: *See*—
Charles, Joel; Gaudriot, Lionel; and Parot, Jean-Marc, 4,628,737, Cl. 73-624.000.

Parsons, John T. Meltable matrix chucking machining center and process using. 4,629,378, Cl. 409-131.000.

Passerell, David P., to Perfection Corporation. Stab-type coupling. 4,628,965, Cl. 138-89.000.

Patalon, Heinrich, to Didier Engineering GmbH. Process and furnace for reheating slabs, billets, blooms and the like. 4,629,417, Cl. 432-5.000.

Patalon, Heinrich, to Didier Engineering GmbH. Process and furnace for reheating metallic objects. 4,629,418, Cl. 432-11.000.

Patchett, Arthur A.: *See*—
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,629,787, Cl. 540-528.000.

Paullin, Dale W. Ventilated boot. 4,629,641, Cl. 428-36.000.

Pavlik, Myrna L.: *See*—
Pavlik, Patrick C.; Pavlik, V. Matthew; and Pavlik, Myrna L., 4,629,067, Cl. 206-425.000.

Pavlik, Patrick C.; Pavlik, V. Matthew; and Pavlik, Myrna L. Diskette holder. 4,629,067, Cl. 206-425.000.

Pavlik, V. Matthew: *See*—
Pavlik, Patrick C.; Pavlik, V. Matthew; and Pavlik, Myrna L., 4,629,067, Cl. 206-425.000.

Paxton, William G.; and Wilkinson, Derek, to Smiths Industries Public Limited Company. Actuators and actuator assemblies. 4,628,752, Cl. 74-411.500.

Peabody Engineering Corp.: *See*—
Love, Richard E., 4,628,838, Cl. 110-347.000.

Pearce, Michael; and Entingh, D. Daniel, to Lucht Engineering, Inc. Thermal marking system for photographic media. 4,629,312, Cl. 355-29.000.

Peckinpaugh, Roger I., to Southern California Edison Company. Voltage controller. 4,630,220, Cl. 364-492.000.

Pedersen, Hans N., to I. C. Moller A/S. Method of joining prefabricated heat insulated pipes and a welding fitting therefore. 4,629,216, Cl. 285-21.000.
Pederson, Fred J. Bee nesting box. 4,628,558, Cl. 6-1.000.
Pegoraro, Luciano, to Pegoraro S.p.A. Rotary blade agricultural implement. 4,629,007, Cl. 172-548 000.
Pegoraro S.p.A.: *See*—
Pegoraro, Luciano, 4,629,007, Cl. 172-548.000.
Pehlken, Wolfgang: *See*—
Dirks, Rolf; and Pehlken, Wolfgang, 4,629,840, Cl. 200-147.00R.
Penneck, Richard J.: *See*—
Booth, Michael; and Penneck, Richard J., 4,629,925, Cl. 310-330.000.
Pennekamp, Engelbert, to Hazemag Dr. E. Andreas GmbH & Co. Roll crusher. 4,629,134, Cl. 241-87.100.
Pentapharm A.G.: *See*—
Svendsen, Lars G., 4,629,695. Cl. 435-19.000.
Percival, William S.: *See*—
Clow, Hugh; Percival, William S.; and Walters, Peter E., 4,629,986, Cl. 324-303.000.
Perepezko, John H.: *See*—
Wiley, John D.; and Perepezko, John H., 4,630,094, Cl. 357-67.000.
Perfection Corporation: *See*—
Passerell, David P., 4,628,965, Cl. 138-89.000.
Perinet, Roland J. Y. Apparatus for aerial scattering. 4,629,148, Cl. 244-136.000.
Perkin-Elmer Corporation, The: *See*—
Gagne, Peter H.; and Morrisroe, Peter J., 4,629,940, Cl. 315-111.510.
Perrine, Walter E., to Weider Health and Fitness. Arm support device. 4,629,183, Cl. 272-123.000.
Perry, Marvin K.: *See*—
Waggoner, Terrence C.; Simmons, James A.; Perry, Marvin K.; and Tromel, Richard H., 4,629,834, Cl. 381-68.200.
Person, Dennis W.; Pierce, Stanley L.; and Liang, Polung, to Ford Motor Company. Hydraulic clutch pressure control for an electronically controlled transmission. 4,628,771, Cl. 74-856.000.
Peter, Gunter: *See*—
Trinks, Hilmar; Peter, Gunter; Eichler, Volker; and Buesse, Winfried, 4,628,817, Cl. 101-426.000.
Peterman, Milton J.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
Petermann, Denis: *See*—
Lemonnier, Marc; Petermann, Denis; Le Fur, Daniel; and Metgert, Stephan, 4,629,897, Cl. 250-385.000.
Petermann, Hans: *See*—
Haubner, Georg; Petermann, Hans; and Zobl, Hartmut, 4,630,043, Cl. 340-825.570.
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Transport carriage. 4,629,079, Cl. 212-98.000.
Peterson Manufacturing Company: *See*—
White, Russell L., 4,629,296, Cl. 350-624.000.
Peterson, Steven G., to E. F. Johnson Company. Latching mechanism. 4,629,227, Cl. 292-19.000.
Petit, Dominique A.; and Du Pasquier, Marc P., to International Business Machines Corporation. Method for identifying a faulty cell in a chain of cells forming a shift register. 4,630,270, Cl. 371-29.000.
Petley, Colin H.: *See*—
Fairbend, Raymond J.; Holmshaw, Richard T.; and Petley, Colin H., 4,629,881, Cl. 250-213.0VT.
Petravicius, Stasys: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
Petrick, Mary S.: *See*—
Carson, Robert A.; Petrick, Mary S.; Vallone, Lee A.; and Walker, John D., 4,629,832, Cl. 340-825.070.
Petrillo, Edward W., Jr.: *See*—
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,629,724, Cl. 514-18.000.
Petrousky, James A.: *See*—
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.
Petrzilka, Martin; and Schadt, Martin, to Hoffmann-La Roche Inc. Cyclohexanecarbonitriles. 4,629,581, Cl. 252-299.630.
Pett, Robert A.: *See*—
Brandt, Randy L.; Boswell, K. Herb; and Pett, Robert A., 4,629,113, Cl. 236-10.000.
Pettis, Charles D. Watt-hour meter display for informing consumer of energy consumption. 4,630,211, Cl. 364-464.000.
Pews, R. Garth, to Dow Chemical Company, The. Substituted oxirane compounds. 4,629,492, Cl. 71-88.000.
Pezzarossi, John J., to United States Brass Corporation. Tub-shower diverter valve. 4,628,962, Cl. 137-625.470.
Pfeifer, Josef, to Ciba-Geigy Corporation. Process for irradiating polyimides. 4,629,685, Cl. 430-583.000.
Pfeifer, Josef, to Ciba-Geigy Corporation. Polyimides, a process for their preparation and their use. 4,629,777, Cl. 528-353.000.
Pfeiffer, Ugo C.: *See*—
Pinza, Mario; and Pfeiffer, Ugo C., 4,629,797, Cl. 548-544.000.
Pfisterer, Dieter, to Pfisterer Environ, Inc. Material compacting device. 4,629,233, Cl. 294-1.100.
Pfisterer Environ, Inc.: *See*—
Pfisterer, Dieter, 4,629,233, Cl. 294-1.100.
Pfitzner, Klaus: *See*—
Gousetis, Charalampos; Oppenlaender, Knut; Liebold, Gert; and Pfitzner, Klaus, 4,629,602, Cl. 422-7.000.
Pfizer Inc.: *See*—
Dirlam, John P., 4,629,794, Cl. 548-225.000.
Pflaum, Michael: *See*—
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,629,893, Cl. 250-363.00S.
Philip Morris Incorporated: *See*—
Driscoll, Dennis M.; and Southwick, Everett W., 4,628,947, Cl. 131-297.000.
Phillips, Gordon L. P. Color printing process and equipment. 4,629,428, Cl. 434-98.000.
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, to Hussmann Corporation. Non-flooding remote air cooled condensers. 4,628,701, Cl. 62-184.000.
Phillips Petroleum Company: *See*—
Cheng, Paul J., 4,629,615, Cl. 423-456.000.
Drake, Charles A., 4,629,533, Cl. 203-51.000.
Ezell, Emory L., 4,629,534, Cl. 203-98.000.
Kukes, Simon G.; and Banks, Robert L., 4,629,719, Cl. 502-242.000.
Shyr, Yen-Shin; Bobsein, Rex L.; and Johnson, Marvin M., 4,629,767, Cl. 525-339.000.
Wu, Yulin; and Mumallah, Naim A.. 4,629,747, Cl. 523-130.000.
Phipps, Henri L. Umbrella music box accessory. 4,628,791, Cl. 84-94.00C.
Physio-Control Corporation: *See*—
Jones, Paul W.; Merry, Rodney J.; and Hakala, Douglas T., 4,628,935, Cl. 128-419.00D.
Pickard, Jurgen; Sandner, Helmut; and Luttge, Klaus, to Daimler-Benz Aktiengesellschaft. Piston of a pressure-medium actuator with a piston rod of adjustable effective length. 4,628,795, Cl. 92-13.410.
Picot, Pascal; and Pressaco, Pierre, to Societe Anonyme D.B.A. Electric contactor for pneumatic servomotor for braking. 4,629,842, Cl. 200-153.00V.
Pierce, John E. Solar energy power system. 4,628,692, Cl. 60-641.800.
Pierce, Stanley L.: *See*—
Person, Dennis W.; Pierce, Stanley L.; and Liang, Polung, 4,628,771, Cl. 74-856.000.
Pierman, Martin J. Golf putter head. 4,629,193, Cl. 273-164.000.
Pierre, Gerard: *See*—
Geniees, Eugene; Pierre, Gerard; Santier, Christian; and Tsintavis, Constantin, 4,629,540, Cl. 204-59.00R.
Pierrel, Michel: *See*—
Gourmel, Yves; and Pierrel, Michel, 4,628,987, Cl. 164-254.000.
Pifer, Richard L.: *See*—
Heine, Charles F.; and Pifer, Richard L., 4,628,753, Cl. 74-447.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Miyajima, Tamotsu; Tanaka, Noriatsu; and Saito, Nobuto, 4,629,748. Cl. 523-161.000.
Pinato, Oskar, to Alfa-Laval Separation AB. Centrifugal separator with annular sealing means arranged around the rotor outlet for separated liquid. 4,629,564, Cl. 210-512.300.
Pinchuk, Leonard, to Cordis Corporation. Reinforcing structure for cardiovascular graft. 4,629,458, Cl. 623-1.000.
Pinnavaia, Thomas J.; and Raythatha, Rasik H., to Michigan State University. Delaminated clay materials. 4,629,712, Cl. 502-63.000.
Pinza, Mario; and Pfeiffer, Ugo C., to I.S.F. Societa per Azioni. Process for the preparation of pyrrolidone derivatives. 4,629,797, Cl. 548-544.000.
Pioneer Electronic Corporation: *See*—
Kanamaru, Hitoshi, 4,630,134, Cl. 358-343.000.
Senso, Hitoshi, 4,629,949, Cl. 318-257.000.
Tanno, Toshihiro, 4,630,303, Cl. 381-87.000.
Pioneer Video Corporation: *See*—
Nonomura, Tadao, 4,630,250, Cl. 369-32.000.
Pipkorn, Mark G., to NCR Corporation. Method and circuit for evaluating an analog voltage. 4,629,976, Cl. 324-73.0PC.
Pirio, Marcel R.: *See*—
Collins, Christine G.; Pirio, Marcel R.; and Singh, Prithipal, 4,629,691, Cl. 435-7.000.
Pissiotas, Georg: *See*—
Rempfler, Hermann; and Pissiotas, Georg, 4,629,813, Cl. 564-256.000.
Rohr, Otto; and Pissiotas, Georg, 4,629,498, Cl. 71-98.000.
Pitcairn, Ian C. Water ski construction. 4,629,435, Cl. 441-68.000.
Pitney Bowes Inc.: *See*—
Salazar, Edilberto I.; and Kirschner, Wallace, 4,630,210, Cl. 364-464.000.
Scribner, Albert W.; and Check, Frank T., Jr., 4,629,871, Cl. 235-375.000.
Pitts, Warren R., to Dennison Manufacturing Company. Flexible transparent notebook and the like. 4,629,349, Cl. 402-74.000.
Plaot, Michael, to Allied Corporation. Optical flat bed scanning system. 4,629,283, Cl. 350-6.800.
Plaskett, Thomas S.: *See*—
Brownlow, James M.; and Plaskett, Thomas S., 4,629,662, Cl. 428-432.000.
Plastivit, S.A.: *See*—
Badia Iniesta, Antonio, 4,629,082, Cl. 215-252.000.

Plavskikh, Vladimir D.: *See*—
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.
Plessey Overseas Limited: *See*—
Komorowski, Robert; and Punia, Harpal, 4,630,001, Cl. 331-34.000.
Plies, Erich, to Siemens Aktiengesellschaft. Deflection lens system for generating a beam of neutral particles of variable cross section. 4,629,899, Cl. 250-396.0ML.
Plona, Thomas J.: *See*—
Gouilloud, Michel M. A.; and Plona, Thomas J., 4,628,725, Cl. 73-19.000.
Plunkett, Robert T.; and Inculet, Ion I., to Nordson Corporation. Electrostatic isolation apparatus and method. 4,629,119, Cl. 239-63.000.
Podell, Allen F., to Cuisinarts, Inc. Magnetic safety interlock for a food processor utilizing vertically oriented, quadrant coded magnets. 4,629,131, Cl. 241-36.000.
Pohndorf, Peter J.; and Schroeppel, Edward A., to Cordis Corporation. Method and means of electrode selection for pacemaker with multi-electrode leads. 4,628,934, Cl. 128-419.0PG.
Polaroid Corporation: *See*—
Bronstein-Bonte, Irena Y.; and Fischer, Alan B., 4,629,821, Cl. 136-257.000.
Erlichman, Irving, 4,630,069, Cl. 346-76.0PH.
McArdle, Donald J.; Russell, Robert H.; and Scott, Donald G., 4,629,475, Cl. 55-52.000.
Polifroni, Nicholas: *See*—
Simelunas, William J.; Aquino, Agostino J.; and Polifroni, Nicholas, 4,629,056, Cl. 198-406.000.
Polikarpov, Vladimir V.: *See*—
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.
Polk, Matthew S.; and Campbell, Colin B. Method and apparatus for reproducing sound having a realistic ambient field and acoustic image. 4,630,298, Cl. 381-1.000.
Pollard, John H., to United States of America, Army. Material analysis using reflected light. 4,629,322, Cl. 356-300.000.
Pollock, Henry J. Electrical connector. 4,629,274, Cl. 339-95.00R.
Polteg, Åke: *See*—
Eriksson, Lennart; and Polteg, Åke, 4,628,899, Cl. 126-64.000.
Poltorak, Alexandr P.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.
Polzer, Rudolf, to ANT Nachrichtentechnik GmbH. Programmable inductively coupled transponder. 4,630,044, Cl. 340-825.720.
Ponce, Emiliano, Jr. Long life traffic control lamp and socket insert. 4,629,943, Cl. 315-200.00R.
Pont-a-Mousson S.A.: *See*—
Gourmel, Yves; and Pierrel, Michel, 4,628,987, Cl. 164-254.000.
Poppitz, Harold A. Fluid and brush cleaning apparatus. 4,629,347, Cl. 401-42.000.
Porche, Albert J. Pneumatic invalid lift. 4,629,162, Cl. 254-93.0HP.
Porel, Louis-Claude, to Hydro Rene Leduc. Hydraulic pump with pistons and controlled suction valves. 4,629,400, Cl. 417-270.000.
Port of Houston Authority: *See*—
Tullos, Melvin L., 4,629,386, Cl. 414-376.000.
Porter-Cable Corporation: *See*—
Clowers, Earl R., 4,628,605, Cl. 30-393.000.
Porter, Donald H.: *See*—
Currey, John E.; McLarty, Colin S.; and Porter, Donald H., 4,628,596, Cl. 29-825.000.
Portescap: *See*—
Oudet, Claude, 4,629,916, Cl. 310-49.00R.
Post, Alexander; Nienhaus, Clemens; and Kampf, Klaus, to Jean Walterscheid GmbH. Clutch mechanism comprising a freewheeling unit disengageable in the driving direction. 4,629,044, Cl. 192-28.000.
Post-Glover Resistors, Inc.: *See*—
Allen, David W., 4,630,024, Cl. 338-58.000.
Poteet, Ken A.; and Chang, Shuen C., to Texas Instruments Incorporated. Dynamic memory with intermediate column derode. 4,630,240, Cl. 365-189.000.
Potzas, Peter: *See*—
Mauer, Dieter; and Potzas, Peter, 4,628,722, Cl. 72-391.000.
Poulos, Jon D. Ash catcher for barbecue kettle. 4,628,901, Cl. 126-243.000.
Powilleit, Hansherger. Single grain sowing machine. 4,628,841, Cl. 111-89.000.
Pozzo, Ennio A.: *See*—
Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, 4,630,077, Cl. 346-140.00R.
Pramuk, David A.; O'Shea, James N.; and O'Shea, Stephen E. Article carrying means. 4,629,239, Cl. 294-153.000.
Pressaco, Pierre; and Sauvee, Jean-Paul, to Societe Anonyme D.B.A. Disc brake with automatic adjustment. 4,629,038, Cl. 188-71.900.
Pressaco, Pierre: *See*—
Picot, Pascal; and Pressaco, Pierre, 4,629,842, Cl. 200-153.00V.
Preston, David C.: *See*—
Oliver, Burton L.; and Preston, David C., 4,630,194, Cl. 364-200.000.
Prevatt, William D.; Akin, Cavit; and Evans, April J., to Standard Oil Company (Indiana). Selective conversion of cyano compounds to amides and carboxylic acids. 4,629,700, Cl. 435-128.000.
Price, Floyd W., to Burry-Lu, Inc. Bottom tuck device for ice cream sandwich wrapping machine. 4,628,664, Cl. 53-232.000.
Princeton Packaging, Inc.: *See*—
Jensen, Clemens J.; and Westmoreland, Wyman R., 4,629,057, Cl. 198-424.000.
Pringle, Ronald E., to Camco, Incorporated. Equalizing means for a subsurface well safety valve. 4,629,002, Cl. 166-324.000.
Printed Circuits International: *See*—
Stenerson, Gary L.; and Miller, Thomas J., 4,630,172, Cl. 361-386.000.
Prinz, Peter: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,629,711, Cl. 502-24.000.
Process Alternatives & Combustion, Inc.: *See*—
Joniec, George W., 4,629,196, Cl. 277-3.000.
Procter & Gamble Company, The: *See*—
Curro, John J.; and Linman, E. Kelly, 4,629,643, Cl. 428-131.000.
Proctor, Rudy, to R & P Company. Method and device for transferring heat through a double walled container. 4,629,866, Cl. 219-439.000.
Products for Health and Industry, Inc.: *See*—
Duncan, David T.; McElligott, John; Lipscomb, David M.; and Williams, Charles W., 4,628,926, Cl. 128-203.280.
Profile Industries Corporation: *See*—
Le Houillier, James G., 4,628,980, Cl. 160-166.00A.
Profoment Utvecklings AB: *See*—
Ericsson, Axel B. R., 4,628,647, Cl. 52-173.00R.
Protoned B.V.: *See*—
Korth, Bernd, 4,629,078, Cl. 211-207.000.
Proud, Joseph M.: *See*—
Fallier, Charles N., Jr.; and Proud, Joseph M., 4,629,945, Cl. 315-207.000.
Provost, Claude: *See*—
Provost, Richard R.; and Provost, Claude, 4,629,340, Cl. 384-554.000.
Provost, Richard R.; and Provost, Claude. Roller bearing assembly. 4,629,340, Cl. 384-554.000.
Prows, John B.: *See*—
Revelt, William F.; Prows, John B.; Thomson, Fred M.; and Avery, Hugh E., 4,629,328, Cl. 366-177.000.
Prud'homme, Robert K.; Stanley, Frederick W., Jr.; and Langhorst, Martin W., to Dow Chemical Company, The. Method for characterizing the molecular weight and molecular weight distribution of ultra-high molecular weight water soluble polymers. 4,629,566, Cl. 110-635.000.
Pryor, Timothy R.: *See*—
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,629,319, Cl. 356-237.000.
Puchta, Rolf: *See*—
Nuesslein, Hans; Puchta, Rolf; and Voelkel, Theodor, 4,629,574, Cl. 252-8.800.
Puff, Roger M.: *See*—
Delessard, Serge L.; Puff, Roger M.; Kita, Jean C.; and Virgilio, Ange, 4,628,831, Cl. 110-245.000.
Pugh, Richard E., to Anchor Hocking Corporation. Modular display package. 4,629,068, Cl. 206-426.000.
Pugh, Richard E., to Anchor Hocking Corporation. Modular display package. 4,629,069, Cl. 206-426.000.
Pugsley, Peter C.; and Dunkley, Rowland A. G., to De La Rue Company PLC, The. Prepayment metering system. 4,629,874, Cl. 235-380.000.
Puhl, Larry C.; and Vilmur, Richard J., to Motorola, Inc. Full duplex speakerphone for radio and landline telephones. 4,629,829, Cl. 379-58.000.
Puig, John E.: *See*—
Hire, Robert C.; and Puig, John E., 4,629,768, Cl. 525-458.000.
Punia, Harpal: *See*—
Komorowski, Robert; and Punia, Harpal, 4,630,001, Cl. 331-34.000.
Pylkki, Russell J.: *See*—
Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,628,726, Cl. 73-61.10C.
Quality Tubing, Incorporated: *See*—
Dubois, Jon D., 4,629,218, Cl. 285-176.000.
Quantz, Chester, to Electro-Tech, Inc. Dual current limiting voltage regulator. 4,629,966, Cl. 322-25.000.
Quinn, Robert E., to Lubrizol Corporation, The. Water dispersed rust inhibitive coating compositions. 4,629,753, Cl. 524-394.000.
Quixote Corporation: *See*—
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., 4,629,668, Cl. 430-11.000.
R. J. Reynolds Tobacco Company: *See*—
Beard, Hoyt S.; and Woempner, Marvin G., 4,628,948, Cl. 131-327.000.
R. L. Best Company, Inc.: *See*—
Best, Richard L., 4,628,719, Cl. 72-257.000.
R & P Company: *See*—
Proctor, Rudy, 4,629,866, Cl. 219-439.000.
Rachels Industries, Inc.: *See*—
Dayus, Lloyd G., 4,628,954, Cl. 137-75.000.
Rademachers, Jakob: *See*—
Janz, Helmut; Rodi, Fritz; Soppe, Alfred; and Rademachers, Jakob, 4,629,500, Cl. 75-0.5BA.
Rader, Sandra B.; and Rader, Steven J. Inflatable toy tunnel. 4,629,182, Cl. 272-113.000.
Rader, Steven J.: *See*—
Rader, Sandra B.; and Rader, Steven J., 4,629,182, Cl. 272-113.000.

Radke, Dietrich: *See—*
Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, 4,629,506, Cl. 75-10.630.

Rafter, John A., Jr., to Chevron Research Company. Method and apparatus for obtaining liquid samples. 4,628,749, Cl. 73-863.710.

Raiche, Rejean. Stitched assembly. 4,628,849, Cl. 112-414.000.

Raines, Russell H., to Union Carbide Corporation. Use of low M.S. hydroxyethyl cellulose for fluid loss control in oil well applications. 4,629,573, Cl. 252-8.510.

Raleigh, Michael: *See—*
Fiorito, Ralph; and Raleigh, Michael, 4,629,975, Cl. 324-71.300.

RAMOT - University Authority for Applied Research and Industrial Development: *See—*
Fruchter, Moshe; and Moscovici, Anutza, 4,629,503, Cl. 75-121.000.

Randon, Michel: *See—*
Buzano, Michel; and Randon, Michel, 4,628,682, Cl. 57-206.000.

Rapoport, William R., to Allied Corporation. Controlled slow Q-switch. 4,630,275, Cl. 372-13.000.

Rasmussen, Carl M.: *See—*
Cooper, Howard C.; Rasmussen, Carl M.; and Law, Perry N., 4,630,163, Cl. 361-56.000.

Rasmussen, Ole-Bendt. Method and apparatus for preparing a high strength sheet material. 4,629,525, Cl. 156-84.000.

Rassaian, Mostafa: *See—*
Goding, David J.; and Rassaian, Mostafa, 4,628,824, Cl. 105-168.000.

Rast, Gustaf J., Jr.: *See—*
Green, Augustus H., Jr.; and Rast, Gustaf J., Jr., 4,630,053, Cl. 342-376.000.

Ratti, Umberto: *See—*
Lorenzi, Mario; Ratti, Umberto; and Severini, Arturo, 4,630,199, Cl. 364-200.000.

Ratzlaff, Thomas D.: *See—*
Parker, Robert; Ratzlaff, Thomas D.; and Siden, Dennis C., 4,628,989, Cl. 165-46.000.

Raubinger, Daniel F.: *See—*
Lee, Michael C.; Raubinger, Daniel F.; and Swanney, Peter L., 4,628,568, Cl. 16-337.000.

Rauch, Ernst: *See—*
Baumgartinger, Josef; Rauch, Ernst; Harms, Haio; and Wimmer, Adalbert, 4,629,867, Cl. 219-469.000.

Raychem Corporation: *See—*
Boettcher, Bodo; and Rupprecht, Werner, 4,629,277, Cl. 339-111.000.
Booth, Michael; and Penneck, Richard J., 4,629,925, Cl. 310-330.000.
Maul, Fred, 4,629,275, Cl. 339-103.00R.
Parker, Robert; Ratzlaff, Thomas D.; and Siden, Dennis C., 4,628,989, Cl. 165-46.000.
Shen, Nelson M.; and Zimmerman, Robert, 4,629,316, Cl. 356-73.100.

Raymond, Charles. Nutating disc type fluid device. 4,629,404, Cl. 418-49.000.

Raythatha, Rasik H.: *See—*
Pinnavaia, Thomas J.; and Raythatha, Rasik H., 4,629,712, Cl. 502-63.000.

Raytheon Company: *See—*
Freedman, George; Bowen, Robert F.; and Dudley, Kenneth W., 4,629,865, Cl. 219-405.000.
Ims, J. Robert, 4,630,068, Cl. 346-76.0PH.

RCA Corporation: *See—*
Brown, Irving, 4,630,058, Cl. 342-359.000.
Fling, Russell T., 4,630,098, Cl. 358-11.000.
Knop, Karl H., 4,630,105, Cl. 358-44.000.
Schiff, Leonard N., 4,630,283, Cl. 375-1.000.
Wargo, Robert A.; and Harwood, Leopold A., 4,630,102, Cl. 358-27.000.
Willis, Donald H., 4,630,294, Cl. 377-48.000.
Wright, Andrew K., 4,629,934, Cl. 313-417.000.

Re-Gen Products Limited: *See—*
Morris, Neil, 4,629,963, Cl. 320-3.000.

Re, Ronale, to Tran-Saver, Inc. Vacuum modulator control for automatic transmission of racing cars. 4,628,775, Cl. 74-863.000.

Realex Corporation: *See—*
Moore, David G., 4,629,097, Cl. 222-153.000.

Realis Luc, Roberto: *See—*
Berruti, Pierangelo; Guelfo, Roberto; Crotti, Alessandro; Pozzo, Ennio A.; and Realis Luc, Roberto, 4,630,077, Cl. 346-140.00R.

Ream, Bernard C.: *See—*
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.

Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal O-alkylsulfonyloxy- and O-alkylsulfonylaminobenzenesulfonamides. 4,629,496, Cl. 71-92.000.

Reck, Reinhold: *See—*
Voigt, Karl; Reck, Reinhold; Bittner, Friedrich; and Kleinschmit, Peter, 4,629,617, Cl. 423-563.000.

Reddy, K. Virupaksha, to Standard Oil Company (Indiana). Enhanced evaporation from a laser-heated target. 4,629,859, Cl. 219-121.0LM.

Redken Laboratories: *See—*
Golding, Frank E., 4,628,742, Cl. 73-829.000.

Reed, John G.: *See—*
Humphrey, John R.; and Reed, John G., 4,628,667, Cl. 53-399.000.

Reed, Katherine E.: *See—*
Campagna, Anthony J., Jr.; Eull, Patricia A.; and Reed, Katherine E., 4,628,917, Cl. 128-90.000.

Reed, Paul A.; and Flannagan, Stephen T., to Motorola, Inc. Chip select speed-up circuit for a memory. 4,630,239, Cl. 365-189.000.

Refractron Corp.: *See—*
Stanton, Robert J., 4,629,483, Cl. 55-487.000.

Regelin, Nancy P.: *See—*
Symsek, Dale R.; and Regelin, Nancy P., 4,628,869, Cl. 122-20.00B.

Regina, Francis J.: *See—*
Diamond, Steven E.; and Regina, Francis J., 4,629,689, Cl. 435-7.000.

Regnier, Gilbert; Guillonneau, Claude; and Lepagnol, Jean, to ADIR S.A.R.L. Antihypoxemic 5-(4-substituted piperazinyl)alkyl-8-substituted quinolines. 4,629,728, Cl. 514-252.000.

Rehse, Denis O.: *See—*
Welsh, David A.; and Rehse, Denis O., 4,629,960, Cl. 318-729.000.

Rein, Hans-Martin, to ANT Nachrichtentechnik GmbH. Broadband switching network in matrix form. 4,630,046, Cl. 340-825.930.

Reinhardt, Paul A., to Baker Oil Tools, Inc. Method and apparatus for taking core samples from a subterranean well side wall. 4,629,011, Cl. 175-58.000.

Reissenweber, Gernot: *See—*
Goetz, Norbert; Jahn, Dieter; Reissenweber, Gernot; and Eckhardt, Heinz, 4,629,799, Cl. 549-13.000.

Reissmann, Klaus; and Herrig, Friedhelm, to E.C.H. Will (GmbH & Co.). Method and apparatus for transporting layers of paper sheets to processing machines. 4,629,058, Cl. 198-461.000.

Rempfler, Hermann; and Pissiotas, Georg, to Ciba-Geigy Corporation. Hydroxyphenyloxime ethers. 4,629,813, Cl. 564-256.000.

Renix Electronique: *See—*
Bourolleau, Joel, 4,630,025, Cl. 338-309.000.

Rennicks, Robin: *See—*
O'Callaghan, Brendan, 4,629,150, Cl. 248-167.000.

Rensselaer Polytechnic Institute: *See—*
Dien, Robert Y.; and Luce, Ethan C., 4,628,765, Cl. 74-665.00A.

Repligen Corporation: *See—*
Herlihy, Walter C.; and Fraser, Thomas H., 4,629,792, Cl. 546-268.000.

Republic Steel Corporation: *See—*
Lepley, Donald M., 4,629,367, Cl. 405-284.000.

Resch, Reinhard; and Krohn, Hellmut, to Daimler-Benz Aktiengesellschaft. Hydraulic dual circuit brake system for road vehicles. 4,629,258, Cl. 303-92.000.

Reumann, Ralf-Dieter: *See—*
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.

Revelt, William F.; Prows, John B.; Thomson, Fred M.; and Avery, Hugh E., to Allied Industries, Inc. Gravity blending apparatus and methods of gravity blending. 4,629,328, Cl. 366-177.000.

Rexnord Inc.: *See—*
Crandall, Robert E., 4,629,061, Cl. 198-807.000.
Hodlewsky, Wasyly G.; and Schroeder, Roger H., 4,629,063, Cl. 198-853.000.

Reynolds, Kenneth R.: *See—*
Amendola, Eugene B.; and Reynolds, Kenneth R., 4,629,918, Cl. 310-65.000.

Reynolds, Raymond B.: *See—*
Brougham, Peter H.; and Reynolds, Raymond B., 4,628,867, Cl. 119-78.000.

Reynolds, Rodger L.: *See—*
Clarke, Donald A.; Reynolds, Rodger L.; and Pryor, Timothy R., 4,629,319, Cl. 356-237.000.

Reznikov, Igor I.: *See—*
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.

Rheinberger, Volker M.: *See—*
Michl, Rudolf J.; Rheinberger, Volker M.; and Ott, Gilbert, 4,629,746, Cl. 523-117.000.

Rhodes, Donald E.: *See—*
Gir, Srikant; and Rhodes, Donald E., 4,629,554, Cl. 208-415.000.

Rhone-Poulenc Fibres: *See—*
Buzano, Michel; and Randon, Michel, 4,628,682, Cl. 57-206.000.

Rhone-Poulenc Industries: *See—*
Soula, Gerard, 4,629,815, Cl. 570-202.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Soula, Gerard; and Lepage, Jean-Luc, 4,629,801, Cl. 556-466.000.

RHR, Inc.: *See—*
Brandt, Randy L.; Boswell, K. Herb; and Pett, Robert A., 4,629,113, Cl. 236-10.000.

Riback, Richard; Lau, Brian; and Gergets, Paul, to Expert Corporation. Attitude controlled float switch. 4,629,841, Cl. 200-153.00A.

Ribi, Edgar E., to Ribi ImmunoChem Research, Inc. Method of inhibiting the onset of acute radiation syndrome. 4,629,722, Cl. 514-2.000.

Ribi ImmunoChem Research, Inc.: *See—*
Ribi, Edgar E., 4,629,722, Cl. 514-2.000.

Richter, Friedrich: *See—*
Hank, Dietrich; Hauer, Kerstin; and Richter, Friedrich, 4,629,902, Cl. 250-559.000.

Richter, Klaus, to Brandschutz GmbH. Walk-in shelter. 4,628,826, Cl. 109-1.500.

Ricoh Company, Ltd.: *See—*
Fujioka, Yoshisato, 4,629,292, Cl. 350-427.000.
Fuwa, Jyoichi, 4,630,127, Cl. 358-285.000.

Kadomatsu, Shigeru, deceased, 4,630,123, Cl. 358-256.000.
Kaku, Takashi; Okita, Ryoji; Inoue, Masayoshi; and Kudo, Shozo, 4,630,126, Cl. 358-280.000.
Kaneko, Tamaki; and Hibi, Kunio, 4,629,311, Cl. 355-14.0SH.
Suzaki, Masayuki; and Kanno, Tetuo, 4,629,345, Cl. 400-208.000.
Tsukano, Moriyoshi; and Ishizu, Hisao, 4,629,309, Cl. 355-3.0DD.

Rieder, Heinz; and Schwaiger, Max, to RSF-Elektronik Gesellschaft m.b.H. Incremental measuring and machine control system. 4,628,609, Cl. 33-125.00C.

Riehl, Mark E.; and Dobberstein, Robert J., to General Electric Company. Patient alignment system for NMR studies. 4,629,989, Cl. 324-318.000.

Riemer, Bernd; and Mehren, Herbert, to Daimler-Benz Aktiengesellschaft. Towing aid for vehicles. 4,629,388, Cl. 414-427.000.

Rieter Machine Works Limited: *See—*
Stalder, Herbert; and Baumgartner, Josef, 4,628,679, Cl. 57-401.000.

Riewerts, Erroll S.: *See—*
King, James D.; Riewerts, Erroll S.; and Rollwitz, William L., 4,629,987, Cl. 324-306.000.

Rinkewich, Isaac. Mobile water irrigation apparatus. 4,629,129, Cl. 239-733.000.

Riollet, Gilbert, to Alsthom-Atlantique. Casing for district heating turbine. 4,628,693, Cl. 60-648.000.

Riso Kagaku Corporation: *See—*
Hasegawa, Takanori; Yoshida, Shuntaro; and Oshio, Susumu, 4,628,813, Cl. 101-116.000.

Ritz, Josef: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,629,613, Cl. 423-265.000.

Roberg, Paul J. Holder for photographic film strips. 4,629,070, Cl. 206-455.000.

Robert Bosch GmbH: *See—*
Brauninger, Jurgen, 4,629,259, Cl. 303-109.000.
Bruggen, Gerhard; Karr, Dieter; Rottler, Wolfgang; and Brauer, Ilan, 4,628,739, Cl. 73-702.000.
Friebe, Karl-Heinz, 4,629,399, Cl. 417-201.000.
Geering, Hans P.; Heess, Gerhard; and Schwarz, Helmut, 4,628,884, Cl. 123-489.000.
Haubner, Georg; Petermann, Hans; and Zobl, Hartmut, 4,630,043, Cl. 340-825.570.
Hofer, Gerald; and Laufer, Helmut, 4,628,957, Cl. 137-493.300.
Holzhauer, Anton, 4,629,923, Cl. 310-234.000.
Kosak, Wolfgang, 4,629,907, Cl. 307-265.000.
Kuhlmann, Gerhard; and Wolf, Erwin, 4,628,608, Cl. 30-373.000.

Roberts, Charles G.; and Hynds, Philip E., to Vecone Development Corporation. Float valve mechanism. 4,628,956, Cl. 137-404.000.

Roberts, David A.: *See—*
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,629,495, Cl. 71-92.000.

Roberts, Lyn: *See—*
Harris, Frank; and Roberts, Lyn, 4,629,090, Cl. 221-7.000.

Roberts, Timothy W.: *See—*
Modglin, Rodger L.; Borthick, W. Ray; and Roberts, Timothy W., 4,629,211, Cl. 280-688.000.

Robertson, David W., to Eli Lilly and Company. Anticonvulsant agents. 4,629,740, Cl. 514-620.000.

Robobar Limited: *See—*
Harris, Frank; and Roberts, Lyn, 4,629,090, Cl. 221-7.000.

Robotic Vision Systems, Inc.: *See—*
Stern, Howard, 4,629,324, Cl. 356-376.000.

Rocchietta, Paul; and Limouzin, Henry, to Sheldons', Inc. Fishing lure having a blade with a variable waterfoil surface. 4,628,629, Cl. 43-42.190.

Roch, Josef: *See—*
Muller, Erich; Nickl, Josef; Roch, Josef; and Narr, Berthold, 4,629,733, Cl. 514-418.000.

Roche, William J., to GTE Products Corporation. Rapid-start fluorescent lamp integrated circuit breaker structure and manufacture. 4,629,437, Cl. 445-26.000.

Rochez Bros., Inc.: *See—*
Hicks, Charles D., 4,628,780, Cl. 83-99.000.

Rock, John A., to General Electric Company. Flame retardant polyetherimide-polycarbonate blends. 4,629,759, Cl. 525-66.000.

Rockwell International Corporation: *See—*.
Rodenbaugh, Stephan M., 4,630,268, Cl. 371-22.000.
Van Kanegan, Eugene M., 4,628,815, Cl. 101-415.100.

Roddeman, Gerardus J. H.; and Hoogerkamp, Paul, to U.S. Philips Corporation. Pressure roller arrangement for a paper transport device. 4,629,177, Cl. 271-240.000.

Rodenbaugh, Stephan M., to Rockwell International Corporation. Communication circuit loopback test apparatus. 4,630,268, Cl. 371-22.000.

Rodgers, Steven S., to Lord & Sons, Inc. Heat generating system and method. 4,628,696, Cl. 62-79.000.

Rodi, Fritz: *See—*
Janz, Helmut; Rodi, Fritz; Soppe, Alfred; and Rademachers, Jakob, 4,629,500, Cl. 75-0.5BA.

Rodrigues, Richard A. A.: *See—*
Maytum, Michael J.; Lear, Anthony; Byatt, Stephen W.; and Rodrigues, Richard A. A., 4,629,944, Cl. 315-207.000.

Rody, Jean: *See—*
Leppard, David G.; and Rody, Jean, 4,629,682, Cl. 430-372.000.

Roetling, Paul G., to Xerox Corporation. Unscreening of stored digital halftone images. 4,630,125, Cl. 358-280.000.

Rogers Corporation: *See—*
Kask, Eugene, deceased; Watson, William A.; and Hernandez, Jorge M., 4,630,170, Cl. 361-306.000.

Rogers, Ralph W., Jr.: *See—*
Lifka, Bernard W.; Truckner, William G.; and Rogers, Ralph W., Jr., 4,629,517, Cl. 148-12.70A.

Roggenkamp, Steven K.: *See—*
Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., 4,628,694, Cl. 60-752.000.

Rogic, Milorad M.: *See—*
Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,629,491, Cl. 71-87.000.

Rogler, Albert C.: *See—*
Vanderpyl, David C.; and Rogler, Albert C., 4,628,681, Cl. 57-59.000.

Rohm and Haas Company: *See—*
James, Michael P., 4,629,814, Cl. 568-645.000.

Rohr Industries, Inc.: *See—*
Lymons, Dennis E., 4,629,146, Cl. 244-53.00R.

Rohr, Otto; and Pissiotas, Georg, to Ciba-Geigy Corporation. Novel phenoxyphenoxyalkanoylthioamides as herbicides. 4,629,498, Cl. 71-98.000.

Rojo, Agustin, Jr.; and Leiseca, Jorge. Micro-hydroelectric power plant. 4,629,904, Cl. 290-52.000.

Rollwitz, William L.: *See—*
King, James D.; Riewerts, Erroll S.; and Rollwitz, William L., 4,629,987, Cl. 324-306.000.

Romick, Tom L.: *See—*
Jogan, Michael J.; Kermode, Kevin T.; Romick, Tom L.; and Stephen, Ken L., 4,628,748, Cl. 73-863.010.

Rommelmann, Douglas W.: *See—*
Rutherford, David A.; Barr, Brian D.; and Rommelmann, Douglas W., 4,629,366, Cl. 405-211.000.

Roncaglione, James W. Vehicle washing apparatus. 4,628,562, Cl. 15-53.0AB.

Ronchinsky, Stanley: *See—*
Dosoretz, Victor J.; and Ronchinsky, Stanley, 4,629,333, Cl. 374-20.000.

Rosa, Edmund: *See—*
Aeschbach, Jurg; and Rosa, Edmund, 4,628,709, Cl. 66-9.00R.

Rose, David; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Oxidation hair dyes comprising bis-(2,4-diaminophenyl)-alkanes as coupling components. 4,629,466, Cl. 8-408.000.

Rose, J. Ken: *See—*
Rose, Timothy M.; and Rose, J. Ken, 4,629,363, Cl. 405-155.000.

Rose, Timothy M.; and Rose, J. Ken. Continuous conduit laying apparatus. 4,629,363, Cl. 405-155.000.

Rose, William H.: *See—*
Meehan, Robert F.; Rose, William H.; and Shaffer, David T., 4,628,597, Cl. 29-827.000.

Rosman, Andrew: *See—*
McMillen, Robert J.; and Rosman, Andrew, 4,630,258, Cl. 370-60.000.

Roth, Gunther, to Sunvic Reglar GmbH. Pneumatic position controller. 4,628,793, Cl. 91-374.000.

Rothe, Herbert; and Haase, Karl, to Badische Stahlwerke AG. Cooling pipe arrangement for a cooling section for rapid cooling of rolled wire or bar material. 4,629,165, Cl. 266-114.000.

Rottler, Wolfgang: *See—*
Bruggen, Gerhard; Karr, Dieter; Rottler, Wolfgang; and Brauer, Ilan, 4,628,739, Cl. 73-702.000.

Rousso, Mauricio. Unilateral external fixation system for small bones. 4,628,921, Cl. 128-92.00Z.

Roux, Christine: *See—*
Lerude, Gerard; and Roux, Christine, 4,630,175, Cl. 361-424.000.

Roux, Georges: *See—*
Mestais, Corinne; Gauthier, Rene ; and Roux, Georges, 4,629,895, Cl. 250-369.000.

Rowley, Daniel S. Lumber mill system. 4,628,781, Cl. 83-371.000.

Rowsey, James H., to Inco Alloys International, Inc. Pipe joint for corrosion resistant alloys. 4,629,225, Cl. 285-334.100.

Roy, Roland W., to Wang Laboratories, Inc. Compression of data for storage. 4,630,030, Cl. 340-347.0DD.

Rozycki, Marek L., to Litton Resources Systems, Inc. Vibrator thermal-stress differential compensator. 4,630,247, Cl. 367-189.000.

RSF-Elektronik Gesellschaft m.b.H.: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,628,609, Cl. 33-125.00C.

Rub, Winfried: *See—*
Gaus, Hermann; Jurgens, Gunter; Frotschner, Eberhard; and Rub, Winfried, 4,629,042, Cl. 192-3.250.

Rubber Millers, Inc.: *See—*
Day, John T.; Herder, Robert O.; and McNatt, Robert B., 4,628,850, Cl. 114-219.000.

Rubbermaid Incorporated: *See—*
Dilyard, Richard D., 4,629,846, Cl. 219-10.55F.

Ruddy, Brian L., to AE PLC. Non-metallic piston rings with controlled expansion pressure. 4,629,200, Cl. 277-216.000.

Rudolph Wittner GmbH & Co.: *See—*
Harle, Fritz, 4,629,331, Cl. 368-147.000.

Ruffino, Mario F. Rear gun sight. 4,628,611, Cl. 33-254.000.

Ruid, John O.; and Stein, Edgar A., to Norton Company. Resilient abrasive polishing product. 4,629,473, Cl. 51-295.000.

Rupprecht, Werner: *See—*
Boettcher, Bodo; and Rupprecht, Werner, 4,629,277, Cl. 339-111.000.

Russell, Robert H.: *See—*
McArdle, Donald J.; Russell, Robert H.; and Scott, Donald G., 4,629,475, Cl. 55-52.000.
Rutgerswerke Aktiengesellschaft: *See—*
Vogel, Hans-Gunter; Muller, Kurt; and Gnewikow, Karl, 4,629,094, Cl. 222-82.000.
Rutherford, David A.; Barr, Brian D.; and Rommelmann, Douglas W., to Texaco Inc. Offshore marine structure with corrosion protection. 4,629,366, Cl. 405-211.000.
Rutherford, Terry: *See—*
Wayne, Mark; and Rutherford, Terry, 4,629,022, Cl. 180-69.220.
Ruyten, Henricus: *See—*
Deutsch, Armin; and Ruyten, Henricus, 4,630,148, Cl. 360-93.000.
Ryan, Douglas G., to Exxon Research and Engineering Company. Method and apparatus for centrifugal separation of dispersed phase from a continuous liquid phase. 4,629,546, Cl. 204-188.000.
Rydborn, Ake. Apparatus for thread monitoring. 4,628,847, Cl. 112-273.000.
Ryono, Denis E.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Amino acid ester and amide renin inhibitors. 4,629,724, Cl. 514-18.000.
Rzeszewski, Theodore S., to AT&T Bell Laboratories. Time multiplexing chrominance information for compatible high-definition television. 4,630,099, Cl. 358-12.000.
S.A.M.M. - Societe d'Applications des Machines Motrices: *See—*
Arnaud, Alain; and Bouiges, Thierry, 4,629,169, Cl. 267-64.190.
S & G Implants GmbH: *See—*
Grundei, Hans; and Biehl, Thomas, 4,629,463, Cl. 623-16.000.
S.O.C. Corporation: *See—*
Yuza, Yasutada, 4,630,022, Cl. 337-282.000.
Sack, Hans: *See—*
Kluge, Bernhard; Mehren, Herbert; and Sack, Hans, 4,629,376, Cl. 404-1.000.
Saegusa, Takashi, to Nippon Kogaku K. K. Test system for camera. 4,629,304, Cl. 354-432.000.
Safran, Robert H.: *See—*
Menchetti, Robert J.; Safran, Robert H.; and Sauer, Gale E., 4,628,656, Cl. 52-481.000.
Sagiv, Oded: *See—*
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, 4,629,310, Cl. 355-8.000.
Sagoi, Masayuki; and Nishikawa, Reiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Perpendicular magnetic-recording medium. 4,629,660, Cl. 428-678.000.
Sahara, Kunizou: *See—*
Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, 4,630,095, Cl. 357-78.000.
St. Louis, Robert M., to Camco Inc. Crimped drier drum structure. 4,628,617, Cl. 34-108.000.
St. Louis, Robert M., to Camco Inc. Scored metal appliance frame. 4,628,661, Cl. 52-658.000.
Saito, Akinori: *See—*
Kawamura, Kiyomi; Saito, Akinori; Yamada, Masatoshi; Imai, Kenji; and Kimura, Masanobu, 4,629,127, Cl. 239-489.000.
Saito, Etsuro, to Sony Corporation. Flexible magnetic disc including hub structure. 4,630,156, Cl. 360-133.000.
Saito, Etsuro, to Sony Corporation. Magnetic disc recording and/or reproducing apparatus. 4,630,159, Cl. 360-133.000.
Saito, Junji: *See—*
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,629,618, Cl. 423-625.000.
Saito, Masato; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Metal vapor discharge lamp. 4,629,929, Cl. 313-25.000.
Saito, Nobuto: *See—*
Miyajima, Tamotsu; Tanaka, Noriatsu; and Saito, Nobuto, 4,629,748, Cl. 523-161.000.
Saito, Takao; and Moriyama, Masakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Audio/visual display system for multiple maps. 4,630,209, Cl. 364-444.000.
Saito, Tokukazu: *See—*
Horikawa, Kazuo; Tanaka, Hirosi; and Saito, Tokukazu, 4,629,900, Cl. 250-484.100.
Saito, Yoji: *See—*
Kato, Shinichi; Saito, Yoji; and Umemoto, Hiroshi, 4,629,351, Cl. 403-27.000.
Sakai, Takamasa, to Clarion Co., Ltd. Semiconductor device with multi-electrode construction equivalent to variable capacitance diode. 4,630,082, Cl. 357-14.000.
Sakai, Yoshio: *See—*
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.
Sakami, Hiroshi: *See—*
Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, 4,629,713, Cl. 502-84.000.
Sakamoto, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Plant operator training simulator. 4,629,430, Cl. 434-219.000.
Sakamoto, Katsuji, to Sumitomo Electric Industries, Ltd. Tape winding apparatus. 4,628,675, Cl. 57-3.000.
Sakamoto, Keiji: *See—*
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,629,958, Cl. 318-723.000.
Sakata, Gozyo: *See—*
Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, 4,629,493, Cl. 71-92.000.
Sakayori, Akihiro: *See—*
Kuwabara, Takao; and Sakayori, Akihiro, 4,629,393, Cl. 415-1.000.
Sakimae, Akihiro; Kagawa, Yuri; Numazawa, Ryozo; and Onishi, Hisao, to Mitsubishi Rayon Company, Limited. Process for preparing optically active carboxylic acids and antipode esters thereof. 4,629,701, Cl. 435-130.000.
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, to Hitachi, Ltd. Plasma ion source. 4,629,930, Cl. 313-359.100.
Sakurai, Hidetoshi; and Yakuwa, Masahiko, to Honda Giken Kogyo K.K. Fuel supply control method for multicylinder internal combustion engines during occurrence of abnormality in engine rotational angle position sensing means. 4,628,882, Cl. 123-479.000.
Sakurai, Yoshimi: *See—*
Nishikawa, Masao; Sakurai, Yoshimi; and Aoki, Takashi, 4,628,767, Cl. 74-731.000.
Nishikawa, Masao; and Sakurai, Yoshimi, 4,628,772, Cl. 74-866.000.
Sakuraya, Takashi: *See—*
Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, 4,629,362, Cl. 405-146.000.
Salama, Mamdouh M.; and Pan, Robert B., to Conoco Inc. Method of reinforcing complex tubular joints. 4,629,111, Cl. 228-182.000.
Salazar, Edilberto I.; and Kirschner, Wallace, to Pitney Bowes Inc. Microprocessor controlled d.c. motor for controlling a load. 4,630,210, Cl. 364-464.000.
Salem, Eli; and Kunin, Robert, to Graver Company, The. Deoxygenation and purification of liquids. 4,629,571, Cl. 210-668.000.
Salihar, Mark W.; Engstrom, Gary G.; and Gauwitz, Donald P., to W. R. Grace & Co. Method of inhibiting cold end corrosion in boilers. 4,629,603, Cl. 422-9.000.
Salmivaara, Martti: *See—*
Virta, Raimo; and Salmivaara, Martti, 4,628,618, Cl. 34-116.000.
Salomon S.A.: *See—*
Boussemart, Jean-Pierre; and Vuarier, Dominique, 4,629,210, Cl. 280-634.000.
Samo, Harvey W., to Margon Corporation. Artificial eye for doll. 4,629,442, Cl. 446-389.000.
Samodovitz, Arthur J. Acoustical wave aimer. 4,629,927, Cl. 310-334.000.
Sanda, Akihiro; Watabe, Nobuyuki; and Sato, Hiroki, to Fuji Photo Film Co., Ltd. Web winding apparatus. 4,629,139, Cl. 242-56.400.
Sander, Helfried, to Leonhard Kurz GmbH & Co. Embossing foils which can be written upon. 4,629,647, Cl. 428-172.000.
Sanders, Susan. Game for teaching time concepts. 4,629,431, Cl. 434-304.000.
Sandner, Helmut: *See—*
Pickard, Jurgen; Sandner, Helmut; and Luttge, Klaus, 4,628,795, Cl. 92-13.410.
Sandoz Ltd.: *See—*
Hasler, Rolf; and Palacin, Francis, 4,629,465, Cl. 8-400.000.
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,629,497, Cl. 71-94.000.
Sands, Charles D.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.
Sank, Gerald W.: *See—*
Farnsworth, Craig A.; Himmel, Robert L.; Sank, Gerald W.; and Stanger, Keith A., 4,628,903, Cl. 126-391.000.
Sankyu Inc.: *See—*
Kuriiwa, Tsuneaki, 4,629,365, Cl. 405-204.000.
Sano, Fumiaki: *See—*
Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; and Asami, Kazutomo, 4,628,963, Cl. 137-857.000.
Sano, Katsuhide: *See—*
Osawa, Shigenobu; Murakami, Tamotsu; Mizuma, Takashi; and Sano, Katsuhide, 4,629,673, Cl. 430-108.000.
Sano, Kenji: *See—*
Makino, Naonori; Sano, Kenji; Horie, Seiji; and Sato, Hideo, 4,629,672, Cl. 430-76.000.
Sano, Shigehisa: *See—*
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, 4,628,977, Cl. 152-451.000.
Sano, Tomomi: *See—*
Kawasaki, Kikuo; Sano, Tomomi; and Yamamoto, Hitoshi, 4,630,042, Cl. 340-825.350.
Santiago, Enrique, to Zeuna-Staerker GmbH & Co. KG. Device for catalytically purifying exhaust gases for a combustion engine. 4,629,605, Cl. 422-179.000.
Santier, Christian: *See—*
Geniees, Eugene; Pierre, Gerard; Santier, Christian; and Tsintavis, Constantin, 4,629,540, Cl. 204-59.00R.
Santilli, Giovanni. Kiln and autonomous heat source portable integrated unit. 4,628,895, Cl. 126-25.00R.
Santrade Limited: *See—*
Hillert, Lars H.; Lindstrom, Jan N.; and Thelin, Anders G., 4,629,661, Cl. 428-698.000.
Sanyo Electric Co., Ltd.: *See—*
Matsuo, Setsuo, 4,629,665, Cl. 429-164.000.
Miyai, Kiyoshi; Uotani, Shuhei; and Tsunemine, Toyohiko, 4,629,307, Cl. 355-3.00R.

Sartorius GmbH: *See—*
Knothe, Erich; Oldendorf, Christian; and Melcher, Franz-Josef, 4,629,016, Cl. 177-25.000.
Sasaki, Hideaki: *See—*
Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, 4,628,616, Cl. 34-78.000.
Sasaki, Hitoshi: *See—*
Yoshimi, Takani; Michisita, Ryoichi; and Sasaki, Hitoshi, 4,628,586, Cl. 29-568.000.
Sasaki, Nobuo; and Suzuki, Yasuo, to Fujitsu Limited. Semiconductor memory device. 4,630,089, Cl. 357-23.700.
Sasaki, Tohru; Endoh, Hiroyuki; and Oohira, Seiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin monofilament and process for producing the same. 4,629,654, Cl. 428-373.000.
Sasaoka, Michio: *See—*
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Kameyama, Yutaka, 4,629,542, Cl. 204-72.000.
Sasayama, Takao: *See—*
Amamo, Matsuo; and Sasayama, Takao, 4,630,206, Cl. 364-431.070.
Satake, Toshimi; Kimura, Yoshihide; Minami, Toshiaki; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 4,630,080, Cl. 346-209.000.
Satellite Industries, Inc.: *See—*
Tegg, Duane T., 4,629,230, Cl. 292-281.000.
Sato, Fumiaki, to Victor Company of Japan, Limited. Video head position control. 4,630,135, Cl. 360-10.200.
Sato, Hideo: *See—*
Makino, Naonori; Sano, Kenji; Horie, Seiji; and Sato, Hideo, 4,629,672, Cl. 430-76.000.
Sato, Hideyori: *See—*
Arai, Mitsuru; Sato, Hideyori; and Inatomi, Shoichiro, 4,628,690, Cl. 60-464.000.
Sato, Hiroki: *See—*
Sanda, Akihiro; Watabe, Nobuyuki; and Sato, Hiroki, 4,629,139, Cl. 242-56.400.
Sato, Joichi: *See—*
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, 4,630,116, Cl. 358-160.000.
Sato, Kazuo; Komori, Masahiro; and Goto, Sumio, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Post-treatment of synthetic fiber fabrics. 4,629,774, Cl. 527-301.000.
Sato, Kozo; Yabuki, Yoshiharu; Kawata, Ken; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable color photographic light-sensitive material with development accelerator. 4,629,684, Cl. 430-559.000.
Sato, Kozo: *See—*
Hayakawa, Yoshihide; Satomura, Masato; and Sato, Kozo, 4,629,676, Cl. 430-203.000.
Sato, Mitsuru: *See—*
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, 4,630,116, Cl. 358-160.000.
Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Non-volatile MNOS memory. 4,630,086, Cl. 357-23.500.
Sato, Osamu; Tano, Eiichi; and Negishi, Kiyoshi, to Asahi Kogaku Kogyo K.K. Automatic exposure camera. 4,629,305, Cl. 354-442.000.
Sato, Yasushi, to Canon Kabushiki Kaisha. Laser beam recording apparatus. 4,630,070, Cl. 346-108.000.
Sato, Yuichi; Tsunekawa, Tokuichi; Kawabata, Takashi; and Matsumura, Susumu, to Canon Kabushiki Kaisha. Photo-electric conversion device. 4,629,877, Cl. 250-201.000.
Satoh, Isao: *See—*
Sugimura, Tatuo; Satoh, Isao; Ichinose, Makoto; and Kuroki, Yuzuru, 4,630,140, Cl. 360-49.000.
Satoh, Yasuta; Tsuchihashi, Hiroshi; and Tani, Saburo, to Takara Co., Ltd. Rotational molding apparatus having robot to open, close, charge and clean molds. 4,629,409, Cl. 425-139.000.
Satomura, Masato: *See—*
Hayakawa, Yoshihide; Satomura, Masato; and Sato, Kozo, 4,629,676, Cl. 430-203.000.
Satomura, Shigeyuki: *See—*
Tani, Toshiyuki; Inazawa, Yoshizumi; Takahashi, Toshihiko; and Satomura, Shigeyuki, 4,630,142, Cl. 360-70.000.
Sauer, Gale E.: *See—*
Menchetti, Robert J.; Safran, Robert H.; and Sauer, Gale E., 4,628,656, Cl. 52-481.000.
Saulson, Stanley H.: *See—*
MacGregor, David C.; and Saulson, Stanley H., 4,628,944, Cl. 128-785.000.
Saunders Archery Co.: *See—*
Windedahl, Alan L.; and Paczosa, Benedict M., 4,628,892, Cl. 124-23.00R.
Sauvee, Jean-Paul: *See—*
Pressaco, Pierre; and Sauvee, Jean-Paul, 4,629,038, Cl. 188-71.900.
Savin Corporation: *See—*
Landa, Benzion; Shmaiser, Aron; and Feher, Peter, 4,629,308, Cl. 355-3.00R.
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, 4,629,310, Cl. 355-8.000.
Savla, Chandrakant V.: *See—*
Steiner, Robert E.; and Savla, Chandrakant V., 4,628,802, Cl. 98-42.100.
Savoy Leather Manufacturing Corporation: *See—*
Howard, William A., 4,629,066, Cl. 206-387.000.
Sawada, Akira: *See—*
Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, 4,628,616, Cl. 34-78.000.
Sawyer, Fred R.: *See—*
Doud, Wilbur O.; Davis, Robert E.; and Sawyer, Fred R., 4,629,488, Cl. 65-83.000.
Sayles, Francis H.; Black, William T.; and Ellis, Earl P., to United States of America, Army. Method and system for relieving pipeline stress due to frost action. 4,629,364, Cl. 405-157.000.
SBP, Inc.: *See—*
Weibel, Michael K., 4,629,575, Cl. 252-8.551.
Scalese, Joseph J. Ferromagnetic eddy current probe apparatus. 4,629,984, Cl. 324-228.000.
Scardovi, Alessandro; Fetta, Adriano; and Chiaro, Aldo, to Ing. C. Olivetti & C., S.p.A. Jet printing apparatus. 4,630,072, Cl. 346-140.00R.
Scavezze, Daniel C.: *See—*
Townsend, Greg M.; Henderson, James A., Jr.; Marten, Russell A.; and Scavezze, Daniel C., 4,630,263, Cl. 370-85.000.
Schadt, Martin: *See—*
Petrzilka, Martin; and Schadt, Martin, 4,629,581, Cl. 252-299.630.
Schaefer, Dieter: *See—*
Balz, Werner; Kovacs, Jenoe; Lechner, Hilmar; Schaefer, Dieter; and Buethe, Ingolf, 4,629,632, Cl. 427-54.100.
Schafer, Fritz P., to Max-Planck-Geselschaft zur Foerderung der Wissenschaften e.V. Method and apparatus for generating short intensive pulses of electromagnetic radiation in the wavelength range below about 100 nm. 4,630,274, Cl. 372-9.000.
Schatz, Friedrich: *See—*
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, 4,629,522, Cl. 156-48.000.
Schausberger, Christoph: *See—*
Lemberger, Heinz; and Schausberger, Christoph, 4,628,762, Cl. 74-559.000.
Scheiderer, Norbert. Arrangement for sealing glass panes in wooden window or door leaves. 4,628,655, Cl. 52-397.000.
Scheiwiller, Bruno: *See—*
Lampert, Heinz; and Scheiwiller, Bruno, 4,629,115, Cl. 236-36.000.
Schemmann, Hugo: *See—*
Bertram, Leo; Schemmann, Hugo; and Bukoschek, Romuald, 4,628,607, Cl. 30-43.920.
Schering A.G.: *See—*
Davey, David D.; Lumma, William C., Jr.; and Wohl, Ronald A., 4,629,739, Cl. 514-605.000.
Schiff, Leonard N., to RCA Corporation. Fast acquisition burst mode spread spectrum communications system with pilot carrier. 4,630,283, Cl. 375-1.000.
Schimmel, Gunther; and Gradl, Reinhard, to Hoechst Aktiengesellschaft. Process for decontaminating phosphoric acid. 4,629,614, Cl. 423-321.00R.
Schindler, Melvin S.; and Holland, John F., to Michigan State University, Board of Trustees of. Positive selection sorting of cells. 4,629,687, Cl. 435-4.000.
Schippers, Heinz; Lenk, Erich; and Bremer, Hermann, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Yarn sensor. 4,629,137, Cl. 242-45.000.
Schlaikjer, Carl R., to Duracell Inc. Separators for electrochemical cells. 4,629,666, Cl. 429-194.000.
Schlegel Corporation: *See—*
Lownsdale, Gary R., 4,628,639, Cl. 49-498.000.
Schlegel, Hans J.; and Wolf, Helmut. Apparatus for handling bulk material. 4,629,060, Cl. 198-508.000.
Schlosser, Helmut: *See—*
Kern, Reinhard; Krauss, Gerhard; and Schlosser, Helmut, 4,629,833, Cl. 381-68.200.
Schlumberger Technology Corporation: *See—*
Gouilloud, Michel M. A.; and Plona, Thomas J., 4,628,725, Cl. 73-19.000.
Schmidt, Laurence J.: *See—*
Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., 4,630,150, Cl. 360-97.000.
Schmidt, Roger C.: *See—*
McCracken, Wendell J.; and Schmidt, Roger C., 4,629,585, Cl. 252-511.000.
Schober, William R.: *See—*
Fallon, William H.; and Schober, William R., 4,629,965, Cl. 320-39.000.
Schoenhard, James D. Polymer layer recovery from a multilayered chip material. 4,629,780, Cl. 528-488.000.
Schoenwald, Ronald D.: *See—*
Barfknecht, Charles F.; and Schoenwald, Ronald D., 4,629,738, Cl. 514-603.000.
Schoettle, Klaus, to BASF Aktiengesellschaft. Tape cassette having one or more pressure springs, and a pressure spring for this purpose. 4,629,144, Cl. 242-198.000.
Schoo David J., to Minnesota Mining and Manufacturing Company. Scanner amplitude stabilization system. 4,630,223, Cl. 364-518.000.
Schott Glaswerke: *See—*
Gunthner, Franz, 4,630,280, Cl. 373-41.000.
Schrager, James E., to Colson Equipment, Inc. Patient transporting vehicle. 4,629,242, Cl. 296-20.000.
Schraub, John D., to Hughes Tool Company. Packoff. 4,628,997, Cl. 166-196.000.

Schroder, Johann: *See—*
Gawron, Klaus; Jonker, Simon; Schroder, Johann; and De Weerdt, Henk V., 4,630,023, Cl. 337-407.000.

Schroeder, Hobe, to Amoco Corporation. Purification of terephthalic acid to relatively low levels of 4-carboxybenzaldehyde and catalyst therefor. 4,629,715, Cl. 502-185.000.

Schroeder, Jack A.: *See—*
Drye, James E.; Schroeder, Jack A.; and Winchell, Vern H., II, 4,630,096, Cl. 357-81.000.

Schroeder, Roger H.: *See—*
Hodlewsky, Wasyly G.; and Schroeder, Roger H., 4,629,063, Cl. 198-853.000.

Schroeppel, Edward A.: *See—*
Pohndorf, Peter J.; and Schroeppel, Edward A., 4,628,934, Cl. 128-419.0PG.

Schroer, William L.; and Donselman, Edward H., to Elkay Manufacturing Company. Liquid dispenser with readily removable liquid container. 4,629,096, Cl. 222-146.600.

Schroeter, Christian L.: *See—*
Madzgalla, Hans-Georg; and Schroeter, Christian L., 4,629,037, Cl. 188-71.800.

Schuh, Frank J., to Atlantic Richfield Company. Drainhole drilling assembly. 4,629,012, Cl. 175-75.000.

Schulze, Jurgen, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland. Stiftung & Co. KG. Tape cassette nonerase mechanism. 4,630,141, Cl. 360-60.000.

Schutsky, Vitaly I.: *See—*
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.

Schutte, Klaus; and Stockmann, Helmut, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cone crusher labyrinth seal. 4,629,197, Cl. 277-53.000.

Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,628,609, Cl. 33-125.00C.

Schwalm, Glendon H.: *See—*
Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., 4,628,599, Cl. 29-857.000.

Schwarz, Helmut: *See—*
Geering, Hans P.; Heess, Gerhard; and Schwarz, Helmut, 4,628,884, Cl. 123-489.000.

Schweitzer, Klaus, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Structural component for use under high thermal load conditions. 4,629,397, Cl. 416-96.00R.

Scientific Systems, Inc.: *See—*
Kercher, Paul W., 4,629,562, Cl. 210-198.200.

Scott, Donald G.: *See—*
McArdle, Donald J.; Russell, Robert H.; and Scott, Donald G., 4,629,475, Cl. 55-52.000.

Scott & Fetzer Company, The: *See—*
Lawrence, Bobby L., 4,629,128, Cl. 239-526.000.

Scott, James R.: *See—*
Charlebois, Leonard J.; Brown, Allan P.; and Scott, James R., 4,629,597, Cl. 264-278.000.

Scott, Robert J. Sound activated lamp arrangement. 4,630,248, Cl. 367-197.000.

Scribner, Albert W.; and Check, Frank T., Jr., to Pitney Bowes, Inc. Electronic postage meter system settable by means of a remotely generated input device. 4,629,871, Cl. 235-375.000.

Seagrave, Earl M.: *See—*
Carter, R. Sykes; and Seagrave, Earl M., 4,629,285, Cl. 350-96.230.

Seaman, Robert B.; and Horne, Keith E., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,628,727, Cl. 73-119.00A.

Sebastian, Danny S.: *See—*
Young, David E.; and Sebastian, Danny S., 4,628,995, Cl. 166-113.000.

Secondo, Pierre: *See—*
Callens, Paul; Galand, Claude; Gergaud, Claude; Noailly, Philippe; and Secondo, Pierre, 4,630,262, Cl. 370-81.000.

Seiko Epson Kabushiki Kaisha: *See—*
Shionozaki, Yoshio; and Mukai, Hiroshi, 4,629,290, Cl. 350-350.00R.

Seitz, John R., to American Antigravity Co., Inc. Protection technique for exposed conductor. 4,630,161, Cl. 361-42.000.

Seki, Akiyoshi: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.

Seki, Takatoshi: *See—*
Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,629,300, Cl. 354-76.000.

Sekibata, Masao: *See—*
Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, 4,630,095, Cl. 357-78.000.

Sekiguchi, Toru, to NEC Corporation. Tape timer apparatus for video tape recorder. 4,630,137, Cl. 360-13.000.

Sekiguchi, Yuji: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,629,199, Cl. 277-204.000.

Selenia-Industrie Elettrotechniche Associate S.p.A.: *See—*
Galati, Gaspare; and Giaccari, Ennio, 4,630,052, Cl. 342-159.000.

Selkee, Thomas V. Exercise apparatus employed for performing two handed curling exercises. 4,629,184, Cl. 272-123.000.

Semiconductor Research Foundation: *See—*
Nishizawa, Jun-ichi, 4,629,901, Cl. 250-551.000.

Semmler, Jurgen; and Kraus, Gunter, to Sigri GmbH. Joint threads carbon on graphite electrode. 4,629,280, Cl. 339-263.00E.

Semyre Electronics AB: *See—*
Asemyr, Nils G., 4,629,885, Cl. 250-235.000.

Senaratne, K. Pushpananda A., to Ethyl Corporation. Process for hydrolyzing nitriles. 4,629,808, Cl. 562-467.000.

Sengupta, Amitava, to Wacker Corporation. Power trowel. 4,629,359, Cl. 404-112.000.

Senoh, Hideaki: *See—*
Kosaka, Takao; Ishiguro, Mamoru; and Senoh, Hideaki, 4,630,079, Cl. 346-207.000.

Senso, Hitoshi, to Pioneer Electronic Corporation. Apparatus for driving a turntable of a disc player system. 4,629,949, Cl. 318-257.000.

Sentman, Robert C.: *See—*
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,629,776, Cl. 528-313.000.

Serenari, Stefano: *See—*
Carpanelli, Carlo; and Serenari, Stefano, 4,629,023, Cl. 180-72.000.

Severini, Arturo: *See—*
Lorenzi, Mario; Ratti, Umberto; and Severini, Arturo, 4,630,199, Cl. 364-200.000.

Sewell Plastics Inc.: *See—*
Herron, Gene A.; Nickel, Gerhard E. B.; and Alberghini, Alfred C., 4,628,669, Cl. 53-425.000.

Sexton, Daniel W., to General Electric Company. Method and apparatus for selecting for use between data buses in a redundant bus communication system. 4,630,265, Cl. 370-85.000.

Shaffer, David T.: *See—*
Meehan, Robert F.; Rose, William H.; and Shaffer, David T., 4,628,597, Cl. 29-827.000.

Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,629,494, Cl. 71-92.000.

Sharp Kabushiki Kaisha: *See—*
Hashimoto, Shintaro; Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Yamamoto, Hidehiko, 4,630,235, Cl. 364-900.000.
Juso, Hiromi; Sudoh, Kengo; and Haikawa, Yukihiko, 4,630,143, Cl. 360-72.200.
Kamuro, Setsufumi; Hirano, Takaaki; and Okada, Mikiro, 4,630,295, Cl. 377-81.000.
Tanabe, Takeshi, 4,629,850, Cl. 219-10.55B.
Yoshida, Hideo; and Kunita, Hisao, 4,630,222, Cl. 364-513.500.
Yoshimura, Hisashi, 4,630,076, Cl. 346-140.00R.
Yoshiura, Shoichiro; and Migita, Haruyoshi, 4,629,314, Cl. 355-55.000.

Shaw, Robert B., III. Bow hanger. 4,628,893, Cl. 124-23.00R.

Sheehan, Paul: *See—*
DelSignore, James R., II; Sheehan, Paul; and Friedman, Robert H., 4,630,100, Cl. 358-21.00R.

Sheldons', Inc.: *See—*
Rocchietta, Paul; and Limouzin, Henry, 4,628,629, Cl. 43-42.190.

Shell Internationale Research Maatschappij, B.V.: *See—*
Zandee, Alexander P. L. M., 4,629,990, Cl. 324-330.000.

Shell Oil Company: *See—*
Coffman, Paul M., 4,629,596, Cl. 264-171.000.
Kemp, Richard A., 4,629,716, Cl. 502-208.000.
Syrier, Johannes L. M.; Vonk, Willem C.; and van Gooswilligen, Gerrit, 4,629,754, Cl. 524-394.000.

Shelly, Javan, to National Distillers and Chemical Corporation. Intermetallic compounds and catalytic use thereof. 4,629,714, Cl. 502-113.000.

Shen, Nelson M.; and Zimmerman, Robert, to Raychem Corporation. Attenuation across optical fiber splice. 4,629,316, Cl. 356-73.100.

Sherbeck, Leander A.: *See—*
Culgan, John M.; and Sherbeck, Leander A., 4,628,848, Cl. 112-412.000.

Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., to Kamyr, Inc. Pressurized reaction of refractory ores with heat recovery. 4,629,502, Cl. 75-118.00R.

Sherwood Medical Company: *See—*
Brownell, Richard G., Sr.; and Fehl, James L., 4,628,783, Cl. 83-862.000.

Shibata, Akira: *See—*
Terada, Toshimichi; Kojima, Noboru; and Shibata, Akira, 4,630,132, Cl. 358-310.000.

Shibukawa, Takeo, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performing apparatus. 4,628,788, Cl. 84-1.030.

Shibuya Kogyo Co., Ltd.: *See—*
Tanaka, Hideo; Naka, Toshiaki; Muranaka, Shiaru; and Miyashita, Yoshikazu, 4,629,528, Cl. 156-351.000.

Shichijo, Shunichi: *See—*
Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, 4,630,231, Cl. 364-900.000.

Shiflet, Wilbur A. Assembly for connection to a ball hitch. 4,629,207, Cl. 280-506.000.

Shiga, Takeo: *See—*
Fushiya, Mitsuji; Imanishi, Shoichi; and Shiga, Takeo, 4,629,823, Cl. 174-52.00R.

Shigehara, Hirotoshi: *See—*
Fujita, Takayuki; Shigehara, Hirotoshi; Negishi, Shigetoshi; Kyotani, Takayoshi; and Kadota, Shozo, 4,628,595, Cl. 29-741.000.

Shigenobu, Hiromichi, to Toyota Jidosha Kabushiki Kaisha. Automatic speed controller for use of a vehicle. 4,629,027, Cl. 180-176.000.

Shigeta, Katsunori, to Mitsubishi Denki K.K. Sewing machine with memory input reconfiguration based on type of memory being used. 4,630,212, Cl. 364-470.000.

Shikatani, Osamu: *See—*
Yamaguchi, Jun; and Shikatani, Osamu, 4,630,093, Cl. 357-55.000.

Shikoku Kakooki Co., Ltd.: *See—*
Kondo, Yoshihito; Wakabayashi, Shigeru; Iwano, Fumiyuki; and Yoshida, Kiyomi, 4,628,670, Cl. 53-551.000.

Shiley Inc.: *See—*
Ionescu, Marian I.; Lenker, Jay A.; and Yang, Philip S., 4,629,459, Cl. 623-2.000.

Shimada, Yasuhei, to Nippon Electric Co., Ltd. Display processing apparatus. 4,630,039, Cl. 340-731.000.

Shimada, Yoshihiro: *See—*
Kitagawa, Hisao; Inoue, Yasuo; Fujihara, Tadafumi; Endo, Itaru; and Shimada, Yoshihiro, 4,629,862, Cl. 219-200.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,628,769, Cl. 74-750.00B.

Shimizu, Akihiko: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,629,854, Cl. 219-69.00D.

Shimizu, Kazuo: *See—*
Hashimoto, Yasuyuki; and Shimizu, Kazuo, 4,629,348, Cl. 401-107.000.

Shimizu, Toshio: *See—*
Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, 4,629,664, Cl. 429-23.000.

Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Driving control method and circuit for electromagnetic servo devices. 4,629,952, Cl. 318-432.000.

Shimotashiro, Masafumi; and Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. FM demodulator. 4,629,994, Cl. 329-110.000.

Shimozawa, Tohru: *See—*
Ide, Toshiaki; Shimozawa, Tohru; and Nishimatsu, Masaharu, 4,629,646, Cl. 428-143.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Arai, Masatoshi; Inoue, Takeo; and Yokoo, Koji, 4,629,775, Cl. 528-17.000.

Shinanokenshi Co., Ltd.: *See—*
Suda, Toshikazu, 4,629,514, Cl. 148-1.500.

Shinohara, Michio: *See—*
Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, 4,628,758, Cl. 74-498.000.

Shinohara, Yoshitsugu: *See—*
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Mizuno, Shinichiro, 4,630,200, Cl. 364-405.000.

Shinomoto, Shoji: *See—*
Hamada, Yoshinori; Shinomoto, Shoji; Yamada, Isamu; and Koike, Haruo, 4,629,795, Cl. 548-341.000.

Shinozaki, Fumiaki: *See—*
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Maemoto, Kazuo, 4,629,680, Cl. 430-288.000.

Shinyagaito, Tatsuya: *See—*
Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, 4,630,231, Cl. 364-900.000.

Shiono, Ryuji: *See—*
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, 4,630,116, Cl. 358-160.000.

Shionogi & Co., Ltd.: *See—*
Hamada, Yoshinori; Shinomoto, Shoji; Yamada, Isamu; and Koike, Haruo, 4,629,795, Cl. 548-341.000.
Uyeo, Shoichiro, 4,629,726, Cl. 514-195.000.

Shionozaki, Yoshio; and Mukai, Hiroshi, to Seiko Epson Kabushiki Kaisha. Liquid crystal compounds and method of preparation. 4,629,290, Cl. 350-350.00R.

Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, to Hitachi, Ltd.; and Hitachi Sanki Engineering Co., Ltd. Vapor tank. 4,628,616, Cl. 34-78.000.

Shiraishi, Yukiya; and Yamashita, Takeshi, to Alps Electric Co., Ltd. Head protection mechanism for disk drive. 4,630,154, Cl. 360-105.000.

Shirasaka, Yusei: *See—*
Fuse, Kenichi; and Shirasaka, Yusei, 4,629,286, Cl. 350-96.230.

Shirato, Kozo; Hiraizumi, Kazuo; Kaneko, Akio; and Nagai, Akihiko, to ERMA Optical Works, Ltd. Liquid chromatograph with flow controller. 4,629,561, Cl. 210-198.200.

Shiroki Kinzoku Kogyo Kabushiki Kaisha: *See—*
Tezuka, Takeshi; Owada, Akira; and Katsumoto, Naoaki, 4,629,250, Cl. 297-362.000.
Tezuka, Takeshi, 4,629,251, Cl. 297-362.000.

Shmaiser, Aron: *See—*
Landa, Benzion; Shmaiser, Aron; and Feher, Peter, 4,629,308, Cl. 355-3.00R.
Landa, Benzion; Sagiv, Oded; Shmaiser, Aron; Bernhauer, Richard J.; and Feher, Peter, 4,629,310, Cl. 355-8.000.

Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Method of forming superimposed color images. 4,629,669, Cl. 430-47.000.

Short Brothers Limited: *See—*
Carson, Oliver S.; McMurtry, George; and Carrington, James E., 4,629,149, Cl. 244-134.00R.

Shroyer, David, to Lamb-Weston, Inc. Apparatus and method for producing weighed batches of aligned elongated articles. 4,629,017, Cl. 177-25.000.

Shyr, Yen-Shin; Bobsein, Rex L.; and Johnson, Marvin M., to Phillips Petroleum Co. Hydrogenation process and catalyst. 4,629,767, Cl. 525-339.000.

SI Handling Systems, Inc.: *See—*
Mangan, Edmund L.; and Conklin, Barry, 4,628,823, Cl. 104-166.000.

Siden, Dennis C.: *See—*
Parker, Robert; Ratzlaff, Thomas D.; and Siden, Dennis C., 4,628,989, Cl. 165-46.000.

Siegal, Burton L., to Kiwi Coders Corporation. Mounting for piezoelectric bender of fluid control device. 4,629,926, Cl. 310-331.000.

Siemens Aktiengesellschaft: *See—*
Blaschke, Felix, 4,629,961, Cl. 318-803.000.
Daisenberger, Georg, 4,629,830, Cl. 340-825.030.
Holle, Johannes, 4,629,851, Cl. 219-10.810.
Kern, Reinhard; Krauss, Gerhard; and Schlosser, Helmut, 4,629,833, Cl. 381-68.200.
Kraicar, Heinz, 4,629,905, Cl. 307-72.000.
Lechner, Alexander, 4,629,913, Cl. 307-475.000.
Plies, Erich, 4,629,899, Cl. 250-396.0ML.
Tihanyi, Jeno , 4,630,084, Cl. 357-23.400.
von Gentzkow, Wolfgang, 4,629,812, Cl. 564-134.000.
Zimmermann, Walter, 4,629,880, Cl. 250-205.000.

Siemens Energy & Automation, Inc.: *See—*
May, William E.; McKinney, Ronald W.; and Wells, James S., 4,630,018, Cl. 336-175.000.
McClellan, David P.; Brown, John M., Jr.; and Black, Robert E., 4,630,014, Cl. 335-16.000.
Young, John W., 4,630,017, Cl. 335-42.000.

Siemens Gammasonics, Inc.: *See—*
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,629,893, Cl. 250-363.00S.

Siewert, Robert L.; and Varnelis, Edmund K., to Lark Equipment Company. Tolerance compensating joint. 4,629,350, Cl. 403-11.000.

Signode Corporation: *See—*
Howard, Frank C.; and Kiefer, Allan E., 4,629,106, Cl. 227-8.000.

Sigri GmbH: *See—*
Semmler, Jurgen; and Kraus, Gunter, 4,629,280, Cl. 339-263.00E.

Sillner, Georg. Apparatus for the automatic handling of electrical components. 4,628,585, Cl. 29-564.600.

Silverthorn, Charles R.; and Allhands, Marcus N., to A. D. Smith Harvestore Products, Inc. Belt trainer apparatus for a conveyor. 4,629,062, Cl. 198-813.000.

Simelunas, William J.; Aquino, Agostino J.; and Polifroni, Nicholas, to Nabisco Brands, Inc. Yeast cake tumbler. 4,629,056, Cl. 198-406.000.

Simmons, Arturo; and Kinch, Michael A., to Texas Instruments Incorporated. Mercury cadmium telluride infrared focal plane devices having step insulator and process for making same. 4,630,090, Cl. 357-24.000.

Simmons, James A.: *See—*
Waggoner, Terrence C.; Simmons, James A.; Perry, Marvin K.; and Tromel, Richard H., 4,629,834, Cl. 381-68.200.

Simon, Nicola-Carlo. Cutting device. 4,628,808, Cl. 99-538.000.

Simrad Optronics A/S: *See—*
Vogl, Georg, 4,629,295, Cl. 350-503.000.

Singh, Prithipal: *See—*
Collins, Christine G.; Pirio, Marcel R.; and Singh, Prithipal, 4,629,691, Cl. 435-7.000.

Sitzwohl, Kenneth J.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.

Siverling, Michael M.: *See—*
Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., 4,630,150, Cl. 360-97.000.

Six, Albert J. Printing apparatus. 4,628,816, Cl. 101-426.000.

Skeltonhall Limited: *See—*
Maurer, Robert, 4,628,724, Cl. 73-3.000.

Slaboszewski, Dale R.: *See—*
Brady, Catherine D.; Metcalfe, Lincoln D.; Slaboszewski, Dale R.; and Frank, Dieter, 4,629,742, Cl. 521-55.000.

Slater Electric, Inc.: *See—*
Gernhardt, Paul D.; and Orbeta, Ferdinand E., 4,630,015, Cl. 335-18.000.

Sleeman, Ralph V.: *See—*
Juricich, Ronald A.; and Sleeman, Ralph V., 4,630,292, Cl. 377-20.000.

Small, Hamish: *See—*
Miller, Theodore E., Jr.; and Small, Hamish, 4,628,743, Cl. 73-861.050.

Small, Vernon R., Jr., to Chevron Research Company. Method for improving fuel economy of internal combustion engines using borated 1,2-alkanediols. 4,629,576, Cl. 252-32.70E.

Smanski, Philip J.: *See—*
Borth, David E.; Gerson, Ira A.; Smanski, Philip J.; and Vilmur, Richard J., 4,630,305, Cl. 381-94.000.

Smeltzer, David C. Automatic fish feeder. 4,628,864, Cl. 119-51.00R.

Smith, Allan L. Toothpaste dispenser. 4,629,095, Cl. 222-96.000.

Smith, Dale K., to Meteor Communications Corporation, Inc. Meteor burst communication system. 4,630,314, Cl. 455-52.000.

Smith, George W., to Envirex Inc. Vertical looped reactor tank with delayed air release feature. 4,629,559, Cl. 210-150.000.

Smith, Harry M.: *See—*
Hall, Tawny R.; and Smith, Harry M., 4,629,803, Cl. 558-92.000.

Smith, Larry J.; and Spaulding, William M., Sr., to Hewlett-Packard Company. Signal synthesizer system. 4,630,217, Cl. 364-480.000.

Smith, Lawrence A., Jr. Resin catalysts and method of preparation. 4,629,710, Cl. 502-11.000.
Smith, Michael L.: *See—*
Miller, Carl B.; Luke, Robert R.; Smith, Michael L.; and Grigar, Larry L., 4,629,001, Cl. 166-297.000.
Smith, Morley S.: *See—*
Kelly, Robert R.; and Smith, Morley S., 4,630,028, Cl. 340-60.000.
Smith, Richard D.: *See—*
O'Hagan, Michael A.; and Smith, Richard D., 4,628,833, Cl. 110-263.000.
Smith, Richard P. Device for separating coffee filters and sheath therefor. 4,629,236, Cl. 294-61.000.
Smith, Thomas D. Externally applied valve for water lines. 4,628,955, Cl. 137-318.000.
SmithKline-RIT: *See—*
Bollen, Alex J.; Chuchana, Paul; and Hoylaerts, Marc, 4,629,567, Cl. 210-635.000.
Smiths Industries Public Limited Company: *See—*
Paxton, William G.; and Wilkinson, Derek, 4,628,752, Cl. 74-411.500.
Snipes, Wallace C., to Zetachron, Inc. Erodible matrix for sustained release bioactive composition. 4,629,621, Cl. 424-19.000.
Societe a Responsabilite Limitee:Ateliers Durand et le Molaire Z.A.: *See—*
Le Molaire, Roger, 4,629,093, Cl. 222-40.000.
Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques; and Cheron, Jean M., 4,629,257, Cl. 303-22.00A.
Picot, Pascal; and Pressaco, Pierre, 4,629,842, Cl. 200-153.00V.
Pressaco, Pierre; and Sauvee, Jean-Paul, 4,629,038, Cl. 188-71.900.
Societe Canadienne des Brevets et d'Exploitation Limitee: *See—*
Cox, William C.; Cox, Gordon; and Leskin, George, deceased, 4,629,369, Cl. 405-303.000.
Societe de Vente et de Fabrication pour le Decolletage Lns SA: *See—*
Louis, Alexandre E., 4,628,779, Cl. 82-2.700.
Societe d'Exploitation des Etablissements Macroex: *See—*
Jacquet, Bernard A., 4,629,104, Cl. 224-324.000.
Societe Europeenne de Propulsion: *See—*
Vives, Michel, 4,628,846, Cl. 112-262.100.
Societe National d'Etude et de Construction de Moteurs d'Aviation: *See—*
Maurer, Gernant E.; Boesch, William J.; and Theret, Jean M., 4,629,521, Cl. 148-410.000.
Societe Nationale des Poudres et Explosifs: *See—*
Moingeon, Marie-Odile; and Chaussard, Jacques, 4,629,541, Cl. 204-59.00R.
Societe Nationale Industrielle Aerospatiale: *See—*
Aubry, Jacques; Bonfils, Michel; and Merlet, Jean-Paul, 4,629,213, Cl. 280-718.000.
Soejima, Tomohide: *See—*
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,630,003, Cl. 331-99.000.
Sofranko, John A.: *See—*
Jones, C. Andrew; Leonard, John J.; Sofranko, John A.; Withers, Howard P.; Breder, E. William, Jr.; Johnson, Marvin F. L.; and Jaecker, John A., 4,629,718, Cl. 502-241.000.
Sokolowski, Adam M. Pick-up tool for grasping night crawlers. 4,629,234, Cl. 294-19.100.
Soldan, Calvin H.: *See—*
Klufas, Oleg; Soldan, Calvin H.; and Coll, William V., Jr., 4,628,575, Cl. 29-156.80R.
Sollman, Larry C., to United States of America, Navy. Automation initialization of reconfigurable on-line automatic test system. 4,630,224, Cl. 364-550.000.
Solvik, R. Sven: *See—*
Kitchel, Frank T.; Solvik, R. Sven; and Opacich, Michael L., 4,629,749, Cl. 523-200.000.
Somatani, Toshifumi: *See—*
Miura, Kenji; Nakajima, Shigeru; Minegishi, Kazushige; Somatani, Toshifumi; Morie, Takashi; and Baba, Tatsuo, 4,630,237, Cl. 365-104.000.
Somers, Steven. Abrasive material spraying apparatus. 4,628,644, Cl. 51-427.000.
Somerton-Rayner, Michael, to Esarco Limited. All-terrain vehicle. 4,629,021, Cl. 180-24.000.
Sommerville, John A., to Imperial Chemical Industries, PLC. Container with memory. 4,629,164, Cl. 239-69.000.
Son, Pyong N.: *See—*
Layer, Robert W.; Lai, John T.; and Son, Pyong N., 4,629,752, Cl. 524-100.000.
Sony Corporation: *See—*
Fukami, Tadashi; Odaka, Kentaro; and Ozaki, Shinya, 4,630,272, Cl. 371-37.000.
Ida, Mitsuru, 4,630,149, Cl. 360-96.400.
Isogawa, Toshiaki; Shiono, Ryuji; Niimura, Tsutomu; Sato, Joichi; and Sato, Mitsuru, 4,630,116, Cl. 358-160.000.
Katakura, Masayuki, 4,629,995, Cl. 330-149.000.
Kikuchi, Akihiro, 4,630,000, Cl. 331-11.000.
Kutaragi, Ken, 4,630,144, Cl. 360-77.000.
Okanobu, Taiwa, 4,629,914, Cl. 307-510.000.
Saito, Etsuro, 4,630,156, Cl. 360-133.000.
Saito, Etsuro, 4,630,159, Cl. 360-133.000.
Tani, Toshiyuki; Inazawa, Yoshizumi; Takahashi, Toshihiko; and Satomura, Shigeyuki, 4,630,142, Cl. 360-70.000.
Soppe, Alfred: *See—*
Janz, Helmut; Rodi, Fritz; Soppe, Alfred; and Rademachers, Jakob, 4,629,500, Cl. 75-0.5BA.
Sorel, Yvon: *See—*
Auffret, Rene ; Le Marer, Rene ; and Sorel, Yvon, 4,630,278, Cl. 372-43.000.
Soto, Stephen: *See—*
Curtin, William J.; Soto, Stephen; and Krueger, Steven, 4,629,831, Cl. 379-213.000.
Soula, Gerard; and Lepage, Jean-Luc, to Rhone-Poulenc Specialites Chimiques. Preparation of hydrogenosilanes. 4,629,801, Cl. 556-466.000.
Soula, Gerard, to Rhone-Poulenc Industries. Isomerization/rearrangement of polychlorobenzenes. 4,629,815, Cl. 570-202.000.
Sourice, Claude. Process and device for sinking wells. 4,629,010, Cl. 175-57.000.
Southam, Danald L., to Combustion Engineering, Inc. Molding register system. 4,628,986, Cl. 164-159.000.
Southdown Meat Company, Inc.: *See—*
Gagliardi, Eugene D., Jr., 4,628,569, Cl. 17-52.000.
Southern California Edison Company: *See—*
Peckinpaugh, Roger I., 4,630,220, Cl. 364-492.000.
Southwest Research Institute: *See—*
King, James D.; Riewerts, Erroll S.; and Rollwitz, William L., 4,629,987, Cl. 324-306.000.
Southwick, Everett W.: *See—*
Driscoll, Dennis M.; and Southwick, Everett W., 4,628,947, Cl. 131-297.000.
Soyk, Melvin A.; and Mitchell, Dean E. Powered lifter. 4,629,391, Cl. 414-563.000.
Space Lab (Hong Kong) Enterprises Ltd.: *See—*
Chan, Wilson, 4,628,810, Cl. 101-27.000.
Spadini, Paolo; and Meier, Willy, to Spadini, Paolo. Timepiece with a quartz watch movement and an electrically controlled sound generator. 4,629,332, Cl. 368-252.000.
Spash, John L., to Digital Equipment Corporation. Vertically loading head module for magnetic disk drive. 4,630,158, Cl. 360-103.000.
Spaulding, William M., Sr.: *See—*
Smith, Larry J.; and Spaulding, William M., Sr., 4,630,217, Cl. 364-480.000.
Speare, Edward J.: *See—*
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,222, Cl. 285-332.400.
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,223, Cl. 285-334.000.
Special Metals Corporation: *See—*
Maurer, Gernant E.; Boesch, William J.; and Theret, Jean M., 4,629,521, Cl. 148-410.000.
Spector, Donald. Multi-aroma cartridge player. 4,629,604, Cl. 422-124.000.
Spectra-Physics, Inc.: *See—*
Hart, Edward E.; and Teach, Ted L., 4,629,321, Cl. 356-248.000.
Speich, Francisco, to Textilma AG. Process for manufacturing a patterned warp-knitted material and a warp knitting machine for its use. 4,628,711, Cl. 66-204.000.
Speranza, George P.: *See—*
Waddill, Harold G.; and Speranza, George P., 4,629,769, Cl. 525-504.000.
Spero, Louis A.; and Markisz-Spero, Anna L. Board game apparatus. 4,629,194, Cl. 273-236.000.
Sperry Corporation: *See—*
Hamilton, Brian J., 4,629,262, Cl. 310-90.500.
Henze, Christopher P., 4,630,187, Cl. 363-41.000.
Spilka, Heinrich. Holding fixture for releasably connecting at least two wall elements. 4,629,152, Cl. 248-488.000.
Spinning, Richard R. Adjustable radial curve radius setting scale. 4,628,610, Cl. 33-177.000.
Spratt, David B.: *See—*
Zorinsky, Eldon J.; and Spratt, David B., 4,628,591, Cl. 29-576.00W.
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Alkyl substituted and unsubstituted para-carboalkoxy cyclohexanones and organoleptic uses thereof. 4,629,805, Cl. 560-126.000.
Springston, Preston S.; and Claxton, Richard L., to United States of America, Navy. Prefabricated panels for rapid runway repair and expedient airfield surfacing. 4,629,358, Cl. 404-35.000.
Srivastava, Santosh K.; and Khakoo, Murtadha A., to California Institute of Technology. Compact electron gun for emitting high current short duration pulses. 4,629,937, Cl. 315-3.000.
Stab, Rudolf: *See—*
Fischer, Emil; and Stab, Rudolf, 4,629,175, Cl. 271-202.000.
Stach, Leonard J.: *See—*
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,629,497, Cl. 71-94.000.
Stafford, Michael K.: *See—*
Bednar, Joseph A., Jr.; Benneti, Richard L.; Dutt, Charbak R.; and Stafford, Michael K., 4,630,196, Cl. 364-200.000.
Stagg, Lester P., Jr.; and Windley, William T., to Du Pont de Nemours, E. I., and Company. Method of reducing throughput of spinning pumps. 4,630,213, Cl. 364-470.000.
Stahl, John I.; Fischel, Burton J.; and Will, Frank J., to Motorola, Inc. Alarm system having alarm transmitter indentification codes and acoustic ranging. 4,630,035, Cl. 340-539.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Spinning machine with a plurality of spinning units. 4,628,680, Cl. 57-401.000.

Stahlecker, Fritz; and Merkel, Heinz, to Stahlecker, Fritz; and Stahlecker, Hans. Yarn piecing arrangement for an open-end friction spinning machine. 4,628,685, Cl. 57-263.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,628,680, Cl. 57-401.000.
Stahlecker, Fritz; and Merkel, Heinz, 4,628,685, Cl. 57-263.000.
Stalder, Herbert; and Baumgartner, Josef, to Rieter Machine Works Limited. Method and apparatus for the production of a yarn by open-end friction spinning. 4,628,679, Cl. 57-401.000.
Stammer, Charles H., to University of Georgia Research Foundation, Inc., The. Synthesis of cyclopropane amino acids. 4,629,784, Cl. 530-328.000.
Standal, Leiv R.: *See—*
Dyrkorn, Arnfinn; and Standal, Leiv R., 4,629,432, Cl. 440-52.000.
Standard Microsystems Corp.: *See—*
Ethe, Ronald S.; and Burstein, Steven, 4,629,908, Cl. 307-273.000.
Standard Oil Commercial Development Company: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., 4,629,820, Cl. 136-255.000.
Standard Oil Company, The: *See—*
Cuellar, Edward A.; and Desmond, Michael J., 4,630,176, Cl. 361-433.000.
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,629,776, Cl. 528-313.000.
Standard Oil Company (Indiana): *See—*
Prevatt, William D.; Akin, Cavit; and Evans, April J., 4,629,700, Cl. 435-128.000.
Reddy, K. Virupaksha, 4,629,859, Cl. 219-121.0LM.
Standard Telephones & Cables Public Limited Company: *See—*
Barton, Russell R., 4,630,109, Cl. 358-103.000.
Stanfa, Peter S.; and Foster, Phillip W., to Broilway, Inc. Gas broiler. 4,628,897, Cl. 126-41.00R.
Stanger, Keith A.: *See—*
Farnsworth, Craig A.; Himmel, Robert L.; Sank, Gerald W.; and Stanger, Keith A., 4,628,903, Cl. 126-391.000.
Stanley Electric Co., Ltd.: *See—*
Kudo, Sinji, 4,630,186, Cl. 363-19.000.
Stanley, Frederick W., Jr.: *See—*
Prud'homme, Robert K.; Stanley, Frederick W., Jr.; and Langhorst, Martin W., 4,629,566, Cl. 110-635.000.
Stanley, Thomas R.; and Wright, David L., to Teepak, Inc. Clip punch device and packaging apparatus equipped therewith. 4,628,663, Cl. 53-138.00A.
Stant Inc.: *See—*
Harris, Robert S., 4,629,560, Cl. 210-184.000.
Stanton, Robert J., to Refractron Corp. Ceramic filter with plural layers of different porosity. 4,629,483, Cl. 55-487.000.
Starmuhler, Erwin: *See—*
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,630,027, Cl. 340-52.00F.
Stauffer Chemical Company: *See—*
Felix, Raymond A.; and Hsu, Joanna K., 4,629,499, Cl. 71-100.000.
STC plc: *See—*
Carr, Peter B., 4,629,837, Cl. 200-50.00C.
Steeltin Can Corporation: *See—*
Kadunce, Leo, 4,629,529, Cl. 156-428.000.
Stein, Edgar A.: *See—*
Ruid, John O.; and Stein, Edgar A., 4,629,473, Cl. 51-295.000.
Steiner, Robert E.; and Savla, Chandrakant V., to Emerson Electric Co. Whole house fan. 4,628,802, Cl. 98-42.100.
Steinmetz, Michael A.: *See—*
French, Daniel B.; and Steinmetz, Michael A., 4,629,955, Cl. 318-625.000.
Stenerson, Gary L.; and Miller, Thomas J., to Printed Circuits International. Semiconductor chip carrier package with a heat sink. 4,630,172, Cl. 361-386.000.
Stenzel, Peter, to Alcan Ohler GmbH. Receptacle with flange closure. 4,629,112, Cl. 229-43.000.
Stenzel, Peter, to Alcan Ohler GmbH. Method and apparatus for producing lids for containers with folded corner tear tabs. 4,629,447, Cl. 493-356.000.
Stepan, William E., to GTE Communication Systems Corporation. Circuit terminating device. 4,629,267, Cl. 339-17.00M.
Stephen, Ken L.: *See—*
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Sterbik, William G.: *See—*
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Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,629,735, Cl. 514-535.000.
Stern, Howard, to Robotic Vision Systems, Inc. Arrangement for measuring depth based on lens focusing. 4,629,324, Cl. 356-376.000.
Stevens, Russell E.: *See—*
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Stevens, Timothy S.: *See—*
Cortes, Hernan J.; and Stevens, Timothy S., 4,629,705, Cl. 436-161.000.
Stewart, James F.; and Chernack, Milton P., to Stewart, James F. Personal flotation assistance device. 4,629,436, Cl. 441-93.000.
Stewart, Ross W., to Arabian American Oil Company. Core slabbing apparatus. 4,628,894, Cl. 125-21.000.
Stillman, Ben S.; and Boricchio, Barry J., to Adcotech Corporation. DIP tube loading/unloading apparatus. 4,629,387, Cl. 414-404.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Method and means for producing and analyzing secret identifying code marks in machine-scanned data carriers. 4,629,873, Cl. 235-380.000.
Stockmann, Helmut: *See—*
Schutte, Klaus; and Stockmann, Helmut, 4,629,197, Cl. 277-53.000.
Stolper, Richard; Adler, Theo; and Kussmann, Lutz, to General Motors Corporation. Motor vehicle seat. 4,629,254, Cl. 297-473.000.
Storm, Volker: *See—*
Storm, Werner; and Storm, Volker, 4,628,671, Cl. 53-588.000.
Storm, Werner; and Storm, Volker. Apparatus for packing produce, such as lettuce, bunches of carrots, asparagus, bananas and the like. 4,628,671, Cl. 53-588.000.
Stouffer Corporation, The: *See—*
Jogan, Michael J.; Kermode, Kevin T.; Romick, Tom L.; and Stephen, Ken L., 4,628,748, Cl. 73-863.010.
Strand, Urban R. A.: *See—*
Yttergren, Erik S.; Strand, Urban R. A.; Jansson, Karl U. H.; and Knipstrom, Karl-Erik, 4,629,853, Cl. 219-60.00A.
Straub, Immanuel. Pipe coupling. 4,629,217, Cl. 285-112.000.
Strazzolini, Paolo; Malabarba, Adriano; and Cavalleri, Bruno, to Gruppo Lepetit S.p.A. Chemical process for preparing L 17392 (deglucoteicoplanin) and its salts. 4,629,781, Cl. 530-317.000.
Streit, Peter, to U.S. Philips Corporation. Electric contact arrangement for liquid crystal display cells. 4,629,289, Cl. 350-336.000.
Stride Rite International, Inc.: *See—*
McBarron, George P., 4,628,622, Cl. 36-50.000.
Stritzl, Karl: *See—*
Lorenz, Bettstein; Leichtfried, Friedrich; Szasz, Tibor; Wittmann, Heinz; and Stritzl, Karl, 4,629,209, Cl. 280-626.000.
Strom, Sigmunn, to A/S Kongsberg Vapenfabrikk. Gas turbine combustor with pneumatically controlled flow distribution. 4,628,687, Cl. 60-39.230.
Strosser, Richard P., to New Holland, Inc. Automatic baler with operator controlled diagnostics. 4,630,191, Cl. 364-186.000.
Struck, Klaus: *See—*
Nohren, Hubert; Knofe, Helmut; and Struck, Klaus, 4,629,142, Cl. 242-107.40B.
Strudel, Werner, to Lindauer Dornier Gesellschaft mbH. Apparatus and method for feeding tubular textile fabric through a treatment range. 4,628,712, Cl. 68-13.00R.
Stumbar, James P.: *See—*
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Suciu, Paul I.: *See—*
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Suda, Toshikazu, to Shinanokenshi Co., Ltd. Method of producing II–V compound semiconductors. 4,629,514, Cl. 148-1.500.
Sudoh, Kengo: *See—*
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Suecia Antiqua Limited: *See—*
Nilsson, Ingvar, 4,629,628, Cl. 428-29.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
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Suenaga, Nobuyuki: *See—*
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Inoue, Hitoshi; Suenaga, Norihiro; Suenaga, Nobuyuki; Sugiyama, Seiji; and Kaneda, Michihiro, 4,630,273, Cl. 372-9.000.
Sugano, Satoshi: *See—*
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Sugawara, Tadashi: *See—*
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Sugawara, Takeo: *See—*
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Sugie, Toshinori; Kobata, Fumihiro; and Kawamura, Takashi, to Dainippon Ink and Chemicals, Inc. Poly(p-phenylene sulfide) film and process for production thereof. 4,629,778, Cl. 528-388.000.
Sugihara, Yoshinobu: *See—*
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Sugimura, Kazuo: *See—*
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Sugimura, Nobuyuki; and Sugimura, Kazuo. Background device for separating member in accumulator chamber. 4,628,964, Cl. 138-30.000.
Sugimura, Tatuo; Satoh, Isao; Ichinose, Makoto; and Kuroki, Yuzuru, to Matsushita Electric Industrial Co., Ltd. Data recording/reproducing apparatus. 4,630,140, Cl. 360-49.000.
Sugiyama, Seiji: *See—*
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Sukeda, Toshiaki; and Imai, Satoru, to Fujitsu Limited. Cassette-type magnetic bubble memory. 4,630,236, Cl. 365-1.000.
Sullivan, James C.: *See—*
Haney, William M., III; and Sullivan, James C., 4,629,472, Cl. 44-51.000.
Sulzer Brothers Limited: *See—*
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Sumitomo Electric Industries, Ltd.: *See*—
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Sakamoto, Katsuji, 4,628,675, Cl. 57-3.000.
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Sumitomo Metal Mining Company Limited: *See*—
Kubota, Mitsugi; and Kakemizu, Hiroshi, 4,629,501, Cl. 75-69.000.

Sundaresan, Ravishankar, to Texas Instruments Incorporated. Method for fabricating stacked CMOS structures. 4,628,589, Cl. 29-571.000.

Sundet, James W., to Cray Research, Inc. Solid state storage device. 4,630,230, Cl. 364-900.000.

Sundles, Timothy B.; and Brown, M. Wayne, to Lubrication Research, Inc. Vehicle cold start system. 4,628,877, Cl. 123-196.00S.

Sundstrand Data Control, Inc.: *See*—
Kirkpatrick, Gordon S., 4,628,735, Cl. 73-517.0AV.

Sunvic Reglar GmbH: *See*—
Roth, Gunther, 4,628,793, Cl. 91-374.000.

Supervision Control Systems, Inc.: *See*—
Cotton, Roger E.; and Lowe, Eugene H., 4,630,110, Cl. 358-108.000.

Surti, Tyrone N. Printer ribbon cassette. 4,629,346, Cl. 400-208.000.

Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,629,476, Cl. 55-68.000.

Sutton, Charles O.: *See*—
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Suzaki, Masayuki; and Kanno, Tetuo, to Ricoh Co., Ltd. Printer cartridge and cartridge retaining means. 4,629,345, Cl. 400-208.000.

Suzuki, Jo; Abe, Masaaki; Yamaguchi, Tamotu; and Terazawa, Shotaro, to Suzuki Shokan Co., Ltd. Substance for reversibly absorbing and desorbing hydrogen. 4,629,720, Cl. 502-400.000.

Suzuki, Kenzi; Iida, Shozo; Sakami, Hiroshi; and Kawase, Kaoru, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Finely porous clay formed preponderantly of spectite type mineral and method for manufacture of said clay. 4,629,713, Cl. 502-84.000.

Suzuki, Kiyohiko: *See*—
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Suzuki, Koji; Kawasaki, Masahiro; and Aoki, Harumi, to Asahi Kogaku Kogyo K.K. Automatic focus detecting circuit. 4,630,121, Cl. 358-227.000.

Suzuki, Ryo: *See*—
Saito, Masato; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,629,929, Cl. 313-25.000.

Suzuki Shokan Co., Ltd.: *See*—
Suzuki, Jo; Abe, Masaaki; Yamaguchi, Tamotu; and Terazawa, Shotaro, 4,629,720, Cl. 502-400.000.

Suzuki, Takahumi: *See*—
Omagari, Masaharu; Kazikawa. Tsuneo; and Suzuki, Takahumi, 4,629,206, Cl. 180-336.000.

Suzuki, Tatsuo; and Matsumoto, Atsushi, to Terumo Corporation. Catheter introducing instrument. 4,629,450, Cl. 604-164.000.

Suzuki, Tomohiro, to Victor Company of Japan, Ltd. Automatic frequency control circuit for a television signal receiving apparatus. 4,630,118, Cl. 358-195.100.

Suzuki, Yasuo: *See*—
Sasaki, Nobuo; and Suzuki, Yasuo, 4,630,089, Cl. 357-23.700.

Suzuki, Yutaka; and Kato, Yuji, to Nissan Motor Company, Limited. Frequency discrimination circuit. 4,629,915, Cl. 307-522.000.

Svendsen, Lars G., to Pentapharm A.G. Peptide derivatives and use thereof as substrates for quantitatively assaying enzymes. 4,629,695, Cl. 435-19.000.

Svensson, Bo, to Autopart Sweden AB. Heating pad, particularly for vehicle seats. 4,629,868, Cl. 219-528.000.

Swanney, Peter L.: *See*—
Lee, Michael C.; Raubinger, Daniel F.; and Swanney, Peter L., 4,628,568, Cl. 16-337.000.

Swanson, Lynwood W.: *See*—
Orloff, Jonathan H.; and Swanson, Lynwood W., 4,629,898, Cl. 250-396.00R.

Sweeney, James D.; and Mortimer, J. Thomas, to Case Western Reserve University. Asymmetric shielded two electrode cuff. 4,628,942, Cl. 128-784.000.

Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation. Oxidized sulfur derivatives of diaminophosphinyl compounds as urease inhibitors and urease inhibited urea based fertilizer compositions. 4,629,491, Cl. 71-87.000.

Swersey, Burt L.: *See*—
Fried, Peter; and Swersey, Burt L., 4,629,015, Cl. 177-25.000.

Swisher, Roger C.; Flobak, Jens O.; Eilertsen, Bjorn; Jakobsen, Nikolai; and Gabrielsen, Jonny, to O.T.C. A/S. Derrick. 4,629,014, Cl. 175-220.000.

Swiss Aluminium Ltd.: *See*—
Venus, Willem, 4,629,423, Cl. 432-247.000.

Symsek, Dale R.; and Regelin, Nancy P., to United States Steel Corporation. Variable temperature waste heat recovery system. 4,628,869, Cl. 122-20.00B.

Syntex (U.S.A.) Inc.: *See*—
Chan, Tai W.; and Becker, Allyn R., 4,629,782, Cl. 530-322.000.
Clark, Robin D.; and Waterbury, L. David, 4,629,730, Cl. 514-331.000.
Collins, Christine G.; Pirio, Marcel R.; and Singh, Prithipal, 4,629,691, Cl. 435-7.000.
Khanna, Pyare, 4,629,693, Cl. 435-7.000.
Weng, Litai; Gibbons, Ian; and Ullman, Edwin F., 4,629,690, Cl. 435-7.000.

Synthes Ltd.: *See*—
Mathys, Robert, Jr.; and Cotting, Anton, 4,628,920, Cl. 128-92.0YZ.

SyQuest Technology: *See*—
Alaimo, Ben; and Couse, Robert F., 4,630,190, Cl. 364-167.000.

Syrier, Johannes L. M.; Vonk, Willem C.; and van Gooswilligen, Gerrit, to Shell Oil Company. Pigmentable composition of matter comprising a mineral lubricating oil extract and modified petroleum and/or coumarone-indene resin. 4,629,754, Cl. 524-394.000.

Systron-Donner Corporation: *See*—
Tarczy-Hornoch, Zoltan; Madni, Asad M.; and Fala, Joseph, 4,630,228, Cl. 364-576.000.

Szasz, Tibor: *See*—
Lorenz, Bettstein; Leichtfried, Friedrich; Szasz, Tibor; Wittmann, Heinz; and Stritzl, Karl, 4,629,209, Cl. 280-626.000.

Szirtes, Thomas. Contour radiography: a system for determining 3-dimensional contours of an object from its 2-dimensional images. 4,630,203, Cl. 364-414.000.

T.A.D. Avanti, Inc.: *See*—
Kilstofte, Richard B., 4,630,152, Cl. 360-105.000.

Tachikawa Spring Co., Ltd.: *See*—
Nishino, Takaichi, 4,629,151, Cl. 248-396.000.

Tachikawa Spring Co. Ltd: *See*—
Matsushita, Kazuyoshi, 4,629,109, Cl. 228-49.100.

Tafelski, Roman J., Jr. Portable deck. 4,628,645, Cl. 52-169.100.

Taga, Yukio, to Yoshida Kogyo K.K. Device for preventing fall of button parts from a chute. 4,628,842, Cl. 112-113.000.

Tagnon, Claude. Air heater and distributor unit. 4,628,798, Cl. 98-31.600.

Tajima, Ikuo, to Tokai Kogyo Mishin Kabushiki Kaisha. Apparatus for feeding a cloth in an embroidery machine. 4,628,843, Cl. 112-121.120.

Takada, Mitsuru: *See*—
Itoh, Hiroshi; Hiramatsu, Shigeki; Takada, Mitsuru; and Tamura, Tadashi, 4,628,773, Cl. 74-867.000.

Takada, Mitsuyuki; Morihiro, Yoshiyuki; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing multilayer circuit board. 4,629,681, Cl. 430-314.000.

Takada, Noboru, to Toko Kabushiki Kaisha. Current controlled variable inductor. 4,630,013, Cl. 334-12.000.

Takagi, Satoshi: *See*—
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,630,153, Cl. 360-105.000.

Takagishi, Kazuhiro: *See*—
Matsuo, Masayoshi; Takagishi, Kazuhiro; Tobita, Kouji; and Kanemaru, Yukihiro, 4,629,043, Cl. 192-4.00A.

Takahashi, Hiroshi, to Nippon Electric Co., Ltd. Sampling frequency converting apparatus. 4,630,034, Cl. 340-347.0DD.

Takahashi, Hiroshi: *See*—
Inaba, Masao; and Takahashi, Hiroshi, 4,630,101, Cl. 358-22.000.

Takahashi, Hisao: *See*—
Hamada, Akira; and Takahashi, Hisao, 4,629,928, Cl. 310-365.000.

Takahashi, Sadatoshi: *See*—
Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, 4,629,294, Cl. 350-427.000.

Takahashi, Toshihiko: *See*—
Tani, Toshiyuki; Inazawa, Yoshizumi; Takahashi, Toshihiko; and Satomura, Shigeyuki, 4,630,142, Cl. 360-70.000.

Takai, Kazuki: *See*—
Ito, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,630,153, Cl. 360-105.000.

Takamura, Yuji: *See*—
Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,629,300, Cl. 354-76.000.

Takanashi, Itsuo; Nakagaki, Shintaro; and Kuriyama, Takashi, to Victor Company of Japan, Limited. Color video signal processing device for enhancing at least one of a plurality of primary color signal components output from a color image pickup apparatus. 4,630,107, Cl. 358-47.000.

Takara Co., Ltd.: *See*—
Satoh, Yasuta; Tsuchihashi, Hiroshi; and Tani, Saburo, 4,629,409, Cl. 425-139.000.

Takasago, Hayato: *See*—
Takada, Mitsuyuki; Morihiro, Yoshiyuki; and Takasago, Hayato, 4,629,681, Cl. 430-314.000.

Takasu, Yoshio: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; Ohtake, Takeshi; Arao, Kozo; and Takasu, Yoshio, 4,629,670, Cl. 430-58.000.

Takata, Susumu; Wakabayashi, Shoichi; Noma, Hiroyasu; and Wakatsuki, Tatsuya, to TDK Corporation. Porous hydroxyapatite material for artificial bone substitute. 4,629,464, Cl. 623-16.000.

Takayama, Chiharu: *See*—
Miura, Yoshio; Fujishima, Tooru; Oku, Masuo; Kudo, Yoshimichi; Takayama, Chiharu; and Kawashima, Tooru, 4,630,252, Cl. 369-44.000.

Takayama, Nobutoshi; Edakubo, Hiroo; Kozuki, Susumu; Takei, Masahiro; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Rotary head type reproducing apparatus. 4,630,146, Cl. 360-77.000.

Takayanagi, Noriyasu: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.

Takeda, Tadao: *See*—
Kato, Namio; and Takeda, Tadao, 4,629,843, Cl. 219-10.49R.

Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; Hatanaka, Isamu; and Harada, Shigeo, to Fuji Photo Film Co., Ltd. Process for thermal development and transfer. 4,629,675, Cl. 430-203.000.

Takei, Masahiro: *See*—
Takayama, Nobutoshi; Edakubo, Hiroo; Kozuki, Susumu; Takei, Masahiro; and Nagasawa, Kenichi, 4,630,146, Cl. 360-77.000.

Takei, Toshihiro: *See*—
Imoto, Yuzo; Hattori, Yoshiyuki; Takei, Toshihiro; and Tanaka, Taro, 4,629,039, Cl. 188-72.100.

Takemoto, Etsuo: *See*—
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Takeuchi, Akihiro: *See*—
Tomita, Masao; Takeuchi, Akihiro; and Hashima, Akio, 4,630,251, Cl. 369-43.000.

Takeuchi, Tsunezo: *See*—
Mizutani, Isao; and Takeuchi, Tsunezo, 4,629,849, Cl. 219-10.55F.

Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,629,212, Cl. 280-707.000.

Tamata, Shin: *See*—
Mori, Kazuhide; Tamata, Shin; Kikuchi, Makoto; Matsuda, Masami; and Aoyama, Yoshiyuki, 4,628,837, Cl. 110-346.000.

Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; Tamba, Shinichi; and Miguchi, Akio, 4,628,876, Cl. 123-192.00B.

Tamer, Ergun: *See*—
Engelhard, Helmut; Feuser, Dieter; Hendricks, Udo; and Tamer, Ergun, 4,629,468, Cl. 8-442.000.

Tampa, Morris. Knee ice pack. 4,628,932, Cl. 128-402.000.

Tamura, Tadashi: *See*—
Itoh, Hiroshi; Hiramatsu, Shigeki; Takada, Mitsuru; and Tamura, Tadashi, 4,628,773, Cl. 74-867.000.

Tanabe Machinery Co., Ltd.: *See*—
Toriyama, Daigoro, 4,629,445, Cl. 493-10.000.

Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Heating apparatus having a selectively movable heater. 4,629,850, Cl. 219-10.55B.

Tanahashi, Tooru; Ishii, Toshiaki; and Mitsui, Shuzo, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator. 4,629,035, Cl. 187-29.00R.

Tanaka, Akira: *See*—
Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, 4,629,362, Cl. 405-146.000.
Morita, Takayuki; Tanaka, Akira; Tsunckawa, Takahiko; and Amano, Hisao, 4,628,684, Cl. 57-263.000.

Tanaka, Haruto, to Nissan Motor Company, Limited. Ultra-sonic distance sensor system and method with correction feature for sensor value. 4,630,226, Cl. 364-561.000.

Tanaka, Hideo; Naka, Toshiaki; Muranaka, Shiaru; and Miyashita, Yoshikazu, to Shibuya Kogyo Co., Ltd. Labeling machine. 4,629,528, Cl. 156-351.000.

Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Kameyama, Yutaka, 4,629,542, Cl. 204-72.000.

Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Capacitive-type position and reference angular rotation detecting apparatus. 4,630,047, Cl. 340-870.370.

Tanaka, Hiromichi: *See*—
Morimura, Atsushi; and Tanaka, Hiromichi, 4,630,106, Cl. 358-44.000.

Tanaka, Hiroshi: *See*—
Moroi, Akihiko; Tanaka, Hiroshi; and Hatanaka, Shinya, 4,630,182, Cl. 362-294.000.

Tanaka, Hirosi: *See*—
Horikawa, Kazuo; Tanaka, Hirosi; and Saito, Tokukazu, 4,629,900, Cl. 250-484.100.

Tanaka, Noriatsu: *See*—
Miyajima, Tamotsu; Tanaka, Noriatsu; and Saito, Nobuto, 4,629,748, Cl. 523-161.000.

Tanaka, Taro: *See*—
Imoto, Yuzo; Hattori, Yoshiyuki; Takei, Toshihiro; and Tanaka, Taro, 4,629,039, Cl. 188-72.100.

Tanaka, Tsugutoshi: *See*—
Horinouchi, Tamotsu; Ishikawa, Takayoshi; Tanaka, Tsugutoshi; and Ono, Masahiro, 4,630,074, Cl. 346-139.00C.

Tanaka, Tsunefumi; Takahashi, Sadatoshi; Kitagishi, Nozomu; Ikemori, Keiji; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Zoom lens. 4,629,294, Cl. 350-427.000.

Tang, Wai-Cheung, to Com Dev Ltd. Cascade waveguide triple-mode filters useable as a group delay equalizer. 4,630,009, Cl. 333-28.00R.

Tani, Kanari. Easy-to-open bag. 4,629,071, Cl. 206-618.000.

Tani, Saburo: *See*—
Satoh, Yasuta; Tsuchihashi, Hiroshi; and Tani, Saburo, 4,629,409, Cl. 425-139.000.

Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, to Hitachi, Ltd. Method of production of cylindrical body. 4,628,720, Cl. 72-368.000.

Tani, Toshiyuki; Inazawa, Yoshizumi; Takahashi, Toshihiko; and Satomura, Shigeyuki, to Sony Corporation. Apparatus for reproducing a digital signal. 4,630,142, Cl. 360-70.000.

Tani, Yoshio: *See*—
Nakano, Keiichi; Tani, Yoshio; and Umeda, Tatsutoshi, 4,628,878, Cl. 123-196.00R.

Tanimoto, Akikazu, to Nippon Kogaku K.K. Exposure apparatus. 4,629,313, Cl. 355-53.000.

Tanioka, Tsuyoshi: *See*—
Horio, Kenji; Otsuka, Akira; and Tanioka, Tsuyoshi, 4,629,942, Cl. 315-169.400.

Tanno, Toshihiro, to Pioneer Electronic Corporation. Speaker system having a movable high range unit. 4,630,303, Cl. 381-87.000.

Tano, Eiichi: *See*—
Sato, Osamu; Tano, Eiichi; and Negishi, Kiyoshi, 4,629,305, Cl. 354-442.000.

Tantardini, Paolo, to Atos Oleodinamica S.p.A. Volumetric vane pump for fluid-hydraulic drive. 4,629,406, Cl. 418-268.000.

Tape-Lock Company: *See*—
Cecchi, Marino; and Borucki, Gregory J., 4,628,713, Cl. 70-58.000.

Tarasenko, Vladimir I.: *See*—
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.

Tarczy-Hornoch, Zoltan; Madni, Asad M.; and Fala, Joseph, to Systron-Donner Corporation. Transmission line analyzer for automatically identifying the severities and locations of multiple mismatches. 4,630,228, Cl. 364-576.000.

Tarjan, Peter P.: *See*—
Hess, Stanley R.; and Tarjan, Peter P., 4,628,937, Cl. 128-642.000.

Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin: *See*—
Tikhonov, Valentin N.; Zhigalov, Gennady V.; Abduganiev, Abdurakhim; and Dulnev, Vladimir K., 4,628,678, Cl. 57-400.000.

Tassinario, Giampiero, to Mavilor Systemes S.A. Electric motor and tachometric generator unit. 4,629,948, Cl. 318-254.000.

Tateisi, Kazuma: *See*—
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Mizuno, Shinichiro, 4,630,200, Cl. 364-405.000.

Tatemoto, Minoru: *See*—
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,629,212, Cl. 280-707.000.

Taya, Shunroku: *See*—
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.

Tayco Developments, Inc.: *See*—
Taylor, Paul H., 4,628,579, Cl. 29-422.000.

Taylor, Attalee S.: *See*—
Andrews, Howard W., Jr.; Bobb, Clifford F.; Cobaugh, Robert F., deceased; and Taylor, Attalee S., 4,629,270, Cl. 339-75.0MP.

Taylor, Edward, to United States of America, Air Force. Mechanical locking between multi-layer printed wiring board conductors and through-hole plating. 4,628,598, Cl. 29-846.000.

Taylor, Fred J.; and Donnermeyer, William I., Jr., to American Autogate Corporation. Sliding gate actuating mechanism. 4,628,825, Cl. 105-289.000.

Taylor, Jefferson H.; and Green, Eugene L., Sr., to Wilson Engraving Company, Inc. Method for measuring the volumetric capacity of anilox rolls. 4,628,728, Cl. 73-149.000.

Taylor, Paul H., to Tayco Developments, Inc. Method of fabricating a liquid spring shock absorber with integral plastic body and seal. 4,628,579, Cl. 29-422.000.

Taylor, William J. A.: *See*—
Hammond, Michael D.; and Taylor, William J. A., 4,629,706, Cl. 436-513.000.

Tazunoki, Masanori: *See*—
Udo, Shinji; and Tazunoki, Masanori, 4,628,590, Cl. 29-575.000.

TDK Corporation: *See*—
Ide, Toshiaki; Shimozawa, Tohru; and Nishimatsu, Masaharu, 4,629,646, Cl. 428-143.000.
Imai, Yuji, 4,629,539; Cl. 204-129.650.
Kato, Namio; and Takeda, Tadao, 4,629,843, Cl. 219-10.49R.
Osaka, Yukio; Imura, Takeshi; and Nakashita, Toshio, 4,629,649, Cl. 428-209.000.
Takata, Susumu; Wakabayashi, Shoichi; Noma, Hiroyasu; and Wakatsuki, Tatsuya, 4,629,464, Cl. 623-16.000.

Teach, Ted L.: *See*—
Hart, Edward E.; and Teach, Ted L., 4,629,321, Cl. 356-248.000.

Technicon Instruments Corporation: *See*—
Uffenheimer, Kenneth F., 4,629,703, Cl. 436-45.000.

Techniques et Systems Elabores T.S.E.: *See*—
Dupont, Robert J., 4,628,908, Cl. 128-24.100.

Tecumseh Products Company: *See*—
Wood, Mark W., 4,629,403, Cl. 418-1.000.

Tedaka, Yoshihisa: *See*—
Hasegawa, Tadashi; Kobayashi, Yoshiharu; Iwamoto, Akira; and Tedaka, Yoshihisa, 4,630,155, Cl. 360-106.000.

Teepak, Inc.: *See*—
Stanley, Thomas R.; and Wright, David L., 4,628,663, Cl. 53-138.00A.

Tegg, Duane T., to Satellite Industries, Inc. Closure fastener. 4,629,230, Cl. 292-281.000.

Tekhnologichesky Institut Vzryvozashischennogo I Rudnichnogo Elektrooborudovania: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.

Tektronix, Inc.: *See—*
Bebernes, Linda K.; and Weiss, Frederick G., 4,629,911, Cl. 307-362.000.
English, James D., 4,629,977, Cl. 324-81.000.
Telefonaktiebolaget L.M. Ericsson: *See—*
Johansson, Jan H., 4,629,970, Cl. 323-285.000.
Telefonaktiebolaget LM Ericsson: *See—*
Hallberg, Bjorn I. C., 4,629,872, Cl. 235-380.000.
Tendrup, Donald; and DeVito, Joseph. Garment hanger with clip. 4,629,102, Cl. 223-85.000.
Terada, Toshimichi; Kojima, Noboru; and Shibata, Akira, to Hitachi, Ltd. Video signal recording/reproducing apparatus. 4,630,132, Cl. 358-310.000.
Terakura, Yukio: *See—*
Ikemoto, Kazuhito; and Terakura, Yukio, 4,628,751, Cl. 74-339.000.
Teramachi, Hiroshi. Ball spline bearing. 4,629,337, Cl. 384-43.000.
Teraoka, Kazuharu, to Teraoka Seikosho Co., Ltd. Bar code printer. 4,630,067, Cl. 346-76.0PH.
Teraoka Seikosho Co., Ltd.: *See—*
Teraoka, Kazuharu, 4,630,067, Cl. 346-76.0PH.
Terashima, Kenji; Kimura, Yoshio; Asada, Masao; and Sugano, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Green-emitting phosphor. 4,629,582, Cl. 252-301.40P.
Terazawa, Shotaro: *See—*
Suzuki, Jo; Abe, Masaaki; Yamaguchi, Tamotu; and Terazawa, Shotaro, 4,629,720, Cl. 502-400.000.
Terebecky, Walter: *See—*
Giacobbe, Thomas J.; Leitman, Richard H.; and Terebecky, Walter, 4,629,903, Cl. 250-573.000.
Terskov, Alexei D.: *See—*
Kostylev, Alexandr D.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,629,008, Cl. 173-91.000.
Terumo Corp.: *See—*
Ishizaka, Hideo, 4,629,336, Cl. 374-169.000.
Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,629,450, Cl. 604-164.000.
Terumo Kabushiki Kaisha: *See—*
Kanno, Michio, 4,629,455, Cl. 604-241.000.
Tessmer, Gero: *See—*
Janusch, Alois; Mayer, Franz W.; and Tessmer, Gero, 4,628,619, Cl. 34-180.000.
Texaco Inc.: *See—*
Knifton, John F., 4,629,807, Cl. 560-204.000.
Rutherford, David A.; Barr, Brian D.; and Rommelmann, Douglas W., 4,629,366, Cl. 405-211.000.
Vanderpool, Steven H.; Lin, Jiang-Jen; and Duranleau, Roger G., 4,629,809, Cl. 562-519.000.
Waddill, Harold G.; and Speranza, George P., 4,629,769, Cl. 525-504.000.
Texas Instruments Incorporated: *See—*
Bell, Kenneth M.; and Giolma, William H., 4,630,162, Cl. 361-56.000.
Brown, Ronald W., 4,630,021, Cl. 337-113.000.
Maytum, Michael J.; Lear, Anthony; Byatt, Stephen W.; and Rodrigues, Richard A. A., 4,629,944, Cl. 315-207.000.
McDavid, James M., 4,628,588, Cl. 29-571.000.
Poteet, Ken A.; and Chang, Shuen C., 4,630,240, Cl. 365-189.000.
Simmons, Arturo; and Kinch, Michael A., 4,630,090, Cl. 357-24.000.
Sundaresan, Ravishankar, 4,628,589, Cl. 29-571.000.
Van Der Ploeg, Arie, 4,628,889, Cl. 123-549.000.
Wagers, Robert S., 4,629,288, Cl. 350-171.000.
Zorinsky, Eldon J.; and Spratt, David B., 4,628,591, Cl. 29-576.00W.
Texaust Australia Limited: *See—*
Towner, John E. T.; and Towner, Geoffrey F., 4,628,994, Cl. 166-68.000.
Textilma AG: *See—*
Speich, Francisco, 4,628,711, Cl. 66-204.000.
Textron, Inc.: *See—*
Kris, Bryan, 4,630,193, Cl. 364-200.000.
Tezuka, Takeshi; Owada, Akira; and Katsumoto, Naoaki, to Shiroki Kinzoku Kogyo Kabushiki Kaisha. Reclining angle adjustment device. 4,629,250, Cl. 297-362.000.
Tezuka, Takeshi, to Shiroki Kinzoku Kogyo Kabushiki Kaisha. Reclining angle adjustment device. 4,629,251, Cl. 297-362.000.
Thelin, Anders G.: *See—*
Hillert, Lars H.; Lindstrom, Jan N.; and Thelin, Anders G., 4,629,661, Cl. 428-698.000.
Theret, Jean M.: *See—*
Maurer, Gernant E.; Boesch, William J.; and Theret, Jean M., 4,629,521, Cl. 148-410.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Continuously advancing track leveling, lining and tamping machine. 4,628,822, Cl. 104-7.200.
Thew, Martin T.: *See—*
Colman, Derek A.; and Thew, Martin T., 4,629,555, Cl. 209-144.000.
Thiele Kaolin Company: *See—*
Yoon, Roe-Hoan; and Hilderbrand, Thomas M., 4,629,556, Cl. 209-166.000.
Thomas, Erwin: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,629,613, Cl. 423-265.000.
Thomas, Junior A. All purpose wire concealer. 4,629,826, Cl. 174-99.00R.
Thompson, Herbert E.; and Meulners, Duane C., to Drivetec, Inc. Fine positioning apparatus for floppy disk drive. 4,630,145, Cl. 360-77.000.
Thompson, Mortimer S., to Tri-Tech Systems International, Inc. Method for forming plastic bottle with integral handle. 4,629,598, Cl. 264-537.000.
Thompson, Stanley P. Flighting for horizontal dryers. 4,628,614, Cl. 34-12.000.
Thomson-CSF: *See—*
Leiba, Rene , 4,630,002, Cl. 331-96.000.
Thomson, Fred M.: *See—*
Revelt, William F.; Prows, John B.; Thomson, Fred M.; and Avery, Hugh E., 4,629,328, Cl. 366-177.000.
Thoone, Martinus L. G., to U.S. Philips Corporation. Arrangement for determining the instantaneous angular position of a moving object. 4,628,729, Cl. 73-178.00R.
Thornhill, Alexander F.: *See—*
Kang, George S.; Everett, Stephanie S.; and Thornhill, Alexander F., 4,630,300, Cl. 381-31.000.
Thornton, Donald I., to Allied Corporation. Thermally formed filter. 4,629,474, Cl. 264-109.000.
Thorsett, Eugene D.: *See—*
Harris, Elbert E.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,629,787, Cl. 540-528.000.
Thummalapally, Vinai K.: *See—*
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., 4,629,668, Cl. 430-11.000.
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, to Ciba-Geigy Corporation. Phosphonomethylcylhydroxamic acid and herbicidally active salts thereof, and their use in herbicidal compositions. 4,629,490, Cl. 71-86.000.
Thurman, Brian, to Craven Tasker (Sheffield) Limited. Steerable device for moving trailer type vehicles. 4,629,020, Cl. 180-19.200.
Tiemann, Jerome J.: *See—*
Welles, Kenneth B., II; Noujaim, Sharbel E.; and Tiemann, Jerome J., 4,630,299, Cl. 381-4.000.
Tiesler, Roy F., to General Motors Corporation. Hinge assembly. 4,629,244, Cl. 296-146.000.
Tietsworth, Alvin M. Alternative health care machine. 4,628,909, Cl. 128-25.00R.
Tihanyi, Jeno , to Siemens Aktiengesellschaft. Vertical misfield effect transistor with low forward resistance. 4,630,084, Cl. 357-23.400.
TII Computer Systems, Inc.: *See—*
Walsworth, Richard L., 4,629,836, Cl. 379-12.000.
Tikhonov, Valentin N.; Zhigalov, Gennady V.; Abduganiev, Abdurakhim; and Dulnev, Vladimir K., to Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin. Twisting member of ringless spinning apparatus. 4,628,678, Cl. 57-400.000.
Tilley, Alvin R.: *See—*
Genaro, Donald M.; Johnson, Chris G.; and Tilley, Alvin R., 4,629,276, Cl. 339-103.00R.
Tiszai, Gyorgy: *See—*
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer, 4,628,999, Cl. 166-274.000.
Titze, Guenter: *See—*
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, 4,629,522, Cl. 156-48.000.
Tlaker, Erich; Erisman, Aaron; and Whitney, Donald, to Fellows Corporation. Disposable disk cutter. 4,629,377, Cl. 409-35.000.
TMC Corporation: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 4,629,208, Cl. 280-618.000.
Lorenz, Bettstein; Leichtfried, Friedrich; Szasz, Tibor; Wittmann, Heinz; and Stritzl, Karl, 4,629,209, Cl. 280-626.000.
Tobias, Samuel, to Hayward Industries, Inc. Pump test ring, cover and strainer and method of providing a pressure-testable pump. 4,629,557, Cl. 210-90.000.
Tobita, Kouji: *See—*
Matsuo, Masayoshi; Takagishi, Kazuhiro; Tobita, Kouji; and Kanemaru, Yukihiro, 4,629,043, Cl. 192-4.00A.
Todd-Davies, Christopher: *See—*
Ward, Arthur G. T.; and Todd-Davies, Christopher, 4,629,419, Cl. 432-13.000.
Toder, Ellis I. Intravenous container support. 4,629,074, Cl. 211-71.000.
Todokoro, Hideo; and Fukuhara, Satoru, to Hitachi, Ltd. Potential analyzer. 4,629,889, Cl. 250-310.000.
Toida, Shigeru: *See—*
Kimura, Shinjiro; and Toida, Shigeru, 4,628,756, Cl. 74-479.000.
Tokai Electric Wire Company Limited: *See—*
Nishikawa, Yasuo, 4,629,279, Cl. 339-210.00M.
Tokai Kogyo Kabushiki Kaisha: *See—*
Ito, Tosikazu, 4,629,595, Cl. 264-104.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See—*
Tajima, Ikuo, 4,628,843, Cl. 112-121.120.
Tokiguchi, Katsumi: *See—*
Sakudo, Noriyuki; Okada, Osami; Ozasa, Susumu; Tokiguchi, Katsumi; Koike, Hidemi; Taya, Shunroku; Komatsumoto, Mitsunori; and Komatsu, Mitsuo, 4,629,930, Cl. 313-359.100.
Tokita, Kiyoshi, to Kabushiki Kaisha Toshiba. Color picture tube having a shadow mask with a coaling layer. 4,629,932, Cl. 313-402.000.
Toko, Inc.: *See—*
Arakawa, Koji, 4,629,962, Cl. 320-2.000.
Toko Kabushiki Kaisha: *See—*
Takada, Noboru, 4,630,013, Cl. 334-12.000.

Tokyo Electric Power Co., Inc., The: *See—*
Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, 4,629,362, Cl. 405-146.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Hori, Nobuo; Yokokura, Takashi; and Ohtomo, Fumio, 4,628,612, Cl. 33-366.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fushiya, Mitsuji; Imanishi, Shoichi; and Shiga, Takeo, 4,629,823, Cl. 174-52.00R.
Kobayashi, Noboru; and Konishi, Satoshi, 4,630,241, Cl. 365-200.000.
Matsumoto, Mitsuo, 4,629,323, Cl. 356-365.000.
Mori, Issei, 4,630,202, Cl. 364-414.000.
Sagoi, Masayuki; and Nishikawa, Reiji, 4,629,660, Cl. 428-678.000.
Terashima, Kenji; Kimura, Yoshio; Asada, Masao; and Sugano, Satoshi, 4,629,582, Cl. 252-301.40P.
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,630,003, Cl. 331-99.000.
Ueshin, Akito, 4,629,382, Cl. 414-48.000.
Tolle, Karl-Heinz: *See—*
Brockhaus, Ernst; and Tolle, Karl-Heinz, 4,628,567, Cl. 16-267.000.
Tomala, Ambrose: *See—*
Buike, James W.; and Tomala, Ambrose, 4,629,024, Cl. 180-79.100.
Tomimori, Kiyoshi: *See—*
Hashimoto, Kiyoshi; Yamashita, Mitsuo; Tomimori, Kiyoshi; and Nakagawa, Shinji, 4,629,173, Cl. 271-65.000.
Tomita, Masao; Takeuchi, Akihiro; and Hashima, Akio, to Matsushita Electric Industrial Co., Ltd. Video disc reproducing apparatus. 4,630,251, Cl. 369-43.000.
Tomite, Tosio: *See—*
Tani, Tatsuhiro; Nagasawa, Hiroyuki; Kikuchi, Rokuro; Tomite, Tosio; and Kobayashi, Hidemitsu, 4,628,720, Cl. 72-368.000.
Tomlinson, Mark C.: *See—*
Beshke, James G.; and Tomlinson, Mark C., 4,629,384, Cl. 414-222.000.
Tomura, Shinya: *See—*
Hosoya, Masahiro; Uehara, Tsutomu; and Tomura, Shinya, 4,628,860, Cl. 118-649.000.
Tone, Shoichi; and Uchida, Hiroshi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for doffing in a spinning frame. 4,628,686, Cl. 57-274.000.
Tonoli, Leonardo. Method and installation for raising the water temperature in inland basins. 4,628,906, Cl. 126-452.000.
Topfl, Werner: *See—*
Kristinsson, Haukur; and Topfl, Werner, 4,629,802, Cl. 558-7.000.
Torgent, Douglas E.; and Mitchell, Robert N., to Kennametal Inc. Sprocket cutter and method of assembling. 4,629,370, Cl. 407-29.000.
Torii, Hideo: *See—*
Monji, Hideto; Aoki, Masaki; Torii, Hideo; and Okinaka, Hideyuki, 4,629,487, Cl. 65-26.000.
Torii, Sigeru; Tanaka, Hideo; Sasaoka, Michio; and Kameyama, Yutaka, to Otsuka Kagaku Kabushiki Kaisha. Process for preparing 3-exomethylenecepham derivatives. 4,629,542, Cl. 204-72.000.
Toriyama, Daigoro, to Tanabe Machinery Co., Ltd. Apparatus for folding rear portion of case blank. 4,629,445, Cl. 493-10.000.
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. FET oscillator exhibiting negative resistance due to high impedance at the source of an FET thereof. 4,630,003, Cl. 331-99.000.
Torok, Janos: *See—*
Kiss, Laszlo ; Dolleschall, Sandor; Nemeth, Ede; Torok, Janos; Tiszai, Gyorgy; and Balint, Valer, 4,628,999, Cl. 166-274.000.
Tosaka, Yoichi: *See—*
Haraguchi, Shosuke; and Tosaka, Yoichi, 4,629,301, Cl. 354-173.100.
Toshiba Kikai Kabushiki Kaisha: *See—*
Banzai, Hideo; Ikeda, Goh; and Omura, Nobukatsu, 4,629,954, Cl. 318-561.000.
Totani, Shinzo: *See—*
Noguchi, Takashi; and Totani, Shinzo, 4,630,056, Cl. 342-357.000.
Toto Ltd.: *See—*
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.
Towner, Geoffrey F.: *See—*
Towner, John E. T.; and Towner, Geoffrey F., 4,628,994, Cl. 166-68.000.
Towner, John E. T.; and Towner, Geoffrey F., to Texaust Australia Limited. Oil wells. 4,628,994, Cl. 166-68.000.
Townsend, Dennis B.: *See—*
Crowther, Russell L.; and Townsend, Dennis B., 4,629,599, Cl. 376-212.000.
Townsend, Greg M.; Henderson, James A., Jr.; Marten, Russell A.; and Scavezze, Daniel C., to Motorola, Inc. Time-division multiplex communications control system. 4,630,263, Cl. 370-85.000.
Toy, Wing N.; and Vaidya, Avinash K., to AT&T Bell Laboratories. Self-routing multipath packet switching network with sequential delivery of packets. 4,630,260, Cl. 370-60.000.
Toy, Wing N.: *See—*
Larson, Mikiel L.; Toy, Wing N.; and Vaidya, Avinash K., 4,630,259, Cl. 370-60.000.
Toyo Jozo Kabushiki Kaisha: *See—*
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,629,793, Cl. 548-154.000.
Toyoda Gosei Co., Ltd.: *See—*
Niwa, Minoru, 4,628,761, Cl. 74-552.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Yoshimi, Takani; Michisita, Ryoichi; and Sasaki, Hitoshi, 4,628,586, Cl. 29-568.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Buma, Shuuichi, 4,629,168, Cl. 267-35.000.
Ikemoto, Kazuhito; and Terakura, Yukio, 4,628,751, Cl. 74-339.000.
Itoh, Hiroshi; Hiramatsu, Shigeki; Takada, Mitsuru; and Tamura, Tadashi, 4,628,773, Cl. 74-867.000.
Okada, Hachiro; and Ono, Kenzi, 4,628,637, Cl. 49-374.000.
Onishi, Akito, 4,628,886, Cl. 123-491.000.
Shigenobu, Hiromichi, 4,629,027, Cl. 180-176.000.
Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, 4,630,179, Cl. 362-66.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Saito, Takao; and Moriyama, Masakazu, 4,630,209, Cl. 364-444.000.
Toyota Jidosha Kubushiki Kaisha: *See—*
Yamashita, Kouichi; Ishiguro, Toshiaki; and Morisawa, Kunio, 4,628,952, Cl. 137-54.000.
Traister, Martin S.: *See—*
Harris, Foster R.; and Traister, Martin S., 4,629,379, Cl. 410-77.000.
Tran-Saver, Inc.: *See—*
Re, Ronale, 4,628,775, Cl. 74-863.000.
Transducer Systems, Inc.: *See—*
Kieslich, Walter G., 4,629,982, Cl. 324-208.000.
Translogic Corporation: *See—*
Tyler, Tommy N.; and Harvey, John W., 4,630,216, Cl. 364-478.000.
Traynor, Lee, to B. F. Goodrich Company, The. Electrically conductive pyrrole polymers and process of preparing the same. 4,629,798, Cl. 548-562.000.
Treybig, Duane S., to Dow Chemical Company, The. Thermosettable polystyrylpyrazine polymers terminated with ethylenically unsaturated groups and cured products therefrom. 4,629,770, Cl. 525-517.000.
Tri-Tech Systems International, Inc.: *See—*
Thompson, Mortimer S., 4,629,598, Cl. 264-537.000.
Trilogy Computer Development Partners, Ltd.: *See—*
Hsiao, Wen-Ting; and Everling, Hubertus A., 4,628,991, Cl. 165-80.400.
Trinks, Hilmar; Peter, Gunter; Eichler, Volker; and Buesse, Winfried, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Method of and arrangement for automatic adjustment of the operating mode of a switchable printing machine. 4,628,817, Cl. 101-426.000.
Tromel, Richard H.: *See—*
Waggoner, Terrence C.; Simmons, James A.; Perry, Marvin K.; and Tromel, Richard H., 4,629,834, Cl. 381-68.200.
Trotman, Steven: *See—*
Draper, Colin P.; Trotman, Steven; Bowden, Christopher M.; and Turfrey, Keith A., 4,629,048, Cl. 192-70.270.
Trubiano, Antoine, to Cari-All Inc. Collapsible and stackable material handling container. 4,629,086, Cl. 220-7.000.
Truckner, William G.: *See—*
Lifka, Bernard W.; Truckner, William G.; and Rogers, Ralph W., Jr., 4,629,517, Cl. 148-12.70A.
Trumbull, Donald; Erland, Jonathan; Fog, Stephen; and Burke, Paul, to Apogee, Inc. Flux projector for use with composite photography. 4,629,298, Cl. 353-30.000.
TRW Inc.: *See—*
Tseng, Chong-Wei, 4,630,254, Cl. 370-1.000.
TRW Probe Electronics Co. Ltd: *See—*
Barnett, John D., 4,628,583, Cl. 29-525.000.
TRW Repa Feinstanzwerk: *See—*
Fohl, Artur, 4,629,214, Cl. 280-808.000.
Tsai, Mei-Yuan: *See—*
Jacoby, John E.; Laemmle, Joseph T.; and Tsai, Mei-Yuan, 4,628,985, Cl. 164-72.000.
Tseng, Chong-Wei, to TRW Inc. Controlled star network. 4,630,254, Cl. 370-1.000.
Tseng, Eric S.: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Lo, Dennis S., 4,629,820, Cl. 136-255.000.
Tsintavis, Constantin: *See—*
Geniees, Eugene; Pierre, Gerard; Santier, Christian; and Tsintavis, Constantin, 4,629,540, Cl. 204-59.00R.
Tsuchihashi, Hiroshi: *See—*
Satoh, Yasuta; Tsuchihashi, Hiroshi; and Tani, Saburo, 4,629,409, Cl. 425-139.000.
Tsuchihashi, Michihiro: *See—*
Saito, Masato; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,629,929, Cl. 313-25.000.
Tsuchiya, Yuji; and Ando, Hiroshi, to Japan Oxygen Co., Ltd. Remote-control apparatus for opening or closing the valve of containers or the like. 4,629,157, Cl. 251-96.000.
Tsukamoto, Shin-ichi; Nagano, Yoshinobu; and Katsuda, Kimio, to Yamanouchi Pharmaceutical Co., Ltd. Fatty acid derivatives and process of producing them. 4,629,736, Cl. 514-563.000.
Tsukamoto, Teisuke: *See—*
Kato, Shoichi; and Tsukamoto, Teisuke, 4,629,031, Cl. 181-204.000.
Tsukano, Moriyoshi; and Ishizu, Hisao, to Ricoh Company, Ltd. Developer supply system for dry process electrophotographic recording apparatus. 4,629,309, Cl. 355-3.0DD.
Tsukiji, Kensuke, to Honda Giken Kogyo Kabushiki Kaisha. Locking structure of a seat to a fuel tank in a straddle type vehicle. 4,629,201, Cl. 280-5.00A.

Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, to Hitachi, Ltd. Liquid fuel cell. 4,629,664, Cl. 429-23.000.

Tsunekawa, Takahiko: *See—*
Morita, Takayuki; Tanaka, Akira; Tsunekawa, Takahiko; and Amano, Hisao, 4,628,684, Cl. 57-263.000.

Tsunekawa, Tokuichi: *See—*
Sato, Yuichi; Tsunekawa, Tokuichi; Kawabata, Takashi; and Matsumura, Susumu, 4,629,877, Cl. 250-201.000.

Tsunemine, Toyohiko: *See—*
Miyai, Kiyoshi; Uotani, Shuhei; and Tsunemine, Toyohiko, 4,629,307, Cl. 355-3.00R.

Tullos, Melvin L., to Port of Houston Authority. Railroad hopper car door opener. 4,629,386, Cl. 414-376.000.

Turco, Inc.: *See—*
Baynes, William R., 4,628,896, Cl. 126-25.00R.

Turfrey, Keith A.: *See—*
Draper, Colin R.; Trotman, Steven; Bowden, Christopher M.; and Turfrey, Keith A., 4,629,048, Cl. 192-70.270.

Turner, Nicholas J.; Ogden, Geoffrey A.; and Bridge, Richard S., to Magnavac Air Systems Limited. Friction spinning. 4,628,677, Cl. 57-301.000.

Tyler, Tommy N.; and Harvey, John W., to Translogic Corporation. Method and apparatus for controlling and monitoring movement of material-transporting carriages. 4,630,216, Cl. 364-478.000.

Uchida, Hiroshi: *See—*
Tone, Shoichi; and Uchida, Hiroshi, 4,628,686, Cl. 57-274.000.

Uchida, Hiroyuki; and Nakauchi, Jun, to Mitsubishi Rayon Company Ltd. Tetrazole compound-containing photopolymerizable resin composition. 4,629,679, Cl. 430-281.000.

Uchida, Ken: *See—*
Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, 4,630,086, Cl. 357-23.500.

Uchiumi, Kyotake: *See—*
Sato, Nobuyuki; Uchiumi, Kyotake; Nabetani, Shinji; and Uchida, Ken, 4,630,086, Cl. 357-23.500.

Uchiyama, Toshiyuki; Sugawara, Takeo; Okuyama, Chiyoshi; and Mizushima, Yoshihiko, to Hamamatsu Photonics Kabushiki Kaisha. Process of how to fabricate the microchannel plate. 4,629,486, Cl. 65-3.150.

Uda, Shinzo: *See—*
Imagire, Yoshiyuki; Hirabayashi, Teruhiko; Nonaka, Nobuo; Kitagawa, Toshifumi; Murakami, Yasukazu; Abe, Iwao; Uda, Shinzo; Ohshima, Osamu; and Takemoto, Etsuo, 4,629,606, Cl. 423-53.000.

Udo, Shinji; and Tazunoki, Masanori, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Method of manufacture of a semiconductor device. 4,628,590, Cl. 29-575.000.

Ueda, Akiteru: *See—*
Inaba, Hiromi; Nakashima, Hajime; Kiwaki, Hisakatsu; Ueda, Akiteru; Ando, Takeki; Kurosawa, Toshiaki; and Sakai, Yoshio, 4,629,034, Cl. 187-29.00R.

Ueda, Sadatoshi: *See—*
Shirai, Mitugu; Sasaki, Hideaki; Ueda, Sadatoshi; and Sawada, Akira, 4,628,616, Cl. 34-78.000.

Ueda, Toshitsugu; Kohsaka, Fusao; and Sugihara, Yoshinobu, to Yokogawa Hokushin Electric Corporation. Pressure sensor. 4,628,740, Cl. 73-705.000.

Uehara, Tsutomu: *See—*
Hosoya, Masahiro; Uehara, Tsutomu; and Tomura, Shinya, 4,628,860, Cl. 118-649.000.

Uematsu, Hiroaki; Kohno, Takeshi; and Miyazaki, Takeshi, to Horibe, Ltd. Method for producing a response membrane for use in a chloride ion selective electrode. 4,629,744, Cl. 521-62.000.

Uemura, Saburo, to Macome Corporation. Verifying device for a key card. 4,629,875, Cl. 235-450.000.

Ueno, Katsunobu; and Hataishi, Osamu, to Fujitsu Limited. Method of forming shallow n-type region with arsenic or antimony and phosphorus. 4,629,520, Cl. 148-188.000.

Ueno, Katsuo: *See—*
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,222, Cl. 285-332.400.
Dearden, Geoffrey C.; Speare, Edward J.; Ueno, Katsuo; and Jones, Donald N., 4,629,223, Cl. 285-334.000.

Ueno, Tutomu, to Hokkaido Electric Power Co., Inc., The. Process for preparing desulfurizing and denitrating agents. 4,629,721, Cl. 502-411.000.

Ueshin, Akito, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet collecting apparatus. 4,629,382, Cl. 414-48.000.

Uffenheimer, Kenneth F., to Technicon Instruments Corporation. Automated analytical system. 4,629,703, Cl. 436-45.000.

Ullman, Edwin F.: *See—*
Weng, Litai; Gibbons, Ian; and Ullman, Edwin F., 4,629,690, Cl. 435-7.000.

Ulrich, Klaus; Janssen, Wilhelm; Neuschuetz, Dieter; Hoster, Thomas; Doerr, Hermann; and Radke, Dietrich, to Fried. Krupp Gesellschaft mit beschraenkter Haftung. Process for the production of ferrochromium. 4,629,506, Cl. 75-10.630.

Umebayashi, Kazuyuki, to Aisin Seiki Kabushikikaisha. Signal transmission apparatus for steering operation board. 4,629,828, Cl. 379-56.000.

Umeda, Tatsutoshi: *See—*
Nakano, Keiichi; Tani, Yoshio; and Umeda, Tatsutoshi, 4,628,878, Cl. 123-196.00R.

Umemoto, Hiroshi: *See—*
Kato, Shinichi; Saito, Yoji; and Umemoto, Hiroshi, 4,629,351, Cl. 403-27.000.

Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner; and Jordan, Alfons, 4,629,028, Cl. 180-259.000.

Union Carbide Corporation: *See—*
Cleveland, Thomas C.; Deitzler, James E.; Doumaux, Arthur R., Jr.; Henry, Joseph P.; Hurt, John M.; Kapicak, Louis A.; and Ream, Bernard C., 4,629,806, Cl. 560-204.000.
Koleske, Joseph V., 4,629,779, Cl. 528-408.000.
Raines, Russell H., 4,629,573, Cl. 252-8.510.

Union Oil Company of California: *See—*
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., 4,629,580, Cl. 252-49.600.
Jessup, Peter J.; Holstedt, Richard A.; and Baron, Kenneth, 4,629,579, Cl. 252-33.600.

Union Sils, Van de Loo & Co. GmbH: *See—*
Konzorr, Hubert, 4,628,763, Cl. 74-594.600.

Uniroyal Plastics Company, Inc.: *See—*
McCracken, Wendell J.; and Schmidt, Roger C., 4,629,585, Cl. 252-511.000.

Unit Rig & Equipment Co.: *See—*
Modglin, Rodger L.; Borthick, W. Ray; and Roberts, Timothy W., 4,629,211, Cl. 280-688.000.

United Kingdom Atomic Energy Authority: *See—*
Dearnaley, Geoffrey, 4,629,631, Cl. 427-38.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Carmichael, Ian C.; Wilson, David J.; and Dean, Anthony B., 4,629,892, Cl. 250-353.000.

United States Brass Corporation: *See—*
Pezzarossi, John J., 4,628,962, Cl. 137-625.470.

United States Manufacturing Co.: *See—*
Lerman, Max, 4,628,913, Cl. 128-78.000.
Lerman, Max; and Bonessa, Vick G., 4,628,916, Cl. 128-80.00C.

United States of America
Agriculture: *See—*
Harper, Robert J., Jr., 4,629,470, Cl. 8-585.000.
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,629,079, Cl. 212-98.000.
Air Force: *See—*
Fogler, Robert J., 4,630,246, Cl. 367-135.000.
Fritts, David H.; and Leonard, John F., 4,628,593, Cl. 29-623.100.
Harris, Foster R.; and Traister, Martin S., 4,629,379, Cl. 410-77.000.
Horine, Graham A., 4,629,297, Cl. 350-632.000.
Niehenke, Edward C.; and Green, Patrick A., 4,630,004, Cl. 331-107.0SL.
Taylor, Edward, 4,628,598, Cl. 29-846.000.
Yarman, Binboga S., 4,630,010, Cl. 333-139.000.
Army: *See—*
Green, Augustus H., Jr.; and Rast, Gustaf J., Jr., 4,630,053, Cl. 342-376.000.
Madderra, Jimmy M.; and Williams, James G., 4,628,821, Cl. 102-517.000.
Pollard, John H., 4,629,322, Cl. 356-300.000.
Sayles, Francis H.; Black, William T.; and Ellis, Earl P., 4,629,364, Cl. 405-157.000.
Energy: *See—*
Berdahl, Paul H., 4,628,695, Cl. 62-3.000.
National Aeronautics and Space Administration: *See—*
Johnson, Joseph L., Jr.; and White, E. Richard, 4,629,147, Cl. 244-55.000.
National Security Agency: *See—*
Dyer, James W.; and Watkins, Raymond R., 4,630,285, Cl. 375-37.000.
Navy: *See—*
Backofen, Joseph E., Jr.; Petrousky, James A.; Butz, Donald J.; Holmes, David W.; Faccini, Ernest C.; and McCree, Arleigh E., 4,628,819, Cl. 102-307.000.
Balsa, Thomas F., 4,629,922, Cl. 310-178.000.
Callahan, Patrick O., Jr., 4,630,048, Cl. 342-45.000.
Callahan, Patrick O., Jr., 4,630,049, Cl. 342-45.000.
Fiorito, Ralph; and Raleigh, Michael, 4,629,975, Cl. 324-71.300.
Kang, George S.; Everett, Stephanie S.; and Thornhill, Alexander F., 4,630,300, Cl. 381-31.000.
Keirsey, James L., 4,628,688, Cl. 60-251.000.
Neidert, Robert E.; and Krowne, Clifford M., 4,630,011, Cl. 333-164.000.
Sollman, Larry C., 4,630,224, Cl. 364-550.000.
Springston, Preston S.; and Claxton, Richard L., 4,629,358, Cl. 404-35.000.

U.S. Philips Corporation: *See—*
Bertram, Leo; Schemmann, Hugo; and Bukoschek, Romuald, 4,628,607, Cl. 30-43.920.
Bijma, Jan; and Gerritsen, Jan, 4,629,933, Cl. 313-414.000.
Braat, Josephus J. M.; and Carasso, Marino G., 4,630,249, Cl. 369-13.000.
Deutsch, Armin; and Ruyten, Henricus, 4,630,148, Cl. 360-93.000.
Dewey, Richard J., 4,630,062, Cl. 343-786.000.
Fairbend, Raymond J.; Holmshaw, Richard T.; and Petley, Colin H., 4,629,881, Cl. 250-213.0VT.
Gawron, Klaus; Jonker, Simon; Schroder, Johann; and De Weerdt, Henk V., 4,630,023, Cl. 337-407.000.
Haaker, Paul; Klotz, Erhard; Koppe, Reiner; Linde, Rolf; and Moller, Holger, 4,630,296, Cl. 378-2.000.
Lelong, Pierre H., 4,629,894, Cl. 250-363.00R.

Lersmacher, Bernhard; and Knippenberg, Wilhelmus F., 4,629,320, Cl. 356-244.000.
Roddeman, Gerardus J. H.; and Hoogerkamp, Paul, 4,629,177, Cl. 271-240.000.
Streit, Peter, 4,629,289, Cl. 350-336.000.
Thoone, Martinus L. G., 4,628,729, Cl. 73-178.00R.
van Oirschot, Theodorus G. J., 4,629,519, Cl. 148-171.000.
Voorman, Johannes O., 4,629,973, Cl. 323-316.000.
Watkinson, Stephen W., 4,630,315, Cl. 455-109.000.
White, Philip D., 4,630,257, Cl. 370-29.000.

United States Steel Corporation: *See—*
Symsek, Dale R.; and Regelin, Nancy P., 4,628,869, Cl. 122-20.00B.

United Technologies Corporation: *See—*
Matuska, David G., 4,629,644, Cl. 428-137.000.

Universal Industrial Products Co. (Div. of Core Industries, Inc.): *See—*
Marko, Neil L.; and Mitton, Bruce W., 4,629,228, Cl. 292-165.000.

Universal Ramps Limited: *See—*
Kushniryk, Delvin J., 4,628,561, Cl. 14-69.500.

University College London: *See—*
Dewar, Michael E., 4,628,922, Cl. 128-92.00Z.

University of Georgia Research Foundation, Inc., The: *See—*
Stammer, Charles H., 4,629,784, Cl. 530-328.000.

University of Iowa Research Foundation: *See—*
Barfknecht, Charles F.; and Schoenwald, Ronald D., 4,629,738, Cl. 514-603.000.

University of Rochester, The: *See—*
Bouvier, Marcel A.; and Bado, Philippe, 4,629,993, Cl. 328-67.000.

University of Sydney: *See—*
Mills, David R., 4,628,905, Cl. 126-443.000.

UOP Inc.: *See—*
Antos, George J.; and Wang, Li, 4,629,551, Cl. 208-139.000.
Chao, Tai-Hsiang, 4,629,717, Cl. 502-208.000.

Uotani, Shuhei: *See—*
Miyai, Kiyoshi; Uotani, Shuhei; and Tsunemine, Toyohiko, 4,629,307, Cl. 355-3.00R.

Upton, Eric L., to Motorola, Inc. Pulse-width discriminating A/D converter. 4,630,031, Cl. 340-347.0AD.

Ura, Yasukazu; Sakata, Gozyo; Makino, Kenzi; Kawamura, Yasuo; Kawamura, Yuzi; Ikai, Takasi; and Oguti, Tosihiko, to Nissan Chemical Industries Ltd. Heterocyclic ether type phenoxy fatty acid derivatives and herbicidal composition. 4,629,493, Cl. 71-92.000.

Urban, Peter: *See—*
O'Hara, Mark J.; and Urban, Peter, 4,629,509, Cl. 106-118.000.

Urdan Industries Ltd.: *See—*
Kataczynski, Nachman, 4,629,154, Cl. 248-610.000.

Urgo, Donald F.: *See—*
Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., 4,628,599, Cl. 29-857.000.

Uriuhara, Makoto: *See—*
Kasai, Hitoshi; Ogawa, Noriaki; Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,629,045, Cl. 192-0.052.

Urma AG: *See—*
Berner, Willy, 4,629,374, Cl. 408-186.000.

URW Unternehmensberatung Karow Rubow Weber GmbH: *See—*
Karow, Peter, 4,630,309, Cl. 382-56.000.

USM Corporation: *See—*
Mauer, Dieter; and Potzas, Peter, 4,628,722, Cl. 72-391.000.

Utsugi, Mikio; and Fukuda, Masahiro, to Fuji Photo Film Co., Ltd. Control apparatus for controlling recording of a scene for use in image recording system. 4,630,138, Cl. 360-33.100.

Uyeda, Tim M.; and Gartner, Klaus W., to La Gard, Inc. Tumbler wheel assembly shield for combination locks. 4,628,715, Cl. 70-333.00R.

Uyeo, Shoichiro, to Shionogi & Co., Ltd. Penem carboxylic acids. 4,629,726, Cl. 514-195.000.

V. G. C. Corporation: *See—*
Glass, James W., 4,628,871, Cl. 123-25.00B.

Vaidya, Avinash K.: *See—*
Larson, Mikiel L.; Toy, Wing N.; and Vaidya, Avinash K., 4,630,259, Cl. 370-60.000.
Toy, Wing N.; and Vaidya, Avinash K., 4,630,260, Cl. 370-60.000.

Valentine, Donald H., Jr.: *See—*
Grate, John H.; Hamm, David R.; and Valentine, Donald H., Jr., 4,629,804, Cl. 560-24.000.

Valeo: *See—*
Lassiaz, Philippe, 4,629,049, Cl. 192-98.000.
Valier, Carlo, 4,629,050, Cl. 192-113.00B.

Valier, Carlo, to Valeo. Multidisk clutch featuring improved lubrication and cooling. 4,629,050, Cl. 192-113.00B.

Vallance, Leslie, to Burroughs Corporation. Demountable two-part reel. 4,629,136, Cl. 242-71.800.

Vallone, Lee A.: *See—*
Carson, Robert A.; Petrick, Mary S.; Vallone, Lee A.; and Walker, John D., 4,629,832, Cl. 340-825.070.

Valmet Oy: *See—*
Makinen, Veikko, 4,628,732, Cl. 73-432.100.
Virta, Raimo; and Salmivaara, Martti, 4,628,618, Cl. 34-116.000.

Van Camp, James L. Electrical cable connector assembly. 4,629,273, Cl. 339-94.00M.

Van Der Ploeg, Arie, to Texas Instruments Incorporated. Device to preheat a fuel mixture. 4,628,889, Cl. 123-549.000.

Vanderpool, Steven H.; Lin, Jiang-Jen; and Duranleau, Roger G., to Texaco Inc. Process for selectively preparing acetic acid by carbonylation of methanol in the presence of a novel iodide-free catalyst system. 4,629,809, Cl. 562-519.000.

Vanderpyl, David C.; and Rogler, Albert C., to Mossberg Industries, Inc. Cabling machine. 4,628,681, Cl. 57-59.000.

van der Wal, Willem J. J.; and Geus, John W., to VEG-Gasinstituut N.V. Reaction mass, method for the manufacture thereof and use thereof. 4,629,612, Cl. 423-244.000.

Vanderzanden, Eugene J., to Chevron Research Company. High float and rapid setting anionic bituminous emulsions. 4,629,511, Cl. 106-277.000.

Vande Walle, Donald R., Jr.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.

Van Dort, Mark A.: *See—*
Friese, David D.; and Van Dort, Mark A., 4,629,610, Cl. 423-240.000.

van Gooswilligen, Gerrit: *See—*
Syrier, Johannes L. M.; Vonk, Willem C.; and van Gooswilligen, Gerrit, 4,629,754, Cl. 524-394.000.

Van Herpe, Francois: *See—*
De Busscher, Cyriel R. J.; and Van Herpe, Francois, 4,628,946, Cl. 130-27.00R.

Van Kanegan, Eugene M., to Rockwell International Corporation. Reversible lockup system for magnetically securable printing plates. 4,628,815, Cl. 101-415.100.

van Oirschot, Theodorus G. J., to U.S. Philips Corporation. Forming magnesium-doped Group III–V semiconductor layers by liquid phase epitaxy. 4,629,519, Cl. 148-171.000.

van Rooij, Jacobus H. M., to Varicar B. V. Device for determining the torque transmitted between a set of conical disks of a continuously variable transmission and the shaft thereof. 4,628,746, Cl. 73-862.340.

Van Slooten, Kevin D. Hair cutting appliance. 4,628,601, Cl. 30-133.000.

Van Wingerden, Arie. Special locking clip with apparatus for carrying plural plants to a watering station. 4,628,631, Cl. 47-17.000.

Vapor Corporation: *See—*
Wollner, Karl E., 4,628,835, Cl. 110-238.000.

Varian Associates, Inc.: *See—*
Helmer, John C., 4,629,548, Cl. 204-298.000.
Whitham, Kenneth, 4,629,938, Cl. 315-5.410.

Varicar B. V.: *See—*
van Rooij, Jacobus H. M., 4,628,746, Cl. 73-862.340.

Varnelis, Edmund K.: *See—*
Siewert, Robert L.; and Varnelis, Edmund K., 4,629,350, Cl. 403-11.000.

Vasella, Marco, to Kothenberger GmbH & Co. Werkzeuge-Maschinen KG. Apparatus for refilling compressed-gas bottles. 4,628,970, Cl. 141-18.000.

Vaughan, Thomas J. Transition between rectangular and relatively large circular waveguide for a UHF broadcast antenna. 4,630,316, Cl. 455-129.000.

Veb Kombinant Polygraph "Werner Lamberz" Leipzig: *See—*
Hank, Dietrich; Hauer, Kerstin; and Richter, Friedrich, 4,629,902, Cl. 250-559.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Trinks, Hilmar; Peter, Gunter; Eichler, Volker; and Buesse, Winfried, 4,628,817, Cl. 101-426.000.

VEB Kombinat Textima: *See—*
Marx, Karl; Offermann, Peter; Reumann, Ralf-Dieter; Magel, Matthias; Frenzel, Bertram; and Grenzendorfer, Dietmar, 4,628,571, Cl. 19-304.000.

VEB Schwermaschinen-Bau Kombinat Ernst Thalmann: *See—*
Knauschner, Alfred; Hensel, Arno; and Dobrindt, Alfons, 4,628,718, Cl. 72-199.000.

Veba Oel Entwicklungs-Gesellschaft mbH: *See—*
Dohler, Werner; Jankowski, Alfons; and Fehrer, Albert, 4,629,550, Cl. 208-134.000.

Vecone Development Corporation: *See—*
Roberts, Charles G.; and Hynds, Philip E., 4,628,956, Cl. 137-404.000.

VEG-Gasinstituut N.V.: *See—*
van der Wal, Willem J. J.; and Geus, John W., 4,629,612, Cl. 423-244.000.

VEGLA, Vereinigte Glaswerke GmbH: *See—*
Wefels, Peter, 4,628,652, Cl. 52-306.000.

Veltman, Preston L., to A/S Niro Atomizer. Process for producing finely divided limestone. 4,629,130, Cl. 241-16.000.

Venus, Willem, to Swiss Aluminium Ltd. Sidewall insulation of a chamber type furnace for baking carbon blocks. 4,629,423, Cl. 432-247.000.

Verheyden, Gerardus M. C. Process and installation for the heat treatment of cylindrical bodies, especially pipes. 4,628,615, Cl. 34-24.000.

Vermarien, Ludovicus E., to AGFA-Gevaert N.V. Photographic processing apparatus. 4,629,303, Cl. 354-320.000.

Vernay Laboratories, Inc.: *See—*
Ford, John R., 4,630,036, Cl. 340-622.000.

Vetter Products, Inc.: *See—*
Jones, William L., 4,629,040, Cl. 190-102.000.

VFW GmbH: *See—*
Malek, Samir; and Hofer, Bernd, 4,629,318, Cl. 356-237.000.

Victor Company of Japan, Limited: *See—*
Fujiwara, Nobuo, 4,629,998, Cl. 330-304.000.
Hirata, Atsumi; Shichijo, Shunichi; Machida, Toyotaka; Kaneko, Kenji; and Shinyagaito, Tatsuya, 4,630,231, Cl. 364-900.000.

Ichinoi, Yutaka; Nishimoto, Naomichi; and Ota, Yoshihiko, 4,630,131, Cl. 358-310.000.
Nakagaki, Shintaro; and Kuriyama, Takashi, 4,630,104, Cl. 358-36.000.
Ogawa, Yukio; and Matsumura, Koji, 4,630,136, Cl. 360-10.300.
Sato, Fumiaki, 4,630,135, Cl. 360-10.200.
Suzuki, Tomohiro, 4,630,118, Cl. 358-195.100.
Takanashi, Itsuo; Nakagaki, Shintaro; and Kuriyama, Takashi, 4,630,107, Cl. 358-47.000.

Victory Engineering Corp.: *See—*
Winters, Arthur; and Molee, Casper S., 4,629,451, Cl. 604-175.000.

Viggo AB: *See—*
Wahlberg, Harry U.; and Csiki, Kalman, 4,629,452, Cl. 604-177.000.

Vilesova, Marina S.: *See—*
Bespalov, Anatoly A.; Khuramshin, Talgat Z.; Bespalov, Nikolai A.; Efimov, Andrei N.; Vilesova, Marina S.; Gendlin, Lev E.; Lukhovitsky, Vladimir I.; and Polikarpov, Vladimir V., 4,629,633, Cl. 427-154.000.

Vilmur, Richard J.: *See—*
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,630,304, Cl. 381-94.000.
Borth, David E.; Gerson, Ira A.; Smanski, Philip J.; and Vilmur, Richard J., 4,630,305, Cl. 381-94.000.
Puhl, Larry C.; and Vilmur, Richard J., 4,629,829, Cl. 379-58.000.

Vinson, Paul: *See—*
Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., 4,628,599, Cl. 29-857.000.

Virgilio, Ange: *See—*
Delessard, Serge L.; Puff, Roger M.; Kita, Jean C.; and Virgilio, Ange, 4,628,831, Cl. 110-245.000.

Virta, Raimo; and Salmivaara, Martti, to Valmet OY. Apparatus in a drying section of a paper machine. 4,628,618, Cl. 34-116.000.

Viselli, Michael A., to AMP Incorporated. Electrical device, such as an electrical connector receptacle, for surface mounting on a circuit board. 4,629,266, Cl. 339-17.0LC.

Vittore, Phillip J.: *See—*
Harrington, Horrall; and Vittore, Phillip J., 4,629,592, Cl. 264-32.000.

Vives, Michel, to Societe Europeenne de Propulsion. Method for the production of a multi-directional fibrous structure and device for carrying out said method. 4,628,846, Cl. 112-262.100.

Vivian, Daniel D.: *See—*
Mugford, Donald A.; and Vivian, Daniel D., 4,630,178, Cl. 362-64.000.

Vivitar Corporation: *See—*
Moskovich, Jacob, 4,629,291, Cl. 350-427.000.

VLSI Technology Research Association: *See—*
Otsuka, Kanji; Sahara, Kunizou; Sekibata, Masao; Mitsusada, Kazumichi; and Ogiue, Katsumi, 4,630,095, Cl. 357-78.000.

Vock, Manfred H.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,629,586, Cl. 252-522.00R.

Voelkel, Theodor: *See—*
Nuesslein, Hans; Puchta, Rolf; and Voelkel, Theodor, 4,629,574, Cl. 252-8.800.

Voest-Alpine Aktiengesellschaft: *See—*
Janusch, Alois; Mayer, Franz W.; and Tessmer, Gero, 4,628,619, Cl. 34-180.000.

Vogel, Hans-Gunter; Muller, Kurt; and Gnewikow, Karl, to Rutgerswerke Aktiengesellschaft. Adhesive applicator. 4,629,094, Cl. 222-82.000.

Vogl, Georg, to Simrad Optronics A/S. Night vision instrument with electronic image converter. 4,629,295, Cl. 350-503.000.

Vogts, Arnold: *See—*
Klebl, Wolfram; Marx, Karl-Heinz; Vogts, Arnold; Schatz, Friedrich; and Titze, Guenter, 4,629,522, Cl. 156-48.000.

Voigt, Karl; Reck, Reinhold; Bittner, Friedrich; and Kleinschmit, Peter, to Degussa AG. Method for the preparation of hydrogen sulfide. 4,629,617, Cl. 423-563.000.

von Conta, Peter E. W., to Hearthstone Corporation. Secondary combustion system for wood burning stove. 4,628,898, Cl. 126-58.000.

von Gentzkow, Wolfgang, to Siemens Aktiengesellschaft. Method for producing N,N'-bis-salicyloyl hydrazine. 4,629,812, Cl. 564-134.000.

Vonk, Willem C.: *See—*
Syrier, Johannes L. M.; Vonk, Willem C.; and van Gooswilligen, Gerrit, 4,629,754, Cl. 524-394.000.

Von Kohorn, David: *See—*
Von Kohorn, Henry; and Von Kohorn, David, 4,630,177, Cl. 362-32.000.

Von Kohorn, Henry; and Von Kohorn, David. Light-conductive device for illuminating centripetally viewed three-dimensional objects. 4,630,177, Cl. 362-32.000.

Voorheis Industries, Inc.: *See—*
Voorheis, James T., 4,629,416, Cl. 431-352.000.

Voorheis, James T., to Voorheis Industries, Inc. Bluff body register. 4,629,416, Cl. 431-352.000.

Voorman, Johannes O., to U.S. Philips Corporation. Current stabilizing circuit operable at low power supply voltages. 4,629,973, Cl. 323-316.000.

Vosper, Ralph R., to Coen Company, Inc. Dual fuel pilot burner for a furnace. 4,628,832, Cl. 110-261.000.

Voss, Richard J., to General Motors Corporation. Generator voltage regulator. 4,629,967, Cl. 322-28.000.

Voth, Elmer D.: *See—*
Mullet, David L.; and Voth, Elmer D., 4,629,006, Cl. 172-15.000.

Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institute Meditsinskoi Tekhniki: *See—*
Fedotov, Vladimir M.; Kharchenko, Vladimir P.; Lipovsky, Iosif L.; and Ivanova, Tatyana L., 4,629,107, Cl. 227-19.000.

Vuarier, Dominique: *See—*
Boussemart, Jean-Pierre; and Vuarier, Dominique, 4,629,210, Cl. 280-634.000.

W. R. Grace & Co.: *See—*
Salihar, Mark W.; Engstrom, Gary G.; and Gauwitz, Donald P., 4,629,603, Cl. 422-9.000.
Welsh, William A.; and Parent, Yves O., 4,629,588, Cl. 260-428.000.

Waagner-Biro AG: *See—*
Hell, Walter; and Hillinger, Bruno, 4,629,565, Cl. 210-607.000.

Wacker Corporation: *See—*
Sengupta, Amitava, 4,629,359, Cl. 404-112.000.

Wada, Fumio: *See—*
Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; and Asami, Kazutomo, 4,628,963, Cl. 137-857.000.

Waddell, George M.; and Hall, Dennis, to Burroughs Corporation. Document conveyor system. 4,629,178, Cl. 271-251.000.

Waddill, Harold G.; and Speranza, George P., to Texaco Inc. 4,4,6-trimethylhexahydropyrimidine as an epoxy curing agent. 4,629,769, Cl. 525-504.000.

Wagers, Robert S., to Texas Instruments Incorporated. Optical spatial address system suitable for flat panel displays and the like. 4,629,288, Cl. 350-171.000.

Waggoner, Terrence C.; Simmons, James A.; Perry, Marvin K.; and Tromel, Richard H., to Bio-Dynamics Research & Development Corporation. Apparatus and method for vibratory signal detection. 4,629,834, Cl. 381-68.200.

Wah, Benjamin W.; and Juang, Jie-Young. Efficient contention-resolution protocol for local multiaccess networks. 4,630,264, Cl. 370-85.000.

Wahlberg, Harry U.; and Csiki, Kalman, to Viggo AB. Arrangement in a catheter unit with attachment wings, for infusion cannulas. 4,629,452, Cl. 604-177.000.

Wakabayashi, Shigeru: *See—*
Kondo, Yoshihito; Wakabayashi, Shigeru; Iwano, Fumiyuki; and Yoshida, Kiyomi, 4,628,670, Cl. 53-551.000.

Wakabayashi, Shoichi: *See—*
Takata, Susumu; Wakabayashi, Shoichi; Noma, Hiroyasu; and Wakatsuki, Tatsuya, 4,629,464, Cl. 623-16.000.

Wakatsuki, Tatsuya: *See—*
Takata, Susumu; Wakabayashi, Shoichi; Noma, Hiroyasu; and Wakatsuki, Tatsuya, 4,629,464, Cl. 623-16.000.

Wakeman, Thomas G.: *See—*
Kelm, James S.; Ludwig, Arthur L.; Maclin, Harvey M.; Roggenkamp, Steven K.; and Wakeman, Thomas G., 4,628,694, Cl. 60-752.000.

Wakisaka, Yukinori; and Miyano, Toshiyuki, to Kabushiki Kaisha Toshiba. Paper sheet collecting apparatus. 4,629,174, Cl. 271-186.000.

Waldenrath, Werner; Weber, Hans-Leo; and Claussen, Uwe, to Bayer Aktiengesellschaft. Coated optically isotropic or monoaxially film of plastic. 4,629,637, Cl. 428-1.000.

Waldron, Gerald E., to Dynapert-HTC Corp. Vapor level control for vapor processing system. 4,629,420, Cl. 432-32.000.

Walker, John D.: *See—*
Carson, Robert A.; Petrick, Mary S.; Vallone, Lee A.; and Walker, John D., 4,629,832, Cl. 340-825.070.

Wallis, Bernard J. Nitrogen die cylinder. 4,628,796, Cl. 92-117.00R.

Walsworth, Richard L., to TII Computer Systems, Inc. Method and apparatus for accessing communication systems. 4,629,836, Cl. 379-12.000.

Walters, Peter E.; and Williams, Anthony M., to EMI Limited. Sensing apparatus. 4,629,957, Cl. 318-662.000.

Walters, Peter E.: *See—*
Clow, Hugh; Percival, William S.; and Walters, Peter E., 4,629,986, Cl. 324-303.000.

Walton, Claude G. Swing-in-swing-out shower chair. 4,628,550, Cl. 4-560.000.

Wanamaker, Joseph L.: *See—*
Butts, Kenneth R.; and Wanamaker, Joseph L., 4,629,968, Cl. 322-29.000.

Wang Laboratories, Inc.: *See—*
Roy, Roland W., 4,630,030, Cl. 340-347.0DD.

Wang, Li: *See—*
Antos, George J.; and Wang, Li, 4,629,551, Cl. 208-139.000.

Ward, Arthur G. T.; and Todd-Davies, Christopher, to BPB Industries Public Limited Company. Calcination method and apparatus. 4,629,419, Cl. 432-13.000.

Ward, Russell G. Reversible face mask with replaceable air filter insert. 4,628,927, Cl. 128-206.170.

Wargo, Robert A.; and Harwood, Leopold A., to RCA Corporation. Digital chroma overload system. 4,630,102, Cl. 358-27.000.

Warmuth, Ivan J., II, to Goodyear Tire & Rubber Company, The. Dual chamber air spring. 4,629,170, Cl. 267-64.270.

Warner-Lambert Company: *See—*
Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, 4,629,731, Cl. 514-353.000.

Warshawsky, Jay: *See—*
Kreisberg, Alan J.; and Warshawsky, Jay, 4,629,421, Cl. 432-77.000.

Warwick, Dennis J., to Data Card Corporation. System for forming picture and alphanumeric images on the surface of a plastic card. 4,629,306, Cl. 355-3.00R.

Wassel, Edward R.; and Watkins, Gerald J., to International Business Machines Corporation. Apparatus for executing an instruction and for simultaneously generating and storing related information. 4,630,192, Cl. 364-200.000.

Watabe, Nobuyuki: *See—*
Sanda, Akihiro; Watabe, Nobuyuki; and Sato, Hiroki, 4,629,139, Cl. 242-56.400.

Watanabe, Keiji: *See—*
Saito, Masato; Suzuki, Ryo; Watanabe, Keiji; and Tsuchihashi, Michihiro, 4,629,929, Cl. 313-25.000.

Watanabe, Kenjiro, to Canon Kabushiki Kaisha. Liquid recording head. 4,630,078, Cl. 346-140.00R.

Watanabe, Takaki: *See—*
Muraki, Katsuo; Honda, Kiyokazu; and Watanabe, Takaki, 4,630,180, Cl. 362-223.000.

Watanabe, Tatsuo; and Suzuki, Kiyohiko, to Kokusai Denshin Denwa Co., Ltd. Feed-forward microwave power amplifier with difference signal distortion cancellation circuit. 4,629,996, Cl. 330-151.000.

Watanabe, Yoichi: *See—*
Ogino, Takao; Watanabe, Yoichi; and Sano, Shigehisa, 4,628,977, Cl. 152-451.000.

Waterbury, L. David: *See—*
Clark, Robin D.; and Waterbury, L. David, 4,629,730, Cl. 514-331.000.

Waterman, Eben C.: *See—*
Gile, Richard H.; Ludwig, Robert W.; Farrar, Steven P.; Farmer, Steven P.; and Waterman, Eben C., 4,628,643, Cl. 51-325.000.

Waterscience, Inc.: *See—*
Littmann, Robert J., 4,628,836, Cl. 110-343.000.

Watkins, Gerald J.: *See—*
Wassel, Edward R.; and Watkins, Gerald J., 4,630,192, Cl. 364-200.000.

Watkins, Raymond R.: *See—*
Dyer, James W.; and Watkins, Raymond R., 4,630,285, Cl. 375-37.000.

Watkinson, Stephen W., to U.S. Philips Corporation. Polar loop transmitter. 4,630,315, Cl. 455-109.000.

Watson Industries, Inc.: *See—*
Watson, William S., 4,628,734, Cl. 73-505.000.

Watson, William A.: *See—*
Kask, Eugene, deceased; Watson, William A.; and Hernandez, Jorge M., 4,630,170, Cl. 361-306.000.

Watson, William S., to Watson Industries, Inc. Angular rate sensor apparatus. 4,628,734, Cl. 73-505.000.

Wattenburg, Eric J.: *See—*
Wattenburg, Willard H.; and Wattenburg, Eric J., 4,629,357, Cl. 404-6.000.

Wattenburg, Willard H.; and Wattenburg, Eric J. Movable barrier. 4,629,357, Cl. 404-6.000.

Wayne, Mark; and Rutherford, Terry, to Choo Choo Customs, Inc. Hoodscoop and method for attaching the same. 4,629,022, Cl. 180-69.220.

Weber, Hans-Leo: *See—*
Waldenrath, Werner; Weber, Hans-Leo; and Claussen, Uwe, 4,629,637, Cl. 428-1.000.

Weber, Robert E.; and Carp, Ralph W., to Allied Corporation. Control system for reversing the rotation of a field wound motor. 4,629,951, Cl. 318-300.000.

Weddell, Ronald P.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,628,580, Cl. 29-428.000.

Weekley, William G.: *See—*
Goudy, Paul R., Jr.; and Weekley, William G., 4,629,126, Cl. 239-452.000.

Weeks, Richard W. Direct FM crystal-controlled oscillator. 4,630,008, Cl. 332-167.000.

Wefels, Peter, to VEGLA, Vereinigte Glaswerke GmbH. Glass brick. 4,628,652, Cl. 52-306.000.

Weibel, Michael K., to SBP, Inc. Well drilling and production fluids employing parenchymal cell cellulose. 4,629,575, Cl. 252-8.551.

Weider Health and Fitness: *See—*
Perrine, Walter E., 4,629,183, Cl. 272-123.000.

Weiner, Irving M.: *See—*
Gruich, Peter, 4,629,241, Cl. 296-1.00S.

Weishaupt, Walter: *See—*
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,630,027, Cl. 340-52.00F.

Weiss, Franz-Josef: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,629,613, Cl. 423-265.000.

Weiss, Frederick G.: *See—*
Bebernes, Linda K.; and Weiss, Frederick G., 4,629,911, Cl. 307-362.000.

Weitz, Gene C.; and Canavan, C. Robert. Method and apparatus for measuring tension. 4,628,747, Cl. 73-862.440.

Weld, Thomas G.; and Beschle, Mark D., to GTE Products Corporation. Tungsten-halogen lamp with means for reducing filament embrittlement. 4,629,936, Cl. 313-579.000.

Welker, Brian H., to Welker Engineering Company. Integrated pump and sample vessel. 4,628,750, Cl. 73-864.630.

Welker Engineering Company: *See—*
Welker, Brian H., 4,628,750, Cl. 73-864.630.

Well Made Toy Manufacturing Corp.: *See—*
Hohl, G. Burnell; and Calvin, Martin, 4,630,301, Cl. 381-36.000.

Wella Aktiengesellschaft: *See—*
Clausen, Thomas; and Konrad, Eugen, 4,629,467, Cl. 8-414.000.

Wellenstam, Kjell I., to Astra Meditec AB. Valve-provided connecting device. 4,629,159, Cl. 251-149.600.

Welles, Kenneth B., II; Noujaim, Sharbel E.; and Tiemann, Jerome J., to General Electric Company. Digital circuit for decoding digitized, demodulated FM stereo signals. 4,630,299, Cl. 381-4.000.

Wells, James S.: *See—*
May, William E.; McKinney, Ronald W.; and Wells, James S., 4,630,018, Cl. 336-175.000.

Wells, Larry; and Graham, Karl, to Cummins Engine Company, Inc. Lubricant supply rail. 4,628,875, Cl. 123-90.360.

Wells, Wilfred H.: *See—*
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Welsh, David A.; and Rehse, Denis O., to Energy Motor Control, Inc. Induction motor controller. 4,629,960, Cl. 318-729.000.

Welsh, William A.; and Parent, Yves O., to W. R. Grace & Co. Method for refining glyceride oils using amorphous silica. 4,629,588, Cl. 260-428.000.

Weng, Litai; Gibbons, Ian; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Homogeneous enzyme specific binding assay on non-porous surface. 4,629,690, Cl. 435-7.000.

Wennlid, Sven G., to Boliden Aktiebolag. Method for assaying sulphur trioxide. 4,629,704, Cl. 436-119.000.

Wentink, William S.: *See—*
Collins, David W.; Johnson, Joel S.; Schmidt, Laurence J.; Siverling, Michael M.; and Wentink, William S., 4,630,150, Cl. 360-97.000.

Wenzel, Werner, to Nordischer Maschinenbau Rud. Device for processing fillets of fish. 4,628,570, Cl. 17-62.000.

Weppler, Robert C., to Allen-Bradley Company, Inc. I/O scanner for an industrial control. 4,630,233, Cl. 364-900.000.

Wera Werk Hermann Werner GmbH & Co.: *See—*
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Werner Holmgren: *See—*
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Wernick, Justin: *See—*
Langer, Sheldon; Wernick, Justin; and Jordan, R. Paul, 4,628,936, Cl. 128-614.000.

Werzalit-Werke J. F. Werz KG: *See—*
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Wescott Steel, Inc.: *See—*
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Weseloh, William E.: *See—*
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., 4,628,881, Cl. 123-447.000.

Wesmer Konstruksie (Eiedoms) Beperk: *See—*
Boswel, Justus A. T., 4,628,654, Cl. 52-319.000.

Wessel, Peter, to Diehl GmbH & Co. Dipole arrangement in a sheath. 4,630,055, Cl. 343-12.000.

West, Geoffrey A. W.; and Hill, Walter J., to National Research Development Corp. Apparatus and methods for coding and storing raster scan images. 4,630,306, Cl. 382-21.000.

Westerwaelder Eisenwerk Gerhard: *See—*
Gerhard, Helmut, 4,629,085, Cl. 220-1.500.

Westinghouse Electric Corp.: *See—*
Blaushild, Ronald M., 4,629,601, Cl. 376-463.000.
Boomgaard, Dirk J.; and Neuner, James A., 4,629,983, Cl. 324-208.000.
Daggett, Kenneth E., 4,630,188, Cl. 363-129.000.
Draper, Robert; and Lorentz, Donald G., 4,628,870, Cl. 122-32.000.
Echols, John D., 4,629,481, Cl. 55-348.000.
Gjertsen, Robert K.; and Wilson, John F., 4,628,581, Cl. 29-428.000.
Maier, Alfred E.; and Farley, James R., 4,630,019, Cl. 337-70.000.

Westmoreland, Wyman R.: *See—*
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Westvaco Corporation: *See—*
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Westward Investments Limited: *See—*
Lackinger, Franz, 4,629,825, Cl. 174-65.0SS.

Wetterwald, Anton; Abrassart, Jacques; Moreau, Max; and Dallemagne, Stanislas, to Fibraconsult Management und Beratungs AG. Process and apparatus for producing mineral fiber boards. 4,629,523, Cl. 156-62.800.

Wettstein, Ernest C.: *See—*
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., 4,628,809, Cl. 100-208.000.

Wheeler, Walter R., to PA Incorporated. Methods and apparatus for detecting tubular defects having a plurality of expandable arcuate segments. 4,629,991, Cl. 324-232.000.

Whirlpool Corporation: *See—*
Nystuen, Arne M.; and Kuss, John M., 4,628,733, Cl. 73-462.000.

White Consolidated, Inc.: *See—*
Mawby, Harold S.; and Harris, Duane H., 4,628,699, Cl. 62-137.000.

White, Darwin D.: *See—*
Bermier, Frank H., Jr.; Schwalm, Glendon H.; Urgo, Donald F.; Vinson, Paul; and White, Darwin D., 4,628,599, Cl. 29-857.000.

White, E. Richard: *See—*
Johnson, Joseph L., Jr.; and White, E. Richard, 4,629,147, Cl. 244-55.000.

White, Fred K.: *See—*
Intengan, Franklin S.; Heller, Zindel H.; and White, Fred K., 4,628,929, Cl. 128-314.000.

White, Peter, to International Security Note & Computer Corporation. On-line and off-line transaction security system using a code gener-

ated from a transation parameter and a random number. 4,630,201, Cl. 364-408.000.
White, Philip D., to U. S. Philips Corporation. Duplex speech transmission method and a system therefor. 4,630,257, Cl. 370-29.000.
White, Russell L., to Peterson Manufacturing Company. Adjustable convex mirror assembly for a vehicle mirror. 4,629,296, Cl. 350-624.000.
Whitham, Kenneth, to Varian Associates, Inc. Standing wave linear accelerator having non-resonant side cavity. 4,629,938, Cl. 315-5.410.
Whiting, Paul E.; and McClure, Gerald B., to Dresser Industries, Inc. Method and apparatus for firing borehole perforating apparatus. 4,629,009, Cl. 175-4.560.
Whitney, Donald: *See*—
Tlaker, Erich; Erisman, Aaron; and Whitney, Donald, 4,629,377, Cl. 409-35.000.
Whitworth, Thomas M.: *See*—
Hamersley, Alan B.; Goff, Michael W.; Thummalapally, Vinai K.; Whitworth, Thomas M.; and Nomula, Ramchandra R., 4,629,668, Cl. 430-11.000.
Wiegers, Wilhelmus J.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,629,805, Cl. 560-126.000.
Wienand, Henning: *See*—
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Wildmoser, Martin M., to Bemis Company, Inc. Unit load wrapping with controlled wrap tensioning. 4,628,668, Cl. 53-399.000.
Wiley, John D.; and Perepezko, John H., to Wisconsin Alumni Research Foundation. Use of metallic glasses for fabrication of structures with submicron dimensions. 4,630,094, Cl. 357-67.000.
Wilke, Wilbur D.: *See*—
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Wilkinson, Derek: *See*—
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Will, Frank J.: *See*—
Stahl, John I.; Fischel, Burton J.; and Will, Frank J., 4,630,035, Cl. 340-539.000.
Willcox, Frederick P. Camera with focal plane shutter apparatus. 4,629,302, Cl. 354-242.000.
Williams, Anthony M.: *See*—
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Williams, Charles W.: *See*—
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Williams, James G.: *See*—
Madderra, Jimmy M.; and Williams, James G., 4,628,821, Cl. 102-517.000.
Williams, Rodney K.: *See*—
Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,628,726, Cl. 73-61.10C.
Williams, Steven N. Soothing comfort girdle. 4,628,930, Cl. 128-379.000.
Williams, Theodore M. Extended range mine. 4,628,820, Cl. 102-411.000.
Williams, Theodore M. Seat occupant-activated underseat support air-cushion. 4,629,253, Cl. 297-452.000.
Williamson, Calvin C., to Kaiser Steel Corporation. Method of roll forming cylindrical pipe. 4,628,721, Cl. 72-370.000.
Williamson, Robert E.: *See*—
Hood, Clarence E., Jr.; Williamson, Robert E.; and Margolin, Amikam, 4,629,005, Cl. 171-20.000.
Willis, Donald H., to RCA Corporation. Digital sample rate reduction system. 4,630,294, Cl. 377-48.000.
Willoughby, Ross C.: *See*—
Browner, Richard F.; and Willoughby, Ross C., 4,629,478, Cl. 55-257.00R.
Wilson, David J.: *See*—
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Wilson Engraving Company, Inc.: *See*—
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Wilson, John F.: *See*—
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Wilson, Peter H., to Black & Decker, Inc. Hot air gun. 4,629,864, Cl. 219-374.000.
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., to International Flavors & Fragrances Inc. Hexynyl alkanoates and organoleptic uses thereof. 4,629,586, Cl. 252-522.00R.
Wimmer, Adalbert: *See*—
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Winchell, Vern H., II: *See*—
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Windedahl, Alan L.; and Paczosa, Benedict M., to Saunders Archery Co. Bow and string silencer. 4,628,892, Cl. 124-23.00R.
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Windley, William T.: *See*—
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Winesett, Franklin P. Off-set means for removing bags from connected plural rows. 4,630,310, Cl. 383-37.000.
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Winslow, Louis E.: *See*—
Brown, Francis W.; and Winslow, Louis E., 4,629,663, Cl. 428-343.000.
Winters, Arthur; and Molee, Casper S., to Victory Engineering Corp. Stereotaxic array plug. 4,629,451, Cl. 604-175.000.
Winters, James C.; Mooth, Robert A.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Size composition. 4,629,655, Cl. 428-402.000.
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Wohl, Ronald A.: *See*—
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Wolf, Erwin: *See*—
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Wolf, Helmut: *See*—
Schlegel, Hans J.; and Wolf, Helmut, 4,629,060, Cl. 198-508.000.
Wolfe, James R., Jr., to Du Pont de Nemours, E. I., and Company. Thermoplastic compositions of multi-block copolyester elastomer and chlorosulfonated polyethylene. 4,629,761, Cl. 525-92.000.
Wolfe, Robert W., to GTE Products Corporation. High strength, low mass porous silicon nitride based articles. 4,629,707, Cl. 501-97.000.
Wolk, Piero. Well logging tool for hot well bores. 4,629,888, Cl. 250-256.000.
Wollner, Karl E., to Vapor Corporation. Waste fluid incinerator having heat recovery means. 4,628,835, Cl. 110-238.000.
Wolters, Hans. Windscreen wipers with at least two wiper blades. 4,628,565, Cl. 15-250.410.
Wong, Patrick S., to ALZA Corporation. Vaginal dispenser for dispensing beneficial hormone. 4,629,449, Cl. 604-55.000.
Woo, Nea-Yea: *See*—
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Wood, Mark W., to Tecumseh Products Company. Rotary compressor with vane slot pressure groove. 4,629,403, Cl. 418-1.000.
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Woodruff, Billy R. Pallet puller. 4,629,238, Cl. 294-92.000.
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Wrasidlo, Wolfgang J., to Brunswick Corporation. Asymmetric membranes. 4,629,563, Cl. 210-500.340.
Wren, Paul E. Emergency locator transmitter incident time correlator. 4,630,289, Cl. 375-71.000.
Wright, Andrew K., to RCA Corporation. Multibeam electron gun having means for positioning a screen grid electrode. 4,629,934, Cl. 313-417.000.
Wright, David L.: *See*—
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Wu, Ching-Tana. Infant's chair. 4,629,247, Cl. 297-174.000.
Wu, Yulin; and Mumallah, Naim A., to Phillips Petroleum Company. Microbiocidal anionic sequesterants with polyvalent metal cations for permeability correction process. 4,629,747, Cl. 523-130.000.
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Yajima, Toshio, to Kabushiki Kaisha Komatsu Seisakusho. Method and apparatus for automatic punching. 4,628,578, Cl. 29-407.000.
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Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, to Hitachi, Ltd. Descrambling apparatus for a television signal. 4,630,112, Cl. 358-120.000.
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Yamada, Masatoshi: *See*—
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Yamada, Takahiro: *See*—
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Yamada, Tetsusyo: *See*—
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Yamagami, Akio; and Narikiyo, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Electronic circuit element insertion apparatus. 4,628,594, Cl. 29-741.000.
Yamaguchi, Fukuyoshi: *See*—
Koike, Makoto; Honma, Hiroyuki; Matsuda, Shoichi; Imagunbai, Masana; Hirai, Masazumi; and Yamaguchi, Fukuyoshi, 4,629,504, Cl. 420-38.000.
Yamaguchi, Jun; and Shikatani, Osamu, to Sumitomo Electric Industries, Ltd. Wafer of semiconductors. 4,630,093, Cl. 357-55.000.
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Yamaguchi, Tomoshige, to Okamura Corporation. Device for a reclining chair. 4,629,249, Cl. 297-300.000.
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Yamakoshi, Shigenobu, to Fujitsu Limited. Light-emitting semiconductor device. 4,630,083, Cl. 357-17.000.
Yamamoto, Hidehiko: *See*—
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Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, to Nichias Corporation. Vortex gasket with composition for high-temperature and high-pressure application. 4,629,199, Cl. 277-204.000.
Yamanaka, Junichi, to Kabushiki Kaisha Toshiba. Blanking signal mixing circuit. 4,630,103, Cl. 358-33.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Tsukamoto, Shin-ichi; Nagano, Yoshinobu; and Katsuda, Kimio, 4,629,736, Cl. 514-563.000.
Yamashita, Kouichi; Ishiguro, Toshiaki; and Morisawa, Kunio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kubushiki Kaisha. Governor valve assembly. 4,628,952, Cl. 137-54.000.
Yamashita, Mitsuo: *See*—
Hashimoto, Kiyoshi; Yamashita, Mitsuo; Tomimori, Kiyoshi; and Nakagawa, Shinji, 4,629,173, Cl. 271-65.000.
Yamashita, Takeshi: *See*—
Shiraishi, Yukiya; and Yamashita, Takeshi, 4,630,154, Cl. 360-105.000.
Yamazaki, Seiichi: *See*—
Kubota, Kazufumi; Yamazaki, Seiichi; and Monma, Yoshiyuki, 4,629,876, Cl. 235-473.000.
Yamazaki, Yasuhiro: *See*—
Endoh, Toshiaki; and Yamazaki, Yasuhiro, 4,630,124, Cl. 358-260.000.
Yanagi, Yoshio: *See*—
Kainuma, Norio; Sakuraya, Takashi; Tanaka, Akira; and Yanagi, Yoshio, 4,629,362, Cl. 405-146.000.
Yanagihara, Kazuhiko: *See*—
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; Hatanaka, Isamu; and Harada, Shigeo, 4,629,675, Cl. 430-203.000.
Yanagiuchi, Shigenobu: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Yanagiuchi, Shigenobu; and Yamamoto, Hidehiko, 4,630,235, Cl. 364-900.000.
Yanase, Tomoo; and Mito, Ikuo, to NEC Corporation. Method of growing InGaAsP on InP substrate with corrugation. 4,629,532, Cl. 156-612.000.
Yang, Philip S.: *See*—
Ionescu, Marian I.; Lenker, Jay A.; and Yang, Philip S., 4,629,459, Cl. 623-2.000.
Yang, Tai-Her. Protective circuit breaker (I). 4,630,020, Cl. 337-79.000.
Yankell, Samuel L.: *See*—
Lauks, Imants R.; and Yankell, Samuel L., 4,629,424, Cl. 433-6.000.
Yarman, Binboga S., to United States of America, Air Force. Low pass T-section digital phase shifter apparatus. 4,630,010, Cl. 333-139.000.
Yasuda, Shigeyuki. Composition of heat-sensitive electrosensitive substances and a panel heater made therefrom. 4,629,584, Cl. 252-511.000.
Yasukawa, Saburo: *See*—
Tsukui, Tsutomu; Yasukawa, Saburo; Shimizu, Toshio; Doi, Ryota; Yamaguchi, Motoo; and Iwaasa, Shuzou, 4,629,664, Cl. 429-23.000.
Yazaki Corporation: *See*—
Kato, Shinichi; Saito, Yoji; and Umemoto, Hiroshi, 4,629,351, Cl. 403-27.000.
Yokogawa Hokushin Electric Corporation: *See*—
Akiyama, Koji; and Iwaoka, Hideto, 4,629,886, Cl. 250-237.00G.
Ueda, Toshitsugu; Kohsaka, Fusao; and Sugihara, Yoshinobu, 4,628,740, Cl. 73-705.000.
Yokokura, Takashi: *See*—
Hori, Nobuo; Yokokura, Takashi; and Ohtomo, Fumio, 4,628,612, Cl. 33-366.000.
Yokoo, Koji: *See*—
Arai, Masatoshi; Inoue, Takeo; and Yokoo, Koji, 4,629,775, Cl. 528-17.000.
Yokozeki, Seiki; and Nomura, Jun, to Matsushita Electric Industrial Co., Ltd. Power and time controlled high frequency heating appliance. 4,629,848, Cl. 219-10.55B.
Yonese, Naoki; Omatsu, Masayuki; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co., Ltd. Fluoran compounds. 4,629,800, Cl. 549-226.000.
Yonezu, Kunio; and Asai, Kenji, to Japan Storage Battery Company Limited. Sealed lead-acid battery. 4,629,622, Cl. 429-57.000.
Yonker, John F.: *See*—
Brasier, Brian D.; Hill, Kenneth J.; and Yonker, John F., 4,629,025, Cl. 180-142.000.
Yoon, Roe-Hoan; and Hilderbrand, Thomas M., to Thiele Kaolin Company. Purification of kaolin clay by froth flotation using hydroxamate collectors. 4,629,556, Cl. 209-166.000.
Yoshida, Hideo; and Kunita, Hisao, to Sharp Kabushiki Kaisha. One chip integrated circuit for electronic apparatus with means for generating sound messages. 4,630,222, Cl. 364-513.500.
Yoshida, Kiyomi: *See*—
Kondo, Yoshihito; Wakabayashi, Shigeru; Iwano, Fumiyuki; and Yoshida, Kiyomi, 4,628,670, Cl. 53-551.000.
Yoshida Kogyo K.K.: *See*—
Kondo, Naoki, 4,629,054, Cl. 198-388.000.
Taga, Yukio, 4,628,842, Cl. 112-113.000.
Yoshida, Shuntaro: *See*—
Hasegawa, Takanori; Yoshida, Shuntaro; and Oshio, Susumu, 4,628,813, Cl. 101-116.000.
Yoshimi, Takani; Michisita, Ryoichi; and Sasaki, Hitoshi, to Toyoda Koki Kabushiki Kaisha. Tool clamping device for main spindle. 4,628,586, Cl. 29-568.000.
Yoshimura, Hisashi, to Sharp Kabushiki Kaisha. Ink-on-demand color ink jet system printer. 4,630,076, Cl. 346-140.00R.
Yoshino, Tatsuo: *See*—
Akimoto, Taizo; Akisada, Masahide; Seki, Takatoshi; Ookawa, Norio; Yoshino, Tatsuo; and Takamura, Yuji, 4,629,300, Cl. 354-76.000.
Yoshiura, Shoichiro; and Migita, Haruyoshi, to Sharp Kabushiki Kaisha. Copying apparatus having variable magnification operation memory function. 4,629,314, Cl. 355-55.000.
Yoshizaki, Kiyoshi: *See*—
Imaizumi, Mitsuyuki; and Yoshizaki, Kiyoshi, 4,629,515, Cl. 148-11.50F.
Young, David E.; and Sebastian, Danny S., to Panex Corporation. Gauge carrier. 4,628,995, Cl. 166-113.000.
Young, John W., to Siemens Energy & Automation, Inc. Magnetic structure for calibrating a circuit breaker. 4,630,017, Cl. 335-42.000.
Young, Vernon V.; and Bright, David R., to ANGUS Chemical Company. Quinoxaline adducts useful as anthelmintics. 4,629,790, Cl. 544-226.000.
Youssef, Kamal A. Toothbrush. 4,628,564, Cl. 15-167.00R.
Yovanofski, Trayan. Thermostatically controlled solar heating and cooling system. 4,628,988, Cl. 165-48.200.
Yttergren, Erik S.; Strand, Urban R. A.; Jansson, Karl U. H.; and Knipstrom, Karl-Erik, to ESAB Aktiebolag. Apparatus for the internal welding of pipes. 4,629,853, Cl. 219-60.00A.
Yuasa, Takao: *See*—
Kurosawa, Masahiro; Niki, Shigeru; Kadomatsu, Shigenari; Moroi, Motoki; Yuasa, Takao; Iida, Masami; Katamune, Tetsuhiro; Seki, Akiyoshi; and Ide, Kazutaka, 4,628,548, Cl. 4-420.400.
Yuhara, Akitsuna: *See*—
Yamada, Jun; Murakami, Takeshi; Yuhara, Akitsuna; Hosaka, Norio; and Fujita, Yuji, 4,630,112, Cl. 358-120.000.
Yukimoto, Kazuyoshi; Fukura, Kenichi; Hiramatsu, Eiji; and Nishimura, Akira, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Retractable lamp structure. 4,630,179, Cl. 362-66.000.
Yuza, Yasutada, to S.O.C. Corporation. Electric fuse for high voltage circuit. 4,630,022, Cl. 337-282.000.
Yuzawa, Shigetoshi; and Nakata, Muneo, to Omron Tateisi Electronics Co. Electromagnetic relay. 4,630,016, Cl. 335-81.000.

Yuzuriha, Naoki; Mochizuki, Taishiro; Kato, Toshinobu; and Shinohara, Michio, to Nissan Motor Co., Ltd.; and Nippon Seiko Kabushiki Kaisha. Steering shaft joint. 4,628,758, Cl. 74-498.000.

Zacharias, William J.: *See—*
Butz, Mark G.; and Zacharias, William J., 4,630,066, Cl. 346-33.0EC.

Zagubeljuk, Vladislav F.: *See—*
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; and Filatov, Nikolai I., 4,629,838, Cl. 200-67.00D.

Zampino, Michael J.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Zampino, Michael J.; Vock, Manfred H.; and Miller, Kevin P., 4,629,586, Cl. 252-522.00R.

Zandee, Alexander P. L. M., to Shell Internationale Research Maatschappij, B.V. Method and apparatus for correcting the relative motion of a transmitter and a receiver in airborne electromagnetic prospecting. 4,629,990, Cl. 324-330.000.

Zantiotis, Jean. Device for sharpening circular knives. 4,628,642, Cl. 51-248.000.

Zenith Electronics Corporation: *See—*
Long, Michael E., 4,630,113, Cl. 358-121.000.
Long, Michael E., 4,630,133, Cl. 358-335.000.

Zetachron, Inc.: *See—*
Snipes, Wallace C., 4,629,621, Cl. 424-19.000.

Zeuna-Staerker GmbH & Co. KG: *See—*
Santiago, Enrique, 4,629,605, Cl. 422-179.000.

Zhigalov, Gennady V.: *See—*
Tikhonov, Valentin N.; Zhigalov, Gennady V.; Abduganiev, Abdurakhim; and Dulnev, Vladimir K., 4,628,678, Cl. 57-400.000.

Zill, Karl: *See—*
Hidasi, Geza; and Zill, Karl, 4,629,405, Cl. 418-102.000.

Zimlich, William C.; Fraeyman, Julius P.; and Johnson, Ronald C., to Chrysler Corporation. Spring mounted molding for a vehicle. 4,629,232, Cl. 293-128.000.

Zimmerman, Richard J. Integrated tubal by-pass fishway. 4,629,361, Cl. 405-83.000.

Zimmerman, Robert: *See—*
Shen, Nelson M.; and Zimmerman, Robert, 4,629,316, Cl. 356-73.100.

Zimmermann, Walter, to Siemens Aktiengesellschaft. Gate bias generating circuit for field effect transistors. 4,629,880, Cl. 250-205.000.

Zobl, Hartmut: *See—*
Haubner, Georg; Petermann, Hans; and Zobl, Hartmut, 4,630,043, Cl. 340-825.570.

Zorinsky, Eldon J.; and Spratt, David B., to Texas Instruments Incorporated. Method for obtaining full oxide isolation of epitaxial islands in silicon utilizing selective oxidation of porous silicon. 4,628,591, Cl. 29-576.00W.

Zunkel, Gary D., to Halliburton Company. Foam gravel packer. 4,628,993, Cl. 166-51.000.

Zwier, Daniel G. Edging strip. 4,628,632, Cl. 47-33.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baer, Ralph H., to Sanders Associates, Inc. Method of employing a television receiver for active participation. Re. 32,305, Cl. 273-85.00G.

Bauer, Kurt: *See—*
Glatt, Werner; and Bauer, Kurt, Re. 32,307, Cl. 366-102.000.

Biosearch Medical Products, Inc.: *See—*
Waters, William E., Re. 32,306, Cl. 604-165.000.

Bulk Lift International Incorporated: *See—*
Nattrass, Peter J., Re. 32,308, Cl. 383-24.000.

Debono, Manuel, to Eli Lilly and Company. Derivatives of A-21978C cyclic peptides. Re. 32,310, Cl. 530-317.000.

Debono, Manuel, to Eli Lilly and Company. Derivatives of A-21978C cyclic peptides. Re. 32,311, Cl. 530-317.000.

Eli Lilly and Company: *See—*
Debono, Manuel, Re. 32,310, Cl. 530-317.000.
Debono, Manuel, Re. 32,311, Cl. 530-317.000.

Glatt, Werner; and Bauer, Kurt, to Glatt, Werner. Fluidized bed apparatus. Re. 32,307, Cl. 366-102.000.

Hwang, Jennie S., to SCM Corporation. Fusible powdered metal paste. Re. 32,309, Cl. 148-23.000.

Maxwell, Richard. Chemical treatment for liquid systems. Re. 32,304, Cl. 166-53.000.

Nattrass, Peter J., to Bulk Lift International Incorporated. End wall closure for bulk material transport bag. Re. 32,308, Cl. 383-24.000.

Sanders Associates, Inc.: *See—*
Baer, Ralph H., Re. 32,305, Cl. 273-85.00G.

SCM Corporation: *See—*
Hwang, Jennie S., Re. 32,309, Cl. 148-23.000.

Waters, William E., to Biosearch Medical Products, Inc. Intubating device. Re. 32,306, Cl. 604-165.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Becton, Dickinson and Company: *See—*
Lynn, Robert W., B1 4,238,568, Cl. 435-285.000.

Best, Willie H. High heat transfer oven. B1 4,235,023, 12-16-86, Cl. 34-31.000.

Buhler, Gunter: *See—*
Egbers, Gerhard; Schuler, Bernhard; Seidel, Adolf; and Buhler, Gunter, B1 4,452,053, Cl. 66-123.000.

Egbers, Gerhard; Schuler, Bernhard; Seidel, Adolf; and Buhler, Gunter, to Sulzer Morat GmbH. Stamped knitting-tool for knitting machines. B1 4,452,053, 12-16-86, Cl. 66-123.000.

Forster, Eckehard: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, B1 3,885,957, Cl. 75-58.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Shiozaki, Ken; Tsuge, Kazunori; and Ohnishi, Akira, B1 4,366,093, Cl. 502-225.000.

Lynn, Robert W., to Becton, Dickinson and Company. Roller bottle. B1 4,238,568, 12-16-86, Cl. 435-285.000.

Ohnishi, Akira: *See—*
Shiozaki, Ken; Tsuge, Kazunori; and Ohnishi, Akira, B1 4,366,093, Cl. 502-225.000.

Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, to Thyssen Niederrhein AG Hutten-und-Walzwerke. Method for the desulfurization of a steel melt. B1 3,885,957, 12-16-86, Cl. 75-58.000.

Rommerswinkel, Heinrich-Wilhelm: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, B1 3,885,957, Cl. 75-58.000.

Schuler, Bernhard: *See—*
Egbers, Gerhard; Schuler, Bernhard; Seidel, Adolf; and Buhler, Gunter, B1 4,452,053, Cl. 66-123.000.

Seidel, Adolf: *See—*
Egbers, Gerhard; Schuler, Bernhard; Seidel, Adolf; and Buhler, Gunter, B1 4,452,053, Cl. 66-123.000.

Shiozaki, Ken; Tsuge, Kazunori; and Ohnishi, Akira, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Cylindrical molded catalyst. B1 4,366,093, 12-16-86, Cl. 502-225.000.

Spetzler, Edgar: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, B1 3,885,957, Cl. 75-58.000.

Sulzer Morat GmbH: *See—*
Egbers, Gerhard; Schuler, Bernhard; Seidel, Adolf; and Buhler, Gunter, B1 4,452,053, Cl. 66-123.000.

Thyssen Niederrhein AG Hutten-und-Walzwerke: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, B1 3,885,957, Cl. 75-58.000.

Tsuge, Kazunori: *See—*
Shiozaki, Ken; Tsuge, Kazunori; and Ohnishi, Akira, B1 4,366,093, Cl. 502-225.000.

Wendorff, Jochen: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, B1 3,885,957, Cl. 75-58.000.

LIST OF DESIGN PATENTEES

Abe, Karl-Heinz, to Bayerische Motoren Werke A.G. Luggage case for motorcycles. 287,237, 12-16-86, Cl. D12-158.000.

AG Sigg, Aluminium- und Metallwarenfabrik: *See—*
Weiss, Paul, 287,211, Cl. D7-77.000.

Allen, James H., to 'totes', incorporated. Umbrella handle. 287,188, 12-16-86, Cl. D3-12.000.

American Commercial, Incorporated: *See—*
Ohtake, Katsuhiro, 287,206, Cl. D7-18.000.
Uglow, Helene, 287,205, Cl. D7-17.000.

Anno Associates Inc.: *See—*
Anno, Koji, 287,247, Cl. D14-60.000.

Anno, Koji, to Anno Associates Inc.; and Suntron Industrial Company, Ltd. Base unit for a cordless telephone or similar article. 287,247, 12-16-86, Cl. D14-60.000.

Austin, Arnold S., to Quabaug Corporation. Shoe sole. 287,183, 12-16-86, Cl. D2-320.000.

Bali Company: *See—*
DiTullio, Flavia, 287,180, Cl. D2-24.000.

Barthropp, Francis M. L. Toy gun. 287,257, 12-16-86, Cl. D21-147.000.

Bausch & Lomb Incorporated: *See—*
Huckenbeck, Claus O., 287,252, Cl. D16-132.000.

Bayerische Motoren Werke A.G.: *See—*
Abe, Karl-Heinz, 287,237, Cl. D12-158.000.
Bianchi Scarpa, Afra; and Scarpa, Tobia, to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S. Shelf unit. 287,199, 12-16-86, Cl. D6-479.000.
Bierlein, James R.; and Williams, James F. Goblet. 287,204, 12-16-86, Cl. D7-11.000.
Billgren, Tomas, to Molnlycke Aktiebolag. Embossed cloth. 287,195, 12-16-86, Cl. D5-53.000.
Binks Manufacturing Company: *See—*
Knetl, George J.; and Scotchmur, Ronald R., 287,266, Cl. D23-17.000.
BKF Industries, Inc.: *See—*
Franklin, Bill R.; and Fernandez, Ernest, 287,201, Cl. D6-559.000.
Bobsin Limited: *See—*
Ryder-Smith, Simon C., 287,196, Cl. D6-339.000.
Bounds, William E. Condiment mill. 287,209, 12-16-86, Cl. D7-53.000.
Bounds, William E. Two-compartment condiment dispenser. 287,210, 12-16-86, Cl. D7-57.000.
Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, to Daimler-Benz Aktiengesellschaft. Automobile. 287,235, 12-16-86, Cl. D12-91.000.
Brown, Wilbert C.; and Saba, Philip B., to TIE/Communications, Inc. Telephone station set. 287,246, 12-16-86, Cl. D14-58.000.
Bulgari, Marina, to Marina B. Creation, S.A. Earring. 287,230, 12-16-86, Cl. D11-40.000.
Bunn-O-Matic Corporation: *See—*
Daugherty, Donald L., 287,212, Cl. D7-309.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,189, 12-16-86, Cl. D3-12.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,190, 12-16-86, Cl. D3-12.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,191, 12-16-86, Cl. D3-12.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,192, 12-16-86, Cl. D3-12.000.
California R & D Center: *See—*
Jones, Lawrence T.; Lee, R. Stephen; Ishikawa, Paul J.; and Howden, Ashley G., 287,256, Cl. D21-90.000.
Cari-All Inc.: *See—*
Trubiano, Antoine, 287,202, Cl. D6-566.000.
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, to Century Fireplace Furnishings, Inc. Fireplace screen. 287,273, 12-16-86, Cl. D23-138.300.
Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S.: *See—*
Bianchi Scarpa, Afra; and Scarpa, Tobia, 287,199, Cl. D6-479.000.
Century Fireplace Furnishings, Inc.: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,273, Cl. D23-138.300.
Challans, John C., to Plessey Overseas Limited. Electrical connector plug. 287,238, 12-16-86, Cl. D13-24.000.
Chia, Louis, to Space Boats Inc. Hovercraft. 287,234, 12-16-86, Cl. D12-5.000.
Chung Ah Manufacturing Company Limited: *See—*
Wan, Kwong Y., 287,291, Cl. D26-38.000.
Clary Corporation: *See—*
Paul, Buddy R., 287,223, Cl. D8-389.000.
Control Data Corporation: *See—*
Foote, Kenneth R.; Miller, William M.; and Scott, Eion G., 287,233, Cl. D11-156.000.
Cooley, Ernest R.; and Kriss, Robert A. Arrowhead sharpener. 287,222, 12-16-86, Cl. D8-91.000.
Copeland, Eddie. Earring. 287,231, 12-16-86, Cl. D11-42.000.
Coret & Company, Ltd.: *See—*
Kojima, Satoru; and Koshida, Kouji, 287,263, Cl. D22-149.000.
Cosmo Co., Ltd.: *See—*
Kibe, Katashi; Nakanishi, Masami; Sunamoto, Youtarou; and Miyamori, Hideo, 287,298, Cl. D28-37.000.
Crouch, William J.: *See—*
Rinaldo, Marion; and Crouch, William J., 287,264, Cl. D23-1.000.
Crowley, George C.; and Jursich, Donald N., to Sunbeam Corporation. Humidifier. 287,274, 12-16-86, Cl. D23-146.000.
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., to Dart Industries Inc. Casserole dish cover or the like. 287,207, 12-16-86, Cl. D7-40.000.
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., to Dart Industries Inc. Casserole dish cover or the like. 287,208, 12-16-86, Cl. D7-40.000.
Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, 287,235, Cl. D12-91.000.
Dart Industries Inc.: *See—*
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,207, Cl. D7-40.000.
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,208, Cl. D7-40.000.
Daugherty, Donald L., to Bunn-O-Matic Corporation. Beverage making machine. 287,212, 12-16-86, Cl. D7-309.000.
DeCoster, Pieter K. J.: *See—*
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,207, Cl. D7-40.000.
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,208, Cl. D7-40.000.
DeTuzzi, Russell: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,273, Cl. D23-138.300.
DiPaolo, Vincent. Grass catcher. 287,251, 12-16-86, Cl. D15-17.000.
DiTullio, Flavia, to Bali Company. Brassiere. 287,180, 12-16-86, Cl. D2-24.000.
Domon, Yoshihiro: *See—*
Fujita, Toshiharu; Domon, Yoshihiro; and Suzuki, Masakatsu, 287,288, Cl. D26-3.000.
Dow Chemical Company, The: *See—*
Turnbull, Guy A., 287,227, Cl. D9-36.000.
Eckert, Roland: *See—*
Mas, Daniel; Eckert, Roland; and Savignat, Lucien, 287,250, Cl. D14-101.000.
Edwards, Joseph W., to MG Industries. Neck ring for a gas cylinder. 287,265, 12-16-86, Cl. D23-2.000.
F.I.R. Rubinetterie S.p.A.: *See—*
Piesco, Nazzareno, 287,269, Cl. D23-25.000.
Piesco, Nazzareno, 287,271, Cl. D23-32.000.
Piesco, Nazzareno, 287,272, Cl. D23-32.000.
Fernandez, Ernest: *See—*
Franklin, Bill R.; and Fernandez, Ernest, 287,201, Cl. D6-559.000.
Foote, Kenneth R.; Miller, William M.; and Scott, Eion G., to Control Data Corporation. Hydroponic trough. 287,233, 12-16-86, Cl. D11-156.000.
Fornara, Pietro, to Sambonet S.p.A. Coffee pot. 287,213, 12-16-86, Cl. D7-317.000.
Franklin, Bill R.; and Fernandez, Ernest, to BKF Industries, Inc. Combined plate and figurine display unit. 287,201, 12-16-86, Cl. D6-559.000.
Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 287,200, Cl. D6-574.000.
Fujita, Toshiharu; Domon, Yoshihiro; and Suzuki, Masakatsu, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 287,288, 12-16-86, Cl. D26-3.000.
Fujita, Toshiharu: *See—*
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Futatsugi, Mitsuyuki; Fujita, Toshiharu; and Iwasawa, Kiyoshi, 287,287, Cl. D26-3.000.
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Gargiulo, Angelino A., to Caratan, Milan M.; and Caratan, Luis M. Grapevine, "Emperatriz". 5,833, 12-16-86, Cl. 47.000.
Haas, Alfred. Olive tree, "Haas Improved Manzanillo". 5,829, 12-16-86, Cl. 33.000.
Huber, Tony, to Monrovia Nursery Company. *Spiraea*×Bumalda cv. Monhub'. 5,834, 12-16-86, Cl. 54.000.
Monrovia Nursery Company: *See—*
Huber, Tony, 5,834, Cl. 54.000.
Oglevee Associates, Inc.: *See—*
Fleischle, Gerhard, 5,830, Cl. 68.000.
Perry, Anthony, to Co-Operative Rose Growers, Inc. Rose plant. 5,827, 12-16-86, Cl. 11.000.
Weeks, O. L. Rose plant. 5,828, 12-16-86, Cl. 12.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G. Peach tree ("Zee-Red"). 5,831, 12-16-86, Cl. 43.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G. Peach tree. 5,832, 12-16-86, Cl. 43.000.
Zaiger, Gary N.: *See—*
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,831, Cl. 43.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,832, Cl. 43.000.
Zaiger, Grant G.: *See—*
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,831, Cl. 43.000.
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 5,832, Cl. 43.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19 4,628,543
158 4,628,544
265 4,628,545

CLASS 4

253 4,628,546
259 4,628,547
420.4 4,628,548
498 4,628,549
560 4,628,550

CLASS 5

12 R 4,628,551
52 4,628,552
62 4,628,553
90 4,628,554
247 4,628,555
424 4,628,556
446 4,628,557

CLASS 6

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CLASS 8

400 4,629,465
408 4,629,466
414 4,629,467
442 4,629,468
557 4,629,469
585 4,629,470

CLASS 12

33 4,628,559

CLASS 14

2.4 4,628,560
69.5 4,628,561

CLASS 15

53 AB 4,628,562
105 4,628,563
167 R 4,628,564
250.41 4,628,565
300 A 4,628,566

CLASS 16

267 4,628,567
337 4,628,568

CLASS 17

52 4,628,569
62 4,628,570

CLASS 19

304 4,628,571

CLASS 24

67.11 4,628,572

CLASS 29

25.35 4,628,573
156.8 R 4,628,574
4,628,575
157.1 R 4,628,576
281.1 4,628,577
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422 4,628,579
428 4,628,580
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451 4,628,582
525 4,628,583
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564.6 4,628,585
568 4,628,586
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571 4,628,588
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575 4,628,590
576 W 4,628,591
596 4,628,592
623.1 4,628,593
741 4,628,594
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825 4,628,596
827 4,628,597
846 4,628,598
857 4,628,599
861 4,628,600

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34.1 4,628,606
43.92 4,628,607
133 4,628,601
261 4,628,602
280 4,628,603
373 4,628,608
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116 4,628,618
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CLASS 36

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50 4,628,622

CLASS 37

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CLASS 40

591 4,628,624
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CLASS 42

70.01 4,628,626
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CLASS 43

26 4,628,628
42.19 4,628,629
43.12 4,628,630

CLASS 44

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426 4,628,638
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427 4,628,644

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169.7 4,628,646
173 R 4,628,647
212 4,628,648
223 L 4,628,649
265 4,628,650
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306 4,628,652
309.12 4,628,653
319 4,628,654
397 4,628,655
481 4,628,656
509 4,628,657
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646 4,628,659
648 4,628,660
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660 4,628,662

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551 4,628,670
588 4,628,671

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257 R 4,629,478
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348 4,629,481
385 A 4,629,482
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CLASS 56

295 4,628,672
370 4,628,673
400.04 4,628,674

CLASS 57

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59 4,628,681
206 4,628,682
213 4,628,683
263 4,628,684
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266 4,628,676
274 4,628,686
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39.23 4,628,687
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100 4,629,499

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829 4,628,742
861.05 4,628,743
861.38 4,628,744
862.04 4,628,745
862.34 4,628,746
862.44 4,628,747
863.01 4,628,748
863.71 4,628,749
864.63 4,628,750

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121 4,629,503
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CLASS 81

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CLASS 82

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2.7 4,628,779

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881 4,628,784

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1.26 4,628,790
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CLASS 91

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CLASS 92

13.41 4,628,795
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27 4,628,810
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415.1 4,628,815
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517 4,628,821

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168 4,628,824
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649 4,628,860
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196 S 4,628,877
198 DB 4,629,471
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432 4,628,880
447 4,628,881
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491 4,628,886
520 4,628,887
531 4,628,888
549 4,628,889
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599 4,628,891

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4,628,893

CLASS 125

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CLASS 126

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92 YZ 4,628,920
92 Z 4,628,921
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402 4,628,932
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558 4,628,960
599 4,628,961
625.47 4,628,962
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94 4,628,973
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CLASS 144

241 4,628,976

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11.5 R 4,629,516
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556 4,628,978

CLASS 156

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66 4,629,524
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285 4,629,527
351 4,629,528
428 4,629,529
502 4,629,530
504 4,629,531
612 4,629,532

CLASS 160

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235 4,628,982

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254 4,628,987

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80.4 4,628,990
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CLASS 166

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116 4,628,996
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237 4,628,998
274 4,628,999
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341 4,629,003
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548 4,629,007

CLASS 173

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CLASS 188

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70.27 4,629,048
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400 4,629,055
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147 R 4,629,840
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CLASS 204

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CLASS 210

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CLASS 224

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213 VT 4,629,881
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237 G 4,629,886
251 4,629,887
256 4,629,888
310 4,629,889
327.2 4,629,890
4,629,891
353 4,629,892
363 R 4,629,894
363 S 4,629,893
369 4,629,895
372 4,629,896
385 4,629,897
396 ML 4,629,899
396 R 4,629,898
484.1 4,629,900
551 4,629,901
559 4,629,902
573 4,629,903

CLASS 251

60 4,629,156
96 4,629,157
148 4,629,158
149.6 4,629,159
327 4,629,160
328 4,629,161

CLASS 252

8.51 4,629,573
8.551 4,629,575
8.8 4,629,574
32.7 E 4,629,576
4,629,577
4,629,578
33.6 4,629,579
49.6 4,629,580
299.63 4,629,581
301.35 4,629,583
301.4 P 4,629,582
511 4,629,584
4,629,585
522 R 4,629,586
628 4,629,587

CLASS 254

93 HP 4,629,162
133 R 4,629,163

CLASS 260

428 4,629,588

CLASS 261

34.1 4,629,589
78.2 4,629,590
122 4,629,591

CLASS 264

32 4,629,592
63 4,629,593
69 4,629,594
104 4,629,595
109 4,629,474
171 4,629,596
278 4,629,597
537 4,629,598

CLASS 266

114 4,629,165
158 4,629,166

CLASS 267

8 R 4,629,167
35 4,629,168
64.19 4,629,169
64.27 4,629,170

CLASS 269

37 4,629,171

CLASS 271

9 4,629,172
65 4,629,173
186 4,629,174
202 4,629,175
204 4,629,176
240 4,629,177
251 4,629,178

CLASS 272

93 4,629,179
4,629,180
97 4,629,181
113 4,629,182
123 4,629,183
4,629,184
130 4,629,185
135 4,629,186

CLASS 273

24 4,629,187
26 A 4,629,188
54 E 4,629,189
67 A 4,629,190
81.4 4,629,191
85 G Re.32,305
156 4,629,192
164 4,629,193
236 4,629,194
254 4,629,195

CLASS 277

3 4,629,196
53 4,629,197
139 4,629,198
204 4,629,199
216 4,629,200

CLASS 280

5 A 4,629,201
47.26 4,629,202
4,629,203
154.5 R 4,629,204
277 4,629,205
506 4,629,207
618 4,629,208
626 4,629,209
634 4,629,210
688 4,629,211
707 4,629,212
718 4,629,213
808 4,629,214

CLASS 283

94 4,629,215

CLASS 285

21 4,629,216
112 4,629,217
176 4,629,218
184 4,629,219
238 4,629,220
328 4,629,221
332.4 4,629,222
334 4,629,223
4,629,224
334.1 4,629,225
382 4,629,226

CLASS 290

52 4,629,904

CLASS 292

19 4,629,227
165 4,629,228
246 4,629,229
281 4,629,230
346 4,629,231

CLASS 293

128 4,629,232

CLASS 294

1.1 4,629,233
19.1 4,629,234
19.2 4,629,235
61 4,629,236
88 4,629,237

92 4,629,238
153 4,629,239

CLASS 296

1 S 4,629,240
4,629,241
20 4,629,242
100 4,629,243
146 4,629,244

CLASS 297

16 4,629,245
44 4,629,246
174 4,629,247
284 4,629,248
300 4,629,249
362 4,629,250
4,629,251
366 4,629,252
452 4,629,253
473 4,629,254

CLASS 299

33 4,629,255

CLASS 303

8 4,629,256
22 A 4,629,257
92 4,629,258
109 4,629,259

CLASS 307

72 4,629,905
80 4,629,906
265 4,629,907
273 4,629,908
279 4,629,909
317 R 4,629,910
362 4,629,911
459 4,629,912
475 4,629,913
510 4,629,914
522 4,629,915

CLASS 310

49 R 4,629,916
59 4,629,917
65 4,629,918
90 4,629,919
90.5 4,629,261
4,629,262
156 4,629,920
4,629,921
178 4,629,922
234 4,629,923
257 4,629,924
330 4,629,925
331 4,629,926
334 4,629,927
365 4,629,928

CLASS 312

216 4,629,263
223 4,629,264
329 4,629,265

CLASS 313

25 4,629,929
359.1 4,629,930
362.1 4,629,931
402 4,629,932
414 4,629,933
417 4,629,934
579 4,629,935
4,629,936

CLASS 315

3 4,629,937
5.41 4,629,938
73 4,629,939
111.51 4,629,940
153 4,629,941
169.4 4,629,942
200 R 4,629,943
207 4,629,944
4,629,945
219 4,629,946

CLASS 318

161 4,629,947
254 4,629,948
257 4,629,949
285 4,629,950
300 4,629,951
432 4,629,952
468 4,629,953
561 4,629,954
625 4,629,955
4,629,956
662 4,629,957
723 4,629,958
727 4,629,959
729 4,629,960
803 4,629,961

CLASS 320

2 4,629,962
3 4,629,963
14 4,629,964
39 4,629,965

CLASS 322

25 4,629,966
28 4,629,967
29 4,629,968

CLASS 323

210 4,629,969
285 4,629,970
289 4,629,971
314 4,629,972
316 4,629,973
357 4,629,974

CLASS 324

71.3 4,629,975
73 PC 4,629,976
81 4,629,977
95 4,629,978
126 4,629,979
166 4,629,980
4,629,981
208 4,629,982
4,629,983
228 4,629,984
232 4,629,985
4,629,991
303 4,629,986
306 4,629,987
309 4,629,988
318 4,629,989
330 4,629,990
464 4,629,992

CLASS 328

67 4,629,993

CLASS 329

110 4,629,994

CLASS 330

149 4,629,995
151 4,629,996
257 4,629,997
304 4,629,998

CLASS 331

1 R 4,629,999
11 4,630,000
34 4,630,001
96 4,630,002
99 4,630,003
107 SL 4,630,004
113 A 4,630,005
117 R 4,630,006

CLASS 332

1 4,630,007
167 4,630,008

CLASS 333

28 R 4,630,009
139 4,630,010
164 4,630,011
235 4,630,012

CLASS 334

12 4,630,013

CLASS 335

16 4,630,014
18 4,630,015
42 4,630,017
81 4,630,016

CLASS 336

175 4,630,018

CLASS 337

70 4,630,019
79 4,630,020
113 4,630,021
282 4,630,022
407 4,630,023

CLASS 338

58 4,630,024
309 4,630,025

CLASS 339

17 LC 4,629,266
17 M 4,629,267
44 M 4,629,268
59 M 4,629,269
75 MP 4,629,270
4,629,271
90 R 4,629,272
94 M 4,629,273
95 R 4,629,274
103 R 4,629,275
4,629,276
111 4,629,277
134 4,629,278
210 M 4,629,279
263 E 4,629,280
272 R 4,629,281

CLASS 340

21 4,630,026
52 F 4,630,027
60 4,630,028
87 4,630,029
347 AD 4,630,031
347 DD 4,630,030
4,630,032
4,630,034
347 P 4,630,033
539 4,630,035
622 4,630,036
628 4,630,037
632 4,630,038
731 4,630,039
763 4,630,040
825.03 4,629,830
825.07 4,629,832
825.35 4,630,042
825.5 4,630,041
825.57 4,630,043
825.72 4,630,044
825.79 4,630,045
825.93 4,630,046
870.37 4,630,047
995 4,630,065

CLASS 342

20 4,630,054
45 4,630,048
4,630,049
62 4,630,050
133 4,630,051
159 4,630,052
357 4,630,056
358 4,630,057
359 4,630,058
376 4,630,053

CLASS 343

12 4,630,055
362 4,630,059
722 4,630,060
749 4,630,061
786 4,630,062
792.5 4,630,063
895 4,630,064

CLASS 346

33 EC 4,630,066
76 PH 4,630,067
4,630,068
4,630,069
4,630,073
108 4,630,070
136 4,630,071
139 C 4,630,074
140 R 4,630,072
4,630,075
4,630,076
4,630,077
4,630,078
207 4,630,079
209 4,630,080

CLASS 350

3.7 4,629,282
6.8 4,629,283
96.21 4,629,284
96.23 4,629,285
4,629,286
96.34 4,629,287
171 4,629,288
336 4,629,289
350 R 4,629,290
427 4,629,291
4,629,292
4,629,293
4,629,294
503 4,629,295
624 4,629,296
632 4,629,297

CLASS 353

30 4,629,298
97 4,629,299

CLASS 354

76 4,629,300
173.1 4,629,301
242 4,629,302
320 4,629,303
432 4,629,304
442 4,629,305

CLASS 355

3 DD 4,629,309
3 R 4,629,306
4,629,307
4,629,308
8 4,629,310
14 SH 4,629,311
29 4,629,312
53 4,629,313
55 4,629,314
75 4,629,315

CLASS 356

73.1 4,629,316
155 4,629,317
237 4,629,318
4,629,319
244 4,629,320
248 4,629,321
300 4,629,322
365 4,629,323
376 4,629,324
399 4,629,325

CLASS 357

6 4,630,081
14 4,630,082
17 4,630,083
23.4 4,630,084
23.5 4,630,085
4,630,086
4,630,087
23.6 4,630,088
23.7 4,630,089
24 4,630,090
30 4,630,091
38 4,630,092
55 4,630,093
67 4,630,094
78 4,630,095
81 4,630,096

CLASS 358

3 4,630,097
11 4,630,098
12 4,630,099
21 R 4,630,100
22 4,630,101
27 4,630,102
33 4,630,103
36 4,630,104
44 4,630,105
4,630,106
47 4,630,107
84 4,630,108
103 4,630,109
108 4,630,110
109 4,630,111
120 4,630,112
121 4,630,113
136 4,630,114
139 4,630,115
160 4,630,116
174 4,630,117
195.1 4,630,118
198 4,630,119
214 4,630,120
227 4,630,121
241 4,630,122
256 4,630,123
260 4,630,124
280 4,630,125
4,630,126
285 4,630,127
296 4,630,128
4,630,129
300 4,630,130
310 4,630,131
4,630,132
335 4,630,133
343 4,630,134

CLASS 360

10.2 4,630,135
10.3 4,630,136
13 4,630,137
33.1 4,630,138
46 4,630,139
49 4,630,140
60 4,630,141
70 4,630,142
72.2 4,630,143
77 4,630,144
4,630,145
4,630,146
78 4,630,147
93 4,630,148
96.4 4,630,149
97 4,630,150
99 4,630,151
103 4,630,158
105 4,630,152
4,630,153
4,630,154
106 4,630,155
128 4,630,157
133 4,630,156
4,630,159
137 4,630,160

CLASS 361

42 4,630,161
56 4,630,162
4,630,163
91 4,630,164
154 4,630,165
205 4,630,166
213 4,630,167
218 4,630,168
225 4,630,169
306 4,630,170
321 4,630,171
386 4,630,172
388 4,630,174
424 4,630,175
433 4,630,176

CLASS 362

32 4,630,177
64 4,630,178
66 4,630,179
223 4,630,180
235 4,630,181
294 4,630,182
311 4,630,183
351 4,630,184
427 4,630,185

CLASS 363

19 4,630,186
41 4,630,187
129 4,630,188

CLASS 364

150 4,630,189
167 4,630,190
186 4,630,191
200 4,630,192
4,630,193
4,630,194
4,630,195
4,630,196
4,630,197
4,630,198
4,630,199
405 4,630,200
408 4,630,201
414 4,630,202
4,630,203
417 4,630,204
424 4,630,205
431.07 4,630,206
431.12 4,630,207
443 4,630,208
444 4,630,209
464 4,630,210
4,630,211
470 4,630,212
4,630,213
474 4,630,214
4,630,215
478 4,630,216
480 4,630,217
481 4,630,218
488 4,630,219
492 4,630,220
505 4,630,221
513.5 4,630,222
518 4,630,223
550 4,630,224
559 4,630,225
561 4,630,226
567 4,630,227
576 4,630,228
726 4,630,229
900 4,630,230
4,630,231
4,630,232
4,630,233
4,630,234
4,630,235

CLASS 365

1 4,630,236
104 4,630,237
185 4,630,238
189 4,630,239
4,630,240
200 4,630,241

CLASS 366

80 4,629,326
4,629,327
102 Re.32,307
177 4,629,328

CLASS 367

73 4,630,242
82 4,630,243
84 4,630,244
93 4,630,245
135 4,630,246
189 4,630,247
197 4,630,248

CLASS 368

10 4,629,329
89 4,629,330
147 4,629,331
252 4,629,332

CLASS 369

13 4,630,249
32 4,630,250
43 4,630,251
44 4,630,252
136 4,630,253

CLASS 370

1 4,630,254
3 4,630,255
4,630,256
29 4,630,257
60 4,630,258
4,630,259
4,630,260
81 4,630,261
4,630,262
85 4,630,263
4,630,264
4,630,265
94 4,630,266
104 4,630,267

CLASS 371

22 4,630,268
24 4,630,269
29 4,630,270
37 4,630,271
4,630,272

CLASS 372

9 4,630,273
4,630,274
13 4,630,275
15 4,630,276
38 4,630,277
43 4,630,278
45 4,630,279

CLASS 373

41 4,630,280
71 4,630,281

CLASS 374

20 4,629,333
103 4,629,334
142 4,629,335
169 4,629,336

CLASS 375

1 4,630,282
4,630,283
36 4,630,284
37 4,630,285
39 4,630,286
4,630,287
4,630,288
71 4,630,289
104 4,630,290
107 4,630,291

CLASS 376

212 4,629,599
257 4,629,600
463 4,629,601

CLASS 377

20 4,630,292
24 4,630,293
.48 4,630,294
81 4,630,295

CLASS 378

2 4,630,296
185 4,630,297

CLASS 379

12 4,629,836
29 4,629,835
56 4,629,828
58 4,629,829
213 4,629,831

CLASS 381

1 4,630,298
4 4,630,299
31 4,630,300
36 4,630,301
57 4,630,302
68.2 4,629,833
4,629,834
87 4,630,303
94 4,630,304
4,630,305

CLASS 382

21 4,630,306
25 4,630,307
27 4,630,308
56 4,630,309

CLASS 383

24 Re.32,308
37 4,630,310
4,630,311
86 4,630,312

CLASS 384

43 4,629,337
49 4,629,260
94 4,629,338
554 4,629,340

CLASSIFICATION OF PATENTS

576 4,629,339

CLASS 400

17 4,629,341
121 4,629,342
124 4,629,343
4,629,344
208 4,629,345
4,629,346

CLASS 401

42 4,629,347
107 4,629,348

CLASS 402

74 4,629,349

CLASS 403

11 4,629,350
27 4,629,351
128 4,629,352
154 4,629,353
261 4,629,354
389 4,629,355
408.1 4,629,356

CLASS 404

1 4,629,376
6 4,629,357
35 4,629,358
112 4,629,359

CLASS 405

16 4,629,360
83 4,629,361
146 4,629,362
155 4,629,363
157 4,629,364
204 4,629,365
211 4,629,366
284 4,629,367
296 4,629,368
303 4,629,369

CLASS 407

29 4,629,370
114 4,629,371
116 4,629,372
118 4,629,373

CLASS 408

186 4,629,374
239 R 4,629,375

CLASS 409

35 4,629,377
131 4,629,378

CLASS 410

77 4,629,379

CLASS 411

29 4,629,380
34 4,629,381

CLASS 414

48 4,629,382
93 4,629,383
222 4,629,384
226 4,629,385
376 4,629,386
404 4,629,387
427 4,629,388
433 4,629,389
527 4,629,390
563 4,629,391
786 4,629,392

CLASS 415

1 4,629,393
38 4,629,394
75 4,629,395
164 4,629,396

CLASS 416

96 R 4,629,397

CLASS 417

1 4,629,398
201 4,629,399
270 4,629,400
273 4,629,401
456 4,629,402

CLASS 418

1 4,629,403
49 4,629,404
102 4,629,405
268 4,629,406

CLASS 420

38 4,629,504

CLASS 422

7 4,629,602
9 4,629,603
124 4,629,604
179 4,629,605

CLASS 423

53 4,629,606
74 4,629,607
226 4,629,608
239 4,629,609
240 4,629,610
4,629,611
244 4,629,612
265 4,629,613
321 R 4,629,614
456 4,629,615
544 4,629,616
563 4,629,617
625 4,629,618

CLASS 424

15 4,629,619
4,629,620
19 4,629,621
78 4,629,623
4,629,624
145 4,629,625
147 4,629,626
195.1 4,629,627

CLASS 425

7 4,629,407
111 4,629,408
139 4,629,409
145 4,629,410
197 4,629,411
405 H 4,629,412

CLASS 426

138 4,629,628
482 4,629,629

CLASS 427

7 4,629,630
38 4,629,631
54.1 4,629,632
154 4,629,633
179 4,629,634
255.2 4,629,635
444 4,629,636

CLASS 428

1 4,629,637
29 4,629,638
35 4,629,639
4,629,640
36 4,629,641
95 4,629,642
131 4,629,643
137 4,629,644
141 4,629,645
143 4,629,646
172 4,629,647
189 4,629,648
209 4,629,649
213 4,629,650
247 4,629,651
304.4 4,629,652
328 4,629,653
343 4,629,663
373 4,629,654
402 4,629,655
411.1 4,629,656
432 4,629,662
461 4,629,657
520 4,629,658
659 4,629,659
678 4,629,660
698 4,629,661

CLASS 429

23 4,629,664
57 4,629,622
164 4,629,665
194 4,629,666

CLASS 430

11 4,629,667
4,629,668
47 4,629,669
58 4,629,670
59 4,629,671
76 4,629,672
108 4,629,673
125 4,629,674
203 4,629,675
4,629,676
215 4,629,677
230 4,629,678
281 4,629,679
288 4,629,680
314 4,629,681
372 4,629,682
390 4,629,683
559 4,629,684
583 4,629,685

CLASS 431

9 4,629,413
46 4,629,414
347 4,629,415
352 4,629,416

CLASS 432

5 4,629,417
11 4,629,418
13 4,629,419
32 4,629,420
77 4,629,421
234 4,629,422
247 4,629,423

CLASS 433

6 4,629,424
31 4,629,425
118 4,629,426

CLASS 434

22 4,629,427
98 4,629,428
203 4,629,429
219 4,629,430
304 4,629,431

CLASS 435

1 4,629,686
4 4,629,687
7 4,629,688
4,629,689
4,629,690
4,629,691
4,629,692
4,629,693
4,629,694
19 4,629,695
25 4,629,696
26 4,629,697
95 4,629,698
101 4,629,699
128 4,629,700
130 4,629,701
285 B1 4,238,568

CLASS 436

32 4,629,702
45 4,629,703
119 4,629,704
161 4,629,705
513 4,629,706

CLASS 440

52 4,629,432

CLASS 441

40 4,629,433
65 4,629,434
68 4,629,435
93 4,629,436

CLASS 445

26 4,629,437

CLASS 446

58 4,629,438
300 4,629,439
356 4,629,440
372 4,629,441
389 4,629,442

CLASS 455

2 4,630,313
52 4,630,314
109 4,630,315
129 4,630,316

CLASS 464

74 4,629,443

CLASS 474

93 4,629,444

CLASS 493

10 4,629,445
317 4,629,446
356 4,629,447

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DESIGN PATENTS

01 :	287,222		287,259		287,212	31 :	287,224	37 :	287,219		287,265
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	287,252	16 :	287,198	26 :	287,227		287,251		287,242		287,297
	287,256	17 :	287,181	27 :	287,233		287,279				

PLANT PATENTS

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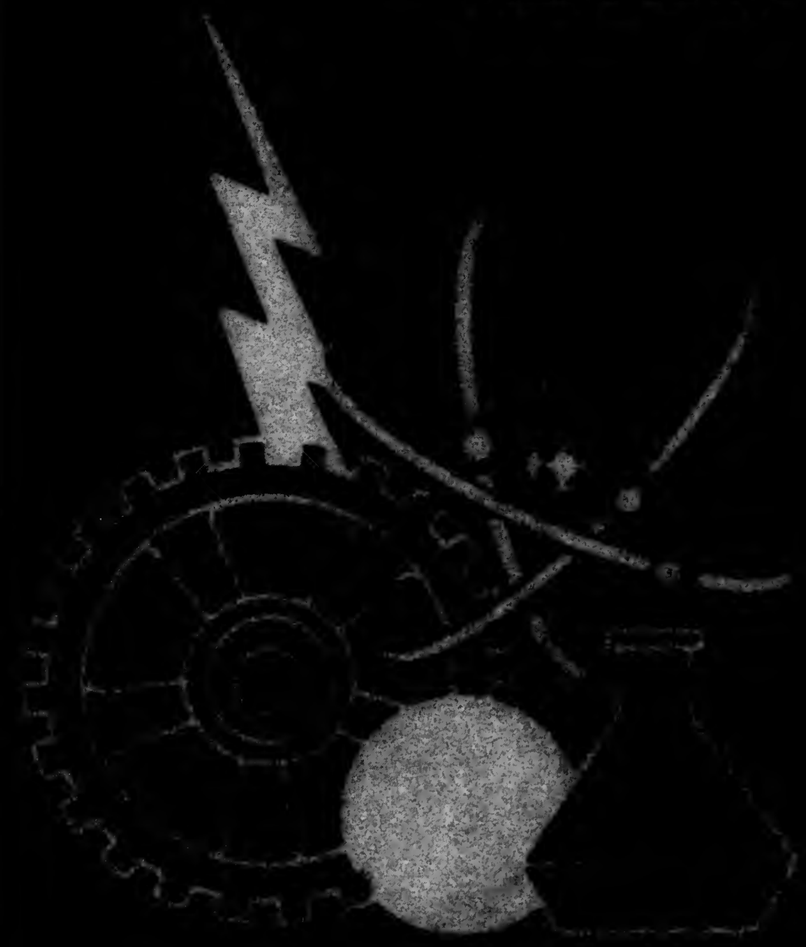
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 23, 1986



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 23, 1986 Volume 1073 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 20, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,420,843 through 4,422,182
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENT WHICH EXPIRED OCTOBER 5, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,352,221	06/259,683	10/5/82
4,352,234	06/223,706	10/5/82
4,352,242	06/273,585	10/5/82
4,352,253	06/243,549	10/5/82
4,352,267	06/221,842	10/5/82
4,352,275	06/258,326	10/5/82
4,352,322	06/255,184	10/5/82
4,352,339	06/227,632	10/5/82
4,352,341	06/251,616	10/5/82
4,352,409	06/226,802	10/5/82
4,352,438	06/233,831	10/5/82
4,352,480	06/230,325	10/5/82
4,352,497	06/215,649	10/5/82
4,352,500	06/229,397	10/5/82
4,352,507	06/247,693	10/5/82
4,352,567	06/272,344	10/5/82
4,352,569	06/272,572	10/5/82
4,352,579	06/255,045	10/5/82
4,352,589	06/284,824	10/5/82
4,352,632	06/231,042	10/5/82
4,352,652	06/246,865	10/5/82
4,352,667	06/241,303	10/5/82
4,352,700	06/218,400	10/5/82
4,352,704	06/271,964	10/5/82
4,352,719	06/230,506	10/5/82
4,352,727	06/255,281	10/5/82
4,352,731	06/220,656	10/5/82
4,352,735	06/259,920	10/5/82
4,352,739	06/262,177	10/5/82
4,352,749	06/235,028	10/5/82
4,352,797	06/280,087	10/5/82
4,352,798	06/283,429	10/5/82
4,352,801	06/218,402	10/5/82
4,352,802	06/268,741	10/5/82
4,352,836	06/255,399	10/5/82
4,352,851	06/217,282	10/5/82
4,352,929	06/268,467	10/5/82
4,352,950	06/226,207	10/5/82
4,352,978	06/308,781	10/5/82
4,352,990	06/243,199	10/5/82
4,352,993	06/300,691	10/5/82
4,352,994	06/261,698	10/5/82
4,353,048	06/305,453	10/5/82
4,353,103	06/252,149	10/5/82
4,353,107	06/234,502	10/5/82
4,353,120	06/250,523	10/5/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,480,293, Re. S.N. 924,403, Filed Oct. 29, 1986, Cl. 362/108, LIGHTED SWEAT SHIRT, Peggy S. Wells, Owner of Record: *PSW, Inc., Sand Springs, Okla.,* Attorney or Agent: Charles S. Cotropia, et al., Ex. Gp.: 340

4,546,296, Re. S.N. 924,920, Filed Oct. 30, 1986, Cl. 318/372, ELECTRIC ACTUATORS, Jack Washbourn, et al., Owner of Record: *Westinghouse Brake and Signal Co., Ltd., Pew Hill, Chipperham, England,* Attorney or Agent: Ross F. Hunt, Jr., et al., Ex. Gp.: 310

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 30,920, Reexam. No. 90/001,123, Requested: Oct. 31, 1986, Cl. 242/152, YARN TENSIONING DEVICE AND METHOD, Otto Zollinger, Owner of Record: *Otto Zollinger, Inc., Spartanburg, S.C.,* Attorney or Agent: None, Ex. Gp.: 240, Requester: Edward J. McBride, Long Pond, Pa.

3,977,091, Reexam. No. 90/001,121, Requested: Oct. 27, 1986, Cl. 165/107, TEMPERING AND STERILIZING DEVICE, Hans Peter Hortig, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 340, Requester: Owner

4,236,467, Reexam. No. 90/001,119, Requested: Oct. 29, 1986, Cl. 112/158.6, SEWING MACHINE WITH DISPLAY UNITS WHICH DISPLAY GUIDANCE DATA GUIDING THE USER IN MANUAL ADJUSTMENT OF OPERATING VARIABLES IN AUTOMATIC RESPONSE TO USER SELECTION OF STITCH TYPE, Yoshikazu Tasaka, et al., Owner of Record: *Janome Sewing Machine Co., Ltd., Kyobashi, Japan,* Attorney or Agent: Striker, Striker, et al., Ex. Gp.: 240, Requester: Gary Lonergan, Alexandria, Va.

4,422,338, Reexam. No. 90/001,124, Requested: Nov. 10, 1986, Cl. 73/861, METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT, James E. Smith, Owner of Record: *Micro Motion, Inc., Boulder, Colo.,* Attorney or Agent: Mary Helen Sears, Ex. Gp.: 260, Requester: Owner

4,472,010, Reexam. No. 90/001,120, Requested: Oct. 28, 1986, Cl. 339/8, TWIST-INHIBITING APPLIANCE FOR CONNECTING A CABLE OF A TELEPHONE SET OR THE LIKE, Nickolas G. Parnello, Owner of Record: *Rosenthal Mftg., Inc., Chicago, Ill.,* Attorney or Agent: Leydig, Voit, et al., Ex. Gp.: 320, Requester: Telephone Products, Inc., Wheeling, Ill.

4,550,136, Reexam. No. 90/001,126, Requested: Nov. 21, 1986, Cl. 524/718, METHOD FOR POLYMERIZING METHYL METHACRYLATE, Ludwig Hosch, Owner of Record: *Rohm GmbH, Darmstadt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 150, Requester: Owner

4,579,530, Reexam. No. 90/001,125, Requested: Nov. 13, 1986, Cl. 433/223, FABRICATION OF PORCELAIN RESTORATIONS, Gerald G. McLaughlin, Owner of Record: *Yukijo Ltd., Oakdale, N.Y.,* Attorney or Agent: Leonard Belkin, Ex. Gp.: 330, Requester: John M. Collins, Kansas City, Mo.

4,593,064, Reexam. No. 90/001,127, Requested: Nov. 21, 1986, Cl. 524/718, METHOD FOR POLYMERIZING METHYL METHACRYLATE, Ludwig Hosch, Owner of Record: *Rohm GmbH, Darmstadt, Germany,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 150, Requester: Owner

4,596,260, Reexam. No. 90/001,122, Requested: Oct. 29, 1986, Cl. 132/73, ARTIFICIAL NAILS, James T.

Giuliano, Owner of Record: *Zotos International, Inc., Darien, Conn.*, Attorney or Agent: George W. Rauchfuss, Ex. Gp.: 330, Requester: Owner

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Horrocks-Ibbotson Co., Utica, N.Y., Reg. No. 551,036, for the mark "HARNELL", Canc. No. 15,704.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 23, 1986

4,157,237	4,584,911	4,601,436	4,610,976
4,338,251	4,585,063	4,601,819	4,611,005
4,422,644	4,585,108	4,602,060	4,611,006
4,432,827	4,587,453	4,602,986	4,611,236
4,437,896	4,587,529	4,603,354	4,611,386
4,451,467	4,588,693	4,603,736	4,611,417
4,456,883	4,588,742	4,604,308	4,611,643
4,457,304	4,588,743	4,604,551	4,611,719
4,466,981	4,588,966	4,605,125	4,612,071
4,469,525	4,591,192	4,605,660	4,612,552
4,469,762	4,591,603	4,606,102	4,613,331
4,501,591	4,591,865	4,606,151	4,613,419
4,503,154	4,591,946	4,606,173	4,613,642
4,505,290	4,592,641	4,606,287	4,613,644
4,506,195	4,592,677	4,606,396	4,613,887
4,523,579	4,592,855	4,606,590	4,614,225
4,535,923	4,593,039	4,606,636	4,614,226
4,544,919	4,593,385	4,607,666	4,614,339
4,550,690	4,593,565	4,608,117	4,614,556
4,552,904	4,594,112	4,608,155	4,614,756
4,553,977	4,594,750	4,608,192	4,614,820
4,559,354	4,595,381	4,608,469	4,615,148
4,560,061	4,595,397	4,608,821	4,615,159
4,563,313	4,595,411	4,608,916	4,615,188
4,572,832	4,595,702	4,608,974	4,615,340
4,573,083	4,597,051	4,609,127	4,616,101
4,575,966	4,598,044	4,609,257	4,616,277
4,576,475	4,598,304	4,609,796	4,616,437
4,577,667	4,599,089	4,609,820	4,616,501
4,578,892	4,599,470	4,610,077	4,617,065
4,580,150	4,599,622	4,610,467	4,617,072
4,580,951	4,600,064	4,610,505	4,617,251
4,582,424	4,600,184	4,610,801	4,618,066
4,582,460	4,601,387	4,610,940	4,619,045

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 8, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,475,765 to 3,480,965, inclusive

Plant Patents . . . . . Numbers 2,937 to 2,944 inclusive

REEXAMINATIONS

DECEMBER 23, 1986

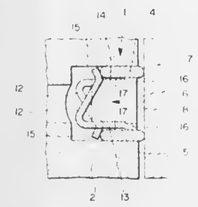
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,429,885 (603rd)

SPACER AND EXPANDER MEMBER FOR HOLDING AND BIASING PISTON RING RAILS

Ko Chiba; Hajime Yamauchi; Yoneo Kawauchi, and Yukio Ikeda, all of Kashiwazaki, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Reexamination Request No. 90/000,871, Oct. 2, 1985.
Reexamination Certificate for Patent No. 4,429,885, issued Feb. 7, 1984, Ser. No. 439,177, Nov. 4, 1982.
Filed Oct. 2, 1985, Ser. No. 439,177
Int. Cl.[4] F16J *9/06, 9/20*
U.S. Cl. 277—140



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

1. A piston ring assembly comprising a pair of rails having cylinder-engaging rounded faces and a spacer and expander member for holding said rails in axially spaced relation and for expanding said rails radially outwardly, said spacer and expander member being constructed of corrugated sheet metal having upper and lower crowns and connecting portions continuously connecting said crowns, each said upper crown being provided at its inner portion with an arm extending downwardly to engage the inner periphery of said rail supported on said lower crown, each said lower crown being provided at its inner portion with an arm extending upwardly to engage the inner periphery of said rail supported on said upper crown, each said arm [being tapered in width] *tapering inwardly in width toward its tip* are provided at its tip with an enlarged rail receiving portion, said arms extending alternately upwardly and downwardly from said lower and upper crowns and being inclined radially outwardly to provide a resilient spring-like action, the rail receiving portions of said arms being inclined radially inwardly.

B1 4,551,177 (604th)

COMPRESSIBLE STARCHES AS BINDERS FOR TABLETS OR CAPSULES

Paolo C. Trubiano, and James J. Kasica, both of Somerville, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Reexamination Request No. 90/000,987, Apr. 14, 1986.
Reexamination Certificate for Patent No. 4,551,177, issued Nov. 5, 1985, Ser. No. 603,021, Apr. 23, 1984.
Filed Apr. 14, 1986, Ser. No. 603,021
Int. Cl.[4] C08B *31/00;* **C08L** *3/00*
U.S. Cl. 106—210

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–17**, **19** and **20** is confirmed.

Claims **1–4** and **18** are cancelled.

[**1**. A starch, useful as a binder for tablets prepared by direct compression or dry granulation or as a binder-diluent for capsules, which consists essentially of a free-flowing, compressible starch powder derived from a cold-water-insoluble, granular starch base by treatment with an acid, and/or alpha-amylase enzyme, the treatment of the starch base and recovery of the free-flowing, compressible starch powder being carried out at a temperature below the gelatinization temperature of the starch; the treated starch being characterized by altered, weakened non-gelatinized granules with a less dense interior and disrupted surface; the compressible starch powder being capable of forming, under direct compression, a tablet having a hardness of at least 5 kg.]

REISSUES

DECEMBER 23, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,312

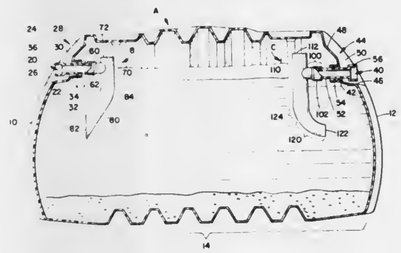
INLET AND OUTLET BAFFLE STRUCTURE FOR SEWAGE TREATMENT TANKS

Fred J. Crates; James L. Fouss, and John J. Parker, all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Original No. 4,363,732, dated Dec. 14, 1982, Ser. No. 152,186, May 22, 1980. Application for reissue Dec. 14, 1984, Ser. No. 681,874

Int. Cl.⁴ B01D *21/02*

U.S. Cl. 210—532.2 **10 Claims**



1. A sewage treatment construction for minimizing fluid turbulence from the ingress of incoming sewage, the construction comprising:

(a) a tank for holding sewage for treatment, said tank including a first end wall which includes an inlet for receiving incoming sewage and a second end wall which includes an outlet for discharging treated fluids;

(b) an inlet baffle structure for introducing incoming sewage into the tank, said inlet baffle structure comprising:

(i) a first generally tubular portion which is operatively connected at one end with said inlet;

(ii) a second generally tubular portion having a vent aperture adjacent one end, the second generally tubular portion being in fluid connection with the other end of said first generally tubular portion;

(iii) a third generally tubular portion defining a fluid introducing opening at one end through which incoming sewage is introduced into the tank, the third tubular portion diverging toward the fluid introducing opening such that the flow rate of incoming sewage tends to be slowed as it approaches the fluid introducing opening, whereby turbulence in the tank is reduced; and

(iv) a transition zone providing fluid connection between the other end of said second generally tubular portion and the other end of said third generally tubular portion;

(c) an outlet baffle structure for receiving treated fluid to be discharged from the tank through said outlet, said outlet baffle structure comprising a second generally tubular structure which is in fluid connection with said outlet and which defines a fluid receiving opening through which treated fluids are received for discharge from said tank.

Re. 32,313

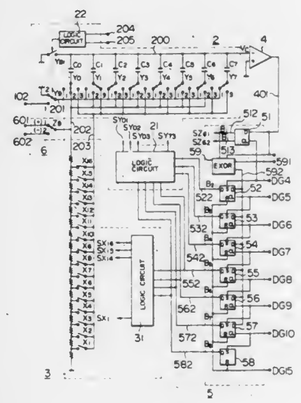
DIGITAL-TO-ANALOG CONVERTER AND PCM ENCODER USING THE CONVERTER

Kazuo Yamakido, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Original No. 4,369,433, dated Jan. 18, 1983, Ser. No. 185,991, Sep. 10, 1980. Application for reissue Jan. 17, 1985, Ser. No. 692,197

Int. Cl.⁴ H03M *1/46*

U.S. Cl. 340—347 DA **13 Claims**



1. A digital-to-analog converter comprising:

a capacitor array circuit inciuding first to eighth capacitors having binary-weighted capacities in ratio, each capacitor having one end thereof connected to an output line, a first common line of a first potential connected to the other ends of said first to eighth capacitors through respective switch contacts of a first switch group, a second common line of a second potential connected to the other ends of said first to seventh capacitors through respective switch contacts of a second switch group, and a third common line connected to the other ends of said first to eighth capacitors through respective switch contacts of a third switch group;

a resistor string circuit including a resistance element connected between said second common line and a source of said first potential, sixteen taps connected to said resistance element at respective points for deriving voltages which correspond to $(2n-1)/33$ (where n represents a given number of 1 to 16) of a voltage applied across said resistance element, and a fourth switch group including a plurality of switches inserted between said third common line and said taps, respectively; and

logic circuit means for controlling selectively the switching operation of said first to fourth switch groups in dependence on a digital signal to be converted, thereby to produce an analog voltage corresponding to the digital signal from said output line.

Re. 32,314

FREQUENCY CONTROL CIRCUITS SUCH AS FOR USE IN MODULATION MEASUREMENT

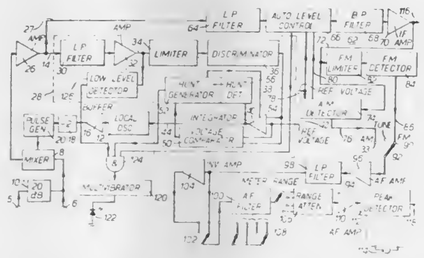
Derek R. Gittins, Wokingham, and Michael D. Gregory, Windsor, both of England, assignors to Racal-Dana Instruments Limited, England

Original No. 3,992,670, dated Nov. 16, 1976, Ser. No. 565,017, Apr. 3, 1975. Application for reissue Nov. 8, 1978, Ser. No. 958,943

Claims priority, application United Kingdom, May 21, 1974, 22510/74

Int. Cl.[4] H04B *17/00*

U.S. Cl. 455—115 **14 Claims**



1. An electrical circuit arrangement responsive to an input signal whose frequency can vary within a first predetermined range and for converting the input signal to a predetermined frequency, comprising

a variable frequency source producing a variable frequency signal variable over a second predetermined range,

mixing means for mixing the input signal with the variable frequency signal so as to produce an intermediate signal whose frequency varies with the two mixed frequencies so as to maintain a predetermined algebraic relationship with the two mixed frequencies as they vary over their said ranges,

discriminator means responsive to the frequency of the intermediate signal as the input signal and the variable frequency signal vary over their respective said ranges, and operative to produce a control signal whose magnitude is dependent on the frequency of the intermediate signal,

a reference [a] signal source,

integrator means for receiving the control signal and the reference signal so as to produce an integrated error signal which is dependent on the difference therebetween,

means responsive to the magnitude of said integrated error signal to produce a second error signal whose value is dependent on the value of said integrated error signal,

means coupled to said integrator means *and responsive to the second error signal* for increasing the rate at which the mean frequency of the intermediate signal is brought to the value represented by the reference magnitude, and

means for feeding the integrated error signal to the variable frequency source to control the frequency of the variable frequency source in such a direction as to bring the mean frequency of the said intermediate signal to a predetermined value represented by the magnitude of the reference signal[.] *the mixing means comprising sampling means operative under control of and in synchronism with the variable frequency signal to repeatedly sample the instantaneous amplitude of the input signal, whereby the said intermediate signal has a frequency dependent on the difference between the frequency of the input signal and a multiple of the variable frequency.*

PLANT PATENTS

GRANTED DECEMBER 23, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,835

ROSE PLANT

Nelson F. Jolly, Galena, Md., assignor to Jolly's Rosehill Farm of Kent, Inc., Galena, Md.

Filed Feb. 15, 1985, Ser. No. 702,376

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by attractive well-formed buds and flowers of the carrot red to Spanish orange color class displayed on a relatively low growing plant with abundant dark green foliage.

5,836

ROSE PLANT INTERSINA

G. Peter Ilsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 11, 1985, Ser. No. 710,591

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long stems having few thorns, pointed buds desirable for cutting, pink coloring suffused over white, little fragrance, short peduncles, petalage of approximately 35.

5,837

PISTACHIO TREE

Henry P. Anderson, III, and Kenneth L. Puryear, both of Pioneer Nursery, 800 N. Chester, Bakersfield, Calif. 93308

Filed Jan. 29, 1985, Ser. No. 696,247

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of pistachio tree (identified as PN-83-F) characterized by a mature tree of rounded upright shape, having several main branches; rapid growth, abundant, leathery foliage, ease of propagation by budding or grafting; and further characterized by the abundant production of female flowers, in clusters, followed by seeds which are especially desirable for planting (when pollenized by the male variety, identified as PN-46-M), said hybrid seeds producing a fast growing, disease resistant tree of value for use as understock upon which to bud or graft commercial nut bearing varieties of pistachio such as 'Kerman'.

5,838

APPLE TREE 'LORIGLO'

Amol O. Akins, Rte. 1, Whitesville, Ky. 42378

Filed Aug. 3, 1983, Ser. No. 495,097

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as shown and described, characterized particularly as to novelty by a unique combination of characteristics, including fruit maturing about two weeks before the Red Delicious with a very attractive appearance and spicy delicious flavor with an attractive red color which is not quite so intense as the Red Delicious.

5,839

PEACH TREE (PRIMECREST)

Georges Carbonneil, Vinca, France, assignor to S.A.R.L. Castang, Gardonne, France

Filed Dec. 24, 1984, Ser. No. 686,132

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized in particular by the regular and very productive bearing of semi-freestone fruit which—while similar to the Springcrest in form, color, and size—ripens approximately two and one-half weeks earlier than the Springcrest.

5,840

STRAWBERRY PLANT—'MR. P'

Harold A. Johnson, Jr., and Amado Q. Amorao, both of Watsonville, Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Feb. 8, 1985, Ser. No. 699,965

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above together with the parts thereof.

PATENTS

GRANTED DEC. 23, 1986

ERRATA

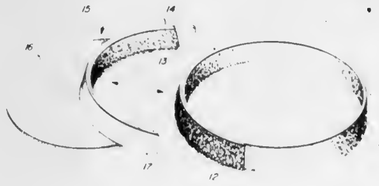
For CLASS	See PATENT NO.
384-045	4,630,872
423-004	4,631,028
540-546	4,631,149
540-310	4,631,150
379-040	4,631,357
379-045	4,631,358
379-324	4,631,359
379-324	4,631,360
379-351	4,631,361
379-384	4,631,362
379-015	4,631,363
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379-167	4,631,365
340-333	4,631,366
379-157	4,631,367
379-029	4,631,368

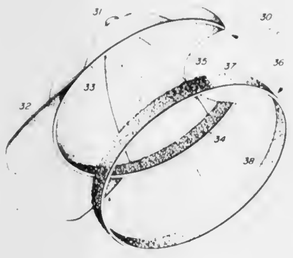
PATENTS

GRANTED DECEMBER 23, 1986

GENERAL AND MECHANICAL

4,630,317
SWEAT BAND APPARATUS
Larry L. Brown, Lantana, Fla., and Jerry H. Lisle, Belleair Beach, Fla., assignors to Larry L. Brown, Lake Worth, Fla.
Continuation of Ser. No. 908,573, May 22, 1978, Pat. No. 4,547,903, which is a continuation-in-part of Ser. No. 672,779, Apr. 1, 1976, abandoned. This application Dec. 31, 1984, Ser. No. 663,200
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—12 **6 Claims**





1. A sweat band visor comprising:
(a) a sweat band, at least a portion of which is an elastic, moisture-absorbing fabric and stretchable to fit around the head of a user;
(b) a strip of hook and loop material attached to, and extending around a substantial portion of the outer periphery of said sweat band; and
(c) a sun visor having an elongated arcuate surface curved for fitting adjacent a person's forehead and extending to the side of the forehead of the user, said arcuate surface having a strip of hook and loop material attached thereto about substantially all of the inside periphery of said arcuate surface for attaching to the co-acting hook and loop material of said sweat band, thereby allowing rapid attachment or removal of a sun visor to said sweat band.

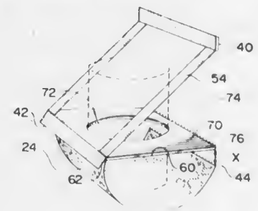
4,630,318
BASEBALL CATCHING MEANS
Akio Aoki, Hirakata, Japan, assignor to Trion Corporation, Japan
Filed Jan. 18, 1985, Ser. No. 692,833
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—19 **2 Claims**

1. A baseball catching means comprising:
a front ply defining a ball receiving area and a back face;
a back ply defining a back side of the baseball catching means;
a lining ply disposed over the back face of the front ply, said lining ply defining a back face;
padding means attached to the top the back face of the lining ply; and



a retainer member for attaching the padding means to the lining ply.

4,630,319
ARTICLE HOLDING MECHANISM FOR A GARMENT AND OTHER SURFACES
Lawrence Mathis, 1451-E Willow Lake Dr., Atlanta, Ga. 30329
Filed Oct. 18, 1985, Ser. No. 789,160
Int. Cl.[4] A41D *27/20*
U.S. Cl. 2—250 **14 Claims**



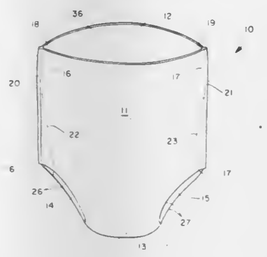
1. A garment having an article holding mechanism comprising:
an outer section having a first edge releasably attached to a first portion of said garment and an opposite second edge pivotably attached to a second portion of said garment for pivotal movement about said second edges, said outer section being movable to an open position in which said first edge is detached from said garment and a closed position in which said first edge is attached to said garment,
a retainer having one edge hingably attached to said first edge of said outer section and a second edge hingably attached to said garment at a position intermediate said first and second portions of said garment;
at least one strap having one end fixed to said first portion of said garment and an opposite end fixed to said first edge of said outer section, said strap having a length sufficient to permit said retainer to extend generally perpendicularly from said garment, said strap being foldably disposed between said outer section and said garment when said first edge of said outer section is fixed to said first portion of said garment; and
support means for retaining said article in said retainer, said support means including an aperture located in said retainer for receiving said article, and a central area of said outer section between said first and second edges, said article being received in said aperture with a base of said article being supported by said central area.

4,630,320

GARMENT WITH ONE OR MORE GUSSETED ADJUSTABLE OPENINGS AND METHOD OF MAKING THE SAME

Paul T. Van Gompel, Hortonville, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 18, 1985, Ser. No. 789,205
Int. Cl.[4] A43B *1/22;* A41B *9/04*
U.S. Cl. 2—406 **26 Claims**



1. A garment including at least one opening for encircling a portion of a wearer's body and having at the periphery of the opening a gusset fold comprised of disengagably bonded together gusset faces, whereby the opening can be increased in size by manual disengagement of at least a portion of the bonded together gusset faces.

11. A panty-type garment having leg openings and including one or more gusset folds at the leg openings, the gusset folds comprising gusset faces being manually disengagably bonded to one another, whereby the leg openings may be adjusted in use to larger sized legs by manual disengagement of at least a portion of the bonded gusset faces.

18. A method for making a garment having adjustable openings therein for encircling a portion of a wearer's body, comprising the steps of:

providing a garment having one or more of said openings therein;

folding material at said opening to form therein gusset faces providing one or more gusset folds at the edge of said leg openings; and

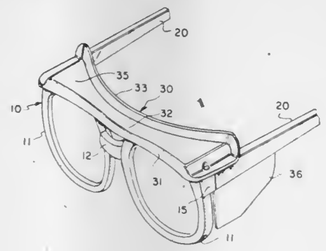
manually disengagably-bonding the gusset faces of a gusset fold to one another.

4,630,321

SAFETY SPECTACLES WITH BROW PROTECTOR

Hans W. Sagemuehl, Cotuit, and Kenneth G. Duffie, Middleboro, both of Mass., assignors to H. L. Bouton Company, Inc., Buzzards Bay, Mass.

Filed Apr. 21, 1986, Ser. No. 854,244
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—426 **6 Claims**



1. A protective spectacle comprising:

(a) a frame including a pair of lens-receiving rims connected by a bridge,

(b) a temple connected to each end of said frame by hinge means,

(c) a brow-protecting bar separate from and extending along the full length of the top of said frame with the ends thereof seated on end portions of said frame, and

(d) means anchoring said bar ends to said frame while leaving the remainder of said bar free of said frame,

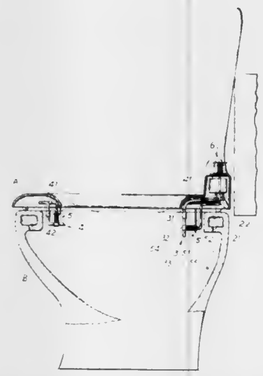
(e) whereby in response to impact on the front of said frame, said frame can move toward the face of the wearer after said bar engages the brow of the wearer.

4,630,322

SPRAYING-ANGLE SELECTOR FOR A TOILET HAVING ADJUSTABLE WATER-SPRAY NOZZLES

Dai-Ming Kuo, P.O. Box 10160, Taipei, Taiwan

Continuation-in-part of Ser. No. 779,833, Sep. 25, 1985. This application Apr. 7, 1986, Ser. No. 849,255
Int. Cl.[4] A47K *3/20*
U.S. Cl. 4—420.4 **1 Claim**



1. A spraying-angle selector for a toilet having adjustable water-spray nozzles comprising: a rotating knob having a hollow cylindrical interior wall and being movably mounted in an upper plate, said interior wall formed with two longitudinal keys, each having a lower tapered end, said keys being symmetrically formed on said wall of the knob, said upper plate having an indicating mark formed on the top surface thereof; a stepwise driving element formed as a cylinder and movably jacketed within said cylindrical interior and formed with a set of rightward-inclined teeth and another set of leftward-inclined teeth, both sets of teeth respectively formed on two helically slope-surfaces equally divided on a perimeter of said cylinder of said driving element, each set of teeth being operatively engaged with the lower tapered end of each said longitudinal key in said knob; a driving bellows having its upper end fixed in a disk portion formed on the bottom of said driving element and having its lower end fixed in a socket of a lower plate, said driving bellows being jacketed with a restoring spring therein; and a bottom plate having a bottom hole fluidically communicated with said driving bellows and with a tube which directs fluid from inside said driving bellows to a follower bellows of a spraying-angle adjuster, said bottom plate fixed on a toilet seat or a frame near the toilet and combined with said upper plate by several connecting means linked therebetween, said spraying-angle adjuster operatively adjusting the water spray angle of a rear-side nozzle or a front-side nozzle adapted for spraying either human anus or genitals portion, whereby upon the rotation of said rotating knob engagement of said longitudinal keys with said two sets of teeth will cause said driving element to descend and press said driving bellows to compress the fluid therein to expand the lower follower bellows for biasing either of said nozzles for selectively changing the desired optimum water-spray angle.

4,630,323

BATHTUB LINER

Dennis R. Sage, and Monica M. Sage, both of 1204 E. Bethany Home, Phoenix, Ariz. 85014

Filed Aug. 2, 1985, Ser. No. 761,689
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—580 **3 Claims**



1. In combination with a bathtub having a drain, an upper peripheral edge, a bottom surface and inner side surfaces, a portable resilient bathtub liner including

(a) a first resilient pad covering and contacting said bottom surface of said bathtub, said pad including an inner core of resilient material enclosed by a layer of water resistent material which detachably adheres to said bottom surface of said bathtub, said pad tapering from one of said ends to the other of said ends such that water in the bathtub flows under the force of gravity from one of said ends down said pad toward said bathtub drain when water is being emptied from said bathtub through said drain;

(b) an upright elongate second resilient pad of generally uniform symmetrical triangular cross section along the length thereof and positioned inside said upper peripheral edge of said bathtub and having

(i) an elongate bottom portion positioned adjacent said first pad and parallel to said bottom surface of said bathtub,

(ii) an elongate top portion generally parallel to said bottom portion,

(iii) a height equal to the shortest distance between said bottom portion and said top portion,

(iv) an outer generally continuous smooth planar surface spanning the distance between said top and bottom portions, facing one of said inner side surfaces of said bathtub, and formed of a material which detachably adheres to said one of said side surfaces, substantially the entire area of said outer surface contacting said one of said side surfaces of said bathtub,

(v) an inner generally smooth planar surface opposed to and spaced apart from said outer surface, spanning the distance between said top and bottom portions, and sloping upwardly from said bottom portion toward said one of said side surfaces of said bathtub and said outer planar surface of said second pad,

the center of gravity of said second pad being in said second pad at a distance from said bottom portion equal to less than one-half of said height of said second pad, the force of gravity's acting on said second pad stabilizing said second pad against said one of said side surfaces of said bathtub; and,

(c) elastic strap means having

(i) a first end attached to said first pad, and

(ii) a second end attached to said bottom portion of said second pad,

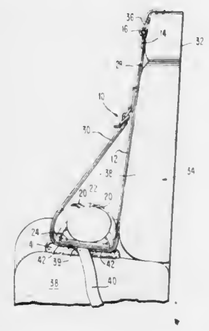
said elastic strap means pulling said bottom portion of said second pad downwardly toward said bottom surface of said bathtub.

4,630,324

TRAVELING RECLINING RESTRAINT AND COLLISION-PROTECTION DEVICE

Kenneth E. Fligsten, and Ann M. Fligsten, both of 507 West Dr., Severna Park, Md. 21146

Filed Nov. 18, 1985, Ser. No. 799,241
Int. Cl.[4] A47C *7/04;* A47D *31/00*
U.S. Cl. 5—94 **13 Claims**



1. A restraint device for restraining a passenger in a moving vehicle, comprising:

a flexible sheeting for cradling the passenger and having first and second end portions and a central portion;

means for securing at least the first end portion of said sheeting to a vehicle seat back;

securement means for securing the passenger in a prone position at the central portion of said sheeting; and

means for attaching the second end of said sheeting to said first end, forming thereby a U-shaped cradle, said central portion of said sheeting forming the curvate portion of said cradle.

4,630,325

METHOD OF AN APPARATUS FOR LASTING SIDES OF SHOES ON LASTS, COMPRISING A SIDE TACK INSERTION DEVICE

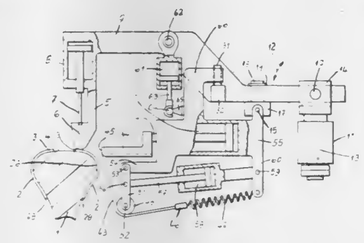
Rudolf Bender, Mucke-Ruppertenrod; Hans-Gerd Dietrich, Friedrichsdorf, and Gerhard Giebel, Bad Soden, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

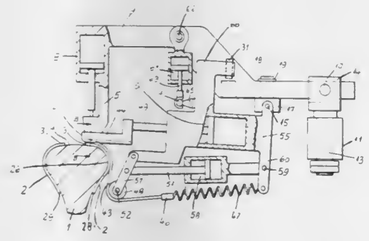
Continuation of Ser. No. 603,508, Apr. 24, 1984. This application Mar. 21, 1986, Ser. No. 842,759

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314906

Int. Cl.[4] A43D *21/12, 23/02, 21/00*

U.S. Cl. 12—8.1 **2 Claims**





1. A combined wiper and tack insertion device for a lasted shoe comprising

a tack insertion device,

an arm for carrying said tack insertion device,

means for supporting said arm for horizontal movement along a selected path,

clamp means for forcefully engaging and tensioning an upper to prepare the upper for tack insertion including

a wiper assembly,

a tensioning assembly, and

housing means for supporting said wiper assembly and said tensioning assembly,

said arm including means for supporting said housing means for rotation about a horizontal axis,

means for forcefully biasing said housinig means from an elevated position towards a lowered position,

said wiper assembly including

wiper means displaceable with said housing means, and

means for horizontally, forcefully displacing said wiper means from a retracted position to an advanced position,

said tensioning assembly including a tension strap secured at one end to said wiper means and having an outer surface adapted to forcefully engage the lasted shoe,

means for non-compressively engaging the inner surface of said tension strap,

means for mounting said non-compressively engaging means on said housing means and

means for pulling the other end of said tension strap.

4,630,326

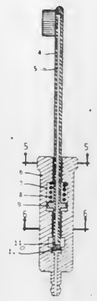
MICRO-STROKE MECHANICAL TOOTHBRUSH

Robert B. Stevens, P.O. Box 26284, Honolulu, Hi. 96825

Filed Jul. 15, 1985, Ser. No. 755,157

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—22 R **1 Claim**



1. A mechanical toothbrush for cleansing and rinsing the sides of the teeth and sulcus by means of a narrow-row soft bristle-brush member that moves through a short-stroke in the direction of the longitudinal axis of the toothbrush stem such that the tips of the bristles of the bristle-brush member tend to remain where placed and produce only an agitation, and wherein, an intermittent stream of water pressure pulses powers the toothbrush and is discharged at the bristle-brush member, comprising;

a tubular toothbrush stem with a hollow channel within the toothbrush stem that receives water through induction ports near the base of the toothbrush stem wherein said water travels within the hollow channel to a bristle-brush member, distal to the toothbrush stem water induction ports, wherein said water is discharged, and wherein, the cross-sectional area of the bristle-brush member has a narrow width of not more than about 0.3 cm by a length of any dimension wherein the length in cross-section is generally parallel in direction to that of the longitudinal axis of the toothbrush stem, and wherein, proximal to the bristle-brush member, within the toothbrush housing, the toothbrush stem is widened to form a flange, and wherein, the toothbrush stem is round in cross-section near its base, where it acts as a piston, and wherein, the toothbrush stem has several flat sides within the toothbrush housing, proximal to the bristle-brush member, so as to prevent rotational motion of the toothbrush stem;

a generally cylindrical housing, that acts as a handle for the toothbrush stem, the longitudinal axis of the housing being in the same direction as that of the longitudinal axis of the toothbrush stem that the housing holds, in part, within it, wherein, within the housing there is a pressurizing conduit that increases the pressure of the intermittent water pressure pulses prior to their impacting upon the toothbrush stem base, and wherein, there is a depressurizing chamber that relieves the pressure of the water pressure pulses after the toothbrush stem has moved a pre-determined short-stroke length distance from the pressurizing conduit wherein the water is directed into the water induction ports of the toothbrush stem by pressure gradient, and wherein, the housing has a spring chamber that houses a spring that acts upon a flange on the toothbrush stem thereby encouraging the toothbrush stem to a position so that the toothbrush stem base is closest to the pressurizing conduit, and wherein, the housing closely holds the toothbrush stem within it.

4,630,327

SINGLE-ARM WINDSHIELD WIPER FOR MOTOR VEHICLES

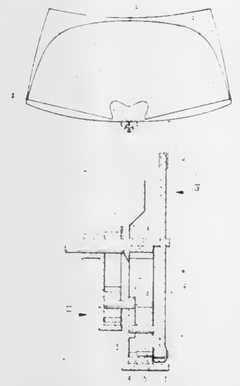
Manfred Schmidt, Sindelfingen; Hans Trube, Herrenberg, and Hermann Grimm, Ostelscheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,054

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427933

Int. Cl.[4] B60S *1/26*

U.S. Cl. 15—250.21 **4 Claims**



1. For motor vehicles, a windshield wiper having at least a single telescope arm, the arm being variable in its effective length during wiper movement,

a drive housing comprising means for guiding the wiper arm during changing of wiper arm effective length,

a first gear rim means provided with internal toothing, the first gear rim means being fixed to the drive housing,

a first pinion means meshing with the first gear rim means for retracting and extending a displaceable part of the wiper arm, wherein the first pinion means has half the pitch diameter of the first gear rim means and being rotatable on a first axis of a crank means,

a shaft of the crank means being rotatably guided on a second axis through an outer wall of the drive housing,

a second pinion means fixed to said shaft outside the outer wall,

a second gear rim means fixed to the vehicle, said second gear rim means meshing with said second pinion means, and

means for articulating the extendable part of the wiper arm to the first pinion means on the pitch diameter of the first gear rim means.

4,630,328

SELF-COMPENSATING SUPPORT ELEMENT AND END CLOSURE THEREFOR

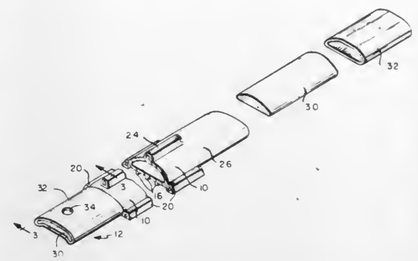
Donald W. Croteau, Oxford, Mass., assignor to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Nov. 27, 1985, Ser. No. 802,693

Int. Cl.[4] G03G *21/00;* **D21G** *3/00*

U.S. Cl. 15—257 R **13 Claims**

1. A self-compensating support element for use in a doctor blade holder or the like, comprising: a hollow elongated flexible tube; an incompressible liquid filling said tube except for the end regions thereof; pliable inserts received in said end regions; and tubular metal sleeves surrounding said end regions, said tube being tightly clamped between said sleeves and



said inserts to seal against the escape of said liquid from said tube.

4,630,329

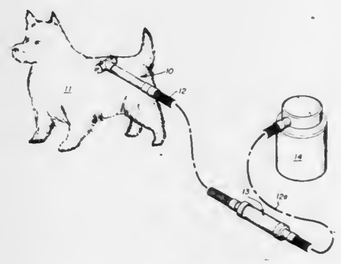
VACUUM ASSISTED FLEA COMBING DEVICE

Stephen Shores, 1112 N. Britain, Irving, Tex. 75061

Filed May 6, 1985, Ser. No. 730,501

Int. Cl.[4] A01M *1/06*

U.S. Cl. 15—368 **4 Claims**



1. A flea combing devise comprising: a vacuum system hollow head including a cylindrical transverse member having a transverse port; a flea comb affixed to said cylindrical transverse member with tines of said flea comb extended through said transverse port; a cylindrical exhaust port member of the hollow head means extending from the cylindrical transverse member at right angles thereto; a hollow cylindrical exhaust extension affixed to and extending coaxially from the exhaust port member; and a means for adjusting a vertical axis of the flea comb from a position at a right angle to a longitudinal axis of the exhaust port member to a multiplicity of acute angle positions to said longitudinal axis.

4,630,330

FASTENING CLIP ROTATABLE IN A HOUSING BORE

Manfred Keller; Rudi Kölle, both of Sindelfingen; Winfried Schreiber, Stuttgart, and Klaus Claar, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,590

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434849

Int. Cl.[4] B23P *11/02*

U.S. Cl. 16—2 **1 Claim**

1. To be rotatably fastened in a housing bore and for receiving a linkage of circular cross-section having a linkage region and a beveled terminal region adjacent thereto,

a fastening clip comprising,

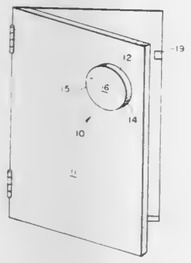
a flange circumferential to the clip located substantially in a central region of said clip,

a plurality of spreadable fastening elements extending from the flange in a first direction,
cylindrical walls extending from the flange in a second direction substantially opposite to said first direction,
each cylindrical wall having an outer surface,
a central passage orifice within the cylindrical walls,
the central passage orifice having an introductory channel in each cylindrical wall remote from the flange for directing the bevelled terminal region of the linkage into said central passage orifice,
each introductory channel having an interior surface,



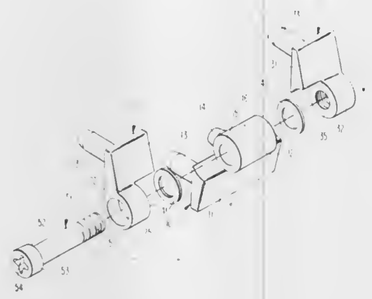
a plurality of clip orifices in said cylindrical walls for holding the linkage region received from the introductory channel of the central passage orifice,
each clip orifice having a periphery,
each of the cylindrical walls being dimensioned so that each clip orifice is enclosed by the cylindrical walls for more than 180° about the periphery of said clip orifice,
and wherein
each of the interior surfaces of the introductory channels is beveled inwardly towards the flange from every point on the outer surface of the cylindrical wall contiguous thereto to a clip orifice.

4,630,331
ONE PIECE CHILD SAFETY HANDLE
Kenneth D. Collister, 130 W. Beardsley, Elkhart, Ind. 46514
Filed Jun. 24, 1985, Ser. No. 747,775
Int. Cl.[4] E05B *1/02*
U.S. Cl. 16—111 R **10 Claims**



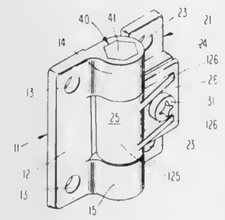
1. One piece child safety handle comprising a substantially circular disc having two substantially parallel sides, each of said sides having a diameter of between about 4.25 inches and about 5 inches and wherein the thickness of said disc between said substantially parallel sides is between about 0.5 inch and about 0.625 inch.

4,630,332
ADJUSTABLE FRICTION PLASTIC HINGE HAVING NON-SQUEAK PROPERTIES
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Continuation of Ser. No. 669,611, Nov. 8, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 800,911
Int. Cl.[4] E05D *11/08*
U.S. Cl. 16—273 **7 Claims**



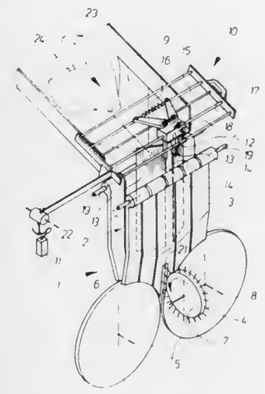
1. An adjustable friction hinge made of different plastic materials selected to have anti-squeak characteristics when in sliding frictional engagement, said hinge comprising:
(a) first means having a leaf portion and a first knuckle projecting therefrom having a bore coaxial with the pivot axis of the hinge;
(b) second means having a leaf portion and spaced-apart knuckles projecting therefrom having bores coaxial with the pivot axis, wherein said second means comprises two separate pieces having integral therewith one of the spaced-apart knuckles;
(c) one of said spaced-apart knuckles having a non-threaded cylindrical bore having an internal shoulder and the other knuckle having an internally-threaded bore;
(d) said first knuckle positioned between said spaced-apart knuckles;
(e) said first and second means formed of a first plastic material having elastic properties;
(f) a single annular washer positioned at each end of the first knuckle, separating the ends of the first knuckle from the ends of the spaced-apart knuckle, and in direct contact with one end of said first knuckle and one end of said spaced-apart knuckles;
(g) said annular washers being formed of a second plastic material selected to be different from said first plastic material such that the coefficients of static and dynamic friction of the first and second plastic materials when in frictional engagement with each other are similar, the difference between the coefficients of static and dynamic friction being substantially less than if the first and second plastic materials were indentical, thereby to provide said hinge with anti-squeak properties, and
(h) an adjustment screw formed of said first elastic plastic material positioned in the bores of said knuckles, said screw having a cylindrical head at its one end for engagement with the internal shoulder of the non-threaded knuckle and having a threaded shank at its other end for threaded engagement with the internally-threaded bore of the other knuckle of the pair, said screw being adapted to elongate slightly when tightened thereby to apply an axial force on the threads of said other knuckle, thereby to maintain the frictional adjustment of said hinge during use.

4,630,333
ADJUSTABLE FRICTION HINGE
James H. Vickers, Middletown Township, Delaware County, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Dec. 16, 1985, Ser. No. 809,342
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.[4] E05D *11/08*
U.S. Cl. 16—338 **4 Claims**



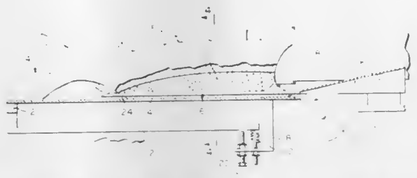
1. An adjustable friction hinge of thermoplastic material, said hinge comprising:
(a) a first hinge leaf having first and second knuckles at spaced separation, each of said first and second knuckles having a non-circular hole therethrough;
(b) a second hinge leaf having a clamping knuckle adapted to be received into the spaced separation between said first and second knuckles of said first hinge leaf, said clamping knuckle having inner and outer clamping extensions for adjusting the inside radius of said clamping knuckle, each of said clamping extensions having a bolt hole therethrough, said bolt holes being in registry with each other, said inner clamping extension having a non-circular recess therein;
(c) a hinge pin having non-circular end portions and a circular cross-section intermediate portion, said non-circular end portions having a maximum diameter larger than that of the circular intermediate portion and also larger than the inside diameter of said clamping knuckle, said non-circular end portions of said hinge pin being received within said spaced-apart non-circular through holes of said spaced-apart first and second knuckles of said first hinge leaf, said circular intermediate portion of said hinge pin being received within the adjustable inside diameter of said clamping knuckle, one of said non-circular end portions of said pin being receivable during assembly within the expanded inside diameter of said clamping knuckle;
(d) an adjustment screw having a shank adapted to pass through said bolt holes of said clamping extensions for adjusting the inside diameter of said clamping knuckle;
(e) a non-circular nut of corresponding size and shape provided in said non-circular recess of said inner clamping extension for receiving a threaded shank portion of said adjustment screw;
(f) said inner clamping extension having at the base of said non-circular recess an integral elevated ring encircling its bolt hole and contiguous to the periphery thereof, the material of said ring being adapted, during tightening of said adjustment screw, to be compressed by said nut and squeezed into the threads of said adjustment screw, thereby to impose sufficient drag on said screw to maintain the adjustment.

4,630,334
DEVICE FOR ALIGNING FISH
Reinhard Evers, Stockelsdorf, and Werner Wenzel, Lübeck, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud., Fed. Rep. of Germany
Filed Oct. 30, 1984, Ser. No. 666,504
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339631
Int. Cl.[4] A22C *25/08*
U.S. Cl. 17—56 **5 Claims**



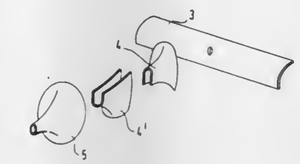
1. A device for aligning the rumps of fish, particularly flat fish, and for feeding the same into a fish processing machine in aligned position, said device comprising:
a. feeding chute means for receiving said fish rumps in aligned head-tail orientation with respect to their longitudinal axes, and for pre-aligning said fish rumps in approximate alignment with the central longitudinal axis of said feeding chute means;
b. feeding shaft means disposed substantially vertically and communicating with the downstream end of said feeding chute means for receiving said pre-aligned fish rumps from the latter, said feeding shaft means having a central longitudinal axis aligned with the central longitudinal axis of said feeding chute means, and including depending guiding elements forming borders of said feeding shaft means, said guiding elements being movably mounted for synchronous and resilient displacement in pairs in response to engagement by said fish rumps;
c. conveyor means communicating with the interior of said feeding shaft means for conveying said fish rumps outwardly thereof;
d. guiding plate means including a pair of depending guiding plates terminating in longitudinal edges; and
e. mounting means pivotally mounting said guiding plates along said longitudinal edges with one longitudinal edge of one guiding plate extending parallel and proximate to one longitudinal edge of the other guiding plate and with said guiding plates being arranged in V-shaped formation opening towards said guiding chute means;
said guiding plates extending downwardly within said feeding shaft means with said guiding plates located symmetrically on either side of said central longitudinal axis of said feeding shaft means, said guiding plates being mounted to pivot resiliently about the axes of their proximate longitudinal edges under contact of the fish rumps passing through said feeding shaft means, thereby increasing the included angle of said V-shaped formation;
whereby said guiding plates center said fish rumps with their longitudinal axes aligned with the central longitudinal axis of said feeding shaft for delivery to said conveyor means.

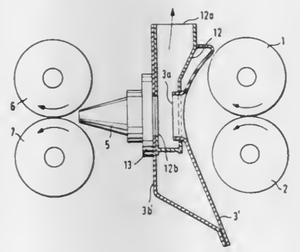
4,630,335
FISH PROCESSOR
Brian J. Claudon, 1604-127th SE, Bellevue, Wash. 98005
Filed Jun. 24, 1983, Ser. No. 507,798
Int. Cl.⁴ A22C *25/08, 25/14*
U.S. Cl. 17—58 **4 Claims**



1. A machine for slicing the belly skin of a fish without damage to the viscera, the slice terminating at the anus comprising:
an upwardly open tray for supporting and guiding a fish in a tail following, belly down condition,
an elongated straight rod having a first end overlying and spaced from the tray and a second end contiguous with a downwardly open hood, said rod being of sufficient length to extend along the inside of the belly skin from the front of the fish and exit the anus,
cutter means mounted within the hood such that a fish placed upon the rod and moved forwardly allows the belly to be sliced, terminating at the anus without damaging the viscera.

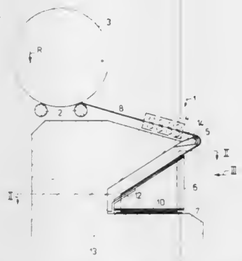
4,630,336
APPARATUS FOR GATHERING A FIBER WEB INTO A SLIVER IN A CARDING MACHINE
Theo Schöpwinkel, and Wilfried Weber, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany
Filed Jul. 27, 1984, Ser. No. 635,259
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327574
Int. Cl.⁴ D01H *13/04*
U.S. Cl. 19—288 **9 Claims**





1. In an apparatus for gathering a running fiber web into a sliver, including a web guide element having edge portions defining an outlet opening through which said web passes; and a trumpet situated downstream of said outlet opening of said web guide element as viewed in a direction of web advance, said trumpet having an entrance opening and an outlet opening and being arranged for compressing said fiber web, the improvement comprising pre-compressing means situated upstream of said trumpet at a distance therefrom for pre-compressing said fiber web prior to its introduction into the entrance opening of said trumpet; said web guide element comprising said pre-compressing means; further comprising at least one trumpet-shaped guide member situated between said outlet opening of said guide element and said trumpet; each trumpet-shaped guide member comprising said pre-compressing means, whereby said pre-compressing means is multi-stage; and guiding means for guiding air, flowing against said direction of web advance and generated by web compression by said trumpet, away from a zone extending between said pre-compressing means and said outlet opening of said trumpet.

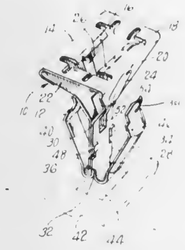
4,630,337
APPARATUS FOR DOUBLING A FIBER WEB
Giuseppe Verzilli, Wiesendangen, and Rene Schmid, Niederneunforn, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland
Filed Oct. 1, 1984, Ser. No. 656,673
Claims priority, application Switzerland, Oct. 10, 1983, 5507/83
Int. Cl.⁴ D01H *5/00*
U.S. Cl. 19—296 **19 Claims**



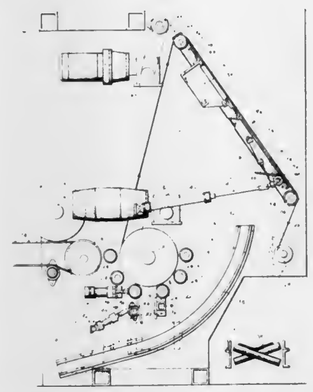
1. An apparatus for doubling webs comprising:
web transport means for transporting a web in a first predetermined transport direction;
a web collecting element for collecting the web delivered by the web transport means and for guiding such for movement in a second predetermined transport direction;
a diverter plate arrangement disposed between said web transport means and said web collecting element for diverting the web from the first predetermined transport direction of the web transport means into the second predetermined transport direction of the web collecting element;
a web diverter arranged between the web transport means and the diverter plate arrangement; and
said diverter plate arrangement being located substantially directly below the web transport means.

4,630,338
MOLDING CLIP
Robert W. Osterland, Marine City, and Nicholas M. Benedetti, Sterling Heights, both of Mich., assignors to USM Corporation, Farmington, Conn.
Filed Dec. 19, 1985, Ser. No. 810,793
Int. Cl.⁴ A44B *21/00*
U.S. Cl. 24—293 **7 Claims**

1. A resilient molding clip for retaining a decorative item in a bridging position over a gap between two spaced members, wherein said clip is received by an aperture in a base disposed within said gap, comprising (1) an upper body position having a planar top containing means adapted to engage and retain the underside of said decorative item; (2) a pair of downwardly and inwardly sloping sides connected to said top which, together with said top, give said upper body portion a triangular cross section; (3) a lower body portion formed by a continuation of said sides in substantially parallel relationship to one another and substantially perpendicular to said top, said lower body portion extending downwardly part the point at which said sides meet in abutting relationship; and (4) a pair of upwardly turning and outwardly facing flexing wings or legs connected to said lower body portion, said wings or legs being adapted to their upper ends to prevent said ends from passing completely through said aperture in said base, said sides each having a cut-out extending into said upper body portion and said lower body portion to permit entry of said upper ends of said flexing wings or legs, thus permitting said wings or legs to be compressed during assembly and disassembly of said clip and said base.



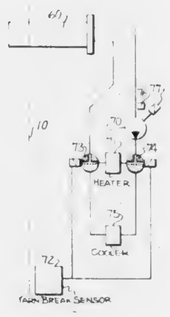
4,630,339
METHOD AND APPARATUS FOR INSPECTING A LENGTH OF MATERIAL
Nicholas L. Morizzo, Cornwall, N.Y., assignor to Krantz America, Inc., Charlotte, N.C.
Filed May 4, 1984, Ser. No. 606,917
Int. Cl.⁴ D06H *3/04*
U.S. Cl. 26—70 **19 Claims**



1. Apparatus for permitting inspection of a length of sheetlike material such as textile fabrics and the like, said apparatus including:
a. mounting means for mounting a pair of spindles in spaced relation to one another with said material being initially wound onto one of said spindles to provide a reach of said material extending in a generally horizontal plane between said spindles, and selectively operable drive means for operating said spindles to cause said material to be unwound from said one of said spindles and onto the other of said spindles;
b. supporting means having a generally flat surface portion across which said material is moved to permit inspection thereof;
c. means for mounting said supporting means at a first position disposed on one side of said plane of said reach of material; and
d. operating means for selectively moving said supporting means and its flat surface portion from said first position in a direction upwardly and through said generally horizontal plane of said reach of material to a second position at the other side of said plane, said operating means including means for disposing said flat surface portion of said supporting means at an acute angle with respect to vertical when said supporting means is at said second position thereof.

16. A method of manipulating a length of sheetlike material such as textile fabrics to permit visual inspection thereof, said method comprising the steps of:
a. providing a reach of said material extending between a pair of spaced spindles in a generally horizontal plane;
b. locating a material supporting member having an extending surface portion at an initial position beneath said reach of material;
c. moving said supporting member in a direction of movement extending upwardly through said plane of said reach of material to cause said material to be engaged by said supporting member and then positioning said supporting member so that said material is supported along said extending surface portion thereof;
d. driving one of said pair of spindles to cause said material to be wound onto said one spindle and unwound from the other spindle while said material is supported along said surface portion; and
e. returning said supporting member to said initial position after all of said material has been wound onto said one spindle.

4,630,340
APPARATUS FOR DRAWING A WARP SHEET OF YARNS
Karl Bauer; Michael Hanisch, and Erich Lenk, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany
Filed Nov. 30, 1984, Ser. No. 676,722
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343499; Feb. 25, 1984, 3406937
Int. Cl.⁴ D02H *13/08;* **D02J** *1/08, 1/22*
U.S. Cl. 28—187 **3 Claims**



1. An apparatus for processing a warp sheet of yarns comprising
means for advancing the warp sheet along a path of travel while drawing the warp sheet,

heating means positioned along the path of travel for applying heat to the advancing warp sheet, and including at least one roll extending transversely across the warp sheet, with said roll having fluid conduit means extending through the interior thereof, a source of heated fluid, and pump means for circulating the heated fluid from said source through said fluid conduit means,

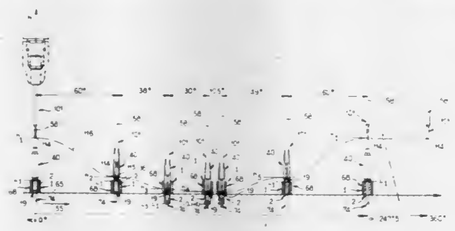
control means for selectively terminating the advance of the warp sheet upon a yarn break or the like, and including means for interrupting the circulation of the heated fluid through said fluid conduit means to thereby interrupt the application of heat from said roll to the warp sheet upon the termination of the advance.

4,630,341

APPARATUS FOR THE INTRODUCTION OF A PIECE INTO A SEAT IN AN OBJECT

Daniel Rohmer, Herrlisheim, and Alain Scherrer, Pfastatt, both of France, assignors to Manufacture de Machines du Haut-Rhin, Mulhouse, France

Filed Dec. 21, 1983, Ser. No. 564,093
Claims priority, application France, Dec. 22, 1982, 82 21557
Int. Cl.⁴ B21D *51/54;* F42B *7/02*
U.S. Cl. 29—1.3 **10 Claims**



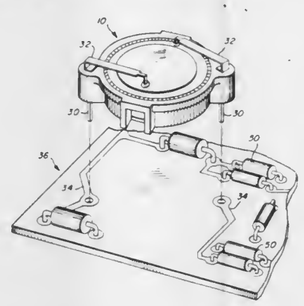
1. In a method of introducing a workpiece into a seat of an object by means of a multi-part vehicle adapted to receive a workpiece therewithin to facilitate the manipulation thereof, comprising at least one tubular lining having a peripheral interior face defining a workpiece receiving space therewithin and a peripheral external face of constant transverse section, and a body in which the lining is mounted for reciprocation along the common axis of the lining and body whereby the lining can be moved from an initial position with respect to the body during the manipulation operation, and can be restored to its initial position with respect to the body following such manipulation, the body presenting an internal peripheral face of constant transverse section which is complementary to the exterior peripheral face of the lining, the lining and body being of equal length so that in one relative position thereof the respective end faces of the body and the lining are coplanar, the seat presenting a predetermined axis and the object presenting, in its zone near the seat an external envelope formed of generatrices parallel to said predetermined axis of the seat, the improvement comprising introducing and retaining the workpiece in the space within the vehicle, coupling the vehicle and the object into a relative position in which the respective axes of the seat and of the space within the lining of the vehicle coincide and in which the seat faces the space, transferring the workpiece from the space to the seat by a relative translation of the workpiece and the space along the common axis thereof, and to separate the vehicle and the object, the body of the vehicle presenting a peripheral interior face of which the section transverse to the axis thereof is complementary to said envelope of the object and, after having introduced the workpiece into the space within the lining of the vehicle, the vehicle and the object are coupled in said relative position by the lining of the vehicle in its said initial position, effecting the transfer of a part while causing a translation of the body with respect to the lining with the lining coupled to the object, to envelope the same by means of the body while allowing it also to engage upon the lining (operation a) and then pushing the workpiece until it goes into the seat (operation b), and thereafter causing the return of the vehicle to the initial position thereof before separating the object therefrom.

4,630,342

METHOD OF MOUNTING A PIEZOELECTRIC HELMHOLTZ TRANSDUCER ON A PRINTED CIRCUIT BOARD

Thomas H. Tichy, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 684,879, Dec. 21, 1984, abandoned.
This application Mar. 10, 1986, Ser. No. 838,441
Int. Cl.⁴ H01L *41/22*
U.S. Cl. 29—25.35 **2 Claims**



1. A method for manufacturing an assembly containing a printed circuit board (PCB) and a piezoelectric transducer comprising the steps of:

(a) mounting the piezoelectric transducer on the PCB, the transducer comprising a piezoelectric driver means for converting applied electric signals into mechanical vibrations which create sound, and Helmholtz resonator means coupled to said driver means for receiving the sound, said resonator means having a resonant chamber defined by bottom, top, and side walls, and at least two ports that provide access to said chamber, at least one of the ports disposed contiguous to both said bottom and side walls;

(b) wave soldering said PCB with said piezoelectric transducer mounted thereto;

(c) applying a cleaning liquid to the soldered assembly; and

(d) causing any cleaning liquid disposed in said resonant chamber to flow out of said resonant chamber unimpeded by the presence of a vacuum since at least two ports in the chamber are provided.

4,630,343

PRODUCT FOR MAKING ISOLATED SEMICONDUCTOR STRUCTURE

John M. Pierce, Palo Alto, and William I. Lehrer, Los Altos, both of Calif., assignors to Fairchild Camera & Instrument Corp., Cupertino, Calif.

Continuation of Ser. No. 362,347, Mar. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 243,987, Mar. 16, 1981, abandoned. This application Sep. 6, 1985, Ser. No. 773,842
Int. Cl.⁴ H01L *21/461*
U.S. Cl. 29—576 W **10 Claims**

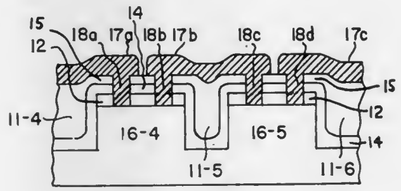
10. The method of forming an isolated semiconductor structure comprising:

forming active devices or selected components in to-be-formed islands of semiconductor material, each island being separated from adjacent islands by a band of semiconductor material in which are formed no active devices, said active devices being formed by placing selected dopants in said to-be-formed islands to form selectively doped regions in said islands;

etching grooves in the surface of the semiconductor material so as to remove a portion of each band in which no active devices were formed, thereby to create a plurality of islands of semiconductor material, each island containing active devices;

oxidizing the semiconductor material exposed by said grooves to form an oxide layer of selected thickness over the surface of said grooves;

forming and smoothing a glass film on the resulting structure by



(a) reacting a gaseous mixture of germane and silane with oxygen at a reaction temperature of from 350°–500° C. to form a mixed germanium oxide/silicon oxide glass vapor;

(b) depositing said glass mixture vapor on said resulting structure as a film, said germanium oxide being about 50 mole percent of the germanium oxide/silicon oxide glass mixture; and

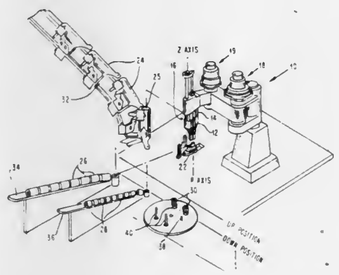
(c) reflowing the resulting glass film at a temperature range of approximately 650° C. to 1000° C. to smooth the surface topography of the film to an essentially flat surface.

4,630,344

APPARATUS AND METHOD FOR ASSEMBLING PARTS

William B. Boyle, Cary, N.C.; Rodolfo Candelaria, Jr., Austin, Tex., and Edward P. Hecker, Coral Springs, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,197
Int. Cl.⁴ B21D *53/10;* B23P *19/02;* B25J *15/00*
U.S. Cl. 29—149.5 R **10 Claims**



1. Apparatus for assembling different size parts in a vertical assembly using a manipulator having a gripper attached thereto, said parts to be assembled each having an opening therein of a diameter slightly larger than a diameter of a section of fingers on said gripper, said apparatus comprising;

a pair of said fingers attached to and extending from said gripper in parallel relationship and movable toward and away from one another under the control of said gripper;

different diameter curved outer sections extending around the periphery of and stepped along the length of said fingers, the smallest diameter curved section located at the outer end of the fingers and successively wider diameter sections located along the fingers as the inner end is approached;

one of said predetermind diameter sections having a predetermined slope;

the diameters of said curved outer sections being small enough when said fingers are in closed position to fit into said opening and to contact the inner surface diameter of the opening in said part to be assembled when the fingers are slightly moved away from one another by said gripper;

said section and its diameter being further selected in accordance with its position along the length of said fingers.

10. A method for automatically assembling different size parts using a manipulator having a gripper with multi-shaped fingers extending therefrom and an assembly fixture located within the work space of said manipulator having a pneumatic cylinder for raising and lowering a base sleeve along a guide post comprising the steps of: 1, picking up a retainer ring from a stack of retainer rings by means of said pair of fingers; 2, raising said base sleeve on said guide post by means of said pneumatic cylinder; 3, placing said retainer ring on said base sleeve; 4, lowering said base sleeve on said guide post by means of said pneumatic cylinder; 5, inserting the pair of fingers into a first bearing a selected distance and opening said fingers so that the outer curved surfaces of said selected sections contact the inner diameter of the opening in the first bearing and placing the bearing on the guide post; 6, inserting the fingers into the opening in the casting and grasping the casting by opening the fingers and placing the casting in the assembly fixture over the bearing on the post and locking the first retainer ring in position; 7, grasping the inner diameter surface of the spacer and placing it in the casting; 8, grasping the inner diameter of the second bearing and placing it into the casting; 9, picking a second retainer ring from a second stack of retainer rings and inserting it into the casting. 10, firing the air cylinder on the assembly fixture to raise the base sleeve thereby pushing the casting onto the fingers of the manipulator which fingers grasp the inside diameter of the assembly fixture while moving to the up position; 11, moving the base sleeve down via the down operation of the pneumatic cylinder so that the casting can be moved and deposited by said manipulator.

4,630,345

METHOD FOR MANUFACTURING A CYLINDER UNIT FOR A CYLINDER PISTON COMBUSTION ENGINE

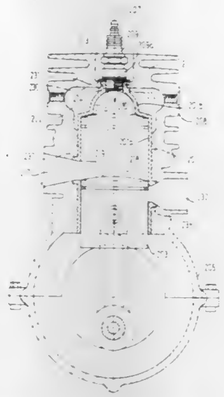
Dieter Lutz, Schweinfurt, Fed. Rep. of Germany, assignor to SACHS-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,693
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310673
Int. Cl.⁴ B23P *15/00, 19/02;* F02F *7/00;* B29B *13/00*
U.S. Cl. 29—156.4 WL **45 Claims**

1. A method of manufacturing an axially extending cylinder unit having a pair of opposite ends spaced apart in the axial direction thereof for a cylinder piston combustion engine, said cylinder unit comprising an internal cylindrical guiding face for a piston extending in the axial direction of the cylinder unit and at least one internal combustion space limiting face at one end of the cylinder unit and extending, at least partially, transversely of the axial direction of the cylinder unit and forming a combustion space, said method comprising the steps of

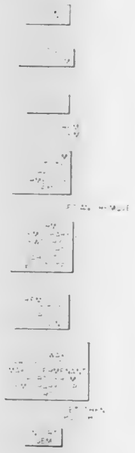
(a) forming the cylinder unit as a lining unit (1) having a longitudinal axis corresponding to the axis of the cylinder unit by one of the forming operations selected from the group consisting of cold impact forming, hot impact forming, deep drawing, press molding and injection molding, said lining unit being a monolithic unit including a cylindrical liner sleeve (1*a*) produced in the forming step and forming said internal cylindrical guiding face and further forming said internal combustion space limiting face, said cylindrical internal guiding face and said internal combus-

tion space limiting face produced in the forming step being ready for operation without further machining,
and said method further comprising the step of



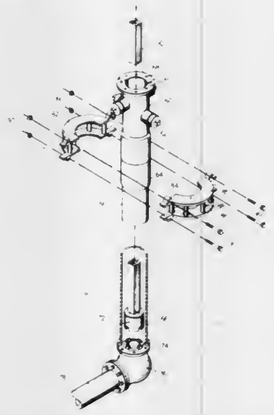
(b) incorporating said lining unit (1) into a cylinder housing (8).

4,630,346
ARTICLE FORMING METHOD
Steven M. Singer, 408 Northlake Ct., Apt. 306, North Palm Beach, Fla. 33408
Filed Mar. 20, 1985, Ser. No. 714,114
Int. Cl.⁴ B23P *5/00*
U.S. Cl. 29—160.6 **4 Claims**



4. A method of making jewelry having a setting to retain a gem therein, comprising, in combination, the steps of:
forming a replica of the gem, said replica having an external configuration being substantially identical to the external configuration of the gem;
crafting a temporary wax gem retainer having an artistic design thereon about the replica, said retainer adhering substantially to the external configuration of the replica so that said replica cannot be physically removed from the temporary retainer without substantially destroying the artistic design thereon or without destroying the replica;
destroying the replica in situ without affecting the artistic design of the setting of the temporary retainer;
forming a permanent setting of cast metal having the artistic design thereon from the temporary setting by a lost wax process;
installing the gem in the cast metal fitting with a minimum of adjustments thereto, whereby the gem is securely held.

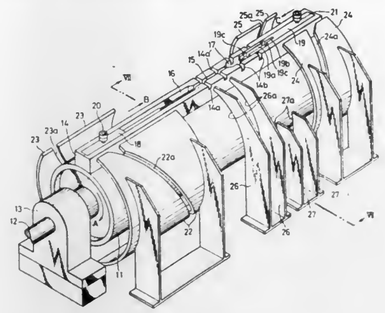
4,630,347
HYDRANT VALVE TOOL
James E. Chilton, 9409 Shady Valley, Dallas, Tex. 75238
Filed Jul. 22, 1985, Ser. No. 757,654
Int. Cl.⁴ B25B *17/00*
U.S. Cl. 29—213 R **15 Claims**



1. A hydrant tool assembly for removing or installing a seat ring and a valve from a hydrant shoe located beneath a hydrant, said tool assembly comprising:
valve cap means including a rectangular extension bar for mating with said seat ring and extending through a top portion of the hydrant;
hydraulic means attachable to the top portion of the hydrant for providing a torque force to the valve cap means; and
lever means attachable to the hydraulic means for enabling leveraged manual turning of the valve cap means.

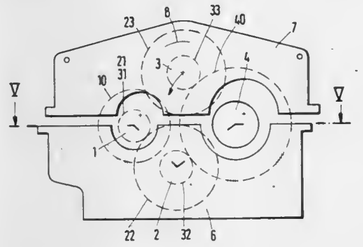
4,630,348
DOUBLE-PIPE COMBINING DEVICE
Katsumasa Hoshi, Hasuda, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 419,624, Sep. 17, 1982, abandoned. This application Aug. 20, 1985, Ser. No. 767,633
Claims priority, application Japan, Sep. 22, 1981, 56-139820[U]; Sep. 22, 1981, 56-139819[U]; Aug. 30, 1982, 57-149223
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—234 **6 Claims**

1. A double-pipe combining device comprising a revolver,
a pipe combining means arranged on the outer surface of said revolver in the axial direction of said revolver and comprising a first pipe receiving means, and a second pipe receiving means respectively formed in the state that they are longitudinally aligned with each other, and a pipe pusher slidably arranged in said pipe combining means in the state that said pipe pusher is longitudinally aligned with said first and second pipe receiving means, and
a cam mechanism for moving said pipe pusher forward and backward when said revolver is rotated to complete one rotation,
said double-pipe combining device being arranged to combine a smaller-diameter pipe and a larger-diameter pipe by rotating said revolver after placing said smaller-diameter pipe and said larger-diameter pipe respectively in said first and second pipe receiving means, said cam mechanism serving to move said pipe pusher forward so that said pipe



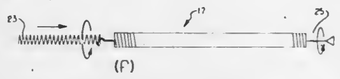
pusher pushes one of said two pipes in order to combine said two pipes and further serving to move said pipe pusher backward to the original position thereof.

4,630,349
METHOD FOR ASSEMBLING TWO-WAY TRANSMISSION GEARS WITH POWER DISTRIBUTION
Josef Hellerhoff, Lowick; Peter Bunse, Rees, both of Fed. Rep. of Germany, and Hans te Beest, Dinxperlo, Netherlands, assignors to A. Friedr. Flender GmbH & Co. KG, Bocholt, Fed. Rep. of Germany
Filed Apr. 29, 1985, Ser. No. 728,570
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418543
Int. Cl.⁴ B23P *11/00;* **F16H** *5/52*
U.S. Cl. 29—434 **6 Claims**



1. A method of assembling power-distributing two-way transmission gear means within a gear case comprising a lower portion and an upper portion forming a partition joint, said gear means comprising an axially freely adjustable shaft having fixed thereto for rotation therewith pinions with oppositely extending helical teeth, said gear means also comprising a driving gear disposed between said pinions for effecting power distribution through said axially freely adjustable shaft, said gear means also comprising two power branches with each power branch including an intermediate shaft, a driven shaft carrying thereon a driven gear and having an axis disposed with the axis of said axially freely adjustable shaft in the plane of said partition joint of said gear case, said intermediate shafts being mounted for rotation and being individually installed in said lower portion and in said upper portion, a gear and a pinion with rigid interconnection to the lower intermediate shaft, and a pinion and a gear connected to the upper intermediate shaft;
the method comprising:
placing said driven shaft into half bores of said lower portion;
placing said axially freely adjustable shaft having said pinions fixed thereto into corresponding half bores of said lower portion in a position displaced by a predetermined value in a suitable direction relative to the operational position of said axially freely adjustable shaft, whereby one of said pinions fixed to said axially freely adjustable shaft and said gear connected to said lower intermediate shaft come to mesh with each other;
pivoting said upper portion inwardly such that initially said pinion connected to said upper intermediate shaft comes into full mesh with said driven gear;
further lowering said upper portion so that said gear connected to said upper intermediate shaft comes into mesh with another of said pinions fixed to said axially freely adjustable shaft as placed into position, with said other pinion fixed to said axially freely adjustable shaft as placed into position with axial displacement; and
further lowering said upper portion to reach its final position so that said other pinion of said axially freely adjustable shaft and said gear connected to said upper intermediate shaft come to full mesh with each other under rotation and axial displacement of said axially freely adjustable shaft to reach its operational position.

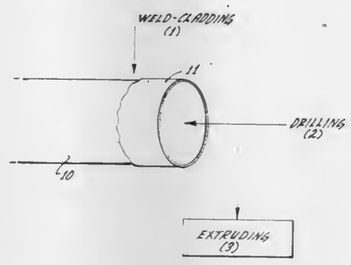
4,630,350
METHOD FOR MAKING A FLEXIBLE CORRUGATED RUBBER TUBING WITH INTERNAL REINFORCEMENT
Vance M. Kramer, Sr., 2341 Townly Rd., Toledo, Ohio 43614, and Vance M. Kramer, Jr., 853 Oak Knoll, Perrysburg, Ohio 43554
Continuation-in-part of Ser. No. 665,350, Oct. 26, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 822,538
Int. Cl.⁴ B23P *11/02;* **B29C** *65/64*
U.S. Cl. 29—453 **1 Claim**



1. A method for making flexible, corrugated rubber tubing with helical corrugations combined with an internal helical reinforcing component, comprising the steps of:
positioning an extruded sleeve of unreinforced, uncured rubber on a forming mandrel;
placing an external, collapsible helical form around said sleeve to define helical convolutions;
expanding said sleeve radially to form radial bulges between said convolutions;
axially foreshortening said sleeve and said helical form to form embryonic corrugations in said sleeve;
heat-treating said rubber sleeve to set said corrugations to form a flexible length of unreinforced, corrugated rubber tubing with a helical internal groove having a root diameter approximately equal to the inner diameter of said helical form;
forming a helix of relatively stiff, resilient wire rod having about the same helix outer diameter as the root diameter of said internal helical groove;
placing said wire rod helix adjacent to and in axial alignment with said length of corrugated rubber tubing while holding the end of said helix opposite said rubber tubing;
extending an elongated pulling tool axially through said length of corrugated rubber tubing from the end opposite said wire rod helix;
gripping with said pulling tool the end of said wire rod helix adjacent said corrugated rubber tubing;
pulling said wire rod helix with said pulling tool toward said corrugated rubber tubing while simultaneously rotating said pulling tool to reduce the diameter of said wire rod helix, thus maintaining a relatively constant pitch;
moving said stretched wire rod helix axially through said tube and simultaneously rotating it in a direction to thread said helix into said length; and
thereafter releasing said pulling tool from said helix whereby

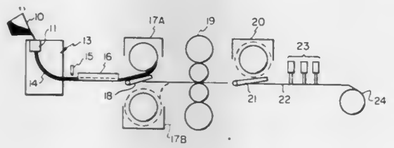
said helix expands radially into tight conformance with said groove.

4,630,351
MAKING CLAD SEAMLESS PIPES
Eckhard Kranz, Meerbusch, and Karl Düren, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany
Filed Nov. 2, 1981, Ser. No. 317,132
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044589
Int. Cl.⁴ B23P *17/00*
U.S. Cl. 29—527.2 **5 Claims**



1. Method of cladding steel tubes or pipes on the outside, comprising the steps of
providing a steel blank;
weld depositing a high-alloyed cladding material with a ferrite content not exceeding 50% onto the blank, an outer diameter of the blank being at least five times the thickness of the welded-on material;
drillig a bore into the blank at a diameter range of $\frac{1}{8}$th to $\frac{1}{3}$rd the blank diameter to obtain a tubular body; and
extruding the resultiing tubular body toward obtaining desired dimensions.

4,630,352
CONTINUOUS ROLLING METHOD AND APPARATUS
Vladimir B. Ginzburg, and George W. Tippins, both of Pittsburgh, Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.
Filed Sep. 4, 1984, Ser. No. 646,956
Int. Cl.⁴ B21B *1/46, 41/00;* **B22D** *11/12*
U.S. Cl. 29—527.7 **4 Claims**



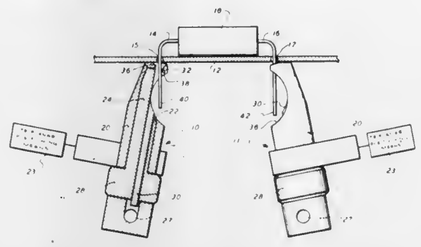
1. A method of casting metal slabs and rolling said metal slabs into strip and/or sheet in line comprising the sequential steps of:
(a) continuously casting a continuous steel slab having a thickness capable of being coiled;
(b) equalizing the temperature of the forward section of said continuous slab to provide a substantially homogeneous temperature therein;
(c) cutting off the forward section from said continuous slab to form an individual slab having the desired length;
(d) coiling alternative individual slabs in a first coiler furnace and in a second coiler furnace vertically disposed relative to said first coiler furnace and located downstream of a continuous caster and upstream of a rolling mill; and
(e) rolling each individual slab to strip by paying off said individual slab through said rolling mill from one of said vertically disposed coiler furnaces while taking up the following individual slab on the other of said vertically disposed coiler furnaces so that the speed of the continuous casting is coordinated with the rolling speed to provide a substantially uninterrupted method of continuous casting and rolling.

4,630,353
INSULATION COVERING STRIPPING DEVICE
Takashi Okazaki, Toyonakashi; Yukio Matsu'ura, Takatsukishi, and Yoshihiko Saijo, Ibaragishi, all of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Osakashi, Japan
Filed Sep. 13, 1985, Ser. No. 775,773
Claims priority, application Japan, Sep. 13, 1984, 59-192268
Int. Cl.⁴ B23P *23/00;* **H01R** *43/05, 43/01*
U.S. Cl. 29—564.4 **3 Claims**



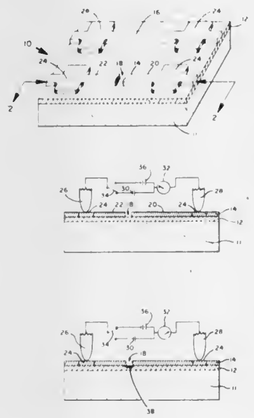
1. An insulation covering stripping device for use in combination with automatic apparatus for making electrical harnesses, wherein the apparatus includes a wire feed path extending substantially horizontally and axially of the apparatus; a connector attaching device comprising a cooperating assembling punch and die pair disposed on respective sides of the wire feed path, and a wire cutting blade located adjacent to the punch and die pair; a connector supplying device for supplying connectors to the assembling die; a first chuck reciprocally movable along the wire feed path for pulling out wires in an advancing movement for a distance corresponding to a desired length of the electrical harness; a second chuck for holding the supplied wires laterally at equal intervals, and guiding the same to the connector attaching device along the wire feed path, the second chuck reciprocally movable in a small range during which movement to align top ends of the wires, characterized in that the insulation covering stripping device comprises:
a third moving chuck for adjusting lengths of insulation covering to be stripped, the third moving chuck being located between the connector attaching device and the second moving chuck;
a stripping length varying device for varying the lengths of insulation covering to be stripped, the device being located between the second and third moving chucks, and including a plurality of varying plates which correspond to individual wires so that when the varying plates are moved down to push the wires individually, the wires are slackened downward, thereby causing the top ends of the wires to withdraw in accordance with a slackened portion; and
a stripping blade for slitting the insulation covering so that the insulation covering is removed from the slit when the wires are pulled backward, wherein end portions of the wires are differentiated in length by the stripping length varying device.

4,630,354
ELECTRICAL COMPONENT LEAD BENDING AND CUTTING APPARATUS
Theodore Staviski, 293 High Crest Dr., West Milford, N.J. 07480
Filed Apr. 22, 1985, Ser. No. 725,425
Int. Cl.⁴ B23P *23/00, 19/04;* **H05K** *3/32*
U.S. Cl. 29—566.4 **19 Claims**



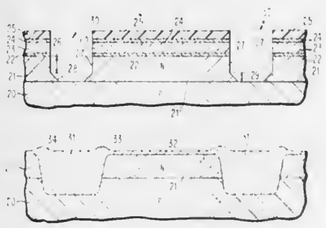
1. A lead bending and cutting apparatus comprising:
a rotatable element having an axis of rotation, a cutting face, and a longitudinal offset bore extending from said cutting face;
a housing having an internal cavity which cooperatively receives and substantially encloses said rotatable element, said rotatable element mounted within said housing for rotatation about said axis of rotation, said housing having an entrance opening which communicates with said bore at said cutting face when said rotatable element is positioned such that said bore and said opening are approximately adjacent to each other; and
drive means for rotating said rotatable element with respect to said housing.

4,630,355
ELECTRIC CIRCUITS HAVING REPAIRABLE CIRCUIT LINES AND METHOD OF MAKING THE SAME
Robert R. Johnson, Franklin, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.
Filed Mar. 8, 1985, Ser. No. 709,876
Int. Cl.⁴ H01L *21/66, 21/42*
U.S. Cl. 29—575 **20 Claims**



1. A method of making a circuit assembly comprising:
providing a supporting substrate;
forming a plurality of conductive lines supported on said substrate to interconnect circuit elements supported or to be supported on said substrate;
forming a deposited phase-change material capable of being changed from an intially relatively disordered, relatively high resistance state to a more ordered, more crystalline relatively low resistance state by the application of sufficient energy, said deposited phase-change material being located in electrical contact with at least portions of said conductive lines to form electrically parallel paths between selected portions of said conductive lines;
detecting at least one open circuit portion in one of said conductive lines within at least one of said selected portions; and applying sufficient energy to said phase-change material within said at least one selected portions of said conductive line having said detected open circuit portion to cause the inducement of a phase change within said phase-change material from said initially high resistance state to said low resistance state to form an electrically shunting conductive path around said detected open circuit portion of said one conductive line.

4,630,356
METHOD OF FORMING RECESSED OXIDE ISOLATION WITH REDUCED STEEPNESS OF THE BIRDS' NECK
Rosemary Christie, Hopewell Junction; Bao-Tai Hwang; San-Mei Ku, both of Poughkeepsie, all of N.Y., and Janet M. Sickler, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 19, 1985, Ser. No. 777,800
Int. Cl.⁴ H01L *21/467, 21/76, 21/94*
U.S. Cl. 29—576 W **18 Claims**



1. Method of forming a recessed oxide isolation with reduced steepness of the bird's neck in a silicon substrate comprising:
providing a semiconductor silicon substrate;
forming on said substrate surface a mask stack of first silicon dioxide layer, polycrystalline silicon layer, second silicon dioxide layer and silicon nitride layer in that order;
patterning said mask stack to form openings at the areas where it is desired to form an oxide isolation pattern within said semiconductor substrate;
anisotropically reactive ion etching the silicon substrate exposed by the openings in said stack to a first portion of the desired depth obtaining therein trenches having substantially vertical walls;
chemically etching said silicon substrate to extend the trenches to a second portion of the desired depth and obtain inwardly sloped walls in the second portion; and
thermally oxidizing the exposed silicon in said trenches to form said isolation with reduced steepness of the bird's neck.

4,630,357

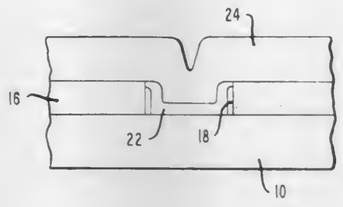
METHOD FOR FORMING IMPROVED CONTACTS BETWEEN INTERCONNECT LAYERS OF AN INTEGRATED CIRCUIT

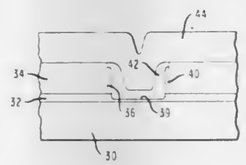
Steven H. Rogers, Midwest City, Okla., and Thomas J. Hwang, Fremont, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 2, 1985, Ser. No. 761,945

Int. Cl.[4] H01L *21/285, 21/88*

U.S. Cl. 29—590 11 Claims





1. A method of forming improved contacts with a metallic lower layer of an integrated circuit comprising:

depositing a dielectric layer over said metallic lower layer;

forming an opening through said dielectric layer;

conformally depositing a layer of a first material of silicon over said dielectric layer;

removing said first material from horizontal surfaces of said dielectric layer;

selectively forming a refractory metal layer on the non-horizontal walls of the opening by reaction with retained first material; and

forming a metallic second layer over said dielectric layer and said refractory metal layer in said opening.

8. A method of forming improved contacts with a refractory metal lower layer of an integrated circuit comprising:

depositing a buffer layer of silicon material over said refractory metal lower layer;

depositing a dielectric layer over said buffer layer;

forming an opening through said dielectric layer having vertical side walls and a horizontal bottom formed of a portion of said buffer layer;

conformally depositing a layer of a first material of silicon over said dielectric layer, including said vertical side walls, and said horizontal bottom;

removing said first material of silicon from exposed horizontal surfaces of said dielectric layer and from said horizontal bottom, leaving at least a portion of said buffer layer over the bottom of said opening;

selectively forming a refractory metal first layer in said opening by reaction with retained first material on said vertical side walls and said buffer layer portion covering the bottom of said opening; and

forming a metallic second layer over said dielectric layer and said refractory metal first layer in said opening.

4,630,358

METHOD OF MAKING AN ELECTROSTATIC TRANSDUCER OF THE MOVING COIL TYPE

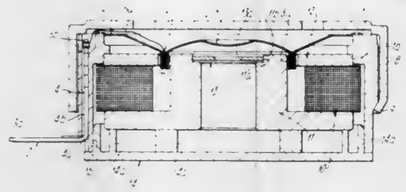
Frank Taylor, Bromley, and Trevor Burton, Maidstone, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Aug. 16, 1984, Ser. No. 641,563

Claims priority, application United Kingdom, Aug. 16, 1983, 8322052

Int. Cl.[4] H04R *31/00*

U.S. Cl. 29—594 8 Claims



1. A method of making an electroacoustic transducer capsule of the moving coil type comprising:

providing a first buffer store with a plurality of first sub-assemblies each comprising a moulded plastics carrier ring with a diaphragm secured thereto and a speech coil secured to the diaphragm concentric with a circular locating reference datum in the ring;

providing a second buffer store with a plurality of magnet assemblies each having a circular locating rim and an annular air gap in which the speech coil will be positioned;

providing a third store with a plurality of closure members for closing the rear of the transducer, and feeding the first sub-assemblies, the magnet assemblies and the closure members automatically to an assembly machine which first locates the rim of the magnet assembly against the reference datum with the speech coil positioned in the air gap and then secures the closure member onto the rear of the carrier ring to close the capsule and hold the magnet assembly against the reference datum.

4,630,359

METHOD OF MAKING MERCURY CONTAINING REED SWITCHES

John Hill, Cincinnati, Ohio; Henryk Turczanski, and Cyril E. Coote, both of Kent, England, assignors to Standex electronics (UK) Limited, Kent, England

Continuation-in-part of Ser. No. 400,001, Jul. 20, 1982, abandoned. This application May 24, 1985, Ser. No. 738,064

Claims priority, application United Kingdom, Jul. 24, 1981, 8122946

Int. Cl.[4] H01H *11/02*

U.S. Cl. 29—602 R 11 Claims

1. A method of making amalgamated plated contact blades for reed switches, comprising the following steps:

providing reed switch contact blades having tips which serve as contact areas;

plating the contact areas of said blades with a first layer of gold;

heating the gold plated blades in a first heating step to cause the gold to diffuse into the underlying material;

plating the contact areas of the blades with a second layer of gold;

providing a container having a mercury-wettable inside bottom surface coated with a thin layer of mercury, said container being of sufficient size to hold a plurality of switch contact blades loosely and approximately vertically;

placing said blades, tips down, in said container and agitating the combination of blades and container, causing said switch contact blade tips to rub on said mercury-coated

container bottom, to coat the tips of the switch contact blades with mercury and cause some amalgamation of the second layer of gold to occur;



heating the blades in a second heating step to cause further amalgamation of said second gold layer to occur.

4,630,360

METHOD OF MAKING DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH

Rolf H. Ochsner, Trumbull, and Charles J. Everett, Clinton, both of Conn., assignors to Robert Shaw Controls Company, Richmond, Va.

Filed Apr. 15, 1985, Ser. No. 723,065

Int. Cl.[4] H01H *35/38*

U.S. Cl. 29—622 9 Claims



1. In a method of making a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid terminals that have body portions thereof disposed substantially parallel to each other and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals from each other when said switch means is in another operating condition thereof, said method comprising the steps of disposing actuator means in said housing means so as to be responsive to differential pressures acting across the same, and operatively associating said actuator means with said switch means to cause said switch means to be in said one condition thereof when having a certain differential pressure acting across the same and to cause said switch means to be in said other condition thereof when having another certain differential pressure acting across the same, the improvement comprising the steps of bending the free ends of said terminals toward each other so that said free ends are each disposed at an angle relative to said body portion of its respective terminal, forming said switch means to comprise a movable contact member and a biasing means operatively associated with said contact member for urging said contact member into bridging contact with said free ends of said terminals and thereby cause said switch means to be in said one condition thereof and for permitting said contact member to be moved out of engagement with said free ends of said terminals and thereby cause said switch means to be in said other condition thereof, and disposing said contact member and said biasing means between said terminals before the step of bending said free ends of said terminals whereby said step of bending said free ends of said terminals confines said contact member and said biasing means between said terminals.

4,630,361

PROCESS FOR PREPARING A VACUUM SWITCH TUBE

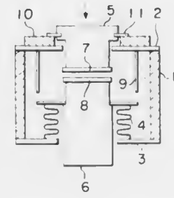
Kouichi Inagaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,152

Claims priority, application Japan, Oct. 24, 1983, 58-198652; Mar. 6, 1984, 59-43134

Int. Cl.[4] H01H *11/00*

U.S. Cl. 29—622 13 Claims



1. A process for preparing a vacuum switch tube having a vacuum envelope having both ends closed by end plates in which a stationary electrode and a movable electrode are placed opposing each other and an electric path is opened and closed by the connection and disconnection of said electrodes, comprising the steps of:

providing a pre-assembled vacuum switch tube having a clearance between an opening of one of said end plates of said vacuum envelope and a stationary electrode rod passing through said opening and connected to said stationary electrode;

forming an enlarged diameter part in said stationary electrode rod at a position where said rod extends outside of said one of the end plates to the outside of said vacuum envelope;

forming a step at said opening of said one of said end plates;

spacing said enlarged diameter part from said one of said end plates by arranging at least one piece of non corrugated plate-like brazing material between said enlarged diameter part and radially outer portion of said step at said end plate over less than the entire length of said clearance;

putting said pre-assembled vacuum switch tube into a vacuum furnace; and

evacuating air and raising temperature in said vacuum furnace to connect said stationary electrode rod to said end plate by melt-bonding said brazing material.

4,630,362

APPARATUS FOR INSTALLING ELECTRICAL ON FLAT CONDUCTOR CABLE

Alajos Z. Bauer, Norwalk, and Michael A. Verespej, Trumbull, both of Conn., assignors to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 314,966, Oct. 26, 1981, abandoned. This application Mar. 27, 1985, Ser. No. 716,600

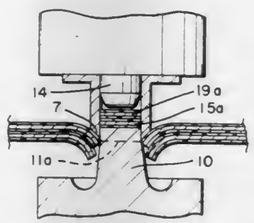
Int. Cl.[4] H01R *43/045*

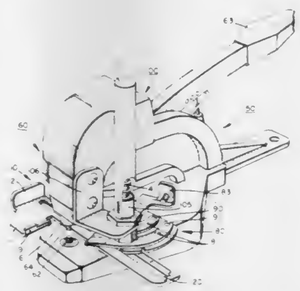
U.S. Cl. 29—751 16 Claims

1. Apparatus for installing connectors onto flat conductor cables having a plurality of spaced conductors comprising:

(a) a supply of one piece connectors, each of said connectors being formed of an electrically conductive material and being of a one piece construction;

(b) means for locating a predetermined one of the conductors of the flat conductor cable at an installation station;
(c) means for removing a single connector from the supply and aligning the single connector with the predetermined conductor and
(d) means for pressing the single connector into the flat conductor cable and into physical contact and electrical contact with the predetermined conductor, the means for





pressing including a fixed anvil means and a ram means movable toward the fixed anvil means for moving a single connector through the flat conductor cable and predetermined conductor and into contact with the fixed anvil whereby the single connector is deformed into the flat conductor cable so that the connector is secured to the flat connector cable and predetermined conductor and electrical current can pass from the predetermined conductor to the connector.

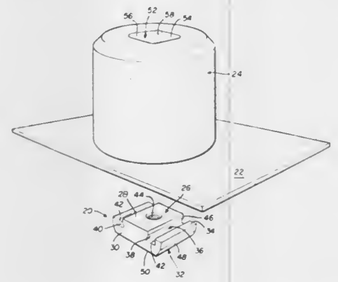
4,630,363

SEALED NUT AND PANEL ASSEMBLY APPARATUS

Harold T. Woods, Livonia, Mich., assignor to Multifastener Corporation, Southfield, Mich.

Division of Ser. No. 397,756, Jul. 13, 1982, Pat. No. 4,484,385. This application Apr. 15, 1985, Ser. No. 700,799
Int. Cl.⁴ B23D *19/00*
U.S. Cl. 29—798 **2 Claims**

1. An apparatus for forming a low pressure fluid sealed nut and panel assembly, comprising:
a self-piercing nut having a rectangular pilot including a top face for piercing an opening in the panel, said nut having end walls generally perpendicular to said top pilot face and flange portion on opposed sides of said pilot, said flange portions having bearing surfaces lying in a plane spaced from said pilot top face and said nut having grooves on opposed sides of said pilot in said flange bearing surfaces, said grooves having an inner side wall adjacent said pilot, a bottom wall and an outer side wall extending to said flange bearing surfaces,
a die member having a generally rectangular opening configured to closely receive said nut pilot portion and cooperating with said nut pilot portion to pierce a slug from a panel received between said self-piercing nut and said die member, the width between the opposed end walls of said die member opening receiving said nut being less than the width of said nut pilot between said end walls and said die opening having arcuate corners, said die member end walls and corners sheering and deforming said pilot nut edges at said end walls and corners simultaneously sheering and deforming the top four corners of the nut pilot toward the plane of the flange bearing surfaces forming a panel bearing surface on said pilot receiving the main portion of said panel spaced below said pilot top face and extending the length of said nut end walls and around said pilot corners into said grooves with the pierced edges of said panel supported on said nut pilot bearing surface in sealed relation, and said die member including upstanding



elongated clinching lips on opposed sides of said die opening, said clinching lips being truncated including a flat top portion and tapered side walls, including tapered inner side walls receiving said pierced panel edges and deforming said edges into said grooves against said nut inner groove side walls in sealed relation spaced from said groove bottom wall, and said clinching lip top walls deforming said panel against said groove bottom walls, the panel portion deformed in said nut grooves thereby being continuous with said main panel portion and said panel being in sealed engagement with said bearing surfaces of said nut pilot and flanges, providing a continuous low pressure seal between said nut and said panel.

4,630,364

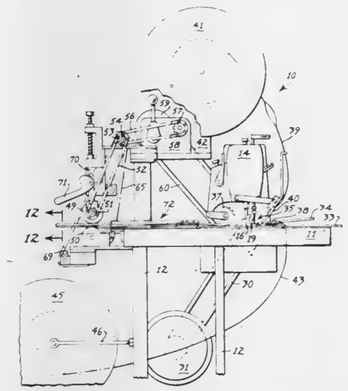
APPARATUS FOR APPLYING FASTENER TAPE TO FABRIC PIECES

Leo W. Fyfe, Nashville, and A. Matthew Seaman, Brentwood, both of Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed May 1, 1985, Ser. No. 729,258
Int. Cl.⁴ B23P *21/00*
U.S. Cl. 29—779 **8 Claims**

1. An apparatus for securing a pair of fastener tapes, having cooperative faces, to a pair of fabric pieces, each piece having a longitudinal edge, and to each other, comprising:
(a) applicator means for securing a first elongated fastener tape face up to a first fabric piece along the longitudinal edge of said first fabric piece, and for securing a second elongated fastener tape face down to a second fabric piece along the longitudinal edge of said second fabric piece, at an applicator station, said applicator means having front and rear portions,
(b) first guide means for guiding said first and second fabric pieces, during movement of said fabric pieces in a longitudinal rearward direction through said applicator station, and in a substantially coplanar position in which the longitudinal edges of said fabric pieces oppose each other.
(c) second guide means for guidings said first fastener tape above said first fabric piece and along the longitudinal edge of said first fabric piece, and guiding said second fastener tape below said second fabric piece and along the longitudinal edge of said second fabric piece, during

movement of said fastener tapes in said longitudinal rearward direction through said applicator station,
(d) rear guide means for guiding said first and second fabric pieces away from said applicator station, said rear guide means being spaced longitudinally rearward of said applicator station and including a lower rear elongated guide member and an upper rear elongated guide member, each of said guide members having front and rear end portions, and each of said guide members comprising an elongated guide element, each guide element being on a longitudinal side of its respective guide member, said guide elements limiting edgewise movement of the fabric pieces guided by said guide members,



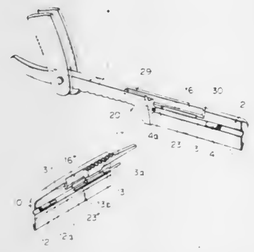
(e) mounting means mounting said upper rear guide member above and at an angle to said lower rear guide member, said front end portions being spaced transversely of each other relative to said longitudinal direction, and said rear end portions being in substantial vertical alignment with each other,
(f) draw means for pulling said first and second fabric pieces into an overlapping relationship from said rear end portions of said lower and upper guide members with said first and second fastener tapes having their opposing cooperative faces in substantially vertical alignment with each other, and for compressing said fastener tapes together to secure said cooperative faces in cooperative engagement, said draw means being behind said rear end portions of said upper and lower guide members.

4,630,365

BLADE REPLACEABLE TYPE BARBER RAZOR

Yoshikatsu Imaizumi, Kanagawa, Japan, assignor to Warner-Lambert K.K., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,001
Claims priority, application Japan, Oct. 11, 1983, 58-155772
Int. Cl.⁴ B26B *21/10*
U.S. Cl. 30—53 **7 Claims**



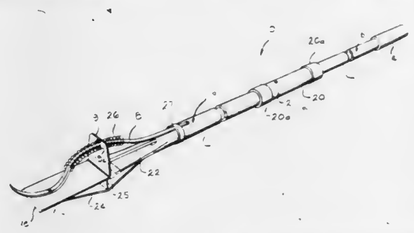
1. In a blade replaceable type barber razor including a razor body comprising a handle portion and a first blade holder half made integral with said handle portion, a second blade holder half engaged by a hinge connection to said first blade holder half for clamping a blade between a first blade clamping surface of said first holder half and a second blade clamping surface of said second holder half, said second blade holder half serving as a cover for the razor body and a slidable wedge slidably in a slide groove extending substantially in parallel with the axis of the hinge connection, in ridge portions of both the blade holder halves, said slidable wedge having an opposing pair of side surfaces which are brought in wedging engagement to inner side wall surfaces of the slide groove, wherein at least one of the first holder half and the second holder half has hinge pins fixedly secured thereto which are adapted to be inserted into associated pin holes on at least one of the second holder half and the first holder half so that the first holder half and the second holder half are engaged to one another by said hinge connection about the hinge pins inserted in the pin holes by sliding movement of the second holder half relative to the razor body, the improvement consisting in that a recess is provided in the corner area as defined between a forward end face of the slide groove and the inner wall surface of the first holder half located opposite to the first blade clamping surface and a rigid projection, projected from the inner wall surface of the second holder half toward the first holder half to come in engagement with said recess, is provided in the corner area as defined by the forward end face of the slide groove and the inner wall surface of the second holder half located opposite to the second blade clamping surface and that the height of said rigid projection is so determined that when no blade is clamped between the first and second holder half, the projection is allowed to move out of engagement with the recess by movement of the second holder half around the hinge connection relative to the first holder half, but when a blade is clamped, the projection comes in engagement with the recess.

4,630,366

WEED CUTTING AND EXTRACTING TOOL

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Filed Jan. 21, 1986, Ser. No. 820,701
Int. Cl.⁴ A01B *1/16;* **B66F** *3/00*
U.S. Cl. 30—124 **20 Claims**



9. An improved tool for cutting and extracting weeds from the ground which comprises:
(a) an elongate shaft means having a longitudinal axis with opposed first and second ends along the axis;
(b) a flat blade means having top and bottom ends and top and bottom sides mounted on the first end of the elongate shaft means parallel to the axis, wherein the bottom end of the blade means has a weed cutting edge;
(c) a flat retaining spring means with a connected end attached to the first end of the elongated shaft and with a free end extending from the connected end over the top side and between the top and bottom ends of the blade so as to be in contact with the blade adjacent the cutting edge and curved away from the cutting edge at the free end wherein the weed is grasped between the blade means and the flat spring means during and after cutting of the weed by the blade;

(d) an ejector plate means moveably mounted adjacent the top side of the blade so as to be linearly moveable towards and back from the bottom end of the blade parallel to the axis and supporting the flat spring, wherein the flat spring is lifted from contact with the blade when the ejector means is moved towards the bottom end to eject the weed grasped between flat spring means and blade means from the tool; and

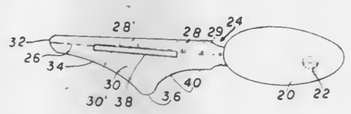
(e) a linearly moveable handle means mounted between the first and second ends and along the axis of the elongate shaft means and connected to the ejector plate means to move the ejector means towards and away from the bottom end of the blade means.

4,630,367

PRODUCE KNIFE WITH DEPTH-LIMITING AND PEEL AIDING FENCE

David Pressman, 1237 Chestnut St., San Francisco, Calif. 94109, and Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Filed Jun. 18, 1984, Ser. No. 621,607
Int. Cl.⁴ B26B *3/00*
U.S. Cl. 30—279 R **7 Claims**



1. A knife for making cuts of controlled predetermined, variable depths for cutting through orange skins or the like which have a thickness within a predetermined range, comprising, in combination:

an elongated, flat, side-cutting blade, one elongated edge thereof being sharpened, said blade having a tip at a distal end thereof and a heel at a proximal end thereof,

a handle, at said heel of said blade, for manually holding said blade at said heel thereof so that said blade extends out of said handle and so that said sharpened edge of said blade can be manually used to cut at least partially through an object in a cutting direction which is generally perpendicular to said direction of elongation of said edge and parallel to the plane of said blade, and

fence means (a) mounted on and attached to at least one side of said blades, (b) comprising an outward protrusion perpendicular to said blade and spaced back and away from said sharpened edge of said blade, and (c) arranged to limit the depth of cut which can be made by said blade in said cutting direction to any selected value within said predetermined range such that blade can be used to cut through produce skins in a direction perpendicular to such skins and through any skin thickness in said predetermined range, and so that said outward protrusion will limit the depth of cut which can be made by said blade to any selected value within said predetermined range without cuttng into the flesh of said orange skin or the like,

said outward protrusion comprising a tongue portion for facilitating peeling of an orange rind,

whereby said blade can be used to cut directly through produce skins of any thickness within said predetermined range without cutting into the flesh thereof.

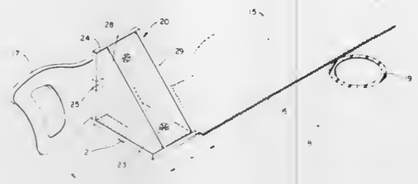
4,630,368

FLUSH CUT HANDSAWS

Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Mar. 11, 1985, Ser. No. 710,230
Int. Cl.⁴ B26B *29/00*
U.S. Cl. 30—289 **2 Claims**

1. A flush cut saw comprising in combination, a flat saw blade, handle mounting means comprising two walls at substantially a right angle to each other, said walls forming two outer flat rectangular surfaces, said blade being affixed to one of said walls on the flat outer surface thereof, a handle affixed to the other of said walls positioned substantially parallel along



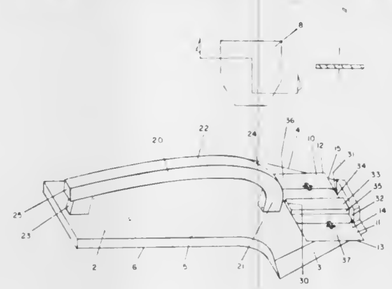
the plane of said other wall for propelling the saw blade with said handle oriented to lie in a plane substantially perpendicular to the saw blade to position the flat saw blade flush on the surface above which a projecting object is to be removed, said flat blade being in flush contiguous contact with the surface.

4,630,369

TWO BLADED WALLPAPER TRIMMER

Tommy E. Bourland, 308 Barcelona St., Vallejo, Calif. 94591

Continuation-in-part of Ser. No. 583,824, Feb. 27, 1984, abandoned. This application Aug. 19, 1985, Ser. No. 766,682
Int. Cl.⁴ B26B *29/00*
U.S. Cl. 30—294 **8 Claims**



1. A handtool for close edge cutting and trimming of sheet material, the tool being of the pull-type intended for manual use and pulled toward the user in a forward direction during the cutting and trimming action, said tool comprising:

a base plate having an upper side and a flat underside for slidably engaging the sheet material and maintaining secure pressure against the material;

the base plate having a triangular shape and being beveled along at least one side to provide a guide edge for creasing the material into a corner;

an upwardly projecting handle fixedly secured to the upper side of the base plate;

a pair of horizontally extending recesses formed in the upper side of the base plate each for receiving a cutting blade separated by a dividing strip that locates the blades;

a cutting blade removably mounted in each of said recesses and having a cutting edge extending outwardly beyond said guide edge to cut the material while it is being engaged by said flat underside and creased by said guide edge; and

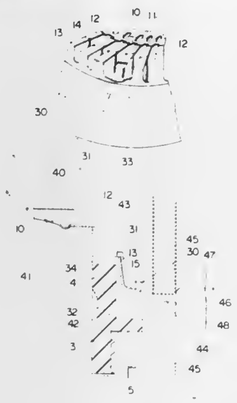
means for securedly removably holding the cutting blade within said recess.

4,630,370

OUTER CUTTER ASSEMBLY FOR AN ELECTRIC SHAVER

Toshikazu Hamada, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Jun. 20, 1985, Ser. No. 746,836
Claims priority, application Japan, Jun. 20, 1984, 59-126819
Int. Cl.⁴ B26B *19/14*
U.S. Cl. 30—346.51 **5 Claims**



1. An outer cutter assembly for an electric shaver which comprises:

an outer shearing foil formed with a plurality of hair entrance peripheral perforations arranged along the periphery thereof to be in hair shearing relation with an inner blade sliding against the inner surface of the outer shearing foil;

a base frame on which the outer shearing foil is mounted with its peripheral edge supported thereby;

a comb forming plastic member provided between the peripheral edge of the outer shearing foil and the upper end of the base frame to have its lower portion connected to the base frame, said comb forming member being provided at its upper portion with a comb having teeth defining between the adjacent ones thereof slits each of which is in open communication with one of the peripheral perforations as well as located inside of the outer shearing foil, the teeth being in alignment with each of a plurality of webs separating adjacent ones of the peripheral perforations;

adjoining means for bringing each of the teeth in intimate contacting relation with each corresponding one of the webs to thereby prevent the presence of any gap therebetween;

said base frame being formed at its upper end with a projection which defines said adjoining means projecting into said comb forming member to separate the comb from the lower portion of the comb forming member in such a way that the upper portion undergoes shrinkage upon its solidification substantially independently of the shrinkage in the lower portion of the comb forming member, whereby the comb is subjected to a lesser amount of shrinkage so as to assure an intimate contacting relation between the teeth of the comb and the webs of the outer shearing foil.

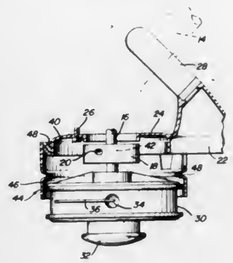
4,630,371

LINE TRIMMER SHIELD

Andrew J. Graham, R.F.D. 1, Box 323, Todd, N.C. 28684

Filed Feb. 6, 1986, Ser. No. 826,100
Int. Cl.⁴ A01G *3/06*
U.S. Cl. 30—347 **8 Claims**

1. In combination with a line trimmer head assembly including a sector-shaped debris shield radiating outward therefrom and wherein the apex end portion of the shield terminates in a rounded base portion having a central aperture formed therethrough and secured to the underside of the head with a line reel mounting shaft end portion extending downwardly from the head, projecting through the aperture and having a "bumping" type line release line reel head mounted thereon beneath said rounded base portion, a tall grass and/or weed entanglement shield comprising an upright axially short sleeve member



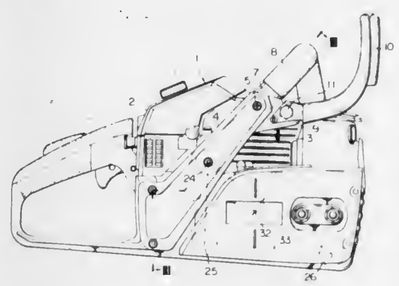
including an upper end extending about and mounted from the outer periphery of said base portion, said upper end including upwardly opening peripherally spaced notch means formed therein registered with, providing clearance for and receiving adjacent portions of the apex portion of said debris shield therein, said sleeve member including a lower end Projecting downward from said debris shield and loosely telescopingly engaged over the upper portion of said line reel head.

4,630,372

FRONT HANDLE SUPPORT MEANS OF PORTABLE CHAIN SAW

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,922
Claims priority, application Japan, Sep. 7, 1983, 58-137811[U]
Int. Cl.⁴ B27B *17/02*
U.S. Cl. 30—381 **2 Claims**



1. Front handle support means of a portable chain saw having a built-in internal combustion engine serving as a power source, comprising:

a handle support arm connected to one lateral side of a machine frame and extending upwardly, said handle support arm having an upper end secured to one end of a handle pipe of a front handle;

a projection formed integrally at an upper end portion of the handle support arm and extending forwardly to pivotally support a hand guard;

said hand guard having integrally formed therewith an arm for cooperation with an actuating lever of a brake band, whereby forward movement of said hand guard effects

rearward movement of said arm to move said brake band actuating lever and effect braking of the chain saw; and

shock absorber means mounted on an inner side of said handle support arm to connect the internal combustion engine therethrough to the machine frame.

4,630,373

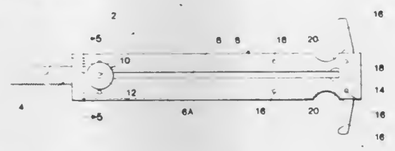
RETRACTABLE UTILITY SAW

Robert A. Staurseth, Rte. #1, Box 426, Poplar, Wis. 54864

Filed Apr. 29, 1985, Ser. No. 728,340

Int. Cl.[4] B23D *45/00*

U.S. Cl. 30—514 **8 Claims**



2. A hand utility saw comprising:

a saw blade having a proximal and a distal end and a plurality of saw teeth disposed along at least one edge thereof;

an elongated handle comprising first and second handle portions, said first handle portion including a lengthwise extending saw blade receiving slideway recessed into an interior surface thereof and a slot through said first handle portion coextensive over a portion of and transverse to said slideway, said second handle portion including an interior blade storage cavity, and wherein said slideway and said storage cavity mount in opposed facing relation to one another;

means mounted to said saw blade in said slideway and through said slot for securing said saw blade to said first handle portion, upon achieving a desired exposure of said saw blade from said handle.

4,630,374

BRIDGE TYPE COORDINATE MEASURING MACHINE

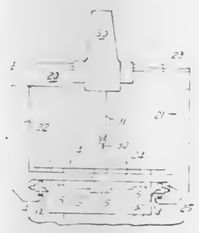
Freddie L. Raleigh, Centerville, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 24, 1985, Ser. No. 694,377

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—1 M **13 Claims**



1. A bridge type coordinate measuring machine of the type having a base (**10**) having a horizontal table surface (**11**) for supporting a work piece to be measured, a bridge (**20**) having a closed loop configuration that extends around said table surface (**11**), by passing above and below the table surface (**11**) of said base (**10**), said closed loop configuration formed by two uprights (**21**, **22**) extending vertically above and below the level of said table surface, a first horizontally extending member (**23**) joined at one end to one of the uprights (**21**, **22**) and joined at the other end to the other of said uprights so as to extend across and above the table surface (**11**) of said base (**10**), and a second horizontally extending member (**24**) joined at one end to one of said uprights, and joined at the other end to the other of said uprights, so as to move with said bridge along said first horizontal axis, means (**25**, **12**, **13**, **41**) for mounting the bridge (**20**) to the base for movement along a first horizontal axis including horizontally extending guideways (**12**, **13**) supporting said bridge and along which the uprights (**21**, **22**) of the bridge (**20**) move; the second horizontal extending member (**24**) located at a vertical level below the table surface (**11**) of said base (**10**) and above the vertical level of the ways (**12**, **13**) a probe (**30**); means (**50**, **31**) for mounting said probe (**30**) on said first horizontal member (**23**) of said bridge (**20**) for movement along a second horizontal axis and a vertical axis, said first and second horizontal axes and said vertical axis orthogonally arranged, said mounting of said bridge and said probe thereby enabling movement of said probe about orthogonal axes to measure distances on a workpiece positioned on said table surface (**11**) of said base (**10**), the means for moveably mounting the bridge (**20**) to the base (**10**) characterized by:

a pair of said guideways (**12**, **13**), each one thereof coacting with a respective plurality of bearings (**41**), said guideways and bearings located below the upper table surface (**11**), one (**12**) of said guideways and its respective bearings (**41**) located at one side of said base (**10**) and the other (**13**) of said guideways and its respective bearings located at the opposite side of said base (**10**), one of said guideways (**12**) having a sidewardly facing surface that faces in the opposite direction of a sidewardly facing surface of the other guideway (**13**), so that the bearings (**41**) apply forces in opposite directions against the uprights (**21**, **22**) of the bridge (**20**).

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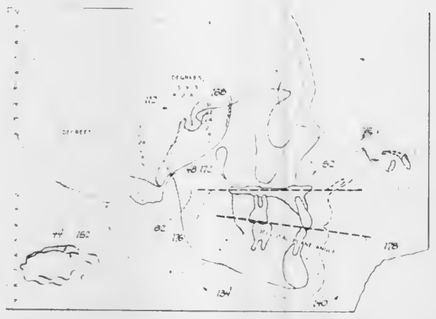
APPARATUS FOR GAUGING AND DETERMINING SPATIAL COORDINATES FOR A SOURCE OF RADIATION TO BE EMPLOYED IN OBTAINING A RADIOGRAPH OF A PATIENT

John L. Spolyar, 2769 Homewood Dr., Troy, Mich. 48098

Filed May 2, 1985, Ser. No. 729,614

Int. Cl.[4] G01B *11/28*

U.S. Cl. 33—1 B **7 Claims**



1. Apparatus for gauging and determining the spatial or angular position of the axis of an X-ray source relative to a patient's head for purposes of obtaining a least obstructed X-ray exposure of the patient's TMJ in an X-ray image comprising, template-like gauge means, said gauge means comprising plate-like body means, said body means at least for the most part being transparent, a reference point designation carried by said body means, reference line means carried by said body means, and a read-out portion carried by said body means, said read-out portion comprising a plurality of gauge areas, wherein when said plate-like body means is placed against an associated lateral cephalogram and said reference point is situated at the articulare of said cephalogram and the palatal plane of said cephalogram is positioned at least parallel to said reference line means the sella of the sella turcica of said cephalogram appears within one of said plurality of gauge areas, and wherein said sella by its appearance within said one of said plurality of gauge areas determines a corresponding set of angular coordinates for use in positioning the radiation axis of said X-ray source for the next following X-ray exposure of said TMJ.

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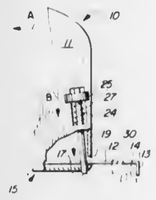
MARKING DEVICE FOR TAPE MEASURE

Randal L. Pentecost, P.O. Box 2882, Flagstaff, Ariz. 86003

Filed Apr. 26, 1985, Ser. No. 727,734

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—138 **1 Claim**



1. A measuring device including

(a) a graduated measuring tape coiled about a transverse axis;

(b) a housing for said tape, said housing including:

(i) a pair of opposed, spaced apart side walls bouding said coiled tape, said side walls having upper and lower portions,

(ii) a front wall spanning the space between and interconnecting said side walls, said front wall having an upper and a lower portion,

(iii) a top portion including said upper portions of said front and side walls,

(iv) a bottom portion including said lower portions of said front and side walls,

(v) a mouth formed through said lower portion of said front wall, said measuring tape being extended through said mouth from within said housing, and

(vi) an aperture formed in said bottom portion generally adjacent said mouth; and,

(c) an inscription unit mounted inside said housing adjacent said front wall and having

(i) an elongate member with a point for forming a mark on the surface of a workpiece,

(ii) thumb rest means extending through and outwardly from one of said side walls and operatively associated with said elongate member to move said elongate member between at least two operative positions,

a first normal operative position with said pointd positioned inside said housing behind said front wall, and

a second operative position with said point displaced downwardly from said first operative position through said aperture to a position generally directly beneath said front wall and mouth thereof,

said thumb rest means being positioned on said side wall such that an individual can pick up said housing in one hand, extend said tape from said housing to make a measurement on a workpiece, and utilize a digit of the hand to operate said thumb rest means to make a mark on the workpiece at a point directly beneath said mouth of said tape meausre,

said elongate member being canted from the vertical such that displacement of said point from said first to said second operative position forwardly displaces said point from within said housing and from behind said front wall to a position outside said housing and generally directly beneath said front wall and said mouth.

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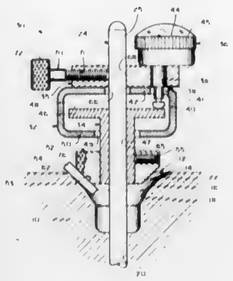
VALVE SEAT RUNOUT GAGE

Michael H. Schneider, Chesterfield, and Thomas J. Chadwell, Warson Woods, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Oct. 17, 1985, Ser. No. 788,492

Int. Cl.[4] G01B *5/24*

U.S. Cl. 33—181 AT **13 Claims**



1. A gage for indicating the runout condition of a valve seat edge formed by and between adjacent valve seat surfaces of a valve seat adjacent one end of a valve guide bore and concentric with the axis thereof, the valve guide bore accommodating an elongated pilot member that extends therefrom through the valve seat surfaces, said gage comprising a housing member adapted to be mounted on the pilot member in fixed spaced relationship from the valve seat, dial indicator means mounted on the housing at a location spaced radially from the pilot member, said dial indicator means having a plunger member extending therefrom substantially parallel to the pilot member and indicator means operatively connected to the plunger member and movable in response to movements of the plunger member to produce a visual indication as to the position of the plunger member, a work engaging member mounted for rotatable and axial movement on the pilot member in the space between the housing and the valve seat, said work engaging member including an annular portion and an elongated member mounted thereon at an angle for slidable engagement with the valve seat edge whose runout is to be indicated, said work engaging member having a second portion including an end face slidably engageable with the plunger member whereby rotation of the work engaging member when the elongated member is engaged with the valve seat edge translates into movements of the plunger member to produce indications as to the runout of the valve seat edge on the dial indicator means.

4,630,378

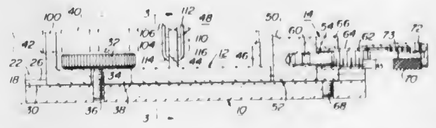
GAUGE FOR EXTENSIBLE-BLADE SURGICAL KNIFE

Rodney J. Kulp, Harleysville, and Andrew J. Furey, Philadelphia, both of Pa., assignors to Pilling Co., Fort Washington, Pa.

Filed Jun. 13, 1985, Ser. No. 744,407

Int. Cl.[4] B27G *23/00*

U.S. Cl. 33—185 R **10 Claims**



1. A gauge for facilitating adjustment of the extent to which the blade tip of an extensible-blade surgical knife projects beyond the end of a cutting depth limiting foot attached to the body of the knife comprising:

a base having guide means;

a cradle slidably supported on said base and guided by said guide means;

means on the cradle for holding the body of an extensible-blade surgical knife so that the cutting edge of the blade lies in a plane parallel to the direction of extension and retraction of the blade and fixed with respect to the cradle;

gauge means on said base comprising a gauge element having an edge located closely adjacent to said plane and substantially parallel thereto, said edge extending transverse to the direction of extension and retraction of the blade, said gauge element being capable of movement relative to the base parallel to said plane, through a range of positions including a reference position fixed with respect to the base, so that a projection of said edge onto the blade, in a direction perpendicular to said plane, is movable in the direction of extension and retraction of the blade as the gauge element moves, and indicator means providing a reading of the position of said gauge element relative to the reference position; and

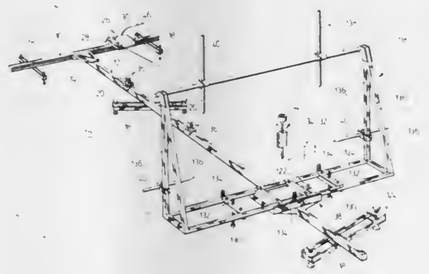
releasable means for fixing the cradle with respect to the base, thereby fixing the location of the cradle relative to said reference position of the gauge element while allowing said movement of the gauge element relative to the base.

4,630,379

LASER GAUGING SYSTEM AND COMPONENT PARTS THEREFOR

John T. Wickmann, Omemee, and Richard Olak, Peterborough, both of Canada, assignors to Chart Industries Limited, Ontario, Canada

Filed Sep. 2, 1983, Ser. No. 529,201
Int. Cl.[4] G01B *5/255*
U.S. Cl. 33—288 **20 Claims**



1. A laser gauging apparatus for measuring a vehicle during construction of and repair of said vehicle, said apparatus comprising:

support means positionable below said vehicle;

laser means mounted on said support means for projecting said least one horizontally extending beam portion beneath said vehicle, said horizontal beam portion defining a horizontal datum plane under said vehicle from which measurements to said vehicle are obtainable, said laser means additionally projecting a vertical beam portion which defines a vertical datum plane, said support means comprising a first elongate rail means, said laser means including a laser adjustably mounted on a first carriage means, said first carriage means being slidable along said first elongate rail means;

second elongate rail means secured at right angles to said first rail means for extending beneath the centerline of said vehicle, said second elongate rail means being adapted to carry measuring instruments, adjustable support means for horizontally supporting said first and second rail means above a base; a

second carriage means slideable along said second elongate rail means, said second carriage means including a beam splitting laser target comprising:

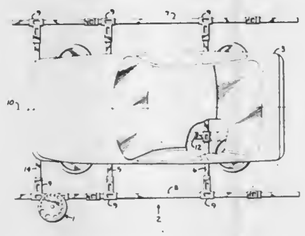
a housing adjustably mounted thereon, said housing havig first opposing slots in alignment with the direction of projection of the laser beam portions, said housing having second elongate slots located at right angles to said first opposing slots, at least two beam splitting means mounted in said housing to deflect portions of said vertical beam portion entering one of said first opposing slots in different directions through the other of said second elongate slots, the remainder of the vertical beam portion and portions of the horizontal beam portion passing through said beam splitting laser target.

4,630,380

HOLE GAUGE

Robert L. Donahue, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Feb. 28, 1986, Ser. No. 835,110
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—288 **6 Claims**



1. A hole gauge arrangement for determining the distance of a fixture hole relative to a datum plane, said arrangement comprising:

(a) an elongate set rod with a measurement scale thereon;

(b) die means mounted to and extending outwardly from a remote end of said set rod;

(c) a first gauge mount with said set rod extending therefrom, each said gauge mount including means for connection to a support structure and an adjustable rod holder means for setting an extension of said rod relative to said gauge mount;

(d) an elongate measurement rod having a tip end; and

(e) a second gauge mount positionable against said first gauge mount with said measurement rod extending therefrom, said second gauge mount being connectible to said support structure and said measurement rod being extensible through said second gauge mount so that said tip end encounters said die means, whereby the height of said measurement rod is set to the height of said set rod, said second gauge mount with said measurement bar thereon being transferrable to a support structure located in a datum plane and positionable thereon aligned with a fixture hole, whereby the spatial relationship of said tip end to said fixture hole is determined.

4,630,381

COORDINATE MEASURING INSTRUMENT

Hideo Sakata, and Eiichi Tsunoda, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,305
Claims priority, application Japan, Jul. 24, 1984, 59-154784; Jul. 24, 1984, 59-154785
Int. Cl.[4] G01B *7/03*
U.S. Cl. 33—503 **11 Claims**

1. A coordinate measuring instrument, comprising:

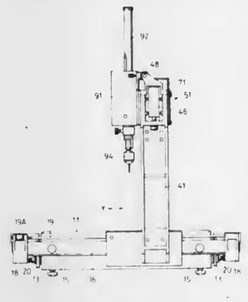
a bedplate;

a pair of elongated and parallel guide rails respectively protruded from opposite side surfaces of said bedplate;

a pair of supports respectively movably supported on said guide rails along the axial length of said guide rails, one of said supports including first means for effecting a positional adjustment in a first direction perpendicular to an upwardly facing top surface of said bedplate and a second direction perpendicularly intersecting said first direction, and the other of said supports being displaceable in said second direction and non-displaceable in said first direction, each of said supports having a first surface means thereon opposed to the other said first surface means;

a slider guide rail connected to and extending between said supports and having supported thereon a slider movable in the longitudinal direction of said slider guide rail, said slider having a measuring element;

second means for facilitating an adjustment of the position of said slider guide rail relative to said supports in at least



two directions perpendicularly intersecting each other, said second means being provided on said respective supports and including four adjusters opposed to and engaging upper and lower portions of each front and rear surfaces of said slider guide rail, said adjusters being respectively adjustable in position relative to said slider guide rail, and members for supporting an undersurface of said slider guide rail and being linearly adjustably movable in said first direction; and

a pair of positionally adjustable members fixably secured to said supports and said slider guide rail and including a third means for facilitating a relative adjustment in position between said slider guide rail and each said support, each of said adjustable members having a second surface means in face-to-face abutting relation with said first surface means on said support so that said slider guide rail is non-displaceably fixed relative to said supports in a moving direction of said slider.

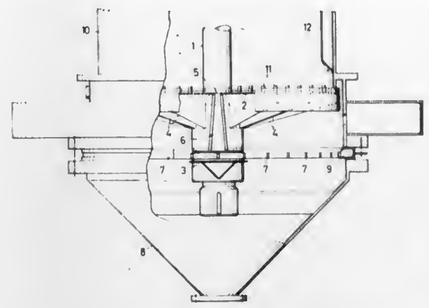
4,630,382

DISCHARGE DEVICE FOR GRANULES

Manfred Keiler, Neusäss; Uwe Bartsch, Wertingen; Hans-Heinrich Drösemeyer, Batzenhofen, and Franz X. Reitsam, Augsburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,981
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344558
Int. Cl.[4] F26B *17/34*
U.S. Cl. 34—173 **5 Claims**

1. A device for discharging granulate material comprising a vertically oriented reactor, a horizontally disposed perforated plate rotatably mounted within the reactor, scraper means on an upper surface of the plate constructed and arranged to scrape material charged into the reactor and positioned directly above the plate, at least one narrow discharge slot in the perforated plate for the passage of granulates removed by the scraper means, granulate collecting means directly below the discharge slot connected to rotate at the same rate as the perforated plate, and stationary scraping means positioned between the discharge slot and the granulate collecting means for re-



moving granulates from the granulate collecting means as the perforated plate and the collecting means rotate.

4,630,383

SHOE WITH GUSSET POCKET

Robert J. Gamm, Olivette, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.

Continuation of Ser. No. 190,791, Sep. 25, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 516,647
Int. Cl.[4] A43B *23/00*
U.S. Cl. 36—136 **6 Claims**



1. An athletic shoe with a gusset normally positioned beneath the shoe lacing and other securing means, over the instep of the wearer's foot, and incorporating a pocket for holding a key, coin, and related item, comprising, said gusset incorporating a tongue, a lower portion of the tongue being located over the instep of the wearer's foot and under the lacing and other securing means on the said shoe when said shoe is being worn, an upper portion of said tongue extending above said shoe lacing, a foldable portion appended to said upper portion of the said tongue, a pocket formed in said foldable portion and capable of holding a key, coin, and related item therein, said foldable portion being foldable over against said lacing to a position wherein said pocket is adjacent said shoe when said shoe is being worn, said foldable portion of the said upper portion of the tongue and the pocket formed therein being integral, and said upper portion and said lower portion of said tongue being integrally formed, the upper portion of said tongue comprising a pair of upper and lower liners stitched along their lateral edges to form said pocket and having a width equal to the width of the tongue in which the pocket is formed, said pocket being formed having side edges, said liners extending above said lacing, and said liners folding over as the foldable portion upon said lacing to a position wherein said pocket is adjacent said shoe, an access opening permitting placement and removal of said key, coin, and related item, into and from said pocket while said shoe is being worn, closure means for closing said access opening, said closure means comprising a zipper, said access opening being provided through one of said upper or lower liners forming the said pocket, said access opening and closure means extending ap-

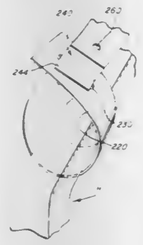
proximately from one side edge to the other side edge of said formed pocket, and releasable holding means for aiding and holding said pocket adjacent said shoe when said shoe is being worn, said releasable holding means comprising a hook and pile connector, one of said hook and pile connector attaching with the underside of the lower liner, and aligned for attaching with the other hook and pile connector securing upon the shoe eyestay, and securing means interconnecting between the formed pocket portion and the footwear for retaining the said portion contiguously against the same during usage.

4,630,384

SELF-LOCKING BAGGAGE TAG

Thomas J. Breen, Arlington Heights, Ill., assignor to Rand McNally & Co., Skokie, Ill.

Filed Jan. 31, 1985, Ser. No. 697,033
Int. Cl.⁴ G09F *3/14*
U.S. Cl. 40—21 R **12 Claims**



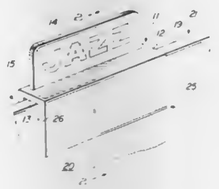
1. A disposable tag for attachment to an articles of baggage or the like comprising:
an elongated reinforced paper product tape strip having longitudinal reinforcing fibers therein;
a locking slit formed in said strip adjacent one end edge thereof; and
locking means carried by said strip intermediate the ends thereof, said locking means comprising a locking tab mounted on one face of said strip, said locking tab comprising a separate thin paper product member which has a portion which is adhered to said strip and having a portion separated from, and unadhered to, said strip for engaging the strip adjacent said slit;
the other end edge of said strip being threadable through said slit to form a loop around a portion of an article, and said locking tab unadhered portion being engageable with the strip adjacent the slit to lock the loop closed and prevent inadvertent opening thereof.

4,630,385

RECORD ALBUM LABELING TAB

Steven M. Swim, 7634 S. 41st St., Phoenix, Ariz. 85040

Filed Dec. 10, 1984, Ser. No. 680,099
Int. Cl.⁴ G09F *3/00*
U.S. Cl. 40—340 **2 Claims**



1. An index marker for panel-shaped members, said panel-shaped members each including
an edge, and
a pair of opposed generally smooth planar sufaces terminating at said edge,
said index marker including
(a) a base having a top side and a bottom side;
(b) a tab attached to said top side of and outwardly projecting from said base;
(c) a first resilient leg attached to said bottom side of and outwardly projecting from said base in a direction away from said tab and having a distal tip and an inner surface;
(d) a second resilient leg attached to said bottom side of and outwardly projecting from said base in a direction away from said tab and having a distal tip and an inner surface, said inner surface of said second leg generally being spaced apart from and opposed to said inner surface of said first leg, a portion of said bottom side of said base being between and bordered by said first and second legs;
said resilient first and second legs normally canting toward one another such that said legs are spaced farther apart from one another near said bottom side of said base than said legs are spaced apart near said distal tips thereof, said distal tips being resiliently forced apart when said edge of said panel member is inserted between said legs;
said portion of said bottom side of said base being shaped and dimensioned to receive the edge of either of a first panel member and a second panel member, said first and second panel members being of differing thickness;
said index marker being mounted on said panel member by grasping said tab and sliding said distal tips onto said smooth planar surfaces in a direction of travel parallel to said surfaces and generally perpendicular to and toward said edge;
said index marker being removed from said panel member by manually grasping said tab and pulling said index marker in a direction of travel generally away from and perpendicular to said edge and parallel to said planar surfaces of said panel member;
said distal ends of said legs sliding over said planar surfaces during installation and removal of said index marker onto and from said panel member;
said edge of each of said first and second panel members including a pair of elongate spaced apart generally parallel corners;
said portion of said bottom side of said base including first and second pairs of elongate generally parallel spaced apart corners; and
said first pair of corners of said base being sized to contact and receive said corners of said first panel member, and said second pair of corners of said base being sized to contact and receive said corners of said second panel member; and
(e) at least one aperture formed through one of said legs thereof to receive plug means to affix said index marker to one of said panel members after said edge of said panel member is inserted between said legs thereof, said plug means being secured to said panel member and extending outwardly therefrom into said aperture to prevent said aperture and said one of said legs from being displaced in a direction of travel generally parallel said planar surfaces of said panel member.

4,630,386

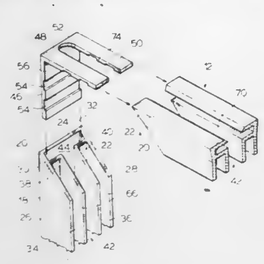
REVERSIBLE PICTURE FRAME

Arthur K. Wilson, 87 Laurentide Drive, Don Mills, Ontario, Canada (M3A 3E3)

Filed Aug. 29, 1985, Ser. No. 770,496
Int. Cl.⁴ G09F *1/00*
U.S. Cl. 40—155 **3 Claims**

1. A frame for two-sided or single-sided display and exchange of pictures and posters comprising, in combination, four frame components, each frame component having an outer planar sidewall with parallel side edges, inwardly facing outer walls depending from said side wall edges substantially parallel to each other, a pair of equispaced inner walls positioned within said inwardly facing outer walls formed integral with and joined to the adjacent inwardly facing outer wall and

spaced therefrom by a pair of shoulders at their respective bases to define a longitudinal recess adjacent each outer wall and to define a longitudinal slot between the inner walls extending to the opposed outer side walls, each pair of said shoulders and opposed outer side wall together defining a transverse channel, one of said frame members having a longi-



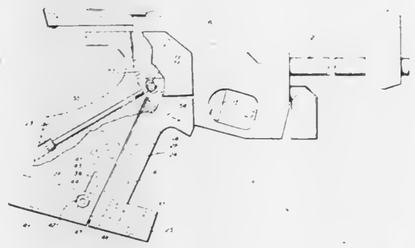
tudinal slot formed substantially from one end to the other in the outer planar side wall centrally thereof co-extensive with said slot formed between equispaced inner walls for insertion and removal of a picture therefrom, and a corner connector for insertion into the channels of adjacent frame members whereby the shoulders can be indented to frictionally engage the corner connector to form a rigid rectangular frame.

4,630,387

ADJUSTABLE PISTOL GRIP

James W. Crane, Fairport, N.Y., and Ragnar Skanaker, Ångelholm, Sweden, assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Oct. 28, 1985, Ser. No. 792,259
Int. Cl.⁴ F41C *23/00*
U.S. Cl. 42—73 **14 Claims**



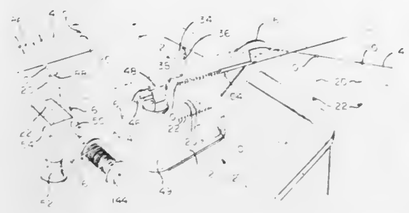
1. A grip for a pistol having a receiver and a barrel, the grip having a width dimension which extends generally parallel to the barrel, comprising:
a palm portion adapted to be gripped by the palm and thumb of a user,
a forepiece portion adapted to be gripped by the fingers of the user,
means for adjustably securing the forepiece to the palm portion so that said width dimension of the grip can be varied by moving the forepiece relative to the palm portion, and
means for attaching the grip to the receiver.

4,630,388

DETACHABLE SWIVEL FOR COUPLING GANGIONS TO LONGLINES AND APPARATUS FOR AUTOMATICALLY ATTACHING SAME

Donn B. Furlong, 15427 Westwick Rd., Snohomish, Wash. 98290

Continuation of Ser. No. 658,179, Oct. 5, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 805,408
Int. Cl.⁴ A01K *91/04*
U.S. Cl. 43—27.4 **31 Claims**



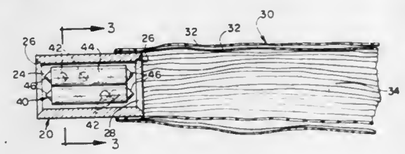
31. A device for connecting a gangion to a continuous longline, comprising:
a stop member fixedly attached to the longline; and
a swivel body with an aperture therethrough sized for rotatably receiving said stop member at least partially therein and a fixed sidewall opening communicating with said body aperture and sized for passage of the longline laterally therethrough for attaching and detaching of said body, said body aperture having axial end openings for passage of said stop member into and out of said body aperture from either of said end openings, said body further having means for attachment of the gangion to said body, and restraining means for releasably restraining said stop member in said body against axial movement.

4,630,389

FISH LURE

Michael Higgins, P.O. Box 95-1706, Stuart, Fla. 33495-1706

Filed Apr. 23, 1985, Ser. No. 726,098
Int. Cl.⁴ A01K *85/00*
U.S. Cl. 43—42.22 **7 Claims**



1. A fish lure, comprising:
a tube open at each end forming a body having leading and trailing ends designed to define a streamlined body;
a plurality of sealed tubes mounted within the body, the sealed tubes having leading and trailing ends, the sealed tubes being aligned parallel to a longitudinal axis of the body; and,
a plurality of elements movably captive in the sealed tubes and a flexible skirt attached to the trailing end to the body.

4,630,390

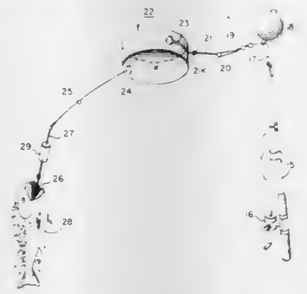
FISHING GEAR PERMITTING SWITCHING TO HEAVY LINE FOR LANDING

Ralph D. Burkeen, 1033 Crescent Ct., and Ron Labender, 440 Lakewood Ter., both of Round Lake, Ill. 60073

Filed May 29, 1985, Ser. No. 738,986
Int. Cl.⁴ A01K *91/00*
U.S. Cl. 43—43.11 **12 Claims**

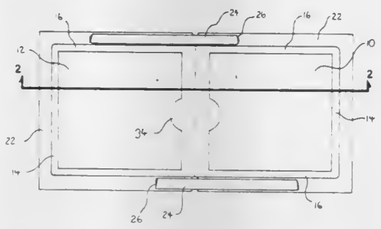
1. Fishing gear for fishing with a light line that permits bait

to behave normally capable of landing large fish when hooked, comprising in combination, a rotatable spool having light line and heavy line lengths attached to the spool for winding thereon in opposite directions with free ends extending from the spool, means for retaining the heavy one of the line lengths wound on the spool with a significant portion of the light line length extending from the spool during casting so that the heavy line may be unwound from the spool when a fish is hooked to wind up the light line onto the spool, means for



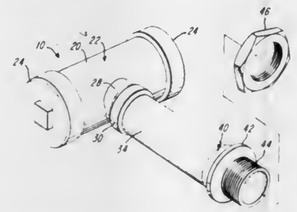
attaching the free end of the heavy line to a fishing line, and a length of heavy line with a hook attached to the end of the light line to reel onto the spool after the light line is fully wound thereon to thereby effectively provide a continuous heavy line for landing the fish coupled by the frictional force of the heavy line portion with the hook wound about the spool through the spool and the connection of the heavy line to the spool to the heavy line length thereon extending to the means for attaching to the fishing line.

4,630,391
RODENT TRAP
Arthur Meyers, 151 E. Palmetto Park Rd., Boca Raton, Fla. 33432, and Albert DeSantis, 1935 - 55 NW. 55th Ave., Margate, Fla. 33063
Filed Mar. 3, 1986, Ser. No. 835,162
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—58 **6 Claims**



1. a rodent trap comprising:
(a) a first and second closure surface, each of said surfaces having an area substantially greater than the size of the rodent to be trapped, said first and second surfaces integrally connected through a thin, flexible hinge of material therebetween, each of said closure surfaces having a recessed central area comprising most of the surface area of said closure surfaces, said recessed central area having planar floors which define a mutual relative angle therebetween in the nature of an arch relative to the floor upon which said rodent trap is placed, each of said closure surfaces further comprising:
(i) a feeding area within each of said recessed central areas, each of said feeding areas disposed proximately to said hinge joining said closure surfaces; and
(ii) a perimetric lip structure, elevated with reference to the level of said recessed central areas, and formed integrally therewith, opposing faces of said lip structure both proximate to said integral hinge forming a mutually included angle therebetween comprising a part of said arch;
(b) elastic means secured to said lip structure and disposed transversely to said flexible hinge and upon opposite sides of said closure surfaces, each of said elastic means extending over said flexible hinge to thereby stabilize said closure surfaces in said arch, whereby the application of the weight of a rodent on said feeding area will press said arch toward the floor thereby destabilizing said elastic means and thereby causing said closure surfaces to rapidly close upon each other and about the rodent.

4,630,392
BAIT STATION
Michael J. Ferraro, 3833 Catalpa Dr., Dayton, Ohio 45405
Filed Jun. 13, 1985, Ser. No. 744,232
Int. Cl.[4] A01M *1/20, 25/00*
U.S. Cl. 43—131 **15 Claims**



1. A bait station for rodents including one section defining an enclosed bait chamber and a relatively projected entrance-exit section defining a passage into and out of said chamber, said entrance-exit section having an inner end connected to said one section and opening into said chamber and an outer end which is normally open to define the access opening to said chamber which is limited as to its cross section to exclude the passage therethrough of any object perceptibly exceeding in size the target rodents, aid one section defining one end portion of said station, said access opening being at the opposite end of said station which is most remote from said chamber, said one section being defined by plastic tubing closed by cap means at least a portion of whic[h] is releasably secured thereto and said plastic tubing having a single access opening connected at the outer surface thereof to one end of a tube element which is anchored thereto and extends therefrom to define said entrance-exit section.

4,630,393
PRODUCTION OF HYBRID "IMPROVED SUPERSWEET" SWEET CORN
Peter A. Bonucci, Northfield, Minn., assignor to UF Genetics, Inc., Hollister, Calif.
Continuation of Ser. No. 653,446, Sep. 21, 1984. This application Oct. 22, 1985, Ser. No. 789,930
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—58 **8 Claims**

1. A method for producing a hybrid sweet corn comprising the steps of:
(a) selecting a first shrunken sweet corn homozygous for sh_2, wherein said shrunken sweet corn can be genotypically represented as:

$Su_1Su_1sh_2sh_2$;

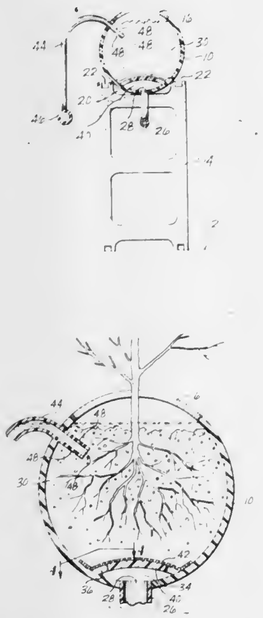
(b) selecting a second, sugary-shrunken, corn which can be genotypically represented as:

$su_1su_1sh_2sh_2$;

(c) crossing said first corn as either parent with said second corn as the other parent, to produce a hybrid sweet corn which is heterozygous and genotypically represented as:

$Su_1su_1sh_2sh_2$.

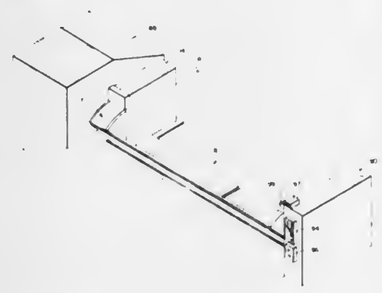
4,630,394
SUBIRRIGATION GRAVEL CULTURE GROWING BED
Michael W. Sherard, 25801 128th Pl. S.E., Kent, Wash. 98031
Filed Sep. 17, 1984, Ser. No. 650,696
Int. Cl.[4] A01G *31/00*
U.S. Cl. 47—59 **10 Claims**



1. A subirrigation gravel growing bed comprising:
an elongated, open top, growing bed container having a laterally concave bottom;
an elongated false bottom in said container spaced above the concave bottom of the container, so as to define an elongated space below the false bottom;
an elongated gravel growing bed above the false bottom;
said false bottom including openings permitting solution movement both upwardly and downwardly between the space below the false bottom and the gravel growing bed above the false bottom;
an inlet/outlet port in a bottom portion of the container, communicating with the space below the false bottom;
means for introducing a water/nutrient solution through the inlet/outlet port into the space below the false bottom, in an amount sufficient to cause such water/nutrient solution to move upwardly through the openings in the false bottom into the gravel growing bed above the false bottom;
means for draining the water/nutrient solution from the gravel growing bed, through the openings in the false bottom, into the space below the false bottom, and then out through said inlet/outlet port,
said false bottom being formed at least in part by a sheet of foraminous fabric material, said fabric material including means comprising openings of a size which allow water/-nutrient solution to pass through but which block the plant roots, so that the false bottom will separate the plant roots from any pools of water/nutrient solution which may form on the concave bottom of the container following drainage of the water/nutrient solution out through the inlet/outlet port.

10. A method of growing plants, comprising:
providing an elongated, open top, growing bed container having a laterally concave bottom;
providing in said container an elongated false bottom spaced above the concave bottom of the container, so as to define an elongated space below the false bottom;
providing an elongated gravel growing bed above the false bottom;
providing in the false bottom openings for solution flow between the space below the false bottom and the gravel growing bed above the false bottom;
providing an inlet/outlet port in a bottom portion of the container, communicating with the space below the false bottom;
placing plants in the gravel growing bed;
periodically introducing a water-nutrient solution through the inlet/outlet port, into the space below the false bottom, in an amount sufficient that such water/nutrient solution will flow upwardly through the openings in the false bottom and then upwardly through the gravel growing bed;
continuing the introduction of water/nutrient solution into the inlet/outlet until such solution rises in the gravel growing bed up to a predetermined level;
then discontinuing the introduction of water/nutrient solution;
then draining the water/nutrient solution which has been introduced into the gravel growing bed to drain out from the gravel growing bed, through the openings in the false bottom, through the space below the false bottom, and out through the inlet/outlet; and
providing additional openings in the false bottom by utilizing as a component of said bottom a sheet of foraminous fabric material which includes openings of a size which allow water/nutrient solution to pass through but which substantially block plant roots, so that the plant roots will be kept away from any pooling of solution which might occur in the region below the false bottom, following draining of the water/nutrient solution out from the gravel growing bed.

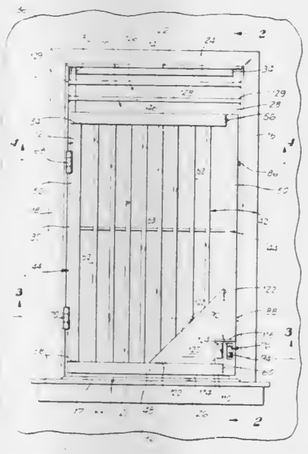
4,630,395
PORTABLE VEHICLE BARRICADE OR PORTABLE MAXIMUM SECURITY BARRIER
Ralph G. Nasatka, 8405 Dangerfield Pl., Clinton, Md. 20735
Filed Jul. 29, 1985, Ser. No. 760,091
Int. Cl.[4] E01F *13/00*
U.S. Cl. 49—49 **20 Claims**



1. A portable vehicle barrier for positioning in a roadway or the like comprising:
(a) first and second spaced stanchions;
(b) plate means extending between said spaced stanchions;
(c) means for securing said barrier to the roadway;

(d) hinged gate means;
(e) said gate means being attached to said plate means;
(f) means in at least one of said stanchions for raising and lowering said gate means between a first generally horizontal position and a second angularly disposed position; and,
(g) anti-tampering means associated with said stanchions and said gate means, said anti-tampering means being fixed to said gate means and movable relative to said stanchions, for preventing unauthorized interference with the raising and lowering of the gate means.

4,630,396
SECURITY GATE APPARATUS
Zadok Zvi, Fort Lee, N.J.; Abraham Kendi, and Emile Tal-Mor, both of New York, N.Y., assignors to Kendi Security, Inc., New York, N.Y.
Filed Apr. 24, 1985, Ser. No. 726,845
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 **20 Claims**



1. In security gate apparatus for securing an opening in a building and including fixed support means operatively associated with said building opening, security gate means supported from said support means and moveable relative thereto between a closed security gate means position wherein the same are operable to prevent entry to the building through the building opening, and an open security gate means position wherein the same are not so operable, and locking means operatively associated with said support means and said security gate means and operable to lock said security gate means in the closed position thereof, the improvements comprising, said locking means comprising a locking member which is generally vertically moveable between a first locking member position wherein the locking member is operable to lock said security gate means in the closed position thereof, and a second locking member position wherein the same is not so operable, locking member mounting means surrounding said locking member at least in part to deny access thereto, and locking member operating means operatively associated with said locking member and said locking member mounting means and operable to enable movement of said locking member from said first position thereof to said second position thereof, said locking member being operable when in the first position thereof to prevent movement of said security gate means into the closed position thereof, said locking member being operable to automatically move from said second position thereof to said first position thereof and remain therein to lock said security gate means upon movement of the latter into said closed position thereof.

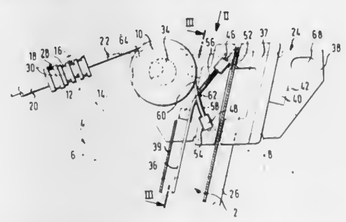
4,630,397
DRUM AND CABLE MECHANISMS FOR OPENING/CLOSING GREENHOUSE VENT
George J. Dean, Jr.; Robert S. Klaeser, both of Arvada, and Lloyd W. Braa, Lakewood, all of Colo., assignors to Roper Corporation, Kankakee, Ill.
Filed May 28, 1985, Ser. No. 738,559
Int. Cl.[4] E05C *7/06*
U.S. Cl. 49—97 **23 Claims**



1. A control mechanism for opening and closing a window sash or like element pivotally mounted in a frame, said control mechanism comprising:
a drive shaft mounted for rotation about the longitudinal axis of said shaft;
means responsive to command signals for rotating said drive shaft in clockwise or counterclockwise rotation;
a drive member mounted on and coaxial with said drive shaft;
an elongated rod directly contacting at its central area the surface of said drive member such that clockwise and counterclockwise rotation of said drive shaft and said drive member causes reciprocal movement of said elongated rod along the longitudinal axis of said rod in directions transverse to the longitudinal axis of said drive shaft;
a housing member for maintaining said elongated rod in direct contact with said drive member such that said elongated rod and said housing member are free to rotate about the longitudinal axis of said drive shaft;
said elongated rod having a first end secured to said window sash such that longitudinal movement of said rod in a first direction in response to rotation of said drive shaft and said drive member results in the opening of said window sash and longitudinal movement of said rod in a second and reverse direction in response to rotation of said drive shaft and said drive member results in the closing of said window sash, with said housing member and rod in each case rotating about the axis of said drive shaft as the window sash pivots about said frame; and
said drive member including first, second and third cylindrical portions wherein each portion is annular in shape and wherein said first portion cradles said rod and said second and third portions are on opposite adjacent sides of said first portion for winding and unwinding cable means associated with said rod as an incident to rotation of said drive shaft and drive member.

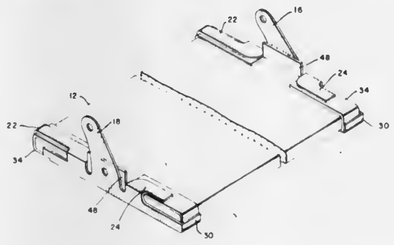
4,630,398
ARRANGEMENT FOR LIFTING AND LOWERING A WINDOWPANE, ESPECIALLY OF A MOTOR VEHICLE WINDOW
Gerhard Schust, Weidhausen, Fed. Rep. of Germany, assignor to Brose Fahrzeugteile GmbH, Coburg, Fed. Rep. of Germany
Filed May 31, 1984, Ser. No. 615,807
Claims priority, application Fed. Rep. of Germany, May 31, 1983, 8315959[U]
Int. Cl.[4] E05F *11/48*; B25G *3/00*; F16H *35/18*
U.S. Cl. 49—352 **2 Claims**

1. An installation for lifting and lowering a window, especially of a motor vehicle window, comprising a guide rail means, an entrainment means adjustable along said guide rail means for lifting and lowering the window, cable means extending approximately parallel to the guide rail means and having a shallow curvature with no sharp bends therein, ends of the cable means being secured on said entrainment means by squeeze nipples, the cable means have cable portions that cross over each other on their way to the squeeze nipples, longitudinal axes of the squeeze nipples extending at an obtuse angle to the cable means and coordinated thereto so as to cause little or no bending of the cable means as the entrainment means is adjusted along said guide rail means, the entrainment means including a plastic block-like member mounted on an entrainment plate provided with fastening means for attaching the entrainment plate to the window, apertures for the squeeze



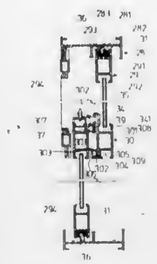
nipples and for the cable means being provided on a side of the plastic block-like member opposite the entrainment plate with one aperture means for the cable means being located further away from the fastening means than other aperture means for the cable means, the cable means crossingly extending out of the plastic block-like member on a side thereof opposite the guide rail means by way of rounded-off support surfaces of the cable apertures and subtending an obtuse angle, and a deflection roller arranged near the upper end of the guide rail means and laterally of the plastic block-like member for the cable means having apertures further away from the fastening means.

4,630,399
SECURITY CLIP FOR A LOUVER PANEL
Gordon Okumoto, 1849 Vancouver Pl., Honolulu, Hi. 96822
Filed Aug. 20, 1985, Ser. No. 767,421
Int. Cl.[4] E06B *7/08*
U.S. Cl. 49—403 **16 Claims**



1. A louver panel assembly comprising:
(a) a generally planar louver panel having a longitudinal axis;
(b) mounting brackets attached to end portions of the louver panel for attaching the panel to a structure, each bracket defining a notch;
(c) a security clip member attached to the louver panel such that it extends substantially around the periphery of the louver panel between the mounting bracket and the louver panel; and,
(d) first tab means on the security clip engaging the notch so as to prevent removal of the louver panel from the mounting brackets in a direction generally perpendicular to the longitudinal axis.

4,630,400
SASHES FOR A CLOSURE
Ming-Hung Hsieh, 179 Sec. 2, Chung Hua Rd., Tai Chung City, Taiwan
Filed Mar. 22, 1985, Ser. No. 715,099
Int. Cl.[4] E05D *13/00*
U.S. Cl. 49—425 **14 Claims**



1. Sashes for a closure comprising an outer sash defining a window opening; a pair of relatively moveable, overlapping inner sashes mounted within said outer sash for opening and closing said window opening; said inner sash including a first upper rail, a first lower rail, a first left stile and a first right stile and being adapted to enclose therein a closure body; said outer sash including a second upper rail, a second lower rail, a second left stile and a second right stile and being adapted to be mounted on a wall of a building;
said second upper rail including a central vertical diaphragm plate for separating the cross-sectional area of said second upper rail into two equal parts;
said second lower rail including two parallel shallow socket channels;
the inner side of said second left stile having a protrusion;
said second right stile being identical to said second left stile in shape;
the cross-section of said first upper rail including a first end formed with a first receiving room for receiving and securing therein one side of said closure body and a second end having a third grooved channel positioned alongside said central vertical diaphragm plate and a fourth grooved channel near one side of said second upper rail;
the cross-section of said first lower rail being identical to that of said first upper rail and being disposed upside down and including a corresponding first end formed with a first receiving room for receiving and securing therein one side of said closure body and corresponding second end having a corresponding third grooved channel positioned alongside said outer side of one of said shallow socket channel and a corresponding fourth grooved channel capable of being positioned above the inner side;
said first left stile being a meeting stile and having a cross-section including a first end formed thereon a first receiving room for receiving and securing therein one side of said closure body and an L-shaped flange attached to the outer surface of said meeting side, near said first receiving room and having the vertical portion of the "L" section parallel to said outer surface to form therebetween a receiving space and a first grooved channel formed on said outer surface and near said second receiving room and a straight flange secured to the end edge of said first grooved channel and having a width extending to terminate on the meeting line;
the cross-section of said first right stile having a first end formed thereon a first receivng room for receiving and securing therein one side of said closure body and a second end formed thereon a second receiving room receiving therein a cushioning piece and the inner side of said second receiving room receiving said cushioning piece

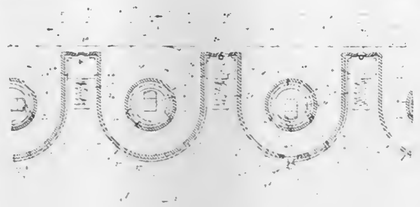
having a second grooved channel receiving therein a sealing piece.

4,630,401

FINISHING MACHINE AND METHOD

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Dec. 11, 1984, Ser. No. 680,300
Int. Cl.⁴ B24B *31/06, 1/00*
U.S. Cl. 51—7 **41 Claims**



1. A finishing machine having a finishing chamber for the vibratory surface-planing of an elongated part or workpiece, which is longer than the width of said chamber from side to side thereof, by feeding said elongated part to said machine from a direction normal to the side walls of the said finishing chamber thereof and in a direction parallel to the front and back walls of said chamber, which comprises

means for causing loose particulate finishing media to undergo vibration and orbital motion in said finishing chamber

said finishing chamber having upwardly-extending substantially vertical front and rear walls and

side walls, connected by an arcuate bottom between said side walls, and

an open top

to produce an orbit,

having an upper portion and a lower portion,

in a direction normal to said side walls of said finishing chamber and parallel to said front and rear walls of said chamber and in a direction corresponding to the longitudinal dimension of said part,

means for causing the upper portion of said orbit to extend vertically at least to the open top of said chamber, and

means for exposing the surface of the elongated part or workpiece to be finished to said orbiting finishing media without submergence in said media by positioning said surface in contact with said orbiting finishing media at the upper portion of its orbit.

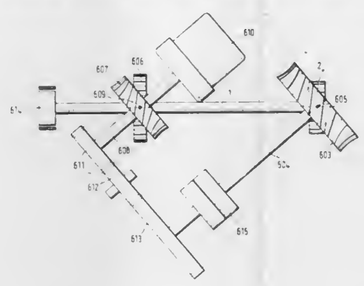
4,630,402

APPARATUS FOR THE MANUFACTURE OR MACHINING OF STRAIGHT OR HELICALLY TOOTHED WORKPIECES

Manfred Erhardt, Puchheim; Herbert Loos, Dorfen-Stadt; Josef Lohrer, Munich; Udo Schapp, Wessling; Karl-Josef Schaeferling, Dillingen, and Walter Freundl, Eichenau, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,437
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402724; Oct. 23, 1984, 3438741
Int. Cl.⁴ B24B *19/00*
U.S. Cl. 51—105 GG **6 Claims**

1. In an apparatus for use in machining a tooth system of straight or helically toothed gears on a workpiece, said apparatus including a hyperboloidally or globoidally formed toothed tool having an abrasive surface on the teeth thereof and which has a sufficient axial dimension such that it meshingly engages said workpiece tooth system from one axially facing side thereof to the other and with normal backlash between the teeth thereof, first means defining a first crossed-axes angle relation between said workpiece and said tool, a first guide gear and first connecting means for coupling said first guide gear to said tool and being rotatable therewith, a second guide gear and second connecting means for coupling said second guide gear to said workpiece and being rotatable therewith, said first and second guide gears operatively engaging each other and having the same speed ratio as between said workpiece and said tool, said first and second guide gears operatively engaging each other and having normal backlash be-



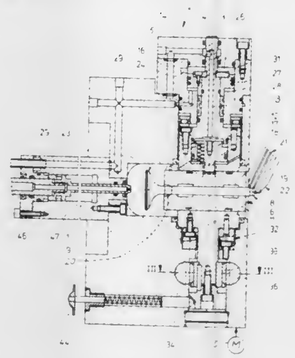
tween the teeth thereof, and control means for controlling the relative positions between teeth on said workpiece and said tool and teeth on said first and second guide gears so that the operatively engaged combination of said workpiece/tool and said first guide gear/second guide gear is entirely backlash free, the improvement comprising wherein second means defines a second crossed-axes angle relation between said first guide gear and said second guide gear which, when meshingly engaged, is independent of said first crossed-axes angle relation.

4,630,403

METHOD AND MACHINE FOR GRINDING ROTATIONALLY SYMMETRICAL WORKPIECES

Heinz Belthle, Aichwald, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,193
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437322
Int. Cl.⁴ B24B *11/00*
U.S. Cl. 51—105 VG **8 Claims**



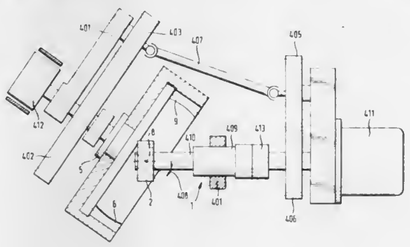
6. A machine for grinding axially spaced-apart first and second portions of rotary workpieces which are symmetrical with reference to their axes of rotation, such as the reciprocatory elements of lift valves, comprising a work holder; means for rotating said holder about a first axis; a chuck having means for clamping a third portion of a workpiece, said holder having means for supporting said chuck for angular movement about a second axis which is inclined with reference to said first axis; means for inverting the chuck and the workpiece in the chuck with reference to said holder, including means for turning said chuck about said second axis; a rotary spindle; and a grinding wheel on said spindle, said grinding wheel having a working surface including circumferentially extending first and second sections and said turning means including means for moving the chuck between a first position in which the first section of the working surface can remove material from the first portion of the workpiece which is held by said chuck and a second position in which the second section of the working surface can remove material from the second portion of the workpiece which is held by said chuck.

4,630,404

APPARATUS FOR MANUFACTURING AND MACHINING GEARS

Manfred Erhardt, Puchheim, and Herbert Loos, Dorfen-Stadt, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,812
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345800
Int. Cl.⁴ B24B *5/00*
U.S. Cl. 51—105 GG **4 Claims**



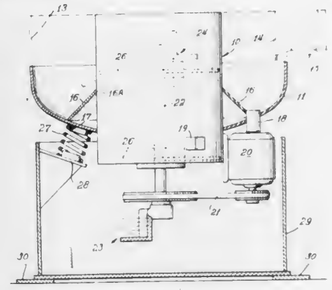
1. In an apparatus for the precision working of a tooth system of a rotatably supported gearlike workpiece by rolling the teeth of said gearlike workpiece with teeth on a rotatably supported gearlike tool, the axes of rotation of said workpiece and said tool being spaced along a common normal, said apparatus having a support means supporting said rotatably supported workpiece and tool for movement toward and away from each other in a direction parallel to said common normal and so that said axes of rotation thereof are crossed, guide gear train means with normal backlash therebetween coupled to and extending between said workpiece and said tool, said guide gear train means providing an effective speed ratio that is the same as between said workpiece and said tool, abrasive surface means on said teeth of said tool, said tool teeth being free of uniformly directed cutting edges, said tool further being formed hyperboliodially in the axial dimension thereof so that when said workpiece and said tool are engaged, at least one of said teeth of said tool is engaged by at least one of said teeth on said workpiece over the entire axial length of the tool tooth, first means providing a first tooth contact between successive teeth on said tool and successive teeth on said workpiece on only one side of each of said successive teeth on said tool, a backlash spacing being provided between each of said successive teeth on said workpiece and the opposite side of each of said successive teeth on said tool, second means for adjusting the relative position between said workpiece/tool and said guide gear train means so that the operatively engaged combination of said workpiece/tool and said guide gear train means is entirely backlash free, the improvement comprising wherein at least one of said tool and said workpiece is an internally toothed gear.

4,630,405

FINISHING CHAMBER AND FINISHING MACHINE COMPRISING THE SAME

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Division of Ser. No. 706,143, Feb. 27, 1985. This application Dec. 16, 1985, Ser. No. 809,575
Int. Cl.⁴ B24B *31/00*
U.S. Cl. 51—163.2 **5 Claims**



1. A structure suitable for use as at least a part of the finishing chamber of a vibratory finishing machine, comprising an essentially cylindrical tube comprising the center column of the finishing chamber,

an essentially circular tank head, having a bottom and an upwardly extending outer wall and a circumference selected so as to constitute the outer circumference of the chamber comprising the bottom portion of said chamber, with an essentially circular opening in the bottom thereof having a circumference corresponding to the circumference of said cylindrical tube,

said cylindrical tube being inserted through the essentially circular opening in said tank head and in circumferential contact therewith,

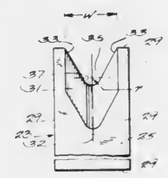
said cylindrical tube and said tank head being welded to secure them to each other at said point of contact.

4,630,406

METHOD OF USING AN ELLIPTICAL FORM TO GENERATE A PERFECT RADIUS IN AN INSULATED ELECTRICAL CONDUCTOR STRIPPING BLADE

John D. Butler, New Berlin, Wis., assignor to Mechtrix Corporation, Wauwatosa, Wis.

Filed Sep. 20, 1984, Ser. No. 652,198
Int. Cl.⁴ B24B *3/36*
U.S. Cl. 51—285 **3 Claims**



1. A method of manufacturing a blade for cutting and stripping insulation from an insulated electrical conductor, the blade having two faces and a predetermined curved surface connecting the two faces, the curved surface having a longitudinal axis at a predetermined angle to the faces and an elliptical contour symmetrical about the axis when viewed along the

axis, the cutting edge in the blank at the junction of the curved surface and one of the faces being circular when viewed perpendicular to the blade faces, comprising the steps of:

a. providing a blank generally shaped as a rectangular paralleopiped having two faces and exterior surfaces;
b. providing a grinding wheel;
c. dressing the periphery of the grinding wheel to a predetermined elliptical cross-section corresponding to the relationship between the desired radius of the blade circular cutting edge and the angle of the curved surface longitudinal axis with respect to the blank faces; and
d. feeding the grinding wheel through the blank at the predetermined angle to remove material from the blank to generate the predetermined curved surface connecting the two faces.

4,630,407

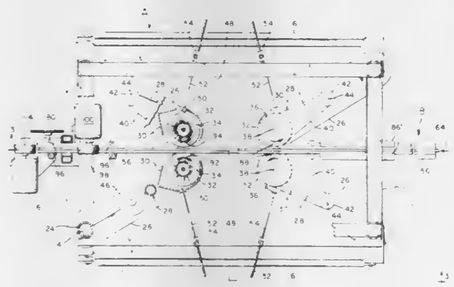
METHOD FOR FINISHING A THERMOPLASTIC COATING

Lynn R. Rhodes, 10706 231st St. SW., Edmonds, Wash. 98020

Continuation of Ser. No. 614,484, May 29, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,466

Int. Cl.⁴ B24B *7/20*

U.S. Cl. 51—322 **8 Claims**



1. A method for finishing a substantially thermoplastic coating on an object, said coating of the type that dries by solvent evaporation, said method comprising:

contacting the coating with an abrasive containing brush, said brush raising the temperature of the coating to just about its thermoplastic temperature, speeding evaporation of said coating solvents; and

adjusting brush contact pressure and time to just that necessary to achieve said thermoplastic temperature of said coating such that said temperature is not substantially exceeded whereby the coating remains on said object but flows in response to said brush, during final solvent evaporation, and said coating solidifies to the final, uniform, smooth finish.

4,630,408

ROTARY FINISHING WHEEL

Joseph P. Iding, Wauwatosa, Wis., assignor to M. P. Iding Disc Grinding Compound Co., Inc., Milwaukee, Wis.

Continuation of Ser. No. 749,317, Jun. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,780, Sep. 4, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,666

Int. Cl.⁴ B24D *13/04*

U.S. Cl. 51—337 **9 Claims**

1. In a finishing wheel, a pair of annular frame members each having an axially extending reach, a radially inward extending reach at one end of the axially extending reach and a radially outward extending reach at the other end of the axially extending reach, said pair of annular frame members comprising the only frame members and being disposed to place their respective radially inward extending reaches in axially adjacent relation to form an annular hub wherein the axial reaches of the respective frame members together with their radially outward reaches provide a single radially opening peripheral recess between the opposed outer reaches, a plurality of axially extending pin members spanning said hub recess and being supported solely by mounting directly to the radially outward extending reaches, said pin members being equidistantly spaced relative to the wheel axis and in circumferential array, and a finishing pack mounted on each of the pin members, said annular hub being drivingly mountable on a rotateable shaft in service.



4,630,409

DEVICE FOR FINISHING THE EDGES OF SKIS

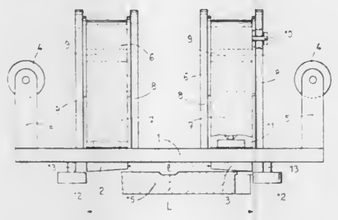
Michel Hofstetter, 3, Rue Eveche, 1204 Geneva, Switzerland

Filed Jul. 8, 1985, Ser. No. 752,649

Claims priority, application Switzerland, Dec. 9, 1982, 7159/82

Int. Cl.⁴ B24D *15/00*

U.S. Cl. 51—361 **3 Claims**



1. Device for finishing the edges of a ski, comprising a base plate adapted to be moved along the sliding surface of the ski, the base plate having on its lower face two blocks disposed on opposite sides of the device, said blocks having finishing surfaces thereon, lateral guiding members bearing in working position against the side faces of the edges of the ski, handles on the upper side of the base plate for moving the device lengthwise of the ski, the handles being transversely movable toward and away from each other and being connected with said lateral guiding members to move the lateral guiding members toward and away from each other with the handles, means resiliently urging the handles toward each other, and sliding plates one on each side of the device and mounted for sliding movement on said base plate, there being a said handle and a said lateral guiding member secured to each sliding plate.

4,630,410

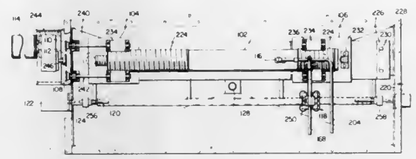
REACTOR VESSEL STUD CLEANING MACHINE

David R. Cavada, Lower Burrell, and Leonard R. Golick, Levelgreen, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1983, Ser. No. 558,722

Int. Cl.⁴ B24C *3/18*

U.S. Cl. 51—410 **25 Claims**



1. A device for cleaning and decontaminating an elongate member having a three dimensional surface topography comprising:

an enclosure;

means for rotatingly supporting said elongate member proximate the ends thereof within said enclosure;

means for driving said elongate member supporting means, to rotate said elongate member; a supply tank for holding water

a spray nozzle connected to said supply tank and disposed within said enclosure operable to move transversely with respect to said elongate member for spraying a cleaning agent comprising high pressure water and abrasive grit against the rotating elongate member;

a self-contained means for supplying said cleaning agent to the spray nozzle and removing spent cleaning agent from the enclosure, said self-contained means including said supply tank and means for disposing of any contaminated solids in the spent cleaning agent, said means for disposing further comprising means for removing spent cleaning agent from said enclosure, means for removing solid particles from said spent cleaning agent and means for recycling water from said spent cleaning agent back to said spray nozzle; and

a control system for selectively controlling at least one of the rate of rotation of said elongate member and rate of traversal of said elongate member by said spray nozzle in accordance with the topography of said elongate member.

4,630,411

EXPLOSIVE ACTION INHIBITING GLAZING

Heinrich Sälzer, Industriestrasse 4, 3550 Marburg-Wehrda, Fed. Rep. of Germany

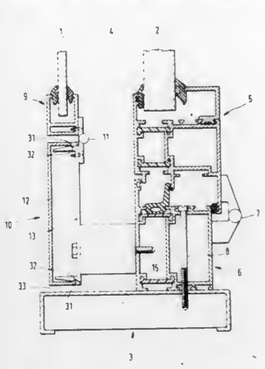
Filed Jul. 19, 1984, Ser. No. 632,444

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327155; Jun. 5, 1984, 3420883

Int. Cl.⁴ E04H *9/00;* **E06B** *5/12*

U.S. Cl. 52—1 **3 Claims**

1. An explosive action resistance glazing unit comprising an embrasure frame, an inner frame member mounted to said embrasure frame, an inner blast resistant pane mounted in said inner frame member, an outer frame member comprised of a glazing frame having an outer blast resistant pane mounted therein and a surrounding frame supporting said glazing frame, said surrounding frame having an inner section operatively connected to said embrasure frame and an outer section snap fitted connected to said inner section, said panes and frames together defining a space there between, pressure relief passage means extending into said space from the exterior in surrounding relation of said outer pane, said passage means being sized to permit the rapid outflow of gases within said space to thus minimize pressures within said space in response to an explosive inwardly directed force applied against said outer pane, said inner section having passages formed there through in communication with said space, whereby said outer section is released from said snap fitting connection with said inner section to open said passages responsive to pressure build up in said space.



4,630,412

COLLAPSE PREVENTING CONNECTION DEVICE FOR BUILDING STRUCTURES

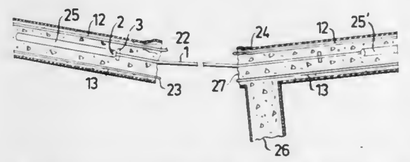
Björn M. H. Engström, Guldringen 27, S-421 52 Västra Frölunda, and Karl-Gustav Bernander, Ringvägen 32, S-133 00 Saltsjöbaden, both of Sweden

PCT No. PCT/SE83/00216, § 371 Date Jan. 30, 1985, § 102(e) Date Jan. 30, 1985, PCT Pub. No. WO84/04773, PCT Pub. Date Dec. 6, 1984

PCT Filed May 30, 1983, Ser. No. 704,248

Int. Cl.⁴ E04B *1/98;* **E04H** *9/00*

U.S. Cl. 52—1 **15 Claims**



1. A tie device for building structures, adapted to connect structural elements and including at least one pull means having a first and a second end, and at least one anchoring means preferably adjacent to one of said ends, said anchoring means being surrounded by a cast material for connection to one of said structural elements, wherein said anchoring means (2,2') and said cast material (10) are so constituted that said anchoring means (2, 2') slides in said cast material when said pull means (1) is exposed to a tensional force that is less than its ultimate tensional strength and preferably greater than half its ultimate tensional strength, and wherein a stop means (3,3') is arranged in said cast material about said pull means in order to stop slippage after a predetermined slip distance by means of abutment of said anchoring means (2,2') against said stop means (3,3'), whereafter a higher tensional force than the slip force can be transmitted between said structural elements connected by said tie device.

4,630,413

POST FOR TRAFFIC SIGNS, LIGHTING AND THE LIKE

Lars Svensson, Vikingavägen 112, Vallentuna S-186 00, Sweden

PCT No. PCT/SE84/00101, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/04117, PCT Pub. Date Oct. 25, 1984
PCT Filed Mar. 21, 1984, Ser. No. 684,923
Claims priority, application Sweden, Apr. 8, 1983, 8301967
Int. Cl.[4] E01F 9/01
U.S. Cl. 52—98 10 Claims



8. A support post deformable and collapsible upon impact by a motor vehicle, comprising

a plurality of essentially rigid generally planar metal sides joined along edges thereof to form a polygonal hollow profile;

folding means along the edges of said sides to provide folding, deformation and collapsing of said post along said edges upon impact by a motor vehicle, said folding means comprising connecting portions along said edges; and

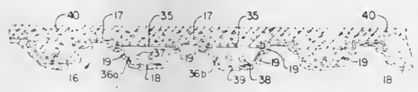
means for effecting tearing along at least some of said connecting portions when subjected to extended deformation beyond a selected angle upon impact by a motor vehicle, said means comprising a groove (6) defining a thinned and weakened line along each said at least some connecting portions, said groove having two edges (9) and a groove bottom (10), the edges (9) of the groove coming into contact with one another upon said extended deformation and causing the groove bottom (10) to tear.

4,630,414

CELLULAR STEEL DECKING

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Continuation-in-part of Ser. No. 559,252, Dec. 8, 1983, abandoned, which is a continuation of Ser. No. 340,869, Jan. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 188,085, Sep. 17, 1980, abandoned. This application Jun. 7, 1985, Ser. No. 778,812
Int. Cl.[4] E04B 5/48
U.S. Cl. 52—220 9 Claims



1. In a cellular flooring for a composite floor of a building comprising nestable corrugated steel decking stations connected in side-by-side arrangement, each of said sections comprising plural essentially imperforate horizontal crests and plural horizontal valleys connected by essentially imperforate generally sloping sidewalls whereby each pair of confronting sidewalls and the included one of said valleys defines a lengthwise trough, a covering layer of concrete compositively engaged with said decking sections to form said composite floor;

the improvement comprising;

cover means comprising one or more strip elements secured to said decking section above the said included valley and below the said crests whereby an enclosed lengthwise cell is defined by said trough and said strip elements;

the said sloping sidewalls diverge from each said crest to the adjacent valleys and a reentrant groove is provided in each of said sloping sidewalls adjacent to the said crest; and the said strip elements are retained in position by engagement in a confronting pair of said grooves;

said covering layer of concrete extending into said reentrant grooves to form a composite bond above the said included valley;

at least one opening in said cover means defining a passageway which opens into said lengthwise cell.

4,630,415

FIRE STOP

Ronald L. Attwell, Wicklow, Ireland, assignor to Selkirk Division of Household Manufacturing Limited, London, England

Filed Dec. 23, 1983, Ser. No. 564,877
Int. Cl.[4] E04B 5/48
U.S. Cl. 52—221 15 Claims



1. A fire stop for sealing the space between a conduit and the periphery of an opening in a structural member through which the conduit passes, the fire stop comprising an annular collar of cementitioius material having a bore for sealable engagement with the conduit and an outer periphery, a major portion of the outer periphery of the collar being tapered in an axial direction to provide sealing engagement with the periphery of an opening.

4,630,416

ACOUSTICAL PANEL

Daniel W. Lapins, Holland, and Richard Szymanski, Norton Shores, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed May 9, 1985, Ser. No. 732,482
Int. Cl.[4] E04B 2/28
U.S. Cl. 52—239 12 Claims



1. In an interior space dividing wall formed from a plurality of portable interior upright space-divider panels which are horizontally connected together in series, said panel having opposed enlarged side surfaces and a sound-absorbing core structure disposed between said side surfaces and extending substantially coextnesively over the area thereof, said core structure including first means for absorbing sound waves of one frequency and second means for absorbing sound waves of a substantially different frequency, said first means including a plurality of Helmholtz resonators each defined by a small substantially closed chamber disposed interiorly of the wall panel and communicating with the surrounding environment through small opening means which project outwardly from the respective chamber toward one of the side surfaces of the panel, said first means including a thin sheetlike skin having said small opening means extending therethrough, and said second means including a layer of porous-sound-absorbing material overlying said plurality of Helmholtz resonators, said layer being of a porous fiberglass material, the improvement wherein said layer comprises:

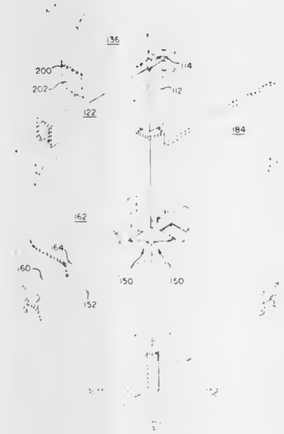
a thin inner layerlike strata disposed so as to directly overlie said pluraltiy of Helmholtz resonators and said thin skin, said inner strata being of a high-density fiberglass material, and a thick outer layerlike strata disposed directly adjacent and coextensively overlying said inner strata, said outer strata being of a low-density fiberglass material, said outer strata having a density gradient which increases as it extends from its outer surface toward said inner strata, said outer strata consisting of a single integral layer having a variable density which progressively increases across the thickness thereof toward said inner strata, said outer strata having a thickness which is several times greater than the thickness of said inner strata, said inner strata having a density which is several times greater than the average density of said outer strata and which is also greater than the maximum density of said outer strata, and said inner strata having a maximum thickness of about 0.080 inch and a minimum density of about 6 pounds per cubic foot.

4,630,417

MODULAR COMBINATION FLOOR SUPPORT AND ELECTRICAL ISOLATION SYSTEM FOR USE IN BUILDING STRUCTURES

William R. Collier, 400 Park Blvd., Itasca, Ill.

Filed Feb. 13, 1984, Ser. No. 579,426
Int. Cl.[4] E04B 2/82
U.S. Cl. 52—263 7 Claims



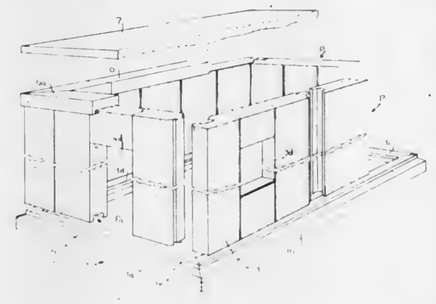
1. A combination working area floor structure and conductor support and isolator assembly comprising, in combination, a plurality of vertically extending floor support column units each having upper and lower end portions and an intermediate column section, a working area floor positioned by and disposed in overlying relation to said upper ends of said column support units; means on at least one intermediate portion of said support columns for positioning and supporting at least one conductor support floor, said conductor support floor being disposed beneath and spaced apart from said working area floor, a plurality of vertically extending imperforate wall panel extending between portions of said conductor support floor and said working area floor so as to subdivide the region above said conductor support floor and below said working area floor into a mechanically isolated conductor plenum adapted to receive and support insulated electrical conductors, and to afford mechnical one upwardly extending opening in said working area floor through which said conductors may pass for attachment to an apparatus supported on said working area floor, with said wall panels also defining a mechanically isolated, vertically extending passage extending from beneath said conductor support floor through said isolated plenum and to said working area floor, with an under portion of said working area floor lying above said vertically extending passage and said conductor support floor also including at least one opening therein to afford communication between the area above said working area floor and the area beneath said conductor support floor.

4,630,418

APPARATUS OF CONSTRUCTION BY MEANS OF PREFABRICATED ELEMENTS, PARTICULARLY OF WOOD

Andre Degut, Pomeys, France, assignor to Societe A. Degut, France

Filed Sep. 13, 1984, Ser. No. 650,355
Claims priority, application France, Sep. 20, 1983, 83 15372; Feb. 23, 1984, 84 03187
Int. Cl.[4] F04B 1/10; E04C 3/02, 3/30
U.S. Cl. 52—264 19 Claims



1. In a building device particularly for building small houses, garages, shelters, doors and shutters, by means of a plurality of panels having transverse sides and lateral surfaces, the improvement which comprises in that each of said panels includes at least two vertical ridges bevelled in the vertical direction with a slanting profile at an angle 45° and formed from the same lateral surface, one of the transverse sides of said panel being provided along the entire length with a vertical groove which is formed at an angle of about 90° from the end of one of said ridges, the other transverse side of the panel being provided vertically along the entire length within the extension plane of the the other of said ridges with a rib parallel to said vertical groove and having a complementary contour.

4,630,419

BUILDING COMPONENTS

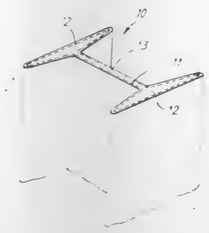
Thomas A. Pilgrim, Edwalton, England, assignor to BPB Industries Public Limited Company, London, England

Continuation of Ser. No. 373,676, Apr. 30, 1982, abandoned. This application Apr. 18, 1985, Ser. No. 724,464
Claims priority, application United Kingdom, May 1, 1981, 8113483
Int. Cl.[4] E04C 3/30, 3/34, 2/06
U.S. Cl. 52—309.13 14 Claims

1. A building component comprising:

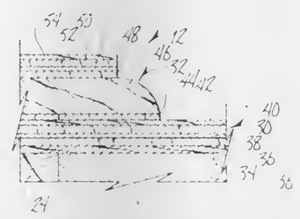
an integral body of angulate, channel or hollow cross section, said body comprising a mixture of gypsum and resin; and

at least one sheet of inorganic fibres, each such sheet being embedded and completely surrounded in said body immediately below a surface thereof;



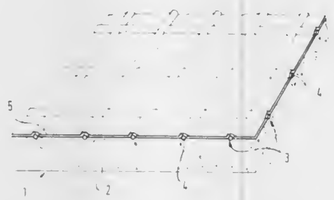
a continuous thin film of said gypsum and resin mixture of said body located on an exterior surface of said building component while being integral with said body and embedding and completely surrounding said sheet.

4,630,420
DOOR
Bruce A. Hagemeyer, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa
Filed May 13, 1985, Ser. No. 732,950
Int. Cl.[4] E06B *3/70*
U.S. Cl. 52—313 **15 Claims**



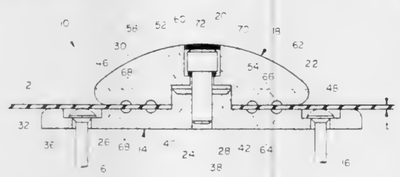
1. A thermal and moisture resistant door, comprising:
a framework defining the perimeter edges of said door and defining the interior and exterior sides of said door, said framework including opposite elongated side frame members, a top frame member extending between said side frame members at the upper ends thereof, and a bottom frame member extending between said side frame members at the lower ends thereof;
a laminated skin secured to said framework on the interior and exterior sides of said door, said skin including an inner wood backer layer attached to said framework and having the wood grain running substantially parallel to the length of the door, a first wood cross-banding layer attached to said backer layer and having the wood grain running substantially perpendicular to the length of the door, a vapor barrier layer attached to said first cross-banding layer, a second wood cross-banding layer attached to said vapor barrier layer and having the wood grain running substantially perpendicular to the length of the door, and an outer wood veneer layer attached to said second cross-band layer and having the wood grain running substantially perpendicular to the length of the door;
a laminated panel secured to said skin on at least one side of said door, said panel including an inner first wood cross-banding layer attached to said veneer layer of said skin, an intermediate wood layer attached to said first cross-banding layer, a second wood cross-banding layer attached to said intermediate wood layer, a vapor barrier layer attached to said second cross-banding layer, a third wood cross-banding layer attached to said vapor barrier layer and an outer wood veneer layer attached to said third cross-banding layer, the wood grain of said intermediate layer and the wood grain of said veneer layer running substantially parallel to one another and the wood grain of at least one of said cross-banding layers running substantially perpendicular to the wood grain of said veneer layer;
wherein the layers of lamination of said skins provide strength to the door to prevent warping of the door due to temperature differentials across the door;
wherein the layers of lamination of said panel provide strength to the door and panel to prevent warping of the door and panel due to temperature differentials across the door and panel;
wherein said vapor barriers in said skins prevent warping of the door due to moisture absorption thereby; and
wherein said vapor barrier in said panel prevents warping of the panel due to moisture absorption thereby.

4,630,421
ROOF WEB FOR PITCHED ROOFS
Hermann Diehl, Mannheim; Günter Baatz, Buxheim, and Walter Machholz, Memmingen, all of Fed. Rep. of Germany, assignors to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany
Filed Nov. 29, 1985, Ser. No. 803,134
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443581; Oct. 30, 1985, 3538597
Int. Cl.[4] E04B *7/00*
U.S. Cl. 52—408 **14 Claims**



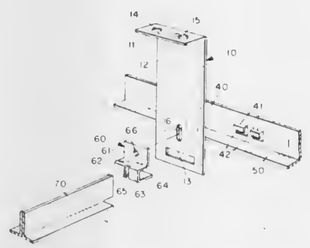
1. Roof web for pitched roofs, comprising a vapor diffusion permeable but surface water impermeable foil, a reinforcement disposed below said foil, and an open-pore soft foam material disposed below said reinforcement and connected to said foil through said reinforcement, said reinforcement being a tear-proof grid fabric with a diffusion equivalent air layer thickness of substantially 0.07–0.12 m.

4,630,422
PENETRATING ROOFING MECHANICAL FASTENING SEALING SYSTEM AND METHOD
Heinz W. Beneze, Richfield, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jan. 22, 1985, Ser. No. 693,550
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] E04B *5/00, 1/38*
U.S. Cl. 52—410 **19 Claims**



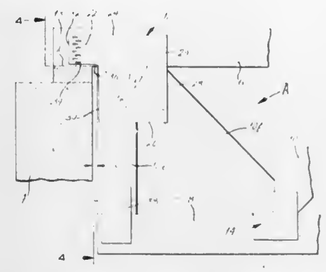
1. A penetrating, fastening and sealing device for both mechanically securing a flexible elastomeric sheet, of a range of thicknesses, to the upper surface of a roof, and sealingly engaging said sheet, said device comprising in combination:
(a) a rigid lower retainer including, on its upper surface a sharp annular edge for cutting an aperture of a first predetermined area and shape in the elastomeric sheet, said lower retainer having an area greater than said sheet aperture;
(b) means for anchoring said lower retainer to said roof upper surface;
(c) a rigid upper retainer, having an area greater than said sheet aperture area, adapted to overlie and completely cover said aperture, thereby confining a continuous peripheral portion of said sheet, bordering said sheet aperture, between said upper and lower retainers; and
(d) separate fastener means engageable with a center portion of the upper retainer and extending from said upper retainer into a center portion of the lower retainer for drawing said retainers perpendicularly against each other to sealingly secure the elastomeric sheet between said retainers.

4,630,423
SUSPENDED-CEILING FRAMEWORK ASSEMBLY
Larry W. Lind, Spring Valley, Calif., assignor to United States Elevator Corporation, Spring Valley, Calif.
Filed Dec. 24, 1984, Ser. No. 686,002
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—484 **9 Claims**



8. A framework assembly for supporting ceiling panels, comprising:
a bracket comprising a flat, plate-like member having opposite flat faces and a support slot;
means for suspending the bracket vertically from an overhead support structure;
a first framing rail comprising an elongate flat web having at least one transverse flange for supporting the edge of a ceiling panel and hook means projecting transversely from the web for engagement through said support slot to support said rail to extend in a first horizontal direction with said web first against one of said flat faces of said bracket and said flange projecting beneath and across the lower edge of said bracket;
a retainer clip having an upper portion releasably secured to said bracket above said support slot on the opposite face of said bracket to said framing rail, the retainer clip having a first, outwardly projecting portion projecting away from said upper portion and a second, inwardly projecting portion projecting through said slot above said hook means to retain said hook means in said slot, the outwardly projecting portion having a cross rail retaining slot for locating a cross rail in a horizontal direction transverse to said first direction;
a cross rail having projecting means at one end for projecting into said cross rail retaining slot and acting between said retainer clip and framing rail flange to support said cross rail to extend in said transverse horizontal direction.

4,630,424
TOP HUNG TRUSS
George F. Eberle, St. Louis; Karl L. Bickel, O'Fallon, both of Mo., and John M. Denny, Renton, Wash., assignors to Lumbermate Company, St. Louis, Mo.
Filed Sep. 14, 1984, Ser. No. 651,041
Int. Cl.[4] E04C *3/17, 3/292*
U.S. Cl. 52—693 **11 Claims**



1. A truss comprising: a wood top chord having an upper surface; a wood bottom chord located below the top chord; wood webs extended between the top and bottom chords with at least some of the webs being oblique to the top and bottom chords so that the chords and webs transmit axial forces in the truss when a downwardly directed load is applied to the truss, the endmost of the webs being offset from the end of the top chord such that a portion of the top chord extends beyond the endmost web in the form of a chord extension at which an upwardly directed supporting force is exerted on the truss to resist the downwardly directed load, the endmost of the oblique webs being oriented such that the axial force transmitted by it intersects the axial force transmitted by the top chord below the upper surface of the top chord and near the inner end of the chord extension, so that the upwardly directed supporting force on the cord extension is offset from the location where the axial forces intersect, whereby shear forces exist at the chord extension and a bending moment develops generally about the inner end of the chord extension; and a metal connector plate joining the top chord and the endmost oblique web together and having an upper margin that is located below the upper surface of the top chord so that a portion of the top chord is exposed above the connector plate, the plate including a main section and a leg extended from the main section, the main section overlying the side faces of the top chord and the endmost oblique web and containing projections which are embedded in the top chord and endmost oblique web, the leg being formed integral with the main section and projecting from the main section such that the leg and main section form an inside corner in the connector plate, the leg overlying the chord extension and containing projections which are embedded in the chord extension, whereby shear forces and bending moments at the chord extension will be transmitted at least in part through the connector plate, the plate being configured and positioned such that the location at which the axial forces transmitted in the top chord and endmost oblique chord intersect is within the confines of the plate.

4,630,425
ERECTION MEANS FOR PORTABLE DRILLING SYSTEM
Lowell M. Reed, Oklahoma City, Okla., assignor to Parker Drilling Company, Tulsa, Okla.
Continuation of Ser. No. 649,929, Sep. 13, 1984, abandoned, which is a division of Ser. No. 261,902, May 8, 1981, Pat. No. 4,473,977. This application Nov. 19, 1985, Ser. No. 799,553
Int. Cl.[4] B66C *27/06*
U.S. Cl. 52—745 **1 Claim**

1. A method of erecting a drawworks structure having four pivoted legs and a mast on a subbase structure wherein the

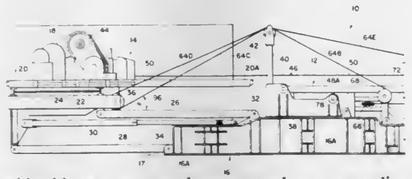
drawworks structure in the unerected position and the mast in the unerected position are of substantially the same elevational height, comprising the steps of:

(1) erecting a subbase on the earth's surface;

(2) erecting an upright sheave post on said subbase structure between an unerected drawworks structure and an unerected mast, the sheave post having a sheave at the upper end thereof, the height of the sheave post being greater than the elevational height of the unerected drawworks structure and less than the height of drawworks structure in erected form;

(3) pivotally pinning the four pivoted legs of the unerected drawworks structure to the subbase, the drawworks structure having a platform thereon with drawworks mounted on the platform;

(4) pivotally pinning the lower end of the unerected mast to



said subbase structure, the unerected mast extending horizontally away from said sheave post in the direction opposite said unerected drawworks structure;

(5) passing a line from said drawworks over said sheave post for connection to a pull point on said mast;

(6) using said drawworks to retract said line to pivot said drawworks structure upwardly into elevated, erected position above said subbase structure, the four legs of the drawworks platform extending vertically and adjacent to said sheave post; and

(7) connecting said line to said mast and continuing to reel in said line on said drawworks to pivot said mast to the upright position adjacent said drawworks structure and adjacent said sheave post, said sheave post remaining in upright position entirely between and independent of said drawworks platform and said mast for use in diserecting said mast and drawworks structure.

4,630,426

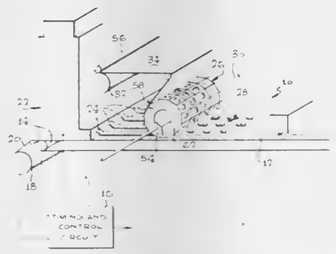
FOOD UNIT MAKING AND PACKAGING APPARATUS AND METHOD

James C. Gentry, 21461 Encina Rd., Topanga, Calif. 90290

Filed May 17, 1985, Ser. No. 735,047

Int. Cl.[4] B65B *9/02*

U.S. Cl. 53—428 **10 Claims**



9. A food unit making and packaging method comprising the steps of:

advancing an indentable conveyor belt;

laying a base layer of packaging film upon the conveyor belt;

laying a continuous strand of moldable material on the conveyor belt as it advances;

positioning a portion-forming wheel having edges around portion cavities therein with ramped press areas within the edges and around the portion-forming cavities, with the portion-forming cavities around the periphery of the portion-forming wheel and sufficiently close to the conveyor belt to rotate and indent the conveyor belt as the conveyor belt advances;

laying a layer of cover packaging film on the portion-forming wheel to cover the portion cavities therein; and

forming units of moldable material by cutting the strand of moldable material by the portion-forming wheel between the cavities and forcing the moldable material into the cavities by the edges and ramped press areas indenting the conveyor belt to form separate portion cavities so that the moldable material is cut into units, shaped by the shape of the portion cavities, and packaged between the films.

4,630,427

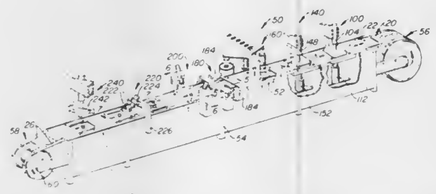
METHOD AND SYSTEM FOR FOLDING FLOPPY DISK ENVELOPES

Bruce Harper, San Jose, and Horace N. Kemp, Walnut Creek, both of Calif., assignors to Xidex Corporation, Santa Clara, Calif.

Filed May 15, 1985, Ser. No. 734,621

Int. Cl.[4] B65B *11/48*

U.S. Cl. 53—460 **8 Claims**



1. A method for folding flopping disk envelopes, said method comprising:

feeding a continuous web of envelope material along a predetermined path, said web including a plurality or partially-cut envelope blanks which comprise a primary flap joined to a secondary flap along a common edge transverse to said path and three sealing flaps joined to the other three edges of the primary flap;

folding at a first location on the path the secondary flap over against the primary flap along a fold line transverse to the path to form the envelope while the primary flaps of the folded blank and the upstream and downstream envelope blanks remain attached at their corners to bhe web;

folding and sealing at a second location on the path at least two of the sealing flaps over against the secondary flap along fold lines parallel to the path to seal those edges of the envelope while said primary flaps remain attached to said web; and

detaching the folded, sealed envelope from the web at a third location along the path.

4,630,428

METHOD AND APPARATUS FOR PLACEMENT OF SMALL ARTICLES, SUCH AS CANDIES OR CHOCOLATES IN PREDETERMINED POSITIONS IN A RECEIVER

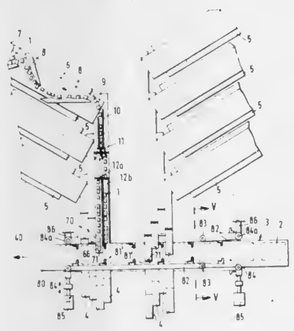
Hans-Bernd Lesch, Munich, Fed. Rep. of Germany, assignor to Sapal Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland

Filed Apr. 2, 1985, Ser. No. 718,862

Claims priority, application European Pat. Off., Apr. 28, 1984, 84104796

Int. Cl.[4] B65B *59/00*

U.S. Cl. 53—474 **17 Claims**



1. Method of placing small articles (1), such as candies, chocolates and the like, in a predetermined position in a receiver (2) having receiving compartments for the articles,

using the steps of

allocating to each article a coordinate position (90) in the receiver (2) in an orthogonal X-Y coordinate system (89);

continuously transporting the receiver (2) in the X coordinate direction, with a predetermined speed and a predetermined spacing, beneath an insertion station;

supplying the articles to the insertion station;

at the insertion station, grasping an article and cyclically moving the grasped article in a predetermined insertion path (47) in the Y coordinate direction, over the continuously moving receiver,

releasing the grasped article into the receiver (2),

and controlling

the X coordinate position of placement or the articles in the receiver during the continuous transport movement of the receiver by selectively controlling the timing of the insertion movement of the articles during said continuous transport movement of the receiver with respect to the continuous transport movement of the receiver (2) to thereby determine, during the continuous transport movement of the receiver, the selected X coordinate position (90) of the article (1) in the receiver upon release of the article into the receiver; and

the step of cyclically moving the articles in the predetermined insertion path (47) comprises moving the articles in a path which is located in a vertical plane, which plane includes said Y coordinate direction,

and is fixed in space; and

the receiver is moving at a constant speed past the insertion station.

4,630,429

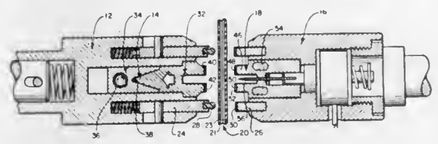
APPARATUS AND METHOD FOR SEALING A WEB OF FILM IN A FORM, FILL, AND SEAL PACKAGING SYSTEM

William C. Christine, Catasauqua, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 1, 1985, Ser. No. 697,556

Int. Cl.[4] B65B *9/00*

U.S. Cl. 53—479 **46 Claims**



6. In a machine for manufacturing from a web of film a closed flexible bag having transverse seals an apparatus for creating the transverse seals comprising:

heating means, including a hot bar with at least one film contact surface and means for heating the hot bar, for melting a portion of the web of film to create the transverse seals;

cooling means for cooling the heating means and the melted portion of the web of film, the cooling means being located diametric the heating means and including a cold bar with at least one film contact surface and means for cooling the cold bar;

a pair of jaws, the heating means being located in a first of the jaws and the cooling means being located in a second of the jaws; and

the heating means includes means for disengaging the means for heating the hot bar from the hot bar as the jaws contact the web of film.

4,630,430

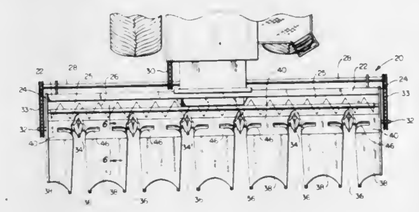
CORN HEAD ASSEMBLY FOR HARVESTING CORN

Harry D. Weeks, 7225 Kile Rd., Plain City, Ohio 43064

Filed Apr. 10, 1985, Ser. No. 721,684

Int. Cl.[4] A01D *45/02*

U.S. Cl. 56—14.1 **4 Claims**



1. In a corn head assembly for mounting on the forward end of a conventional self-propelled combine and shelling apparatus; the combination of a frame means supporting a corn ear collecting means; a plurality of forward extending guide members laterally spaced from one another relative to the normal direction of travel to define a plurality of corn stalk-receiving openings; a corn stalk distributing means disposed at or near the rearward end of each of said corn stalk-receiving openings and including a rotatably mounted disk-like member provided with a vertially disposed knife-like outer edge and pair of curved surfaces extending laterally in opposing directions from said outer edge for engaging and imparting lateral movement to a corn stalk passing through said corn stalk-receiving openings; a stripping plate means disposed adjacent to each side of distributing means and including a longitudinal slot means having an open end facing said distributing means and aligned

to receive a corn stalk laterally directed by said distributing means and having a width insufficient to permit a corn ear from passing through said slot means, and a pair of closely spaced, snapping rolls rotatably driven in opposing directions relative to one another and mounted on said frame means below a respective one of said slot means and adjacent to a respective one of said distributing means to engagably receive a corn stalk directed by said distributing means between said rolls and force said stalk downwardly through said slot means; the axis of rotation of said rolls being generally parallel to the longitudinal extent of said slot means and disposed at generally a right angle to the normal direction of travel of said apparatus.

4,630,431

COMBINATION PLATFORM AND SHIELD FOR AN IMPLEMENT

Francis E. Schlueter, Des Moines, and Joel M. Schreiner, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 31, 1985, Ser. No. 793,605
Int. Cl.[4] A01D *46/08;* **B62J** *13/06*
U.S. Cl. 56—28 **21 Claims**



1. In an implement having upright structure supporting operable elements during operation, movable shield structure comprising:

linkage structure rockably connected to the implement adjacent the lower portion of the upright supporting structure and movable between an upright position and an outwardly extending position;

an upright shield having upper and lower ends; and

means connecting the lower end of the shield to the linkage structure for rocking therewith between a shielding position adjacent the operable elements and an access position offset from the elements as the linkage structure moves between the upright and outwardly extending positions, respectively, wherein said linkage structure includes means for maintaining the shield upright in both the shielding and access positions.

4,630,432

PICK-UP TINE ASSEMBLY FOR HARVESTER REELS

John E. Love; Archie E. Neal, both of Garfield, and Scott Libby, Spokane, all of Wash., assignors to J. E. Love Company, Garfield, Wash.

Filed Mar. 21, 1985, Ser. No. 714,624
Int. Cl.[4] A01D *57/02*
U.S. Cl. 56—220 **11 Claims**

1. A harvester bat and pick-up tine combination, comprising:

an elongated bat having front and rear walls extending between top and bottom edges of the bat; and

a plurality of individual tine assemblies individually releasably mounted to the bat, with each individual tine assembly including:

a wire tine in the form of a coil wound about a central coil axis and having a downwardly extending finger leading from one side and an upwardly extending shank leading from its remaining side, said shank terminating in a closed transverse loop;

a bracket covering the shank of the tine and overlying the rear wall of the bat, said bracket including an apertured upper end centered on the closed transverse loop of the tine shank;

releasable fastening means extending through the closed transverse loop of the tine shank and the rear wall of the bat for clamping the upper end of the bracket and tine shank against the bat;



said bracket including a lower hooked lip releasably received over the bottom edge of the bat and extending longitudinally along the lower bat edge to releasably secure the bracket to the bat in cooperation with the fastening means; and

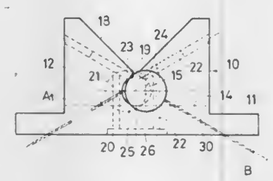
retaining means on the bracket and engaging the tine for preventing motion of the tine shank in the plane of the rear bat wall, the retaining means including an opening in said bracket in which the coil of the tine is located with the coil axis coplanar with the bottom edge of the bat.

4,630,433

METHOD FOR THE SPLICING OF TEXTILE THREADS BY MEANS OF A COMPRESSED GAS, AND SPLICING DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

Mauro Premi, Salo, Italy, assignor to Mesdan S.p.A., Salo, Italy

Filed Nov. 8, 1985, Ser. No. 796,436
Claims priority, application Italy, Nov. 12, 1984, 23530 A/84
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22 **10 Claims**



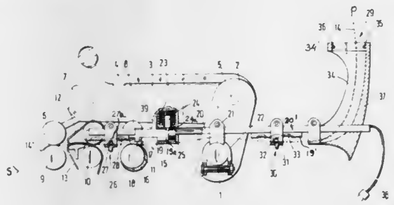
1. A method for the splicing of two textile threads by means of a compressed gas which comprises the steps of inserting the two threads to be joined through a longitudinal slit into a splicing chamber having a longitudinal axis and provided in a head having two opposite parallel side walls perpendicular to the longitudinal axis of the chamber, in correspondence of which walls there are side outlet openings of the same chamber, and subjecting the lengths of threads enclosed within the chamber to at least one burst of compressed gas blown into the inside of the chamber, characterized in that before the introduction of the compressed gas into the splicing chamber, the side outlet openings are substantially closed, in that at the same time the threads entering the chamber are locked against the respective side walls of the head, and in that the cut tails of the threads extending out of the side outlet openings are left free and unlocked, and in that the compressed gas blown into the chamber escapes from the same mostly through at least one port provided in the head transversely to the longitudinal axis of the chamber.

4,630,434

ROVING BLOCKING MECHANISM ON DRAW FRAMES OF SPINNING MACHINES

Max Hartmannsgruber, Kirchheim; Michael von Ronai-Horvath, Ludwigsburg; Kurt Seebo, Esslingen, and Bernhard Schoenung, Filderstadt, all of Fed. Rep. of Germany, assignors to SKF Textilmaschinen-Komponenten GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,961
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406397
Int. Cl.[4] D01H *13/16, 13/18*
U.S. Cl. 57—87 **10 Claims**



1. A draw frame for a spinning machine adapted to convert a roving supplied from an external source into a thread, comprising aligned pairs of inlet rollers and drafting rollers through wnich said roving travels from said external source, sensing means for detecting the continuity of the roving as supplied to said inlet rollers from said external source, blocking means associated with said inlet rollers selectively actuable to arrest the movement of said roving through said inlet rollers, clamp means selectively actuable, to arrest the travel of said roving, said clamp means being located along the path of travel of said roving between said sensing means and said blocking means at said inlet rollers and roving support means located between said inlet rollers and said drafting rollers, and means responsive to the sensing by said sensing means of a breakage in said roving supplied from said external source for simultaneously activating said blocking means and said clamp means to arrest said roving, said clamp means, blocking means and support means being aligned along the path of travel of said roving so as to maintain said arrested roving along the path of travel in alignment with said paired inlet and drafting rollers and the end of said arrested roving in position for re-combination with the roving from said external source.

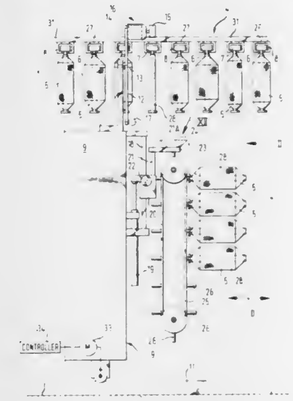
10. A draw frame for a spinning machine adapted to convert a single roving supplied from an external source into a thread, comprising upper and lower paired inlet rollers and drafting rollers through which said roving travels from said external source, blocking means associated with said inlet rollers selectively actuable to arrest the movement of said roving at said inlet rollers, clamp means actuable for holding said roving located upstream along the path of travel of said roving and guide means for directing said roving from said external source to said clamp means and sensing means located upstream of said clamp means responsive to the sensing of a breakage in said roving supplied from said external source for activating both said blocking means and said clamp means simultaneously to arrest said roving to thereby hold one end of said arrested roving at said inlet rollers and the other end of said arrested roving in the path of travel from said external source.

4,630,435

SYSTEM FOR AUTOMATICALLY CHANGING SPOOLS OF A SPINNING MACHINE

Wolfgang Igel, Ebersbach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 595,992, Apr. 2, 1984, abandoned. This application Jun. 27, 1985, Ser. No. 749,870
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312116
Int. Cl.[4] D01H *9/02, 9/10, 9/18*
U.S. Cl. 57—281 **8 Claims**



1. A spinning system comprising:

a spinning apparatus having a longitudinal succession of spinning stations;

a creel extending longitudinally above the apparatus and having respective pendant hangers above the stations and each capable of holding a respective yarn package;

a respective slide above each station supporting the respective hanger slidable between an inner position directly above the respective station and an outer position above but horizontally offset therefrom;

a reloading apparatus displaceable longitudinally along the apparatus at least generally under the hangers in the outer positions of the respective slides;

a magazine holding a supply of fresh roving packages on the reloading apparatus;

means on the reloading apparatus for displacing the slide between the inner and outer positions; and

means on the reloading apparatus for grabbing the package on the hanger in the outer position of the slide.

4,630,436

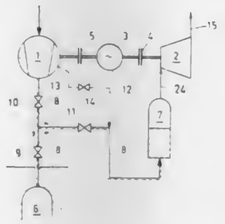
AIR STORAGE GAS TURBINE POWER STATION WITH FLUIDIZED BED FIRING

Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 11, 1985, Ser. No. 753,913
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1984, 3428041
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.183 **3 Claims**

1. An air storage gas turbine power station with fluidized bed firing whose gas turbine group comprises a turbine, a compressor, an electrical machine which can be operated alternatively as a generator and an electric motor, a first clutch

between the turbine and the electrical machine, a second clutch between the electrical machine and the compressor, an air storage chamber, a coal-fired fluidized bed combustion chamber, a combustion gas duct which communicates the fluidized bed combustion chamber with the turbine, a main air duct; and which communicates an outlet of the compressor with the air storage chamber and communicates both the air storage chamber and the outlet of the compressor with the fluidized bed combustion chamber, a first shut-off valve for selectively shutting-off the outlet of the compressor from said



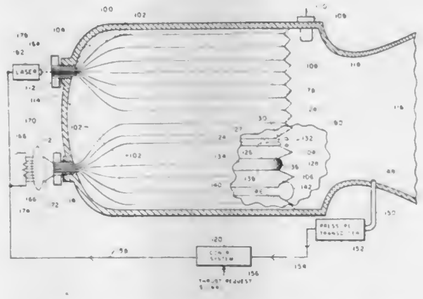
main air duct, a second shut-off valve for selectively shutting-off the air storage chamber from the main air duct, a throttle unit at a location along the main air duct upstream of the fluidized bed combustion chamber and a separator cyclone at a location along the combustion gas duct between the fluidized bed combustion chamber and the turbine, a low load air duct which communicates tapping means on the compressor with a section of the main air duct between the throttle unit and the fluidized bed combustion chamber and a third shut-off valve at a location along the low load air duct.

4,630,437

OPTICAL CONTROL METHOD FOR SOLID FUEL ROCKET BURN RATE

Peter C. Winch, Elizabeth East, Australia, and Mick Blackledge, Lancaster, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 696,298, Jan. 29, 1985, Pat. No. 4,587,805. This application Nov. 25, 1985, Ser. No. 801,362
Int. Cl.⁴ F02K *9/26*
U.S. Cl. 60—204 **11 Claims**



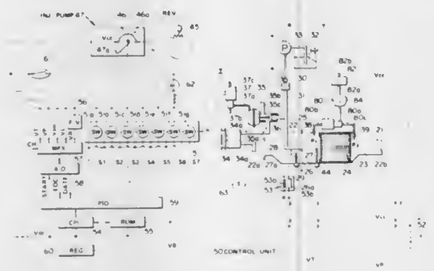
1. A method for generating controlled thrust from a solid fuel grain rocket motor comprising the steps of:
igniting the rocket fuel at a grain face burn surface:
sensing the achieved burn rate of the fuel grain, generating thereby a burn rate representive signal;
preheating a plurality of grain regions located across the grain body preceding the progressing burn surface with externally supplied optical energy; and
modulating the rate of said preheating in response to the difference between a thrust control signal and said burn rate representative signal.

4,630,438

EXHAUST PARTICLE REMOVING SYSTEM FOR AN ENGINE

Motohiro Shinzawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 6, 1985, Ser. No. 773,193
Claims priority, application Japan, Sep. 12, 1984, 59-189488
Int. Cl.⁴ F01N *3/02*
U.S. Cl. 60—274 **5 Claims**



4. A method comprising the steps of:
(a) measuring degree of clogging of a filter which traps particles suspended in exhaust gas emitted from an engine;
(b) indicating when the measured degree of clogging of the filter is equal to or greater than a first reference level;
(c) burning off the particles deposited on the filter when the measured degree of clogging of the filter is equal to or greater than the first reference level and when a manual switch is in a preset position; and
(d) burning off the particles deposited on the filter independent of whether or not the manual switch is in the preset position when the measured degree of clogging of the filter is equal to or greater than a second reference level greater than the first reference level.

4,630,439

EXHAUST GAS AFTERBURNER

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed Jun. 3, 1985, Ser. No. 740,580
Int. Cl.⁴ F01N *3/30*
U.S. Cl. 60—305 **20 Claims**



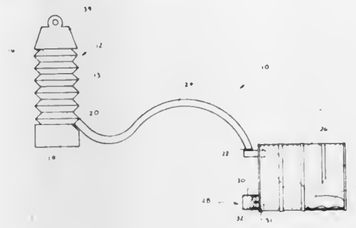
1. An exhaust gas afterburner device adapted for installation between an exhaust manifold and a corresponding portion of the engine block of an internal combustion engine, said device comprising: a spacer sandwiched between portions of two sheet metal members forming a gasket section of said device, said gasket section surrounding at least one exhaust gas port, a plenum section formed by remaining portions of said members, wall sections defining a plurality of passageways extending from the interior of said plenum section to said port and an air supply inlet on said plenum.

4,630,440

PROCESS AND APPARATUS FOR GENERATING ELECTRICAL POWER FROM OCEAN WAVES

Mary E. Meyerand, 64 Littel Acres Rd., Glastonbury, Conn. 06033

Filed Nov. 21, 1985, Ser. No. 800,279
Int. Cl.⁴ F03B *13/12*
U.S. Cl. 60—398 **15 Claims**



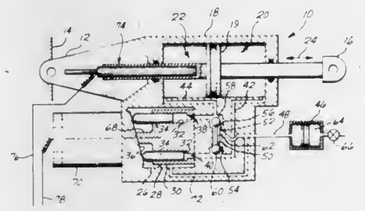
1. An apparatus for generating electrical power from ocean waves comprising:
first housing means adapted for submersion at a selected depth beneath the ocean waves, said first housing means including at least one opening therethrough;
first flexible bladder means, said first bladder means being disposed within said first housing means;
electrical generating means being associated with said first housing means opening whereby ocean water flowing through said opening will actuate said electrical generating means;
constant pressure reservoir means adapted for positioning above said ocean waves;
conduit means communicating between said first flexible bladder means and said constant pressure reservoir means; and
a fixed quantity of fluid being disposed within said first bladder means, said constant pressure reservoir means and said conduit means.

4,630,441

ELECTROHYDRAULIC ACTUATOR FOR AIRCRAFT CONTROL SURFACES

Theron R. Chamberlain, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 4, 1984, Ser. No. 646,755
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—413 **12 Claims**



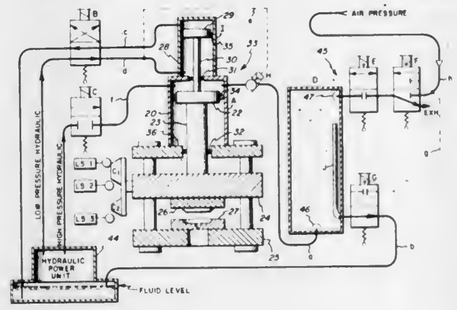
1. An improved electrohydraulic actuator for use aboard an aircraft, said actuator being of a type including a balanced, double-acting hydraulic ram connectable between a support and a member to be moved relative to said support, such ram having a cylinder and a movable piston received within the cylinder, said piston dividing the cylinder into first and second chambers, one on each side of said piston, said actuator further comprising:
a fixed displacement pump, the operative rotation of which is reversible, and having a pair of ports, said pump being characterized in that one of said ports acts as a pump outlet and the other of said ports acts as a pump inlet, and vice versa, depending on the direction of rotation of said pump, wherein said port acting as an outlet outputs hydraulic fluid at a certain outlet pressure;
a reversible variable drive electric motor drivingly connected to said pump;
a first conduit unobstructedly connecting one of said pump ports to one of said cylinder chambers, for providing an uninterrupted fluid flow path between said one port and said one chamber;
a second conduit unobstructedly connecting the other of said pump ports to the other of said cylinder chambers, for providing an uninterrupted fluid flow path between said other port and said other chamber;
a third conduit interconnecting said first and second conduits;
an accumulator means, connected to said third conduit, for delivering pressurized hydraulic fluid thereto, at a pressure less than said pump outlet pressure; and
valve means, positioned in said third conduit, for blocking pump outlet flow in one of said first and second conduits from flowing into the other of said first and second conduits, and for at the same time permitting hydraulic fluid flow from said accumulator means to be communicated into said other conduit.

4,630,442

APPARATUS AND METHOD FOR PRE-FILLING A HYDRAULIC MOTOR

Peter C. Massaro, Syracuse, and Ronald F. Legawiec, E. Syracuse, both of N.Y., assignors to Trol-Mation, Inc., Syracuse, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,563
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—415 **21 Claims**



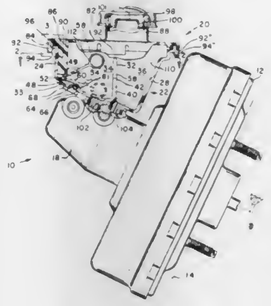
1. In a hydraulic press of the type having a hydraulic power unit with a hydraulic fluid tank and an independent means for advancing and retracting the piston of a hydraulic motor, a hydraulic fluid pre-fill system comprised of:
a reservoir for holding a supply of hydraulic fluid for use in pre-filling the hydraulic motor, said reservoir having a gas inlet for connection to a compressed gas source, a pre-fill fluid port connected to the power input side of the hydraulic motor and a hydraulic fluid drain outlet for discharging excess volume hydraulic fluid; and
control means connected in the gas inlet, the hydraulic fluid drain outlet and the pre-fill fluid port for causing hydraulic fluid to be transmitted from the reservoir to the hydraulic motor under pressure from the compressed gas source as the piston is advanced, and for allowing hydraulic fluid to be discharged from the motor to the reservoir as the piston is retracted with any excess fluid being discharged from the reservoir under compressed gas pressure through the hydraulic fluid drain outlet.

4,630,443

RESERVOIR FOR A MASTER CYLINDER

John E. Steer, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jun. 3, 1985, Ser. No. 740,668
Int. Cl.⁴ F15B *7/00*
U.S. Cl. 60—535 **3 Claims**



1. A reservoir for a master cylinder of a brake system, said reservoir consisting of:

a body having side walls connected to a base member, said body having an interior wall that separates a first compartment from a second compartment, said interior wall having an opening located a fixed distance from said base to permit communication of fluid between said first and second compartments while assuring a minimum volume of fluid is retained in each of said first and second compartments, said base member having first and second ports therein for connecting said first and second compartments with first and second chambers within said master cylinder, said side walls having a flange with a first peripheral lip located thereon, said body having first and second arms extending from one side into said first compartment, said base member having an external slot with a corresponding internal flat surface located in said first compartment;

a lever having a pin on a first end, a float attached to a second end and a magnet positioned between said first and second ends, said pin being attached to said first and second arms, said float being responsive to the level of fluid in said first compartment by pivoting said lever about said first end and positioning said magnet within said first compartment;

sensor means located in said external slot and responsive to the position of said magnet for generating a signal indicative of the fluid level in said first compartment;

an end member having a vent tube extending therefrom, said end member having a second peripheral lip with a corresponding shoulder located adjacent thereto to define a groove, said end member having a projection extending from said shoulder into said first compartment, said projection having an end surface that assures that said pin is retained in said first and second arms on movement of said lever by said float;

a seal resiliently retained on said shoulder in said groove on said end member;

a cap connected to said vent tube through which fluid is supplied to said first and second compartments; and

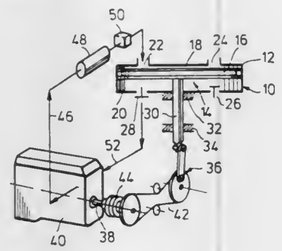
a plurality of tangs extending from said second peripheral lip on said end member, said tangs initially radially expanding to allow said first peripheral lip to be located in said groove and when said shoulder engages said flange to radially contract and lock said end member to said body, said shoulder and flange first forming a first mechanical barrier and the compression of said seal between said shoulder and first peripheral lip forming a second mechanical barrier to retain fluid in said first and second compartments, said base member being located in a plane that forms an acute angle with said end member, said float following the level of fluid in first and second chambers and when the float is below the opening in said interior wall, positioning said magnet with respect to said flat surface to provide said sensor means with a signal indicative of the fluid level in said first compartment.

4,630,444

INTERNAL COMBUSTION ENGINE WITH A COMBINATION EXHAUST AND DIRECT DRIVE SUPERCHARGER

Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,957
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318093; May 18, 1983, 3318162
Int. Cl.⁴ F02B *37/10*
U.S. Cl. 60—598 **4 Claims**



1. A combination supercharger and exhaust driven motor for an internal combustion engine comprising:

a housing defining a chamber,

a piston disposed in said chamber for movement therein and separating said chamber into an exhaust gas chamber and an air charging chamber,

first conduit means for connecting said exhaust gas chamber with the exhaust port of a cylinder of said engine, whereby exhaust gas pulses urge said piston toward said air charging chamber,

second conduit means for connecting said air charging chamber with the intake port of a cylinder of said engine, whereby air in said air charging chamber compressed by said piston is directed to said cylinder,

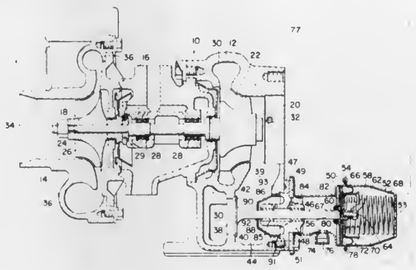
a drive train causing reciprocation of said piston in a predetermined phase relationship with the rotation of the crankshaft of said engine whereby both said exhaust gas and said drive train are able to transmit energy to said piston to thereby compress air in said air charging chamber which is transmitted to said cylinder and whereby when said exhaust gas energy exceeds the magnitude needed to compress said air in said air charging chamber, a portion of said exhaust gas energy is transmitted by said engine through said piston and said drive train, and means for changing said phase relationship between said piston and said engine crankshaft.

4,630,445

WASTEGATE VALVE FOR INTERNAL COMBUSTION ENGINE TURBOCHARGER

John Parker, Huddersfield, England, assignor to Holset Engineering Company Limited, Turnbridge, England

Filed Mar. 15, 1985, Ser. No. 712,950
Claims priority, application United Kingdom, Mar. 16, 1984, 8406859
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—602 **6 Claims**



1. A wastegate valve assembly for a turbine mounted for rotation within a turbocharger housing having an inlet passage for delivering hot exhaust gases to said turbine, said valve assembly comprising:

means for defining an exhaust gas flow path around said turbine, said flow path means including a valve seat;

a valve head carried by a valve stem;

a valve guide means slideably mounting said valve stem for movement between two positions, the first of which causes said valve head to engage said valve seat and block flow through said flow path means and the second of which permits flow through said flow path means thus bypassing said turbine;

a shield means surrounding said valve stem and positioned to shield said stem from hot exhaust gas passing through said bypass flow path means; and,

means for conducting a flow of cooling fluid to the valve stem in at least part of the portion thereof that is surrounded by said shield means and to the interior of said shield means and to the exterior of said shield means in sufficient quantity to cool the valve stem and provide a barrier between the shield means and said valve guide means.

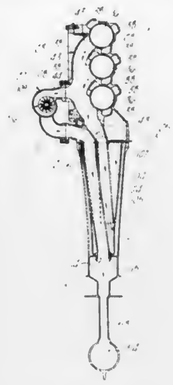
4,630,446

OUTBOARD MOTOR WITH TURBO-CHARGER

Tomio Iwai, Hamamatsu, and Yukio Matsushita, Iwata, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed May 25, 1984, Ser. No. 614,439
Claims priority, application Japan, May 27, 1983, 58-92340; May 27, 1983, 58-92341; May 27, 1983, 58-92342
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—602 **22 Claims**

1. A turbo-charger arrangement for an internal combustion engine having an exhaust chamber for receiving exhaust gases from a plurality of exhaust ports of respective engine chambers, an outlet from said exhaust chamber, an exhaust pipe having an inlet end communicating with said exhaust chamber outlet and an outlet end, a turbo-charger having a turbine stage inlet communicating directly with said exhaust chamber and a turbine outlet, valve means for closing said outlet for directing substantially all of the flow of exhaust gases from said exhaust chamber to said turbo-charger turbine stage inlet without flowing through said exhaust pipe, and an expansion chamber,



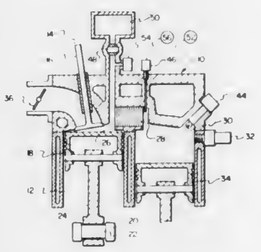
said exhaust pipe extending into said expansion chamber with its outlet end opening directly into said expansion chamber.

4,630,447

REGENERATED INTERNAL COMBUSTION ENGINE

William T. Webber, 30704 Davey Jones Dr., Agoura, Calif. 91301

Filed Dec. 26, 1985, Ser. No. 813,595
Int. Cl.⁴ F02G *1/02*
U.S. Cl. 60—712 **6 Claims**



1. A thermally regenerated four-stroke cycle internal combustion engine, comprising:

a cold side cylinder, having:

an intake valve located through cold side cylinder wall for drawing air into said cold side cylinder;

an exhaust valve independently located through said cold side cylinder wall for emitting exhaust gases; and

a cold side piston connected to a crank shaft through a connecting rod;

a hot side cylinder having:

a fuel injector and igniter located through hot side cylinder wall; and

a hot side piston connected to a crank shaft through a connecting rod;

a regenerator duct, for connecting said cold side and said hot side cylinders and for housing a regenerator oriented so as to have its cold end adjacent to said cold side cylinder and the hot end adjacent to said hot side cylinder;

means for opening and closing the intake and exhaust valves once each two crankshaft revolutions; and

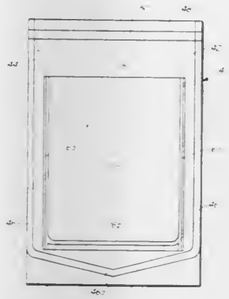
means for injecting fuel into said hot cylinder once each two crankshaft revolutions.

4,630,448

CONTAINER FOR STORING SOLID LIVING TISSUE PORTIONS

Arnold C. Bilstad, Deerfield, and William C. Brown, Palatine, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 25, 1985, Ser. No. 791,181
Int. Cl.[4] B65B *63/08*
U.S. Cl. 62—60 **14 Claims**



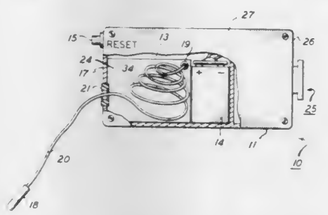
1. The method of storing solid, living tissue portions, which comprises;
- placing a wide-mouthed, flexible, collapsible, sterile bag into a aseptic field containing a solid tissue portion, said bag being made of sheeting of poly (ethylene-vinyl acetate) containing from 5 to 35 weight percent of vinyl acetate units;
- inserting said tissue portion into said bag through the wide mouth;
- heat sealing the wide mouth of said bag; and storing said bag at a cryogenic temperature;
- and after said storage, placing said bag in a second, aspetic field and opening said bag by severing said sheeting to retrieve said tissue sample.

4,630,449

MONITORING APPARATUS

William H. Adams, Auburn, N.Y., assignor to Richards Technical Products, Inc., Syracuse, N.Y.

Filed May 3, 1985, Ser. No. 730,086
Int. Cl.[4] G01K *13/00*
U.S. Cl. 62—130 **19 Claims**



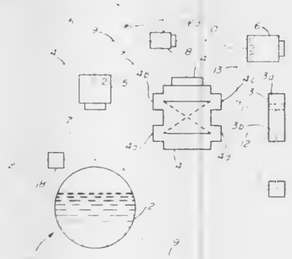
1. Apparatus for moditoring the temperature inside a refrigeration unit that experiences periodic defrost cycles of a known duration, said apparatus including
- a temperature sensor located within the refrigeration unit for providing an electrical output signal indicative of the temperature level inside the unit,
- a comparator means for comparing the sensor output signal level with a preset signal level and providing a first output signal when the sensed temperature level is above the preset level and a second output signal when the sensed temperature level is below the preset level,
- a timer means connected to the output of the comparator means which is enabled when the comparator means produces said first output signal whereby the timer means generates a continuous chain of timing pulses and is disabled when the comparator means produces said second output signal,
- counter means being coupled to the timer means for counting the number of pulses generated by the timer means and producing a counter output signal when a preset count is reached, the duration of the counter means cycle being greater than the duration of the defrost cycle, and
- an audio means coupled to the output of both the timer means and the counter means and including an audio transducer means providing a first audible alert signal any time the timer means is enabled and a second audible alarm signal when the counter means reaches the preset count,
- said audio means including time constant circuit means for actuating said audio transducer means for leading edge portions of said pulses to produce audible ticks as said first audible alert signal, and gating means enabled by said counter output signal for actuating said audio transducer means to produce an audible tone as said second audible alarm signal.

4,630,450

EXPENDABLE REFRIGERATION CONTROL

Kenneth J. Clarke, Senneville, and Gordon Lamb, Dorval, both of Canada, assignors to Conterm International Terminals, Inc., Pointe Claire, Canada

Filed May 6, 1985, Ser. No. 730,826
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—222 **9 Claims**



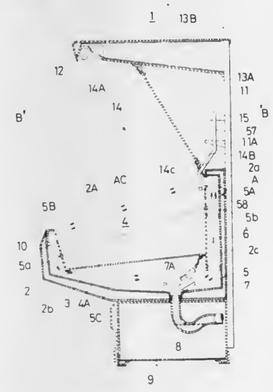
1. In a refrigeration system an apparatus for controlling the opening and closing operation of a liquid flow valve for dispensing fluid fed thereto from a reservoir and using the inherent gas pressure from the reservoir, comprising in combination:
- (a) a pneumatic piston operated actuator device having a piston side and a rod side, said rod side being operably connected to said flow valve for opening and closing the same; and
- (b) control means for controlling the operation of said pneumatic actuator device, said control means having a first pneumatic linear timer valve having a cycle time delay and connected to a gas pressure line of said reservoir, a second pneumatic linear timer valve having an injection time delay and also connected to said gas pressure line of said reservoir, said first and second pneumatic linear timer valves being interconnected through a control valve, a pneumatic actuator control valve connected to said gas pressure line of said reservoir and to said piston side and rod side of said actuator device for controlling the operation of said actuator device, said first pneumatic linear timer valve being connected to said actuator control valve to operate same after said cycle time delay to cause said actuator device to operate said liquid flow valve to dispense fluid from said reservoir and to further actuate said second pneumatic linear device to initiate said injection time delay and open condition of said liquid flow valve where, upon completion, of same said first pneumatic linear timer valve receives a signal through said control valve to deactivate said actuator control valve and said actuator device to close said liquid flow valve to end liquid flow from said reservoir and to recommence a further cycle time delay of said first pneumatic linear timer valve.

4,630,451

REFRIGERATED DISPLAY CABINET

Daisaburo Kishimoto, Tatebayashi, Japan, assignor to Sanyo Electric Co., Ltd and Tokyo Sanyo Electric Co., Ltd, both of, Japan

Filed Jul. 26, 1984, Ser. No. 634,807
Claims priority, application Japan, Oct. 20, 1983, 58-197030
Int. Cl.[4] A47F *3/04*
U.S. Cl. 62—247 **7 Claims**



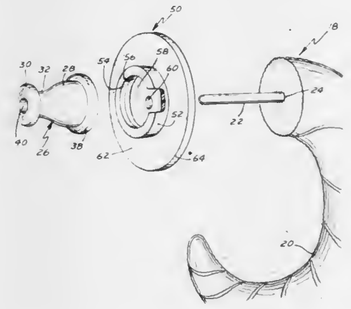
1. A refrigerated display cabinet comprising:
- an insulated cabinet body having an open side;
- a partition plate disposed in said cabinet body defining therein a storage chamber and a cooled air passage, said cooled air passage having an outlet extending along one edge of said open side, said cooled air passage also having an inlet extending along an opposite edge thereof;
- a refrigerating unit disposed in said cooled air passage for cooling air therein;
- an air blower disposed in said cooled air passage for forcibly circulating air drawn into said inlet through said refrigerating unit, said air thereby being cooled, and then out through said outlet, said cooled air furhter returning into said inlet so as to form a cooled air curtain across said open side for cooling said storage chamber;
- a mist-producing humidifier unit disposed in said body outside of said storage chamber so that said humidifier is not cooled by said cooled air curtain; and
- outlet pipe means for delivering mist produced by said humidifier unit for being mixed in the forcibly circulated cooled air, said outlet pipe means having an outlet port positioned in said storage chamber adjacent said outlet of said cooled air passage and on the side of said formed air curtain nearer said storage chamber, whereby said mist discharged from said outlet port of said outlet pipe means is rapidly mixed through an involving action with an inner stream of said air curtain on the side of said curtain nearer said storage chamber and is gradually dispersed in said storage chamber to uniformly humidify the interior of said storage chamber.

4,630,452

EARRING CLUTCH MECHANISM AND DETACHABLE LOAD DISTRIBUTION MEMBER FOR USE IN COMBINATION THEREWITH

Lynette M. Connelly, Staton Island, and Norman Gatof, New York, both of N.Y., assignors to Crystal Brands, Inc., New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,468
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **14 Claims**



1. For use with an earring clutch mechanism, a detachable load distribution member comprising a resilient cylindrical sleeve having inner and outer surfaces of generally uniform diameter, for receiving one end of said clutch mechanism, said sleeve having first and second ends, a flange extending outwardly a substantial distance from said sleeve and surrounding said sleeve at said first end thereof, for confronting a greater surface portion of a pierced ear lobe than would be confronted by only said one end of said clutch mechanism, and a resilient lip extending inwardly a preferred distance from said sleeve at said second end thereof for releasably retaining said one end of said clutch mechanism within said sleeve, said lip at least partially surrounding the inner surface of said sleve, the substantial distance said flange extends outwardly from said first end of said sleeve being appreciably greater than the preferred distance said lip extends inwardly from said second end of said sleeve.

4,630,453

APPARATUS AND METHOD FOR SECURELY FASTENING VARIOUS PIERCED EARRING POSTS

Cullen L. Burkett, 515 Robin Dr., Seneca, S.C. 29678

Filed Jun. 20, 1985, Ser. No. 746,646
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **4 Claims**

1. An apparatus for securing threaded post earrings, conventional, indented shoulder post earrings, and earrings fitted with a specially designed post having a shoulder of such shape as to be positively held in the apparatus, comprising:
- (a) a finger-releasable means for receiving and positively retaining any one of the ends of said specially designed post earrings, threaded post earrings and conventional indented shoulder post earrings, and;
- (b) a clutch means for receiving, guiding, and retaining said one earring post end when the latter is received by said

finger-releasable means, said clutch including means positioned to act as a back-up gripping device to an earring





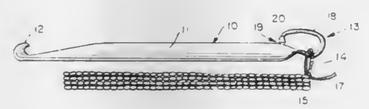
post which may become released from the primary finger-releasable means of said apparatus.

4,630,454

DEVICE FOR HOLDING INTERIM CROCHET STITCHES AGAINST UNRAVELLING

Carmella M. Seremjian, 10721 Greenbay Rd., Kenosha, Wis. 53142

Filed Oct. 3, 1985, Ser. No. 783,668
Int. Cl.⁴ D04B *35/00*
U.S. Cl. 66—1 A **14 Claims**



1. A device for temporarily holding an interim crochet stitch against unravelling when a crochet hook is removed from the loop of the stitch, comprising:

an elongated body having opposite ends;

a flexible stitch retainer substantially shorter than said body and having a proximal end and a distal end;

said proximal end of said retainer fixedly attached to one end of said body;

said retainer being freely extensible from said one end of said body for extending the retainer through said stitch for holding the stitch against unravelling;

latching means on said distal end of said retainer;

complementary latching means on said body adjacent to said one end;

and said latching means being operable by manipulation of said retainer for latching cooperation for holding said distal end latched to said body for maintaining said retainer in the stitch retaining relation to said one end of the body and said latching means being releasable by manipulation of said retainer for releasing said retainer distal end relative to said body for releasing said stitch from said retainer.

4,630,455

TRIPLE ROLL, LAYER TOP, SOCK

Ralph E. Lingenfelter, Union Point, Ga., assignor to Chipman-Union, Inc., Union Point, Ga.

Filed Mar. 19, 1984, Ser. No. 591,175
Int. Cl.⁴ D04B *9/46*
U.S. Cl. 66—172 R **15 Claims**



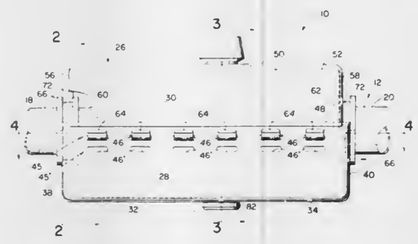
1. A knitted sock of the type having a body and a top connected to said body, said body having a neck portion adjacent to said top, wherein the improvement comprises the top including a first top increment, a second top increment connected along a common first border portion to said first top increment, a third top increment connected along a common second border portion to said second top increment and along a common third border portion to said neck of said body, said first top increment having an outer edge for connection to said neck portion and extending downwardly from said outer edge and from said first border portion over the neck of said body, said third top increment extending from said third border portion and said second border portion upwardly from the neck of said body, said second increment extending upwardly from said first border portion and said second border portion in overlapping fashion over said third top increment, and means for securing said first increment and said third increment to said neck portion and for securing said second increment to said first increment.

4,630,456

CASKET LOCK FOR VALVE ASSEMBLY

Anker J. Nielsen, Jr., Holden, Mass., assignor to Inner-Tite Corporation, Springfield, N.J.

Filed May 7, 1984, Ser. No. 607,576
Int. Cl.⁴ F16K *35/00*
U.S. Cl. 70—232 **11 Claims**



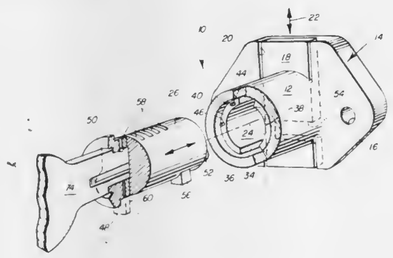
1. A casket lock for a valve assembly including a valve, coaxially aligned generally cylindrical inlet and outlet conduits extending in axially opposite directions from said valve, and connecting means for securing the conduits to the valve, said casket lock comprising a pair of telescopically mating casket sections having open and closed positions, one of said casket sections having a marginal portion telescopically received within an and in overlapping relation with an associated marginal position of said other of said casket sections when said casket sections are in said closed position, adjustable hinge means for connecting said casket sections together to move about a hinge axis between said open and closed positions and including a plurality generally paralled rows of apertures formed in a marginal edge portion of one of said casket sections and a row of spaced prongs integrally connected to and projecting form a marginal edge portion of the other of said casket sections for positioning within the apertures of a selected one of said rows, said prongs projecting outwardly from within said casket through said apertures of said selected one of said rows when said casket sections are in said closed position, each of said casket sections having cutout portions at its opposite ends in generally opposing relation to said cutout portions in the other of said casket sections, said cutout portions cooperating in said closed position to define a pair of coaxially aligned generally circular openings of adjustable size in said casket at axially opposite ends of said casket and disposed in axially parallel alignment with said hinge axis for receiving the inlet and outlet conduits of an associated valve assembly therethrough, said casket sections cooperating in said closed positions to define a casket for containing the valve and the connecting means, said openings receiving the inlet and outlet conduits therethrough when said casket sections are in said closed position, and locking means including a fastener within said casket for releasably securing said casket sections in said closed position and a lock for preventing access to said fastener when said casket sections are secured in said closed position by said locking means, said adjustable hinge means and said locking means cooperating to define means for adjusting the size of said openings to receive conduits of differing size.

4,630,457

LOCK WITH REMOVABLE PLUG

Herbert Kincaid, Libertyville, and Alan D. Favia, Lake in the Hills, both of Ill., assignors to Eastern Company, Naugatuck, Conn.

Filed Dec. 24, 1984, Ser. No. 685,473
Int. Cl.⁴ E05B *29/04*
U.S. Cl. 70—369 **11 Claims**



1. A lock comprising:

a lock barrel with an opening therein;

a key plug rotatable within the barrel opening between first and second operative positions and a third position in which the plug can be withdrawn from the barrel;

a first tumbler adapted to lock the plug against turning within the barrel;

a second tumbler adapted to prevent the plug from turning to the third position and allowing rotation between the first and second positions;

an annular slot in the barrel adapted to receive the second tumbler as the plug is turned between the first and second positions;

a shoulder with an axial slot in the barrel; and

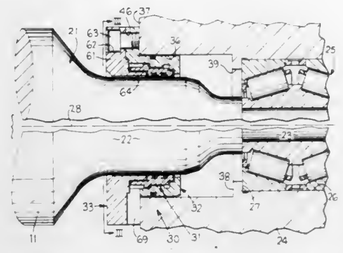
a tab on the plug, said tab abutting the barrel shoulder to hold the plug therein during turning between the first and second positions, and said tab further being aligned with the axial slot when the plug is in the third position.

4,630,458

SEAL ARRANGEMENT FOR MILL ROLL

Kenneth G. Kakabaker, Kalamazoo, Mich., assignor to Dura-metallic Corporation, Kalamazoo, Mich.

Filed Mar. 12, 1985, Ser. No. 710,822
Int. Cl.⁴ B21B *27/10, 31/07*
U.S. Cl. 72—237 **7 Claims**



1. In a mill roll assembly having a pair of large-diameter rotatable rolls disposed in parallel relation, the rolls being disposed adjacent one another to define a nip therebetween through which metal stock is fed, means for discharging coolant on the metal stock in the vicinity of said nip, each roll having support shafts of slightly reduced diameter projecting coaxially outwardly from opposite ends thereof, each said shaft projecting into an opening in a stationary stand, and bearing means disposed within said opening for rotatably supporting said shaft on said stand, the improvement comprising:

an isolator assembly coacting between said shaft and said stand adjacent the outer end of said opening for isolating said bearing means from the coolant, said isolator assembly including first, second and third isolator rings which substantially concentrically surround said shaft and are concentric with one another for cooperation between said shaft and said stand;

said first isolator ring being nonrotatably secured to said stand and having an annular sleevelike hub part which projects coaxially into said opening from the outer end thereof and is sealingly coupled with the wall of said opening;

said second isolator ring being nonrotatably fixed relative to said stand and cooperating with said first isolator ring to effectively close off the outer end of said opening, said second isolator ring including a sleeve part which closely surrounds said shaft to define a first radially narrow but axially elongated clearance space therebetween, said first clearance space at its axially outer end being in communication with the surrounding environment containing the coolant;

said sleeve part defining thereon an exterior annular surface of substantial axial extent which is concentrically surrounded by an interior annular surface of substantial axial extent as defined on said first isolator ring, said interior and exterior surfaces being radially spaced a substantial distance apart to define an annular clearance region therebetween of substantial radial and axial extent, said region at the outer axial end thereof being closed by the cooperation of said first and second isolator rings;

said third isolator ring being concentrically and nonrotatably mounted on said shaft within said opening and having a main hub portion directly adjacent the inner axial end of said sleeve part, said third ring having an annular flange part which projects axially outwardly from said main hub portion into said annular region, said flange part having an inner annular surface thereon which concentrically surrounds and is closely adjacent the exterior annular surface on said sleeve part to define a second annular clearance space therebetween of narrow radial but substantial axial extent, said second clearance space at the inner axial end thereof communicating with the axially inner end of the first clearance space through a radially directed clearance

passage which extends between the opposed ends of said main hub portion and said sleeve part, said flange part having an exterior annular surface which is substantially concentric with but spaced a substantial distance from said interior annular surface as defined on said first ring to define therebetween an annular collection chamber of substantial axial and radial extent which communicates with the axially outer end of said second clearance space through a radial passage which extends across the free end of said flange part;

said third ring having an annular dam-like wall fixed to and projecting radially outwardly therefrom adjacent the inner axial end of said flange part, said dam-like wall having an outer annular surface which is positioned close to but spaced from the interior annular surface on said first ring;

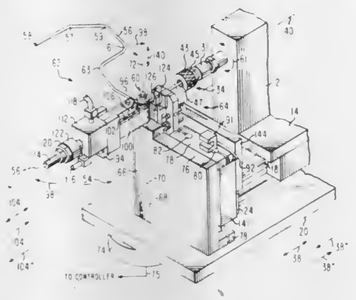
said first ring having an annular flange portion which is fixed thereto and projects radially inwardly from said interior annular surface, said last mentioned flange portion being disposed axially inwardly of but closely axially adjacent said dam-like wall, said annular flange portion and said dam-like wall having closely adjacent and axially opposed surfaces which define therebetween a narrow passage which projects radially from a location disposed adjacent said inner annular surface to a location for communication with a third annular clearance space which is of small radial but substantial axial extent as formed between said flange portion and said main hub portion, said third clearance space at said inner axial end thereof being connected for communication with that portion of the opening containing the bearing means.

4,630,459

AUTOMATIC COAXIAL CABLE BENDING APPARATUS

George A. Elliott, Maple Shade, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 3, 1985, Ser. No. 740,716
Int. Cl.⁴ B21D *7/02*
U.S. Cl. 12—307 **13 Claims**



1. An automatic coaxial cable bending apparatus comprising:

a base;

a chuck for automatically securing and locating an end of said cable at a reference point on a given axis;

cable positioning means secured to the base for automatically selectively moving said chuck so that said reference point and cable end are displaced to a second point on said axis and including means for selectively rotating said chuck and said cable about said axis;

bend means secured to the base including a cable pressure die for automatically engaging and bending said cable at a third point spaced a predetermined distance from the second point, said bend means further including a bend die rotatable about a stationary axis relative to the base and a stationary cable support die fixed in place to the base relative to the bend die to support bending loads induced by said cable during said bending, said bend and support dies being adapted to support the cable during said selective moving of the chuck, said pressure die being secured to rotate relative to and about the bend die in a direction away from said support die during the bending engaged state and to automatically return to the initial position in the opposite direction; and

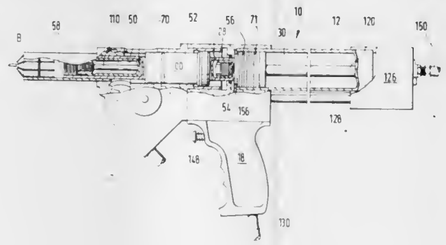
clamp means secured to the base adjacent to said support die adapted to selectively hold said cable in a first clamp region between said support die and said chuck and to selectively displace to a second idle region, said cable positioning means including means selectively displacing said chuck adjacent said bend means in said first region when said clamp means are in the idle region.

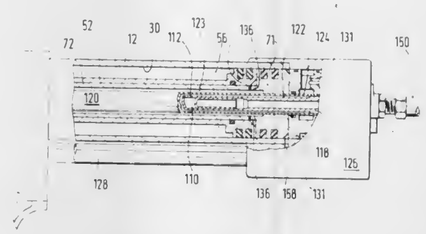
4,630,460

FASTENER-SETTING TOOL

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Feb. 14, 1986, Ser. No. 830,311
Int. Cl.⁴ B21J *15/00*
U.S. Cl. 72—391 **5 Claims**





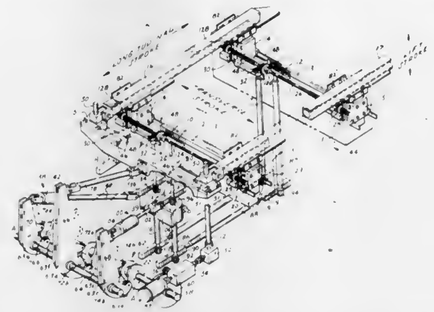
1. A tool for setting two-part fasteners of the kind in which one part requires to be pushed and the other pulled to set the fastener, comprising a housing, a thrust member reciprocable back and forth along an axis of the housing and having a fastener-engaging face at its forward end to push on said one part of the fastener in a fastener-setting operation, and pulling means also reciprocable within the housing along said axis to pull the other part of the fastener relative to the thrust member in the fastener-setting operation, characterized in that the thrust member comprises a sleeve with a piston at its rear end slidable in a fluid-pressure cylinder, and said pulling means also comprises a sleeve projecting forwardly into that of the thrust member and having a piston at its rear end slidable in said cylinder behind that of the thrust member, fluid passages being provided in the housing to enable pressurized fluid to act on the rear of the piston of the pulling means to advance both pistons, and in front of the piston of the thrust member to retract them both, there being also a fluid passage through the sleeve of the pulling means adjacent its piston which thus opens into said cylinder between said pistons and through which fluid under pressure can be introduced to separate said pistons and effect a fastener-setting stroke of the tool.

4,630,461

TRANSFER FEED MECHANISM FOR POWER PRESSES

Ronald Votava, North Riverside, Ill., assignor to Avondale Industries, Inc., New York, N.Y.

Filed May 17, 1985, Ser. No. 735,437
Int. Cl.⁴ B21J *13/08*
U.S. Cl. 72—405 **10 Claims**



1. A power press with a transfer feed mechanism comprising the combination of:

multiple finger units for moving successive workpieces along a plurality of mutually perpendicular axes so as to transfer the workpieces to desired work stations in desired positions and attitudes,

a main drive connected to said power press for driving said press,

a power takeoff from the main drive of said power press,

a plurality of drive means connected to said power takeoff through at least one differential mechanism for independently driving said finger units along said mutually perpendicular axes in synchronism with said power press, and

a secondary drive motor connected to said drive mechanism for driving said finger units along at least one of said axes independently of said power takeoff,

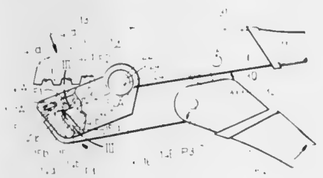
whereby said differential mechanism connected to both said power takeoff and said secondary drive motor permits said finger units to be selectively driven by either said power takeoff or said secondary drive motor in order to adjust said transfer feed mechanism along said mutually perpendicular axes.

4,630,462

TOOL FOR CRIMPING CABLE SHOE TERMINALS

Hans Wiener, Täby, and Hans Undin, Åkersberga, both of Sweden, assignors to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,856
Claims priority, application Sweden, Jan. 3, 1985, 8500018
Int. Cl.⁴ B21D *7/06*
U.S. Cl. 72—410 **20 Claims**



1. A tool for crimping cable shoe terminals having a contact part and an affixing part onto the ends of electrical conductors and comprising in combinaton:

a pair of jaws, each jaw having a free forward end and a rear end, one jaw being a relatively fixed first jaw and the other jaw a relatively movable second jaw pivotable between an open end position and a closed end position in regard to the first jaw;

at least one die element at each said jaw, between which die elements the affixing part of a cable shoe is crimped when the second jaw has reached its closed end position;

a pivot pin means pivotally connecting said jaws one with another at their rear ends;

an actuating means for moving the second jaw between said end positions thereof;

a locator member for fixing in a predetermined position relative to a pair of said die elements a cable shoe to be treated, said member comprising a rocker arm having an inner face facing the pair of jaws, a forward end adjacent said free forward ends and a rear end adjacent said pivoted rear ends and being at that rear end pivotally mounted on said pivot pin means:

in said rocker arm, intermediate to both said ends thereof, and in alignment with each pair of said die elements, a retaining member for the contact part of a cable shoe to be treated, each said retaining element having an entrance opening defined by a continuous surface at said inner face and being in the direction toward the first jaw spanned by a bridging element;

a means for releasably urging said rocker arm to retain its relative pivotal position in regard to the first jaw;

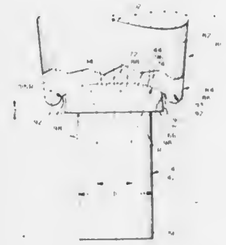
a pair of coacting carrier means on the rocker arm and the second jaw respectively for pivoting, when in mutual engagement, the rocker arm into an initial position as the second jaw is pivoted into its open end position, said bridging element defining a means for carrying the rocker arm into a terminal position when the second jaw is pivoted into its closed end position so as to crimp the affixing part of said cable shoe between the die elements of the first and second jaws; said urging means releasably holding the rocker arm in said terminal position and said carrier means being located so as to reengage one another and thereby to carry the rocker arm, overruling the urging means, back into its initial position only after the second jaw already has executed a part of its return movement into the open end position, the just crimped affixing part being thus liberated from the die element in the first jaw when the second jaw commences the said return movement and the rocker arm is still retained in its terminal position, and is liberated from the die element in the second jaw after said reengagement has occurred.

4,630,463

RIVET DRIVING DIE AND METHOD

Dale E. Knowlton, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 28, 1984, Ser. No. 675,771
Int. Cl.⁴ B21J *13/02*
U.S. Cl. 72—479 **8 Claims**



1. A method of driving a rivet, where the rivet comprises:

a. an elongate shank having a lengthwise axis and being adapted to fit through an opening in material to be riveted

together, where the material has a top surface, a bottom surface, and an annular surface defining said opening and extending between said top and bottom surfaces;

b. a head attached to one end of the shank, the head having a generally circular configuration relative to planar cross sections perpendicular to the longitudinal axis, said head comprising:

1. a first bottom annular surface adapted to engage an annular top surface portion of the top surface of the material;

2. a second circumferential generally laterally facing surface portion extending upwardly from said bottom annular surface with a substantial alignment component parallel to the lengthwise axis;

3. a third upper middle central surface portion that is substantially planar;

4. a fourth upper annular intermediate surface portion that is convexly curved and extends between said central surface portion and said lateral surface portion;

said method comprising:

a. providing a die having an end driving portion which comprises:

1. an annular outer circumferential containing lip portion, having a fifth lower annular surface portion and a sixth inwardly facing annular containing surface portion extending upwardly from the first lower annular surface portion;

2. a recessed driving portion located within the lip portion, said driving portion having a seventh metal middle main contact surface portion and an eighth intermediate secondary contact surface portion extending between the seventh main contact surface portion and said sixth containing surface portion;

b. arranging said seventh middle contact surface portion and said eighth secondary contact surface portion relative to the third upper central surface portion and the fourth intermediate surface portion of the rivet head so that when the end driving portion of the die is placed over the rivet head in driving relationship, least part of said eighth surface portion is spaced from said fourth surface portion;

c. impacting said die to drive the rivet, so that said seventh surface portion initially comes into driving contact with the third surface portion so that a major portion of driving force from the die is transmitted through said third surface portion to in turn transmit substantial driving force directly into said shank, after which said eighth surface portion comes into greater driving engagement with said fourth surface portion;

d. utilizing said sixth containing surface portion, which is configured and sized relative to the second lateral surface portion to fit closely around said second surface portion, to properly locate the end driving portion of the die laterally relative to the rivet head;

e. arranging said fifth lower annular surface portion relative to the seventh and eighth surface portions so that with the seventh and eighth surface portions coming into driving engagement with the third and fourth surface portions, said fifth surface portion remains spaced upwardly from the top surface of the material that is being riveted together.

4,630,464

METHOD FOR THE CONTINUOUS SURVEILLANCE OF THE POISON CONTENT OF EXHAUST GASES CONTAINING PARTICULATE MATTER

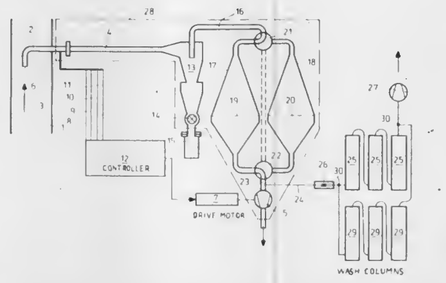
Sonja Maul, Straubenhardt; Erwin Büttner, Stutensee; Heiner Meichelböck, Eggenstein-Leopoldshafen; Albert Merz, and Hubert Vogg, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,482

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422062

Int. Cl.⁴ G01N *15/02*

U.S. Cl. 73—28 **2 Claims**



1. A methed for the continuous surveillance of the poison content of exhaust gases containing particulate material such as the exhaust gases of large furnaces or waste incinerators wherein a sampling stream is continuously drawn from the exhaust gas stream through a suction line at a rate which corresponds to the exhaust gas stream flow rate and the particulate material is separated from the sampling gas stream under temperature-controlled conditions, said method being characterized by the following steps:

(a) continuously separating from the sample gas stream in a gas cyclone as a first separation step any coarse particulate material,

(b) continuously discharging the separated coarse particulate material from the gas cyclone, by means of a rotating lock, into a storage container,

(c) continuously separating any fine particles suspended in the sample gas stream from the gas stream in alternatively connectable filter structure with exchangeable fine filters,

(d) continuously drawing, with respect to the sample gas stream, a small partial gas stream from the sample gas stream downstream of said filter structure and conducting said partial gas stream through wash columns containing a liquid adapted to absorb any poisonous gases contained in said partial gas stream, and

(e) determining, for a standard, the poison distribution in the exhaust gas stream from sample analysis of the material collected in the storage container, on the filters and in the wash liquid and, after establishment of the standard by the initial determination of the poison distribution in the exhaust gas stream, collecting only the coarse particulate material of the first separation step and determine therefrom the poison distribution in the exhaust gas on the basis of said standard.

4,630,465

LOW VISCOUS DRAG KNOCK SENSOR

Bruce M. Hatton, Carol Stream, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1984, Ser. No. 672,402

Int. Cl.⁴ G01L *23/22*

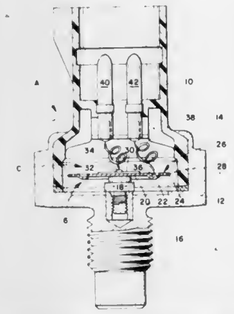
U.S. Cl. 73—35 **14 Claims**

1. A low viscous drag knock sensor comprising:

a housing defining an interior air filled chamber therein, the housing being operatively connectable with an internal combustion engine to be vibrated in response to engine knock;

a diaphragm mounting member operatively connected with the housing and disposed in the housing chamber;

a diaphragm including a central portion, a stiffening rib surrounding the central portion, and an edge portion disposed peripherally around the stiffening rib, the diaphragm central portion being mounted to the diaphragm mounting member, the diaphragm edge portion being supported only by the diaphragm stiffening rib and diaphragm central portion such that the diaphragm edge portion is free to move relative to the housing;



the diaphragm peripheral edge portion defining a plurality of passages therethrough for reducing drag from air flowing from one side of the diaphragm to another during vibratory displacement thereof, whereby the passages reduce a resonant frequency bandwidth of the diaphragm; and,

a transducer for providing an electrical output signal which varies with sensed vibratory displacement, said transducer being operatively connected to the diaphragm central portion to produce an output electrical signal which varies with vibratory displacement thereof.

4,630,466

APPARATUS FOR TESTING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

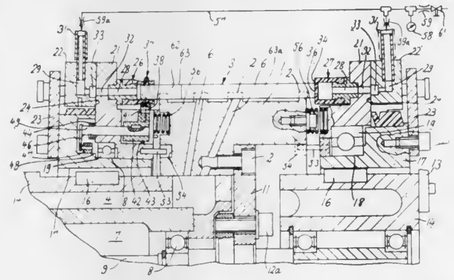
Herbert Berlin, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,007

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336667

Int. Cl.⁴ G01M *3/04*

U.S. Cl. 73—38 **10 Claims**



1. Apparatus for testing rod-shaped articles of the tobacco processing industry wherein an openended tubular wrapper surrounds a filler of tobacco and/or filter material, comprising means for conveying a succession of articles sideways past a testing station, including elongated receiving means for the articles; carrier means adjacent to one end of each of said receiving means and arranged to move with said conveying means; elastically deformable tubular sealing elements provided on said carrier means, one for each of said receiving means and each in register with the adjacent end of the article in the respective receiving means; means for effecting a relative movement between said conveying means and said carrier means so that the ends of articles at said testing station penetrate into the respective sealing elements; substantially annular clamping members, one for each of said sealing elements and each surrounding the respective sealing element; and actuating means for varying the diameters of said clamping members so as urge the respective sealing elements into sealing engagement with the peripheral surfaces of the article ends therewithin during travel of articles past said testing station.

4,630,467

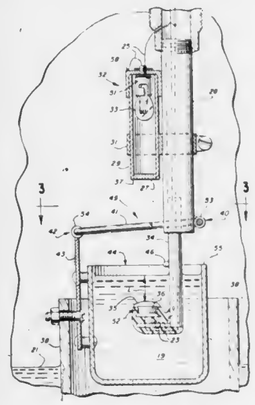
LEAK DETECTOR

Frank J. Senese, and Lloyd A. Baillie, both of 400 E. Sibley Blvd., Harvey, Ill. 60426

Continuation of Ser. No. 616,042, Jun. 1, 1984, abandoned, which is a division of Ser. No. 340,439, Jan. 18, 1982, Pat. No. 4,453,400. This application Feb. 22, 1985, Ser. No. 704,230

Int. Cl.⁴ G01M *3/38;* G01F *23/10*

U.S. Cl. 73—49.2 **8 Claims**



1. A method for detecting small leaks in a tank storing a liquid, said tank having

a float means positioned in contact with said stored liquid,

a detector means and

a signal means in fixed relationship to each other,

said float means moving in relationship to the level of said stored liquid and having a reservoir means for holding a measuring medium, said measuring medium being capable of modulating a signal characteristic representative of the position of said detecting means, comprising

sealing said float means to prevent the condensation of vapors within said float means,

positioning initially said float means at a depth approximately equal to V_L/S_L,

said V_L comprising the volume of said stored liquid and S_L comprising the free surface area of said stored liquid,

emitting a signal having a characteristic from said signal means into said measuring medium,

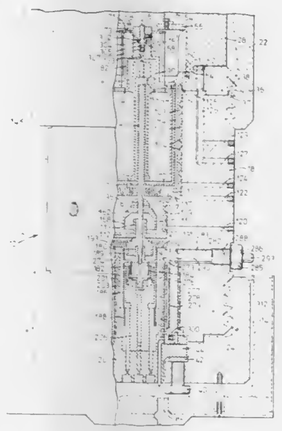
modulating said signal characteristic by an amount which varies with the changes in the location of said float means,

detecting said modulated signal characteristic, and

producing a response signal directly related to said detected characteristic,

wherein changes in said response signal are indicative of small leaks in said tank.

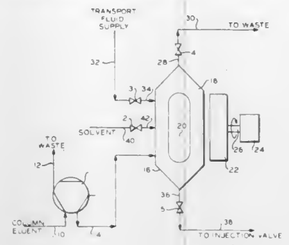
4,630,468
VISCOMETER
Edmund G. F. Sweet, Ontario, Canada, assignor to Ontario Research Foundation, Mississauga, Canada
Filed Sep. 27, 1983, Ser. No. 536,307
Claims priority, application Canada, Aug. 9, 1983, 434176
Int. Cl.⁴ G01N *11/14*
U.S. Cl. 73—59 **31 Claims**



1. An apparatus for measuring the viscosity of a fluid medium, comprising:
means for rotating a first member at an accurately known rate,
a freely turning rotary member having an axis of rotation and having a first portion adjacent said first member but out of contact therewith,
a first fluid cavity between said first member and said first portion,
a fluid being located in said first fluid cavity such that rotation of the first member will place torque on said rotary member thus seeking to induce rotation therein,
the rotary member having a second portion moving adjacent a fixed surface but out of contact therewith,
a second fluid cavity between said second portion and the fixed surface into which can be placed said fluid medium of which the viscosity is to be measured,
and means to measure the rotational speed of the rotary member.

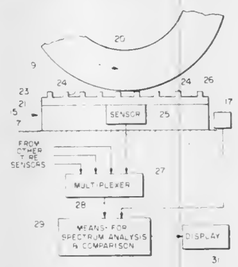
4,630,469
SAMPLE HOMOGENIZER
Robert K. Bade, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sep. 30, 1985, Ser. No. 781,563
Int. Cl.⁴ G01N *30/02*
U.S. Cl. 73—61.1 C **7 Claims**

1. A chromatograph sample homogenizer comprising a mixing chamber containing means for homogenizing a mixture therein and connected thereto:
(a) a first valved inlet for eluant from a chromatographic column comprising a first valve and connecting conduit;
(b) a second valved inlet for solvent comprising a second valve and connecting conduit;
(c) a third valved inlet for transport fluid supply comprising a third valve and connecting conduit;
(d) a fourth valved outlet for waste comprising a fourth valve and connecting conduits; and



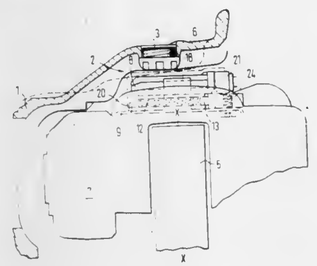
(e) a fifth valved outlet for sample injection to a downstream analyzer comprising a fifth valve and connecting conduit.

4,630,470
REMOTE SENSING OF VEHICLE TIRE PRESSURE
Robert L. Brooke, Woodbridge; Peter J. McConnell, Vienna, both of Va.; Anthony M. Testa, Elkridge, Md., and George B. Maksymonko, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 16, 1984, Ser. No. 672,327
Int. Cl.⁴ G01M *17/02*
U.S. Cl. 73—146.2 **6 Claims**



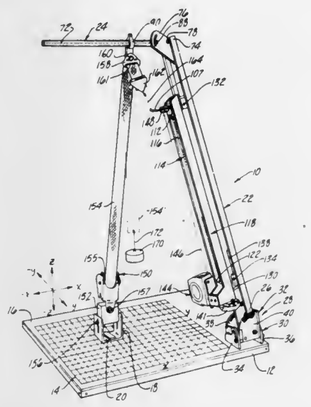
1. Apparatus for remotely sensing differential tire pressures of vehicles as they pass an instrumented checkpoint on a roadway, comprising: a plurality of rigid corrugated sections adapted to be adjacently arrayed across a single lane roadway so that each tire of each vehicle will simultaneously traverse at least two adjacent corrugated sections, said corrugated sections comprising a series of parallel hard ridges arranged perpendicular to the direction of vehicle travel, with a transducer or sensor attached to each of said corrugated sections for detecting vibrations indicative of different tire pressures as the vehicle traverses said corrugated sections, circuit means connected to all of said sensors for performing a spectral analysis and comparison of the output of each of said sensors to the outputs of all other of said sensors as the vehicles traverse said array of corrugated sections, and display means connected to said circuit means for indicating the tire or tires of vehicles which produce an abnormal spectrum indicative of abnormal tire pressure.

4,630,471
TEMPERATURE RESISTANT TIRE PRESSURE CONTROL DEVICE
Axel Kamprath, Mühlacker, and Volker Ruehr, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Mar. 4, 1985, Ser. No. 707,575
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407895
Int. Cl.⁴ G01L *9/00*; G01M *17/02*
U.S. Cl. 73—146.5 **14 Claims**



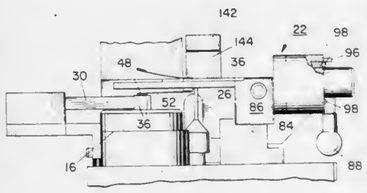
1. An apparatus for the heat-insulated placement of an electronic emitter which is part of a tire pressure control device which is situated adjacent to a wheel rim on a caliper of a brake disk arrangement of a motor vehicle, the tire pressure control device having a rotating manometric switch attached to a side of said wheel rim, said switch interacting with said emitter so that impulses are generated in said emitter, the apparatus comprising, a housing for mounting the emitter to the caliper, said housing having receiving means for holding the emitter and a bottom portion containing insulating material for thermally isolating the emitter from heat generated in the area of the caliper.

4,630,472
SEAT BELT TESTING DEVICE
Karen A. Zimmerman, Allen Park; Randall L. Weston, Sterling Heights, and Richard D. Thomas, Wixom, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Sep. 3, 1985, Ser. No. 771,874
Int. Cl.⁴ G01L *5/00*; G01N *3/26*
U.S. Cl. 73—161 **4 Claims**



1. A three-dimensional seat belt testing apparatus comprising;
a horizontally disposed support base having X and Y axes intersecting at an origin with a vertically disposed Z-axis of an X, Y and Z coordinate system;
a seat belt retractor anchor bracket adapted to be selectively positioned on said base coordinate system relative to said origin;
means for pivotally securing a seat belt retractor to said anchor bracket;
an articulated arm assembly comprising a primary arm and a secondary arm;
said primary arm having upper and lower ends, said primary arm lower end mounted by dual pivot means on said base adjacent said origin for adjustable movement in both a first plane defined by said X and Z axes and a second plane defined by said Y and Z axes;
said secondary arm pivotally mounted on the upper end of said primary arm for adjustable movement in a plurality of positions so as to be maintained parallel to said x-axis;
means for adjustably positioning a seat belt turning loop on said secondary arm permitting graduated angular and longitudinal positioning of said turning loop relative to the axis defined by said secondary arm;
elevator means on said primary arm for raising and lowering truck means along an axis parallel to said primary arm;
a flexible cantilevered beam having a fixed end and a free end, said fixed end secured to said truck means for movement therewith;
said retractor including a spool mounted roll of seat belt webbing mounted on a spring biased reel, said roll of webbing adapted to be extracted from said reel with its free end threaded through said turning loop;
rotary deflection transducer means mounted adjacent said primary arm lower end, said rotary deflection transducer means including a cable adapted to be reeled from said transducer means, said cable having its free end attached to said truck means, whereby said rotary deflection transducer measures the linear travel of said truck means;
means securing the free end of said cantilevered beam to latch plate simulator means attached to said belt webbing free end, and
force transducer means mounted on said beam adjacent to its free end for measuring the maximum bending movement applied to said beam upon said elevator means moving said truck means from an initial predetermined position adjacent said primary arm upper end to a second position adjacent said primary arm lower end, whereby the force required to extract said belt webbing from said retractor means may be directly measured and correlated relative to the linear travel recorded by said rotary deflection transducer means for a plurality of relative spacial locations occupied by said retractor means and said turning loop.

4,630,473
VERSATILE FORCE MEASURING SYSTEM
Kyong Park, Chatsworth, and Goran S. Alwerud, Granada Hills, both of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.
Filed Mar. 5, 1985, Ser. No. 708,088
Int. Cl.⁴ G01L *5/00*; G01N *3/20*
U.S. Cl. 73—161 **19 Claims**



10. A force measuring apparatus for measuring the deflec-

tion force of spring-mounted magnetic heads, or similar part comprising:

a base;

a force or pressure transducer mounted on said base and having a predetermined axis along which force is preferably applied thereto;

movable carriage means for holding a part to be tested under predetermined levels of deflection;

means for mounting an elongaged flexible part securely on said carriage with the part extending substantially perpendicular to said predetermined axis;

means for guiding one portion of said part into a deflection measuring position in force-transmitting coupling with said transducer along said predetermined axis, and for shifting said part between said deflection measuring position and a loading position wherein said part is spaced laterally away from said axis;

means for providing a controlled amount of deflection of said part as it applies force to said transducer; and

means for determining the force applied to said transducer from the output from said transducer.

4,630,474

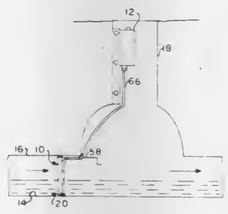
FLOW ANALYZER

Peter D. Petroff, 4102 Piedmont Dr., Huntsville, Ala. 35802

Division of Ser. No. 407,996, Aug. 13, 1982, Pat. No. 4,407,158, which is a division of Ser. No. 264,644, May 18, 1981, Pat. No. 4,344,329, which is a division of Ser. No. 104,540, Dec. 17, 1979, Pat. No. 4,295,197, which is a division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application Sep. 26, 1983, Ser. No. 535,711

Int. Cl.⁴ G01F *1/52*

U.S. Cl. 73—196 **4 Claims**



1. A system of measurement of flow values in a sewer system including first and second sewer access manhole enclosures and there being included in said system a first channel having at least a circular lower region, and said first channel providing flow accessible from said first sewer access manhole enclosure, and a second channel having at least a circular lower region, and said second channel providing flow accessible from said second sewer access manhole enclosure, and each said channel comprising a circular pipe in a region just preceding, flowwise, a said sewer access manhole, and said system of measurement comprising:

at least first and second monitoring assemblies, said first monitoring assembly being located at said first sewer access manhole, and said second monitoring assembly being located at said second sewer access manhole, and wherein each monitoring assembly comprises:

liquid height sensing means comprising a pressure-to-electrical signal transducer for sensing liquid height above it and providing, as an output, an electrical signal which is a function of such liquid height,

mounting means for positioning each said transducer adjacent an existing bottom of a said circular lower region of a said channel accessible from the said sewer access manhole enclosure,

timing means synchronizable with timing means in each other said monitoring assembly for providing timing signals,

analog-to-digital conversion means responsive to timing signals from said timing means and signals from said liqud height sensing means for periodically converting said signals into digitally encoded, time identifiable signals which are a function of said liquid height, and

memory means responsive to said analog-to-digital conversion means for storing discrete time identifiable said digitally encoded liquid height function signals covering periodic measurements over a selected period of time;

transfer storage means, responsive to said first and second monitoring assemblies, for storing liquid height function signals from said memory means; and

conversion means responsive to said transfer storage means for converting said digitally encoded signals derived from said monitoring assemblies to timewise relatable liquid flow values.

4,630,475

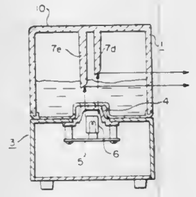
FIBER OPTIC LEVEL SENSOR FOR HUMIDIFIER

Saburo Mizoguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Saka, Japan

Filed Mar. 20, 1985, Ser. No. 714,161

Int. Cl.⁴ G01F *23/02*

U.S. Cl. 73—293 **6 Claims**



1. A humidifier comprising a water tank and an atomization chamber mounted on a bottom section having driving means therein, said water tank having an external wall and a bottom wall means made of a transparent material and having a surface substantially exposed to the exterior, a light source mounted on support means beneath said bottom wall means for emitting light into said water tank, and a means on said bottom wall means for guiding and leading said light onto said external wall, the water level in said tank being detectable visually through said external wall by said light.

4,630,476

LIQUID LEVEL GAUGE

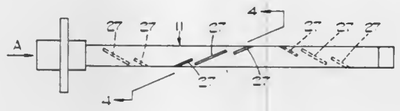
Raymond Moore, Solihull, England, assignor to Lucas Industries Public Limited Company, England

Filed Aug. 13, 1985, Ser. No. 765,217

Claims priority, application United Kingdom, Sep. 11, 1984, 8422910

Int. Cl.⁴ G01F *23/02*

U.S. Cl. 73—293 **7 Claims**



1. A liquid level gauge comprising an elongate support member, a plurality of optical fibres carried by the support member, said fibres extending on the support member generally lengthwise thereof and generally parallel to each other, and a light source disposed at one end of the support member, each of said fibres having one end adjacent said one end of the support member and communicating with the light source to receive light therefrom, said fibres being spaced apart from each other circumferentially of the support member and each fibre being divided at a point along the length of the support member by a gap so arranged that the transmission of light from said source across the gap from one part of the fibre to the other part thereof is determined by the presence or absence in the gaps of the liquid being gauged, the gaps of the fibres being spaced lengthwise of the support member, and the faces of each fibre presented to one another across the gap of the fibre being parallel and lying at an angle to the length of the fibre such that, in the absence of liquid to be gauged in the gap, light from said source passing along the fibre and striking a face will be totally internally reflected, whereas, when liquid to be gauged fills the gap, light from one part of the fibre can be conducted across the gap by the liquid to the other part of the fibre.

4,630,477

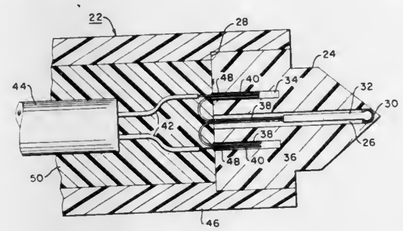
THERMISTOR LIQUID-LEVEL SENSING PROBE

James B. Murtland, Jr., 441 SE. 15th Ave., Pompano Beach, Fla. 33060

Filed Dec. 30, 1983, Ser. No. 567,162

Int. Cl.⁴ G01F *23/24*

U.S. Cl. 73—295 **2 Claims**



2. A liquid-level indicating probe comprising an elongated body of plastic material having a longitudinally-extending bore therein which extends from the back of the body to a forward end closely adjacent the forward terminal end of the body without projecting through the forward end of the body, a thermistor inserted into said bore having electrical leads extending backwardly through said bore and having external leads connected within said body in blind bores of said body to said leads of said thermistor, said external and thermistor leads being sealed and embedded by epoxy material molded about said leads at points adjacent and external said body, and a thermally-conductive compound at the forward end of said bore and in thermal engagement with the forward end of said elongated body, said thermistor being in contact with said thermally-conductive compound.

4,630,478

LIQUID VOLUME SENSOR SYSTEM

Dennis Johnson, Saskatoon, Canada, assignor to Pakwa Engineering Ltd., Saskatoon, Canada

Filed Jun. 15, 1984, Ser. No. 620,966

Claims priority, application Canada, Jun. 23, 1983, 431065

Int. Cl.⁴ G01F *23/14*

U.S. Cl. 73—299 **13 Claims**

1. Apparatus for determining the volume of liquid relative to a known reference temperature in a tank comprising:

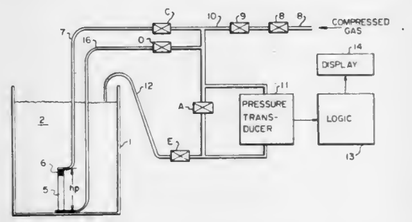
(a) first means for determining the pressure of the liquid at the bottom of the tank,

(b) second means for determining the pressure of the liquid at a height above the bottom of the tank,

(c) a first tube closed at one end, and closed at the other end by an expansion means, the tube being formed of material having a similar temperature coefficient of expansion as that of the tank, and being filled with a liquid having a temperature coefficient of expansion similar to that of the liquid in the tank, whereby the expansion means moves outwardly or inwardly axially of the tube with expansion or contraction of the tube and liquid in the tube,

(d) the first and second means being located such that upon immersion into the tank with said second means vertically above the first means, they are separated by the ends of the tube, their separation defining said height, and whereby with expansion of the expansion means, their separation changes,

(e) the expansion means being comprised of a bellows, individual first and second elongated tubes, means for disposing one end of one elongated tube at the end of said first tube, means for disposing one end of the other elongated tube at the end of the bellows opposite said first tube, and a third elongated tube, means for disposing one end of the



third elongated tube in the atmosphere just above the surface of the liquid, a source of compressed gas, means for applying the compressed gas to the first and second elongated tubes at pressures just balancing the liquid pressures at the bottom of the tank and at said height respectively, a differential pressure transducer, means for connecting inputs to the transducer to the third and first elongated tubes respectively to obtain a measure of the liquid pressure at the bottom of the tank relative to atmospheric pressure, means for connecting inputs to the transducer to the third and second elongated tubes respectively to obtain a measure of the liquid pressure at said height relative to atmospheric pressure, and means for providing an output signal from the transducer corresponding to said pressures, relative to atmospheric, whereby the pressure differential of the liquid at the locations of said first and second means can be determined as a parameter for obtaining an indication of the volume of liquid in the tank independently of the effects of expansion of the liquid and of the tank due to their temperature changes.

4,630,479

SAMPLING DEVICE FOR SOLIDS IN A PRESSURIZED REACTOR

Heinrich Wagener, Bochum; Reinhold Kirchhoff, Hattingen; Karl H. Van Heek, and Harald Jüntgen, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,415

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418311

Int. Cl.⁴ G01N *1/04*

U.S. Cl. 73—863.83 **9 Claims**

1. A sampling device for solids from a pressure reactor having a reactor wall, said sampling device comprising:

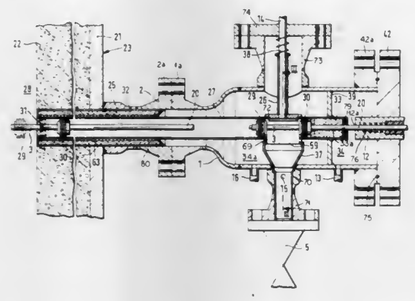
a housing connected to the reactor and defining an axis;

a tube in said housing extending through the reactor wall with one axial end opening into the reactor, said tube

being provided with an outlet opening in said housing between ends of said tube

a piston movable within said tube in an axial direction between a first position in which solids are withdrawn from the reactor and a second position in which said piston registers with said outlet opening;

discharge means connected to said opening of said tube for allowing solids drawn from the reactor by said piston to be removed from said tube and said housing; and



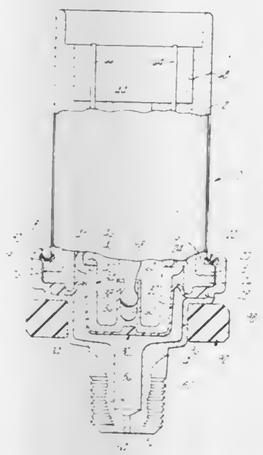
inlet and outlet means connected to said housing for providing a supply and discharge of at least one barrier flushing and cooling gas for said housing and said tube to block incursion of gas under pressure in said reactor, said piston including two spaced gas-permeable piston rings each of which has a plurality of spaced-apart plates and respective soft and elastic dust-trapping insulating layers arranged between each two successive plates of each of said rings.

4,630,480

TRANSDUCER FASTENING DEVICE

Joseph T. Betterton, Arab, and Alfred H. Glover, Decatur, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 12, 1985, Ser. No. 796,337
Int. Cl.[4] G01L *7/16, 19/14*
U.S. Cl. 73—431 **4 Claims**



1. A pressure transducer having first and second housings connected together by an annularly shaped fastener means comprising:

a generally tubular first housing having a substantially cylindrical end portion with a radially outwardly extending edge flange adjacent thereto;

a generally tubular second housing having a substantially cylindrical end portion of greater diameter than the diameter of the edge flange of the first housing, the end portion of the second housing encircling the edge flange and the end cylindrical portion of the second housing encircling the edge flange and the end cylindrical portion of the first housing when the housings are assembled together in a telescopically arranged condition, whereby an open channel means extends between the cylindrical portion of the first housing and the encircling end portion of the second housing;

first groove means extending circumferentially in the outer surface of the first housing adjacent the edge flange thereof;

second groove means extending circumferentially in the inner surface of the end portion of the second housing, whereby the first and second groove means are axially aligned with respect to one another when the housings are arranged in the telescopically assembled condition;

an annularly configured fastener means with a generally V-shaped cross section characterized by radially outwardly and inwardly projecting leg portions which extend from a common central portion, the fastener means being of resilient but stiff material to permit the inner and outer leg portions to distortingly flex toward one another when the fastener means passes into the channel means formed between the first and second housings and whereby the leg portions move toward their predistorted configuration into the groove means as the common central portion moves into close relationship with the flange of the first housing whereas the fastener means is wholly within the space defined by the first and second channel means.

4,630,481

METHOD AND INSTRUMENT TO ESTIMATE THE WEIGHTS OF GREEN TREES AND LOGS

Gary C. Bergstrom, Jacksonville, and Michael B. Lambert, Boring, both of Oreg., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 9, 1985, Ser. No. 764,040
Int. Cl.[4] G01G *5/02*
U.S. Cl. 73—437 **13 Claims**



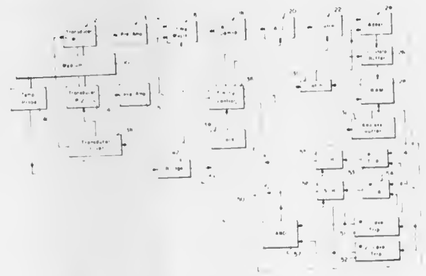
1. An instrument for determining the weight of a living or freshly cut tree, comprising a sample chamber and quill assembly, a float chamber to receive said sample chamber and quill assembly, a scale for preparing samples for use in said sample chamber and quill assembly, said samples comprising cores bored out of said living or freshly cut tree whose weight is to be determined and said cores being bored out of said tree transverse to the axis of said tree and at regular intervals along the length of the said tree and said cores being of a predetermined diameter, said scale comprising means to prepare said samples from said cores such that said samples will have a predetermined length so as to permit a sample so prepared to fit into said sample chamber and quill assembly and whereby a sample so prepared will have a predetermined volume, said scale comprising means to prepare said samples from said cores such that the ratio of heartwood to sapwood in said sample simulates that same ratio in the living or freshly cut tree at the height thereon at which the corresponding core was bored, and means to use the data produced by said instrument concerning all of said samples made from said cores bored at said regular intervals out of said tree to determine the weight of said tree.

4,630,482

METHOD AND APPARATUS FOR ULTRASONIC MEASUREMENTS OF A MEDIUM

John Traina, 303 N. Rose Dr., Glenshaw, Pa. 15116

Filed Jun. 17, 1985, Ser. No. 745,725
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 **22 Claims**



1. A method of ultrasonic measurement of a time taken by an ultrasonic tone burst to traverse a medium comprising the steps of:

(a) placing a first transducer, said first transducer being capable of emitting a first ultrasonic signal upon receipt of a first electric signal and generating a first output electrical signal upon receipt of a second ultrasonic signal;

(b) placing a second transducer at a distance from the first transducer, said second transducer being capable of emitting the second ultrasonic signal upon receipt of a second electrical signal and generating a second output electrical signal upon receipt of the first ultrasonic signal;

(c) emitting the first ultrasonic signal from the first transducer to the second transducer thereby producing a second output signal;

(d) checking the second transducer for the second output signal during sequential time slots along a chosen time interval;

(e) producing a sequence of input samples, one for each time slot, according the presence and strength of the output signal at each time slot;

(f) selecting an address in a memory which corresponds to each time slot;

(g) storing each input sample in memory at an address which corresponds to the time slot at which the input sample was taken;

(h) emitting from the first transducer additional ultrasonic signals;

(i) checking after emission at each additional ultrasonic signal the second transducer for an output signal at the sequential time slots along the previously chosen time interval;

(j) producing a subsequent sequence of input samples, one for each time slot according to the presence and strength of the output signal at each time slot;

(k) mathematically combining each subsequent sequence of input samples to the input samples stored in memory thereby producing a corresponding new processed sample at each address;

(l) examining each new processed sample as to its degree of enhancement with a threshold value; and

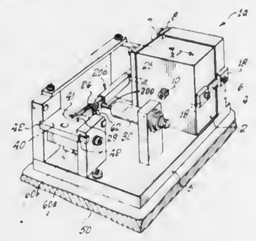
(m) measuring a traverse time by determining the time which corresponds time slot of the new processed sample which first reaches sufficient enhancement.

4,630,483

PEAK ACCELEROGRAPH

Paul D. Engdahl, 2850 Monterey Ave., Costa Mesa, Calif. 92626

Filed Jul. 24, 1985, Ser. No. 758,307
Int. Cl.[4] G01D *15/02*
U.S. Cl. 73—652 **8 Claims**



1. A peak accelerograph comprising an accelerograph element having

a base member and a proof mass each having generally parallel facing surfaces defining a clearance space therebetween,

parallel flat spring reeds connecting said base member and said mass to permit relative parallel oscillatory displacement therebetween,

said reeds being three in number;

a displacement-magnifying lever arm having a root portion, a push-rod portion, an arm portion, and a stylus-carrier portion;

a connection from said root portion to said base member and a connection from said push rod portion to said proof mass,

all said portions being integral parts of a single bent piece of sheet material,

said arm and push-rod portions having channel-shaped cross sections.

4,630,484

MASS FLOWMETER

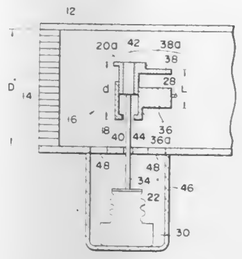
Toru Mizuno, Aichi; Sinzi Nanba, Kariya; Kazuma Matsui, Toyohashi, and Tsukasa Goto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 29, 1985, Ser. No. 739,004
Claims priority, application Japan, May 31, 1984, 59-112301; Dec. 5, 1984, 59-256827; Dec. 5, 1984, 59-256828; Dec. 5, 1984, 59-256830
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **16 Claims**

1. A mass flowmeter for measuring the mass flow of a fluid, comprising:

a vortex generator, which is placed in the flow of a fluid, for shedding a Karman vortex street downstream of the vortex generator, said vortex generator including a stationary member having a trough extending in a direction at right angles to the flow of the fluid and a movable member located inside said trough and including a bellows for expanding and contracting in response to changes in the

pressure and temperature of the fluid, the movable member being displaceable in a direction at right angles to the flow of the fluid to thereby vary a characteristic dimension of said vortex generator;



compensation means for displacing the movable member in relation to the stationary member in response to changes in pressure and temperature of the fluid to vary the characteristic dimension of said vortex generator; and

detection means for detecting Karman vortices generated downstream of said vortex generator.

4,630,485

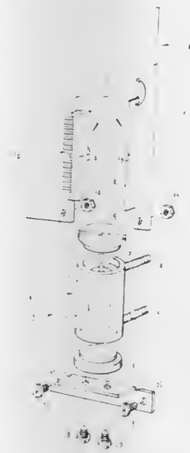
GAS OR LOW VOLUME LIQUID FLOW METER

Max Wastl, Sr., Lafayette, Ind., assignor to Lafayette Instrument Co., Inc., Lafayette, Ind.

Filed Dec. 3, 1984, Ser. No. 677,543

Int. Cl.⁴ G01F *1/24*

U.S. Cl. 73—861.56 **9 Claims**



1. An apparatus for metering the volume of flow of a fluid, comprising:

a mechanical flow gage including,

(a) a housing having upper and lower portions and defining an inner flow chamber, the upper and lower portions of said housing respectively having output and input flow passages in flow communication with said chamber, said chamber including a cylindrical passageway having a first diameter and being further defined by a plurality of longitudinal slits in said housing, said slits extending outwardly of said cylindrical passageway and radially spaced apart, each of said slits having along at least a portion of their lengths a taper extending outwardly towards the upper portion of said housing such that the cross-sectional area of said chamber increases upwardly along the length of said tapered portions of said slits, and

(b) a spherically shaped float indicator received within said chamber and having a diameter slightly smaller than the cylinder diameter of said chamber, whereby, when the center of said indicator is positioned along the tapered portion of said slits, the flow rate of said fluid flowing through said chamber is directly linearly related to the upward displacement of said indicator;

a position detection means, associated with said flow gage but non-invasive with respect thereto, for detecting the positon of said indicator and providing an analog output which is responsive to the position of said indicator, said position detection means including a light emitting means and a light sensitive element oppositely positioned relative to said flow meter, said light sensitive element having a working surface facing said light emitting means which varies in electrical resistance in relationship to light cast upon its surface, said working surfaces aligned with said cylindrical passageway and said light emitting means, said light emitting means bathing said light sensitive element in a beam of light having a constant intensity throughout said working surface except when said float indicator is in a position which interferes with the passage of light between said light emitting means and said light sensitive element, wherein the resistance across said light sensitive element varies linearly with the vertical displacement of said float indicator along the length of said tapered portions of said slits; and

an analog to digital conversion means for converting the analog output from said position detection means into a digital output representative of the accumulative volume of fluid flow through said mechanical flow gage.

4,630,486

MEASURING INSTRUMENTS

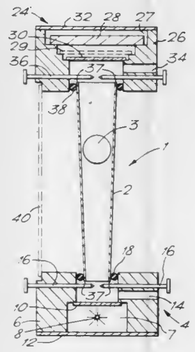
James J. Miles, Birch Vale, and John M. Smith, Keighley, both of England, assignors to The BOC Group, Inc., Montvale, N.J.

Filed May 20, 1985, Ser. No. 735,906

Claims priority, application United Kingdom, May 22, 1984, 8413048

Int. Cl.⁴ G01F *1/24*

U.S. Cl. 73—861.56 **7 Claims**



1. A device for measuring the flowrate of a fluid comprising a tube having a tapered bore for the passage therethrough of the fluid, a float freely movable along the length of the tube, means for producing a beam of electromagnetic radiation within and along the tube diverging at an angle substantially the same as the tapered divergence of said bore and a sensor for detecting electromagnetic radiation emitted by said means axially along the tube, the arrangement being such that, for a given flowrate of fluid through the tube, the float will take up a corresponding position in the bore of the tube thereby determining the amount of electromagnetic energy reaching the sensor from the source.

4,630,487

FLOW RATE METER

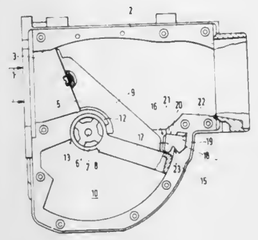
Eberhard Biermann, Uhldingen; Erwin Nägele, Hessigheim, and Peter Romann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,033

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414012

Int. Cl.⁴ G01F *1/28*

U.S. Cl. 73—861.76 **3 Claims**



1. A flow rate meter having a housing and a flow conduit embodied in the housing, an air flow measuring body disposed in said flow conduit and pivotable counter to a restoring force about a bearing shaft supported in said housing in accordance with a quantity of medium flowing through said flow conduit, a damping chamber including a wall, a damping body coupled with said air flow measuring body and pivotable about said bearing shaft in said damping chamber, said damping body having a form of a movable wall defining said damping chamber with respect to said flow conduit, in which a pivoting movement of said damping body within said damping chamber toward the flow conduit is limited by means of an elastic stop body supported on said damping chamber wall outside said flow conduit between said damping body and said flow conduit, said stop body includes a retaining section which form-fittingly engages a retaining groove in said damping chamber wall, and a stop section which protrudes into said damping chamber.

4,630,488

SINGLE JET LIQUID METER

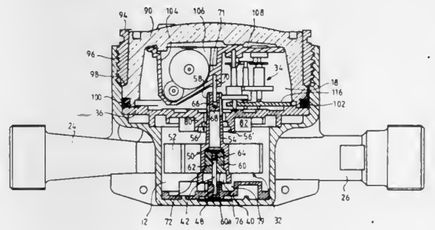
Alain Marlier, Lugny, and Henri Oszajca, Macon, both of France, assignors to Flonic, Montrouge, France

Filed Jun. 26, 1985, Ser. No. 749,032

Claims priority, application France, Jun. 28, 1984, 84 10212

Int. Cl.⁴ G01F *1/07, 1/08*

U.S. Cl. 73—861.81 **13 Claims**



1. A single jet liquid meter comprising: a cylindrical measuring chamber having first and second end walls perpendicular to the axis of said chamber; an injector and an ejector in communication with said measuring chamber; a turbine having a hub and plurality of blades fixed to said hub, said hub having first and second end faces disposed opposite said first and second end walls respectively; means for guiding the said turbine in rotation about the axis of said chamber; a set of radiating ribs fixed to said first end wall and projecting into said chamber; the meter including the improvement whereby it further comprises an assembly constituting an axial stop disposed adjacent said first end face and constituted by a pivot having a tapering point and an abutment which is in contact with said point when the liquid flow rate is zero, means for subjecting said second end face to a pressure reduction effect produced by rotation of said liquid in said chamber, and means for protecting said first end face from said reduced pressure effect at low speeds of rotation of said turbine, in such a manner that the turbine moves axially to take said point out of contact with said abutment, and to subject said first end face to said pressure reduction phenomenon from a given axial displacement of said turbine, such that said turbine is fixed axially under the reduced pressure effect which is applied to both of said end faces.

4,630,489

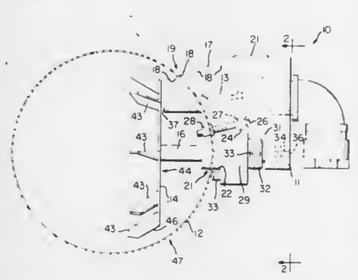
FLOW SENSOR FOR PARTICULATE MATERIAL

Glen W. Fisher, 708 - 99th SE., Bellevue, Wash. 98004; Lionel C. Helweg, 640 SW. 124th St., Seattle, Wash. 98146, and Rick S. Jones, 5030 51st Ave. SW., Seattle, Wash. 98136

Filed Aug. 16, 1984, Ser. No. 641,382

Int. Cl.⁴ G01F *1/06*

U.S. Cl. 73—861.87 **12 Claims**



1. An apparatus for sensing the flow of particulate material comprising a paddle wheel having a plurality of radially spaced blades for engaging a stream of particulate material.

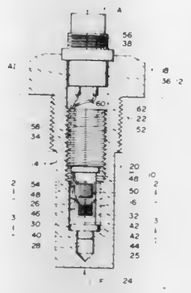
each of the blades of said paddle wheel including generally linear outer edge;

mounting means for rotatably mounting said rotor means such that it rotates when it contacts a stream of flowing particulate material; a generally cylindrical housing for receiving a flow of particulate material to which said housing is connected such that said paddle wheel is positioned within said housing to contact a flow of particulate material therein, and

such that, when each blade is moved to its lowest rotational position, the outer edge thereof is generally parallel to a line tangent to the adjacent wall of the housing;

and means operatively associated with said rotor means for sensing rotation of said rotor means and producing an output signal in response to such rotation.

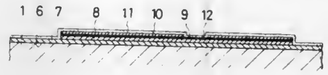
4,630,490
COMPRESSION STRAIN GAUGE TRANSDUCER ASSEMBLY
Raymond W. Malicki, Dearborn Heights, Mich., assignor to Carron & Company, Inkster, Mich.
Filed Jul. 12, 1985, Ser. No. 754,623
Int. Cl.[4] G01L *1/22*; G01B *7/18*
U.S. Cl. 73—862.65 **3 Claims**



1. A compression strain gauge transducer assembly comprising: a sensing member including a head and a shank extending from the head along a central axis of the sensing member; said shank having threads for mounting the sensing member and having a distal end at which the shank is loaded in compression; a counterbored hole extending through the head of the sensing member into the shank thereof along the central axis; said counterbored hole including an inner pilot end, an annular seat of a flat shape extending radially outward from the inner pilot end in a perpendicular relationship to the central axis, an intermediate portion extending axially outward from the annular seat, and a threaded outer portion; a strain gauge transducer received within the counterbored hole of the sensing member and having a central axis coaxial with the central axis of the counterbored hole in the sensing member; said transducer including an inner pilot received within the inner pilot end of the counterbored hole to locate the transducer; an annular seat on the transducer extending radially outward from the inner pilot thereof and having a flat shape extending perpendicular to the central axis thereof in engagement with the annular seat of the counterbored hole in the sensing member; an intermediate portion of the transducer extending axially outward from the inner pilot thereof and having four outer surfaces defining a square cross section; at least two strain gauges each of which is mounted on an associated outer surface of the square intermediate transducer portion; the transducer including a threaded outer portion connected to the intermediate portion thereof and threaded into the threaded outer portion of the counterbored hole in the sensing member to maintain an engaged relationship of the annular seats; and wires extending from the strain gauges to permit sensing of compression loading applied to the distal shank end of the mounted sensing member.

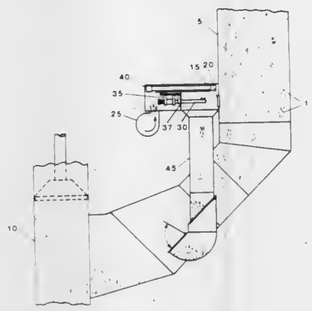
4,630,491
LOAD CELL AND METHOD OF COMPENSATING THE SAME
Tohru Kitagawa; Koichiro Sakamoto, and Yasuhiro Ushijima, all of Mishima, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1985, Ser. No. 721,408
Claims priority, application Japan, Apr. 9, 1984, 59-70480
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.67 **4 Claims**

1. A method of compensating a load cell which comprises the steps of:
laminating layers of thin metal films to form strain gage resistor portions, lead portions for bridge coupling of said resistor portions and compensating portions,
forming a pigmented protection film on said thin metal films, and



applying laser trimming to the thin metal films from above the protection film, whereby energy absorbtion is enhanced in said laser trimming step.

4,630,492
AUTOMATIC STAPLE FIBER SAMPLER
Sidney H. Goode, Spartanburg, S.C., assignor to American Hoechst Corporation, Somerville, N.J.
Filed Dec. 2, 1985, Ser. No. 803,362
Int. Cl.[4] G01N *1/02*
U.S. Cl. 73—863.82 **19 Claims**

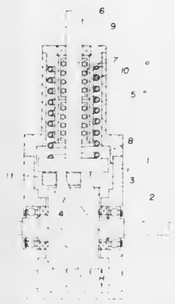


1. An apparatus for sampling staple fibers which are falling within a fiber chute comprising
(i) a sampler housing;
(ii) means for attachment of said sampler housing to a sample port on said fiber chute;
(iii) means for maintaining the air pressure within said sampler housing substantially equivalent to the air pressure within said fiber chute;
(iv) a sample discharge chute attached to said sampler housing;
(v) a rod-like sample probe mounted within said sampler housing having a smooth, convex fiber-sampling section at one rounded end and, opposite thereto, a mounting means engagement end, said fiber-sampling section having at least one protrusion mounted at or near said rounded end;
(vi) means for retractably inserting said rod-like sample probe from within said sampler housing into said fiber chute perpendicularly to the direction of fiber travel;
(vii) means for rotating said rod-like sample probe more than 90 degrees about its major axis from a first, fiber-sampling position to a second, fiber-discharging position;
(viii) means for controlling the movements of said rod-like sample probe by the retractable insertion means and the rotation means.

4,630,493
CAM ARRANGEMENT
Heizaburou Kato, Ichikawa, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Mar. 13, 1984, Ser. No. 589,668
Int. Cl.[4] F16H *37/16*
U.S. Cl. 74—22 R **3 Claims**

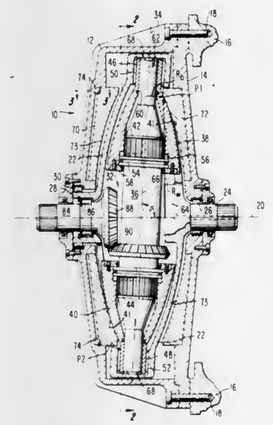
1. A cam arrangement comprising:
a housing;

an input shaft rotatably mounted on said housing;
a solid cam having a central portion fixed to said input shaft and having a plurality of ribs formed on a circumferential surface thereof and spaced from each other, said solid cam being formed to a non-circular configuration at an outer periphery of said ribs, said ribs including a linear portion extending in a circumferential direction and an inclined portion inclined in a lateral direction with respect to said circumferential direction;



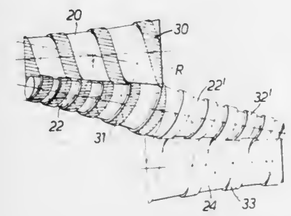
an output shaft extending in perpendicular relationship to said input shaft and mounted for rotational movement and also for movement in opposite axial directions;
a spider fixed to an end of said output shaft and maintained in contact with said outer periphery of said ribs of said solid cam;
a plurality of cam followers mounted on said spider, each said cam follower being guided between an adjacent pair of said ribs; and
means for resiliently pressing said spider into continuous contact with said outer periphery of said ribs.

4,630,494
RADIALLY ORIENTED NUTATIONAL TRACTION DRIVE TRANSMISSION
Yves J. Kemper, 1371 Kirkway Rd., Bloomfield Hills, Mich. 48013
Continuation-in-part of Ser. No. 705,647, Feb. 26, 1985, abandoned, and a continuation-in-part of Ser. No. 694,964, Jan. 25, 1985, abandoned. This application Apr. 18, 1985, Ser. No. 724,746
Int. Cl.[4] F16H *15/44, 15/16*
U.S. Cl. 74—191 **23 Claims**



1. In a continuously variable traction drive transmission having a frame, an alpha body supported by said frame for rotation about a first axis, a beta body supported by said alpha body on a second axis intersecting said first axis at a point of axes intersection and at an acute angle of axes intersection, said beta body having a pair of members on opposite sides of said point of axis intersection for defining beta rolling surfaces of revolution about said second axis, omega body means for defining a pair of omega rolling surfaces of revolution about said first axis, said beta and omega surfaces being in rolling friction engagement at two points of contact in a plane containing said first and second axes, said two points of contact being located on opposite sides of said first axis and on opposite sides of said second axis, and means for varying the radius ratio of said beta and omega surfaces at said points of contact, the improvement comprising:
means for defining said alpha, beta and omega bodies so that said points of contact always lie within said acute angle between said first and second axes.

4,630,495
VARIABLE RATIO POWER TRANSMISSION MEANS
John D. Smith, Bristol, England, assignor to Fairey Hydraulics Limited, Hounslow, England
Filed Feb. 9, 1983, Ser. No. 465,085
Claims priority, application United Kingdom, Feb. 11, 1982, 8204040
Int. Cl.[4] F16H *15/44, 15/16*
U.S. Cl. 74—191 **19 Claims**



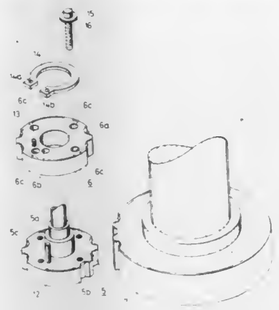
1. A rolling member for use in a continuously variable power transmission, the rolling member comprising a truncated cone having a concave circumferential surface, generated about an axis substantially parabolic in axial section and having a substantially straight rolling contact line extending along substantially the length of the surface and disposed at a compound angle with respect to the axis, whereby rolling contact may be made with an equivalent straight rolling contact line of a similarly configured cone.

4,630,496
BACKLASH CORRECTING DEVICE FOR SWIVEL ARM OF ROBOT
Hirotoshi Yasuoka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 30, 1985, Ser. No. 696,553
Claims priority, application Japan, Jan. 30, 1984, 59-13428
Int. Cl.[4] F16H *55/18*
U.S. Cl. 74—409 **10 Claims**

1. A swivel shaft backlash correcting device for a robot, comprising:
a gear shaft, a spur gear mounted at one end of said shaft and having first and second axial surfaces and a plurality of threaded axial holes, said spur gear further having an axially-extending first pin having a predetermined length fixed to said first axial surface of said spur gear, said shaft being coupled through a speed reducer to an electric motor;
a correcting gear having first and second axial surfaces and disposed with its second axial surface facing said first axial surface of said spur gear, said correcting gear having an

axial through-hole through which said first pin extends, a plurality of additional through-holes in alignment with said threaded axial holes in said spur gear and an axially-extending second pin having a predetermined length, said correcting gear having the same diameter and number of teeth as said spur gear;

a retaining ring disposed adjacent said first axial surface of said correcting gear and engaged with said first and sec-



ond pins in a contracted or compressed state of said retaining ring to apply a force of expansion to said gear shaft and said correcting gear;

a center gear fixedly secured to a stationary stand and engaged with said correcting gear and said spur gear; and

a plurality of bolts for extending through said additional through-holes in said correcting gear and threadedly engaging respective ones of said threaded holes in said spur gear.

4,630,497

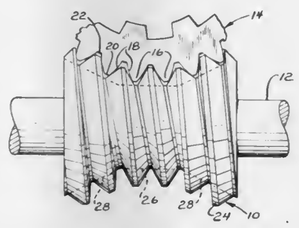
TAPERED WORM

Bertel S. Nelson, Naperville, Ill., assignor to Wedgtrac Corporation, Yorkville, Ill.

Filed Nov. 5, 1984, Ser. No. 668,196

Int. Cl.[4] F16H *1/16, 1/20, 55/17, 55/22*

U.S. Cl. 74—425 **5 Claims**



5. A worm and a worm gear meshing therewith, said worm gear having a plurality of teeth, said worm comprising a substantially cylindrical portion, and a pair of tapered frustoconical portions at each end of said cylindrical portion, and a thread extending over said substantially cylindrical portion and both of said tapered portions, the thread on both said cylindrical portions and on said tapered portions being simultaneously in driving engagement with the teeth of said gear.

4,630,498

LAMINATED WHEEL ASSEMBLY

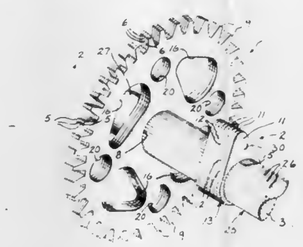
John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

Continuation-in-part of Ser. No. 403,465, Jul. 30, 1982. This application Jan. 23, 1985, Ser. No. 694,106

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] F16H *55/12;* **B21D** *53/28;* **F16G** *11/00;* **F16B** *3/00*

U.S. Cl. 74—445 **6 Claims**



1. A wheel assembly, comprising:

a rotatable shaft;

a pair of wheels fixedly secured to said shaft and disposed in axially spaced relation to one another, each of said wheels including a laminated stack of flat plates disposed in abutting relation to one antoehr, each of said plates having an opening formed therethrough disposed in axial registry for frictionally receiving said shaft, one of said wheels includes intergral teeth formed in its periphery to provide a laminated gear and the other wheel includes an integral cam surface formed in its periphery to provide a laminated cam, and each of the individual plates of said cam is stamped from the individual plates of said gear; and

means for mounting said wheels on said shaft, said mounting means includes a serrated outer surface on said shaft having a plurality of axially extending, radially projecting teeth disposed circumferentially about substantially the entire outer surface of said shaft, said teeth being tapered along their axial length so that their radially outer diameter at one end of said shaft is less than their radially outer diameter at the other end of said shaft to secure said wheels aginst both axial and circumferential movement relative to said shaft by virtue of the interference of said teeth with said wheels.

4,630,499

SELECTOR MECHANISM FOR AN AUTOMATIC TRANSMISSION VEHICLE

Allan S. Hopkins, Coventry, United Kingdom, assignor to Jaguar Cars Limited, West Midlands, England

Filed Jan. 25, 1985, Ser. No. 694,824

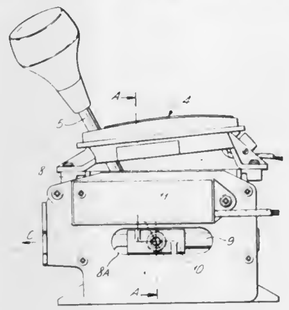
Claims priority, application United Kingdom, Jan. 27, 1984, 8402164

Int. Cl.[4] B60K *20/00;* **G05G** *9/00*

U.S. Cl. 74—473 R **13 Claims**

1. A selector mechanism for an automatic transmission comprising in combination a longitudinally movable operating member for operative attachment to an automatic gearbox, a control lever pivotable about a first, transverse, axis and a second, longitudinal, axis and arranged to control movement of the operating member, guide means for said control lever defining first and second generally longitudinally extending paths, an interconnection between the paths at one end of each path such that the paths extend generally in the same direction from said interconnection, a first driving means and a second driving means each operatively connected to the control lever on opposite sides of said first axis such that generally longitudinal movement of the control lever along one of said first and second paths produces corresponding movement of said first

and second driving means in mutually opposite generally longitudinal directions, a first driven means and a second driven means operatively connected to said operating member, said first driving means being moved into operative engagement with said first driven means in response to positioning said control lever in said first path and said second driving means being moved into operative engagement with said second



driven means in response to positioning said control lever in said second path whereby movement of the control lever from a position remote from the interconnection on the first path, along said first path towards said interconnection causes movement of the operating member in one direction and thereafter movement of the control lever along said second path away from said interconnection causes further movement of the operating member in the same direction.

4,630,500

TRANSMISSION OPERATING DEVICE

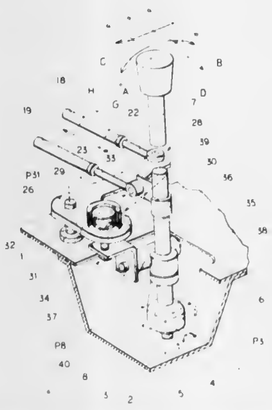
Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Jul. 24, 1985, Ser. No. 758,612

Claims priority, application Japan, Jun. 14, 1985, 60-130341

Int. Cl.[4] G05G *9/16, 9/02*

U.S. Cl. 74—473 R **4 Claims**



1. A transmission operating device comprising:

(a) a frame;

(b) a first ball joint provided on a lowered portion of the frame;

(c) a change speed lever supported on the frame by means of the first ball joint;

(d) a first control cable and a second control cable extending in the plane crossing with an axis of the change speed lever and being arranged substantially parallel to each other;

(e) a bell crank being provided on the frame so as to rotate around a first axis extending substatially parallel to the change speed lever and having a first arm extending in the direction crossing with the first control cable and a second arm extending substantially parallel to the second control cable; and

(f) a connecting link of which one end is connected with the change speed lever so as to rotate around a second axis crossing with the axis of the change speed lever, and of which the other end is connected with the second arm by means of a second ball joint, and extending in the direction crossing with the second arm,

wherein one end of the first control cable is connected with the first arm, and one end of the second control cable is connected with the change speed lever.

4,630,501

STEERING SWITCH PAD APPARATUS

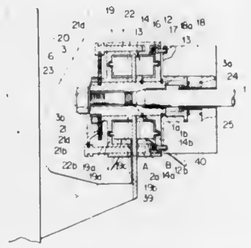
Kazuhisa Kubota, and Takafumi Ichikawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 29, 1984, Ser. No. 665,876

Claims priority, application Japan, Oct. 28, 1983, 58-167106[U]; Dec. 29, 1983, 58-204077[U]; Dec. 29, 1983, 58-204078[U]; Dec. 29, 1983, 58-204079[U]

Int. Cl.[4] B62D *1/04, 1/16*

U.S. Cl. 74—484 R **6 Claims**



1. A steering wheel switch pad apparatus for mounting on a boss at the steering wheel end of a steering shaft and within the circumference of the steering wheel, said steering wheel being mounted on a boss plate fixed to said boss inward of said end of said shaft, said boss being fixed to said steering shaft for turning said steering shaft when said boss and said boss plate are turned by said steering wheel, said switch pad apparatus comprising:

a cam plate fixed to the end of said boss adjacent said steering wheel end of said shaft for rotation with said boss when said boss and said steering shaft are turned by said steering wheel;

a pin holder mounted on said boss intermediate said cam plate and said boss plate, said pin holder having at least two pin guide holes extending therethrough in substantial alignment with the axis of said steering shaft, each of said pin holes having a pin therein for axial movement therethrough, each of said pins having means at one end of said pin extending outwardly from the cam plate end of said pin holder for engaging said cam plate and means at the other end for projecting axially beyond the rotating path of said boss plate when said pin is advanced by said cam plate and for retracting axially out of said rotating path of said boss plate when said pin is retracted by said cam plate; and

a base having pin guide holes therein aligned with said pin guide holes in said pin holder, said base being mounted on said boss at the side of said boss plate opposite to the side of said boss plate where said pin holder is mounted and said cam plate is fixed to said boss, said pin guide holes in said base receiving the ends of said pins projecting axially

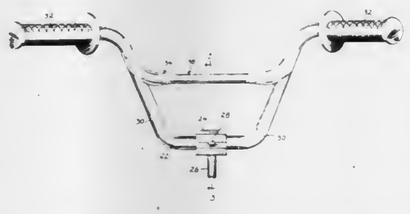
beyond the rotating path of said boss plate by said cam plate when said boss and said boss plate are rotated by the turning of said steering wheel to hold said projecting pins and said pin holder from rotating as said boss and boss plate are turned by said steering wheel.

4,630,502

FLAT CROSS BAR FOR FREESTYLE BICYCLE HANDLEBAR

Mark Greco, Kenosha, Wis., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Sep. 4, 1985, Ser. No. 772,552
Int. Cl.[4] B62K *21/12*
U.S. Cl. 74—551.1 **4 Claims**



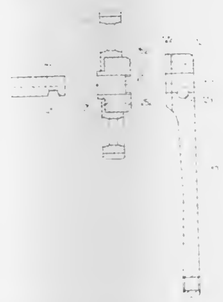
1. A handlebar for a bicycle comprising in combination:
a horizontal tubular mid section adapted to be connected to the stem of a bicycle fork;
a pair of diverging arms extending upwardly from opposite ends of said tubular mid section and having handle members extending outwardly from the ends of said arms;
a horizontal cross bar connecting said arms at a level intermediate the levels of said tubular mid section and said handle members;
said tubular mid section, arms and cross bar being coplanar in an upright plane: and
a flat upper surface on the cross bar to support a rider to facilitate performing freestyle maneuvers.

4,630,503

PEDAL LINK ASSEMBLY FOR BICYCLE

King Liu, 19, Shun-Fan Road, Ta-Cha Town, Taichung Hsien, Taiwan

Filed Oct. 4, 1985, Ser. No. 784,102
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.2 **1 Claim**



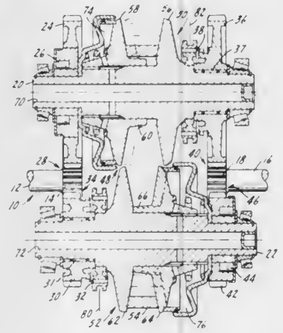
1. A transmission mechanism comprising: a crank member having a screw opening at one end for making connection with a pedal-like element, and a head portion formed at another end, said head portion having a horizontal penetrating hole, an open slot vertically provided across said penetrating hole, and a pin hole horizontally formed in another side with a central axis tangentially crossing a lower periphery of said penetrating hole; a plastic-moulded transmission means having a central through opening connected to said head portion through said open slot with the through opening aligned with said penetrating hole; a transmission linking unit with an arcuate notch longitudinally formed at one end disposed in the aligned through opening and penetrating hole with the arcuate notch located in line with said pin hole; and a push pin member connected in said pin hole and securing said plastic-moulded transmission means and said transmission linking unit in firm position against the head portion of said crank member; whereby, said plastic-moulded transmission means mounted on the head portion of said crank member is always centered during rotation of the transmission mechanism, wherein said plastic-moulded transmission means comprises: an inside gearing member having an annular body portion, a central through opening formed in the body portion with a diameter similar to that of said penetrating hole of said crank head portion, a circular flange with a diameter smaller than that of the body portion located around a lower end of the through opening, a pair of side pieces opposing each other on the body portion at a pedetermined height thereof, a pair of L-shaped positioning lugs each having a vertical portion integrated with the body portion and extend in perpendicular direction to said side pieces, and each having a horizontal portion respectively curving over and integrated with an upper edge of the body portion; and a plastic transmission gear member disposed around the periphery of the annular body portion of said inside gearing member through an injection moulding operation with wear-resistant plastic material, so that said plastic transmission gear member and said inside gearing member are incorporated into a single solidified transmission unit which generates no noise and does not wobble and become loose from said crank member during rotation.

4,630,504

DUAL-PASS CONTINUOUSLY VARIABLE TRANSMISSION

Richard L. Smirl, Arlington Hts., Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 22, 1985, Ser. No. 768,294
Int. Cl.[4] F16H *11/02, 37/06;* F16D *41/04, 47/04*
U.S. Cl. 74—689 **7 Claims**



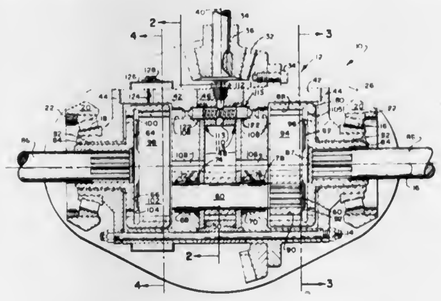
7. A multi-pass continuously variable transmission comprising rotatable input and output shafts; first and second rotatable intermediate shafts; a variator; drive means having one-way clutch means engageable for completing a first drive path extending in one direction from said input shaft through said first intermediate shaft, variator, and second intermediate shaft to said output shaft; and other drive means having clutching means engageable for completing a second drive path extending in one direction from said input shaft through said second intermediate shaft, variator, and first intermediate shaft to said output shaft; said second drive path also extending in the opposite direction from said output shaft through said first intermediate shaft, variator, and second intermediate shaft to said input shaft; said other drive means also having other one-way clutch means engageable for completing said second drive path extending in said opposite direction; said other one-way clutch means being engageable upon disengagement of said one-way clutch means when said clutching means is disengaged.

4,630,505

HYDRAULIC-CONTROLLED DIFFERENTIAL

Archie O. Williamson, 5916 S. Halifax Ave., Edina, Minn. 55424

Filed Oct. 24, 1985, Ser. No. 791,101
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 **12 Claims**



1. A hydraulic-controlled differential, which comprises:
a case supported for rotation about a transverse axis, said case defining a central chamber and two opposite side chambers;
means for effecting rotation of said case;
a rotatable output shaft extending outwardly from each side chamber of said case along the transverse axis;
at least two control gears supported for rotation in the central chamber of said case, said control gears and the central chamber of said case defining a gear pump with adjacent gears being intermeshed for rotation in opposite directions;
means extending between the central chamber and the side chambers of said case for drivingly connecting said control gears with the respective output shaft;
the side chambers in said case being fluidly connected for fluid level and pressure equalization between the side chambers; and
control valve means connected between each side chamber and the central chamber of said case adjacent intermesh of said control gears for limiting maximum fluid flow rate between the chambers to effect hydraulic modulation during differential drive of said output shafts.

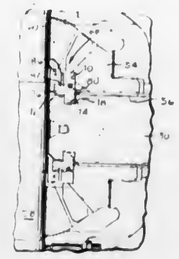
4,630,506

DRIVE AXLE AND METHOD OF ASSEMBLING SAME

Donald D. Allmandinger, and Richard L. Pifer, both of Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 6, 1984, Ser. No. 679,004
Int. Cl.[4] F16H *1/40*
U.S. Cl. 74—713 **12 Claims**

1. In an axle assembly, the combination comprising:
a differential cage,
a pair of side gears disposed in said cage, each side gear having a splined opening,
a pinion shaft mounted in said cage,
a pair of pinion gears rotatably journaled on said pinion shaft and meshing with said side gears,
a ring gear fastened to said cage and disposed to at least partially overlie said pinion shaft so that said pinion shaft cannot be removed from said cage after said ring gear is fastened to said cage,
a splined axle shaft having a groove adjacent one end, said axle shaft being disposed to extend through and engage the splined opening in one of said side gears so that said one end is adjacent said pinion shaft,



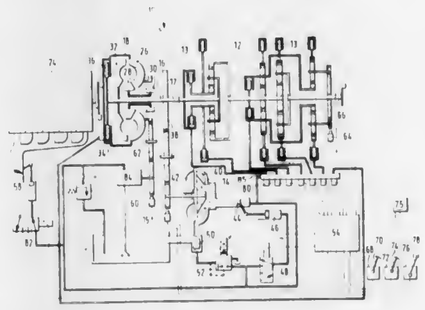
a plurality of separate and independent retainer ring segments disposed in said groove and engaging the adjacent side gear, and
means resiliently holding said segments in said groove.

4,630,507

DRIVE SYSTEM WITH FLOW BRAKE

Artur Kugler, Augsburg; Rudi Reppert, Fussen, and Franz-Xaver Zaunberger, Augsburg, all of Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,971
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3321948
Int. Cl.[4] F16H *47/04;* B60K *41/28*
U.S. Cl. 74—733 **10 Claims**



1. A vehicle drive system for improved braking efficiency, the system comprising a torque converter adapted to be driven by an engine, a speed change gear, control means for downshifting the speed change gear at least one speed during a braking cycle, the speed change gear including primary rotative input means, means drivingly interconnecting the torque converter and the primary input means, a bypass clutch, the bypass clutch being engaged to provide a direct drive coupling between the engine and the primary input means, control means for disengaging the bypass clutch to permit torque converter slip between the engine and the speed change gear during a braking cycle, a flow brake, the flow brake including a rotor, gear train means drivingly interconnecting the rotor and the primary input means, control means for applying the flow brake during a braking cycle, drive system further including a mechanical vehicle brake, control means for variably engaging the mechanical vehicle brake, electronic processor

means for automatically actuating the speed change control means, the bypass clutch control means and the flow brake control means during a braking cycle, the electronic processor measn including means for automatically reducing but not eliminating the flow brake braking moment during speed change gear shifting to avoid shifting shocks, the electronic processor means further including means for preventing excessive engine speed during a braking cycle, the preventing means including means for monitoring the engine speed and in response to a predetermined monitored speed reducing the engine speed by actuating the mechanical vehicle brake control means to increase the braking moment of the mechanical vehicle brake or actuate the speed shift control means to upshift the speed change gear.

4,630,508

METHOD AND APPARATUS TO DETERMINE CONSTANT SPEED TORQUE ON AN ENGINE

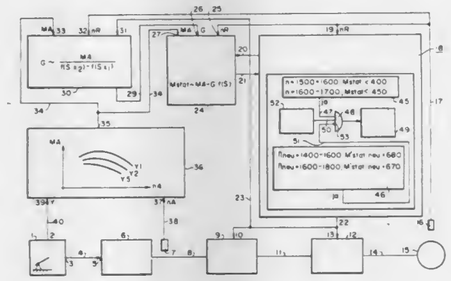
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,247

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 3311254; Mar. 28, 1983, 3311295; Mar. 28, 1983, 3311306; Apr. 23, 1983, 3314800

Int. Cl.⁴ B60K *41/06*

U.S. Cl. 74—866 **56 Claims**



1. An apparatus to determine the constant speed drive torque of a vehicle engine, said apparatus comprising:

(a) a first means for providing a signal having a value that is representative of a momentary drive torque of such vehicle engine;

(b) a second means for providing a signal having a value that is representative of the weight of such vehicle connected to receive said signal value directly from said first means;

(c) a third means for providing a signal having a value that is representative of the acceleration of such vehcile at a preselected time and under preselected driving conditions connected to transmit said signal value directly to said second means;

(d) a fourth means for generating a signal having a value that is representative of a constant speed drive torque of such vehicle engine, said signal generating fourth means connected to receive said signal value directly from said first means and said signal value directly from said second means and said signal value directly from said third means, said signal generating fourth means determining said constant speed drive torque by subtracting the product of said weight representative signal value and said acceleration representative signal value from the value of said momentary drive torque representative signal and generating said signal value that is representative of said constant speed drive torque; and

(e) a fifth means connected to receive said signal value directly from said fourth means for controlling such vehicle in response to said constant speed drive torque representative signal.

4,630,509

ARTICULATED ASSEMBLY OF MEMBERS

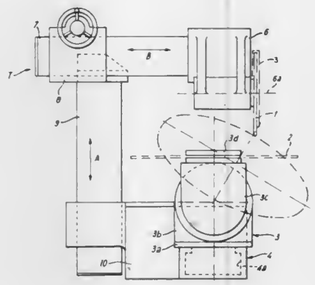
Joseph G. McLean, 'Crest Nook', 7A Ridge Avenue, Marple, Stockport, Cheshire, United Kingdom

Filed Mar. 21, 1984, Ser. No. 591,990

Claims priority, application United Kingdom, Mar. 26, 1983, 8308385; Oct. 21, 1983, 8328255

Int. Cl.⁴ B23D *63/14*

U.S. Cl. 76—37 **13 Claims**



1. An articulated assembly, comprising:

a first base member;

a second member mounted on said first base member for rotation relative thereto about a first axis;

a third member mounted on said second member for rotation relative thereto about a second axis; and

a fourth member mounted on said third member for rotation relative thereto about a third axis, said fourth member having an outer surface with means for mounting a tool or workpiece,

said first and third axes being co-axial and said first, second and third axes being co-planar when said first and second members are in at least a first relative position, said first and third axes being perpendicular and said first, second and third axes being co-planar when said first and second members are in at least a second relative position, said second axis being inclined relative to said first and third axes at an angle of substantially 45°, said axes intersecting at a common point throughout the range of angular movement of said members, said common point lying outside said fourth member and adjacent to and spaced from said outer surface.

4,630,510

TACTILE ENGAGING WRENCHING MECHANISM

Victor Belanger, Huntington Beach, Calif., assignor to Monogram Industries, Inc., Culver City, Calif.

Filed May 10, 1984, Ser. No. 608,765

Int. Cl.⁴ B25B *13/50*

U.S. Cl. 81—55 **20 Claims**

1. A tactile engaging wrenching tool adapted for use in the installation of a fastener to fasten a plurality of structures together, said fastener including a nut having a nut head with a surface for engagement with said wrenching tool and a screw having a wrench portion for engagement with said tool, said fastener being installed to fasten said structures together by inserting said fastener into a common opening in said structures and turning said screw relative to said nut to thereby deform said fastener in such a manner so as to fasten the structures together, said wrenching tool comprising:

a wrench adapter having a bottom end and a top end;

means associated with said wrench adapter bottom end for engaging the wrench portion of said screw to provide common only rotation of said screw and wrench adapter;

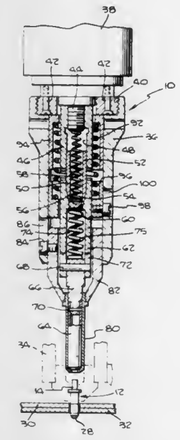
drive means for rotating said wrench adapter with sufficient torque to rotate said screw when said wrench adapter is engaged with the wrench portion of said screw and said nut is held stationary;

first connection means for connecting said drive means to said wrench adapter, said first connection means including a clutch assembly which provides common rotation of said drive means and said wrench adapter when said wrench adapter is engaged with said screw except when said nut is held stationary, said clutch assembly providing rotation of said drive means relative to said screw when said nut is held stationary and said wrench adapter is engaged with said screw so that said screw does not rotate relative to said nut;

a nose-piece having a bottom end and a top end;

means associated with said nose-piece bottom end for engaging said nut to hold said nut stationary and prevent rotation of said nut;

means for biasing said nose-piece bottom end against said nut head; and



second connection means for directly connecting said drive means to said wrench adapter and overriding said clutch assembly, said second connection means providing torquing of said wrench adapter by said drive means sufficient to turn said screw relative to said stationary nut head when said wrench adapter is engaged with said screw and said nose-piece is engaged with said nut head to deform said fastener to fasten said structures together, said second connection means being operable to provide the direct connection between said wrench adapter and said drive means only when said nose-piece is biased against said nut head by said nose-piece biasing means to thereby provide positive engagement of said nose-piece with said nut head prior to direct connection of said drive means to said wrench adapter.

4,630,511

LUG WRENCH SUPPORT TOOL

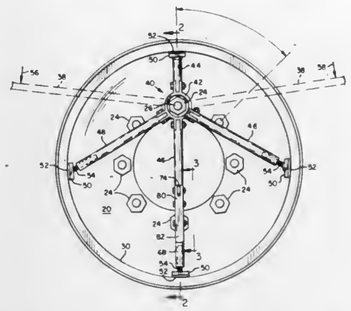
Chester L. Shirley, Rt. 1, Box 49-D, Elgin, Oreg. 97827

Continuation of Ser. No. 632,862, Jul. 20, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 831,053

Int. Cl.⁴ B25B *23/00*

U.S. Cl. 81—462 **4 Claims**

1. A lug wrench support tool for removing lug nuts located inside a wheel well having a peripheral wall defining a circle with a defined inside diameter, said support tool comprising; a containment ring and four leg members coupled together, said leg members radially extended to terminate at spaced radially directed positions, which positions define a circle equal to the diameter of the circle defined by the wheel well, one of said legs including first and second leg segments axially slideable relative to each other, a toggle mechanism including a pair of pivotally connected links, one of the links connected to one leg segment and the other link connected to the other leg segment, said links being relatively pivotable between a first position for shortening the overall length of the leg segments and a second position for lengthening the overall length of the leg segments and thereby extending said one leg to engage the periphery of said defined circle, said lug wrench containment ring being a



fully enclosed circle closely matching the lug wrench to confine the lug wrench radially, said containment ring spaced inwardly of the periphery of the defined circle a distance substantially equal to the distance of the location of the lug nuts inwardly from the peripheral wall of the wheel well.

4,630,512

ADJUSTABLE MOTOR-OPERATED SCREW DRIVING DEVICE

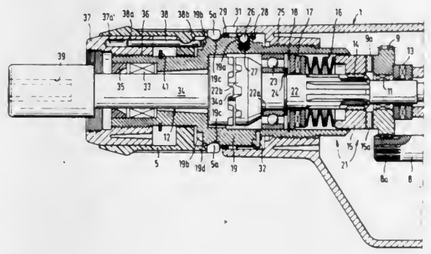
Paul Dürr, Ulisbach, Switzerland, assignor to Hilti Aktiengeselischaft

Filed Sep. 3, 1985, Ser. No. 771,975

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432382

Int. Cl.⁴ B25B *23/157*

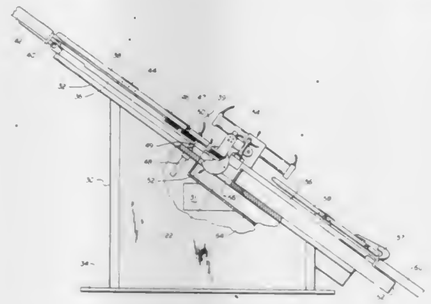
U.S. Cl. 81—475 **3 Claims**



1. Motor driven screw driving device comprising a housing having a front end and a rear end, a drive unit located within said housing adjacent the rear end thereof, a drive member located within the front end of said housing and extending from the front end of said housing for operative engagement with a screw for driving the screw into a receiving material, an adjustable torque limiting coupling operatively connecting said drive unit and said drive member, an axially elongated stop sleeve located within and extending in the front end-rear end direction of said housing and having a front end and a rear end, said stop sleeve is adjustably displaceable relative to the housing in the front end-rear end direction thereof, said torque limiting coupling includes an adjustable spring element located within said stop sleeve for adjusting said torque limiting coupling, said stop sleeve includes a depth stop adjacent the front end thereof, said depth stop being displaceable in the front end-rear end direction of said housing relative to said stop sleeve, an actuating sleeve connected to said depth stop for

rotating said depth stop, said actuating sleeve being displaceable in the front end-rear end direction of said housing, wherein the improvement comprises that said actuating sleeve includes a connecting member for selective interengagement with said stop sleeve so that said actuating sleeve and said stop sleeve can be rotated as a unit.

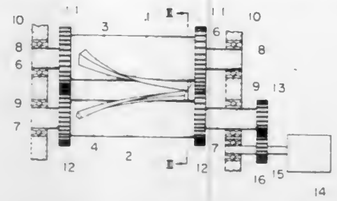
4,630,513
AUTOMATIC DIP TRIMMER APPARATUS
Ernst Keller, 259 Leota Ave., Sunnyvale, Calif. 94086
Filed Feb. 14, 1985, Ser. No. 701,409
Int. Cl.[4] B23D *33/02*
U.S. Cl. 83—152 **18 Claims**



1. An improved lead frame trimmer apparatus for trimming Cerdip type DIP devices having a lead frame that extends fore and aft of the ends of the device terminating in horizontal tabs or the like, comprising:
means forming an inclined input rail for receiving untrimmed DIP devices;
means forming an inclined output rail for receiving trimmed DIP devices, said output rail being separated from said input rail;
lead trimming cutter means disposed between said input rail and said output rail and including insert means for positioning a DIP device to be trimmed such that one of said tabs engages a first stop and the other rests upon a support surface forming a part of said insert means;
singulating and separating means disposed between said input rail and said cutter means for admitting DIPs one at a time to said cutter means; and
lift means for engaging a trimmed DIP disposed in said cutter means, lifting it from said input rail, and transporting it to said output rail.

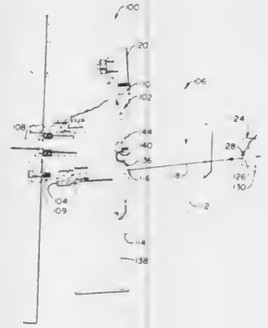
4,630,514
ROTARY DRUM SHEAR
Shunji Ohmori; Hiroyuki Takenaka; Akira Hozoji; Kazunori Kono; Kiyomitsu Yoshikawa, and Seishi Kajihara, all of Mitsubishi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan
Filed Mar. 4, 1985, Ser. No. 707,844
Int. Cl.[4] B23D *25/12*
U.S. Cl. 83—342 **3 Claims**

1. A rotary drum shear comprising, two drums rotating in opposite directions to each other and around spaced-apart parallel axes and each having a spiral knife on the periphery thereof so that material fed between the drum in a feed direction is cut by engagement of the knives, the axes being perpendicular to the feed direction, the knives having cutting edges which is at a radii r_A and r_B from the axis of their respective drums that are gradually reduced along the axis of the drums from a starting point of engagement between the knives,



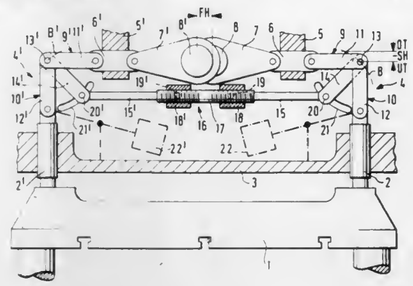
whereby a cut which is perpendicular to the feed direction can be made.

4,630,515
APPARATUS FOR CUTTING CONTINUOUS STRAND
Albert E. Spaller, Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 15, 1985, Ser. No. 787,561
Int. Cl.[4] D01G *1/04*
U.S. Cl. 83—402 **8 Claims**



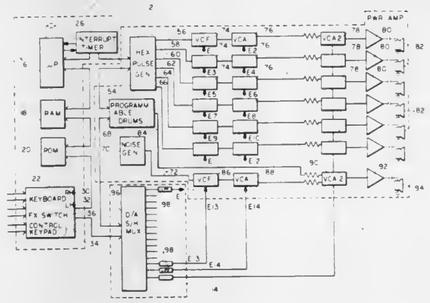
1. An apparatus for cutting a continuous strand into predetermined lengths comprising
a cutting head mounted for rotation around its axis and having an array of spaced cutting blades projecting radially around the cutting head,
a strand winding device mounted to rotate around an axis intersecting the axis of the cutting head and comprising a dome extending arcuately across the diameter of the cutting head and defining a circumferential edge spaced radially outwardly from and around the cutting head, said circumferential edge being in line with the array of cutting blades and having a strand hooking member adapted to catch a continuous strand moved into its path of rotation and guide the continuous strand to and around the array of cutting blades as the strand winding device rotates,
guide means spaced at a position from the center of the dome of the strand winding device and equidistant from said circumferential edge, said guide means comprising a toroidal strand guide member having a curved interior annular guide surface and defining a diagonal slot extending from and across the outer diameter of the toroidal strand guide member and through the curved interior annular guide surface; and
means for supporting said guide means at said position.

4,630,516
ECCENTRIC PRESS
Elmar Koch, Bad Homburg, and Hermann Gleich, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Mabu-Pressen Maschinenfabrik Karl Burkard KG, Oberursel, Fed. Rep. of Germany
Filed Nov. 30, 1984, Ser. No. 676,829
Int. Cl.[4] B26D *5/18, 7/26*
U.S. Cl. 83—530 **8 Claims**



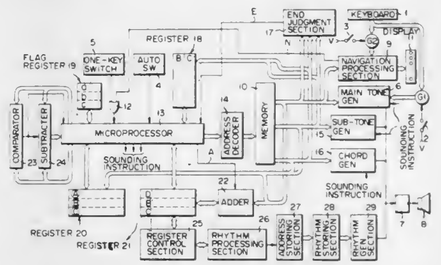
1. An eccentric press, comprising:
at least one eccentric portion which is disposed on a driven eccentric shaft, has invariable eccentricity and is engaged by a connecting rod;
at least one lever arrangement which connects the connecting rod to a press ram for converting movement of the connecting rod to a press ram stroke;
a counterweight for mass balancing the eccentric press during movement; and
a stroke adjustment means including a support lever which is articulately connected to an articulation point between the lever arrangement and an adjustment rod and which guides a joint at one end thereof on an adjustable movement path and whose other end thereof is guided variably in a circular arc,
wherein a center point of the circular arc coincides with the articulation point, which corresponds to a bottom dead center of the press ram.

4,630,517
SHARING SOUND-PRODUCING CHANNELS IN AN ACCOMPANIMENT-TYPE MUSICAL INSTRUMENT
Robert J. Hall, 20756 Tribune St., Chatsworth, Calif. 91311; George R. Hall, 13613 Huston St., Sherman Oaks, Calif. 91423, and Jack C. Cookerly, 26916 Barbacoa Pl., Saugus, Calif. 91350
Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981, Pat. No. 4,508,002. This application Jun. 15, 1984, Ser. No. 621,327
Int. Cl.[4] G10H *1/22;* **G10F** *1/00*
U.S. Cl. 84—1.01 **14 Claims**



1. In a method for providing musical accompaniment in response to the playing of a musical instrument, wherein the accompaniment has a plurality of musical components performing different musical functions, the improvement comprising the steps, accomplished by the instrument itself, of:
providing access to a first preselected number of physical sound-producing channels;
defining a second preselected number of virtual channels which effectively function as physical sound-producing channels, each of the virtual channels corresponding to a musical component which might be sounded through one of the physical sound-producing channels;
generating accompaniment information for said second preselected number of virtual channels to implement said plurality of musical components, the second preselected number exceeding the first preselected number at least once during the playing of the instrument; and
mapping the virtual channels into the physical channels such that the allocation of physical channels between said plurality of musical components fluctuates over time.

4,630,518
ELECTRONIC MUSICAL INSTRUMENT
Ryuuzi Usami, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Oct. 1, 1984, Ser. No. 656,691
Claims priority, application Japan, Oct. 6, 1983, 58-185846
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. An electronic musial instrument having a keyboard and comprising:
memory means for storing a plurality of different autoplay data;
reading means coupled to said memory means for retrieving selected autoplay data sequentially at a predetermined timing frequency;
comparing means for comparing said predetermined timing frequency with a timing of play operation executed by a player on said keyboard for generating a time difference signal; and
correcting means coupled to said comparing means for modifying the predetermined timing frequency for retrieving said autoplay data when said time difference signal is beyond a predetermined range while retrieving said autoplay data at the predetermined timing frequency when the time difference signal is within the predetermined range.

4,630,519

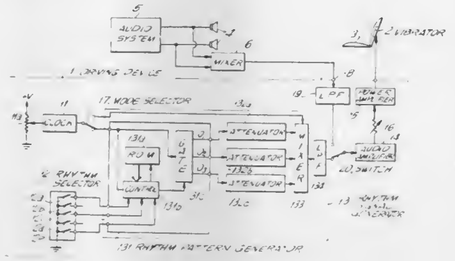
DEVICE FOR RHYTHMICALLY DRIVING AN ELECTROMECHANICAL VIBRATOR

Mutsuo Hirano, 5-10-3, Motobuto, Urawa-shi, Saitama-ken, and Nagatoshi Tsunoda, 662-2, Katsura-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed Jun. 21, 1985, Ser. No. 747,368

Int. Cl.[4] G10H *1/42*

U.S. Cl. 84—1.03 **6 Claims**



1. A driving device for an electromechanical vibrator comprising:

means for generating a clock pulse signal of a constant repetition frequency of less than about 12 Hz;

rhythm selecting means for selecting one of a plurality of different musical rhythms;

rhythm signal generating means including rhythm pattern generator means coupled with said clock pulse generating means and said rhythm selecting means, said rhythm pattern generator means having at least two output terminals from which electric pulses are outputted corresponding to respective beats of a music rhythm as selected by said rhythm selecting means at a tempo controlled by the repetition frequency of said clock pulses, a first one of said at least two output terminals providing pulses corresponding to strong beats of the selected music rhythm while a second one of said at least two output terminals providing pulses corresponding to weak beats of said selected music rhythm, first and second attenuator means coupled with said first and second output terminals, respectively, said first attenuator means having an attenuation factor lower than said second attenuator means, and mixer means coupled with the outputs of said first and second attenuator means for mixing the output signals of said first and second attenuator means to provide said rhythm signal;

mode selector means for selecting one of a first mode to drive said electromechanical vibrator at a desired music rhythmical vibration, and a second mode to drive said electromechanical vibrator at a constant vibration frequency, said mode selector means being connected to an output of said clock pulse generating means so that the clock pulse is applied to said rhythm pattern generator means in said first mode but is applied to said mixer means in said second mode; and

amplifier means for amplifying said rhythm signal to produce a driving signal for said electromechanical vibrator.

4,630,520

GUITAR CONTROLLER FOR A MUSIC SYNTHESIZER

Carmine Bonanno, 820 Rushmore Ave., Mamaroneck, N.Y. 10543

Filed Nov. 8, 1984, Ser. No. 669,666

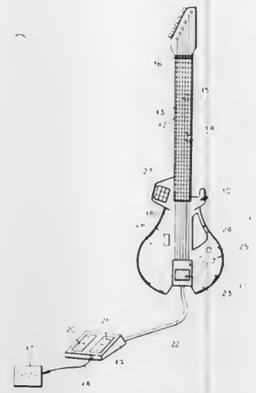
Int. Cl.[4] G10H *3/18*

U.S. Cl. 84—1.16 **27 Claims**

1. A method of detecting note selection in a guitar having a plurality of frets spaced apart along a neck of said guitar and a plurality of guitar strings extending along said neck over said frets, said method comprising the steps of:

(a) passing an electric current through each of said strings whereby a voltage gradient is established along each string at least in a region thereof overlying said frets;

(b) measuring a continuous voltage, from a high value representing last of said frets being selected and a low value representing none of sid frets being selected, forming part of said gradient of each string upon the depression thereof



into contact with a respective fret without drawing significant electric current through the point of contact or deterring substantially said gradient, thereby determining a free tone-generating length of the respective string; and

(c) controlling a music synthesizer to generate a corresponding tone in accordance with the measured voltage.

4,630,521

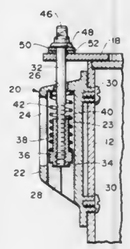
DRUM HEAD RETAINER

Darro F. Alletto, 13434 Chandler Blvd., Van Nuys, Calif. 91401

Continuation-in-part of Ser. No. 668,392, Nov. 5, 1984, abandoned. This application Jan. 16, 1986, Ser. No. 819,750

Int. Cl.[4] G10D *13/02*

U.S. Cl. 84—413 **14 Claims**



1. A drum head retainer for a drum employing a plurality of drum head retainers comprising:

(a) a casing having a vertical channel and an apertured side communicating with a portion of said vertical channel, said vertical channel terminating in an upper opening and a lower opening;

(b) means for attaching said casing to the side wall of a drum;

(c) a threaded bolt passing downwardly through said upper opening and threaded into a flanged nut provided with an integral, upwardly extending cylindrical portion and having a predetermined length, the upper end of which bolt is adapted for passing through means for providing tension on a drum head, said flange portion of said nut accommodated in said lower opening so as to provide lateral support of said nut;

(d) a spring maintained in said casing between said upper opening and the top of said flange of said nut, centered in said vertical channel by said upwardly extending portion of said nut; and

(e) indicating means comprising a series of parallel markings for providing a measure of tension, said means indicating the relative position of a portion of said nut,

whereby turning of said bolt in a given direction applies tension to said drum head and simultaneously moves said nut relative to said indicating means so as to provide a measure of the extent of tension applied to said drum head.

4,630,522

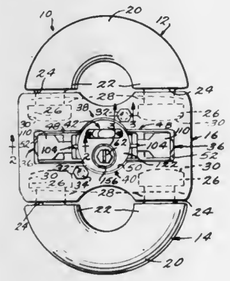
ACOUSTICALLY DETONATED EXPLOSIVELY RELEASABLE LINK

James E. Palmer, Berwyn; Rocco D. Albertini, Media, and Michael A. Coladonato, Havertown, all of Pa., assignors to Baldt Incorporated, Chester, Pa.

Filed Mar. 1, 1985, Ser. No. 707,492

Int. Cl.[4] F41F *5/00*

U.S. Cl. 89—1.14 **20 Claims**



1. A separable link for use in separably connecting two lengths of chain each having a multiplicity of interconnected links configured to be moved through a restricted chain handling mechanism, said separable link comprising: a plurality of removably interconnected parts operable when interconnected to interengage with the end links of the two lenghts of chain; fastener means for operably retaining said parts in interconnected relation in interengagement with the end links; explosive means within said fastener means operable to be detonated so as to separate said fastener means, the parts of said separable link and hence the two lengths of chain; miniaturized acoustical receiver means for receiving a transmitted acoustical detonation signal and causing said explosive means to detonate said fastener means; said explosive means and said miniaturized acoustical receiver means being mounted on said parts such that when said parts are retained in interconnected relation as aforesaid the separable link is shaped to be moved through the restricted chain handling mechanism with the links of the two lengths of chain, the improvement which comprises:

said fastener means comprising a pair of bolt assemblies mounted in spaced operative relation within said parts, each of said bolt assemblies including a bolt having a cavity therein;

said explosive means including an explosive in each cavity and electrically actuated means for detonating each explosive;

said miniaturized acoustical receiver means including hydrophone means for receiving a transmitted acoustical detonation signal, battery means and circuitry means operatively connected with said hydrophone means, said battery means, and said electrically actuated detonation means for conducting an electrical current from said battery means to said electrically actuated detonation means in response to said hydrophone means receiving a transmitted acoustical detonation signal, and

water pressure resistant container means mounted in said parts between said pair of spaced bolt assemblies for containing said battery means and said circuitry means including the operative connections thereof free from contact with water under pressure and for retaining said hydrophone means in a position of proximity to water under pressure such as to receive an acoustical detonation signal transmitted through said water under pressure.

4,630,523

ELECTROHYDRAULIC REGULATING DRIVE

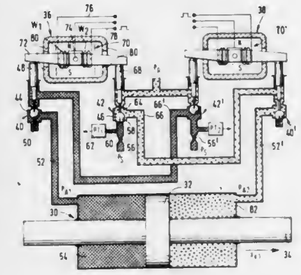
Johannes Tersteegen, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 564,348, Dec. 21, 1983, abandoned, which is a continuation of Ser. No. 259,242, Apr. 30, 1981, abandoned. This application Feb. 27, 1985, Ser. No. 706,892

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017080

Int. Cl.[4] F01B *25/26*

U.S. Cl. 91—1 **2 Claims**



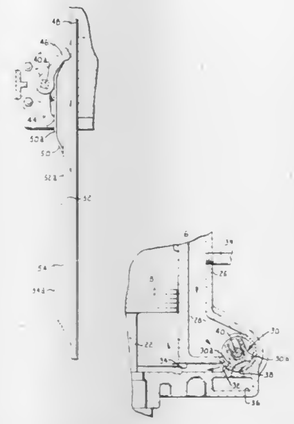
1. An electrohydraulic regulating drive, particularly for aircraft controls, comprising a regulating cylinder including a piston with equal load faces capable of being loaded at either side thereof and cylinder chambers connectable alternatingly to the pressure side and the return flow of a hydraulic system, the chambers of said regulating cylinder being adapted to be supplied with oil volumes in the form of discreet oil volumes necessary for positioning the piston by means of electrohydraulic switch valves actuated by a switch pulse sequence, a computer by which the switch pulses to be fed to the valves are determined, and sensors connected between said electrohydraulic switch valves and the pressure side of said system generating electrical signals and being connected to said computer for feeding back said signals thereto, said electrohydraulic switch valves being bistable controlled ball valves, the opening times of said electrohydraulic switch valves being determined by the computer with pulses of variable duration in dependence on the predetermined adjustment distance of the regulating piston, the electrical signals generated by the sensors being fed back to the computer purely as a confirmation of operation, said electrohydraulic regulating drive further comprising stop valves at the pressure side of said hydraulic system opening in direction to the regulating cylinder, and restrictors at the pressure side before the electrohydraulic switch valves for determining the throughput of fluid, the stop valves being each formed as releasable stop valves and being provided between the electrohydraulic switch valves and the corresponding cylinder chambers of the regulating cylinder, the stop valves and the electrohydraulic switch valves being switched in such way that in the resting position both cylinder chambers are closed by the stop valves and both electrohydraulic switch valves are opened towards the return flow, and wherein for positioning the regulating piston always one of the switch valves is switched to open in direction of the pressure side of said hydraulic system and at the same time the stop valve connected to the opposite cylinder chamber is released.

4,630,524

CONTROL VALVE FOR PILE DRIVER AND METHOD

E. Don Jackson, Jackson County, Mo., assignor to Conmaco, Inc., Kansas City, Kans.

Filed Aug. 13, 1984, Ser. No. 639,701
Int. Cl.⁴ F01L *31/00*
U.S. Cl. 91—219 **6 Claims**



1. In a power driver having a drive head, a cylinder, and a piston, said piston being coupled with said drive head and said cylinder having an intake port and an exhaust port, said cylinder being adapted to be coupled with a source of compressible fluid, and further including a valve for controlling the flow of said fluid to and from said cylinder, the improvement comprising the combination of:
- a first valve trip coupled with said valve;
- a second valve trip coupled with said valve;
- a slide bar movable along a rectilinear path in response to movement of said piston;
- first camming means on said slide bar for moving said first valve trip to a first position wherein said intake port is open and said exhaust port is closed, whereby said fluid enters said cylinder under compression;
- second camming means on said slide bar for moving said second valve trip to a first position wherein said valve blocks passage of said fluid to said cylinder will also preventing escape of said fluid from said cylinder, said second camming means maintaining said second valve trip in said first position for a sufficient length of time to allow the expansion of the fluid to move the piston along a significant portion of its travel distance; and
- third camming means on said slide bar for moving said second valve trip to a second position wherein said intake port and said exhaust port are in communication whereby said fluid is exhausted from said cylinder.

4,630,525

VACUUM BOOSTER ASSEMBLY

Michiharu Nishii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 26, 1985, Ser. No. 716,205
Claims priority, application Japan, Mar. 29, 1984, 59-045589[U]
Int. Cl.⁴ F15B *9/10*
U.S. Cl. 91—369 A **4 Claims**

1. A vacuum booster assembly, comprising:
- a front shell made of pressed sheet metal and having an annular opening end portion;
- a rear shell made of pressed sheet metal and having an annular opening end portion coupled with the annular opening end portion of said front shell;
- a power piston housed within said coupled shells, said power piston having a cylindrical portion axially slidably supported on said rear shell and a pressure receiving portion secured to the front end of the cylindrical portion, the pressure receiving portion being formed with a pair of radial recesses;
- a diaphragm member attached to the pressure receiving portion of said power piston to subdivide the interior of said shells when coupled into a constant pressure chamber and a variable pressure chamber, said diaphragm member having an outer annular bead clamped between the annular opening end portions of said shells, an inner annular bead coupled over the cylindrical portion of said power piston, a flexible portion extending along the contour of the pressure receiving portion of said power piston, and a pair of radially extending, extruded support portions formed to correspond with the radial recesses of the pressure receiving portion of said power piston;



- a pair of support members having a through hole therein and positioned within the support portions of said diaphragm member in such a manner as to permit axial movement of said power piston;
- a pair of tie bars extending in parallel respectively across said front shell, through said through hole in said support member, across the support portion of said diaphragm member and said rear shell and fastened at opposite ends thereof to said front and rear shells to clamp the support portions of said diaphragm member between said support members and said rear shell, and
- valve means assembled within the cylindrical portion of said power piston for selectively connecting said variable pressure chamber to said constant pressure chamber or atmospheric air in response to operation of said power piston.

4,630,526

FORCE CONTROL SYSTEM INCLUDING BYPASS FLOW PATH FOR IMPLEMENT WITH RELATIVELY MOVABLE FRAME PARTS

Ronnie F. Burk, Waterloo; Larry M. Delfs, Cedar Falls; Michael R. Gilmore, Davenport, all of Iowa, and Warren L. Thompson, Colona, Ill., assignors to Deere & Company, Moline, Ill.

Filed May 8, 1985, Ser. No. 731,699
Int. Cl.⁴ F15B *13/06;* **B60G** *11/30;* **A01B** *73/00*
U.S. Cl. 91—452 **11 Claims**

1. A force control system for an implement, the implement having a first frame part, a second frame part movable with respect to the first frame part, and at least one of the frame parts supporting a ground-engaging tool, the control system comprising:
- a hydraulic cylinder for connection between the frame parts to move one frame part with respect to the other;
- a pump;
- a reservoir;
- a control valve for controlling fluid communication between the pump, the reservoir and head and rod ends of the cylinder, the control valve having first and second outlet ports;
- a pressure-controlling valve connected between one outlet port of the control valve and one end of the cylinder; and
- a bypass circuit communicated with the other outlet port and comprising means for bypassing fluid flow around the pressure-controlling valve from one end of the cylinder to the control valve when the cylinder is moving in response to pressurization of its other end, and comprising means



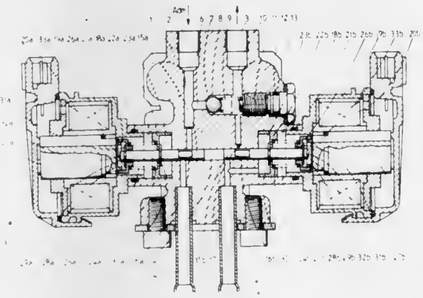
for communicating fluid pressure from the control valve to the one end of the cylinder via the pressure-controlling valve when the cylinder has reached a limit of its motion in response to pressurization of its other end.

4,630,527

ELECTRO-HYDRAULIC HEIGHT CORRECTOR FOR MOTOR VEHICLES

Philippe P. Quin, Vincennes, France, assignor to Automobiles Citroen, Neuilly and Automobiles Peugeot, Paris, both of, France

Filed Jul. 26, 1984, Ser. No. 634,762
Claims priority, application France, Jul. 27, 1983, 83 12746
Int. Cl.⁴ F15B *11/08*
U.S. Cl. 91—449 **2 Claims**



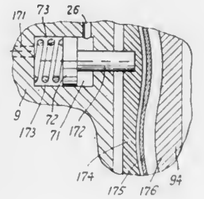
1. In an electro-hydraulic height corrector for a motor vehicle comprising an hydraulic distributor having ducts connected to a pressurized supply source, to suspension cylinders and to an exhaust circuit, and means for connecting these different ducts together, and detecting means sensitive to the position of a suspended part of the vehicle with respect to a nonsuspended part thereof operatively connected to said distributor, the improvement wherein said distributor comprises two slide valves each connected to a core of an electromagnet, one of said slide valves being inserted in a fluid path directly connecting an intake duct to an exhaust duct and the other of said slide valves being inserted directly in a fluid path connecting a user duct to an exhaust duct, said slide valves being subject to the action of first and second resilient means tending to return the first slide valve to a position in which communication between the intake and the user ducts is established and the second slide valve to a position in which communication between the user and exhaust ducts is interrupted and a ball valve which is subject to the action of third resilient means and is inserted in a path connecting said intake duct and said user duct together, said user duct being connected to said suspension cylinder of said electromagnets being operated by said detecting means, the core of each electromagnet being connected to the corresponding slide valve by a lost motion connection and said resilient first and second means acting on the respective cores, said first and second resilient means each bearing on a cup which is controlled by the core of the respective electromagnet and engages a first stop integral with the respective slide valve, a second stop integral with the respective slide valve being engageable with a fixed element of the distributor so as to limit the travel of the respective slide valve and maintain a certain clearance in the rest position between an end of each slide valve and the respective core of the electromagnet, said second stop being formed by a washer engaged in a groove of the respective slide valve and movable inside a chamber formed in the fixed part of said distributor.

4,630,528

FLUID MOTOR WITH ARRESTING AND DISARRESTING MEANS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 243,324, Mar. 13, 1981, Pat. No. 4,456,430.
This application Jun. 12, 1984, Ser. No. 619,958
Int. Cl.⁴ F01B *13/06;* **B60T** *11/00;* **F16D** *11/06*
U.S. Cl. 91—491 **4 Claims**



1. A fluid motor, comprising, in combination, a housing with a therein revolvable rotor, fluid intaking and expelling working chambers, entrance port and exit port means, passage means between said ports and said chambers and fluid flow control means between said housing and said rotor;
wherein
- said rotor includes a thrust chamber with a thrust piston therein with one end of said piston communicated to one of said passages and the other end of said piston subjected to a thrusting spring,

wherein
- said piston extends with a piston shaft from said thrust chamber through a portion of said rotor and out of said rotor to engage a plate provided between said rotor and an inner portion of said housing,

wherein
- said housing forms said inner portion adjacent of said plate while said inner portion of said housing forms a wave configuration with valleys and hills with said hills more close to said plate than said valleys;

wherein
- said plate forms towards said inner portion a configuration complementary relative to said inner portion,

wherein
- said spring is provided to thrust said piston against said plate and said plate against said inner portion of said housing to thereby arrest said valleys and hills in each other and said rotor on said housing, and;

wherein
- pressure in the fluid in said passage presses said piston inwardly in said thrust chamber in said rotor to disengage said configurations and thereby to disarrest said plate from said inner portion and said rotor from said inner portion of

said housing to permit the revolution of said rotor in said housing.

4,630,529

PNEUMATICALLY OPERATING DEVICE COMPRISING MEANS FOR LIMITING THE DISPLACEMENT OF A PISTON

Hendricus C. P. Tijs, Mierlo, Netherlands, assignor to Weld-Equip b.v., Helmond, Netherlands

Filed Nov. 29, 1984, Ser. No. 676,284

Claims priority, application Netherlands, Dec. 5, 1983, 8304168

Int. Cl.⁴ F15B *15/24*

U.S. Cl. 92—13 **7 Claims**



1. A fluid operated piston having an adjustable stroke including a cylinder having first and second end walls, the piston having first and second end faces and being reciprocatingly situated in the cylinder, the first face of the piston and the first end wall of the cylinder defining a work space, a first reciprocating pin fixed to and extending axially from the first face of the piston and extending through the work space and the first end wall, a second reciprocating pin fixed to and extending axially from the second face of the piston and through the second end wall, a cylindrical sleeve member having internal threads, the sleeve extending axially from the second end wall of the cylinder, a first stop member comprising an annular setting ring having a side facing the cylinder and a side facing away from the cylinder and threads on its periphery and threadedly received within the cylindrical sleeve member, a means to prevent rotation of the setting ring, the second pin slidably extending through the setting ring and having a second stop member capable of abutting the first stop member on the side thereof facing away from the cylinder, the cylindrical sleeve being rotatably mounted such that rotation of the sleeve causes axial displacement of the setting ring thereby adjusting the stroke of said piston.

4,630,530

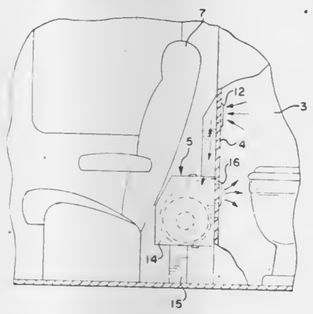
FILTERING SYSTEMS FOR BUSES

William R. Eckstrom, Dolton, Ill., and John R. Conrad, Westlake Village, Calif., assignors to Travel-Aire, Inc., Dolton, Ill.

Filed May 9, 1984, Ser. No. 608,382

Int. Cl.⁴ B60H *3/06*

U.S. Cl. 98—2.11 **20 Claims**



4. A filtering unit for a bus, the unit comprising outer housing of a size to fit between a row of seats in the bus and a forwardly facing vertical wall of a bus lavatory behind said row of seats, the housing having an upper portion with a downwardly and forwardly inclining front wall portion for clearing the rearwardly sloping back portion of the adjacent row of seats, and air inlet and air outlet openings for communication with openings in vertically spaced portions of said vertical lavartory wall, said housing including air circulating fan means for drawing air from said air inlet opening and discharging filtered air through said air outlet opening, and an air filtering means in the path of movement of said air in said housing between said air inlet and air outlet openings and including means for removing at least lavatory odor-causing gaseous and particle materials from the air stream passing therethrough.

4,630,531

BULK SILO

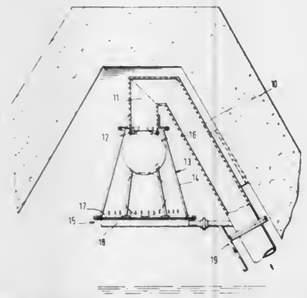
Werner Krauss, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Jul. 30, 1985, Ser. No. 760,467

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3429715

Int. Cl.⁴ E04H *7/22*

U.S. Cl. 98—52 **4 Claims**



1. In a bulk silo with an outlet chamber having an upper area from which an open non-vertical ventilation line runs, and a closing part for protection against flooding, the improvement comprising a closing part constructed as a float cage (**13**) surrounding a float valve comprising a float having a given area (**16, 20**), and a float valve opening edge (**12**); said cage having an aeration device (**17**) under the float area within said cage.

4,630,532

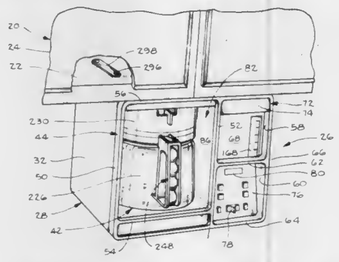
COFFEEMAKER

Kurt J. Sonnentag, Naperville, and Norman A. Steinkamp, La Grange Park, both of Ill., assignors to John Zink Company, Tulsa, Okla.

Filed Apr. 12, 1985, Ser. No. 722,941

Int. Cl.⁴ A47J *31/10;* **A47B** *57/02*

U.S. Cl. 99—279 **38 Claims**



1. A coffeemaker comprising a housing having a carafe-receiving cavity in the front thereof, a water reservoir, a carafe having a coffee basket supported therein, a cover for said carafe having a spreader configuration in its upper surface, said carafe and cover being insertable in said cavity, means for heating said reservoir water and directing said heated water from the upper portion of said carafe-receiving cavity to said spreader configuration of said carafe cover, and sealing means mounted in said cavity for automatically sealing the upper portion of said cavity to the upper surface of said carafe cover when said carafe is inserted into said cavity.

4,630,533

COOKING EXTRUDER

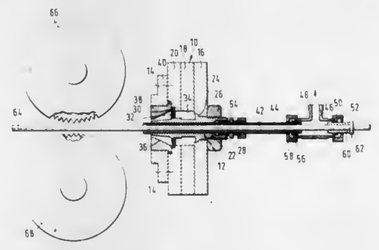
Heinz Schaaf, Camberg-Oberselters, and Horst Walter, Grevenbroich, both of Fed. Rep. of Germany, assignors to Convent Knabber-Geback GmbH & Co., Cologne, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,636

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3433013

Int. Cl.⁴ A47J *37/00;* **A21C** *9/06*

U.S. Cl. 99—353 **19 Claims**



1. A cooking extruder head for use with a cooking extruder, having a source of envelope material and a source of filling material, said cooking extruder head comprising:

a nozzle plate having opposed forward and rearward sides, said nozzle plate being characterized by forward and rearward apertures offset from one another and extending into the respective forward and rearward sides of said nozzle plate, and a passage extending between said forward and rearward apertures and providing communication therebetween, said nozzle plate being connectable to said source of envelope material at the rearward aperture therein, such that the envelope material is deliverable to the forward aperture of said nozzle plate through said passage; and

a filling tube connectable to said source of filling material and adjustably and removably mounted to said nozzle plate and extending entirely therethrough from the rearward side to the forward side thereof, said filling tube being substantially aligned with and extending from the forward aperture therein and being angularly aligned to said passage, whereby the amount of extension of the filling tube from the forward side of said nozzle plate is selectively adjustable and whereby the filling tube is selectively removable from said nozzle plate.

4,630,534

APPARATUS FOR INACTIVATION OF ENZYMES IN OIL SEEDS

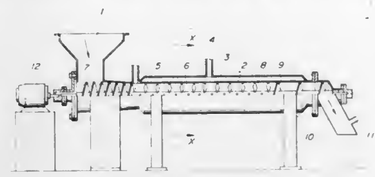
Kanji Tsuchiya, Tokyo, and Shizumi Ono, Chiba, both of Japan, assignors to Seikensha Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,850

Int. Cl.⁴ A23C *3/02*

U.S. Cl. 99—483 **6 Claims**

2. An apparatus for inactivation of enzymes in oil seeds comprising an elongated pressure cylinder having an upstream end and a downstream end, feed hopper means for feeding oil seeds to the interior of said pressure cylinder at the upstream end thereof, said hopper means being mounted on said pressure cylinder; exhaust pipe means for discharging treated oil seeds from the downstream end of the pressure cylinder, said exhaust pipe means being mounted at the down-stream end of said pressure cylinder; a pressure cylinder jacket surrounding said pressure cylinder along at least a part of the length thereof, said jacket being provided with a water vapor supply pipe; said pressure cylinder being perforated with holes over its surface lying within said pressure cylinder jacket, said holes having diameters less than 1.5 mm; a buffering solution supply pipe means for supplying buffering solution to the interior of said pressure cylinder at a location corresponding to about ¼ of the length of said pressure cylinder from the upstream end thereof and without passage through said jacket; a rotary axle



located within said pressure cylinder and coaxial therewith, and provided with a first conveying screw, an agitation fan screw and a second conveying screw, said first and second conveying screws being in slidable contact with the internal wall face of said pressure cylinder so that the space formed by said internal wall face of said pressure cylinder and the screw blades of said first and second conveying screws is maintained air tight.

4,630,535

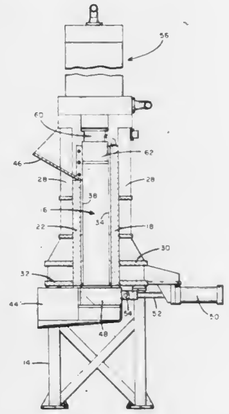
METHOD AND APPARATUS FOR DE-WATERING BIOMASS MATERIALS IN A COMPRESSION DRYING PROCESS

John G. Haygreen, Roseville, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 12, 1984, Ser. No. 660,066

Int. Cl.⁴ B30B *9/06*

U.S. Cl. 100—127 **8 Claims**



1. Apparatus for reducing the moisture content of biomass material comprising:

an enclosed chamber having generally vertical side walls and a base forming the bottom of said chamber and movable with respect to said side walls;

means for loading moisture ladened biomass material into said chamber;

a vertically reciprocable ram having a working face opposed to said movable base, and disposed in said chamber in slidable relationship to said vertical side walls;

a conduit means elongate in the generally vertical direction along said side walls for conducting moisture removed from said biomass material out of said chamber;

means for applying a predetermined force on said ram for pressing said biomass material against said base; and

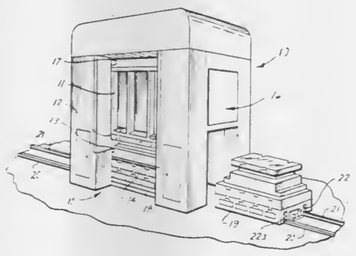
means forming a select, non-planar profile in said working face, for developing and sustaining a selected pressure gradient across said biomass material as said ram presses thereagainst; said profile converging toward said base and characterized by a plurality of discrete, substantially horizontal stepped portions, and a vertical stepped portion joined with each pair of adjacent horizontal portions; said gradient characterized by a maximum pressure at the center of said chamber diminishing to a minimum pressure near said side walls to drive moisture radially outward from said center, yet provide a minimum pressure sufficiently large to expel moisture out of said chamber through said conduit means; thus to enhance the amount of moisture expelled from said biomass material and chamber as said ram presses against said material.

4,630,536

HYDRAULIC DRIVE APPARATUS FOR DIE CARRIERS

Chandrakant K. Shah, Niles, Ill., assignor to Avondale Industries, Inc., New York, N.Y.

Filed Nov. 18, 1985, Ser. No. 798,913
Int. Cl.⁴ B30B *15/06*
U.S. Cl. 100—229 R **11 Claims**



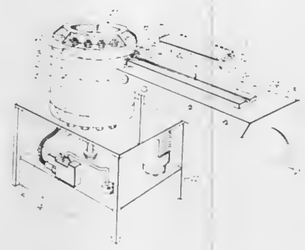
1. A hydraulically driven die carrier for a power press, said carrier comprising:
- a bolster for carrying a die;
- a set of wheels supporting said bolster for horizontal rolling movement to position said die horizontally;
- a separate hydraulic drive motor for each of said wheels;
- a plurality of hydraulic lift cylinders for moving said bolster vertically relative to said wheels; and
- a hydraulic control system for operating said hydraulic drive motors and lift cylinders for horizontal rolling and vertical movement of said die carrier, said control system including:
  - a supply pump having two separate outputs for providing separate sources of pressurized hydraulic fluid for said hydraulic drive motors and for said lift cylinders;
  - a reservoir of hydraulic fluid connected to said pump;
  - valve means for connecting and disconnecting said separate sources of hydraulic fluid and the respective drive motors and lift cylinders; and
  - means for locking said lift cylinders in their raised positions while said cylinders are disconnected from said supply pump so that the hydraulic fluid in the line used to lift the carrier can be returned directly to the reservoir without being overheated as long as the carrier remains in its raised position.

4,630,537

SELECTIVE EMBOSSER WITH BUCKLING PREVENTION

David J. Pretorius, Pretoria, South Africa, assignor to The National Savings & Finance Corp. (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 502,541, Jun. 14, 1983, abandoned, which is a continuation of Ser. No. 279,064, Jun. 30, 1981, abandoned. This application Aug. 22, 1985, Ser. No. 768,174
Claims priority, application South Africa, Jul. 2, 1980, 80/3982
Int. Cl.⁴ B31F *1/07;* **B44B** *5/00*
U.S. Cl. 101—3 R **11 Claims**



1. Apparatus for embossing characters in a workpiece such as a motor vehicle registration plate, said apparatus comprising:
- (a) buckling prevention means for preventing buckling of said workpiece during embossing, said buckling prevention means comprising:
  - a pair of cooperating press members reciprocally movable relative to each other and each having an operative face, at least one of said press members being movable and having an elongated configuration defining a piston which is snugly slidably received in a cylinder, said piston having an upper surface defining one of said operative faces, said piston and its operative face remaining substantially within said cylinder during movement of said piston in said cylinder, thereby preventing the operative face of the movable press member from moving out of alignment with the operative face of the other press member during movement of the movable press member relative to the other press member during the embossing operation;
  - at least on die for embossing one or more characters in said workpiece, said at least one die comprising first and second pivotally interconnected die members, said workpiece, during the embossing operation, being trapped between said first and second pivotally interconnected die members to provide a die/workpiece assembly, said die/workpiece assembly being locatable for the embossing operation between said pair of cooperating press members, said operative faces of said press members being of such dimensions that they extend over the whole of the die/workpiece assembly during the embossing operation;
- (b) at least one die element carried by said first die member; said press members during the embossing operation exerting pressure equally over the entire/workpiece assembly to prevent buckling of said workpiece and to ensure evenly shaped embossed characters.

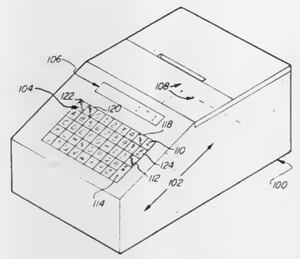
4,630,538

PORTABLE LABEL MAKER

Larry A. Cushman, 5151 Windham, Sterling Heights, Mich. 48078

Filed Apr. 22, 1985, Ser. No. 725,555
Int. Cl.⁴ B30B *15/30*
U.S. Cl. 101—45 **13 Claims**

1. Apparatus operable to make a plurality of copies of a designated sequence of symbology-bearing labels of adhesive tape, the tape being supplied in bulk, the bulk supply having a primary direction of orientation, the labels being defined by separation from the bulk by separating the tape along cut lines all having the same directional orientation to the primary direction of orientation of the bulk supply, the symbology borne by each of the labels being a copy of a member of the designated sequence and being contained within confines on the tape which are substantially parallel to the cut lines of the tape which define the labels, comprising:
- means for causing the symbology to be placed on the tape within the confines;



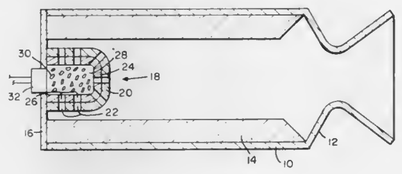
- means adapted to hold the bulk supply with its primary direction of orientation in fixed relationship to the symbology placing means;
- input means for designating the number of copies and the sequence of symbologies desired to be borne by the labels;
- means adapted to cause the symbology placing means to place the desired number of copies of the desired sequence of symbologies on the tape, the copies of the desired sequence being placed on the tape successively; and
- advancing means for urging the tape, after the symbology has been placed thereon, past the symbology placing means.

4,630,539

DEVICE FOR FLASH SUPPRESSION OF A ROCKET MOTOR

Lawrence B. Thorn, Madison, and Robert E. Betts, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 747,742
Int. Cl.⁴ F42C *19/08*
U.S. Cl. 102—202 **5 Claims**



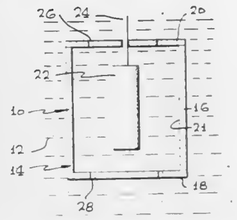
1. A rocket motor having a rocket motor housing with a forward end and an aft end that has a nozzle mounted thereat, a solid propellant grain of the fast burning and smokeless type mounted in said rocket motor housing between said forward and aft ends, a sustained action igniter means mounted within said rocket motor housing at the forward end for igniting said solid propellant grain to cause the solid propellant grain to produce combustion gases, said igniter means including support structure that surrounds and mounts pyrotechnic material and solid suppressant ablative material in direct contact with one another and contained therein, said solid suppressant ablative material acting when ablated to suppress burning of fuel rich gases from said solid propellant grain, and said structure having means therein for allowing gases produced therein to be communicated into the main rocket motor chamber, and initiater means provided for igniting the pyrotechnic material.

4,630,540

DETONATOR APPARATUS FOR LIQUID EXPLOSIVE COMPOSITIONS

Joseph L. Trocino, 15233 Ventura Blvd., P-8, Sherman Oaks, Calif. 91403

Filed Sep. 30, 1985, Ser. No. 781,348
Int. Cl.⁴ F42B *1/02*
U.S. Cl. 102—307 **12 Claims**



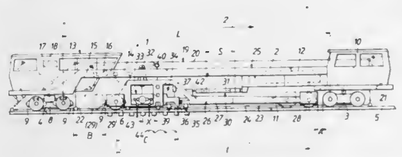
1. In a detonator apparatus for liquid explosive compositions, the combination which comprises:
- a container enclosing a bulk quantity of combined explosive liquid ingredients;
- a detonation amplifier submerged in said liquid ingredients within the confines of said container;
- a portion of said explosive liquid ingredients held in said detonation amplifier;
- a pyrotechnic charge immersed in said held portion of liquid ingredients; and
- activation means operably coupled to said pyrotechnic charge for detonating said pyrotechnic charge causing detonation of said bulk quantity of combined liquid ingredients.

4,630,541

MOBILE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 7, 1984, Ser. No. 618,122
Claims priority, application Austria, Aug. 19, 1983, 2981/83
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.⁴ E01B *27/17*
U.S. Cl. 104—7.2 **20 Claims**



1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast, which comprises
- (a) a main frame supported on undercarriages for continuous movement in an operating direction,
- (b) a power plant and operating control means carried by the main frame,
- (c) an elongated subframe pivotally and longitudinally adjustably connected to the main frame, the subframe having two ends and being arranged ahead of one of the under-

carriages supporting the main frame, in the operating direction, and

(1) respective undercarriages supporting the subframe ends,

(d) tamping means mounted on the subframe between the respective undercarriages for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties,

(e) track lifting and lining means associated with the two rails mounted on the subframe ahead of the tamping means at a fixed distance therefrom in the operating direction and being arranged on the subframe between the respective undercarriages,

(1) the subframe having a wheelbase which is at least double the distance of the track lifting and lining means from a respective one of the undercarriages supporting a rear one of the subframe ends, in the operating direction, the wheelbase having a length corresponding at least to about 14 to 16 times the average tie spacing,

(f) track leveling and lining reference systems associated with the track lifting and lining means, and

(g) a longitudinally adjustable coupling device pivotally connecting the elongated subframe to the main frame whereby the subframe moves with the main frame while being longitudinally adjusted in relation thereto.

4,630,542

NACELLE

Xavier M. Peyre, Ruvere, and Jean-Pierre Manesse, Basse Goulaine, both of France, assignors to Alsthom-Atlantique and Plastibenne, France

PCT No. PCT/FR83/00176, § 371 Date Apr. 25, 1984, § 102(e) Date Apr. 25, 1984

PCT Filed Sep. 7, 1983, Ser. No. 605,029

Claims priority, application France, Sep. 7, 1982, 82 15164

Int. Cl.[4] B63B *27/30*

U.S. Cl. 104—114 **5 Claims**



1. An autonomous nacelle for moving up and down a cable between first and second vertically spaced structures, one of said structures being a vertically heaving structure, one of said structures having an anchor point, and the other of said structures having a hook unit, said nacelle receiving said cable (**6**) with said cable passing through said nacelle and having a top end that leaves the nacelle upwardly and a bottom end that leaves the nacelle downwardly, said nacelle comprising:

means (**11**) within said nacelle for gripping said cable as it passes through said nacelle for driving the nacelle to move it up and down the cable when the top end of the cable is hooked to said hook unit (**4**), tensioning means (**9**, **10**) within said nacelle and engaging said cable passing through said nacelle for enabling the top portion of the cable to be subjected to a tension greater than the weight of the nacelle while the bottom portion (**7**) of the cable is fixed to said anchor point, said tensioning means serving to vary the distance between the nacelle (**3**) and said hook unit at the top end of the cable, and means (**12**, **14**) within said nacelle for acting, on command, on said tensioning means so as to prevent the distance between the nacelle (**3**) and the hook unit (**4**) at the top end of the cable from shortening while permitting it to lengthen.

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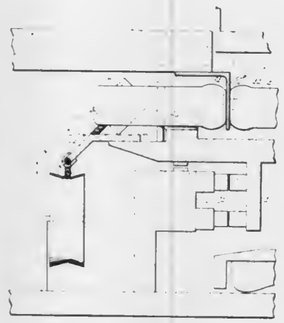
BOGIE FOR CABLE-DRAWN VEHICLE

Norman McQueen, Parker, Colo., assignor to Otis Elevator Company, Farmington, Conn.

Filed Dec. 16, 1983, Ser. No. 562,137

Int. Cl.[4] B61C *11/02*

U.S. Cl. 104—173.1 **2 Claims**





1. A transportation system comprising:

a guideway having a flat smooth base, a guideway-side, and a longitudinal length, wherein a cross-sectional area of the guideway is defined by a plane normal to the longitudinal length of the guideway;

a vehicle supported by hoverpads above the base of the guideway;

a motor-driven cable disposed in the guideway for imparting motion to the vehicle;

sheaves, disposed at selected locations and orientations in the guideway, for providing both lateral and vertical support to the cable;

two spaced-apart cable support arms, each connected at one end to the vehicle and at the other end to the cable, for displacing the cable from the sheaves and replacing the cable onto the sheaves as the vehicle moves in the guideway;

a cable clamp, disposed on the vehicle between the two cable supports, for attaching the vehicle in driving relationship to the cable;

a vertically-oriented guiderail, disposed along the length of the guideway and having a guideway-side face and an opposite face, for providing guidance to the vehicle as the vehicle moves in the guideway;

a rail follower, disposed on the vehicle, including two horizontally-oriented, horizontally spaced-apart wheels, one wheel disposed on each face of the guiderail, characterized in that:

a first portion of the cross-sectional area of the guideway is defined by the displacement of the cable by the cable support arms and the cable clamp;

the cable support arms are disposed substantially within the first portion of the cross-sectional of the guideway;

a second portion of the cross-sectional area of the guideway is defined by the wheel disposed on the guideway-side face of the guiderail;

the cable clamp is disposed within the second portion of the cross-sectional area of the guideway.

4,630,544

ACTUATING MECHANISM IN OVERHEAD RAIL EQUIPMENT

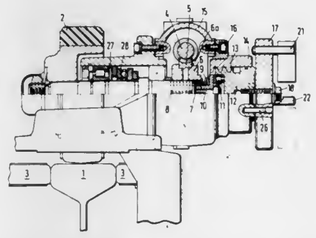
Joachim Hecht, Mettmann, and Gerhard Rudat, Hagen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,567

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241626

Int. Cl.[4] B61B *13/04*

U.S. Cl. 105—130 **10 Claims**



1. Overhead equipment including a rail means for suspending a vehicle, there being a drive wheel on the vehicle running on the rail, the vehicle having a motor driven shaft, the drive wheel having a shaft, there being a coupling interposed between the motor driven shaft and the shaft for the drive wheel, an actuating system comprising:

the coupling being constructed for obtaining connection and disconnection through rotational motion of one of its parts, there being a pair of pins extending axially from said part in a particular angularly spaced relation to each other;

at least one first actuating piece arranged along the rail at a relative disposition in relation to a passing vehicle so as to engage one of the pins for turning the rotational part of the coupling in one direction to cause the coupling to connect the two shafts; and

at least one second actuating piece also arranged along said rail at a relative disposition to a passing vehicle so as to engage the other one of the pins to thereby effect an oppositely effective turning motion of the rotatable part of the coupling to obtain disconnection between the two shafts.

4,630,545

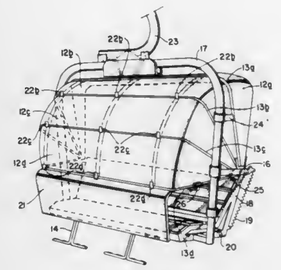
CHAIR LIFT FITTED WITH A PASSENGER PROTECTIVE DEVICE

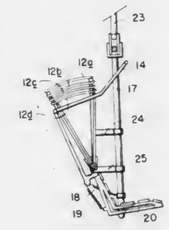
Max Michel, 7, rue de la Chapelle-St. Sauveur Aincourt, F 95510 Vetheuil, France

Filed Oct. 2, 1985, Ser. No. 783,099

Int. Cl.[4] B60N *3/00;* **B61D** *17/12;* **E04F** *10/10;* **A47C** *1/00*

U.S. Cl. 105—329.1 **6 Claims**





1. A chair for an aerial cableway chair-lift comprising:

a seat with an open front side and a back,

a hanger for suspending the chair to the aerial cable,

a safe-guard rail pivoted to said seat and pivotal between an upward rest position and a forward position in which said safe-guard rail is positioned in front of the open front side of the seat,

a plurality of rigid plates partially encompassing said seat and each including a transverse portion connected to pair of lateral side portions, each of which is pivotally connected at its end to said seat for pivoting the plate about a transverse axis between an upward folded position, in which the transverse portions of the plates are disposed substantially horizontally, and an operative deployed position, said plates being shaped and so arranged that each one can slide above or under the next preceding one to become superposed in said upward folded position, the transverse portions being in their upward substantially horizontal position away from the front of the seat and towards the aerial cable and movable to their deployed position in which the plates are disposed side by side with their edges overlapping to form a continuous shield extending from above the seat to downward and frontward of the seat,

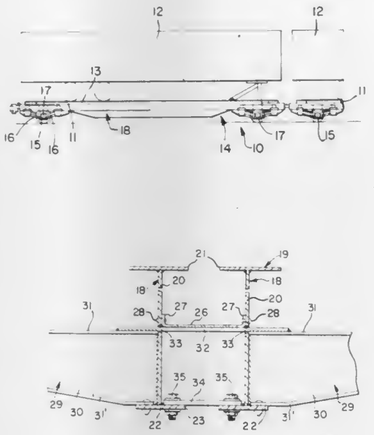
spring means resiliently biasing said safe-guard rail with respect to said seat to bias said rail and said plurality of plates towards said folded position.

4,630,546

DOUBLE GROOVE CENTER SILL

Henry K. Wiger, Arlington, Va., and Manfred Katz, Statesville, N.C., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Nov. 18, 1983, Ser. No. 553,316
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **10 Claims**



1. A railway car comprising:
a pair of single axle railway car trucks; and
an underframe adapted to be supported on said car trucks;
said underframe including a longitudinally extending center sill;
said center sill having longitudinally opposite end portions being operatively associated with said car trucks and an intermediate portion connecting said end portions;
said intermediate portion having flexible means providing for torsional flexure to permit relative angular twisting of said end portions along a longitudinal axis to accommodate track profiles which tend to raise opposite corners of the underframe;
said centersill comprising upright laterally spaced side walls, and upper and lower horizontal walls,
said upper and lower horizontal walls being connected to said side walls and being substantially coextensive therewith;
said centersill having an aperture means providing for said torsional flexing of said walls; and
said aperture means defining slots in said upper and lower horizontal sill walls.

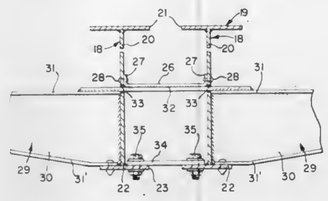
4,630,547

CROSS BEARER ARRANGEMENT FOR SLOTTED CENTER SILL

Phillip G. Przybylinski, Schererville, and John H. Spence, Munster, both of Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 597,028
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **14 Claims**

1. A railway car underframe comprising a center sill including horizontally spaced upright side walls and upper and lower horizontal walls connected to said side walls,
each of said horizontal walls including a pair of laterally spaced longitudinally extending middle portions being connected to the side walls, said middle portions defining therebetween a longitudinally extending slot to provide a torsionally flexible sill structure, said slots being substantially aligned with each other,
first and second crossbearer assemblies projecting outwardly from opposite sides of said center sill,
the first and second crossbearer assemblies each including an upright wall having upper and lower flanges, said lower flanges being connected to the lower horizontal wall of said sill, a connector member extending through said side



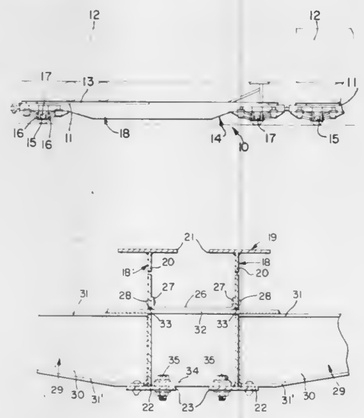
walls of said center sill connecting said first and second assemblies, and
tie means pivotally associated with each of the lower wall middle portions for providing lateral support for the lower wall middle portions in varying positions due to torsional flexure of the center sill.

4,630,548

CENTER SILL HORIZONTAL DIVIDER

Henry K. Wiger, Arlington, Va., and Phillip G. Przybylinski, Schererville, Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Nov. 18, 1983, Ser. No. 553,252
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—416 **14 Claims**



11. A railroad car comprising:
a pair of single axle railway trucks; and
an underframe adapted to be supported on said car trucks, said underframe including a longitudinally extending center sill;
said center sill having longitudinally opposite end portions being operatively associated with said car trucks and an intermediate portion connecting said end portions;
said intermediate portion having torsionally flexible means providing torsional flexure of the center sill to permit relative angular twisting of said end portions along a longitudinal axis to accommodate track profiles which tend to raise opposite corners of the underframe; and
said flexible means including a pair of laterally spaced upright wall means connected to the end portions and being allowed movement to provide for torsional flexibility of the flexible means; and
reinforcing means for resisting lateral buckling of the wall means, said reinforcement means being connected to both of the wall means to support laterally direction forces therein; and
said reinforcing means being connected to said wall means at approximately midheight of the wall means thereby receiving the minimum stress due to relative movement of the wall means during torsional flexure.

4,630,549

STRUCTURAL LOCKING DEVICE

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Dec. 26, 1985, Ser. No. 813,660
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—111 **9 Claims**



1. A factory preformed upper shelving unit means (**10**) comprising:
plural layer means (**11, 12, 13**) comprised of a corrugated fiberboard material,
an outer wrapping layer means (**15, 16**) formed around said plural layer means (**11, 12, 13**),
a flap recieving layer means (**14**) being formed between two of said plural layer means (**11, 12, 13**),
said flap receiving layer means (**14**) having a widened channel means (**24**) factory preformed therein,
at least one of said plural layer means (**13**) having narrow channel means (**23**) factory preformed therein and positioned so as to open into said widened channel means (**24**),
a portion of said outer wrapping layer means (**16**) having narrow channel means (**26**) formed therein and positioned so as to open into the narrow channel means (**23**) of said at least one plural layer means (**13**),
means whereby a flap (**57**) may be slid into said widened channel means (**24**),
and means whereby an extension (**56***a*) of said flap (**57**) is received by each of said narrow channel means (**23, 26**).

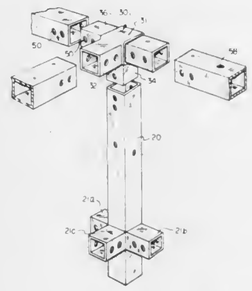
4,630,550

PREFABRICATED KNOCK-DOWN METAL-FRAME WORK TABLE

Harry L. Weitzman, White Plains, N.Y., assignor to Jack J. Weitzman, Spring Valley, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,214
Int. Cl.[4] A47B *47/02;* **F16B** *7/00*
U.S. Cl. 108—155 **5 Claims**

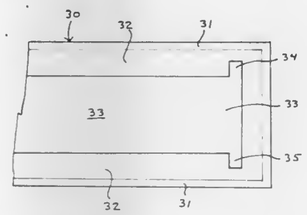
1. A heavy duty, knock-down, prefabricated, metal-frame work table capable of supporting heavy loads, as for example, stacks of textile fabric laid up in preparation for a cutting operation, which frame can be shipped in disassembled form and easily assembled at a work site, said frame comprising:
(a) a plurality of upper and lower end, side, and cross rails, each formed of a square steel tubing member open at the ends and of prescribed length;
(b) a plurality of vertical corner leg members formed of square steel tubing, each of said corner leg members further including a square steel tubing projection secured to and extending horizontally from the surface of each of two adjacent walls at a point intermediate the top and bottom thereof, and an open top, one of said projections being inserted into the open end of one of said lower side rails and the other of said projections being inserted into the open end of one of said lower end rails;
(c) a plurality of vertical side leg members formed of square steel tubing, each of said side leg members further including square steel tubing projections secured to and extending horizontally from the surface of three adjacent walls thereof at a point intermediate the top and bottom thereof and an open top, the central one of said projections being inserted into the open end of one of said lower cross rails and the other two projections being inserted into the open ends of two of said lower side rails:
(d) a plurality of connector members having a body portion formed of square steel tubing, each of said side connector members including square steel tubing projections secured to and extending perpendicularly from the surface of two adjacent walls of the body portion thereof of such length and cross sectional dimension as to be insertable into the open end of one of said leg and rail members;
(e) some of said connector members being arranged with the axis of the opening through the tubular body member aligned with the longitudinal axis of the upper side rails of said table, with one of said projections extending downwardly into the open top of a side leg member, and with the other of said projections extending horizontally inwardly into the open end of one of said upper cross rails, a relatively short bridging member formed of square steel tubing of such length and cross-sectional dimension as to be inserted axially through the opening in said tubular body portion and extend longitudinally from each end thereof for insertion into the ends of two adjacent upper side rail members;



(f) other of said connector members being arranged with the axis of the opening through the tubular body member aligned with the longitudinal axis of one of said corner leg members, with one of said projections extending horizontally into the open end of one of said upper end rails, with the other of said projections extending horizontally into the open end of one of said upper side rails, and a relatively short bridging member formed of square steel tubing secured to and extending axially in a downwardly direction from the opening in said tubular body portion, said short bridging member being of such length and cross-sectional dimension as to be inserted into the upper end of one of said corner leg members;
(g) each of said side rails, cross rails, leg members, projections and short bridging members being provided with a pair of openings in the opposite side walls thereof adjacent the free ends of said rails and the upper end of said leg members for receiving connecting bolts therethrough;
(h) a planar top member secured across the top of said frame;
(i) whereby said upper and lower side and cross rails are

assembled to the projections and short bridging members extending from said side and corner members and bolted together to form said sturdy work table.

4,630,551
EXECUTIVE DESK
Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.
Filed Dec. 26, 1985, Ser. No. 813,568
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—159 **1 Claim**



1. An executive desk assembly kit comprising three distinct component parts as follows:

a vertical side wall assembly (**10**) comprising multiple factory pre-glued layers of corrugated fiberboard (**12,13,14,15,16**), wherein said vertical side wall layers include factory pre-formed narrow channel means for receipt of pedestal stabilizer means (**20**) and wider channel means for receipt of flaps (**21**) formed on said pedestal stabilizer means (**20**),

a pedestal stabilizer means (**20**) having flaps (**21**) formed on the ends thereof, said pedestal stabilizer means being sized so as to slidably interfit with the channel means of the vertical side wall assembly whereby a joinder is accomplished without the need for separate mechanical fasteners,

a desk top assembly (**30**) comprising plural factory pre-glued layers of corrugated fiberboard, wherein at least one lower layer of said desk top assembly has cut-away section means (**33**) for interfitting with the vertical side wall assembly (**10**) and the pedestal stabilizer means (**20**),

wherein said vertical side wall assembly (**10**) comprises:

a first outer wrapping layer (**11**) made of corrugated fiberboard,

a second layer (**12**) comprised of double wall corrugated fiberboard,

a third layer (**13**) comprised of double wall corrugated fiberboard,

a fourth layer (**14**) comprised of double wall corrugated fiberboard,

a fifth layer (**15**) comprised of double wall corrugated fiberboard,

a sixth layer (**16**) comprised of single wall corugated fiberboard,

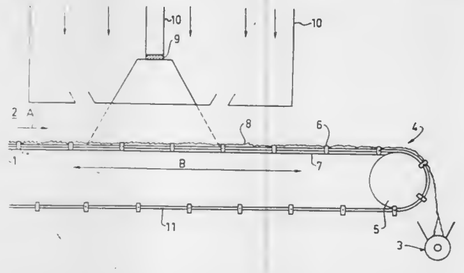
and means wherein each of said layers (**11–16**) are factory pre-glued together for finished use in the executive desk assembly kit,

wherein said first outer wrapping layer (**11**) and all of said double wall corrugated layers (**12–15**) of said vertical side wall assembly have a narrow channel means factory preformed therein for receipt of a body portion of a pedestal stabilizer means (**20**),

wherein said sixth layer (**16**) of said vertical side wall assembly (**10**) comprising single wall corrugated fiberboard has widened channel means factory preformed therein for receipt of flap means (**21**) formed on the end portion of a pedestal stabilizer means (**20**), said widened channel means being wider than said narrow channel means formed in said double wall corrugated layers (**12–15**),

wherein said pedestal stabilizer means (**20**) is made entirely of corrugated fiberboard material and wherein said flaps (**21**) formed thereon are bendable so as to allow said pedestal stabilizer means (**20**) to a slidably interfit with the narrow and wider channel means formed in the corrugated fiberboard layers of said vertical side wall assembly (**10**).

4,630,552
DEVICE AT COMBUSTION PLANTS FOR AUTOMATICAL FEEDING OF FUELS WITHIN THE FIREPLACE OF THE PLANT
Anders Lövgren, Skellefteå , Sweden, assignor to AB Megaron, Skelleftea, Sweden
Filed Sep. 16, 1985, Ser. No. 776,628
Int. Cl.[4] F23H *5/02*
U.S. Cl. 110—190 **3 Claims**



1. A method for feeding solid fuel through a fireplace of a combustion plant, comprising the steps of:

positioning solid fuel on a fuel-receiving end of movable grate means,

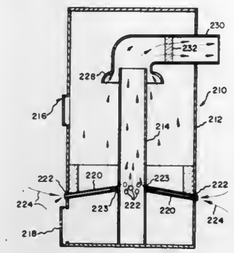
advancing said movable grate means through said fireplace from said fuel-receiving end to a fuel-discharging end of said grate means, while combusting the fuel disposed thereon, said grate means being advanced through a sensing zone of said fireplace disposed in the vicinity of, and upstream of, said fuel-discharging end,

conducting a supply of measuring air to fuel disposed on said grate means in said sensing zone, such that the temperature of incompletely combusted fuel increases and the temperature of completely combusted fuel decreases,

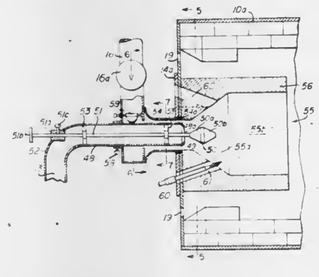
sensing the temperature of the fuel in said sensing zone to obtain an indication of the extent of combustion thereof, and adjusting the rate of advance of said grate means in accordance with the sensed temperature in a manner tending to achieve a complete combustion of the fuel.

4,630,553
DUAL STAGE COMBUSTION FURNACE
Robert G. Goetzman, 519 Cayuga Ave., Niagara Falls, N.Y. 14304
Continuation of Ser. No. 634,096, Aug. 30, 1984, abandoned, which is a division of Ser. No. 501,738, Jun. 6, 1983, Pat. No. 4,484,530. This application Jan. 15, 1986, Ser. No. 819,982
Int. Cl.[4] F23B *5/00*
U.S. Cl. 110—214 **9 Claims**

1. In a solid fuel burning furnace having a primary combustion chamber, said primary combustion chamber having a wall and a hollow grate supporting a bed of fuel for superheating secondary air passing there through, the improvement comprising an afterburner which comprises an exhaust pipe which extends through the wall of said chamber entirely above said bed and defines a secondary combustion chamber entirely within said primary combustion chamber, said exhaust pipe having a throat with an open end which projects into said primary combustion chamber above said bed, a tube around said exhaust pipe defining a passage for secondary air toward the throat of said exhaust pipe, a conduit between said hollow grate and said passage for communicating superheated air toward said throat, and ignitor means in said exhaust pipe.

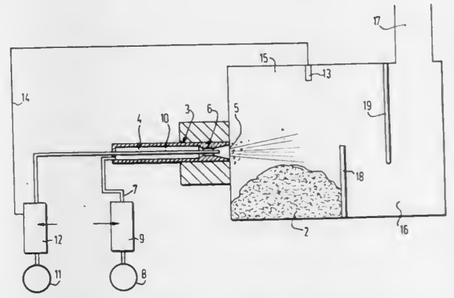


4,630,554
PULVERIZED SOLID FUEL BURNER AND METHOD OF FIRING PULVERIZED FUEL
William H. Sayler, Salt Lake City, and Justin C. White, Magna, both of Utah, assignors to T.A.S., Inc., Magna, Utah
Division of Ser. No. 588,900, Mar. 12, 1984, Pat. No. 4,531,461, which is a continuation-in-part of Ser. No. 378,347, May 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,267, Dec. 15, 1980, abandoned. This application Mar. 8, 1985, Ser. No. 709,887
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 **5 Claims**



1. A pulverized solid fuel burner adapted for attachment to a furnace or other heating structure, comprising means defining an ignition chamber; an elongate firing conduit having one end adapted to connect with means for supplying a stream of primary air and pulverized solid fuel and having a fuel firing orifice at the other end for discharge of a stream of the pulverized fuel and primary air that passes through said firing conduit internally and from end-to end thereof, said firing orifice being directed into said ignition chamber; a valve element movably mounted relative to said firing orifice for adjustment closer thereto or farther therefrom as a primary air and fuel feed control valve, said conduit being relatively long and longitudinally imperforate so as to confine the longitudinally extensive flow of said primary air and fuel stream therethrough; structural means within said conduit and mutually spaced along the length thereof for imparting turbulence to said longitudinally extensive flow of primary air and fuel prior to its discharge from said conduit and its entering said ignition chamber; means for introducing a controlled quantity of secondary air into the turbulent stream after its discharge through said firing orifice, said means being a conduit concentric with and surrounding said firing conduit and opening into the ignition chamber, the firing conduit being slidable longitudinally relative to the secondary air conduit and to the ignition chamber, so as to permit selective positioning of the firing orifice; means for securing said firing conduit in the selected position; means for igniting the pulverized solid fuel in said ignition chamber; means for observing conditions within said ignition chamber; and means for adjusting the position of said valve element relative to said firing orifice in accord with observed conditions in the ignition chamber to control the quantity of primary air and fuel fired into said ignition chamber and to influence flame propagation and flame shape.

4,630,555
PROCESS FOR INCINERATING WASTE PRODUCTS AT A CONTROLLED TEMPERATURE
Paul Guillaume, Ivry-sur-Seine; Didier Kayser, Paris, and Jean Propice, Bois d'Arcy, all of France, assignors to L'Air Liquide, Paris, France
PCT No. PCT/FR85/00347, § 371 Date Mar. 20, 1986, § 102(e) Date Mar. 20, 1986, PCT Pub. No. WO86/03575, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 3, 1985, Ser. No. 860,194
Claims priority, application France, Dec. 5, 1984, 84 18.508
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—346 **9 Claims**



1. Process for incinerating waste products in a furnace in which a comburent and sprayed water are injected into the furnace, characterized in that the introduction of the waste products in the furnace is effected by successive charges and comprises, for each charge of waste products, the following steps:

lowering the temperature of the hearth to around 650° C.,

introducing the charge to be incinerated,

injecting oxygen at least in the zone located between the charge and 20 cm above the latter, preferably at sonic speed so as to immediately oxidize the carbon and the oxygen formed by cracking the pyrolysis gas above about 450° C., the presence of oxygen very rapidly producing a rise in temperature of the hearth above 750° C., beyond which temperature the carbon monoxide which could be possibly formed is immediately oxidized in the form of carbon dioxide, water being vaporized when the temperature in the furnace becomes higher than about 750° C., by spraying by means of oxygen in such manner, on one hand, as to produce active oxygen by thermal cracking and accelerate the oxydation of C, CO and H and, on the other hand, as to maintain a temperature in the furnace which does not become substantially higher than about 850° C., by absorption of heat upon its vaporization.

4,630,556

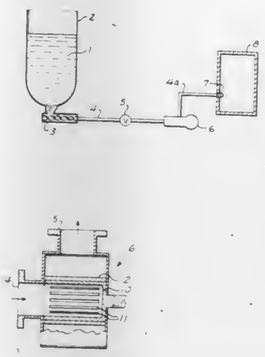
METHOD FOR BURNING COAL-LIQUID SLURRY FUELS AND APPARATUS THEREFOR

Robert S. Scheffee, Lorton, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Feb. 17, 1982, Ser. No. 349,450

Int. Cl.⁴ F23D *1/00;* **F23G** *7/04*

U.S. Cl. 110—347 **20 Claims**



1. A method for burning a coal/liquid fuel slurry which has been formulated to have the characteristics essential for use as a liquid fuel, including predetermined proper coal particle sizes having a maximum size smaller than that of the orifice of a given atomizing means and which, subsequent to said formulation may, at the point of use as a fuel, contain as contaminants coal particles, such as agglomerates, which are excessively sized relative to the orifice size of said atomizing means, comprising:

a. flowing said slurry fuel through a passage connected to said atomizing means and through said atomizing means into a combustion chamber;

b. positioning a comminuting means in said passage closely upstream of said atomizing means;

c. continuously passing all of said fuel in said passage through said comminuting means prior to passing into said atomizing means;

said comminuting means providing continuous passage of all said fuel therethrough and applying shear stresses sufficient to comminute said excessively-sized particles to a size smaller than said orifice.

9. Apparatus for burning a fluid coal-liquid slurry fuel which has been formulated to have the characteristics essential for use as a liquid fuel, including predetermined proper coal particle sizes having a maximum size smaller than that of the orifice of a given atomizing means and which, subsequent to said formulation may, at the point of use as a fuel, contain as contaminants coal particles, such as agglomerates, which are excessively sized relative to the orifice size of said atomizing means, comprising:

a. a combustion chamber;

b. atomizing means for said fuel opening into said chamber, said atomizing means having an orifice of given size to permit passage therethrough of said predetermined proper particle sizes;

c. a passage for said fuel connected to said atomizing means;

d. comminuting means positioned in said passage closely upstream of said atomizing means in such manner that all of said fuel flowing through said passage passes through said comminuting means;

said comminuting means providing continuous passage therethrough of all of said fuel and applying shear stresses sufficient to comminute said excessively sized particles to a size smaller than said orifice.

4,630,557

ADJUSTABLE LOW INERTIA PRESSER BAR

Angus R. T. Russell, Englishtown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 14, 1981, Ser. No. 263,623

Int. Cl.⁴ D05B *29/02*

U.S. Cl. 112—235 **2 Claims**



1. A presser mechanism for a sewing machine having a frame including a head overlying a work support, said mechanism comprising a hollow main presser bar slidably supported by said head, a first force adjusting member carried by said head coaxial with said main presser bar, a first resilient means acting between said first force adjusting member and said main presser bar for urging said main presser bar towards said work support, a low inertia presser bar internally supported in the lower end of said hollow main presser bar, a presser foot attached to the end of said low inertia presser bar for engagement with work material supported on said work support, a second adjusting member supported coaxially with said first adjusting member, a second resilient means supported internally of said main presser bar and extending between said second adjusting member and said low inertia presser bar, and means for selectively limiting the travel of said low inertia presser bar whereby said main presser bar and said first resilient means may be brought into operation after a selected travel of said low inertia presser bar, said limiting means including a collar adjustably supported on said main presser bar, said collar limiting motion of said main presser bar through said head toward said work support.

4,630,558

TUFTING MACHINE AND METHOD OF TUFTING FOR PRODUCING MULTIPLE ROWS OF TUFTS WITH SINGLE LENGTHS OF YARN

Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

Continuation of Ser. No. 496,010, May 19, 1983, Pat. No. 4,440,102. This application Mar. 22, 1984, Ser. No. 592,384

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

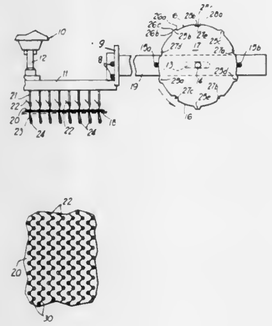
Int. Cl.⁴ D05C *17/02, 15/30*

U.S. Cl. 112—266.2 **7 Claims**

1. Method of producing a tufted product wherein the backing material is progressively moved along a path, passing between reciprocating needles on one side of the backing material and reciprocating loopers on the other side of the backing material, the needles in their reciprocation being moved toward the loopers in a yarn inserting stroke and away from the loopers during a needle retracting stroke, the needles being free of the backing material when the needles are retracted, the needles having ends which are sufficiently pointed that they will engage and penetrate the backing material when the needles are moved from their retracted position toward the loopers, and yarns are supplied to the needles so that the needles carry the yarns through the backing material during the movement of the needles toward the loopers, the lengths of the yarn inserting strokes of the needles being sufficient for the yarns to form loops of the yarn which protrude from the other side of the backing material after the needles have penetrated the backing material, the loopers having hook portions which are inserted, in a loop engaging action, through the loops carried by the needles when the needles are adjacent to the loopers, and the loopers temporarily holding the loops as the needles are retracted out of the backing material, the improvement comprising:

(a) moving the needles laterally after the needles have engaged the backing material, for shifting a transverse portion of the backing material laterally of its normal path;

(b) then, continuing the movement of the needles so as to position the loops being inserted by the needles respectively for the loop engaging action of the loopers; and



(c) thereafter, withdrawing the needles from said backing material to release the portion of the backing material which was shifted.

6. A tufting machine having a reciprocating needle bar, a plurality of spaced parallel needles carried by the needle bar for reciprocation by the needle bar toward any away from loopers and wherein backing material is passed between the needles and the loopers so that successive lengths of yarn carried by the respective needles are inserted from one side through successive transverse increments of the backing material to form tufts protruding from the other side of the backing material and wherein the loops when inserted by the needles are respectively caught and held and subsequently released by the loopers, the needles being withdrawn from the backing material as they are moved by the needle bar away from the loopers, the improvement comprising:

(a) means for shifting the needle bar laterally while the needles are withdrawn from the backing material; and

(b) said means also shifting said needles laterally after the needles have penetrated the backing material and prior to the time the loopers engage and hole the loops of yarn, whereby the needles move the increment of backing material, through which the needles project, laterally and the needles release this increment of backing material when the needles are withdrawn therefrom.

4,630,559

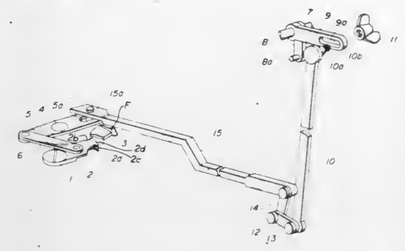
THREAD CUTTING MECHANISM IN LOCK STITCH SEWING MACHINE

Tomoaki Kinoshita, Kanagawa, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Oct. 30, 1984, Ser. No. 666,485

Int. Cl.⁴ D05B *65/02*

U.S. Cl. 112—291 **1 Claim**



1. A thread cutting mechanism for a lock stitch sewing machine comprising;

a stationary blade fixedly secured to the framework of said sewing machine;

a movable blade for reciprocal movement between initial and operative positions and having a thread handling portion formed at the leading edge of said movable blade for initially engaging threads attached to a work piece being sewn as the blade moves from an initial to an operative position and passing said threads to a guide portion formed at the outer edge of the blade whereby said threads when said blade moves to an operative position are caused to slide off said guide portion and lie adjacent a thread arresting portion of said blade, whereby said arresting portion traps the threads upon the return reciprocal movement of the blade to its initial position to cause said threads to be cut by the relative movement between said movable and stationary blades;

operation means operatively connected to said movable blade for causing the movable blade to move reciprocally when said operation means is actuated wherein the improvement comprises adjusting means operatively associated with said operation means for adjusting the distance the blade reciprocates between said initial and operative positions to ensure that said threads will slide off said guide portion upon said return movement of the blade to its initial position.

4,630,560

DEVICE FOR STABILIZING THE NEEDLE THREAD LOOP IN SEWING MACHINES

Klaus Stutznäcker, Frechen-Königsdorf, Fed. Rep. of Germany, assignor to Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 192,963

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939888

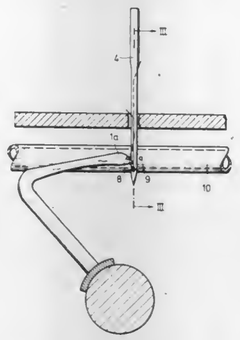
Int. Cl.⁴ B65H *57/24;* **D05B** *57/00*

U.S. Cl. 112—302 **6 Claims**

6. A device for stabilizing a needle thread loop in the area of a looper in sewing machines having at least one needle for forming a needle thread loop on one side thereof, comprising:

two compressed air nozzles for each needle which are positioned on the opposite side of the associated needle facing away from the needle thread loop and which are oriented in such a manner that the compressed air streams emanating therefrom meet in a converging manner and are directed toward the area of the needle thread loop, said

compressed air nozzles being spaced apart from each other and from said needle and being located on opposite



sides of a vertical plane passing through the center of said one side and said opposite side of said needle.

4,630,561

SHIP HAVING STANDARDIZED ACCESS WAYS

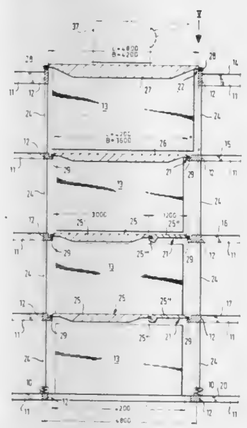
Hans-Joachim Franz, Kölln-Reisiek; Willy Schmidt, Ellerbek, and Karl O. Sadler, Hamburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 580,611, Feb. 16, 1984. This application Mar. 27, 1985, Ser. No. 716,566

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411299

Int. Cl.[4] B63G *1/00;* **B63B** *3/00*

U.S. Cl. 114—1 **29 Claims**



1. In a ship having a plurality of vertically spaced decks and a ship bottom within a hull, said decks comprising an uppermost deck and lower decks, said hull having a longitudinal direction and a transverse direction, an assembly arrangement for equipment and apparatus, said arrangement comprising:

a plurality of substantially horizontal load bearing elements comprising a plurality of longitudinal members substantially parallel to said longitudinal direction and a plurality of transverse members transverse to said longitudinal members, substantially parallel to said transverse direction, said longitudinal members and said transverse members supporting said plurality of decks;

at least a substantial portion of said longitudinal members defining a plurality of vertical longitudinal planes and being disposed in said longitudinal planes;

at least a substantial portion of said transverse members defining a plurality of vertical transverse planes and being disposed in said transverse planes;

said vertical planes forming substantially horizontal rectangles on each deck and said bottom;

said horizontal load bearing elements being disposed such that at least some of said horizontal rectangles are disposed one above the other and aligned vertically;

said horizontal rectangles being disposed one above another for forming a plurality of adjacent vertical groups of rectangles, having rectangles within each said group aligned vertically one above another;

vertical access ways being disposed in at least some of sAid vertical groups of rectangles;

each of said access ways comprising access openings in said uppermost deck and at least in some of said lower decks in each corresponding vertical group;

an uppermost of said access openings of each said access way being at least as large as a lower one of said access openings in said corresponding access way in its corresponding vertical group;

second deck access openings of said access openings being directly under an uppermost of said openings of each of said vertical access ways in its corresponding vertical group;

said second deck access openings having means for receiving a water tight cover; and

said uppermost of said access openings having a watertight load-bearing cover and an apparatus installed on said watertight cover, at least some of said lower deck access openings being provided with watertight load-bearing covers and including equipment bearing containers installed on at least some of said covers.

4,630,562

ADJUSTABLE MAST STEP

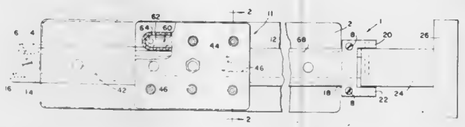
Richard W. Grant, and Ronald D. Sciulli, both of Honolulu, Hi., assignors to Atecs Corporation, Honolulu, Hi.

Continuation of Ser. No. 490,472, May 2, 1983, Pat. No. 4,527,499. This application Dec. 17, 1984, Ser. No. 682,189

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] B63H *9/06*

U.S. Cl. 114—39 **17 Claims**



1. Adjustable apparatus comprising track means, connecting means connected to the track means for connecting the tract means to a sailboard on which the adjustable apparatus is to be mounted, traveler means connected to the track means for moving along the track means, and detent means movable through the track means into the traveler means for securing the traveler means in a selected position on the track means, wherein the detent means further comprises slider means connected to the track means for sliding adjacent the track means, and wherein the detent means further comprises abutment means mounted in the track means and wherein the slider means further comprises receiver means for receiving the abutment means, whereby the abutment means may be moved into the receiver means and out of contact with the traveler means.

4,630,563

TRAPEZE BELT OR HARNESS FOR WINDSURFING

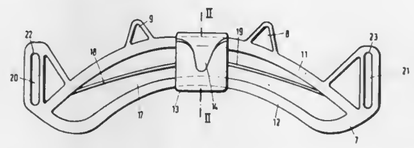
Siegried Pertramer, Ferdinand-Miller-Strasse 11, D-8080 Fürstenfeldbruck, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,808

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342526; Sep. 17, 1984, 3434087

Int. Cl.[4] B63H *9/04*

U.S. Cl. 114—39 **17 Claims**



1. A trapeze belt device for windsurfing which comprises:

(a) a belt means worn by the body of a user in the chest region;

(b) a rigid holding and spreading means secured to said belt means for wearing across the lower front chest of the user;

(c) a carriage on said belt means and mounted for movement along said holding and spreading means; and

(d) a hook on said carriage adapted for engagement with lines secured to both sides of a wishbone boom of a windsurfer.

4,630,564

BOOM CONTROL DEVICE FOR A SAILBOAT BOOM

Donald Duckman, Brunnsgatan 9; Curt Duckman, Oslovägen 41, both of 452 00 Strömstad, and Kjell Andrén, Dr Südows gata 28, 431 24 Göteborg, all of Sweden

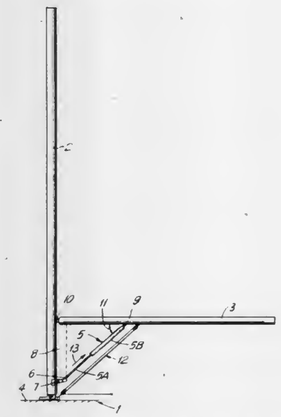
PCT No. PCT/SE83/00150, § 371 Date Dec. 22, 1983, § 102(e) Date Dec. 22, 1983, PCT Pub. No. WO83/03806, PCT Pub. Date Nov. 10, 1983

Continuation of Ser. No. 571,546, Dec. 22, 1983, abandoned. This PCT application Apr. 21, 1983, Ser. No. 778,754

Claims priority, application Sweden, Apr. 23, 1982, 8202555

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—98 **6 Claims**



1. A boom control device for a sail boat having a mast, a mounting projecting from the mast, and a boom pivotally connected to said mounting and to be connected to a sail; said boom control device comprising: a unit having two sections, a first pivot directly connecting one section to said boat rearwardly of said mounting as viewed in the longitudinal direction of the boat to be spaced from said boom rearwardly of said boat, and a second pivot directly connecting the other section to said boom, said two sections forming a spring element such that the device urges the boom to swing out transversely across the boat from the longitudinal direction thereof and resists swinging back to the longitudinal direction, said device extending at a first angle in a vertical plane with respect to said boom and at a second angle in a horizontal plane when swung out across the boat, said spacing and angles being set so that urging force exerted on said boom by said spring element is maximum when the boom is oriented transversely of the longitudinal centerline of the boat and decreases to a minimum when the boom is oriented to extend along the longitudinal centerline of the boat.

4,630,565

EQUIPMENT FOR UNIFORMLY SPREADING ANTI-STICKING POWDERS ON BITUMINOUS MEMBRANES FOR BUILDING COVERINGS

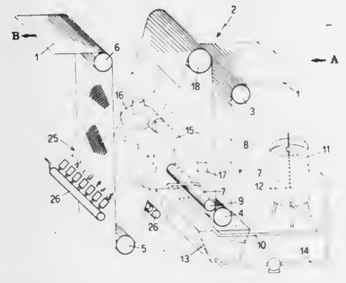
Silvio Olioso, Castel d'Azzano, Italy, assignor to Index S.p.A. Technologie Impereabili, Italy

Filed Jan. 16, 1986, Ser. No. 819,900

Claims priority, application Italy, Dec. 13, 1985, 84975 A/85

Int. Cl.[4] B05C *3/172, 11/06*

U.S. Cl. 118—47 **6 Claims**



1. An equipment for uniformly spreading anti-sticking powders on bituminous membranes for building coverings, of the kind using anti-sticking powders in an aqueous suspension and comprising a series of rotating rollers on which the bituminous membrane provided with a continuous feed motion runs and further comprising a station in which the aqueous suspension is applied to the membrane as well as a drying station, wherein, downstream of the suspension-applying station and upstream of the drying station relative to the membrane feed direction, provision is made for a rotating drum on which the membrane runs, said rotating drum having its cylindrical surface disposed in contact with the membrane, provided with shaped reliefs, and wherein, downstream of the suspension-applying station and upstream of said rotating drum provision is also made for a compressed air duct placed in the vicinity of the membrane transversely to the feed direction of the latter and provided with a longitudinal slit turned towards the membrane surface so that it generates a flattened air jet adapted to eliminate the liquid in excess on the membrane and to form a liquid film thereon.

4,630,566

MICROWAVE OR UHF PLASMA IMPROVED APPARATUS

Jes Asmussen, Okemos, and Donnie K. Reinhard, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668. This application Nov. 15, 1985, Ser. No. 798,309

Int. Cl.[4] C23C *13/08;* **H01J** *7/46*

U.S. Cl. 118—50.1 **4 Claims**

1. An ion generating apparatus for treating a surface which comprises:

(a) a plasma source employing a radio frequency, including UHF or microwave, wave coupler which is metallic and in the shape of a hollow cavity and which is excited in one or more of its TE or TM modes of resonance and optionally including a static magnetic field surrounding the plasma source which aids in coupling a electron cyclotron resonance and aids in confining the ions in the coupler, wherein the plasma is maintained at a reduced pressure in operation and wherein the ion source apparatus includes an electrically insulated chamber having a central longitudinal axis mounted in closely spaced relationship to an area of the coupler;

(b) gas supply means for providing a gas which is ionized to form the plasma in the insulated chamber, wherein the radio frequency wave applied to the coupler creates and maintains the plasma in the shape of an elongate plasma



disk perpendicular to and surrounding the central longitudinal axis in the chamber;

(c) movable metal plate means in the cavity mounted perpendicular to the axis and movable towards and away from the chamber;

(d) a movable probe connected to and extending inside the coupler for coupling the radio frequency waves to the coupler, wherein movement of the plate means and the probe in the coupler achieves the selected TE or TM mode of resonance of the radio frequency wave in the coupler and varies the resonance of the mode;

(e) ion attracting means for attachment to the surface to be treated for attracting ions from the plasma to the surface by means of a suitable voltage potential; and

(f) a platform supporting the surface to be treated and electrically insulated from the ion attracting means.

4,630,567

SPRAY PAINT SYSTEM INCLUDING PAINT BOOTH, PAINT ROBOT APPARATUS MOVABLE THEREIN AND RAIL MECHANISM FOR SUPPORTING THE APPARATUS THEREOUT

Gerald J. Bambousek, Algonac; Donald S. Bartlett, and Thomas D. Schmidt, both of Troy, all of Mich., assignors to GMF Robotics Corporation, Troy, Mich.

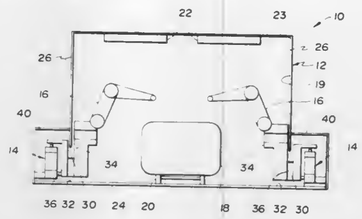
Filed Aug. 28, 1985, Ser. No. 770,261
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—323 **15 Claims**

1. A spray paint system comprising:

a paint booth having walls defining an enclosed painting area;

at least one track means located outside of said painting area and in fluid communication therewith through at least one opening formed in said paint booth;

at least one paint robot located within said painting area to paint a body disposed therein, said paint body robot being movably supported on said track means outside of the painting area; and



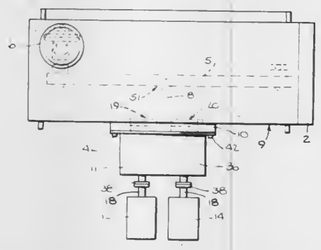
sealing means for sealing said painting area at said opening, said sealing means including at least one labyrinthian seal.

4,630,568

APPARATUS FOR COATING SUBSTRATES BY PLASMA POLYMERIZATION

Jörg Kieser, Albstadt, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,513, Mar. 26, 1985, abandoned, which is a continuation of Ser. No. 556,847, Dec. 1, 1983, abandoned. This application May 21, 1985, Ser. No. 736,556
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244391
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—723 **11 Claims**



1. Apparatus for coating substrates by means of a reaction for depositing atoms or molecules which is initiated by a plasma, which apparatus comprises:

a reaction chamber, including means for transporting the substrates, for containing an atmosphere comprising ionized gas and comprising, in one of its walls, two windows penetrable by microwaves;

one or more wave-gude structures disposed outside said chamber and in front of said windows;

means for distributing gas in said chamber; and

a support frame at said reaction chamber, said support frame being of rectangular shape and comprising said two windows which extend parallel to the longer sides of the rectangle and a frame strut between said two windows, the apparatus also comprising cooling ducts, beside said windows, in said support frame, said distributing means being at least partially disposed in said frame strut;

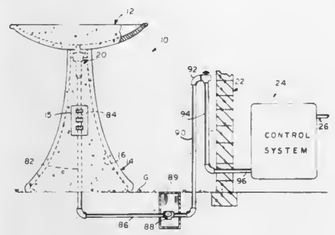
said windows, penetrable by microwaves, said one or more wave-guide structures and said distributing means being secured jointly to said support frame and said support frame being secured to said reaction chamber in such manner that said windows, said one or more wave-guide structures, said distributin means and said support frame are displaceable from said reaction chamber as a unit.

4,630,569

SELF-CLEANING BIRDBATH APPARATUS

Lawrence A. Dieleman, 2119 Tulip La., Jenison, Mich. 49428

Filed May 2, 1985, Ser. No. 729,979
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **31 Claims**



15. A birdbath assembly for controlled automatic filling, self-cleaning and emptying with water pressure comprising:

a bowl for receiving and holding a quantity of water, said bowl having an inner surface and a top edge;

means for supporting said bowl;

a spray nozzle mounted for movement through the inside surface of said bowl, said spray nozzle adapted to fill said bowl with water, agitate the water and any effluents therein, empty said bowl of any water and effluents, and refill said bowl;

fluid responsive means for moving at least a portion of said spray nozzle through said inside bowl surface to a position within said bowl in response to water pressure to direct water spray for agitation of water within said bowl and subsequent removal of the water and effluents from the bowl;

said spray nozzle including water spraying means for spraying water toward and/or against said inside surface of said bowl during movement of said spray nozzle into said bowl and for spraying water over said top edge of said bowl and out of said bowl while said spray nozzle is in said position within said bowl; and

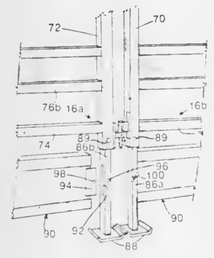
connection means for connecting said spray nozzle with a source of water under pressure.

4,630,570

PORTABLE STOCK HANDLING UNIT

James A. Wilson, Bacchus Marsh, and James R. Ellis, Melton, both of Australia, assignors to Holland Hitch Company, Holland, Mich.

Division of Ser. No. 667,451, Nov. 1, 1984, Pat. No. 4,569,309, which is a division of Ser. No. 627,072, Jul. 2, 1984, abandoned, which is a division of Ser. No. 416,302, Sep. 9, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,904
Int. Cl.[4] A01K *3/00*
U.S. Cl. 119—20 **5 Claims**



1. A portable stock race and yard comprising:

said stock race having a body and wheels supporting said body for transport;

a plurality of wings swingably connected to said stock race body and arranged to be folded out to form at least part of the periphery of a stockyard, each of said wings being connected to said stock race sufficiently high to pass over said wheels of said stock race when said wings are folded against the body of said stock race;

a plurality of legs supporting said wings when said wings are folded out to form said stockyard; and

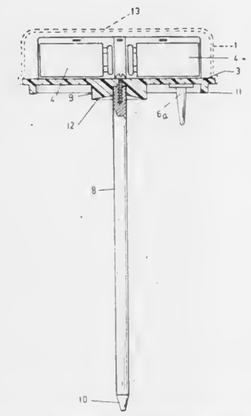
a plurality of panel sections, one each releasably securable under one of said wings and between two of said legs, said panel sections being secured to said legs under said wings when said wings are folded out to form said stockyard to prevent stock from passing under said wings, said panel sections being removed from said legs when said wings are folded against said stock race to permit said wings to pass over the wheels of said race.

4,630,571

DEVICE TO REACTION TRAIN ANIMALS

Robert S. Palmer, 20 Dolly Avenue, Gosford, New South Wales, 2250, Australia

Filed Sep. 30, 1985, Ser. No. 781,689
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 **3 Claims**



1. A device to reaction train animals to avoid an area where the device is located, the device comprising a housing body made of electrically non-conductive material, a housing cover made of electrically conductive material mounted over the body to provide a watertight compartment therebetween, dry cell battery mounting means in the compartment having positive and negative terminals, an electrically conductive contact fixed to the housing body within the compartment and engaged by the housing cover, an electrically conductive earthing post fixed to and projecting from the underside of the housing body, a switch mounted in the compartment, an operating member to connect and disconnect two terminals of the switch, an electrical connection between one terminal of the battery mounting means and one terminal of the switch means, a second electrical connection between the other terminal of the battery mounting means and the earthing post and a third electrical connection between the contact engaged by the housing cover part and the second terminal of the switch means, and a continuous moisture barrier means projecting from the underside of the housing body and encircling the earthing post to interrupt a direct moisture path between the housing cover and the earthing post.

4,630,572

BOILING LIQUID COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

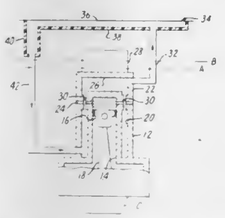
John W. Evans, Sharon, Conn., assignor to Evans Cooling Associates, Sharon, Conn.

PCT No. PCT/US83/01775, § 371 Date Jun. 13, 1984, § 102(e) Date Jun. 13, 1984, PCT Pub. No. WO84/01979, PCT Pub. Date May 24, 1984

Continuation-in-part of Ser. No. 442,721, Nov. 18, 1982, abandoned. This PCT application Nov. 14, 1983, Ser. No. 625,919

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.21 **14 Claims**



1. A cooling system for an internal combustion engine, the engine including a coolant jacket, and having a condenser and conduit means for conducting coolant vapor from substantially the highest zone in the coolant jacket to the condenser and for returning coolant condensate to the coolant jacket characterized in that the coolant is a high molecular weight organic liquid having a saturation temperature at atmospheric pressure of not less than about 132° C. (270° F.), a molar heat of vaporization at atmospheric pressure of greater than about 9,800 cal/mole and a surface tension at 15° C. (59° F.) of less than about 70 dynes/cm.

6. A boiling liquid cooling process for internal combustion engines in which coolant vapor is conducted from substantially the highest zone in the engine coolant jacket to a condenser, is condensed and the condensate is returned from the condenser to the engine, characterized by the step of under all operating conditions of the engine supplying coolant exclusively in a liqud state substantially free of vapor to the coolant jacket of the engine head such that the major part of the head coolant jacket is kept fiiled with coolant in the liquid phase at all times, the coolant being a boilable organic liquid having a saturation temperature at atmospheric pressure of not less than about 132° C. (270° F.), a molar heat of vaporization at atmospheric pressure of greater than about 9,800 cal/mole and a surface tension at 15° C. (59° F.) of less than 70 dynes/cm.

4,630,573

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Naoki Ogawa, Yokohama; Takao Kubozuka, Yokosuka, and Yoshinori Hirano, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 23, 1985, Ser. No. 779,395

Claims priority, application Japan, Sep. 29, 1984, 59-202950

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.27 **10 Claims**

1. In an internal combustion engine having a structure subject to high heat flux, a cooling system comprising:

(a) a cooling system for removing heat from said structure, said cooling system comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and permitted to boil;

a radiator in which coolant vapor is condensed to its liquid form;

a vapor transfer conduit leading from a vapor collection spaced defined in said coolant jacket to said radiator;

means for returning liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of liquid coolant, said liquid coolant returning means including:

a coolant return conduit leading from the bottom of said radiator to said coolant jacket, and

a pump disposed in said coolant return conduit, said pump being selectively energizable to return coolant from said radiator to said coolant jacket through said coolant return conduit;

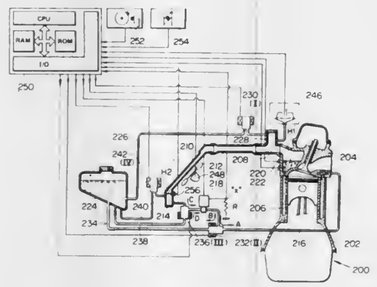
(b) a reservoir in which liquid coolant is stored,

(c) valve and conduit means for selectively providing fluid communication between said reservoir and said cooling circuit, said valve and conduit means comprising:

a first valve disposed in said coolant return conduit at a location between said radiator and said pump, and

a first conduit leading from said reservoir to said valve, said first valve having a first position wherein communication between said radiator and said pump is established and communication between said pump and said first conduit cut-off, and a second position wherein communication between said radiator and said pump is cut-off and communication between said reservoir and said pump is established via said first conduit; and

means for sensing the load on said pump when energized and for causing said first valve to assume said first position



when the load on the pump is above a predetermined minimum limit and for causing said first valve to assume said second position in response to the load on said pump being equal to or lower than said predetermined minimum level.

10. In an internal combustion engine having a structure subject to high heat flux, a method of cooling said engine comprising the steps of:

introducing liquid coolant into a coolant jacket disposed about said structure;

permitting said coolant to boil and produce coolant vapor;

condensing the coolant vapor produced in said coolant jacket to its liquid form in a radiator;

using a pump to return the liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of coolant;

storing liquid coolant in a reservoir;

sensing the load on said pump when energized; and

interrupting the communication between said radiator and said pump and establishing fluid communication between said reservoir in which liquid coolant is stored and said pump in response to said step of sensing indicating that the load on said pump is equal to or lower than a predetermined minimum limit.

4,630,574

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

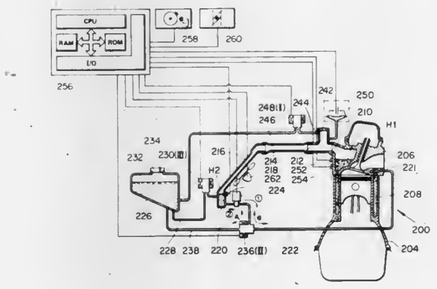
Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 780,908

Claims priority, application Japan, Sep. 29, 1984, 59-202932

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.27 **5 Claims**



1. In an internal combustion engine having a structure subject to high heat flux;

a cooling circuit for removing heat from said engine comprising:

a coolant jacket formed about said structure, said coolant jacket being arranged to receive coolant in liquid form and discharge same in gaseous form;

a radiator in which the gaseous coolant produced in said coolant jacket is condensed to its liquid form;

a vapor transfer conduit leading from said coolant jacket to said radiator for transfering gaseous coolant from said coolant jacket to said radiator;

a device associated with said radiator for varying the rate of heat exchange between said radiator and a cooling medium surrounding the radiator;

a liquid coolant return conduit leading from said radiator to said coolant jacket for returning coolant condensed to its liquid state in said radiator to said coolant jacket;

a reservoir the interior of which is maintained constantly at atmospheric pressure;

valve and conduit means for selectively interconnecting said reservoir and said cooling circuit, said valve and conduit means including a three-way valve disposed in said return conduit and a level control conduit leading from said three-way valve to said reservoir, said three-way valve having a first state wherein fluid communication between said radiator and said coolant jacket is interrupted and communication between said radiator and said reservoir established, and a second state wherein communication between said reservoir and said radiator is interrupted and communication between said radiator and said coolant jacket established;

a reversible pump disposed in said coolant return conduit at a location between said radiator and said three-way valve, said pump being selectively energizable to pump coolant in (a) a first flow direction from said radiator toward said three-way valve and (b) in a second flow direction from said three-way valve toward said radiator;

a first sensor for sensing a parameter which varies with the temperature of the liquid coolant in said coolant jacket;

a second sensor for sensing a parameter which varies with the load on the engine; and

a control circuit responsive to said first and second sensors for controlling the operation of said device, said valve and conduit means and said pump, said control circuit including means for:

defining a control schedule in terms of engine speed and load, said schedule including:

a first low speed/low load zone wherein the temperature to which the coolant should be controlled is set within a first range;

a second low speed/high load zone wherein the temperature to which the coolant should be controlled is set within a second range which is lower than the first rangennd;

a third high speed zone wherein the temperature to which the coolant should be controlled is set within a third range intermediate of the first and second ranges;

determining which of said first, second and third zones the engine is operating;

operating said device in a manner to vary the rate of condensation in said radiator and bring the temperature of the coolant in said coolant into the temperature range of the zone in which the engine is being operated; and

operating said three-way valve and said pump in a manner to vary the amount of coolant in said cooling circuit and therefore modify the pressure prevailing in said cooling circit in a manner which tends to bring the temperature of the coolant into the temperature range of the zone in which the engine is operating.

5. A method of cooling an internal combustion engine comprising the steps of:

introducing liquid coolant into a cooling circuit which includes a coolant jacket formed about structure of the engine subject to high heat flux;

permitting the coolant in said coolant jacket to boil and produce coolant vapor;

transferring the coolant vapor to a radiator which defines a further section of said cooling circuit;

condensing the coolant to its liquid form in said radiator;

sensing operational parameters of said engine;

sensing the temperature of the coolant in said coolant jacket;

using a control schedule which includes:

a first low speed/low load zone in which the coolant temperature should be maintainied in a first temperature range;

a second low speed/high load zone in which the temperature of the coolant should be maintained in a second temperature range which is higher than the first range; and

a third high speed zone in which the temperature of the coolant should be maintained in a third range intermediate of the first and second ranges;

determing which of the first, second and third zones the engine is operating;

using a device located externally of said radiator to vary the rate of heat exchange beteen the radiator and a cooling medium surrounding said radiator in a manner which tends to bring the temperature of the coolant in the coolant jacket into range of the mode determined in said mode determining step; and

using a reversible pump to pump coolant into and out of said cooling circuit in a manner which varies the pressure prevailing therein and which tends to bring the temperature of the coolant in said coolant jacket into the range of the mode determined in said mode determining step.

4,630,575

INTAKE SYSTEM FOR MULTICYLINDER ENGINE

Koichi Hatamura, and Tetsuo Hiraoka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 22, 1985, Ser. No. 768,343

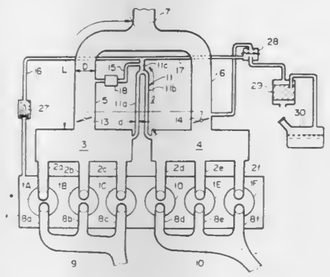
Claims priority, application Japan, Aug. 27, 1984, 59-177791; Jan. 14, 1985, 60-4670

Int. Cl.[4] F02B *27/02*

U.S. Cl. 123—52 M **17 Claims**

1. An intake system for a multicylinder engine in which discrete intake passage portions immediately connected to the respective cylinders are divided into two groups so that intake timings of the discrete intake passage portions in each group are not immediately successive, and the discrete intake passage portions in each group are concentrated to form a concentrated portion, branch intake passage portions extending upstream from the concentrated portions for the both groups and

being integrated with each other to form a main intake passage portion, wherein the improvement comprises a fluid introduction passage for introducing at least one desired fluid into the cylinders, the fluid introduction passage comprising a main introduction passage portion connected to a source of the desired fluid at its upstream end portion and a pair of branch introduction passage portions connected to the respective branch intake passage portions or concentrated portions at their downstream ends and to the downstream end of the main introduction passage portion at their upstream ends; the fluid introduction passage being provided with a flow control valve means for controlling the flow of the fluid passing there-



through at a portion upstream of the junction of the branch introduction passage portions to the main introduction passage portion, the diameter and the average length of the branch introduction passage portions satisfying the condition $d/\sqrt{l} < D/\sqrt{L}$ so that the air column in the branch introduction passage portions resonates at a lower frequency than the air column vibration system in the intake passage upstream of the concentrated portions wherein D and d respectively represent the diameters of the branch intake passage portions and the branch introduction passage portions, and L and l respectively represent the average lengths of the branch intake passage portions and the branch introduction passage portions.

4,630,576

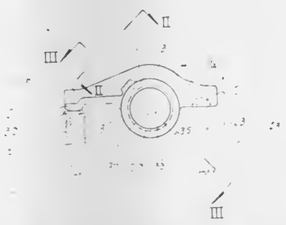
INTAKE VALVE ROCKER ARMS OF CERTAIN SIX CYLINDER INTERNAL COMBUSTION ENGINES

Kenneth W. Raymond, 956 E. Seminole Dr., Venice, Fla. 33595

Filed May 15, 1985, Ser. No. 734,042

Int. Cl.[4] F01M *9/10*

U.S. Cl. 123—90.36 **3 Claims**



1. in an internal combustion engine wherein rocker arms coact with the top of the valve stems of intake valves therein and wherein each one of said rocker arms has an internal peripheral groove that conveys lubricating oil through a radially extending passage in said rocker arm so that lubricating oil flows into the top of the intake valve stems, the improvements in said rocker arm comprising means for sealing said radial passage in said rocker arm in such a way that lubricating oil does not flow through said radial passage onto said intake valve stem.

4,630,577

STOP-START DEVICE FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE OF A VEHICLE PROVIDED WITH AN AUTOMATIC TRANSMISSION

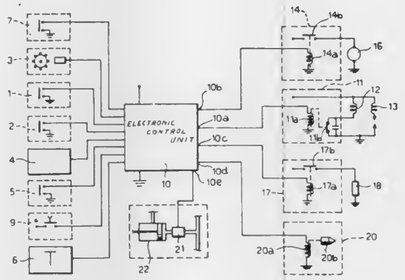
Felice Cornacchia, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 26, 1985, Ser. No. 716,055

Claims priority, application Italy, Mar. 26, 1986, 67289 A/84

Int. Cl.[4] F02N *11/08*

U.S. Cl. 123—179 B **8 Claims**



1. A stop-start device for controlling the operation of an internal combustion engine of a motor vehicle provided with a brake pedal, an accelerator pedal, an electric starter motor and, an automatic transmission, comprising:

sensor means operable to provide electrical signals indicative of the speed of the vehicle, the speed of rotation of the engine, and the position of the accelerator pedal,

actuator means arranged, respectively when activated and deactivated, to cause the engine to be turned off and to allow starting thereof, and

an electronic monitoring and control unit connected to the said sensor means, to the actuator means and to the electric starter motor of the engine; the said unit being arranged

to activate the said actuator means whenever the signals provided by the said sensor means indicate that for a period of time of predetermined duration the speed of rotation of the engine is less than a first predetermined value, the speed of the vehicle is less than a predetermined threshold, and the accelerator pedal is released, and

to deactivate the said actuator means and automatically activate the electric starter motor when the signals provided by the said sensor means indicate that the speed of rotation of the engine is lower than a second predetermined value, less than the said first value, and the accelerator pedal is depressed, wherein the said sensor means are arranged to provide further electrical signals indicative of the position of the brake pedal, and in that the said electronic monitoring and control unit is arranged to activate the said actuator means whenever the signals provided by the said sensor means indicate that for a period of time of predetermined duration, the speed of rotation of the engine is less than the said first predetermined value, the speed of the vehicle is less than the said threshold value and the brake pedal and the accelerator pedal are both released.

4,630,578

APPARATUS FOR CONTROLLING THE POSITION OF A THROTTLE DEVICE DISPOSED IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

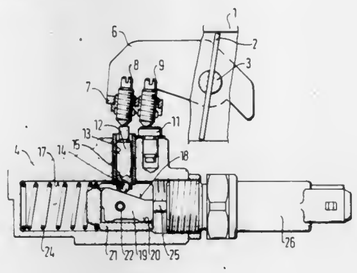
Hermann Nusser, Markgröningen, and Klaus-Jürgen Peters, Affalterbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,840

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441404

Int. Cl.[4] F02D *9/02*

U.S. Cl. 123—179 G **6 Claims**



1. An apparatus comprising a housing, a portion of an intake tube of an internal combustion engine and means for controlling positioning of a throttle device disposed in the intake tube, said throttle device being rotatably supported in said intake tube by means of a shaft, said shaft further arranged to engage a lever, said lever adapted to be actuated by an expansion element, said expansion element further including a control body having a cam track, said cam track being displaceable counter to a force applied by a restoring spring and a feeler pin displaceably supported in the housing arranged to engage said cam track whereby said lever actuates said throttle device.

4,630,579

INTERNAL COMBUSTION ENGINE

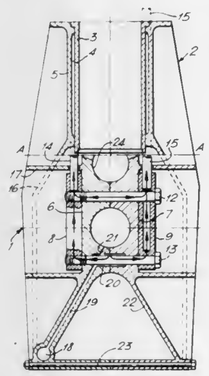
Graham E. Atkin, Kennilworth, United Kingdom, assignor to Austin Rover Group Limited, Coventry, United Kingdom

Filed Nov. 28, 1984, Ser. No. 675,878

Claims priority, application United Kingdom, Dec. 2, 1983, 8332315; Jul. 31, 1984, 8419493

Int. Cl.[4] F02F *7/00*

U.S. Cl. 123—195 R **10 Claims**



1. An internal combustion engine comprising a cylinder head, a plurality of cylinders and a cylinder block containing rigidly secured thereto crankshaft bearings, housing for each crankshaft bearing is in two halves which meet in a plane containing the axes of the cylinders which are adjacent to each other, a respective yoke is provided on opposite outer sides of each bearing housing for holding each pair of bearing housing halves together, and tensile members are provided for securing the cylinder head to the cylinder block, which tensile members extend to and are secured to the yokes, wherein each yoke includes clamping members extending in generally in a direction same as the tensile members and fasteners transverse to said clamping members which clamp the clamping members together.

4,630,580

OIL PASSAGE USABLE FOR AN ENGINE

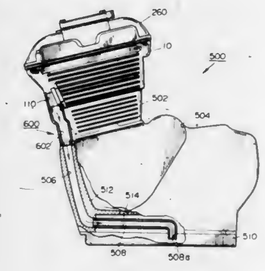
Yasushi Sawaki; Hironori Iguchi, and Tateshi Shimizu, all of Shizuoka, Japan, assignors to Suzuki Motor Co., Ltd., Japan

Filed Sep. 12, 1985, Ser. No. 775,220

Claims priority, application Japan, Sep. 14, 1984, 59-193089

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 R **4 Claims**



1. An internal combustion engine comprising a valve actuating mechanism, a cylinder head having a recess formed around an ignition plug seat, said recess being defined by a peripheral wall, a cover covering said recess, means for injecting oil from an oil pan into said recess without passing through said valve actuating mechanism to thereby cool said cylinder head, oil passage means including a main discharge passage provided in said cylinder head with one end of said main discharging passage being in communication with said recess at a lower portion of said peripheral wall and with another end of said main discharging passage being led to a side face of said cylinder head, and pipe means with one end thereof being in communication with said main discharging passage other end and extending into oil accumulated in said oil pan whereby oil injected into said recess is returned below the surface of oil accumulated in said oil pan.

4,630,581

SYSTEM FOR CONTROLLING VAPORIZED FUEL IN AN INTERNAL COMBUSTION ENGINE

Norio Shibata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 29, 1984, Ser. No. 666,251

Claims priority, application Japan, Jul. 31, 1984, 59-158733

Int. Cl.[4] F02M *25/08*

U.S. Cl. 123—325 **3 Claims**

1. An internal combustion engine comprising

an engine body;

an intake system connected to the engine body;

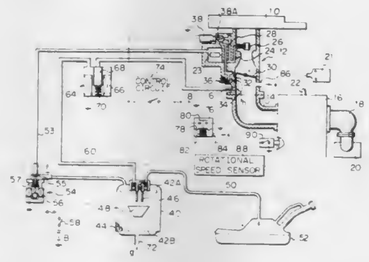
a throttle valve arranged in the intake system;

fuel passageway means opened to the intake system at a position downstream of the throttle valve in its idle position;

a canister provided therein with a layer for absorbing vaporized fuel, said canister having a purge air inlet on one side of the layer and a purge air outlet on the other side of the layer;

second passageway means for connecting the outlet of the

canister with the intake system at a position always downstream of the throttle valve;
purge control valve means for controlling the introduction of vaporized fuel from the canister to the engine;
fuel-cut valve means for controlling the introduction of fuel from the fuel passageway to the engine;
fuel-cut means responsive to a predetermined deceleration condition of the engine for operating the fuel-cut valve means so that the fuel passageway means are closed, including
first sensor means for detecting a predetermined degree of throttle opening corresponding to the idle condition of the engine,



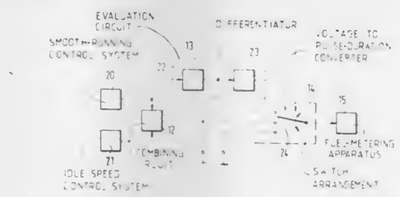
second sensor means for detecting an engine speed lower than a predetermined value, and
a first gate means responsive to signals from the first and the second sensor means for operating the fuel-cut valve
means to close the fuel passageway means when the throttle opening is smaller than the predetermined degree while the engine speed is higher than the first predetermined value; and
operating mens for closing the purge control valve means to prevent the introduction of vaporized fuel when the fuel is cut by the fuel-cut means and for opening the purge control valve means in accordance with the operating conditions, including at least engine speed, when the fuel is not cut.

4,630,582

ARRANGEMENT FOR RAPIDLY ADJUSTING AN ELECTROMAGNETIC LOAD ASSOCIATED WITH AN INTERNAL COMBUSTION ENGINE

Thomas Küttner; Max Straubel, both of Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,808
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337908
Int. Cl.⁴ F02M *51/00, 3/00;* F02P *33/00*
U.S. Cl. 123—339 **13 Claims**



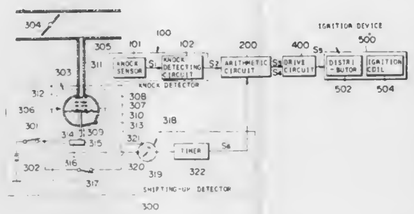
1. Arrangement for rapidly adjusting an electromagnetic load associated with an internal combustion engine or the like, the arrangement comprising:
first control means for generating a first signal for influencing said load;
second control means for generating a second signal for influencing said load;
combining circuit means for combining said first and said second signals to form one control signal for controlling said load;
said first control means having a priority status over said second control means;
evaluation means receiving and evaluating said first signal for generating an output influencing signal dependent thereon; and,
selection means for receiving both said control signal and said output influencing signal so as to permit said output influencing signal to influence said control signal applied to said load in dependence upon the evaluation performed in said evaluation means.

4,630,583

SPARK IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH RETARDING MEANS RESPONSIVE TO TRANSMISSION GEAR SHIFTING

Mikio Suzuki, Zushi, and Masafumi Yamazaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Dec. 4, 1981, Ser. No. 327,570
Claims priority, application Japan, Dec. 4, 1980, 55-171325
The portion of the term of this patent subsequent to Sep. 23, 2001, has been disclaimed.
Int. Cl.⁴ F02P *5/14*
U.S. Cl. 123—425 **16 Claims**



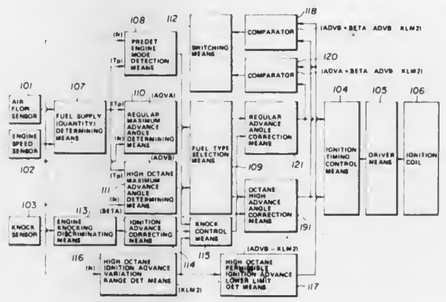
1. A spark ignition timing control system for an internal combustion engine of a vehicle having a transmission comprising:
an ignition device for causing spark ignition of the engine at a controlled timing;
a first sensor for detecting engine speed and producing a first sensor signal which has a value proportional to the detected engine speed;
a second sensor for detecting a knocking condition of the engine and producing a second sensor signal having a value proportional to the magnitude of engine knocking;
a third sensor for detecting the first sensor signal value indicative of the engine speed at which a shifting-up of a gear position of said transmission occurs and producing a third sensor signal when the transmission gear upshifting first sensor signal value is detected; and
control means for controlling a spark advance angle of said spark ignition based on the first sensor signal value and second sensor signal value, which control means is responsive to said third sensor signal to retard the spark advance angle.

4,630,584

FUEL OCTANE RESPONSIVE INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Kazuhiro Higashiyama, Ebina, and Kazuhiro Ishigami, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 28, 1985, Ser. No. 717,102
Claims priority, application Japan, Apr. 5, 1984, 59-68035
Int. Cl.⁴ F02P *5/145*
U.S. Cl. 123—425 **9 Claims**



1. In an internal combustion engine having a combustion chamber
a first sensor for sensing a parameter which varies with the presence of knocking phenomena in the combustion chamber of said engine;
a second sensor for sensing the load on said engine;
a third sensor responsive to the rotational speed of said engine;
a spark generating arrangement for producing a spark in said combustion chamber; and
a control circuit responsive to the outputs of said first, second and third sensors for controlling the timing at which said spark is generated, said control circuit including control means for:
(a) causing said spark to be initially generated according to a first schedule suitable for fuel having a first octane value,
(b) sensing said engine entering a predetermined mode of operation;
(c) advancing the ignition timing until said first sensor detects said knocking phenomena;
(d) comparing the conditions under which said knocking occurs with pre-recorded data,
(e) determining the octane value of the fuel being combusted in said combustion chamber, and
(f) causing said spark to be generated according to a second schedule suitable for fuel having a second octane value higher than said first octane value in the event that the octane value of the fuel being combusted in said combustion chamber is determined to be higher than that for which said first schedule is suited.

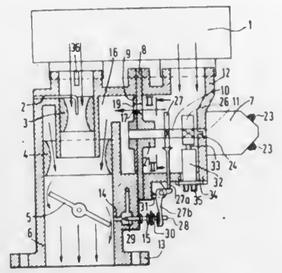
4,630,585

CARBURETING DEVICE FOR AN ENGINE

Jean Maraux, 43 Avenue Foch, 95170 Deuil la Barre, France

Filed Mar. 8, 1985, Ser. No. 709,734
Claims priority, application France, Mar. 9, 1984, 84 03652
Int. Cl.⁴ F02B *33/00*
U.S. Cl. 123—438 **3 Claims**

1. A carburetor for supplying at least one chamber of an internal combustion engine with an air-fuel mixture, the carburetor comprising:
a first conduit for carrying a fuel-rich mixture;
a second conduit for delivering air to the fuel-rich mixture;
adjustable constriction means located in the second conduit for setting the final fuel richness of the air-fuel mixture;
servo means, responsive to engine speed, connected to an actuating motor;
an adjustment member of the constriction means connected to the actuating motor for:
sealing the constriction means near engine idling speeds;
rapidly opening the constriction means at speeds slightly than idling;



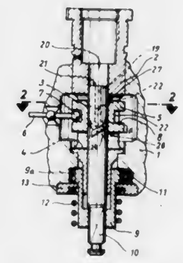
continuing to open the constriction means at a slower rate after engine speed exceeds a predetermined level corresponding to an enrichment cut-out condition;
wherein the servo means slightly delays movement of the adjustment member during engine speed increases so as to obtain fuel enrichment during engine acceleration.

4,630,586

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Josef Güntert, Gerlingen, and Walter Häfele, Fellbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,539
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428174
Int. Cl.⁴ F02M *37/04*
U.S. Cl. 123—500 **9 Claims**



1. A fuel injection pump for internal combustion engines comprising at least one rotatable pump piston having a jacket face provided with a longitudinal groove and defining a pump work chamber, a control slide on said piston, a radial diversion bore arranged to control an oblique groove on said pump piston jacket face, said control slide axially displaceable on said pump piston, said oblique groove further arranged to communicate with said pump work chamber via a conduit in said pump piston, the aforesaid longitudinal groove has an end arranged to communicate with an end of said oblique groove in proximity to said pump work chamber, and said longitudinal groove further including an end zone remote from said pump work chamber arranged to be uncovered by said control slide, at least at bottom dead center of said pump piston, whereby plunging of said pump piston into said control slide predetermines the supply onset of said injection pump.

4,630,587

FUEL INJECTION PUMP HAVING AN ADJUSTABLE INSTANT OF INJECTION

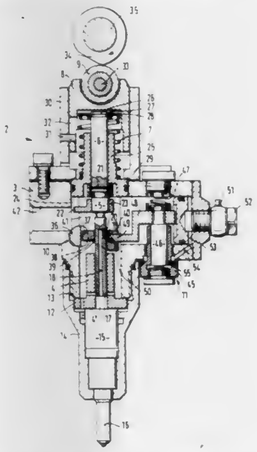
Gerald Höfer, Weissach-Flacht; Eberhard Hofmann, Kirchberg-/Murr; Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany; Francois Rossignol, Mornant, France; Reinhard Schwartz; Max Straubel, both of Stuttgart, Fed. Rep. of Germany, and Raymond Tissot, Genas, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 4, 1982, Ser. No. 432,600

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143073

Int. Cl.⁴ F02M *39/00, 59/28*

U.S. Cl. 123—502 **8 Claims**



1. A housed fuel injection pump for Diesel engines having a pump cylinder, a pump piston in said cylinder, said pump piston having at least one control recess, said pump piston being reciprocated by a cam means and a spring means and being rotatable for adjusting an injection quantity, a control sleeve secured against rotation and arranged to cooperate with said control recess for varying the injection quantity, said pump including a hydraulic adjusting means for varying the instant of injection, said hydraulic adjusting means being disposed in a pressure chamber, said pressure chamber comprises an adjusting cylinder which is disposed parallel to said pump cylinder and said hydraulic adjusting means further includes an adjusting piston, said adjusting piston and said adjusting cylinder are accommodated inside said housing of said injection pump, and further said control sleeve and said adjusting piston encircle said pump piston and comprise a one-piece structural component and are adjustable longitudinally of said pump piston.

4,630,588

FUEL INJECTION TIMING CONTROL SYSTEM

Ryuichi Sagawa; Osamu Nagata, both of Kobe, and Takashi Kajima, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,274

Claims priority, application Japan, Nov. 25, 1982, 57-207292; Nov. 25, 1982, 57-207293

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—506 **2 Claims**

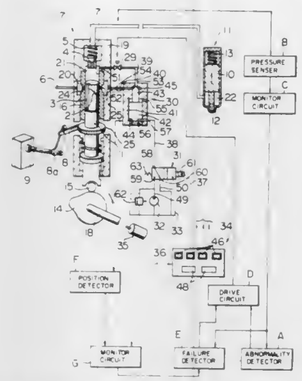
1. A fuel injection timing control system of an internal combustion engine comprising:

a fuel injection pump of a constant stroke type driven in synchronism with the operation of the internal combustion engine;

a fuel valve operative to automatically effect fuel injection by the pressure under which a fuel is discharged from said fuel injection pump, said fuel valve being connected to said fuel injection pump through a fuel injection pipe;

fuel return means including a return passage and a control valve in said return passage for controlling the return of fuel discharged from the fuel injection pump to a fuel source supplying the fuel to the fuel injection pump;

means for controlling the timing of operation of said control valve to vary the initiation of pressure output from the fuel injection pump and thereby the timing of fuel injection including an angle detector for detecting the crank angular position of the internal combustion engine, a setter



for setting a desired advance angle therein, and a comparator for comparing the crank angular position detected by said angle detector with the desired advance angle set in said setter and generating a signal responsive to the output from said comparator for actuating said control valve;

an independent solenoid-operated cut-off valve mounted in said return passage;

a means for sensing an abnormality in fuel injection timing and producing a signal representative thereof; and

a drive means for closing said cut-off valve to prevent return fuel flow through said return passage responsive to the signal from said abnormality sensing means.

4,630,589

EXHAUST GAS RECIRCULATION METHOD FOR INTERNAL COMBUSTION ENGINES

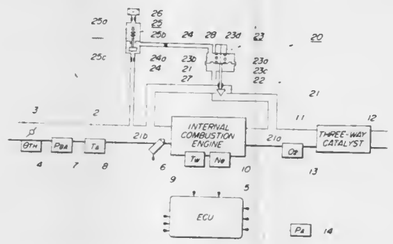
Makoto Hashiguchi, Kawagoe, and Yohji Fukutomi, Sayama, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 773,818

Claims priority, application Japan, Sep. 11, 1984, 59-188948

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—571 **4 Claims**



1. A method of controlling exhaust gas recirculation in an internal combustion engine having an exhaust passage, an intake passage, and a throttle valve arranged in said intake passage, by means of an exhaust gas recirculation control system including an exhaust recirculating passage connected between said exhaust passage and said intake passage, an exhaust gas recirculating valve arranged across said exhaust gas recirculating passage, and differential pressure-operated actuator means for varying the opening of said exhaust gas recirculating valve, said differential pressure-operated actuator means having a pressure-responsive member having one side surface acted upon by atmospheric pressure, and another side surface by a synthetic pressure of pressure within said intake passage at a zone downsteam of said throttle valve and atmospheric pressure wherein said pressure-responsive member is displaceable in response to a pressure difference between the atmospheric pressure applied to said one side surface thereof and said synthetic pressure of said intake passage pressure and atmospheric pressure, applied to said another side surface thereof, said differential pressure-operated actuator means being adapted to vary said synthetic pressure in response to at least one operating parameter of said engine to control said exhaust gas recirculating valve, the method comprising the steps of: (1) detecting the atmospheric pressure and the pressure within said intake passage at said zone downstream of said throttle valve; (2) determining a difference between the detected value of atmospheric pressure and the detected value of the pressure within said intake passage; and (3) controlling said exhaust gas recirculating valve to a fully closed position when the determined pressure difference is smaller than a predetermined value.

4,630,590

INTERNAL COMBUSTION ENGINE APPARATUS

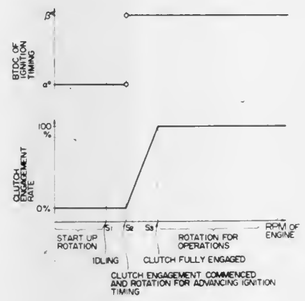
Tadashige Kondo, Nerima, and Hisashi Inaga, Suginami, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 744,694

Claims priority, application Japan, Jun. 27, 1984, 59-95182[U]

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—602 **2 Claims**



1. An internal combustion engine apparatus comprising, in combination,

an internal combustion engine having an ignition system capable of step advance when a predetermined engine speed is reached between low and high ranges of engine speed; and

a centrifugal clutch connected to an output shaft of said internal combustion engine, said centrifugal clutch being engaged and disengaged at substantially said predetermined engine speed.

4,630,591

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINES

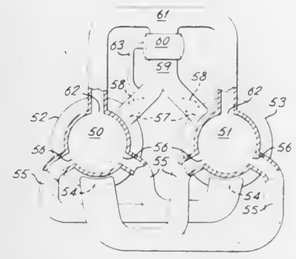
Bernard Hooper, Stourbridge, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 467,166, Feb. 16, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,069

Claims priority, application United Kingdom, Feb. 17, 1982, 8204716

Int. Cl.⁴ F02B *75/02*

U.S. Cl. 123—65 S **7 Claims**



1. A stratified-charge, stepped piston, two-stroke internal combustion engine comprising:

at least first and second stepped cylinders;

a first stepped piston movable within said first stepped cylinder and defining therewith first and second working spaces of variable volume, said first working space constituting a volume in which a firing force is generated by which said first piston is driven, and said second working space being adapted to contribute to a pumping action;

a second stepped piston movable within said second cylinder and defining therewith third and fourth working spaces of variable volume, said third working space constituting a volume in which a firing force is generated to drive said second piston and said fourth working space being adapted to contribute to a pumping action;

a first connection between said second working space and said third working space and a second connection between said fourth working space and said first working space, said first and second connections being without intercommunication and serving main transfer passages wherein combustion air necessary for the generation of the firing forces operable upon said second and first pistons is generated;

a third connection between said second working space and said third working space and a fourth connection between said fourth working space and said first working space;

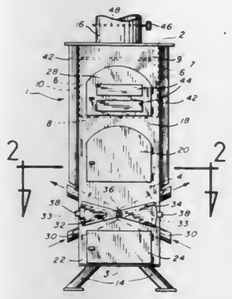
said third and fourth connections being interconnected at a meeting point, a first non-return valve positioned in said fourth connection between said fourth working space and said meeting point, wherein said third and fourth connections are adapted to act as a common auxiliary transfer passage system such that further combustion air may pass from said second to said third working space and from said fourth to said first working space;

fuel supply means for supplying fuel to be mixed with said further combustion air flowing to said first and said third working spaces, and located within said auxiliary transfer passage system in proximity to said meeting point; and

regulator means being provided within said fuel supply means and associated with the flow of said further combustion air within said auxiliary transfer passage system in proximity to said meeting point, for regulating the rate of said supply of fuel so that said rate of fuel supply bears a predetermined relationship to said air flow within said auxiliary transfer passage system.

4,630,592
WOOD STOVE
Ludger Larabie, R.R. 2, Kapuskasing, Ontario, Canada P5N 2X8

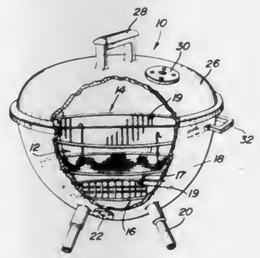
Filed Jun. 24, 1985, Ser. No. 748,220
Int. Cl.⁴ F24C *1/14*
U.S. Cl. 126—4 **4 Claims**



1. A stove comprising an enclosure having a front wall, a rear wall, top and bottom walls, and two side walls, a smoke outlet made in said top wall, an upper and a lower partition fixedly mounted to said walls in vertically-shaped relationship within said enclosure, intermediate and parallel to said top and bottom walls, a smoke space, and a cooking oven space being defined above said upper partition and between said upper and lower partitions, respectively, a grate extending within said enclosure intermediate said lower partition and said bottom wall, a combustion chamber and an ash-pit being defined above and below said grate, respectively, an air intake for said combustion chamber, said grate comprising a plurality of hollow cylindrical metallic ducts, which criss cross in order to form an X and which open outwardly at each end, the ends of each duct extending through and fixed to said side walls permitting the ambient air to circulate through said ducts; each of said ducts having an intermediate crossing portion that is substantially flattened, said grate being able to support a solid combustible, yet allowing therethrough by gravity the cinders into said ash-pit; a plurality of lateral semi-cylindrical upright pipes closed at both ends and fixedly secured to and projecting from the exterior face of each of said side walls between said top wall and the outer ends of said ducts, said side walls having first and second openings making communication between said combustion chamber and said pipes and between the latter and said smoke space, respectively.

4,630,593
BARBECUE GRILL WITH FIRE RETARDING SCREEN
Ernest J. Gremillion, P.O. Box 556, Larose, La. 70373

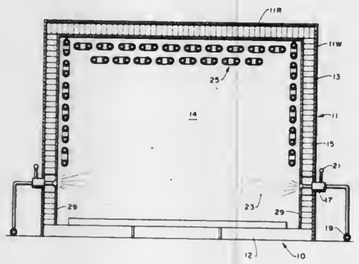
Filed Sep. 27, 1985, Ser. No. 780,986
Int. Cl.⁴ A47J *37/07;* **F24B** *13/02*
U.S. Cl. 126—25 R **4 Claims**



1. In combination with a barbecue grill which includes a food product cooking grill supported in generally a horizontal plane for supporting food articles to be cooked thereon and a fuel burning assembly located below the cooking grill for cooking the food products on the grill, the improvement comprising a fire retarding screen, and means supporting the fire retarding screen in spaced parallel relation below the cooking grill and above the fuel burning assembly to retard flare up of flame from grease or fat drippings dropping onto and accumulating in the fuel burning assembly and subject to flame flare-up when supplied with oxygen resulting in charring of the food products and danger to the user of the grill, said fire retarding screen including metal wire members woven into a mesh with small passageways to retard flame passing upwardly therethrough with the passageways being of a size to retard any flame passing therethrough, said fuel burning assembly producing high heat intensity in the retarding screen for immediately dissipating grease and/or fat drippings dripping thereon, said means supporting the fire retarding screen including a plurality of hook-shaped clips, means movably connecting the hook-shaped clips to the fire retarding screen to enable the clips to move to a position against the fire retarding screen to be packaged, stored and transported in a compact condition, said clips including hooks on the free ends thereof for detachable hooking engagement with the food grill to support the fire retarding screen suspended below the grill with the fire retarding screen and clips being removable with the cooking grill to enable access to the fuel burning assembly without separation of the fire retarding screen from the cooking grill.

4,630,594
FURNACE WALL LINING COMPOSITION AND THE USE THEREOF
Russell R. Ellersick, 600 Commerce Dr., Suite A, Roseville, Calif. 95678

Continuation-in-part of Ser. No. 473,759, Mar. 9, 1983, abandoned. This application Feb. 6, 1985, Ser. No. 698,613
Int. Cl.⁴ F24C *15/08*
U.S. Cl. 126—64 **7 Claims**



1. An improved natural gas or heating oil fired furnace which furnace has tubes therein for the formation of super heated steam or for the carrying out of chemical reactions, and which furnace further comprises a chamber lined with an insulative material, the improvement comprising: a combination of said insulative material, and an infrared ray reflecting composition thereupon, said reflecting composition adapted to impede penetration of infrared rays through said insulative material, said composition comprising:

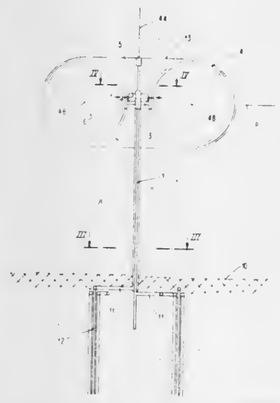
1 to 50% of an aqueous slurry having an acidic pH of a chromate-phosphate binder and dispersed aluminum particles,

50 to 90% of a coating cement comprised of
about 38% of Al_2O_3
about 58% SiO_2
about 0.7% Na_2O
about 0.3% MgO
about 0.7% Fe_2O_3

about 1.5% TiO_2
an trace organics about 0.6%
1 to 5% of a suspended amorphous silica hardener the total being 100%.

4,630,595
ENERGY COLLECTOR FOR HEAT PUMP INSTALLATIONS
Erhard Ledwon, Tannenweg 29, D-6340 Dillenburg 3, and Willibald Lang, Lorenz-Oechsler-Weg 13, D-7590 Achern 2, both of Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,269
Int. Cl.⁴ F24J *2/00*
U.S. Cl. 126—417 **8 Claims**

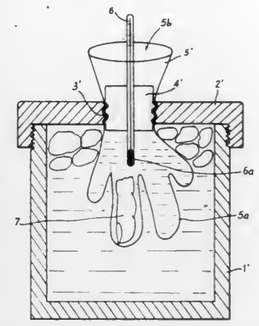


1. Energy collector for an outdoor heat pump installation, comprising an upright stand and an air-heat exchanger body through which a heat transport medium is to be conducted, said body mounted on said stand and comprising helical tubular coil means for conducting the heat transport medium, said coil means extending helically about a helix axis, said helix axis being endless about a main axis such that said coil means forms a toroid and said endless helix axis defines a plane disposed perpendicularly to said main axis.

4,630,596
EMERGENCY CONTAINER FOR AN ACCIDENTALLY AMPUTATED MEMBER
Patrick Hales, 25 Allée de la Fontaine au Blanc, 78860 St Nom La Breteche; Jean-Pierre Laurier, Le Moulin de la Bonde, 78121 Crespieres, and Gerard Pradet, 5 rue des Gate-Ceps, 92210 Saint-Cloud, all of France

Filed Feb. 21, 1985, Ser. No. 703,841
Claims priority, application France, Feb. 24, 1984, 84 02822; Nov. 13, 1984, 84 17309
Int. Cl.⁴ A61F *7/10, 17/00*
U.S. Cl. 128—1 R **12 Claims**

1. A portable emergency container for conserving an accidentally amputated member, the container comprising: a rigid, open topped receptacle having thermally insulating walls and a thermally insulating base, said receptacle being adapted to hold iced water, a thermally insulating cover for closing the open top of the receptacle, said cover defining a through opening, a bag of flexible material adapted to carry an amputated member and be immersed in iced water inside the receptacle with an opening of the bag coinciding with the opening of the cover, and a stopper for simultaneously closing the openings in both the cover and the bag to thereby maintain an amputated



member at a near freezing temperature to implement the prolonged conservation of said member.

4,630,597
DYNAMIC AORTIC PATCH FOR THORACIC OR ABDOMINAL IMPLANTATION
Adrian Kantrowitz, 70 Gallogly Rd., Pontiac, Mich. 48055, and Paul S. Freed, 1486 Sodon Ct., Bloomfield, Mich. 48013

Filed Apr. 30, 1984, Ser. No. 604,944
Int. Cl.⁴ A61F *1/24;* **A61M** *1/03*
U.S. Cl. 128—1 D **3 Claims**



1. In a dynamic aortic patch or the like adapted to be positioned in a aorta including a flexible bladder means in contact with blood passing through the aorta, the bladder means adapted to be cyclically inflated and deflated and conduit means for conducting fluid to and from the interior of said bladder to inflate and deflate said bladder means; the improvement wherein said bladder means comprises an elongate semi-rigid shell member having an outer surface and a concave inner surface terminating at a smoothly rounded, continuously curved peripheral side edge located between the concave inner surface and the outer surface, and a flexible, air-tight membrane bonded to said shell member continuously along the outer surface of the shell membrane immediately adjacent to the entire peripheral side edge and defining an enclosed internal chamber between said membrane and said concave inner surface of said shell membrane, said membrane having a surface area substantially equal to the surface area of said inner surface whereby said membrane lies in substantially smooth, face-to-face contact with said inner surface when said bladder means is deflated, passage means extending through said shell member for placing said internal chamber in fluid communication with said conduit means.

4,630,598

URETERO-RENOSCOPE

Ludwig Bonnet, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,678

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 8416392[U]

Int. Cl.[4] A61B *1/30*

U.S. Cl. 128—7 **9 Claims**



1. In an uretero-renoscope comprising a hollow main shaft with axial passage means therethrough for receiving both an optical system with an outer surface and an auxiliary instrument with an outer surface and for the passage of a scavenging fluid, an improvement comprising said axial passage means being formed by a single inner shaft being received within said hollow main shaft, said inner shaft having an axial passage therethrough and having a smaller cross-sectional area than the inner cross-section of said hollow main shaft to divide said inner cross-section into two separate passages with inner surfaces to separately accommodate said optical system and said auxiliary instrument respectively, each of said two separate passages with the respective optical system and auxiliary instrument in position a providing free space between the inner surface of each passage and an outer surface for the passing of scavenging fluid so that the inflow and outflow of said scavenging fluid can proceed simultaneously.

4,630,599

HYDROMASSAGE APPARATUS

Matthew J. Perovick, Cleve, and James W. Lang, Lakewood, both of Ohio, assignors to Unidyne, Inc., Cleveland, Ohio

Filed Jan. 31, 1986, Ser. No. 824,540

Int. Cl.[4] A61H *9/00*; A47K *3/10*

U.S. Cl. 128—66 **14 Claims**



1. A hydromassage apparatus for producing whirlpool action in a conventional bathtub having a water inlet conduit and drain valve control in association with one wall of the bathtub, said hydromassage assembly adapted to be partially immersed in the bathtub filled with a supply of liquid, said hydromassage assembly comprising;

a housing having a pair of leg portions positionable adjacent opposing sides of the drain valve control and downward the one side of the bathtub, said leg portions having lower portions thereof adapted to be immersed in the bathtub when filled with a supply of liquid;

said housing having an intermediate portion interconnecting said leg portions;

said housing having an inlet chamber, said inlet chamber having at least one inlet opening in each of said lower immersed portions for receiving liquid contained in the bathtub into said inlet chamber, said inlet chamber extending between said inlet openings of said lower immersed portions of said leg portions;

said housing having an outlet chamber, said outlet chamber having at least one opening in each of said lower immersed portions of said leg portions for allowing pressurized liquid to flow therefrom and provide a hydromassage whirlpool action, said outlet chamber extending between said outlet openings of said lower immersed portions of said leg portions;

said intermediate portion of said housing having a front face contoured to allow water to flow from the water inlet conduit into the bathtub;

said intermediate portion of said housing having a side face contoured to allow mounting of the housing adjacent the drain valve control without impeding the operation thereof; and

said hydromassage apparatus including means for connecting said inlet chamber to a pump for receiving liquid from said inlet chamber and means for connecting the pump to said outlet chamber of said housing for providing the flow of pressurized liquid from the pump to said outlet chamber.

4,630,600

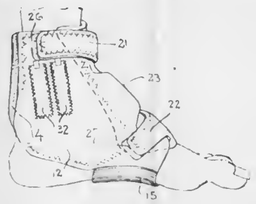
ANKLE BRACE AND PROTECTOR

Treesa Spencer, and Terry Alberta, both of Santa Ana, Calif., assignors to Pro-Tec Sports, Inc., Santa Ana, Calif.

Filed Feb. 18, 1986, Ser. No. 830,325

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 R **7 Claims**



1. A device for protecting and bracing the ankle and adjacent portions of a user's foot comprising

a pair of similar opposing side pads adapted to fit against said ankle portion, said side pads having rear and bottom edges,

first elastic strap means for joining together the rear edges of said side pads,

second elastic strap means for joining together the front portions of the bottom edges of said side pads, there being a space between the first and second elastic strap means for receiving the user's heel,

flap portions extending laterally from each of said side pads, each of said flap portions having cinch strap means extending therefrom for cinching the side pads against the user's ankle, and

front pad member means attached to one of said side pads for covering and protecting the user's instep.

4,630,601

BONE NAIL FOR THE TREATMENT OF FRACTURES

Hans E. Harder, Probsteierhagen, and Hermann Kramer, Neumunster, both of Fed. Rep. of Germany, assignors to Howmedica International, Inc., Kiel, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,887

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 8214493[U]; European Pat. Off., Mar. 18, 1983, 83102694.3

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YZ **11 Claims**



1. A thin, flexible and resilient bone nail for the treatment of fractures in the proximal femur zone, comprising a distal end portion adapted to be disposed at the outer surface of the femoral condyle, said distal end portion including a coupling portion for engagement with a driving tool, a proximal end portion adapted to be seated in the natural femoral head and having a free end, and a curved intermediate portion between said end portions, with said proximal end portion being provided at the free end thereof with a rounded-off thickened portion having a flattened proximal surface angulated at such a non-perpendicular angle with respect to the segment of said proximal end portion immediately adjoining said rounded-off thickened portion that said surface lies approximately normal to the direction of physiological loading of the natural femoral head when said proximal end portion is seated therein in use.

4,630,602

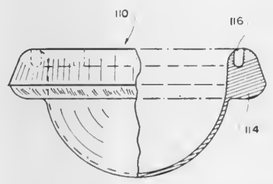
DISPOSABLE CONTRACEPTIVE CERVICAL BARRIER

Melvyn B. Strickman, R.D. 1, Lawrence Rd., Bridgeton, N.J. 08302, and Erick-Pierre Fournier, 30 Park Ave., New York, N.Y. 10016

Filed Mar. 29, 1984, Ser. No. 594,933

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—127 **7 Claims**



1. A disposable contraceptive cervical barrier comprising:

a substantially bowl-shaped thin flexible member;

a substantially circular rim portion unitary with said flexible member adjacent the upper portion thereof, said rim portion being substantially thicker than said flexible member and defining a means for achieving a spring tension effect;

said rim portion extending only outwardly from said flexible member such that the inner surface of said bowl-shaped member adjacent the upper portion thereof is substantially smooth, and

a plurality of cavities formed in said rim portion, said cavities being open so as to be capable of receiving and holding a quantity of a spermicide.

4,630,603

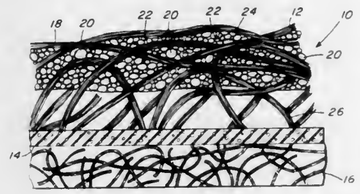
WOUND DRESSING

John M. Greenway, Westwood, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 13, 1986, Ser. No. 829,587

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 **5 Claims**



1. A wound dressing comprising at least one ply of an aerated latex microsized porous bacterial barrier fabric, having an adhesive disposed on at least one surface of said fabric, and a nonwoven pad material disposed on said adhesive and secured thereby.

4,630,604

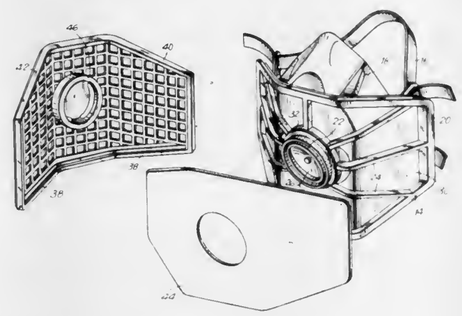
VALVE ASSEMBLY FOR A REPLACEABLE FILTER RESPIRATOR

Edward N. Montesi, Barrington, R.I., assignor to Siebe North, Inc., Charleston, S.C.

Filed Apr. 9, 1985, Ser. No. 721,284

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—206.15 **1 Claim**



1. In a half mask of the type including:

a face piece,

a valve assembly rigidly affixed to said face piece and providing an exhalation valve having an inlet and an outlet defining a cylindrical valve seat for an exhalation valve, and, an inhalation valve having an inlet and an outlet defining an annular valve seat for an inhalation valve arranged concentrically with and radially outwardly of said exhalation valve;

valve members cooperating with said respective valve seats; and,

filter element means in communication with said annular valve seat: the improvement comprising:

said face piece being formed from a resilient and compliant material;

a substantially rigid imperforate wall member integral with and completely surrounding said annular valve seat and extending radially outwardly thereof;

said imperforate wall member terminating at its outer periphery in a continuous peripheral flange extending forwardly of said wall member and then outwardly thereof to define a shallow recess at the front of said wall member;

ribs on said wall member extending forwardly thereof and in directions generally radially of said valve assembly, said ribs defining channels on the front face of said wall member which communicate with said inlet of said annular inhalation valve seat;

a layer of filter material co-extensive with said imperforate wall member and overlying said ribs;

a perforate frame member co-extensive with said wall member and overlying said filter material, said frame member having a central opening and a cylindrical extension surrounding said opening for spigotal cooperation with said cylindrical valve seat of said exhalation valve;

latch means integral with said frame member and for latching cooperation with the outwardly extending portion of said wall flange; and,

harness attachment means on a rearmost face of said wall for attaching said half mask to the head of a user;

said wall, said filter element and said frame extending laterally toward both sides of said face piece in dihedral formation and presenting a maximized filtering surface area of said filter.

4,630,605

RESPIRATOR CONTROL DEVICE

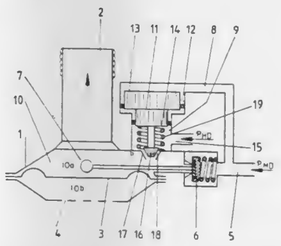
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,560

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422023

Int. Cl.⁴ A62B *9/02*

U.S. Cl. 128—205.24 **3 Claims**



1. A device for use with a respirator having a breathing gas supply and a pressure gas supply, comprising a housing having a hollow space, a diaphragm extending across the hollow space dividing the space into an ambient side communicating with the atmosphere and a high pressure side having a nipple connection for the supply of a patient, a medium pressure supply line connected to the breathing gas supply and to the high pressure side of said housing hollow space, a swivel valve in said medium pressure supply line having an actuator extending into the high pressure side and positioned to be moved by said diaphragm during pressure changes in said housing hollow space to open and close said valve, a high pressure connection to said housing high pressure side and to said pressure gas supply, a high pressure piston valve in said high pressure connection including a valve cylinder having a small diameter portion connected to said high pressure connection and a larger diameter portion having a larger diameter than said small diameter portion connected to said medium pressure supply line upstream of said swivel valve, a valve member for opening and closing said piston valve having a large diameter piston portion in said large diameter cylinder portion with a top end area exposed to connection pressure of said pressure gas supply connection and a small diameter portion having a bottom end area exposed to said high pressure connection, spring biasing said piston valve to an open position and acting with said large diameter piston portion and said small diameter piston portion to regulate flow into the high pressure side of said housing, said swivel valve providing normal access for the respiratory gas in the medium pressure to the high pressure side of said machine housing and said high pressure connection of said piston valve to said supply connection permitting direction high pressure gas flow into the high pressure side of said housing through said piston valve, which valve opens upon failure of the medium pressure supply.

4,630,606

DEVICE FOR DETERMINING AND EVALUATING THE PRESSURE IN A BALLOON SLEEVE OF A CLOSED TRACHEAL TUBE

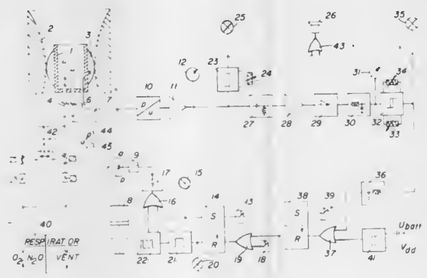
Hilko Weerda, Bad Krozingen, and Peter Pedersen, Freiburg, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,100

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327342

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—207.14 **17 Claims**



1. A device for determining and acting upon the pressure in a balloon sleeve of a closed tracheal tube, with inflation means connected to the sleeve for inflating and deflating the sleeve, comprising:

a tracheal tube;

a balloon sleeve surrounding said tube;

inflation means, connected to said sleeve, for inflating said sleeve;

deflation means connected to the inflation means for deflating the sleeve;

a cannula connected to the sleeve and to the inflation means for inflating the sleeve;

a pressure-to-voltage converter connected to said cannula for generating a first voltage signal corresponding to an instantaneous static pressure in the sleeve; and

voltage signal processing means connected between said converter and said deflating means for producing a deflation signal when a frequency of variations of pressure in the sleeve is out of a selected range of frequencies for a selected period of time, said deflation signal being applied to said deflation means for deflating the sleeve.

4,630,607

APPARATUS FOR THE NON-CONTACT DISINTEGRATION OF STONY OBJECTS PRESENT IN A BODY BY MEANS OF SOUND SHOCKWAVES

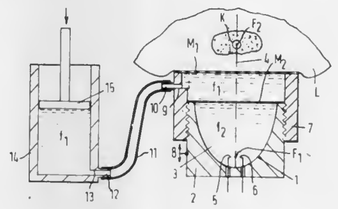
Simon Duinker, Bloemendaal, and Hendrik Mulder, Delft, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft" , Netherlands

Filed Jul. 18, 1984, Ser. No. 632,209

Claims priority, application European Pat. Off., Jul. 19, 1983, 83201075.5

Int. Cl.⁴ A61B *17/22*

U.S. Cl. 128—328 **14 Claims**



1. An apparatus for the non-contact disintegration of a concrement present in a body by means of sound shockwaves, which comprises:

a reflector block having a reflector chamber defining a reflective axis, said reflector chamber being filled with a liquid, said reflector chamber having a surface rotary symmetry in a semi-elliptical cross-sectional configuration defining a first focus for generating sound shockwaves and a second focus for focusing reflected sound waves generated at said first focus;

means for generating said shockwaves at said first focus;

a rigid coupling member disposed on said reflector block for contacting said body, said coupling member being filled with a liquid;

means for axially adjusting said coupling member with respect to said reflector block; and

means for angularly adjusting said coupling member with respect to said reflector block, said adjusting means permitting alignment of said second focus to coincide with said concrement present in said body.

4,630,608

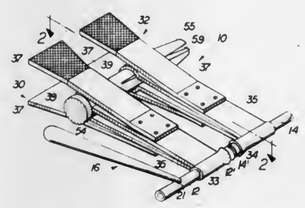
SURGICAL INSTRUMENTATION INCLUDING A CLAMP ASSEMBLY TO FACILITATE ATTACHMENT OF BLOOD VESSEL SECTIONS

Juan Arroyo, 12200 SW. 93 St., Miami, Fla. 33186

Filed Jun. 12, 1985, Ser. No. 743,940

Int. Cl.⁴ A61B *17/08, 17/00*

U.S. Cl. 128—335 **21 Claims**



1. A surgical instrumentation assembly of the type primarily designed for the attachment of blood vessel sections about correspondingly positioned open ends thereof and in aligned relation to one another, said assembly comprising:

(a) support means for aligned positioning of the vessel sections relative to one another and structured for interior, supporting engagement of both vessel sections,

(b) said support means including an elongated portion disposable in coaxial relation concurrently within both vessel sections,

(c) positioning means structured for exterior engagement with said vessel sections and aligned positioning and maintenance of the open ends into attachable position relative to one another,

(d) said positioning means comprising a sleeve element for each vessel section, each sleeve element positionable into at least partially surrounding and engaging relation with the respective vessel section,

(e) each sleeve element comprising a proximal end disposable adjacent the open end of the respective vessel sections, each of said proximal ends dimensioned and structured for engagement and maintenance of the respective open end into said attachable position,

(f) securement means for positioning said sleeve elements relative to one another and structured for interconnecting said sleeve elements to one another for maintenance thereof into engageable relation with said respective vessel sections, and

(g) said support means and said sleeve elements relatively structured and dimensioned to maintain the respective vessel sections in sandwiched relation therebetween and the open ends of the vessel sections in said attachable position.

4,630,609

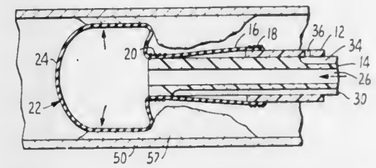
DILATATION CATHETER METHOD AND APPARATUS

Albert K. Chin, San Franscisco, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Filed May 14, 1981, Ser. No. 263,776

Int. Cl.⁴ A61M *29/02*

U.S. Cl. 128—344 **5 Claims**



3. A dilatation catheter for occluded blood vessels comprising a tubular carrier, a first balloon having proximal and distal end portions attached to said carrier at the distal end portion thereof, a second balloon having a proximal end portion attached to said carrier at the distal end thereof adjacent the distal end portion of said first balloon and having a free end inverted within said carrier, and means to selectively pressurize and depressurize said balloons, said first balloon being radially expansible and contractible in response to pressurization and depressurization, said second balloon being evertable from said carrier and longitudinally expansible without substantial lateral expansion under pressurization and thereafter laterally expansible under increased pressurization.

4,630,610

SURGICAL VEST

Jo Ann Fletcher, 220 Carroll Dr., St. Clairsville, Ohio 43950

Filed Jul. 26, 1985, Ser. No. 759,251

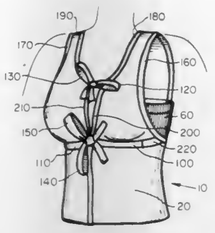
Int. Cl.⁴ A41C *3/00*

U.S. Cl. 128—501 **10 Claims**

1. An article of apparel, comprising:

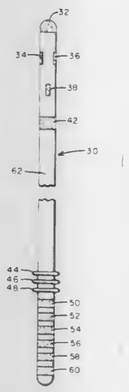
a thoracic sheath having at least one external strap means thereon which extends, when in position on a wearer; generally from the area of the sternum to a point generally under the arm, and which is attached at each of its ends to

said thoracic sheath both in the area of the sternum and at a point generally under the arm, whereby said external



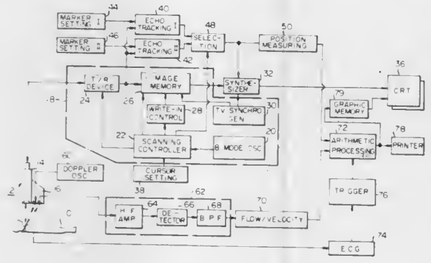
strap means positions below and supports the natural or prosthetic breast of the wearer.

4,630,611
ORTHOGONALLY-SENSING LEAD
Wendell L. King, North Oaks, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Feb. 2, 1981, Ser. No. 230,572
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **4 Claims**



1. A body implantable lead comprising:
first, second, third, fourth, fifth, and sixth electrodes mutually insulated from one another and arranged as three electrode pairs;
an elongated lead body means for disposing said first, second, third, fourth, fifth, and sixth electrodes in substantially fixed relationship to one another, arranged such that said three electrode pairs define three mutually orthogonal sensing vectors;
first, second, third, fourth, fifth, and sixth connector means for simultaneously coupling said first, second, third, fourth, fifth, and sixth electrodes to a monitoring device; and
first, second, third, fourth, fifth, and sixth mutually insulated conductors extending along said lead body means each having a proximal end respectively coupled to said first, second, third, fourth, fifth, and sixth connector means and a distal end respectively coupled to said first, second, third, fourth, fifth, and sixth electrodes.

4,630,612
ULTRASONIC DIAGNOSTIC APPARATUS
Rokuroh Uchida; Katsuhiko Nagasaki; Yasunori Miyake, all of Tokyo; Michio Ohno, Kawasaki; Hitoshi Takeichi, Kawasaki, and Hiroji Matsumoto, Kawasaki, all of Japan, assignors to Aloka Co., Ltd., Tokyo and Hayashi Electric Co., Ltd., Kanagawa, both of, Japan
Filed May 25, 1984, Ser. No. 614,432
Claims priority, application Japan, May 25, 1983, 58-90765; May 25, 1983, 58-90766; May 25, 1983, 58-77587[U]
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **11 Claims**

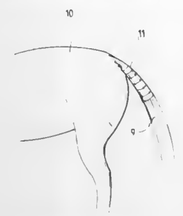


1. An ultrasonic diagnostic apparatus comprising an ultrasonic probe which transmits and receives an ultrasonic wave signal to and from a portion under examination which includes a moving member, a transmission and reception circuit coupled to said ultrasonic probe for controlling the pulse transmission and reception operation of the ultrasonic probe, a B-mode display for displaying a B-mode tomographic image in accordance with an ultrasonic B-mode image signal received from the transmission and reception control circuit, a cursor setting device for supplying to the transmission and reception control circuit a cursor position signal in order to display a cursor at a desired scan position of the B-mode display, at least one echo tracking circuit coupled to said B-mode display for causing at least one marker to track the video signal of the moving member at a desired position on the cursor in response to the receipt of an initial marker signal, at least one marker setting device for supplying to the echo tracking device said initial marker signal for setting the initial position of the marker on the cursor, a synthesizer coupled to said transmission and reception control circuit and said echo tracking circuit for synthesizing and sending to the B-mode display the B-mode image signal from the transmission and reception control circuit and the marker image signal from the echo tracking circuit, and a position measuring circuit coupled to said echo tracking circuit for measuring the position of the moving member on the cursor in accordance with the marker image signal from the echo tracking circuit.

4,630,613
PULSE DETECTION
Christopher J. Dennis, Harrogate, England, assignor to Equipaid Limited, West Yorkshire, England
Filed Jun. 27, 1983, Ser. No. 508,278
Claims priority, application United Kingdom, Jun. 26, 1982, 8218563
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—687 **3 Claims**

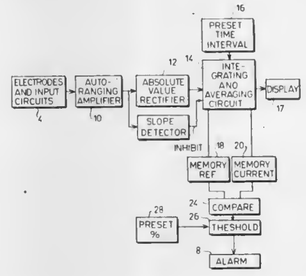
1. A method for monitoring the pulse rate of an animal having a tail with a root attached to the body of the animal, the methd comprising: detecting the pulse at the root of the tail of said animal, producing a pulse signal corresponding to said pulse of said animal, transmitting said pulse signal to a remote signal analyzer which includes a pulse indicator means which

is responsive to analyzed signals, and exhibiting on the indica-



tor means at least one characteristic of the pulse of the animal.

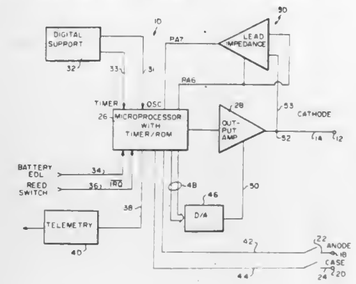
4,630,614
APNEA MONITORING APPARATUS
Dan Atlas, Mashabim 20, Hod Hasharon, Israel
Filed Mar. 5, 1985, Ser. No. 708,416
Claims priority, application Israel, Apr. 8, 1984, 71468
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—721 **8 Claims**



1. Apparatus for monitoring a subject to detect the occurrence of apnea, comprising:
a plurality of electrodes to be applied to spaced points on the subject for detecting the respiration rate and respiration amplitude of the subject by the change in electrical impedance between said spaced points;
computing means including an averaging circuit averaging the detected respiration rate and respiration amplitude over a predetermined time interval covering a plurality of breaths of the subject and computing therefrom the average respiration volume of the subject;
storage means for storing, as a reference average volume, the average respiration volume of the subject during an initial time interval, and also for storing, as current average volumes, the average respiration volume of the subject during subsequent time intervals;
comparing means for comparing each of said current average respiration volumes with said reference average respiration volume; and
signalling means actuated to indicate the occurrence of apnea whenever a current average respiration volume falls below said reference average respiration volume by a predetermined percentage.

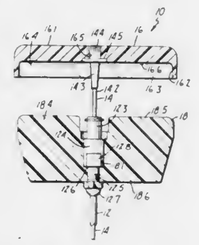
4,630,615
APPARATUS FOR MEASURING IMPEDANCE
Barry M. Yomtov, Cooper City, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed May 21, 1984, Ser. No. 612,553
Int. Cl.[4] H61B *5/00*
U.S. Cl. 128—734 **13 Claims**

1. In a neural stimulating apparatus of the type comprising a cathode adapted to be juxtaposed to the spinal cord in a body, in anode adapted to be placed in contact with the body, means for generating constant current output pulses which are supplied to the cathode, a cathode lead coupled between the pulse generating means and the cathode for carrying the pulses to the cathode and means for controlling (a) the generation of pulses and (b) the supplying of pulses to the cathode, the improvement comprising means coupled to the cathode lead for measuring changes in the cathode impedance at the connection of said pulse generating means to the cathode lead, said means for measuring changes in the cathode impedance comprising means for comparing the voltage pulses at which the constant



current pulses are being supplied to the load with an increasing reference voltage, means for counting the number of voltage pulses that are greater in magnitude than the increasing reference voltage over a sampling period, and means for correlating said count of pulses over the sampling period with the impedance of the load presented by the lead and connections to tissue required to generate that number of constant current pulses at the voltage required for same.

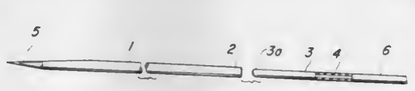
4,630,616
BONE MARROW NEEDLE
Carl W. Tretinyak, Rochester, Minn., assignor to Berkley and Company, Inc., Spirit Lake, Iowa
Continuation of Ser. No. 621,135, Jun. 15, 1984, abandoned, which is a continuation of Ser. No. 225,048, Apr. 17, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 766,681
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—753 **2 Claims**



1. A bone marrow biopsy needle assembly, comprising:
(a) an elongated tubular cannula having an axially extending bore therethrough;
(b) a cannula handle positioned on the proximal end of said cannula; wherein
(c) said cannula handle extends perpendicularly to the axis of said cannula; and wherein
(d) said cannula handle is comprised of two equal rectangular halves extending in diametrically opposed directions to each other from said cannula axis;
(e) each of said equal halves of said cannula handle having proximally extending shoulder projections substantially parallel to the axis;
(f) an orifice in said cannula handle in flow communication with said cannula bore, said orifice being coaxial with said cannula bore;
(g) a stylus handle removably positioned on the proximal end of said cannula handle; wherein

(h) said stylus handle extends perpendicularly to the axis of said cannula and includes an elongated palm contacting surface on the proximal side thereof; and wherein
(i) said stylus handle is comprised of two equal rectangular halves extending in diametrically opposed directions to each other from said cannula axis along the same diameter and substantially to the same extent as said equal halves of said cannula handle;
(j) an elongated stylus extending from the distal side of said stylus handle and slidably received within said cannula bore, said stylus having a sharpened distal tip which extends distally from the distal end of said cannula;
(k) and wherein the distal side of said stylus handle further includes recess means mated to the shouldered projections for allowing relative movement between the stylus and cannula handles only in the axial direction of siad cannula;
(l) whereby when said equal cannula handle halves are received in said recesses of said equal stylus handle halves, force may be rotatingly applied around either axial direction of said elongated stylet positioned in said elongated cannula without relative rotation of said elongated stylet and said elongated cannula.

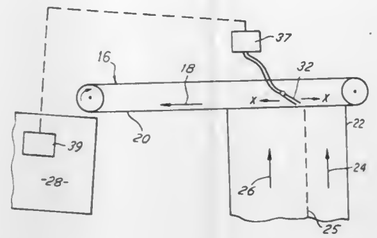
4,630,617
HEART PACER LEAD WIRE WITH PULL-AWAY NEEDLE
Thomas A. Ritter, Bristol; James C. Bray, Danbury, and Alan L. Kaganov, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 9, 1980, Ser. No. 195,531
Int. Cl.⁴ A61N *1/04*
U.S. Cl. 128—784 **8 Claims**



1. A surgical electrode comprising:
(a) an electrically conductive wire having a first needle attached to and in electrical contact with one end of said wire;
(b) an electrically conductive connector pin permanently attached to and in electrical contact with the other end of said wire and having a blunt pointed end opposite the end attached to said wire;
(c) a second needle having a cylindrical blind hole in one end into which is inserted, with removable attachment and in electrical contact, the blunt pointed end of said pin; and
(d) a dielectric insulating coating over the exterior surface of said wire electrically insulating said wire over a major portion of the length thereof;
the removable attachment being such that the needle and pin may be readily pulled away from each other.

4,630,618
APPARATUS AND METHOD FOR FORMING A ROD OF SMOKEABLE MATERIAL
Brian C. Chard, Bristol, England, assignor to Imperial Group PLC, England
Filed Aug. 1, 1983, Ser. No. 519,317
Claims priority, application United Kingdom, Aug. 5, 1982, 8222638
Int. Cl.⁴ A24C *5/18*
U.S. Cl. 131—84.3 **12 Claims**

1. Apparatus for forming a rod of smokeable material from at least two types of smoking material comprising storage means for storing said at least two types of smoking material, an air pervious conveyor belt, a vacuum source located on one side of the belt, means located on the other side of the belt for depositing first and second types of smoking material respectively on the belt so that the second type of smoking material overlies the first type, and gate means to interrupt the deposition of the first type of material and allow predetermined



amounts of the second type of smoking material to be periodically deposited directly on the belt.

4,630,619
PROCESS FOR TREATING TOBACCO
Kevin R. Korte, Louisville, Ky., and Dan T. Wu, Surabaya, Indonesia, assignors to Brown & Williamson Tobacco Corp., Louisville, Ky.
Filed Dec. 16, 1983, Ser. No. 566,750
Int. Cl.⁴ A24B *3/18*
U.S. Cl. 131—296 **8 Claims**

1. An improved tobacco treating process comprising:
immersing a preselected tobacco product in a liquid nitrogen bath at a preselected low temperature for a sufficient period of time to cool the tobacco product in a uniform manner;
treating the cooled tobacco product with gaseous carbon dioxide at a preselected pressure and for a sufficient period of time to allow the gaseous carbon dioxide to condense evenly on the surface and into the pores of the tobacco product; and,
reducing the gaseous pressure and drying the gaseous tobacco product with hot gases to arrive at a final expanded tobacco product.

4,630,620
CIGARETTE WITH CONDENSING SURFACE THEREIN
Naeem B. Gabriel, 2 Kingsbury Sq., Apt. #19E, Trenton, N.J. 08611
Continuation of Ser. No. 931,102, Aug. 25, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 230,360
Int. Cl.⁴ A24D *1/00*
U.S. Cl. 131—331 **2 Claims**

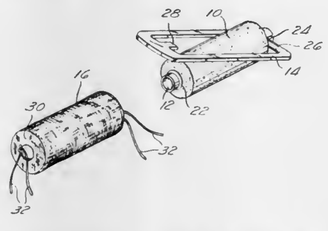


1. A cigarette comprising a paper wrapper surrounding a tobacco core, and a plurality of thin aluminum discs co-axially aligned along the central longitudinal axis of said tobacco core, said discs extend from one end of said core to the other end of said core.

4,630,621
METHOD AND COMPOSITION FOR SIMULTANEOUSLY PERMANENTLY WAVING AND DYEING HUMAN HAIR
Susanne Pontani, P.O. Box 758, Mars, Pa. 16046
Filed Sep. 27, 1985, Ser. No. 781,952
Int. Cl.⁴ A45D *7/00*
U.S. Cl. 132—7 **11 Claims**

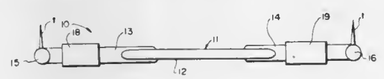
1. In the process of permanently waving hair with a reforming solution, removing said reforming solution and rebonding said hair by saturating said hair with an oxidizing rebonding agent and subsequently removing said rebonding agent, the improvement comprising contacting said hair with a dyeing composition after said reforming solution is removed from said hair but before said rebonding agent is removed from said hair.

4,630,622
HAIR ROLLING DEVICE
Adele J. Foreman, 1502 Puls, Oceanside, Calif. 92054
Filed Jul. 2, 1984, Ser. No. 627,058
Int. Cl.⁴ A45D *2/02*
U.S. Cl. 132—39 **1 Claim**



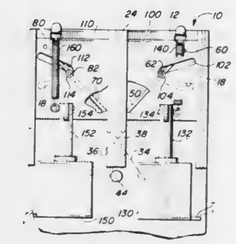
1. The improvement to reduce friction in a hair rolling device in which there is a resilient plastic foam roller having working surfaces around which hair is tightly wound and securing means operative to clamp in place hair wound around said roller, comprising:
(a) a fabric sleeve directly fitting and completely covering said working surfaces of said roller and drawstrings at the end of said sleeve releasably securing said sleeve to said roller, the fabric of said sleeve having a coefficient of static friction less than 0.900 that is lower than the coefficient of static friction of the surface of said foam roller which is substantially above 1.00 whereby hair wound around said sleeve will have less breakage than hair wound directly around said roller because hair can slip more easily in contact with said fabric than in direct contact with said foam roller under pressure of said roller tending to restore its original shape, and
(b) a plastic hollow longitudinally-open single-walled tube on which said foam roller is mounted, said plastic tube being sufficiently resilient to collapse and to flex longitudinally under the weight of the head of a reclining user, so as to be more comfortable to such a reclining user than a rigid tube.

4,630,623
TOOTHPICK HOLDER
Joseph Hadary, 5405 Linden Ct., Bethesda, Md. 20814
Continuation-in-part of Ser. No. 476,555, Mar. 16, 1983. This application Aug. 8, 1983, Ser. No. 521,259
Int. Cl.⁴ A61C *15/00*
U.S. Cl. 132—89 **5 Claims**



1. A toothpick holder for holding toothpicks in different positions for gaining access to different portions of the mouth, comprising:
an elongate, one-piece handle having portions of polygonal cross-sectional shape to facilitate gripping thereof;
a pair of arms integral with the handle and each projecting therefrom at substantially a right angle to the axis of the handle; and
each said arm having a free end with an opening therethrough, said openings each having a polygonal cross-sectional configuration adapted to grip and hold a toothpick inserted therein in a predetermined orientation, said openings being oriented so that a toothpick inserted into one of the openings is oriented in a first position for gaining access to a first portion of the mouth and a toothpick inserted into the other of the openings is oriented for gaining access to a different portion of the mouth.

4,630,624
COIN ESCROW APPARATUS FOR COIN OPERATED EQUIPMENT
James R. Turner, 4602 E. Pueblo, Phoenix, Ariz. 85040
Filed Jan. 22, 1986, Ser. No. 820,977
Int. Cl.⁴ G07D *1/00*
U.S. Cl. 133—4 A **21 Claims**



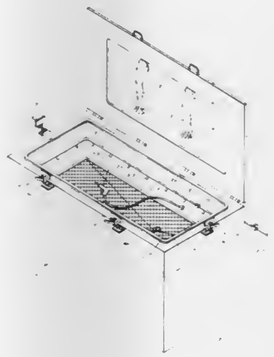
1. Coin escrow apparatus comprising, in combination: side panel means, including
a first side panel and a second side panel;
slot means in the side panel means including a first slot and a second slot;
first valve means pivotally secured between the first and second side panels and movable between an open and a closed position;
second valve means pivotally secured between the first and second side panels and movable between a closed position adjacent to the first valve means and an open position remote from the first valve means, and defining, with the first and second side panels and the first valve means when both the first and second valve means are in their closed position, a coin escrow box for holding coins;
first actuator panel means disposed adjacent to the first slot;
a first actuator slot in the first actuator panel means overlying a portion of the first slot;
second actuator panel means disposed adjacent to the second slot;
a second actuator slot in the second actuator panel means overlying at least a portion of the second slot;
a first cam rod secured to the first valve means and extending into the first slot and the first actuator slot for pivoting the first valve means in response to movement of the first actuator panel means;
a second cam rod secured to the second valve means and extending into the second slot and the second actuator slot for pivoting the second valve means in response to movement of the second actuator panel means;
first actuator means for moving the first actuator panel means to pivot the first valve means; and
second actuator means for moving the second actuator panel means to pivot the second valve means.

4,630,625

TOOL DECONTAMINATION APPARATUS

Joseph A. Capella, Crystal River, and David E. Fowler, Gainesville, both of Fla., assignors to Quadrex HPS, Inc., Gainesville, Fla.

Division of Ser. No. 228,971, Jan. 22, 1981, Pat. No. 4,443,269.
This application Apr. 29, 1983, Ser. No. 490,243
Int. Cl.[4] B08B *3/02*; B05B *15/04*
U.S. Cl. 134—104 **9 Claims**



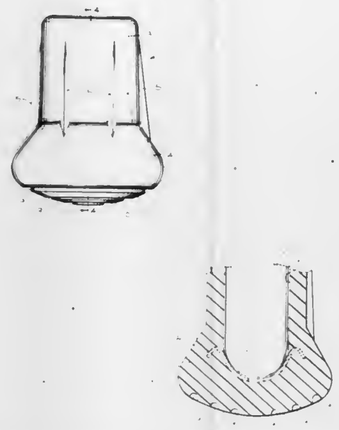
1. System for cleaning radioactively contaminated articles, which comprises:
- a cleaning chamber adapted to receive and seal therein the contaminated articles,
- means for spraying the contaminated articles with a high pressure spray of a clean solvent to dislodge and/or dissolve the contaminants,
- means for draining the contaminated solvent from the cleaning chamber at a rate at least as great as that which the clean solvent is sprayed into the cleaning chamber,
- and means for decontaminating the contaminated solvent for reuse,
- a cabinet having an opening through which the articles may be placed into and removed from the cleaning chamber,
- means for closing and sealing the opening,
- window means for providing a view of the inside of the cleaning chamber when the opening is closed and sealed,
- and glove means for permitting the manipulation of the articles within the cleaning chamber when the opening is closed and sealed,
- a solvent reservoir adapted to receive contaminated solvent drained from the cleaning chamber,
- filter means for removing contaminants suspended in the contaminated solvent,
- and means for recirculating solvent from said solvent reservoir through the filter means,
- a low pressure high volume pump having an intake connected to the pick-up tube, a first conduit connecting the discharge of the low pressure high volume pump to the filter means, and a second conduit connecting the filter means to the solvent reservoir, and
- a high pressure low volume pump having an intake connected to the second conduit,
- a spray gun in the cleaning chamber,
- and means for connecting the discharge from the high pressure low volume pump to the spray gun.

4,630,626

CRUTCH TIP CONSTRUCTION

Ted. F. Urban, Oshkosh, Wis., assignor to Lamico, Inc., Oshkosh, Wis.

Filed Feb. 11, 1985, Ser. No. 700,277
Int. Cl.[4] A45B *9/04*
U.S. Cl. 135—84 **4 Claims**



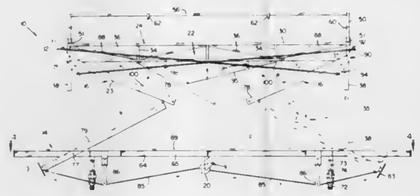
1. A crutch construction, comprising a crutch having a lower end, a resilient tip having an axial recess to receive said lower end, said recess having a bottom, and a concave metallic socket disposed at the bottom of said recess and disposed in engagement with the lower end of said crutch, said tip having an enlarged lower head terminating in a curved convex lower surface adapted to engage a supporting surface during use of said crutch, said lower surface being formed with a plurality of spaced concentric grooves, said concave socket opening upwardly and having its periphery formed with an outwardly and downwardly extending flange which is embedded within the material of said tip, and said lower end of said crutch being convex to fit the concavity of said socket.

4,630,627

COLLAPSIBLE FRAME STRUCTURE

David W. Windows, 1581 40th Ave., NW., Salem, Oreg. 97304, and Ronald E. Burback, 1202 SE. Chelsea Ave., Vancouver, Wash. 98664

Filed Jan. 7, 1985, Ser. No. 689,292
Int. Cl.[4] E04H *15/48, 15/56*
U.S. Cl. 135—112 **4 Claims**



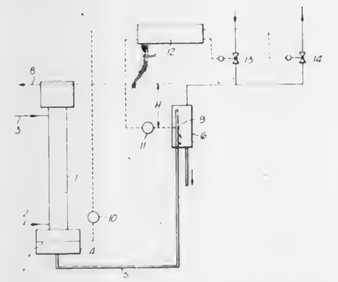
1. A collapsible frame structure comprising:
an upper frame section;
a base frame section;
at least one pair of opposed hinged struts having upper and lower portions, each of the struts being hinged between its upper and lower portions, the upper portion pivotally connected to the upper frame section and the lower portion pivotally connected to the base frame section, the hinged struts being adapted to extend to raise the upper section to an operative frame position above the base frame section and being collapsible to lower the upper section to a stored position;
- a stabilizing plate fixedly mounted adjacent each upper portion of a strut each said plate with an upper and a lower portion;
- winch means mounted to the base section and connected to ends of the lower portions of the hinged struts for pivoting the lower portions to extend the struts; and
- a pair of stabilizing members linking the upper portions of the struts of the pair to equalize the angular movement of each upper strut portion relative to each hinged lower strut portion, as the struts extend, one of the members being connected to the upper portion of one plate and to the lower portion of the other plate, the other of the members being connected to the upper portion of the other plate and to the lower portion of the one plate, the members crossing each other intermediate the plates.

4,630,628

FLOW CONTROL APPARATUS

Ian C. Hepworth, Norley, England, assignor to British Nuclear Fuels plc, Risley, England

Filed May 7, 1984, Ser. No. 607,823
Claims priority, application United Kingdom, May 24, 1983, 8314319
Int. Cl.[4] F17D *3/00*
U.S. Cl. 137—12 **5 Claims**



1. In combination, a vertical solvent extraction column in which an interface between a light phase and a heavy phase forms during operation, flow control means for maintaining the level of the interface at a predetermined level and an outlet for the light phase, said flow control means comprising a pressure vessel located outside the column at an elevated position relative to the predetermined interface level, means forming a flow path between the base and interior of the solvent extraction column and the base and interior of the pressure vessel to permit flow from the column to enter the pressure vessel, means having a plurality of vertically spaced apart apertures in the flow path within the vessel so that fluid entering the vessel will sequentially reach and flow in parallel through the apertures depending on the liquid level in the flow path within the vessel, and means for selectively varying the pressure within the vessel to control the liquid level in the flow path in the vessel, and hence for varying the parallel flow through the apertures, so that the interface in the column is maintained at the predetermined level.

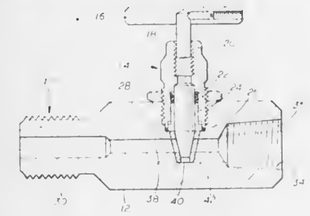
5. A method of controlling the level of an interface between a light phase and a heavy phase in a vertical solvent extraction column comprising locating a pressure vessel outside the column at an elevated position with respect to the interface, and locating an outlet for the light phase above the bottom of the column, providing a flow connection between the bottom and interior of the column and the bottom and interior of the vessel to permit flow from the column to enter the vessel, arranging a means having a plurality of vertically spaced apart apertures in parallel flow relationship in the flow path in the vessel so that fluid entering the vessel will sequentially reach and flow in parallel through the apertures depending on the liquid level in the flow path within the vessel, and selectively varying the pressure within the vessel to control the liquid level in the flow path in the vessel and hence to control the parallel flow through the apertures, so that the interface is maintained at a substantially constant level.

4,630,629

VALVE WITH COMPRESSIBLE VALVE STEM AND VALVE BODY SEALS

Spencer M. Nimberger, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Filed Mar. 7, 1986, Ser. No. 837,387
Int. Cl.[4] F16K *41/00, 51/00*
U.S. Cl. 137—15 **20 Claims**



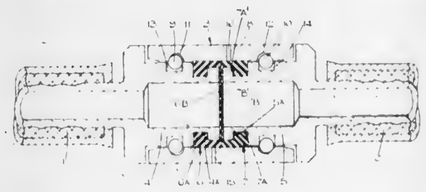
15. A method of sealing fluid within a valve of a type including a valve body having a fluid inlet and a fluid outlet, a valve seat, a valve bonnet for removable engagement with said valve body, a valve stem having a central axis movable relative to said bonnet, and sealing surface on said valve stem for sealing engagement with said valve seat, the method comprising:
- providing a first compressible seal between said bonnet and said valve body for sealing between said bonnet and said valve body;
- providing a second compressible seal between an end surface of said valve bonnet and said valve body;
- providing a retainer axially positioned relative to said valve bonnet and in engagement with said valve body upon movement of said valve bonnet; and
- selectively axially moving said bonnet relative to said valve body and thereby simultaneously sealingly compressing both said first seal and said second seal.

4,630,630

HYDROSTATIC HYDRAULIC COUPLING

Desmond H. J. Reynolds, and Philip A. Taft, both of West Midlands, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

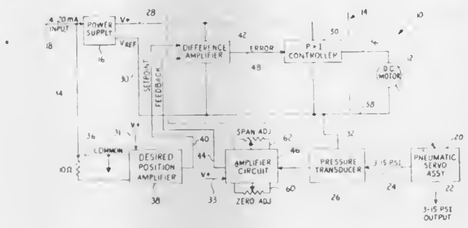
Filed Feb. 4, 1985, Ser. No. 697,767
Claims priority, application United Kingdom, Feb. 8, 1984, 8403370
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—68.1 **11 Claims**



1. A connector for use in a hydraulic system comprising:
first and second body members forming parts of the hydraulic system and each having first and second channel

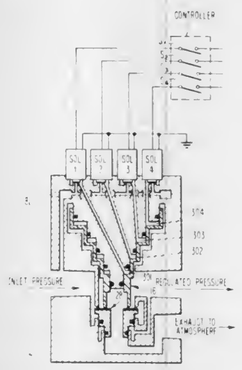
means, respectively, through which hydraulic fluid passes when in use;
a first and second diaphragm mounted on said first and second body members, respectively, and between said first and second channel means for sealing said first and second channel means to prevent flow of fluid therethrough;
a tubular sleeve coupling member having open ends into which said body members are insertable for coupling said first and second body members together in a coupling position so that said diaphragms are in contiguous relationship;
means integral with each respective diaphragm to cause rupture of each diaphragm, respectively, at a predetermined hydraulic system pressure to facilitate flow through and between said first and second channel means in use;
first sealing means for each of said first and second body members forming a fluid-tight seal between the respective body member and the inner surface of said tubular sleeve coupling member surrounding said respective body member;
at least one normally closed air leakage path which, when open, provides communication between the ambient atmosphere and space between said body members and said diaphragms;
second sealing means operatively disposed in said at least one air leakage path for normally closing said air leakage path when said tubular sleeve coupling member is applied for coupling said first and second body members together, and for allowing air entrapped between said body members and said diaphragms to be expelled through said path; and
at least one locking device operatively engageable between at least one of said first and second body members and said tubular sleeve coupling members for locking said at least one body member and said tubular sleeve coupling member against relative axial and rotational movement comprising,
grooves formed respectively in said tubular sleeve coupling member and said at least one of said body members, said grooves being positioned to be juxtaposed when said at least one of said body members is in said coupling position in said tubular sleeve coupling member, and
a U-shaped clip removably engageable in said grooves.

4,630,631
PNEUMATIC SERVO ASSEMBLY FOR AN ELECTRO-PNEUMATIC CONVERTER
Christine B. Barnes, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Continuation of Ser. No. 637,948, Aug. 6, 1984, abandoned, which is a division of Ser. No. 469,200, Feb. 24, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 833,505
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—85 **11 Claims**



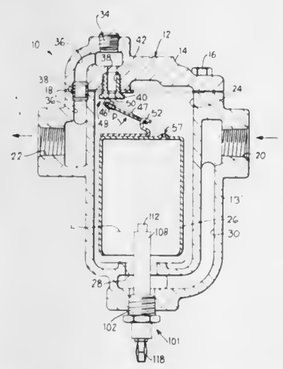
1. A pneumatic servo assembly for an electropneumatic closed loop control system providing a pneumatic output signal in response to a corresponding input signal comprising:
variable restriction means for producing different pneumatic output signals from the pneumatic servo assembly;
motor means for moving said variable restriction means to vary the pneumatic output from the pneumatic servo assembly, said motor means having a cam assembly connected thereto for variably restricting the pneumatic servo assembly depending on the position of the cam;
a backpressure nozzle mounted proximately to said cam assembly to be variable restricted by said cam assembly;
means for actuating said motor means in response to a control signal;
means for establishing a set point signal in response to the electrical input signal indicative of a desired pneumatic output signal;
means for establishing a feedback signal indicative of the pneumatic output signal;
combining means for comprising the setpoint signal with the feedback signal to establish a control signal to said actuating means; and
a nozzle clamp for exerting drag on the cam assembly to maintain a constant pneumatic output signal from said pneumatic servo assembly corresponding to the last control signal to said pneumatic servo assembly in response to an electrical failure.

4,630,632
PRESSURE REGULATOR
John L. Johnson, Morrisville, N.C., assignor to Schrader Bellows Inc., Akron, Ohio
Filed Nov. 26, 1984, Ser. No. 674,742
Int. Cl.[4] F16K *31/363*
U.S. Cl. 137—85 **17 Claims**



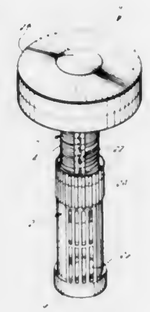
1. A fluid pressure regulator comprising:
(a) body having;
an outlet connected to the upper side of a downward-facing first valve seat formed inside the body,
an inlet connected to the lower side of the seat, the body presenting an inner and outer concentric annular upward guide walls in the housing below and aligned with the first seat and partly defining between them an outlet pressure chamber connected to the outlet and defining inside the inner wall an exhaust chamber connected to the exterior of the body, the inner wall being shorter than the outer wall, and
an inverted stepped cone-like projection formed in the body and extending downward and aligned with and above the first seat, the projection having a plurality of generally cylindrical faces of increasing diameter as the upper end of the projection is approached and a plurality of passage means in the projection all having one end terminating respectively in openings adjacent the faces,
(b) a vertically reciprocable valve member having;
an axial passage and an upwardly facing annular sealing surface adapted in its upper position to engage upward against the first seat,
beneath the sealing service an upper piston cooperating with the outer of the concentric walls and adapted to be urged upward by the outlet pressure in the outlet pressure chamber, and
a lower piston cooperating with the inner of the walls,
(c) a valve actuator in the housing adapted to be urged upward by the outlet pressure and having;
a stepped inner shape comprising spaced annular horizontal surfaces, the actuator reciprocably receiving the cone-like projection, and
terminating in a downward annular second seat adapted in the lower position of the actuator to engage downward against the sealing surface of the valve member inside the first seat,
(d) a plurality of control valve means connected between the inlet and respectively the plurality of passage means; and
(e) a plurality of seal means disposed between the projection and the actuator to isolate pressurewise chambers partly defined by individual annular horizontal surfaces of the actuator from chambers partly defined by other annular horizontal surfaces, whereby the outlet pressure may be precisely controlled depending on the selected one or number of control valve means in the "off" or "on" mode.

4,630,633
STEAM TRAP CHECKER
Stafford J. Vallery, New Braunfels, Tex., assignor to Armstrong International, Inc., Three Rivers, Mich.
Filed Sep. 13, 1985, Ser. No. 775,903
Int. Cl.[4] F17T *1/28*
U.S. Cl. 137—185 **14 Claims**



1. In combination, a steam trap and apparatus for checking same for steam leakage, comprising:
a steam trap casing having an inlet for steam and condensate and an outlet for condensate;
a steam trap means in said casing operative independent of said probe and by itself responsive to accumulation of a preselected amount of condensate in said casing for releasing condensate to said outlet while trapping steam in said casing, said steam trap means constituting the entirety of a normally operational steam trap mechanism including a condensate outlet valve normally closing said outlet and actuating means for actuating said valve to release condensate therethrough to said outlet;
a probe extending into said steam trap casing and responsive to condensate build up to an excessive level in said steam trap casing for changing an electrical condition;
means responsive to said electrical condition change for indicating said steam trap means has a fault condition, said steam trap comprising an inverted bucket steam trap, said actuating means comprising a downward opening inverted bucket vertically movable in said casing, a passage from said inlet which opens under said inverted bucket to supply steam and condensate, means connecting said condensate outlet valve to said inverted bucket for opening and closing said valve in response to low and high positioning of said inverted bucket in said steam trap casing, said probe having a condensate level sensing part extending up in noninterfering relation into the open bottom of said inverted bucket and responsive to the condensate level within said inverted bucket.

4,630,634
SOLID CHLORINE DISPENSER FOR SPAS
Isao Sasaki, Altadena, and Michael L. Schuman, Walnut, both of Calif., assignors to Rainbow Lifegard Products, Inc., El Monte, Calif.
Filed Dec. 2, 1985, Ser. No. 803,635
Int. Cl.[4] B01D *11/02;* **B01F** *1/00*
U.S. Cl. 137—268 **3 Claims**



1. A reusable device for dispensing a solution derived from a solid into a body of water, comprising:
a tubular container having a closed end and an open end;
a sleeve having one closed end and one open end threadable at the open end thereof onto the open end of the container so that the sleeve and the container define a chamber of variable length for receiving the solid;
apertures in the walls of the sleeve proximately adjacent to the closed end of the sleeve where the degree of closure of the apertures is variable from a fully closed position to a fully open position dependent upon the location of the sleeve axially on the container;
a float member larger in diameter than the container filled with foam attached to the container at the closed end thereof;
ballast contained within the sleeve adjacent the closed end thereof;
the float member, ballast and structure and material of the container and sleeve being cooperatively defined to cause the device to float erect, with the sleeve closed end down, irrespective of the quantity of solid in the chamber and irrespective of the presence or absence of air in the chamber above the open end of the container; and
a nut cooperable between the container and the sleeve for securing the sleeve in a desired location on the container.

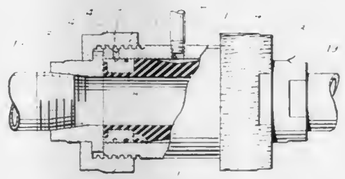
4,630,635
FLOW DEVICE WITH RESILIENT ELASTOMERIC SLEEVE
Robert E. Bernstein, Framingham, and Alan E. Nelson, Franklin, both of Mass., assignors to Larad Equipment Corporation, Medfield, Mass.
Continuation of Ser. No. 441,613, Feb. 11, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 769,783
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **15 Claims**

2. A flow device with a resilient elastomeric sleeve for use in a pipe system comprising:
a hollow housing having openings at opposite ends and inner

circular wall portions at the ends and a generally central opening for communicating with a motive fluid line;

a removable flexible resilient elastomeric sleeve inside the housing, defining a motive fluid space between the sleeve exterior and the interior of the housing and having a rigid annular portion proximate to each end of the sleeve and integral therewith, each rigid annular portion being radially concentrically aligned in the housing at a respective one of the circular wall portions;

exterior sealing means near each end of the sleeve acting circumferentially between the respective rigid annular portion and inner circular wall portion for sealing the motive fluid space between the sleeve and the housing independently of any portion of the piping system in which the flow device is used;



releasable means co-acting with the housing and the sleeve for fixing the axial position of said exterior sealing means relative to the housing; and

means for sealing the device when mounted in a pipe system effective to seal process material flowing through the device against leakage;

whereby when the device is off-line it may be tested maintaining effective seal of motive fluid in the motive fluid space due to the sealing effect of the exterior sealing means between the housing and the sleeve, and when the device is online the seal is also maintained, and the device may be installed in or removed from a pipe system while maintaining the exterior seal.

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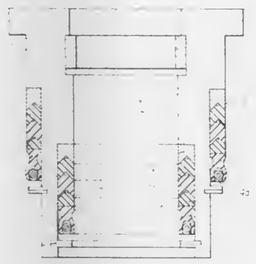
ACTUATOR WITH NONELASTOMERIC SEAL

Dennis R. Cutcher, Gretna, La., assignor to Baker CAC, Belle Chasse, La.

Filed Nov. 16, 1983, Ser. No. 552,248

Int. Cl.[4] F16K *43/00, 41/00*

U.S. Cl. 137—315 **3 Claims**



1. A non-elastomeric self-energizing annular seal system for use in establishing sealing integrity between concentric tubular members defining a passage exposed to high fluid pressures, comprising:

a first deformable non-elastomeric seal element mounted between said tubular members adjacent the high pressure end of the seal system;

a radially expandable, metallic spring member radially biasing only said first non-elastomeric seal element into radial sealing contact with the concentric tubular members without applying an axially biasing force to the seal system, but permitting axial movement of said first non-elastomeric seal element by said high fluid pressure; additional deformable non-elastomeric annular seal elements axially contiguous to each other and to the first non-elastomeric seal element, said additional seal elements being freely insertable between said tubular members; a metallic element at the low pressure end of the seal system limiting axial movement of said non-elastomeric seal elements; and interfitting convex and concave surfaces on the additional non-elastomeric seal elements and the metallic element, oriented with the elements more closely adjacent the high pressure end urging adjacent elements radially in contact with said concentric tubular elements when subjected to loading by axial movement of said first non-elastomeric seal element produced by said high fluid pressure.

4,630,637

GAS FLOW REGULATOR FOR GASES WITH CONDENSABLE COMPONENTS

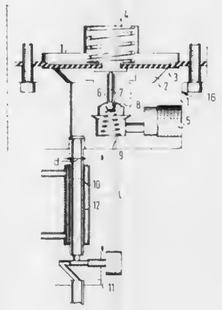
Leander Furst, Jülich, Fed. Rep. of Germany; Johan T. G. Ballast, Veenendaal, Netherlands, and Kurt Jahnel, Düsseldorf-Itter, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich and Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH, Elmshorn, both of, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,736

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3434024

Int. Cl.[4] F16K *49/00*

U.S. Cl. 137—340 **8 Claims**



1. In a gas flow regulator for a gas with a condensable component comprising a spring-loaded membrane bounding a gas-receiving chamber, said spring-loaded membrane being subjected to the pressure of said gases, a controlling inlet valve positioned adjacent said membrane and a restrictor positioned downstream from said chamber constricting flow of said gas, the improvement which comprises for the condensation of said condensable component a cooled cooling section positioned substantially vertically and connected between said gas-receiving chamber and said restrictor, from which all condensate formed directly reaches by the action of the force of gravity the region underneath a gas flow regulator mechanism formed by said chamber, membrane and inlet valve.

4,630,638

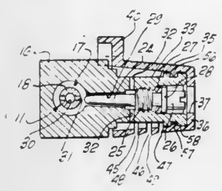
ROTATING CAP, SCREEN AND MOUNTING MEANS FOR PROTECTING AIR METERING VALVE

V. Walter Hafner, Whittier; Ron T. Hahn, Fullerton, and Keith D. Marshall, Whittier, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 28, 1986, Ser. No. 823,392

Int. Cl.[4] F16K *27/08*

U.S. Cl. 137—381 **16 Claims**



1. An improved needle valve of the type useful for metering the flow of air into a controlled device, said needle valve being of the type having an adjustable needle held in a housing connected to an air line, said housing having an air inlet orifice therein, wherein the improvement comprises:

a cap for protecting an air metering valve from liquid or foreign objects comprising:

a generally cylindrical body having a generally circular base having a distinctive marking protrusion thereon, said cylindrical body having a central axis and a generally cylindrical sidewall having at least one circumferentially oriented slit formed therein, said slit covering no more than about half of the circumference; and

holding means for holding said cap on said housing at a location so that said generally cylindrical sidewall extends over said air inlet orifice of said housing, said holding means permitting the rotation of said generally cylindrical body about its central axis.

4,630,639

APPARATUS FOR CONTROLLING PRESSURE AND FLOW RATE

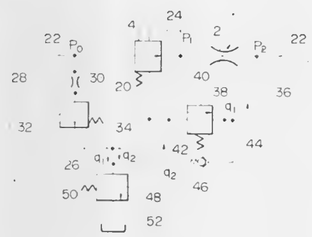
Yoshisuke Akita; Ichiro Tenmyo; Kiyoshi Hayashi; Kazuyuki Kihara, and Akio Mito, all of Tokyo, Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,377

Claims priority, application Japan, Mar. 30, 1984, 59-62811

Int. Cl.[4] F16K *31/36*

U.S. Cl. 137—486 **2 Claims**



1. An apparatus for controlling a pressure and a flow rate comprising:

a main passage having an upstream end and a downstream end for flow of fluid therein;

a variable throttle interposed in said main passage for adjusting a flow rate of fluid through said main passage, said variable throttle having an input port and an output port;

a differential pressure regulator interposed in said main passage in series with and upstream from said variable throttle, said differential pressure regulator having a primary pilot chamber in fluid communication with said input port of said variable throttle and a secondary pilot chamber with a differential pressure setting spring disposed within said secondary pilot chamber;

a constant flow control valve having an input port in fluid communication with said main passage upstream from said differential pressure regulator and an output port for fluid communication with said secondary pilot chamber of said differential pressure regulator, said constant flow control valve allowing fluid at a constant flow rate to pass through said output port thereof;

first fluid passage means connecting said output port of said constant flow control valve to said secondary pilot chamber of said differential pressure regulator;

second fluid passage means connecting said secondary pilot chamber of said differential pressure regulator to said main passage downstream from said output port of said variable throttle;

a sequence valve means, interposed in said second fluid passage means connecting said secondary pilot chamber of said differential pressure regulator to said main passage downstream of said variable throttle, for detecting front-to-back differential pressure of said variable throttle and for controlling the amount of fluid supplied from said constant flow control valve to said secondary pilot chamber of said differential pressure regulator due to a throttle operation of said sequence valve means in response to said front-to-back differential pressure of said variable throttle, whereby said front-to-back differential pressure is held to a constant value corresponding to a set flow rate of said variable throttle;

a tank for storage of fluid;

a third fluid passage means connecting said output port of said constant flow control valve to said tank;

a relief valve interposed in said third fluid passage means connecting said output port of said constant flow control valve to said tank, said relief valve being set to a predetermined relief pressure for allowing fluid to pass to said tank when pressure at said output port of said constant flow control valve exceeds said predetermined relief pressure;

fourth fluid passage means connecting said main passage downstream of said variable throttle to said relief valve; and

a check valve interposed in said fourth fluid passage means connecting said main passage downstream of said variable throttle to said relief valve, said check valve being set to a predetermined pressure for allowing fluid to pass from said main passage downstream of said variable throttle to said relief valve when a predetermined differential pressure exists on either side of said check valve.

4,630,640

PRESSURE COMPENSATED RESTRICTIVE FLOW REGULATOR CARTRIDGE

Ernest A. DiBartolo, Sarasota, Fla., assignor to Sun Hydraulics Corp., Sarasota, Fla.

Filed Jun. 10, 1985, Ser. No. 743,293

Int. Cl.[4] F16K *31/363*

U.S. Cl. 137—501 **18 Claims**

1. A flow regulator cartridge for use in a manifold having fluid passages forming fluid ports which cooperate with valve openings, said cartridge comprising:

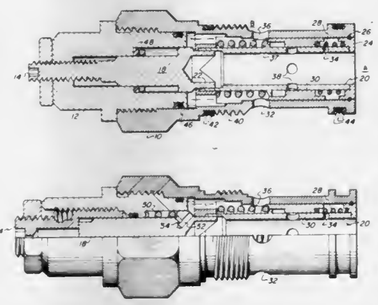
a valve body having a first portion to be disposed in the manifold and a second portion to be extended from the manifold;

means for sealingly securing said valve body in the manifold;

said valve body having an opening to port A at the end of said portion to be disposed in the manifold and an opening to port B on the side of said portion to be disposed in the manifold;

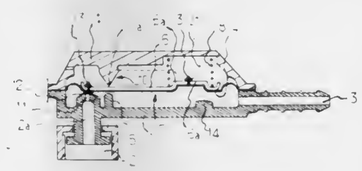
a stem longitudinally extending in said valve body from an

outer end at port A to an inner end, providing a fluid passage therethrough;
a valve element providing a preset flow control orifice between said inner end of said stem and port B;
a compensating spool slideably mounted to control the opening to port B;
said compensating spool having a first annular area which will bias it, under the influence of fluid pressure, to decrease the opening to port B;
first passage means through the wall of said stem for admitting fluid from port A to exert fluid pressure against said first annular area of said compensating spool;



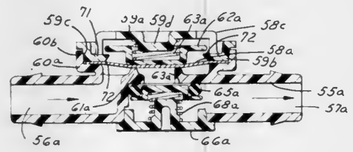
second passage means through the wall of said stem for admitting fluid from port B to said stem;
said compensating spool closing said second passage means when the fluid pressure at port A is greater than the fluid pressure at port B, and opening said second passage means when the fluid pressure at port B is greater than the fluid pressure at port A;
said compensating spool having a second annular area which will bias it, under the influence of fluid pressure, to increase the opening to port B; and
a control spring biasing said compensating spool to increase the opening to port B.

4,630,641
PRESSURE-REDUCING APPARATUS
Gilbert Lacour, Rueil Malmaison, France, assignor to Clesse-Mandet, France
Filed Jan. 15, 1985, Ser. No. 691,581
Claims priority, application France, Jan. 19, 1984, 84 00819; Dec. 14, 1984, 84 19207
Int. Cl.[4] F16K *35/361*
U.S. Cl. 137—505.38 **2 Claims**



1. A gas-pressure reducing apparatus comprising a casing having a gas inlet connection and a gas outlet connection, a cover mounted upon said casing, a manometric membrane mounted between the casing and the cover and comprising two faces subjected to the pressure of the gas to be controlled and to the action of an adjustment spring respectively, abutment means extending from said cover towards the interior of the apparatus and onto which the membrane is adapted to bear and pivot, the position of said abutment means being such that it divides the membrane into two unequal surfaces comprising a relatively large surface subjected to the action of said adjustment spring and a relatively small surface adapted to close the gas inlet into the casing of the apparatus, wherein said casing is provided with one stop member extending therefrom and directed towards the membrane at a position located below, and substantially aligned with, said abutment means so as to positively prevent said membrane from closing said gas inlet connection when the membrane is collapsed under the action of said spring within the casing of the apparatus.

4,630,642
CHECK VALVE AND WATER INJECTION SYSTEMS AND FUEL SYSTEMS UTILIZING THE SAME
Charles A. Detweiler, Durand, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.
Filed Dec. 3, 1984, Ser. No. 677,289
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—506 **6 Claims**

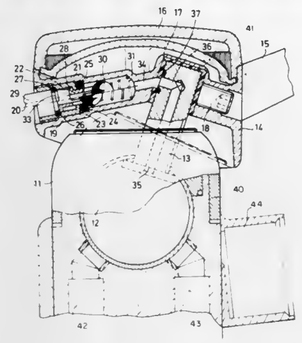


1. A check valve including
a valve body having an inlet and an outlet,
a seat separating the inlet and the outlet,
a valve member,
and yielding means external of the flow of the inlet, outlet and seat yieldingly urging the valve member into engagement with the seat,
said valve body being made of plastic material,
said valve body including a peripheral flange,
a cover being made of plastic,
said cover having a complementary flange overlying said flange,
a diaphragm interposed between said flanges,
said body including an annular wall surrounding said flange thereon,
said cover including a complementary annular wall ultrasonically welded to said annular wall of said body,
said body having an integral annular set,
a pressure member associated with said diaphragm on the side opposite said seat,
yielding means comprising a spring interposed between said cover and said pressure member,
said cover and said pressure member having interengaging means defining a subassembly preventing movement of said pressure member axially out of said cover so that the subassembly can be handled before the cover is ultrasonically welded to the body.

4,630,643
VALVE, PARTICULARLY MIXING VALVE
Werner Lorch, Schramberg, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Oct. 24, 1983, Ser. No. 544,872
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239301
Int. Cl.[4] F16K *21/00, 11/072*
U.S. Cl. 137—597 **8 Claims**

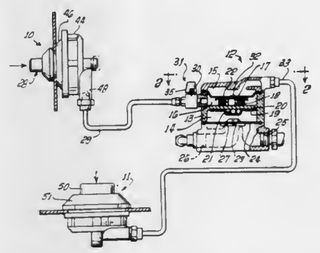
1. A mixing valve for attachment to a water faucet or the like, comprising:
a valve casing having a water outlet and two water inlets;
a control member having an interior liquid mixing chamber rotatably mounted in said casing between said inlets and said outlet for mixing and controlling the water, said control member comprising a spherical plug valve;

means for connecting a supplemental apparatus in communication with the interior of said mixing chamber, said means having a quick-action coupling means, and
handle means interposed between the control member and said connecting means, said handle means being associated



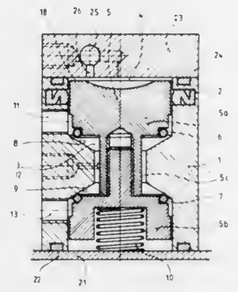
with said control member through a hollow rod, said rod engaging an opening in said control member and having a bore therethrough for communicating the mixing chamber and said connecting means, whereby fluid from said mixing chamber passes through said rod and connecting means to said supplemental apparatus.

4,630,644
DUAL OPERATED METERING VALVE CONNECTED TO BOTH A HAND OPERATED PUSH BUTTON AND A FOOT OPERATED PUSH BUTTON
V. Walter Hafner, Whittier; Ron T. Hahn, Fullerton; Keith D. Marshall, Whittier, and Theodore J. Sally, Graton, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.
Filed Jan. 27, 1986, Ser. No. 822,392
Int. Cl.[4] F16K *31/326*
U.S. Cl. 137—624.11 **8 Claims**



1. An improved, remote controlled valve and dual push button assembly, the remote controlled valve being of the type which has a valve diaphragm including a closeable opening therethrough, said diaphragm being in the middle of a chamber which divides the chamber into an upper chamber and a lower chamber, wherein when the valve diaphragm moves downwardly, a magnet attracts a pilot orifice plate positioned below said chamber, causing the valve to open, and when the pressure on both sides of the valve diaphragm is equalled, the valve diaphragm moves upwardly releasing the pilot orifice plate, thereby closing the valve and the push buttons connected to said valve being a hand operated push button of the type which contains a hand button diaphragm which, when depressed, ejects a small volume of control air and then, when released, intakes the same volume of air, which hand operated push button is connected to the lower of said chambers and, upon intake, pulls the valve diaphragm downwardly causing the magnet to attract the pilot orifice plate, thereby holding the valve open for an amount of time required for metered air to pass through a needle valve to release the pilot orifice plate, and the second push button being a foot operated button of the type which contains a foot button diaphragm which, when depressed by a piston, ejects a small volume of control air, which foot operated button is connected to the upper of said chambers and when the small volume of air is injected into the upper chamber, the valve diaphragm is moved downwardly for as long as the foot button is held down, wherein the improvement comprises:
air vent means in said foot operated button to permit the escape of air initiated by the depressing of the hand operated push button, which air has passed through the closeable opening in the valve diaphragm, and to allow the escape of such air through said foot operated button when said foot operated button is in its non-depressed configuration, said air vent means comprising:
an opening through the foot button diaphragm at about the axial center thereof; and
a piston having a circular contact face which contacts the diaphragm when the piston is depressed, said piston having at least one groove passing from about the center thereof, extending away from the center an amount sufficient to provide free passage of air from the opening in the foot button diaphragm along the groove to the atmosphere when said piston is in its uppermost or non-depressed position, said groove not extending to the exterior periphery of said contact face of said piston so that when said piston is held in its downward position, no air escapes through the opening in the foot button diaphragm.

4,630,645
PNEUMATIC SWITCHING DEVICE, E.G., FOR SAFEGUARDING AGAINST OVERPRESSURE
Lambertus K. J. Spa, The Hague, Netherlands, assignor to Beta B.V., The Hague, Netherlands
Continuation of Ser. No. 414,050, Sep. 2, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,798
Claims priority, application Netherlands, Mar. 17, 1982, 8201105
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.6 **1 Claim**



1. A pneumatic switching device comprising a housing having a bore, a piston mounted for axial movement within said bore between first and second spaced-apart positions, said piston having a narrowed portion intermediate its ends, the piston having axially spaced-apart sealing means in the narrowed portion, said bore having a pair of seats cooperating with said axially spaced-apart sealing means to provide a seal with one of said seats upon movement of the piston to a first of said spaced-apart positions and with the other of said seats upon movement of the piston to the second of said spaced-apart positions, said housing having an outlet aperture in communication with the bore intermediate said seats and a pair of signal pressure apertures spaced axially of the bore on opposite

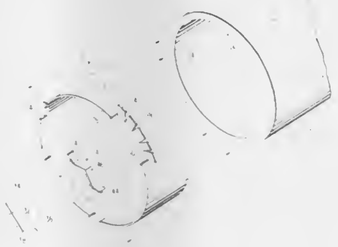
sides of said outlet aperture, and axially outboard of said pair of seats, the piston and the bore being configured to open one of said signal pressure apertures for communication with the outlet aperture and to close the other signal pressure aperture when the piston is in said first position and to close the opened signal pressure aperture and open the closed signal pressure aperture when the piston is in said second position, means biasing the piston to the first of said spaced-apart positions, a chamber at the end of the bore towards which the piston is biased, a pilot passage independent of said apertures for admitting a gas under pressure to said chamber, a vent passage for venting said chamber, a vent valve in said vent passage, said vent passage having a cross-sectional area which is large in relation to the cross-sectional area of said pilot passage, a vent valve actuating means operable to close said vent valve to effect movement of the piston to the second of said spaced-apart positions under influence of said pilot pressure in response to one pressure condition and to open said valve in response to another pressure condition to allow movement of the piston to the first of said positions under influence of said biasing means, and means including said piston for isolating said apertures from said chamber, said vent valve actuating means comprising a lever, a pivotal connection for pivotally connecting the lever to the housing, said vent valve having an actuating pin projecting from the housing and being movable to open said vent valve, the lever being in engagement with the actuating pin at a point on the lever remote from the pivotal connection, a second actuating pin engageable with said lever at a point intermediate the pivotal connection and point of engagement with the actuating pin, movement of said second actuating pin causing pivotal motion of said lever and movement of said first-named actuating pin to open said vent valve.

4,630,646

BEVEL END PROTECTOR

Siegfried E. Koehle, Panama City, Fla., assignor to Berg Steel Pipe Corp., Panama City, Fla.

Filed Oct. 22, 1985, Ser. No. 790,274
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—96 R **10 Claims**



1. A bevel end protector for protecting the bevel end of a pipe comprising:

a circumferentially expansible, collar-like means, having spaced apart ends and being adapted for insertion into the pipe, for protecting the end of the pipe;

wedge means adapted to be received between said space-apart ends, for applying an initial expanding force to expand the circumference of the collar-like means to equal the circumference of the interior of the pipe; and

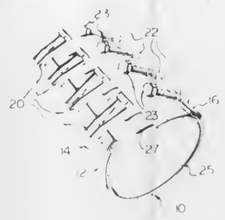
urging means, adapted to connect said spaced-apart ends, said urging means being structurally deformable for thereafter maintaining said initial circumferentially expanding force on said collar-like means whereby said wedge means is removable.

4,630,647

PIPE REPAIR CLAMP

David G. Thomson, Cambridge, Canada, assignor to Waltec Inc., Cambridge, Canada

Filed Nov. 27, 1985, Ser. No. 802,470
Claims priority, application Canada, Jan. 2, 1985, 471308
Int. Cl.[4] F16L *55/16*
U.S. Cl. 138—99 **8 Claims**



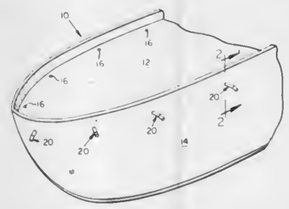
1. A pipe repair clamp comprising a metal band adapted to be wrapped around a pipe and having first and second longitudinally extending edge portions and first and second lug bars, said first and second longitudinally extending edge portions being secured to said first and second lug bars, said first lug bar having attached to it a plurality of fingers and said second lug bar having attached to it a plurality of threaded bolts each provided with a nut/washer assembly, each finger being generally U-shaped including a base portion and two leg portions extending from said base portion, said leg portions having top edges and bottom edges and first and second ends, said first ends being adjacent said base portion, said bottom edges being secured to said first lug bar adjacent said second ends, said leg portions converging over a part of their length from a first spacing in the region of said base portion sufficient to accommodate one of said nut/washer assemblies to a second spacing in the region of said first lug bar sufficient to accommodate one of said bolts but not said one of nut/washer assemblies, said top edges sloping outwardly with respect to said bottom edges along said part of the length of said leg portions, said second ends being substantially flat and having tabs in the region of said top edges, said flat ends accommodating said washers and said tabs restraining said washers against outward movement when said clamp is closed.

4,630,648

DECK DRAIN BY-PASS PLUG

Herbert E. McCord, 28306 NE. 112th, Battleground, Wash. 98604

Filed Jan. 7, 1985, Ser. No. 689,225
Int. Cl.[4] F16L *55/07*
U.S. Cl. 138—103 **10 Claims**



1. For use with a ship deck drain having a bore wall which terminates at a drain opening in an exterior surface of the ship's hull, an apparatus to drain any fluid accumulating in the ship deck so as to facilitate the repair of such surface comprising:

conduit means having a first portion with an inlet end insertable coaxially into said ship deck drain and a second portion with an outlet end extending away from said ship deck drain and hull, said conduit means defining a bore through which fluid is permitted to flow by gravity away from said ship drain opening and hull to drain;

inflatable sleeve means surrounding and in coaxial relationship with said first portion of said conduit means;

sleeve inflating means for inflating said sleeve means under pressure such that said sleeve means expands to contact said ship bore wall to provide a fluid-proof barrier between said conduit means and ship bore wall, whereby fluid in said deck drain is permitted to drain only through said conduit means away from the hull and not down the ship's exterior surface; and

collar means extending radially from an outer surface of said conduit means to support opposite ends of said sleeve means;

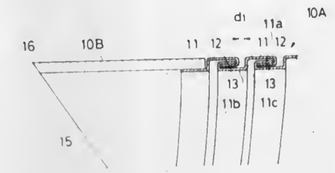
said collar means including a first collar for supporting the end of said sleeve means closest to said inlet end and a second collar for supporting the other end of said sleeve means, said conduit means and first collar being threaded such that said first collar is threadably mounted on said conduit means, whereby said first collar is detachable from said conduit means.

4,630,649

GUIDE TUBE FOR INDUSTRIAL ENDOSCOPE

Toshio Oku, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,545
Claims priority, application Japan, May 2, 1984, 59-64483[U]
Int. Cl.[4] F16L *55/00*
U.S. Cl. 138—122 **3 Claims**



1. A guide tube for guiding the movement of an endoscope into a passageway which comprises a tubular body having:

a front end slanted with respect to an axis thereof, at least that portion of said tubular body adjacent to said front end being axially compressible resiliently and resiliently bendable, and

a strip formed into a spiral configuration, each adjacent turns of said spiral strip being movable toward each other a predetermined distance to allow the axial compression of said body, said strip having a pair of first and second engaging portions formed along opposite lateral edges thereof, said first and second engaging portions of each adjacent turns of said spiral strip being engaged with each other in a manner to hold the spiral strip in a slightly axially compressed condition.

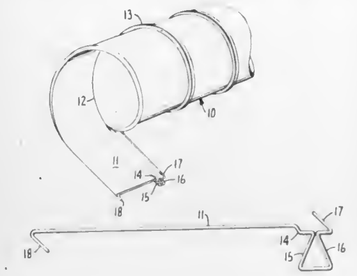
4,630,650

SPIRAL RIBBED PIPE

Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.

Filed Oct. 15, 1984, Ser. No. 660,637
Int. Cl.[4] F16L *11/16*
U.S. Cl. 138—154 **10 Claims**

1. A spiral ribbed pipe formed from an elongated strip coiled helically, said pipe having a helical sam and an integral reinforcing rib formed helically along said seam, said helical seam comprising interlocking edges of said coiled strip, said integral reinforcing rib being formed adjacent one edge of the elongated strip, the improvement wherein each rib comprises a pair of leg portions of substantially equal length, the radially inward end of each leg being offset approximately three strip thicknesses from the inner surface of the pipe, said interlocking edges of said coiled strip being located between the ends of said leg portions and the inner surface of said pipe, whereby



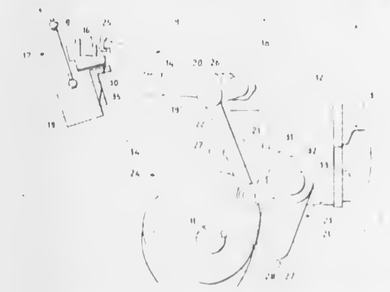
the inner surface of each coil of said coiled strip is longitudinally aligned with the surfaces of adjacent coils to provide a smooth interior pipe surface.

4,630,651

APPARATUS FOR THE CONSTRAINED ACTUATION OF THE CLAMPING SYSTEM OF FILLING-YARN INSERTION DEVICES IN SHUTTLELESS WEAVING MACHINES

Florian Windischbauer, Lindau, Fed. Rep. of Germany, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Continuation-in-part of Ser. No. 510,833, Jul. 5, 1983, Pat. No. 4,515,185. This application Feb. 5, 1985, Ser. No. 698,396
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224708
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] D03D *47/18*
U.S. Cl. 139—446 **10 Claims**



1. In an apparatus employed in a shuttleless weaving machine wherein filling-yarn is inserted by gripper systems which are bilaterally advanced into the shed and then retracted and which are provided with clamping means for the filling-yarn, for constrained actuation of the clamping means by control levers controlled by cam means and entering through the warp threads of the shed from the exterior, the improvement which comprises:

pivot means defining a pivot axis for pivotably mounting said control levers at a fixed location below a path of travel of a fabric being woven in the weaving machine;

a control shaft extending beneath said path of travel of said fabric and substantially parallel to said pivot axis;

said cam means comprising at least one mutually complementary cam wheel pair mounted on said control shaft in driven relationship thereto;

actuation means comprising at least one double-lever rocker arm, sensing rolls cooperating therewith for operatively

following said cam means, and rocking means defining a rocking axis extending substantially parallel to said control shaft for pivotably mounting said at least one double-lever rocker arm;

said cam means and said actuating means conjointly defining a constrained-control cam system; and

linkage means operatively connecting said control levers with said actuation means for pivoting said control levers out of an operative position entering said shed into an idle position beneath a path of motion of a reed tay of a reed of the weaving machine.

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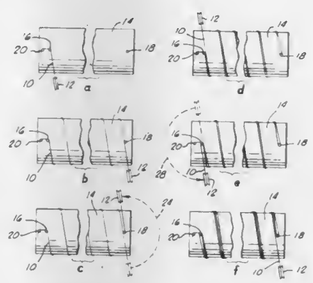
METHOD FOR FORMING A FLAT BAND OF PARALLEL, CONTIGUOUS STRANDS

Frank L. Dieterich, 5113 Miembro, Laguna Hills, Calif. 92653

Filed Jul. 1, 1985, Ser. No. 749,988

Int. Cl.⁴ B21F *3/04*

U.S. Cl. 140—92.1 **6 Claims**



1. A method of forming a flat band of parallel, contiguous strands, comprising steps of:

winding a single strand in a first direction around a mandrel, to form a single-strand helical winding having a substantially constant pitch;

winding the single strand in a second, opposite direction around the mandrel, contiguous with the previous single-strand helical winding, to form a double-strand helical winding;

repeating the first and second winding steps in an alternating fashion until a multi-strand helical winding having a predetermined plurality of parallel, contiguous strands has been wound, each successive winding being contiguous with the second previous winding; and

removing the multi-strand helical winding from the mandrel to produce a flat band of parallel, contiguous strands.

4,630,653

WASTE TONER COLLECTING APPARATUS

Yuji Kan, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 23, 1985, Ser. No. 693,868

Claims priority, application Japan, May 17, 1984, 59-72682[U]

Int. Cl.⁴ B65B *1/04*

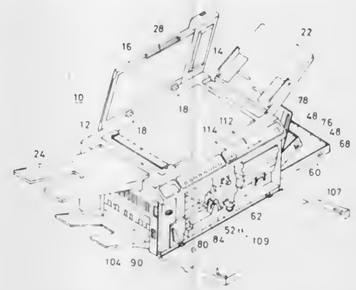
U.S. Cl. 141—83 **11 Claims**

1. A waste toner collecting apparatus for use in an image forming machine, the image forming machine using a toner for forming an image and having photosensitive means and a toner cleaning apparatus for removing waste toner from the photosensitive means, the waste toner collecting apparatus comprising:

a waste toner container for collecting waste toner;

means defining a passageway adapted to pass waste toner therethrough, the passageway defining means including an elongated, hollow inner tube, the inner tube having opposite ends, a first opening formed near one of its ends and a second opening formed near the other of its ends, the first opening being in communication with the waste toner cleaning apparatus and the second opening being selectively in communication with the toner container; and

a hollow outer tube at least partially surrounding at least a portion of the inner tube, the outer tube being adapted to rotate circumferentially about the inner tube between a first position and a second position, the outer tube including a third opening formed therein and situated to be



selectively in alignment with the second opening to allow waste toner to flow therethrough and into the waste toner container, wherein the second and third openings are in alignment and the second opening communicates with the toner container when the outer tube is in the first position, and wherein the second and third openings are in non-alignment and the second opening is not in communication with the toner container when the outer tube is in the second position.

4,630,654

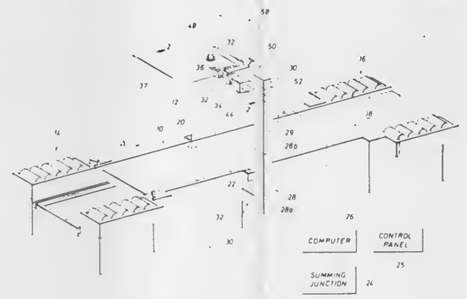
APPARATUS FOR LIQUID FILLING OF CONTAINERS

Conrad P. Kennedy, Jr., Beaumont, Tex., assignor to Patrick Howard Gibson, Sweeney, Tex.

Filed Aug. 10, 1984, Ser. No. 640,003

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—83 **15 Claims**



1. An apparatus for filling a container to a predetermined weight with a liquid from a liquid source while generating a minimum amount of foam comprising:

scale means operational to generate a control signal based on the weight of said liquid within said container and a control equation;

control valve means in flow controlling relationship between said liquid source and said container, said valve means having a movable valve element permitting selectively a calculated variable flow rate therethrough;

actuator means operatively associated with said control valve for moving said valve element to vary said flow rate;

valve positioner means operatively associated with said actuator means to control operation of said actuator means in response to a calculated positioning signal;

an interface arrangement operatively associated with said scale means and said positioner to generate said positioning signal, said positioning signal being a calculated signal which is a formation of said control signal and a control program;

a conduit assembly for introducing said liquid into said container from said liquid source through said valve means and including a filling lance having a first run portion interconnected to a second run portion, said first run portion and said second run portion being angularly disposed with respect to one another, said filling lance being mounted for pivotal movement about a generally horizontal axis transverse to and extending generally through the end of said first run portion distal said second run portion; said second run portion having a free end distal said first run portion and a discharge opening generally transverse to the axis of said second run portion and away from said first run portion whereby said filling lance can be moved to a position such that said liquid is discharged through said discharge opening in a generally downward and outward path toward a side of said container; and

means for pivoting said lance between filling and non-filling positions.

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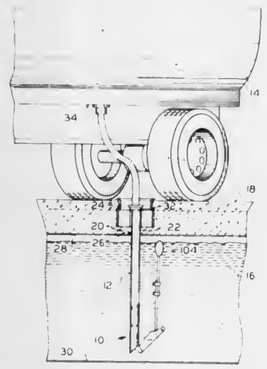
STORAGE TANK FLOW CONTROL VALVE ASSEMBLY

Donald W. Fleischer, Wethersfield, and Bruno S. Smilgys, Hartford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Oct. 24, 1985, Ser. No. 791,056

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—198 **15 Claims**



1. In combination,

an underground fuel storage system comprising a fuel storage tank positioned below ground level and a fill pipe assembly extending from ground level into said tank for refilling said tank from a gravity feed tanker truck, said fill pipe assembly including a fill tube extending into said tank and having a discharge end within said tank, and

a passive flow control valve assembly for controlling the flow of fuel through said fill pipe into said tank comprising

a valve housing mounted to the discharge end of said fill pipe and having an upstream end and a downstream end,

valve means pivotally mounted within said housing for controlling flow through said housing, said valve means having pivotally opposing sections and being pivotally moveable between a first open position permitting substantially unrestricted flow through said housing between said upstream and downstream ends and at least a second position substantially restricting flow through said housing between said upstream and downstream ends,

actuator arm means for moving said valve means between said first and second positions, said actuator arm means being mounted for movement between first and second positions and being interconnected to said valve means so as to correspondingly move said valve means from said first position to said second position as said actuator arm means moves from said first position to said second position, wherein said valve means is releasably pivotally moveable from said second position in the direction of said first position to permit less restricted flow through said housing between said upstream and downstream ends than the corresponding flow at said second position upon application of a suitable force to a said valve means section in a direction generally toward said downstream end, and

float means connected to said actuator arm means for moving said arm means to said second position when the liquid level of the storage tank reaches a predetermined level.

4,630,656

ROUTER ATTACHMENT

J. W. Collins, 412 Bristle Cone La., Naples, Fla. 33962

Filed Jun. 10, 1985, Ser. No. 743,022

Int. Cl.⁴ B27C *5/10*

U.S. Cl. 144—134 D **20 Claims**



19. A router attachment attachable to a work table for controlling the operation on a workpiece of a router having a router bit extending therefrom, said workpiece resting on said table, said attachment comprising:

a pair of angle support members;

means for maintaining said support members parallel to one another at a desired distance above said table, said desired distance being greater than the thickness of said workpiece;

carriage means for holding a router and adapted for moving between said support members, said carriage means having a bottom and two sides vertical to said bottom, said sides having outer surfaces parallel to one another and separated by said desired distance;

means for raising and lowering said carriage means between a first position at which said bottom rests on said workpiece and a second position at which said router bit is above said workpiece;

means coupled below said support members for holding said workpiece; and

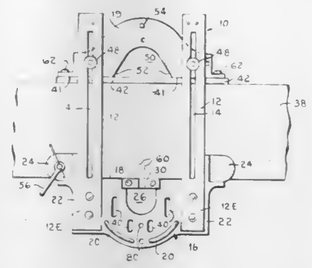
stop means for defining the limits of movement of said carriage means.

4,630,657

VERSATILE ROUTER GUIDE APPARATUS

George Obradovich, 812 Kennedy Ave., Schererville, Ind. 46375

Filed May 28, 1985, Ser. No. 738,444
Int. Cl.⁴ B27C *5/10*
U.S. Cl. 144—144.5 GT **14 Claims**



1. A guide apparatus for a router that is portable and easily moved and adjusted to fit and used with different sized workpieces, comprising:

a pair of side rail members;

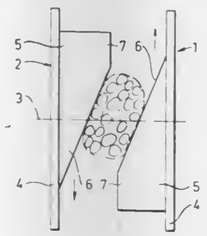
means attachable to each of said rail members spanning between them so as to secure them in a parallel but spaced apart relationship, spaced at a separation that receives, in a guiding fit, the base of the router, and for releasably coupling the apparatus to a workpiece so that the router may be guided thereon without the need for any attachment of the guide apparatus nor the router to any other support, with said means and side rail members being attachable in different positions so as to accommodate the apparatus to differing sized workpieces or differing cuts therein.

4,630,658

COUNTER ROTATING DOUBLE DISC CHUNKER

Rodger A. Arola, Hancock, Mich., and Hans-Olof Säll, Hedemora, Sweden, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 16, 1985, Ser. No. 734,527
Int. Cl.⁴ B27L *11/02*
U.S. Cl. 144—176 **14 Claims**



1. A device for cutting wood materials such as roundwood, treetops, branches and waste wood into pieces of such wood materials of predetermined substantially uniform lengths of such materials suitable for combustion comprising

a pair of opposed disc members;

means to mount said disc members to that their circular faces are in facing relation to each other;

means to feed the wood materials to be cut into the space between said pair of facing opposed disc members;

means to rotate said disc members in opposite directions;

knife means mounted on each of said disc members on the respective facing circular faces thereof; each of said knife means comprising a first cutting edge and a second cutting edge, said second cutting edge being located in a plane parallel to the plane of rotation of its respective member, said first cutting edge extending in the direction of rotation of its respective disc member from the end of said second cutting edge which leads in the direction of rotation of its respective disc member at a slant to said circular face of said respective disc member, the planes containing the second cutting edges of said knife means on said pair of disc members being located in the space between said facing circular faces of said disc members; and means to locate said disc members with respect to each other such that said second cutting edges pass each other in the same predetermined closely spaced relation during each rotation of said disc members in said opposite directions;

said knife means alone performing all of the cutting of said wood materials; and

said oppositely rotating knife means tending to rotate said wood materials about a line of wood material feed defined by said feed means;

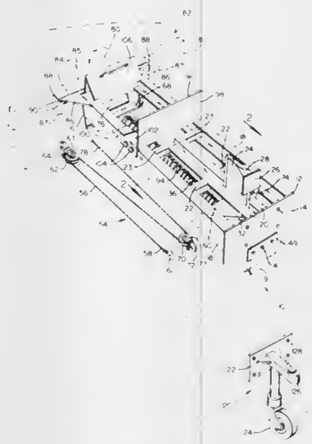
whereby wood materials fed longitudinally between said knife means are cut by said knife means into said lengths rather than being chipped or crushed or otherwise finely divided, and whereby cutting of said wood materials proceeds continuously.

4,630,659

WINCH-POWERED WOOD SPLITTER

Joel W. Warthen, P.O. Box 105, Kellogg, Id. 83837

Filed Apr. 26, 1985, Ser. No. 727,728
Int. Cl.⁴ B27L *7/00*
U.S. Cl. 144—193 R **8 Claims**



8. A wood splitting device comprising:

a support frame attachable to the bumper of a motor vehicle;

a movable blade adapted for reciprocating motion along said support frame, said blade having upper and lower portions and a leading edge positioned to face a log or other wooden workpiece during splitting;

a splitting wedge fixedly secured to said upper portion of said blade;

a cable attachment member fixedly secured to said lower portion of said blade;

a blade carriage sleeve fixedly secured to said lower portion of said blade;

blade guide means positioned within said support frame for controlling the path of said blade, said guide means comprising two parallel elongate guide rails fixedly attached within said support frame, said elongate guide rails being positioned to allow passage of said blade therebetween;

a blade carriage shaft fixedly positioned within said support frame, said sleeve being slidably movable on and along said blade carriage shaft;

a blade return spring extending along said blade carriage shaft from said leading edge of said blade;

an abutment member mounted on said support frame to limit the movement of said workpiece during splitting;

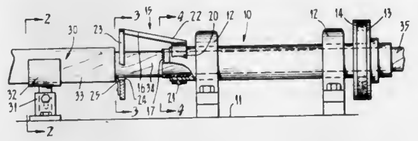
a drive transmission comprising first and second snatchblocks to guide a drive cable which is securable to said cable attachment member on said blade so that said cable extends away from said attachment member toward and through said first snatchblock which is secured to said support frame, from which said cable extends away from said snatchblock toward and through said second snatchblock which is secured to said attachment member on said blade, from which said cable extends away from said second snatchblock to a winch mounted on said motor vehicle, whereby when said winch exerts pulling force on said cable, said blade is pulled along and through said blade guide means toward and into said workpiece, during which said blade carriage sleeve moves along said blade carriage shaft compressing said blade return spring until splitting of said workpiece is accomplished, and whereby, when said cable is subsequently slacked, said blade return spring pushes said blade carriage sleeve and attached blade away from said log or wooden workpiece.

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DOWELL MAKING

William J. McGuire, 13 Albert Rd., Moonah, Tasmania 7009, Australia

Filed Jun. 25, 1985, Ser. No. 748,468
Int. Cl.⁴ B27B *1/00*
U.S. Cl. 144—363 **11 Claims**



1. A dowell making machine having a central hollow rotatable shaft, a driving means and means for connecting the shaft to the driving means, an end plate located co-axial with the shaft and rotatable therewith, the end plate having a central aperture co-axial with the aperture of the shaft, the aperture being larger in diameter than the dowell to be made and having cutting blades thereabout, a cylindrical saw blade associated with the tool and being co-axial with the axis of the aperture of the shaft, and between the end plate and the shaft, the arrangement being such that timber passing through the end plate is first formed to a substantially cylindrical shape and on passing through the cylindrical blade is sized to form a dowell.

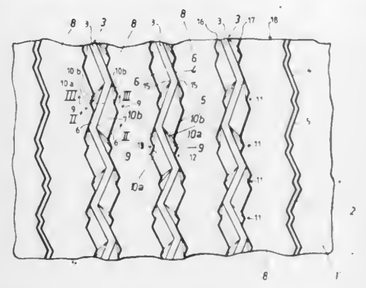
9. A method of making a dowell using a dowell making machine having a central hollow rotatable shaft adapted for rotation by connection to a driving means, and having an end plate located co-axial with the shaft and adapted to be located for rotation therewith, the end plate having a central aperture co-axial with the aperture of the shaft, the aperture being larger in diameter than the dowell to be made and having cutting blades thereabout, and having a cylindrical saw blade associated with the tool and being co-axial with the axis of the aperture of the shaft, and between the end plate and the shaft, the arrangement is such that the timber passing through the end plate is first formed into a cylindrical shape and on passing through the cylindrical blade is sized to form a dowell, comprising the step of passing the stock from which the dowell is to be made through the machine.

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PNEUMATIC VEHICLE TIRE TREAD, ESPECIALLY RADIAL-PLY TIRE FOR TRUCKS

Josef Stelzer, Vienna, Austria, assignor to Semperit Reifen AG, Vienna, Austria

Filed Dec. 10, 1984, Ser. No. 680,186
Claims priority, application Austria, Dec. 23, 1983, 4505/83
Int. Cl.⁴ B60C *11/06*
U.S. Cl. 152—209 R **14 Claims**



1. A pneumatic vehicle tire, especially a radial-ply truck tire, comprising:

a tread defining a circumferential direction;

a predetermined number of ribs formed in said tread and extending in said circumferential direction thereof;

a predetermined number of zig-zag-shaped grooves separating said ribs from each other;

each one of said predetermined number of zig-zag-shaped grooves defining a base and having a cross-section which decreases towards said base;

each one of said predetermined number of zig-zag-shaped grooves being bounded by two opposite sidewalls and defining angled regions;

each one of said predetermined number of zig-zag-shaped grooves, when viewed in cross-section and between said angled regions, being bounded by a first sidewall section which extends at least approximately normally to said tread, and a second sidewall section located opposite said first sidewall section and constituting a dually-angled sidewall section;

each one of said predetermined number of zig-zag-shaped grooves comprising circumferentially consecutive groove sections;

said first sidewall sections and said second sidewall sections being disposed on alternating sides of each one of said grooves in said circumferentially consective groove sections of each one of said grooves;

each said angled region in each one of said predeterminded number of zig-zag-shaped grooves comprising a salient angled region and a reentrant angled region confronting said salient angled region across each one of said grooves; and

each one of said predetermined number of zig-zag-shaped grooves comprising a recessed corner region formed in each said salient angled region and a protuberant corner region formed in each said reentrant angled region.

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VEHICLE WHEEL WITH TIRE BEAD CLAMPING RING

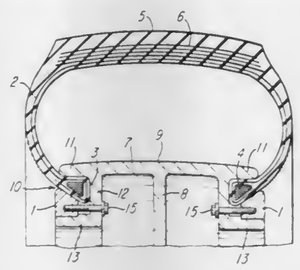
Volker Howind, Wedemark, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,771
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3410048
Int. Cl.⁴ B60B *21/00, 21/10*
U.S. Cl. 152—397 **10 Claims**

1. A vehicle wheel, especialy for trucks and other heavy

vehicles as well as being suitable for so-called emergency running operation, having an axis of rotation and a rigid rim on which can be mounted a pneumatic tire of rubber or rubber-like material including tire beads drawn spontaneously into a sealing position during inflating of the tire as well as being also automatically centered thereby relative to said rim as dual effects attained therewith; the carcass of the tire is anchored in the tire beads by being looped around pull-resistant bead cores, and the tire beads are disposed on the radially inner periphery of the rim ring; said wheel comprises:

a central rim ring portion, to both sides of which extend respective axially outer rim ring parts, each of said rim



ring parts forming a seating surface for a tire bead, each of said seating surfaces extending essentially parallel to said axis of rotation of said wheel;

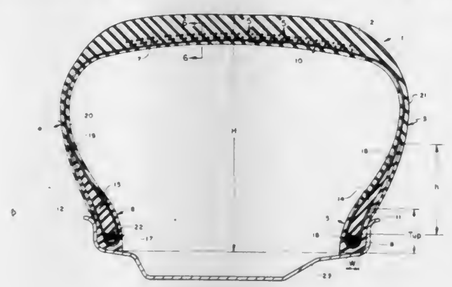
a respective clamping ring disposed radially inwardly of each of said tire beads, said clamping ring having a side including a surface which rests at an acute angle against its tire bead, said side surface extending at an acute angle to said axis of rotation of said wheel; each of said bead cores having a cross-sectional shape which includes a side which is essentially parallel to said side surface of said clamping ring, and a side which is essentially parallel to said seating surface for its bead.

4,630,663

TIRE CONSTRUCTION UTILIZING LOW-TWIST BODY PLY YARN WITH LOW TURN-UP ENDS

Thomas W. Bell, Mogadore, and Louis W. Shurman, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 27, 1984, Ser. No. 675,164
Int. Cl.⁴ B60C *15/06*
U.S. Cl. 152—541 **9 Claims**



1. An improved pneumatic tire of the type having a tread portion, a pair of side wall portions, a pair of bead portions located below the side wall portions which include an annular bead core and a generally triangular-shaped bead filler, and a body ply structure extending circumferentially about the tire and being turned-up around the bead portions from the inside to the outside and terminating in a pair of turn-up end portions adjacent the bead filler, said improvement being characterized by:

(a) the body ply being formed of a low twist yarn having between 3 and 6 turns-per-inch;

(b) the turn-up end portions extending along the side wall portions a distance of between 10% and 30% of the tire section height;

(c) the bead filler consisting of a high hardness rubber having a Shore A hardness of between 75 and 98, a height of between 20% and 50% of the tire section height, and a maximum base width of between 15% and 35% of the bead filler height; and

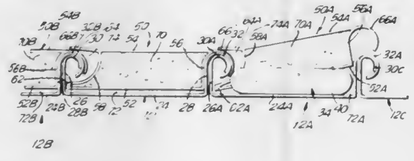
(d) said side wall portions between the tread portion and bead portion being free of any additional textile or metal reinforcement except that provided by the body ply structure.

4,630,664

INSULATED ROLL-UP DOOR

Sebastian Magro, 78-47 75th St., Glendale, N.Y. 11385

Filed Mar. 28, 1984, Ser. No. 594,296
Int. Cl.⁴ E06B *9/10*
U.S. Cl. 160—232 **11 Claims**



1. A roll-up door comprising:

a plurality of elongated adjoining slats;

hinge means for coupling said adjoining slats together for relative movement of said slats between a vertical co-planar arrangement when the door is closed, and an arcuate arrangement when the door is being rolled up;

each of said slats including a U-shaped elongated channel having a web portion interconnecting inwardly directed opposed flange portions, said web portions of said slats cumulatively defining a front face of the door;

distal ends of said opposed flange portions of each slat terminating in forwardly directed arcuately curved first and second segments to define said hinge means;

said first segment on each slat having a curvature substantially concentric with and smaller than a curvature of said second segment on each respective slat;

said smaller first segment defining an elongated hinge pin for insertion into a hinge barrel of an adjoining slat on one side thereof;

said larger second segment defining an elongated hinge barrel for receiving a hinge pin of an adjoining slat on an opposite side thereof; and

insertable and removable elongated insulation members being co-extensively disposed along each slat with each insulation member being positioned between said opposed flange portions of each respective slat;

each of said insulation members having a thickness from front to rear thereof less than depth of each of said U-shaped slat channels correspondingly from front to rear thereof so that said front of each of said insulation members is in a rearwardly spaced apart relationship to said web portion of each of said slats;

first and second support means on opposing sides of each of said insulation members for suspending each of said insulation members in said rearwardly spaced apart relationship to each of said slat web portions to provide an air space therebetween for additional insulation, said air space extending from one flange portion of each of said slats to the other flange portion of each of said slats;

said first support means including an elongated arcuate hook extending from a rear edge on one side of said insulation member for latching around an exterior of said elongated hinge barrel on each respective slat;

said second support means including an elongated lip resiliently projecting from said rear edge on the opposite side of said insulation member;

said elongated lip being in continuous engagement on an elongated hook of an adjoining insulation member for suspending said insulation member above said slat web portion of its respective slat;

said elongated hook of each insulation member securing and suspending said insulation member relative to its respective slat;

foot means for wedging against said one flange portion beneath said elongated hinge pin on each respective slat to retain said insulation members in its suspended position along said respective slats;

said foot means including an elongated foot projecting from a front edge on said opposite side of each insulation member;

said opposite side of each insulation member being provided with recess means between said lip and said foot for accommodating said elongated hinge barrel and elongated hook of its associated adjoining slat; and

said recess means including an arcuate recess having a curvature extending from said foot to be concentric with an arc of rotation of said adjoining slats.

4,630,665

BONDING ALUMINUM TO REFRACTORY MATERIALS

John W. Novak, Jr., New Kensington; Dennis R. Raines, Holiday Park, and Donald J. Bray, Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 769,132
Int. Cl.⁴ B22D *19/14*
U.S. Cl. 164—97 **17 Claims**

1. A method of bonding aluminum and aluminum alloys to a refractory material, comprising

(a) heating a body of aluminum or an aluminum alloy to a temperature of about 1100°–1500° C.,

(b) controlling total pressure adjacent the heated body above the vapor pressure of aluminum but less than about 1,000 microns Hg,

(c) maintaining the partial pressure of oxygen adjacent the heated body sufficiently low to prevent substantial oxidation of the body, the contact angle between the heated body and refractory material being less than about 45°, and

(d) contacting the heated body with a mass comprising a refractory material.

12. A method of forming a composite comprising a metal matrix reinforced by fibers of a refractory material without application of a pressure differential, said method comprising

(a) providing a mold defining a mold cavity containing a mass of fibers of a refractory material, said fibers forming a network defining a plurality of interstices,

(b) heating a body of aluminum or an aluminum alloy to a temperature of about 1200°–1500° C.,

(c) introducing the heated body into the mold cavity so that the body contacts the mass of fibers, while controlling total pressure adjacent the heated body above the vapor pressure of aluminum but less than about 1,000 microns Hg and maintaining the partial pressure of oxygen adjacent the heated body sufficiently low to prevent substantial oxidation, said heated body thereby being drawn by capillarity into the interstices of said mass, and

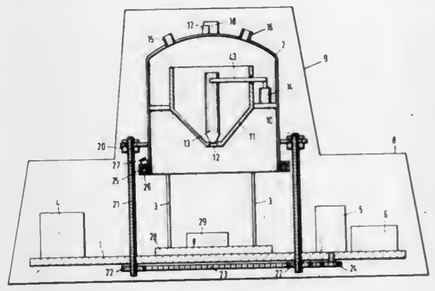
(d) cooling said body and said refractory material, thereby to form a composite comprising a matrix of aluminum or aluminum alloy reinforced by a network of refractory fibers.

4,630,666

CASTING DEVICE FOR DENTAL CASTS

Horst Wismann, Gartenstr. 22, D-8162 Schliersee, Fed. Rep. of Germany

Continuation of Ser. No. 495,432, May 17, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,155
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3219008
Int. Cl.⁴ A61C *13/20*; **B22D** *18/00*
U.S. Cl. 164—155 **12 Claims**



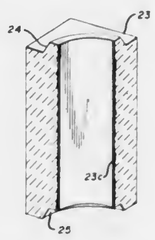
1. A casting device for making dental casts with low melting metals or alloys comprising a casting chamber in the form of a bell having a rim and an external surface, means for sealing the casting chamber in a pressure-tight manner including a plate, said bell being liftable and lowerable relative to said plate by lifting means and having connection means for connection to a source of pressure and to vacuum means, said means for sealing further including a fluid pressure actuated sealing member disposed on said external surface of said bell and adjacent and surrounding said rim so that said sealing member will seal against both said rim and said plate when said bell is lowered to engage said plate and said sealing member is actuated, a melting crucible mounted in said bell and being movable with said bell, said bell being provided with a filling hole for material to be melted, said crucible having a discharge opening and a casting valve means mounted in said crucible for movement toward said discharge opening to close said opening and away from said opening by means of a solenoid mounted in said bell, an agitator disposed in said crucible, driving means mounted in said bell for driving said agitator, said casting device further including means for automatically controlling the operation of said device.

4,630,667

COATED REFRACTORY SHAPES USEFUL IN BOTTOM POURING OF INGOTS IN INGOT MOLDS

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jul. 17, 1985, Ser. No. 755,734
Int. Cl.⁴ B22C *9/08*
U.S. Cl. 164—363 **5 Claims**



2. In an ingot mold assembly for the bottom pouring of

molten metal into said ingot mold having a plurality of connecting horizontally disposed hollow tiles communicating with said ingot mold and a plurality of connecting vertically disposed hollow tiles communicating with said horizontally disposed hollow tiles; the improvement comprising said hollow tiles being formed of refractory material and a penetrating heat insulating lining in the interior of said hollow tiles for controlling heat transfer from molten metal therein to said refractory material whereby thermal shock and resultant cracking and spalling of said refractory material is controlled.

4,630,668

INTEGRAL CASTING APPARATUS FOR USE IN CONTINUOUS CASTING OF MOLTEN METAL

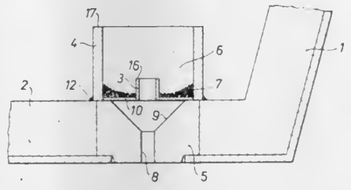
Rolf Waltenspühl, Zug, Switzerland, assignor to Stoping Aktiengesellschaft, Baar, Switzerland

Filed May 20, 1985, Ser. No. 736,122

Claims priority, application Switzerland, May 23, 1984, 2532/84

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—437 **22 Claims**



11. An apparatus, for use with a metallurgical vessel for the continuous casting of molten metal through a discharge opening in a bottom thereof, for preventing solidification of the molten metal in the discharge opening at the beginning of a casting operation, said apparatus comprising:

a first overflow pipe adapted to be mounted above the discharge opening to extend above the bottom of the vessel; and

a second overflow pipe mounted about said first overflow pipe and defining therewith an annular recess;

whereby molten metal to be cast from the vessel is adapted to first overflow the upper edge of said second overflow pipe into said annular recess and then to overflow the upper edge of said first overflow pipe to be discharged through the discharge opening of the vessel.

4,630,669

HEAT EXCHANGE APPARATUS FOR HIGH TEMPERATURE LPCVD EQUIPMENT

Peter H. Kessler; Wilson D. Calvert, Sr., both of Round Rock, and Faivel S. Pintchovski, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1985, Ser. No. 765,640

Int. Cl.⁴ F28F *3/12*

U.S. Cl. 165—1 **4 Claims**

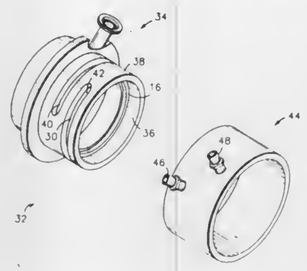
4. A method for cooling and preserving the O-rings sealing a heat exchange assembly between a quartz reactor tube and a heat exchanger end cap, comprising the steps of:

conducting a LPCVD reaction inside the quartz reactor tube at a temperature in the range of 800° to 900° C.; and

circulating a heat exchange fluid through a sinuous fluid channel of an end cap comprising:

a base sleeve having a first surface having the sinuous fluid channel formed therein extending between an inlet portion and an outlet portion, and a second surface having at least one O-ring for sealing tightly against the quartz reactor tube, and wherein the sinuous fluid channel is positioned along the first surface such that the channel is positioned oppositely, in close proximity of and adjacent to the O-ring in the second surface to withdraw heat therefrom; and

a cover sleeve having at least a first surface of substantially the same cross-section as that of the first surface of the base sleeve so as to substantially seal the fluid channel in an operative position of the sleeves, the cover



sleeve having an inlet port and an outlet port extending therethrough so as to align with the inlet and outlet portions, respectively, of the fluid channel in the operative position of the sleeves; and

drawing heat from the quartz reactor tube past the O-rings positioned between the quartz reactor tube and the end cap and transferring it to the heat exchange fluid.

4,630,670

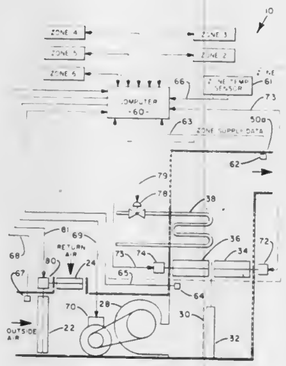
VARIABLE VOLUME MULTIZONE SYSTEM

Donald C. Wellman, Marcellus, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 562,912, Dec. 19, 1983, Pat. No. 4,549,601, which is a continuation-in-part of Ser. No. 390,606, Jun. 21, 1982, Pat. No. 4,495,986. This application Jun. 17, 1985, Ser. No. 745,041

Int. Cl.⁴ F25B *29/00*

U.S. Cl. 165—16 **8 Claims**



5. A variable volume multizone system for simultaneously supplying warm, cool and neutral air, as required, to a plurality of zones from a common source comprising;

variable volume air supply means for supplying air in required amounts;

air cooling means;

a variable multizone section divided into a plurality of units corresponding to the number of zones;

each of said units having a first inlet controlled by a first damper means for supplying cool air to a zone, a second inlet controlled by a second damper means for supplying neutral or heated air to a zone and heating means for heating air passing through said second damper means;

means for sensing the temperature in each zone;

means for sensing the amount of air supplied to each zone;

means for controlling said first and second damper means in each zone responsive to the sensed temperature and amount of air supplied to the zone.

4,630,671

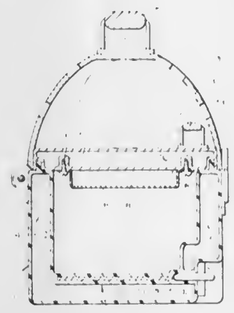
LUNCH BOX

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11121, and Ilya Zborovsky, 3285 Wolfson Dr., Baldwin, N.Y. 11510

Filed Feb. 12, 1985, Ser. No. 700,962

Int. Cl.⁴ F25B *29/00*

U.S. Cl. 165—61 **1 Claim**



1. A lunch box, comprising

a hollow body bounding an inner substantially closed chamber for accommodating food;

a hollow vessel removably attached to a part of said body so as to be located in said inner chamber when it is attached, and filled with a liquid which can be frozen and thereby cools said inner chamber; and

an electrical heating element connected with said hollow body and connectable with an electric power source so as to be heated and to supply heat into said inner chamber for accommodating food contained in said inner chamber for accommodating food, and disconnectable from an electric power source so as to be deactuated for cooling said inner chamber by said liquid-filled vessel,

said liquid-filled vessel being mounted in said inner chamber so as to be movable between a first position in which it faces toward said inner chamber for cooling the latter, and a second position in which it faces away of said inner chamber and therefore said heating element so that when said heating element heats said inner chamber said vessel is less subjected to the action of heat from said heating element.

4,630,672

ON LINE SCRUBBING SYSTEM FOR PLATE AND FRAME HEAT EXCHANGERS

Richard O. Kaufmann, 6050 El Camino del Cerro, Tucson, Ariz. 85705

Continuation of Ser. No. 390,848, Jun. 22, 1982, abandoned, which is a continuation of Ser. No. 101,719, Dec. 10, 1979, abandoned, and a continuation of Ser. No. 873,252, Jan. 30, 1978, abandoned. This application Jul. 12, 1984, Ser. No. 630,021

Int. Cl.⁴ F28G *1/16*

U.S. Cl. 165—95 **1 Claim**

1. An on line recovery system for use in a commercial laundry and the like comprising:

a. a sump for receiving a laundry's heated waste water;

b. separating means connected to said sump for receiving said waste water and separating particulate therefrom;

c. a flat plate heat exchanger having interstices between adjacent plates of sufficiently small size as to be subject to clogging by contaminates passing said separating means connected to receive pressurized heated waste water from said separating means for cooling said waste water and connected to a source of fresh water to be heated for use in said laundry;

d. an injection means for injecting air into said heated waste water, said injection means positioned to inject air into



said heated waste water before said waste water enters said heat exchanger to create bubbles of air permeating said waste water as said waste water flows through said heat exchanger; and

e. means connected to said heat exchanger for directing heated fresh water exiting therefrom to said laundry and means connected to said heat exchanger for disposing of cooled waste water exiting therefrom.

4,630,673

CLAMPING ASSEMBLY HEAT EXCHANGER TUBE PLATES

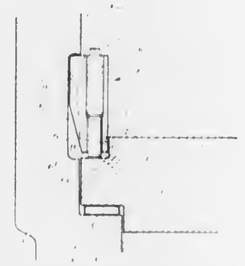
Riccardo Belleli, Mantova, Italy, assignor to Belleli S.p.A., Mantova, Italy

Filed Jun. 14, 1983, Ser. No. 504,344

Claims priority, application Italy, Jun. 21, 1982, 21968 A/82; Oct. 15, 1982, 23204/82[U]; Oct. 22, 1982, 23890 A/82; Mar. 15, 1983, 21112/83[U]

Int. Cl.⁴ F28F *9/06*; F28D *1/06*; F16L *39/00*

U.S. Cl. 165—158 **1 Claim**



1. In an annular heat exchanger having a a longitudinal and a radial extent including a header chamber portion extending from a shell portion of the heat exchanger and having an annular seating surface means and a tube plate having a shell side facing the shell portion and a head side facing the header chamber portion of the heat exchanger and resting with said shell side thereof onto said seating surface means,

a clamping assembly structure comprising a circumferential groove in said header chamber portion, at a distance from said seating surface means and coaxial therewith, said groove defining a first upper shoulder means near said head side of the tube plate and a second opposite shoulder means longitudinally at a distance from said head side of the tube plate and an outwardly recessed circumferential longitudinally extending cylindrical bottom surface of said groove and connecting said first and said second shoulders,

in said tube plate at said head side thereof a circumferential step formation facing said groove, said step formation having a flange surface and a longitudinally extending riser surface transverse thereto and having a circumferential top edge, said flange surface and said riser surface being inwardly

offset with respect to said first and second shoulder means, a segmented ring comprising annular segment elements with a top surface and a base surface, each said element having a longitudinal extension which is less than the distance between said first and said second shoulder means and greater than the longitudinal distance between said second shoulder means and said top edge of said riser surface thereby to leave a gap between said base surface and said flange surface and having a diametral extension which is substantially equal to the sum of the diametral extensions of said second shoulder and said flange surface, said segmented ring elements having each an external longitudinally extending first mating surface portion in mating engagement with at least part of said bottom surface of said groove, said segmented ring elements having each a longitudinally extending internal second mating surface portion in mating engagement with at least part of said riser surface and inwardly offset with respect to said external first mating surface, said segmented ring elements having each a radially extending third mating surface portion extending transverse to said first and said second mating surface portions and in mating engagement with said second shoulder means and, wherein said segmented ring elements have each a tapering region at the outward surface thereof, tapering from said first mating surface portion towards said base surface thereof thereby to allow insertion by a tilting movement of said segmented ring elements into the space between said step formation and said circumferential groove,

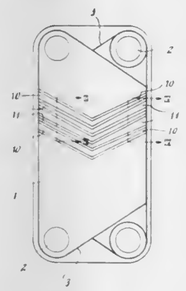
pressing means within said segmented ring elements, said pressing means having one end portion thereof projecting towards said flange surface of said step formation beyond said segmented ring element thereof and in pressing engagement with said flange surface, thereby to clamp said tube plate against said seating surface means.

4,630,674

PLATE HEAT EXCHANGER

Malte Skoog, Tumba, Sweden, assignor to Malte Skoog Invent Ab, Lund, Sweden

Filed Jan. 11, 1980, Ser. No. 111,472
Claims priority, application Sweden, Jan. 17, 1979, 7900410-7
Int. Cl.⁴ F28F *13/08, 3/04*
U.S. Cl. 165—147 **8 Claims**



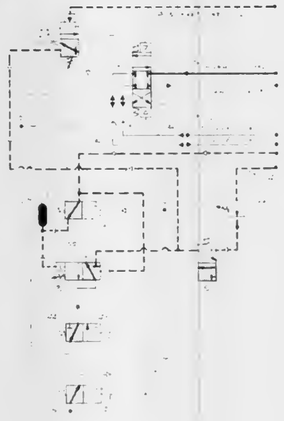
1. A plate heat exchanger comprising a plurality of generally rectangular plates stacked together to define between them passages for two heat exchanging fluids, the plates having openings at the corner regions thereof for conveying said fluids to and from respective passages, each plate having inlet and outlet openings for one fluid located adjacent one side edge of the plate and having inlet and outlet openings for the other fluid located adjacent the opposite side edge of the plate, the plates having corrugations defining alternate ridges and grooves which extend across the plates to increase turbulence of the heat exchanging fluids in the passages, the cross-section of each corrugation groove increasing along the length of the groove in such a direction that the volume per unit width of each passage changes across the width of the two plates defining said passage, said volume per unit width of each passage being relatively small adjacent those side edges of said two plates which are nearer said inlet and outlet openings through which fluid is conducted to and from said passage, said volume per unit width of each passage being relatively larger adjacent the opposite side edges of said two plates.

4,630,675

DRILLING CHOKE PRESSURE LIMITING CONTROL SYSTEM

Lawrence E. Neipling, Long Beach, and Mark C. Flohr, Irvine, both of Calif., assignors to Smith International Inc., Newport Beach, Calif.

Filed May 28, 1985, Ser. No. 737,942
Int. Cl.⁴ E21B *7/00*
U.S. Cl. 166—53 **8 Claims**



1. A pneumatic pressure limiting system for a hydraulically actuated drilling choke having a pneumatic pressure signal indicative of the choke position comprising:

means responsive to casing pressure for selectively activating the pressure limiting system by applying pneumatic pressure when the casing pressure exceeds a maximum allowable pressure;

a memory accumulator connected to the source of the pressure signal indicative of choke position;

a pilot controlled memory latching valve operable upon activation of the system for temporarily isolating the memory accumulator for storing the pressure signal indicative of choke position before activation of the pressure limiting system; and

pneumatic accumulator means connected to the pilot operator of the memory latching valve for maintaining isolation of the memory accumulator until the casing pressure decreases below the maximum allowable pressure.

4,630,676

REMOTELY CONTROLLED HYDRAULIC CUTTER APPARATUS

Charles A. Long, Jr., Birmingham, Ala., assignor to Long Technologies, Inc., Birmingham, Ala.

Filed Dec. 23, 1983, Ser. No. 564,983
Int. Cl.⁴ E03F *3/06*
U.S. Cl. 166—55 **10 Claims**



1. A remotely controlled, hydraulically operated cutter apparatus for use within a conduit comprising:

control means located outside of the conduit for generating a plurality of electrical control signals for controlling the operation of the cutter apparatus;

a source of pressurized hydraulic fluid;

valve means for receiving both pressurized hydraulic fluid from the fluid source and control signals from the control means and for distributing the received hydraulic fluid in accordance with the received control signals;

a hydraulically powered cutter motor located within the conduit and including a cutting tool, said cutter motor receiving hydraulic fluid from the valve means for driving the cutting tool;

means for supporting the cutter motor within the conduit;

first hydraulically actuated means for receiving hydraulic fluid from the valve means and for holding the supporting means at a fixed axial position within the conduit as long as the received hydraulic fluid exceeds a predetermined minimum;

second hydraulically actuated means for receiving hydraulic fluid from the valve means and for adjusting the axial position of the cutter motor with respect to the supporting means in accordance with the received hydraulic fluid;

third hydraulically actuated means for receiving hydraulic fluid from the valve means and for adjusting the radial position of the cutter motor with respect to the supporting means in accordance with the received hydraulic fluid; and

fourth hydraulically actuated means for receiving hydraulic fluid from the valve means and for rotating the cutter motor up to 180 degrees about the axis of the conduit in either a clockwise or counterclockwise direction with respect to an initial position in accordance with the received hydraulic fluid, the first, second, third and fourth hydraulically actuated means cooperating to position the cutter motor to facilitate cutting by the cutting tool,

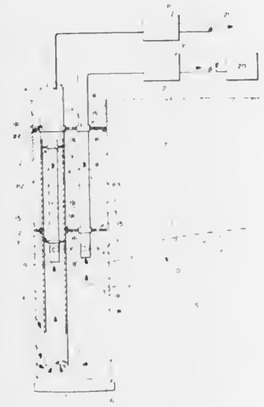
the valve means comprising manifold means including an inlet port for receiving the pressurized fluid from the fluid source, an outlet port for transmitting fluid to the fluid source and a plurality of at least nine fluid transfer ports for transmitting pressurized hydraulic fluid to and receiving return hydraulic fluid from the cutter motor and the first, second, third and fourth hydraulically actuated means, a plurality of at least nine electrically operated solenoid valves for selectively directing the hydraulic fluid between the manifold means inlet and outlet ports and the manifold means transfer ports in accordance with the received control signals, at least nine flexible hydraulic hoses, a first end of each hose being connected to one of the manifold means fluid transfer ports and the second end of each hose being connected to one of the cutter motor or the first, second, third or fourth hydraulically actuated means, and means for maintaining the nine hydraulic hoses in an untangled condition while facilitating the movement of one or more of the hydraulic hoses to accommodate for axial or radial adjustments in the position of the cutter motor and for the rotation of the cutter motor, the means for maintaining the nine hydraulic hoses comprising an elongated hydraulic hose control housing positioned within the conduit, the housing being generally U-shaped in cross section and including a pair of guide grooves extending generally parallel to the axis of the conduit and a slide member supported by the guide grooves for movement along the axis of the conduit with respect to the housing in correspondence with axial movement of the cutter motor, the hydraulic hoses having second ends which are connected to the cutter motor and the third and fourth hydraulically actuated means being six in number and being secured to said slide member for movement therewith, said six hydraulic hoses including expansion loops to permit axial movement of the six hydraulic hoses for a predetermined distance to compensate for axial movement of the cutter motor without substantial stressing or stretching of the six hoses.

4,630,677

FLUID RECOVERY SYSTEM

Paul G. Jakob, 7201 Venetian Way, West Palm Beach, Fla. 33406

Filed Jan. 7, 1986, Ser. No. 816,829
Int. Cl.⁴ E21B *43/14*
U.S. Cl. 166—68 **12 Claims**



1. A system for recovering a fluid product floating atop ground water comprising, a well having a well screen extending downwardly substantially below the static water and product level of the ground, a product withdrawal pipe and a water withdrawal pipe each provided with a bottom intake disposed within said well below said static level, an enlarged internal diameter separator tube surrounding said water withdrawal pipe and having a bottom opening disposed substantially below said water withdrawal pipe intake, said two pipes extending upwardly from said well to points adjacent grade level, a water and product pump respectively connected to said two pipes to separately withdraw water and product from said well respectively, said water pump operable to remove ground water from the lowest reaches of the well through said separator tube bottom opening and said water withdrawal pipe intake whereby, the static level of the ground water is lowered and forms an inverted cone of depression of ground water well below said pipe intakes with said product floating thereatop, said product accumulating as a central zone within said well and having a surface level normally no lower than said product

withdrawal pipe intake, and said product pump operable to remove said product from said central zone.

4,630,678

IN-SITU FORMATION OF POLYVALENT METAL IONS FOR CROSSLINKING POLYMERS WITHIN CARBONATE ROCK-CONTAINING RESERVOIRS

Naim A. Mumallah, Bartlesville, Okla.; Donald D. Bruning, Houston, Tex., and Riley B. Needham, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 3, 1985, Ser. No. 740,447
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—281 **14 Claims**

1. A method for treating a carbonate-containing underground formation wherein said carbonate comprises a calcium or calcium/magnesium carbonate which method comprises the sequential injection of

(A) effective permeability control proportions of an in-situ gelable composition comprising effective ratios of:

(a) water, and (b) at least one polymer capable of gelling with a crosslinking agent selected from calcium and magnesium irons within an acidic gelation pH range,

(B) an aqueous solution of a water-soluble acid in amounts sufficient to dissolve a portion of said carbonate, thereby liberating calcium or calcium and magnesium ions, and

(C) an aqueous solution of the polymer of (A), thereby gelling in-situ said polymer of steps (A) and (C) with said calcium or calcium and magnesium ions and effecting permeability contrast correction.

4,630,679

METHOD FOR TREATMENT AND/OR WORKOVER OF INJECTION WELLS

Henry C. Reeves, III, Layfayette, La.; Gary F. Potter, Tulsa, Okla., and Suzanne M. Riley, Houston, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Mar. 27, 1985, Ser. No. 716,783
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—305.1 **21 Claims**

18. A method for shutting down a high pressure injection well penetrating a subterranean formation, said method involving the use of a relatively high density brine composition containing one or more water soluble calcium halide salts as a kill weight work-over fluid for confinement of formation fluid pressure and comprising the steps of:

a. injecting into said well an aqueous preflush composition which comprises an effective amount of a scale inhibitor, said preflush composition being injected in an amount sufficient to prevent any substantial intermingling of said formation fluids with said high density brine composition; and

b. subsequently placing said high density brine composition into said well so as to

(1) displace said preflush into said formation; and

(2) to counterbalance and contain the pressurized fluids in said formation.

4,630,680

WELL CONTROL METHOD AND APPARATUS

Hubert L. Elkins, Kingwood, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 461,618, Jan. 27, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,907
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—34.2 **30 Claims**

1. Well apparatus adapted for use with a floating drilling vessel and adapted for connection to the structural casing string in a well bore established beneath the seabed comprising,

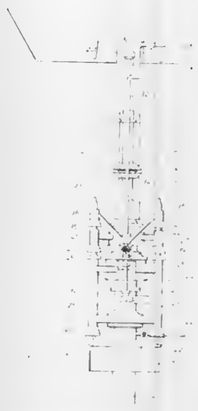
a conductor casing,

a first wellhead connected to the structural casing string,

a first conductor means for connecting a first conduit to the first wellhead,

an annular blowout preventer connected to the first conduit providing a flow path between the bore of the wellhead and the bore of the annular blowout preventer when the blowout preventer is normally open,

a valve disposed in a line connected to the first conduit between the blowout preventer and the first wellhead connector,



a kill line extending between the line and the drilling vessel, and

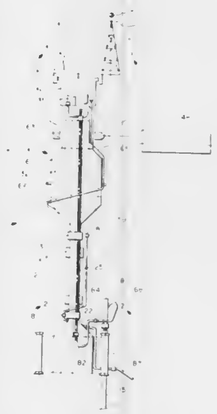
stripper and guidance means connected to the blowout preventer by a second connector for guiding said conductor casing through the blowout preventer and into the borehole and for stripping said conductor casing while it is being inserted therein.

4,630,681

MULTI-WELL HYDROCARBON DEVELOPMENT SYSTEM

William T. Iwamoto, Berkeley, Calif., assignor to Decision-Tree Associates, Inc., Berkeley, Calif.

Filed Feb. 25, 1985, Ser. No. 705,092
Int. Cl.[4] E21B *7/12*
U.S. Cl. 166—366 **10 Claims**



1. An offshore structure for development of a multi-well system by drilling through at least one of a plurality of piles securing a base structure for a center well to the seabed, comprising

a buoyant body connected to said base structure through at least one universl joint means such that vertical motion of said buoyant body is substantially attenuated, said buoyant body including a containment means adapted to store and separate produced fluids, a compartmentalized external shell surrounding said containment means for ballasting and deballasting, a turntable above said containment means, skid beams affixed onto said turntable, a drilling rig mast means slidably mounted on said skid beams, and a jack means for moving said drilling rig means with respect to said skid beams, said turntable and said jack means being adapted to function cooperatively to position said drilling rig means over one of said piles.

8. A method for development of a multi-well system comprising the steps of

providing a base structure secured to the seabed by piles, a buoyant body connected to said base structure and including a containment means adapted for storage and/or processing, a production riser assembly passing through said containment means, a turntable with skid beams affixed thereonto, and a drilling rig movably disposed on said skid beams,

positioning said rig over one of said piles by rotating said turntable and moving said rig with respect to said skid beams,

drilling a cluster well through said one pile, and

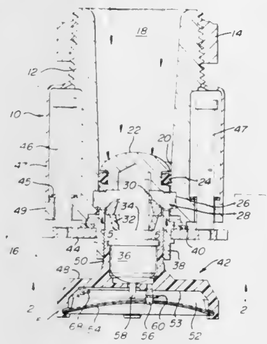
transporting produced fluids from said cluster well through said riser assembly into said containment means.

4,630,682

RAPID RESPONSE SPRINKLER HEAD

George S. Pieczykolan, North Wales, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Feb. 21, 1985, Ser. No. 703,979
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—38 **10 Claims**



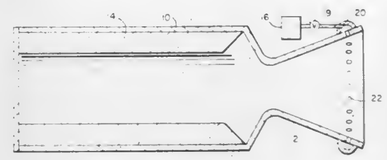
1. A rapid response sprinkler head comprising a housing having a flow passage therethrough, a valve member closing said passage, said valve member being supported by said housing and being movable to an open position, latch means including a frangible member for retaining said valve member in a closed position, an explosive detonator for fracturing said frangible member, and a temperature responsive controller for controlling the actuation of said detonator whereby said detonator fractures said frangible member when said controller senses a predetermined temperature to thereby enable said valve member to move to an open position, and said temperature responsive controller and said explosive detonator and deflector plate are supported by said valve member for movement therewith.

4,630,683

AFTERBURNING REDUCTION

Barry D. Allan, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 22, 1985, Ser. No. 801,023
Int. Cl.[4] A62C *1/14, 1/18, 3/08*
U.S. Cl. 169—45 **3 Claims**



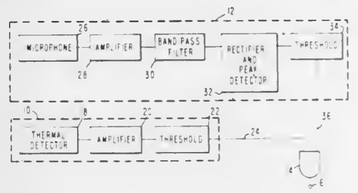
1. A method of reducing the visible flash from the exhaust nozzle of a rocket motor comprising injecting a fire extinguishing suppressant of a fluoro halogenated carbon compound into exhausting exhaust gases just prior to their exhausting from the exhaust nozzle of a rocket motor that has a fast burning solid propellant burning therein to substantially reduce visible flash of the exhausting gases of said rocket motor as the exhaust gases are exhausted from said exhaust nozzle and into contact with oxygen in the atmosphere to effectively control visible flash and afterburning of the exhaust gases which are fuel rich.

4,630,684

FIRE SENSING AND SUPPRESSION METHOD AND SYSTEM RESPONSIVE TO OPTICAL RADIATION AND MECHANICAL WAVE ENERGY

Robert J. Cinzori, Santa Barbara, and Mark T. Kern, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 18, 1984, Ser. No. 621,645
Int. Cl.[4] A62C *37/04*
U.S. Cl. 169—46 **20 Claims**



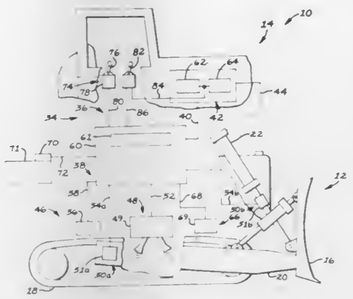
1. A method for sensing explosive fires which includes:

(a) sensing the substantially simultaneous occurrence of electromagnetic wave energy and mechanical wave energy emanating from said fire or explosion within a preselected time frame to in turn generate first and second detection signals, said mechanical wave energy being generated by an event likely to initiate a fire or explosion and preceding the generation of the electromagnetic wave energy; and

(b) simultaneously processing said first and second detection signals in parallel to generate a fire suppression output signal; and

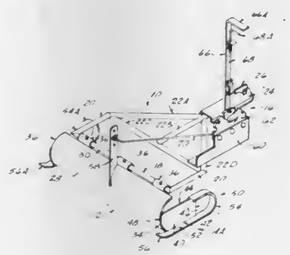
(c) activating a fire suppressant in response to said output signal.

4,630,685
APPARATUS FOR CONTROLLING AN EARTHMOVING IMPLEMENT
Francis B. Huck, Jr., Peoria, and David C. Janzen, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Nov. 18, 1983, Ser. No. 553,271
Int. Cl.[4] A01B *63/112;* E02F *3/76*
U.S. Cl. 172—7 **12 Claims**



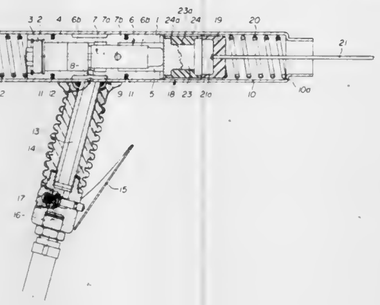
1. In an apparatus for controlling an earthmoving implement of an earthmoving machine, said earthmoving machine being movable at a longitudinal angular velocity and said earthmoving implement being movable to a plurality of up/down positions, said apparatus including actuatable means for controllably raising and lowering said earthmoving implement to any of said plurality of positions, the improvement comprising:
means for sensing longitudinal angular velocity and producing an angular velocity signal in response to said sensed longitudinal angular velocity; and
means for receiving said angular velocity signal and controlling said actuatable means in response to said received angular velocity signal.

4,630,686
EARTH SCRAPER FOR USE WITH A SMALL TRACTOR
Dee H. Ausmus, Jr., 2000 W. Taft, Sapulpa, Okla. 74066
Filed Jun. 27, 1985, Ser. No. 749,523
Int. Cl.[4] E02F *3/64, 3/76*
U.S. Cl. 172—393 **2 Claims**



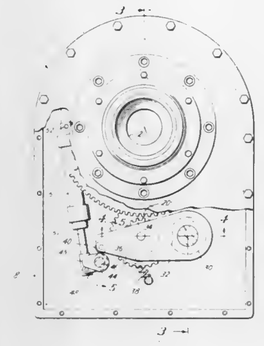
1. An earth scraper for use with a small tractor having a hitch comprising:
a generally horizontal frame having a forward end and a rearward end, the forward end having means for removable attachment to a hitch of a tractor;
an elongated blade of semi-circular, cross-sectional configuration taken perpendicular the longitudinal axis thereof providing a concave forward surface and a convex rearward surface, opposed ends, and a top and bottom edge, the top edge being pivotally secured to said frame rearward end, the bottom edge forming a scraping edge;
a first and a second vertical skid plate, each skid plate having a rearward end, a forward end, a top edge and a bottom edge, the rearward edge of the first skid plate being affixed to one end of said blade and the rearward edge of the second skid plate being affixed to the other end of said blade, the top and bottom edges of both plates being perpendicular to the plane of said blade longitudinal axis, and the lower edge of both skid plates being above said bottom edge of said blade; and
a first runner formed of an elongated flat piece of metal attached to said first skid plate lower edge and extending forwardly of said forst skid plate forward edge in an arcuate configuration and one end of the first runner being attached to said skid plate upper edge, the other end of the runner extending rearwardly of said blade;
a second runner configured as said first runner and being attached to said second skid plate; and
means to rotationally adjust said blade relative to said frame.

4,630,687
PERCUSSION DEVICE
Paul Dummermuth, Zunzgen, Switzerland, assignor to Von Arx AG, Sissach, Switzerland
Filed Nov. 1, 1984, Ser. No. 667,281
Claims priority, application Switzerland, Nov. 4, 1983, 5962/83
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—131 **3 Claims**



1. A percussion device comprising
an elongate housing from the front end of which a tool projects axially,
a tool holder mounted to slide longitudinally inside the housing,
an axially displaceable anvil in the housing having a front end forwardly axially engageable with the tool, a rear end, and a sliding surface between the ends slidably supporting the anvil in the housing;
a spring which presses the tool axially backward against the front end of the anvil;
a cylinder the front end of which is axially forwardly engageable with the rear end of the anvil and which is open;
a free piston which is axially movable in the cylinder and which acts as a percussion device axially forwardly engageable with the rear end of the anvil, and
drive means to start up and maintain a series of percussions of the said percussion device against the said anvil,
characterized in that
the anvil comprises a high-density metal body integrally forming the front and rear ends of the anvil and at least one low-density annular body of plastics material encircling the metal body and forming the sliding surface thereof, the total volume occupied by this plastics material being a substantial portion of the total volume of the anvil.

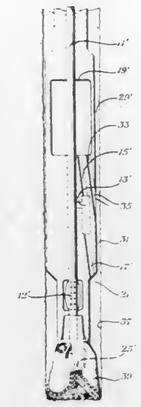
4,630,688
POWER SPINNER FOR ROTATING A KELLY JOINT
Martin E. True, and Clarence W. Sullivan, both of Houston, Tex., assignors to Weatherford/Lamb, Inc., Houston, Tex.
Filed Jun. 24, 1981, Ser. No. 278,438
Int. Cl.[4] E21B *3/00*
U.S. Cl. 173—163 **4 Claims**



1. In a power spinner for rotating a kelly joint having a pipe sub rotatably mounted in a housing, a ring gear on said sub, and a reversible motor mounted on the housing for powering the ring gear and sub in either direction, the improvement comprising,
a drive gear connected coaxially to the motor,
a shifting arm pivotally mounted coaxially with the axis of the drive gear,
a movable gear is positioned in the plane of the ring gear and mounted on the shifting arm for engagement and disengagement with the ring gear, said movable gear connected to and driven by the drive gear and rotatable about the drive gear,
a cam engaging the arm for rotating the arm about the axis of the drive gear for laterally moving the movable gear toward and away from the ring gear, said cam including a locking surface for holding the gears together when engaged, and
power actuated means connected to the cam for actuating the cam to the locked position.

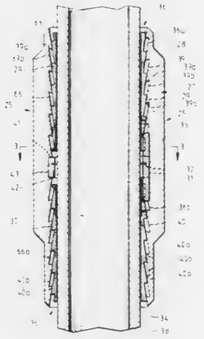
4,630,689
DOWNHOLE PRESSURE FLUCTUATING TOOL
Edward M. Galle, Friendswood, and Billey E. Baker, Houston, both of Tex., assignors to Hughes Tool Company-USA, Houston, Tex.
Filed Mar. 4, 1985, Ser. No. 708,207
Int. Cl.[4] E21B *7/24*
U.S. Cl. 175—56 **3 Claims**

1. A pump drive, downhole pressure fluctuating tool having an improved acoustical circuit that comprises:
a body adapted for connection with a string of pipe in a well, with a passage to receive liquid from the pump;
a fluid oscillator connected with the passage of the body, including two output leg means to generate out-of-phase pressure fluctuations;
two acoustical compliance means, each connected to an output leg, one of said compliance means having walls partially defined by the tool exterior and partially by the wall of well and the other being defined by walls inside the tool;
an acoustical inertance means connecting the two acoustical compliance means, with a pressure node at the midregion, said midregion communicating with the annulus between



the body and the wall of the hole to discharge fluid from the body.

4,630,690
SPIRALLING TAPERED SLIP-ON DRILL STRING STABILIZER
Thomas R. Beasley, Katy, and Chuan C. Teng, Houston, both of Tex., assignors to Dailey Petroleum Services Corp., Conroe, Tex.
Filed Jul. 12, 1985, Ser. No. 755,053
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—57 **29 Claims**



1. A stabilizer for use in a drilling string comprising:
a substantially cylindrical body member having a central passageway to accommodate the drill string, the inside surface of the body member defining a right-hand spiralling thread with a tapered trailing edge which spirals from a starting point on said body member, said thread terminating internally of said body member in an arcuate recess extending around the interior of said body member;
a key member is secured to the inner wall surface of said recess of said body member, said key member having a lug extending longitudinally of said body member within said recess;
a slip member adapted to thread within the body member between said body member and said drill string, the slip defining a right-hand thread with a matching tapered trailing edge configured to make up with said right-hand thread on said body member and to wedge between said

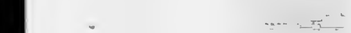
body member and said drill string, one end of said slip terminating in a longitudinally disposed shoulder capable of abutting said lug upon threading of said slip within said body member.

4,630,691

ANNULUS BYPASS PERIPHERAL NOZZLE JET PUMP PRESSURE DIFFERENTIAL DRILLING TOOL AND METHOD FOR WELL DRILLING

David W. Hooper, 1500 E. Warren Space 82, Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 496,133, May 19, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 686,241
Int. Cl.[4] E21B *7/00*
U.S. Cl. 175—65 **40 Claims**



1. A pressure differential drilling tool for reducing circulating fluid pressure in a drilling zone at the bit-to-bore bottom interface of a drill bit operated by a drilling string to continuously make hole in a well bore and including;

a body coupled to the lower end of the drilling string and carrying the drill bit for bit-to-bore bottom engagement and conducting circulating fluid under pressure and for removing formation chips from the bore bottom,

a pressure expandable plug-stabilizer rotatably surrounding the body on bearings to advance down-hole therewith and having expansion limiting means restricting the plug-stabilizer to less than the diameter of the well bore for free sliding engagement therein withing a controlled annulus bypass of circulating fluid between the plug-stabilizer and the surround well bore and standing under pressure in the well bore annulus above the plug-stabilizer and isolated from said drilling zone below the plug-stabilizer,

and a jet pump with a suction tube open from said drilling zone and a diffuser open into the well bore above the plug-stabilizer and having a flow restricting nozzle sharing the flow of circulating fluid under pressure with a port opening within the plug-stabilizer to expand and modulate the diameter of the same while ejecting the chip laden circulating fluid and significantly reducing the pressure thereof within the drilling zone.

40. A method of annulus bypass underbalanced rotary drilling of a well bore, and including;

rotating a drilling string made up of a drill pipe supplied with circulating fluid under pressure and with the weight thereof applied to a drill bit at the lower end thereof to penetrate the bit-to-bore bottom interface for continuously making hole,

placing a pressure expandable plug-stabilizer immediately above the drill bit and rotating the drilling string therethrough and defining a drilling zone below the plug-stabilizer,

reducing the circulating fluid pressure in the drilling zone by pump means operating as a result of the flow of circulating fluid under pressure to the drill bit,

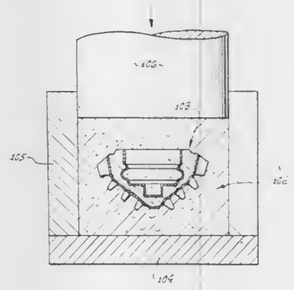
and sharing the circulating fluid pressure with the pressure expandable plug-stabilizer to expand the same to the proximate diameter of the well bore to modulate a downward annulus bypass surrounding the plug-stabilizer to control the flow of circulating fluid into the drilling zone while continuously making hole.

4,630,692

CONSOLIDATION OF A DRILLING ELEMENT FROM SEPARATE METALLIC COMPONENTS

Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

Continuation-in-part of Ser. No. 656,641, Oct. 1, 1984, Pat. No. 4,554,130, which is a continuation-in-part of Ser. No. 633,508, Jul. 23, 1984, Pat. No. 4,562,892. This application Jun. 10, 1985, Ser. No. 743,308
Int. Cl.[4] E21B *10/00*
U.S. Cl. 175—330 **22 Claims**



1. The method of forming a cutter, which includes a core and wear resistant insert defining a body means which includes:

(a) applying to the body means a mixture of:
(i) wear resistant powder, and
(ii) binder

said mixture being in fluid state and applied to said body means by one of the following:
(i) dipping of the body means into said mixture,
(ii) painting said mixture on the body means,
(iii) spraying the mixture onto the body means,

(b) volatilizing the binder

(c) and applying sufficient pressure via a grain bed to the body means and powder at elevated temperature, to consolidate same,

(d) at least one of the core and insert being consolidated at the same time as step (c) is carried out.

4,630,693

ROTARY CUTTER ASSEMBLY

Robert D. Goodfellow, Meadowbrook Ter., Bedford, Pa. 15522

Filed Apr. 15, 1985, Ser. No. 723,139
Int. Cl.[4] F21B *10/20*
U.S. Cl. 175—366 **9 Claims**

1. A rotary cutter assembly comprising:

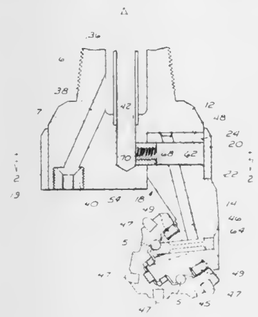
a drill head adapted at an upper portion thereof for coupling to a drill string for rotation about a central axis and having at a lower portion thereof a plurality of angularly spaced receptacles defined between a pair of opposing containment walls and adapted for receiving a shank of a drill bit unit;

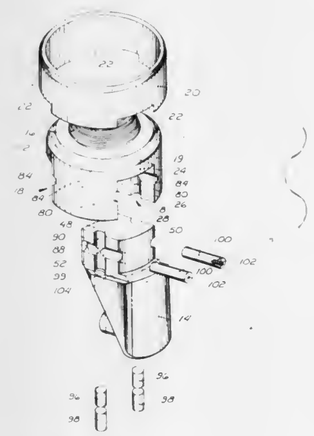
each said containment wall being traversed by an axial groove extending substantially parallel to the central rotational axis and a transverse groove extending substantially orthogonally to the central rotational axis;

at least one bit unit comprising a shank receivable in a said receptacle and having axial and transverse grooves complementary with said longitudinal and transverse grooves of said drill head and cooperatively alignable therewith upon reception of said shank in a said receptacle;

first lock pin means receivable in said complementary axial grooves of said drill head and the said shank to releasably secure the shank transversely relative to the drill head; and

second lock pin means receivable in said complementary transverse grooves of said drill head and the said shank to releasably secure the shank axially relative to the drill head.





6. A rotary cutter assembly comprising:

a drill head adapted at an upper portion thereof for coupling to a drill string for rotation about a central axis and having at a lower portion thereof a plurality of angularly spaced receptacles defined between a pair of opposing containment walls and adapted for receiving a shank of a drill bit unit, said lower portion forming a segmented cylindrical peripheral surface extending between said receptacles;

at least one drill bit unit comprising a shank which is receivable in a said receptacle;

locking means to releasably secure the shank in said receptacle in a fixed position with said drill head; and

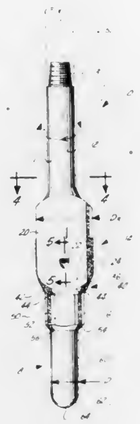
a wear sleeve extending circumferentially of said drill head and interiorly engaging said segmented cylindrical surface and said shank.

4,630,694

INTEGRAL BLADE HOLE OPENER

Paul G. Walton, 211 Hamner Dr., Houma, La. 70364, and Percy A. Little, 5825 Cherokee La., Alexandria, La. 71301

Filed Oct. 16, 1985, Ser. No. 788,011
Int. Cl.[4] E21B *10/26*
U.S. Cl. 175—391 **10 Claims**



1. A drill string tool apparatus for enlarging the size of oil/gas holes comprising:

a. a tool body having at least a portion thereof with a generally triangular cross-sectional area that includes three radially spaced blades;

b. means for forming a removable connection between the tool body and a drill string;

c. the tool body having an open ended flow conveying longitudinal internal bore for circulating fluids between the tool body and a drill string connected thereto;

d. the body including a triangular midsection comprising:

i. three longitudinal, radially spaced apart midsection blade members that are parallel to the central axis of the tool body bore so that the blade members can cut into the walls of the bore hole to enlarge the size of the bore hole;

ii. three generally flat flow zone surfaces which span between the midsection blade members;

e. each said midsection blade member comprising:

i. a contact surface area means carried on the blade member for defining the radial dimensional limit of the tool body during a rotation of the tool body and a connected drill string;

ii. a longitudinally extending cutting edge positioned adjacent the contact surface area means;

f. pilot section means positioned on the tool body below the midsection and having a smaller outer diameter than the outer diameter of the midsection during rotation of the tool body, for gradually enlarging the size of the bore hole, comprising:

i. three longitudinal, radially spaced apart pilot section blade members that are parallel to the central axis of the tool body bore;

ii. three annular flow zone surfaces which span the distance between the pilot section blade members; and

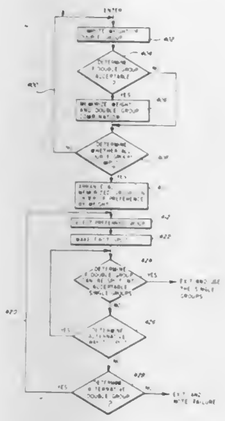
g. a lowermost, generally cylindrical bull nose tip portion of the tool body having a substantially rounded end portion for guiding the tool body through the bore hole.

4,630,695

COMBINATORIAL WEIGHER EMPLOYING DOUBLE GROUP SPLIT LOGIC

Robert H. Connors, Chicago, and James T. Williams, Wilmette, both of Ill., assignors to Triangle Package Machinery Co., Chicago, Ill.

Filed Feb. 20, 1985, Ser. No. 703,343
Int. Cl.[4] G01G *19/22*
U.S. Cl. 177—1 9 Claims



1. A method for making up multiple discrete quantities of solid product, each having a preferred product weight, from a plurality of product holding chambers without refilling such product holding chambers, said method comprising the steps of:

(a) establishing an acceptable range of the preferred product weight to be delivered from a single group of holding chambers;

(b) establishing an acceptable range of a multiple product weight to be delivered from a multiple group of holding chambers;

(c) registering the weight of product stored in each of said holding chambers;

(d) calculating a multiple group combination of said holding chambers having a multiple product weight within the acceptable range established therefor;

(e) splitting said multiple group combination to yield multiple single groups of holding chambers which each have a preferred product weight within the acceptable range established therefor; and

(f) making up multiple discrete quantities of said product from said multiple single groups of said holding chambers comprising said multiple group combination.

4,630,696

APPARATUS AND METHOD FOR AUTOMATIC SYSTEM CALIBRATION TO PROVIDE ENHANCED RESOLUTION IN COMPUTERIZED WEIGHING SYSTEMS

Tadeusz F. Kemnitz, Chapel Hill, N.C., assignor to Azionaria Costruzioni Macchine Automatiche, Bologna, Italy

Filed Oct. 25, 1985, Ser. No. 791,322
Int. Cl.[4] G01G *13/14, 19/22*
U.S. Cl. 177—165 16 Claims

1. An apparatus for calibrating voltages corresponding to measured weight in an automatic combination weighing machine so as to provide a tare weight voltage which does not consume a significant portion of the range of voltages for indicating total measured weight, said apparatus comprising:

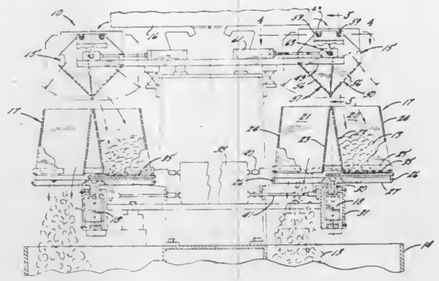
a bucket for holding product to be weighed;

weighing means for providing an electrical signal indicative of the combined weight of bucket and product;

computer means having

(a) means to identify which buckets are empty;

(b) means for determining if an electrical signal from said weighing means is within a first predetermined range of an ideal value indicative of tare weight; and



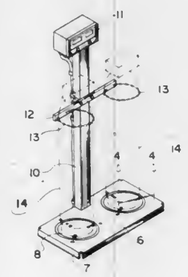
(c) means for adjusting the signal from said weighing means in response to an indication from means (b) that the signal is outside said predetermined range and an indication from means (a) that the signal is indicative of tare weight.

4,630,697

STRAIN GAUGE SCALE

Russell D. Hartman, Perkasie, and Edward M. Dougherty, Ottsville, both of Pa., assignors to Scaletron, Inc., Perkasie, Pa.

Filed Sep. 20, 1985, Ser. No. 778,029
Int. Cl.[4] G01G *3/14, 3/08;* G01L *1/22*
U.S. Cl. 177—211 9 Claims



1. A scale comprising at least two weighing discs, a common platform for supporting the discs, with the discs arranged in side-by-side relation, and for each disc a set of three load cells for suspending the disc from the platform, the load cells of each set being equally spaced around the periphery of the disc, and each load cell of each set being elongated radially of the disc, with a first portion extended radially inboard below the periphery of the associated disc and with a second portion extended radially outboard of the periphery of the disc below a portion of the supporting platform, for each load cell of each set fastening means rigidly interconnecting the associated weighing disc and said first portion of the load cell at points spaced from each other radially of the associated disc, and for each load cell of each set means for connecting the load cell with the platform comprising a flexible cable connected with said second portion of the load cell, and for each load cell of each set a strain gauge mounted on the load cell intermediate said fastening means and connecting means.

4,630,698

SELF-STORING SIDE PANEL

Robert L. Siewert, Benton Harbor, and Edmund K. Varnelis, St. Joseph, both of Mich., assignors to Clark Michigan Company, Cleveland, Ohio

Filed Aug. 13, 1985, Ser. No. 765,090
Int. Cl.[4] B62D *25/10*
U.S. Cl. 180—69.24 9 Claims



1. A panel mechanism for a vehicle engine compartment which has a lower side frame member extending longitudinally of the vehicle adjacent one side of the compartment, the lower side frame member having an inside surface, and an upper structural portion extending longitudinally above the lower side frame member and forming with said lower side frame member an access opening into the engine compartment, the upper structural portion having an inside surface, the panel mechanism comprising

a movable side panel which in the closed position extends across said access opening,

first means detachably securing the upper edge of said panel to said inside surface of said structural portion,

at least one vertically disposed guide cable extending from a support on the inside surface of the upper structural portion to said inside surface of the lower frame member,

a guide secured to said panel through which said guide cable extends, and

second means for securing the lower edge of said panel to the lower side frame member with said first means secured, and releasing the lower edge of said panel from said lower side frame for detaching said upper edge of the panel from said upper structural portion and allowing the panel to move by gravity to the open position outside the engine compartment.

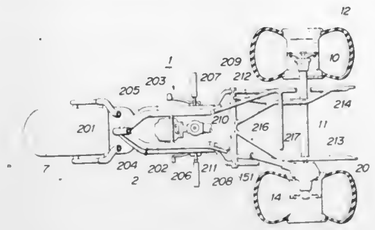
4,630,699

DRIVING WHEEL SUPPORTING SYSTEM

Kozo Yamada, and Yoshikazu Washizawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00392, § 371 Date Mar. 21, 1985, § 102(e) Date Mar. 21, 1985
PCT Filed Jul. 31, 1984, Ser. No. 718,020
Claims priority, application Japan, Aug. 2, 1983, 58-141403
Int. Cl.[4] B60K *17/04*
U.S. Cl. 180—75 3 Claims

1. A driving wheel supporting system comprising: a pair of plate-like brackets secured respectively to the left and right frames of a vehicle body; a pipe extending between said brackets for supporting a driving axle shaft, said pipe having one end welded to one of said brackets, an intermediate portion welded to the other bracket and the other end projecting outwardly from said other bracket, said driving axle shaft being disposed in said pipe and having one end portion supported on a bearing mounted in said other end of said pipe, said one end portion of said driving axle shaft supporting thereon one of left and right



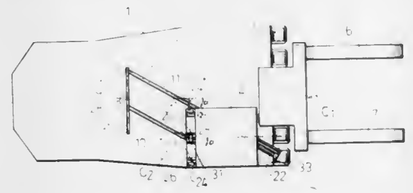
wheels; and a final power transmission unit including a transmission mechanism mounted on said one bracket at one surface thereof extending in a plane outside said frames, the other end of said driving axle shaft being connected to said transmission mechanism and being supported on a bearing mounted therein.

4,630,700

ADJUSTABLE OPERATOR CAB ON A MOTOR-DRIVE TRUCK

Nils-Olof Larsson, Halmstad, Sweden, assignor to Kalmar LMV, Ljungby, Sweden

Filed Nov. 14, 1985, Ser. No. 798,111
Claims priority, application Sweden, Dec. 3, 1984, 8406091
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.13 8 Claims



1. A motor-driven truck comprising a longitudinal chassis, a lifting stand mounted on the front end thereof, first guide and journalling means including a longitudinal, stationary stand mounted on the chassis, second guide and journalling means including a stand movable along said stationary stand, an operator's cab supported by said movable stand and arranged to be placed in a desired position which is variable with respect to said stationary stand and to the front lifting stand as well, said first guide and journalling means including journalling elements which are firmly connected to the movable stand and guided by the stationary stand, and first and second force-transmitting means arranged for moving the operator's cab to said desired position, said stationary stand being diagonally arranged so that it encompasses an acute angle α together with a longitudinal center line of the truck and so that it extends between a rear place at substantially said longitudinal center line and a front place at substantially a front corner of the truck near one side of the front lifting stand, said movable stand including a horizontal stand member located under the operator's cab and a vertical stand member rigidly connected to the horizontal stand member and arranged close to the rear surface of the operator's cab facing away from the front lifting stand, said journalling elements being firmly mounted onto the under side of the horizontal stand member of the movable stand, said second guide and journalling means including journalling

elements firmly connected to the operator's cab and guided by the vertical stand member of the movable stand, said first force-transmitting means being connected to the stationary stand and to the horizontal stand member of the movable stand for controlled movement of the operator's cab and the movable stand along the stationary stand, and said second force-transmitting means being connected to the rear surface of the operator's cab facing away from the front lifting stand and to the movable stand for controlled movement of the operator's cab along the vertical stand member of the movable stand, the operator's cab being thus arranged to be placed in said desired position with its horizontal longitudinal central line maintained parallel to the said longitudinal center line of the truck and with maintained alignment in a vertical plane.

4,630,701

VEHICLE STEERING MECHANISM

Juhani T. Venetjoki, Helsinki, Finland, assignor to Lokari-Tuote Oy and Auto Lokari Oy, both of Metallitie, Finland

Filed Mar. 25, 1985, Ser. No. 715,793
Claims priority, application Finland, Apr. 6, 1984, 841372
Int. Cl.[4] B62D *3/12*
U.S. Cl. 180—209 **3 Claims**



1. A vehicle steering mechanism in which a pair of king pins are mounted on the vehicle, with means for positioning said king pins at differing axial distances from each other to adjust the track of the vehicle, the improvement comprising:
- a forwardly extending control arm connected to one of said king pins,
- a rearwardly extending control arm connected to the other of said king pins,
- a pair of articulating links, one each connected to each of said control arms, and
- a tie rod mechanism connected between said articulating links, said tie rod mechanism comprising:
- a first transversely extending rack having a free end and a connecting end, means connecting said connecting end to one of said articulating links, a second transversely extending rack having a free end and a connecting end, means mounting said second rack in parallel juxtaposition to said first rack, means connecting said connecting end of said second rod to the other of said articulating links,
- a steering gear, means mounting said steering gear between said racks in mutual engagement with each of said racks so that rotation of said gear is translated uniformly to cause simultaneous opposite movement of each of said racks.

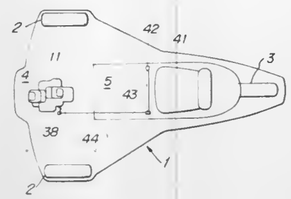
4,630,702

THREE-WHEELED MOTOR VEHICLE GEAR SHIFT MECHANISM

Shoichiro Irimajiri, Mie; Katsusuke Komuro, and Kunihiko Aikawa, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,404
Claims priority, application Japan, Apr. 28, 1983, 58-63059
Int. Cl.[4] B62D *61/06;* **B60K** *17/00*
U.S. Cl. 180—215 **5 Claims**

1. A three-wheeled motor vehicle having a body, two front wheels and one rear wheel with an engine mounted in a front section of the vehicle body containing said front wheels, comprising, a transmission formed integrally with said engine and having a gear shift spindle projecting from one side thereof, a control mechanism for controlling said transmission, said vehicle body including a passenger compartment having a floor, and said control mechanism comprising a rod rotatably secured to said floor via an attachment member, and both said rod and said attachment member extending laterally of said vehicle body across substantially all of said compartment, a shift lever coupled to one end of said rod at a right angle



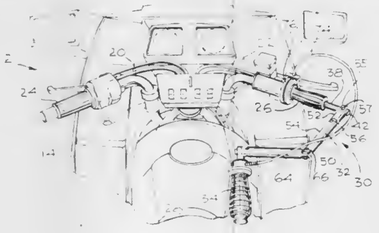
thereto, and connector means coupling the other end of said rod to said gear shift spindle, wherein the control mechanism rod only is rotated about its axis by movement of said shift lever longitudinally to said vehicle body.

4,630,703

TWO-WHEELED MOTOR VEHICLE ASSEMBLY

James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed Dec. 12, 1985, Ser. No. 808,246
Int. Cl.[4] B62K *11/14, 23/04*
U.S. Cl. 180—219 **14 Claims**



1. An improved two-wheeled motor vehicle assembly, said assembly comprising, in combination:
- a. a two-wheeled motor vehicle having a frame and a pair of wheels, one in front and one in the rear, a steering column, including a pair of handlebars, with a pair of handles, a seat and a motor with carburator, throttle and throttle linkage, and a throttle control connected to one of the handles and to said throttle linkage; and,
- b. an auxiliary steering device comprising an elongated movable arm connected to at least one of said handlebars and extending rearwardly therefrom to an area adjacent said seat, whereby a rider can sit back in said seat with hands off of said handlebars and accurately steer said vehicle through said auxiliary steering device, said auxiliary steering device also including a throttle control extension means connected to the rear portion of said elongated arm and to said throttle control.

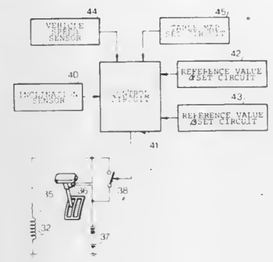
4,630,704

SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakakiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,557
Claims priority, application Japan, Sep. 20, 1983, 58-173595
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—247 **4 Claims**

1. In an improved system for controlling a power transmission of a four-wheel drive vehicle powered by an engine having a transmission for transmitting the power of said engine to main driving wheels of said four-wheel drive vehicle, a clutch for transmitting the power to auxiliary driving wheels, second sensor for detecting the speed of the vehicle and for producing a speed output signal dependent on the speed, circuit means for operating said clutch in accordance with driving conditions, wherein the improvement comprises



a first sensor for detecting the inclination of roads and for producing an inclination output signal dependent on the inclination, and

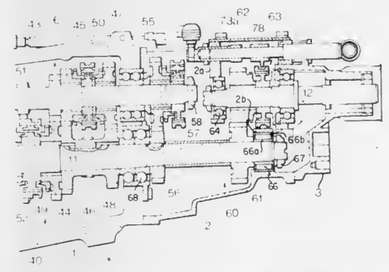
said circuit means includes control means responsive to said output signals from said first sensor and said second sensor for engaging said clutch when said speed output signal is smaller than a predetermined speed signal which is decided by the inclination of the road.

4,630,705

TRANSMISSION FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,508
Claims priority, application Japan, Jul. 4, 1984, 59-139336
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—247 **8 Claims**



1. In a transmission system for a four-wheel drive motor vehicle having a transmission disposed in a transmission case, the transmission having an output shaft rotatably supported in said transmission case, an end portion of the output shaft extending out of the transmission case and constituting an extended portion of the output shaft, and a transfer device disposed in a transfer case for transmitting the output of the transmission to auxiliary drive wheels of the vehicle through an auxiliary drive shaft, the transfer device comprising a transfer drive gear secured to the extended portion of the output shaft of the transmission and a transfer driven gear mounted on the auxiliary drive shaft and engaged with the transfer drive gear, the improvement in the system wherein

the transfer case has a wall forming a hole,

a bearing having an outer ring and an inner ring,

said outer ring being disposed in said hole and secured to said wall of the transfer case, and

said inner ring being mounted on said extended portion of the output shaft on a side of the transfer drive gear facing away from said transmission case,

a nut engageable with said extended portion of the output shaft,

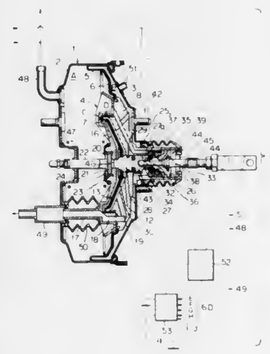
said extended portion of the output shaft being inserted into said outer ring with the inner ring being secured to said extended portion of the output shaft by said nut engaged on said extended portion of the output shaft, so that the extended portion of the output shaft is rotatably supported by said bearing at said side of the transfer drive gear facing away from said transmission case.

4,630,706

VEHICLE BRAKING SYSTEM

Toshio Takayama, Kanagawa, and Tetsuo Haraikawa, Chiba, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 19, 1984, Ser. No. 683,553
Claims priority, application Japan, Jan. 28, 1984, 59-14063
Int. Cl.[4] B60K *28/00*
U.S. Cl. 180—273 **5 Claims**



1. A vehicle braking system including a pneumatic booster which includes a shell casing, a flexible diaphragm, a power piston connected to the diaphragm to define a constant pressure chamber and a variable pressure chamber in the shell casing, an input shaft, a valve mechanism provided in the power piston and associated with the input shaft to control the pressure in the variable pressure chamber, an output shaft receiving the output force from the power piston, and a reaction mechanism for the reaction force of the output shaft to the input shaft, wherein the booster further comprises a control chamber, and a control piston partitioning the interior of the control chamber into a second constant pressure chamber and a second variable pressure chamber, said control piston being associated with the input shaft such that the control piston applies a force to the input shaft in the brake applying direction when the control piston is displaced by receiving the differential pressure between two second chambers.

4,630,707

SOUND-ABSORBING STRUCTURE IN VEHICULAR COMPARTMENT

Shinjiro Yukawa, Isehara, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

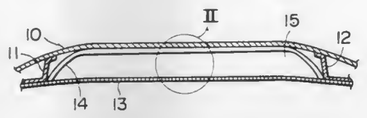
Filed Aug. 30, 1985, Ser. No. 770,978
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—288 **5 Claims**

1. A sound-absorbing structure in a vehicular compartment, comprising:

a panel forming part of a vehicular body;

a porous sound-absorbing lining separated from the inner surface of said panel by a space; and

means, being air-impermeable and disposed within the space,



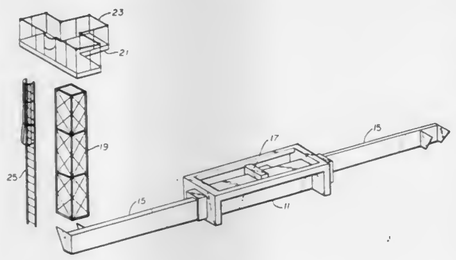
for preventing air leakage between the inside and the outside of the vehicular compartment through the space, said sound-absorbing lining and said preventing means defining an air chamber.

4,630,708

SEMI-ADJUSTABLE SERVICE PLATFORM APPARATUS FOR GANTRY CRANE

George J. Thompson, 134 Watersedge, Ocean Springs, Miss. 39564

Filed Jan. 29, 1986, Ser. No. 823,565
Int. Cl.⁴ E04G *3/10, 3/16*
U.S. Cl. 182—12 **2 Claims**



1. A service platform apparatus for a gantry crane having a crane support structure, a horizontal boom structure and gantry, a trolley moveable on said boom and gantry, lifting ropes depending from said trolley and actuated by crane mounted hoist machinery, and a head block reeved to the lower ends of said lifting ropes, said service platform apparatus comprising

a base frame adapted to be releasably secured to said head block, said base frame including a pair of horizontally sliding beams which are extendible in opposite directions from said base frame with either an integrated or independent movement,

a pair of detachable towers secured to the ends of said sliding beams which project outboard from said base frame, said towers including detachable work platforms at the upper ends thereof, said towers being sized to stack on top of said base frame when disassembled and said base frame with the towers disposed thereon sized to fit into a standard 40′ container along with the two work platforms when the platforms are stacked on top of each other and disposed in one end of the same container, and

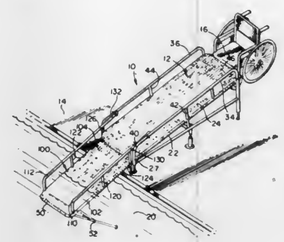
remote control means on said platforms for permitting an operator on a particular platform to independently control the reciprocating movement of the sliding beams for moving the platforms inboard and outboard relative to the base frame and to control the hoisting and translational motions of the crane trolley.

4,630,709

POOL ENTRY AND EXIT DEVICE

William Taylor, 209 Park Ave., Lake Park, Fla. 33403

Filed Nov. 6, 1985, Ser. No. 795,636
Int. Cl.⁴ A63G *21/04*
U.S. Cl. 182—48 **15 Claims**



1. A foldable pool entry and exit device for use by non-ambulatory persons comprising:

ramp means comprising at least upper and lower ramp portions, the portions being linked by hinge means, the ramp surface comprising a friction material adapted to prevent slippage; and,

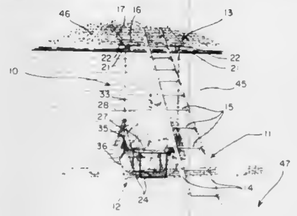
support means adapted to position the upper ramp means above the pool deck at a height substantially equal to the height of a wheel chair seat such that the ramp means extends angularly downward at a gentle slope to a position at least adjacent the surface of the water, at least a portion of said lower ramp portion extending over the water, whereby the user can enter and exit the water in a controlled fashion and with a minimum of exertion, and whereby the lower ramp portion can be pivoted out of the swimming area and folded to overlap the upper ramp portion when not in use.

4,630,710

ELEVATABLE WORK STATION

Furney M. Eubanks, Rte. 2, Box 361, Trenton, N.C. 28585

Filed May 9, 1985, Ser. No. 732,189
Int. Cl.⁴ E06C *7/12;* **E04G** *3/10*
U.S. Cl. 182—116 **11 Claims**



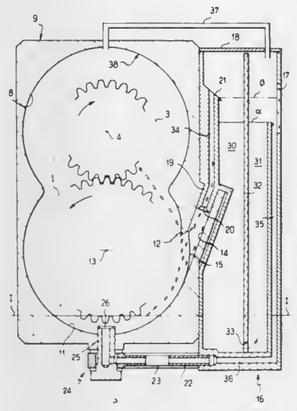
1. An elevated work station comprising: a portable support means; a work platform having a pair of take-up drums rotatively mounted on opposite sides thereof, said take up drums having a common axis of rotation extending transversly beneath said work platform; a pair of line-like means extending between said support means and said work platform for suspending said work platform at an elevated position relative to the ground, each said line-like means being wound about a respective take-up drum; rotation prevention means extending upwardly from said work platform to a point above and in alignment with said take up drums for engaging said line-like means and preventing said work platform from rotating about said axis of rotation of said take-up drums thereby maintaining said work platform in a level position relative to the ground; and means for rotating said take-up drums wheeby said work station can be controllingly moved upwardly and downwardly.

4,630,711

DEVICE FOR LUBRICATING A GEARTRAIN

Roland Levrai, Stains; Pierre Courbot, Villiers-le-Bel, and Pascal Picot, Bonneuil-sur-Marne, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jun. 19, 1985, Ser. No. 747,083
Claims priority, application France, Jun. 27, 1984, 84 10143; Apr. 10, 1985, 85 05377
Int. Cl.⁴ F01M *9/06, 11/02;* **F16N** *7/36*
U.S. Cl. 184—6.12 **11 Claims**



1. A device for lubricating a geartrain arranged in an internal chamber of a housing, said chamber having a bottom part which forms a storing area for storing a lubricant for the gear train and in which a bottom part of one of the gears rotating around an axis is normally immersed, characterized in that the chamber has, at least locally around the one gear, a peripheral inner profile matching substantially the peripheral outline of said one gear, adjacent the latter, and comprises, at a level higher than that of said bottom part of said chamber, a separating nose extending inwardly into said chamber and toward the periphery of said one gear and connected to a discharge conduit which is formed in said housing and opens inwardly in said chamber in front of said nose relative to a direction of rotation of said one gear, the discharge conduit communicating outwardly with a top part of a lubricant storage container located outside said housing and having a base portion communicating with said bottom part of said chamber via an external return conduit, said storage container defining a generally vertical inner accumulation volume divided, by a partition wall, into first and second chambers intercommunicating via a passage formed in a lower part of said partition wall, said discharge conduit opening outwardly, at a first level, in an upper part of said first chamber, and the storage container further comprising a feeding conduit having a lower portion communicating with said bottom part of said internal chamber and opening upwardly at a second level into an upper part of said second chamber.

4,630,712

AUTOMATIC CHAIN LUBRICATING SYSTEM

Rex A. Hoseley, Wheaton, Md., assignor to United States Postal Service, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,360
Int. Cl.⁴ F16N *7/00, 29/00*
U.S. Cl. 184—15.3 **1 Claim**

1. An apparatus for lubricating a chain having links of a fixed length arranged in spaced apart rows and cross pins connecting the links and including rollers positioned between the rows and adapted to ride within a chain sprocket or gear, said apparatus comprising

a source of lubricant;

lubricant transfer means connected to said source of lubricant for delivering a given quantity of lubricant to the chain upon receipt of a signal;

said lubricant transfer means comprising a plurality of nozzles positioned adjacent to said chain and directed toward the links thereof;

said lubricant transfer means further including high-speed solenoid operated valve mechanisms in operative association with each of said lubricant nozzles; and

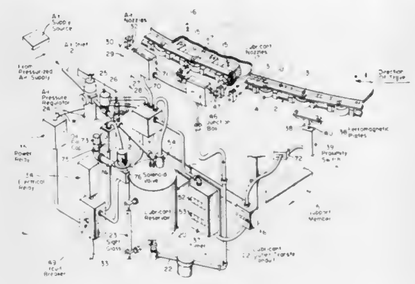
ferromagnetic means positioned at fixed points along the chain sprocket or gear on which said chain is cause to rotate;

electromagnetic sensing means for generating a signal in response to proximate contact with said ferromagnetic means caused by rotation of said sprocket and chain;

said signal causing said solenoid valves to open and deliver a minute, predetermined quanity of lubricant through each of said lubricant nozzles and onto said chain at precise points thereof as defined by the preset position of said ferromagnetic means relative to said chain;

a timing device in operative electrical association with said electromagnetic sensing means and adapted to control the time cycle of the signal produced by said sensing means whereby said solenoid valves remain open for a period of time equal to said time cycle; and

a pair of air nozzles positioned on opposite sides of said lubricant nozzles and adapted to remove dust and debris from the moving chain forward of said lubricant nozzles and to force the lubricant into the chain interfaces and to remove any excess lubricant dispersed from said lubricant nozzles.

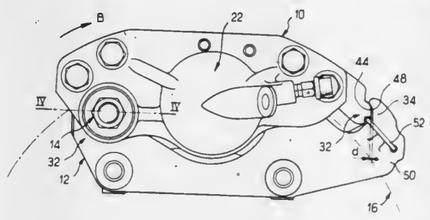


4,630,713

DISC BRAKE WITH SLIDING CALIPER

Jean-Jacques Carre, Le Raincy; Alain Thioux, Chennevieres, and Jean-Claude Mery, Pavillons-sous-Bois, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Apr. 17, 1985, Ser. No. 724,144
Claims priority, application France, Apr. 26, 1984, 84 06585
Int. Cl.⁴ F16D *55/224, 65/00*
U.S. Cl. 188—73.44 **2 Claims**



1. A disc brake of the type incorporating a caliper sliding on a fixed support by means of at least one axial pin lying parallel

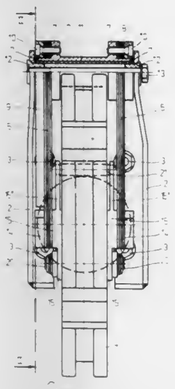
to the rotational axis of a disc, a brake actuator acting directly upon an inner friction component and, by reaction through the caliper, upon an outer friction component, the friction components being tangentially offset on each side of a radial plane passing through the translational axis of the brake actuator, the inner friction component being anchored on the fixed support, the outer friction component being anchored on the caliper, the tangential offset of the friction components being such that during forward braking the caliper is subjected to a tangential force generated by the outer friction component, characterized in that the caliper includes a positioning device for positioning the caliper relative to the fixed support, the positioning device being progressive and dependent upon the tangential force over a predetermined range of the tangential force, the positioning device including the axial pin which has a progressively deformable componet which is progressively deformable under the effect of the tangential force that effects a circumferential movement of the caliper relative to the fixed support, the positioning device also including abutment means for limiting the circumferential movement to the predetermined range, the abutment means fixed firmly to the pin and limiting deformation of the progressively deformable component, the pin comprising an elastic sleeve positioned without play between concentric inner and outer tubes, the inner tube being fixed to the fixed support and the outer tube passing through a bore formed in the caliper, the caliper capable of sliding relative to the outer tube, and two rigid rings positioned with a radial clearance at ends of the tubes and between the tubes in order to limit the deformation of the elastic sleeve to a radial distance corresponding to a predetermined maximum movement of the caliper.

4,630,714

BLOCK BRAKE ACTUATOR FOR A RAIL VEHICLE

Olov G. Stjärne, Löddeköpinge; Lars M. Severinsson, Hishult, both of Sweden, and Alastair C. B. Lowrie, Darlington, England, assignors to Sab Nife AB, Landskrona, Sweden

Filed Dec. 6, 1984, Ser. No. 678,834
Claims priority, application Sweden, Dec. 21, 1983, 8307077
Int. Cl.⁴ B61H *13/24*
U.S. Cl. 188—206 R **2 Claims**



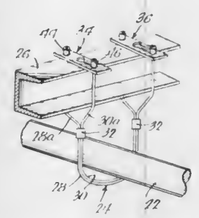
1. For use with a flanged wheel set having a flange on each wheel and each wheel having a tapered tread, a rail vehicle brake system having a brake actuator affixed to the vehicle by a bracket having a brake block holder suspended by hangers for operation by the brake actuator on the brake block hangers by movement during a braking stroke causing the brake blocks to follow the axial wheel movement of the wheel set, a wheel taper compensating structure wherein said hangers are leaf springs pivoted to the bracket and brake block holder and movable with axial movement of the flanged wheel set, said leaf springs being prestressed in a direction toward the wheel flange prior to and subsequent with engagement with the tapered wheel tread and thus overcoming bias exertion on the brake block by the wheel taper tending to cause the brake block to move down the wheel taper because of the component force acting down the taper for compensating for the bias of the taper of the wheel tread over a range of axial movement of the wheel set.

4,630,715

BOTTOM ROD SAFETY GUARD FOR RAILWAY BRAKE RIGGING

Frank P. Adler, Michigan City, Ind., assignor to Trans-Dyne, Incorporated, Chicago, Ill.

Filed Jun. 8, 1984, Ser. No. 618,919
Int. Cl.⁴ B61H *13/34*
U.S. Cl. 188—210 **13 Claims**



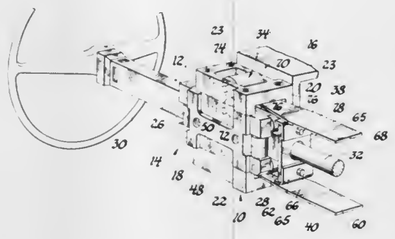
1. A railway brake bottom rod safety guard adapted to hang from a supporting part of a railway vehicle, said safety guard compring a flexible elongate member, first and second pairs of flexible legs extending from opposite ends of said flexible member, a pair of plates adapted to rest on the upper surface of said supporting part in a spaced relation, and means for attaching said first and second pairs of flexible legs to the respective plates comprising means for securing one leg near one end of the plate, and means for releasably attaching the other leg near the other end of said plate to allow the flexible member and plate assembly to be installed and removed.

4,630,716

STRIP ROLL FORMING ENERGY ABSORBING DEVICE

Daniel P. Faust, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 3, 1985, Ser. No. 740,391
Int. Cl.⁴ F16F *7/12*; B62D *1/18*
U.S. Cl. 188—371 **4 Claims**



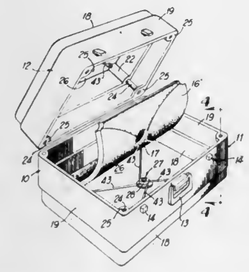
1. An energy absorber unit comprising a stationary support member and a movable member, said movable member being mounted for linear stroking movement relative to said stationary member, said stationary member having a pair of fixed location rollers of predetermined diameter and spaced a predetermined distance from one another, shaft means associated with each of said rollers operatively mounting said rollers for turning movement with respect to said stationary member, a floating roller having an axis of rotation in a plane parallel to a plane extending through said shaft means, said floating roller bearing disposed to one side of said pair of rollers having a diameter greater than the predetermined spacing between said rollers, an elongated strip of thin ductile material extending from a free end portion to a fixed end portion, securement means securing said fixed end portion of said strip to said movable member, and said strip leading from said securement means in a fixed path under one of said fixed rollers and around said floating roller and then over the other of said fixed rollers to said free end portion so that stroking of said movable member upon application of a predetermined load thereto pulls said strip and to instantaneously effect the radial displacement of said floating roller against said strip and toward a position between the fixed location rollers so that said strip is simultaneously bent with a predetermined and fixed radius and is worked to provide a predetermined resistive force to immediately retard said stroking movement and progressively absorb the energy of said load.

4,630,717

EXPANDABLE CARRYING CASE

Kun-Yuan Tong, 2308 W. Doublegate Dr., Albany, Ga. 31707

Continuation-in-part of Ser. No. 592,563, Mar. 23, 1984. This application Apr. 29, 1985, Ser. No. 728,081
Int. Cl.⁴ A45C *7/00*
U.S. Cl. 190—104 **8 Claims**



1. A variable volume carrying case comprising a pair of hinged case sections each including telescoping relatively movable portions having stop means thereon to limit relative movement in one direction, a push-pull cable operating system for each carrying case section including a manually turnable and releasably lockable operator and four push-pull cable assemblies operatively connected between said operator and said portions, and including a housing on one of said portions with circumferentially spaced adjusting means for said operator for locking said portions in selected positions.

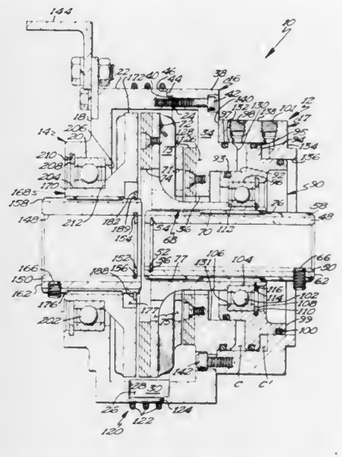
4,630,718

COUPLING CLUTCH/BRAKE AND HOUSING

James V. Hanks, Robbinsdale, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Feb. 1, 1985, Ser. No. 697,495
Int. Cl.⁴ F16D *67/04*
U.S. Cl. 192—18 A **17 Claims**

1. Coupling clutch/brake comprising, in combination: a first hub; a second hub; a first, driven interface disc having a first interface and a second interface; means for slidably mounting the first driven interface disc on the first hub; a second, drive interface disc, with the second, drive interface disc being selectively relatable with the first interface of the first, driven interface disc to rotatably relate the first, driven interface disc and the second, drive interface disc; means for slidably mounting the second, drive interface disc on the second hub; a first shell section; means for holding the first shell section in a stationary, non-rotating position, a second shell section; means for interconnecting the first shell section to the second shell section; means for rotatably mounting the second shell section on the second, drive interface disc; with the first shell section including a radially extending annular portion and an axially extending, annular flange extending from the first shell section in a direction opposite from the second shell section, with the annular flange including a radially inward axially extending surface and a radially outward axially extending surface; a third shell section including an open end having a size and shape complementary to and for receipt on the outward axially extending surface of the annular flange of the first shell section; a piston reciprocally mounted on the radially inward axially extending surface of the annular flange of the first shell section and on the third shell section; means for reciprocally relating the piston and the first, driven interface disc and for rotatably mounting the piston with respect to the first, driven interface disc; means for reciprocating the piston between a first axial position where the first interface of the first interface disc is



rotatably independent of the second interface disc and the second interface of the first interface disc rotatably relates with the radially extending annular portion of the first shell section and a second axial position where the first interface of the first, driven interface disc engages with the second interface disc and the second interface of the first interface disc is rotatably independent of the radially extending annular portion of the first shell section; wherein the piston and the shell sections have tolerances allowing the canting of the first, driven interface disc with respect to the first hub to take up horizontal misalignment of the first and second hubs and wherein the second, drive interface disc slidably mounting means allow canting of the second, drive interface disc with respect to the second hub to take up angular misalignment of the first and second hubs.

4,630,719

TORQUE AIDED PULSED IMPACT SHIFT MECHANISM

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

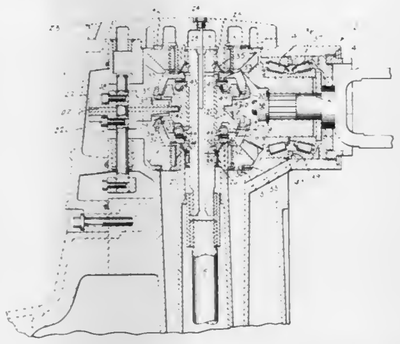
Filed Aug. 13, 1985, Ser. No. 765,326
Int. Cl.⁴ F16D *11/08, 23/12*
U.S. Cl. 192—21 **18 Claims**

1. A shift mechanism and clutch apparatus comprising:
a main axial shaft;
reverse gear means freely rotatable about said main shaft, said reverse gear means having a clutch face on one side;
forward gear means freely rotatable about said main shaft, said forward gear means having a clutch face on one side, with said clutch faces facing each other;
a drive gear meshed with said reverse and forward gear means for driving said reverse and forward gear means in respectively opposite directions of rota- tion;
a sleeve member mounted on said main shaft between said

reverse and forward gear means, said sleeve member having

a clutch face at each end, each clutch face selectively engageable with one of said clutch faces of said reverse and forward gear means, and

an exterior circumferential groove in said sleeve member between said clutch faces; yoke means for engaging said groove and moving said sleeve member axially;



cam means operatively associated with said yoke means; and

actuating means for actuating said cam means into engagement with one of said gear means to actuate said yoke means and drive said sleeve member out of engagement with said one gear means and into engagement with the other of said gear means.

4,630,720

VEHICLE DRIVE ARRANGEMENT

Renato Boni, Carpi, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

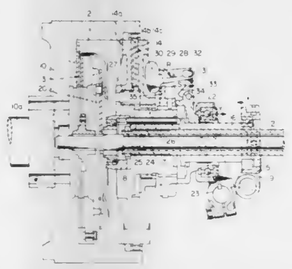
PCT No. PCT/EP84/00191, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00205, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 25, 1984, Ser. No. 700,580

Claims priority, application United Kingdom, Jun. 28, 1983, 8317452

Int. Cl.⁴ F16D *21/02*

U.S. Cl. 192—48.8 **7 Claims**



1. A vehicle drive arrangement having a drive shaft (**10***a*), a first hollow driven shaft (**12**), a second driven shaft (**11**) rotatable within the first hollow driven shaft, first and second clutches (**13, 14**) co-axial with the driven shafts for coupling the drive shaft with the first and second driven shafts respectively, one (**14**) of said clutches being connected with its associated driven shaft via a central hub portion (**24**), and the other clutch (**13**) being operated by a plurality of operating members (**17**) which passes through corresponding apertures in the central hub portion and which are located outside both driven shafts.

4,630,721

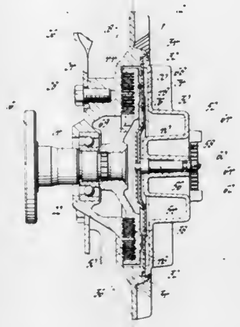
VISCOUS CLUTCH FOR ENGINE COOLING FAN

Gary L. Johnston, Pleasant Hill, and Harvey J. Lambert, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1984, Ser. No. 657,974

Int. Cl.⁴ F16D *31/00*

U.S. Cl. 192—58 B **4 Claims**



1. A bladed fan and viscous clutch assembly for inducing a flow of air comprising an input shaft member adapted to be rotatably driven, clutch plate means rotatably driven by said shaft member, said clutch plate means having a rear face for shearing viscous fluid and having a front face, clutch body means housing said clutch plate means and having an inner viscous shear face axially spaced from said rear face of said clutch plate means to form a viscous fluid shear zone therebetween for receiving a shearable viscous clutch fluid so that said clutch body means can be driven by said clutch plate means through the shear of said fluid in said zone, fan blade means extending from said clutch body means, a cover plate attached to said clutch body means, a pump plate secured to said clutch body means and cooperating with said cover plate to form a reservoir for a quantity of fluid stored therein, said pump plate having pumping means associated therewith to pump fluid exiting from said shear space back to said reservoir, said reservoir being hydraulically separated from said clutch plate means by said pump plate, valve means associated with said pump plate to control the flow of fluid between said reservoir and said shear space, control means for operating said valve means, and fluid sealing ring means sealingly mounted between the interfacing surfaces of said pump plate and said front face of said clutch plate means to establish a discrete pump out cavity and to hydraulically block the interface between said pump plate and said clutch plate means so that substantially all the fluid exiting from said reservoir will be forced to flow through said shear zone and then to said pump out cavity for subsequent discharge by said pumping means on said pumping plate to said reservoir.

4,630,722

ELECTROMAGNETIC WRAP SPRING CLUTCH

Stephen Figueira, Penfield, and Philip A. Billings, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1982, Ser. No. 445,332

Int. Cl.⁴ F16D *13/08, 27/10*

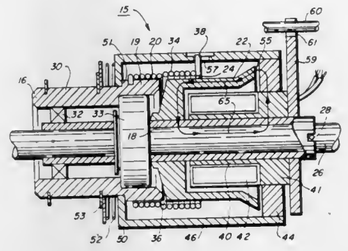
U.S. Cl. 192—84 T **2 Claims**

1. In an electromagnetically actuated wrap spring clutch having a cylindrical input clutching surface, an output clutching surface, a helical spring surrounding the surfaces and having one end secured to the input surface to rotate therewith, said input surface being adapted to impart rotation to the output clutching surface by virtue of frictional engagement of the spring upon the output surface, and an electromagnetic coil

being coaxial with the surfaces and the spring for selectively causing the frictional engagement, the improvement including:

a cylindrical control member surrounding the clutching surfaces and arranged to impart contracting of the helical spring when actuated for wrapping the same upon the output clutch surface,

an armature operatively associated with said control member,



said electromagnetic coil when energized produces a magnetic flux path which passes through said armature to cause the same to actuate said control member and thereby provide a driving connection between the input and output clutching surfaces, said electromagnetic coil having a diameter less than the diameter of the helical spring and the output clutching surface.

4,630,723

CENTRIFUGAL TYPE FRICTION CLUTCH

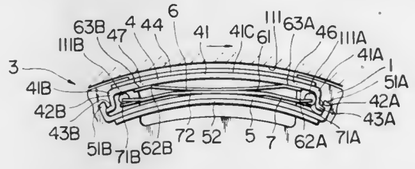
Shiro Sakakibara, Anjo, Japan, assignor to Aisin-Warner Limited, Anjo, Japan

Filed Sep. 20, 1984, Ser. No. 652,479

Claims priority, application Japan, Sep. 22, 1983, 58-175784

Int. Cl.⁴ F16D *43/14*

U.S. Cl. 192—105 BA **1 Claim**



1. A centrifugal type friction clutch which permits clutch slipping in both drive power transmission and driven power transmission modes, said clutch having a torque capacity in driven power transmission less than that in drive power transmision and comprising:

a drum having an interior cylindrical surface serving as a frictional coupling surface;

a disk coaxially mounted within said drum, said disk having a plurality of radial projections, said radial projections radially extending from the periphery of said disk and defining a plurality of peripheral notches therebetween, each of said radial projections having a pair of axially extending stop members mounted thereon;

a plurality of frictional coupling elements, one of said coupling elements mounted in each of said notches for radial movement therein, each of said frictional coupling elements comprising:

an arcuate portion with a friction surface for engaging said frictional coupling surface of said drum;

a pair of arms integral with said arcuate portion and extending radially inward from opposite ends of said arcuate portion, one of said arms engaging one of said radial projections in the driven power transmission mode, whereby the frictional coupling element becomes a trailing element;

a pair of grooves, one groove formed in each end of said frictional coupling element and extending into said arcuate portion, each of said grooves receiving an edge portion of an adjacent radial projection, the bottom of the groove extending through said one arm providing a point of contact with said disk in the drive power transmission mode, whereby the frictional coupling element becomes a leading element;

a plurality of weights, one of said weights mounted in each of said notches radially inward of said axially extending stop members and having arm portions extending circumferentially beyond said axially extending stop members so that the extent of the radially outward movement of the weight is limited by said axially extending stop members;

a plurality of resilient load elements, one of said resilient load elements mounted in each of said notches, said one resilient load element located between and urging apart one of said weights and one of said frictional coupling elements; and

a plurality of resilient retracting elements, each of said resilient retracting elements having end portions, each of said end portions engaging an axially extending stop member and having an intermediate portion engaging a weight so as to urge the weight radially inward.

4,630,724

METHOD AND DEVICE FOR FORMING A ROW OF FILTER-TIP CIGARETTES

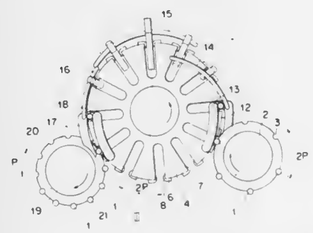
Motonobu Horie; Minoru Suzuki, both of Tokyo, and Shinji Ogura, Nagareyama, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,185

Claims priority, application Japan, May 2, 1984, 59-087775

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—399 **6 Claims**



1. A method of forming a row of filter-tip cigarettes, said method comprising the steps of:

feeding a plurality of filter-tip cigarettes in two rows, cigarettes in each row having filters attached thereto extending in opposite direction, the cigarettes in one row being arranged in axial alignment with respect to the cigarettes in the other row;

providing a center support means for supporting cigarettes substantially about their centers of gravity;

supporting cigarettes in one of said rows substantially at their centers of gravity by said center support means, so that each cigarette so supported is rotatable about its center of gravity with respect to its respective center support means;

rotating said cigarettes supported by said center support means about their respective centers of gravity to invert said cigarettes;

moving the cigarettes in the other row forwardly with respect to a flow direction of said cigarettes to form two zig zag rows of said cigarettes, where said filters are attached to said cigarettes in the same direction and said two rows

of said cigarettes are arranged out of axial alignment with respect to each other; and

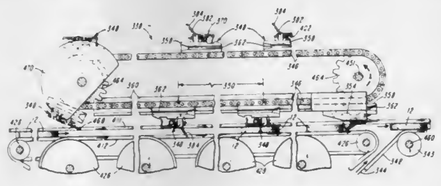
moving said cigarettes in said two zig zag rows in an axial direction to form one row of said cigarettes.

4,630,725

APPARATUS FOR ARRANGING ARTICLES IN A PREDETERMINED MANNER AND METHOD OF MAKING SAME

Karl H. Steurmer, New Richmond, Ohio, assignor to Planet Products, Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 292,741, Aug. 14, 1981, Pat. No. 4,421,222. This application Nov. 9, 1983, Ser. No. 550,180
Int. Cl.⁴ B65G *47/26*
U.S. Cl. 198—425 **16 Claims**



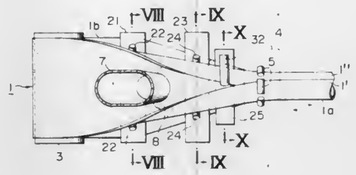
1. In an apparatus for arranging randomly oriented articles of roughly equal size in a predetermined pattern comprising; means for receiving said articles and disposing same in at least one substantially rectilinear row and in a single layer thereof; an accumulator for receiving said articles from said row; said accumulator having moving means for moving said articles therethrough and cooperating gate means for controlling the articles moved through said accumulator; said moving means and gate means being independently driven; and a collection device for collecting said articles from said accumulator; the improvement wherein said gate means comprises; a mechanism supported for movement in an endless path; said mechanism being disposed above at least a portion of said accumulator; a plurality of gates carried by said mechanism in spaced relation with a particular pitch between immediately adjacent gates establishing a predetermined number of said articles therebetween; means for serially indexing said mechanism a distance equal to said pitch to thereby move a gate disposed immediately adjacent said collection device and thus allow movement of the predetermined number of articles immediately upstream of said immediately adjacent gate out of said accumulator to said collection device; and a cam structure immediately upstream of said collection device, said cam structure being adapted to actuate each of said gates upon movement thereof thereagainst, each of said gates comprising means enabling movement of articles therepast and also providing a gating action upon being actuated by said cam structure or by a particular article, said gate action by a particular article being defined by the last article of said predetermined number of articles actuating the gate it has just moved past, said gating action serving to prevent movement past its associated gate of the next article upstream thereof, and said means for indexing said mechanism said distance equal to said pitch operating to move an exit gate engaged by said cam structure away therefrom and thereby allow movement of the predetermined number of articles immediately upstream of said exit gate out of said accumulator to said collection device.

4,630,726

TUBULAR BELT CONVEYOR AND A BELT ROLLING UP MEANS OF THE SAME

Kunio Hashimoto, Kitakyushu, Japan, assignor to Haruo Okazaki and Japan Pipe Conveyor Co., Ltd., both of Fukuoka, Japan

Filed May 3, 1984, Ser. No. 606,664
Int. Cl.⁴ B65G *15/08*
U.S. Cl. 198—819 **1 Claim**



1. A tubular belt conveyor having a belt pressing device comprising:

an endless belt able to be rolled to form an overlapped tubular shape;

a plurality of spaced apart supporting frames each of which is disposed to surround outgoing and returning paths of said endless belt;

a plurality of closely spaced belt shape maintaining rollers which are arranged to configure substantially a circle inside each of said supporting frames;

and a belt pressing roller, disposed adjacent a conveyor loading station at one end of said conveyor between said station and the nearest supporting frame which pressedly bends one side end portion of said endless belt horizontally inwardly, and beneath the other side end portion, said belt pressing roller reduces frictional contact between said one side end portion and said other side end portion as the side end portions move laterally relative to each other during formation of the overlap by being positioned between said one side end portion and said other side end portion where said endless belt is to be rolled horizontally into said overlapped tubular shape; wherein said belt pressing roller is adjustable laterally of the belt and vertically, said belt pressing roller extends in a substantially horizontal direction laterally of the belt over said outgoing path of said endless belt on an upper side of the belt and a receptacle is provided to receive the materials carried adjacent the end of the outgoing path.

4,630,727

CONTAINER FOR A BICARBONATE CONTAINING FLUID

Mariano Feriani, Arcugnano, and Stefano Biasioli, Vicenza, both of Italy, assignors to Fresenius, AG, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,903
Claims priority, application Italy, Apr. 6, 1984, 85554 A/84
Int. Cl.⁴ B65D *81/32*
U.S. Cl. 206—221 **19 Claims**

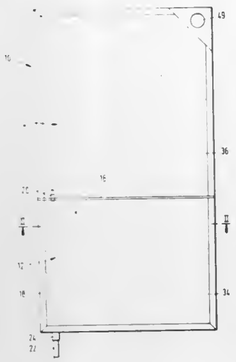
1. A container for preparing a bicarbonate-containing solution for dialysis, substitution or infusion for peritoneal dialysis, hemo filtration and the like comprising:

(a) an outer bag structure of organic polymer having at least two chambers,

(b) a first of said chambers filled with an aqueous solution containing carbonate,

(c) a second of said chambers filled with an aqueous acid solution,

(d) an openable flow blocking valve connecting said first with said second chamber, said valve being the sole ingress or egress means to said second chamber, and



(e) at least one discharge tube fitted with a removable closure, said discharge tube passing through and being sealed to said outer bag and into a said first chamber.

4,630,728

DISC CARTRIDGE

Fujio Matsumoto, and Yoshitake Kato, both of Ibaragi, Japan, assignors to Hitachi Maxwell, Ltd., Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,524
Claims priority, application Japan, Sep. 7, 1983, 58-139344[U]
Int. Cl.⁴ B65D *85/57*
U.S. Cl. 206—313 **7 Claims**



1. A disc cartridge comprising:

a disc case having an upper half and a lower half;

said disc case including at least one drive shaft insertion hole on a central portion thereof and at least one magnetic head insertion hole, each half having an inner and outer surface;

a disc rotatably mounted therein;

ribs, arcuately shaped and provided on said inner surface of each half of said disc case and located to generally surround approximately half or greater of the perimeter of said drive shaft insertion hole, and

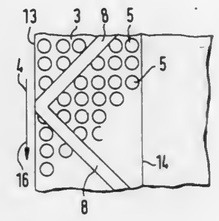
liners, laid on respective inner surfaces of each of the halves of said disc case, and being positioned between said ribs and said disc, for slidably contacting both surfaces of said disc.

4,630,729

PACKAGE, FOR EXAMPLE, FOR SURGICAL INSTRUMENTS AND PRODUCTS

Edmund Hirt, Stuttgart; Dietmar Send, Memmingen, and Günter Diete, Buchenberg, all of Fed. Rep. of Germany, assignors to Firma Dixie Union Verpackungen GmbH, Kempten, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,274
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427702
Int. Cl.⁴ B65D *43/02, 81/18*
U.S. Cl. 206—363 **7 Claims**



1. A packaging device for use with products to be sterilized such as surgical instruments and products and the like, comprising: a first sheet of plastics material and a second sheet of flexible material; said second sheet being composed of paper-like material which is composed of single fibers; said first sheet and said second sheet having corresponding marginal portions; said marginal portions of said first and second sheets of material being joined together; a body; said body having a cavity adapted to contain a product; said first sheet being connected to said body adjacent said cavity; said cavity being closed by said second sheet; said second sheet being adapted to permit permeatation of a gas therethrough; said marginal portions which are joined together comprising a joined region; said cavity being bounded by said joined region; at least a portion of said second sheet projecting beyond said joined region to facilitate an opening operation by peeling said joined region apart;

said first sheet and said second sheet having respective confronting surfaces at said joined region; there being disposed upon at least one of said confronting surfaces a first group of bonding elements and a second group of bonding elements; individual elements of said first group each being of a first, small, dimension in at least one direction in a plane of said joined region; individual elements of said second group comprising a narrow elongated line of bonding; each of said individual elements of said second group being disposed generally transversely to a predetermined direction of peeling for an opening operation; whereby said first group of bonding elements is so constructed as to permit separation of said first and second sheets of said joined region readily without substantial pulling out of fibers from said second sheet; and whereby said second group of bonding elements is so constructed as to provide a stronger bond than does said first group of bonding elements, and whereby fibers pulled out from said second sheet by said second group of elements during separation of said joined region are retained by said individual elements of said second group to avoid contamination of the product.

4,630,730

KNITTING PROJECT WORKBOX

Patricia J. Storey, 1502 E. Mission, Escondido, Calif. 92025

Filed Mar. 31, 1986, Ser. No. 846,155
Int. Cl.⁴ B65D *85/66*
U.S. Cl. 206—392 **7 Claims**

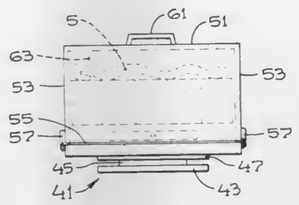
1. A workbox for a knitting project, comprising:

(a) a plurality of fully enclosed small containers, in which to

store different yarns needed as source yarns in the project, said containers assembled in tangential geometry so that their tops lie in a common plane;

(b) each said container having a hinged loading door and an aperture through which a strand of yarn may pass from storage to the knitting project for incorporation therein;

(c) a swivel stand supporting said assembled containers to permit rotation thereof in phase with rotation by the knitter of the knitting project;



(d) a cover for placement over said containers comprising a top plate spaced above said containers, creating a space therebetween for storage of the knitting project therein, enclosing sides depending from said plate around the outside of said storage boxes to encase said knit project storage area and containers therein, means for temporarily fastening said cover to said assembled containers; and,

(e) a handle atop said cover for transporting said workbox.

4,630,731

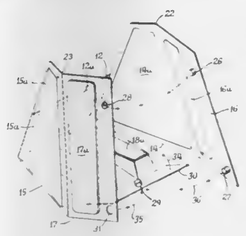
BROCHURE HOLDER AND BLANK THEREFOR

Lewis L. Albery, Dolton, Ill., assignor to The Cooperative Marketing Co., Elk Grove Village, Ill.

Filed Feb. 8, 1985, Ser. No. 699,815

Int. Cl.⁴ B65D *37/00*

U.S. Cl. 206—425 **12 Claims**



1. A substantially flat, preformed one-piece plastic blank for assembling into a holder for brochures and the like comprising, in combination, a substantially rectangular front panel;

a first side panel adjoining the front panel on one side thereof;

a second side panel adjoining the front panel on the other side thereof;

said side panels each having a rear edge oriented at an acute angle to a bottom edge,

a first substantially rectangular back panel adjoining the rear edge of the first side panel;

a second substantially rectangular back panel adjoining the rear edge of the second side panel, the first and second back panels being inclined forwardly from bottom to top when the holder is assembled as a result of the orientation of the rear edges of said side panels;

a bottom panel adjoining said front panel, the bottom panel having a surface formed therein inclined upwardly from front to back so that, when the holder is assembled, any brochures held therein will slide toward the front of the holder and having a flap hinged to its rear edge; and

integral interfitting and frictionally engaging means on said bottom panel flap and said back panels for securing together the holder in its assembled condition which permit said blank to be shipped in a substantially flat condition and assembled without the use of tools or adhesives.

4,630,732

STORAGE DEVICE FOR STORING DISC-SHAPED ARTICLES

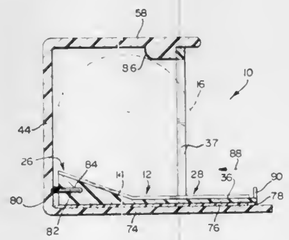
Robert Snyman, 1180 Pretorius Street, Hatfield, Pretoria, Transvaal Province, South Africa

Filed Aug. 26, 1985, Ser. No. 769,574

Claims priority, application South Africa, Sep. 6, 1984, 84/7013

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 206—445 **6 Claims**



1. A storage device for storing a plurality of disc-shaped articles in closely spaced vertical side-by-side relationship which includes

a floor and a rear wall extending upwardly from the floor; a plurality of supports, each being slidably mounted on the floor, one support being provided for each article to be stored, each support having a support surface for supporting the articles, and including first bias means for biasing the articles towards rolling; and

releasable restraining means associated with each support to restrain the articles against rolling under the effect of the first bias means, each restraining means including second bias means to bias its associated support away from the rear wall or the device, and a shoulder at an upper portion of the front of the device against which a part of the periphery of the article abuts in use.

4,630,733

PRODUCT INDICATING TAB

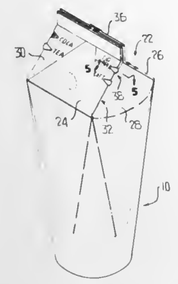
Robert E. Fear, Wheaton, Ill., assignor to Continental Bondware, Inc., Rolling Meadows, Ill.

Filed Dec. 20, 1985, Ser. No. 811,366

Int. Cl.⁴ B65D *73/00*

U.S. Cl. 206—459 **11 Claims**

1. A carton formed of a laminate including a core formed of a readily delaminatable material and separate inner and outer surface layers, said carton having at least one corner whereat said laminate is generally reversely folded, at least one product identifying tab formed at said corner by a cut line through said outer surface layer and terminating in said core, said product identifying tab having a starting end extending partially around said corner, and product identifying indicia on said carton adjacent said tab, said tab starting end being rounded to effect



automatic separation of said tab starting end from said laminate when said laminate is folded to form said corner.

4,630,734

PACKAGE FOR HANGING OR STAND-UP DISPLAY

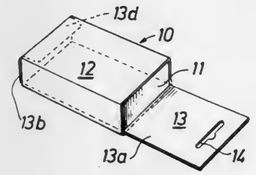
Eric Severin; Arne Jansson, and Kjell Östman, all of Jönköping, Sweden, assignors to AB Jönköping Vulcan, Sweden

Filed Mar. 21, 1985, Ser. No. 714,252

Claims priority, application Sweden, Mar. 30, 1984, 84017748

Int. Cl.⁴ B65D *6/06*

U.S. Cl. 206—461 **12 Claims**



1. A package comprising an inner box having a predetermined length, an outer box including an entrance aperture, an exit aperture, and a pathway of at least said predetermined length extending therebetween, whereby said inner box can move slidably along said pathway between an open position in which said inner box is only partially contained within said pathway and a closed position in which said inner box is contained entirely within said pathway, and insert means insertable into said pathway, said insert means having a length greater than said predetermined length whereby when said insert means is inserted within said pathway between said inner and outer boxes said insert means can extend for substantially said entire predetermined length and an extended portion of said insert means extends beyond said outer box, whereby said package may be mounted on a support affixed to said extended portion of said insert means, said insert means further including fixation means for removably maintaining a relatively fixed relationship between said outer box and said insert means when said insert means is inserted within said pathway while simultaneously permitting said inner box to be freely slidable along said pathway from said closed position to said open position.

4,630,735

DISPENSER CARTON FOR DRINKING STRAWS WITH TEAR-OUT DISPENSING OPENING

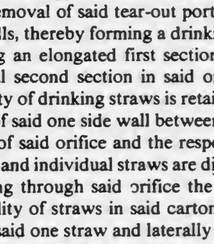
Klaus Jebens, No. 67, Saselheider Strasse, 2000 Hamburg 72, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,151

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445927

Int. Cl.⁴ B65D *5/54*

U.S. Cl. 206—611 **2 Claims**



1. A drinking straw dispenser assembly comprising a dispenser carton containing a group of a plurality of drinking straws of predetermined length and arranged in contiguous, parallel, coextensive relationship; said carton comprising rectangular front and rear walls spaced from each other and having opposite side edges and opposite end edges extending between said opposite side edges; two side walls extending between respective opposite side edges of said front and rear walls, opposite ends of said side walls being in substantial alignment with said opposite end edges of said front and rear walls; and two end walls extending between respective opposite end edges of said front and rear walls and respective ends of said side walls to confine said group of straws within said container; said front wall and one of the adjoining side walls having a tear-out portion defined by a pattern of perforations and comprising a first section in said one side wall which extends in a narrow elongated configuration along a substantial length of said one side wall intermediate the opposite ends thereof, providing portions of said one side wall between opposite ends of said first section of said tear-out portion and the respective ends of said one side wall, the length of said first section of said tear-out portion being less than said predetermined length of said plurality of straws; and a second section which extends laterally from one side of said first section in said one side wall to the junction of said one side wall with the respective side edge of said front wall and from said respective side edge in said front wall for a substantial distance toward the opposite side edge thereof, the width of said second section being substantially less than the length of said first section and said second section being intermediate the opposite ends of said one side wall and the opposite end edges of said front wall; whereby, upon removal of said tear-out portion from said one side and front walls, thereby forming a drinking straw dispensing orifice having an elongated first section in said one side wall and a lateral second section in said one side and front walls, said plurality of drinking straws is retained in said carton by said portions of said one side wall between opposite ends of said first section of said orifice and the respective ends of the said one side wall and individual straws are dispensed from said carton by gripping through said orifice the opposite sides of one of said plurality of straws in said carton intermediate the opposite ends of said one straw and laterally withdrawing said one straw through said first section of said orifice in said one side of said carton without contacting and contaminating the opposite ends of said one straw.

4,630,736

SORTING MACHINE UTILIZING AN IMPROVED LIGHT DETECTION SYSTEM

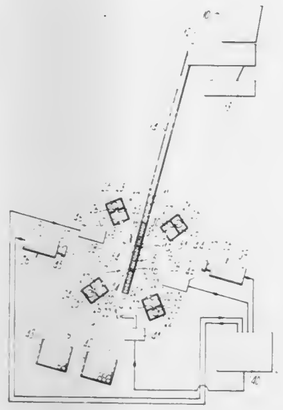
William S. Maughan, West Sussex, and Herbert Fraenkel, London, both of England, assignors to Sortex Limited, London, England

Filed Jun. 15, 1984, Ser. No. 621,253

Claims priority, application United Kingdom, Jun. 30, 1983, 8317777

Int. Cl.⁴ B07C *5/342*

U.S. Cl. 209—587 **25 Claims**



1. A sorting machine comprising:

means for moving a plurality of objects sequentially past a plurality of viewing zones which are spaced apart in the direction of movement of the objects so that the moving objects pass to an object separation zone in which relative separation is effected between desired and undesired objects;

light sources on opposite sides of said moving objects, each light source directing first and second beams of light to different viewing zones respectively;

viewing means for effecting viewing from opposite sides of the objects passing through the viewing zones, each of said first beams being out of alignment with any viewing means on either side of the moving objects, and each of said second beams being directed to a viewing zone different to that illuminated by the respective first beams and being less powerful than the latter;

discriminator means, controlled by the output from said viewing means, for determining whether objects which have been so viewed are desired or undesired; and

object separation means, controlled by said discriminator means, for effecting relative separation in the object separation zone between said desired and undesired objects, at least most of the light which is reflected by an object so as to be directed into a viewing means being derived from a light source disposed on the same side of said moving objects as the respective viewing means.

4,630,737

SPACER CLIP

Ronald R. King, Sutton, Mass., assignor to Wright Line, Inc., Worcester, Mass.

Filed Mar. 13, 1986, Ser. No. 839,698

Int. Cl.⁴ A47G *29/00*

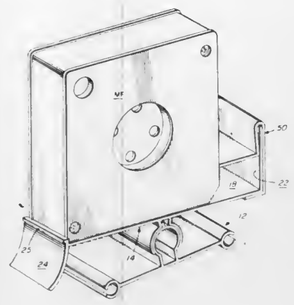
U.S. Cl. 211—40 **10 Claims**

3. A spacer clip attached to a cell for storing and dispensing cartridges, the clip comprising:

an upstanding back member,

a front member spaced from and substantially parallel to the back member,

a bridge joining the upper ends of the front and back members,



a removable cartridge engaging member projecting from the lower end of the front member in a direction away from the back member.

4,630,738

RACK FOR STORING NUCLEAR FUEL ELEMENTS

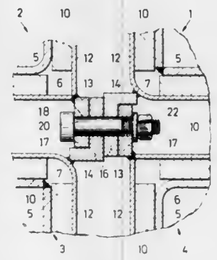
Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 17, 1983, Ser. No. 552,746

Claims priority, application Switzerland, Nov. 17, 1982, 6692/82

Int. Cl.⁴ A47F *7/00*

U.S. Cl. 211—60.1 **11 Claims**



1. A rack for storing nuclear fuel elements comprising

a baseplate;

a plurality of parallel neutron-absorbent square tubes secured to said baseplate in upright manner;

a plurality of connectors secured to said tubes for laterally supporting said tubes, each said connector being secured to a respective corner of a respective tube and disposed in lateral contact with a connector of at least one adjacent tube at least in a central plane between adjacent tubes; and

tightening means for drawing said contacting connectors laterally against one another.

4,630,739

STATIONERY RACK CONSTRUCTION

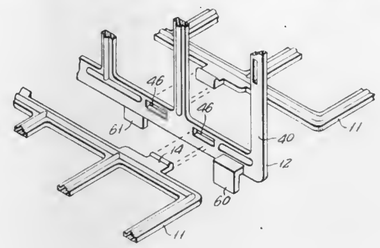
Nat Levenberg, Lynbrook, N.Y., assignor to Jefsteel Business Equipment Corp., Brooklyn, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,224

Int. Cl.⁴ A47F *5/00*

U.S. Cl. 211—189 **4 Claims**

1. Stationery rack construction comprising: a first plurality of floor members of generally planar configuration, a second plurality of side wall members of generally planar rectangular configuration, and a third plurality of rear wall members of generally planar rectangular configuration; said first, second and third pluralities being formed of moulded synthetic resinous material and having a limited degree of resiliency; said first plurality of floor members having a pair of opposed side edges having planar laterally projecting tabs thereon in mutually non-symmetrical relation, said second plurality of side wall members having plural sets of first and second slots at correspondingly disposed locations so as to be selectively engage-



able with projections on said first plurality of floor members on one side thereof in said first slots, and on the oppositely disposed sides thereof by projections in said second slots thereof; whereby a number of members of said first plurality of floor members may be engaged upon either side of a single member of said second plurality of side wall members, enabling said single member to serve selectively as an end wall or a medially disposed wall of said rack construction.

4,630,740

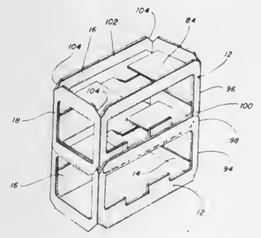
MODULAR DISPLAY STAND

Paul Belokin, Jr., P.O. Box 1907, Denton, Tex. 76201

Filed Oct. 1, 1984, Ser. No. 656,361

Int. Cl.⁴ A47F *43/00*

U.S. Cl. 211—194 **2 Claims**



1. A collapsible display module comprising:

a wall blank having substantially flat wall panels connected end to end foldably relative to each other to define a continuous wall structure,

said wall blank collapsible to a flattened state for storage and convertible to an expanded display state in which pairs of opposed, facing panels cooperatively bound a display space;

at least one flap associated with each of the wall panels of one said wall panel pair, said flaps each comprising a body and at least one tooth extending from the body; and

means attaching the body of each said flap foldably relative to its respective wall panel so that said flaps can be situated in meshed, overlapping relation with each other with said blank in the display state without distorting the panels or the flaps, wherein the tooth on each flap overlies the body of the flap on the opposed panel,

the extension of one of the bodies from its respective wall panel being greater than the extension of the other of the bodies from its respective wall panel so that a resulting opening in the wall blank from the flap with the one body is larger than an opening in the wall blank from the flap with the the other body,

said flaps serving as shelves for placement of articles to be displayed and the panel with the flap with the other body has a larger retaining surface for articles on the shelf.

4,630,741

EXTENDIBLE BOOM INCLUDING A RACK AND PINION MECHANISM

Alec M. Stevens, P.O. Box 329, Atherton, Queensland 4883, Australia

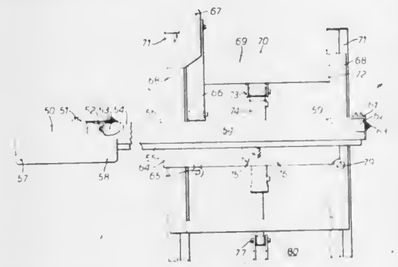
PCT No. PCT/AU84/00047, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/03603, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 20, 1984, Ser. No. 678,554

Claims priority, application Australia, Mar. 22, 1983, PF8551

Int. Cl.⁴ B66C *23/56*

U.S. Cl. 212—203 **9 Claims**



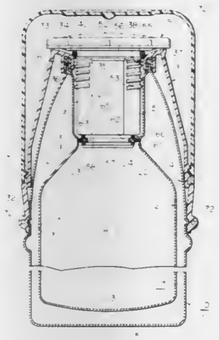
1. An extendible boom comprising an elongated work head carrying arm mounted on a supporting means therefor which enables reciprocating movement of said elongated arm in a generally horizontal direction along the length thereof, a source of motive power for application to said elongated work head carrying arm to move said elongated arm back and forth, a rack and pinion mechanism for coupling said source of motive power to said elongated arm wherein said rack extends along the length of said elongated arm and said pinion is connected to said source of motive power, said elongated arm being a hollow channel section which is rectangular in cross section and is closed on all its sides but the lower having a lengthwise extending slot through the lower side thereof, said supporting means having a plate-like member passed through said slot for supporting a bearing assembly comprising two roller pairs disposed on axles supported by the plate-like member, said roller pairs engaging with inner surfaces of the upper and lower sides of said hollow channel section to locate and guide said channel for lengthwise movement on said roller pairs, said rack being disposed along the underside of the elongated arm and said pinion and source of motive power being mounted to said plate-like member beneath said elongated arm, said rack being fixed at each end to opposite ends of said elongated arm, a resilient bumper means being provided at each rack end to engage with an end stop at the extent of each of the extending and retracting movements, one of said rack ends being interconnected with a rack tension adjusting mechanism comprising a tapped, sliding block attached to said rack end, a housing to prevent twisting of said sliding block and a screw bolt which engages said tapped block whereby the rack tension is adjusted.

4,630,742

CONTAINER AND PLUG ASSEMBLY

Kenichi Miyaji; Shouji Toida; Seiichi Ito; Isao Watanabe, and Masatoshi Kishida, all of Yoshidamachi, Japan, assignors to Nippon Sanso Kabushiki Kaisha, Japan

Filed May 28, 1985, Ser. No. 738,652
Claims priority, application Japan, May 31, 1984, 59-80527
Int. Cl.[4] B65D *25/18*
U.S. Cl. 215—13 R **18 Claims**



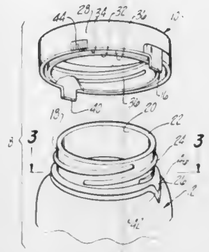
1. A container and plug assembly comprising; an elongated container having a closed longitudinal one end and the other longitudinal end, said container having a receiving space defined at the longitudinal one end for receiving therein contents, an opening defined at the other longitudinal end, the contents being filled into said receiving space and discharged therefrom through said opening, and an annular ridge formed at a location spaced from said opening toward said receiving space a predetermined distance, said annular ridge defining a throat having a diameter less than that of said opening, said receiving space being in communication with said opening through said throat, said ridge having a circumferentially continuous sealing surface extending substantially longitudinally of said container a predetermined distance, a plug having one and the other axial ends and threadedly engageable with said container so as to open and close said opening by the axial one end of said plug, said plug having annular resilient sealing means carried on the other axial end of said plug, said sealing means carried on the other axial end of said plug being in sealing contact with said sealing surface with said opening of said container being closed by the axial one end of said plug threadedly engaged with said container, a circumferentially continuous second sealing surface formed on said container adjacent to said opening and said second sealing means carried on said plug adjacent to the one axial end thereof, the first-mentioned sealing means being in sealing contact with the first-mentioned sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening, the first-mentioned sealing means comprises an annular body fitted in the other axial end of said plug and an annular projection extending radially outwardly from said annular body and having an annular free end in intimate contact with the first-mentioned sealing surface such that said first-mentioned sealing means is subjected only to a force directed substantially radially inwardly from the first-mentioned sealing surface with said second sealing means being in sealing contact with said second sealing surface to close said opening.

4,630,743

TAMPER INDICATING CHILD RESISTANT CLOSURE

David M. Wright, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 1, 1984, Ser. No. 656,472
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—216 **17 Claims**



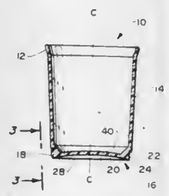
1. A tamper indicating and child resistant package including a threaded closure and a container having a threaded neck to receive said closure, said package comprising: a lock member on said container, a closure having a top with concentric inner and outer walls depending from said top, said inner wall having threads engageable with said threaded neck on said container, a lock element on said outer wall for engaging said lock member upon opening rotation of said closure to prevent rotation beyond a predetermined point, said lock element being deflectable radially outwardly upon radial inward squeezing of said outer wall at diametrically opposed points to permit said lock element to pass said lock member and permit opening rotation of said closure, a tamper indicating element on said outer wall for engaging said lock member to prevent rotation of said closure in an opening direction, said tamper indicating element being frangible relative to said outer wall for removal from said closure to permit rotational movement of said closure relative to said lock member and to indicate tampering, and means connecting said tamper indicating element to said inner wall to prevent radial outward deflection of said lock element upon squeezing of said outer wall at said diametrically opposed points to prevent rotation and maintain said closure on said container until removal of said tamper indicating element.

4,630,744

CONTAINER WITH REGISTRATION RIB

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.

Filed Sep. 3, 1985, Ser. No. 771,775
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—1 R **4 Claims**



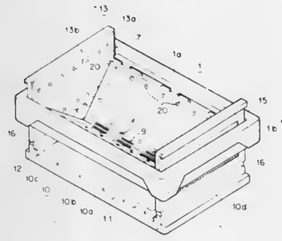
1. A container having a base from which extends a sidewall with a lower portion comprising an annular shoulder defining an inner corner from which an offset sidewall extends downwardly to a lower end defining the outer periphery of said container base, said offset sidewall including a single elongated rib exterior member extending from said inner corner downwardly to a terminus proximate said lower end with the longitudinal axis thereof coextensive with the rotational axis of said container wherein the lower portion interior of said container comprises an annular inclined surface intersecting and extending inwardly from the container sidewall to said base forming a thickened region about the base periphery.

4,630,745

FOLDABLE CONTAINERS

Yosuke Shiotani, Komaki, Japan, assignor to Kunimori Kagaku Co., Ltd., Aichi, Japan

Filed Mar. 13, 1985, Ser. No. 711,412
Claims priority, application Japan, Apr. 13, 1984, 59-55337[U]; Sep. 5, 1984, 59-135293[U]; Nov. 22, 1984, 59-177964[U]
Int. Cl.[4] B65D *6/18, 6/26*
U.S. Cl. 220—6 **5 Claims**



1. A foldable container, comprising:
an upper rectangular frame wherein said frame is provided with a pair of flanges on one pair of opposed inner sides and upwardly bent edges on the remaining pair of opposed inner sides;
a rectangular bottom plate having studs insertable into opposing sides of said upper frame;
a pair of side plates, the upper end of each of said side plates being rotatably connected to a corresponding flange of said upper frame, and the lower end of each side plate being detachably engageable with said bottom plate;
wherein each side plate is provided with a plurality of openings at the lower side thereof, and said bottom plate is provided with a plurality of inwardly protruded bosses to be inserted through said openings of each side plate; and
a pair of end plates, the upper end of each of said end plates being detachably engageable with said frame and the lower end of each end plate being detachably engageable with said studs of said bottom plate;
wherein each side of said end plate is fit into a spacing between side edges of said flanges and an adjacent inner side surface of said frame, and each end plate is provided with a downwardly bent edge at the upper end thereof to be engageable with said bent edge of the frame.

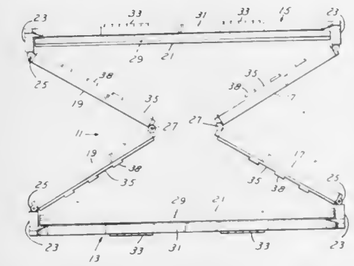
4,630,746

COLLAPSIBLE STACKABLE SHIPPING CONTAINER

Jerry B. Fortenberry, Northville, Mich., assignor to Fortenberry & Associates, Inc., Northville, Mich.

Filed Feb. 27, 1984, Ser. No. 584,091
Int. Cl.[4] B65D *7/24*
U.S. Cl. 220—6 **18 Claims**

1. A collapsible stackable lightweight shipping container having an open top comprising front and rear walls;
opposed sectional end walls, each end wall including a pair of aligned end wall sections pivotally interconnected along their inner adjacent upright edges and a their outer upright edges pivotally connected to opposite side edges of said front and rear walls respectively;
a corner member of L-shape configuration located upon and along the outer upright edges of said front and rear walls, each corner member forming a part of the front or rear wall to which it is connected and extending inwardly at right angles thereto;
a pair of aligned bottom walls at their outer edges pivotally connected to bottom edges of said front and rear walls respectively and at their opposite sides supported upon said end walls respectively;
said bottom walls adapted for upward pivoting into engagement with said front and rear walls respectively;
said end wall sections adapted for inward pivotal movement into parallel engagement with each other and with the front and rear walls and the lifted bottom walls;
said bottom walls being enclosed by the corresponding corner members when collapsed to facilitate inward folding and collapsing of said end wall sections;
said front, rear and bottom walls and said end wall sections being made from molded plastic material and having inner and outer surfaces;



each wall and section including a plurality of spaced right angularly related ribs defining an open mesh construction between the inner and outer surfaces throughout substantially the entire area of each wall and section;
said front wall having a central rectangular opening adjacent its upper edge;
an upright front wall access section made from molded plastic material and having inner and outer surfaces, said section being nested within said opening coplanar with said front wall, along its lower edge pivotally connected to said front wall;
said front access section including a plurality of spaced right angularly related ribs defining an open mesh construction between the inner and outer surfaces thereof; and
opposed outwardly directed latch means slidably mounted upon upper side portions of said access section aligned with and retainingly engageable with corresponding detents said front wall.

4,630,747

GRAVITATIONALLY-OPERATING COLLAPSIBLE BASKET

Ming-Yao Chiang, and Pei-Leh Chiang, both of P.O. Box 10160, Taipei, Taiwan

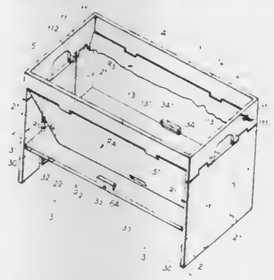
Filed Apr. 30, 1986, Ser. No. 857,482
Int. Cl.[4] B65D *6/18*
U.S. Cl. 220—7 **2 Claims**

1. A gravitationally-operating collapsible basket comprising:
an upper frame having two side fencing elements, a rear and a front fencing element to form a rectangular or square frame;
two side plates, each pivotedly mounted on each said fencing element by a hinge and each side plate formed with two longitudinal grooves, corresponding to two short grooves formed on each said side fencing element of said upper frame, and each formed with an extension key on its inner bottom edge;
a bottom plate including two pairs of extensions formed on the two side edges thereof and each pair of extensions respectively engaged with every two longitudinal grooves

formed on each side plate, two grooves formed on two side bottom edges each groove operatively engaged with each said extension key of side plate, an extension key formed on the front edge, and another extension key formed on the rear edge;

a rear plate pivotedly mounted on said rear fencing element by a hinge and formed with a groove on its bottom edge to operatively engage with said extension key formed on the rear edge of said bottom plate; and

a front plate pivotedly mounted on said front fencing element by a hinge and formed with a groove on its bottom edge to operatively engage with said extension key formed on the front edge of said bottom plate;



said height of each said side fencing element of said upper frame being larger than the height of said rear or front fencing element such that the difference of said two heights is equal to the sum of thickness of all said plates as folded by the order of the uppermost rear and front plates, middle bottom plate and the lowest two side plates, as horizontally stacked;

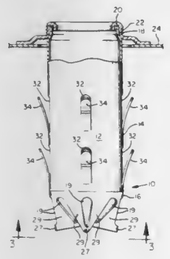
whereby upon the releasing of said two side plates, said bottom plate will gravitationally descend along said two side plates, and the rear and front plates will then angularly move to be pendant to assemble a cubic or parallelepiped basket; and upon the reversing of the assembled basket, all plates will be gravitationally collapsed to become a folded compact unit.

4,630,748

ANTI-SIPHON FUEL FILLER ASSEMBLY

Russell D. Keller, 149 N. Lotus Beach Dr., Portland, Oreg. 97217

Filed Aug. 7, 1985, Ser. No. 763,475
Int. Cl.⁴ B65D *25/02*
U.S. Cl. 220—86 AT **24 Claims**



1. An anti-siphon fuel filler assembly for placement in a fuel tank comprising:

tube means adapted to be positioned in said fuel tank for allowing fuel to flow therethrough into said tank;

restriction means in said tube means for preventing the insertion of a siphon hose into said tank;

a plurality of openings in the side walls of said tube means; and

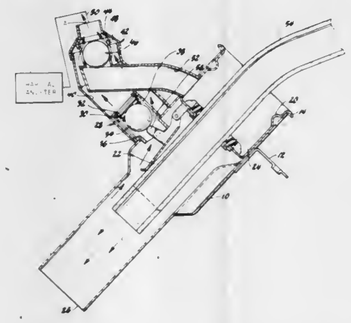
deflection means for outwardly directing any reverse flow of fuel in said tube means, said deflection means including a plurality of tabs, each tab being positioned adjacent one of said openings, and projecting outwardly therefrom.

4,630,749

FUEL FILL TUBE WITH VAPOR VENT AND OVERFILL PROTECTION

Donald J. Armstrong, Troy; Roy A. Giacomazzi, Washington Township, Macomb County, and George W. Niepoth, Milford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1986, Ser. No. 840,871
Int. Cl.⁴ B65D *31/06*
U.S. Cl. 220—86 R **3 Claims**



1. A fuel tank fill tube for a vehicle having a fuel tank and a vapor storage canister; said fill tube comprising: an open end adapted to be closed with a fuel cap; a spring closed flap means adjacent said open end for closing said open end from said fuel tank when a cap is installed and being opened by a fuel fill nozzle when refueling of the tank is undertaken, said flap means including a finger portion; spring loaded shut-off means disposed in said fill tube for closing said tube from said canister and being opened by abutment of said finger portion when said flap means is opened; and float valve means for permitting passage of vapor from said tube passing through said shut-off valve to said canister and preventing liquid from flowing to said canister and including overflow means for directing liquid flowing through said shut-off valve to the open end of said fill tube.

4,630,750

CONTAINER CAM LOCK

Joel Hughes, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Jan. 22, 1986, Ser. No. 821,038
Int. Cl.⁴ B65D *45/16*
U.S. Cl. 220—324 **8 Claims**

1. A locking assembly between a removable lid and a four sided, open top waste container, comprising,

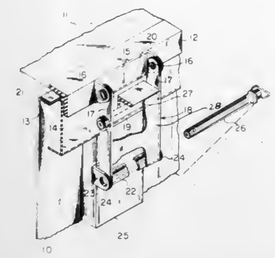
(a) a rotatable latch assembly carried by the lid to be locked upon the open top of the container,

(b) means for hingedly mounting said latch assembly to the lid for movement from a plane parallel to the lid into a plane perpendicular to the lid and parallel to the side of the container,

(c) said latch assembly including a latch lever rotatable therewith into and out of a latching position,

(d) latch means provided by the container and in the path of movement of said latch lever as it is rotated with said latch assembly into contact therewith as said assembly is rotated perpendicular to the lid and parallel to the side of the container so as to secure the lid upon the container, and

(e) means for releasably locking said latch lever in contact with said latch means contacted thereby for preventing



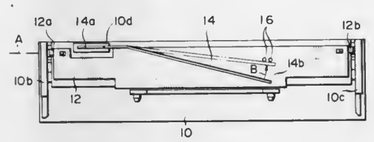
rotatable movement of said latch lever out of a lid locking position.

4,630,751

CLOSURE MECHANISM

Asao Saito, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,550
Claims priority, application Japan, Mar. 25, 1985, 60-42472[U]
Int. Cl.⁴ B65D *43/14, 51/04*
U.S. Cl. 220—334 **4 Claims**



1. A closure mechanism comprising a panel having an opening formed therein, a lid member journalled on said panel for opening and closing said opening and a biasing spring for biasing said lid member toward its closed position, the improvement comprising that said biasing spring is rigidly mounted at one end on said panel with the opposite free end of said biasing spring being resiliently engaged by said lid member under the action of a preselected biasing force to form a point of action, said point of action being slidably moved on the surface of said lid member depending on variations of the opening angle of said lid member, said point of action being thus located at the farthest position from the pivotal axis of said lid member, the distance between the point of action and the pivotal axis of said lid member being decreased as the opening angle of said lid member increases, whereby the biasing force exerted from said biasing spring to said lid member can be maintained substantially constant.

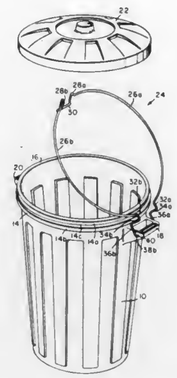
4,630,752

TRASH CAN HOOP RETAINER

Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed Apr. 21, 1986, Ser. No. 853,956
Int. Cl.⁴ B65D *67/12, 45/00*
U.S. Cl. 220—404 **10 Claims**

1. A trash can retainer for retaining trash bags in removable securement in a trash can having two lifting handles and a rim, comprising a rod-like body of substantially circular configuration, with means on one side for hingedly engaging in one of said handles of said trash can and means on the opposite side therefrom to engage said rim just above the second of said handles of said trash can in clamping relationship to thereby



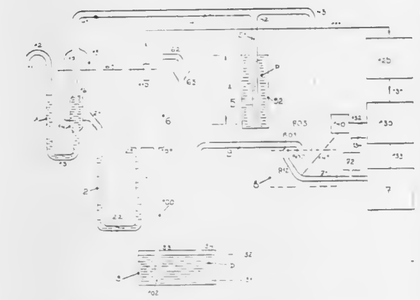
engage a top portion of said trash bag in friction-fit relationship.

4,630,753

DEVICE FOR DISPENSING DOSES OF LIQUID

Arnost Anscherlik, Schwarzenbergerstrasse 1, 8134 Adliswil, Switzerland

PCT No. PCT/CH84/00089, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04964, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 4, 1984, Ser. No. 705,435
Claims priority, application Switzerland, Jun. 7, 1983, 3107/83; Jun. 16, 1983, 3295/83
Int. Cl.⁴ B67D *5/30*
U.S. Cl. 222—17 **24 Claims**



13. A pneumatic dosing device comprising

a dispensing tank for containing a liquid, said tank having (a) a vent tube extending from an upper portion of the tank where the vent tube includes an opening disposed above a predetermined level above the upper portion of the tank, (b) an inlet opening in said upper portion of the tank, and (c) a dispensing tube extending from a lower portion of the tank to at least a predetermined level; and

a filling bulb where at least said upper portion of said dispensing tank is disposed within and enclosed by the filling bulb;

a source of said liquid for said dispensing tank where said source is disposed below said tank;

an isolation pipe disposed between a lower portion of said filling bulb and said liquid source where said isolation pipe has an intermediate portion which is at a lower elevation

than the inlet and outlet thereof and where said isolation pipe is disposed above said liquid source;

a compressed air source;

means for filling said tank from said liquid source through said isolation pipe and said filling bulb until the liquid reaches said predetermined level in the dispensing tube and the filling bulb;

means for withdrawing the liquid from the filling bulb whereby liquid will remain in (a) the dispensing tank and its associated dispensing tube and (b) the isolation pipe; and means for supplying said compressed air to said dispensing tank to dispense the liquid remaining in said dispensing tank and the dispensing tube

whereby, during said filling of the dispensing tank, any air in the tank is forced through the dispensing tube and the vent tube to eliminate the formation of air bubbles.

4,630,754

FUEL SUPPLY SYSTEM

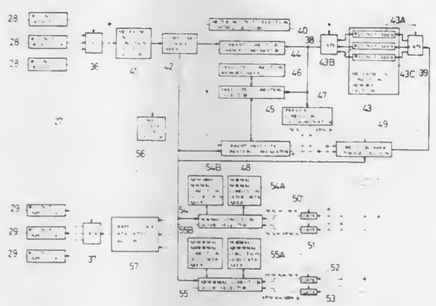
Shigemi Komukai, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Oct. 2, 1984, Ser. No. 657,016

Claims priority, application Japan, Oct. 15, 1983, 58-193027; May 19, 1984, 59-101278

Int. Cl.⁴ B67D *5/32*; G05B *1/03*

U.S. Cl. 222—28 **3 Claims**



1. A fuel supply system, comprising in combination:

at least one metering unit having a pump and a flowmeter for supplying a metered amount of fuel through a fuel feed nozzle provided at the distal end of a fuel feed hose;

a detector for detecting the operating condition of said metering unit in various operational stages thereof;

a guide means actuatable to give information on the action to be taken in the next step of operation of said metering unit; and

a control system for controlling said guide means, arranged to send said guide means a signal of a predetermined form of guidance according to a signal from said detector to change the contents of said information to the next step of operation in each operational stage of said metering unit;

wherein said control system comprises:

a temporary storage means for temporarily storing a current metering unit condition signal supplied from said detector;

a metering unit condition memory means for storing the metering unit condition signal from said temporary storage means as a previous metering unit condition;

a condition predicting means for predicting a next metering unit condition according to the metering unit condition stored in said memory means;

a current condition comparison means for discriminating a change in current metering unit condition by comparing the metering unit conditions stored in said temporary storage means and said memory means;

a current/predicted condition comparison means for comparing the current metering unit condition from said temporary storage means with the predicted condition from said condition predicting means according to the results of comparison by said current condition comparison means; and

a guide means control means for controlling said guide means to give a guide for a next step of operation of said metering unit according to the results of comparison by said current/predicted condition comparison means.

4,630,755

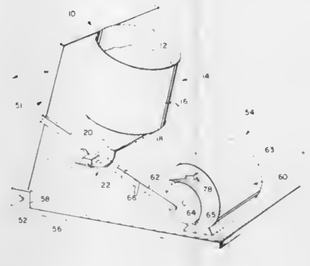
APPARATUS FOR PRECISELY DISPENSING FREE FLOWING SOLIDS

Jeptha E. Campbell, Cincinnati, Ohio, assignor to Spiral Systems, Inc., Cincinnati, Ohio

Filed Dec. 11, 1984, Ser. No. 680,496

Int. Cl.⁴ B67D *5/14, 5/64*

U.S. Cl. 222—56 **21 Claims**



1. An apparatus for dispensing free flowing solids comprising:

(a) a container for holding a free flowing solid to be dispensed;

(b) a transporting means including a passage defined by a continuous closed surface for transporting particles of the free flowing solid through the passage, the transporting means having an inlet connected to the container and a discharge end located remote from the container, the passage having segments defining a transport angle having an apex greater than 90° but less than 180°, the transport angle causing the particles disposed within the passage to form a bridge within the passage which functions to stop the flow through the passage under the influence of gravity when the transporting means is inclined at a vertical angle of inclination less than a vertical angle of inclination at which gravity causes free flow of particles through the passage;

(c) means for selectively applying vibrations to the particles within the passage with an energy sufficient to cause the bridge to break apart to cause the particles to be free flowing from the container;

(d) means for varying the vertical angle of inclination of at least part of the transporting means with respect to a vertical reference to cause variation in the rate of flow of the particles through the passage as a function of the vertical angle of inclination during the application of vibrations to the particles; and

(e) the rate of flow of the particles through the passage being a linear function of the vertical inclination of the segment of the passage between the discharge end and the apex of the transport angle when the discharge end is inclined with a downward slope from the apex of the transport angle to the discharge end.

4,630,756

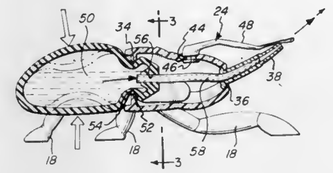
LIQUID SQUIRTING CREATURE

Francis R. Amici, Northford; Richard I. Farrington, New Britain, and Pietro Piazza, Prospect, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,395

Int. Cl.⁴ A63H *3/24*

U.S. Cl. 222—78 **5 Claims**



1. A liquid-squirting simulated creature comprising:

(a) a front member integrally formed of relatively rigid synthetic resin simulating a creature's head portion at its forward end portion and a creature's torso portion at its rearward end portion, said front member torso portion having a sidewall extending rearwardly from said head portion and a rear wall extending transversely inwardly from said sidewall adjacent the rearward end thereof to define a cavity therewithin, said rear wall having an aperture extending therethrough and said head portion having a nozzle aperture;

(b) a seperately formed rear member integrally formed of resiliently deflectable resin with a body portion simulating the rearward portion of the creature's body and a neck portion, said body portion and neck portion defining a chamber therewithin, said neck portion extending through said aperture of said rear wall of said front member and into said cavity therewithin, said neck cavity extending forwardly of said rear wall towards said head portion with its forward end spaced forwardly of said rear wall, said neck portion having a passage therethrough extending outwardly from said chamber providing the only aperture from said chamber, said rear wall of said front member engaging said neck portion of said rear member adjacent its rearward end;

(c) a tubular conduit having one end supported in said passage of said neck portion, said neck portion providing integrally formed sealing means at its forward end sealingly engaged with said conduit forwardly of said rear wall of said front member and extending therefrom to said nozzle aperture in said head, said conduit being imperforate along its length and open only at its ends at said nozzle aperture and said neck portion passage, whereby fluid may be drawn into an expelled from said chamber by compression of said rear member.

4,630,757

TOY GUN

Hiroshi Yano, 2 Jinai-Cho, 1-Chome, Moriguchi-Shi, Osaka, Japan (570)

Continuation of Ser. No. 371,492, Apr. 23, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 750,998

Claims priority, application Japan, Apr. 25, 1981, 56-62829

Int. Cl.⁴ A63H *3/18*

U.S. Cl. 222—79 **5 Claims**

1. A toy gun for projecting a fluent material, comprising:

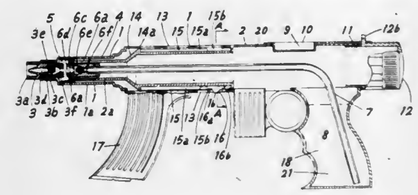
a front gun body and a hollow rear gun body, one having a cylinder means as a part thereof and the other having a piston means as a part thereof, said piston means being slidable in said cylinder means for a distance greater than the finger travel of a user;

spaced-apart handle means on the respective gun bodies projecting laterally thereof for gripping said bodies for relatively moving them for moving said piston means back and forth in said cylinder means;

a nozzle means on said piston or cylinder means on said front gun body;

a first one way valve means connected to said nozzle means for closing when said gun bodies are moved relative to each other for moving the piston means out of the cylinder means;

a second one way valve means on said piston or cylinder means on said rear gun body for closing when said gun bodies are moved relative to each other for moving said piston means into said cylinder means;



fluent material conduit means connected to said second one way valve means from within said rear gun body; and

a stop member on one of said gun bodies extending around the circumference of said one gun body, and a further stop member on the other of said gun bodies, said first mentioned stop member having a cut-out portion in the periphery thereof through which said further stop means can pass when the gun bodies are being assembled.

4,630,758

LIQUID TANK

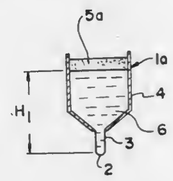
Masayuki Mutoh, Machida, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1983, Ser. No. 463,544

Claims priority, application Japan, Feb. 20, 1982, 57-26477

Int. Cl.⁴ B67D *3/00*

U.S. Cl. 222—189 **3 Claims**



1. A liquid tank structure for reducing hydrostatic pressure at an outlet thereof, comprising a liquid container having an outlet at its lower portion, a capillary member within said liquid container for contacting a liquid therein to exert an upward force on the liquid for reducing the hydrostatic pressure at the outlet, said capillary member having a gradually decreasing apparent mean pore size in the upward direction.

4,630,759

VESSEL WITH PUMP SUCTION TUBE SUPPORT

Ronald C. Dawn, 9517 Harrison Bay Rd., Harrison, Tenn. 37341

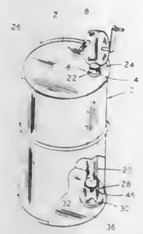
Filed Oct. 24, 1985, Ser. No. 791,055

Int. Cl.⁴ B67D *5/40*

U.S. Cl. 222—377 **6 Claims**

1. The combination of fluid storage vessel having a bottom wall, a top wall and an aperture in the top wall for receiving a pump suction tube having a circular cross section through which fluid may be pumped out of the vessel, and a suction tube support for supporting the lower end of the suction tube, said suction tube support comprising a base member fastened

to said bottom wall, tube support member secured to and extending upwardly from said base member, said support member comprising a hollow cylindrical body aligned with the aperture for receiving said tube, the bottom of said support member having wall means spaced above said base for permit-



ting fluid to flow over the base member and into the interior of the support member for communication with the suction tube, the upper end of said support member including a slot extending diametrically therethrough, and said tube includes a pin receivable within said slot for precluding rotation of said tube when positioned in said support member.

4,630,760

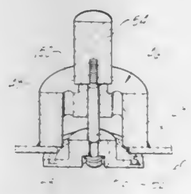
MAGNADRUM PUMP ASSEMBLY

Robert E. Wold, Troy, Mich., assignor to Johnstone Pump Company, Troy, Mich.

Division of Ser. No. 594,750, Mar. 29, 1984. This application Jul. 22, 1985, Ser. No. 757,377

Int. Cl.[4] B67D *5/42*

U.S. Cl. 222—387 **1 Claim**



1. A dispensing system for viscous materials comprising:

a ram plate for entry into the open end of a container for such material and having an opening therein;

an air driven pump motor having an air inlet circuit and an air exhaust circuit and having a positive displacement pick-up which operates through and in conjunction with the ram plate;

elevator means for raising and lowering the ram plate and the pump motor relative to the container;

a frame;

hanger means connecting the ram plate and air motor in depending relationship with the frame, said frame being supported by said elevator means above said container; and

valve means mounted on said ram plate for automatically admitting air to the space between the ram plate and the material in said container as said ram plate is drawn away from said material, said valve means comprising:

(A) a cup shaped valve body mounted on said ram plate over said ram plate opening and having a top wall and an annular side wall coacting to define a central downwardly opening cavity communicating with and substantially coextensive with said opening;

(B) a central plunger passing through said top wall of said body and downwardly through said cavity and through said opening;

(C) a plate member secured to the lower end of said plunger below said opening;

(D) an annular valve seat defined on the upper surface of said plate member and sealingly coacting with the confronting undersurface of said ram plate around said ram plate opening;

(E) a weight secured to the upper end of said plunger above said top wall and normally resting on said top wall when said annular valve seat is spaced downwardly from said confronting undersurface of said ram plate thereby to open said valve means by gravity action; and

(F) vent means in said body communicating between said cavity and atmosphere to allow the escape of air from the container, past said valve seat, and through said vent means.

4,630,761

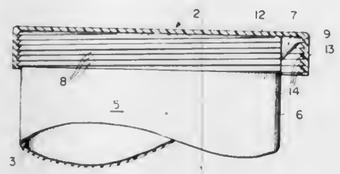
CONTAINER WITH POURING SPOUT AND REMOVABLE COVER

Loronzo H. Thomson, Warner Robins, Ga., assignor to Little Rapids Corp., Green Bay, Wis.

Filed Mar. 12, 1984, Ser. No. 588,814

Int. Cl.[4] B65D *47/00, 5/72, 41/04*; A61B *5/00*

U.S. Cl. 222—551 **5 Claims**



1. In a container, the combination of

an integral hollow container body having a side wall and a bottom wall,

the side wall having an upper end portion and a bottom end portion and being of such configuration that any transverse cross section of the side wall defines a closed figure,

the bottom end portion of the side wall joining the bottom wall and being closed thereby,

the upper end portion of the side wall comprising external rib means including portions which lie generally on a circle which is generally transverse to the container body,

a portion of the side wall extending generally as a chord with respect to said circle,

the upper end portion of the side wall terminating in an upper edge lying in a plane transverse to the container body,

said portion of the side wall having an upper edge which forms part of said upper edge of the side wall and is interrupted by an outwardly projecting pouring spout having an upper edge which is coplanar with said upper edge of the side wall,

the pouring spout being of generally triangular transverse cross section and terminating in a tip lying on said circle, said tip being formed to constitute a portion of said rib means; and

a detachable cover including a main wall and dependent securing means joined to the main wall,

the main wall of the cover being of such size and shape as to be capable of simultaneously engaging the upper edge of the side wall and the upper edge of the pouring spout,

the dependent securing means including inwardly directed retaining rib means constructed and arranged to mate with the external retaining rib means of the container body and the tip of the pouring spout,

the external retaining rib means, the tip of the pouring spout, and the inwardly directed retaining rib means being so located that, when the rib means are fully mated, the main wall of the cover engages both the upper edge of the side wall of the container body and the upper edge of the pouring spout and thus closes the entire container including the pouring spout.

4,630,762

MANNEQUIN

Richard G. Stringer, London, England, assignor to R. G. Stringer and Andre Clive Michell, both of London, England

Filed Aug. 15, 1985, Ser. No. 766,128

Int. Cl.[4] A41H *5/00*

U.S. Cl. 223—66 **6 Claims**



1. A mannequin comprising, in combination:

(a) a pair of feet forming members;

(b) a first pair of elongated rads forming calves of said mannequin, each having upper and lower ends;

(c) first lockable swivel joints connecting the lower ends of each of said rods of the first pair, each to a separate one of said feet forming members;

(d) a second pair of elongated rods forming thighs of said mannequin, each having upper and lower ends;

(e) second lockable swivel joints connecting the lower ends of each of said rods of the second pair to the upper end of a separate one of the rods of the first pair;

(f) a frame including a first transverse rod forming a pelvis of said mannequin and a second transverse rod forming shoulders of said mannequin, said first and second rods each having ends;

(g) third lockable swivel joints each connecting one of the ends of said first transverse rods to a separate one of the upper ends of said second elongate rods;

(h) a third pair of rods, forming upper arms of said mannequin and having upper and lower ends;

(i) fourth lockable swivel joints each connecting one of the ends of said second transverse rod to a separate one of the upper ends of said third pair of rods;

(j) a fourth pair of rods, forming forearms of said mannequin and having upper and lower ends;

(k) a fifth pair of lockable swivel joints connecting the upper ends of said fourth pair of rods to the lower ends of said third pair of rods;

(l) a pair of hand forming members each mounted at the lower end of a separate one of said fourth pair of rods;

(m) a head forming member secured to the frame;

(n) means on each of said swivel joints permitting said swivel joints to be locked in any one of a number of different positions, and

(o) said lockable swivel joints each comprising first and second pivotal elements, a threaded pivot pin passing through said first and second elements and allowing said elements to pivot relative to one another about a first axis, a third element formed separately from the first and second elements and positioned on the side of the second element remote from said first element, complementary thread means on said third element effective to receive said threaded pin, means to prevent significant rotation of said third element relative to said first element, whereby tightening of said pin locks said first and second elements against rotation about said first axis, means allowing an elongated rod to be attached to each end of said first and second elements, while allowing relative rotation between the elongate rod and the associated one of said first and second elements about the axis of the elongate rod and means to secure the end of each elongated rod to the associated first or second element.

4,630,763

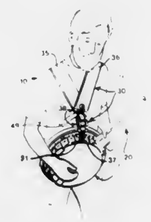
APPARATUS FOR SUPPORTING THE WEIGHT OF A BANJO IN ADJUSTABLE PROPORTIONS FROM BOTH THE TORSO AND THE SHOULDERS OF A PLAYER

Daniel J. Friedman, 8960 Cynthia St. #201, West Hollywood, Calif. 90069

Filed May 28, 1985, Ser. No. 738,449

Int. Cl.[4] A45F *3/04*

U.S. Cl. 224—259 **3 Claims**



1. Apparatus for supporting and distributing the weight of a banjo, in playing position, from both the waist or hips and the shoulders of a banjo player in adjustable proportion, comprising:

first substantially nonresilient dual strap means for supporting a first significant fraction of such banjo weight from such palyer's waist or hips while the banjo is in use, said first strap means being connected to two separated points at respective sides of the banjo body and passing substantially around such player's waist or hips and behind such player's back;

second substantially nonresilient strap means for supporting a second significant fraction of such banjo weight from such player's two shoulders approximately equally while the banjo is in use, said second strap means being connected near the top of the banjo body remote from both of said two separated points and passing over such player's shoulders and behind such player's back; and

weight-distribution means for controlling the relative size of said first and second fractions of such banjo weight while the banjo is in use; and wherein:

said second strap means are connected to the top of the banjo body through the weight-distribution means, and comprise:

separate left and right shoulder straps secured together at a junction in front of such player's torso, and

a connector depending from said junction of the left and right shoulder straps;

said weight-distribution means comprise an adjustable linkage, depending from the connector and connected to the

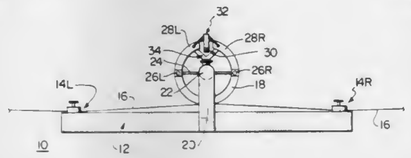
top of the banjo body at substantially only a single point, for controlling tension in the shoulder straps; and adjustment of the linkage varies the relative size of said first and second fractions controllably.

4,630,764

FIBER OPTIC CABLE CLEAVING TOOL

Fred D. West, 6800 Curry Dr. Box 32514, The Colony, Tex. 75056

Filed Oct. 18, 1985, Ser. No. 789,193
Int. Cl.[4] C03C *37/16*
U.S. Cl. 225—2 **6 Claims**



1. The method of cleaving optical fibers to achieve substantially flat-end surfaces at a desired point of cleavage comprising the steps of:

(a) reeving the optical fiber to be cleaved around a drum having a peripheral cleaving break therein with the optical fiber spanning said cleaving break;

(b) circumferentially scoring said optical fiber at the desired point of cleavage within said cleaving break; and

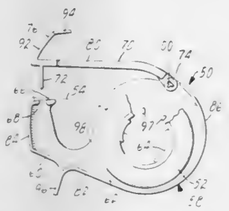
(c) expanding the size of said cleaving break by changing the curvature of said drum to thereby tension said optical fiber and effect a cleavage therethrough at the circumferentially scored point of cleavage.

4,630,765

DISPENSER FOR TAPE WITH A STRETCHABLE BACKING

Bruce E. Samuelson, West Lakeland Township, Washington County, and John T. Rueb, St. Paul, both of Minn., assignors to Minnesota Minning and Manufacturing Company, St. Paul, Minn.

Filed May 22, 1985, Ser. No. 736,254
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—96 **3 Claims**



1. A tape dispenser of the type including a roll of pressure sensitive adhesive coated tape having a stretchable backing; and

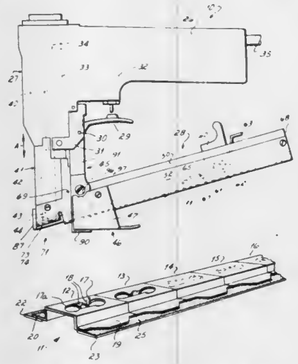
a housing comprising walls including opposed top and bottom walls, and opposed front and rear walls each intersecting different corresponding ends of said top and bottom walls, said housing including a base portion formed by walls including said front wall, said bottom wall, and said rear wall that define a cavity, walls defining a hub transverse of said cavity about which hub said roll of tape is rotatably mounted, and walls defining a land area spaced from said hub at the end of said front wall adjacent said top wall against which land area tape from said roll may be releasably adhered, the walls defining said land area defining a slot transverse of said land area and providing a portion of said land area on both sides of said slot; said housing also including a cover portion formed by walls including said top wall and having a row of teeth located at the end of said top wall adjacent said front wall adapted to move into said slot to cut through tape adhered on said land area, and means between said rear wall and said top wall for mounting said cover portion on said base portion for relative pivotal motion between an open position with the teeth spaced from the slot and a closed postion with the teeth disposed within the slot; said cover further including a generally L-shaped wall having one part projecting away from said top wall and front wall and a second part projecting along and in spaced relation to said top wall so that said top wall and generally L-shaped wall define a socket therebetween adapted to receive a portion of a user's thumb so that the user may grasp the dispenser in one hand with his fingers around the base portion and his thumb in the socket and with one hand alone move said cover and base portions between said open and closed positions.

4,630,766

FASTENER DRIVING APPARATUS AND METHODS AND FASTENER SUPPLY

Jay M. Steeves, and Gilbert A. Cotta, both of Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Jun. 1, 1983, Ser. No. 499,862
Int. Cl.[4] B21J *15/28*
U.S. Cl. 227—8 **18 Claims**



1. Fastener driving apparatus for driving a fastener onto a fastener receiving member, and including:

a reciprocating fastener driver means movable in a drive path;

a fastener magazine means for feeding fasteners serially to a drive position beneath said driver means from where they can be driven onto a fastener receiving member;

said magazine means inclined at an acute angle with respect to the direction of movement of said driver means;

a guide foot extending beneath said magazine laterally of said drive position and having a reference surface in a plane perpendicular to the direction of reciprocation of said driver means, said guide foot including slot means in said reference surface spaced outside said drive path for receiving a fastener receiving member and for guiding said apparatus with respect to said member; and

means for moving said driver means to drive a fastener onto a fastener receiving member.

4,630,767

METHOD OF BRAZING USING A DUCTILE LOW TEMPERATURE BRAZING ALLOY

Howard Mizuhara, San Mateo, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 757,962, Sep. 20, 1984, which is a continuation of Ser. No. 394,226, Jul. 1, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 765,832
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—122 **2 Claims**

1. The method of joining silicon nitride to another part by brazing comprising the steps of:

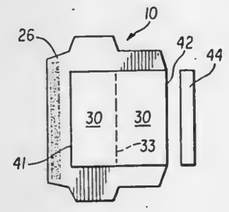
preparing a brazing alloy composition consisting essentially of 20 to 98.75 weight percent silver, 20 to 40 weight percent copper, and 0.25 to 4 weight percent titanium, said composition having a liquidus temperature in the range from about 750° to 950° C.; rolling the brazing alloy composition down to a thin foil; disposing brazing alloy in said thin foil form between an assembly comprising the silicon nitride and the part to which the silicon nitride is to be brazed; and heating said assembly in vacuum to a temperature at which the foil melts, thereby brazing the silicon nitride to said part.

4,630,768

ENVELOPE AND ENCLOSURE SHEET

William P. Bradley, Hollidaysburg, Pa., assignor to Bedford Engineering Co., Armonk, N.Y.

Division of Ser. No. 574,308, Jan. 26, 1984, Pat. No. 4,531,993. This application Jun. 12, 1985, Ser. No. 733,783
Int. Cl.[4] B65D *27/00*
U.S. Cl. 229—92.7 **1 Claim**



1. A mailing sub-assembly comprising:

an envelope sheet and an enclosure sheet, said enclosure sheet positioned upon said envelope sheet to form a part double layer and part triple layer of a sheet material wherein one edge of said envelope sheet is in colinear alignment with one edge of said enclosure sheet;

said envelope sheet having four score lines forming a rectangle wherein two of said four separate score lines and said edge that is in colinear alignment with one edge of said enclosure sheet are parallel; and

said enclosure sheet being free of adhesive material and having one score line wherein said one score line is parallel to said edge that is in colinear alignment with one of said two parallel envelope sheet score lines; and

wherein one edge of said enclosure sheet and said score line on said enclosure sheet lie within said rectangle formed by said score lines of said envelope sheet.

4,630,769

DOCUMENT STORAGE CONTAINER

Randell D. Ball, 1141 Elk, Yukon, Okla. 73099

Filed May 8, 1985, Ser. No. 732,255
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—1 D **11 Claims**

1. A document storage container, comprising:

a receptacle having an open-ended cavity defined therein;

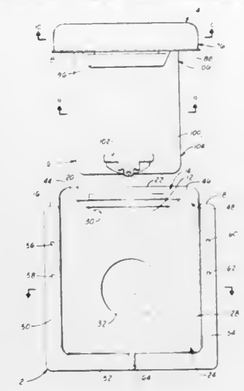
lid means for removably closing the open end of said cavity;

document retaining means, connected to said lid means and received within said cavity when said lid means closes the open end of said cavity, for retaining a document so that the document moves into and out of said cavity when said lid means moves onto said receptacle to close the open end of said cavity and off of said receptacle to open the open end of said cavity, wherein said document retaining means includes a clipboard; and

wherein said lid means includes:

a cap having an interior hollow region opening through a mouth, said hollow region receiving a portion of said receptacle through said mouth when said lid means closes the open end of said cavity; and

a web connected to said cap so that said web extends into said interior hollow region, said web having said clipboard connected thereto.

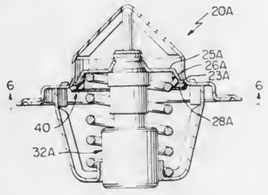


4,630,770

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, and Joseph P. Wagner, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 25, 1985, Ser. No. 791,378
Int. Cl.[4] F16K *51/00, 1/00*
U.S. Cl. 236—34.5 **18 Claims**



1. In a valve construction having an annular valve seat means and a movable valve member for opening and closing said valve seat means and being operatively interconnected to a thermal power element that is carried by said valve construction, said valve member having an annular rigid part for engaging said valve seat means and having an annular flexible part for also engaging said valve seat means at a point upstream of said rigid part, said parts of said valve member being so constructed and arranged that said rigid part moves out of engagement with and away from valve seat means a certain distance before said flexible part moves out of engagement with said valve seat means, the improvement wherein said flexible part of said valve member has opening means therethrough that is adapted to provide a certain sized fluid flow path through said flexible part of said valve member when said rigid part of said valve member is in a position to be just out of engagement with said valve seat means and said flexible part of said valve member is still in engagement with said valve seat means, said opening means providing a fluid flow path through said flexible part of said valve member that increases in size from said certain size thereof as said rigid part of said valve member moves from said position to be just out of engagement with said valve seat through said certain distance thereof.

4,630,771

ECONOMICAL FOUNTAINHEAD

Bill R. Hall, 2206 Annandale Rd., Huntsville, Ala. 35801

Filed Nov. 20, 1985, Ser. No. 799,786
Int. Cl.[4] B05B *17/08*
U.S. Cl. 237—17 **2 Claims**

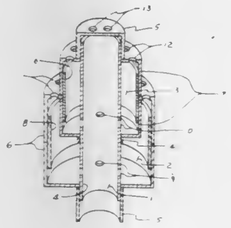
1. An ornamental fountainhead to produce three tiers of

water spray which is constructed of slightly modified, standard Polyvinyl Chloride, PVC, plumbing parts to form different pressure chambers and flow paths to feed each tier, the construction consists of:

a low pressure chamber constructed of an upper and a lower large-sized standard PVC cap connected to each other by a cemented matching sized standard PVC pipe, the upper cap having an upper wall with a hole and having

output orifices located circumferentially around the outer portion of the upper wall of said upper cap, the lower cap having a central hole;

an intermediate pressure chamber constructed of an upper and a lower intermediate-sized standard PVC pipe cap connected to each other by a cemented matching intermediate-sized standard PVC pipe, the intermediate-sized pipe tightly and axially penetrating the hole in the upper cap of the low pressure chamber, said upper and lower intermediate-sized caps abutting the upper and lower surfaces of the upper wall of the low pressure chamber,



respectively, and being cemented thereto, forming a secure seal, the upper and lower caps of the intermediate pressure chamber having centrally located holes, the upper intermediate-sized cap having outlet orifices located circumferentially on the outer edge of the top surface;

a high pressure chamber being constructed from a small standard sized PVC pipe and capped at the upper end with a matching sized standard PVC cap, and having one or more outlet orifices on its upper surface, wherein the high pressure chamber passes tightly and axially through the hole in the lower cap of the low pressure chamber forming inlet pressure means for the fountainhead and passes tightly and axially through the holes in the upper and lower caps of the intermediate pressure chamber, the high pressure chamber pipe having an approximate number and sizes of orifices located in a manner to connect the low and intermediate pressure chambers to the high pressure chamber thereby creating a controlled source of water for the low and intermediate pressure chambers.

4,630,772

INSULATING PLATE FOR RAIL INSULATED JOINT

Kainen Watanabe, Tokyo; Hiroto Yasuhara, Ayase; Toru Sugiyama, Kunitachi; Keiji Shimizu, Tokyo, and Yoshihiro Murata, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Japanese National Railways, Tokyo, both of, Japan

Continuation of Ser. No. 641,287, Aug. 16, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,908

Claims priority, application Japan, Aug. 18, 1983, 58-149663

Int. Cl.⁴ F01B *11/00*

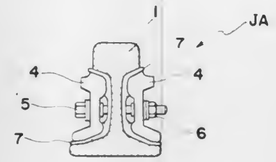
U.S. Cl. 238—159 **6 Claims**

1. In an insulating plate for forming an insulated rail joint by positioning said insulated plate between a rail and a joint plate clamped thereto, said insulating plate being of the type having upper and lower flanges connected by a web, whereby said insulating plate is clamped between the rail and the joint plate with the joint plate contacting said upper and lower flanges, the improvement of means for increasing the area of contact of said insulating plate with the joint plate and comprising:

upper and lower portions of said insulating plate being thickened, said thickened portions comprising said upper and lower flanges and respective portions of said web contiguous to said upper and lower flanges;

said insulating plate being formed of a thermoplastic resin material; and

means, provided in said thickened portions only of said



insulating plate, for heating said thickened portions to soften said thermoplastic resin material to an extent such that clamping of the joint plate enables the softened thermoplastic resin material of said thickened portions to deform to the configuration of the joint plate, whereby the joint plate contacts said insulating plate throughout the area of said thickened portions including said upper and lower flanges and said respective contiguous web portions.

4,630,773

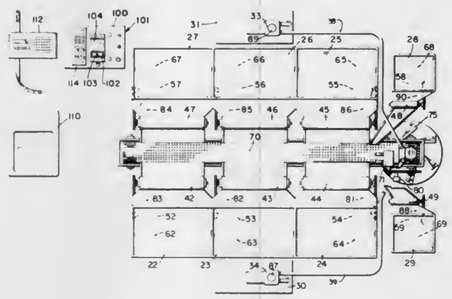
METHOD AND APPARATUS FOR SPREADING FERTILIZER

Earl W. Ortlip, Carefree, Ariz., assignor to Soil Teq., Inc., Waconia, Minn.

Continuation of Ser. No. 668,736, Nov. 6, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 827,225

Int. Cl.⁴ B05B *17/00, 17/04, 9/06*

U.S. Cl. 239—1 **18 Claims**



1. Fertilizer blending and spreading apparatus comprising:

a vehicle;

a plurality of product bins mounted on said vehicle, each of said bins for holding a product to be applied to a field to be fertilized;

a plurality of feeder means mounted on said vehicle, each one of said feeder means operative in response to a feeder control signal for dispensing product at a selected dispensing rate from one of said bins;

conveying and spreading means mounted on said vehicle for conveying product dispensed from said bins via said feeder means and spreading said product over the ground; and

control means operatively connected to said plurality of feeder means for generating said feeder control signals to control the rate of dispensation of each of said products,

said control means including:

(a) digital soil map means for storing a digital soil map indicating the distribution of different soil types in said field to be fertilized;

(b) x-y locator means for indicating the position of said vehicle relative to said field as it moves about said field;

(c) speed indicator means for indicating the speed of said vehicle as it moves about said field; and

(d) means responsive to said soil map means, said locator means and said speed indicator means for controlling the generation of said feeder control signals by correlating the location of the vehicle in the field to said map and determining the type of soil the vehicle is currently over and adjusting said feeder control signals in response to the determined soil type and the vehicle speed to provide that each of said products can be applied at different rates to different soil types in the field as the vehicle moves about the field.

4,630,774

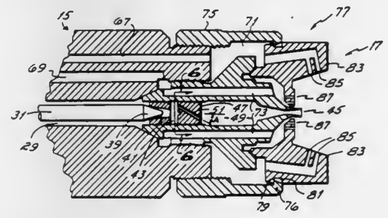
FOAM GENERATING NOZZLE

William R. Rehman, Vermillion, and James C. Smith, Lorain, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 436,012, Oct. 22, 1982, Pat. No. 4,533,701. This application Aug. 22, 1985, Ser. No. 768,555

Int. Cl.⁴ B05B *17/00*

U.S. Cl. 239—8 **3 Claims**



1. The method of forming a liquid/gas solution into a foam, the gas being maintained in solution in the liquid, comprising:

conveying the liquid/gas solution into a foaming chamber formed in a nozzle assembly;

impacting the liquid/gas solution against an obstruction within the foaming chamber to agitate the liquid/gas solution;

maintaining while the liquid/gas solution is conveyed into the foaming chamber a pressure in the foaming chamber which is greater than atmospheric but less than the pressure required to maintain all of the gas in solution in the liquid, at least a portion of the gas evolving from solution within the foaming chamber and becoming entrapped in the surrounding liquid to form a foam.

4,630,775

DISPENSER FOR RELEASING A VOLATILE ACTIVE SUBSTANCE

Jean-Pierre Mandon, Chasseneuil du Poitou, and Jean Rapiteau, Saint Benoit, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed May 6, 1985, Ser. No. 730,527

Claims priority, application Switzerland, May 11, 1984, 2334/84

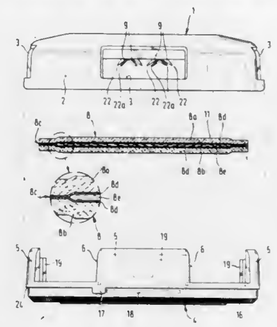
Int. Cl.⁴ A61L *9/04*

U.S. Cl. 239—56 **6 Claims**

1. A dispenser for releasing a volatile active substance from a carrier material which surrounds a liquid-impermeable sheath containing the active substance in liquid form, said dispenser comprising:

a base circular part having supporting members for said carrier material and having a sidewall section with a plurality of apertures;

an upper circular part rotatably mounted on the base circular part and having a cylindrical sidewall section with a plurality of apertures equal in number and size to the apertures on the sidewall section of said base circular part, the upper circular part adapted to be rotated relative to the base circular part so as to cause the respective aper-



tures to be in an open position in register with each other, in a partially open position in partial register with each other, or in a closed position out of register with each other; and

at least one decentrally positioned flexible blade disposed on the inner surface of said upper circular part and adapted, upon rotation of the upper circular part from the closed position to a partially open position, to pierce the sheath containing said active substance, thereby causing the carrier material to be impregnated with the active substance.

4,630,776

LIQUID DISPERSAL DEVICE

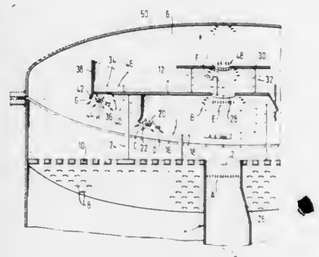
Josef Findling, Ettlingen, Fed. Rep. of Germany, assignor to GEA Wiegand GmbH, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,311

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427298

Int. Cl.⁴ B05B *1/26*

U.S. Cl. 239—553.3 **8 Claims**



1. A manifold device for the dispersal of a liquid from an end of a supply line, comprising:

a dispersal chamber defined by a top wall and a bottom wall, the supply line penetrating the bottom wall from below, and the bottom wall being provided with a plurality of openings;

a deflector plate located in the dispersal chamber spaced

above the end of the supply line for deflecting the liquid impinging thereupon from below from the end of the supply line toward an edge of the deflector plate;

a collar attached to the underside of the deflector plate and encompassing the axis of the supply line; and

tab means along a lower edge of the collar and radially bent alternately inwardly and outwardly from the edge of the collar.

4,630,777

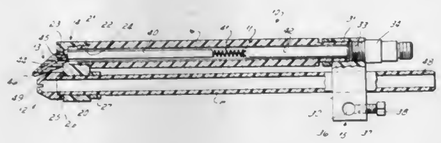
POWDER SPRAY GUN

Thomas E. Hollstein; James J. Turner, both of Amherst; Douglas C. Mulder, Wellington, and David E. O'Ryan, Avon Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation of Ser. No. 583,898, Feb. 27, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 814,273

Int. Cl.⁴ B05B *5/04*

U.S. Cl. 239—707 **1 Claim**



1. An electrostatic spray gun for spraying solid particulate powder materials comprising:

an electrically non-conductive housing, said housing comprising a pair of spaced mounting blocks and a pair of parallel tubes extending between said mounting blocks, one of said mounting blocks being spaced forwardly of the other, the forwardmost mounting block having an electrode extending forwardly therefrom,

a first one of said pair of parallel tubes being fixedly mounted to said forwardmost mounting block,

an electrical resistor mounted within said first one of said pair of tubes, said electrical resistor being electrically connected to said electrode,

the second one of said pair of tubes being of adjustably mounted in said forwardmost mounting block,

said second one of said pair of tubes being a straight powder transport tube, said powder transport tube having an inlet end and a forward outlet end, nozzle means mounted to the forward outer end of the powder transport tube,

locking means for removably securing said powder transport tube and said nozzle means in an adjustable position relative to said forwardmost mounting block and said forwardly extending electrode,

said first one of said pair of parallel tubes being fixedly mounted in the rearwardmost of said mounting blocks,

said powder transport tube being slideably received in a bore of said second mounting block so as to facilitate removal and replacement of said powder transport tube from said mounting blocks, and

means for supporting said electrostatic spray gun from said second mounting block.

4,630,778

SEPARATION OF MIXTURES OF BITUMINOUS COAL AND LOWER RANK COAL BY SELECTIVE CHEMICAL COMMINUTION

Ju-Nam Chew, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

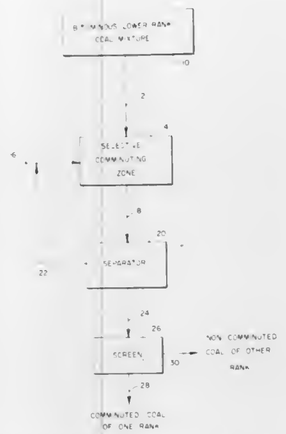
Filed Nov. 14, 1983, Ser. No. 550,709

Int. Cl.⁴ B02C *19/00*

U.S. Cl. 241—1 **11 Claims**

1. A method for separating a mixture of bituminous coal and a lower rank coal comprising the steps of:

(a) contacting said coal mixture with an effective amount of a dilute aqueous methanol solution, of a strength of about 75 volume percent and sufficient to give substantially better comminution reactivity than substantially anhydrous methanol, and maintaining said contact for a time sufficient whereby said methanol selectively comminutes a substantial portion of bituminous coal to a reduced particle size;



(b) separating the comminuted bituminous coal of one rank and noncomminuted coal of the other rank from said methanol comminuting solution; and

(c) separating the comminuted coal particles of one rank from the noncomminuted coal of the other rank.

4,630,779

METHOD FOR DISCHARGING CONSOLIDATED WASTE CATALYST

Osamu Suuchi, Tokyo; Shuzo Mimaya, and Masaru Ohashi, both of Okayama, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1985, Ser. No. 761,719

Claims priority, application Japan, Aug. 2, 1984, 59-161527; Dec. 28, 1984, 59-274409

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—1 **8 Claims**



1. A method for discharging a consolidated waste catalyst from a reactor, comprising the steps of:

(1) making at least one hole in the catalyst;

(2) filing said hole with a hydrative expansive fracturing agent in the presence of water;

(3) heating the part of the agent which is at the open end of the at least one hole so that said part of the agent will expand and solidify earlier than the other portions of the fracturing agent;

(4) leaving said catalyst to stand until it is fractured by said agent; and

(5) discharging the fractured catalyst from the reactor.

4,630,780

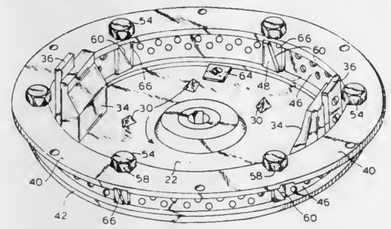
REPLACEABLE BEVELED SHEAR MEMBERS FOR A WASTE PULPING MACHINE

Robert W. Immel, Newtown Square, and Evan P. Fields, Pomeroy, both of Pa., assignors to Somat Corporation, Pomeroy, Pa.

Filed Dec. 24, 1984, Ser. No. 686,014

Int. Cl.⁴ B02C *18/42*

U.S. Cl. 241—46 B **10 Claims**



1. A pulping apparatus for comminuting waste material comprising:

a rotary disc impeller;

a sieve ring encircling said impeller, said sieve ring having a bottom edge and a top edge and being formed with a plurality of through apertures;

at least one first shear means support means secured to said impeller;

at least one second shear means support means secured stationary with respect to said rotary impeller;

first shear means removably mounted to said first shear member support means;

second shear means mounted to said second shear means support means, said second shear means extending between said top and bottom edge of the sieve ring and interposed between sections of the sieve ring, said second shear means having at least two cutting edges spaced apart a predetermined amount, said second shear means being rotationally adjustably mounted to said second shear means support means so that upon rotational adjustment, a different cutting edge comes into play; said first shear member having a cutting edge for periodically coming into play with a cutting edge of said second shear means portions upon rotation of said impeller; said cutting edge of said second shear means having a beveled cutting edge inclining in the direction of rotation of the rotary disk impeller so that unpulpable material is pushed above the shear member and away from the impeller.

4,630,781

APPARATUS AND METHOD FOR REMOVING CRUSHING ROLLS FROM A CRUSHING APPARATUS

Donald W. Brown, Jr., St. Louis, Mo., and Mark L. Kohler, Waterloo, Ill., assignors to T.J. Gundlach Machine Company, Belleville, Ill.

Filed Jul. 11, 1984, Ser. No. 629,656

Int. Cl.⁴ B02C *4/28*

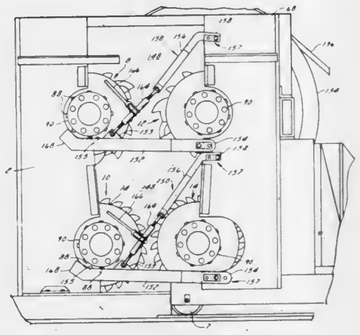
U.S. Cl. 241—159 **13 Claims**

1. In a roll crushing apparatus having first and second rotatable crushing rolls disposed with their axial lengths parallel, the combination comprising:

first means for supporting and holding the first crushing roll to permit rotation of said roll, the first crushing roll being releasable from the first means;

second means movable in a direction away from the first means for supporting the second crushing roll at a crushing position adjacent the first roll and the first means, and moving the second crushing roll from said crushing position to a position spaced from the first means for greater accessibility to said rolls;

roll removal means removably mounted on the second means for supporting the first crushing roll upon release of the latter from the first means and carrying the first crushing roll to a position spaced from the first means as the roll removal means moves with the second means;



said roll removal means comprising a pair of arm means, one of the arm means being engageable with the first crusher roll and the other of the arm means being engageable with the first roll at a position spaced from the one arm means along the axial length of the first roll;

said arm means comprising a first arm connected to the second means and extendable into engagement with the first crushing roll and a second arm connected to the first arm and the second means; and

said arm means being constructed and arranged to be mounted to said second means primarily during the roll removal process.

4,630,782

METHOD AND APPARATUS FOR FORMING A THREAD RESERVE FROM THE THREAD END OF A TEXTILE COIL

Joachim Rohner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Continuation of Ser. No. 683,967, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 556,066, Nov. 29, 1983, abandoned, which is a continuation of Ser. No. 426,692, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 789,622, Apr. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 658,883, Feb. 18, 1976, abandoned. This application Sep. 16, 1985, Ser. No. 775,715

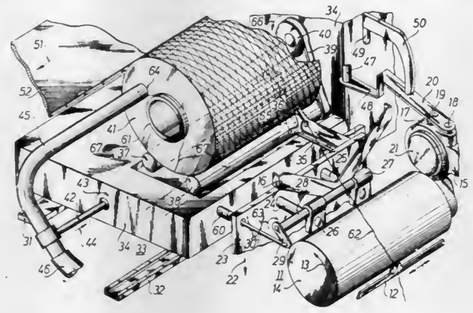
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2506930

Int. Cl.⁴ B65H *54/02*

U.S. Cl. 242—18 EW **8 Claims**

1. A method for forming a thread reserve from a thread end of a textile coil fully wound on a coil core having an end projecting out of the textile coil and frictionally driven by a winding roller in a winding device, which comprises removing the textile coil from the winding device by means of a coil removing device, retaining the coil on the coil removing device, pneumatically seizing a thread extending between the winding roller and the textile coil by means of a suction gripper and sucking the thread in the form of a loop into a mouth of a suction gripper while simultaneously rotating the textile coil in

a direction opposite to the direction in which a thread has been previously wound on the coil, severing the thread between the suction gripper and the winding roller by thread clamping shears while firmly holding a thus severed thread end from the winding roller and setting free a thus severed thread end of the



textile coil, swinging the mouth of the suction gripper to the end of the coil core projecting out of the textile coil, releasing the thread end at the coil core, and disposing a length of the thread end of the textile coil as a thread reserve on the coil core.

4,630,783

MACHINE FOR WINDING A WEB OF PAPER ON A ROLL

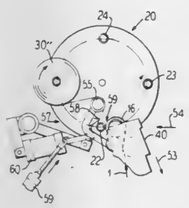
Werner Mülfarth, Kirchheim, Fed. Rep. of Germany, assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 21, 1985, Ser. No. 747,297

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3423987

Int. Cl.⁴ B65H *19/26, 19/28*

U.S. Cl. 242—56 A **9 Claims**



1. A machine for winding webs of paper and the like onto a roll core, said machine comprising a frame; a plurality of work stations mounted in the frame; a turret mounted for rotation on an axis in said frame, said turret having a plurality of winding shafts, which receive tubular cores on which the web is wound, being mounted for rotation in the turret with the shafts being spaced around a circle concentric with the axis; means for rotating the turret in a step-like manner to move the shafts from station-to-station; and one of the work stations being a winding station having blade means for cutting a web and means for aiding the winding of the web onto a core at that station, said blade means including a cutting edge extending parallel to the shaft and means for moving the edge in a direction perpendicular to the edge from a retracted position to a cutting position, said means for aiding including a contact roller extending parallel to the shaft and positioning means for moving the roller approximately along the circle to press a web against the core on which it is being wound, said positioning means also moving the contact roller radially to the circle and the turret to clear the circular path of the next shaft being moved into the winding station so that as the winding of a roll on the shaft at the winding station nears completion, the contact roller is moved radially out of the path of a newly presented shaft and core and coacts with the blade means to cut the web and entrain the leading cut end of the web onto the newly presented core to begin winding.

4,630,784

PROCESS AND DEVICE FOR MANUFACTURING MOTHER CAPACITORS BY HELICAL WINDING

Claude Roy, Bagnolet, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36, Bagnolet, France

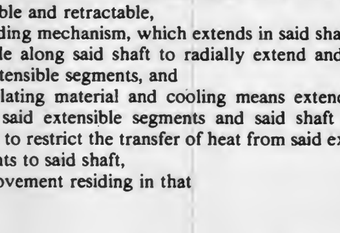
Continuation of Ser. No. 457,476, Jan. 12, 1983, Pat. No. 4,494,704. This application Dec. 5, 1984, Ser. No. 678,279

Claims priority, application France, Jan. 12, 1982, 82 00374

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.⁴ B65H *35/04, 39/16;* **H01G** *13/02*

U.S. Cl. 242—56.1 **22 Claims**



1. A process for manufacturing mother capacitors separated by an insert to form a block wherein the insert divides the block into at least two superposed mother capacitors, comprising spiral winding of metalized films on a wheel as well as periodic interpositioning, after a given number of winding revolutions, of said insert having an input or leading edge and a rear edge, which process comprises an operation for making the position of an insert interpositioning device dependent on the position of the external layer of the winding, and an insert interpositioning operation comprising the steps of stopping said wheel, moving the interpositioning device from a rear, so-called rest, position to a forward position for presenting the insert by its leading edge, setting the wheel again in rotation so as to interposition said insert, moving the interpositioning device from its forward position to its rear position so as to continue winding of the films, and cutting said insert.

4,630,785

COILER

Rudolf Buchegger, St. Florian, and Rudolf Langeder, Mauthausen, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 10, 1985, Ser. No. 742,743

Claims priority, application Austria, Jun. 18, 1984, 1972/84

Int. Cl.⁴ B65H *75/24*

U.S. Cl. 242—72.1 **8 Claims**

1. In a coiler comprising an expanding coiler core comprising

a tubular coiler shaft,

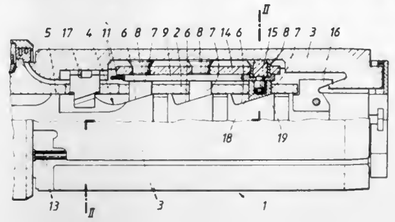
a plurality of extensible segments, which are adapted to be heated and constitute an annular series surrounding said shaft and are mounted in said coiler core to be radially extensible and retractable,

an expanding mechanism, which extends in said shaft and is movable along said shaft to radially extend and retract said extensible segments, and

heat insulating material and cooling means extending between said extensible segments and said shaft and arranged to restrict the transfer of heat from said extensible segments to said shaft,

the improvement residing in that

a plurality of pressure applying tubes extend between each of said segments and said expanding mechanism, each of said tubes having an axis which is radial with respect to



said coiler shaft and having a wall thickness which increases toward the associated extensible segment, and said cooling means extend between all of said pressure applying tubes and said expanding mechanism.

4,630,786

APPARATUS FOR DISPENSING PLASTICS STRETCH FILM

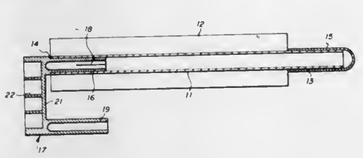
James Lambert, Kehlen, Luxembourg, and William E. Rice, Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 636,771, Aug. 1, 1984, abandoned. This application May 1, 1986, Ser. No. 858,876

Claims priority, application United Kingdom, Feb. 8, 1984, 8403314

Int. Cl.⁴ B65H *23/06, 75/40*

U.S. Cl. 242—96 **2 Claims**



1. An apparatus for dispensing plastic film having a hollow core with an axial centerline comprising:

a first handle extending along the axial centerline of the core and fixed to the core for simultaneous rotation therewith;

a flexible handgrip covering said first handle configured for slideable rotation on said first handle; and

a second generally U-shaped handle with two members, a first resilient member having a centerline coincident with said centerline of said core and a second member having a centerline parallel to said centerline of said core, said first member mounted in said core to remain stationary and urging by its own resiliency against the internal surface of said core, while permitting axial rotation of said core and said second member arranged to provide a handgrip.

4,630,787

AIRFRAME AND PROPULSION SYSTEM

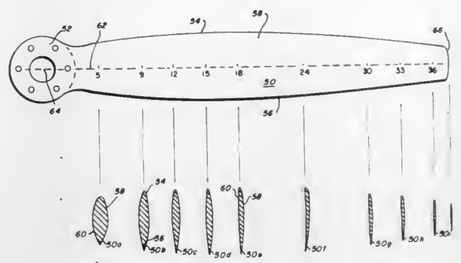
Daryl L. Middlebrook, 2612 Sisson Rd., Penn Yan, N.Y. 14527

Filed Nov. 18, 1985, Ser. No. 799,343

Int. Cl.⁴ B64C *11/18*

U.S. Cl. 244—65 **1 Claim**

1. The combination of an aircraft comprising a high wing airframe, a power plant having a size and power specification of at least the 360 type horizontally opposed engine and a fixed blade propeller in drive relationship with said engine by means of a propeller hub, said propeller having two blades each being defined by a leading edge and a trailing edge and being formed with a front camber having a convex profile between said edges and extending continuously from said hub to the tip thereof, with the greatest degree of convexity of the said front camber immediately adjacent said hub, each of said blades being formed with a rear camber having a convex profile beginning from said hub to approximately the midpoint thereof



and for at least the last 15% of the blade, said rear camber profile being slightly concave beginning at approximately two-thirds of the distance from said hub, and being flat thereafter before assuming said convex profile.

4,630,788

AIRCRAFT LANDING GEAR, IN PARTICULAR FOR HELICOPTERS

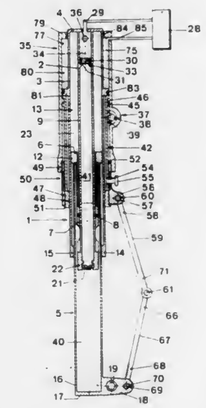
Jacques Veaux, Chatillon, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Oct. 29, 1984, Ser. No. 666,170

Claims priority, application France, Nov. 9, 1983, 83 17778

Int. Cl.⁴ B64C *25/60*

U.S. Cl. 244—104 FP **17 Claims**



1. In an aircraft landing gear having a shock absorber, comprising:

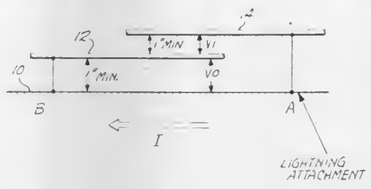
a first and a second nested tube interconnected at one end by a common end plate, said first tube having a larger diameter than said second tube, and said first tube having on its outside lateral surface an outwardly projecting shoulder;

shock absorber means comprising said nested tubes and a first cylinder slidably mounted between said nested tubes and cooperating therewith;

a second cylinder disposed around said first tube having an annulus end plate around said first tube towards said one end and cooperating with said outwardly projecting shoulder to constitute therewith a jack and forming a pressure chamber therebetween, said pressure chamber being defined by said shoulder, said second cylinder, said first tube and said annulus end plate; and

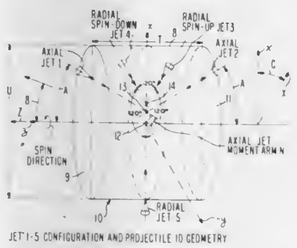
means connecting said pressure chamber to an hydraulic unit.

4,630,789
DIELECTRIC ISOLATED FUEL AND HYDRAULIC TUBES
Jerome C. Rosenberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Sep. 23, 1983, Ser. No. 535,300
Int. Cl.[4] B64D *37/32*
U.S. Cl. 244—135 R **5 Claims**



1. In an aircraft,
a fuel tank comprising walls of a non-metallic composite material such as carbon-epoxy or the like,
a metal conduit for fuel or a hydraulic liquid extending through said tank, and spaced from the tank and normally being surrounded by a fuel-air mixture within the tank;
means for electrically grounding said metal conduit to said tank; and
a dielectric insulator on said metal conduit of a thickness sufficient to prevent arcing between the tank and the conduit which might otherwise occur in response to a lightening strike on the tank.

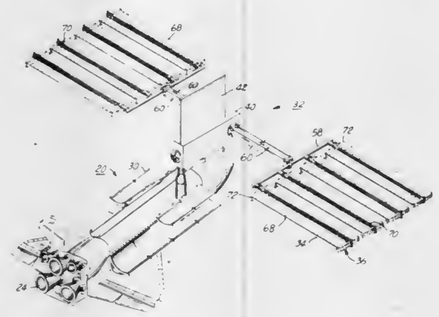
4,630,790
VELOCITY AND ATTITUDE CONTROL FOR EXOATMOSPHERIC PROJECTILE
Richard L. Williams, Jr., Corona Del Mar, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.
Filed Nov. 19, 1984, Ser. No. 672,550
Int. Cl.[4] B64G *1/26*
U.S. Cl. 244—169 **17 Claims**



JET 1-5 CONFIGURATION AND PROJECTILE 10 GEOMETRY

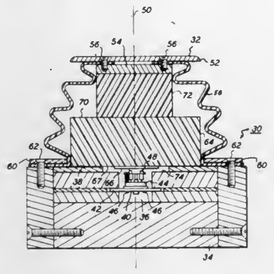
1. A system for controlling the velocity and attitude of an exoatmospheric projectile spinning about a spin axis and having a generally cylindrical outer shape consisting of a generally cylindrical periphery whose long axis is the spin axis, and front and aft generally circular faces located at opposing ends of the generally cylindrical periphery, said system comprising:
a first axial thruster positioned on the front face and having a force vector pointing inwardly through the projectile;
a second axial thruster positioned on the aft face and having a force vector pointing inwardly through the projectile; and
first and second radial thrusters, positioned on the generally cylindrical periphery and each having a force vector pointing inwardly through the projectile and intersecting at a common point that is offset from the spin axis; wherein
the spin axis can be reoriented in inertial space by firing the axial thrusters;
velocity can be added to the projectile in any direction, without a concomitant change in orientation of the spin axis, by firing a combination comprising at least one of the thrusters; and
the spin rate of the projectile can be changed by firing one of the radial thrusters.

4,630,791
TRANSPORTABLE SOLAR POWER STATION
Malcolm R. Chapman, Melville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Oct. 28, 1983, Ser. No. 546,441
Int. Cl.[4] B64G *1/44*
U.S. Cl. 244—173 **3 Claims**



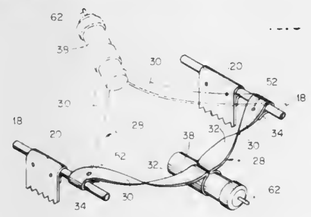
1. A solar operated power station for space operation transportable in a spacecraft having a hold with a deck, said power station comprising:
a chassis module containing electrical components and circuits of said station and drive system;
articulated base support means movably interconnecting said chassis and said spacecraft to guide the displacement of said chassis from said craft;
a pair of opposing extensible arms each movably connected at its inboard end to a corresponding side of said chassis for operation by said drive system and extensible outwardly from said chassis side when driven by said drive system, each of said arms having two members and each of said members having two links pivotally interconnected to each other to form a scissor linkage;
panel support tubes rotatably mounted transversely of each arm at an outboard end thereof, said panel support tubes being configured to be driven by said drive system when said arms are folded against the chassis sides; and
an assembly of solar panels supported by each of said panel support tubes, each of said solar panel assemblies being configured for packing in a stowed position and including extender means for depolying solar cells of said panel assembly from a retracted position adjacent said chassis to a fully extended position for intercepting rays of sunlight, said tubes being secured to said arms for rotation of said solar panel assemblies from a position pointing toward the deck of the hold during stowage to an outwardly extending position after said chassis has been positioned.

4,630,792
RAILWAY WHEEL DETECTOR
Klaus H. Frielinghaus, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.
Filed Jan. 10, 1985, Ser. No. 690,288
Int. Cl.[4] B61L *1/04*
U.S. Cl. 246—369 **17 Claims**



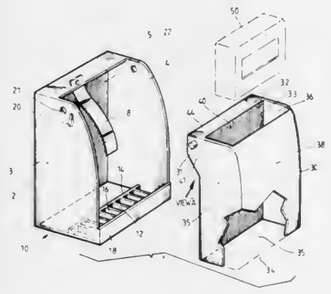
1. Apparatus for use on a railway track for detecting flanged wheels of railway vehicles on said track, said apparatus comprising a body of rigid material having an opening therein extending from a surface thereof, an electrical switch having a depressible plunger, said switch being disposed in said body with said plunger in said opening extending upwardly in the direction of said surface, means operated by the flange of a railway vehicle wheel for actuating said switch by depressing and releasing said plunger, said actuating means having a surface contacted by the wheel flange and spaced above the bottom of the cycloidal path of any point on the outer circumference of the flange as it moves along the track so as to move vertically and longitudinally along said track with said flange, said means including a body of compressible, resilient material supporting said contacted surface for said vertical and longitudinal movement, said compressible, resilient body having a surface on one end thereof bearing upon said body surface and bridging said opening, which one end surface moves vertically into contact with said plunger for depressing said plunger when said contacted surface is engaged by said wheel flange.

4,630,793
BABY BOTTLE BELT
Leslye Hunter, 36 Lakeland Ave., Congers, N.Y. 10920
Filed Nov. 7, 1984, Ser. No. 669,266
Int. Cl.[4] A47D *15/00*
U.S. Cl. 248—102 **2 Claims**



1. An improved baby bottle holder for attachment to a pair of generally horizontal, parallel side arms extending from about a supporting seat area for an infant, comprising:
a relatively short flexible belt made from a biasable material of a predetermined width and having opposed sides and opposed end portions,
symmetrical quick connect connecting means at said opposed end portions for removably securing said belt to each of said pair of side arms by encircling same, and biasable loop means, of the same material as said flexible belt disposed in the mid-area of said belt, for securely holding the body of a baby bottle in said loop means and being capable of removably gripping said body of said baby bottle; said connecting means being snap-on type connectors secured to said belt and positioned at each of said end portions, each said snap-on type connector including a female receptacle and a male projection capable of being removably secured by said female receptacle, said female receptacle and said male projection being sufficiently spaced apart from each other so as to allow said end portion to encircle said side arm;
said belt being of relatively short length and movable between a first position wherein said belt generally hangs downwardly out of the way and is slack, and said loop means is disposed below the horizontal plane of said pair of side arms; and a second position wherein said belt is generally raised to the vicinity of the mouth of the infant with little slack available; and said loop means is a loop member
formed by pinch gathering and sewing said belt material together to form said loop member generally of a predetermined diameter size to tightly embrace a baby bottle in said mid-area of said belt; and said belt and said loop member being made of a unitary, one-piece elastic material.

4,630,794
SOAP HOLDER AND DISPENSER
Rodger L. Ross, P.O. Box 30, Alleyton, Tex. 78935
Filed Jan. 3, 1985, Ser. No. 688,554
Int. Cl.[4] A47K *5/08*
U.S. Cl. 248—309.1 **12 Claims**



10. A soap holder and dispenser, comprising:
a housing having a vertically disposed back panel adapted to be mounted on a wall surface, two side panels, and a bottom panel spanning a front portion of the bottom of said housing, the back edge of said bottom panel defining an opening in said housing;
a hopper having a substantially rectangular cross section, open at its top and bottom, pivotally suspended within said housing to swing between a forward position with said hopper bottom opening above said bottom panel and a back position with said hopper bottom opening over said housing opening;
a vertically disposed front panel laterally extending between said side panels and extending above the upper surface of said bottom panel a sufficient distance to form a hopper return stop; and
spring means interposed between said housing and said hopper biased to urge said hopper into said forward position.

4,630,795

SUSPENDABLE DISPLAY RECEPTACLE

Michael Kagan, 273 Moore Park Avenue, Willowdale, Ontario, Canada

Filed Mar. 3, 1980, Ser. No. 126,663

The portion of the term of this patent subsequent to Jul. 23, 1999, has been disclaimed.

Int. Cl.⁴ A47H *1/10*

U.S. Cl. 248—318 **6 Claims**



1. A suspendable display unit comprising in combination; a display receptacle, in situ, suspended at, at least three horizontally co-planar spaced points, a plurality of supporting strands of uniform length connected to each others' upper ends, upsets integral with the material of said strands at the lower ends of said strands, means on said receptacle at said spaced points for securing said upsets thereto so as to reduce tensile stress tending to part said upsets from said strands, said means for securing said upsets each comprise essentially a tabulate body having a central portion secured against said receptacle at or in the vicinity of the rim of said receptacle, a bead projecting from and extending curvilinearly around at, at least one side and a base portion of said body and being also spaced from said receptacle, said securing means also including a socket for said upset, the end portion of said strand adjacent said upset being receivable against the slight outward flexure of at least the upper end of said bead under lateral pressure upon said end portion of said strand, into the space between said bead and said receptacle, and means on said strands for gathering said strands into a single multi-stranded suspension at any desired common point equidistant from said receptacle and securing said strands at said common point, and means for adjusting the effective length of said suspension and retaining it at said effective length from a location above said unit.

4,630,796

X-RAY APPARATUS COMPRISING A PART MOBILE THEREON

Harald Kayser, Wedel, and Walter Schmedemann, Tangstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,881

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 3416000

Int. Cl.⁴ F16M *3/00*

U.S. Cl. 248—648 **10 Claims**

1. An X-ray apparatus comprising:

a frame;

a first part moveable with respect to the frame;

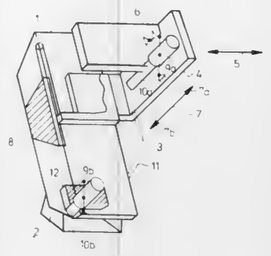
a first piston/cylinder assembly having a chamber between the piston and the cylinder, said chamber being filled with a volume of fluid, said first assembly having one of the piston or cylinder attached to the frame and the other attached to the first part;

a counterweight moveable with respect to the frame;

a second piston/cylinder assembly having a chamber between the piston and the cylinder, said chamber being filled with a volume of fluid, said second assembly having one of the piston or cylinder attached to the frame and the other attached to the counterweight; and

a hydraulic duct for providing fluid communication between the chamber in the first piston/cylinder assembly and the chamber in the second piston/cylinder assembly;

whereby movement of the first part in a first direction relative to the frame changes the volume of fluid in the chamber of the first piston/cylinder assembly, the change in the volume of fluid in the chamber of the first piston/cylinder



assembly produces an equal but opposite change in the volume of fluid in the chamber of the second piston/cylinder assembly, and the change in the volume of fluid in the chamber of the second piston/cylinder assembly causes movement of the counterweight in a second direction opposite to the first direction.

4,630,797

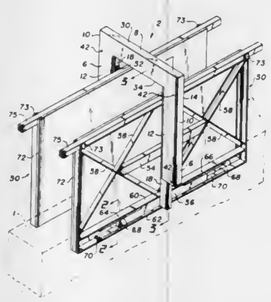
CLAMPING YOKE FOR CONCRETE FORMS

James A. Bomford, Box 215, Mill Bay, British Columbia, Canada (V0R 2P0)

Filed Feb. 11, 1985, Ser. No. 700,450

Int. Cl.⁴ E04G *11/30*

U.S. Cl. 249—20 **14 Claims**



1. A clamping device for concrete forms to apply pressure to opposted form panels that contact and mold concrete, the device comprising:

a yoke to receive the opposed form panels;

the yoke comprising a cross member and arms at each end of the cross member extending downwardly to receive the panels;

each arm being of open channel section with the opening in each channel facing inwardly towards the other arm;

a pressure member corresponding to and within each arm reciprocable through the opening of the channel section of the arm to vary the pressure applied by the pressure member; and

means to force each pressure member outwardly comprising

a fluid cylinder to force the corresponding said pressure member outwardly of its corresponding arm and inwardly with respect to the yoke, each said fluid cylinder including a piston, reciprocable within the cylinder and a piston rod attached to the piston and extending outwardly of the cylinder, and

a pair of linking members pivotally attached to each end of the corresponding said fluid cylinder, one member of each said pair of linking members also being pivotally attached to the corresponding pressure member and the other link of each said pair also being pivotally attached to the corresponding said arm whereby extension of the piston rods of the cylinders acts to force the pressure members outwardly of their corresponding said arms.

4,630,798

METHOD AND DEVICE FOR ERECTING BUILDING STRUCTURES SUCH AS BRIDGES, USING PRE-FABRICATED CONCRETE BEAMS

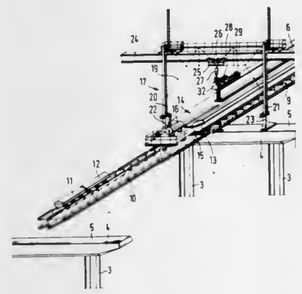
Eberhard Müller, Cologne, Fed. Rep. of Germany, assignor to Philipp Holzmann Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 389,083, Jun. 16, 1982, Pat. No. 4,497,153. This application Nov. 1, 1984, Ser. No. 667,123

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124038

Int. Cl.⁴ E01D *21/02*

U.S. Cl. 249—50 **13 Claims**



1. An apparatus for erecting a structure at a site using pre-fabricated beams, comrpising:

(a) a feed rigging in the associated work area of the structure, said feed rigging comprising:

(i) a form for forming the pre-fabricated beams; and

(ii) a support scaffolding operatively supporting said form;

(b) means operatively connected to said support scaffolding for continuously equalizing flexure of said support scaffolding during concretizing of the pre-fabricated beams; and

(c) means operatively proximate to said feed rigging for emplacing the pre-fabricated beams in their final position in the work area.

4,630,799

REMOTELY CONTROLLED OVERRIDE VALVE WITH CALIBRATION MEANS

John H. Nolan, 803 Voxpoint Cir., Delray Beach, Fla. 33444, and William A. Nolan, 3010 NE. 46th St., Lighthouse Point, Fla. 33064

Continuation-in-part of Ser. No. 531,848, Sep. 14, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,571

Int. Cl.⁴ F16K *31/02*

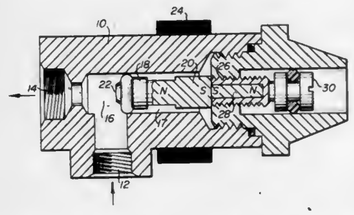
U.S. Cl. 251—129.18 **2 Claims**

1. A fluid control valve including a housing, a fluid inlet passage therein, and a fluid outlet passage in communication with said fluid inlet passage, said fluid control device comprising:

(a) a reciprocating valve capable of permitting, limiting, or precluding communication between said inlet and outlet passages, said valve comprising a ferromagnetic armature susceptable of receiving an electromagnetic induction of a magnetic axis along its axis of reciprocation, said magnetic axis generally corresponding to the longitudinal center of a fluid-tight chamber within said housing within which said valve may reciprocate, said valve having a variable flow-responsive integral first radial end face disposed within a region of communication between said inlet and outlet passages;

(b) a magnetic stator wound about said housing in the region of said reciprocating valve when said valve is in its open or limiting position, said stator, upon receipt of current, being capable of electromagnetic co-action with said armature valve to reciprocate said end face selectively out of or into closure across said region of fluid communication between said inlet and outlet passages, such closure and non-closure being dependent upon the direction of current flow through the windings of said stator; and

(c) magnetic bias and calibration means disposed within said housing and disposed co-linearly with and proximate to said reciprocating valve, near a radial end thereof opposite to said flow-responsive radial end of said valve, said bias and calibration means provided with an axis of magnetic polarity substantially co-linear with said magnetic axis of said reciprocating valve, said bias and calibration means further comprising external means for selectably advancing said flow-responsive first radial end face partially into said region of inlet-outlet communication to thereby correspondingly calibrate the level of fluid flow necessary to overcome the magnetic co-action between said bias and calibration means, and said reciprocating valve, to thereby precisely regulate the closure thereof,



whereby the electromagnetic co-action of said reciprocating valve and said stator may be used to selectively override and otherwise open or close said reciprocating valve in said region of communication between said inlet and outlet passages and, further whereby, said magnetic bias and calibration means will attract said reciprocating valve when the polarity of the magnetic axis of said bias and calibration means is the same as the polarity of the axis of said reciprocating valve and, conversely, will repel said reciprocating valve when the polarity of the magnetic axis of said calibration means is opposite to that of said reciprocating valve.

4,630,800

SEALING ARRANGEMENT FOR A SLIDE VALVE

Walter Brausfeld, Hanover, and Ernst-August Meyer, Algermissen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,926

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505046

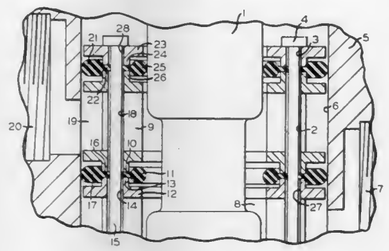
Int. Cl.⁴ F16K *11/07*

U.S. Cl. 251—324 **7 Claims**

1. A sealing arrangement, which can be located in a recess formed in a valve housing, to establish a seal between at least two fluid chambers formed in the valve housing, and having a movable member which moves in the recess, comprising:

(a) a first gasket and a second gasket, which are located in coaxial relationship with one another, and concentric with the recess of the housing;

(b) the first gasket and the second gasket are connected to one another by an annular connecting piece;
(c) the first and second gaskets are fixed in the recess of the housing by ring-shaped retaining elements, which are in contact with a portion of the end surfaces on each side of the connecting pieces of said first and second gaskets, which are located between the retaining elements;



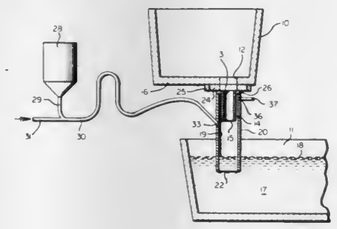
(d) the connecting pieces consist of an elastic material;
(e) the connecting pieces being designed to be thinner in the axial direction, along the length of the recess, than the gaskets; and
(f) means for interconnecting the retaining elements with one another, and with the connecting pieces which pierce the connecting pieces.

4,630,801

APPARATUS FOR ADDING SOLID ALLOYING INGREDIENTS TO MOLTEN METAL STREAM

Daniel Rellis, Jr., Lansing, Ill.; Donald R. Fosnacht, Crown Point, and Charles R. Jackson, Dyer, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 731,077, May 6, 1985. This application Jan. 31, 1986, Ser. No. 824,517
Int. Cl.[4] C21C *7/00*
U.S. Cl. 266—216 **6 Claims**



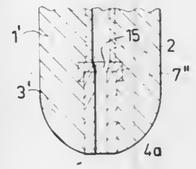
1. A device for use in adding solid particles of an alloying ingredient to molten metal, said device comprising:
a vertically disposable, elongated conduit having a lower end;
vertically disposable solid tubular shroud means for said conduit, said shroud means having walls located around the outside of and laterally spaced from said conduit to define an unfilled, annular space therebetween;
the cross-sectional area of the shroud's interior being greater than the cross-sectional area of the conduit's interior;
said shroud means having a lower end terminating below the lower end of said conduit, there being an unobstructed, columnar, vertical space within the shroud means and extending between said two lower ends;
said columnar space having a center line;
said conduit comprising means for directing a descending stream of molten metal downwardly into said columnar space substantially along the center line thereof and laterally spaced from the walls of said shroud means;
an injection port in said shroud means above said lower end thereof;
said injection port comprising means for directing a mixture of gas and solid particles into the interior of a descending stream of molten metal inside said shroud means, at a location below the lower end of the conduit and substantially above the lower end of the shroud means.

4,630,802

NOZZLE FOR INJECTION LANCE

Björn Frykendahl, Hagfors, Sweden, assignor to IFM Development AB, Gripensas, Sweden

Filed Oct. 12, 1983, Ser. No. 541,054
Claims priority, application Sweden, Oct. 15, 1982, 8205880
Int. Cl.[4] C21C *5/32*
U.S. Cl. 266—225 **15 Claims**



1. A nozzle construction for use in combination with an injection lance intended for injecting powderous material into a metal bath, freely in a metal bath or in a casting nozzle, the lance comprises both an outer pipe, made from ceramic, and an inner pipe, made from metal, in which said powderous material is intended to be transported all the way to the lance tip, at which tip the powderous material is intended to pass out through at least one nozzle, comprising an annular wall with a through passageway, in the lance tip, for said powderous material, said nozzle, which includes said annular wall and said through passageway being characterized by being made from a nozzle material with very high wear resistance, on the order of the wear resistance of highly purified Al_2O_3, and with a fusion point, which is substantially higher than the fusion point of a metal bath, into which the injection is to be made and in that said nozzle material differs from that of said lance tip, is tubular with an outer diameter substantially smaller than the average outer diameter of the lance tip, and said nozzle material constitutes at least the material of the nozzle wall immediately surrounding the nozzle passageway and the surface of said nozzle passageway, and said tubular nozzle material is separate from and is secured in and to the lance tip.

4,630,803

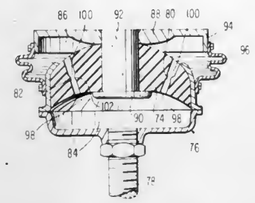
SUSPENSION-STRUT MOUNTING FOR INSTALLATION BETWEEN A SHOCK-ABSORBER STRUT OR SPRING STRUT AND A VEHICLE BODY SPRING-SUPPORTED WITH RESPECT TO THE AXLES, IN PARTICULAR OF A MOTOR VEHICLE

Hans Werner, Fellbach-Oeffingen; Frank Knothe, Stuttgart; Paul Graf, Koengen; Henning Wallentowitz, Aichwald; Hans-Hermann Keller, Notzingen, and Alfred Kist, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 414,389, Sep. 2, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,051
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135043
Int. Cl.[4] B60G *15/06*; F16F *9/54*
U.S. Cl. 267—8 R **25 Claims**

1. A suspension-strut mounting for installation between a shock-absorbing strut and a vehicle body spring supported with respect to axles, comprising at least one resiliently elastic

vibration-damping connecting means operatively connected with the vehicle body and with a piston rod of said strut, additional vibration damping means operable in parallel to said connecting means, said additional damping means including a



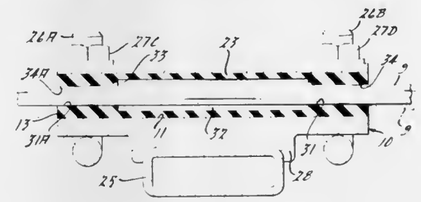
flow medium disposed in at least one space means, and wherein said connection and additional damping means operate to reduce vibrations in the same direction as, and independently of, the piston of the shock absorbing strut and even when said piston does not operate to absorb shocks.

4,630,804

LEAF SPRING CLAMP FOR SYNTHETIC MATERIAL LEAF SPRING

Donald G. Fesko, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,364
Int. Cl.[4] F16F *1/30*
U.S. Cl. 267—52 **23 Claims**



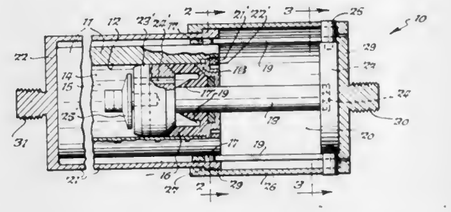
1. A leaf spring clamp assembly adapted to secure a leaf spring in position in a suspension system, said leaf spring clamp assembly comprising:
a rigid clamp base comprising a bottom wall and two side walls, said side walls being substantially parallel to each other and each extending upwardly from said bottom wall to form therewith a longitudinal channel, wherein an inward surface of at least one of said side walls fairs from each longitudinal end into a channel-widening concavity;
a resilient wedge insert adapted to be positioned within said longitudinal channel, comprising a wedge insert bottom wall adapted to lie adjacent to the clamp base bottom wall, and two wedge insert side walls being substantially parallel to each other and each extending upwardly from said wedge insert bottom wall to form therewith an inner longitudinal channel adapted to jacket said leaf spring laterally, wherein the inward surface of each said wedge insert side wall is adapted to contact said leaf spring along substantially the entire longitudinal dimension of said inner longitudinal channel, the outer surface of each said wedge insert side wall being adapted to lie adjacent and in substantial contact with the corresponding clamp base side wall to substantially fill said channel-widening concavity, said wedge insert further comprising a resilient support pad at each longitudinal end of said inner channel, said support pads being adapted to contact and support said leaf spring, said support pads extending within said inner channel laterally between said wedge insert side walls, the upper surface of said support pads being higher than the wedge insert bottom wall between said support pads to form a cavity, said cavity being substantially longitudinally centered within said leaf spring clamp and being adapted to accommodate leaf spring displacement within said leaf spring clamp upon bending of said leaf spring;
a substantially rigid clamp plate adapted to be fixedly attached to said clamp base to clamp said leaf spring between them within said inner channel; and
a resilient cover pad adapted to be positioned between said clamp plate and said leaf spring and to cooperate with said wedge insert to laterally encircle said leaf spring, said cover pad comprising a sheet of resilient material and a laterally extending resilient upper support pad at each longitudinal end of said sheet, said upper support pads being longitudinally spaced substantially the same distance as said wedge insert support pads, each providing a surface raised from the surface of said sheet, which raised surface is adapted to contact and support said leaf spring to form an upper cavity, said upper cavity being substantially longitudinally centered within said leaf spring clamp and being adapted to accommodate leaf spring displacement within said leaf spring clamp upon bending of said leaf spring.

4,630,805

TENSION-COMPRESSION LIQUID SPRING UNIT

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,846
Int. Cl.[4] F16F *9/10*
U.S. Cl. 267—64.13 **16 Claims**



1. A liquid spring unit operable in both tension and compression comprising: a liquid spring including a cylinder, piston, compressible liquid in said cylinder and a liquid seal for said piston; sleeve means for telescopic mounting relative to said cylinder; a collapsible housing for mounting about said cylinder; first attachment means mounted relative to said sleeve means for attachment to a first external member; second attachment means on said housing for attachment to a second external member; means for permitting said housing to collapse when compression forces are applied to said first and second attachment means; means for preventing said housing from extending beyond a predetermined length when tension forces are applied to said first and second attachment means: and coupling means extending between said liquid spring and said collapsible housing for driving said piston into said cylinder when both compression and tension forces are applied to said unit.

4,630,806

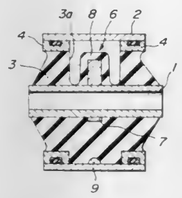
LIQUID-FILLED ELASTOMERIC BUSHINGS

Takuya Dan, and Michihiro Orikawa, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,318
Claims priority, application Japan, Apr. 5, 1984, 59-66635; Feb. 15, 1985, 60-26440
Int. Cl.[4] F16F *1/36*
U.S. Cl. 267—140.1 **6 Claims**

1. A liquid-filled elastomeric bushing comprising; inner and

outer sleeves coaxially arranged with each other, an elastomeric member disposed between the inner and outer sleeves and bonded only to the inner sleeve, plural liquid chambers formed in the axially middle portion of the elastomeric member at a given interval in the circumferential direction thereof, two separate intermediate rings interposed between the elastomeric member and the outer sleeve only at both axial end portions of the elastomeric member and bonded to the elastomeric member so that said intermediate rings can move in an axial direction to prevent rising of internal pressure inside said liquid chambers, each of said rings provided at its outer peripheral surface with a circumferential groove, an O-ring in each of the grooves, and at least one restricted passage formed on the outer peripheral in the middle portion of the elastomeric member and establishing communication between the liquid chambers.

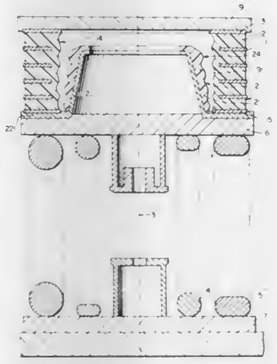


4,630,807

ELASTIC SUPPORTED MECHANISM

Gaston Gaudiau, Le Creusot, France, assignor to Societe Mte, Puteaux, France

Filed Feb. 15, 1985, Ser. No. 702,028
Claims priority, application France, Feb. 24, 1984, 84 02810
Int. Cl.[4] F16F *3/07*
U.S. Cl. 267—140.1 **16 Claims**



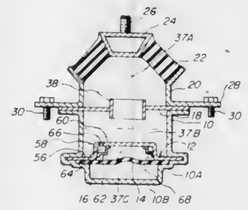
1. An elastic supported mechanism comprising a hollow elastic ring of generally cylindrical cross section, a plurality of intercalated rigid rings within said elastic ring respectively disposed about the axis of said elastic ring, said intercalated rings being spaced from one another along the axis of said elastic ring in substantially parallel relationship with one another, a stop fixedly disposed within a central bore of said elastic ring and having an outer peripheral surface normally spaced from the inner periphery of said elastic ring, said outer peripheral surface of said stop and the inner periphery of said elastic ring being configured such that when said elastic ring is subjected to an increasing pressure perpendicular to said axis thereof, said outer peripheral surface of said stop and the inner periphery of said elastic ring come progressively into contact with each other, thereby progressively increasing the rigidity of said mechanism in the direction of said load.

4,630,808

VIBRATION ISOLATING DEVICES

Takao Ushijima, Chigasaki, and Harumichi Yamazaki, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,337
Claims priority, application Japan, Dec. 28, 1983, 58-248908; Jun. 13, 1984, 59-121530
Int. Cl.[4] F16F *9/10*
U.S. Cl. 267—140.1 **5 Claims**



1. A vibration isolating device comprising; two frame bodies for joining to a vibration source side on one hand and a vibrating side on the other hand, a vibration-absorbing body interposed between said two frame bodies and composed of an elastomeric material, a hollow chamber mainly defined by an inner wall face of said vibration-absorbing body and containing a vibration-damping liquid therein, and first and second partition members dividing said hollow chamber into first, second and third liquid chambers; said first liquid chamber being defined by wall faces including at least vibration-absorbing body and first partition member; said second liquid chamber being defined by all faces including at least first and second partition members; each of said two partition members being provided with a restricted passage establishing communication between the adjacent liquid chambers; said restricted passage in said first partition member having a sectional area larger than that in said second partition member; and said second liquid chamber being provided with a pressure-reducing means.

4,630,809

VIBRATION ISOLATOR AND SHOCK ABSORBER DEVICE

Allen Duckworth, Middlefield, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed May 13, 1985, Ser. No. 732,928
Int. Cl.[4] F16F *3/08*
U.S. Cl. 267—141.1 **8 Claims**

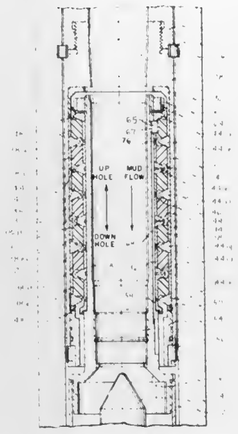
1. A vibration isolator and shock absorber device having a longitudinal axis and including:

a plurality of ring elements in an array, each of said ring elements having an outer ring, an inner ring, and elastomeric material extending between and adhered to said rings, said inner and outer rings being substantially parallel to said longitudinal axis;

means for connecting said outer rings to an outer support member;

means for connecting said inner rings to an inner support member;

at least one reaction element positioned between an adjacent pair of said ring elements, said reaction element extending from one of said inner or outer rings into a space between the elastomeric materials of said pair of adjacent ring elements, said reaction element having reaction surfaces facing the adjacent surfaces of each of said adjacent elastomeric materials; and



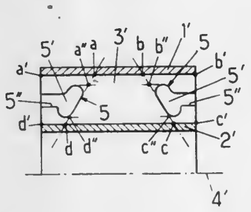
at least one of said reaction surfaces and surface of the elastomeric material adjacent thereto being differently contoured.

4,630,810

RESILIENT COUPLING WITH A LIMITED RANGE OF RADIAL MOVEMENT, MORE PARTICULARLY FOR A PULLED WHEEL ATTACHMENT

Jacques Pierrat, Paris, France, assignor to Hutchinson Societe Anonyme, Paris, France

Filed Apr. 25, 1985, Ser. No. 727,287
Claims priority, application France, May 2, 1984, 84 06800
Int. Cl.[4] F16F *1/38*
U.S. Cl. 267—153 **5 Claims**



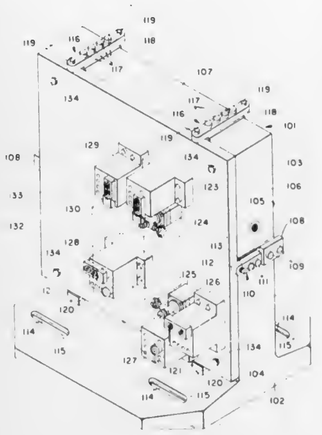
1. A resilient coupling with a limited range of radial movement of the type comprising two cylindrical sleeves one of which surrounds the other and between which is adhered a block of a resilient material, wherein in said block of resilient material are formed two grooves extending laterally endwise along the whole periphery of said block and being essentially symmetrical with each other with respect to the median transverse plane of the two cylindrical sleeves, each groove comprising a bottom portion of an elongate shape generally in the radial direction and which is continued laterally by a recess opening outwardly and having, in the radial direction, a smaller dimension than that of said bottom portion.

4,630,811

MODULAR FIXTURING APPARATUS

Carl D. Rudisill, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 16, 1985, Ser. No. 755,643
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 269—118 **3 Claims**



1. A fixturing apparatus for positioning and holding a workpiece during a metal working operation comprising:

(a) a mounting plate for holding said workpiece in a known, repeatable position and orientation, said plate having a workpiece receiving face, a first plurality of threaded holes in said face in a pattern specific to said workpiece for defining the location and orientation of said workpiece on said plate and adapted to locate and hold workpiece support and clamp devices, wherein said first plurality of threaded holes includes holes having a counterbored, reamed, unthreaded upper portion and a lower threaded portion adjacent thereto, and wherein said plate has a second plurality of clearance, plate mounting holes; and

(b) a carrier apparatus for releasably and rigidly supporting said plate in an accurate, repeatable position thereon, said carrier apparatus comprising:

(1) a unitary molded filled epoxy resin system structure wherein the filler comprises crushed granite rock having a mixture comprising particle sizes in the range of from 0.08 mm to 16 mm in the major diameter and constitutes from 50% to 99% by weight of said filled epoxy resin system;

(2) at least one planar surface defined by adjacent perimeter faces substantially normal to each other end adapted to receive and hold said plate;

(3) a base having a base surface substantially normal to said planar surface;

(4) a plurality of non-movable plate locating stop means positioned at two adjacent perimeter faces of said planar surface and extending beyond said planar surface for engaging said plate;

(5) pusher means positioned at perimeter faces of said planar surface opposing said stop means and extending beyond said planar surface for engaging and applying a force on said plate to urge said plate against said stop means; and

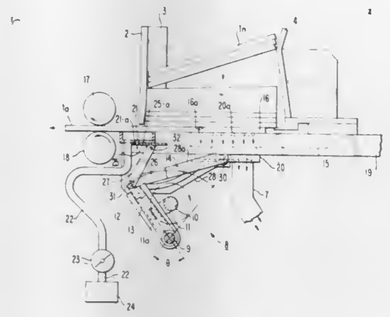
(6) a plurality of threaded holes in said planar surface corresponding to said second plurality of clearance plate mounting holes.

4,630,812

DELIVERY DEVICE FOR SHEET BODIES

Tadashi Yano, and Arifumi Okamoto, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,863
Claims priority, application Japan, Aug. 5, 1983, 58-142428
Int. Cl.[4] B65H *3/64*
U.S. Cl. 271—132 **6 Claims**



1. A delivery device for sheet bodies comprising:
a kicker which is adapted to engage an end of a single sheet which is at a standby position, and move said sheet to a position away from said standby position, after which said kicker returns to said standby position;
a movable suction plate connected to a source of vacuum which engages at least a portion of said sheet and is movable in cooperation with said kicker to a predetermined position and stops at said position while said kicker continues to move said sheet, said suction plate being pivotably coupled to said kicker by means of linkage, a cam, a guide slot in said cam and a pivot pin attached to said linkage and arranged to follow the path of said slot for causing said suction plate to travel at a decelerated rate of speed as said suction plate approaches said predetermined position;
means for simultaneously moving said kicker and said suction plate away from said standby position and for moving said suction plate to said predetermined position and said kicker to said position away from said standby position; and
means for removing the suction applied by said suction plate when said plate reaches said predetermined position, whereby said sheet is moved by only said kicker after said movable suction plate reaches said predetermined distance.

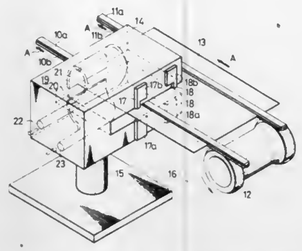
4,630,813

METHOD OF AND DEVICE FOR DETECTING DISPLACEMENT OF PAPER SHEETS

Toshiyuki Watanabe, Tokyo, and Noboru Yamada, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 31, 1984, Ser. No. 636,290
Claims priority, application Japan, Nov. 28, 1983, 58-222234
Int. Cl.[4] B65H *7/02*
U.S. Cl. 271—227 **10 Claims**

1. A displacement detection method of detecting the displacement of a paper sheet in transit along a conveyance line in a conveyance device, comprising:
detecting a leading edge of the paper sheet at a prescribed location of said conveyance line of the conveyance device for the paper sheet;
detecting a distance between one side edge of the paper sheet and a reference line set up traverse to the conveyance line based on a time interval after elapse of a prescribed time following the leading edge detection; and



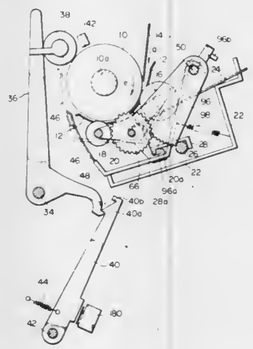
calculating a passing interval, inclination, and lateral shift to the paper sheet being transported based on the leading edge and distance detecting steps.

4,630,814

SHEET FEED APPARATUS FOR PRINTER

Toshio Kawakubo, Yokohama; Chuji Ishikawa, Kawasaki, and Shizuo Yokoyama, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,428
Claims priority, application Japan, Apr. 13, 1983, 58-55290; Apr. 13, 1983, 58-55291; Apr. 13, 1983, 58-55293
Int. Cl.[4] B65H *5/02, 5/04*
U.S. Cl. 271—272 **15 Claims**



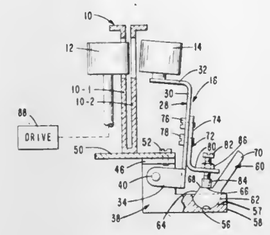
1. A sheet feed apparatus for a printer which lays a sheet to print out data on a rotatable platen, comprising:
platen drive means for rotating the platen;
a deflector for guiding the sheet along a periphery of the platen;
a paper bail roller for pressing the paper against the periphery of the platen;
a guide member movable to face the periphery of the platen between the paper bail roller and the deflector;
guide member drive means for integrally holding said guide member and moving the guide member toward and away from the periphery of the platen;
control means for controlling the guide member drive means such that, after the guide member is moved toward the periphery of the platen to face a substantially whole area of the periphery of the platen between the paper bail roller and the deflector, the paper guide member is moved away from the periphery of the platen when a leading end of the sheet guided from the deflector to the paper bail roller is held between the paper bail roller and the platen; and
the guide member drive means comprising a transmission mechanism for transmitting a rotation of the platen to the guide member.

4,630,815

QUICK RELEASING, PINCH ROLLER MECHANISM

Borge Petersen, Elmira, and Rickard P. Nally, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 11, 1985, Ser. No. 807,563
Int. Cl.[4] B65H *5/06*
U.S. Cl. 271—273 **8 Claims**



1. A quick-releasing, pinch roller mechanism comprising:
a base plate;
a document track upstanding from said base plate;
a driving roller mounted on one side of said document track to move documents in said document track in cooperation with a pinch roller;
a pinch roller;
a mounting block having fastener means for detachably mounting said mounting block on said base plate;
said mounting block having a mounting pin thereon and also having an arcuately-shaped recess therein;
a frame having first and second ends with said first end being pivotally mounted on said pin and with said pinch roller being rotatably mounted on said second end to enable said frame to be pivoted between an active position in which said pinch roller is in operating engagement with said driving roller and a retracted position in which said pinch roller is spaced from said driving roller to facilitate removing a jammed document from said document track;
an actuating lever having thereon an arcuately-shaped portion which is complementary in shape to said arcuately-shaped recess to enable said lever to be pivoted in said arcuately-shaped recess between first and second positions; and
coupling means secured to said frame and cooperating with said actuating lever to move said frame to said active and retracted positions when said actuating lever is moved to said first and second positions, respectively.

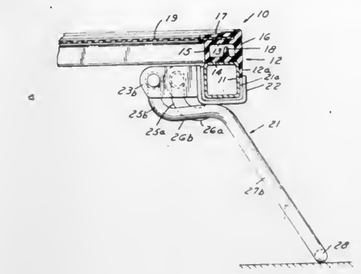
4,630,816

JOGGING APPARATUS

Charles C. Hill, Del Mar, Calif., assignor to James Virgil Watters, San Diego, Calif.

Continuation of Ser. No. 304,804, Sep. 23, 1981, abandoned. This application Mar. 19, 1984, Ser. No. 590,541
Int. Cl.[4] A63B *23/04, 5/18;* A47B *3/00*
U.S. Cl. 272—70 **24 Claims**

1. A jogging apparatus comprising
an annular frame defining an opening,
an elastomeric annular body bonded to said frame,
a mat bonded to said elastomeric body and covering the opening in said frame such that the mat is yieldingly supported on said frame,
said elastomeric body being hollow in cross section and comprises a top wall, a bottom wall and inner and outer side walls,
said elastomeric body, in the unloaded and undeformed state, assumes a configuration such that the inner wall and outer wall extend upwardly and outwardly and, in the deformed state with the mat attached to the top wall, assumes a configuration such that the inner wall and outer wall are deflected radially inwardly such that they are generally vertical and the mat is stretched such that the elastomeric body is self-sustaining and having a configuration such that it is free to deflect in shear deformation radially inwardly upon downward movement of the mat, and



means for supporting said frame in spaced relation to a supporting surface.

4,630,817

RECREATION APPARATUS

James F. Buckley, Marlboro, N.J., assignor to Gym Bee Enterprises, Inc., Marlboro, N.J.

Filed Dec. 20, 1983, Ser. No. 563,657
Int. Cl.[4] A63B *69/16*
U.S. Cl. 272—73 **42 Claims**



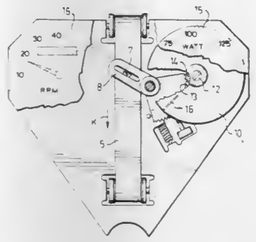
40. An exercise apparatus in combination with a video game apparatus which includes display means for displaying a video game including a movable cursor and for showing the progress of the video game and the degree of success of an operator, said exercise apparatus comprising a joystick for controlling said video game apparatus to cause movements of said cursor of said display means, said joystick being shiftable by an operator from a neutral central position; centralizer means connected to said joystick for yieldably holding said joystick in said neutral central position with sufficient resistance so as to require an operator to exert at least one pound of force on said joystick to move said joystick from said neutral central position during play of said video game; and switch means selectively operable by said joystick upon movement of said joystick from said neutral central position, said switch means being connected to said video game apparatus to control said video game apparatus to move said cursor along first and second directions on said display means, whereby an operator is encouraged to exert considerable physical energy to play the game.

4,630,818

TORQUE METERING DEVICE FOR A BICYCLE-TYPE ERGOMETER

Sulevi Saarinen, Ilmarinen, Finland, assignor to Tunturipyora Oy, Turku, Finland

Filed Oct. 22, 1985, Ser. No. 790,058
Claims priority, application Finland, Jun. 27, 1985, 852544
Int. Cl.[4] A63B *21/00*; A61B *5/22*; G01L *3/18*
U.S. Cl. 272—73 **3 Claims**



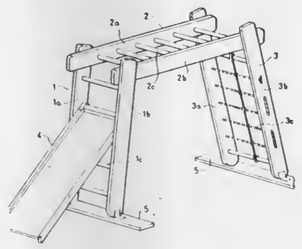
1. Torque metering device for a bicycle-type ergometer, in which ergometer the braking force is steplessly adjustable and in which the rotating movement is compensated by means of a flywheel (2), whereby the rotating movement of said flywheel is braked by means of a belt (5) or the like which is pressed against the outer periphery of the flywheel and moves limitedly with the flywheel, the movement of the belt with the flywheel being restricted by means of a spring member (6) connected to one end of the belt and the frame structure (1) of the ergometer, characterized in that the device comprises a pin member (7) fastened on said belt (5) and means (8) for rotating an indicator (10) which is journalled for rotation, that said rotating means (8) of the indicator are, essentially at the central portion thereof, journalled on the frame structure (1), and that one end of the rotating means (8) of the indicator is connected to said pin member (7), the other end being correspondingly secured on a shaft (12) of the indicator (10) in such a manner that the linear movement of the pin member (7) with the belt (5) moves one end of the rotating means (8) of the indicator around the journalling point (11) of said means, thus effecting a corresponding rotating movement of the other end of the rotating means (8), which movement turns the indicator (10).

4,630,819

COLLAPSIBLE PLAYGROUND DEVICE

Eliezar Levin, c/o Avi Nakash, 498 7th Ave., New York, N.Y. 11803

Filed Sep. 10, 1984, Ser. No. 649,187
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—113 **5 Claims**



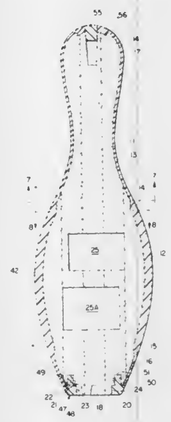
1. A playground device, comprising:
a plurality of ladder sections including at least a first, a second and a third ladder section;
each of said ladder sections having a pair of parallel frame members and a plurality of rungs fixed to and extending transversely across said frame members in parallel spaced relationship to each other along the length of said frame members;
first attaching means for releasably attaching one end of said first ladder section directly to one end of said second ladder section with the two ladder sections at a desired angular position with respect to each other;
second attaching mens for releasably attaching the opposite end of said second ladder section directly to one end of said third ladder section with the latter two ladder sections at a desired angular position with respect to each other;
the free ends of each of said first and second ladder sections including a base bar of large surface area pivotably mounted to, and extending across, the parallel frame members of the respective section for supporting the playground device on the ground;
the pair of frame members of each ladder section being bars formed with flat, parallel, outer surfaces at each end where coupled to another ladder section;
each of the flat surfaces of one pair of frame members at each coupled end being formed with a first opening, and with a plurality of further openings arranged in a circular array;
each of the flat surfaces of the other pair of frame members at each coupled end being formed with a first opening alignable with said first opening of said one pair of frame members, and with another opening alignable with a selected one of said circular array of openings in said one pair of frame members;
said first and second attaching means each comprising a pivot pin passing through each of said aligned first openings in the coupled ends of the frame members, and a locking pin passing through said selected one of the circular array of openings in said one pair of frame members and said aligned other opening in said other pair of frame members for locking the two ladder sections at each coupled end at a selected angular position with respect to each other.

4,630,820

PLASTIC COATED BOWLING PIN

Albert Bertozzi, 9 Harding Ave., East Providence, R.I.

Filed Dec. 5, 1984, Ser. No. 678,273
Int. Cl.[4] A63D *9/00*
U.S. Cl. 273—82 R **1 Claim**



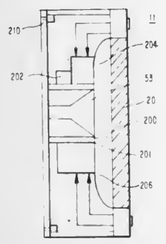
1. A composite bowling pin structure comprising a maple wooden core body member contoured to provide a head section at the top of said body, a neck section extending therefrom, a belly section extending from said neck station and a tapered bottom section at the bottom of said body; said belly section being circumferentially recessed and said bottom section having a base wherein said body further includes a ledge between said recess and neck and a collar between said recess and bottom section, said pin having a main axis extending along its length, said ledge and collar being defined by a circumferential band whose surface is substantially parallel to the main axis of the pin, the thickness of a portion of said recessed belly section in a direction perpendicular to said main axis being greater than the corresponding thickness of said ledge, said collar being located adjacent the base of the bottom section and having a sharp corner at the junction with the tapered bottom section, said bottom section base having a recessed means for receiving a plug and being tapered downward from said collar to the base, a plug, said plug removably secured in said recessed means, and an outer covering of molded plastic consisting of high density, high molecular weight polyethelene bonded to said core body member, with the thickness of said plastic being greater in said circumferential recessed belly than the thickness of said covering over the remainder of said core, whereby, said ledge and said collar structurally support said covering of molded plastic through the difference of thickness between the thickness of said plastic in said circumferential recessed belly and the thickness of said covering over the remainder of said core body member, thereby, to provide protection to said wooden core body member of bowling ball shock and function of restitution to said wooden core.

4,630,821

VIDEO GAME APPARATUS INTEGRAL WITH AIRPLANE PASSENGER SEAT TRAY

Larry H. Greenwald, New York, N.Y., assignor to Aero-Vision Systems, Inc., New York, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,202
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—85 G **18 Claims**



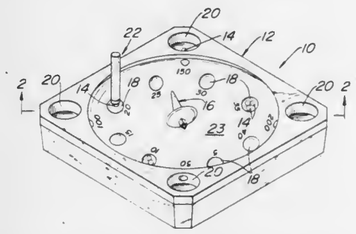
1. Video game apparatus to be employed by a passenger of an airplane comprising:
a tray mounted on the rear of an airplane seat in front of a passenger seat, said tray having an inegral hollow with a top rectangular aperture on a top surface facing said passenger;
a TV display screen positioned in said top rectangular aperture of said tray, said TV display screen having a viewing area no larger than 3″×3″ and a depth readily accommodated by said tray;
video game means located in said hollow of said tray and adapted to illuminate said TV screen when energized;
a plurality of control menas mounted on said top surface of said tray and coupled to said video game means for enabling said passenger to operate said game means;
cable coupling means positioned on said tray coupled to said video game means to actuate said video game means and said display for play by a passenger when a cable is inserted into said means;
a cable coupled to a head set and adapted to be inserted into said cable coupling means to actuate said video game means for play and to enable said passenger to receive audio information from said video game means via said headset when said cable is inserted;
brightness limiter means interconnected to said TV display menas, said brightness limiter means including means for sensing ambient light conditions and adjusting brightness exhibited by said TV display screen in response thereto;
panel means fitted in said top rectangular aperture of said tray overlying said TV display screen, said panel means occupying a substantial portion of the top surface of said tray; and
a lens assembly in optical communication with said TV display screen, said lens assembly enlarging information displayed on said TV display screen to a size facilitating play of said plurality of video games by passengers and projecting said enlarged information on said panel means.

4,630,822

GAME EMPLOYING TOP AND PLATFORM

Giovanni Massaglia, Hadden Heights, N.J., assignor to Jem Imports, Inc., Hadden Heights, N.J.

Filed Sep. 24, 1985, Ser. No. 779,739
Int. Cl.[4] A63D *3/00*; A63F *7/00*
U.S. Cl. 273—118 A **2 Claims**



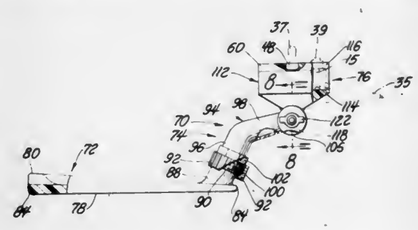
1. A top and platform game comprising a platform having a plurality of cavities in an upper surface thereof and a numerical value specified adjacent each of said cavities; a plurality of spherical members positionable on said platform; a spinable top having a lower surface for engaging the platform when the top is spun thereon, said top having surface means for engaging said spherical members about said platform; one of said spherical members having a different magnetic property from the other spherical members and indicator means for identifying said different magnetic properties.

4,630,823

VIDEO GAME CONTROL BOX HOLDER

Timothy L. Grant, 582 Kellogg, Apt. A, Ann Arbor, Mich. 48105

Filed Oct. 31, 1983, Ser. No. 547,032
Int. Cl.[4] A63B *71/00*; A63F *9/00*
U.S. Cl. 273—148 B **1 Claim**



1. A self-contained portable video game control box holder device for a control box having control means such as a fire button and a joy-stick or a ball control element, said device comprising base means, control box holder means and connecting means connecting said base means and said holder means, said base means being adapted to be itself supported in use of said device by separate support means such as the floor, a chair

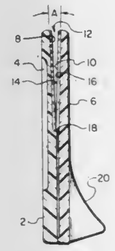
or the like, and said base means having peripheral spaced front and rear portions and spaced side portions, said connecting means being disposed at said front portion of said base means, said rear portion of said base means being disposed away from said base front portion and said connecting and holder means to the extent sufficient to enable the game operator to sit on said base portion with his buttocks, or to kneel thereon with his knees, without interference with said connecting and holder means, whereby at least the entire upper body weight of the operator including his buttocks is applied to said base to provide maximum stability of said device during use thereof, with no effort required of the operator except sitting or kneeling on said base means, said connecting means having means for adjusting said holder means laterally, vertically and angularly toward and away from the game operator while the operator is sitting or kneeling on said base, said holder means including a bottom wall to support a control box, spaced side walls and control box clamp means supported by and extending between said side walls, said clamp means including means for clamping control boxes of varying sizes, and means adapted to at least partially encircle the joy stick or ball control element to increase stability of the control box in said holder means, said device being constructed or relatively light-weight materials so as to be easily portable.

4,630,824

PLAYING CARD HOLDER

Richard F. Sweet, 1454 Briarglen Ave., Westlake Village, Calif. 91361

Filed Nov. 7, 1985, Ser. No. 795,933
Int. Cl.⁴ A63F *1/10*
U.S. Cl. 273—150 **7 Claims**



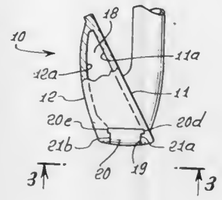
1. A holder for playing cards, comprising:
a base,
first and second generally arcuate plates formed from a stiff material extending generally upward from the base, the plates having opposed surfaces which mutually diverge from each other away from the base to form a tapered slot of substantially permanent dimensions and having an angular divergence within the approximate range of about 1°–8°, said slot having a generally arcuate bottom stop which is generally concentric with the plates, said plates being spaced apart from each other to releasably secure playing cards placed in the slot by the opposed lateral pressures of the plates against the cards with no substantial movement of the plates, the slot dimensions being adapted to accommodate the penetration of a small number of cards to a location near the stop, and of larger number of cards to locations further removed from the stop, the spacing between the plates being sufficiently small to hold cards placed throughout the slot against lateral slippage, and
means for holding the base in a generally upright position.

4,630,825

GOLF CLUBS

Glenn H. Schmidt, 1854 Los Encinos, Glendale, Calif. 91208; Howard F. Schmidt, S. Gate, and Glenn R. Seidman, Palos Verdes, both of Calif., assignors to Glenn H. Schmidt, Glendale, Calif.

Filed Dec. 17, 1984, Ser. No. 682,440
Int. Cl.⁴ A63B *53/04*
U.S. Cl. 273—167 H **14 Claims**



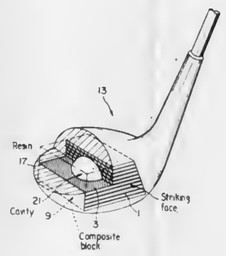
1. In a golf iron, the combination comprising
(a) means defining a hollow metallic head having a ball striking front face and a bottom surface,
(b) the head defining an opening between the hollow and the exterior, the opening located at the bottom of the head, the head having a heel and toe,
(c) and a closure for said opening having elongated, tongue and groove, linear sliding connection with said means, said closure located at the bottom of the head, the closure directly exposed along its length to the head hollow above the closure,
(d) said connection having a substantially T-shaped cross section, the closure being longitudinally elongated in the direction between said heel and toe, and said connection comprising two pairs of tongue and groove elements, each pair including a tongue element on the closure and a groove element on said head, the grooves having shoulders adjacent the head hollow to limit inward displacement of the tongue elements, and the closure having a lowermost outer surface everywhere spaced from said tongue and groove elements and flush with said head bottom surface at opposite sides of the closure lowermost outer surface, the closure entirely confined within the outer perimeter outline of the head.

4,630,826

GOLF CLUB HEAD

Susumu Nishigaki, Nagoya; Akio Ohkoshi, and Torao Aozuka, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,353
Int. Cl.⁴ A63B *53/04*
U.S. Cl. 273—167 H **5 Claims**



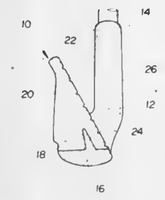
1. A golf club head having a striking face portion for striking a ball, said striking face portion being formed at least in part by a composite block comprising a plurality of layers of thin ceramic plates and a plurality of layers of thin glass fibers or carbon fibers laminated in alternating layers and united into an integral composite block by a thermoset resin impregnated into said layers of glass fibers or carbon fibers.

4,630,827

GOLF CLUB HEAD

Minoru Yoneyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan

Filed Mar. 19, 1985, Ser. No. 713,742
Claims priority, application Japan, Mar. 19, 1984, 59-38138
Int. Cl.⁴ A63B *53/04*
U.S. Cl. 273—169 **6 Claims**



1. A golf club head of the iron type and comprising:
a sole formed of metal material and defining a lower end portion of the golf club head;
a rib formed on an upper surface of said sole integrally therewith, said rib extending from a heel portion to a toe portion of the golf club head along the longitudinal direction of said sole;
a hitting portion formed of carbon fiber reinforced resin material and having a substantially triangular shape in cross section, said hitting portion being integrally fixed over said sole with said rib being embedded within said hitting portion, lower edges of said hitting portion being coplanar with upper edges of said sole;
said sole and said hitting portion constituting an integral head body, said hitting portion occupying an area of from 70 to 85% of the total area of said head body taken along a transverse cross section substantially at the longitudinal center of said head body; and
a hosel for receiving a shaft therein and formed of metal material integrally with said sole, said hosel being connected to said sole at said heel portion.

4,630,828

SAND TRAP PRACTICE DEVICE

Arthur Lovin, 2609 Petaluma Ave., Long Beach, Calif. 90815

Continuation-in-part of Ser. No. 617,960, Jun. 7, 1984, Pat. No. 4,535,989. This application Aug. 14, 1985, Ser. No. 765,860
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—176 FB **14 Claims**



1. Apparatus for the practice of golf shots, comprising:
support means defining a perimeter enclosing an area large enough to allow a person to stand within said perimeter and swing a golf club therein, said support means including a frame having a plurality of short, vertical legs for resting said frame on a supporting surface and elevating said frame from said surface;
a piece of foldable sheet material supported by said support means to form a receptacle having substantially vertical sides approximately at said perimeter and a substantially planar bottom substantially coextensive with the area enclosed by said perimeter, the height of said sides being small relative to the horizontal dimensions of the enclosed area, said piece of foldable sheet material having an integral extension portion that, when unfolded, extends over at least one side of said support means to form an apron extending outwardly from the perimeter of said support means; and
a layer of particulate material contained in said receptacle;
said apron extending outwardly from the perimeter of said support means along at least one side of said receptacle by a distance sufficient to catch a substantial amount of the particulate material which is scattered from said receptacle as a result of a person swinging a golf club into said particulate material.

4,630,829

COMPACT GOLF SWING TRAINING AND PRACTICE DEVICE

Arthur A. White, P.O. Box 10396, Santa Ana, Calif. 92711

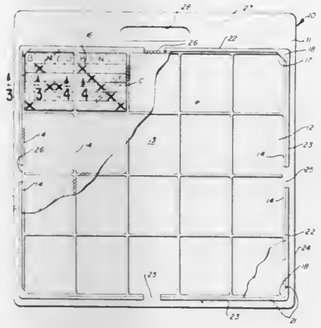
Filed Mar. 29, 1985, Ser. No. 717,966
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—186 A **14 Claims**



1. A golf swing practice device for measuring the speed at which a golfer swings his club through a measuring zone, said practice device including at least two optical detectors, the respective optical axes of which define opposite ends of the measuring zone, means by which to supply said optical detectors with incident light, computational means interfaced with said optical detectors to measure the elapsed time for the golfer to swing his club through the measuring zone so as to obtain an indication of the speed at which the golfer swings his club therethrough, and detector circuitry interfaced with said optical detectors and comprising:
signal generating means interconnected with each of said optical detectors to generate output signals, the magnitudes of which are representative of the optical intensity of the incident light received by said optical detectors from said incident light supply means;
reference signal supply means providing first and second reference signals, the magnitudes of which are representative of minimum and maximum optical intensities in a predetermined range of optical intensities to which said optical detectors are responsive; and
limit detector means connected to receive and compare the magnitudes of the first and second reference signals from said reference signal supply means with the magnitudes of the output signals provided by said signal generating means, said limit detector means providing an output signal indicative of whether the intensity of the incident light at said optical detectors is above, below or within the

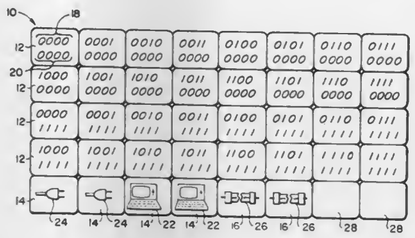
range of predetermined optical intensities established by said reference signal supply means.

4,630,830
BINGO GAME CARD HOLDER
Helen E. Gadd, 2200 North 73rd Ave., Elmwood Park, Ill. 60635
Filed Sep. 16, 1981, Ser. No. 302,828
Int. Cl.⁴ A63F *3/06*
U.S. Cl. 273—240 **12 Claims**



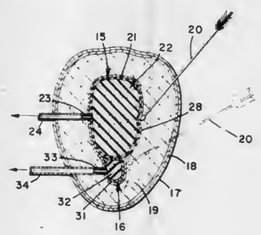
1. A bingo game card holder comprising:
means defining a base having a plurality of upwardly opening pockets adapted to receive one each a plurality of bingo game cards in laterally related disposition for viewing of the plurality of cards by a player;
light-transmissive cover means for covering the bingo game cards received in said pockets while permitting reading of the cards therethrough, said cover means defining an upper writing surface constructed to be marked by conventional erasable marking means to identify called numbers appearing on the cards in said pockets; and
means at opposite portions of said cover means for releasably retaining said cover means on said base in overlying relationship to said pockets for retaining the cards therein.

4,630,831
TILE GAME
Cecine B. Stadden, 169 Giffin, Los Altos, Calif. 94022
Filed Apr. 19, 1985, Ser. No. 725,224
Int. Cl.⁴ A63F *9/20*
U.S. Cl. 273—292 **7 Claims**



1. A process for playing a game, which comprises providing a first plurality of tiles bearing first indicia, a second plurality of tiles bearing second indicia and a third plurality of tiles bearing third indicia, the first, second and third pluralties of tiles being distinguishable into a set for each player, at least the first indicia having scoring significance, assigning a set of the tiles to each player, distributing at least some of the first plurality of tiles to each player, forming strings of the first plurality of tiles by each player in turn connecting a tile of the first plurality to a previsouly played tile of the first plurality by matching at least a part of the indicia between the tiles of the first plurality, drawing one of said second and third plurality of tiles after forming a string, validating a string in turn by attaching at least one of the drawn second and third plurality of tiles on the string, and cancelling the validated string of an opponent in turn by attaching at least one of the third plurality of tiles to the validated string, the players being required to play their playable tiles of the first plurality, but having discretion to withhold playing their tiles of the second and third plurality of tiles.

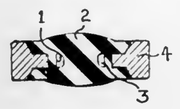
4,630,832
PROJECTILE SENSING TARGET
Dale A. Swanson, 6106 Birch Rd., Prior Lake, Minn. 55372
Filed Aug. 14, 1984, Ser. No. 640,924
Int. Cl.⁴ F41J *5/04*
U.S. Cl. 273—374 **21 Claims**



1. Apparatus for sensing the impact of a projectile, comprising:
a target area to be hit by a projectile;
a hollow projectile impenetrable member disposed to be impacted by a projectile which has hit said target area and having an enclosed chamber defined at least in part by a movable wall, the movable wall having a predetermined normal position and being constructed and arranged for movement to permit the chamber to be reduced in size upon impact by a projectile;
the hollow member having an air outlet from which a pulse of air can escape when the size of the chamber is reduced;
resilient means disposed within the chamber and operatively engaging the movable wall for urging the movable wall toward its normal position after impact by a projectile;
sensor means operatively connected to the hollow member for sensing a pulse of air and generating an indicator signal in response thereto indicating a score;
said hollow member and sensor means defining an open pneumatic circuit, said open pneumatic circuit having an air passage in air flow communication with atmospheric air to admit atmospheric air into the open pneumatic circuit as the resilient means urges the movable wall toward its normal position;
said sensor means including means for sensing said pulse of air escaping said circuit.

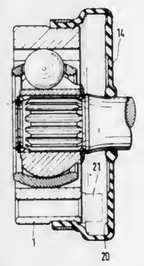
4,630,833
MOLDED RING SEAL WITH END SUPPORT RINGS
William G. Boyle, Dallas, and Ernest P. Fisher, Jr., Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.
Division of Ser. No. 459,058, Jan. 19, 1983, Pat. No. 4,483,543.
This application Sep. 7, 1984, Ser. No. 648,084
Int. Cl.⁴ F16J *15/12*
U.S. Cl. 277—188 A **32 Claims**

1. A seal ring comprising end support rings having the same diameters, each support ring having a substantially flat outer end and inner end surfaces with openings therein, one support ring connected to each end of an elongate generally cylindrical resilient material portion by forming said material in said openings and said portion in a mold, said resilient material portion having a cylindrical end section, a middle contoured ring section and another cylindrical end section wherein the outside of said contoured ring section curves radially outward from the outside of one of said cylindrical end sections to a larger diameter and curves radially inward from said larger diameter to the outside of the other end section, and the inside of said



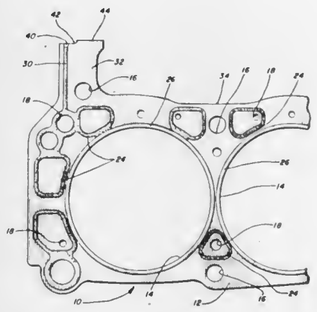
contoured section curves radially inward from the inside of one of said cylindrical end sections to a smaller diameter and curves radially outward from said smaller diameter to the inside of the other cylindrical end section, and said inward and outward curves are blending radii tangent to lines forming angles of 5 to 30 degrees, preferably 15 degrees, with the outside and inside surfaces of said cylindrical end sections.

4,630,834
SEALING ASSEMBLY FOR UNIVERSAL JOINT
Karl-Heinz Müller, Wissen, and Alfons Jordan, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany
Continuation of Ser. No. 517,466, Jul. 26, 1983, abandoned. This application May 20, 1985, Ser. No. 736,415
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227969
Int. Cl.⁴ F16J *15/52*
U.S. Cl. 277—212 FB **6 Claims**



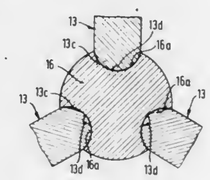
1. A sealing assembly for a rotary universal joint including an outer joint member and an inner joint member arranged in torque-transmitting engagement with each other, with a shaft part in rotative driving engagement with said inner joint member, said sealing assembly comprising: an annular disc made of resilient material extending in sealing engagement between said inner joint member and said outer joint member; an annular collar on the radially outer edge of said annular disc secured in sealing engagement with said outer joint member; a central bore formed with a diameter smaller than the diameter of said shaft part having said shaft part extending therethrough in sealing engagement therewith; a reinforcing annular portion of enlarged thickness having a rotund cross-sectional configuration extending circumferentially around said central bore immediately adjacent thereto arranged in press-fitted engagement around said shaft part; and a plicated configuration formed in the region of the radially outermost portion of said disc to absorb deflecting forces applied to said disc as a result of relative movement between said shaft part and said outer joint member; said reinforcing annular portion being shaped to define a convexly curved outer configuration in abutting engagement with said shaft part and said shaft part being formed with a smooth continuous cylindrical surface along which said abutting engagement is maintained to effect a rolling contact between said reinforcing annular portion and said shaft part thereby to insure continued sealing engagement therebetween during relative movement between said shaft part and said outer joint member.

4,630,835
HEAD GASKET AND SEALING ASSEMBLY FOR A V-ENGINE AT THE INTERSECTION OF A BLOCK, A HEAD AND AN INTAKE MANIFOLD COVER
Robert F. Locacius, Lake Zurich, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.
Filed Mar. 13, 1986, Ser. No. 839,103
Int. Cl.⁴ F16J *15/12*
U.S. Cl. 277—235 B **8 Claims**



1. A sealing gasket comprising
an elongated main body portion having a pair of spaced ends and a pair of spaced sides,
an opening defined by said main body portion,
an elongated sealing bead disposed on said main body portion and terminating just short of a peripheral edge of said main body portion, and
an embossment on said main body portion, said embossment extending inwardly from said peripheral edge in line with said sealing bead and merging into said sealing bead.

4,630,836
DRILL CHUCK FOR USE IN PERCUSSION DRILLING
Josef Hunger, Olching, and Anton Neumaier, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Liechtenstein
Continuation of Ser. No. 589,874, Mar. 15, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,833
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310147
Int. Cl.⁴ B23B *31/04*
U.S. Cl. 279—19 **2 Claims**



1. A chuck for a drilling device operable for rotary drilling and rotary/percussion drilling, in the manner of a hammer drill, comprising axially extending chuck means forming an axially extending central opening for receiving a drilling tool, at least two radially adjustable clamping jaws elongated in the axial direction of said chuck means mounted in said chuck

means and each having a clamping surface facing inwardly toward the center of the drill opening, said clamping surfaces being arcuately convex in the direction transverse to the axial direction of said chuck means and having a radius of curvature, wherein the improvement comprises that each said clamping surface has the same radius of curvature, the most radially inward portion of said convexly shaped surface of each said clamping jaw has a notch formed therein extending in the axial direction of said chuck means for approximately the full axial length of said clamping jaw, said notch is V-shaped in the transverse direction, the included angle of said notch is in the range of 60° to 120°, said V-shaped notch having a pair of edges spaced apart with said edges being located at the transition from said notch to said arcuately convex clamping surface, and the spacing in the circumferential direction relative to the axis of said chuck means between said edges being in the range of 0.25 to 0.6 times the radius of the arcuately convexly shaped clamping surface whereby said clamping jaws can be used with the edges of said notches gripping the shank of a drilling tool or with the clamping jaws fitted in correspondingly shaped recesses in the shank of a drilling tool.

4,630,837

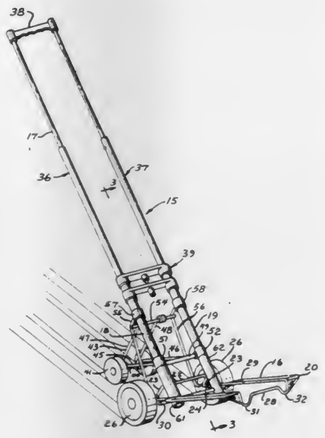
TWO-WHEELED CART WITH AUXILIARY WHEEL

Eugene A. Kazmark, 5 Remin La., Joliet, Ill. 60433

Continuation-in-part of Ser. No. 507,764, Jun. 27, 1983, abandoned. This application Jun. 14, 1984, Ser. No. 620,753

Int. Cl.⁴ B62B *1/04*

U.S. Cl. 280—47.2 **2 Claims**



1. A cart for transporting articles such as luggage and the like comprising a base portion for supporting an article to be transported, a handle portion extending upwardly from the base portion, an axle mounted on the base portion, a pair of wheels mounted on the axle, an auxiliary wheel frame movably mounted on the cart for movement between a storage position and a supporting position, and an auxiliary wheel mounted on the auxiliary wheel frame, the auxiliary wheel supporting the handle portion at an acute angle with respect to a supporting surface when the auxiliary wheel frame is in its support position whereby the cart is self-supporting, said auxiliary wheel frame including a generally U-shaped rod which is connected to the base portion for pivotal movement with respect to the base portion, a first support arm which is pivotally attached to the U-shaped rod, a second support arm which is pivotally attached to the base portion, pivot means mounted on one of the support arms for pivotally attaching said one support arm to the other support arm, the first and second support arms being movable between a first portion in which they support the auxiliary wheel frame in its support position and a second position in which the auxiliary wheel frame can move to its storage position, and means for releasably locking the first and second support arms in their first position, the base portion including a pair of parallel tubes, said axle extending between and being connected to said parallel tubes, said U-shaped rod being pivotally connected to said axle, a generally L-shaped rod attached to each of the parallel tubes and to the axle, a rod extending generally perpendicularly to the parallel tubes and being connected to said L-shaped rods, said second support arm being pivotally connected to said perpendicularly extending rod.

4,630,838

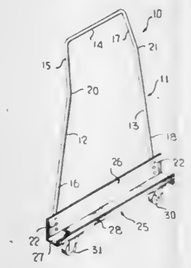
CARRIER FOR SHEET MATERIAL, WALL PANELING OR THE LIKE

Edward Stockton, 5202 Meyers Ave., Eureka, Calif. 95501

Filed Sep. 10, 1984, Ser. No. 648,985

Int. Cl.⁴ B62B *3/10*

U.S. Cl. 280—47.17 **7 Claims**



1. A carrier particularly adapted for transporting relatively large sheets of relatively thin material such as wall panelling, wallboard, composite board, sheetrock or the like comprising a generally inverted U-shaped handle defined by a pair of legs spanned at upper ends thereof by a gripping handle portion, each leg having upper and lower leg portions integrally joined to each other by a radius portion therebetween, said lower leg portions being disposed in a generally common first plane, said upper leg portions being disposed in a generally common second plane, said first and second planes being disposed at an included acute angle to each other as established by said radius portions, said lower leg portions being further disposed in upwardly converging relationship to each other, said lower leg portions having lower ends, means carried by said lower ends in spanning relationship thereto for edge-supporting thereupon relatively large sheets of relatively thin material, said edge-supporting means including an elongated bar of a generally L-shaped cross-sectional configuration defined by a generally vertically disposed spanning leg and a generally horizontally disposed relatively narrow supporting leg, means for securing said spanning leg to each of said leg lower ends, said elongated bar having opposite ends, means at one of said elongated bar ends for abuttingly contacting upright edges of sheets supported upon said narrow supporting leg when said narrow supporting leg is inclined to the horizontal thereby preventing sheets from sliding edgewise off said narrow supporting leg, said upright edges contacting means including an abutment plate disposed in generally transverse relationship to the longitudinal axis of said elongated bar, and means for eccentrically pivotally mounting said abutment plate relative to said elongated bar for movement of said abutment plate between a first inoperative position at which said abutment plate is disposed generally below a plane through an upper surface of said supporting leg and a second operative position at which said abutment plate is disposed generally above said upper surface plane.

4,630,839

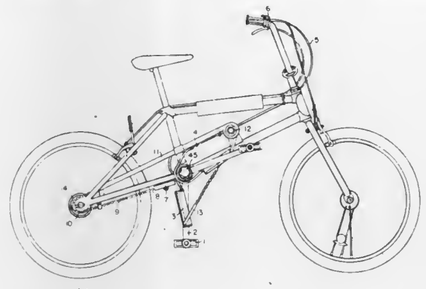
PROPULSION MECHANISM FOR LEVER PROPELLED BICYCLES

Marn T. Seol, Rochester, N.Y., assignor to Alenax Corp., Rochester, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,995

Int. Cl.⁴ B62M *1/04*

U.S. Cl. 280—255 **34 Claims**



1. A propulsion mechanism for a lever propelled bicycle having a frame with main and rear shaft receiving portions, pedal lever assemblies including speed change devices, said assemblies being pivotally mounted in said main shaft portion, a rear axle mounted in said rear shaft portion, a rear wheel hub journalled on said rear axle, a pair of sprockets also journalled on said rear axle, a pair of one-way clutches for connecting said sprockets to said hub, said propulsion mechanism being characterized in that:

a chain of flexible material is entrained in a loop extending between each of said lever assemblies' speed change devices and around said sprockets enabling the pedal levers to execute see-saw motion as said levers are oscillated upwardly and downwardly by force applied to the pedals thereof;

a pair of pawl and ratchet mechanisms is provided in each of said one-way clutches, one of which effects locking of the clutch to impart forward motion when said pedal levers are depressed downwardly and the other of which effects release of said clutch to enable said bicycle to be rolled backwards; and

each of said speed change devices having a housing having a surface extending away from said main shaft to define the length of the lever arm of said pedal lever assemblies to said main shaft, a plurality of pawls pivotally mounted in said housing to move transversely to said surface and define a plurality of locations each at a different lever arm length, a speed selection bar for pivoting said pawls, and a link connected to an end of the chain and moveable along said surface between different ones of said locations.

4,630,840

VEHICLE HEIGHT ADJUSTING DEVICE

Mitsuhiro Masuda; Osamu Igarashi, and Keiichi Tokuyama, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1985, Ser. No. 804,937

Claims priority, application Japan, Dec. 7, 1984, 59-257613; Feb. 1, 1985, 60-16561

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—707 **3 Claims**

1. A vehicle height adjusting device comprising:

a vehicle height sensor for sensing the height of a vehicle;

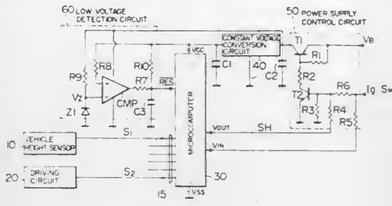
means for controlling the vehicle height which produces a vehicle height adjusting signal in response to the signal from the vehicle height sensor;

driving means for adjusting the vehicle height in response to the vehicle height adjusting signal;

constant voltage conversion means for converting a power supply voltage into a constant voltage and supplying the constant voltage to said vehicle height control means;

power supply control means for on-off controlling the supply of the power supply voltage in accordance with the turn-on and turn-off of an ignition switch;

means for stopping the power supply by a power supply stopping signal from said vehicle height control means when a predetermined time elapses after the ignition switch is turned off; and



low voltage detecting means for stopping the operation of said vehicle height control means when the power supply is stopped and the output voltage from said constant voltage conversion means becomes lower than a predetermined reference voltage.

4,630,841

WEBBING TENSION ADJUSTING APPARATUS

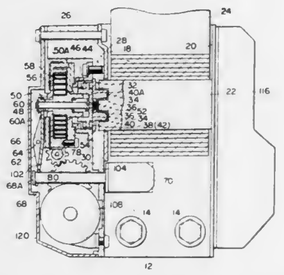
Yuji Nishimura; Shinji Mori, and Teruhiko Kawaguchi, all of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jun. 3, 1985, Ser. No. 740,426

Claims priority, application Japan, Jun. 7, 1984, 59-85237[U]

Int. Cl.⁴ A62B *35/02*

U.S. Cl. 280—806 **22 Claims**



11. A webbing tension adjusting apparatus for use in a seat-belt system designed to protect an occupant of a vehicle, said apparatus comprising:

(a) a frame secured to the body of said vehicle;

(b) a takeup shaft rotatably supported by said frame to wind up an occupant restraining webbing;

(c) a spring case supported by said frame;

(d) a spiral spring housed in said spring case and having its outer end retained by said spring case;

(e) a rotating shaft connected with the inner end of said spiral spring;

(f) a clutch plate connected to said rotating shaft to receive the biasing force of said spiral spring, said clutch plate being movable relative to said rotating shaft in the axial direction thereof;

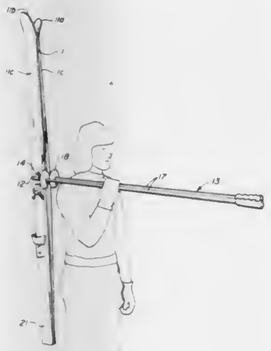
(g) engagement means provided between said clutch plate and said takeup shaft to transmit the biasing force of said spiral spring to said takeup shaft;

(h) driving means for moving said clutch plate relative to

said rotating shaft in the axial direction thereof when an associated door is opened to thereby disengage said engagement means, whereby it is possible for said door to be smoothly opened, and the friction occurring between said webbing and the body of said occupant is reduced; and

(i) winding means for winding up said spiral spring by driving said spring case.

4,630,842
METHOD AND APPARATUS FOR CARRYING SNOW SKIS
Gary E. Roda, 367 Rugby Ave., Berkeley, Calif. 94708
Filed Aug. 2, 1985, Ser. No. 761,693
Int. Cl.[4] A63C *11/02*
U.S. Cl. 280—814 **5 Claims**



1. In combination with a snow ski having a top surface and a longitudinal axis, and a ski pole having a generally cylindrical tip portion, a ski carrier accessory comprising:

a ski pole tip receiver means rigidly and non-rotatably secured to the top surface of the ski, said means defining a generally cylindrical space sized to receive and retain the cylindrical ski pole tip potion in close co-axial relationship wherein the axis of the cylindrical space is generally perpendicular to the longitudinal axis of the ski and generally parallel to the top surface of the ski

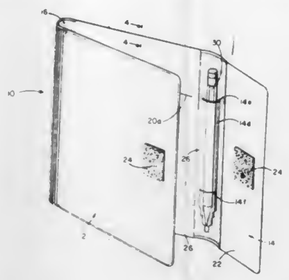
whereby when the ski pole tip portion is inserted in the generally cylindrical space of the receiver means affixed to the top surface of the ski, the ski pole is effectively secured to the ski at a right angle to the longitudinal axis of the ski which orients the ski generally vertically along a skier's back when the ski pole is supported on the skier's shoulder.

4,630,843
BINDER
Boyd Willat, Los Angeles, Calif., assignor to Harper House, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 427,559, Sep. 27, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,628
Int. Cl.[4] B42D *3/06, 3/12;* B32B *31/00;* F16C *11/00*
U.S. Cl. 281—30 **23 Claims**

1. A durable binder for holding papers and the like, said binder comprising:

an exterior plastic cover sheet;

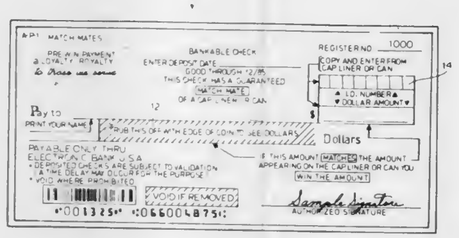
an interior plastic cover sheet overlying said exterior cover sheet, said cover sheets being attached to each other along their respective peripheries and being foldable together to define relatively rigid panels separated by at least one flexible hinge panel, said hinge panel being characterized by a multitude of minute separated depressed areas in which said cover sheets are connected, said depressed areas being surrounded by intersecting raised areas, said



cover sheets being connected by heat sealing in said depressed areas; and

means for releasably retaining said pages between said panels.

4,630,844
TWO-STEP BANK DRAFT
Seymour L. Troy, and Kenneth E. Mullenix, both of P.O. Box 5027, Ft. Lauderdale, Fla. 33310
Filed Jul. 24, 1985, Ser. No. 758,511
Int. Cl.[4] B42D *15/00;* A63F *1/18;* G06F *15/20*
U.S. Cl. 283—67 **6 Claims**



1. A sales promotional check for direct deposit or cashing at a bank as a bankable item comprising:

a preprinted sheet having at least a portion which conforms to a bankable bank draft and having a first dollar amount and means for receiving a second dollar amount and an identification number;

identifying information obtained from an outside commercial source affixed to the preprinted sheet to complete the bankable bank draft, the identifying information comprising the second dollar amount which matches the first dollar amount, and the identification number; and

verifying means for verifying that the identifying information affixed to the preprinted sheet was obtained from a proper source.

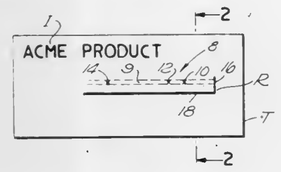
6. A method of providing a redeemable bank draft comprising the steps of:

providing a preprinted portion of a bank draft to a participant having a first dollar amount printed thereon and having spaces for a second dollar amount and an identification number;

placing the second dollar amount which matches the first dollar amount, and the identification number for verifying the second dollar amount, on an outside commercial source;

combining the second dollar amount and the identification number from the outside source with the preprinted portion of a bank draft to form a bankable bank draft; and validating and paying the bankable bank draft.

4,630,845
AUTHENTICATION DOCUMENT SYSTEM
M. Duane Sanner, Irvine, Tex., assignor to Light Signatures, Inc., Los Angeles, Calif.
Filed Aug. 25, 1983, Ser. No. 526,185
Int. Cl.[4] B42D *15/00;* G07D *7/00*
U.S. Cl. 283—91 **8 Claims**

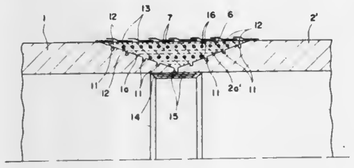


1. An authenticator device as for verifying authenticity comprising:

a sheet (T) of medium including a section (8) that exhibits an optically sensible characteristic of distinction to identify the authentication device; and

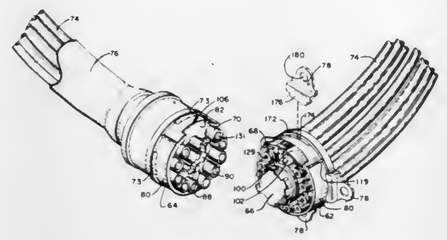
a magnetic-ink mark (R) on said sheet of medium including an elongate extension (18), said mark (18) being of a shape to optically specify boundaries of a predetermined portion of said section (8) on said sheet in the form of a scansion line (9) for optical sensing, said mark (R) further being selectively magnetized to record signals representative of said characteristic in said scansion line (9) whereby to identify the authentication device.

4,630,846
PIPE JOINT
Yoshinori Nishino, Yamato-takada; Masahiko Yamamoto, Nishinomiya; Tadayoshi Uda, Izumi, and Tomoyoshi Kanazawa, Kobe, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan
Filed Apr. 7, 1983, Ser. No. 482,840
Int. Cl.[4] F16L *47/02*
U.S. Cl. 285—21 **13 Claims**



1. A pipe joint for connecting the opposed ends of two pipes to each other, said pipe joint comprising a connecting resin body extending over the outer peripheries of the opposed pipe ends and formed by the application of resin thereto, and a releasable tape wound on the outer periphery of said resin body while said resin is uncured, said tape having overlapping side edges with a clearance therebetween, said clearance permitting the outward flow of excess resin to smooth the outer periphery of said resin body.

4,630,847
MULTIPLE TUBE CONNECTOR
Brian J. Blenkush, Maple Grove, Minn., assignor to Colder Products Company, St. Paul, Minn.
Filed Oct. 5, 1984, Ser. No. 658,271
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—29 **22 Claims**



1. A multiple tube connector, comprising:

(a) a first cylindrical connector housing having an axially extending, outer rim portion interconnected to a transversely extending wall portion, the wall portion having an aperture substantially coaxial with respect to the rim portion, a plurality of apertures of lesser diameter than the coaxial aperture being disposed in the wall portion circumferentially about a major portion of the coaxial aperture, the coaxial aperture including a plurality of inwardly projecting, evenly spaced apart and substantially identical spline members, the spline members defining a plurality of axially extending keyways therebetween;

(b) a second cylindrical connector housing substantially identical to the first cylindrical connector housing;

(c) a plurality of axially extending hollow male and female inserts removably positioned in at least some of the apertures of lesser diameter, a first end of the female inserts being adapted to receive a first end of the corresponding male inserts when the first and second connector housings are placed in an abutting relationship, a second end of the male and female inserts being configured for insertion into a tube; and

(d) a cylindrical locking spindle being rotatably retained proximate a first end in the first connector housing, the locking spindle defining proximate a second end a plurality of evenly spaced apart, outwardly projecting and substantially identical spline members, axially extending keyways being defined between the spline members, the locking spindle being interconnected by an elongated radially extending shaft to manually activated switch means for rotating the locking spindle between a first released position and a second locked position, the splines of the locking spindle cooperating with the key ways of the second connector housing to enable partial insertion of the locking spindle through the coaxial aperture of the second connector housing so as to place the first and second connector housings in an abutting relationship when in the first released position, the splines of the locking spindle cooperating with the splines of the second connector housing to lock the first and second connector housings together in an abutting relationship when in the second locked position, the rim portions of the first and second connector housings being cut away along a predetermined circumferential extent and the wall portions of the first and second connector housings being void of the apertures of lesser diameter along a corresponding extent to enable a predetermined amount of pivotal motion of the elongated shaft, the elongated shaft and the splines of the locking spindle cooperating with the first and second connector housings to provide a keying feature whereby proper matching of the respective male and female inserts is assured upon positioning of the first and second connector housings in an abutting relationship.

4,630,848

RELEASABLE COUPLING FOR TUBES OR PIPES

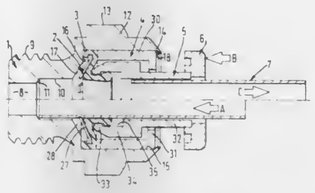
Michael Twist, Manchester, and Paul Mundy, Ashton-Under-Lyne, both of England, assignors to Hawke Cable Glands Limited, Lancashire, England

Filed May 29, 1985, Ser. No. 739,041

Claims priority, application United Kingdom, Jun. 13, 1984, 8415098

Int. Cl.⁴ F16L *37/00*

U.S. Cl. 285—308 **7 Claims**



1. A releasable coupling for connecting a tube or pipe to a coupling body, said coupling providing a through bore with an entry for said tube and comprising a body providing a housing in which is received a seal of generally Z-shape in section and a clamping ring having a plurality of teeth for engagement with a tube received within the body, a retainer located in said housing to retain said seal and clamping ring therein, a releaser having an inner portion extending within said housing and an outer portion projecting from said body, said releaser being mounted and located by said retainer for limited axial movement relative to said body, said seal having a first outer annular flange portion engaging said housing, a second inner annular flange portion for engagement with said tube and said first and second flange portions extending in opposed senses, said seal having a web connected to and extending between said first and second flange portions with said web converging away from said entry, said clamping ring being in located engagement with said first flange portion of said seal with said teeth projecting radially inwards and overlying said web on the face opposed to said releaser, the arrangement being such that, in use with a tube received within said coupling, on moving said releaser axially inwards of said entry, said releaser acts through said seal to displace said teeth away from said tube into a clearance in said housing thereby releasing said tube for axial withdrawal from said entry.

4,630,849

OIL WELL PIPE JOINT

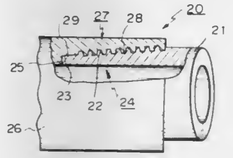
Kunihiro Fukui, Kawanishi; Minoru Nishihara, Kyoto; Toshiro Mase, Ashiya; Yoshiyasu Morita, Nara, and Hisakazu Kawashima, Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1985, Ser. No. 716,765

Claims priority, application Japan, Mar. 29, 1984, 59-62629

Int. Cl.⁴ F16L *9/14*

U.S. Cl. 285—55 **10 Claims**



1. An oil well pipe joint having a metal-to-metal sealing portion, which comprises:

an externally-threaded pipe member including at the outer end a lip portion having a peripheral surface free from threads; and

an internally-threaded pipe member including at the inner end an inner surface which corresponds to said peripheral surface and which is free from threads;

characterized in that a galling resistant layer exhibiting improved resistance to galling is provided only on said externally-threaded pipe member and at least on the threadfree lip portion thereof.

4,630,850

PIPE JOINT

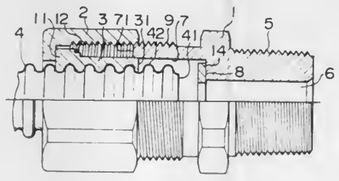
Yoshimi Saka, Suzuka, Japan, assignor to Hitachi Metals, LTD, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,736

Claims priority, application Japan, Sep. 30, 1983, 58-180637

Int. Cl.⁴ F16L *21/06*

U.S. Cl. 285—322 **13 Claims**



1. Apparatus for sealingly coupling to a free end of a flexible corrugated tubing, the tubing free end having an axially directed face, the apparatus comprising:

a body having an axial, generally straight through-bore portion terminating at an inner annular shoulder with an axial sealing face, and a threaded outer surface;

a sleeve having an inner corrugated surface complementing the outer surface of the tubing to be coupled and having an axially straight outer surface radially opposed to said inner corrugated surface and disposed in sliding engagement with said axial bore portion, said sleeve also having at least one axial slit extending through the sleeve wall; and

a cap nut overlying said sleeve and having a threaded inner surface engaging said body outer threaded surface,

said cap further including a flange engaging said sleeve member for urging said sleeve into said axial bore portion toward said shoulder upon rotation of said cap,

said axial bore portion being tapered relative to said sleeve outer surface to converge in the direction toward said shoulder,

whereby during coupling operation rotation of said cap nut, acting through said sleeve member, will force the tubing end face into axial sealing engagement with said shoulder and simultaneously force said slit sleeve into radial pressing engagement with the outer surface of the corrugated tubing.

4,630,851

PIPE COUPLINGS

Susumu Ogawa, Osaka, Japan, assignor to Fujikin International, Inc., Osaka, Japan

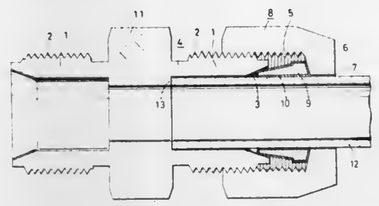
Filed Mar. 30, 1983, Ser. No. 480,235

Claims priority, application Japan, Mar. 30, 1982, 57-46747[U]

Int. Cl.⁴ F16L *19/08*

U.S. Cl. 285—341 **3 Claims**

1. A pipe coupling comprising a hollow main body having two ends, at least one of the ends having an externally threaded portion and a tapered portion on its inner surface; a cap nut having an internally threaded portion engageable with the externally threaded portion of the main body and a pipe passing bore formed in the center of its top wall; a sleeve provided on its outer surface with a tapered portion for engagement with said tapered portion of said hollow main body, said tapered portion of said sleeve for engagement with said tapered portion of said hollow main body having a smaller angle of inclination than the angle of inclination of said tapered portion of the main body, the sleeve being formed with a ceramic



coating layer over its entire surface, the main component of said ceramic coating layer being selected from the group consisting of TiC, $A1_2O_3$ and TiN, the ceramic coated leading edge of the inner surface at said tapered portion of said sleeve biting into the outer surface of the pipe coupled therewith and forming a firm, sealing connection with said pipe without pipe seizure.

4,630,852

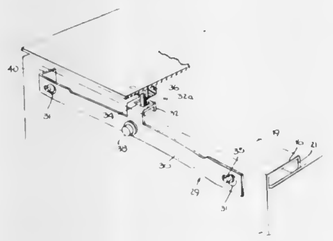
LATCHING MECHANISM

Robert M. White, Wilkes-Barre, and Rodney E. Brancher, Wyoming, both of Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed May 1, 1985, Ser. No. 729,217

Int. Cl.⁴ E05C *19/06*

U.S. Cl. 292—87 **8 Claims**



1. A latching mechanism for latching and unlatching a panel movable relative to a stationary panel of a container, said latching mechanism comprising:

latch means secured to one of said panels;

means defining an opening in the other of said panels through which opening said latch means extends when said movable panel is in container-closing position;

a latch keeper including an elongate portion formed with a slot at each end thereof;

means removably mounting said keeper in operative position with said other of said panels, said keeper being mounted by said mounting means for movement between a latching position engaging and retaining said latch means when said movable panel is in container-closing position and a latch-releasing position releasing said latch means to permit said movable panel to move away from said stationary panel, said mounting means including a pair of headed studs fixed to said other panel, each stud being formed to enter and to disengage from one of said slots removably to position said keeper in said operative position, said studs and said slots being formed to permit manual shifting of said keeper from said operative position for disengagement from said other of said panels by disengaging said studs from said slots; and

keeper actuating means operable to move said latch keeper, mounted by said mounting means, to said latch-releasing position, said mounting means and keeper cooperating to maintain said keeper in said operative position.

4,630,853

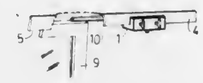
LOCK FOR SLIDING DOORS

L. James Bell, Willowdale, Canada, assignor to O. Ruben Pettersson, Toronto, Canada

Filed Mar. 29, 1985, Ser. No. 718,120

Int. Cl.⁴ E05C *19/18*

U.S. Cl. 292—258 **1 Claim**



1. An auxiliary locking device (as recited in claim 2,) for a sliding door, comprising:

a blocking member having an upward-opening longitudinal channel near its inner side for receiving the inner frame member of the sliding door channel;

at least one clamping screw protruding through threaded hole(s) in the inner side of said blocking member into said longitudinal channel, for clamping said blocking member to said inner frame member of said sliding door with the outer portion of said blocking member protruding into the sliding door channel for blocking sliding of said sliding door, thereby preventing opening of the door past the blocking member location;

a rod projecting from the outer portion of said blocking member for positioning along said sliding door channel above said sliding door when said device is installed, for thereby preventing said sliding door from being lifted out of its channel for removal;

in which said outer portion of said blocking member is provided with an upward-opening channel, in which said rod is L-shaped, in which the rod portion constituting the base of said L-shape extends through a hole passing downwardly through said outer portion of said blocking member in said channel, and in which spring means are provided between said rod and said blocking member for biasing said rod into said channel, whereby said rod may be lifted from said channel against said spring force to swing said rod to project from said blocking member in either direction of said channel.

4,630,854

SECURITY DEVICE

Tor Persson, and Gerthy Persson, both of 594 Goddard Road, R.R. 1, Nelson, British Columbia, Canada (V1L 5P4)

Filed Aug. 30, 1985, Ser. No. 771,323

Int. Cl.⁴ E05C *17/54*

U.S. Cl. 292—343 **4 Claims**

1. A security device comprising:

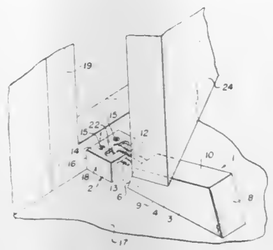
a wedge to contact a door to restrict opening of the door, the wedge including a first end and a second end and an upper surface, the upper surface sloping upwardly from the first end to the second end;

an anchor to be attached adjacent the door;

a slot in the anchor of predetermined length and width, the slot being generally aligned parallel to the door when attached adjacent the door;

a catch member attached to the wedge and comprising a limb extending longitudinally outwardly from the first end of the wedge with a hook on the limb, remote from the wedge, the hook having a length and width less than said predetermined length and width; whereby to restrict opening of the door, the hook is engaged in the slot, with

the hook and the limb lying widthwise of the slot, release of the wedge to enable opening of the door being achieved



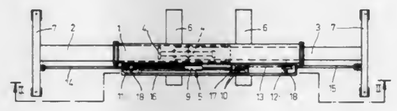
by moving the wedge so the hook portion lies along the slot and can be removed through the slot.

4,630,855

LIFTING YOKE FOR CONTAINERS

Anders Bjurling, Skultuna, Sweden, assignor to Dynatrans Technology Ltd., Douglas, Sweden

Filed Sep. 20, 1985, Ser. No. 778,434
Int. Cl.⁴ B66C *1/00*
U.S. Cl. 294—81.21 **4 Claims**



1. A lifting yoke for containers consisting of a central beam (1) and two extending beams (2, 3), which are coaxial with the central beam and guided therein for reciprocating movements and are equipped with means (7, 8) for gripping containers, one of said extending beams (3) being so arranged as to be capable of telescoping into the other (2), characterized in that a guide tube (4) coaxial with the extending beams (2, 3) and having a smaller cross-sectional area than the extending beam (3) with the smallest cross-sectional area thereby to produce a light yoke weight is arranged to connect the two extending beams in the position in which they are extended away from each other and, when they are telescoped one into the other, to guide one beam (3) into the other (2), and in that the central beam (1) and the extending beams have light weight telescoping reinforcing and load distributing means to increase the yoke capacity to bear transverse forces comprising beams of hexagonal cross-section with resulting transfer of transverse forces in the central section of the beam.

4,630,856

TWISTLOCK OPERATING MECHANISM

Jan A. Peeters Weem, Gresham; David E. Krueger, Mulino, and Dennis P. Graham, Milwaukie, all of Oreg., assignors to Hyster Company, Portland, Oreg.

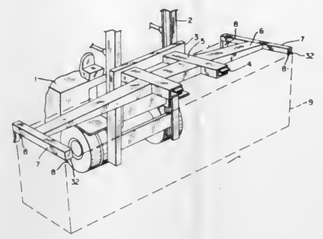
Filed Jan. 31, 1985, Ser. No. 697,039
Int. Cl.⁴ B66C *1/42*
U.S. Cl. 294—81.53 **14 Claims**

1. In a spreader, having a plurality of remotely rotatable twistlocks located for insertion in mating connectors on a container, a twistlock operating mechanism comprising:

(a) a means of directing pressurized fluid from a source to;

(b) the first of a plurality of fluid motors connected in series, each operatively coupled to rotate a twistlock; and

(c) a valve means, responsive to twistlock insertion in the corresponding mating connector for selectively blocking



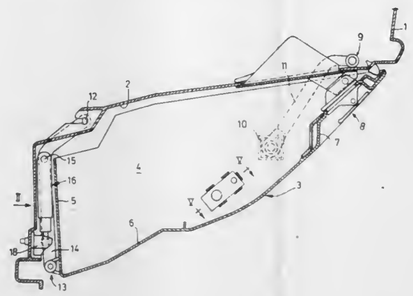
the flow of fluid through the motors if a twistlock is not properly inserted.

4,630,857

STORAGE APPARATUS FOR MOTOR VEHICLES

Hansjurgen Zweiniger, and Horst Willenbrock, both of Cologne, Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1985, Ser. No. 808,134
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445211
Int. Cl.⁴ B60R *7/06*
U.S. Cl. 296—37.12 **8 Claims**



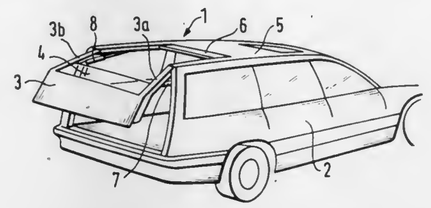
1. A storage apparatus carried inside interior panels of motor vehicles, having a storage container which is open toward the interior of the panel and which is movable forwardly and downwardly through a guide mechanism arranged in parallelogram fashion by overcoming dead center in a closed position flush with the panel wherein the storage container is spring-mounted by way of lever arms articulated on the panel at one end and on the storage container at the other end and which is operatively connected to a spring and shock absorber arrangement cooperating with the guide mechanism and which is lockable on stop means in an opened position projecting from the panel, characterized in that two forward, laterally outer lever arms and a rear, triangularly shaped lever arm disposed outside of and parallel to the approximately vertical rear wall of the storage container are provided, and a spring and bell-crank lever arrangement engages below on a support point mounting on the panel and above on a transverse bar of the triangularly shaped lever arm.

4,630,858

MULTI-PURPOSE PASSENGER MOTOR VEHICLE, ESPECIALLY STATION WAGON

Ulrich Bez, Poecking, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 739,023
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420349
Int. Cl.⁴ B60J *1/18*
U.S. Cl. 296—146 **15 Claims**



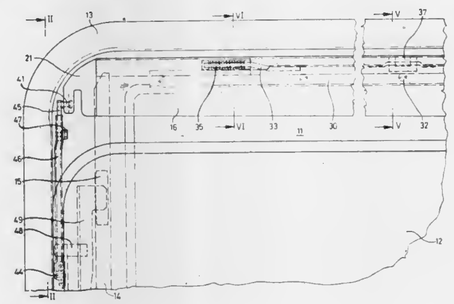
1. A multi-purpose passenger motor vehicle, comprising a rear door including a rear window means lowerable into the door, roof means including a movable rear roof section, against which the closed rear window means abuts, vehicle side walls devoid of any roof connection between the rear upper sections thereof, and means pivotally connecting the rear door in the upper rear end areas of the vehicle body side walls including two arms serving as window frame means for the rear window means, and wherein the upper pivotal ends of the two arms are unconnected with each other to define an open area with an area occupied by the movable roof section when the window is lowered and the roof section is moved.

4,630,859

WIND DEFLECTOR ARRANGEMENT FOR A MOTOR VEHICLE ROOF

Horst Bienert, Gauting, and Georg Kohlpaintner, Martinsried, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,907
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415361
Int. Cl.⁴ B60J *7/22*
U.S. Cl. 296—217 **21 Claims**



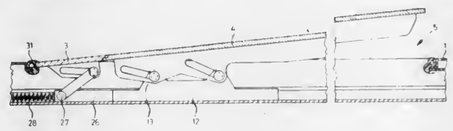
1. A wind deflector arrangement for a motor vehicle roof having a roof opening and a sliding cover for closing the roof opening comprising a wind deflector arranged along the front edge of the roof opening and mounted so as to pivot around an axis extending transversely to a longitudinal axis of the vehicle, and spring means for swinging said wind deflector out when the sliding cover is opened and cam means for swinging said wind deflector in when the sliding cover is closed, said cam means being displaceable as a function of the movement of the cover and interacting with at least one lever arm, said lever arm being connected with the wind deflector via a driving arrangement, wherein the wind deflector comprises a body formed at least partly of an as extruded, extruded profiled part side edges of which are covered by attachment to the body of a respective end piece which, at the same time, forms a part of the driving arrangement connecting the lever arm with the wind deflector.

4,630,860

VEHICLE ROOF COVER AND WIND DEFLECTOR

Arpad Fuerst, Munich, and Alfons Lutz, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,571
Int. Cl.⁴ B60J *7/22, 7/04, 7/047*
U.S. Cl. 296—217 **20 Claims**



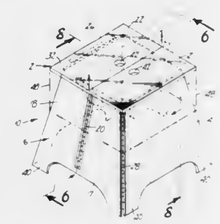
1. A vehicle roof having a cover which is mounted and arranged for being rearwardly slidable from a closed position into an open position along guide rails extending on longitudinally opposite sides of a roof opening, as well as having a wind deflector forming a part of the roof located in front of the cover that is mounted and arranged for being automatically raised and lowered as a function of the position of the cover, said wind deflector and cover closing the roof opening and being pivotable about an axis extending transversely relative to the sliding direction of the cover, wherein the cover is also mounted and arranged for being tilted out into a ventilating position in conjunction with said wind deflector in a manner whereby the cover and wind deflector together effectively form a single panel arrangement, the wind deflector being at least partially raised along with the tilting of the cover.

4,630,861

FOLDABLE STOOL

Reed E. Henschel, Rte. 4, Box 33, Sundance, Wyo. 82729

Filed Oct. 28, 1985, Ser. No. 792,303
Int. Cl.⁴ A47C *4/08*
U.S. Cl. 297—44 **4 Claims**



1. In connection with a folding stool movable between an upright and a folded condition, said stool having:

first and second nonfolding side walls,

a folding top wall including first and second nonfolding top half-walls and hinge means connecting these top half-walls to each other,

first and second folding end walls, each including first and second nonfolding half-walls and each including hinge means connecting its first and second end half-walls to each other,

hinge means conneting each first half-wall to said first side wall, and

hinge means connecting each second half-wall to said second side wall; the improvement wherein:

A. the top wall is provided with

(1) a lip extending outwardly around the outer horizontal periphery of the top wall as the top wall is viewed when the stool is in its upright condition with the top half-walls lying in a common horizontal plane, and

(2) a shoulder below and spaced inwardly of said lip around the outer periphery of the top wall;

B. said lip is so positioned as to lie in supported relation to the uppermost surface of each of said side walls and each of said end half-walls when said stool is in its upright condition;

C. said shoulder is so positioned as to lie in inward-movement-preventing contact with the uppermost inner edge of each of said side and end half-walls when said stool is in its upright condition;

D. each of said top half walls is movable into face-to-face relation with its hinged-together counterpart and said side walls being movable into parallel, spaced-apart relation to each other and in adjacent, closely spaced relation to said folded end walls to accomplish movement of said stool to said folded condition;

E. each of said end half-walls is movable into face-to-face relation with its hinged-together counterpart to lie entirely between the side walls;

F. said top wall shoulder is effective around substantially the entire periphery of the top wall to be in contacting relation with the top inner edge surface of each of said side walls and each of said end walls when said stool is in its upright condition;

G. those side-wall-contacting portions of the top wall shoulder in contact with each of said side walls each define a vertical plane coincident with substantially the entire top inner edge surface of such side wall when the stool is in its upright condition;

H. those end-wall-contacting portions of the top wall shoulder in contact with each of the folding end walls each define a vertical plane coincident with the top inner edge surface of its contacted end wall over a central hinged portion of such end wall when said stool is in its upright condition, only so much of said end-wall-contacting shoulder portions as are in adjacent relation to the side-wall-contacting shoulder portions being relieved as is needed to allow those portions of the top wall shoulder adjacent the hinged edges of the first and second end half-walls of each end wall to initially clear the tops of those end-walls as the stool is moved from upright toward folded condition; and

I. said top wall shoulder is relieved by providing four ramps which are formed by cutting away all four ends of the side-wall-contacting portions of the top wall shoulder by a dimension at least approximately equal to the depth of the shoulder and cutting away all four adjacent end-wall-contacting portions of the top wall shoulder so that such ramps taper into the end-wall-contacting portions of the top wall shoulder at a point at least approximately eight times the thickness of the shoulder from the side walls when the stool is in an upright condition.

4,630,862

DENTAL CHAIR

Minoru Watanabe, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

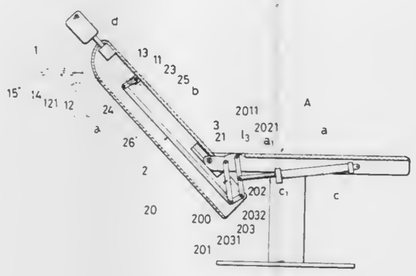
Filed Dec. 6, 1984, Ser. No. 678,661

Claims priority, application Japan, Dec. 10, 1983, 58-190749[U]

Int. Cl.⁴ A47B *39/00*

U.S. Cl. 297—167 **3 Claims**

1. A dental treatment chair including a seat, a backrest tiltably secured to the seat and a first drive means for tilting the backrest, said chair including a unit table having therein on the inside top thereof a first link rotatable with respect to the backrest in a vertical plane and journalled in the backrest by a first pin, said first link being kept always constant in the angle of incidence to the axis of the first link even when the backrest tilts so as to journal a horizontal rotary arm in the first link through a longitudinal shaft and to hold at the end of the arm the table rotatable in a horizontal plane around a support shaft, whereby even when the backrest tilts, the table is arranged to be held horizontally such that an operator is enabled to take a position convenient for making access to various dental tools on the table and to take a position opposite the table, a lower end of said backrest is journalled in the lower end of a frame member of the seat through a transverse shaft, while one end of a second link is pivotally connected to the swing end of the first link through a second pin and the other end of the second link is pivotally supported through a third pin by the rear the rear end of the frame member of the seat, and a first segment between the first and second pins and a second segment between the transverse shaft and the third pin are made equal in length and horizontal so as to compose a substantially parallel first linkage of the first link, frame member and backrest in the manner that the backrest is tilted with respect to the seat by cooperation between the actuation of a drive means for tilting the backrest and the action of the parallel first linkage to move the unit table up and down in the state of the table being kept



horizontal, third and fourth links of equal length with each other are pivotally supported by fourth and fifth pins, respectively, a fifth link equal in length to a third segment between the fourth and fifth pins is spanned between and pivotally connected to the lower ends of the third and fourth links through sixth and seventh pins to compose a parallel second linkage of the third and fourth links and a fifth link and a frame member on the underside of the seat and wherein one end of the seventh link is pivotally connected to swing end of the first link to a second pin and the other end of the seventh link is pivotally connected to the lower end of the third link and to one end of the fifth link through the sixth pin so as to compose a substantially parallel third linkage of the first, seventh and fifth links and the backrest inside the backrest in such a manner that the third and second linkages which are parallel, are joined by the fifth link to form a double parallel linkage and also where the backrest has a groove formed in the side thereof such that the transverse shaft fixed to the rear end of the frame member of the seat is slidably fitted into the groove to permit tilting of the backrest with respect to the seat and to permit vertical movement of the table when the table is kept horizontal under the cooperative control of the actuation of the drive means for tilting the backrest of the action of the double parallel linkage, and of the tilting of the transverse shaft with respect to the groove.

4,630,863

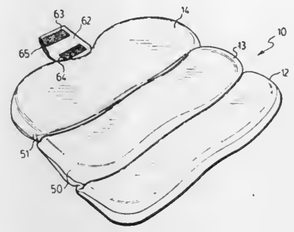
PORTABLE SEAT

Frank L. Roberts, Thornhill, Canada, assignor to Bio-Support Industries Ltd., Toronto, Canada

Filed Sep. 9, 1985, Ser. No. 773,716

Int. Cl.⁴ A47C *27/16*

U.S. Cl. 297—219 **9 Claims**



1. A portable seat comprising:

a rear portion having a forwardly facing transverse bounding margin;

a front portion having a rearwardly facing transverse bounding margin;

a mid portion having transverse bounding margins facing the respective bounding margins of said front portions and said rear portions;

each said portion consisting essentially of a rigid, resilient, unitary support layer and a foam layer overlaying each said support layering;

each said portion being completely surrounded by an upholstered finish, and

hinge means joining said portions along the length of the bounding margins thereof,

wherein each said support layer of each said portion has a central upstanding ridge which extends to its forward transverse bounding margin,

and wherein the lateral edges of each said support layer and the rear edge of the support layer of the rear portion are upturned,

and wherein the rearward transverse edge of the support layer of said rear portion has a V-shaped cut out therein centrally located thereon.

4,630,864

AIRCRAFT SEATS

Ian C. Toll, Poole, England, assignor to Futaire Limited, Poole, England

PCT No. PCT/GB84/00403, § 371 Date Jul. 2, 1985, § 102(e) Date Jul. 2, 1985, PCT Pub. No. WO85/02384, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 23, 1984, Ser. No. 751,051

Claims priority, application United Kingdom, Nov. 23, 1983, 8331260

Int. Cl.⁴ A47C *3/00*; B64D *11/06*

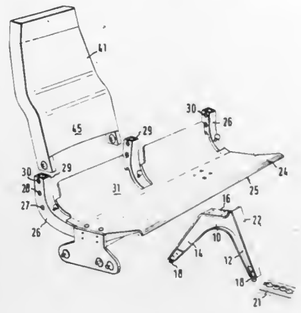
U.S. Cl. 297—232 **13 Claims**

1. A seat frame assembly for an aircraft seat comprising a single laterally extending spar, at least one leg assembly to support the spar from the aircraft floor, a plurality of generally J-shaped seat supports extending from one side of the spar at laterally spaced locations with their cranked rear ends directed upwardly to locate pivoting seat backs and seat cushion support means between the or each pair of seat supports, characterised in that:

(a) the seat supports extend unilaterally from the spar, and the spar and seat supports are formed with a skin of carbon fibre reinforced plastics and reinforcing cores of expanded material that prevent buckling of the spar and seat supports under load;

(b) the spar is of generally rectangular section with its width greater than its depth to present a flat upper surface;

(c) the apex of the or each leg assembly is formed with a cut-out in which the spar is located; and



(d) the seat cushion support means is a diaphragm supported upon the spar and the seat supports.

4,630,865

BACKREST ADJUSTING DEVICE

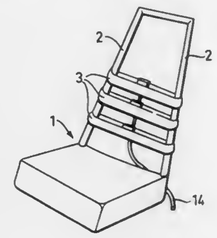
Wilgot Ahs, Koppom, Sweden, assignor to Erress, Hagfors, Sweden

Filed Nov. 23, 1983, Ser. No. 554,766

Claims priority, application Sweden, Nov. 24, 1982, 8206689

Int. Cl.⁴ A47C *3/00, 7/02*

U.S. Cl. 297—284 **14 Claims**



1. A device for adjusting the backrest of a seat, comprising:

first and second plates movable relative to one another, said first plate being connected by an adjustable belt to a rigid part of a first lateral edge of a seat back, said second plate being connected by the adjustable belt to a rigid part of a second lateral edge of the seat back, said first and second plates being oriented such that a side of the first plate substantially faces a side of the second plate;

spring means for adjusting the length of the adjustable belt between the lateral edges of the seat back;

a supporting member located outside of a space defined between said first and second plates for receiving means for pressing said plates into locking engagement with one another and with the supporting member.

4,630,866

SEAT RECLINE UNIT

Arthur H. McFarlane, Basildon, England, assignor to Morse Controls Limited, Basildon, England

Filed Mar. 11, 1985, Ser. No. 710,392

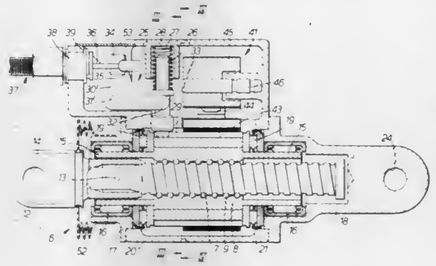
Claims priority, application United Kingdom, Mar. 14, 1984, 8406697

Int. Cl.⁴ B60N *1/02*; F16H *29/20*; F03G *1/00*

U.S. Cl. 297—361 **17 Claims**

1. A recline unit for the inclinable back rest of a seat, comprising a cooperating screw and nut means, mounting means for mounting the cooperating screw and nut means between

the back rest and a fixed part of the seat so that the recline unit is interposed as a strut therebetween, the cooperating screw and nut means when so mounted being responsive to the back rest being inclined such that relative axial movement occurs between the cooperating screw and nut means so varying the length of the strut in accordance with the inclination of the back rest with attendant relative rotational movement between



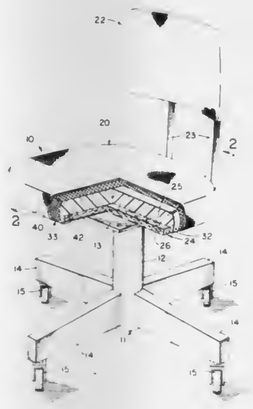
the cooperating screw and nut means, and torsion spring means strained in response to the cooperating screw and nut means making said relative rotational movement and operative to effect reverse relative rotational movement between the cooperating screw and nut means with attendant reverse relative axial movement thereof to cause opposite variation in the length of the strut and so return the back rest to a lesser inclination.

4,630,867

ELECTROSTATIC DISSIPATIVE CHAIR

Barron J. Gulliver, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Mar. 20, 1985, Ser. No. 714,006
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **10 Claims**



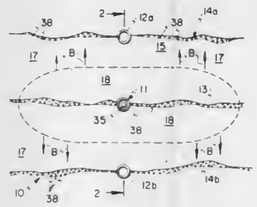
1. A seating device capable of dissipating an electrostatic charge received thereby, comprising:
- a supportive substrate having an upper surface;
- electrically conductive flexible mesh substantially enveloping said upper surface of said supportive substrate, said conductive mesh being suitable for receiving an electrostatic charge;
- separate electrically nonconductive cover means substantially entirely contiguous to said electrically conductive means, said cover means being physically independent from said conductive mesh; and,
- means for electrically communicating said conductive mesh with an electrical ground;
- wherein said supportive substrate presents a seating region, said conductive mesh being continuous throughout substantially the entire said seating region.

4,630,868

PROCESS FOR SOLUTION MINING

Arfon H. Jones, and Sidney J. Green, both of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 38,311, May 11, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,847
Int. Cl.[3] E21B *43/26*
U.S. Cl. 299—4 **8 Claims**



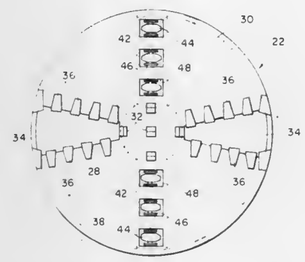
1. An improved method for in situ mining of a subsurface aggregate mineral deposit of low permeability comprising the steps of:
- locating a subsurface aggregate mineral deposit suitable for in situ mining;
- forming an injector well bore into said mineral deposit;
- packing off, at a desired depth within said mineral deposit, a portion of said injector well bore where fracture will be undertaken;
- positioning stress sensing means appropriate to said injector well bore, such stress sensing means for sensing pressure changes that result when said injector well bore is fractured for resolution into principal components for mathematically determining the direction of a major fracture induced in said injector well bore;
- fracturing said mineral deposit around said injector well bore by introducing a disintegrating solution under pressure as the pressure medium within the packed off area in said injector well bore, that also dissolves the aggregate bonding to open the deposit along the fracture;
- determining from the surface pressure changes sensed by said stress sensing means the direction of the major fracture emanating from said injector well bore;
- positioning at least one production well bore alongside said injector well bore such that a line through said production and injector well bores will be essentially normal to said major fracture, said production well bore being spaced appropriately from said injector well bore such that a flow of solution can be established between said well bores;
- packing off and fracturing, utilizing a disintegrating solution under pressure as the pressure medium, said production well bore at essentially the same depth as said injector well bore fracture, which disintegrating solution also dissolves the aggregate bonding to open the deposit along the fracture;
- after withdrawal of the disintegrating solution, introducing a leaching solution into said mineral deposit to dissolve minerals therefrom, and withdrawing that solution pregnant with dissolved minerals therefrom for further refining; and by the steps set out above, locating the direction of major fracture emanating from each injector well bore formed into said mineral deposit for placement of production wells to practice said solution mining process.

4,630,869

SHIELD TUNNELING MACHINE

Toshio Akesaka, Yokohama; Kenju Suzuki, Mobara, and Toshio Sumi, Kodaira, all of Japan, assignors to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Sep. 18, 1985, Ser. No. 777,312
Claims priority, application Japan, Dec. 25, 1984, 59-271910
Int. Cl.[4] E21D *9/08, 23/03*
U.S. Cl. 299—33 **6 Claims**



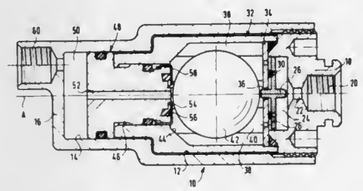
1. A shield tunneling machine comprising:
- a tubular shield body;
- a partition wall provided in the shield body;
- a rotary shaft supported rotatably by the partition wall and extending along the axis of said shield body;
- a cutter head disposed on the front end of the rotary shaft and including a first cutter provided with a plurality of cutter bits for excavating soft layers and a second cutter provided with a plurality of roller bits for excavating hard layers;
- a mechanism for rotating said cutter head through said rotary shaft; and
- a mechanism for moving straight one of said first and second cutters forward and backward relative to the other to place them alternatively between a first position where one is projected more forward than the other and a second position where the said one is retreated more backward than the said other.

4,630,870

PRESSURE REGULATOR FOR HYDRAULIC VEHICLE BRAKING SYSTEMS

Manfred Kaub, Rhens, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 31, 1985, Ser. No. 739,686
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 8418527[U]
Int. Cl.[4] B60T *8/14*
U.S. Cl. 303—24 A **3 Claims**



1. A pressure regulator for hydraulic vehicle braking systems, comprising
- a casing which has an inlet and a valve chamber connected to the same as well as an outlet,
- a valve seat which is arranged in the valve chamber at the entrance of a passage leading to the outlet, and
- a valve member which is arranged in the valve chamber so that brake fluid can flow around it and which is movable relative to the casing in response to deceleration of said casing from an inoperative position clear of said valve seat to a positiom against said valve seat,
- a partition defining an antechamber between the inlet and the valve chamber and having a central aperture,

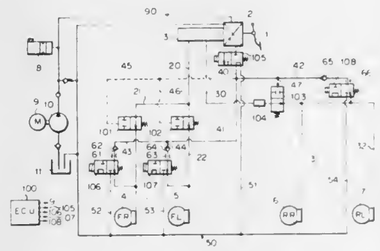
wherein a movable barrier member is disposed in the antechamber and includes a stem which is movable through the central aperture against the valve member, brake fluid being adapted to flow around or through said barrier member which is movable in response to the flow from an inoperative position remote from the valve member until its stem hits the valve member at least approximately in the direction of movement thereof.

4,630,871

ANTISKID CONTROL DEVICE

Yuzo Imoto, Kariya; Hideo Wakata, Nagoya; Toshihiro Takei, Okazaki; Yoshiyuki Hattori, Toyoake, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 30, 1985, Ser. No. 792,927
Claims priority, application Japan, Oct. 31, 1984, 59-227970
Int. Cl.[4] B60T *8/04*
U.S. Cl. 303—113 **9 Claims**



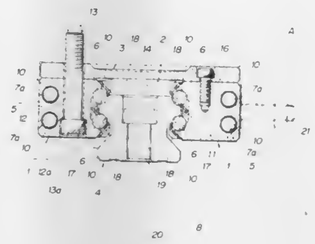
1. An antiskid control device controlling pressure in wheel cylinders of a brake system provided in a vehicle for preventing the vehicle from skidding through locking of the wheels thereof, said device comprising;
- means for discharging pressurized fluid,
- a main line system having a main line connecting said discharging means to wheel cylinders, and an open-close means for opening and closing said main line,
- means for switching said open-close means to normally open said main line, and to close said main line when a locking condition occurs in the wheels of the vehicle,
- a subline system having a subline connecting said discharging means to the wheel cylinders, a first control valve opening and closing said subline, a second control valve opening or closing said subline when said first control valve opens said subline, means for controlling said first and second control valves to open or close according to the locking condition of the wheel, means for releasing pressurized fluid in the wheel cylinder to outside thereof when said second control valve closes, said controlling means controlling said first control valve to normally close said subline, and to open said subline when locking occurs, and controlling said second control valve to open or close when locking occurs,
- said subline system introducing a pressurized fluid to the wheel cylinder according to the locking condition when opening, the flow rate of said pressurized fluid in said subline system being smaller than that of the pressurized fluid introduced by said main line system.

4,630,872

LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,472
Claims priority, application Japan, Sep. 21, 1984, 59-196535
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 384—45 **5 Claims**



1. A linear bearing unit comprising:

a pair of bearing case halves disposed in spaced parallel relation with each other and having opposed surfaces facing one another thereby defining a space therebetween, each of the bearing case halves having loaded ball rolling grooves longitudinally formed on their opposed surfaces and ball-recirculating bores longitudinally formed therethrough;

a top plate of less rigidity than said bearing case halves separately formed from the bearing case halves and secured by fastening means to the upper surfaces of the bearing case halves so as to provide an assembled formation of a channellike cross section, the top plate being adapted to be elastically deformable between the bearing case halves;

a track rail disposed in the space defined between the bearing case halves with predetermined clearances formed therebetween, the track rail being provided on the opposite side surfaces thereof with loaded-ball rolling grooves which are disposed in face-to-face relation with corresponding loaded-ball rolling grooves on the bearing case halves so as to form respective loaded-ball rolling regions;

two pairs of end plates which are respectively secured to the opposite longitudinal ends of each of the bearing case halves, each of the end plates being provided, on the inner surface thereof which abuts the corresponding end of one of the bearing case halves, with ball-guide grooves which respectively interconnect each loaded-ball rolling region and the corresponding one of the ball-recirculating bores so as to form respective endless ball-recirculating passages;

a multiplicity of balls disposed in and adapted for recirculating through the endless ball-recirculating passages for bearing a load applied to the bearing unit in the loaded-ball rolling regions formed between the bearing case halves and the track rail; and

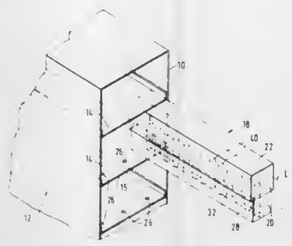
means for causing the top plate to elastically deform for adjusting the clearances between the bearing case halves and the track rail and preloading the balls in the loaded-ball rolling regions.

4,630,873

APPARATUS FOR LOW TEMPERATURE STORAGE OF BIOLOGICAL OR PHARMACEUTICAL SAMPLES

Wolfgang Volker, Tonisvorst, and Klemens Thoma, Krefeld-Huls, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,318
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342489
Int. Cl.⁴ F25D *3/10*
U.S. Cl. 312—209 **10 Claims**



1. An apparatus for the low temperature storage of biological or pharmaceutical samples by means of ampoules in a container having cases arranged in the container, wherein the cases are disposed one above the other and have extensible compartments for the storage of the ampoules, the improvement being each of said compartments consisting of a box having means for tightly packing at least two rows of the ampoules in each of said boxes, each of said boxes having a pair of side walls interconnected by a bottom plate, said means for tightly packing said ampoules including at least one row of pins extending upwardly from said bottom plate whereby a row of ampoules may be located on each side of said row of pins with the total number of rows of pins being one less than the number of rows of ampoules, the distance between the vertical axes of each pair of adjacent pins being equal to the distance of the vertical axis of each pin to the nearer of said side walls whereby ampoules having a diameter equal to said distance may be tightly placed between said pins and said side walls, each of said cases including two opposite and parallel side walls, a plurality of spaced flat partitions spanning said side walls of each of said cases, said boxes being stored on said flat partitions, the length of each box being no greater than the length of each of said flat partitions, the distance between adjacent flat partitions being slightly greater than the height of said boxes to minimize storage space, and each partition having a projection nested in a recess in each of said boxes.

4,630,874

ZERO INSERTION FORCE ELECTRICAL INTERCONNECTION ASSEMBLY

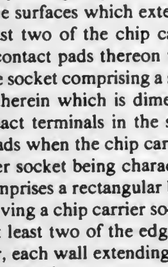
Robert M. Renn, Pfafftown, and John R. Shoemaker, Reidsville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1985, Ser. No. 747,088
Int. Cl.⁴ H01R *9/07*
U.S. Cl. 339—17 F **27 Claims**

1. An electrical interconnection assembly for interconnecting conductors in an array to circuitry on the surface of a substrate, the connector comprising:

a housing attachable to the substrate and having a plurality of conductor members each electrically connectable to corresponding circuitry on the substrate;

a unitary spring metal member attachable to the housing and further comprising a formed metal body having a first section and a second section joined by an intermediate bight, the first and second sections being relatively inclined about an acute included angle in a first position, the first and second sections being mutually relatively deflectable about said bight to a second position in which the relative inclination therebetween is less than in the first position, and a lock depending from the first section for retaining the first and second sections in the second position, energy being stored in the body in the second position, whereby upon positioning the array of conductors



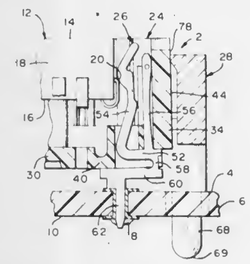
between the second body section and the conductor members in the housing, and deflecting the first section to the second position, the stored energy is transmitted through the second section to the conductor array to maintain a normal force electrical contact between the conductors in the array and the circuitry on the substrate.

4,630,875

CHIP CARRIER SOCKET WHICH REQUIRES LOW INSERTION FORCE FOR THE CHIP CARRIER

Iosif Korsunsky, Harrisburg, and Dimitry Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 627,150, Jul. 2, 1984, abandoned. This application Dec. 18, 1985, Ser. No. 814,511
Int. Cl.⁴ H01R *9/09, 13/62, 13/635*
U.S. Cl. 339—17 CF **20 Claims**



17. A chip carrier socket for an integrated circuit chip carrier, the chip carrier comprising a rectangular chip carrier body having oppositely facing major surfaces and outwardly facing chip carrier side surfaces which extend normally of the major surfaces, at least two of the chip carrier side surfaces having spaced-apart contact pads thereon which are between the major surfaces, the socket comprising a socket body having a rectangular recess therein which is dimensioned to receive the chip carrier, contact terminals in the socket body which contact the contact pads when the chip carrier is placed in the recess, the chip carrier socket being characterized in that:

the socket body comprises a rectangular base having peripheral edges and having a chip carrier socket wall extending normally from at least two of the edges which are opposite to each other, each wall extending between two adjacent corners of the base,

the chip carrier socket walls defining the recess for the chip carrier, the walls each having an internal surface which is opposed to a chip carrier side surface when a chip carrier is placed in the recess and having an external surface which faces outwardly, each wall having terminal-receiving cavities extending inwardly thereof from its internal surface, the contact terminals being in the cavities,

the walls being connected to the peripheral edges of the base by integral hinge sections and being stiffly pivotally movable, with the hinge sections serving as pivotal axes, outwardly of the recess,

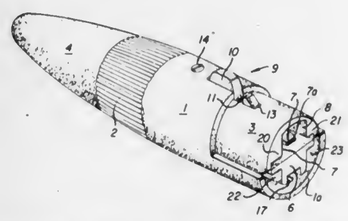
a cam is provided on the socket body and is movable relative thereto, the cam and the walls having camming means which are effective, upon movement of the cam relative to the body, to pivotally move the walls outwardly of the recess thereby to enlarge the recess and permit placement of the leadless chip carrier in the recess.

4,630,876

ELECTRICAL CONNECTOR

Robert M. Grunberg, 15 Fairfax Road, Bellevue Hill, N.S.W., 2023, and Michael Dixon, 56 Alt Street, Bondi Junction, N.S.W., 2022, both of Australia

Filed Aug. 2, 1985, Ser. No. 761,851
Int. Cl.⁴ H01R *13/639, 13/645*
U.S. Cl. 339—48 **2 Claims**



1. A genderless electrical connector able to matingly co-act with an identical counterpart, said connector including an outer shell having a forward lip and inner wall; an insert portion surrounded by said outer shell and having inserted therein at least a pair of electrical contact strips having matable ends which project into a chamber defined between said outer shell and said insert portion at a counterpart-seeking end thereof; a cable-receiving tail-end portion associated with said outer shell, through which tailend portion an electrical cable may be passed, said contact strips having opposite other ends adapted for connection to the electrical cable; resilient latch means carried by said outer shell and being provided with an outwardly-directed latch hook; and a slot formed in said outer shell, said slot disposed diametrically opposite said resilient latch means and adjacent said lip of said outer shell, said slot being adapted to receive therein the latch hook of a resilient latch means of a said identical counterpart when two of said electrical connectors are pushed longitudinally together into mating relationship so that at least two pairs of said contact strips are pressed together in pairs of like polarity: characterized in that said shell includes at least two splines projecting inwardly from said inner wall, said insert portion spaced inwardly from said outer shell to provide at least two keyways, said projecting splines being so dimensioned as to fit closely into co-acting ones of said keyways formed in the insert portion of a said identical counterpart; said splines and keyways cooperating to prevent inappropriate electrical connection being made, and the said insert portion being removably secured in said outer shell.

4,630,877

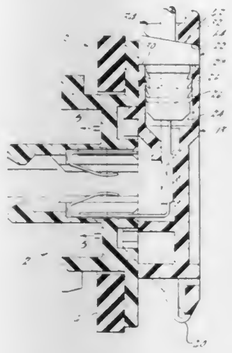
SOCKET

Marvin W. Moore, Oxford, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Nov. 15, 1985, Ser. No. 798,434
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—60 M **5 Claims**

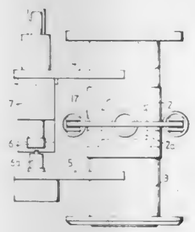
1. A socket for the reception of a bulb comprising:

a housing having a terminal strip internally thereof electrically engageable with said bulb,
an elongated grommet receptacle in said housing,
a grommet in said receptacle,
an electrically conductive wire extending 6through said grommet in sealed relation thereto,
a wire terminal on said wire releasably connectable to the terminal strip in said housing,



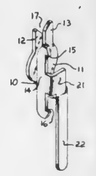
a foldable latch on said housing engageable with said grommet to bias said grommet into the grommet receptacle in said housing and to maintain said grommet in the receptacle in said housing, and
sealing means on the periphery of said grommet for sealing said grommet relative to the receptacle in said housing.

4,630,878
APPARATUS FOR THE REMOTE-CONTROLLED CONNECTING OR SEPARATING OF TWO COUPLING PARTS
Franz Heine, Dortmund, and Heinz-Joachim Rüttershoff, Schwelm, both of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany
Filed Mar. 26, 1984, Ser. No. 593,594
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311502
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 339—75 M **1 Claim**



1. An apparatus for remote-controlled coupling or decoupling of upper and lower lockable coupling parts, wherein respectively said two coupling parts are equipped with mechanical form-locking elements and with control-line connectors, one of which parts is operatively provided on a working tool and the other operatively on a carrying device of a hydraulic excavator, said parts being connectable in force-locked manner with each other by a hydraulic-mechanical locking device, said two coupling parts respectively cooperatively define a bore and a pin as the form-locking elements, said upper coupling part provided with an upper lateral holding device and said lower coupling part provided with a lower lateral holding device, the upper coupling part being connected via a rotary drive to said carrying device, and said locking device operatively transverse to the longitudinal axis of the two coupling parts, the improvement comprising:
hydraulic displacement drive means for connecting the control-line connectors separately with each other and respectively for separating said connectors from each other,
a shift element, and wherein at least one of said control-line connectors is mounted on said shift element,
said shift element further comprises a yoke,
guide bolts, wherein said yoke is guided by said guide bolts, and wherein said guide bolts comprise shift displacement members,
guide bushings, wherein each of said guide bolts extends within a respective one of said guide bushings,
said guide bushings are rigidly connected to said holding device of the upper coupling part,
springs,
each respective guide bushing defining an internal seat for cooperation with one end of a respective one of said springs, each said spring being tensioned at its other end against said yoke.

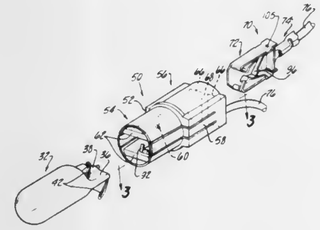
4,630,879
IDC LATCHING TERMINAL
Wilhelmus B. T. van Alst, St. Oedenrode, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 501,107, Jun. 6, 1983, Pat. No. 4,564,254. This application Mar. 11, 1985, Ser. No. 710,125
Claims priority, application United Kingdom, Jun. 10, 1982, 8216938
Int. Cl.⁴ H01R *4/24*
U.S. Cl. 339—99 R **7 Claims**



1. An electrical terminal comprising an insulation displacement contact at a first end of said terminal and another electrical contact at a second end, a body portion separating the first and second contact ends, a shoulder and support member together forming an L-shaped member extending perpendicularly from the body portion and supporting a pair of latches spaced apart from the body portion and the first contact end, the latches having mutually facing latch surfaces and being capable of securing two parts of a housing containing the terminal.

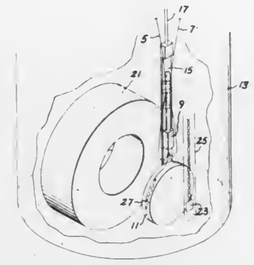
4,630,880
TAB REDUNDANT TERMINAL
Remie P. Durand, Fraser, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed Jul. 3, 1985, Ser. No. 752,328
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.⁴ H01R *13/514*
U.S. Cl. 339—176 L **3 Claims**

1. A snap-in lamp terminal for use in a socket housing for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on sides of the wedge base, a pair of troughs extending transverse to the wedge base, the wedge base further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extending side wings of the wedge base, the snap-in terminal comprising:
a lamp receiving portion and a conduit receiving portion;
the conduit receiving portion including wire retention means;



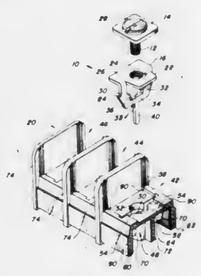
the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;
cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;
the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;
the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;
a wire guide means projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires; and
redundant terminal means comprising a tab redundant terminal notched out from the contact arm designed for contact with the filament wires;
the tab redundant terminal being directed toward the interior of the generally channelized lamp receiving portion of the snap-in terminal toward contact between filament wire and contact arm.

4,630,881
IMMEDIATELY TESTABLE SUPERCONDUCTOR JOINT
Robert C. Kumpitsch, Johnstown; James P. Retersdorf, Gloversvill, and Charles W. Lewis, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 4, 1985, Ser. No. 794,994
Int. Cl.⁴ H01R *11/01*
U.S. Cl. 339—176 R **4 Claims**



1. An immediately testable superconductor joint comprising:
a test loop of superconductor wire;
two superconductor wires to be joined; and
a joint coupling the ends of the test loop and the ends of the two superconductor wires to be joined in a single joint.

4,630,882
LOW PROFILE SCREW TERMINAL BLOCK WITH SPLIT PLASTIC BARREL
Herbert C. Naylor, West Dundee, Ill.; Gregory J. Smith, North Attleboro, Mass., and Howard J. Roeser, Jr., Wheaton, Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.
Filed Jan. 18, 1985, Ser. No. 692,933
Int. Cl.⁴ H01R *9/24*
U.S. Cl. 339—198 R **8 Claims**



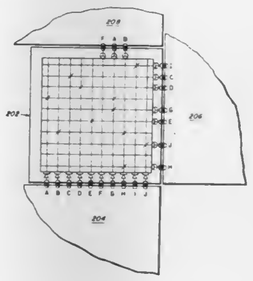
1. A terminal block comprising in combination:
a unitary block having a plurality of screw terminal assembly insert positions, each position including a slotted barrel, said block including at each insert position ribs supporting said barrel, a pair of said ribs including slots which communicate with the slot of said slotted barrel; and
at least one screw terminal assembly including a screw and an insert, said insert including a laterally-running tab with an extruded tube and a vertically-running portion;
said slotted barrel being adapted to receive the insert portion of said screw assembly and the distal end of said screw, said vertically-running portion of said insert being inserted into said slotted barrel such that said vertically-running portion is held in position in the slot of said slotted barrel.

4,630,883

OPTICAL WAVEGUIDE APPARATUS AND METHOD FOR MANUFACTURING

Henry F. Taylor, Alexandria; George H. Sigel, Great Falls, and Michael E. Gingerich, Woodbridge, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 480,966
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **21 Claims**



1. An optical waveguide matrix comprising:
a base having
a plurality of sides and
at least one major surface which has
a plurality of intersecting grooves,
said grooves being arranged such that a matrix of intersecting grooves is thereby formed on said base, with at least some of said intersecting grooves extending between different sides of said base,
said matrix having a plurality of nodes where said intersecting grooves cross each other;
a dielectric waveguide material in said grooves such that a matrix of intersecting light waveguides is formed in the base,
said waveguides having ends at the sides of said base,
said waveguides also having cuts made after and not contemporaneous with the manufacture of the base and waveguides at some but not all nodes; each cut forming a slot in the waveguide material that does not extend significantly into the base; and
a plurality of reflecting surfaces formed by said cuts at said nodes,
whereby a light beam traveling in any one of said waveguides may be deflected into at least one intersecting waveguide.

4,630,884

METHOD AND APPARATUS FOR MONITORING OPTICAL FIBER LAPPING AND POLISHING

Paul Jubinski, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 4, 1984, Ser. No. 647,226
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **7 Claims**

1. An apparatus for monitoring the removal of optical cladding from an optical fiber during the lapping of an optical flat thereon, said optical fiber mounted on a convex surface of a mandrel coupled to a lapping fixture of a lapping and polishing device, comprising:
means for generating a beam of radiation;
means for evanescently coupling said beam of radiation across said optical flat and into said optical fiber; and
means for measuring an intensity level of said radiation evanescently coupled into said optical fiber, and intensity



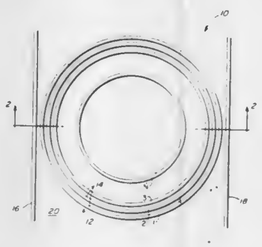
level and function of the amount of optical cladding removed from said optical fiber.

4,630,885

MULTICHANNEL OPTICAL WAVE GUIDE RESONATOR

John R. Haavisto, Scituate, Mass., assignor to Northrop Corporation, Century City, Calif.

Filed Mar. 2, 1984, Ser. No. 585,577
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **14 Claims**



1. Multichannel optical waveguide resonator comprising:
an input dielectric waveguide;
an output dielectric waveguide; and
a plurality of coupled dielectric waveguide rings;
wherein said input and said output dielectric waveguides are coupled to one of said coupled waveguide rings for evanescent wave coupling of light into and out of said one of said waveguide rings; and wherein the perimeters of said waveguide rings and the spacing therebetween are selected for evanescent coupling therebetween so that light in the input waveguide reinforces with light in said one of said waveguide rings.

4,630,886

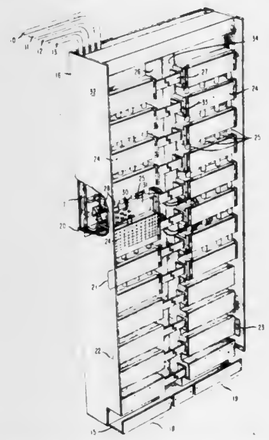
LIGHTGUIDE DISTRIBUTING UNIT

Philip J. J. Lauriello, Basking Ridge, and Lawrence M. Slavin, Rockaway, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 16, 1984, Ser. No. 600,891
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **10 Claims**

1. A lightguide fiber distributing unit for providing cross-connection facility for relatively fragile lightguide fibers, separated out of at least one otherwise sheathed multifiber cable, by means of relatively robust cross-connection jumper fibers, said unit comprising

at least one shelf portion including spaced upper and lower horizontal plate members in essentially parallel planes with one face of each plate member facing one face of the other, said plate member each having front and rear edges,
means for covering a space between said rear edges of said plate members except for an opening through which said fibers of said cable can be pulled into a region between said plate members,
means for mounting at least one fiber connector means to provide optical coupling via said connector means through said mounting means and between fibers extended to opposite sides of said mounting means,
means for removably securing said mounting means between said front and rear edges of said plate members with a first of said opposite sides facing through said region toward said rear edges and a second of said opposite sides facing toward said front edges so that at least a part of said



mounting means can be temporarily removed to permit access from said front edges for pulling fibers of said cable into said region and connecting such fibers to said connector means on said first side of said mounting means while allowing cross-connect jumper installation on, and removal from, said second side of said mounting means when said mounting means is secured by said securing means,
said removably securing means being spaced back from said front edges of he respective plate members by a distance which is sufficient to assure at least a predetermined minimum fiber bending radius for a jumper fiber extending from a connector on said mounting means second side and out between said front edges of said plate members, but not so far back as to impede significantly installation of cross-connect jumper fibers in connector means on said mounting means.

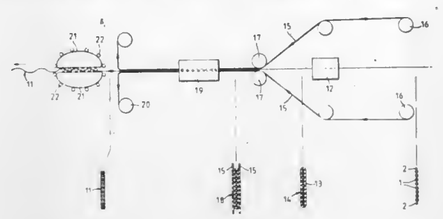
4,630,887

OPTICAL FIBRE RIBBON STRUCTURE

John E. Taylor, Berkshire, England, assignor to BICC Public Limited Company, London, England

Filed Jun. 14, 1984, Ser. No. 620,426
Claims priority, application United Kingdom, Jun. 17, 1983, 8316493
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **15 Claims**

1. An optical fibre ribbon structure comprising a plurality of optical fibres and at least one flexible elongate reinforcing element of substantially resilient material arranged side by side and embedded in an elongate body of plastics material, wherein the resilient reinforcing element is set in such a form that the ribbon structure follows a path of smoothly curved undulations whose axes of curvature lie transverse to the longitudinal axis of the ribbon structure, the arrangement being such that, when the undulating ribbon structure is subjected to a tensile force, the ribbon structure straightens in a lengthwise



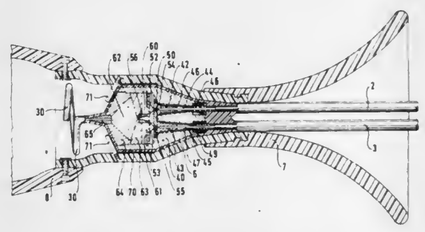
direction against the action of the undulating resilient reinforcing element thereby reducing the tensile force applied to the optical fibres and when the tensile force is removed, the ribbon structure returns towards its original undulating form.

4,630,888

MULTIPLE JOINT FOR UNDERWATER OPTICAL FIBER CABLES

Thierry Dubar, Calais, France, assignor to Les Cables de Lyon, Clinchy Cedex, France

Filed Jun. 15, 1984, Ser. No. 621,310
Claims priority, application France, Jun. 15, 1983, 83 09865
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **7 Claims**



1. Multiple joint for underwater optical fiber cables (**1, 2, 3**) each comprising an optical core of optical fibers (**11, 52, 53**), a strength member (**12**) of steel wires, a copper tube swaged onto said strength member and an insulative outer sheath (**13**), said joint comprising a first cable termination which terminates at least one cable (**1**), a first storage chamber (**22**) for storing excess lengths of fiber (**11**) in said first cable termination, a first connecting member (**14**) receiving said at least one cable through a bore therein and fastened to the end of said at least one cable (**1**), a first water tight member (**18**) closing off said bore within said first connecting member and forming a water tight passage (**19**) therethrough for passage of the optical fibers (**11**) of said at least one cable, a first hollow reinforcing member (**4**) concentrically surrounding said first cable termination, a second cable termination which terminates at least two cables (**2, 3**) disposed parallel to one another, a common connecting member (**40**) having parallel bores therein receiving respectively the ends of each of said at least two cables (**2, 3**) a second watertight member (**50**) closing off said parallel bores of said common connecting member (**40**), watertight passages (**53, 54**) within said second watertight member (**50**) receiving respective fibers (**52, 53**) of said at least two cables (**2, 3**), a second storage chamber (**62**) for storing excess lengths of fibers (**52, 53**) projecting from said second watertight member (**50**), a second hollow reinforcing member (**6**) concentrically surrounding said second cable termination, an access cable (**30**) incorporating fibers (**11**) from said first storage chamber (**22**) welded to fibers (**52,53**) from said second storage chamber (**62**) , a watertight insulative coating (**24, 70**) protecting the combination of said first and second cable terminations and said

access cable, and a hollow, tubular coupling box (8), and means mechanically linking opposite ends of said coupling box (8) to said first and second reinforcing members (4, 6), said coupling box (8) accommodating said access cable (30), wherein fibers of said at least one cable (1) welded to fibers of said at least two cables (2, 3) are held by said access cable and mechanically protected by said hollow, tubular coupling box.

4,630,889

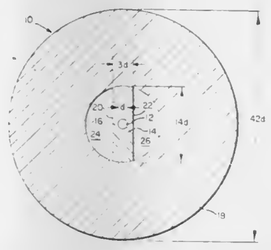
POLARIZATION LOCKED OPTICAL FIBER AND METHOD

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 549,875, Nov. 9, 1983, which is a continuation-in-part of Ser. No. 241,861, Mar. 9, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,739

Int. Cl.⁴ G02B *6/16*

U.S. Cl. 350—96.30 **21 Claims**



1. A single-mode optical waveguide comprising a longitudinally extending hollow tubular member, at least one rigid web transversely bridging the inside of said tubular member and extending longitudinally therealong, a core of light transmitting material mounted in said web and extending longitudinally therealong with at least portions of said web adjoining said core having an index of refraction lower than that of said core to enhance single-mode propagation therein, said waveguide having physical characteristics establishing a stress along the bridging direction of said web for exerting an anisotropic force radially on said core along said web direction to effect a polarization locked characteristic within said waveguide since external forces on said waveguide must be resolved generally along said web direction.

4,630,890

EXPOSED CORE OPTICAL FIBERS, AND METHOD OF MAKING SAME

Arthur Ashkin, and Rogers H. Stolen, both of Rumson, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 22, 1983, Ser. No. 506,594

Int. Cl.⁴ G02B *6/16*

U.S. Cl. 350—96.30 **16 Claims**



13. An optical fiber comprising a core having a circumference and at least one cladding layer contactingly surrounding the core, at least a part of the optical fiber being an exposed core optical fiber wherein the cladding layer partially surrounds the core, and wherein in the exposed core part of the optical fiber the cladding layer has a cross section with an outer boundary comprising an arcuate first portion and two second portions, each second portion extending from an endpoint of the arcuate first portion substantially to the core, and wherein the exposed portion of the core extends above the second portions of the outer boundary of the cladding cross section.

4,630,891

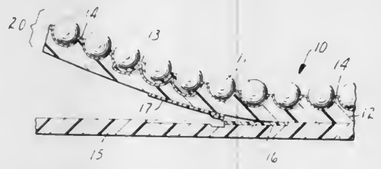
TAMPER RESISTANT SECURITY FILM

Wu S. Li, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 14, 1984, Ser. No. 650,411

Int. Cl.⁴ G02B *5/128*

U.S. Cl. 350—105 **12 Claims**



1. A security film comprising a monolayer of transparent microspheres supported in a thin layer of binder material, the binder material comprising an acrylic low-molecular-weight polymer soluble in a nonpolar solvent; a pressure-sensitive adhesive coated onto the binder material; and at least a first patterned layer disposed between the pressure-sensitive adhesive and binder material layers and covering a portion of the interface between the two layers, said patterned layer comprising either (a) a dye having lower adhesion to the binder material than to the pressure-sensitive adhesive such that upon exposure of the complete film to an elevated temperature of 100° C. or more, the pressure-sensitive adhesive separates from the binder material in areas covered by the dye or (b) a nonpolar thermoplastic resin promoting adhesion between the binder material and pressure-sensitive adhesive such that upon exposure of the complete film to an elevated temperature of 100° C. or more, the pressure-sensitive adhesive tends to remain adhered to the binder material in areas covered by the adhesion-promoting resin.

4,630,892

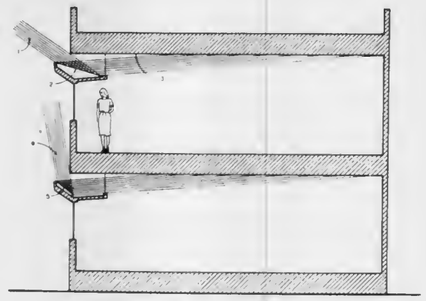
VARIABLE AREA LIGHT REFLECTING ASSEMBLY

Thomas C. Howard, Raleigh, N.C., assignor to Synergetics, Inc., Raleigh, N.C.

Filed Sep. 5, 1985, Ser. No. 772,775

Int. Cl.⁴ G02B *17/00*

U.S. Cl. 350—264 **25 Claims**



1. A device for projecting daylight into a structure comprising:

(a) a housing having an exterior aperture and an interior aperture;
(b) a reflective surface comprised of a flexible reflective material inside the housing, said reflective surface having an upper edge and a lower edge;
(c) means for adjusting the angle of the reflective surface with respect to the exterior aperture, such that light entering the exterior aperture may be reflected by the reflective surface through the interior aperture;
(d) means for defining the lower edge of the reflective surface;
(e) means for moving said lower edge defining means;
(f) means for keeping the reflective material substantially taut as the lower edge defining means is moved.

4,630,893

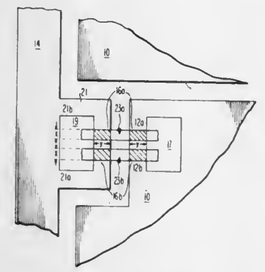
LCD PIXEL INCORPORATING SEGMENTED BACK-TO-BACK DIODE

Thomas L. Credelle, Lawrenceville, and Arthur H. Firester, Skillman, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 29, 1985, Ser. No. 728,660

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—334 **11 Claims**



1. A liquid crystal display pixel comprising:
a substrate;
an address line disposed on said substrate;
an electrode disposed on said substrate adjacent to said address line and having an additional portion;
a free area of said substrate being adjacent to said additional portion;
a first segmented back-to-back diode having a pair of segments respectively disposed on said address line and said additional portion, with the diode area defined by the overlap of one diode segment and said additional portion and the overlap of the remaining diode segment and said address line; and
wherein said free area comprises a hole in said electrode, and said additional portion comprises two segments adjacent said hole, one of the segments of said segmented diode layer being disposed on both of said additional portion segments.

4,630,894

MULTI-COLORED LIQUID CRYSTAL DISPLAY WITH COLOR TRANSFLECTOR AND COLOR FILTER

Rolf A. Cremers, Marxzell, Fed. Rep. of Germany, assignor to Borg Instruments GmbH, Fed. Rep. of Germany

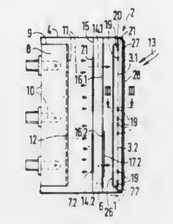
Filed Mar. 20, 1984, Ser. No. 591,533

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310444; Mar. 23, 1983, 3310427

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—338 **8 Claims**

1. A multi-colored liquid crystal display device comprising:
a plurality of offset information areas;
a liquid crystal cell;
an illuminating device extending substantially over the entire display device;
a plurality of colored foils having different colorings, said foils being spaced from and interposed between said liquid crystal cell and said illuminating device in alignment with respective information areas; and
a white or bright metallic transflector arranged intermediate and spaced from said colored foils and said liquid crystal cell, said transflector having different colored areas in alignment with specific colored foils;
whereby light from said illuminating device passes through said colored foils and then through the colored areas of the transflector to said liquid crystal cell to illuminate said information areas and light from the environment passes through said liquid crystal cell and is reflected by the colored areas of said transflector back through said liquid crystal cell to illuminate said information areas.



4,630,895

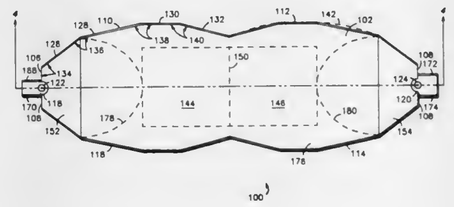
LCD LIGHTGUIDE

Julio Abdala, Jr., Miami, and Bernard V. Gasparaitis, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1985, Ser. No. 741,912

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—345 **18 Claims**



1. A display system, comprising in combination:
a liquid crystal display;
a light guide positioned behind said display;
said light guide including a transparent slab of substantially uniform thickness, said slab having a front surface adjacent said display, a rear surface opposing said front surface, and six bordering surfaces substantially perpendicular to said front and rear surfaces, completing the enclosure of said slab;
two of said bordering surfaces being substantially mutually parallel and located at opposite ends of said slab, the remaining four of said bordering surfaces being substantially arcuate in shape;
said rear surface having two planes centrally located and depressed into said rear surface, said planes being substantially rectangular with one edge of each of said planes intersecting said rear surface and the opposite edges mutually terminating at a centerline located substantially equidistant between said parallel bordering surfaces, said centerline being located between said front and rear surfaces;

said arcuate bordering surfaces, said rear surface, and said depressed planes having a means for reflecting light; and a light source located adjacent to each of said parallel bordering surfaces.

4,630,896

BENZONITRILES

Martin Petrzilka, Kaiseraugst, and Alois Villiger, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

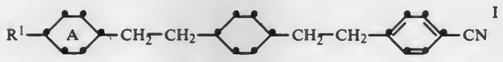
Filed May 29, 1984, Ser. No. 614,622

Claims priority, application Switzerland, Jun. 17, 1983, 3334/83

Int. Cl.[4] C09K *3/34;* **G02F** *1/13;* **C07C** *121/60, 120/00*

U.S. Cl. 350—350 R **6 Claims**

1. A compound of the formula



I

wherein

ring A is 1,4-phenylene or trans-1,4-cyclohexylene, and

R^1 is straight-chain C_1–C_{12}-alkyl or when positioned on a 1,4-phenylene ring R^1 may also be straight chain C_1–C_{12}-alkoxy.

4,630,897

LIQUID CRYSTAL COMPOUNDS

Beatrice M. Andrews, Grimsby; Neil Carr, Hull, both of United Kingdom; George W. Gray, Cottingham, and Christine Hogg, Beverley, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 501,783, Jun. 7, 1983, Pat. No. 4,512,636.

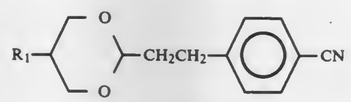
This application Feb. 4, 1985, Ser. No. 697,624

Claims priority, application United Kingdom, Jun. 15, 1982, 8217355

Int. Cl.[4] C09K *3/34;* **G02F** *1/13;* **C07D** *319/06*

U.S. Cl. 350—350 R **4 Claims**

1. A dioxan compound having the formula:



where R_1 represents an alkyl group.

4,630,898

ETALON OPTICAL LOGIC GATE APPARATUS AND METHOD

Jack L. Jewell, 12 Timberline Dr., Bridgewater, N.J. 08807

Filed Oct. 14, 1983, Ser. No. 542,003

Int. Cl.[4] G02F *1/03, 1/17, 3/00*

U.S. Cl. 350—354 **12 Claims**

1. A method of operating an optical logic apparatus including a first etalon optical switching device having a nonlinear medium, said method comprising the steps of:

(a) producing a first input beam having a first wavelength and representing a relatively high intensity that represents a first logical state of a first logic signal and guiding said first input beam along an axis that is perpendicular to a surface of said first optical switching device;

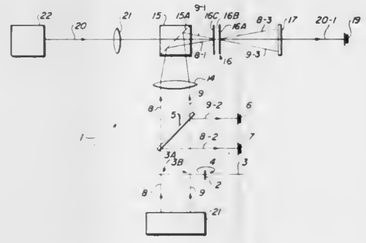
(b) producing a second input beam having said first wavelength and representing a relatively high intensity that represents said first logical state of a second logic signal and guiding said second input beam to said first optical switching device;

(c) producing a first probe beam having a second wavelength and guiding said first probe beam to said first optical switching device while the nonlinear medium is under the influence of said first and second input beams,

wherein the intensity of said first probe beam is much greater than any intensities of said first and second input beams, and wherein said second wavelength is such that said first probe beam does not significantly modify the transmissivity of said nonlinear medium and said first wavelength is such that said first and second input beams do significantly modify the transmissivity of said nonlinear medium;

(d) causing said first optical switching device to produce a first output beam in response to steps (a) through (c), which first output beam has said second wavelength and contains an output signal that is a predetermined logical function of said first and second logic signals, said first output beam having a first intensity level;

(e) changing said first and second input beams to a configuration wherein at least one of said first and second input



beams is at a relatively low intensity representing a second logic level of the first or second logic signal represented by that input beam;

(f) in response to step (e), causing said first output beam to undergo a transistion from said first intensity level to a second intensity level that represents a logic state opposite to one represented by said first intensity level; and

(g) guiding said first output beam to a second optical switching device having a nonlinear medium, and producing a second probe beam having said first wavelength and guiding said second probe beam to said second optical switching device, said nonlinear medium of said second optical switching device being such that changing of the intensity of light in said first output beam causes a predetermined change in the transmissivity of said second optical switching device at said first wavelength, causing said second optical switching device to produce a second output beam which has said first wavelength and is a predetermined logical function of said first output beam.

4,630,899

ZOOM LENS HAVING MOVABLE DIAPHRAGM

Masatake Kato, Tokyo, and Keiji Ikemori, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,577

Claims priority, application Japan, Sep. 18, 1982, 57-162660

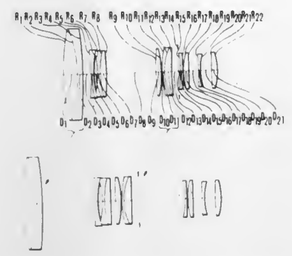
Int. Cl.[4] G02B *15/14, 15/15*

U.S. Cl. 350—427 **7 Claims**

1. A zoom lens comprising:

a varifocal lens system having a plurality of lens components, said lens system including a front component having a positive refractive power and arranged frontmost in the system and a lens component positioned furthest toward the image, wherein positions at which said front lens component and rear lens component lie are more forward in a telephoto setting than at a wide-angle setting; and

a diaphragm on the image side of said rear lens component and movable with zooming so that the position of said



diaphragm in the telephoto setting is further forward in the wide-angle setting.

4,630,900

SYSTEM FOR INTRODUCING BY REFLECTION ADDITIONAL INFORMATION INTO BINOCULARS

Carl Steiner, Dr.-Hans-Frisch-Str. 9, D-8580 Bayreuth, Fed. Rep. of Germany

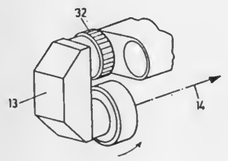
PCT No. PCT/DE84/00079, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04177, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 5, 1984, Ser. No. 686,259

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 8310763[U]; May 9, 1983, 8314105[U]

Int. Cl.[4] G02B *23/02*

U.S. Cl. 350—539 **8 Claims**



1. A device for selectively incorporating additional information in the optical path of binoculars in the form of a slide or film strip outside the optical path of the binoculars, the slide or film strip containing a map sector with angle information, said device comprising:

(a) means for illuminating the slide or film strip from behind so as to establish image rays thereof;

(b) means for rotating said slide or film strip so as to rotate the image rays of the additional information;

(c) an arm including a prism arrangement and lens system, said prism arrangement and lens system adapting the path of the image rays of the additional information to the optical path of the binoculars; and

(d) means for pivotably moving said arm between a first position in which the image rays of the additional information are superimposed on the optical path of the binoculars and a second position in which said image rays are removed from said optical path.

4,630,901

BINOCULAR TELESCOPE WITH CENTRAL CONTROL

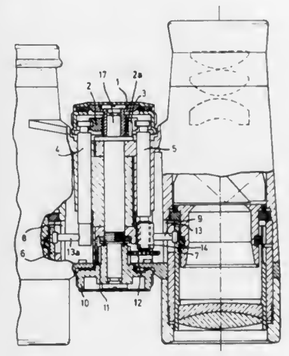
Erwin Altenheiner, Waldsolms-Hasselborn; Günther Schlicht, Solms-Oberbiel, and Joachim Hornschu, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,274

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 8404136[U]

Int. Cl.[4] G02B *23/00, 7/06*

U.S. Cl. 350—552 **7 Claims**



1. A binocular telescope comprising, in combination:

(a) two telescope tubes hinged to each other, each of said tubes having an eyepiece near one end thereof and an objective axially movable within the tube near the other end thereof;

(b) a central hinge shaft on which said two tubes swing relative to each other, said shaft having an eyepiece end and an objective end;

(c) each of said tubes having a housing portion which receives said eyepiece and said objective, and a connecting portion which surrounds said hinge shaft;

(d) an adjustment knob (**1**) for joint focusing of said objectives in both tubes, said adjustment knob being mounted between said tubes near said eyepiece end of said shaft;

(e) a linearly guided drive disk (**2**) operatively connected by screw threads to said adjustment knob;

(f) two transmission members (**4, 5**) both operatively connected to said drive disk to be moved thereby and each having a drive part (**13, 13***a*) operatively connected to a mount (**6, 7**) of one of said objectives to cause focusing movement of the respective objective;

(g) a second adjustment knob (**10**) for moving said objective in only one of said tubes to focus one tube differently than the other tube to compensate for defective vision of a user, said second adjustment knob being mounted between said tubes near said objective end of said shaft;

(h) one of said drive parts (**13**) being connected to its said transmission member (**5**) by means of a screw thread so that rotation of said transmission member will cause said drive part to travel axially on said transmission member;

(i) a pinion (**12**) fixed to said one of said transmission members (**5**); and

(j) gear teeth (**11**) turned by said second adjustment knob and meshing with said pinion so that rotation of said second adjustment knob will cause rotation of said transmission member (**5**) to cause its said drive part (**13**) to travel axially, thereby to cause focusing movement of its associated objective mount (**7**) of one tube independently of focusing movement of said objective mount in the other tube.

4,630,902

COMPOUND EYE OPTICAL SYSTEM HAVING A VARIABLE MAGNIFICATION FUNCTION

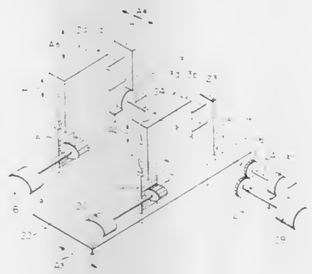
Noritaka Mochizuki, Yokohama, and Setsuo Minami, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,684, Apr. 22, 1982, abandoned. This application May 6, 1985, Ser. No. 731,341

Claims priority, application Japan, Jul. 31, 1981, 56-120455

Int. Cl.⁴ G02B *15/04, 15/14, 27/00*

U.S. Cl. 350—570 **5 Claims**



1. A compound eye optical system having a variable magnification function, comprising:

a first imaging element array component comprising a plurality of imaging elements of the same focal length arranged at an equal pitch;

a second imaging element array component comprising a plurality of imaging elements of the same focal length arranged at a pitch different from that of said first imaging element array component, said second imaging element array component being disposed more adjacent to the image side than said first imaging element array component, a composite optical system consisting of said first imaging element array component and said second imaging element array component forming an image of an object on an image plane; and

means for varying the imaging magnification of the image of the object on the image plane formed by said composite optical system with respect to the same object, said varying means comprising at least three of the following six means all of which three means are varied for each magnification change;

first means for varying the focal lengths of the imaging elements forming said first imaging element array component;

second means for varying the focal lengths of the imaging elements forming said second imaging element array component;

third means for varying the spacing between said first imaging element array component and said second imaging element array component;

fourth means for varying the spacing between said first imaging element array component and the object point;

fifth means for varying the spacing between said second imaging element array component and the image point; and

sixth means for varying the value of the ratio of the pitch of the imaging elements of said first imaging element array component to the pitch of the imaging elements of said second imaging element array component.

4,630,903

EYEGUARDS

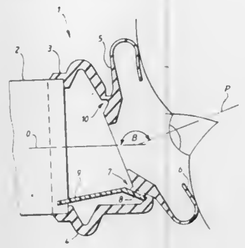
Richard I. Jones, Clwyd, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Nov. 28, 1984, Ser. No. 675,938

Claims priority, application United Kingdom, Dec. 7, 1983, 8332701

Int. Cl.⁴ G02B *23/16*

U.S. Cl. 350—579 **12 Claims**



1. An eyeguard comprising a moulded body of deformable material, the body having a front portion adapted to fit onto the viewing end of a device with which the eyeguard is used, a cup portion, and a deformable portion connecting the cup portion to said front portion, said cup portion being urged or biased towards an inclined position at which its axis is inclined relative to the front portion axis, and said deformable portion permitting angular movement of the cup portion relative to said front portion, the eyeguard further having a single closure flap secured to said deformable portion and moveable between a closed position and an open position on angular movement from said inclined position of said cup portion relative to said front portion.

4,630,904

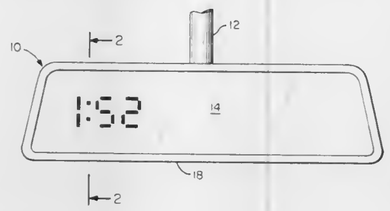
COMBINATION REAR VIEW MIRROR AND DIGITAL DISPLAYS

Ronald Pastore, 149 Heathcote Rd., Lindenhurst, N.Y. 11757

Filed Jan. 22, 1985, Ser. No. 693,368

Int. Cl.⁴ G02B *5/08, 7/18*

U.S. Cl. 350—600 **4 Claims**



1. An improved rear view mirror of the type used in motorized vehicles comprising a two-way mirror consisting of a plate of tinted glass and housing means mounted flush against one side of said glass plate, both supported by a mounting column, means consisting of a light emitting diode clock mounted along the perimeter of said glass plate joining said housing to said plate and preventing light from entering between said housing and plate, and recesses formed in said housing up against said plate wherein means are mounted flush with said glass plate for producing a light to display information, whereby in the absence of said light the full surface of said glass plate is available as a rear view mirror.

4,630,905

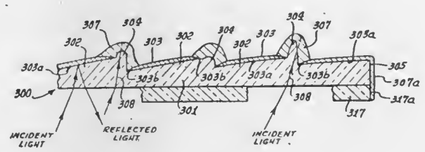
ELIMINATION OF INTERNAL REFLECTIONS AND DIFFRACTIONS FROM JUNCTURES IN, AND AT THE PERIPHERY OF, A SEGMENTED MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Division of Ser. No. 642,179, Aug. 20, 1984, and a continuation-in-part of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a division of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951. This application Nov. 18, 1985, Ser. No. 799,248

Int. Cl.⁴ G02B *5/08, 1/10, 7/18*

U.S. Cl. 350—613 **7 Claims**



1. In a molded segmented mirror having individual sectors and comprising a myriad of reflecting surfaces on the front side of a molding closest to the viewer, said surfaces oriented to produce, in the eyes of the viewer, one virtual image, or separate virtual images from separate portions of such molded mirror, there being a network of zones separating the individual mirror sectors, and the sectors being metallized, the improvement comprising:

(a) the metalizing material being applied to the sectors and not to the intervening zones,

(b) the thickness of metalizing material being feathered to a partial mono-molecular thickness around the periphery of each sector.

4,630,906

BLANK FOR EYEGLASS LENSES HAVING ELLIPSE-LIKE EDGE CURVES AND MEANS AND METHOD FOR SELECTING

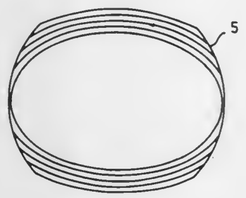
Hubert Bammert, Aalen; Hans Lahres, AA-Wasseralfingen, and Egon Mosch, Essingen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,729

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 32181396

Int. Cl.⁴ G02C *7/02*

U.S. Cl. 351—159 **10 Claims**



1. A series of eyeglass blanks forming a collection from which one may select a blank suitable for making by normal finishing methods and without grinding a new surface on the blank, a finished eyeglass lens in accordance with a prescription which calls for a lens which

(a) has a center thickness greater than its edge thickness in at least one cross section, and

(b) has different optical powers in different cross sections, and

(c) has dioptric powers within a substantial range of powers for which the series is designed,

each blank in said series having an ellipse-like edge curve on at least partial regions of its periphery, said ellipse-like edge curve being so placed with respect to dioptric curvatures of said blank that the edge thickness of the finished eyeglass lens made from the blank varies by less than 1.5 mm throughout said ellispe-like edge curve, and the weight of the finished lens is substantially less than the weight of a lens of the same dioptric power made from a conventional circular blank.

4,630,907

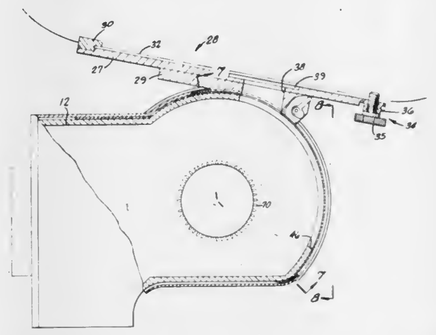
APPARATUS FOR PIVOTALLY MOUNTING A FILM MAGAZINE TO A MOTION PICTURE CAMERA

Albert L. Mayer, Tarzana, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Jan. 8, 1986, Ser. No. 817,001

Int. Cl.⁴ G03B *23/02*

U.S. Cl. 352—75 **16 Claims**



1. An apparatus for mounting a motion picture film magazine to a motion picture camera body, the apparatus comprising, a mounting bracket, said mounting bracket having an aperture therethrough, means to attach a first side of said mounting bracket to the film magazine, an adjustment aperture formed in the motion picture camera body, flexible light shield means having an aperture therethrough and being connected to a second side of said mounting bracket, said flexible light shield means being arranged so as to be slidable within said adjustment aperture and being further arranged such that said aperture in said flexible light shield means is aligned substantially with said aperture in said mounting bracket, and means to releaseably lock said mounting bracket in a selected position.

4,630,908

AUDIO-VISUAL TUNNEL WITH ENDLESS CONVEYOR

Daniel Tremblay, 1429 Dupuis Street, Macouche, Canada (J7K 2V2)

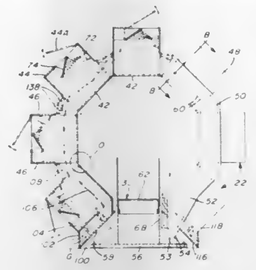
Filed May 20, 1985, Ser. No. 735,986

Int. Cl.⁴ G03B *21/10*

U.S. Cl. 353—94 **13 Claims**

1. An apparatus for entertaining a number of persons, comprising an elongated tunnel including an endless conveyor constituting the floor of the tunnel, a plate supporting said conveyor, a number of spaced-parallel arch-shaped frames upstanding from said base plate and tunnel floor transversely to said conveyor, a number of image projecting boxes removaly supported by said arch-shaped frames each having an inner wall constituting a projection screen, the projection screens of

the several boxes defining the inner wall of said tunnel, and means in said boxes producing images on said screens that are



visible from within said tunnel, said conveyor capable of transporting said persons from one end to the other of said tunnel.

4,630,909

APPARATUS FOR MEASURING THE POSITION OF A LIGHT SOURCE DISPOSED INSIDE A LIGHTHOUSE

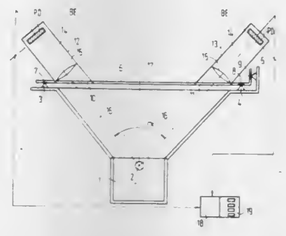
Dieter Forker, Altbach; Joachim Hassler, Esslingen; Bernhard Lau, Aichwald, and Rolf Schmidt, Esslingen, all of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,415

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405306

Int. Cl.⁴ G03B *41/00, 11/26*

U.S. Cl. 354—1 **6 Claims**



1. Apparatus for measuring a position of an elongated light source in a lighthouse used in the manufacture of luminescent screens of color picture tubes, comprising:

a base plate capable of being placed onto the lighthouse in place of a face-plate and aperture-mask unit;

first and second optical projection devices carried on said base plate, each projecting an image of said light source on first and second imaging planes, respectively;

at least two first position diodes disposed in said first imaging plane;

at least two second position diodes disposed in said second imaging plane; and

an evaluating circuit coupled to said first and second position diodes.

4,630,910

METHOD OF MEASURING IN THREE-DIMENSIONS AT HIGH SPEED

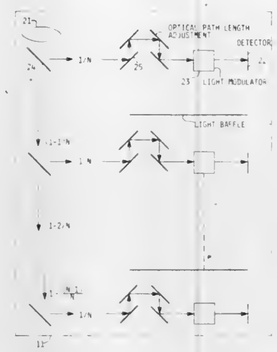
Joseph Ross, Ft. Salonga, and Paul DiMatteo, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Feb. 16, 1984, Ser. No. 580,653

Int. Cl.⁴ G03B *29/00*

U.S. Cl. 354—76 **8 Claims**

1. An arrangement for recording a scene with a common aperture and multiple cameras comprising: a lens for imaging the scene on N light-sensitive surfaces; N beam splitters for dividing light from said lens into N equal intensity paths; N shutters operated by a controller, one controller being in each said path; N said light-sensitive surfaces following each said



shutter; and means for independently adjusting the path length to each said light-sensitive surface; each shutter blocking incident light of its path until commanded by said controller to pass said light for the duration of a coded pattern projected during said duration.

4,630,911

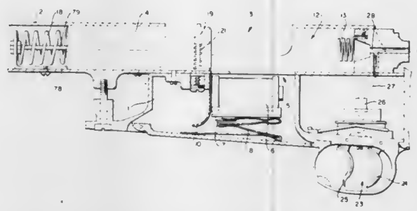
CAMERA GUN

Larry W. Paul, 28950 Bonita Vista Rd., Mountain Center, Calif. 92361

Filed Sep. 21, 1984, Ser. No. 653,025

Int. Cl.⁴ G03B *17/00, 29/00, 3/00*

U.S. Cl. 354—82 **46 Claims**



1. An assembly for mounting a camera and having the appearance of a firearm comprising: means for supporting a camera including a stock and a barrel mounted on the stock; a chamber portion in the barrel; a bolt which is slidably mounted within the chamber; and film storage means communicating with the chamber so that a film cartridge can be stored in the film storage means and removed from the chamber when the bolt is open.

4,630,912

WET PROCESSING WEB CAMERA AND METHOD

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 24, 1985, Ser. No. 747,899

Int. Cl.⁴ G03B *17/50*

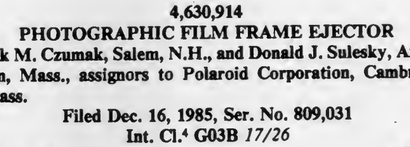
U.S. Cl. 354—88 **14 Claims**

1. Photographic apparatus for a film system having a pair of sheet elements, one of which includes a processing agent and the other of which includes a photographic negative, said apparatus comprising:

a cassette having means for defining spaced first and second discrete storage chambers for the processing and negative elements of said film system, respectively, both said storage chambers having openings for the passage of the respective elements thereform;

means situated between said storage chambers to present the negative element for exposure;

means for withdrawing the film elements from said storage chambers and for bringing said processing and negative elements into face-to-face contact after exposure of the negative element;



movable means for sealing the opening of the one of said storage chambers containing the processing element; and

means for withdrawing said movable means from the opening of said one storage chamber during passage of the element carrying the processing agent from said one storage chamber.

4,630,913

EXTENDED DEPTH-OF-FIELD 3-D CAMERA

Allen K. W. Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338

Filed Dec. 16, 1985, Ser. No. 809,598

Int. Cl.⁴ G03B *35/10*

U.S. Cl. 354—115 **7 Claims**

1. In a three dimensional camera for taking three dimensional pictures:

(a) a plurality of lenses with a negative holder for each lens, with each negative holder being optically offset from the axis of the respective lens, with alternate negative holders being offset from each other;

(b) at least one reflective element placed between each lens and its respective negative holder, with each element having at least one reflective surface arranged in a position so that each reflective surface is at an angle of approximately 45° to the image transmitted from the lens so that the images transmitted through each lens are reflected by the reflective elements onto the respective negative holders.

4,630,914

PHOTOGRAPHIC FILM FRAME EJECTOR

Frank M. Czumak, Salem, N.H., and Donald J. Sulesky, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

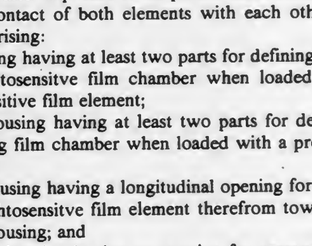
Filed Dec. 16, 1985, Ser. No. 809,031

Int. Cl.⁴ G03B *17/26*

U.S. Cl. 354—212 **9 Claims**

1. Apparatus for sequentially moving a plurality of individual film frames from a container of the type having an ingress, an egress, and a restraining structure for restricting movement of a film frame ejector to a single plane, said apparatus comprising:

a film frame ejector having a film frame engaging portion which is adapted to extend into the container via the ingress, said film frame ejector being adapted to be moved from a first configuration wherein said film frame ejector is located at least in part within the restraining structure of the container and is in a relatively unstressed condition with said film frame engaging portion located adjacent an edge of a film frame, and a second configuration wherein said film frame ejector is in a stressed condition, said film



frame engaging portion being moved in a first direction so as to move a film frame at least partially through the container's egress as said film frame ejector is moved from said first configuration to said second configuration; and

means for applying a force in a second direction substantially normal to said first direction for moving said film frame ejector from said first configuration to said second configuration.

4,630,915

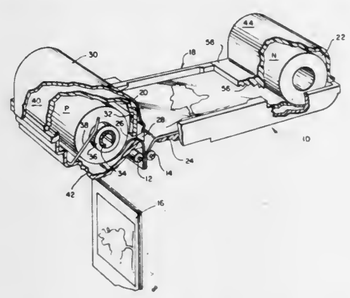
MULTIPART CASSETTE FOR TWO COMPONENT FILM SYSTEM

George D. Whiteside, Lexington, and Robert E. Cavallaro, Norwood, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 24, 1985, Ser. No. 747,901

Int. Cl.⁴ G03B *17/26, 17/50*

U.S. Cl. 354—275 **10 Claims**



1. A cassette for a photographic film system, the cassette having photosensitive and processing film elements adapted for processing after exposure of the photosensitive element by face-to-face contact of both elements with each other, said cassette comprising:

a first housing having at least two parts for defining a light-tight photosensitve film chamber when loaded with a photosensitive film element;

a second housing having at least two parts for defining a processing film chamber when loaded with a processing element;

said first housing having a longitudinal opening for passage of said phtosensitve film element therefrom toward said second housing; and

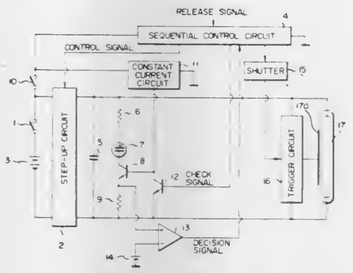
said second housing having an opening for passage of said processing film element toward said second housing and into face-to-face contact with portions of said photosensitive film element extending from said first housing.

4,630,916

CIRCUIT FOR DETECTING CHARGED VOLTAGE OF ELECTRONIC FLASH

Minoru Ishiguro, Urawa; Kouji Kaneko, Oomiya, and Toru Kondo, Yokohama, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Oomiya and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Sep. 5, 1984, Ser. No. 647,400
Claims priority, application Japan, Sep. 12, 1983, 58-166760
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—418 **3 Claims**



1. A circuit for detecting charged voltage of electronic flash comprising:

means for stepping up a voltage of a battery;

means for storing charges under a high voltage from said step-up means;

means for flashing in response to a trigger signal applied, with a charged voltage across said storing means applied between electrodes of said flashing means;

voltage dividing means having a switching means inserted therein in a series fashion, said voltaging dividing means providing a voltage corresponding to the charged voltage across said storing means;

means for comparing a voltage from said voltage dividing means with a reference voltage; and

a sequence control circuit, operating such that said sequence control circuit operates in response to a release signal produced when a release button is operated, applies a check signal to said switching means in said voltage dividing circuit, thereby to render said switching means conductive, and fetches the result of the comparison from said comparing means to check whether a recharge to said storing means is needed or not.

4,630,917

EXPOSURE CONTROL DEVICE OF A CAMERA

Osamu Maida, Tokyo, and Takashi Saegusa, Kawasaki, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,226
Claims priority, application Japan, Sep. 20, 1983, 58-173666
Int. Cl.[4] G03B *7/08*
U.S. Cl. 354—456 **29 Claims**

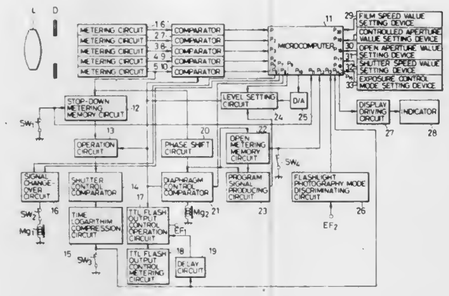
1. A camera in which setting means for setting plural exposure factors is provided and a stop and a shutter are driven in response to a release operation in accordance with said plural exposure factors which are set, comprising:

(a) metering means which meters the light of a subject to be photographed through the stop and generates a metering signal, the metering signal being an analog signal;

(b) first control means which produces a first control signal prior to said release operation and which produces a second control signal in response to said release operation in accordance with at least one of said plural exposure factors which are set, the first and second control signals each being a digital signal;

(c) means for making a first reference signal in accordance with said first control signal and a second reference signal in accordance with said second control signal, the first and second reference signals each being an analog signal;

(d) means for comparing said first reference signal with said metering signal, the comparing means producing a comparison signal when said first reference signal and said metering signal reach a predetermined relation and said first control means operating, prior to said release operation, to obtain a proper exposure in accordance with said comparison signal and said plural exposure factors to generate an operation output;



(e) means for indicating in accordance with said operation output; and

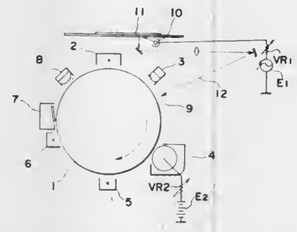
(f) second control means for controlling said shutter in response to said release operation in accordance with said metering signal and said second reference signal.

4,630,918

IMAGE COMPENSATING METHOD IN A COPYING MACHINE

Yuhi Yui, Nara, and Hiroshi Kinashi, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1985, Ser. No. 743,650
Claims priority, application Japan, Jun. 11, 1984, 59-121009
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



1. An image compensating method in a copying machine comprising the steps of:

applying a bias voltage to a developer unit of the copying machine;

controlling the intesity of light to be projected at an exposure section of the copying machine; and

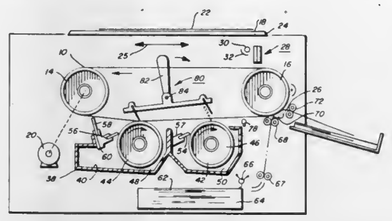
simultaneously adjusting both said bias voltage to be applied to the developer unit and the intensity of light to be projected at said exposure section onto a photosensitive medium.

4,630,919

SELECTABLE COLOR SYSTEM

Joseph Fantuzzo, Webster, and Edwin R. Monkelbaan, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 22, 1985, Ser. No. 757,552
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—4 **6 Claims**



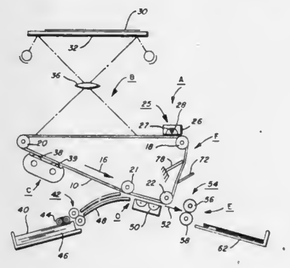
1. Printing apparatus comprising a flexible photoreceptor belt movable past a series of image processing stations, said belt being driven around at least two support rollers, means to form an electrostatic latent image on said belt, means to develop said electrostatic latent image with a marking material comprising a developer module having at least two alternately selectable stationary developer housings positioned within a run of the photoreceptor belt between said support rolls, means to alternately urge said photoreceptor belt into development engagement with one of said stationary developer housings to develop said electrostatic latent image said urging means comprising a dual position articulating backup blade in the interior of the run of said belt, the two ends of which are alternately engageable with the belt to provide developing engagement with one of said developer housings, and means to transfer said developed image to a receiving surface.

4,630,920

BLADE CLEANING APPARATUS FOR REMOVING RESIDUAL TONER FROM A CHARGE RETENTIVE SURFACE

Mort Silverberg, Rochester; Richard G. Maus, Macedon, and Nero R. Lindblad, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1985, Ser. No. 773,288
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **47 Claims**



1. Blade cleaning apparatus for removing residual toner particles from a flexible charge retentive member supported for movement in an endless path, said apparatus comprising:

a cleaning blade supported for contact with the imaging side of said charge retentive member;

means for effecting pressure engagement between said blade and belt whereby said belt is deflected; and

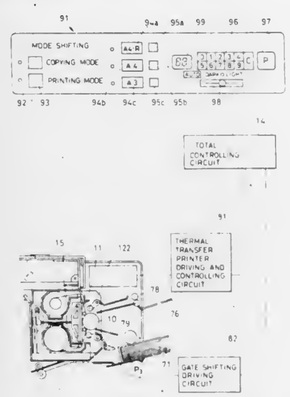
a backing member supported in contact with the opposite side of said charge retentive member from said imaging side for controlling the deflection of said flexible belt whereby the force required for efficient cleaning by the cleaning blade is minimized and there is substantially uniform contact between the blade and the charge retentive member.

4,630,921

COMBINED PRINTER-COPIER APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 18, 1984, Ser. No. 682,921
Claims priority, application Japan, Dec. 21, 1983, 58-241382
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SH **9 Claims**



1. An apparatus for transferring an image onto sheet-shaped material, comprising:

a housing;

storage means, attached to said housing, for storing a plurality of sheets of said sheet-shaped material;

an original holding surface on which an original is placed;

a discharging tray connected to said housing;

copying means, mounted within said housing, for copying an image of the original placed on said original holding surface onto said sheets, said copying means including a photosensitive body, means for forming a latent image corresponding to said image of said original on said photosensitive body, means for developing said latent image, and means for transferring said developed latent image to said sheets;

printing means, mounted within said housing, for printing an information-based image onto said sheets in response to image information, said printing means including at least one coloring agent and means for transferring said coloring agent onto said sheets to form said information-based image on said sheets;

feeding means for selectively feeding said sheets from said storage means to either said copying means or said printing means;

conveying means for selectively conveying a sheet onto which said information-based image has been printed by said printing means either to said original holding surface or to said discharging tray; and

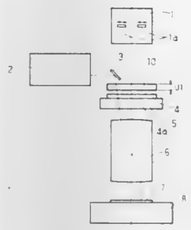
control means for controlling said copying means, printing means, feeding means, and conveying means so as to perform a printing-copying operation in which copying is carried out by said copying means using as said original a sheet having an information-based image formed in said printing means and being conveyed to said original holding surface by said conveying means.

4,630,922

PATTERN TRANSFER APPARATUS

Shunzo Imai, Yamato, and Ichiro Ishiyama, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,235
Claims priority, application Japan, Mar. 6, 1984, 59-41326
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—55 **23 Claims**



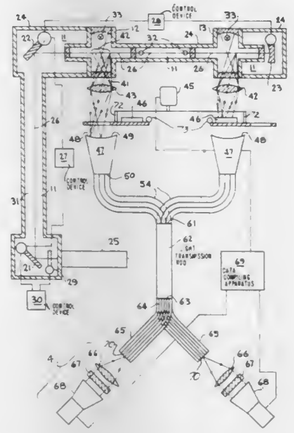
1. An apparatus for transferring a pattern of a first object onto a second object, comprising:
optical means for relating the first and second objects to each other with a beam; and
correcting means for optically correcting any change in the optical path length between said optical means and the pattern of the first object due to any change in the thickness of the first object, said correcting means including a flat plate-like member.

4,630,923

FIBEROPTIC SPECTROPHOTOMETER

Petrus P. Tans, and Daniel A. Lashof, both of Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 4, 1985, Ser. No. 697,824
Int. Cl.[4] G01J *3/44*; G01N *21/65*
U.S. Cl. 356—301 **16 Claims**



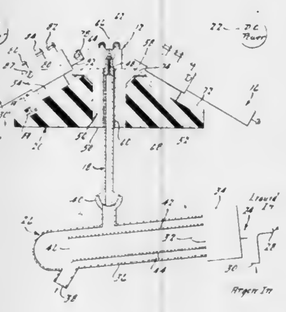
1. A method for analyzing the relative composition of two similar gases, including the steps of:
passing an intense laser beam through samples of each of the two gases, the composition of one of which is accurately known, for producing a band of Raman-scattered light from each;
alternately directing each of the bands of Raman-scattered light from each gas through a common light-mixing system so that all wavelengths present in the Raman-scattered light from each sample will be mixed spatially in a thorough manner;
directing the mixed Raman-scattered light to light detection systems each of which is tuned to measure a particular wavelength of light representing the presence of and relative amount of a constituent element of the gas sample;
comparing a ratio of constituent elements present in the known gas sample to that of the unknown gas sample; and
determining the relative amounts of each constituent element of the unknow gas by comparing the relationship of an amount of Raman-scattered light from a constituent in the unknown gas sample to the amount of Raman-scattered light from the other constituents in the unknown gas sample with the relationship of an amount of Raman-scattered light from a constituent in the known gas sample to the amount of Raman-scattered light from the other constituents in the known gas sample.

4,630,924

CONICAL DC PLASMA EMISSION SOURCE

Gerhard A. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 29, 1985, Ser. No. 760,182
Int. Cl.[4] G01N *21/73*
U.S. Cl. 356—316 **19 Claims**



1. A spectrochemical emission source, comprising:
at least three sources of an ionized gas plasma stream, each of said sources receiving D.C. electrical power such that one of said sources has the opposite polarity of the other of said sources;
means for supporting and aligning said sources such that the combination of said ionized gas plasma streams form a plasma body having a generally conical shape at one end of said plasma; and
means for injecting a sample stream into said plasma body such that said sample stream is captured by said conical shape of said plasma body and transmitted into said plasma body.

4,630,925

COMPACT TEMPORAL SPECTRAL PHOTOMETER

Norman H. Schiller, Whitestone, and Robert R. Alfano, Bronx, both of N.Y., assignors to Hamamatsu Corp., Middlesex, N.J.

Filed Nov. 1, 1982, Ser. No. 437,897
Int. Cl.[4] G01J *3/30*
U.S. Cl. 356—318 **25 Claims**

1. A temporal spectral photometer for use in obtaining spectral and temporal information simultaneously of an ultrafast pulse of light comprising:
a. a housing having a pin hole type entrance slit for admitting at least a portion of said light,
b. a streak camera tube disposed inside said housing, said streak camera tube having a photocathode on front thereof and a phosphor screen on the back thereof,
c. electronic circuit means for driving said streak camera tube,
d. optical means disposed inside said housing between said pin hole slit and said streak camera tube for forming an

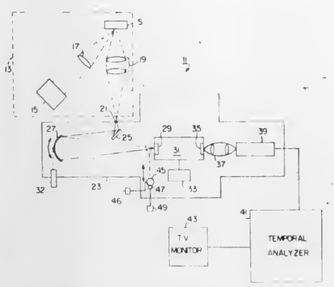


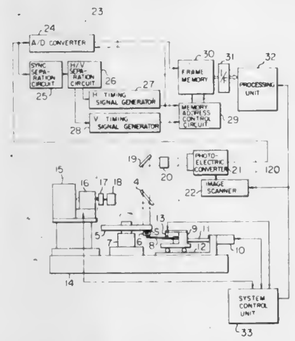
image of the pin hole slit onto the photocathode of the streak camera tube and at the same time dispersing the light admitted through said pin hole slit into its component wavelengths, and
e. means for recording the resulting output image formed on the phosphor screen.

4,630,926

FINE CLEARANCE MEASURING APPARATUS

Katsuyuki Tanaka; Seiichiroo Terashima; Yoshinori Takeuchi; Toshiko Odaka, all of Ibaraki, and Yokuo Saito, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,274
Claims priority, application Japan, Dec. 21, 1983, 58-239732
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—357 **10 Claims**



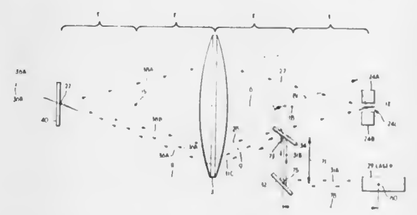
1. An apparatus for measuring a clearance between two articles, at least one of said two articles having a transparent portion, comprising:
optical means for applying light of variable wavelength to said clearance through said transparent portion in said one article;
means for focusing a reflection light including information of an interference fringe pattern from a surface plane of said clearance;
photo-electric conversion means for photo-electrically converting a light intensity distribution on the focusing plane of said reflection light to form a photo-electrically converted plane corresponding to said focusing plane;
means for scanning an interference fringe pattern on said photo-electrically converted plane formed by said photo-electric conversion means to produce an electrical signal representing the interference fringe pattern;
means connected to said optical means, for altering the wavelength of said variable-wavelength light, so as to enable said scanning means to produce electrical signals representing respective interference fringe patterns produced by different wavelengths; and
processing means for detecting positions of the interference fringe patterns based on said electrical signals to determine the order of a peak point of either one of said interference fringe patterns on the basis of a difference in positions of the interference fringe patterns, to thereby calculate a value of the clearance between said two articles.

4,630,927

OPTICAL PROJECTOR

Emmet M. Fulkerson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 15, 1983, Ser. No. 466,741
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—372 **6 Claims**



1. An optical projector, comprising:
(a) a laser, which is subject to pointing instability, for projecting a light beam along a first path, the light beam appearing as a virtual point source;
(b) a lens having a center, a first and a second side, and an optical axis for
(i) receiving the light beam on a first side and off-center,
(ii) focusing the light beam toward an object located on a second side of the lens,
(iii) receiving light reflected by the object, and
(iv) focusing the light received in (iii) to a point on the first side of the lens;
(c) a photosensor positioned near the point of (b)(iv) for
(i) receiving the focused light of (b)(iv) and
(ii) producing a predetermined signal when the reflection of (b)(iii) occurs at a predetermined point; and
(d) means interposed in the first path of (a) for
(i) receiving the light beam of (a),
(ii) transmitting the light beam toward the lens along a second path which is nonparallel to the optical axis, and
(iii) imparting to the light beam characteristics of a light beam projected from the virtual point source positioned in the photosensor, for reducing the effects of the pointing instability.

4,630,928

LENGTH MEASURING DEVICE

Otto Klingler, Oberndorf-Boll, and Siegfried Gruhler, Vöhringen, both of Fed. Rep. of Germany, assignors to Mäuser-Werke Oberndorf GmbH, Fed. Rep. of Germany

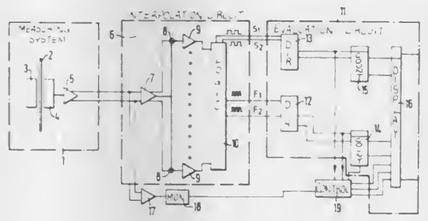
Filed Mar. 21, 1985, Ser. No. 714,695
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412557
Int. Cl.[4] G01B *7/02*
U.S. Cl. 356—374 **4 Claims**

1. A device for measuring the length of a movement comprising:

measuring means for generating two mutually offset sinusoidal voltage signals which depend on the movement whose length is to be measured;

interpolation means connected to said measuring means for receiving said voltage signals and for generating therefrom two high resolution rectangular pulse sequences which are offset from each other by 90° and which correspond to an interpolation between said two voltage signals, said interpolation means also generating two low resolution rectangular pulse sequences which are offset with respect to each other by 90° and which correspond to the two voltage signals;

evaluation means connected to said interpolation means for receiving said high and low-resolution pulse sequences



and for evaluating a length measurement based on at least one of said pulse sequences;

monitor means connected to said measuring means for receiving said voltage signals and for generating a speed related signal which corresponds to a speed of the movement to be measured; and

control logic means connected to said monitor means for receiving said speed related signal and being connected to said evaluation means for blocking the use of said high resolution pulse sequences when said speed related signal indicates a speed above a selected value, and for including said high resolution pulse sequences and said low resolution pulse sequences for evaluation of the length when said speed relates signal indicates a speed below said value.

4,630,929

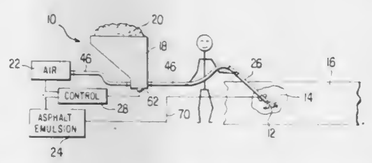
APPARATUS FOR PRODUCING PATCHING MATERIAL FOR FILLING POTHOLES IN PAVED SURFACES

Michael A. Medlin, 125 Conestoga Rd., Madison, Miss. 39110

Continuation-in-part of Ser. No. 659,133, May 9, 1984, abandoned. This application Aug. 29, 1985, Ser. No. 770,617

Int. Cl.⁴ B28C *5/06*

U.S. Cl. 366—10 **6 Claims**



1. An apparatus for producing patching material for filling potholes in paved surfaces comprising:

(a) a hopper means for holding a quantity of pulverulent material, said means having an opening for receiving said marterial from a source and a transport tube means in the bottom of said hopper means, said tube means having an inlet opening connected to a source of air under pressure and an outlet opening connected to a discharge nozzle, said transport tube means also having an intake opening intermediate said inlet and outlet openings to receive said material into said transport tube means, and means adjacent said intake opening to cause said material to be drawn into said tube by said air flowing under pressure in through said intake opening and out through said outlet opening;

(b) means between said outlet opening and said discharge nozzle to dissipate part of the air stream so that said material will not be blown out of said pothole during filling; and

(c) means adjacent said discharge nozzle for introducing an emulsion to combine with said material prior to its discharge from said nozzle into said pothole.

4,630,930

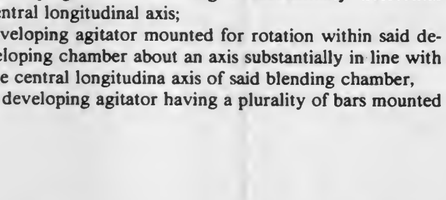
HIGH SPEED BATCH MIXER

Samuel O. Seiling, Richmond, Va., assignor to AMF Union Machinery Inc., Richmond, Va.

Filed Sep. 4, 1984, Ser. No. 646,410

Int. Cl.⁴ B28C *7/16;* **A21C** *1/00*

U.S. Cl. 366—77 **10 Claims**



1. A semi-continuous batch mixing apparatus for mixing and developing bakery dough comprising:

a cylindrical blending chamber for mixing a batch of bakery dough ingredients, said blending chamber having a substantially horizontal central longitudinal axis;

a helical agitator mounted for rotation about the central longitudinal axis of said blending chamber,

said helical agitator having a plurality of blades for rotation adjacent to the circumference of the interior of said blending chamber, each said blade having an angled slope with respect to the horizontal at substantially each point along said blade and having a cross section with a flat side moving adjacent to said blending chamber's circumferential wall such that upon rotation of said blades the batch ingredients are mixed by driving the ingredients towards one lateral end of said blending chamber;

means for rotating said helical agitator;

inlet means into said blending chamber for introduction of a batch of dough ingredients from the top of said blending chamber, said inlet means being sealed when closed to prevent leakage of the batch ingredients during agitation:

a selectively closable outlet hatchway located at the lateral end of said blending chamber in the direction of movement of the batch ingredients, said hatchway being located above the central longitudinal axis of said blending chamber, and being sealed when closed such that leakage is prevented from said blending chamber during agitation and upon opening said hatchway the batch ingredients are moved through the opening by the rotation of said helical agitator and out of said blending chamber;

a cylindrical developing chamber for developing the mixed batch of ingredients into a proper consistency mounted horizontally adjacent to said hatchway on said blending chamber for receiving the mixed batch of ingredients, said developing chamber having a substantially horizontal central longitudinal axis;

a developing agitator mounted for rotation within said developing chamber about an axis substantially in line with the central longitudina axis of said blending chamber,

said developing agitator having a plurality of bars mounted for rotation concentrically about the axis of said developing agitator;

means for rotating said developing agitator;

two exhaust rollers mounted adjacent to each other on the periphery of said developing chamber below the central longitudinal axis of said developing chamber providing a discharge means for a fully developed batch of dough; and

means for rotating said rollers such that the developed dough is pulled through the nip of said rollers and out of said developing chamber upon the batch being fully developed into a proper consistency by said rotating developing agitator.

4,630,931

PROCESS AND APPARATUS FOR THE MIXING OF SLURRIES

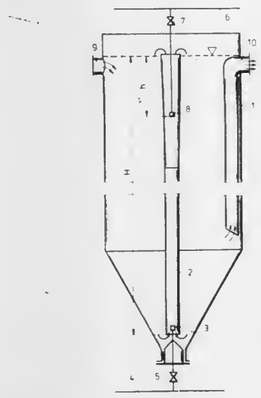
József Harsányi, Budapest; Janos Pintér, and Alajos Suri, both of Mosonmagyaróvár, all of Hungary, assignors to Magyar Aluminiumipari Troszt

Filed Feb. 25, 1985, Ser. No. 704,870

Claims priority, application Hungary, Feb. 28, 1984, 801/84

Int. Cl.⁴ B01F *13/02*

U.S. Cl. 366—107 **12 Claims**



1. A process for mixing a slurry, comprising the steps of:

introducing said slurry into a mixing tank having a conical bottom, an upright axis and a mixing pipe forming an air-lift pump extending axially in said tank and open at upper and lower ends in said tank;

injecting compressed air into said pipe at a first location close to said lower end for inducing an air-lift circulation of said slurry upwardly through said pipe by air lift action of said compressed air for a starting period of a mixing operation; and

terminating at least for a part of a subsequent period of said mixing operation the injection of compressed air into said pipe at said first location, and injecting compressed air into said pipe at a second location above said first location and within an upper third of the length thereof but below an upper eighth of said length to effect air lift circulation of said slurry through said pipe for the balance of said mixing operation.

4,630,932

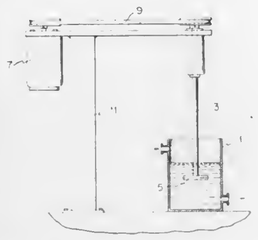
DISPERSING APPARATUS WITH WIRE WHEEL IMPELLER

Anthony J. Revelli, 395 Pinebrook Blvd., New Rochelle, N.Y. 10804, and Herbert Greenfield, 81-11-155 Ave., Howard Beach, N.Y. 11414

Filed Feb. 10, 1986, Ser. No. 827,895

Int. Cl.⁴ B01F *7/16*

U.S. Cl. 366—279 **27 Claims**



1. An improved apparatus for dispersing substances in a liquid having:

a vessel for holding liquid dispersing medium,

a rotatable stirrer shaft,

an impeller affixed to said shaft,

a motor capable of rotating said shaft,

a support structure for positioning said motor to rotate said shaft with impeller, and position said impeller within said vessel,

wherein the improvement comprises;

a dispersing impeller in the form of a disc of radially extending stiff wires, the parallel corrugated sides of said impeller formed from the outermost layer of the trim length of said wires, and the face of said impeller formed from the ends of said wires.

4,630,933

ELECTRICALLY OPERATED CLOCK AND SHAVER COMBINATION

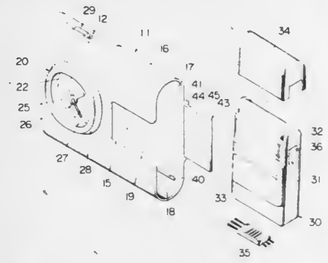
Sadashige Horii, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Mar. 3, 1986, Ser. No. 835,784

Claims priority, application Japan, Mar. 20, 1985, 60-56597

Int. Cl.⁴ G04B *47/00;* **B26B** *19/28*

U.S. Cl. 368—10 **9 Claims**



1. An electrically operated clock and shaver combination which comprises:

a casing provided with an electric clock and a battery source therefor;

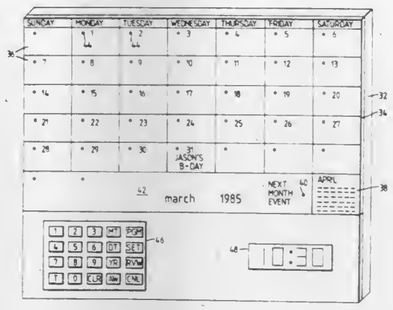
a self-contained battery powered electric shaver detachably received in a compartment formed in said casing; and said clock and compartment being arranged in side-by-side relation.

4,630,934

CALENDAR WITH INDICATING MEANS

Amihadar Arber, 13 Mendele Street, Tel-Aviv, Israel

Filed Feb. 10, 1986, Ser. No. 827,750
Int. Cl.[4] G04B *19/24;* **G09D** *3/00*
U.S. Cl. 368—28 **11 Claims**



1. An electronic, attention attracting calendar comprising a base having a front surface for exhibiting conventional calendar information indicia;

means associated with said front surface for lighting through selected areas thereon;

said front surface is adapted to have a plurality of interchangeable paper sheets mounted thereon, such as a yearly calendar refill, each interchangeable paper sheet, divided into defined monthly date areas bearing a calendar information indicia in a small portion thereof and at least the majority of said areas each include an aperture through the sheet in a second small portion thereof at a predetermined location for registering with each other sheet and revealing said lighting means individually through each aperture, said apertures and indicia leaving a large portion of said areas for accommodating jotted-down information;

circuit means for selectively activating and deactivating said lighting means to project light through at least one of said selected areas, and

control and memory means for programming said circuit means.

4,630,935

OTHER TIME INSTRUMENT

Charles M. Zettek, 39 E. Main St., Hopkinton, Mass. 01748

Filed Sep. 4, 1984, Ser. No. 646,777
Int. Cl.[4] G04B *45/00*
U.S. Cl. 368—41 **15 Claims**



1. An electronic timepiece comprising:

clock means providing an output indicative of sidereal time;

clock display means for displaying time of day information provided by said clock means;

a chronograph means for automatically counting given elapsed sidereal time periods of greater than one hour and for accumulated totals of said periods greater than thirty one;

chronograph display means for continuously displaying the dynamic total of said periods counted by said chronograph means;

manually operable actuator means;

calculator means for counting sequential actuations of said actuator means;

other time display means for displaying the accumulated total of said sequential actuations counted by said calculator means;

manual chronograph reset means for setting to zero the counted total of said time periods; and

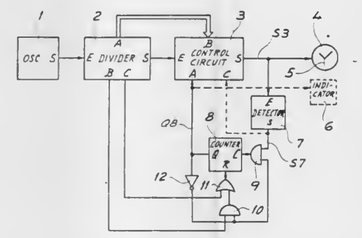
other time reset means for setting to zero the counted sequential actuations of said actuator means.

4,630,936

ELECTRONIC TIMEPIECE

Claude-Eric Leuenberger, Chezard, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Apr. 11, 1986, Ser. No. 850,784
Claims priority, application Switzerland, Apr. 12, 1985, 01571/85
Int. Cl.[4] G04B *9/00*
U.S. Cl. 368—66 **5 Claims**



1. An electronic timepiece comprising means for producing drive pulses, a motor having a rotor and means for turning the rotor through a set angle in response to each drive pulse, an autonomous source for supplying the drive pulse producing means with electric energy, means for producing an imminent end-of-life signal upon detecting the imminent end of the source's life and means for producing a warning signal in response to the signal from the detecting means, wherein the detecting means include means for producing a tally signal whenever the rotor does not turn correctly in response to a drive pulse, and a counter arranged to be incremented directly by said tally signal, with said counter producing, in response to a predetermined state, the imminent end-of-life signal.

4,630,937

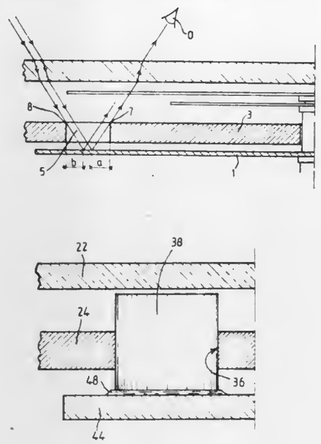
WATCHES OR THE LIKE EQUIPPED WITH A DISPLAY DEVICE OF THE DATE TYPE

Claude Grossiord, Annecy, France, assignor to S. T. DuPont, Paris, France

Filed Oct. 10, 1985, Ser. No. 786,273
Claims priority, application France, Oct. 31, 1984, 84 16702
Int. Cl.[4] G04B *19/00*
U.S. Cl. 368—223 **12 Claims**

1. A watch or the like with a display device of the date type, wherein the symbols to be displayed are supported by a mobile support element (**44**) and are perceived by an observer through a window (**36**) provided in part of the watch, said watch being characterized by a bundle (**38**) of coherent optical fibers being mounted in said window such that one end of said bundle is disposed near the mobile support (**44**) while the other end is flush with a visible surface of an element of the watch and

where a film of low-viscosity liquid is interposed between said mobile support element (**44**) and the contiguous end of the bundle of fibers (**38**) to provide an optical bridge between said support and said bundle of fibers.

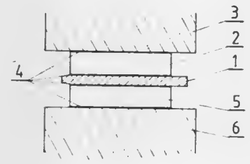


4,630,938

METHOD OF DETERMINATION OF THERMAL CONDUCTION COEFFICIENT AND HEAT CAPACITY OF MATERIALS AND THE APPARATUS FOR MEASUREMENTS OF THERMAL CONDUCTION COEFFICIENT AND HEAT CAPACITY OF MATERIAL

Ewa Piórkowska-Palczewska; Andrzej Galeski, and Marian Kryszewski, all of Lódź, Poland, assignors to Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych, Lodz, Poland

Filed Apr. 24, 1984, Ser. No. 603,559
Claims priority, application Poland, Apr. 27, 1983, 241663
Int. Cl.[4] G01N *25/00, 25/16;* **G01K** *17/00*
U.S. Cl. 374—44 **7 Claims**



1. A method for the determination of the heat conduction coefficient, heat capacity and thermal diffusivity of a material sample, comprising the measurement of a heat flux Q across the sample and the measurement of a momentary temperature difference ΔT between first and second opposite surfaces of said sample, which method is characterized in that the momentary temperature difference ΔT between both surfaces of the sample perpendicular to the direction of said heat flux is measured during a preferably linear applied continuous change of the temperature of said first surface of said sample, and supplying an amount of heat by a heater directly to said second surface of said sample in order to give rise to the heat flux Q across the sample, measuring said amount of heat supplied, while the values of the thermal conductivity coefficient, heat capacity and thermal diffusivity are determined on the basis of the following equation:

$$\lambda = \frac{(2Q - b1c)1}{2\Delta T}$$

where

γ—thermal conductivity coefficient

$Q = \frac{P}{2s}$ — heat flowing across the sample per time unit per surface area s, where P is the power supplied to the heater

c—heat capacity of the sample

1—thickness of the sample

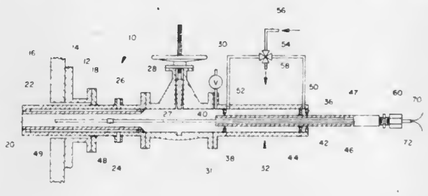
b—rate of change of the temperature of said first surface of said sample.

4,630,939

TEMPERATURE MEASURING APPARATUS

M. Dale Mayes, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1985, Ser. No. 798,500
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—135 **13 Claims**



1. An apparatus for measuring the temperature of a fluid environment within a vessel, said apparatus comprising:

(a) a chamber means that is sealingly connected to and which opens into said vessel to form a chamber which contains a portion of said fluid environment;

(b) a temperature sensing means which is movable between a first and a second position, whereby at said first position,

(i) at least a portion of said temperature sensing means is within said chamber, and

(ii) said temperature sensing means is out of contact with the remainder of said fluid environment, and whereby at said second position,

(iii) at least a portion of said temperature sensing means is exterior of said chamber and is in contact with said remainder of said fluid environment so as to obtain said temperature measurement;

(c) means for preventing substantial convective movement between said portion of said fluid environment and said remainder of said fluid environment when said temperature sensing means is moving between and at said first and second positions; and

(d) means for maintaining said portion of said fluid environment in said chamber at a cooler temperature than the temperature of said remainder of said fluid environment.

4,630,940

TEMPERATURE DISPLAY DEVICE FOR ATTACHMENT TO A WATER OUTLET

Ulrich K. Ostertag, and Reinhard F. Ostertag, both of Eibenweg 10, D-7000 Stuttgart 70, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,515
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328782
Int. Cl.[4] G01K *1/14, 13/02*
U.S. Cl. 374—148 **8 Claims**

1. A device for measuring and displaying the temperature of

the liquid flowing out of a spout that has an interiorly threaded outlet, which device comprises

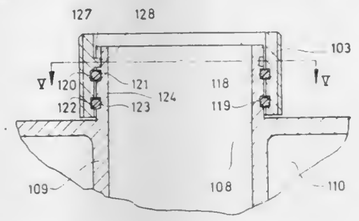
(a) a housing that includes

(1) an inlet end,

(2) an outlet end, and

(3) a liquid passageway connecting said inlet end to said outlet end of said housing,

(b) a connecting stud for connecting said spout to said housing, one end of said stud having exterior threading that is adapted to engage the interior threads on the outlet end of said spount and connecting means for connecting said connecting stud to the inlet end of said housing so that the connection therebetween will be fluid tight while still



permitting rotational movement relative to each other around the same axis, said connecting means comprising at least one O-ring seal that engages into a groove formed in the circumferential surface of said connecting stud as well as into a groove formed in an opposing circumferential surface of said housing,

(c) temperature sensor means mounted in said housing which can detect the temperature of the liquid flowing through said passageway,

(d) digital display means located on an exterior portion of said housing to display a visible indication of the temperature, and

(e) electrical means interconnecting said temperature sensor means with said digital display means.

4,630,941

TUBULAR SQUEEZE BEARING APPARATUS WITH ROTATIONAL RESTRAINT

Timothy J. Chainer, Mahopac; Robert A. Scranton, and David A. Thompson, both of South Salem, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 581,748, Feb. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 470,658, Feb. 28, 1983. This application Oct. 24, 1985, Ser. No. 790,650

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—1 **39 Claims**



1. An improved squeeze bearing apparatus comprising:

a rod-like bearing member having an exterior surface with a non-circular exterior perimeter, said perimeter comprising a plurality of outwardly projecting lobes;

a sleeve-like bearing member for receiving said rod-like bearing member, said sleeve-like bearing member having a non-circular interior bore perimeter symmetrical with said rod-like bearing member exterior perimeter; and

means for causing sufficient relative radial vibration between said sleeve-like bearing member and said rod-like bearing member to cause fluid in the clearance between said members alternately to be compressed and decompressed and thereby generate a load supporting force which is substantially inversely proportional to the number of said lobes in the squeeze bearing defined between said bearing members to resist relative rotation between said bearing members about said axis due to said compression and decompression of said fluid by said non-circular perimeters and to allow relative translation between said bearing members along said axis.

4,630,942

GUIDING APPARATUS

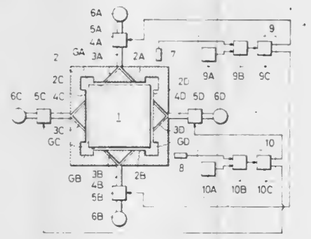
Nobuo Tsumaki; Hiromitsu Tokisue, and Hiroshi Inoue, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,574

Claims priority, application Japan, Jan. 20, 1984, 59-7173

Int. Cl.⁴ B23Q *1/26;* **F16C** *29/00, 32/06, 33/02*

U.S. Cl. 384—8 **2 Claims**



1. A guiding apparatus comprising: a base having two pairs of opposing parallel surfaces; a slider supported above the base in a floating manner by means of hydrostatic bearings and linearly movable in a z-axis direction along said base; pressurized fluid supplying means for supplying pressurized fluid to said hydrostatic bearings; detecting means for detecting the displacement of said slider with respect to a designated coordinate position which is independent with said base and said slider in an x-axis and y-axis direction; memory means for storing a reference position of said slider with respect to said base in said x-axis and said y-axis direction; comparing means for comparing the values of the x-axis distance and y-axis distance measured by said detecting means with the respective values of the reference position in the x-axis direction and the y-axis direction stored in said memory means; and correcting and controlling means for adjusting the pressure of said pressurized fluid supplying means in accordance with the signal from said comparing means thereby correcting the position of said slider with respect to the designated coordinate position so as to enable accurate positioning of said slider along said base, said slider being a rectangular member, and said correcting and controlling means controlling two pairs of opposing gaps for forming hydrostatic fluid films for said hydrostatic bearings.

4,630,943

FERROFLUID BEARING AND SEAL APPARATUS

Philip Stahl, Holliston, Mass.; Donald F. Wilcock, Schenectady, and Dudley D. Fuller, Lake Hill, both of N.Y., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 545,875, Oct. 27, 1983, abandoned. This application Feb. 26, 1986, Ser. No. 833,841

Int. Cl.⁴ F16C *33/74, 33/82;* **F16J** *15/40*

U.S. Cl. 384—133 **5 Claims**

1. A ferrofluid seal-radial-thrust bearing apparatus which comprises:

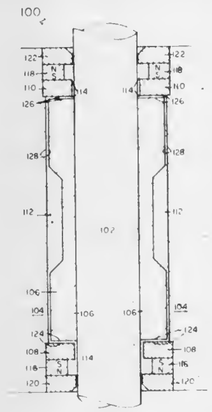
(a) a rotatable magnetically permeable shaft element;

(b) a housing which surrounds the shaft element and has an interior radial surface to form a radial bearing surface;

(c) a collar element secured to the shaft and having an exterior radial surface which is spaced apart from the interior surface of the housing to form a radial bearing cavity, the collar element having one and the other end generally with surfaces perpendicular to the axis of the shaft;

(d) first and second thrust bearing elements at the one and other end of the collar element and having lower and upper surfaces respectively, which surfaces form respectively with the end surfaces a lower and upper thrust bearing cavity surrounding the shaft element;

(e) separate, spaced apart upper first and lower second ferrofluid seal apparatus each of which comprises an annular permanent magnet about the shaft element and at least one pole piece which forms at the one end a radial gap with



the surface of the shaft element, the first and second ferrofluid seal apparatus adjacent respectively either end of the first and second thrust bearing elements so that the bearing cavities are not substantially exposed to a magnetic field; and

(f) ferrofluid which fills the radial thrust bearing cavities to act as a ferrolubricant and extends continuously to each of the radial gaps of the upper and lower ferrofluid seal apparatus to form at least one lower and upper O-ring ferrofluid seal about the surface of the shaft element to prevent the escape of the ferrofluid on the longitudinal outward movement of the ferrofluid from the thrust and radial bearing cavities and entrainment of gases in the ferrofluid during rotation of the shaft.

4,630,944

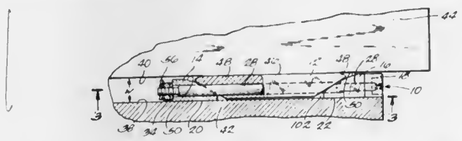
GIB FOR MACHINE TOOL

Robert L. Moehr, Mt. Clemens, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Jul. 22, 1985, Ser. No. 757,156

Int. Cl.⁴ F16C *33/02, 29/12*

U.S. Cl. 384—39 **8 Claims**



1. A gib for use with a machine tool having first and second members and means for moving the first member along a first axis with respect to the second member, the second member having a planar surface extending along the first axis and the first member having a planar surface in opposing relation with the planar surface of the second member, said gib comprising:

first and second wedges, each of said wedges having a crowned surface and a base surface, said base surfaces comprising at least a portion of a first side of said gib;

a body positioned between said wedges having tapered ends and a side surface, said side surface of said body comprising at least a portion of a second side of said gib, each of said tapered ends of said body abutting the crowned surface of one of said wedges;

means for mounting said body and said first and second wedges for movement with said first member and within a space between said planar surfaces of said first and second members; and

means directed along a second axis passing through said wedges and said body for both moving and guiding movement of said body relative to said wedges to urge said side surface of said body against one of said planar surfaces of said first and second members and for urging said base surfaces of said wedges against the other of said planar surfaces of said first and second members to align said planar surface of said first member along said first axis as said first member moves with respect to said second member.

4,630,945

BEARING HOUSING

Paul Gerling, Oberhausen, Fed. Rep. of Germany, assignor to Glyco-Maschinenbau GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,797

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414476

Int. Cl.⁴ F16C *3/13, 37/00, 35/02;* **F24H** *3/12*

U.S. Cl. 384—320 **6 Claims**



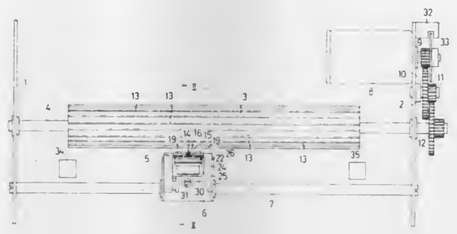
1. A plain-bearing housing for plain shaft bearings, comprising a bottom housing part and an upper housing part together defining a passage for a shaft and adapted to receive a plain bearing, said housing parts joining along a junction extending through said passage, said housing parts each being provided upon opposite axial sides thereof with cooling ribs lying substantially in parallel planes and uniformly spaced transversely apart, an upper portion of said upper part being additionally provided with cooling ribs, at least the ribs of at least one of said sides of said bottom housing part being provided in at least two rows perpendicularly aligned to the planes of said ribs, the ribs of said rows running vertical and perpendicular to said junction and said ribs being mutually staggered whereby ribs of one of said rows lie in line with spaces between the ribs of an adjoining row, and wherein ribs of said upper housing part are subdivided into respective rib registers.

4,630,946

DOT PRINTER OPERABLE IN HIGH RESOLUTION AND ORDINARY PRINTING MODES

Seiki Mizutani; Mikio Hayashi, and Kazuaki Ikeda, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,925
Claims priority, application Japan, Oct. 8, 1982, 57-177434
Int. Cl.⁴ B41J *3/02, 3/08*
U.S. Cl. 400—121 **2 Claims**



1. In a dot printer which is provided with a rotary drum having a plurality of parallel protrusions axially extending therealong on its outer circumferential periphery and a printing head movable back and forth in front of said rotary drum in directions perpendicular to the feeding direction of a recording medium, said printing head carrying a printing hammer mounted so as to face said protrusions of the rotary drum so that said printing hammer can be selectively driven to strike against respective ones of said protrusions to thereby form characters or the like on the recording medium, a printing method comprising the steps of;

driving said rotary drum, during the backward travelling of said printing head, to rotate in a direction of rotation opposite to the rotational direction of the rotary drum during the forward travelling of said printing head; and

driving said printing hammer such that dots are formed on the recording medium during the backward travelling of said printing hammer between dot rows formed during the forward travelling of said printing hammer so that printing is performed over one line through one reciprocating travelling of said printing head without advancing the recording medium throughout the printing of said one line.

2. In a dot printer which is provided with a rotary drum having a plurality of parallel protrusions axially extending therealong on its outer circumferential periphery and a printing head movable back and forth in front of said rotary drum in directions perpendicular to the feeding direction of a recording medium, said printing head carrying a printing hammer mounted so as to face said protrusions of the rotary drum so that said printing hammer can be selectively driven to strike against respective ones of said protrusions to thereby form characters or the like on the recording medium, a printing method comprising the steps of:

driving said rotary drum, during the backward travelling of said printing head, to rotate in a direction of rotation opposite to the rotational direction of the rotary drum during the forward travelling of said printing head such that the printing mode is selectable between a high resolution printing mode and an ordinary printing mode;

driving said printing hammer, in said high resolution printing mode, such that during the backward travelling of said printing hammer, dots are formed on the recording medium between dot rows formed during the forward travelling of said printing hammer so that printing is performed over one line through one reciprocating travelling of said printing head without advancing the recording medium throughout the printing of said one line; and

driving said printing hammer, in said ordinary printing mode, such that printing is performed on the recording medium over one line through each of the forward and backward travelling of said printing head.

4,630,947

ENLARGED PATTERN GENERATOR

Kunio Yoshida, Nara, and Fusao Makino, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 22, 1985, Ser. No. 693,125
Claims priority, application Japan, Feb. 16, 1984, 59-28028
Int. Cl.⁴ B41J *11/44;* **H04N** *1/21, 1/17*
U.S. Cl. 400—124 **7 Claims**



1. Apparatus for enlarging an original pattern on a dot matrix comprising

means for defining four matrix positions corresponding to each dot included in said original pattern, and

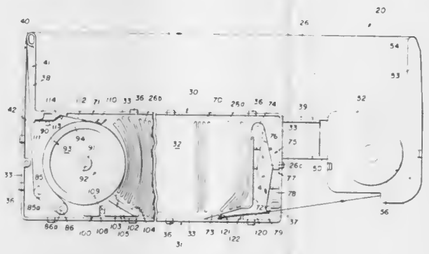
means for examining each dot included in said original pattern to determine whether three of the eight matrix positions adjacent to and surrounding said dot included in said original pattern are all unoccupied by dots belonging to said original pattern, said three positions being above, left-above and at left of said dot, or above, right-above and at right of said dot, or below, left-below and at left of said dot or below, right-below and at right of said dot.

4,630,948

INKED RIBBON CARTRIDGE

Ward L. Karns, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Sep. 30, 1982, Ser. No. 429,002
Int. Cl.⁴ B41J *32/02, 32/28*
U.S. Cl. 400—196.1 **15 Claims**



1. An inked ribbon cartridge for a printing device comprising:

an endless ribbon,

an elongated housing having an interior cavity defined by top and bottom surfaces for storing said ribbon,

said housing having a port at one end thereof through which said ribbon exits,

a first rigid end support member in said housing located adjacent to said port, a second rigid end support member in said housing, a middle rigid support member in said housing disposed between said end support members,

a leaf spring member in engagement with all of said support members,

the middle support member being over center with respect to said end support members so that said spring member is biased tightly against said first end support member but free to flex away therefrom in response to forces opposing the spring force,

said ribbon being drawn between said spring member and said first end support member out of said port, and

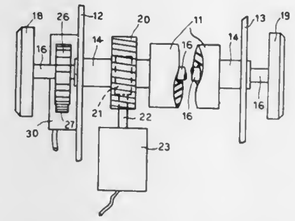
means to prevent said ribbon from being caught above or below said leaf spring between the spring and top or bottom housing surfaces comprising integral top and bottom tabs on the end portion of said spring member which is in contact with said first end support member, said top and bottom tabs extending to provide a total combined spring height thereat greater than the distance between the top and bottom surfaces of the housing to positively prevent said ribbon from becoming caught between the spring and said top and bottom surfaces as it exits from said housing, said top and bottom surfaces having openings therein respectively receiving said top and bottom tabs and said openings being sized to permit flexing movement by the end of said spring member.

4,630,949

DEVICE FOR CONTROLLING THE ROTARY MOVEMENT OF A PLATEN

Marcello Boella, Loranzè, and Ugo Carena, Ivrea, both of Italy, assignors to Ing C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 11, 1984, Ser. No. 649,491
Claims priority, application Italy, Sep. 12, 1983, 67938 A/83
Int. Cl.⁴ B41J *19/92*
U.S. Cl. 400—568 **10 Claims**



1. In a device for controlling the rotary movement of a platen comprising a frame having two side plates for rotatably supporting said platen, an electric motor coupled to said platen, a knob rotatably mounted on said frame, and transducer means having a fixed portion and a movable portion, wherein said movable portion is operatively connected with said knob and cooperates with said fixed portion for generating signals indicative of the rotation of said knob and wherein control means respond to said signals to drive said motor in accordance with the rotation of said knob, wherein said electric motor is of bidirectional type and said signals are dependent on the direction of rotation of said movable portion, and wherein the direction of rotation of said electric motor is determined by the direction of rotation of said rotating member, the combination comprising:

a rotating member carrying the movable portion of said transducer means;

a support member for rotatably supporting said rotating member around a given axis; and

a spring member having an intermediate portion partially coiled around said axis and two end portions cooperative with two pegs fixed to said rotating member for urging said rotating member toward a rest position;

wherein said knob is fixed coaxially with a gear wheel, wherein said rotating member comprises a toothed sector engageable with said gear wheel and wherein said support member comprises a casing fixed to one of said two side plates adjacent to said platen;

wherein said motor can rotate at two different speeds, and wherein a lower speed and a higher speed are determined by lower rotations and higher rotations of said movable portion, further comprising

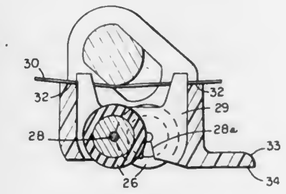
second resilient means for establishing on said rotating member an opposing force greater than the force of said spring member as said knob rotates said movable portion through said higher rotations to select the higher of said two speeds.

4,630,950

PAPER BAIL FOR A PRINTER AND ASSOCIATED METHODS OF OPERATION THEREOF

Mosi Chu, Setauket, and Meng S. Kuo, Ronkonkoma, both of N.Y., assignors to Primages, Inc., Ronkonkoma, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,445
Int. Cl.⁴ B41J *13/16, 13/20*
U.S. Cl. 400—639.1 **20 Claims**



1. Paper bail apparatus for operation with a platen of a printer comprising a paper bail shaft movable between an operative position adjacent the platen of the printer and an inoperative position remote from the platen, and a plurality of paper bail assemblies mounted on said paper bail shaft, each paper bail assembly comprising a frame non-rotatably supported on said shaft and movable for slidable displacement radially of the shaft in a plane substantially perpendicular to the axis of the shaft, spring means mounted on said frame for engaging said shaft to urge the frame in its direction of slidable displacement radially of the shaft to a lowered position on said shaft, and two rollers mounted on said frame for rotation about respective axes which are at offset locations for rollingly contacting the platen along two separate lines of contact under the urging of said spring means with the paper bail shaft in its operative position, said rollers being supported in the frame with their axes of rotation transversely offset from one another such that the rollers are circumferentially spaced on said platen.

4,630,951

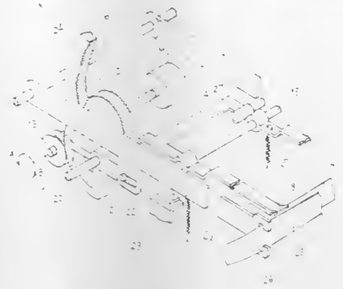
INK RIBBON AND CORRECTION TAPE LIFTING MECHANISM FOR A TYPEWRITER

Tomio Nii, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,510
Int. Cl.⁴ B41J *35/22*
U.S. Cl. 400—697.1 **7 Claims**

1. A lifting mechanism for lifting ink ribbon and correction tape for a typewriter, comprising: a large gear wheel and a small gear wheel which are fixed to a driving motor shaft and which provide gear teeth at predetermined portions of the circumferences of the respective gear wheels, a ribbon lift arm including a gear wheel portion integrally connected thereto and an extended portion for supporting and lifting said ink ribbon, and providing a pivot point between said gear wheel portion and said extended portion, said gear wheel portion being arranged to engage at the time of lifting with the gear teeth of said large wheel, said ribbon lift arm pivoting about said pivot point at the time of lifting, and further comprising a tape lift arm including a gear wheel portion integrally connected thereto which is arranged to engage at the time of lifting with the gear teeth of said small gear wheel, a tape lift plate for supporting and lifting said correction tape and a direct

connection between said tape lift arm and said tape lift plate whereby rotary motion imparted to said tape lift arm is transmitted as lifting motion to said tape lift plate, said tape lift arm



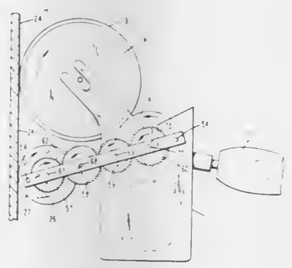
rotating about a pivot point located between its gear wheel portion and an opposite end thereof whereat said tape lift plate is connected.

4,630,952

DESIGN PAINTING DEVICE WITH STABILITY AND INDEPENDENT DRIVE

Saul Elbaum, 11702 Kemp Mill Rd., Silver Spring, Md. 20902

Filed Apr. 29, 1985, Ser. No. 728,348
Int. Cl.⁴ B43M *11/02;* **B05C** *17/02*
U.S. Cl. 401—48 **16 Claims**



1. A device for painting wallpaper-like patterns on walls comprising:
(a) a container for holding paint;
(b) a pattern roller for applying a pattern as it is manually driven by friction contact between itself and a wall;
(c) at least one feeder roller which is driven by friction contact with said pattern roller;
(d) a friction roller, independent of said pattern roller, for providing stability and avoiding lateral movements of said device across said wall;
(e) a driver roller for driving said feeder roller; and
(f) means for transferring rotary motion from said friction roller to said driver roller such that said feeder roller rotates at the same linear speed at which said pattern roller is manually driven along said wall.

4,630,953

PENCIL HOLDER

José E. Rocha Cabral, Avenida Tiradentes, 1595, Londrina, PR., and Oswaldo A. Correa Mellone, Rua Bandeira Paulista, 104 - Apt°. 71, Sao Paulo, both of Brazil

Filed Apr. 11, 1985, Ser. No. 722,143
Claims priority, application Brazil, Jun. 29, 1984, 8403212
Int. Cl.⁴ B43K *21/06, 24/04, 23/00*
U.S. Cl. 401—83 **3 Claims**

1. Pencil holder, comprising a body or case having in one of its sides a slit that extends from the upper part to the lower part of the tip of the body or case, said slit being grooved in a manner similar to a scale a piston having an "L"-shaped section extending into said slit, said piston consisting of a rod, a head interconnected by an intermediary wall, the head being located inside the body or case and having in the middle a cavity for



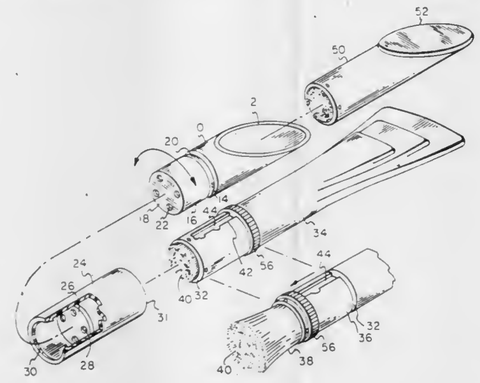
receiving the graphite; said rod running parallel to the body along said slit; said rod also having in the middle thereof a slit causing the formation of two sides that receive at the top two projections, similar to crossbars that are arranged horizontally in relation to the rod and whose ends are separated to establish small lateral extensions in the form of an "L".

4,630,954

COSMETIC POWDER DISPENSER AND APPLICATOR

James E. Ladd, Jr., Rowayton, Conn., assignor to Laura Lupton, Inc, Rowayton, Conn.

Continuation-in-part of Ser. No. 752,133, Jul. 5, 1985. This application Sep. 25, 1985, Ser. No. 779,484
Int. Cl.⁴ A46B *11/00, 11/04*
U.S. Cl. 401—123 **4 Claims**



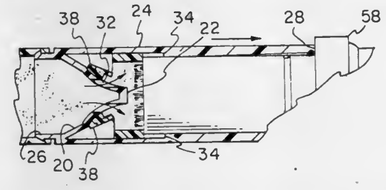
1. A cosmetic powder dispenser and applicator comprising:
a first elongated hollow member having first and second opposite ends, the first end being open, the second end having a plurality of small spaced apart openings therein and being otherwise closed;
a hollow elongated capsule adapted to be filled with cosmetic powder, either face powder or blush, said capsule being closed at one end and open at the other, the capsule being removably slidable into and out of the first member and when inserted in the first member, having its open end adjacent the second end of the first member and its closed end closing the first end of the first member;
a second elongated hollow member having a first end with a like plurality of like openings and a second open end, the second member rotatably engaging the first member with the first end of the second member adjacent the second end of the first member, the first and second members having a first position of relative rotation at which the openings in the two members are aligned and a second position of relative rotation at which the openings in the two members are out of alignment;
a third elongated hollow member having an open end detachably engaging the second end of the second member and having an opposite closed end; and
a brush having a plurality of essentially parallel bristles with powder applying tips, the brush being disposed in the third member with the tips adjacent the second member, said brush and said third member having manually operated cooperating means for establishing a first forward position when the capsule contains face powder at which the bristles will extend almost entirely out of the third member, a second forward position when the capsule contains blush at which the bristles extend out of the third member to a lesser extend then when the first position is used, and a third withdrawn position at which the brush is disposed within the third member.

4,630,955

COSMETIC POWDER DISPENSER AND APPLICATOR

James E. Ladd, Jr., Rowayton, and David R. Jacobs, Norwalk, both of Conn., assignors to Laura Lupton Inc., Rowayton, Conn.

Continuation-in-part of Ser. No. 752,133, Jul. 5, 1985. This application Nov. 8, 1985, Ser. No. 796,230
Int. Cl.⁴ A46B *11/00, 11/04*
U.S. Cl. 401—123 **5 Claims**



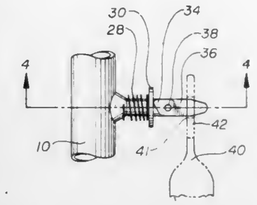
1. A cosmetic powder dispenser and applicator comprising:
a first elongated hollow member having a first open end and an opposite closed end with a plurality of small spaced openings therein;
a hollow elongated capsule, adapted to be filled with cosmetic powder, closed at one end and open at the other and removably slidable into and out of the first member, the capsule, when inserted in the first member, having its open end adjacent the second end of the first member and its closed end closing the first end of the second member;
a second elongated hollow member having first and second open ends, said first member having its closed end disposed in the first end of the second member, said second member having a cam in the first end having openings aligned with the openings in the closed end of the first member, said second member having a cam follower disposed slidably in the second member, said follower and said cam always being engaged, the follower and cam having a first normal position of engagement at which the follower seals the cam openings and a second momentary position of engagement at which the follower exposes the cam openings;
a third elongated hollow member having an open end:
a brush having a plurality of essentially parallel bristles with powder applying tips, the brush being disposed in the open third member end, the brush carrying end of the third member being removably disposed in the second end of the second member and engaging the follower, the second member being slidable back and forth along the third member between a first normal position at which the cam and follower are in the first position of engagement and a second momentary position at which the cam and follower are in the momentary second position of engagement.

4,630,956

SCAFFOLDING CONNECTION AND RETENTION DEVICE AND METHOD

William E. Gilbreath, Huffman, Tex., assignor to Safway Scaffolds Company of Houston, Houston, Tex.

Filed Oct. 5, 1984, Ser. No. 657,979
Int. Cl.⁴ E04G *7/00;* **F16B** *1/00, 21/00*
U.S. Cl. 403—49 **25 Claims**



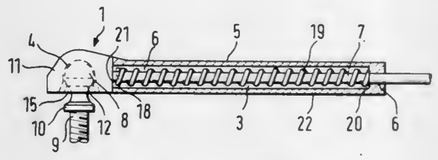
1. A scaffolding connection and retention device for temporarily securing together a first elongate support member and a second elongate bracing member, comprising:
a stud affixed to said first member and having a longitudinal slot within a portion of the length of said stud;
a dog member pivotally mounted to said stud and rotatable within said slot, said dog member having a washer engaging end and bracing member receiving end;
a washer axially movable relative to said stud and having a transverse bar portion movable within said slot for engagement with said dog member;
said washer engaging end of said dog member having an outer surface configuration for substantially line contact engagement between said washer engaging end and said washer when said dog member is pivotably rotated is alignment with said stud for receiving said bracing member; and
a spring member substantially encompassing at least a portion of said stud and spaced between said first member and said washer for biasing said washer away from said first member and supplying at least a preselected biasing force on said dog member when positioned for receiving said bracing member.

4,630,957

BALL CUP FOR A BALL BEARING

Erich Ausprung, Geislingen, Fed. Rep. of Germany, assignor to Springfix-Befestigungstechnik GmbH, Salach, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,323
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218962
Int. Cl.⁴ F16C *11/00*
U.S. Cl. 403—76 **3 Claims**



1. A ball cup for a ball bearing comprising a ball cup body having a spherically formed ball-receiving chamber and said chamber having an annular restricted entrace whose diameter is less than the maximum diameter of said chamber and extending along the whole circumference of said chamber, said ball cup body having formed therein a pair of diametrically opposing spaced arcuate slits which substantially surround said

chamber and restricted entrance concentrically, and said slits defining with said restricted entrance a pair of arcuate bridge elements which are coextensive with said slits circumferentially of the chamber and restricted entrance, said bridge elements having their circumferential ends connected to said ball cup body and being elongated and radially narrow and therefore are yielding and somewhat stretchable radially and along their circumferential lengths, whereby a non-yielding ball bearing possessing substantially the maximum diameter of said chamber may pass through the restricted entrance and will be securely retained by the restricted opening within said chamber, said ball cup body having a flat surface lying in a plane parallel to said restricted entrance and spaced therefrom in a direction away from the center of said chamber, and the ball cup body having a tapered surface formed from said flat surface extending along the whole circumference of said chamber and being concentric with and leading to the restricted entrance and forming a guideway for the ball bearing being passed through the restricted entrance and said ball cup body being formed from a somewhat yielding plastics material.

4,630,958

ATTACHING COAXIALLY A MEMBER OR FITTING WITH A BORE THERETHROUGH TO A SHAFT

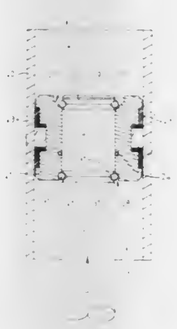
John S. McCallister, Christchurch, New Zealand, assignor to Sim-Tech Limited, Christchurch, New Zealand

Filed Sep. 29, 1983, Ser. No. 536,659

Claims priority, application New Zealand, Oct. 4, 1982, 202076

Int. Cl.⁴ F16B *21/16, 21/18*

U.S. Cl. 403—257 **23 Claims**



1. In a connection between a first member and a bore in a second member, wherein the periphery of the first member has a shape similar to that of the bore and the first member is dimensioned to have a sliding fit within the bore, the improvement comprising:

two spaced grooves formed around the periphery of the first member, each groove being defined by at least one face;

two spaced steps formed in said bore, each step being defined by at least one face and being provided by a region of enlarging diameter relative to said bore, said enlarging diameter region extending to the adjacent end of said second member; and

a compression clip located in and occupying a major portion of the circumferential length of each groove, said compression clip having a solid cross-section;

each step being located and having a configuration so that at least one groove is in register with one of said steps, said compression clip in said at least one groove is compressed between said at least one face of said at least one groove and said at least one face of said one step and the angle between the compressive forces acting upon said compressed clip and the longitudinal axis of the bore is in the range of 30°–70°, and the other of said steps is positioned relative to said other groove for providing a predetermined amount of binary cushioning in the range from zero to any positive dimension, between the first member and the second member.

4,630,959

CONNECTION OF TWO SPACER FRAME PROFILES AS WELL AS PROCESS AND APPARATUS FOR THE ESTABLISHMENT OF THE CONNECTION

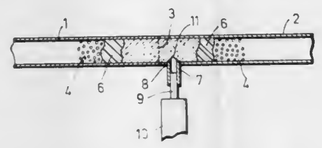
Siegfried Glaser, Beverungen, Fed. Rep. of Germany, assignor to Helmut Lingemann GmbH & Co., Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,591

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233399

Int. Cl.⁴ F16B *12/04*; B29C *31/06*

U.S. Cl. 403—266 **14 Claims**



1. Connection of two spacer frame hollow profile pieces that are usable for production of an insulating glazing, comprising:

each of said two hollow profile pieces having spaced apart top and bottom walls and spaced apart side walls to provide an interior space within each of said profile pieces, a first portion of said interior space within each of said profile pieces being filled with a drying agent to define a second portion of said interior space within each of said profile pieces adjacent to outer edges of each of said profile pieces;

first and second plugs being disposed in respective ones of said two hollow profile pieces within an inner section of said second portion of said interior space against said drying agent to retain said drying agent within said first portion of each of said profile pieces;

said outer edges of said profile pieces being set against one another in an abutting arrangement so that said second portions of said interior spaces are in communication with each other to provide a cavity extending on both sides of said abutting arrangement from said first plug to said second plug;

said cavity being closed off on opposite sides thereof by said first and second plugs respectively;

connecting means being injectable through at least one of said walls of said profile pieces for connecting said profile pieces together;

said connecting means including a one-piece connecting body being seated within said cavity within said profile pieces, said connecting body bridging across said abutting arrangement and being disposed against said first and second plugs for positioning on both sides of said abutting edges;

said connecting body including adhesive means to adhere adhesively to inner wall surfaces of said top, bottom and side walls of each of said profile and to facing walls of said first and second plugs;

said adhesive means including a hardened fusion adhesive third plug; and

means for injecting said third plug as a liquid through said one of said walls of said profile pieces into said cavity.

4,630,960

ADJUSTABLE HERRINGBONE LOCK JOINT

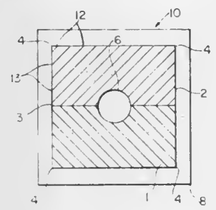
James B. Reeves, Jr., 1315 Whitman Dr., Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 512,540, Jul. 11, 1983, Pat. No. 4,531,926, Ser. No. 611,111, May 17, 1984, Pat. No. 4,559,028, and Ser. No. 647,437, Sep. 5, 1984, Pat. No. 4,571,218. This application Dec. 27, 1984, Ser. No. 686,826

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.⁴ F16B *5/00*

U.S. Cl. 403—345 **29 Claims**



1. A mechanical joint, comprising:

first and second joint members having mating joint surfaces with a dividing line;

a first set of a plurality of alternating and parallel ridges and notches on one side of said dividing line for each of said members, so that said members may be placed together with the mating surfaces contacting each other and the ridges and notches of one member interengaging with the notches and ridges of the other member, respectively, in a first assembly position, moved away from each other to disengage the ridges and notches so that the surfaces may be shifted laterally of the extent of the ridges and notches to a new position wherein they may be re-engaged at a second assembly position offset from the first assembly position, and in a like manner adjusted to a plurality of additional assembly positions that are different from each other;

a second set of a plurality of alternating and parallel ridges and notches on each of said members on the other side of said dividing line so arranged that the ridges and notches of the second set will interengage with each other respectively for the two members in each of said assembly positions;

said first set and second set of ridges and notches each being arranged at an acute angle with respect to said dividing line and at an angle to each other to thereby prevent relative movement between said members along their mating surfaces in any direction when in any one of said assembly positions; and

fastener means for holding said members in their assembled positions, and said fastener means being selectively releasable to permit movement of said mating surfaces of said members perpendicular to said mating away from each other so that they may be shifted and reassembled in another of said assembly positions to thereby provide a secure and adjustable joint between said members.

4,630,961

TRAFFIC INTERSECTION

Horst Hellwig, Im Saales 18, D-6338 Huettenberg-Rechtenbach, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,888

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224429; PCT Int'l Appl., Jun. 16, 1983, PCT/DE83/00111

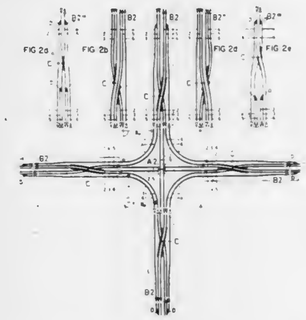
Int. Cl.⁴ E01C *1/04*

U.S. Cl. 404—1 **11 Claims**

1. An intersection for handling traffic from a plurality of intersecting roads, each of said roads having oppositely directed lanes for oppositely traveling traffic, said intersection comprising:

a cental zone into which each of said roads extends, said lanes being divided into incoming lanes relative to said zone and outgoing lanes relative to said zone;

an interchange zone associated with each of said roads entering said central zone, each interchange zone being outside of said central zone and including an overpass for exchanging the relative position of at least two of said oppositely directed lanes for each of said roads, said overpass being used to exchange all lanes which require exchanging in said interchange zone; and



wherein said lanes are divided into main traffic lanes and access lanes for each of said roads, said access lanes connecting to said main traffic lanes at points of conflict, and said main traffic lanes of certain of said roads being connected to provide a main traffic stream, there being at least as many incoming lanes in each road, prior to said overpasses, as the directional choices available and all points of conflict on said incoming lanes being positioned prior to said overpasses and on the same level, all points of conflict on said outgoing lanes being positioned after said overpasses whereby the choice of direction is selected by entering a unique lane for a particular direction prior to said interchange zone.

4,630,962

DRAINAGE CHANNEL WITH LOCKING GRATE

Roland Thomann, Hehlstrasse 6, 8135 Langnau; Heinz Witschi, Am Luzernbach 9, 6043 Adligenswil; Heinz-Deiter Brink, Oberfeldweg 153, 3322 Mattstetten, and Markus Amann, Wieswaldweg 36, 8135 Langnau, all of Switzerland

Continuation-in-part of Ser. No. 506,245, Jun. 20, 1983, abandoned. This application Aug. 16, 1985, Ser. No. 766,088

Claims priority, application Switzerland, Nov. 23, 1982, 6826/82

Int. Cl.⁴ E01F *5/00*

U.S. Cl. 404—2 **9 Claims**

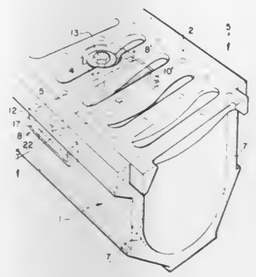
1. A drainage channel including an elongate concrete channel body having an upwardly directed opening; a grate for being positioned in and covering the opening of said channel body; and anchor means for detachably securing said grate to said channel body, said anchor means comprising:

(a) a bolt rotatably mounted on said grate and having an end extending into said channel body;

(b) a locking strap carried transversely by said bolt for rotation thereon within said channel body into and out of proximity to the walls of said channel body; and

(c) a locking block carried in a recess in the walls of said channel body and cooperating with said locking strap and including means for securing said locking strap within said locking block upon rotation of said locking strap in one direction and for detaching said locking strap from said locking block upon rotation in the other direction

whereby said grate can be easily and quickly secured to or detached from said channel body; said locking block comprising an insert positioned in said recess and interposed between the concrete walls of the channel body and locking strap to protect the concrete walls of the channel



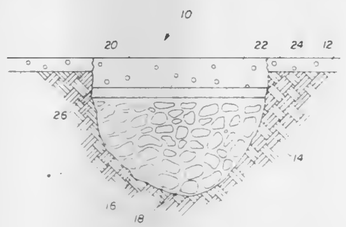
body from breaking and crushing caused by tightening the locking strap within the locking block and flexure of the channel structure caused by vertical loading of the channel and prevent loosening said locking strap within said locking block.

4,630,963

POLYMER CONCRETE BY PERCOLATION

Ransome J. Wyman, 821 Camino Colibri, Calabasas, Calif. 91302

Filed Sep. 5, 1984, Ser. No. 647,597
Int. Cl.[4] E01C *7/30;* **C08G** *18/26*
U.S. Cl. 404—75 **14 Claims**



1. A method for the repair of a roadway having a cavity therein, comprising:

filling the cavity with an aggregate;

forming a solution comprising from about 0 to 8% of an OH terminated polyether polyol having a molecular weight of less than 2,000, from about 23 to 35% of an organic polyisocyanate from about 38 to 58% of a solvent having a specific gravity of greater than 1, from about 8 to 16% of a diaminotetrahydroxyl polyol, from about 0.15 to 0.3% to an organic mercury catalyst and from about 0 to 1% of an organic lead catalyst; and

dispersing the solution through the aggregate and allowing the solution to percolate therethrough to fill the cavity.

4,630,964

SUBGRADING MACHINE

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Filed Oct. 22, 1984, Ser. No. 663,196
Int. Cl.[4] E01C *19/15*
U.S. Cl. 404—96 **19 Claims**

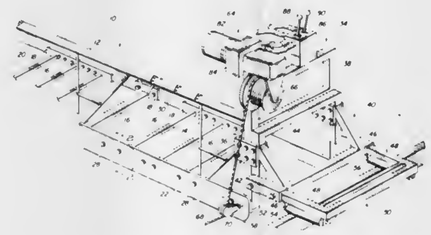
1. A subgrading machine for precisely levelling and contouring the subgrade within an area having first and second parallel-oriented forms including parallel upper surfaces vertically spaced above the subgrade and defining a form surface plane, comprising:

a. a triangular truss frame having a length less than the spacing between the first and second forms, a linear, load bearing front edge, and a linear, load bearing rear edge spaced apart from and oriented parallel to the front edge and defining a load bearing frame base plane, said frame being terminated by first and second end sections each having spaced apart front and rear surfaces extending vertically upward from the frame base plane;

b. a rigid, load bearing grading blade mechanically secured to and extending along the load bearing front edge of said frame for engaging the subgrade, said blade including a curved blade section having an upper surface extending above the frame base plane and a lower surface protruding below the frame base plane;

c. an adjustable end bracket coupled to the front and rear surfaces of each of said end sections for controlling the elevation of the frame to position the frame base plane below the form surface plane and for transferring the weight of said frame to the upper surface of said forms, including

i. form contact means extending laterally outward from said end sections and having a lower surface contacting the upper surface of the adjacent forms for maintaining a parallel alignment between the frame base plane and the form surface plane;



ii. a first roller assembly having first and second spaced apart cylindrical rollers rotatably coupled to the lower surface of said form contact means for establishing rolling contact between said adjustable end bracket and the upper surface of an adjacent form, wherein each of said rollers includes an axis of rotation oriented parallel to the front edge of said frame;

iii. frame elevation control means for coupling said form contact means to said end section at a selectable vertical position to vary the spacing between the frame base plane and the form surface plane to thereby determine the grading depth of said grading blade with respect to the subgrade; and

d. a winch system for advancing the machine into the uncontoured subgrade, including

i. first and second winches coupled to the end sections of said frame for reeling in first and second winch cables to generate a traction force;

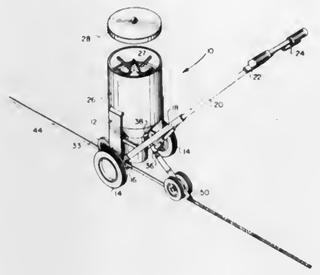
ii. first and second pulleys coupled to the ends of said frame at an elevation intermediate to the upper and lower surfaces of said grading blade for lowering the elevation of the traction force exerted on said frame by said winch cables to a level in proximity to the subgrade and for causing the traction force to be distributed along the length of the load bearing front edge of said frame and through said grading blade into the subgrade to level and contour the subgrade as the machine is advanced by said winch system.

4,630,965

APPARATUS FOR SEALING PAVEMENT SEAMS

Hung T. Nguyen, Farmers Branch; Vu Q. Dang, Coppell; Henry H. Duval, Jr., and Donald J. Kennedy, both of Dallas, all of Tex., assignors to Cleanseal Systems, Inc., Dallas, Tex.

Filed Jan. 14, 1985, Ser. No. 691,287
Int. Cl.[4] E01C *23/09, 19/12*
U.S. Cl. 404—107 **11 Claims**



1. An apparatus for filling the gap between pavement sections with an asphaltic emulsion sealing composition comprising:

a wheeled support platform;

a storage container disposed on said wheeled support platform for containing an asphaltic emulsion sealing composition;

applicator means coupled to a bottom portion of said storage container for coupling a stream of said asphaltic emulsion sealing composition into said gap between pavement sections; and

means for preventing gelling of said asphaltic emulsion sealing composition in response to movement of said wheeled support platform, said means for preventing gelling comprising a substantially vertically disposed rotatable shaft in said container driveably connected to said wheeled support platform;

said shaft having a first agitator disposed within the bottom portion of said container for propelling asphaltic emulsion upward from the bottom of said container, and a second stirring means disposed above said first agitator for stirring said asphaltic emulsion.

4,630,966

DRAINAGE CHANNEL

Peter Karbstein, Neumünster, Fed. Rep. of Germany, assignor to ACO Polymer Products, Inc., Chagrin Falls, Ohio

Filed Nov. 7, 1985, Ser. No. 795,953
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 8435101[U]
Int. Cl.[4] E01C *11/22*
U.S. Cl. 405—118 **7 Claims**



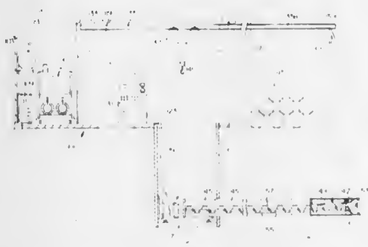
1. A drainage channel having a body which is U-shaped, with two complementary and opposite ends which are capable of form interlocking with another channel body placed adjacent thereto in abutting and mating relationship, one of said complementary ends having skewed surface sections (**16**), and the opposite of said ends having skewed surface sections (**18**) and (**19**), said channel having side walls (**11**, **12**) and a channel trough (**13**), said skewed surface sections being capable of fitting together holohedrally with adjacent drainage channels, each of said side walls being fitted with an edge protective frame device (**23**) formed of a web resting on top of each of said side walls and two anchor legs extending downwards therefrom and linked by the web, at least one of said legs being flush with its respective side wall of the channel, the upper part of each of said channel side walls extending between the two anchor legs, said device having a mounting leg extending upwardly from the outer edge of the web and adapted to receive a channel cover, said edge protective device being formed of sheet metal bent to form said web (**27**) and said inner anchor leg (**28**) and folded to form a double sheet metal layer mounting leg (**26**).

4,630,967

ARRANGEMENT FOR UNDERGROUND ADVANCE DRIVING OF PIPE TRAINS COMPOSED OF INDIVIDUAL PIPE LENGTHS

Gerd Soltau, Artlenburger Landstr. 15, D-2120 Luneburg, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,768
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439433; Oct. 30, 1984, 3439620
Int. Cl.[4] F16L *1/02*
U.S. Cl. 405—184 **11 Claims**



1. An apparatus for laying underground segments of pipeline along street routes from within jacking shafts disposed in the ground along the street comprising jacking shafts comprised of tubular concrete rings provided in the ground allowing access for jacking pipeline segments and for serving later as manholes, the jacking of the pipeline segments being effected by a jacking apparatus lowerable into the jacking shaft and operable therewithin such that inside an interior portion thereof and restricted thereto, the jacking apparatus can be rotated and steered in any desired jacking direction, whereby said apparatus is particularly adapted to lay sewer pipes and mains having non-man-accessible pipe cross-sections.

4,630,968

REALIZATION PROCEDURE OF A MODULAR SYSTEM PARTICULARLY SUITABLE FOR USE OFF COASTS

Hubert Berthet; Noël Laugier, both of Arles, and Bernard Ricome, Carnon sur Mer, all of France, assignors to Institut Francais du Petrole, Malmaison, France

Filed Oct. 17, 1984, Ser. No. 661,931
Claims priority, application France, Oct. 17, 1983, 83 16482
Int. Cl.[4] B63B *35/44*
U.S. Cl. 405—195 **4 Claims**

1. A method for constructing a modular system suitable for use offshore, said system comprising a set of cylinders riddily linked together, said set comprising at least one central cylinder and a plurality of peripheral cylinders, said method comprising the following successive stages:

(a) joining together, on a quay, at least two first peripheral

cylinders, said two peripheral cylinders being carried out on at least one support cradle;

(b) joining the central cylinder to said at least two first peripheral cylinders to form a unit of assembled cylinders;



(c) placing the unit of a assembled cylinders in the water; and

(d) after said unit is placed in the water, further joining any remaining peripheral cylinders of said plurality of cylinders to said unit.

4,630,969

ARTIFICIAL ISLAND

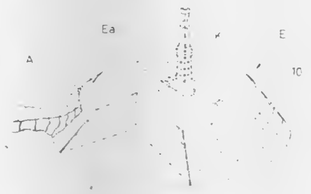
Masanao Oshima, Tokyo, and Nobuyoshi Yashima, Funabashi, both of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 593,720

Claims priority, application Japan, Apr. 18, 1983, 58-66981

Int. Cl.[4] E02D *21/00*

U.S. Cl. 405—217 **1 Claim**



1. An artificial island comprising:

a mass of solid material defining an inclined surface about the periphery thereof;

a plurality of plate body sheets having a top surface and an underside;

a plurality of surface protection members covering said inclined surface, each of said surface protection members comprising a plurality of plate body sheets, and anchoring means for fixing said plate body sheets to said inclined surface fixed to and downwardly extending from the underside of said plate body sheets through said inclined surface, said anchoring means being secured within said mass of solid material, said anchoring means including a grid comprising a plurality of interconnected supports fixed to and depending downwardly from said plate body sheets and secured within said mass of solid material.

4,630,970

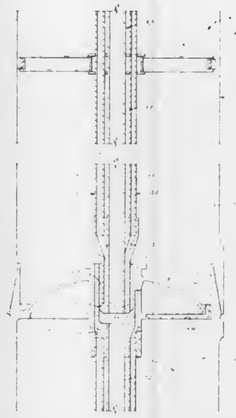
BUOYANCY SYSTEM FOR SUBMERGED STRUCTURAL MEMBER

Richard H. Gunderson; Terry N. Gardner, both of Houston, Tex., and Peter J. D. Guile, Berkshire, England, assignors to Exxon Production Research Co., Houston, Tex.

Filed Sep. 13, 1985, Ser. No. 775,913

Int. Cl.[4] E02B *17/00*; B63B *35/44*

U.S. Cl. 405—224 **30 Claims**



1. A structural member adapted for use in a body of water, comprising:

an elongate load bearing wall portion, said wall portion defining a central channel extending the length of said structural member, said central channel being isolated from said body of water by said wall portion;

a plurality of bulkheads in the interior of said wall portion, said bulkheads dividing said central channel into a series of buoyancy cells adapted to contain gas;

an access tube extending along said central channel and passing through at least some of said bulkheads, said access tube being adapted to contain a column of liquid; and,

means for establishing fluid communication between the interior of at least some of said buoyancy cells and the interior of said access tube, whereby fluids may be transferred between said buoyancy cells and the interior of said access tube.

4,630,971

APPARATUS FOR ANCHORING ROCK AND THE LIKE

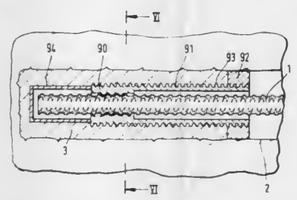
Thomas Herbst, Wessling, and Lorenz Schitzler, Pöcking, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1986, Ser. No. 823,055

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503012

Int. Cl.[4] E21D *20/00*

U.S. Cl. 405—260 **27 Claims**



1. Anchoring apparatus for insertion into a borehole in a rock stratum for supporting an exposed rock surface or wall such as in a rock tunnel or a rock excavation, comprising a tension member in the form of an axially elongated steel anchor rod formed of at least one axially extending part with force transmission ribs on the outer surface of said rod and said rod having a pair of opposite ends spaced apart in the axial direction, said ribs located along a helically extending line around the axis of said rod and forming at least a partial thread, an anchoring element mounted on said rod, said anchoring element having an inside surface arranged to encircle and engage the surface of said rod, said inside surface having inwardly directed projections, said projections forming grooves therebetween so that said grooves can receive said ribs on said rod with said projections arranged to contact said ribs, said anchoring element in engagement with said rod being arranged to be axially movable relative to said rod while a predetermined axially directed tensile force on said rod is exceeded, wherein the improvement comprises that said anchoring element is formed of a material having a higher strength than the material forming said rod, said projections have flanks defining said grooves therebetween arranged to contact said force transmission ribs, and when the predetermined axially directed tensile force is exceeded, during relative axial movement between said anchoring element and said rod, said projections on said anchoring element cut and displace the portion of said force transmission ribs contacted by the flanks of said projections.

4,630,972

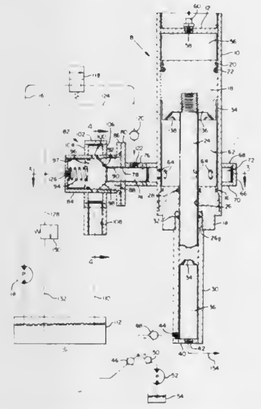
IMPULSE INJECTOR APPARATUS

Frank R. Kinnan, Winston, Oreg., assignor to Utilitech, Incorporated, Sam Ramon, Calif.

Filed Oct. 29, 1984, Ser. No. 666,292

Int. Cl.[4] E02D *3/12*; F15B *7/00*

U.S. Cl. 405—269 **7 Claims**



1. Intensified impulse injector apparatus comprising:

an elongate cylinder,

an actuating piston mounted for reciprocation within said cylinder,

a chamber within said cylinder defined between one end of the piston and one extermity of said cylinder and a captured compressible gas supply within this chamber,

another chamber within said cylinder defined between the opposite end of said piston and an opposite extremity of said cylinder,

a pressure fluid conduit connected to a supply of pressure fluid,

a drain conduit connected to a drain for the drainage of fluid,

control means for first selectively connecting the pressure fluid conduit to said other chamber to admit pressure fluid to said other chamber to cause movement of said actuating cylinder towards said one extermity of said cylinder and compression of said captured gas supply and for then selectively connecting the drain conduit to said other chamber to allow dumping of pressure fluid from said other chamber with said actuating piston moving toward said opposite extermity of the cylinder under the urging of expansion of said captured gas supply, said control means comprising aperture means in the side of said cylinder adjacent its said opposite extermity and said piston having a side that moves into covering relation over said aperture means on moving adjacent said opposite extremity of said cylinder,

means forming an elongated material-holding chamber for holding injection material having an oulet at one end and an injection piston movable within said material-holding chamber toward said one end of the material-holding chamber to cause discharge of the material from said outlet, and

means connecting the actuating piston and injection piston whereby movement of the actuating piston toward said opposite extremity of said cylinder produces movement of the injection piston toward said one end of the material-holding chamber.

4,630,973

PERIPHERALLY FLEXIBLE PROP ARCH FOR MINING TRACKS, TUNNELS OR THE LIKE

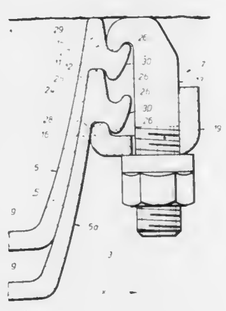
Peter Heintzmann, Bochum; Manfred Koppers, Duisberg; Karlheinz Bohnes, Bochum, and Lothar Domanski, Oberhausen, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhuette Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,522

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320829

Int. Cl.[4] E21D *11/18*

U.S. Cl. 405—288 **12 Claims**



1. A peripherally flexible prop arch for mining tracks, tunnels or the like for propping a rock structure or a backfill material, comprising at least two elongated gutter-shaped segments partially overlapping one another to define an overlapping region and having end portions superposed one on another and extended in the same direction and having congruent cross sections; and clamping devices each applied to said segments at said overlapping region to clamp said segments to each other, the end portion of each segment being directed toward the rock structure and having an end, each segment further having a bottom portion directed away from the rock structure and a lateral flange offset from said end portion in the direction toward said bottom portion, each flange being formed with a first elongated groove facing and open toward said rock structure and extended along the elongation of the segment and an opposite second elongated groove facing toward said bottom portion, each clamping device including at an upper end thereof facing the rock structure a hook designed

so as to completely fill said first groove and engaged in said firs groove, and at a lower end thereof a claw-shaped portion engaged in said second groove, the lateral flange of each segment including a flange edge portion extended toward the rock structure and limiting said first groove from outside, said edge portion being spaced from said end of the end portion in the direction toward said bottom portion at least such a distance that the hook of said clamping device is engaged with said edge portion and said hook does not extend beyond the end of the end portion of said one segment in the direction toward said rock structure at any place along the elongation of said one segment.

4,630,974

ROOF SUPPORT SYSTEM FOR A MINE AND METHOD FOR PROVIDING THE SAME

James L. Sherman, Bethel Park, Pa., assignor to Price & Adams, Pittsburgh, Pa.

Filed Mar. 13, 1985, Ser. No. 711,302
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—288 **14 Claims**



1. An improved roof support system for a mine or the like comprising,

a pair of plates secured to a roof of said mine at opposite sides thereof and adjacent opposing ribs of said mine,

an elongated reinforcing member extending horizontally and transversely of said mine between said pair of said plates,

said reinforcing member having a first rod means and a second rod means and adjustable means for joining said first rod means and said second rod means to vary an overall length of said reinforcing member,

at least one of said first and second rod means having an enlarged bolt head end portion formed integral therewith,

at least one of said pair of plates having an opening therein to receive said enlarged bolt head end portion of said reinforcing member therethrough,

at least one of said plates having a surface adjacent said opening operable to abut at least a part of said enlarged bolt head of said reinforcing member, and

said reinforcing member arranged to exert a tension on said first plate and said second plate as said bolt head end portion is urged against said respective plate surface, said tension being varied by rotation of at least one of said rod means in said adjustable means.

4,630,975

AIR ENCASEMENT SYSTEM FOR TRANSPORTATION OF PARTICULATES

John H. Becker, 100 Orchard St., Auburn, N.Y. 13021

Continuation-in-part of Ser. No. 540,313, Oct. 11, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 683,012
Int. Cl.[4] B65G *53/18, 53/28, 53/60*
U.S. Cl. 406—85 **25 Claims**

1. A method for transporting particulates which includes:

moving a transport air stream through a pipeline;

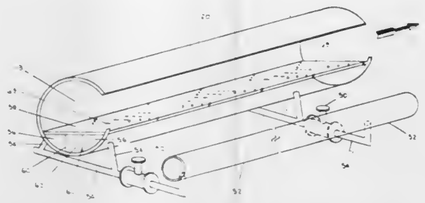
entraining in said transport air stream the particulates;

introducing energizing air in opposed directions into the pipeline at a rate and in an amount to form a forward leaning pulsating-air encasement between the inner wall of the pipeline and the transport air stream,

wherein the pulsating effect is created by:

flowing the energizing air into a chamber; and

discharging the air from the chamber into the pipeline through a plate having a plurality of orifices wherein the



air flows at various rates, pressures and angles with reference to a vertical plane;

maintaining the velocity of the energizing air stream at a greater rate than the velocity of the transport air stream whereby the precipitation of the particulates from the transport air stream is inhibited; and

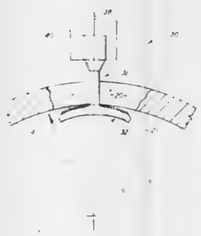
removing the particulates from the air stream.

4,630,976

CUTTING TOOL

Henry Belcher, 61 Somers Dr., Fulton, N.Y. 13069

Filed May 20, 1985, Ser. No. 735,596
Int. Cl.[4] B23P *15/28;* B26D *3/16*
U.S. Cl. 407—65 **11 Claims**



1. A cutting tool for removing unwanted material from the interior of a welded pipe joint that is being repaired wherein a portion of the weld material has been removed from the joint to provide a repair opening into the pipe passage, said tool including

a cutting segment having cutting teeth formed along a convexly curved top surface thereof, said segment being curved along its length with the radius of curvature of the top surface being less than that of a pipe section forming the weld joint, said segment having a width that is less than the width of the weld joint,

an elongated shank having a width substantially equal to that of the cutting segment, said shank being connected at one end to the top surface of the segment and extending radially therefrom, the axis of said shank bisecting the segment and passing through its radius of curvature, whereby the segment can be passed through the repair opening into the pipe passage and rotated inside the passage by turning the shank.

4,630,977

VALVE SEAT RESURFACING APPARATUS

Theos E. Theofanous, 4747 Kester Rd., Winston-Salem, N.C. 27103

Filed May 28, 1985, Ser. No. 738,342
Int. Cl.[4] B23B *47/60*
U.S. Cl. 408—83.5 **1 Claim**



1. An apparatus for sequentially and separately resurfacing cylinder head valve seats in an engine cylinder head having the seats formed therein and corresponding valve stem guide holes, comprising:

(a) a base mounting positionable support means for supporting said head with a selected valve seat and its corresponding valve stem guide hole in a selected position in which the axis of said guide hole is substantially vertical;

(b) drive means supported by said base above said positionable support means and having associated therewith an axially movable rotating chuck rotatable about a fixed vertical axis with means for releasably receiving a Morse tapered shaft of a tool to be driven;

(c) a constant velocity universal joint having:

(i) a drive shaft having at one end a Morse taper releasably secured in, supported by and driven by said chuck and at the opposite end a spline section rotatable around said fixed axis and concentric with said taper and section;

(ii) a driven shaft; and

(iii) universal connecting means between said drive shaft and driven shaft comprising:

(aa) an inner ball housing having a central bore portion mounted on, concentric with, supported and driven by said drive shaft spline section about said fixed axis and surrounding said central bore portion a first set of ball bearing receiving recesses;

(bb) a ball bearing mounted in each of said recesses;

(cc) a ball retainer surrounding and vertically movable relative to said inner ball housing and providing a ball retention passage for each said ball bearing;

(dd) an outer ball housing having a first driven portion surrounding and vertically movable relative to said inner ball housing and ratainer and formed with a second set of ball bearing receiving recesses mounting and utilizing said ball bearings with said retainer to support said outer ball housing and form a driving connection with said inner ball housing in which said inner and outer ball housings are prevented from rotating relative to each other and having a second portion integrally formed with said drive shaft; and

(ee) means for preventing end play between said outer and inner ball housings comprising a ball mount member having at one end a shank mounting a spring located in a bore formed in and concentric with said spline section and at the opposite end a rotatably mounted ball engaging an inner surface of said outer ball housing under the force of said spring to resist said end play while permitting both misalignment of said drive and driven shafts and vertical sliding of said shank in said bore,

said universal connecting means being operative for maintaining the velocity of the driven shaft substantially constant when driven through said universal connecting means by said drive shaft independent of said drive shaft being axially aligned with said driven shaft during rotation thereof;

(d) a resurfacing tool mounting shaff secured to, forming an aligned extension of and driven by said driven shaft at said constant velocity;

(e) a resurfacing cutting tool removably secured to said tool-mounting shaft; and

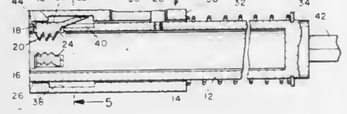
(f) a guide rod threadably secured to, forming an aligned extension of and extending outwardly from said tool-mounting shaft and adapted to enter and move axially in a selected said valve seat guide hole in a free sliding fit to bring said resurfacing tool in engagement with the corresponding valve seat for resurfacing thereof at said constant velocity.

4,630,978

THREAD CHASING TOOL

Terry L. Keiser, 2148 Euclid Ave., El Cajon, Calif. 92021, and Charles L. Guinnip, Chula Vista, Calif., assignors to Terry L. Keiser and Grant Y. Keiser, both of El Cajon, Calif.

Filed Oct. 3, 1985, Ser. No. 783,775
Int. Cl.[4] B23G *5/04*
U.S. Cl. 408—159 **9 Claims**



1. A thread chasing tool, comprising:

inner and outer relatively slidable cylindrical sleeve members;

the inner sleeve member having a through bore and a series of spaced slots around its periphery adjacent one end of the tool;

a plurality of separate die elements rockably and releasably mounted between the opposed inner and outer surfaces of said outer and inner sleeve members adjacent said one end of the tool;

each die element comprising a head portion and a tail portion, the head and tail portions each having an outwardly directed cam surface for engagement with the inner surface of the outer sleeve member, the cam surfaces being angled relative to one another, the head portion having inwardly facing thread cutting teeth each die element having its head portion aligned with a respective one of said slots; and

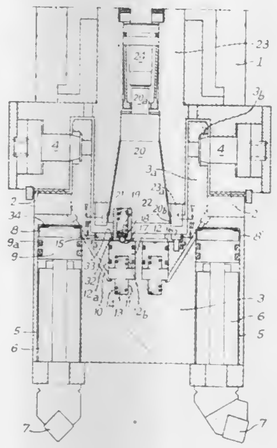
the outer cam surfaces on said die elements and the opposing inner surface of said outer sleeve member comprising cooperating means for urging said die elements back and forth between an expanded position in which said head portion is expanded out of said slots and a contracted, thread engaging position in which said head portion projects partially through said slots so that said thread cutting teeth project inwardly into the central bore of said inner sleeve member to engage a threaded member inserted in said one end of said inner sleeve member in response to relative sliding movement of said sleeve member in opposite directions.

4,630,979

CARTRIDGE TOOL LOCKING AND UNLOCKING DEVICE FOR TOOLHOLDERS

Jean-Pierre Roux, Saint Etienne, France, assignor to Berthiez-Saint-Etienne, Saint Etienne, France

Filed May 17, 1985, Ser. No. 735,044
Claims priority, application France, May 17, 1984, 84 07671
Int. Cl.[4] B23B *31/26, 31/30*
U.S. Cl. 409—232 **8 Claims**



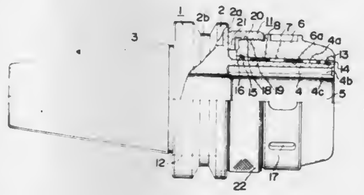
1. Device for locking and unlocking tool cartridges in a lathe or vertical boring machine toolholder mounted on a ram of a machine tool, wherein said cartridges are inserted into hollow compartments of the toolholder, said compartments comprising top parts that include first plungers for actuating locking and unlocking of said cartridges, said device comprising transmission means linked to control means and mounted to slide axially in a rotating block of said ram, said transmission means including a pin operable to selectively actuate any of several second plungers slidably mounted in one of several hydraulic cylinders arranged in the toolholder and connected via a duct to a hydraulic chamber provided in said top parts of said tool cartridge compartments, said chamber containing a fluid which acts upon one of said first plungers actuating the locking and unlocking of the tool cartridges.

4,630,980

CHUCK ASSEMBLY FOR A MACHINE TOOL

Haruaki Kubo, Osaka, Japan, assignor to Dai Showa Seiki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1985, Ser. No. 722,819
Claims priority, application Japan, Jun. 29, 1984, 59-99419[U]
Int. Cl.[4] B23B *31/04*
U.S. Cl. 409—234 **9 Claims**



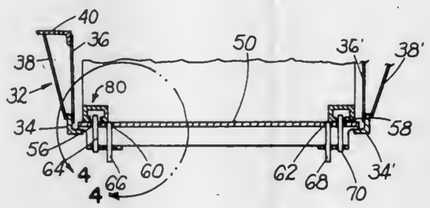
1. A chuck assembly for use in a machine tool for holding a tool element, which chuck assembly comprises a chuck body having a sleeve integrally formed therewith so as to protrude in one direction in alignment with the axis of rotation of the chuck assembly, said sleeve having a support bore defined therein for the receipt and support of the tool element, said sleeve also having its outer peripheral tapering surface in one direction away from the chuck body; a circumferentially extending, radially inwardly recessed engagement groove for engagement with a manipulator arm for the replacement of the chuck assembly with another chuck assembly defined in said chuck body; a fastening nut having its inner peripheral surface tapering in complementary relation to the tapered outer peripheral surface of the sleeve and rotatably mounted on said sleeve; a male screw thread provided on an outer peripheral surface of said fastening nut; a plurality of roll bearings interposed between the outer peripheral surface of the sleeve and the inner peripheral surface of the fastening nut thereby permitting the fastening nut to be helically rotated relative to the sleeve about the axis of rotation of the chuck assembly while moving axially of the sleeve; and a reinforcing nut having a cylindrical barrel, a contact flange extending inwardly in the radial direction from one end of said cylindrical barrel, and a female screw thread provided on an inner peripheral surface of the cylindrical barrel which is in rotatable engagement with the male screw thread provided on the outer peripheral surface of the fastening nut, the reinforcing nut is threadingly mounted on the fastening nut and the contact flange is adapted to be engaged under pressure with an annular end face of the chuck body by rotating the reinforcing nut when said fastening nut is fastened.

4,630,981

APPARATUS FOR RESTRAINING CONTAINERS IN A RAILWAY CAR

Richard J. Mandrell, St. Charles, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Filed Aug. 24, 1984, Ser. No. 643,983
Int. Cl.[4] B60P *1/64*
U.S. Cl. 410—91 **1 Claim**



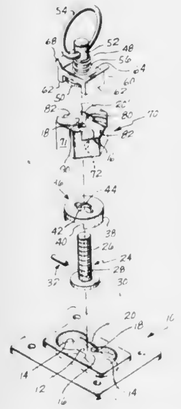
1. Apparatus for securing any one of four standard size containers in a railway car so as to substantially restrain the container against lateral and longitudinal movement with respect to the railway car, said containers having one of two standard lengths including a longest and a shorter length and one of two standard widths including a widest and a narrower width, said car having a bottom on which said container rests, a side wall extending above said bottom at each side thereof, said side walls being spaced apart only somewhat wider than the width of said standard widths, and an end wall at each end of said car, said end walls extending above said car bottom and being spaced apart from one another a distance only somewhat greater than the longest of said standard lengths, said container having a container foot at each corner thereof, each corner foot having an opening in the bottom face thereof, a plurality of pins carried by said car bottom and being spaced for reception in said corner feet openings of said corner feet of certain of said containers, a first standard size container of said longest length and said widest width being restrained against lateral and longitudinal movements by said side walls and said end walls, a second standard container of said longest length and said narrower width being restrained against longitudinal movement by said end walls and being restrained against lateral movement by a first set of said pins, a third standard size container of said shorter length and said wider width receiving a second set of said pins within said corner openings thereby to restrain said third container against longitudinal movement with respect to said car, said third container being restrained against lateral movewment by said side walls, and with a fourth standard size container of said shortest length and narrowest width receiving a third set of said pins within the corner foot openings thereby to restrain said fourth container against both longitudinal and lateral shifting with respect to said car, said pins being resiliently depressable into said car bottom upon a container bearing thereon such that when one of said four standard size containers is loaded onto said car, its respective set of pins is spaced for reception in the openings of the bottom feet castings thereof, and such that the remaining pins in engagement with the bottom of the one standard size container are resiliently depressed into the car bottom.

4,630,982

CARGO TIE-DOWN SYSTEM

James A. Fenner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 27, 1985, Ser. No. 802,868
Int. Cl.[4] B61D *45/00;* F16B *37/00, 39/00*
U.S. Cl. 410—102 **10 Claims**



1. Apparatus for releasably securing two or more devices to a structure at a single location, said apparatus comprising the combination of:

a receptacle mounted on the structure and having a first socket;

a stud having a threaded shaft portion for engaging a first device, and a head portion dimensioned to be received into the socket with said shaft portion projecting from the socket;

retaining means for releasably securing said head portion in the socket;

a nut having a hole with threads for threadedly engaging said shaft portion to secure said first device thereto, and a second socket that is substantially the same as the first socket to enable it to receive substantially any stud that is receivable by the first socket; and

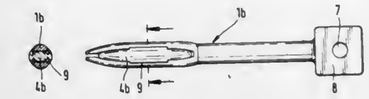
a second stud having a head portion dimensioned to be received into the second socket, and means for engaging a second device.

4,630,983

EXPANSION PIN

Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 679,020
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345331; Feb. 8, 1984, 3404306
Int. Cl.[4] F16B *21/08*
U.S. Cl. 411—15 **11 Claims**



1. An expansion pin for securing articles to a support structure, comprising:

a shank having an apertured region, two ends, an outer surface, and an expandable portion at one end;

means for securing the articles by the expansion pin at said other end of said shank; and

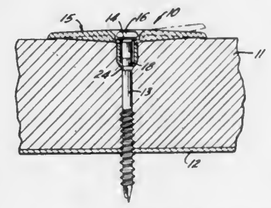
a deformable expansion element oriented in said apertured region so as to thicken said shank, said expansion element having a length and having guide ribs at least over a part of said length that rest against said outer surface of said shank.

4,630,984

ASSEMBLY FOR FASTENING A LAYER OF COMPRESSIBLE MATERIAL TO A RIGID MEMBER

Ernest W. Reinwall, McHenry, and John Spibey, Rockford, both of Ill., assignors to Elco Industries, Inc., Rockford, Ill.

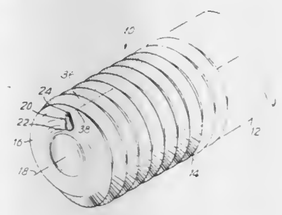
Filed Jan. 27, 1984, Ser. No. 574,570
Int. Cl.[4] F16B *43/00*
U.S. Cl. 411—368 **2 Claims**



1. An assembly for fastening together a stack of flat generally horizontal members including a layer of compressible material and a rigid member underlying the layer, said assembly comprising a disk made of a resiliently flexible material and having a central hole, an annular flange formed integrally with and depending from the underside of said disk adjacent the periphery thereof and having a downwardly facing surface defining a contact pad engageable with said stack to apply downward pressure thereto around an annular sealing band, an elongated fastener projecting through said hole and adapted to project down through said layer, the lower end portion of said fastener being threaded to be driven into said rigid member, a head formed on the upper end of said fastener to engage the upper side of said disk, an annular hub formed integrally with said disk and projecting downwardly from the underside thereof, said hub being coaxial with said hole to surround the upper end portion of said fastener and being of sufficient length to project downwardly a substantial distance below said disk and into said layer, the upper end portion of said hub being joined continuously to said disk around the entire circumference of the hub, the lower end portion of said hub being formed with downwardly opening longitudinally extending slots to define angularly spaced fingers which flex to enable the

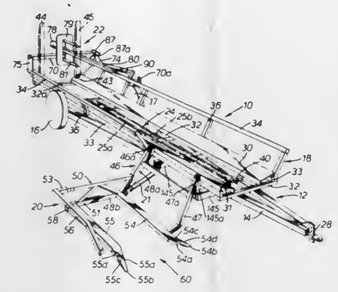
hub to expand, the lower ends of said fingers being located in a substantially horizontal plane, and a collar formed on said fastener above said threaded lower end portion and having an upper end providing an upwardly facing shoulder spaced downwardly from the underside of said head, said collar having a side surface which tapers downwardly from the periphery of said shoulder to cam said fingers apart and permit said collar to pass through said hub as said fastener is inserted through said hole, said shoulder being located completely below all portions of said disk so as to be located within said layer, said shoulder being located in a substantially horizontal plane and being spaced from said head a distance generally equal to the length of said hub to squarely engage the lower ends of said fingers and to hold the disk adjacent said head, the substantially horizontal shoulder and the lower ends of said fingers constituting means configured to keep the disk adjacent the head of the fastener regardless of whether the fastener rotates in either direction relative to the disk after the fastener is inserted through said hole in said hub.

4,630,985
SELF ALIGNING SCREW
Leon Simons, 303 E. 57th St., Apt. 47-E, New York, N.Y. 10022
Filed Jan. 12, 1984, Ser. No. 570,104
Int. Cl.⁴ F16B *25/00*
U.S. Cl. 411—386 **9 Claims**



1. A self-aligning screw for use in a pre-threaded opening, the self-aligning screw comprising:
- a screw body of extended length, the screw body having a longitudinal axis in the body length direction;
- a screw thread spirally encircling at least a portion of the body, the screw thread adapted to engage a thread in a pre-threaded opening;
- a leading end on the screw body, the leading end extending in the lengthwise direction of the body and being adapted to precede the screw body into the pre-threaded opening; and
- a sole projection extending from the leading end of the screw body in a direction generally transverse to the axis, the projection being joined at a first end to the leading end of the screw body, the other end of the projection being free, the projection being positioned and contoured at the free end for nesting within the groove between adjacent threads of the pre-threaded opening when the screw thread and the thread of the pre-threaded opening are engaged, the projection comprising a conical segment having a rounded end, the projection being so positioned on the screw body relative to the start of the screw thread that, when the screw enters the pre-threaded opening, contact of the projection at any point along the outward-facing surface of the thread in the pre-threaded opening will serve to guide the screw thread into mating engagement with the thread of the pre-threaded opening as the screw and the pre-threaded opening are turned relative to one another.

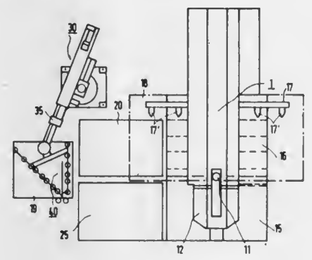
4,630,986
BALE HANDLER
Robert W. A. Taylor, Island Rd., Cohuna, Victoria, Australia
Filed Feb. 28, 1985, Ser. No. 706,988
Claims priority, application Australia, Mar. 29, 1984, PG4317; Aug. 13, 1984, PG6532
Int. Cl.⁴ A01D *87/12*
U.S. Cl. 414—24.6 **16 Claims**



1. A bale handler comprising:
- a body with a pair of ground wheels rotatable substantially on a common axis;
- a bed for supporting two or more round bales end-to-end;
- pivot means for rotatably supporting said bed on said body for rearward tilting movement about a horizontal axis to unload the bales as a vertical stack;
- means to effect said rearward tilting movement of said bed; and
- secondary support means upstanding from the rear end of the bed and extending substantially normally therefrom, for abutting the rearmost bale thereon and supporting the bales as the bed is tilted, which secondary support means terminates at an outer tip and is shaped to define heel means substantially nearer said tip than to said bed;
- wherein, by means of said rearward tilting movement, said bed may be brought from a fully lowered position to an unloading/reloading position past vertical at which the stack remains stable and said heel means of the secondary support means contacts the ground and bears the weight of the bed and bales thereon;
- and wherein said horizontal axis is located close behind the vertical plane containing said common axis of the ground wheels and is displaced from said rear end of the bed in a direction parallel to the bed so that the portion of said bed between said support means and said axis which moves rearwardly as the bed is lowered from said position during the reloading is sufficient to stabilize the stack.

10. A bale handler comprising:
- a vehicle which defines a bed for supporting bales;
- a loading cradle moveably mounted to the vehicle for picking up bales form the ground on-the-run; and
- means for moving said cradle to transfer a picked up bale onto the bed;
- wherein the loading cradle comprises:
- a pair of laterally spaced support members which project in the direction of travel of the vehicle for passing under a bale to lift and support it and which define at their forward ends opposed edges which, in a horizontal plane, are inclined to the direction of traval so as to be mutually forwardly divergent, said inclined edge which is further from said bed extending, in said direction of travel, further rearwardly than the other inclined edge, whereby to facilitate centering a bale approached off-centre, each support member further being tapered at its forward end, in both vertical and horizontal planes, to facilitate engagement under a bale; and
- a pair of restraining members positioned to restrain the bale respectively to it s rear and outer sides, relative to the vehicle, as it is lifted and supported by said support member.

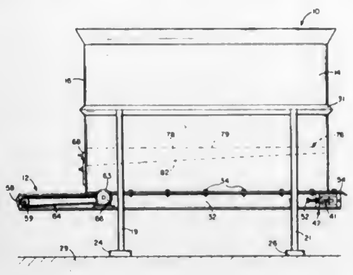
4,630,987
PERIPHERAL AUXILIARY SYSTEM FOR THE AUTOMATIC FEEDING AND UNLOADING OF A STAMPING/NIBBLING MACHINE
Hans Poersch, and Gustav Stark, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin/-Munich, Fed. Rep. of Germany
Filed Aug. 8, 1984, Ser. No. 638,820
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329902
Int. Cl.⁴ B65G *60/00*
U.S. Cl. 414—32 **10 Claims**



1. A peripheral auxiliary system for automatic feeding and unloading of a stamping/nibbling machine, comprising:
- an industrial robot having a gripping mechanism for picking up blanks and stamped parts, the gripping mechnaism comprising
- a V-shaped frame which is shaped to carry a blank along an edge and a diagonal and a means for adhering to blanks, stamped parts and stamped-out blanks comprising a plurality of suction cups and connections to a vacuum line, said suction cups being classified in groups and being connectable in groups to the vacuum line, and said frame having an apex;
- an extendable arm mounted to the frame at said apex; means for transporting and delivering stamped parts and stamped-out blanks; and
- means for stacking stamped-out blanks in piles, said stacking means having a delivery surface which can be swivelled and displaced in one operation.

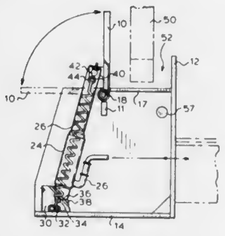
4,630,988
BULK MATERIAL HOPPER
Donald D. LaRue, Ionia, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa
Filed Jul. 11, 1984, Ser. No. 629,794
Int. Cl.⁴ B65G *65/00*
U.S. Cl. 414—327 **15 Claims**

6. A material handling apparatus comprising: a box having walls including a bottom wall surrounding a chamber for accommodating material, one of said walls having a material discharge opening adjacent said bottom wall, said bottom wall extended through said material discharge opening, conveyor means located on said bottom wall in said chamber operable to move material from the chamber, through said material discharge opening, means for operating the conveyor means, and divider means located in the chamber above the conveyor means providing openings on opposite sides thereof for facilitating the flow of material in the chamber to the conveyor means, said divider means having a pair of divider side walls, each divider side wall terminating in an outer lower edge, each outer lower edge extended downwardly and outwardly in the direction of movement of the conveyor means, said divider means increasing in width in the direction of movement of the conveyor means whereby the openings adjacent opposite sides of the divider means decrease in the direction of movement of the conveyor means and the vertical distance between the lower edges of the divider side walls decreases in the direction



of movement of the conveyor means to facilitate the flow of material to the conveyor means and minimize bridging and packing of material in the chamber.

4,630,989
TRUCK RESTRAINT SYSTEM
Jack E. Davey, Brampton, Canada, assignor to Blue Giant Equipment of Canada Ltd., Brampton, Canada
Filed Sep. 30, 1985, Ser. No. 782,290
Int. Cl.⁴ B65G *67/02, 69/00*
U.S. Cl. 414—401 **11 Claims**



1. A device for restraining a vehicle, such as a truck or transport trailer, at a loading dock comprising a frame having a vertical securing face and a lower horizontal bearing face,
- a pivotal bar having one end pivotally secured to said frame above and intermediate the length of said lower bearing securing face and said vertical securing face,
- said pivotal bar being movable from a generally horizontal vehicle release position, with said bar generally parallel to said lower horizontal bearing face, to a vehicle restraining position with said bar generally perpendicular to said lower horizontal bearing face,
- a hydraulic cylinder pivotally secured adjacent the forward end of said lower horizontal bearing face and pivotally secured to said bar to be angled rearwardly towards said vertical securing face,
- said hydraulic cylinder being pivotally secured to arms secured to and extending below said bar beyond said pivot securement of said bar to said frame,
- said hydraulic cylinder when actuated to extend causing said bar to move from said horizontal vehicle release position to said vehicle restraint position,
- the pivot of said bar being spaced from the vertical securing face, at least about 9 inches to accommodate therebetween a vehicle IC bar.

4,630,990

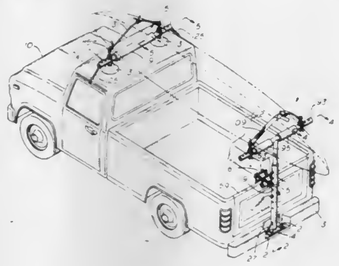
DEVICE AND METHOD FOR LOADING AND TRANSPORTING ELONGATE OBJECTS ON THE TOPS OF VEHICLES

Montague Whiting, Box 6109 SFA, Nacogdoches, Tex. 75962

Filed Sep. 3, 1985, Ser. No. 772,154

Int. Cl.[4] B60P *3/10*

U.S. Cl. 414—462 **10 Claims**



1. A device for loading and transporting elongate objects on a vehicle, said vehicle including means adjacent the front end thereof for supporting one end of said elongate objects, comprising:

a lower hollow tubular member adapted for connection at its lower end in an upright orientation to said vehicle adjacent the rear end thereof;

a first upper member having a lower portion adapted to be rotatably supported within said lower hollow tubular member, said first upper member having an upper end;

a second upper member of elongate configuration mounted at substantially its mid-portion on the upper end of said first upper member and being transversely disposed with respect thereto, said second upper member having an upper bearing surface for supporting the other ends of said elongate objects;

a clamping means for providing support and stability to the upper portion of said lower hollow tubular member, wherein said clamping means comprises a U-shaped clamp disposed on said upper portion of said hollow tubular member, said clamp having a curved portion disposed around and attached to said lower hollow tubular member and threaded leg portions extending perpendicularly to said lower hollow tubular member, and a pair of downwardly extending plates disposed on said threaded leg portions of said U-shaped clamp for receiving the tailgate of said vehicle between said plates.

4,630,991

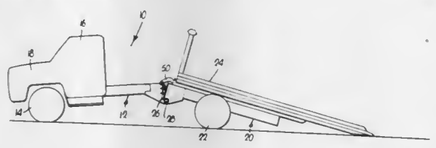
TRUCK HAVING TILTABLE FRONT AND REAR FRAMES

Donald R. Landoll; Kyle D. Swart, both of Marysville, Kans., and Joseph B. Morris, Lincoln, Nebr., assignors to Landoll Corporation, Marysville, Kans.

Filed Jan. 7, 1985, Ser. No. 689,386

Int. Cl.[4] B60P *1/32*

U.S. Cl. 414—478 **5 Claims**



1. In a vehicular chassis having a first frame with an end, a second frame with an end proximal to said first frame end, and an articulation interconnecting the ends of respective frames for up and down tilting movement of both frames about a normally horizontal axis, a three-bar linkage assembly to effect tilting of said first frame and said second frame, said linkage assembly comprising:

a first rigid bar means having a first end portion pivotally coupled to said first frame;

a second extensible bar means having a first end portion pivotally coupled to said first frame at a position spaced from said first bar means; and

a third rigid bar means having a first portion, a second portion and a third portion,

said first bar means having a second end portion pivotally coupled to said third bar means first portion,

said second bar means having a second end portion pivotally coupled to said third bar means second portion,

said third bar means third portion being pivotally coupled to said second frame at a fixed location on the latter,

said second bar means being selectively extensible and retractable for pivoting said third bar means relative to said second frame and for simultaneously swinging said first bar means to thereby tilt said first frame and said second frame.

4,630,992

MACHINE FOR EFFECTING THE TRANSFER OF OBJECTS IN THE SPACE BETWEEN POSITIONS HAVING PREDETERMINED CO-ORDINATES

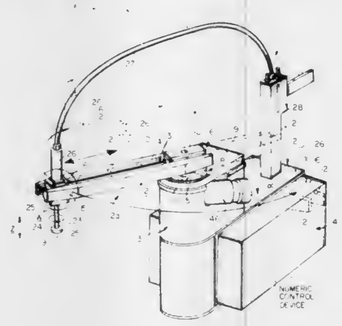
Luigi Gilli, Luserna San Giovanni, and Franco Sartorio, Turin, both of Italy, assignors to Prima Progetti S.p.A., Turin, Italy

Filed Sep. 30, 1983, Ser. No. 537,483

Claims priority, application Italy, Oct. 1, 1982, 68155 A/82; Jul. 11, 1983, 67750 A/83

Int. Cl.[4] B25J *9/00, 17/02*

U.S. Cl. 414—744 R **9 Claims**



1. A machine for transferring objects in space between positions having predetermined co-ordinates, the machine comprising

a fixed tubular support member extending along a first axis;

a tubular carousel coaxial with said tubular support member and rotatably supported thereby;

a support head connected to said carousel for rotation therewith about said first axis;

sliding means connected to said support head to slide relative to said support head in a direction substantially perpendicular to said first axis;

an object-holding head supported by said sliding means so as to be rotatable relative thereto about a second axis substantially parallel to said first axis;

a first and a second shaft coaxial with each other and with said carousel and supported by said carousel so as to be rotatable relative to each other and to said carousel;

drive means carried by said fixed tubular member to selectively rotate said first and second shafts and said carousel about said first axis; and

first and second transmission means of the type adapted for transmission of rotation between members mounted for rotation about respective axes parallel to each other, said first and second transmission means being coupled with said first and said second shafts respectively, and both said first and second transmission means coupled with said object-holding head.

4,630,993

AXIAL-FLOW FAN

Carl E. Jensen, Naestved, Denmark, assignor to Nordisk Ventilator Co., Naestved, Denmark

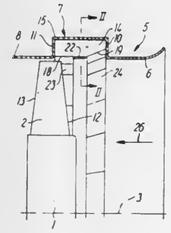
PCT No. PCT/DK84/00070, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00640, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 23, 1984, Ser. No. 717,265

Claims priority, application Denmark, Jul. 28, 1983, 3458/83

Int. Cl.[4] F04D *5/00*

U.S. Cl. 415—53 R **9 Claims**



1. An axial flow fan comprising; a rotor adapted to rotate in a predetermined direction about an axis and having a hub and a plurality of rotor blades each of which extends radially outwards from the hub and terminates in a blade tip, each rotor blade having a leading and a trailing edge;

a casing coaxially surrounding the rotor and including an inlet section having a downstream end located upstream of the rotor blades, an outlet section of substantially the same diameter as the inlet section and having an upstream end located in a plane extending normally to the rotor axis intermediate the leading and trailing edges of the rotor blades, and an intermediate section connecting the inlet and outlet sections and having a larger diameter than those sections, said intermediate section being defined by a peripheral wall and two end walls and being attached to the downstream end of the inlet section and the upstream end of the outlet section, respectively, whereby said peripheral and end walls define an annular chamber partly overlapping the blade tips of the rotor;

a plurality of guide vanes angularly spaced within said annular chamber, thereby dividing the chamber into a plurality of compartments distributed along the circumference thereof, each guide vane being secured to the walls of the annular chamber and extending from one end wall to the opposite end wall thereof and having a radially innermost edge zone which is oriented into the predetermined direction of rotation of the rotor and includes an angle of between 65° and 40° with an associate radius connecting the inner edge of the vane with the rotor axis.

4,630,994

APPARATUS FOR AXIALLY AND CIRCUMFERENTIALLY LOCKING STATIONARY CASING COMPONENTS OF TURBOMACHINES

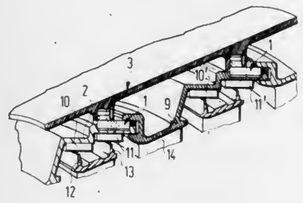
Helmut Gröss, Esterhofen, Fed. Rep. of Germany, assignor to Motoren- und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,801

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333436

Int. Cl.[4] F01D *1/02*

U.S. Cl. 415—190 **18 Claims**



1. A device for axially and circumferentially locking two stationary components of a turbomachine, each of which components is at least part of a ring and wherein said components are concentrically engaged along opposed surfaces, said device comprising a locking member including a smooth, cylindrical disc portion and an axially projecting angular segment on said disc portion forming an axial step thereon, said angular segment being substantially semi-cylindrical and having an outer periphery continuous with the outer periphery of said disc portion, the components being provided with axially aligned intercommunicating hollows, the hollow of one of said components being substantially cylindrical and the hollow of the other of said components being of step form with a cylindrical portion coaxial and of the same diameter as the hollow of said one component and a substantially semi-cylindrical portion extending axially of the cylindrical portion and having a lateral opening, said locking member being engaged in the hollows of the stationary components in a locking position in which said disc portion extends in part in the hollow of said component and in part in the cylindrical portion of the hollow of said other component and said angular segment extends into said semi-cylindrical portion of said other component whereby said components are prevented from undergoing relative axial and circumferential movement, said locking member being turnable in said hollows to a release position in which said stationary components are unlocked, said cylindrical disc portion being rotatable in the hollows of both said components for movement of the locking member between the locking and release position, said angular segment being positioned and formed in relation to said semi-cylindrical portion of the hollow in said other component to emerge from said hollow in said other component through said lateral opening when said locking member rotates from the locked position to the release position, said locking member in said release position being removable from said hollow in said one component by axial displacement of the locking member relative to said components whereafter said locking member can be separated from the components.

4,630,995

FLUID FLOW ENGINE, ESPECIALLY POWER ENGINE ACTED UPON BY GAS

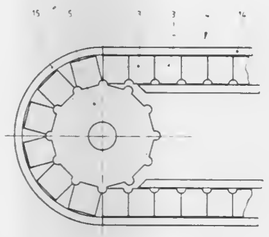
Wolfgang Betz, Gauting, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 643,434

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3347775

Int. Cl.[4] F01D *23/00*

U.S. Cl. 416—7 **8 Claims**



1. A fluid flow engine for converting flow energy into useful energy, comprising a plurality of force transmitting means absorbing energy from said fluid flow and which are devoid of any common driving element and arranged to be displaceable along an endless closed path in guide means having straight and circular parts for straight and reversing drive direction, respectively, said path being perpendicular to the main direction of fluid flow, shaft means responsive to the displacement of said force transmitting means, wherein said force transmitting means are displaceable along said path in response to the absorption of energy to cause rotation of said shaft means.

4,630,996

WINDMILL

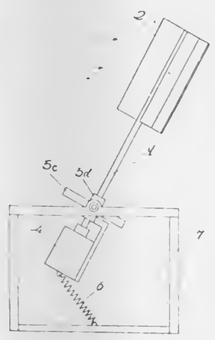
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Sep. 10, 1984, Ser. No. 649,067

Claims priority, application Japan, Sep. 22, 1983, 58-174191

Int. Cl.[4] F03D *7/06, 11/04*

U.S. Cl. 416—16 **1 Claim**



1. In a vertical-type windmill consisting essentially of
a tower structure;
a pivot;
a strut rotatably supported on the upper portion of the tower structure by the pivot so that the strut is capable of inclining around the pivot when the velocity of the wind exceeds a prescribed level;
a vertically disposed impeller including a plurality of fliers, said impeller being carried on said strut;
and a dynamo installed on the lower portion of the strut and engaged with the lower part of the tower structure with a spring, said dynamo functioning as a counterweight,
the improvement comprising:
said pivot constituting a gyrocompass-type bearing having a pedestal supported on the upper portion of the tower structure, the strut being rotatably supported on the pedestal,
whereby the strut is capable of instantly inclining in the direction of the wind when the velocity of the wind exceeds a prescribed level.

4,630,997

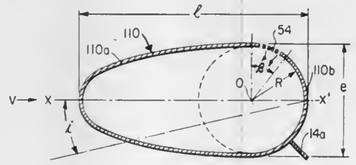
APPARATUS FOR PRODUCING A FORCE WHEN IN A MOVING FLUID

Jacques Y. Cousteau, Monaco, Monaco; Lucien Malavard, Paris, and Bertrand Charrier, Meudon, both of France, assignors to Fondation Cousteau, Paris, France

Continuation-in-part of Ser. No. 324,624, Nov. 24, 1981, abandoned. This application May 4, 1984, Ser. No. 607,386

Int. Cl.[4] B63H *9/02*

U.S. Cl. 416—90 A **56 Claims**



1. A device which is to be placed in a fluid moving in a first direction in order to produce a drive force in a second direction which is substantially transverse with respect to the first direction, wherein said device comprises an elongated body having in cross-section a rounded and symmetrical profile with respect to an axis of symmetry which defines with the first direction an angle of incidence in the second direction, said profile defining a rounded and elongated leading portion whose thickness increases from the front to the rear and a rounded trailing portion whose thickness decreases from the front to the rear, the maximum thickness of the profile being between 50 and 100% of its length in the direction defined by its axis of symmetry, the leading portion being longer than the trailing portion, the device also comprising means for sucking the fluid into the body in a suction area located on a first side of the profile on which said force is to be produced, at least on the trailing portion of the profile, and at least one flap which projects with respect to the body, said flap being located on the trailing portion of the profile, on a second side of the profile opposite to said first side.

4,630,998

APPARATUS FOR CONTROL OF COLLECTIVE AND CYCLIC PITCH OF THE BLADES OF A ROTOR

Jean-Luc Leman; Michel V. Russier, both of Aix-en-Provence, and Robert J. Suzzi, Marseilles, all of France, assignors to Aerospatiale Société Nationale Industrielle, Paris, France

Filed May 10, 1985, Ser. No. 732,767

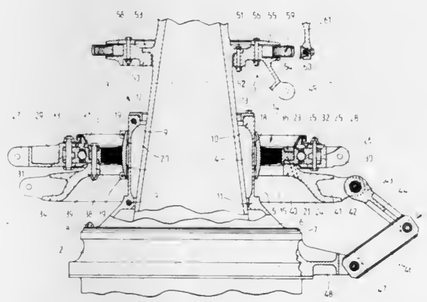
Claims priority, application France, May 14, 1984, 84 07421

Int. Cl.[4] B64C *27/35, 27/605*

U.S. Cl. 416—134 A **7 Claims**

1. Apparatus for controlling the collective pitch and cyclic pitch of blades of a rotor of a rotorcraft, the rotor craft having a main body and a housing rigidly connected to the main body, the rotor comprising a shaft extending out of the housing rotatably driven about a rotor rotation axis and rotor blades connected to the shaft, each rotor blade having a pitch, a control lever for controlling the pitch, and a respective pitch control rod connected to the control lever,

said apparatus comprising:
two annular plates coaxially mounted around said shaft, one of said plates being a turning plate and the other being a non-turning plate;
ball bearing means interconnecting said plates;
at least one lower linking member preventing rotation of said non-turning plate about said rotation axis connected to the housing and to the non-turning plate, said non-turning plate including articulating means for mounting said apparatus to be displacable in translation in the direction of said rotation axis and tiltable with respect to said rotation axis;
at least one upper linking member driving said turning plate in rotation with the shaft linked to the shaft and to said turning plate, the pitch control rod of each of the rotor blades being connected to said turning plate;
combined function collective pitch and cyclic pitch control member connected to said non-turning plate for displacing it along said shaft and for tilting it with respect to said rotation axis, said turning plate following the movement of said non-turning plate and transmitting these movements to the pitch control levers via the pitch control rods;
said articulating means including at least three deformable laminated assemblies spaced apart from one another and distributed about the shaft, each assembly comprising a stack of alternating dish-shaped elements of rigid material and layers of an elastic material allowing, by shear deformation of said elastic material, said plates to be tilted with respect to said rotation axis for controlling cyclic pitch, and a radially inner rigid armature and a radially outer rigid armature between which said stack is sandwiched, said inner armature being armated substantially in the form of an arc of a circle, the inner armatures of all said assemblies being assembled together forming a unitary radially inner ring slidingly mounted in the direction of said rotation axis, the outer armature of all said assemblies forming a crown supporting said ball bearing means.



4,630,999

AXIAL FAN

Jean H. De La Harpe, Transvaal, South Africa, assignor to James Howden & Company Limited, Glasgow, Scotland

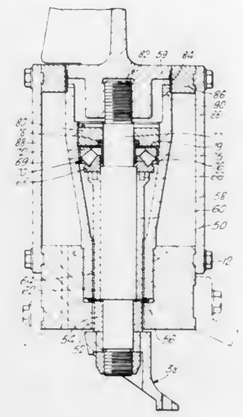
Filed Oct. 11, 1984, Ser. No. 659,639

Claims priority, application European Pat. Off., Oct. 14, 1983, 83306249.0

Int. Cl.[4] F04D *29/36*

U.S. Cl. 416—167 **8 Claims**

1. An axial flow fan comprising a hub, a plurality of bearings mounted on said hub in circumferentially spaced relationship, a blade spindle mounted on each bearing and extending radially relative to said hub, and each blade spindle being pivotable about its own axis in the associated bearing, a fan blade removably carried by each spindle for pivotal movement therewith, an operating mechanism for causing the pivotal movement thereof to give adjustment to the blade angle and, associated with each spindle, a replaceable cartridge, each replaceable cartridge comprising a tubular casing coaxially surrounding its associated spindle, a threaded inner end portion of said tubular casing removably threaded into the hub of the fan, a thrust bearing and at least one radial bearing axially spaced from said thrust bearing mounted wholly within each said tubular casing to take up axial and radial loads, respectively, between said spindle and casing, said thrust bearing and at least one radial bearing being mounted wholly within said casing, effective to be removable from the hub and shaft as the tubular casing is removed from the hub as a unit leaving the spindle mounted on the hub.



4,631,000

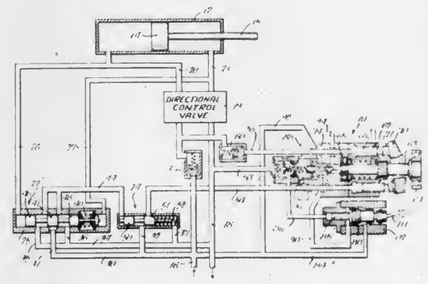
VARIABLE DISPLACEMENT HYDRAULIC PRESSURE INTENSIFIER

Wesley A. Burandt, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 16, 1984, Ser. No. 631,981

Int. Cl.[4] F04B *17/00, 35/00*

U.S. Cl. 417—225 **22 Claims**



1. A hydraulic pressure intensifier comprising, a motor-pump unit having a rotatable cylinder block with cylinders each of which has a movable piston therein and a wobbler for controlling the stroke of the pistons and which functions simultaneously as both a pump and a motor by means of porting to said cylinders including a supply pressure port, an intensified pressure port and a return pressure port, means for supplying fluid under pressure to the supply pressure port at all times during operation with an increase in fluid pressure at the intensified pressure port, the improvement characterized by means for varying the position of the wobbler to vary the stroke of the pistons and thereby vary the speed of rotation of the cylinder block for a given rate of fluid flow to the unit with the

speed of the cylinder block being solely dependent upon the stroke of the pistons, and means operable when the rotatable cylinder block of the motor-pump unit is operating at a speed limit for activating said wobbler position varying means to prevent the speed of the cylinder block from going beyond the speed limit while the pressure is maintained at the intensified pressure port.

4,631,001
T-FITTING WITH ONE WAY VALVE AND WATER LEVEL SENSOR FOR A SUMP APPARATUS
David W. Keech, Bryan, Ohio, assignor to The Scott & Fetzer Co., Fort Wayne, Ind.
Filed Aug. 9, 1985, Ser. No. 764,868
Int. Cl.[4] F04B *41/06, 49/00*
U.S. Cl. 417—3 **27 Claims**

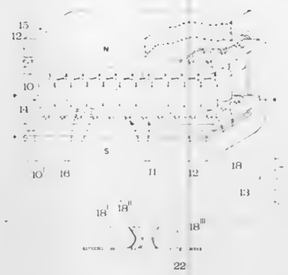


1. In a sump system having a primary and a secondary backup pump, an apparatus comprising:
a T-fitting fluidly connecting the primary pump and secondary pump outlets to a common exhaust, said T-fitting having cylindrically shaped connecting ends, said secondary pump cylindrically shaped connecting end substantially horizontally disposed,
a fastening means on the extetior surface of said T-fitting for fastening thereon a water level sensor means for electrically sensing the water level to in turn energize the secondary pump and
a one-way valve within said secondary pump cylindrically shaped connecting end.

7. In a sump system having a primary and a secondary backup pump, an article comprising:
a T-fitting having a primary pump connecting end and a secondary pump connecting end, said T-fitting fluidly connecting the primary pump and the secondary pump outlets to a common exhaust, a one-way valve positioned within said T-fitting in the secondary pump connecting end so as to be substantially horizontally disposed and a slot on said secondary pump connecting end starting at the outermost radial periphery and extending axially towards said T-fitting, whereby said slot makes the outermost periphery of said secondary pump connecting end radially flexible.

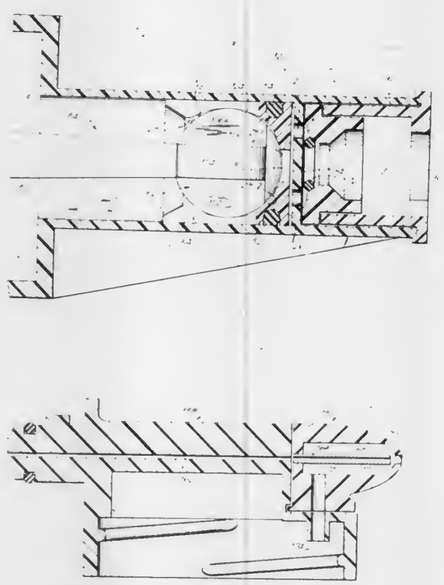
4,631,002
ION PUMP
Marco Pierini, Genoa, Italy, assignor to Varian S.p.A., Turin, Italy
Filed Aug. 22, 1983, Ser. No. 525,468
Claims priority, application Italy, Sep. 14, 1982, 68093 A/82
Int. Cl.[4] F04F *11/00*
U.S. Cl. 417—49 **4 Claims**

1. A sputter ion pump comprising a pumping element arranged between spaced pole pieces of a magnet, said pumping element including two spaced cathodes of getter material and an anode having a plurality of hollow cylindrical cells disposed between said cathodes, characterized in that each of said cathodes has a plurality of areas composed of a plurality of inwardly extending blades, each said area of each cathode being located adjacent an anode cell and being coaxial with a corresponding area in the other cathode, said inwardly extending



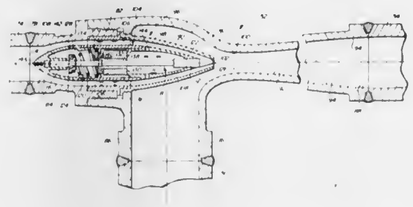
blades of each cathode area being disposed radially relative to the axis of its adjacent anode cell and extending parallel to the axis of its adjacent anode cell.

4,631,003
FLUID MEDIUM COMPRESSOR AND USER APPARATUS
Edward B. Chamberlin, Short Hills; Edward M. Brown, Livingston, and Edward J. Towns, Morristown, all of N.J., assignors to Spray-All, Inc., Millburn, N.J.
Filed Aug. 15, 1983, Ser. No. 523,127
Int. Cl.[4] F04F *5/00;* **F04B** *7/00;* **B05B** *9/04*
U.S. Cl. 417—151 **30 Claims**



1. Apparatus for compressing a fluid medium comprising:
a housing having fluid medium inlet and outlet ports;
a resilient, hollow piston supported for movement in said housing, said piston defining a fluid compression surface and having a fluid flow passage extending through said piston and said fluid compression surface;
a drive source having an output member displaced in first and second respectively opposite strokes, and
a piston rod having an end portion insertable within said piston and capable of limited translation with respect thereto, said piston rod interconnecting said piston and said output member for displacing said piston in said first stroke while translated with respect to said piston so as to preclude flow communication between said passage and said inlet port and for displacing said piston in said second stroke while translated with respect to said piston so as to place said passage in flow communication with said inlet port.

4,631,004
JET PUMP HAVING PRESSURE RESPONSIVE MOTIVE FLUID CONTROL VALVE
Edward A. Mock, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Division of Ser. No. 397,749, Jul. 13, 1982, Pat. No. 4,573,323.
This application Sep. 23, 1985, Ser. No. 758,193
Int. Cl.[4] F04F *5/48*
U.S. Cl. 417—189 **8 Claims**



1. A fluid pressure responsive variable jet pump comprising a housing defining an inlet, an outlet, and a high pressure inlet;
a nozzle assembly in association with said high pressure inlet for forming a jet of fluid directed toward said outlet to entrain fluid from said inlet; and valve means for comparing fluid pressure at said high pressure inlet with a substantially constant reference fluid pressure and controlling fluid flow through said nozzle assembly in response to said comparison;
said housing defining a chamber communicating with said inlet, a convergent section of said chamber leading to a throat section, and a divergent diffuser section leading from said throat section to said outlet, said nozzle assembly being disposed to discharge said jet of fluid across at least a portion of said chamber toward said outlet;
said valve means including a valve member movable to control said fluid flow through said nozzle assembly, means defining a variable-volume resilient chamber operatively coupled with said valve member, and resilient means for biasing said valve member in a first direction;
said variable-volume chamber defining means including a resilient annular bellows member; and
said chamber defining means including a pair of said resilient annular bellows members arranged coannularly.

4,631,005
INPUT TORQUE CONTROL DEVICE
Gerald K. Warren, Rosenweg 15,, D-6382 Friedrichsdort, and Raffaele Sandroni, Gartenfeldstrasse 40E, D-6380 Bad Homburg, both of Fed. Rep. of Germany
Filed Oct. 11, 1985, Ser. No. 786,791
Claims priority, application European Pat. Off., Aug. 17, 1985, 85110318.4
Int. Cl.[4] F04B *1/26*
U.S. Cl. 417—218 **13 Claims**

1. Input torque control device for adjusting the input torque acting on a hydraulic variable displacement pump comprising:
means for changing said pump displacement including hydraulic servo motor means;
control valve means including a spool having a first and a second side which are opposed;
a first control piston means acting on said first side of said spool, an adjustable return means including spring means acting onto said second side of said spool, said control valve means also having a pressure supply port, an output control port and a tank port, said output control port being connected to said servo motor means;
a torque sensor delivering a hydraulic feedback pressure signal indicative of input torque acting onto said variable displacement pump;
said feedback pressure signal acting upon said first control piston means against the action of said return means to

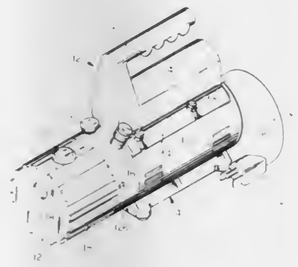


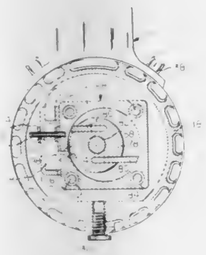
move said spool of said control valve means when said pump displacement is being changed;
a remote control device adapted to deliver a further pressure signal showing at least one selective pressure level;
a second control piston means adapted to receive said further pressure signal and being arranged to act onto said first side of said spool against said return means so that said spool is moved to a position indicative of one desired input torque acting onto said variable displacement pump corresponding to said one selective pressure level.

4,631,006
COMPACT VACUUM PUMP
Gary P. Murray, Montpelier, Ohio, assignor to Robinair Division, Montpelier, Ohio
Filed Feb. 19, 1985, Ser. No. 703,185
Int. Cl.[4] F04C *25/02, 29/08*
U.S. Cl. 417—234 **2 Claims**

1. A vacuum pump characterized by its light weight and concise configuration comprising, in combination, an electric motor having a substantially cylindrical casing having first and second open ends and upper and lower regions, a base affixed to said casing lower region, a one-piece handle assembly affixed to the exterior of said casing upper region, said handle assembly including a lower capacitor housing disposed adjacent the exterior of said casing upper region and an upper hand grip homogeneously extending above said capacitor housing, flanges homogeneously defined on said handle assembly extending downwardly from said capacitor housing in engagement with said casing upper region, fasteners attaching said flanges to said casing upper region, a motor capacitor located within said capacitor housing, an end plate mounted upon and enclosing said casing first end, a pump-motor adapter mounted upon and enclosing said casing second end, tie rods connected to said adapter extending through said end plate and casing mounting said end plate and adapter upon the associated casing end, a motor armature within said casing rotatably mounted upon said end plate and adapter having a shaft extending through said adapter, said adapter having a cyindrical exterior configuration having a maximum diameter substantially corresponding to the motor casing diameter and concentric therewith, a pump assembly mounting base defined upon said adapter, said shaft extending through said mounting base, a

pump assembly mounted upon said mounting base including a pump rotor directly mounted upon said armature shaft, a substantially cylindrical shell having an inner open end and an outer closed end enclosing said pump assembly and defining a chamber about said pump assembly, said shell having a diameter substantially corresponding to the diameter of said motor casing and adapter and concentric therewith, said shell open end being sealingly mounted upon said adapter, an inlet port defined in said adapter in communication with said pump assembly, an exhaust port defined in said pump assembly in communication with said chamber, an outlet port defined in said shell in communication with said chanber, said pump assembly including a rotor block having a cavity defined by a circumferential surface, vanes mounted upon said pump rotor engaging said cavity circumferential surface, said pump assembly exhaust port including an exhaust orifice defined in said rotor block intersecting said circumferential surface and the exterior of said rotor block, a relief pocket defined in said





cavity circumferential surface intersecting said exhaust orifice having a circumferential dimension greater than that of said orifice, a resilient reed valve mounted on the exterior of said rotor block controlling egress through said orifice, said relief pocket increasing the effective gas pressure upon said reed valve during exhausting, an exhaust riser mounted upon the exterior of said rotor block, said riser comprising a hollow vertically oriented jacket having an upper end and an opening disposed toward said rotor block, a single threaded shaft extending through said jacket and said reed valve threaded into said rotor block, first and second nuts threaded on said shaft holding said reed valve and said jacket against said rotor block, respectively, said reed valve extending through said jacket opening and located within said jacket, and an exhaust deflector conduit mounted on said jacket extending from the upper end thereof in communication with said jacket and having a horizontally disposed discharge for discharging exhausted gas into said chamber.

4,631,007

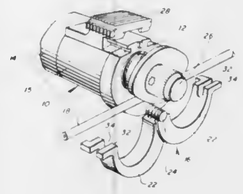
PRESSURE PUMP HAVING JAWS AND END-SLOTS

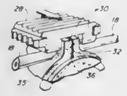
Raymond G. Olson, Niles, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 572,496, filed as PCT US83/00528, Apr. 11, 1983, published as WO83/04285, Dec. 8, 1983, § 102(e) date Oct. 24, 1983, Pat. No. 4,540,351, which is a continuation-in-part of Ser. No. 380,977, May 24, 1982, abandoned. This application Jun. 27, 1985, Ser. No. 749,604

Int. Cl.⁴ F04B *43/12;* **A61M** *1/00, 25/00*

U.S. Cl. 417—476 **2 Claims**





1. In a pressure pump for conveying fluids through tubing which comprises a pressure member of generally circular periphery, means for moving said pressure member in orbital motion about said pressure member and spaced for receiving and retaining the flexible tubing in an annular space between the pressure member and the sleeve member with the flexible tubing surrounding said pressure member for pumping of fluids through said flexible tubing, the sleeve member being divided into a pair of jaws hinged together at one end to permit opening and closing of the jaws about the pressure member to facilitate installation of the flexible tubing, the improvement comprising, in combination:

said jaws including end surfaces which abut together when said jaws are in the closed position and means defining slots in said end surfaces for accommodating passage of said flexible tubing into and out of said annular space when said end surfaces of said jaws are in abutting relation, and

movable latch means defining a slot for retaining said end surfaces of said jaws in abutting relation, said latch means being positionable adjacent a region of said flexible tubing when said end surfaces of said jaws are retained in abutting relation so that said flexible tubing which passes through said slots in said jaw end surfaces is folded about an angle which is substantially 180 degrees with said tubing extending from said abutting jaw surfaces.

4,631,008

PERISTALTIC PUMP HOUSING

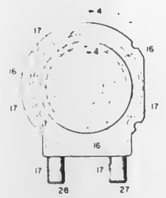
Gustav H. Stenner, Jacksonville, Fla., assignor to G. H. Stenner & Co., Inc., Jacksonville, Fla.

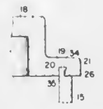
Filed Nov. 4, 1985, Ser. No. 794,560

Int. Cl.⁴ F04B *43/12;* **B65D** *41/18*

U.S. Cl. 417—477 **6 Claims**

1. In a peristaltic pump having a housing, a roller assembly, a flexible feeder tube, and a housing cover, the improvement which comprises a tapered tongue member around the outer perimeter of said housing adapted to frictionally engage a recess around the outer perimeter of said housing cover to close tightly said cover onto said housing without need for additional fastening means, said housing being generally cylindrical about a central longitudinal axis, said tongue member includes an inward cylindrical surface generally parallel to said





axis and an outward frustoconical surface wherein the angle of taper is about 5°–15° from said axis, the outer extremity of said frustoconical surface being larger in diameter than the inner end of said tongue.

4,631,009

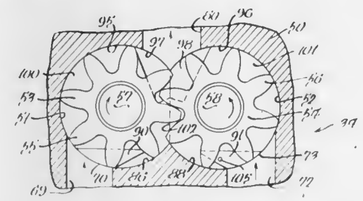
LUBRICATION SCAVENGE SYSTEM

John E. Cygnor, and John Hallman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 18, 1984, Ser. No. 631,922

Int. Cl.⁴ F04C *2/18, 15/00*

U.S. Cl. 418—15 **6 Claims**



1. A dual inlet gear pump operable in either a pumping mode or a metering mode for scavenging fluid from a pair of compartment outlets and wherein the fluid at said compartment outlets may alternate between air or oil or a mixture thereof comprising, a pump housing having a pair of inlet ports for association one with each of said compartment outlets and a single discharge port, a pair of separate fill slots in said housing communicating one with each of said inlet ports, said housing having a pair of generally cylindrical pump chambers, a pair of rotatable meshing gears in said pump chambers which separately rotate past an associated fill slot to carry fluid to the discharge port, portions of the walls of said pump chambers defining inlet and discharge seal arcs for each gear to preclude any direct fluid communication between the inlet ports and between the inlet ports and the discharge port, said inlet seal arcs extending between the leading edge of each fill slot and the intersection of said pump chambers and at least equal to the spacing between adjacent gear tooth tips and the discharge seal arcs being at least equal to the spacing between adjacent gear tooth tips and extending between the discharge port and the trailing edge of the fill slots, bearing means pressure loaded against the end faces of the gears, and a passage through said bearing means which communicates with only one of said inlet ports when the pump is used in a metering mode to provide said pressure loading without creating a flow path between the inlet ports.

4,631,010

HYDROSTATIC CONTROL DEVICE, PARTICULARY STEERING DEVICE

Hans C. Petersen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

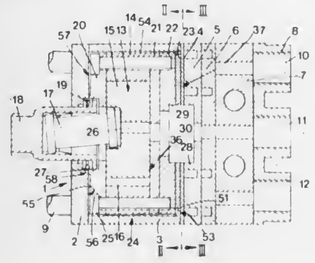
Filed Nov. 10, 1983, Ser. No. 550,320

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3243401

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.⁴ F03C *2/08;* **F16D** *31/02*

U.S. Cl. 418—61 B **15 Claims**



1. A hydrostatic steering control device, comprising, a housing having a plurality of ports including inlet and outlet ports and motor ports connectable to an external servomotor, a metering motor having a casing rotatably mounted in said housing, a rotor mounted in said metering motor casing and being moveable relative thereto to form expansible and collapsible chambers, control shaft means connected to said rotor, directional valve means having opposite turn functions, said directional valve means having relatively rotatable planar faces between said housing and said metering motor casing and being operable upon said shaft means turning said casing and said rotor in unison, commutating valve means between said metering motor casing and said rotor, resilient means for maintaining said directional valve means in a neutral position in the absence of a turning force on said shaft, passage means cooperable with and connecting said housing ports with said directional valve means and said commutating valve means, said directional valve means being operable for each said turning function to (1) route pressure fluid from said inlet port through one side of said commutating valve means to expanding chambers of said metering motor and pressurized fluid from collapsing chambers of said metering motor to one of said motor ports and (2) route fluid from the other of said motor ports to said outlet port, means providing in one of said planar surfaces an annularly shaped high pressure zone near the periphery thereof, first throttle means between said planar surfaes radially outwardly from said high pressure zone, said housing and said metering motor casing having adjacent annularly shaped wall means at the opposite end thereof from said directional valve means, second throttle means between said adjacent wall means providing an intermediate pressure zone between said first and second throttle means and a low pressure zone downstream from said second throttle means, said adjacent wall means upstream from said second throttle means being sufficient relative to said high pressure zone to provide a net pressure force in a direction biasing said directional valve planar faces towards each other.

4,631,011

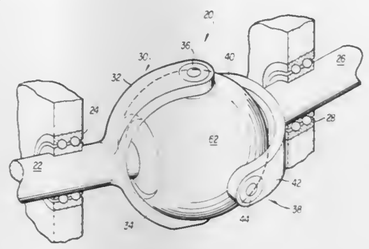
FLUID HANDLING DEVICE USEFUL AS A PUMP, COMPRESSOR OR ROTARY ENGINE

Roger R. Whitfield, 501 Robin Dr., Lynchburg, Va. 24502

Continuation-in-part of Ser. No. 709,381, Mar. 7, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,414

Int. Cl.⁴ F01C *3/06;* **F03C** *2/00;* **F04C** *3/00*

U.S. Cl. 418—68 **3 Claims**



1. A fluid handling device having a plurality of variable volume chambers for use as a pump, compressor or rotary engine which comprises:

a. a first rotary shaft member supported by bearings and carrying variable volume chamber forming components having at least a pair of angularly disposed flat surfaces and a curvilinear shell portion,

b. a second rotary shaft member supported by bearings and carrying variable volume chamber forming components having at least a pair of angularly disposed flat surfaces and a curvilinear shell portion,

(1) said shaft members being disposed at an angle other than 180° to one another,

c. a centrally disposed disk member forming a plurality of variable volume chambers with the flat surfaces of said variable volume chamber forming components,

(1) said centrally disposed disk member carrying a curvilinear shell member engageable in sealing relationship with said curvilinear shell portions of each of said variable volume chamber forming components,

(2) and said centrally disposed disk member being journalled within bearings carried by a pair of yoke members externally of said curvilinear shell member carried by said disk member and with one of said yoke members being displaced 90° with respect to said other yoke member,

(3) one of said yoke members being attached to said first rotary shaft member and the other of said yoke members being attached to said second rotary shaft member.

4,631,012

PNEUMATIC TOOLS

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 426,516, Sep. 29, 1982, abandoned. This application Nov. 25, 1985, Ser. No. 778,953

Int. Cl.⁴ F03C *2/00*

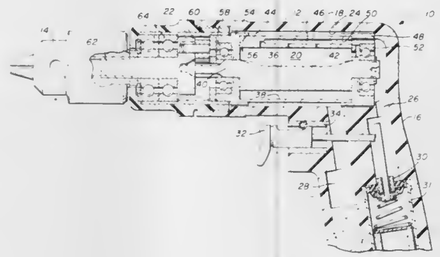
U.S. Cl. 418—70 **1 Claim**

1. In a pneumatic powered tool, with an improved tool housing and pneumatic motor assembly, comprising:

(a) an elongated motor assembly with a hollow motor cylinder, a motor rotor located in said cylinder and including a shaft portion extending from each end thereof, first and second motor end means receiving shaft portion for journaling said rotor in said motor cylinder and engaging said motor cylinder for holding said motor cylinder, said motor rotor, and said motor end means assembled in an operating relationship;

(b) a hollow cast pneumatic powered tool housing body constructed from a high density plastic material and being hollow for receiving and mounting in a motor end portion thereof as an assembly said motor cylinder, both of said motor end means and said motor rotor, said housing body motor end portion having a hollow interior with an open end portion, a generally cylindrical internal side wall, a closed end portion, and a planer abutment at said closed end portion oriented transverse to said generally cylindrical internal side wall, said generally cylindrical internal side wall being sufficiently larger than the exterior of said motor cylinder and said motor end means so as not to contact said motor cylinder exterior and said motor end means and not provide structural support for said motor cylinder around the cylindrical exterior thereof; and said first motor end means for supporting and positioning said rotor being positioned in abutting and supporting contact with said planer abutment only and said tool housing body having a handle end portion including an air valve means operably mounted therein to control air flow between an air source inlet in said handle portion and said motor assembly through a passageway communicating with said housing closed end portion;

(c) a tool housing end member threadedly mounted to said housing body and mechanically engaged with said motor second end means at said housing body open end portion



to compressively clamp and physically retain said motor assembly in an operating position wherein said first motor end means is positioned in abutting and supporting contact with said planer abutment and supporting contact with said planer abutment in said tool housing and also mounted in air flow sealing contact with said planer abutment in order to insure air flow through said tool housing closed end portion from said air valve means to said motor assembly;

(d) said first and second motor end means each receive one of said shaft portions for journaling said motor rotor in said motor cylinder and for holding said motor cylinder, said motor rotor and both of said motor end means in an operating relationshp;

(e) each of said motor end means includes a counterbore in facing sides thereof for receiving and mounting therein each one an end portion of said motor cylinder and said motor rotor in an operating relationship; and

(f) one of said motor shaft portions being an output shaft being a sun gear of a planetary gear assembly having gear teeth formed thereon to be operably engageable with a planetary gear assembly upon installation of said motor assembly in said tool housing body to provide an output drive for mounting a drive bit chuck.

4,631,013

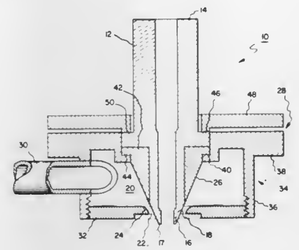
APPARATUS FOR ATOMIZATION OF UNSTABLE MELT STREAMS

Steven A. Miller, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,689

Int. Cl.⁴ B22F *9/08*

U.S. Cl. 425—7 **3 Claims**



1. An atomization apparatus for atomization of a melt at high temperature comprising:

a ceramic melt delivery tube having a melt entry end and a melt discharge end for delivery of a stream of melt of solid cross section to a zone at the discharge end of said tube,

a gas delivery system surrounding said melt delivery tube and including a gas delivery orifice extending completely around the discharge end of said melt delivery tube and closely coupled to said discharge end for delivery of atomizing gas at elevated pressure against the discharge end of said tube and into said zone,

said melt delivery tube having the discharge end internally shaped to expand the external configuration of the melt stream in the melt delivery tube and thereby to increase the extenral surface area per unit volume of melt flowing from the melt discharge end of said melt delivery tube into said zone, and

said melt delivery tube having the discharge end externally tapered and shaped to conform to the internal shape thereof.

4,631,014

HYDRAULIC CURING PRESS

Günter Drewel, Seevetal; Horst Enoch, and Klaus Grotkasten, both of Hamburg, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,464

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443730

Int. Cl.⁴ B29C *33/28, 35/00*

U.S. Cl. 425—34 R **10 Claims**

1. A hydraulic curing press for molding and vulcanizing a tire, comprising:

a frame;

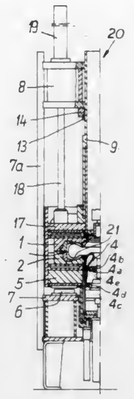
a lower mold part connected to said frame;

an upper mold part defining with said lower mold part a mold cavity;

moving means for displacing said upper part in vertical direction with respect to said lower part so as to allow closing and opening of said mold cavity;

means for accurately guiding said upper part during its displacement by said moving means and including a vertically extending guide bar connected to said upper part at a central area thereof and supported by said frame, said guide bar being provided with an adjusting nut along a predetermined section thereof; and

clamping means for locking said upper part when the latter is closed against said lower part to close said cavity and



including pivotable clamp jaws embracing said bar and engageable by said adjustng nut.

4,631,015

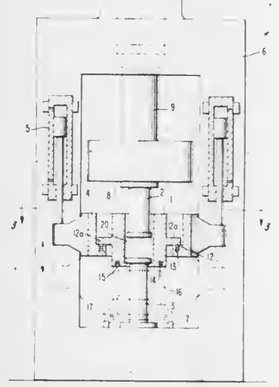
MOLDING APPARATUS WITH REPLACEABLE PLUNGER AND DIE SET

Iwasaki Shigeo, and Haguchi Hiroshi, both of Okayama, Japan, assignors to Mitsuishi Fukai Tekkosho, Ltd., Bizen, Japan

Filed May 8, 1981, Ser. No. 261,221

Int. Cl.⁴ B30B *9/04, 9/28;* **B29C** *43/00*

U.S. Cl. 425—195 **2 Claims**



1. A machine for forming bricks, comprising:

a horizontal mold support having an open center and one side open;

support moving fluid pressure cylinders on which said mold support is mounted for vertical movement in said machine;

an upper fluid pressure cylinder above said open center for exerting a downward thrust;

replaceable sets each consisting of an upper plunger, a metallic mold having an open upper end into which said plunger fits for compressing brick material within said mold and an open lower end, and a lower plunger which fits into the open lower end of said mold for compressing brick material within said mold, an upper plunger, metallic mold and lower plunger when in position in said ma-

chine being aligned vertically with said upper fluid pressure cylinder, and having said mold removably held within said mold support, and said lower plunger having a diameter less than the open side of said mold support for being movable out of said mold support through said open side;

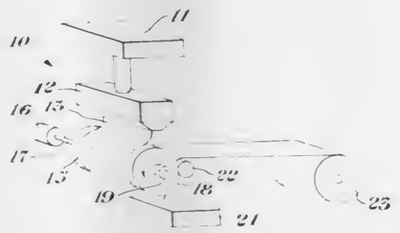
whereby when said replaceable set is positioned in said machine, the upper fluid pressure cylinder can press the plungers downwardly with said lower plunger against the bottom of the machine, and said support moving fluid pressure cylinders can move said mold support with said mold relative to said plungers, and when it is desired to replace said set, said mold support can be moved downwardly until said open side is aligned with said lower plunger, and said set can be moved laterally out of said mold support and be replaced by a set of a different mold and an upper and a lower plunger.

4,631,016

FILM CASTING APPARATUS INCLUDING HEAT TRANSFER ROLL

Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1985, Ser. No. 781,814
Int. Cl.⁴ B29C *39/38*
U.S. Cl. 425—224 **8 Claims**



1. A heat transfer roll, comprising a static mandrel having a longitudinal axis, a drive end and a heat transfer fluid end; the mandrel having a centrally disposed heat transfer passage, the mandrel having a first bearing mounted external thereto adjacent the heat transfer fluid end and a second bearing mounted adjacent the drive end; a jacket for heat transfer fluid surrounding the mandrel between the bearings, a plurality of generally radially extending axially spaced conduits disposed between the bearings and providing communication between the heat transfer passageway within the mandrel and space external to the jacket, the jacket defining a plurality of axially spaced passageways which provide communication between space external to the jacket and a generally annular space disposed between the jacket and the mandrel, means external to the mandrel to provide passage of the heat transfer liquid to space internal to the mandrel and means to provide communication between the annular space between the mandrel and the jacket and space external to the mandrel, a cylindrical rotatable roll member disposed external to the jacket and rotatably supported on the bearings; the roll member defining a plurality of internal baffles, the roll member being free to rotate on the bearings.

4,631,017

APPARATUS FOR ROLLING PLASTIC DOUGH

Torahiko Hayashi, Utunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Oct. 21, 1985, Ser. No. 789,559
Claims priority, application Japan, Oct. 20, 1984, 59-220767
Int. Cl.⁴ A21C *3/02*
U.S. Cl. 425—335 **4 Claims**

1. An apparatus for rolling plastic dough, comprising a frame; a conveyor assembly consisting of an intake conveyor, an outlet conveyor, and center roller positioned between the two conveyors, the conveyors and the center roller having driving means such that the peripheral speed of the center roller is greater than the speed of the intake conveyor and the speed of the outlet conveyor is greater than the peripheral speed of the center roller; and an endless roller mechanism having a plurality of rollers arranged above the conveyor assembly and with an arcuate path for the rollers at its bottom, the endless roller mechanism being movable forwardly and rearwardly, as a whole, along the conveyance path of the conveyor assembly to adjust the thickness of the dough to be flattened, and the center roller being vertically movable to satisfy the formula:



$$Ta > Tb > Tc$$

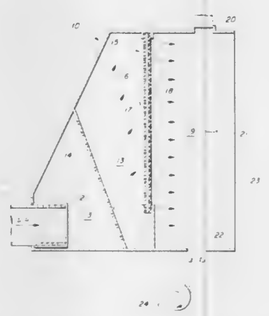
wherein Ta is the distance between the rear end of the conveyance path of the intake conveyor and the outermost periphery of the roller path of the endless roller mechanism, Tb is the distance between the center roller and the outermost periphery of the roller path of the endless roller mechanism, and Tc is the distance between the front end of the conveyance path of the outlet conveyor and the outermost periphery of the roller path of the endless roller mechanism.

4,631,018

PLATE, FOAM AND SCREEN FILAMENT QUENCHING APPARATUS

Ramunas L. Valteris, Seaford, and Gary L. Caldwell, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 1, 1984, Ser. No. 667,049
Int. Cl.⁴ B29C *35/06, 47/88*
U.S. Cl. 425—445 **2 Claims**



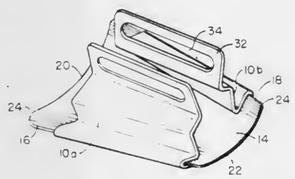
1. In an apparatus for quenching synthetic filaments which includes: an elongated chimney, a porous open-celled foam sheet, dividing said chimney longitudinally into a plenum chamber and a quenching chamber, through which filaments pass in a path from an extrusion device to a means for collecting filaments and a means to supply a flow of gas to the plenum chamber, the improvement of which comprises: a mesh screen coextensive with the foam sheet positioned between the foam sheet and the quenching chamber wherein the screen is from about a 50 mesh screen to about a 150 mesh screen.

4,631,019

COMBINATION APPLICATOR AND SHAPER FOR MOLDABLE MATERIALS

Bruce F. House, 2249 E. Goldpearl La., Hernando, Fla. 32642

Filed Nov. 4, 1985, Ser. No. 794,840
Int. Cl.⁴ B05C *17/10*
U.S. Cl. 425—458 **6 Claims**



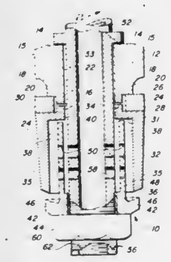
1. A combination applicator and shaper for moldable materials comprising, in combination, a flat, resilient spreader member, said spreader member defining a regular trapezoid in peripheral shape having the axis of symmetry about its longitudinal axis, and a pair of handle members removably attachable along the mutually convergent marginal longitudinal edge portions of said spreader member to facilitate manual bending of said spreader member about its axis of symmetry.

4,631,020

SEGMENTED BLOW PIN FOR MOLDING MACHINES EMPLOYING REPLACEABLE CUTTING RING

Robert E. Frankenberg, and Mark A. Calderazzo, both of Orlando, Fla., assignors to Sewell Plastics, Inc., Atlanta, Ga.

Filed Nov. 14, 1985, Ser. No. 797,928
Int. Cl.⁴ B29C *49/58*
U.S. Cl. 425—527 **17 Claims**



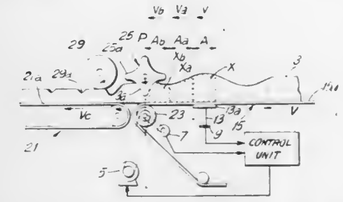
1. A blow-pin apparatus for a blow-molding machine, comprising: a blow-tube for introducing fluid into a parison: a first member mounted on said blow-tube; a second member, mounted on said blow tube, separable from said first member and juxtaposed adjacent to said first member; a radially perforated cylindrical sleeve member extending at least partially through said second member; a replaceable cutting member position between said first member and said second member; and means for holding said first and said second members together with said cutting member positioned therebetween.

4,631,021

APPARATUS FOR QUANTIFYING THE FLOW RATE OF DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Apr. 1, 1985, Ser. No. 718,126
Claims priority, application Japan, Apr. 3, 1984, 59-65837; May 21, 1984, 59-102321
Int. Cl.⁴ B29C *47/92*
U.S. Cl. 425—140 **10 Claims**



1. An apparatus for quantifying the flow rate of dough, comprising a feed conveyor assembly for continuously feeding the dough, a dough weighing device continuously measuring the weight of each portion of the dough conveyed past the weighing device, said dough weighing device being located between the opposite ends of the conveying portion of said feed conveyor assembly, a first pressing means disposed at a predetermined fixed position above and adjacent to the rear end of said feed conveyor assembly, said first pressing means being adapted to rotate about its own axis at substantially the same linear speed as the conveyor speed of at least the rear end portion of said feed conveyor assembly, a constant-speed conveyor arranged in series with and adjacent to said feed conveyor assembly, a second pressing means disposed at a predetermined fixed position above and adjacent to the front end of said constant-speed conveyor, said second pressing means comprising a single roller element adapted to rotate about its own axis at substantially the same linear speed as the speed of said constant-speed conveyor, a control unit for controlling the speed of at least the rear end portion of said feed conveyor assembly at a speed inversely proportional to the weight of a dough portion measured so as to make constant the weight of dough per unit length.

4,631,022

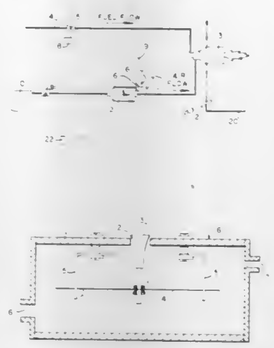
HEAT RECUPERATOR WITH COMPENSATOR FOR PRESSURE OPERATED FUEL REGULATOR

John L. Ferri; William C. Fulkerson; Ray L. Newman, and Jeffrey M. Gonzalez, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 15, 1983, Ser. No. 561,759
Int. Cl.⁴ F23N *1/00*
U.S. Cl. 431—90 **4 Claims**

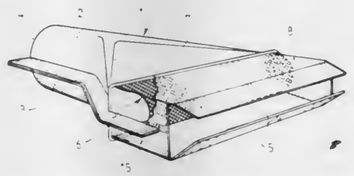
1. The combination of a heat recuperator and a compensator for a pressure operated fuel regulator, the recuperator having means for heating air to be used for combustion of fuel the flow of which is controlled by the fuel regulator, means for supplying recuperator-heated air to the compensator, means for delivering outlet pressure from the compensator to the fuel regulator, the compensator comprising a housing having an opening for bleeding air therethrough, a tapered plug in the opening, the tapered plug being fastened to a thermostatic metal within the housing, the cross sectional area of the plug being less than the area of the opening, the clearance around the plug being a free flow area through which air bleeds out of the compensator, the thermostatic metal being heated by air entering the compensator so that when the temperature of the air

increases, the thermostatic metal is heated and deflected and displaces the plug within the opening, thereby increasing the



free flow area and bleeding more air out of the compensator, thereby increasing the pressure drop across the compensator.

4,631,023
BURNER FOR GAS BLOW TORCH
Claude Courrege, La Haillan, France, assignor to Rippes S.A., France
Continuation-in-part of Ser. No. 345,749, Feb. 4, 1982, abandoned, which is a continuation of Ser. No. 40,953, May 21, 1979, abandoned. This application Dec. 27, 1985, Ser. No. 813,760
Claims priority, application France, May 29, 1978, 78 16497
Int. Cl.⁴ F23D *14/14*
U.S. Cl. 431—329 **6 Claims**



1. A gas burner for burning a high velocity gas to produce an external flame having a homogeneous front portion, wherein said gas burner comprises:
gas injecting means having a nozzle connected to a source of inflammable gas under pressure;
a tube through which said inflammable gas is injected, said tube having an inlet portion connected to said nozzle and an outlet portion;
at least an air passage debouching in said tube close to said nozzle, so as to form with said nozzle and said tube a jet pump which creates through said tube a flow of a combination of air and inflammable gas at high speed oriented towards said outlet portion;
an adaptation chamber having first and second sections, said first section comprising a first entrance portion connected to said outlet portion and a first outlet orifice and extending from said entrance portion to said first outlet orifice, a first top wall, a first bottom wall and first and second opposite lateral walls, said first top wall and bottom wall converging inwardly towards each other and increasing in width from said entrance portion to said outlet orifice and said first and second opposite lateral walls diverging from the first entrance portion to the first outlet orifice, said second section comprising a tubular portion having an inlet orifice connected to said first outlet orifice and a second outlet orifice and a second top wall, and a second bottom wall which are substantially parallel to each other and extend respectively from said first top wall and said first bottom wall, and third and fourth substantially parallel lateral walls which extend respectively from said first and said second lateral walls;
two deflectors connected to said second section and extending respectively from said second top wall and said second bottom wall, said first and second deflectors converging towards each other from said second outlet orifice and having two respective parallel front edges, spaced from each other by a first distance;
a curved diffusion grill having a curvature axis which is parallel to said second top and bottom walls and extends perpendicularly to said third and fourth lateral walls, said curved diffusion grill having two substantially parallel longitudinal edges which are respectively connected to said second top wall and to said second bottom wall, two elongated zones respectively formed between said grill and said second top and bottom walls, and two lateral curved edges which are respectively connected to said third and fourth lateral walls, said two longitudinal zones respectively delimiting with said second top and bottom walls two passageways each forming a dead space into which the flame does not spread.

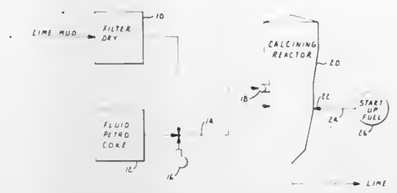
4,631,024
CATALYTIC COMBUSTION DEVICE
Tsuneo Shibata, Kawanishi; Yoshitaka Mohri, Minoo; Haruo Ida, Sakai, and Haruo Ishikawa, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP84/00192, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04377, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 16, 1984, Ser. No. 682,671
Claims priority, application Japan, Apr. 20, 1983, 58-70360; Apr. 20, 1983, 58-70362; Apr. 22, 1983, 58-71667; Jul. 8, 1983, 58-125028
Int. Cl.⁴ A45D *1/04*; F23Q *11/00*
U.S. Cl. 431—268 **6 Claims**



1. In a catalytic combustion device including a catalyst for oxidation of a fuel vapor and air, and an ignition heater for initiating oxidation on said catalyst, the improvement which comprises a tubular first member carrying thereon said catalyst for supplying the fuel vapor to said catalyst, a tubular second member disposed in said first member defining therein a passageway for the fuel vapor, said second member being secured at its one end to said first member so as to constitute a thermostatic element, and means, cooperating with said first and second members constituting said thermostatic element, for controlling the rate of fuel vapor flow to said catalyst in response to a difference in thermal expansion between said first and second members.

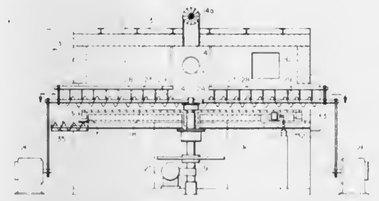
4,631,025
CALCINING PROCESS USING FLUID COKE FUEL
Robert K. Casper, and James F. Runner, both of Wichita, Kans., assignors to Koch Carbon Inc., Wichita, Kans.
Filed Aug. 20, 1985, Ser. No. 767,614
Int. Cl.⁴ F27B *15/00*
U.S. Cl. 432—15 **10 Claims**

1. In a calcining process wherein a material is placed in a reactor with a combustible fuel for calcination, the improvement comprising:



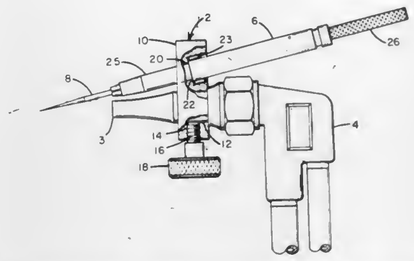
introducing into said reactor a quantity of fluid petroleum coke.

4,631,026
ROTARY TURNTABLE FURNACE FOR LITHARGE PRODUCTION
Benjamin F. McKinney, Indianapolis, Ind., assignor to Oxide & Chemical Corporation, Indianapolis, Ind.
Filed Nov. 8, 1985, Ser. No. 796,236
Int. Cl.⁴ F27B *9/16*
U.S. Cl. 432—138 **7 Claims**



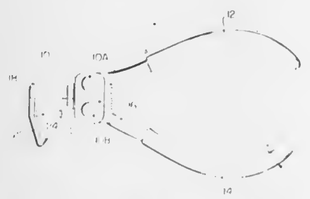
1. A furnace for heating particulate material comprising:
top and side refractory walls defining a furnace chamber, at least one of said refractory walls defining a feed inlet for feeding particulate matter into said chamber, a discharge outlet for discharging said particulate material outside said chamber, and a burner inlet communicating inside said chamber:
heating means associated with said burner inlet for heating said particulate matter within said chamber:
a turntable hearth rotatably driving said hearth:
a distributing means, including at least one screw auger rotatably disposed above said turntable hearth, for mixing and conveying the contents of said chamber in a radial direction relative to said first axis of rotation of said turntable hearth by screw movement simultaneously with the rotation of said particulate material on said turntable hearth about said first axis of rotation, said distributing means including first and second screw augers angularly spaced apart relative to the first axis of rotation of said turntable hearth, said second screw auger having an opposite pitch from said first screw auger;
a second drive means connected to said screw auger for rotatably driving said screw auger in said chamber; and
a third drive means connected to said second screw auger for rotatably driving said second screw auger at a slower speed than said first screw auger, said first and second screw augers distributing said particulate material in opposite radial directions relative to the center of said turntable hearth.

4,631,027
METHOD AND APPARATUS FOR SHARPENING TUNGSTEN ELECTRODES
Charles H. Lindberg, 4294 Helm Rd., Duluth, Minn. 55811
Filed Mar. 18, 1985, Ser. No. 712,687
Int. Cl.⁴ F27B *14/00*; B29C *35/02*; B23K *7/00*; F24J *3/00*
U.S. Cl. 432—13 **10 Claims**



8. A method for flame sharpening a welding electrode including the steps of:
(a) mounting a blunt welding electrode at an acute angle in the range of 10 to 20 degrees in engulfed relation to the flame of a heat source capable of temperatures in excess of 5500° F.; and
(b) rotating the electrode as the electrode material is vaporized until a needle-like point profile is obtained.

4,631,028
ORTHODONTIC TOOL
Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291
Filed Sep. 20, 1982, Ser. No. 420,276
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—4 **2 Claims**



1. A tool for removing an adhesively bonded orthodontic appliance from the lingual surface of a tooth which comprises: a transverse support member; first and second sections pivotally coupled to said support member at transversely spaced pivot points for pivotal movement about spaced pivotal axes, said first and second sections defining first and second handles and upper and lower jaws for the tool; a head portion formed on the lower jaw in position to engage the top of a tooth; and a unitary one-piece elongated depending portion positioned on the upper jaw in overhanging relationship with the lower jaw and having an integral catch member at the distal end thereof in position to extend down behind the tooth and under the edge of the appliance when the head portion engages the top of the tooth for removal of the appliance from the tooth.

4,631,029

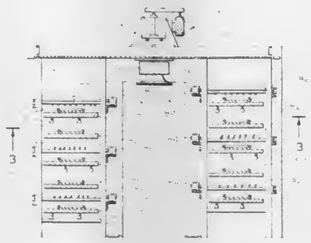
BAKING OVEN WITH HEATED AIR DISTRIBUTION-II

William E. Lanham, Conyers, and Stephen R. Smith, Tucker, both of Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 559,892, Dec. 9, 1983, Pat. No. 4,544,352. This application Sep. 25, 1985, Ser. No. 780,967

Int. Cl.[4] F27B *9/00*

U.S. Cl. 432—133 **6 Claims**



1. A baking oven comprising an oven enclosure; a generally spiral conveyor within said enclosure including an ingress conveyor section for carrying bakery goods to be baked into said enclosure, a first conveyor tier leading from said ingress conveyor section, a plurality of further conveyor tiers serially arranged with respect to each other, and an egress conveyor section carrying baked bakery goods from a final one of said conveyor tiers out of said oven enclosure; heating means within said oven enclosure means for heating the air therewithin for baking the bakery goods being carried on said conveyor tiers in said oven enclosure; and air distribution means for taking heated air from near the top of said oven enclosure and distributing the heated air, through a piping conduit network, between at least selected ones of said conveyor tiers, to provide generally uniform heat distribution with said oven enclosure and minimize stratification of heat therein; said piping conduit network including a plurality of air distribution manifolds within said oven enclosure and extending generally parallel to selected conveyor tiers and a plurality of air distribution pipes connected to and extending generally perpendicular to said manifolds beneath selected conveyor tiers; said heating means including a plurality of heating elements disposed within said oven enclosure and disposed beneath selected ones of the tiers of said spiral conveyor; and said heating elements being disposed beneath alternate ones of said conveyor tiers, while said air distribution pipes are disposed beneath the remaining ones of said conveyor tiers.

4,631,030

EQUIPMENT FOR PUTTING IN APPROXIMAL FILLINGS WITH LIGHT-HARDENING MATERIALS

Beat von Weissenfluh, Gentilino, Switzerland, assignor to Hawe-Neos Dental Dr. H. von Weissenfluh S.A., Gentilino, Switzerland

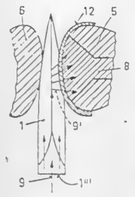
Filed Jun. 18, 1985, Ser. No. 746,058

Claims priority, application Switzerland, Jul. 9, 1984, 3301/84

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—149 **5 Claims**

1. Equipment for putting in approximal fillings (between teeth) with light-hardening materials, comprising a wedge (**1**) transparent to the rays used and adapted to be inserted between the teeth, the wedge having means to refract or reflect concentrated light supplied to it in the axial direction (**9**) by a light source (**10**), by deflecting it in the lateral direction (**9'**), so as to illuminate the filing material (**8**) with the greatest possible intensity in the approximal part of the cavity, making possible



hardening of the filling material starting from the approximal-apical stratum (**8'**).

4,631,031

ARTIFICIAL DENTAL PROSTHESIS

Ernst-Jürgen Richter, Neupforte 15, 5100 Aachen, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,262

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413811

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **13 Claims**



1. A crown attachment comprising:

an implant adapted to be seated in a bone of a jaw and having an attachment end turned away from said bone and having an axis;

a first coupling member fixed to said end of said implant and provided with an annular first formation located along said axis and surrounded by an annular shoulder lying in a plane generally perpendicular to said axis;

a second coupling member formed centrally with a second formation matingly engageable with said first formation with freedom of swivelling and axial mobility therebetween, and with an annular shoulder surrounding said second formation and lying in a plane and juxtaposed with said shoulder of said first coupling member, said shoulders being each formed with a respective groove opening toward the other shoulder and registering with one another;

a dental crown affixed to said second coupling member; and

an elastic ring disposed in said grooves and of a material and so associated with the shapes of said grooves as to yieldably resist displacement of said shoulders toward one another with a force/displacement characteristic having a break between an initial section of greater yieldability and an adjacent subsequent section of lesser yieldability.

4,631,032

ENGINE EXHAUST APPARATUS FOR WATER-JET PROPULSION BOAT

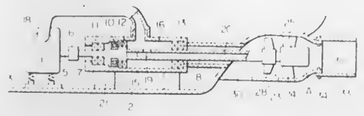
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jan. 22, 1985, Ser. No. 693,097

Claims priority, application Japan, Jan. 27, 1984, 59-14123

Int. Cl.[4] B63H *11/103*

U.S. Cl. 440—47 **6 Claims**



4. A propulsion apparatus for a water jet propulsion boat having a hull, a water jet pump casing with said hull, and an impeller in said pump casing driven by an engine in said hull, said propulsion apparatus comprising:

means in said pump casing defining a converging passage for increasing water flow velocity and having a smaller diameter section within which water jet pressure is reduced due to the increase in velocity;

a hollow impeller shaft defining an exhaust passage within an inner wall of said impeller shaft, said exhaust passage being communicated at a forward end portion of said impeller shaft with an exhaust port of said engine;

means connecting said impeller to said impeller shaft:

an exhaust outlet communicating with said exhaust passage formed in said impeller shaft and located rearward of said impeller and within said smaller diameter section of said pump casing to discharge exhaust into a water jet portion of higher velocity and reduced pressure within said section,

said exhaust outlet communicating at a rear end surface of said impeller shaft, and

a centrifugally operated stop valve for said outlet operated by said impeller shaft.

4,631,033

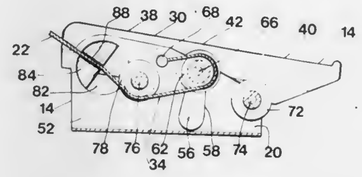
OUTBOARD MOTOR FOOT CONTROL WITH ADJUSTABLE CABLES

Eugene P. Menne, Mankato, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.

Filed Apr. 23, 1984, Ser. No. 602,774

Int. Cl.[4] B60L *15/20;* **B63H** *25/00*

U.S. Cl. 440—7 **18 Claims**



1. In a portable outboard motor foot control device of the type having a base, a pedal mounted thereto pivotably about an axis, and at least one cable extending therefrom toward the motor, the improvement comprising:

(a) a cable house secured to the base adjacent to the pedal, said at least one cable being secured within said cable house and exiting said cable house to extend toward the controlling motor and

(b) adjustable means rotatable about a substantially horizontal axis through a substantial arc on the cable house to set the direction of said at least one cable as it exits the cable house to firmly orient said at least one cable in various directions in a vertical plane as necessary to avoid nearby obstacles.

4,631,034

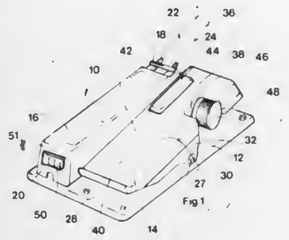
OUTBOARD MOTOR FOOT CONTROL

Eugene P. Menne, Mankato; William B. Lagerquist, North Mankato, and Del P. Decko, Mankato, all of Minn., assignors to Johnson Fishing, Inc., Mankato, Minn.

Filed Apr. 23, 1984, Ser. No. 602,773

Int. Cl.[4] B63H *25/02*

U.S. Cl. 440—7 **20 Claims**



1. In a portable outboard motor foot control device of the type having a base, a pedal mounted thereto pivotably about an axis, and first and second pull-cables each of which have an end secured within the device and extend from the front thereof toward the controlled motor, the improvement comprising:

a cable house secured to the base adjacent to the pedal and having front and rear ends;

a pivot shaft linked to the pedal and extending into the cable house;

a lever arm fixed to the shaft within the cable house and having first and second cable-turning means thereon movable therewith between forward and rearward positions;

means securing the end of the first cable at a first position in front of the first turning means, said first cable extending from the first position around the first turning means to exit the front end of the cable house;

a third cable-turning means secured within the cable house to the rear of the second turning means; and

means securing the end of the second cable at a second position to the rear of the second turning means, said second cable extending from the second position around the second turning means and from there around the third turning means to exit the front end of the cable house;

whereby movements of the lever arm toward its forward and rearward positions pull the second and first cables, respectively.

4,631,035

HYDRAULIC TILT DEVICE FOR MARINE PROPULSION UNIT

Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 22, 1985, Ser. No. 704,708

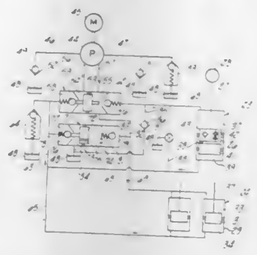
Claims priority, application Japan, Feb. 23, 1984, 59-31416

Int. Cl.[4] B63H *5/12*

U.S. Cl. 440—61 **17 Claims**

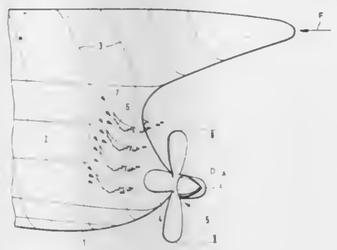
1. In a hydraulic tilt and trim unit for a marine outboard drive pivotal about a generally horizontal axis between a tilted up position and a tilted down position comprising a double acting fluid motor operatively connected between said outboard drive and the associated watercraft for pivotal movement of said outboard drive about said horizontal axis upon operation of said fluid motor, a reversible pump having a first port operative as a suction port when said fluid pump is operated in a forward direction and was a pressure port when said fluid pump is operated in a reverse direction and a second port

operative as a pressure port when said fluid pump is operated in the forward direction and as a suction port when the fluid pump is operated in the reverse direction, and conduit means for delivering fluid from said first port to drive said fluid motor in a lifting direction when said fluid pump is operated in its reverse direction for effecting pivotal movement of said outboard drive toward its tilted up position and for delivering



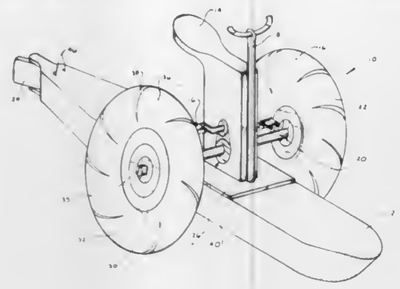
fluid from said second port when said fluid pump is operated in its forward direction to drive said fluid motor in its lowering direction to effect pivotal movement of said outboard drive toward its tilted down position, the improvement comprising means for discharging fluid from said fluid motor when operated by said pump in its lowering direction without having to flow through the first fluid pump port.

4,631,036
STERN FIN FOR SINGLE-PROP SHIP
Hermann Grothues-Spork, Heimat 61, D-1000 Berlin, Fed. Rep. of Germany
Filed Jul. 5, 1984, Ser. No. 628,016
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324753
Int. Cl.⁴ B63H *1/18*
U.S. Cl. 440—66 **15 Claims**



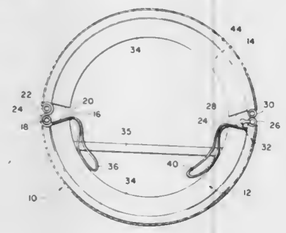
1. In combination with a ship having a stern provided with a propeller that rotates in a plane and about a horizontal midline ship axis perpendicular to this plane to displace the ship horizontally forward and form a downward and rearward boundary-layer flow,
a plurality of fins secured to and extending horizontally from the stern ahead of the propeller in the ship displacement direction, each such fin being curved and having relative to this direction a swept-back leading edge directed parallel and into the direction of boundary-layer flow at this leading edge and a trailing edge extending parallel to the axis, the fins projecting horizontally from the stern and perpendicular thereto at the respective fin by a distance at most equal to the thickness of the boundary-flow layer.

4,631,037
PONTOON VEHICLE
James Dickens, 28 Westland St., Hartford, Conn. 06120
Filed May 31, 1985, Ser. No. 739,519
Int. Cl.⁴ B63H *16/00*
U.S. Cl. 440—100 **6 Claims**



1. An aquatic vehicle comprising:
central pontoon means adapted to float on water and including an upper surface thereon, said pontoon means being an elongated, non-circular member extending forwardly and rearwardly of a pair of paddle wheel means;
seat means attached to said upper surface of said pontoon means;
steering means adjacent said seat means and attached to said pontoon means;
a rudder pivotably attached to said pontoon means at one end thereof and being connected to said steering means;
said pair of paddle wheel means being disposed at opposed locations on either side of said pontoon means and being interconnected by an axle wherein said paddle wheel means are adapted to provide buoyancy and propulsion, said paddle wheel means comprising;
a plastic buoyant core;
a fluid tight elastomeric inner tube surrounding said core and having fluid therein;
an outer tube surrounding said inner tube, said outer tube having cleats thereon; and
drive means for dirving said pair of paddle wheel means.

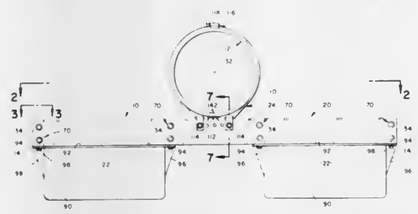
4,631,038
PROTECTIVE CAPSULE
Betty J. Ritter, and Ronald G. Ritter, both of 1826 S. 139 E. Ave., Tulsa, Okla. 74108
Filed Feb. 11, 1985, Ser. No. 700,605
Int. Cl.⁴ B63C *9/00*
U.S. Cl. 441—80 **3 Claims**



3. A safety capsule comprising:
a housing having two semi-cylindrical housing sections having adjacent longitudinal side edges hingely secured together to provide alternate open and close position for the capsule and of a legnth to receive an occupant in a completely lying position;

yieldable and bouyant material provided on the inner periphery of the housing for protection of an occupant of the capsule and to provide flotation force for the housing;
a first and a second pair of straps secured along the longitudinal side of at least one of said semi-cylindrical sections;
latching means operable for selectively locking the two semi-cylindrical housing sections in the closed position thereof;
at least two spaced-apart ring shaped roll bars provided on the semi-cylindrical housing sections for protection of the occupant.

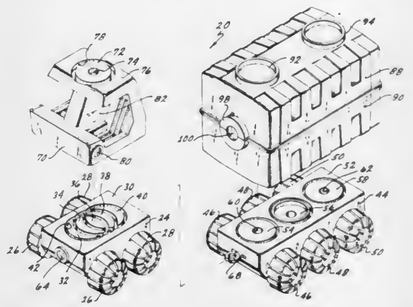
4,631,039
PIPE FLOTATION ASSEMBLY
Jon D. Meriwether, Follensbee, W. Va., assignor to Follansbee Steel Corporation, Follansbee, W. Va.
Filed Oct. 25, 1985, Ser. No. 791,317
Int. Cl.⁴ B63B *21/52*
U.S. Cl. 441—133 **9 Claims**



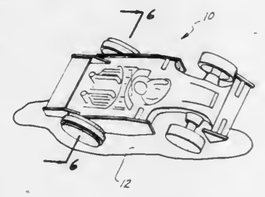
1. In a pipe flotation system having a flotation device attached to the underside of a frame member, said frame member having spaced side beam members on which a pipe member is fixedly supported, the improvement comprising: a plurality of longitudinally spaced apertures in each of said side beam members; a pair of bracket members slidably carried on each of said side members; an aperture in each said bracket member selectively alignable with said plurality of apertures in the side member carrying the said bracket member; fastener means extending through aligned apertures of said side member and said bracket member for fixedly securing said bracket member to said side member; clamping means comprising a thin wall band member having a center portion retained between said bracket member and said side member and having end portions extending above the frame member; adjusting means operative between the end portions of said band member for establishing a closed loop defining a transverse opening, and for varying the effective length of the loop to variably size the transverse opening, for said opening to thereby receive said pipe member therethrough, said adjusting means being adjustable to reduce said opening to thereby fixedly clamp said pipe member between said band member and said side member.

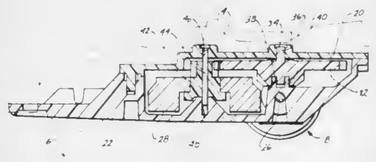
4,631,040
CONSTRUCTION TOY SET
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 18, 1984, Ser. No. 683,248
Int. Cl.⁴ A63H *17/00*
U.S. Cl. 446—95 **12 Claims**

1. A toy construction set which comprises:
at least one base, said base having a base moving means for moving said base on a support surface;
said base including at least one connector of a first type;
at least one housing;
said housing including at least one connector of a second type;
one of said first and said second type connectors being a first male connector and the other of said first and said second connectors being a first female connector;
said first male connector shaped as a truncated conical element;
said first female connector shaped as a hollow truncated conical boss;
said first male connector sized to fit into and frictionally connect to said first female connector so as to temporarily connect said housing to said base;
at least one mushroom shaped element comprising a connector of a third type, said connector of said third type independent of each of said base and said housing and including a first male connector and, further, including an elongated cylindrical section projecting perpendicularly from the center of the base of said first male connector;
said housing including at least one opening located on said housing and forming a connector of a fourth type, said connector of said fourth type sized and shaped such that said elongated cylindrical section of said third type connector fits into and is temporarily contained in said fourth type connector;
said base and said housing temporarily connectable by said connectors of said first, said second, said third and said fourth types.



4,631,041
MINIATURE FLYWHEEL CAR FOR SIDE-WHEELIE STUNTS
Richard Chang, Rolling Hills Estates, and Walter Nakano, Manhatten Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 27, 1986, Ser. No. 823,169
Int. Cl.⁴ A63H *1/00*
U.S. Cl. 446—233 **3 Claims**





1. A toy car for performing side-wheelie stunts comprising:

a bottom chasis having a first aperture and an annular extension;
front and rear axles rotatably engaging said bottom chasis;
a top chasis attached to said bottom chasis having second and third apertures;
front wheels attached to said front axle having sides made out of a low friction material;
rear wheels attached to said rear axle having sides made out of a low friction material and a high friction material surrounding the perephery of each of said rear wheels;
a bevel pinion gear attached to said rear axle;
a change gear having an extension rotatably engaging said second aperture of said top chasis and an annular groove rotatably engaging said annular extension of said bottom chasis, said change gear having a vertical spin axis and engaging said bevel pinion gear;
a pin having one end thereof rotatably engaging said third aperture in said top chasis and the other end thereof rotatably engaging said first aperture in said bottom chasis, said pin having a vertical longitudinal axis;
a pinion gear attached to said pin, said pinion gear rotating about said vertical longitudinal axis of said pin and engaging said change gear; and
a flywheel attached to said pinion gear, said flywheel having a vertical spin axis and a center of gravity substantially located in a horizontal plane passing through the longitudinal axis of said rear axle so that said toy car is capable of balancing on said sides of said front and rear wheels when said toy car is performing side-wheelie stunts on a supporting surface and said longitudinal axis of said rear axle substantially approaches a vertical position when said toy car is performing said side-wheelie stunts.

4,631,042

INFINITELY VARIABLE CONE-DISK TRANSMISSION

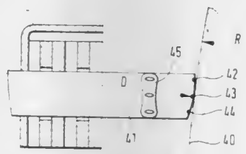
Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Zug, Switzerland

Filed Dec. 3, 1985, Ser. No. 804,382

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447092

Int. Cl.⁴ F16H *55/56*

U.S. Cl. 474—8 **10 Claims**



1. Infinitely variable cone disk transmission having two pairs of cone disks (**24**, **25**; **26**, **27**), in which the cone disks of the pairs are formed with mutually facing engagement faces, which engagement faces are, at least approximately, part spherically curved about a curvature radius, and in a diagonal relationship one cone disk of the disks of each pair is axially shiftable, the other cone disk of the disks of the pair being fixed;
a transmission chain (**9**) looped between the cone disk pairs, having link elements formed with outwardly curved lateral contact surfaces, contacting the mutually facing engagement faces of the cone disks of the pairs, and transferring rotary power by frictional engagement with said faces, between the pairs of disks,
wherein, in accordance with the invention,
the radius of curvature R of the at least in part spherical engagement surfaces at any point of engagement with the curved contact surfaces of the chain link elements is greater than a theoretical radius of curvature r,
which theoretical radius of curvature results when the distance of axial movement of the movable cone disk of one of the pairs is equal to the distance of axial movement of the movable cone disk of the other of the pairs upon change of transmission ratio—within the range of transmission ratios of the transmission-while maintaining torque transmitting engagement with the outwardly curved contact surfaces of the link elements; and
wherein the radius D of curvature of the contact surfaces of the link elements is greater than half the width of the link elements, measured transversely to the running direction of the chain, when looped between said pairs of cone disks.

4,631,043

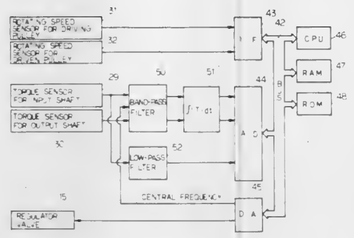
HYDRAULIC CONTROL APPARATUS FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Setsuo Tokoro; Takashi Shigematsu, and Tomoyuki Watanabe, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 3, 1984, Ser. No. 606,467

Int. Cl.⁴ F16H *11/06*

U.S. Cl. 474—18 **31 Claims**



1. A hydraulic control apparatus for controlling a RPM of an engine in a motor vehicle using a continuously variable transmission, the transmission having a driving pulley mounted in an input shaft, the driving pulley comprising a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member, a driven pulley mounted on an output shaft, the driven pulley comprising another fixed member and another movable member, the another movable member being similarly actuated by another hydraulic cylinder supplied with a line pressure to form another V-shaped opening between said another movable member and said another fixed member and an endless belt member spanning the pulleys so that an effective diameter of the pulleys can be varied with regard to each other so that different speed ratios can be obtained, comprising:
a first torque sensing means for detecting an input torque on the input shaft of the driving pulley generated by the power stroke of the engine and for outputting an input torque signal, said first torque sensing means being in communication with said input shaft;
a second torque sensing means for detecting an output torque on the output shaft of the driven pulley generated by the power stroke of the engine and for outputting an output torque signal, said second torque sensing means being in communication with said output shaft;
a control circuit including:
a first calculating means for receiving the input and output torque signals and for calculating a first actual ratio between the output torque of the ouput shaft detected by the second torque sensing means and the input torque of the input shaft detected by the first torque sensing means, the first calculating means outputting at least a first calculated signal having a first value and a second calculated signal having a second value, said first calculating means outputting the second calculated signal a predetermined time period after outputting the first calculated signal;
a second calculating means for receiving the first and second calculated signals from the first calculating means and calculating a second actual ratio between the first value of the first calculated signal and the second value of the second calculated signal, the second calculating means outputting a third calculated signal, the third calculated signal being indicative of the second actual ratio;
a memory means for receiving said first and second calculated signals and for storing a predetermined ratio between the output torque of the output shaft and the input torque of the input shaft;
a comparison means for comparing the stored predetermined ratio with said second actual ratio of the third calculated signal, the comparison means outputting a comparison signal indicative of a result of the comparison; and
hydraulic fluid control means for receiving said comparison signal and for controlling the line pressure supplied to said another hydraulic cylinder of the driven pulley in accordance with said comparison signal, whereby said control means increases the line pressure to obtain said predetermined ratio when said second actual ratio is less than the predetermined ratio, and decreases the line pressure to obtain said predetermined ratio when said second actual ratio is greater than the predetermined ratio.

4,631,044

SPEED CHANGING DEVICE

Larry Redmon, Fort Wayne, Ind., assignor to Challenge Tool & Manufacturing, Inc., New Haven, Ind.

Filed Oct. 7, 1985, Ser. No. 785,068

Int. Cl.⁴ F16H *7/14*

U.S. Cl. 474—114 **11 Claims**



1. A speed changer for changing the rotational output speed of a motor comprising:
a motor mounting plate adapted to receive a motor thereupon, said plate having an aperture through which passes the motor output shaft;
a housing having two generally parallel guide grooves for slidably receiving said motor mounting plate and an aperture between said grooves through which passes said motor output shaft;
a driver pulley adapted to be concentrically mounted upon said motor output shaft;
a speed changer output shaft rotatably mounted upon said housing;
a driven pulley different in diameter than said driver pulley concentrically mounted upon said speed changer output shaft;
an endless member rotatably coupling together said driver and driven pulleys; and
a screw means, connected to said mounting plate, for slidably adjusting said mounting plate within said grooves so as to provide tension to said drive belt.

4,631,045

APPARATUS FOR PRODUCING A ROD-LIKE SMOKING ARTICLE WITH SECONDARY AIR CHANNELS

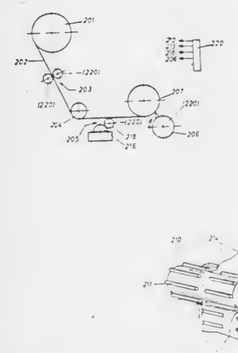
Antonio P. A. Frattolillo, Boudry, Switzerland, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Continuation of Ser. No. 744,804, Jun. 14, 1985, abandoned, which is a continuation of Ser. No. 644,073, Aug. 24, 1984, abandoned, which is a division of Ser. No. 348,571, Feb. 12, 1982, Pat. No. 4,498,487. This application Dec. 27, 1985, Ser. No. 815,116

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105456

Int. Cl.⁴ B31C *13/00*

U.S. Cl. 493—46 **4 Claims**



1. Apparatus for producing a rod-like smoking article wherein a double-length mouthpiece core with coaxially extending tobacco rods at either end is circumscribed by a preglued wrapping strip portion over the entire length of the double-length mouthpiece core and over adjacent portions of the two tobacco rods, said wrapping strips having an overlap region when wrapped about said core and said rods, an inside surface for contracting said core and said rods, and an outside surface, said apparatus comprising:
a reel for carrying a double-width wrapping paper strip;
means for receiving said strip from said reel and for stamping notches exclusively into said inside surface for producing a unitary strip having one smooth surface and one notched surface;
glueing means for receiving said unitary strip from said stamping means and for coating said inside surface with glue except in the notches; and
means synchronized with said stamping means for receiving said glued strip from said glueing means and for cutting said glued strip into portions.

4,631,046

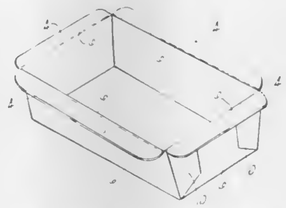
BAKE IN TRAY AND METHOD OF FORMING A BLANK FOR THE SAME

Kenneth V. Kennedy, Little Canada, Minn., assignor to Waldorf Corporation, St. Paul, Minn.

Continuation of Ser. No. 628,584, Aug. 23, 1984, abandoned, which is a division of Ser. No. 540,107, Oct. 11, 1983, abandoned, which is a continuation of Ser. No. 347,711, Feb. 10, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 703,184

Int. Cl.⁴ B31B *3/20, 9/26;* **B32B** *23/08*

U.S. Cl. 493—59 **2 Claims**



1. A method of forming a blank from which a paperboard microwave cooking tray can be erected, said method comprising the steps of:

(a) providing a supply of stock paperboard one side of which is coated with a moisture resistant styrene methyl methacrylate copolymer coating;

(b) forming a plurality of score lines on said coated paperboard thereby defining a bottom wall and four side walls connected to said bottom wall by said score lines;

(c) simultaneously with the formation of said plurality of score lines, forming a plurality of interrupted cut score fold lines thereby defining foldable connections and a plurality of flanges which are foldably connected to said side walls, the cuts of said interrupted cut score lines passing through the paperboard as well as its coating; and

(d) simultaneously with the formation of said plurality of score lines and the formation of said plurality of interrupted cut score fold lines, cutting said coated paperboard to form the periphery of said blank and separate said blank from said supply of stock paperboard.

4,631,047

APPARATUS FOR CUTTING HAND HOLES IN BAGS

Karl Dreckmann, Hennef-Altenbödingen, and Theo Miesen, Niederkassel-Rheidt, both of Fed. Rep. of Germany, assignors to Lemo M Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,890

Claims priority, application Fed. Rép. of Germany, Dec. 14, 1984, 3445660

Int. Cl.⁴ B31B *1/20;* **B26F** *1/44*

U.S. Cl. 493—227 **5 Claims**

1. An apparatus for forming aligned front and rear hand holes in the front and rear panels of a bag, the apparatus comprising:

a support having a front face and an oppositely directed rear face adapted to respectively support the front and rear panels of the bag and formed with respective aligned front and rear annular recesses of a shape corresponding to that of the hand holes to be cut;

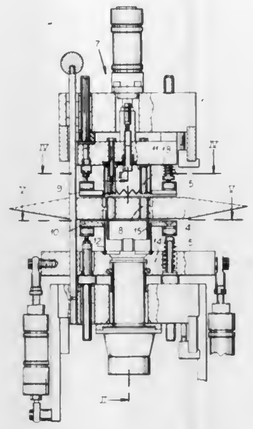
respective annular front and rear outer holddowns engageable with the respective faces for pressing the respective panels thereagainst around the respective recesses;

an annularly continuous front cutter blade engageable in the front recess;

an annular but discontinuous rear cutter blade engageable in the rear recess;

a rear inner holddown engageable with the rear face within the recess; and

actuator means for pressing the holddowns against the respective faces and for simultaneously pressing the blades into the respective recesses and thereby cutting a piece



from the front panel and forming an annular but discontinuous cut in the rear panel.

4,631,048

METHOD AND APPARATUS FOR PNEUMATICALLY EVACUATING CENTRIFUGES

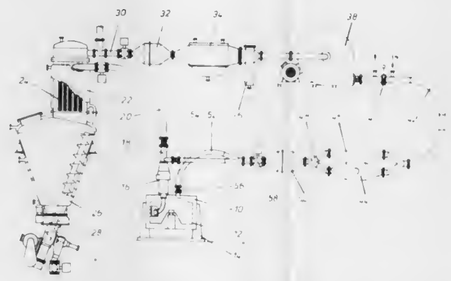
Hans-Joachim Titus, Dornach, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,020

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340636

Int. Cl.⁴ B04B *15/02*

U.S. Cl. 494—13 **13 Claims**



1. A method for evacuating centrifuges, wherein the centrifuged product being peeled from the wall of a rotating centrifuging drum is fed to a discharge pipe passing through a closed centrifuge housing, comprising the steps of:

providing a primary flow of heated drying gas and a secondary flow of heated drying gas;

feeding said primary flow into the centrifuge housing as carrier fluid for conveying said product into said discharge pipe;

transforming said secondary flow of drying gas into a turbulent longitudinal flow essentially concentrically enclosing said discharge pipe adjacent a downstream end portion thereof;

and uniting said mixture of product and heating gas of the primary flow conveyed through said discharged pipe with said turbulent flow along a tubular product drying distance.

4,631,049

CENTRIFUGE FOR CLARIFYING OR SEPARATING SUSPENSIONS

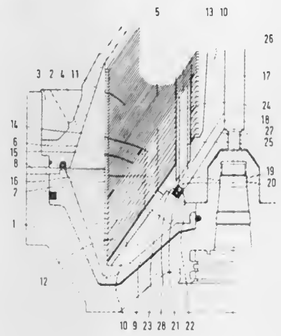
Karl H. Zettier, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,772

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426479

Int. Cl.⁴ B04B *1/08*

U.S. Cl. 494—71 **6 Claims**



1. In a centrifuge for clarifying or separating suspensions and having a centrifuge drum with a bottom, a lid, an annular seal uniting the bottom and lid, an access chamber for a the suspension, and a distributor past which suspension is supplied to a package of conical plates provided with inner ascending channels, the improvement comprising: a diversion chamber disposed below each inner ascending channel and in communication with the access chamber, wherein each diversion chamber has means forming at least one calibrated aperture for separating off part of the suspension with its solids; wherein the package of plates comprises an upper section and a lower section, with the lower section having outer ascending channels, which are positioned radially farther out than the inner ascending channels and to which the separated portion of the flowing suspension is supplied; and pipe connections extending from the diversion chamber to the inner ascending channels in the upper section of the plate package and supplying the remainder of the flowing suspension to the inner ascending channels.

4,631,050

AUTOTRANSFUSION SYSTEM AND METHOD

Charles C. Reed, Rte. 3, Box 803, Conway, Ark. 72032, and Denton A. Cooley, 3014 Del Monte, Houston, Tex. 77019

Filed Sep. 24, 1985, Ser. No. 779,497

Int. Cl.⁴ A61M *1/03*

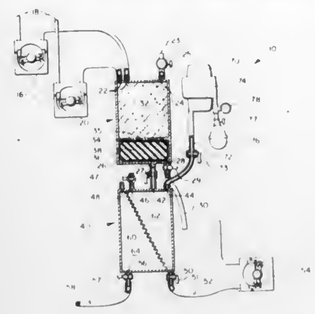
U.S. Cl. 604—4 **34 Claims**

1. A continuous blood filtering, washing, and concentrating apparatus comprising:

a filtration unit having both an inlet port for continuously receiving a mixture of healthy blood cells, fluid, and particulate debris, and a first outlet port, said filtration unit being capable of removing at least a portion of the particulate debris from the mixture;

means for removing at least a portion of the fluid from the mixture, said fluid-removing means having a receiving chamber which is in communication with the first outlet port of the filtration unit, said fluid-removing means having a semipermeable membrane which is at least partially bounded by the receiving chamber;

means for selectively pressurizing the receiving chamber of the fluid-removing means such that at least a portion of the fluid of the mixture is forced through the semipermeable membrane under pressure and out of the receiving chamber while the healthy blood cells are retained by the membrane within the receiving chamber; and



means, communicating with the receiving chamber of the fluid-removing means, for selectively injecting a washing solution into the receiving chamber of the fluid-removing means.

4,631,051

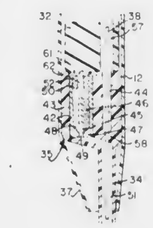
VENTRICULAR AMNIOTIC SHUNT AND INTRODUCER SYSTEM

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 24, 1984, Ser. No. 653,340

Int. Cl.⁴ A61M *27/00, 25/00*

U.S. Cl. 604—9 **26 Claims**



1. A ventricular amniotic shunt and introducer system for the relief of fetal hydrocephalus, comprising:

an introducer assembly including a guiding assembly having a longitudinal lumen therethrough;

a pushing tool of said introducer assembly, said pushing tool including an elongated rod insertable through said longitudinal lumen of the introducer assembly, said pushing tool having a distal end, and said pushing tool including a stylet slidable through a lumen of said pushing tool elongated rod;

a valve assembly inserted through said longitudinal lumen of the introducer assembly and inclining a hydrocephalus valve mounted within a valve housing and a catheter depending from said valve housing, said valve having an inflow end and an outflow end, said catheter having a distal end, said catheter and said valve inflow end housing having a common passageway between the hydrocephalus valve and the distal end of the catheter, said valve assembly having a top end, and said valve housing includes a stylet guiding partial lumen longitudinally positioned therewith and spaced from said common passageway;

the distal end of the pushing tool pushingly engages the top end of the valve assembly; and

an orifice is included at the distal end of the catheter, and an opening in said top end of the valve assembly is in fluid-

passing communication with the outflow end of the hydrocephalus valve, said orifice being in fluid-passing communication with the inflow end of the hydrocephalus valve through said common passageway.

4,631,052

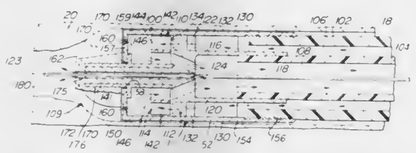
METHOD AND APPARATUS FOR SURGICALLY REMOVING REMOTE DEPOSITS

Kenneth R. Kensey, Hinsdale, Ill., assignor to Intravascular Surgical Instruments, Inc., Frazer, Pa.

Continuation-in-part of Ser. No. 567,506, Jan. 3, 1984, Pat. No. 4,589,412. This application Dec. 17, 1984, Ser. No. 682,393

Int. Cl.⁴ A61B *17/32*

U.S. Cl. 604—22 **12 Claims**



1. An apparatus for opening a restriction formed of material inside of a passageway within a living being, said apparatus comprising: a flexible catheter having a longitudinal axis and a distal portion including fluid-driven, movable working means located at said distal portion, fluid delivery means for providing a fluid under pressure to said working means for rotating said working means about said axis and with respect to said material while said working means is advanced into said material to open said restriction, and constraining means for constraining a substantial portion of said fluid within said catheter to preclude the egress of said substantial portion of said fluid into the location of said restriction while enabling a minor portion of said fluid to gain ingress into said passageway adjacent said working means.

4,631,053

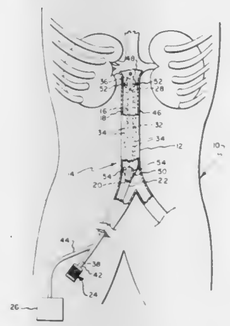
OXYGENATOR

Syde A. Taheri, 268 Dan Troy Dr., Williamsville, N.Y. 14221

Filed Mar. 19, 1984, Ser. No. 590,701

Int. Cl.⁴ A61M *3/00*

U.S. Cl. 604—49 **10 Claims**



1. An oxygenator capable of oxygenating blood within a patient's body comprising:

an elongated wire support of such length that one end portion of the support may be disposed within a patient's body at the location where blood is to be oxygenated with the other end portion of the support being disposed outside the patient's body;

an elongated hollow membrane formed of a gas permeable material and capable of being twisted to a collapsed condition, said membrane being closed at one end and open at the other end, the closed end being secured to said one end portion of said wire, said wire supporting said hollow membrane during insertion into a patient's body, said membrane being fully inserted within the patient's body during oxygenation; and

tubular means having one end portion connected to the open end of said hollow membrane, and other end portion connectible to an oxygen supply when the hollow membrane is disposed within the patient's body whereby oxygen may be introduced into said membrane through said tubular means, a portion of said wire support passing through said tubular means.

4,631,054

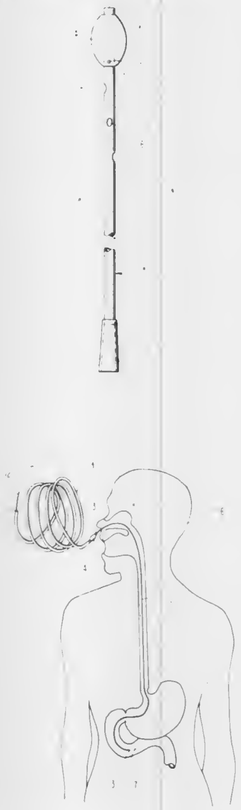
APPARATUS AND PROCESS FOR NASO-INTESTINAL INTUBATION

Il G. Kim, N. Main St., Hughesville, Pa. 17737

Filed Nov. 16, 1984, Ser. No. 672,361

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—54 **10 Claims**



1. An edoscopic guided naso-intestinal tube in combination with a guide wire comprising

a. a tubular member having two ends and

b. a diameter accommodatingly larger than said guide wire;

b. a mercury bas circumferentially mounted adjacent to the first end of said tubular member;

c. means for connecting the tubular member to other instruments, said means mounted on the second end of the tubular member;

d. a series of drainage ports defined in the wall of said tubular member to provide communication between the inside and outside of said tubular member located along the length of said tubular member; and

e. means for injecting mercury into said mercury bag.

6. A method for intubation of the duodenum of a human patient comprising

a. anesthetism of the patient's throat and nostrils;

b. intubation through the oral cavity of a flexible gastro duodenoscope, comprising a biopsy port, Into the second portion of the duodenum;

c. introduction of a flexible guide wire of at least about twelve (12) feet in length through said biopsy port into the second portion of the duodenum to a given position;

d. removal of said duodenoscope;

e. marking of the wire position on said wire;

f. insertion of a lubricated tube through the nostril into the oral cavity;

g. withdrawal of one end of said tube through the mouth;

h. sliding the guide wire through said tube until it exits the nasal cavity end;

i. removal of said tube;

j. introduction of a naso-intestinal tube over said guide wire in a sliding fashion until the desired level is reached wherein said naso-intestinal tube comprises

(1) a tubular member having two ends and a diameter accommodatingly larger than a guide wire

(2) a mercury bag circumferentially mounted adjacent to the first end of said tubular member

(3) means for connecting the tubular member to other instruments said means mounted on the second end of the tubular member

(4) a series of drainage ports defined in the wall of said tubular member to provide communication between the inside and outside of said tubular member located along the length of said tubular member; and

k. removal of the guide wire thereby completing the intubation.

4,631,055

APPARATUS FOR APPLYING A TISSUE ADHESIVE

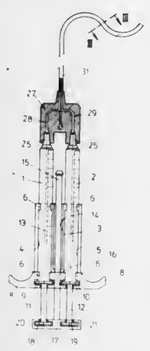
Heinz Redl, and Georg Habison, both of Vienna, Austria, assignors to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte, Vienna, Austria

Filed Feb. 26, 1985, Ser. No. 705,725

Claims priority, application Austria, Mar. 29, 1984, 1063/84

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—82 **2 Claims**



1. In an apparatus for applying a tissue adhesive based on human or animal proteins to be used for seamlessly or seam-supportingly connecting human or animal tissue or organ parts, for sealing wounds, stopping bleedings and the like, said tissue adhesive being formed in situ by bringing together at least two components comprised of solutions of said proteins and blood clot-promoting coagulation factors, said apparatus comprising a plurality of disposable syringe bodies made of synthetic material and adapted to contain said components, said bodies including coni through which the components are to be expelled, a connecting head attachable to said coni, and separate component-conveying channels disposed in said connecting head for conducting said components to be applied, the improvement wherein a gas-conveying channel is provided in said connecting head for conducting a medicinal gas, said gas-conveying channel extending to a front side of said connecting head to discharge gas in a direction parallel to the discharge of said components from said component-conveying channels and closely adjacent thereto, a multi-lumen catheter formed of one-piece integral construction with said connecting head and including a plurality of component-conveying lumina communicating with respective ones of said component conveying channels, and a gas-conveying lumen communicating with said gas-conveying channel, whereby said syringes can be removed from said connecting head and integral catheter for replacement.

4,631,056

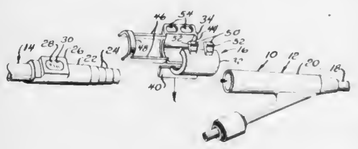
TAMPER DISCOURAGING SYSTEM

John F. Dye, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 12, 1984, Ser. No. 630,174

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—111 **8 Claims**



1. A tamper discouraging system, comprising:

a catheter having an elongated shaft and a hollow connector at a proximal end of the shaft;

a drainage tube having an adapter at an upstream end of the drainage tube, with said adapter being received in the connector;

a first semi-annular shell for placement over the connector;

a second semi-annular shell for placement over the connector;

hinge means connecting one end of the first shell to one end of the second shell: and

means for locking the other end of the first shell to the other end of the second shell, wherein the hinge means comprises a spaced pair of lines of weakness adjacent the one end of the first and second shells, and including an outwardly directed tab intermediate the lines of weakness to rupture the hinge means.

4,631,057

SHIELDED NEEDLE

Charles B. Mitchell, Greenville, S.C., assignor to Dolores A. Smith; Norma A. Sampson and Earl W. Sampson, all of Fullerton, Calif., a part interest to each

Filed Dec. 17, 1985, Ser. No. 809,277

Int. Cl.⁴ A61M *5/32*

U.S. Cl. 604—198 **9 Claims**

1. An apparatus for injecting a substance into a human or animal comprising:

a body adapted to contain the substance to be injected;

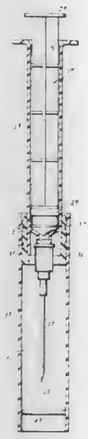
means for mounting a hypodermic needle on the body with the needle having a passage extending therethrough and terminating in a point whereby the substance can pass from the body to and through the passage of the needle;

a collar carried by said body;

a needle guard;

the needle guard being mounted on the body for movement

relative to said body and over said collar from a retracted position in which the needle guard does not materially obstruct access to the point of the needle and an extended position in which the needle guard obstructs access to the point of the needle, said extended and retracted positions being axially spaced;



means for releasably retaining the needle guard in the retracted position; and

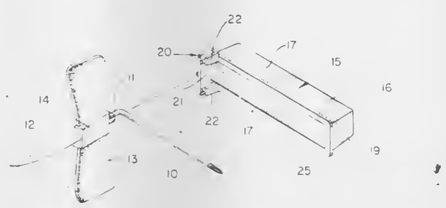
interlocking means on the needle guard and the collar responsive to movement of the needle guard to the extended position to lock the needle guard in the extended position.

4,631,058

GUARD FOR RIGHT ANGLE WINGED INFUSION NEEDLE

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical, Inc., Bethlehem, Pa.

Filed Jun. 24, 1985, Ser. No. 747,569
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—263 **5 Claims**



5. A guard for a right angle winged infusion needle comprising

an elongated approximately rectangular body which is open along one side and including opposite side longitudinal walls, a back longitudinal wall and a pair of end walls,

a marginal flange on said body adjacent to its open side and being contiguous with said longitudinal side walls and one end wall and projecting outwardly of such walls approximately perpendicular thereto, and

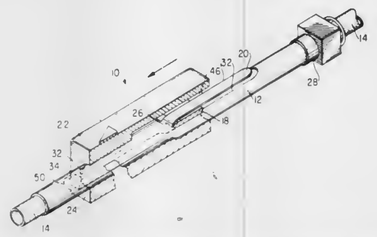
a clip attachment on said body substantially at one end thereof and extending outwardly from the open side of the body and away from said back wall, the clip attachment including a clip wall which is contiguous with one end wall of the body and forms substantially a continuation thereof, the clip wall projecting somewhat laterally outwardly of the longitudinal side walls of the body and being joined with said marginal flange and having spaced gripping elements formed on one face thereof, and the clip attachment further including a pair of spaced fingers united with said flange and being in spaced opposing substantially parallel relationship to the clip wall and also being in spaced opposing relationship to the gripping elements and being substantially coextensive lengthwise with the clip wall away from said flange and away from the open side of said body.

4,631,059

SHEATH REMOVER

Sidney Wolvek, Brooklyn, N.Y.; Walter Kaiser, Ramsey, and Kenneth Kaltenbach, Leonia, both of N.J., assignors to Datascope Corp., Oakland, N.J.

Filed Mar. 26, 1985, Ser. No. 716,259
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **34 Claims**



1. Apparatus for removing a hollow, elongated, deformable introducer sheath from a position enclosing at least a portion of a catheter which has been inserted through the sheath with a close tolerance and introduced into a human body thereby, said apparatus comprising

cutting means,

guiding means carrying said cutting means for moving over said sheath along a selected portion of the length thereof, deforming means on said guiding means engaging the outside of said sheath for exerting pressure thereon in such a manner as to deform a part thereof away from said catheter at a point immediately adjacent to said cutting means and into contact with said cutting means to permit said cutting means to cut through said deformed part of said sheath while maintaining said catheter beyond the reach of said cutting means,

whereby said cutting means cuts said sheath in a lengthwise direction as the guiding means moves therealong for removal from said catheter while said catheter remains in place.

4,631,060

VAGINAL SPERMICIDE DISTRIBUTING MEMBRANE

Virgil A. Place, Half Moon Bay, Calif., assignor to Pavex, Inc., San Juan Capistrano, Calif.

Continuation of Ser. No. 754,228, Jul. 12, 1985, abandoned, which is a division of Ser. No. 527,850, Aug. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 441,154, Nov. 12, 1982, abandoned. This application Jan. 10, 1986, Ser. No. 817,577
Int. Cl.[4] A61F *5/46*
U.S. Cl. 604—285 **20 Claims**

1. A process for making a vaginal spermicide distributing contraceptive device providing a physical barrier to the access of sperm to the cervical os and a support for the placement of spermicide when in use, comprising the step of molding a single piece of thermoplastic material into a generally planar flexible membrane having an integral thicker margin at the periphery thereof and at least one integral thicker rings disposed within said thicker margin, said peripheral margin and said ring having sufficient resistance to deformation to provide

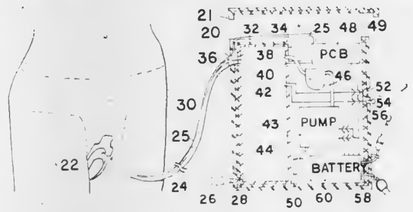
said membrane with a tendency to resume its planar configuration after being flexed.

4,631,061

AUTOMATIC URINE DETECTING, COLLECTING AND STORING DEVICE

Frank D. Martin, P.O. Box 72, Kerrville, Tex. 78028

Filed Jun. 19, 1984, Ser. No. 622,117
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—318 **17 Claims**



1. An automatic in-place urine detecting, collecting and storing device for urinary incontinent users to maintain relative dryness adjacent to a user's body, wherein the device comprises;

an elongated collection vessel approximately conforming to the user's urinary-genital area wherein the collection vessel comprises:

an interior collection surface lining the collection vessel;

a top edge which faces the user's body such that the interior collection surface surrounds the urinary-genital area upon putting the device on;

an interior perimeter of the interior collection surface adjacent to the top edge immediately adjacent to the user's body;

a resilient elevated lip which surrounds the top edge;

a flexible tube leading from the collection vessel to a separate temporary storage tank having a level sensing means and a rapid release valve to empty the tank;

a vacuum pump means for drawing the urine from the collection vessel through the flexible tube into the storage tank, wherein a one-way valve is positioned between the tube and the tank to prevent liquid flow from the tank into the tube, and wherein the vacuum draws the lip of the collection vessel into liquid tight contact with the body of the user;

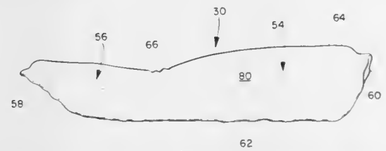
a multiplicity of droplet-sensitive liquid sensing means randomly located within the collection vessel which cover the interior collection surface of the collection vessel and cover the interior perimeter of the collection surface and can detect droplets of liquid when the device is in any spatial orientation which might cause urine to contact the body, wherein upon detecting liquid urine within the collection vessel, the liquid sensing means activates the vacuum pump to create a vacuum in the storage tank drawing the urine from the collection vessel to the storage tank until the sensor no longer detects liquid in the collection vessel leaving the collection vessel relatively dry.

4,631,062

LABIAL SANITARY PAD

Frederich O. Lassen, Winnebago County; Robert J. Peerenboom, and Cheri L. Schultz, both of Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 654,927, Sep. 27, 1984, abandoned, and a continuation-in-part of Ser. No. 612,506, May 21, 1984, abandoned. This application Mar. 1, 1985, Ser. No. 707,338
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **32 Claims**



1. An anatomically, generally self-conforming sanitary napkin configured for partial labial disposition within the vestibule of a wearer and for at least partially occluding said vestibule respecting fluid flow therefrom, said napkin comprising a fluid absorbent body having a posterior region including a raised profile for projection within said vestibule intermediate the labia majora inwardly bounding same from a position posteriorly remote from the clitoris and extending to the rearwardmost aspect of said vestibule, and an anterior region merging with said posterior region for a generally external disposition about the vulvar region over said labia majora and spaced from said clitoris.

4,631,063

PROCESS FOR FINISH DRESSING MINERALLY DRESSED LEATHERS OR THOSE DRESSED BY A COMBINED METHOD, USING POLYMER DRESSINGS

Dolf Stockhausen; Rudolf Nowak; Miroslav Chmelir; Manfred Kaussen, all of Krefeld, and Kurt Dahmen, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,661

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413301

Int. Cl.[4] C14C *5/00*

U.S. Cl. 8—94.21 9 Claims

1. A process for treating leathers which were previously treated by a mineral or combined method comprising contacting the leathers with an aqueous solution of a water soluble polymer derived from at least one monomer selected from the group consisting of an ethylenically unsaturated acrylic sulfonic acid, esters thereof, and an ethylenically unsaturated substituent containing aromatic sulfonic acid, salts thereof or mixtures thereof.

4,631,064

DEPILATORY COMPOSITIONS

Prem S. Juneja, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1982, Ser. No. 383,432

Int. Cl.[4] A61K *7/155;* C14C *1/06*

U.S. Cl. 8—161 13 Claims

1. An aqueous depilatory composition comprising:

(a) from about 0.1M to about 2.0M of an active thiol agent; and

(b) from about 0.01M to about 2.0M of biguanide or its salts; wherein said composition has a pH of from about 10.5 to about 12.5 at 25° C.

4,631,065

REACTIVE DYES, PROCESS FOR THEIR PREPARATION AND USE THEREOF

Karl Seitz, Oberwil; Peter Scheibli, Bottmingen, and Herbert Seiler, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 618,153, Jun. 7, 1984, abandoned. This application Aug. 20, 1985, Ser. No. 767,246

Claims priority, application Switzerland, Jun. 17, 1983, 3329/83

Int. Cl.[4] C09B *62/02;* D06P *3/66*

U.S. Cl. 8—549 13 Claims

1. A reactive dye of the formula



wherein D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone, or perylenetetracarbimide dye; each of R_1 and R_2 independently is hydrogen or an unsubstituted or substituted C_1-C_4-alkyl radical; X_1 is an amino-fluoro-s-triazine radical in which the amino radical is $—NH_2$, alkylamino, N,N-dialkylamino, cycloalkylamino, N,N-dicycloalkylamino, aralkylamino, arylamio, N-alkyl-N-cyclohexylamino, N-alkyl-N-arylamino, an amino group which contains a heterocyclic radical which may contain further fused carbocyclic rings, or an amino group in which the amino nitrogen atom is a member of an N-heterocyclic ring which may contain further hetero atoms, the alkyl, cycloalkyl, aralkyl or aryl radicals, the heterocyclic radicals or the N-heterocyclic rings being unsubstituted or further substituted by halogen, nitro, cyano, trifluoromethyl, sulfamoyl, carbamoyl, C_1-C_4-alkyl, C_1-C_4-alkoxy, acylamino, ureido, hydroxy, carboxy, sulfomethyl or sulfo; and X_2 is a halotriazine or halospramidine or halopyradazine radical which is attached directly to the radical D through the $—N(R_2)$ bridge member, with the proviso that X_2 is not an unsubstituted or substituted aminofluoro-s-triazine radical.

4,631,066

METHOD FOR IMPROVING LIGHT-RESISTANCE OF AROMATIC POLYAMIDE FIBERS

Norihiro Minemura; Fumiki Takabayashi, both of Takatsuki, and Setsuo Yamada, Ibaraki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 18, 1984, Ser. No. 632,205

Claims priority, application Japan, Jul. 26, 1983, 58-135202; Mar. 30, 1984, 59-61122

Int. Cl.[4] D06M *13/28, 13/34*

U.S. Cl. 8—115.56 10 Claims

1. A method for improving the light-resistance of aromatic polyamide fibers, which comprises the steps of heat-treating aromatic polyamide fibers while in contact with a mixture of urea and thiourea in the range 80:20 to 20:80.

4,631,067

DISCHARGE PRINT PASTE AND METHOD OF USING SAME FOR THE DISCHARGE PRINTING OF SYNTHETIC TEXTILE MATERIALS

Samir Hussamy, Lynchberg, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 8, 1985, Ser. No. 720,736

Int. Cl.[4] D06P *5/15*

U.S. Cl. 8—464 16 Claims

1. An aqueous discharge print paste consisting essentially of:

a thickening agent;

lithium hydroxide;

an organic acid selected from the group consisting of ethanedioic acid, hydroxyacetic acid, propionic acid, butanedioic acid, butenedioic acid and mixtures thereof, said organic acid being present in an amount of from about 5 to about 10 parts by weight of the print paste;

a polyethylene glycol compound having a molecular weight between 400–800, said polyethylene glycol compound being present in an amount between about 5 to about 10 parts by weight of the print paste;

at least one polyoxyethylene sorbitan fatty acid ester wherein the residue of the fatty acid moiety thereof is derived from lauric acid, plamitic acid, stearic acid, or oleic acid, said at least one polyoxyethylene sorbitan fatty acid ester being present in amount between about 5 to about 10 parts by weight of the print paste; and

a polyalkylene glycol ether in an amount between about 3 to about 10 parts by weight of the print paste.

4,631,068

REMOVAL OF SULFUR FROM AQUEOUS SUSPENSION USING FILTRATION

Roy A. Baker; Rocky C. Costello, both of Houston, Tex., and Michael J. Engel, White Plains, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

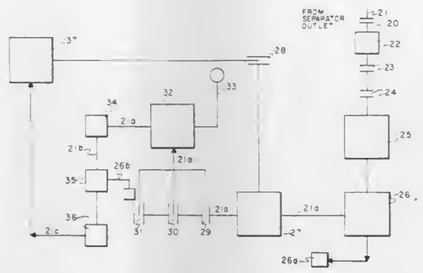
Filed Jul. 18, 1985, Ser. No. 756,156

Int. Cl.[4] C01B *17/027*

U.S. Cl. 23—293 S 12 Claims

1. A process for initiating the coalescence of sulfur from an

aqueous sulfur-containing suspension above the melting point of sulfur which comprises passing said sulfur-containing aqueous suspension through at least one filter means comprised of a multi-passage filter material to initiate the coalescence.



4,631,069

ANTI-WEAR ADDITIVES FOR ALCOHOL FUELS

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 20, 1985, Ser. No. 746,816
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—56 **16 Claims**

1. A fuel composition for an internal combustion engine comprising:

(a) a major portion of a fuel containing (i) a C_1–C_2 alcohol and (ii) 0–50 volumes of gasoline per volume of alcohol; and

(b) from about 0.003 to about 10.0 (w)% of, as a wear-inhibiting additive, a condensate product of the process comprising:

(i) reacting a dibasic acid anhydride with a polyoxyisopropylenediamine

$$NH_2-CH(CH_3)-CH_2-(OCH_2CH(CH_3))_x-NH_2$$

where x is a numeral of about 2 to about 68 at 75° to 150° C. for 2 to 4 hours, thereby forming a maleamic acid;

(ii) reacting said maleamic acid with an N-alkyl-alkylene diamine at about 60° to 100° C. for about 0.1 to 10.0 hours, thereby forming a condensate product; and

(iii) recovering said condensate product.

4,631,070

GLYCIDOL MODIFIED SUCCINIMIDES AND FUEL COMPOSITIONS CONTAINING THE SAME

Frank Plavac, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 673,962, Nov. 21, 1984. This application Jun. 3, 1986, Ser. No. 870,066
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—63 **19 Claims**

1. A fuel composition comprising a hydrocarbon boiling in the gasoline range and from 10 to 10,000 parts per million of a product produced by the process which comprises contacting at a temperature sufficient to cause reaction an alkenyl or alkyl succinimide containing at least one primary or secondary amine with glycidol wherein the charge mole ratio ranges from greater than 1 and up to 10 of glycidol to each of the basic nitrogens of the alkenyl or alkyl succinimide.

4,631,071

COLD FLOW IMPROVING FUEL ADDITIVE COMPOUND AND FUEL COMPOSITION CONTAINING SAME

Joan C. Axelrod, Media, Pa., and Sheldon Chibnik, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,115
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—71 **32 Claims**

1. A product of reaction useful for improving the low temperature characteristics of hydrocarbyl distillate fuels produced from the reaction of (1) a branched chain monocarboxylic acid ester having at least one tertiary amine group and at least one branched chain acid ester group, (2) an epoxide having from 2 to about 18 carbon atoms and (3) additional carboxylic acid selected from branched chain monocarboxylic acids and linear monocarboxylic acids and wherein said reactants are reacted in substantially stoichiometric or equimolar amounts at temperatures ranging from about 50° to about 175° C. under autogenous pressure in 0.5 to about 3 hours or more.

4,631,072

MIXTURE FOR THE CARE AND CLEANING OF CONTACT LENSES

Anton Koller, Operngasse 23, 1040 Wien, Austria

Filed Dec. 9, 1985, Ser. No. 806,975
Claims priority, application Austria, Dec. 10, 1984, 3910/84
Int. Cl.[4] B24D *3/06;* C09C *1/04*
U.S. Cl. 51—309 **8 Claims**

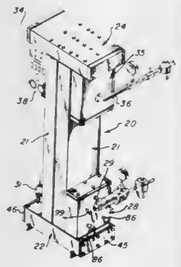
1. Mixture for the care and cleaning of contact lenses, containing water, an abrasive which is at least one metal oxide having a grain size smaller than 10 μm, and a suspension aid, the ratio of abrasive to water in the mixture ranging between 1:99 and 90:10, the abrasive being at least one member selected from the group consisting of zinc oxide and tin oxide.

4,631,073

METHOD AND APPARATUS FOR THEADSORPTIVE FRACTIONATION OF GASES

Robert A. Null; Lonnie C. Laughlin, both of Littleton, and Michael L. Goldberg, Breckenridge, all of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Continuation of Ser. No. 590,348, Mar. 16, 1984, abandoned, which is a continuation of Ser. No. 590,013, Mar. 15, 1984, Pat. No. 4,559,065. This application Jul. 5, 1985, Ser. No. 752,098
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—18 **25 Claims**



1. A method of controlling gas flow for the adsorptive fractionation of gases in a twin tower gas fractionation apparatus including a generally elongated prism shaped tower of heat conductive material integrally defining first and second parallel tower bores extending axially longitudinally through said tower, said first and second tower bores containing first and second sorbent beds respectively, an input manifold sealingly secured to said tower at one end thereof, an output manifold sealingly secured to said tower at the other end thereof, the tower bores extending between the input and output manifolds,

each of said manifolds being formed as an elongated prism, means in each said manifold defining first and second parallel manifold bores extending therein, means in each manifold for communicating the first and second manifold bores with the corresponding first and second tower bores respectively, said inlet manifold including in communication with each manifold bore an inlet gas port for receiving a gaseous mixture to be fractionated and an outlet port for discharging purge gas to regenerate or purge the sorbent bed in the corresponding tower bore, and said outlet manifold including in communication with each manifold bore an outlet gas port for discharging fractionated gas and a restricted orifice opening extending between said first and second outlet manifold bores for introducing purge gas from said stream of fractionated gas in one outlet manifold bore to the other outlet manifold bore, an inlet gas control assembly comprising an inlet housing mounted on said inlet manifold in operative alignment with said inlet gas ports, a shuttle valve in said inlet housing including first and second shuttle valve members operatively positioned for selectively opening and closing said first and second inlet gas ports respectively in response to a relative predetermined pressure differential in the first and second inlet manifold bores, an outlet gas control assembly including an outlet housing mounted on said outlet manifold in operative alignment with said outlet gas ports, a check valve operatively positioned in said outlet housing for controlling the fractionated gas flow from the associated outlet gas port in relation to the pressure at the outlet gas port, and first and second pilot controlled purge valves operatively mounted on said inlet manifold in communication with the outlet port of said first and second inlet manifold bores respectively; said method comprising the steps of directing a flow of the pressurized gaseous mixture to be fractionated containing a component to be adsorbed from a source thereof to said shuttle valve, withdrawing a major flow of pressurized gas lower in said adsorbable component from one outlet gas port of said outlet housing while conducting a minor flow of said gas lower in said adsorbable component at a predetermined lower pressure as a purge gas through the restricted orifice opening from the one bore to the other bore of said outlet manifold, the pressure of the major flow of pressurized gas in the one bore of the outlet manifold corresponding to the sorbent bed receiving the flow of pressurized gaseous mixture being sufficient to open the check valve operatively associated with the one outlet gas port of the one bore, the predetermined lower pressure of the minor flow of gas conducted by the restricted orifice opening to the other bore of the outlet manifold being insufficient to open the check valve operatively associated with the outlet gas port of the other bore, opening the first one of said purge valves for exhausting purge gas from the corresponding first of said sorbent beds, the opening of said first purge valve effecting a pressure reduction in said first corresponding sorbent bed and in the first manifold bore associated therewith, said pressure reduction causing said shuttle valve to shift to close the corresponding inlet port to said first inlet manifold bore and simultaneously open the inlet port to the second inlet manifold bore to direct the flow of pressurized gaseous mixture to the second sorbent bed wherein said adsorbable gas component is at least partially removed from the gaseous mixture, closing said first purge valve after a first purge time sufficient to purge said first one of said sorbent beds of the adsorbed gas component, flowing pressurized gas through said second one of said sorbent beds for a first adsorbing time period at least equal to said first purge time but not exceeding the time period in which said second sorbent bed would become saturated with said adsorbable gas component, and at the end of said first adsorbing time period opening the second one of said purge valves to exhaust purge gas from said second sorbent bed and simultaneously effect a pressure reduction in the second inlet manifold bore and in the corresponding second sorbent bed, the pressure reduction causing said shuttle valve to shift to close said second corresponding inlet gas port and open the first inlet gas port corresponding to said first inlet manifold and first sorbent bed to direct the pressurized gaseous mixture thereto wherein said adsorbable gas component is at least partially removed from the gaseous mixture, and continuously repeating said steps to alternately shift said sorbent beds from adsorption to purge by directly controlling the opening and closing of substantially only the first and second purge valves, thereby to provide for the continuous adsorption of said adsorbable gas component from said pressurized gas.

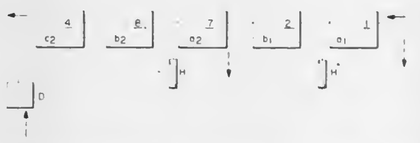
8. In an apparatus for adsorptive fractionation of a gaseous mixture, including at least a pair of sorbent beds, means for directing a flow of the gaseous mixture from a source thereof to one of the beds for removing a gaseous component of said mixture while simultaneously directing a flow of purge gas through the other of said beds for stripping the adsorbed gas component thereform, and means for controlling the flow of said gases to and from said beds, the improvement comprising, a generally elongated prism shaped tower of heat conductive material, and means integrally in said tower prism defining a pair of parallel tower bores extending axially longitudinally through said tower, and said tower bores being adapted each to contain a sorbent bed, an input manifold sealingly secured to said tower at one end thereof, an output manifold sealingly secured to said tower at the other end thereof, the tower bores extending between the input and output manifolds, esch of said manifolds being formed as a one-piece elongated prism, means integrally in each said manifold defining a pair of parallel longitudinally extending manifold bores, means in each manifold defining a communication port for communicating each manifold bore with a different one of said tower bores, said inlet manifold including inlet gas ports for receiving a gaseous mixture to be fractionated and outlet ports for discharging purge gas, said outlet manifold including outlet gas ports for discharging fractionated gas, and said tower prism and said inlet and outlet manifolds having essentially the same cross-sectional configuration taken transverse to the bores therethrough.

4,631,074

METHOD AND APPARATUS FOR REDUCING THE TEMPERATURE OF AIR

Axel Eschner, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,474
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149672
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—27 **6 Claims**



1. A method of reducing the temperature of humid environmental air, said method comprising:

providing in series connection a first moisture storage agent, a first heat storage agent, a second moisture storage agent and a second heat storage agent;

passing said air serially through said agents and thereby:

passing said air through said first moisture storage agent and therein substantially reducing the moisture content of said air;

passing said air through said first heat storage agent and therein lowering the temperature of said air without changing the humidity thereof;

passing said air through said second moisture storage agent and therein substantially freeing said air of the remaining moisture content thereof; and

passing said air through said second heat storage agent and therein further lowering the temperature of said air without changing the humidity thereof; and

then passing said air through a water saturated moisture

storage agent and therein increasing the moisture content of said air and further lowering the temperature thereof.

4. An apparatus for reducing the temperature of humid environmental air and for use with a blower and piping system for conveying the air, said apparatus comprising:

a first moisture storage agent for receiving humid environmental air and for substantially reducing the moisture content thereof;

a first heat storage agent for receiving said air from said first moisture storage agent and for lowering the temperature of said air without changing the humidity thereof;

a second moisture storage agent for receiving said air from said first heat storage agent and for substantially freeing said air of the remaining mosisture content thereof;

a second heat storage agent for receiving said air from said second moisture storage agent and for further lowering the temperature of said air without changing the humidity thereof; and

a water saturated moisture storage agent for receiving said air from said second heat storage agent and for increasing the moisture content of said air and further lowering the temperature thereof.

4,631,075

COMPOSITE MEMBRANE FOR GAS SEPARATION

Masaaki Yamabe, Machida; Shigeyoshi Kobayashi, Kawasaki; Noriyuki Yoshihara, Yokohama, and Masaru Nakamura, Setagaya, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,334

Claims priority, application Japan, Apr. 26, 1983, 58-72210

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—158 **9 Claims**

1. A composite membrane for gas separation having a three-layered structure comprising:

(A) a porous polymer supporting membrane layer having a cross-sectional oxygen permeation flux of at least 5 $m^3/m^2.hr.atm$ (STP) and having a porous structure such that the average pore diameter at one surface is from 5 to 500 Å and the average pore diameter at the other surface is greater than that at said one surface;

(B) a polyorganosiloxane layer having a thickness of from 300 Å to 5 μm; and

(C) a thin layer having a thickness of from 100 to 5000 Å and made of a polymer containing monomer units of at least one monomer selected from the group consisting of fluoroolefin monomers and pivalate

$$(-OCC(CH_3)_3)$$
$$\parallel$$
$$O$$

group-containing monomers, being soluble in an organic solvent and having an O_2/N_2 permeability coefficient ratio of at least 3.5;

said layer B contacting said one surface with the smaller pore diameter of the layer A, said layer C contacting the surface of the layer B, and the composite membrane having an oxygen permeation flux of at least 0.1 $m^3/m^2.hr.atm$ (STP) and a O_2/N_2 permeation flux ratio of at least 2.5.

4,631,076

APPARATUS FOR REMOVING CARBON PARTICLES FROM EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

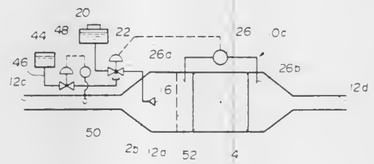
Mitsuo Kurihara, Machida; Fumio Sato, Kawasaki; Yoshiyuki Iwasawa, Tokyo; Nobutaka Koibuchi, Koganei, and Hiroshi Harada, Matsudo, all of Japan, assignors to Tokyo Roki Co., Ltd. and Shimizu Construction Co., Ltd., both of, Japan

Filed Nov. 27, 1984, Ser. No. 675,132

Claims priority, application Japan, Nov. 30, 1983, 58-225559

Int. Cl.⁴ B01D *46/00*

U.S. Cl. 55—283 **1 Claim**



1. Apparatus for removing particulate emissions from exhaust gas from an internal combustion engine which apparatus comprises:

(a) filter mounted on an exhaust pipe of the engine, said filter comprising a body defining a filter chamber and a filter element mounted within said filter chamber for collecting carbon particles constituting the particulate emissions;

(b) means for dispersing a solution of catalyst to the exhaust gas in said filter chamber at a position upstream of said filter element to cause the oxidation of the carbon particles collected in said filter element to remove them therefrom, said dispersing means including a source of supply of said catalyst solution, means connected to said supply source for controlling the flow of said catalyst solution, means for detecting the amount of the carbon particles collected in said filter element to feed a first detection signal when said amount of the carbon particles reaches a predetermined level, means for detecting the temperature of the exhaust gas in said filter chamber to feed a second detection signal until said temperature of the exhaust gas reaches a predetermined level;

(c) means for supplying an auxiliary fuel to the exhaust gas in said filter chamber at a position upstream of said filter element, said auxiliary fuel supply means being operable in response to said second detection signal for supplying said auxiliary fuel to said flow control means, and said flow control means being operable in response to said first detection signal for feeding a mixture of the catalyst solution and the auxiliary fuel to said filter chamber; and

(d) ignition means mounted within said filter chamber adjacent to and upstream of said filter element for igniting said auxiliary fuel fed to said filter chamber to increase the temperature of the exhaust gas.

4,631,077

FOAM PLASTIC AIR FILTER

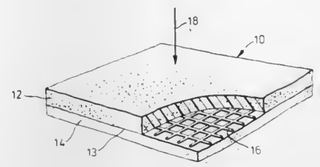
Barry Spicer, Northants, and Joseph T. Wills, Northampton, both of England, assignors to PipercrossLimited, Lutterworth, England

Filed Mar. 26, 1985, Ser. No. 716,087

Int. Cl.⁴ B01D *25/04*

U.S. Cl. 55—487 **1 Claim**

1. An air filter comprising a first layer of reticulated foam plastic material having a thickness of between 10 mm and 20 mm and a porosity of 45±4 pores to the linear inch, a second layer of reticulated foam plastic material having a thickness of between 6 mm and 10 mm and a porosity of 65±2 pores to the linear inch, and at the interface between said first and second layers on open mesh substrate approximately one millimeter in thickness constricting a maximum of about ten percent of each of the first and second layers, the filter being impregnated with



a flame proof retention and plasticiser additive, the first and second layers being bonded together at the interface.

4,631,078

COATING OPTICAL FIBRES

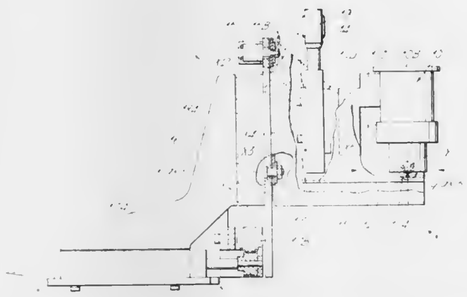
Paul G. Tomlinson, Sawbridgeworth, and Richard T. Newbould, Harlow, both of United Kingdom, assignors to STC plc, London, England

Filed Oct. 2, 1985, Ser. No. 782,930

Claims priority, application United Kingdom, Oct. 10, 1984, 8425610

Int. Cl.⁴ C03B *37/027;* **C03C** *25/02*

U.S. Cl. 65—3.11 **5 Claims**



1. A method of coating an optical fibre comprising drawing the fibre through a coating applicator having an entrance orifice and an exit orifice substantially concentric about the fibre, monitoring the concentricity of the coating on the fibre, and tilting the applicator about a pivot point at or close to the lower exit orifice to adjust and thereby maintain the desired concentricity of the coating on the fibre.

4,631,079

METHOD FOR STRETCHING A GLASS ROD

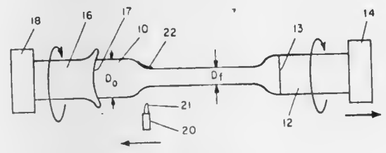
Harold R. Clark, Plainfield Township, Union County, and David A. Nicol, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 654,600, Sep. 26, 1984, Pat. No. 4,578,101.

This application Nov. 25, 1985, Ser. No. 801,431

Int. Cl.⁴ C03B *23/04*

U.S. Cl. 65—109 **5 Claims**



1. A method for stretching a glass rod which affords increased control over fluctuations in the diameter thereof comprising the steps of:

(a) heating a portion of the rod to a first temperature which is high enough for reflow thereof;

(b) necking down the portion of the rod to approximately the desired final diameter by stretching the rod;

(c) cooling the rod;

(d) progressively reheating the necked down portion of the rod at a lower temperature which is high enough to reflow that portion thereof which had been necked down, but not high enough to reflow the portion of the rod not yet necked down; and

(e) stretching the rod during said progressive reheating to draw out the portion of the rod previously necked down, to the desired final diameter and to provide a new necked down portion from the part of the rod not yet reduced in diameter.

4,631,080

METHOD AND APPARATUS FOR THE HEAT PROCESSING OF GLASS AND GLASS FORMING MATERIAL

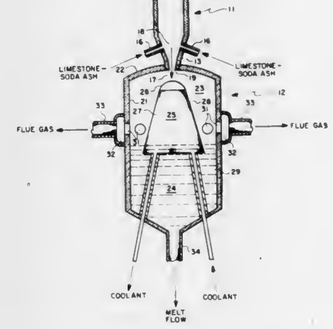
Leonard F. Westra, Reading; Jaime A. Woodroffe, Andover, and David B. Stickler, Carlisle, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 4, 1985, Ser. No. 784,188

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.⁴ C03B *3/00*

U.S. Cl. 65—134 **28 Claims**



1. Apparatus for producing a glass product by heat processing glass batch material comprising:

(a) a heating chamber;

(b) means for generating a first hot gas stream having a peak temperature substantially greater than the melting temperature of the glass product;

(c) means for entraining glass batch material in said first hot gas stream;

(d) a separation chamber having an upper separation portion and a lower molten glass collection portion;

(e) nozzle means having an outlet for receiving and exhausting from said heating chamber said first hot gas stream and entrained glass batch material as a directed exhaust stream into said reaction chamber upper portion, said exhaust stream having at said outlet in a plane normal to its direction of flow a first dimension normal to and not greater than a second dimension;

(f) impact surface means within said reaction chamber for receiving said exhaust stream and entrained glass batch material from said nozzle means whereby said entrained glass batch material impacts on said inpact surface means,

said impact surface means being spaced a distance from the outlet of said nozzle means to provide at least substantial separation of entrained glass batch material from: said exhaust stream but not substantially greater than about three times said first dimension;

(g) means for controlling the temperature of said products of combustion, batch material composition and particle size distribution, and the period said glass batch material is entrained in said products of combustion and said exhaust stream to cause at least a portion of said glass batch material to substantially reach a fluid condition prior to the time it impacts on said impact surface means; and

(h) means for receiving glass batch material from said impact surface means and directing said received glass batch material to said separation chamber lower portion.

18. In the method of producing a glass product by heat processing glass batch material, the steps comprising:

(a) generating in a heating chamber a first hot gas stream having a peak temperature substantially greater than the melting temperature of the glass product;

(b) entraining glass batch material in said first hot gas stream;

(c) exhausting said first hot gas stream and entrained glass batch material from said heating chamber into a separation chamber through a nozzle as a directed exhaust stream, said exhaust gas stream at the outlet of said nozzle having in a plane normal to its direction of flow a first dimension normal to and not greater than a second dimension;

(d) causing said exhaust gas stream and entrained glass batch material exiting from said nozzle to impact on an impact surface spaced a distance from the outlet of said nozzle to provide at least substantial separation of entrained glass batch material from said exhaust stream but not greater than about three times said first dimension, at least a substantial portion of said entrained glass batch material being caused to impact and be deposited on said impact surface in at least partial liquid form; and

(e) causing said impacted glass batch material to flow from said impact surface to a collection region.

4,631,081

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir; Richard J. Conway, and Peter G. Tucker, both of Essendon, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

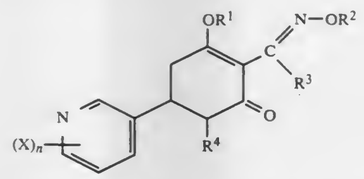
Filed Sep. 27, 1983, Ser. No. 536,392

Claims priority, application Australia, Sep. 29, 1982, PF6111; May 20, 1983, PF9456

Int. Cl.⁴ A01N *43/40*

U.S. Cl. 71—94 **6 Claims**

1. A compound of formula III



wherein:

X are independently selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_6 alkoxy C_1 to C_6 alkylthio, halogen and C_1 to C_6 haloalkyl;

R^1 is selected from the group consisting of hydrogen, C_2 to C_6 alkanoyl, benzoyl, the alkali metals, the transition metals, the ammonium ion and the tri- and tetra-(alkyl)ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;

R^2 is selected from the group consisting of: C_1 to C_3 alkyl, C_1 to C_3 haloalkyl, allyl, haloallyl, and propargyl;

R^3 is selected from C_1 to C_3 alkyl;

R^3 is selected from hydrogen and (C_1 to C_6 alkoxy)carbonyl;

k is zero; and

n is selected from the integers 3 and 4.

4,631,082

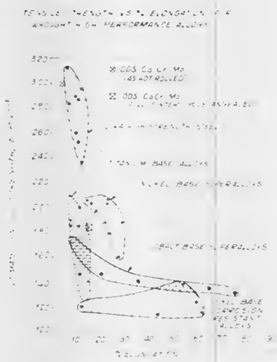
COBALT-CHROMIUM SUPERALLOY

Henry L. Andrews, Old Saybrook, and Gregory E. Gardiner, Branford, both of Conn., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Feb. 20, 1985, Ser. No. 703,352

Int. Cl.⁴ C22C *29/12*

U.S. Cl. 75—235 **5 Claims**



1. A high strength, corrosion-resistant, high temperature stable, consolidated, biocompatible, composite alloy produced by mechanical alloying and consisting essentially of the following percentage composition by weight:

chromium	26 to 30
molybdenum	5 to 7
manganese	0 to 1
silicon	0 to 1
iron	0 to 1.5
nickel	0 to 2.5
carbon	0 to 0.35
refractory oxide	0.05 to 1.0
aluminum	0.05 to 0.6
titanium	0.05 to 0.6

and the balance cobalt, apart from trace amounts of incidental impurities; in which the refractory oxide is silica or an oxide of a metal of Group IIA, IIIA, IIIB or IVB of the Periodic Table which forms high temperature-stable, non-accretive, fine particles and is present in the dispersed phase and said alloy after fabrication by mechanical alloying, consolidation and hot rolling, has an ultimate tensile strength of at least 250 k.s.i., a 0.2% offset yield strength of at least 220 k.s.i., an elongation of 2 to 5%, and a fatigue strength at 10^7 cycles (Rotating Cantilever Beam) of at least 100 k.s.i.

4,631,083

PIPE VARNISH COMPOSITIONS AND USE THEREOF

Harold H. Christhilf, Trainer, Pa.; Paul E. Morrison, New York, N.Y., and Paul W. Niemczura, W. Chester, Pa., assignors to Witco Corporation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,762

Int. Cl.⁴ C09D *5/08*

U.S. Cl. 106—14.23 **22 Claims**

1. A pipe varnish composition including, as essential ingredients, (a) a thixotropic overbased calcium organic sulfonate/calcium carbonate complex, (b) a drying oil, (c) at least one member selected from the group of epoxidized oils and convertible resins, (d) a drier, and (e) a volatile organic solvent carrier in which said ingredients are dissolved or colloidally dispersed, said pipe varnish composition, after application in the form of a thin film or coating on steel pipe surface and curing, forming a hard essentially non-oily film which protects said steel pipes against corrosion during storage for substantial periods of time.

4,631,084

HEAT-SENSITIVE COMPOSITION AND IMAGING SHEET INCORPORATING SAME

Burt K. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 458,323, Jan. 17, 1983, Pat. No. 4,531,141. This application May 8, 1985, Ser. No. 731,932

Int. Cl.⁴ C09D *11/00*

U.S. Cl. 106—21 **6 Claims**

1. Heat-sensitive composition comprising:

A. at least two reactants which at normal room temperature do not react with each other, but which, upon application of thermal energy, undergo a chemical reaction with each other which results in change of color, said at least two reactants comprising either (1) a ferric salt of an organic acid and (2) a phenolic compound which forms a complex with the ferric ion of said ferric salt upon application of thermal energy or (1*a*) at least one zinc salt selected from the class consisting of zinc lower alkyl di-substituted di-thiocarbamates, the substituted radicals of which have from one to five carbon atoms, and zinc aryl di-substituted di-thiocarbamates, and (2*a*) at least one heavy metal salt of a higher fatty acid which is non-reactive with said zinc salt at normal room and storage temperature and is reactive therewith at temperatures above the melting point of said zinc salt to produce a color change, and

B. a non-complexing phenolic compound wherein said non-complexing phenolic compound does not have hydroxyl groups in adjacent positions on any aromatic ring of a monocyclic or polycyclic aromatic compound.

4,631,085

AQUEOUS INK COMPOSITION FOR INK-JET RECORDING

Toshiyuki Kawanishi, Numazu; Masaru Shimada; Kakuji Murakami, both of Shizuoka; Tamotsu Aruga, and Hiroyuki Uemura, both of Numazu, all of Japan, assignors to Ricoh Company, LTD., Tokyo, Japan

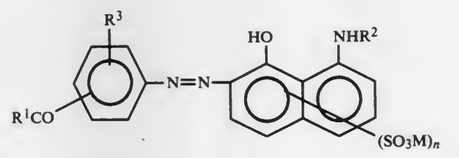
Filed Oct. 22, 1985, Ser. No. 790,197

Claims priority, application Japan, Oct. 23, 1984, 59-221275

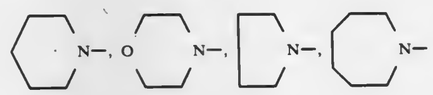
Int. Cl.⁴ C09D *11/02*

U.S. Cl. 106—22 **9 Claims**

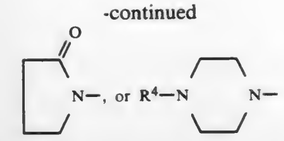
1. An aqueous ink composition for ink-jet recording comprising an aqueous solution of a water-soluble dye of formula (I) and a humectant dissolved in water:



wherein R^1 represents



-continued



wherein R^4 represents an alkyl group or a hydroxyalkyl group; R^2 represents hydrogen, an alkyl group, an acetyl group, an unsubstituted or substituted benzoyl group, an unsubstituted or substituted benzenesulfonyl group, or a substituted 1,3,5-triazine ring; R^3 represents hydrogen, an alkyl group, an alkoxy group, halogen or a sulfonic acid group; M represents hydrogen ion, an alkali metal cation, amine cation or an ammonium ion; and n is an integer of 1, 2 or 3.

4,631,086

CONCENTRATED COMPOSITIONS FOR COATING CORRUGATED BOARD

James C. Jones, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 2, 1985, Ser. No. 751,770

Int. Cl.⁴ C09K *3/14;* **B32B** *5/16*

U.S. Cl. 106—36 **17 Claims**

1. A concentrated coating composition for coating corrugated board to reduce warp, enhance print quality and provide non-skid properties to the board, the composition comprising a mixture of:

(a) about 20 to 40 wt. % of finely divided silica having an average particle size of about 0.01 to 1 micron;

(b) about 20 to 40 wt. % of urea; and

(c) about 20 to 60 wt. % of water, the weight ratio of silica/urea being about 0.5/1 to about 2.75/1, the composition being stable against premature gelling due to heat or cold and being stable through at least 4 cycles of freezing and thawing.

4,631,087

SURFACE COATING COMPOSITIONS

John H. W. Turner, Stockport, England, assignor to Alcan International Limited, Canada

Filed Dec. 18, 1984, Ser. No. 683,312

Claims priority, application United Kingdom, Dec. 22, 1983, 8334268

Int. Cl.⁴ C08L *91/00;* **C08K** *5/04*

U.S. Cl. 106—252 **15 Claims**

1. An additive for a surface-coating composition comprising:

(i) at least one aluminium compound which is an aluminium alkoxide or a compound derived from an aluminum alkoxide by an addition, substitution or condensation reaction;

(ii) a stabilizer selected from the group comprising ammonium hydroxide, at least one organic base and a mixture of an organic base with ammonia; and

(iii) a metal-containing organic compound, the metal being selected from Cu, Mn, Fe, Co, Zn and the rare earth metals.

4,631,088

ROAD ASPHALT COMPOSITIONS CONTAINING VISBREAKING RESIDUES

Marc-André Poirier, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Dec. 11, 1985, Ser. No. 807,792

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—273 R **7 Claims**

1. A road asphalt composition having a penetration at 25° C. in the range of 85 to 100 comprising a blend of:

(a) a pitch having an initial boiling point of at least 520° C. obtained as a residue in the visbreaking of crude oil, and

(b) a distillation residue having a penetration at 25° C. in the range of 150 to 500 obtained in the distillation of crude oil.

4,631,089

COLOR-INTENSIVE IRON OXIDE BLACK PIGMENTS AND PROCESS FOR THEIR PRODUCTION

Jakob Rademachers; Rolf Naumann, and Günther Teichmann, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 668,970

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341885

Int. Cl.⁴ C09C *1/22*

U.S. Cl. 106—304 **7 Claims**

1. Color intensive black anisometric magnetite iron oxide pigment having an FeO content of from 26 to 29% by weight and manganese content of less than 0.1% by weight, said pigment further having a specific BET surface area of from 5 to 15 square meters per gram and being needle shaped particles with an average needle diameter of 0.1 to 0.2 μm and an average needle length of from 0.6 to 0.8 μm.

4,631,090

PREPARATION AND USE OF IRON MAGNETIC PIGMENTS

Rolf Naumann; Lutz Leitner; Jakob Rademachers, and Gunter Buxbaum, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 740,090

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422916

Int. Cl.⁴ C04B *14/00, 35/26;* C01G *49/08*

U.S. Cl. 106—304 **14 Claims**

1. A magnetic pigment consisting essentially of iron, having a X-ray crystallite size with the 110 reflex of from 14 to 22 nm, a coercive force from 55 to 88 kA/m and a switching field distribution of aligned pigment particles of less than 0.55.

4,631,091

METHOD FOR IMPROVING THE DISPERSIBILITY OF ORGANOCLAYS

Howard Goodman, Cornwall, United Kingdom, assignor to English China Clays Lovering Pochin & Co. Ltd., St. Austell, England

Filed Aug. 13, 1985, Ser. No. 765,259

Int. Cl.⁴ C04B *14/00, 33/00*

U.S. Cl. 106—308 N **10 Claims**

1. A process for preparing an organoclay which is readily dispersible in an organic liquid medium, comprising the steps of:

(a) suspending a smectite clay in water to form an aqueous suspension;

(b) treating said aqueous suspension of the smectite clay with a solution of an inorganic salt wherein the cation of said inorganic salt has a valency of at least 2, the concentration of the salt being such as to flocculate the smectite clay substantially completely;

(c) mixing the suspension of the flocculated smectite clay with a quaternary ammonium compound at least one of the four alkyl groups of which has from 10 to 24 carbon atoms; and

(c) dewatering the product of step (c).

4,631,092

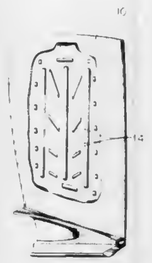
METHOD FOR HEAT TREATING CAST TITANIUM ARTICLES TO IMPROVE THEIR MECHANICAL PROPERTIES

Duane L. Ruckle, and Ponciano P. Millan, Jr., both of Mesa, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 18, 1984, Ser. No. 662,212

Int. Cl.⁴ C22F *1/18*

U.S. Cl. 148—3 **22 Claims**



1. A method of heat treating a cast titanium alloy article comprising the steps of:

heating the article to a temperature above its beta transus temperature;

rapidly cooling the article to produce an acicular martensitic microstructure;

thermally decomposing the martensitic microstructure by stabilizing the article at a temperature between 1500°–825° F.; and

aging the article at a temperature of 1000°–1300° F. for a time of 1 to 8 hours.

4,631,093

CHROMATE FREE METHOD OF TREATING METAL SUBSTRATES TO IMPART CORROSION RESISTANCE AND COLOR TO THE SUBSTRATE SURFACE

Alex Etemovich, Fountain Valley, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Jul. 27, 1984, Ser. No. 635,056

Int. Cl.⁴ C23C *22/48*

U.S. Cl. 148—6.1 **19 Claims**

1. An aqueous solution for imparting corrosion resistance and color to a metal surface comprising a chrysoidine dye and nitric acid, the pH of the solution ranging from 1.5 to 3.5.

4,631,094

METHOD OF PROCESSING A NICKEL/TITANIUM-BASED SHAPE MEMORY ALLOY AND ARTICLE PRODUCED THEREFROM

John A. Simpson, Mountain View; Keith Melton, Cupertino, and Tom Duerig, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 6, 1984, Ser. No. 668,771

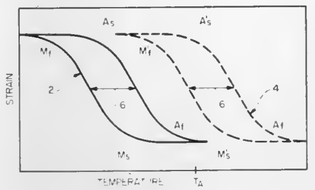
Int. Cl.⁴ C22F *1/10, 1/00*

U.S. Cl. 148—11.5 F **56 Claims**

1. A method of processing a nickel/titanium-based shape memory alloy having a transformation hysteresis defined by M_s, M_f, A_s, and A_f temperatures, the method consisting essentially of:

overdeforming the alloy, isothermally, at a temperature that is less than about the maximum temperature at which martensite can be stress-induced, by applying a continously increasing stress sufficient to cause nonrecoverable strain in the alloy so as to temporarily expand the transformation hysteresis by elevating the A_s and A_f temperatures to A_s' and A_f', respectively, so that the temperature difference between A_s' and M_s is greater than the temperature difference between A_s and M_s; and

storing the alloy at a temperature between A_s and A_s'.



4,631,095

STEEL THAT IS EXPOSED TO HYDROGEN SULFIDE

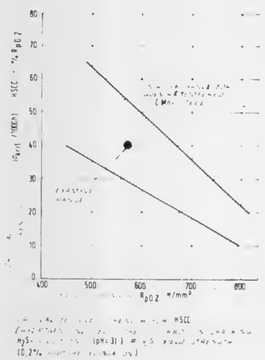
Ingo von Hagen, Krefeld; Hans-Georg Hillenbrand, Düsseldorf, and Rolf K. Popperling, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,799

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1984, 3415590

Int. Cl.⁴ C21D *7/08*

U.S. Cl. 148—12 F **3 Claims**



1. Method of making steel pipes and tubing to be highly resistant against stress corrosion cracking when exposed to H2S, comprising the steps of:

using a ferritic perlite steel within the following alloying range, all percentages by weight:

from 0.3 to 0.45 C

from 1.4 to 1.8 Mn

from 0.2 to 0.5 Si

from 0.2 to 0.5 Cr

from 0.04 to 0.1 V

up to 0.06 Nb

not more than 0.003 S

the remainder being iron

whereby the combined Niobium and Vanadium content must obey the rule that the sum of the V content plus twice the Nb content must not be not less than 0.1%;

making tubing from said steel by hot working; and

cooling in air the hot worked tube from a final temperature attained during hot working so that a texture and grain size in accordance with ASTM finer than 8 obtains and the tubing has strength value of 552 N/square mm≦0.2% of rupture elongation ≦655 N/square mm and a tensile strength exceeding 655 N/square mm.

4,631,096

HIGH ENERGY MATERIALS CONTAINING METASTABLE HELIUM, A PROCESS FOR P .ODUCING SAME AND APPLICATIONS THER OF

Georg Sänger, Voorschoten; Gerrit Hietkamp, l oordwijkerhout, both of Netherlands, and Walter Peschka, Sindelfingen, Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V., Bonn, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,311

Int. Cl.⁴ C06B *47/00;* C01B *23/00*

U.S. Cl. 149—1 **7 Claims**

1. A high energy chemical complex comprising He_mNH_3.

4,631,097

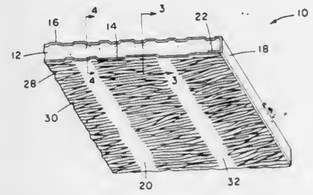
EMBOSSED GYPSUM BOARD

Donald A. Kossuth, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Mar. 11, 1982, Ser. No. 356,977

Int. Cl.⁴ B32B *31/12*

U.S. Cl. 156—44 **1 Claim**



1. The method of making predecorated gypsum wallboard comprising the steps of forming a decorative embossed pattern in a web of substantially uniform thickness wallboard face paper, forming a utilitarian embossed pattern, as opposed to a decorative design, in a web of substantially uniform thickness wallboard back paper, said utilitarian embossed back paper being of substantially lower quality paper than the quality of said face paper, and forming a gypsum wallboard with said embossed face paper and said embossed back paper forming respectively the front face and the back side of said wallboard, with a core of gypsum therebetween, said forming step further including the step wherein said back paper is disposed on top of a slurry of settable gypsum during forming of said wallboard, and an elongate lightweight straight bar is disposed on said back paper, extending thereacross, as formed board is continuously moved outward from forming means.

4,631,098

HEAT-RECOVERABLE ARTICLE

Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Limited, London, England

Filed Dec. 30, 1983, Ser. No. 567,122

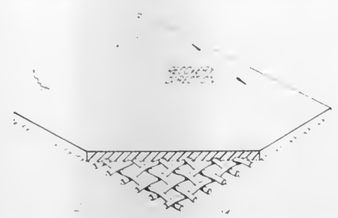
Claims priority, application United Kingdom, Jan. 6, 1983, 8300217; Jul. 23, 1983, 8319855; Aug. 16, 1983, 8322004

Int. Cl.⁴ B32B *3/02*

U.S. Cl. 156—86 **24 Claims**

1. A dimensionally heat-recoverable article for enclosing at least part of a substrate, which comprises a fabric having fibres which will recover when heated and which have a tensile strength of at least 0.1 MPa at their recovery temperature, the

fabric having an external surface that is coated with a layer of polymeric material of at least 0.03 mm thickness, the polymeric



material being softenable without flowing when heated to accomodate recovery of the article.

4,631,099

METHOD FOR ADHESION OF OXIDE TYPE CERAMICS WITH COPPER OR ALLOY THEREOF

Yoshihiro Ebata, Kawanishi; Saburo Kose, Ikeda, and Ryozo Hayami, Takarazuka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,930
Int. Cl.⁴ B32B *31/24*
U.S. Cl. 156—89 **12 Claims**

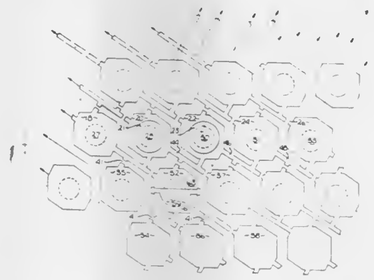
1. A method for the adhesion of oxide type ceramics and copper or a copper alloy, which comprises placing an oxide type ceramics and copper or a copper alloy in mutual contact, heating them in an oxidative atmosphere thereby effecting adhesion thereof, and subsequently cooling the resultant composite of adhesion at a cooling rate of at least 200° C./sec.

4,631,100

METHOD AND APPARATUS FOR MASS PRODUCING PRINTED CIRCUIT BOARDS

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124

Continuation-in-part of Ser. No. 439,333, Jan. 10, 1983, Pat. No. 4,521,262. This application Nov. 15, 1984, Ser. No. 671,672
Int. Cl.⁴ C25D *7/00*; C23F *1/02*; B05D *5/00*; B44C *1/22*
U.S. Cl. 156—150 **33 Claims**



1. A method of making printed circuit boards of any of a large number of circuit patterns comprising the steps of

(a) proviiding a printed circuit board blank having an electrically insulative substrate with a predetermined two dimensionally repetitive pattern of conductive pads interconnected by a corresponding two dimensionally repetitive pattern of individual conductive pad interconnects electrically integral therewith on one surface thereof;

(b) coating the conductive pattern with a photoresist;

(c) exposing and developing the photoresist in a predetermined pattern to remove photoresist from those interconnects desired to be opened; and

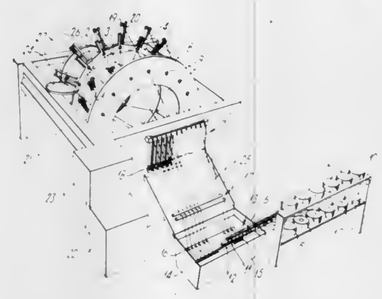
(d) removing the exposed interconnects whereby the conductive pads and the remaining interconnects provide the desired circuit pattern.

4,631,101

APPARATUS AND METHOD FOR FILAMENT WINDING CYLINDRICAL BODIES WITH CLOSED END

Clifford Rix, Gosport, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 14, 1985, Ser. No. 701,529
Claims priority, application United Kingdom, Feb. 15, 1984, 8403965
Int. Cl.⁴ B65H *81/00*
U.S. Cl. 156—175 **14 Claims**



1. A method of filament winding a hollow body with a closed end characterised in that there are included the following steps:

a. supporting a former at one end;

b. providing circumferentially spaced filament retainers near the opposed end of the former;

c. rotating the former about its longitudinal axis; and

d. laying at least one filament on the former by a filament guide means which traverses the former parallel to the longitudinal axis between the supported end of the former and a position axially spaced beyond the end of the former;

the rotation of the former and the traversing of the filament guide means being selected for controlling the lay angle of the filament on the former up to the filament retainers and also over the end of the former.

6. A filament winding machine for winding cylindrical bodies closed at one end thereof, said machine comprising means to support a former, filament guide means to guide at least one filament in spaced relationship to the former, means to reversibly move the filament guide means relative to the former such that the filament guide means traverses the length of the former and means to rotate the former relative to the filament guide means about an axis parallel to the traversing movement, wherein the improvement lies in that:

the former is secured to a support at one axial end, the remote end being free; a circumferential array of filament retainers is attached to the periphery of the former near said remote end to limit slippage of the filament as it is laid between pairs of adjacent filament retainers; and the means to move the filament guide means traverses to a position beyond said remote end of the former whereby the filament is wound over the end of the former.

4,631,102

METHOD OF MANUFACTURING HEAT EXCHANGE MAT

Yoshiaki Kitagawa, Osaka, and Hideo Iwata, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

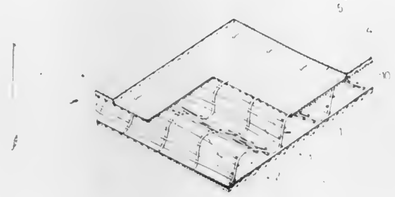
Filed Mar. 7, 1985, Ser. No. 709,413
Claims priority, application Japan, May 15, 1984, 59-98401
Int. Cl.⁴ C09J *5/02*
U.S. Cl. 156—210 **6 Claims**

1. A method of manufacturing a heat exchange mat comprising the steps of:

forming a hollow member by providing a textile insert on both surfaces of a heat exchanging element including wavy warp and linear weft filaments knitted substantially at right angles with each other,

disposing a surface sheet of polyvinyl chloride over each of said textile inserts on both sides of said hollow member, with a pasty polyvinyl chloride resin adhesive interposed between each said surface sheet and its associated insert,

forming a preliminary heat exchange mat member by subjecting said hollow member with said surface sheets to a



first heating step at about 170° C. for about 1 to 2 minutes for semi-gelatinizing said pasty resin adhesive, and thereafter

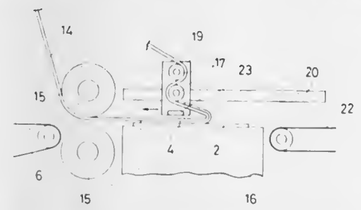
fully gelatinizing said pasty resin adhesive by subjecting said preliminary heat exchange mat member to a second heating step at about 170° C. for about 3 minutes and under a pressure while maintaining a required height of said hollow member, wherein said second heating step includes a step of securing a peripheral sealing member to peripheral edges of said preliminary heat exchange mat member.

4,631,103

PROCESS FOR PEELING PROTECTIVE FILM OFF A THIN ARTICLE

Minoru Ametani, Osaka, Japan, assignor to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 29, 1984, Ser. No. 626,083
Claims priority, application Japan, Apr. 10, 1984, 59-72546; May 25, 1984, 59-107191
Int. Cl.⁴ B44C *1/16*; B32B *31/00*
U.S. Cl. 156—241 **4 Claims**



1. Process for peeling a protective adhesive film stuck to substantially the entire surface of one side of a thin article such as a silicon wafer, comprising:

(a) feeding a web of adhesive tape, having an adhesive surface, from a source of supply to a position above the protective film with the adhesive surface facing the protective film;

(b) adhering said tape to substantially the entire surface of said protective film while adhered to the article;

(c) applying a holding force to said article; to hold the article stationary

(d) while holding said article stationary, peeling said protective film off the article by the adhesive force of said adhesive tape acting on the protective film while taking up said adhesive tape; and said protective film and

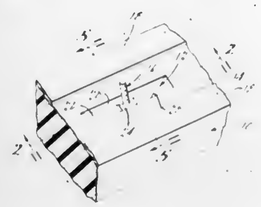
(e) said taking up of said adhesive tape being started some time after the peeling of the adhesive tape and the protective film from said article has been started.

4,631,104

STUD ATTACHMENT METHOD FOR VEHICLE MOLDING

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,292
Int. Cl.⁴ B32B *31/20*
U.S. Cl. 156—293 **13 Claims**



1. A method of attaching a first member to a second member, said first member having a laterally-protruding base portion thereon, said method comprising:

forming a cavity in said second member, said cavity being adapted for receiving said base portion of said first member therein when said base portion is in a first lateral orientation;

heating at least said base portion of said first member;

inserting said base portion of said first member into said cavity;

moving said heated base portion to a second lateral orientation in order to locally melt a portion of the material of said second member surrounding said cavity and to embed said base portion in said material;

cooling said material of said second member to cause it to reharden around said base portion, thereby forming an interlocking engagement between said first and second members.

6. A method of attaching a mounting member to a thermoplastic member, said mounting member having a laterally-elongated base portion thereon, said method comprising:

forming an elongated slot in said thermoplastic member, said slot having lateral length and width dimensions at least as large as the corresponding length and width dimensions of said elongated base portion;

heating at least the elongated base portion of said mounting member;

inserting said elongated base portion of said mounting member into said slot in a non-interfering relationship with said thermoplastic member;

rotating the heated elongated base portion in a generally lateral plane so that said heated elongated base portion locally melts, traverses through, and embeds itself in, a portion of the thermoplastic member surrounding said slot;

cooling said portion of said thermoplastic member to reharden the thermoplastic material around said elongated base portion and to form an interlocking engagement between said mounting member and said thermoplastic member.

4,631,105

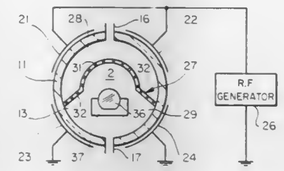
PLASMA ETCHING APPARATUS

John C. Carroll, Hayward, and Robert A. Shepherd, Jr., Oakland, both of Calif., assignors to Branson International Plasma Corporation, Hayward, Calif.

Filed Apr. 22, 1985, Ser. No. 725,802
Int. Cl.⁴ B44C *1/22*; C03C *15/00*; C23F *1/00*; H01L *21/306*
U.S. Cl. 156—345 **18 Claims**

1. Plasma etching apparatus comprising a reaction chamber having a peripheral wall, means for introducing a reagent gas into the reaction chamber, a perforated shield extending between two points on the chamber wall and dividing the cham-

ber into first and second regions on opposite sides of the shield, said first region being bounded by the shield and a first portion of the chamber wall and said second region being bounded by the shield and a second portion of the chamber wall, a driven electrode positioned outside the chamber wall adjacent to the first region, a grounded electrode positioned outside the chamber wall adjacent to the second region, and means for energizing the electrodes to ionize the gas and form a plasma of active species in the first region, said active species passing through the perforated shield and impinging upon a workpiece in the second region, the glow discharge of the plasma being confined to the first region.



4,631,106

PLASMA PROCESSOR

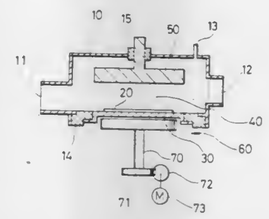
Norio Nakazato, Kudamatsu; Yutaka Kakehi, Hikari; Takeshi Harada, Chiyoda; Ryoji Fukuyama; Makoto Nawata, both of Kudamatsu; Hironobu Ueda, Hitachi; Yutaka Omoto; Katsuaki Nagatomo, both of Kudamatsu, and Fumio Shibata, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,725

Claims priority, application Japan, Sep. 19, 1984, 59-194695; Nov. 21, 1984, 59-244417; Nov. 21, 1984, 59-244418; Mar. 13, 1985, 60-48305; May 15, 1985, 60-101229; May 15, 1985, 60-101230; May 15, 1985, 60-101231

Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*

U.S. Cl. 156—345 **12 Claims**



1. A plasma processor comprising a processing chamber, means to reduce a pressure in said processing chamber so as to evacuate an interior thereof, means to introduce a processing gas into said processing chamber, means to generate an electric field within said processing chamber, and means to establish a magnetic field orthogonal to the electric field, this means being rotatable relative to a surface to-be-processed of a sample which is processed in a plasma arising under an action of the electric field and the magnetic field.

4,631,107

THERMOPLASTIC FITTING ELECTRIC HEAT WELDING APPARATUS

Russel G. Ramsey, Holdenville, Okla., assignor to Central Plastics Company, Shawnee, Okla.

Division of Ser. No. 734,836, May 16, 1985, Pat. No. 4,602,148. This application Jan. 21, 1986, Ser. No. 820,126

Int. Cl.⁴ B32B *31/26*

U.S. Cl. 156—359 **6 Claims**

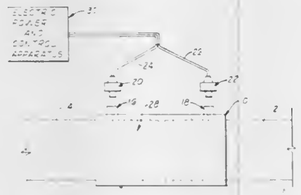
1. Apparatus for electrically heat welding a thermoplastic fitting having an electric resistance heating element disposed therein connected to a pair of electric contacts attached to said fitting whereby a regulated quantity of electric power is supplied to the heating element during the welding process and the making of a high quality weld is insured comprising:

electric power generating means for producing controlled electric power;

current sensor means for sensing the magnitude of the current flow from said electric power generating means electrically connected thereto;

electric cable means connected to said electric power generating means and adapted for removable connection to said electric contacts of said fitting for conducting electric power to said electric resistance heating element of said fitting;

switch means electrically connected between said electric power generating means and said cable means; and



computer means operably connected to said current sensor means and said switch means for receiving and comparing the magnitude of the current flowing through said resistance heating element of said fitting with predetermined current levels for various sizes of fittings and thereby determining the size of the fitting being welded and the total time the constant voltage electric power should be supplied to said heating element of said fitting for the making of a high quality weld, and for comparing such magnitude at predetermined time intervals with predetermined current levels for the size of fitting being welded to thereby determine if the welding process is proceeding abnormally at such time intervals and for operating said switch means to terminate the supply of electric power to said heating element of said fitting if it is determined that said welding process is proceeding abnormally or otherwise at the end of the total time determined to be required for the making of a high quality weld.

4,631,108

APPARATUS FOR FABRICATING HONEYCOMB INSULATING MATERIAL

Wendell B. Colson, Boulder, Colo., assignor to Thermocell, Ltd., Broomfield, Colo.

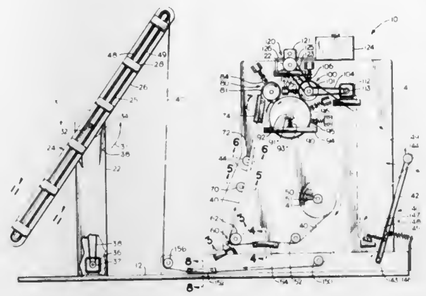
Continuation-in-part of Ser. No. 406,319, Aug. 9, 1982, Pat. No. 4,450,027. This application May 22, 1984, Ser. No. 612,875

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—461 **29 Claims**

1. Apparatus for fabricating honeycomb material, comprised of:

stacking means for continuously stacking a plurality of elongated sections of continuous tubular material in layers one over another to form a collapsed panel of honeycomb material, said stacking means including a rotatable rack having an elongated flat surface thereon, the plane of which is parallel to the axis of rotation and is adapted for receiving thereon and retaining successive layers of said tubular material; and folding means for continuously



forming a strip of flat, thin, flexible material into a tubular structure prior to stacking on said rack.

4,631,109

SINGLE FACER

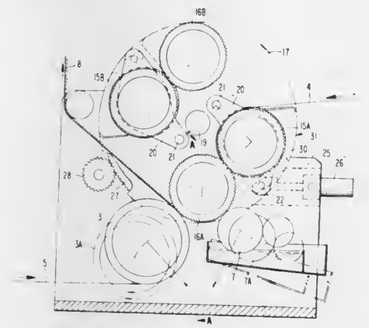
Tadashi Hirakawa; Kiyomitsu Yoshikawa; Shigenari Yoshioka, and Hiroaki Sasashige, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,376

Claims priority, application Japan, Nov. 10, 1983, 58-211417

Int. Cl.⁴ B31F *1/28*

U.S. Cl. 156—472 **1 Claim**



1. In a single facer of the type wherein a core paper sheet introduced in a first direction is corrugated by means of a pair of upper and lower corrugated rolls, said rolls having a corrugated circumferential configuration, the corrugated core paper sheet has its crest portions applied with paste, and then a liner introduced to said single facer from a second direction different from said first direction is pasted on the corrugated paper sheet while passing between said lower corrugated roll and a pressure roll to form a single-faced corrugated sheet, the improvement wherein:

said single facer comprises a rotatable frame supporting said pair of upper and lower corrugated rolls; and at least one pair of additional upper and lower corrugated rolls also is supported from said rotatable frame and has a different shape of circumferential corrugations from that of said first mentioned pair of upper and lower corrugated rolls; and means for rotating said rotatable frame for bringing a selected said pair of corrugated rolls into operative position with said pressure roll for performing a corrugating operation.

4,631,110

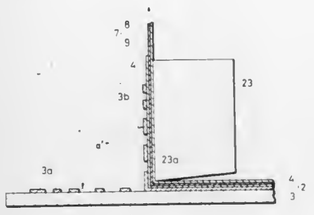
PEELING TYPE DEVELOPING APPARATUS

Akio Tsumura; Shun-ichi Hayashi; Chiharu Miyaake; Kazuo Oouchi, and Yutaka Yamamura, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Japan

Filed Jul. 25, 1985, Ser. No. 758,985

Int. Cl.⁴ B32B *31/16*

U.S. Cl. 156—584 **7 Claims**



1. A peeling type developing device in which an image forming material layer comprising a transparent support and a photopolymerization compound layer formed thereon is formed on the surface of a rectangular substrate on which an image composed of exposed portions of said photopolymerization compound layer is to be formed, comprising: means for sticking an adhesive tape to said transparent support after said image forming material layer has been exposed in such a manner that said adhesive tape crosses opposite corners of said substrate; a pair of conveying pinch rolls for conveying said substrate obliquely; a peeling bar extending in a direction perpendicular to a direction of conveyance of said substrate; a pair of peeling pinch rolls for pulling said adhesive tape away from said substrate at a constant speed while moving said tape over said peeling bar with said peeling bar in line contact with said substrate through said adhesive tape and said picture forming material layer, whereby said adhesive tape, said support, and unexposed parts of said photopolymerization compound layer are peeled from said substrate, and exposed parts of said photopolymerization compound layer remain on said substrate.

4,631,111

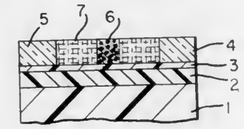
DICHROMIC PROCESS FOR PREPARATION OF CONDUCTIVE CIRCUIT

David W. Williston, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1984, Ser. No. 675,229

Int. Cl.⁴ B44C *1/22;* **B29C** *17/08;* **G03C** *5/00*

U.S. Cl. 156—630 **17 Claims**



1. A process for the preparation of a conductive circuit which comprises

(a) applying to a substrate two photohardenable layers, the upper photohardenable layer being sensitive to ultraviolet radiation and relatively insensitive to visible radiation and being hardenable and nontacky when exposed to short wavelength ultraviolet actinic radiation but unhardenable when exposed to longer wavelength visible radiation, and the lower photohardenable layer being tacky and hardenable when exposed to the longer wavelength visible actinic radiation;

(b) exposing the photohardenable layers to radiation con-

taining ultraviolet and visible radiation through a dichromic phototool containing one or more areas characteristic of a circuit pattern which transmit visible radiation and masks out ultraviolet radiation whereby the lower photohardenable layer becomes hardened but remains tacky and the upper photohardenable layer remains unhardened, one or more clear areas which transmit visible and ultraviolet radiation whereby the upper and lower photohardenable layers become hardened, and areas characteristic of vias of the circuit pattern which mask out all said radiation;

(c) removing with a solvent the unhardened areas of the upper photohardenable layer to uncover the exposed tacky areas of the lower photohardenable layer corresponding to the circuit pattern and removing unhardened areas of the unexposed lower photohardenable layer forming holes corresponding to the vias;

(d) applying finely divided metal, alloy or plating catalyst material to the uncovered tacky circuit areas and edges of the via holes of the lower photohardenable layer; and

(e) plating the metallized or catalyzed image to form an electrically conductive circuit.

4,631,112

SURFACE-TREATED ALUMINUM ALLOY SUBSTRATES FOR MAGNETIC DISKS

Eiki Usui, and Masahiro Kawaguchi, both of Mooka, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 18, 1985, Ser. No. 724,639

Claims priority, application Japan, May 1, 1984, 59-88199

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—644 **7 Claims**

1. A method for treating surfaces of magnetic disk substrates of aluminum alloy with an anodic oxide film on the surfaces thereof to render said surfaces heat resistant and substantially free from cracking, which comprises dissolving a portion of said anodic oxide film by an etching treatment to broaden the micropores of said anodic oxidation film to a diameter having an enlargement rate in the range of 10–150%, based upon the micropore diameter before said etching treatment but after anodic oxidation, provided that the enlarged pore diameter is at least about 170 Å.

4,631,113

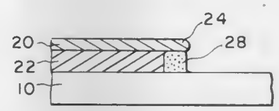
METHOD FOR MANUFACTURING A NARROW LINE OF PHOTOSENSITIVE MATERIAL

Raymond G. Donald, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 23, 1985, Ser. No. 812,538

Int. Cl.⁴ B44C *1/22;* **B29C** *17/08;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—659.1 **12 Claims**



1. A method comprising the steps of:

forming a first film along the upper surface of a substructure;

covering a portion of the first film with a patterned second film;

removing the uncovered portion of the first film and a contiguous part of the covered portion of the first film, whereby a portion of the patterned second film overhangs the remainder of the first film;

forming a layer of photosensitive material on at least the surface portion of the substructure where the material of the first film has been removed;

removing substantially all of the layer of photosensitive material except for the portion under the overhanging portion of the patterned second film; and

removing substantially all the remaining material of the films.

4,631,114

METHOD FOR REMOVING A SURFACE LAYER FROM A METAL FLUORIDE GLASS

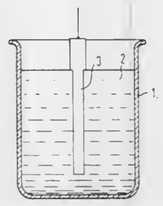
Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 840,582

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3514082

Int. Cl.⁴ C03C *15/00*

U.S. Cl. 156—663 **15 Claims**



1. A method for the removal of a surface layer from a metal fluoride glass of the type suitable for the manufacture of fibers for optical communications technology and which glass contains ions of at least one chemical element whose fluoride is difficultly water-soluble, said process comprising the step of contacting surface portions of said glass with an etchant solution for sufficient time to etch the surface portions of said glass, the etchant solution containing dissolved therein at least one material selected from the group consisting of (a) at least one fluoride complexing agent, (b) at least one complexing agent capable of complexing with the ions of said chemical element whose fluoride is difficultly water-soluble, and (c) mixtures thereof.

4,631,115

DEHYDRATION OF ETHANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 752,784, Jul. 8, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,734

Int. Cl.⁴ B01D *3/40;* **C07C** *29/84*

U.S. Cl. 203—19 **8 Claims**

1. A method for recovering anhydrous ethanol from a mixture of ethanol and water which comprises distilling a mixture of ethanol and water containing not more than 30% water in a rectification column in the presence of about one part of extractive agent per part of ethanol-water mixture, recovering water as overhead product, obtaining the ethanol and the extractive agent from the stillpot, separating the ethanol from the extractive agent by distillation in another rectification column, wherein the extractive agent comprises at least a benzoate containing from eight to twenty carbon atoms.

4,631,116

METHOD OF MONITORING TRACE CONSTITUENTS IN PLATING BATHS

Frank A. Ludwig, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 5, 1985, Ser. No. 741,492

Int. Cl.⁴ G01N *27/42, 27/40*

U.S. Cl. 204—1 T **21 Claims**

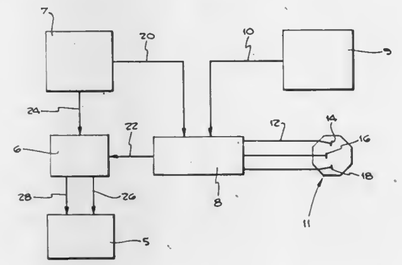
1. A method for monitoring the minor constituents present in a solution used in a plating process wherein said minor constituents affect plating deposit properties, said method comprising the steps of:

(a) applying a selected dc potential to a working electrode which has been subjected to pretreatment and is positioned with said solution containing said minor constituents;

(b) superimposing a constant ac signal on said dc potential applied to said working electrode, said ac signal having a peak to peak potential and a frequency and producing an ac current;

(c) varying said dc potential at a chosen sweep rate over a chosen range; and

(d) measuring said ac current at one or more phase angles with respect to said constant ac signal between said working electrode and a counter electrode positioned within said solution as said dc potential is varied over said range, said measurement of ac current in relation to varying dc potential being expressed as an ac current spectra wherein the improvement comprises varying in combination each parameter comprising said peak to peak potential of said ac signal, said frequency of said ac signal, said sweep rate of said dc potential, said range of dc potential, said one or more phase angles, and said pretreatment of said working electrode, to determine the specific value of each said parameter which, when taken in combination with the remaining said parameters, provides maximum spectra detail in said ac current spectra to determine and monitor said minor constituents in said solution which affect said plating deposit properties.



4,631,117

ELECTROLESS PLATING PROCESS

Karl L. Minten, Cannock, United Kingdom; Angelo J. Battisti, New City, N.Y., and Galina Pismennaya, Palisades Park, N.J., assignors to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 731,188, May 6, 1985. This application May 5, 1986, Ser. No. 859,672

Int. Cl.⁴ C25D *5/02, 5/54*

U.S. Cl. 204—15 **22 Claims**

1. A process for electroless plating a conductive metal layer to the surface of a non-conductive material which comprises:

(a) preparing a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle diameter of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) applying said liquid dispersion to the surface of the non-conducting material;

(c) separating substantially all of said liquid dispersing medium from said carbon black particles, whereby said particles are deposited on said non-conductive surface in a substantially continuous layer; and

(d) electroless plating a substantially continuous conductive metal layer over the deposited carbon black layer and said non-conductive surface.

4,631,118

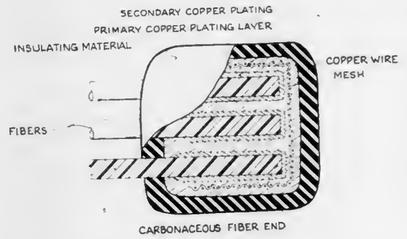
LOW RESISTANCE COLLECTOR FRAME FOR ELECTROCONDUCTIVE ORGANIC, CARBON AND GRAPHITIC MATERIALS

Francis P. McCullough, Lake Jackson, and Roy V. Snelgrove, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1985, Ser. No. 729,702

Int. Cl.⁴ C25D *5/48*

U.S. Cl. 204—16 **24 Claims**



1. A method for producing a low resistance electrical connection onto an electroconductive material selected from the group consisting of electroconductive polymeric organic materials, carbon and graphite which consists of

(1) electroplating the area of desired electrical contact with an electroconductive metal;

(2) joining said so plated area into a continuous electroconductive path by crimping a fine wire mesh or gauze of electroconductive metal onto said electroplated area and at least the abutting electroconductive material; and thereafter bonding and coating said mesh/gauze to said plated area by subjecting said area to a treatment selected from the group consisting of (i) continuing said plating to bond said mesh to said plated area; (ii) applying a solder coat onto and over said mesh embedding said mesh in said solder; or (iii) applying a solder bead onto said electroplated area securing said mesh/gauze to said electroplated area;

(3) connecting an electrical current carrying conductor to said metal area;

(4) coating said metal area and at least a portion of any electrical current carrying conductor attached thereto and the electroconductive material immediately adjacent to said metal area by subjecting said area to a treatment selected from the group consisting of

(a) coating with

(i) a polymeric organic non-conductive material,

(ii) a cathodic electrodepositable polymeric material,

(b) applying an

(i) oxidizable metal thereto and oxidizing the same

(ii) fluoridizable metal thereto and fluoridating the same,

or

(c) oxidizing or fluorinating said metal surface per se.

4,631,119

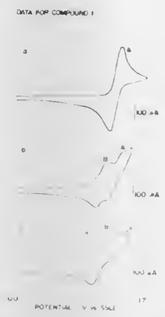
REVERSIBLE, ELECTROCHEMICALLY-SWITCHED LARIAT ETHERS

George W. Gokel, and Luis Echegoyen, both of Miami, Fla., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 554,686, Nov. 23, 1983, abandoned. This application May 22, 1985, Ser. No. 736,993

Int. Cl.[4] C25C *1/00*

U.S. Cl. 204—59 R 1 Claim



1. The electrochemical process of forming a radical anion of a heteromacrocyclic ring compound composed of a substituted heteromacrocyclic ring containing 12–36 contiguous atoms selected from the group C, N, O or S, said N, O or S being separated by at least two carbon atoms, one or more of said ring C or N atoms having attached thereto a substituted or unsubstituted sidearm consisting of C, N, O of S, said sidearm having attached thereto at the other terminus thereof a substituted carbocyclic aromatic or substituted or unsubstituted heteroaromatic residue containing at least one uncharged Lewis basic donor group, the reduction potential of said residue being less than 2.0 V vs. SCE, said sidearm being of sufficient length and flexibility, such that the donor group on or part of the residue will position itself over the macroring cavity to interact with any ring bound cation which is present, which comprises electron transfer thereto.

4,631,120

METHOD IN WHICH ELEMENTAL PARTICLES ELECTROPHORETICALLY MIGRATE THROUGH A GEL ONTO A COLLECTING SURFACE OF A MOVING BELT

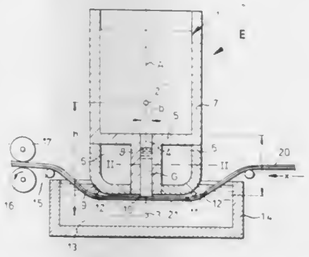
Fritz Pohl, Zähringer Platz 21, D-7750 Konstanz, Australia

Filed Jun. 12, 1981, Ser. No. 273,116

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022527

Int. Cl.[4] G01N *27/26*

U.S. Cl. 204—182.8 24 Claims



1. A method of performing electrophoresis comprising electrophoretically producing migration of elemental particles through a porous substance to a collection region thereof, transporting a belt having a collecting surface past said collection region of said porous substance and collecting said elemental particles from said collection region onto said collecting surface for transport with said belt away from the porous substance.

4,631,121

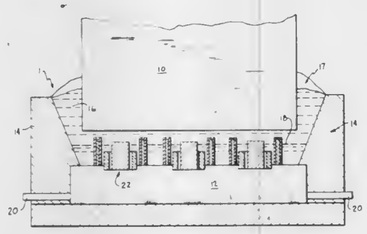
ALUMINA REDUCTION CELL

Douglas V. Stewart, Florence; Alton T. Tabereaux, Sheffield, and John T. Willett, Florence, all of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Feb. 6, 1986, Ser. No. 826,727

Int. Cl.[4] C25C *3/08, 7/04, 7/02*

U.S. Cl. 204—243 R 10 Claims



1. In an alumina reduction cell having an anode, a carbonaceous cathode and a plurality of refractory hard metal (RHM) shapes resting upon, but not fixedly mounted to, said cathode, said RHM shapes having a height sufficient to extend vertically upwardly from said cathode, through a molten aluminum pad and into an alumina-cryolite bath, the improvement comprising inert refractory stabilizing sleeves surrounding said RHM shapes and fixedly mounted to said cathode, said stabilizing sleeves having a height less than said RHM shapes such that said stabilizing sleeves extend vertically into said molten aluminum pad but not into said alumina-cryolite bath, and inert refractory anode stops surrounding said stabilizing sleeves, said anode stops resting upon, but not fixedly mounted to, said cathode and having a height greater than said RHM shapes.

4,631,122

ELECTROPHORETIC APPARATUS EMPLOYING A COLLECTING BELT MOVING IN CONTACT WITH A GEL

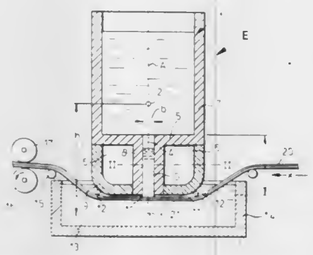
Fritz Pohl, Zähringer Platz 21, D-7750 Konstanz, Australia

Division of Ser. No. 273,116, Jun. 12, 1981. This application Sep. 24, 1985, Ser. No. 779,689

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022527

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—299 R 23 Claims



1. Apparatus for performing an electrophoretic operation comprising first means for accommodating a porous substance, second means for providing an electrical field traversing said porous substance, displacable tape collection means adjacent the porous substance, and drive means driving said tape collection means to provide relative movement between the tape collection means and the porous substance whereby to effect said electrophoretic operation on an electrophoretically responsive substance inclusive of substances capable of migrating through the porous substance under the influence of said electrical field.

4,631,123

METHOD OF DEHYDROCYCLIZING ALKANES

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,572, Feb. 1, 1982, Pat. No. 4,435,283. This application Jun. 28, 1982, Ser. No. 393,160

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—138 31 Claims

1. A method of reforming hydrocarbons comprising contacting said hydrocarbons with a catalyst comprising a large-pore zeolite containing:

(a) at least one Group VIII metal; and

(b) an alkaline earth metal selected from the group consisting of barium, strontium and calcium, wherein the Selectivity Index of the catalyst is greater than 60%.

4,631,124

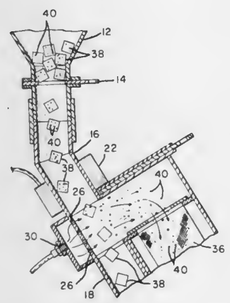
KINETIC GRAVITY DEDUSTER

Jerome I. Paulson, 969 Edinburgh Dr., Lancaster, Pa. 17604

Continuation-in-part of Ser. No. 495,700, May 18, 1983, abandoned. This application May 20, 1985, Ser. No. 735,790

Int. Cl.[4] B07B *7/04*

U.S. Cl. 209—3 7 Claims



1. A dedusting device for separating dust and similar unwanted debris adhering to particulate material and entrained therewith, said dedusting device comprising:

a series of chambers defining a substantially vertical feed path through which said particulate material falls by gravity, at least one of said chambers being a static electricity neutralization chamber having a linear kinetic cell surrounding a portion thereof; and

the next adjacent down stream chamber being a cleaning chamber having a perforate lower side and an open upper side and being provided with means to cause a gaseous fluid flow substantially transverse to the particulate material flow whereby the electrically neutralized dust and debris is separated from the remaining particulate material.

4,631,125

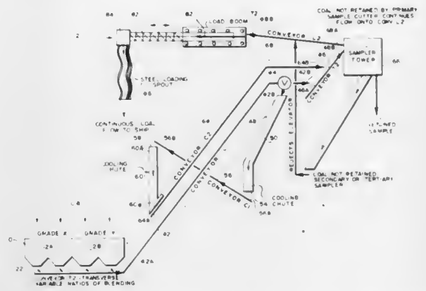
MIDSTREAM COAL HANDLING APPARATUS

Billy W. Parks, Mobile, Ala., assignor to Ryan-Walsh Stevedoring Company, Inc., New Orleans, La.

Filed Mar. 26, 1985, Ser. No. 716,346

Int. Cl.[4] B03C *1/00*

U.S. Cl. 209—215 7 Claims



1. An apparatus for the loading of coal upon ocean going vessels comprising:

barge means for supporting the apparatus upon a deck thereof;

receiving means mounted at a first level upon said barge for receiving coal;

continuous movement means mounted on said barge, connected to said receiving means, for establishing a flow of and raising said coal to a second, higher level;

means mounted on said barge for receiving said coal at said second level, adapted to divert said coal to a first or a second alternative flow path,

said first flow path being adapted to cool said coal and to convey said coal to said second flow path,

said second flow path being adapted to move said coal to a sampling position;

sampling means mounted on the barge at said sampling position for extracting a sample of said coal periodically from the flow; and

positionable means for receiving said flow of coal, adapted for delivering said flow of coal to a plurality of positions within an ocean going vessel.

4,631,126

FILTER INSERT SYSTEM

Robert C. Keith, Wellesley, Mass.; Teunis VandenBerg, Walnut, Calif.; Marshall C. Randolph, Wellesley, Mass.; Thomas B. Lewis, Mount Laurel, N.J., and Patrick J. Gillis, Jr., Stoughton, Mass., assignors to Vacco Industries, South El Monte, Calif.

Filed Oct. 25, 1982, Ser. No. 436,642

Int. Cl.[4] B01D *29/38*

U.S. Cl. 210—108 17 Claims

1. In a backflushable filter system, the improvement comprising:

a pressure vessel with an inlet and a waste outlet;

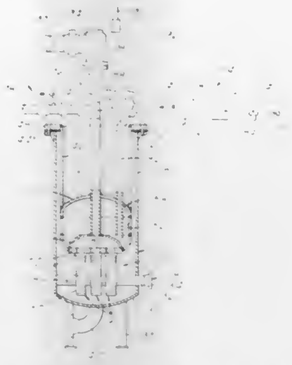
an accumulator chamber comprising a head that closes one side of said pressure vessel;

said accumulator chamber supporting a filter means within said pressure vessel on an inner end of said accumulator chamber;

first passage means defining a passage through said accumulator chamber in fluid communication with the interior of said vessel;

second passage means defining a passage for fluid communi-

cation between the interior of said accumulator chamber and said first passage means;



and a valve means for selectively opening or closing said second passage means.

4,631,127

MULTI-PURPOSE FILTER SYSTEM

Paul A. Condit, Sr., 10737 N. Autumnwood Way, The Woodlands, Tex. 77380

Continuation of Ser. No. 549,803, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 220,976, Dec. 29, 1980, abandoned. This application May 28, 1985, Ser. No. 737,739

Int. Cl.⁴ B01D *29/00*

U.S. Cl. 210—232 **32 Claims**



1. A multi-purpose filter system comprising:
a housing having an inlet for receiving fluid to be filtered and an outlet for removal of filtered fluid;
a filter element for filtering the fluid;
means for mounting the filter element in the housing between the inlet and the outlet; and
a tensioning support mounted within said housing;
a tensioning rod affixed to said tensioning support, said tensioning rod extending through said filter element;
adjustable engaging means attached to said tensioning rod for exerting force on said filter element parallel to the cylindrical axis of said filter element thereby placing said element in tension to prevent collapse or flutter of said filter element during operation.

4,631,128

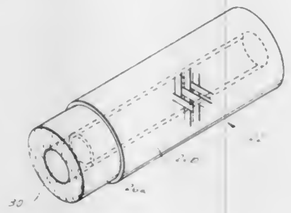
PERMSELECTIVE HOLLOW FIBER BUNDLE

Myron J. Coplan, Natick, and Fred Bilewski, Medway, both of Mass., assignors to Albany International Corporation, Menands, N.Y.

Continuation of Ser. No. 212,193, Dec. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 943,739, Sep. 19, 1978, abandoned. This application Jun. 6, 1983, Ser. No. 501,368

Int. Cl.⁴ B01D *31/00*

U.S. Cl. 210—321.5 **10 Claims**



1. In a bundle of permselective hollow fibers to be used in pressure driven separations wherein fiber length is controlled to avoid adverse permeability and selection capabilities the improvement consisting of a plurality of radially displaced annular lamellae of said bundle, each lamella comprising a plurality of wraps of helical segments of fiber in which adjacent helical fiber segments are positioned in helices of opposite hand, each said helical segment of fiber within a respective lamella lying at a radial position R_f substantially constant over a length of said bundle and with all wraps which comprise any given lamella incorporating helical segments each of whose radial position R_f may differ incrementally from one to another segment but with each segment having the same number of turns N per length D; N in each lamella being such that helix paths within each respective lamella are displaced circumferentially and successive traverses of common hand do not overlie one another and thereby substantially avoid helical ridges and each such value of N varies between successive lamellae of increasing median radius.

4,631,129

PRODUCTION OF PURE SUGARS AND LIGNOSULFONATES FROM SULFITE SPENT LIQUOR

Heikki Heikkila, Espoo, Finland, assignor to Suomen Sokeri Oy, Kantvik, Finland

Filed Oct. 4, 1985, Ser. No. 784,819

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—635 **9 Claims**



1. A process for the separation of sugars and lignosulfonates from sulfite spent liquor comprising the steps of:
(a) introducing sulfite spent liquor with a pH of 2.5 to 3.5 onto a chromatographic column containing a resin in metal salt form;
(b) eluting the sulfite spent liquor from the column with water to recover a substantially sugar-free lignosulphonate-rich fraction and a sugar-rich fraction;
(c) collecting the sugar-rich fraction for further purification;
(d) adjusting the pH of the sugar-rich material to between 5.5 and 6.5 and introducing the material onto a second chromatographic column containing a resin in monovalent salt form; and
(e) eluting the sugar-rich material from the second column with water, whereby a second sugar-rich fraction and a second lignosulfonate-rich fraction are formed.

4,631,130

PLASMA SEPARATOR

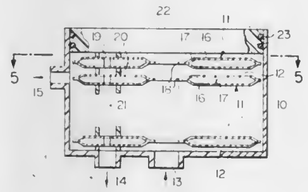
Masaharu Watanabe, Kawasaki, Japan, assignor to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 520,226, Aug. 4, 1983, abandoned, which is a continuation of Ser. No. 302,551, Sep. 16, 1981, abandoned. This application Oct. 29, 1985, Ser. No. 793,479

Claims priority, application Japan, Sep. 25, 1980, 55-133171; Sep. 26, 1980, 55-134102

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—651 **16 Claims**



1. A plasma separator comprising:
(a) a casing having a blood inlet port, a filtrate outlet port for recovering filtered plasma and a blood outlet port;
(b) a plurality of membrane units piled one above the other acting as filter means arranged within said casing, said membrane unit comprising a filter membrane and a core material superposed one upon the other such that said core material is wrapped in said filter membrane;
(c) a plurality of substantially flat blood channels which are formed between said membrane units and through which blood introduced said blood inlet port is continuously allowed to flow for plasma separation, said plurality of substantially flat blood channels each having a predetermined effective membrane area defined by a chanel width and a channel length, and a channel thickness;
(d) a plurality of plate-like spacers, each said spacer having no blood flow path formed therein and each said spacer being interposed between respective adjacent membrane units at a distance from adjacent membrane units and in a parallel relationship thereto, thereby defining said plurality of substantially flat blood channels between at least one spacer and said adjacent membrane units, said plurality of spacers each having two main surfaces and a number of small projections formed at both moain surfaces thereof;
(e) said filter membrane of said membrane unit comprising a microporous filter membrane having a pore size of 0.1 to 0.8μm, a thickness of from 100 to 300 μm and a porosity of from: 70 to 90%;
(f) said channel thickness of said plurality of substantially flat blood channels being within the range of from 50 to 150 μm;
(g) said channel width a (cm) of said plurality of substantially flat blood channels being so set as to satisfy the following relationship:

$$100 \leqq 6Q/ab^2 \leqq 1000\ (sec^{-1})$$

where Q denotes a blood flow rate (cm^3/sec) corresponding to 50 ml/min. to 500 ml/min., and b denotes said channel thickness; and
(h) said channel width, channel thickness and channel length being so predetermined as to set a pressure drop PD of blood between said blood inlet and outlet ports within the range in which the relation $0 < PD \leqq 0.4\ (Kg/cm^2)$ is held.

4,631,131

METHOD FOR INHIBITING SCALE

Dionisio G. Cuisia, Chicago, and Chih M. Hwa, Palatine, both of Ill., assignors to R. W. Grace & Co., New York, N.Y.

Division of Ser. No. 559,517, Dec. 8, 1983, Pat. No. 4,600,524. This application Sep. 10, 1985, Ser. No. 774,517

Int. Cl.⁴ C02F *5/14*

U.S. Cl. 210—697 **7 Claims**

1. A method for inhibiting formation of scale in an aqueous steam generating boiler system comprising a chemical treatment consisting essentially of adding to the water in the system scale inhibiting amounts of a composition comprising:
(1) a copolymer of maleic acid and allyl sulfonic acid or a water soluble salt thereof, said copolymer having a molecular weight of from about 800 to about 25,000 and an allyl sulfonic acid to maleic acid mole ratio of about 1:3 to 3:1; and
(2) from about 0.25 to about 4 parts by weight, per part by weight of said copolymer or copolymer salt, of hydroxyethylidene-1,1-diphosphonic acid or a water soluble salt thereof; and further adding to the water
(3) from about 500 to about 0.1 parts by weight, per part by weight of said copolymer or copolymer salt, of a water soluble sodium phosphate hardness precipitating agent.

4,631,132

WASTEWATER FLOCCULATING AGENT

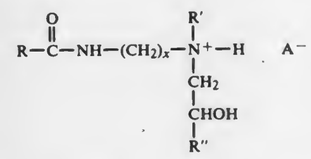
Larry D. Jones, Simpsonville, S.C., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 19, 1985, Ser. No. 757,215

Int. Cl.⁴ C02F *1/54*

U.S. Cl. 210—727 **11 Claims**

1. A process for treating wastewater containing an undesired level of suspended organic solids comprising polymeric latex wastes that have been precipitated and coagulated by the addition of an effective amount of lime and phosphoric acid, which comprises (a) adding to the wastewater, subsequent to precipitation and coagulation of said solids, an effective amount of a non-polymeric, cationic flocculating agent comprising a salt of a fatty acid aminoalkyl alkanolamide of the following general structure:



wherein R is a carbon chain of a fatty acid having from 14–22 carbon atoms,
R′ is H, or C_1–C_6 alkyl group,
R″ is H, or CH_3,
x is an integer of 1–6, and A is an anion,
(b) adding to the wastewater an effective amount of an anionic polymeric flocculant, thereby enhancing the flocculation of said precipitated and coagulated solids and thereafter (c) separating the flocculated solids from the water.

4,631,133

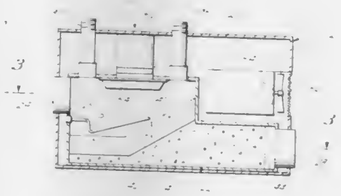
WASTE TREATMENT DEVICE AND METHOD USING MICROWAVES

Burton Axelrod, Girard, Pa., assignor to Axelrod R & D, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 649,939, Sep. 13, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 752,153

Int. Cl.[4] C02F *1/02, 1/30;* B01D *35/18;* F23G *7/04*

U.S. Cl. 210—739 15 Claims



1. A device for separating and disposing of solid waste material from sewage effluent, comprising:

a housing;

an inlet in the housing for introducing sewage effluent into the housing;

filter means disposed in the housing for receiving the sewage effluent introduced into the housing, said filter means having a portion transparent to microwaves and being operable for trapping a generally solid waste material component of the sewage effluent in the microwave transparent portion and passing therethrough a generally aqueous component;

an outlet in the housing for releasing said aqueous component from the housing;

means for incinerating said solid waste material component trapped in the microwave transparent portion of the filter means and operable for reducing said waste material component into an ash particulate, including,

microwave generator means oriented and operable for treating and dehydrating with microwaves the solid waste material trapped by said microwave transparent filter portion, and

heating element means for cooperating with the microwave generator means to incinerate the solid waste material component: and

means for removing the ash particulate from the housing.

9. A method of separating and disposing the solid waste material from sewage effluent, comprising the steps of:

introducing the sewage effluent to a filter media;

separating the sewage effluent into a waste material component suspended in the filter media and a generally aqueous component;

incinerating the waste material component suspended in the filter media into a generally ash particulate, including,

irradiating the waste material component suspended in the filter media with microwaves and heating the waste material component suspended in the filter media, whereby said irradiating and heating cooperate to burn the waste material component suspended in the filter media; and

removing the ash particulate from the filter media.

4,631,134

PROCESS FOR THE INTERMITTENT AERATION OF LIQUIDS AND AERATION DEVICE FOR USE IN SUCH PROCESS

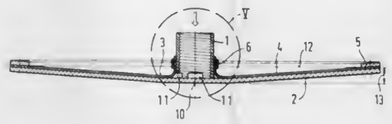
Karl H. Schüssler, Philipp-Reis-Strasse 16, D-6460 Gelnhausen, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,640

Claims priority, application European Pat. Off., Sep. 12, 1984, 84710032.8; Apr. 10, 1985, 85104359.6

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—758 17 Claims



1. A process for the intermittent aeration of a liquid such as waste water or the like medium in an aeration tank by means of an aeration device arranged below the surface of the liquid and comprising at least one supporting body having first perforations therein, an air-supply, and an elastic diaphragm covering the supporting body, said diaphragm being of air-tight material and having a second perforations in the form of punctures, slots or holes in parts thereof out of register with said first perforations, as well as a frame structure locking the supporting body in position, said supporting body being rigid, self-supporting and air being directed substantially vertically onto said supporting body in at least deflecting reach thereof, and substantially in the center of gravity thereof or in series along a gravity line, the air being deflected toward the periphery of said body, said periphery being disposed slightly higher vis-a-vis said center of gravity, said air then being passed between said diaphragm and said supporting body with decreasing pressure into the water to be aerated, in an aerating plane being inclined with regard to the water surface at an angle of up to $\pm 90°$ and is adapted to be swivelled for adjusting that angle.

4. A device for the intermittent aeration of a liquid in an aeration tank, comprising:

a rigid supporting body bearing an aeration face having first perforations therein, of random shape,

a diaphragm of air-tight material covering said supporting body and having a second perforations in parts thereof out of register with said first perforations,

a frame structure adapted for locking said supporting body in a chosen position in the aeration tank,

said supporting body having a center of gravity and a periphery being disposed slightly higher than said center of gravity, an air supply adapted for feeding air directed substantially vertically relative to said supporting body and substantially in the center of gravity thereof, so as to enter a deflecting zone adapted to direct said air toward said periphery and to pass said air between said diaphragm and said supporting body with decreasing pressure into the water to be aerated,

said aerating face extending in a plane being inclined with regard to the water surface at an angle of up to $\pm 90°$, and

swivelling means associated with said supporting body and adapted for swivelling said body to adjust said angle,

the static resistance of said supporting body being determined, besides the choice of material and the dimensionally of its thickness, by the magnitude of the displacement of the level thereof, situated at an angle of up to $\pm 90°$ between the deepest point or deepest limit in the center of gravity or on a gravity line, respectively, the inclination of said angle being determined by the cross-sectional area of said aeration face, leading from said deepest point or limit to said periphery.

4,631,135

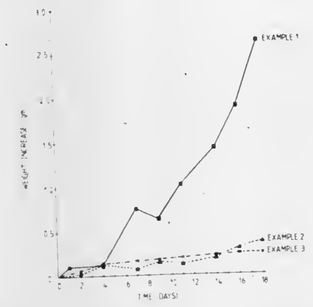
TREATING A MEDIUM

John E. Duddridge, Faringdon, and Christopher A. Kent, Stoke-on-Trent, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 9, 1985, Ser. No. 721,420

Int. Cl.[4] B01D *37/00*

U.S. Cl. 210—764 8 Claims



1. A method for the reduction or inhibition of biofouling of a part of a system which is subject to contact with a medium capable of causing biofouling by providing biological material which comprises contacting the medium with a support material so as to cause biological material to form on the support material in preference to the said part of the system.

4,631,136

NON-POLLUTING NON-TOXIC DRILLING FLUID COMPOSITIONS AND METHOD OF PREPARATION

Reed W. Jones, III, 1114 W. Hull St., Denison, Tex. 75020

Filed Feb. 15, 1985, Ser. No. 702,077

Int. Cl.[4] C09K *7/06*

U.S. Cl. 252—8.5 M 6 Claims

1. The process for the preparation of a non-polluting non-toxic plant or vegetable oil base drilling fluid composition comprising the steps of:

(a) introducing a plant or vegetable base oil having a C-12 to C-24 carbon chain into a mixing container,

(b) adding a minor amount of antioxidant to said base oil,

(c) adding a minor amount of a synergist for said antioxidant, said synergist being selected from the group consisting of citric acid, ascorbic acid, phosphoric acid, monoesters of ascorbic acid and monoesters of fatty acids, to said base oil,

(d) heating the said base oil including said antioxidants to a temperature of about 93° C. (200° F.),

(e) introducing a minor amount of an oleate ester emulsifier into said base oil with thorough mixing,

(f) adding a minor amount of viscosifier consisting of amine-treated bentonite into said mixture with thorough mixing,

(g) introducing a minor amount of an oleate ester wetting agent into said mixture with thorough mixing,

(h) shear mixing of the mixture for a period of not less than about 30 minutes to effect more thorough mixing to form a stable emulsion, and

optionally (i) adding a finely-divided filler material into said mixture with thorough mixing to form a stable oil base drilling fluid composition having a low coefficient of friction less than about 0.15 for varied drilling purposes.

4,631,137

MATERIALS FOR USE IN DRILLING FLUIDS

Brian Dymond, Bradford, England, assignor to Allied Colloids Ltd., England

Filed Oct. 30, 1984, Ser. No. 666,412

Claims priority, application United Kingdom, Nov. 2, 1983, 8329249

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 12 Claims

1. A composition comprising a blend of (a) a low molecular weight, water soluble non-ionic or anionic polymer having a molecular weight of about 1,000 to about 20,000 and formed from 0 to 100% acrylamide and 100 to 0% anionic monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, allyl sulfonate and 2-acrylamido-2-methyl propane sulphonic acid and (b) a high molecular weight, water soluble, polymer having molecular weight of at least about 1 million and formed from polymerisable monomers of which 0 to 70% by weight are acrylamide and 30 to 100% by weight are selected from acrylic acid, allyl sulphonate and 2-acrylamido-2-methyl propane sulphonic acid, said blend being substantially free of polymer of molecular weight 50,000 to 500,000, and wherein the weight ratio of low molecular weight polymer:high molecular weight polymer is about 10:1 to 1:5.

4,631,138

CORROSION INHIBITORS

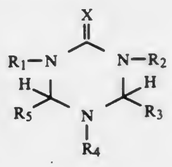
Marshall E. Johns, Creve Coeur; Keith D. Strassner, and Thomas G. Braga, both of St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 7, 1985, Ser. No. 699,390

Int. Cl.[4] C23F *11/04, 11/14, 11/16*

U.S. Cl. 252—8.555 13 Claims

1. Method of inhibiting corrosion of ferrous metals in oil and gas well drilling and production systems comprising adding to said systems an effective corrosion inhibiting amount of a composition comprising a solution, dispersion or emulsion of a compound selected from the group consisting of compounds represented by the formula



wherein X represents oxygen or sulfur, R_1 and R_2 are the same or different and R_3 and R_5 are the same and represent hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkaryl and heterocyclyl, R_4 represents an organic radical, and the acid salts and quaternary ammonium salts thereof.

4,631,139

CORROSION INHIBITING METAL WORKING FLUID

James R. Burton, Groves, and David J. Kushner, Beaumont, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,504

Int. Cl.[4] C10M *173/00*

U.S. Cl. 252—49.3 18 Claims

1. A water-base composition which is non corroding to metals in contact therewith comprising an effective corrosion inhibiting amount of a concentrate comprising:

A. 2-heptyl-1-ethoxypropionic acid imidazoline, sodium salt in an amount of at least about 2 wt %;

B. a free amine selected from the group consisting of diethanolamine, triethanolamine and mixtures thereof in an amount of about 20 to 27 wt %; and

C. an amine salt of a dicarboxylic acid selected from the group consisting of the diethanolamine and triethanol-

amine salts of a C_8 to C_{14} dicarboxylic acid and mixtures thereof in an amount such that the weight ratio of amine salt to free amine is about 3:8 to 5:8.

4,631,140

FERRIMAGNETIC PARTICLES AND THEIR PREPARATION

Werner Steck, Ludwigshafen, and Helmut Jakusch, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 15, 1985, Ser. No. 787,086

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438093

Int. Cl.⁴ C01G *49/08*

U.S. Cl. 252—62.56 **3 Claims**

1. Ferrimagnetic particles which are useful as magnetic material for magnetic recording media, which particles comprise a core of a magnetic material exhibiting multiaxial anisotropy and consisting essentially of a ferrimagnetic FeO_x which which is doped uniformly throughout its volume with cobalt(II) ions and in which x is from 1.33 to 1.50, and of a magnetic coating which surrounds the core, possesses uniaxial anisotropy, and consists essentially of Co(II), Fe(II), Fe(III) and oxygen.

4,631,141

ACTIVATION

Paul L. Baxter, Cheshire, England, assignor to Interox Chemicals Limited, London, England

Filed Jan. 16, 1986, Ser. No. 819,276

Claims priority, application United Kingdom, Jan. 30, 1985, 8502374

Int. Cl.⁴ C11D *7/20*

U.S. Cl. 252—95 **25 Claims**

1. A bleach composition comprising a particulate mixture of a hydrogen peroxide-developing persalt and an insoluble mixed oxide of calcium, barium or strontium and manganese.

4,631,142

DIPHOSPHONIC EXTRACTANTS

Georges Sturtz, Brest, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Division of Ser. No. 166,363, Jul. 7, 1980, Pat. No. 4,460,548. This application Oct. 11, 1983, Ser. No. 540,842

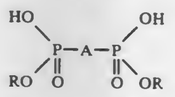
Claims priority, application France, Jul. 9, 1979, 79 17736

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

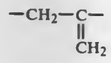
Int. Cl.⁴ C01B *31/16;* **C07F** *9/28*

U.S. Cl. 252—184 **7 Claims**

1. A composition for the extraction of a metal from an aqueous solution comprising an organic liquid containing 1 to 30% by weight of a diphosphonic diacid diester of the formula



in which A is a grouping selected from the group consisting of



and $-CH_2-CH=\overset{}{C}H-$ and R is a C_6 to C_{18} alkyl.

4,631,143

TRIPHENYLENE DERIVATIVES

Klaus Praefcke; Bernd Kohne; Wadi Poules, all of Berlin, and Eike Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

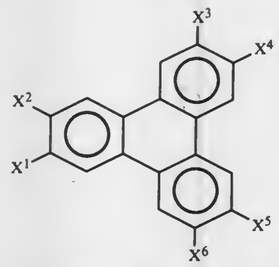
Filed Dec. 21, 1984, Ser. No. 685,084

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346980; Jul. 10, 1984, 3425261

Int. Cl.⁴ C09K *3/34;* **C07C** *149/30, 149/34, 149/31, 149/415, 147/06, 147/08, 147/14*

U.S. Cl. 252—299.62 **19 Claims**

1. A triphenylene of the formula



wherein X^1 to X^6 are each —SH, —SR, —SOR, $-SO_2R$ or —S—COR, and each R is alkyl of up to 20 C atoms, or such an alkyl group wherein one or two CH_2 groups not bound to S are replaced by O atoms and/or vinylene or vinylidene groups or vinylene or vinylidene groups substituted by F, Cl, or CN, the total number of C atoms being up to 20 in all cases, and O atoms being non-adjacent

the X-substitution being hexakis and saturated, or pentakis and saturated with the sixth X being unsaturated.

16. A discotic liquid-crystalline phase comprising at least two liquid-crystalline components, wherein at least one component is a triphenylene derivative of claim 1.

4,631,144

ALUMINATE PHOSPHOR

William W. Beers, Lyndhurst, and Thomas G. Parham, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,858

Int. Cl.⁴ C09K *11/475*

U.S. Cl. 252—301.4 R **10 Claims**

1. A fluorescent lamp phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_zAl_{11}O_{19}$$

wherein

La is an optional constituent and x is in an amount up to about 0.50,

y is in the range from about 0.20 up to about 0.50, and

z is in the range from about 0.60 up to about 0.87,

said crystals having a median particle size of about 5.0 microns diameter and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402 in a low pressure mercury vapor discharge lamp.

4,631,145

DEFOAMER AND ANTIFOAMER COMPOSITION AND METHOD FOR DEFOAMING AQUEOUS FLUID SYSTEMS

Craig Zychal, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 467,335, Feb. 17, 1983, abandoned. This application May 22, 1984, Ser. No. 612,871

Int. Cl.⁴ B01D *19/04*

U.S. Cl. 252—321 **24 Claims**

1. A defoamer and antifoamer composition for use in aqueous fluid systems used in the drilling and maintenance of oil and gas wells consisting essentially of (1) a high-boiling mixture comprising ethers, alcohols, esters and aldehydes containing at least 40 wt % components having from 6 to 12 carbon atoms and (2) a fatty acid ester, wherein said high-boiling mixture is present in an amount within the range of about 50 wt % to about 90 wt % and said fatty acid ester is present in an amount within the range of about 10 wt % to about 50 wt %.

14. A method for defoaming an aqueous fluid system used in the drilling and maintenance of oil and gas wells and preventing the formation of foam in said system, which method comprises adding to said system an effective defoaming and antifoaming amount of a composition consisting essentially of (1) a high-boiling mixture comprising ethers, alcohols, esters and aldehydes and (2) a fatty acid ester, said high-boiling mixture being present in an amount within the range of about 50 wt % to about 90 wt % and said fatty acid ester being present in an amount within the range of about 10 wt % to about 50 wt %.

4,631,146

ALPHA-TERTIARY DIMETHYLACETALS AND THEIR USE AS FRAGRANT SUBSTANCES

Helmut Gebauer, and Marlies Regiert, both of Munich, Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 639,498, Aug. 10, 1984, abandoned. This application Feb. 19, 1986, Ser. No. 831,156

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341605

Int. Cl.⁴ C07C *43/303;* **C11D** *3/50, 9/44;* **C11B** *9/00*

U.S. Cl. 252—522 R **7 Claims**

1. An α-tertiary dimethylacetal selected from the group consisting of 1,1-dimethoxy-2,5-dimethyl-2-vinyl-4-hexene, 1,1-dimethoxy-2,2,5-trimethyl-4-hexene and 1,1-dimethoxy-2,2-dimethyl-3-phenyl-propane.

4. A perfumery preparation comprising an effective amount of a compound according to claim 1, as the sole fragrance-imparting substance.

4,631,147

CYCLOALKAN-1-OL DERIVATIVES AND PERFUME COMPOSITIONS COMPRISING THE SAME

Kiyoshi Matsumoto; Yoshiaki Fujikura, both of Utsunomiya, and Motoki Nakajima, Miyashitomachi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

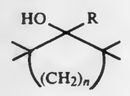
Filed Feb. 6, 1986, Ser. No. 826,905

Claims priority, application Japan, Feb. 18, 1985, 60-30049; Oct. 14, 1985, 60-228439

Int. Cl.⁴ C11B *9/00;* **C07C** *35/20;* **A61K** *7/46*

U.S. Cl. 252—522 R **2 Claims**

1. A cycloalkan-1-ol derivative of the following formula (I)



(I)

in which R represents a hydrogen atom, lower alkyl group or allyl group, and n is an integer of 3 or 4 provided that when n is 3, R is not a hydrogen atom or lower alkyl group.

4,631,148

FLAME RETARDANT ALLYLIC ESTERS OF TETRABROMOPHTHALIC ACID AND FLAME RETARDANT POLYMERS CONTAINING SAME

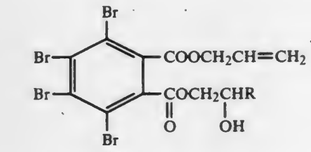
Diza P. Braksmayer, Cranbury; Fui-Tseng H. Lee, Princeton, and Fred R. Scholer, East Windsor, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 15, 1985, Ser. No. 712,060

Int. Cl.⁴ C09K *21/00;* **C07C** *69/76, 69/80*

U.S. Cl. 252—609 **6 Claims**

3. A flame retardant thermosetting composition comprising a copolymer of an ethylenically unsaturated component capable of further polymerization to the thermoset stage with an allylic flame retardant compound of the formula:



wherein R is an aliphatic group of 1 to 10 carbon atoms.

4,631,149

ANTIVIRAL EUDISTOMINS FROM A MARINE TUNICATE

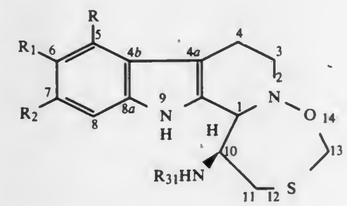
Kenneth L. Rinehart, Jr., Champaign County, Ill.; Gary C. Harbour, Texas Township, Kalamazoo County, Mich., and Jun'ichi Kobayashi, Tokyo, Japan, assignors to University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 517,117, Jul. 25, 1983, abandoned. This application Feb. 9, 1984, Ser. No. 578,443

Int. Cl.⁴ C07D *515/14;* **A61K** *31/39*

U.S. Cl. 540—546 **1 Claim**

1. A compound selected from the group consisting of eudistomins C, E, K, L, F, and the acylates of C and E having the formula II:



II

wherein the variables for each eudistomin are defined as follows:

Eudistomin	R	R_1	R_2	R_{31}
C	H	OH	Br	H
E	Br	OH	H	H
K	H	H	Br	H
L	H	Br	H	H
F	H	OH	Br	$-COCH_2OH$
C (diacetyl)	H	$-OCOCH_3$	Br	$-COCH_3$
E (diacetyl)	Br	$-OCOCH_3$	H	$-COCH_3$

or other carboxylic acylates or pharmaceutically acceptable salts.

4,631,150

PROCESS FOR THE PREPARATION OF PENEMS

Carlo Battistini, Novate Milanese; Maurizio Foglio, Milan; Giovanni Franceschi, Milan, and Cosimo Scarafile, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

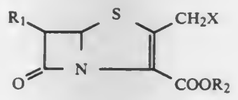
Filed Aug. 6, 1984, Ser. No. 637,878

Claims priority, application United Kingdom, Aug. 11, 1983, 8321677

Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 540—310 **9 Claims**

1. A process for the preparation of a compound of the formula:



(I)

wherein

R_1 represents an organic group selected from the group consisting of a C_1 to C_{12} aliphatic hydrocarbon group, a substituted C_1 to C_{12} aliphatic hydrocarbon group substituted with at least one of hydroxy, amino, cyano, or mercapto; a C_4 to C_7 monocycloalkyl group, a substituted C_4 to C_7 monocycloalkyl group substituted with at least one of hydroxy, amino, cyano, mercapto, or C_1 to C_6 alkyl; phenyl; and substituted phenyl substituted with at least one of hydroxy, amino, cyano, mercapto, or C_1 to C_6 alkyl,

R_2 represents a hydrogen atom or a carboxy-protecting group, and

X represents:

(i) an optionally-protected hydroxy group,

(ii) a halogen atom,

(iii) an azido group,

(iv) a pyridyl group which is unsubstituted or substituted by carbamoyl groups,

(v) a formyloxy group, an unsubstituted acyloxy group having from 2 to 6 carbon atoms, or an acyloxy group having from 2 to 6 carbon atoms, being substituted by one or more halogen atoms, acyl groups having from 2 to 6 carbon atoms, amino, hydroxy, or mercapto groups, the amino, hydroxy or mercapto groups being free or protected,

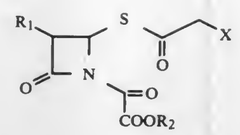
(vi) a carbamoyloxy or N-alkyl-carbamoyloxy group,

(vii) an alkoxy or alkylthio group, each of which has from 1 to 12 carbon atoms and is unsubstituted or substituted by one or more halogen atoms, formyl groups, acyl groups having from 2 to 6 carbon atoms, amino, hydroxy, or mercapto groups, the amino, mercapto, or hydroxy groups being free or protected,

(viii) a triarylmethylthio group, or

(ix) a heterocyclylthio group, wherein the heterocycle is a pentatomic or hexatomic heteromonocyclic ring, containing at least one double bond and at least one heteroatom selected from N, S, and O, unsubstituted or substituted by one or more substituents or a heterobicyclic ring, containing at least two double bonds wherein each of the condensed heteromonocyclic rings, being the same or different, is a pentatomic or hexatomic heteromonocyclic ring containing at least one heteroatom selected from N, S, and O, said heterobicyclic ring being unsubstituted or substituted by one or more substituents,

which comprises the steps of reacting an azetidinone derivative of the formula



(II)

wherein R_1, R_2, and X are as above defined

with up to 2 mole equivalents of a trivalent organophosphorous compound wherein said organophosphorous compound is selected from the group consisting of a cyclic trialkylphosphite, and acyclictrialkylphosphite, a triarylphosphite, a mixed arylphosphite, and phosphoramide

in an inert solvent

at a temperature of from 110° to 150° C. for a period of at least 2 hours or more.

4,631,151

METHOD FOR PRODUCTION OF FLUORINE-CONTAINING AROMATIC DERIVATIVE

Michio Kobayashi; Masato Yoshida, both of Tokyo; Hideo Sawada, Aichi; Hidehiko Hagii, Aichi, and Kazuyoshi Aoshima, Aichi, all of Japan, assignors to Nippon Oil & Fars Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,632

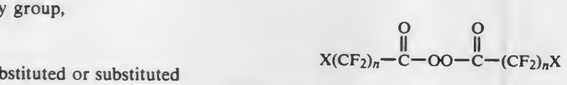
Claims priority, application Japan, Feb. 27, 1984, 59-34400

Int. Cl.[4] C09F *7/00;* **C07C** *19/08*

U.S. Cl. 260—408 **14 Claims**

1. A method for the production of a fluorine-containing derivative of an aromatic compound by introducing an $X(CF_2)_n$—group, wherein X is fluorine, chlorine or hydrogen and n is an integer having a vlaue of 1 to 10, into an aromatic ring of the aromatic compound, which comprises the steps of:

reacting a de(haloacyl)peroxide represented by the general formula:



wherein X and n are as defined above with an aromatic compound selected from the group consisting of (a) benzene, (b) a mono-substituted benzene in which the substituent is a member selected from the group consisting of halogen, alkyl, nitro, ester and alkoxy groups, (c) naphthalene and (d) a monohalo-substituted naphthalene at a temperature 0° to 50° C. at a molar ratio of said di(-haloacyl)peroixde to said aromatic compound in the range of 1:2 to 10; and

refining the reaction products to obtain a fluorine-containing derivative of the aromatic compound having the $X(CF_2)_n$—group introduced into the aromatic ring thereof.

4,631,152

HUMIDIFIER

Tetsuei Uchida; Tsutomu Uchida; Nobuo Tsuchida, and Susumu Kazama, all of Sanjo, Japan, assignors to Uchida Manufacturing Co., Niigata, Japan

Filed Oct. 21, 1985, Ser. No. 789,763

Claims priority, application Japan, Mar. 6, 1985, 60-32446[U]

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—4 **4 Claims**

1. A humidifier comprising:

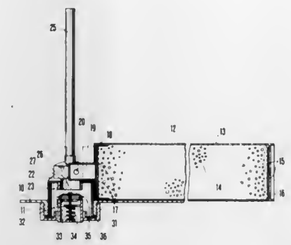
a closed water tank detachably mounted on the body of the humidifier;

a demineralizer having a container containing ion-exchange resin;

an air exchange pipe for introducing the outside air;

the water tank having a water supply port through which the demineralizer and the air exchange pipe can be inserted into the water tank;

a housing disposed below the container of the demineralizer and defining a chamber, one hollow end of the container



of the demineralizer being rotatably connected to the chamber such that the container is in communication with the chamber; and

a resilient means for always causing the container of the demineralizer to lie on its side.

4,631,153

THROTTLE CONTROL DEVICE FOR GENERAL PURPOSE ENGINE

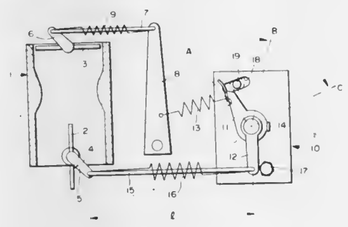
Shinichi Tamba, Kakogawa; Toru Ogino, Kobe, and Noboru Fukui, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 645,173, Aug. 28, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,328

Claims priority, application Japan, Sep. 6, 1983, 58-163893

Int. Cl.[4] F02M *3/06*

U.S. Cl. 261—52 **3 Claims**



1. Throttle control device for the general purpose engine comprising;

a throttle lever pivotally supported on a control panel and connected with a throttle valve of a carburetor through a throttle link, a governor arm and a spring;

a choke lever pivotally supported on said control panel and connected with a choke valve of said carburetor through a choke link;

a fastening bolt attached to the control panel on a line extending through the choke link;

said control panel being rotatable around said fastening bolt; and

said choke lever being rotatable with said throttle lever in a predetermined timing.

4,631,154

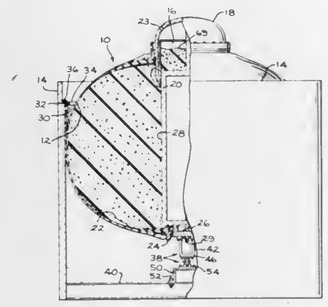
METHOD OF CONSTRUCTING A DOME RESTRAINT ASSEMBLY FOR ROCKET MOTORS

Peter F. O'Driscoll, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 586,952, Mar. 7, 1984, Pat. No. 4,577,542. This application Dec. 6, 1985, Ser. No. 805,680

Int. Cl.[4] C06B *21/00*

U.S. Cl. 264—3.1 **8 Claims**



1. A method for improving the bond between a cured solid propellant in a rocket motor and a dome portion of the case of said motor, the steps of which comprise:

providing a substantially rigid base fur supporting said case of said motor;

attaching an adjustable restraint assembly between said dome portion and said rigid base;

loosening said restraint assembly prior to loading said case of said motor with uncured propellant to permit maximum downward deflection of said dome portion after said uncured propellant is loaded in said case of said motor but before maximum curing pressure is applied to the propellant in said case of said motor;

loading said case of said motor with uncured propellant;

expanding said restraint assembly between said dome portion and said base to a maximum extent without producing upward deflection or horizontal twisting of said dome portion;

pressurizing said propellant in said case of said motor to a maximum predetermined curing pressure level;

compressing said restraint assembly to produce a net downward deflection of said dome portion essentially equal to the amount of shrinkage of said propellant upwardly away from said dome portion anticipated as a result of the curing of said propellant; and thereafter

expanding said restraint assembly in increments in at least two separate steps at different times during the propellant curing process to permit said dome portion to deflect upwardly toward said propellant to a normal position wherein no downward deflection of said dome portion is produced by said restraint assembly.

4,631,155

PROCESS FOR MANUFACTURE OF SURFACE-MODIFIED ORIENTED POLYMERIC FILM

R. Scott Caines, Taylors, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Feb. 1, 1985, Ser. No. 697,313

Int. Cl.[4] B29C *17/02*

U.S. Cl. 264—22 **11 Claims**

1. A process for surface modification of oriented, thermoplastic polymeric film comprising subjecting at least one surface of said polymeric film to a short pulse of electromagnetic radiation possessing sufficient intensity to enhance the heat seal adhesion of said film without substantially decreasing the ten-

sile strength of the film, wherein only selected areas or strips of the film surface are subjected to said short pulse of electromagnetic radiation.

4,631,156

SYSTEM AND METHOD OF PARTICULATING 4,4' METHYLENEBIS (2-CHLOROANILINE)

Blair H. Hills, Whitehall, and Vincent J. Crispino, Big Rapids, both of Mich., assignors to Bofors Nobel, Inc., Muskegon, Mich.

Filed Jul. 27, 1984, Ser. No. 634,991
Int. Cl.[4] B02B *5/02;* **C22B** *1/24;* **B01J** *2/16*
U.S. Cl. 264—37 **45 Claims**

1. A method of producing a MBOCA product having granules substantially all of a desired size, said method comprising:
agglomerating MBOCA in an enclosed agglomeration means to produce granular MBOCA and incidentally producing MBOCA dust;
circulating an enclosed gaseous stream through the agglomeration means to carry away the heat of fusion and MBOCA dust;
cooling the gaseous stream;
removing MBOCA dust from the gaseous stream; and
classifying the granulated MBOCA to separate the MBOCA product having granules of a desired size from granules having an undesired size.

4,631,157

PRODUCTION OF PERMEABLE CELLULOSE TRIACETATE MEMBRANES

Bruce M. Johnson, Bend, Oreg., assignor to Bend Research, Inc., Bend, Oreg.

Filed Sep. 16, 1985, Ser. No. 776,522
Int. Cl.[4] B29C *67/20;* **B29K** *1/00*
U.S. Cl. 264—41 **6 Claims**

1. A method for the preparation of porous cellulose triacetate membranes comprising:
(a) preparing a casting solution by dissolving from 1.25 wt% to 20 wt% cellulose triacetate in a solvent mixture comprising cyclohexanone and methylene chloride in a weight ratio of from 4:1 to 1:4;
(b) casting a film from said casting solution;
(c) immersing said cast film in a methanol bath at −30° C. to +25° C. to precipitate a membrane; and
(d) recovering said membrane.

4,631,158

SHAPED ARTICLES OF SILICATE MATERIAL, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Hans-Peter Rieck, Hofheim am Taunus; Martin Schott, Steinbach, and Jürgen Russow, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,562
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440252
Int. Cl.[4] B29C *27/60*
U.S. Cl. 264—43 **21 Claims**

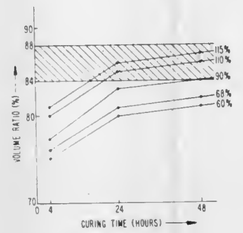
1. A process for the preparation of shaped articles of silicate material, which comprises shaping a pulverulent layered silicic acid of the formula $H_2Si_yO_{2y+1}$, in which y is a number from 1.7 to 24, or a salt thereof, in which all or some of H is replaced by at least one cation from the group comprising Li^+, Na^+, K^+, NH_4^+, Ca^{2+}, Cu^{2+}, Ni^{2+} and Mg^{2+}, into pieces and heating the pieces under conditions such that the starting material is chiefly converted into cristobalite and/or tridymite.

4,631,159

METHOD OF AGING EXPANSION-MOLDED BODY OF POLYOLEFIN

Hirofumi Maeda, Takatsuki; Kazuyoshi Watanabe; Naruhiko Akamatsu, both of Settsu; Kenichi Senda, Hirakata, and Shunichi Nishioka, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1984, Ser. No. 676,180
Int. Cl.[4] C08J *9/22, 3/24*
U.S. Cl. 264—53 **6 Claims**



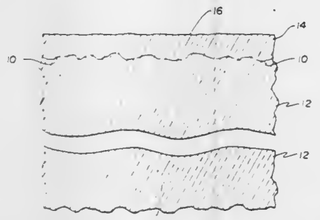
1. A method of aging an expansion-molded body of polyolefin prepared by heating the pre-expanded polyolefin particles filled in a mold which comprises cooling the molded body in the mold within the extent that the molded body in the mold is not substantially smaller than the volume of the mold cavity and is temporarily expandable after being removed from the cavity to not more than 110% relative to the volume of the mold cavity, removing the molded body from the mold, placing the molded body into an atmosphere substantially under atmospheric pressure having a temperature 25° to 55° C. lower than the melting point of the base polyolefin resin while the volume of the molded body is 70 to 110% relative to the volume of the mold cavity, and holding the molded body in the atmosphere until the temperature of the molded body at least equilibriates with the temperature of the atmosphere.

4,631,160

METHOD OF MANUFACTURING CERAMIC SUBSTRATE FOR FINE-LINE ELECTRICAL CIRCUITRY

Richard A. Langman, Lakewood; Donald R. Giovanini, Arvada, and Michael P. Letzig, Broomfield, all of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Division of Ser. No. 216,397, Dec. 15, 1980, Pat. No. 4,340,635.
This application Nov. 4, 1981, Ser. No. 318,289
Int. Cl.[4] C04B *33/32*
U.S. Cl. 264—62 **9 Claims**



1. A method for making a sintered monolithic ceramic substrate for fine-line electrical circuitry comprising:
(1) forming a raw ceramic batch containing as its ceramic ingredients at least 90% by weight particulate crystalline material selected from the group consisting of alumina and beryllia;
(2) forming said raw batch into a plate;
(3) firing said plate to sintering temperature thereby to form a sintered plate;

(4) coating a surface of the plate with a thin layer of ceramic containing as its ceramic ingredients at least 90% by weight particulate crystalline material substantially all of which is the same as that used in the raw batch for said plate but the average particle size of which is less than that of the crystalline material used in said raw batch for said plate; and
(5) firing said plate to sinter said layer.

4,631,161

CONTINUOUS MOLDING METHOD

Anatoliy Popow, 6009 S. Rte 31, Crystal Lake, Ill. 60014

Division of Ser. No. 458,787, Jan. 18, 1983, Pat. No. 4,497,619.
This application Feb. 1, 1985, Ser. No. 697,203
Int. Cl.[4] B29C *47/32*
U.S. Cl. 264—167 **10 Claims**



1. A continuous molding method comprising the steps of molding products between complementary molding surfaces at least one of which is continuously moving relative to the other, at least one of said complementary molding surfaces also being configured to form a series of discrete molded products, forcing molding material in a moldable condition between the complementary molding surfaces, and continuous sliding sealing of the molding material in a molding material chamber around each of the discrete products to be molded by the complementary molding surfaces while forming continuous predetermined molding material pressure, temperature and confinement in the molding material chamber around each of the discrete products to be molded during the molding operation.

4,631,162

PROCESS FOR PRODUCING A HOLLOW IRREGULAR MULTIFILAMENT YARN

Masato Yoshimoto, and Shinji Ohwaki, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 692,386, Jan. 17, 1985, Pat. No. 4,546,043.
This application Jun. 14, 1985, Ser. No. 745,268
Claims priority, application Japan, Jan. 18, 1984, 59-5699; Feb. 29, 1984, 59-36097
Int. Cl.[4] D01D *5/20*
U.S. Cl. 264—167 **10 Claims**

1. A process for producing a hollow, irregular, multifilament, synthetic polymer yarn capable of being converted to a bulky yarn, comprising a plurality of hollow irregular individual filaments, each of which filaments comprises:
(1) a hollow filamentary constituent having at least one hollow extending along the longitudinal axis of the filament;
(2) a non-hollow sinuous filamentary constituent sinuously extending in a wave form along the hollow filamentary constituent (1) and having an average thickness smaller than that of the hollow filamentary constituent (1); and
(3) a middle filamentary constituent distortedly extending along the hollow filamentary constituent (1) and connecting therethrough the non-hollow sinuous filamentary constituent (2) to one side of the hollow filamentary constituent (1) to provide a hollow irregular filament having a thickness varying along the longitudinal axis of the filament, and having a cross-sectional profile in the form of a waist formed between the hollow filamentary constituent (1) and the non-hollow sinuous filamentary constituent (2), said process comprising the steps of:
(A) extruding at least one fiber-forming polymer melt through a spinneret having a plurality of spinning orifices, in each of which orifices, (a) a polymer melt is extruded through a first orifice segment adequate for forming a hollow filament at a first extruding rate to form a hollow filamentary stream constituent; (b) a polymer melt is extruded through a second orifice segment adequate for



forming a non-hollow filament at a second extruding rate larger than the first extruding rate to form a non-hollow filamentary stream constituent, the first orifice segment having a size larger than that of the second orifice segment; and (c) at least one polymer melt is extruded through a third orifice segment which is in the form of a thin slit and through which the first orifice segment is connected to the second orifice segment to form the orifice body, to form a middle filamentary stream constituent, whereby the non-hollow filamentary stream constituent is caused to sinuously travel in a wave form connected to one side of the hollow filamentary stream constituent through the middle filamentary stream constituent to form a hollow irregular filamentary stream;
(B) cool-solidifying the resultant hollow irregular filamentary streams; and
(C) taking up the resultant hollow irregular filaments.

4,631,163

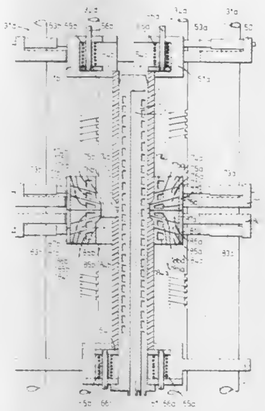
METHOD FOR PRODUCING A TUBULAR OBJECT OF POLYETHYLENE TEREPHALATE OR SIMILAR THERMOPLASTIC MATERIAL FROM A TUBULAR BLANK OF AMORPHOUS MATERIAL

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM AB, Malmo, Sweden

Division of Ser. No. 489,750, Apr. 29, 1983, Pat. No. 4,580,968, which is a division of Ser. No. 264,665, May 18, 1981, Pat. No. 4,405,548. This application Dec. 9, 1983, Ser. No. 559,666
Claims priority, application Sweden, May 29, 1980, 8004003
Int. Cl.[4] B29C *55/00*
U.S. Cl. 264—291 **25 Claims**

1. A method of forming a container body of plastic material comprising providing an elongated, tubular element of orientable plastic material, said tubular element having a wall of given thickness, engaging the wall over a portion of the thickness thereof with an annular shaping element, the engagement of the wall by the annular shaping element being continuous, applying axial force to said wall over an annular region corresponding to said portion of said thickness engaged by said shaping element, relatively displacing said elements axially of said tubular element to reduce the thickness of the tubular element substantially by the amount of said portion engaged by the shaping element while elongating said tubular element to produce crystallization of the material of the elongated element substantially with monoaxial orientation, said shaping

element being in contact with and forming a bearing surface against the plastic material in a transitional zone between the original wall thickness and the reduced wall thickness of the tubular element, and controlling the temperature of said material during thickness reduction thereof to provide a determined



temperature of the material in said transitional zone during the thickness reduction and while elongating the tubular element the combination of the elongation of the tubular element by axial movement of said transitional zone with concurrent temperature control at said transitional zone producing said crystallization with substantially monoaxial orientation.

4,631,164

NUCLEAR POWER STATION WITH A CONTAINMENT

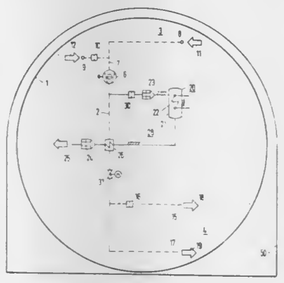
Reinhard Heck, Hanau, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Continuation of Ser. No. 426,725, Sep. 29, 1982, abandoned. This application Mar. 6, 1985, Ser. No. 708,372

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143989

Int. Cl.⁴ G21C *9/00*

U.S. Cl. 376—300 **4 Claims**



1. Nuclear power station, comprising a reactor building for housing personnel during operation of the station, a containment inside said building for enclosing radioactive components having a given height and upper and lower parts, at least one pipeline being extended in vertical direction in said containment over at least half of said given height thereof from said upper part to said lower part of said containment for mixing a gas atmosphere in said containment, said at least one pipeline having an open top and bottom and an outlet in said lower part of said containment, a transporting device for mixing the gas atmosphere in said containment in the form of a blower connected in said at least one pipeline for transporting gas from said upper part to said lower part of said containment in said at least one pipeline, a recombination device in said containment having an inlet connected downstream of said blower in said at least one pipeline and an outlet for shunting said outlet of said at least one pipeline in said lower part and for targeted oxidation of free hydrogen within said containment, a heat exchanger having a primary side with a primary inlet connected to said outlet of said recombination device and a primary outlet for cooled gas, means for venting said cooled gas into said containment, said heat exchanger having a secondary side connected downstream of said inlet to said recombination device in said at least one pipeline leading to said outlet of said at least one pipeline and being shunted by said recombination device, and flame arrestors disposed upstream and downstream of said recombination device.

4,631,165

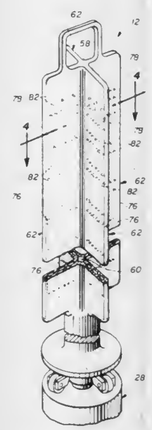
BOILING WATER REACTOR CONTROL ROD

John F. Wilson, and Pratap K. Doshi, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1984, Ser. No. 637,183

Int. Cl.⁴ G21C *7/10*

U.S. Cl. 376—333 **7 Claims**



1. In a control rod for a boiling water type nuclear power reactor, the improvement comprising:

(a) an elongated central stem defining a longitudinally extending internal central gas plenum;

(b) a plurality of blades connected to and extending along and radially outward from said stem, each said blade including an elongated body portion extending along said stem and terminating in an end tip portion;

(c) means defining a series of internal cavities in each of said blades, said cavities being arranged in columns and rows across the length and width of said body and tip portions of said blade;

(d) a plurality of pellets of neutron absorbing material, each disposed within one of said cavities with each of said cavities being oversized in relation to the size of said pellet disposed therein to allow extra space for swelling of said pellet, said cavities and said pellets disposed therein being arranged to define a longer, constant worth section generally coextensive with said body portion of said blade and a shorter, reduced worth section generally coextensive with said end tip portion of said blade; and

(e) means defined within each blade communicating each of said cavities with said central gas plenum for allowing any gases generated by irradiation of said pellets to expand from said cavities into said plenum.

4,631,166

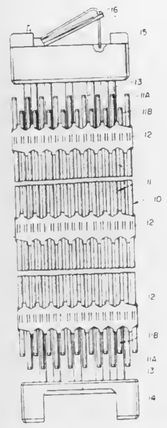
HIGH UTILIZATION FUEL ASSEMBLY

Thomas M. Camden, Jr., Apollo, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1984, Ser. No. 609,251

Int. Cl.⁴ G21C *3/32*

U.S. Cl. 376—435 **12 Claims**



1. A nuclear fuel assembly comprising an array of parallel arranged guide tubes, an inlet nozzle attached to one end of said guide tubes, an outlet nozzle attached to the other end of said guide tubes, a plurality of grids having the openings therethrough attached to and spaced along the length of said guide tubes, and a plurality of parallel arranged fuel rod assemblies each having an upper end and a lower end, said fuel rod assemblies being fitted within said openings in said grids, said fuel rod assemblies being arranged axially offset relative to each adjacent fuel rod assembly and comprising an upper fuel rod and a lower axially aligned fuel rod with a gap therebetween, said gap between said fuel rods each being axially offset relative to each adjacent gap so as to eliminate an axial gap across the core.

4,631,167

METHOD FOR THE PRODUCTION OF A NUCLEAR REACTOR ASSEMBLY AND ASSEMBLY OBTAINED BY THIS METHOD

Jean-Marc Brunon, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 29, 1984, Ser. No. 594,719

Claims priority, application France, Apr. 8, 1983, 83 05790

Int. Cl.⁴ G21C *3/32*

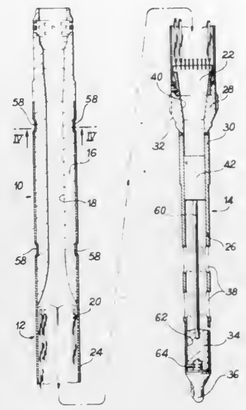
U.S. Cl. 376—446 **10 Claims**

1. A method for the production of an assembly incorporating a tube having a polygonal cross-section, a bundle of rods located in said tube, an upper neutron protection part fixed to the upper end of the tube and a hollow assembly foot fixed to the lower end of the tube, wherein it comprises the following successive stages:

fixing the assembly foot and the polygonal tube by butt welding;

inspection of the thus formed weld;

introduction of the bundle of rods into the vertically positioned polygonal tube;



fixing the polygonal tube to the upper neutron protection part by pressing the tube into recesses formed in said part.

4,631,168

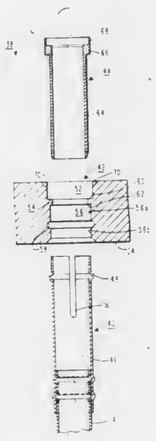
NUCLEAR REACTOR FUEL ASSEMBLY WITH A REMOVABLE TOP NOZZLE

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 537,775, Sep. 30, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,758

Int. Cl.⁴ G21C *3/30*

U.S. Cl. 376—446 **23 Claims**



1. In a fuel assembly having at least one control rod guide thimble and a top nozzle, said top nozzle including a transversely extending adapter plate, an improved attaching structure for removably mounting the top nozzle on the guide thimble comprising:

(a) means defining an outer socket in the top nozzle, said outer socket defining means including a passageway extending through said adapter plate and having a first mating element defined in said adapter plate within said passageway;

(b) means on an upper end of said guide thimble defining an inner socket, said inner socket defining means including an

elongated sleeve having an upper end portion, said upper end portion of said sleeve having a second mating element formed thereon and at least one elongated axial slot defined therein for permitting radial movement of said sleeve upper end portion between a compressed releasing position for removing and inserting said inner socket from and into said outer socket and an expanded locking position for locking said inner and outer sockets together and correspondingly permitting inward elastic collapse of said second mating element so as to allow said second mating element to enter and exit said passageway and outward elastic expansion of said second mating element so as to allow said second mating element to expand and mate with said first mating element; and

(c) a locking member inserted into said inner socket for retaining said inner socket in its locking position and thereby attachment of said top nozzle to said guide thimble, said locking member being removable from said inner socket for allowing said inner socket to be moved to its compressed releasing position and thereby detachment of said top nozzle from said guide thimble, said locking member including an elongated body portion having an outer diameter substantially equal to the inner diameter of said elongated sleeve for allowing snug fitting slidable nonthreading engagement of said locking member relative to said sleeve to a locking relation in which said locking member body portion extends through said sleeve upper end portion above and below said second mating element formed in said sleeve and through said passageway of said adapter plate.

4,631,169

ALLOYS FOR EXHAUST VALVES

Susumu Isobe; Kenkichi Matsunaga, both of Aichi; Yoshiaki Takagi, Saitama, and Norikatsu Sato, Tochigi, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha and Honda Giken Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 2, 1985, Ser. No. 719,102

Claims priority, application Japan, Apr. 3, 1984, 59-65280

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—443 **2 Claims**

2. An alloy for use in exhaust valves consisting essentially of, by weight percentage, of 0.01～0.15% of carbon, not more than 2.0% of silicon, not more than 2.5% of manganese, 53～65% of nickel, 15～25% of chromium, 0.3～3.0% of niobium, 2.0～3.5% of titanium, 0.2～1.5% of aluminum, 0.0010～0.020% of boron, at least one element selected from the group consisting of 0.001～0.030% of magnesium, 0.001～0.030% of calcium and 0.001～0.050% of rare earth element, and the remainder being substantially iron.

4,631,170

CALCIUM-NICKEL-MISCH METAL-ALUMINUM QUATERNARY ALLOY FOR HYDROGEN STORAGE

Keizo Ohnishi, and Takatoshi Ogawa, both of Hokkaido, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,247

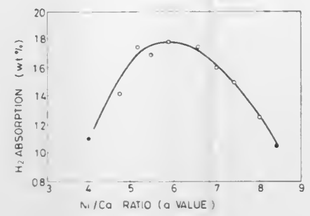
Claims priority, application Japan, Oct. 5, 1984, 59-208048

Int. Cl.[4] C01B *6/24*

U.S. Cl. 420—455 **2 Claims**

1. A calcium-nickel-misch metal-aluminum quaternary alloy for hydrogen storage that reacts with hydrogen to form a metal hydride, said alloy having the formula:

$$CaNi_aMm_bAl_c,$$



wherein Mm is a misch metal; a, b and c are, respectively, atomic ratios of Ni, Mm and Al, with Ca taken as unity; and $5-(b+c)<a\leqq 8$, $0<b\leqq 0.4$, and $0<c\leqq 0.6$.

4,631,171

COPPER-ZINC-MANGANESE-NICKEL ALLOYS

Allen S. McDonald, Bridgeport, Conn.; Charles W. Philp, New York, and Thomas A. Sperakis, E. Elmhurst, both of N.Y., assignors to Handy & Harman, New York, N.Y.

Filed May 16, 1985, Ser. No. 734,944

Int. Cl.[4] C22C *9/04*

U.S. Cl. 420—481 **8 Claims**

1. A copper alloy composition consisting essentially of about 43 to 57 weight percent copper, about 23 to 37 weight percent zinc, about 7 to 13 weight percent manganese, about 7 to 13 weight percent nickel, and between about 0.05 and 2 weight percent silicon.

4,631,172

ALUMINUM ALLOYS FOR GALVANIC ANODE

Ikuo Yamamoto, Omiya; Takehito Umino, Hanno; Yoshio Shinoda, Ageo, and Hisao Yoshino, Kitamoto, all of Japan, assignors to Nadagawa Corrosion Protecting Co., Ltd. and Mitsui Mining & Smelting Co., both of Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,256

Claims priority, application Japan, May 8, 1984, 59-91486; May 8, 1984, 59-91487

Int. Cl.[4] C22C *21/10*

U.S. Cl. 420—541 **3 Claims**

1. An aluminum alloy for a galvanic anode which contains 1.0 to 10% zinc, 0.1 to 6% magnesium, 0.01 to 0.04% indium, 0.005 to 0.15% tin 0.09 to 1.0% silicon, 0.005 to 0.45% barium or a mixture of barium and calcium, and the balance being aluminum.

4,631,173

METHOD OF STERILIZING PACKAGING MATERIAL, ESPECIALLY CONTAINER-TYPE PACKAGES

Horst Müller, Westerwaldweg 12, 4020 Mettmann, and Gerhard Deimel, Kolberger Str. 83, 5090 Leverkusen 3, both of Fed. Rep. of Germany

Continuation of Ser. No. 441,143, Nov. 12, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 775,103

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145274; Sep. 24, 1982, 3235476

Int. Cl.[4] A61L *2/20*

U.S. Cl. 422—28 **6 Claims**

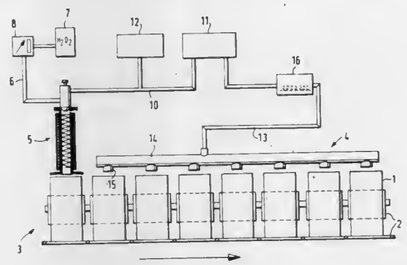
1. A method of sterilizing containers being conveyed along a path and stopped intermittently in a sterilizing station, comprising the following steps:

intermittently injecting a liquid disinfectant containing hydrogen peroxide from a nozzle when the containers stop and atomizing the disinfectant into fine droplets when the containers stop by means of an intermittent stream of compressed air to thoroughly mix the atomized sterilizing agent and the stream of compressed air,

directing the resulting combined stream onto a heated surface that has a temperature sufficient to rapidly evaporate the disinfectant in the mixed stream,

generating turbulence in the mixed stream to accelerate the droplets of disinfectant against the heated surface and to evaporate them there,

orienting the heated surface so that the resulting stream of



compressed air and vapor is diverted by the heated surface directly onto the inside of the container,

disposing the inner surface of the container at a temperature below the condensation point of the stream of compressed air and vapor,

condensing the disinfectant vapor onto the inner surface of the container, and

blowing hot air into the container to dry its inner surface.

4,631,174

MULTILAYER CHEMICAL ANALYSIS MEMBER HAVING AN OUTER WATERPROOF LAYER

Asaji Kondo, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 614,590, May 29, 1984, abandoned, which is a continuation of Ser. No. 177,553, Aug. 13, 1980, abandoned, which is a continuation of Ser. No. 35,182, May 2, 1979, abandoned. This application Apr. 2, 1985, Ser. No. 718,976

Claims priority, application Japan, May 2, 1978, 53-59888

Int. Cl.[4] G01N *33/52*

U.S. Cl. 422—56 **9 Claims**



1. A multilayer chemical analysis member comprising

a waterproof layer having a thickness of 8 microns to 1 mm and provided with at least one opening having a size of about 30 microns to about 4 mm in diameter for application of a sample liquid to be tested;

a porous spreading layer;

a chemical reagent layer comprising a chemical reagent in a hydrophilic or hydrophobic medium, said reagent being capable of reacting with a test material in said sample liquid; and

a support layer,

all of said layers being bonded together in a unified structure.

4,631,175

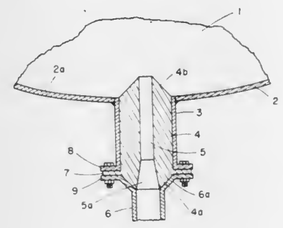
PREPARATION OF CHLORINATED POLYOLEFINS

James B. Akers, Jr., Baton Rouge, La.; Douglas E. Leng, Midland, Mich., and Randall J. Normand, Plaquemine, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 591,653, Mar. 20, 1984, Pat. No. 4,524,189. This application Feb. 15, 1985, Ser. No. 702,162

Int. Cl.[4] B01J *8/10*

U.S. Cl. 422—135 **2 Claims**



1. An apparatus for contacting a particulate polyolefin or chlorinated polyolefin solid suspended in a liquid with a gas, comprising: a vessel defining an interior space and including an agitator for keeping the solid suspended in the liquid; inlet means located in a bottom wall of said vessel for introducing chlorine gas into said vessel, said inlet means including a tubular member attached at one end to said bottom wall and extending outwardly and away from the bottom wall; jet-forming means disposed in the tubular member for forming a jet of chlorine gas introduced into the vessel, said jet-forming means including a plug disposed within the tubular member, said plug having an internal passageway through which the chlorine gas is introduced into the vessel, the plug having an end defining a surface which is tapered and extends into the interior space of the vessel from an inner surface of the bottom wall, with the tapered surface of the end of the plug defining with the inner surface of the bottom wall an angle of between about 120 degrees to about 150 degrees; and means for connecting the tubular member to a chlorine gas delivery line.

4,631,176

RECOVERY OF ANHYDROUS ZINC CHLORIDE

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corporation, Wheat Ridge, Colo.

Filed Jul. 22, 1982, Ser. No. 400,947

Int. Cl.[4] C01G *9/04*

U.S. Cl. 423—100 **25 Claims**

1. A process for stripping zinc chloride from an organic extraction agent comprising contacting the loaded extraction agent with an organic composition immiscible in the extraction agent.

4,631,177

METHOD FOR RECOVERING GALLIUM

Takao Yotsuyanagi, Miyagi, and Yoshinobu Nishiyama, Kitakyushu, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,211

Int. Cl.[4] C01G *15/00*

U.S. Cl. 423—112 **6 Claims**

1. A method for recovering gallium selectively from an aqueous basic solution containing gallium, which comprises dissolving 7-substituted-8- quinolinol having a C_5–C_{20} hydrocarbon group at the 7-position in a solvent, mixing the resulting solution with a porous polymer having a pore volume of from 0.3 to 1.2 ml/g, letting the solvent evaporate to obtain a porous polymer retaining substantially only the substituted quinolinol, filling a column with the polymer, passing the aqueous basic solution through the column to absorb gallium in the polymer

and passing an aqueous acid solution through the column to elute gallium.

4,631,178

METHOD OF REMOVING BORIC OXIDE FROM FLUE GASES

Charles F. Rapp, Newark, and Robert A. Herrick, Maumme, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 18, 1983, Ser. No. 485,972
Int. Cl.⁴ B01D *47/00*
U.S. Cl. 423—210 **5 Claims**



1. A method of reducing the boron content of a gas stream from a glass melting furnace which comprises passing said gas stream into contact with a moving bed of sodium bicarbonate-coated glass fibers to reduce the boron content of said stream and continuously introducing the coated glass fibers into said glass melting furnace.

4,631,179

PROCESS FOR THE PRODUCTION OF SILICON CARBIDE BY THE PYROLYSIS OF A POLYCARBOSILANE POLYMER

Troy L. Smith, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 28, 1985, Ser. No. 738,445
Int. Cl.⁴ C01B *31/36*
U.S. Cl. 423—345 **17 Claims**

1. In a process of producing silicon carbide by pyrolysis of a polycarbosilane polymer, the improvement which comprises utilizing as the polycarbosilane polymer a moldable or shapeable poly(silmethylene) formed by polymerizing 1,3-disilacyclobutane with a ring-opening catalyst of a Group VIII element of atomic number 44 or above, in an inert liquid medium and under an inert atmosphere.

4,631,180

PROCESS FOR PRODUCING CARBON BLACK

Syuichi Yoshimura; Hiromu Kobayashi, both of Kitakyushu; Yoshikazu Toyonaga, Yamaguchi; Hozo Yamazaki, Kitakyushu, and Masanori Karatsu, Yokkaichi, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,762
Claims priority, application Japan, Sep. 21, 1984, 59-198205; Sep. 3, 1985, 60-194184
Int. Cl.⁴ C01B *31/02;* **C09C** *1/48*
U.S. Cl. 423—450 **6 Claims**

1. A process for producing carbon black, comprising:
(a) generating a high temperature combustion gas stream in a first zone by the combustion of a heating fuel with an oxygen containing gas;
(b) mixing a hydrocarbon starting material with the high temperature combustion gas stream as the stream passes into a second zone, thereby forming carbon black particles; and
(c) without allowing the carbon black particles to cool, intimately contacting the carbon black particles with steam as an activating agent at a temperature of 1200°–1800° C. for a time of from 0.1–10 seconds in a third zone downstream form the second zone, thereby activating the carbon black.

4,631,181

PROCESS FOR PRODUCING MESOPHASE PITCH

Mitsuaki Matsumoto; Masatosi Furuyama; Tadao Tomioka; Hirofumi Sunago, and Masakazu Higuchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,069
Claims priority, application Japan, Mar. 31, 1984, 59-64227; Mar. 31, 1984, 59-64228
Int. Cl.⁴ C01B *31/02;* **C09C** *1/48;* **C10C** *1/00, 1/20*
U.S. Cl. 423—449 **13 Claims**

1. A process for producing a mesophase pitch for carbon products, which comprises adding one part to 200 parts by weight of at least one of an alcohol and a phenol to 100 parts by weight of heavy bitumens, subjecting the resulting mixture to pretreatment by heating at least at 250° C. under pressure, and then subjecting the pretreated mixture to heat treatment until mesophases are formed.

4,631,182

PROCESS FOR PREPARATION OF A REDUCING GAS

Peter B. Tottrup, Allerod, and Jens R. Rostrup-Nielsen, Virum, both of Denmark, assignors to Haldor Topsoe A/S, Denmark

Filed Jan. 29, 1985, Ser. No. 696,291
Claims priority, application Denmark, Feb. 1, 1984, 446/84
Int. Cl.⁴ C10B *3/26*
U.S. Cl. 423—652 **10 Claims**

1. A process for the preparation of a reducing gas containing hydrogen and/or carbon monoxide and having a high reduction potential by catalytic conversion in two steps of a sulphur-free hydrocarbon feedstock gas having a content of hydrocarbons having two or more carbon atoms of up to 70% and a content of hydrocarbons having three or more carbon atoms at the same time of up to 40%, the percentages being calculated on basis of the number of carbon atoms, wherein, in the first step at least a part of the gas together with added steam is passed as an inlet stream through an adiabatic reactor containing a steam reforming catalyst at an inlet temperature of 440°–510° C. and an outlet temperature of 400°–500° C. and at a pressure of 1–30 kg/cm² g, the amount of added steam being calculated for obtaining in the inlet stream an H/C ratio of at least 4.8 and an O/C ratio of between 0.5 and 1, the outlet gas stream from the adiabatic reactor being combined with the outlet gas stream from a reduction furnace, and in the second step the combined stream is further converted by steam reforming into a reducing gas.

4,631,183

PROCESS FOR THE DESTRUCTION OF TOXIC ORGANIC PRODUCTS

Jean M. Lalancette, Sherbrooke, and Germain Belanger, St-Germain de Grantham, both of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Jun. 25, 1985, Ser. No. 748,565
Int. Cl.⁴ F23G *7/00;* **C01B** *21/00;* **B01J** *8/00;* **C10H** *23/00*
U.S. Cl. 423—659 **14 Claims**

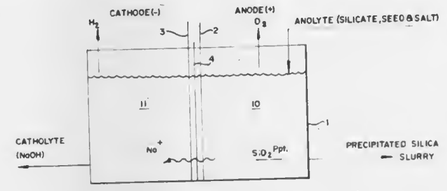
1. Process for the destruction of toxic organic halogenated substances which comprises treating in a reaction chamber under a reductive atmosphere and heated by a member of the group consisting of resistance heating, arc heating, and induction heating at a temperature of from 1000° to 1600° C. a mixture of a toxic organic halogenated substance, carbon and a carbonate or bicarbonate of an alkali metal and generating "in situ" to cause essentially total degradation of the toxic organic halogenated substance into alkali metal halide and free carbon and carbon monoxide exit gas containing at least some free alkali metal which carbon monoxide is subsequently oxidized into carbon dioxide.

4,631,184

DIALYTIC SILICA DENTIFRICE

Milton E. Winyall, Columbia, and Cathy L. Harville, Glen Burnie, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,687
Int. Cl.⁴ A61K *7/16*
U.S. Cl. 424—49 **5 Claims**



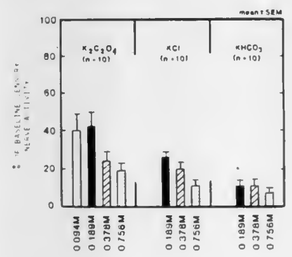
1. A dentifrice composition containing humectants, binders, preservatives, surfactants, flavoring agents, sweeteners or theraputic agents, and from about 5 to 50 percent by weight of a dialytic silica abrasive having an internal pore volume of about 0.1 to 6 cc/g, and a ratio of pore volume in pores greater than 3000 Å in diameter to pore volume in pores less than 3000 Å in diameter of greater than 1.

4,631,185

METHOD OF DESENSITIZING HYPERSENSITIVE DENTIN EMPLOYING COMPOSITIONS CONTAINING POTASSIUM SALTS

Syngcuk Kim, Orangeburg, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,163
Int. Cl.⁴ A61K *7/16*
U.S. Cl. 424—49 **12 Claims**



1. A method for reducing sensory nerve activity in a hypersensitive tooth of a subject which comprises applying to the surface of exposed dentin of the hypersensitive tooth potassium bicarbonate in an amount effective to reduce the sensory nerve activity of the hypersensitive tooth.

4,631,186

METHOD OF TREATING FINGERNAILS AND CUTICLES

Ann H. Brown, 4848 Dexter St., N.W., Washington, D.C. 20007

Continuation of Ser. No. 143,150, Apr. 23, 1980, abandoned. This application Feb. 25, 1982, Ser. No. 352,098
Int. Cl.⁴ A61K *7/135, 7/021, 7/04*
U.S. Cl. 424—61 **10 Claims**

1. A method for improving the quality and strength of nails and their cuticles consisting essentially of applying topically to the nails and cuticles an effective amount of a composition consisting essentially of sour cherry juice.

4,631,187

HAIR TREATING COMPOSITION CONTAINING A QUATERNARY AMMONIUM COMPOUND CONTAINING AN ERUCYL GROUP

Timothy J. Padden, and Heidi J. Uick, both of Racine, Wis., assignors to S.C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 29, 1982, Ser. No. 426,460
Int. Cl.⁴ A61K *7/06, 7/09*
U.S. Cl. 424—70 **8 Claims**

1. A hair conditioning composition having good wet combing characteristics, static control and clean feel, said composition comprising:
(a) An aqueous base
(b) From about 0.5 to about 10% by weight of quaternary ammonium compound having the formula:

$$[R_1-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{N}}}}-R_2]^+ A^-$$

wherein R_1 is a mixture of C_{18} to C_{24} alkyls and C_{18} to C_{24} alkenyls, said mixture comprising at least about 65% by weight docosenyl for improved water solubility, clean feel, wet combing characteristics and good static control, less than 15% by weight docosyl and less than about 35% by weight of a mixture of C_{18} to C_{24} alkyls other than docosyl and C_{18} to C_{24} alkenyls other than docosenyl, R_2 is selected from methyl, ethyl and benzyl and A is an anion, wherein the composition has a pH within the range of 3 to 6.

4,631,188

INJECTABLE PHYSIOLOGICALLY-ACCEPTABLE POLYMERIC COMPOSITION

Vladimir A. Stoy, Princeton, N.J., and Milos Chvapil, Tucson, Ariz., assignors to S.K.Y. Polymers, Ltd. (Kingston Technologies), Dayton, N.J.

Continuation-in-part of Ser. No. 528,058, Aug. 31, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,243
Int. Cl.⁴ A61K *31/78, 31/74*
U.S. Cl. 424—81 **15 Claims**

1. A method of in situ formation of a solid polymer in a mammal, said method comprising:
injecting into said mammal a physiologically-acceptable polymeric composition comprised of a polymeric compound dissolved in a water soluble, non-toxic polar solvent, said polymeric compound comprising a water insoluble, non-toxic non-crosslinked polymer or copolymer selected from the group consisting of polymers and copolymers of acrylonitrile, polyvinylacetate, copolymers of polyvinylacetate, linear or slightly branched polymers and copolymers of 2-hydroxyethylacrylate and methylacrylate, poly (n-vinyliminocarbonyl), polycondensates and polyadducts and having a solubility parameter of from about 9.2 to about 15.5 $(cal/cc)^{\frac{1}{2}}$.

4,631,189
N,N-DIMETHYLGLYCINE AND USE IN IMMUNE RESPONSE

Roger V. Kendall, New Haven, Vt., and Charles D. Graber, Charleston, S.C., assignors to Da Vinci Laboratories, a division of FoodScience Corporation, Essex Junction, Vt.

Continuation of Ser. No. 469,478, Feb. 24, 1983, abandoned, which is a continuation of Ser. No. 128,781, Mar. 10, 1980, Pat. No. 4,385,068. This application Apr. 9, 1985, Ser. No. 722,172
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.[4] A61K *39/395, 31/195*
U.S. Cl. 424—85 **17 Claims**

1. A process for enhancing the natural immunological response of a human which comprises orally administering N,N-dimethylglycine or a pharmaceutically acceptable salt thereof to the human in an amount effective to enhance the immunological response of such human.

13. A process for producing and collecting antibody which comprises administering an antigenic substance to a non-radiation sick lower animal, administering N,N-dimethylglycine or a pharmaceutically acceptable salt thereof to the lower animal before, with or after the antigenic substance in an amount effective to enhance the immunological response of said animal to the antigenic substance and collecting antibody produced by said animal in response to said antigenic substance.

4,631,190
ACIDITY-SENSITIVE SPACER MOLECULE TO CONTROL THE RELEASE OF PHARMACEUTICALS FROM MOLECULAR CARRIERS

Wei C. Shen, 145 Richdale Rd., Needham, Mass. 02194, and Hugues J. Ryser, 503 Annursnac Hill Rd., Concord, Mass. 01742

Filed Jun. 26, 1981, Ser. No. 277,633
Int. Cl.[4] A61K *39/44*
U.S. Cl. 424—85 **20 Claims**

1. A method of employing a first molecule and a second molecule to transport a third molecule through a first region to a second region that is more acidic than said first region, and to release said third molecule from said first and second molecules in said second region, comprising the following steps:

a. selecting at least one first molecule that is capable of increasing the transport of other molecules from said first region to second region;

b. selecting at least one second molecule comprising an alkene with multiple attached moieties, at least two of which are acidic moieties attached to said alkene in a cis configuration;

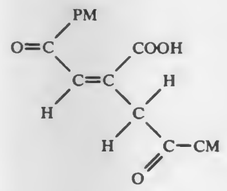
c. selecting at least one third molecule that is capable of performing at least one useful function at said second region;

d. bonding said third molecule to one of said acidic moieties that is attached to said second molecule in a cis configuration;

e. bonding said first molecule to said second molecule through a moiety that is not attached to said second molecule in a cis configuration with another acidic moiety;

f. introducing said molecular conjugate into said first region.

20. A molecular conjugate that is spontaneously hydrolyzed when ingested by a cell, comprising the following structural formula:



where PM comprises a drug and CM comprises a molecule which is readily ingested into cells or which specifically attaches to a substance on the surface of a cell.

4,631,191
METHODS AND COMPOSITIONS USEFUL IN PREVENTING EQUINE INFLUENZA

Beverly Dale, Sunnyvale, and Barbara Cordell, San Francisco, both of Calif., assignors to Biotechnology Research Partners, Ltd., Mountain View, Calif.

Filed Jun. 20, 1985, Ser. No. 747,020
Int. Cl.[4] A61K *39/00, 39/12;* **C07K** *7/08, 7/10*
U.S. Cl. 424—88 **4 Claims**

1. A peptide useful in preparing a vaccine against equine influenza which comprises an amino acid sequence selected from the group consisting of:

Ala-Cys-Arg-Arg-Ser-Arg-Ser-Ser-Phe-Tyr-Ala-Glu-Met-Lys-Trp-Leu-Leu-Ser-Asn-Thr-Asp-Asn-Gly-Val-Phe-Pro-Gln-Met;

Cys-Lys-Arg-Glu-Pro-Ala-Leu-Ile-Ile-Trp-Gly-Ile-His-His-Ser-Gly-Ser-Thr-Ala-Glu-Gln-Thr-Arg-Leu-Tyr-Gly-Ser-Gly-Asn-Lys-Cys;

Arg-Ala-Ile-Gly-Lys-Cys-Pro-Arg-Tyr-Val-Lys-Gln-Lys-Ser-Leu-Met-Leu-Ala-Thr-Gly-Met-Lys-Asn-Val-Pro-Glu-Asn-Ser-Thr;

Thr-Gly-Val-Thr-Gln-Asn-Gly-Arg-Ser-Gly-Ala-Cys-Arg-Arg-Gly-Ser-Ala-Ser-Arg;

Lys-Leu-Tyr-Ile-Trp-Gly-Ile-His-His-Pro-Ser-Thr-Asn-Asn-Glu-Gln-Thr-Lys-Leu-Tyr-Ile-Gln-Glu-Ser-Gly-Arg-Val-Thr;

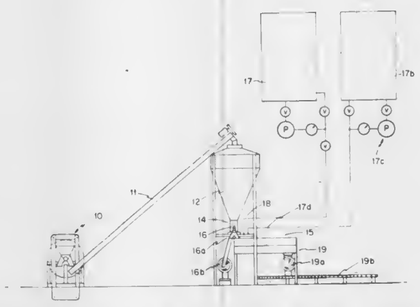
Lys-Tyr-Ile-Lys-Gln-Asn-Thr-Leu-Lys-Leu-Ala-Thr-Gly-Met-Arg-Asn-Val-Pro-Glu-Lys-Gln-Ile; and

Gly-Ile-Phe-Gly-Ala-Ile-Ala-Gly-Phe-Ile-Glu-Asn-Gly-Lys-Lys.

4,631,192
CONTINUOUS-FLOW PROCESS FOR MAKING A HARDENED ANIMAL FEED COMPOSITION

Richard P. Mommer, Loveland, and Johnny M. Thomas, II, Fort Collins, both of Colo., assignors to Uniscope, Inc., Johnstown, Colo.

Continuation-in-part of Ser. No. 204,627, Nov. 6, 1980, abandoned. This application Dec. 20, 1984, Ser. No. 683,857
Int. Cl.[4] A23K *1/22;* **A23N** *17/00*
U.S. Cl. 426—69 **15 Claims**



1. A continuous-flow process for making a hardened animal feed composition comprising the steps of:

(a) continuously feeding solid ingredients comprising calcium oxide into a mixer;

(b) continuously feeding liquid ingredients comprising molasses into a mixer, wherein the molasses weight is from equal to 22 times the calcium weight;

(c) metering the solid and liquid ingredients from the mixers into a continuous-flow mixer, wherein the solid and liquid ingredients are mixed for a period of from about one-half to about ten minutes to produce a homogeneous animal feed composition; and

(d) discharging the homogeneous animal feed composition from the continuous-flow mixer into a shaping device to form a hardened animal feed composition.

4,631,193
TREATING BEER TO PREVENT CHILL HAZE

Michael T. Sobus, Philadelphia, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 674,802, Nov. 26, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,034
Int. Cl.[4] C12H *1/02*
U.S. Cl. 426—330.4 **12 Claims**

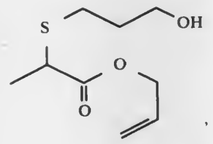
1. A composition for treating beer to prevent chill haze consisting of 0.2 to 4.0 parts by weight (pbw) of gelatin and 100 pbw of a silica gel.

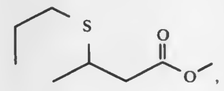
4,631,194
ESTERS OF ALKYLTHIOALKANOIC ACIDS

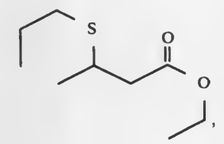
Thomas F. Courtney, Jr., Keyport; Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust, and Charles Wiener, Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

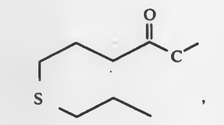
Filed Dec. 6, 1985, Ser. No. 789,162
Int. Cl.[4] A23L *1/226, 1/231, 1/235*
U.S. Cl. 426—535 **12 Claims**

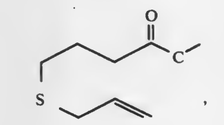
1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from about 0.001 ppm up to about 250 ppm by weight of said foodstuff of an ester of alkylthioalkanoic acid selected from the group consisting of



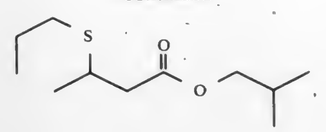


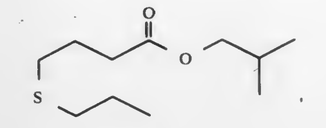


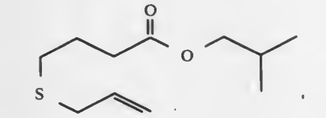


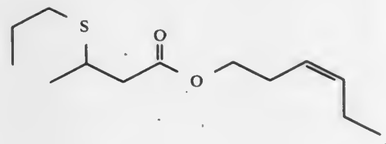


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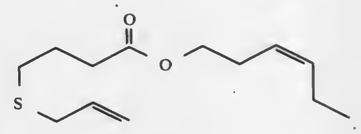








, and



4,631,195
SWEETENING COMPOSITION

John A. Colliopoulos, 1114 Dobson, Evanston, Ill. 60202; James G. Young, 2729 Oak Ave., Northbrook, Ill. 60062, and Josef H. Tsau, 876 Crimson Ct., Prospect Heights, Ill. 60070

Continuation of Ser. No. 661,539, Oct. 16, 1984, which is a continuation of Ser. No. 395,423, Jul. 6, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,200
Int. Cl.[4] A23L *1/22, 1/236*
U.S. Cl. 426—548 **8 Claims**

6. An improved cooked or baked foodstuff comprising a high caloric sweetener, flour or other starchy material wherein the improvement comprises replacing all or part of the high caloric sweetener, flour or other starchy material with a composition comprising a dipeptide sweetener and a polyglucose or polymaltose in a ratio of from about 1:40 to about 1:200.

4,631,196
LOW CALORIE DAIRY PRODUCT

Clifford L. Zeller, 11628 North Shore Cliff La., Mequon, Wis. 53092

Filed Apr. 15, 1985, Ser. No. 723,319
Int. Cl.[4] A23C *9/154, 9/20*
U.S. Cl. 426—580 **10 Claims**

1. A low cholesterol, low calorie, no-fat dairy product, consisting essentially of, in unflavored form, a blend of water, a no-fat protein-containing material selected from the group

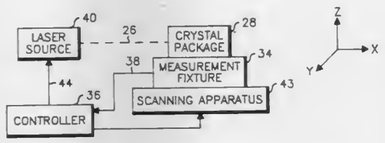
consisting of skim milk and cultured skim milk, sugars consisting of a mixture of 10% to 90% polydextrose and 90% to 10% fructose, milk-derived solids, stabilizers and emulsifiers, said water accounting for up to about 40% by weight of the product, said no-fat protein-containing material accounting for about 30% to 70% by weight of the product and having a total milk solids content of about 20% to about 25% by weight said sugars accounting for about 5% to 30% by weight of the product, said milk-derived solids accounting for about 2% to 8% by weight of the product, and said stabilizers and emulsifiers accounting for about 0.2% to 2.5% by weight of the product.

4,631,197

APPARATUS AND METHOD FOR ADJUSTING THE FREQUENCY OF A RESONATOR BY LASER

Jeffrey A. DeFreese, Mount Prospect, and Theodore E. Lind, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 17, 1985, Ser. No. 755,885
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—10 **21 Claims**



1. An improved crystal resonator device, comprising:
a crystal resonator;
a base constructed and arranged to receive said crystal resonator;
at least two terminal leads extending through said base electrically connected to said crystal resonator; and
a cover having at least one transparent area with an effective amount of plating material deposited thereon forming a layer having at least one goemetrically shaped surface;
whereby, said geometrically shaped surface operates to control the vaporization of said plating material.

14. A method for fabricating a crystal resonator to a specified operating frequency, comprising the steps of:
mounting the crystal resonator within a housing having at least one transparent area with an effective amount of plating material deposited thereon;
shaping said plating material such that at least one geometrically shaped surface is formed thereon;
measuring the operating frequency of the crystal resonator; and
vaporizing said plating material with a laser beam such that the vaporization pattern of said plating material is controlled by said geometrically shaped surface thereby adjusting the crystal resonator's operating frequency.

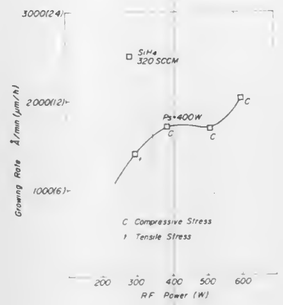
4,631,198

METHOD OF MANUFACTURING THIN AMORPHOUS SILICON FILM

Hiroaki Kakinuma; Satoshi Nishikawa, and Tsukasa Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 606,095, May 2, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,194
Claims priority, application Japan, May 16, 1983, 58-84121
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **6 Claims**

1. A method of manufacturing thin amorphous silicon hydride film by a plasma CVD process comprising the steps of providing a substrate for supporting the amorphous silicon hydride film, providing raw material gas produced by mixing hydrogen silicide $Si_nH_{2n+2}(n \geqq 1)$ with additive gas in the concentration from about 0.1 to 10 parts per million by volume, setting a gas flow rate of the raw material gas in the range from about 200 to about 700 SCCM, applying radio frequency electric power to said gas in plasma CVD apparatus, said



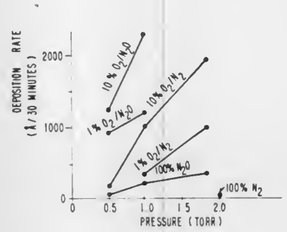
power being selected in the range from about 300 W to about 700 W to result in a ratio of electric power in watts to gas flow rate in SCCM of at least about 1, and growing thin amorphous silicon hydride film on the substrate from the raw material gas.

4,631,199

PHOTOCHEMICAL VAPOR DEPOSITION PROCESS FOR DEPOSITING OXIDE LAYERS

James T. Hall, Redondo Beach, and John W. Peters, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 22, 1985, Ser. No. 757,562
Int. Cl.[4] C23C *16/50*
U.S. Cl. 427—54.1 **4 Claims**



1. A photochemical vapor deposition process for depositing a layer of an oxide of a chosen material on the surface of a selected substrate comprising the steps of:
(a) providing said substrate; and
(b) exposing said substrate to a selected vapor phase reactant and an oxygen-containing precursor comprising a mixture of nitrous oxide admixed with molecular oxygen in a predetermined ratio, in the presence of radiation of a selected wavelength sufficient to cause the direct dissociation of said oxygen-containing precursor to form neutral oxygen atoms that react with said vapor phase reactant and form said oxide which deposits as said layer on said substrate, wherein the rate of reaction to form and deposit said oxide is enhanced by said molecular oxygen in said mixture.

4,631,200

GRAPHITE COMPOSITE CHIPS

Thomas R. Bierschenk, Round Rock, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1985, Ser. No. 734,996
Int. Cl.[4] B05D *3/02, 5/12*
U.S. Cl. 427—113 **8 Claims**

1. A method for making composite chips for use in packed bed electrolytic cells featuring a uniform coating of carbon and Teflon on graphite chips wherein the method comprises:
(a) preliminarily washing particulate carbon with a metal removing wash;
(b) mixing the washed particulate carbon with a fluorocarbon dispersion in water and adding thereto graphite chips having a specified mesh;
(c) removing the water until dry; and
(d) sintering the dried material at an elevated temperature for a specified interval wherein the coating material is applied to an average thickness of about 90 microns on about 95% or more of the graphite chips so treated.

4,631,201

METHOD FOR INSULATING A MAGNET WIRE WITH TETRAALKYL TITANATE MODIFIED NYLON

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 732,534, May 10, 1985, Pat. No. 4,599,387.
This application Sep. 23, 1985, Ser. No. 778,832
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—118 **4 Claims**

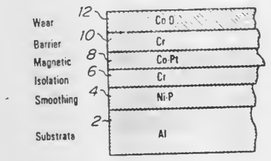
1. A method of coating a magnet wire substrate comprising applying to an electrically conductive wire substrate at least one layer of an enamel composition comprising nylon reacted with 0.5% to 3.5% by weight based on the weight of the nylon present in the enamel composition of a tetraalkyl titanate.

4,631,202

THIN FILM MAGNETIC RECORDING FILM

James E. Opfer, Palo Alto, and Bangalore R. Natarajan, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 549,331, Nov. 3, 1983, Pat. No. 4,610,911.
This application Apr. 21, 1986, Ser. No. 853,870
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—131 **30 Claims**



1. A method of providing a film of an alloy of cobalt and platinum having certain magnetic properties comprising:
(a) forming a layer of chromium on a substrate;
(b) depositing said film of said alloy of cobalt and platinum on said layer of chromium;
(c) forming said film to a predetermined thickness to obtain a predetermined magnetization-thickness product thereof; and
(d) setting the percentage of platinum of said alloy to obtain a predetermined coercivity, said percentage of platinum ranging from about 1 to about 20 atomic percent.

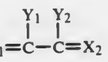
4,631,203

LATENT IMAGING AND DEVELOPER SYSTEM

Rolf Schaefer, Im Brueggli 12, CH-4422 Arisdorf, Switzerland, and Haywood A. Walker, Jr., Box 432 D, Rte. 1, Liberty, Mo. 64068

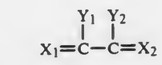
Filed Apr. 8, 1985, Ser. No. 720,759
Int. Cl.[4] B41M *5/12*
U.S. Cl. 427—145 **23 Claims**

1. A method of imaging a substrate with a concealed image, and subsequently developing the concealed image to render the same visible, said method comprising the steps of:
imaging said substrate with a printing material having therein a dissociable salt of a transition metal, said material being characterized by the properties of being invisible to the naked eye when applied to said substrate, and remaining invisible to the naked eye on the substrate under normal ambient conditions for a period of at least about three months;
thereafter visually developing said invisible image by applying thereto a liquid developer substance, said developer comprising a color precursor compound selected from the group consisting of dithiooxalic acid and compounds of the formula



wherein X_1 and X_2 are respectively taken from the group consisting of NH and N—R_1, R_1 being an alkyl group of from 1 to 4 carbon atoms, inclusive, and Y_1 and Y_2 are respectively taken from the group consisting of SH and S—R_2, R_2 being an alkyl group having from 1 to 4 carbon atoms, inclusive, said precursor compound being dispersed in a carrier for dissociating said salt into dissociated transition metal cation and salt-forming anions, and for maintaining said color precursor compound in a solubilized state in the presence of the dissociated salt for permitting a color reaction to take place between said dissociated transition metal cation and said solubilized color precursor compound.

16. A liquid developer for use in developing an invisible image on a substrate, said image including therein a dissociable salt of a transition metal, said developer comprising a color precursor compound selected from the group consisting of dithiooxalic acid and compounds of the formula.



wherein X_1 and X_2 are respectively taken from the group consisting of NH and N—R_1, R_1 being an alkyl group of from 1 to 4 carbon atoms, inclusive, and Y_1 and Y_2 are respectively taken from the group consisting of SH and S—R_2, R_2 being an alkyl group having from 1 to 4 carbon atoms, inclusive, said precursor compound being dispersed in a carrier comprising water and a surfactant for dissociating said salt into dissociated transition metal cation and salt-forming anion, and for maintaining said color precursor compound in a solubilized state in the presence of the dissociated salt for permitting a color reaction to take place between said dissociated transition metal ion and said solubilized color precursor compound.

4,631,204

PROCESS OF PRODUCING COLOR DEVELOPER SHEET FOR PRESSURE-SENSITIVE RECORDING

Hirofumi Mitsuo, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1984, Ser. No. 608,833
Claims priority, application Japan, May 10, 1983, 58-81524
Int. Cl.[4] B41M *5/22*
U.S. Cl. 427—150 12 Claims

1. A process for producing a color developer sheet for pressure-sensitive recording comprising mixing a coating liquid containing a metal salt of an aromatic carboxylic acid and an aqueous emulsion of an organic solvent and coating the resulting mixture on a support, wherein the organic solvent is a biphenyl derivative or a diphenylalkane having a boiling point of about 150° C. to about 315° C. and dissolves the metal salt of the aromatic carboxylic acid in such an amount that the metal salt of the aromatic carboxylic acid has a solubility in the organic solvent of 10 or more at 25° C.

4,631,205

PROCESS FOR PRODUCING COHERENT FILMS OF POLYACETYLENE

John W. Eveleigh, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Bartlesville, Mass.

Filed Oct. 11, 1984, Ser. No. 659,900
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—255.6 13 Claims

1. A process for producing coherent films of polyacetylene, comprising:

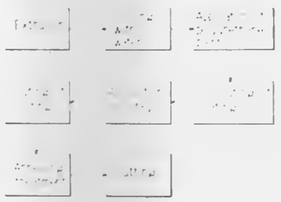
contacting at about −80° C. a chemically inert support with an acidic, active catalyst solution having a pH of 5 or below comprising a transition metal salt, polar medium, water and a borohydride to produce a catalytically active surface; and exposing at a temperature from about −80° C. to about −20° C. the catalytically active surface to acetylene gas whereby coherent films of polyacetylene adherent to the support are produced.

4,631,206

METHOD FOR CURING POLYURETHANE COATING

Akira Mabuchi, Nagoya; Kenji Yano, and Hisashi Mizuno, both of Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 25, 1985, Ser. No. 758,828
Claims priority, application Japan, Jul. 30, 1984, 59-161313
Int. Cl.[4] B05D *3/02;* C09J *3/14, 3/16*
U.S. Cl. 427—340 5 Claims



1. A method for curing a polyurethane coating, comprising the steps of:

(1) applying a polyurethane paint containing isocyanate prepolymer at a stated position on the surface of a substrate,

(2) applying a catalyst (cure accelerator) on the uncured polyurethane coating formed in the preceding step (1), and

(3) subsequently curing said polyurethane coating in a heating atmosphere of 60° to 100° C.

4,631,207

SILOXANE COMPOSITIONS AND PROCESS FOR TREATMENT OF MATERIALS

John G. C. Price, Barry, Wales, assignor to Dow Corning Ltd., Barry, Wales

Filed Dec. 13, 1985, Ser. No. 808,772
Claims priority, application United Kingdom, Dec. 22, 1984, 8432570
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 11 Claims

1. Compositions comprising (1) a component selected from the group consisting of mixtures and reaction products of (A), a polydiorganosiloxane having a molecular weight of at least 350 and at least one silicon-bonded —OX group, wherein X represents a group selected from a hydrogen atom, an alkyl group or an alkoxyalkyl group, the said polydiorganosiloxane having at least one silicon-bonded substituent selected from aminoalkyl and polyaminoalkyl acid salt groups derived from a water-soluble organic or inorganic acid, at least 0.5% by weight of the polydiorganosiloxane being provided by amino nitrogen, at least 40% of the total number of silicon-bonded substituents in the polydiorganosiloxane being methyl groups and any remaining substituents being monovalent hydrocarbon groups having from 2 to 10 carbon atoms, and (B) a silicon compound which is soluble in (2) and which has per molecule more than 2 silicon-bonded groups reactive with the —OX groups in (A), and (2) a water-soluble solvent for (A) which comprises at least one glycol ether of the formula $C_4H_9—O—(CH_2—CH_2—O)_nH$, where n has a value of 1 or 2.

4,631,208

ORGANOSILOXANE-OXYALKYLENE COPOLYMERS

Stephen Westall, Barry, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Oct. 28, 1985, Ser. No. 791,956
Claims priority, application United Kingdom, Nov. 9, 1984, 8428401
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 8 Claims

1. An organosiloxane-oxyalkylene copolymer wherein a silicon atom of at least one organosiloxane unit has attached thereto a group represented by the general formula

$$—X(OR)_nOSiR'_a(OR'')_{3-a}$$

wherein X represents a divalent hydrocarbon group having from 2 to 8 inclusive carbon atoms, R represents an alkylene group having from 2 to 4 inclusive carbon atoms, n is an integer of at least 2, R′ represents a group selected from the group consisting of alkyl groups having from 1 to 8 inclusive carbon atoms, the vinyl group, the allyl group and the phenyl group, R″ represents an alkyl or an alkoxyalkyl group having less than 7 carbon atoms and a has a value of 1 or 2, the remaining silicon-bonded substituents in the organosiloxane units being selected from hydrogen atoms, monovalent hydrocarbon groups and groups represented by the general formula

$$—X(OR)_nOG$$

wherein X and R are as hereinabove defined and G is a substituent selected from the group consisting of the hydrogen atom, monovalent hydrocarbon groups having from 1 to 10 inclusive carbon atoms and acyl groups having from 2 to 6 inclusive carbon atoms, at least 40 percent of the total substituents bonded to siloxane silicon atoms in the copolymer being methyl.

4,631,209

MANUFACTURE OF ASBESTOS-FREE FRICTION FACING MATERIAL

Ralph Baker, Buxton; Eric T. Smith, New Mills; Vaughan T. Dickinson, Whitworth; Noel C. McKenzie, Rochdale, and Brian Hargreaves, Flixton, all of England, assignors to Ferodo Ltd. and T&N Research Ltd., both of Manchester, England

Filed Aug. 8, 1985, Ser. No. 763,782
Claims priority, application United Kingdom, Aug. 30, 1984, 8421915
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—392 2 Claims

1. In a method of making asbestos-free friction facing material suitable for operation in oil, in the form of a fibrous sheet whose fibers consist essentially of cellulosic fibers and which contains friction-imparting particles and particles of friction modifier, the sheet containing a thermosetting phenolic resin which after curing binds the ingredients firmly together, said method comprising preparing a water-laid sheet by a paper-making process from an aqueous suspension of cellulosic fibers and other sheet forming ingredients,

the improvement comprising in (1) employing as the cullulosic fibers a mixture of cotton fibers and refined cellulose pulp, and (2) including the thermosetting phenolic resin in emulsified from in the aqueous suspension from which the sheet is laid.

4,631,210

LIQUID-CONTAINING DECORATIVE DEVICE

Theodore W. McGee, 2810 W. Logan Blvd., Chicago, Ill. 60647; Charles Muncy, St. Louis County, Mo., and John E. Suerth, Glenview, Ill., assignors to Theodore W. McGee, Chicago, Ill.

Filed Aug. 12, 1985, Ser. No. 764,772
Int. Cl.[4] B44C *5/04*
U.S. Cl. 428—13 17 Claims



1. A decorative device for use in conjunction with garments of natural or synthetic fabrics or combinations thereof comprising front and back normally flat sheets of transparent, fluid impervious, plastic material disposed in flatwise registering relationship, means securing said front and back sheets, one to the other, in the marginal zones thereof for developing a central chamber or volume therebetween, liquid provided within said chamber being of predetermined coloration for visual display through said front sheet, and means securing said marginally joined sheets upon the selected garment.

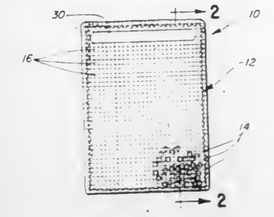
4,631,211

MEANS FOR SEQUENTIAL SOLID PHASE ORGANIC SYNTHESIS AND METHODS USING THE SAME

Richard A. Houghten, Solana Beach, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Filed Mar. 25, 1985, Ser. No. 715,654
Int. Cl.[4] D03D *1/04;* B65D *33/01;* C08F *283/00*
U.S. Cl. 428—35 40 Claims

1. A means for carrying out a sequential, solid phase organic synthesis to form a reaction product containing a plurality of reacted subunits comprising an immersible mesh packet having enclosed therein a free form aliquot of reactive particles, said particles being of a size that is larger than any of the foraminae defined by said mesh packet and having a known amount of organic synthesis reactive functionality covalently linked to said particles, said reactive functionality being capable of reacting during said organic synthesis, said mesh packet and said particles being substantially insoluble in water and in organic solvents.

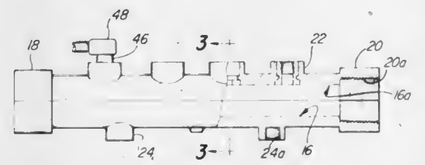


4,631,212

MANIFOLD

David C. Shifflett, and Dennis I. Shifflett, both of Mt. Clemens, Mich., assignors to Al-Ko Products, Inc., Fraser, Mich.

Filed May 1, 1985, Ser. No. 729,234
Int. Cl.[4] F16I *15/00*
U.S. Cl. 428—36 4 Claims



1. A manifold comprising:

(A) a plastic member including an elongated tubular portion having a generally cylindrical bore, means defining a longitudinally extending flatted surface on the inside of said tubular portion, and a plurality of transverse bores extending transversely through the wall of said tubular portion at longitudinally spaced locations therealong and opening at their inner ends in said flatted surface and at their outer ends in an exterior surface of said plastic member;

(B) a metal tubular insert, including a flat polygonal head portion having a flat annular end surface and a tubular body portion, received in each transverse bore with the central axis of the insert generally perpendicular to the central axis of said tubular portion and said flat annular end surface of said polygonal head portion flush mounted in said flatted surface; and

(C) thread means on the interior of each insert for receipt of a threaded member therein.

4,631,213

THERMOFORMED SHEET FOR A PLATE-TYPE GAS-GAS HEAT EXCHANGER AND THE EXCHANGER INCLUDING SAID SHEET

Georges J. P. E. Bosne, Viroflay, France, assignor to Hamon-Industries, Paris, France

Filed Jul. 19, 1985, Ser. No. 757,128
Int. Cl.[4] B32B *3/28*
U.S. Cl. 428—53 5 Claims

1. A thermoformed sheet (**1** ; **101**) for a plate type gas-gas heat exchanger of the type comprising a case (**40** ; **60**) in which are stacked parallel plates spaced apart from each other by lateral spacing means, these plates having at their ends pointed regions provided with elements for alternately closing one of the two sides of the pointed regions, the case further compris-

ing walls connected in a fluidtight manner to the points of the ends of the plate so as to form distinct inlet and outlet conduits for the gases which circulate in a countercurrent manner in the alternating spaces formed by the plates, this sheet comprising a series of identical rows of elongated patterns (**2***a*, **2***b*, **2***c*, **2***d*; **102***a*, **102***b*, **102***c*, **102***d*) having folded edge portions on one side or the other of the sheet, each pattern having two parallel longitudinal edge portions (**3***a*, **4***a*; **3***b*, **4***b*; **3***c*, **4***c*; **3***d*, **4***d*; **103***a*,



104*a*; **103***b*, **104***b*; **103***c*, **104***c*; **103***d*, **104***d*) by which it is connected to adjacent patterns so as to form a row and terminating in two pointed end portions (**8***a*, **9***a*; **8***b*, **9***b*; **8***c*, **9***c*; **8***d*, **9***d*; **110***a*, **111***a*; **110***b*, **111***b*; **110***c*, **111***c*; **110***d*, **111***d*) by which the patterns of a row are connected to the patterns of the following row, the intermediate regions (**13**, **14**, **15**, **16**, **17**; **112**, **113**, **114**, **115**, **116**) existing between these rows projecting alternately on one side and the other of the sheet (**1**, **101**).

4,631,214

TRANSPARENT ELECTROMAGNETIC WAVE SHIELDING MATERIAL

Hiroaki Hasegawa, Fukui, Japan, assignor to Fukuvi Chemical Industry Co., Ltd., Fukui, Japan

Filed Dec. 23, 1985, Ser. No. 812,573

Claims priority, application Japan, Dec. 24, 1984, 270728; Mar. 29, 1985, 44832; Mar. 29, 1985, 63923

Int. Cl.[4] **H05K** *9/00*; **B32B** *3/30, 15/08, 27/12*

U.S. Cl. 428—68 **11 Claims**



1. A transparent electromagnetic wave shielding material comprising a molded body of a synthetic resin composed mainly of diethylene glycol bisallyl carbonate and a blackened electroconductive fiber gauze embedded therein.

4,631,215

EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME

Dennis G. Welygan, Cottage Grove, and Ronald O. Zemke, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 550,641, Nov. 10, 1983, abandoned.

This application Oct. 15, 1985, Ser. No. 788,091

Int. Cl.[4] **B32B** *3/28, 3/30*

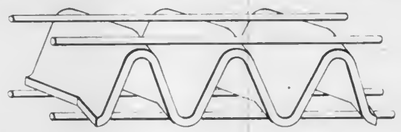
U.S. Cl. 428—105 **31 Claims**

1. An article comprising a plurality of straight continuous spaced parallel extruded elements, each of said extruded elements comprising a plurality of filaments, said extruded elements being separated by a regularly folded undulated extruded element having an aspect ratio of at least 2 with undulations having opposed apexes on either side thereof, with apexes on one side of said undulated element being bonded to said filaments of said straight continuous parallel extruded elements and apexes on the other side of said undulated element being bonded to another set of filaments comprising said straight continuous parallel extruded element.

17. An article prepared by a method comprising:

(1) extruding at a first rate a first filament-forming, extrudable plastic means to form a plurality of spaced, straight continuous parallel elements;

(2) extruding simultaneously, at a second rate faster than said first extrusion rate and between adjacent spaced, continuous parallel elements, a second filament-forming extrudable plastic mass to form an undulatable element which is thinner than it is wide to provide a cross-section with an aspect ratio of at least two, with the undulatable element being positioned with each opposite face of its wide dimension facing one of said continuous straight parallel elements, the surfaces of said plastic masses having a tacky first physical state which permits said surfaces to bond to one another at points of mutual contact and a second



physical state in which subsequent bonding will no longer occur and in which latter state said elements have sufficient structural integrity to maintain their extruded bonded shape;

(3) while the surfaces of said elements are sufficiently tacky to simultaneously cause bonding therebetween at points of contact, causing said undulatable element to undulate in its thin dimension by permitting contact between a parallel element on one side of said undulatable element to form an apex while maintaining the other adjacent parallel element in sufficiently close proximity to permit subsequent contact between it and the undulating undulatable element to form an opposed apex and to permit repetition of such undulation and subsequent contact to form a plurality of apexes, thereby providing an article having an undulated element with apexes aligned on opposed sides wherein the apexes on one side of the undulated element are bonded to one of said parallel elements and the apexes on the other side of said undulated element are bonded to the other adjacent parallel element; and

(4) changing or permitting the change of said plastic masses to said second physical state.

4,631,216

LARGE-SURFACE AREA CONTROL PANEL

Stig Olofsson, Televerkets Industridivision, Box 1001, S-149 01 Nynsähamn, Sweden

Filed Nov. 13, 1984, Ser. No. 670,723

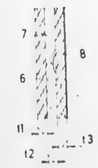
Claims priority, application Sweden, Nov. 16, 1983, 8306315

Int. Cl.[4] **B32B** *5/12, 3/02, 21/04*

U.S. Cl. 428—106 **4 Claims**

1. A large-surface area control panel comprising a major portion made of a large piece of solid wood having a first thickness and a remaining portion of a second reduced thickness, said reduced thickness being in the range of from about 1.5 mm to about 6 mm, said control panel at least in said second thickness portion consisting of a plurality of sheets of wood

positioned in face-to-face contact with each other, wherein the number of said sheets is uneven and wherein the directions of



the grain of wood in two adjacent sheets run cross-wise to each other.

4,631,217

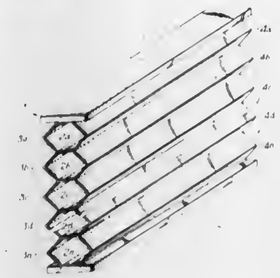
HONEYCOMB STRUCTURE WITH Z-FOLDED MATERIAL AND METHOD OF MAKING SAME

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Oct. 25, 1985, Ser. No. 791,239

Int. Cl.[4] **B32B** *3/12*

U.S. Cl. 428—118 **12 Claims**



1. In an expandable honeycomb structure constructed of foldable material and defined by a plurality of longitudinally extending cells, one on top of the other, each cell having a longitudinally extending front face and a longitudinally extending back face, any one cell intermediate the end cells having a first and second adjacent cell, the improvement wherein:

(a) the front face of any one cell, intermediate the end cells, and the back face of the first adjacent cell is defined by a first piece of material; and

(b) the back face of said any one cell and the front face of the second adjacent cell is defined by a second piece of material.

4,631,218

WOODEN BASE PLATE

Stig Olofsson, Televerkets Industridivision, Box 1001, S-149 01 Nynäshamn, Sweden

Filed Nov. 13, 1984, Ser. No. 670,724

Claims priority, application Sweden, Nov. 16, 1983, 8306316

Int. Cl.[4] **B32B** *3/10, 3/02*; **H04M** *1/05*; **B05D** *3/02*

U.S. Cl. 428—131 **3 Claims**

1. A plate, for an apparatus made of wood, said plate having an upwardly projecting peripheral rim and slots located on the edge of said rim, wherein said plate comprises a first, flat component made of wood and a second component connected to said flat component to form said upwardly projecting rim, said second component made of solid wood and comprising a composite frame having at least three parts, wherein a plank of solid wood from which each of the frame parts has been made has first been subjected to drying to a moisture content of about 4 to 5% and has then been heat-treated whereby pith fibers of the wood are sealed by resin released from said wood and is further surface treated with varnish for sealing the surface pores of the wood, and wherein each part of said frame is so arranged that the grain of the wood coincides essentially



with the height direction of the plate, and wherein said plate further comprises a reinforcing element next to the free end edge of said frame part for preventing warping in the wood caused by internal stresses.

4,631,219

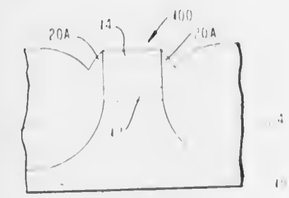
GROWTH OF BIRD'S BEAK FREE SEMI-ROX

Henry J. Geipel, Jr., and Pai-Hung Pan, both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,824

Int. Cl.[4] **B32B** *15/04*

U.S. Cl. 428—131 **13 Claims**



1. An oxygen-impervious pad formed on a surface of a semiconductor substrate, comprising:

a pad structure disposed on the surface of the substrate, said pad structure having an upper surface which is impervious to oxygen specie diffusion therethrough;

sidewall spacers disposed on said pad structure, said sidewall spacers being formed of a material impervious to oxygen specie diffusion therethrough; and

a thin layer of silicon oxynitride grown on said surface of said substrate and disposed below said sidewall spacers, said thin layer of silicon oxynitride preventing diffusion of oxygen specie beneath said sidewall spacers into said portion of the substrate beneath said pad structure.

4,631,220

COATED ABRASIVE BACK-UP PAD WITH METAL REINFORCING PLATE

Richard B. Clifton, St. Croix, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 14, 1985, Ser. No. 734,391

Int. Cl.[4] **B24D** *7/16, 17/00*

U.S. Cl. 428—133 **7 Claims**

1. A coated abrasive back-up pad comprising a layer of resiliently compressible foam having first and second generally parallel spaced surfaces; a generally rigid fiber reinforced polymeric backing plate fixed to the first surface of said layer of foam; and a flexible adhesion layer fixed to the second surface of said layer of foam, said adhesion layer having a

generally planar support surface opposite said layer of foam adapted to have pressure sensitive adhesive coated abrasive sheets removably adhered thereto; said backing plate having a circular concentric array of through openings adapted to receive the shanks of screws for coupling the backing plate to a drive mechanism and said layer of foam and said adhesion layer having a corresponding array of aligned larger access openings for receiving and accessing the heads of such screws; said back-up pad further including a metal reinforcing plate around said through openings between said backing plate and said layer of foam, said reinforcing plate having through open-



ings for receiving the shanks of the screws aligned with the through openings in said backing plate and having a periphery spaced a substantial distance inwardly from the periphery of said backing plate; and said adhesion layer being curved out of the plane of said support surface toward said backing plate around said access openings to provide radiuses at the junctures of said support surface with said access openings so that the adhesion layer will not be pulled away from the foam layer around the access openings by removal of abrasive sheets, and skins on the foam layer defining the access openings will not produce areas of higher grinding pressure along the support surface than will adjacent portions of the foam layer.

4,631,221

SHEET-LIKE SANDWICH MOLDING

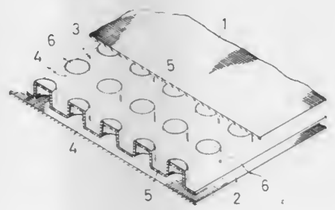
Dieter Disselbeck, Bad Soden am Taunus, and Dieter Stahl, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,349

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412846

Int. Cl.⁴ B32B *3/28, 3/26*

U.S. Cl. 428—166 **9 Claims**



1. A rigid sheet-like sandwich structure comprising two outer rigid covering layers connected by a core of low density and less rigid material than the covering layers, the core consisting of at least one sheet-like textile fabric of fiber material having open spaces between the fiber material, the sheet-like fabric having deformations therein formed by deep-drawing to thereby prestress the fiber material so deformed, and synthetic resin impregnating the fiber material.

4,631,222

EMBOSSING FOILS

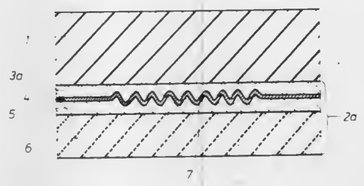
Helfried Sander, Nuremberg, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,795

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422910

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—172 **21 Claims**



1. An embossing foil comprising a backing foil having first and second surfaces, and on said first surface of said backing foil a transfer layer means which is releasable therefrom, said transfer layer means including: a diffraction layer having first and second surfaces, and comprised of, at least in part, a protective lacquer, said diffraction layer having a portion thereof configured to provide an optical diffraction structure; and a magnetic layer having first and second surfaces and comprising a dispersion of magnetisable particles in a binding agent, said first surface of said diffraction layer being disposed towards said first surface of said backing foil, and said second surface of said diffraction layer lacquer being disposed towards said first surface of said magnetic layer.

4,631,223

EMBOSSING FOILS HAVING A MAGNETIC LAYER

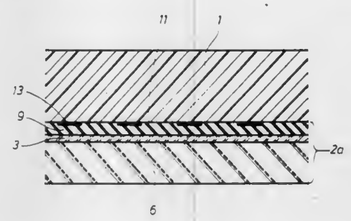
Helfried Sander, Nuremberg, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,793

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 34229116

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—172 **19 Claims**



1. An embossing foil comprising a backing foil having first and second surfaces, and on said first surface a transfer layer means which is releasable therefrom, said transfer layer means including a magnetic layer having first and second sides and comprising a dispersion of magnetisable particles in a binding agent, said transfer layer means at said first side of the magnetic layer which is towards the backing foil being provided at least in a region-wise manner thereon with at least one layer of lacquer which after removal of the backing foil provides a surface which can be written upon to constitute a signing layer, wherein provided between said signing layer and said magnetic layer is a blocking layer adapted to prevent the signing layer from being attacked by solvent contained in said magnetic layer.

4,631,224

HIGH TEMPERATURE, MOLTEN METAL RESISTANT FABRIC COMPOSITION

Stephen George, and Thomas George, both of Clinton, N.J., assignors to Subtex, Inc., Hartsdale, N.Y.

Continuation-in-part of Ser. No. 688,693, Jan. 4, 1985, Pat. No. 4,591,516, and a continuation-in-part of Ser. No. 688,709, Jan. 4, 1985, Pat. No. 4,563,219, which is a division of Ser. No. 585,909, Mar. 2, 1984, Pat. No. 4,507,355. This application Aug. 12, 1985, Ser. No. 764,874

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—246 **9 Claims**

1. A molten metal resistant, coated fabric composition comprising:

(a) a base fabric, and

(b) a coating on the surface of the fabric comprising

(i) an inorganic binder composition colloidal silica, monoaluminum phosphate, aluminum chlorohydrate and an amount of an alkyl tin halide catalyst effective to increase the bonding of said inorganic binder composition to said fabric

(ii) an organic binder

(iii) metallic flakes having a saucer-like configuration, a particle size range of about 30 to about 150μ and a thickness of about 0.5 to about 1.5μ, the amounts of said inorganic binder composition and said organic binder being effective to bond said metallic flakes to said fabric.

4,631,225

RUBBERIZED FABRIC

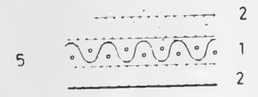
Akira Nishimura, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 28, 1985, Ser. No. 706,991

Claims priority, application Japan, Mar. 6, 1984, 59-43145

Int. Cl.⁴ B05D *1/36;* **B32B** *25/04, 25/10;* **B65D** *85/84*

U.S. Cl. 428—250 **10 Claims**



1. An oil-proof rubberized fabric comprising (a) a woven fabric as a strength member having coated thereon (b) an adhesive resin substantially impermeable to oil applied so as to provide a uniform coating layer over said woven fabric by dip-coating, and said adhesive resin having coated thereon (c) an oil-proof synthetic rubber layer on each side substantially symmetrical relative to said woven fabric.

4,631,226

COMPOSITIONS FOR THE TREATMENT OF TEXTILE MATERIALS

Thomas Jellinek, Plenty, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 494,290, May 13, 1983, Pat. No. 4,520,143, which is a continuation-in-part of Ser. No. 300,217, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 175,371, Aug. 5, 1980, abandoned, which is a continuation of Ser. No. 33,504, Apr. 26, 1979, abandoned. This application Mar. 19, 1985, Ser. No. 713,703

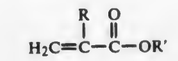
Claims priority, application Australia, May 9, 1978, PD4334

Int. Cl.⁴ B05D *3/00*

U.S. Cl. 428—270 **17 Claims**

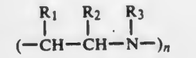
1. A textile material when treated by a composition comprising an admixture of:

(a) an aqueous emulsion of a copolymer of a monomeric mixture consisting essentially of an oxirane-containing monoethylenically-unsaturated material and at least one other monethylenically-unsaturated material selected from the group characterized by the formula



wherein R is H or C_1 to C_4 alkyl and R′ is a straight chain or branched chain radical of a primary or secondary alkanol, alkoxyalkanol or alkylthiaalkanol having up to 14 carbon atoms, and

(b) a water soluble or water dispersible polyamine which is composed of at least 4 alkylenimine units (—CH—CH—N—) which occur in sequences of such alkylenimine units having the formula A



(A)

wherein R_1 and R_2 are independently selected from hydrogen, and lower alkyl radicals of 1 to 4 carbon atoms, R_3 is H or other alkylenimine sequences of formula A, and n is a number which has an average value of at least 2, wherein the admixture (a) and (b) is further characterized in that it exists as a stable emulsion at a pH in the range 3 to 11 and wherein the proportion of polyamine (b) is such that the sequences of alkylenimine units of formula A represent from 0.5% to 25% by weight of the non-volatile material in the combined mass of the emulsion copolymer and polyamine.

4,631,227

TOILET ARTICLE

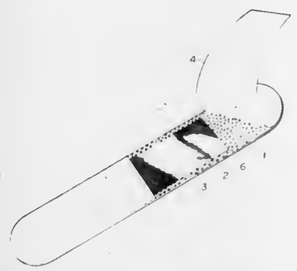
Kenji Nakamura, 3-7, Higashiyodogawa-ku, Osaka, Japan

Filed Dec. 5, 1983, Ser. No. 558,114

Claims priority, application Japan, Dec. 8, 1982, 57-213930

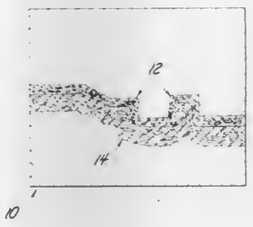
Int. Cl.⁴ A47L *13/16, 17/00;* **B32B** *3/00, 5/22*

U.S. Cl. 428—283 **11 Claims**



1. A cosmetic article comprising a sheet-like material, an adhesive layer formed on said sheet-like material, and a sheet consisting essentially of at least one hydrogel formable polymer selected from the group consisting of crosslinked alkali metal salts of carboxymethylcellulose and crosslinked polyalkylene oxide on said adhesive layer, said sheet of hydrogel formable polymer being present in an essentially dry condition but having the property of swelling and forming a gel when water at ambient temperature or a substance containing water is applied, said gel retaining at least 10 times its weight of water.

4,631,228
METHOD FOR MAKING A POROUS RIGID STRUCTURE AND THE POROUS RIGID STRUCTURE MADE THEREBY
Edmund R. Kruger, Sterling Heights, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 16, 1985, Ser. No. 809,021
Int. Cl.[4] B32B *5/22*
U.S. Cl. 428—316.6 15 Claims



15. A porous rigid structure for use as a mold comprising; finely divided metallic particles coated with a composition of fluid thermosetting resin dissolved in a volatile solvent, carbide particles coated with said composition of fluid thermosetting resin dissolved in a volatile solvent, carbon fibers, said carbon fibers and said metallic particles and said carbide particles being mixed and compacted into a predetermined shape of particles, and characterized by a substrate structure integrally bonded to the particle layer comprising needles coated with said composition of thermosetting resin, and glass fibers, said glass fibers being mixed with said metallic needles.

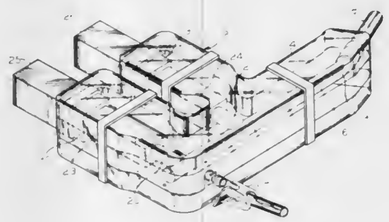
4,631,229
ARTICLE HAVING A COATING PREPARED FROM RADIATION CURABLE POLY(VINYL CHLORIDE) RESIN COMPOSITION
John A. Martens, and Brian H. Williams, both of White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 501,270, Jun. 6, 1983, Pat. No. 4,559,382.
This application Aug. 26, 1985, Ser. No. 769,369
Int. Cl.[4] C09U *7/02;* B32B *27/32*
U.S. Cl. 428—343 14 Claims

1. An article comprising a substrate bearing a coating prepared from a composition comprising a poly(vinyl chloride) resin and a vinyl chloride resin-compatible compound having (a) two to six terminal or pendant ethylenically-unsaturated groups, (b) two or more groups selected from divalent carbonylamino groups, divalent thiocarbonylamino groups, or both, and (c) polyvalent aliphatic group, Z, where Z represents the polyvalent residue remaining after the removal of hydroxyl or amino groups from an oligomeric nucleophilic compound, $Z(XH)_n$, Z containing carbon and hydrogen atoms, and having a molecular weight of 500 to 5000, where X represent —O— or



in which R^2 is hydrogen or lower alkyl group, and where n represents an integer having a value of 2 to 6, provided that there is at least one divalent carbonylamino or thiocarbonylamino group per ethylenically-unsaturated group, the amount of said vinyl chloride resin-compatible compound being sufficient so that upon exposure of the composition to actinic radiation, a gel is formed, provided that a film formed from a composition comprising poly(vinyl chloride) resin and about 10 percent by weight of said vinyl chloride resin-compatible compound remains transparent when pressed at elevated temperatures near the fusing point of the composition of poly(vinyl chloride) resin and said vinyl chloride resin-compatible compound.

4,631,230
UNIQUE EPOXY RESIN COMPOSITIONS AND COMPOSITE MOLDED BODIES FILLED THEREWITH
Kevork A. Torossian; Mark Markovitz, both of Schenectady, and Frederick E. Cox, Gloversville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Apr. 2, 1984, Ser. No. 595,599
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—412 7 Claims

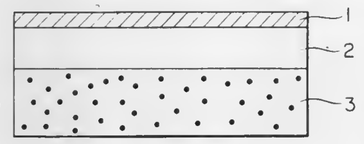


1. A composite molded body of electric insulating material comprising a mold shell of thermoplastic resin selected from the group consisting of polycarbonate, polyphenylene oxide, polysulfone and polyethermide, and a cured thermosetting resin composition contained in the shell and in contact therewith and bonded thereto consisting essentially of an epoxy resin mixture of 25–75 of 1,2 epoxy resin having at least two expoxide groups per molecule and 75–25% of a polyglycol diepoxide having viscosity from 2,000–5,000 cps at 25° C. and small but effective amounts of both a phenolic accelerator and a catalytic hardener.

4,631,231
PYRETHROID-CONTAINING MOLDED ARTICLES FOR COMBATING ECTOPARASITES
Wilhelm Stendel, Wuppertal, and Herbert Voege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Aug. 31, 1984, Ser. No. 646,551
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333657
Int. Cl.[4] B32B *27/38;* B28B *3/20;* G09F *3/00*
U.S. Cl. 428—413 5 Claims

1. An article molded of at least one polymer selected from the group consisting of a polyvinyl resin, polyacrylate, epoxy resin, cellulose, cellulose derivative, polyamide and polyester and containing at least one pyrethroid selected from the group consisting of 3'-phenoxy-4'-fluoro-α-cyano-benzyl 2,2-dimethyl-3-(2''-p-chlorophenyl-2''-chlorovinyl)-cyclopropanecarboxylate,3'-phenoxy-4'-fluoro-α-cyano-benzyl 2,2-dimethyl-3-(2'',2''-dichlorovinyl)cyclopropane-carboxylate, pentafluorobenzyl permethrate, and isomers thereof.

4,631,232
HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM
Osamu Ikawa, Yahata, and Takashi Yamahata, Yamato Koriyama, both of Japan, assignors to General Company Limited, Osaka, Japan
Filed Jul. 16, 1985, Ser. No. 755,451
Claims priority, application Japan, Jul. 18, 1984, 59-147580; Aug. 21, 1984, 59-172382
Int. Cl.[4] B32B *27/38*
U.S. Cl. 428—413 5 Claims



1. A heat-sensitive transferring recording medium which comprises a base film, a heat melting ink layer provided on the under surface of the base film, and a conveyance improving layer provided on the upper surface of the base film, said conveyance improving layer comprising a material selected from the group consisting of compounds having a perfluoroalkyl group and ultraviolet ray-curing type resins.

4,631,233
ADHESION OF LATEX COATINGS TO POLYMERIC SURFACES
Charles S. Kan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 23, 1985, Ser. No. 812,437
Int. Cl.[4] B32B *7/10;* B05D *5/00*
U.S. Cl. 428—420 18 Claims

1. A process for adhering a latex film to a polymeric substrate comprising:
contacting a polymeric substrate comprising a cyclic imino ether group, with a latex comprising a coreactive group to form a latex film whereby covalent bonds are formed at the interface of said polymeric substrate and said latex film.

10. a product prepared by the process of claim 1.

11. A process for adhering a latex film to polymeric substrate comprising:
contacting a latex comprising a cyclic imino ether group, with a polymeric substrate comprising a coreactive group to form a latex film whereby covalent bonds are formed at the interface of said latex film and said polymeric substrate.

18. A product prepared by the process of claim 11.

4,631,234
GERMANIUM HARDENED SILICON SUBSTRATE
Graydon B. Larrabee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 13, 1985, Ser. No. 775,885
Int. Cl.[4] H01L *21/20*
U.S. Cl. 428—428 14 Claims

1. A method of fabricating a strengthened silicon semiconductor substrate material, comprising the steps of:
adding to a silicon melt a high concentration of atoms having a size larger than the size of silicon atoms, said atoms being of the type which are substitutionally placed in the crystalline structure of said silicon substrate; and
growing said stregthened silicon semiconductor substrate material from said melt.

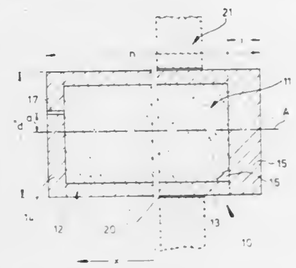
8. A method of growing a strengthened silicon crystal, comprising the steps:
adding polycrystalline silicon to a crucible;
adding germanium to the crucible;
heating the crucible, and thus the silicon and germanium, to form a composite melt;
dipping a monocrystalline silicon seed crystal into said melt; and
withdrawing said seed from said melt to thereby produce the strengthened silicon crystal.

10. A strengthened monocrystalline semiconductor substrate, comprising:
a silicon semiconductor material having a number of atoms of another type and of size greater than the atoms of said silicon material, said other atoms numbering more than eight thousand per million atoms of silicon and being substitutionally disposed within the silicon lattice of said material.

4,631,235
BONDING METHOD EMPLOYING COMPOSITION FOR IMPROVED ADHESION OF VINYLIDENE CHLORIDE LATEX TO IONOMER FILMS
John Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Division of Ser. No. 540,442, Oct. 11, 1983, Pat. No. 4,544,699.
This application Feb. 25, 1985, Ser. No. 705,351
Int. Cl.[4] B32B *27/08;* C09J *5/02*
U.S. Cl. 428—518 50 Claims

1. A method for laminating a substrate to an ionomer polyethylene carboxylate-containing film which comprises:
(a) applying as a coating to the substrate a dispersion of a vinylidene chloride copolymer in water, such vinylidene chloride copolymer comprising on a comonomer weight basis:
(1) from about 45 to about 90 percent vinylidene chloride,
(2) from about 5 to about 25 percent of a polar comonomer having one or more hydroxyl groups, and
(3) a cross-linking agent for hydroxyl groups, dissolved in said aqueous dispersion; and
(b) forcefully engaging said ionomer carboxylate-containing film with said coating at a temperature between about 130° and 250° F. so as to adhere to said coated substrate and form a laminated structure.

4,631,236
PROCESS FOR MANUFACTURING A DEVICE AND EXTRUSION BILLET FOR THIS
Hans-Gerd Roczyn, Hilzingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Feb. 14, 1985, Ser. No. 702,001
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406560
Int. Cl.[4] B22F *3/02;* B21C *23/22;* C22C *21/00, 21/10*
U.S. Cl. 428—558 2 Claims



1. An extrusion billet having a blank core and a mantel surrounding said core wherein said core is formed from a material comprising an aluminum alloy selected from the group consisting of high purity aluminum, AlFe, AlFeSi,

AlMn, AlMg, AlMgMn, AlZnMg, AlZnMgCu, AlCuMg and AlCuSiMn with additions of boron in a concentration of between 0.05 to 50 wt. % and said mantel is formed from a boron free aluminum alloy.

4,631,237

WIRE ELECTRODE FOR SPARK-ERODING SYSTEMS

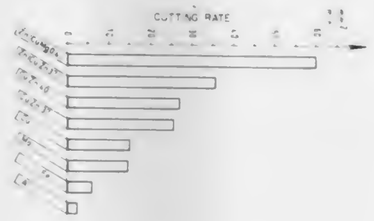
Erich Dommer, Heuchelheim, and Heinrich Groos, Herborn, both of Fed. Rep. of Germany, assignors to Berkenhoff GmbH, Heuchelheim-Kinzenbach, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 723,992

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415054

Int. Cl.⁴ B23P *1/12*

U.S. Cl. 428—621 **8 Claims**



1. In a wire electrode for spark-eroding systems for cutting of workpieces by eroding using intermittent electrical charges, including a core of a current-conducting material and a wire coating of a material having a lower evaporation temperature, the improvement which comprises: the core consists essentially of one of the following alloys:

(1) Mg 0.3–0.5% by weight
Others up to 0.3% by weight
Cu balance % by weight

(2) Fe 2.1–2.6% by weight
P 0.015–0.15% by weight
Pb up to 0.03% by weight
Zn 0.05–0.20% by weight
Others up to 0.5% by weight
Cu balance % by weight

(3) Cr 0.3–1.2% by weight
Zr 0.03–0.3% by weight
Others up to 0.2% by weight
Cu balance % by weight

(4) Zr 0.1–0.3% by weight
Others up to 0.2% by weight
Cu balance % by weight.

4,631,238

COBALT DOPED LANTHANUM CHROMITE MATERIAL SUITABLE FOR HIGH TEMPERATURE USE

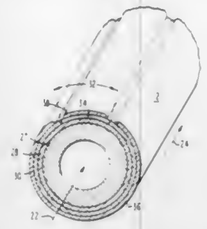
Roswell J. Ruka, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1985, Ser. No. 692,813

Int. Cl.⁴ H01M *8/12*

U.S. Cl. 429—30 **12 Claims**

1. In a high temperature, solid electrolyte electrochemical cell, subject to thermal cycling temperatures of between about 25° C. and about 1200° C., capable of electronic interconnection to at least one other electrochemical cell and capable of operating in an environment containing oxygen, said cell having two electrodes with solid electrolyte therebetween and an electronically conductive interconnect material disposed over a portion of one electrode, the improvement comprising an interconnect comprising a cobalt doped lanthanum chromite material, where the interconnect is characterized as being



nearly impermeable to oxygen, and having a coefficient of thermal expansion that approximates the solid electrolyte in the temperature range of between about 25° C. and about 1200° C.

4,631,239

FUEL CELL PLATES WITH IMPROVED ARRANGEMENT OF PROCESS CHANNELS FOR ENHANCED PRESSURE DROP ACROSS THE PLATES

Francis R. Spurrier; Bill L. Pierce, both of Whitehall Boro, and Maynard K. Wright, Bethel Park, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1985, Ser. No. 804,414

Int. Cl.⁴ H01M *8/24*

U.S. Cl. 429—39 **20 Claims**



1. In an electrochemical fuel cell including a pair of plates with one plate having fuel gas flow defining means formed therein and the other plate having oxidant gas flow defining means formed therein, an anode electrode and a cathode electrode disposed between said plates and an electrolyte matrix sandwiched between said anode and cathode electrodes, at least one of said fuel and oxidant gas flow defining means comprising:

(a) a first group of ribs defining a first group of gas flow channels, said channels at the ame one of their opposite ends being open at a first edge of said plate and at the same other of their opposite ends being connected together in flow communication in adjacent pairs, said ribs having formed therein a first group of spaced slots which interconnect and provide flow communication between adjacent channels;

(b) a second group of ribs defining a second group of gas flow channels, said channels being connected together in flow communication in adjacent pairs at their respective opposite ends, said rib having formed therein a second group of spaced slots which interconnect and provide flow communication between adjacent channels; and

(c) a third group of ribs defining a third group of gas flow channels, said channels at the same one of their opposite ends being open at a second edge of said plate and at the

same other of their opposite ends being connected together in flow communication in adjacent pairs, said ribs having formed therein a third group of spaced slots which interconnect and provide flow communication between adjacent channels;

(d) said second group of ribs and channels being disposed between said first and third groups thereof with said slots in one of said ribs of said first and third groups thereof interconnecting and providing flow communication between respective adjacent channels in said first and second groups thereof and said second and third groups thereof.

4,631,240

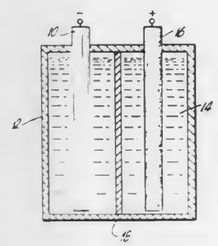
ELECTROCHEMICAL CELL

Fraser M. Walsh, Arlington, Mass., assignor to Tracer Technologies, Inc., Newton, Mass.

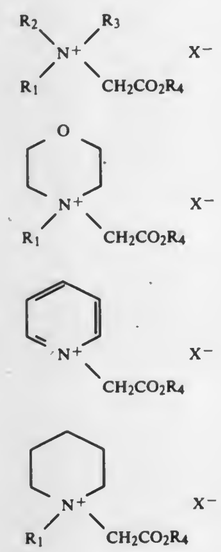
Filed Dec. 13, 1978, Ser. No. 969,227

Int. Cl.⁴ H01M *4/36*

U.S. Cl. 429—105 **3 Claims**



1. In an electrochemical cell having a metal anode wherein the metal is selected from zinc and cadmium; a bromine cathode; an aqueous electrolyte containing a metal bromide, the metal bromide having the same metal as the metal of the anode, the improvement comprising: a bromine complexing agent in said aqueous metal bromide electrolyte, said complexing agent consisting solely of a quaternary ammonium salt of an N-organo substituted alpha amino acid, ester, or betaine having one of the following formulas:



wherein X^{θ} is a halide anion selected from the group consisting of chloride and bromide ions, R_1, R_2, and R_3 are aryl, alkyl and haloalkyl groups of from 1 to 8 carbon atoms and R_4 is hydrogen in the case of acids or alkyl and haloalkyl groups of from 1 to 8 carbon atoms in the case of esters and in the case of betaines X— represents a negative charge on the carboxyl group and R_4 is nothing which quaternary ammonium salt is soluble in water and forms a cathodically active halogen complex which is substantially water immiscible liquid at temperatures in the range of from about 10° to about 60° C.

4,631,241

RETAINER TYPE LEAD-ACID BATTERY

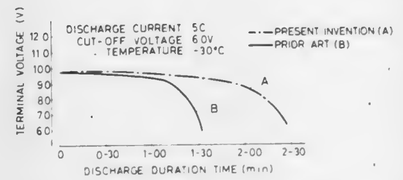
Yoshiharu Kawanami, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jul. 23, 1985, Ser. No. 758,007

Claims priority, application Japan, Jul. 23, 1984, 59-153583

Int. Cl.⁴ H01M *4/56, 4/62*

U.S. Cl. 429—225 **5 Claims**



1. A retainer type lead-acid battery having an electrolyte impregnated and retained only in a separator and positive and negative active material, wherein said separator comprises glass fibers having an average diameter of no more than 5.0 microns, said battery being fabricated such that applied pressure to an assembled element in the dry state prior to electrolyte filling is kept at a pressure of 5 to 50 kg/dm², and wherein said positive active material is composed of a lead oxide powder blended with anisotropic graphite in an amount of at least 0.1% of the weight of the lead oxide powder.

4,631,242

BISAZO ELECTROPHOTOGRAPHIC SENSITIVE MATERIALS WITH —CF_3 GROUP

Kazuhiro Emoto; Kozo Haino, and Akira Itoh, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,878

Claims priority, application Japan, Sep. 13, 1984, 59-191992; Oct. 1, 1984, 59-206851; Oct. 2, 1984, 59-207631

Int. Cl.⁴ G03G *5/06, 5/14*

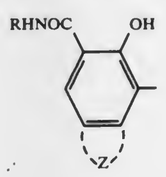
U.S. Cl. 430—58 **6 Claims**

1. An electrophotographic sensitive material which comprises an electrically conductive support and a light-sensitive layer which contains at least one of the azo compound selected from the group consisting of the following general formulas [I]–[III]:

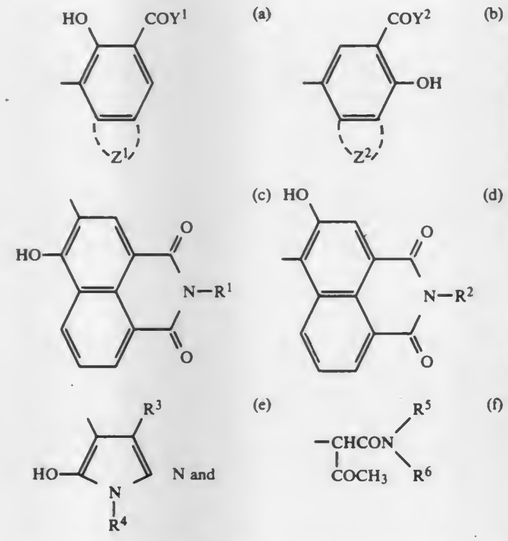
General Formula [I]:

$$Cp_1\text{-}N{=}N\text{-}A\text{-}N{=}N\text{-}Cp_2$$

wherein A represents a divalent residue which bonds through C atoms to N atoms which constitute azo and Cp_1 is a group represented by the formula:

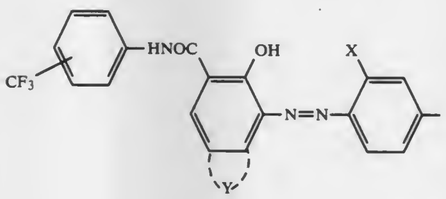


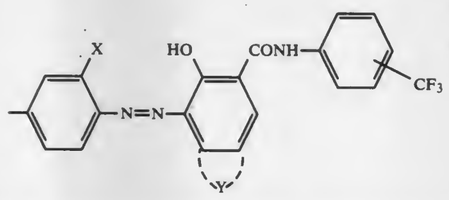
wherein Z is a group of atoms necessary to form a substituted or unsubstituted carbocyclic aromatic ring, a substituted or unsubstituted heterocyclic aromatic ring or a unsaturated monocyclic hydrocarbon ring and R represents an aryl group containing one or two CF_3 groups and Cp_2 is a coupler residue different from said Cp_1 and is selected from the group consisting of those which have the following formulas (a)–(f):



In the above formulas, Z^1 and Z^2 each is a group of atoms necessary to form a substituted or unsubstituted aromatic hydrocarbon ring or substituted or unsubstituted heterocyclic ring, R^1 and R^2 each is substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group, R^3 is an alkyl or carboxyl group or an ester thereof, R^4 and R^6 is a substituted or unsubstituted aryl or heterocyclic ring group and R^5 is H, a substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group and Y^1 and Y^2 each is $—NR^7R^8$, $—OR^9$, $—NHN=CH—R^{10}$ or $—NHNR^{11}R^{12}$ wherein R^7, R^8, R^9, R^{11} and R^{12} is H, substituted or unsubstituted alkyl, aralkyl, aryl or heterocyclic ring group and R^{10} is a substituted or unsubstituted aryl or heterocyclic ring group;

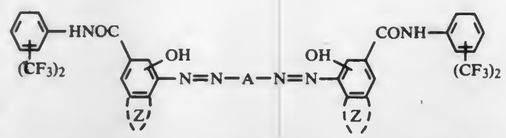
General formula (II):





wherein X is H, a halogen atom, a lower alkyl group, methoxy group or nitro group and Y is an aromatic ring or heterocyclic ring which may be substituted;

General formula (III):



wherein A is a divalent residue which bonds through C atoms to N atoms which constitute azo and Z is a group of atoms necessary to form a substituted or unsubstituted carbocyclic-aromatic ring, a substituted or unsubstituted heterocyclic aromatic ring or unsaturated monocyclic hydrocarbon ring.

3. An electrophotographic sensitive material according to claim 1 wherein the light-sensitive layer comprises a charge generation layer containing the azo compound and a charge transport layer containing a charge transport substance.

4,631,243

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER AND A PROCESS FOR THE PRODUCTION THEREOF

Wolfgang Podszun; John Goossens, both of Cologne; Carlhans Süling, Odenthal, all of Fed. Rep. of Germany; Herman Uyterhoeven, Bonheiden; Walter de Winter, Grafenwezen, both of Belgium; Günther Hoffarth, Leverkusen, and Wolfgang Richter, Krefeld, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,086

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426198

Int. Cl.⁴ G03G *9/12*

U.S. Cl. 430—114 **12 Claims**

1. An electrostatographic suspension developer which contains a dispersed pigment and at least one polymer formed from basic, secondary or tertiary amino group-containing monomers, in an electrically insulating carrier liquid with a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant of below 3, the improvement that the amino-groups of the polymer are completely or partially neutralised with a Bronsted acid, which contains at least one hydrocarbon radical having from 6 to 24 carbon atoms and which is a sulfonic acid, a phosphonic acid, a sulfuric acid monoester, a phosphoric acid mono- or diester or a CH-acid compound, the copolymer being added in a quantity of from 10 to 300% by weight, based on the pigment, the Bronsted acids being added in a quantity of from 0.01 to 10% by weight, based on the solids content of the suspension developer.

4,631,244

PROCESS FOR PREPARATION OF LIQUID TONERS FOR ELECTROSTATIC IMAGING USING POLAR ADDITIVE

Robert D. Mitchell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1986, Ser. No. 830,851

Int. Cl.⁴ G03G *9/12*

U.S. Cl. 430—137 **20 Claims**

1. A process for preparing toner particles for electrostatic imaging comprising

A. dispersing at an elevated temperature in a vessel a thermoplastic resin, a dispersant nonpolar liquid having a Kauri-butanol value of less than 30, and optionally a colorant, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the dispersant nonpolar liquid degrades and the resin and/or colorant decomposes;

B. cooling the dispersion, either

(1) without stirring to form a gel or solid mass, followed by shredding the gel or solid mass and grinding by means of particulate media in the presence of additional liquid;

(2) with stirring to form a viscous mixture and grinding by means of particulate media in the presence of additional liquid; or

(3) while grinding by means of particulate media to prevent the formation of a gel or solid mass in the presence of additional liquid; and

C. separating the dispersion of toner particles having an average by area particle size of less than 10 μm from the particulate media, the improvement whereby there is present, at least during the grinding in step B, 0.5 to 99% by weight of a polar additive having a Kauri-butanol value of at least 30, the percentage based on the total weight of liquid.

4,631,245

PHOTOSENSITIVE COMPOSITION ADMIXTURE OF A DIAZONIUM SALT POLYCONDENSATION PRODUCT AND POLYMERIC BINDER WITH CARBOXYL SIDE CHAIN GROUPS

Georg Pawlowski, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,925

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404366

Int. Cl.⁴ G03C *1/60*

U.S. Cl. 430—175 **18 Claims**

1. A photosensitive composition, comprising: a diazonium salt polycondensation product in admixture with a non-photosensitive polymeric binder having carboxyl side groups, said diazonium salt present in an amount sufficient to render said composition insoluble upon photoexposure, said binder being soluble or at least swellable in aqueous-alkaline solutions, the binder comprising the reaction product of an intramolecular anhydride of an organic polycarboxylic acid and a synthetic polymer containing vinyl alcohol units and having no further functional groups capable of reaction with acid anhydrides the amount of said anhydride being sufficient to render said composition soluble in an aqueous-alkaline developer if said composition is not subjected to photoexposure.

4,631,246

UNIFORM COVER SHEET WITH ROUGH SURFACE IN A PHOTOSENSITIVE ELEMENT

Allyn N. Bennett, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 642,822, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 368,126, Apr. 4, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,759

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—271 **20 Claims**

1. In a photosensitive element wound into laps of a roll comprising a flexible support bearing at least one layer of a photosensitive composition and a removable cover sheet protecting a surface of the photosensitive composition, wherein said photosensitive composition is positive working or is negative working and photopolymerizable or crosslinkable, said support having greater adhesion than the cover sheet to the photosensitive composition whereby the improvement comprises the cover sheet is of uniform composition, is strippable from the photosensitive composition and has a roughened finish with a peak to valley average difference of at least two microns on its surface which faces away from the photosensitive composition which allows air to be present between laps of the roll and the cover sheet has a substantially smooth surface which faces toward the photosensitive composition wherein said photosensitive composition on said flexible support is capable of lamination to a substrate after removal of said cover sheet and wherein said flexible support is capable of removal from the photosensitive composition.

4,631,247

ACETYLENE COMPOUNDS AS SHELF LIFE IMPROVERS FOR PHOTORESIST COMPOSITIONS CONTAINING ORGANIC IODIDES

Frank P. Tise, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 9, 1985, Ser. No. 764,038

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **8 Claims**

1. A photoresist composition comprising:

(a) at least one monomer capable of polymerization by photo-decomposition of an organic halide;

(b) an organic halide photoinitiator;

(c) a polymeric binder;

(d) about 0.1% to about 10%, based on the weight of the compositon, of an acetylene compound having the general formula RC≡CR′ where R and R′ are each indepedently phenyl, hydrogen, benzyl, vinyl, lower alkyl substituted vinyl, phenyl substituted vinyl, lower alkoxy methyl and phenoxymethyl; and

(e) a solvent.

4,631,248

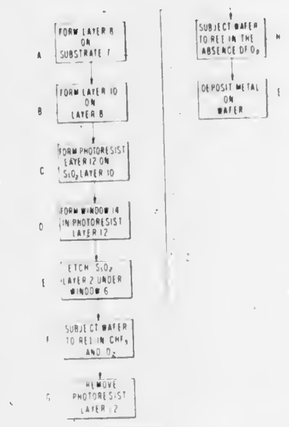
METHOD FOR FORMING AN ELECTRICAL CONTACT IN AN INTEGRATED CIRCUIT

Nicholas Pasch, Mt. View, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 21, 1985, Ser. No. 747,474

Int. Cl.⁴ B44C *1/22*

U.S. Cl. 430—313 **16 Claims**



1. A method of forming a contact through first material to material subjacent to said first material comprising the steps of:

forming a mask above said first material, said mask including a window region;

etching a first portion of said first material within said window region, a second portion of said first material remaining in said window region after said step of etching said first portion of said first material;

removing said mask; and

etching through said second portion of said first material to said subjacent layer.

4,631,249

PROCESS FOR FORMING THERMALLY STABLE NEGATIVE IMAGES ON SURFACES UTILIZING POLYGLUTARIMIDE POLYMER IN PHOTORESIST COMPOSITION

Palaiyur S. Kalyanaraman, Chalfont, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

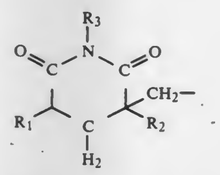
Division of Ser. No. 571,053, Jan. 5, 1984, Pat. No. 4,569,897. This application Nov. 14, 1985, Ser. No. 797,731

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.⁴ G03F *7/26*

U.S. Cl. 430—325 **6 Claims**

1. A process forming an image on a surface comprising depositing a negative acting photoresist film on said surface, said film comprising a polyglutarimide polymer and a negative-acting photosensitizer dissolved in a solvent wherein said polyglutarimide polymer comprises at least about 5 wt% glutarimide units of the formula:



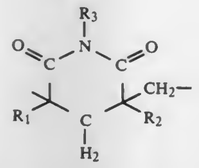
where R_1, R_2, and R_3 independently are hydrogen, unsubstituted and substituted alkyl, aryl, aralkyl or alkaryl hydrocarbons having from one to twenty carbon atoms or mixtures thereof, where at least about 20 mole percent of the R_3 substituents are hydrogen and where said negative-acting photosensitizer is selected from the group consisting of photosensitive azides and bisazides and is present in said photoresist at a sufficient quantity to enable the photoresist to become insoluble in an aqueous developer upon exposure of the photoresist to actinic radiation,

softbaking said film,

exposing a portion of said film to a source of actinic radiation that decreases the dissolution rate of said polyglutarimide in an aqueous developer, and

removing the unexposed portion of said film with said aqueous developer to form said image.

3. A process for forming an image on a surface comprising depositing a negative acting photoresist film on said surface, said film comprising a polyglutarimide polymer dissolved in a solvent wherein said polyglutarimide polymer comprises at least about 5 wt% glutarimide units of the structural formula:



where R_1, R_2, and R_3, prior to functionalization, are hydrogen, unsubstituted and substituted alkyl, aryl, aralkyl or alkaryl hydrocarbons having from one to twenty carbon atoms or mixtures thereof, and where all the R_3 hydrogen substitutents are functionalized by reacting said R_3 hydrogen substitutents with an unsaturated compound selected from the group consisting of alkenyl halides and alkenyl aromatic halides,

soft baking said film,

exposing a portion of said film to deep ultra violet light and

removing the unexposed portion of said film with an organic developer.

4,631,250

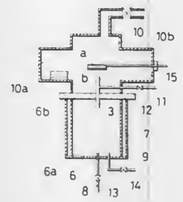
PROCESS FOR REMOVING COVERING FILM AND APPARATUS THEREFOR

Chikara Hayashi, Chigasaki, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,475

Int. Cl.⁴ G03C *11/24;* **B24B** *1/00;* **B24C** *1/00;* **B08B** *7/00*

U.S. Cl. 430—329 **2 Claims**



1. A process for removing a covering film from a surface of a substrate wherein CO_2 particles, produced in an air-tight sealed chamber, are blown from a jet nozzle by N_2 gas, said CO_2 particles being introduced into a treatment chamber against a covering film applied to the surface of the substrate.

4,631,251

HEAT-DEVELOPABLE COLOR PHOTO-SENSITIVE MATERIAL WITH POLYMERIC COUPLER

Tawara Komamura, Hachioji; Shunji Suginaka, Tokyo, and Kimie Tachibana, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,000

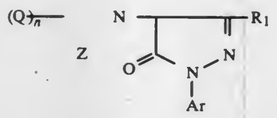
Claims priority, application Japan, Aug. 31, 1984, 59-182506

Int. Cl.⁴ G03C *1/40, 5/54*

U.S. Cl. 430—548 **13 Claims**

1. In a heat-developable color photo-sensitive material comprising a support bearing thereon a photographic component layer containing at least a photo-sensitive silver halide, a reducing agent, a binder and a dye-providing material; said heat-developable photo-sensitive material characterized in that at least one of said dye-providing materials is a polymer having a repetition unit being derived from a monomer represented by the Formula below:

Formula [I]



wherein, Q represents an ethylene unsaturated group or a group having an ethylene unsaturated group; Z represents a group of atoms required for forming a nitrogen-containing heterocyclic residual group in which a polymerizable ethylene unsaturated bond may also be incorporated into the heterocyclic ring, together with a nitrogen atom; R_1 represents an alkyl, aryl, alkylamino, anilino, acylamino or ureido group; Ar represents an aryl group or a heterocyclic residual group; and n is an integer of zero or one with the proviso that, when n is equal to zero, Z has an ethylene unsaturated bond in the ring of the heterocyclic residual group.

4,631,252

HYDROQUINONE ETHER COMPOUNDS

Frederick H. Howell, Atherton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

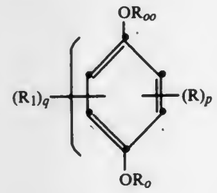
Division of Ser. No. 504,283, Jun. 14, 1983, Pat. No. 4,549,015. This application Jun. 6, 1985, Ser. No. 741,888

Claims priority, application United Kingdom, Jun. 16, 1982, 8217445; Dec. 15, 1982, 8235665

Int. Cl.⁴ G03C *7/26, 7/38*

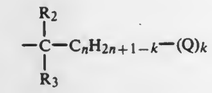
U.S. Cl. 430—551 **3 Claims**

1. A colour photographic silver halide material on a support which comprises at least one colour coupler—containing silver halide emulsion layer, there being present in the silver halide emulsion layer(s) or in a layer adjacent to the silver halide emulsion layer(s) a light stabilising amount of at least one compound having the formula I



(I)

wherein p is 1 or 2 and q is 0 or 1, provided that p+q is 1 or 2; R is a residue of formula II



(II)

wherein Q is selected from the residues:

(i) $—COZR_4$ wherein Z is —O— or $—NR_5$, and R_4 independently is —H, a C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to five oxygen atoms and optionally substituted by a group $—OR_6$ wherein R_6 is C_3–C_{12} cycloalkyl, straight or branched C_3–C_{20} alkenyl, C_6–C_{10} aryl optionally substituted by one or two C_1–C_4 alkyl groups or C_7–C_{13} aralkyl, or R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue, a C_3–C_{20} straight or branched chain alkenyl group or a C_3–C_{12} cycloalkyl group; a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_8 alkyl groups or a C_7–C_{13} aralkyl group; a 5 or 6 membered heterocycle containing an oxygen atom, and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups; or methyl substituted by a 5 or 6 membered heterocycle containing an oxygen atom and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups; and when Z is $—NR_5$, R_5 is hydrogen or a straight or branched chain C_1–C_{20} alkyl group or a C_5–C_6 cycloalkyl group, or R_4 and R_5 together with the nitrogen atom to which they are each bonded may form a 5 or 6 membered heterocyclic ring, optionally substituted by one or two C_1–C_4 alkyl groups;

(ii) —OX wherein X is R_7 or $—COR_7$, wherein R_7 is —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group, or a C_6–C_{10} aryl group, optionally substituted by one or two C_1–C_4 alkyl groups;

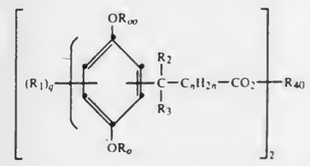
(iii) $—N(R_8)(R_9)$ wherein R_8 and R_9 independently, are —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group or a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_4 alkyl groups, or an acyl group of formula $—COR_7$ wherein R_7 has its previous significance, or R_8 and R_9, together with the nitrogen atom to which they are each bonded, form a 5- or 6-membered heterocyclic ring, optionally substituted by one or two C_1–C_4 alkyl groups;

(iv) $—PO(OR_{10})([O]_rR_{11})$ wherein x is 0 or 1, and when x is 1 R_{10} and R_{11} are the same or different and each is —H or a straight or branched chain C_1–C_{20} alkyl group, or a C_6–C_{10} aryl optionally substituted with one or two C_1–C_4 alkyl groups; or R_{10} and R_{11} may be linked together to form a C_2–C_3 alkylene chain optionally substituted by one to four C_1–C_{20} alkyl groups; and when x is 0, R_{10} has its previous significance and R_{11} is a C_1–C_5 straight chain alkyl group;

(v) $—SO_2R_{12}$ wherein R_{12} is —OH, —Cl or $—N(R_5)(R_7)$ wherein R_5 and R_7 have their previous significance; provided that, when R_{12} is —OH, then R_1 is a residue of formula II;

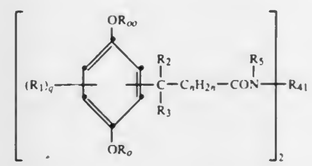
(vi) —CN, halogen or $—NO_2$; and

(vii) $—COR_{15}$ wherein R_{15} is —H or a C_1–C_{20} straight or branched chain alkyl group or halogen; n is an integer from 1 to 20; k is 1 or 2; R_2 and R_3 are the same or different and each is straight or branched chain alkyl group having from 1 to 5 carbon atoms and, when Q is $—CO_2R_4$, either R_2 or R_3 is optionally substituted by a $—CO_2R_4$ group, the R_4 groups being independent, or when Q is $—COOR_4$ R_2 or R_3 may be so linked to the residue C_nH_{2n}——$COOR_4$ that there is formed a C_5–C_{12} cycloalkylene residue optionally substituted by another group $—CO_2R_4$ the R_4 groups being independent, wherein R_4 has its previous significance; or when Q is $—COR_{15}$, R_2 and R_3 may be so linked to the residue C_nH_{2n}——COR_{15} that there is formed a C_5–C_{12} cycloalkylene residue wherein R_{15} has its previous significance; provided that, when the group Q is a $—CO_2R_4$ residue wherein R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue then p and k are both 1 and the compound of formula I has the formula Ia:



(Ia)

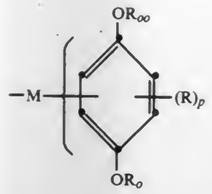
wherein R_{40} is a C_2–C_{20} divalent straight or branched chain alkylene residue; and provided that, when the group Q is a $—CON(R_4)(R_5)$ residue wherein R_4 is a C_2–C_{20} divalent straight or branched chain alkylene residue and R_5 has its previous significance, then p and k are both 1 and the compound of formula I has the formula Ib:



(Ib)

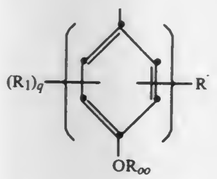
wherein R_2, R_3, q and n have their previous significance, R_{41} is a C_2–C_{20} divalent straight or branched chain alkyl residue; R_1 is C_1–C_8 straight or branched chain alkyl, C_5–C_7 cycloalkyl optionally substituted by one or two methyl or ethyl groups, C_7–C_9 aralkyl or a residue of formula II as hereinbefore defined, and when R_1 is a residue of formula II then R_1 and R may be the same or different; or R_1 is a residue of formula III:

(III)



in which R and p have their previous significance; and M is a direct bond; —C(R_{13})(R_{14})— in which R_{13} and R_{14} are the same or different and are hydrogen, C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to 3 sulphur atoms, C_6–C_{10} aryl or R_{13} and R_{14}, together with the carbon atom to which they are attached may form a 5- or 6-membered ring which may be further substituted by one or two C_1–C_8 straight or branched chain alkyl groups; —S—; —S—S—; —SO_2—; —CH_2SCH_2—; —CH_2OCH_2— or —$C(CH_3)_2$-p-phenylen-$C(CH_3)_2$—; R_o and R_{oo} are the same or different and each is hydrogen, a C_1–C_{20} straight or branched chain alkyl group optionally interrupted by 1 to 5 oxygen atoms, a C_3–C_{12} cycloalkyl group, a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups, or a C_7–C_{13} aralkyl group provided that both of R_o and R_{oo} are not hydrogen, or R_{oo} has its previous significance and R_o is a residue of formula IV:

(IV)



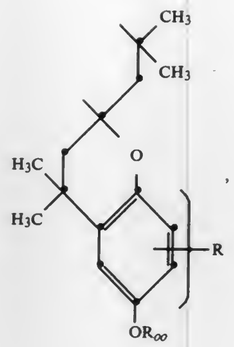
in which R, R_{oo}, R_1 and q have their previous significance, or R_o and R_1, when in ortho position to one another, together with the carbon atoms to which they are attached, may form an optionally substituted residue of formula V:

(V)

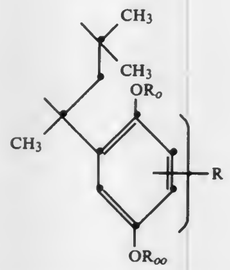


wherein A is a carbon residue containing 4 to 20 carbon atoms which forms a substituted chroman or coumaran system, or R_o and R_1 together may form a residue having the formula VI or VII:

(VI)

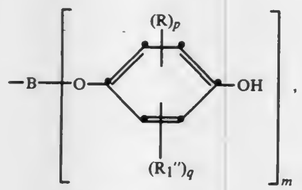


(VII)

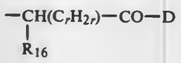


wherein R, R_o and R_{oo} have their previous significance, provided that the compound of formula I contains only one residue of formula III or IV; or R_{oo} is hydrogen and R_o is a residue having the formula IVa or IVb:

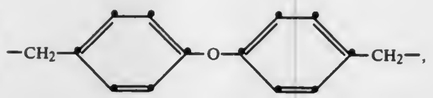
(IVa)



(IVb)

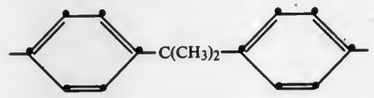


wherein p, q and R have their previous significance, R_1'' is C_1–C_8 straight or branched alkyl, C_7–C_9 aralkyl or a residue of formula II, as hereinbefore defined, m is 1 or 2, B, when m is 1, represents C_2–C_{12} alkylene which may be interrupted by 1 to 3 oxygen or sulphur atoms, C_4–C_{10} alkenylene, C_5–C_{12} cycloalkylene, C_6–C_{12} arylene, C_8–C_{12} aralkylene, $C_{4\text{-}6}$ alkynylene, xylylene, —$CH_2CH(OH)CH_2$—, —$CH_2CH(OH)CH_2$—O—Y—O—$CH_2CH(OH)CH_2$—,

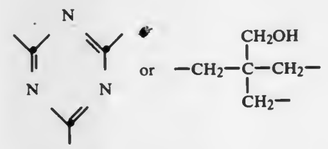




or —CH_2COO—B'—$OCOCH_2$— wherein Y is C_2–C_{10} alkylene, C_6–C_{12} arylene,



or C_6–C_{12} cycloalkylene, B' is C_2–C_8 alkylene, C_4–C_8 oxaalkylene, or cyclohexylene and, when m is 2, B represents a group of the formula



r is 0 to 12, R_{16} represents hydrogen or straight or branched C_1–C_{12} alkyl and D is —OR_4 or —$N(R_4)(R_5)$ wherein R_4 and R_5 have their previous significance; and with the proviso that excluded from the scope of the claim are those compounds in which p is 1, q is 1, Q is COR_{15} wherein R_{15} is H, R_o and R_{oo} are C_1–C_{20} alkyl and R_1 is C_1–C_8 alkyl, as well as salts of compounds of formula I with bases or organic or inorganic acids, respectively, when Q is an acidic or basic group.

4,631,253

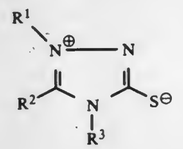
METHOD FOR FORMING SILVER HALIDE EMULSION COMPRISING FORMING SILVER HALIDE GRAINS IN THE PRESENCE OF MESOIONIC 1,2,4-TRIAZOLIUM-3-THIOLATE COMPOUND

Hiroyuki Mifune; Koki Nakamura, and Shoji Ishiguro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1985, Ser. No. 697,825
Claims priority, application Japan, Feb. 3, 1984, 59-19096
Int. Cl.[4] G03C *1/02, 1/06*
U.S. Cl. 430—569 **6 Claims**

1. A method for forming a silver halide emulsion comprising forming silver halide grains in the presence of a compound represented by formula (I), said compound being present during precipitation of said silver halide grains or thereafter until during physical ripening of said grains,

(I)



wherein $R^1$and R^2 each represents an unsubstituted or substituted alkyl group, alkenyl group, cycloalkyl group, aralkyl group, aryl group, or heterocyclic group; R^3 represents an unsubstituted or substituted alkyl group, alkenyl group, cycloalkyl group, aralkyl group, aryl group, —NR^4R^5, or a heterocyclic group, and R^4 and R^5 each represents a hydrogen atom, an alkyl group, or an aryl group; and wherein R^1 and R^2 or R^2 and R^3 can combine with each other to form a 5- or 6-membered ring.

4,631,254

CARCINOEMBRYONIC ANTIGEN DETERMINATION

Nicholas A. Giorgio, Avenel; John Krupey, Glen Rock, and Leonard T. Wilson, Verona, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 446,925, Dec. 6, 1982, abandoned. This application Sep. 6, 1985, Ser. No. 773,263
Int. Cl.[4] G01N *33/53, 33/539, 33/541, 33/574*
U.S. Cl. 435—7 **12 Claims**

1. A method of determining the concentration of carcinoembryonic antigen in a sample of serum or plasma from a human which comprises:

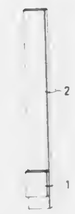
(a) adding sufficient buffer to a sample of serum or plasma to produce a pH of from about 6.0 to about 6.5;
(b) adding hydrophilic silica having a BET surface area of from 100 to 400 m^2/g and an average primary particle size of from 7–16 nanometer to said sample and incubating said sample to neutralize materials in said sample which would interfere with determination of CEA;
(c) separating the silica from the sample;
(d) adding an excess of an antibody to CEA to said sample and incubating for a predetermined time;
(e) adding to said sample an amount of carcinoembryonic antigen labeled with a labeling substance capable of being quantitatively determined at least sufficient to react with the amount of antibody added in step (d) and incubating for a predetermined time;
(f) adding to said sample an insolubilizing agent thus forming a solid phase containing antibody-bound CEA and a liquid phase containing unbound CEA;
(g) separating said solid and liquid phases;
(h) determining the amount of said labeling substance present in either said solid or said liquid phase; and
(i) determining the amount of carcinoembryonic antigen present in said sample by comparison against a standard.

4,631,255

COMPOSITION FOR ASSAYING FOR NITRITES

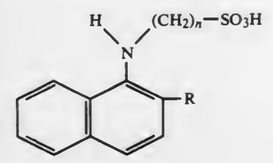
Kiyoko Takino, Akishima; Hidetoshi Asahi, Kokubunji, and Hiroshi Wada, Chigasaki, all of Japan, assignors to Eiken Kagaku Kabushiki Kaisha, Japan

Filed Dec. 17, 1984, Ser. No. 682,143
Claims priority, application Japan, Jul. 23, 1984, 59-152509
Int. Cl.[4] C12Q *1/12;* **G01N** *33/00*
U.S. Cl. 435—37 **14 Claims**



1. A composition for assaying for nitrites comprising a diazotizable amine, an acid component and a coupling component, wherein said coupling component comprises a compound of the following formula I:

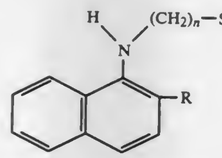
(I)



wherein R represents a hydrogen atom or a straight-chain alkyl group having 1 to 6 carbon atoms, and n represents an integer of 1 to 6, with the proviso that carbon atoms of the sulfoalkyl group may be substituted with at least 1 hydroxyl group,

or a water-soluble salt thereof.

9. A test device for assaying for nitrites, comprising a composition for assaying for nitrites supported on an absorptive carrier applied to a support, wherein said composition comprises a diazotizable amine, an acid component and a coupling component, said coupling component being a compound of the following formula I:



(I)

wherein R represents a hydrogen atom or a straight-chain alkyl group having 1 to 6 carbon atoms, and n represents an integer of 1 to 6 with the proviso that carbon atoms of the sulfoalkyl group may be substituted with at least 1 hydroxyl group,

or a water-soluble salt thereof.

4,631,256

FERMENTATION PROCESS FOR BBM-928

Hideo Koshiyama, Musashino; Fumihide Sakai, Yokohama, and Hiroaki Ohkuma, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 390,149, Jun. 21, 1982, Pat. No. 4,451,456, which is a division of Ser. No. 122,626, Mar. 6, 1980, Pat. No. 4,360,458, which is a continuation-in-part of Ser. No. 26,488, Apr. 2, 1979, abandoned. This application Oct. 6, 1983, Ser. No. 539,513

Int. Cl.⁴ C12P *21/00, 1/06;* **C12R** *1/03*

U.S. Cl. 435—68 **3 Claims**

1. A fermentation process for production of antitumor antibiotic BBM-928 complex which comprises cultivating a strain of Actinomadura sp. having all the identifying characteristics of strain No. G455-101 in aqueous solution containing an assimilable carbon source and an assimilable nitrogen source under submerged aerobic conditions until the BBM-928 complex produced imparts substantial antitumor antibiotic activity to said solution.

4,631,257

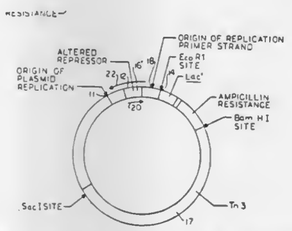
STABLE HIGH COPY NUMBER PLASMIDS

David H. Gelfand, Oakland, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 239,165, Feb. 27, 1981, abandoned, and a continuation-in-part of Ser. No. 972,705, Dec. 26, 1978, abandoned. This application Feb. 17, 1983, Ser. No. 467,369

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00, 1/00*

U.S. Cl. 435—68 **10 Claims**



1. A DNA plasmid comprising, a site for replication origin, a gene for formation of a replication primer strand, a site for the initiation of readthrough expression, a section of heterologous DNA downstream from said expression initiation site encoded and in proper reading frame to produce a desired protein, and an altered repressor gene leading to high copy number replication, said plasmid further having a disabling configuration for preventing readthrough transcription into said gene for the replication primer strand, said disabling configuration comprising said expression initiation site and said heterologous DNA oriented so that transcription thereof occurs oppositely to the direction of transcription of said replication primer strand gene or a stop sequence interposed between said heterologous DNA and said replication primer strand gene or both.

4,631,258

IRRADIATION ALCOHOL FERMENTATION PROCESS

Youn W. Han, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 17, 1983, Ser. No. 524,178

Int. Cl.⁴ C12P *19/14, 7/06*

U.S. Cl. 435—99 **4 Claims**

1. An alcohol fermentation process which eliminates the heat gelatinization process comprising:

(a) irradiating a starch based substrate with a sufficient amount of gamma radiation to effect sugar yield, susceptibility to enzymatic hydrolysis of starch, yeast growth, and alcohol production;

(b) treating the irradiated starch based substrate with a sufficient amount of amylases complex to effect enzymatic action;

(c) adding sufficient yeast to ferment the product of (b).

4,631,259

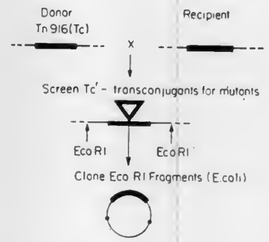
TRANSPOSON IN CLONING DNA

Don B. Clewell, and Mary C. Gawron-Burke, both of Ann Arbor, Mich., assignors to Board of Regents of The University of Michigan, Ann Arbor, Mich.

Filed May 4, 1983, Ser. No. 491,352

Int. Cl.⁴ C12P *21/00;* **C12N** *1/00, 15/00*

U.S. Cl. 435—172.3 **8 Claims**



1. A process for cloning a gene which comprises,

(1) introducing excising transposon Tn 916 by transformation, conjugation, or transduction into a host microorganism which comprises a gene which is to be cloned,

(2) selecting for the transformed microorganisms which comprise Tn 916 inserted into said gene as evidenced by the insertional inactivation of the phenotype encoded for by said gene,

(3) isolating the DNA which contains Tn 916 from said selected transformed microorganisms,

(4) cleaving said isolated DNA with a suitable restriction enzyme so as to leave the Tn 916 and the gene intact,

(5) ligating said cleavage DNA fragment which comprises the Tn 916 and the cloned gene to a vector,

(6) introducing the chimaeric DNA produced in step (5) into a host microorganism by transformation,

(7) selecting for the transformed microorganisms which comprise said chimaeric DNA by screening for tetracycline resistance, and

(8) culturing said selected transformed microorganism in the absence of tetracycline so as to excise Tn 916 from said chimaeric DNA and thereby restore the phenotypical trait encoded for by the cloned gene.

4,631,260

PROCESS FOR PREPARING CERAMIC MATERIALS

Donald M. Bartos, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 748,109, Jun. 24, 1985. This application May 23, 1986, Ser. No. 868,177

Int. Cl.⁴ C04B *35/56*

U.S. Cl. 501—88 **30 Claims**

1. A method of preparing a ceramic material, which method comprises (1) treating a preceramic silazane polymer with steam at a temperature in the range of 35° C. to 200° C. for a time sufficient to render the preceramic silazane polymer infusible wherein the treatment temperature is sufficiently low so that the preceramic silazene polymer remains unfused during the treatment step, and (2) heating the infusible preceramic silazane polymer of step (1) in an inert atmosphere, vacuum or ammonia-containing atmosphere to a temperature of at least 750° C. until said infusible preceramic silazane polymer is converted to a ceramic material.

4,631,261

METHOD FOR PREPARING HYDROCARBON CATALYTIC CRACKING CATALYST COMPOSITIONS

Goro Sato; Masamitsu Ogata, and Takanori Ida, all of Kita-Kyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 713,075

Claims priority, application Japan, Mar. 15, 1984, 59-49968

Int. Cl.⁴ B01J *29/06*

U.S. Cl. 502—65 **7 Claims**

1. A method for preparing a catalyst composition for cracking hydrocarbons, which comprises:

a. preparing flash-calcined alumina particles by heating alumina hydroxide, which has been prepared by the Bayer process, with hot air having a temperature of from 350° to 700° C., for 5 seconds or less,

b. mixing (i) said flash-calcined alumina particles with (ii) clay predominantly composed of silica and alumina, (iii) crystalline aluminosilicate zeolite, (iv) a precursor of siliceous inorganic oxide, and (v) water, to form an aqueous slurry,

c. spray drying said slurry to obtain fine spherical catalyst particles, said catalyst particles containing cores of said flash-calcined alumina particles covered by exterior shells of silica-alumina formed by reaction between said flash-calcined alumina and said precursor;

d. washing said catalyst particles until the alkali metal content thereof is 1.0 wt. % or less, calculated as the oxide, and

e. then substantially uniformly impregnating said catalyst particles with a rare earth component.

4,631,262

METHOD OF MAKING SEED SOLUTION USEFUL IN ZEOLITE CATALYST MANUFACTURE

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Filed Jun. 5, 1985, Ser. No. 741,511

Int. Cl.⁴ B01J *29/08, 21/12*

U.S. Cl. 502—65 **10 Claims**

1. The method for increasing the storage life of a clear solution of amorphous sodium aluminosilicate seeds prepared by mixing solutions of sodium silicate, sodium aluminate and sodium hydroxide, used in proportion such as to form a clear solution, heating said solution to mature the seeds in said solution, and diluting the clear seed solution by adding an effective amount of alkaline sodium silicate solution.

2. The method of claim **1** wherein the matured seed solution has a molar composition within the following range:

H_2O/Na_2O	15 to 18
Na_2O/SiO_2	.9 to 1.1
SiO_2/Al_2O_3	15.5 to 19

9. The method of claim **1** wherein said seed solution is employed to initiate the crystallization of zeolite Y in step (e) of a process for making a fluid catalytic cracking catalyst comprising the steps of:

(a) forming an aqueous slurry of finely divided hydrous kaolin clay and finely divided kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(b) spray drying the aqueous slurry to obtain microspheres comprising a mixture of hydrous kaolin clay and kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(c) calcining the microspheres obtained in step (b) at a temperature and for a time sufficient to convert the hydrous kaolin clay in the microspheres substantially to metakaolin and to obtain microspheres of calcined clay comprising a mixture of about 30–60% by weight metakaolin and about 40–70% by weight kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(d) mixing the microspheres obtained in step (c) with the sodium silicate diluted clear seed solution prepared in claim **1** and with one or more sources of sodium silicate and water to obtain an alkaline slurry of microspheres of calcined clay in an aqueous solution containing sodium silicate, the sodium silicate used to dilute the clear seeds plus the sodium silicate added in step (d) being provided in amounts such that microspheres having a SiO_2/Al_2O_3 molar ratio of about 1.7–3.4 are obtained in step (f) below;

(e) heating the slurry of microspheres of calcined clay to a temperature and for a time sufficient to crystallize at least about 40% by weight Y-faujasite in the microspheres, said Y-faujasite being in the sodium form;

(f) separating the microspheres containing at least about 40% by weight Y-faujasite from at least a major portion of its mother liquor;

(g) and replacing sodium cations in the microspheres separated in step (f) with ammonium or rare earth cations or both.

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WATER-REPELLENT CATALYST FOR GAS/LIQUID REACTIONS AND PROCESS FOR GAS/LIQUID REACTIONS BY USING THE SAME

Mamoru Mizumoto; Hisao Yamashita, both of Hitachi; Shinpei Matsuda, Toukai, and Kazuhiko Yamaguchi, Urayasu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 458,988, Jan. 18, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 787,077

Claims priority, application Japan, Jan. 18, 1982, 57-4998

Int. Cl.⁴ B01J *31/06, 35/00*

U.S. Cl. 502—159 **5 Claims**

1. A water-repellent catalyst assembly for promoting a three-phase interface in gas/liquid reactions comprising a catalyst consisting of a carrier formed of a sheet or film consisting of a water-repellent porous polytetrofluoroethylene, said carrier having a mean pore size of 0.1 to 10 μm to provide gas permeability and liquid impermeability and a thickness of 10 to 100 μm, and a catalytically active noble metal carried directly on at least one surface of said carrier, the amount of the catalytically active noble metal being 0.1 to 10 weight % with respect to the total weight of said carrier and said catalytically active noble metal; and a hydrophilic supporting member disposed on the surface of said carrier where the catalytically active noble metal is carried, thereby facilitating contact of liquid with said catalytically active nobel metal and promoting formulation of liquid drops on the surface of the carrier.

4,631,264

CATALYST AND PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ACIDS

Gary P. Hagen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 632,018, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 412,914, Aug. 30, 1982, abandoned. This application Oct. 7, 1985, Ser. No. 785,325

Int. Cl.⁴ B01J *21/08, 27/14, 27/185, 27/182*

U.S. Cl. 502—243 **10 Claims**

1. A catalytic composition comprising a Group IA alkali metal component deposited on a silica component wherein said alkali metal component is present in an amount in the range of from about 200 parts per million to about 15,000 parts per million by weight and wherein said silica component is prepared by precipitating a colloidal silica from water in the presence of hydrogen ions and thereupon dried, crushed, and calcined such that the resulting silica component has a surface area of 50–500 m^2/g, a pore volume of 0.5–3.5 cc/g and an average pore diameter of 80–600 Å, and contains less than about 500 parts per million individually of aluminum, zirconium, titanium, and iron.

4,631,265

NICKEL/ALUMINA/SILICATE CATALYST, ITS PREPARATION

Johannes C. Oudejans, Delft; Peter Nootenboom, Oud-Beyerland; Keshab L. Ganguli, Bleiswijk, and Cornelis M. Lok, Rockanje, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" P.B.V., Rotterdam, Netherlands

Filed Jun. 21, 1985, Ser. No. 747,439

Claims priority, application Netherlands, Jun. 21, 1984, 8401965

Int. Cl.⁴ B01J *21/12, 23/74*

U.S. Cl. 502—259 **14 Claims**

1. A nickel/alumina/silicate catalyst, in which the atomic ratio of nickel/aluminium is between 20 and 5, the nickel/silicate molar ratio between 20 and 4.5 and the active nickel surface area is between 70 and 150 m^2/g nickel, which catalyst has an open, porous structure with macropores of 50–500 nanometers and a mesopore structure having an average pore size between 8 and 20 nanometers.

6. A process for the preparation of a nickel/alumina/silicate catalyst as defined in claim 1 wherein an insoluble nickel compound is precipitated from an aqueous solution of a nickel salt with an excess alkaline precipitating agent, which precipitate is subsequently allowed to age in suspended form and is then collected, dried and reduced, in which, after the nickel ions have been precipitated, a soluble aluminium compound and a soluble silicate added.

4,631,266

CATALYST FOR CONVERSION OF METHANOL

Johnny Wold, and Leif A. Kristiansen, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Oslo, Norway

PCT No. PCT/NO85/00016, § 371 Date Oct. 10, 1985, § 102(e) Date Oct. 10, 1985, PCT Pub. No. WO85/04597, PCT Pub. Date Oct. 24, 1985

PCT Filed Mar. 12, 1985, Ser. No. 794,924

Claims priority, application Norway, Apr. 12, 1984, 841453

Int. Cl.⁴ B01J *21/04, 23/02, 23/34, 23/72*

U.S. Cl. 502—324 **4 Claims**

1. A catalyst comprising aluminium oxide and copper oxide where at least 60% by weight of this oxide mixture consists of a copper-alumina spinel and 60–100% of the copper present in the catalyst is bound to aluminium oxide as copper oxide-aluminium oxide spinel, and wherein the catalyst contains an alkali or alkaline earth oxide which is present in pores of the spinel in an amount of 0.2–12% by weight calculated as metal, and wherein the catalyst contains manganese oxide in an amount corresponding to 0–10% by weight of manganese.

4,631,267

METHOD OF PRODUCING HIGH-STRENGTH HIGH SURFACE AREA CATALYST SUPPORTS

Irwin M. Lachman, and Lawrence A. Nordlie, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,874

Int. Cl.⁴ B01J *20/28, 29/04, 35/00*

U.S. Cl. 502—439 **32 Claims**

1. A method of producing a monolithic catalyst support having substantial strength and high surface area comprising:

(a) Mixing into a substantially homogeneous body

(i) a porous oxide having a surface area of at least 20 m^2/g selected from the group consisting of zeolite, silica, alumina, spinel, titania, zirconia, and mixtures of these;

(ii) a precursor of a permanent binder for the porous oxide selected from the group consisting of alumina precursors, silica precursors, titania precursors, zirconia precursors, and mixtures of these, said binder precursor having a crystallite size below 200 angstoms; and

(iii) a temporary binder; and

(b) heating the body to a temperature of from 500°–1000° C. to result in substantial strength and substantial surface area and to substantially completely burn off said temporary binder.

20. A monolithic catalyst support having a modulus of rupture of at least 500 psi, comprising 70–97 parts by weight of a high surface area porous oxide phase and 3–30 parts by weight of a permanent binder for the porous oxide phase dispersed throughout wherein

(i) the porous oxide phase has a surface area of at least 20 m^2/g and consists of alumina, silica, zeolite, spinel, zirconia, or mixtures of these; and

(ii) the binder results from heating in situ, at a temperature of 500°–1,000° C., a binder precursor consisting of alumina precursors, silica precursors, zirconia precursors, or mixtures of these, said binder precursor having a crystallite size below 200 anstroms.

4,631,268

PREPARATION OF MONOLITHIC CATALYST SUPPORT STRUCTURES HAVING AN INTEGRATED HIGH SURFACE AREA PHASE

Irwin M. Lachman; Pronob Bardhan, and Lawrence A. Nordlie, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,875

Int. Cl.⁴ B01J *20/28, 35/00*

U.S. Cl. 502—439 **21 Claims**

1. A method of producing a monolithic catalyst support having a first substantially continuous high-strength ceramic matrix phase and a second, discontinuous, catalyst-support phase of high surface area porous oxide embedded therein, comprising:

(a) providing multiple matrix bodies comprising a mixture of a sinterable ceramic and a plasticizing/bonding agent for the ceramic;

(b) providing multiple support bodies comprising a mixture of (i) a high surface area porous oxide having a surface area of at least 20 m^2/g selected from the group consisting of alumina, silica, spinel, titania, zirconia, zeolite, and mixtures of these, and (ii) a plasticizing/binding agent for the oxide;

(c) intermingling the matrix bodies and support bodies to form a composite thereof wherein the ratio of matrix bodies to support bodies is at least 1.3:1 and wherein the support bodies are substantially uniformly distributed through the composite;

(d) passing the composite body through a die to form a desired shape thereof; and

(e) heating the shape to sinter the ceramic material therein.

16. A monolithic catalyst support comprising a first substantially continuous ceramic matrix phase and a second, discontinuous, discrete, high surface area support phase embedded

therein wherein the matrix phase is 60–90 percent by weight of the monolith and the high surface area phase is 10–40 percent by weight of the monolith and has a surface area of at least 20 mm^2/g and comprises alumina, silica, spinel, titania, zirconia, zeolite, or mixtures of these.

17. A monolithic catalyst support of claim 16 wherein the ceramic matrix phase comprises cordierite, mullite, clay, talc, zirconia, zirconia-spinel, alumina, silica, lithium aluminosilicate, alumina-zirconia, or mixtures of these.

4,631,269

MONOLITHIC CATALYST SUPPORTS INCORPORATING A MIXTURE OF ALUMINA AND SILICA AS A HIGH SURFACE AREA CATALYST SUPPORT MATERIAL

Irwin M. Lachman, and Lawrence A. Nordlie, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 712,886, Mar. 18, 1985, abandoned, and Ser. No. 712,875, Mar. 18, 1985, abandoned. This application May 31, 1985, Ser. No. 739,627

Int. Cl.⁴ B01J *21/12, 20/28*

U.S. Cl. 502—439 **15 Claims**

1. An improved monolithic catalyst support structure comprising a structural phase of a sintered ceramic material and a high surface area support phase of a porous oxide integral with the structural phase, wherein the porous oxide support phase consists essentially of 50–93% by weight alumina and 7–50% by weight silica.

3. An improved monolithic support of claim 2 in which the monolith has a surface area of at least 15 m^2/g.

4,631,270

THERAPEUTICALLY USEFUL PSEUDOPEPTIDES, COMPOSITIONS CONTAINING THE SAME AND METHODS OF PREPARATION AND USE

John A. Yankeelov, Jr., and Kam-Fook Fok, both of Louisville, Ky., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 962,100, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,626, Jan. 11, 1978, abandoned. This application Mar. 25, 1985, Ser. No. 715,424

Int. Cl.⁴ A61K *37/43;* **C07K** *7/12, 7/20, 7/06*

U.S. Cl. 514—15 **13 Claims**

1. Pseudodipeptides useful in the preparation of peptide mimics of a member of the natural catalyst substrate pairs, said pseudodipeptides being selected from the group consisting of Gly Ψ Leu, Phe Ψ His, Gly Ψ Ile, Leu Ψ Leu, Ala Ψ Ala, Tyr Ψ Gly, Arg Ψ Gly, Pro Ψ Gly -NH_2, Lys Ψ Ser, and Arg Ψ Met.

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SEROTONIN-D-FRUCTOSE AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Làszlo Mester, and Madeleine Mester nee Szadeczky-Kardoss, both of 3, Parc de Béarn, Saint-Cloud, France (92210)

Filed Jul. 19, 1976, Ser. No. 706,533

Claims priority, application France, Jul. 18, 1975, 75 22577

Int. Cl.⁴ A61K *31/70;* **C07H** *5/06*

U.S. Cl. 514—23 **3 Claims**

1. The serotonin derivative which is 1-desoxyl-1-(5-hydroxy-tryptamino) D-fructose, and its water-soluble physiologically acceptable salts.

2. A pharmaceutical composition which comprises a physiologically effective amount of the serotonin derivative of claim 1, and a physiologically acceptable carrier.

4,631,272

N-ACYLATED 1-ALKYLAMINO-1-DEOXY-KETOSE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Oswald Lockhoff, Cologne; Bernd-Wieland Krüger, Wuppertal; Peter Stadler, Haan; Karl G. Metzger, Wuppertal; Hein-Peter Kroli, Wuppertal; Klaus Schaller, Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

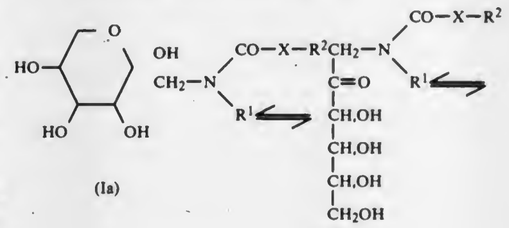
Filed Feb. 8, 1985, Ser. No. 699,712

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405841

Int. Cl.⁴ A61K *31/70;* **C07H** *5/06*

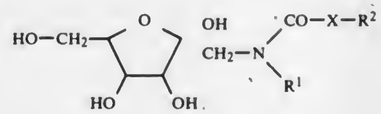
U.S. Cl. 514—23 **15 Claims**

1. A compound of the formulae Ia to Ic



(Ia)

(Ib)



(Ic)

in which

R^1 represents hydrogen or a straight-chain or branched alkyl or mono or poly-unsaturated alkenyl radical with in each case up to 30 carbon atoms and optionally substituted by phenyl, halogen, amino, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, OH, C_1-C_6-alkoxy, SH, C_1-C_6-alkyl—COO and C_1-C_6-alkyl—CO—NH,

X represents CH_2, O, S or NR,

wherein

R denotes hydrogen or an alkyl group with up to 20 carbon atoms, and

R^2 represents hydrogen or a straight-chain or branched, saturated or mono- or poly-unsaturated hydrocarbon radical with up to 30 carbon atoms and optionally substituted by phenyl, halogen, amino, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, OH, C_1-C_6-alkoxy, SH, C_1-C_6-alkyl—COO and C_1-C_6-alkyl—CO—NH,

or a pharmaceutically acceptable salt thereof.

13. A method of stimulating the immune system of an animal which comprises administering to such animal an immunostimulating effective amount of a compound or salt according to claim 1.

4,631,273

AQUEOUS EMULSIONS USING CATIONIC SILANES

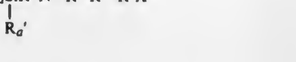
Lynne Blehm; James R. Makek, and W. Curtis White, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 5, 1984, Ser. No. 668,047

Int. Cl.⁴ A01N *63/02;* **A61K** *31/71;* **B01J** *13/00*

U.S. Cl. 514—29 **80 Claims**

1. Aqueous oil in water emulsion comprising a stable (a) water, (b) a water immiscible liquid, and (c) a cationic silane having the general formula



wherein R is an alkyl radical of 1 to 4 carbon atoms or hydrogen; a has a value of 0, 1 or 2; R' is a methyl or ethyl radical; R'' is an alkylene group of 1 to 4 carbon atoms; R''', R'''' and R^{v} are each independently selected from a group consisting of (i) saturated or unsaturated hydrocarbon radicals containing 1 to 18 carbon atoms and (ii) saturated and unsaturated organic radicals consisting of carbon, hydrogen and oxygen; carbon, hydrogen and sulfur, and carbon, hydrogen and nitrogen; the total number of carbon atoms from R''', R'''' and R^{v} in each of (i) and (ii), must be equal to or greater than twelve carbon atoms and X is selected from a group consisting of chloride, fluoride, bromide, iodide, acetate and tosylate.

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HALOVINYL CEPHEM COMPOUNDS

Takao Takaya; Kazuo Sakane, both of Kawanishi; Hideaki Yamanaka, Hirakata, and Kenzi Miyai, Kawanishi, all of Japan, assignors to Fujisawa Pharmceutical Co., Ltd., Osaka, Japan

Filed Feb. 25, 1985, Ser. No. 704,776

Claims priority, application United Kingdom, Mar. 9, 1984, 8406231

Int. Cl.^{4} A61K *31/545;* **C07D** *501/24*

U.S. Cl. 514—202 **3 Claims**

1. 7-[2-carboxymethoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-[2-chlorovinyl]-3-cephem-4-carboxylic acid (syn isomer) and pharmaceutically acceptable salts thereof.

2. A method of treating an infectious disease comprising administering to a subject in need of such treatment an antimicrobially effective amount of the compound of claim **1**.

4,631,275

1-OXADETHIACEPHALOSPORIN DERIVATIVES AND ANTIBACTERIAL USE THEREOF

Wolfgang Hartwig; Dieter Häbich; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

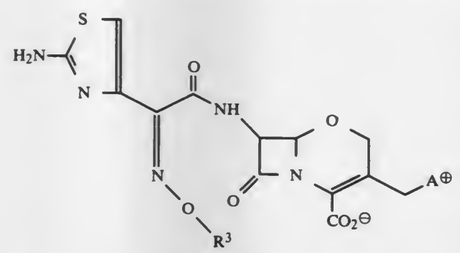
Filed Jan. 30, 1985, Ser. No. 696,275

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404906

Int. Cl.^{4} A01N *43/90;* **C07D** *498/04*

U.S. Cl. 514—210 **7 Claims**

1. A 1-oxadethiacephalosporin derivative of the formula



in which

R^3 is methyl or ethyl, and

A is pyridinium or trimethylenepyridinium.

6. A method of combating bacteria which comprises administering to a patient an antibacterially effective amount of a compound according to claim **1**.

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PROSTAGLANDINS AND PROSTACYCLINS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Helmut Vorbrüggen; Walter Elger; Michael-Harold Town, and Ekkehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

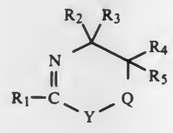
Division of Ser. No. 380,326, May 20, 1982, Pat. No. 4,468,395, which is a continuation-in-part of Ser. No. 367,869, Apr. 13, 1982, abandoned. This application Jul. 3, 1984, Ser. No. 627,572

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3115997; Nov. 13, 1981, 3145830

Int. Cl.^{4} C07D *263/14, 233/14, 277/10;* **A61K** *31/42*

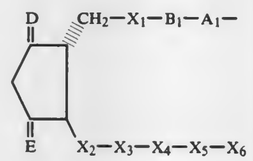
U.S. Cl. 514—211 **12 Claims**

1. A compound of the formula



wherein

(I) R_1 is a prostaglandin residue of the formula



wherein in $-X_1-B_1-A_1-$,

(a) A_1 is $-(CH_2)_n-$, $-(CH_2)_m-O-$, $-CF_2-(CH_2)_m-$, wherein n is an integer of 1-3 and m is an integer of 1-2, $-CH=CH-CH_2-$ or $-CH_2-CH=CH-$, and B_1-X_1 is $-(CH_2)_3-$ or $-CH=C=CH-$;

(b) $-X_1-B_1-A_1-$ is $-(CH_2)_5-$;

(c) B_1-A_1 is $-(CH_2)_o-$, $-(CH_2)_n-O-$, $-CF_2-(CH_2)_n-$, $-CH=CH-(CH_2)_m-$, or $-(CH_2)_m-CH=CH-$, wherein m is an integer of 1-2, n is an integer of 1-3, and o is an integer of 1-4, and X_1 is cis-alkenylene of the formula



wherein R_8 and R_9 each independently is hydrogen or C_1-C_6-alkyl; or

(d) A_1 is $-CH_2-$, B_1 is oxygen or $-CH_2-$, and X_1 is m-phenylene;

D is oxygen; hydrogen and α- or β- hydroxy; hydrogen and α- or β-(F,Cl,Br or I); or CH_2;

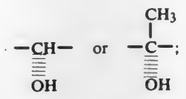
E is oxygen; hydrogen and α-hydroxy; hydrogen and α—CH_3; or hydrogen and α—CH_2OH;

X_2 is $-CH_2-CH_2-$, $-C\equiv C-$, or trans-alkenylene of the formula



wherein R_8 and R_9 are as defined above;

X_3 is



X_4 is $-(CH_2)_n-$,

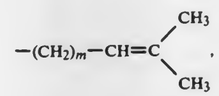
wherein n is an integer of 1-3, or



wherein R_{10} and R_{11} each independently is hydrogen, fluorine, methyl or methoxy, or R_{10} and R_{11} jointly represent $-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-$;

X_5 is $-CH_2-$, oxygen, sulfur, or a direct bond; and

X_6 is phenyl, 3- or 4-chlorophenyl, 3-trifluoromethylphenyl, α- or β-naphthyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 3-, or 4-pyridyl or, when X_5 is a direct bond, X_6 is



$-(CH_2)_m-C\equiv C-CH_3$ or $-(CH_2)_m-C\equiv C-CH_2-CH_3$, wherein m is an integer of 1-2, $-(CH_2)_4-OCH_3$, $-CH(CH_3)-CH_2-CH_2-CH_3-CH_2-CH_2-CH_2-CH_3$ or $-(CH_2)_3-CH=CH_2$;

Y is oxygen, sulfur, imino, or N—(C_1-C_4-alkyl)imino;

Q is $(CR_6R_7)_p$ wherein p is an integer of 0 to 3,

R_2 is hydrogen; alkyl of 1-6 carbon atoms; alkyl of 1-6 carbon atoms substituted by hydroxy, amino, nitro, fluorine, chlorine, bromine, C_1-C_4-alkoxycarbonyl, di-C_1-C_4-alkylaminocarbonyl, C_1-C_4-alkylaminocarbonyl, tri-C_1-C_4-alkylsilyloxy, tetrahydropyranyloxy, or benzoyloxy; C_1-C_4-alkoxycarbonyl; benzyloxycarbonyl; cyano; or di-C_1-C_4-alkylaminocarbonyl;

R_3, R_4, R_5, R_6 and R_7 each independently is hydrogen; alkyl of 1-6 carbon atoms; alkyl of 1-6 carbon atoms substituted as recited for R_2; or C_{6-10}-aryl; and

R_3 and R_4 together also can form trimethylene, tetramethylene, or 1,3-butadienylene when R_2 and R_5 jointly represent an additional bond;

or a corresponding compound wherein in at least one OH group, the H atom is replaced by tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid.

4,631,277

HEXAHYDRODIBENZODIOXANE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Michel Combourieu, Aurillac; Yvon Bernet, Jussac; Jean-Claude Laigle, and Nadine Simbille, both of Aurillac, all of France, assignors to Riom Laboratories C.E.R.M. "RL-C.E.R.M." S.A., Riom, France

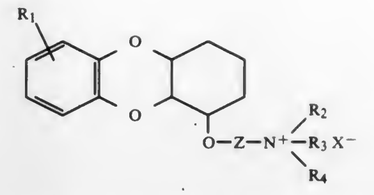
Filed Jul. 11, 1985, Ser. No. 753,866

Claims priority, application France, Jul. 13, 1984, 84 11174

Int. Cl.^{4} A61K *31/335, 31/535;* **C07D** *319/24, 413/12*

U.S. Cl. 514—239 **10 Claims**

1. Compounds of the formula I



(I)

in which R_1 denotes H, halogen or a linear or branched C_1 to C_3 alkoxy or alkyl group, R_2, R_3 and R_4 separately denote a linear or branched C_1 to C_4 alkyl group or R_2 and R_3 together with the nitrogen atom to which they are bound form a saturated heterocyclic radical, Z denotes a linear or branched C_1 to C_6 alkylene group and X^- denotes an anion.

2. Compounds according to claim **1** in which Z denotes $-CH_2-CH_2-$.

7. Pharmaceutical composition for antispasmodic activity, characterised in that it contains at least one of the compounds according to claim **1**, together with one or more usual pharmaceutical auxiliaries.

4,631,278

ANTI-PROTOZOAL α-ARYL-4-(4,5-DIHYDRO-3,5-DIOXO-1,2,4-TRIAZIN-2(3H)-YL)-BENZENEACETONITRILE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS, AND METHOD OF USE THEREFOR

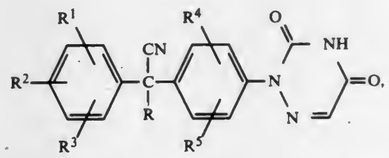
Gustaaf M. Boeckx, Oud-Turnhout; Alfons H. M. Raeymaekers, Beerse, and Victor Sipido, Merksem, all of Belgium, assignors to Janssen Pharmaceutica N.V., Belgium

Continuation-in-part of Ser. No. 636,538, Aug. 1, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 748,075

Int. Cl.^{4} A61K *31/53;* **C07D** *253/06*

U.S. Cl. 514—242 **18 Claims**

1. A chemical compound having the formula



(I)

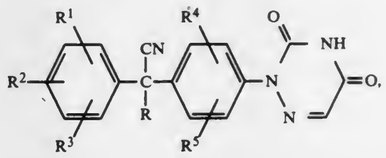
a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;

R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and

R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

7. A pharmaceutical composition effective in combatting Protozoa, comprising inert carrier materials and as an active ingredient an anti-protozoal effective amount of a compound having the formula



(I)

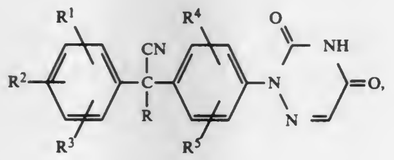
a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;

R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and

R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

13. A method of destroying or preventing the growth of Protozoa in subjects suffering from such Protozoa by the administration of an anti-protozoal effective amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

R^1, R^2 and R^3 are each independently hydrogen, halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio or C_{1-6} alkylsulfonyl;

R^4 and R^5 are each independently hydrogen, halo, trifluoromethyl or C_{1-6} alkyl; and

R is hydrogen, C_{1-6} alkyl, cyclo C_{3-6} alkyl phenyl or phenyl substituted with up to three substituents each independently selected from the group consisting of halo, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkyloxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyloxy.

4,631,279

6-(PYRIDINYLPHENYL)DIHYDROPYRIDAZINONES AS INOTROPIC AGENTS

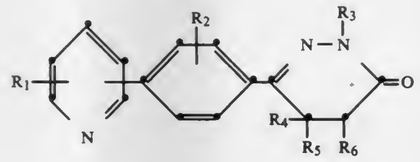
David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1984, Ser. No. 660,840

Int. Cl.⁴ C07D *401/10, 213/55, 211/20;* **A61K** *31/50*

U.S. Cl. 514—247 **20 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3, R_4, R_5, and R_6 are independently hydrogen or C_1–C_4 alkyl, or R_6 and one of R_4 and R_5 taken together form a bond; and pharmaceutically acceptable acid addition salts thereof.

8. A method of treating a mammal, including a human subject, suffering from or susceptible to heart failure, which comprises administering to said mammal an effective amount of a compound of claim **1**.

4,631,280

PYRIDAZINE DERIVATIVES HAVING A PSYCHOTROPIC ACTION, AND MEDICAMENTS IN WHICH THEY ARE PRESENT

Jean-Paul Kan; Kathlèen Biziere, both of Clapiers, and Camille-Georges Wermuth, Strasbourg, all of France, assignors to Sanofi, Paris, France

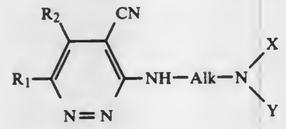
Division of Ser. No. 571,696, Jan. 18, 1984, Pat. No. 4,565,814. This application May 20, 1985, Ser. No. 735,580

Claims priority, application France, Jan. 28, 1983, 83 01366; Nov. 18, 1983, 83 18433

Int. Cl.⁴ A61K *31/50;* **C07D** *237/10*

U.S. Cl. 514—247 **7 Claims**

1. A 4-cyanopyridazine corresponding to the formula:



(I)

in which:

one of the substituents R_1 and R_2 represents hydrogen or a lower alkyl group and the other represents hydrogen; a C_1–C_6 alkyl group; a C_3–C_7 cycloalkyl group; a phenyl group; a phenyl group monosubstituted by a halogen atom, a trifluoromethyl group, a hydroxyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkyl group, a C_1–C_6 alkanoyloxy group, a cyano group, a C_1–C_6 alkylthio group, a C_1–C_6 alkylsulphinyl group, a C_1–C_6 alkylsulphonyl group, a nitro group, or a sulphamyl group; a phenyl group disubstituted by one of the abovementioned substituents and at least a chlorine atom, a fluorine atom or a methoxy group; a naphth-1-yl group; a naphth-2-yl group; a thien-2-yl group; a thien-3-yl group; or an indol-3-yl group;

Alk represents an ethylene group, a 1,2-propyelene group or a 1,3-propylene group;

X represents hydrogen;

Y represents hydrogen or a β-hydroxyethyl group; and pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition containing as active ingredient the compound of claim **1** present in an amount sufficient to produce psychotropic action and a pharmaceutically acceptable carrier.

4,631,281

SUBSTITUTED PHENYLPIPERAZINYL-PROPANOLS, A PROCESS FOR THEIR PREPARATION AND THEIR USE, AND FORMULATIONS CONTAINING THESE COMPOUNDS

Wolfgang Stenzel, Reinbek, and Eva Hofferber, Hamburg, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

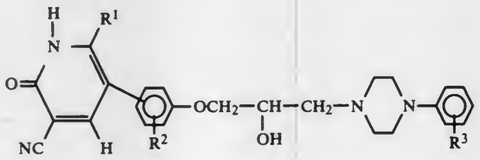
Filed Jun. 28, 1985, Ser. No. 750,729

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424685

Int. Cl.⁴ A61K *31/445;* **C07D** *401/10*

U.S. Cl. 514—252 **12 Claims**

1. Substituted phenylpiperazinyl-propanols formula I



(I)

in which R^1 denotes hydrogen or an alkyl group with 1 to 4 carbon atoms and R^2 and R^3, which can be identical or different, each denote hydrogen, halogen, cyano, a trifluoromethyl group, a nitro group, a hydroxyl group, an alkoxy group or an alkyl group with in each case 1 to 4 carbon atoms, it being possible for the alkyl parts in each case to be straight-chain or branched, and their tautomeric forms and their salts as well as acid addition salts and N-oxides.

9. A method of combatting cardiovascular irregularity in warm-blooded animals which comprises administering to the said animal a cardiovascular effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,631,282

ANTIHYPERTENSIVE CHROMANS AND CHROMENES

Frederick Cassidy, Harlow, England, assignor to Beecham Group Plc, England

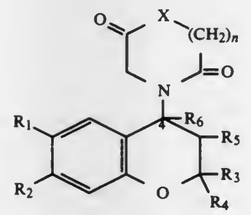
Filed Jun. 20, 1985, Ser. No. 746,968

Claims priority, application United Kingdom, Jun. 22, 1984, 8415931; Dec. 13, 1984, 8431479

Int. Cl.⁴ A61K *31/495;* **C07D** *405/04*

U.S. Cl. 514—254 **12 Claims**

1. A compound of formula (I):



(I)

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, 1-mercapto C_{2-7} alkyl, formyl, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino, C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino, or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or —C(C_{1-6} alkyl)-NOH or —C(C_{1-6} alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

either R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} carboxylic acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

n is 0 or 1; and

X is CH_2 or NR_7 wherein R_7 is hydrogen or C_{1-6} alkyl;

the nitrogen-containing group in the 4-position being trans to the R_5 group when R_5 is hydroxy, C_{1-6} alkoxy or C_{1-7} carboxylic acyloxy; or a pharmaceutically acceptable salt or solvate thereof.

12. A method of treatment of hypertension in mammals which comprises the administration to the mammal of an effective amount of a compound according to claim **1** or a pharmaceutically acceptable salt thereof.

4,631,283

ORTHO SUBSTITUTED DIHYDROXY-2(1H)QUINAZOLINONE-1-ALKANOIC ACIDS

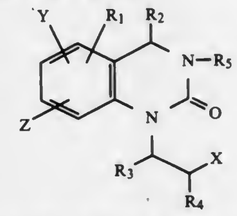
Victor T. Bandurco, Bridgewater; Seymour D. Levine, North Brunswick, both of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 430,552, Sep. 30, 1982, Pat. No. 4,490,374. This application Aug. 27, 1984, Ser. No. 644,583

Int. Cl.⁴ A61K *31/505;* **C07D** *279/80*

U.S. Cl. 514—259 **18 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, amino and nitro; R_2 is hydrogen, alkyl having 1–20 carbon atoms, cycloalkyl wherein the cycloalkyl group has 4–8 carbon atoms, cycloalkylalkyl wherein the cycloalkyl group has 4–8 carbon atoms and the alkyl group has 1–3 carbon atoms, haloalkyl wherein the alkyl group has 1–5 carbon atoms, and norbornyl and norbornylmethyl; R_3 and R_4 are the same or different and are selected from hydrogen, lower alkyl having 1–6 carbon atoms, phenyl and substituted phenyl, wherein the substituent is alkyl having 1–6 carbon atoms, lower alkoxy having 1–4 carbon atoms, and hydroxy; R_5 may be hydrogen, lower alkyl having 1–6 carbon atoms, benzyl or substituted benzyl wherein the substituent is selected from fluoro, chloro, bromo, alkyl and alkoxy, provided that when R_5 is other than hydrogen the compound is a quaternary salt; X is benzyl, carboxy, carboalkoxy wherein the alkoxy group has 1–3 carbon atoms, cyano, carboxamido, methanesulfonyl, formyl, benzoyl, alkylbenzoyl wherein the alkyl group has 1–4 carbon atoms, pyridoyl, 2-thienoyl, 2-furoyl and 3-(1,2,5-thia-diazolyl); and pyridyl and 2-thienyl; Y and Z are hydroxy and hydrogen, provided that at least one of Y and Z is hydroxy and when Y and Z are both hydroxy the hydroxy groups are positoned at either the 5,6- or the 6,7-position; including the quaternary ammonium salts at N_3; and the alkali metal and alkaline earth metal salts of the phenols and the carboxy group at N_1 as well as the amine salts selected from meglumine, piperazine, N-methylpiperazine, morpholine and aliphatic amine salts wherein the aliphatic amine contains 1–5 carbon atoms; aminoalcohol salts selected from the ethanolamine, 2-amino-1,3-propanediol and bis(hydroxymethyl)methylamine salts; and the amino acid salts selected from the arginine, lysine and ornithine salts.

18. The method of treating a patient having hypertension and other cardiovascular disorders characterized by poor renal perfusion which comprises admininstering to said patient an effective antihypertensive amount of a compound of claim **1** in a pharmaceutically acceptable carrier.

4,631,284

ACETAMINOPHEN COMPOSITIONS CONTAINING LOW DOSES OF CHLORPHENIRAMINE MALEATE, METHOD FOR PREPARING SAME AND TABLETS FORMED THEREFROM

Anil M. Salpekar, Creve Coeur, Mo., and John Johnson, Collinsville, Ill., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 672,563, Nov. 19, 1984, abandoned. This application Jul. 16, 1985, Ser. No. 755,743

Int. Cl.⁴ A61K *31/16, 31/435, 31/135*

U.S. Cl. 514—277 **24 Claims**

1. A spray-dried, direct tabletting, free-flowing, particulate pharmaceutical composition having a substantially high

amount of acetaminophen and a substantially low amount of a water-soluble pheniramine maleate, and, when prepared in large quantity, being capable of being directly formed into a multiplicity of dosage-form tablets in high-speed tablet-forming operation of pharmaceutical tabletting presses, the pheniramine maleate being present in the composition in such highly uniform distribution throughout that the tablets have such tablet-to-tablet uniformity of the amount of the pheniramine maleate therein that the percent relative standard deviation of said amount is not more than about 3% as determined for a random sample of 10 tablets, the tablets being substantially free of adherence to the press and having high hardness, short disintegration time, and low friability, the composition comprising as components thereof:

(A) acetaminophen in a pharmaceutically effective major amount,

(B) a water-soluble pheniramine maleate component in a pharmaceutically effective low amount not exceeding about 5.0% based on the total weight of the acetaminophen,

(C) a pharmaceutically acceptable binder-disintegrant agent in an amount effective for imparting said hardness, disintegration time and friability,

(D) a pharmaceutically acceptable lubricant in an amount at least sufficient to impart effective mold release properties to said tablets, and

(E) water in an amount from about 0.5 to about 1.5% based on the total weight of the composition,

the composition being the product of spray drying an aqueous liquid slurry comprising an aqueous liquid medium and said components (A), (B), (C) and (D) dispersed substantially uniformly throughout said medium, the pheniramine maleate being dissolved in said medium.

4,631,285

β-CARBOLINE-3-CARBOXYLIC ACID DERIVATIVES, AND THEIR USE AS PSYCHOTROPIC AGENTS

Erling N. Petersen, Glostrup; Leif H. Jensen, Helierup; Frank Watjen, Bajsvaerd, all of Denmark, and Dieter Seidelmann, Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

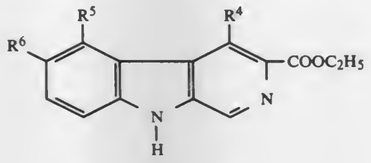
Filed May 15, 1985, Ser. No. 734,222

Claims priority, application Denmark, May 15, 1984, 2401/84

Int. Cl.[4] A61K *31/395*; C07D *471/04*

U.S. Cl. 514—292 **12 Claims**

1. A β-carboline-3-carboxylic acid ester of the formula



(I)

wherein

R^4 is methyl, ethyl or methoxymethyl,

R^5 is $—OR^8$

R^8 is C_{3-7}-cycloalkyl, C_{4-7}-alkylcycloalkyl, propinyl or cyclohexenyl,

R^9 is C_{1-4}-alkyl,

R^6 is hydrogen, $—OR^{10}$, or $—CH_2—OR^9$,

R^{10} is C_{1-4}-alkyl or C_{3-6}-cycloalkyl.

11. A method of achieving a psychotropic effect in a patient comprising administering to the patient a psychotropically effective amount of a compound of claim **1**.

4,631,286

9-AMINO-1,2,3,4-TETRAHYDROACRIDIN-1-OL AND RELATED COMPOUNDS

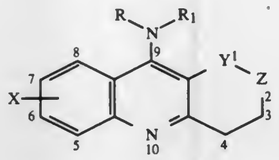
Gregory M. Shutske, and Frank A. Pierrat, both of Somerset, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Oct. 25, 1984, Ser. No. 664,731

Int. Cl.[4] A61K *31/47*; C07D *219/10*

U.S. Cl. 514—297 **143 Claims**

1. A compund having the formula



where X is hydrogen, loweralkyl, loweralkoxy, halogen, hydroxy, nitro, $NHCOR_2$ wherein R_2 is loweralkyl, or a group of the formula NR_3R_4 wherein R_3 and R_4 are independently hydrogen or loweralkyl; R and R_1 are independently hydrogen, loweralkyl, phenylloweralkyl, phenylloweralkyl in which the phenyl group is substituted by one or more loweralkyl, loweralkoxy, halogen, hydroxy or trifluoromethyl, diphenylloweralkyl or diphenylloweralkyl in which one or both phenyl groups are substituted by one or more loweralkyl, loweralkoxy, halogen, hydroxy or trifluoromethyl; Y is C═O or CR_5OH wherein R_5 is hydrogen or loweralkyl; Z is CH_2 or $C═CR_6R_7$ wherein R_6 and R_7 are independently hydrogen or loweralkyl; an optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

138. A method of treating a patient in need of memory enhancement, wherein an effective memory enhancing amount of a compound defined in claim **1** is administered to the patient.

4,631,287

ARYL AND HETEROARYL ETHERS AS AGENTS FOR THE TREATMENT OF HYPERSENSITIVE AILMENTS

Utpal R. Chakraborty, Orangeburg, and Raymond D. Yousefyeh, Tarrytown, both of N.Y., assignors to USV Pharmaceutical Corp., Fort Washington, Pa.

Filed Apr. 16, 1985, Ser. No. 723,781

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—307 **55 Claims**

1. A method for the treatment of hypersensitive, inflammatory or allergic conditions in a mammal, comprising the administration of a therapeutically effective amount of a compound having the following formula:

$$(R_1)(R_2)\ Ar—Z—M—Ar_1\ (R_3)(R_4)$$

and salts thereof;

wherein

Ar and Ar_1 are independently phenyl, naphthyl or a nitrogen heterocyclic ring elected from the group consisting of quinoline and isoquinoline

Z is an alkylene chain containing from 1 to 5 carbon atoms in the principal chain and up to a total of 10 carbon atoms;

M is oxygen, sulfur or NR5,

R_1, R_2, R_3 and R_4 are each independently H, lower alkyl, lower alkoxy, hydroxy, halo, trihalomethyl, hydroxy lower alkyl, carboxy, formyl, aryl, aryloxy, benzyloxy, lower alkanoyl, carboxy lower alkoxy, nitro, amino, lower alkylamino, dilower alkylamino, cyano, lower alkanoyloxy, carbamoyl, lower alkoxy-alkoxy, or carbo-lower-alkoxy-alkoxy; and

R_5 is hydrogen or lower alkyl in a pharmaceutically acceptable carrier.

4,631,288

TRIAZOLYLMETHYL-PYRIDYLOXYMETHYL-CARBINOL FUNGICIDES

Udo Kraatz, Leverkusen; Karl H. Büchel, Burscheid; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

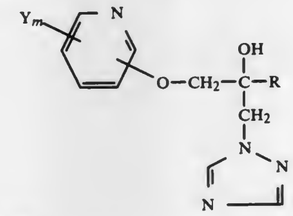
Filed Sep. 14, 1984, Ser. No. 651,002

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334409

Int. Cl.[4] C07D *401/12*; A61K *31/41*

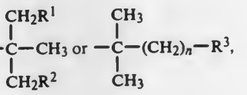
U.S. Cl. 514—340 **9 Claims**

1. A triazolylmethyl-pyridyloxymethyl-carbinol of the formula



in which

R is a radical of the formula



wherein

R^1 is hydrogen or halogen,

R^2 is halogen,

R^3 is C_1–C_4 alkoxy or C_1–C_4 alkylthio, halogenoalkoxy or halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms; alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part; cyano; or phenoxy, phenylthio, phenylalkoxy with 1 to 4 carbon atoms in the alkyl part of phenylalkylthio with 1 to 4 carbon atoms in the alkyl part, each of which is unsubstituted or substituted on the phenyl by halogen or phenyl,

n is 0, 1 or 2,

Y is halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or cyano, and

m is 0, 1, 2, 3 or 4,

or an addition product thereof with an acid or metal salt.

4,631,289

USEFUL IN RADIOTHERAPY OF CHEMOTHERAPY 4-AZIRIDINO-1-NITROIMIDAZOL-1-YL-2,3-BUTANEDIOLS

Israr Ahmed, London; Gerald E. Adams, Epsom Downs; Ian J. Stratford, Oxted, and David Gibson, London, all of England, assignors to National Research Development Corporation, England

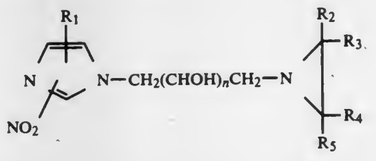
Filed May 27, 1983, Ser. No. 498,827

Claims priority, application United Kingdom, May 27, 1982, 8215545; Nov. 1, 1982, 8231107

Int. Cl.[4] A61K *31/415*; C07D *403/06*

U.S. Cl. 514—397 **13 Claims**

1. A compound of the formula:



in which formula:

R_1 represents hydrogen or alkyl;

R_2–R_5 represents hydrogen or C_1–C_6 alkyl, or unsubstituted carbocylic aryl, aralkyl or alkaryl, wherein the alkyl moiety thereof is C_1–C_6 alkyl; and

n is 2.

11. A method of treating a patient having a radiation sensitive cancer, which comprises administering a radiation sensitizing effective amount of a compound of formula I according to claim **1** to the patient prior to irradiation of the cancer.

12. A method of treating a patient having a localized or metastatic cancer, which comprises administering to the patient a chemopotentiating effective amount of a compound of formula I according to claim **1** before or simultaneously with administration of a chemotherapeutic agent.

4,631,290

METHOD OF TREATING HEPATITIS

Paul P. Hung, Bryn Mawr, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 29, 1985, Ser. No. 770,807

Int. Cl.[4] A61U *31/21, 31/26*

U.S. Cl. 514—450 **8 Claims**

1. A method of treating an animal infected by hepatitis B virus comprising administering to such infected animal an amount of a rifamycin derivative selected from a group consisting of

(a) 3-amino-4-deoxo-4-imino-rifamycin S,

(b) 3-amino-4-deoxo-4-[(4-aminophenyl)sulphonyl[amino-rifamycin SV,

(c) 4-O-(n-butylsulphonyl)-3-[(1-piperidinylimino)methyl[-rifamycin SV,

(d) 4-O-(n-butylsulfonyl)-3-[(4-morpholinylimino)methyl]-rifamycin SV, and

(e) 3-[(dimethylhydrazono)methyl]-4-O-[(3-phenylpropyl)-sulfonyl]-rifamycin SV, said amount being effective to reduce the effects of said hepatitis B virus.

4,631,291

ENTEROBACTIN TYPE COMPOUNDS

Abraham Shanzer, Rishon-Le-Zion, and Jacqueline Libman, Rehovot, both of Israel, assignors to Yeda Research & Development Co. Limited, Rehovot, Israel

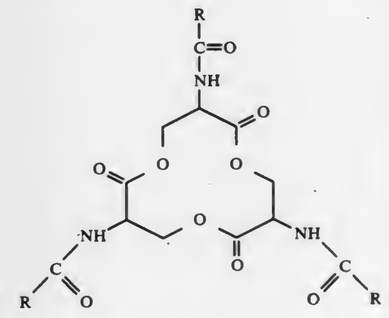
Filed Jun. 5, 1984, Ser. No. 617,465

Claims priority, application Israel, Jun. 8, 1983, 68929

Int. Cl.[4] C07D *323/00, 405/12*; A61K *31/365*

U.S. Cl. 514—450 **2 Claims**

1. An enterobactin-type compound of the formula



wherein R designates lower alkyl, fluoro-lower-alkyl, phenyl, pyridyl, hydroxyquinolyl, bipyridyl or imidazolyl.

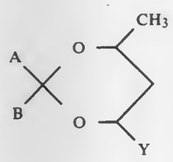
4,631,292

1,3-DIOXANE DERIVATIVES, METHOD OF THEIR SYNTHESIS AND ANTI-PEPTIC ULCER AGENT

Tsuyoshi Tomiyama, Sakaki, and Akira Tomiyama, Togura, both of Japan, assignors to Kotobuki Seiyaku Co., Ltd., Nagano, Japan

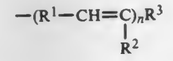
Filed Jul. 31, 1984, Ser. No. 636,143
Claims priority, application Japan, Aug. 8, 1983, 58-144709
Int. Cl.[4] C07D *319/06*
U.S. Cl. 514—452 7 Claims

1. A method of treating peptic ulcer which comprises administering to a patient suffering from peptic ulcer a therapeutic composition comprising a compound of the formula



wherein:

A is an alkyl group, an alkenyl group or a



group in which R^1 represents an alkylene group, R^2 and R^3 each represents a hydrogen atom or a lower alkyl group and n is an integer of 1 to 4,

B and Y each represents a hydrogen atom or lower alkyl group, and

A and B together may form a cyclohexyl ring optionally substituted by one or more lower alkyl groups, in an amount effective to inhibit peptic ulcer in combination with a pharmeceutically acceptable carrier.

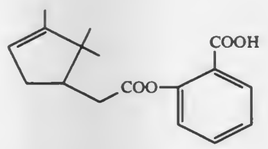
4,631,293

(−) CAMPHOLENIC ACID ESTER OF SALICYLIC ACID AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF HAVING MUCOSECRETOLYTIC, ANTI-INFLAMMATORY, ANALGESIC, AND ANTIPYRETIC ACTIVITY

Camillo C. Mora, Piacenza, Italy, assignor to Camillo Corvi S.p.A., Italy

Filed May 15, 1985, Ser. No. 734,067
Claims priority, application Italy, Jun. 26, 1984, 21608/84
Int. Cl.[4] C07C *69/74;* A61K *31/235*
U.S. Cl. 514—530 10 Claims

1. A (−) campholenic acid ester of salicylic acid, having the formula:



(I)

9. A method of imparting mucosecretolytic, anti-inflammatory, analgesic and antipyretic activity in a host in need thereof which comprises administering to the host an effective therapeutic amount of the compound of formula (I) of claim 1 or a pharmaceutically acceptable salt thereof.

4,631,294

TREATMENT OF CEREBRAL ISCHEMIA WITH DICHLOROACETATE

William G. Barsan, Cincinnati, Ohio, assignor to University E.M., Inc., Cincinnati, Ohio

Filed Jul. 5, 1985, Ser. No. 752,091
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—557 18 Claims

1. A method of alleviating brain damage caused by cerebral ischemia in a mammal comprising parenterally administering thereto a therapeutically effective amount of a composition containing as its active substance a pharmaceutically acceptable salt of dichloroacetic acid.

4,631,295

FUNCTIONAL OIL-CREAM BATH

Walter Engel, Pinneberg; Udo Hoppe, Hamburg, and Gerhard Sauermann, Wiemersdorf, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 582,370, Feb. 22, 1984, abandoned.
This application May 22, 1985, Ser. No. 736,749
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307297
Int. Cl.[4] A61K *31/20*
U.S. Cl. 514—558 18 Claims

1. In a cosmetic regenerating and normalizing oil-cream bath preparation containing pelargonic acid, an active ingredient and an inert cosmetic carrier, the improvement wherein the active ingredient contains 0.5 to 5.0% weight of pelargonic acid.

4,631,296

METHOD OF PRODUCING A SILICONE WATER-BASED ELASTOMER

Therese M. Bauman, and Alan L. Freiberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 830,418, Feb. 18, 1986. This application May 28, 1986, Ser. No. 867,725
Int. Cl.[4] C08J *9/30*
U.S. Cl. 521—65 6 Claims

1. A method of producing an open-cell, elastomeric foam consisting essentially of

(1) mixing in a first aerosol container under superatmospheric pressure, a composition consisting essentially of (A) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of above 50,000, the organic radicals being monovalent hydrocarbon radicals containing less than seven carbon atoms per radical or 2-(perfluoroalkyl)ethyl radicals having less than seven carbon atoms per radical, present as an emulsion of dispersed particles in water, the emulsion having a pH of greater than 9; (D) from 1 to 10 parts by weight of colloidal silica, (F) optionally from 1 to 10 parts by weight of fibers having a diameter of from 1 to 10 micrometers and a length of from 30 micrometers to 10 millimeters with a length to diameter ratio of greater than 10 to 1, or from 0.2 to 1.5 parts by weight of lauryl alcohol, or mixtures thereof; and from 1 to 20 parts by weight of an aerosol propellant selected from the group consisting of isobutane, propane, dichlorodifluoromethane, trichlorofluoromethane, and mixtures thereof,

(2) mixing in a second aerosol container under superatmospheric pressure, a composition consisting essentially of (B) from 0.1 to 2.0 parts by weight of dialkyltindicarboxylate; (C) from 1 to 10 parts by weight of alkylorthosilicate of the formula $Si(OR')_4$ where R' is a lower alkyl radical of from 1 to 4 carbon atoms inclusive; (D) from 15 to 35 parts parts by weight of colloidal silica; and from 1 to 20 parts by weight of an aerosol propellant selected from the group consisting of isobutane, propane, dichlorodifluoromethane, trichlorofluoromethane, and mixtures thereof,

(3) discharging the mixture of the first and second aerosol containers into a third mixing container under superatmospheric pressure at rates which maintain the ratio of ingredients shown in (2), and mixing the contents of the third container,

(4) immediately discharging the mixture of step (3) into a space at atmospheric pressure to form a froth, then

(5) immediately removing water from the froth to form a foam.

4,631,297

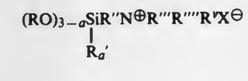
ANTIMICROBIALLY EFFECTIVE ORGANIC FOAMS AND METHODS FOR THEIR PREPARATION

David R. Battice, Midland, and Michael G. Hales, Clare, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

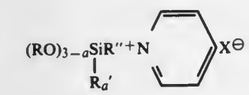
Continuation of Ser. No. 588,855, Mar. 12, 1984, abandoned.
This application Oct. 15, 1985, Ser. No. 787,700
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—78 108 Claims

1. A process for preparing an antimicrobially active nonfilled stable foam which comprises

(I) contacting and intimately mixing, prior to foaming, a foamable organic system and an organosilane having the general formula selected from the group consisting of



and



wherein, in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2;

R' is a methyl or ethyl radical;

R'' is an alkylene group of 1 to 4 carbon atoms;

R''', R'''' and R^v are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms;

X is chloride, bromide, fluoride, iodide, acetate or tosylate;, and

(II) foaming the mixture from (I), and

(III) allowing the foamable organic system to stabilize, whereby an antimicrobially active stable foam is obtained.

4,631,298

MIXED DIAMINE CHAIN EXTENDER

J. Kenneth Presswood, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 16, 1985, Ser. No. 809,563
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—163 32 Claims

1. A polyurethane formed by reaction of:

(a) an organic active hydrogen group-containing compound;

(b) an organic polyisocyanate; and

(c) a chain extender mixture comprising:

(i) a first aromatic diamine having a machine gel time of about 1.0 to about 4.0 seconds in a 50,000 psi modulus RIM formulation reaction: and

(ii) a second aromatic diamine having a machine gel time in a 50,000 psi modulus RIM formulation reaction of about 1.5 to 15 times the machine gel time of said first aromatic diamine;

said polyurethane having non-brittle, rigid green strength after reaction and having a flexural modulus of at least about 50,000 psi at 75° F.

4,631,299

BURN RESISTANT ORGANOPOLYSILOXANE FOAMS

Bernard Laisney, Sainte-Foy Les Lyon, and Maurice Duvernay, Saint-Genis Laval, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Feb. 10, 1986, Ser. No. 827,881
Claims priority, application France, Feb. 8, 1985, 85 01764
Int. Cl.[4] C08J *9/04*
U.S. Cl. 521—77 12 Claims

1. An organopolysiloxane composition adopted for conversion into burn resistant foam, comprising (A) a diorganopolysiloxane oil blocked at each chain end by a vinyl diorganosiloxy unit, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, n-propyl, vinyl, phenyl, and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 100 to 250,000 mPa·s at 25° C., (B) a diorganopolysiloxane oil blocked at each chain end by a triorganosiloxy unit, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 10 to 5,000 mPa·s at 25° C., (C) a diorganopolysiloxane oil blocked at each chain end by a hydroxyl radical, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 5 to 10,000 mPa·s at 25° C., (D) a liquid resin which comprises (i) a resin containing units of the formulae $CH_3SiO_{1.5}$ and $(CH_3)_2SiO$, in a CH_3/Si ratio of 1.1 to 1.6, having a weight content of 1 to 6% of hydroxyl radicals bonded to the silicon atoms, and having a viscosity of 1,500 to 20,000 mPa·s at 25° C., (2i) the reaction product of a solution, in an organic solvent, of a silicone resin containing units of the formulae $(CH_3)_3Si_{0.5}$ and SiO_2, the molar ratio $(CH_3)_3SiO_{0.5}/SiO_2$ of which ranges from 0.4 to 1.2, having 0.6 to 5.5 mole percent of hydroxyl radicals bonded to the silicon atoms, interracted with a diorganopolysiloxane oil blocked at each chain end by a hydroxyl radical bonded to the terminal silicon atom, in which the organic radicals bonded to the silicon atoms are methyl, ethyl, phenyl and/or 3,3,3-trifluoropropyl radicals, and having a viscosity of 10 to 4,000 mPa·s at 25° C., the weight ratio of the silicone resin to the diorganopolysiloxane oil being 0.1 to 1.0, or (3i) the mixture of the resin (i) with the reaction product (2i), the weight ratio of the resin (i) to the reaction product (2i) ranging from 0.2 to 5, (E) a liquid organohydropolysiloxane polymer containing at least three SiH groups per mole, (F) an inorganic and/or metal filler, and (G) a catalytically effective amount of a platinum catalyst.

4,631,300

PROCESS FOR PREPARING LOW VISCOSITY UV CURABLE POLYACRYLATES

Darrell D. Hicks, Jeffersontown, Ky., assignor to Interez, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 663,286, Oct. 22, 1984, which is a division of Ser. No. 488,317, Apr. 25, 1983, Pat. No. 4,511,732, which is a continuation-in-part of Ser. No. 357,960, Mar. 15, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 773,978
Int. Cl.[4] C08L *63/10;* C07C *67/08*
U.S. Cl. 522—100 5 Claims

5. A process for preparing a liquid photopolymerizable composition which comprises:

(a) reacting at a temperature of about 60° C. to about 80° C. a C_1–C_8 aliphatic alcohol or a C_3–C_8 aliphatic ether alcohol with a diglycidyl ether of p,p'-dihydroxydiphenyl propane having an epoxide equivalent weight of about 190 to produce a diether of the diglycidyl ether wherein the diglycidyl ether is added to an excess of alcohol which contains boron trifluoride etherate in the amount of about 0.05 to about 2.0 percent by weight, based on the total reaction mixture, and wherein at least 3 equivalents of alcohol are present for each equivalent of epoxide group;

(b) removing the excess unreacted alcohol by distillation;

(c) reacting the diether of the diglycidyl ether with acrylic acid or methacrylic acid in the presence of about 0.1 to

about 3 percent by weight based on the total reaction mixture of hydroquinone monomethyl ether and about 1 to about 10 percent by weight based on the total reaction mixture of para-toluene sulfonic acid at a temperature no higher than about 120° C. while removing the water of esterification as a toluene/water azeotrope; and

(d) adding a photosensitizer.

4,631,301

METHOD FOR INCORPORATING CHLORPYRIFOS INTO THERMOPLASTIC RESINS

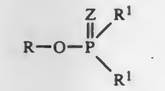
Jiro Kozuma, Fujisawa; Hirohiko Hamaguchi, Yokohama; Tetsuya Shibahara, Yamato, and Joseph P. Strasser, Tokyo, all of Japan, assignors to Dow Chemical Japan Limited, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,779

Int. Cl.[4] A01N *17/10, 17/08, 25/10;* **C08K** *5/52*

U.S. Cl. 523—122 **9 Claims**

1. A method for thermally stabilizing an O-pyridyl phosphate compound of the formula



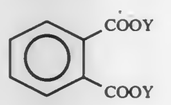
wherein

R represents halopyridyl,

Z is oxygen or sulphur, and

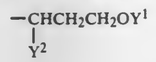
each R^1 is loweralkyoxy, amino or loweralkylamino, comprising

(a) mixing said O-pyridyl phosphate with a phthalate ester of the formula



wherein

Y is alkyl from about 2 to about 20 carbon atoms or



wherein

Y^1 is alkyl from about 1 to about 20 carbon atoms, and

Y^2 is hydrogen or methyl;

said O-pyridyl phosphate and said phthalate ester being present in proportions effective to prevent appreciable ecomposition of said O-pyridyl phosphate upon heating said mixture, and

(b) incorporating said mixture into a thermoplastic resin heated to a temperature which would decompose the O-pyridyl phosphate compound if the O-pyridyl phosphate were heated alone.

4,631,302

UNDERWATER BIOCIDAL WAX COMPOSITION AND PREPARATION THEREOF

Robert F. Supcoe, Annapolis, Md., and Thomas Radakovich, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 749,975

Int. Cl.[4] A61K *31/745*

U.S. Cl. 523—122 **7 Claims**

1. A wax-based antifouling coating composition wherein said wax matrix composition comprises from about 16 to 26 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to about 13 and a chlorine content from about 65 to about 70 percent, from about 8.5 to about 11.5 weight of a chlorinated wax having an average number of carbon atoms from about 22 to about 26 and a chlorine content from about 39 to 45 percent, from about 8 to 12 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to 13 and a chlorine content from about 55 to about 65 percent, and from about 9 to about 13 weight percent of a chlorinated wax having an average number of carbon atoms from about 18 to about 22 and a chlorine content from about 36 to about 44 percent.

4,631,303

UNDERWATER FORMULATION AND METHOD FOR CLEANING AND WAXING SIMULTANEOUSLY

Robert F. Supcoe; Harold H. Singerman, and Jack E. Whitacre, all of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,893

Int. Cl.[4] C09K *3/12*

U.S. Cl. 523—177 **7 Claims**

1. A wax formulation coating material for application to submerged surfaces consisting of a mixture, by weight percent, of about 3.5% to about 6.0% of a polyethylene homopolymer having a softening point at 85 C. (ASTM E28), a hardness of 90 (ASTM D5), a density of 0.88 g/cc (ASTM D 1505), a viscosity of 40 cps at 140 C. (Brookfield), and an acid number of nil mg./KOH gram; of about 27% to about 31% of a mixture of Chlorowaxes selected from the group consisting of chlorinated waxes with a molecular average of 12 carbon atoms and 70% chlorine content, a molecular average of 24 carbon atoms and 42% chlorine content, a molecular average of 12 carbon atoms and a chlorine content of 60%, a molecular average of 20 carbon atoms and a chlorine content of 40%, and a microcrystalline laminating wax; of about 3.5% to about 6.0% USP white mineral oil; of about 18.0% to about 20.0% 2,4,5,6-tetrachloro isophthalornitride; of about 40.5% to about 42.5% USP petrolatum; and of about 0.6% to about 1.05% Autofast Black 104 in xylene.

4,631,304

NOVEL CARBON BLACK AND PROCESS FOR PREPARING SAME

Charles R. Wilder, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 518,556, Jul. 29, 1983, Pat. No. 4,518,434. This application Mar. 18, 1985, Ser. No. 713,505

Int. Cl.[4] C08K *3/04, 9/00, 9/02;* **C09C** *1/48*

U.S. Cl. 523—215 **6 Claims**

1. A carbon black pellet which has been treated with an organic peroxide by incorporating said organic peroxide into the pelleting liquid used in forming the carbon black pellet wherein the carbon black is characterized by a surface area in the range of 20–200 m^2/g, a DBP structure in the range of 20–200 cm^3/g and a pH in the range of 5–10 and the organic peroxide is characterized by the formula R—O—O—R′ in which R and R′ can be the same or different and comprise hydrocarbyl groups containing in the range of from about 4 to about 12 carbon atoms, from about 1 to about 30 parts by weight of organic peroxide having been applied to each 100 parts by weight of carbon black and wherein the pelleting liquid comprises water.

4,631,305

POLYMERIC MATERIAL AS A DISINTEGRANT IN A COMPRESSED TABLET

Thomas L. Guyer, Richland, and Robert M. Franz, Otsego, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 22, 1985, Ser. No. 714,786

Int. Cl.[4] A61K *9/20, 47/00;* **C08L** *63/00, 25/04*

U.S. Cl. 523—400 **12 Claims**

1. A compressed tablet comprising an effective disintegrating amount of a disintegrant selected from the group consisting of:

(1) the free base or partial acid addition salt form of a cross-linked copolymerization product of (a) a polyethylenepolyamine containing from about 2 to about 10 ethylene units and (b) a member selected from the group consisting of epichlorohydrin, glycerol-1,3-dichlorohydrin, 1,2:3,4-diepoxybutane, bis-epoxypropyl ether, ethylene glycol bis-epoxypropyl ether and 1,4-butanediol bis-epoxypropyl ether;

(2) a copolymer of polystyrene cross-linked with up to 5% w/w divinylbenzene and containing quaternary ammonium groups;

(3) a polyethylene imine polymer cross-linked with a polyfunctional halogen compound; and

(4) a polyalkyleneimine polymer prepared by cross-linking a polyalkyleneimine with linking groups containing from about 2 to 10 carbon atoms and having a molecular weight of about 20 to about 200.

4,631,306

METHOD FOR THE MANUFACTURE OF MOLDED MATERIALS

Helmut Markert; Klaus-Robert Hauschildt, both of Nuremberg; Wolfgang Rogler, and Klaus Kretzschmar, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 624,984, Jun. 27, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 822,913

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323084

Int. Cl.[4] C08L *63/00;* **C08K** *3/34, 3/26, 3/22*

U.S. Cl. 523—457 **13 Claims**

1. A method for the preparation of molded material for insulating components, which comprises:

mixing a polyepoxide, and a polyisocyanate to form a reaction resin mixture having a viscosity of up to about 7000 mPa.sec at 25° C. wherein the mole ration of epoxy to isocyanate groups is in the range of more than 1:1 to 5:1;

reacting the reaction resin mixture with a hardening catalyst selected from the group consisting of a tertiary amine and an imidazole under conditions of an elevated pressure of 1 to 10 bar, a gelling temperature of about 130° to 150° C., and a mold occupation time of between 5 and 15 minutes to form a cross-linked polymer; heating the cross-linked polymer at a temperature from about 150° to about 200° C. to cause post-hardening and produce a molded material;

said molded material having a mole ratio of oxazolidinone and isocyanurate rings greater than about 1; and the reaction of the epoxy and isocyanate groups therein being greater than 90% after hardening.

4,631,307

HEAT-RESISTANT HIGH IMPACT STYRENE RESIN, PROCESS FOR PRODUCTION THEREOF, AND RESIN COMPOSITION COMPRISING SAID STYRENE RESIN

Atsushi Hosoda; Yoshikiyo Miura, both of Chiba; Takehisa Mizuno, and Tsuyoshi Morita, both of Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 671,871, Nov. 15, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 774,872

Claims priority, application Japan, Nov. 15, 1983, 58-213312; Feb. 29, 1984, 59-38358

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—269 **13 Claims**

1. A moldable, thermoplastic rubber-modified styrene copolymer resin composition having heat resistance and impact strength, said composition comprising

(1) a mixture composed of (i) a rubber-modified styrene copolymer resin obtained by copolymerizing 3 to 70% by weight of a rubbery polymer and 97 to 30% by weight in total of styrene, methacrylic acid and optionally another vinyl monomer copolymerizable with styrene and methacrylic acid, the proportions of styrene, methacrylic acid and the optional other vinyl monomer being 3 to 35% by weight of methacrylic acid and correspondingly from 97 to 65% by weight in total of styrene and the optional other vinyl monomer with the proviso that when a mixture of both styrene and the other vinyl monomer is used more than 50% by weight of the mixture is styrene, said styrene, methacrylic acid and the optional other vinyl monomer being partly grafted to the rubbery polymer, and (ii) a styrene/methacrylic acid copolymer resin composed of 97 to 65% by weight of styrene or a mixture of styrene and another vinyl monomer copolymerizable with styrene and methacrylic acid with the proviso that when said mixture is used the majority of said mixture is comprised of styrene, and 3 to 35% by weight of methacrylic acid, said composition containing 1 to 50% by weight of the rubbery polymer as dispersed particles having an average particle diameter of 0.1 to 0.8 micrometer, and 3 to 35% by weight of the methacrylic acid, and

(2) 0.001 to 0.2% by weight, as silicon, of an organopolysiloxane.

4,631,308

ADHESIVE AND COATING COMPOSITION

Stephen L. Graham, Clute; David O. Plunkett, Lake Jackson, and Robert S. Lacey, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 528,754, Sep. 1, 1983. This application May 20, 1985, Ser. No. 736,041

Int. Cl.[4] C08F *91/06*

U.S. Cl. 524—272 **14 Claims**

1. A hot melt adhesive and coating composition comprising: a normally solid ethylene-acrylic acid or methacrylic acid copolymer characterized as falling within the boundries defined by Points A, B, D and E of the trapezoidal figure set forth in the Drawing, wherein Points A, B, D and E represent the following characteristics of the copolymer; A, a copolymer having an acid number of about 23 and a flow rate of about 0.77; B, a copolymer having an acid number of about 93 and a flow rate of about 69; D, a copolymer having an acid number of about 8 and a flow rate of about 69; and E, a copolymer having an acid number of about 8 and a flow rate of about 0.77; a compatable wax from about 10 to about 40 percent by weight and a compatable tackifier from about 10 to about 40 percent by weight wherein the composition is characterized by limited separation for at least about 24 hours when maintained at a temperature of about 120° C. to about 232° C.

4,631,309

SHAPED ARTICLES FOR USE IN THE EXPLORATION FOR AND/OR PRODUCTION OF PETROLEUM AND NATURAL GAS

Joachim Thörmer, Leverkusen; Friedrich Leibbrandt, Kuerten; Zsolt Szentivanyi, Leverkusen, and Hartmuth Buding, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 510,286, Jul. 1, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 678,720

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226081

Int. Cl.[4] C08F *8/04;* **C08K** *3/26, 3/36*

U.S. Cl. 524—426 **4 Claims**

1. Shaped filled rubber articles for use in the exploration for and/or production of petroleum and natural gas, wherein the rubber is a crosslinked hydrogenated butadiene-acrylonitrile copolymer having an acrylonitrile content of from 24 to 55%, by weight, a residual double bond content less than 1%, with the nitrile moieties remain unhydrogenated, and wherein the filler amounts to 20 to 200 parts per hundred parts of copolymer.

about 3 percent by weight based on the total reaction mixture of hydroquinone monomethyl ether and about 1 to about 10 percent by weight based on the total reaction mixture of para-toluene sulfonic acid at a temperature no higher than about 120° C. while removing the water of esterification as a toluene/water azeotrope; and

(d) adding a photosensitizer.

4,631,301

METHOD FOR INCORPORATING CHLORPYRIFOS INTO THERMOPLASTIC RESINS

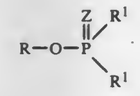
Jiro Kozuma, Fujisawa; Hirohiko Hamaguchi, Yokohama; Tetsuya Shibahara, Yamato, and Joseph P. Strasser, Tokyo, all of Japan, assignors to Dow Chemical Japan Limited, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,779

Int. Cl.[4] A01N *17/10, 17/08, 25/10;* **C08K** *5/52*

U.S. Cl. 523—122 **9 Claims**

1. A method for thermally stabilizing an O-pyridyl phosphate compound of the formula



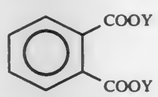
wherein

R represents halopyridyl,

Z is oxygen or sulphur, and

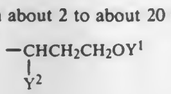
each R^1 is loweralkyoxy, amino or loweralkylamino, comprising

(a) mixing said O-pyridyl phosphate with a phthalate ester of the formula



wherein

Y is alkyl from about 2 to about 20 carbon atoms or



wherein

Y^1 is alkyl from about 1 to about 20 carbon atoms, and Y^2 is hydrogen or methyl;

said O-pyridyl phosphate and said phthalate ester being present in proportions effective to prevent appreciable ecomposition of said O-pyridyl phosphate upon heating said mixture, and

(b) incorporating said mixture into a thermoplastic resin heated to a temperature which would decompose the O-pyridyl phosphate compound if the O-pyridyl phosphate were heated alone.

4,631,302

UNDERWATER BIOCIDAL WAX COMPOSITION AND PREPARATION THEREOF

Robert F. Supcoe, Annapolis, Md., and Thomas Radakovich, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 749,975

Int. Cl.[4] A61K *31/745*

U.S. Cl. 523—122 **7 Claims**

1. A wax-based antifouling coating composition wherein said wax matrix composition comprises from about 16 to 26 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to about 13 and a chlorine content from about 65 to about 70 percent, from about 8.5 to about 11.5 weight of a chlorinated wax having an average number of carbon atoms from about 22 to about 26 and a chlorine content from about 39 to 45 percent, from about 8 to 12 weight percent of a chlorinated wax having an average number of carbon atoms from about 11 to 13 and a chlorine content from about 55 to about 65 percent, and from about 9 to about 13 weight percent of a chlorinated wax having an average number of carbon atoms from about 18 to about 22 and a chlorine content from about 36 to about 44 percent.

4,631,303

UNDERWATER FORMULATION AND METHOD FOR CLEANING AND WAXING SIMULTANEOUSLY

Robert F. Supcoe; Harold H. Singerman, and Jack E. Whitacre, all of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,893

Int. Cl.[4] C09K *3/12*

U.S. Cl. 523—177 **7 Claims**

1. A wax formulation coating material for application to submerged surfaces consisting of a mixture, by weight percent, of about 3.5% to about 6.0% of a polyethylene homopolymer having a softening point at 85 C. (ASTM E28), a hardness of 90 (ASTM D5), a density of 0.88 g/cc (ASTM D 1505), a viscosity of 40 cps at 140 C. (Brookfield), and an acid number of nil mg./KOH gram; of about 27% to about 31% of a mixture of Chlorowaxes selected from the group consisting of chlorinated waxes with a molecular average of 12 carbon atoms and 70% chlorine content, a molecular average of 24 carbon atoms and 42% chlorine content, a molecular average of 12 carbon atoms and a chlorine content of 60%, a molecular average of 20 carbon atoms and a chlorine content of 40%, and a microcrystalline laminating wax; of about 3.5% to about 6.0% USP white mineral oil; of about 18.0% to about 20.0% 2,4,5,6-tetrachloro isophthalornitride; of about 40.5% to about 42.5% USP petrolatum; and of about 0.6% to about 1.05% Autofast Black 104 in xylene.

4,631,304

NOVEL CARBON BLACK AND PROCESS FOR PREPARING SAME

Charles R. Wilder, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 518,556, Jul. 29, 1983, Pat. No. 4,518,434.

This application Mar. 18, 1985, Ser. No. 713,505

Int. Cl.[4] C08K *3/04, 9/00, 9/02;* **C09C** *1/48*

U.S. Cl. 523—215 **6 Claims**

1. A carbon black pellet which has been treated with an organic peroxide by incorporating said organic peroxide into the pelleting liquid used in forming the carbon black pellet wherein the carbon black is characterized by a surface area in the range of 20–200 m^2/g, a DBP structure in the range of 20–200 cm^3/g and a pH in the range of 5–10 and the organic peroxide is characterized by the formula R—O—O—R′ in which R and R′ can be the same or different and comprise hydrocarbyl groups containing in the range of from about 4 to about 12 carbon atoms, from about 1 to about 30 parts by weight of organic peroxide having been applied to each 100 parts by weight of carbon black and wherein the pelleting liquid comprises water.

4,631,305

POLYMERIC MATERIAL AS A DISINTEGRANT IN A COMPRESSED TABLET

Thomas L. Guyer, Richland, and Robert M. Franz, Otsego, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 22, 1985, Ser. No. 714,786

Int. Cl.[4] A61K *9/20, 47/00;* **C08L** *63/00, 25/04*

U.S. Cl. 523—400 **12 Claims**

1. A compressed tablet comprising an effective disintegrating amount of a disintegrant selected from the group consisting of:

(1) the free base or partial acid addition salt form of a cross-linked copolymerization product of (a) a polyethylenepolyamine containing from about 2 to about 10 ethylene units and (b) a member selected from the group consisting of epichlorohydrin, glycerol-1,3-dichlorohydrin, 1,2:3,4-diepoxybutane, bis-epoxypropyl ether, ethylene glycol bis-epoxypropyl ether and 1,4-butanediol bis-epoxypropyl ether;

(2) a copolymer of polystyrene cross-linked with up to 5% w/w divinylbenzene and containing quaternary ammonium groups;

(3) a polyethylene imine polymer cross-linked with a polyfunctional halogen compound; and

(4) a polyalkyleneimine polymer prepared by cross-linking a polyalkyleneimine with linking groups containing from about 2 to 10 carbon atoms and having a molecular weight of about 20 to about 200.

4,631,306

METHOD FOR THE MANUFACTURE OF MOLDED MATERIALS

Helmut Markert; Klaus-Robert Hauschildt, both of Nuremberg; Wolfgang Rogler, and Klaus Kretzschmar, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 624,984, Jun. 27, 1984, abandoned.

This application Jan. 22, 1986, Ser. No. 822,913

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323084

Int. Cl.[4] C08L *63/00;* **C08K** *3/34, 3/26, 3/22*

U.S. Cl. 523—457 **13 Claims**

1. A method for the preparation of molded material for insulating components, which comprises:

mixing a polyepoxide, and a polyisocyanate to form a reaction resin mixture having a viscosity of up to about 7000 mPa.sec at 25° C. wherein the mole ration of epoxy to isocyanate groups is in the range of more than 1:1 to 5:1;

reacting the reaction resin mixture with a hardening catalyst selected from the group consisting of a tertiary amine and an imidazole under conditions of an elevated pressure of 1 to 10 bar, a gelling temperature of about 130° to 150° C., and a mold occupation time of between 5 and 15 minutes to form a cross-linked polymer; heating the cross-linked polymer at a temperature from about 150° to about 200° C. to cause post-hardening and produce a molded material;

said molded material having a mole ratio of oxazolidinone and isocyanurate rings greater than about 1; and the reaction of the epoxy and isocyanate groups therein being greater than 90% after hardening.

4,631,307

HEAT-RESISTANT HIGH IMPACT STYRENE RESIN, PROCESS FOR PRODUCTION THEREOF, AND RESIN COMPOSITION COMPRISING SAID STYRENE RESIN

Atsushi Hosoda; Yoshikiyo Miura, both of Chiba; Takehisa Mizuno, and Tsuyoshi Morita, both of Ichihara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 671,871, Nov. 15, 1984, abandoned.

This application Sep. 12, 1985, Ser. No. 774,872

Claims priority, application Japan, Nov. 15, 1983, 58-213312; Feb. 29, 1984, 59-38358

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—269 **13 Claims**

1. A moldable, thermoplastic rubber-modified styrene copolymer resin composition having heat resistance and impact strength, said composition comprising

(1) a mixture composed of (i) a rubber-modified styrene copolymer resin obtained by copolymerizing 3 to 70% by weight of a rubbery polymer and 97 to 30% by weight in total of styrene, methacrylic acid and optionally another vinyl monomer copolymerizable with styrene and methacrylic acid, the proportions of styrene, methacrylic acid and the optional other vinyl monomer being 3 to 35% by weight of methacrylic acid and correspondingly from 97 to 65% by weight in total of styrene and the optional other vinyl monomer with the proviso that when a mixture of both styrene and the other vinyl monomer is used more than 50% by weight of the mixture is styrene, said styrene, methacrylic acid and the optional other vinyl monomer being partly grafted to the rubbery polymer, and (ii) a styrene/methacrylic acid copolymer resin composed of 97 to 65% by weight of styrene or a mixture of styrene and another vinyl monomer copolymerizable with styrene and methacrylic acid with the proviso that when said mixture is used the majority of said mixture is comprised of styrene, and 3 to 35% by weight of methacrylic acid, said composition containing 1 to 50% by weight of the rubbery polymer as dispersed particles having an average particle diameter of 0.1 to 0.8 micrometer, and 3 to 35% by weight of the methacrylic acid, and

(2) 0.001 to 0.2% by weight, as silicon, of an organopolysiloxane.

4,631,308

ADHESIVE AND COATING COMPOSITION

Stephen L. Graham, Clute; David O. Plunkett, Lake Jackson, and Robert S. Lacey, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 528,754, Sep. 1, 1983. This application May 20, 1985, Ser. No. 736,041

Int. Cl.[4] C08F *91/06*

U.S. Cl. 524—272 **14 Claims**

1. A hot melt adhesive and coating composition comprising: a normally solid ethylene-acrylic acid or methacrylic acid copolymer characterized as falling within the boundries defined by Points A, B, D and E of the trapezoidal figure set forth in the Drawing, wherein Points A, B, D and E represent the following characteristics of the copolymer; A, a copolymer having an acid number of about 23 and a flow rate of about 0.77; B, a copolymer having an acid number of about 93 and a flow rate of about 69; D, a copolymer having an acid number of about 8 and a flow rate of about 69; and E, a copolymer having an acid number of about 8 and a flow rate of about 0.77; a compatable wax from about 10 to about 40 percent by weight and a compatable tackifier from about 10 to about 40 percent by weight wherein the composition is characterized by limited separation for at least about 24 hours when maintained at a temperature of about 120° C. to about 232° C.

4,631,309

SHAPED ARTICLES FOR USE IN THE EXPLORATION FOR AND/OR PRODUCTION OF PETROLEUM AND NATURAL GAS

Joachim Thörmer, Leverkusen; Friedrich Leibbrandt, Kuerten; Zsolt Szentivanyi, Leverkusen, and Hartmuth Buding, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 510,286, Jul. 1, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 678,720

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226081

Int. Cl.[4] C08F *8/04;* **C08K** *3/26, 3/36*

U.S. Cl. 524—426 **4 Claims**

1. Shaped filled rubber articles for use in the exploration for and/or production of petroleum and natural gas, wherein the rubber is a crosslinked hydrogenated butadiene-acrylonitrile copolymer having an acrylonitrile content of from 24 to 55%, by weight, a residual double bond content less than 1%, with the nitrile moieties remain unhydrogenated, and wherein the filler amounts to 20 to 200 parts per hundred parts of copolymer.

4,631,310

PLATINUM (O) ALKYNE COMPLEXES AND A METHOD FOR THEIR PREPARATION

Grish Chandra, and Peter Y. Kwai Lo, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 641,903, Aug. 20, 1984, Pat. No. 4,603,215. This application Jan. 30, 1986, Ser. No. 824,041

Int. Cl.⁴ C08L *83/04*

U.S. Cl. 524—862 **13 Claims**

1. A method for making platinum (O) alkyne complexes, said method comprising mixing an alkyne with a platinum-vinylsiloxane complex.

4,631,311

ACRYLONITRILE FREE BLENDS OF A POLYCARBONATE, A GRAFT RUBBER AND A TERPOLYMER RESIN

Frank Wingler, Leverkusen; Otto Koch; Christian Lindner, both of Cologne, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,684

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430689

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—67 **1 Claim**

1. A thermoplastic moulding composition consisting essentially of a blend of

(A) 12–78 parts by weight, based on the weight of the moulding composition, of a randomly structured copolymer of

(a_1) 24 to 87 parts by weight, based on the weight of the copolymer, of styrene, p-methyl styrene or mixtures thereof

(a_2) 8 to 30 parts by weight, based on the weight of the copolymer, of maleic acid anhydride and

(a_3) 5 to 68 parts by weight, based on the weight of the copolymer, of methyl methacrylate,

(B) 12–78 parts by weight, based on the weight of the moulding composition, of a thermoplastic aromatic polycarbonate and

(C) 10–40 parts by weight, based on the weight of the moulding composition, of a graft polymer of 20 to 80 parts, by weight of the graft polymer, of methacrylate on 80 to 20 parts, by weight of the graft polymer, of a rubber having a glass transition temperature below −20° C.

4,631,312

POLYMERIC COMPOSITIONS USEFUL AS BINDERS IN COATING COLORS AND COATING COLORS PREPARED THEREFROM

Jose L. Trevino, Rheinmunster, Fed. Rep. of Germany, and Bernardus J. van Rooden, Richterswil, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,551

Int. Cl.⁴ C08L *33/02, 33/04, 33/18*

U.S. Cl. 525—221 **13 Claims**

1. A polymeric composition useful as the binder component in a coating color, said polymeric composition comprising at least two different polymer components a binder copolymer polymerized from unsaturated monomers, at least one of which being selected form the group consisting of monovinylidene aromatic monomers, conjugated diene monomers and α,β-ethylenically unsaturated carboxylic acid ester monomers; and a lightly cross-linked, rheology control copolymer comprising an α,β-ethylenically unsaturated carboxylic acid, an ester of an α,β-ethylenically unsaturated carboxylic acid, an unsaturated nitrile, up to 10 weight percent of a vinyl ester of a monocarboxylic acid and from 0.01 to 10 weight percent of a cross-linking monomer, said weight percent being based on the total weight of said rheology control copolymer.

4,631,313

PROCESS FOR THE POLYMERIZATION OF MIXTURES OF CIS AND TRANS-ISOMERS OF 1,3-PENTADIENE IN THE PRODUCTION OF BLOCK COPOLYMERS

Lu H. Tung, and Jerald A. Griggs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1985, Ser. No. 749,074

Int. Cl.⁴ C08F *297/04*

U.S. Cl. 525—250 **7 Claims**

1. In a process for preparing block copolymers from vinyl-substituted aromatic monomers and conjugated diene monomers in the absence of air and moisture, the presence of heat, a hydrocarbon solvent and an organolithium initiator, one of the conjugated diene monomers being a mixture of cis and trans-isomers of 1,3-pentadiene, the improvement comprises polymerizing the mixture of cis and trans-isomers of 1,3-pentadiene in the presence of a hydrocarbon solvent having no added aprotic solvents of a polar nature, a cis-isomer of 1,3-pentadiene polymerizing amount of a polymerization promoter, the polymerization promoter consisting essentially of a vinyl-substituted aromatic monomer added during the 1,3-pentadiene polymerization and a 1,3-pentadiene polymerization temperature of at least about 40 degrees C. but not exceeding about 60 degrees C. in the absence of added polymerization promoter or about 70 degrees C. in the presence of added polymerization promoter.

4,631,314

BLOCK COPOLYMERS UTILIZING A MIXTURE OF CIS AND TRANS-ISOMERS OF 1,3-PENTADIENE

Lu H. Tung, and Jerald A. Griggs, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 26, 1985, Ser. No. 749,080

Int. Cl.⁴ C08F *297/04*

U.S. Cl. 525—314 **8 Claims**

1. A block copolymer prepared in a hydrocarbon solvent with an organolithium initiator of a polymerized vinyl-substituted aromatic hydrocarbon and a polymerized conjugated diene comprising:

(a) at least two blocks; and

(b) at least one block polymerized from a mixture of cis and trans-isomers of 1,3-pentadiene and a cis-isomer of 1,3-pentadiene polymerizing amount of a polymerization promoter continuously or incrementally added during the polymerization of the 1,3-pentadiene mixed isomer mixture, the polymerization promoter consisting essentially of a vinyl-substituted aromatic hydrocarbon.

5. A block copolymer wherein the block copolymer comprises a structure represented by any of the following formulae:

S-(P/S)

S-(P/S)-S

(S/P)-(P/S)-(S/P)

(S/P)-(P/S)-P-B-P-(P/S)-(S/P)

(S/P)-(P/S)-B-(P/S)-(S/P)

(S/P)-(P/S)-P-(P/S)-(S/P)

S-(P/S)-$(P/S)_1$-(P/S)

S-(P/S)-$(P/S)_1$-$(P/S)_2$-$(P/S)_3$

where S is a homopolymerized vinyl-substituted aromatic hydrocarbon, B is a conjugated diene homopolymer or copolymer, P is poly(1,3-pentadiene) polymerized from a mixture of mixed isomers of 1,3-pentadiene, S/P is a copolymer having a major amount of a polymerized vinyl-substituted aromatic hydrocarbon and a minor amount of a polymerized mixture of mixed isomers of 1,3-pentadiene, P/S is a copolymer having a major amount of a polymerized mixture of mixed isomers of 1,3-pentadiene and a minor amount of a polymerized vinyl-substituted aromatic hydrocarbon, $(P/S)_1$, $(P/S)_2$ and $(P/S)_3$ are copolymers of a polymerized mixture of mixed isomers of 1,3-pentadiene and a vinyl-substituted aromatic hydrocarbon, where the subscripts going from 1 to 3 refer to decreasing amounts of polymerized mixed isomers of 1,3-pentadiene.

4,631,315

HYDROGENATION OF NITRILE GROUP-CONTAINING UNSATURATED POLYMERS

Hartmuth Buding, Dormagen; Paul Fiedler, Cologne; Heinrich Königshofen, Bergisch-Gladbach, and Joachim Thörmer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,646

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433392

Int. Cl.⁴ C08F *8/04*

U.S. Cl. 525—338 **5 Claims**

1. In a process for the hydrogenation of at least 80% of olefinic bonds contained in an unsaturated copolymer derived from:

85 to 50%, by weight, conjugated diene,

15 to 50%, by weight, unsaturated nitrile,

0 to 10%, by weight, of a monomer copolymerizable with the conjugated diene and the unsaturated nitrile,

with preservation of the nitrile groups, the improvement comprising, hydrogenating in the presence of a low molecular weight ketone solvent with a catalyst of the formula

$$RuX[(L_1)(L_2)_n]$$

wherein X is hydrogen or halogen,

L_1 is hydrogen, halogen, cyclopentadienyl, or methyl, ethyl or phenyl substituted cyclopentadienyl,

L_2 is a phosphane, bisphosphane or arsane,

n is 1, 2 or 3,

or $[(L_1)(L_2)_n]$ is a cyclopentadienyl-bisphosphane,

where the concentration of the catalyst, calculated as Ruthenium and based on the unsaturated polymer, is from 10 to 1000 ppm and the concentration of the unsaturated copolymer, based on the total solution, is from 1 to 99% by weight.

4,631,316

CURABLE RUBBER COMPOSITIONS COMPRISING SUBSTITUTED DITHIOCARBAMYLUREA ACCELERATORS

Joseph F. Stieber, Prospect, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Mar. 1, 1984, Ser. No. 585,072

Int. Cl.⁴ C08C *19/20*

U.S. Cl. 525—352 **1 Claim**

1. A curable rubber composition comprising:

(a) an accelerator compound of the formula

$$R^1—NHC(O)NHSC(S)NR^2R^3$$

wherein R^1 is phenyl; and R^2 and R^3 are methyl; and

(b) at least one member of the group consisting of uncured natural rubber, cis-polyisoprene, trans-polyisoprene, polybutadiene, styrene-butadiene copolymer, acrylonitrile-butadiene copolymer and ethylene-propylene-nonconjugated diene terpolymer.

4,631,317

PRODUCTION OF SULPHONIC ACID GROUP-CONTAINING ACRYLONITRILE POLYMERS AND MONOMERS THEREFOR

Joachim König, Odenthal, and Siegfried Korte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,551

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342694

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—383 **17 Claims**

1. A process for the production of sulphonic acid- and sulphonate group-containing acrylonitrile copolymers comprising copolymerization of 75 to 99.95% by weight of acrylonitrile, up to 24.95% by weight of further copolymerizable monomers free from ionic or sulphonic acid ester groups, and 0.05 to 8% by weight of a third component, the weight percentages relating to the total quantity of the monomers, in aliphatic hydrocarbons or in mixtures of aliphatic hydrocarbons using a redox catalyst comprising SO_2 and an organic hydroperoxide, the third component being an ethylenically unsaturated sulphonic acid ester free from carboxylic acid and carboxylic acid ester groups, the sulphonic acid ester groups of the copolymer are saponified before, during or after shaping.

4,631,318

POLYMERIC MOLECULAR COMPOSITES

Wen-Fang Hwang; Donald R. Wiff, both of Beavercreek, and Thaddeus E. Helminiak, Oakwood, all of Ohio, assignors to Research Corporation, New York, N.Y.

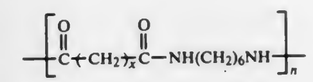
Filed Mar. 8, 1983, Ser. No. 473,214

Int. Cl.⁴ C08L *77/00*

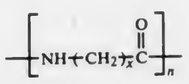
U.S. Cl. 525—432 **19 Claims**

1. A polymeric molecular composite comprising, based on the total weight of said composite, a mixture of about 30 to 60 weight percent of an aromatic heterocyclic rigid rod polymer dispersed in about 70 to 40 weight percent of a continuous flexible coil-like thermoplastic polymer matrix,

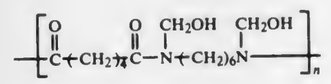
said coil-like thermoplastic polymer being a polyamide having a structural formula selected from the group consisting of



wherein x is 4 or 8,

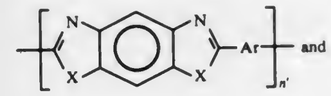


wherein x' is 5 or 6, and

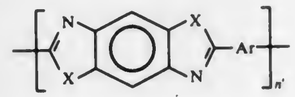


wherein n is an integer having a value such that the coil-like polymer has an intrinsic viscosity of about 1 to about 5 dl/g as determined in methanesulfonic acid at 30° C., and

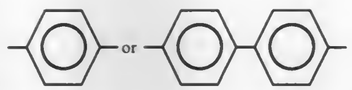
said aromatic heterocyclic rigid rod polymer comprising repeating units having a structural formula selected from the group consisting of



and



wherein X is NH, Nϕ, ϕ, S, where ϕ is phenyl, and Ar is



and n' is an integer having a value such that the rigid rod polymer has an intrinsic viscosity of about 10 to 40 dl/g as determined in methanesulfonic acid at 30° C.

4,631,319

THERMOSETTING CYANATE RESIN AND THE USE THEREOF FOR THE PRODUCTION OF COMPOSITE MATERIALS AND IPNS

Johannes Blahak; Rolf Dhein, both of Krefeld; Lothar Preis, Bergisch-Gladbach, and Manfred Schreckenberg, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,800

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413547

Int. Cl.⁴ C08L *67/02;* **C08G** *63/18*

U.S. Cl. 525—437 **7 Claims**

1. A thermosetting resin which comprises:

(a) at least one polycyanate and

(b) from 1 to 40%, by weight, based on (a), of at least one polyester having a hydroxyl number of from 28 to 320, a number average molecular weight $\overline{M}_n$ of from 700 to 8000 and containing from 50 to 92%, by weight, of alcohol residues, acid residues, or both with each of said residues containing cycloaliphatic moieites.

4,631,320

COATING COMPOSITIONS CONTAINING POLYURETHANE OR POLYUREA POLYMERS AND AMINO RESINS

Girish G. Parekh, Fairfield, and Werner J. Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,015

Int. Cl.⁴ C08F *283/04;* **C08G** *2/00, 12/02*

U.S. Cl. 525—452 **17 Claims**

1. A thermosettable coating composition comprising:

(a) a polymer selected from the class consisting of one or more of hydroxy group-containing polyurethane, hydroxy group-containing polyurea and hydroxy group-containing polyurethane/polyurea polymers;

(b) an amino cross-linker; and

(c), optionally, an acid catalyst; wherein the polymer (a) is the reaction product of one or more reaction routes selected from the class consisting of (i) self-condensation of a poly-hydroxyalkyl carbamate compound, (ii) condensation of a poly-hydroxyalkyl carbamate compound with a polyol, and (iii) condensation of a poly-hydroxyalkyl carbamate compound with a polyamine.

4,631,321

ALKENYL ORGANOPOLYSILOXANE AND CURABLE COMPOSITION THEREFROM

Toshio Suzuki, Ichihara, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,639

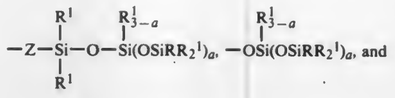
Claims priority, application Japan, Feb. 28, 1984, 59-37112

Int. Cl.⁴ C08L *83/06;* **C08G** *77/04*

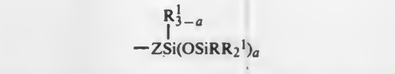
U.S. Cl. 525—478 **13 Claims**

1. A curable organopolysiloxane composition comprising

(a) organopolysiloxane in which at least the molecular chain ends possess groups with a general formula selected from the group consisting of



and



wherein R is an alkenyl group, R^1 is a monovalent organic group selected from the group consisting of alkyl, alkenyl, alkoxy, aryl, and halogenated alkyl, Z is an alkylene group, and a is 2 or 3,

(b) organohydrogenpolysiloxane which contains at least two silicon-bonded hydrogen atoms per molecule, and

(c) a catalytic quantity of platinum or a platinum-type compound, in said curable organopolysiloxane composition the blending ratio of (a) to (b) is such that the total alkenyl groups in (a) to total silicon-bonded hydrogen atoms in (b) is in a molar ratio of from 1:0.1 to 1:10.

4,631,322

CURABLE COMPOSITION OF PHENOLIC RESIN AND POLYETHER CONTAINING SILICONE CONTAINING REACTIVE GROUP

Katsuhiko Isayama; Toshifumi Hirose; Takahisa Iwahara, and Fumio Kawakubo, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

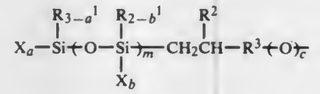
Filed Apr. 8, 1985, Ser. No. 721,017

Claims priority, application Japan, Apr. 9, 1984, 59-70508

Int. Cl.⁴ C08L *61/10, 61/14, 71/02*

U.S. Cl. 525—480 **7 Claims**

1. A curable composition comprising (A) a phenol resin selected from the group consisting of a resol phenol resin, a modified resol phenol resin, a novolak phenol resin and a modified novolak phenol resin, said novolak phenol resins containing a curing agent, and (B) 1 to 200 parts by weight of, per 100 parts by weight of the phenol resin, a polyether having at least one silicon-containing reactive group in its molecule, the main chain of said polyether consisting essentially of recurring units of the formula —R—O—, wherein R is a bivalent alkylene group having 2 to 4 carbon atoms, and said silicon-containing reactive group being a group of the formula:



wherein X is hydroxyl group or a hydrolyzable group, R^1 is a monovalent hydrocarbon group having 1 to 20 carbon atoms or an organosiloxy group, a is 0, 1, 2 or 3, b is 0, 1 or 2, m is 0 or an integer of 1 to 18, R_2 is hydrogen or a monovalent organic group having 1 to 20 carbon atoms, R_3 is a bivalent organic group having 1 to 20 carbon atoms, and c is 0 or 1, with the proviso that a and b are not both zero at the same time.

4,631,323

METHOD OF MAKING CONDUCTING POLYMER COMPLEXES OF N-SUBSTITUTED CARBAZOLES AND SUBSTITUTED BENZALDEHYDES

Samson A. Jenekhe, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1985, Ser. No. 760,028

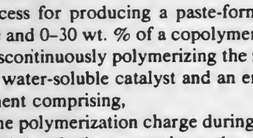
Int. Cl.⁴ C08F *283/00;* **C08L** *61/00*

U.S. Cl. 525—509 **11 Claims**

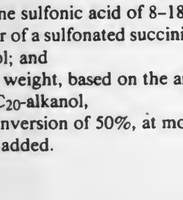
1. A method of making a conductive polymer complex comprising the steps of

reacting a mixture of carbazole or an N-substituted carbazole and benzaldehyde or a substituted benzaldehyde in a first solvent in the presence of a protic acid catalyst at a temperature below the boiling point of said solvent and for a period of time commensurate with the degree of polymerization desired to form a copolymer thereof;

wherein said benzaldehyde or N-substituted carbazole is selected from the following fomulae;



wherein R_4 is H, CH_3, C_2H_5 or $Si(CH_3)_3$ and said substituted benzaldehyde is selected from the following formulae;



wherein

R_1 is H, CH_3, F, Cl or Br

R_2 is H, CH_3, F, Cl, Br, OH, NO_2, $—OCH_3$ or $—S—CH_3$

R_3 is H, CH_3, F, Cl or Br

precipitating the polymer in a non-solvent;

doping said polymer by exposure to a compatible charge transfer donor or acceptor selected from the group of sources or dopant counter ions consisting of I_2, Br_2, Cl_2, Hl, HBr, HCl, SO_3, ClO_4^-, HSO_4^-, $FeCl_4^-$, $SO_3CF_3^-$, $COOCF_3^-$, $C_6H_2(NO_2)SO_3^-$, $Cr_6H_4SO_3^-$, AsF_6^-, SbF_6^-, BF_4^-, FCl_4, Na^+, Li^+ or K^+.

4,631,324

PROCESS FOR THE PRODUCTION OF PASTE-FORMING POLYMERS OF VINYL CHLORIDE

Burkhard Boeke, Haltern, and Josef Kalka, Herten, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,517

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210891

Int. Cl.⁴ C08F *2/24*

U.S. Cl. 526—212 **17 Claims**

1. In a process for producing a paste-forming polymer of vinyl chloride and 0–30 wt. % of a copolymerizable monomer comprising discontinuously polymerizing the monomers in the presence of a water-soluble catalyst and an emulsifier system, the improvement comprising,

adding to the polymerization charge during the polymerization period, batchwise or continuously, an emulsifier system comprising:

(a) 0.2–3% by weight based on the total weight of the monomers, of an alkali metal or ammonium salt of an alkyl sulfonic acid of 10–20 carbon atoms in the alkyl group, of an alkylbenzene sulfonic acid of 8–18 carbon atoms in the alkyl group, or of a sulfonated succinic acid diesterified by a C_{6-14}-alkanol; and

(b) 50–200% by weight, based on the amount of component (a) of a C_{14}–C_{20}-alkanol,

whereby at a conversion of 50%, at most half of the emulsifier system is added.

4,631,325

ACCELERATOR COMBINATIONS FOR ANAEROBIC POLYMERIZATION

John R. Ray, Allison Park, Pa.; Michael A. Williamson, Washington, D.C., and James D. B. Smith, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1985, Ser. No. 755,118

Int. Cl.⁴ C08F *4/00, 4/40, 20/20*

U.S. Cl. 526—220 **10 Claims**

1. A curable composition comprising:

(A) an anaerobically polymerizable prepolymer containing acrylic material; and

(B) a complex of free radical initiator and accelerator, said accelerator comprising a complex of tertiary amine containing at least one aryl ring structure, and sulfur dioxide.

4,631,326

CURABLE FLUORINE-CONTAINING COPOLYMER AND COATING LIQUID COMPOSITION USING SAME

Toshio Koishi, Sakado, and Takashi Yasumura, Fujimi, both of Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Aug. 22, 1985, Ser. No. 768,244

Claims priority, application Japan, Aug. 30, 1984, 59-179174

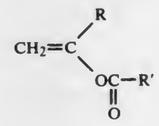
Int. Cl.⁴ C08F *214/18*

U.S. Cl. 526—249 **12 Claims**

1. A curable copolymer comprising:

25 to 75 mol % of first repeating units which originate from chlorotrifluoroethylene;

10 to 70 mol % of second repeating units which originate from a fatty acid ester represented by the general formula (I),



(I)

wherein R represents hydrogen atom or methyl group and R′ represents an alkyl group having 1 to 12 carbon atoms; and

3 to 40 mol % of third repeating units which originate from a hydroxyl-containing allyl ether represented by the general formula (II),

$$CH_2=CH—CH_2—O—CH_2CH_2O_nH \quad (II)$$

wherein n is an integer from 1 to 6.

4,631,327

β-ELIMINATION POLYMERS USEFUL FOR PROVIDING DIFFUSION CONTROL LAYERS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS

Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 454,447, Dec. 29, 1982, Pat. No. 4,461,824.

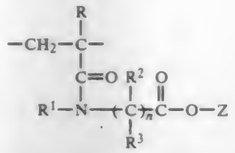
This application Jul. 10, 1984, Ser. No. 629,473

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.⁴ C08F *28/02, 28/06, 22/38*

U.S. Cl. 526—256 **3 Claims**

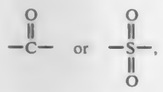
1. A polymer comprising recurring units having the formula



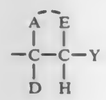
wherein R is hydrogen, halogen or lower alkyl; R^1 is hydrogen or lower alkyl; R^2 and R^3 are independently hydrogen, lower alkyl, substituted lower alkyl, aryl, alkaryl, aralkyl, cycloalkyl, or R^2 and R^3 together with the carbon atoms to which they are bonded constitute a carbocyclic or heterocyclic ring, or R^3, when substituted on the methylene carbon atom next adjacent the nitrogen atom, is taken together with R^1 to form part of a substituted or unsubstituted N-containing ring; and n is a positive integer one to six; and Z is a cyclic β-elimination moiety and having the formula



wherein Y is



A represents the atoms necessary with Y to complete a four- to seven-membered ring structure, and D and E are independently hydrogen, methyl or phenyl, provided that not more than one of D and E is methyl or phenyl, or said cyclic β-elimination moiety is a moiety having the formula



wherein A and E together represent the atoms necessary to complete with the carbon atoms to which they are bonded a five-, six- or seven-membered ring structure, D is hydrogen, methyl or phenyl, and Y is an activating group for said β-elimination reaction.

4,631,328

POLYMERS CONTAINING MESOGENIC GROUPS AND DYE RADICALS IN THE SIDE CHAINS

Helmut Ringsdorf, Mainz; Michael Portugall, Wachenheim; Hans W. Schmidt, Mainz, and Karl H. Etzbach, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

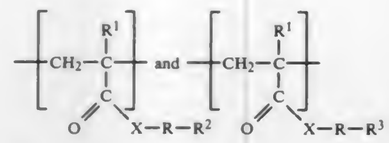
Continuation of Ser. No. 475,642, Mar. 15, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 685,213

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211400

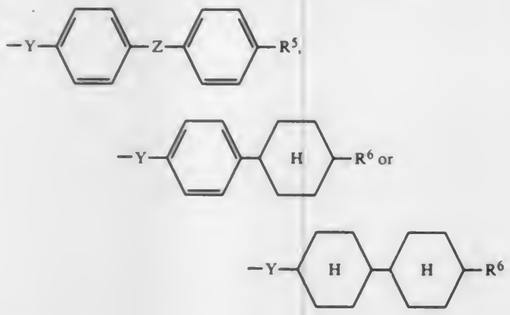
Int. Cl.[4] C08F *26/06, 20/70;* **C02F** *1/13;* **C09K** *19/52*

U.S. Cl. 526—259 **6 Claims**

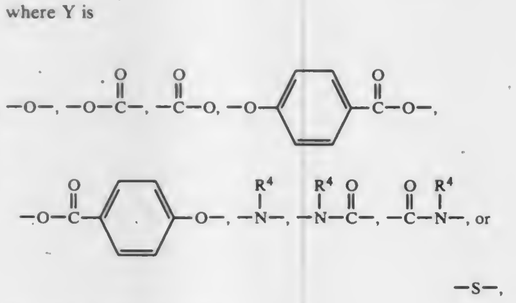
1. A polymer, wherein the polymer chain comprises monomers of the formula:



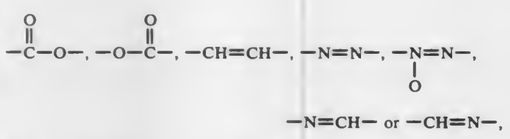
wherein R^1 is hydrogen or methyl, X is —O— or —N—R^4; R is a linear or branched C_2-C_{12}-alkylene group which is uninterrupted or interrupted by one or more of the groups —O—, —S— or —N—R^4; R^2 is a radical of the formula:



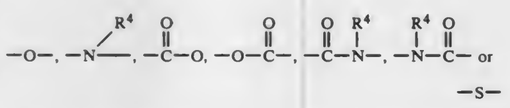
where Y is



and Z is a chemical bond or



R^5 is hydrogen, C_1-C_{12}-alkyl, C_5-C_7-cycloalkyl, C_1-C_{12}-alkoxy, C_1-C_{12}-alkoxycarbonyl, C_2-C_{12}-alkanoyloxy, fluorine, chlorine, bromine, cyano or nitro, and R^6 is hydrogen, C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy or C_1-C_{12}-alkoxycarbonyl; R^3 is the radical of a pleochroic dye comprising anthraquinone, stilbene, monoazo, bisazo and trisazo dyes, which is bonded to R via



or an imide group; and R^4 is hydrogen or unsubstituted or substituted C_1-C_4-alkyl, and which contains from 0.1 to 40% by weight, based on the polymer, of the R^3 dye radicals.

4,631,329

MOISTURE RESISTANT POLYURETHANES DERIVED FROM NON-AROMATIC DIISOCYANATES

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 29, 1985, Ser. No. 802,880

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—28 **20 Claims**

1. A method for preparing a polyurethane exhibiting a hardness of less than 90 on the Shore A durometer scale and retention of useful tensile properties at a relative humidity greater than 50%, said method comprising heating a reaction mixture comprising an aliphatic or cycloaliphatic diisocyanate, a diol or diamine chain extender and at least one polyol for a period of time sufficient to form said polyurethane, wherein the molar ratio of the combination of said diisocyanate and chain extender to all isocyanate-reactive ingredients other than said chain extender is at least 4:1, respectively, and isolating the resultant polyurethane from said reaction mixture.

4,631,330

ADDITION COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Erwin Dietz, Kelkheim; Albert Münkel, Frankfurt am Main; Otmar Hafner, Glashütten; Wolfgang Rieper, Frankfurt am Main, and Adolf Kroh, Selters, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 16, 1985, Ser. No. 809,529

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446084

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—49 **10 Claims**

1. An addition compound comprising
50 equivalent % of structural units R of the formula



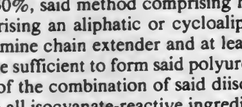
5 to 40 equivalent % of structural units of the formula (I)

$$—NH—CO—R^1—R^3—R^2 \quad (I)$$

5 to 40 equivalent % of structural units of the formula (II)

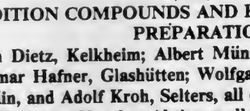
$$—NH—CO—(R^4)_a—R^5—R^6 \quad (II)$$

0 to 25 equivalent % of structural units of the formula (III)



(III)

and/or
0 to 25 equivalent % of structural units of the formula (IV)



(IV)

where (III) and (IV) cannot be 0 equivalent % at the same time and the sum (I)+(II)+(III)+(IV) is 50 equivalent %, having a molecular weight of 1,500 to 25,000, soluble in inert solvents, where d stands for a whole number from 0 to 6,

R^1 stands for a direct bond, —O—, —$NR^{10}R^{11}$—, in which R^{10} denotes a direct bond or C_1-C_{20}-alkylene and R^{11} denotes —H, —OH or —NH_2,

R^2 stands for —H, —OH or —$N(R^3R^{11})(R^{10}R^{12})$, in which R^{10} and R^{11} have the above meaning and R^{12} denotes —H, —OH or —NH_2 and

R^3 denotes a direct bond or C_1-C_6-alkylene, or

R^2 stands for a saturated or unsaturated heterocyclic or an aromtic ring system having 2 to 16 carbon atoms which may be substituted by —R^{13}, halogen, —OR^{13}, —$NR^{13}R^{14}$, —$COOR^{13}$, —$CONR^{13}R^{14}$, —NR^{13}—COR^{14}, —CN, —CF_3 or —NO_2,

where

R^{13} and R^{14} denote independently of each other —H or C_1-C_4-alkyl and where at least one of the radicals R^1 and R^2 must contain a nitrogen atom and R^1 is a direct bond only when R^2 stands for a heterocyclic ring system which is attached via the ring nitrogen, and R^3 likewise stands for a direct bond,

R^4 stand independently of each other for —O—R^{15}—, —O—R^{15}—CO— or —O—R^{15}—O—CO—R^{16}—CO—,

where

R^{15} denotes C_2-C_{20}-alkylene or phenylethylene and

R^{16} denotes a direct bond, C_1-C_{12}-alkylene, C_6-C_{12}-arylene or C_6-C_{12}-aralkylene and where the radicals R^4 in the formulae (II), (III) and (IV) can in each case be different,

a stands for a whole number from 2 to 200,

R^5 stands for —O—, —S—, —NH— or —NR'—, where R' has one of the meanings mentioned for R^6,

R^6 stands for a monovalent aliphatic, aromatic or araliphatic radical having 1 to 40 carbon atoms, and

R^7 and R^8 stand independently of each other for —O—, —S—, —NR''— or a direct bond, where R'' has one of the meanings mentioned for R^6,

R^9 stands for a direct bond or a divalent aliphatic or araliphatic radical having 2 to 200 carbon atoms,

where

R^7, R^8 and R^9 are not a direct bond at the same time, and

b stands for a whole number from 2 to 200.

4,631,331

USE, AS LATENT CROSS-LINKERS FOR EPOXY RESINS, OF COMPOUNDS WHICH CAN BE REARRANGED IN SITU TO DIFUNCTIONAL PHENOLS

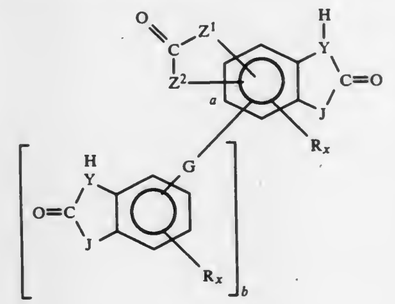
Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1985, Ser. No. 763,866

Int. Cl.[4] C08G *59/02*

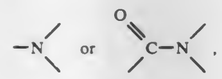
U.S. Cl. 528—96 **25 Claims**

1. A latent epoxide composition comprising a polyepoxide and a benzo-N-heterocyclic compound which is a latent, phenolic chain extender or cross-linker for polyepoxides, said compound being of the formula



(L)

wherein
one of a and b is zero and the other is zero or 1;
one of Z^1 and Z^2 is YH and the other is J and, when a=1, Z^1 and Z^2 are attached to adjacent ring carbons;
x, independently in each occurrence, is 0, 1 or 2;
R is a non-interfering substituent, independently the same or different in each occurrence;
G is a valence bond, an alkylene or alkenylene group—optionally halosubstituted, CO, O, S, SO, SO_2, SiO_2;
Y is



independently in each occurrence;
J is O or S, independently in each occurrence;
and the number of Y—H groups in the molecule is 1 or 2.

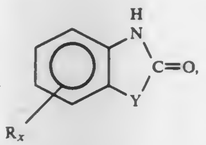
4,631,332

USE OF BENZO-N-HETEROCYCLES TO ADVANCE EPOXY RESINS

Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1985, Ser. No. 796,145
Int. Cl.⁴ C08G *59/02*
U.S. Cl. 528—117 **25 Claims**

1. The process for advancing a difunctional epoxide which comprises reacting the epoxide, in the presence of an advancement catalyst, with from about 0.33 to about 1 molecular proportions of a benzo-N-heterocycle of the formula



(1)

wherein Y is NH, O or S and each of R^1, R^2, R^3 and R^4, independently, is H or a non-interfering substituent, and x is zero, 1 or 2.

4,631,333

PROCESS FOR THE PREPARATION OF POLYIMIDE ESTERS OF TRIMELLITIC ACID

Hans R. Kricheldorf; Ralf Pakull, both of Hamburg, and Hans-Rudolf Dicke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1985, Ser. No. 760,461
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429680; Feb. 9, 1985, 3504481
Int. Cl.⁴ C08G *73/16*
U.S. Cl. 528—170 **4 Claims**

1. Process for the preparation of homo and copolyesters of N-(hydroxyaryl)-trimellitic acid imides which comprises
(a) reacting trimellitic acid anhydride and an aminophenol in a vessel in a solvent at 40° to 150° C. to produce the corresponding trimellitic acid amide and
(b) in said vessel the amide is then cyclized and polycondensed with a dehydrating agent at 200° to 400° C. in the presence of a high boiling reaction medium.

4,631,334

OPTICAL ARTICLES OF BRANCHED POLYCARBONATE RESIN

Mituhiko Masumoto; Shigeo Yanada, both of Osaka; Toshiaki Izumida, Hyogo, and Kazuyuki Akahori, Osaka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Apr. 10, 1985, Ser. No. 721,604
Claims priority, application Japan, Apr. 10, 1984, 59-71287; Apr. 10, 1984, 59-71288
Int. Cl.⁴ C08G *63/62*
U.S. Cl. 528—202 **6 Claims**

1. An optical article comprising a molding of a branched polycarbonate resin having a viscosity average molecular weight in the range of from 13,000 to 20,000 and having a Q value of at least 30×10^{-2} cc/sec produced by injection molding at a resin temperature of from 280° to 360° C., said branched polycarbonate resin being produced from (1) at least one dihydric phenol compound, (2) a polyfunctional organic compound having at least two phenolic hydroxyl groups as a branching agent in an amount of from 0.1 to 1 mol% based on the amount of said dihydric phenol compound, and (3) a terminator in an amount of from 4.4 to 8.0 mol% based on the amount of said dihydric phenol compound.

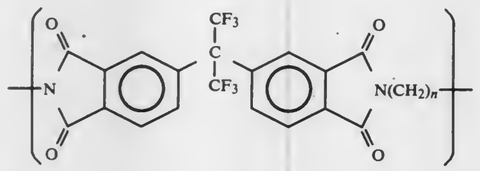
4,631,335

POLYIMIDE OF ALKYLENE DIAMINE AND 4,4'(HEXAFLUOROISOPROPYLIDENE)BIS(O-PHTHALIC ANHYDRIDE)

Daniel A. Scola, Glastonbury, Conn., and Ruth H. Pater, Rocky River, Ohio, assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1984, Ser. No. 685,937
Int. Cl.⁴ C08G *73/10*
U.S. Cl. 528—353 **5 Claims**

1. A polyimide having repeating polymer units of the formula



wherein n is 2 to about 20 and the molecular weight of the polymer chain is such that the polymer absorbs below about 0.2% by weight moisture at room temperature.

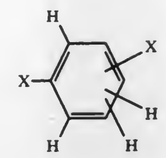
4,631,336

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED POLYARYLENE SULPHIDE WITH AN ESTER OR ANHYDRIDE OF A CARBOXYLIC ACID

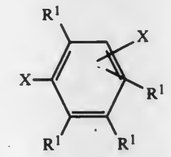
Karsten Idel, Krefeld; Edgar Ostlinning, Duesseldorf, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1985, Ser. No. 761,369
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3428986
Int. Cl.⁴ C08G *75/16*
U.S. Cl. 528—388 **15 Claims**

1. A process for the production of a high molecular weight polyarylene sulphide or branched polyarylene sulfide which comprises reacting a mixture of components of:
(a) from 50 to 100 mol-% of an aromatic dihalogen compound corresponding to the following formula:



and from 0 to 50 mol-% of an aromatic dihalogen compound corresponding to the following formula:



wherein
X represents halogens in the meta- or para-position to each other; and each
R^1 is independently hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two groups R^1 in the orthoposition to each other joined together to form an aromatic or heterocyclic ring, with the proviso that at least one R^1 is not hydrogen; and
(b) from 0 to 5 mol-%, based on the sum of components (a) and (b), of an aromatic tri- or tetra-halogen compound corresponding to the following formula:

$$ArX^1_n$$

wherein
Ar represents an aromatic or heterocyclic group;
X^1 represents chlorine or bromine; and
n represents 3 or 4; and
(c) an alkali metal sulphide, in which the molar ratio of (a+b):c is from 0.5:1 to 1.5:1; in
(d) an organic solvent; in the presence of from 0.5 to 100 mol-%, based on the moles of aromatic dihalogen compounds (I) and (II), of
(e) an ester or anhydride of a carboxylic acid.

4,631,337

HYDROLYTICALLY-STABLE DENSE STAR POLYAMINE

Donald A. Tomalia, Midland, and James R. Dewald, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 641,807, Aug. 17, 1984, Pat. No. 4,568,737, which is a continuation-in-part of Ser. No. 565,686, Dec. 27, 1983, Pat. No. 4,558,120, and a continuation-in-part of Ser. No. 456,226, Jan. 1, 1983, Pat. No. 4,507,466. This application Jul. 15, 1985, Ser. No. 755,259
Int. Cl.⁴ C08G *73/00*
U.S. Cl. 528—391 **21 Claims**

1. A dense star polyamine having at least one core branch emanating from a core, each core branch having at least one terminal amine group provided that (1) the ratio of terminal amine groups to the branches emanating from the core is 2:1 or greater, (2) the density of terminal amine groups in the dense star polyamine is at least 1.5 times that of an extended conventional star polyamine having similar core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the conventional star polyamine bears only one terminal amine group, and (3) a molecular volume that is equal to or less than 80 percent of the molecular volume of said extended conventional star polyamine.

4,631,338

PROCESS FOR THE ISOLATION OF THERMOPLASTIC POLYCARBONATE FROM SOLUTION WITH VAPOR OF BENZENE OR ALKYLBENZENE

Karl-Heinrich Meyer, Krefeld; Uwe Hucks, Alpen, and August Horsthemke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,209
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3429960
Int. Cl.⁴ C08G *63/62*
U.S. Cl. 528—483 **9 Claims**

1. A process for the isolation of a thermoplastic polycarbonate based on bisphenol A, which is prepared by the phase boundary process, from a solution containing an organic solvent comprising (i) continuously treating a solution of said polycarbonate in said organic solvent with a vapor of at least one member selected from the group consisting of benzene and alkylbenzene, said member being characterized in that polycarbonate is sparingly soluble or insoluble therein at room temperature and further in that its boiling point is lower than that of said organic solvent, until said organic solvent is evaporated off down to a residual content of less than 0.5% by weight based on the total weight of the mixture of said polycarbonate and said member and (ii) isolating said polycarbonate either as a melt from said mixture by evaporating off said member under pressure or by solidifying said mixture and removing said member by drying.

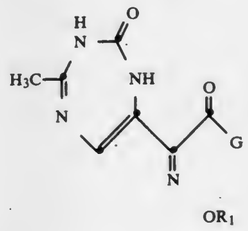
4,631,339

1,3,5-TRIAZEPINONES

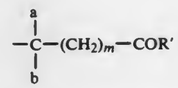
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 486,132, Apr. 18, 1983, Pat. No. 4,514,564. This application Feb. 13, 1985, Ser. No. 701,060
Int. Cl.⁴ C07D *255/02*
U.S. Cl. 540—492 **7 Claims**

1. A compound of the formula



wherein:
R_1 is C_1 to C_4 alkyl, a carboxy-substituted alkyl, an amido-substituted alkyl, an amido-substituted cycloalkyl or carboxy-substituted cycloalkyl group represented by the formula

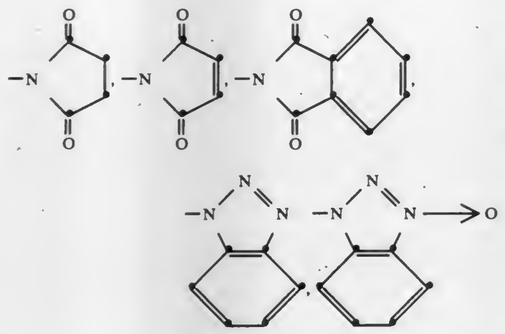


wherein m is 0 to 3, a and b when taken separately are independently hydrogen or C_1 or C_3 alkyl, or when taken together with the carbon to which they are attached form a C_3 to C_7 carbocyclic ring; R' is hydroxy, amino, C_1 to C_4 alkoxy, or —OR'', where R'' is 2-iodoethyl, tert-butyl, 2,2,2-trichloroethyl, 4-methoxybenzyl, 4-nitrobenzyl, diphenylmethyl, allyl, 4-methoxydiphenylmethyl, 4,4'-dimethoxydiphenylmethyl, benzyl, trialkylsilyl, 2,4,6-trimethyoxybenzyl, trityl, 4-methoxytrityl, 4,4'-dimethoxytrityl, or 4,4',4''-trimethoxytrityl; G is

chloro, bromo, hydroxy, C_1 to C_4 alkoxy, phenoxy, or a group of the formula

—O—J

wherein J is p-nitrophenyl, 2,4-dinitrophenyl, pentachlorophenyl, a group of the formula



methoxycarbonyl, iso-butoxycarbonyl, pivaloyl, or trichloroacetyl; or a group of the formula

$-O^{\ominus}M^{\oplus}$

wherein $M^{\oplus}$ is lithium, sodium, potassium, ammonium, dibenzyl ammonium, benzylammonium, phenylethylbenzylammonium, 2-hydroxyethylammonium, or dicyclohexylammonium.

4,631,340

1,4-OXAZINONE DERIVATIVES

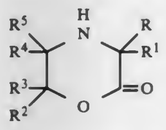
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 647,787, Sep. 6, 1984, Pat. No. 4,549,014. This application Oct. 18, 1985, Ser. No. 789,270

Int. Cl.[4] C07D *265/32*

U.S. Cl. 544—171 **8 Claims**

1. A 1,4-oxazinone derivative of the formula



wherein R and R^1 together represent the group $=CHCO_2R^6$ where R^6 is alkyl, R^2 and R^3 are hydrogen or phenyl, and R^4 and R^5 are hydrogen, alkyl or benzyl, provided that when both R^2 and R^3 are hydrogen, at least one of R^4 and R^5 is benzyl and when R^4 and R^5 are either hydrogen or alkyl, at least one of R^2 and R^3 is phenyl.

4,631,341

ANTHRAQUINONE COMPOUND HAVING BOTH MONOHALOGENOTRIAZINYL AND VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Yutaka Kayane, Ibaraki; Takashi Omura, Ashiya; Katsumasa Otake, Nara, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

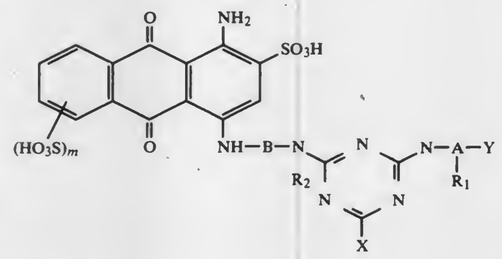
Filed May 16, 1984, Ser. No. 610,750

Claims priority, application Japan, May 23, 1983, 58-91215; May 25, 1983, 58-092944; Oct. 26, 1983, 58-201835

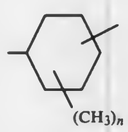
Int. Cl.[4] C07D *251/50*

U.S. Cl. 544—189 **4 Claims**

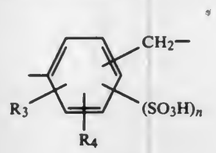
1. A compound, or a salt thereof, represented by the formula,



wherein X is a halogen atom, Y is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$, wherein Z is selected from the group consisting of sulfuric acid ester; thiosulfuric acid ester; phosphoric acid ester; acetic acid ester; and a halogen atom, A is a phenylene group unsubstituted or substituted with one or two members selected from the group consisting of bromine and chlorine atoms, methyl, ethyl, methoxy, ethoxy and sulfo groups, or a naphthalene group unsubstituted or substituted with one sulfo group, B is a cycloalkylene group of the formula,



an arylene group of the formula,



or an alkylene of the formula $-(CH_2)_l-$, wherein R_3 and R_4 are independently a hydrogen atom or a methyl, ethyl or methoxy group, n is 0, 1 or 2 and l is an integer of 2 to 6, R_1 and R_2 are independently a hydrogen atom, an unsubstituted lower alkyl group or a substituted lower alkyl group substituted by hydroxy, cyano, alkoxy, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, sulfomoyl or halogen atoms, and m is 0, 1 or 2, provided that the group Y is located at m- or p-position to the group



when B is the arylene group.

4,631,342

PROCESS FOR PRODUCING 5-FLUOROURACIL

Teruo Umemoto, Kanagawa, and Eiji Ogura, Tokyo, both of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi and Sagami Chemical Research Center, Tokyo, both of, Japan

Filed Mar. 7, 1985, Ser. No. 709,284

Claims priority, application Japan, Mar. 9, 1984, 59-43779

Int. Cl.[4] C07D *239/22*

U.S. Cl. 544—313 **6 Claims**

1. A process for producing 5-fluorouracil comprising reacting uracil in an aqueous phosphoric acid solution with elemental fluorine and heating the resultant intermediate reaction solution.

4,631,343

CYANOPYRAZOLE INTERMEDIATES

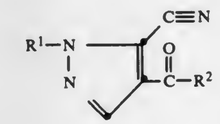
James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 549,111, Nov. 7, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 650,160

Int. Cl.[4] C07D *401/04, 231/14*

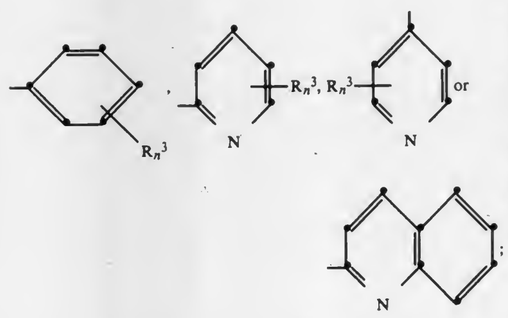
U.S. Cl. 546—279 **15 Claims**

1. A compound of the formula



wherein

R^1 is C_5–C_6 cycloalkyl,



R^2 is halogen, hydroxy or C_1–C_6 alkoxy;

each R^3 is independently halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy or cyano; and n is 0–3;

with the proviso that when R_3 is C_1–C_4 alkyl, that substituent exists at other than the 2 or 6 position of the phenyl ring.

4,631,344

PHOTOGRAPHIC PRODUCTS AND PROCESSES

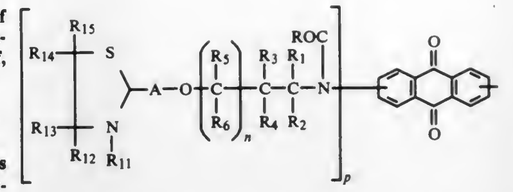
Myron S. Simon, West Newton, and David P. Waller, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

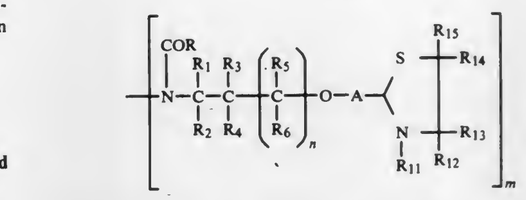
Division of Ser. No. 644,915, Aug. 27, 1984, Pat. No. 4,535,051. This application Apr. 29, 1985, Ser. No. 728,210

Int. Cl.[4] C07D *277/04, 277/06*

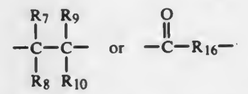
U.S. Cl. 548—146 **6 Claims**

1. A compound represented by the formula





wherein R is hydrogen, alkyl having from 1 to 6 carbon atoms or phenyl or pyridyl; R_1, R_2, R_3, R_4, R_5 and R_6 are each independently hydrogen, alkyl having from 1 to 6 carbon atoms or phenyl; A is



R_7, R_8 and R_9 are each independently hydrogen, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{10} is hydrogen or carboxy; R_{11} is alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{12} is hydrogen, carboxy, dialkylcarboxamido, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{13}, R_{14} and R_{15} are each hydrogen, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or phenethyl; R_{16} is alkylene having 2 or 3 carbon atoms or phenyl; n is 0 or 1; m is 1 or 2; and p is 0, 1 or 2.

4,631,345

THIAZOLE PRECURSORS FOR THE PREPARATION OF BIOTIN

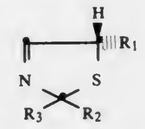
Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 587,757, May 17, 1984, Pat. No. 4,581,459, which is a division of Ser. No. 379,247, May 17, 1982, Pat. No. 4,468,516. This application Feb. 18, 1986, Ser. No. 807,064

Int. Cl.[4] C07D *277/10, 471/10, 513/10, 277/60*

U.S. Cl. 548—147 **5 Claims**

1. A compound of the formula



or a boron trifluoride adduct thereof, wherein

R_1 is $-(CH_2)_4CH_3$,

$-(CH_2)_3OR$ or $-(CH_2)_5OR$ wherein R is alkyl,

$-(CH_2)_4CN$, or

$-(CH_2)_4COOR'$ wherein R' is alkyl or phenyl;

R_2 and R_3 when taken together are cycloalkyl or $-CH_2-CH_2-Y-CH_2-CH_2$ wherein Y is sulfur, oxygen or NR'' wherein R'' is COOR''' wherein R''' is alkyl, or

R_2 and R_3 when taken separately are each alkyl, cycloalkyl or phenyl provided that R_2 and R_3 are not both phenyl;

said alkyl having from 1 to 4 carbon atoms and said cycloalkyl having from 5 to 7 carbon atoms.

4,631,346

SILYL CARBAMATES AND THEIR USE IN THE PREPARATION OF BIS (AMINOALKYL) DISILOXANES

Jimmy L. Webb, Ballston Lake, and Cathryn E. Olsen, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 707,630, Mar. 4, 1985, abandoned. This application Aug. 22, 1985, Ser. No. 768,255

Int. Cl.⁴ C07F *7/08, 7/10*

U.S. Cl. 556—420 **20 Claims**

1. A silyl carbamate having formula I in the drawings, wherein R^1 is a C_{1-4} primary or secondary alkyl radical, phenyl or substituted phenyl; each R^2 is independently hydrogen, a C_{1-4} primary or secondary alkyl radical, phenyl or substituted phenyl; and m is from 1 to about 20.

4,631,347

DITHIOLPHOSPHORIC ACID ESTERS

Haruyasu Yamamoto, Takarazuka; Kiyoshi Kasamatsu, Toyonaka; Takayuki Okabe, Nishinomiya, and Kunio Mukai, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

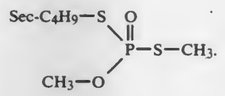
Filed Oct. 17, 1983, Ser. No. 542,709

Claims priority, application Japan, Oct. 25, 1982, 57-188004

Int. Cl.⁴ C07F *9/165*

U.S. Cl. 260—963 **1 Claim**

1. A dithiolphosphoric acid ester of the formula



4,631,348

PREPARATION OF ACETIC ACID

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Little Ferry, N.J.

Continuation of Ser. No. 431,450, Sep. 30, 1982, abandoned. This application Jun. 19, 1985, Ser. No. 746,447

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ C07C *51/12, 51/353, 53/08*

U.S. Cl. 562—607 **4 Claims**

1. A process for the preparation of acetic acid which comprises heating methyl formate with carbon monoxide in the presence of a molybdenum - nickel - alkali metal, a chromium - nickel - alkali metal or a tungsten - nickel - alkali metal co-catalyst component, and being free from organic promoters selected from the group consisting of organo-phosphorus compounds and organo-nitrogen compounds, and in the presence of an iodide or bromide.

4,631,349

HETEROGENEOUS CATALYST PROCESS

Dixie E. Goins, Orangeburg; Silas W. Holmes, Columbia, and Edward A. Burt, Orangeburg, all of S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1985, Ser. No. 748,733

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.⁴ C07C *37/14*

U.S. Cl. 568—789 **41 Claims**

1. A process for alkylating phenols comprising reacting in a liquid reaction medium a mixture of:

(a) a phenol having at least one ortho or para position unsubstituted except for H;

(b) an olefin; and

(c) a heterogeneous catalyst comprising an aluminum phenoxide bonded to a solid polymeric resin.

4,631,350

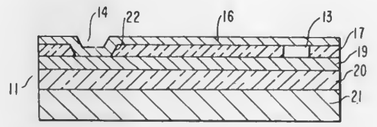
LOW COST THERMOCOUPLE APPARATUS AND METHODS FOR FABRICATING THE SAME

Damon Germanton, 7 Alberta Dr., Kennelon, N.J. 07405, and Donald Weiss, 200 Cliffside Park, Englewood, N.J. 07631

Filed Dec. 30, 1983, Ser. No. 567,377

Int. Cl.⁴ H01L *35/28*

U.S. Cl. 136—225 **7 Claims**



1. A thermocouple device, comprising:

a planar plastic layer member of a rectangular configuration and having a given length greater than the width, said member having disposed on said surface a first thin layer of a thermocouple element metal completely covering the same, a layer of an insulator material disposed upon and completely covering said first thin layer of said thermocouple element metal, said insulating layer having a first aperture near one end and located above a center line parallel to said longer sides, and a second aperture at said other end and located below said center line, each of said apertures directed through said insulating layer to directly contact said first metal layer, a second thin layer of a different thermocouple metal disposed on top of said insulating layer and positioned above said center line and directed from one end to the other along the length to overlie said first aperture with said second metal layer contacting said first metal layer via said first aperture to form a hot junction for said thermocouple, with said second aperture in contact with said first layer forming one terminal of a reference junction and with the other terminal supplied by contact with said second metal layer at a point above said center line and adjacent to said second aperture.

4,631,351

INTEGRATED SOLAR CELL

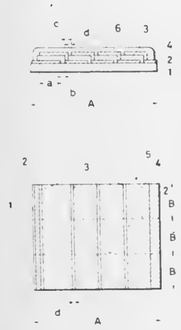
Yoshihisa Tawada, and Kazunori Tsuge, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1985, Ser. No. 703,975

Claims priority, application Japan, Feb. 29, 1984, 59-39078

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 136—244 **3 Claims**



1. An integrated solar cell of cut-off construction, comprising

a transparent support,

a transparent electrode layer provided on said transparent support in the form of a plurality of elongated parallel bands,

a semiconductor layer disposed on said transparent electrode layer in the form of a plurality of elongated parallel bands so that each of said semiconductor bands does not cover one of the long sides of the corresponding transparent electrode band but extends beyond the other long side over said transparent support or the adjacent transparent electrode, and

a back side electrode disposed on said semiconductor layer in the form of a plurality of elongated parallel bands so that each of said back side electrode bands does not cover one of the long sides of the corresponding semiconductor band, which side corresponds to the uncovered side of said transparent electrode band, but extends beyond the other long side of said semiconductor band onto the adjacent transparent electrode band and may optionally extend onto the adjacent semiconductor band; wherein the relationship between the positions of said transparent electrode, said semiconductor layer, and said back side electrode are as follows:

$a > 20b$,

$a > 20c$, and

$a > 20d$

in which a is the space between the covered long side of said transparent electrode band and the opposite long side of said back side electrode band disposed through said semiconductor layer on said transparent electrode, b is the space between the covered long side of said transparent electrode band and the other long side of the adjacent transparent electrode band, c is the space between the covered long side of said semiconductor band and the other long side of the adjacent semiconductor band, and d is the space between the long side of the back side electrode band on the last mentioned covered side and the other long side of the adjacent back side electrode band; and said solar cell is obtained by cutting the above construction in the widthwise direction of said transparent electrode bands with an interval B so as to satisfy the relationship of $3B < A < 50B$ wherein A is the overall length of said integrated solar cell.

4,631,352

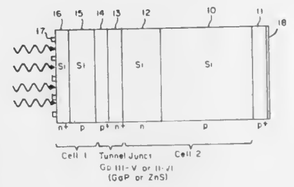
HIGH BAND GAP II–VI AND III–V TUNNELING JUNCTIONS FOR SILICON MULTIJUNCTION SOLAR CELLS

Taher Daud, La Crescenta, and Akaram H. Kachare, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 17, 1985, Ser. No. 809,975

Int. Cl.⁴ H01L *31/06, 27/14*

U.S. Cl. 136—249 **2 Claims**



1. A multijunction silicon solar cell comprising a plurality of p/n junction solar cells epitaxially grown in layers to receive

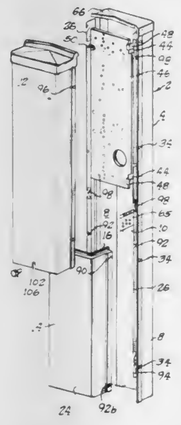
solar energy in series through the n-type layer of each solar cell and having the p-type layer of one connected to the n-type layer of the next in series by a p^+/n^+ tunnel junction of III-V or II-VI semiconductor material of higher band-gap than silicon, and having a near perfect lattice match with silicon.

4,631,353

TERMINAL PEDESTAL FOR BURIED CABLE INSTALLATION

Robert J. Marks, Carpentersville, Ill., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 31, 1984, Ser. No. 666,760
Int. Cl.[4] H02G *9/02*
U.S. Cl. 174—16 R **10 Claims**



2. A closure for electrical terminals associated with a buried cable installation comprising: a body having a rear section including an extruded plastic channel having a web and a pair of legs with opposed edges defining an opening into the channel, means within the channel and integral with the plastic of the channel for supporting electrical wire termination structure, front cover means for closing the opening into said channel, said front cover means comprising upper and lower front cover sections, each being of a cross-section that is the same cross-sectional profile as that of said rear section, means for attaching said cover sections to said rear section with the legs of the rear section being presented respectively to the legs of the cover sections, brackets on the legs of said rear section, and means on the lower front cover section for snap-fitting engagement with said brackets.

5. A closure for electrical terminals associated with a cable installation comprising: a body having a rear section with an open side and front cover means for closing said open side, said front cover means including at least one front cover section, said front cover section having an upper end with a front cap section affixed hereto, a rear cap section affixed to the upper end of said rear section, the cap sections abutting and cooperating to define a cap for the upper end of said body, the abutting parts of the cap sections forming vent passageway means from the interior of the body to the exterior of the cap, and in which said cap sections have surfaces that are inclined to the vertical when the closure is installed in its normal upright position, said surfaces being positioned to receive and drain away from the closure condensate discharged from said vent passageway means.

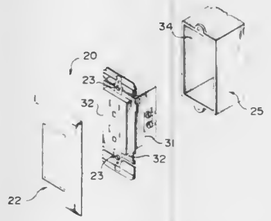
9. A closure for electrical terminals associated with a cable installation comprising: a body having a rear section including a channel having a web and a pair of legs with opposed edges defining an opening into the channel, cover means for said opening, said cover means and said rear section each having an upper end and with cap sections on each said upper end, said cap section on the upper end of the rear section overhanging said web on said rear section, and removable grommets on said web and projecting outwardly therefrom at least the amount of said overhang for enabling the grommets to serve as spacers when the closure is secured to a vertical surface with the grommets against said vertical surface.

4,631,354

COVER ASSEMBLY FOR ELECTRICAL OUTLET BOX

William C. Boteler, Bridgeport, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed May 13, 1985, Ser. No. 732,960
Int. Cl.[4] H02G *3/14*
U.S. Cl. 174—66 **16 Claims**



1. A cover assembly for an electrical outlet box, comprising:
a mounting strap having a longitudinal axis mounting an electrical device with a peripheral flange extending laterally therefrom adjacent a front face of the device, said mounting strap having opposite ends mounting a plurality of elongated lips with each lip being adjacent a different end of said strap, the lips being elongated in a direction substantially perpendicular to said longitudinal axis and extending substantially parallel to one another, a substantially planar, central section of said strap between said lips, each of said lips formed unitary with said strap and extending outwardly away from said central section at an acute angle relative to the plane of said central section; and
a cover plate having a substantially planar rearward surface and opposite ends and comprising a plurality of ledges each adjacent an opposite end of said plate for engaging different ones of said lips, each of said ledges of said cover plate being elongated and extending substantially parallel to one another and to said lips, said ledges being adjacent said rearward surface and inclined toward each other and being spaced apart laterally substantially the same distance as said lips; and
said plate being resilient and having a convex cross sectional portion, whereby pressing the convex portion towards said strap flattens said plate and permits said ledges to pass over said lips to and thereby couple said plate to said strap.

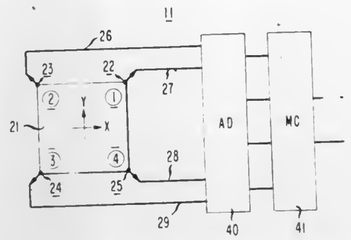
4,631,355

TELAUTOGRAPH SYSTEM

Joseph Federico, Berkeley Heights, and Sigurd G. Waaben, Princeton, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1984, Ser. No. 682,780
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **8 Claims**

1. A terminal comprising
(a) first large area conductive means provided with at least three spaced apart localized electrode connections thereto,
(b) means under control of recording information for injecting current into a point in the first conductive means for flow in the first conductive means and for dividing among said at least three electrodes and supplying a separate portion of the current to each of said at least three electrodes, and
(c) signal processing means, supplied with the separate current portions from at least the three electrodes, for processing the at least three current portions and deriving a pair of signals representative of the coordinates of the injection point.

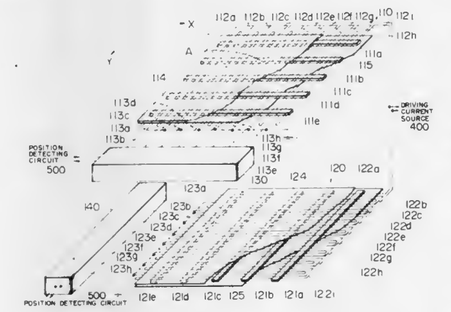


4,631,356

COORDINATE INPUT DEVICE WITH DISPLAY

Yoshinori Taguchi, and Tsuguya Yamanami, both of Ageo, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Filed Mar. 1, 1985, Ser. No. 707,311
Claims priority, application Japan, Mar. 6, 1984, 59-41376
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **4 Claims**



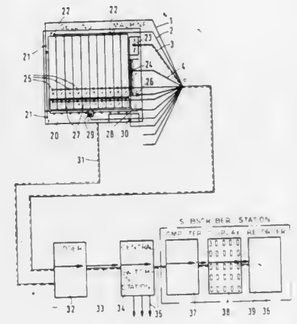
1. A coordinate input device with a display comprising:
a tablet having an X-direction position detecting section having elongated magnetic bodies and a plurality of exciting lines and a plurality of detecting lines which are arranged alternatingly such as to cross said magnetic bodies orthogonally thereto, and a Y-direction position detecting section having a construction similar to that of said X-direction position detecting section and superposed thereon;
a tabular display superposed on said tablet;
a position appointing magnetism generator adapted for imparting local biases to said magnetic bodies of said X- and Y-direction position detecting sections;
a driving current source adapted to apply A.C. current of a predetermined frequency to said exciting lines of said X- and Y-direction position detecting sections;
a position detecting circuit for detecting the coordinate values of a position appointed by said position appointing magnetism generator through detection of voltages induced in said detecting lines in said tablet;
a display control circuit for driving said display; and
a processing means for controlling the operation of the constituents set forth above.

4,631,357

METHOD OF AND DEVICE FOR MONITORING A PLURALITY OF AUTOMATIC SELLING MACHINES

Dieter Grünig, Alpnach, Switzerland, assignor to Grünig Administration, Badger, Minn.

Filed Sep. 14, 1984, Ser. No. 651,699
Claims priority, application Switzerland, Sep. 14, 1983, 5020/83
Int. Cl.[4] H04Q *9/00*; H04M *11/00*
U.S. Cl. 379—40 **3 Claims**



2. A device for monitoring a plurality of automatic selling machines each having a plurality of sensors for delivering in response to a predetermined operational condition and/or interference in the machine an output signal, comprising a coding device for converting respective output signals from the sensors into corresponding codes, said sensors being connected to a power source, said power source being a low voltage source from a telephone network, a part of said plurality of sensors being directly connected to the coding device via conductors and the remaining sensors being connected to the coding device by different combinations of said conductors, said coding device generating composite coded signals by combining the coded output signals with a recognition code pertaining to particular selling machines and to a particular subscriber station, said coding device further converting the composite coded signals into different frequencies, a central switching station connected via telephone network to the coding device of each of said selling machines to receive said different frequencies, said central switching station decoding the recognition code pertaining to a subscriber station and switching over the coded output signal to a corresponding subscriber line, and a subscriber station connected to a subscriber line and including a computer for decoding the received output signals and processing the received message and displaying the message on a display and/or recording means.

4,631,358

DEVICE AND METHOD FOR ARTICLE STORAGE AND RELEASE

Thomas W. Newcome, III, 66 E. 9th St., St. Paul, Minn. 55101, and Mark H. Kartarik, 810 Thornton St., SE., Minneapolis, Minn. 55414

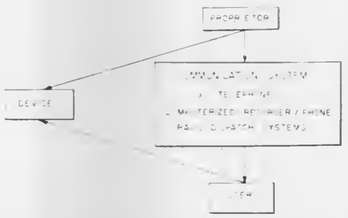
Filed Feb. 14, 1984, Ser. No. 579,669
Int. Cl.[4] G07F *11/00*; H04M *11/04*
U.S. Cl. 379—45 **13 Claims**

9. A method for storing and protecting an article for access to a predetermined user, said method comprising:
a. providing an automatically resetting and tamper resistant device for releasably storing an article from an internal secured location and for dispensing the article to an external location accessible to a user having been provided with a changeable predetermined code, said device comprising:
1. a tamper resistant structure having article storage

means therein and being accessible to the proprietor of the device, said structure further having an article input chute having a generally open flat bottom portion for receiving and holding the article therein,

2. a reciprocating tamper resistant article release means located spacially below said input chute in said tamper resistent structure and being in communication with an externally accessible location to a user,
3. a logic unit having changeable code setting means for a proprietor to enter a predetermined code, a code input means located at an externally accessible location for input of the predetermined code by a user and signal output means in communication with said article release means,
4. power source means in communication with said code setting means, logic unit, and code input means for activating said article release means to release the stored article to a user at the externally accessible location,
5. said reciprocating article release means further being comprised of a solenoid valve having activatable and reciprocating piston means having an elongated and generally flat chute cover means connected thereto and extending outwardly therefrom, said solenoid valve





being in communication with said signal output means, and said tamper resistant structure further having output chute means with a generally flat open top area in communication with the externally accessible location, said movable and reciprocating chute cover means for holding an article thereabove and being located spacially between said input and output chutes, said chute cover means further having an apertured portion extending therethrough, said apertured portion of said chute cover being located outside the top of said output chute when being in its set position and having its apertured portion aligned with the interior of said input and output chutes when activated to permit the article to pass therethrough,

6. said movable chute cover means additionally having resilient means attached in opposition to the solenoid valve piston movement so that said chute cover means is returnable to its original set position subsequent the activation of said solenoid valve to reset the chute cover with said aperture outside said input and output chutes for subsequent use, and
7. said article input chute further being disposed above said chute cover means and being in spacial alignment with said output chute means, whereby said elongated and flat reciprocating chute cover means is located spacially between said flat input chute bottom portion and said flat output chute top portion and having said apertured portion located to the outside of said spacially aligned chutes when said chute cover is in its set position to ensure against tampering,
   b. placing an article in said tamper resistant article storage means by the proprietor of said device,
   c. storing a predetermined code into the changeable code setting means by the proprietor of said device,
   d. providing a user with the predetermined code for input into the externally located code input means to release an article from the storage device to the externally located access means for subsequent use by the user, and
   e. activating of said tamper resistant article release means by the user by input of the predetermined code for releasing the article to the externally located access means from said tamper resistant device.

10. The method of claim **9**, wherein the predetermined code is provided to a communication system for predetermined use, and wherein a user obtains the predetermined code from the communication system.

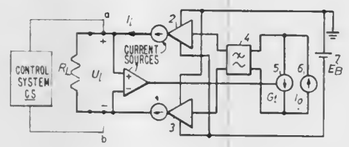
11. The method of claim **10**, wherein the communication system provided is the 911 emergency telephone system, and wherein the users provided with the predetermined code is selected from a group consisting of firemen, policemen and medical personnel.

4,631,359

ARRANGEMENT FOR SUPPLYING CURRENT TO A SUBSCRIBER TELEPHONE SET

Jan H. Johansson, Bålsta, and Nils J. Sundvall, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00333, § 371 Date May 4, 1984, § 102(e) Date May 4, 1984, PCT Pub. No. WO84/01250, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 22, 1983, Ser. No. 610,291
Claims priority, application Sweden, Sep. 22, 1982, 8205437
Int. Cl.⁴ H04M *19/00*
U.S. Cl. 379—324 **6 Claims**



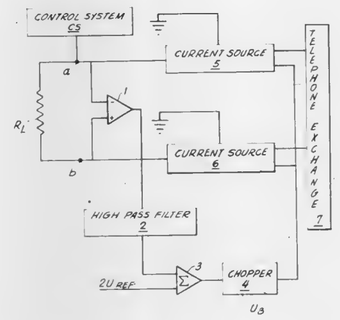
1. A telephone exchange system apparatus for supplying current to a subscriber telephone set connected via a two-wire line to first and second terminals of the telephone exchange, said apparatus comprising: first and second analog current amplifier means each having a first input, each also having an output connected to one of said terminals for emitting signals, and each further having voltage supply input means; voltage supply means with an output voltage E_B connected to each of said voltage supply input means; means for maintaining the output of said first current amplifier means at a constant potential; and control means connected to said first inputs of each of said current amplifier means for controlling the output current amplitudes thereof.

4,631,360

APPARATUS FOR THE CURRENT SUPPLY OF A SUBSCRIBER SET FROM AN EXCHANGE

Jan H. Johansson, Bålsta, and Nils J. Sundvall, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00329, § 371 Date Apr. 27, 1984, § 102(e) Date Apr. 27, 1984, PCT Pub. No. WO84/01249, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 14, 1983, Ser. No. 606,820
Claims priority, application Sweden, Sep. 17, 1982, 8205342
Int. Cl.⁴ H04M *19/00*
U.S. Cl. 379—324 **6 Claims**



1. In a telephone exchange system apparatus for supplying current to a subscriber telephone set connected via a two-wire line to first and second terminals of the telephone exchange, said apparatus comprising first and second current source amplifiers each having an output connected to one of the terminals and each having input means, a DC/DC converter means having a control input and an output means connected to the input means of at least one of said current source amplifiers, means for maintaining the first terminal at a fixed potential, a series circuit means having an input connected across the first and second terminals and an output connected to the control input of said DC/DC converter means, said series circuit means generating a control signal to control said DC/DC converter means to emit a signal from the output means of said DC/DC converter means having a voltage which is a given level above the potential of the second terminal.

4,631,361

PROGRAMMABLE RING GENERATOR

Robert L. Miller, Westerville, Ohio, assignor to ITT Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,865
Int. Cl.⁴ H04M *3/02, 19/02*
U.S. Cl. 379—351 **18 Claims**

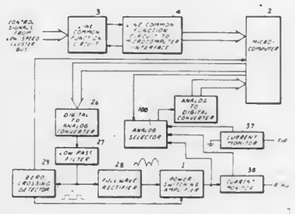
1. A ring generator capable of supplying a plurality of predeterminedly selected distinct voltages each having a predetermined high amplitude and a predetermined frequency to a telephone line comprising:

a programmable computer means having low amplitude versions of said plurality of voltages stored therein in digital form, said computer means being responsive to predetermined control signals to select a desired one of said low amplitude versions of said plurality of voltages stored therein;

first means coupled to said computer means to convert said selected one of said low amplitude versions of said plurality of voltages to an analog version thereof and to increase said analog version to the predetermined high amplitude corresponding thereto prior to coupling to said telephone line;

second means coupled to said first means, said telephone line and said computer means to monitor said selected one of said plurality of voltages coupled from said first means to said telephone line to detect the operating condition of said ring generator and said telephone line; and

an interface means to couple said control signals from control equipment to said computer means and to couple status signals from said computer means to said control equipment, wherein said interface means includes



a serial to parallel converter to couple said control signals from said control equipment to said computer means, and

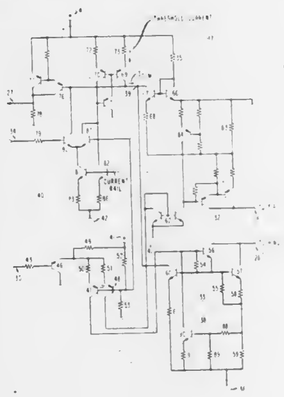
a parallel to serial converter to couple said status signals from said computer means to said control equipment.

4,631,362

LOW RESISTANCE ORIGINATION SCAN CIRCUIT

Tom D. Arntsen, Boonton, N.J.; Milton L. Embree; Joseph H. Havens, both of Reading, Pa., and Rouben Toumani, Randolph, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1984, Ser. No. 655,372
Int. Cl.⁴ H04M *3/22*
U.S. Cl. 379—384 **15 Claims**



1. An origination scan circuit for monitoring a telephone subscriber loop circuit state to detect a subscriber off-hook condition and comprising

tip and ring termainals for making connection to a subscriber loop circuit,

first and second resistance means connected in series between said tip and ring terminals, respectively, and connections for a supply voltage,

means for sensing current level in each of said resistance means,

means, responsive to an output of said sensing means, for producing and indicating signal upon the occurrence in at least one of said tip and ring terminals and its associated resistance means of current in excess of condition,

means for switchably connecting said first and second resistance means to respective ones of said tip and ring connections, and

means, responsive to said indicating signal representing detection of loop current in excess of said predetermined level, for actuating said switchably connecting means to disconnect said first and second resistance means from said tip and ring connection terminals.

4,631,363

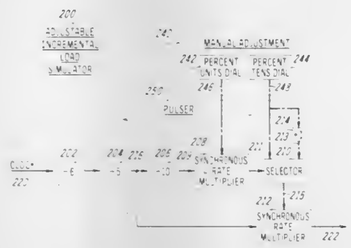
METHOD AND APPARATUS FOR INCREMENTAL LOAD SIMULATION

Robert W. Foster, Glen Ellyn, and Max D. Weekly, Big Rock, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 269,265, Jun. 1, 1981, abandoned. This application Nov. 14, 1985, Ser. No. 798,137

Int. Cl.[4] H04Q *11/00*

U.S. Cl. 379—15 **19 Claims**



1. In a digital processing, telecommunication, or telephone control system, apparatus for simulating an overload state and testing the performance of the system in the simulated overload state, comprising:

control means responsive to requests for service for executing system tasks; and

manually controllable interrupt signal generating means for generating interrupt signals at a manually adjustable rate;

said control means responsive to said interrupt signals for simulating an overload state by preventing the execution of system tasks for a percentage of time directly proportional to the rate of said interrupt signals;

said control means comprising clock means and operative under program control for testing system performance by measuring the time required by said system to respond to requests for service.

4,631,364

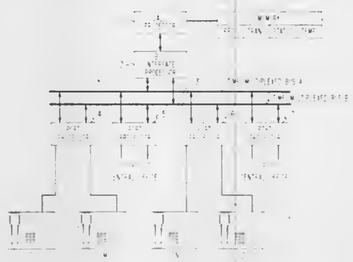
COMMUNICATION SYSTEM HAVING DYNAMICALLY ASSIGNED STATION SET BUTTONS

Joan H. Coyne, Holmdel; David J. Dooling, Fair Haven; Louis E. Miller, Howell, all of N.J., and Robert D. Nalbone, Boulder, Colo., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 23, 1984, Ser. No. 582,850

Int. Cl.[4] H04M *3/42, 3/545*

U.S. Cl. 379—164 **14 Claims**



1. A communication system including a common control and a station having a capability of receiving a call over a shared facility and a call over a dedicated facility, said station comprising a call appearance button for initiating at said station a first type of call selected from a group of call types including a shared facility call and a dedicated facility call, said common control comprising

means responsive to a received call of said group of call types to said station for dynamically assigning said received call to said call appearance button at said station.

4,631,365

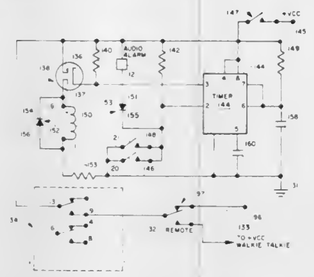
INTERCOM SYSTEM

Clinton Potter, 1012 Aloha Dr., Encinitas, Calif. 92024, and Robert Hasty, 1882 Burton St., San Diego, Calif. 92111

Filed Sep. 24, 1984, Ser. No. 653,284

Int. Cl.[4] H04M *9/00*

U.S. Cl. 379—167 **2 Claims**



1. An intercom system for communicating between persons through a structure having an interior and exterior side comprising:

a first transceiver located on the exterior of said structure;

a second transceiver located on the interior side of said structure and remote therefrom;

an external source of voltage for operating said first transceiver means;

a timing means interconnected between said external source of voltage and said first transceiver means for providing said voltage to said first transceiver means for a set time period when activated;

an activating means manually initiated by a person positioned on said exterior side of said structure for starting the operation of said timing means to activate said first transceiver means;

an audio alarm energized momentarily by the activating means when said timing means is activated, whereby when the activating means initiates power to said first transceiver means by activating said timing means and sounds said audio alarm a person on said interior side of said structure remote therefrom is alerted to turn on the power to said second transceiver to initiate a conversation via said transceivers.

4,631,366

BATTERY FEED CIRCUIT FOR SUBSCRIBER LINE

Kenji Takato, Kawasaki; Mitsutoshi Ayano, Tokyo; Kiyoshi Shibuya; Yoshimi Iijima, both of Kawasaki, and Atsuo Serikawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 21, 1985, Ser. No. 736,345

Claims priority, application Japan, May 26, 1984, 59-105660; Jun. 14, 1984, 59-120668

Int. Cl.[4] H04M *19/00*

U.S. Cl. 340—333 **14 Claims**



1. A battery feed circuit for feeding constant currents from a power source with a power source level to a first subscriber line and a second subscriber line having voltages thereon, comprising:

first and second feed circuit parts operatively connected to the first and second subscriber lines, respectively;

first and second reference voltage output circuits, operatively connected to said first and second feed circuit parts and the power source, for producing first and second reference voltages by dividing the ground level and the power source level and for applying the first and second reference voltages to said first and second feed circuit parts, respectively; and

an intermediate voltage output circuit, operatively connected to said first and second feed circuit parts and said first and second reference voltage output circuits, for producing an intermediate voltage between the voltages on the first and second subscriber lines and for supplying the intermediate voltage to each of said first and second reference voltage output circuits simultaneously.

4,631,367

MULTI-LINE TELEPHONE SYSTEM

Frank Coviello, Peekskill, and Michael Antico, Northport, both of N.Y., assignors to Lantel International Corp., Export, Pa.

Filed Aug. 29, 1984, Ser. No. 645,450

Int. Cl.[4] H04Q *5/20*

U.S. Cl. 379—157 **21 Claims**

1. A multi-line telephone system comprising:

a plurality of telephone station sets operably connected together;

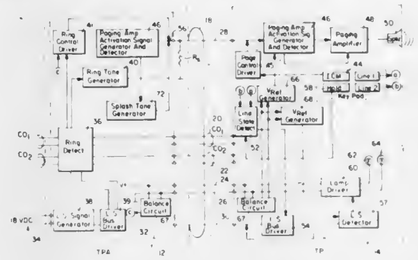
at least one of said station sets being adapted to interface with telephone CO lines;

at least one of said station sets being adapted to interface with a common power source;

a bus means operably connecting said station sets together in bussed loop fashion;

said bus means including at least one status signal conductor for providing CO line status information to said station sets;

each said station set having drive circuit means for impressing variable value CO line status signals on said one status signal conductor in accordance with the line status imparted by the respective said station set, and detector



circuit means for detecting the varying values of such a line status signal;

reference voltage generating means located in each said station set and independently operable from such a common power source to generate in each said station set reference voltages for comparison with such a line status signal by said detector circuit means to determine CO line status; and

each said station set further including indicator means which are operable in response to the line status signal detected by the said detector circuit means of the respective said station sets to inform users of said respective station sets of CO line status.

4,631,368

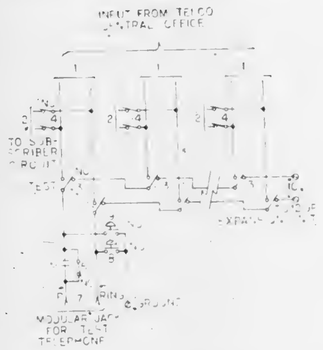
SWITCHING SYSTEM FOR READILY ACCESSING THE SERVICE LINE FOR TEST BASIC UNIT AND THE SWITCHING SYSTEM FOR READILY ACCESSING THE SERVICE LINE FOR TEST EXPANSION UNIT

Alfred E. Fisler, 25872 John Rd., Olmsted Falls, Ohio 44138

Filed Aug. 20, 1984, Ser. No. 642,408

Int. Cl.[4] N04B *3/46*

U.S. Cl. 379—29 **2 Claims**



1. An electromechanical switching arrangement equipped for testing a plurality of two-wire telephone circuits existing between a plural number of subscriber stations and a plural

number of telephone company two-wire lines to a central office, the arrangement comprising:

an individual double pole single throw, normally closed switch connected at the subscriber premises in series between each of said plurality of two-wire telephone circuits,

an individual double pole double throw switch with each normally open contact of each switch connected to one or the other line of a respective one of said two-wire lines of said plural number of telephone company two-wire lines,

an individual normally closed contact of each double pole double throw switch connected to an individual switch arm terminal of a next adjacent of said double pole double throw switches,

each individual normally closed contact of a last of said double pole double throw switches being connected to an individual terminal of a two terminal means for further connection,

individual switch arm terminals of a first of said adjacent of said double pole double throw switches being connected to two terminals of a modular jack for connection to a standard telephone which is to be used for testing,

a capacitor inserted in series with a tip line between said modular jack and said first double pole double throw switch,

a normally closed single pole single throw switch connected in parallel with said capacitor, and

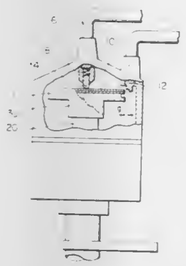
a respective normal open switch connected in series between each said line between the modular jack and said first double pole double throw switch, and a system ground circuit.

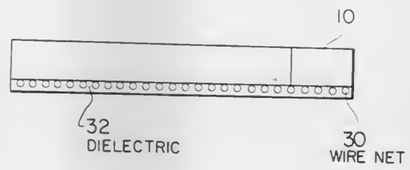
4,631,369

DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

Yutaka Ohashi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,731
Claims priority, application Japan, Sep. 21, 1984, 59-199033
Int. Cl.⁴ H01H *1/00, 19/00*
U.S. Cl. 200—19 R **9 Claims**





1. In a distributor for suppressing radio frequency interference in the ignition system of an internal combustion engine having a rotor rotated by said engine, the improvement comprising:

a rotor electrode carried by said rotor, said electrode including a plate having a bottom surface facing said rotor and a top surface, and a dielectric material adhered to one of said surfaces of said plate;

a plurality of lateral terminal electrodes disposed in the rotating locus of said rotor and separated from said rotor electrode by a discharge gap;

a contact electrode contacting said rotor electrode for supplying a high voltage to said rotor electrode; and

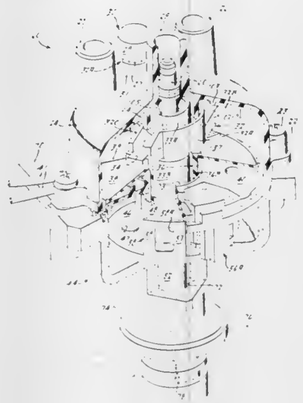
a wire net disposed on said dielectric material, said dielectric material being present in the openings of said wire net and bonding said wire net to said one surface of said plate.

4,631,370

LABYRINTH FOR AN IGNITION DISTRIBUTOR CAP AND ROTOR ASSEMBLY WITH ATMOSPHERIC PURGING ACTION

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,758
Int. Cl.⁴ H01H *19/00*
U.S. Cl. 200—19 R **6 Claims**



5. An ignition distributor to work with spark plug electrodes, a rotor electrode, a coil electrode and a shaft for an internal combustion engine with cylinders, the ignition distributor comprising:

a bowl shaped housing;

a distributor cap comprising:

a generally dome shape with a generally hollow interior and with a circular shaped bottom to mate with the bowl shaped housing;

spark towers equal in number to the number of cylinders of the internal combustion engine, projecting up from the top of the dome shape and slotted to accept spark plug electrodes and allow them to protrude into the distributor cap interior for communication with the rotor electrode;

a vent tower projecting up from the top of the dome shape and provided with a vent port through to the distributor cap interior to allow for the outward flow of the atmosphere inside the distributor cap and bowl shaped housing;

a coil tower projecting up from the top of the dome shape and slotted to accept a coil electrode and allow it to protrude into the distributor cap interior for communication with the rotor electrode;

an inner labyrinth of annular shape on the interior surface of the dome shape surround the coil electrode and protruding into the hollow interior of the dome shape; and

an outer labyrinth of annular shape on the interior surface of the dome shape surrounding the inner labyrinth thereby forming an annular channel; and

a rotor comprising:

a cylindrical member having an upper and lower portion, each portion having a bore;

a platform integrally formed to the cylindrical member for supporting a rotor electrode perpendicular to and surrounding the cylindrical member dividing the cylindrical member into an upper portion and a lower portion;

rotor electrode mounting means on the platform for securing the rotor electrode to the platform;

a rotor ring surrounding the upper portion of the cylindrical member thereby forming an annular channel; and

the rotor ring and upper portion of the cylindrical member having a slot interrupting the annular channel to accept the rotor electrode which allows communication between the rotor electrode and the coil electrode and further allows communication between the rotor electrode and the spark plug electrodes as the rotor rotates about the shaft;

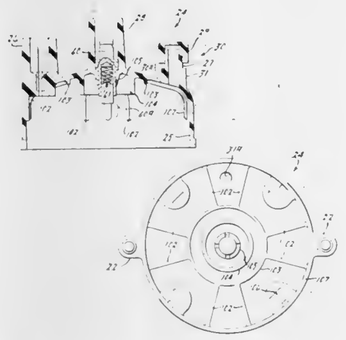
the rotor ring and upper portion of the cylindrical member inter-nested with the inner and outer labyrinths of the distributor cap in combination providing a labyrinth for increased cylinder-to-cylinder misfire resistance.

4,631,371

WET SURFACE TRACKING RESISTANCE FOR AN IGNITION DISTRIBUTOR CAP

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,759
Int. Cl.⁴ H01H *19/00;* F02P *1/00*
U.S. Cl. 200—19 DC **1 Claim**



1. An ignition distributor cap to work with a rotor, the rotor having a cylindrical member having an upper and lower portion, each portion having a bore where a rotor ring surrounds the upper portion of the cylindrical member thereby forming an annular channel, spark plug electrodes, a coil electrode, a shaft, a bowl shaped housing and a rotor electrode in an ignition distributor for an internal combustion engine with cylinders, the ignition distributor cap comprising:

a generally domed shape with a generally hollow interior and with a circular shaped bottom to mate with the bowl shaped housing;

spark towers equal in number to the number of cylinders of the internal combustion engine, projecting up from the top of the dome shape and slotted to accept spark plug electrodes and allow them to protrude into the distributor cap interior for communication with the rotor electrode;

a vent tower projecting up from the top of the dome shape and provided with a vent port through to the distributor cap interior to allow for the outward flow of the atmosphere inside the distributor cap and bowl shaped housing;

a coil tower projecting up from the top of the dome shape and slotted to accept a coil electrode and allow it to protrude into the distributor cap interior for communication with the rotor electrode;

interruption ribs which radially follow the dome shape, protruding into the hollow interior of the dome shape;

a rib ring of annular shape which surrounds the coil electrode protruding into the hollow interior of the dome shape and intersecting with and providing a termination for each of the interruption ribs thereby providing spark isolation and increased wet surface tracking resistance by urging the spark to follow the less resistance path provided by the rotor electrode and the spark plug electrodes;

an inner labyrinth of annular shape on the interior surface of the dome shape surrounding the coil electrode and protruding into the hollow interior of the dome shape; and

an outer labyrinth of annular shape on the interior surface of the dome shape surrounding the inner labyrinth thereby forming an annular channel;

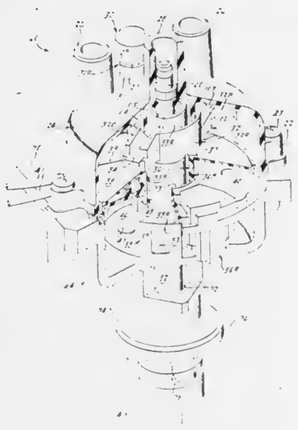
the inner and outer labyrinths of the distributor cap for use in combination and inter-nesting with the rotor ring and upper portion of the cylindrical member to provide a labyrinth for increased cylinder-to-cylinder misfire resistance.

4,631,372

PLASTIC HUB AND INTERRUPTER ASSEMBLY FOR AN IGNITION DISTRIBUTOR

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,761
Int. Cl.⁴ F02P *1/00;* H01H *19/00*
U.S. Cl. 200—19 R **5 Claims**



1. For an internal combustion engine with cylinders, an ignition distributor comprising:

distributor cap;

a rotor;

spark plug electrodes;

a coil electrode;

a shaft;

a bowl shaped housing with a bearing surface;

a switch plate assembly;

an interrupter and hub assembly;

and a rotor electrode;

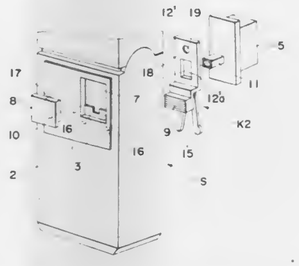
the interrupter and hub assembly, being mounted onto the shaft such that rotation of the shaft results in rotation of the interrupter and hub assembly, rotates directly on the bearing surface of the bowl shaped housing.

4,631,373

PUSH-BUTTON SWITCH LOCKING DEVICE FOR USE IN ELECTRIC APPLIANCE

Masahiko Ochiai, Nogata, Japan, assignor to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Division of Ser. No. 475,156, Mar. 14, 1983, Pat. No. 4,504,707.
This application Dec. 18, 1984, Ser. No. 693,271
Claims priority, application Japan, Mar. 15, 1982, 57-36698[U]; May 17, 1982, 57-72843[U]; Jul. 8, 1982, 57-104664[U]; Jul. 8, 1982, 57-104666[U]
Int. Cl.⁴ H01H *3/20*
U.S. Cl. 200—43.17 **5 Claims**



1. A push-button switch locking device for use in an electric appliance, comprising: a casing; a push-button mounted on a portion of the outer surface of said casing; a switch provided in said casing, said switch being connected to said push-button so as to be actuated upon depression of said push-button such that said push-button and said switch constitute a push-button switch; a sliding knob which is slidably mounted on the outer surface of said casing so as to be slid between a locking position of said push-button and an unlocking position of said push-button in a direction at right angles to the direction of depression of said push-button, said sliding knob being connected with a locking piece having a hole therein; and a projection mounted on said push-button for cooperating with said hole in said locking piece for preventing depression of said push-button when said sliding knob is in said locking position and for allowing depression of said push-button when said sliding knob is in said unlocking position, said sliding knob being integrally formed with said locking piece through a stepped portion such that upon actuation of the sliding knob perpendicular to the depression of said push-button, the locking piece cooperates with said projection thereby preventing the actuation of the switch by preventing depression of the push-button and at the same time the stepped portion engages the lower end portion of the push-button to support said push-button and positively prevent the depression of the push-button at its locked position.

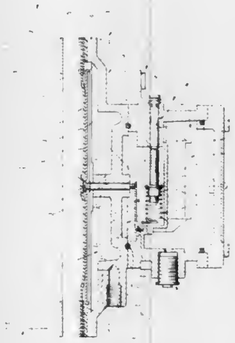
4,631,374

DIAPHRAGM OPERATED SWITCH TYPE BIN LEVEL SENSOR

Richard S. Zoludow, South Bend, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Dec. 6, 1985, Ser. No. 805,780
Int. Cl.⁴ B67D *5/08;* **H01H** *35/34*
U.S. Cl. 200—61.21 **8 Claims**

1. A bin level sensor device, said device comprising:
a housing member that is recessed on one side of same to define a diaphragm chamber, having a central cross wall structure defining a passage thereacross that is located in alignment with the center of said diaphragm chamber and defines the central axis of said device,
a shaft shiftably mounted in said passage in close fitting relation thereto and having its opposed ends projecting therefrom, with one of said shaft ends being disposed in said diaphragm chamber,
a diaphragm mounted across said diaphragm chamber and having a perimeter that is fixed in sealed relation to said housing,
a diaphragm plate interposed between said diaphragm and said one end of said shaft within said chamber in centered relation to said diaphragm, and said shaft and being disposed on one side of said diaphragm,
said diaphragm plate being seated against said shaft one end, with the other side of said diaphragm being exposed about said axis a predetermined amount for actuation inwardly of said diaphragm chamber under pressure of particulate material of a bin,



said device including means for fulcruming said diaphragm plate at a predetermined location of the housing member on the margin of same when said diaphragm is deflected against said diaphragm plate on the opposite side of said axis,
and including off-on switch means mounted on the other side of said housing member actuated by said shaft adjacent the other end of said shaft and including means for adjustably spring biasing said shaft lengthwise of said axis in the direction of said diaphragm plate.

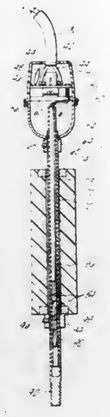
4,631,375

DELAYED ACTION LIQUID LEVEL SENSING APPARATUS

Gerald McCann, Valencia, Calif., assignor to McCann's Engineering & Manufacturing Company, Los Angeles, Calif.

Filed Dec. 5, 1984, Ser. No. 678,270
Int. Cl.⁴ H01H *35/18*
U.S. Cl. 200—84 C **7 Claims**

1. In a liquid level float controlled switch apparatus having a housing within which electrical components are present in a fluid-tight medium, and a probe section integral with and suspended from said housing; the improvements comprising, in combination:
a float means disposed about said probe section for traversing said probe section in a vertical plane,
a first magnet integral with said float means and positioned in a lower portion of said float means,
a magnetically operated switch means located within said probe section and having oppositely facing magnetic elements adapted to contact one another in response to the presence of a magnetic field occasioned by the position of said first magnet relative to said magnetic elements,
a lower magnet spaced apart on the same axis from said magnetic switch means, said lower magnet slidably engaged with the exterior of said probe section;
a second magnet integral with said float means and positioned in an upper portion of said float means in a vertically spaced apart relationship with respect to said first magnet;



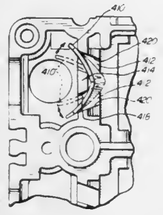
an upper magnet located along said probe section at the uppermost portion thereof.

4,631,376

MOLDED CASE CIRCUIT BREAKER WITH AN IMPROVED ARC GAS EXTERNAL VENTING SYSTEM

David A. Leone, Aliquippa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1984, Ser. No. 655,956
Int. Cl.⁴ H02B *1/08*
U.S. Cl. 200—306 **3 Claims**



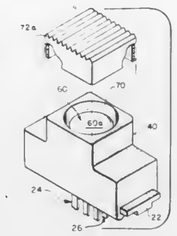
1. An electrical circuit breaker comprising:
a first electrical contact,
a second electrical contact,
operating means for moving said first and said second electrical contacts into engagement and out of engagement,
a molded case for housing the internal components of said circuit breaker,
pressure responsive venting means for controllably venting gaseous arc products from the interior of said molded case to the exterior thereof and for minimizing the ingress of environmental contaminants, said venting means comprising a pair of side by side vent slots extending through said case and, said vent slots being defined by sidewalls integrally formed in said case and being separated from each other by a barrier, and one way valve means comprising an elongated resilient member elastically bent around said barrier and having portions on opposite sides of barrier inserted in the respective slots to form a one-way valve in each of said slots.

4,631,377

SLIDE SWITCH WITH INDICATOR LIGHT

Kazuyoshi Imazeki, and Nobuaki Yokoyama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,819
Int. Cl.⁴ H01H *9/02, 9/16*
U.S. Cl. 200—314 **10 Claims**



1. A slide switch comprising: a plurality of sets of aligned terminals, each said set comprising at least a center terminal and two end terminals, one to either side of said center terminal and aligned along a common axis therewith; a plurality of elongate slide means for slidably engaging predetermined ones of said terminals and respectively associated with said plurality of sets of terminals, said slide means being of sufficient length to engage said center terminal and only one of the associated end terminals; actuator means including means for mounting said slide means for movement in unison with said actuator means between a first position wherein said slide means electrically couple each of said center terminals with one of its associated end terminals and a second position wherein said slide means electrically couple each of said center terminals with ther other of its associated end terminals; light emitting means having a pair of electrodes and responsive to a given voltage across said electrodes for emitting light; said actuator means further including an actuator body having a recess for mounting said light emitting means therein for observing the presence or absence of light therefrom during operation of said slide switch; and guide means for guiding said pair of electrodes into position for electrically conductive contact with selected ones of said plurality of slide means; wherein said terminals comprise generally flat, rectilinear upstanding members, wherein said slide means comprise elongate members which are generally U-shaped in cross-section for complementary slideable, wiping engagement over protruding end portions of said terminals, and further including tubular socket members located on external side surfaces of ones of said elongate U-shaped members comprising said selected ones of said plurality of slide means for egaging said electrodes.

4,631,378

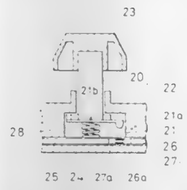
PUSH BUTTON SWITCH

Shigeru Nobesawa, Sagamihara, Japan, assignor to Jelco. Co., Ltd., Japan

Filed Oct. 19, 1984, Ser. No. 662,686
Claims priority, application Japan, Oct. 31, 1983, 58-168619[U]
Int. Cl.⁴ H01H *3/12*
U.S. Cl. 200—340 **7 Claims**

1. A push button switch comprising an integral homogeneous one piece molded plastic key stem and cantilever portion, said key stem having a longitudinal axis, means for mounting said key stem for sliding movement relative to a switch mounting frame generally parallel to said longitudinal axis, a contact positioned so as to be closed upon movement of said key stem in a first direction, said integrally molded cantilever portion lying generally in a plane transverse to said longitudinal axis, said cantilever portion being at least in partial surrounding and partial circumferentially spaced relationship to said key stem,

said cantilever portion being relatively thin and resilient in said first direction and in an opposite second direction, said cantilever portion carrying oppositely directed projections, a first of said projections being operative for closing said contact upon movement of said key stem in said first direction, a second of



said projections being operative for contacting said switch frame upon movement of said key stem in said second direction, said cantilever portion resilience and the projecting thereof effecting damping of said stem upon return movement toward said switch mounting frame, and a coil spring for moving said key stem in said second direction.

4,631,379

HIGH-FREQUENCY HEATING DEVICE HAVING ROTATABLE TRAY AND HIGH FREQUENCY WAVE AGITATOR

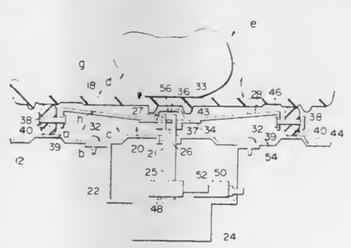
Shuki Aoyama, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 16, 1985, Ser. No. 723,899

Claims priority, application Japan, Apr. 20, 1984, 59-79383; Apr. 20, 1984, 59-79384; Sep. 7, 1984, 59-187574; Sep. 7, 1984, 59-197578; Sep. 7, 1984, 59-135950

Int. Cl.⁴ H05B *6/78*

U.S. Cl. 269—10.55 F **14 Claims**



1. A high-frequency heating device comprising:

a heating chamber;

high-frequency oscillating means for irradiating high-frequency waves into the heating chamber;

a rotatable tray disposed in the heating chamber and adapted to receive thereon an object to be heated, said rotatable tray being made of a material permeable to electric waves and having a guide portion formed at a central portion of its lower surface;

torque transmitting means, disposed between the rotatable tray and the bottom of the heating chamber, for transmitting torque to the rotatable tray, said torque transmitting means including a roller holder having an engaging portion and a plurality of roller supporting arms which extend radially from the engaging portion and are slanted upward toward the rotatable tray to reflect waves passed through the rotatable tray toward the object on the rotatable tray, and a plurality of rollers rotatably supported on the extended end of the corresponding roller supporting arms and adapted to roll on the bottom of the heating chamber, said rotatable tray being placed on the rollers; and

driving means for rotating the roller holder, said engaging portion of the roller holder detachably coupled to the driving means to thereby facilitate cleaning of underlying surfaces, and being engaged with the guide portion of the rotatable tray to position the rotatable tray relative to the roller holder.

4,631,380

SYSTEM FOR THE MICROWAVE TREATMENT OF MATERIALS

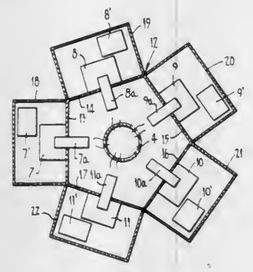
Van N. Tran, Marshall, Australia, assignor to Durac Limited, Australia

Filed Aug. 23, 1984, Ser. No. 643,810

Claims priority, application Australia, Aug. 23, 1983, PG 0992

Int. Cl.⁴ H05B *6/72*

U.S. Cl. 219—10.55 A **17 Claims**



1. A system for the microwave treatment of materials, comprising a treatment zone including means to confine the material to be treated in at least a partly cylindrical form, radiation means spaced from and outside said treatment zone for directing microwave radiation into said zone along at least three different axes of radiation, said radiation means being arranged in spaced relation around said zone, said axes of radiation being in spaced relation to each other at the radiation means, means for reflecting the microwave radiation directed along each axis back into said treatment zone after it passes through said zone, said microwave radiation being non-coherent, said at least partly cylindrical confinement of said material to be treated serving to focus said microwave radiation on the material contained in said treatment zone.

4,631,381

MAGNETIC YOKE INDUCTOR FOR GLASS FIBER MANUFACTURING EQUIPMENT

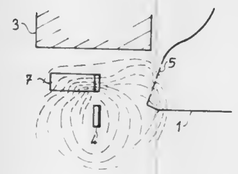
Daniel Delage, Grieres, and Jean Reboux, Savigny sur Orge, both of France, assignors to Saphymo Stel, Massy, France

Filed Jul. 29, 1985, Ser. No. 760,308

Claims priority, application France, Aug. 3, 1984, 84 12335

Int. Cl.⁴ H05B *6/40*

U.S. Cl. 219—10.57 **10 Claims**



1. A glass fiber manufacturing equipment comprising a centrifuge, a main gas heating device and a complementary induction heating device with an annular inductor (4) and a separate magnetic induction flow element (7) adapted to direct at least part of leakage flow towards the centrifuge of said equipment, said element having low energy dissipating characteristics at the frequency of the current supplied to said inductor.

4,631,382

BED FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

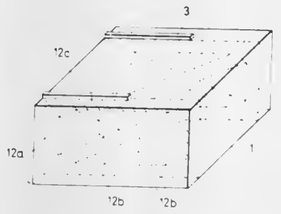
Tokio Fukunaga; Takuji Magara; Shigekazu Sakabe, all of Hyogo; Jun Aramaki, Aichi; Toshiharu Karashima, Aichi, and Minoru Ushida, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,568

Claims priority, application Japan, Sep. 19, 1983, 58-172514; Sep. 19, 1983, 58-172515; Sep. 19, 1983, 58-172517

Int. Cl.⁴ B23H *1/00, 7/32;* **A47B** *7/02*

U.S. Cl. 219—69 R **14 Claims**



9. An electric discharge machining apparatus, comprising: a bed constituted by a pair of opposed side plates and an upper plate, a machining head supported above said bed by a column, a pair of saddle guide rails disposed on said upper plate, a saddle for supporting a workpiece movably mounted on said saddle guide rails, and reinforcing members provided under said upper plate and extending parallel to and directly under respective ones of said saddle guide rails, said reinforcing members extending vertically from said upper plate to a supporting surface of said bed, and each including at least one plate like member extending vertically from said upper plate to said supporting surface.

4,631,383

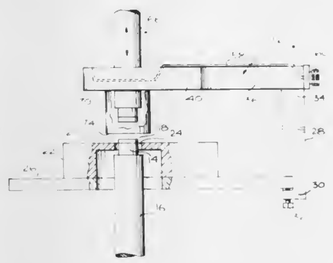
MACHINE WITH AUTOMATIC FINGER SAFETY GUARD

Irving C. Haggett, Canterbury, Conn., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Sep. 27, 1985, Ser. No. 780,761

Int. Cl.⁴ B23K *11/00*

U.S. Cl. 219—78.01 **4 Claims**



1. An improved resistance welding machine with automatic finger safety guard, said machine comprising, in combination:

a. a resistance welding machine body defining a finger-accessible work space defined between a pair of welding electrodes with at least one of said electrodes being vertically disposed and movable in said work space; and,

b. an electric motor connected by leads to a power source and to said movable electrode for powering said movable electrode; and,

c. an automatic finger safety guard secured to said machine body and comprising:

i. a finger-movable enclosure comprising a hollow tubular body vertically disposed around said movable electrode, the upper end of said hollow tubular body including an outwardly extending flange, and said guard including a bracket upon which said flange is disposed and from which said hollow tubular body depends; and,

ii. switch means connected to said hollow tubular body and to said electric motor leads for automatically interrupting said powering of said movable electrode upon movement of said enclosure.

4,631,384

BITUMEN COMBUSTION PROCESS

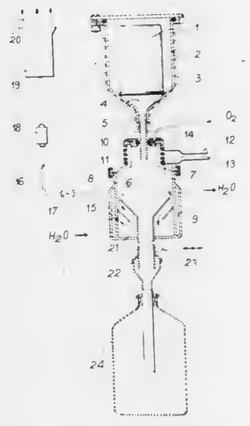
Aymé Cornu, Meylan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 13, 1984, Ser. No. 579,813

Claims priority, application France, Feb. 17, 1983, 83 02581

Int. Cl.⁴ B23K *9/00;* **C07C** *27/10*

U.S. Cl. 219—121 P **4 Claims**



1. A process for the combustion of bitumen, wherein the bitumen is softened by preheating and is then introduced into a combustion chamber, traversed by an amount of oxygen and subjected to ionization by an intense ultra-high frequency field, said amount of oxygen being in excess of the quantity of oxygen necessary for combustion of the bitumen, so as to raise the surface of the bitumen to a temperature above 1000° C., thereby ensuring its vaporization and rapid combustion in the thus produced oxygen plasma.

4,631,385

AUTOMATED POSITION DETECTORS AND WELDING SYSTEM UTILIZING SAME

Ronald R. Rothermel, Pollock Pines, Calif., assignor to Dimetrics, Inc., Diamond Springs, Calif.

Filed Mar. 29, 1985, Ser. No. 717,357

Int. Cl.⁴ B23K *9/12*

U.S. Cl. 219—124.03 **39 Claims**

16. A welding system comprising:

a supply of consumable electrode metal;

means for directing said consumable electrode metal from said supply through contact means in a welding torch means to a workpiece;

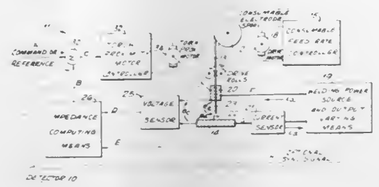
means for providing electrical power to establish an arc between the consumable electrode metal and workpiece;

means for varying the electrical power supplied to the arc;

means for detecting impedance related information due to

the effect of the electrical power variation on at least one of arc voltage or arc current;

means for processing the detected impedance related information so as to produce contact means to workpiece distance related information; and



GENERALIZED TORCH PROXIMITY/WELDMENT GEOMETRY DETECTOR AND TORCH PROXIMITY CONTROLLER

means operatively associated with the processing means for controlling the relative distance between the contact means and workpiece.

4,631,386

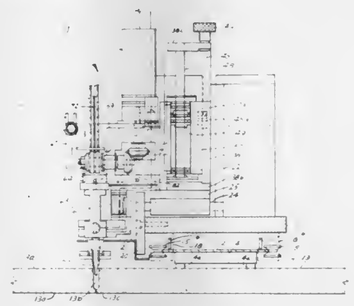
WELDING HEAD APPARATUS

Clyde M. Slavens, Evans Automatic Welding Systems, Inc. P.O. Box 440,577, Houston, Tex. 77244

Filed May 14, 1984, Ser. No. 610,316

Int. Cl.[4] B23K *9/12, 37/02*

U.S. Cl. 219—125.12 **17 Claims**



1. Welding head apparatus, comprising welding head body means, a welding tip having a shaft connected transversely thereof, a circular opening in said body means having a slot leading therefrom to a side of said body means, said circular opening having said shaft disposed therein, a screw across said slot for tightening said circular opening about said shaft, said shaft and welding tip being rotatably adjustable when said screw is loosened so that the angle of said tip with respect to a workpiece may be adjusted, passage means through said body means for delivering a gas to said welding tip, drive roller and idler roller means within said body means for delivering welding wire through said welding tip, and means for supplying welding current to said welding wire within said welding tip.

4,631,387

AROMA GENERATING APPARATUS WITH ELECTRICAL HEATING ELEMENT

Dov Z. Glucksman, Brookline, Mass., assignor to Environmental Fragrance Technologies, Ltd., New York, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,944

Int. Cl.[4] H05B *3/20;* **A61L** *9/03*

U.S. Cl. 219—272 **18 Claims**

1. An aroma generating apparatus comprising:

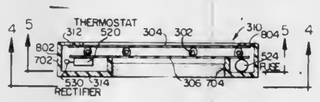
a housing with openings for allowing an air current to pass therethrough;

a medium impregnated with aroma producing fluid and removably supported by said housing at least partially within said air current; and

electrical heating means adapted for coupling to an external power source and supported by said housing proximate said medium when said medium is supported by said housing, said electrical heating means comprising:

a heating element disposed between substantially parallel and spaced apart electrical insulating layers, said heating element comprising at least a pair of terminals electrically extended through at least one of said insulating layers; and

a frame which clamps said insulating layers along a perimeter region thereof against said heating element and which cooperates with said at least one of said insulating layers



to form a compartment surrounding said electrically extended terminals, said frame comprising:

first and second sections, said first section further comprising a peripheral wall member and a flange extending inwardly therefrom for engagement with the periphery of one of said insulating layers; and

said second section includes an outer peripheral wall member adapted for mating engagement with said first section peripheral wall member whose sides are shorter than said outer peripheral wall member, said inner peripheral wall member adapted to engage one of said insulating layers whereby said insulating layers and intermediate heating element are pressed together when said first and second sections are joined together, said inner peripheral wall member having at least one side spaced apart from an associated side of said outer wall member to form said compartment.

4,631,388

OFF-PEAK ELECTRIC LIQUID HEATING SYSTEM EMPLOYING REGULATABLE HEAT PIPE

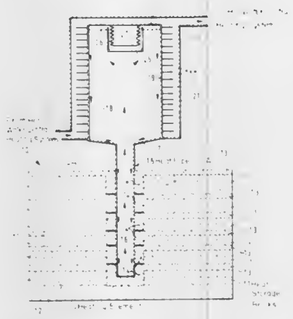
Howard J. Manning, Cambridge, England, assignor to TI Domestic Appliances Limited, London, England

Filed Nov. 7, 1984, Ser. No. 668,948

Claims priority, application United Kingdom, Nov. 8, 1983, 8329740

Int. Cl.[4] F24H *7/00;* **H05B** *1/00;* **F28D** *15/02*

U.S. Cl. 219—326 **12 Claims**



1. In a liquid heating system for heating a first liquid, said system including a heat store to be heated to a relatively high temperature by off-peak electricity, and said heat store being thermally connected to a vessel containing the first liquid to be heated to a temperature lower than said relatively high temperature, wherein the improvement comprises a controllable heat pipe providing said thermal connection, the heat pipe including an evaporator zone in thermal contact with the heat store and a condenser zone in thermal contact with the vessel, the zones joined by at least one duct, the evaporator zone, condenser zone and the at least one duct being hermetically sealed and containing a predetermined quantity of a volatile second liquid, arranged so that after the second liquid is evaporated in the evaporator zone, it passes through said at least one duct to the condenser zone where it is condensed, and from whence the second liquid returns to the evaporator zone through said at least one duct, the quantity of second liquid being chosen to be sufficiently small so that, in use, the rate of heat transfer from the evaporator zone to the condenser zone is determined by the rate of return flow of the second liquid towards the evaporator zone rather than the rate of flow of the evaporated second liquid towards the condenser zone, or the rate of heat transfer to the evaporator zone or from the condenser zone, and control means being provided directly responsive to the pressure of the evaporated second liquid in said condenser zone for controlling the rate of return flow of the second liquid to the evaporator zone.

4,631,389

ELECTRICALLY OPERATED HEATING ELEMENT FOR A HOT-RUNNER TOOL

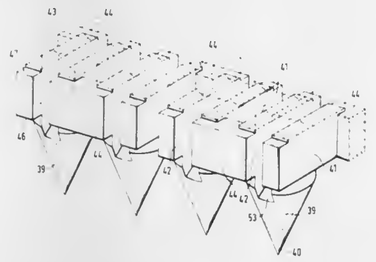
Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co.KG, Herford, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,990

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 3425518; Sep. 29, 1983, 3335296; Sep. 29, 1983, 3335294

Int. Cl.[4] F27B *14/06*

U.S. Cl. 219—421 **6 Claims**



1. In a hot-runner tool that has an electrical resistance heated heat conductor and is positioned in a hot runner and in runners that derive from the heat conductor and lead to a series of outflow channels from the hot-runner tool, the improvement wherein the heat conductor comprises a flat body with tongues on a side toward the outflow channels, each tongue extending to the vicinity of one outflow channel wherein the heat conductor has a longitudinal midplane and further comprising a plurality of hot rods each having two separated jaws displaced with respect to the longitudinal midplane of the heat conductor, with each adjacent bridging web positioned on opposite sides of the midplane.

4,631,390

THERMAL LIMITER

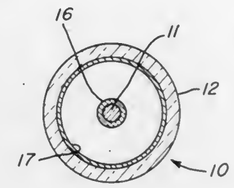
Peter W. Crossley, Havant; Bernard F. Fellerman, Hayling Island, and Graham H. Goodchild, Portchester, all of England, assignors to THORN EMI Domestic Appliances Limited, London, England

Filed Oct. 15, 1984, Ser. No. 661,295

Claims priority, application United Kingdom, Dec. 1, 1983, 8332087; Jan. 24, 1984, 8401799

Int. Cl.[4] H05B *3/72*

U.S. Cl. 219—449 **7 Claims**



1. A thermal limiting device for controlling energization of at least one source of infra-red radiation mounted in heating apparatus, said device comprising:

a tubular member having an annular wall formed from a material transmissive of infra-red radiation of a first wavelength and absorptive of infra-red radiation of a second wavelength, said wall defining an inner surface of said member,

a wire member accommodated within said tubular member and formed from a material of higher thermal expansion than said material of said tubular member,

switching means, for de-energising said at least one source,

means securing said wire member, said tubular member and said switching means relative to each other, such that said switching means is operable by thermal expansion of said wire member, and

a coating of material reflective of infra-red radiation, provided on one of said wire member and said inner surface,

whereby infra-red radiation of aid first wavelength transmitted through said wall is reflected back out of said tubular member by said coating and infra-red radiation of said second wavelength absorbed by said tubular member causes heating, and thus thermal expansion, of said wire member to operate said switching means.

4,631,391

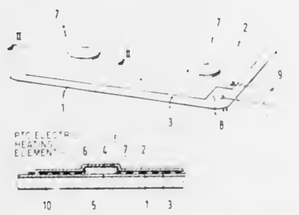
ELECTRICAL HEATING DEVICE, ESPECIALLY FOR MIRRORS

Günter Tiepke, Schnaittach, Fed. Rep. of Germany, assignor to Stettner & Co., Lauf, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,948

Int. Cl.[4] H05B *1/02, 3/00;* **B60R** *1/06;* **H01C** *1/148*

U.S. Cl. 219—541 **5 Claims**



1. An electrical heating device for a mirror comprising a pair of electrically conductive heating lining plates providing for heat distribution on a mirror, electrical conductors connected to said plates for connecting said plates to a source of power,

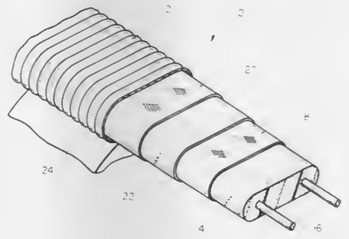
an insulating layer disposed between said plates, said electrical insulating layer having openings, and PTC resistor platelettes disposed in said openings and in electrical contact with said pair of plates, one of said plates having a larger area than said insulation layer such that the entire outer peripheral edge portion of said one plate is spaced outwardly of the outer peripheral edge of said insulating layer the other of said pair of plates not being larger in area than said insulating layer.

4,631,392

FLEXIBLE HIGH TEMPERATURE HEATER

Michael T. O'Brien, Union City; Umesh K. Sopory, San Jose, and Shou-Mean Fang, Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 13, 1984, Ser. No. 630,792
Int. Cl.⁴ H05B *3/34*
U.S. Cl. 219—549 **10 Claims**



1. A method of heating a substrate, which method comprises placing adjacent the substrate and in thermal contact therewith an assembly comprising

(a) a flexible corrugated metal tube which is impervious to air, which has an elliptical cross-section and which has been made by deformation of a continuous non-corrugated tube, the metal of the metal tube being selected from the group consisting of an alloy of nickel, cobalt and iron, an alloy of copper and nickel, and stainless steel; the corrugations extending around the entire periphery of the tube, the tube having a wall thickness less than 0.012 inch, the depth of the corrugations being greater than 0.030 inch and the distance between corresponding points on adjacent corrugations being from 0.02 inch to 0.30 inch; and

(b) an elongate high temperature resistive heating element which is within the tube, which is thermally coupled to the tube and electrically insulated from the tube and which is connected to an AC power supply so that it is maintained at a temperature of 600° F. or more.

4,631,393

CALORIE COUNTING DEVICE

John R. Ross, Jr., 13020 Long Boat Way, Del Mar, Calif. 92014

Filed Oct. 30, 1985, Ser. No. 781,017
Int. Cl.⁴ G06C *3/00*
U.S. Cl. 235—89 A **8 Claims**



1. A calorie counting device comprising:

a support structure,

a plurality of activity pieces comprised of solid matter, each piece representing a level of human activity and having a weight approximately proportional to the number of calories expended by a particular type of person engaged in said level of activity for a particular period of time,

a plurality of consumption pieces comprised of solid matter, each piece representing a number of calories consumed in food and/or drink and having a weight approximately proportional to said number of calories,

a balance board balanced on said structure along a line on said balance board defining a center line, said center line defining two sides of said balance board, such balance board comprising a plurality of location means for easy placement and removal of said activity pieces on one side and said consumption pieces on the other side, and

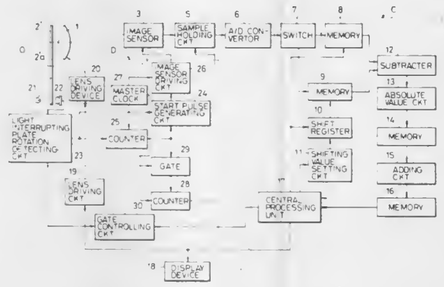
a scale means disposed on said support structure to indicate the net calories gained or lost during a time period or the net weight gained or lost during such period.

4,631,394

FOCUSING DEVICE FOR OPTICAL SYSTEMS

Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 436,488, Oct. 25, 1982, abandoned. This application Sep. 30, 1985, Ser. No. 781,329
Int. Cl.⁴ G01J *1/20;* **G03B** *3/00, 13/18*
U.S. Cl. 250—201 **5 Claims**



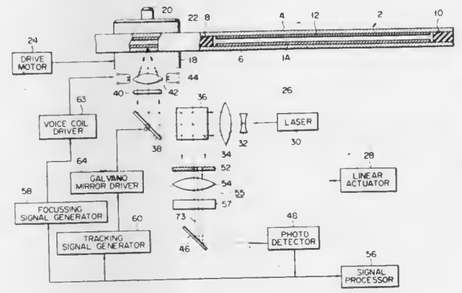
1. A focusing device for optical systems comprising an image forming optical system, a light interrupting member located at the position of a pupil of said image forming optical system and having a first zone and second zone capable of passing a light bundle from an object, a photoelectric converting device arranged on the predetermined image forming surface of said image forming optical system, having a light receiving surface capable of receiving a first image formed by the light bundle having passed through said first zone and a second image formed by the light bundle having passed through said second zone and converting the light intensity distributions of said first image and second image respectively to electric signals, a central operation circuit being supplied with said electric signals and operating said electric signals according to a predetermined evaluating function and thereby generating resultant signals representing the direction and amount of displacement of said second image to said first image, and a driving means being supplied with said resultant signals and performing an auto-focusing according to said resultant signals.

4,631,395

OPTICAL APPARATUS FOR DETECTING THE FOCUSING STATE AND POSITIONAL ACCURACY OF A LIGHT BEAM DIRECTED ONTO AN OPTICAL DISK TRACKING GUIDE IN AN OPTICAL READ/WRITE SYSTEM

Hideo Ando, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Denki, Kawasaki, Japan

Continuation of Ser. No. 416,694, Sep. 10, 1982, Pat. No. 4,585,933. This application Jan. 8, 1986, Ser. No. 817,259
Claims priority, application Japan, Sep. 17, 1981, 56-146540; Sep. 17, 1981, 56-146542; Sep. 17, 1981, 56-146543; Oct. 22, 1981, 56-168966; Oct. 22, 1981, 56-168969
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 250—201 **2 Claims**



2. An optical system for controlling a light beam which is directed onto a light reflecting surface having a tracking guide, comprising:

means for generating a light beam;

objective lens means for converging said light beam into a converged light beam having a beam waist, and for directing said converged light beam onto said light reflecting surface to produce a beam spot on said tracking guide, said objective lens means being in focus when said beam spot is substantially equal in size to said beam waist and being out of focus when said beam spot is larger than said beam waist, and for directing light reflected from said light reflecting surface, said directed light having an optical path and containing a beam spot image with diffraction patterns which are caused by light reflected from said tracking guide;

refractor means, positioned in said directed light optical path to cause a first portion of said directed light to pass through said refractor means while a second portion of said directed light bypasses said refractor means, for refracting said first portion to produce refracted light;

projection lens means for reconverging said refracted light and said second portion of said directed light; and

photodetecting means for receiving the reconverged light and detecting the focus and tracking state of said converged light beam on said tracking guide, said photodetecting means including photosensitive regions to cause: (1) said refracted light and said second portion of said directed light to fall substantially symmetrically with respect to a first boundary between at least two of said regions when said converged beam is in focus on said tracking guide, (2) said refracted light and said second portion to fall predominantly asymmetrically with respect to said first boundary when said converged light beam is out of focus, (3) said diffraction patterns to fall symmetrically with respect to a second boundary between at least two of said regions when said converged light beam is properly tracking said tracking guide, and (4) said diffraction patterns to fall assymetrically with respect to said second boundary when said tracking is improper.

4,631,396

FOCUS ERROR DETECTION DEVICE

Yoshihiro Utsumi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 504,800
Claims priority, application Japan, Jun. 17, 1982, 57-090828[U]
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **3 Claims**



1. A focus error detection device for use with a system for recording and reading out information, the system having an optical system including a source of light and an optical path for leading a light beam from the source of light onto a recording surface of a recording medium through an objective lens, said device comprising:

a beam splitter disposed in said cptical path between the source of light and the recording surface of the recording medium, for directing light reflected by the recording surface into a position for detection;

a photo detector for receiving the light from said beam splitter and for generating an output signal to be used for producing a focus error signal; and

first and second uniaxial lenses disposed between said beam splitter and said photo detector, said uniaxial lenses having axial directions which are substantially perpendicular to each other, and disposed so that a photo receiving surface of said photo detector is located between focal lines of said first and second uniaxial lenses, wherein said first and second uniaxial lenses are positioned and the focal lengths of said objective lens and of said first and second uniaxial lenses are determined that a distance between a focal plane of said optical system and a conjugate plane of said photo receiving surface defined by said first uniaxial lens is equal to a distance between said focal plane and a conjugate plane of said photo receiving surface defined by said second uniaxial lens, and that lateral magnifications between said conjugate planes and said photo receiving surface in a plane perpendicular to the axis of said first uniaxial lens and the axis of said optical path and in a plane perpendicular to the axis of said second uniaxial lens and the axis of said optical path are equal to each other.

4,631,397

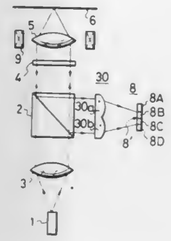
FOCUSSING ERROR DETECTING APPARATUS EMPLOYING A COMPOSITE LENS

Kiyoshi Ohsato, Chiba, and Shigeo Kubota, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,995
Claims priority, application Japan, May 31, 1983, 58-96058
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **2 Claims**

1. A focussing error detecting apparatus comprising: a composite lens formed of a single lens made of glass and a single lens made of plastic; and a photodetector disposed behind said composite lens in opposed relation thereto, wherein said glass single lens has a uniform focal length, said plastic single lens is formed of a pair of lens regions divided by a flat interface including an optical axis of light incident on said composite lens, said pair of lens regions have back focal lengths different from each other and optical axes spaced apart from each other, said photodetector is placed so that its photodetecting face is positioned at a middle point between converged points of light rays emitted from said pair of lens regions on the optical axis of

said incident light when said light incident on said composite lens is in the focussed state, and said photodetector is formed of first and second photodetecting sensors for receiving light rays passed through portions of the first lens region of said pair of lens regions which are respectively spaced apart from and adjacent to said flat interface and third and fourth photodetecting sensors for receiving light rays passed through portions of

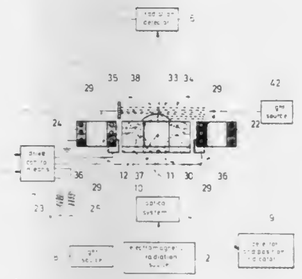


the second lens region of said pair of lens regions which are respectively spaced apart from and adjacent to said flat interface so that a focussing error signal is produced from the difference between the sum of first and fourth photodetected signals from said first and fourth photodetecting sensors and the sum of second and third photodetected signals from said second and third photodetecting sensors.

4,631,398
APPARATUS FOR RECEIVING ELECTROMAGNETIC RADIATION

Lothar Liebing, Neuhausen, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,919
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434159
Int. Cl.⁴ H01J *3/14*
U.S. Cl. 250—216 **10 Claims**

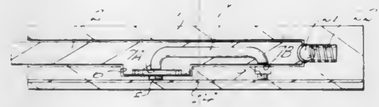


1. Apparatus for receiving electromagnetic radiation energy having varying angles of incidence and including an optical element (**10**) movable to continuously direct the radiation energy upon a detector (**6**), comprising
(a) an optical element (**10**) arranged to receive the electromagnetic radiation energy;
(b) shock-resistant means supporting said optical element for movement relative to said radiation detector, including
(1) a permanent magnet (**12**) upon which said optical element is mounted; and
(2) a plurality of coplanar diametrically-arranged circumferentially-spaced linear elements (**31**) each connected at one end with said magnet, said linear elements extending radially outwardly for connection at their remote ends with fixed locations relative to said radiation detector, said linear elements normally supporting said magnet in a first plane for pivotal movement about pivot axes positioned in said first plane, said linear elements also supporting said magnet for displacement in a direction normal to said first plane;
(c) drive means for adjusting the position of said optical element relative to the radiation detector, said drive means including a plurality of selectively energizable coils (**22–25**) arranged circumferentially about said magnet adjacent the electromagnetic field thereof, the axes of said coils being normal to said magnet plane;
(d) means for controlling said drive means as a function of the displacement of the magnet from its first position in a direction normal to said magnet plane, including
(1) a spherical segment (**33**) secured to a face of said magnet parallel with said first plane, the central point of generation (**37**) of said segment being coincident with the center point of said magnet; and
(2) a light source (**42**) and a light detector (**35**) mounted in fixed relation relative to said radiation detector adjacent said magnet end face in diametrically opposite relation relative to said segment, said light source producing light rays (**34**) that extend parallel with said end face for at least partial interruption by said spherical segment when said magnet is in said first position;
(3) said light detector being operable to supply to said drive means a control signal that is a function of the magnitude of the light rays received thereby.

4,631,399
MULTIPOSITION ROTARY SWITCH WITH PHOTOTRANSISTORS

Russell G. Ward, 2050 SW. 71st Ave., Portland, Oreg. 97225

Filed May 30, 1984, Ser. No. 615,226
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—221 **9 Claims**



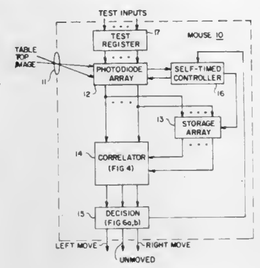
1. A finger actuated switch comprising,
a housing defining an open area,
a light source in said housing in circuit with a power source,
phototransistors in said housing and located adjacent said open area and each having an electrode in circuit with a power source,
a manually positionable rotor in said housing open area and having an exposed surface for contact by the user's finger and including light transmission means for communicating light from said light source to one of said phototransistors and operable so as to selectively subject one of said phototransistors to light so as to perform a switching function, and
said phototransistors each having a second electrode in circuit with a lead routed exteriorly of the housing.

4,631,400
CORRELATING OPTICAL MOTION DETECTOR

John E. Tanner, and Carver A. Mead, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 20, 1984, Ser. No. 572,698
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—221 **8 Claims**

1. An optical motion detector comprised of a linear array of photodiodes, means for focusing an image onto said array, means for sampling and storing pixels of said image for correlation with pixels of a new image from said array, at least three distinct correlators, a first correlator in which stored pixels are offset relative to pixels of a new image in one of two directions for detection of motion in said one direction, a second correlator in which stored pixels are not offset relative to pixels of the new image, and a third correlator in which stored pixels are offset relative to pixels of the new image in the second of said

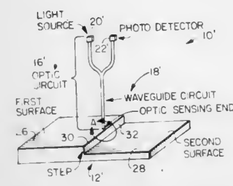


two directions for detection of motion in said second direction, and means for detecting which correlator has the greatest value as an indication of direction of motion associated with said first and third correlators in said one direction or said second direction, or no motion when said second correlator has the greatest value.

4,631,401
OPTIC SENSORS

Larry E. Parkhurst, Boulder, and Michael R. Meadows, Nederland, both of Colo., assignors to Dieterich Standard Corporation, Boulder, Colo.

Filed Jun. 6, 1984, Ser. No. 617,889
Int. Cl.⁴ H01J *5/16*
U.S. Cl. 250—227 **10 Claims**



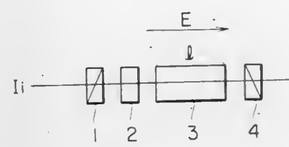
2. The sensor as defined in claim **1** wherein each first and second optic circuit has a sensing end; said second region fabricated such that motion of the said boundary between said first surface and second region modulates the light flux density reflected from the light reflecting means; means mounting the reflecting means whereby the motion of said first reflective surface and the boundary between the first reflective surface and the second region is primarily transverse to the light propagation at the sensing ends of the first and second optic circuits; and wherein the sensing end of the first optic circuit is mounted adjacent the first reflective surface and the sensing end of the second optic circuit is mounted adjacent said boundary between the first reflective surface and the second region.

4,631,402
OPTICAL ELECTRIC-FIELD MEASURING APPARATUS

Kazuyuki Nagatsuma, Hachioji; Kazumasa Takagi, Tokyo, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,783
Claims priority, application Japan, Feb. 10, 1983, 58-19822
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 R **15 Claims**

1. An optical electric-field measuring apparatus, comprising a light source part, an electric-field sensing part including a material with electrooptic effect for varying intensity of light produced by said light source part in correspondence with intensity of an electric field to be measured, a measuring part for measuring intensity of light output from said electric-field sensing part, and light transmission paths for optically coupling said light source part, said electric-field sensing part and said measuring part, wherein at least one electrooptical crystal element arrayed along the light traveling direction having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m is used as said material with electrooptic effect, and

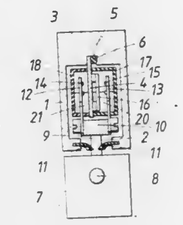


wherein said at least one electrooptic crystal element having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m has an effective whole length within said at least one electrooptic crystal as measured in the light traveling direction that is greater than a common length at which the same modulation degree is produced when using an electrooptical crystal having a crystallographically eulytite structure and belonging to a point group $\bar{4}3$ m and when using an electrooptical crystal belonging to point group 23.

4,631,403
LENGTH MEASURING INSTRUMENT COMPRISING A SCALE MEMBER AND A SIGNAL-GENERATING SCANNING UNIT WHICH IS MOVABLE ALONG THE SCALE MEMBER

Heinz Rieder, St. Pantaleon, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Jan. 2, 1986, Ser. No. 815,991
Claims priority, application Austria, Jan. 11, 1985, 56/85
Int. Cl.⁴ H01J *3/14, 5/16*
U.S. Cl. 250—237 G **10 Claims**



1. In a length measuring instrument comprising
a scale carrier,
an elongate scale member secured to said scale carrier and provided with a longitudinal scale, and
a scanning unit, which is associated with and movable along said scale member and comprises signal-generating means for scanning said scale and covering hood means which are open toward said scale member and define with said scale member at least one measuring chamber, which contains said signal-generating means,
said covering hood means having at the periphery of said at least one measuring chamber at least one annular boundary surface facing said scale member,
said covering hood means being provided with elastomeric scraping means disposed at said boundary surface and in sealing sliding contact with said scale member,

the improvement residing in that

said elastomeric scraping means comprise at least one annular seal, which is in sealing sliding contact with said scale member under initial compressive stress throughout the peripheral extent of said boundary surface.

4,631,404

POSITION MEASURING SYSTEM

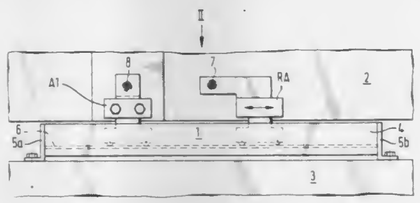
Horst Burkhardt, Truchtlaching; Alfons Ernst; Holmer Dangschat, both of Traunreut, and Horst Wogatzke, Neuss, all of Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,189

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415091; May 30, 1984, 3420187; Oct. 23, 1984, 3438750; Mar. 19, 1985, 3509838

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—237 G **22 Claims**



1. In a system for measuring the relative position of first and second objects movable relative to one another, of the type comprising at least one measuring graduation carrier connected to the first object, a measuring incremental graduation defined by the measuring graduation carrier, at least one measuring scanning unit connected to the second object to scan the measuring incremental graduation, and means for defining at least one reference position at a selected absolute position with respect to the measuring incremental graduation, the improvement comprising:

at least one reference scanning unit for scanning the at least one reference position, said reference scanning unit mounted to move independently of the measuring scanning unit, the first object, and the second object, said reference scanning unit comprising means for scanning the at least one reference position; and

means for determining the distance between a scanned one of the reference positions and the measuring scanning unit in order to determine the absolute position of the measuring scanning unit with respect to the scanned reference position.

4,631,405

METHOD AND APPARATUS FOR DUAL-SPACED FAST/EPITHERMAL NEUTRON POROSITY MEASUREMENTS

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 5, 1984, Ser. No. 678,423

Int. Cl.⁴ G01V *5/00*

U.S. Cl. 250—266 **2 Claims**

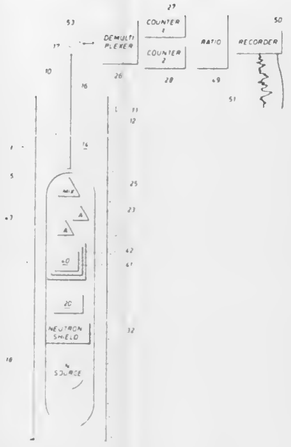
1. A method for determining the porosity of earth formations in the vicinity of a well borehole, comprising:

(a) irradiating the earth formations in the vicinity of the well borehole with a continuous chemical type source of fast neutrons,

(b) detecting the fast neutron population at a first shorter spaced distance from the neutron source in the borehole and generating signals representative thereof,

(c) detecting the epithermal neutron population at a second spaced distance from the neutron source in the borehole and generating signals representative thereof, said second spaced distance being greater than the first spaced distance from said neutron source,

(d) forming a ratio of the signals representing the fast and epithermal neutron populations to derive a measurement signal functionally related to the porosity of the earth formations in the vicinity of the borehole, and



(e) calibrating said measurement signal according to a predetermined functional relationship to derive a porosity signal quantitatively representative of the porosity of the earth formations in the vicinity of the borehole.

4,631,406

INFRARED RAY DETECTOR

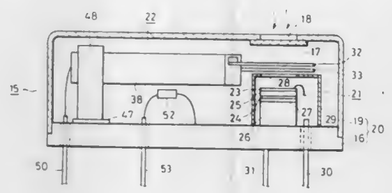
Takeshi Nakata, Shiga, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Nov. 2, 1984, Ser. No. 667,542

Claims priority, application Japan, Nov. 18, 1983, 58-218235

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—338 **8 Claims**



1. An infrared ray detector comprising:

an infrared ray detecting member for generating electric charges in response to changes in the amount of incident infrared rays;

a pair of opposing members disposed in the area of incidence of infrared rays on said detecting member, each having a plurality of infrared ray transmitting portions and infrared ray non-transmitting portions;

a vibrator for vibrating at least one of said pair of opposing members; and

driving signal supplying means supplying a driving signal for driving said vibrator so that relative positional relation between said pair of opposing members is periodically changed;

wherein the amplitude of said driving signal is selected to be smaller than the maximum amplitude of a driving signal

employed in a case where there are periodically repeated a first state in which said infrared ray transmitting portions of said opposing members are completely overlapped to be most opened and a second state in which said infrared ray transmitting portions of one opposing member and said infrared ray non-transmitting portions of the other opposing member are completely overlapped whereby said infrared ray transmitting portions are most blocked, in changing said relative positional relation between said opposing members.

4,631,407

RADIATION IMAGE INFORMATION READ-OUT SYSTEM

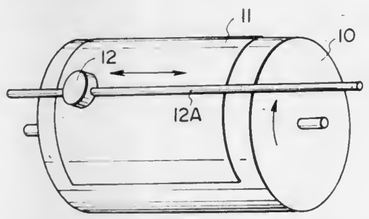
Kazuhiro Kawajiri; Hiroshi Sunagawa; Nobuharu Nozaki; Yuichi Hosoi, and Kenji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,234

Claims priority, application Japan, Nov. 21, 1983, 58-219314

Int. Cl.⁴ G03C *5/16*

U.S. Cl. 250—327.2 **5 Claims**



1. A radiation image information read-out system comprising point-source light for projecting a spot of stimulating rays onto a stimulable phosphor sheet carrying a radiation image stored therein, a solid state photoelectric converter which is opposed to the spot-like portion of the stimulable phosphor sheet exposed to the spot of stimulating rays and is adapted to receive light emitted from the spot-like portion to convert it into an electric signal, and driving means for simultaneously moving the point-source light associated with the solid state photoelectric converter and the solid state photoelectric converter with respect to the stimulable phosphor sheet to scan the same.

4,631,408

METHOD OF SIMULTANEOUSLY DETERMINING GAUGE AND ORIENTATION OF POLYMER FILMS

David Zelmanovic, Monsey, and Stanley J. Kishner, Pomona, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 653,962

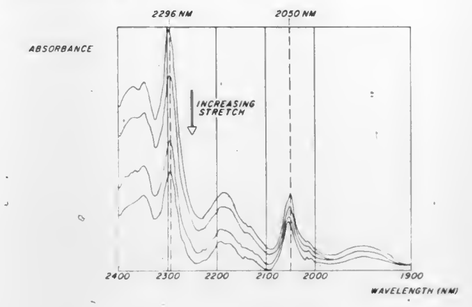
Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—339 **28 Claims**

1. Method of determining, simultaneously, the thickness and absorption coefficients of each of the materials in a multilayer structure, comprising the steps of:

measuring the first optical absorbance of each material of said multilayer structure at two or more wavelengths; and

analyzing said first optical absorbances to simultaneously determine the thicknesses and absorption coefficients of



said materials and, from said absorption coefficients, determine the degree of orientation of each said material.

4,631,409

SCINTILLATOR CRYSTAL HAVING A HIGHLY REFLECTIVE SURFACE

Frank M. Sparacia, Solon, and Oley D. Wimer, Hudson, both of Ohio, assignors to Harshaw/Filtrol, Cleveland, Ohio

Filed Apr. 3, 1984, Ser. No. 596,480

Int. Cl.⁴ G01T *1/20*

U.S. Cl. 250—361 R **12 Claims**

1. An inorganic scintillation crystal selected from the group consisting of inorganic halides and inorganic oxides wherein the crystal emits light pulses in the 200–700 nm range when the crystal is subjected to ionizing crystal is subjected to ionizing radiation, said crystal having at least one surface coated with a reflective layer capable of reflecting said light pulses back into the crystal, said layer comprising particles of barium sulfate and a binder consisting essentially of sodium silicate.

4,631,410

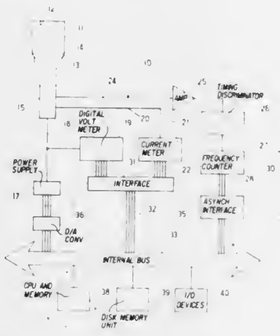
METHOD AND APPARATUS FOR MEASUREMENT OF RADIOACTIVITY OVER AN EXTENDED RANGE

Robert J. Nickles, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 3, 1984, Ser. No. 657,397

Int. Cl.⁴ G01T *1/167, 1/161*

U.S. Cl. 250—363 R **17 Claims**



1. Apparatus for measuring radioactivity over an extended range of activity levels comprising:

(a) a body of scintillator material;

(b) a photomultiplier tube mounted adjacent to the scintillator body to receive light flashes therefrom and having an anode, a cathode, and a plurality of dynodes;

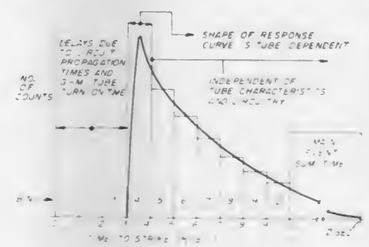
(c) means for biasing the anode, cathode and dynodes of the photomultiplier tube to provide an acceleration voltage for electrons from the cathode across the dynodes to the anode;
(d) means for selectively measuring the current flowing from the anode of the photomultiplier tube resulting from scintillation events in the scintillator body sufficient to cause a measurable current to flow from the anode; and
(e) means for selectively counting the rate of electron pulses in the photomultiplier tube resulting from scintillation events in the scintillator body, and wherein the means for measuring anode current and the means for counting the electron pulse rate are capable of doing so simultaneously over an intermeidate rate range of scintillation events.

4,631,411

RADIATION MEASURING APPARATUS AND METHOD

Charles V. Noback, Cresskill, N.J., assignor to Nuclear Research Corp., Warrington, Pa.

Filed Dec. 19, 1984, Ser. No. 683,666
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—374 **20 Claims**



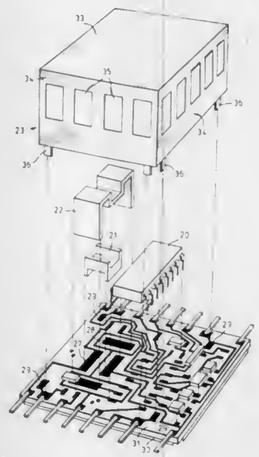
1. Apparatus for measuring radiation field strength comprising in combination,
(a) a biased potential radiation detector having an output circuit, said detector being of the type that is effective when biased to respond to impingement of radiation by generating an output pulse at its output circuit, and when not biased being ineffective to generate an output pulse when impinged by radiation,
(b) biasing means operatively coupled to said radiation detector for selectively biasing said radiation detector to generate an output pulse in response to impingement by radiation,
(c) time counting means including timing control means operable to start and terminate time counting, said radiation detector output circuit being operatively coupled to said time counting means and being effective upon generation of an output pulse to cause said time counting means to terminate time counting,
(d) actuatable time count storage means operatively coupled to said time counting means and effective when actuated to store the time count registered by said time counting means,
(e) a plurality of selectably actuatable event count storage means effective when selectively actuated to register an event count in the selected one of said plurality of event count storage means whenever said radiation detector generates an output pulse,
(f) master control means operatively coupled to
(1) said biasing means to selectively cause said biasing means to bias said radiation detector to respond to impingement by radiation,
(2) said time counting means any effective to cause said time counting means to start time counting simultaneously with the operative biasing of said radiation detector, said master control means receiving a signal when said radiation detector generates an output pulse.
(3) said time count storage means and effective to actuate the latter to cause the time count registered by said time counting means to be stored in said time count storage means when said registered time count is equal to or greater than a predetermined value as monitored by said master control means,
(4) said plurality of event count storage means and effective to cause an event count to be stored in a first selected one of said plurality of event count storage means when the time count registered in said time counting means is stored in said time count storage means, and effective to cause an event count to be stored in a different selected one of said plurality of event count storage means when the time count registered in said time counting means is less than the said predetermined value.

4,631,412

IONIZATION SMOKE DETECTOR

Zbigniew Turlej, 655 Indian Road, Mississauga, Ontario, Canada (L5H 1R2)

Filed Oct. 9, 1984, Ser. No. 658,918
Claims priority, application Canada, Oct. 21, 1983, 439445
Int. Cl.[4] G01T *1/185;* G08B *17/10*
U.S. Cl. 250—381 **8 Claims**



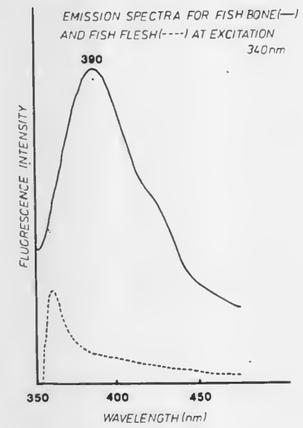
1. An ionization smoke detector comprising an electrode system and electronic circuitry interconnected therewith for deriving an electrical signal in response to the detection of smoke, the electronic circuitry providing terminals for connection to an alarm device,
the electrode system comprising an inner electrode providing a source of ionizing radiation, an outer electrode providing openings to allow smoke to pass therethrough, and an auxiliary electrode positioned to define with said inner and outer electrodes, respectively, a first and a second ionization chamber disposed one within the other, the auxiliary electrode having a hole capable of passing radioactive rays so as to produce ionization simultaneously in both chambers,
wherein the electrodes and electronic circuitry are surface mounted on one side of a support plate, the outer electrode conforming to the configuration and dimensions of the support plate so as to form therewith a box-like enclosure for the inner and auxiliary electrodes and electronic circuitry so mounted, the detector further comprising a shield plate laminated to the other side of the support plate and electrically connected to the outer electrode to form an electrically shielded enclosure for the electronic circuitry.

4,631,413

METHOD FOR QUALITY CONTROL OF PRODUCTS FROM FISH, CATTLE, SWINE AND POULTRY

Svend A. K. Jensen, Soborg; Lars Munck, Helsingor; Poul Sigsgaard, Helsinge, and Hans H. Huss, Copenhagen, all of Denmark, assignors to De Forenede Bryggerier A/S, Copenhagen, Denmark

Filed Jun. 7, 1984, Ser. No. 618,161
Claims priority, application Sweden, Jun. 13, 1983, 8303327; Aug. 5, 1983, 8304288
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—458.1 **23 Claims**



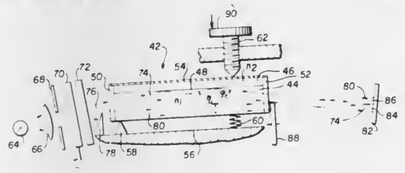
1. A method for quality control of products from fish, meat, cattle, swine and poultry, for instance for controlling a process for treating or handling such products, characterised in that the product to be subjected to quality control, or a sample thereof, is exposed to excitation electromagnetic radiation within the range of about 325–360 nm, preferably about 340 nm, that any fluorescent radiation emitted by the product as a result of this irradiation, is analysed for identifying characteristic fluorescence from biological components in the product or a sample thereof, the presence of such biological components determining the quality of the product, and that said quality control is carried out in dependence upon the analysis result.

4,631,414

RADIOLOGICAL INSTRUMENT

Stanley Kronenberg, Skillman, N.J.; William L. McLaughlin, Washington, D.C., and Carl R. Seibentritt, Jr., McLean, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 20, 1985, Ser. No. 778,120
Int. Cl.[4] G01T *1/02*
U.S. Cl. 250—474.1 **19 Claims**



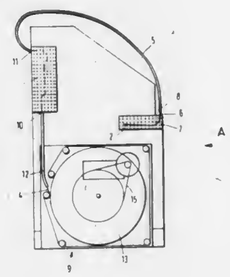
1. An instrument for measuring radiation, particularly nuclear radiation, comprising:
a radiation sensitive structure pivoted toward one end and including a pair of elongated solid members contiguously joined together along their length dimensions and having a common planar interface therebetween, one of said pair of members being comprised of radiochromic material whose index of refraction changes due to anomolous dispersion as a result of being exposed to nuclear radiation, said pair of members further having mutually different indices of refraction with the member having the larger index of refraction further being transparent for the passage of light and of energy therethrough;
means located toward the other end of said structure for varying the angle of longitudinal elevation of said pair of members;
means for generating and projecting a beam of light into one end of said member having the larger index of refraction, said beam of light being projected toward said planar interface where it is reflected out of the other end of said same said member as a first output beam;
means projecting a portion of said beam of light into said one end of said member having the larger index of refraction where it traverses therethrough without reflection and out of the other end of said same said member as a second output beam; and
means adjacent said structure for receiving said first and second output beams, whereby a calibrated change in the angle of elevation of said structure between positions of equal intensity of said first and second output beams prior to and following exposure provides a measure of the radiation sensed due to a change of refraction of said radiochromic material.

4,631,415

RADIATION TREATMENT APPARATUS

Kurt Sauerwein, Bergische Strasse 16, D-5657 Haan 1; Norbert Kinzer, and Karl Weinlich, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Kurt Sauerwein, Haan, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,296
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335438
Int. Cl.[4] G21F *5/02*
U.S. Cl. 250—497.1 **13 Claims**



1. A radiation treatment apparatus comprising
a first radiation shielding container comprising a rest container having a plurality of first openings,
a plurality of flexible hoses connected to said openings respectively,
a plurality of drive cables extending through said flexible hoses respectively,
a plurality of radiator holders connected to said drive cables respectively, said radiator holders are axially insertable and removable from said openings by means of a respec-

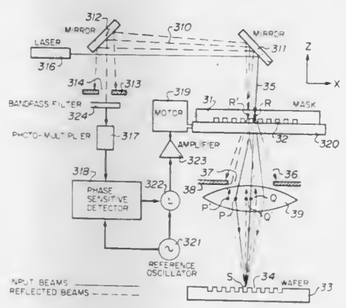
tive of said drive cables through a respective of said flexible hoses,
a common single drive means connected to all of said drive cables for joint movement of all said drive cables and therewith for joint insertion and joint removal of said radiator holders into and from said openings, respectively, via said drive cables,
a second radiation shielding container comprising an intermediate container having a plurality of second openings for selectively receiving respective of said radiation holders,
a plurality of means comprising hose coupling elements for producing detachable through-connections of free ends of said flexible hoses, respectively, selectively to one of a respective of said second openings and a respective hollow probe for treatment,
all of said plurality are the same in number,
said drive means further for simultaneously inserting said radiation holders which are selected for treatment into the respective hollow probes and for simultaneously inserting said radiation holders which are not selected for treatment into the respective second openings, whereby the radiator holders not selected at the time for treatment are guided through said respective flexible hoses into the respective second openings in the second radiation shielding container while the radiation holders selected at the time for treatment are guided into the respective hollow probes.

4,631,416

WAFER/MASK ALIGNMENT SYSTEM USING DIFFRACTION GRATINGS

William R. Trutna, Jr., Atherton, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 19, 1983, Ser. No. 564,854
Int. Cl.⁴ G01B *9/02, 11/27*
U.S. Cl. 250—548 **13 Claims**



1. A method of aligning a first object with a second object, said method comprising the steps of:
(a) diffracting light from a first diffraction grating on the first object to the second object;
(b) diffracting light from the first diffraction grating off of a second diffraction grating on the second object to produce a zeroth order output beam from the second grating; and
(c) varying, in a first direction, the relative position between the first object and the second object until the intensity of the zeroth order output beam is at an extremum with respect to such positional variation in order to align these two objects in the first direction.

4,631,417

ADDRESSABLE PHOTODETECTOR ARRAY

Michel Brilman, Bruyeres le Chatel, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 27, 1984, Ser. No. 625,159
Claims priority, application France, Jun. 29, 1983, 83 10719
Int. Cl.⁴ H04N *5/335*
U.S. Cl. 250—578 **7 Claims**



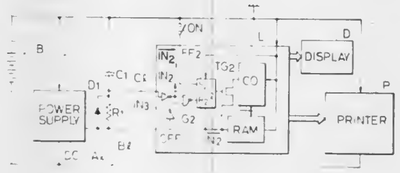
1. Matrix array of addressable photodetectors comprising:
an output line common to each of said photodetectors,
a biasing line common to each of said photodetectors,
row addressing lines,
column addressing lines,
a ground connection to each photodetector, and
a respective addressing circuit associated with each photodetector each addressing circuit comprising first means for connecting said each photodetector to said output line, second means for connecting said each photodetector to said biasing line, third means connected to said biasing line and to ground for controlling said second means, and fourth means connected to one of said row addressing lines and to one of said column addressing lines and to ground for controlling said first and third means, wherein said first, third and fourth means are turned off and said second means are turned on in the absence of signals on said row and column addressing lines, and said first, third and fourth means are turned on and said second means are turned off when signals are applied to said row and column addressing lines to select said each photodetector associated with said addressing circuit.

4,631,418

POWER SUPPLY CONTROL DEVICE

Shigeru Toyomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 503,856, Jun. 13, 1983, abandoned.
This application Nov. 12, 1985, Ser. No. 796,540
Claims priority, application Japan, Jul. 15, 1982, 57-123146
Int. Cl.⁴ H03K *19/003;* **G06F** *1/00*
U.S. Cl. 307—200 A **7 Claims**



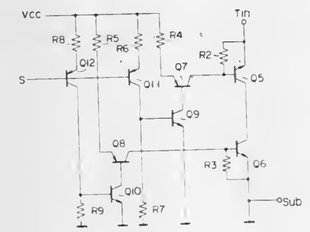
1. A power supply control device for use in battery-powered electronic apparatus, comprising:
transfer gate means connected between a battery and the battery-powered electronic apparatus for selectively supplying power to the battery-powered electronic apparatus;
a flip-flop circuit for selectively opening and closing said transfer gate means;
means for generating a first signal upon electrical loading the battery; and
means for generating a second signal to instruct the start of operation of the battery-powered electronic apparatus;
wherein said flip-flop circuit receives the first signal at one input thereof and the second signal at the other input thereof so that said transfer gate means is opened by the first signal and is subsequently closed by the second signal to supply power to the battery-powered electronic apparatus.

4,631,419

TRANSISTOR SWITCH AND DRIVER CIRCUIT

Hiroshi Sadamatsu; Yoshio Wada, both of Yokohama, and Hideaki Ito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 565,177
Claims priority, application Japan, Dec. 28, 1982, 57-233563
Int. Cl.⁴ H03K *17/60, 3/26*
U.S. Cl. 307—255 **4 Claims**



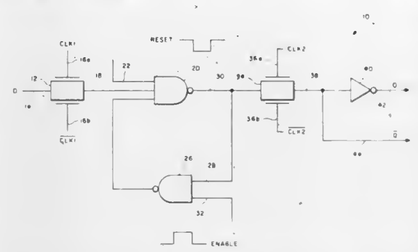
1. A switch circuit, having a control input terminal and an output terminal, comprising:
first and second transistors, for receiving an input voltage, each having a collector and emitter and a base, the collectors of said first and second transistors being interconnected, the emitter of said first transistor being connected to said output terminal, and the emitter of said second transistor being connected to ground;
a first series circuit comprising a first resistor and a third transistor connected in series thereto, said third transistor having a collector, an emitter and a base, one terminal of said first resistor being connected to a constant power source potential, the other terminal of said first resistor being connected to one terminal of an electric current path of the emitter and the collector of said third transistor, and the other terminal of said electric current path of said third transistor being connected to the base of said first transistor;
a second series circuit comprising a second resistor and a fourth transistor connected in series thereto, said fourth transistor having a collector, an emitter and a base, one terminal of said second resistor being connected to said constant power source potential, the other terminal of said second resistor being connected to one terminal of an electric current path of the emitter and the collector of said fourth transistor, and the other terminal of said electric current path of said fourth transistor being connected to the base of said second transistor; and
bias circuit means connected to the bases of said third and fourth transistors, having a first state and a second state, for receiving at said control input terminal a control signal switchable between first and second levels, said bias circuit means changing from said first state to said second state in accordance with a change in said control signal from said first level to said second level, thereby changing the state of conduction of said third and fourth transistors simultaneously to switch the voltage level at said output terminal.

4,631,420

DYNAMIC FLIP-FLOP WITH STATIC RESET

Ernest E. Hollis, Bedford, and Joseph H. Born, Boston, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 9, 1984, Ser. No. 578,445
Int. Cl.⁴ H03K *3/284, 17/56*
U.S. Cl. 307—272 R **4 Claims**



1. An asynchronously resettable high-speed dynamic flip-flop comprising:
A. a state gate, having an output port and reset and data input ports, for presenting a first, set value at its output port when the values at its input ports, including a latch input port, are all true and for presenting a second, reset value at its output port when at least one of the values at its input ports is false;
B. a first transmission gate, having an input port, a clock port, and an output port connected to the data input port of the state gate, for presenting at its output port the value of the signal at its input port when the signal at its clock port has a first, enabling value and for maintaining at the state-gate input ports, while the signal at its clock port has a second, disabling value, the value that the signal at its input port had when the signal at its clock port assumed the disabling value;
C. a second transmission gate having a clock port, an output port connected to a capacitive load, and an input port connected to receive the signal at the output port of the state gate, for presenting at its output port the value of the signal at its input port when the signal at its clock port is has a first, enabling value and for maintaining on said capacitive load connected to its output port, while the signal at its clock port has a second, disabling value, the value that the signal at its input port had when the signal at its clock port assumed the disabling value, the flip-flop thereby operating synchronously as a D-type flip-flop when appropriate clock signals are applied to its clock input ports but being asynchronously resettable by application of a false signal to its reset input port;
D. a latch gate having a feedback input port connected to receive the state-gate output, the latch gate also having an enable input port and having an output port connected to the latch input port of the state gate, the latch gate presenting at its output port a false value when the signal at its enable port has a first, enable value and the output of the state gate is at its reset value, the output of the latch gate being true when the signal at its enable port has a second, disable value or the output of the state gate is at its set value, the flip-flop, once it has assumed its reset state, remaining in said reset state only so long as the signal at the enable input port has the enable value, and selectively being returned to a state in which the signal on the output port of the flip-flop becomes equal to the signal of the data input to the flip-flop after the flip-flop has been clocked and a suitable propagation time has elapsed upon the

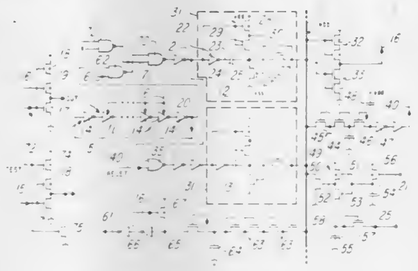
signal at the enable input port returning to the disable value.

4,631,421

CMOS SUBSTRATE BIAS GENERATOR

Shinji Inoue, and Rama S. Akundi, both of Houston, Tex., assignors to Texas Instruments, Dallas, Tex.

Filed Aug. 14, 1984, Ser. No. 640,720
Int. Cl.[4] H03L *1/00*
U.S. Cl. 307—297 **14 Claims**



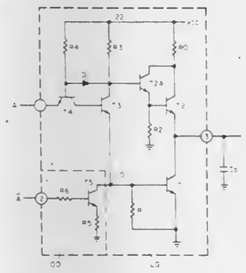
1. A substrate bias generator circuit comprising:
a bias node,
means for generating a feedback signal related to the voltage on said bias node,
an oscillator responsive to said feedback signal so that its frequency is inversely related to the voltage on said bias node, and
a charge pump circuit comprising a capacitor, a transistor having a source-to-drain path in series with the capacitor and having a gate, buffer means coupling the output of the oscillator to one side of said capacitor, a CMOS inverter, responsive to the output of the oscillator and connected to said gate, for coupling said gate to the other side of said capacitor or to a voltage supply dependent upon the output of the oscillator, and a diode having an anode connected to said bias node and having a cathode connected to said other side of said capacitor.

4,631,422

TTL CIRCUIT WITH A CLAMPING TRANSISTOR FOR SPEEDY TURN-OFF OF OUTPUT TRANSISTOR

Douglas S. Piasecki, Middletown Township, Monmouth County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 562,529
Int. Cl.[4] H03K *19/013, 19/088*
U.S. Cl. 307—300 **8 Claims**



1. The combination comprising:
first and second power terminals for the application therebetween of an operating potential;
first, second, third and fourth transistors of same conductivity type, each transistor having first and second electrodes defining the ends of its main conduction path, and a control electrode whose potential relative to said first electrode determines the conductivity of the transistor;
an input terminal and a control terminal;
means for applying external signals to said input and control terminals, said external signals being independent of the signals produced at the first and second electrodes of said first, second, third and fourth transistors;
an output terminal;
means coupling the main conduction path of said first transistor between said output terminal and said first power terminal;
means coupling the main conduction path of said second transistor between said output terminal and said second power terminal;
means coupling the main conduction path of said third transistor between the control electrodes of said first and second transistors;
means coupling the main conduction path of said fourth transistor between the control electrode of said first transistor and said first power terminal; and
means coupling the control electrode of said third transistor to said input terminal and means coupling the control electrode of said input terminal and means coupling the control electrode of said fourth transistor to said control terminal, responsive to the signals at said input and control terminals, for turning-on said fourth transistor and turning off said first transistor when said third transistor is being turned-off.

4,631,423

ULTRA HIGH RESOLUTION JOSEPHSON SAMPLING TECHNIQUE

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 105,674, Dec. 20, 1979, Pat. No. 4,401,900. This application Jul. 25, 1983, Ser. No. 516,836
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.[4] H03K *17/92*
U.S. Cl. 307—352 **11 Claims**



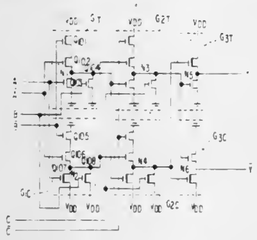
1. A sampling system for measuring unknown signals, comprising:
a monitor gate having at least two distinguishable states to which said unknown signal is applied as a control signal along with a sampling pulse and an adjustable bias signal,
switching means for switching the state of said monitor gate, said switching means including a source of said unknown signal, a source of said sampling pulse, and a source of said adjustable bias signal,
noise elimination means for unambiguously defining the switching threshold of said monitor gate, said noise elimination means including means for time averaging the output of said monitor gate and being connected in a feedback loop between said source of bias signals and said monitor gate, said means for time averaging including means for applying an error signal to said source of bias signals in order to adjust the amplitude of said bias signal to that exact amplitude which switches the state of said monitor gate,
a monitor gate source for providing a signal through said monitor gate of a predetermined value,
timing means for providing a timing reference and an accurate sampling delay time, said timing means including means for initiating the sampling of said unknown signal by said monitor gate and means for establishing a sampling delay time, said timing means including said source of sample pulses and a delay means for establishing a delay in the application of said sample pulses with respect to the application of said unknown signals,
a trigger pulse source for providing trigger pulses to said source of unknown signals and to said source of sampling pulses to initiate the application of said unknown signal to said monitor gate and the application of said sampling pulse to said monitor gate,
means for recording the state of said monitor gate at the instance of each said sampling pulse application, said recording means including means relating the magnitude of said bias signal to the magnitude of said unknown signal at each sampling instant.

4,631,424

MULTI-INPUT LOGIC CIRCUIT

Isamu Miyagi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,610
Claims priority, application Japan, Mar. 30, 1982, 57-52031
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—448 **5 Claims**



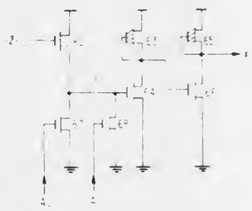
1. A multi-input logic circuit comprising:
(a) an input logic stage performing a predetermined logic operation with respect to a first plurality of logic input signals, said input logic stage including:
first receiving means for receiving said first plurality of logic input signals;
second receiving means for receiving a second plurality of logic input signals that are complementary to said first plurality of signals;
a first power source terminal to which a first voltage is applied;
a second power source terminal to which a second voltage is applied;
a first transistor combination circuit coupled between a first output terminal and said second power source terminal, said first transistor combination circuit having a plurality of enhancement field effect transistors, each connected to said first receiving means for receiving a different one of said first plurality of logic input signals and providing a current path between said first output terminal and said second power source terminal only when the combination of said first plurality of logic input signals is in a predetermined state;
a second transistor combination circuit coupled between said first power source terminal and said first output terminal, said second transistor combination circuit having a plurality of depletion field effect transistors, each connected to said second receiving means for receiving a different one of said second plurality of logic signals, and providing a current path of a first resistance between said first power source terminal and said first output terminal when said first logic input signals are in said predetermined state and providing a current path of a second resistance therebetween at all other times, said second resistance being lower than said first resistance;
(b) a second multi-input logic stage for producing an output signal that is complementary to the output signal at said first output terminal, said second logic stage including:
a second output terminal,
a third transistor combination circuit having a plurality of enhancement field effect transistors coupled between said second output terminal and said second power source terminal, said third transistor combination circuit being connected to said means for receiving said second plurality of logic input signals, and
a fourth transistor combination circuit having a plurality of depletion field effect transistors coupled between said first power source terminal and said second output terminal, said fourth transistor combination circuit being connected to receive said first plurality of logic input signals; and
(c) a third logic stage including:
means for receiving additional true and complementary logic signals;
a first logic section composed of a fifth transistor combination circuit having a plurality of enhancement field effect transistors coupled between a first output node and said second power source terminal, and a sixth transistor combination circuit having a plurality of depletion field effect transistors coupled between said first output node and said first power source terminal;
said fifth transistor combination circuit being responsive to said first output signal and said additional true signal; and
said sixth transistor combination circuit being responsive to said second plurality of logic input signals and said additional complementary signal.

4,631,425

LOGIC GATE CIRCUIT HAVING P- AND N- CHANNEL TRANSISTORS COUPLED IN PARALLEL

Shigeru Koshimaru, Tokyo, Japan, assignor to NEC, Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,596
Claims priority, application Japan, Jan. 31, 1983, 58-14197
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—449 **8 Claims**



1. A logic circuit comprising a plurality of insulated-gate field effect transistors coupled in parallel with each other between an output node and a reference potential point, means for supplying electric charge to said output node, means for applying each one of a plurality of input signals to only a respective each one of the gate electrodes of said transistors, and means for deriving an output signal from said output node, said output signal taking either one of a first level and a second level, at least one of said transistors being a P-channel type transistor and another being an N-channel type transistor,

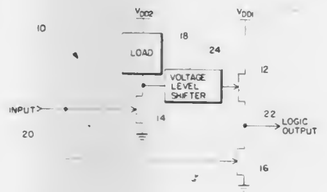
whereby said output signal takes said first level when at least one P-channel type transistor becomes conductive in response to said input signal applied thereto or at least one N-channel types becomes conductive in response to said input signal applied thereto and said output signal takes said second level when all of said P-channel type transistors and of said N-channel type transistors become non-conductive in response to said plurality of input signals, wherein said input signals may be supplied only in non-complementary form due to the provision of both P-channel and N-channel transistors.

4,631,426

DIGITAL CIRCUIT USING MESFETS

Roderick D. Nelson, Minneapolis, and Tho T. Vu, Fridley, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1984, Ser. No. 625,151
Int. Cl.[4] H03K *19/094, 19/20*
U.S. Cl. 307—450 **13 Claims**



1. An electrical circuit having an input for receiving a digital electrical signal of either a first or second value, a logic output node and a voltage reference point, and being adapted to connect to first and second voltage supplies, comprising:

means for inverting said digital electrical signal applied to said input to produce an inverted digital electrical signal, said inverting means including a first metal-semiconductor field effect transistor (MESFET) having a first source, a first drain and a first gate, wherein said first gate is directly electrically connected to said input, said first drain is electrically connected to said first voltage supply, said first source is directly electrically connected to said voltage reference point and said inverted digital electrical signal is generated at said first drain;

a second MESFET having a second source, second drain and a second gate, wherein said second MESFET is a depletion mode MESFET and said second drain is directly electrically connected to said second voltage supply;

a third MESFET having a third source, third drain and a third gate wherein said digital electrical signal applied to said input is also applied to said third gate, said third source is directly electrically connected to said voltage reference point and said third drain is directly electrically connected to said second source at said logic output node;

and wherein application of said digital electrical signal of said first value to said input will turn off said first and third MESFETs, and application of said digital electrical signal of said second value to said inupt will turn on said first and third MESFETs; and

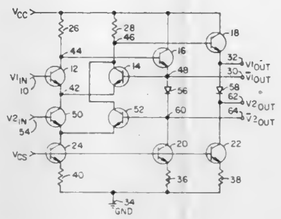
means for shifting the voltage level of said inverted digital signal to a lower voltage inverted digital signal, said lower voltage inverted digital signal being applied to said second gate and being sufficient to turn on said second MESFET when said digital electrical signal of said first value is applied to said input, and said lower voltage inverted digital signal being sufficient to turn off said second MESFET when said digital electrical signal of said second value is applied to said input.

4,631,427

ECL GATE CIRCUIT HAVING INTERNALLY GENERATED REFERENCE VOLTAGES

Nikhil C. Mazumder, San Jose, and David H. B. Yee, San Francisco, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 19, 1984, Ser. No. 672,768
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **5 Claims**



1. An emitter coupled logic (ECL) gate circuit having internally generated reference voltages in which externally generated reference voltages are eliminated, said circuit comprising:

a first level of switching transistors being formed of a first input transistor and a first reference transistor, said first input transistor and said first reference transistor having their emitters coupled to a current source, said first input transistor having its base coupled to a first level input terminal, said first reference transistor having a base and collector;

first and second emitter follower transistors, said first emitter follower transistor being coupled to said first reference transistor, said second emitter follower transistor being coupled to said first input transistor, said second emitter follower transistor having its emitter coupled to the base of said first reference transistor;

at least a second level of switching transistors being formed of a second input transistor and a second reference transistor, said second level of switching transistors coupling said first level of switching transistors to said current source, said second input transistor and said second reference transistor having their emitters coupled to said current source, said second input transistor having its base coupled to a second level input terminal and its collector coupled to the emitters of said first level of switching transistors, said second reference transistor having a base and collector, said second reference transistor having its collector coupled to the collector of said first reference transistor; and

means, coupling the base of said first reference transistor to the base of said second reference transistor, for producing a second level reference voltage substantially proportional to a first level reference voltage at the base of said first reference transistor.

4,631,428

COMMUNICATION INTERFACE CONNECTING BINARY LOGIC UNIT THROUGH A TRINARY LOGIC TRANSMISSION CHANNEL

Dwight W. Grimes, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,312
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—475 **24 Claims**

1. A communications interface including a first converter for performing a binary to binary conversion having a first binary control signal generator and a trinary driver and also a second converter for performing a trinary to binary conversion having a trinary receiver and a second binary control signal generator and said communications interface also having a transmission channel for transmitting trinary logic levels where said first converter performs at least one of the functions:

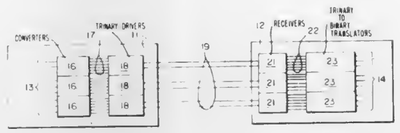
$(T_1=1)=\bar{A}B\bar{C}+ABC+A\bar{B}\bar{C}$

$(T_1=2)=\bar{A}B\bar{C}+A\bar{B}C$

$(T_1=0)=\bar{A}\bar{B}\bar{C}+\bar{A}BC+AB\bar{C}$

$(T_3=1)=A\bar{B}+\bar{A}BC$

$(T_3=2)=AB$



$(T_3=0)=\bar{A}\bar{B}+\bar{A}\bar{C}$

where outputs $T_1=1$, $T_1=2$, $T_1=0$, $T_3=1$, $T_3=2$, $T_3=0$ are are a first set of binary control signals generated by said first binary control signal generator and where A, B and C are the bit values of any three bits in adjacent bit positions selected from a first set of binary logic signals to be converted from binary to trinary.

4,631,429

HIGH VOLTAGE COMPRESSING INPUT BUFFER

G. Fred Riebeek, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Aug. 7, 1984, Ser. No. 638,434
Int. Cl.[4] G06G *7/12*
U.S. Cl. 307—490 **2 Claims**



1. A voltage compressing electronic circuit comprising:

a voltage source having a first lead connected to a first voltage source and a voltage source output lead for providing a large transient peak voltage;

a resistor having a first lead connected to said voltage source output lead of said input voltage source and having a second lead;

a means for comparing two current values having a first input lead connected to said second lead of said resistor, a second input lead, an output lead for providing an output signal, wherein said output signal is high when said first input lead carries a larger current than said second input lead, and wherein said output signal is low when said second input lead carries a larger current than said first input lead; and

a variable current source having a current output lead connected to said second input lead of said means for comparing, an input lead connected to said output lead of said means for comparing, and a reset input node,

wherein when said input lead receives a low voltage, the current on said current output lead increases in proportion with the time said input node receives a low voltage,

wherein said output lead of said means for comparing provides an output voltage having a selected mathematical relationship with the current provided by said current output lead, and

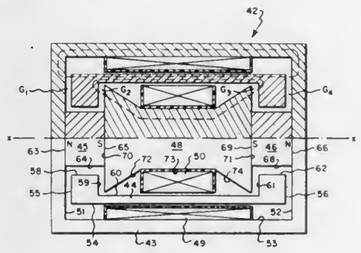
wherein said current source supplies no current when said reset input node receives a high voltage level.

4,631,430

LINEAR FORCE MOTOR

Richard A. Aubrecht, Orchard Park, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,122
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 **23 Claims**



1. A linear force motor, comprising:

a body having an elongated chamber therewithin;

an armature arranged within said chamber for axial movement therealong relative to said body, said body and armature having surfaces cooperating to form first, second, third and fourth variable-reluctance axial air gaps therebetween, said first and second air gaps being arranged in one reciprocal pair such that the sum of their lengths is constant, said third and fourth air gaps being arranged in another reciprocal pair such that the sum of their lengths is constant, said first and third air gaps forming one parallel pair such that their lengths vary proportionally when said armature moves relative to said body, and said second and fourth air gaps forming another parallel pair such that their lengths vary proportionally when said armature moves relative to said body;

magnet means mounted on said body and operatively arranged to provide static flux in said air gaps; and

coil means arranged in said chamber and selectively energizable to produce control flux in one path which passes through said first and fourth air gaps but not said second and third air gaps, and in another path which passes through said second and third air gaps but not said first and fourth air gaps.

4,631,431

LINEAR MOTOR HAVING IMPROVED MAGNETIC CHARACTERISTICS

Stephen R. Viskochil, San Jose, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed Jul. 30, 1984, Ser. No. 635,618
Int. Cl.[4] H02K *41/02*
U.S. Cl. 310—13 **7 Claims**

1. A linear motor and carriage assembly comprising

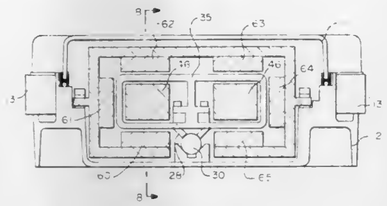
a first magnetic housing component including top and bottom surfaces, side surfaces, and one end surface, said end surface including integral therewith first and second magnetic center pieces, said end surface including an opening between said first and second magnetic center pieces,

a second magnetic housing component including an end plate for mating with said first magnetic housing compo-

nent, said end plate including integral therewith first and second magnetic center pieces which mate with said first and second magnetic center pieces of said first magnetic housing component,

first, second, and third magnets mounted to said top and bottom surfaces and one side surface of said housing in cooperative relationship with said first center piece,

fourth, fifth, and sixth magnets mounted to said top and



bottom surfaces and the other side surface of said housing in cooperative relationship with said second magnetic center piece, and

a carriage assembly extending through said opening in said first magnetic housing component with coil means positioned within said first and second magnetic housing components and coupled to said first and second magnetic center pieces whereby energization of said coil means moves said carriage assembly.

4,631,432

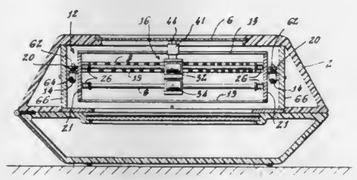
LINEAR MOTOR FACSIMILE MACHINE

Michael R. Thaler, Cheshire, Conn., assignor to Image Communications, Inc., New Milford, Conn.

Division of Ser. No. 390,210, Jun. 21, 1982, Pat. No. 4,476,496. This application Jul. 20, 1984, Ser. No. 632,731

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—14 **9 Claims**



1. A linear motor comprising:

a movable element,

a plurality of electrical coils connected to said movable element and movable therewith,

a plurality of longitudinal members each having a plurality of magnetic elements spaced apart along its longitudinal axis, said longitudinal members guiding and supporting the entire weight of said movable element as it moves along said members, said electrical coils and magnetic elements being arranged so that when said electrical coils are energized magnetic interaction between said electrical coils and said magnetic elements causes said movable element to move along said longitudinal members,

wherein the longitudinal extent of individual magnetic elements is greater than the longitudinal extent of the electrical coil.

4,631,433

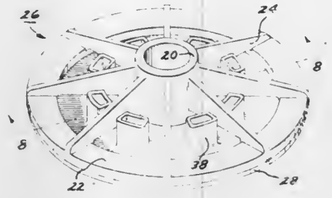
PLASTIC END SHIELD WITH THERMAL BARRIER FOR DYNAMOELECTRIC MACHINES

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1985, Ser. No. 730,889

Int. Cl.⁴ H02K *5/08, 9/00*

U.S. Cl. 310—89 **20 Claims**



1. An end shield for a dynamoelectric machine of the type having a rotor assembly rotatably disposed in a housing, said end shield comprising:

an end plate comprising high strength plastic attached to said housing for providing structural support for one axial end of said rotor assembly and for maintaining a predetermined distance between the radially outermost portion of said rotor assembly and the radially innermost portion of said housing; and

a substantially solid thermal barrier comprising a plastic plate having both a low thermal conductivity and an ability to withstand heat in the range of approximately 150–200 degrees centigrade located adjacent to said end plate and disposed so as to thermally insulate said end plate from connective heat generated inside said housing.

4,631,434

INTERNAL COMBUSTION ENGINE STARTER HAVING LAMINATED PLATES SIMULTANEOUSLY FORMING THE SWITCH YOKE AND THE MOTOR YOKE

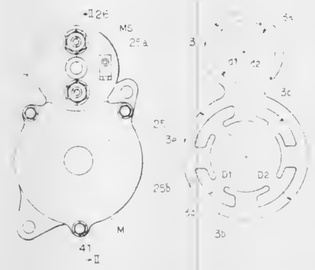
Ryuji Asaoka, Okazaki, and Yasuhiro Nagao, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 15, 1985, Ser. No. 723,285

Claims priority, application Japan, Apr. 18. 1984, 59-78900

Int. Cl.⁴ H02K *1/12*

U.S. Cl. 310—112 **11 Claims**



8. A starter for an internal combustion engine comprising:

a starter motor having a motor yoke; and

a magnet switch arranged in parallel with said starter motor and having a switch yoke,

wherein said motor yoke and switch yoke comprise a plurality of magnetic lamination plates having a section for forming said switch yoke, a second section for forming said motor yoke and a connecting portion connecting said first section with said second section,

said connection portion being a common magnetic path for magnetic fluxes flowing through said switch yoke and said motor yoke.

4,631,435

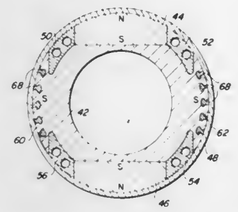
CONSEQUENT POLE PERMANENT MAGNET ROTOR

Frederick B. McCarty, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 18, 1985, Ser. No. 810,967

Int. Cl.⁴ H02K *21/14*

U.S. Cl. 310—156 **17 Claims**



1. A permanent magnet rotor for an electrical machine, comprising:

a ferromagnetic yoke;

a plurality of permanent magnets installed about the periphery of said ferromagnetic yoke to form permanent magnet poles, said ferromagnetic yoke having a plurality of radially outwardly extending projections disposed between said permanent magnets, said ferromagnetic projections being consequent ferromagnetic poles;

a plurality of damper bars fitted between said permanent magnet poles and said ferromagnetic poles, said damper bars made of a non-ferromagnetic, conducting material; and

a retaining hoop placed in interference fit fashion over said permanent magnets, said ferromagnetic projections, and said damper bars.

4,631,436

TRANSDUCER PLATE FOR PIEZOELECTRIC TRANSDUCERS

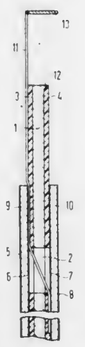
Egon Edinger, Krailling, and Reinhart Schade, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,890

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335431

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—322 **7 Claims**



1. In a transducer of the type in which a transducer plate includes first and second sides, first and second electrically-insulating adhesive layers are carried on the first and second sides, and first and second piezoceramic elements, each carrying electrodes on both of its sides, mounted on respective adhesive layers, and in which the piezoceramic elements are connected in parallel via the electrodes, the improvement wherein:

the transducer includes a passage extending therethrough from the first side to the second side; and

an electrical conductor extending through said passage parallel to and electrically contacting the respective electrode of each of the piezoceramic elements between that electrode and the respective adhesive layer.

4,631,437

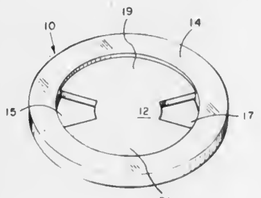
STRESS COMPENSATED PIEZOELECTRIC CRYSTAL DEVICE

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,358

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—369 **3 Claims**



1. A piezoelectric crystal comprising:

a piezoelectric resonant plate having a periphery and having a crystallographic force-frequency function, said crystallographic force-frequency function being zero for at least one null point on said periphery and the mathematical integral of said periphery being non-zero;

a supporting member positioned adjacent to but spaced separately from said plate; and

at least one supporting bridge coplanar with said plate and connected to a first position of said periphery, said first portion including at least one said null point, the angular span of said bridge being asymmetrically positioned about said null point and the mathematical integral of said crystallographic force-frequency function over said first portion being zero; and

at least one second portion of said periphery hanging free.

4,631,438

MULTICHARGED ION SOURCE WITH SEVERAL ELECTRON CYCLOTRON RESONANCE ZONES

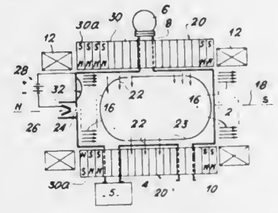
Bernard Jacquot, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 6, 1984, Ser. No. 678,821

Claims priority, application France, Dec. 7, 1983, 83 19572

Int. Cl.⁴ H05H *00/00*

U.S. Cl. 313—359.1 **5 Claims**



1. A multicharged ion source comprising a sealed enclosure

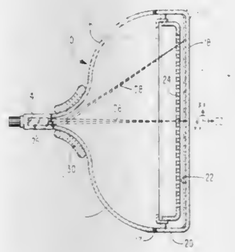
containing a gas for forming a plasma confined within said enclosure, means for producing within said enclosure a high frequency electromagnetic field, means for producing within said enclosure a group of axial and radial, local magnetic fields defining equimagnetic surfaces for confining said plasma produced by electron cyclotron resonance whereof the condition has been satisfied on one of them, said group having an axis of symmetry, means for extracting said ions through an orifice made on the wall of said enclosure and located on said axis of symmetry, said means for producing said local fields comprising first and second alternated magnetic bars arranged symmetrically around said enclosure and formed by several elementary magnets, the magnets of said first bars having polarities opposed to the polarities of the magnets of said second bars except that the terminal elementary magnets situated at the extraction orifice have the same polarity in order to reduce outside the volume occupied by the confined plasma, the amplitude of the local axial magnetic fields located in the vicinity of the extraction orifice, slightly upstream and downstream of said orifice, in n small zones located outside the axis of symmetry.

4,631,439

CATHODE-RAY TUBE HAVING CYLINDRICAL FACEPLATE AND SHADOW MASK WITH MINOR AXIS CURVATURES

Ralph J. D'Amato, and Richard H. Godfrey, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1983, Ser. No. 469,701
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 313—402 **4 Claims**



1. A shadow mask type cathode-ray tube including,

a cylindrical faceplate having a rectangular peripheral shape with two long sides and two short sides and having curvature along its minor axis which substantially parallels the two short sides and being substantially straight along its major axis which substantially parallels the two long sides;

an apertured shadow mask mounted within said tube; said mask having curvature along its minor axis and being substantially straight along its major axis, said mask being of a type of metal having a linear coefficient of thermal expansion of less than 3×10^{-6} $\Delta l/l/°C.$; and

said faceplate having a sufficiently larger linear coefficient of thermal expansion than that of said shadow mask to require correction for moving the shadow mask away from said faceplate during tube operation.

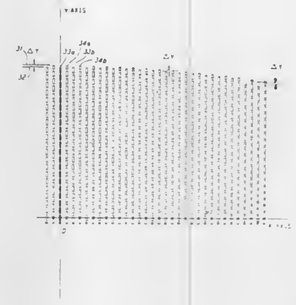
4,631,440

COLOR CATHODE RAY TUBE HAVING SMOOTH SCREEN EDGES

John D. Robbins, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,368
Int. Cl.⁴ H01J *29/07, 31/20*
U.S. Cl. 313—403 **7 Claims**

1. In a color CRT having a cathodoluminescent screen comprising an array of vertical phosphor stripes and an aperture mask positioned in spaced relationship to the screen, the mask comprising an array of slot-shaped apertures arranged in vertical columns corresponding to the vertical phosphor stripes, the distance from the center of one slot to the center of a vertically adjacent slot being designated as vertical pitch, the slots in adjacent columns being vertically displaced from one another, slots in non-adjacent columns lying in horizontal rows, and diagonally adjacent slots lying in adjacent rows, the



array defined by top, bottom, left and right edges, at least the top and bottom edges being curved,

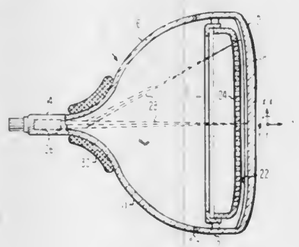
characterized in that every other column terminates in full length slots, and adjacent columns terminate in partial-length slots, and the vertical pitch varies uniformly between each row of adjacent slots to maintain the same number of slots in every other column, thereby to provide relatively smooth edges.

4,631,441

COLOR PICTURE TUBE HAVING IMPROVED LINE SCREEN

Albert M. Morrell, East Hempfield Township, Lancaster County, and Walter D. Masterton, Manheim Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 14, 1985, Ser. No. 711,723
Int. Cl.⁴ H01J *29/32, 29/07*
U.S. Cl. 313—408 **2 Claims**



1. In a color picture tube including a shadow mask mounted adjacent to a line screen, said shadow mask including a plurality of slit-shaped apertures therein located in columns, said line screen having a substantially rectangular periphery with two opposing long sides and two opposing short sides, a major axis of said screen being an axis passing through the center of the screen and centrally extending through the short sides, and a minor axis of said screen being an axis passing through the center of the screen and centrally extending through the long sides, and said screen including cathodoluminescent lines generally extending in the same direction as the minor axis, the improvement comprising

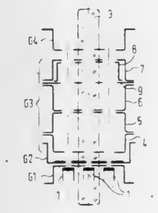
the cathodoluminescent lines of said screen, in plan front view, first increasing in curvature and then decreasing in curvature with increasing distance from the minor axis, to become approximately straight at the short sides of the screen, the curvature of the screen lines being concave facing the minor axis.

4,631,442

TEMPERATURE COMPENSATED ELECTRON GUN SYSTEM

Hans Reule, Wendlingen, and Hartmut Ganzle, Plochingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,753
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334242
Int. Cl.⁴ H01J *29/50, 29/82*
U.S. Cl. 313—414 **18 Claims**



1. An electron-gun system for multi-cathode-ray tubes comprising:

one or more cathodes; and

at least second, third and fourth electrodes following said one or more cathodes and arranged one behind each other in the electron beam direction;

said third electrode having a substantially larger spatial expansion in said electron beam direction than said second and fourth electrodes and comprising at least a first electrode segment neighboring said second electrode and a second electrode segment neighboring said fourth electrode;

said second and fourth electrodes and said first and second electrode segments each consisting of materials having different temperature expansion coefficients, said second electrode segment consisting of a material having a smaller temperature expansion coefficient than the material of said fourth electrode, said first electrode segment consisting of a material having a temperature expansion coefficient either larger than or the same as that of the material of said second electrode.

4,631,443

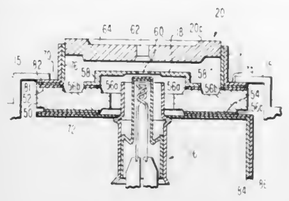
MULTIBEAM ELECTRON GUN HAVING A FORMED TRANSITION MEMBER

Sigmund T. Villanyi, Lancaster Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1985, Ser. No. 769,734
Int. Cl.⁴ H01J *29/82, 29/50*
U.S. Cl. 313—417 **5 Claims**

1. In a multibeam electron gun for a cathode-ray tube comprising a plurality of cathode assemblies and at least two spaced, successive electrodes having aligned apertures therethrough for passage of a plurality of electron beams, said cathode assemblies and said electrodes being individually held in position from a common ceramic member, said ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, said electrodes being attached to said first major surface and said cathode assemblies being attached to said second major surface, wherein the improvement comprises

a transition member disposed on said first major surface of said ceramic member, said transition member including a substantially flat portion attached to said metallized pattern and two upright portions substantially perpendicular to said flat portion, said upright portions being substantially parallel to each other, one of said electrodes being disposed between said upright portions and attached thereto, whereby said one electrode can be longitudinally spaced from the other electrode.

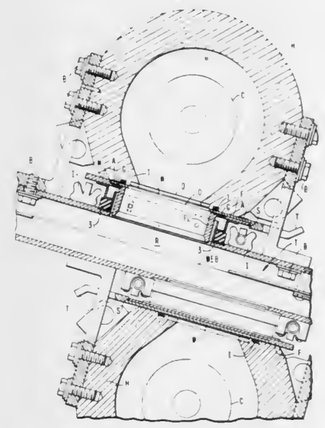


4,631,444

READILY ATTACHABLE AND DETACHABLE ELECTRON-BEAM PERMEABLE WINDOW ASSEMBLY

Richard N. Cheever, Acton, Mass., assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Continuation of Ser. No. 427,903, Sep. 29, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,070
Int. Cl.⁴ H01J *33/04;* **G21G** *1/12*
U.S. Cl. 313—420 **5 Claims**



1. A readily attachable and detachable electron-beam permeable window assembly having, in combination, a frame defining an internal opening; a thin electron-beam permeable window overlying the opening and having a marginal region secured to one side of the frame and a peripheral region supported by the frame laterally inward of the marginal region and against which a peripheral sealing ring around an opening in an electron beam housing may be compressed; tab means extending laterally outward from the frame and fixed thereto to permit lateral insertion and removal of the frame from the sealing ring; flange means for supporting the frame on its side opposite the window, with the opening in the frame aligned with the opening in the housing, the flange means being positioned relative to the sealing ring to provide a space therebetween into which the frame may be laterally inserted or from which the frame may be laterally withdrawn by said tab means;

and locking means cooperative with the flange means and adapted when inactivated to permit the lateral insertion or withdrawal of the frame by the tab means into or from said space, and adapted when activated to cause locking force to be exerted against the flange means to seal the window to the sealing ring, said locking means comprising inflatable resilient means disposed adjacent the flange means.

4,631,445

MONOCHROME DISPLAY CATHODE RAY TUBE WITH LONG AFTER GLOW PHOSPHORS

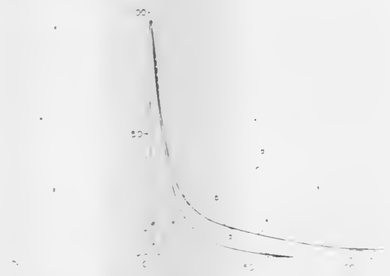
Takashi Hase; Hidemi Yoshida; Hideo Suzuki, and Morio Hayakawa, all of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,946

Claims priority, application Japan, Mar. 23, 1983, 58-40778[U]

Int. Cl.⁴ H01J *29/20;* **C09K** *11/54*

U.S. Cl. 313—467 **9 Claims**



1. A monochrome display cathode ray tube which comprises a white emitting fluorescent screen formed on a face plate facing an electron gun to emit cathode rays, said white emitting fluorescent screen comprising a phosphor mixture which comprises:

(a) from 40–70% by weight of a long after-glow red emitting europium-activated indium borate phosphor,

(b) from 10–40% by weight of a long after-glow green emitting manganese-activated zinc silicate phosphor, and

(c) from 10–50% by weight of a long after-glow blue emitting silver-activated zinc sulfide phosphor, which is a zinc sulfide phosphor co-activated by silver and at least one of gallium and indium and having the formula:

$$ZnS:Ag_{a'}X_{b'}Y_{c'}Z_{d'}$$

wherein X is at least one of Ga and In, Y is at least one of Cu and Au, Z is at least one element selected from the group consisting of Al, Cl, I, Br and F, and a', b', c' and d' represent from 5×10^{-4} to 10^{-1}% by weight, from 10^{-6} to 5×10^{-1}% by weight, at most 2×10^{-2}% by weight and from 5×10^{-6} to 5×10^{-2}% by weight, respectively.

4,631,446

SINGLE-ENDED HIGH INTENSITY DISCHARGE LAMP

George J. English, Reading; Peter R. Gagnon, Georgetown, and Stephen J. Leadvaro, Salem, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 4, 1984, Ser. No. 608,310

Int. Cl.⁴ H01J *61/30, 61/36*

U.S. Cl. 313—634 **10 Claims**

1. A single-ended low wattage high intensity dischange lamp comprising:

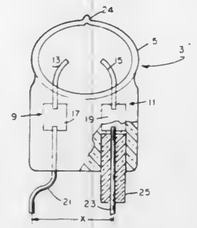
a quartz envelope having a "pinch" seal at one end;

a fill gas within said envelope;

a pair of spaced electrodes within said envelope and sealed in said "pinch" seal;

a pair of spaced electrical conductors sealed into said "pinch" seal and coupled respectively to said electrodes;

a tubular sleeve of electrically insulating material having a coefficient of expansion substantially similar to the coefficient of expansion of said quartz envelope, said sleeve being telescoped over a substantial external portion of at



least one of said pair of spaced electrical conductors and having one end fused into said "pinch" seal of said quartz envelope, said sleeve substantially inhibiting arcing between said pair of spaced electrical conductors external of said envelope resulting in a "cold start" voltage for said lamp of greater than or about 2 KV and a "hot-restrike" voltage of greater than or about 5 KV.

4,631,447

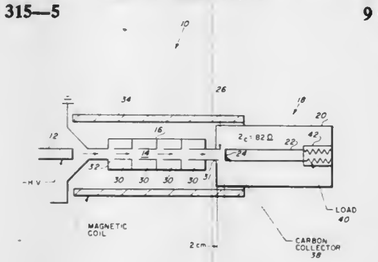
IREB CONVERTER TO AC PULSES

Moshe Friedman, Washington, D.C., and Victor Serlin, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,838

Int. Cl.⁴ H01J *25/02*

U.S. Cl. 315—5 **9 Claims**



1. A device for converting the energy of an intense relativistic electron beam having a current between 1 kiloamp and 1 megaamp into high power AC electrical pulses comprising:

a longitudinally-running drift tube with a first and second ends;

means for generating an intense relativistic electron beam (IREB) and injecting said IREB to propagate along a path in said drift tube from said first end thereof;

means for modulating said IREB with at least one frequency to obtain longitudinally spaced bunches of electrons in said drift tube in accordance therewith;

coaxial means including an outer conductor and a center conductor with an end of said center conductor disposed across the second end of said drift tube in the path of said IREB; and

a gap disposed between the second end of said drift tube and the end of said center conductor;

wherein said coaxial means in combination with said gap acts to convert the kinetic energy of the electron bunches in said drift tube into electrical energy for propagation along said coaxial means.

4,631,448

ION SOURCE

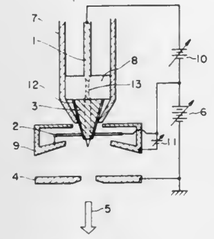
Hifumi Tamura, Hachioji, Japan; Clay Shepherd, Los Altos, Calif.; Toru Ishitani, Sayama, and Kaoru Umemura, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,206

Claims priority, application Japan, Mar. 9, 1983, 58-37394

Int. Cl.⁴ H01J *27/22*

U.S. Cl. 315—111.81 **20 Claims**



1. An ion source comprising:

an emitter chip having a sharp tip;

an ion source material holding part made of a material having a high melting point and provided with an aperture in a bottom wall, said emitter chip being disposed within said ion source material holding part in a coaxial manner so that said tip of said emitter chip passes through said aperture;

means for emitting an electron beam;

a power supply for heating said electron beam emitting means;

an extraction electrode adapted to form an electric field for extracting an ion beam, around said tip of said emitter chip;

an ion extracting power supply for applying a high voltage between said extraction electrode and said emitter chip; and

an ion source material reservoir placed inside the ion source material holding part and being electrically conductive and adapted to be electrically connected to the emitter chip, the ion source material reservoir and the emitter chip forming a space for loading an ion source material and forming a slit for feeding a molten ion source material to the tip of the emitter chip.

4,631,449

INTEGRAL CRYSTAL-CONTROLLED LINE-VOLTAGE BALLAST FOR COMPACT RF FLUORESCENT LAMPS

Philip H. Peters, Jr., Greenwich, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,166

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—205 **19 Claims**

1. A ballast circuit for a fluorescent lamp comprising:

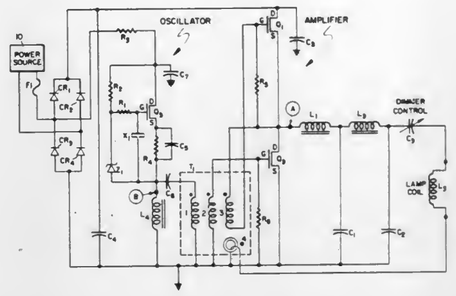
a rectifier-filter means adapted for coupling to an AC power source to generate a DC voltage,

an oscillator circuit coupled to said DC voltage for developing an RF oscillator signal,

switching signal generating means response to said oscillator signal to develop concurrent oppositely phased switching signals at the frequency of said oscillator signal,

series connected power transistors having inputs coupled to said switching signals, said transistors having a common output, a fluorescent lamp energization coil coupled to said common output,

said switching signal generating means including feedback means for regeneratively feeding back a portion of the current in said coil to aid in switching said power transistors whereby said transistors develop an RF power output signal at said common output to drive said coil, said power output signal being in the form of a square wave, and



a filter circuit coupled intermediate said common output and said coil to transform said square wave to a sinusoidal wave.

4,631,450

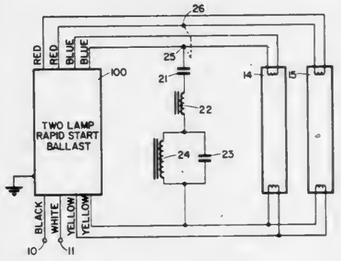
BALLAST ADAPTOR FOR IMPROVING OPERATION OF FLUORESCENT LAMPS

James L. Lagree, Wilkinsburg, and Robert T. Elms, Monroeville, both of Pa., assignors to North American Philips Lighting Corporation, New York, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,240

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—244 **20 Claims**



1. A ballast adaptor for connection to the terminals of a first type of discharge lamp so as to adapt said first type of discharge lamp for operation with a ballast device designed to operate with a second type of discharge lamp similar to the first type of lamp but having significantly different starting and operating characteristics, said adaptor comprising a series-parallel LC network adapted to produce an odd order harmonic current of an AC supply voltage, said series-parallel LC network including a series LC circuit connected to a parallel LC circuit.

4,631,451

BLAST GAP IGNITION SYSTEM

Richard W. Anderson, Ann Arbor; Joseph R. Asik, Bloomfield Hills; Richard C. Ronzi, Birmingham, and Aladar O. Simko, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

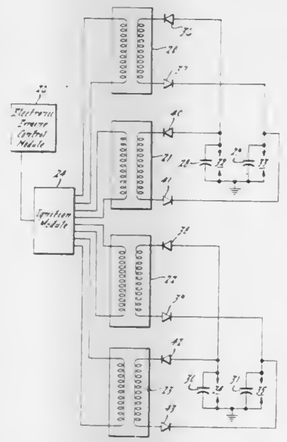
Continuation-in-part of Ser. No. 553,210, Nov. 18, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,137

Int. Cl.⁴ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **7 Claims**

1. An ignition system including a spark coupled to a supplemental spark energy circuit, said spark plug having a ring air gap and surface spark path including:

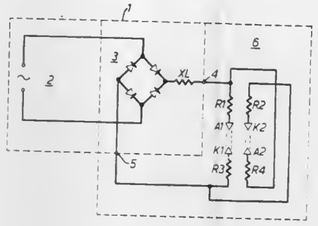
a first electrode having a ring shape defining a central opening:
a second substantially cylindrical electrode positioned coaxially within said central opening of said first electrode;
a symmetrically shaped insulating material positioned between said first and second electrodes so as to provide a surface for a spark path between said first and second electrodes, said insulating material being spaced from said first electrode so as to provide therebetween an air gap;
said spark plug having a substantially symmetrical firing end comprising said first ring electrode, said cylindrical second electrode, and said symmetrically shaped insulating material so that said spark plug (a) has substantially no orientation dependency with respect to the fluid flow direction in a combustion cylinder, and (b) exhibits electrical discharge stability with respect to the in-cylinder fluid flow which is manifested by less elongation and stretching of the electrical discharge path and less subsequent reigni-

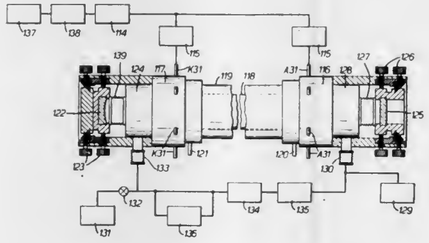


tion of the original discharge path resulting in improved combustion stability;
said supplemental spark energy circuit including:
an ignition coil having a primary winding and a secondary winding;
an ignition module coupled to said primary winding;
a supplementary spark plug energy module coupled to said secondary winding for providing an electrical output to be applied in combination with the electrical output of said secondary winding to said ring gap spark plug to produce a spark of increased magnitude and duration with increased electrical discharge stability that results in higher spark energy density with the combination of said ring air gap and surface spark path and improved ignitability of dilute combustible mixtures;
a distributor coupled to said secondary winding; and
a plurality of spark plugs selectively coupled to said distributor.

4,631,452
APPARATUS AND METHOD FOR GENERATING A PLURALITY OF ELECTRIC DISCHARGES
John E. Harry, Oakham, England, assignor to Loughborough Consultants Limited, Loughborough, England
Filed Sep. 28, 1982, Ser. No. 425,752
Int. Cl.⁴ H01J *11/04, 13/48, 15/04, 17/36;* **H05B** *37/00*
U.S. Cl. 315—334 **14 Claims**

1. A gas laser including a discharge tube, optical path means for providing an optical path in the discharge tube, a power supply, a first set of at least two adjacent electrodes extending into the discharge tube and a like number of first impedances each of which connects one electrode of the first set to one side of the power supply, and a second set of at least two adjacent electrodes spaced along the optical path from the first set and extending into the discharge tube and a like number of second impedances each of which connects one electrode of the second set to an opposite side of the power supply, whereby stable electric glow discharges which coalesce and extend along the

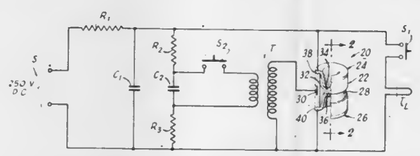




optical path are generated between the respective electrodes of the first and second sets to provide a stable volume of electric discharge in the optical path of the laser for exciting the laser.

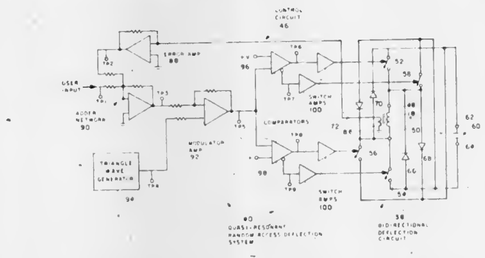
5. An apparatus as claimed in claim 1 in which the impedances are each above a minimum value of the same order of magnitude as the impedance of the discharge path during stabilized operation.

4,631,453
TRIGGERABLE CERAMIC GAS TUBE VOLTAGE BREAKDOWN DEVICE
Alwyn A. DeSouza, and Hans W. Oertel, both of Goleta, Calif., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed Aug. 29, 1983, Ser. No. 526,988
Int. Cl.⁴ H01J *11/04, 13/48, 15/04;* **H05B** *37/00*
U.S. Cl. 315—340 **29 Claims**



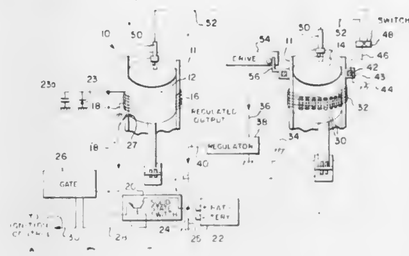
1. A hermetically sealed triggerable gas tube voltage breakdown device comprising
a first gap electrode,
a second gap electrode, said first and second gap electrodes being the only gap electrodes in said device,
an electrode gap formed between said gap electrodes, said electrode gap being the only electrode gap in said device,
an elongated ceramic insulating spacer disposed between said gap electrodes and enclosing said electrode gap, and
trigger electrode means, physically separated from the electrically insulated from both of said gap electrodes and adapted to receive a trigger voltage signal other than the voltage applied across said gap electrodes, for increasing the electrical field intensity in the region of said electrode gap in response to said trigger voltage signal, said trigger electrode means being entirely exteriorly disposed about the outer periphery of said insulating spacer and being axially aligned along the length of said insulating spacer with said region of said electrode gap and being electrically insulated from said electrode gap by said insulating spacer,
said spacer including means disposed about the region of said electrode gap for enabling the electric field intensity in said region to be increased in response to the application of said trigger voltage signal to said trigger electrode, said enabling means comprising a thin wall portion of said insulating spacer disposed at least partially about the region of said electrode gap, said thin wall portion having a wall thickness in the range of from about 0.015 inch to about 0.030 inch.

4,631,454
QUASI-RESONANT RANDOM ACCESS DEFLECTION SYSTEM FOR A CALLIGRAPHIC DISPLAY MONITOR
Paul T. Ballard, 2409 Westlawn Dr., Kettering, Ohio 45440
Filed Mar. 25, 1985, Ser. No. 715,519
Int. Cl.⁴ H01J *29/70*
U.S. Cl. 315—408 **26 Claims**



1. In a video display apparatus, such as a calligraphic display monitor, having means for generating an electron beam and a deflection yoke operable for magnetically deflecting said beam, said deflection yoke including first and second opposite terminals, a quasi-resonant random access deflection system comprising:
(a) a resonant deflection circuit connected to said deflection yoke and being actuable to cause selected movement of said beam along a bidirectional path and stopping of said beam at any position along said bidirectional path; and
(b) a control circuit coupled to said resonant deflection circuit and being operable to actuate said resonant deflection circuit;
(c) said resonant deflection circuit including first, second, third and fourth switches and a capacitor having a pair of first and second opposite plates, said first and second switches being connected respectively to said first and second terminals of said deflection yoke and to said first and second plates of said capacitor, and said third and fourth switches being connected respectively to said second and first terminals of said deflection yoke and to said first and second plates of said capacitor.

4,631,455
METHOD AND APPARATUS FOR CONVERTING A CONVENTIONAL INTERNAL COMBUSTION ENGINE INTO A HIGH SPEED ELECTRIC MOTOR AND GENERATOR
Howard A. Taishoff, 105 Oxford Blvd., Great Neck, N.Y. 11023
Continuation-in-part of Ser. No. 551,849, Nov. 15, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,690
Int. Cl.⁴ H02K *33/12*
U.S. Cl. 318—37 **14 Claims**

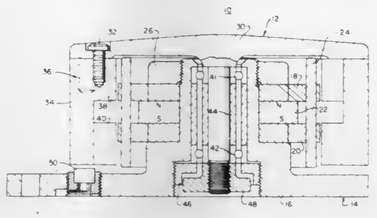


1. Apparatus for converting a conventional internal combustion engine into a high speed electric motor wherein the engine is capable of switching between heat operation and propulsion by electricity including in combination a sleeve mounted in the engine block, a conventional piston of ferromagnetic material mechanically connected to a conventional crankshaft for reciprocal movement in said sleeve, a low voltage high current coil solenoidally wound around said sleeve in close proximity thereto, said coil extending a relatively short distance along the longitudinal length of said sleeve and being positioned thereon so as to be substantially centrally disposed with respect to the linear path swept by said piston, solid state switch means electrically connected between said coil and a battery, and means for turning on said solid state switch means and turning off heat operation, the former-mentioned means responsive to battery status and power requirements whereby when heat operation is shut off, the turning on of said solid state switch means applies electric current to said coil such that current is sent into said coil when said piston is moving in a direction relatively towards said coil, and current to said coil is interrupted when said piston is moving in a direction relatively away from said coil whereby magnetic interaction between said piston and the magnetic field induced around said coil drives said piston in a direction complementary with its motion so that the engine runs as either electrically propelled or heat operated.

4,631,456
INERTIAL ENERGY STORAGE DEVICE AND SYNCHRONOUS ROTARY ELECTRICAL MACHINE FOR USE THEREIN
Robert D. Drescher, Cambridge; David B. Eisenhaure, Hull; Richard L. Hockney, Saugus, all of Mass.; Bruce G. Johnson, Sacramento, Calif.; Emery St. George, Jr., Duxbury, and David C. Whipple, Cohasset, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Continuation of Ser. No. 360,410, Mar. 22, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,071
Int. Cl.⁴ H02K *47/14, 7/02*
U.S. Cl. 318—140 **47 Claims**

1. A synchronous rotary electrical machine for bidirectional conversion between mechanical and electrical energy comprising:
a stator having two axially spaced sets of circumferentially spaced teeth;
axially polarized field excitation means disposed on said stator to provide an axially polarized magnetic field;
a rotor having a plurality of circumferentially spaced magnetic poles facing said stator teeth and magnetic means interconnecting adjacent rotor poles; and

stator windings distinct from said field excitation means and including a plurality of coils, each of which surrounds,



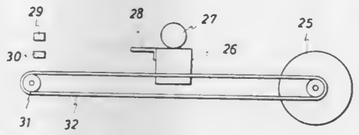
from one of said sets, at least one tooth which is covered by a rotor pole and, from the other of said sets, at least one tooth which is not simultaneously covered by a pole.

4,631,457

METHOD OF LEADING A MOVING BODY DRIVEN BY A DIRECT CURRENT BRUSHLESS MOTOR TO A STARTING POSITION

Jiro Tanuma; Takao Uchida, and Kunihal Hayashi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,047
Claims priority, application Japan, Nov. 1, 1983, 58-203626
Int. Cl.⁴ H02P *6/02;* H02K *29/12*
U.S. Cl. 318—254 **3 Claims**



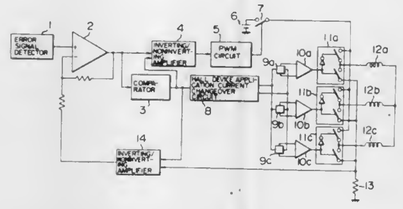
1. An apparatus for moving a movable body comprising:
a direct current brushless motor comprising a stator including a plurality of armature coils secured on a stator yoke through a substrate; a disc-like magnet having N and S poles arranged alternately in a circumferential direction to confront the armature coils, and a rotatable rotor having a rim and a speed-detecting slit on the rim;
means for applying an electric current corresponding to a magnetic pole of the magnet to each armature coil to obtain rotating power for the motor;
a speed detector responsive to the speed detecting slit of the rotor for generating a frequency voltage pulse proportional to motor speed;
counter means for counting the frequency pulses from said speed detector;
means for changing excitation phases after every definite number of pulses counted;
stopper means for stopping the movable body at a predetermined position at or close to the maximum torque of the motor, whereby impingement of the movable body against the stopper means stops rotation of the rotor;
means for resetting the counter means to a count number corresponding to said predetermined position; and
means for rotating the rotor in a reverse direction to locate the rotor at a stable stop position and position the motor at a starting point.

4,631,458

CURRENT CONTROL TYPE CIRCUIT FOR BRUSHLESS MOTOR

Tokinori Furuichi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,344
Claims priority, application Japan, Oct. 26, 1984, 59-223953
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **3 Claims**



1. A driver circuit for a motor having stator coils comprising:
error detector means for detecting the rotation phase of the motor and generating an error signal;
amplifier means for amplifying said error signal;
control signal generator means for generating an interrupted control signal on the basis of the amplified error signal of said amplifier means;
switch means for supplying an interrupted current to said stator coils in response to the control signal and having a polarity corresponding to the polarity of said error signal;
current detector means for generating a detected voltage dependent upon the magnitude of the interrupted current supplied to said stator coils, said current detector means being placed in the path of the interrupted current supplied said stator coils; and
negative feedback means for negatively feeding back the detected voltage with a polarity dependent upon the polarity of said error signal to said amplifier means.

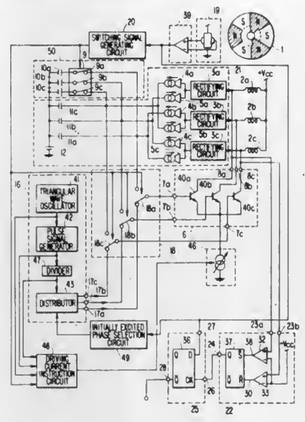
4,631,459

BRUSHLESS DC MOTOR

Souichirou Fujioka, Sakai; Toshio Inaji, Mino, and Susumu Yamamoto, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 3, 1985, Ser. No. 804,253
Claims priority, application Japan, Dec. 25, 1984, 59-277165; Jul. 2, 1985, 60-145586; Sep. 30, 1985, 60-217013
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **17 Claims**

1. A brushless DC motor comprising:
a permanent magnet rotor magnetized to have 2n poles (n is a positive integer);
a plurality of stator coils mounted on a stator;
a position detecting arithmetic circuit for obtaining a rotating position signal of said permanent magnet rotor by processing a counter electromotive force generated in each of said plurality of stator coils;
a coil driving circuit for energizing said plurality of stator coils;
a starting circuit for controlling said coil driving circuit to rotate said permanent magnet rotor by forcibly energizing said plurality of stator coils sequentially during a starting of said motor;
a position detecting means composed for detecting at least one specific rotating position of said rotor; and
a driving status switching circuit which allows said coil driving circuit to be responsive to an output signal of said starting circuit until said position detecting means detects said specific rotating position, and to an output signal of said position detecting arithmetic circuit after said position detecting means detects said specific rotating position.

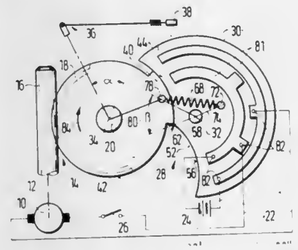


4,631,460

DRIVING DEVICE HAVING A REVERSIBLE ELECTRIC MOTOR

Siegfried Reichmann, Rheinau-Honau, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 792,830
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440261
Int. Cl.⁴ H01H *3/16;* B60R *27/00*
U.S. Cl. 318—280 **14 Claims**



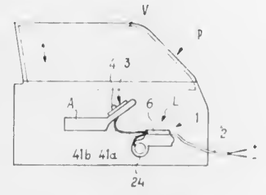
1. A driving device for a control member of a functional unit, comprising a reversible electric motor, switching means connected between electric power source terminals and said electric motor to reverse direction of rotation of the latter, reduction gears having an input gear connected to a driving shaft of said electric motor and an output gear linked to said control member to move the same between two working positions, a stop member arranged for joint rotation with said output gear, said switching means including a contact disc supported for rotation in a plane of rotation of said stop member, said contact disc being provided with two stop surfaces cooperating with said stop member, and means for coupling said output gear with said contact disc to rotate the latter in one direction into a first angular position in which one of said stop surfaces engages said stop member and said control member is moved into one working position, and in opposite direction into another angular position in which the other stop surface engages said stop member and said control member is moved into an opposite working position.

4,631,461

DEVICE FOR ELECTRICALLY CONTROLLING THE POSITION OF A SLIDING OPENING PANEL OF A MOTOR VEHICLE

Michel Peugeot, Seloncourt, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Dec. 24, 1984, Ser. No. 685,661
Claims priority, application France, Dec. 23, 1983, 83 20722
Int. Cl.⁴ H02P *1/00*
U.S. Cl. 318—280 **11 Claims**



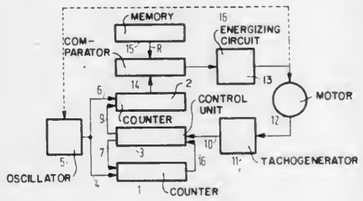
1. A device for electrically controlling the position of a sliding opening panel of a motor vehicle, said device being connected to a power supply in series with a control circuit of a driving motor for shifting the panel between a closing position and an opening position said device comprising a series of conductors which are electrically connected in parallel and mechanically disposed in adjacent positions relative to one another, said conductors materializing a particular position that the panel is capable of occupying in its travel between said closing position and said opening position, all the conductors except one being connected together by a first of their ends so as to form a first terminal of said control device, a setting slider having an adjustable position which sets the position that the panel must reach and which is operative to selectively break the connection of said first ends, all the conductors having second ends opposed to said first ends, a copying slider comprising a bridge element associated with said second ends and constituting a second terminal of said control device and capable of selectively connecting together the second ends of pairs of adjacent conductors, said copying slider being adapted to be connected to move with said panel.

4,631,462

SYSTEM FOR CONTROLLING THE SPEED OF AN ELECTRIC MOTOR

Willem J. A. Geven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1986, Ser. No. 825,837
Claims priority, application Netherlands, Sep. 11, 1985, 8502479
Int. Cl.⁴ G05B *19/28*
U.S. Cl. 318—318 **10 Claims**



1. A system for controlling the speed of an electric motor controlled by a control signal via an energising circuit, comprising:
an oscillator which supplies a first pulse train whose frequency depends on the desired motor speed,
a first counter having a clock-pulse input connected to the

oscillator output and which counts up to a predetermined value and stops counting when said value is reached,

a second counter having a clock-pulse input connected to the oscillator output and which starts counting as soon as the first counter supplies a signal when said predetermined value is reached,

means for producing a second pulse train whose frequency depends on the motor speed, said second pulse train being applied to the first counter to re-start said counter when a pulse appears to count from a specific initial count up to said predetermined value and which pulse train is applied to the second counter, and

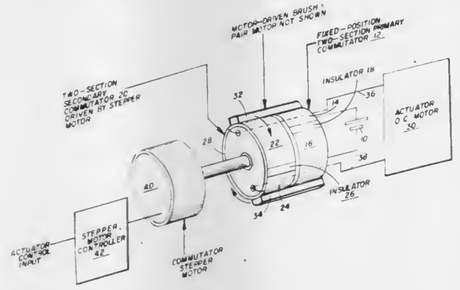
decoding means to which the output signals of the second counter are applied to generate a control signal for the energising circuit, characterized in that the second counter comprises a bidirectional counter which counts in one direction in the said interval between the instant at which the first counter reaches the predetermined value and the occurrence of a pulse in the second pulse train and which counts in the other direction in the intermediate intervals and in that the decoding means include a comparator to which a reference value is applied in addition to the output signals of the second counter and which supplies a signal of a first level if the reference value exceeds the count of the second counter and a signal of a second level if the reference value is smaller than the count of the second counter.

4,631,463

LINEAR CONTROLLER FOR ELECTROCHEMICAL DEVICE AND METHOD

John F. Klinchuch, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 14, 1985, Ser. No. 701,892
Int. Cl.[4] H02P *7/00*
U.S. Cl. 318—558 **9 Claims**



1. An apparatus for generating and linearly controlling periodic bipolar drive signals from a DC power source having supply voltage and reference terminals to drive an electromechanical device, said apparatus comprising:

a base;

a primary commutator having conductive first and second sections insulated from each other connected to said supply voltage and reference terminals, respectively;

a secondary commutator adjustable in rotational position coaxial with said primary commutator having conductive third and fourth sections insulated from each other, said electromechanical device connected between said third and fourth sections;

means attached to said base insulatively supporting said primary commutator;

a pair of diametrically opposed conductive brushes, each brush for electrically connecting one section of said primary commutator to one positionally related section of said secondary commutator;

means attached to said base for insulatively supporting and rotating at a given fixed rate said pair of brushes in electrical contact with said sections of said primary and secondary commutators; and

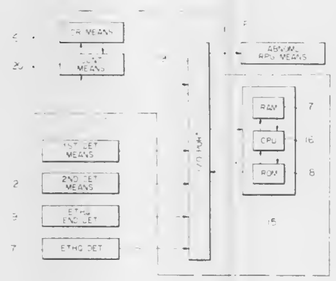
means for insulatively supporting and adjustably setting the rotational position of said secondary commutator relative to said primary commutator to linearly control the periodic bipolar drive signal applied to said electromechanical device corresponding to said rotational position of said secondary commutator as said pair of brushes rotates simultaneously about said primary and secondary commutators.

4,631,464

INDUSTRIAL ROBOT SYSTEM

Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,093
Claims priority, application Japan, Oct. 5, 1984, 59-209407
Int. Cl.[4] G05B *9/02*
U.S. Cl. 318—563 **3 Claims**



1. An industrial robot system comprising:

a robot disposed in an environment having peripheral equipment and operable under program control of a control unit to shift between normal job mode operation and earthquake mode operation,

earthquake detection means for detecting earth vibration and for producing a first detection signal when the vibration exceeds a predetermined value,

earthquake mode control means disposed between said earthquake detection means and said control unit for generating a control output in response to the first detection signal to interrupt the normal job mode operation of said robot and shift said robot to the earthquake mode operation, said robot being moved to a position away from the peripheral equipment under the earthquake mode operation.

4,631,465

TOOL DISPLAY SYSTEM OF AUTOMATIC TOOL CHANGING APPARATUS

Hiroomi Fukuyama, Hachioji; Kiyoshi Hattori, Shiroyama, and Yoshihiro Nakashima, Machida, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

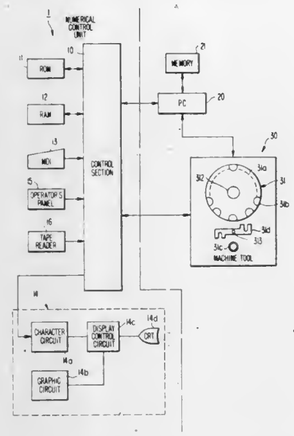
PCT No. PCT/JP85/00048, § 371 Date Jul. 31, 1985, § 102(e) Date Jul. 31, 1985, PCT Pub. No. WO85/03470, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 6, 1985, Ser. No. 766,839
Claims priority, application Japan, Feb. 6, 1984, 59-019564
Int. Cl.[4] G05B *23/02*
U.S. Cl. 318—565 **5 Claims**

1. A tool display system of an automatic tool changing apparatus having a machine tool equipped with an automatic tool changing apparatus, a numerical control unit for executing numerical control of the machine tool, and a programmable controller for executing sequential control of the machine tool on the basis of a control signal from said numerical control unit, said tool display system comprising:

a tool magazine provided on the automatic tool changing apparatus;

a plurality of pots, provided on said tool magazine, for accommodating tools;

a memory, operatively connected to the machine tool, for storing the position of each of said plurality of pots and for



storing position information for tools accommodated at the pot positions; and

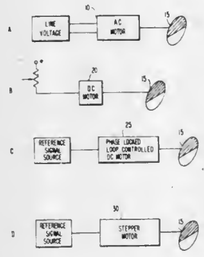
a display unit, operatively connected to the numerical control unit, for displaying pot positions, the pot positions changing due to movement of said tool magazine, and said tools accommodated at the pot positions, on the basis of said position information stored in said memory.

4,631,466

PHASE LOCKED STEPPER MOTOR CONTROLLED LIGHT CHOPPER

Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,156
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **6 Claims**



1. A phase locked loop stepper motor controlled light chopper, comprising:

comparator and signal generation means, operatively connected to receive a reference signal and a comparison signal, for generating signal pulses in accordance with a difference between phases of said reference signal and said comparison signal;

counter means, operatively connected to receive the signal pulses, for counting the signal pulses and for providing count signals varying in accordance with the counted number of the signal pulses;

divider means, operatively connected to receive a one of the count signals, for counting a predetermined number of the one of the count signals and for providing the comparison signal each time the predetermined number of count signals is counted;

driver means for generating a four phase signal having eight states varying in response to the count signals;

a stepper motor having a drive shaft rotated in response to the four phase signal ; and

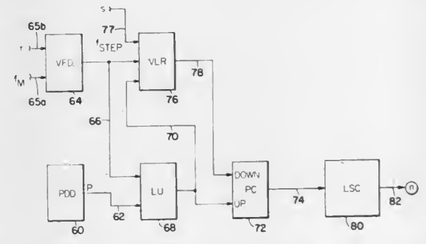
a chopper wheel mounted on and rotated by the drive shaft.

4,631,467

ESCALATOR PASSENGER FLOW CONTROL

Dietrich E. Herrmann, Vechelde, and Detlev Abraham, Berlin, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed May 28, 1985, Ser. No. 738,336
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—798 **4 Claims**



1. A circuit for providing a load signal (**74**) indicative of the number of passengers on an escalator, comprising:

means (**66**) for providing a step speed signal (f_{step}) indicative of the speed of the escalator;

means (**77**) for providing a step number signal (s) indicative of the number of steps in an escalator run;

sensor means (**60**) for providing an entry signal (P) indicative of the entry of a passenger onto the escalator;

variable length shift register means (**76**) for providing a down signal (**78**) in response to the entry signal (p) having moved through the shift register, wherein the length of the register is determined by the step number signal (s) and the rate of the register is determined by the step speed signal (f_{step}); and

up/down counter means (**72**) for incrementing the load signal (**74**) in response to each occurrence of the entry signal and for decrementing the load signal in response to each occurrence of the down signal (**78**).

4,631,468

BATTERY CHARGING CIRCUIT FOR ELECTRONIC APPARATUS

Masaharu Satoh, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1984, Ser. No. 604,009
Claims priority, application Japan, Apr. 30, 1983, 58-77815
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—14 **5 Claims**

1. A charging circuit for charging a battery from an external power supply and supplying power to a load comprising:

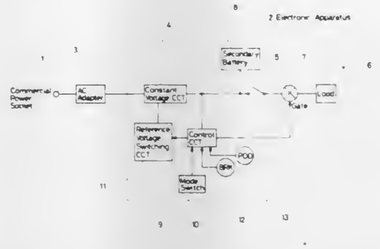
first charging means provided for interrupting the supply of power from said external power supply to the load to rapidly charge a secondary battery from said external power supply in a rapid charge mode;

second charging means provided for enabling the supply of power to said load from said external power supply to

charge said secondary battery in a trickle charge mode; and

control means for selectively activating said first charging means or said second charging means, said control means including,

a constant voltage circuit for developing a constant voltage,



a reference voltage circuit for generating two kinds of reference signals,

a mode switch for selectively switching between said first charging means and said second charging means,

a gate coupled to said load, and

a control circuit responsive to the switching of said mode switch for controlling said reference voltage circuit and said gate.

4,631,469

DEVICE FOR DRIVING ELECTRICAL CURRENT GENERATOR FOR USE IN MOTORCYCLE

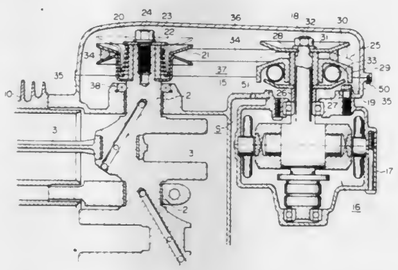
Masaharu Tsuboi, and Kuniaki Watanabe, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 367,517, Apr. 12, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,881

Claims priority, application Japan, Apr. 14, 1981, 56-52686[U]; Apr. 14, 1981, 56-55006

Int. Cl.⁴ H02P *15/00*

U.S. Cl. 322—42 **9 Claims**



1. A device for driving an electrical current generator for use in a motorcycle comprising:

(a) an engine unit for housing an engine of said motorcycle;

(b) said electrical current generator provided separately from and mounted outside of said engine unit;

(c) power transmission means provided between one end of an output shaft of said engine and one end of a rotary shaft of said generator and comprising:

a V-belt;

a first pulley mounted on one of said one ends of said output shaft and said rotary shaft; and

a second pulley mounted on the other of said one end, said second pulley including means for increasing a rotational speed ratio of said rotary shaft to said output shaft during low rotation range of said engine and decreasing said ratio during high rotation range thereof, said V-belt being mounted between said first pulley and said second pulley, said engine unit and said electrical current generator being provided at the same side of said power transmission means;

said power transmission means further comprising;

an endless transmission member;

a planetary gear and clutch mechanism connected to said one end of said output shaft;

a first pulley mounted on said planetary gear and clutch mechanism, and

a second pulley mounted on said one end of said rotary shaft, said V-belt being mounted between said first and second pulleys; and

(d) covering means providing a confined space outside of said engine unit for housing said power transmission means within said confined space separate from said electric current generator.

4,631,470

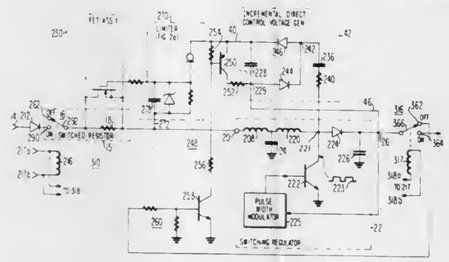
CURRENT SURGE LIMITED POWER SUPPLY

John D. Bingley, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1985, Ser. No. 808,633

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 323—282 **20 Claims**



1. An inrush surge current limited power supply, comprising:

regulating means including an input terminal adapted for receiving voltage to be regulated and also including an output terminal at which a regulated voltage is generated, said regulating means further including capacitance means coupled to said input terminal, whereby if a source of uncontrolled direct voltage is applied to said input terminal an undesirably large surge current occurs as a result of charging said capacitance means;

first switch means serially coupled with surge limiting resistance means to form a switched resistor, said switched resistor being coupled to said input terminal of said regulating means and also being adapted to be coupled to said source of uncontrolled direct voltage for applying conditioned direct voltage to said input terminal of said regulating means whereby said input surge current is limited to an acceptable magnitude, but said resistance means undesirably dissipates power during normal operation of said regulating means;

at least one field effect transistor including a gate electrode and a channel connected between source and drain electrodes, said channel being coupled across said resistance means and having conductivity which is low when the voltage between said gate and source electrodes is small and high when said voltage between said gate and source electrodes is large for preventing large surge currents immediately after said first switch means is rendered conductive at each turn-on;

a source of direct control voltage coupled to one of said input and output terminals of said regulating means and to said gate of said field effect transistor for generating an incremental direct control voltage from a source of alternating voltage and for adding said incremental direct control voltage to one of said conditioned and regulated voltages to generate and apply to said gate a sum direct control voltage, whereby said sum direct control voltage is greater than said one of said conditioned and unregulated voltages, whereby said field effect transistor is rendered conductive at a time after said one of said conditioned and regulated voltages have risen to near their steady-state values to bypass current around said resistance means thereby reducing said undesirable power dissipation.

4,631,471

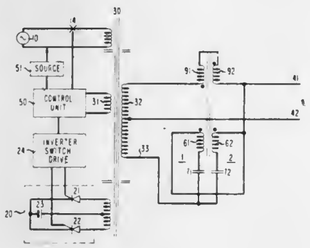
INDUCTOR APPARATUS FOR APPLICATION OF FERRORESONANT REGULATORS

Fakhry A. Fouad, Morristown; Robert J. Kakalec, Madison, and Henry E. Menkes, Pine Brook, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1985, Ser. No. 715,366

Int. Cl.⁴ G05F *1/70*

U.S. Cl. 323—306 **8 Claims**



1. In combination:

a multiphase ferroresonant regulator,

an inductor structure combined with the multiphase ferroresonant regulator and accommodating at least two substantially independent self-inductive reactances which are utilized as independent regulation inductors for at least a first and second phase of the multiphase ferroresonant regulator, the inductor structure comprising;

a two window magnetic core including first and second outer legs and a center leg between the first and second outer legs,

a first inductor winding wound on the first outer leg,

a second inductor winding wound on the second outer leg, and

the center leg having a cross sectional area equaling a combined cross sectional area of the first and second outer legs,

whereby the coupling between the first and second inductor windings is less than one-half.

4,631,472

ISOLATED LOW POWER THYRISTOR GATE DRIVE CIRCUIT

Patrick E. McCollum, Yorba Linda; James K. Brownrigg, Brea, and Carl O. Linder, La Habra Heights, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1985, Ser. No. 740,465

Int. Cl.⁴ H02J *3/12*

U.S. Cl. 323—325 **10 Claims**

1. An isolated low power thyristor gate drive circuit, for driving the gate of a thyristor having an anode and a cathode, the drive circuit being responsive to a signal voltage from a signal source, powered by a low voltage source with respect to a first reference potential, the gate drive circuit comprises:

a dual polarity source (DPS) responsive to said signal source for simultaneously providing a positive drive signal having a positive polarity with respect to a second reference potential and a negative drive signal having a negative polarity with respect to said second reference potential;

a normally open semiconductor device network having:

a current sink terminal,

a current source terminal, and

a gate terminal;

a normally conducting semiconductor device having:

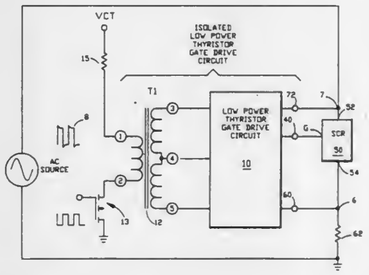
a current sink terminal,

a current source terminal, and

a control terminal;

said normally open semiconductor device network current sink terminal being coupled to said thyristor anode, said normally open semiconductor device network gate being coupled to receive said dual polarity source positive drive signal;

said normally conducting semiconductor device current sink terminal being coupled to said second reference potential, said thyristor gate and to said normally open semiconductor device network current source terminal,



said normally conducting semiconductor device current source control terminal being responsive to said negative drive signal; and

said normally conducting semiconductor device current source terminal being coupled to said thyristor cathode;

said normally conducting semiconductor device providing a relatively low resistance path between said thyristor gate and cathode in the absence of said dual polarity source negative drive signal, and

a substantially open circuit in response to said negative drive signal;

said normally open semiconductor device operating to provide a conduction path between said thyristor anode and said thyristor gate in response to said dual polarity source positive drive signal and an open circuit between said thyristor anode and gate in the absence of said dual polarity source positive drive signal.

4,631,473

TRANSIENT ELECTROMAGNETIC FIELD DETECTOR

Masamitsu Honda, Tokyo, Japan, assignor to Nippon Univac Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 413,717, Sep. 1, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 675,252

Claims priority, application Japan, Sep. 7, 1981, 56-140784

Int. Cl.⁴ G01R *31/02*

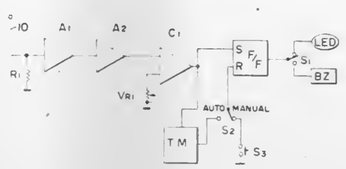
U.S. Cl. 324—72.5 **7 Claims**

1. A transient electromagnetic field detector for detecting a low strength transient electromagnetic field having a duration of less than a microsecond, comprising:

a broadband rod antenna less than 30 mm long for producing a voltage due to the reception of the induction term of the transient electromagnetic field;

an amplifier having an input connected directly to the bottom end of said antenna, for directly receiving and amplifying said voltage induced on the antenna by the induction term of the transient;

a comparator circuit for comparing the output of the amplifier with a predetermined reference level to produce a signal when the amplifier output exceeds the reference level;



a memory circuit responsive to the signal from the comparator circuit for remembering that said signal has been produced; and

an indicator responsive to the memory circuit for indicating that the amplifier output has exceeded the reference level.

4,631,474

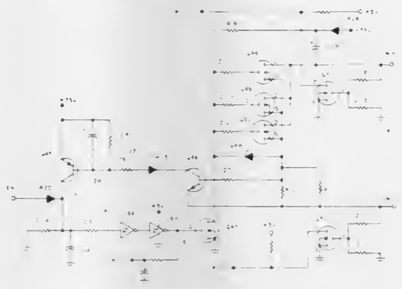
HIGH OR LOW-SIDE STATE RELAY WITH CURRENT LIMITING AND OPERATIONAL TESTING

Carlisle R. Dolland, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,862

Int. Cl.[4] G01R *31/02;* **H03K** *17/687*

U.S. Cl. 324—73 R **9 Claims**



1. A solid state relay having a high-side terminal and a low-side terminal for use in series with a load between a positive pole and a negative pole of a direct-current power supply, the negative pole being ground, the solid state relay being adapted for use either as a high-side switch in a configuration in which the high-side terminal is connected directly to said positive pole and the load is connected between the low-side terminal and ground, or as a low-side switch in a configuration in which the the load is connected between said positive pole and the high-side terminal with the low-side terminal connected directly to ground;

wherein said solid state relay comprises:

solid state switch means connected in series with current detection means between said high-side and low-side terminals, the solid state switch means having a control terminal for turning it on or off, on being a low-impedance state and off being a high-impedance state;

input means including Schmitt Trigger means coupled between an input terminal and said control terminal, responsive to first and second digital logic signals at the input terminal respectively to control a potential level at the control terminal for turning the solid state switch means on or off, bias means connected to the control terminal;

overload protection means coupled between said current detection means and said Schmitt Trigger means, including amplifying means and integrating means, for turning off the solid state device means in response to exceeding predetermined conditions of current and time; and

first test means having an input coupled to the high-side terminal and an output to a first indication terminal, and second test means having an input coupled to the low-side terminal and an output to a second indication terminal, for detecting given switch conditions and providing digital output indications.

4,631,475

METHOD OF DETECTING HAZARDOUS LINE VOLTAGES OVER A TWO-WIRE LINE

Lars E. Hammarberg, Handen, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

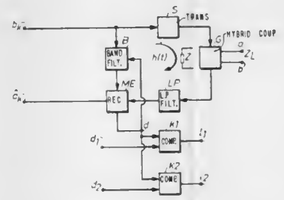
PCT No. PCT/SE83/00464, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/02625, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 20, 1983, Ser. No. 626,865

Claims priority, application Sweden, Dec. 21, 1982, 8207303

Int. Cl.[4] H04B *3/46*

U.S. Cl. 324—102 **3 Claims**



1. A method of detecting hazardous line voltages occurring over a two-wire connection (L) resulting from a cut-off or a short-circuiting, the connection being terminated by a hybrid coupler (G) and an apparatus (ME, B, LP) for adaptive echo elimination, which sends a digital signal (d) which stands in an unambiguous relation to the line impedance (Z_L) of the connection, said method comprising comparing said digital signal (d) with at least one digital limit value (d_1 or d_2), corresponding to an upper or lower limit of the normal value of the line impedance (Z_L), and sending an alarm signal in response to the thusly made comparison.

4,631,476

MEMORY PROGRAMMER INTERFACE FOR ELECTRONIC DEMAND REGISTER

Warren R. Germer, Dover, and Richard A. Balch, Rochester, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Oct. 11, 1984, Ser. No. 659,688

Int. Cl.[4] G01R *11/64*

U.S. Cl. 324—103 R **7 Claims**

1. An interface for interfacing a modular electronic demand register and a non-volatile memory programmer, said electronic demand register being of a type which includes a non-volatile memory comprising:

a circuit board in said electronic demand register;

means for mounting said non-volatile memory on said circuit board;

a housing for substantially completely enclosing said circuit board and said non-volatile memory;

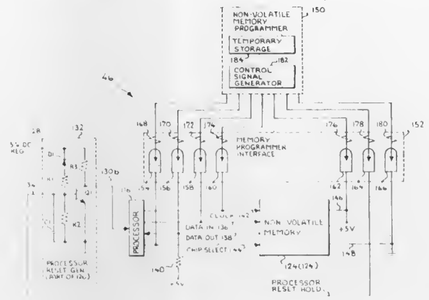
a plurality of conductive pads on said circuit board;

at least one slot in said housing aligned over at least some of said plurality of conductive pads;

a plurality of spring-pin connectors on said non-volatile memory programmer;

means for aligning said electronic demand register on said non-volatile memory programmer with said plurality of spring-pin connectors aligned with corresponding ones of said at least some of said plurality of conductive pads;

means for urging ends of said plurality of spring-pin connectors through said at least one slot and into resiliently urged contact with said at least some of said plurality of conductive pads; and



means for holding said electronic demand register in position on said non-volatile memory programmer with said plurality of spring-pin connectors resiliently urged into contact with said at least some of said plurality of conductive pads.

4,631,477

METHOD FOR ELIMINATING SPURIOUS SIGNALS IN A MEASURING INSTALLATION FOR IDENTIFYING THE POSITION OF A RIGID BODY IN SPACE

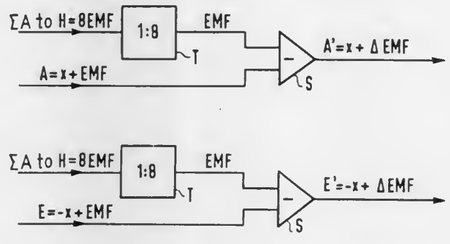
Bernd Nickel, Lorsch, and Wolfgang Schorr, Heppenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,298

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3327742

Int. Cl.[4] G01B *7/14;* **A61B** *5/10*

U.S. Cl. 324—207 **3 Claims**



1. A method for measuring the location of a fixed body in space by evaluating a plurality of signals respectively obtained from a plurality of magnetic flux receivers spaced from a magnetic flux generator carried on said fixed body, said receivers each having means defining the corner points of a pair of spaced parallel squared with said flux generator therebetween, each receiver generating a signal corresponding to the magnetic flux or change in magnetic flux generated by said flux generator and said signals being evaluated by the method comprising the steps of:

adding all signals from all of said receivers and thereby forming an aggregate interference signal;

subtracting said aggregate interference signal from each of the signals obtained from each receiver for eliminating the influence of external field interference from the resulting measurement.

4,631,478

METHOD AND APPARATUS FOR USING SPRING-TYPE RESISTIVE ELEMENTS IN A MEASUREMENT BRIDGE CIRCUIT

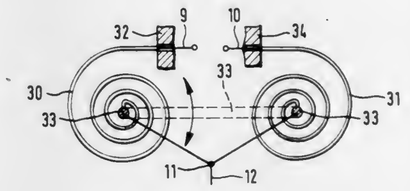
Manfred Knetsch, and Wolfgang Kühne, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,173

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218913

Int. Cl.[4] G01B *7/14;* **H01F** *21/02*

U.S. Cl. 324—207 **6 Claims**



1. An apparatus for converting a movement into a variable electrical voltage, which depends on the movement in accordance with an arbitrarily predeterminable function, and having at least one variable inductive measuring resistor located in an electrical current circuit, said resistor comprising a measuring spiral spring including an electrically conductive helix said measuring spiral spring being connected to a holder means and arranged to extend in a single plane and to exhibit rotational movement about the center of said measuring coil within said plane, said holder means being rotatable selectively to increase and decrease tension in said measuring spiral spring, and said spiral spring further is connected to a means for measuring rotational movement of said holder means as a function of said variable electrical voltage.

4,631,479

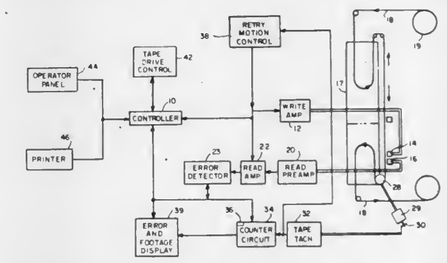
ERROR LOCATOR FOR HIGH-SPEED INSPECTION OF MAGNETIC TAPE

Hirokazu Haga, Euless, Tex., assignor to Graham Magnetics Inc., North Richland Hills, Tex.

Filed Apr. 18, 1983, Ser. No. 486,191

Int. Cl.[4] G01R *33/12;* **G01N** *27/72;* **G11B** *27/36;* **B08B** *7/00*

U.S. Cl. 324—212 **7 Claims**



4. In apparatus for inspecting and refurbishing the coating of a continuous, coated web, said apparatus comprising:

(a) means to detect a fault in said coating;

(b) means to stop said web after it has passed fault-detecting means;

(c) means to refurbish said coating at the point of said fault; and

(d) means to return any fault detected on said web to a return

position where it may be passed again through said refurbishing means;

(e) the improvement wherein said apparatus comprises electronic means to track the exact position of said fault and to compensate for inertial of the web on stopping and starting providing a tracking of the position of said fault through a repetitive number of attempts to refurbish said coating, said electronic means comprising a web-drive tachometer, and digital counting means to count and store digital pulses derived from the output of said tachometer as a function of the position of said tape.

4,631,480

NUCLEAR MAGNETIC RESONANCE METHOD AND APPARATUS

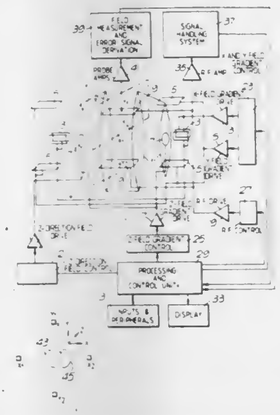
Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International Limited, Wembley, England

Filed Oct. 4, 1983, Ser. No. 539,008

Claims priority, application United Kingdom, Oct. 13, 1982, 8229193

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **6 Claims**



5. An imaging apparatus comprising means for applying RF magnetic field pulses of a predetermined frequency effective to excite nuclear magnetic resonance in a region including part of a body and means for measuring the free induction decay signal from said region, characterised in that said apparatus includes a quantity of a material of known nuclear magnetic resonance properties within said region, said quantity being excitable by said RF magnetic field pulses of a predetermined frequency, said material being present in sufficient quantity to enhance said free induction decay signal, and further including means for processing said free induction decay signal contributed by said material for enhancing the signal to noise ratio of the total free induction decay signal from said region.

4,631,481

N.M.R. SHIMS

Ian R. Young, Sunbury-on-Thames; Philip R. Evans, Bath, and Peter A. Luker, Wembley, all of England, assignors to Picker International Limited, Middlesex, England

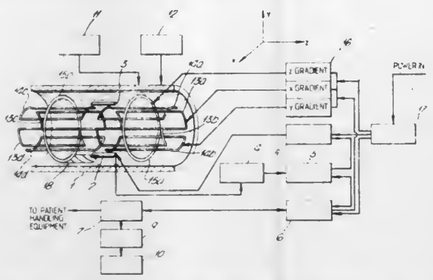
Filed Jan. 24, 1985, Ser. No. 694,424

Claims priority, application United Kingdom, Jan. 30, 1984, 8402360

Int. Cl.⁴ G01R *33/22*

U.S. Cl. 324—320 **6 Claims**

1. A method of reducing magnetic field inhomogeneities in N.M.R. apparatus, said method comprising the steps of cutting to size a deformable substantially non-electrically conducting body incorporating dispersed magnetic material but containing



substantially no hydrogen nuclei and applying said body to a supporting surface of the N.M.R. apparatus.

4,631,482

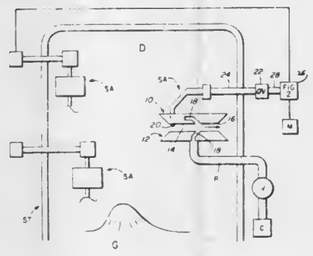
DUST FLOW INDUCING MONITOR

Robert E. Newton, Tewksbury, and Russell S. Girgenti, South Hamilton, both of Mass., assignors to Auburn International, Inc., Danvers, Mass.

Filed Oct. 9, 1984, Ser. No. 658,586

Int. Cl.⁴ G01N *27/60*

U.S. Cl. 324—454 **3 Claims**



1. Apparatus for dust concentration detection in a gas volume comprising suspended dust particles comprising:

(a) at least one means for converting a selected portion of the gas volume into a small cross-section i.e., less than one squ. in., fast gas stream of velocity of at least 1,000 feet per minute, said means comprising a gas flow inductor as a source of negative pressure,

(b) means for creating a charge transfer and resultant electrical signal varying in relation to dust concentration in the gas stream,

(c) the apparatus being constructed and arranged to provide a velocity-charge transfer match that produces a sensitive reading and avoids dust particle collection within the means for creating, and

(d) apparatus wherein the means for converting comprises a gas flow inductor as a source of negative pressure, wherein the inductor comprises a Venturi with a throat and with annular inductor gas flow through a portion thereof downstream of the throat of said Venturi.

4,631,483

PARTICLE ANALYZING APPARATUS AND METHOD OF MOVING PARTICLES IN SUSPENSION THROUGH SUCH APPARATUS

Oscar Proni, Hollywood, and Bobby D. James, Hialeah, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 1, 1984, Ser. No. 576,096

Int. Cl.⁴ G01N *27/00*

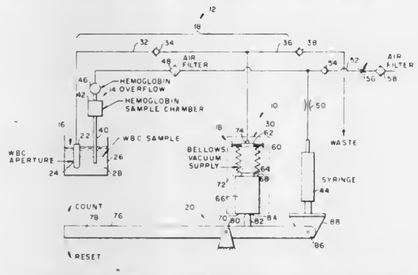
U.S. Cl. 324—71.4 **10 Claims**

1. A particle analyzing apparatus comprising:

a particle counting device wherein a suspension of particles is caused to be moved during a counting interval through an aperture, said aperture having an effective electrical impedance which is changed with the passage of each particle therethrough; and

fluid connection means connected to said particle counting device for drawing a quantity of said suspension through said aperture for a time period, said fluid connection means including a source of vacuum for generating a substantially constant level of vacuum during said counting interval, said source of vacuum comprising:

bellows means having an axis of symmetry and an end, and



constant force means connected to said end of said bellows means, said constant force means having a vertical axis of symmetry, whereby the same quantity of said suspension is drawn through said aperture during each counting interval.

4,631,484

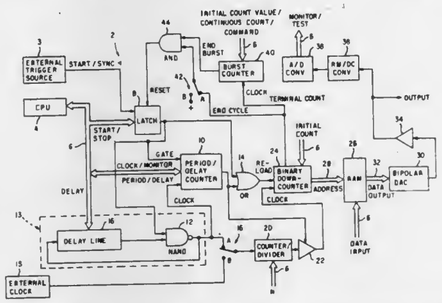
MULTIMODE PULSE GENERATOR

Jacob H. Malka, Fair Lawn, and Mordechai Friedlander, Palisades Park, both of N.J., assignors to Allied Corporation, Morris Twp., Morris County, N.J.

Filed Dec. 21, 1984, Ser. No. 684,757

Int. Cl.⁴ H03K *3/86, 5/26*

U.S. Cl. 328—63 **16 Claims**



1. A pulse generator for providing output pulse waveform cycles having an expanded resolution period and phase synchronization to external trigger pulses from an external trigger source, characterized by:

memory means for storing predetermined pulse output waveforms;

latch means receiving the external trigger pulses and latched thereby for providing outputs;

means for providing delay data;

clock means including an internal clock having delay line means connected to the delay data means and responsive to the data therefrom for providing delay outputs, and first gating means connected to the delay line means and to the latch means for gating the latch outputs and the delay outputs and for providing clock outputs in phase synchronization with the latch outputs; and

first counter means connected to the latch means, the clock means and the memory means, and responsive to the outputs from the latch means and the clock means for addressing the memory means, whereby the memory means provides predetermined stored output pulse waveform cycles, each cycle having a maximum of three periods, one of which is the expanded resolution period.

4,631,485

SYNCHRONOUS DEMODULATOR FOR AMPLITUDE MODULATED SIGNALS

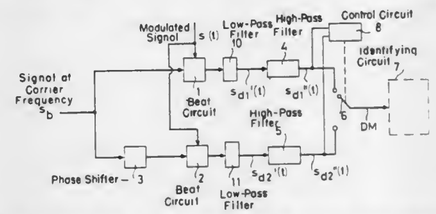
Guido Torelli, S. Alessio, and Vincenzo Daniele, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Dec. 28, 1984, Ser. No. 687,739

Claims priority, application Italy, Dec. 30, 1983, 24478 A/83

Int. Cl.⁴ H03D *1/06*

U.S. Cl. 329—50 **5 Claims**



1. A synchronous demodulator for amplitude modulated carrier signals, comprising a first beat circuit having a first input fed with the modulated signal and a second input fed with a beat signal substantially at the same frequency as the carrier of said modulated signal; a second beat circuit having a first input fed with said modulated signal and a second input fed with said beat signal phase-shifted by 90°; a commutator for alternately connecting the output signals of said first and second beat circuits to a common output of the demodulator; and control circuit means with an operation threshold for controlling switching of said commutator according to the amplitudes of the outputs signals of said beat circuits.

4,631,486

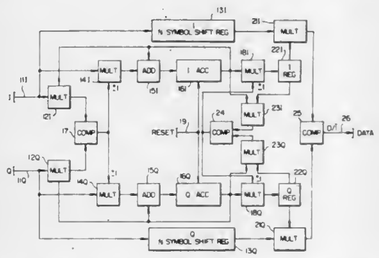
M-PHASE PSK VECTOR PROCESSOR DEMODULATOR

James L. Snell, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 1, 1985, Ser. No. 718,285

Int. Cl.⁴ H03D *3/06, 3/18*

U.S. Cl. 329—50 **45 Claims**



1. For use in a demodulator for detecting information signals which have been encoded in the form of M-ary phase shift keying signals, a method of generating a reference phase signal through the use of which information signals are recovered from received M-ary phase shift keying signals comprising the steps of:

(a) for a respective one of a plurality of received M-ary PSK signals, generating M respective vector sum signals respectively representative of the vector sums of a reference phase vector signal and each of M prescribed phase vectors referenced relative to said respective one of a plurality of received M-ary PSK signals;

(b) replacing said reference phase vector signal with that one

of the vector sum signals generated in step (a) whose magnitude is largest; and

(c) repeating steps (a) and (b) for a prescribed number N of received M-ary PSK signals to derive a reference phase vector signal that has been refined over said prescribed number N of received signals; whereby

upon completion of steps (a)–(c), the refined reference phase vector signal corresponds to said reference phase signal through the use of which information signals encoded in the form of M-ary PSK signals are recovered.

30. For use in a demodulator for detecting information signals which have been encoded in the form of M-ary phase shift keying signals, an arrangement for generating a reference phase signal through the use of which information signals are recovered from received M-ary phase shift keying signals comprising:

first means for generating, for each respective one of a plurality N of received M-ary PSK signals, M respective vector sum signals respectively representative of the vector sums of a reference phase vector signal and each of M prescribed phase vectors referenced relative to said respective one of a plurality of received M-ary PSK signals; and

second means, coupled to said first means, for replacing said reference phase vector signal with that one of the vector sum signals generated by said first means whose magnitude is largest; whereby

upon said second means having replaced said reference phase vector signal for the Nth one of said plurality N of received M-ary PSK signals there is obtained a refined reference phase vector signal corresponding to said reference phase signal through the use of which information signals encoded in the form of M-ary PSK signals are recovered.

4,631,487

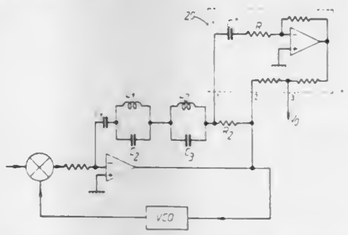
PHASE LOCK LOOP TELEVISION SIGNAL DEMODULATOR

Brian H. Beech, Bishopstoke, England, assignor to Independent Broadcasting Authority, London, England

Filed Sep. 24, 1985, Ser. No. 779,571

Int. Cl.[4] H03D *3/24*; H04N *9/66*

U.S. Cl. 329—50 **5 Claims**



1. A phase lock loop demodulator including a loop amplifier and filter and an equaliser circuit, wherein the amplifier and filter has its transfer function optimised for the presence of sound and colour subcarriers, and wherein the equaliser circuit has a transfer function which is independent of the transfer function of the loop amplifier and filter.

4,631,488

QAM DEMODULATOR WITH DISTORTION COMPENSATION

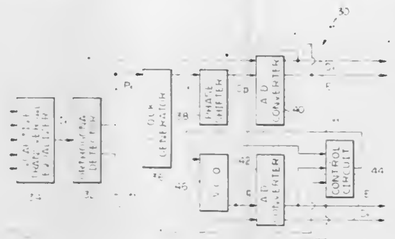
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,426

Claims priority, application Japan, Dec. 10, 1984, 59-260374

Int. Cl.[4] H03D *3/18*

U.S. Cl. 329—50 **8 Claims**



1. A demodulator for demodulating a quadrature-amplitude modulated signal, comprising:

an orthogonal detector for detecting the quadrature-amplitude modulated signal to produce first and second demodulated signals;

a first clock generator for regenerating a signal which is synchronous to a clock out of transition points of the quadrature-amplitude modulated signal or the first demodulated signal;

a first phase shifter for shifting a phase of said regenerated signal of said first clock generator to produce a first clock signal;

a first analog-to-digital converter for discriminating the first demodulated signal responsive to the first clock signal to produce a first group of data signals;

a second clock generator for producing a second clock signal, a frequency or a phase of which is controlled by a control signal;

a second analog-to-ditigal converter for discriminating the second demodulated signal responive to the second clock signal to produce a second group of data signals; and

a control circuit for gating and logically processing the second group of data signals to produce the control signal.

4,631,489

FM SIGNAL MAGNITUDE QUANTIZER AND DEMODULATOR COMPATIBLE WITH DIGITAL SIGNAL PROCESSING

Kevin M. Laird, Haltom, and Walt Rozanski, Hurst, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1985, Ser. No. 751,916

Int. Cl.[4] H03D *3/00, 3/24*

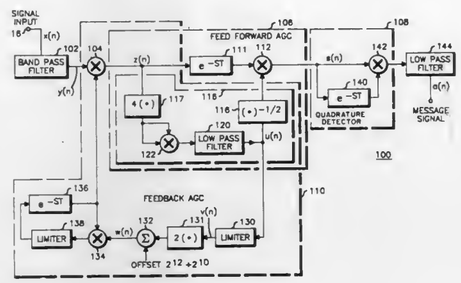
U.S. Cl. 329—110 **3 Claims**

1. An improved FM demodulator circuit for recovering and demodulating a FM signal in a received carrier signal, which demodulator circuit is compatible with digital signal processing and effective in maintaining a relatively constant envelope at the input to the associated FM detector, said demodulator circuit comprising:

(a) means including bandpass filter means for selecting a desired band of IF frequencies;

(b) feedback AGC means, including multiplier means coupled to the output of said bandpass filter means, and an AGC input and output, said feedback AGC means removing slow envelope variations of the FM IF signal; and

(c) feedforward AGC means, coupled to said output of said feedback AGC means, for eliminating fast amplitude modulation variations present on the FM IF signal, said feedforward AGC means further having a first output comprising the recovered FM signal and a second output coupled to said AGC input of said feedback AGC means, said second output comprising the square of the envelope of the recovered FM signal; and



(d) FM detector means coupled to said first output of said feedforward AGC means for recovering a baseband signal.

4,631,490

AUDIO OUTPUT AMPLIFYING DEVICE

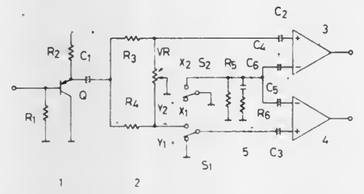
Yoshiaki Takahashi, Saitama, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,447

Claims priority, application Japan, Dec. 19, 1983, 58-195771[U]

Int. Cl.[4] H03F *3/68*

U.S. Cl. 330—51 **6 Claims**



1. An audio output amplifying device, comprising:

first differential amplifier means to which an audio output is supplied at a positive phase input;

signal selecting means for selectively outputting one of said audio output and a predetermined fixed voltage;

second differential amplifier means to which an output of said signal selecting means is applied at a positive phase input;

feedback means having an input terminal selectively connected to or disconnected from an output of said first differential amplifier, and output terminals respectively connected to negative phase input terminals of said first and second differential amplifier means so that said output of said first differential amplifier means is selectively fed back to said negative phase input terminals of said first and second differential amplifier means via said feedback means; and

switching means connected between said input terminal of said feedback means and a predetermined reference potential point, said switching means being turned on and said feedback means being disconnected from said first differential amplifier output, to disable said feedback means when an instruction is present to cause said signal selecting means to selectively output said audio output.

4,631,491

BIPOLAR TRANSISTOR RF POWER AMPLIFIER

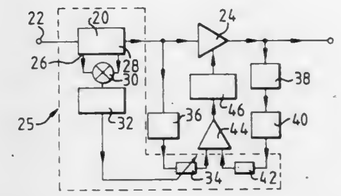
Colin R. Smithers, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,635

Claims priority, application United Kingdom, Aug. 17, 1984, 8420934

Int. Cl.[4] H03F *1/30, 3/24*

U.S. Cl. 330—149 **3 Claims**



1. A bipolar transistor R.F. power amplifier comprising a bipolar transistor having base and collector electrodes, an input circuit coupled to the base electrode and an output circuit coupled to the collector electrode, an adjustable collector voltage power supply coupled to said collector electrode, means for deriving a characteristic of an input signal in the input circuit, means for deriving the same type of characteristic of an output signal in the output circuit, and comparator means for comparing said corresponding characteristics of the input and output signals and providing a feedback control signal to the collector voltage power supply, wherein the collector voltage power supply is adapted to adjust said collector supply voltage so that the bipolar transistor operates in a mode where gain, phase shift and input impedance are simultaneously linearised, found at the onset of gain saturation in response to variations in input drive level;

further comprising means for sensing the magnitude and sign of the amplifier input reflections and means for deriving another control signal in response to the reflections sensed, said another control signal being used to adapt the feedback conditions of the amplifier; and

wherein said sensing means comprises a directional coupler connected to the input circuit of the bipolar transistor, the directional coupler having forward and reflected ports which are coupled to respective inputs of a synchronous detector, the output signal from which is used to provide said another control signal.

4,631,492

ULTRA HIGH FREQUENCY POWER AMPLIFIER

John Magarshack, Rueil Malmaison, and Dimitri Pavlidis, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1984, Ser. No. 604,036

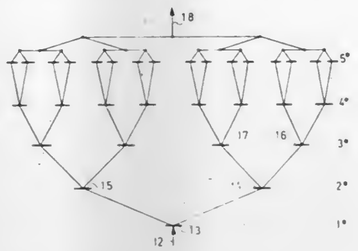
Claims priority, application France, Apr. 29, 1983, 8307179

Int. Cl.[4] H03F *3/68*

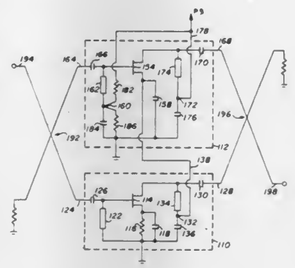
U.S. Cl. 330—277 **10 Claims**

1. An ultra high frequency power amplifier comprising an input terminal to which a low level input signal is applied and an output terminal from which is collected a high power signal, the structure of said amplifier, of arborescent form, comprises a pluraltiy of series connected amplifier stages, the first stage comprising a single transistor and the remaining stages comprising a plurality of elementary transistors, each transistor having one input terminal and at least two output terminals, the

transistor of the first stage being directly connected to and directly driving at least two transistors of the following amplification stage, the outputs of the transistors of the last stage being connected to a single output terminal.

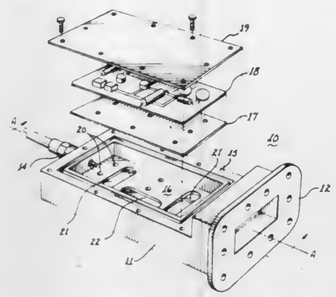


4,631,493
CIRCUIT FOR DC BIASING
George D. Vendelin, Saratoga, and Behruz Rezvani, Cupertino, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio
Filed Mar. 18, 1985, Ser. No. 712,879
Int. Cl.⁴ H03F *3/193, 3/60, 3/68*
U.S. Cl. 330—277 **7 Claims**



1. The combination comprising:
a first stage for connection to at least one of a pair of power-supply potentials; and
a second stage for connection to at least the other one of said pair of power-supply potentials, said second stage including,
a field-effect transistor having a drain, a source, and a gate,
means for coupling said drain of said second-stage transistor to said other one of said pair of power-supply potentials,
means for DC coupling said source of said second-stage transistor to said first stage and for AC decoupling said source of said second-stage transistor from said first stage, and
means for biasing said gate of said second-stage transistor at a predetermined DC potential which is independent of the level of the DC current which flows through said second-stage transistor establishing the DC potential developed at said source of said second-stage transistor.

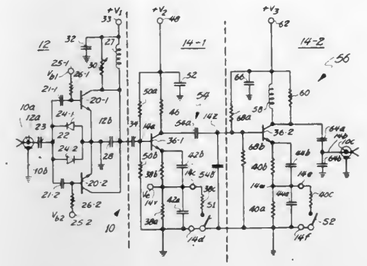
4,631,494
CONDUCTIVE HOUSING AND BIASING SYSTEM FOR MICROWAVE INTEGRATED CIRCUITS
Harry J. Gould, 1649 E. Hale, Mesa, Ariz. 85204
Filed Jul. 20, 1984, Ser. No. 633,104
Int. Cl.⁴ H03F *3/60*
U.S. Cl. 330—286 **14 Claims**



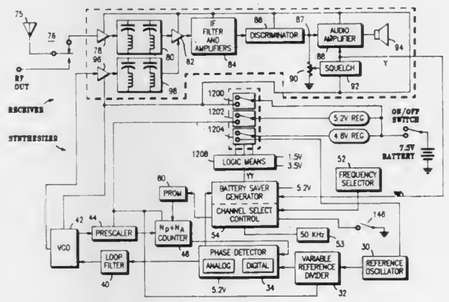
1. A system for processing microwave signals residing within a frequency band of interest, said system comprising:
(a) a segment of transmission line including a conductive ground plane, a first strip conductor and a dielectric substrate therebetween;
(b) a processing circuit including at least one transist or located on said segment, said transistor having source, drain and gate electrodes;
(c) input and output means electrically coupled to spaced regions of the strip conductor and adapted for connection to external circuit means;
(d) a conductive housing including receiving means for placement of said segment of transmission line therein;
(e) means for applying a supply voltage between said conductive housing and said strip conductor;
(f) dielectric means interposed between said segment and said receiving means whereby said ground plane is spaced from the conductive housing and the strip conductor;
(g) impedance means formed in the receiving means of said conductive housing, said impedance means electrically coupling said conductive housing to said ground plane at frequencies within the band of interest; and
(h) bias circuit means coupled to said strip conductor and said processing circuit for establishing the operating voltages therefor.

4,631,495
LOW-NOISE RF PREAMPLIFIER (ESPECIALLY FOR NUCLEAR MAGNETIC RESONANCE SYSTEM)
Otward M. Mueller, Ballston Lake, and William A. Edelstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed May 6, 1985, Ser. No. 730,522
Int. Cl.⁴ H03F *3/04*
U.S. Cl. 330—310 **16 Claims**

1. A radio-frequency (RF) preamplifier comprising:
a linear low-noise input stage having a plurality N of bipolar junction transistors having like electrodes effectively connected in RF parallel, and with each of the base electrodes of said plurality of parallel bipolar junction transistors being isolated from one another for direct current flow.

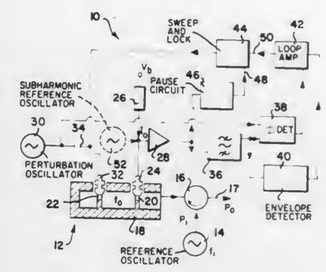


4,631,496
BATTERY SAVING SYSTEM FOR A FREQUENCY SYNTHESIZER
Jaime A. Borras, Hialeah, and Jose I. Suarez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 650,977, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 251,558, Apr. 6, 1981, abandoned. This application Dec. 13, 1985, Ser. No. 808,905
Int. Cl.⁴ H03L *7/18;* **H04B** *1/40*
U.S. Cl. 331—1 A **15 Claims**



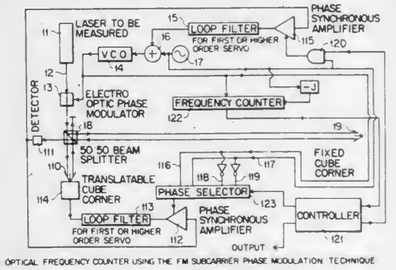
1. In a digital frequency synthesizer having a reference frequency source, sample and hold phase detector, voltage controlled oscillator and variable frequency divider, a power saving system comprising:
a power source; and
a power saving generator means generating a power saving signal having a predetermined duty cycle and period, said generator means, being coupled between said synthesizer and said power source, and responsive to the hold timing periods of said phase detector to interrupt power to said reference frequency source and variable divider in synchronism with the establishment of the hold timing periods of the phase detector to conserve power yet maintain the voltage controlled oscillator output without deviation or interruption.

4,631,497
INJECTION LOCKED RF OSCILLATOR WITH CONTROL HOOP
Robin M. Braun, Cape Town, South Africa, assignor to Plessey South Africa Limited, Cape Province, South Africa
Filed May 31, 1985, Ser. No. 739,695
Claims priority, application South Africa, Jun. 5, 1984, 84/4213
Int. Cl.⁴ H03L *7/12, 7/24*
U.S. Cl. 331—4 **9 Claims**



1. An injection locked RF oscillator, which comprises:
an RF source having a variable resonance frequency, for generating RF output power;
a reference oscillator for generating a reference signal having a reference frequency, and for injecting the reference signal into the RF source, thereby to cause injection locking of the RF source onto a lock frequency equal to the reference frequency or a harmonic of the reference frequency; and
a control loop comprising sensing means for sensing a parameter which varies in accordance with the difference between the lock frequency and the resonance frequency, and control means which is operative in response to the sensing means to control the resonance frequency;
said parameter being the current consumption of the RF source.

4,631,498
CW LASER WAVEMETER/FREQUENCY LOCKING TECHNIQUE
Gregory M. Cutler, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 26, 1985, Ser. No. 727,457
Int. Cl.⁴ H03L *7/00*
U.S. Cl. 331—9 **8 Claims**



OPTICAL FREQUENCY COUNTER USING THE FM SUBCARRIER PHASE MODULATION TECHNIQUE

1. A frequency locking circuit comprising:
a source of a beam of continuous wave, coherent radiation of frequency f_0;
means for phase modulating the beam, in response to a subcarrier of frequency f_1 that is itself modulated, to produce a phase modulated beam;
a filter through which the phase modulated beam passes, said

filter having a transfer function that has a characteristic frequency f_f;

a detector, responsive to the beam after the beam passes through the filter to produce a detector output signal;

means, responsive to the detector output signal, for adjusting the ratio of f_0/f_f to a fixed value L; and

means, responsive to the detector output signal, for adjusting the ratio of f_1/f_f to a fixed value K.

4,631,499

PHASE-LOCKED LOOP FOR A DIRECTLY MIXING SYNCHRONOUS AM-RECEIVER

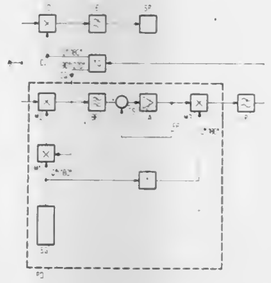
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,543

Claims priority, application Netherlands, Nov. 30, 1984, 8403648

Int. Cl.⁴ H03L *7/06;* **H03D** *3/18;* **H03K** *9/02*

U.S. Cl. 331—11 **9 Claims**



1. A phase-locked loop comprising a controllable oscillator phase-coupled through a phase detection arrangement and a low-pass filter to receive an input carrier applied to a signal input of the phase detection arrangement, characterized in that the phase detection arrangement comprises first, second and third cascade-coupled mixer stages, an auxiliary mixing signal having a fundamental frequency being applied to said first and third mixer stages from a signal generator, an input of one of the first and second mixer stages being connected to the signal input of the phase detection arrangement and an input of the other of the two last-mentioned mixer stages being coupled to an output of the controllable oscillator, the output of said third mixer stage being coupled to said low-pass filter, said low-pass filter having a cut-off frequency which is lower than the fundamental frequency of said auxiliary mixing signal, said fundamental frequency being lower than the frequency of the input carrier.

4,631,500

MICROWAVE FREQUENCY DIVIDER HAVING REGENERATIVE OSCILLATION

Christen Rauscher, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1984, Ser. No. 603,382

Int. Cl.⁴ H03B *19/00*

U.S. Cl. 331—51 **2 Claims**

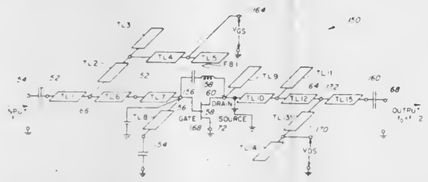
1. A regeneratively oscillating broadband microwave frequency divider circuit comprising:

nonlinear amplifier means for amplifying signals including a three-electrode field effect transistor connected between an input port and an output port, said field effect transistor exhibiting a nonlinear transconductance characteristic, said input port being adapted to receive a first signal having a frequency f_1;

said three electrode field effect transistor comprising a gate electrode, a drain electrode, and a source electrode, and being configured as a common source amplifier, said gate electrode forming said input port of said amplifier means and said drain electrode forming said output port of said amplifier means;

biasing means coupled to all three of said electrodes of said field-effect transistor for biasing said transistor at or just short of pinch off such that said field-effect transistor exhibits said nonlinear transconductance characteristic;

feedback means connected across two of said three electrodes of said field effect transistor between said output port and said input port of said nonlinear amplifier means for coupling a second signal having a frequency f_o that is



half said frequency f_1 from said output port to said input port of said nonlinear amplifier means, said first and second signals combining at said input port to modulate said nonlinear transconductance characteristic of said field effect transistor such that said first and second signals are mixed together and amplified in said field effect transistor to produce said second signal having a frequency f_o that is half said frequency f, said feedback means comprising an inductor and a d.c. blocking capacitor coupled in a non-resonant series circuit between said gate electrode and said drain electrode of said field-effect transistor;

whereby said frequency f_1 of said first signal is divided in half by said circuit to produce said frequency f_o of said second signal.

4,631,501

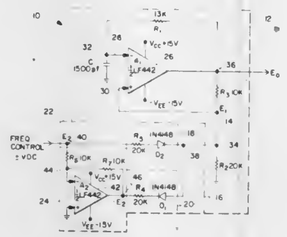
VOLTAGE CONTROLLED OSCILLATOR

Robert J. Matthys, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1985, Ser. No. 697,369

Int. Cl.⁴ H03K *3/35*

U.S. Cl. 331—143 **13 Claims**



1. A voltage controlled circuit, comprising:

means for producing an output voltage that switches polarity, said switch in polarity being determined by a comparison of first and second voltages, said first voltage being established at a node;

means for varying said first voltage including:

first and second unidirectional current conducting means connected in parallel at said node and adapted to pass substantial current only in different directions through said node;

means for applying a first frequency control voltage to said first unidirectional current conducting means, said first frequency control voltage having a first polarity; and

means for applying a second frequency control voltage to said second unidirectional current conducting means, said second frequency control voltage having a second polarity and being substantially equal in magnitude to said first frequency control voltage.

4,631,502

TRANSISTOR MODULATOR FOR CONVERTING VIDEO GAME SIGNALS INTO ANTENNA INPUT SIGNALS FOR A TELEVISION RECEIVER

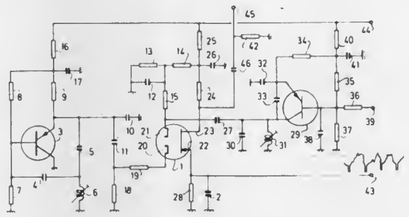
Nguyen Tran Kiem, Chatillon, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,082

Claims priority, application France, Nov. 20, 1984, 84 17669

Int. Cl.⁴ H03C *1/36, 3/00*

U.S. Cl. 332—16 T **3 Claims**



1. In a circuit for processing video and sound signals of a video game so as to produce a composite output signal which may be applied to the antenna input of a domestic television receiver to produce a video and audio display of such video game, such processing circuit comprising a frequency modulated oscillator producing FM sound intercarrier signals from such sound signals and an oscillator producing VHF carrier signals, the improvement consisting of a transistor modulator comprising:

an MOS transistor having a source electrode, a drain electrode and two gate electrodes, one of said source and drain electrodes and said two gate electrodes constituting inputs to said transistor and the other of said source and drain electrodes constituting the output from said transistor; one of said input electrodes being connected to said FM oscillator to receive said FM sound intercarrier signals, a second one of said input electrodes being connected to said VHF oscillator to receive said carrier signals;

circuit means for applying said video signals to the third one of said input electrodes;

and impedance means connected to said other one of said source and drain electrodes, said MOS transistor being adapted to produce said composite signal across said impedance means.

4,631,503

GROOVED WAVEGUIDE SHORTING BLOCK AND METHOD OF ASSEMBLY

Paul R. Brown, Marlton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1985, Ser. No. 749,272

Int. Cl.⁴ H01P *1/28, 1/397*

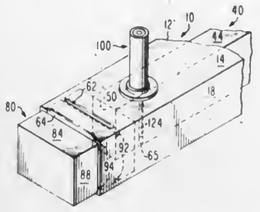
U.S. Cl. 333—24.1 **6 Claims**

1. The combination comprising

a deformable, conductive, waveguide having a pair of parallel, opposed relatively broad walls and a pair of parallel, relatively narrow walls extending between said broad walls;

a conductuve rigid block having a pair of substantially parallel, relatively broad faces, a pair of substantially parallel, relatively narrow faces extending between said broad faces and a groove in each of said broad faces extending across said broad faces and substantially perpendicular to said narrow faces;

said block extending into and substantially filling one end of said waveguide with said broad faces in substantial contact with said broad walls, said narrow faces disposed



adjacent said narrow walls and said grooves disposed within said waveguide; and

deformation in each of said broad walls extending into said groove adjacent thereto for securing said block to said waveguide and providing a radio frequency seal between said block and said broad walls.

4,631,504

IMPEDANCE CONVERSION TRANSFORMER

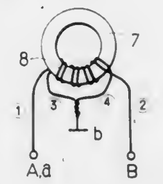
Takeshi Matsuda, and Harumi Kano, both of Tokyo, Japan, assignors to Showa Musen Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,409

Claims priority, application Japan, May 28, 1984, 59-106405

Int. Cl.⁴ H01P *5/10*

U.S. Cl. 333—25 **1 Claim**



1. An impedance conversion transformer comprising:

a ferrite core having a permeability which reduces in proportion to an increase in frequency within a frequency band used; and

a pair of coils wound about said ferrite core in a bifilar arrangement so that the electric length of each of said coils is a half-wave length for each frequency within said band used, with one of said coils having the opposite terminals thereof being electrically connected to each other and grounded and with the impedance conversion and balanced to unbalanced conversion being achieved between the opposite terminals of the other coil.

4,631,505

RIGHT ANGLE MICROWAVE STRIPLINE CIRCUIT CONNECTOR

Frank J. Schiavone, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,018

Int. Cl.⁴ H01P *5/08*

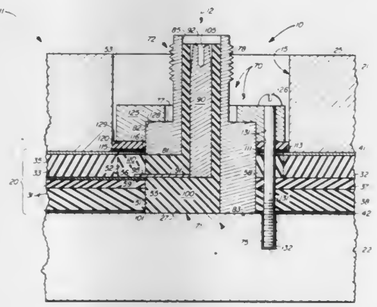
U.S. Cl. 333—33 **10 Claims**

1. A connector for use between a generally planar stripline circuit and a coaxial conductor extending perpendicularly thereto from one side thereof, the circuit having a ground plane spaced from said side and a conductive stripe disposed therebetween, the circuit defining a socket extending between said plane and said side, the socket having a greater transverse width between the stripe and said side than between the stripe

and said plane so that the stripe is accessible through said socket from said side; the coaxial conductor having a central conductive element, an outer conductive element circumscribing said central element, and a dielectric disposed therebetween; and the connector comprising:

a body having opposite ends and being configured to be received in such a socket with one of the ends juxtapositioned to such a ground plane, the other of said ends being adapted for connection to such a coaxial conductor and the body having;

a hollow conductor extending between said ends and bearing a planar surface at said other end disposed for engagement flatly with such a ground plane, the hollow conductor defining in one side thereof an opening disposed for alignment centrally with such a stripe when the body is so received;



an inner conductor disposed generally within and spaced from the hollow conductor, the inner conductor having a first portion which extends generally parallel to such a ground plane when the body is so received and which extends through said opening, said first portion extending outwardly of the hollow conductor and, outwardly thereof, being disposed to engage the stripe when the body is inserted into the socket in a direction from said one side toward said ground plane, and said inner conductor having a second portion extending from said first portion inwardly of said opening and generally perpendicular thereto to said one end of the body; and

means for releasably mounting the body on the circuit when the body is so received;

and means disposed at said one end of the body for electrically connecting the hollow conductor to said outer conductive element and for electrically connecting the inner conductor to said central conductive element.

4,631,506

FREQUENCY-ADJUSTABLE COAXIAL DIELECTRIC RESONATOR AND FILTER USING THE SAME

Mitsuo Makimoto, Yokohama; Haruyoshi Endo, and Sadahiko Yamashita, both of Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 15, 1983, Ser. No. 514,262

Claims priority, application Japan, Jul. 15, 1982, 57-124085

Int. Cl.⁴ H01P *7/04*

U.S. Cl. 333—224 **1 Claim**

1. A coaxial dielectric resonator comprising:

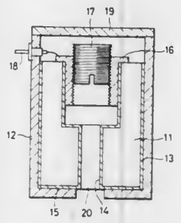
a longitudinally extending hollow dielectric member having two ends and longitudinally extending cylindrical inner and outer surfaces extending between the two ends;

an inner hollow conductor disposed on said cylindrical inner surface extending between the two ends forming a longitudinally extending passage therethrough;

an outer conductor disposed on said cylindrical outer surface extending between the two ends, said outer conductor also extending across one of the two ends to contact said inner conductor to form a short-circuit end;

a third, hollow cylindrical conductor having a threaded inner surface and an outer surface contacting said inner conductor adjacent the other of the two ends of said hollow dielectric member;

a fourth, cylindrical conductor having a threaded circumference engaging the threaded inner surface of said third conductor, the fourth conductor having means adapted to be engageable through said passage with an adjustment



tool by which the position of the fourth conductor is longitudinally adjustable, said engageable means being located inwardly from said short-circuit end;

a fifth conductor contacting said outer conductor and longitudinally spaced from said fourth conductor to form a capacitive coupling therewith; and

wherein said inner surface of the dielectric has a small diameter portion and a large diameter portion defining a stepped shoulder therebetween, said third conductor being accommodated in said large diameter portion.

4,631,507

VARIABLE COMPOSITION SWITCHING DEVICE

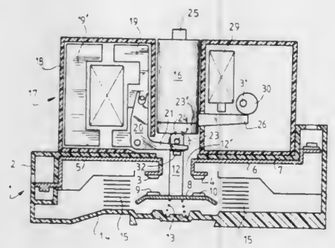
Jean-Pierre Guery, Bezons; Gerald Gashet, Puteaux; Jacques Olifant, Nanterre, and Raymond Plumeret, Asnieres, all of France, assignors to La Telemecanique Electrique, France

Filed Sep. 27, 1985, Ser. No. 780,772

Claims priority, application France, Sep. 27, 1984, 84 14826

Int. Cl.⁴ H01H *73/00, 77/02*

U.S. Cl. 335—27 **17 Claims**



1. A variable composition switching device comprising a set of modular components assembled together as required to ensure miscellaneous switching functions such as those usually associated with a switch, a contactor, a contactor with relay, the said assembly comprising:

(i) at least one basic modular component incorporating a controllable switching device, said controllable switching device including:

at least one fixed contact unit,

a mobile element carrying at least one mobile contact unit, and able to move between a first position in which the mobile contact unit is in contact with the fixed contact unit, and a second position in which the mobile contact unit is separated from the fixed contact unit,

elastic means exerting a pull on the mobile element that tends to force the latter to return to the said second position, and

an operating rod, rigidly attached to the mobile element or part of same, this operating rod comprising at least one bearing surface upon which a control force antagonistic to the elastic means can be applied to cause the mobile element to move into the first position,

and

(ii) at least two types of modular control components with means assembled to the basic modular component, said modular control components comprising :

a modular direct swiching control component involving direct-action operating means, able to exert on the bearing surface of at least one basic modular component a fast enough control action with sufficient force to ensure proper switching operation;

one modular indirect switching control component involving operating means which, in response to a slow order, or one with insufficient energy to ensure proper switching, act on the bearing surface of at least one basic modular component by means of a potential energy accumulation tripping device, wherein said potential energy accumulation tripping device can take a set stable state and a tripped stable state, a setting transient phase and a tripping transient phase, said potential energy accumulation tripping device including:

actuating means that can successively take a stable tripped position in which it exerts an action antagonistic to that of the elastic means on the bearing surface of the operating rod of the switching device, to make sure that the mobile element is securely held in the first position, and a stable reset position in which the actuating means allows the mobile element to return to its second position;

potential energy accumulation means designed to store potential energy during the setting phase, and to restitute it as mechanical energy on the actuating means, and so to cause the mobile element to move from the second position to the first position during the tripping phase;

setting means involving at least one setting part upon which energy can be applied during the setting phase and a setting mechanism designed to apply the said energy to cause the actuating means to move from the tripped position to the set position, and simultaneously to transmit part of the said energy to the potential energy accumulation means, and

a tripper involving at least one tripping part upon which at least one operating control action can be applied to generate the tripping phase, whereas this control action can be produced by one or several control and/or protection means designed to induce a sudden change of state in the controllable switching device.

4,631,508

ELECTRO-MECHANICAL DEVICES INCORPORATING FUSE CARTRIDGES

Jean P. Cinquin, Cremieu; Christian Gazzoto, Villeurbanne, and Michel Pisciotta, Bron, all of France, assignors to Ferraz, Lyons, France

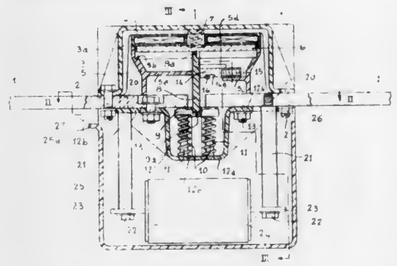
Filed Sep. 20, 1985, Ser. No. 778,470

Int. Cl.⁴ H01H *51/00, 53/00*

U.S. Cl. 335—142 **8 Claims**

1. An electro-mechanical circuit breaker having improved structure, the breaker being of the type having opposed fixed contacts spaced apart across a gap and having an insulating plate guided in a housing for reciprocation within the gap, the plate being spring-urged from a open position to a closed position and the plate carrying mobile contacts which in the closed position connect said fixed contacts together and which in the open position are spaced therefrom, and the breaker having a conductive disc in the housing disposed normal to the plate and having a coil in the housing disposed adjacent to the conductive disc on the opposite side thereof from the insulating plate and operative when the coil is energized to repel the conductive disc against the plate and drive it from its closed position toward a fully open position, and the breaker having a fuse cartridge connected in shunt with the fixed contacts and operative to melt after a brief delay when the contacts are driven open, the improvements comprising:

(a) a latch bolt supported in the housing and spring-urged toward the insulating plate, and the plate having a latching



notch therein disposed to lie opposite the latch bolt when the plate is in fully open position; and

(b) the housing retaining the conductive disc between the coil and the insulating plate and normal to the plate and having a shoulder disposed to stop motion of the disc after it has driven the plate part-way toward its fully open position, the kinetic energy of the insulating plate carrying it the rest of the way to latch with the bolt in fully open position.

4,631,509

ELECTRICAL INDUCTION APPARATUS WITH SUPPORT INSIDE CASING

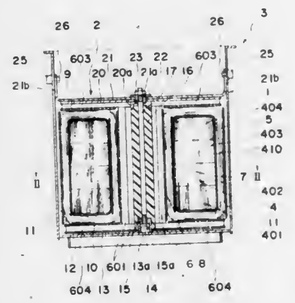
Kazuhiro Arii, Kobe; Yasuo Yamamoto, Settsu; Nobuyuki Sumida, Sakai; Katsumi Hanaoka, Kawanishi, and Kazuhiro Tanaka, Suita, all of Japan, assignors to Allied Corporation, New York, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,450

Claims priority, application Japan, Apr. 25, 1984, 59-61100[U]

Int. Cl.⁴ H01F *27/06*

U.S. Cl. 336—92 **5 Claims**



1. An electrical induction apparatus having a magnetic core unit being comprised of a toroidal magnetic core and at least one winding wound around the core and a casing for housing the magnetic core unit therein, comprising

a support plate for supporting the bottom of the magnetic core unit having at least one opening,

means for positioning the unit at a predetermined position in the casing being engageable to the opening of the support plate,

a cylindrical member made of an insulating material which is so formed as to fit into the central hole of the unit,

a mounting plate for fixing the unit being disposed on the top of the unit,

an axial member passing through the central hole of the cylindrical member, one end of which is connected to the supporting plate and the other end of which is projected outwardly in the axial direction thereof,

a nut means for fastening the mounting plate to hold the unit between the mounting plate and the supporting plate which is engageable to a threaded portion provided on the other end of the axial member,

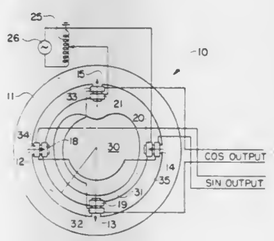
wherein the mounting plate is fixed to the casing so as to hang the unit in the casing.

4,631,510

HARMONICALLY GRADED AIRGAP RELUCTANCE-TYPE ROTATING ELECTRIC RESOLVER

Ashok Nagarkatti; Robert E. Lordo, both of Charlotte, N.C., and Burkhart Kind, Pittsburgh, Pa., assignors to Powerton, division of Contraves Goerz Corporation, Charlotte, N.C.

Filed Sep. 3, 1985, Ser. No. 771,815
Int. Cl.[4] H01F *21/06;* H02K *19/24*
U.S. Cl. 336—135 **15 Claims**



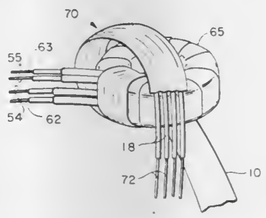
1. A reluctance-type resolver for an electric machine comprising a toothed stator having input and output windings thereon and a rotor rotatably positioned within said stator, wherein said rotor defines a periphery profiled to produce during rotation a smoothly varying airgap according to a formula wherein the inverse of the radial airgap at any predetermined point on the rotor is proportional to a constant plus the sine of the product of the number of lobes on said rotor and the angle between the predetermined point on the rotor and a reference point on the stator, whereby the magnetic permeance of the airgap varies sinusoidally.

4,631,511

TOROID TRANSFORMERS AND SECONDARY WINDINGS

Robert D. Sylvester, Jr., Dover; Paul C. Horn, Somersworth, and Vincent J. Bober, Rochester, all of N.H., assignors to GFS Manufacturing Company, Inc., Dover, N.H.

Filed Mar. 1, 1985, Ser. No. 707,135
Int. Cl.[4] H01F *27/28*
U.S. Cl. 336—180 **8 Claims**



1. A toroid transformer having a primary winding with indexed turns distributed evenly around a toroidal core of permeable material and a plurality of separate multifilar secondary windings formed in separate layers over the indexed primary winding and around the toroidal core where the toroid transformer is characterized by a relatively high ratio of primary winding turns to secondary winding turns of approximately at least 6 and the secondary windings are formed over the compound curvature and irregular surface layers of the toroid transformer comprising:

a plurality of layers of electrically insulating tape formed over the primary winding around the toroidal core, each layer comprising successive overlapping turns of tape of elongate strip configuration, each turn lapping adjacent turns thereby increasing distance over material surfaces between layers;

a multifilar first secondary strap winding formed over the indexed turns of the primary winding and layers of electrically insulating tape in substantially equally spaced turns around the toroidal core, said first secondary strap winding comprising a flat array of a plurality of coplanar parallel secondary winding filaments electrically coupled in parallel, a first elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to one side of the multiple filaments, and a second elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to the other side ofthe filaments and to the first elongate strip, said first and second elongate strips being wider than the flat array of multiple filaments thereby forming a margin of two strips of adhesively bonded tape along the sides of the first secondary strap winding extending beyond the outside filaments of the first secondary strap winding thereby increasing distance over material surfaces between separate winding layers, the filaments of the first secondary strap winding being maintained in substantially equally spaced relationship relative to each other without crossover and relative to the turns of the primary winding over the compound curvature and uneven surfaces of the layers around the toroidal core by the first and second elongate strips adhesively bonded to each other and to the multiple filaments of the first secondary strap winding thereby optimizing mutual inductance between the first secondary strap winding and the primary winding and minimizing leakage inductance;

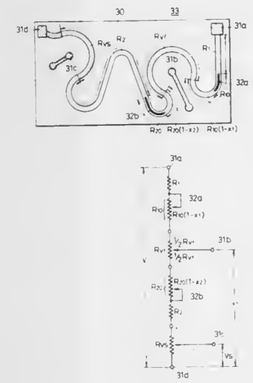
a second secondary strap winding formed directly over the first secondary strap winding in substantially equally spaced turns around the toroidal core without a separate electrically insulating layer of tape between the first and second secondary strap windings, said second secondary strap winding comprising a flay array of a plurality of coplanar parallel secondary winding filaments electrically coupled in parallel, a first elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to one side of the filaments, a second elongate strip of electrically insulating tape having an adhesive layer on one side adhesively bonded to the other side of the filaments and to the first elongate strip, said first and second elongate strips being wider than the flat array of multiple filaments of the second secondary strap winding forming a margin of two strips of adhesively bonded tape along the sides of the second secondary strap winding extending beyond the outside filaments of the second secondary strap winding thereby increasing distance over material surfaces between separate winding layers, the multiple filaments of the second secondary strap winding being maintained in substantially equal spaced relationship relative to each other without crossover and relative to the turns of the primary winding over the compound curvature and uneven surfaces of the layers around the toroidal core thereby optimizing mutual inductance between the primary winding and the second secondary strap winding and minimizing leakage inductance.

4,631,512

VOLTAGE DIVIDING RESISTOR DEVICE

Hideo Hishiki, and Yukio Kamiyama, both of Iwai, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jun. 1, 1984, Ser. No. 616,471
Claims priority, application Japan, Jun. 3, 1983, 58-84945[U]
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—48 **9 Claims**



1. A voltage dividing resistor device comprising:

a substrate (**30**);

first through third electrodes (**31***a*, **31***b*, **31***d*) printed on said substrate;

a group of resistor bodies (R_{Vs}, R_2, R_{20}, R_{Vf}, R_{10}, R_1) printed on said substrate, said group of resistor bodies at least comprising first through third resistor bodies (R_{10}, R_{Vf}, R_{20}) connected in series so that one end of said first resistor body (R_{10}) is coupled to said first electrode (**31***a*) and one end of said third resistor body (R_{20}) is coupled to said third electrode (**31***d*) with said decond resistor body (R_{Vf}) connected between said first and third resistor bodies, said first and third resistor bodies having mutually identical lengths and resistances;

a conductive member (**25**) coupling said second electrode (**31***b*) with a predetermined point on said second resistor body (R_{Vf}), a first desired divided voltage (V_f) being obtained across said second and third electrodes (**31***b*, **31***d*) when a predetermined voltage (V) is applied across said first and third electrodes (**31***a*, **31***d*); and

first and second conductor parts (**32***a*; **32***b*), at least one of which is formed to be in a mutually overlapping relationship with a part of at least one of said first and third resistor bodies (R_{10}, R_{20}), respectively,

said first and second conductor parts having lengths thereof set depending on the value of said first desired divided voltage (V_f) so that an equation $X_1+X_2=1$ stands, where X_1 represents a ratio of the length of said first conductor part with respect to a length of said first resistor body and X_2 represents a ratio of the length of said second conductor part with respect to a length of said third resistor body,

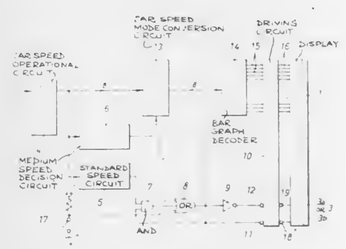
said group of resistor bodies having a fixed total length and a fixed pattern on said substrate independent of a value of said first desired divided voltage.

4,631,513

DISPLAY UNIT OF SPEEDOMETER FOR AUTOMOBILE

Tohru Teshima, Yokohama; Hidehiko Naete, Kawasaki, both of Japan, and Pierre H. Robert, Bougival, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France and Stanley Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,580
Claims priority, application Japan, Apr. 20, 1982, 57-64874
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 R **2 Claims**



1. A display unit of a speedometer for an automobile, comprising:

a car speed operational circuit adapted to receive signals corresponding to car speed for producing and transmitting corresponding output signals;

a set standard decision circuit coupled to said output signals of said car speed operational circuit for determining when car speed exceeds a set standard speed and for producing a corresponding output;

a set medium speed decision circuit coupled to said output signals of said car speed operational circuit for determining when car speed exceeds a set medium speed and for producing a corresponding output;

an OR circuit having plural inputs and an output, including a first input coupled to said output of said set medium speed detector;

an AND circuit having a first input coupled to an output of said set standard decision circuit, a second input coupled to said output of said OR circuit, and an output coupled to a second input of said OR circuit;

display means for displaying car speeds in at least two scale modes including a standard scale mode and an enlarged scale mode, including a bar graph display including plural display segments, a scale display, and a driving circuit for selectively driving said segments and said scale display; and

a car speed mode conversion circuit coupled to said output signals of said car speed operational circuit for converting said output signals thereof to display signals and applying said display signals to said driving circuit, said conversion circuit having a control input coupled to the output of said OR circuit for controlling whether said display signals are operative to produce a standard scale display in said standard mode or an enlarged scale display in said enlarged scale mode based on the output of said OR circuit and which operates in a hysterisis mode;

said OR circuit output coupled to said driving circuit to control the scale display to display scale as either a standard scale or an enlarged scale.

4,631,514

MALFUNCTION DETECTION ARRANGEMENT FOR JERK CONTROLLED BRAKE COMMAND SYSTEM

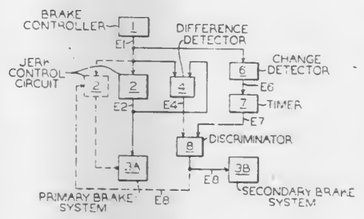
Tatsuo Fujiwara, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 8, 1985, Ser. No. 720,773

Claims priority, application Japan, Apr. 26, 1984, 59-62751[U]

Int. Cl.⁴ B60Q *1/00*; B60T *13/70*; B61B *13/16*

U.S. Cl. 340—52 R **13 Claims**



1. A railway car brake control system comprising:

(a) brake controller means for providing a brake command signal according to the amount of braking desired;

(b) first means for modifying said brake command signal to provide a jerk control signal;

(c) primary brake means operative in response to said jerk control signal for providing smooth application of braking of said railway car;

(d) difference detector means for providing a difference signal anytime said brake command and said jerk control signals disagree;

(e) discriminator means subject to said difference signal for providing a malfunction signal;

(f) change detector means for providing a change signal anytime said brake command signal is varied; and

(g) timer means subject to said change signal for initiating a preset time period each time said brake command signal is varied, during which time period, said discriminator means is prevented from providing said malfunction signal, to thereby distinguish the temporary existence of said difference signal due to normal operation of said jerk control means from said difference signal due to abnormal operation of said jerk control means.

4,631,515

VEHICLE GEAR SHIFT INDICATOR

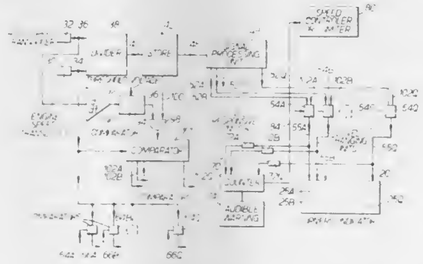
Timothy J. Blee, and Norman P. Deane, both of Rugby, Great Britain, assignors to AE PLC, Warwickshire, England

Filed Dec. 22, 1982, Ser. No. 452,083

Claims priority, application United Kingdom, Apr. 22, 1981, 8112478

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—62 **14 Claims**



1. An indicating system for use on a mechanically propelled vehicle having a driver-operated engine-driving wheels transmission system using a plurality of separate gears normally operable in an ascending or descending sequence and to indicate to the driver thereof when he should change from the particular one of the gears which is engaged at any time to the next gear in one of the sequences comprising

means responsive to the particular gear engaged to produce an electrical datum signal having a value representing a datum speed dependent on the identity of that gear,

indicating means comprising means operative in response to predetermined control signals to produce respective ones of a series of indications to the driver indicating with successively greater urgency that he should change to the next gear in the said sequence,

means responsive to the actual speed of the engine or of the vehicle to produce an electrical signal representing that speed,

control means responsive to the datum signal and to the electrical signal representing the actual speed and operative when the actual speed reaches the datum speed to produce a first one of the said control signals,

means feeding the first control signal to the indicating means to cause the indicating means to produce the first said indication in the said series,

means responsive to the datum signal and to the electrical signal representing the actual speed and connected to sense whether the driver changes to the said next gear in the sequence in response to the said first indication in the said series and, if he does not, to produce successive further said control signals as the actual speed exceeds the datum speed by a respective predetermined amount or amounts, and

means connected to feed the said further control signals to the indicating means to cause the indicating means to produce in succession the other indications in the said series,

the values of the datum signals being respectively predetermined so that the respective datum signals are such that respective gear changes at those speeds promote engine efficiency, the datum signals having values which are pre-calculated and are independent of the actual operation of the vehicle at any time.

4,631,516

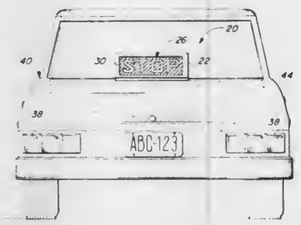
AUXILIARY VEHICLE WARNING SYSTEM

Gerald Clinker, 4647 Don Pio, Woodland Hills, Calif. 91364

Filed Sep. 3, 1985, Ser. No. 771,249

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—76 **8 Claims**



1. An information display system for vehicles, said system comprising, in combination:

(a) a housing containing a visual display means for providing a plurality of individually selectable messages,

(b) mounting means for removeably securing said display means to a vehicle,

(c) a multiple message display storage unit,

(d) sensor-discriminator means,

(e) pulse generation means capable of generating a plurality of different signals and which is adapted to be selectively activated by the operator of said vehicle said pulse generation means comprising existing electrical equipment for actuating standard vehicle functions, wherein the method of operation of the existing electrical equipment generates pulses,

(f) an electfical power source,

(g) electrical circuit means interconnecting said power source, said pulse generating means, said sensor-discriminator means, said multiple message display storage unit, and said visual display means,

(h) whereby the transmission of a particular signal from said pulse generation means to said sensor discriminator means will cause a predetermined message to be displayed on said visual display means.

4,631,517

FREQUENCY-MATCHED SIGNAL DEVICE FOR PERSONS WITH IMPAIRED HEARING

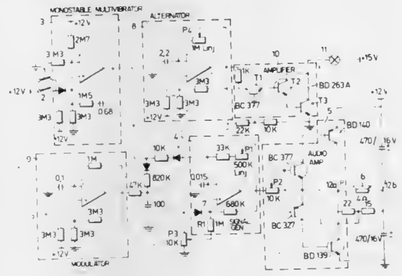
Kenth J. Ajland, Riddarvagen 74, S-184 02 Osterskar

Filed Nov. 28, 1980, Ser. No. 211,338

Claims priority, application Sweden, Nov. 30, 1979, 7909920

Int. Cl.⁴ G08B *3/10*

U.S. Cl. 340—326 **8 Claims**



1. A frequency-matched signal device for a person with impaired hearing, but whose right and left ears do not have identical hearing impairments, such that the person's hearing is sensitive to tones of two respective particular frequencies at substantially normal audio levels, comprising

an acutator for selectively initiating operation of the device;

signal generating means activated by said actuator for generating alternating first and second audio tones; and

output transducer means providing an acoustic signal in response to said audio tones; wherein

said signal generating means includes

an audio signal generator providing an electrical audio tone,

first freely and continuously adjustable means for selectively setting the fundamental frequency of said electrical audio tone emitted thereby to the higher of the two particular frequencies to which the hearing of the person with impaired hearing is sensitive;

second freely and continuously adjustable means coupled to said audio signal generator for selectively setting the fundamental frequency of said second audio tone emitted thereby, without disturbing the setting effected by the first adjustable means, to the lower of said two particular frequencies, the second adjustable means being freely adjustable from the higher of the two particular frequencies downward over a range of three octaves; and

an alternator coupled to the signal generator for causing the electrical output signal of the signal generator to alternate between said two particular frequencies at a predetermined slow rate.

4,631,518

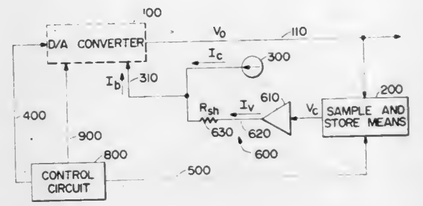
DIGITAL-TO-ANALOG CONVERTER BIASING CONTROL CIRCUIT

George J. Caspell, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 24, 1984, Ser. No. 653,617

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 DA **10 Claims**



1. The method of operating a device for controlling the output voltage range of a digital-to-analog converter including means for sampling and storing an output voltage of the digital-to-analog converter and means to bias the voltage range of the digital-to-analog converter in accordance with the stored value, said method comprising:

storing said output voltage in said sampling and storing means,

biasing the voltage range of the digital-to-analog converter in accordance with a controlled current proportion to the stored value in combination with a predetermined constant current to provide a new output voltage, and

successively sampling and storing a new output voltage value and using the same to bias said voltage range until a desired voltage range is achieved.

4,631,519

POSITION MEASURING APPARATUS

James S. Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, England

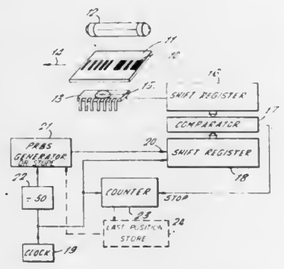
PCT No. PCT/GB83/00215, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/01027, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 1, 1983, Ser. No. 606,814

Claims priority, application United Kingdom, Sep. 1, 1982, 8224888

Int. Cl.⁴ H03M *1/22*

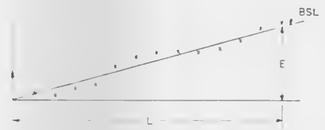
U.S. Cl. 340—347 P **23 Claims**



1. Position measuring apparatus for determining the relative position of two relatively movable members comprising markings forming regularly spaced code elements on one member extending in the direction of relative movement and defining a pseudo-random binary sequence (PRBS), and detecting means on the other member for sensing said markings, said detecting means being arranged to sense markings in a sufficient number of successive code elements, which number is less than the full

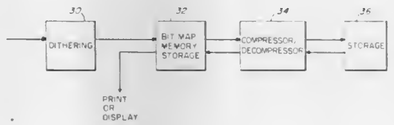
length of the PRBS, to define a unique position along the PRBS and thereby give a coarse unambiguous position determination, and said detecting means further being arranged to sense the positions of transitions or edges of markings in a plurality of successive code elements to define a fine position within the length of a code element.

4,631,520
POSITION ENCODER COMPENSATION SYSTEM
Sidney A. Wingate, Concord, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.
Filed Jun. 8, 1984, Ser. No. 618,509
Int. Cl.[4] H03K *13/02, 13/18*
U.S. Cl. 340—347 CC **15 Claims**



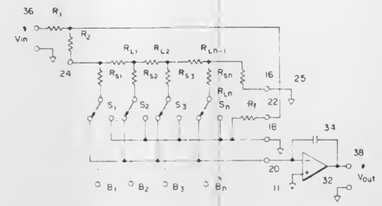
9. A position encoder having a scale and a head relatively movable along the scale;
means for providing sinusoidal encoder signals representing the position of the head relative to the scale;
means for compensating for scale error comprising:
means operative in response to the encoder signals for providing a signal indication of each predetermined increment of relative motion;
means for providing phase correction signals representing an error function of the scale; and
means operative in response to the signal indication to combine the phase correction signal with the encoder signals and provide output signals compensated for scale error.

4,631,521
METHOD AND APPARATUS FOR DIFFERENTIAL RUN-LENGTH CODING
Ahmed M. El-Sherbini, Giza, Egypt, assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 31, 1984, Ser. No. 687,629
Int. Cl.[4] H03K *13/22;* **H04N** *1/00*
U.S. Cl. 340—347 DD **22 Claims**



1. A method for data compression of binary bits representing the pixels of a dithered image in a digital imaging process comprising the steps of
in every scan line of pixels, differentiating between corresponding bits of bytes from a specified reference byte located in the scan line to be used unchanged in each differentiation and every other byte in the scan line to generate intermediate image data representing said dithered image, the original state of said reference byte being included in said imtermediate image data and
encoding said intermediate image data.

4,631,522
METHOD AND CIRCUIT FOR COMPENSATION OF A MULTIPLYING DIGITAL-TO-ANALOG CONVERTER
Richard C. Cabot, Beaverton, Oreg., assignor to Audio Precision, Inc., Beaverton, Oreg., a part interest
Filed Apr. 12, 1985, Ser. No. 722,858
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 CC **5 Claims**

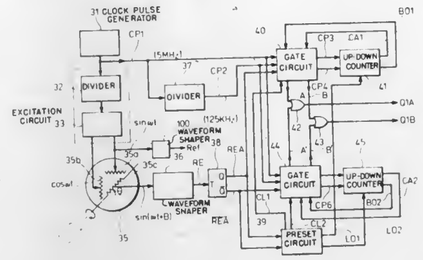


1. A compensation circuit for reducing the effect of variations in resistance values of circuit elements within a multiplying digital-to-analog converter having a ladder resistor network comprising a plurality of first resistance elements connected together in series, with one end of said series providing a converter input connection and the other end of said series providing a reference connection, and a corresponding plurality of second resistance elements each connected at one end thereof to the input end of a respective first resistance element, a plurality of switch means, each connected to the other end of a respective second resistance element, for selectively connecting said second resistance elements to one of a first or a second output connection, and a feedback resistance element connected at one end to said first output connection and at its other end to a feedback connection, said converter having a converter input resistance defined as the resistance from said input connection to said reference connection with both said first and said second output connections connected to said reference connection, and a feedback resistance defined as the resistance from said feedback connection to said first output connection, said compensation circuit comprising:
(a) a first resistor connected at one end to said feedback connection, the other end providing a compensated circuit input connection; and
(b) a second resistor connected at one end to said feedback connection and at the other end to said converter input connection, said first output connection being connected to said reference connection, the product of the resistances of said first and second resistors being equal to the product of said converter input resistance and said feedback resistance, and said second output connection providing a compensated circuit output connection.

4,631,523
PULSE GENERATOR
Tadahiro Ono, Shizuoka, and Shigenori Igarashi, Susono, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Toei Denki Kabushiki Kaisha, both of Tokyo, Japan
Filed Jun. 11, 1985, Ser. No. 743,493
Claims priority, application Japan, Jun. 12, 1984, 59-120289
Int. Cl.[4] H03M *1/64*
U.S. Cl. 340—347 SY **7 Claims**

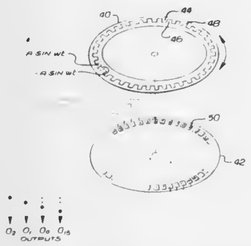
1. A pulse generator comprising:
(a) a driven body;
(b) a transducer coupled to said driven body for converting a mechanical motion thereof to a phase-modulated signal;
(c) excitation signal generating means for supplying an excitation signal as a carrier of the phase-modulated signal to said transducer;
(d) clock pulse generator means for generating a train of clock pulses;
(e) waveform shaping means for shaping the waveform of the phase-modulated signal issued from said transducer;

(f) counter means for receiving said clock pulses to form a content of count representing a time interval by which the output from said waveform shaping means being in a high or low logical state is longer or shorter than the corresponding period of said excitation signal;
(g) count pulse generator means for generating count pulses;



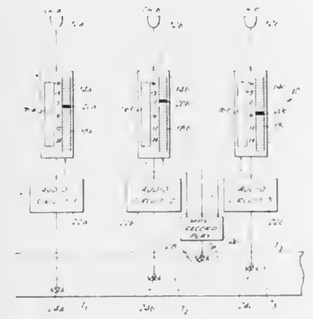
(h) gate means for allowing the count pulses to enter said counter means until said counter means having contents of count corresponding to said time interval is initialized while the output from said waveform shaping means is in its succeeding logical state; and
(i) output gate means for allowing the count pulses counted by said counter to issue out as a serial train of pulses.

4,631,524
CAPACITIVE ENCODER HAVING MULTIPLE PRECISION OUTPUTS
Raymond Brooke, Calabasas, and Gaston Palombo, Agoura, both of Calif., assignors to Computer Memories, Inc., Chatsworth, Calif.
Filed May 2, 1983, Ser. No. 490,571
Int. Cl.[4] G08C *9/02*
U.S. Cl. 340—347 P **10 Claims**



1. A high resolution capacitive encoder, comprising:
a first plate having first and second conductive input areas formed thereon, wherein the input areas are separated by a square wave shaped gap having a wavelength C_p;
a second plate whose surface is spaced a predetermined distance from the surface of the first plate for capacitive coupling therebetween, said plates being movable with respect to each other, said second plate including a series of rectangular conductive output areas positioned in facing relation to the gap along the length thereof, each of said output areas having a length equal to one half of the wavelength of the gap and being spaced from adjacent output areas by a distance C_p/N, where N is an integer greater than 2;
means for applying a first periodic signal to the first input area;
means for applying a second periodic signal which is the inverse of the first signal to the second input area, wherein the first and second signals will capacitively couple to the output areas to provide an output signal at each output area, whereby the maximum amplitude of each output signal will vary linearly as the first and second plates move with respect to each other and will have a null value when equal portions of the respective output area are capacitively coupled to the first and second input areas, wherein N null outputs are generated as the plates move with respect to each other by an amount C_p.

4,631,525
DIGITAL FADER OR LIKE DEVICE
Joseph M. Serravalle, Jr., Boca Raton, Fla., assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 11, 1983, Ser. No. 483,856
Int. Cl.[4] G08C *9/02*
U.S. Cl. 340—365 S **26 Claims**

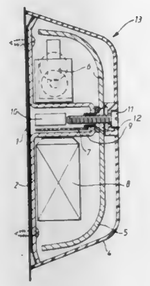


1. Apparatus comprising a plurality of channels of audio signals and, in association with each of said channels, a touch-sensitive strip having first and second overlying portions are of which is relatively flexible with respect to the other so as to contact said other portion at a location corresponding to the position of an operator's finger thereon; detecting means for detecting said contact and for detecting said contact and for producing a signal in response thereto; and encoding means coupled to said detecting means for encoding said produced signal into a digital signal representing said contact location, whereby each of said channels can be faded independently of the others by movement of the operator's finger; wherein one of said overlying portions of said touch-sensitive strip is provided with multiple discrete conductive elements and the other portion is provided with a reference potential which is coupled to at least one conductive element as a function of the particular location of contact of said portions.

4,631,526
THEFT PROOF ALARM BELL ASSEMBLY
John C. Marsh, East Molesey, United Kingdom, assignor to Automated Security Holdings, Ltd., United Kingdom
Continuation of Ser. No. 386,771, Jun. 10, 1982, abandoned.
This application Dec. 20, 1985, Ser. No. 815,175
Int. Cl.[4] G08B *3/00*
U.S. Cl. 340—396 **11 Claims**

1. An alarm bell assembly including an alarm bell and comprising:
a supportive base;
a gong;
securing means for attaching said gong to said supportive base;
a plurality of alarm bell components concealed beneath and protected by said gong; and

detector means suitably designed and cooperatively arranged with said securing means for actuating said alarm



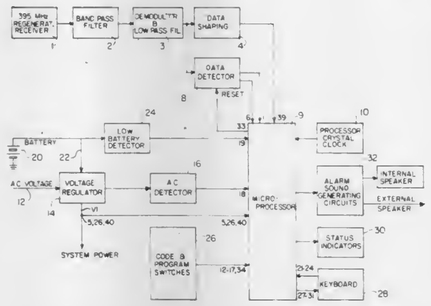
bell in response to attempts to tamper with said gong by removal of said securing means.

4,631,527

TRANSMITTER-RECEIVER CODED SECURITY ALARM SYSTEM

Kenneth I. De Witt, Phoenix, and Michael L. Kovens, Randallstown, both of Md., assignors to Universal Security Instruments, Inc., Owings Mills, Md.

Filed Nov. 25, 1980, Ser. No. 210,477
Int. Cl.[4] G08B *1/08*
U.S. Cl. 340—539 **24 Claims**



1. A transmitter-receiver burglar alarm system comprising

a battery powered transmitter unit including a transmitter of radio waves,

means for sensing a low battery voltage at said transmitter unit,

said transmitter unit having means for transmitting a low battery voltage signal, and means for transmitting a channel selecting code bit,

means connected to the transmitter unit for preventing said transmitter unit from making further transmissions after transmitting said low battery voltage signal,

a base station including a receiver for receiving radio waves transmitted by said transmitter unit,

said base station having means responsive to transmission of said channel selecting code bit to provide a first audible sound and responsive to the absence of said channel selecting code bit to produce a second audible sound,

said base station further including at will actuatable means responsive to receipt of said channel selecting code bit for producing a third audible sound, and

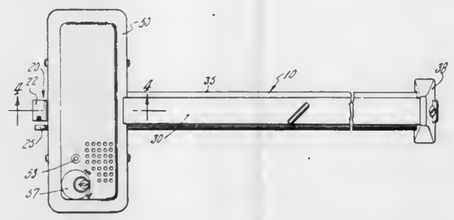
means responsive to said low battery voltage signal for producing a fourth audible sound.

4,631,528

PUSH BAR EXIT DEVICE WITH ALARM

Martin G. Handel, Newington; James E. Robida, Middletown, and Ronald S. Slusarski, Berlin, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 2, 1984, Ser. No. 656,828
Int. Cl.[4] G08B *13/08*; E05B *65/10*
U.S. Cl. 340—545 **12 Claims**



1. An improved exit device for doors, said device including a frame, a push bar mounted to the frame for relative movement between an extended position and a depressed position, and a latch bolt assembly at one end of the frame having mechanisns for retracting the latch bolt in response to the movement of said push bar toward its depressed position, in which the improvement comprises:

an alarm assembly including an electrically actuated alarm, means for actuating the alarm in response to the movement of said push bar, and means for controlling the actuation of said alarm in response to an externally operable switch;

a housing for said alarm assembly which contains its elements and shields them from manipulation; and

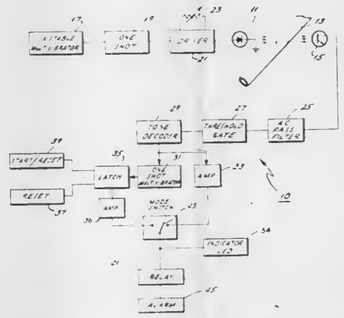
means for fastening the alarm housing to said frame, with said push bar when in its extended position shielding said fastening means and when in its depressed position, permitting access to said fastening means to permit separation of said alarm housing from said frame.

4,631,529

ELECTRO-OPTICAL FLUID DETECTOR

Vernon Zeitz, Springfield, Vt., assignor to Ivek Corporation, Springfield, Vt.

Filed Oct. 17, 1984, Ser. No. 661,638
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—619 **19 Claims**



1. An electro-optical fluid detector capable of sensing the presence and absence of fluid in a clear tube, comprising:

means for pulsing a light emitting source at an adjustably fixed repetition rate and pulse duration, said means including a light source, said light emitted therefrom being shaped into a narrow beam 0.050 inches in diameter;

photo sensing means for detecting said light beam from said emitting source, said sensing means including a photo transistor operating in its unsaturated active switching region of operation, said detecting means generating an alarm signal;

tone decoder means for reacting to a pre-determined frequency of said pulsed light connected to said sensing means; and

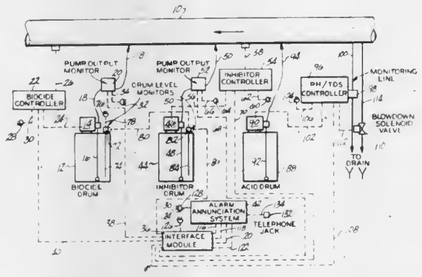
wherein said clear tube is disposed to intercept said emitted narrow beam of light.

4,631,530

CHEMICAL PROCESS MONITOR

Kenneth E. Gasper, Leawood, Kans., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 2, 1984, Ser. No. 595,776
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—679 **17 Claims**



1. A monitor system for simultaneously monitoring both chemical process parameter control means and adjustment means for adjusting the controlled process parameter comprising:

(a) adjustment means for adjusting a chemical process parameter;

(b) control means for sensing said chemical process parameter and for generating a first output signal to said adjustment means when a predetermined condition exists, said first output signal capable of causing a positive response in said adjustment means;

(c) monitoring means for sensing whether said adjustment means made a positive response to said first output signal from said control means and for generating a second output signal as evidence of said positive response; and

(d) interrogation means for sensing both said first and second output signals and for performing an interrogation, said interrogation comprising:

(i) when said second output signal is not sensed within a predetermined time period after the beginning of said sensing of said first output signal, then an alarm signal is generated to an alarm annunciating means; and

(ii) when said second output signal is sensed within said predetermined time period after the beginning of said sensing of said first output signal, then no alarm signal is generated to said alarm annunication means.

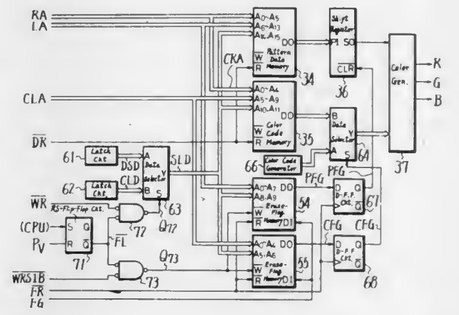
4,631,531

SYSTEM FOR TEXT DISPLAY WITH PLURAL PAGE MEMORY AND FLAG MEMORY

Satoru Maeda, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00333, § 371 Date Apr. 26, 1983, § 102(e) Date Apr. 26, 1983, PCT Pub. No. WO83/00789, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 24, 1982, Ser. No. 491,205
Claims priority, application Japan, Aug. 27, 1981, 56-134582
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—701 **3 Claims**

1. An image display apparatus comprising image memory means having plural display areas corresponding to areas of a visual display and for storing image signals of plural pages, each page being formed of a plurality of packets of data, and read out means for reading out said image signal in said image memory means and supplying it to an image display means for visual display, in which said image memory means includes a pattern memory for storing plural line data of the image to be displayed, and said image display apparatus further comprises flag memory means having plural flag areas corresponding to respective ones of said plural display areas of said image memory means and in which said plural flag areas include plural line flag areas corresponding to each line of said image to be



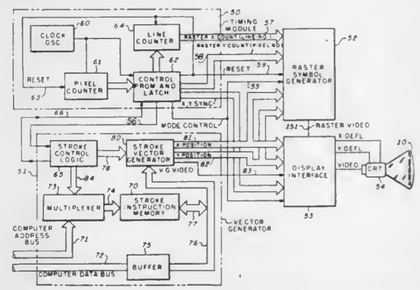
displayed, flag control means for setting a flag of a corresponding display area to a first value when an erase code contained in one of said plurality of packets is received and setting said flag to a second value when an image signal contained in said plurality of packets is received, and read out control means for controlling said read out means so as to supply a blank signal instead of the image signal of said corresponding display area to said image display means when said corresponding flag is set to said first value, and to supply the image signal in said corresponding display area to said image display means when said corresponding flag is set to said second value.

4,631,532

RASTER DISPLAY GENERATOR FOR HYBRID DISPLAY SYSTEM

Steven P. Grothe, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,810
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 **8 Claims**



1. Apparatus for superposing a raster symbol diaplay and a vector symbol diaplay on a cathode ray tube viewing screen, comprising:

clock means for providing timing signals for said raster symbol display and said vector symbol display, said clock means comprising:

(a) a clock pulse source, for generating regular timing pulses at a predetermined repetition rate,

(b) first digital counting means responsive to said regular clock pulses for providing a first digital count signal in accordance therewith,

(c) logic means responsive to said first digital count signal for providing digital signals for synchronizing displacements of a plurality of sequentially disposed raster lines comprising said raster symbol display along first and second display axes, and further providing said first digital count signal to programmable raster symbol generating means, and

(d) second digital counting means coupled to receive signals derived from said logic means for providing a second digital count signal representative of displacements along one of said display axes to said programmable raster symbol generating means, said first digital count signal and said second digital count signal having relative output frequencies in accordance with a predetermined ratio,

programmable vector generating means responsive to said clock means and coupled to said raster symbol generating means for providing positional signals representing a stroke vector of predetermined length, origin, and slope, said vector comprising a plurality of sequential picture elements defining positional and color data for regions of predetermined colors,

said programmable raster symbol generating means including memory means for storing an incremental location corresponding to a color change of ones of said raster lines, thereby providing at least one of said regions of predetermined colors defined by said stroke vector and said plurality of raster lines, and

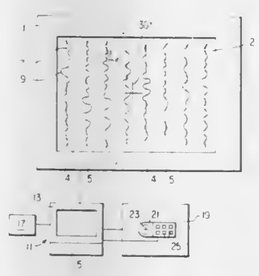
display interface means coupled to said raster symbol generating means and said vector generating means for alternately providing raster information and stroke vector information to said cathode ray tube viewing screen.

4,631,533

DISPLAY OF EDDY CURRENT DETECTOR DATA

Richard H. Mark, Jr., Pitcairn, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1984, Ser. No. 621,002
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—721 **9 Claims**



1. A method for producing a display of eddy current test data from signals produced by an eddy current detector which is supplied with an alternating current signal composed of alternating currents at several different frequencies, the detector signals including a respective signal associated with each alternating current and varying in amplitude and in phase relative to its associated alternating current as the detector is displaced along a selected path relative to a test body, comprising:

generating, from each detector signal, a data signal representing the detector signal component in phase with the alternating current associated with that detector signal and a data signal representing the detector signal component in quadrature with the alternating current associated with that detector signal;

storing a representation of each data signal; and

supplying the representation of each data signal to a display device for producing a first display composed of visible representations of all data signals along parallel reference axes, with each reference axis being associated with a respective data signal and being representative of the selected path of movement of the detector relative to the test body.

4,631,534

DISTRIBUTED PACKET SWITCHING SYSTEM

Andrew D. Franklin, Boulder, Colo.; Lloyd A. Hasley, Carrollton, Tex., and James E. Smith, Palo Alto, Calif., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 13, 1984, Ser. No. 670,981
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.5 **10 Claims**



1. In a packet switching system having a plurality of ports interconnected by a data bus:

a system controller connected by a control bus and by said data bus to all of said ports,

at least one station connected to each of said ports,

means for applying call establishment information to a calling one of said ports from a connected calling station with said information including a called station number and a number identifying said calling station and a calling station off-hook indication signifying the initiation of a call,

means in said calling port for transmitting information identifying said calling and called station to said controller, said controller being responsive to the receipt of said information for applying destination port and called station addresses over said control bus to said calling port,

means in said calling port for subsequently receiving further information from said calling station with said further information including said calling station identification number as well as data to be transmitted over said data bus to said destination port and called station,

means in said calling port responsive to the receipt of said further information for translating said received calling station identification number into said destination port and called station addresses,

means in said calling port responsive to said translation for forming a packet comprising said data as well as said destination port and called station addresses, and

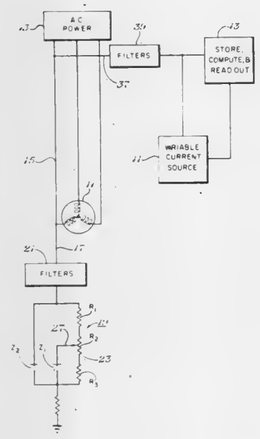
means for applying said formed packet to said data bus for transmission to said destination port.

4,631,535

SUBMERSIBLE PUMP PRESSURE DETECTION CIRCUIT

Duncan M. Butlin, Tulsa, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Jul. 5, 1985, Ser. No. 751,824
Int. Cl.[4] G01L *9/02*
U.S. Cl. 340—856 **4 Claims**



1. In a submersible well pump system having a downhole electrical motor for driving the pump, an improved means for measuring a fluid property in the environment of the well, comprising in combination:

a downhole potentiometer having a resistor connected to a transmission line linked to the surface and engaged by a wiper connected to ground, the wiper being movable along the resistor in response to changes in the fluid property;

a first downhole blocking means connected to the wiper between the wiper and ground for blocking current flow until a selected power level B is reached;

a second downhole blocking means connected to the transmission line above the resistor and to ground for blocking current flow until a selected power level C is reached that is greater than the power level B;

means at the surface for providing a power level A, which is below power levels B and C, to the transmission line, providing current which passes through the resistor to ground and is blocked by the first blocking means, for providing the power level B to the transmission line, providing current which passes through the upper portion of the resistor above the wiper and through the first blocking means to ground, and for providing the power level C which passes through the second blocking means to ground; and

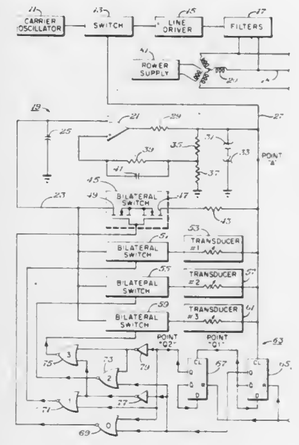
means at the surface for monitoring the voltage and current at the surface during each of the power levels, and for computing with the monitored voltage and current, the position of the wiper on the potentiometer resistor.

4,631,536

MULTIPLEX SUBMERSIBLE PUMP TELEMETRY SYSTEM

Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wood Dale, both of Ill., assignors to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 376,792, May 10, 1982, Pat. No. 4,581,613. This application Oct. 14, 1983, Ser. No. 541,939
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G01V *1/40*
U.S. Cl. 340—857 **4 Claims**



4. In a pump installation having a power cable for delivering AC power from a power source at the surface to an AC motor located in a well, measuring means for monitoring at the surface physical parameters in the environment of the motor, comprising in combination:

a downhole assembly located in the well in the vicinity of the motor and having a transmitter means for generating a carrier signal and for superimposing the carrier signal onto the power cable;

switching means for switching the carrier signal on and off the power cable;

a plurality of transducer means in the downhole assembly, each for providing a variable resistance corresponding to a physical parameter of the motor environment;

modulating means in the downhole assembly for charging a capacitor, then discharging the capacitor through a synchronizing resistance to turn on and off the switching means for equal duration corresponding to the synchronizing resistance, to provide the carrier signal with a synchronizing envelope that has an on and off duration corresponding to the synchronizing resistance;

downhole sequencing means in the downhole assembly for swithing each of the transducer means separately to the modulating means in place of the synchronizing resistance to provide the carrier signal with data envelopes with on and off duration corresponding to the resistance of the transducer means, the downhole sequencing means being triggered by the switching of the switching means;

the synchronizing resistance being selected to provide a synchronizing envelope of duration less than the duration of any of the data envelopes;

a plurality of readout means at the surface, each corresponding to one of the transducer means, for converting each of the data envelopes to a readout signal proportional to the parameter sensed;

surface sequencing means at the surface for sequentially turning on each of the readout means for the duration of each of the data envelopes, the surface sequencing means

being triggered by the receipt of one of the data envelopes; and

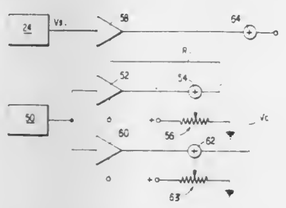
synchronizing means at the surface for detecting the synchronizing envelope and for resetting the sequencing means upon receipt of the synchronizing envelope, to assure that each of the readout means is turned on by its respective data envelope.

4,631,537

METHOD FOR TEMPERATURE COMPENSATING A ROD POSITION INDICATION SYSTEM

James A. Neuner, Richland Township, Lebanon County; Dirk J. Boomgaard, Monroeville; Susan A. Wilbur, Wilkins Township, Allegheny County, and Charles G. Geis, N. Huntington, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1984, Ser. No. 606,421
Int. Cl.[4] G08C *19/08*
U.S. Cl. 340—870.17 **4 Claims**



1. A method for temperature compensating a position indicator which includes a sensor for producing an output signal whose magnitude corresponds to the position of an element that is linearly movable between first and second positions and which is subject to changes in temperature within a given temperature range, wherein the output signal of the sensor contains a temperature variable offset component and the rate of increase of the output signal as the element moves from the first to the second position fluctuates with changes in temperature, comprising the steps of:

monitoring the temperature of the element;

generating an electrical representation of an offset correction, relative to a reference temperature, required for the offset component of the output signal of the sensor at the temperature of the element;

generating an electrical representation of a rate correction factor, relative to a reference temperature, required for the rate of increase in the output signal of the sensor at the temperature of the element;

causing the sensor to produce an output signal corresponding to the position of the element; and

compensating the output signal of the sensor by forming an electrical representation of the product of the sensor output signal and the rate correction factor required at the temperature of the element, and adding to such product the offset correction required at the temperature of the element.

4,631,538

SINGLE FREQUENCY MULTITRANSMITTER TELEMETRY SYSTEM

Victor A. Carreno, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

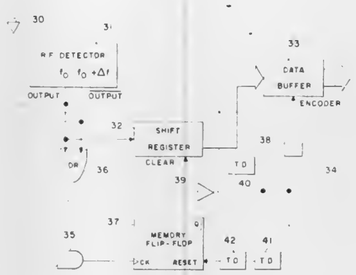
Filed Feb. 28, 1983, Ser. No. 470,113
Int. Cl.[4] G08C *19/16*
U.S. Cl. 340—870.18 **10 Claims**

1. A single frequency multitransmitter telemetry system comprising:

a plurality of sensors with each sensor at a different location;

a plurality of transmitters with each transmitter connected to the output of one of said sensors for transmitting the output of the sensor;

each of said transmitters including means for modulating the output of its sensor in frequency shift keying with frequencies f_o and $f_o+\Delta f$ so that all of said transmitters, when transmitting, transmit one or the other of said frequencies; and



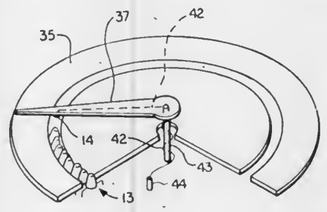
a receiver means including a single receiver input for receiving from all of said transmitters the modulated outputs from said sensors, said receiver means further comprising means for accepting data from said transmitters only one transmitter is transmitting and for discarding data from the transmitters when more than one transmitter is transmitting.

4,631,539

DIGITAL POINTER POSITION DETECTOR

Gary G. Sanders, Lakewood, and Michael E. Corwon, Parma, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Jan. 19, 1983, Ser. No. 459,262
Int. Cl.[4] G08C *9/06, 19/36*
U.S. Cl. 340—870.29 **11 Claims**



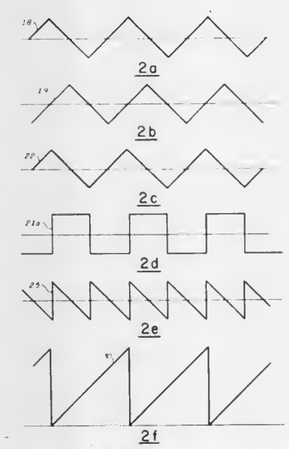
1. An indicating gauge or meter of the scalar dial type with an indicator pointer whose position may be signalled with acceptable resolution and with negligible torsional mechanical loading of the pointer or associated pointer linkage, said indicating gauge comprising: said pointer, an arcuate or linear indicator scale along which said pointer moves, an array of LED's arranged along said scale and each having its own unique address, said array of LED's being of a high linear density corresponding to acceptable resolution for indicator scale readings, a photodetector mounted as a unitary part of said indicator pointer to sweep as a part of the pointer itself back and forth in both directions over said high density array of LED's according to the movements of said pointer, means for cyclically sequentially lighting the LED's for single point transmission independently of said pointer's position and correspondingly counting through the addresses of LED's being lighted, on a one-to-one basis of single point activation to instantaneously-current count, whereby each said LED in said high-linear density single point transmission array is lighted only for the instant that its unique address is the instantaneously-current count, buffer means responsive to activation of said photodetector for latching the count corresponding to the pointer's then-obtained position as the sequential lighting of the LED's cycles to or past the photodetector whereby the then-obtained position of said pointer defines the value of said latched count and the defined value of the latched count identifies pointer position with a degree of resolution acceptable for indicator gauge readings.

4,631,540

ANGULAR POSITION TO LINEAR VOLTAGE CONVERTER

Alan Feldman, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,602
Int. Cl.[4] G08C *19/04*
U.S. Cl. 340—870.38 **8 Claims**



1. Apparatus to convert angular position to linear voltage comprising:

angular position means for generating a first and second cyclical voltage waveform, said waveforms being disposed at a predetermined angular separation from one another,

waveform converting means for receiving said first and second cyclical waveforms and for providing therefrom a waveform that is an inverted representation of said first cyclical voltage waveform when said second cyclical voltage waveform is negative and a direct representation of said first cyclical waveform when said second cyclical waveform is positive, and

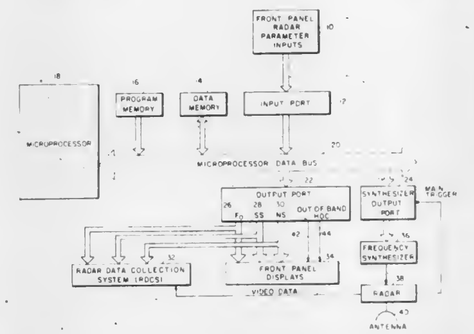
means for summing output of said waveform converting means and a predetermined d.c. voltage for providing a linear positive going ramp waveform representative of said angular position voltage generating means.

4,631,541

MICROPROCESSOR BASED PROGRAMMABLE FREQUENCY CONTROLLER FOR FREQUENCY AGILE RADAR

Michael J. Prickett; Murray H. Mott, both of San Diego, and Nicholas Panos, El Cajon, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,576
Int. Cl.[4] G01S *7/42, 13/26*
U.S. Cl. 343—5 DP **25 Claims**



1. A programmable stepped frequency controller for frequency agile radar which comprises:

means for receiving input radar control parameters, said control parameters being entered by the system operator;

means for retaining a computer program, said computer program constructed to provide operational control and data transfer management directions for the system;

means for storing data, said storing means being able to receive or transmit data pertaining to the operation of the frequency agile radar system;

means for processing and controlling, said processing means capable of executing the computer program contained in the retaining means, of processing data during operation of the radar system, and of controlling the operation of the frequency agile system;

means for transceiving data and operational commands between the components of the programmable frequency controller, said transceiving means being connected to receive signals from the receiving means, and the retaining means, being connected to send and receive data signals from the storing means, and being connected to receive and send control and data signals to the processing means;

means for synthesizing a radar signal to control the method of radar transmission from a radar system and antenna, said synthesizing means attached to the transceiving means for receiving control and data signals from the processing means to creae a predetermined frequency, bandwidth, and repetition rate radar signal;

means for outputting data information, said outputting means being connected to receive the data information from the transceiving means as controlled by the processing means, and said data including operational information for the frequency agile radar system;

means for displaying the data information outputted to the outputting means, said displaying means being connected to the outputting means to receive said data; and

means for collecting said data information, said colecting means connected to receive select data from the outputting means and also connected to receive select data from the radar system, and said collecting means capable of holding said data for further processing;

wherein the means for receiving input control parameters comprises:

a plurality of adjustable switches for selectably setting the

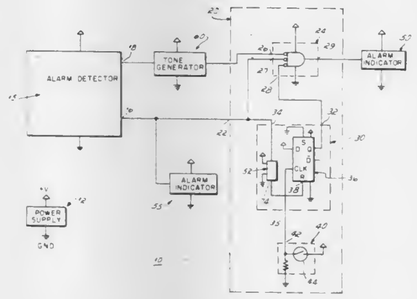
control radar parameters which include the initial frequency of the output sequence of frequency bursts, the step size of the incremental value of frequency added to the latest frequency output to produce the next frequency burst in the output sequence, the total number of different frequency bursts in the output sequence, the mode for the output sequence, the type of radar band to be used for the output sequence of frequencies, a restart function to initiate new sequences, the radio-frequency pulse width for each frequency burst, and an unambiguous maximum range parameter.

4,631,542

POLICE RADAR WARNING RECEIVER WITH MUTE FUNCTION

Richard L. Grimsley, Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Sep. 28, 1984, Ser. No. 656,029
Int. Cl.[4] G01S *7/40*; H04B *17/00*; G08B *7/00*
U.S. Cl. 342—20 **16 Claims**



2. A method of controlling a vehicle-mounted police radar detector alarm indicator comprising:

generating an alarm signal in response to detectable presence of a police radar signal;

energizing an alarm indicator in response to initial generation of said alarm signal;

selectively generating a mute signal while said alarm indicator is energized;

de-energizing the alarm indicator in response to said mute signal;

continuing to de-energize the alarm indicator until a predetermined time after the alarm signal terminates;

terminating the alarm signal in response to the termination of the detectable presence of police radar signal whereby a subsequent detectable presence of a police radar signal will again generate an alarm signal but will not energize the alarm indicator unless the alarm signal is again generated after said predetermined time.

4,631,543

METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF IMPULSE NOISE IN LORAN-C RECEIVERS

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 28, 1983, Ser. No. 536,479
Int. Cl.[4] G01S *1/24*
U.S. Cl. 342—389 **15 Claims**

1. Apparatus for reducing the effects of impulse noise on the operation of a navigation receiver of the type that provides navigation information by receiving signals periodically transmitted by each of a plurality of navigation transmitters and measuring the difference in time of arrival of said signals from pairs of said navigation transmitters, the receiver having filter and amplifier means for filtering/amplifying the appropriate bandwidth of received signals, and acquisition/tracking means and microprocessor means for generating appropriately timed pulse output signals upon receiving the passed signals, and providing the navigation information from the time difference between the generation of said pulse signals, said apparatus comprising:

means associated with the microprocessor means for generating a time gate signal which defines a time period of



selected duration that preceeds the time of arrival at said receiver of said periodically transmitted signals, and

means in the front end of said receiver responsive to said time gate signal for attenuating signals received by said receiver prior to where the received signals are filtered and amplified during the time periods defined by said time gate signal.

4,631,544

S-BAND COAXIAL SLOT ARRAY ANTENNA

George Ploussios, Andover, Mass., assignor to Tideland Signal Corporation, Houston, Tex.

Filed Apr. 10, 1985, Ser. No. 722,097
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—771 **4 Claims**



1. An S-band coaxial antenna comprising,

a body having an inner circular tube and a coaxial outer circular tube, the circumference of the outer tube being equal one wave length of S-band radar,

a plurality of pairs of axial elongated slots in the outer tube, the slots of each pair being diametrically opposed to each other, said adjacent pair of slots being axially displaced from each other a distance of one-half wave length,

said pairs of slots being rotational offset at an angle equal to 360 divided by N, where N is the number of pairs, and a dielectric cover around the outer tube.

4,631,545

ANTENNA ARRANGEMENT CAPABLE OF ASTIGMATISM CORRECTION

Corrado Dragone, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 16, 1984, Ser. No. 671,975
Int. Cl.[4] H01Q *19/12*
U.S. Cl. 343—779 **10 Claims**



1. An antenna arrangement comprising:

an offset main reflector comprising a reflecting surface for reflecting a substantially planar wavefront impinging the reflecting surface in a predetermined direction from the far field of view of the antenna arrangement to an associated spherical reflected wavefront including first and second astigmatic phase centers which (a) increasingly separate in a direction away from a common focal point (F) on a focal plane of the main reflector along first and second focal lines, respectively, when the planar wavefront is moved, and (b) are located in respective first and second principal planes of curvature of the reflected wavefront; and

a feed arrangement comprising:

a parabolic cylindrical reflector including a parabolic reflecting curve in a plane of symmetry of the feed arrangement which corresponds to the first principal plane of the reflected wavefront from the main reflector, the reflector of the feed arrangement being disposed both (a) confocally with the common focal point (F) of the main reflector and along a reflected central ray from the far field of view of the antenna arrangement, and (b) relative to the main reflector for producing movable first and second astigmatic phase centers for rays in the plane of symmetry of the feed arrangement which correspond to locations of the first and second astigmatic phase centers when moving the planar wavefront in the first principal plane of the reflected wavefront, the first and second astigmatic phase centers being disposed on opposite sides of an axis (X) of the antenna arrangement in the first principal plane of the reflected wavefront which passes through the common focal point (F) and is orthogonal to the central ray, and

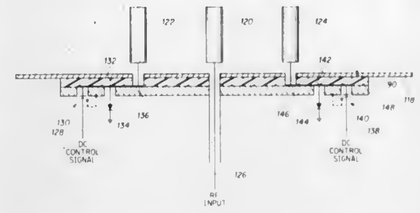
a phase array comprising N feed elements for providing a linearly scannable beam along the plane of symmetry of the feed arrangement, the N feed elements comprising an aperture thereof which is disposed to cover a predetermined portion of the image of the main reflector.

4,631,546

ELECTRONICALLY ROTATED ANTENNA APPARATUS

Ted A. Dumas, Dallas, Tex., and Les V. Griffee, Marysville, Kans., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 483,793, Apr. 11, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,335
Int. Cl.[4] H01Q *3/44*
U.S. Cl. 343—833 **8 Claims**



1. Electronically signal direction oriented antenna means comprising, in combination:

ground plane means;

driven element means mounted on said ground plane means;

a plurality of parasitic elements, each of equal length and having a base portion juxtaposed said driven element means and mounted at the base portion on said ground plane means; and

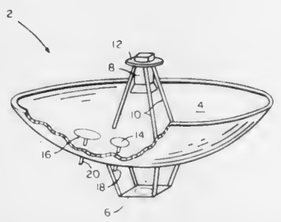
selector means, connected to one end of each of said parasitic elements below said ground plane means, for electrically and selectively altering the impedance at the base portion of said parasitic elements from director to reflector means by changing the impedance from capacitive to inductive while maintaining the same mechanical radiating length.

4,631,547

REFLECTOR ANTENNA HAVING SIDELOBE SUPPRESSION ELEMENTS

Daniel Jacavanco, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 623,905
Int. Cl.[4] H01Q *19/19*
U.S. Cl. 343—840 **9 Claims**



1. In a directional antenna of the type having a substantially parabolic main reflector of electromagnetic energy and a feed horn positioned at the focal point of said main reflector characterized in that said antenna further comprises:

a plurality of energy reflecting elements affixed to the focusing surface of said main reflector and being entirely within the aperture of said main reflector;

each of said plurality of energy reflecting elements having its reflecting surface parallel to the tangent of said main reflector at the point where affixed to said main reflector; and

means for individually adjusting the penetration distance of said reflecting elements above the surface of said main

reflector to suppress selected sidelobes in the response pattern of said antenna.

4,631,548

MULTICOLOR INK JET PRINTER

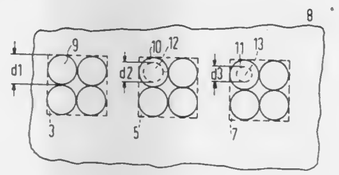
Artur Milbrandt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,493

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415825

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—1.1 **4 Claims**



1. In a method of representing multi-colored characters employing a print head having a plurality of ink channels with discharge openings directed toward a recording meidum, each ink channel having a piezo-electric drive element for effecting a drop-by-drop ejection of ink from said ink channel to form picture points on said recording medium in response to drive pulses generated by a control circuit in accordance with characters or patterns to be represented, said drive pulses applied to each channel being selectable in terms of number, and in amplitude or duration to select the volume of ink in each drop, a plurality of ink supply reservoirs, each containing a primary color and supplying an individual one of said ink channels, and a drive mechanism for producing relative movement between said print head and said recording medium, the steps of;

applying a single discrete droplet to a first of said picture points and applying two or more discrete droplets to another of said picture points from different ones of said ink channels for the represention of mixed colors, and selecting drive pulses for said ink channels so that each picture point on said recording medium has a constant diameter, regardless of whether such picture point is composed of one discrete droplet of one primary color, or of a plurality of discrete droplets of different primary colors.

4,631,549

METHOD AND APPARATUS FOR ADJUSTING STIMULATION AMPLITUDE IN CONTINUOUS INK JET PRINTER

Hilarion Braun, Xenia; Linda Lush, and Scott Lehman, both of Dayton, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

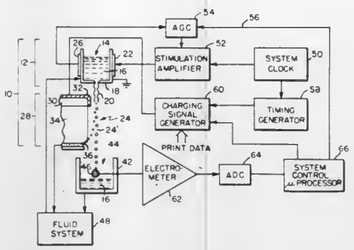
Filed Aug. 15, 1985, Ser. No. 765,972

Int. Cl.⁴ G01D *18/00*

U.S. Cl. 346—1.1 **10 Claims**

1. A method for adjusting stimulation amplitude in a continuous ink jet printer to operate the ink jet printer in the satellite free region of ink drop production, characterized by the steps of:

periodically sensing the stimulation amplitude at which infinite satellites are first produced, and



adjusting the stimulation amplitude as a function of the sensed amplitude.

4,631,550

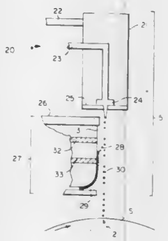
DEVICE AND METHOD FOR SENSING THE IMPACT POSITION OF AN INK JET ON A SURFACE OF AN INK CATCHER, IN A CONTINUOUS INK JET PRINTER

Michael J. Piatt, Enon, and Mark E. Brown, West Carrollton, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,973

Int. Cl.⁴ G01D *18/00*

U.S. Cl. 346—1.1 **23 Claims**



9. A method for sensing the impact position of an ink jet on the vertical face of an ink catcher extending generally parallel to the ink jet and forming part of the printing head of an ink jet printer, comprising the steps of:

(a) varying an electrical property at said catcher face as a function of the portion of that face which is wetted by the ink flowing downstream the impact position of the jet and,

(b) sensing said electrical property and deriving therefrom a signal representative of the jet impact position.

4,631,551

COLOR IMAGING APPARATUS USING ELECTRO-OPTIC MODULATORS

Albert B. Vergona, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 762,173, Aug. 5, 1985, abandoned. This application Oct. 7, 1985, Ser. No. 784,990

Int. Cl.⁴ G01D *9/42, 15/14;* **H04N** *1/21*

U.S. Cl. 346—108 **4 Claims**

1. Color imaging apparatus for forming a beam of light having three separate intensity modulated color components and for line scanning such beam across the surface of a photosensitive member for image recording, comprising:

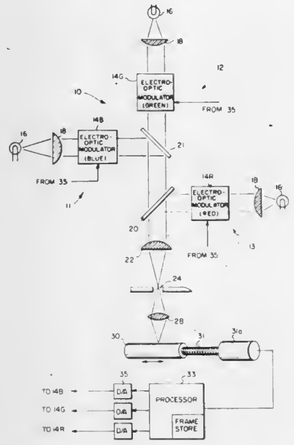
(a) three separate color component light modulating channels, each including:

(i) a panchromatic, incoherent light source;

(ii) means for collimating light from the source;

(iii) an electro-optic modulator responsive to a voltage signal for establishing an electric field which modulates the intensity of collimated light from the source passing through it in accordance with the desired intensity of a color component; and

(iv) feedback means for sensing the intensity of light at the output of the modulator to produce an error signal which is a function of the difference in intensity of the color component from a desired level, said feedback means including means responsive to said error signal for adjusting the voltage signal applied to the electro-optic modula-



tor to effect a change in the electric field and cause the light intensity at such output to be at the desired intensity;

(b) means including two dichroic mirrors for separating light from each channel into an intensity modulated, color component;

(c) means for combining the color components into a single beam and for focusing such beam on the surface of the photosensitive member; and

(d) means for providing relative movement between the photosensitive member and the beam for line scanning the beam across the member's surface.

4,631,552

THERMAL RECORDER PAPER STACKER

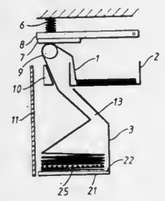
Shouzou Kobayashi, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1985, Ser. No. 703,495

Claims priority, application Japan, Feb. 28, 1984, 59-26698[U]

Int. Cl.⁴ G01D *15/24, 15/00;* **B41J** *11/26*

U.S. Cl. 346—136 **2 Claims**



1. A recorder comprising:

a supply of fanfold recording paper, said paper being divided by folds into lengths and having a width extending in a transverse direction to said lengths and parallel to said folds;

a tray for receiving said paper;

a thermal head for recording data on said paper;

a paper supporting surface in said tray,

an assisting member disposed substantially in the widthwise center of and on said paper supporting surface and extending over only a portion of the width of the received recording paper and having a length substantially equal to the length of said paper between folds, for assisting the folding of said recording paper by raising the central portion of the width of the stack of the folded fanfold recording paper to a prescribed height, and

guides located on the paper supporting surface of the tray and spaced at an interval substantially equal to the width of the recording paper for initially positioning the recording paper on the paper supporting surface,

wherein at least either the assisting member and the paper supporting surface are inclined for increasing the height of the stacked recording paper at a front side thereof in a direction normal to the width of the recording paper.

4,631,553

PRINTER HEAD OF AN INK-JET PRINTER

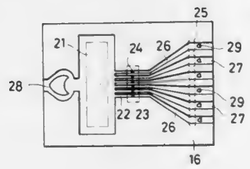
Takuro Sekiya, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

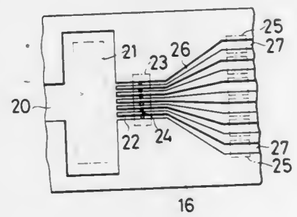
Continuation-in-part of Ser. No. 399,004, Jul. 16, 1982, abandoned. This application Apr. 8, 1985, Ser. No. 720,489

Claims priority, application Japan, Jul. 17, 1981, 56-111668; Aug. 20, 1981, 56-130786; Aug. 20, 1981, 56-130787

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **18 Claims**





1. A printer head for use in a non-impact printer such as an ink-jet printer comprising:

a first flow passage extending from an ink inlet port to an ink draining port;

a second flow passage branching out from said first flow passage and connected to an ink discharging nozzle through which ink is discharged to form ink droplets to be deposited on a recording medium, said second flow passage having a first flow resistance against a flow of ink flowing therethrough which is substantially smaller than a second flow resistance presented by that portion of said first flow passage from the branch-out point between said first and second flow passages to said ink draining port;

means for periodically imparting motion to the ink residing between said ink inlet port and the branch-out point between said first and second flow passages thereby normally causing the ink to be discharged out of said ink discharging nozzle for use in printing; and

flow control means for controlling the flow of ink through

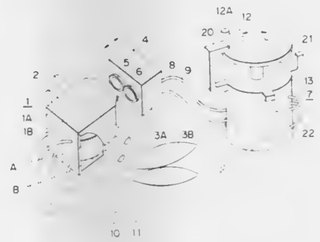
said ink draining port in response to an image signal supplied thereto whereby when said flow control means is operated to drain ink through said ink draining port, ink is prevented from being discharged out of said ink discharging nozzle through a difference between said first and second flow resistances.

4,631,554

INK JET PRINTING APPARATUS WITH SUCTION RECOVERY UNIT

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,736
Claims priority, application Japan, Oct. 4, 1982, 57-174201
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



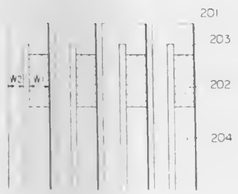
1. An ink jet printing apparatus comprising:
printing means for ejecting an ink as an ink drop from an opening onto a printing medium, the ink being stored inside said ink jet printing apparatus;
suction means, arranged to communicate with said printing means through a channel, for eliminating nonejection of the ink from said printing means by generating a negative pressure, said suction means having (i) a main body with a predetermined space therein, and (ii) a rotatable member, supported for rotational movement with respect to said main body, for generating the negative pressure in said space upon rotational movement thereof, said main body including means for detecting an angular position of said rotatable member; and
an operation member for enabling said rotatable member to be manually rotated.

4,631,555

LIQUID JET TYPE RECORDING HEAD

Masami Ikeda, Machida; Makoto Shibata, Hiratsuka; Hiroto Matsuda, Ebina, and Hiroto Takahashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 596,908
Claims priority, application Japan, Apr. 19, 1983, 58-67723
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **1 Claim**



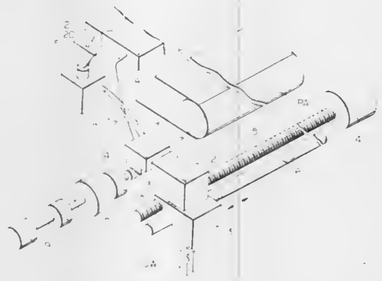
1. A liquid jet type recording head comprising a plurality of liquid discharge sections, each including an orifice for discharging liquid to form flying droplets and a liquid passage having therein a heat acting portion at which thermal energy acts on the liquid to provide the droplets, a plurality of electrodes, each being associated with one of each said liquid discharge sections and comprising opposed portions, and a plurality of electro-thermal converting elements, each having a heat generating portion located between said opposed portions of an associated one of said electrodes, wherein:
each of said electrodes has a turned portion with a part adjacent to and beside said associated heat generating portion and other parts adjacent to and beside said opposed portions of said electrode,
the part of said turned portion adjacent to said associated heat generating portion has a width smaller than the width of said heat generating portion and the width across said turned portion and said opposed portions of each said electrode is substantially the same as the width across said turned portion and said associated heat generating portion, and
said heat generating portions are spaced from each other at locations providing a compactly formed recording head.

4,631,556

LIQUID JET RECORDING APPARATUS

Yoshitaka Watanabe, Tokyo, and Takashi Endo, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,656
Claims priority, application Japan, May 11, 1983, 58-82351; May 11, 1983, 58-82352; May 11, 1983, 58-82354; May 16, 1983, 58-85206; May 16, 1983, 58-85207
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **24 Claims**



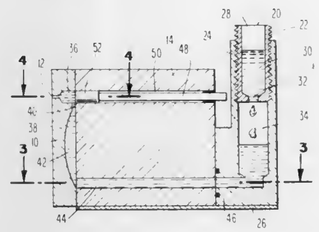
1. A liquid jet recording apparatus comprising:
a jet head for emitting a recording liquid;
a first recording liquid storing chamber of a large capacity;
a second recording liquid storing chamber of a small capacity said jet head communicating with said second chamber and said first chamber being isolated from said second chamber;
pressure producing means; and
supplying and didshcarging means, connected with said first chamber and selectively coupled to said second chamber and to said jet head, for supplying said recording liquid from said first recording liquid storing chamber to said second recording liquid storing chamber and discharging the recording liquid from said jet head in operation of said pressure producing means.

4,631,557

INK JET EMPLOYING PHASE CHANGE INK AND METHOD OF OPERATION

Theodore M. Cooke, Danbury, and William J. DeBonte, Kent, both of Conn., assignors to Exxon Printing Systems, Inc., Brookfield, Conn.

Filed Oct. 15, 1984, Ser. No. 660,656
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—140 R **61 Claims**



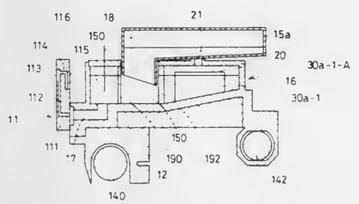
1. A method of operating an ink jet comprising the following steps:
supporting ink in the solid state in a cartridge;
mounting the cartridge in communication with an ink jet;
melting the ink so as to change the ink from a solid state to a liquid state;
supplying the ink in the liquid state to the ink jet; and
ejecting droplets of ink from the ink jet.

4,631,558

INK LIQUID BAFFLE-REGULATED RESERVOIR IN AN INK JET SYSTEM PRINTER

Takafumi Hara, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1983, Ser. No. 491,667
Claims priority, application Japan, May 6, 1982, 57-76146
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **16 Claims**



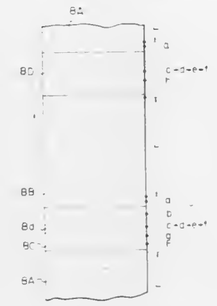
1. An ink liquid supply system for an ink jet system printer which includes a printer head mounted on a reciprocating carriage, said ink liquid supply system comprising: an ink liquid reservoir mounted on said reciprocating carriage, said ink liquid reservoir comprising:
a ceiling wall provided with an opening exposed to the atmosphere for introducing air into said ink liquid reservoir; at least one plate disposed in said ink liquid reservoir in a manner such that the plate stands in the ink liquid reservoir, the free top edge of the plate being separated from said ceiling wall of said ink liquid reservoir; and an ink liquid cartridge in liquid communication with said reservoir mounted on top of said reservoir wherein ink feeds from said cartridge into said reservoir when the ink level in said reservoir is lowered.

4,631,559

IMAGE FORMING METHOD

Shuzo Kaneko, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,989
Claims priority, application Japan, Oct. 18, 1983, 58-195760
Int. Cl.⁴ G01G *15/00*
U.S. Cl. 346—160 **21 Claims**



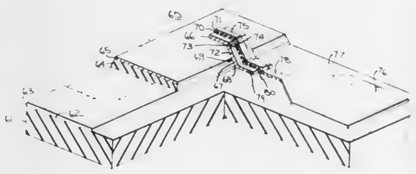
1. An image forming method of irradiating light onto a side of a photosensitive body having a photoconductive layer and a conductive layer, supplying a conductive developing agent to the photosensitive body while a bias voltage is applied between the conductive layer and the developing agent, and forming an image of the developing agent on the photosensitive body in accordance with the light irradiating the photosensitive body, comprising the sequentially performed steps of:
starting supplying said photosensitive body with the developing agent from the side opposing the light irradiated side of said photosensitive body and starting driving of said photosensitive body in a direction of image formation, which sub-steps are performed in any order;
starting application of the bias voltage between said photosensitive body and the developing agent;
stopping application of the bias voltage after irradiation of the light is completed and stopping driving of said photosensitive body, which sub-steps are performed in any order; and
stopping supplying said photosensitive body with the developing agent.

4,631,560

MOMS TUNNEL EMISSION TRANSISTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1984, Ser. No. 683,686
Int. Cl.⁴ H01L *49/02*
U.S. Cl. 357—6 **18 Claims**



1. An MOMS semiconductor device comprising:
a plurality of mesa stacked horizontal layers including at least one semiconductor layer having an exposed edge at a generally vertical side of the mesa;

a first metal layer having a generally vertical portion extending along said side of said mesa; and

a generally vertical oxide layer on said vertical portion of said first metal layer; and

a second metal layer having a generally vertical portion on said oxide layer.

4,631,561

SEMICONDUCTOR OVERVOLTAGE SUPPRESSOR WITH ACCURATELY DETERMINED STRIKING POTENTIAL

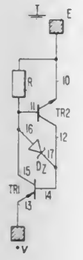
Mario Foroni, Verona, and Franco Bertotti, Milan, both of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milano, Italy

Filed Jul. 23, 1984, Ser. No. 633,434

Claims priority, application Italy, Jul. 29, 1983, 22338 A/83

Int. Cl.⁴ H01L *29/90*

U.S. Cl. 357—13 **1 Claim**



1. A two-terminal semiconductor device with a three-junction structure which is formed on a semiconductor chip and which comprises:

a substrate of a first type of conductivity delimited by a first main surface of said semiconductor chip;

a layer of a second type of conductivity disposed on said substrate and delimited by a second main surface of said semiconductor chip;

a layer of insulating material which extends onto said second main surface;

a first region of said first type of conductivity that extends into said layers of said second type of conductivity from said second main surface;

a second region of said second type of conductivity which extends into said first region from said second main surface;

a first metallic layer which is in ohmic contact with said substrate on said first main surface thereof; and

a second metallic layer which extends onto a portion of said second main surface through an aperture in said insulating layer so as to be in ohmic contact with said first and second regions, and which is on said insulating layer so as to rise above a portion of said layer of said second type of conductivity along a contour of said first region;

wherein said layer of said second type of conductivity has at least one zone which is adjacent to a boundary plane portion of a junction formed between said first region and said layer of said second type of conductivity, said zone having a concentration of impurities that is greater than that of the rest of said layer, and said zone being localized in a portion of said boundary with said first region which does not contact said second region.

4,631,562

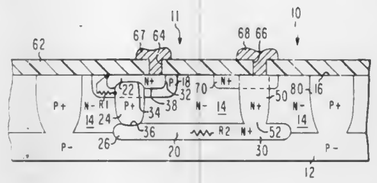
ZENER DIODE STRUCTURE

Leslie R. Avery, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1985, Ser. No. 739,820

Int. Cl.⁴ H01L *29/90*

U.S. Cl. 357—13 **7 Claims**



1. A temperature compensating buried zener diode device comprising:

(a) a substrate of a first conductivity type semiconductor material;

(b) a first layer of a second conductivity type semicondutor material disposed on said substrate and having a surface;

(c) a second layer of highly doped second conductivity type semiconductor material intermediate a portion of said substrate and said first layer;

(d) a first region of first conductivity type diposed within and in PN junction forming relation with said first layer and extending downwardly from said surface directly opposed but not in contact with one end of said second layer;

(e) a second region of highly doped second conductivity type extending downwardly from said surface entirely within said first region and being in PN junction forming relation with said first region at an interface therebetween and forming a first zener breakdown junction at said interface;

(f) a third region of highly doped first conductivity type in said first layer, said third region being in PN junction forming relation with said second region along a portion of said interface directly opposed said second layer thereby forming a second zener breakdown junction therebetween, said third region extending through both said first region and said first layer and into PN junction forming relation with said one end of said second layer thereby forming a third zener breakdown junction threebetween; and

(g) a fourth region of second conductivity type in said first layer extending downwardly from said surface into electrical contact with another end of said second layer.

4,631,563

METAL OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH METAL SOURCE REGION

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 211,929, Dec. 1, 1980, abandoned. This application Mar. 8, 1984, Ser. No. 585,639

Claims priority, application Japan, Dec. 7, 1979, 54-157967

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.1 **3 Claims**

1. A metal oxide semiconductor field-effect transistor comprising:

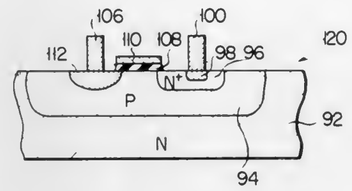
A semiconductor layer of a first conductivity type;

means for providing an inversion layer carrier source consisting essentially of a metal diffusion region, formed in said semiconductor layer in ohmic contact with said semiconductor layer;

a drain region of a second conductivity type formed in said semiconductor layer and separated from said metal diffusion region;

an insulating layer formed on said semiconductor layer between said metal diffusion region and drain region;

a gate layer formed on said insulating layer, whereby (i) current flows in a first direction between said metal diffusion region and said drain through an inversion layer which is induced in the surface of said semiconductor layer under said gate layer and which is coupled to said



metal diffusion region when a first polarity voltage is applied to said gate layer, and (ii) a current flows in a second, opposite direciton between said metal diffusion region and said semicondcutor layer and a p-n junction between said semiconductor layer and said drain region is reverse biased when a second polarity votlage is applied to said gate layer.

4,631,564

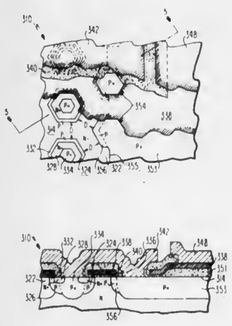
GATE SHIELD STRUCTURE FOR POWER MOS DEVICE

John M. S. Neilson, Lower Providence Township, Montgomery County; Carl F. Wheatley, Jr., Butler Township, Luzerne County, both of Pa., and Norbert W. Brackelmanns, Randolph Township, Morris County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 23, 1984, Ser. No. 664,027

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **7 Claims**



1. In a VDMOS device comprising a semiconductor wafer having first and second opposing major surfaces, a first conductivity type drain region at the first surface, an array of second conductivity type body regions diffused into the drain region from the first surface and spaced from each other by a distance D, each forming a body/drain PN junction, a relatively high conductivity supplementary body region diffused into each body region from within the boundary thereof at the first surface, a first conductivity type source region diffused into each body region so as to form a source/body PN junction, the spacing between the source/body PN junction and body/drain PN junction defining a channel region at the first surface, a source electrode contacting the source and body regions, an insulated gate electrode overlying the channel region, and a gate bond pad, in direct contact with the gate electrode, overlying a second conductivity type gate shield region and insulated therefrom, the gate shield region being contiguous with the drain region and spaced from the channel regions, the improvement comprising:

a predetermined number of source/body cells neighboring the gate shield region and being spaced therefrom by distance D;

the gate shield region including a plurality of contact areas proximate to the periphery thereof;

the gate bond pad including a bonding area portion and a runner;

the number of said contact areas which neighbor the bonding area portion being approximately equal to the number of source/body cells which neighbor the bonding area portion;

the number of said contact area which neighbor the runner being approximately equal to one fifth the number of course/body cells which neighbor the runner, the contact areas which neighbor the runner being substantially uniformly spaced from each other; and

the source electrode ohmically contacting said contact areas.

4,631,565

MISFET WITH INPUT AMPLIFIER

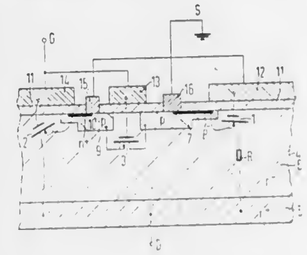
Jenö Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,712

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301648

Int. Cl.⁴ H01L *29/78, 27/02*

U.S. Cl. 357—23.4 **6 Claims**



1. A semiconductor device having a substrate, the substrate containing a first vertical MISFET of a first channel type including a first source zone and a gate zone controlled by a gate electrode, the drain zone of the first vertical MISFET is formed by the substrate, the first source zone and the gate zone extending from a first surface of said substrate into said substrate, an improvement comprising:

(a) a second vertical MISFET of said first channel type including a second source zone and a gate zone controlled by a gate electrode, the drain zone of the second vertical MISFET is formed by said substrate said second source zone and the gate zone of said second MISFET extending from said first surface into said substrate;

(b) a lateral MISFET of a second channel type with a source zone located on the first surface of said substrate and a drain zone located on the first surface, said source zones of said second vertical MISFET and of said lateral MISFET being electrically connected to each other and to the gate electrode of said first vertical MISFET, the gate electrodes of said lateral MISFET and of said second vertical MISFET being electrically connected to each other, and the drain zone of said lateral MISFET being electrically connected to the source zone of said first vertical MISFET;

(c) said gate zone of said first vertical MISFET and said drain zone of said lateral MISFET being a single zone and

said source zone of said lateral MISFET and said gate zone of said second vertical MISFET being a single zone;

(d) the first source zone embedded in said drain zone of said lateral MISFET and bounded by the first surface and the second source zone embedded in said source zone of said lateral MISFET and being of an opposite conductivity type thereto; and

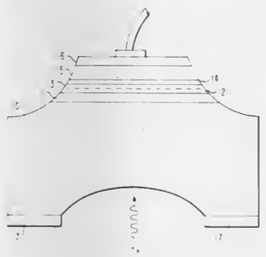
(e) a first contact electrically connected to the first source zone of said first vertical MISFET and being electrically connected to said drain zone of said lateral MISFET, and a second contact electrically connected to the second source zone of said second vertical MISFET and being electrically connected to the source zone of said lateral MISFET.

4,631,566

LONG WAVELENGTH AVALANCHE PHOTODETECTOR

Joe C. Campbell, Middletown, and Andrew G. Dentai, Atlantic Highlands, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1983, Ser. No. 525,455
Int. Cl.⁴ H01L *27/14, 31/00*
U.S. Cl. 357—30 **7 Claims**



1. In a semiconductor device including in succession a first conductivity type terminal region, a second conductivity type multiplication region, a second conductivity type grading region, and a second conductivity type absorption region, each region being comprised of semiconductor material, the device being characterized in that the multiplication region is comprised of a first multiplication layer and a second multiplication layer, both multiplication layers being substantially identical with respect semiconductor composition and substantially similar with respect to carrier concentration.

4,631,567

PNPN INTEGRATED CIRCUIT PROTECTIVE DEVICE WITH INTEGRAL RESISTOR

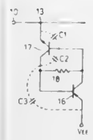
Masayuki Kokado, Kawasaki, and Hidezi Sumi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

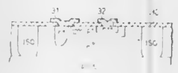
Continuation of Ser. No. 543,215, Oct. 19, 1983, abandoned, which is a continuation of Ser. No. 221,330, Dec. 29, 1980, abandoned. This application Jan. 23, 1985, Ser. No. 693,306
Claims priority, application Japan, Dec. 27, 1979, 54-169181
Int. Cl.⁴ H01L *29/74*
U.S. Cl. 357—38 **4 Claims**

1. A semiconductor device for receiving an input signal, comprising: a substrate, an internal circuit formed in the substrate and an electrostatic destruction preventing circuit formed in the substrate and connected between a predetermined electrical potential point which is operatively connected to receive a most negative power supply voltage, and having a signal input terminal which is operatively connected to receive the input signal for said internal circuit, wherein said electrostatic destruction preventing circuit comprises:

a PNP-transistor having a collector region, a base region, and an emitter region connected to said predetermined electrical potential point;

an NPN-transistor having an emitter region connected to said signal input terminal and to said internal circuit, a collector region connected to the base region of said





PNP-transistor, and a base region connected to the collector region of said PNP-transistor; and

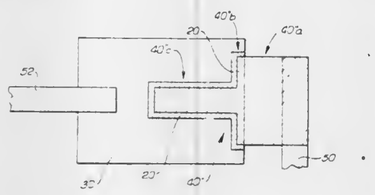
resistor means comprising a portion of the collector region of said PNP-transistor, and the base region of said NPN-transistor.

4,631,568

BIPOLAR TRANSISTOR CONSTRUCTION

Neal F. Gardner, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 473,382, Mar. 8, 1983. This application Apr. 16, 1984, Ser. No. 600,707
Int. Cl.⁴ H01L *27/12*
U.S. Cl. 357—49 **4 Claims**



1. A bipolar transistor construction, comprising:

a collector region formed from a semiconductor material having a first conductivity type;

a base region formed over said collector region, from a semiconductor material having the opposite conductivity type to that of the collector region;

an emitter region formed to overlap a selected mid-portion of said base region, from a semiconductor material of the same conductivity type as said collector region;

a wall of insulating material formed on said base region in contact with the edges of said emitter region and having a height approximately equal to the thickness of said emitter region; and

a conductive layer formed over said base region and said emitter region but not over said wall of insulating material, said conductive layer serving to establish separate connections to said base region and said emitter region;

whereby said wall of insulating material electrically separates the separate connections to said base and emitter regions and reduces the size of inactive portions of said base region, thereby decreasing base resistance and base-collector capacitance, and increasing speed and device packing density;

and wherein said emitter region has a relatively wide inactive portion, not overlapping said base region, and an adjoining active portion with a first area that is of substantially the same width as the inactive portion, to provide a relatively low emitter resistance, and a contiguous second area that is narrower than the first area and provides a relatively long active emitter perimeter and therefore a relatively low base resistance.

4,631,569

MEANS AND METHOD OF REDUCING THE NUMBER OF MASKS UTILIZED IN FABRICATING COMPLEX MULTI-LEVEL INTEGRATED CIRCUITS

Donald F. Calhoun, Inglewood, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 211,037, Dec. 22, 1971, which is a continuation of Ser. No. 16,868, Mar. 5, 1970, abandoned. This application Dec. 13, 1974, Ser. No. 532,359
Int. Cl.⁴ H01L *27/06*
U.S. Cl. 357—45 **11 Claims**



1. A multi-level complex integrated circuit for defining a specific electrical function fabricated in an identical manner on each of a plurality of N (where N is an integer) wafers each having an imperfect yield of cells including usable cells distributed randomly across the surfaces of the N wafers, said usable cells terminating in signal-connects at a first level of metalization with a portion Y (where Y is an integer) of the usable cells having a common yield distribution on all N wafers, the improvement for each of the N wafers comprising:

means for defining a first layer of dielectric insulation on each of the N wafers and for defining identically located vias formed through said dielectric insulation layer only to the Y common yield usable cells at the first level of metalization, and thereby for identically exposing only the signal-connects of said Y common yield usable cells on each of the N wafers;

means for defining identically located electrical conductors in a second level of metalization on said dielectric insulation means for identical routing of said identically located electrical conductors from said exposed first level signal-connects of each of the N wafers to second level signal-connects at identical positions on each of the N wafers;

means for defining a second layer of dielectric insulation on said electrical conductor means of each of the N wafers and for defining identically located vias formed through said second dielectric insulation layer thereby for identically exposing said second level signal-connects on each of the N wafers; and

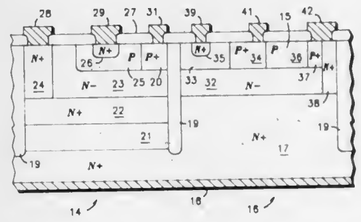
means for defining identically located electrical interconnect routings in at least a further level of metalization on said second layer of dielectric insulation means and for interconnecting said exposed second level signal-connects identically on each of the N wafers, thereby for enabling performance of the specific electrical function.

4,631,570

INTEGRATED CIRCUIT HAVING BURIED OXIDE ISOLATION AND LOW RESISTIVITY SUBSTRATE FOR POWER SUPPLY INTERCONNECTION

Mark S. Birrittella, Phoenix; Robert H. Reuss, Scottsdale, and Walter C. Seelbach, Fountain Hills, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1984, Ser. No. 628,019
Int. Cl.⁴ H01L *27/12, 27/02*
U.S. Cl. 357—49 **1 Claim**



1. A monolithic semiconductor integrated circuit structure, comprising:

a plurality of islands, each of said islands comprising at least one semiconductor device;

a substrate of a first conductivity type for coupling to a voltage supply;

a first region comprising a dielectric material formed between said substrate and at least one of said plurality of islands of isolating said voltage supply from said at least one of said plurality of islands;

a second region having said first conductivity type and having a first portion epitaxially grown above said first region and a second portion epitaxially grown between said substrate and another of said plurality of islands;

a third region having a second conductivity type formed at a surface of said first portion of said second region;

a fourth region having said first conductivity type formed at a surface of said third region, said first portion of said second region, and said third and fourth regions forming a first semiconductor device;

a fifth region having said second conductivity type epitaxially grown on a surface of said second portion of said second region;

a sixth region having said first conductivity type epitaxially grown on a surface of said fifth region, said second portion of said second region, and said fifth and sixth regions forming a second semiconductor device;

a seventh region having said second conductivity type, formed at a surface of a third portion of said second region and adjacent to said fifth region; and

an eighth region having said first conductivity type formed at a surface of said substrate and extending adjacent to said second and seventh regions.

4,631,571

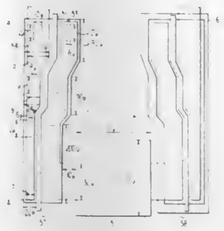
SEMICONDUCTOR DEVICE FOR USE IN A LARGE SCALE INTEGRATION CIRCUIT

Fusao Tsubokura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,371
Claims priority, application Japan, Mar. 14, 1983, 58-41673
Int. Cl.⁴ H01L *23/48, 29/44, 29/78, 27/10*
U.S. Cl. 357—68 **10 Claims**

1. A semiconductor device comprising an output buffer element having an MOS transistor and a bonding pad on a

semiconductor chip, said MOS transistor having a source region, a gate electrode and a drain region, said source region having a first end portion, an intermediate portion narrower than said first end portion and a second end portion narrower than said intermediate portion, said second end portion being



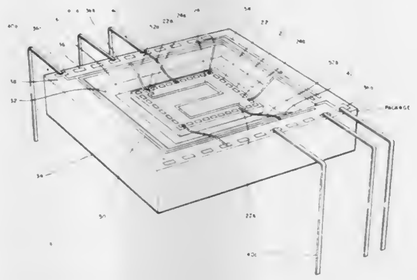
adjacent to said bonding pad and near a peripheral side of said semiconductor chip, said first end portion being positioned far from said peripheral side of said semiconductor chip, and said gate electrode and said drain region being elongated along and in parallel with said source region.

4,631,572

MULTIPLE PATH SIGNAL DISTRIBUTION TO LARGE SCALE INTEGRATION CHIPS

Thomas A. Zimmerman, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 27, 1983, Ser. No. 536,129
Int. Cl.⁴ H01L *23/02, 23/16, 39/02*
U.S. Cl. 357—74 **4 Claims**



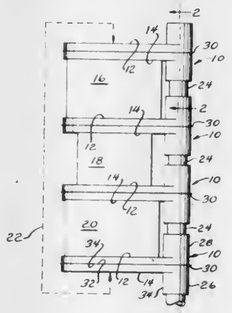
3. In combination:
an integrated circuit chip package substrate having an area at one side of the substrate on which an integrated circuit chip may be mounted;
an integrated circuit chip mounted on said substrate area and having a plurality of pads exposed at one side of the substrate;
a first ring conductor having an exposed surface at said one side of said substrate at least partially surrounding said chip and substrate area between the substrate area and the edge of said substrate;
a plurality of conductive bases at said one side of said substrate between said ring conductor and the edge of the substrate;
a plurality of external connection pins about the edge of said substrate;
at least one conductor such as a wire extending across said side of the substrate and directly bonded at one end of to said exposed ring conductor surface and at its other end to a selected chip pad;
additional connectors such as wires extending across said one side of the substrate and each bonded at one end to a substrate base and at is other end to a chip pad;
an integrated circuit bus conductor extending across the chip, said bus conductor having at least two ends connected to separate chip pads, respectively; and
conductors such as wires extending across said one side of the substrate and bonded directly to said latter chip pads, respectively, and to said ring conductor.

4,631,573

COOLED STACK OF ELECTRICALLY ISOLATED SEMICONDUCTORS

Thomas A. Sutrina, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 24, 1985, Ser. No. 738,057
Int. Cl.⁴ H04N *9/02;* **H02B** *1/00;* **F28F** *7/00;* **H01B** *7/34*
U.S. Cl. 357—82 **12 Claims**



1. A heat sink structure comprising:
a thin sheet of electrical insulating material;
first and second electrically conductive heat sink elements each having a planar surface and an opposite side configured to make good electrical and thermal contact with a semiconductor, each said heat sink element having a fluid inlet and a fluid outlet spaced from said inlet and an internal conduit interconnecting said inlet and said outlet and said conduit being in heat transfer relation to said opposite side, and elements sandwiching said sheet between said planar surfaces; and
means bonding said planar surfaces to said sheet.

4,631,574

COMPATIBLE HIGH-DEFINITION TELEVISION WITH EXTENDED ASPECT RATIO

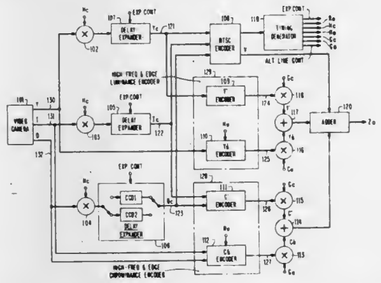
Joseph L. LoCicero, Riverside; Melih Pazarci, Chicago, and Theodore S. Rzeszewski, Lombard, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 29, 1984, Ser. No. 626,453
Int. Cl.⁴ H04N *11/06, 7/06*
U.S. Cl. 358—12 **23 Claims**

1. A system for encoding high-definition luminance and chrominance information from a high-definition video source having low-frequency chrominance and luminance information and high-frequency luminance and chrominance information and extended aspect ratio luminance and chrominance information, said system comprises
means for gating said low-frequency and high-frequency luminance and chrominance information from said high-definition luminance and chrominance information;
means for time expanding the gated low-frequency and high-frequency luminance and chrominance information;
means for encoding the time expanded low-frequency luminance and chrominance information into a first baseband signal;
means for encoding the expanded high-frequency luminance and chrominance information into a second baseband signal;

means for separating said extended aspect ratio luminance and chrominance information from said high-definition luminance and chrominance information;
means for encoding the separated extended aspect ratio luminance and chrominance information into the horizontal retrace interval of said second baseband signal; and
means for transmitting said first baseband signal and said second baseband signal.

8. A system for decoding high-definition information of a high-definition baseband video signal having a first baseband signal including low-frequency luminance and chrominance information and a second baseband signal including high-frequency luminance and chrominance information and band-limited edge luminance and chrominance information in the horizontal retrace interval of said second baseband signal to provide extended aspect ratio information, said system comprises
means for decoding said low-frequency and high-frequency luminance information;
means for time compressing the decoded low-frequency and high-frequency luminance information;



means for decoding said band-limited edge luminance information;
means for combining the compressed low-frequency and high-frequency luminance information and the decoded band-limited edge luminance information for display;
means for decoding said low-frequency chrominance information;
means for decoding said high-frequency chrominance information;
means for combining the decoded low-frequency chrominance information and the decoded high-frequency chrominance information;
means for time compressing the combined low-frequency and high-frequency chrominance information;
means for decoding said band-limited edge chrominance information; and
means for adding the time compressed low-frequency chrominance information and high-frequency chrominance information and the decoded band-limited edge chrominance information for display.

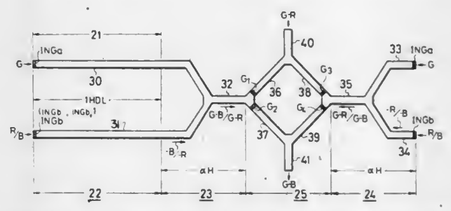
4,631,575

CHARGE TRANSFER DEVICE FOR FORMING DESIRED COLOR DIFFERENCE SIGNALS

Maki Sato, Sagamihara, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00149, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984, PCT Pub. No. WO83/04361, PCT Pub. Date Dec. 8, 1983
PCT Filed May 19, 1983, Ser. No. 573,913
Claims priority, application Japan, May 21, 1982, 57-86254
Int. Cl.⁴ H04N *9/67, 9/64, 9/04, 9/07*
U.S. Cl. 358—30 **8 Claims**

1. A charge transfer device for processing color signals, comprising:
signal separating means for forming a first color signal during predetermined periods and for forming a sequential signal formed of alternating second and third color signals such that only one of said second and third color signals is present during alternate ones of said predetermined periods;
first charge transfer means for forming first color signal charges connected to receive said first color signal from said signal separating means;
second charge transfer means for forming sequential signal charges connected to receive said sequential signal from said signal separating means;
first combining means for combining the first color signal



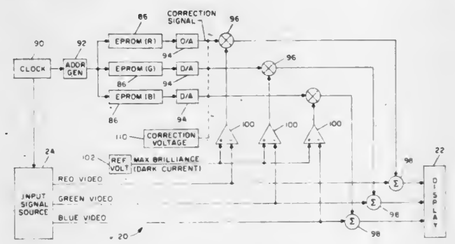
charges with the sequential signal charges during said predetermined periods so as to create sequential resultant signal charges formed of first and second resultant signal charges such that only one of said first and second resultant signal charges is present during alternate ones of said predetermined periods; and
switching means having a first input and two outputs, wherein said switching means receives the sequential resultant signal charges formed of the first and second resultant signal charges at the first input and outputs the first resultant signal charges at one output and the second resultant signal charges at the other output during said predetermined periods.

4,631,576

NONUNIFORMITY CORRECTION SYSTEM FOR COLOR CRT DISPLAY

Karl M. St. John, Huntington Station, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Nov. 13, 1984, Ser. No. 671,137
Int. Cl.⁴ H04N *9/20, 9/16, 5/243, 5/68*
U.S. Cl. 358—65 **9 Claims**



1. A CRT display compensation system for correction of nonuniformity comprising:
a. means for storing correction signals as a function of primary color and as a function of location on a screen of said display;
b. means for combining the correction signals with video display signals employed in driving electron guns of said display; and
c. means coupled between said storing means and said combining means for altering the values of said correction signals in inverse proportion to the magnitudes of the video display signals.

4,631,577

IMAGE FORMING APPARATUS DISPLAYING THE STEPS OF THE IMAGE FORMING PROCESS

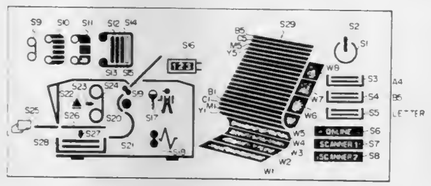
Eiichi Yamanishi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1984, Ser. No. 635,161

Claims priority, application Japan, Aug. 1, 1983, 58-140870; May 1, 1984, 59-088045

Int. Cl.[4] H04N *1/46, 1/00;* **G01D** *15/10;* **G03G** *15/01*

U.S. Cl. 358—75 **8 Claims**



1. An image forming apparatus comprising:

means for forming a color image on an image forming medium by sequentially forming color component images superimposedly on each other; and

displaying means for representing the image forming medium, a displaying area of said displaying means being gradually increased in accordance with the progress of image formation by said forming means in order to indicate steps of an image forming process.

4,631,578

METHOD OF AND APPARATUS FOR FORMING A COLOR PICTURE USING A PLURALITY OF COLOR CORRECTION PROCESSINGS

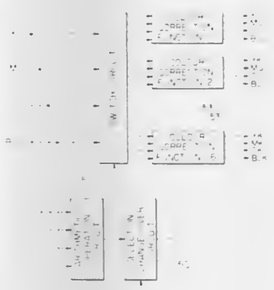
Takashi Sasaki; Hideaki Kawamura, both of Tokyo, and Nobuaki Sakurada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,735

Claims priority, application Japan, Mar. 4, 1983, 58-35359; Mar. 7, 1983, 58-37045

Int. Cl.[4] G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **17 Claims**



1. Color picture forming method comprising the steps of:

inputting color input picture data;

forming a color picture using a plurality of colorants by selecting one of a plurality of combinations of colorants in response to the color input picture data;

providing a plurality of color correction processings corresponding to the plurality of combinations of colorants; and

selecting the color correction processing corresponding to the selected combination of colorants.

5. Color picture data processing method comprising the steps of:

inputting color input picture data;

dividing a color space into a plurality of areas;

providing a corresponding color correction processing for each of said areas; and

selecting at least two of said color correction processings for the color input picture data in a mutually exclusive random of alternating manner.

17. Color picture forming method of reproducing a color picture, comprising the steps of:

inputting color input picture data;

providing colorants for a pluraltiy of different colors, wherein a plurality of colorants of different concentrations are provided for at least one of the different colors;

providing a plurality of different color correction processings corresponding to a pluraltiy of different combinations of said colorants; and

selecting one of said pluraltiy of different combinations of said colorants and a corresponding one of said plurality of different color correction processings in response to the color input picture data.

4,631,579

METHOD AND APPARATUS FOR THE PRODUCTION OF COLOR SEPARATIONS FOR SINGLE COLOR PRINTING

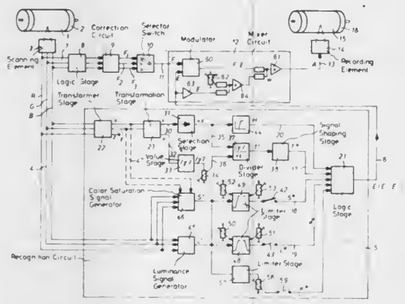
Ingo Hoffrichter, Kiel, and Eggert Jüng, Schoenberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,820

Claims priority, application European Pat. Off., Dec. 14, 1983, 83112578.6

Int. Cl.[4] G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **31 Claims**



1. A method for production of color separations of a color original for single color printing, comprising the steps of:

(a) trichromatically scanning the color original point-by-point and line-by-line by an optoelectronic scanning element for obtaining measured color value signals R, G, B;

(b) generating corrected color signals F_1, F_2, F_3 from the measured color value signals R, G, B;

(c) determining a color locus F_0 of a selected separation hue T_0 of a color of the original by color values R_0, G_0, B_0;

(d) transforming the color locus F_0 of the selected separation hue T_0 into a chrominance plane of a chrominance/luminance color space by a first transformation of said color values R_0, G_0, B_0 corresponding chrominance values x'_0, y'_0 such that a transformed color locus F'_0 lies on one of the axes of a rotated X'Y' color coordinate system in said chrominance plane of the color space, and retaining transformation coefficients required therefor;

(e) continuously transforming color loci of hues of the scanned colors of the original into the chrominance plane by a second transformation of the measured color value signals R, G, B into chrominance values x', y' with the previously identified transformation coefficients;

(f) selecting those chrominance values x', y' whose corresponding transformed color loci F' lie in a same half of the X'Y' rotated color coordinate system as the transformed color locus F'_0 of the selected separation hue T_0;

(g) acquiring a hue signal T' by forming a quotient of absolute values of the selected chrominance values x', y', this respectively corresponding to a tangent of an angle β described by the corresponding axis and a connecting line between coordinate origin and a transformed color locus F' of the hue of a scanned color of the original, the hue signal T' being a measure for a respective value-wise hue deviation of the hue of the scanned color of the original from the selected separation hue T_0;

(h) acquiring a hue recognition signal E' from auxiliary control signal H and the hue signal T', said hue recognition signal E' having its highest value when scanning the selected separation hue T_0 and having a value of zero when scanning a hue having a prescribed maximum hue deviation from the selected separation hue T_0, a sector-shaped hue recognition region being defined around the corresponding axis and around the selected separation hue T_0;

(i) emitting the hue recognition signal E' when the measured color value signals R, G, B fall within the hue recognition region;

(j) selecting at least one of said corrected color signals F_1, F_2, F_3 as a selected color signal F;

(k) combining said hue recognition signal E' for the selected separation hue T_0 with said selected color signal F to form a separation signal A; and

(l) recording a color separation point-by-point and line-by-line on a recording medium by a recording element controlled by said separation signal A.

4,631,580

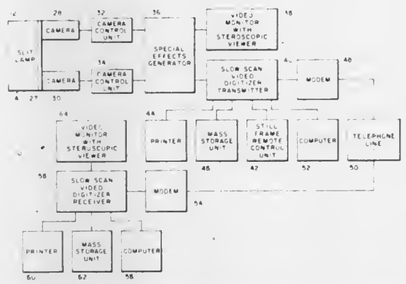
VIDEO-STEREOSCOPIC-IMAGE-PRODUCING SYSTEM

John Taube, 3020 NW. 29th, Gainesville, Fla. 32605; Lawrence W. O'Dell, 34498 Deerwood Dr., Eugene, Oreg. 97401, and Michael D. O'Dell, 19030 SW. Willow Creek Ter., Aloha, Oreg. 97006

Filed Nov. 9, 1984, Ser. No. 670,321

Int. Cl.[4] H04N *7/18, 13/00;* **A61B** *3/14*

U.S. Cl. 358—88 **2 Claims**



1. A binocular camera mount for aligning two video cameras to produce a pair of image signals of an object for stereoscopic viewing by a remote observer comprising:

visual observing means for directly, ocularly stereoscopically viewing two input images of the object,

beam splitting means for diverting each input image into two image paths, one of which is directed to a video camera and the other of which is directed to said visual observing means,

adjusting means for adjusting the direction of projection of said one image path, and

video-stereoscopic-image-producing system means for compiling the image signals into a combined video stereoscopic signal, transmitting the combined signal to a remote location, and generating a stereoscopic video display representative of the object for stereoscopic viewing by such an observer.

4,631,581

METHOD AND APPARATUS FOR MICROPHOTOMETERING MICROSCOPE SPECIMENS

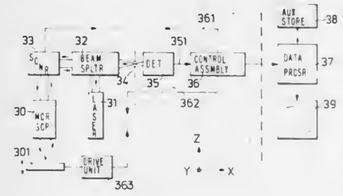
Kjell S. Carlsson, Vallentuna, Sweden, assignor to Sarastro AB, Stockholm, Sweden

Filed Feb. 21, 1985, Ser. No. 703,842

Claims priority, application Sweden, Mar. 15, 1984, 8401458

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **9 Claims**



1. A method for microphotometering and subsequent image combination by generating with the aid of a convergent light beam a luminous dot or cursor in the focal plane (**11**) of a microscope (**30**), fitting the cursor to a plurality of part elements in the specimen (**10**), and collecting light created by the luminous cursor and the specimen (**10**), detecting the collected light and producing corresponding electric signals, characterized by changing the mutual position between the specimen (**10**) and the focal plane (**11**) and re-fitting the luminous cursor to a plurality of part elements in the specimen (**10**); repeating stepwise changes in the mutual position between the specimen (**10**) and the focal plane (**11**) and, subsequent to each such change, again fitting or matching the luminous cursor to a plurality of part elements in the specimen; collecting the light created by the luminous cursor and part elements in the specimen (**10**) and screening-off any disturbing light created synchronously from adjacent (above, beneath, beside) part elements in the specimen (**10**); detecting the thus collected light and storing measurement values obtained through said detection, said storage optionally being effected synchronously with the matching of the luminous cursor with part elements in the specimen (**10**) and with the changes in the mutual position between the specimen (**10**) and the focal plane (**11**), said measurement values being representative of locations in various layers through the specimen; and combining the measurement values from locations in a plurality of layers, representative of a given volume of the specimen, in dependence upon a planned/desired analysis of the specimen.

4,631,582

ENDOSCOPE USING SOLID STATE IMAGE PICK-UP DEVICE

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,311

Claims priority, application Japan, Aug. 31, 1984, 59-183089

Int. Cl.[4] A61B *1/04, 1/06*

U.S. Cl. 358—98 **7 Claims**

1. An endoscope with a solid state image pick-up for receiving an image from a subject to be examined, comprising:

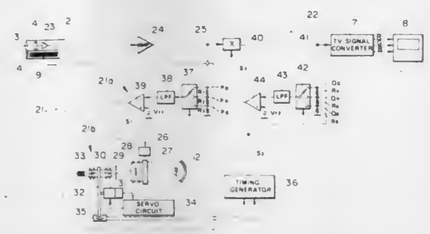
an illuminating means for projecting light onto the subject;

a first level detecting means for detecting a level of a video signal supplied from the solid state image pick-up device;

a first level comparing means connected to said first level detecting means for comparing the level of the signal detected by said first level detecting means with a preset first reference level and generating a first control signal in accordance with the level difference;

a light controlling means connected to the output of said first level comparing means for controlling the amount of light emitted from said illuminating means based on said first control signal;

a gain-variable amplifying means for receiving and amplifying the video signal from the solid state image pick-up device;



a second level detecting means connected to said gain-variable amplifying means for detecting the level of the signal therefrom; and

a circuit means connected to said second level detecting means for comparing the level of the signal detected by said second level detecting means with a preset second reference level and generating a second control signal in accordance with the level difference therebetween and providing said second control signal as a gain controlling signal to said gain-variable amplifying means.

4,631,583

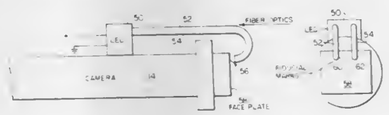
VIDICON IMAGE MOTION COMPENSATION TECHNIQUE

Mark O. Paul, Costa Mesa, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 28, 1985, Ser. No. 695,659

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—125 **11 Claims**



1. In a video system having a camera for imaging a scene, the improvement comprising:

means connected to an output of the camera for tracking displacement of a moving image in the scene;

computing means connected to the tracking means for storing positional data of the moving image;

means for generating a reticle superimposed on a central point of the image;

interfacing means for combining video signals from the computing means and the generating means in order to form a combined signal, on a display, of the image and the reticle superimposed thereon; and

at least one fiducial mark applied to the faceplate of the camera, the computing means further ensuring a fixed preselected relationship between the displayed reticle and the fiducial mark which in turn ensures proper positioning of the displayed reticle over the image.

4,631,584

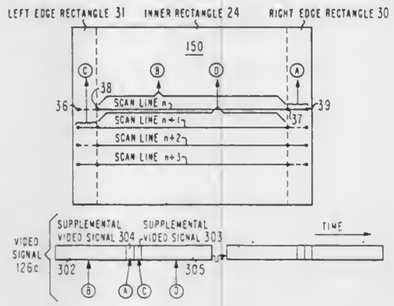
TRANSMISSION OF REDUCED RESOLUTION PICTURE EDGE INFORMATION USING HORIZONTAL BLANKING PERIOD

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 3, 1984, Ser. No. 576,916

Int. Cl.[4] H04N *7/093*

U.S. Cl. 358—141 **3 Claims**



3. An encoder, comprising:

a source for providing a video input signal representative of a wide screen image having an aspect ratio greater than 4:3, each line of said video input signal comprising a central portion and two end portions, said central portion corresponding to a portion of said image having a 4:3 aspect ratio;

a single transmission channel; and

circuit means for sequentially coupling said central portion and one of said end portions of said video input signal to said transmission channel during alternate line intervals and for sequentially coupling said central portion and the other of said end portions of said video input signal to said transmission channel during intermediate line intervals to provide a processed output signal for said transmission channel in which each line includes said central portion and only one of said end portions with said end portions alternating line by line and in which each said end portions of said processed video signal is timed to occur in an interval corresponding to a portion of a blanking interval of a given television broadcast standard.

4,631,585

APPARATUS FOR SYNCHRONIZING THE OPERATION OF A MICROPROCESSOR WITH A TELEVISION SYNCHRONIZATION SIGNAL USEFUL IN GENERATING AN ON-SCREEN CHARACTER DISPLAY

Charles M. Wine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 7, 1984, Ser. No. 607,595

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 **23 Claims**

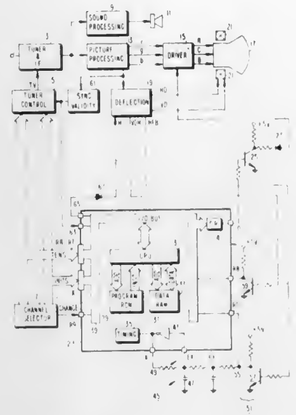
1. Apparatus comprising:

computing means operating in response to stored program instructions generated in timed relationship to instruction cycles occurring at a rate synchronously related to a clock signal;

clock signal generating means for generating said clock signal and for controlling the phase and frequency of said clock signal in response to a control signal;

a source of a reference frequency signal having a reference frequency;

said computing means being programmed to generate a comparison signal each time a predetermined number of instruction cycles have occurred; and



comparison means for comparing the phase and frequency of said comparison signal and said reference signal and generating said control signal in response thereto.

4,631,586

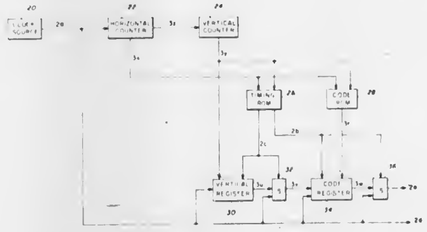
DIGITAL RASTER TIMING ENCODER/DECODER

Edward W. Gennetten, San Diego, and Duane A. Gomez, El Cajon, both of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 617,220

Int. Cl.[4] H04N *5/04, 7/04*

U.S. Cl. 358—148 **16 Claims**



1. A digital raster timing encoder/decoder system, for generating horizontal and vertical control synchronization signals for a video raster scan and other preselected timing and digital data signals for said video scan, comprising:

a clock source;

an encoding means connected to receive a clock signal from the clock source, said encoding means being preprogrammed to encode preselected digital signals to be output by said encoding means; and

a decoding means disposed to receive the encoded digital signals which are output by said encoding means, said decoding means programmed to decode the digital signals; wherein

the encoding means further comprises:

first means for counting connected to receive the clock source signal, said counting means disposed to accumulate count related to the time progression for horizontal video scan segments;

second means for counting connected to the output of the first counting means, said second counting means disposed to accumulate count in reference to the vertical control synchronization signals of the video raster scan;

first memory means connected to receive digital count signals from the first and second counting means;

second memory means connected to receive said digital count signals from the first and second counting means;

first means for registering, connected to receive said digital count signal from the second means for counting, a first digital timing signal from the first memory means, and also connected to receive the clock source signal, said first registering means storing said digital count signal for output; and

second means for registering connected to receive the stored digital count signal output from the first registering means, a second digital timing signal from the first memory means, said signal from the clock source, and a digital code signal from the second memory means, said second registering means encoding said code signal ahead of the digital count signal output from the first registering means, said second registering means outputting said encoded digital signals to said decoding means.

4,631,587

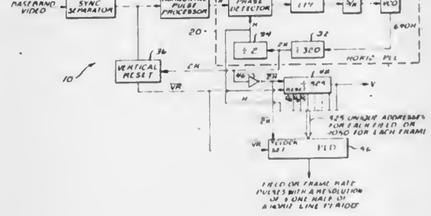
FIELD RESPONSIVE VERTICAL PULSE GENERATOR

Rudolf Turner, Vernon Hills, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 19, 1985, Ser. No. 702,534

Int. Cl.[4] H04N *7/04*

U.S. Cl. 358—148 **8 Claims**



1. Apparatus for processing a baseband video signal having alternately occurring even and odd fields and including a composite sync signal having an H signal component for generating a pulse to within a half horizontal line resolution within the even and odd fields, said apparatus comprising:

first means responsive to the composite sync signal for developing the H signal and a 2H signal;

counting means coupled to said first means and responsive to said 2H signal for successively developing a sequence of coded signals, wherein each of said coded signals identifies a respective half of a horizontal line within successive alternating even and odd fields of the baseband video signal; and

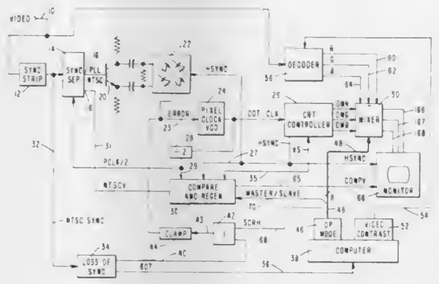
decoding means coupled to said first means and to said counting means and responsive to said developed H signal and to said sequence of coded signals respectively output therefrom for developing a first selected decoded signal during each said even field of the baseband video signal and a second selected decoded signal during each said odd field of the baseband video signal.

4,631,588

APPARATUS AND ITS METHOD FOR THE SIMULTANEOUS PRESENTATION OF COMPUTER GENERATED GRAPHICS AND TELEVISION VIDEO SIGNALS

Lawrence C. Barnes, Apopka, and Robert G. Mankedick, Longwood, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 11, 1985, Ser. No. 700,568
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—149 **19 Claims**



10. In a system for overlaying a computer display on a video signal, an apparatus for generating vertical sync pulses comprising:

video input means for receiving a video signal including sync pulses;

separating means for separating horizontal sync pulses and vertical pulses from the sync pulses of the video signal received by said video input means;

computer graphics sync pulse generating means for generating computer graphics sync pulses in phase with the horizontal sync pulses of said separating means when a video signal is received by said video input means, and for generating computer graphics sync pulses at a set rate when a video signal is not received by said video input means; and

counter means for generating vertical sync pulses responsive to vertical sync pulses separated by said separating means when a video signal is received by said video input means, and for generating vertical sync pulses responsive to a set number of generated computer graphics sync pulses counted from the last vertical sync pulse from said separating means when a video signal is not received by said video input means.

4,631,589

DARK LEVEL RESTORING CIRCUIT

Masayuki Hongu, Kanagawa; Takahiko Tamura, Tokyo, and Masaharu Tokuhara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

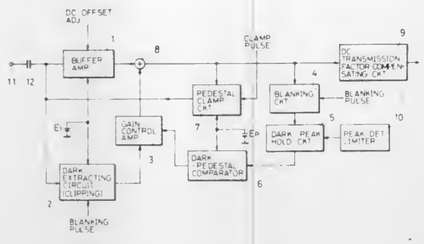
Filed Aug. 20, 1984, Ser. No. 642,334
Claims priority, application Japan, Aug. 22, 1983, 58-152926
Int. Cl.[4] H04N *5/16*
U.S. Cl. 358—171 **7 Claims**

1. A dark level restoring circuit for use in a television apparatus, comprising:

extracting means for extracting a dark signal from an incoming video signal exceeding a predetermined dark level;

adding means connected to said extracting means for adding the extracted dark signal to said incoming video signal;

peak detecting means connected to said adding means for detecting a dark peak of a video signal obtained from said adding means; and



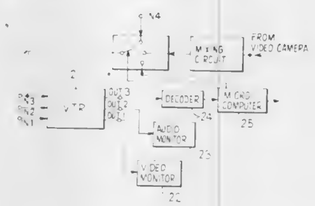
adjusting means connected to said adding means and said peak detecting means for adjusting a level of the extracted dark signal to be added to said incoming signal.

4,631,590

AUTOMATIC CAMERA CONTROL SYSTEM

Kimichika Yamada, and Takao Miyazaki, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 515,848, Jul. 21, 1983, abandoned. This application Feb. 4, 1986, Ser. No. 827,206
Claims priority, application Japan, Jul. 27, 1982, 57-130845; Jul. 27, 1982, 57-130846; Aug. 3, 1982, 57-118609; Aug. 4, 1982, 57-119199
Int. Cl.[4] H04N *5/24*
U.S. Cl. 358—185 **4 Claims**



1. A self-control television system comprising:

an audio tape recorder having an audio tape which has prerecorded thereon self-control signals necessary for control of video signal recording of a series of pictures changing in a predetermined stepwise manner;

a video tape recorder;

an auto-focusing video camera having a color temperature switching member and a white balance adjusting member;

a video camera position control means for moving said video camera vertically and horizontally;

a video camera control means for controlling the color temperature switching member and white balance adjusting member of said video camera;

an illumination control means including a plurality of lamps with different colors associated with said camera for selectively turning on and off and adjusting brightness of said lamps;

a microcomputer having output means for outputting control signals to said video camera position control means, video camera control means and illumination control means for controlling same;

a decoder means for converting said self-control signals reproduced by said audio tape recorder into a digital signal and entering it in said microcomputer, said microcomputer being responsive to said digital signal to output said control signals to said individual ones of said control means; and

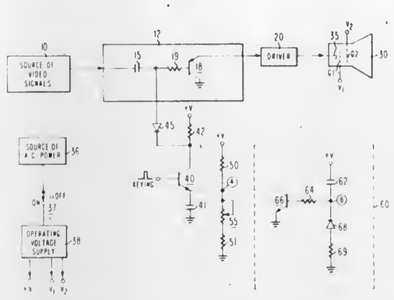
a video signal entering means for entering video signals from said video camera in said video recorder and therewith for recording said series of pictures.

4,631,591

KINESCOPE WITH COMPENSATED CONDUCTION CHARACTERISTIC

Wayne Lee, Taipei, Taiwan, assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 8, 1985, Ser. No. 699,556
Int. Cl.[4] H04N *5/63*
U.S. Cl. 358—190 **8 Claims**



1. A video signal processing and display system comprising:

means for energizing said system;

a source of video signals containing information to be displayed;

an image display device coupled to said energizing means and responsive to said video signals, said display device having an inherent initial conduction characteristic resulting in declining light output during an initial warm-up interval from a time soon after the system is initially energized to a later time when stable steady-state operation is achieved;

a compensation circuit coupled to said energizing means and having a conduction characteristic which approximates the conduction characteristic of said display device during said warm-up interval; and

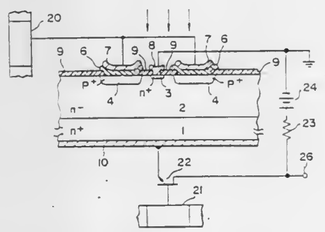
means for coupling said compensation circuit to said display device to counteract said initial conduction characteristic of said display device so that said display device exhibits substantially uniform conduction and light output during said warm-up interval.

4,631,592

SEMICONDUCTOR IMAGE SENSOR

Jun-ichi Nishizawa, Sendai, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 527,574, Aug. 16, 1983, Pat. No. 4,562,474. This application Oct. 31, 1985, Ser. No. 793,239
Claims priority, application Japan, Dec. 17, 1981, 56-204656
Int. Cl.[4] H01L *27/14*
U.S. Cl. 358—213 **12 Claims**



1. A semiconductor image sensor comprising:

a matrix corresponding to intersections of a plurality of row lines and a plurality of column lines on a substrate;

a static induction transistor photocell provided with said substrate for each said intersection, each said photocell including

a first main electrode connected to one of the column lines,

a second main electrode connected in common to the second main electrodes of the other photocells,

a channel region disposed in said substrate between the first and second main electrodes,

a control region in said substrate, and

a capacitor connected between said control region and a respective one of said row lines;

a respective switching transistor for each said column line, each including

a control electrode,

a first main electrode connected to the respective column line, and

a second main electrode connected in common to the second main electrodes of the other switching transistors;

a respective video line selecting circuit for each said column line, each connected to the control electrode of the respective switching transistor; and

a respective read address circuit for each said row line, connected to the gate electrode of each respective photocell via the respective capacitor

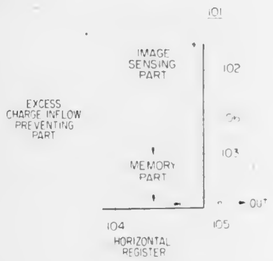
wherein said substrate includes a lightly doped layer of a first conductivity type in which each said channel region is formed, and each said transistor photocell has as its source or drain a first region of said first conductivity type but of higher conductivity than said lightly doped layer, each said first region being connected to a respective one of said first and second main electrodes of the respective photocell transistor and each said control region is formed of a second conductivity type that is opposite said first conductivity type.

4,631,593

STILL PICTURE RECORDING APPARATUS AND A SOLID-STATE IMAGE PICKUP DEVICE SUITABLE FOR THIS APPARATUS

Takao Kinoshita, Tokyo, and Shinji Sakai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 557,937, Dec. 5, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 841,025
Claims priority, application Japan, Dec. 14, 1982, 57-218882; Dec. 14, 1982, 57-218883
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 **23 Claims**



1. A still picture recording apparatus comprising:

(A) solid-state frame transfer type charge-coupled image pick-up means having:

(A-1) an image pick-up portion for generating an image representing signal pattern in response to a received picture image;

(A-2) a storage portion for temporarily storing said signal pattern generated by said pick-up portion;

(A-3) a read-out portion for reading out the stored signal

pattern from said storage portion to produce an electrical output corresponding to the signal pattern; and

(A-4) an overflow signal clear portion for clearing said image pick-up portion of overflow signals, said overflow signal clear portion being disposed along a first side of said image pick-up portion opposite to a second side thereof to which said storage portion is coupled;

(B) recording means for recording a video signal representing said picture image on the basis of the electrical output of said image pick-up means; and

(C) control means for controlling said recording means and said image pick-up means, said control means enabling the recording means to record a video signal corresponding to a selected still picture image and causing said image pick-up means to prevent overflow signals from flowing into said storage portion from said image pick-up portion at least during the recording of the video signal by the recording means.

4,631,594

PROJECTION DEVICE

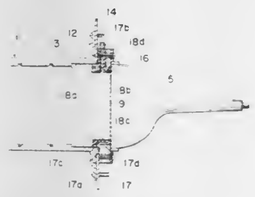
Koji Imabayashi; Hiroshi Kawamura, both of Toyonaka; Shigeru Takeuchi, Moriyama; Masayoshi Shinobu, Kyoto, and Shinobu Kawajiri, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,678

Claims priority, application Japan, Jun. 12, 1984, 59-122499

Int. Cl.⁴ H04N *5/74*

U.S. Cl. 358—231 **7 Claims**



1. A projection device which comprises:

a CRT having a glass face surface and a fitting ear section;

a fitting bracket attached to said fitting ear section with a space therebetween;

a spacer having a ring-shaped body located in said space and having an internal groove in said body;

ring-shaped packing means, including an elastic thin film section contacting the internal surface of said spacer and covering said groove for providing a space in said groove of said spacer;

a lens unit having a cylindrical body and a fitting flange at one end thereof fixed to said fitting bracket;

a lens fixed within said cylindrical body adjacent said fitting flange and spaced from and confronting said CRT glass face surface,

said ring-shaped packing means extending from said lens to said CRT glass face surface; and

a transparent means having a light refractive index close to that of said CRT glass face for filling the space between said glass face surface of said CRT and said lens of said lens unit.

4,631,595

FEEDBACK DISPLAY DRIVER STAGE

John B. George, Carmel, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 25, 1985, Ser. No. 758,954

Int. Cl.⁴ H04N *5/68, 9/16*

U.S. Cl. 358—243 **7 Claims**

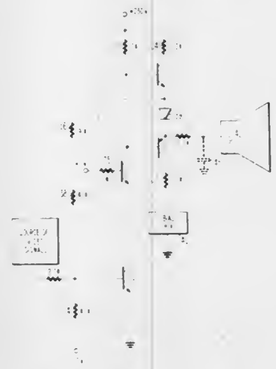
1. In a video signal processing system including an image display device for displaying video information in response to a video signal applied thereto, a display driver stage comprising:

an amplifier with an input for receiving video signals, and an output;

a first semiconductor device with an input coupled to said amplifier output, and an output for providing video signals to said display device;

a second semiconductor device with an input coupled to said amplifier output, and an output;

a feedback path coupled from said output of said second semiconductor device to said amplifier input; and



a normally nonconductive third semiconductor device coupled between said outputs of said first and second semiconductor devices and poled to conduct current from said output of said second semiconductor device; said third device being rendered conductive for coupling said amplifier output to said display device via said second semiconductor device in response to said first semiconductor device being rendered nonconductive in the presence of large video signal transitions of a given polarity.

4,631,596

IMAGE COMMUNICATIONS APPARATUS FOR LONG-SIZE COPY IMAGE

Tatsuya Yaguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,673

Claims priority, application Japan, Feb. 24, 1984, 59-32602

Int. Cl.⁴ H04N *1/18, 1/387*

U.S. Cl. 358—256 **11 Claims**



1. An image communications apparatus comprising:

first sensing means for sensing whether or not the length of an original image is longer than a predetermined length;

second sensing means for sensing a blank portion of the original; and

processing means for dividing the original image utilizing said blank portion as a border when the length of the original image is sensed to be longer than the predetermined length.

4,631,597

VIDEO DATA TRANSMISSION APPARATUS

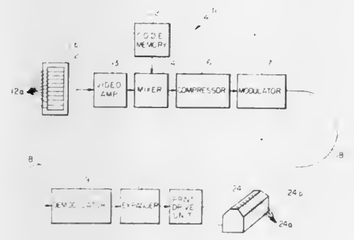
Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 969,423, Dec. 14, 1978, abandoned. This application Mar. 8, 1982, Ser. No. 355,642

Claims priority, application Japan, Dec. 22, 1977, 52-153581

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—258 **21 Claims**



1. A video data transmission apparatus including scanning means for producing electrical data signals representing a visual image and transmission means for transmitting the data signals, characterized by comprising:

memory means for storing character code signals; and

mixing means for reading the code signals out of the memory means, generating character dot signals corresponding to the character codes in a same line scan format as the data signals and mixing the character dot signals with the data signals for transmission by the transmission means as a single integral image.

4,631,598

HIGH SPEED, HIGH RESOLUTION IMAGE PROCESSING SYSTEM

Norman S. Burkhardt, 6868 Wyman Way, Westminster, Colo. 80030; Maureen M. Richard, 2020 S. Fairplay St., Aurora, Colo. 80014; Forrest T. Buxton, 7216 S. Zephyr Way, Littleton, Colo. 80123, and Ronald J. Nowak, 1037 S. Evanston Way, Apartment 101, Aurora, Colo. 80012

Filed Oct. 15, 1984, Ser. No. 660,854

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—280 **8 Claims**



1. A high speed, high resolution document scanning system comprising:

CCD detector means aligned in a linear array for sequentially scanning documentary data and producing an analog signal representative of scanned documentary data;

video converter means for digitizing said analog signal and calibrating said digital signal for response levels of individual detector elements of said CCD detector means;

spatial compressor means for electronically compressing data by both integer and fractional values to match the data handling capabilities of an end user device;

automatic thresholding means for setting gain and offset levels and for performing pixel averaging and prediction techniques to detect edges and filter out noise variances;

camera controller means for controlling the sequential reading of data from said CCD detector means to said video converter means, merging overlapping data from said CCD detector means to provide raster lines of non-overlapping and continuous data, selecting a contiguous subset of detector arrays of said CCD detector array means which fall within the scan width of said documentary data and selecting a predetermined dead time between said raster lines of data to variably control the scanning speed of said scanning system to control the average data output rate;

display means for electronically displaying said scanned documentary data in real time with a preselected variable resolution allowing varying amounts of said scanned documentary data to be displayed.

4,631,599

SELECTIVE OPTOELECTRONIC COPIER

Anthony E. Cawkell, Uxbridge, Great Britain, assignor to Institute for Scientific Information, Inc., Philadelphia, Pa.

Filed Oct. 5, 1984, Ser. No. 657,913

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—285 **12 Claims**

1. Apparatus for selectively storing and copying one or more portions of an image, comprising:

(a) optoelectronic sensor means for making first and second optical scans of the entire image and generating an electronic signal representative of the image,

(b) means for storing the electronic signal from the first optical scan in a memory,

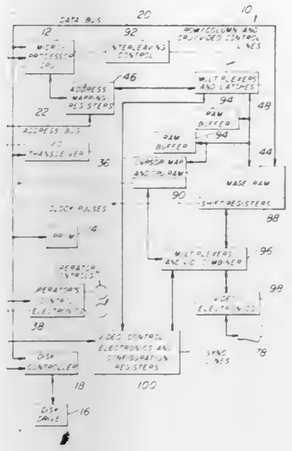
(c) means for selectably reducing the effective resolution of the sensor means to selectably reduce the the amount of memory space required for storage of the electronic signal,

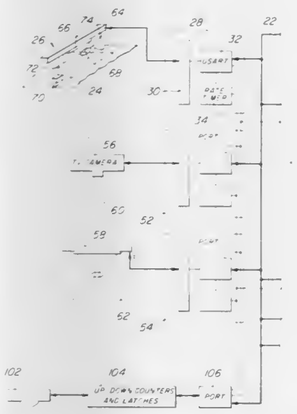
(d) means operatively associated with the electronic scanning means for selecting the portions of the entire image to be copied,

(e) write means responsive to the selecting means and the second optical scan for causing portions of the electronic signal corresponding to the portions of the image to be copied to over-write the signal from the first optical scan in said memory,

(f) read means for causing the portions of the electronic signal corresponding to the portions of the image to be copied to be recalled from the memory without gaps between the selected portions, and

(g) output means for presenting the recalled portions of the electronic signal to means for transmitting the recalled





portions over a telecommunications channel to a remote location.

4,631,600

TIME-AXIS CORRECTING CIRCUIT FOR RECORDED DATA REPRODUCING DEVICE

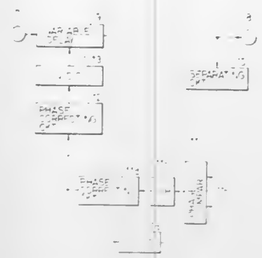
Tsutomu Fukui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,379
Claims priority, application Japan, Apr. 28, 1983, 58-73903
Int. Cl.⁴ H04N *9/493, 5/781*
U.S. Cl. 358—320 **7 Claims**

1. A time-axis correcting circuit for a recorded data reproducing device, comprising:

a first time-axis correcting circuit, comprising a first flywheel oscillator loop, for suppressing a time-axis error component having a frequency equal to a first predetermined oscillation frequency of said first flywheel oscillator servo loop; and

a second time-axis correcting circuit, comprising a second flywheel oscillator loop, for suppressing a time-axis error component having a frequency equal to a second predetermined oscillation frequency of said second flywheel oscillator servo loop different from said first predeter-



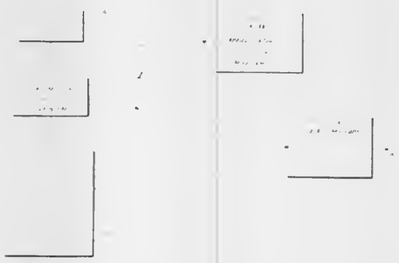
mined oscillation frequency said first and second time-axis correcting circuits being cascade connected.

4,631,601

TIME PROGRAMMABLE CONTROL SYSTEM FOR A CONVERTER/VCR SYSTEM

Vito Brugliera, Evanston; George R. J. Green, Algonquin, and Michael E. Long, Western Springs, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 5, 1984, Ser. No. 658,105
Int. Cl.⁴ H04N *5/782*
U.S. Cl. 358—335 **5 Claims**



1. In combination:

a converter for receiving a plurality of television signals at different channel frequencies, converting them to a single channel frequency and supplying said single channel frequency to an output;

selection means in said converter for selecting among said different channel frequencies in response to remotely transmitted channel command signals;

a VCR having an input coupled to the output of said converter and tuned to said single channel frequency for recording television signals therefrom;

program means, including timer means, in said VCR for initiating and terminating recording by said VCR in response to a user programmed time schedule for said timer means; and

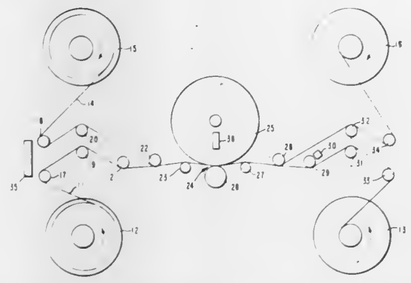
user programmable remote transmitter means, including timer means, for automatically transmitting channel command signals to operate said selection means in said converter to convert user desired channel frequency signals to said single channel frequency at said output for recording by said VCR when said VCR is programmed by a user to correspond with said programmed time schedule.

4,631,602

PROCESS FOR THERMOREMANENT DUPLICATION OF MAGNETIC TAPES USING TRANSVERSE LASER BEAMS SPANNING THE TAPE WIDTH

Michael P. Chouinard, Newark, and Lewis C. Bancroft, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 449,277, Dec. 13, 1982, abandoned.
This application Sep. 11, 1985, Ser. No. 774,885
Int. Cl.⁴ G11B *5/86, 15/60*
U.S. Cl. 360—16 **26 Claims**



16. A process for replicating a magnetic pattern on a moving flexible magnetizable recording member containing a particulate layer with chromium dioxide particles on a flexible support transparent to a beam of energy which comprises

(a) passing the magnetizable recording member and a flexible prerecorded magnetizable medium into pressure contact with one another whereby said contact is maintained during steps (b) and (c), with the chromium dioxide particles facing said prerecorded magnetizable medium wherein the prerecorded magnetizable medium has a higher Curie temperature than the layer with chromium dioxide particles of the magnetizable recording member,

(b) passing a beam of continuous energy through the flexible support of the magnetizable recording member to simultaneously heat chromium dioxide particles across the width of the recording member on which a magnetic pattern is to be replicated for a time period in the range of from 0.01 to 5 milliseconds while in contact with the prerecorded magnetizable medium, said chromium dioxide particles being heated to above their Curie temperature,

(c) cooling the chromium dioxide particles to below their Curie temperature while in intimate contact with the prerecorded medium for a time period in the range from 0.1 to 100 milliseconds.

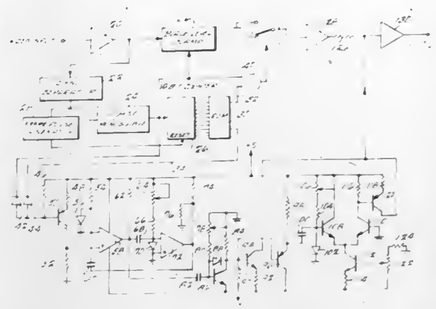
4,631,603

METHOD AND APPARATUS FOR PROCESSING A VIDEO SIGNAL SO AS TO PROHIBIT THE MAKING OF ACCEPTABLE VIDEO TAPE RECORDINGS THEREOF

John O. Ryan, Santa Clara, Calif., assignor to Macrovision, San Jose, Calif.

Filed Apr. 17, 1985, Ser. No. 724,006
Int. Cl.⁴ H04N *5/91*
U.S. Cl. 360—37.1 **20 Claims**

1. A method for processing a video signal so as to inhibit the making of acceptable videotape recordings therefrom while producing a normal color picture on a television receiver, wherein the video signal has a blanking interval which includes a sync pulse, said method comprising the step of adding a plurality of ordered pseudo-sync pulse and positive pulse pairs to said video signal following said sync pulse and within said blanking interval, whereby said added pulse pairs cause an automatic gain control system in a videotape recorder to sense an erroneous indication of video signal level and produce a



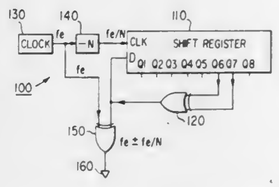
gain correction that results in an unacceptable videotape recording.

4,631,604

BIASING FOR MAGNETIC CIRCUITS

Bruce E. Randall, Alpharetta, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Dec. 24, 1984, Ser. No. 685,503
Int. Cl.⁴ G11B *5/03, 5/02*
U.S. Cl. 360—66 **8 Claims**



1. A method of biasing a magnetic circuit to which is applied a periodic signal of interest comprising the steps of:

generating a sequence of biasing signals having a random frequency distribution with respect to said periodic signal, wherein said biasing signals are random noise signals; and

applying said sequence of biasing signals to said magnetic circuit.

4,631,605

MULTIPLE SPEED SCANNER SERVO SYSTEM FOR PROTECTING THE HEADS AND TAPE OF HELICAL RECORDERS

David C. O'Gwynn, Colorado Springs, Colo., assignor to Ampex Corporation, Redwood City, Calif.

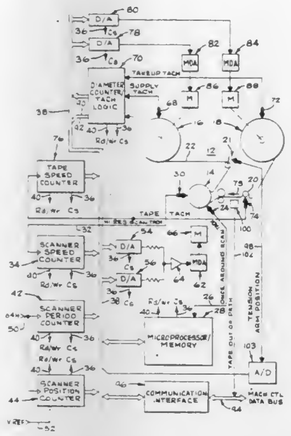
Filed Sep. 20, 1984, Ser. No. 653,651
Int. Cl.⁴ G11B *15/66, 5/52*
U.S. Cl. 360—70 **20 Claims**

1. A scanner servo system for a tape transport having supply and takeup reels, and a rotating scanner about which the type may be unthreaded and threaded during a corresponding mode of transport operation wherein the tape is moved in the reverse direction, said transport including a normal record/playback mode of operation, comprising:

a first scanner servo circuit for generating scanner control signals to drive the scanner at a speed commensurate with the normal record playback mode of operation;

a second scanner servo circuit for generating control signals to controllably maintain the scanner at a preselected reduced speed substantially below the normal scanner record/playback speed; and

a processor device for enabling the second scanner servo circuit in place of the first scanner servo circuit only in



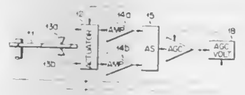
response to the unthreading and threading modes of operation in the reverse tape direction.

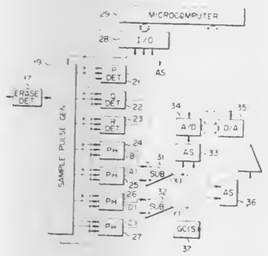
4,631,606

SYSTEM FOR DETECTING THE POSITION OF A READ-WRITE HEAD ON A DISK RECORDING MEDIUM HAVING SERVO SECTORS WITH THREE OR MORE SERVO PATTERNS

Toshihiro Sugaya, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 5, 1984, Ser. No. 586,440
Claims priority, application Japan, Mar. 11, 1983, 58-40370
The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.
Int. Cl.[4] G11B *21/08, 21/10*
U.S. Cl. 360—78 **7 Claims**





1. A disk recording medium having a plurality of data sectors each having concentric data tracks and servo sectors each having concentric servo tracks and embedded between adjacent data sectors, characterized in that each servo sector has K (an integer of not less than 3) servo information patterns which consist of a first servo pattern consisting of a first pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, and a second pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, said first and second pairs of alternate pattern arrays being displaced by one track with respect to each other; a second servo pattern consisting of a pair of alternate pattern arrays having a period of 2^{K+1} tracks and displaced by 2^{K-1} tracks with respect to each other; and a kth servo pattern consisting of an alternate pattern array having a period of 2^{K-k+3} (k includes all intergers of not less than 3 and not more than K) tracks and displaced by 2^{K-k+1} tracks with respect to a (k−1)th servo pattern.

7. A tracking servo system for positioning a read-write head on a target track of a disk recording medium having a plurality of data sectors each having concentric data tracks and servo sectors each having concentric servo tracks and embedded between adjacent data sectors, each servo sector having K (an integer of not less than 3) servo patterns which consist of a first servo pattern consisting of a first pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, and a second pair of alternate pattern arrays having a period of four tracks and arranged in a staggered fashion, said first and second pairs of alternate pattern arrays being displaced by one track with respect to each other; a second servo pattern consisting of a pair of alternate pattern arrays having a period of 2^{K+1} tracks and displaced by 2^{K-1} tracks with respect to each other; and a kth servo pattern consisting of an alternate pattern array having a period 2^{K-k+3} (k includes all intergers of not less than 3 and not more than K) tracks and displaced by 2^{K-k+1} tracks with respect to a (k−1)th servo pattern, comprising:

head driving means for driving said read-write head in the radial direction of said disk recording medium;

detecting means for detecting servo signals, corresponding to said pattern arrays of said servo patterns from an output signal of said read-write head obtained at each of said servo sectors; and

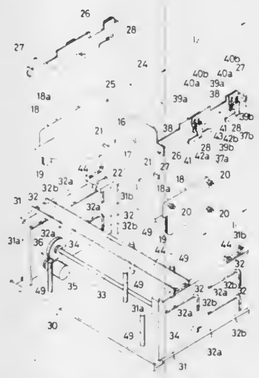
controlling means responsive to the servo signals from said detecting means for controlling said head driving means to position said read-write head on the target track.

4,631,607

CASSETTE LOADING DEVICE

Hiroshi Katsumata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,355
Claims priority, application Japan, Oct. 7, 1983, 58-188847
Int. Cl.[4] G11B *15/66*
U.S. Cl. 360—96.5 **11 Claims**



1. A cassette loading device movable between a cassette inserting position and a cassette loading position lying thereunder after insertion of a cassette in the cassette inserting position, and upon movement to the cassette loading position a positioning element is arranged for positioning the cassette, the cassette loading device comprising:

a channel-shaped cassette holder opened at a top of the channel;

a cassette pressing plate arranged above said cassette holder so as to cover said cassette holder; and

engagement means including a first element affixed to said cassette holder and a second element affixed to said cassette pressing plate, said first and second elements being arranged for mutual engagement, whereby motion in a selected direction of said cassette holder causes motion of said cassette pressing plate;

a pressing means affixed to said second element of said engagement means for pressing said cassette pressing plate on an upper surface of said cassette holder upon engagement of said first and second elements,

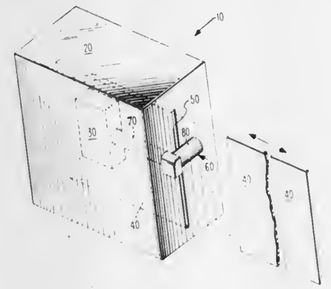
whereby, upon said cassette holder being moved downward from said cassette inserting position to said cassette loading position, a top face of said cassette is pushed in the downward direction by said cassette pressing plate on which a thrust of said pressing means acts, so as to press and position said cassette on said positioning element.

4,631,608

DISK DRIVE DISK CONTROL APPARATUS

George A. Sudol, Mine Hill, N.J.; Edward H. Comfort, Morrisville, Pa., and Stephen R. Solomon, Cranford, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 23, 1984, Ser. No. 633,634
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99 **4 Claims**



1. A magnetic disk drive for data processing apparatus comprising

a housing;

electronic apparatus in said housing for engaging a magnetic disk and reading information on said disk;

an operating knob positioned outside said housing, a shaft rotatably disposed in said housing for coupling said knob to said electronic apparatus, whereby the concurrent rotation of said knob and said shaft causes said electronic apparatus to selectively engage and disengage said magnetic disk; and

a first slot in said housing into which a diskette including said magnetic disk can be inserted;

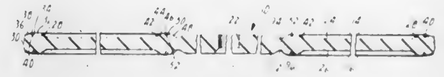
said knob including a finger-engaging portion having a second slot, a plate loosely seated in said slot, spring means disposed in said second slot, said plate having a pair of opposed edges, a first of said edges contacting and compressing said spring means and a second of said edges being urged against the surface of said housing adjacent said first slot by said spring means, said knob being positioned such that, when it rotates, it tends to traverse said first slot, whereby if said diskette is only partially inserted in said first slot, said plate impacts said diskette and prevents said knob from fully rotating, thereby precluding engagement of said magnetic disk by said electronic apparatus, or, if said diskette is substantially but not fully inserted in said first slot, said plate pushes against the trailing edge of said diskette, fully seating and maintaining the latter properly within said first slot and inside said housing.

4,631,609

STRETCHED SURFACE RECORDING DISK SUBSTRATE

Leif O. Erickson, Hudson, Wis., and Vurnen J. Leonard, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1984, Ser. No. 580,892
Int. Cl.[4] G11B *5/82*
U.S. Cl. 360—135 **7 Claims**



1. A stretched surface recording disk including an annular substrate and an annular or circular film stretched across at least one of the major surfaces of said substrate and adhesively secured thereto, said substrate comprising:

a raised annular first ridge adjacent the outer periphery of said substrate, said first ridge projecting above said major surface to define a reference surface upon which said film is supported above said major surface and including a radially outward edge defining a fulcrum around which said film may be drawn downwardly toward said major surface to tension said film;

a raised, annular second ridge adjacent the inner diameter of said substrate, said second ridge projecting above said major surface a distance equal to the projection of said first ridge to define a reference surface upon which said film is supported above and parallel to said major surface and including a radially inward edge defining a fulcrum around which said film is drawn downwardly toward said major surface to tension said film;

an annular outer film attachment surface located radially outward of said first ridge and sloping from a point adjacent said first ridge fulcrum and intermediate said major surface and said first ridge fulcrum outwardly and downwardly toward the plane of said major surface;

an annular inner film attachment surface radially inward of said second ridge fulcrum and curved radially inwardly and downwardly toward said major surface from a point adjacent said second ridge fulcrum and intermediate said second ridge fulcrum and said major surface, said inner film attachment surface having a radius equal to or less than the radius of the contour assumed by said film as said film is drawn around said second ridge fulcrum toward said major surface; and

adhesive disposed on said inner and outer film attachment surfaces for securing said film to said substrate.

4,631,610

MULTICHANNEL MAGNETIC HEAD SUPPORTING MECHANISM

Akira Kobayashi, and Fukashi Yanagisawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Sanyo Seiki Seisakusho, Nagano, Japan

Continuation of Ser. No. 456,905, Jan. 10, 1983, abandoned. This application Mar. 18, 1986, Ser. No. 842,063
Claims priority, application Japan, Jan. 18, 1982, 57-5549
Int. Cl.[4] G11B *5/48*
U.S. Cl. 360—104 **10 Claims**

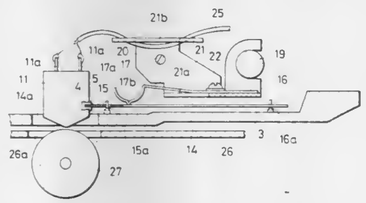
1. A multichannel magnetic head supporting mechanism, comprising:

a plurality of magnetic heads,

a plurality of associated head supporting members connected to and supporting said magnetic heads, each of said supporting members being independent of one another, and each having a longitudinal centerline normally falling in a first plane, said head supporting members each supporting a magnetic head at a position which is on said

centerline, said supporting members further including two insertion apertures on said centerline,

a plurality of associated holding members mounted on a stationary support structure for independently holding said supporting members, each of said holding members having a first portion which is receivable into a respective insertion aperture of one of said supporting members and a cone-shaped portion having a diameter which is larger than said insertion aperture, said holding members holding said supporting members in such a manner that at least two holding members hold an associated supporting member, said plurality of holding members being arranged in a plurality of lines, each of which is formed by said at least two holding members holding an associated supporting member, said lines being parallel to one another, said holding members holding said supporting members in



such a manner that each of said first portions of said holding members movably penetrates an associated insertion aperture of a supporting member and such that each of said cone-shaped portions of said holding members abut against sides of said insertion aperture so that said supporting members may move in a direction normal to a recording medium and swing with respect to said first plane,

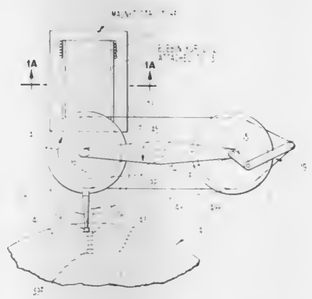
and means for biasing said head supporting members generally toward said recording medium, said biasing means comprising a plurality of independently movable biasing members provided in a number equal to that of said supporting members, each of said biasing members being in contact with its associated supporting member such that said supporting members are urged toward said recording medium while allowing longitudinal swinging of said supporting members.

4,631,611

READ/WRITE HEAD POSITIONER ARRANGEMENT

Guenter Schneider, Concord, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 6, 1983, Ser. No. 529,840
Int. Cl.[4] G11B *5/58, 21/08*
U.S. Cl. 360—106 **13 Claims**



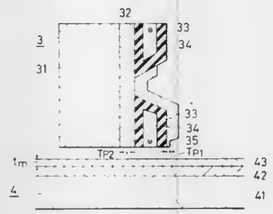
1. An arrangement to move a read/write head across a plurality of tracks on a magnetizable disk comprising in combination: a fixed member formed to hold first bearing means; a movable member formed to hold second bearing means; rigid means formed to include first and second bearing means, said first bearing means formed and disposed to be rotationally coupled to said fixed member and said second bearing means formed and coupled to said movable member to enable said movable member to rotate about said second bearing means, whereby said rigid means can effect a rotary movement relative to said fixed member and said movable member can effect a rotary movement relative to said second bearing means; flexible means formed and disposed to come in contact with a substantial section of said movable member, said substantial section lying away from said fixed member and said flexible means formed and disposed to be secured in tension to said fixed member; and read/write head assembly means secured to said movable member, whereby in response to said rotary movement of said rigid means said movable member is moved thereby moving said read/write head substantially radially across a magnetic disk.

4,631,612

MAGNETIC RECORDING AND REPRODUCING SYSTEM

Kazuo Shiiki, 2644-6, Kawashiri, Shiroyama-cho, Tsukui-gun, Kanagawa-ken; Yoshihiro Shiroishi, 2-32-A101, Koyasu-cho, Hachioji-shi, Tokyo; Isamu Yuito, 3-413, Chigase-machi, Ohme-shi, Tokyo; Kiminari Shinagawa, 3603-2, Kawashiri, Shiroyama-cho, Tsukui-gun, Kanagawa-ken; Yasutaro Uesaka, 3-17-40, Tokura, Kokubunji-shi, Tokyo; Hideo Fujiwara, 1272-50, Shimotomi, Tokorozawa-shi, Saitama-ken, and Hitoshi Nakamura, 3-24-19, Higashi-ohme, Ohme-shi, Tokyo, all of Japan

Filed Jul. 14, 1983, Ser. No. 513,615
Claims priority, application Japan, Jul. 14, 1982, 57-121117
Int. Cl.[4] G11B *5/127*
U.S. Cl. 360—125 **9 Claims**



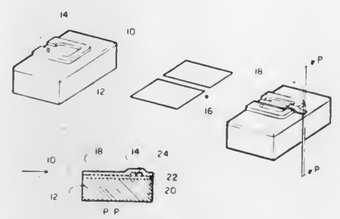
1. A magnetic recording and reproducing system comprising a perpendicular magnetic recording and reproducing head and a perpendicular magnetic recording medium, said head having a first magnetic pole and a second magnetic pole, in which said first magnetic pole, for magnetic recording and reproduction, is made of a magnetic material having a saturation flux density of at least 7 kG, and an edge face of the first magnetic pole confronting the recording medium, is 0.15–0.5 μm thick, while an edge face of the second magnetic pole, confronting the recording medium, the second magnetic pole lying on the same side as the first magnetic pole with respect to the recording medium, is at least 5 times thicker than the first magnetic pole, and the perpendicular magnetic recording medium comprises a magnetic thin film which is formed on a magnetic layer of high magnetic permeability directly or through an intermediate layer, which magnetic thin film has an easy magnetization axis in a direction nearly perpendicular to the plane of the film, and which magnetic thin film has a thickness of 0.1–0.5 μm and a coercive force in the direction perpendicular to the film plane of 250–600 Oe.

4,631,613

THIN FILM HEAD HAVING IMPROVED SATURATION MAGNETIZATION

William W. French, Cardiff, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,857
Int. Cl.[4] G11B *5/12, 5/20*
U.S. Cl. 360—125 **10 Claims**



1. A thin film magnetic head for recording in and/or reproducing from a magnetic recording medium, said head comprising

(a) means defining first and second magnetic poles, and

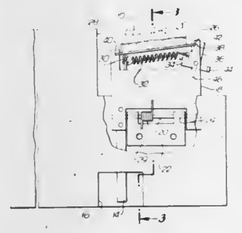
(b) means defining a nonmagnetic transducer gap between said poles, at least one of said magnetic poles being comprised of a thin film of an alloy of silicon, aluminum and iron, said alloy being richer in iron in that portion thereof which is in proximity to said transducer gap than that portion which is distal with respect thereto, said thin film being so disposed with respect to said head that both said proximate and distal portions reside at the same distance from said medium when said head is in use.

4,631,614

TAPE CARTRIDGE DRIVE HEAD CLEANER

C. Paul Davis, Woodland Hills, Calif., and Eli Neuman, Magdiel, Israel, assignors to Innovative Computer Products Corporation, Chatsworth, Calif.

Filed Nov. 18, 1982, Ser. No. 442,647
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **11 Claims**



1. A cleaning cartridge for use with cartridge tape drive systems having a plurality of magnetic heads arranged along a tape path, comprising:

a cartridge that is adapted for insertion into the drive system and includes an opening that is adjacent to the heads when the cartridge is inserted into the drive system;

a cleaning pad supported in the area of the opening, wherein the pad is adapted for contacting each of the heads when the cartridge is inserted into the drive system; and

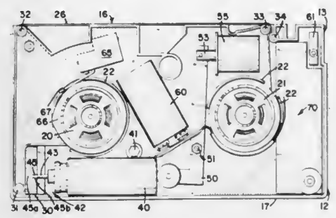
actuator means secured within the cartridge for moving the cleaning pad in a direction that is substantially perpendicular to the tape path thereby causing the cleaning pad to simultaneously clean the heads.

4,631,615

HEAD CLEANING CASSETTE FOR A VIDEO CASSETTE RECORDER

Craig B. Grossman, Minnetonka; Mark A. Schwartz, Crystal, and Stanley S. Hammer, Minnetonka, all of Minn., assignors to Video Dynamics, Inc., St. Louis Park, Minn.

Filed May 31, 1985, Ser. No. 739,990
Int. Cl.[4] G11B *5/10*
U.S. Cl. 360—128 **3 Claims**



1. Head cleaning apparatus for use in cleaning the heads of a video cassette recorder, comprising:

(a) video cassette tape housing means including means for supporting a pay-out spool and a take-up spool adapted to be rotated by the winding mechanism of a video cassette recorder, a fluid absorptive cleaning tape disposed between said spools and guide means for guiding said tape between said spools along a tape path traversing the front end of said housing means;

(b) fluid applicator means for dispersing a cleaning fluid onto said cleaning tape, said applicator means disposed inside said housing means adjacent said tape path between said pay-out spool and said front end;

(c) reservoir means for holding a supply of head cleaning fluid disposed within said housing means;

(d) valve means for selectively connecting said reservoir means in fluid communication with said applicator means so that cleaning fluid may be selectively delivered to said applicator means by opening said valve means;

(e) detector means responsive to the rotation of one of said spools for producing an electrical signal indicating that said tape is being wound from spool to spool by the winding mechanism of a video cassette recorder;

(f) means responsive to said electrical signal for opening said valve means temporarily and thereby cause cleaning fluid to be applied to said tape; and

(g) audible alarm means for indicating that a desired head cleaning time interval has elapsed from the time that cleaning fluid was applied to said tape, whereby the user is alerted to remove the head cleaning apparatus from the video cassette recorder.

4,631,616

CLEANING CASSETTE FOR TAPE RECORDER AND/OR PLAYER MAGNETIC HEAD

Giovanni Zago, Via N. Aprilis, 41, 33080 San Quirino (Prov. of Pordenone), and Giovanni Prataviera, Via Caorle, 4, 33170 Pordenone, both of Italy

Filed Mar. 19, 1984, Ser. No. 591,084
Claims priority, application Italy, Mar. 24, 1983, 21274/83[U]
Int. Cl.[4] G11B *5/41;* **A47L** *25/00*
U.S. Cl. 360—128 **4 Claims**

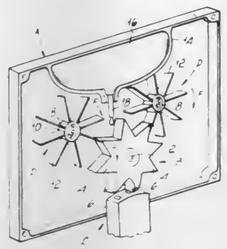
1. A device for cleaning heads of a cassette tape recorder or player, comprising:

a cassette casing insertable into the cassette recorder or player in juxtaposition with the heads, the casing defining two apertures therethrough to accomodate spindles of the recorder or player;

a rotary drive member associated with each said aperture of the casing, each drive member having a hub with serrations for engaging serrations of a spindle in a torque trans-

fer relationship, and having a plurality of vanes extending radially from the hub; and

a rotary cleaning member being rotatable about a pin, the cleaning member having elastic radially extending teeth,



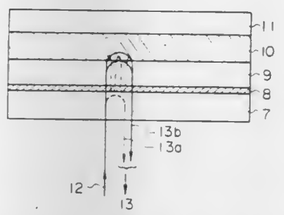
and the cleaning member being positioned in the casing so that the elastic teeth drivingly engage the vanes of the drive members and also may frictionally engage the heads of the recorder or player when the device is inserted therein.

4,631,617

MAGNETO-OPTICAL RECORDING MEDIUM

Fujio Tanaka, and Nobutake Imamura, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,189
Claims priority, application Japan, Sep. 14, 1982, 57-160422
Int. Cl.⁴ G11B *5/74, 5/66*
U.S. Cl. 360—131 **2 Claims**



1. A magneto-optical recording thin film, in which a transparent synthetic resin substrate/defining a light incidence side, a light transparent thin film of metal or a metal compound, a dielectric layer, a recording medium layer formed of an amorphous alloy having an easy axis of magnetization in a direction perpendicular to the film surface and thick enough to reflect light, and a protective film are provided in this order from said light incidence side.

4,631,618

TAPE CASSETTE WITH PROTECTION COVER AND TAPE END SENSING MEANS

Kazuo Ozawa, Miyagi, and Hideki Nonoyama, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,749
Claims priority, application Japan, Apr. 29, 1983, 58-75710
Int. Cl.⁴ G11B *23/02*
U.S. Cl. 360—132 **1 Claim**

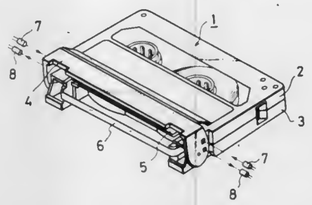
1. In combination in a tape cassette having a casing, a lid with a front portion for protecting a tape stretched and transported over a front opening portion of the cassette casing and side portions extending therefrom,

(a) means for pivotally supporting said lid side portions at both side portions of said cassette casing;

(b) first and third apertures formed through a side portion of said lid;

(c) second and fourth apertures formed through said cassette casing of said tape cassette; and

(d) a sensor chip provided inside said cassette casing and optically exposed to said second and fourth apertures to provide for an optical path from outside said cassette casing through one of said second and fourth apertures, through said sensor chip and said tape and back outside said cassette casing through the other of said second and



fourth apertures, said apertures being positioned that when said tape cassette is in a using state with said lid opened, said first and third apertures are aligned with said second and fourth apertures and the optical path is clear except for the tape while when said tape cassette is in a non-using state with said lid closed, said first and third apertures are unaligned with said second and fourth apertures and said lid side portions close off said second and fourth apertures protecting said sensor chip disposed inside said tape cassette casing.

4,631,619

MAGNETIC TAPE CASSETTE HAVING IMPROVED REEL LOCKING MEANS

Kenji Hashizume; Haruo Shiba, and Masatoshi Okamura, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,438
Claims priority, application Japan, Mar. 7, 1984, 59-31713[U]
Int. Cl.⁴ G11B *23/02, 15/32, 23/04;* **G03B** *1/04*
U.S. Cl. 360—132 **4 Claims**



1. A magnetic tape cassette comprising:

a locking means slidably placed between a locking position of coming into engagement with a pair of reels held in said magnetic tape cassette and a releasing position of disengagement from said reels;

a pair of flexible pawls which are fixed to said locking means and are curved in an arch form in a direction of separation from each other

a tapered guide rib fixed to an inner bottom surface of a cassette casing and between said pair of flexible pawls, the width of said guide rib decreasing toward a root of said pair of flexible pawls; and

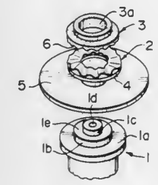
a pair of fixed guide pins provided at opposite sides of said pair of flexible pawls in said direction of separation, whereby when said locking means is advanced to said locking position, said flexible pawls are forcibly opened by tapered surfaces of said guide rib and engage with said reels and when said locking means is retracted to said releasing position, said flexible pawls are forcibly closed by said guide pins.

4,631,620

MAGNETIC DISK CARTRIDGE

Kengo Oishi, and Shingo Katagiri, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 18, 1985, Ser. No. 712,979
Claims priority, application Japan, Apr. 12, 1984, 59-54592[U]
Int. Cl.⁴ G11B *23/03*
U.S. Cl. 360—133 **2 Claims**



1. A magnetic disk cartridge comprising

a disk-shaped recording medium formed of a flexible material;

a center core disposed at the center of said recording medium for the rotation thereof which comprises a main core, a resilient ring and an upper core arranged concentrically one on the other in that order, with the recording medium being held between the main core and the resilient ring; and

a cartridge casing which integrally houses said recording medium and said center core;

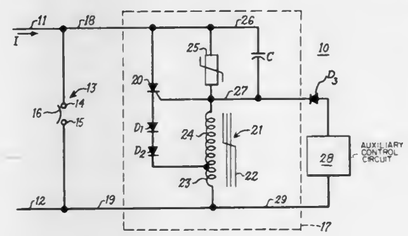
wherein the resilient ring has radially extending ridges formed on the side which contacts the upper core and is provided on its other side with double-sided adhesive tape, and the upper core is provided with a plurality of grooves extending radially across the whole of the surface which comes into contact with the resilient ring for engagement with the ridges of the resilient ring.

4,631,621

GATE TURN-OFF CONTROL CIRCUIT FOR A SOLID STATE CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,032
Int. Cl.⁴ H01H *9/42*
U.S. Cl. 361—13 **7 Claims**



1. A circuit interrupter comprising:

a pair of separable contacts serially connected within an electric circuit;

a gated semiconductor device connected across said contacts for transferring circuit current away from said contacts upon separation; and

control means in circuit with said gated semiconductor device for turning on said gated semiconductor device immediately upon separation of said contacts and for turning off said gated semiconductor device a predetermined time thereafter, said control means including a current transformer connected in series with said gated semiconductor device, a secondary winding of said current transformer being connected to the cathode and gate of said gated semiconductor device to provide regenerative gate current to said gate,

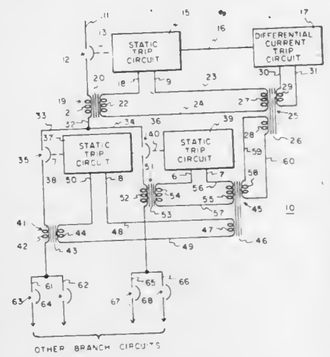
said current transformer comprising a saturable core for interrupting said gate current to turn off said gated semiconductor after a predetermined time delay.

4,631,622

MULTIPLE STATIC TRIP CIRCUIT BREAKER COORDINATION

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,880
Int. Cl.⁴ H02H *3/28*
U.S. Cl. 361—45 **5 Claims**



1. A static trip circuit breaker coordination system comprising:

a first pair of separable contacts connected with a first current sensing transformer and controlled by a differential current trip circuit within a protected circuit;

a second pair of separable contacts in series with and downstream from said first contacts and connected with a second current sensing transformer;

a third pair of separable contacts downstream from said first contacts connected in parallel with said second contacts and connected with a third current sensing transformer;

a first differential current transformer connected with said second and third transformers for vectorial summing of downstream current through said second and third contacts; and

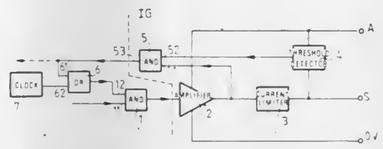
a second differential current transformer connected with said first current sensing transformer and said first differential current transformer for vectorial subtracting of upstream current from said downstream current and opening said first contacts to interrupt said protected circuit upon the occurrence of a predetermined difference.

4,631,623

DC POWER CONTROL CIRCUIT WITH STATUS REPORTING AND PROTECTION AGAINST OVERLOADS AND SHORT CIRCUITS

Pierre Gohl, La Colle sur Loup, France, assignor to La Telemecanique Electrique, France

Filed Dec. 6, 1984, Ser. No. 678,855
Claims priority, application France, Dec. 6, 1983, 83 19465
Int. Cl.⁴ H02H *3/26*
U.S. Cl. 361—86 **3 Claims**



1. A DC power control device comprising:

i- an output stage including an output amplifier having an input and an output, a current limiter connected to the output of said output amplifier, said current limiter having an output, a source of power supply voltage for said output stage and a threshold detector comparing the difference between the power supply voltage from said source and the voltage at the output of said current limiter to a predetermined threshold voltage, said threshold detector having an output on which a non overload signal is generated when said difference is less than said predetermined threshold voltage;

ii- means for applying a control logic signal to the input of said output amplifier;

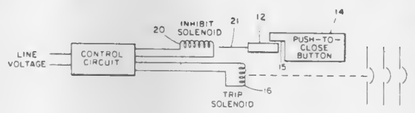
iii-first AND circuit means having an output, a first input connected to the output of said output amplifier and a second input connected to the output of the threshold detector, said first AND circuit means generating a report signal when the non overload signal is generated and the power supply voltage is present.

4,631,624

TIME DELAY UNDERVOLTAGE RELEASE

Robert F. Dvorak, Mount Vernon; Harley W. Jansen, Marion, and Henry J. Zylstra, Alburnette, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Nov. 2, 1984, Ser. No. 667,928
Int. Cl.⁴ H02H *3/247*
U.S. Cl. 361—89 **17 Claims**



1. A circuit breaker comprising:

separable contacts;

an operating mechanism to open and close the separable contacts;

an activation button to signal the operating mechanism to close the separable contacts;

a control voltage source;

test means coupled to said control voltage source for establishing a test voltage proportional to said control voltage;

reference means coupled to said control voltage source for establishing a reference voltage;

an inhibit solenoid having a plunger with a first position and a second position, said inhibit solenoid being connected to the operating mechanism to open the separable contacts upon activation of said solenoid means;

a pin connected to said inhibit solenoid and adapted to obstruct the operation of the activation button when the plunger is in the first position; and

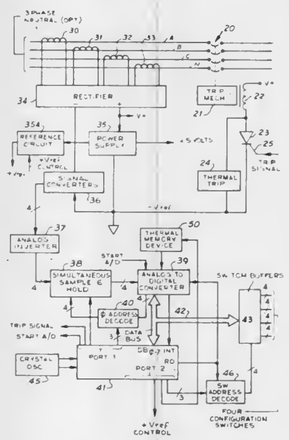
differential means having inputs connected to said test means and to said reference means and having an output connected to said inhibit solenoid, said differential means activating said inhibit solenoid and causing said inhibit solenoid plunger to move to the first position whenever the test voltage drops below the reference voltage, said differential means causing said inhibit solenoid plunger to move to the second position whenever the test voltage rises above the reference voltage.

4,631,625

MICROPROCESSOR CONTROLLED CIRCUIT BREAKER TRIP UNIT

James O. Alexander, Clarkston; William A. King, Lithonia; William E. May, Lawrenceville, and Von G. Pardue, Duluth, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Sep. 27, 1984, Ser. No. 655,152
Int. Cl.⁴ H02H *3/08*
U.S. Cl. 361—94 **18 Claims**



1. A microprocessor based circuit breaker trip unit comprising, in combination:

a plurality of current transformers connected to corresponding lines of a multiphase circuit which are connected to respective poles of said circuit breaker;

a trip mechanism energizable to open said poles of said circuit breaker;

respective signal conversion means connected to said plurality of current transformers for converting the current output of said current transformers to respective voltage signals;

respective sample and hold circuits for repetitively and simultaneously sampling and holding sample analog values of each of said voltage signals for a predetermined number of samples;

analog-to-digital converter means connected to each of said respective sample and hold circuits for converting the analog value produced in said sample and hold cirucit after said predetermined number of samples of a corresponding digital value;

a microprocessor means coupled to each of said analog-to-digital converters for computing a true RMS value of the current of each of said line from said predetermined number of samples; and

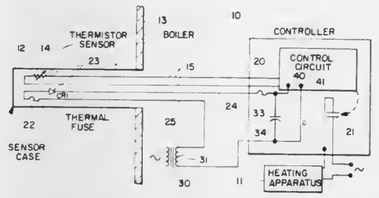
an output circuit means connected between said microcomputer and said trip mechanism for operating said trip mechanism in response to predetermined current conditions.

4,631,626

TEMPERATURE CONTROLLER WITH TEMPERATURE LIMITING SENSOR

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 27, 1985, Ser. No. 780,787
Int. Cl.⁴ H02H *5/04*
U.S. Cl. 361—104 **6 Claims**



1. In a temperature limiting circuit for a sensor and controller comprising,

a remote sensor comprising temperature responsive switch means providing an open circuit at a predetermined temperature and a unidirectional current conducting means connected in series to two output terminals,

a temperature controller having a two terminal power input circuit, comprising a current responsive switch means opening at a predetermined current connected to a first of said two terminals and a capacitance connected between said current responsive switch means and a second of said two terminals,

a source of alternating current power, and

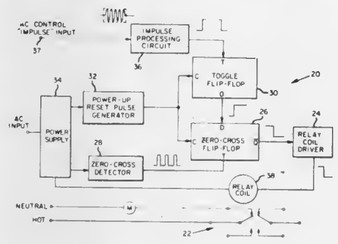
circuit means including said two output terminals of said remote sensor for connecting said source of power to said power input circuit whereby, upon said remote sensor having a short between said two output terminals, said current responsive switch means opens to disconnect said source of power from said controller.

4,631,627

IMPULSE OPERATED RELAY SYSTEM

Ronald E. Morgan, 5900 SE. Yamhill, Portland, Oreg. 97215

Filed May 9, 1985, Ser. No. 732,520
Int. Cl.⁴ H02N *7/22*
U.S. Cl. 361—153 **18 Claims**



1. An impulse relay control circuit for controlling a relay powered by an interruptable power signal, comprising:

means connectable to a power line for inputting the power signal to the circuit;

reset means for generatring a reset pulse signal in response to an initiation of the power signal on the power line;

means for inputting an AC impulse control signal to the circuit;

logic means responsive to successive occurrences of the AC impulse control signal for alternately generating first and second logic signals;

relay energizing means responsive to the first and second logic signals for energizing and deenergizing the relay; and

initializing means responsive to the reset pulse signal for initially applying said second logic signal to the relay energizing means to deenergize the relay;

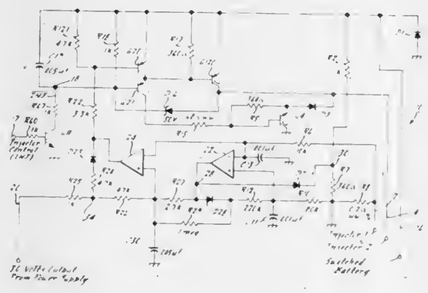
the logic means including preset means responsive to the reset signal for presetting the logic means so that the first logic signal following initiation of the power signal energizes the relay.

4,631,628

ELECTRONIC FUEL INJECTOR DRIVER CIRCUIT

William R. Kissel, Milford, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 8, 1983, Ser. No. 502,410
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—154 **4 Claims**



1. An electronic driver circuit for controlling the energization of a solenoid coil, forming part of an electromagnetic fuel injection valve, in response to an injector control pulse, produced by a main fuel injection control circuit, comprising:

a current regulating circuit including a power transistor connected in series with said coil, forming part of an electromagnetic fuel injection valve, and a current sensing resistor between a power source and ground, and a first switching transistor responsive to said injector control pulse, produced by a main fuel injection control circuit, for controlling the actuation of said power transistor;

a free-wheeling circuit connected in parallel with said power transistor and including a diode and a second switching transistor actuation of which is also controlled by said first switching transistor so that said free-wheeling circuit is operative to allow current to flow to said solenoid coil, forming part of an electromagnetic fuel injection valve, during said injector control pulse, produced by a main fuel injection control circuit;

a first comparator having one input thereof connected to said current sensing resistor and its other input thereof connected to receive a first reference signal from a reference circuit, said first reference signal being set so that said first comparator switches output states when the current through said coil attains a predetermined peak current value; the output of said first comparator being connected to said reference circuit for changing the value of said first reference signal when said first comparator switches output states so that said first comparator will not switch back to its original output state until the current through said coil, forming part of an electromagnetic fuel injection valve, is substantially equal to zero; and

a second comparator having its output connected to a third switching transistor which is in turn connected to said power transistor for controlling the actuation of said

power transistor, said second comparator having one input thereof connected to said current sensing resistor and its other input connected to receive a second reference signal from said reference circuit; said second reference signal being set so that initially said second comparator switches output states in response to said first comparator switching output states to thereby actuate said third switching transistor and deactuate said power transistor; said second reference signal being thereafter changed by the effect of the switched output state of said first comparator on said reference circuit to a voltage value substantially equal to the voltage across said current sensing resistor when the current through said coil, forming part of an electromagnetic fuel injection valve, is equal to a predetermined hold current level; said second comparator further having positive feedback for providing a hysteresis effect to said second comparator for oscillating the output of said second comparator to cycle said power transistor on and off to substantially maintain the current through said coil, forming part of an electromagnetic fuel injection valve, at said predetermined hold current level;

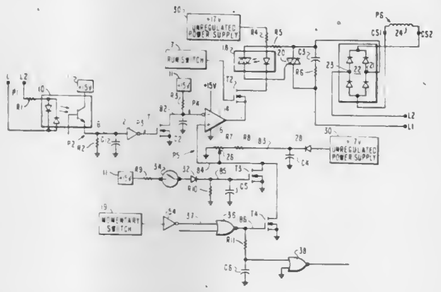
said free-wheeling circuit remaining actuated during the off periods of said power transistor so that the current through said coil, forming part of an electromagnetic fuel injection valve, decays slowly when said power transistor is off.

4,631,629

SOLENOID CONTROL CIRCUIT

George T. Mallick, Jr., Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 13, 1985, Ser. No. 775,917
Int. Cl.[4] H01H *47/22*
U.S. Cl. 361—154 8 Claims



1. Electrical apparatus comprising:

an electrically operated solenoid;

line voltage means at a line voltage level for supplying a source of current to said solenoid;

operable switch means interconnected between said line voltage means and said solenoid for regulating the flow of current from said line voltage means to said solenoid; and

control circuit means coupled to said switch means for controlling the operation of said switch means, said control circuit means operating said switch means to increase the duration of current flow to said solenoid when said line voltage level decreases and comprising:

means for generating a reference voltage independent of said line voltage level;

means for generating a control voltage proportional to said line voltage level; and

means for operating said switch means to permit current flow to said solenoid whenever said control voltage exceeds said reference voltage.

4,631,630

METHOD OF SUPPRESSING THE EFFECTS OF STATIC ELECTRICITY IN A TUMBLE DRIER FOR TEXTILE GOODS

Thomas F. Beane, P.O. Box 708, Concord, N.C. 28025

Filed Jan. 2, 1986, Ser. No. 815,509
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—212 12 Claims

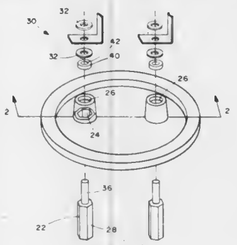
1. A method of suppressing the effects of static electricity in the operation of a tumble drier for textile goods and comprising the steps of preparing a textile fabric containing an electrically conductive strand material, including the prepared textile fabric in a batch of textile goods to be processed in the tumble drier, and drying the goods while dissipating through the prepared textile fabric static electrical charges otherwise possibly accumulating on and in the textile goods during drying.

4,631,631

CAPACITOR COVER AND TERMINAL CONNECTION

C. Wayne Hodges, and Jozef K. Limanowski, both of Huntsville, Ala., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 3, 1985, Ser. No. 783,690
Int. Cl.[4] H01G *9/00, 1/14;* H05K *5/00*
U.S. Cl. 361—306 7 Claims



1. A capacitor cover and terminal connection which comprises:

a disc fabricated of an electrically insulative material, at least one aperture in said disc,

keying means in a first portion of said aperture,

an elastic bushing fabricated of an electrically insulative material carried in a second portion of said aperture,

a metal insert extending through said bushing and having an outer face adapted to engage said keying means to thereby provide an antitwist characteristic between said disc and said insert,

receiving means within said insert adapted to receive an electrical terminal, and

retaining means holding an internal electrical lead into electrical contact with said metal insert.

4,631,632

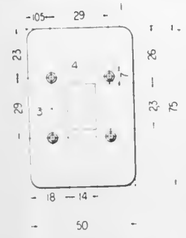
IMPREGNATED CAPACITOR

Masafumi Kano, Otsu; Megumu Tanaka, Otsuhachiman; Atsushi Sato, Tokyo, and Shigenobu Kawakami, Ichikawa, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,697
Claims priority, application Japan, Sep. 26, 1984, 59-199419
Int. Cl.[4] H01G *4/22, 4/32*
U.S. Cl. 361—315 6 Claims

1. An impregnated capacitor wherein at least part of the capacitor element comprises a metallized film comprising a polypropylene film as a base film impregnated with an insulating impregnating agent comprising a compound having three

condensed or non-condensed aromatic rings, the ratio of the amount of the impregnating agent which penetrates between



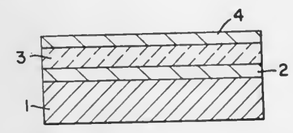
the base film layers to that of said agent which penetrates into the base film per unit thickness (μ) being at least 60.

4,631,633

THIN FILM CAPACITORS AND METHOD OF MAKING THE SAME

Avner A. Shaulov, Monsey; Stanley J. Lukasik, Hawthorn; Myron H. Frommer, Monsey, and Walter K. Zwicker, Scarborough, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,158
Int. Cl.[4] H01G *3/075, 1/01, 4/10*
U.S. Cl. 361—321 11 Claims



1. A thin film capacitor having a low temperature coefficient of capacitance and a high capacitance density, said capacitor consisting essentially of a thin crystalline electrically insulative substrate, a first thin crystalline film of a conductive metal situated on a surface of said thin substrate, a thin film of crystalline strontium barium niobate having a composition of the formula $Sr_{1-x}Ba_xNb_2O_6$ wherein $25 \leqq x \leqq 75$ and having 2.77 Å spaced atomic planes oriented non-perpendicularly to said surface of said thin substrate situated on said first crystalline film of a conductive metal and a second thin film of a conductive metal situated on the surface of said crystalline film of strontium barium niobate.

4,631,634

LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCuin, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,454
Int. Cl.[4] H02B *1/06*
U.S. Cl. 361—358 2 Claims

1. A circuit breaker panelboard assembly comprising:

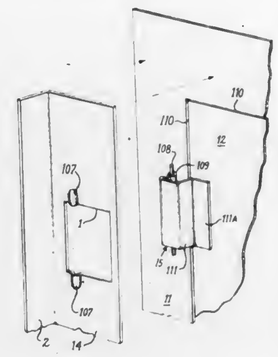
closure means housing at least one main circuit breaker or at least one main wire terminal lug and a plurality of branch circuit breakers;

access means movably arranged on said closure means providing access to said main and said branch circuit breakers from outside of said closure;

mounting means within said closure supporting said branch circuit breakers and providing electrical connection between said branch circuit breakers and electrical bus bars connectable with an external circuit; and

shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers;

said access means comprising a metal or plastic face plate encompassing an opening defined through said face plate and a door arranged within said opening and supported



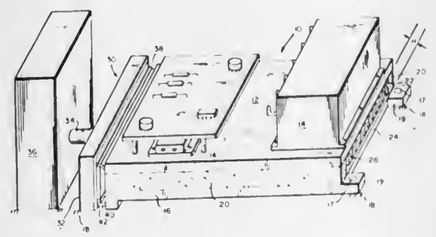
therein by at least one hinge, said hinge being formed from a single piece of metal having an L-shaped end and a cylindrical end, said L-shaped end being welded to said door and said cylindrical end encompassing a pin captured within a rabbet member, said rabbet member being welded to said face plate.

4,631,635

VIBRATION ISOLATED COLD PLATE ASSEMBLY

Richard T. Dolbeare, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 31, 1984, Ser. No. 666,786
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—383 9 Claims



1. A vibration isolated cold plate assembly comprising:

a base;

means made of a heat conducting material for supporting thereon at least one electronic component;

means interposed between said base and said supporting means for substantially preventing any vibration of said base from reaching said supporting means, said vibration preventing means defining an elongated channel between said base and said supporting means;

means located in said channel and secured only to said supporting means for conducting heat from said supporting means; and

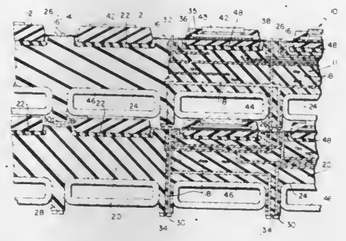
means interconnected with said channel for supplying a coolant into said channel so as to flow in communication with said heat conducting means and said supporting means, said coolant supplying means including a flexible interconnecting seal directly connected to said base and said supporting means.

4,631,636

HIGH DENSITY PACKAGING TECHNIQUE FOR ELECTRONIC SYSTEMS

D. Marshall Andrews, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 26, 1984, Ser. No. 593,516
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—385 **26 Claims**



1. A high density packaging arrangement for electronics systems, comprising:

a first circuit board assembly, comprising an insulating circuit board having a plurality of electronic components mounted on a first side thereof and having conductor means interconnecting said electronic components, and having cooling means, mounted on a second side thereof, for passage of a coolant; and

a second circuit board assembly, comprising an insulating circuit board having cooling means, mounted on a second side thereof, for passage of a coolant;

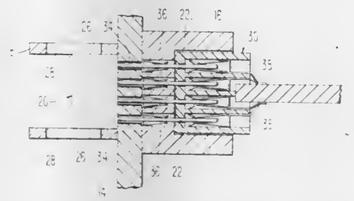
wherein said first and second circuit board assemblies are arranged such that said cooling means mounted on said second circuit board assembly is in heat conductive contact with at least one of said plurality of electronic components mounted on said first circuit board assembly.

4,631,637

DUAL BACKPLANE INTERCONNECT SYSTEM

Samuel R. Romania, Phoenixville, and Grant F. Steen, Bryn Athyn, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1985, Ser. No. 812,834
Int. Cl.⁴ H01R *23/68*
U.S. Cl. 361—413 **6 Claims**



1. A dual backplane interconnect system comprising in combination:

a pair of backplanes disposed in parallel, spaced-apart relation, each of said backplanes having at least a set of feed-through holes formed therein, the respective sets of feed-through holes of said pair of backplanes being homologously oriented with respect to each other,

a plurality of female feed-through sockets each having a plurality of electrical contacts, said feed-through sockets being affixed respectively to the interior opposing surfaces of said pair of backplanes, and overlying said sets of feed-through holes, said electrical contacts of said feed-through sockets being aligned respectively with said feed-through holes,

a plurality of pin header housings, each of said pin header housings being affixed to an exterior surface of one of said backplanes in direct positional relation to a corresponding feed-through socket,

a plurality of pin headers each having a plurality of pins, each of said pin headers being movably disposed within a pin header housing, said pins being registered with said feed-through holes in said backplanes, said pins engaging said electrical contacts of said feed-through sockets via said feed-through holes, the extremities of said pins being retained within said feed-through sockets when said pin header is in a retracted position and being extended beyond said electrical contacts of said sockets when said pin header is in an extended position,

at least one logic board having female connectors at respective opposite extremities thereof, each of said female connectors having a plurality of electrical contacts, said retracted position of the pin headers permitting the unimpeded alignment of said electrical connectors with a pair of feed-through sockets on the respective backplanes, whereupon the movement of the pin headers to said extended position effects the engagement of said pins with the electrical contacts of said female connectors of said logic board.

4,631,638

BOX FOR HOLDING CIRCUIT BOARDS

Fritz Felsner, Leinburg, and Erich Geier, Stein, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 738,200
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419781
Int. Cl.⁴ H05K *7/16*
U.S. Cl. 361—415 **4 Claims**



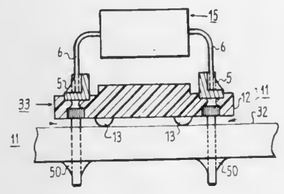
1. A box with a front and a back for holding circuit boards, said box having horizontal slots in a side wall which slots are arranged vertically one above the other, said box including a lever which is operable from the front of the box, said lever being disposed between a circuit board held in said box and said side wall, said lever including a fulcrum disposable in said horizontal slots for movement therein and an operating projection at the end of said lever at the back of said box for engaging a circuit board to aid in the removal thereof.

4,631,639

STUD AND A SUPPORT FOR FIXING AN ELECTRONIC COMPONENT TO A PRINTED CIRCUIT BOARD

Lucien Biraud, Fontenay-aux-Roses, France, assignor to Thomson CSF, Paris, France

Filed Apr. 26, 1984, Ser. No. 604,116
Claims priority, application France, Apr. 29, 1983, 83 07182
Int. Cl.⁴ H05K *7/04*
U.S. Cl. 361—417 **10 Claims**



5. A support arrangement for an electronic component comprising:

a plurality of support studs supporting an electronic component having a plurality of lugs, on a printed circuit board each of said studs including,

a pin electrically connecting one of said lugs of said electronic component to said printed circuit board,

means receiving one of said lugs, said receiving means including at least one abutment portion having an abutment face which by abutting said lug, positions said lug to said stud, the portion of said receiving means opposite said abutment portion being open to the extent that said lug has unhindered access to said abutment face and abuts said abutment portion on said abutment face and to the extent that solder can be withdrawn; and

structural means supporting said support studs, with a portion of each of said support studs being fixed in said structural means.

4,631,640

PORTABLE RADIO DEVICE FOR PROTECTING A RADIO CIRCUIT FROM STATIC ELECTRICITY

Shinjiro Umetsu, and Takashi Oyamada, both of Tokyo, Japan, assignors to Nippon Electric Co. Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,685
Claims priority, application Japan, Nov. 13, 1981, 56-181910
Int. Cl.⁴ H05K *7/00*
U.S. Cl. 361—422 **5 Claims**



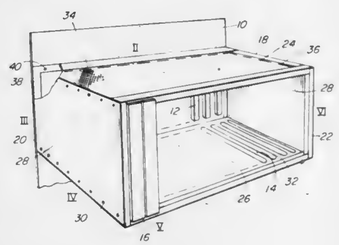
1. A portable radio device comprising: a printed wiring board having a first hole site which defines a tapped hole formed into said printed circuit board, a radio circuit mounted on said printed wiring board, an antenna, a housing of a non-conductive material encasing said printed wiring board together with said radio circuit and having a second hole site which defines a via hole formed through said housing and aligned with said tapped hole when said printed wiring board is encased in said housing, and a screw member fixing said printed wiring board in position to said housing, with said antenna brought into contact in said housing with said printed wiring board to be electrically connected to said radio circuit through said printed wiring board, said screw member having a metal machine screw portion having first and second ends with a threaded portion near said second end and engaged with said tapped hole; an axis extending between said first and second ends, and a head portion having a screw slot transverse to said axis on said first end; and an insulating cap enclosing said head portion so as not to expose said screw slot and having a groove along said axis.

4,631,641

ELECTRONIC APPARATUS WITH ELECTRO-MAGNETIC INTERFERENCE SCREENING

David S. Brombal, Dunrobin; Charles B. D. Bunner; Nickolas S. Gulis, both of Carp, and John P. Luszczek, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1985, Ser. No. 756,421
Int. Cl.⁴ H05K *9/00*
U.S. Cl. 361—424 **14 Claims**



1. Electronic apparatus comprising:

a backpanel including a plurality of connectors;

a plurality of circuit boards each connected via a connector to the backpanel at a back edge of the board and including at an opposite, front, edge of the board a faceplate comprising electrically conductive material;

an electrically conductive enclosure extending between the backpanel at a back edge of the enclosure and the faceplates at a front edge of the enclosure; and

electrically conductive means electrically interconnecting the faceplates around their peripheries with one another and with the enclosure at its front edge, adjacent faceplates being electrically interconnected by the electrically conductive means therebetween;

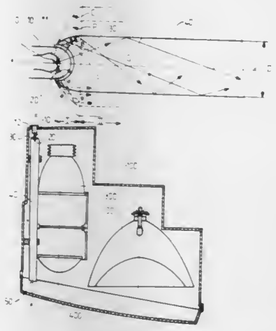
the backpanel including a ground conductor to which the enclosure is electrically connected around the periphery of its back edge.

4,631,642

ADAPTOR FOR COUPLING A LIGHT GUIDE TO A LIGHT SOURCE, IN PARTICULAR FOR PROVIDING AN INTEGRATED SIDE LIGHT IN A MOTOR VEHICLE HEADLAMP ASSEMBLY

Norbert Brun, Bobigny, France, assignor to Cibie Projecteurs, France

Filed May 21, 1985, Ser. No. 736,460
Claims priority, application France, May 25, 1984, 84 08241
Int. Cl.⁴ F21V *7/04*
U.S. Cl. 362—32 **9 Claims**



1. A coupling adaptor for a cylindrical light guide, for coupling said guide with a substantially point light source located on the axis of and integral with the guide, said coupling adaptor being solid and homogeneous and comprising:

an inlet surface which is spherical and concave, which is centered on said point light source and which receives a portion thereof, whereby any light ray emitted by said source and striking said inlet surface passes through said inlet surface without deflection and penetrates inside the light guide; and

a light flux recovery surface which is convex and symmetrical about the axis of said light guide, said recovery surface being shaped in such a manner that the angle of incidence of a ray emitted by the source, passing through said inlet surface and striking said recovery surface is always greater than the limiting angle for total internal reflection appropriate to the refractive index of the material constituting the light guide;

whereby any light ray which passes through the inlet surface is totally reflected by the recovery surface and is captured by the light guide.

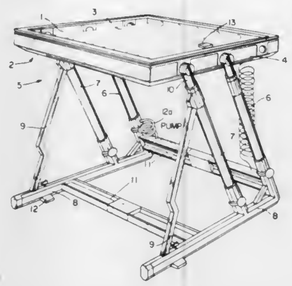
4,631,643

DEMOUNTABLE MULTI-PURPOSE LIGHT TABLE

Detlef Köster, c/o Progressive Design Service, 137 Bayswater Rd., Rushcutters Bay, Sydney, 2011, New South Wales, Australia

Filed Oct. 4, 1985, Ser. No. 784,208
Int. Cl.⁴ G09F *13/04*
U.S. Cl. 362—97 **11 Claims**

1. A storage case light table combination that includes a storage case, one or more work surfaces able to be housed in the storage case, and a support stand in which the storage case includes a light compartment, having an opening extending on at least one side, and adapted to pass light through the opening, one of the work surfaces is a light transmitting work surface that extends across, or can be releasably attached to extend across, the light compartment opening, and the support stand includes a pair of end support means able to be put in a closed configuration for storage in the storage case and in an open configuration for support of the work surface, and a stay means for maintaining the open configuration, each support means including at least one variable length telescopic leg so that the



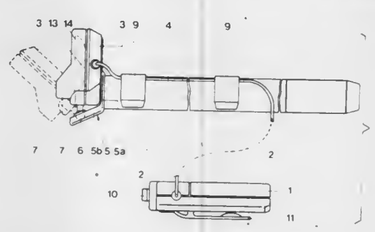
work surface can be put at an angle to the horizontal as required.

4,631,644

PORTABLE LAMP, ADAPTED TO BE WORN ON THE HEAD OF A USER

Günter Dannhauer, Grünwald, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,156
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426358
Int. Cl.⁴ A42B *1/24;* **F21L** *15/14, 15/08*
U.S. Cl. 362—105 **8 Claims**



1. A light-weight, vibration-resistant, head-mounted portable lamp and power source combination, particularly adapted for hands-free recreational and repair activities, comprising:

a housing (**1**) which can be disposed on the person of the user, remote from the head,

a low-voltage power source disposed in said housing;

a lamp unit (**3**) of light-weight materials including

a reflector (**14**) and

a low-voltage halogen incandescent light source (**13**);

a cable (**2**) interconnecting the housing and the lamp unit;

a universally adjustable carrying headband (**4**) capable of being secured around the head of a user and remaining so secured throughout any athletic activity by the user;

and means (**5,6**) providing a detachable mounting of the lamp unit (**3**) on the carrying band,

including

an angle element (**5**), having first (**5***a*) and second (**5***b*) portions disposed at angle with respect to each other, said first portion (**5***a*) being separably attached to the carrying headband (**4**) and said second portion (**5***b*) projecting slightly from the head of the user; and

a single separable ball and socket joint (**6**) adjustably interconnecting the lamp unit (**3**) and said angle element (**5**), at least one of said ball and said socket being formed of elastically deformable material, one part of said ball-and-socket joint being formed in said second portion (**5***b*) of said angle element,

said angle element being so dimensioned and said joint being so positioned thereon to permit pointing of said light source, selectively, horizontally directly ahead of the user, within a range of about 50° downwardly from the horizontal, rotated around the vertical axis, and any combination of the foregoing.

4,631,645

HEADLAMP ASSEMBLY

Stanley Lenart, Rte. 12, Alder Creek, N.Y. 13301

Filed Jun. 24, 1985, Ser. No. 747,796
Int. Cl.⁴ F21L *15/14*
U.S. Cl. 362—105 **9 Claims**



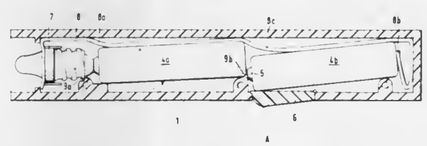
6. A headlamp assembly particularly for mechanics comprising in combination an adjustable head encircling headband; a first, unitary overhead strap connected at its opposite ends to the headband; a second, adjustable overhead strap connected at its opposite ends to the headband; the first and second overhead straps being disposed at an oblique angle to one another; a mounting member positioned on the first overhead strap for sliding movement therealong between its opposite ends; a lamp; means pivotally connecting the lamp to the mounting member whereby the lamp can be located at any point along the overhead strap and disposed in a position of desired angular adjustment; and an adjustable chin strap the ends of which are connected to the headband.

4,631,646

DISCARDABLE FLASHLIGHT

Hans Spindler, Remchingen-Singen, Fed. Rep. of Germany, assignor to Trautz & Co. Inh. Hans Spindler, Pforzheim, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 831,134
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 8505037[U]
Int. Cl.⁴ F21L *7/00*
U.S. Cl. 362—118 **11 Claims**



1. In a discardable flashlight comprising

a housing having forward and rear ends,

a lampholder assembly mounted in said housing at said forward end,

two batteries, which are stacked in said housing, and

manually operable control means for connecting said batteries in circuit with said lampholder assembly,

the improvement residing in that

each of said batteries has a forward portion and a rear portion,

said forward portion of said forward battery is in electric contact with said lampholder assembly,

said forward portion of said rear battery is laterally movable in said housing between a make position, in which said forward portion of said rear battery is in electric contact with said rear portion of said forward battery, and a break position, in which said electric contact is eliminated,

conducting means are provided, which are arranged to connect said batteries in series with each other and with said lampholder assembly when said forward portion of said rear battery is in said make position, spring means are contained in said housing and bear on one side of said forward portion of said rear battery and urge said forward portion of said rear battery toward said break position, and

said control means comprises a fingerpiece, which is carried by said housing and accessible from the outside and bears on said forward portion of said rear battery, on the side which is opposite to said spring means, and

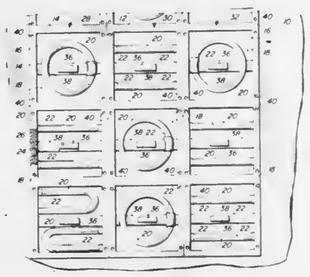
said fingerpiece is manually depressible to move said forward portion of said rear battery from said break position to said make position against the force of said spring means.

4,631,647

WALL AND CEILING LIGHT DEVICE

Robert Ranney, Star Rte. 3 - Box 4950-31, Tehachapi, Calif. 93561

Filed Feb. 24, 1986, Ser. No. 831,859
Int. Cl.⁴ F21S *1/02*
U.S. Cl. 362—147 **10 Claims**



1. An improved interior wall and ceiling light device, said device comprising, in combination:

(a) a rigid, generally flat rear grid bearing electrical wiring, including means for connecting to an external power source, and also including spaced electrical outlets;

(b) a plurality of electrical lights releasably electrically connected to said spaced outlets;

(c) connector means for releasably connecting said grid to a building wall and a building ceiling;

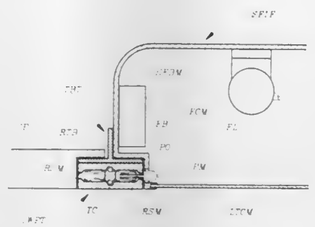
(d) a plurality of flat translucent panels bearing beveled outer edges; and,

(e) a plurality of spacer legs releasably spacing each of said panels in front of said grid and generally parallel thereto and releasably interconnecting said panels to said grid, said legs also releasably retaining said panels in abutting edge to edge relation to form a continuous translucent sheet, wherein said panels can be easily pulled away from adjacent panels and said grid for easy access to those electrical lights adjacent thereto, said light device when in operation providing a continuous wall of light of uniform illumination.

4,631,648
MODULAR SUSPENDED CEILING AND LIGHTING SYSTEM

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jul. 9, 1984, Ser. No. 629,221
Int. Cl.⁴ F21S *1/14*
U.S. Cl. 362—150 **29 Claims**



1. A lighting system for a suspended ceiling, said suspended ceiling being suspended some distance below a permanent ceiling by way of a suspended grid with grid members and grid openings, said grid openings being covered by removable cover means thereby forming an enclosed air space between the two ceilings, the enclosed air space being useful as an air plenum, said cover means comprising ceiling panels and electric lighting means, said lighting system comprising:

a voltage source;

power track means attached to said suspended grid, said power track means having receptacle means and track conductors connected with said voltage source, said receptacle means being: i) operable to receive and hold electric plug means, and ii) accessible only from outside of said enclosed air space; and

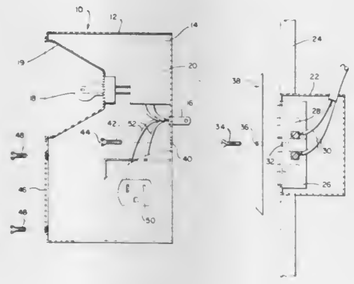
said lighting means being adapted to be powered from said voltage source by way of electric input means accessible only from outside of said air space, said input means having electric plug means adapted for plug-in insertion into said receptacle means;

such that disconnectable electrical connection is made between said voltage source and said lighting means while obviating the need for having electrical conductor means traversing said enclosed air space.

4,631,649
PLUG-IN EMERGENCY LIGHT FIXTURE

Robert J. McCue, and Ronald H. Minter, both of Guilford, Conn., assignors to Chloride Systems, a division of Chloride Power Electronics, Incorporated, El Paso, Tex.

Filed Oct. 16, 1985, Ser. No. 788,033
Int. Cl.⁴ F21L *7/00*
U.S. Cl. 362—183 **4 Claims**



1. An emergency light fixture permanently mountable in a conventional power outlet box having in fixed relation a threaded bore for accommodating a screw for a face plate and slots for accommodating an electric plug, the emergency light fixture comprising:

a housing;

an electric plug extending from the rear wall of the housing;

a battery mounted in the housing;

a lamp mounted in the housing and connected to the battery for illumination during a power outage;

charging means connected to the electric plug and the battery for charging the battery;

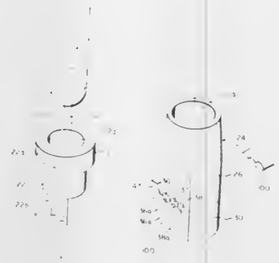
a tamperproof screw for permanently attaching the housing to the outlet box having a tamperproof engaging means for engagement with a complementary portion of a screwdriver for tamperproof screws and for preventing engagement with conventional slotted or phillips head screwdrivers; and

aperture means in the rear wall of the housing for accommodating the screw for permanently attaching the housing to the outlet box, the aperture means being in fixed relationship with the electric plug so that the aperture means is aligned with the threaded bore in the outlet box when the electric plug is aligned with the slots in the outlet box.

4,631,650
SERIES-PARALLEL CONNECTED MINIATURE LIGHT SET

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Filed Oct. 24, 1984, Ser. No. 664,153
Int. Cl.⁴ F21V *19/00*
U.S. Cl. 362—249 **21 Claims**



1. A lighting string comprising:

a plurality of series of lampholders with lights and wireways;

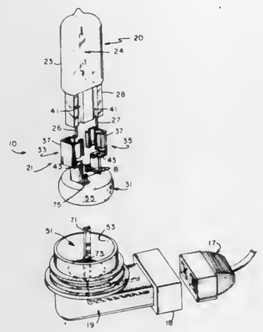
a cord passing through the wireway of each of said lampholders, said cord having three wires separated by insulation and having a respective cutout entirely within the wireway of each lampholder and severing one of said wires, said cutouts being shorter than the wireways, the other two wires being non-severed at the lampholders; and

respective contact means in the lampholders piercing the cord insulation and engaging the severed wire, said contact means bridging said cutouts in the severed wire via the lights, the contact means of the first lampholder in each of said series also piercing said cord insulation and making electrical contact with one of the non-severed wires, and the contact means of the last lampholder in each of said series also piercing said cord insulation and making electrical contact with the other of the non-severed wires, whereby said plurality of series of lampholders are connected in parallel.

4,631,651
REPLACEABLE AUTOMOBILE HEADLIGHT LAMP UNIT AND AUTOMOBILE HEADLIGHT UTILIZING SAME

John A. Bergin, Hancock, and Frank Cangiano, Hillsboro, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 10, 1985, Ser. No. 743,122
Int. Cl.⁴ F21V *29/00*
U.S. Cl. 362—267 **18 Claims**



1. A lamp unit for being removably positioned within an opening within the rear of an automobile headlight reflector, said lamp unit comprising:

an electrically insulative holder for being positioned within said opening, said holder defining a cavity therein having at least one curved surface;

an electric lamp adapted for being securedly retained in a predetermined orientation relative to said holder, said lamp including an envelope having a filament structure therein adapted for being positioned within said reflector when said holder is positioned within said opening of said reflector and at least two lead-in wires projecting from said envelope; and

a clamp member including an electrically insulative base positioned within said cavity of said holder and fixedly secured thereto, and a pair of electrically conductive clips spacedly positioned within said base and secured about said envelope of said lamp, each of said lead-in wires being connected to a respective one of said clips at a precise depth location relative to said filament structure, said base including at least one external surface of a curvature substantially similar to said curved surface of said cavity of said holder and engaging said curved surface, said base and cavity orientation enabling said electric lamp to be both rotatably and pivotally oriented within said cavity of said holder prior to said fixed securement of said base to said holder to precisely position said filament structure within said lamp envelope relative to a surface of said holder.

4,631,652
FREQUENCY CONTROLLED RESONANT REGULATOR

Frank S. Wendt, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,821
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—16 **9 Claims**

1. A frequency controlled resonant regulator comprising:

a source of unregulated voltage;

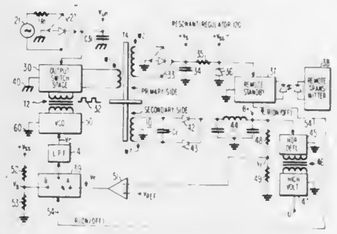
a power transformer having a first winding coupled to said source;

output switching means coupled to said first winding;

a controllable source of switching signals coupled to said output switching means for operating said switching means at a controllable frequency to generate a first alternating output voltage across a second winding of said power transformer to power a first load circuit, said transformer incorporating high leakage inductance between said first and second windings;

a resonanting capacitance coupled to said second winding for forming a tuned circuit with the leakage inductance of said transformer to establish the amplitude of said output voltage in accordance with said controllable frequency;

means coupled to said controllable source and responsive to a sense signal for developing a control signal that varies said controllable frequency in accordance with said sense signal to regulate said first altnerating output voltage;



a third winding of said transformer tightly coupled with said first winding and loosely coupled with said second winding for generating a second alternating output voltage having an amplitude that is generally unaffected by substantial changes in the operating point of said tuned circuit; and

a DC power supply responsive to said second alternating output voltage for generating a DC voltage having an amplitude that is generally unaffected by substantial changes in the operating point of said tuned circuit and that is available for powering a second load circuit when said operating point is outside the normal regulation range.

4,631,653
CAPACITOR COUPLED CURRENT MODE BALANCE CIRCUIT

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Incorporated, Milpitas, Calif.

Filed May 25, 1984, Ser. No. 614,420
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—17 **12 Claims**



1. A power supply comprising:

a first switch;

a second switch;

an output terminal;

a transformer having a secondary winding coupled to said output terminal and a primary winding, said primary winding having a first lead coupled to said first and second switches, said primary winding having a second lead;

a first capacitor coupled to said second lead;

a second capacitor coupled to said second lead;

means for closing said first switch, then opening said first switch, then closing said second switch, and then opening said second switch, current flowing through said primary winding in a first direction when said first switch is closed, current flowing through said primary winding in a second direction when said second switch is closed; and

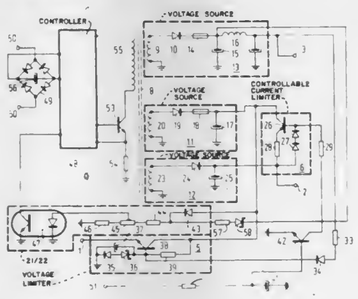
means for sensing the voltage across said first and second capacitors and reducing any inequality between the times said first and second switches are closed by an amount of time dependent on the magnitude of said sensed voltage.

4,631,654

TWO-STATE SWITCHED-MODE POWER SUPPLY

Yves L. P. Houee, Nanterre, and Pierre Vacher, Suresnes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,116
Claims priority, application France, Dec. 10, 1982, 82 20742
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **7 Claims**



1. A switched-mode power supply capable of operating optionally in two states, comprising at least two controllable voltage sources having respective control inputs, at least two power supply output terminals and first regulating means coupled to the control input on each of said voltage sources for supplying a signal which acts, on the switching operation, to reduce the values of the voltages supplied by all of the voltage sources when one voltage exceeds a first reference value, characterized in that said switched-mode power supply further comprises second regulating means also coupled to said control inputs for supplying a signal which acts, on the switching operation, to reduce the values of the voltages supplied by all the voltage sources when a voltage exceeds a second reference voltage,

first change-over elements for selectively connecting an output of one of the voltage sources to the first regulating means in a first state or to the second regulating means in a second state,

second change-over elements for selectively connecting one of said output terminals to one voltage source in the first state or to the other voltage source in the second state,

and a device which simultaneously controls the first and second change-over elements for selecting the desired state.

4,631,655

POWER DISTRIBUTION SYSTEM

Hendrik van Husen, Glen Ellyn, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Dec. 24, 1984, Ser. No. 685,655
Int. Cl.[4] H02H *7/10*
U.S. Cl. 363—50 **23 Claims**

1. A power distribution system for use in an electronic system that includes a load bus, a load connected to said load bus, and a direct current power source which is operative to provide power of a first characteristic, said power distribution system comprising:

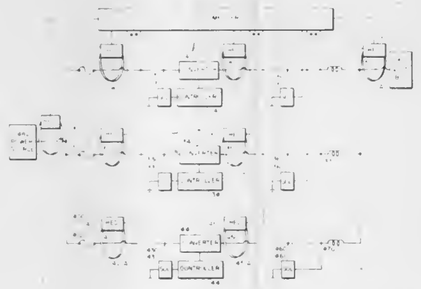
an input power monitoring circuit connected to said power source;

a plurality of power conversion circuits that are connected to said input power monitoring circuit;

said input power monitoring circuit being operative to monitor current flow from said power source to said power conversion circuit and to provide a plurality of power input status signals, each associated with a different one of said power conversion circuits;

each of said power conversion circuits being operative to convert said power of a first characteristic to power of a different characteristic;

an output power monitor and control circuit that is connected between said plurality of power conversion circuits and said load bus, and is operative both to monitor current flow from said power conversion circuits and to



provide a plurality of power output status signals, each associated whit a different one of said power conversion circuits; and

a power comparison circuit that is connected to said plurality of power conversion circuits and is operative both to compare said power input and output status signals to predetermined values therefor, and to provide a failure signal for each status signal that does not correspond to its predetermined value;

said output power monitor and control circuit comprising a plurality of current controlling inductors, each being connected between said load bus and an associated one of said power conversion circuits, each of said current controlling inductors being effective to restrict current flow from said load bus into said associated power conversion circuit to a predetermined level and for a predetermined time which is greater than the time required for said output power monitor and control circuit to disconnect said associated power conversion circuit from said load bus.

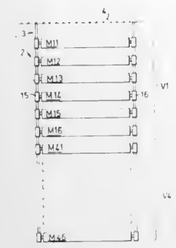
4,631,656

MOUNTING FOR ELECTRICAL CONVERTER VALVE ASSEMBLY

Karl-Erik Olsson, Ludvika, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 15, 1984, Ser. No. 621,286
Claims priority, application Sweden, Jun. 16, 1983, 8303459
Int. Cl.[4] H02M *7/757*
U.S. Cl. 363—123 **14 Claims**

1. A static electrical converter, particularly for high voltage DC, including at least one valve assembly with one or more valves electrically connected in series, each of said valves having a plurality of valve modules carried in a carrier means included in the valve assembly and adapted to be dependently mounted, wherein the valve modules are suspended under each other and are each connected to the carrier means by resilient members allowing relative vertical movement between the valve modules and between the valve modules and an upper



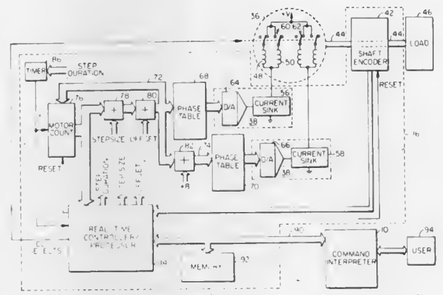
part of the carrier means, said upper part being adapted to be suspended from a carrier structure.

4,631,657

CONTROL AND FORCE-SENSING METHOD AND APPARATUS FOR MOTORS

John W. Hill, Palo Alto, and Anthony J. Sword, San Francisco, both of Calif., assignors to Microbot, Inc., Mountain View, Calif.

Division of Ser. No. 426,631, Sep. 29, 1982, Pat. No. 4,535,405. This application May 1, 1985, Ser. No. 729,475
Int. Cl.[4] G06F *15/46*; G05B *19/40*
U.S. Cl. 364—167 **24 Claims**



16. An apparatus responsive to a set of drive instructions for controlling the rotation of a shaft of a stepper motor in a number of predetermined modes, wherein the stepper motor is responsive to a drive waveform having a sequence of stair steps and is capable of rotation at a rotational velocity which is selected from a range of velocities, the apparatus comprising

means responsive to a set of drive instructions for generating a sequence of step size and step duration data which are a function of a selected rotational velocity, wherein the step size and step duration data respectively designate relative amplitude and relative duration magnitudes and are generated as a function of the particular mode designated by the drive instructions; and

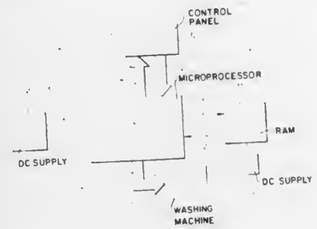
means responsive to the sequence of step size and step duration data for generating the sequence of stair steps, whereby the duration of each stair step in the drive waveform is determined by the step duration data.

4,631,658

METHOD OF AND APPARATUS FOR CONTROLLING A DOMESTIC APPLIANCE

Stephen P. Easthill, Chessington, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,662
Claims priority, application United Kingdom, Aug. 17, 1983, 8322169
Int. Cl.[4] G06F *15/46, 11/00*
U.S. Cl. 364—184 **8 Claims**



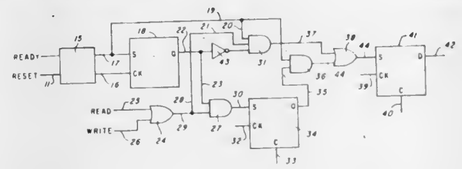
5. A domestic appliance, operable from an electric mains supply, comprising control means including a solid state processor which controls the appliance by selecting an optionally variable number of operating steps from N such steps, held in the processor, in accordance with any one of a number of programmes selectable by the user, the control means further including a non-volatile memory containing a corruption test code, information identifying a selected programme, and respective data at each of N addresses which defines whether or not a particular step corresponding to that address was processed during the running of the last previous programme, start-up means solely operative before the processor effects any operating step to check the test code for corruption and to examine the data at each of the N addresses in the memory in sequence, the processor having means for reading the memory and starting the operation of the appliance either from the first selected one of the N operating steps or, if the data at any of the N addresses in the memory indicates that a particular operating step was not crossed during the last previous run, starting the operation of the appliance from the first operating step in the sequence that was not so processed.

4,631,659

MEMORY INTERFACE WITH AUTOMATIC DELAY STATE

John Hayn, II, Midland, and John Schabowski, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 587,335, Mar. 8, 1984, abandoned. This application Apr. 1, 1985, Ser. No. 718,584
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 **5 Claims**



1. In a digital processing system including a processor with an internal clock and an external memory, a memory interface connected between the processor and external memory, the memory interface comprising:

an information transfer bus operably connected between the processor and the external memory for transferring of

information between the processor and the external memory;

control means connected to the information transfer bus and the processor for generating at least one control signal for synchronously controlling the transfer of information on the information bus by controlling the time at which the processor reads information from the external memory;

flip-flop means having a first logic state and a second logic state for selecting whether to time delay the control signal; and

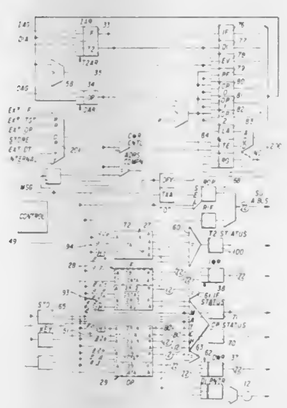
wait circuit connected to said control means and said flip flop means for delaying the control signal by a first time delay when the flip flop means is at the first logic state.

4,631,660

ADDRESSING SYSTEM FOR AN ASSOCIATIVE CACHE MEMORY

Gary A. Woffinden, Scotts Valley; Gene M. Amdahl, Atherton, and Donald L. Hanson, Los Altos Hills, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 527,674
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 8 Claims



1. A memory system comprising:

a main store for storing lines of data;

a buffer store, accessed by a requesting address, for storing lines of data that are a sub-set of the lines of data stored in said main store, said buffer having a first and second associativity;

said first associativity having a line of data from a first address in said buffer store and said second associativity having a line of data from a second address in said buffer store;

pointer means for storing a data select pointer that indicates a bit location within said first and second addresses which has a first value in said first address at said bit location and a second value in said second address at said bit location; and

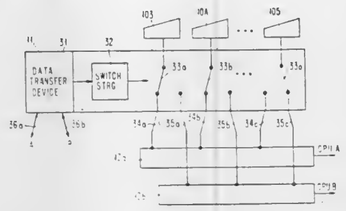
data selection means for receiving said data select pointer to access said bit location in said requesting address to select between said first and second associativities.

4,631,661

FAIL-SAFE DATA PROCESSING SYSTEM

Wolfgang Eibach, Holzgerlingen; Kuno M. Roehr, Boeblingen, and Klaus M. Schulz, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 545,285, Oct. 25, 1983, abandoned.
This application Mar. 19, 1986, Ser. No. 850,425
Claims priority, application European Pat. Off., Dec. 7, 1982, 82111312.3
Int. Cl.[4] G06F *11/16*
U.S. Cl. 364—200 11 Claims



1. A fail-safe data processing system including:

a plurality of processors;

a plurality of switching units connected in series and star-connected to said plurality of processors, said plurality of switching units being addressable by each of said plurality of processors; and

a plurality of peripheral units coupled to said plurality of switching units, said plurality of peripheral units thereby being connected to any of said plurality of processors

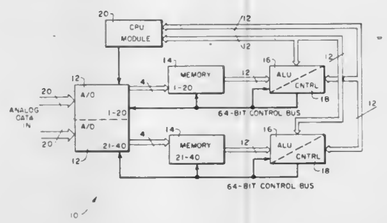
whereby said fail-safe data processing system can continue operating even upon the failure of one of said plurality of processors because the peripheral units connected to the failed processor are switched to an operable processor by said plurality of switching units.

4,631,662

SCANNING ALARM ELECTRONIC PROCESSOR

Richard A. Stutler, King George, Va., and Jeffrey T. Harris, Palm Bay, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1984, Ser. No. 628,093
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 5 Claims



1. A scanning alarm electronic processor (SAEP) for receiving and evaluating a predetermined number of analog signals, said SAEP being physically divided into two sections each section being configured to process halve of the predetermined number of analog signals, said SAEP comprising:

a plurality of first section analog-to-digital (A/D) modules operatively connected at their inputs to half of the predetermined number of analog signals;

a plurality of first section memory modules operatively

connected to corresponding ones of said plurality of first section A/D modules;

a plurality of first section arithmetic logic unit (ALU) modules operatively connected to corresponding ones of said plurality of first section memory modules;

a plurality of first section control modules operatively connected to corresponding ones of said plurality of first section ALU modules, memory modules, and A/D modules;

a plurality of second section A/D modules operatively connected at their inputs to the other half of the predetermined number of analog signals;

a plurality of second section memory modules operatively connected to corresponding ones of said plurality second section of A/D modules;

a plurality of second section ALU modules operatively connected to corresponding ones of said plurality of second section memory modules;

a plurality of second section control modules operatively connected to corresponding ones of said plurality of second section ALU modules, memory modules, and A/D modules;

said pluralities of first and second section analog-to-digital modules, memory modules, arithmetic logic units and control modules being connected to their respective preceeding input devices and succeeding output devices in pipeline fashion, and

a common central processor unit (CPU) module operatively connected to both of said first and second section plurality of control modules, and operatively connected to both of said first and second section plurality of A/D modules, and ALU modules so as to coordinate the first and second sections together in a parallel pipeline fashion to increase the processing speed.

4,631,663

MACROINSTRUCTION EXECUTION IN A MICROPROGRAM-CONTROLLED PROCESSOR

Herbert Chilinski; Klaus J. Getzlaff, both of Schoenaich; Johann Hajdu, and Franz J. Raeth, both of Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,583
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1982, 82105015[U]
Int. Cl.[4] G06F *9/22, 9/40*
U.S. Cl. 364—200 7 Claims



1. In a microprogram-controlled processor which carries out macroinstructions by either execution of a series of microinstructions which are routed to the operation decoder or by direct routing of said macroinstruction to said operation decoder from the macroinstruction operation register, comprising:

a control storage for storing a hardware control word which controls said direct routing of a macroinstruction, said hardware control word comprising a mode control bit and a plurality of direct control bits;

a microinstruction operation register connected to said control storage for reading said hardware control word from said control storage and for generating control signals from said plurality of direct control bits contained in said hardware control word;

first gating means coupled to said microinstruction operation register for outputting said generated control signals; and

second gating means coupled to said macroinstruction operation register for directly routing said macroinstruction to said operation decoder;

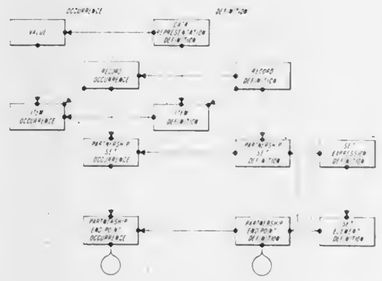
a mode latch connected to said microinstruction operation register, said mode latch being activated by said mode control bit having a preselected value indicating that a macroinstruction is to be directly routed to said operation decoder, said mode latch controlling said first and second gating means, whereby the execution of said macroinstruction is controlled by said control signals.

4,631,664

PARTNERSHIP DATA BASE MANAGEMENT SYSTEM AND METHOD

Charles W. Bachman, Lexington, Mass., assignor to Bachman Information Systems, Inc., Cambridge, Mass.

Filed Jul. 19, 1983, Ser. No. 515,290
Int. Cl.[4] G06E *7/00*
U.S. Cl. 364—200 10 Claims



1. A data base management system for controlling storage, retrieval and modification of information in a data collection contained in storage devices in a data processing system, said data collection consisting of a plurality of data records, each data record including zero, one or more items, each item being representative of zero, one or more data values, comprising:

A. means for establishing in said data processing system one or more partnership sets within at least one data record, each of said partnership sets being representative of zero, one or more partnerships,

B. means for establishing in said data processing system one or more of said partnerships, wherein each of said partnerships is characterized by one partnership set associated with itself or associated with one other partnership set,

C. means for accessing in said data processing system one or more data records by reference to a partnership set which is in partnership with partnership sets of said one or more data records.

4,631,665

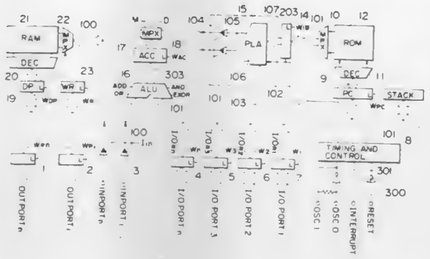
MICROPROCESSOR HAVING A PROGRAMMABLE LOGIC ARRAY

Hiroshi Yokouchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,169
Claims priority, application Japan, Apr. 14, 1982, 57-60876
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 4 Claims

1. A microprocessor comprising: a program counter for designating instruction data, a data bus line, a timing and control circuit for outputting an internal reset signal in response to an external reset signal, a programmable logic array for output-

ting a reset data signal and a reset data bus control signal by interpreting said internal reset signal as an instruction, and a



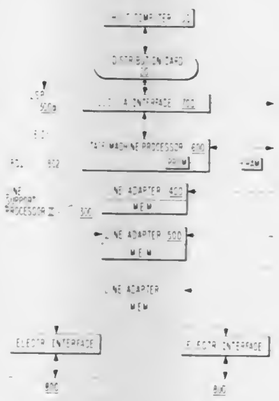
gate circuit means for inputting said reset data signal into said data bus line in response to said reset data bus control signal so as to reset said program counter.

4,631,666

DATA TRANSFER NETWORK FOR VARIABLE PROTOCOL MANAGEMENT

Craig W. Harris, El Toro; Lyle O. Jevons, Jr., Mission Viejo, and Richard A. Loskorn, Dana Point, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 25, 1982, Ser. No. 436,710
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. A data transfer network for data transfers between a main host computer and a plurality of remote data sets operating under different protocol and timing disciplines wherein said main host computer initiates I/O data transfer commands to a line support processor means having a plurality of line support processors, each one of which manages data transfers between one of said remote data sets and said main host computer, said data transfer network comprising:

(a) said main host computer connected to each one of said line support processors and including:

(a1) main memory means for storing data to be transmitted to/received from said remote data sets and including:

(a1a) a first dedicated memory area for storing a I/O data transfer commands for transmittal to said line support processors;

(a1b) a second dedicated memory area for storing operational codes for transmittal to said line support processors wherein said operational codes contain information translatable, by said line support processor, into control data for selecting timing and protocol discipline for a selected line adapter;

(a2) a main processor for selecting said I/O data transfer commands and said operational codes for communication and control of said line support processor, said processor including:

(a2a) connection means to a distribution control circuit;

(b) a base module providing backplane connection means for slide-in circuitry cards, said base module including:

(b1) said distribution control circuit functioning to connect and/or disconnect said host computer to/from a selected line support processor in line support processor means;

(b2) said line support processor means functioning to execute said I/O data transfer commands by controlling a selected line adapter to a remote data set, said line support processor means including:

(b2a) a plurality of line support processors connected to said distribution control circuit wherein each said line support processor includes:

(B2a1) interface circuit means connecting said main host computer, via said distribution control circuit, to a plurality of line adapter means and to a state machine processor means;

(b2a2) said state machine processor means including a state machine processor operating to translate said operational codes into control data for operating a selected line adapter in a desired timing and protocol discipline for managing data transfers between said selected line adapter and an associated said data set, said state machine processor means including:

(i) a first auxiliary memory storage area for receiving said operational codes from said host computer;

(ii) program memory means for enabling said state machine processor to translate said operation codes into control data for operating a selected line adapter;

(iii) said state machine processor operating to transmit said control data to said selected line adapter for selecting and managing the timing and protocol discipline for data transfers, and including:

(ie) means for selecting a particular line adapter in said plurality of line adapter means;

(iie) means for identifying the required timing and protocol discipline for said particular line adapter;

(iiie) means for generating address signals for selecting a desired control register in said particular line adapter and placing said control data therein;

(ive) means for transferring data to/from said particular line adapter;

(ve) means for selecting a group of multiplexors associated with said selected particular line adapter;

(c) said plurality of line adapter means connected to said state machine processor means and including a plurality of line adapters, wherein each line adapter includes:

(c1) a data communication line to an associated said remote data set;

(c2) a plurality of control registers holding said control data for managing data transfers according to a desired timing and protocol discipline, said control data being derived from said state machine processor means;

(d) transceiver-controller means, operating under control of said state machine processor means, for switching a data bus to connect said state machine processor to a selected line adapter or to connect said selected line adapter to a multiplexor means;

(e) said data bus connecting each of said line adapters to said transceiver-controller means;

(f) multiplexor means including:

(f1) a plurality of groups of multiplexors whereby each group of multiplexors is connected to an associated line adapter for conveying bytes of data from said remote data set to said state machine processor means for subsequent transfer to said host computer, and wherein each said group of multiplexors includes:

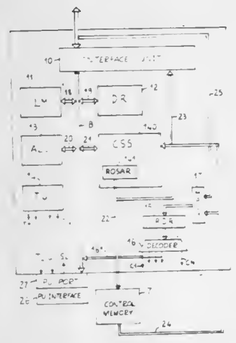
(f1a) coded input signal means for identifying the particular timing and protocol discipline required for the said associated line adapter.

4,631,667

ASYNCHRONOUS BUS MULTIPROCESSOR SYSTEM

Ferruccio Zulian, Cornaredo, and Vittorio Zanchi, Milan, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Jun. 27, 1983, Ser. No. 507,854
Claims priority, application Italy, Jul. 6, 1982, 22248 A/82
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **6 Claims**



1. An improved asynchronous bus multiprocessor system of the type in which a plurality of processors communicate with a working memory through a common system bus wherein each processor comprises:

a first bus interface register for the latching of working memory address/commands through an internal bus,

a second bus interface register for the latching of information read out from working memory through the internal bus,

a microprogrammed control unit comprising: a microprogram memory, a microprogram memory address register having outputs connected to address inputs of said microprogram memory, a microinstruction register for the latching of a microinstruction read out from said microprogram memory, a first loading path from the output of said microprogram memory to the input of said microinstruction register, a decoder for microcommand generation from said microinstruction and a timing unit, wherein the improvement consists in that at least one said processor comprises:

a third bus interface register the output of which is coupled to the system bus via the internal bus for the latching of working memory address/commands, having inputs connected to the outputs of said microprogram memory address register;

a second loading path for said microinstruction register from said working memory through said system bus to the input of said microinstruction register;

gate means inserted on said first and second paths to control information flow on said paths;

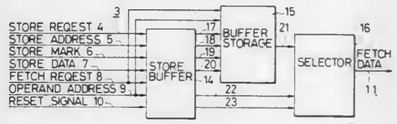
a logical sequencing network which, clocked by said timing unit, when enabled by an information identifying a microinstruction addressed by said microprogram memory address register as stored in working memory, generates a sequence of microcommands, said microcommands controlling the accesss to said working memory by inhibiting said first and second interface registers and controlling said gate means to inhibit said first loading path and further enabling said third interface register and said second loading path.

4,631,668

STORAGE SYSTEM USING COMPARISON AND MERGER OF ENCACHED DATA AND UPDATE DATA AT BUFFER TO CACHE TO MAINTAIN DATA INTEGRITY

Kanji Kubo, and Chikahiko Izumi, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,018
Claims priority, application Japan, Feb. 3, 1982, 57-14964
Int. Cl.⁴ G06F *13/00/13/18, 13/12*
U.S. Cl. 364—200 **3 Claims**



1. A storage system comprising:

main storage means for storing data;

cache storage means coupled to said main storage means for storing a portion of the data stored in said main storage means, said cache storage means operating to store data in response to receipt of a write pulse and a store address and to read out data in response to receipt of a fetch request and a fetch address;

request generating means for generating a fetch address together with a fetch request when data is to be fetched from said cache storage means, and for generating a store address, store data and a store mark together with a store request when data is to be stored in said storage means, said store mark identifying that portion of the store data to be stored in said cache storage means; and

store buffer means coupled to said cache storage means and said request generating means for temporarily storing data before it is stored in said cache storage means, including a plurality of register means for storing the store address, store data and store mark from said request generating means into one of said register means in response to receipt of the store request for said request generating means input control means for specifying in regular order the register means to store the store address, store data and store mark accompanied by the store request, in response to said store request, means for transferring said store address, store data and store mark stored in said register means to said cache storage means along with a write pulse at a time when no fetch request is being generated by said request generating means, output control means for specifying in regular order the register means storing the store address, store data and store mark to be transferred to said cache storage means, comparison means for comparing the fetch address accompanied by the fetch request from said request generating means and the store addresses stored in the respective register means, and for providing coincidence signals indicating coincidence between said addresses, and output means responsive to the coincidence signal from the comparison means for controlling said transferring means to output the store data and store mark from the register means which said comparison means indicates has provided said coincidence; and

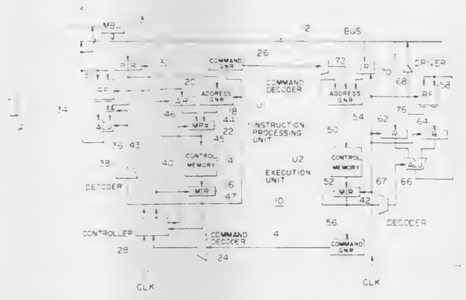
means for merging the data read from said cache storage means in response to the fetch request and the portion of said store data outputted under control of said output means and identified by said store mark outputted from said store buffer means.

4,631,669

DATA PROCESSING SYSTEM HAVING NO BUS UTILIZATION PRIORITY CONTROL

Akinori Horikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,964
Claims priority, application Japan, Apr. 7, 1983, 58-61148
Int. Cl.⁴ G06F *13/36*
U.S. Cl. 364—200 **2 Claims**



1. A data processing system having no bus utilization priority control, comprising:

an instruction processing unit operating in accordance with a plurality of first microinstructions prestored therein;

an execution unit which operates in accordance with a plurality of second microinstructions prestored therein and which operates synchronously with said instruction processing unit; and

a bus operatively connected with said instruction processing unit and said execution unit;

said execution unit generating a pause command when said execution unit uses said bus during the next microinstruction cycle of said second microinstructions;

said instruction processing unit being supplied with said pause command, and including a circuit which causes double occurrences of one of said first microinstructions in response to said pause command in the event that said instruction processing unit uses said bus during the next microinstruction cycle of said second microinstructions, said instruction processing unit further including an instruction processing portion which is arranged to temporarily disable the first microinstruction of said double occurrences in response to said pause command;

said instruction processing unit comprising:

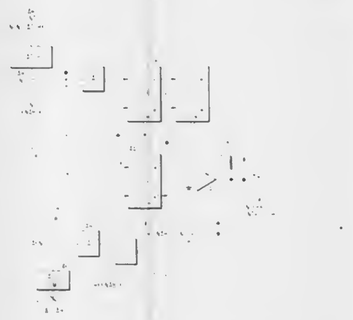
a first control memory for previously storing said first microinstructions, a first control memory address generator for generating address signals for deriving microinstructions from said first microinstructions within said first control memory, a first address register, a multiplexer for selectively allowing either said first control memory address generator or said first address register to couple with said first control memory, said multiplexer normally coupling said first control memory address generator with said first control memory, said first address register receiving the output of said multiplexer and updating the content thereof, a first microinstruction register for storing each microinstruction derived from said first control memory, said first microinstruction register communicating the content thereof back to said first control memory address generator, and a controller receiving the content of said first microinstruction register, said controller, in response to said pause command, allowing said multiplexer to couple said first address register with said first control memory in order to cause said double occurrences of said first microinstructions and at the same time disabling said insturction processing portion in case said instruction processing unit uses said bus during the next microinstruction cycle of said processing unit.

4,631,670

INTERRUPT LEVEL SHARING

David J. Bradley, Boca Raton, and William B. Ott, Lake Worth, both of Fla., assignors to IBM Corporation, Armonk, N.Y.

Filed Jul. 11, 1984, Ser. No. 629,868
Int. Cl.⁴ G06F *9/46*
U.S. Cl. 364—200 **11 Claims**



1. In an interrupt system having an interconnection for an external interrupt signal, a shared interrupt interface circuit for permitting sharing of interrupt levels, comprising:

pulse generating means for impressing on said interconnection a pulse transition to a first level from a second level, said interconnection being held at said first level if any such pulse generating means is impressing a first level on said interconnection;

interrupt state means having an interrupt state and a noninterrupt state in response to an internal interrupt signal generated by a device requesting an interrupt, said state means causing said pulse generating means to generate said transition to said first level when said state means are in said interrupt state;

inhibiting means responsive to a transition to said first level on said interconnection for inhibiting the generation of any subsequent first level signal by said pulse generating means; and

reenabling means responsive to a single indicating an end of interrupt servicing for releasing the inhibiting by said inhibiting means.

4,631,671

DATA PROCESSING SYSTEM CAPABLE OF TRANSFERRING SINGLE-BYTE AND DOUBLE-BYTE DATA UNDER DMA CONTROL

Asayoshi Kawashita, Chigasaki, and Hirofumi Kuniga, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

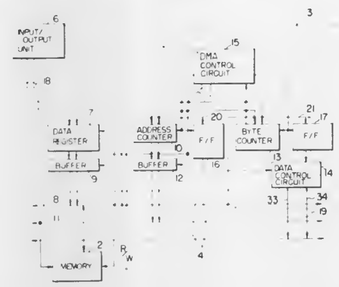
Filed Nov. 23, 1982, Ser. No. 443,873
Claims priority, application Japan, Nov. 26, 1981, 56-190258
Int. Cl.⁴ G06F *3/04*
U.S. Cl. 364—200 **5 Claims**

1. In a data processing system having a processor and a memory connected to said processor via a system bus for storing bytes of data identified by even or odd addresses and being capable of reading or writing two bytes of data having an even and a succeeding odd address in one operation in response to receipt of the even address, an input/output adaptor connected to said system bus and at least one input/output unit for effecting DMA data transfer in a controlled manner at one byte per cycle or two bytes per cycle of the processor between said input/output unit and said memory comprising:

an address counter and a byte counter connected to said system bus to receive from the processor and store an address for the memory and a byte number indicating the number of bytes of data to be transferred in a DMA operation, respectively, such that the bits of the address and the byte number are stored into stages of the address counter and byte counter by shifting the bits one bit to the right so that the least significant bit of the address and the byte number are not stored in the respective counters;

buffer means connected to said address counter and said system bus for receiving the contents of said address counter and for supplying said contents along with an added bit in the least significant position to said system bus as an address which is always an even address; and

DMA control means for incrementing said address counter for each processor cycle a number of times according to said byte number, whereby DMA data transfer at two bytes per cycle is effected on the basis of the even addresses applied to said system bus from said buffer means.

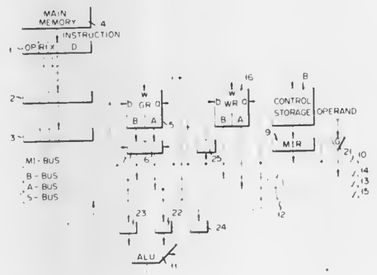


4,631,672

ARITHMETIC CONTROL APPARATUS FOR A PIPELINE PROCESSING SYSTEM

Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1983, Ser. No. 459,989
Claims priority, application Japan, Jan. 27, 1982, 57-11121
Int. Cl.⁴ G06F *7/00*
U.S. Cl. 364—200 **9 Claims**



1. An arithmetic control apparatus for a pipeline processing system having

an instruction fetch stage, an operand address computation stage, an operand fetch stage, and an instruction execution stage, said arithmetic control apparatus comprising:

first instruction register means for storing an instruction at an end of said instruction fetch stage, for outputting said instruction during said operand address computation stage, and for transferring said instruction at an end of said operand address computation stage;

second instruction register means, coupled to said first instruction register means, for storing said instruction at said end of said operand address computation stage, and for transferring said instruction at an end of said operand fetch stage;

third instruction register means, coupled to said second instruction register means, for storing said instruction at said end of said operand fetch stage;

means, coupled to said first instruction register means, for storing microinstructions, and for outputting, during said operand fetch stage, a microinstruction corresponding to said instruction;

means, coupled to said microinstruction storing and outputting means, for storing data, and for outputting therefrom fetched operands during said operand fetch stage in accordance with said microinstruction, said third instruction register means also for outputting a portion of said instruction to said data storing and fetched operands outputting means; and

arithmetic and logic means, coupled to said microinstruction storing and outputting means and said data storing and fetched operands outputting means, for storing at an end of said operand fetch stage said fetched operands output by said data storing and fetched operands outputting means, for performing, during said instruction execution stage, an arithmetic operation upon said fetched operands in accordance with said microinstruction, and for outputting at an end of said instruction execution stage a result of said arithmetic operation to said data storing and fetched operands outputting means.

4,631,673

METHOD FOR REFRESHING MULTICOLUMN TABLES IN A RELATIONAL DATA BASE USING MINIMAL INFORMATION

Laura M. Haas, Palo Alto, and Bruce G. Lindsay, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,500
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—300 **3 Claims**



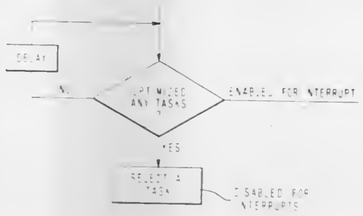
1. A method for updating an extensible multicolumn table (snapshot table) which is a subset of a logically independent extensible multicolumn table (base table) in a nodal network of a distributed relational data base system, each row entry of the base table being assigned a unique identifier, said data base system having local means for generating time stamps in ascending order upon demand, said method comprising the steps of:

(a) defining on the base table a partial ordering of time stamps on the row updates (insertions, deletions, modifications), a total ordering of row entry identifiers, and a backward chaining of the identifiers of adjacent row entries;

(b) scanning the base table and detecting changes thereto as anomalies to the orderings or chaining; and

(c) communicating the anomalies to the snapshot table and altering its contents therewith.

4,631,674
ACTIVE WAIT
Geoffrey O. Blandy, New Paltz, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 5, 1985, Ser. No. 698,304
Int. Cl.⁴ G06F *9/46*
U.S. Cl. 364—300 **3 Claims**



1. In a tightly coupled multiprocessor system configured so as to process tasks at least some of which are required to be processed by only one processor at a time, and in which the operation of an Active processor can lead to the readying or creation of a dispatchable task, a method of causing an Idle processor to select a task readied by an Active processor, comprising the steps of:

enabling a first processor for interrupt when the first processor detects that it is Idle;

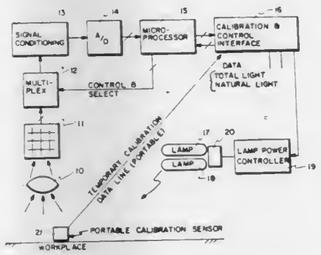
detecting, by said first processor, whether a readied, dispatchable task eligible to be run on said first processor exists in the system;

disabling said first processor for interrupt if such a dispatchable task is found by said first processor; and then

selecting said task, for running on said first processor; and

repeating the step of detecting after a predetermined delay selected to reduce interference between said first processor and other processors in the system, if such a dispatchable task is not found by said first processor.

4,631,675
AUTOMATIC LIGHT-INTENSITY CONTROL
William F. M. Jacobsen, Blaine, Minn., and Zoltan Zansky, Willowdale, Canada, assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jul. 20, 1984, Ser. No. 632,786
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—400 **8 Claims**



1. An illumination level sensing and controlling system for controlling the level of artificial light in an area of interest comprising:

light collector means capable of receiving light from a wide angle such that the light received is representative of a relatively large portion of said area of interest and focusing said light on a two-dimensional surface;

two-dimensional light-sensitive array means including a matrix of light-intensity sensitive elements disposed to receive the light focused by said light collector means in a manner such that the matrix of light-sensitive elements produces an output corresponding to a light-intensity mapping of the area from which said light is collected;

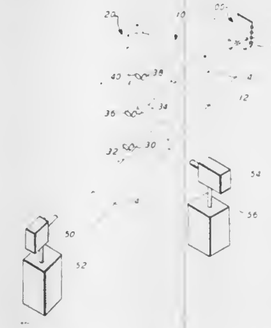
multiplexer means for addressing each of said light-intensity sensitive elements and determining the relative light intensity value thereof, said values being representative of the light intensity in corresponding portions of the controlled area;

signal conditioning means including means for digitizing said light intensity values;

microprocessor means for storing control values associated with desired light levels of the area of interest, processing the digitized data and controlling the operation and control functions of the system based on a comparison with said control values; and

control means for controlling the light level of one or more lamps associated with the illumination of the area to be controlled based on the control function of said microprocessor means.

4,631,676
COMPUTERIZED VIDEO GAIT AND MOTION ANALYSIS SYSTEM AND METHOD
James W. Pugh, 115 E. 9th St., New York, N.Y. 10003
Filed May 25, 1983, Ser. No. 497,823
Int. Cl.⁴ A61B *5/10*
U.S. Cl. 364—413 **18 Claims**



1. A motion analysis system for analyzing the movements of a portion of the body of a subject as it moves along a predetermined path; comprising:

(a) marking means of relatively small size and weight in comparison to the size and weight of the subject and being attachable to the subject so as not to modify or hinder the movement of the subject;

(b) video recording means for viewing and making a video record of the movements of the subject over a predetermined period of time, and at a recording rate of sixty frames per second, said video recording means being formed to be particularly sensative to said marking means;

(c) minicomputer means connected to said video recording means and coacting therewith for receiving frame by frame views of the movements of the subject and more particularly the images of said marking means as viewed by said video recording means;

(d) said minicomputer means including video analysis means for receiving and for sequentially digitizing, into a predetermined array of pixels, each of said views of said movement of said subject and said marker as viewed by said video recording means;

(e) each said pixel having predetermined horizontal and vertical coordinates with respect to horizontal and vertical reference lines and having a gray level corresponding to the brightness of that part of the image represented by said pixel and particularly the brightness of the image of said marking means as viewed by said video recording means;

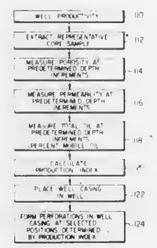
(f) first program means coacting with said minicomputer to effect scanning of each said pixel array and for setting a first threshold of gray level above which said minicomputer will respond and provide a predetermined indication thereof, and for changing said first threshold to a second threshold of gray level when said minicomputer fails to respond to a pixel of at least said first threshold of gray level in a frame at the approximate horizontal and vertical coordinates of a pixel previously responded to by said minicomputer in the previous last scanned frame;

(g) said first program means coacting with said minicomputer to locate, by x and y type data coordinates, each of said pixels responded to by said minicomputer for each frame so viewed and to record same, and to thereafter automatically and similarly locate each of said pixels having at least the gray level established by said first program for such pixel for all of said frames so viewed and to record same;

(h) computer means coacting with said minicomputer means for receiving said pixel data coordinates and for combining same into a predetermined data display;

(i) and data output means coacting with said computer means for providing a visual depiction of said predetermined data display.

4,631,677
METHOD FOR DETERMINING THE PLACEMENT OF PERFORATIONS IN A WELL CASING
Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Company, Midland, Tex.
Filed Jun. 1, 1984, Ser. No. 616,410
Int. Cl.⁴ G01V *1/00*; G01N *15/08*; E21B *49/00*
U.S. Cl. 364—422 **13 Claims**



1. A method for determining the productivity of a well site, comprising:

extracting a representative core sample of a formation of interest from the well site utilizing sponge coring techniques, the portion of the total oil that bleeds out of the core sample absorbed by the sponge utilized in sponge coring techniques;

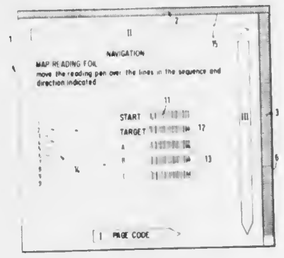
measuring the porosity of the core sample at predetermined depth increments;

measuring the fraction of the core space in the core sample occupied by total oil at each of the predetermined depth increments, the total oil equal to the oil remaining in the core on the surface of the well in addition to the oil that bleeds out of the core sample upon extraction thereof, the fraction equal to the percent mobile oil;

determining a Production Index to indicate the producibility of the well as a function of depth increments, the Production Index varying directly with the product of the porosity, permeability and percent mobile oil; and

placing a well casing in a well that is disposed in the formation of interest and placing perforations in the well casing at selected positions determined by the Production Index such that the selected perforations are located at depths having a Production Index greater than a predetermined number along the formation of interest.

4,631,678
INFORMATION INPUT
Helmut Angermüller, Frankfurt am Main, and Günther Hahlganss, Kriftel, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany
Filed May 18, 1984, Ser. No. 612,102
Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319224
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—424 **22 Claims**



1. A system for identifying locations on a map for inputting data of the locations into an optical map reading device of a navigation device, the locations including a start point and a target point, the navigation device including a data processor, the system comprising

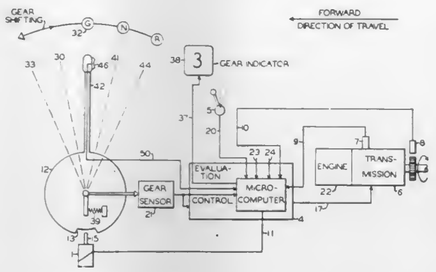
stencil means configured for emplacement on the map for measuring coordinate distances on the map, said stencil means including a mark for association with a starting point or target point on the map, and

location marking means constructed with optically readable location markings, and being disposed on said stencil means for inputting location data into said reading device for use by said data processor, said location data being inputted upon alignment of said mark of said stencil means with a coordinate of the starting point or target point.

4,631,679
GEARSHIFT SELECTION SYSTEM FOR A POWER-ASSISTED TRANSMISSION
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany
Filed Sep. 26, 1983, Ser. No. 535,484
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237509
Int. Cl.⁴ G05G *5/04*; F16H *57/06, 5/80*
U.S. Cl. 364—424.1 **5 Claims**

1. A vehicle gearshift selection system for a power-assisted transmission comprising, a unilateral gearshift actuator is capable of being shifted by a driver to cause a gear change of the transmission, a gear sensor for sensing the position of said unilateral gearshift actuator, and an evaluation control circuit for receiving a gearshift command signal from said gear sensor and for receiving input signals representing the gas pedal position, the vehicle speed and the load carried by the vehicle for calculating and computing an optimum new gear and for allowing a shift-up or shift-down into the optimum new gear of

the transmission when said unilateral gearshift actuator is shifted to an initial speed selection position by the driver and for permitting said unilateral gear shift actuator to be shifted



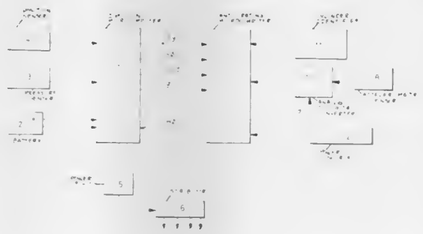
beyond said initial speed selection position when the optimum new gear is engaged by causing a stop pin to be withdrawn from a notch of a locking device.

4,631,680

PROCESS FOR OPTIMIZING THE IGNITION ADVANCE OF AN INTERNAL COMBUSTION ENGINE

Jean P. Korb, Joinville Le Pont, and Jean P. Lagrue, Palaiseau, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Jul. 8, 1983, Ser. No. 511,946
Claims priority, application France, Jul. 20, 1982, 82 12628
Int. Cl.⁴ F02P *5/15;* **G06F** *15/20*
U.S. Cl. 364—431.05 **13 Claims**



1. Process for optimizing the ignition advance of an internal combustion engine equipped with a computer containing a programmed law for ignition advance as a function of the speed and the load of the engine and a system for detection of pinging that supplies data representative of the presence or absence of pinging for each engine stroke, according to which there is determined, as a function of the speed and the load of the engine, at least two operating zones, namely a critical zone and a noncritical zone and, in the case of detection of pinging in the critical zone, the ignition advance generated during at least one of the following engine strokes is delayed, comprising the following steps in response to the detection of pinging of a cylinder in the critical zone concerned:

delaying the ignition advance of the cylinder concerned by n_1+n_2 degrees in relation to the programmed law of advance; and

controlling the return of the programmed advance of said cylinder at a fast rate and a slow rate by decrement of n_1 at a high speed and of n_2 at a low speed respectively;

wherein said process further comprises the following steps in response to a fast rate correction occurring during a passage from the critical zone to the noncritical zone;

cancelling said fast rate correction occurring during said passage from the critical zone to the noncritical zone;

storing the value of n_2 occurring during a passage from the critical zone to the noncritical zone; and

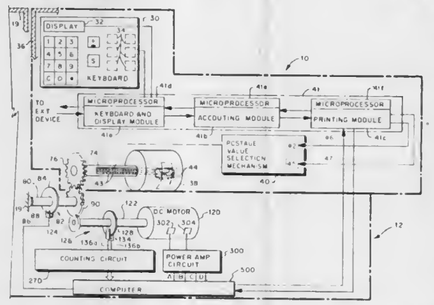
suspending the advance correction and the decrement of n_2 at the slow rate until the following passage from the noncritical zone to the critical zone where the correction and the decrement of n_2 at the slow rate is resumed.

4,631,681

MICROPROCESSOR CONTROLLED D.C. MOTOR AND APPLICATION THEREFOR

Edilberto I. Salazar, Brookfield; Wallace Kirschner, Trumbull; John L. Lorenzo, Southbury; Keith E. Schubert, West Norwalk, and Philip Pollak, Jr., Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,569
Int. Cl.⁴ G06F *15/20;* **H02P** *5/06;* **H02K** *37/00*
U.S. Cl. 364—464 **25 Claims**



1. In combination with a postage meter including a rotary drum having a periphery adapted for feeding a sheet in a path of travel, an improvement comprising:

(a) first means for sensing a time interval during which a sheet is linearly displaced a predetermined distance in the path of travel;

(b) a d.c. motor coupled to the drum for rotation thereof;

(c) second means for sensing angular displacement of the drum; and,

(d) computer means coupled to the first and second sensing means and to the d.c. motor, the computer means comprising:

(i) means responsive to the first sensing means for providing respective amounts representative of desired angular displacements of the drum during successive sampling time periods,

(ii) means responsive to the second sensing means for providing respective amounts representative of actual angular displacements of the drum during successive sampling time periods, and

(iii) means for compensating for the difference between desired and actual angular displacements and generating a d.c. motor control signal for controlling rotation of the motor to cause the linear displacement of the periphery of the drum to substantially match the linear displacement of the sheet during respective sampling time periods.

4,631,682

METHOD AND APPARATUS FOR CONTROLLING A WINDER FOR STOP-TO-LENGTH OR STOP-TO-ROLL DIAMETER

David T. Ng, Rockford, Ill., and Roger C. Brendemuehl, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 7, 1984, Ser. No. 638,408
Int. Cl.⁴ B65H *17/12, 25/00*
U.S. Cl. 364—471 **7 Claims**

7. A winder control comprising:

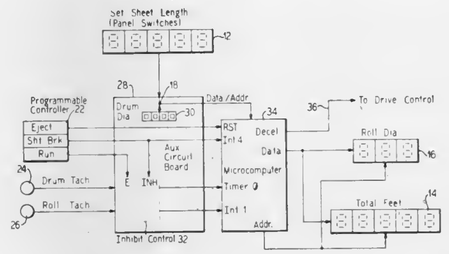
a rotatable support drum and a drum tachometer for producing first tachometer pulses;

a rotatable roll for winding a sheet thereon and a roll tachometer for producing second tachometer pulses;

drive means connected to and operable to cause rotation of said drum and roll, including a drive circuit switchable between a first deceleration rate and a lower second deceleration rate;

first means for storing target information representing desired wound up sheet length;

second means connected to said drum and roll tachometers for counting and storing the respective tachometer pulses as representing an cumulative length; and



said second means including third means connected to said first means and to said drive circuit, said third means operable to determine an anticipated stopping distance from the speed and the drive deceleration rate and cause said drive circuit to operate at said first deceleration rate when the sum of the stopping distance and the cumulative length is greater than the target length and at said lower, second deceleration rate when such sum is less than the target length.

4,631,683

ACOUSTIC DETECTION OF CONTACT BETWEEN CUTTING TOOL AND WORKPIECE

Charles E. Thomas, Scotia; Minyoung Lee, Schenectady; James F. Bedard, Schenectady; Steven R. Hayashi, Schenectady, and William S. Yerazunis, Troy, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,203
Int. Cl.⁴ G06F *15/46;* **G01N** *24/04;* **G01M** *7/00*
U.S. Cl. 364—474 **14 Claims**

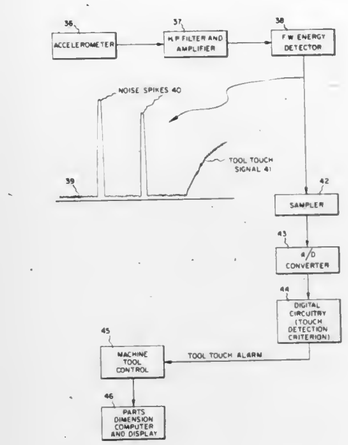
1. An improved system for acoustic detection of the initial touch of a cutting tool to a workpiece on a machine tool comprising:

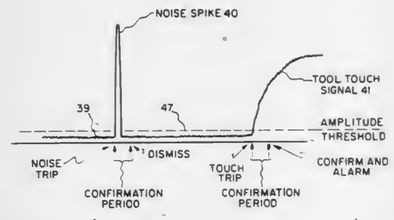
a vibration sensor which is most sensitive to frequencies around a resonant frequency and is positioned on said machine tool to sense vibrations at the tool-workpiece interface and convert these and other vibrations to an electrical signal;

an analog preprocessor including means to high-pass filter and amplify said vibration signal to discriminate against lower frequency machinery noise, and means to rectify and low-pass filter said signal and detect the energy in a band around said resonant frequency;

means for sampling the signal at the preprocessor output and converting each sample to digital form; and

digital signal pattern recognition circuitry comprising means for comparing each sample with a preset amplitude threshold level which is a minimum factor above the continuous noise level produced by operation of said machine tool with no tool-workpiece contact, and means for detecting a sample amplitude above said threshold and then confirming detection of a tool touch signal while ignoring pre-touch high amplitude spiky noise pulses, and





generating a touch alarm signal to be sent to the machine tool control to stop the advance of said cutting tool.

4,631,684

TOOL SUPPORT SYNCHRONIZING SYSTEM FOR NUMERICAL CONTROL APPARATUS

Kyosuke Akasofu, and Kiyoshi Kuchiki, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,205
Claims priority, application Japan, Mar. 22, 1983, 58-47478
Int. Cl.⁴ G05B *19/18*
U.S. Cl. 364—474 **7 Claims**

FIG. 5A

FIG 5B

1. In a tool post synchronizing system for a numerical control apparatus for controlling a tool machine having a plurality of tool supports through control circuitry, a tool support synchronizing system for said numerical control apparatus comprising:

reading means provided for each tool support for reading an independent work program for controlling each of said tool supports;

command decode processing means for decoding commands of said independent work programs read by said reading means to output a signal;

control circuit means for controlling shifting means for

shifting said tool supports in accordance with said signal from said command decode processing means; and

synchronization controlling means for controlling said control circuit means and guiding execution of said independent work programs in synchronization with one another when said command decode processing means decodes a synchronizing command from said independent work programs and composed of a predetermined single character or symbol in the form of a mark not usually used in said independent work programs;

wherein said command decode processing means comprises a coincidence circuit for sensing the coincidence of a code pattern with said synchronizing command, an output of said coincidence circuit representing coincidence being supplied to said synchronization controlling means,

wherein said control circuitry comprises a programmable controller coupled to said central circuit means for controlling an auxiliary function of said tool machine; and

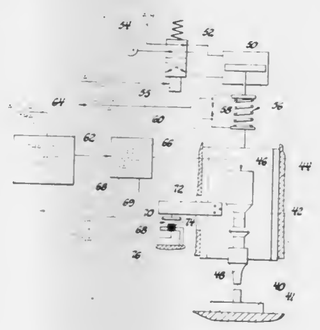
wherein said synchronization controlling means includes means for preventing execution of the shifting of a tool support during a period from receipt of a synchronizing command of the work program for said tool support until detection of a synchronizing command of a work program for another tool support.

4,631,685

METHOD AND APPARATUS FOR ULTRASONIC PLASTIC FORMING AND JOINING

David A. Peter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1984, Ser. No. 679,364
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—476 **8 Claims**



1. A method of dimensional control in ultrasonic processing of work comprising one or more plastic parts to be deformed, comprising the steps of;

applying force to a surface of the work and sensing a preset force value,

when the preset force value is attained, measuring the surface position to establish an initial dimension and initiating ultrasonic energy application to the work,

monitoring surface displacements occurring after initiating the ultrasonic energy,

terminating ultrasonic energy when the surface displacement reaches a preset value,

then maintaining force on the surface for a hold period and thereafter releasing the force, and

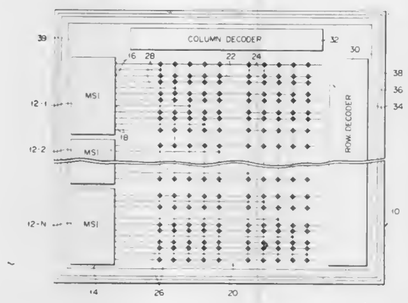
measuring overall surface displacement after the hold period when the force is at the preset value, thereby determining the dimensional change due to deformation of the work.

4,631,686

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuo Ikawa, Tokyo; Tadashi Shibata; Kiyoshi Urui, both of Yokohama; Misao Miyata, Tokyo; Masahiko Kawamura, Yokohama, and Noboru Amano, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1984, Ser. No. 646,121
Claims priority, application Japan, Aug. 31, 1983, 58-157718
Int. Cl.⁴ H03K *19/173;* H04Q *9/00*
U.S. Cl. 364—490 **17 Claims**



1. A semiconductor integrated circuit device comprising:

(a) a semiconductive substrate;

(b) a plurality of different kinds of functional elements formed on said substrate, each having a predetermined unit logic function and having at least one input terminal and at least one output terminal;

(c) first wiring lines formed on an area of said substrate adjacent to said functional elements and extending in a first direction, each said first wiring line being connected to one of the input terminal and the output terminal of the corresponding functional element;

(d) second wiring lines formed on said substrate area to be electrically insulated from said first wiring lines and extending in a second direction, each said second wiring line being connected to the other of the input terminal and the output terminal of the corresponding functional element, said second wiring lines forming mutually electrically insulated crossing points with said first wiring lines;

(e) first switching elements provided at said crossing points between said first and second wiring lines and connected to corresponding first and second wiring lines, said first switching elements being capable of changing their own electrical state at least once between conductive and non-conductive states; and

(f) wiring pattern make-up means, connected to said switching elements, for supplying electric signals necessary for setting given electrical states of said switching elements to set a given mutual wiring of said functional elements through shortest signal transmission paths using said first and second wiring lines, thereby realizing an exclusive custom device function conforming to a given specification.

4,631,687

METHOD AND APPARATUS FOR ANALYSIS EMPLOYING MULTIPLE SEPARATION PROCESSES

Bruce R. Kowalski, and Gilson H. Rohrback, both of Seattle, Wash., assignors to Rohrback Technology Corporation, Seattle, Wash.

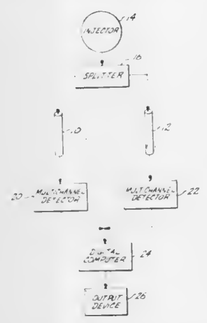
Filed Nov. 3, 1983, Ser. No. 548,493
Int. Cl.⁴ G01N *31/00;* G06F *15/46*
U.S. Cl. 364—497 **29 Claims**

1. A method for analyzing a sample in order to produce data corresponding to a set of properties of at least one of the individual components thereof, the properties being selected such

that said set of properties is adequate for identifying at least one of said components, said method comprising the steps of:

subjecting said sample to a plurality of separation processes, the separation processes being adapted to produce a corresponding plurality of different distributions of the sample;

determining said set of properties of the sample, to produce a corresponding sample set, at each of a plurality of positions along each of said distributions;



determining one or more basic sets for each separation process, such that all sample sets corresponding to the distribution produced by that process can be represented by the basic sets for that process; and

comparing the basic sets for the different processes with one another to thereby identify one or more common basic sets such that all of the sample sets can be represented by the common basic sets, whereby said common basic sets are estimates of said set of properties for individual components.

4,631,688

METHOD OF AND APPARATUS FOR TESTING A METAL BODY BY MEANS OF EDDY CURRENTS

Bernard Boehm, 35, rue de la Croix de Fer, 78100 Saint-Germain-en-Laye, and Marc Lacroix, 6, Impasse des Pêcheries, 78230 Le Pecq, both of France

Filed Jun. 6, 1980, Ser. No. 157,632
Claims priority, application France, Jun. 14, 1979, 79 15481
Int. Cl.⁴ G06F *15/20;* G01R *33/12*
U.S. Cl. 364—507 **10 Claims**



1. A method of inspecting a metal body for defects, the method comprising the steps of:

relatively longitudinally displacing the body and a plurality of pairs of coils connected in respective bridge circuits;

exciting the bridge circuits with alternating current;

exciting the coils with alternating current so that eddy-current variations caused by defects in the body become impedance variations of the coils which in turn become imbalance signals in the respective bridges;

demodulating the imbalance signals to form respective imbalance voltages;

periodically sampling the demodulated imbalance voltages;

storing the levels of the sampled demodulated voltages;

averaging the sampled demodulated voltages of each bridge to produce respective base lines;

comparing the respective stored levels of each sampled voltage with the respective base line and generating respective error signals corresponding to the differences;

comparing each of these error signals with a relatively low threshold corresponding to the smallest defect to be detected and with a relatively high threshold;

establishing a longitudinal succession of at least abutting zones on the body and summing error signals for each zone to obtain sums of error signals for each zone; and

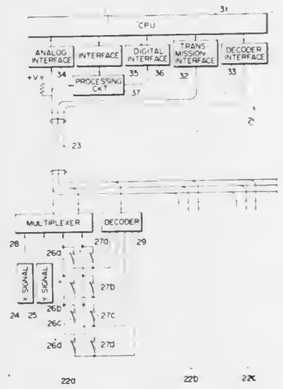
comparing each of these sums with a predetermined threshold, whereby when one of the error signals exceeds only said relatively low threshold it indicates a small defect, when one of the error signals exceeds said relatively high threshold it indicates a large defect, and when one of the sums exceeds said predetermined threshold it indicates a long defect.

4,631,689

MULTI-JOINT ARM ROBOT APPARATUS

Yoshiaki Arimura, Yokohama; Masao Obama, Yokosuka, and Yutaka Hitomi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 20, 1984, Ser. No. 591,492
Claims priority, application Japan, Mar. 26, 1983, 58-50711
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—513 **3 Claims**



1. A multi-joint arm robot apparatus, comprising:

a multi-joint arm including a plurality of unit arms connected to tandem through a joint sections;

means provided in said multi-joint arm for driving each of said joints to move said multi-joint arm;

state detecting means, provided in each of said joint sections, including rotation angle detecting means for detecting a rotation angle of a corresponding joint section to provide rotation angle signals representative of a joint rotation angle in an analog form, and

obstacle detecting means for detecting whether a unit arm associated with the corresponding joint section is brought into contact with obstacles to provide obstacle detect signals in a binary form when the unit arm contacts obstacles;

signal processing means responsive to said state detecting means for driving said joint driving means to move said multi-joint arm on a path; said signal processing means being arranged to transmit common control signals to said state detecting means of said joint sections so that said state detecting means of said joint sections are successively enabled; and said state detecting means of said joint sections each being arranged to transmit, when enabled by

said signal processing means, the obstacle detection signals and the rotation angle signals to said signal processing means on a multiplexing basis.

4,631,690

MULTIPROCESSOR COMPUTER SYSTEM FOR FORMING A COLOR PICTURE FROM OBJECT ELEMENTS DEFINED IN A HIERARCHIC DATA STRUCTURE

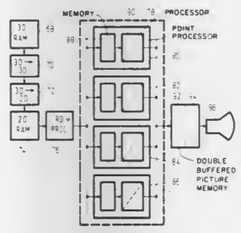
Marc E. A. Corthout, and Pieter M. Mielekamp, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,264

Claims priority, application Netherlands, Mar. 10, 1982, 8300872

Int. Cl.⁴ G06F *15/40, 15/626;* **G09G** *1/14*

U.S. Cl. 364—518 **12 Claims**



8. A multiprocessor computer system for forming a picture on a display field of a display member from object elements which are defined in a hierarchic data structure, said system comprising:

(a) a connection for a host processor;

(b) an input memory (**74**) fed by said connection for storing elementary level object elements in the form of respective Bezier polygons each of which is exclusively defined by the describing points of its polygon sides and furthermore storing for each next-higher hierarchic level two-dimensional transformation functions that form object elements of said next-higher level, up to a highest hierarchic level having a two-dimensional data structure;

(c) an array of point-processors (**80**, **82**, **84**, **86**) fed in parallel by said input memory and being each assigned to a rectangular subfield of said display field, each of said point processors having state-sequencing means, for operating in a first state as a structure processor for determining, for each assigned point starting from the highest level and progressively for each next-lower level of the data structure, the application coordinates of said assigned point within any object element of that level until such object element is either found to be irrelevant for the point in question or is found to be an elementary object element; for operating in a second state as a polygon processor for calculating, for each elementary object element thus found in a first state a binary inside/outside indicator and generating a list of all relevant elementary object elements for which an "inside" value applies with respect to the current point, associated with such elementary object's color information; and for operating in a third state, in case of a list of more than one elementary object element thus generated, as a priority processor for determining a priority among the latter object elements and producing therefrom a color information for the pixel in question; and

(d) a cyclically operable multiplexer (**176**) for receiving the color information generated by the point-processors for forwarding to said display member.

4,631,691

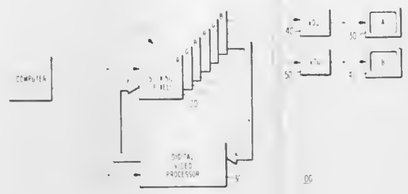
VIDEO DISPLAY DEVICE SIMULATION APPARATUS AND METHOD

Albert P. Pica, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 14, 1984, Ser. No. 610,006

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—521 **9 Claims**



9. An apparatus for simulating a video display device comprising:

a computer for controlling the simulation;

means responsive to the computer for replicating on a test image the effects of at least one parameter of the simulated display device; and

a video monitor for displaying the output from the replicating means.

4,631,692

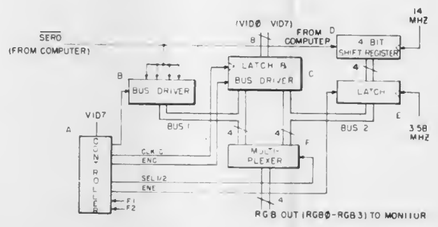
RGB INTERFACE

Walter F. Broedner, San Jose, Calif., assignor to Video-7 Incorporated, Milpitas, Calif.

Filed Sep. 21, 1984, Ser. No. 653,491

Int. Cl.⁴ G06F *15/626;* **G09G** *3/02, 1/28;* **H04N** *1/46*

U.S. Cl. 364—518 **6 Claims**



1. A multi-mode video interface for use in adapting an Apple TM II-series computer having an NTSC-type video output for driving an RGB-type monitor, comprising:

means for receiving first and second video mode controlling flags from said computer;

means for receiving serial video data from said computer;

means for receiving parallel video bus data from said computer;

an RGB output bus for driving said RGB-type monitor;

means for receiving a clock signal from said computer;

binary switch means, responsive to said first and second flags, for generating first and second binary switches **F1** and **F2** for controlling an output video mode of said interface;

means for controlling the states of said first and second flags to select a video mode; and

RGB conversion circuit means for providing, in response to said clock signal, flags, parallel video data and serial video data RGB video data on said RGB output bus, said circuit comprising:

a controller, responsive to said binary switches **F1** and **F2** for steering video data;

a bus driver, under the control of said controller for receiving said serial video data and placing it on a first four bit bus;

a shift register circuit, having a data input for receiving said serial data and a clock input for receiving said clock signal, for outputting serial data onto a shift register output bus;

a first latch having an input coupled to said shift register output bus for latching data therefrom onto a second bus;

a second latch and bus driver having an input video bus receiving said parallel data and first and second outputs coupled to said first and second buses respectively; and

a multiplexer for providing said RGB video data to said RGB bus.

4,631,693

SYSTEM FOR MONITORING THE OPERATION OF OUTPUT TRANSDUCERS OF A CENTRAL CONTROL AND MONITORING UNIT FOR MACHINES AND/OR DEVICES USABLE IN PRODUCTION AND/OR PRODUCT PACKAGING LINES

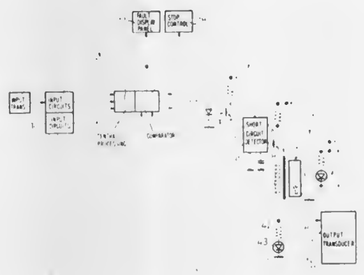
Armando Neri, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Dec. 28, 1983, Ser. No. 566,370

Claims priority, application Italy, Feb. 15, 1983, 3336 A/83

Int. Cl.⁴ G01R *31/34;* **G05B** *9/02;* **G08B** *21/00;* **G01P** *13/00*

U.S. Cl. 364—550 **8 Claims**



1. A monitoring system for a machine used in a production line, said system comprising a central control unit; an output circuit connected to said central control unit; an output transducer connected to said output circuit; a monitoring circuit means associated with said output circuit for detecting the passage of current in said output transducer, said monitoring circuit means generating a comparison signal, there being no direct electrical connection between said monitoring circuit means and said output circuit; said central control unit including a control circuit which emits a control signal for said output transducer and receives the comparison signal from said monitoring circuit means; a stop control means to stop the machine; a first luminous indicator; said control circuit including means to emit a signal to said stop control means to stop the machine and send a signal to said first luminous indicator, whereby in the event of loss of said comparison signal said means to emit a stop signal is activated to stop the machinery.

4,631,694

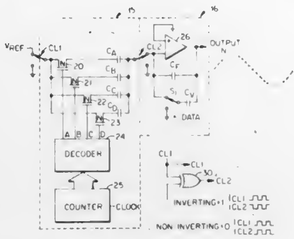
SINE WAVE SYNTHESIZER

Peter S. Single, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 27, 1984, Ser. No. 604,718

Int. Cl.⁴ G06F *1/02*

U.S. Cl. 364—608 **13 Claims**



9. In an integrated circuit, a sine wave synthesizer circuit, comprising:

an integrator;

at least two selectable integration constant capacitors;

a reference source;

at least two switches, one of each coupled in a series with a corresponding one of said integration constant capacitors and operable to select said integration constant capacitor;

decoder means, coupled to said switches, for sequential operation of said switches to select an integration constant capacitor from among said selectable integration constant capacitors in a sequence and at a rate corresponding to a desired sine wave frequency; and

means for effecting switched capacitor phasing of said integration constant capacitors, including:

a first phase switch for alternately coupling a first terminal of a selected integration constant capacitor between a reference source and a circuit ground; and

a second phase switch, for alternately coupling a second terminal of said selected integration constant capacitor between an integrator input and said circuit ground;

whereby operation of said first and second phase switches at the same time produces transition of said sine wave in a first direction; and

whereby operation of said first and second phase switches 180° out-of-phase produces transition of said sine wave in a second, opposite direction, such that coordinated operation of said first and second phase switches and said decoder operates said circuit to produce a sloped line approximation of a sine wave output signal.

4,631,695

DETECTOR OF PREDETERMINED PATTERNS OF ENCODED DATA SIGNALS

Tony J. Kozlik, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 24, 1984, Ser. No. 573,899

Int. Cl.⁴ G06F *7/02*

U.S. Cl. 364—715 **5 Claims**

1. A detector for a unique pattern of Manchester encoded data in serially received Manchester encoded data signals in which each bit of data is in a Manchester bit cell with each such Manchester bit cell being divisible into two half-bit cells, comprising:

means for producing a receive clock signal in synchronism with the encoded data signal as received, said receive clock signal having a voltage transition of one plarity substantially in the center of each half-bit cell of each Manchester bit cell of the received signal;

receive data shift register means to which the encoded data signal and receive clock signal are applied for storing voltage levels of the encoded data signal at each voltage

transition of one polarity of the receive clock, said shift register means storing the voltage levels of all of the half-bit cells of said pattern of the data signals; and



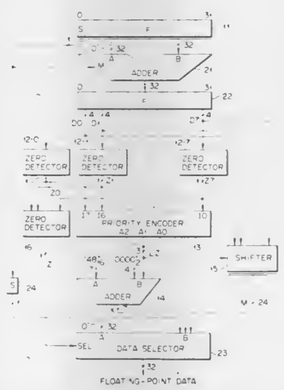
programmable array logic means to which all of the voltage levels stored in the receive data shift register means are applied for producing an output signal when the pattern of voltages stored in the receive data shift register is said unique pattern.

4,631,696

FIXED-POINT DATA/FLOATING-POINT DATA CONVERTING APPARATUS

Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 24, 1984, Ser. No. 573,347
Claims priority, application Japan, Jan. 28, 1983, 58-12527
Int. Cl.⁴ G06F *7/38, 5/00*
U.S. Cl. 364—748 **11 Claims**



1. A fixed-point data/floating-point data converting apparatus comprising:

a priority encoder, for respectively receiving signals which indicate whether or not the digits of a first fixed-point data are "0", to thereby generate a number of continuous "zero" digits from a most significant digit of the first fixed-point data, in accordance with the signals;

a shifter for shifting the first fixed-point data to the left by the number of continuous "zero" digits from said priority encoder, thereby obtaining a mantissa part;

subtracting means for subtracting the number of continuous "zero" digits from a reference value, thereby obtaining an exponent part; and

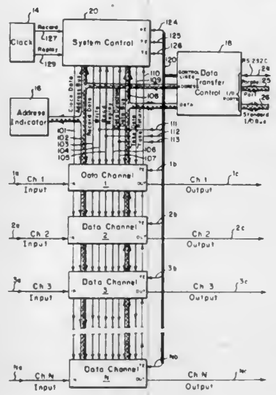
means for generating floating-point data normalized in accordance with the mantissa part from said shifter and the exponent part from said subtracting means.

4,631,697

SIGNAL CONTROLLED WAVEFORM RECORDER

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Troy, N.Y.

Continuation-in-part of Ser. No. 522,356, Aug. 11, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 676,915
Int. Cl.⁴ G06F *3/05, 3/06*
U.S. Cl. 364—900 **14 Claims**



1. A signal controlled waveform recorder having a plurality of data channels for recording selected portions of the signals supplied to the data channels of said recorder, said recorder comprising;

(a) latch means for each of said plural data channels, each being responsive to an assigned data input signal and a clock pulse to provide latch values of the assigned data input signals;

(b) means for producing digital output signals having substantially the same logical values as those of previously stored values of said input signals;

(c) means for comparing the logical values of said input signals and said digital output signals and producing control signals responsive to any logical differences occurring therebetween; and

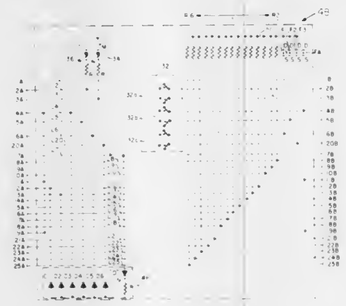
(d) means responsive to said control signals for storing in parallel the latched values of said input signals.

4,631,698

INTERFACE APPARATUS

Joseph F. Walsh, and William P. Dean, both of King County, Wash., assignors to IQ Technologies, Inc., Bellevue, Wash.

Filed Jul. 29, 1983, Ser. No. 518,404
Int. Cl.⁴ G06F *13/42;* **H04B** *17/00*
U.S. Cl. 364—900 **35 Claims**



1. An interface apparatus for interconnecting computers and

peripheral devices with external connectors having mismatched data signal lines or open inputs on handshake or control signal lines, comprising:

means for electrically interconnecting a pair of designated data signal lines of a first computer or peripheral device connector with a pair of designated data signal lines of a second computer or peripheral device connector;

detection means for detecting mismatching interconnections of said pairs of data signal lines;

switching means responsive to a detected mismatch by said detection means for selectively reversing the electrical interconnection of said pairs of data signal lines;

interconnecting means for electrically interconnecting a plurality of designated handshake and control signal lines of said first connector with a plurality of designated handshake and control signal lines of said second connector; and

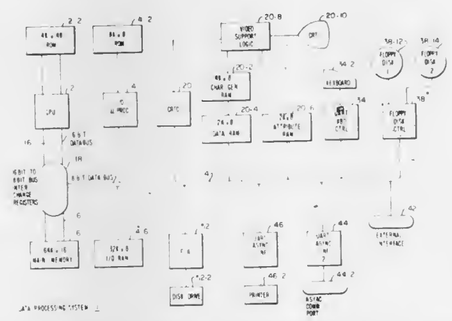
means for detecting an enable signal on at least one of said designated handshake or control lines of said first or second connectors and detecting an open input on any other of said designated handshake or control signal lines of said first or second connectors, and in response to said detected enable signal supplying a non-linear current-limited enable signal to one or more of said other handshake or control signal lines detected as having an open input.

4,631,699

FIRMWARE SIMULATION OF DISKETTE DATA VIA A VIDEO SIGNAL

James C. Siwik, Nashua; Thomas L. Murray, Jr., Merrimack, both of N.H., and Thomas O. Holtey, Newton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 30, 1982, Ser. No. 445,631
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—900 **10 Claims**



1. A data processing system including apparatus for verifying the integrity of the system by using a cathode ray tube (CRT) subsystem to generate a stream of data bits to simulate the flow of information between a disk and a disk controller comprising:

data random access memory (RAM) means for storing data bytes having a fixed format, each of said data bytes being represented by combinations of clock bit cells, data bit cells and no bit cells, each of said clock bit cells being represented by a first plurality of data bytes, each of said data bit cells being represented by a second plurality of data bytes and each of said no bit cells being represented by a third plurality of data bytes, each of said first, second and third plurality of data bytes being stored in a first predetermined number of locations;

CRT controller means for generating a plurality of sequential data RAM address signals and a plurality of raster signals, said data RAM means having means for receiving each of said plurality of sequential data RAM address signals and generating data byte signals representative of the contents of each addressed location of said data RAM means; and

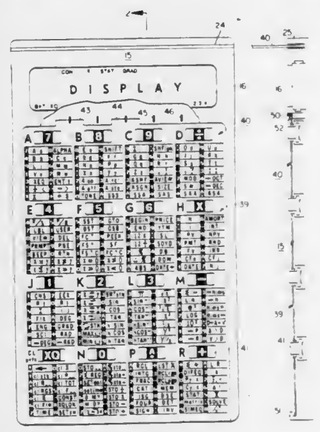
character generator RAM means coupled to said data RAM means and said CRT controller means for storing a first byte in a first location, a second byte in a second location and a third byte in a third location, and having means for receiving a sequence of said data byte signals and said plurality of raster signals for addressing combinations of the contents of said first, said second and said third locations and having means for generating said stream of data bits at a first bit rate including said clock bit cells, said data bit cells and said no bit cells representative of said data bytes having said fixed format.

4,631,700

MAGNETICALLY CODED SOFTWARE FOR MULTI-PURPOSE COMPUTER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 460,004, Jan. 21, 1983. This application Aug. 11, 1983, Ser. No. 522,234
Int. Cl.⁴ G06F *9/06, 15/08*
U.S. Cl. 364—900 **12 Claims**



1. A software accessory system for a computer data processing system having a coded data strip reading transducer attachment, a manual keyboard with a plurality of keys and internal data processing capabilities of changing operational modes, receiving and storing data and program instructions from either said reading transducer or said keyboard, comprising in combination,

a self supporting keyboard key overlay matrix panel defining a plurality of straight edges and having structure thereon for mating with a set of the keyboard keys to permit manual operation of the keys,

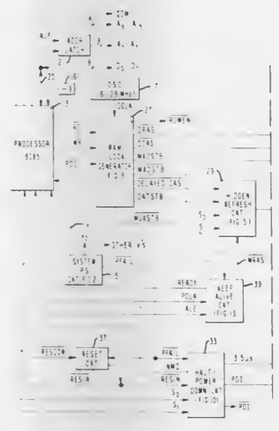
program control means in said computer data processing system activating individual keys to enter a plurality of data and instruction functions greater than the number of keys in response to combinations of more than one keystroke per entry,

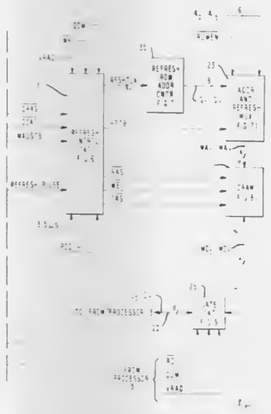
graphic indicia on the panel identifying respective individual ones of the keys for indicating a plurality of operational functions attainable by those individual keys by said combinations of keystrokes,

coded data means comprising at least one coded data storage strip disposed along one straight edge of the panel for presenting in coded format for reading data and instructions into the computer data processing system by means of said transducer attachment, software storage means in said computer system for storing data read from the strip

by said transducer for access by the computer data processing system as data and instructions for use in data processing operations and mode selection means responsive to said coded data means on the panel for inplementing an operational mode in the computer data processing system enabling the keys to perform those operational fucntions displayed by the graphic indicia on the panel.

4,631,701
DYNAMIC RANDOM ACCESS MEMORY REFRESH CONTROL SYSTEM
Ronald P. Kappeler, and Robert C. Hughes, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 31, 1983, Ser. No. 547,523
Int. Cl.[4] G06F *12/16*; G11C *7/00*
U.S. Cl. 364—900 **3 Claims**





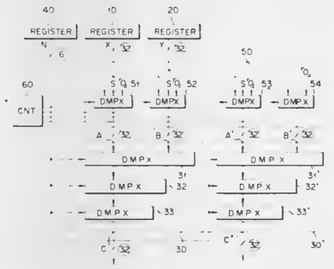
1. In a data processing system including a data processor outputting first and second status signals, first and second operating control signals, first clock signals and first memory address signals, a memory system comprising;
a dynamic random access memory coupled to said processor for receiving said first memory address signals;
generator means coupled to said data processor for generating first and second timing signals in response to receiving said first operating control signals;
first gating means coupled to said data processor for outputting an opcode fetch signal in response to receiving said first and second status signals;
a plurality of bistable devices coupled to said generator means and said first gating means for generating a first control signal in response to receiving said opcode fetch signal and said first timing signals;
first logic circuit means coupled to said bistable devices for outputting a first refresh signal in response to the generation of said first control signal;
first multiplexer means coupled to said first logic circuit means, said generator means and said memory for outputting a second refresh signal, an address clock signal and first and second select signals in response to the outputting of said first refresh signal and the generation of said second timing signals to refresh one of a plurality of predetermined portions of said memory identified by the first memory address signals during an opcode fetch cycle of each instruction being executed by said processor;
counter means coupled to said first multiplexer means for developing second memory address signals in response to the outputting of said address clock signal;
second multiplexer means coupled to said counter means, said processor, said generator means and said first multiplexer means for transmitting the second memory address signals to said memory so that at the time of the generation of the next second refresh signal, a refresh operation can be performed on that portion of said memory identified by the second memory address signals in response to the outputting of said first select signal and for selecting address signals from said processor to enable read-write operations to be performed on data in said memory in response to the outputting of said second select signal;
a first one-shot circuit coupled to said processor for outputting a second control signal upon the elapsing of a predetermined time period, said one-shot circuit being disabled from operation, said one-shot circuit being disabled from operation in response to receiving said second operating control signal; and
second logic circuit means coupled to said first logic circuit means, said one-shot circuit and said processor for outputting a plurality of third control signals to said first logic circuit means in response to the outputting of said second control signal and said first clock signals enabling said first logic circuit means to output said first refresh signal to said first multiplexer means whereby the first multiplexer means will output a plurality of said second refresh signals and an associated sequence of address clock signals to the memory causing all of the portions in said memory to be sequentially refreshed upon failure of the processors to start processing before the expiration of said predetermined time period.

4,631,702
COMPUTER SPEED CONTROL
Larry Korba, Ottawa, Canada, assignor to Canadian Patents and Deveopment Limited—Société Canadienne des Brevets et d'Exploitation Limitée, Ottawa, Canada
Filed Feb. 28, 1984, Ser. No. 584,497
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—900 **6 Claims**



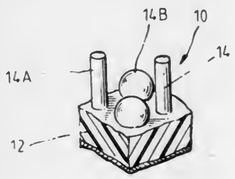
1. A slow down circuit for a digital computer having a microprocessor which has a microprocessor ready line which enables said microprocessor when impressed with a first logic level voltage and disables the microprocessor when impressed with a second logic level voltage, an address bus, a data bus and a clock pulse generator for producing a clock pulse train, said slow down circuit comprising:
(a) address decode logic means connected to said address bus and said clock pulse generator for producing a clock pulse train when predetermined bit patterns appear on said address bus, said predetermined bit patterns representing special computer functions which require the computer to operate at normal speed;
(b) inhibit signal generating means connected to said address bus and said address decode logic means for producing an inhibit signal when said predetermined bit patterns appear on said address bus and in the presence of said clock pulse train from said address decode logic means;
(c) slow down signal generating means connected to said address bus and said data bus for generating a bi-level signal; and
(d) combining means having input terminals connected to said inhibit signal generating means and said slow down signal generating means and an output terminal connected to said microprocessor ready line for combining said inhibit signal and said bi-level signal to produce a control signal; wherein, said control signal has said first and second logic level voltages and wherein said control signal is at said first logic level voltage for enabling said ready line in the presence of said special computer functions and alternately switches between said first logic level voltage and said second logic level voltage in the absence of said special computer functions, said second logic level voltage causing a disabling of said microprocessor to thereby slow down the operation of said microprocessor.

4,631,703
SHIFT CIRCUIT FOR DOUBLE WORD LENGTH DATA
Tsutomu Sakamoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Apr. 14, 1983, Ser. No. 484,865
Claims priority, application Japan, Apr. 22, 1982, 57-67932
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—900 **2 Claims**



1. A shift circuit comprising:
a shift number designation register for storing (n+1)-bit shift number information (n: a positive integer) representing the number of shifts;
shift type specifying means for specifying shifting directions and types of arithmetic/logic operations;
first and second data registers for respectively storing the higher 2^n bits and the lower 2^n bits of 2^{n+1}-bit data;
a first data multiplexer, coupled to said first data register and shift type specifying means, for selecting one of the content of said first data register and at least one of a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said shift type specifying means;
a second data multiplexer, coupled to said second data register and shift type specifying means, for selecting one of the content of said second data register and at least one of a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said shift type specifying means;
a third data multiplexer, coupled to said second data register and shift type specifying means, for selecting one of the content of said second data register, a 2^n-bit constant and a 2^n-bit sign, in accordance with the shift type information from said type specifying means;
a fourth data multiplexer, coupled to said first data register and shift type specifying means, for selecting one of the content of said first data register and a 2^n-bit constant, in accordance with the shift type information from said shift type specifying means; and
first and second shifters, coupled to said shift number designation register and said first to fourth data multiplexers and having input sections to which 2^n-bit data from said first and second data multiplexers and 2^n-bit data from said third and fourth data multiplexers are respectively supplied, for performing data shifting only in one direction, either to the left or the right, within a shifting range of 0 to 2^n-1 bits in accordance with the shift number information from said shift number designation register, thereby providing a 2^n-bit shift output.

4,631,704
METHODS AND DEVICES FOR CHARGED BEAM ACCESSIBLE DATA STORAGE
Ronald J. Lucas, Columbia; Ivan L. Berry, Ellicott City, both of Md., and John C. Wolfe, Houston, Tex., assignors to The University of Houston, Houston, Tex.
Filed Dec. 15, 1983, Ser. No. 561,747
Int. Cl.[4] G11C *11/46*
U.S. Cl. 365—126 **9 Claims**

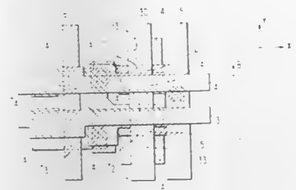


1. A method for creating an archival charged beam accessible data storage device comprising the steps of:
forming a storage medium having a base with an array of elongate uniformly spaced, free standing, charged beam absorbing protrusions formed thereon, said protrusions having aspect ratios of at least about three; and
selectively and individually melting certain of said protrusions with a charged beam to form widened protrusions having aspect ratios of less than three.

4,631,705
SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY DEVICE
Masahiko Honda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jun. 25, 1984, Ser. No. 624,072
Claims priority, application Japan, Jun. 23, 1983, 58-113133
Int. Cl.[4] G11C *11/34*; H01L *27/04*
U.S. Cl. 365—182 **9 Claims**

7. A semiconductor integrated circuit memory device comprising a plurality of memory cells arranged in one direction in a semiconductor substrate, each memory cell including a plurality of insulated gate type field effect transistors, and a word line including a first word wiring layer made of polycrystalline silicon extending in said one direction and forming each gate electrode of two of said transistors and a second word wiring

layer made of metallic material extending substantially in parallel to said first word wiring layer, said first and second word



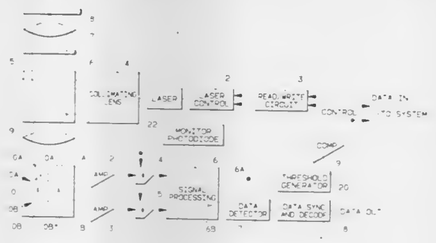
wiring layers being connected with each other at one location for every three or more memory cells.

4,631,706

SYSTEM FOR PREVENTING THE OVERWRITING OF PREVIOUSLY OPTICALLY RECORDED DATA AND FOR READING OPTICALLY RECORDED DATA DURING WRITING

Glenn D. Batalden; Duane W. Baxter, both of Rochester, and Neil R. Davie, Spring Valley, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,559
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—215 **10 Claims**



1. An optical data storage system having an alterable recording medium, laser means for scanning said alterable recording medium to record data on said medium or read data from said medium, laser control means for driving said laser means at a write state to alter the recording medium and for driving the laster at a read state when reading or not altering the recording medium, and apparatus for preventing the overwriting of data by said laser beam, said apparatus comprising:

radiation detection means responsive to changes in reflected light from said medium as the medium is scanned by said laser beam for generating an output signal representative of data stored at the center of the area scanned by said laser beam;

a portion of said detection means oriented to the relative scanning motion between the laser beam and said medium such that said portion is responsive to changes in reflected light prior to other portions of said detection means as previously recorded data enters the area scanned by the laser beam; said portion generating an anticipatory signal indicating previously recorded data is entering the area scanned by said laser beam;

means responsive to said anticipatory signal for inhibiting said laser control means from switching to the write state if previously recorded data is entering the area scanned by the laser beam.

4,631,707

MEMORY CIRCUIT WITH POWER SUPPLY VOLTAGE DETECTION MEANS

Takayuki Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,006
Claims priority, application Japan, Aug. 31, 1982, 57-150844
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—226 **16 Claims**



1. A memory circuit comprising:

a matrix of memory cells,

an operation control terminal said terminal adapted to assume at least a first signal level,

a power voltage terminal, said terminal having a voltage value at least within a normal range or a retention range,

a reference voltage terminal,

means coupled to said matrix and said power voltage terminal for supplying a power voltage to said memory cells,

circuit means operable to read information from and write information into said memory cells, said circuit means being operable when a potential at said power voltage terminal is within normal voltage range,

a detection means including a series connection of an impedance element and first and second field effect transistors coupled between said power voltage terminal and said reference voltage terminal, a gate of said first transistor being coupled to said operation control terminal, a gate of said second transistor being coupled to said power voltage terminal, said first transistor conducting when said operation control terminal assumes a first signal level, said second transistor assuming a conducting state when a potential at said power voltage terminal is within said normal voltage range and a non-conducting state when a potential at said power voltage terminal is outside said normal voltage range, said detection means generating a detection signal ohly when both of said first and second transistors assume conducting states simultaneously, and

means coupled to said detection means and to said circuit means for enabling said circuit means in response to said detection signal.

4,631,708

TRANSMITTER/RESPONDER SYSTEMS

David H. Wood, Stoke Poges, and Martin Creswick, Flackwell Heath, both of England, assignors to Senelco Limited, United Kingdom

Continuation of Ser. No. 450,152, Dec. 15, 1982. This application Feb. 18, 1986, Ser. No. 830,913
Claims priority, application United Kingdom, Dec. 18, 1981, 8138270
Int. Cl.⁴ H04B *1/59;* G01S *9/56, 13/74;* H04Q *5/22*
U.S. Cl. 367—2 **16 Claims**

1. A responder comprising:

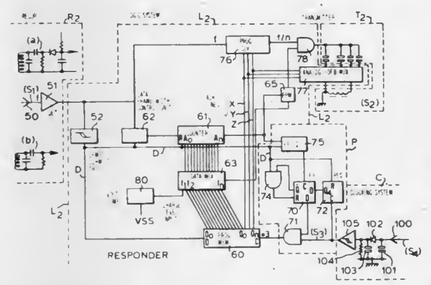
(a) receiver means for receiving a transmitted signal **S1** comprising a frequency **f1**;

(b) generator means for generating a carrier frequency **f2** of a carrier component of a transmittable signal **S2** comprising carrier frequency **f2** and code;

(c) logic means for enabling frequency **f2** to be in mathematical relationship wherein **f1** is related to **f2** by a function of at least one variable having a value other than zero and one with signal **S1**, said logic means comprising;

(i) at least one memory means, adapted to be programmed for storing code,

(ii) at least one modulation means for modulating said carrier component of signal **S2**, the modulation being under control of at least a portion of said stored code,



such that said frequency **F2**, will be encoded to provide said mathematical relationship with said frequency **f1** and,

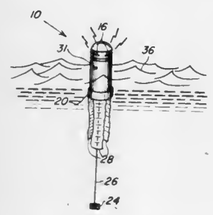
(iii) at least one clock means for providing at least one clocking signal for controlling access of at least a portion of said stored code to said at least one modulation means; and wherein means are provided whereby said at least one memory means is adapted to be programmed with said code by receiving at least one programming signal to be provided by an electromagnetic linkage between said responder and at least one source of said at least one programming signal, said at least one programming signal comprising code to be routed to said at least one memory means so as to provide said stored code.

4,631,709

LOW COST SONOBUOY

Roland A. Bender, 538 Norris Dr., Furlong, Pa. 18925; Lawrence R. Howarth, 8020 Colfax St., Philadelphia, Pa. 19136, and Lawrence F. Coar, 329 Juniper St., Warminster, Pa. 18974

Filed Jul. 13, 1984, Ser. No. 630,628
Int. Cl.⁴ B63B *22/00;* B64D *19/00*
U.S. Cl. 367—4 **3 Claims**



3. A low cost, air launched sonobuoy suitable for immersion in water, comprising:

a section of plastic pipe;

a first plastic end cap formed to be nonseparably bonded to one end of said plastic pipe section, said first end cap having a tapered face;

a radio antenna formed to be affixed to said first end cap;

a second plastic end cap formed to be nonseparably bonded to the other end of said plastic pipe section, said second end cap having a recess and a central opening;

hydrophone means deployably positioned within the recess of said second end cap;

a plurality of flexible strips, each contiguously and permanently attached at one end around the periphery of said second end cap and formed for trailing from said sonobuoy during descent thereby providing in-air stability;

electrical component means enclosed within said plastic pipe section and operatively connected between said hydrophone means and said radio antenna for processing and transmitting detected acoustic signals; and

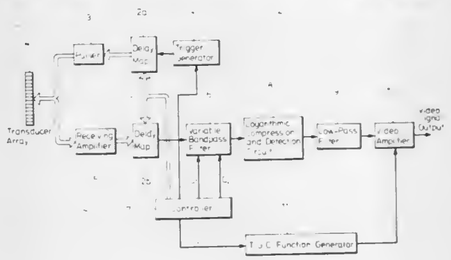
means for orienting said sonobuoy such that said radio antenna is above the water surface and said second end cap is below the water surface.

4,631,710

AZIMUTH ADAPTIVE PHASED ARRAY SONAR

Keiki Yamaguchi; Takao Higashiizumi; Toru Shimazaki; Shinichi Sano, and Yasuhito Takeuchi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 591,036
Claims priority, application Japan, Apr. 18, 1983, 58-68231
Int. Cl.⁴ G01S *3/80;* G10K *11/34*
U.S. Cl. 367—103 **8 Claims**



1. An azimuth adaptive phased array sonar (see FIG. 3), comprising

a sensor (**4**) having an array of a plurality of ultrasonic transducer elements (**4**) which transmit ultrasonic signals and receive echo signals;

a first delay stage (**2***a*) which in accordance with a trigger signal supplied from a trigger generator (**2**) generates a plurality of driving signals having a phase relationship corresponding to the direction of transmission of the ultrasonic beams, respectively;

a pulser (**3**) for amplifying the driving signals to produce output signals which drive said individual ultrasonic elements (**4**);

an amplifier (**5**) for amplifying the echo signals detected by said individual ultrasonic transducer elements (**4**), respectively;

a second delay stage (**2***b*) for delaying the respective output signals of said amplifier (**5**) for achieving a phase relationship corresponding to the direction of reception of the echo signal;

control means (**7**) for controlling the phase relationship in said first delay stage (**2***a*) and said second delay stage (**2***b*) in accordance with the respective direction of transmission of the ultrasonic signals and directions of reception of the echo signals;

a bandpass filter (**6**) disposed in a signal path of received echo signals and/or in a signal path of producing ultrasonic signals, said bandpass filter (**6**) having a variable frequency response; and

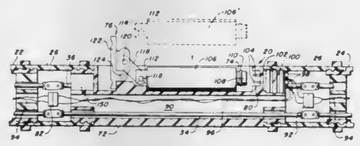
wherein said control means (7) further controls said band-pass filter (6) so as to substantially shift the pass band toward a lower frequency side as the azimuth of the ultrasonic beam is increased.

4,631,711

SYSTEM FOR REMOVABLY HOUSING AND ALIGNING COMPONENTS IN A TOWED ARRAY

John T. Fowler, Marblehead, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Nov. 24, 1982, Ser. No. 444,073
Int. Cl.⁴ G01V *1/38;* H04R *1/44*
U.S. Cl. 367—149 **41 Claims**



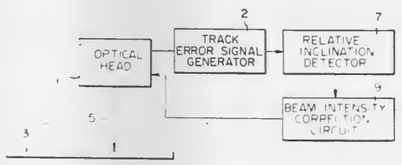
1. In combination:
a streamer section;
an adapter module coupled to at least one portion of said section and having an exterior surface faired with the exterior surface of said streamer section, said module having a breech and at least one strain member channel running therethrough;
at least one strain member in said strain member channel and means for clamping said strain member in said channel to said module;
a cartridge adapted to be removably mounted in said breech, said cartridge having a surface which is faired to the exterior surface of said module adjacent said breech when said cartridge is mounted in said breech; and
means for removably locking said cartridge in said breech.

4,631,712

OPTICAL DISK APPARATUS WITH BEAM ENERGY CORRECTION FOR DEVIATIONS IN INCLINATION

Nobuhide Matsubayashi; Hideyuki Kenjyo; Kiichi Kato, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,764
Claims priority, application Japan, Jul. 14, 1983, 58-128433
Int. Cl.⁴ G11B *7/125*
U.S. Cl. 369—44 **13 Claims**



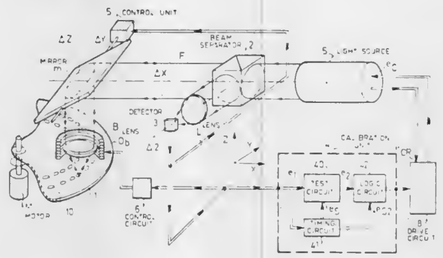
1. An optical disk apparatus, comprising:
an optical head for radiating a light beam onto a recording medium and for forming pits in said recording medium so as to record a signal;
detecting means for detecting a relative inclination between the light beam radiated from said optical head and a given direction relative to the radiated surface portion of said recording medium, and for generating a signal corresponding to an angle of the relative inclination; and
correcting means coupled to said detecting means for receiving the signal corresponding to the angle of the relative inclination from said detecting means, and for increasing the energy of the light beam in proportion to the relative inclination to form pits of a predetermined length in said recording medium.

4,631,713

CALIBRATION DEVICE OF THE OPTICAL POWER APPLIED TO AN OPTICAL DISC FOR RECORDING OF DATA

René Romeas, Palaiseau; Claude Bricot, Villejuif, and Jean-Louis Gerard, Les Ulis, all of France, assignors to Thomson-CSF, Paris, France

Filed May 17, 1984, Ser. No. 611,535
Claims priority, application France, May 20, 1983, 83 08425
Int. Cl.⁴ G11B *7/125*
U.S. Cl. 369—54 **15 Claims**



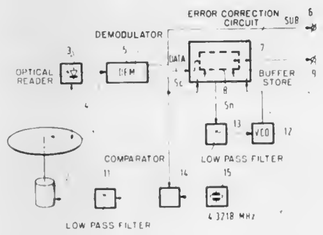
1. Device for recording data in an optically detectable form at the surface of a data support comprising a material sensitive to optical radiation, said device comprising means for focusing in said surface an optical beam electrically modulable by an incident electric signal for imparting local modifications of optical characteristics in said surface, means ensuring the exploration of said surface along any one of a plurality of adjacent track elements with a light spot projected by said optical beam, electro-optical reading means the interaction of which with said modifications of optical characteristics produce an electric reading signal and control means allowing to adjust the power of said optical beam in such a way that said electrical reading signal suitably reproduces the temporal distribution of the impulses constituting said incident electric signal, wherein binary test words are recorded in an area of said surface arranged sidely of the area specifically alotted to the storage of said incident electric signal with several staggered power values of said optical beam and wherein the analysis of the portion of said reading signal corresponding to said staggered power values allows to determine which power value is most suitable for recording said incident electric signal in said specifically alotted area; said control means comprising a calibrating circuit associated to a control or drive circuit of the source of said optical beam; said calibrating circuit comprising a memory logic circuit controlling the writing and the reading of said binary test words according to a predetermined cycle and an analysis circuit of the reading signal delivering tested values to said memory logic circuit, in order to assign said power value to said optical beam, prior to the beginning of a recording of said incident electric signal.

4,631,714

APPARATUS FOR FURNISHING DATA SIGNALS FROM AN OPTICALLY READABLE RECORD CARRIER AT THE SAME FREQUENCY AS THE ASSOCIATED SUBCODE SIGNALS

Josephus A. H. M. Kahlman, and Constant P. M. J. Baggen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,639
Claims priority, application Netherlands, Sep. 2, 1983, 8303061
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—59 **4 Claims**



1. Apparatus for modifying a digital audio player furnishing data signals at a constant rate and subcode signals at a varying channel bit frequency to furnish said data signals at said channel bit frequency, said player having motor means for driving disc-shaped record carrier means, read-out means for reading out said subcode signals and said data signals from said record carrier means at said channel bit frequency, error correction circuit means connected to said read out means and having a buffer storage receiving said data signals at said channel bit frequency, fixed frequency oscillator means external to said error correction circuit means for controlling read-out of said data signals from said buffer storage means at said constant rate, said error correction circuit means further generating an error signal corresponding to deviations of said channel bit frequency from said constant frequency, said apparatus comprising
voltage controlled oscillator means for generating a control signal for controlling said readout of said data signals from said buffer storage means and applying said control signal to said buffer storage means; and
means connected to said voltage controlled oscillator means for applying said error signal to said voltage controlled oscillator means so that said frequency of said voltage controlled oscillator means varies in accordance with said error signal and therefore in accordance with said channel bit frequency.

4,631,715

AUDIO STRAW AND CUP LID

Lawrence E. Hoover, 8625 W. Vernor, Detroit, Mich. 48209

Filed May 6, 1985, Ser. No. 731,049
Int. Cl.⁴ G11B *1/04, 3/00, 7/24;* A47G *21/18*
U.S. Cl. 369—68 **4 Claims**

1. The combination of a cup lid having a pair of cross-slits for allowing passage therethrough of a drinking straw, said cup lid being made of substantially thin resilient material, said drinking straw having at least one longitudinal linear soundtrack embossed on its surface, said soundtrack consisting of a series of embossed crests and valleys according to a specific audio modulation, said cross-slits on said lid forming a plurality of substantially triangular flaps having adjoining tips, one of said flaps having a stylus-like projection having a sharp apex formed at the tip of said one of said flaps for engagement with said soundtrack when said drinking straw is pushed through said cross-slits causing said one of said flaps having said stylus-like projection to bend and thereby engage the apex of said stylus-like projection with said soundtrack, whereby said lid is set in vibration for emitting a sound corresponding to said soundtrack on said drinking straw, wherein said drinking straw has a plurality of longitudinal linear soundtracks and means at



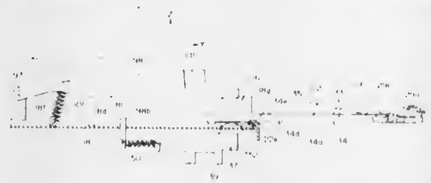
the tip of the flaps other than said one of said flaps provided with said stylus-like projection preventing engagement of the tip of said other flaps with said soundtracks.

4,631,716

OPERATION CHANGEOVER MECHANISM

Yuji Ikedo, and Masao Kase, both of Saitama, Japan, assignors to Pioneer Electronic Corp., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,767
Claims priority, application Japan, Feb. 17, 1984, 59-29308; Feb. 28, 1984, 59-29787[U]
Int. Cl.⁴ G11B *1/00, 25/04*
U.S. Cl. 369—75.2 **8 Claims**



1. In a front loading recorded disk playing apparatus having a housing with an opening in a front panel, a chassis within said housing on which operational electrical apparatus and mechanical apparatus are mounted, a record carrying means for supporting a record disk, said record carrying means being adapted to move between a first position within said housing and a second position extended from said housing, said record carrying means being mounted to said chassis by an extendable track apparatus which is adapted to support said record carrying means in its first position and its second position, the improvement comprising:
a stationary base means, said stationary base means being mounted on and stationary with respect to said chassis in a first planar direction, said stationary base further comprising a first rail means integrally formed with said base means and aligned in the direction of movement of said record carrying means between its first and second positions, said first rail means further including a first recess means;
an extendable rail means, said extendable rail means having a second rail means aligned in the direction of movement of said record carrying means between its first and second positions, said second rail means further including a second recess means;
a moveable base means, said moveable base means forming a part of said record carrying means and being at least partly disposed between the first rail means and the second rail means and said moveable base means being adapted for slidable movement relative to said first and second rail means as said record carrying means moves

between its first and second positions, said moveable base further including an opening therein;

a detent means, said detent means being contained within the opening in said moveable base means;

said first recess of said first rail means, said second recess of said second rail means and said opening of said moveable base means being in alignment when said record carrying means is in said first position and said first and second recess means being adapted to resistively contain said detent means whereby said moveable base means is locked with respect to said said second rail means and relative movement between said moveable base means and said first rail means is allowed until said record carrying means arrives at said first position, and after said arrival of said record carrying means at said first position, relative movement between said second rail means and said moveable base means is allowed and said moveable base means is locked with respect to said first rail means.

4,631,717

HIGH DENSITY INFORMATION RECORDS OF AN ELECTROSTATIC CAPACITANCE TYPE

Kazuhira Namikawa; Toshiaki Hamaguchi; Mutsuaki Nakamura; Akio Kuroda, all of Yokohama; Akio Hata, and Noriki Fujii, both of Shinnanyo, all of Japan, assignors to Victor Company of Japan, Ltd. and Tokuyama Sekisui Industry Corporation, Limited, both of, Japan

Filed Nov. 26, 1984, Ser. No. 675,014

Claims priority, application Japan, Nov. 26, 1983, 58-221426

Int. Cl.⁴ G08K *3/04;* **G11B** *5/00*

U.S. Cl. 369—276 **8 Claims**

1. In a high density information record of the electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations and which is made of a conductive resin composition comprising 100 parts by weight of a graft polymer between a copolymer of ethylene and vinyl acetate and monomeric vinyl chloride in a ratio by weight of 1 to 10:99 to 90, which copolymer has a content of vinyl acetate not less than 35 wt%, and 5 to 30 parts by weight of a conductive powder and 0.5 to 5 parts by weight of a lubricant dispersed in said graft polymer, the improvement wherein said copolymer is obtained by solution polymerization and has a melt index not larger than 20 and said lubricant is an ester between a fatty acid and an alcohol having a hydroxyl value not larger than 15.

4,631,718

METHOD AND DEVICE FOR SYNCHRONIZATION OF SYSTEM TIMING

Fumio Miyao, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

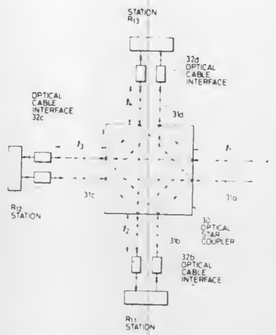
Filed Jan. 7, 1985, Ser. No. 689,381

Claims priority, application Japan, Jan. 20, 1984, 59-7344

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—4 **7 Claims**

1. In a multistation communication network for effecting time-sharing multiplex transmission and reception of digital signals in a form of packets by use of optical cables, a method for synchronization of system timing, which comprises putting up a flag identifying a signal from a master station only in a packet signal issued from a personal station which has acquired priority in system timing, determining front guard time for packet signals of individual personal stations by an arithmetic processing using distances from an optical star coupler located at a middle of said communication network to said individual personal stations and a predetermined guard time representative of the guard time needed for a signal originating at the position of said optical star coupler, clocking said front guard time starting from trailing ends of the packet signals of said master station received by said individual personal stations,



and establishing system timing based on times at which said clocking is completed.

4,631,719

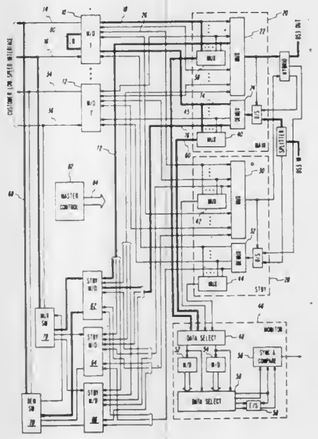
CHANNEL LOOPING APPARATUS FOR FAILURE ANALYSIS

Charles E. Huffman, Plano, and Paul E. Pepmiller, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 13, 1984, Ser. No. 599,872

Int. Cl.⁴ H04J *1/16, 3/14*

U.S. Cl. 370—15 **7 Claims**



1. The method of checking the operability of a muldem (multiplex-demultiplex) unit comprising the steps of:

supplying customer input data simultaneously both to a muldem to be tested for operability and to a further operational muldem for uninterrupted customer input data transmission during testing;

looping back output signals from one-half of said muldem to an input of the other half of said muldem such that identical data is being multiplexed and demultiplexed by the muldem being tested; and

comparing, after loopback, a predetermined number of data bits input to and output from the muldem being tested on a bit by bit basis for identical values as a check for operability of said muldem.

4,631,720

SERVICE INTEGRATED TRANSMISSION SYSTEM

Klaus Koeck, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

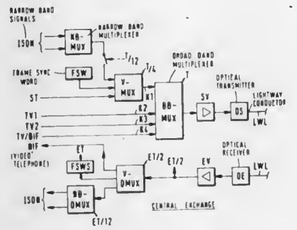
Continuation of Ser. No. 330,453, Dec. 14, 1981, abandoned.

This application Oct. 21, 1985, Ser. No. 789,341

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047045

Int. Cl.⁴ H04J *3/16*

U.S. Cl. 370—84 **9 Claims**



1. In a method of transmitting signals of different information rates between a subscriber station and a central exchange in a service integrated transmission system operating in time multiplex and with two-way transmission between the subscriber station and the central exchange, said method including combining the data signals of different information rates to be transmitted at the transmitting end of the system by time multiplexing same, transmitting the time multiplexed signals within a multiplexing bit stream having a clock pulse frequency according to the entire operating information rate, and recovering the original data signals at the receiving end by demultiplexing the received signals; the improvement comprising: selecting a time multplex frame frequency equal to the smallest information rate of the data signals to be transmitted; transmitting one information unit of a data signal having the smallest information rate per frame; and, causing said step of combining at said central station to include: providing each transmitting frame, and hence the receiving frame at the subscriber station, with N subframes, each including a head portion and an information portion of respective constant lengths, and with a multibit frame sync word being accommodated in said head portion of each said subframe, said information units of said data signals having the smallest information rate (narrowband signals) being accommodated in said head portions of said subframes, the data signals of larger information rate being accommodated in said information portion of each said subframe, each subframe being subdivided into z time slots each accommodating only one information unit of said signals being transmitted, and successive said time slots being associated with different ones of said data signals.

4,631,721

BIDIRECTIONAL COMMUNICATION SYSTEM OF A TWO-WIRE BUS COMPRISING AN ACTIVE TERMINATOR

Tatsuhiro Ono; Shin'ichi Koike; Haruhiko Tsuchiya, all of Tokyo, and Yuji Inoue, Kanagawa, all of Japan, assignors to NEC Corporation and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,917

Claims priority, application Japan, Aug. 16, 1983, 58-149339

Int. Cl.⁴ H04J *3/02, 3/06*

U.S. Cl. 370—85 **6 Claims**

1. In a bidirectional communication system for use in carrying out bidirectional communication in a time division fashion through a two-wire bus having a first and a second end, said system comprising a central terminator connected to said first end and an active terminator connected to said second end, said central terminator being for transmitting a down burst from said first end towards said second end and for receiving an up burst transmitted from said second end towards said first end, said down and said up bursts including a down and an up synchronization signal, respectively, the improvement wherein:

each of said down and said up bursts is encoded by the use of the Manchester codes with each of said down and said up synchronization signals having a code pattern formed by a positive violation code "V_+", a code "1", and a negative violation code "V_-" of said Manchester codes;

said active terminator comprising:

synchronization signal deriving means responsive to said down burst for deriving said code pattern from said down



burst to detect said down synchronization signal and to establish synchronization of said active terminator with reference to said down synchronization signal; and

synchronization signal delivering means coupled to said synchronization signal deriving means for delivering said up synchronization signal in relation to said down synchronization signal towards said first end; and

said system further comprising:

at least one terminal equipment intermediate between said first and said second ends for carrying out reception of said down burst in response to said down synchronization signal so as to form said up burst in response to said up synchronization signal.

4,631,722

ELECTRONIC CONTROLLER FOR CYCLICALLY OPERATING MACHINERY

Thomas Voss, Tettnang, Fed. Rep. of Germany, assignor to ZF-Herion-Systemtechnik GmbH, Friedrichshafe, Fed. Rep. of Germany

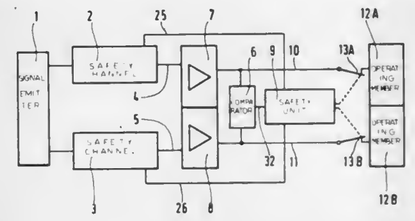
PCT No. PCT/EP83/00030, § 371 Date Oct. 11, 1983, § 102(e) Date Oct. 11, 1983, PCT Pub. No. WO83/02816, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 4, 1983, Ser. No. 562,580

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204709

Int. Cl.⁴ G06F *11/00, 7/34;* **G05B** *15/08, 9/02*

U.S. Cl. 371—9 **6 Claims**



1. An electronic controller for a cyclically operating mechanical device comprising:

two safety channels of different circuit construction, simultaneously having identical control functions and acting upon respectively associated operating members, of which a first of said safety channels is constructed with hard-wired switching logic and a second of such safety channels with microcomputer circuitry, including at least a microprocessor having a control program and a check

program, said check program effecting a self-check of all components of said second safety channel, said channels having respective output signals;

a common safety stage connected to both channels, which upon the occurrence of unequal output signals of the two safety channels places the device in a safe state;

a self-check facility, different from said self-check of said second channel for effecting self-check of the first safety channel, the self-checks of said channels being effected periodically within the cycle periods; and

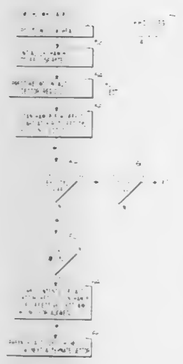
amplifiers connected to the outputs of the safety channels and having output signals applied to a comparator for monitoring equality and synchronism of said two safety channels, said comparator having an output signal, the output signal of the comparator and output signals of the self-check facilities acting upon said common safety stage.

4,631,723

MASS STORAGE DISK DRIVE DEFECTIVE MEDIA HANDLING

Donald J. Rathbun, Andover; Bruce H. Tarbox, Billerica, both of Mass., and Taian Su, Palo Alto, Calif., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 8, 1984, Ser. No. 618,640
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—10 **4 Claims**



1. A method in a mass storage disk device of addressing a sector on the surface of a disk and selecting an alternate sector if said sector was previously recorded as being a defective sector, the method comprising the steps of:

(a) prestoring a predetermined number in a register;

(b) storing an address of each defective sector in a first area of a random access memory (RAM);

(c) comparing in turn each cylinder number portion of said address stored in said RAM with a cylinder number of said sector on said disk being addressed;

(d) incrementing said register after each comparison test; and

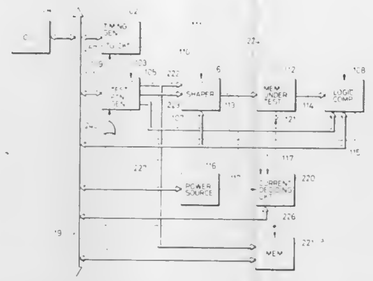
(e) writing the contents of said register in a second area of said RAM during each equal comparison at a location specified by each head and sector number portion of said address, said contents of said register being indicative of an alternate sector number and an alternate head number of a predetermined cylinder on which is stored said alternate sector.

4,631,724

SEMICONDUCTOR MEMORY TEST EQUIPMENT

Masao Shimizu, Gyoda, Japan, assignor to Advantest Corp., Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,109
Claims priority, application Japan, May 23, 1984, 59-103882
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—21 **7 Claims**



1. Semiconductor memory test equipment comprising:

a timing generator for generating an operating clock of a set period and an output timing signal of a phase set relative to the operating clock;

a test pattern generator supplied with the operating clock, for generating addresses and applying them to a memory under test with the period of the operating clock;

a power source circuit for supplying a power source current necessary for operation of the memory under test; and

a current value deciding circuit including

a current value detecting means for detecting the value of the power source current being supplied to the memory under test,

a deciding means for deciding, by comparison, whether the detected current value is greater than a predetermined value, and

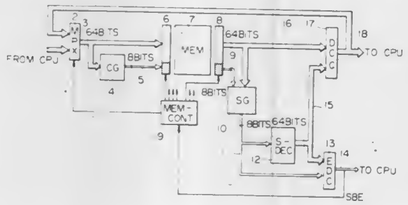
an output means responsive to the output timing signal from the timing generator to output the decision result from the deciding means at the timing of the output timing signal.

4,631,725

ERROR CORRECTING AND DETECTING SYSTEM

Moriyuki Takamura, Yokohama; Shigeru Mukasa, Machida, and Takashi Ibi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1984, Ser. No. 686,815
Claims priority, application Japan, Dec. 28, 1983, 58-250004
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—39 **8 Claims**



1. A error correcting and detecting system comprising means (**4**) for producing 8 redundancy bits from 64 data bits in accordance with the following parity-check H-matrix (**100**) formed by 18 vector blocks, each vector block comprising 4 column vectors

$$\begin{pmatrix} i^h1j \\ i^h2j \\ i^h3j \\ . \\ . \\ i^h8j \end{pmatrix}$$

where each element is 0 or 1;

i = 1, 2, . . . , 18; and j = 1, 2, 3, 4; then

H = (100)

$$\begin{pmatrix} \text{BLOCK 1} & \text{BLOCK 2} & & \text{BLOCK 18} \\ 1^h11\ 1^h12\ 1^h13\ 1^h14 & 2^h11\ 2^h12\ 2^h13\ 2^h14 & \cdots & 18^h11\ 18^h12\ 18^h13\ 18^h14 \\ 1^h21\ 1^h22\ 1^h23\ 1^h24 & 2^h21\ 2^h22\ 2^h23\ 2^h24 & & 18^h21\ 18^h22\ 18^h23\ 18^h24 \\ 1^h31\ 1^h32\ 1^h33\ 1^h34 & 2^h31\ 2^h32\ 2^h33\ 2^h34 & & 18^h31\ 18^h32\ 18^h33\ 18^h34 \\ . & . & & . \\ . & . & & . \\ . & . & & . \\ 1^h81\ 1^h82\ 1^h83\ 1^h84 & 2^h81\ 2^h82\ 2^h83\ 2^h84 & & 18^h81\ 18^h82\ 18^h83\ 18^h84 \end{pmatrix}$$

wherein

(i) there are no all "0" vector;

(ii) all column vectors are different from each other;

(iii) 8 column vectors each having only one "1" are included therein;

(iv) each column vector has an odd number of "1's";

(V) the modulo-2 sum h_A of any three column vectors within any block never equals any column vectors of the H-matrix (**100**), i.e.,

$$h_A = \begin{pmatrix} i^h1k \\ i^h2k \\ i^h3k \\ . \\ . \\ i^h8k \end{pmatrix} \oplus \begin{pmatrix} i^h1l \\ i^h2l \\ i^h3l \\ . \\ . \\ i^h8l \end{pmatrix} \oplus \begin{pmatrix} i^h1m \\ i^h2m \\ i^h3m \\ . \\ . \\ i^h8m \end{pmatrix}$$

$$= \begin{pmatrix} i^h1k \oplus i^h1l \oplus i^h1m \\ i^h2k \oplus i^h2l \oplus i^h2m \\ i^h3k \oplus i^h3l \oplus i^h3m \\ . \\ . \\ i^h8k \oplus i^h8l \oplus i^h8m \end{pmatrix}$$

$$\neq \begin{pmatrix} p^h1j \\ p^h2j \\ p^h3j \\ . \\ . \\ p^h8j \end{pmatrix}$$

where i=1, 2, . . . , 18; j=1, 2, 3, 4; p=1, 2, . . . , 18; (k,l,m)=(2,3,4) (1,3,4), (1,2,4), (1,2,3);

(vi) the modulo-2 sum h_B of four column vectors within any block i never equals the all "0" vector, i.e.,

$$h_B = \begin{pmatrix} i^h11 \\ i^h21 \\ i^h31 \\ . \\ . \\ i^h81 \end{pmatrix} \oplus \begin{pmatrix} i^h12 \\ i^h22 \\ i^h32 \\ . \\ . \\ i^h82 \end{pmatrix} \oplus \begin{pmatrix} i^h13 \\ i^h23 \\ i^h33 \\ . \\ . \\ i^h83 \end{pmatrix} \oplus \begin{pmatrix} i^h14 \\ i^h24 \\ i^h34 \\ . \\ . \\ i^h84 \end{pmatrix}$$

$$= \begin{pmatrix} i^h11 \oplus i^h12 \oplus i^h13 \oplus i^h14 \\ i^h21 \oplus i^h22 \oplus i^h23 \oplus i^h24 \\ i^h31 \oplus i^h32 \oplus i^h33 \oplus i^h34 \\ . \\ . \\ i^h81 \oplus i^h82 \oplus i^h83 \oplus i^h84 \end{pmatrix}$$

$$\neq \begin{pmatrix} 0 \\ 0 \\ 0 \\ . \\ . \\ 0 \end{pmatrix}$$

where i=1, 2, . . . , 18;

(vii) the modulo-2 sum of eight column vectors within any two blocks p and q never equals the all "0" vector, i.e.,

$$h_C = \begin{pmatrix} p^h11 \\ p^h21 \\ p^h31 \\ . \\ . \\ p^h81 \end{pmatrix} \oplus \begin{pmatrix} p^h12 \\ p^h22 \\ p^h32 \\ . \\ . \\ p^h82 \end{pmatrix} \oplus \begin{pmatrix} p^h13 \\ p^h23 \\ p^h33 \\ . \\ . \\ p^h83 \end{pmatrix} \oplus \begin{pmatrix} p^h14 \\ p^h24 \\ p^h34 \\ . \\ . \\ p^h84 \end{pmatrix}$$

$$= \begin{pmatrix} q^h11 \\ q^h21 \\ q^h31 \\ . \\ . \\ q^h81 \end{pmatrix} \oplus \begin{pmatrix} q^h12 \\ q^h22 \\ q^h32 \\ . \\ . \\ q^h82 \end{pmatrix} \oplus \begin{pmatrix} q^h13 \\ q^h23 \\ q^h33 \\ . \\ . \\ q^h83 \end{pmatrix} \oplus \begin{pmatrix} q^h14 \\ q^h24 \\ q^h34 \\ . \\ . \\ q^h84 \end{pmatrix}$$

$$= \begin{pmatrix} p^h11 \oplus p^h12 \oplus p^h13 \oplus p^h14 \oplus q^h11 \oplus q^h12 \oplus q^h13 \oplus q^h14 \\ p^h21 \oplus p^h22 \oplus p^h23 \oplus p^h24 \oplus q^h21 \oplus q^h22 \oplus q^h23 \oplus q^h24 \\ p^h31 \oplus p^h32 \oplus p^h33 \oplus p^h34 \oplus q^h31 \oplus q^h32 \oplus q^h33 \oplus q^h34 \\ . \\ . \\ p^h81 \oplus p^h82 \oplus p^h83 \oplus p^h84 \oplus q^h81 \oplus q^h82 \oplus q^h83 \oplus q^h84 \end{pmatrix}$$

$$\neq \begin{pmatrix} 0 \\ 0 \\ 0 \\ . \\ . \\ 0 \end{pmatrix}$$

where p, q=1, 2, . . . , 18; p≠q;

said system further comprising:

a memory unit (**7**);

write means (**6**, **19**) for writing a 72-bit codeword formed by said 8 redundancy bits and 64 data bits into said memory unit (**7**);

read means (**8**, **19**) for reading said 72-bit codeword from said memory unit (**7**);

means (**10**) for producing 8 syndrome bits (**S0** to **S7**)

from said 72-bit codeword in accordance with the H-matrix (**100**);

means (**12**) for decoding said 8 syndrome bits (**S0** to **S7**) to produce a 72-bit error bit signal (**EB01** to **EB64**, **EBC0** to **EBC7**) showing the location of a single-bit error;

means (**17**) for correcting a single-bit error of said data bits (**MRD01** to **64**) read by said read means (**8**, **19**) with said 64-bit error bit signal; and

means (**13**) for determining the existence of a double-bit error, a triple-bit error within one block, a quadruple-bit error within one block, and an 8-bit burst error within two blocks by the logical operation of said error bit signal (**EB01** to **EB64**, **EBC0** to **EBC7**) and said 8 syndrome bits (**S0** to **S7**).

4,631,726

LASER DIODE CONTROL CIRCUITRY

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1983, Ser. No. 470,489
Int. Cl.⁴ H01S *3/13*
U.S. Cl. 372—31 **1 Claim**



1. A control circuitry for a laser diode adapted to direct its light output to a resonant scanning mirror having a velocity that varies sinusoidally, the circuit comprising:

means for providing a bias current for the laser diode that is in excess of a laser threshold current and is applied directly to the laser diode, and

means resistively coupled to the laser diode providing a signal directly to the laser diode for changing the current through the laser diode, said signal varying inversely proportional to the velocity of the resonant scanning mirror;

means resistively coupled to the laser diode for receiving digital signals for providing a signal directly to the laser diode for one state of the digital signal which reduces the current through the laser diode below the laser threshold current; and

means for inhibiting operation of the second-mentioned means and the last-mentioned means for a portion of the movement of the scanning mirror.

4,631,727

COLD CATHODE GAS TUBES

Dale E. Crane, Sunnyvale, Calif.; Robert E. Jones, Lesington, Mo.; Mathew D. Watson, Sunnyvale, Calif., and Alan D. White, Berkeley Heights, N.J., assignors to UNIPHASE Corporation, Sunnyvale, Calif.

Filed Apr. 18, 1985, Ser. No. 724,583
Int. Cl.⁴ H01S *3/00*
U.S. Cl. 372—33 **10 Claims**



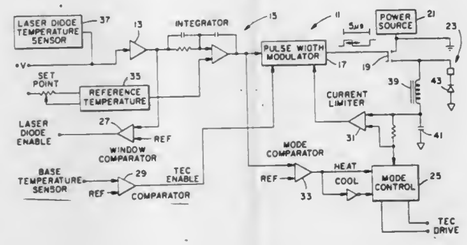
1. In a cold cathode gas tube comprising an anode and a cathode, the improvement including an electric field concentrator located in the region between said anode and said cathode.

4,631,728

THERMOELECTRIC COOLER CONTROL CIRCUIT

Brent S. Simons, Santa Clara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1985, Ser. No. 757,397
Int. Cl.⁴ H01S *3/00*
U.S. Cl. 372—38 **5 Claims**



1. A thermoelectric cooler control circuit for a laser diode that has its temperature regulated by a thermoelectric cooler and its temperature sensed by a laser diode temperature sensor including:

(a) an amplifier, an integrator, a pulse width modulator, a reference voltage generator, a power source, a switching transistor, a filter network and a mode controller;

(b) the output of said laser diode temperature sensor being applied to the input of said amplifier, the output of said amplifier being applied to a first input of said integrator, the output of said reference voltage generator being applied to a second input of said integrator, the output of said integrator being applied to a first input of said pulse width modulator, the output of said pulse width modulator being applied to the base of said transistor, the output of said power source being passed through said transistor to the input of said filter network, the output of said filter network being connected to the input of said mode controller, the output of said mode controller being connected to the power input of said thermoelectric cooler; whereby

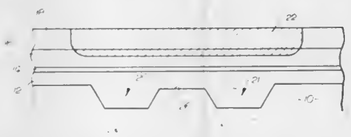
(c) the voltage output of said reference voltage generator is selected to establish a preselected laser diode temperature and said integrator provides an output signal to said pulse width modulator and to said mode controller to apply power to said thermoelectric cooler to maintain said laser diode at a constant temperature.

4,631,729

SEMICONDUCTOR LASER STRUCTURE

Frank E. Goodwin, Marina Del Rey; Hsiang-Yi D. Law, Agoura; Charles B. Morrison, and Luis Figueroa, both of Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 1, 1983, Ser. No. 556,879
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—44 **24 Claims**



1. A semiconductor laser structure, comprising:

an active semiconductor layer;

means defining at least two principal lasing regions laterally spaced in said active layer, said means including at least two parallel lasing channels formed under said active semiconductor layer, to confine the lasing action to the principal lasing regions located adjacent to the channels, and wherein the two principal lasing regions are configured to produce different sets of longitudinal modes of output; and

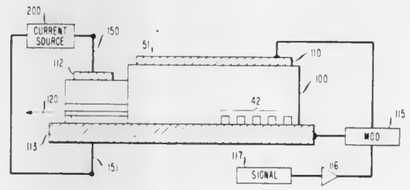
means for defining an intermediate coupling region between the principal lasing regions, to provide close coupling between the two principal lasing regions, resulting in a composite output from the structure that includes longitudinal modes common to both principal lasing regions, whereby said structure can be easily designed to operate in a single desired longitudinal mode.

4,631,730

LOW NOISE INJECTION LASER STRUCTURE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 28, 1984, Ser. No. 655,258
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—50 **17 Claims**



1. An injection laser comprising:

an active laser region having a first end and a second end, the first end being a partial reflector of laser radiation generated in the active laser region,

means for injection pumping the active laser region to produce the laser radiation, and

a passive waveguide region having a first end and a second end, the first end being a partial reflector of the laser radiation, and wherein the active laser region and the passive waveguide region are joined to one another at the second ends of each one to form a laser cavity between the respective first ends of the active laser and the passive waveguide regions; and wherein the passive waveguide region has an index of refraction which is substantially equal to the index of refraction of the active region and is substantially loss and reflection free and frequency nonselective for a length which is at least as great as the length of the active laser region.

4,631,731

DEVICE FOR PRODUCING OR AMPLIFYING COHERENT RADIATION

Joachim H. Wolter, and Robert E. Horstman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

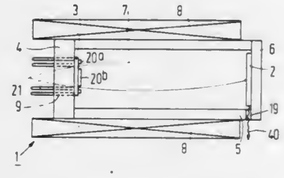
Filed Feb. 3, 1984, Ser. No. 576,974
Claims priority, application Netherlands, Feb. 21, 1983, 8300631
Int. Cl.⁴ H01S *3/09*
U.S. Cl. 372—74 **10 Claims**

1. A device having a coherent electromagnetic radiation output, which comprises:

a first body having a first layer for generating said electromagnetic radiation output;

an active region in said first layer, in which, in the operating state, population inversion is obtained by electron injection; and

a semiconductor device having semiconductor cathode means for generating a beam of electrons in said operating state for injection into said active region, said semiconductor cathode means comprising a semiconductor body having a p-type region and an n-type region which adjoins a surface of the semiconductor body, said p-type and n-type regions forming a p-n junction, whereby, when a voltage is applied in the reverse direction across said p-n junction in the semiconductor body, electrons are produced by avalanche multiplication, which electrons emanate from the semiconductor body, said p-n junction having a portion extending at least locally substantially parallel to the surface and having a lower breakdown voltage at said portion than at the remaining part of said p-n junction, said portion having the lower breakdown voltage being separated from the surface by a portion of said n-type region forming a conducting layer having a thickness and doping concentration such that at the breakdown voltage the depletion zone of the p-n junction does not extend to the surface, but remains separated therefrom by a surface layer which is sufficiently thin to pass said electrons.

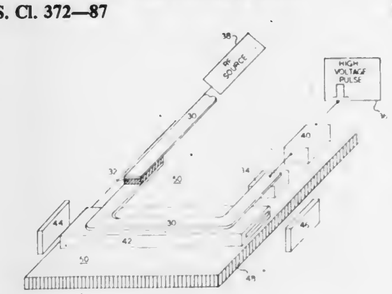


4,631,732

HIGH FREQUENCY RF DISCHARGE LASER

Clad P. Christensen, 2233, Arlington Ter., Alexandria, Va. 22303

Filed Apr. 25, 1984, Ser. No. 603,846
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—87 **26 Claims**



1. A high frequency high power stabilized RF discharge laser comprising in combination;

a ground plane;

a stripline waveguide electrode having first and second ends located in a plane substantially parallel to said ground plane;

an RF souce connected to said first end of said stripline waveguide electrode by a means for preventing a high voltage pulse from damaging said RF source;

a discharge tube located between said ground plane and said stripline waveguide electrode;

preionization pulse means including a high voltage source

applying a high voltage pulse to said second end of said stripline waveguide electrode and a means placed between said high voltage pulse source and said stripline waveguide electrode for preventing said RF from damaging said high voltage source; and

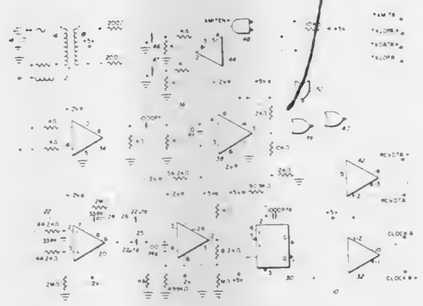
a waveguide region formed by said ground plane and said stripline waveguide electrode wherein said discharge tube lies within said waveguide region.

4,631,733

TRANSCEIVER

Robert L. Spiesman, Phoenix, Ariz., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Dec. 17, 1984, Ser. No. 682,521
Int. Cl.⁴ H04L *27/18, 7/06, 1/24*
U.S. Cl. 375—7 **5 Claims**



1. A transceiver for applying substantially square wave data signals having a first frequency to a coaxial cable and of receiving data signals carried by the coaxial cable and quasi-sinusoidal timing signals having a second frequency, which data and timing signals are carried concurrently by the coaxial cable, comprising:

a coupling transformer having a transmission line winding and a transceiver winding;

transmitter means connected to the transceiver winding for inducing a voltage across the transmission line winding to apply data signals to the coaxial cable;

first receiver means connected to the transceiver winding for receiving and reshaping data signals present in voltage across the transceiver winding; and

second receiver means connected to the transceiver winding for receiving, amplifying and reshaping the quasi-sinusoidal timing signals into substantially square wave signals of the second frequency.

4,631,734

CROSS-POLARIZATION CANCELER/EQUALIZER

Gerard J. Foschini, Sayreville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 21, 1985, Ser. No. 714,441
Int. Cl.⁴ H03H *7/30*
U.S. Cl. 375—15 **4 Claims**

1. A cross-polarization equalizer/canceler for concurrently equalizing and canceling cross-polarization components in a first and a second orthogonally polarized digital signal, the equalizer/canceler comprising:

a first and second input terminals for receiving the first and second orthogonally polarized signal, respectively;

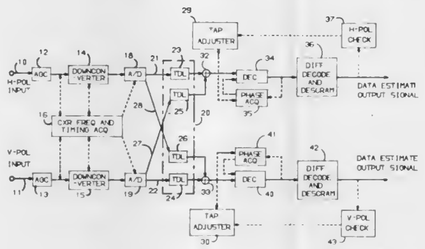
a first and a second straight-through path (**21,22**) coupled to the first and second input terminal, respectively;

a tapped delay line matrix (**20**) comprising a separate tapped delay line (TDL) in each of the first and second straight-through paths and each of the first and second cross-over paths, each TDL including a plurality of complex taps which are individually responsive to control signals for appropriately changing a current tap setting and a resultant output signal of each TDL;

a first adder means (**32**) for adding the output signals from the TDLs in the first straight-through path and the second cross-over path;

second adder means (**33**) for adding the output signals from the TDLs in the second straight-through path and the first cross-over path; and

tap adjusting means (**29, 30**) coupled to the output of the first and second adder means and to the complex taps of the TDLs in the TDL matrix for generating appropriate



control signals to the complex taps of the TDL matrix for appropriately changing the tap settings to effect concurrent equalization and cross-polarization component convergence in each of the first and second orthogonally polarized signals at the output of the first and second adder means, respectively, the tap adjusting means generating the appropriate control signals to each of the complex taps as derived from the addition of an associated current complex tap signal and an updated gradient representative of a vector of the component of the associated TDL signal in accordance with the relationship

$$\min_{(c_{11}c_{12})} E\,(|z_{Hn}|^2 - E|a_n|^4)^2$$

$$\min_{(c_{21}c_{22})} E\,(|z_{vn}|^2 - E|b_n|^4)^2$$

where E represents an average of the associated term; a_n and b_n are the nth complex data symbol of the first and second orthogonally polarized signals, respectively; z_{Hn} and Z_{vn} are the complex samples at time nT of the first and second orthogonally polarized signals, respectively, at the output of the respective first and second adder means; and $c_{i,j}$ identify a TDL within the TDL matrix where i and j designate the input to output path, respectively, of the TDL and 1 and 2 indicate the respective first and second orthogonally polarized signals.

4,631,735

CODED MODULATION SYSTEM WITH FEEDBACK

Shahid U. H. Qureshi, Natick, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Dec. 28, 1984, Ser. No. 687,205
Int. Cl.⁴ H04B *1/10*
U.S. Cl. 375—34 **15 Claims**

1. A communication system comprising a transmitter, and a receiver for use in deciding which signal points were sent from said transmitter based on corresponding noise affected signals received over a channel, said transmitter comprising an encoder for encoding a stream of information symbols into said signal points, said noise affected signals carrying information about a particular sequence of possible states occupied in a succession of time intervals by a finite state means,

said receiver comprising feedback circuitry for generating a plurality of different modified versions of each said received signal, and

a decoder for deciding which signal points were sent based on estimating said particular sequence of states by using at least two different said modified versions, said decoder storing a plurality of surviving sequences of states each ending in a current state,



said feedback circuitry being connected to receive feedback information from said decoder,

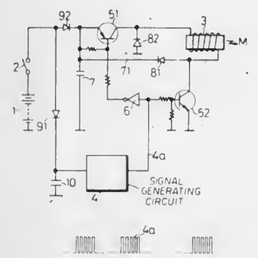
each said modified version being based on at least some states that are earlier in said surviving sequences than said current states.

4,631,736

PORTABLE TRANSMITTER WHICH CONSERVES TRANSMITTER POWER BY STORING CHARGES FROM PREVIOUS PULSES

Kouichi Yamanoue, and Junji Kitagawa, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 7, 1984, Ser. No. 638,649
Claims priority, application Japan, Sep. 8, 1983, 58-165688
Int. Cl.⁴ H02M *3/17*
U.S. Cl. 375—71 **11 Claims**



6. A portable transmitter, comprising:

a switch adapted to be coupled to a source of electric current;

transmitting means for transmitting a signal, said transmitting means having first and second ends;

first switching means, coupled between said switch and said transmitting means first end, for selectively providing electric current to said transmitting means;

second switching means, coupled between said transitting means second end and ground, for selectively causing said electric current to flow through said transmitting means;

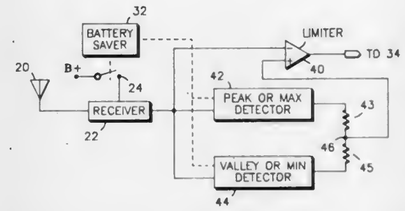
storing means, coupled between ground and said transmitting means second end, for storing an electric charge induced by said transmitting means when said first switching means is not providing electric current to said transmitting means.

4,631,737

SELF BIASING DIRECT COUPLED DATA LIMITER

Walter L. Davis, Coral Springs; Yolanda Prieto, Miami, and George W. Smoot, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 6, 1984, Ser. No. 678,933
Int. Cl.⁴ H04L *27/14, 25/06;* **H04B** *1/16*
U.S. Cl. 375—88 **17 Claims**



1. In a frequency shift keying receiver having a plurality of radio frequency elements including a discriminator which is the last stage of said elements, said receiver including power switching means coupled to a power source for periodically supplying power to said elements, a limiter interface circuit coupled to said discriminator, comprising:

a signal limiter directly coupled to said discriminator;

first detection means having an input coupled to said discriminator for detecting a peak or maximum signal magnitude and producing an output signal corresponding thereto;

second detection means having an input coupled to said discriminator for detecting a valley or minimum signal magnitude and producing an output signal corresponding thereto;

said first and second detection means being coupled to said power switching means and said first and second detection means each include means, responsive to said power switching means, for initializing the magnitudes of the corresponding output signals; and

means coupling the output signals from said first and second detection means to said signal limiter to provide a reference signal thereto.

4,631,738

GAIN TRACKER FOR DIGITAL MODEM

William L. Betts, St. Petersburg, and Edward Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 6, 1984, Ser. No. 678,652
Int. Cl.⁴ H04L *27/08*
U.S. Cl. 375—98 **4 Claims**



1. In a modem for receiving a QAM encoded data signal which corresponds to a received vector, and having a decoder adapted to generate an ideal vector corresponding to said received vector, an error corrector comprising:

means for obtaining the radial component in the direction of

said ideal vector of an error vector, said error vector being a difference vector between said received and ideal vectors;

means for obtaining a gain error signal determined by said radial component; and

first means for modifying said received vector in accordance with said gain error signal.

4,631,739

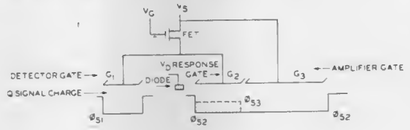
HIGH DYNAMIC RANGE CHARGE AMPLIFIER

Roland J. Handy, Northridge, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1984, Ser. No. 675,599

Int. Cl.⁴ H03F *3/04*

U.S. Cl. 377—60 **1 Claim**



1. A high dynamic range charge amplifier integrated circuit which permits the sensing and amplifying of low quantities of charge, wherein the improvement comprises:

a first detector gate means (G_1) on said integrated circuit,

a second response gate means (G_2) on said integrated circuit in spaced proximity to said first gate means (G_1),

means on said integrated circuit for electrically connecting said first and second gate means together,

field effect transistor means coupled to a supply voltage (V_S) and said electrical connecting means, said field effect transistor means applying said supply voltage (V_S) to said electrical connecting means and thus said first and second gate means, when said field effect transistor means is enabled by a gate voltage (V_G), and said first and second gate means floating at said supply voltage (V_S) when said gate voltage (V_G) is removed,

a source of charge (Q) to be amplified deposited beneath said first gate means (G_1), such that the supply voltage (V_S) floating on said first gate means (G_1) is affected by the change in surface potential (ϕ_{S1}) beneath said first gate means (G_1), the voltage on said second gate means (G_2) being affected, thereby varying the surface potential (ϕ_{S2}) beneath said second gate means (G_2),

a third amplifier gate means (G_3) in close proximity to said second gate means (G_2) and connected to said supply voltage (V_S) and directly affected by said surface potential (ϕ_{S2}) beneath said second gate means (G_2), said third gate means (G_3) defining a larger area wherein additional charge can be deposited beneath both said second and third gate means (G_2, G_3) in direct proportion to the amount of charge (Q) deposited beneath said first gate means (G_1), and

diode means between said first gate means (G_1) and said second gate means (G_2) for injecting charge beneath said second and third gate means (G_2, G_3), and then to subsequently dissipate all charge over that determined by the original surface potential (ϕ_{S2}) and the affected surface potential (ϕ_{S3}).

4,631,740

TIME BASE GENERATOR FOR COLOR IMAGE PROCESSOR

Galen Collins, San Jose, Calif., assignor to Benson, Inc., Mountain View, Calif.

Filed Apr. 9, 1985, Ser. No. 721,353

Int. Cl.⁴ H03K *17/28*

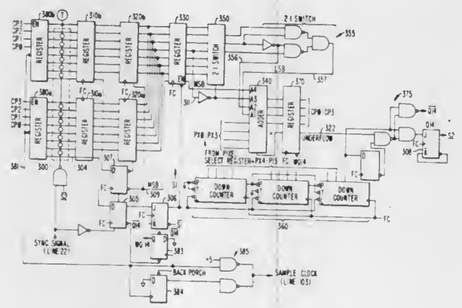
U.S. Cl. 377—76 **14 Claims**

1. A circuit controlled by a clock signal having a clock period, the circuit for producing an output signal at an output terminal at a selected time after receiving an input signal at an input terminal, which selected time includes an integral number of clocks periods and a fraction of a clock period, the circuit comprising:

delay line means connected to the input terminal for delaying a signal, the delay line means including a plurality of taps thereto;

first register means connected to receive the clock signal and connected to each of the taps to thereby provide data indicative of a measure of a first time delay between the time of the input signal and the time of the first clock signal;

subtracting means connected to receive the data indicative of the fraction of a clock period of the selected time, and connected to receive the data indicative of the measure of



the first time delay, for subtracting the first time delay from the fraction of a clock period of the selected time, to thereby provide data indicative of a measure of a second time delay;

counting means connected to receive the clock signal to count the integral number of clock periods, and connected to the subtracting means, for supplying an intermediate signal when only the second time delay remains before the output signal is to be produced;

second register means connected to the output terminal, connected to each of the taps of the delay line means, and connected to receive the data from the subtracting means, the second register means for selectively connecting one of the taps to the output terminal to thereby provide the output signal in response to the intermediate signal.

4,631,741

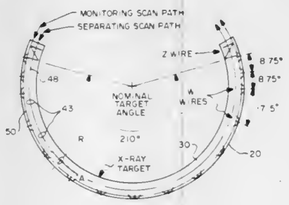
BEAM SPOT MONITORING ARRANGEMENT FOR USE IN A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER AND METHOD

Roy E. Rand, Palo Alto, and John L. Couch, San Francisco, both of Calif., assignors to Imatron, Inc., San Francisco, Calif.

Filed Apr. 5, 1984, Ser. No. 597,133

Int. Cl.⁴ H05G *1/52*; H01J *35/30, 35/14*

U.S. Cl. 378—10 **14 Claims**



1. In a scanning electron beam computed tomography scanner including means defining a vacuum chamber, means for producing an electron beam at one location in said chamber

and for directing it to a second location therein, a target of the type which produces x-rays as a result of the impingement thereon by said electron beam, and means at said second location for causing said beam to scan a section of said target in a way which causes it to impinge and form a beam spot on said target along a given scan path and thereby produce x-rays, the improvement comprising means for detecting the entire profile of said beam spot at a plurality of different points along said scan path and for determining if said actual profile conforms to a desired profile of said beam spot at each of said points and, in the case of a desired non-circular beam spot, for determining if the spot detected at each point conforms to a desired orientation, said detecting means also detecting the position of said beam spot on said target laterally and longitudinally relative to the scan path as said spot moves along said path, said detecting means including an electron beam intercepting arrangement at each of said points along said scan path immediately in front of said target, each of said arrangements being designed to produce a plurality of electrical signals upon impingement by said beam such that configuration of said signals vary in shape and temporal positioning, relative to one another with the profile, lateral position and orientation of said beam spot, such that the configuration and temporal positioning of said signals are used to monitor the profile, lateral position and orientation of said beam spot.

4,631,742

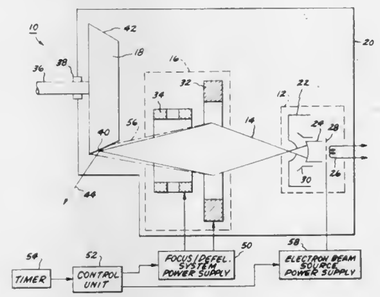
ELECTRONIC CONTROL OF ROTATING ANODE MICROFOCUS X-RAY TUBES FOR ANODE LIFE EXTENSION

David W. Oliver, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1985, Ser. No. 704,983

Int. Cl.⁴ H05G *1/52*

U.S. Cl. 378—113 **12 Claims**



1. A method of extending the life of an anode of an x-ray tube of the type in which an electron bean from an electron beam source is focused onto the anode to produce x-rays, the method comprising the steps of:

defocusing the electron beam upon turn-on of the tube to apply a reduced electron beam power density to the anode, the reduced power density having a value selected to be less than a normal operating electron beam power density and to minimize thermal stresses in the anode;

maintaining said reduced power density for a predetermined period of time sufficient to afford a controlled increase in anode temperature to a predetermined temperature at which the anode is ductile; and

focusing the electron beam after said predetermined period of time to increase the power density applied to the anode to said normal operating power density.

4,631,743

X-RAY GENERATING APPARATUS

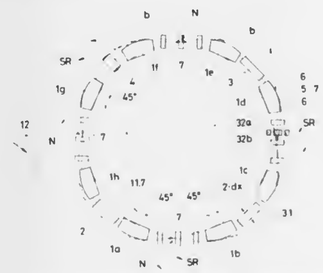
Takio Tomimasu, Yatabemachi; Tsutomu Noguchi, Kukisakimachi; Hiroshi Tanino, Sakuramura, and Suguru Sugiyama, Ishioka, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,588

Claims priority, application Japan, Sep. 22, 1983, 58-175517; Sep. 27, 1983, 58-178984

Int. Cl.⁴ H05H *13/04*

U.S. Cl. 378—138 **10 Claims**



1. An X-ray generating apparatus, comprising: a source of electrons

a plurality of deflecting electromagnets disposed along an electron orbit;

at least one high-frequency cavity disposed between pair of adjacent deflecting electromagnets and adapted to accelerate electrons;

a multipole electromagnetic mechanism formed of at least one multipole electromagnet disposed between a pair of adjacent deflecting electromagnets and focusing electrons in the horizontal direction and/or the vertical direction; and

at least one deflecting means disposed between a pair of adjacent deflecting electromagnets and undulating the orbit of electrons around a design orbit.

4,631,744

X-RAY TUBE

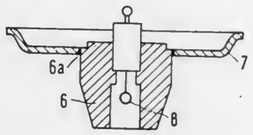
Klaus Haberrecker, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,737

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342688

Int. Cl.⁴ H01J *35/06, 35/26*

U.S. Cl. 378—138 **12 Claims**

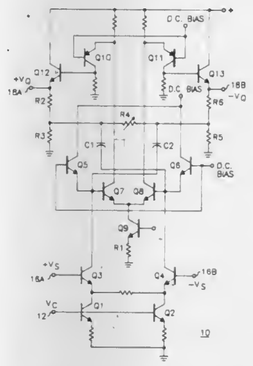


1. In an x-ray tube having an envelope containing a cathode and an anode, said cathode having a cathode head and a support means for said cathode head and an electron source disposed within said cathode head, the improvement comprising a cathode head consisting of ferromagnetic material having a Curie point greater than 700° C., and said cathode head being soldered to said support means.

5. In an x-ray tube having an envelope containing a cathode and an anode, said cathode having a cathode head and a support means for said cathode head and an electron source disposed within said cathode head, the improvement comprising

a cathode head consisting of ferromagnetic material having a Curie point greater than 700° C., and said cathode head being welded to said support means.

4,631,745
ANALOG DIVIDER WITH MINIMAL PHASE DISTORTION
Charles J. Marik, Richmond, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 26, 1985, Ser. No. 727,936
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—15 **6 Claims**



1. An analog voltage divider circuit comprising:
first input means for receiving an analog voltage signal;
second input means for receiving a control voltage signal;
first circuit means coupled to the first and second input means for providing signals which are functions of the logarithms of said analog voltage signal and of said control voltage signal, respectively, and producing a third signal which is a function of the difference between said logarithmic function signals;
second circuit means coupled to the first circuit means for deriving a fourth signal which is a function of the antilog of said third signal;
output means coupled to the second circuit means for providing a buffered output signal from said third signal; and
passive feedback means coupled to the second circuit means and the output means for compensating for unwanted phase deviation due to non-voltage-tracking capacitances within the divider circuit.

4,631,746
COMPRESSION AND EXPANSION OF DIGITIZED VOICE SIGNALS
Lawrence E. Bergeron, Andover; Daniel F. Daly, Lowell, and Elaine C. Grosso, Billerica, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Feb. 14, 1983, Ser. No. 466,250
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—35 **34 Claims**



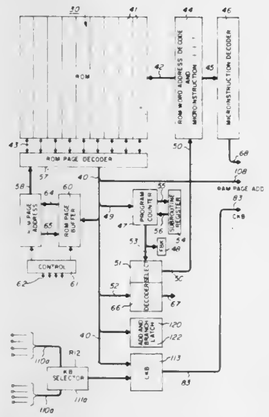
1. A method of compressing a digital input signal representative of a continuously-varying input signal into a digital pitch value and a plurality of associated signal values, said digital input signal including a plurality of binary words, each reprsentative of the amplitude of said continuously-varying input signal sampled at successive intervals of time, including the steps of:
processing a selected plurality of the binary words of said digital input signal to determine the pitch period of said continuously-varying input signal and providing a digital pitch value representative thereof;
performing a time domain harmonic compression on a first plurality of said binary words in response to said pitch value to provide a TDHC output signal representative of the digital input signal but compressed in time by a first predetermined factor, so that said TDHC output signal has a second plurality of binary words equal to said first plurality divided by said first factor;
interpolating, in response to the TDHC output signal, a predetermined number of binary words between each pair of binary words in the TDHC output signal to provide an expanded signal representative of the TDHC output signal but having a plurality of binary words equal to said second plurality multiplied by a second factor;
encoding said expanded signal by means of a delta modulator to provide an encoded output signal wherein each word in the expanded signal is converted into one bit in the encoded output signal representative of the slope of the expanded signal, the encoded output signal providing said signal values.

4,631,747
DIGITAL SOUND SYNTHESIZER
Arthur J. Tardif, Warren, R.I., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 674,365, Nov. 26, 1984, abandoned, which is a continuation of Ser. No. 549,016, Nov. 4, 1983, abandoned, which is a continuation of Ser. No. 417,732, Sep. 13, 1982, abandoned, which is a continuation of Ser. No. 252,966, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 85,166, Oct. 15, 1979, abandoned, which is a continuation of Ser. No. 925,130, Jul. 17, 1978, abandoned. This application Feb. 24, 1986, Ser. No. 834,139
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **2 Claims**



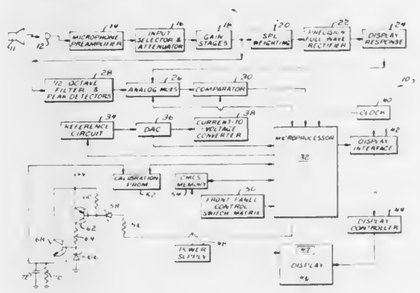
1. A sound synthesizer comprising:
a first (**21**) and second (**22**) memory each containing a plurality of addresses, each address containing a numeral, the numeral of said second memory being smaller than the numeral contained in the corresponding address of said first memory;
addressing means (**29**) for repetitively providing a sequence of addresses to said first and second memories to provide a first and second sequence of numerals from corresponding addresses of said first and second memories respectively;
means (**42**) for providing a random sign bit to each of said sequence of numerals from said second memory to provide a polarized second numeral sequence;
first means (**37**) adding each of said first and said polarized second numerals of said first and second sequences;
a third memory (**25**) containing a plurality of addresses and corresponding storage cells and responsive to said addressing means (**29**) to provide a sequence of numerals from each of said addresses;
second means (**38**) for adding the read-out numeral contents of each storage cell at each address of said third memory (**25**) to the numeral of the corresponding address of the sequence of numerals provided by said first adding means (**37**);
said second adding means (**38**) having a modulo numeral sum output;
a fourth memory (**26**) containing sine values over the range of numerals of the same modulus as provided by said second adding means (**38**), said fourth memory being responsive to each numeral of the sequence of numerals provided by said second adding means (**38**) to provide a sequence of numerals representing the sine values of said numerals corresponding to said sequence of addresses;
a fifth memory (**24**) providing output numerals at its addresses corresponding to the addresses provided by said address providing means to thereby provide a succession of numerals;
means (**44**) multiplying the numerals of the succession of numerals of corresponding addresses of said fith memory (**24**) and of said fourth memory (**26**) to provide a succession of products;
means (**48**) accumulating each product of said succession of products to provide a final sum after each sequence of addresses to thereby provide a succession of final sums;
means (**50**) storing each said final sum value of said succession of final sums until replaced by the succeeding final sum to provide a synthesized sound.

4,631,748
ELECTRONIC HANDHELD TRANSLATOR HAVING MINIATURE ELECTRONIC SPEECH SYNTHESIS CHIP
Paul S. Breedlove; James H. Moore; George L. Brantingham, all of Lubbock, and Richard H. Wiggins, Jr., Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 44,804, Jun. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 901,395, Apr. 28, 1978, abandoned. This application Feb. 24, 1982, Ser. No. 351,844
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **6 Claims**



1. An electronic language translator comprising:
memory means having digital data stored therein including digital speech data from which synthesized speech as words in more than one human language may be derived:
operator input means for receiving an operator input indicative of a request in a first human language for a particular word or phrase in a second human language, said operator input means comprises a keyboard having a plurality of individual keys, including numbered keys representative of numbers "0" through "9", which are manually actuatable in correspondence to a predetermined code for selectively indicating a request in said first human language for a particular word or phrase in said second human language, said predetermined code derivable from said digital speech data stored in said memory means comprises respective numbers corresponding to particular words or phrases;
control means responsive to the operator input received by said operator input means for selectively acessing digital speech data from said memory means corresponding to the indicated request for a particular word or phrase in said second human language;
speech synthesizer means operably associated with said memory means and said control means for receiving selected digital speech data from said memory means in response to the accessing thereof by said control means to generate analog audio signals representative of human speech in said second huyman language; and
audio means coupled to said speech synthesizer means for converting said analog audio signals generated thereby into audible human speech for pronouncing said particular word or phrase in said second human language;
wherein the selective actuation of at least one numbered key of said keyboard by the operator as an operator input indicating a request for a particular word or phrase in said second human language.

4,631,749
ROM COMPENSATED MICROPHONE
Mark Rapaich, Stevensville, Mich., assignor to Heath Company, St. Joseph, Mich.
Filed Jun. 22, 1984, Ser. No. 623,647
Int. Cl.[4] H03G *5/00*
U.S. Cl. 381—103 **11 Claims**



1. A system for compensating for the nonlinear frequency response of a microphone in an audio signal processing apparatus, said system comprising:
conversion means coupled to said microphone for converting an audio signal received by said microphone to a digital signal;
memory means for storing data representing a frequency response complementary to the nonlinear frequency response of said microphone; and
signal processing means coupled to said conversion means and to said memory means for respectively receiving and reading said digital audio signal and said complementary frequency response data therefrom and for combining said digital audio signal and said complementary frequency response data for generating a linearly compensated audio signal independent of the microphone's environment, wherein the microphone and said memory means form a frequency compensated matched pair.

4,631,750

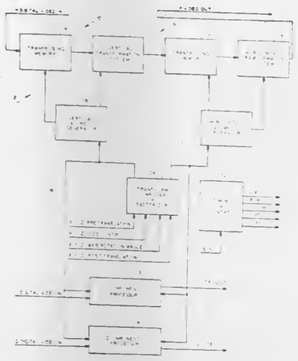
METHOD AND SYSTEM FOR SPACIALLY TRANSFORMING IMAGES

Steven A. Gabriel, Sunnyvale, and Lawrence J. Evans, Los Gatos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 310,907, filed as PCT US81/00471, Apr. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 139,589, Apr. 10, 1980, abandoned. This application Jul. 24, 1984, Ser. No. 634,177

Int. Cl.[4] G06K *9/32*

U.S. Cl. 382—41 **48 Claims**



1. A method of electronically transforming input data samples corresponding to picture elements of an image, said transforming corresponding to transformation of said picture elements of said image from a source location to a target location according to a dimensionally interdependent spatial transformation in a multidimensional coordinate system in which a plurality of coordinates indicate position in respective coordinate directions, said method comprising

factoring said interdependent transformation into a plurality of factors each corresponding to a transformation providing repositioning of picture elements in a respective single said coordinate direction, at least one of said factors being a function of a plurality of said coordinates,

successively and separately electronically applying each of said factors to said data samples to produce transformed data samples according to the respective transformation corresponding to repositioning of respective picture elements in the respective coordinate direction for said factor without repositioning in another coordinate direction, any succeeding application of a said factor being made to said data samples as transformed according to the preceding application.

4,631,751

METHOD FOR ENLARGING A BINARY IMAGE

Karen L. Anderson, A4 Hudson View Estates, Lakeview Dr., Peekskill, N.Y. 10566; Frederick C. Mintzer, 3798 Oriole Ct., Shrub Oak, N.Y. 10588, and Gerald Goertzel, 7 Sparrow Cir., White Plains, N.Y. 10605

Filed Oct. 24, 1984, Ser. No. 664,190

Int. Cl.[4] G06K *9/42*

U.S. Cl. 382—47 **14 Claims**

1. A method for enlarging a binary digital image along two orthogonal axes by factors of F1 and F2, respectively, comprising the steps of:

storing said image in raster scan order in an input storage area in a computer;

rotating said stored image by rearranging the raster data representing said stored image to create a representation of the image in raster scan order with the one of said axes originally oriented horizontally rotated in a first direction by ninety degrees;

inserting one or more rows of expansion bits along said one of said orthogonal axes of said rotated image to convert i rows of bits to j rows of bits, where $i<j<=2i$, and assigning a value to each expansion bit inserted by the steps as follows:

(1) initializing a counter to a value between T−S and T, where T is an integer selected as a threshold value and S is an integer such that the rounded value of (F1−1)•S is not equal to zero;

(2) processing the stored image by the steps of:

(a) incrementing said counter by I, where I is an integer equal to the rounded value of (F1−1)•S;

(b) copying a first row of said stored image from said input storage area into an output storage area in which the enlarged image is to be stored;

(c) comparing the counter value to T;

(d) if the counter value is not between T−S and T, then

(i) inserting a row of bits in the output storage area adjacent to said copied first row;

(ii) assigning values to all the bits in said inserted row based upon the values of the bits in at least one neighboring row of said first row in said input storage area;

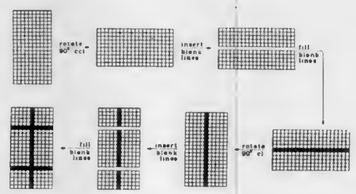
(iii) decrementing the counter by S; and

(e) if the counter value is between T−S and T, then omitting said steps (i), (ii), and (iii);

(3) repeating said processing steps (a)–(e) until all rows of the stored image have been processed; then

(4) replicating in said output storage area the last remaining stored image row in said input storage area if the limit of said output storage area has not been reached;

repeating said step of inserting and assigning a predetermined number of times to achieve an enlargement by a factor of F1 along said one orthogonal axis;



Steps of the Expansion Process

rotating said enlarged image in said output storage area by rearranging the raster data representing said enlarged image to create a representation of the image in raster scan order with said one orthogonal axis rotated in a second direction opposite said first direction by ninety degrees;

inserting one or more rows of expansion bits along the other of said orthogonal axes in said rotated enlarged image to convert i′ rows of bits to j′ rows of bits, where $i'<j'<=2i'$, and assigning a value to each expansion bit inserted by the steps as follows:

(6) initializing a counter to a value between T′−S′ and T′, where T′ is an integer selected as a threshold value and S′ is an integer such that the rounded value of (F2−1)•S′ is not equal to zero;

(7) processing a first row of the rotated enlarged image by the steps of:

(f) incrementing said counter by I′, where I′ is an integer equal to the rounded value of (F2−1)•S′;

(g) copying said first row into a second output storage area;

(h) comparing the counter value to T′;

(j) if the counter value is between T′−S′ and T′, then

(iv) inserting a row of bits in the second output storage area adjacent to said copied first row;

(v) assigning values to all the bits in said inserted row based upon the values of the bits in at least one neighboring row of said first row in said output storage area;

(vi) decrementing the counter by S′; and

(k) if the counter value is between T′−S′ and T′, inclusive, then omitting said steps (iv), (v), and (vi);

(8) repeating said processing steps (f)–(k) until all rows of the rotated enlarged image have been processed;

(9) replicating in said second output storage area the last remaining stored image row in said output storage area if the limit of said second output storage area has not been reached; and

repeating said step of inserting and assigning along said other orthogonal axis a predetermined number of times to achieve an enlargement by a factor of F2 along said other orthogonal axis.

DESIGN PATENTS

GRANTED DEC. 23, 1986

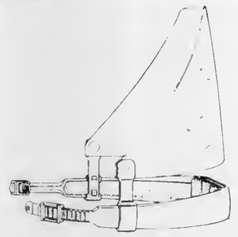
ERRATA

For CLASS	See PATENT NO.
D29-016	287,300
D02-331	287,366

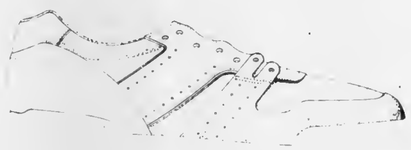
DESIGNS

DECEMBER 23, 1986

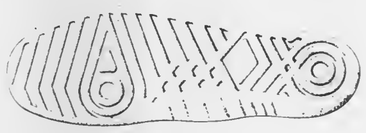
287,300
FACE SHIELD ATTACHMENT FOR A SAFETY HELMET
Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden
Filed Dec. 21, 1984, Ser. No. 685,062
Claims priority, application Sweden, Jul. 4, 1984, 84-1990
Term of patent 14 years
U.S. Cl. D29—16



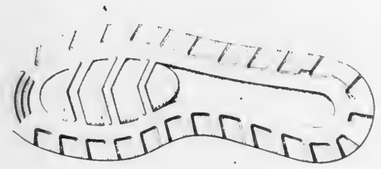
287,301
SHOE UPPER
James K. Tong, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Feb. 14, 1986, Ser. No. 834,022
Term of patent 14 years
U.S. Cl. D2—314



287,302
SHOE INSOLE
Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.
Filed Feb. 24, 1986, Ser. No. 834,866
Term of patent 14 years
U.S. Cl. D2—318



287,303
SHOE SOLE
Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.
Filed Feb. 24, 1986, Ser. No. 834,868
Term of patent 14 years
U.S. Cl. D2—320



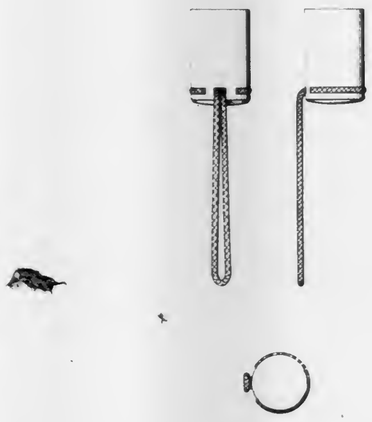
287,304
SHOE SOLE
Robert L. Peterson, Taichung, Taiwan, and James K. Tong, Beaverton, Oreg., assignors to Pensa, Inc., Portland, Oreg.
Filed Feb. 24, 1986, Ser. No. 834,867
Term of patent 14 years
U.S. Cl. D2—320



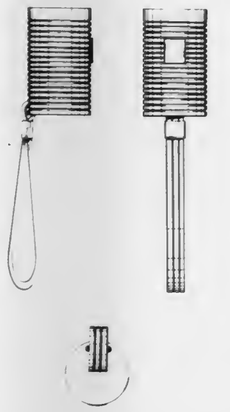
287,305
PAGER CARRYING CASE
Frederick D. Brown, P.O. Box 16881, Orlando, Fla. 32861
Filed Feb. 13, 1984, Ser. No. 579,606
Term of patent 14 years
U.S. Cl. D3—106



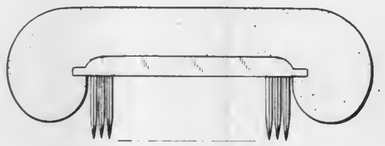
287,306
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,626
Claims priority, application Taiwan, Mar. 6, 1985, 74301064
Term of patent 14 years
U.S. Cl. D3—12



287,307
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 667,968
Claims priority, application Taiwan, Mar. 6, 1985, 74301059
Term of patent 14 years
U.S. Cl. D3—12

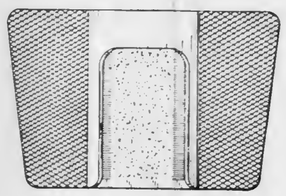


287,308
SCRUB BRUSH WITH WRAP AROUND SPONGE
Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566
Filed Feb. 4, 1985, Ser. No. 697,850
Term of patent 14 years
U.S. Cl. D4—116



287,309
HYGIENE BRUSH ASSEMBLY
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,322
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119

287,310
FOOT SCRUBBING BRUSH
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,348
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119



287,311
FOOT HYGIENE DEVICE
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Jan. 9, 1984, Ser. No. 569,327
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—119



287,312
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,438
Claims priority, application Japan, Sep. 10, 1982, 57-41579
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123



287,313
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,441
Claims priority, application Japan, Sep. 10, 1982, 57-41576
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123



287,314
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,440
Claims priority, application Japan, Sep. 10, 1982, 57-41577
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123



287,315
COMBINED CHAIR AND STEP STOOL
Valeska Ginouves, 1142 Farmington Ave., West Hartford, Conn. 06107
Filed Oct. 21, 1983, Ser. No. 544,089
Term of patent 14 years
U.S. Cl. D6—335



287,316
OTTOMAN
Robert D. Vanderminden, Granville, N.Y., assignor to The Telescope Folding Furniture Co., Granville, N.Y.
Filed May 18, 1984, Ser. No. 611,704
Term of patent 14 years
U.S. Cl. D6—349



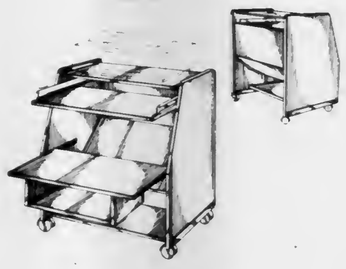
287,317
TRICYCLE SEAT
David A. Allen, and Robert L. Diekman, both of Centerville, Ohio, assignors to Huffy Corporation, Dayton, Ohio
Filed Apr. 25, 1984, Ser. No. 603,873
Term of patent 14 years
U.S. Cl. D6—354



287,318
PORTABLE, FOLDING DIAPER CHANGING TABLE
Stephanie Garduno, 13 Bull Run, Irvine, Calif. 92714
Filed Apr. 19, 1984, Ser. No. 602,006
Term of patent 14 years
U.S. Cl. D6—429



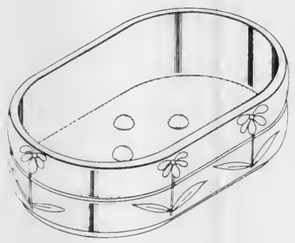
287,319
COMPUTER WORKSTATION
Carlos V. Ugalde, San Dimas, Calif., assignor to Continental Engineering Group, Inc., Irwindale, Calif.
Filed Dec. 24, 1985, Ser. No. 813,000
Term of patent 14 years
U.S. Cl. D6—474



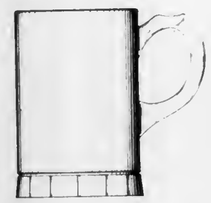
287,320
TOOTHBRUSH HOLDER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,352
Term of patent 14 years
U.S. Cl. D6—534



287,321
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,356
Term of patent 14 years
U.S. Cl. D6—539



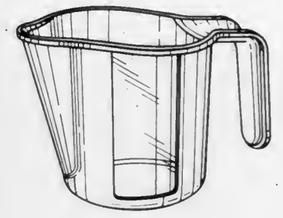
287,322
BEVERAGE MUG
Fred R. Martin, 136 Stillman Loop, Benton, Ark. 72015
Filed May 31, 1984, Ser. No. 615,800
Term of patent 14 years
U.S. Cl. D7—9



287,323
TUMBLER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,354
Term of patent 14 years
U.S. Cl. D7—12



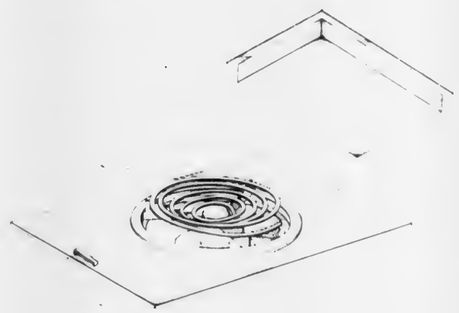
287,324
MEASURING PITCHER OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 16, 1984, Ser. No. 571,015
Term of patent 14 years
U.S. Cl. D7—50



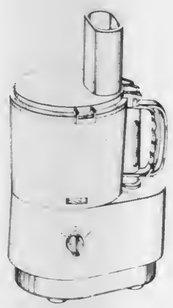
287,325
MEASURING PITCHER OR THE LIKE
Janice L. Schmidt, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 16, 1984, Ser. No. 571,016
Term of patent 14 years
U.S. Cl. D7—50



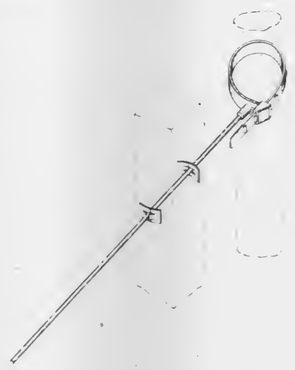
287,326
WOK COOKTOP
Stanley M. Joseph, Glendale, Calif., assignor to Distinctive Appliances, Inc., Pasadena, Calif.
Filed Jan. 17, 1983, Ser. No. 458,613
Term of patent 14 years
U.S. Cl. D7—346



287,327
FOOD PROCESSOR
Alfredo Cavalli, 9, Via G. Galilei, Pessano Con Bornago, Milan, Italy
Filed Jan. 6, 1984, Ser. No. 568,594
Claims priority, application Italy, Jul. 20, 1983, 22426/83[U]
Term of patent 14 years
U.S. Cl. D7—384



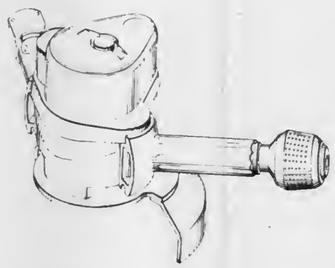
287,328
TREE SUPPORT
Clifford H. Paul, Troutdale, and Richard J. Paul, Portland, both of Oreg., assignors to Paul Brothers, Inc., Boring, Oreg.
Filed Apr. 9, 1984, Ser. No. 598,075
Term of patent 14 years
U.S. Cl. D8—1



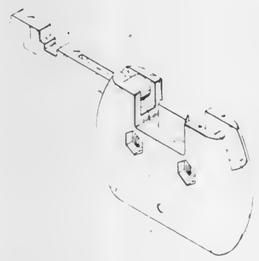
287,329
PUSH ROD HOLDER FOR DIESEL ENGINE WITH INSTALLED AFTERCOOLER
George Hamatani, Rte. 1, Box 400, Sacramento, Calif. 95612
Filed Apr. 12, 1984, Ser. No. 599,316
Term of patent 14 years
U.S. Cl. D8—14



287,330
PORTABLE GRINDING MACHINE
Karl G. Kårdén, Nacka, and Karl-Gustav Berger, Saltsjö-Duvnäs, both of Sweden, assignors to Atlas Copco AB, Nacka, Sweden
Filed May 29, 1984, Ser. No. 614,984
Term of patent 14 years
U.S. Cl. D8—62



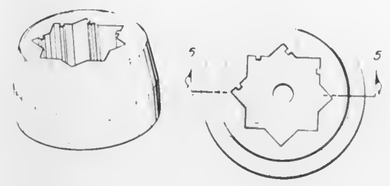
287,331
CUTTING TOOL FOR OPTICAL FIBERS WITH PROTECTIVE COVER
Kevin T. Monroe, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 29, 1984, Ser. No. 626,007
Term of patent 14 years
U.S. Cl. D8—98



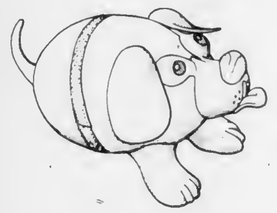
287,332
COMBINATION TOOL FOR ADJUSTING SKI BINDINGS AND SKI BOOTS OR THE LIKE
Christopher L. Gamble, 2040 E. Howe, Tempe, Ariz. 85281
Filed Feb. 28, 1983, Ser. No. 470,255
Term of patent 14 years
U.S. Cl. D8—105



287,333
WINCH HANDLE HOLDER
Leigh J. Knudson, 629 Terminal Way, Costa Mesa, Calif. 92627
Filed Feb. 21, 1984, Ser. No. 582,206
Term of patent 14 years
U.S. Cl. D8—373



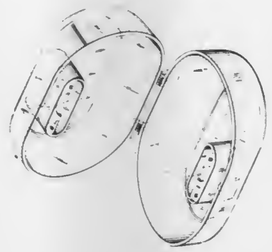
287,334
PACKAGING CONTAINER FOR CANDY OR THE LIKE
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Aug. 23, 1984, Ser. No. 643,404
Claims priority, application Italy, May 18, 1984, 53392/84[U]
Term of patent 14 years
U.S. Cl. D9—318



287,335
ALCOHOL APPLICATOR BOTTLE
Kent R. Anderson, Shawnee Mission, Kans., assignor to Larken Industries, Ltd., Lenexa, Kans.
Filed Sep. 24, 1984, Ser. No. 653,203
Term of patent 14 years
U.S. Cl. D9—338



287,336
CONTAINER FOR PACIFIERS
Peter Roehrig, Himmelschluesselweg 5, A-1160, Vienna, Austria
Filed Mar. 20, 1984, Ser. No. 591,518
Claims priority, application Austria, Sep. 21, 1983, 530508/83
Term of patent 14 years
U.S. Cl. D9—341



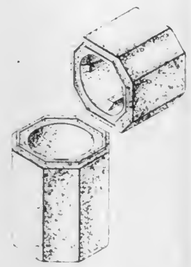
287,337
BOTTLE OR SIMILAR ARTICLE
Gerhard E. B. Nickel, Kennesaw, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.
Filed Aug. 17, 1984, Ser. No. 641,746
Term of patent 14 years
U.S. Cl. D9—349



287,338
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Inc., Boyertown, Pa.
Division of Ser. No. 517,119, Jul. 25, 1983. This application Nov. 7, 1985, Ser. No. 803,993
Term of patent 14 years
U.S. Cl. D9—355



287,339
PACKAGING CONTAINER FOR A PHARMACEUTICAL VIAL
Daniel M. Dominski, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Nov. 21, 1983, Ser. No. 553,604
Term of patent 14 years
U.S. Cl. D9—377



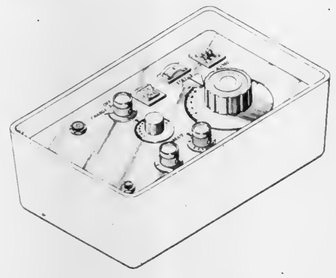
287,340
BOTTLE
Pierre Dinand, Levallois Perret, France, assignor to Saint-Gobain Desjonqueres, Courbevoie, France
Filed Aug. 7, 1984, Ser. No. 638,589
Claims priority, application France, Feb. 8, 1984, 840538
Term of patent 14 years
U.S. Cl. D9—401



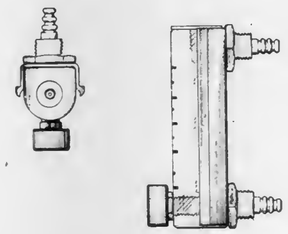
287,341
WRISTWATCH
Gary Grimes, Kessel-Lo, Belgium, assignor to Timex Corporation, Waterbury, Conn.
Filed Jul. 27, 1984, Ser. No. 635,326
Term of patent 14 years
U.S. Cl. D10—30



287,342
PASSIVE GEOPHYSICAL EXPLORATION DEVICE
Carl L. Kober, and H. David Procter-Gregg, both of Littleton, Colo., assignors to Denver Mineral Exploration Corp., Littleton, Colo.
Filed Apr. 20, 1984, Ser. No. 602,377
Term of patent 14 years
U.S. Cl. D10—75



287,343
FLOWMETER
Craig Waters, Lansdale, Pa., assignor to Matheson Gas Products, Inc., Secaucus, N.J.
Division of Ser. No. 557,742, Dec. 2, 1983, Pat. No. Des. 283,805. This application Nov. 21, 1985, Ser. No. 806,018
Term of patent 14 years
U.S. Cl. D10—96



287,344
MOOSE HEAD TROPHY
John Hinnen, 4810 N. Prospect Rd., P.O. Box 5305, Peoria, Ill. 61601
Filed Mar. 26, 1984, Ser. No. 593,121
Term of patent 14 years
U.S. Cl. D11—134



287,345
SCULPTURE
Gwen McLaughlin, Squan Rd., Clarksburg, N.J. 08510
Filed Nov. 5, 1984, Ser. No. 668,476
Term of patent 14 years
U.S. Cl. D11—139



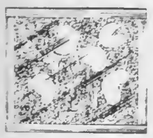


287,346
BUD VASE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,353
Term of patent 14 years
U.S. Cl. D11—151



287,347
AQUATIC SCULPTURE OR SIMILAR ARTICLE
Otto Grun, 44 Cocoanut Row, Palm Beach, Fla. 33480
Filed Oct. 31, 1983, Ser. No. 547,068
Term of patent 14 years
U.S. Cl. D11—157





287,348
COMBINED BACK REST AND LUGGAGE RACK
Willard S. Larson, Box 338, Isanti, Minn. 55040
Filed Oct. 9, 1984, Ser. No. 658,580
Term of patent 14 years
U.S. Cl. D12—119



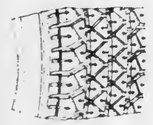
287,349
VEHICLE TIRE
Toshio Yonekura, Kishiwada; Kotaro Tsutsumi, Izumi, and Masaaki Minamitani, Sennan, all of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 11, 1984, Ser. No. 609,390
Claims priority, application Japan, Feb. 13, 1984, 59-4997
Term of patent 14 years
U.S. Cl. D12—140



287,350
TIRE
David A. Weston, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Jun. 4, 1984, Ser. No. 616,957
Term of patent 14 years
U.S. Cl. D12—147



287,351
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,095
Term of patent 14 years
U.S. Cl. D12—147



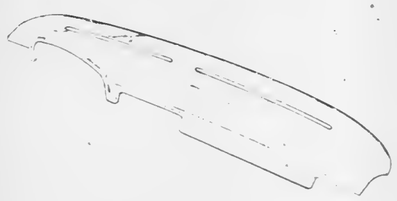
287,352
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,102
Term of patent 14 years
U.S. Cl. D12—151



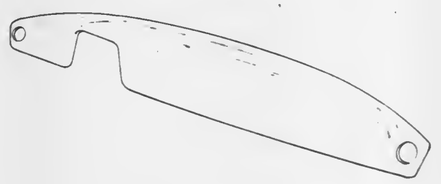
287,353
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed Aug. 17, 1984, Ser. No. 642,046
Term of patent 14 years
U.S. Cl. D12—192



287,354
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,235
Term of patent 14 years
U.S. Cl. D12—192



287,355
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,236
Term of patent 14 years
U.S. Cl. D12—192



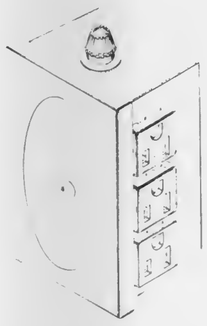
287,356
DASHBOARD COVER
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed May 14, 1984, Ser. No. 610,231
Term of patent 14 years
U.S. Cl. D12—192



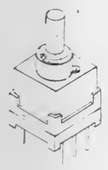
287,357
PLANING BOAT
Darris E. Allison, Rte. 3, Box 771, Louisville Rd., Louisville, Tenn. 37777
Filed May 29, 1984, Ser. No. 614,952
Term of patent 14 years
U.S. Cl. D12—314



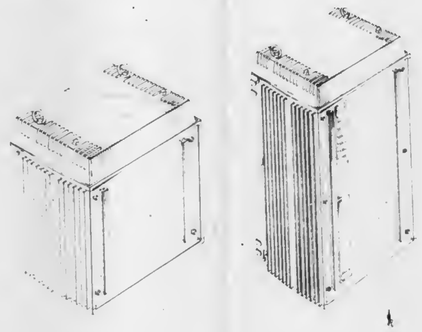
287,358
MULTIPLE OUTLET
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 7, 1984, Ser. No. 607,555
The portion of the term of this patent subsequent to Jul. 24, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—30



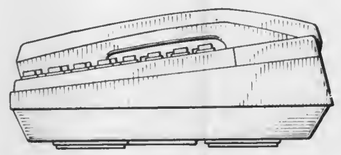
287,359
PUSH BUTTON SWITCH
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-chome, Ohta-ku, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 558,051
The portion of the term of this patent subsequent to Oct. 1, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—32

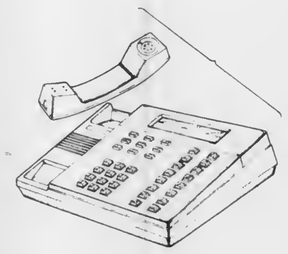


287,360
CASING FOR ELECTRICAL EQUIPMENT
Kjeld Lehmann, Sondorborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 539,930, Oct. 7, 1983, Pat. No. Des. 281,315. This application Nov. 7, 1985, Ser. No. 803,935
Term of patent 14 years
U.S. Cl. D13—40



287 361
HANDSET AND STAND TELEPHONE UNIT
Akira Sekiguchi, Tokyo, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1984, Ser. No. 627,834
Claims priority, application Japan, Mar. 12, 1984, 59-9514; Mar. 12, 1984, 59-9515
Term of patent 14 years
U.S. Cl. D14—53

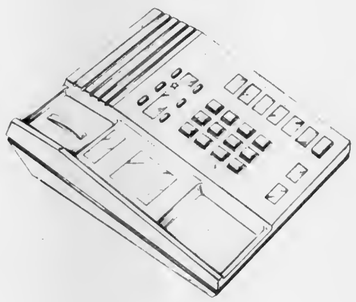




287,362
HANDSET TELEPHONE AND STAND UNIT
James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Jul. 26, 1985, Ser. No. 759,177
Term of patent 14 years
U.S. Cl. D14—53

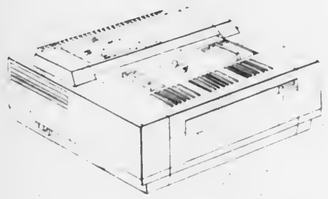


287,363
TELEPHONE SET BASE
Gerhart F. Klaiber, Paradise Valley, Ariz., and Donald Foggia, Ocean, N.J., assignors to Vodavi Technology Corporation, Scottsdale, Ariz.
Filed Sep. 21, 1984, Ser. No. 652,731
Term of patent 14 years
U.S. Cl. D14—62

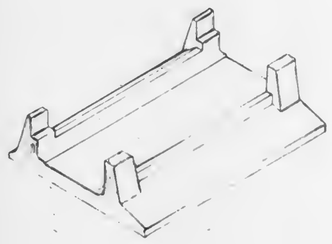




287,364
FACSIMILE
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1984, Ser. No. 583,736
Claims priority, application Japan, Aug. 31, 1983, 58-37922
Term of patent 14 years
U.S. Cl. D14—94



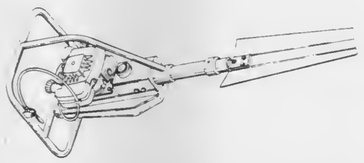
287,365
STAND FOR COMPUTER DISK DRIVE
Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Peterborough, N.H.
Filed Dec. 9, 1983, Ser. No. 559,719
Term of patent 14 years
U.S. Cl. D14—114



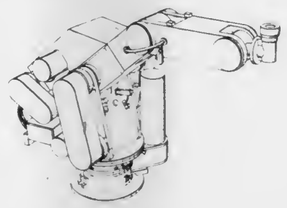
287,366
SOCK
Carl E. Hagen, New York, N.Y., assignor to Chipman-Union, Inc., Union Point, Ga.
Filed Oct. 19, 1983, Ser. No. 543,504
Term of patent 14 years
U.S. Cl. D2—331



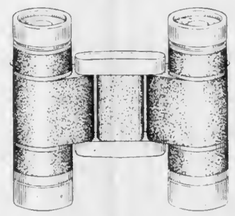
287,367
MOTORIZED SHOVEL
Gerald Woods, Franklin, N.C., assignor to Blue Ridge Industrial Support Company, Swannanoa, N.C.
Filed Sep. 27, 1984, Ser. No. 654,965
Term of patent 14 years
U.S. Cl. D15—12



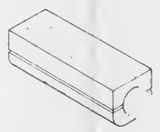
287,368
INDUSTRIAL ROBOT
Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Daijiro Ida, Narashino; Masayuki Ohshiro, Narashino; Ichiro Takahashi, Narashino; Yasuhiro Hashimoto, Chiyoda; Humio Hujisawa, Mito, and Takeshi Araya, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 6, 1984, Ser. No. 577,498
Claims priority, application Japan, Oct. 26, 1983, 58-46263; Oct. 26, 1983, 58-46264; Oct. 26, 1983, 58-46265
Term of patent 14 years
U.S. Cl. D15—199



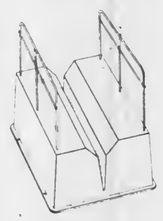
287,369
BINOCULAR
Heinrich Janke, Braunfels; Alfred Hengst, Lahnau, and Hans-Kurt Uellenberg, Edingen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar G.m.b.H., Wetzlar, Fed. Rep. of Germany
Filed May 3, 1984, Ser. No. 607,893
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 5MR246
Term of patent 14 years
U.S. Cl. D16—133



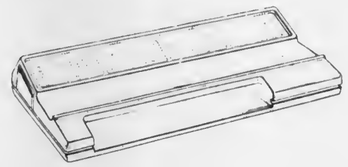
287,370
CALCULATOR FOR A SHOPPING CART
Scott A. Stoll, 3311 S. 88 E. Ave., Tulsa, Okla. 74145, and Mike Brennan, 9335 S. 65th East Pl., Tulsa, Okla. 74133
Filed Feb. 13, 1984, Ser. No. 579,383
Term of patent 14 years
U.S. Cl. D18—7



287,371
REFOLDING AND STACKING RECEPTACLE FOR SEGMENTAL SHEET MATERIAL
Jan T. Bekooy, 7670 SW. Barnard Dr., Beaverton, Oreg. 97007
Filed Nov. 9, 1984, Ser. No. 669,803
Term of patent 14 years
U.S. Cl. D18—22



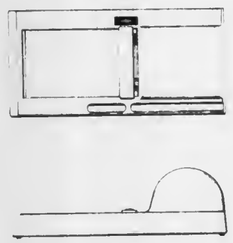
287,372
COMBINED HOLDER FOR NOTE PAPER AND A CALENDAR
Walter Henkels, Holunderweg 1, D-5145 Hückelhoven, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,531
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, MR 150
Term of patent 14 years
U.S. Cl. D19—22



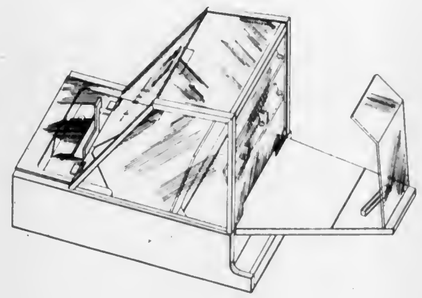
287,373
WRITING INSTRUMENT
Pierre Regnault, Valence, France, assignor to Etablissements Regnault, Valence, France
Filed Dec. 6, 1984, Ser. No. 678,804
Claims priority, application France, Jun. 6, 1984, 842,518
Term of patent 14 years
U.S. Cl. D19—43



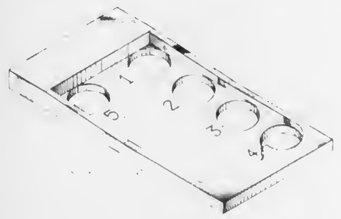
287,374
MEMO PAPER HOLDER
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 10, 1984, Ser. No. 608,734
Term of patent 14 years
U.S. Cl. D19—89



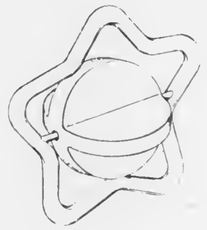
287,375
BASEBALL GAME HOUSING
Benjamin D. Suarez, 2000 - 49th St. NW., Canton, Ohio 44709
Filed Jan. 4, 1984, Ser. No. 568,246
Term of patent 14 years
U.S. Cl. D21—11



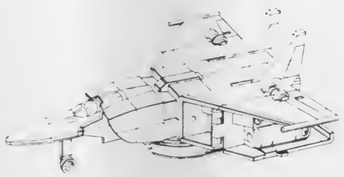
287,376
NOVELTY DIGITAL CALCULATOR
Marvin L. Emmons, 1029 Wisteria Trail, Austin, Tex. 78753
Filed Apr. 13, 1984, Ser. No. 599,960
Term of patent 14 years
U.S. Cl. D21—59

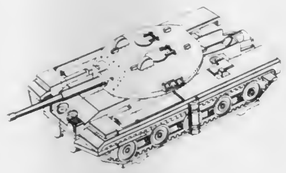


287,377
STAR TEETHER TOY
Lawrence B. Grubb, Monkton, Md., and David M. Williams, New York, N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Jul. 16, 1984, Ser. No. 631,275
Term of patent 14 years
U.S. Cl. D21—65

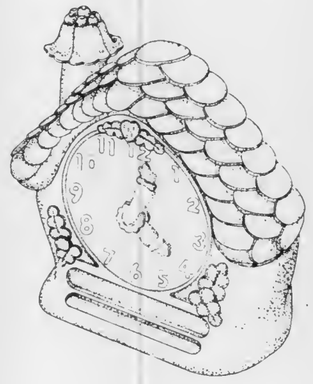


287,378
RECONFIGURABLE JET-PLANE TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 27, 1984, Ser. No. 655,327
Claims priority, application Japan, May 25, 1984, 59-21295
Term of patent 14 years
U.S. Cl. D21—87

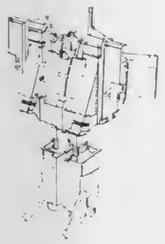




287,379
TOY CLOCK
Russell C. Edmisson, Manhattan Beach, Calif.; Charlotte A. Eicher, Fort Mitchell, Ky., and Stephen M. Toth, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Aug. 15, 1984, Ser. No. 640,909
Term of patent 14 years
U.S. Cl. D21—109

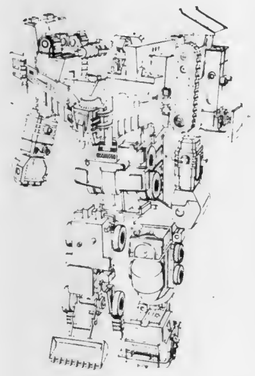


287,380
TOY TELEPHONE
Kathryn A. Cavnar, Covington, Ky., and Stephen M. Toth, Loveland, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jul. 9, 1984, Ser. No. 629,136
Term of patent 14 years
U.S. Cl. D21—111





287,381
ASSEMBLED HUMANOID ROBOT TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1984, Ser. No. 647,227
Term of patent 14 years
U.S. Cl. D21—150



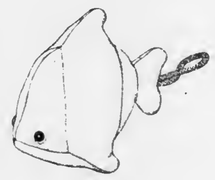
287,382
NOVELTY TOOTH FIGURE
James C. Anastassiades, 1604 Lawrence Rd., Havertown, Pa. 19083, and Elliott D. Maser, 3101 Bristol Rd., Bensalem, Pa. 19020
Filed Feb. 29, 1984, Ser. No. 584,758
Term of patent 14 years
U.S. Cl. D21—155



287,383
TOY FUR SEAL
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,175
Term of patent 14 years
U.S. Cl. D21—157



287,384
TOY ANGELFISH
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,231
Term of patent 14 years
U.S. Cl. D21—157



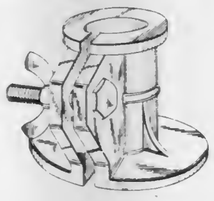
287,385
TOY CRAB
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,365
Term of patent 14 years
U.S. Cl. D21—157

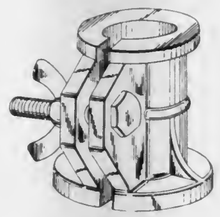


287,386
DOLL HOLDER
Thomas P. Kaiser, and Philip P. Kaiser, Jr., both of Northbrook, Ill., assignors to Kaiser Manufacturing Co., Chicago, Ill.
Filed Apr. 30, 1984, Ser. No. 605,233
Term of patent 14 years
U.S. Cl. D21—189

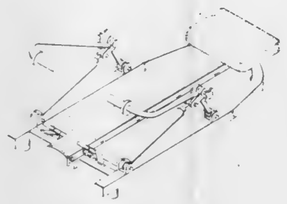


287,387
COLLAR FOR BARBELL OR SIMILAR ARTICLE
Morris A. Oliver, and Reginald R. Bell, both of Auckland, New Zealand, assignors to Don Oliver Barbell (1977) Limited, Auckland, New Zealand
Continuation of Ser. No. 477,527, Mar. 21, 1983, abandoned. This application Jan. 7, 1986, Ser. No. 816,810
Claims priority, application New Zealand, Sep. 27, 1982, 17955 27
Term of patent 14 years
U.S. Cl. D21—191

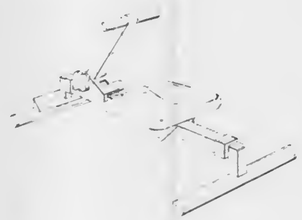




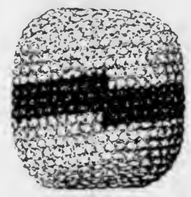
287,388
ROWING EXERCISE MACHINE OR SIMILAR ARTICLE
William Cheng, Taipei, Taiwan, assignor to Michael Hung, Taipei, Taiwan
Filed Sep. 25, 1984, Ser. No. 654,117
Term of patent 14 years
U.S. Cl. D21—195



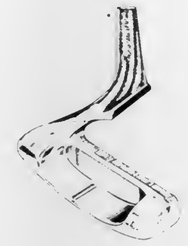
287,389
TOY EXERCISING MACHINE
Richard P. Nadeau, Frankfort, N.Y., assignor to Zorcom Enterprise, Inc., Utica, N.Y.
Filed May 29, 1985, Ser. No. 738,753
Term of patent 14 years
U.S. Cl. D21—195



287,390
SEAMLESS CROCHET GAME FOOTBAG
Mark E. Charles, and Stephan J. Connella, both of 1278 Glenneyre, #96, Laguna Beach, Calif. 92651
Filed Jun. 6, 1984, Ser. No. 617,888
Term of patent 14 years
U.S. Cl. D21—204



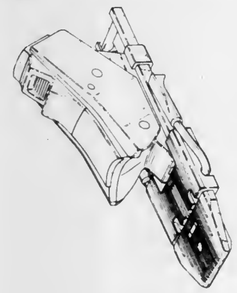
287,391
PUTTER HEAD
William B. Shearer, 2905 W. Main St., Muncie, Ind. 47305
Filed Apr. 9, 1984, Ser. No. 598,498
Term of patent 14 years
U.S. Cl. D21—219



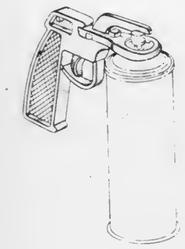
287,392
GOLF CLUB HEAD COVER
Stephen L. Brittner, and Maureen F. Brittner, both of 4453 Poplar Road, Yarrow, BC V0Y 2A0, Canada
Filed Jul. 20, 1984, Ser. No. 633,038
Term of patent 14 years
U.S. Cl. D21—221



287,393
HEEL ELEMENT FOR SKI BINDING
Herbert H. Schultes, Fürstenfeldbruck, and Edwin Wahl, Munich, both of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah
Filed May 3, 1982, Ser. No. 374,637
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, MR 18676
Term of patent 14 years
U.S. Cl. D21—230



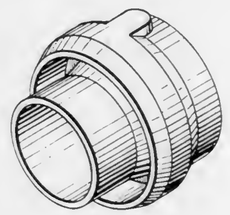
287,394
SPRAY GUN FOR AEROSOL CAN
Soichiro S. Yamamoto, 32 Charade Court, Agincourt, Ontario, Canada M1W 1C8
Filed Aug. 26, 1983, Ser. No. 526,797
Term of patent 14 years
U.S. Cl. D23—18



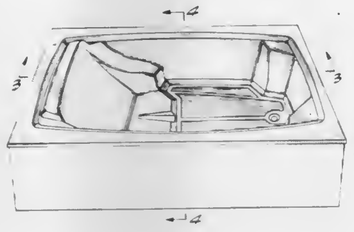
287,395
FAUCET SPOUT
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,385
Claims priority, application Italy, Dec. 6, 1983, 23769/83[U]
Term of patent 14 years
U.S. Cl. D23—32



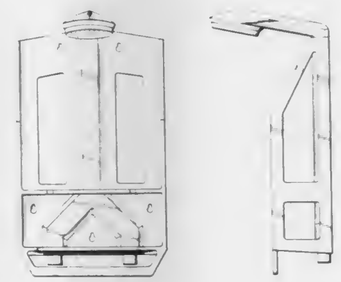
287,396
COMPRESSION SEALING GASKET FOR A LIQUID-TIGHT FITTING
Sami Shemtov, Brooklyn, N.Y., assignor to Berger Industries, Inc., Maspeth, N.Y.
Filed May 9, 1983, Ser. No. 492,871
Term of patent 14 years
U.S. Cl. D23—47



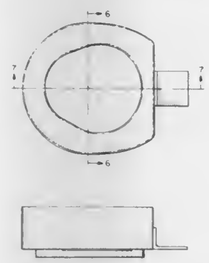
287,397
BATHTUB
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Nov. 8, 1984, Ser. No. 669,643
Term of patent 14 years
U.S. Cl. D23—55



287,398
PORTABLE SHOWER
Myles A. Fisher, and Joseph S. Justin, both of 308 E. Government St., Pensacola, Fla. 32501
Filed Jul. 6, 1983, Ser. No. 511,192
Term of patent 14 years
U.S. Cl. D23—57



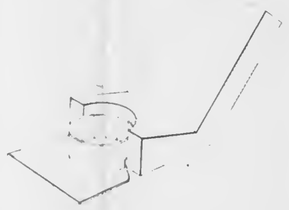
287,399
RAISED SUPERIMPOSED TOILET SEAT OR THE LIKE
John Broeils, Wycoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.
Filed Sep. 23, 1982, Ser. No. 422,469
Term of patent 14 years
U.S. Cl. D23—71



287,400
DECORATIVE DUST SHIELD FOR A FIREPLACE ASH CONTAINER AND STAND THEREFOR
Randall B. Long, 3715 Cornell, Dearborn, Mich. 48124
Filed Mar. 23, 1984, Ser. No. 592,488
Term of patent 14 years
U.S. Cl. D23—131



287,401
COMBINATION OBSTECTRICAL CHAIR AND COVER
Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465
Filed May 5, 1983, Ser. No. 491,745
Term of patent 14 years
U.S. Cl. D24—3



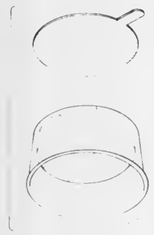
287,402
NOZZLE FOR A SUCTION DRAINAGE DEVICE FOR PERFORMING SURGERY IN THE MOUTH
Ernst L. Orsing, Missionsgatan 12, S-253 70 Helsingborg, Sweden
Filed Jun. 17, 1983, Ser. No. 505,502
Term of patent 14 years
U.S. Cl. D24—10



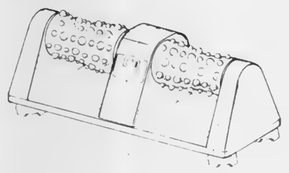
287,403
PULSE RECEIVER
Heikki Kiiski, Turku; Seppo Säynäjäkangas, Kempele; Martti Karppinen, and Tapio Tammi, both of Oulu, all of Finland, assignors to Polar Electro KY, Kempele, Finland
Filed Jun. 4, 1984, Ser. No. 616,840
Term of patent 14 years
U.S. Cl. D24—17



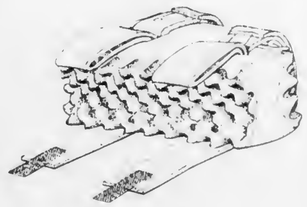
287,404
MEDICINE DISPENSING CUP
Jan-Erik Johansson, Räfsta, Vallentuna, Sweden 18600, and Håkan K. Bergkvist, Beckombergavägen 72, Bromma, Sweden 161 53
Filed Jul. 26, 1983, Ser. No. 517,301
Claims priority, application Sweden, Jan. 26, 1983, 830209
Term of patent 14 years
U.S. Cl. D24—34



287,405
ELECTRIC MASSAGER
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Tetumi Fujiyama, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Japan
Filed Dec. 8, 1983, Ser. No. 559,537
Claims priority, application Japan, Aug. 23, 1983, 58-36652
Term of patent 14 years
U.S. Cl. D24—40



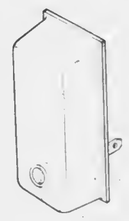
287,406
HIP ABDUCTION PILLOW
Linda H. Dixon, 1221 Andersen Dr., San Rafael, Calif. 94901
Filed Feb. 3, 1984, Ser. No. 576,669
Term of patent 14 years
U.S. Cl. D24—64



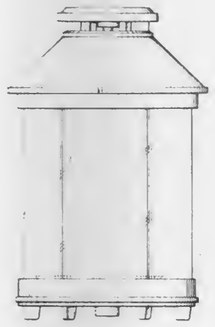
287,407
FLUORESCENT LAMP
Toshiharu Fujita, Kanagawa; Yoshihiro Domon, Kamakura, and Fuminobu Takizawa, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 15, 1984, Ser. No. 661,158
Claims priority, application Japan, Apr. 27, 1984, 59-17362; Apr. 27, 1984, 59-17363
Term of patent 14 years
U.S. Cl. D26—3



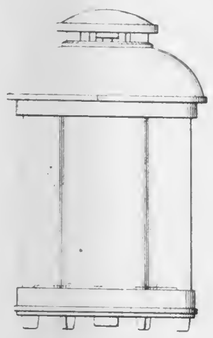
287,408
SENSOR NIGHT LIGHT
Donald R. Gaines, 26165 Hidden Valley Dr., Farmington Hill, Mich. 48018
Filed Feb. 15, 1983, Ser. No. 466,620
Term of patent 14 years
U.S. Cl. D26—26



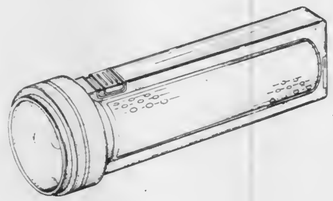
287,409
LANTERN
Lars-Gunnar Johansson, Paris, France, assignor to Architectural Structures Inc., London, England
Filed May 24, 1983, Ser. No. 497,663
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—40



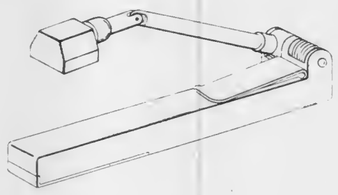
287,410
LANTERN
Lars-Gunnar Johansson, Paris, France, assignor to Architectural Structures Inc., London, England
Filed Dec. 19, 1983, Ser. No. 563,180
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—40



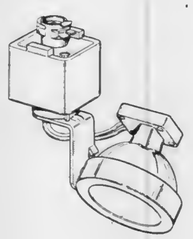
287,411
HAND TORCH
John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.
Filed May 7, 1984, Ser. No. 607,538
Claims priority, application United Kingdom, Nov. 21, 1983, 1016436
Term of patent 14 years
U.S. Cl. D26—46



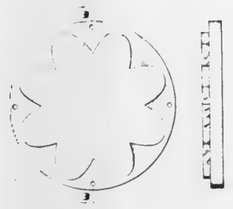
287,412
PORTABLE READING LIGHT
May Fung, Hong Kong, Hong Kong, assignor to Etna Products Co., Inc., New York, N.Y.
Filed May 4, 1984, Ser. No. 607,151
Claims priority, application United Kingdom, Mar. 30, 1984, 1018839
Term of patent 14 years
U.S. Cl. D26—60



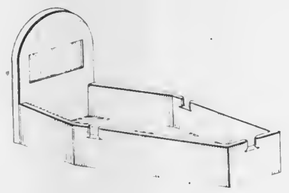
287,413
TRACK LIGHT FIXTURE
Raymond J. Kusmer, Elgin, and Raymond K. Tinley, Mt. Prospect, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 10, 1984, Ser. No. 578,871
Term of patent 14 years
U.S. Cl. D26—65



287,414
HEADLIGHT COVER
Diane A. Giles, and Joseph Giles, both of 2359 Miriam La., Decatur, Ga. 30032
Filed Sep. 4, 1984, Ser. No. 646,821
Term of patent 14 years
U.S. Cl. D26—139



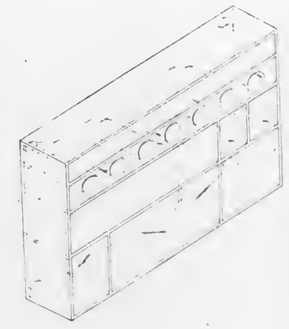
287,415
ASHTRAY
Charles W. Cramer, 13496 Pike Lake Trail NE., Prior Lake, Minn. 55372
Filed Apr. 29, 1985, Ser. No. 728,526
Term of patent 14 years
U.S. Cl. D27—22



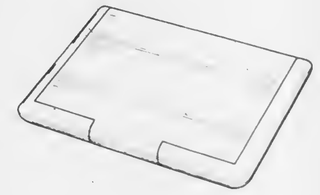
287,416
TWEEZERS
William D. Smith, 2335 32nd St., Moline, Ill. 61265
Filed Aug. 14, 1984, Ser. No. 640,739
Term of patent 14 years
U.S. Cl. D28—55



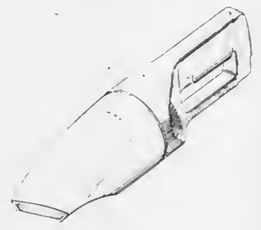
287,417
COSMETIC TRAY OR SIMILAR ARTICLE
Elizabeth H. Mocek, 602 Hickory Dr., Lafayette, La. 70503
Filed Jun. 25, 1984, Ser. No. 624,212
Term of patent 14 years
U.S. Cl. D28—76



287,418
CASE FOR COSMETIC PRODUCTS
Roberto Trabattoni, Petit-Lancy, Switzerland, assignor to Trasi S.A., Petit-Lancy, Switzerland
Filed Aug. 14, 1984, Ser. No. 640,689
Term of patent 14 years
U.S. Cl. D28—83



287,419
HAND-HELD VACUUM CLEANER
Gabriel T. Y. Ling, Tsuen Wan, Hong Kong, assignor to Conair Corporation, Edison, N.J.
Filed Apr. 16, 1984, Ser. No. 600,777
Term of patent 14 years
U.S. Cl. D32—18



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Friedr. Flender GmbH & Co. KG: *See—*
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.

AB Jonkoping Vulcan: *See—*
Severin, Eric; Jansson, Arne; and Ostman, Kjell, 4,630,734, Cl. 206-461.000.

AB Megaron: *See—*
Lovgren, Anders, 4,630,552, Cl. 110-190.000.

Abdala, Julio, Jr.; and Gasparaitis, Bernard V., to Motorola, Inc. LCD lightguide. 4,630,895, Cl. 350-345.000.

Abraham, Detlev: *See—*
Herrmann, Dietrich E.; and Abraham, Detlev, 4,631,467, Cl. 318-798.000.

ACF Industries, Incorporated: *See—*
Mandrell, Richard J., 4,630,981, Cl. 410-91.000.

Aciers et Outillage Peugeot: *See—*
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ACO Polymer Products, Inc.: *See—*
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Acorn Engineering Company: *See—*
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.

Adams, Gerald E.: *See—*
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.

Adams, William H., to Richards Technical Products, Inc. Monitoring apparatus. 4,630,449, Cl. 62-130.000.

Adler, Frank P., to Trans-Dyne, Incorporated. Bottom rod safety guard for railway brake rigging. 4,630,715, Cl. 188-210.000.

Advanced Micro Devices, Inc.: *See—*
Mazumder, Nikhil C.; and Yee, David H. B., 4,631,427, Cl. 307-455.000.

Advantest Corp.: *See—*
Shimizu, Masao, 4,631,724, Cl. 371-21.000.

AE PLC: *See—*
Blee, Timothy J.; and Deane, Norman P., 4,631,515, Cl. 340-62.000.

Aero-Vision Systems, Inc.: *See—*
Greenwald, Larry H., 4,630,821, Cl. 273-85.00G.

Aerospatiale Societe Nationale Industrielle: *See—*
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.

Agency of Industrial Science & Technology: *See—*
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Agfa Gevaert Aktiengesellschaft: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, to National Research Development Corporation. Useful in radiotherapy of chemotherapy 4-aziridino-1-nitroimidazol-1-yl-2,3-butanediols. 4,631,289, Cl. 514-397.000.

Ahroni, Joseph M. Series-parallel connected miniature light set. 4,631,650, Cl. 362-249.000.

Ahs, Wilgot, to Erress. Backrest adjusting device. 4,630,865, Cl. 297-284.000.

Aikawa, Kunihiko: *See—*
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,630,702, Cl. 180-215.000.

Airwick Industries, Inc.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
Nishii, Michiharu, 4,630,525, Cl. 91-369.00A.

Aisin-Warner Limited: *See—*
Sakakibara, Shiro, 4,630,723, Cl. 192-105.0BA.

Ajland, Kenth J. Frequency-matched signal device for persons with impaired hearing. 4,631,517, Cl. 340-326.000.

Akahori, Kazuyuki: *See—*
Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, 4,631,334, Cl. 528-202.000.

Akamatsu, Naruhiko: *See—*
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Akasofu, Kyosuke; and Kuchiki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Tool support synchronizing system for numerical control apparatus. 4,631,684, Cl. 364-474.000.

Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., to Dow Chemical Company, The. Preparation of chlorinated polyolefins. 4,631,175, Cl. 422-135.000.

Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Shield tunneling machine. 4,630,869, Cl. 299-33.000.

Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, to Tokyo Keiki Co., Ltd. Apparatus for controlling pressure and flow rate. 4,630,639, Cl. 137-486.000.

Aktiengesellschaft Adolph Saurer: *See—*
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Akundi, Rama S.: *See—*
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Al-Ko Products, Inc.: *See—*
Shifflett, David C.; and Shifflett, Dennis I., 4,631,212, Cl. 428-36.000.

Albany International Corporation: *See—*
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Alberta, Terry: *See—*
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Albertini, Rocco D.: *See—*
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., 4,630,522, Cl. 89-1.140.

Albery, Lewis L., to Cooperative Marketing Co., The. Brochure holder and blank therefor. 4,630,731, Cl. 206-425.000.

Alcan International Limited: *See—*
Turner, John H. W., 4,631,087, Cl. 106-252.000.

Alenax Corp.: *See—*
Seol, Marn T., 4,630,839, Cl. 280-255.000.

Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., to Siemens Energy & Automation, Inc. Microprocessor controlled circuit breaker trip unit. 4,631,625, Cl. 361-94.000.

Alfano, Robert R.: *See—*
Schiller, Norman H.; and Alfano, Robert R., 4,630,925, Cl. 356-318.000.

Allan, Barry D., to United States of America, Army. Afterburning reduction. 4,630,683, Cl. 169-45.000.

Allen Engineering Corporation: *See—*
Allen, J. Dewayne, 4,630,964, Cl. 404-96.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Subgrading machine. 4,630,964, Cl. 404-96.000.

Alletto, Darro F. Drum head retainer. 4,630,521, Cl. 84-413.000.

Allied Colloids Ltd.: *See—*
Dymond, Brian, 4,631,137, Cl. 252-8.514.

Allied Corporation: *See—*
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.
Malka, Jacob H.; and Friedlander, Mordechai, 4,631,484, Cl. 328-63.000.
Steer, John E., 4,630,443, Cl. 60-535.000.

Allmandinger, Donald D.; and Pifer, Richard L., to Dana Corporation. Drive axle and method of assembling same. 4,630,506, Cl. 74-713.000.

Aloka Co., Ltd.: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, to Carl-Zeiss-Stiftung. Binocular telescope with central control. 4,630,901, Cl. 350-552.000.

Altomare, Carol A., to Engelhard Corporation. Method of making seed solution useful in zeolite catalyst manufacture. 4,631,262, Cl. 502-65.000.

Aluminum Company of America: *See—*
Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.

Alwerud, Goran S.: *See—*
Park, Kyong; and Alwerud, Goran S., 4,630,473, Cl. 73-161.000.

Amann, Markus: *See—*
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus, 4,630,962, Cl. 404-2.000.

Amano, Noboru: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Amdahl Corporation: *See—*
Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., 4,631,660, Cl. 364-200.000.

Amdahl, Gene M.: *See—*
Woffinden, Gary A.; Amdahl, Gene M.; and Hanson, Donald L., 4,631,660, Cl. 364-200.000.

American Cyanamid Company: *See—*
Parekh, Girish G.; and Blank, Werner J., 4,631,320, Cl. 525-452.000.

Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.

American Hoechst Corporation: *See—*
Caines, R. Scott, 4,631,155, Cl. 264-22.000.
Goode, Sidney H., 4,630,492, Cl. 73-863.820.

American Home Products Corporation: *See—*
Hung, Paul P., 4,631,290, Cl. 514-450.000.

American Microsystems, Inc.: *See—*
Riebeek, G. Fred, 4,631,429, Cl. 307-490.000.

Ametani, Minoru, to Nitto Electric Industrial Co., Ltd. Process for peeling protective film off a thin article. 4,631,103, Cl. 156-241.000.

AMF Union Machinery Inc.: *See—*
Seiling, Samuel O., 4,630,930, Cl. 366-77.000.

Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, to Coleco Industries, Inc. Liquid squirting creature. 4,630,756, Cl. 222-78.000.

Amoco Corporation: *See—*
Zychal, Craig, 4,631,145, Cl. 252-321.000.

AMP Incorporated: *See—*
Korsunsky, Iosif; and Grabbe, Dimitry, 4,630,875, Cl. 339-17.0CF.
Renn, Robert M.; and Shoemaker, John R., 4,630,874, Cl. 339-17.00F.

Ampex Corporation: *See—*
Gabriel, Steven A.; and Evans, Lawrence J., 4,631,750, Cl. 382-41.000.
O'Gwynn, David C., 4,631,605, Cl. 360-70.000.

Anderson, Karen L.; Mintzer, Frederick C.; and Goertzel, Gerald. Method for enlarging a binary image. 4,631,751, Cl. 382-47.000.

Anderson, Richard N., to Hunter Douglas Inc. Honeycomb structure with Z-folded material and method of making same. 4,631,217, Cl. 428-118.000.

Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., to Ford Motor Company. Blast gap ignition system. 4,631,451, Cl. 315-209.00R.

Ando, Hideo, to Tokyo Shibaura Denki Kabushiki Denki. Optical apparatus for detecting the focusing state and positional accuracy of a light beam directed onto an optical disk tracking guide in an optical read/write system. 4,631,395, Cl. 250-201.000.

Andren, Kjell: *See—*
Duckman, Donald; Duckman, Curt; and Andren, Kjell, 4,630,564, Cl. 114-98.000.

Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compounds. 4,630,897, Cl. 350-350.00R.

Andrews, D. Marshall, to Harris Corporation. High density packaging technique for electronic systems. 4,631,636, Cl. 361-385.000.

Andrews, Henry L.; and Gardiner, Gregory E., to Pfizer Hospital Products Group Inc. Cobalt-chromium superalloy. 4,631,082, Cl. 75-235.000.

Angermuller, Helmut; and Hahlganss, Gunther, to VDO Adolf Schindling AG. Information input. 4,631,678, Cl. 364-424.000.

Anscherlik, Arnost. Device for dispensing doses of liquid. 4,630,753, Cl. 222-17.000.

Antico, Michael: *See—*
Coviello, Frank; and Antico, Michael, 4,631,367, Cl. 379-157.000.

Aoki, Akio, to Trion Corporation. Baseball catching means. 4,630,318, Cl. 2-19.000.

Aoshima, Kazuyoshi: *See—*
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.

Aoyama, Shuki, to Kabushiki Kaisha Toshiba. High-frequency heating device having rotatable tray and high frequency wave agitator. 4,631,379, Cl. 269-10.55F.

Aozuka, Torao: *See—*
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.

Aramaki, Jun: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Arber, Amihadar. Calendar with indicating means. 4,630,934, Cl. 368-28.000.

Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, to Allied Corporation. Electrical induction apparatus with support inside casing. 4,631,509, Cl. 336-92.000.

Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-joint arm robot apparatus. 4,631,689, Cl. 364-513.000.

Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., to General Motors Corporation. Fuel fill tube with vapor vent and overfill protection. 4,630,749, Cl. 220-86.00R.

Armstrong International, Inc.: *See—*
Vallery, Stafford J., 4,630,633, Cl. 137-185.000.

Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, to AT&T Bell Laboratories. Low resistance origination scan circuit. 4,631,362, Cl. 379-384.000.

Arola, Rodger A.; and Sall, Hans-Olof, to United States of America, Agriculture. Counter rotating double disc chunker. 4,630,658, Cl. 144-176.000.

Arroyo, Juan. Surgical instrumentation including a clamp assembly to facilitate attachment of blood vessel sections. 4,630,608, Cl. 128-335.000.

Aruga, Tamotsu: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.

Asahi Glass Company Ltd.: *See—*
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Asahi, Hidetoshi: *See—*
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Fukui, Tsutomu, 4,631,600, Cl. 358-320.000.

Asaoka, Ryuji; and Nagao, Yasuhiro, to Nippondenso Co., Ltd. Internal combustion engine starter having laminated plates simultaneously forming the switch yoke and the motor yoke. 4,631,434, Cl. 310-112.000.

Asea Aktiebolag: *See—*
Olsson, Karl-Erik, 4,631,656, Cl. 363-123.000.

Ashkin, Arthur; and Stolen, Rogers H., to AT&T Bell Laboratories. Exposed core optical fibers, and method of making same. 4,630,890, Cl. 350-96.300.

Asik, Joseph R.: *See—*
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.

Asmussen, Jes; and Reinhard, Donnie K., to Board of Trustees operating Michigan State University. Microwave or UHF plasma improved apparatus. 4,630,566, Cl. 118-50.100.

Asulab S.A.: *See—*
Leuenberger, Claude-Eric, 4,630,936, Cl. 368-66.000.

AT&T Bell Laboratories: *See—*
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Ashkin, Arthur; and Stolen, Rogers H., 4,630,890, Cl. 350-96.300.
Campbell, Joe C.; and Dentai, Andrew G., 4,631,566, Cl. 357-30.000.
Dragone, Corrado, 4,631,545, Cl. 343-779.000.
Federico, Joseph; and Waaben, Sigurd G., 4,631,355, Cl. 178-18.000.
Foschini, Gerard J., 4,631,734, Cl. 375-15.000.
Foster, Robert W.; and Weekly, Max D., 4,631,363, Cl. 379-15.000.
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., 4,631,471, Cl. 323-306.000.
Lauriello, Philip J. J.; and Slavin, Lawrence M., 4,630,886, Cl. 350-96.200.
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.

AT&T Information Systems Inc.: *See—*
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.

AT&T Technologies, Inc.: *See—*
Clark, Harold R.; and Nicol, David A., 4,631,079, Cl. 65-109.000.

Atecs Corporation: *See—*
Grant, Richard W.; and Sciulli, Ronald D., 4,630,562, Cl. 114-39.000.

Atkin, Graham E., to Austin Rover Group Limited. Internal combustion engine. 4,630,579, Cl. 123-195.00R.

Atlantic Research Corporation: *See—*
Scheffee, Robert S., 4,630,556, Cl. 110-347.000.

Atlas, Dan. Apnea monitoring apparatus. 4,630,614, Cl. 128-721.000.

Attwell, Ronald L., to Selkirk Division of Household Manufacturing Limited. Fire stop. 4,630,415, Cl. 52-221.000.

Aubrecht, Richard A., to Moog Inc. Linear force motor. 4,631,430, Cl. 310-12.000.

Auburn International, Inc.: *See—*
Newton, Robert E.; and Girgenti, Russell S., 4,631,482, Cl. 324-454.000.

Audio Precision, Inc.: *See—*
Cabot, Richard C., 4,631,522, Cl. 340-347.0CC.

Ausmus, Dee H., Jr. Earth scraper for use with a small tractor. 4,630,686, Cl. 172-393.000.

Ausprung, Erich, to Springfix-Befestigungstechnik GmbH. Ball cup for a ball bearing. 4,630,957, Cl. 403-76.000.

Austin Rover Group Limited: *See—*
Atkin, Graham E., 4,630,579, Cl. 123-195.00R.

Auto Lokari Oy: *See—*
Venetjoki, Juhani T., 4,630,701, Cl. 180-209.000.

Automated Security Holdings, Ltd.: *See—*
Marsh, John C., 4,631,526, Cl. 340-396.000.

Automobiles Citroen: *See—*
Quin, Philippe P., 4,630,527, Cl. 91-449.000.

Automobiles Peugeot: *See—*
Quin, Philippe P., 4,630,527, Cl. 91-449.000.

Avery, Leslie R., to RCA Corporation. Zener diode structure. 4,631,562, Cl. 357-13.000.

Avondale Industries, Inc.: *See—*
Shah, Chandrakant K., 4,630,536, Cl. 100-229.00R.
Votava, Ronald, 4,630,461, Cl. 72-405.000.

Axelrod, Burton, to Axelrod R & D, Inc. Waste treatment device and method using microwaves. 4,631,133, Cl. 210-739.000.

Axelrod, Joan C.; and Chibnik, Sheldon, to Mobil Oil Corporation. Cold flow improving fuel additive compound and fuel composition containing same. 4,631,071, Cl. 44-71.000.

Axelrod R & D, Inc.: *See—*
Axelrod, Burton, 4,631,133, Cl. 210-739.000.

Ayano, Mitsutoshi: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,531,366, Cl. 340-333.000.

Azionaria Costruzioni Macchine Automatiche: *See—*
Kemnitz, Tadeusz F., 4,630,696, Cl. 177-165.000.

Baatz, Gunter: *See—*
Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, 4,630,421, Cl. 52-408.000.

Babcock & Wilcox Company, The: *See—*
Barnes, Christine B., 4,630,631, Cl. 137-85.000.

Bachman, Charles W., to Bachman Information Systems, Inc. Partnership data base management system and method. 4,631,664, Cl. 364-200.000.

Bachman Information Systems, Inc.: *See—*
Bachman, Charles W., 4,631,664, Cl. 364-200.000.

Bade, Robert K., to Phillips Petroleum Company. Sample homogenizer. 4,630,469, Cl. 73-61.10C.

Baggen, Constant P. M. J.: *See—*
Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., 4,631,714, Cl. 369-59.000.

Baillie, Lloyd A.: *See—*
Senese, Frank J.; and Baillie, Lloyd A., 4,630,467, Cl. 73-49.200.

Baker, Billey E.: *See—*
Galle, Edward M.; and Baker, Billey E., 4,630,689, Cl. 175-56.000.

Baker CAC: *See—*
Cutcher, Dennis R., 4,630,636, Cl. 137-315.000.

Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, to Ferodo Ltd.; and T&N Research Ltd. Manufacture of asbestos-free friction facing material. 4,631,209, Cl. 427-392.000.

Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., to Stauffer Chemical Company. Removal of sulfur from aqueous suspension using filtration. 4,631,068, Cl. 23-293.00S.

Balch, Richard A.: *See—*
Germer, Warren R.; and Balch, Richard A., 4,631,476, Cl. 324-103.00R.

Baldt Incorporated: *See—*
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., 4,630,522, Cl. 89-1.140.

Ball, Randell D. Document storage container. 4,630,769, Cl. 232-1.00D.

Ballard, Paul T. Quasi-resonant random access deflection system for a calligraphic display monitor. 4,631,454, Cl. 315-408.000.

Ballast, Johan T. G.: *See—*
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Ballato, Arthur, to United States of America, Army. Stress compensated piezoelectric crystal device. 4,631,437, Cl. 310-369.000.

Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., to GMF Robotics Corporation. Spray paint system including paint booth, paint robot apparatus movable therein and rail mechanism for supporting the apparatus thereout. 4,630,567, Cl. 118-323.000.

Bammert, Hubert; Lahres, Hans; and Mosch, Egon, to Carl-Zeiss-Stiftung. Blank for eyeglass lenses having ellipse-like edge curves and means and method for selecting. 4,630,906, Cl. 351-159.000.

Bancroft, Lewis C.: *See—*
Chouinard, Michael P.; and Bancroft, Lewis C., 4,631,602, Cl. 360-16.000.

Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Ortho substituted dihydroxy-2(1H)quinazolinone-1-alkanoic acids. 4,631,283, Cl. 514-259.000.

Bardhan, Pronob: *See—*
Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., 4,631,268, Cl. 502-439.000.

Barmag Barmer Maschinenfabrik AG: *See—*
Bauer, Karl; Hanisch, Michael; and Lenk, Erich, 4,630,340, Cl. 28-187.000.

Barnes, Christine B., to Babcock & Wilcox Company, The. Pneumatic servo assembly for an electro-pneumatic converter. 4,630,631, Cl. 137-85.000.

Barnes, Lawrence C.; and Mankedick, Robert G., to NCR Corporation. Apparatus and its method for the simultaneous presentation of computer generated graphics and television video signals. 4,631,588, Cl. 358-149.000.

Barsan, William G., to University E.M., Inc. Treatment of cerebral ischemia with dichloroacetate. 4,631,294, Cl. 514-557.000.

Bartlett, Donald S.: *See—*
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.

Bartos, Donald M.; and Gaul, John H., Jr., to Dow Corning Corporation. Process for preparing ceramic materials. 4,631,260, Cl. 501-88.000.

Bartsch, Uwe: *See—*
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.

BASF Aktiengesellschaft: *See—*
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.
Steck, Werner; and Jakusch, Helmut, 4,631,140, Cl. 252-62.560.

Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., to International Business Machines Corporation. System for preventing the overwriting of previously optically recorded data and for reading optically recorded data during writing. 4,631,706, Cl. 365-215.000.

Battice, David R.; and Hales, Michael G., to Dow Corning Corporation. Antimicrobially effective organic foams and methods for their preparation. 4,631,297, Cl. 521-78.000.

Battisti, Angelo J.: *See—*
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.

Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, to Farmitalia Carlo Erba S.p.A. Process for the preparation of penems. 4,631,150, Cl. 540-310.000.

Bauer, Alajos Z.; and Verespej, Michael A., to Burndy Corporation. Apparatus for installing electrical on flat conductor cable. 4,630,362, Cl. 29-751.000.

Bauer, Karl; Hanisch, Michael; and Lenk, Erich, to Barmag Barmer Maschinenfabrik AG. Apparatus for drawing a warp sheet of yarns. 4,630,340, Cl. 28-187.000.

Bauman, Therese M.; and Freiberg, Alan L., to Dow Corning Corporation. Method of producing a silicone water-based elastomer. 4,631,296, Cl. 521-65.000.

Baxter, Duane W.: *See—*
Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., 4,631,706, Cl. 365-215.000.

Baxter, Paul L., to Interox Chemicals Limited. Activation. 4,631,141, Cl. 252-95.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bilstad, Arnold C.; and Brown, William C., 4,630,448, Cl. 62-60.000.
Christine, William C., 4,630,429, Cl. 53-479.000.
Olson, Raymond G., 4,631,007, Cl. 417-476.000.

Bayer Aktiengesellschaft: *See—*
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,631,275, Cl. 514-210.000.
Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, 4,631,336, Cl. 528-388.000.
Konig, Joachim; and Korte, Siegfried, 4,631,317, Cl. 525-383.000.
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
Meyer, Karl-Heinrich; Hucks, Uwe; and Horsthemke, August, 4,631,338, Cl. 528-483.000.
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.
Stendel, Wilhelm; and Voege, Herbert, 4,631,231, Cl. 428-413.000.
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Bayerische Motoren Werke AG: *See—*
Bez, Ulrich, 4,630,858, Cl. 296-146.000.

BBC Brown, Boveri & Company, Limited: *See—*
Frutschi, Hansulrich, 4,630,436, Cl. 60-39.183.

Beane, Thomas F. Method of suppressing the effects of static electricity in a tumble drier for textile goods. 4,631,630, Cl. 361-212.000.

Beasley, Thomas R.; and Teng, Chuan C., to Dailey Petroleum Services Corp. Spiralling tapered slip-on drill string stabilizer. 4,630,690, Cl. 175-57.000.

Beck, James R., to Eli Lilly and Company. Cyanopyrazole intermediates. 4,631,343, Cl. 546-279.000.

Becker, John H. Air encasement system for transportation of particulates. 4,630,975, Cl. 406-85.000.

Bedard, James F.: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.

Bedford Engineering Co.: *See—*
Bradley, William P., 4,630,768, Cl. 229-92.700.

Beech, Brian H., to Independent Broadcasting Authority. Phase lock loop television signal demodulator. 4,631,487, Cl. 329-50.000.

Beecham Group Plc: *See—*
Cassidy, Frederick, 4,631,282, Cl. 514-254.000.

Beers, William W.; and Parham, Thomas G., to General Electric Company. Aluminate phosphor. 4,631,144, Cl. 252-301.40R.

Beiersdorf Aktiengesellschaft: *See—*
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, 4,631,295, Cl. 514-558.000.
Stenzel, Wolfgang; and Hofferber, Eva, 4,631,281, Cl. 514-252.000.

Belanger, Germain: *See—*
Lalancette, Jean M.; and Belanger, Germain, 4,631,183, Cl. 423-659.000.

Belanger, Victor, to Monogram Industries, Inc. Tactile engaging wrenching mechanism. 4,630,510, Cl. 81-55.000.

Belcher, Henry. Cutting tool. 4,630,976, Cl. 407-65.000.

Bell Communications Research, Inc.: *See—*
Miller, Stewart E., 4,631,730, Cl. 372-50.000.

Bell, L. James, to O. Ruben Pettersson. Lock for sliding doors. 4,630,853, Cl. 292-258.000.

Bell, Thomas W.; and Shurman, Louis W., to Firestone Tire & Rubber Company, The. Tire construction utilizing low-twist body ply yarn with low turn-up ends. 4,630,663, Cl. 152-541.000.

Belleli, Riccardo, to Belleli S.p.A. Clamping assembly heat exchanger tube plates. 4,630,673, Cl. 165-158.000.

Belleli S.p.A.: *See—*
Belleli, Riccardo, 4,630,673, Cl. 165-158.000.

Beloit Corporation: *See—*
Mulfarth, Werner, 4,630,783, Cl. 242-56.00A.
Ng, David T.; and Brendemuehl, Roger C., 4,631,682, Cl. 364-471.000.

Belokin, Paul, Jr. Modular display stand. 4,630,740, Cl. 211-194.000.

Belthle, Heinz, to Schaudt Maschinenbau GmbH. Method and machine for grinding rotationally symmetrical workpieces. 4,630,403, Cl. 51-105.0VG.

Bend Research, Inc.: *See—*
Johnson, Bruce M., 4,631,157, Cl. 264-41.000.

Bender, Roland A.; Howarth, Lawrence R.; and Coar, Lawrence F. Low cost sonobuoy. 4,631,709, Cl. 367-4.000.

Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, to USM Corporation. Method of an apparatus for lasting sides of shoes on lasts, comprising a side tack insertion device. 4,630,325, Cl. 12-8.100.

Benedetti, Nicholas M.: *See—*
Osterland, Robert W.; and Benedetti, Nicholas M., 4,630,338, Cl. 24-293.000.

Beneze, Heinz W., to Firestone Tire & Rubber Company, The. Penetrating roofing mechanical fastening sealing system and method. 4,630,422, Cl. 52-410.000.

Bennett, Allyn N., to Du Pont de Nemours, E. I., and Company. Uniform cover sheet with rough surface in a photosensitive element. 4,631,246, Cl. 430-271.000.

Benson, Inc.: *See—*
Collins, Galen, 4,631,740, Cl. 377-76.000.

Berg, Lloyd; and Yeh, An-I. Dehydration of ethanol by extractive distillation. 4,631,115, Cl. 203-19.000.

Berg Steel Pipe Corp.: *See—*
Koehle, Siegfried E., 4,630,646, Cl. 138-96.00R.

Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., to Wang Laboratories, Inc. Compression and expansion of digitized voice signals. 4,631,746, Cl. 381-35.000.

Bergin, John A.; and Cangiano, Frank, to GTE Products Corporation. Replaceable automobile headlight lamp unit and automobile headlight utilizing same. 4,631,651, Cl. 362-267.000.

Bergstrom, Gary C.; and Lambert, Michael B., to United States of America, Agriculture. Method and instrument to estimate the weights of green trees and logs. 4,630,481, Cl. 73-437.000.

Bergwerksverband GmbH: *See—*
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.

Berkenhoff GmbH: *See—*
Dommer, Erich; and Groos, Heinrich, 4,631,237, Cl. 428-621.000.

Berkley and Company, Inc.: *See—*
Tretinyak, Carl W., 4,630,616, Cl. 128-753.000.

Berlin, Herbert, to Hauni-Werke Korber & Co. KG. Apparatus for testing rod-shaped articles of the tobacco processing industry. 4,630,466, Cl. 73-38.000.

Bernander, Karl-Gustav: *See—*
Engstrom, Bjorn M. H.; and Bernander, Karl-Gustav, 4,630,412, Cl. 52-1.000.

Bernet, Yvon: *See—*
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.

Bernstein, Robert E.; and Nelson, Alan E., to Larad Equipment Corporation. Flow device with resilient elastomeric sleeve. 4,630,635, Cl. 137-315.000.

Berry, Ivan L.: *See—*
Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., 4,631,704, Cl. 365-126.000.

Berthet, Hubert; Laugier, Noel; and Ricome, Bernard, to Institut Francais du Petrole. Realization procedure of a modular system particularly suitable for use off coasts. 4,630,968, Cl. 405-195.000.

Berthiez-Saint-Etienne: *See—*
Roux, Jean-Pierre, 4,630,979, Cl. 409-232.000.

Bertotti, Franco: *See—*
Foroni, Mario; and Bertotti, Franco, 4,631,561, Cl. 357-13.000.

Bertozzi, Albert. Plastic coated bowling pin. 4,630,820, Cl. 273-82.00R.

Beta B.V.: *See—*
Spa, Lambertus K. J., 4,630,645, Cl. 137-625.600.

Betterton, Joseph T.; and Glover, Alfred H., to Chrysler Motors Corporation. Transducer fastening device. 4,630,480, Cl. 73-431.000.

Betts, Robert E.: *See—*
Thorn, Lawrence B.; and Betts, Robert E., 4,630,539, Cl. 102-202.000.

Betts, William L.; and Zuranski, Edward, to Paradyne Corporation. Gain tracker for digital modem. 4,631,738, Cl. 375-98.000.

Betz, Wolfgang, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Fluid flow engine, especially power engine acted upon by gas. 4,630,995, Cl. 416-7.000.

Bez, Ulrich, to Bayerische Motoren Werke AG. Multi-purpose passenger motor vehicle, especially station wagon. 4,630,858, Cl. 296-146.000.

Biale, John, to Union Oil Company of California. Bonding method employing composition for improved adhesion of vinylidene chloride latex to ionomer films. 4,631,235, Cl. 428-518.000.

Biasioli, Stefano: *See—*
Feriani, Mariano; and Biasioli, Stefano, 4,630,727, Cl. 206-221.000.

BICC Public Limited Company: *See—*
Taylor, John E., 4,630,887, Cl. 350-96.230.

Bickel, Karl L.: *See—*
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.

Bienert, Horst; and Kohlpaintner, Georg, to Webasto-Werk W. Baier GmbH & Co. Wind deflector arrangement for a motor vehicle roof. 4,630,859, Cl. 296-217.000.

Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, to Robert Bosch GmbH. Flow rate meter. 4,630,487, Cl. 73-861.760.

Bierschenk, Thomas R., to Dow Chemical Company, The. Graphite composite chips. 4,631,200, Cl. 427-113.000.

Bilewski, Fred: *See—*
Coplan, Myron J.; and Bilewski, Fred, 4,631,128, Cl. 210-321.500.

Billings, Philip A.: *See—*
Figueira, Stephen; and Billings, Philip A., 4,630,722, Cl. 192-84.00T.

Bilstad, Arnold C.; and Brown, William C., to Baxter Travenol Laboratories, Inc. Container for storing solid living tissue portions. 4,630,448, Cl. 62-60.000.

Bingley, John D., to RCA Corporation. Current surge limited power supply. 4,631,470, Cl. 323-282.000.

Bio-Support Industries Ltd.: *See—*
Roberts, Frank L., 4,630,863, Cl. 297-219.000.

Biotechnology Research Partners, Ltd.: *See—*
Dale, Beverly; and Cordell, Barbara, 4,631,191, Cl. 424-88.000.

Biraud, Lucien, to Thomson CSF. Stud and a support for fixing an electronic component to a printed circuit board. 4,631,639, Cl. 361-417.000.

Bird, Graham J.: *See—*
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.

Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., to Motorola, Inc. Integrated circuit having buried oxide isolation and low resistivity substrate for power supply interconnection. 4,631,570, Cl. 357-49.000.

Bisbing, Robert H., to Southco, Inc. Adjustable friction plastic hinge having non-squeak properties. 4,630,332, Cl. 16-273.000.

Biziere, Kathleen: *See—*
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.

Bjurling, Anders, to Dynatrans Technology Ltd. Lifting yoke for containers. 4,630,855, Cl. 294-81.210.

Blackledge, Mick: *See—*
Winch, Peter C.; and Blackledge, Mick, 4,630,437, Cl. 60-204.000.

Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, to Bayer Aktiengesellschaft. Thermosetting cyanate resin and the use thereof for the production of composite materials and IPNs. 4,631,319, Cl. 525-437.000.

Blandy, Geoffrey O., to International Business Machines Corporation. Active wait. 4,631,674, Cl. 364-300.000.

Blank, Werner J.: *See—*
Parekh, Girish G.; and Blank, Werner J., 4,631,320, Cl. 525-452.000.

Blee, Timothy J.; and Deane, Norman P., to AE PLC. Vehicle gear shift indicator. 4,631,515, Cl. 340-62.000.

Blehm, Lynne; Makek, James R.; and White, W. Curtis, to Dow Corning Corporation. Aqueous emulsions using cationic silanes. 4,631,273, Cl. 514-29.000.

Blenkush, Brian J., to Colder Products Company. Multiple tube connector. 4,630,847, Cl. 285-29.000.

Blohm & Voss AG: *See—*
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.

Blom, C. James, to Roxor Corporation. Elimination of internal reflections and diffractions from junctures in, and at the periphery of, a segmented mirror. 4,630,905, Cl. 350-613.000.

Blue Giant Equipment of Canada Ltd.: *See—*
Davey, Jack E., 4,630,989, Cl. 414-401.000.

Board of Trustees operating Michigan State University: *See—*
Asmussen, Jes; and Reinhard, Donnie K., 4,630,566, Cl. 118-50.100.

Bober, Vincent J.: *See—*
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,631,511, Cl. 336-180.000.

BOC Group, Inc., The: *See—*
Miles, James J.; and Smith, John M., 4,630,486, Cl. 73-861.560.

Bochumer Eisenhuette Heintzmann GmbH & Co. KG: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, to Janssen Pharmaceutica N.V. Anti-protozoal α-aryl-4-(4,5-dihydro-3,5-dioxo-1,2,4-triazin-2(3H)-yl)-benzeneacetonitrile derivatives, pharmaceutical compositions, and method of use therefor. 4,631,278, Cl. 514-242.000.

Boehm, Bernard; and Lacroix, Marc. Method of and apparatus for testing a metal body by means of eddy currents. 4,631,688, Cl. 364-507.000.

Boeing Company, The: *See—*
Chamberlain, Theron R., 4,630,441, Cl. 60-413.000.
Fenner, James A., 4,630,982, Cl. 410-102.000.
Knowlton, Dale E., 4,630,463, Cl. 72-479.000.
Rosenberg, Jerome C., 4,630,789, Cl. 244-135.00R.

Boeke, Burkhard; and Kalka, Josef, to Huels Aktiengesellschaft. Process for the production of paste-forming polymers of vinyl. 4,631,324, Cl. 526-212.000.

Boella, Marcello; and Carena, Ugo, to Ing C. Olivetti & C., S.p.A. Device for controlling the rotary movement of a platen. 4,630,949, Cl. 400-568.000.

Bofors Nobel, Inc.: *See—*
Hills, Blair H.; and Crispino, Vincent J., 4,631,156, Cl. 264-37.000.

Bohan, John E., Jr., to Honeywell Inc. Temperature controller with temperature limiting sensor. 4,631,626, Cl. 361-104.000.

Bohnes, Karlheinz: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Bomford, James A. Clamping yoke for concrete forms. 4,630,797, Cl. 249-20.000.

Bonanno, Carmine. Guitar controller for a music synthesizer. 4,630,520, Cl. 84-1.160.

Boni, Renato, to Massey-Ferguson Services N.V. Vehicle drive arrangement. 4,630,720, Cl. 192-48.800.

Bonnet, Ludwig, to Richard Wolf GmbH. Uretero-renoscope. 4,630,598, Cl. 128-7.000.

Bonucci, Peter A., to UF Genetics, Inc. Production of hybrid "improved supersweet" sweet corn. 4,630,393, Cl. 47-58.000.

Boomgaard, Dirk J.: *See—*
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.

Borg Instruments GmbH: *See—*
Cremers, Rolf A., 4,630,894, Cl. 350-338.000.

Borg-Warner Corporation: *See—*
Smirl, Richard L., 4,630,504, Cl. 74-689.000.

Born, Joseph H.: *See—*
Hollis, Ernest E.; and Born, Joseph H., 4,631,420, Cl. 307-272.00R.

Borras, Jaime A.; and Suarez, Jose I., to Motorola, Inc. Battery saving system for a frequency synthesizer. 4,631,496, Cl. 331-1.00A.

Boschert Incorporated: *See—*
Small, Kenneth T., 4,631,653, Cl. 363-17.000.

Bosne, Georges J. P. E., to Hamon-Industries. Thermoformed sheet for a plate-type gas-gas heat exchanger and the exchanger including said sheet. 4,631,213, Cl. 428-53.000.

Bosshard, Ernst, to Sulzer Brothers Limited. Rack for storing nuclear fuel elements. 4,630,738, Cl. 211-60.100.

Boteler, William C., to Harvey Hubbell Incorporated. Cover assembly for electrical outlet box. 4,631,354, Cl. 174-66.000.

Bourland, Tommy E. Two bladed wallpaper trimmer. 4,630,369, Cl. 30-294.000.

Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., to International Business Machines Corporation. Apparatus and method for assembling parts. 4,630,344, Cl. 29-149.50R.

Boyle, William G.; and Fisher, Ernest P., Jr., to Otis Engineering Corporation. Molded ring seal with end support rings. 4,630,833, Cl. 277-188.00A.

BPB Industries Public Limited Company: *See—*
Pilgrim, Thomas A., 4,630,419, Cl. 52-309.130.

Braa, Lloyd W.: *See—*
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.

Brackelmanns, Norbert W.: *See—*
Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., 4,631,564, Cl. 357-23.400.

Bradley, David J.; and Ott, William B., to International Business Machines Corporation. Interrupt level sharing. 4,631,670, Cl. 364-200.000.

Bradley, William P., to Bedford Engineering Co. Envelope and enclosure sheet. 4,630,768, Cl. 229-92.700.

Braga, Thomas G.: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.

Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., to FMC Corporation. Flame retardant allylic esters of tetrabromophthalic acid and flame retardant polymers containing same. 4,631,148, Cl. 252-609.000.

Brancher, Rodney E.: *See—*
White, Robert M.; and Brancher, Rodney E., 4,630,852, Cl. 292-87.000.

Brandes, Wilhelm: *See—*
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.

Branson International Plasma Corporation: *See—*
Carroll, John C.; and Shepherd, Robert A., Jr., 4,631,105, Cl. 156-345.000.

Brantingham, George L.: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.

Braun, Hilarion; Lush, Linda; and Lehman, Scott, to Eastman Kodak Company. Method and apparatus for adjusting stimulation amplitude in continuous ink jet printer. 4,631,549, Cl. 346-1.100.

Braun, Robin M., to Plessey South Africa Limited. Injection locked RF oscillator with control hoop. 4,631,497, Cl. 331-4.000.

Brausfeld, Walter; and Meyer, Ernst-August, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Sealing arrangement for a slide valve. 4,630,800, Cl. 251-324.000.

Bray, Donald J.: *See—*
Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.

Bray, James C.: *See—*
Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.

Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., to Texas Instruments Incorporated. Electronic handheld translator having miniature electronic speech synthesis chip. 4,631,748, Cl. 381-51.000.

Breen, Thomas J., to Rand McNally & Co. Self-locking baggage tag. 4,630,384, Cl. 40-21.00R.

Brendemuehl, Roger C.: *See—*
Ng, David T.; and Brendemuehl, Roger C., 4,631,682, Cl. 364-471.000.

Bricot, Claude: *See—*
Romeas, Rene; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.

Bridgestone Corporation: *See—*
Dan, Takuya; and Orikawa, Michihiro, 4,630,806, Cl. 267-140.100.
Ushijima, Takao; and Yamazaki, Harumichi, 4,630,808, Cl. 267-140.100.

Briggs & Stratton Corp.: *See—*
Santi, John D., 4,630,498, Cl. 74-445.000.

Brilman, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Addressable photodetector array. 4,631,417, Cl. 250-578.000.

Brink, Heinz-Deiter: *See—*
Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus, 4,630,962, Cl. 404-2.000.

Bristol-Myers Company: *See—*
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.

British Nuclear Fuels plc: *See—*
Hepworth, Ian C., 4,630,628, Cl. 137-12.000.

Brodeur, Lester R., to Sanders Associates, Inc. Method and apparatus for reducing the effects of impulse noise in Loran-C receivers. 4,631,543, Cl. 342-389.000.

Broedner, Walter F., to Video-7 Incorporated. RGB interface. 4,631,692, Cl. 364-518.000.

Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., to Northern Telecom Limited. Electronic apparatus with electro-magnetic interference screening. 4,631,641, Cl. 361-424.000.

Brooke, Raymond; and Palombo, Gaston, to Computer Memories, Inc. Capacitive encoder having multiple precision outputs. 4,631,524, Cl. 340-347.00P.

Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., to United States of America, Army. Remote sensing of vehicle tire pressure. 4,630,470, Cl. 73-146.200.

Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH: *See—*
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Brose Fahrzeugteile GmbH: *See—*
Schust, Gerhard, 4,630,398, Cl. 49-352.000.

Brown, Ann H. Method of treating fingernails and cuticles. 4,631,186, Cl. 424-61.000.

Brown, Donald W., Jr.; and Kohler, Mark L., to T.J. Gundlach Machine Company. Apparatus and method for removing crushing rolls from a crushing apparatus. 4,630,781, Cl. 241-159.000.

Brown, Edward M.: *See—*
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.

Brown, Larry L.; and Lisle, Jerry H., to Brown, Larry L. Sweat band apparatus. 4,630,317, Cl. 2-12.000.

Brown, Mark E.: *See—*
Piatt, Michael J.; and Brown, Mark E., 4,631,550, Cl. 346-1.100.

Brown, Paul R., to RCA Corporation. Grooved waveguide shorting block and method of assembly. 4,631,503, Cl. 333-24.100.

Brown, William C.: *See—*
Bilstad, Arnold C.; and Brown, William C., 4,630,448, Cl. 62-60.000.

Brown & Williamson Tobacco Corp.: *See—*
Korte, Kevin R.; and Wu, Dan T., 4,630,619, Cl. 131-296.000.

Brownrigg, James K.: *See—*
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., 4,631,472, Cl. 323-325.000.

Brugliera, Vito; Green, George R. J.; and Long, Michael E., to Zenith Electronics Corporation. Time programmable control system for a converter/VCR system. 4,631,601, Cl. 358-335.000.

Brun, Norbert, to Cibie Projecteurs. Adaptor for coupling a light guide to a light source, in particular for providing an integrated side light in a motor vehicle headlamp assembly. 4,631,642, Cl. 362-32.000.

Bruning, Donald D.: *See—*
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.

Brunon, Jean-Marc, to Commissariat a l'Energie Atomique. Method for the production of a nuclear reactor assembly and assembly obtained by this method. 4,631,167, Cl. 376-446.000.

Brunswick Corporation: *See—*
McCormick, Daniel F., 4,630,719, Cl. 192-21.000.

Buchegger, Rudolf; and Langeder, Rudolf, to Voest-Alpine Aktiengesellschaft. Coiler. 4,630,785, Cl. 242-72.100.

Buchel, Karl H.: *See—*
Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, 4,631,288, Cl. 514-340.000.

Buckley, James F., to Gym Bee Enterprises, Inc. Recreation apparatus. 4,630,817, Cl. 272-73.000.

Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, to Bayer Aktiengesellschaft. Hydrogenation of nitrile group-containing unsaturated polymers. 4,631,315, Cl. 525-338.000.

Buding, Hartmuth: *See—*
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.

Bunner, Charles B. D.: *See—*
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Bunse, Peter: *See*—
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.

Burandt, Wesley A., to Sundstrand Corporation. Variable displacement hydraulic pressure intensifier. 4,631,000, Cl. 417-225.000.

Burback, Ronald E.: *See*—
Windows, David W.; and Burback, Ronald E., 4,630,627, Cl. 135-112.000.

Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., to Deere & Company. Force control system including bypass flow path for implement with relatively movable frame parts. 4,630,526, Cl. 91-452.000.

Burkeen, Ralph D.; and Labender, Ron. Fishing gear permitting switching to heavy line for landing. 4,630,390, Cl. 43-43.110.

Burkett, Cullen L. Apparatus and method for securely fastening various pierced earring posts. 4,630,453, Cl. 63-12.000.

Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, to Johannes Heidenhain GmbH. Position measuring system. 4,631,404, Cl. 250-237.00G.

Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J. High speed, high resolution image processing system. 4,631,598, Cl. 358-280.000.

Burlington Industries, Inc.: *See*—
Hussamy, Samir, 4,631,067, Cl. 8-464.000.

Burndy Corporation: *See*—
Bauer, Alajos Z.; and Verespej, Michael A., 4,630,362, Cl. 29-751.000.

Burron Medical, Inc.: *See*—
Raines, Kenneth C., 4,631,058, Cl. 604-263.000.

Burroughs Corporation: *See*—
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,631,666, Cl. 364-200.000.
Romania, Samuel R.; and Steen, Grant F., 4,631,637, Cl. 361-413.000.
Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., 4,631,608, Cl. 360-99.000.

Burt, Edward A.: *See*—
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,631,349, Cl. 568-789.000.

Burton, James R.; and Kushner, David J., to Texaco Inc. Corrosion inhibiting metal working fluid. 4,631,139, Cl. 252-49.300.

Burton, Trevor: *See*—
Taylor, Frank; and Burton, Trevor, 4,630,358, Cl. 29-594.000.

Buss, Waldeen C.; and Hughes, Thomas R., to Chevron Research Company. Method of dehydrocyclizing alkanes. 4,631,123, Cl. 208-138.000.

Butler, John D., to Mechtrix Corporation. Method of using an elliptical form to generate a perfect radius in an insulated electrical conductor stripping blade. 4,630,406, Cl. 51-285.000.

Butlin, Duncan M., to Hughes Tool Company. Submersible pump pressure detection circuit. 4,631,535, Cl. 340-856.000.

Buttner, Erwin: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Buxbaum, Gunter: *See*—
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.

Buxton, Forrest T.: *See*—
Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J., 4,631,598, Cl. 358-280.000.

C. A. Weidmuller GmbH & Co.: *See*—
Wiener, Hans; and Undin, Hans, 4,630,462, Cl. 72-410.000.

Cabot, Richard C., to Audio Precision, Inc., a part interest. Method and circuit for compensation of a multiplying digital-to-analog converter. 4,631,522, Cl. 340-347.0CC.

Caines, R. Scott, to American Hoechst Corporation. Process for manufacture of surface-modified oriented polymeric film. 4,631,155, Cl. 264-22.000.

Calderazzo, Mark A.: *See*—
Frankenberg, Robert E.; and Calderazzo, Mark A., 4,631,020, Cl. 425-527.000.

Caldwell, Gary L.: *See*—
Valteris, Ramunas L.; and Caldwell, Gary L., 4,631,018, Cl. 425-445.000.

Calhoun, Donald F., to Hughes Aircraft Company. Means and method of reducing the number of masks utilized in fabricating complex multi-level integrated circuits. 4,631,569, Cl. 357-45.000.

California Institute of Technology: *See*—
Tanner, John E.; and Mead, Carver A., 4,631,400, Cl. 250-221.000.

Calvert, Wilson D., Sr.: *See*—
Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.

Calviello, Joseph A., to Eaton Corporation. MOMS tunnel emission transistor. 4,631,560, Cl. 357-6.000.

Camden, Thomas M., Jr., to Westinghouse Electric Corp. High utilization fuel assembly. 4,631,166, Cl. 376-435.000.

Camillo Corvi S.p.A.: *See*—
Mora, Camillo C., 4,631,293, Cl. 514-530.000.

Campbell, Joe C.; and Dentai, Andrew G., to AT&T Bell Laboratories. Long wavelength avalanche photodetector. 4,631,566, Cl. 357-30.000.

Campell, Jeptha E., to Spiral Systems, Inc. Apparatus for precisely dispensing free flowing solids. 4,630,755, Cl. 222-56.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Poirier, Marc-Andre , 4,631,088, Cl. 106-273.00R.

Canadian Patents and Deveopment Limited—Societe Canadienne des Brevets et d'Exploitation Limitee: *See*—
Korba, Larry, 4,631,702, Cl. 364-900.000.

Candelaria, Rodolfo, Jr.: *See*—
Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., 4,630,344, Cl. 29-149.50R.

Cangiano, Frank: *See*—
Bergin, John A.; and Cangiano, Frank, 4,631,651, Cl. 362-267.000.

Canon Kabushiki Kaisha: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.
Imai, Shunzo; and Ishiyama, Ichiro, 4,630,922, Cl. 355-55.000.
Kaneko, Shuzo, 4,631,559, Cl. 346-160.000.
Kato, Masatake; and Ikemori, Keiji, 4,630,899, Cl. 350-427.000.
Kinoshita, Takao; and Sakai, Shinji, 4,631,593, Cl. 358-213.000.
Mochizuki, Noritaka; and Minami, Setsuo, 4,630,902, Cl. 350-570.000.
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, 4,631,578, Cl. 358-80.000.
Terasawa, Koji, 4,631,554, Cl. 346-140.00R.
Toyomura, Shigeru, 4,631,418, Cl. 307-200.00A.
Watanabe, Yoshitaka; and Endo, Takashi, 4,631,556, Cl. 346-140.00R.
Yaguchi, Tatsuya, 4,631,596, Cl. 358-256.000.

Capella, Joseph A.; and Fowler, David E., to Quadrex HPS, Inc. Tool decontamination apparatus. 4,630,625, Cl. 134-104.000.

Card, Joseph L.: *See*—
Card, Roy T.; and Card, Joseph L., 4,630,558, Cl. 112-266.200.

Card, Roy T.; and Card, Joseph L. Tufting machine and method of tufting for producing multiple rows of tufts with single lengths of yarn. 4,630,558, Cl. 112-266.200.

Carena, Ugo: *See*—
Boella, Marcello; and Carena, Ugo, 4,630,949, Cl. 400-568.000.

Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See*—
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Erhardt, Manfred; and Loos, Herbert, 4,630,404, Cl. 51-105.0GG.

Carl-Zeiss-Stiftung: *See*—
Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, 4,630,901, Cl. 350-552.000.
Bammert, Hubert; Lahres, Hans; and Mosch, Egon, 4,630,906, Cl. 351-159.000.

Carlsson, Kjell S., to Sarastro AB. Method and apparatus for microphotometering microscope specimens. 4,631,581, Cl. 358-93.000.

Carr, Neil: *See*—
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.

Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, to Societe Anonyme D.B.A. Disc brake with sliding caliper. 4,630,713, Cl. 188-73.440.

Carreno, Victor A., to United States of America, National Aeronautics and Space Administration. Single frequency multitransmitter telemetry system. 4,631,538, Cl. 340-870.180.

Carrier Corporation: *See*—
Wellman, Donald C.; and Clark, William E., 4,630,670, Cl. 165-16.000.

Carroll, John C.; and Shepherd, Robert A., Jr., to Branson International Plasma Corporation. Plasma etching apparatus. 4,631,105, Cl. 156-345.000.

Carron & Company: *See*—
Malicki, Raymond W., 4,630,490, Cl. 73-862.650.

Casio Computer Co., Ltd.: *See*—
Usami, Ryuuzi, 4,630,518, Cl. 84-1.030.

Caspell, George J., to Tektronix, Inc. Digital-to-analog converter biasing control circuit. 4,631,518, Cl. 340-347.0DA.

Casper, Robert K.; and Runner, James F., to Koch Carbon Inc. Calcining process using fluid coke fuel. 4,631,025, Cl. 432-15.000.

Cassidy, Frederick, to Beecham Group Plc. Antihypertensive chromans and chromenes. 4,631,282, Cl. 514-254.000.

Catalysts & Chemicals Industries Co., Ltd.: *See*—
Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, 4,631,261, Cl. 502-65.000.

Caterpillar Inc.: *See*—
Huck, Francis B., Jr.; and Janzen, David C., 4,630,685, Cl. 172-7.000.

Cato Research Corporation: *See*—
Kruesi, Paul R., 4,631,176, Cl. 423-100.000.

Cavada, David R.; and Golick, Leonard R., to Westinghouse Electric Corp. Reactor vessel stud cleaning machine. 4,630,410, Cl. 51-410.000.

Cavallaro, Robert E.: *See*—
Whiteside, George D.; and Cavallaro, Robert E., 4,630,915, Cl. 354-275.000.

Cawkell, Anthony E., to Institute for Scientific Information, Inc. Selective optoelectronic copier. 4,631,599, Cl. 358-285.000.

CDP, Ltd.: *See*—
Eeer, Gunes M., 4,630,692, Cl. 175-330.000.

Central Glass Company Limited: *See*—
Koishi, Toshio; and Yasumura, Takashi, 4,631,326, Cl. 526-249.000.

Central Plastics Company: *See*—
Ramsey, Russel G., 4,631,107, Cl. 156-359.000.

Central Sprinkler Corporation: *See*—
Pieczykolan, George S., 4,630,682, Cl. 169-38.000.

Cetus Corporation: *See*—
Gelfand, David H., 4,631,257, Cl. 435-68.000.

Chadwell, Thomas J.: *See*—
Schneider, Michael H.; and Chadwell, Thomas J., 4,630,377, Cl. 33-181.0AT.

Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., to International Business Machines Corp. Tubular squeeze bearing apparatus with rotational restraint. 4,630,941, Cl. 384-1.000.

Chakraborty, Utpal R.; and Youssefyeh, Raymond D., to USV Pharmaceutical Corp. Aryl and heteroaryl ethers as agents for the treatment of hypersensitive ailments. 4,631,287, Cl. 514-307.000.

Challenge Tool & Manufacturing, Inc.: *See*—
Redmon, Larry, 4,631,044, Cl. 474-114.000.

Chamberlain, Theron R., to Boeing Company, The. Electrohydraulic actuator for aircraft control surfaces. 4,630,441, Cl. 60-413.000.

Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., to Spray-All, Inc. Fluid medium compressor and user apparatus. 4,631,003, Cl. 417-151.000.

Chandra, Grish; and Kwai Lo, Peter Y., to Dow Corning Corporation. Platinum (O) alkyne complexes and a method for their preparation. 4,631,310, Cl. 524-862.000.

Chang, Richard; and Nakano, Walter, to Mattel, Inc. Miniature flywheel car for side-wheelie stunts. 4,631,041, Cl. 446-233.000.

Chapman, Malcolm R., to Grumman Aerospace Corporation. Transportable solar power station. 4,630,791, Cl. 244-173.000.

Chard, Brian C., to Imperial Group PLC. Apparatus and method for forming a rod of smokeable material. 4,630,618, Cl. 131-84.300.

Charles Stark Draper Laboratory, Inc., The: *See*—
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.

Charrier, Bertrand: *See*—
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, 4,630,997, Cl. 416-90.00A.

Chart Industries Limited: *See*—
Wickmann, John T.; and Olak, Richard, 4,630,379, Cl. 33-288.000.

Cheever, Richard N., to Tetra Pak Developpement SA. Readily attachable and detachable electron-beam permeable window assembly. 4,631,444, Cl. 313-420.000.

Chemische Fabrik Stockhausen GmbH: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.

Chevron Research Company: *See*—
Buss, Waldeen C.; and Hughes, Thomas R., 4,631,123, Cl. 208-138.000.
Plavac, Frank, 4,631,070, Cl. 44-63.000.

Chew, Ju-Nam, to Mobil Oil Corporation. Separation of mixtures of bituminous coal and lower rank coal by selective chemical comminution. 4,630,778, Cl. 241-1.000.

Chiang, Ming-Yao; and Chiang, Pei-Leh. Gravitationally-operating collapsible basket. 4,630,747, Cl. 220-7.000.

Chiang, Pei-Leh: *See*—
Chiang, Ming-Yao; and Chiang, Pei-Leh, 4,630,747, Cl. 220-7.000.

Chibnik, Sheldon: *See*—
Axelrod, Joan C.; and Chibnik, Sheldon, 4,631,071, Cl. 44-71.000.

Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., to International Business Machines Corporation. Macroinstruction execution in a microprogram-controlled processor. 4,631,663, Cl. 364-200.000.

Chilton, James E. Hydrant valve tool. 4,630,347, Cl. 29-213.00R.

Chin, Albert K., to Fogarty, Thomas J. Dilatation catheter method and apparatus. 4,630,609, Cl. 128-344.000.

Chipman-Union, Inc.: *See*—
Lingenfelter, Ralph E., 4,630,455, Cl. 66-172.00R.

Chloride Systems, a division of Chloride Power Electronics, Incorporated: *See*—
McCue, Robert J.; and Minter, Ronald H., 4,631,649, Cl. 362-183.000.

Chmelir, Miroslav: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.

Chouinard, Michael P.; and Bancroft, Lewis C., to Du Pont de Nemours, E. I., and Company. Process for thermoremanent duplication of magnetic tapes using transverse laser beams spanning the tape width. 4,631,602, Cl. 360-16.000.

Christensen, Clad P. High frequency RF discharge laser. 4,631,732, Cl. 372-87.000.

Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., to Witco Corporation. Pipe varnish compositions and use thereof. 4,631,083, Cl. 106-14.230.

Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., to International Business Machines Corporation. Method of forming recessed oxide isolation with reduced steepness of the birds' neck. 4,630,356, Cl. 29-576.00W.

Christine, William C., to Baxter Travenol Laboratories, Inc. Apparatus and method for sealing a web of film in a form, fill, and seal packaging system. 4,630,429, Cl. 53-479.000.

Chrysler Motors Corporation: *See*—
Betterton, Joseph T.; and Glover, Alfred H., 4,630,480, Cl. 73-431.000.
Durand, Remie P., 4,630,880, Cl. 339-176.00L.
Kissel, William R., 4,631,628, Cl. 361-154.000.
Kronberger, Leonard J., 4,631,370, Cl. 200-19.00R.
Kronberger, Leonard J., 4,631,371, Cl. 200-19.0DC.
Kronberger, Leonard J., 4,631,372, Cl. 200-19.00R.
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., 4,630,472, Cl. 73-161.000.

Chu, Mosi; and Kuo, Meng S., to Primages, Inc. Paper bail for a printer and associated methods of operation thereof. 4,630,950, Cl. 400-639.100.

Chvapil, Milos: *See*—
Stoy, Vladimir A.; and Chvapil, Milos, 4,631,188, Cl. 424-81.000.

Ciba-Geigy AG: *See*—
Howell, Frederick H., 4,631,252, Cl. 430-551.000.

Ciba-Geigy Corporation: *See*—
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, 4,631,065, Cl. 8-549.000.

Cibie Projecteurs: *See*—
Brun, Norbert, 4,631,642, Cl. 362-32.000.

Cincinnati Microwave, Inc.: *See*—
Grimsley, Richard L., 4,631,542, Cl. 342-20.000.

Cincinnati Milacron Inc.: *See*—
Rudisill, Carl D., 4,630,811, Cl. 269-118.000.

Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, to Ferraz. Electro-mechanical devices incorporating fuse cartridges. 4,631,508, Cl. 335-142.000.

Cinzori, Robert J.; and Kern, Mark T., to Santa Barbara Research Center. Fire sensing and suppression method and system responsive to optical radiation and mechanical wave energy. 4,630,684, Cl. 169-46.000.

Citizen Watch Co., Ltd.: *See*—
Saito, Asao, 4,630,751, Cl. 220-334.000.

Claar, Klaus: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.

Clarion Co., Ltd.: *See*—
Yamada, Kimichika; and Miyazaki, Takao, 4,631,590, Cl. 358-185.000.

Clark, Harold R.; and Nicol, David A., to AT&T Technologies, Inc. Method for stretching a glass rod. 4,631,079, Cl. 65-109.000.

Clark Michigan Company: *See*—
Siewert, Robert L.; and Varnelis, Edmund K., 4,630,698, Cl. 180-69.240.

Clark, William E.: *See*—
Wellman, Donald C.; and Clark, William E., 4,630,670, Cl. 165-16.000.

Clarke, Kenneth J.; and Lamb, Gordon, to Conterm International Terminals, Inc. Expendable refrigeration control. 4,630,450, Cl. 62-222.000.

Claudius Peters AG: *See*—
Krauss, Werner, 4,630,531, Cl. 98-52.000.

Claudon, Brian J. Fish processor. 4,630,335, Cl. 17-58.000.

Cleanseal Systems, Inc.: *See*—
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Clesse-Mandet: *See*—
Lacour, Gilbert, 4,630,641, Cl. 137-505.380.

Clewell, Don B.; and Gawron-Burke, Mary C., to University of Michigan, Board of Regents of The. Transposon in cloning DNA. 4,631,259, Cl. 435-172.300.

Clifton, Richard B., to Minnesota Mining and Manufacturing Company. Coated abrasive back-up pad with metal reinforcing plate. 4,631,220, Cl. 428-133.000.

Clinker, Gerald. Auxiliary vehicle warning system. 4,631,516, Cl. 340-76.000.

Coar, Lawrence F.: *See*—
Bender, Roland A.; Howarth, Lawrence R.; and Coar, Lawrence F., 4,631,709, Cl. 367-4.000.

Codex Corporation: *See*—
Qureshi, Shahid U. H., 4,631,735, Cl. 375-34.000.

Coladonato, Michael A.: *See*—
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., 4,630,522, Cl. 89-1.140.

Colder Products Company: *See*—
Blenkush, Brian J., 4,630,847, Cl. 285-29.000.

Coleco Industries, Inc.: *See*—
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.

Coleman Company, Inc., The: *See*—
Crane, James W.; and Skanaker, Ragnar, 4,630,387, Cl. 42-73.000.

Collier, William R. Modular combination floor support and electrical isolation system for use in building structures. 4,630,417, Cl. 52-263.000.

Collins, Galen, to Benson, Inc. Time base generator for color image processor. 4,631,740, Cl. 377-76.000.

Collins, Jiles W. Router attachment. 4,630,656, Cl. 144-134.00D.

Colliopoulos, John A.; Young, James G.; and Tsau, Josef H. Sweetening composition. 4,631,195, Cl. 426-548.000.

Collister, Kenneth D. One piece child safety handle. 4,630,331, Cl. 16-111.00R.

Colson, Wendell B., to Thermocell, Ltd. Apparatus for fabricating honeycomb insulating material. 4,631,108, Cl. 156-461.000.

Columbia University in the City of New York, The Trustees of: *See*—
Kim, Syngcuk, 4,631,185, Cl. 424-49.000.

Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, to Riom Laboratories C.E.R.M. "RL-C.E.R.M." S.A. Hexahydrodibenzodioxane compounds and pharmaceutical compositions. 4,631,277, Cl. 514-239.000.

Comfort, Edward H.: *See*—
Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., 4,631,608, Cl. 360-99.000.

Commissariat a l'Energie Atomique: *See*—
Brunon, Jean-Marc, 4,631,167, Cl. 376-446.000.

Cornu, Ayme , 4,631,384, Cl. 219-121.00P.
Jacquot, Bernard, 4,631,438, Cl. 313-359.100.

Commonwealth Scientific and Industrial Research Organization: *See*—
Jellinek, Thomas, 4,631,226, Cl. 428-270.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Brilman, Michel, 4,631,417, Cl. 250-578.000.

Computer Memories, Inc.: *See*—
Brooke, Raymond; and Palombo, Gaston, 4,631,524, Cl. 340-347.00P.

Condit, Paul A., Sr. Multi-purpose filter system. 4,631,127, Cl. 210-232.000.

Conmaco, Inc.: *See*—
Jackson, E. Don, 4,630,524, Cl. 91-219.000.

Connelly, Lynette M.; and Gatof, Norman, to Crystal Brands, Inc. Earring clutch mechanism and detachable load distribution member for use in combination therewith. 4,630,452, Cl. 63-12.000.

Connors, Robert H.; and Williams, James T., to Triangle Package Machinery Co. Combinatorial weigher employing double group split logic. 4,630,695, Cl. 177-1.000.

Conrad, John R.: *See*—
Eckstrom, William R.; and Conrad, John R., 4,630,530, Cl. 98-2.110.

Consortium fur elektrochemische Industrie GmbH: *See*—
Gebauer, Helmut; and Regiert, Marlies, 4,631,146, Cl. 252-522.00R.

Container Products Corp.: *See*—
Hughes, Joel, 4,630,750, Cl. 220-324.000.

Conterm International Terminals, Inc.: *See*—
Clarke, Kenneth J.; and Lamb, Gordon, 4,630,450, Cl. 62-222.000.

Continental Bondware, Inc.: *See*—
Fear, Robert E., 4,630,733, Cl. 206-459.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Howind, Volker, 4,630,662, Cl. 152-397.000.

Convent Knabber-Geback GmbH & Co.: *See*—
Schaaf, Heinz; and Walter, Horst, 4,630,533, Cl. 99-353.000.

Conway, Richard J.: *See*—
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.

Cooke, Theodore M.; and DeBonte, William J., to Exxon Printing Systems, Inc. Ink jet employing phase change ink and method of operation. 4,631,557, Cl. 346-140.00R.

Cookerly, Jack C.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,630,517, Cl. 84-1.010.

Cooley, Denton A.: *See*—
Reed, Charles C.; and Cooley, Denton A., 4,631,050, Cl. 604-4.000.

Cooperative Marketing Co., The: *See*—
Albery, Lewis L., 4,630,731, Cl. 206-425.000.

Coors Porcelain Company: *See*—
Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., 4,631,160, Cl. 264-62.000.

Coote, Cyril E.: *See*—
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.

Coplan, Myron J.; and Bilewski, Fred, to Albany International Corporation. Permselective hollow fiber bundle. 4,631,128, Cl. 210-321.500.

Cordell, Barbara: *See*—
Dale, Beverly; and Cordell, Barbara, 4,631,191, Cl. 424-88.000.

Cordis Corporation: *See*—
Harris, Donald L., 4,631,051, Cl. 604-9.000.
Yomtov, Barry M., 4,630,615, Cl. 128-734.000.

Cornacchia, Felice, to Fiat Auto S.p.A. Stop-start device for controlling the operation of an internal combustion engine of a vehicle provided with an automatic transmission. 4,630,577, Cl. 123-179.00B.

Corning Glass Works: *See*—
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,267, Cl. 502-439.000.
Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., 4,631,268, Cl. 502-439.000.
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,269, Cl. 502-439.000.

Cornu, Ayme , to Commissariat a l'Energie Atomique. Bitumen combustion process. 4,631,384, Cl. 219-121.00P.

Correa Mellone, Oswaldo A.: *See*—
Rocha Cabral, Jose E.; and Correa Mellone, Oswaldo A., 4,630,953, Cl. 401-83.000.

Corthout, Marc E. A.; and Mielekamp, Pieter M., to U.S. Philips Corporation. Multiprocessor computer system for forming a color picture from object elements defined in a hierarchic data structure. 4,631,690, Cl. 364-518.000.

Corwon, Michael E.: *See*—
Sanders, Gary G.; and Corwon, Michael E., 4,631,539, Cl. 340-870.290.

Costello, Rocky C.: *See*—
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.

Cotta, Gilbert A.: *See*—
Steeves, Jay M.; and Cotta, Gilbert A., 4,630,766, Cl. 227-8.000.

Couch, John L.: *See*—
Rand, Roy E.; and Couch, John L., 4,631,741, Cl. 378-10.000.

Coulter Electronics, Inc.: *See*—
Proni, Oscar; and James, Bobby D., 4,631,483, Cl. 324-71.400.

Courbot, Pierre: *See*—
Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.

Courrege, Claude, to Rippes S.A. Burner for gas blow torch. 4,631,023, Cl. 431-329.000.

Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, to International Flavors & Fragrances Inc. Esters of alkylthioalkanoic acids. 4,631,194, Cl. 426-535.000.

Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, to Fondation Cousteau. Apparatus for producing a force when in a moving fluid. 4,630,997, Cl. 416-90.00A.

Coviello, Frank; and Antico, Michael, to Lantel International Corp. Multi-line telephone system. 4,631,367, Cl. 379-157.000.

Cox, Frederick E.: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,631,230, Cl. 428-412.000.

Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., to AT&T Information Systems Inc. Communication system having dynamically assigned station set buttons. 4,631,364, Cl. 379-164.000.

Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., to UNIPHASE Corporation. Cold cathode gas tubes. 4,631,727, Cl. 372-33.000.

Crane, James W.; and Skanaker, Ragnar, to Coleman Company, Inc., The. Adjustable pistol grip. 4,630,387, Cl. 42-73.000.

Credelle, Thomas L.; and Firester, Arthur H., to RCA Corporation. LCD pixel incorporating segmented back-to-back diode. 4,630,893, Cl. 350-334.000.

Cremers, Rolf A., to Borg Instruments GmbH. Multi-colored liquid crystal display with color transflector and color filter. 4,630,894, Cl. 350-338.000.

Creswick, Martin: *See*—
Wood, David H.; and Creswick, Martin, 4,631,708, Cl. 367-2.000.

Crispino, Vincent J.: *See*—
Hills, Blair H.; and Crispino, Vincent J., 4,631,156, Cl. 264-37.000.

Cross Company, The: *See*—
Moehr, Robert, 4,630,944, Cl. 384-39.000.

Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., to THORN EMI Domestic Appliances Limited. Thermal limiter. 4,631,390, Cl. 219-449.000.

Croteau, Donald W., to Thermo Electron-Web Systems, Inc. Self-compensating support element and end closure therefor. 4,630,328, Cl. 15-257.00R.

Crystal Brands, Inc.: *See*—
Connelly, Lynette M.; and Gatof, Norman, 4,630,452, Cl. 63-12.000.

Cuisia, Dionisio G.; and Hwa, Chih M., to R. W. Grace & Co. Method for inhibiting scale. 4,631,131, Cl. 210-697.000.

Cushman, Larry A. Portable label maker. 4,630,538, Cl. 101-45.000.

Cutcher, Dennis R., to Baker CAC. Actuator with nonelastomeric seal. 4,630,636, Cl. 137-315.000.

Cutler, Gregory M., to Hewlett-Packard Company. CW Laser wavemeter/frequency locking technique. 4,631,498, Cl. 331-9.000.

Cutters Exchange, Inc.: *See*—
Fyfe, Leo W.; and Seaman, A. Matthew, 4,630,364, Cl. 29-779.000.

Cygnor, John E.; and Hallman, John, to Sundstrand Corporation. Lubrication scavenge system. 4,631,009, Cl. 418-15.000.

Czumak, Frank M.; and Sulesky, Donald J., to Polaroid Corporation. Photographic film frame ejector. 4,630,914, Cl. 354-212.000.

Da Vinci Laboratories, a division of FoodScience Corporation: *See*—
Kendall, Roger V.; and Graber, Charles D., 4,631,189, Cl. 424-85.000.

Dahmen, Kurt: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.

Dai Showa Seiki Kabushiki Kaisha: *See*—
Kubo, Haruaki, 4,630,980, Cl. 409-234.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.

Dailey Petroleum Services Corp.: *See*—
Beasley, Thomas R.; and Teng, Chuan C., 4,630,690, Cl. 175-57.000.

Daimler-Benz Aktiengesellschaft: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, 4,630,327, Cl. 15-250.210.
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Dainippon Ink and Chemicals, Inc.: *See*—
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000

Dale, Beverly; and Cordell, Barbara, to Biotechnology Research Partners, Ltd. Methods and compositions useful in preventing equine influenza. 4,631,191, Cl. 424-88.000.

Daly, Daniel F.: *See*—
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., 4,631,746, Cl. 381-35.000.

D'Amato, Ralph J.; and Godfrey, Richard H., to RCA Corporation. Cathode-ray tube having cylindrical faceplate and shadow mask with minor axis curvatures. 4,631,439, Cl. 313-402.000.

Dan, Takuya; and Orikawa, Michihiro, to Bridgestone Corporation. Liquid-filled elastomeric bushings. 4,630,806, Cl. 267-140.100.

Dana Corporation: *See*—
Allmandinger, Donald D.; and Pifer, Richard L., 4,630,506, Cl. 74-713.000.

Danfoss A/S: *See*—
Petersen, Hans C.; and Kyster, Erik, 4,631,010, Cl. 418-61.00B.

Dang, Vu Q.: *See*—
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Dangschat, Holmer: *See*—
Burkhardt, Horst; Ernst, Alfons; Dangschat, Holmer; and Wogatzke, Horst, 4,631,404, Cl. 250-237.00G.

Daniele, Vincenzo: *See*—
Torelli, Guido; and Daniele, Vincenzo, 4,631,485, Cl. 329-50.000.

Dannhauer, Gunter, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Portable lamp, adapted to be worn on the head of a user. 4,631,644, Cl. 362-105.000.

Datascope Corp.: *See*—
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.

Daud, Taher; and Kachare, Akaram H., to United States of America, National Aeronautics and Space Administration. High band gap II-VI and III-V tunneling junctions for silicon multijunction solar cells. 4,631,352, Cl. 136-249.000.

Davey, Jack E., to Blue Giant Equipment of Canada Ltd. Truck restraint system. 4,630,989, Cl. 414-401.000.

Davie, Neil R.: *See*—
Batalden, Glenn D.; Baxter, Duane W.; and Davie, Neil R., 4,631,706, Cl. 365-215.000.

Davis, C. Paul; and Neuman, Eli, to Innovative Computer Products Corporation. Tape cartridge drive head cleaner. 4,631,614, Cl. 360-128.000.

Davis, Paul K., to Pacific Roller Die Co., Inc. Spiral ribbed pipe. 4,630,650, Cl. 138-154.000.

Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., to Motorola, Inc. Self biasing direct coupled data limiter. 4,631,737, Cl. 375-88.000.

Dawn, Ronald C. Vessel with pump suction tube support. 4,630,759, Cl. 222-377.000.

De Forenede Bryggerier A/S: *See*—
Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.

De La Harpe, Jean H., to James Howden & Company Limited. Axial fan. 4,630,999, Cl. 416-167.000.

Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., to Roper Corporation. Drum and cable mechanisms for opening/closing greenhouse vent. 4,630,397, Cl. 49-97.000.

Dean, William P.: *See*—
Walsh, Joseph F.; and Dean, William P., 4,631,698, Cl. 364-900.000.

Deane, Norman P.: *See*—
Blee, Timothy J.; and Deane, Norman P., 4,631,515, Cl. 340-62.000.

DeBonte, William J.: *See*—
Cooke, Theodore M.; and DeBonte, William J., 4,631,557, Cl. 346-140.00R.

Decision-Tree Associates, Inc.: *See*—
Iwamoto, William T., 4,630,681, Cl. 166-366.000.

Decko, Del P.: *See*—
Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., 4,631,034, Cl. 440-7.000.

Deere & Company: *See*—
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.
Schlueter, Francis E.; and Schreiner, Joel M., 4,630,431, Cl. 56-28.000.

DeFreese, Jeffrey A.; and Lind, Theodore E., to Motorola, Inc. Apparatus and method for adjusting the frequency of a resonator by laser. 4,631,197, Cl. 427-10.000.

Degut, Andre, to Societe A. Degut. Apparatus of construction by means of prefabricated elements, particularly of wood. 4,630,418, Cl. 52-264.000.

Deimel, Gerhard: *See*—
Muller, Horst; and Deimel, Gerhard, 4,631,173, Cl. 422-28.000.

Delage, Daniel; and Reboux, Jean, to Saphymo Stel. Magnetic yoke inductor for glass fiber manufacturing equipment. 4,631,381, Cl. 219-10.570.

Delfs, Larry M.: *See*—
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.

DeMars, Robert A. Trash can hoop retainer. 4,630,752, Cl. 220-404.000.

Dennis, Christopher J., to Equipaid Limited. Pulse detection. 4,630,613, Cl. 128-687.000.

Denny, John M.: *See*—
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.

Dentai, Andrew G.: *See*—
Campbell, Joe C.; and Dentai, Andrew G., 4,631,566, Cl. 357-30.000.

Derrien, Michel: *See*—
Veaux, Jacques; and Derrien, Michel, 4,630,788, Cl. 244-104.0FP.

DeSantis, Albert: *See*—
Meyers, Arthur; and DeSantis, Albert, 4,630,391, Cl. 43-58.000.

deSouza, Alwyn A.; and Oertel, Hans W., to Joslyn Mfg. and Supply Co. Triggerable ceramic gas tube voltage breakdown device. 4,631,453, Cl. 315-340.000.

Detweiler, Charles A., to Tom McGuane Industries, Inc. Check valve and water injection systems and fuel systems utilizing the same. 4,630,642, Cl. 137-506.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Liebing, Lothar, 4,631,398, Cl. 250-216.000.

Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.
Tersteegen, Johannes, 4,630,523, Cl. 91-1.000.

Dewald, James R.: *See*—
Tomalia, Donald A.; and Dewald, James R., 4,631,337, Cl. 528-391.000.

de Winter, Walter: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

De Witt, Kenneth I.; and Kovens, Michael L., to Universal Security Instruments, Inc. Transmitter-receiver coded security alarm system. 4,631,527, Cl. 340-539.000.

Dhein, Rolf: *See*—
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.

Diamond Oil Well Drilling Company: *See*—
Park, Arthur; and Wilson, Bob T., 4,631,677, Cl. 364-422.000.

DiBartolo, Ernest A., to Sun Hydraulics Corp. Pressure compensated restrictive flow regulator cartridge. 4,630,640, Cl. 137-501.000.

Dicke, Hans-Rudolf: *See*—
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.

Dickens, James. Pontoon vehicle. 4,631,037, Cl. 440-100.000.

Dickinson, Vaughan T.: *See*—
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

Didier-Werke AG: *See*—
Eschner, Axel, 4,631,074, Cl. 55-27.000.

Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, to Metzeler Schaum GmbH. Roof web for pitched roofs. 4,630,421, Cl. 52-408.000.

Dieleman, Lawrence A. Self-cleaning birdbath apparatus. 4,630,569, Cl. 119-1.000.

Diete, Gunter: *See*—
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.

Dieterich, Frank L. Method for forming a flat band of parallel, contiguous strands. 4,630,652, Cl. 140-92.100.

Dieterich Standard Corporation: *See*—
Parkhurst, Larry E.; and Meadows, Michael R., 4,631,401, Cl. 250-227.000.

Dietrich, Hans-Gerd: *See*—
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, 4,630,325, Cl. 12-8.100.

Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, to Hoechst Aktiengesellschaft. Addition compounds and process for their preparation. 4,631,330, Cl. 528-49.000.

Digital Equipment Corporation: *See*—
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DiMatteo, Paul: *See*—
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Dimetrics, Inc.: *See*—
Rothermel, Ronald R., 4,631,385, Cl. 219-124.030.

Disselbeck, Dieter; and Stahl, Dieter, to Hoechst Aktiengesellschaft. Sheet-like sandwich molding. 4,631,221, Cl. 428-166.000.

Dixie Union Verpackungen GmbH, Firma: *See*—
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.

Dixon, Michael: *See*—
Grunberg, Robert M.; and Dixon, Michael, 4,630,876, Cl. 339-48.000.

Dr. Ing.h.c.F Porsche Aktiengesellschaft: *See*—
Kamprath, Axel; and Ruehr, Volker, 4,630,471, Cl. 73-146.500.

Dr. Ing. Rudolf Hell GmbH: *See*—
Hoffrichter, Ingo; and Jung, Eggert, 4,631,579, Cl. 358-80.000.

Dolbeare, Richard T., to United States of America, Air Force. Vibration isolated cold plate assembly. 4,631,635, Cl. 361-383.000.

Dolland, Carlisle R., to United States of America, Air Force. High or low-side state relay with current limiting and operational testing. 4,631,474, Cl. 324-73.00R.

Domanski, Lothar: *See*—
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Dommer, Erich; and Groos, Heinrich, to Berkenhoff GmbH. Wire electrode for spark-eroding systems. 4,631,237, Cl. 428-621.000.

Donahue, Robert L., to Hein-Werner Corporation. Hole gauge. 4,630,380, Cl. 33-288.000.

Donald, Raymond G., to Signetics Corporation. Method for manufacturing a narrow line of photosensitive material. 4,631,113, Cl. 156-659.100.

Dooling, David J.: *See*—
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.

Doshi, Pratap K.: *See*—
Wilson, John F.; and Doshi, Pratap K., 4,631,165, Cl. 376-333.000.

Dougherty, Edward M.: *See*—
Hartman, Russell D.; and Dougherty, Edward M., 4,630,697, Cl. 177-211.000.

Dow Chemical Company, The: *See*—
Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.
Bierschenk, Thomas R., 4,631,200, Cl. 427-113.000.
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.
Hay, Robert A., II, 4,631,016, Cl. 425-224.000.

Kan, Charles S., 4,631,233, Cl. 428-420.000.
Mayes, M. Dale, 4,630,939, Cl. 374-135.000.
McCulfough, Francis P.; and Snelgrove, Roy V., 4,631,118, Cl. 204-16.000.
Meyer, Gerhard A., 4,630,924, Cl. 356-316.000.
Parker, Theodore L., 4,631,331, Cl. 528-96.000.
Parker, Theodore L., 4,631,332, Cl. 528-117.000.
Tomalia, Donald A.; and Dewald, James R., 4,631,337, Cl. 528-391.000.
Trevino, Jose L.; and van Rooden, Bernardus J., 4,631,312, Cl. 525-221.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,314, Cl. 525-314.000.

Dow Chemical Japan Limited: *See—*
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.

Dow Corning Corporation: *See—*
Bartos, Donald M.; and Gaul, John H., Jr., 4,631,260, Cl. 501-88.000.
Battice, David R.; and Hales, Michael G., 4,631,297, Cl. 521-78.000.
Bauman, Therese M.; and Freiberg, Alan L., 4,631,296, Cl. 521-65.000.
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.
Chandra, Grish; and Kwai Lo, Peter Y., 4,631,310, Cl. 524-862.000.
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,631,329, Cl. 528-28.000.

Dow Corning Ltd.: *See—*
Price, John G. C., 4,631,207, Cl. 427-387.000.
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Dowell Schlumberger Incorporated: *See—*
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., 4,630,679, Cl. 166-305.100.

Dragerwerk AG: *See—*
Pasternack, Adalbert, 4,630,605, Cl. 128-205.240.
Weerda, Hilko; and Pedersen, Peter, 4,630,606, Cl. 128-207.140.

Dragone, Corrado, to AT&T Bell Laboratories. Antenna arrangement capable of astigmatism correction. 4,631,545, Cl. 343-779.000.

Dreckmann, Karl; and Miesen, Theo, to Lemo M Lehmacher & Sohn GmbH Maschinenfabrik. Apparatus for cutting hand holes in bags. 4,631,047, Cl. 493-227.000.

Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., to Charles Stark Draper Laboratory, Inc., The. Inertial energy storage device and synchronous rotary electrical machine for use therein. 4,631,456, Cl. 318-140.000.

Dresser Industries, Inc.: *See—*
Eckman, Richard E., 4,631,012, Cl. 418-70.000.

Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic curing press. 4,631,014, Cl. 425-34.00R.

Drosemeyer, Hans-Heinrich: *See—*
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.

Dubar, Thierry, to Les Cables de Lyon. Multiple joint for underwater optical fiber cables. 4,630,888, Cl. 350-96.230.

Duckman, Curt: *See—*
Duckman, Donald; Duckman, Curt; and Andren, Kjell, 4,630,564, Cl. 114-98.000.

Duckman, Donald; Duckman, Curt; and Andren, Kjell. Boom control device for a sailboat boom. 4,630,564, Cl. 114-98.000.

Duckworth, Allen, to Teleco Oilfield Services Inc. Vibration isolator and shock absorber device. 4,630,809, Cl. 267-141.100.

Duddridge, John E.; and Kent, Christopher A., to United Kingdom Atomic Energy Authority. Treating a medium. 4,631,135, Cl. 210-764.000.

Duerig, Tom: *See—*
Simpson, John A.; Melton, Keith; and Duerig, Tom, 4,631,094, Cl. 148-11.50F.

Duffers Scientific, Inc.: *See—*
Ferguson, Hugo S., 4,631,697, Cl. 364-900.000.

Duffie, Kenneth G.: *See—*
Sagemuehl, Hans W.; and Duffie, Kenneth G., 4,630,321, Cl. 2-426.000.

Duinker, Simon; and Mulder, Hendrik, to N.V. Optische Industrie "De Oude Delft" . Apparatus for the non-contact disintegration of stony objects present in a body by means of sound shockwaves. 4,630,607, Cl. 128-328.000.

Dumas, Ted A.; and Griffee, Les V., to Rockwell International Corporation. Electronically rotated antenna apparatus. 4,631,546, Cl. 343-833.000.

Dummermuth, Paul, to Von Arx AG. Percussion device. 4,630,687, Cl. 173-131.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bennett, Allyn N., 4,631,246, Cl. 430-271.000.
Chouinard, Michael P.; and Bancroft, Lewis C., 4,631,602, Cl. 360-16.000.
Eveleigh, John W., 4,631,205, Cl. 427-255.600.
Mitchell, Robert D., 4,631,244, Cl. 430-137.000.
Valteris, Ramunas L.; and Caldwell, Gary L., 4,631,018, Cl. 425-445.000.
van Alst, Wilhelmus B. T., 4,630,879, Cl. 339-99.00R.
Williston, David W., 4,631,111, Cl. 156-630.000.

Durac Limited: *See—*
Tran, Van N., 4,631,380, Cl. 219-10.55A.

Durametallic Corporation: *See—*
Kakabaker, Kenneth G., 4,630,458, Cl. 72-237.000.

Durand, Remie P., to Chrysler Motors Corporation. Tab redundant terminal. 4,630,880, Cl. 339-176.001.

Duren, Karl: *See—*
Kranz, Eckhard; and Duren, Karl, 4,630,351, Cl. 29-527.200.

Durr, Paul, to Hilti Aktiengesellschaft. Adjustable motor-operated screw driving device. 4,630,512, Cl. 81-475.000.

Duval, Henry H., Jr.: *See—*
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Duvernay, Maurice: *See—*
Laisney, Bernard; and Duvernay, Maurice, 4,631,299, Cl. 521-77.000.

Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., to Square D Company. Time delay undervoltage release. 4,631,624, Cl. 361-89.000.

Dwyer Instruments, Inc.: *See—*
Zoludow, Richard S., 4,631,374, Cl. 200-61.210.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas; and Schitzler, Lorenz, 4,630,971, Cl. 405-260.000.

Dye, John F., to Kendall Company, The. Tamper discouraging system. 4,631,056, Cl. 604-111.000.

Dymond, Brian, to Allied Colloids Ltd. Materials for use in drilling fluids. 4,631,137, Cl. 252-8.514.

Dynamics Research Corporation: *See—*
Wingate, Sidney A., 4,631,520, Cl. 340-347.0CC.

Dynatrans Technology Ltd.: *See—*
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Eastern Company: *See—*
Kincaid, Herbert; and Favia, Alan D., 4,630,457, Cl. 70-369.000.

Easthill, Stephen P., to U.S. Philips Corporation. Method of and apparatus for controlling a domestic appliance. 4,631,658, Cl. 364-184.000.

Eastman Kodak Company: *See—*
Braun, Hilarion; Lush, Linda; and Lehman, Scott, 4,631,549, Cl. 346-1.100.
French, William W., 4,631,613, Cl. 360-125.000.
Piatt, Michael J.; and Brown, Mark E., 4,631,550, Cl. 346-1.100.
Spaller, Albert E., 4,630,515, Cl. 83-402.000.
Vergona, Albert B., 4,631,551, Cl. 346-108.000.

Eaton Corporation: *See—*
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Hatton, Bruce M., 4,630,465, Cl. 73-35.000.
Vendelin, George D.; and Rezvani, Behruz, 4,631,493, Cl. 330-277.000.

Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, to Agency of Industrial Science & Technology. Method for adhesion of oxide type ceramics with copper or alloy thereof. 4,631,099, Cl. 156-89.000.

Eberle, George F.; Bickel, Karl L.; and Denny, John M., to Lumbermate Company. Top hung truss. 4,630,424, Cl. 52-693.000.

Ecer, Gunes M., to CDP, Ltd. Consolidation of a drilling element from separate metallic components. 4,630,692, Cl. 175-330.000.

Echegoyen, Luis: *See—*
Gokel, George W.; and Echegoyen, Luis, 4,631,119, Cl. 204-59.00R.

Eckman, Richard E., to Dresser Industries, Inc. Pneumatic tools. 4,631,012, Cl. 418-70.000.

Eckstrom, William R.; and Conrad, John R., to Travel-Aire, Inc. Filtering systems for buses. 4,630,530, Cl. 98-2.110.

Edelstein, William A.: *See—*
Mueller, Otward M.; and Edelstein, William A., 4,631,495, Cl. 330-310.000.

Edinger, Egon; and Schade, Reinhart, to Siemens Aktiengesellschaft. Transducer plate for piezoelectric transducers. 4,631,436, Cl. 310-322.000.

Eibach, Wolfgang; Roehr, Kuno M.; and Schulz, Klaus M., to International Business Machines Corporation. Fail-safe data processing system. 4,631,661, Cl. 364-200.000.

Eickmann, Karl. Fluid motor with arresting and disarresting means. 4,630,528, Cl. 91-491.000.

Eiken Kagaku Kabushiki Kaisha: *See—*
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.

Eisenhaure, David B.: *See—*
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Elbaum, Saul. Design painting device with stability and independent drive. 4,630,952, Cl. 401-48.000.

Elco Industries, Inc.: *See—*
Reinwall, Ernest W.; and Spibey, John, 4,630,984, Cl. 411-368.000.

Elger, Walter: *See—*
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Eli Lilly and Company: *See—*
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Robertson, David W., 4,631,279, Cl. 514-247.000.
Wheeler, William J., 4,631,339, Cl. 540-492.000.

Elkins, Hubert L., to Hydril Company. Well control method and apparatus. 4,630,680, Cl. 166-34.200.

Ellersick, Russell R. Furnace wall lining composition and the use thereof. 4,630,594, Cl. 126-64.000.

Elliott, George A., to RCA Corporation. Automatic coaxial cable bending apparatus. 4,630,459, Cl. 12-307.000.

Ellis, James R.: *See—*
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Elms, Robert T.: *See—*
Lagree, James L.; and Elms, Robert T., 4,631,450, Cl. 315-244.000.

El-Sherbini, Ahmed M., to Wang Laboratories, Inc. Method and apparatus for differential run-length coding. 4,631,521, Cl. 340-347.0DD.

Embree, Milton L.: *See—*
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Emhart Industries, Inc.: *See—*
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Hodges, C. Wayne; and Limanowski, Jozef K., 4,631,631, Cl. 361-306.000.

Emoto, Kazuhiro; Haino, Kozo; and Itoh, Akira, to Mitsubishi Paper Mills, Ltd. Bisazo electrophotographic sensitive materials with $-CF_3$ group. 4,631,242, Cl. 430-58.000.

Endo, Haruyoshi: *See—*
Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, 4,631,506, Cl. 333-224.000.

Endo, Takashi: *See—*
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Energy Conversion Devices, Inc.: *See—*
Johnson, Robert R., 4,630,355, Cl. 29-575.000.

Engdahl, Paul D. Peak accelerograph. 4,630,483, Cl. 73-652.000.

Engel, Michael J.: *See—*
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.

Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, to Beiersdorf Aktiengesellschaft. Functional oil-cream bath. 4,631,295, Cl. 514-558.000.

Engelhard Corporation: *See—*
Altomare, Carol A., 4,631,262, Cl. 502-65.000.

English China Clays Lovering Pochin & Co. Ltd.: *See—*
Goodman, Howard, 4,631,091, Cl. 106-308.00N.

English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., to GTE Products Corporation. Single-ended high intensity discharge lamp. 4,631,446, Cl. 313-634.000.

Engstrom, Bjorn M. H.; and Bernander, Karl-Gustav. Collapse preventing connection device for building structures. 4,630,412, Cl. 52-1.000.

Enoch, Horst: *See—*
Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, 4,631,014, Cl. 425-34.00R.

Environmental Fragrance Technologies, Ltd.: *See—*
Glucksman, Dov Z., 4,631,387, Cl. 219-272.000.

Equipaid Limited: *See—*
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Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Apparatus for the manufacture or machining of straight or helically toothed workpieces. 4,630,402, Cl. 51-105.0GG.

Erhardt, Manfred; and Loos, Herbert, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Apparatus for manufacturing and machining gears. 4,630,404, Cl. 51-105.0GG.

Erickson, Leif O.; and Leonard, Vurnen J., to Minnesota Mining and Manufacturing Company. Stretched surface recording disk substrate. 4,631,609, Cl. 360-135.000.

Ernst, Alfons: *See—*
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Eschner, Axel, to Didier-Werke AG. Method and apparatus for reducing the temperature of air. 4,631,074, Cl. 55-27.000.

Essex Group, Inc.: *See—*
Lavallee, Francois A., 4,631,201, Cl. 427-118.000.

Etemovich, Alex, to TRE Corporation. Chromate free method of treating metal substrates to impart corrosion resistance and color to the substrate surface. 4,631,093, Cl. 148-6.100.

Ethyl Corporation: *See—*
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,631,349, Cl. 568-789.000.
Presswood, J. Kenneth, 4,631,298, Cl. 521-163.000.
Smith, Troy L., Jr., 4,631,179, Cl. 423-345.000.

Etzbach, Karl H.: *See—*
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Eubanks, Furney M. Elevatable work station. 4,630,710, Cl. 182-116.000.

Evans Cooling Associates: *See—*
Evans, John W., 4,630,572, Cl. 123-41.210.

Evans, John W., to Evans Cooling Associates. Boiling liquid cooling system for internal combustion engines. 4,630,572, Cl. 123-41.210.

Evans, Lawrence J.: *See—*
Gabriel, Steven A.; and Evans, Lawrence J., 4,631,750, Cl. 382-41.000.

Evans, Philip R.: *See—*
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.

Eveleigh, John W., to Du Pont de Nemours, E. I., and Company. Process for producing coherent films of polyacetylene. 4,631,205, Cl. 427-255.600.

Everett, Charles J.: *See—*
Ochsner, Rolf H.; and Everett, Charles J., 4,630,360, Cl. 29-622.000.

Evers, Reinhard; and Wenzel, Werner, to Nordischer Maschinenbau Rud. Device for aligning fish. 4,630,334, Cl. 17-56.000.

Ewikon Entwicklung und Konstruktion GmbH & Co.KG: *See—*
Muller, Walter, 4,631,389, Cl. 219-421.000.

Exxon Printing Systems, Inc.: *See—*
Cooke, Theodore M.; and DeBonte, William J., 4,631,557, Cl. 346-140.00R.

Exxon Production Research Co.: *See—*
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., 4,630,970, Cl. 405-224.000.

Fabriques de Tabac Reunies, S.A.: *See—*
Frattolillo, Antonio P. A., 4,631,045, Cl. 493-46.000.

Fairchild Camera & Instrument Corp.: *See—*
Pierce, John M.; and Lehrer, William I., 4,630,343, Cl. 29-576.00W.

Fairey Hydraulics Limited: *See—*
Smith, John D., 4,630,495, Cl. 74-191.000.

Fang, Shou-Mean: *See—*
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.

Fantuzzo, Joseph; and Monkelbaan, Edwin R., to Xerox Corporation. Selectable color system. 4,630,919, Cl. 355-4.000.

Fanuc Ltd: *See—*
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.

Faris, Sadeg M., to International Business Machines Corporation. Ultra high resolution Josephson sampling technique. 4,631,423, Cl. 307-352.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.

Farquharson, Graeme J.: *See—*
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.

Farrington, Richard I.: *See—*
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.

Faust, Daniel P., to General Motors Corporation. Strip roll forming energy absorbing device. 4,630,716, Cl. 188-371.000.

Favia, Alan D.: *See—*
Kincaid, Herbert; and Favia, Alan D., 4,630,457, Cl. 70-369.000.

Fear, Robert E., to Continental Bondware, Inc. Product indicating tab. 4,630,733, Cl. 206-459.000.

Federico, Joseph; and Waaben, Sigurd G., to AT&T Bell Laboratories. Telautograph system. 4,631,355, Cl. 178-18.000.

Feldman, Alan, to Sperry Corporation. Angular position to linear voltage converter. 4,631,540, Cl. 340-870.380.

Fellerman, Bernard F.: *See—*
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., 4,631,390, Cl. 219-449.000.

Felsner, Fritz; and Geier, Erich, to U.S. Philips Corporation. Box for holding circuit boards. 4,631,638, Cl. 361-415.000.

Felt Products Mfg. Co.: *See—*
Locacius, Robert F., 4,630,835, Cl. 277-235.00B.

Fenner, James A., to Boeing Company, The. Cargo tie-down system. 4,630,982, Cl. 410-102.000.

Ferguson, Hugo S., to Duffers Scientific, Inc. Signal controlled waveform recorder. 4,631,697, Cl. 364-900.000.

Feriani, Mariano; and Biasioli, Stefano, to Fresenius, AG. Container for a bicarbonate containing fluid. 4,630,727, Cl. 206-221.000.

Ferlan, Stephen J.: *See—*
Shallenberger, John M.; and Ferlan, Stephen J., 4,631,168, Cl. 376-446.000.

Ferodo Ltd.: *See—*
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

Ferraro, Michael J. Bait station. 4,630,392, Cl. 43-131.000.

Ferraz: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.

Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., to GTE Products Corporation. Heat recuperator with compensator for pressure operated fuel regulator. 4,631,022, Cl. 431-90.000.

Ferrofluidics Corporation: *See—*
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., 4,630,943, Cl. 384-133.000.

Fesko, Donald G., to Ford Motor Company. Leaf spring clamp for synthetic material leaf spring. 4,630,804, Cl. 267-52.000.

Fiat Auto S.p.A.: *See—*
Cornacchia, Felice, 4,630,577, Cl. 123-179.00B.

Fiedler, Paul: *See—*
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.

Fields, Evan P.: *See—*
Immel, Robert W.; and Fields, Evan P., 4,630,780, Cl. 241-46.00B.

Figueira, Stephen; and Billings, Philip A., to Xerox Corporation. Electromagnetic wrap spring clutch. 4,630,722, Cl. 192-84.00T.

Figueroa, Luis: *See—*
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.

Findling, Josef, to GEA Wiegand GmbH. Liquid dispersal device. 4,630,776, Cl. 239-553.300.

Firester, Arthur H.: *See—*
Credelle, Thomas L.; and Firester, Arthur H., 4,630,893, Cl. 350-334.000.

Firestone Tire & Rubber Company, The: *See—*
Bell, Thomas W.; and Shurman, Louis W., 4,630,663, Cl. 152-541.000.
Beneze, Heinz W., 4,630,422, Cl. 52-410.000.
Fischer, Artur. Expansion pin. 4,630,983, Cl. 411-15.000.
Fisher, Ernest P., Jr.: *See—*
Boyle, William G.; and Fisher, Ernest P., Jr., 4,630,833, Cl. 277-188.00A.
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S. Flow sensor for particulate material. 4,630,489, Cl. 73-861.870.
Fisler, Alfred E. Switching system for readily accessing the service line for test basic unit and the switching system for readily accessing the service line for test expansion unit. 4,631,368, Cl. 379-29.000.
Fleischer, Donald W.; and Smilgys, Bruno S., to Veeder Industries, Inc. Storage tank flow control valve assembly. 4,630,655, Cl. 141-198.000.
Fletcher, James D. Two-wheeled motor vehicle assembly. 4,630,703, Cl. 180-219.000.
Fletcher, Jo Ann. Surgical vest. 4,630,610, Cl. 128-501.000.
Fligsten, Ann M.: *See—*
Fligsten, Kenneth E.; and Fligsten, Ann M., 4,630,324, Cl. 5-94.000.
Fligsten, Kenneth E.; and Fligsten, Ann M. Traveling reclining restraint and collision-protection device. 4,630,324, Cl. 5-94.000.
Flohr, Mark C.: *See—*
Neipling, Lawrence E.; and Flohr, Mark C., 4,630,675, Cl. 166-53.000.
Flonic: *See—*
Marlier, Alain; and Oszajca, Henri, 4,630,488, Cl. 73-861.810.
FMC Corporation: *See—*
Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., 4,631,148, Cl. 252-609.000.
Fogarty, Thomas J.: *See—*
Chin, Albert K., 4,630,609, Cl. 128-344.000.
Foglio, Maurizio: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.
Fok, Kam-Fook: *See—*
Yankeelov, John A., Jr.; and Fok, Kam-Fook, 4,631,270, Cl. 514-15.000.
Follansbee Steel Corporation: *See—*
Meriwether, Jon D., 4,631,039, Cl. 441-133.000.
Fondation Cousteau: *See—*
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, 4,630,997, Cl. 416-90.00A.
Ford Aerospace & Communications Corporation: *See—*
Williams, Richard L., Jr., 4,630,790, Cl. 244-169.000.
Ford Motor Company: *See—*
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.
Fesko, Donald G., 4,630,804, Cl. 267-52.000.
Zweiniger, Hansjurgen; and Willenbrock, Horst, 4,630,857, Cl. 296-37.120.
Foreman, Adele J. Hair rolling device. 4,630,622, Cl. 132-39.000.
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, to Standard Elektrik Lorenz AG. Apparatus for measuring the position of a light source disposed inside a lighthouse. 4,630,909, Cl. 354-1.000.
Foroni, Mario; and Bertotti, Franco, to SGS-ATES Componenti Elettronici SpA. Semiconductor overvoltage suppressor with accurately determined striking potential. 4,631,561, Cl. 357-13.000.
Fortenberry & Associates, Inc.: *See—*
Fortenberry, Jerry B., 4,630,746, Cl. 220-6.000.
Fortenberry, Jerry B., to Fortenberry & Associates, Inc. Collapsible stackable shipping container. 4,630,746, Cl. 220-6.000.
Foschini, Gerard J., to AT&T Bell Laboratories. Cross-polarization canceler/equalizer. 4,631,734, Cl. 375-15.000.
Fosnacht, Donald R.: *See—*
Rellis, Daniel, Jr.; Fosnacht, Donald R.; and Jackson, Charles R., 4,630,801, Cl. 266-216.000.
Foster, Robert W.; and Weekly, Max D., to AT&T Bell Laboratories. Method and apparatus for incremental load simulation. 4,631,363, Cl. 379-15.000.
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., to AT&T Bell Laboratories. Inductor apparatus for application of ferroresonant regulators. 4,631,471, Cl. 323-306.000.
Fournier, Erick-Pierre: *See—*
Strickman, Melvyn B.; and Fournier, Erick-Pierre, 4,630,602, Cl. 128-127.000.
Fowler, David E.: *See—*
Capella, Joseph A.; and Fowler, David E., 4,630,625, Cl. 134-104.000.
Fowler, John T., to Laitram Corporation, The. System for removably housing and aligning components in a towed array. 4,631,711, Cl. 367-149.000.
Fraenkel, Herbert: *See—*
Maughan, William S.; and Fraenkel, Herbert, 4,630,736, Cl. 209-587.000.
Franceschi, Giovanni: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.
Frankenberg, Robert E.; and Calderazzo, Mark A., to Sewell Plastics, Inc. Segmented blow pin for molding machines employing replaceable cutting ring. 4,631,020, Cl. 425-527.000.
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., to AT&T Information Systems Inc. Distributed packet switching system. 4,631,534, Cl. 340-825.500.
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., to Blohm & Voss AG. Ship having standardized access ways. 4,630,561, Cl. 114-1.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Hansmann, Johann, 4,630,541, Cl. 104-7.200.
Franz, Robert M.: *See—*
Guyer, Thomas L.; and Franz, Robert M., 4,631,305, Cl. 523-400.000.
Frattolillo, Antonio P. A., to Fabriques de Tabac Reunies, S.A. Apparatus for producing a rod-like smoking article with secondary air channels. 4,631,045, Cl. 493-46.000.
Freed, Paul S.: *See—*
Kantrowitz, Adrian; and Freed, Paul S., 4,630,597, Cl. 128-1.00D.
Freiberg, Alan L.: *See—*
Bauman, Therese M.; and Freiberg, Alan L., 4,631,296, Cl. 521-65.000.
Freitag, Dieter: *See—*
Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, 4,631,336, Cl. 528-388.000.
French, William W., to Eastman Kodak Company. Thin film head having improved saturation magnetization. 4,631,613, Cl. 360-125.000.
Fresenius, AG: *See—*
Feriani, Mariano; and Biasioli, Stefano, 4,630,727, Cl. 206-221.000.
Freundl, Walter: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Drewel, Gunter; Enoch, Horst; and Grotkasten, Klaus, 4,631,014, Cl. 425-34.00R.
Friedlander, Mordechai: *See—*
Malka, Jacob H.; and Friedlander, Mordechai, 4,631,484, Cl. 328-63.000.
Friedman, Daniel J. Apparatus for supporting the weight of a banjo in adjustable proportions from both the torso and the shoulders of a player. 4,630,763, Cl. 224-259.000.
Friedman, Moshe; and Serlin, Victor, to United States of America, Navy. IREB converter to AC pulses. 4,631,447, Cl. 315-5.000.
Frielinghaus, Klaus H., to General Signal Corporation. Railway wheel detector. 4,630,792, Cl. 246-369.000.
Frommer, Myron H.: *See—*
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.
Frutschi, Hansulrich, to BBC Brown, Boveri & Company, Limited. Air storage gas turbine power station with fluidized bed firing. 4,630,436, Cl. 60-39.183.
Fry, Merle A. Weed cutting and extracting tool. 4,630,366, Cl. 30-124.000.
Frykendahl, Bjorn, to IFM Development AB. Nozzle for injection lance. 4,630,802, Cl. 266-225.000.
Fuerst, Arpad; and Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof cover and wind deflector. 4,630,860, Cl. 296-217.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Toshio, 4,630,705, Cl. 180-247.000.
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Fuji Photo Film Co., Ltd.: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.
Kondo, Asaji, 4,631,174, Cl. 422-56.000.
Mifune, Hiroyuki; Nakamura, Koki; and Ishiguro, Shoji, 4,631,253, Cl. 430-569.000.
Mitsuo, Hirofumi, 4,631,204, Cl. 427-150.000.
Nishizawa, Jun-ichi, 4,631,592, Cl. 358-213.000.
Oishi, Kengo; and Katagiri, Shingo, 4,631,620, Cl. 360-133.000.
Fuji Photo Optical Co., Ltd.: *See—*
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.
Fuji Xerox Co., Ltd.: *See—*
Miyao, Fumio, 4,631,718, Cl. 370-4.000.
Fujii, Noriki: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Fujikin International, Inc.: *See—*
Ogawa, Susumu, 4,630,851, Cl. 285-341.000.
Fujikura, Yoshiaki: *See—*
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.
Fujimori, Hiroyoshi: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,631,582, Cl. 358-98.000.
Fujioka, Souichirou; Inaji, Toshio; and Yamamoto, Susumu, to Matsushita Electric Industrial Co., Ltd. Brushless DC motor. 4,631,459, Cl. 318-254.000.
Fujisawa Pharmceutical Co., Ltd.: *See—*
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.
Fujitsu Limited: *See—*
Kokado, Masayuki; and Sumi, Hidezi, 4,631,567, Cl. 357-38.000.
Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, 4,631,725, Cl. 371-39.000.
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.

Fujiwara, Hideo: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
Fujiwara, Tatsuo, to Nippon Air Brake Co., Ltd. Malfunction detection arrangement for jerk controlled brake command system. 4,631,514, Cl. 340-52.00R.
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, to Sumitomo Metal Industries, Ltd. Oil well pipe joint. 4,630,849, Cl. 285-55.000.
Fukui, Noboru: *See—*
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.
Fukui, Tsutomu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Time-axis correcting circuit for recorded data reproducing device. 4,631,600, Cl. 358-320.000.
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Bed for electrical discharge machining apparatus. 4,631,382, Cl. 219-69.00R.
Fukutomi, Yohji: *See—*
Hashiguchi, Makoto; and Fukutomi, Yohji, 4,630,589, Cl. 123-571.000.
Fukuvi Chemical Industry Co., Ltd.: *See—*
Hasegawa, Hiroaki, 4,631,214, Cl. 428-68.000.
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, to Fanuc Ltd. Tool display system of automatic tool changing apparatus. 4,631,465, Cl. 318-565.000.
Fukuyama, Ryoji: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Fulkerson, Emmet M., to General Electric Company. Optical projector. 4,630,927, Cl. 356-372.000.
Fulkerson, William C.: *See—*
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.
Fuller, Dudley D.: *See—*
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., 4,630,943, Cl. 384-133.000.
Furey, Andrew J.: *See—*
Kulp, Rodney J.; and Furey, Andrew J., 4,630,378, Cl. 33-185.00R.
Furlong, Donn B. Detachable swivel for coupling gangions to longlines and apparatus for automatically attaching same. 4,630,388, Cl. 43-27.400.
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, to Kernforschungsanlage Julich GmbH; and Brooks Instrument, Zweigniederlassung Elmshorn der Emerson Electric GmbH. Gas flow regulator for gases with condensable components. 4,630,637, Cl. 137-340.000.
Furuichi, Tokinori, to Hitachi, Ltd. Current control type circuit for brushless motor. 4,631,458, Cl. 318-254.000.
Furuyama, Masatosi: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.
Futaire Limited: *See—*
Toll, Ian C., 4,630,864, Cl. 297-232.000.
Fyfe, Leo W.; and Seaman, A. Matthew, to Cutters Exchange, Inc. Apparatus for applying fastener tape to fabric pieces. 4,630,364, Cl. 29-779.000.
G.D. Societa per Azioni: *See—*
Neri, Armando, 4,631,693, Cl. 364-550.000.
G. H. Stenner & Co., Inc.: *See—*
Stenner, Gustav H., 4,631,008, Cl. 417-477.000.
Gabriel, Naeem B. Cigarette with condensing surface therein. 4,630,620, Cl. 131-331.000.
Gabriel, Steven A.; and Evans, Lawrence J., to Ampex Corporation. Method and system for spacially transforming images. 4,631,750, Cl. 382-41.000.
Gadd, Helen E. Bingo game card holder. 4,630,830, Cl. 273-240.000.
Gagnon, Peter R.: *See—*
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,631,446, Cl. 313-634.000.
Galeski, Andrzej: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.
Galle, Edward M.; and Baker, Billey E., to Hughes Tool Company-USA. Downhole pressure fluctuating tool. 4,630,689, Cl. 175-56.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Shoe with gusset pocket. 4,630,383, Cl. 36-136.000.
Ganguli, Keshab L.: *See—*
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.
Ganzle, Hartmut: *See—*
Reule, Hans; and Ganzle, Hartmut, 4,631,442, Cl. 313-414.000.
Gardiner, Gregory E.: *See—*
Andrews, Henry L.; and Gardiner, Gregory E., 4,631,082, Cl. 75-235.000.
Gardner, Neal F., to TRW Inc. Bipolar transistor construction. 4,631,568, Cl. 357-49.000.
Gardner, Terry N.: *See—*
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., 4,630,970, Cl. 405-224.000.
Garrett Corporation, The: *See—*
McCarty, Frederick B., 4,631,435, Cl. 310-156.000.
Mock, Edward A., 4,631,004, Cl. 417-189.000.
Ruckle, Duane L.; and Millan, Ponciano P., Jr., 4,631,092, Cl. 148-3.000.
Gas Research Institute: *See—*
Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., 4,631,080, Cl. 65-134.000.
Gashet, Gerald: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.
Gasparaitis, Bernard V.: *See—*
Abdala, Julio, Jr.; and Gasparaitis, Bernard V., 4,630,895, Cl. 350-345.000.
Gasper, Kenneth E., to Olin Corporation. Chemical process monitor. 4,631,530, Cl. 340-679.000.
Gatof, Norman: *See—*
Connelly, Lynette M.; and Gatof, Norman, 4,630,452, Cl. 63-12.000.
Gaudiau, Gaston, to Societe Mte. Elastic supported mechanism. 4,630,807, Cl. 267-140.100.
Gaul, John H., Jr.: *See—*
Bartos, Donald M.; and Gaul, John H., Jr., 4,631,260, Cl. 501-88.000.
Gawron-Burke, Mary C.: *See—*
Clewell, Don B.; and Gawron-Burke, Mary C., 4,631,259, Cl. 435-172.300.
Gazzolo, Christian: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.
GEA Wiegand GmbH: *See—*
Findling, Josef, 4,630,776, Cl. 239-553.300.
Gebauer, Helmut; and Regiert, Marlies, to Consortium fur elektrochemische Industrie GmbH. Alpha-tertiary dimethylacetals and their use as fragrant substances. 4,631,146, Cl. 252-522.00R.
Geier, Erich: *See—*
Felsner, Fritz; and Geier, Erich, 4,631,638, Cl. 361-415.000.
Geipel, Henry J., Jr.; and Pan, Pai-Hung, to International Business Machines Corporation. Growth of bird's beak free semi-rox. 4,631,219, Cl. 428-131.000.
Geis, Charles G.: *See—*
Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.
Gelfand, David H., to Cetus Corporation. Stable high copy number plasmids. 4,631,257, Cl. 435-68.000.
General Company Limited: *See—*
Ikawa, Osamu; and Yamahata, Takashi, 4,631,232, Cl. 428-413.000.
General Electric Company: *See—*
Beers, William W.; and Parham, Thomas G., 4,631,144, Cl. 252-301.40R.
Fulkerson, Emmet M., 4,630,927, Cl. 356-372.000.
Germer, Warren R.; and Balch, Richard A., 4,631,476, Cl. 324-103.00R.
Howell, Edward K., 4,631,621, Cl. 361-13.000.
Howell, Edward K., 4,631,622, Cl. 361-45.000.
Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., 4,630,881, Cl. 339-176.00R.
Miller, Steven A., 4,631,013, Cl. 425-7.000.
Mueller, Otward M.; and Edelstein, William A., 4,631,495, Cl. 330-310.000.
Oliver, David W., 4,631,742, Cl. 378-113.000.
Peters, Philip H., Jr., 4,631,449, Cl. 315-205.000.
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.
Stokes, Vijay K., 4,631,433, Cl. 310-89.000.
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,631,230, Cl. 428-412.000.
Webb, Jimmy L.; and Olsen, Cathryn E., 4,631,346, Cl. 556-420.000.
General Motors Corporation: *See—*
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Faust, Daniel P., 4,630,716, Cl. 188-371.000.
Johnston, Gary L.; and Lambert, Harvey J., 4,630,721, Cl. 192-58.00B.
Peter, David A., 4,631,685, Cl. 364-476.000.
General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi; and Yokoyama, Nobuaki, 4,631,377, Cl. 200-314.000.
General Screw Products Company: *See—*
Nimberger, Spencer M., 4,630,629, Cl. 137-15.000.
General Signal Corporation: *See—*
Frielinghaus, Klaus H., 4,630,792, Cl. 246-369.000.
Genicom Corporation: *See—*
Karns, Ward L., 4,630,948, Cl. 400-196.100.
Gennetten, Edward W.; and Gomez, Duane A., to United States of America, Navy. Digital raster timing encoder/decoder. 4,631,586, Cl. 358-148.000.
Gentry, James C. Food unit making and packaging apparatus and method. 4,630,426, Cl. 53-428.000.
George, John B., to RCA Corporation. Feedback display driver stage. 4,631,595, Cl. 358-243.000.
George, Stephen; and George, Thomas, to Subtex, Inc. High temperature, molten metal resistant fabric composition. 4,631,224, Cl. 428-246.000.

George, Thomas: *See—*
George, Stephen; and George, Thomas, 4,631,224, Cl. 428-246.000.
Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. 1,4-oxazinone derivatives. 4,631,340, Cl. 544-171.000.
Gerard, Jean-Louis: *See—*
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.
Gerling, Paul, to Glyco-Maschinenbau GmbH. Bearing housing. 4,630,945, Cl. 384-320.000.
Germanton, Damon; and Weiss, Donald. Low cost thermocouple apparatus and methods for fabricating the same. 4,631,350, Cl. 136-225.000.
Germer, Warren R.; and Balch, Richard A., to General Electric Company. Memory programmer interface for electronic demand register. 4,631,476, Cl. 324-103.00R.
Getzlaff, Klaus J.: *See—*
Chilinski, Herbert; Getzlaff, Klaus J.; Hajdu, Johann; and Raeth, Franz J., 4,631,663, Cl. 364-200.000.
Geven, Willem J. A., to U.S. Philips Corporation. System for controlling the speed of an electric motor. 4,631,462, Cl. 318-318.000.
GFS Manufacturing Company, Inc.: *See—*
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,631,511, Cl. 336-180.000.
Giacomazzi, Roy A.: *See—*
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Gibson, David: *See—*
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Gilbreath, William E., to Safway Scaffolds Company of Houston. Scaffolding connection and retention device and method. 4,630,956, Cl. 403-49.000.
Gilli, Luigi; and Sartorio, Franco, to Prima Progetti S.p.A. Machine for effecting the transfer of objects in the space between positions having predetermined co-ordinates. 4,630,992, Cl. 414-744.00R.
Gillis, Patrick J., Jr.: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.
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Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.
Gingerich, Michael E.: *See—*
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.
Ginzburg, Vladimir B.; and Tippins, George W., to Tippins Machinery Company, Inc. Continuous rolling method and apparatus. 4,630,352, Cl. 29-527.700.
Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., to Hoffmann-La Roche Inc. Carcinoembryonic antigen determination. 4,631,254, Cl. 435-7.000.
Giovanini, Donald R.: *See—*
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Girgenti, Russell S.: *See—*
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Glaser, Siegfried, to Helmut Lingemann GmbH & Co. Connection of two spacer frame profiles as well as process and apparatus for the establishment of the connection. 4,630,959, Cl. 403-266.000.
Gleich, Hermann: *See—*
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Glover, Alfred H.: *See—*
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Glucksman, Dov Z., to Environmental Fragrance Technologies, Ltd. Aroma generating apparatus with electrical heating element. 4,631,387, Cl. 219-272.000.
Glyco-Maschinenbau GmbH: *See—*
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GMF Robotics Corporation: *See—*
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.
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Goetzman, Robert G. Dual stage combustion furnace. 4,630,553, Cl. 110-214.000.
Gohl, Pierre, to La Telemecanique Electrique. DC power control circuit with status reporting and protection against overloads and short circuits. 4,631,623, Cl. 361-86.000.
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., to Ethyl Corporation. Heterogeneous catalyst process. 4,631,349, Cl. 568-789.000.
Gokel, George W.; and Echegoyen, Luis, to W. R. Grace & Co. Reversible, electrochemically-switched lariat ethers. 4,631,119, Cl. 204-59.00R.
Goldberg, Michael L.: *See—*
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Gonzalez, Jeffrey M.: *See—*
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Goodchild, Graham H.: *See—*
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Goode, Sidney H., to American Hoechst Corporation. Automatic staple fiber sampler. 4,630,492, Cl. 73-863.820.
Goodfellow, Robert D. Rotary cutter assembly. 4,630,693, Cl. 175-366.000.
Goodman, Howard, to English China Clays Lovering Pochin & Co. Ltd. Method for improving the dispersibility of organoclays. 4,631,091, Cl. 106-308.00N.
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, to TRW Inc. Semiconductor laser structure. 4,631,729, Cl. 372-44.000.
Goossens, John: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.
Gornowicz, Gerald A.; and Lee, Chi-Long, to Dow Corning Corporation. Moisture resistant polyurethanes derived from non-aromatic diisocyanates. 4,631,329, Cl. 528-28.000.
Goto, Tsukasa: *See—*
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Gould, Harry J. Conductive housing and biasing system for microwave integrated circuits. 4,631,494, Cl. 330-286.000.
Goulter, Victor H.: *See—*
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Grabbe, Dimitry: *See—*
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Graber, Charles D.: *See—*
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Graf, Paul: *See—*
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Graham, Andrew J. Line trimmer shield. 4,630,371, Cl. 30-347.000.
Graham, Dennis P.: *See—*
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Graham Magnetics Inc.: *See—*
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Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., to Dow Chemical Company, The. Adhesive and coating composition. 4,631,308, Cl. 524-272.000.
Grant, Richard W.; and Sciulli, Ronald D., to Atecs Corporation. Adjustable mast step. 4,630,562, Cl. 114-39.000.
Grant, Timothy L. Video game control box holder. 4,630,823, Cl. 273-148.00B.
Gray, George W.: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.
Greco, Mark, to Schwinn Bicycle Company. Flat cross bar for freestyle bicycle handlebar. 4,630,502, Cl. 74-551.100.
Green, George R. J.: *See—*
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Green, Sidney J.: *See—*
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Greenfield, Herbert: *See—*
Revelli, Anthony J.; and Greenfield, Herbert, 4,630,932, Cl. 366-279.000.
Greenwald, Larry H., to Aero-Vision Systems, Inc. Video game apparatus integral with airplane passenger seat tray. 4,630,821, Cl. 273-85.00G.
Greenway, John M., to Kendall Company, The. Wound dressing. 4,630,603, Cl. 128-156.000.
Gremillion, Ernest J. Barbecue grill with fire retarding screen. 4,630,593, Cl. 126-25.00R.
Griffee, Les V.: *See—*
Dumas, Ted A.; and Griffee, Les V., 4,631,546, Cl. 343-833.000.
Griggs, Jerald A.: *See—*
Tung, Lu H.; and Griggs, Jerald A., 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., 4,631,314, Cl. 525-314.000.
Grimes, Dwight W., to International Business Machines Corporation. Communication interface connecting binary logic unit through a trinary logic transmission channel. 4,631,428, Cl. 307-475.000.
Grimm, Hermann: *See—*
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Grimsley, Richard L., to Cincinnati Microwave, Inc. Police radar warning receiver with mute function. 4,631,542, Cl. 342-20.000.

Groos, Heinrich: *See—*
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Gross, Helmut, to Motoren-und Turbinen Union Muchen GmbH. Apparatus for axially and circumferentially locking stationary casing components of turbomachines. 4,630,994, Cl. 415-190.000.
Grossiord, Claude, to S. T. DuPont. Watches or the like equipped with a display device of the date type. 4,630,937, Cl. 368-223.000.
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., to Video Dynamics, Inc. Head cleaning cassette for a video cassette recorder. 4,631,615, Cl. 360-128.000.
Grosso, Elaine C.: *See—*
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Grothe, Steven P., to Sperry Corporation. Raster display generator for hybrid display system. 4,631,532, Cl. 340-703.000.
Grothues-Spork, Hermann. Stern fin for single-prop ship. 4,631,036, Cl. 440-66.000.
Grotkasten, Klaus: *See—*
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Gruhler, Siegfried: *See—*
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Grumman Aerospace Corporation: *See—*
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Grunberg, Robert M.; and Dixon, Michael. Electrical connector. 4,630,876, Cl. 339-48.000.
Grunig Administration: *See—*
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Grunig, Dieter, to Grunig Administration. Method of and device for monitoring a plurality of automatic selling machines. 4,631,357, Cl. 379-40.000.
GTE Communication Systems Corp.: *See—*
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GTE Products Corporation: *See—*
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English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,631,446, Cl. 313-634.000.
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.
Mizuhara, Howard, 4,630,767, Cl. 228-122.000.
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, to La Telemecanique Electrique. Variable composition switching device. 4,631,507, Cl. 335-27.000.
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Guillaume, Paul; Kayser, Didier; and Propice, Jean, to L'Air Liquide. Process for incinerating waste products at a controlled temperature. 4,630,555, Cl. 110-346.000.
Guinnip, Charles L.: *See—*
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Gulliver, Barron J., to Harter Corporation. Electrostatic dissipative chair. 4,630,867, Cl. 297-452.000.
Gunderson, Richard H.; Gardner, Terry N.; and Guile, Peter J. D., to Exxon Production Research Co. Buoyancy system for submerged structural member. 4,630,970, Cl. 405-224.000.
Guntert, Josef; and Hafele, Walter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,630,586, Cl. 123-500.000.
Guyer, Thomas L.; and Franz, Robert M., to Upjohn Company, The. Polymeric material as a disintegrant in a compressed tablet. 4,631,305, Cl. 523-400.000.
Gym Bee Enterprises, Inc.: *See—*
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Sagemuehl, Hans W.; and Duffie, Kenneth G., 4,630,321, Cl. 2-426.000.
Haas, Laura M.; and Lindsay, Bruce G., to International Business Machines Corporation. Method for refreshing multicolumn tables in a relational data base using minimal information. 4,631,673, Cl. 364-300.000.
Haavisto, John R., to Northrop Corporation. Multichannel optical wave guide resonator. 4,630,885, Cl. 350-96.150.
Haberrecker, Klaus, to Siemens Aktiengesellschaft. X-ray tube. 4,631,744, Cl. 378-138.000.
Habich, Dieter: *See—*
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Hadary, Joseph. Toothpick holder. 4,630,623, Cl. 132-89.000.
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Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., to Acorn Engineering Company. Rotating cap, screen and mounting means for protecting air metering valve. 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., to Acorn Engineering Company. Dual operated metering valve connected to both a hand operated push button and a foot operated push button. 4,630,644, Cl. 137-624.110.
Haga, Hirokazu, to Graham Magnetics Inc. Error locator for high-speed inspection of magnetic tape. 4,631,479, Cl. 324-212.000.
Hagemeyer, Bruce A., to Rolscreen Company. Door. 4,630,420, Cl. 52-313.000.
Hagen, Gary P., to Standard Oil Company (Indiana). Catalyst and process for preparation of alpha, beta-unsaturated acids. 4,631,264, Cl. 502-243.000.
Haggett, Irving C., to Yardney Corporation. Machine with automatic finger safety guard. 4,631,383, Cl. 219-78.010.
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Halcon SD Group, Inc., The: *See—*
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Hales, Patrick; Laurier, Jean-Pierre; and Pradet, Gerard. Emergency container for an accidentally amputated member. 4,630,596, Cl. 128-1.00R.
Hall, Bill R. Economical fountainhead. 4,630,771, Cl. 237-17.000.
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Hall, Robert J.; Hall, George R.; and Cookerly, Jack C. Sharing sound-producing channels in an accompaniment-type musical instrument. 4,630,517, Cl. 84-1.010.
Halliburton Company: *See—*
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Hamon-Industries: *See—*
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Han, Youn W., to United States of America, Agriculture. Irradiation alcohol fermentation process. 4,631,258, Cl. 435-99.000.
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Handel, Martin G.; Robida, James E.; and Slusarski, Ronald S., to Emhart Industries, Inc. Push bar exit device with alarm. 4,631,528, Cl. 340-545.000.
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Handy, Roland J., to Xerox Corporation. High dynamic range charge amplifier. 4,631,739, Cl. 377-60.000.
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Harada, Hiroshi: *See—*
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Harder, Hans E.; and Kramer, Hermann, to Howmedica International, Inc. Bone nail for the treatment of fractures. 4,630,601, Cl. 128-92.0YZ.

Hargreaves, Brian: *See—*
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Harper, Bruce; and Kemp, Horace N., to Xidex Corporation. Method and system for folding floppy disk envelopes. 4,630,427, Cl. 53-460.000.

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Harris Corporation: *See—*
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Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., to Burroughs Corporation. Data transfer network for variable protocol management. 4,631,666, Cl. 364-200.000.

Harris, Donald L., to Cordis Corporation. Ventricular amniotic shunt and introducer system. 4,631,051, Cl. 604-9.000.

Harris, Jeffrey T.: *See—*
Stutler, Richard A.; and Harris, Jeffrey T., 4,631,662, Cl. 364-200.000.

Harry, John E., to Loughborough Consultants Limited. Apparatus and method for generating a plurality of electric discharges. 4,631,452, Cl. 315-334.000.

Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, to Magyar Alumini-umipari Troszt. Process and apparatus for the mixing of slurries. 4,630,931, Cl. 366-107.000.

Harshaw/Filtrol: *See—*
Sparacia, Frank M.; and Wimer, Oley D., 4,631,409, Cl. 250-361.00R.

Harter Corporation: *See—*
Gulliver, Barron J., 4,630,867, Cl. 297-452.000.

Hartman, Russell D.; and Dougherty, Edward M., to Scaletron, Inc. Strain gauge scale. 4,630,697, Cl. 177-211.000.

Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, to SKF Textilmaschinen-Komponenten GmbH. Roving blocking mechanism on draw frames of spinning machines. 4,630,434, Cl. 57-87.000.

Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. 1-Oxadethiacephalosporin derivatives and antibacterial use thereof. 4,631,275, Cl. 514-210.000.

Harvey Hubbell Incorporated: *See—*
Boteler, William C., 4,631,354, Cl. 174-66.000.

Harville, Cathy L.: *See—*
Winyall, Milton E.; and Harville, Cathy L., 4,631,184, Cl. 424-49.000.

Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, to Kasei Optonix, Ltd. Monochrome display cathode ray tube with long after glow phosphors. 4,631,445, Cl. 313-467.000.

Hasegawa, Hiroaki, to Fukuvi Chemical Industry Co., Ltd. Transparent electromagnetic wave shielding material. 4,631,214, Cl. 428-68.000.

Hashiguchi, Makoto; and Fukutomi, Yohji, to Honda Giken Kogyo K.K. Exhaust gas recirculation method for internal combustion engines. 4,630,589, Cl. 123-571.000.

Hashimoto, Kunio, to Okazaki, Haruo; and Japan Pipe Conveyor Co., Ltd. Tubular belt conveyor and a belt rolling up means of the same. 4,630,726, Cl. 198-819.000.

Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, to TDK Corporation. Magnetic tape cassette having improved reel locking means. 4,631,619, Cl. 360-132.000.

Hasley, Lloyd A.: *See—*
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.

Hassler, Joachim: *See—*
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.

Hasty, Robert: *See—*
Potter, Clinton; and Hasty, Robert, 4,631,365, Cl. 379-167.000.

Hata, Akio: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Hatamura, Koichi; and Hiraoka, Tetsuo, to Mazda Motor Corporation. Intake system for multicylinder engine. 4,630,575, Cl. 123-52.00M.

Hatton, Bruce M., to Eaton Corporation. Low viscous drag knock sensor. 4,630,465, Cl. 73-35.000.

Hattori, Kiyoshi: *See—*
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.

Hattori, Yoshiyuki: *See—*
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Hauni-Werke Korber & Co. KG.: *See—*
Berlin, Herbert, 4,630,466, Cl. 73-38.000.

Hauschildt, Klaus-Robert: *See—*
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.

Havens, Joseph H.: *See—*
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.

Hawe-Neos Dental Dr. H. von Weissenfluh S.A.: *See—*
von Weissenfluh, Beat, 4,631,030, Cl. 433-149.000.

Hawke Cable Glands Limited: *See—*
Twist, Michael; and Mundy, Paul, 4,630,848, Cl. 285-308.000.

Haworth, Inc.: *See—*
Lapins, Daniel W.; and Szymanski, Richard, 4,630,416, Cl. 52-239.000.

Hay, Robert A., II, to Dow Chemical Company, The. Film casting apparatus including heat transfer roll. 4,631,016, Cl. 425-224.000.

Hayakawa, Morio: *See—*
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.

Hayami, Ryozo: *See—*
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.

Hayashi, Chikara, to Research Development Corporation of Japan. Process for removing covering film and apparatus therefor. 4,631,250, Cl. 430-329.000.

Hayashi Electric Co., Ltd.: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Hayashi, Kiyoshi: *See—*
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.

Hayashi, Kunihal: *See—*
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.

Hayashi, Mikio: *See—*
Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, 4,630,946, Cl. 400-121.000.

Hayashi, Shun-ichi: *See—*
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.

Hayashi, Steven R.: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.

Hayashi, Torahiko, to Rheon Automatic Machinery Co.; Ltd. Apparatus for rolling plastic dough. 4,631,017, Cl. 425-335.000.

Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for quantifying the flow rate of dough. 4,631,021, Cl. 425-140.000.

Hayashibara, Ken: *See—*
Masaki, Kazumi, 4,630,996, Cl. 416-16.000.

Haygreen, John G., to University of Minnesota, Regents of the. Method and apparatus for de-watering biomass materials in a compression drying process. 4,630,535, Cl. 100-127.000.

Hayn, John, II; and Schabowski, John, to Texas Instruments Incorporated. Memory interface with automatic delay state. 4,631,659, Cl. 364-200.000.

Hazeltine Corporation: *See—*
St. John, Karl M., 4,631,576, Cl. 358-65.000.

Heath Company: *See—*
Rapaich, Mark, 4,631,749, Cl. 381-103.000.

Hecht, Joachim; and Rudat, Gerhard, to Mannesmann AG. Actuating mechanism in overhead rail equipment. 4,630,544, Cl. 105-130.000.

Heck, Reinhard, to Kraftwerk Union Aktiengesellschaft. Nuclear power station with a containment. 4,631,164, Cl. 376-300.000.

Hecker, Edward P.: *See—*
Boyle, William B.; Candelaria, Rodolfo, Jr.; and Hecker, Edward P., 4,630,344, Cl. 29-149.50R.

Heikkila, Heikki, to Suomen Sokeri Oy. Production of pure sugars and lignosulfonates from sulfite spent liquor. 4,631,129, Cl. 210-635.000.

Hein-Werner Corporation: *See—*
Donahue, Robert L., 4,630,380, Cl. 33-288.000.

Heine, Franz; and Ruttershoff, Heinz-Joachim, to O&K Orenstein & Koppel Aktiengesellschaft. Apparatus for the remote-controlled connecting or separating of two coupling parts. 4,630,878, Cl. 339-75.00M.

Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, to Bochumer Eisenhuette Heintzmann GmbH & Co. KG. Peripherally flexible prop arch for mining tracks, tunnels or the like. 4,630,973, Cl. 405-288.000.

Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, to A. Friedr. Flender GmbH & Co. KG. Method for assembling two-way transmission gears with power distribution. 4,630,349, Cl. 29-434.000.

Hellwig, Horst. Traffic intersection. 4,630,961, Cl. 404-1.000.

Helminiak, Thaddeus E.: *See—*
Hwang, Wen-Fang; Wiff, Donald R.; and Helminiak, Thaddeus E., 4,631,318, Cl. 525-432.000.

Helmut Lingemann GmbH & Co.: *See—*
Glaser, Siegfried, 4,630,959, Cl. 403-266.000.

Helweg, Lionel C.: *See—*
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S., 4,630,489, Cl. 73-861.870.

Henschel, Reed E. Foldable stool. 4,630,861, Cl. 297-44.000.

Hepworth, Ian C., to British Nuclear Fuels plc. Flow control apparatus. 4,630,628, Cl. 137-12.000.

Herbst, Thomas; and Schitzler, Lorenz, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for anchoring rock and the like. 4,630,971, Cl. 405-260.000.

Hercules Incorporated: *See—*
Tise, Frank P., 4,631,247, Cl. 430-281.000.

Herrick, Robert A.: *See—*
Rapp, Charles F.; and Herrick, Robert A., 4,631,178, Cl. 423-210.000.

Herrmann, Dietrich E.; and Abraham, Detlev, to Otis Elevator Company. Escalator passenger flow control. 4,631,467, Cl. 318-798.000.

Hewlett-Packard Company: *See—*
Cutler, Gregory M., 4,631,498, Cl. 331-9.000.
Opfer, James E.; and Natarajan, Bangalore R., 4,631,202, Cl. 427-131.000.
Trutna, William R., Jr., 4,631,416, Cl. 250-548.000.

Hicks, Darrell D., to Interez, Inc. Process for preparing low viscosity UV curable polyacrylates. 4,631,300, Cl. 522-100.000.

Hicks, John W., Jr., to Polaroid Corporation. Polarization locked optical fiber and method. 4,630,889, Cl. 350-96.300.

Hietkamp, Gerrit: *See—*
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.

Higashiizumi, Takao: *See—*
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.

Higashiyama, Kazuhiro; and Ishigami, Kazuhiro, to Nissan Motor Co., Ltd. Fuel octane responsive internal combustion engine ignition system. 4,630,584, Cl. 123-425.000.

Higgins, Michael. Fish lure. 4,630,389, Cl. 43-42.220.

Higuchi, Masakazu: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Hill, Charles C., to Watters, James Virgil. Jogging apparatus. 4,630,816, Cl. 272-70.000.

Hill, John; Turczanski, Henryk; and Coote, Cyril E., to Standex electronics (UK) Limited. Method of making mercury containing reed switches. 4,630,359, Cl. 29-602.00R.

Hill, John W.; and Sword, Anthony J., to Microbot, Inc. Control and force-sensing method and apparatus for motors. 4,631,657, Cl. 364-167.000.

Hillenbrand, Hans-Georg: *See—*
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.

Hills, Blair H.; and Crispino, Vincent J., to Bofors Nobel, Inc. System and method of particulating 4,4' methylenebis (2-chloroaniline). 4,631,156, Cl. 264-37.000.

Hilti Aktiengesellschaft: *See—*
Durr, Paul, 4,630,512, Cl. 81-475.000.
Hunger, Josef; and Neumaier, Anton, 4,630,836, Cl. 279-19.000.

Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Single facer. 4,631,109, Cl. 156-472.000.

Hirano, Mutsuo; and Tsunoda, Nagatoshi. Device for rhythmically driving an electromechanical vibrator. 4,630,519, Cl. 84-1.030.

Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,630,574, Cl. 123-41.270.

Hirano, Yoshinori: *See—*
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.

Hiraoka, Tetsuo: *See—*
Hatamura, Koichi; and Hiraoka, Tetsuo, 4,630,575, Cl. 123-52.00M.

Hirose, Toshifumi: *See—*
Isayama, Katsuhiko; Hirose, Toshifumi; Iwahara, Takahisa; and Kawakubo, Fumio, 4,631,322, Cl. 525-480.000.

Hiroshi, Haguchi: *See—*
Shigeo, Iwasaki; and Hiroshi, Haguchi, 4,631,015, Cl. 425-195.000.

Hirt, Edmund; Send, Dietmar; and Diete, Gunter, to Dixie Union Verpackungen GmbH, Firma. Package, for example, for surgical instruments and products. 4,630,729, Cl. 206-363.000.

Hishiki, Hideo; and Kamiyama, Yukio, to Victor Company of Japan, Ltd. Voltage dividing resistor device. 4,631,512, Cl. 338-48.000.

Hitachi Cable, Ltd.: *See—*
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.

Hitachi, Ltd.: *See—*
Furuichi, Tokinori, 4,631,458, Cl. 318-254.000.
Kawashita, Asayoshi; and Kuniga, Hirofumi, 4,631,671, Cl. 364-200.000.
Kubo, Kanji; and Izumi, Chikahiko, 4,631,668, Cl. 364-200.000.
Masuda, Mitsuhiro; Igarashi, Osamu; and Tokuyama, Keiichi, 4,630,840, Cl. 280-707.000.
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, 4,631,263, Cl. 502-159.000.
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.
Tsumaki, Nobuo; Tokisue, Hiromitsu; and Inoue, Hiroshi, 4,630,942, Cl. 384-8.000.

Hitachi Maxwell, Ltd.: *See—*
Matsumoto, Fujio; and Kato, Yoshitake, 4,630,728, Cl. 206-313.000.

Hitachi Metals, LTD: *See—*
Saka, Yoshimi, 4,630,850, Cl. 285-322.000.

Hitachi Zosen Corporation: *See—*
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.

Hitomi, Yutaka: *See—*
Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, 4,631,689, Cl. 364-513.000.

Hockney, Richard L.: *See—*
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.

Hodges, C. Wayne; and Limanowski, Jozef K., to Emhart Industries, Inc. Capacitor cover and terminal connection. 4,631,631, Cl. 361-306.000.

Hoechst Aktiengesellschaft: *See—*
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.
Disselbeck, Dieter; and Stahl, Dieter, 4,631,221, Cl. 428-166.000.
Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., 4,630,382, Cl. 34-173.000.
Pawlowski, Georg, 4,631,245, Cl. 430-175.000.
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, 4,631,158, Cl. 264-43.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Shutske, Gregory M.; and Pierrat, Frank A., 4,631,286, Cl. 514-297.000.

Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, to Robert Bosch GmbH. Fuel injection pump having an adjustable instant of injection. 4,630,587, Cl. 123-502.000.

Hoffarth, Gunther: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Hofferber, Eva: *See—*
Stenzel, Wolfgang; and Hofferber, Eva, 4,631,281, Cl. 514-252.000.

Hoffmann-La Roche Inc.: *See—*
Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., 4,631,254, Cl. 435-7.000.
Petrzilka, Martin; and Villiger, Alois, 4,630,896, Cl. 350-350.00R.

Hoffrichter, Ingo; and Jung, Eggert, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for the production of color separations for single color printing. 4,631,579, Cl. 358-80.000.

Hofmann, Eberhard: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.

Hofstetter, Michel. Device for finishing the edges of skis. 4,630,409, Cl. 51-361.000.

Hogg, Christine: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.

Holland Hitch Company: *See—*
Wilson, James A.; and Ellis, James R., 4,630,570, Cl. 119-20.000.

Hollis, Ernest E.; and Born, Joseph H., to Sanders Associates, Inc. Dynamic flip-flop with static reset. 4,631,420, Cl. 307-272.00R.

Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., to Nordson Corporation. Powder spray gun. 4,630,777, Cl. 239-707.000.

Holmes, Silas W.: *See—*
Goins, Dixie E.; Holmes, Silas W.; and Burt, Edward A., 4,631,349, Cl. 568-789.000.

Holset Engineering Company Limited: *See—*
Parker, John, 4,630,445, Cl. 60-602.000.

Holtey, Thomas O.: *See—*
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,631,699, Cl. 364-900.000.

Honda Giken Kogyo K.K.: *See—*
Hashiguchi, Makoto; and Fukutomi, Yohji, 4,630,589, Cl. 123-571.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,630,702, Cl. 180-215.000.
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.
Tsuboi, Masaharu; and Watanabe, Kuniaki, 4,631,469, Cl. 322-42.000.
Yamada, Kozo; and Washizawa, Yoshikazu, 4,630,699, Cl. 180-75.000.

Honda, Masahiko, to NEC Corporation. Semiconductor integrated circuit memory device. 4,631,705, Cl. 365-182.000.

Honda, Masamitsu, to Nippon Univac Kaisha, Ltd. Transient electromagnetic field detector. 4,631,473, Cl. 324-72.500.
Honeywell Inc.: *See—*
Bohan, John E., Jr., 4,631,626, Cl. 361-104.000.
Jacobsen, William F. M.; and Zansky, Zoltan, 4,631,675, Cl. 364-400.000.
Jenekhe, Samson A., 4,631,323, Cl. 525-509.000.
Kozlik, Tony J., 4,631,695, Cl. 364-715.000.
Matthys, Robert J., 4,631,501, Cl. 331-143.000.
Nelson, Roderick D.; and Vu, Tho T., 4,631,426, Cl. 307-450.000.
Spiesman, Robert L., 4,631,733, Cl. 375-7.000.
Honeywell Information Systems Inc.: *See—*
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, 4,631,723, Cl. 371-10.000.
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,631,699, Cl. 364-900.000.
Honeywell Information Systems Italia: *See—*
Zulian, Ferruccio; and Zanchi, Vittorio, 4,631,667, Cl. 364-200.000.
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, to Sony Corporation. Dark level restoring circuit. 4,631,589, Cl. 358-171.000.
Hooper, Bernard, to National Research Development Corporation. Stratified charge internal combustion engines. 4,630,591, Cl. 123-65.00S.
Hooper, David W. Annulus bypass peripheral nozzle jet pump pressure differential drilling tool and method for well drilling. 4,630,691, Cl. 175-65.000.
Hoover, Lawrence E. Audio straw and cup lid. 4,631,715, Cl. 369-68.000.
Hopkins, Allan S., to Jaguar Cars Limited. Selector mechanism for an automatic transmission vehicle. 4,630,499, Cl. 74-473.00R.
Hoppe, Udo: *See—*
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, 4,631,295, Cl. 514-558.000.
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, to Japan Tobacco & Salt Public Corporation, The. Method and device for forming a row of filter-tip cigarettes. 4,630,724, Cl. 198-399.000.
Horii, Sadashige, to Matsushita Electric Works, Ltd. Electrically operated clock and shaver combination. 4,630,933, Cl. 368-10.000.
Horikawa, Akinori, to NEC Corporation. Data processing system having no bus utilization priority control. 4,631,669, Cl. 364-200.000.
Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Focusing device for optical systems. 4,631,394, Cl. 250-201.000.
Horn, Paul C.: *See—*
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,631,511, Cl. 336-180.000.
Hornschu, Joachim: *See—*
Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, 4,630,901, Cl. 350-552.000.
Horsthemke, August: *See—*
Meyer, Karl-Heinrich; Hucks, Uwe; and Horsthemke, August, 4,631,338, Cl. 528-483.000.
Horstman, Robert E.: *See—*
Wolter, Joachim H.; and Horstman, Robert E., 4,631,731, Cl. 372-74.000.
Horton Manufacturing Co., Inc.: *See—*
Hanks, James V., 4,630,718, Cl. 192-18.00A.
Hoseley, Rex A., to United States Postal Service. Automatic chain lubricating system. 4,630,712, Cl. 184-15.300.
Hoshi, Katsumasa, to Showa Denko Kabushiki Kaisha. Double-pipe combining device. 4,630,348, Cl. 29-234.000.
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, to Dainippon Ink and Chemicals, Inc. Heat-resistant high impact styrene resin, process for production thereof, and resin composition comprising said styrene resin. 4,631,307, Cl. 524-269.000.
Hosoi, Yuichi: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.
Houee, Yves L. P.; and Vacher, Pierre, to U.S. Philips Corporation. Two-state switched-mode power supply. 4,631,654, Cl. 363-21.000.
Houghten, Richard A., to Scripps Clinic & Research Foundation. Means for sequential solid phase organic synthesis and methods using the same. 4,631,211, Cl. 428-35.000.
House, Bruce F. Combination applicator and shaper for moldable materials. 4,631,019, Cl. 425-458.000.
Howard, Thomas C., to Synergetics, Inc. Variable area light reflecting assembly. 4,630,892, Cl. 350-264.000.
Howarth, Lawrence R.: *See—*
Bender, Roland A.; Howarth, Lawrence R.; and Coar, Lawrence F., 4,631,709, Cl. 367-4.000.
Howell, Edward K., to General Electric Company. Gate turn-off control circuit for a solid state circuit interrupter. 4,631,621, Cl. 361-13.000.
Howell, Edward K., to General Electric Company. Multiple static trip circuit breaker coordination. 4,631,622, Cl. 361-45.000.
Howell, Frederick H., to Ciba-Geigy AG. Hydroquinone ether compounds. 4,631,252, Cl. 430-551.000.
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Jones, Richard I., to Pilkington P.E. Limited. Eyeguards. 4,630,903, Cl. 350-579.000.
Jones, Rick S.: *See—*
Fisher, Glen W.; Helweg, Lionel C.; and Jones, Rick S., 4,630,489, Cl. 73-861.870.
Jones, Robert E.: *See—*
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.
Jordan, Alfons: *See—*
Muller, Karl-Heinz; and Jordan, Alfons, 4,630,834, Cl. 277-212.0FB.
Joslyn Mfg. and Supply Co.: *See—*
deSouza, Alwyn A.; and Oertel, Hans W., 4,631,453, Cl. 315-340.000.
Jubinski, Paul, to Western Geophysical Co. of America. Method and apparatus for monitoring optical fiber lapping and polishing. 4,630,884, Cl. 350-96.150.
Juneja, Prem S., to Proctor & Gamble Company, The. Depilatory compositions. 4,631,064, Cl. 8-161.000.
Jung, Eggert: *See—*
Hoffrichter, Ingo; and Jung, Eggert, 4,631,579, Cl. 358-80.000.
Juntgen, Harald: *See—*
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See—*
Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, 4,630,869, Cl. 299-33.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Usui, Eiki; and Kawaguchi, Masahiro, 4,631,112, Cl. 156-644.000.
Kabushiki Kaisha Machida Seisakusho: *See—*
Oku, Toshio, 4,630,649, Cl. 138-122.000.
Kabushiki Kaisha Morita Seisakusho: *See—*
Watanabe, Minoru, 4,630,862, Cl. 297-167.000.
Kabushiki Kaisha Sanyo Seiki Seisakusho: *See—*
Kobayashi, Akira; and Yanagisawa, Fukashi, 4,631,610, Cl. 360-104.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Kubota, Kazuhisa; and Ichikawa, Takafumi, 4,630,501, Cl. 74-484.00R.
Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, 4,630,841, Cl. 280-806.000.
Kabushiki Kaisha Toshiba: *See—*
Aoyama, Shuki, 4,631,379, Cl. 269-10.55F.
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.

Kobayashi, Shouzou, 4,631,552, Cl. 346-136.000.
Watanabe, Junji, 4,630,921, Cl. 355-3.0SH.
Watanabe, Toshiyuki; and Yamada, Noboru, 4,630,813, Cl. 271-227.000.
Yamanishi, Eiichi, 4,631,577, Cl. 358-75.000.
Kachare, Akaram H.: *See—*
Daud, Taher; and Kachare, Akaram H., 4,631,352, Cl. 136-249.000.
Kagan, Michael. Suspendable display receptacle. 4,630,795, Cl. 248-318.000.
Kaganov, Alan L.: *See—*
Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., 4,630,617, Cl. 128-784.000.
Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., to U.S. Philips Corporation. Apparatus for furnishing data signals from an optically readable record carrier at the same frequency as the associated subcode signals. 4,631,714, Cl. 369-59.000.
Kaiser, Walter: *See—*
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.
Kajihara, Seishi: *See—*
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.
Kajima, Takashi: *See—*
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, 4,630,588, Cl. 123-506.000.
Kakabaker, Kenneth G., to Durametallic Corporation. Seal arrangement for mill roll. 4,630,458, Cl. 72-237.000.
Kakalec, Robert J.: *See—*
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., 4,631,471, Cl. 323-306.000.
Kakehi, Yutaka: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, to Oki Electric Industry Co., Ltd. Method of manufacturing thin amorphous silicon film. 4,631,198, Cl. 427-38.000.
Kalka, Josef: *See—*
Boeke, Burkhard; and Kalka, Josef, 4,631,324, Cl. 526-212.000.
Kalmar LMV: *See—*
Larsson, Nils-Olof, 4,630,700, Cl. 180-89.130.
Kaltenbach, Kenneth: *See—*
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, 4,631,059, Cl. 604-280.000.
Kalyanaraman, Palaiyur S., to Rohm & Haas Company. Process for forming thermally stable negative images on surfaces utilizing polyglutarimide polymer in photoresist composition. 4,631,249, Cl. 430-325.000.
Kamiyama, Yukio: *See—*
Hishiki, Hideo; and Kamiyama, Yukio, 4,631,512, Cl. 338-48.000.
Kamprath, Axel; and Ruehr, Volker, to Dr. Ing.h.c.F Porsche Aktiengesellschaft. Temperature resistant tire pressure control device. 4,630,471, Cl. 73-146.500.
Kan, Charles S., to Dow Chemical Company, The. Adhesion of latex coatings to polymeric surfaces. 4,631,233, Cl. 428-420.000.
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, to Sanofi. Pyridazine derivatives having a psychotropic action, and medicaments in which they are present. 4,631,280, Cl. 514-247.000.
Kan, Yuji, to Sanyo Electric Co., Ltd. Waste toner collecting apparatus. 4,630,653, Cl. 141-83.000.
Kanazawa, Tomoyoshi: *See—*
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Isayama, Katsuhiko; Hirose, Toshifumi; Iwahara, Takahisa; and Kawakubo, Fumio, 4,631,322, Cl. 525-480.000.
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,631,351, Cl. 136-244.000.
Kaneko, Kouji: *See—*
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.
Kaneko, Shuzo, to Canon Kabushiki Kaisha. Image forming method. 4,631,559, Cl. 346-160.000.
Kangaroos U.S.A., Inc.: *See—*
Gamm, Robert J., 4,630,383, Cl. 36-136.000.
Kano, Harumi: *See—*
Matsuda, Takeshi; and Kano, Harumi, 4,631,504, Cl. 333-25.000.
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, to Nippon Petrochemicals Company, Limited. Impregnated capacitor. 4,631,632, Cl. 361-315.000.
Kantrowitz, Adrian; and Freed, Paul S. Dynamic aortic patch for thoracic or abdominal implantation. 4,630,597, Cl. 128-1.00D.
Kao Corporation: *See—*
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.
Kappeler, Ronald P.; and Hughes, Robert C., to NCR Corporation. Dynamic random access memory refresh control system. 4,631,701, Cl. 364-900.000.
Karashima, Toshiharu: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.
Karatsu, Masanori: *See—*
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.
Karbstein, Peter, to ACO Polymer Products, Inc. Drainage channel. 4,630,966, Cl. 405-118.000.
Karns, Ward L., to Genicom Corporation. Inked ribbon cartridge. 4,630,948, Cl. 400-196.100.
Kartarik, Mark H.: *See—*
Newcome, Thomas W., III; and Kartarik, Mark H., 4,631,358, Cl. 379-45.000.
Kasamatsu, Kiyoshi: *See—*
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.
Kase, Masao: *See—*
Ikedo, Yuji; and Kase, Masao, 4,631,716, Cl. 369-75.200.
Kasei Optonix, Ltd.: *See—*
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.
Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Phase-locked loop for a directly mixing synchronous AM-receiver. 4,631,499, Cl. 331-11.000.
Katagiri, Shingo: *See—*
Oishi, Kengo; and Katagiri, Shingo, 4,631,620, Cl. 360-133.000.
Kato, Heizaburou, to Sankyo Manufacturing Company, Ltd. Cam arrangement. 4,630,493, Cl. 74-22.00R.
Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot system. 4,631,464, Cl. 318-563.000.
Kato, Kiichi: *See—*
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.
Kato, Masatake; and Ikemori, Keiji, to Canon Kabushiki Kaisha. Zoom lens having movable diaphragm. 4,630,899, Cl. 350-427.000.
Kato, Yoshitake: *See—*
Matsumoto, Fujio; and Kato, Yoshitake, 4,630,728, Cl. 206-313.000.
Katsumata, Hiroshi, to Sony Corporation. Cassette loading device. 4,631,607, Cl. 360-96.500.
Katz, Manfred: *See—*
Wiger, Henry K.; and Katz, Manfred, 4,630,546, Cl. 105-416.000.
Kaub, Manfred, to Lucas Industries public limited company. Pressure regulator for hydraulic vehicle braking systems. 4,630,870, Cl. 303-24.00A.
Kaufmann, Richard O. On line scrubbing system for plate and frame heat exchangers. 4,630,672, Cl. 165-95.000.
Kaussen, Manfred: *See—*
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.
Kavlico Corporation: *See—*
Park, Kyong; and Alwerud, Goran S., 4,630,473, Cl. 73-161.000.
Kawaguchi, Masahiro: *See—*
Usui, Eiki; and Kawaguchi, Masahiro, 4,631,112, Cl. 156-644.000.
Kawaguchi, Teruhiko: *See—*
Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, 4,630,841, Cl. 280-806.000.
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image information read-out system. 4,631,407, Cl. 250-327.200.
Kawajiri, Shinobu: *See—*
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Kawakami, Shigenobu: *See—*
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.
Kawakubo, Fumio: *See—*
Isayama, Katsuhiko; Hirose, Toshifumi; Iwahara, Takahisa; and Kawakubo, Fumio, 4,631,322, Cl. 525-480.000.
Kawakubo, Toshio; Ishikawa, Chuji; and Yokoyama, Shizuo, to Ricoh Company, Ltd. Sheet feed apparatus for printer. 4,630,814, Cl. 271-272.000.
Kawamura, Hideaki: *See—*
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, 4,631,578, Cl. 358-80.000.
Kawamura, Hiroshi: *See—*
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Kawamura, Masahiko: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.
Kawanami, Yoshiharu, to Japan Storage Battery Company Limited. Retainer type lead-acid battery. 4,631,241, Cl. 429-225.000.
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, to Ricoh Company, LTD. Aqueous ink composition for ink-jet recording. 4,631,085, Cl. 106-22.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Nishida, Hiroshi, 4,631,032, Cl. 440-47.000.
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.

Kawashima, Hisakazu: *See*—
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Kawashita, Asayoshi; and Kuniga, Hirofumi, to Hitachi, Ltd. Data processing system capable of transferring single-byte and double-byte data under DMA control. 4,631,671, Cl. 364-200.000.

Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Anthraquinone compound having both monohalogenotriazinyl and vinylsulfone type fiber reactive groups. 4,631,341, Cl. 544-189.000.

Kayser, Didier: *See*—
Guillaume, Paul; Kayser, Didier; and Propice, Jean, 4,630,555, Cl. 110-346.000.

Kayser, Harald; and Schmedemann, Walter, to U.S. Philips Corporation. X-ray apparatus comprising a part mobile thereon. 4,630,796, Cl. 248-648.000.

Kazama, Susumu: *See*—
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.

Kazmark, Eugene A. Two-wheeled cart with auxiliary wheel. 4,630,837, Cl. 280-47.200.

Keech, David W., to Scott & Fetzer Co., The. T-fitting with one way valve and water level sensor for a sump apparatus. 4,631,001, Cl. 417-3.000.

Keiler, Manfred; Bartsch, Uwe; Drosemeyer, Hans-Heinrich; and Reitsam, Franz X., to Hoechst Aktiengesellschaft. Discharge device for granules. 4,630,382, Cl. 34-173.000.

Keiser, Grant Y.: *See*—
Keiser, Terry L.; and Guinnip, Charles L., 4,630,978, Cl. 408-159.000.

Keiser, Terry L.; and Guinnip, Charles L., to Keiser, Terry L.; and Keiser, Grant Y. Thread chasing tool. 4,630,978, Cl. 408-159.000.

Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., to Vacco Industries. Filter insert system. 4,631,126, Cl. 210-108.000.

Keller, Ernst. Automatic dip trimmer apparatus. 4,630,513, Cl. 83-152.000.

Keller, Hans-Hermann: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, to Daimler-Benz Aktiengesellschaft. Fastening clip rotatable in a housing bore. 4,630,330, Cl. 16-2.000.

Keller, Russell D. Anti-siphon fuel filler assembly. 4,630,748, Cl. 220-86.0AT.

Kemnitz, Tadeusz F., to Azionaria Costruzioni Macchine Automatiche. Apparatus and method for automatic system calibration to provide enhanced resolution in computerized weighing systems. 4,630,696, Cl. 177-165.000.

Kemp, Horace N.: *See*—
Harper, Bruce; and Kemp, Horace N., 4,630,427, Cl. 53-460.000.

Kemper, Yves J. Radially oriented nutational traction drive transmission. 4,630,494, Cl. 74-191.000.

Kendall Company, The: *See*—
Dye, John F., 4,631,056, Cl. 604-111.000.
Greenway, John M., 4,630,603, Cl. 128-156.000.

Kendall, Roger V.; and Graber, Charles D., to Da Vinci Laboratories, a division of FoodScience Corporation. N,N-dimethylglycine and use in immune response. 4,631,189, Cl. 424-85.000.

Kendi, Abraham: *See*—
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, 4,630,396, Cl. 49-55.000.

Kendi Security, Inc.: *See*—
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, 4,630,396, Cl. 49-55.000.

Kenjyo, Hideyuki: *See*—
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.

Kennedy, Conrad P., Jr., to Gibson, Patrick Howard. Apparatus for liquid filling of containers. 4,630,654, Cl. 141-83.000.

Kennedy, Donald J.: *See*—
Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., 4,630,965, Cl. 404-107.000.

Kennedy, Kenneth V., to Waldorf Corporation. Bake in tray and method of forming a blank for the same. 4,631,046, Cl. 493-59.000.

Kensey, Kenneth R., to Intravascular Surgical Instruments, Inc. Method and apparatus for surgically removing remote deposits. 4,631,052, Cl. 604-22.000.

Kent, Christopher A.: *See*—
Duddridge, John E.; and Kent, Christopher A., 4,631,135, Cl. 210-764.000.

Kern, Mark T.: *See*—
Cinzori, Robert J.; and Kern, Mark T., 4,630,684, Cl. 169-46.000.

Kernforschungsanlage Julich GmbH: *See*—
Furst, Leander; Ballast, Johan T. G.; and Jahnel, Kurt, 4,630,637, Cl. 137-340.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., to Motorola, Inc. Heat exchange apparatus for high temperature LPCVD equipment. 4,630,669, Cl. 165-1.000.

Kieser, Jorg, to Leybold-Heraeus GmbH. Apparatus for coating substrates by plasma polymerization. 4,630,568, Cl. 118-723.000.

Kihara, Kazuyuki: *See*—
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.

Kim, Il G. Apparatus and process for naso-intestinal intubation. 4,631,054, Cl. 604-54.000.

Kim, Syngcuk, to Columbia University in the City of New York, The Trustees of. Method of desensitizing hypersensitive dentin employing compositions containing potassium salts. 4,631,185, Cl. 424-49.000.

Kimberly-Clark Corporation: *See*—
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.
Van Gompel, Paul T., 4,630,320, Cl. 2-406.000.

Kinashi, Hiroshi: *See*—
Yui, Yuhi; and Kinashi, Hiroshi, 4,630,918, Cl. 355-3.00R.

Kincaid, Herbert; and Favia, Alan D., to Eastern Company. Lock with removable plug. 4,630,457, Cl. 70-369.000.

Kind, Burkhart: *See*—
Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, 4,631,510, Cl. 336-135.000.

King, Ronald R., to Wright Line, Inc. Spacer clip. 4,630,737, Cl. 211-40.000.

King, Wendell L., to Medtronic, Inc. Orthogonally-sensing lead. 4,630,611, Cl. 128-642.000.

King, William A.: *See*—
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.

Kinnan, Frank R., to Utilitech, Incorporated. Impulse injector apparatus. 4,630,972, Cl. 405-269.000.

Kinoshita, Takao; and Sakai, Shinji, to Canon Kabushiki Kaisha. Still picture recording apparatus and a solid-state image pickup device suitable for this apparatus. 4,631,593, Cl. 358-213.000.

Kinoshita, Tomoaki, to Tokyo Juki Industrial Co., Ltd. Thread cutting mechanism in lock stitch sewing machine. 4,630,559, Cl. 112-291.000.

Kinzer, Norbert: *See*—
Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, 4,631,415, Cl. 250-497.100.

Kioritz Corporation: *See*—
Kondo, Tadashige; and Inaga, Hisashi, 4,630,590, Cl. 123-602.000.
Nagashima, Akira, 4,630,372, Cl. 30-381.000.

Kirchhoff, Reinhold: *See*—
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.

Kirschner, Wallace: *See*—
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Kishida, Masatoshi: *See*—
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Kishimoto, Daisaburo, to Sanyo Electric Co., Ltd; and Tokyo Sanyo Electric Co., Ltd. Refrigerated display cabinet. 4,630,451, Cl. 62-247.000.

Kishner, Stanley J.: *See*—
Zelmanovic, David; and Kishner, Stanley J., 4,631,408, Cl. 250-339.000.

Kissel, William R., to Chrysler Motors Corporation. Electronic fuel injector driver circuit. 4,631,628, Cl. 361-154.000.

Kist, Alfred: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Kitagawa, Junji: *See*—
Yamanoue, Kouichi; and Kitagawa, Junji, 4,631,736, Cl. 375-71.000.

Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, to Tokyo Electric Co., Ltd. Load cell and method of compensating the same. 4,630,491, Cl. 73-862.670.

Kitagawa, Yoshiaki; and Iwata, Hideo, to Matsushita Electric Works, Ltd. Method of manufacturing heat exchange mat. 4,631,102, Cl. 156-210.000.

Klaeser, Robert S.: *See*—
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Method and apparatus to determine constant speed torque on an engine. 4,630,508, Cl. 74-866.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Gearshift selection system for a power-assisted transmission. 4,631,679, Cl. 364-424.100.

Klinchuch, John F., to Rockwell International Corporation. Linear controller for electrochemical device and method. 4,631,463, Cl. 318-558.000.

Klingler, Otto; and Gruhler, Siegfried, to Mauser-Werke Oberndorf GmbH. Length measuring device. 4,630,928, Cl. 356-374.000.

Knetsch, Manfred; and Kuhne, Wolfgang, to Robert Bosch GmbH. Method and apparatus for using spring-type resistive elements in a measurement bridge circuit. 4,631,478, Cl. 324-207.000.

Knothe, Frank: *See*—
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Knowlton, Dale E., to Boeing Company, The. Rivet driving die and method. 4,630,463, Cl. 72-479.000.

Kobayashi, Akira; and Yanagisawa, Fukashi, to Kabushiki Kaisha Sanyo Seiki Seisakusho. Multichannel magnetic head supporting mechanism. 4,631,610, Cl. 360-104.000.

Kobayashi, Hiromu: *See*—
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.

Kobayashi, Jun'ichi: *See*—
Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, 4,631,149, Cl. 540-546.000.

Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, to Nippon Oil & Fars Co., Ltd. Method for production of fluorine-containing aromatic derivative. 4,631,151, Cl. 260-408.000.

Kobayashi, Shigeyoshi: *See*—
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Kobayashi, Shouzou, to Kabushiki Kaisha Toshiba. Thermal recorder paper stacker. 4,631,552, Cl. 346-136.000.

Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Transmission for a four-wheel drive motor vehicle. 4,630,705, Cl. 180-247.000.

Koch Carbon Inc.: *See*—
Casper, Robert K.; and Runner, James F., 4,631,025, Cl. 432-15.000.

Koch, Elmar; and Gleich, Hermann, to Mabu-Pressen Maschinenfabrik Karl Burkard KG. Eccentric press. 4,630,516, Cl. 83-530.000.

Koch, Otto: *See*—
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Koeck, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Service integrated transmission system. 4,631,720, Cl. 370-84.000.

Koehle, Siegfried E., to Berg Steel Pipe Corp. Bevel end protector. 4,630,646, Cl. 138-96.00R.

Kohler, Mark L.: *See*—
Brown, Donald W., Jr.; and Kohler, Mark L., 4,630,781, Cl. 241-159.000.

Kohlpaintner, Georg: *See*—
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Kohne, Bernd: *See*—
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.

Koibuchi, Nobutaka: *See*—
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.

Koike, Shin'ichi: *See*—
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.

Koishi, Toshio; and Yasumura, Takashi, to Central Glass Company Limited. Curable fluorine-containing copolymer and coating liquid composition using same. 4,631,326, Cl. 526-249.000.

Kokado, Masayuki; and Sumi, Hidezi, to Fujitsu Limited. PNPN integrated circuit protective device with integral resistor. 4,631,567, Cl. 357-38.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Tanaka, Fujio; and Imamura, Nobutake, 4,631,617, Cl. 360-131.000.

Kolle, Rudi: *See*—
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.

Koller, Anton. Mixture for the care and cleaning of contact lenses. 4,631,072, Cl. 51-309.000.

Kollmorgen Technologies Corporation: *See*—
Zelmanovic, David; and Kishner, Stanley J., 4,631,408, Cl. 250-339.000.

Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, to Konishiroku Photo Industry Co., Ltd. Heat-developable color photo-sensitive material with polymeric coupler. 4,631,251, Cl. 430-548.000.

Komukai, Shigemi, to Tokico Ltd. Fuel supply system. 4,630,754, Cl. 222-28.000.

Komuro, Katsusuke: *See*—
Irimajiri, Shoichiro; Komuro, Katsusuke; and Aikawa, Kunihiko, 4,630,702, Cl. 180-215.000.

Kondo, Asaji, to Fuji Photo Film Co., Ltd. Multilayer chemical analysis member having an outer waterproof layer. 4,631,174, Cl. 422-56.000.

Kondo, Tadashige; and Inaga, Hisashi, to Kioritz Corporation. Internal combustion engine apparatus. 4,630,590, Cl. 123-602.000.

Kondo, Toru: *See*—
Ishiguro, Minoru; Kaneko, Kouji; and Kondo, Toru, 4,630,916, Cl. 354-418.000.

Konig, Joachim; and Korte, Siegfried, to Bayer Aktiengesellschaft. Production of sulphonic acid group-containing acrylonitrile polymers and monomers therefor. 4,631,317, Cl. 525-383.000.

Konigshofen, Heinrich: *See*—
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Kono, Kazunori: *See*—
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.

Koppers, Manfred: *See*—
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Domanski, Lothar, 4,630,973, Cl. 405-288.000.

Korb, Jean P.; and Lagrue, Jean P., to Regie Nationale des Usines Renault. Process for optimizing the ignition advance of an internal combustion engine. 4,631,680, Cl. 364-431.050.

Korba, Larry, to Canadian Patents and Deveopment Limited—Societe Canadienne des Brevets et d'Exploitation Limitee. Computer speed control. 4,631,702, Cl. 364-900.000.

Korsunsky, Iosif; and Grabbe, Dimitry, to AMP Incorporated. Chip carrier socket which requires low insertion force for the chip carrier. 4,630,875, Cl. 339-17.0CF.

Korte, Kevin R.; and Wu, Dan T., to Brown & Williamson Tobacco Corp. Process for treating tobacco. 4,630,619, Cl. 131-296.000.

Korte, Siegfried: *See*—
Konig, Joachim; and Korte, Siegfried, 4,631,317, Cl. 525-383.000.

Kose, Saburo: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,631,099, Cl. 156-89.000.

Koshimaru, Shigeru, to NEC. Logic gate circuit having P- and N-channel transistors coupled in parallel. 4,631,425, Cl. 307-449.000.

Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, to Bristol-Myers Company. Fermentation process for BBM-928. 4,631,256, Cl. 435-68.000.

Kossuth, Donald A., to National Gypsum Company. Embossed gypsum board. 4,631,097, Cl. 156-44.000.

Koster, Detlef. Demountable multi-purpose light table. 4,631,643, Cl. 362-97.000.

Kotobuki Seiyaku Co., Ltd.: *See*—
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,631,292, Cl. 514-452.000.

Kovens, Michael L.: *See*—
De Witt, Kenneth I.; and Kovens, Michael L., 4,631,527, Cl. 340-539.000.

Kowalski, Bruce R.; and Rohrback, Gilson H., to Rohrback Technology Corporation. Method and apparatus for analysis employing multiple separation processes. 4,631,687, Cl. 364-497.000.

Kozlik, Tony J., to Honeywell Inc. Detector of predetermined patterns of encoded data signals. 4,631,695, Cl. 364-715.000.

Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., to Dow Chemical Japan Limited. Method for incorporating chlorpyrifos into thermoplastic resins. 4,631,301, Cl. 523-122.000.

Kraatz, Udo; Buchel, Karl H.; Hanssler, Gerd; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Triazolylmethyl-pyridyloxymethyl-carbinol fungicides. 4,631,288, Cl. 514-340.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Heck, Reinhard, 4,631,164, Cl. 376-300.000.

Kramer, Hermann: *See*—
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Kramer, Vance M., Jr.: *See*—
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr., 4,630,350, Cl. 29-453.000.

Kramer, Vance M., Sr.; and Kramer, Vance M., Jr. Method for making a flexible corrugated rubber tubing with internal reinforcement. 4,630,350, Cl. 29-453.000.

Krantz America, Inc.: *See*—
Morizzo, Nicholas L., 4,630,339, Cl. 26-70.000.

Kranz, Eckhard; and Duren, Karl, to Mannesmann AG. Making clad seamless pipes. 4,630,351, Cl. 29-527.200.

Krauss-Maffei Aktiengesellschaft: *See*—
Titus, Hans-Joachim, 4,631,048, Cl. 494-13.000.

Krauss, Werner, to Claudius Peters AG. Bulk silo. 4,630,531, Cl. 98-52.000.

Kretzschmar, Klaus: *See*—
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.

Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of polyimide esters of trimellitic acid. 4,631,333, Cl. 528-170.000.

Kridl, Thomas A.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,631,098, Cl. 156-86.000.

Kristiansen, Leif A.: *See*—
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Kroh, Adolf: *See*—
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.

Kroll, Hein-Peter: *See*—
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Kronberger, Leonard J., to Chrysler Motors Corporation. Labyrinth for an ignition distributor cap and rotor assembly with atmospheric purging action. 4,631,370, Cl. 200-19.00R.

Kronberger, Leonard J., to Chrysler Motors Corporation. Wet surface tracking resistance for an ignition distributor cap. 4,631,371, Cl. 200-19.0DC.

Kronberger, Leonard J., to Chrysler Motors Corporation. Plastic hub and interrupter assembly for an ignition distributor. 4,631,372, Cl. 200-19.00R.

Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., to United States of America, Army. Radiological instrument. 4,631,414, Cl. 250-474.100.

Krueger, David E.: *See*—
Peeters Weem, Jan A.; Krueger, David E.; and Graham, Dennis P., 4,630,856, Cl. 294-81.530.

Kruesi, Paul R., to Cato Research Corporation. Recovery of anhydrous zinc chloride. 4,631,176, Cl. 423-100.000.

Kruger, Bernd-Wieland: *See—*
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.

Kruger, Edmund R., to Lear Siegler, Inc. Method for making a porous rigid structure and the porous rigid structure made thereby. 4,631,228, Cl. 428-316.600.

Krupey, John: *See—*
Giorgio, Nicholas A.; Krupey, John; and Wilson, Leonard T., 4,631,254, Cl. 435-7.000.

Kryszewski, Marian: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.

Ku, San-Mei: *See—*
Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., 4,630,356, Cl. 29-576.00W.

Kubo, Haruaki, to Dai Showa Seiki Kabushiki Kaisha. Chuck assembly for a machine tool. 4,630,980, Cl. 409-234.000.

Kubo, Kanji; and Izumi, Chikahiko, to Hitachi, Ltd. Storage system using comparison and merger of encached data and update data at buffer to cache to maintain data integrity. 4,631,668, Cl. 364-200.000.

Kubota, Kazuhisa; and Ichikawa, Takafumi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Steering switch pad apparatus. 4,630,501, Cl. 74-484.00R.

Kubota, Shigeo: *See—*
Ohsato, Kiyoshi; and Kubota, Shigeo, 4,631,397, Cl. 250-201.000.

Kubozuka, Takao: *See—*
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.

Kuchiki, Kiyoshi: *See—*
Akasofu, Kyosuke; and Kuchiki, Kiyoshi, 4,631,684, Cl. 364-474.000.

Kugler, Artur; Reppert, Rudi; and Zaunberger, Franz-Xaver, to Zahnraderfabrik Renk Aktiengesellschaft. Drive system with flow brake. 4,630,507, Cl. 74-733.000.

Kuhne, Wolfgang: *See—*
Knetsch, Manfred; and Kuhne, Wolfgang, 4,631,478, Cl. 324-207.000.

Kulp, Rodney J.; and Furey, Andrew J., to Pilling Co. Gauge for extensible-blade surgical knife. 4,630,378, Cl. 33-185.00R.

Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., to General Electric Company. Immediately testable superconductor joint. 4,630,881, Cl. 339-176.00R.

Kuniga, Hirofumi: *See—*
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Kunimori Kagaku Co., Ltd.: *See—*
Shiotani, Yosuke, 4,630,745, Cl. 220-6.000.

Kuo, Dai-Ming. Spraying-angle selector for a toilet having adjustable water-spray nozzles. 4,630,322, Cl. 4-420.400.

Kuo, Meng S.: *See—*
Chu, Mosi; and Kuo, Meng S., 4,630,950, Cl. 400-639.100.

Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, to Tokyo Roki Co., Ltd.; and Shimizu Construction Co., Ltd. Apparatus for removing carbon particles from exhaust gas from internal combustion engine. 4,631,076, Cl. 55-283.000.

Kuroda, Akio: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Kurz, Craven H. Orthodontic tool. 4,631,028; Cl. 433-4.000.

Kushner, David J.: *See—*
Burton, James R.; and Kushner, David J., 4,631,139, Cl. 252-49.300.

Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, to Robert Bosch GmbH. Arrangement for rapidly adjusting an electromagnetic load associated with an internal combustion engine. 4,630,582, Cl. 123-339.000.

Kwai Lo, Peter Y.: *See—*
Chandra, Grish; and Kwai Lo, Peter Y., 4,631,310, Cl. 524-862.000.

Kyster, Erik: *See—*
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Kyushu Hitachi Maxell, Ltd.: *See—*
Ochiai, Masahiko, 4,631,373, Cl. 200-43.170.

L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36: *See—*
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La Telemecanique Electrique: *See—*
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Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.

LaBate, Michael D. Coated refractory shapes useful in bottom pouring of ingots in ingot molds. 4,630,667, Cl. 164-363.000.

Labender, Ron: *See—*
Burkeen, Ralph D.; and Labender, Ron, 4,630,390, Cl. 43-43.110.

Lacey, Robert S.: *See—*
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.

Lachman, Irwin M.; and Nordlie, Lawrence A., to Corning Glass Works. Method of producing high-strength high surface area catalyst supports. 4,631,267, Cl. 502-439.000.

Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., to Corning Glass Works. Preparation of monolithic catalyst support structures having an integrated high surface area phase. 4,631,268, Cl. 502-439.000.

Lachman, Irwin M.; and Nordlie, Lawrence A., to Corning Glass Works. Monolithic catalyst supports incorporating a mixture of alumina and silica as a high surface area catalyst support material. 4,631,269, Cl. 502-439.000.

Lacour, Gilbert, to Clesse-Mandet. Pressure-reducing apparatus. 4,630,641, Cl. 137-505.380.

Lacroix, Marc: *See—*
Boehm, Bernard; and Lacroix, Marc, 4,631,688, Cl. 364-507.000.

Ladd, James E., Jr., to Laura Lupton, Inc. Cosmetic powder dispenser and applicator. 4,630,954, Cl. 401-123.000.

Ladd, James E., Jr.; and Jacobs, David R., to Laura Lupton Inc. Cosmetic powder dispenser and applicator. 4,630,955, Cl. 401-123.000.

Lafayette Instrument Co., Inc.: *See—*
Wastl, Max, Sr., 4,630,485, Cl. 73-861.560.

Lagerquist, William B.: *See—*
Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., 4,631,034, Cl. 440-7.000.

Lagree, James L.; and Elms, Robert T., to North American Philips Lighting Corporation. Ballast adaptor for improving operation of fluorescent lamps. 4,631,450, Cl. 315-244.000.

Lagrue, Jean P.: *See—*
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Lahres, Hans: *See—*
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Laigle, Jean-Claude: *See—*
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.

L'Air Liquide: *See—*
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Laird, Kevin M.; and Rozanski, Walt, to Motorola, Inc. FM signal magnitude quantizer and demodulator compatible with digital signal processing. 4,631,489, Cl. 329-110.000.

Laisney, Bernard; and Duvernay, Maurice, to Rhone-Poulenc Specialites Chimiques. Burn resistant organopolysiloxane foams. 4,631,299, Cl. 521-77.000.

Laitram Corporation, The: *See—*
Fowler, John T., 4,631,711, Cl. 367-149.000.
Lapeyre, James M., 4,631,700, Cl. 364-900.000.

Lalancette, Jean M.; and Belanger, Germain, to Hydro-Quebec. Process for the destruction of toxic organic products. 4,631,183, Cl. 423-659.000.

Lamb, Gordon: *See—*
Clarke, Kenneth J.; and Lamb, Gordon, 4,630,450, Cl. 62-222.000.

Lambert, Harvey J.: *See—*
Johnston, Gary L.; and Lambert, Harvey J., 4,630,721, Cl. 192-58.00B.

Lambert, James; and Rice, William E., to Mobil Oil Corporation. Apparatus for dispensing plastics stretch film. 4,630,786, Cl. 242-96.000.

Lambert, Michael B.: *See—*
Bergstrom, Gary C.; and Lambert, Michael B., 4,630,481, Cl. 73-437.000.

Lamico, Inc.: *See—*
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Landoll Corporation: *See—*
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., to Landoll Corporation. Truck having tiltable front and rear frames. 4,630,991, Cl. 414-478.000.

Lang, James W.: *See—*
Perovick, Matthew J.; and Lang, James W., 4,630,599, Cl. 128-66.000.

Lang, Willibald: *See—*
Ledwon, Erhard; and Lang, Willibald, 4,630,595, Cl. 126-417.000.

Langeder, Rudolf: *See—*
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Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., to Coors Porcelain Company. Method of manufacturing ceramic substrate for fine-line electrical circuitry. 4,631,160, Cl. 264-62.000.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; and Smith, Stephen R., 4,631,029, Cl. 432-133.000.

Lanham, William E.; and Smith, Stephen R., to Lanham Machinery Company, Inc. Baking oven with heated air distribution-II. 4,631,029, Cl. 432-133.000.

Lantel International Corp.: *See—*
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Lapeyre, James M., to Laitram Corporation, The. Magnetically coded software for multi-purpose computer. 4,631,700, Cl. 364-900.000.

Lapins, Daniel W.; and Szymanski, Richard, to Haworth, Inc. Acoustical panel. 4,630,416, Cl. 52-239.000.

Larabie, Ludger. Wood stove. 4,630,592, Cl. 126-4.000.

Larad Equipment Corporation: *See—*
Bernstein, Robert E.; and Nelson, Alan E., 4,630,635, Cl. 137-315.000.

Larrabee, Graydon B., to Texas Instruments Incorporated. Germanium hardened silicon substrate. 4,631,234, Cl. 428-428.000.

Larsson, Nils-Olof, to Kalmar LMV. Adjustable operator cab on a motor-drive truck. 4,630,700, Cl. 180-89.130.

LaRue, Donald D., to Hydrotile Machinery Company. Bulk material hopper. 4,630,988, Cl. 414-327.000.

Lashof, Daniel A.: *See—*
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Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., to Kimberly-Clark Corporation. Labial sanitary pad. 4,631,062, Cl. 604-385.00R.

Lau, Bernhard: *See—*
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Laufer, Helmut: *See—*
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Laugier, Noel: *See—*
Berthet, Hubert; Laugier, Noel; and Ricome, Bernard, 4,630,968, Cl. 405-195.000.

Laura Lupton, Inc: *See—*
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Laura Lupton Inc.: *See—*
Ladd, James E., Jr.; and Jacobs, David R., 4,630,955, Cl. 401-123.000.

Lauriello, Philip J. J.; and Slavin, Lawrence M., to AT&T Bell Laboratories. Lightguide distributing unit. 4,630,886, Cl. 350-96.200.

Laurier, Jean-Pierre: *See—*
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Lavallee, Francois A., to Essex Group, Inc. Method for insulating a magnet wire with tetraalkyl titanate modified nylon. 4,631,201, Cl. 427-118.000.

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Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.

Leadvaro, Stephen J.: *See—*
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Lear Siegler, Inc.: *See—*
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Ledwon, Erhard; and Lang, Willibald. Energy collector for heat pump installations. 4,630,595, Cl. 126-417.000.

Lee, Chi-Long: *See—*
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,631,329, Cl. 528-28.000.

Lee, Fui-Tseng H.: *See—*
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Lee, Minyoung: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., 4,631,683, Cl. 364-474.000.

Lee, Wayne, to RCA Corporation. Kinescope with compensated conduction characteristic. 4,631,591, Cl. 358-190.000.

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Lehman, Scott: *See—*
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Lehrer, William I.: *See—*
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Leibbrandt, Friedrich: *See—*
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Leitner, Lutz: *See—*
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.

Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., to Aerospatiale Societe Nationale Industrielle. Apparatus for control of collective and cyclic pitch of the blades of a rotor. 4,630,998, Cl. 416-134.00A.

Lemo M Lehmacher & Sohn GmbH Maschinenfabrik: *See—*
Dreckmann, Karl; and Miesen, Theo, 4,631,047, Cl. 493-227.000.

Lenart, Stanley. Headlamp assembly. 4,631,645, Cl. 362-105.000.

Leng, Douglas E.: *See—*
Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.

Lenk, Erich: *See—*
Bauer, Karl; Hanisch, Michael; and Lenk, Erich, 4,630,340, Cl. 28-187.000.

Leonard, Vurnen J.: *See—*
Erickson, Leif O.; and Leonard, Vurnen J., 4,631,609, Cl. 360-135.000.

Leone, David A., to Westinghouse Electric Corp. Molded case circuit breaker with an improved arc gas external venting system. 4,631,376, Cl. 200-306.000.

Les Cables de Lyon: *See—*
Dubar, Thierry, 4,630,888, Cl. 350-96.230.

Lesch, Hans-Bernd, to Sapal Societe Anonyme des Plieuses Automatiques. Method and apparatus for placement of small articles, such as candies or chocolates in predetermined positions in a receiver. 4,630,428, Cl. 53-474.000.

Letzig, Michael P.: *See—*
Langman, Richard A.; Giovanini, Donald R.; and Letzig, Michael P., 4,631,160, Cl. 264-62.000.

Leuenberger, Claude-Eric, to Asulab S.A. Electronic timepiece. 4,630,936, Cl. 368-66.000.

Levenberg, Nat, to Jefsteel Business Equipment Corp. Stationery rack construction. 4,630,739, Cl. 211-189.000.

Levin, Eliezar. Collapsible playground device. 4,630,819, Cl. 272-113.000.

Levine, Seymour D.: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.

Levrai, Roland; Courbot, Pierre; and Picot, Pascal, to Societe Anonyme D.B.A. Device for lubricating a geartrain. 4,630,711, Cl. 184-6.120.

Lewis, Charles W.: *See—*
Kumpitsch, Robert C.; Retersdorf, James P.; and Lewis, Charles W., 4,630,881, Cl. 339-176.00R.

Lewis, Thomas B.: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Leybold-Heraeus GmbH: *See—*
Kieser, Jorg, 4,630,568, Cl. 118-723.000.

Li, Wu S., to Minnesota Mining and Manufacturing Company. Tamper resistant security film. 4,630,891, Cl. 350-105.000.

Libby, Scott: *See—*
Love, John E.; Neal, Archie E.; and Libby, Scott, 4,630,432, Cl. 56-220.000.

Libman, Jacqueline: *See—*
Shanzer, Abraham; and Libman, Jacqueline, 4,631,291, Cl. 514-450.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Koeck, Klaus, 4,631,720, Cl. 370-84.000.

Liebing, Lothar, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Apparatus for receiving electromagnetic radiation. 4,631,398, Cl. 250-216.000.

Light Signatures, Inc.: *See—*
Sanner, M. Duane, 4,630,845, Cl. 283-91.000.

Limanowski, Jozef K.: *See—*
Hodges, C. Wayne; and Limanowski, Jozef K., 4,631,631, Cl. 361-306.000.

Lind, Larry W., to United States Elevator Corporation. Suspended-ceiling framework assembly. 4,630,423, Cl. 52-484.000.

Lind, Theodore E.: *See—*
DeFreese, Jeffrey A.; and Lind, Theodore E., 4,631,197, Cl. 427-10.000.

Lindberg, Charles H. Method and apparatus for sharpening tungsten electrodes. 4,631,027, Cl. 432-13.000.

Lindblad, Nero R.: *See—*
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., 4,630,920, Cl. 355-15.000.

Linder, Carl O.: *See—*
McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., 4,631,472, Cl. 323-325.000.

Lindner, Christian: *See—*
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, 4,631,311, Cl. 525-67.000.

Lindsay, Bruce G.: *See—*
Haas, Laura M.; and Lindsay, Bruce G., 4,631,673, Cl. 364-300.000.

Lingenfelter, Ralph E., to Chipman-Union, Inc. Triple roll, layer top, sock. 4,630,455, Cl. 66-172.00R.

Lisle, Jerry H.: *See—*
Brown, Larry L.; and Lisle, Jerry H., 4,630,317, Cl. 2-12.000.

Little, Percy A.: *See—*
Walton, Paul G.; and Little, Percy A., 4,630,694, Cl. 175-391.000.

Little Rapids Corp.: *See—*
Thomson, Loronzo H., 4,630,761, Cl. 222-551.000.

Liu, King. Pedal link assembly for bicycle. 4,630,503, Cl. 74-594.200.

Lo, Allen K. W. Extended depth-of-field 3-D camera. 4,630,913, Cl. 354-115.000.

Locacius, Robert F., to Felt Products Mfg. Co. Head gasket and sealing assembly for a V-engine at the intersection of a block, a head and an intake manifold cover. 4,630,835, Cl. 277-235.00B.

LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., to AT&T Bell Laboratories. Compatible high-definition television with extended aspect ratio. 4,631,574, Cl. 358-12.000.

Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. N-acylated 1-alkylamino-1-deoxyketose derivatives, a process for their preparation and their use. 4,631,272, Cl. 514-23.000.

Lohrer, Josef: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.

Lok, Cornelis M.: *See—*
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.

Lokari-Tuote Oy: *See—*
Venetjoki, Juhani T., 4,630,701, Cl. 180-209.000.

Long, Charles A., Jr., to Long Technologies, Inc. Remotely controlled hydraulic cutter apparatus. 4,630,676, Cl. 166-55.000.

Long, Michael E.: *See—*
Brugliera, Vito; Green, George R. J.; and Long, Michael E., 4,631,601, Cl. 358-335.000.

Long Technologies, Inc.: *See—*
Long, Charles A., Jr., 4,630,676, Cl. 166-55.000.

Loos, Herbert: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.
Erhardt, Manfred; and Loos, Herbert, 4,630,404, Cl. 51-105.0GG.

Lorch, Werner, to Hans Grohe GmbH & Co. KG. Valve, particularly mixing valve. 4,630,643, Cl. 137-597.000.

Lordo, Robert E.: *See*—
Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, 4,631,510, Cl. 336-135.000.

Lorenzo, John L.: *See*—
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Loskorn, Richard A.: *See*—
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,631,666, Cl. 364-200.000.

Loughborough Consultants Limited: *See*—
Harry, John E., 4,631,452, Cl. 315-334.000.

Love, John E.; Neal, Archie E.; and Libby, Scott, to J. E. Love Company. Pick-up tine assembly for harvester reels. 4,630,432, Cl. 56-220.000.

Lovgren, Anders, to AB Megaron. Device at combustion plants for automatical feeding of fuels within the fireplace of the plant. 4,630,552, Cl. 110-190.000.

Lovin, Arthur. Sand trap practice device. 4,630,828, Cl. 273-176.0FB.

Lowrie, Alastair C. B.: *See*—
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.

LSI Logic Corporation: *See*—
Pasch, Nicholas, 4,631,248, Cl. 430-313.000.

Lucas Industries public limited company: *See*—
Kaub, Manfred, 4,630,870, Cl. 303-24.00A.
Moore, Raymond, 4,630,476, Cl. 73-293.000.
Reynolds, Desmond H. J.; and Taft, Philip A., 4,630,630, Cl. 137-68.100.

Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., to University of Houston, The. Methods and devices for charged beam accessible data storage. 4,631,704, Cl. 365-126.000.

Ludwig, Frank A., to Hughes Aircraft Company. Method of monitoring trace constituents in plating baths. 4,631,116, Cl. 204-1.00T.

Lukasik, Stanley J.: *See*—
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.

Luker, Peter A.: *See*—
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.

Lumbermate Company: *See*—
Eberle, George F.; Bickel, Karl L.; and Denny, John M., 4,630,424, Cl. 52-693.000.

Lush, Linda: *See*—
Braun, Hilarion; Lush, Linda; and Lehman, Scott, 4,631,549, Cl. 346-1.100.

Luszczek, John P.: *See*—
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Lutz, Alfons: *See*—
Fuerst, Arpad; and Lutz, Alfons, 4,630,860, Cl. 296-217.000.

Lutz, Dieter, to SACHS-Systemtechnik GmbH. Method for manufacturing a cylinder unit for a cylinder piston combustion engine. 4,630,345, Cl. 29-156.4WL.

M. P. Iding Disc Grinding Compound Co., Inc.: *See*—
Iding, Joseph P., 4,630,408, Cl. 51-337.000.

Mabu-Pressen Maschinenfabrik Karl Burkard KG: *See*—
Koch, Elmar; and Gleich, Hermann, 4,630,516, Cl. 83-530.000.

Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, to Toyoda Gosei Co., Ltd. Method for curing polyurethane coating. 4,631,206, Cl. 427-340.000.

Machholz, Walter: *See*—
Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, 4,630,421, Cl. 52-408.000.

Macrovision: *See*—
Ryan, John O., 4,631,603, Cl. 360-37.100.

Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of aging expansion-molded body of polyolefin. 4,631,159, Cl. 264-53.000.

Maeda, Satoru, to Sony Corporation. System for text display with plural page memory and flag memory. 4,631,531, Cl. 340-701.000.

Magara, Takuji: *See*—
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Magarshack, John; and Pavlidis, Dimitri, to Thomson-CSF. Ultra high frequency power amplifier. 4,631,492, Cl. 330-277.000.

Magro, Sebastian. Insulated roll-up door. 4,630,664, Cl. 160-232.000.

Magyar Aluminiumipari Troszt: *See*—
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.

Maida, Osamu; and Saegusa, Takashi, to Nippon Kogaku K. K. Exposure control device of a camera. 4,630,917, Cl. 354-456.000.

Makek, James R.: *See*—
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.

Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency-adjustable coaxial dielectric resonator and filter using the same. 4,631,506, Cl. 333-224.000.

Makino, Fusao: *See*—
Yoshida, Kunio; and Makino, Fusao, 4,630,947, Cl. 400-124.000.

Makita, Fujio: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.

Maksymonko, George B.: *See*—
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.

Malavard, Lucien: *See*—
Cousteau, Jacques Y.; Malavard, Lucien; and Charrier, Bertrand, 4,630,997, Cl. 416-90.00A.

Malicki, Raymond W., to Carron & Company. Compression strain gauge transducer assembly. 4,630,490, Cl. 73-862.650.

Malka, Jacob H.; and Friedlander, Mordechai, to Allied Corporation. Multimode pulse generator. 4,631,484, Cl. 328-63.000.

Mallick, George T., Jr., to Westinghouse Electric Corp. Solenoid control circuit. 4,631,629, Cl. 361-154.000.

Mallinckrodt, Inc.: *See*—
Salpekar, Anil M.; and Johnson, John, 4,631,284, Cl. 514-277.000.

Malte Skoog Invent Ab: *See*—
Skoog, Malte, 4,630,674, Cl. 165-147.000.

Mandon, Jean-Pierre; and Rapiteau, Jean, to Airwick Industries, Inc. Dispenser for releasing a volatile active substance. 4,630,775, Cl. 239-56.000.

Mandrell, Richard J., to ACF Industries, Incorporated. Apparatus for restraining containers in a railway car. 4,630,981, Cl. 410-91.000.

Manesse, Jean-Pierre: *See*—
Peyre, Xavier M.; and Manesse, Jean-Pierre, 4,630,542, Cl. 104-114.000.

Mankedick, Robert G.: *See*—
Barnes, Lawrence C.; and Mankedick, Robert G., 4,631,588, Cl. 358-149.000.

Mannesmann AG: *See*—
Hecht, Joachim; and Rudat, Gerhard, 4,630,544, Cl. 105-130.000.
Kranz, Eckhard; and Duren, Karl, 4,630,351, Cl. 29-527.200.
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.

Manning, Howard J., to TI Domestic Appliances Limited. Off-peak electric liquid heating system employing regulatable heat pipe. 4,631,388, Cl. 219-326.000.

Manufacture de Machines du Haut-Rhin: *See*—
Rohmer, Daniel; and Scherrer, Alain, 4,630,341, Cl. 29-1.300.

Maraux, Jean. Carbureting device for an engine. 4,630,585, Cl. 123-438.000.

Marik, Charles J., to Motorola, Inc. Analog divider with minimal phase distortion. 4,631,745, Cl. 381-15.000.

Mark, Richard H., Jr., to Westinghouse Electric Corp. Display of eddy current detector data. 4,631,533, Cl. 340-721.000.

Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, to Siemens Aktiengesellschaft. Method for the manufacture of molded materials. 4,631,306, Cl. 523-457.000.

Markovitz, Mark: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,631,230, Cl. 428-412.000.

Marks, Robert J., to Reliance Electric Company. Terminal pedestal for buried cable installation. 4,631,353, Cl. 174-16.00R.

Marlier, Alain; and Oszajca, Henri, to Flonic. Single jet liquid meter. 4,630,488, Cl. 73-861.810.

Marsh, John C., to Automated Security Holdings, Ltd. Theft proof alarm bell assembly. 4,631,526, Cl. 340-396.000.

Marshall, Keith D.: *See*—
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., 4,630,638, Cl. 137-381.000.
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.

Martens, John A.; and Williams, Brian H., to Minnesota Mining and Manufacturing Company. Article having a coating prepared from radiation curable poly(vinyl chloride) resin composition. 4,631,229, Cl. 428-343.000.

Martin, Frank D. Automatic urine detecting, collecting and storing device. 4,631,061, Cl. 604-318.000.

Masaki, Kazumi, to Hayashibara, Ken. Windmill. 4,630,996, Cl. 416-16.000.

Mase, Toshiro: *See*—
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Massaglia, Giovanni, to Jem Imports, Inc. Game employing top and platform. 4,630,822, Cl. 273-118.00A.

Massaro, Peter C.; and Legawiec, Ronald F., to Trol-Mation, Inc. Apparatus and method for pre-filling a hydraulic motor. 4,630,442, Cl. 60-415.000.

Massey-Ferguson Services N.V.: *See*—
Boni, Renato, 4,630,720, Cl. 192-48.800.

Masterton, Walter D.: *See*—
Morrell, Albert M.; and Masterton, Walter D., 4,631,441, Cl. 313-408.000.

Masuda, Mitsuhiro; Igarashi, Osamu; and Tokuyama, Keiichi, to Hitachi, Ltd. Vehicle height adjusting device. 4,630,840, Cl. 280-707.000.

Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, to Mitsubishi Gas Chemical Company, Inc. Optical articles of branched polycarbonate resin. 4,631,334, Cl. 528-202.000.

Mathis, Lawrence. Article holding mechanism for a garment and other surfaces. 4,630,319, Cl. 2-250.000.

Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, to Olympus Optical Co., Ltd. Optical disk apparatus with beam energy correction for deviations in inclination. 4,631,712, Cl. 369-44.000.

Matsuda, Hiroto: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.

Matsuda, Shinpei: *See*—
Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, 4,631,263, Cl. 502-159.000.

Matsuda, Takeshi; and Kano, Harumi, to Showa Musen Kogyo Kabushiki Kaisha. Impedance conversion transformer. 4,631,504, Cl. 333-25.000.

Matsui, Kazuma: *See*—
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Matsumoto, Fujio; and Kato, Yoshitake, to Hitachi Maxwell, Ltd. Disc cartridge. 4,630,728, Cl. 206-313.000.

Matsumoto, Hiroji: *See*—
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, to Kao Corporation. Cycloalkan-1-ol derivatives and perfume compositions comprising the same. 4,631,147, Cl. 252-522.00R.

Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, to Nippon Steel Corporation; and Nippon Steel Chemical Co., Ltd. Process for producing mesophase pitch. 4,631,181, Cl. 423-449.000.

Matsumura, Hiroyoshi: *See*—
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.

Matsunaga, Kenkichi: *See*—
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fujioka, Souichirou; Inaji, Toshio; and Yamamoto, Susumu, 4,631,459, Cl. 318-254.000.
Makimoto, Mitsuo; Endo, Haruyoshi; and Yamashita, Sadahiko, 4,631,506, Cl. 333-224.000.
Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, 4,631,024, Cl. 431-268.000.
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Matsushita Electric Works, Ltd.: *See*—
Hamada, Toshikazu, 4,630,370, Cl. 30-346.510.
Horii, Sadashige, 4,630,933, Cl. 368-10.000.
Kitagawa, Yoshiaki; and Iwata, Hideo, 4,631,102, Cl. 156-210.000.

Matsushita, Yukio: *See*—
Iwai, Tomio; and Matsushita, Yukio, 4,630,446, Cl. 60-602.000.

Matsu'ura, Yukio: *See*—
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,630,353, Cl. 29-564.400.

Mattel, Inc.: *See*—
Chang, Richard; and Nakano, Walter, 4,631,041, Cl. 446-233.000.

Matthys, Robert J., to Honeywell Inc. Voltage controlled oscillator. 4,631,501, Cl. 331-143.000.

Mauer, Dieter, to USM Corporation. Fastener-setting tool. 4,630,460, Cl. 72-391.000.

Maughan, William S.; and Fraenkel, Herbert, to Sortex Limited. Sorting machine utilizing an improved light detection system. 4,630,736, Cl. 209-587.000.

Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, to Kernforschungszentrum Karlsruhe GmbH. Method for the continuous surveillance of the poison content of exhaust gases containing particulate matter. 4,630,464, Cl. 73-28.000.

Maus, Richard G.: *See*—
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., 4,630,920, Cl. 355-15.000.

Mauser-Werke Oberndorf GmbH: *See*—
Klingler, Otto; and Grühler, Siegfried, 4,630,928, Cl. 356-374.000.

May, William E.: *See*—
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.

Mayer, Albert L., to Panavision, Inc. Apparatus for pivotally mounting a film magazine to a motion picture camera. 4,630,907, Cl. 352-75.000.

Mayes, M. Dale, to Dow Chemical Company, The. Temperature measuring apparatus. 4,630,939, Cl. 374-135.000.

Mazda Motor Corporation: *See*—
Hatamura, Koichi; and Hiraoka, Tetsuo, 4,630,575, Cl. 123-52.00M.

Mazumder, Nikhil C.; and Yee, David H. B., to Advanced Micro Devices, Inc. ECL gate circuit having internally generated reference voltages. 4,631,427, Cl. 307-455.000.

McCallister, John S., to Sim-Tech Limited. Attaching coaxially a member or fitting with a bore therethrough to a shaft. 4,630,958, Cl. 403-257.000.

McCann, Gerald, to McCann's Engineering & Manufacturing Company. Delayed action liquid level sensing apparatus. 4,631,375, Cl. 200-84.00C.

McCann's Engineering & Manufacturing Company: *See*—
McCann, Gerald, 4,631,375, Cl. 200-84.00C.

McCarty, Frederick B., to Garrett Corporation, The. Consequent pole permanent magnet rotor. 4,631,435, Cl. 310-156.000.

McCollum, Patrick E.; Brownrigg, James K.; and Linder, Carl O., to Rockwell International Corporation. Isolated low power thyristor gate drive circuit. 4,631,472, Cl. 323-325.000.

McConnell, Peter J.: *See*—
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.

McCord, Herbert E. Deck drain by-pass plug. 4,630,648, Cl. 138-103.000.

McCormick, Daniel F., to Brunswick Corporation. Torque aided pulsed impact shift mechanism. 4,630,719, Cl. 192-21.000.

McCue, Robert J.; and Minter, Ronald H., to Chloride Systems, a division of Chloride Power Electronics, Incorporated. Plug-in emergency light fixture. 4,631,649, Cl. 362-183.000.

McCuin, Jon P.: *See*—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.

McCullough, Francis P.; and Snelgrove, Roy V., to Dow Chemical Company, The. Low resistance collector frame for electroconductive organic, carbon and graphitic materials. 4,631,118, Cl. 204-16.000.

McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., to Handy & Harman. Copper-zinc-manganese-nickel alloys. 4,631,171, Cl. 420-481.000.

McFarlane, Arthur H., to Morse Controls Limited. Seat recline unit. 4,630,866, Cl. 297-361.000.

McGee, Theodore W.; Muncy, Charles; and Suerth, John E., to McGee, Theodore W. Liquid-containing decorative device. 4,631,210, Cl. 428-13.000.

McGuire, William J. Dowell making. 4,630,660, Cl. 144-363.000.

McKenzie, Noel C.: *See*—
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

McKinney, Benjamin F., to Oxide & Chemical Corporation. Rotary turntable furnace for litharge production. 4,631,026, Cl. 432-138.000.

McLaughlin, William L.: *See*—
Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., 4,631,414, Cl. 250-474.100.

McLean, Joseph G. Articulated assembly of members. 4,630,509, Cl. 76-37.000.

McNeil, Gary L., to Roto-Finish Company, Inc. Finishing machine and method. 4,630,401, Cl. 51-7.000.

McNeil, Gary L., to Roto-Finish Company, Inc. Finishing chamber and finishing machine comprising the same. 4,630,405, Cl. 51-163.200.

McQueen, Norman, to Otis Elevator Company. Bogie for cable-drawn vehicle. 4,630,543, Cl. 104-173.100.

Mead, Carver A.: *See*—
Tanner, John E.; and Mead, Carver A., 4,631,400, Cl. 250-221.000.

Meadows, Michael R.: *See*—
Parkhurst, Larry E.; and Meadows, Michael R., 4,631,401, Cl. 250-227.000.

Mechtrix Corporation: *See*—
Butler, John D., 4,630,406, Cl. 51-285.000.

Medlin, Michael A. Apparatus for producing patching material for filling potholes in paved surfaces. 4,630,929, Cl. 366-10.000.

Medtronic, Inc.: *See*—
King, Wendell L., 4,630,611, Cl. 128-642.000.

Mehta, Avinash C., to Polaroid Corporation. β-Elimination polymers useful for providing diffusion control layers in diffusion transfer photographic products. 4,631,327, Cl. 526-256.000.

Meichelbock, Heiner: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Melton, Keith: *See*—
Simpson, John A.; Melton, Keith; and Duerig, Tom, 4,631,094, Cl. 148-11.50F.

Menkes, Henry E.: *See*—
Fouad, Fakhry A.; Kakalec, Robert J.; and Menkes, Henry E., 4,631,471, Cl. 323-306.000.

Menne, Eugene P., to Johnson Fishing, Inc. Outboard motor foot control with adjustable cables. 4,631,033, Cl. 440-7.000.

Menne, Eugene P.; Lagerquist, William B.; and Decko, Del P., to Johnson Fishing, Inc. Outboard motor foot control. 4,631,034, Cl. 440-7.000.

Merchandising Innovations, Inc.: *See*—
Sheffer, Phil B., 4,630,549, Cl. 108-111.000.
Sheffer, Phil B., 4,630,551, Cl. 108-159.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.

Meriwether, Jon D., to Follansbee Steel Corporation. Pipe flotation assembly. 4,631,039, Cl. 441-133.000.

Mery, Jean-Claude: *See*—
Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, 4,630,713, Cl. 188-73.440.

Merz, Albert: *See*—
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Mesdan S.p.A.: *See*—
Premi, Mauro, 4,630,433, Cl. 57-22.000.

Messer Griesheim GmbH: *See*—
Volker, Wolfgang; and Thoma, Klemens, 4,630,873, Cl. 312-209.000.

Messier-Hispano-Bugatti (S.A.): *See*—
Veaux, Jacques; and Derrien, Michel, 4,630,788, Cl. 244-104.0FP.

Messrs. Leonhard Kurz GmbH & Co.: *See*—
Sander, Helfried, 4,631,222, Cl. 428-172.000.
Sander, Helfried, 4,631,223, Cl. 428-172.000.

Mester, Laszlo; and Mester nee Szadeczky-Kardoss, Madeleine. Serotonin-D-fructose and pharmaceutical composition containing same. 4,631,271, Cl. 514-23.000.

Mester nee Szadeczky-Kardoss, Madeleine: *See*—
Mester, Laszlo; and Mester nee Szadeczky-Kardoss, Madeleine, 4,631,271, Cl. 514-23.000.

Metzeler Schaum GmbH: *See—*
Diehl, Hermann; Baatz, Gunter; and Machholz, Walter, 4,630,421, Cl. 52-408.000.

Metzger, Karl G.: *See—*
Hartwig, Wolfgang; Habich, Dieter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,631,275, Cl. 514-210.000.
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.

Meyer, Ernst-August: *See—*
Brausfeld, Walter; and Meyer, Ernst-August, 4,630,800, Cl. 251-324.000.

Meyer, Gerhard A., to Dow Chemical Company, The. Conical DC plasma emission source. 4,630,924, Cl. 356-316.000.

Meyer, Karl-Heinrich; Hucks, Uwe; and Horsthemke, August, to Bayer Aktiengesellschaft. Process for the isolation of thermoplastic polycarbonate from solution with vapor of benzene or alkylbenzene. 4,631,338, Cl. 528-483.000.

Meyerand, Mary E. Process and apparatus for generating electrical power from ocean waves. 4,630,440, Cl. 60-398.000.

Meyers, Arthur; and DeSantis, Albert. Rodent trap. 4,630,391, Cl. 43-58.000.

Michel, Max. Chair lift fitted with a passenger protective device. 4,630,545, Cl. 105-329.100.

Michell, Andre Clive: *See—*
Stringer, Richard G., 4,630,762, Cl. 223-66.000.

Microbot, Inc.: *See—*
Hill, John W.; and Sword, Anthony J., 4,631,657, Cl. 364-167.000.

Microdot Inc.: *See—*
Moore, Marvin W., 4,630,877, Cl. 339-60.00M.

Middlebrook, Daryl L. Airframe and propulsion system. 4,630,787, Cl. 244-65.000.

Mielekamp, Pieter M.: *See—*
Corthout, Marc E. A.; and Mielekamp, Pieter M., 4,631,690, Cl. 364-518.000.

Miesen, Theo: *See—*
Dreckmann, Karl; and Miesen, Theo, 4,631,047, Cl. 493-227.000.

Mifune, Hiroyuki; Nakamura, Koki; and Ishiguro, Shoji, to Fuji Photo Film Co., Ltd. Method for forming silver halide emulsion comprising forming silver halide grains in the presence of mesoionic 1,2,4-triazolium-3-thiolate compound. 4,631,253, Cl. 430-569.000.

Milbrandt, Artur, to Siemens Aktiengesellschaft. Multicolor ink jet printer. 4,631,548, Cl. 346-1.100.

Miles, James J.; and Smith, John M., to BOC Group, Inc., The. Measuring instruments. 4,630,486, Cl. 73-861.560.

Millan, Ponciano P., Jr.: *See—*
Ruckle, Duane L.; and Millan, Ponciano P., Jr., 4,631,092, Cl. 148-3.000.

Miller, Louis E.: *See—*
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.

Miller, Robert L., to ITT Corporation. Programmable ring generator. 4,631,361, Cl. 379-351.000.

Miller, Steven A., to General Electric Company. Apparatus for atomization of unstable melt streams. 4,631,013, Cl. 425-7.000.

Miller, Stewart E., to Bell Communications Research, Inc. Low noise injection laser structure. 4,631,730, Cl. 372-50.000.

Mimaya, Shuzo: *See—*
Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.

Minami, Setsuo: *See—*
Mochizuki, Noritaka; and Minami, Setsuo, 4,630,902, Cl. 350-570.000.

Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, to Teijin Limited. Method for improving light-resistance of aromatic polyamide fibers. 4,631,066, Cl. 8-115.560.

Ministry of International Trade & Industry: *See—*
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Minnesota Mining and Manufacturing Company: *See—*
Clifton, Richard B., 4,631,220, Cl. 428-133.000.
Erickson, Leif O.; and Leonard, Vurnen J., 4,631,609, Cl. 360-135.000.
Li, Wu S., 4,630,891, Cl. 350-105.000.
Martens, John A.; and Williams, Brian H., 4,631,229, Cl. 428-343.000.
Sagawa, Burt K., 4,631,084, Cl. 106-21.000.
Schoon, David J., 4,631,726, Cl. 372-31.000.
Welygan, Dennis G.; and Zemke, Ronald O., 4,631,215, Cl. 428-105.000.

Minnesota Minning and Manufacturing Company: *See—*
Samuelson, Bruce E.; and Rueb, John T., 4,630,765, Cl. 225-96.000.

Minolta Camera Kabushiki Kaisha: *See—*
Mutoh, Masayuki, 4,630,758, Cl. 222-189.000.

Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, to Olin Hunt Specialty Products Inc. Electroless plating process. 4,631,117, Cl. 204-15.000.

Minter, Ronald H.: *See—*
McCue, Robert J.; and Minter, Ronald H., 4,631,649, Cl. 362-183.000.

Mintzer, Frederick C.: *See—*
Anderson, Karen L.; Mintzer, Frederick C.; and Goertzel, Gerald, 4,631,751, Cl. 382-47.000.

Mitchell, Charles B., to Smith, Dolores A.; Sampson, Norma A.; and Sampson, Earl W., a part interest to each. Shielded needle. 4,631,057, Cl. 604-198.000.

Mitchell, Robert D., to Du Pont de Nemours, E. I., and Company. Process for preparation of liquid toners for electrostatic imaging using polar additive. 4,631,244, Cl. 430-137.000.

Mito, Akio: *See—*
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.
Yotsuyanagi, Takao; and Nishiyama, Yoshinobu, 4,631,177, Cl. 423-112.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Akasofu, Kyosuke; and Kuchiki, Kiyoshi, 4,631,684, Cl. 364-474.000.
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Inagaki, Kouichi, 4,630,361, Cl. 29-622.000.
Kato, Hisao, 4,631,464, Cl. 318-563.000.
Ohashi, Yutaka, 4,631,369, Cl. 200-19.00R.
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, 4,630,588, Cl. 123-506.000.
Yasuoka, Hirotoshi, 4,630,496, Cl. 74-409.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Masumoto, Mituhiko; Yanada, Shigeo; Izumida, Toshiaki; and Akahori, Kazuyuki, 4,631,334, Cl. 528-202.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,631,109, Cl. 156-472.000.
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.
Yano, Tadashi; and Okamoto, Arifumi, 4,630,812, Cl. 271-132.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Emoto, Kazuhiro; Haino, Kozo; and Itoh, Akira, 4,631,242, Cl. 430-58.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Oshima, Masanao; and Yashima, Nobuyoshi, 4,630,969, Cl. 405-217.000.

Mitsui Mining & Smelting Co.: *See—*
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.

Mitsuishi Fukai Tekkosho, Ltd.: *See—*
Shigeo, Iwasaki; and Hiroshi, Haguchi, 4,631,015, Cl. 425-195.000.

Mitsuo, Hirofumi, to Fuji Photo Film Co., Ltd. Process of producing color developer sheet for pressure-sensitive recording. 4,631,204, Cl. 427-150.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Sakata, Hideo; and Tsunoda, Eiichi, 4,630,381, Cl. 33-503.000.

Miura, Yoshikiyo: *See—*
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.

Miyaake, Chiharu: *See—*
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.

Miyagi, Isamu, to Nippon Electric Co., Ltd. Multi-input logic circuit. 4,631,424, Cl. 307-448.000.

Miyai, Kenzi: *See—*
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.

Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, to Nippon Sanso Kabushiki Kaisha. Container and plug assembly. 4,630,742, Cl. 215-13.00R.

Miyake, Yasunori: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Miyao, Fumio, to Fuji Xerox Co., Ltd. Method and device for synchronization of system timing. 4,631,718, Cl. 370-4.000.

Miyata, Misao: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Miyazaki, Takao: *See—*
Yamada, Kimichika; and Miyazaki, Takao, 4,631,590, Cl. 358-185.000.

Mizoguchi, Saburo, to Sharp Kabushiki Kaisha. Fiber optic level sensor for humidifier. 4,630,475, Cl. 73-293.000.

Mizuhara, Howard, to GTE Products Corporation. Method of brazing using a ductile low temperature brazing alloy. 4,630,767, Cl. 228-122.000.

Mizumoto, Mamoru; Yamashita, Hisao; Matsuda, Shinpei; and Yamaguchi, Kazuhiko, to Hitachi, Ltd. Water-repellent catalyst for gas/liquid reactions and process for gas/liquid reactions by using the same. 4,631,263, Cl. 502-159.000.

Mizuno, Hisashi: *See—*
Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, 4,631,206, Cl. 427-340.000.

Mizuno, Takehisa: *See—*
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.

Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, to Nippondenso Co., Ltd. Mass flowmeter. 4,630,484, Cl. 73-861.220.

Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, to Seikosha Co., Ltd. Dot printer operable in high resolution and ordinary printing modes. 4,630,946, Cl. 400-121.000.

Mobil Oil Corporation: *See—*
Axelrod, Joan C.; and Chibnik, Sheldon, 4,631,071, Cl. 44-71.000.
Chew, Ju-Nam, 4,630,778, Cl. 241-1.000.
Lambert, James; and Rice, William E., 4,630,786, Cl. 242-96.000.

Mochizuki, Noritaka; and Minami, Setsuo, to Canon Kabushiki Kaisha. Compound eye optical system having a variable magnification function. 4,630,902, Cl. 350-570.000.

Mock, Edward A., to Garrett Corporation, The. Jet pump having pressure responsive motive fluid control valve. 4,631,004, Cl. 417-189.000.

Moehr, Robert, to Cross Company, The. Gib for machine tool. 4,630,944, Cl. 384-39.000.

Mohri, Yoshitaka: *See—*
Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, 4,631,024, Cl. 431-268.000.

Mommer, Richard P.; and Thomas, Johnny M., II, to Uniscope, Inc. Continuous-flow process for making a hardened animal feed composition. 4,631,192, Cl. 426-69.000.

Monkelbaan, Edwin R.: *See—*
Fantuzzo, Joseph; and Monkelbaan, Edwin R., 4,630,919, Cl. 355-4.000.

Monogram Industries, Inc.: *See—*
Belanger, Victor, 4,630,510, Cl. 81-55.000.

Montesi, Edward N., to Siebe North, Inc. Valve assembly for a replaceable filter respirator. 4,630,604, Cl. 128-206.150.

Moog Inc.: *See—*
Aubrecht, Richard A., 4,631,430, Cl. 310-12.000.

Moore, James H.: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.

Moore, Marvin W., to Microdot Inc. Socket. 4,630,877, Cl. 339-60.00M.

Moore, Raymond, to Lucas Industries Public Limited Company. Liquid level gauge. 4,630,476, Cl. 73-293.000.

Mora, Camillo C., to Camillo Corvi S.p.A. (−) Campholenic acid ester of salicylic acid and pharmaceutically acceptable salts thereof having mucosecretolytic, anti-inflammatory, analgesic, and antipyretic activity. 4,631,293, Cl. 514-530.000.

Morgan, Ronald E. Impulse operated relay system. 4,631,627, Cl. 361-153.000.

Mori, Shinji: *See—*
Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, 4,630,841, Cl. 280-806.000.

Morita, Tsuyoshi: *See—*
Hosoda, Atsushi; Miura, Yoshikiyo; Mizuno, Takehisa; and Morita, Tsuyoshi, 4,631,307, Cl. 524-269.000.

Morita, Yoshiyasu: *See—*
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Morizzo, Nicholas L., to Krantz America, Inc. Method and apparatus for inspecting a length of material. 4,630,339, Cl. 26-70.000.

Morrell, Albert M.; and Masterton, Walter D., to RCA Corporation. Color picture tube having improved line screen. 4,631,441, Cl. 313-408.000.

Morris, Joseph B.: *See—*
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Morrison, Charles B.: *See—*
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.

Morrison, Paul E.: *See—*
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., 4,631,083, Cl. 106-14.230.

Morse Controls Limited: *See—*
McFarlane, Arthur H., 4,630,866, Cl. 297-361.000.

Mosch, Egon: *See—*
Bammert, Hubert; Lahres, Hans; and Mosch, Egon, 4,630,906, Cl. 351-159.000.

Motoren-und Turbinen Union Muchen GmbH: *See—*
Gross, Helmut, 4,630,994, Cl. 415-190.000.

Motorola, Inc.: *See—*
Abdala, Julio, Jr.; and Gasparaitis, Bernard V., 4,630,895, Cl. 350-345.000.
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., 4,631,570, Cl. 357-49.000.
Borras, Jaime A.; and Suarez, Jose I., 4,631,496, Cl. 331-1.00A.
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.
DeFreese, Jeffrey A.; and Lind, Theodore E., 4,631,197, Cl. 427-10.000.
Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.
Laird, Kevin M.; and Rozanski, Walt, 4,631,489, Cl. 329-110.000.
Marik, Charles J., 4,631,745, Cl. 381-15.000.
Tichy, Thomas H., 4,630,342, Cl. 29-25.350.

Mott, Murray H.: *See—*
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.

Mrowka, Joseph J.: *See—*
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.

MTU Motoren- und Turbinen-Union Muenchen GmbH: *See—*
Betz, Wolfgang, 4,630,995, Cl. 416-7.000.

Mueller, Otward M.; and Edelstein, William A., to General Electric Company. Low-noise RF preamplifier (especially for nuclear magnetic resonance system). 4,631,495, Cl. 330-310.000.

Mukai, Kunio: *See—*
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Mukasa, Shigeru: *See—*
Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, 4,631,725, Cl. 371-39.000.

Mulder, Douglas C.: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.

Mulder, Hendrik: *See—*
Duinker, Simon; and Mulder, Hendrik, 4,630,607, Cl. 128-328.000.

Mulfarth, Werner, to Beloit Corporation. Machine for winding a web of paper on a roll. 4,630,783, Cl. 242-56.00A.

Mullen, George B.: *See—*
Georgiev, Vassil S.; and Mullen, George B., 4,631,340, Cl. 544-171.000.

Mullenix, Kenneth E.: *See—*
Troy, Seymour L.; and Mullenix, Kenneth E., 4,630,844, Cl. 283-67.000.

Muller, Eberhard, to Philipp Holzmann Aktiengesellschaft. Method and device for erecting building structures such as bridges, using pre-fabricated concrete beams. 4,630,798, Cl. 249-50.000.

Muller, Horst; and Deimel, Gerhard. Method of sterilizing packaging material, especially container-type packages. 4,631,173, Cl. 422-28.000.

Muller, Karl-Heinz; and Jordan, Alfons, to Uni-Cardan Aktiengesellschaft. Sealing assembly for universal joint. 4,630,834, Cl. 277-212.0FB.

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co.KG. Electrically operated heating element for a hot-runner tool. 4,631,389, Cl. 219-421.000.

Multifastener Corporation: *See—*
Woods, Harold T., 4,630,363, Cl. 29-798.000.

Mulvey, Dennis M.: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.

Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., to Phillips Petroleum Company. In-situ formation of polyvalent metal ions for crosslinking polymers within carbonate rock-containing reservoirs. 4,630,678, Cl. 166-281.000.

Munck, Lars: *See—*
Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.

Muncy, Charles: *See—*
McGee, Theodore W.; Muncy, Charles; and Suerth, John E., 4,631,210, Cl. 428-13.000.

Mundy, Paul: *See—*
Twist, Michael; and Mundy, Paul, 4,630,848, Cl. 285-308.000.

Munkel, Albert: *See—*
Dietz, Erwin; Munkel, Albert; Hafner, Otmar; Rieper, Wolfgang; and Kroh, Adolf, 4,631,330, Cl. 528-49.000.

Murakami, Kakuji: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.

Muralidhara, Ranya: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Murata, Yoshihiro: *See—*
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Murray, Gary P., to Robinair Division. Compact vacuum pump. 4,631,006, Cl. 417-234.000.

Murray, Thomas L., Jr.: *See—*
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,631,699, Cl. 364-900.000.

Murtland, James B., Jr. Thermistor liquid-level sensing probe. 4,630,477, Cl. 73-295.000.

Mutoh, Masayuki, to Minolta Camera Kabushiki Kaisha. Liquid tank. 4,630,758, Cl. 222-189.000.

Nadagawa Corrosion Protecting Co., Ltd.: *See—*
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.

Naete, Hidehiko: *See—*
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.

Nagao, Yasuhiro: *See—*
Asaoka, Ryuji; and Nagao, Yasuhiro, 4,631,434, Cl. 310-112.000.

Nagarkatti, Ashok; Lordo, Robert E.; and Kind, Burkhart, to Powerton, division of Contraves Goerz Corporation. Harmonically graded airgap reluctance-type rotating electric resolver. 4,631,510, Cl. 336-135.000.

Nagasaki, Katsuhiko: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Endoscope using solid state image pick-up device. 4,631,582, Cl. 358-98.000.

Nagashima, Akira, to Kioritz Corporation. Front handle support means of portable chain saw. 4,630,372, Cl. 30-381.000.

Nagata, Osamu: *See*—
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, 4,630,588, Cl. 123-506.000.

Nagatomo, Katsuaki: *See*—
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Optical electric-field measuring apparatus. 4,631,402, Cl. 250-231.00R.

Nagele, Erwin: *See*—
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.

Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG: *See*—
Stutznacker, Klaus, 4,630,560, Cl. 112-302.000.

Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Hydraulic tilt device for marine propulsion unit. 4,631,035, Cl. 440-61.000.

Nakajima, Motoki: *See*—
Matsumoto, Kiyoshi; Fujikura, Yoshiaki; and Nakajima, Motoki, 4,631,147, Cl. 252-522.00R.

Nakamura, Hitoshi: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.

Nakamura, Kenji. Toilet article. 4,631,227, Cl. 428-283.000.

Nakamura, Koki: *See*—
Mifune, Hiroyuki; Nakamura, Koki; and Ishiguro, Shoji, 4,631,253, Cl. 430-569.000.

Nakamura, Masaru: *See*—
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, 4,631,075, Cl. 55-158.000.

Nakamura, Mutsuaki: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Nakano, Walter: *See*—
Chang, Richard; and Nakano, Walter, 4,631,041, Cl. 446-233.000.

Nakashima, Yoshihiro: *See*—
Fukuyama, Hiroomi; Hattori, Kiyoshi; and Nakashima, Yoshihiro, 4,631,465, Cl. 318-565.000.

Nakata, Takeshi, to Sanyo Electric Co., Ltd. Infrared ray detector. 4,631,406, Cl. 250-338.000.

Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, to Hitachi, Ltd. Plasma processor. 4,631,106, Cl. 156-345.000.

Nalbone, Robert D.: *See*—
Coyne, Joan H.; Dooling, David J.; Miller, Louis E.; and Nalbone, Robert D., 4,631,364, Cl. 379-164.000.

Nally, Rickard P.: *See*—
Petersen, Borge; and Nally, Rickard P., 4,630,815, Cl. 271-273.000.

Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, to Victor Company of Japan, Ltd.; and Tokuyama Sekisui Industry Corporation, Limited. High density information records of an electrostatic capacitance type. 4,631,717, Cl. 369-276.000.

Nanba, Sinzi: *See*—
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Nasatka, Ralph G. Portable vehicle barricade or portable maximum security barrier. 4,630,395, Cl. 49-49.000.

Natarajan, Bangalore R.: *See*—
Opfer, James E.; and Natarajan, Bangalore R., 4,631,202, Cl. 427-131.000.

National Gypsum Company: *See*—
Kossuth, Donald A., 4,631,097, Cl. 156-44.000.

National Research Development Corporation: *See*—
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.
Hooper, Bernard, 4,630,591, Cl. 123-65.00S.

National Savings & Finance Corp. (Proprietary) Limited, The: *See*—
Pretorius, David J., 4,630,537, Cl. 101-3.00R.

National Semiconductor Corporation: *See*—
Single, Peter S., 4,631,694, Cl. 364-608.000.

National Starch and Chemical Corporation: *See*—
Jones, Larry D., 4,631,132, Cl. 210-727.000.

Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, to Bayer Aktiengesellschaft. Preparation and use of iron magnetic pigments. 4,631,090, Cl. 106-304.000.

Naumann, Rolf: *See*—
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.

Nawata, Makoto: *See*—
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., to Reed Devices, Inc. Low profile screw terminal block with split plastic barrel. 4,630,882, Cl. 339-198.00R.

NCR Corporation: *See*—
Barnes, Lawrence C.; and Mankedick, Robert G., 4,631,588, Cl. 358-149.000.

Kappeler, Ronald P.; and Hughes, Robert C., 4,631,701, Cl. 364-900.000.
Petersen, Borge; and Nally, Rickard P., 4,630,815, Cl. 271-273.000.
Rogers, Steven H.; and Hwang, Thomas J., 4,630,357, Cl. 29-590.000.

Neal, Archie E.: *See*—
Love, John E.; Neal, Archie E.; and Libby, Scott, 4,630,432, Cl. 56-220.000.

NEC: *See*—
Koshimaru, Shigeru, 4,631,425, Cl. 307-449.000.

NEC Corporation: *See*—
Honda, Masahiko, 4,631,705, Cl. 365-182.000.
Horikawa, Akinori, 4,631,669, Cl. 364-200.000.
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.
Tsubokura, Fusao, 4,631,571, Cl. 357-68.000.
Watanabe, Takayuki, 4,631,707, Cl. 365-226.000.
Yoshida, Yasuharu, 4,631,488, Cl. 329-50.000.

Needham, Riley B.: *See*—
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.

Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., to RCA Corporation. Gate shield structure for power MOS device. 4,631,564, Cl. 357-23.400.

Neipling, Lawrence E.; and Flohr, Mark C., to Smith International Inc. Drilling choke pressure limiting control system. 4,630,675, Cl. 166-53.000.

Nelson, Alan E.: *See*—
Bernstein, Robert E.; and Nelson, Alan E., 4,630,635, Cl. 137-315.000.

Nelson, Bertel S., to Wedgtrac Corporation. Tapered worm. 4,630,497, Cl. 74-425.000.

Nelson, Roderick D.; and Vu, Tho T., to Honeywell Inc. Digital circuit using MESFETS. 4,631,426, Cl. 307-450.000.

Neri, Armando, to G.D. Societa per Azioni. System for monitoring the operation of output transducers of a central control and monitoring unit for machines and/or devices usable in production and/or product packaging lines. 4,631,693, Cl. 364-550.000.

Neumaier, Anton: *See*—
Hunger, Josef; and Neumaier, Anton, 4,630,836, Cl. 279-19.000.

Neuman, Eli: *See*—
Davis, C. Paul; and Neuman, Eli, 4,631,614, Cl. 360-128.000.

Neuner, James A.; Boomgaard, Dirk J.; Wilbur, Susan A.; and Geis, Charles G., to Westinghouse Electric Corp. Method for temperature compensating a rod position indication system. 4,631,537, Cl. 340-870.170.

Newbould, Richard T.: *See*—
Tomlinson, Paul G.; and Newbould, Richard T., 4,631,078, Cl. 65-3.110.

Newcome, Thomas W., III; and Kartarik, Mark H. Device and method for article storage and release. 4,631,358, Cl. 379-45.000.

Newman, Ray L.: *See*—
Ferri, John L.; Fulkerson, William C.; Newman, Ray L.; and Gonzalez, Jeffrey M., 4,631,022, Cl. 431-90.000.

Newton, Robert E.; and Girgenti, Russell S., to Auburn International, Inc. Dust flow inducing monitor. 4,631,482, Cl. 324-454.000.

Ng, David T.; and Brendemuehl, Roger C., to Beloit Corporation. Method and apparatus for controlling a winder for stop-to-length or stop-to-roll diameter. 4,631,682, Cl. 364-471.000.

Nguyen, Hung T.; Dang, Vu Q.; Duval, Henry H., Jr.; and Kennedy, Donald J., to Cleanseal Systems, Inc. Apparatus for sealing pavement seams. 4,630,965, Cl. 404-107.000.

Nickel, Bernd; and Schorr, Wolfgang, to Siemens Aktiengesellschaft. Method for eliminating spurious signals in a measuring installation for identifying the position of a rigid body in space. 4,631,477, Cl. 324-207.000.

Nickles, Robert J., to Wisconsin Alumni Research Foundation. Method and apparatus for measurement of radioactivity over an extended range. 4,631,410, Cl. 250-363.00R.

Nicol, David A.: *See*—
Clark, Harold R.; and Nicol, David A., 4,631,079, Cl. 65-109.000.

Nielsen, Anker J., Jr., to Inner-Tite Corporation. Casket lock for valve assembly. 4,630,456, Cl. 70-232.000.

Niemczura, Paul W.: *See*—
Christhilf, Harold H.; Morrison, Paul E.; and Niemczura, Paul W., 4,631,083, Cl. 106-14.230.

Niepoth, George W.: *See*—
Armstrong, Donald J.; Giacomazzi, Roy A.; and Niepoth, George W., 4,630,749, Cl. 220-86.00R.

Nii, Tomio, to Tokyo Juki Industrial Co., Ltd. Ink ribbon and correction tape lifting mechanism for a typewriter. 4,630,951, Cl. 400-697.100.

Nilssen, Ole K. Modular suspended ceiling and lighting system. 4,631,648, Cl. 362-150.000.

Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,631,163, Cl. 264-291.000.

Nimberger, Spencer M., to General Screw Products Company. Valve with compressible valve stem and valve body seals. 4,630,629, Cl. 137-15.000.

Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See*—
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,630,353, Cl. 29-564.400.

Nippon Air Brake Co., Ltd.: *See*—
Fujiwara, Tatsuo, 4,631,514, Cl. 340-52.00R.

Nippon Cable System Inc.: *See*—
Suzuki, Kazuhiro, 4,630,500, Cl. 74-473.00R.

Nippon Electric Co., Ltd.: *See*—
Miyagi, Isamu, 4,631,424, Cl. 307-448.000.
Umetsu, Shinjiro; and Oyamada, Takashi, 4,631,640, Cl. 361-422.000.

Nippon Kogaku K. K.: *See*—
Maida, Osamu; and Saegusa, Takashi, 4,630,917, Cl. 354-456.000.

Nippon Mining Co., Ltd.: *See*—
Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.

Nippon Oil & Fars Co., Ltd.: *See*—
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.

Nippon Petrochemicals Company, Limited: *See*—
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.

Nippon Sanso Kabushiki Kaisha: *See*—
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Nippon Soken, Inc.: *See*—
Yamanoue, Kouichi; and Kitagawa, Junji, 4,631,736, Cl. 375-71.000.

Nippon Steel Chemical Co., Ltd.: *See*—
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Nippon Steel Corporation: *See*—
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.

Nippon Univac Kaisha, Ltd.: *See*—
Honda, Masamitsu, 4,631,473, Cl. 324-72.500.

Nippondenso Co., Ltd.: *See*—
Asaoka, Ryuji; and Nagao, Yasuhiro, 4,631,434, Cl. 310-112.000.
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.
Mizuno, Toru; Nanba, Sinzi; Matsui, Kazuma; and Goto, Tsukasa, 4,630,484, Cl. 73-861.220.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Engine exhaust apparatus for water-jet propulsion boat. 4,631,032, Cl. 440-47.000.

Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, to Sony Corporation. Golf club head. 4,630,826, Cl. 273-167.00H.

Nishihara, Minoru: *See*—
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Vacuum booster assembly. 4,630,525, Cl. 91-369.00A.

Nishikawa, Satoshi: *See*—
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.

Nishimura, Akira, to Sumitomo Electric Industries, Ltd. Rubberized fabric. 4,631,225, Cl. 428-250.000.

Nishimura, Yuji; Mori, Shinji; and Kawaguchi, Teruhiko, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing tension adjusting apparatus. 4,630,841, Cl. 280-806.000.

Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, to Hitachi Zosen Corporation. Pipe joint. 4,630,846, Cl. 285-21.000.

Nishioka, Shunichi: *See*—
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Nishiyama, Yoshinobu: *See*—
Yotsuyanagi, Takao; and Nishiyama, Yoshinobu, 4,631,177, Cl. 423-112.000.

Nishizawa, Jun-ichi, to Fuji Photo Film Co., Ltd. Semiconductor image sensor. 4,631,592, Cl. 358-213.000.

Nissan Motor Co., Ltd.: *See*—
Higashiyama, Kazuhiro; and Ishigami, Kazuhiro, 4,630,584, Cl. 123-425.000.
Hirano, Yoshinori, 4,630,574, Cl. 123-41.270.
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, 4,630,573, Cl. 123-41.270.
Shinzawa, Motohiro, 4,630,438, Cl. 60-274.000.
Suzuki, Mikio; and Yamazaki, Masafumi, 4,630,583, Cl. 123-425.000.
Yukawa, Shinjiro, 4,630,707, Cl. 181-288.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Ametani, Minoru, 4,631,103, Cl. 156-241.000.
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.

Noback, Charles V., to Nuclear Research Corp. Radiation measuring apparatus and method. 4,631,411, Cl. 250-374.000.

Nobesawa, Shigeru, to Jelco. Co., Ltd. Push button switch. 4,631,378, Cl. 200-340.000.

Noguchi, Tsutomu: *See*—
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Nolan, John H.; and Nolan, William A. Remotely controlled override valve with calibration means. 4,630,799, Cl. 251-129.180.

Nolan, William A.: *See*—
Nolan, John H.; and Nolan, William A., 4,630,799, Cl. 251-129.180.

Nomura, Yoshihisa: *See*—
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Nonoyama, Hideki: *See*—
Ozawa, Kazuo; and Nonoyama, Hideki, 4,631,618, Cl. 360-132.000.

Noonan, Joseph F.: *See*—
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., 4,631,634, Cl. 361-358.000.

Nootenboom, Peter: *See*—
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,631,265, Cl. 502-259.000.

Nordischer Maschinenbau Rud.: *See*—
Evers, Reinhard; and Wenzel, Werner, 4,630,334, Cl. 17-56.000.

Nordisk Ventilator Co.: *See*—
Jensen, Carl E., 4,630,993, Cl. 415-53.00R.

Nordlie, Lawrence A.: *See*—
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,267, Cl. 502-439.000.
Lachman, Irwin M.; Bardhan, Pronob; and Nordlie, Lawrence A., 4,631,268, Cl. 502-439.000.
Lachman, Irwin M.; and Nordlie, Lawrence A., 4,631,269, Cl. 502-439.000.

Nordson Corporation: *See*—
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.
Rehman, William R.; and Smith, James C., 4,630,774, Cl. 239-8.000.

Normand, Randall J.: *See*—
Akers, James B., Jr.; Leng, Douglas E.; and Normand, Randall J., 4,631,175, Cl. 422-135.000.

Norsk Hydro a.s: *See*—
Wold, Johnny; and Kristiansen, Leif A., 4,631,266, Cl. 502-324.000.

North American Philips Consumer Electronics Corp.: *See*—
Robbins, John D., 4,631,440, Cl. 313-403.000.

North American Philips Corporation: *See*—
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.

North American Philips Lighting Corporation: *See*—
Lagree, James L.; and Elms, Robert T., 4,631,450, Cl. 315-244.000.

Northern Telecom Limited: *See*—
Brombal, David S.; Bunner, Charles B. D.; Gulis, Nickolas S.; and Luszczek, John P., 4,631,641, Cl. 361-424.000.

Northrop Corporation: *See*—
Haavisto, John R., 4,630,885, Cl. 350-96.150.
Paul, Mark O., 4,631,583, Cl. 358-125.000.

Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., to Aluminum Company of America. Bonding aluminum to refractory materials. 4,630,665, Cl. 164-97.000.

Nowak, Ronald J.: *See*—
Burkhardt, Norman S.; Richard, Maureen M.; Buxton, Forrest T.; and Nowak, Ronald J., 4,631,598, Cl. 358-280.000.

Nowak, Rudolf: *See*—
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, 4,631,063, Cl. 8-94.210.

Nozaki, Nobuharu: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Nuclear Research Corp.: *See*—
Noback, Charles V., 4,631,411, Cl. 250-374.000.

Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., to Wilkerson Corporation. Method and apparatus for theadsorptive fractionation of gases. 4,631,073, Cl. 55-18.000.

Nusser, Hermann; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Apparatus for controlling the position of a throttle device disposed in the intake tube of an internal combustion engine. 4,630,578, Cl. 123-179.00G.

N.V. Optische Industrie "De Oude Delft" : *See*—
Duinker, Simon; and Mulder, Hendrik, 4,630,607, Cl. 128-328.000.

O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Heine, Franz; and Ruttershoff, Heinz-Joachim, 4,630,878, Cl. 339-75.00M.

O. Ruben Pettersson: *See*—
Bell, L. James, 4,630,853, Cl. 292-258.000.

Obama, Masao: *See*—
Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, 4,631,689, Cl. 364-513.000.

Obradovich, George. Versatile router guide apparatus. 4,630,657, Cl. 144-144.5GT.

O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, to Raychem Corporation. Flexible high temperature heater. 4,631,392, Cl. 219-549.000.

Ochiai, Masahiko, to Kyushu Hitachi Maxell, Ltd. Push-button switch locking device for use in electric appliance. 4,631,373, Cl. 200-43.170.

Ochsner, Rolf H.; and Everett, Charles J., to Robert Shaw Controls Company. Method of making differential pressure operated electrical switch. 4,630,360, Cl. 29-622.000.

Odaka, Toshiko: *See*—
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.

O'Dell, Lawrence W.: *See*—
Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D., 4,631,580, Cl. 358-88.000.

O'Dell, Michael D.: *See*—
Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D., 4,631,580, Cl. 358-88.000.

O'Driscoll, Peter F., to United States of America, Air Force. Method of constructing a dome restraint assembly for rocket motors. 4,631,154, Cl. 264-3.100.
Oertel, Hans W.: *See—*
deSouza, Alwyn A.; and Oertel, Hans W., 4,631,453, Cl. 315-340.000.
Ogata, Masamitsu: *See—*
Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, 4,631,261, Cl. 502-65.000.
Ogawa, Mutsuo, to Ricoh Company, Ltd. Video data transmission apparatus. 4,631,597, Cl. 358-258.000.
Ogawa, Naoki; Kubozuka, Takao; and Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,630,573, Cl. 123-41.270.
Ogawa, Susumu, to Fujikin International, Inc. Pipe couplings. 4,630,851, Cl. 285-341.000.
Ogawa, Takatoshi: *See—*
Ohnishi, Keizo; and Ogawa, Takatoshi, 4,631,170, Cl. 420-455.000.
Ogino, Toru: *See—*
Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, 4,631,153, Cl. 261-52.000.
Ogura, Eiji: *See—*
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.
Ogura, Shinji: *See—*
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,630,724, Cl. 198-399.000.
O'Gwynn, David C., to Ampex Corporation. Multiple speed scanner servo system for protecting the heads and tape of helical recorders. 4,631,605, Cl. 360-70.000.
Ohashi, Masaru: *See—*
Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, 4,630,779, Cl. 241-1.000.
Ohashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Distributor for an internal combustion engine. 4,631,369, Cl. 200-19.00R.
Ohkoshi, Akio: *See—*
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.
Ohkuma, Hiroaki: *See—*
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary drum shear. 4,630,514, Cl. 83-342.000.
Ohnishi, Keizo; and Ogawa, Takatoshi, to Japan Steel Works, Ltd., The. Calcium-nickel-misch metal-aluminum quaternary alloy for hydrogen storage. 4,631,170, Cl. 420-455.000.
Ohno, Michio: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.
Ohsato, Kiyoshi; and Kubota, Shigeo, to Sony Corporation. Focussing error detecting apparatus employing a composite lens. 4,631,397, Cl. 250-201.000.
Ohwaki, Shinji: *See—*
Yoshimoto, Masato; and Ohwaki, Shinji, 4,631,162, Cl. 264-167.000.
Oishi, Kengo; and Katagiri, Shingo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,631,620, Cl. 360-133.000.
Okabe, Takayuki: *See—*
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.
Okamoto, Arifumi: *See—*
Yano, Tadashi; and Okamoto, Arifumi, 4,630,812, Cl. 271-132.000.
Okamura, Masatoshi: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.
Okazaki, Haruo: *See—*
Hashimoto, Kunio, 4,630,726, Cl. 198-819.000.
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, to Nippon Acchakutanshi Seizo Kabushiki Kaisha. Insulation covering stripping device. 4,630,353, Cl. 29-564.400.
Oki Electric Industry Co., Ltd.: *See—*
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.
Yokouchi, Hiroshi, 4,631,665, Cl. 364-200.000.
Oku, Toshio, to Kabushiki Kaisha Machida Seisakusho. Guide tube for industrial endoscope. 4,630,649, Cl. 138-122.000.
Okumoto, Gordon. Security clip for a louver panel. 4,630,399, Cl. 49-403.000.
Olak, Richard: *See—*
Wickmann, John T.; and Olak, Richard, 4,630,379, Cl. 33-288.000.
Olifant, Jacques: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.
Olin Corporation: *See—*
Gasper, Kenneth E., 4,631,530, Cl. 340-679.000.
Olin Hunt Specialty Products Inc.: *See—*
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.
Olioso, Silvio, to Indéx S.p.A. Technologie Impereabili. Equipment for uniformly spreading anti-sticking powders on bituminous membranes for building coverings. 4,630,565, Cl. 118-47.000.
Oliver, David W., to General Electric Company. Electronic control of rotating anode microfocus x-ray tubes for anode life extension. 4,631,742, Cl. 378-113.000.
Olofsson, Stig. Large-surface area control panel. 4,631,216, Cl. 428-106.000.
Olofsson, Stig. Wooden base plate. 4,631,218, Cl. 428-131.000.
Olsen, Cathryn E.: *See—*
Webb, Jimmy L.; and Olsen, Cathryn E., 4,631,346, Cl. 556-420.000.
Olson, Raymond G., to Baxter Travenol Laboratories, Inc. Pressure pump having jaws and end-slots. 4,631,007, Cl. 417-476.000.
Olsson, Karl-Erik, to Asea Aktiebolag. Mounting for electrical converter valve assembly. 4,631,656, Cl. 363-123.000.
Olympus Optical Co., Ltd.: *See—*
Horikawa, Yoshiaki, 4,631,394, Cl. 250-201.000.
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,631,582, Cl. 358-98.000.
Omoto, Yutaka: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Omura, Takashi: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.
Ono, Shizumi: *See—*
Tsuchiya, Kanji; and Ono, Shizumi, 4,630,534, Cl. 99-483.000.
Ono, Tadahiro; and Igarashi, Shigenori, to Toshiba Kikai Kabushiki Kaisha; and Toei Denki Kabushiki Kaisha. Pulse generator. 4,631,523, Cl. 340-347.0SY.
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, to NEC Corporation; and Nippon Telegraph & Telephone Public Corporation. Bidirectional communication system of a two-wire bus comprising an active terminator. 4,631,721, Cl. 370-85.000.
Onoda Cement Company, Ltd.: *See—*
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.
Ontario Research Foundation: *See—*
Sweet, Edmund G. F., 4,630,468, Cl. 73-59.000.
Oouchi, Kazuo: *See—*
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, 4,631,110, Cl. 156-584.000.
Opfer, James E.; and Natarajan, Bangalore R., to Hewlett-Packard Company. Thin film magnetic recording film. 4,631,202, Cl. 427-131.000.
Orikawa, Michihiro: *See—*
Dan, Takuya; and Orikawa, Michihiro, 4,630,806, Cl. 267-140.100.
Ortho Pharmaceutical Corporation: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.
Ortlip, Earl W., to Soil Teq., Inc. Method and apparatus for spreading fertilizer. 4,630,773, Cl. 239-1.000.
O'Ryan, David E.: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.
Oshima, Masanao; and Yashima, Nobuyoshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Artificial island. 4,630,969, Cl. 405-217.000.
Osterland, Robert W.; and Benedetti, Nicholas M., to USM Corporation. Molding clip. 4,630,338, Cl. 24-293.000.
Ostertag, Reinhard F.: *See—*
Ostertag, Ulrich K.; and Ostertag, Reinhard F., 4,630,940, Cl. 374-148.000.
Ostertag, Ulrich K.; and Ostertag, Reinhard F. Temperature display device for attachment to a water outlet. 4,630,940, Cl. 374-148.000.
Ostlinning, Edgar: *See—*
Idel, Karsten; Ostlinning, Edgar; and Freitag, Dieter, 4,631,336, Cl. 528-388.000.
Ostman, Kjell: *See—*
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Oszajca, Henri: *See—*
Marlier, Alain; and Oszajca, Henri, 4,630,488, Cl. 73-861.810.
Otake, Katsumasa: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.
Otis Elevator Company: *See—*
Herrmann, Dietrich E.; and Abraham, Detlev, 4,631,467, Cl. 318-798.000.
McQueen, Norman, 4,630,543, Cl. 104-173.100.
Otis Engineering Corporation: *See—*
Boyle, William G.; and Fisher, Ernest P., Jr., 4,630,833, Cl. 277-188.00A.
Ott, William B.: *See—*
Bradley, David J.; and Ott, William B., 4,631,670, Cl. 364-200.000.
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., to Internationale Octrooi Maatschappij "Octropa" P.B.V. Nickel/alumina/silicate catalyst, its preparation. 4,631,265, Cl. 502-259.000.
Owens-Corning Fiberglas Corporation: *See—*
Rapp, Charles F.; and Herrick, Robert A., 4,631,178, Cl. 423-210.000.
Owens-Illinois, Inc.: *See—*
Jones, James C., 4,631,086, Cl. 106-36.000.
Oxide & Chemical Corporation: *See—*
McKinney, Benjamin F., 4,631,026, Cl. 432-138.000.
Oyamada, Takashi: *See—*
Umetsu, Shinjiro; and Oyamada, Takashi, 4,631,640, Cl. 361-422.000.

Ozawa, Kazuo; and Nonoyama, Hideki, to Sony Corporation. Tape cassette with protection cover and tape end sensing means. 4,631,618, Cl. 360-132.000.
Pacific Roller Die Co., Inc.: *See—*
Davis, Paul K., 4,630,650, Cl. 138-154.000.
Padden, Timothy J.; and Uick, Heidi J., to S.C. Johnson & Son, Inc. Hair treating composition containing a quaternary ammonium compound containing an erucyl group. 4,631,187, Cl. 424-70.000.
Pakull, Ralf: *See—*
Kricheldorf, Hans R.; Pakull, Ralf; and Dicke, Hans-Rudolf, 4,631,333, Cl. 528-170.000.
Pakwa Engineering Ltd.: *See—*
Johnson, Dennis, 4,630,478, Cl. 73-299.000.
Palmer, James E.; Albertini, Rocco D.; and Coladonato, Michael A., to Baldt Incorporated. Acoustically detonated explosively releasable link. 4,630,522, Cl. 89-1.140.
Palmer, Robert S. Device to reaction train animals. 4,630,571, Cl. 119-29.000.
Palombo, Gaston: *See—*
Brooke, Raymond; and Palombo, Gaston, 4,631,524, Cl. 340-347.00P.
Pan, Pai-Hung: *See—*
Geipel, Henry J., Jr.; and Pan, Pai-Hung, 4,631,219, Cl. 428-131.000.
Panavision, Inc.: *See—*
Mayer, Albert L., 4,630,907, Cl. 352-75.000.
Panos, Nicholas: *See—*
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.
Paradyne Corporation: *See—*
Betts, William L.; and Zuranski, Edward, 4,631,738, Cl. 375-98.000.
Pardue, Von G.: *See—*
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.
Parekh, Girish G.; and Blank, Werner J., to American Cyanamid Company. Coating compositions containing polyurethane or polyurea polymers and amino resins. 4,631,320, Cl. 525-452.000.
Parham, Thomas G.: *See—*
Beers, William W.; and Parham, Thomas G., 4,631,144, Cl. 252-301.40R.
Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Company. Method for determining the placement of perforations in a well casing. 4,631,677, Cl. 364-422.000.
Park, Kyong; and Alwerud, Goran S., to Kavlico Corporation. Versatile force measuring system. 4,630,473, Cl. 73-161.000.
Parker Drilling Company: *See—*
Reed, Lowell M., 4,630,425, Cl. 52-745.000.
Parker, John, to Holset Engineering Company Limited. Wastegate valve for internal combustion engine turbocharger. 4,630,445, Cl. 60-602.000.
Parker, Theodore L., to Dow Chemical Company, The. Use, as latent cross-linkers for epoxy resins, of compounds which can be rearranged in situ to difunctional phenols. 4,631,331, Cl. 528-96.000.
Parker, Theodore L., to Dow Chemical Company, The. Use of benzo-n-heterocycles to advance epoxy resins. 4,631,332, Cl. 528-117.000.
Parkhurst, Larry E.; and Meadows, Michael R., to Dieterich Standard Corporation. Optic sensors. 4,631,401, Cl. 250-227.000.
Parks, Billy W., to Ryan-Walsh Stevedoring Company, Inc. Midstream coal handling apparatus. 4,631,125, Cl. 209-215.000.
Pasch, Nicholas, to LSI Logic Corporation. Method for forming an electrical contact in an integrated circuit. 4,631,248, Cl. 430-313.000.
Pasternack, Adalbert, to Dragerwerk AG. Respirator control device. 4,630,605, Cl. 128-205.240.
Pastore, Ronald. Combination rear view mirror and digital displays. 4,630,904, Cl. 350-600.000.
Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Dannhauer, Gunter, 4,631,644, Cl. 362-105.000.
Pater, Ruth H.: *See—*
Scola, Daniel A.; and Pater, Ruth H., 4,631,335, Cl. 528-353.000.
Paul, Larry W. Camera gun. 4,630,911, Cl. 354-82.000.
Paul, Mark O., to Northrop Corporation. Vidicon image motion compensation technique. 4,631,583, Cl. 358-125.000.
Paulson, Jerome I. Kinetic gravity deduster. 4,631,124, Cl. 209-3.000.
Pavex, Inc.: *See—*
Place, Virgil A., 4,631,060, Cl. 604-285.000.
Pavlidis, Dimitri: *See—*
Magarshack, John; and Pavlidis, Dimitri, 4,631,492, Cl. 330-277.000.
Pawlowski, Georg, to Hoechst Aktiengesellschaft. Photosensitive composition admixture of a diazonium salt polycondensation product and polymeric binder with carboxyl side chain groups. 4,631,245, Cl. 430-175.000.
Pazarci, Melih: *See—*
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.
Pedersen, Peter: *See—*
Weerda, Hilko; and Pedersen, Peter, 4,630,606, Cl. 128-207.140.
Peerenboom, Robert J.: *See—*
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.
Peeters Weem, Jan A.; Krueger, David E.; and Graham, Dennis P., to Hyster Company. Twistlock operating mechanism. 4,630,856, Cl. 294-81.530.
Pellegrino, Peter P. Method and apparatus for mass producing printed circuit boards. 4,631,100, Cl. 156-150.000.
Pennwalt Corporation: *See—*
Georgiev, Vassil S.; and Mullen, George B., 4,631,340, Cl. 544-171.000.
Pentecost, Randal L. Marking device for tape measure. 4,630,376, Cl. 33-138.000.
Pepmiller, Paul E.: *See—*
Huffman, Charles E.; and Pepmiller, Paul E., 4,631,719, Cl. 370-15.000.
Perovick, Matthew J.; and Lang, James W., to Unidyne, Inc. Hydromassage apparatus. 4,630,599, Cl. 128-66.000.
Persson, Gerthy: *See—*
Persson, Tor; and Persson, Gerthy, 4,630,854, Cl. 292-343.000.
Persson, Tor; and Persson, Gerthy. Security device. 4,630,854, Cl. 292-343.000.
Pertramer, Siegried. Trapeze belt or harness for windsurfing. 4,630,563, Cl. 114-39.000.
Peschka, Walter: *See—*
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, 4,631,096, Cl. 149-1.000.
Peter, David A., to General Motors Corporation. Method and apparatus for ultrasonic plastic forming and joining. 4,631,685, Cl. 364-476.000.
Peters, John W.: *See—*
Hall, James T.; and Peters, John W., 4,631,199, Cl. 427-54.100.
Peters, Klaus-Jurgen: *See—*
Nusser, Hermann; and Peters, Klaus-Jurgen, 4,630,578, Cl. 123-179.00G.
Peters, Philip H., Jr., to General Electric Company. Integral crystal-controlled line-voltage ballast for compact RF fluorescent lamps. 4,631,449, Cl. 315-205.000.
Petersen, Borge; and Nally, Rickard P., to NCR Corporation. Quick releasing, pinch roller mechanism. 4,630,815, Cl. 271-273.000.
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, to Schering Aktiengesellschaft. β-Carboline-3-carboxylic acid derivatives, and their use as psychotropic agents. 4,631,285, Cl. 514-292.000.
Petersen, Hans C.; and Kyster, Erik, to Danfoss A/S. Hydrostatic control device, particulary steering device. 4,631,010, Cl. 418-61.00B.
Petroff, Peter D. Flow analyzer. 4,630,474, Cl. 73-196.000.
Petrolite Corporation: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.
Petrzilka, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Benzonitriles. 4,630,896, Cl. 350-350.00R.
Peugeot, Michel, to Aciers et Outillage Peugeot. Device for electrically controlling the position of a sliding opening panel of a motor vehicle. 4,631,461, Cl. 318-280.000.
Peyre, Xavier M.; and Manesse, Jean-Pierre, to Plastibenne. Nacelle. 4,630,542, Cl. 104-114.000.
Pfizer Hospital Products Group Inc.: *See—*
Andrews, Henry L.; and Gardiner, Gregory E., 4,631,082, Cl. 75-235.000.
Pfizer Inc.: *See—*
Volkmann, Robert A., 4,631,345, Cl. 548-147.000.
Philipp Holzmann Aktiengesellschaft: *See—*
Muller, Eberhard, 4,630,798, Cl. 249-50.000.
Phillips Petroleum Company: *See—*
Bade, Robert K., 4,630,469, Cl. 73-61.10C.
Mumallah, Naim A.; Bruning, Donald D.; and Needham, Riley B., 4,630,678, Cl. 166-281.000.
Wilder, Charles R., 4,631,304, Cl. 523-215.000.
Philp, Charles W.: *See—*
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., 4,631,171, Cl. 420-481.000.
Piasecki, Douglas S., to RCA Corporation. TTL circuit with a clamping transistor for speedy turn-off of output transistor. 4,631,422, Cl. 307-300.000.
Piatt, Michael J.; and Brown, Mark E., to Eastman Kodak Company. Device and method for sensing the impact position of an ink jet on a surface of an ink catcher, in a continuous ink jet printer. 4,631,550, Cl. 346-1.100.
Piazza, Pietro: *See—*
Amici, Francis R.; Farrington, Richard I.; and Piazza, Pietro, 4,630,756, Cl. 222-78.000.
Pica, Albert P., to RCA Corporation. Video display device simulation apparatus and method. 4,631,691, Cl. 364-521.000.
Picker International Limited: *See—*
Young, Ian R., 4,631,480, Cl. 324-309.000.
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., 4,631,481, Cl. 324-320.000.
Picot, Pascal: *See—*
Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.
Pieczykolan, George S., to Central Sprinkler Corporation. Rapid response sprinkler head. 4,630,682, Cl. 169-38.000.
Pierce, Bill L.: *See—*
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., 4,631,239, Cl. 429-39.000.
Pierce, John M.; and Lehrer, William I., to Fairchild Camera & Instrument Corp. Product for making isolated semiconductor structure. 4,630,343, Cl. 29-576.00W.
Pierini, Marco, to Varian S.p.A. Ion pump. 4,631,002, Cl. 417-49.000.
Pierrat, Frank A.: *See—*
Shutske, Gregory M.; and Pierrat, Frank A., 4,631,286, Cl. 514-297.000.

Pierrat, Jacques, to Hutchinson Societe Anonyme. Resilient coupling with a limited range of radial movement, more particularly for a pulled wheel attachment. 4,630,810, Cl. 267-153.000.
Pifer, Richard L.: *See—*
Allmandinger, Donald D.; and Pifer, Richard L., 4,630,506, Cl. 74-713.000.
Pilgrim, Thomas A., to BPB Industries Public Limited Company. Building components. 4,630,419, Cl. 52-309.130.
Pilkington P.E. Limited: *See—*
Jones, Richard I., 4,630,903, Cl. 350-579.000
Pilling Co.: *See—*
Kulp, Rodney J.; and Furey, Andrew J., 4,630,378, Cl. 33-185.00R.
Pintchovski, Faivel S.: *See—*
Kessler, Peter H.; Calvert, Wilson D., Sr.; and Pintchovski, Faivel S., 4,630,669, Cl. 165-1.000.
Pinter, Janos: *See—*
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.
Pioneer Electronic Corp.: *See—*
Ikedo, Yuji; and Kase, Masao, 4,631,716, Cl. 369-75.200.
Takahashi, Yoshiaki, 4,631,490, Cl. 330-51.000.
Utsumi, Yoshihiro, 4,631,396, Cl. 250-201.000.
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, to Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych. Method of determination of thermal conduction coefficient and heat capacity of materials and the apparatus for measurements of thermal conduction coefficient and heat capacity of material. 4,630,938, Cl. 374-44.000.
PipercrossLimited: *See—*
Spicer, Barry; and Wills, Joseph T., 4,631,077, Cl. 55-487.000.
Pisciotta, Michel: *See—*
Cinquin, Jean P.; Gazzolo, Christian; and Pisciotta, Michel, 4,631,508, Cl. 335-142.000.
Pismennaya, Galina: *See—*
Minten, Karl L.; Battisti, Angelo J.; and Pismennaya, Galina, 4,631,117, Cl. 204-15.000.
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., to Raychem Limited. Heat-recoverable article. 4,631,098, Cl. 156-86.000.
Pitney Bowes Inc.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.
Pittet, Alan O.: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.
Place, Virgil A., to Pavex, Inc. Vaginal spermicide distributing membrane. 4,631,060, Cl. 604-285.000.
Planet Products, Corporation: *See—*
Steurmer, Karl H., 4,630,725, Cl. 198-425.000.
Plastibenne: *See—*
Peyre, Xavier M.; and Manesse, Jean-Pierre, 4,630,542, Cl. 104-114.000.
Plastic Oddities, Inc.: *See—*
Izzi, Lewis B., Sr., 4,630,368, Cl. 30-289.000.
Plavac, Frank, to Chevron Research Company. Glycidol modified succinimides and fuel compositions containing the same. 4,631,070, Cl. 44-63.000.
Plessey South Africa Limited: *See—*
Braun, Robin M., 4,631,497, Cl. 331-4.000.
PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,631,163, Cl. 264-291.000.
Ploussios, George, to Tideland Signal Corporation. S-band coaxial slot array antenna. 4,631,544, Cl. 343-771.000.
Plumeret, Raymond: *See—*
Guery, Jean-Pierre; Gashet, Gerald; Olifant, Jacques; and Plumeret, Raymond, 4,631,507, Cl. 335-27.000.
Plunkett, David O.: *See—*
Graham, Stephen L.; Plunkett, David O.; and Lacey, Robert S., 4,631,308, Cl. 524-272.000.
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, to Agfa Gevaert Aktiengesellschaft. Electrostatographic suspension developer and a process for the production thereof. 4,631,243, Cl. 430-114.000.
Poersch, Hans; and Stark, Gustav, to Siemens Aktiengesellschaft. Peripheral auxiliary system for the automatic feeding and unloading of a stamping/nibbling machine. 4,630,987, Cl. 414-32.000.
Poetsch, Eike: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.
Pohl, Fritz. Method in which elemental particles electrophoretically migrate through a gel onto a collecting surface of a moving belt. 4,631,120, Cl. 204-182.800.
Pohl, Fritz. Electrophoretic apparatus employing a collecting belt moving in contact with a gel. 4,631,122, Cl. 204-299.00R.
Poirier, Marc-Andre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Road asphalt compositions containing visbreaking residues. 4,631,088, Cl. 106-273.00R.
Polaroid Corporation: *See—*
Czumak, Frank M.; and Sulesky, Donald J., 4,630,914, Cl. 354-212.000.
Hicks, John W., Jr., 4,630,889, Cl. 350-96.300.
Mehta, Avinash C., 4,631,327, Cl. 526-256.000.
Simon, Myron S.; and Waller, David P., 4,631,344, Cl. 548-146.000.
Whiteside, George D., 4,630,912, Cl. 354-88.000.
Whiteside, George D.; and Cavallaro, Robert E., 4,630,915, Cl. 354-275.000.
Pollak, Philip, Jr.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.
Polska Akademia Nauk Centrum Badan Molekularnych i Makromolekularnych: *See—*
Piorkowska-Palczewska, Ewa; Galeski, Andrzej; and Kryszewski, Marian, 4,630,938, Cl. 374-44.000.
Pontani, Susanne. Method and composition for simultaneously permanently waving and dyeing human hair. 4,630,621, Cl. 132-7.000.
Popow, Anatoliy. Continuous molding method. 4,631,161, Cl. 264-167.000.
Popperling, Rolf K.: *See—*
von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., 4,631,095, Cl. 148-12.00F.
Portugall, Michael: *See—*
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.
Potter, Clinton; and Hasty, Robert. Intercom system. 4,631,365, Cl. 379-167.000.
Potter, Gary F.: *See—*
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., 4,630,679, Cl. 166-305.100.
Poules, Wadi: *See—*
Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, 4,631,143, Cl. 252-299.620.
Powerton, division of Contraves Goerz Corporation: *See—*
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PQ Corporation: *See—*
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Pradet, Gerard: *See—*
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Praefcke, Klaus; Kohne, Bernd; Poules, Wadi; and Poetsch, Eike, to Merck Patent Gesellschaft mit beschrankter Haftung. Triphenylene derivatives. 4,631,143, Cl. 252-299.620.
Prataviera, Giovanni: *See—*
Zago, Giovanni; and Prataviera, Giovanni, 4,631,616, Cl. 360-128.000.
Preis, Lothar: *See—*
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.
Premi, Mauro, to Mesdan S.p.A. Method for the splicing of textile threads by means of a compressed gas, and splicing device for the accomplishment of the method. 4,630,433, Cl. 57-22.000.
Pressman, David; and Goulter, Victor H. Produce knife with depth-limiting and peel aiding fence. 4,630,367, Cl. 30-279.00R.
Presswood, J. Kenneth, to Ethyl Corporation. Mixed diamine chain extender. 4,631,298, Cl. 521-163.000.
Pretorius, David J., to National Savings & Finance Corp. (Proprietary) Limited, The. Selective embosser with buckling prevention. 4,630,537, Cl. 101-3.00R.
Priam Corporation: *See—*
Viskochil, Stephen R., 4,631,431, Cl. 310-13.000.
Price & Adams: *See—*
Sherman, James L., 4,630,974, Cl. 405-288.000.
Price, John G. C., to Dow Corning Ltd. Siloxane compositions and process for treatment of materials. 4,631,207, Cl. 427-387.000.
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, to United States of America, Navy. Microprocessor based programmable frequency controller for frequency agile radar. 4,631,541, Cl. 343-5.0DP.
Prieto, Yolanda: *See—*
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.
Prima Progetti S.p.A.: *See—*
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Primages, Inc.: *See—*
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Pro-Tec Sports, Inc.: *See—*
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Proctor & Gamble Company, The: *See—*
Juneja, Prem S., 4,631,064, Cl. 8-161.000.
Proni, Oscar; and James, Bobby D., to Coulter Electronics, Inc. Particle analyzing apparatus and method of moving particles in suspension through such apparatus. 4,631,483, Cl. 324-71.400.
Propice, Jean: *See—*
Guillaume, Paul; Kayser, Didier; and Propice, Jean, 4,630,555, Cl. 110-346.000.
Przybylinski, Phillip G.; and Spence, John H., to Pullman Standard Inc. Cross bearer arrangement for slotted center sill. 4,630,547, Cl. 105-416.000.
Przybylinski, Phillip G.: *See—*
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Pugh, James W. Computerized video gait and motion analysis system and method. 4,631,676, Cl. 364-413.000.
Pullman Standard Inc.: *See—*
Przybylinski, Phillip G.; and Spence, John H., 4,630,547, Cl. 105-416.000.
Wiger, Henry K.; and Katz, Manfred, 4,630,546, Cl. 105-416.000.

Wiger, Henry K.; and Przybylinski, Phillip G., 4,630,548, Cl. 105-416.000.
Quadrex HPS, Inc.: *See—*
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Quin, Philippe P., to Automobiles Citroen; and Automobiles Peugeot. Electro-hydraulic height corrector for motor vehicles. 4,630,527, Cl. 91-449.000.
Qureshi, Shahid U. H., to Codex Corporation. Coded modulation system with feedback. 4,631,735, Cl. 375-34.000.
R. W. Grace & Co.: *See—*
Cuisia, Dionisio G.; and Hwa, Chih M., 4,631,131, Cl. 210-697.000.
Raabe, Rodney D.; Mrowka, Joseph J.; McCuin, Jon P.; and Noonan, Joseph F., to General Electric Company. Lighting circuit breaker panelboard modular assembly. 4,631,634, Cl. 361-358.000.
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Supcoe, Robert F.; and Radakovich, Thomas, 4,631,302, Cl. 523-122.000.
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, to Bayer Aktiengesellschaft. Color-intensive iron oxide black pigments and process for their production. 4,631,089, Cl. 106-304.000.
Rademachers, Jakob: *See—*
Naumann, Rolf; Leitner, Lutz; Rademachers, Jakob; and Buxbaum, Gunter, 4,631,090, Cl. 106-304.000.
Raeth, Franz J.: *See—*
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Rainbow Lifegard Products, Inc.: *See—*
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Novak, John W., Jr.; Raines, Dennis R.; and Bray, Donald J., 4,630,665, Cl. 164-97.000.
Raines, Kenneth C., to Burron Medical, Inc. Guard for right angle winged infusion needle. 4,631,058, Cl. 604-263.000.
Raleigh, Freddie L., to Warner & Swasey Company, The. Bridge type coordinate measuring machine. 4,630,374, Cl. 33-1.00M.
Ramsey, Russel G., to Central Plastics Company. Thermoplastic fitting electric heat welding apparatus. 4,631,107, Cl. 156-359.000.
Rand McNally & Co.: *See—*
Breen, Thomas J., 4,630,384, Cl. 40-21.00R.
Rand, Roy E.; and Couch, John L., to Imatron, Inc. Beam spot monitoring arrangement for use in a scanning electron beam computed tomography scanner and method. 4,631,741, Cl. 378-10.000.
Randall, Bruce E., to Sangamo Weston, Inc. Biasing for magnetic circuits. 4,631,604, Cl. 360-66.000.
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Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.
Ranney, Robert. Wall and ceiling light device. 4,631,647, Cl. 362-147.000.
Rapaich, Mark, to Heath Company. ROM compensated microphone. 4,631,749, Cl. 381-103.000.
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Rapp, Charles F.; and Herrick, Robert A., to Owens-Corning Fiberglas Corporation. Method of removing boric oxide from flue gases. 4,631,178, Cl. 423-210.000.
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, to Honeywell Information Systems Inc. Mass storage disk drive defective media handling. 4,631,723, Cl. 371-10.000.
Rattunde, Manfred, to Reimers Getriebe AG. Infinitely variable cone-disk transmission. 4,631,042, Cl. 474-8.000.
Rauscher, Christen, to United States of America, Navy. Microwave frequency divider having regenerative oscillation. 4,631,500, Cl. 331-51.000.
Ray, John R.; Williamson, Michael A.; and Smith, James D. B., to Westinghouse Electric Corp. Accelerator combinations for anaerobic polymerization. 4,631,325, Cl. 526-220.000.
Raychem Corporation: *See—*
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.
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Raychem Limited: *See—*
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Bingley, John D., 4,631,470, Cl. 323-282.000.
Brown, Paul R., 4,631,503, Cl. 333-24.100.
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D'Amato, Ralph J.; and Godfrey, Richard H., 4,631,439, Cl. 313-402.000.
Elliott, George A., 4,630,459, Cl. 12-307.000.
George, John B., 4,631,595, Cl. 358-243.000.
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Morrell, Albert M.; and Masterton, Walter D., 4,631,441, Cl. 313-408.000.
Neilson, John M. S.; Wheatley, Carl F., Jr.; and Brackelmanns, Norbert W., 4,631,564, Cl. 357-23.400.
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Redl, Heinz; and Habison, Georg, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Apparatus for applying a tissue adhesive. 4,631,055, Cl. 604-82.000.
Redmon, Larry, to Challenge Tool & Manufacturing, Inc. Speed changing device. 4,631,044, Cl. 474-114.000.
Reed, Charles C.; and Cooley, Denton A. Autotransfusion system and method. 4,631,050, Cl. 604-4.000.
Reed Devices, Inc.: *See—*
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Reed, Lowell M., to Parker Drilling Company. Erection means for portable drilling system. 4,630,425, Cl. 52-745.000.
Reeves, Henry C., III; Potter, Gary F.; and Riley, Suzanne M., to Dowell Schlumberger Incorporated. Method for treatment and/or workover of injection wells. 4,630,679, Cl. 166-305.100.
Reeves, James B., Jr. Adjustable herringbone lock joint. 4,630,960, Cl. 403-345.000.
Regie Nationale des Usines Renault: *See—*
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Reichmann, Siegfried, to Robert Bosch GmbH. Driving device having a reversible electric motor. 4,631,460, Cl. 318-280.000.
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Reinwall, Ernest W.; and Spibey, John, to Elco Industries, Inc. Assembly for fastening a layer of compressible material to a rigid member. 4,630,984, Cl. 411-368.000.
Reitmeier, Glenn A., to RCA Corporation. Transmission of reduced resolution picture edge information using horizontal blanking period. 4,631,584, Cl. 358-141.000.
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Rellis, Daniel, Jr.; Fosnacht, Donald R.; and Jackson, Charles R., to Inland Steel Company. Apparatus for adding solid alloying ingredients to molten metal stream. 4,630,801, Cl. 266-216.000.
Renn, Robert M.; and Shoemaker, John R., to AMP Incorporated. Zero insertion force electrical interconnection assembly. 4,630,874, Cl. 339-17.00F.
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Research Corporation: *See—*
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Revelli, Anthony J.; and Greenfield, Herbert. Dispersing apparatus with wire wheel impeller. 4,630,932, Cl. 366-279.000.
Reynolds, Desmond H. J.; and Taft, Philip A., to Lucas Industries Public Limited Company. Hydrostatic hydraulic coupling. 4,630,630, Cl. 137-68.100.
Reynolds Metals Company: *See—*
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Richter, Wolfgang: *See*—
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Ricoh Company, Ltd.: *See*—
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Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
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Riebeek, G. Fred, to American Microsystems, Inc. High voltage compressing input buffer. 4,631,429, Cl. 307-490.000.
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Shaped articles of silicate material, a process for their production and their use. 4,631,158, Cl. 264-43.000.
Rieder, Heinz; and Schwaiger, Max, to RSF Elektronik Gesellschaft m.b.H. Length measuring instrument comprising a scale member and a signal-generating scanning unit which is movable along the scale member. 4,631,403, Cl. 250-237.00G.
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Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, to University of Illinois. Antiviral eudistomins from a marine tunicate. 4,631,149, Cl. 540-546.000.
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., to BASF Aktiengesellschaft. Polymers containing mesogenic groups and dye radicals in the side chains. 4,631,328, Cl. 526-259.000.
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Ritter, Thomas A.; Bray, James C.; and Kaganov, Alan L., to American Cyanamid Company. Heart pacer lead wire with pull-away needle. 4,630,617, Cl. 128-784.000.
Rix, Clifford, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus and method for filament winding cylindrical bodies with closed end. 4,631,101, Cl. 156-175.000.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of acetic acid. 4,631,348, Cl. 562-607.000.
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Robert Bosch GmbH: *See*—
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.
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Roberts, Frank L., to Bio-Support Industries Ltd. Portable seat. 4,630,863, Cl. 297-219.000.
Robertshaw Controls Company: *See*—
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Robertson, David W., to Eli Lilly and Company. 6-(pyridinylphenyl)-dihydropyridazinones as inotropic agents. 4,631,279, Cl. 514-247.000.
Robida, James E.: *See*—
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Roczyn, Hans-Gerd, to Swiss Aluminium Ltd. Process for manufacturing a device and extrusion billet for this. 4,631,236, Cl. 428-558.000.
Roda, Gary E. Method and apparatus for carrying snow skis. 4,630,842, Cl. 280-814.000.
Roehr, Kuno M.: *See*—
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Roeser, Howard J., Jr.: *See*—
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Rogers, Steven H.; and Hwang, Thomas J., to NCR Corporation. Method for forming improved contacts between interconnect layers of an integrated circuit. 4,630,357, Cl. 29-590.000.
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Rohmer, Daniel; and Scherrer, Alain, to Manufacture de Machines du Haut-Rhin. Apparatus for the introduction of a piece into a seat in an object. 4,630,341, Cl. 29-1.300.
Rohner, Joachim, to W. Schlafhorst & Co. Method and apparatus for forming a thread reserve from the thread end of a textile coil. 4,630,782, Cl. 242-18.0EW.
Rohrback, Gilson H.: *See*—
Kowalski, Bruce R.; and Rohrback, Gilson H., 4,631,687, Cl. 364-497.000.
Rohrback Technology Corporation: *See*—
Kowalski, Bruce R.; and Rohrback, Gilson H., 4,631,687, Cl. 364-497.000.
Rolscreen Company: *See*—
Hagemeyer, Bruce A., 4,630,420, Cl. 52-313.000.
Romania, Samuel R.; and Steen, Grant F., to Burroughs Corporation. Dual backplane interconnect system. 4,631,637, Cl. 361-413.000.
Romann, Peter: *See*—
Biermann, Eberhard; Nagele, Erwin; and Romann, Peter, 4,630,487, Cl. 73-861.760.
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, to Thomson-CSF. Calibration device of the optical power applied to an optical disc for recording of data. 4,631,713, Cl. 369-54.000.
Ronzi, Richard C.: *See*—
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.
Roper Corporation: *See*—
Dean, George J., Jr.; Klaeser, Robert S.; and Braa, Lloyd W., 4,630,397, Cl. 49-97.000.
Rosemount Engineering Company Limited: *See*—
Johnston, James S., 4,631,519, Cl. 340-347.00P.
Rosenberg, Jerome C., to Boeing Company, The. Dielectric isolated fuel and hydraulic tubes. 4,630,789, Cl. 244-135.00R.
Ross, John R., Jr. Calorie counting device. 4,631,393, Cl. 235-89.00A.
Ross, Joseph; and DiMatteo, Paul, to Robotic Vision Systems, Inc. Method of measuring in three-dimensions at high speed. 4,630,910, Cl. 354-76.000.
Ross, Rodger L. Soap holder and dispenser. 4,630,794, Cl. 248-309.100.
Rossignol, Francois: *See*—
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Rostrup-Nielsen, Jens R.: *See*—
Tottrup, Peter B.; and Rostrup-Nielsen, Jens R., 4,631,182, Cl. 423-652.000.
Rothermel, Ronald R., to Dimetrics, Inc. Automated position detectors and welding system utilizing same. 4,631,385, Cl. 219-124.030.
Roto-Finish Company, Inc.: *See*—
McNeil, Gary L., 4,630,401, Cl. 51-7.000.
McNeil, Gary L., 4,630,405, Cl. 51-163.200.
Roux, Jean-Pierre, to Berthiez-Saint-Etienne. Cartridge tool locking and unlocking device for toolholders. 4,630,979, Cl. 409-232.000.
Roxor Corporation: *See*—
Blom, C. James, 4,630,905, Cl. 350-613.000.

Roy, Claude, to L.C.C.-C.I.C.E.-Compagnie Europeenne des Composants Electroniques-36. Process and device for manufacturing mother capacitors by helical winding. 4,630,784, Cl. 242-56.100.
Rozanski, Walt: *See*—
Laird, Kevin M.; and Rozanski, Walt, 4,631,489, Cl. 329-110.000.
RSF Elektronik Gesellschaft m.b.H.: *See*—
Rieder, Heinz; and Schwaiger, Max, 4,631,403, Cl. 250-237.00G.
Ruckle, Duane L.; and Millan, Ponciano P., Jr., to Garrett Corporation, The. Method for heat treating cast titanium articles to improve their mechanical properties. 4,631,092, Cl. 148-3.000.
Rudat, Gerhard: *See*—
Hecht, Joachim; and Rudat, Gerhard, 4,630,544, Cl. 105-130.000.
Rudisill, Carl D., to Cincinnati Milacron Inc. Modular fixturing apparatus. 4,630,811, Cl. 269-118.000.
Rueb, John T.: *See*—
Samuelson, Bruce E.; and Rueb, John T., 4,630,765, Cl. 225-96.000.
Ruehr, Volker: *See*—
Kamprath, Axel; and Ruehr, Volker, 4,630,471, Cl. 73-146.500.
Ruka, Roswell J., to Westinghouse Electric Corp. Cobalt doped lanthanum chromite material suitable for high temperature use. 4,631,238, Cl. 429-30.000.
Runner, James F.: *See*—
Casper, Robert K.; and Runner, James F., 4,631,025, Cl. 432-15.000.
Russell, Angus R. T., to Singer Company, The. Adjustable low inertia presser bar. 4,630,557, Cl. 112-235.000.
Russier, Michel V.: *See*—
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.
Russow, Jurgen: *See*—
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, 4,631,158, Cl. 264-43.000.
Ruttershoff, Heinz-Joachim: *See*—
Heine, Franz; and Ruttershoff, Heinz-Joachim, 4,630,878, Cl. 339-75.00M.
Ryan, John O., to Macrovision. Method and apparatus for processing a video signal so as to prohibit the making of acceptable video tape recordings thereof. 4,631,603, Cl. 360-37.100.
Ryan-Walsh Stevedoring Company, Inc.: *See*—
Parks, Billy W., 4,631,125, Cl. 209-215.000.
Ryser, Hugues J.: *See*—
Shen, Wei C.; and Ryser, Hugues J., 4,631,190, Cl. 424-85.000.
Rzeszewski, Theodore S.: *See*—
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,631,574, Cl. 358-12.000.
S.C. Johnson & Son, Inc.: *See*—
Padden, Timothy J.; and Uick, Heidi J., 4,631,187, Cl. 424-70.000.
S.K.Y. Polymers, Ltd. (Kingston Technologies): *See*—
Stoy, Vladimir A.; and Chvapil, Milos, 4,631,188, Cl. 424-81.000.
S. T. DuPont: *See*—
Grossiord, Claude, 4,630,937, Cl. 368-223.000.
Saarinen, Sulevi, to Tunturipyora Oy. Torque metering device for a bicycle-type ergometer. 4,630,818, Cl. 272-73.000.
Sab Nife AB: *See*—
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.
SACHS-Systemtechnik GmbH: *See*—
Lutz, Dieter, 4,630,345, Cl. 29-156.4WL.
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Transistor switch and driver circuit. 4,631,419, Cl. 307-255.000.
Sadler, Karl O.: *See*—
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.
Saegusa, Takashi: *See*—
Maida, Osamu; and Saegusa, Takashi, 4,630,917, Cl. 354-456.000.
Safway Scaffolds Company of Houston: *See*—
Gilbreath, William E., 4,630,956, Cl. 403-49.000.
Sagami Chemical Research Center: *See*—
Umemoto, Teruo; and Ogura, Eiji, 4,631,342, Cl. 544-313.000.
Sagawa, Burt K., to Minnesota Mining and Manufacturing Company. Heat-sensitive composition and imaging sheet incorporating same. 4,631,084, Cl. 106-21.000.
Sagawa, Ryuichi; Nagata, Osamu; and Kajima, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection timing control system. 4,630,588, Cl. 123-506.000.
Sage, Dennis R.; and Sage, Monica M. Bathtub liner. 4,630,323, Cl. 4-580.000.
Sage, Monica M.: *See*—
Sage, Dennis R.; and Sage, Monica M., 4,630,323, Cl. 4-580.000.
Sagemuehl, Hans W.; and Duffie, Kenneth G., to H. L. Bouton Company, Inc. Safety spectacles with brow protector. 4,630,321, Cl. 2-426.000.
Saijo, Yoshihiko: *See*—
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,630,353, Cl. 29-564.400.
St. George, Emery, Jr.: *See*—
Drescher, Robert D.; Eisenhaure, David B.; Hockney, Richard L.; Johnson, Bruce G.; St. George, Emery, Jr.; and Whipple, David C., 4,631,456, Cl. 318-140.000.
St. John, Karl M., to Hazeltine Corporation. Nonuniformity correction system for color CRT display. 4,631,576, Cl. 358-65.000.
Saito, Asao, to Citizen Watch Co., Ltd. Closure mechanism. 4,630,751, Cl. 220-334.000.
Saito, Yokuo: *See*—
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.
Saka, Yoshimi, to Hitachi Metals, LTD. Pipe joint. 4,630,850, Cl. 285-322.000.
Sakabe, Shigekazu: *See*—
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.
Sakai, Fumihide: *See*—
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,631,256, Cl. 435-68.000.
Sakai, Shinji: *See*—
Kinoshita, Takao; and Sakai, Shinji, 4,631,593, Cl. 358-213.000.
Sakakibara, Shiro, to Aisin-Warner Limited. Centrifugal type friction clutch. 4,630,723, Cl. 192-105.0BA.
Sakakiyama, Ryuzo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Sakamoto, Koichiro: *See*—
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.
Sakamoto, Masaharu: *See*—
Matsubayashi, Nobuhide; Kenjyo, Hideyuki; Kato, Kiichi; and Sakamoto, Masaharu, 4,631,712, Cl. 369-44.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic control apparatus for a pipeline processing system. 4,631,672, Cl. 364-200.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Fixed-point data/floating-point data converting apparatus. 4,631,696, Cl. 364-748.000.
Sakamoto, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Shift circuit for double word length data. 4,631,703, Cl. 364-900.000.
Sakane, Kazuo: *See*—
Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, 4,631,274, Cl. 514-202.000.
Sakata, Hideo; and Tsunoda, Eiichi, to Mitutoyo Mfg. Co., Ltd. Coordinate measuring instrument. 4,630,381, Cl. 33-503.000.
Sakurada, Nobuaki: *See*—
Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, 4,631,578, Cl. 358-80.000.
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., to Pitney Bowes Inc. Microprocessor controlled d.c. motor and application therefor. 4,631,681, Cl. 364-464.000.
Sall, Hans-Olof: *See*—
Arola, Rodger A.; and Sall, Hans-Olof, 4,630,658, Cl. 144-176.000.
Sally, Theodore J.: *See*—
Hafner, V. Walter; Hahn, Ron T.; Marshall, Keith D.; and Sally, Theodore J., 4,630,644, Cl. 137-624.110.
Salpekar, Anil M.; and Johnson, John, to Mallinckrodt, Inc. Acetaminophen compositions containing low doses of chlorpheniramine maleate, method for preparing same and tablets formed therefrom. 4,631,284, Cl. 514-277.000.
Salzer, Heinrich. Explosive action inhibiting glazing. 4,630,411, Cl. 52-1.000.
Sampson, Earl W.: *See*—
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Sampson, Norma A.: *See*—
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Samuelson, Bruce E.; and Rueb, John T., to Minnesota Minning and Manufacturing Company. Dispenser for tape with a stretchable backing. 4,630,765, Cl. 225-96.000.
Sander, Helfried, to Messrs. Leonhard Kurz GmbH & Co. Embossing foils. 4,631,222, Cl. 428-172.000.
Sander, Helfried, to Messrs. Leonhard Kurz GmbH & Co. Embossing foils having a magnetic layer. 4,631,223, Cl. 428-172.000.
Sanders Associates, Inc.: *See*—
Brodeur, Lester R., 4,631,543, Cl. 342-389.000.
Hollis, Ernest E.; and Born, Joseph H., 4,631,420, Cl. 307-272.00R.
Sanders, Gary G.; and Corwon, Michael E., to Scott & Fetzer Company, The. Digital pointer position detector. 4,631,539, Cl. 340-870.290.
Sandroni, Raffaele: *See*—
Warren, Gerald K.; and Sandroni, Raffaele, 4,631,005, Cl. 417-218.000.
Sangamo Weston, Inc.: *See*—
Randall, Bruce E., 4,631,604, Cl. 360-66.000.
Sanger, Georg; Hietkamp, Gerrit; and Peschka, Walter, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt E.V. High energy materials containing metastable helium, a process for producing same and applications thereof. 4,631,096, Cl. 149-1.000.
Sankyo Manufacturing Company, Ltd.: *See*—
Kato, Heizaburou, 4,630,493, Cl. 74-22.00R.
Sanner, M. Duane, to Light Signatures, Inc. Authentication document system. 4,630,845, Cl. 283-91.000.
Sano, Shinichi: *See*—
Yamaguchi, Keiji; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.
Sanofi: *See*—
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Iwai, Tomio; and Matsushita, Yukio, 4,630,446, Cl. 60-602.000.
Nakahama, Ryoji, 4,631,035, Cl. 440-61.000.
Santa Barbara Research Center: *See*—
Cinzori, Robert J.; and Kern, Mark T., 4,630,684, Cl. 169-46.000.
Santi, John D., to Briggs & Stratton Corp. Laminated wheel assembly. 4,630,498, Cl. 74-445.000.

Sanyo Electric Co., Ltd.: *See—*
Kan, Yuji, 4,630,653, Cl. 141-83.000.
Nakata, Takeshi, 4,631,406, Cl. 250-338.000.

Sanyo Electric Co., Ltd: *See—*
Kishimoto, Daisaburo, 4,630,451, Cl. 62-247.000.

Sapal Societe Anonyme des Plieuses Automatiques: *See—*
Lesch, Hans-Bernd, 4,630,428, Cl. 53-474.000.

Saphymo Stel: *See—*
Delage, Daniel; and Reboux, Jean, 4,631,381, Cl. 219-10.570.

Sarastro AB: *See—*
Carlsson, Kjell S., 4,631,581, Cl. 358-93.000.

Sartorio, Franco: *See—*
Gilli, Luigi; and Sartorio, Franco, 4,630,992, Cl. 414-744.00R.

Sasaki, Isao; and Schuman, Michael L., to Rainbow Lifegard Products, Inc. Solid chlorine dispenser for spas. 4,630,634, Cl. 137-268.000.

Sasaki, Takashi; Kawamura, Hideaki; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Method of and apparatus for forming a color picture using a plurality of color correction processings. 4,631,578, Cl. 358-80.000.

Sasashige, Hiroaki: *See—*
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,631,109, Cl. 156-472.000.

Sato, Atsushi: *See—*
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.

Sato, Fumio: *See—*
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.

Sato, Goro; Ogata, Masamitsu; and Ida, Takanori, to Catalysts & Chemicals Industries Co., Ltd. Method for preparing hydrocarbon catalytic cracking catalyst compositions. 4,631,261, Cl. 502-65.000.

Sato, Maki, to Sony Corporation. Charge transfer device for forming desired color difference signals. 4,631,575, Cl. 358-30.000.

Sato, Norikatsu: *See—*
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.

Satoh, Masaharu, to Sharp Kabushiki Kaisha. Battery charging circuit for electronic apparatus. 4,631,468, Cl. 320-14.000.

Sauermann, Gerhard: *See—*
Engel, Walter; Hoppe, Udo; and Sauermann, Gerhard, 4,631,295, Cl. 514-558.000.

Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, to Sauerwein, Kurt. Radiation treatment apparatus. 4,631,415, Cl. 250-497.100.

Sawada, Hideo: *See—*
Kobayashi, Michio; Yoshida, Masato; Sawada, Hideo; Hagii, Hidehiko; and Aoshima, Kazuyoshi, 4,631,151, Cl. 260-408.000.

Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, to Suzuki Motor Co., Ltd. Oil passage usable for an engine. 4,630,580, Cl. 123-196.00R.

Sayler, William H.; and White, Justin C., to T.A.S., Inc. Pulverized solid fuel burner and method of firing pulverized fuel. 4,630,554, Cl. 110-264.000.

Scaletron, Inc.: *See—*
Hartman, Russell D.; and Dougherty, Edward M., 4,630,697, Cl. 177-211.000.

Scarafile, Cosimo: *See—*
Battistini, Carlo; Foglio, Maurizio; Franceschi, Giovanni; and Scarafile, Cosimo, 4,631,150, Cl. 540-310.000.

Schaaf, Heinz; and Walter, Horst, to Convent Knabber-Geback GmbH & Co. Cooking extruder. 4,630,533, Cl. 99-353.000.

Schabowski, John: *See—*
Hayn, John, II; and Schabowski, John, 4,631,659, Cl. 364-200.000.

Schade, Reinhart: *See—*
Edinger, Egon; and Schade, Reinhart, 4,631,436, Cl. 310-322.000.

Schaefer, Rolf; and Walker, Haywood A., Jr. Latent imaging and developer system. 4,631,203, Cl. 427-145.000.

Schaeferling, Karl-Josef: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.

Schaller, Klaus: *See—*
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4.631,272, Cl. 514-23.000.

Schapp, Udo: *See—*
Erhardt, Manfred; Loos, Herbert; Lohrer, Josef; Schapp, Udo; Schaeferling, Karl-Josef; and Freundl, Walter, 4,630,402, Cl. 51-105.0GG.

Schatz, Oskar. Internal combustion engine with a combination exhaust and direct drive supercharger. 4,630,444, Cl. 60-598.000.

Schaudt Maschinenbau GmbH: *See—*
Belthle, Heinz, 4,630,403, Cl. 51-105.0VG.

Scheffee, Robert S., to Atlantic Research Corporation. Method for burning coal-liquid slurry fuels and apparatus therefor. 4,630,556, Cl. 110-347.000.

Scheibli, Peter: *See—*
Seitz, Karl; Scheibli, Peter; and Seiler. Herbert, 4,631,065, Cl. 8-549.000.

Schering Aktiengesellschaft: *See—*
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.

Scherrer, Alain: *See—*
Rohmer, Daniel; and Scherrer, Alain, 4,630,341, Cl. 29-1.300.

Schiavone, Frank J., to United States of America, Navy. Right angle microwave stripline circuit connector. 4,631,505, Cl. 333-33.000.

Schiller, Norman H.; and Alfano, Robert R., to Hamamatsu Corp. Compact temporal spectral photometer. 4,630,925, Cl. 356-318.000.

Schillinger, Ekkehard: *See—*
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.

Schitzler, Lorenz: *See—*
Herbst, Thomas; and Schitzler, Lorenz, 4,630,971, Cl. 405-260.000.

Schlicht, Gunther: *See—*
Altenheiner, Erwin; Schlicht, Gunther; and Hornschu, Joachim, 4,630,901, Cl. 350-552.000.

Schlueter, Francis E.; and Schreiner, Joel M., to Deere & Company. Combination platform and shield for an implement. 4,630,431, Cl. 56-28.000.

Schmedemann, Walter: *See—*
Kayser, Harald; and Schmedemann, Walter, 4,630,796, Cl. 248-648.000.

Schmid, Rene: *See—*
Verzilli, Giuseppe; and Schmid, Rene, 4,630,337, Cl. 19-296.000.

Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., to Schmidt, Glenn H. Golf clubs. 4,630,825, Cl. 273-167.00H.

Schmidt, Hans W.: *See—*
Ringsdorf, Helmut; Portugall, Michael; Schmidt, Hans W.; and Etzbach, Karl H., 4,631,328, Cl. 526-259.000.

Schmidt, Howard F.: *See—*
Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., 4,630,825, Cl. 273-167.00H.

Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, to Daimler-Benz Aktiengesellschaft. Single-arm windshield wiper for motor vehicles. 4,630,327, Cl. 15-250.210.

Schmidt, Rolf: *See—*
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.

Schmidt, Thomas D.: *See—*
Bambousek, Gerald J.; Bartlett, Donald S.; and Schmidt, Thomas D., 4,630,567, Cl. 118-323.000.

Schmidt, Willy: *See—*
Franz, Hans-Joachim; Schmidt, Willy; and Sadler, Karl O., 4,630,561, Cl. 114-1.000.

Schneider, Guenter, to Digital Equipment Corporation. Read/write head positioner arrangement. 4,631,611, Cl. 360-106.000.

Schneider, Hartmut, to Siemens Aktiengesellschaft. Method for removing a surface layer from a metal fluoride glass. 4,631,114, Cl. 156-663.000.

Schneider, Michael H.; and Chadwell, Thomas J., to Sunnen Products Company. Valve seat runout gage. 4,630,377, Cl. 33-181.0AT.

Schoenung, Bernhard: *See—*
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.

Scholer, Fred R.: *See—*
Braksmayer, Diza P.; Lee, Fui-Tseng H.; and Scholer, Fred R., 4,631,148, Cl. 252-609.000.

Schoon, David J., to Minnesota Mining and Manufacturing Company. Laser diode control circuitry. 4,631,726, Cl. 372-31.000.

Schopwinkel, Theo; and Weber, Wilfried, to Trutzschler GmbH & Co. KG. Apparatus for gathering a fiber web into a sliver in a carding machine. 4,630,336, Cl. 19-288.000.

Schorr, Wolfgang: *See—*
Nickel, Bernd; and Schorr, Wolfgang, 4,631,477, Cl. 324-207.000.

Schott, Martin: *See—*
Rieck, Hans-Peter; Schott, Martin; and Russow, Jurgen, 4,631,158, Cl. 264-43.000.

Schrader Bellows Inc.: *See—*
Johnson, John L., 4,630,632, Cl. 137-85.000.

Schreckenberg, Manfred: *See—*
Blahak, Johannes; Dhein, Rolf; Preis, Lothar; and Schreckenberg, Manfred, 4,631,319, Cl. 525-437.000.

Schreiber, Winfried: *See—*
Keller, Manfred; Kolle, Rudi; Schreiber, Winfried; and Claar, Klaus, 4,630,330, Cl. 16-2.000.

Schreiner, Joel M.: *See—*
Schlueter, Francis E.; and Schreiner, Joel M., 4,630,431, Cl. 56-28.000.

Schubert, Keith E.: *See—*
Salazar, Edilberto I.; Kirschner, Wallace; Lorenzo, John L.; Schubert, Keith E.; and Pollak, Philip, Jr., 4,631,681, Cl. 364-464.000.

Schultz, Cheri L.: *See—*
Lassen, Frederich O.; Peerenboom, Robert J.; and Schultz, Cheri L., 4,631,062, Cl. 604-385.00R.

Schulz, Klaus M.: *See—*
Eibach, Wolfgang; Roehr, Kuno M.; and Schulz, Klaus M., 4,631,661, Cl. 364-200.000.

Schuman, Michael L.: *See—*
Sasaki, Isao; and Schuman, Michael L., 4,630,634, Cl. 137-268.000.

Schussler, Karl H. Process for the intermittent aeration of liquids and aeration device for use in such process. 4,631,134, Cl. 210-758.000.

Schust, Gerhard, to Brose Fahrzeugteile GmbH. Arrangement for lifting and lowering a windowpane, especially of a motor vehicle window. 4,630,398, Cl. 49-352.000.

Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max. 4,631,403, Cl. 250-237.00G.

Schwartz, Mark A.: *See—*
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., 4,631,615, Cl. 360-128.000.

Schwartz, Reinhard: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.

Schwinn Bicycle Company: *See—*
Greco, Mark, 4,630,502, Cl. 74-551.100.

Sciulli, Ronald D.: *See—*
Grant, Richard W.; and Sciulli, Ronald D., 4,630,562, Cl. 114-39.000.

Scola, Daniel A.; and Pater, Ruth H., to United Technologies Corporation. Polyimide of alkylene diamine and 4,4'(hexafluoroisopropylidene)bis(o-phthalic anhydride). 4,631,335, Cl. 528-353.000.

Scott & Fetzer Co., The: *See—*
Keech, David W., 4,631,001, Cl. 417-3.000.
Sanders, Gary G.; and Corwon, Michael E., 4,631,539, Cl. 340-870.290.

Scranton, Robert A.: *See—*
Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., 4,630,941, Cl. 384-1.000.

Scripps Clinic & Research Foundation: *See—*
Houghten, Richard A., 4,631,211, Cl. 428-35.000.

Seaman, A. Matthew: *See—*
Fyfe, Leo W.; and Seaman, A. Matthew, 4,630,364, Cl. 29-779.000.

Seebo, Kurt: *See—*
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.

Seelbach, Walter C.: *See—*
Birrittella, Mark S.; Reuss, Robert H.; and Seelbach, Walter C., 4,631,570, Cl. 357-49.000.

Seibentritt, Carl R., Jr.: *See—*
Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., 4,631,414, Cl. 250-474.100.

Seidelmann, Dieter: *See—*
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.

Seidman, Glenn R.: *See—*
Schmidt, Glenn H.; Schmidt, Howard F.; and Seidman, Glenn R., 4,630,825, Cl. 273-167.00H.

Seikensha Co., Ltd.: *See—*
Tsuchiya, Kanji; and Ono, Shizumi, 4,630,534, Cl. 99-483.000.

Seikosha Co., Ltd.: *See—*
Mizutani, Seiki; Hayashi, Mikio; and Ikeda, Kazuaki, 4,630,946, Cl. 400-121.000.

Seiler, Herbert: *See—*
Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, 4,631,065, Cl. 8-549.000.

Seiling, Samuel O., to AMF Union Machinery Inc. High speed batch mixer. 4,630,930, Cl. 366-77.000.

Seitz, Karl; Scheibli, Peter; and Seiler, Herbert, to Ciba-Geigy Corporation. Reactive dyes, process for their preparation and use thereof. 4,631,065, Cl. 8-549.000.

Sekiya, Takuro, to Ricoh Company, Ltd. Printer head of an ink-jet printer. 4,631,553, Cl. 346-140.00R.

Selkirk Division of Household Manufacturing Limited: *See—*
Attwell, Ronald L., 4,630,415, Cl. 52-221.000.

Semperit Reifen AG: *See—*
Stelzer, Josef, 4,630,661, Cl. 152-209.00R.

Senco Products, Inc.: *See—*
Steeves, Jay M.; and Cotta, Gilbert A., 4,630,766, Cl. 227-8.000.

Send, Dietmar: *See—*
Hirt, Edmund; Send, Dietmar; and Diete, Gunter, 4,630,729, Cl. 206-363.000.

Senda, Kenichi: *See—*
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Senelco Limited: *See—*
Wood, David H.; and Creswick, Martin, 4,631,708, Cl. 367-2.000.

Senese, Frank J.; and Baillie, Lloyd A. Leak detector. 4,630,467, Cl. 73-49.200.

Seol, Marn T., to Alenax Corp. Propulsion mechanism for lever propelled bicycles. 4,630,839, Cl. 280-255.000.

Seremjian, Carmella M. Device for holding interim crochet stitches against unravelling. 4,630,454, Cl. 66-1.00A.

Serikawa, Atsuo: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.

Serlin, Victor: *See—*
Friedman, Moshe; and Serlin, Victor, 4,631,447, Cl. 315-5.000.

Serravalle, Joseph M., Jr., to Sony Corporation. Digital fader or like device. 4,631,525, Cl. 340-365.00S.

Severin, Eric; Jansson, Arne; and Ostman, Kjell, to AB Jonkoping Vulcan. Package for hanging or stand-up display. 4.630,734, Cl. 206-461.000.

Severinsson, Lars M.: *See—*
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., 4,630,714, Cl. 188-206.00R.

Sewell Plastics, Inc.: *See—*
Frankenberg, Robert E.; and Calderazzo, Mark A., 4,631,020; Cl. 425-527.000.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Torelli, Guido; and Daniele, Vincenzo, 4,631,485, Cl. 329-50.000.

SGS-ATES Componenti Elettronici SpA: *See—*
Foroni, Mario; and Bertotti, Franco, 4,631,561, Cl. 357-13.000.

Shah, Chandrakant K., to Avondale Industries, Inc. Hydraulic drive apparatus for die carriers. 4,630.536, Cl. 100-229.00R.

Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Nuclear reactor fuel assembly with a removable top nozzle. 4,631,168, Cl. 376-446.000.

Shanzer, Abraham; and Libman, Jacqueline, to Yeda Research & Development Co. Limited. Enterobactin type compounds. 4,631,291, Cl. 514-450.000.

Sharon Manufacturing Company: *See—*
Hudson, Sharon J., Jr., 4,630,439, Cl. 60-305.000.

Sharp Kabushiki Kaisha: *See—*
Hara, Takafumi, 4,631,558, Cl. 346-140.00R.
Mizoguchi, Saburo, 4,630,475, Cl. 73-293.000.
Satoh, Masaharu, 4,631,468, Cl. 320-14.000.
Yoshida, Kunio; and Makino, Fusao, 4,630,947, Cl. 400-124.000.
Yui, Yuhi; and Kinashi, Hiroshi, 4,630,918, Cl. 355-3.00R.

Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., to North American Philips Corporation. Thin film capacitors and method of making the same. 4,631,633, Cl. 361-321.000.

Sheffer, Phil B., to Merchandising Innovations, Inc. Structural locking device. 4,630,549, Cl. 108-111.000.

Sheffer, Phil B., to Merchandising Innovations, Inc. Executive desk. 4,630,551, Cl. 108-159.000.

Shen, Wei C.; and Ryser, Hugues J. Acidity-sensitive spacer molecule to control the release of pharmaceuticals from molecular carriers. 4,631,190, Cl. 424-85.000.

Shepherd, Clay: *See—*
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.

Shepherd, Robert A., Jr.: *See—*
Carroll, John C.; and Shepherd, Robert A., Jr., 4,631,105, Cl. 156-345.000.

Sherard, Michael W. Subirrigation gravel culture growing bed. 4,630,394, Cl. 47-59.000.

Sherman, James L., to Price & Adams. Roof support system for a mine and method for providing the same. 4,630,974, Cl. 405-288.000.

Sherman, Victor; and Zborovsky, Ilya. Lunch box. 4,630,671, Cl. 165-61.000.

Sherwin, Gary W., to Westinghouse Electric Corp. Phase locked stepper motor controlled light chopper. 4,631,466, Cl. 318-696.000.

Shiba, Haruo: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.

Shibahara, Tetsuya: *See—*
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.

Shibata, Fumio: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.

Shibata, Makoto: *See—*
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.

Shibata, Norio, to Toyota Jidosha Kabushiki Kaisha. System for controlling vaporized fuel in an internal combustion engine. 4,630,581, Cl. 123-325.000.

Shibata, Tadashi: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Shibata, Tsuneo; Mohri, Yoshitaka; Ida, Haruo; and Ishikawa, Haruo, to Matsushita Electric Industrial Co., Ltd. Catalytic combustion device. 4,631,024, Cl. 431-268.000.

Shibuya, Kiyoshi: *See—*
Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, 4,631,366, Cl. 340-333.000.

Shifflett, David C.; and Shifflett, Dennis I., to Al-Ko Products, Inc. Manifold. 4,631,212, Cl. 428-36.000.

Shifflett, Dennis I.: *See—*
Shifflett, David C.; and Shifflett, Dennis I., 4,631,212, Cl. 428-36.000.

Shigematsu, Takashi: *See—*
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.

Shigeo, Iwasaki; and Hiroshi, Haguchi, to Mitsuishi Fukai Tekkosho, Ltd. Molding apparatus with replaceable plunger and die set. 4,631,015, Cl. 425-195.000.

Shiiki, Kazuo: Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi. Magnetic recording and reproducing system. 4,631,612, Cl. 360-125.000.

Shimada, Masaru: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.

Shimazaki, Toru: *See—*
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.

Shimizu Construction Co., Ltd.: *See—*
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.

Shimizu, Keiji: *See—*
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Shimizu, Masao, to Advantest Corp. Semiconductor memory test equipment. 4,631,724, Cl. 371-21.000.

Shimizu, Tateshi: *See—*
Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, 4,630,580, Cl. 123-196.00R.
Shinagawa, Kiminari: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
Shinobu, Masayoshi: *See—*
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.
Shinoda, Yoshio: *See—*
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.
Shinzawa, Motohiro, to Nissan Motor Company, Limited. Exhaust particle removing system for an engine. 4,630,438, Cl. 60-274.000.
Shiotani, Yosuke, to Kunimori Kagaku Co., Ltd. Foldable containers. 4,630,745, Cl. 220-6.000.
Shiraishi, Masami, to Tomy Kogyo Co., Inc. Construction toy set. 4,631,040, Cl. 446-95.000.
Shirley, Chester L. Lug wrench support tool. 4,630,511, Cl. 81-462.000.
Shiroishi, Yoshihiro: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
Shoemaker, John R.: *See—*
Renn, Robert M.; and Shoemaker, John R., 4,630,874, Cl. 339-17.00F.
Shores, Stephen. Vacuum assisted flea combing device. 4,630,329, Cl. 15-368.000.
Showa Denko Kabushiki Kaisha: *See—*
Hoshi, Katsumasa, 4,630,348, Cl. 29-234.000.
Showa Musen Kogyo Kabushiki Kaisha: *See—*
Matsuda, Takeshi; and Kano, Harumi, 4,631,504, Cl. 333-25.000.
Shurman, Louis W.: *See—*
Bell, Thomas W.; and Shurman, Louis W., 4,630,663, Cl. 152-541.000.
Shutske, Gregory M.; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals Inc. 9-amino-1,2,3,4-tetrahydroacridin-1-ol and related compounds. 4,631,286, Cl. 514-297.000.
Sickler, Janet M.: *See—*
Christie, Rosemary; Hwang, Bao-Tai; Ku, San-Mei; and Sickler, Janet M., 4,630,356, Cl. 29-576.00W.
Siebe North, Inc.: *See—*
Montesi, Edward N., 4,630,604, Cl. 128-206.150.
Siemens Aktiengesellschaft: *See—*
Edinger, Egon; and Schade, Reinhart, 4,631,436, Cl. 310-322.000.
Haberrecker, Klaus, 4,631,744, Cl. 378-138.000.
Markert, Helmut; Hauschildt, Klaus-Robert; Rogler, Wolfgang; and Kretzschmar, Klaus, 4,631,306, Cl. 523-457.000.
Milbrandt, Artur, 4,631,548, Cl. 346-1.100.
Nickel, Bernd; and Schorr, Wolfgang, 4,631,477, Cl. 324-207.000.
Poersch, Hans; and Stark, Gustav, 4,630,987, Cl. 414-32.000.
Schneider, Hartmut, 4,631,114, Cl. 156-663.000.
Tihanyi, Jeno , 4,631,565, Cl. 357-23.400.
Siemens Energy & Automation, Inc.: *See—*
Alexander, James O.; King, William A.; May, William E.; and Pardue, Von G., 4,631,625, Cl. 361-94.000.
Siewert, Robert L.; and Varnelis, Edmund K., to Clark Michigan Company. Self-storing side panel. 4,630,698, Cl. 180-69.240.
Sigel, George H.: *See—*
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.
Signetics Corporation: *See—*
Donald, Raymond G., 4,631,113, Cl. 156-659.100.
Sigsgaard, Poul: *See—*
Jensen, Svend A. K.; Munck, Lars; Sigsgaard, Poul; and Huss, Hans H., 4,631,413, Cl. 250-458.100.
Silverberg, Mort; Maus, Richard G.; and Lindblad, Nero R., to Xerox Corporation. Blade cleaning apparatus for removing residual toner from a charge retentive surface. 4,630,920, Cl. 355-15.000.
Sim-Tech Limited: *See—*
McCallister, John S., 4,630,958, Cl. 403-257.000.
Simbille, Nadine: *See—*
Combourieu, Michel; Bernet, Yvon; Laigle, Jean-Claude; and Simbille, Nadine, 4,631,277, Cl. 514-239.000.
Simko, Aladar O.: *See—*
Anderson, Richard W.; Asik, Joseph R.; Ronzi, Richard C.; and Simko, Aladar O., 4,631,451, Cl. 315-209.00R.
Simon, Myron S.; and Waller, David P., to Polaroid Corporation. Photographic products and processes. 4,631,344, Cl. 548-146.000.
Simons, Brent S., to United States of America, Navy. Thermoelectric cooler control circuit. 4,631,728, Cl. 372-38.000.
Simons, Leon. Self aligning screw. 4,630,985, Cl. 411-386.000.
Simpson, John A.; Melton, Keith; and Duerig, Tom, to Raychem Corporation. Method of processing a nickel/titanium-based shape memory alloy and article produced therefrom. 4,631,094, Cl. 148-11.50F.
Singer Company, The: *See—*
Russell, Angus R. T., 4,630,557, Cl. 112-235.000.
Singer, Steven M. Article forming method. 4,630,346, Cl. 29-160.600.
Singerman, Harold H.: *See—*
Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., 4,631,303, Cl. 523-177.000.
Single, Peter S., to National Semiconductor Corporation. Sine wave synthesizer. 4,631,694, Cl. 364-608.000.
Sipido, Victor: *See—*
Boeckx, Gustaaf M.; Raeymaekers, Alfons H. M.; and Sipido, Victor, 4,631,278, Cl. 514-242.000.
Siwik, James C.; Murray, Thomas L., Jr.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Firmware simulation of diskette data via a video signal. 4,631,699, Cl. 364-900.000.
Skanaker, Ragnar: *See—*
Crane, James W.; and Skanaker, Ragnar, 4,630,387, Cl. 42-73.000.
SKF Textilmaschinen-Komponenten GmbH: *See—*
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.
Skoog, Malte, to Malte Skoog Invent Ab. Plate heat exchanger. 4,630,674, Cl. 165-147.000.
Slavens, Clyde M. Welding head apparatus. 4,631,386, Cl. 219-125.120.
Slavin, Lawrence M.: *See—*
Lauriello, Philip J. J.; and Slavin, Lawrence M., 4,630,886, Cl. 350-96.200.
Sliger, Boyd P.; and Wagner, Joseph P., to Robertshaw Controls Company. Valve construction and method of making the same. 4,630,770, Cl. 236-34.500.
Slusarski, Ronald S.: *See—*
Handel, Martin G.; Robida, James E.; and Slusarski, Ronald S., 4,631,528, Cl. 340-545.000.
Small, Kenneth T., to Boschert Incorporated. Capacitor coupled current mode balance circuit. 4,631,653, Cl. 363-17.000.
Smilgys, Bruno S.: *See—*
Fleischer, Donald W.; and Smilgys, Bruno S., 4,630,655, Cl. 141-198.000.
Smirl, Richard L., to Borg-Warner Corporation. Dual-pass continuously variable transmission. 4,630,504, Cl. 74-689.000.
Smith, Dolores A.: *See—*
Mitchell, Charles B., 4,631,057, Cl. 604-198.000.
Smith, Eric T.: *See—*
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.
Smith, Gregory J.: *See—*
Naylor, Herbert C.; Smith, Gregory J.; and Roeser, Howard J., Jr., 4,630,882, Cl. 339-198.00R.
Smith, Harry D., Jr., to Halliburton Company. Method and apparatus for dual-spaced fast/epithermal neutron porosity measurements. 4,631,405, Cl. 250-266.000.
Smith International Inc.: *See—*
Neipling, Lawrence E.; and Flohr, Mark C., 4,630,675, Cl. 166-53.000.
Smith, James C.: *See—*
Rehman, William R.; and Smith, James C., 4,630,774, Cl. 239-8.000.
Smith, James D. B.: *See—*
Ray, John R.; Williamson, Michael A.; and Smith, James D. B., 4,631,325, Cl. 526-220.000.
Smith, James E.: *See—*
Franklin, Andrew D.; Hasley, Lloyd A.; and Smith, James E., 4,631,534, Cl. 340-825.500.
Smith, John D., to Fairey Hydraulics Limited. Variable ratio power transmission means. 4,630,495, Cl. 74-191.000.
Smith, John M.: *See—*
Miles, James J.; and Smith, John M., 4,630,486, Cl. 73-861.560.
Smith, Stephen R.: *See—*
Lanham, William E.; and Smith, Stephen R., 4,631,029, Cl. 432-133.000.
Smith, Troy L., Jr., to Ethyl Corporation. Process for the production of silicon carbide by the pyrolysis of a polycarbosilane polymer. 4,631,179, Cl. 423-345.000.
Smithers, Colin R., to U.S. Philips Corporation. Bipolar transistor RF power amplifier. 4,631,491, Cl. 330-149.000.
Smoot, George W.: *See—*
Davis, Walter L.; Prieto, Yolanda; and Smoot, George W., 4,631,737, Cl. 375-88.000.
Snelgrove, Roy V.: *See—*
McCullough, Francis P.; and Snelgrove, Roy V., 4,631,118, Cl. 204-16.000.
Snell, James L., to Harris Corporation. M-phase PSK vector processor demodulator. 4,631,486, Cl. 329-50.000.
Snyman, Robert. Storage device for storing disc-shaped articles. 4,630,732, Cl. 206-445.000.
Sobus, Michael T., to PQ Corporation. Treating beer to prevent chill haze. 4,631,193, Cl. 426-330.400.
Societe A. Degut: *See—*
Degut, Andre, 4,630,418, Cl. 52-264.000.
Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, 4,630,713, Cl. 188-73.440.
Levrai, Roland; Courbot, Pierre; and Picot, Pascal, 4,630,711, Cl. 184-6.120.
Societe Mte: *See—*
Gaudiau, Gaston, 4,630,807, Cl. 267-140.100.
Societe Nationale Elf Aquitaine (Production): *See—*
Sturtz, Georges, 4,631,142, Cl. 252-184.000.
Soil Teq., Inc.: *See—*
Ortlip, Earl W., 4,630,773, Cl. 239-1.000.
Solomon, Stephen R.: *See—*
Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., 4,631,608, Cl. 360-99.000.
Soltau, Gerd. Arrangement for underground advance driving of pipe trains composed of individual pipe lengths. 4,630,967, Cl. 405-184.000.

Somat Corporation: *See—*
Immel, Robert W.; and Fields, Evan P., 4,630,780, Cl. 241-46.00B.
Sonnentag, Kurt J.; and Steinkamp, Norman A., to John Zink Company. Coffeemaker. 4,630,532, Cl. 99-279.000.
Sony Corporation: *See—*
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.
Katsumata, Hiroshi, 4,631,607, Cl. 360-96.500.
Maeda, Satoru, 4,631,531, Cl. 340-701.000.
Nishigaki, Susumu; Ohkoshi, Akio; and Aozuka, Torao, 4,630,826, Cl. 273-167.00H.
Ohsato, Kiyoshi; and Kubota, Shigeo, 4,631,397, Cl. 250-201.000.
Ozawa, Kazuo; and Nonoyama, Hideki, 4,631,618, Cl. 360-132.000.
Sato, Maki, 4,631,575, Cl. 358-30.000.
Serravalle, Joseph M., Jr., 4,631,525, Cl. 340-365.00S.
Sopory, Umesh K.: *See—*
O'Brien, Michael T.; Sopory, Umesh K.; and Fang, Shou-Mean, 4,631,392, Cl. 219-549.000.
Sortex Limited: *See—*
Maughan, William S.; and Fraenkel, Herbert, 4,630,736, Cl. 209-587.000.
Southco, Inc.: *See—*
Bisbing, Robert H., 4,630,332, Cl. 16-273.000.
Vickers, James H., 4,630,333, Cl. 16-338.000.
Spa, Lambertus K. J., to Beta B.V. Pneumatic switching device, e.g., for safeguarding against overpressure. 4,630,645, Cl. 137-625.600.
Spaller, Albert E., to Eastman Kodak Company. Apparatus for cutting continuous strand. 4,630,515, Cl. 83-402.000.
Sparacia, Frank M.; and Wimer, Oley D., to Harshaw/Filtrol. Scintillator crystal having a highly reflective surface. 4,631,409, Cl. 250-361.00R.
Spence, John H.: *See—*
Przybylinski, Phillip G.; and Spence, John H., 4,630,547, Cl. 105-416.000.
Spencer, Treesa; and Alberta, Terry, to Pro-Tec Sports. Inc. Ankle brace and protector. 4,630,600, Cl. 128-80.00R.
Sperakis, Thomas A.: *See—*
McDonald, Allen S.; Philp, Charles W.; and Sperakis, Thomas A., 4,631,171, Cl. 420-481.000.
Sperry Corporation: *See—*
Feldman, Alan, 4,631,540, Cl. 340-870.380.
Grothe, Steven P., 4,631,532, Cl. 340-703.000.
Spibey, John: *See—*
Reinwall, Ernest W.; and Spibey, John, 4,630,984, Cl. 411-368.000.
Spicer, Barry; and Wills, Joseph T., to PipercrossLimited. Foam plastic air filter. 4,631,077, Cl. 55-487.000.
Spiesman, Robert L., to Honeywell Inc. Transceiver. 4,631,733, Cl. 375-7.000.
Spindler, Hans, to Trautz & Co. Inh. Hans Spindler. Discardable flashlight. 4,631,646, Cl. 362-118.000.
Spiral Systems, Inc.: *See—*
Campell, Jeptha E., 4,630,755, Cl. 222-56.000.
Spolyar, John L. Apparatus for gauging and determining spatial coordinates for a source of radiation to be employed in obtaining a radiograph of a patient. 4,630,375, Cl. 33-1.00B.
Spray-All, Inc.: *See—*
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.
Springfix-Befestigungstechnik GmbH: *See—*
Ausprung, Erich, 4,630,957, Cl. 403-76.000.
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., to Westinghouse Electric Corp. Fuel cell plates with improved arrangement of process channels for enhanced pressure drop across the plates. 4,631,239, Cl. 429-39.000.
Square D Company: *See—*
Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., 4,631,624, Cl. 361-89.000.
Stadden, Cecine B. Tile game. 4,630,831, Cl. 273-292.000.
Stadler, Peter: *See—*
Lockhoff, Oswald; Kruger, Bernd-Wieland; Stadler, Peter; Metzger, Karl G.; Kroll, Hein-Peter; Schaller, Klaus; and Zeiler, Hans-Joachim, 4,631,272, Cl. 514-23.000.
Stahl, Dieter: *See—*
Disselbeck, Dieter; and Stahl, Dieter, 4,631,221, Cl. 428-166.000.
Stahl, Philip; Wilcock, Donald F.; and Fuller, Dudley D., to Ferrofluidics Corporation. Ferrofluid bearing and seal apparatus. 4,630,943, Cl. 384-133.000.
Standard Elektrik Lorenz AG: *See—*
Forker, Dieter; Hassler, Joachim; Lau, Bernhard; and Schmidt, Rolf, 4,630,909, Cl. 354-1.000.
Standard Oil Company (Indiana): *See—*
Hagen, Gary P., 4,631,264, Cl. 502-243.000.
Standard Products Company, The: *See—*
Jackson, Norman C., 4,631,104, Cl. 156-293.000.
Standard Telephones and Cables Public Limited Company: *See—*
Taylor, Frank; and Burton, Trevor, 4,630,358, Cl. 29-594.000.
Standex electronics (UK) Limited: *See—*
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.
Stanley Electric Co., Ltd.: *See—*
Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., 4,631,513, Cl. 340-52.00R.
Stark, Gustav: *See—*
Poersch, Hans; and Stark, Gustav, 4,630,987, Cl. 414-32.000.
Stauffer Chemical Company: *See—*
Baker, Roy A.; Costello, Rocky C.; and Engel, Michael J., 4,631,068, Cl. 23-293.00S.
Staurseth, Robert A. Retractable utility saw. 4,630,373, Cl. 30-514.000.
Staviski, Theodore. Electrical component lead bending and cutting apparatus. 4,630,354, Cl. 29-566.400.
STC plc: *See—*
Tomlinson, Paul G.; and Newbould, Richard T., 4,631,078, Cl. 65-3.110.
Steck, Werner; and Jakusch, Helmut, to BASF Aktiengesellschaft. Ferrimagnetic particles and their preparation. 4,631,140, Cl. 252-62.560.
Steen, Grant F.: *See—*
Romania, Samuel R.; and Steen, Grant F., 4,631,637, Cl. 361-413.000.
Steer, John E., to Allied Corporation. Reservoir for a master cylinder. 4,630,443, Cl. 60-535.000.
Steeves, Jay M.; and Cotta, Gilbert A., to Senco Products, Inc. Fastener driving apparatus and methods and fastener supply. 4,630,766, Cl. 227-8.000.
Steiner, Carl. System for introducing by reflection additional information into binoculars. 4,630,900, Cl. 350-539.000.
Steinkamp, Norman A.: *See—*
Sonnentag, Kurt J.; and Steinkamp, Norman A., 4,630,532, Cl. 99-279.000.
Stelzer, Josef, to Semperit Reifen AG. Pneumatic vehicle tire tread, especially radial-ply tire for trucks. 4,630,661, Cl. 152-209.00R.
Stendel, Wilhelm; and Voege, Herbert, to Bayer Aktiengesellschaft. Pyrethroid-containing molded articles for combating ectoparasites. 4,631,231, Cl. 428-413.000.
Stenner, Gustav H., to G. H. Stenner & Co., Inc. Peristaltic pump housing. 4,631,008, Cl. 417-477.000.
Stenzel, Wolfgang; and Hofferber, Eva, to Beiersdorf Aktiengesellschaft. Substituted phenylpiperazinyl-propanols, a process for their preparation and their use, and formulations containing these compounds. 4,631,281, Cl. 514-252.000.
Stettner & Co.: *See—*
Tiepke, Gunter, 4,631,391, Cl. 219-541.000.
Steurmer, Karl H., to Planet Products, Corporation. Apparatus for arranging articles in a predetermined manner and method of making same. 4,630,725, Cl. 198-425.000.
Stevens, Alec M. Extendible boom including a rack and pinion mechanism. 4,630,741, Cl. 212-203.000.
Stevens, Robert B. Micro-stroke mechanical toothbrush. 4,630,326, Cl. 15-22.00R.
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., to Reynolds Metals Company. Alumina reduction cell. 4,631,121, Cl. 204-243.00R.
Stickler, David B.: *See—*
Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., 4,631,080, Cl. 65-134.000.
Stieber, Joseph F., to Uniroyal Chemical Company, Inc. Curable rubber compositions comprising substituted dithiocarbamylurea accelerators. 4,631,316, Cl. 525-352.000.
Stjarne, Olov G.; Severinsson, Lars M.; and Lowrie, Alastair C. B., to Sab Nife AB. Block brake actuator for a rail vehicle. 4,630,714, Cl. 188-206.00R.
Stockhausen, Dolf; Nowak, Rudolf; Chmelir, Miroslav; Kaussen, Manfred; and Dahmen, Kurt, to Chemische Fabrik Stockhausen GmbH. Process for finish dressing minerally dressed leathers or those dressed by a combined method, using polymer dressings. 4,631,063, Cl. 8-94.210.
Stockton, Edward. Carrier for sheet material, wall paneling or the like. 4,630,838, Cl. 280-47.170.
Stokes, Vijay K., to General Electric Company. Plastic end shield with thermal barrier for dynamoelectric machines. 4,631,433, Cl. 310-89.000.
Stolen, Rogers H.: *See—*
Ashkin, Arthur; and Stolen, Rogers H., 4,630,890, Cl. 350-96.300.
Stoping Aktiengesellschaft: *See—*
Waltenspuhl, Rolf, 4,630,668, Cl. 164-437.000.
Storey, Patricia J. Knitting project workbox. 4,630,730, Cl. 206-392.000.
Stoy, Vladimir A.; and Chvapil, Milos, to S.K.Y. Polymers, Ltd. (Kingston Technologies). Injectable physiologically-acceptable polymeric composition. 4,631,188, Cl. 424-81.000.
Strasser, Joseph P.: *See—*
Kozuma, Jiro; Hamaguchi, Hirohiko; Shibahara, Tetsuya; and Strasser, Joseph P., 4,631,301, Cl. 523-122.000.
Strassner, Keith D.: *See—*
Johns, Marshall E.; Strassner, Keith D.; and Braga, Thomas G., 4,631,138, Cl. 252-8.555.
Stratford, Ian J.: *See—*
Ahmed, Israr; Adams, Gerald E.; Stratford, Ian J.; and Gibson, David, 4,631,289, Cl. 514-397.000.
Straubel, Max: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, 4,630,582, Cl. 123-339.000.
Strickman, Melvyn B.; and Fournier, Erick-Pierre. Disposable contraceptive cervical barrier. 4,630,602, Cl. 128-127.000.
Stringer, R. G.: *See—*
Stringer, Richard G., 4,630,762, Cl. 223-66.000.
Stringer, Richard G., to Stringer, R. G.; and Michell, Andre Clive. Mannequin. 4,630,762, Cl. 223-66.000.

Sturtz, Georges, to Societe Nationale Elf Aquitaine (Production). Diphosphonic extractants. 4,631,142, Cl. 252-184.000.

Stutler, Richard A.; and Harris, Jeffrey T., to United States of America, Navy. Scanning alarm electronic processor. 4,631,662, Cl. 364-200.000.

Stutznacker, Klaus, to Nahmaschinenfabrik Emil Stutznacker GmbH & Co. KG. Device for stabilizing the needle thread loop in sewing machines. 4,630,560, Cl. 112-302.000.

Su, Taian: *See—*
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, 4,631,723, Cl. 371-10.000.

Suarez, Jose I.: *See—*
Borras, Jaime A.; and Suarez, Jose I., 4,631,496, Cl. 331-1.00A.

Subtex, Inc.: *See—*
George, Stephen; and George, Thomas, 4,631,224, Cl. 428-246.000.

Sudol, George A.; Comfort, Edward H.; and Solomon, Stephen R., to Burroughs Corporation. Disk drive disk control apparatus. 4,631,608, Cl. 360-99.000.

Suerth, John E.: *See—*
McGee, Theodore W.; Muncy, Charles; and Suerth, John E., 4,631,210, Cl. 428-13.000.

Sugaya, Toshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. System for detecting the position of a read-write head on a disk recording medium having servo sectors with three or more servo patterns. 4,631,606, Cl. 360-78.000.

Suginaka, Shunji: *See—*
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Sugiyama, Suguru: *See—*
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Sugiyama, Toru: *See—*
Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, 4,630,772, Cl. 238-159.000.

Sulesky, Donald J.: *See—*
Czumak, Frank M.; and Sulesky, Donald J., 4,630,914, Cl. 354-212.000.

Suling, Carlhans: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Sullivan, Clarence W.: *See—*
True, Martin E.; and Sullivan, Clarence W., 4,630,688, Cl. 173-163.000.

Sulzer Brothers Limited: *See—*
Bosshard, Ernst, 4,630,738, Cl. 211-60.100.

Sumi, Hidezi: *See—*
Kokado, Masayuki; and Sumi, Hidezi, 4,631,567, Cl. 357-38.000.

Sumi, Toshio: *See—*
Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, 4,630,869, Cl. 299-33.000.

Sumida, Nobuyuki: *See—*
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.

Sumitomo Chemical Company, Limited: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.
Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, 4,631,347, Cl. 260-963.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nishimura, Akira, 4,631,225, Cl. 428-250.000.

Sumitomo Metal Industries, Ltd.: *See—*
Fukui, Kunihiro; Nishihara, Minoru; Mase, Toshiro; Morita, Yoshiyasu; and Kawashima, Hisakazu, 4,630,849, Cl. 285-55.000.

Sun Hydraulics Corp.: *See—*
DiBartolo, Ernest A., 4,630,640, Cl. 137-501.000.

Sunagawa, Hiroshi: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Sunago, Hirofumi: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.

Sunbeam Plastics Corporation: *See—*
Wright, David M., 4,630,743, Cl. 215-216.000.

Sundstrand Corporation: *See—*
Burandt, Wesley A., 4,631,000, Cl. 417-225.000.
Cygnor, John E.; and Hallman, John, 4,631,009, Cl. 418-15.000.
Sutrina, Thomas A., 4,631,573, Cl. 357-82.000.

Sundvall, Nils J.: *See—*
Johansson, Jan H.; and Sundvall, Nils J., 4,631,359, Cl. 379-324.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,360, Cl. 379-324.000.

Sung, Rodney L., to Texaco Inc. Anti-wear additives for alcohol fuels. 4,631,069, Cl. 44-56.000.

Sunnen Products Company: *See—*
Schneider, Michael H.; and Chadwell, Thomas J., 4,630,377, Cl. 33-181.0AT.

Suomen Sokeri Oy: *See—*
Heikkila, Heikki, 4,631,129, Cl. 210-635.000.

Supcoe, Robert F.; and Radakovich, Thomas, to United States of America, Army. Underwater biocidal wax composition and preparation thereof. 4,631,302, Cl. 523-122.000.

Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., to United States of America, Navy. Underwater formulation and method for cleaning and waxing simultaneously. 4,631,303, Cl. 523-177.000.

Suri, Alajos: *See—*
Harsanyi, Jozsef; Pinter, Janos; and Suri, Alajos, 4,630,931, Cl. 366-107.000.

Sutrina, Thomas A., to Sundstrand Corporation. Cooled stack of electrically isolated semiconductors. 4,631,573, Cl. 357-82.000.

Suuchi, Osamu; Mimaya, Shuzo; and Ohashi, Masaru, to Nippon Mining Co., Ltd. Method for discharging consolidated waste catalyst. 4,630,779, Cl. 241-1.000.

Suzuki, Hideo: *See—*
Hase, Takashi; Yoshida, Hidemi; Suzuki, Hideo; and Hayakawa, Morio, 4,631,445, Cl. 313-467.000.

Suzuki, Kazuhiro, to Nippon Cable System Inc. Transmission operating device. 4,630,500, Cl. 74-473.00R.

Suzuki, Kenju: *See—*
Akesaka, Toshio; Suzuki, Kenju; and Sumi, Toshio, 4,630,869, Cl. 299-33.000.

Suzuki, Mikio; and Yamazaki, Masafumi, to Nissan Motor Company, Limited. Spark ignition timing control system for an internal combustion engine with retarding means responsive to transmission gear shifting. 4,630,583, Cl. 123-425.000.

Suzuki, Minoru: *See—*
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,630,724, Cl. 198-399.000.

Suzuki Motor Co., Ltd.: *See—*
Sawaki, Yasushi; Iguchi, Hironori; and Shimizu, Tateshi, 4,630,580, Cl. 123-196.00R.

Suzuki, Toshio, to Toray Silicone Co., Ltd. Alkenyl organopolysiloxane and curable composition therefrom. 4,631,321, Cl. 525-478.000.

Suzzi, Robert J.: *See—*
Leman, Jean-Luc; Russier, Michel V.; and Suzzi, Robert J., 4,630,998, Cl. 416-134.00A.

Svensson, Lars. Post for traffic signs, lighting and the like. 4,630,413, Cl. 52-98.000.

Swanson, Dale A. Projectile sensing target. 4,630,832, Cl. 273-374.000.

Swart, Kyle D.: *See—*
Landoll, Donald R.; Swart, Kyle D.; and Morris, Joseph B., 4,630,991, Cl. 414-478.000.

Sweet, Edmund G. F., to Ontario Research Foundation. Viscometer. 4,630,468, Cl. 73-59.000.

Sweet, Richard F. Playing card holder. 4,630,824, Cl. 273-150.000.

Swim, Steven M. Record album labeling tab. 4,630,385, Cl. 40-340.000.

Swiss Aluminium Ltd.: *See—*
Roczyn, Hans-Gerd, 4,631,236, Cl. 428-558.000.

Sword, Anthony J.: *See—*
Hill, John W.; and Sword, Anthony J., 4,631,657, Cl. 364-167.000.

Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., to GFS Manufacturing Company, Inc. Toroid transformers and secondary windings. 4,631,511, Cl. 336-180.000.

Synergetics, Inc.: *See—*
Howard, Thomas C., 4,630,892, Cl. 350-264.000.

Szentivanyi, Zsolt: *See—*
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, 4,631,309, Cl. 524-426.000.

Szymanski, Richard: *See—*
Lapins, Daniel W.; and Szymanski, Richard, 4,630,416, Cl. 52-239.000.

T.A.S., Inc.: *See—*
Sayler, William H.; and White, Justin C., 4,630,554, Cl. 110-264.000.

T.J. Gundlach Machine Company: *See—*
Brown, Donald W., Jr.; and Kohler, Mark L., 4,630,781, Cl. 241-159.000.

T&N Research Ltd.: *See—*
Baker, Ralph; Smith, Eric T.; Dickinson, Vaughan T.; McKenzie, Noel C.; and Hargreaves, Brian, 4,631,209, Cl. 427-392.000.

Tabereaux, Alton T.: *See—*
Stewart, Douglas V.; Tabereaux, Alton T.; and Willett, John T., 4,631,121, Cl. 204-243.00R.

Tachibana, Kimie: *See—*
Komamura, Tawara; Suginaka, Shunji; and Tachibana, Kimie, 4,631,251, Cl. 430-548.000.

Taft, Philip A.: *See—*
Reynolds, Desmond H. J.; and Taft, Philip A., 4,630,630, Cl. 137-68.100.

Taguchi, Yoshinori; and Yamanami, Tsuguya, to Wacom Co., Ltd. Coordinate input device with display. 4,631,356, Cl. 178-19.000.

Taheri, Syde A. Oxygenator. 4,631,053, Cl. 604-49.000.

Taishoff, Howard A. Method and apparatus for converting a conventional internal combustion engine into a high speed electric motor and generator. 4,631,455, Cl. 318-37.000.

Takabayashi, Fumiki: *See—*
Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, 4,631,066, Cl. 8-115.560.

Takagi, Kazumasa: *See—*
Nagatsuma, Kazuyuki; Takagi, Kazumasa; and Matsumura, Hiroyoshi, 4,631,402, Cl. 250-231.00R.

Takagi, Yoshiaki: *See—*
Isobe, Susumu; Matsunaga, Kenkichi; Takagi, Yoshiaki; and Sato, Norikatsu, 4,631,169, Cl. 420-443.000.

Takahashi, Hiroto: *See—*
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,631,555, Cl. 346-140.00R.

Takahashi, Kenji: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,631,407, Cl. 250-327.200.

Takahashi, Yoshiaki, to Pioneer Electronic Corp. Audio output amplifying device. 4,631,490, Cl. 330-51.000.

Takamura, Moriyuki; Mukasa, Shigeru; and Ibi, Takashi, to Fujitsu Limited. Error correcting and detecting system. 4,631,725, Cl. 371-39.000.

Takato, Kenji; Ayano, Mitsutoshi; Shibuya, Kiyoshi; Iijima, Yoshimi; and Serikawa, Atsuo, to Fujitsu Limited. Battery feed circuit for subscriber line. 4,631,366, Cl. 340-333.000.

Takaya, Takao; Sakane, Kazuo; Yamanaka, Hideaki; and Miyai, Kenzi, to Fujisawa Pharmceutical Co., Ltd. Halovinyl cephem compounds. 4,631,274, Cl. 514-202.000.

Takayama, Toshio; and Haraikawa, Tetsuo, to Tokico Ltd. Vehicle braking system. 4,630,706, Cl. 180-273.000.

Takei, Toshihiro: *See—*
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Takeichi, Hitoshi: *See—*
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, 4,630,612, Cl. 128-660.000.

Takenaka, Hiroyuki: *See—*
Ohmori, Shunji; Takenaka, Hiroyuki; Hozoji, Akira; Kono, Kazunori; Yoshikawa, Kiyomitsu; and Kajihara, Seishi, 4,630,514, Cl. 83-342.000.

Takeshita, Akira: *See—*
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,631,341, Cl. 544-189.000.

Takeuchi, Shigeru: *See—*
Imabayashi, Koji; Kawamura, Hiroshi; Takeuchi, Shigeru; Shinobu, Masayoshi; and Kawajiri, Shinobu, 4,631,594, Cl. 358-231.000.

Takeuchi, Yasuhito: *See—*
Yamaguchi, Keiki; Higashiizumi, Takao; Shimazaki, Toru; Sano, Shinichi; and Takeuchi, Yasuhito, 4,631,710, Cl. 367-103.000.

Takeuchi, Yoshinori: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.

Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, to Eiken Kagaku Kabushiki Kaisha. Composition for assaying for nitrites. 4,631,255, Cl. 435-37.000.

Tal-Mor, Emile: *See—*
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, 4,630,396, Cl. 49-55.000.

Tamba, Shinichi; Ogino, Toru; and Fukui, Noboru, to Kawasaki Jukogyo Kabushiki Kaisha. Throttle control device for general purpose engine. 4,631,153, Cl. 261-52.000.

Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, to Hitachi, Ltd. Ion source. 4,631,448, Cl. 315-111.810.

Tamura, Takahiko: *See—*
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.

Tanaka, Fujio; and Imamura, Nobutake, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,631,617, Cl. 360-131.000.

Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, to Hitachi, Ltd. Fine clearance measuring apparatus. 4,630,926, Cl. 356-357.000.

Tanaka, Kazuhiro: *See—*
Arii, Kazuhiro; Yamamoto, Yasuo; Sumida, Nobuyuki; Hanaoka, Katsumi; and Tanaka, Kazuhiro, 4,631,509, Cl. 336-92.000.

Tanaka, Megumu: *See—*
Kano, Masafumi; Tanaka, Megumu; Sato, Atsushi; and Kawakami, Shigenobu, 4,631,632, Cl. 361-315.000.

Tanino, Hiroshi: *See—*
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, 4,631,743, Cl. 378-138.000.

Tanner, John E.; and Mead, Carver A., to California Institute of Technology. Correlating optical motion detector. 4,631,400, Cl. 250-221.000.

Tans, Petrus P.; and Lashof, Daniel A., to United States of America, Energy. Fiberoptic spectrophotometer. 4,630,923, Cl. 356-301.000.

Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, to Oki Electric Industry Co., Ltd. Method of leading a moving body driven by a direct current brushless motor to a starting position. 4,631,457, Cl. 318-254.000.

Tarbox, Bruce H.: *See—*
Rathbun, Donald J.; Tarbox, Bruce H.; and Su, Taian, 4,631,723, Cl. 371-10.000.

Tardif, Arthur J., to Raytheon Company. Digital sound synthesizer. 4,631,747, Cl. 381-51.000.

Taube, John; O'Dell, Lawrence W.; and O'Dell, Michael D. Video-stereoscopic-image-producing system. 4,631,580, Cl. 358-88.000.

Tawada, Yoshihisa; and Tsuge, Kazunori, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Integrated solar cell. 4,631,351, Cl. 136-244.000.

Tayco Developments, Inc.: *See—*
Taylor, Paul H., 4,630,805, Cl. 267-64.130.

Taylor, Frank; and Burton, Trevor, to Standard Telephones and Cables Public Limited Company. Method of making an electrostatic transducer of the moving coil type. 4,630,358, Cl. 29-594.000.

Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., to United States of America, Navy. Optical waveguide apparatus and method for manufacturing. 4,630,883, Cl. 350-96.150.

Taylor, John E., to BICC Public Limited Company. Optical fibre ribbon structure. 4,630,887, Cl. 350-96.230.

Taylor, Paul H., to Tayco Developments, Inc. Tension-compression liquid spring unit. 4,630,805, Cl. 267-64.130.

Taylor, Robert W. A. Bale handler. 4,630,986, Cl. 414-24.600.

Taylor, William. Pool entry and exit device. 4,630,709, Cl. 182-48.000.

TDK Corporation: *See—*
Hashizume, Kenji; Shiba, Haruo; and Okamura, Masatoshi, 4,631,619, Cl. 360-132.000.

te Beest, Hans: *See—*
Hellerhoff, Josef; Bunse, Peter; and te Beest, Hans, 4,630,349, Cl. 29-434.000.

Teichmann, Gunther: *See—*
Rademachers, Jakob; Naumann, Rolf; and Teichmann, Gunther, 4,631,089, Cl. 106-304.000.

Teijin Limited: *See—*
Minemura, Norihiro; Takabayashi, Fumiki; and Yamada, Setsuo, 4,631,066, Cl. 8-115.560.
Yoshimoto, Masato; and Ohwaki, Shinji, 4,631,162, Cl. 264-167.000.

Tektronix, Inc.: *See—*
Caspell, George J., 4,631,518, Cl. 340-347.0DA.

Teleco Oilfield Services Inc.: *See—*
Duckworth, Allen, 4,630,809, Cl. 267-141.100.

Telefonaktiebolaget LM Ericsson: *See—*
Hammarberg, Lars E., 4,631,475, Cl. 324-102.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,359, Cl. 379-324.000.
Johansson, Jan H.; and Sundvall, Nils J., 4,631,360, Cl. 379-324.000.

Teng, Chuan C.: *See—*
Beasley, Thomas R.; and Teng, Chuan C., 4,630,690, Cl. 175-57.000.

Tenmyo, Ichiro: *See—*
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.

Teramachi, Hiroshi. Linear slide bearing. 4,630,872, Cl. 384-45.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet printing apparatus with suction recovery unit. 4,631,554, Cl. 346-140.00R.

Terashima, Seiichiroo: *See—*
Tanaka, Katsuyuki; Terashima, Seiichiroo; Takeuchi, Yoshinori; Odaka, Toshiko; and Saito, Yokuo, 4,630,926, Cl. 356-357.000.

Terra Tek, Inc.: *See—*
Jones, Arfon H.; and Green, Sidney J., 4,630,868, Cl. 299-4.000.

Tersteegen, Johannes, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Electrohydraulic regulating drive. 4,630,523, Cl. 91-1.000.

Terumo Corporation: *See—*
Watanabe, Masaharu, 4,631,130, Cl. 210-651.000.

Teshima, Tohru; Naete, Hidehiko; and Robert, Pierre H., to Regie Nationale des Usines Renault; and Stanley Electric Co., Ltd. Display unit of speedometer for automobile. 4,631,513, Cl. 340-52.00R.

Testa, Anthony M.: *See—*
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.

Tetra Pak Developpement SA: *See—*
Cheever, Richard N., 4,631,444, Cl. 313-420.000.

Texaco Inc.: *See—*
Burton, James R.; and Kushner, David J., 4,631,139, Cl. 252-49.300.
Sung, Rodney L., 4,631,069, Cl. 44-56.000.

Texas Instruments: *See—*
Inoue, Shinji; and Akundi, Rama S., 4,631,421, Cl. 307-297.000.

Texas Instruments Incorporated: *See—*
Breedlove, Paul S.; Moore, James H.; Brantingham, George L.; and Wiggins, Richard H., Jr., 4,631,748, Cl. 381-51.000.
Hayn, John, II; and Schabowski, John, 4,631,659, Cl. 364-200.000.
Larrabee, Graydon B., 4,631,234, Cl. 428-428.000.

Thaler, Michael R., to Image Communications, Inc. Linear motor facsimile machine. 4,631,432, Cl. 310-14.000.

Theofanous, Theos E. Valve seat resurfacing apparatus. 4,630,977, Cl. 408-83.500.

Thermo Electron-Web Systems, Inc.: *See—*
Croteau, Donald W., 4,630,328, Cl. 15-257.00R.

Thermo-Serv, Inc.: *See—*
Trombly, Edgar F., 4,630,744, Cl. 220-1.00R.

Thermocell, Ltd.: *See—*
Colson, Wendell B., 4,631,108, Cl. 156-461.000.

Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping machine. 4,630,541, Cl. 104-7.200.

Thioux, Alain: *See—*
Carre, Jean-Jacques; Thioux, Alain; and Mery, Jean-Claude, 4,630,713, Cl. 188-73.440.

Thoma, Klemens: *See—*
Volker, Wolfgang; and Thoma, Klemens, 4,630,873, Cl. 312-209.000.

Thomann, Roland; Witschi, Heinz; Brink, Heinz-Deiter; and Amann, Markus. Drainage channel with locking grate. 4,630,962, Cl. 404-2.000.

Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; Hayashi, Steven R.; and Yerazunis, William S., to General Electric Company. Acoustic detection of contact between cutting tool and workpiece. 4,631,683, Cl. 364-474.000.

Thomas, Johnny M., II: *See—*
Mommer, Richard P.; and Thomas, Johnny M., II, 4,631,192, Cl. 426-69.000.

Thomas, Richard D.: *See—*
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., 4,630,472, Cl. 73-161.000.

Thompson, David A.: *See—*
Chainer, Timothy J.; Scranton, Robert A.; and Thompson, David A., 4,630,941, Cl. 384-1.000.

Thompson, George J. Semi-adjustable service platform apparatus for gantry crane. 4,630,708, Cl. 182-12.000.

Thompson, Warren L.: *See—*
Burk, Ronnie F.; Delfs, Larry M.; Gilmore, Michael R.; and Thompson, Warren L., 4,630,526, Cl. 91-452.000.
Thomson CSF: *See—*
Biraud, Lucien, 4,631,639, Cl. 361-417.000.
Magarshack, John; and Pavlidis, Dimitri, 4,631,492, Cl. 330-277.000.
Romeas, Rene ; Bricot, Claude; and Gerard, Jean-Louis, 4,631,713, Cl. 369-54.000.
Thomson, David G., to Waltec Inc. Pipe repair clamp. 4,630,647, Cl. 138-99.000.
Thomson, Loronzo H., to Little Rapids Corp. Container with pouring spout and removable cover. 4,630,761, Cl. 222-551.000.
Thormer, Joachim; Leibbrandt, Friedrich; Szentivanyi, Zsolt; and Buding, Hartmuth, to Bayer Aktiengesellschaft. Shaped articles for use in the exploration for and/or production of petroleum and natural gas. 4,631,309, Cl. 524-426.000.
Thormer, Joachim: *See—*
Buding, Hartmuth; Fiedler, Paul; Konigshofen, Heinrich; and Thormer, Joachim, 4,631,315, Cl. 525-338.000.
THORN EMI Domestic Appliances Limited: *See—*
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., 4,631,390, Cl. 219-449.000.
Thorn, Lawrence B.; and Betts, Robert E., to United States of America, Army. Device for flash suppression of a rocket motor. 4,630,539, Cl. 102-202.000.
TI Domestic Appliances Limited: *See—*
Manning, Howard J., 4,631,388, Cl. 219-326.000.
Tichy, Thomas H., to Motorola, Inc. Method of mounting a piezoelectric helmholtz transducer on a printed circuit board. 4,630,342, Cl. 29-25.350.
Tideland Signal Corporation: *See—*
Ploussios, George, 4,631,544, Cl. 343-771.000.
Tiepke, Gunter, to Stettner & Co. Electrical heating device, especially for mirrors. 4,631,391, Cl. 219-541.000.
Tihanyi, Jeno , to Siemens Aktiengesellschaft. MISFET with input amplifier. 4,631,565, Cl. 357-23.400.
Tijs, Hendricus C. P., to Weld-Equip b.v. Pneumatically operating device comprising means for limiting the displacement of a piston. 4,630,529, Cl. 92-13.000.
Ting, Raymond M. L. Cellular steel decking. 4,630,414, Cl. 52-220.000.
Tippins, George W.: *See—*
Ginzburg, Vladimir B.; and Tippins, George W., 4,630,352, Cl. 29-527.700.
Tippins Machinery Company, Inc.: *See—*
Ginzburg, Vladimir B.; and Tippins, George W., 4,630,352, Cl. 29-527.700.
Tise, Frank P., to Hercules Incorporated. Acetylene compounds as shelf life improvers for photoresist compositions containing organic iodides. 4,631,247, Cl. 430-281.000.
Tissot, Raymond: *See—*
Hofer, Gerald; Hofmann, Eberhard; Laufer, Helmut; Rossignol, Francois; Schwartz, Reinhard; Straubel, Max; and Tissot, Raymond, 4,630,587, Cl. 123-502.000.
Titus, Hans-Joachim, to Krauss-Maffei Aktiengesellschaft. Method and apparatus for pneumatically evacuating centrifuges. 4,631,048, Cl. 494-13.000.
Tobia, Alfonso J.: *See—*
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,631,283, Cl. 514-259.000.
Toei Denki Kabushiki Kaisha: *See—*
Ono, Tadahiro; and Igarashi, Shigenori, 4,631,523, Cl. 340-347.0SY.
Toida, Shouji: *See—*
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.
Tokico Ltd.: *See—*
Komukai, Shigemi, 4,630,754, Cl. 222-28.000.
Takayama, Toshio; and Haraikawa, Tetsuo, 4,630,706, Cl. 180-273.000.
Tokisue, Hiromitsu: *See—*
Tsumaki, Nobuo; Tokisue, Hiromitsu; and Inoue, Hiroshi, 4,630,942, Cl. 384-8.000.
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control apparatus for a continuously variable transmission. 4,631,043, Cl. 474-18.000.
Tokuhara, Masaharu: *See—*
Hongu, Masayuki; Tamura, Takahiko; and Tokuhara, Masaharu, 4,631,589, Cl. 358-171.000.
Tokuyama, Keiichi: *See—*
Masuda, Mitsuhiro; Igarashi, Osamu; and Tokuyama, Keiichi, 4,630,840, Cl. 280-707.000.
Tokuyama Sekisui Industry Corporation, Limited: *See—*
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.
Tokyo Electric Co., Ltd.: *See—*
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.
Tokyo Juki Industrial Co., Ltd.: *See—*
Kinoshita, Tomoaki, 4,630,559, Cl. 112-291.000.
Nii, Tomio, 4,630,951, Cl. 400-697.100.
Tokyo Keiki Co., Ltd.: *See—*
Akita, Yoshisuke; Tenmyo, Ichiro; Hayashi, Kiyoshi; Kihara, Kazuyuki; and Mito, Akio, 4,630,639, Cl. 137-486.000.
Tokyo Roki Co., Ltd.: *See—*
Kurihara, Mitsuo; Sato, Fumio; Iwasawa, Yoshiyuki; Koibuchi, Nobutaka; and Harada, Hiroshi, 4,631,076, Cl. 55-283.000.
Tokyo Sanyo Electric Co., Ltd: *See—*
Kishimoto, Daisaburo, 4,630,451, Cl. 62-247.000.
Tokyo Shibaura Denki Kabushiki Denki: *See—*
Ando, Hideo, 4,631,395, Cl. 250-201.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Arimura, Yoshiaki; Obama, Masao; and Hitomi, Yutaka, 4,631,689, Cl. 364-513.000.
Iizuka, Tetsuya, 4,631,563, Cl. 357-23.100.
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, 4,631,419, Cl. 307-255.000.
Sakamoto, Tsutomu, 4,631,672, Cl. 364-200.000.
Sakamoto, Tsutomu, 4,631,696, Cl. 364-748.000.
Sakamoto, Tsutomu, 4,631,703, Cl. 364-900.000.
Sugaya, Toshihiro, 4,631,606, Cl. 360-78.000.
Toll, Ian C., to Futaire Limited. Aircraft seats. 4,630,864, Cl. 297-232.000.
Tom McGuane Industries, Inc.: *See—*
Detweiler, Charles A., 4,630,642, Cl. 137-506.000.
Tomalia, Donald A.; and Dewald, James R., to Dow Chemical Company, The. Hydrolytically-stable dense star polyamine. 4,631,337, Cl. 528-391.000.
Tomashek, James R.: *See—*
Ward, Donald H.; and Tomashek, James R., 4,631,536, Cl. 340-857.000.
Tomimasu, Takio; Noguchi, Tsutomu; Tanino, Hiroshi; and Sugiyama, Suguru, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. X-ray generating apparatus. 4,631,743, Cl. 378-138.000.
Tomioka, Tadao: *See—*
Matsumoto, Mitsuaki; Furuyama, Masatosi; Tomioka, Tadao; Sunago, Hirofumi; and Higuchi, Masakazu, 4,631,181, Cl. 423-449.000.
Tomiyama, Akira: *See—*
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,631,292, Cl. 514-452.000.
Tomiyama, Tsuyoshi; and Tomiyama, Akira, to Kotobuki Seiyaku Co., Ltd. 1,3-dioxane derivatives, method of their synthesis and anti-peptic ulcer agent. 4,631,292, Cl. 514-452.000.
Tomlinson, Paul G.; and Newbould, Richard T., to STC plc. Coating optical fibres. 4,631,078, Cl. 65-3.110.
Tomy Kogyo Co., Inc.: *See—*
Shiraishi, Masami, 4,631,040, Cl. 446-95.000.
Tong, Kun-Yuan. Expandable carrying case. 4,630,717, Cl. 190-104.000.
Toray Silicone Co., Ltd.: *See—*
Suzuki, Toshio, 4,631,321, Cl. 525-478.000.
Torelli, Guido; and Daniele, Vincenzo, to SGS-ATES Componenti Elettronici S.p.A. Synchronous demodulator for amplitude modulated signals. 4,631,485, Cl. 329-50.000.
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., to General Electric Company. Unique epoxy resin compositions and composite molded bodies filled therewith. 4,631,230, Cl. 428-412.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ono, Tadahiro; and Igarashi, Shigenori, 4,631,523, Cl. 340-347.0SY.
Tottrup, Peter B.; and Rostrup-Nielsen, Jens R., to Haldor Topsoe A/S. Process for preparation of a reducing gas. 4,631,182, Cl. 423-652.000.
Toumani, Rouben: *See—*
Arntsen, Tom D.; Embree, Milton L.; Havens, Joseph H.; and Toumani, Rouben, 4,631,362, Cl. 379-384.000.
Town, Michael-Harold: *See—*
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,631,276, Cl. 514-211.000.
Towns, Edward J.: *See—*
Chamberlin, Edward B.; Brown, Edward M.; and Towns, Edward J., 4,631,003, Cl. 417-151.000.
Toyoda Gosei Co., Ltd.: *See—*
Mabuchi, Akira; Yano, Kenji; and Mizuno, Hisashi, 4,631,206, Cl. 427-340.000.
Toyomura, Shigeru, to Canon Kabushiki Kaisha. Power supply control device. 4,631,418, Cl. 307-200.00A.
Toyonaga, Yoshikazu: *See—*
Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, 4,631,180, Cl. 423-450.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Shibata, Norio, 4,630,581, Cl. 123-325.000.
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.
Tracer Technologies, Inc.: *See—*
Walsh, Fraser M., 4,631,240, Cl. 429-105.000.
Traina, John. Method and apparatus for ultrasonic measurements of a medium. 4,630,482, Cl. 73-597.000.
Tran Kiem, Nguyen, to U.S. Philips Corporation. Transistor modulator for converting video game signals into antenna input signals for a television receiver. 4,631,502, Cl. 332-16.00T.
Tran, Van N., to Durac Limited. System for the microwave treatment of materials. 4,631,380, Cl. 219-10.55A.
Trans-Dyne, Incorporated: *See—*
Adler, Frank P., 4,630,715, Cl. 188-210.000.
Trautz & Co. Inh. Hans Spindler: *See—*
Spindler, Hans, 4,631,646, Cl. 362-118.000.
Travel-Aire, Inc.: *See—*
Eckstrom, William R.; and Conrad, John R., 4,630,530, Cl. 98-2.110.

TRE Corporation: *See—*
Etemovich, Alex, 4,631,093, Cl. 148-6.100.
Tremblay, Daniel. Audio-visual tunnel with endless conveyor. 4,630,908, Cl. 353-94.000.
Tretinyak, Carl W., to Berkley and Company, Inc. Bone marrow needle. 4,630,616, Cl. 128-753.000.
Trevino, Jose L.; and van Rooden, Bernardus J., to Dow Chemical Company, The. Polymeric compositions useful as binders in coating colors and coating colors prepared therefrom. 4,631,312, Cl. 525-221.000.
Triangle Package Machinery Co.: *See—*
Connors, Robert H.; and Williams, James T., 4,630,695, Cl. 177-1.000.
Trion Corporation: *See—*
Aoki, Akio, 4,630,318, Cl. 2-19.000.
Triplett, James T.: *See—*
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,631,098, Cl. 156-86.000.
Trocino, Joseph L. Detonator apparatus for liquid explosive compositions. 4,630,540, Cl. 102-307.000.
Trol-Mation, Inc.: *See—*
Massaro, Peter C.; and Legawiec, Ronald F., 4,630,442, Cl. 60-415.000.
Trombly, Edgar F., to Thermo-Serv, Inc. Container with registration rib. 4,630,744, Cl. 220-1.00R.
Troy, Seymour L.; and Mullenix, Kenneth E. Two-step bank draft. 4,630,844, Cl. 283-67.000.
Trube, Hans: *See—*
Schmidt, Manfred; Trube, Hans; and Grimm, Hermann, 4,630,327, Cl. 15-250.210.
True, Martin E.; and Sullivan, Clarence W., to Weatherford/Lamb, Inc. Power spinner for rotating a kelly joint. 4,630,688, Cl. 173-163.000.
Trutna, William R., Jr., to Hewlett-Packard Company. Wafer/mask alignment system using diffraction gratings. 4,631,416, Cl. 250-548.000.
Trutzschler GmbH & Co. KG: *See—*
Schopwinkel, Theo; and Weber, Wilfried, 4,630,336, Cl. 19-288.000.
TRW Inc.: *See—*
Gardner, Neal F., 4,631,568, Cl. 357-49.000.
Goodwin, Frank E.; Law, Hsiang-Yi D.; Morrison, Charles B.; and Figueroa, Luis, 4,631,729, Cl. 372-44.000.
Zimmerman, Thomas A., 4,631,572, Cl. 357-74.000.
Tsau, Josef H.: *See—*
Colliopoulos, John A.; Young, James G.; and Tsau, Josef H., 4,631,195, Cl. 426-548.000.
Tsuboi, Masaharu; and Watanabe, Kuniaki, to Honda Giken Kogyo Kabushiki Kaisha. Device for driving electrical current generator for use in motorcycle. 4,631,469, Cl. 322-42.000.
Tsubokura, Fusao, to NEC Corporation. Semiconductor device for use in a large scale integration circuit. 4,631,571, Cl. 357-68.000.
Tsuchida, Nobuo: *See—*
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Tsuchiya, Haruhiko: *See—*
Ono, Tatsuhiro; Koike, Shin'ichi; Tsuchiya, Haruhiko; and Inoue, Yuji, 4,631,721, Cl. 370-85.000.
Tsuchiya, Kanji; and Ono, Shizumi, to Seikensha Co., Ltd. Apparatus for inactivation of enzymes in oil seeds. 4,630,534, Cl. 99-483.000.
Tsuge, Kazunori: *See—*
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,631,351, Cl. 136-244.000.
Tsumaki, Nobuo; Tokisue, Hiromitsu; and Inoue, Hiroshi, to Hitachi, Ltd. Guiding apparatus. 4,630,942, Cl. 384-8.000.
Tsumura, Akio; Hayashi, Shun-ichi; Miyaake, Chiharu; Oouchi, Kazuo; and Yamamura, Yutaka, to Nitto Electric Industrial Co., Ltd. Peeling type developing apparatus. 4,631,110, Cl. 156-584.000.
Tsunoda, Eiichi: *See—*
Sakata, Hideo; and Tsunoda, Eiichi, 4,630,381, Cl. 33-503.000.
Tsunoda, Nagatoshi: *See—*
Hirano, Mutsuo; and Tsunoda, Nagatoshi, 4,630,519, Cl. 84-1.030.
Tucker, Peter G.: *See—*
Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., 4,631,081, Cl. 71-94.000.
Tung, Lu H.; and Griggs, Jerald A., to Dow Chemical Company, The. Process for the polymerization of mixtures of cis and trans-isomers of 1,3-pentadiene in the production of block copolymers. 4,631,313, Cl. 525-250.000.
Tung, Lu H.; and Griggs, Jerald A., to Dow Chemical Company, The. Block copolymers utilizing a mixture of cis and trans-isomers of 1,3-pentadiene. 4,631,314, Cl. 525-314.000.
Tunturipyora Oy: *See—*
Saarinen, Sulevi, 4,630,818, Cl. 272-73.000.
Turczanski, Henryk: *See—*
Hill, John; Turczanski, Henryk; and Coote, Cyril E., 4,630,359, Cl. 29-602.00R.
Turlej, Zbigniew. Ionization smoke detector. 4,631,412, Cl. 250-381.000.
Turner, James J.: *See—*
Hollstein, Thomas E.; Turner, James J.; Mulder, Douglas C.; and O'Ryan, David E., 4,630,777, Cl. 239-707.000.
Turner, James R. Coin escrow apparatus for coin operated equipment. 4,630,624, Cl. 133-4.00A.
Turner, John H. W., to Alcan International Limited. Surface coating compositions. 4,631,087, Cl. 106-252.000.
Turner, Rudolf, to Zenith Electronics Corporation. Field responsive vertical pulse generator. 4,631,587, Cl. 358-148.000.
Twist, Michael; and Mundy, Paul, to Hawke Cable Glands Limited. Releasable coupling for tubes or pipes. 4,630,848, Cl. 285-308.000.
Uchida Manufacturing Co.: *See—*
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Uchida, Rokuroh; Nagasaki, Katsuhiko; Miyake, Yasunori; Ohno, Michio; Takeichi, Hitoshi; and Matsumoto, Hiroji, to Aloka Co., Ltd.; and Hayashi Electric Co., Ltd. Ultrasonic diagnostic apparatus. 4,630,612, Cl. 128-660.000.
Uchida, Takao: *See—*
Tanuma, Jiro; Uchida, Takao; and Hayashi, Kunihal, 4,631,457, Cl. 318-254.000.
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, to Uchida Manufacturing Co. Humidifier. 4,631,152, Cl. 261-4.000.
Uchida, Tsutomu: *See—*
Uchida, Tetsuei; Uchida, Tsutomu; Tsuchida, Nobuo; and Kazama, Susumu, 4,631,152, Cl. 261-4.000.
Uda, Tadayoshi: *See—*
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; and Kanazawa, Tomoyoshi, 4,630,846, Cl. 285-21.000.
Ueda, Hironobu: *See—*
Nakazato, Norio; Kakehi, Yutaka; Harada, Takeshi; Fukuyama, Ryoji; Nawata, Makoto; Ueda, Hironobu; Omoto, Yutaka; Nagatomo, Katsuaki; and Shibata, Fumio, 4,631,106, Cl. 156-345.000.
Uemura, Hiroyuki: *See—*
Kawanishi, Toshiyuki; Shimada, Masaru; Murakami, Kakuji; Aruga, Tamotsu; and Uemura, Hiroyuki, 4,631,085, Cl. 106-22.000.
Uesaka, Yasutaro: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Yuito, Isamu; Shinagawa, Kiminari; Uesaka, Yasutaro; Fujiwara, Hideo; and Nakamura, Hitoshi, 4,631,612, Cl. 360-125.000.
UF Genetics, Inc.: *See—*
Bonucci, Peter A., 4,630,393, Cl. 47-58.000.
Uick, Heidi J.: *See—*
Padden, Timothy J.; and Uick, Heidi J., 4,631,187, Cl. 424-70.000.
Umemoto, Teruo; and Ogura, Eiji, to Onoda Cement Company, Ltd.; and Sagami Chemical Research Center. Process for producing 5-fluorouracil. 4,631,342, Cl. 544-313.000.
Umemura, Kaoru: *See—*
Tamura, Hifumi; Shepherd, Clay; Ishitani, Toru; and Umemura, Kaoru, 4,631,448, Cl. 315-111.810.
Umetsu, Shinjiro; and Oyamada, Takashi, to Nippon Electric Co. Ltd. Portable radio device for protecting a radio circuit from static electricity. 4,631,640, Cl. 361-422.000.
Umezawa, Mitsuo: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,630,704, Cl. 180-247.000.
Umino, Takehito: *See—*
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, 4,631,172, Cl. 420-541.000.
Undin, Hans: *See—*
Wiener, Hans; and Undin, Hans, 4,630,462, Cl. 72-410.000.
Uni-Cardan Aktiengesellschaft: *See—*
Muller, Karl-Heinz; and Jordan, Alfons, 4,630,834, Cl. 277-212.0FB.
Unidyne, Inc.: *See—*
Perovick, Matthew J.; and Lang, James W., 4,630,599, Cl. 128-66.000.
Union Oil Company of California: *See—*
Biale, John, 4,631,235, Cl. 428-518.000.
UNIPHASE Corporation: *See—*
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.
Uniroyal Chemical Company, Inc.: *See—*
Stieber, Joseph F., 4,631,316, Cl. 525-352.000.
Uniscope, Inc.: *See—*
Mommer, Richard P.; and Thomas, Johnny M., II, 4,631,192, Cl. 426-69.000.
United Kingdom Atomic Energy Authority: *See—*
Duddridge, John E.; and Kent, Christopher A., 4,631,135, Cl. 210-764.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Andrews, Beatrice M.; Carr, Neil; Gray, George W.; and Hogg, Christine, 4,630,897, Cl. 350-350.00R.
Rix, Clifford, 4,631,101, Cl. 156-175.000.
United States Elevator Corporation: *See—*
Lind, Larry W., 4,630,423, Cl. 52-484.000.
United States of America
Agriculture: *See—*
Arola, Rodger A.; and Sall, Hans-Olof, 4,630,658, Cl. 144-176.000.
Bergstrom, Gary C.; and Lambert, Michael B., 4,630,481, Cl. 73-437.000.
Han, Youn W., 4,631,258, Cl. 435-99.000.
Air Force: *See—*
Dolbeare, Richard T., 4,631,635, Cl. 361-383.000.
Dolland, Carlisle R., 4,631,474, Cl. 324-73.00R.

Jacavanco, Daniel, 4,631,547, Cl. 343-840.000.
O'Driscoll, Peter F., 4,631,154, Cl. 264-3.100.
Winch, Peter C.; and Blackledge, Mick, 4,630,437, Cl. 60-204.000.

Army: *See—*
Allan, Barry D., 4,630,683, Cl. 169-45.000.
Ballato, Arthur, 4,631,437, Cl. 310-369.000.
Brooke, Robert L.; McConnell, Peter J.; Testa, Anthony M.; and Maksymonko, George B., 4,630,470, Cl. 73-146.200.
Kronenberg, Stanley; McLaughlin, William L.; and Seibentritt, Carl R., Jr., 4,631,414, Cl. 250-474.100.
Supcoe, Robert F.; and Radakovich, Thomas, 4,631,302, Cl. 523-122.000.
Thorn, Lawrence B.; and Betts, Robert E., 4,630,539, Cl. 102-202.000.

Energy: *See—*
Tans, Petrus P.; and Lashof, Daniel A., 4,630,923, Cl. 356-301.000.

National Aeronautics and Space Administration: *See—*
Carreno, Victor A., 4,631,538, Cl. 340-870.180.
Daud, Taher; and Kachare, Akaram H., 4,631,352, Cl. 136-249.000.

Navy: *See—*
Friedman, Moshe; and Serlin, Victor, 4,631,447, Cl. 315-5.000.
Gennetten, Edward W.; and Gomez, Duane A., 4,631,586, Cl. 358-148.000.
Prickett, Michael J.; Mott, Murray H.; and Panos, Nicholas, 4,631,541, Cl. 343-5.0DP.
Rauscher, Christen, 4,631,500, Cl. 331-51.000.
Schiavone, Frank J., 4,631,505, Cl. 333-33.000.
Simons, Brent S., 4,631,728, Cl. 372-38.000.
Stutler, Richard A.; and Harris, Jeffrey T., 4,631,662, Cl. 364-200.000.
Supcoe, Robert F.; Singerman, Harold H.; and Whitacre, Jack E., 4,631,303, Cl. 523-177.000.
Taylor, Henry F.; Sigel, George H.; and Gingerich, Michael E., 4,630,883, Cl. 350-96.150.

U.S. Philips Corporation: *See—*
Corthout, Marc E. A.; and Mielekamp, Pieter M., 4,631,690, Cl. 364-518.000.
Easthill, Stephen P., 4,631,658, Cl. 364-184.000.
Felsner, Fritz; and Geier, Erich, 4,631,638, Cl. 361-415.000.
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Houee, Yves L. P.; and Vacher, Pierre, 4,631,654, Cl. 363-21.000.
Kahlman, Josephus A. H. M.; and Baggen, Constant P. M. J., 4,631,714, Cl. 369-59.000.
Kasperkovitz, Wolfdietrich G., 4,631,499, Cl. 331-11.000.
Kayser, Harald; and Schmedemann, Walter, 4,630,796, Cl. 248-648.000.
Smithers, Colin R., 4,631,491, Cl. 330-149.000.
Tran Kiem, Nguyen, 4,631,502, Cl. 332-16.00T.
Wolter, Joachim H.; and Horstman, Robert E., 4,631,731, Cl. 372-74.000.

United States Postal Service: *See—*
Hoseley, Rex A., 4,630,712, Cl. 184-15.300.

United Technologies Corporation: *See—*
Scola, Daniel A.; and Pater, Ruth H., 4,631,335, Cl. 528-353.000.

Universal Security Instruments, Inc.: *See—*
De Witt, Kenneth I.; and Kovens, Michael L., 4,631,527, Cl. 340-539.000.

University E.M., Inc.: *See—*
Barsan, William G., 4,631,294, Cl. 514-557.000.

University of Houston, The: *See—*
Lucas, Ronald J.; Berry, Ivan L.; and Wolfe, John C., 4,631,704, Cl. 365-126.000.

University of Illinois: *See—*
Rinehart, Kenneth L., Jr.; Harbour, Gary C.; and Kobayashi, Jun'ichi, 4,631,149, Cl. 540-546.000.

University of Michigan, Board of Regents of The: *See—*
Clewell, Don B.; and Gawron-Burke, Mary C., 4,631,259, Cl. 435-172.300.

University of Minnesota, Regents of the: *See—*
Haygreen, John G., 4,630,535, Cl. 100-127.000.

Upjohn Company, The: *See—*
Guyer, Thomas L.; and Franz, Robert M., 4,631,305, Cl. 523-400.000.

Urban, Ted. F., to Lamico, Inc. Crutch tip construction. 4,630,626, Cl. 135-84.000.

Urui, Kiyoshi: *See—*
Ikawa, Yasuo; Shibata, Tadashi; Urui, Kiyoshi; Miyata, Misao; Kawamura, Masahiko; and Amano, Noboru, 4,631,686, Cl. 364-490.000.

Usami, Ryuuzi, to Casio Computer Co., Ltd. Electronic musical instrument. 4,630,518, Cl. 84-1.030.

Ushida, Minoru: *See—*
Fukunaga, Tokio; Magara, Takuji; Sakabe, Shigekazu; Aramaki, Jun; Karashima, Toshiharu; and Ushida, Minoru, 4,631,382, Cl. 219-69.00R.

Ushijima, Takao; and Yamazaki, Harumichi, to Bridgestone Corporation. Vibration isolating devices. 4,630,808, Cl. 267-140.100.

Ushijima, Yasuhiro: *See—*
Kitagawa, Tohru; Sakamoto, Koichiro; and Ushijima, Yasuhiro, 4,630,491, Cl. 73-862.670.

USM Corporation: *See—*
Bender, Rudolf; Dietrich, Hans-Gerd; and Giebel, Gerhard, 4,630,325, Cl. 12-8.100.
Mauer, Dieter, 4,630,460, Cl. 72-391.000.
Osterland, Robert W.; and Benedetti, Nicholas M., 4,630,338, Cl. 24-293.000.

Usui, Eiki; and Kawaguchi, Masahiro, to Kabushiki Kaisha Kobe Seiko Sho. Surface-treated aluminum alloy substrates for magnetic disks. 4,631,112, Cl. 156-644.000.

USV Pharmaceutical Corp.: *See—*
Chakraborty, Utpal R.; and Youssefyeh, Raymond D., 4,631,287, Cl. 514-307.000.

Utilitech, Incorporated: *See—*
Kinnan, Frank R., 4,630,972, Cl. 405-269.000.

Utsumi, Yoshihiro, to Pioneer Electronic Corporation. Focus error detection device. 4,631,396, Cl. 250-201.000.

Uytterhoeven, Herman: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Uytterhoeven, Herman; de Winter, Walter; Hoffarth, Gunther; and Richter, Wolfgang, 4,631,243, Cl. 430-114.000.

Vacco Industries: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Vacher, Pierre: *See—*
Houee, Yves L. P.; and Vacher, Pierre, 4,631,654, Cl. 363-21.000.

Vallery, Stafford J., to Armstrong International, Inc. Steam trap checker. 4,630,633, Cl. 137-185.000.

Valteris, Ramunas L.; and Caldwell, Gary L., to Du Pont de Nemours, E. I., and Company. Plate, foam and screen filament quenching apparatus. 4,631,018, Cl. 425-445.000.

van Alst, Wilhelmus B. T., to Du Pont de Nemours, E. I., and Company. IDC latching terminal. 4,630,879, Cl. 339-99.00R.

VandenBerg, Teunis: *See—*
Keith, Robert C.; VandenBerg, Teunis; Randolph, Marshall C.; Lewis, Thomas B.; and Gillis, Patrick J., Jr., 4,631,126, Cl. 210-108.000.

Van Gompel, Paul T., to Kimberly-Clark Corporation. Garment with one or more gusseted adjustable openings and method of making the same. 4,630,320, Cl. 2-406.000.

Van Heek, Karl H.: *See—*
Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, 4,630,479, Cl. 73-863.830.

van Husen, Hendrik, to GTE Communication Systems Corp. Power distribution system. 4,631,655, Cl. 363-50.000.

van Rooden, Bernardus J.: *See—*
Trevino, Jose L.; and van Rooden, Bernardus J., 4,631,312, Cl. 525-221.000.

Varian S.p.A.: *See—*
Pierini, Marco, 4,631,002, Cl. 417-49.000.

Varnelis, Edmund K.: *See—*
Siewert, Robert L.; and Varnelis, Edmund K., 4,630,698, Cl. 180-69.240.

VDO Adolf Schindling AG: *See—*
Angermuller, Helmut; and Hahlganss, Gunther, 4,631,678, Cl. 364-424.000.

Veaux, Jacques; and Derrien, Michel, to Messier-Hispano-Bugatti (S.A.). Aircraft landing gear, in particular for helicopters. 4,630,788, Cl. 244-104.0FP.

Veeder Industries, Inc.: *See—*
Fleischer, Donald W.; and Smilgys, Bruno S., 4,630,655, Cl. 141-198.000.

Vendelin, George D.; and Rezvani, Behruz, to Eaton Corporation. Circuit for DC biasing. 4,631,493, Cl. 330-277.000.

Venetjoki, Juhani T., to Lokari-Tuote Oy; and Auto Lokari Oy. Vehicle steering mechanism. 4,630,701, Cl. 180-209.000.

Verespej, Michael A.: *See—*
Bauer, Alajos Z.; and Verespej, Michael A., 4,630,362, Cl. 29-751.000.

Vergona, Albert B., to Eastman Kodak Company. Color imaging apparatus using electro-optic modulators. 4,631,551, Cl. 346-108.000.

Verzilli, Giuseppe; and Schmid, Rene, to Rieter Machine Works Limited. Apparatus for doubling a fiber web. 4,630,337, Cl. 19-296.000.

Vickers, James H., to Southco, Inc. Adjustable friction hinge. 4,630,333, Cl. 16-338.000.

Victor Company of Japan, Ltd.: *See—*
Hishiki, Hideo; and Kamiyama, Yukio, 4,631,512, Cl. 338-48.000.
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; Kuroda, Akio; Hata, Akio; and Fujii, Noriki, 4,631,717, Cl. 369-276.000.

Video Dynamics, Inc.: *See—*
Grossman, Craig B.; Schwartz, Mark A.; and Hammer, Stanley S., 4,631,615, Cl. 360-128.000.

Video-7 Incorporated: *See—*
Broedner, Walter F., 4,631,692, Cl. 364-518.000.

Villanyi, Sigmund T., to RCA Corporation. Multibeam electron gun having a formed transition member. 4,631,443, Cl. 313-417.000.

Villiger, Alois: *See—*
Petrzilka, Martin; and Villiger, Alois, 4,630,896, Cl. 350-350.00R.

Viskochil, Stephen R., to Priam Corporation. Linear motor having improved magnetic characteristics. 4,631,431, Cl. 310-13.000.

Vock, Manfred H.: *See—*
Courtney, Thomas F., Jr.; Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; and Wiener, Charles, 4,631,194, Cl. 426-535.000.

Voege, Herbert: *See—*
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Voest-Alpine Aktiengesellschaft: *See—*
Buchegger, Rudolf; and Langeder, Rudolf, 4,630,785, Cl. 242-72.100.

Vogg, Hubert: *See—*
Maul, Sonja; Buttner, Erwin; Meichelbock, Heiner; Merz, Albert; and Vogg, Hubert, 4,630,464, Cl. 73-28.000.

Volker, Wolfgang; and Thoma, Klemens, to Messer Griesheim GmbH. Apparatus for low temperature storage of biological or pharmaceutical samples. 4,630,873, Cl. 312-209.000.

Volkmann, Robert A., to Pfizer Inc. Thiazole precursors for the preparation of biotin. 4,631,345, Cl. 548-147.000.

Von Arx AG: *See—*
Dummermuth, Paul, 4,630,687, Cl. 173-131.000.

von Hagen, Ingo; Hillenbrand, Hans-Georg; and Popperling, Rolf K., to Mannesmann AG. Steel that is exposed to hydrogen sulfide. 4,631,095, Cl. 148-12.00F.

von Ronai-Horvath, Michael: *See—*
Hartmannsgruber, Max; von Ronai-Horvath, Michael; Seebo, Kurt; and Schoenung, Bernhard, 4,630,434, Cl. 57-87.000.

von Weissenfluh, Beat, to Hawe-Neos Dental Dr. H. von Weissenfluh S.A. Equipment for putting in approximal fillings with light-hardening materials. 4,631,030, Cl. 433-149.000.

Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, to Schering Aktiengesellschaft. Prostaglandins and prostacyclins, process for their preparation and their use as medicaments. 4,631,276, Cl. 514-211.000.

Voss, Thomas, to ZF-Herion-Systemtechnik GmbH. Electronic controller for cyclically operating machinery. 4,631,722, Cl. 371-9.000.

Votava, Ronald, to Avondale Industries, Inc. Transfer feed mechanism for power presses. 4,630,461, Cl. 72-405.000.

Vu, Tho T.: *See—*
Nelson, Roderick D.; and Vu, Tho T., 4,631,426, Cl. 307-450.000.

W. R. Grace & Co.: *See—*
Gokel, George W.; and Echegoyen, Luis, 4,631,119, Cl. 204-59.00R.
Winyall, Milton E.; and Harville, Cathy L., 4,631,184, Cl. 424-49.000.

W. Schlafhorst & Co.: *See—*
Rohner, Joachim, 4,630,782, Cl. 242-18.0EW.

Waaben, Sigurd G.: *See—*
Federico, Joseph; and Waaben, Sigurd G., 4,631,355, Cl. 178-18.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Klatt, Alfred, 4,630,508, Cl. 74-866.000.
Klatt, Alfred, 4,631,679, Cl. 364-424.100.

WABCO Westinghouse Steuerungstechnik GmbH & Co.: *See—*
Brausfeld, Walter; and Meyer, Ernst-August, 4,630,800, Cl. 251-324.000.

Wacom Co., Ltd.: *See—*
Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,631,356, Cl. 178-19.000.

Wada, Hiroshi: *See—*
Takino, Kiyoko; Asahi, Hidetoshi; and Wada, Hiroshi, 4,631,255, Cl. 435-37.000.

Wada, Yoshio: *See—*
Sadamatsu, Hiroshi; Wada, Yoshio; and Ito, Hideaki, 4,631,419, Cl. 307-255.000.

Wagener, Heinrich; Kirchhoff, Reinhold; Van Heek, Karl H.; and Juntgen, Harald, to Bergwerksverband GmbH. Sampling device for solids in a pressurized reactor. 4,630,479, Cl. 73-863.830.

Wagner, Joseph P.: *See—*
Sliger, Boyd P.; and Wagner, Joseph P., 4,630,770, Cl. 236-34.500.

Wakata, Hideo: *See—*
Imoto, Yuzo; Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; and Nomura, Yoshihisa, 4,630,871, Cl. 303-113.000.

Waldorf Corporation: *See—*
Kennedy, Kenneth V., 4,631,046, Cl. 493-59.000.

Walker, Haywood A., Jr.: *See—*
Schaefer, Rolf; and Walker, Haywood A., Jr., 4,631,203, Cl. 427-145.000.

Wallentowitz, Henning: *See—*
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, 4,630,803, Cl. 267-8.00R.

Waller, David P.: *See—*
Simon, Myron S.; and Waller, David P., 4,631,344, Cl. 548-146.000.

Walsh, Fraser M., to Tracer Technologies, Inc. Electrochemical cell. 4,631,240, Cl. 429-105.000.

Walsh, Joseph F.; and Dean, William P., to IQ Technologies, Inc. Interface apparatus. 4,631,698, Cl. 364-900.000.

Waltec Inc.: *See—*
Thomson, David G., 4,630,647, Cl. 138-99.000.

Waltenspuhl, Rolf, to Stoping Aktiengesellschaft. Integral casting apparatus for use in continuous casting of molten metal. 4,630,668, Cl. 164-437.000.

Walter, Horst: *See—*
Schaaf, Heinz; and Walter, Horst, 4,630,533, Cl. 99-353.000.

Walton, Paul G.; and Little, Percy A. Integral blade hole opener. 4,630,694, Cl. 175-391.000.

Wang Laboratories, Inc.: *See—*
Bergeron, Lawrence E.; Daly, Daniel F.; and Grosso, Elaine C., 4,631,746, Cl. 381-35.000.
El-Sherbini, Ahmed M., 4,631,521, Cl. 340-347.0DD.

Ward, Donald H.; and Tomashek, James R., to Hughes Tool Company. Multiplex submersible pump telemetry system. 4,631,536, Cl. 340-857.000.

Ward, Russell G. Multiposition rotary switch with phototransistors. 4,631,399, Cl. 250-221.000.

Warner-Lambert K.K.: *See—*
Imaizumi, Yoshikatsu, 4,630,365, Cl. 30-53.000.

Warner & Swasey Company, The: *See—*
Raleigh, Freddie L., 4,630,374, Cl. 33-1.00M.

Warren, Gerald K.; and Sandroni, Raffaele. Input torque control device. 4,631,005, Cl. 417-218.000.

Warthen, Joel W. Winch-powered wood splitter. 4,630,659, Cl. 144-193.00R.

Washizawa, Yoshikazu: *See—*
Yamada, Kozo; and Washizawa, Yoshikazu, 4,630,699, Cl. 180-75.000.

Wastl, Max, Sr., to Lafayette Instrument Co., Inc. Gas or low volume liquid flow meter. 4,630,485, Cl. 73-861.560.

Watanabe, Isao: *See—*
Miyaji, Kenichi; Toida, Shouji; Ito, Seiichi; Watanabe, Isao; and Kishida, Masatoshi, 4,630,742, Cl. 215-13.00R.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Combined printer-copier apparatus. 4,630,921, Cl. 355-3.0SH.

Watanabe, Kainen; Yasuhara, Hiroto; Sugiyama, Toru; Shimizu, Keiji; and Murata, Yoshihiro, to Matsushita Electric Industrial Co., Ltd.; and Japanese National Railways. Insulating plate for rail insulated joint. 4,630,772, Cl. 238-159.000.

Watanabe, Kazuyoshi: *See—*
Maeda, Hirofumi; Watanabe, Kazuyoshi; Akamatsu, Naruhiko; Senda, Kenichi; and Nishioka, Shunichi, 4,631,159, Cl. 264-53.000.

Watanabe, Kuniaki: *See—*
Tsuboi, Masaharu; and Watanabe, Kuniaki, 4,631,469, Cl. 322-42.000.

Watanabe, Masaharu, to Terumo Corporation. Plasma separator. 4,631,130, Cl. 210-651.000.

Watanabe, Minoru, to Kabushiki Kaisha Morita Seisakusho. Dental chair. 4,630,862, Cl. 297-167.000.

Watanabe, Takayuki, to NEC Corporation. Memory circuit with power supply voltage detection means. 4,631,707, Cl. 365-226.000.

Watanabe, Tomoyuki: *See—*
Tokoro, Setsuo; Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,631,043, Cl. 474-18.000.

Watanabe, Toshiyuki; and Yamada, Noboru, to Kabushiki Kaisha Toshiba. Method of and device for detecting displacement of paper sheets. 4,630,813, Cl. 271-227.000.

Watanabe, Tsukasa: *See—*
Kakinuma, Hiroaki; Nishikawa, Satoshi; and Watanabe, Tsukasa, 4,631,198, Cl. 427-38.000.

Watanabe, Yoshitaka; and Endo, Takashi, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 4,631,556, Cl. 346-140.00R.

Watjen, Frank: *See—*
Petersen, Erling N.; Jensen, Leif H.; Watjen, Frank; and Seidelmann, Dieter, 4,631,285, Cl. 514-292.000.

Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; Conway, Richard J.; and Tucker, Peter G., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,631,081, Cl. 71-94.000.

Watson, Mathew D.: *See—*
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.

Watters, James Virgil: *See—*
Hill, Charles C., 4,630,816, Cl. 272-70.000.

Weatherford/Lamb, Inc.: *See—*
True, Martin E.; and Sullivan, Clarence W., 4,630,688, Cl. 173-163.000.

Webasto-Werk W. Baier GmbH & Co: *See—*
Fuerst, Arpad; and Lutz, Alfons, 4,630,860, Cl. 296-217.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Bienert, Horst; and Kohlpaintner, Georg, 4,630,859, Cl. 296-217.000.

Webb, Jimmy L.; and Olsen, Cathryn E., to General Electric Company. Silyl carbamates and their use in the preparation of bis (aminoalkyl) disiloxanes. 4,631,346, Cl. 556-420.000.

Webber, William T. Regenerated internal combustion engine. 4,630,447, Cl. 60-712.000.

Weber, Wilfried: *See—*
Schopwinkel, Theo; and Weber, Wilfried, 4,630,336, Cl. 19-288.000.

Wedgtrac Corporation: *See—*
Nelson, Bertel S., 4,630,497, Cl. 74-425.000.

Weekly, Max D.: *See—*
Foster, Robert W.; and Weekly, Max D., 4,631,363, Cl. 379-15.000.

Weeks, Harry D. Corn head assembly for harvesting corn. 4,630,430, Cl. 56-14.100.

Weerda, Hilko; and Pedersen, Peter, to Dragerwerk AG. Device for determining and evaluating the pressure in a balloon sleeve of a closed tracheal tube. 4,630,606, Cl. 128-207.140.

Weinlich, Karl: *See—*
Sauerwein, Kurt; Kinzer, Norbert; and Weinlich, Karl, 4,631,415, Cl. 250-497.100.

Weiss, Donald: *See—*
Germanton, Damon; and Weiss, Donald, 4,631,350, Cl. 136-225.000.

Weitzman, Harry L., to Weitzman, Jack J. Prefabricated knock-down metal-frame work table. 4,630,550, Cl. 108-155.000.

Weitzman, Jack J.: *See—*
Weitzman, Harry L., 4,630,550, Cl. 108-155.000.

Weld-Equip b.v.: *See—*
Tijs, Hendricus C. P., 4,630,529, Cl. 92-13.000.

Wellman, Donald C.; and Clark, William E., to Carrier Corporation. Variable volume multizone system. 4,630,670, Cl. 165-16.000.
Welygan, Dennis G.; and Zemke, Ronald O., to Minnesota Mining and Manufacturing Company. Extruded article and method of making the same. 4,631,215, Cl. 428-105.000.
Wendt, Frank S., to RCA Corporation. Frequency controlled resonant regulator. 4,631,652, Cl. 363-16.000.
Wenzel, Werner: *See—*
Evers, Reinhard; and Wenzel, Werner, 4,630,334, Cl. 17-56.000.
Wermuth, Camille-Georges: *See—*
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille-Georges, 4,631,280, Cl. 514-247.000.
Werner, Hans; Knothe, Frank; Graf, Paul; Wallentowitz, Henning; Keller, Hans-Hermann; and Kist, Alfred, to Daimler-Benz Aktiengesellschaft. Suspension-strut mounting for installation between a shock-absorber strut or spring strut and a vehicle body spring-supported with respect to the axles, in particular of a motor vehicle. 4,630,803, Cl. 267-8.00R.
Wessel, Wolf: *See—*
Kuttner, Thomas; Straubel, Max; and Wessel, Wolf, 4,630,582, Cl. 123-339.000.
West, Fred D. Fiber optic cable cleaving tool. 4,630,764, Cl. 225-2.000.
Westall, Stephen, to Dow Corning, Ltd. Organosiloxane-oxyalkylene copolymers. 4,631,208, Cl. 427-387.000.
Western Geophysical Co. of America: *See—*
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Camden, Thomas M., Jr., 4,631,166, Cl. 376-435.000.
Cavada, David R.; and Golick, Leonard R., 4,630,410, Cl. 51-410.000.
Leone, David A., 4,631,376, Cl. 200-306.000.
Mallick, George T., Jr., 4,631,629, Cl. 361-154.000.
Mark, Richard H., Jr., 4,631,533, Cl. 340-721.000.
Neuner, James A.; Boomgaard, Dirk J.; Wilbur. Susan A.; and Geis, Charles G., 4,631,537, Cl. 340-870.170.
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Shallenberger, John M.; and Ferlan, Stephen J., 4,631,168, Cl. 376-446.000.
Sherwin, Gary W., 4,631,466, Cl. 318-696.000.
Spurrier, Francis R.; Pierce, Bill L.; and Wright, Maynard K., 4,631,239, Cl. 429-39.000.
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Westra, Leonard F.; Woodroffe, Jaime A.; and Stickler, David B., to Gas Research Institute. Method and apparatus for the heat processing of glass and glass forming material. 4,631,080, Cl. 65-134.000.
Wheatley, Carl F., Jr.: *See—*
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Wheeler, William J., to Eli Lilly and Company. 1,3,5-triazepinones. 4,631,339, Cl. 540-492.000.
Whipple, David C.: *See—*
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White, Alan D.: *See—*
Crane, Dale E.; Jones, Robert E.; Watson, Mathew D.; and White, Alan D., 4,631,727, Cl. 372-33.000.
White, Arthur A. Compact golf swing training and practice device. 4,630,829, Cl. 273-186.00A.
White, Justin C.: *See—*
Sayler, William H.; and White, Justin C., 4,630,554, Cl. 110-264.000.
White, Robert M.; and Brancher, Rodney E., to InterMetro Industries Corporation. Latching mechanism. 4,630,852, Cl. 292-87.000.
White, W. Curtis: *See—*
Blehm, Lynne; Makek, James R.; and White, W. Curtis, 4,631,273, Cl. 514-29.000.
Whiteside, George D., to Polaroid Corporation. Wet processing web camera and method. 4,630,912, Cl. 354-88.000.
Whiteside, George D.; and Cavallaro, Robert E., to Polaroid Corporation. Multipart cassette for two component film system. 4,630,915, Cl. 354-275.000.
Whitfield, Roger R. Fluid handling device useful as a pump, compressor or rotary engine. 4,631,011, Cl. 418-68.000.
Whiting, Montague. Device and method for loading and transporting elongate objects on the tops of vehicles. 4,630,990, Cl. 414-462.000.
Wickmann, John T.; and Olak, Richard, to Chart Industries Limited. Laser gauging system and component parts therefor. 4,630,379, Cl. 33-288.000.
Wiener, Charles: *See—*
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Wiener, Hans; and Undin, Hans, to C. A. Weidmuller GmbH & Co. Tool for crimping cable shoe terminals. 4,630,462, Cl. 72-410.000.
Wiff, Donald R.: *See—*
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Wiger, Henry K.; and Katz, Manfred, to Pullman Standard Inc. Double groove center sill. 4,630,546, Cl. 105-416.000.
Wiger, Henry K.; and Przybylinski, Phillip G., to Pullman Standard Inc. Center sill horizontal divider. 4,630,548, Cl. 105-416.000.
Wiggins, Richard H., Jr.: *See—*
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Willenbrock, Horst: *See—*
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Willett, John T.: *See—*
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Williams, Richard L., Jr., to Ford Aerospace & Communications Corporation. Velocity and attitude control for exoatmospheric projectile. 4,630,790, Cl. 244-169.000.
Williamson, Archie O. Hydraulic-controlled differential. 4,630,505, Cl. 74-711.000.
Williamson, Michael A.: *See—*
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Williston, David W., to Du Pont de Nemours, E. I., and Company. Dichromic process for preparation of conductive circuit. 4,631,111, Cl. 156-630.000.
Wills, Joseph T.: *See—*
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Wilson, John F.; and Doshi, Pratap K., to Westinghouse Electric Corp. Boiling water reactor control rod. 4,631,165, Cl. 376-333.000.
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Winch, Peter C.; and Blackledge, Mick, to United States of America, Air Force. Optical control method for solid fuel rocket burn rate. 4,630,437, Cl. 60-204.000.
Windischbauer, Florian, to Aktiengesellschaft Adolph Saurer. Apparatus for the constrained actuation of the clamping system of filling-yarn insertion devices in shuttleless weaving machines. 4,630,651, Cl. 139-446.000.
Windows, David W.; and Burback, Ronald E. Collapsible frame structure. 4,630,627, Cl. 135-112.000.
Wine, Charles M., to RCA Corporation. Apparatus for synchronizing the operation of a microprocessor with a television synchronization signal useful in generating an on-screen character display. 4,631,585, Cl. 358-148.000.
Wingate, Sidney A., to Dynamics Research Corporation. Position encoder compensation system. 4,631,520, Cl. 340-347.0CC.
Wingler, Frank; Koch, Otto; Lindner, Christian; and Reinking, Klaus, to Bayer Aktiengesellschaft. Acrylonitrile free blends of a polycarbonate, a graft rubber and a terpolymer resin. 4,631,311, Cl. 525-67.000.
Winyall, Milton E.; and Harville, Cathy L., to W. R. Grace & Co. Dialytic silica dentifrice. 4,631,184, Cl. 424-49.000.
Wisconsin Alumni Research Foundation: *See—*
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Wolter, Joachim H.; and Horstman, Robert E., to U.S. Philips Corporation. Device for producing or amplifying coherent radiation. 4,631,731, Cl. 372-74.000.
Wolvek, Sidney; Kaiser, Walter; and Kaltenbach, Kenneth, to Datascope Corp. Sheath remover. 4,631,059, Cl. 604-280.000.
Wood, David H.; and Creswick, Martin, to Senelco Limited. Transmitter/responder systems. 4,631,708, Cl. 367-2.000.
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Woods, Harold T., to Multifastener Corporation. Sealed nut and panel assembly apparatus. 4,630,363, Cl. 29-798.000.
Wright, David M., to Sunbeam Plastics Corporation. Tamper indicating child resistant closure. 4,630,743, Cl. 215-216.000.
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Xerox Corporation: *See—*
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Figueira, Stephen; and Billings, Philip A., 4,630,722, Cl. 192-84.00T.
Handy, Roland J., 4,631,739, Cl. 377-60.000.
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Yaguchi, Tatsuya, to Canon Kabushiki Kaisha. Image communications apparatus for long-size copy image. 4,631,596, Cl. 358-256.000.
Yamabe, Masaaki; Kobayashi, Shigeyoshi; Yoshihara, Noriyuki; and Nakamura, Masaru, to Asahi Glass Company Ltd. Composite membrane for gas separation. 4,631,075, Cl. 55-158.000.
Yamada, Kimichika; and Miyazaki, Takao, to Clarion Co., Ltd. Automatic camera control system. 4,631,590, Cl. 358-185.000.
Yamada, Kozo; and Washizawa, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Driving wheel supporting system. 4,630,699, Cl. 180-75.000.
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Yamamoto, Haruyasu; Kasamatsu, Kiyoshi; Okabe, Takayuki; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Dithiolphosphoric acid esters. 4,631,347, Cl. 260-963.000.
Yamamoto, Ikuo; Umino, Takehito; Shinoda, Yoshio; and Yoshino, Hisao, to Nadagawa Corrosion Protecting Co., Ltd.; and Mitsui Mining & Smelting Co. Aluminum alloys for galvanic anode. 4,631,172, Cl. 420-541.000.
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Yamanishi, Eiichi, to Kabushiki Kaisha Toshiba. Image forming apparatus displaying the steps of the image forming process. 4,631,577, Cl. 358-75.000.
Yamanoue, Kouichi; and Kitagawa, Junji, to Nippon Soken, Inc. Portable transmitter which conserves transmitter power by storing charges from previous pulses. 4,631,736, Cl. 375-71.000.
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Yankeelov, John A., Jr.; and Fok, Kam-Fook, to Research Corporation. Therapeutically useful pseudopeptides, compositions containing the same and methods of preparation and use. 4,631,270, Cl. 514-15.000.
Yano, Hiroshi. Toy gun. 4,630,757, Cl. 222-79.000.
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Yoshimura, Syushichi; Kobayashi, Hiromu; Toyonaga, Yoshikazu; Yamazaki, Hozo; and Karatsu, Masanori, to Mitsubishi Chemical Industries Ltd. Process for producing carbon black. 4,631,180, Cl. 423-450.000.
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Yotsuyanagi, Takao; and Nishiyama, Yoshinobu, to Mitsubishi Chemical Industries Ltd. Method for recovering gallium. 4,631,177, Cl. 423-112.000.
Young, Ian R., to Picker International Limited. Nuclear magnetic resonance method and apparatus. 4,631,480, Cl. 324-309.000.
Young, Ian R.; Evans, Philip R.; and Luker, Peter A., to Picker International Limited. N.M.R. shims. 4,631,481, Cl. 324-320.000.
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Yukawa, Shinjiro, to Nissan Motor Company, Limited. Sound-absorbing structure in vehicular compartment. 4,630,707, Cl. 181-288.000.
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Zeitz, Vernon, to Ivek Corporation. Electro-optical fluid detector. 4,631,529, Cl. 340-619.000.
Zeller, Clifford L. Low calorie dairy product. 4,631,196, Cl. 426-580.000.
Zelmanovic, David; and Kishner, Stanley J., to Kollmorgen Technologies Corporation. Method of simultaneously determining gauge and orientation of polymer films. 4,631,408, Cl. 250-339.000.
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Zettek, Charles M. Other time instrument. 4,630,935, Cl. 368-41.000.
Zettier, Karl H., to Westfalia Separator AG. Centrifuge for clarifying or separating suspensions. 4,631,049, Cl. 494-71.000.
ZF-Herion-Systemtechnik GmbH: *See*—
Voss, Thomas, 4,631,722, Cl. 371-9.000.
Zimmerman, Karen A.; Weston, Randall L.; and Thomas, Richard D., to Chrysler Motors Corporation. Seat belt testing device. 4,630,472, Cl. 73-161.000.
Zimmerman, Thomas A., to TRW Inc. Multiple path signal distribution to large scale integration chips. 4,631,572, Cl. 357-74.000.
Zinser Textilmaschinen GmbH: *See*—
Igel, Wolfgang, 4,630,435, Cl. 57-281.000.
Zoludow, Richard S., to Dwyer Instruments, Inc. Diaphragm operated switch type bin level sensor. 4,631,374, Cl. 200-61.210.
Zulian, Ferruccio; and Zanchi, Vittorio, to Honeywell Information Systems Italia. Asynchronous bus multiprocessor system. 4,631,667, Cl. 364-200.000.
Zuranski, Edward: *See*—
Betts, William L.; and Zuranski, Edward, 4,631,738, Cl. 375-98.000.
Zvi, Zadok; Kendi, Abraham; and Tal-Mor, Emile, to Kendi Security, Inc. Security gate apparatus. 4,630,396, Cl. 49-55.000.
Zweiniger, Hansjurgen; and Willenbrock, Horst, to Ford Motor Company. Storage apparatus for motor vehicles. 4,630,857, Cl. 296-37.120.
Zwicker, Walter K.: *See*—
Shaulov, Avner A.; Lukasik, Stanley J.; Frommer, Myron H.; and Zwicker, Walter K., 4,631,633, Cl. 361-321.000.
Zychal, Craig, to Amoco Corporation. Defoamer and antifoamer composition and method for defoaming aqueous fluid systems. 4,631,145, Cl. 252-321.000.
Zylstra, Henry J.: *See*—
Dvorak, Robert F.; Jansen, Harley W.; and Zylstra, Henry J., 4,631,624, Cl. 361-89.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Crates, Fred J.; Fouss, James L.; and Parker, John J., to Hancor, Inc. Inlet and outlet baffle structure for sewage treatment tanks. Re. 32,312, Cl. 210-532.200.
Fouss, James L.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.
Gittins, Derek R.; and Gregory, Michael D., to Racal-Dana Instruments Limited. Frequency control circuits such as for use in modulation measurement. Re. 32,314, Cl. 455-115.000.
Gregory, Michael D.: *See*—
Gittins, Derek R.; and Gregory, Michael D., Re. 32,314, Cl. 455-115.000.
Hancor, Inc.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.
Hitachi, Ltd.: *See*—
Yamakido, Kazuo, Re. 32,313, Cl. 340-347.0DA.
Parker, John J.: *See*—
Crates, Fred J.; Fouss, James L.; and Parker, John J., Re. 32,312, Cl. 210-532.200.
Racal-Dana Instruments Limited: *See*—
Gittins, Derek R.; and Gregory, Michael D., Re. 32,314, Cl. 455-115.000.
Yamakido, Kazuo, to Hitachi, Ltd. Digital-to-analog converter and PCM encoder using the converter. Re. 32,313, Cl. 340-347.0DA.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, to Kabushiki Kaisha Riken. Spacer and expander member for holding and biasing piston ring rails. B1 4,429,885, 12-23-86, Cl. 277-140.000.
Ikeda, Yukio: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.
Kabushiki Kaisha Riken: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.
Kasica, James J.: *See*—
Trubiano, Paolo C.; and Kasica, James J., B1 4,551,177, Cl. 106-210.000.
Kawauchi, Yoneo: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.
National Starch and Chemical Corporation: *See*—
Trubiano, Paolo C.; and Kasica, James J., B1 4,551,177, Cl. 106-210.000.
Trubiano, Paolo C.; and Kasica, James J., to National Starch and Chemical Corporation. Compressible starches as binders for tablets or capsules. B1 4,551,177, 12-23-86, Cl. 106-210.000.
Yamauchi, Hajime: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, B1 4,429,885, Cl. 277-140.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Allen, David A.; and Diekman, Robert L., to Huffy Corporation. Tricycle seat. 287,317, 12-23-86, Cl. D6-354.000.
Allison, Darris E. Planing boat. 287,357, 12-23-86, Cl. D12-314.000.
American Greetings Corporation: *See*—
Cavnar, Kathryn A.; and Toth, Stephen M., 287,380, Cl. D21-111.000.
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., 287,379, Cl. D21-109.000.
AMP Incorporated: *See*—
Monroe, Kevin T., 287,331, Cl. D8-98.000.
Anastassiades, James C.; and Maser, Elliott D. Novelty tooth figure. 287,382, 12-23-86, Cl. D21-155.000.
Anderson, Kent R., to Larken Industries, Ltd. Alcohol applicator bottle. 287,335, 12-23-86, Cl. D9-338.000.
Araya, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Architectural Structures Inc.: *See*—
Johansson, Lars-Gunnar, 287,409, Cl. D26-40.000.
Johansson, Lars-Gunnar, 287,410, Cl. D26-40.000.
Atlas Copco AB: *See*—
Karden, Karl G.; and Berger, Karl-Gustav, 287,330, Cl. D8-62.000.
Bekooy, Jan T. Refolding and stacking receptacle for segmental sheet material. 287,371, 12-23-86, Cl. D18-22.000.
Bell, Reginald R.: *See*—
Oliver, Morris A.; and Bell, Reginald R., 287,387, Cl. D21-191.000.
Berger Industries, Inc.: *See*—
Shemtov, Sami, 287,396, Cl. D23-47.000.
Berger, Karl-Gustav: *See*—
Karden, Karl G.; and Berger, Karl-Gustav, 287,330, Cl. D8-62.000.
Bergkvist, Hakan K.: *See*—
Johansson, Jan-Erik; and Bergkvist, Hakan K., 287,404, Cl. D24-34.000.
Biesecker, Frederick N., to Drug Plastics & Glass Company, Inc. Bottle. 287,338, 12-23-86, Cl. D9-355.000.
Blue Ridge Industrial Support Company: *See*—
Woods, Gerald, 287,367, Cl. D15-12.000.
Brennan, Mike: *See*—
Stoll, Scott A.; and Brennan, Mike, 287,370, Cl. D18-7.000.
Bristol-Myers Company: *See*—
Dominski, Daniel M., 287,339, Cl. D9-377.000.
Brittner, Maureen F.: *See*—
Brittner, Stephen L.; and Brittner, Maureen F., 287,392, Cl. D21-221.000.
Brittner, Stephen L.; and Brittner, Maureen F. Golf club head cover. 287,392, 12-23-86, Cl. D21-221.000.
Broeils, John, to Maddak, Inc. Raised superimposed toilet seat or the like. 287,399, 12-23-86, Cl. D23-71.000.
Brown, Frederick D. Pager carrying case. 287,305, 12-23-86, Cl. D3-106.000.
Bussell, Vanda J. Toothbrush holder. 287,320, 12-23-86, Cl. D6-534.000.
Bussell, Vanda J. Soap dish. 287,321, 12-23-86, Cl. D6-539.000.
Bussell, Vanda J. Tumbler. 287,323, 12-23-86, Cl. D7-12.000.
Bussell, Vanda J. Bud vase. 287,346, 12-23-86, Cl. D11-151.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 287,358, Cl. D13-30.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,306, 12-23-86, Cl. D3-12.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,307, 12-23-86, Cl. D3-12.000.
Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,351, 12-23-86, Cl. D12-147.000.
Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,352, 12-23-86, Cl. D12-151.000.
Canon Kabushiki Kaisha: *See—*
Kando, Masahiro, 287,364, Cl. D14-94.000.
Cavalli, Alfredo. Food processor. 287,327, 12-23-86, Cl. D7-384.000.
Cavnar, Kathryn A.; and Toth, Stephen M., to American Greetings Corporation. Toy telephone. 287,380, 12-23-86, Cl. D21-111.000.
Charles, Mark E.; and Connella, Stephan J. Seamless crochet game footbag. 287,390, 12-23-86, Cl. D21-204.000.
Cheng, William, to Hung, Michael. Rowing exercise machine or similar article. 287,388, 12-23-86, Cl. D21-195.000.
Chipman-Union, Inc.: *See—*
Hagen, Carl E., 287,366, Cl. D2-331.000.
Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Fujiyama, Tetumi, 287,405, Cl. D24-40.000.
Conair Corporation: *See—*
Ling, Gabriel T. Y., 287,419, Cl. D32-18.000.
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 287,362, Cl. D14-53.000.
Connella, Stephan J.: *See—*
Charles, Mark E.; and Connella, Stephan J., 287,390, Cl. D21-204.000.
Continental Engineering Group, Inc.: *See—*
Ugalde, Carlos V., 287,319, Cl. D6-474.000.
Cooper Industries, Inc.: *See—*
Kusmer, Raymond J.; and Tinley, Raymond K., 287,413, Cl. D26-65.000.
Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,353, 12-23-86, Cl. D12-192.000.
Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,354, 12-23-86, Cl. D12-192.000.
Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,355, 12-23-86, Cl. D12-192.000.
Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard cover. 287,356, 12-23-86, Cl. D12-192.000.
Cramer, Charles W. Ashtray. 287,415, 12-23-86, Cl. D27-22.000.
Curtis Manufacturing Company, Inc.: *See—*
Judd, Thomas W., 287,365, Cl. D14-114.000.
Cuttriss, Richard J., to Gruber Systems, Inc. Bathtub. 287,397, 12-23-86, Cl. D23-55.000.
Danfoss A/S: *See—*
Lehmann, Kjeld, 287,360, Cl. D13-40.000.
Dart Industries Inc.: *See—*
Schmidt, Janice L., 287,324, Cl. D7-50.000.
Schmidt, Janice L., 287,325, Cl. D7-50.000.
Denver Mineral Exploration Corp.: *See—*
Kober, Carl L.; and Procter-Gregg, H. David, 287,342, Cl. D10-75.000.
Diekman, Robert L.: *See—*
Allen, David A.; and Diekman, Robert L., 287,317, Cl. D6-354.000.
Dinand, Pierre, to Saint-Gobain Desjonqueres. Bottle. 287,340, 12-23-86, Cl. D9-401.000.
Distinctive Appliances, Inc.: *See—*
Joseph, Stanley M., 287,326, Cl. D7-346.000.
Dixon, Linda H. Hip abduction pillow. 287,406, 12-23-86, Cl. D24-64.000.
Dr. Miller's Health Care Products, Inc.: *See—*
Miller, Griffith C., 287,309, Cl. D4-119.000.
Miller, Griffith C., 287,310, Cl. D4-119.000.
Miller, Griffith C., 287,311, Cl. D4-119.000.
Dominski, Daniel M., to Bristol-Myers Company. Packaging container for a pharmaceutical vial. 287,339, 12-23-86, Cl. D9-377.000.
Domon, Yoshihiro: *See—*
Fujita, Toshiharu; Domon, Yoshihiro; and Takizawa, Fuminobu, 287,407, Cl. D26-3.000.
Don Oliver Barbell (1977) Limited: *See—*
Oliver, Morris A.; and Bell, Reginald R., 287,387, Cl. D21-191.000.
Drane, John H., to Duracell Inc. Hand torch. 287,411, 12-23-86, Cl. D26-46.000.
Drug Plastics & Glass Company, Inc.: *See—*
Biesecker, Frederick N., 287,338, Cl. D9-355.000.
Duracell Inc.: *See—*
Drane, John H., 287,411, Cl. D26-46.000.
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., to American Greetings Corporation. Toy clock. 287,379, 12-23-86, Cl. D21-109.000.
Eicher, Charlotte A.: *See—*
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., 287,379, Cl. D21-109.000.
Emmons, Marvin L. Novelty digital calculator. 287,376, 12-23-86, Cl. D21-59.000.
Ernst Leitz Wetzlar G.m.b.H.: *See—*
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 287,369, Cl. D16-133.000.
Etablissements Regnault: *See—*
Regnault, Pierre, 287,373, Cl. D19-43.000.
Etna Products Co., Inc.: *See—*
Fung, May, 287,412, Cl. D26-60.000.
F.I.R. Rubinetterie S.p.A.: *See—*
Piesco, Nazzareno, 287,395, Cl. D23-32.000.
Ferrero, Pietro, to Ferrero S.p.A. Packaging container for candy or the like. 287,334, 12-23-86, Cl. D9-318.000.
Ferrero S.p.A.: *See—*
Ferrero, Pietro, 287,334, Cl. D9-318.000.
Fisher, Myles A.; and Justin, Joseph S. Portable shower. 287,398, 12-23-86, Cl. D23-57.000.
Foggia, Donald: *See—*
Klaiber, Gerhart F.; and Foggia, Donald, 287,363, Cl. D14-62.000.
Fujita, Toshiharu; Domon, Yoshihiro; and Takizawa, Fuminobu, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 287,407, 12-23-86, Cl. D26-3.000.
Fujiyama, Tetumi: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Fujiyama, Tetumi, 287,405, Cl. D24-40.000.
Fung, May, to Etna Products Co., Inc. Portable reading light. 287,412, 12-23-86, Cl. D26-60.000.
Gaines, Donald R. Sensor night light. 287,408, 12-23-86, Cl. D26-26.000.
Gamble, Christopher L. Combination tool for adjusting ski bindings and ski boots or the like. 287,332, 12-23-86, Cl. D8-105.000.
Garduno, Stephanie. Portable, folding diaper changing table. 287,318, 12-23-86, Cl. D6-429.000.
Giles, Diane A.; and Giles, Joseph. Headlight cover. 287,414, 12-23-86, Cl. D26-139.000.
Giles, Joseph: *See—*
Giles, Diane A.; and Giles, Joseph, 287,414, Cl. D26-139.000.
Ginouves, Valeska. Combined chair and step stool. 287,315, 12-23-86, Cl. D6-335.000.
Grimes, Gary, to Timex Corporation. Wristwatch. 287,341, 12-23-86, Cl. D10-30.000.
Grubb, Lawrence B.; and Williams, David M., to Johnson & Johnson Baby Products Company. Star teether toy. 287,377, 12-23-86, Cl. D21-65.000.
Gruber Systems, Inc.: *See—*
Cuttriss, Richard J., 287,397, Cl. D23-55.000.
Grun, Otto. Aquatic sculpture or similar article. 287,347, 12-23-86, Cl. D11-157.000.
Haber, Barry M.: *See—*
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 287,362, Cl. D14-53.000.
Hagen, Carl E., to Chipman-Union, Inc. Sock. 287,366, 12-23-86, Cl. D2-331.000.
Hamatani, George. Push rod holder for diesel engine with installed aftercooler. 287,329, 12-23-86, Cl. D8-14.000.
Hashimoto, Yasuhiro: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Hengst, Alfred: *See—*
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 287,369, Cl. D16-133.000.
Henkels, Walter. Combined holder for note paper and a calendar. 287,372, 12-23-86, Cl. D19-22.000.
Hinnen, John. Moose head trophy. 287,344, 12-23-86, Cl. D11-134.000.
Hitachi, Ltd.: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 287,312, 12-23-86, Cl. D4-123.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 287,313, 12-23-86, Cl. D4-123.000.
Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 287,314, 12-23-86, Cl. D4-123.000.
Huffy Corporation: *See—*
Allen, David A.; and Diekman, Robert L., 287,317, Cl. D6-354.000.
Hujisawa, Humio: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Hung, Michael: *See—*
Cheng, William, 287,388, Cl. D21-195.000.
Ida, Daijiro: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Import Auto Products, Ltd.: *See—*
Cornwell, Paul D., 287,353, Cl. D12-192.000.
Cornwell, Paul D., 287,354, Cl. D12-192.000.
Cornwell, Paul D., 287,355, Cl. D12-192.000.
Cornwell, Paul D., 287,356, Cl. D12-192.000.
Ishii, Yoshiyasu: *See—*
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Iwatsu Electric Co., Ltd.: *See—*
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Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, to Ernst Leitz Wetzlar G.m.b.H. Binocular. 287,369, 12-23-86, Cl. D16-133.000.
Johansson, Jan-Erik; and Bergkvist, Hakan K. Medicine dispensing cup. 287,404, 12-23-86, Cl. D24-34.000.
Johansson, Lars-Gunnar, to Architectural Structures Inc. Lantern. 287,409, 12-23-86, Cl. D26-40.000.
Johansson, Lars-Gunnar, to Architectural Structures Inc. Lantern. 287,410, 12-23-86, Cl. D26-40.000.

Johnson & Johnson Baby Products Company: *See—*
Grubb, Lawrence B.; and Williams, David M., 287,377, Cl. D21-65.000.
Joseph, Stanley M., to Distinctive Appliances, Inc. Wok cooktop. 287,326, 12-23-86, Cl. D7-346.000.
Judd, Thomas W., to Curtis Manufacturing Company, Inc. Stand for computer disk drive. 287,365, 12-23-86, Cl. D14-114.000.
Justin, Joseph S.: *See—*
Fisher, Myles A.; and Justin, Joseph S., 287,398, Cl. D23-57.000.
Kaiser Manufacturing Co.: *See—*
Kaiser, Thomas P.; and Kaiser, Philip P., Jr., 287,386, Cl. D21-189.000.
Kaiser, Philip P., Jr.: *See—*
Kaiser, Thomas P.; and Kaiser, Philip P., Jr., 287,386, Cl. D21-189.000.
Kaiser, Thomas P.; and Kaiser, Philip P., Jr., to Kaiser Manufacturing Co. Doll holder. 287,386, 12-23-86, Cl. D21-189.000.
Kando, Masahiro, to Canon Kabushiki Kaisha. Facsimile. 287,364, 12-23-86, Cl. D14-94.000.
Karden, Karl G.; and Berger, Karl-Gustav, to Atlas Copco AB. Portable grinding machine. 287,330, 12-23-86, Cl. D8-62.000.
Karppinen, Martti: *See—*
Kiiski, Heikki; Saynajakangas, Seppo; Karppinen, Martti; and Tammi, Tapio, 287,403, Cl. D24-17.000.
Kaufman, Jack W. Scrub brush with wrap around sponge. 287,308, 12-23-86, Cl. D4-116.000.
Ketcham & McDougall, Inc.: *See—*
Macowski, William, 287,374, Cl. D19-89.000.
Kiiski, Heikki; Saynajakangas, Seppo; Karppinen, Martti; and Tammi, Tapio, to Polar Electro KY. Pulse receiver. 287,403, 12-23-86, Cl. D24-17.000.
Klaiber, Gerhart F.; and Foggia, Donald, to Vodavi Technology Corporation. Telephone set base. 287,363, 12-23-86, Cl. D14-62.000.
Knudson, Leigh J. Winch handle holder. 287,333, 12-23-86, Cl. D8-373.000.
Kober, Carl L.; and Procter-Gregg, H. David, to Denver Mineral Exploration Corp. Passive geophysical exploration device. 287,342, 12-23-86, Cl. D10-75.000.
Kodama, Hideaki: *See—*
Sekiguchi, Akira; and Kodama, Hideaki, 287,361, Cl. D14-53.000.
Kusmer, Raymond J.; and Tinley, Raymond K., to Cooper Industries, Inc. Track light fixture. 287,413, 12-23-86, Cl. D26-65.000.
Larken Industries, Ltd.: *See—*
Anderson, Kent R., 287,335, Cl. D9-338.000.
Larson, Willard S. Combined back rest and luggage rack. 287,348, 12-23-86, Cl. D12-119.000.
Lehmann, Kjeld, to Danfoss A/S. Casing for electrical equipment. 287,360, 12-23-86, Cl. D13-40.000.
Ling, Gabriel T. Y., to Conair Corporation. Hand-held vacuum cleaner. 287,419, 12-23-86, Cl. D32-18.000.
Long, Randall B. Decorative dust shield for a fireplace ash container and stand therefor. 287,400, 12-23-86, Cl. D23-131.000.
Lonnstedt, Bo G. Face shield attachment for a safety helmet. 287,300, 12-23-86, Cl. D29-16.000.
Macowski, William, to Ketcham & McDougall, Inc. Memo paper holder. 287,374, 12-23-86, Cl. D19-89.000.
Maddak, Inc.: *See—*
Broeils, John, 287,399, Cl. D23-71.000.
Marker International Company: *See—*
Schultes, Herbert H.; and Wahl, Edwin, 287,393, Cl. D21-230.000.
Martin, Fred R. Beverage mug. 287,322, 12-23-86, Cl. D7-9.000.
Maser, Elliott D.: *See—*
Anastassiades, James C.; and Maser, Elliott D., 287,382, Cl. D21-155.000.
Matheson Gas Products, Inc.: *See—*
Waters, Craig, 287,343, Cl. D10-96.000.
McLaughlin, Gwen. Sculpture. 287,345, 12-23-86, Cl. D11-139.000.
Michelin Recherche et Technique S.A.: *See—*
Cain, Michael W., 287,351, Cl. D12-147.000.
Cain, Michael W., 287,352, Cl. D12-151.000.
Weston, David A., 287,350, Cl. D12-147.000.
Miller, Griffith C., to Dr. Miller's Health Care Products, Inc. Hygiene brush assembly. 287,309, 12-23-86, Cl. D4-119.000.
Miller, Griffith C., to Dr. Miller's Health Care Products, Inc. Foot scrubbing brush. 287,310, 12-23-86, Cl. D4-119.000.
Miller, Griffith C., to Dr. Miller's Health Care Products, Inc. Foot hygiene. 287,311, 12-23-86, Cl. D4-119.000.
Minamitani, Masaaki: *See—*
Yonekura, Toshio; Tsutsumi, Kotaro; and Minamitani, Masaaki, 287,349, Cl. D12-140.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujita, Toshiharu; Domon, Yoshihiro; and Takizawa, Fuminobu, 287,407, Cl. D26-3.000.
Mocek, Elizabeth H. Cosmetic tray or similar article. 287,417, 12-23-86, Cl. D28-76.000.
Monroe, Kevin T., to AMP Incorporated. Cutting tool for optical fibers with protective cover. 287,331, 12-23-86, Cl. D8-98.000.
Nadeau, Richard P., to Zorcom Enterprise, Inc. Toy exercising machine. 287,389, 12-23-86, Cl. D21-195.000.
Nakao, Shinroku; Ishii, Yoshiyasu; and Fujiyama, Tetumi, to Combi Co., Ltd. Electric massager. 287,405, 12-23-86, Cl. D24-40.000.
Nickel, Gerhard E. B., to Sewell Plastics, Inc. Bottle or similar article. 287,337, 12-23-86, Cl. D9-349.000.
Nippon Paint Co., Ltd.: *See—*
Hori, Kiyoshi, 287,312, Cl. D4-123.000.
Hori, Kiyoshi, 287,313, Cl. D4-123.000.
Hori, Kiyoshi, 287,314, Cl. D4-123.000.
Ohashi, Shigeo. Push button switch. 287,359, 12-23-86, Cl. D13-32.000.
Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable jet-plane toy. 287,378, 12-23-86, Cl. D21-87.000.
Ohno, Kouzin, to Takara Co., Ltd. Assembled humanoid robot toy. 287,381, 12-23-86, Cl. D21-150.000.
Ohshiro, Masayuki: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.
Ohtsu Tire & Rubber Co., Ltd., The: *See—*
Yonekura, Toshio; Tsutsumi, Kotaro; and Minamitani, Masaaki, 287,349, Cl. D12-140.000.
Oliver, Morris A.; and Bell, Reginald R., to Don Oliver Barbell (1977) Limited. Collar for barbell or similar article. 287,387, 12-23-86, Cl. D21-191.000.
Orsing, Ernst L. Nozzle for a suction drainage device for performing surgery in the mouth. 287,402, 12-23-86, Cl. D24-10.000.
Paul Brothers, Inc.: *See—*
Paul, Clifford H.; and Paul, Richard J., 287,328, Cl. D8-1.000.
Paul, Clifford H.; and Paul, Richard J., to Paul Brothers, Inc. Tree support. 287,328, 12-23-86, Cl. D8-1.000.
Paul, Richard J.: *See—*
Paul, Clifford H.; and Paul, Richard J., 287,328, Cl. D8-1.000.
Pensa, Inc.: *See—*
Peterson, Robert L., 287,302, Cl. D2-318.000.
Peterson, Robert L., 287,303, Cl. D2-320.000.
Peterson, Robert L.; and Tong, James K., 287,304, Cl. D2-320.000.
Tong, James K., 287,301, Cl. D2-314.000.
Peterson, Robert L., to Pensa, Inc. Shoe insole. 287,302, 12-23-86, Cl. D2-318.000.
Peterson, Robert L., to Pensa, Inc. Shoe sole. 287,303, 12-23-86, Cl. D2-320.000.
Peterson, Robert L.; and Tong, James K., to Pensa, Inc. Shoe sole. 287,304, 12-23-86, Cl. D2-320.000.
Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet spout. 287,395, 12-23-86, Cl. D23-32.000.
Pilot Ink Co., Ltd.: *See—*
Sato, Akito, 287,383, Cl. D21-157.000.
Sato, Akito, 287,384, Cl. D21-157.000.
Sato, Akito, 287,385, Cl. D21-157.000.
Polar Electro KY: *See—*
Kiiski, Heikki; Saynajakangas, Seppo; Karppinen, Martti; and Tammi, Tapio, 287,403, Cl. D24-17.000.
Procter-Gregg, H. David: *See—*
Kober, Carl L.; and Procter-Gregg, H. David, 287,342, Cl. D10-75.000.
Regnault, Pierre, to Etablissements Regnault. Writing instrument. 287,373, 12-23-86, Cl. D19-43.000.
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., to Conair Corporation. Handset telephone and stand unit. 287,362, 12-23-86, Cl. D14-53.000.
Roehrig, Peter. Container for pacifiers. 287,336, 12-23-86, Cl. D9-341.000.
Saint-Gobain Desjonqueres: *See—*
Dinand, Pierre, 287,340, Cl. D9-401.000.
Sato, Akito, to Pilot Ink Co., Ltd. Toy fur seal. 287,383, 12-23-86, Cl. D21-157.000.
Sato, Akito, to Pilot Ink Co., Ltd. Toy angelfish. 287,384, 12-23-86, Cl. D21-157.000.
Sato, Akito, to Pilot Ink Co., Ltd. Toy crab. 287,385, 12-23-86, Cl. D21-157.000.
Saynajakangas, Seppo: *See—*
Kiiski, Heikki; Saynajakangas, Seppo; Karppinen, Martti; and Tammi, Tapio, 287,403, Cl. D24-17.000.
Schmidt, Janice L., to Dart Industries Inc. Measuring pitcher or the like. 287,324, 12-23-86, Cl. D7-50.000.
Schmidt, Janice L., to Dart Industries Inc. Measuring pitcher or the like. 287,325, 12-23-86, Cl. D7-50.000.
Schultes, Herbert H.; and Wahl, Edwin, to Marker International Company. Heel element for ski binding. 287,393, 12-23-86, Cl. D21-230.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Multiple outlet. 287,358, 12-23-86, Cl. D13-30.000.
Sekiguchi, Akira; and Kodama, Hideaki, to Iwatsu Electric Co., Ltd. Handset and stand telephone unit. 287,361, 12-23-86, Cl. D14-53.000.
Sewell Plastics, Inc.: *See—*
Nickel, Gerhard E. B., 287,337, Cl. D9-349.000.
Shearer, William B. Putter head. 287,391, 12-23-86, Cl. D21-219.000.
Shemtov, Sami, to Berger Industries, Inc. Compression sealing gasket for a liquid-tight fitting. 287,396, 12-23-86, Cl. D23-47.000.
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, to Hitachi, Ltd. Industrial robot. 287,368, 12-23-86, Cl. D15-199.000.
Simons, Sanford L. Combination obstectrical chair and cover. 287,401, 12-23-86, Cl. D24-3.000.
Smith, William D. Tweezers. 287,416, 12-23-86, Cl. D28-55.000.
Stoll, Scott A.; and Brennan, Mike. Calculator for a shopping cart. 287,370, 12-23-86, Cl. D18-7.000.
Suarez, Benjamin D. Baseball game housing. 287,375, 12-23-86, Cl. D21-11.000.
Takahashi, Ichiro: *See—*
Shibayama, Masato; Abe, Takeshi; Ida, Daijiro; Ohshiro, Masayuki; Takahashi, Ichiro; Hashimoto, Yasuhiro; Hujisawa, Humio; and Araya, Takeshi, 287,368, Cl. D15-199.000.

Takara Co., Ltd.: *See*—
Ohno, Kouzin, 287,378, Cl. D21-87.000.
Ohno, Kouzin, 287,381, Cl. D21-150.000.
Takizawa, Fuminobu: *See*—
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Kiiski, Heikki; Saynajakangas, Seppo; Karppinen, Martti; and Tammi, Tapio, 287,403, Cl. D24-17.000.
Telescope Folding Furniture Co., The: *See*—
Vanderminden, Robert D., 287,316, Cl. D6-349.000.
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Tinley, Raymond K.: *See*—
Kusmer, Raymond J.; and Tinley, Raymond K., 287,413, Cl. D26-65.000.
Tong, James K., to Pensa, Inc. Shoe upper. 287,301, 12-23-86, Cl. D2-314.000.
Tong, James K.: *See*—
Peterson, Robert L.; and Tong, James K., 287,304, Cl. D2-320.000.
'totes', incorporated: *See*—
Cain, Ann S., 287,306, Cl. D3-12.000.
Cain, Ann S., 287,307, Cl. D3-12.000.
Toth, Stephen M.: *See*—
Cavnar, Kathryn A.; and Toth, Stephen M., 287,380, Cl. D21-111.000.
Edmisson, Russell C.; Eicher, Charlotte A.; and Toth, Stephen M., 287,379, Cl. D21-109.000.
Trabattoni, Roberto, to Trasi S.A. Case for cosmetic products. 287,418, 12-23-86, Cl. D28-83.000.
Trasi S.A.: *See*—
Trabattoni, Roberto, 287,418, Cl. D28-83.000.
Tsutsumi, Kotaro: *See*—
Yonekura, Toshio; Tsutsumi, Kotaro; and Minamitani, Masaaki, 287,349, Cl. D12-140.000.
Uellenberg, Hans-Kurt: *See*—
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 287,369, Cl. D16-133.000.
Ugalde, Carlos V., to Continental Engineering Group, Inc. Computer workstation. 287,319, 12-23-86, Cl. D6-474.000.
Vanderminden, Robert D., to Telescope Folding Furniture Co., The. Ottoman. 287,316, 12-23-86, Cl. D6-349.000.
Vodavi Technology Corporation: *See*—
Klaiber, Gerhart F.; and Foggia, Donald, 287,363, Cl. D14-62.000.
Wahl, Edwin: *See*—
Schultes, Herbert H.; and Wahl, Edwin, 287,393, Cl. D21-230.000.
Waters, Craig, to Matheson Gas Products, Inc. Flowmeter. 287,343, 12-23-86, Cl. D10-96.000.
Weston, David A., to Michelin Recherche et Technique S.A. Tire. 287,350, 12-23-86, Cl. D12-147.000.
Williams, David M.: *See*—
Grubb, Lawrence B.; and Williams, David M., 287,377, Cl. D21-65.000.
Wong, Ting W.: *See*—
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 287,362, Cl. D14-53.000.
Woods, Gerald, to Blue Ridge Industrial Support Company. Motorized shovel. 287,367, 12-23-86, Cl. D15-12.000.
Yamamoto, Soichiro S. Spray gun for aerosol can. 287,394, 12-23-86, Cl. D23-18.000.
Yonekura, Toshio; Tsutsumi, Kotaro; and Minamitani, Masaaki, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 287,349, 12-23-86, Cl. D12-140.000.
Zorcom Enterprise, Inc.: *See*—
Nadeau, Richard P., 287,389, Cl. D21-195.000.

LIST OF PLANT PATENTEES

Akins, Amol O. Apple tree 'Loriglo'. 5,838, 12-23-86, Cl. 34.000.
Amorao, Amado Q.: *See*—
Johnson, Harold A., Jr.; and Amorao, Amado Q., 5,840, Cl. 49.000.
Anderson, Henry P., III; and Puryear, Kenneth L. Pistachio tree. 5,837, 12-23-86, Cl. 30.000.
Carbonneil, Georges, to S.A.R.L. Castang. Peach tree (Primecrest). 5,839, 12-23-86, Cl. 43.000.
Driscoll Strawberry Associates, Inc.: *See*—
Johnson, Harold A., Jr.; and Amorao, Amado Q., 5,840, Cl. 49.000.
Ilsink, G. Peter, to Jackson & Perkins Company. Rose plant Intersina. 5,836, 12-23-86, Cl. 18.000.
Jackson & Perkins Company: *See*—
Ilsink, G. Peter, 5,836, Cl. 18.000.
Johnson, Harold A., Jr.; and Amorao, Amado Q., to Driscoll Strawberry Associates, Inc. Strawberry plant—Mr. P. 5,840, 12-23-86, Cl. 49.000.
Jolly, Nelson F., to Jolly's Rosehill Farm of Kent, Inc. Rose plant. 5,835, 12-23-86, Cl. 7.000.
Jolly's Rosehill Farm of Kent, Inc.: *See*—
Jolly, Nelson F., 5,835, Cl. 7.000.
Puryear, Kenneth L.: *See*—
Anderson, Henry P., III; and Puryear, Kenneth L., 5,837, Cl. 30.000.
S.A.R.L. Castang: *See*—
Carbonneil, Georges, 5,839, Cl. 43.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 23, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 184

6.12 4,630,711
15.3 4,630,712

CLASS 188

73.44 4,630,713
206 R 4,630,714
210 4,630,715
371 4,630,716

CLASS 190

104 4,630,717

CLASS 192

18 A 4,630,718
21 4,630,719
48.8 4,630,720
58 B 4,630,721
84 T 4,630,722
105 BA 4,630,723

CLASS 198

399 4,630,724
425 4,630,725
819 4,630,726

CLASS 200

19 DC 4,631,371
19 R 4,631,369
4,631,370
4,631,372
43.17 4,631,373
61.21 4,631,374
84 C 4,631,375
306 4,631,376
314 4,631,377
340 4,631,378

CLASS 203

19 4,631,115

CLASS 204

1 T 4,631,116
15 4,631,117
16 4,631,118
59 R 4,631,119
182.8 4,631,120
243 R 4,631,121
299 R 4,631,122

CLASS 206

221 4,630,727
313 4,630,728
363 4,630,729
392 4,630,730
425 4,630,731
445 4,630,732
459 4,630,733
461 4,630,734
611 4,630,735

CLASS 208

138 4,631,123

CLASS 209

3 4,631,124
215 4,631,125
587 4,630,736

CLASS 210

108 4,631,126
232 4,631,127
321.5 4,631,128
532.2 Re.32,312
635 4,631,129
651 4,631,130
697 4,631,131
727 4,631,132
739 4,631,133
758 4,631,134
764 4,631,135

CLASS 211

40 4,630,737
60.1 4,630,738
189 4,630,739
194 4,630,740

CLASS 212

203 4,630,741

CLASS 215

13 R 4,630,742
216 4,630,743

CLASS 219

10.55 A 4,631,380
10.57 4,631,381
69 R 4,631,382
78.01 4,631,383
121 P 4,631,384
124.03 4,631,385
125.12 4,631,386
272 4,631,387
326 4,631,388
421 4,631,389
449 4,631,390
541 4,631,391
549 4,631,392

CLASS 220

1 R 4,630,744
6 4,630,745
4,630,746
7 4,630,747
86 AT 4,630,748
86 R 4,630,749
324 4,630,750
334 4,630,751
404 4,630,752

CLASS 222

17 4,630,753
28 4,630,754
56 4,630,755
78 4,630,756
79 4,630,757
189 4,630,758
377 4,630,759
387 4,630,760
551 4,630,761

CLASS 223

66 4,630,762

CLASS 224

259 4,630,763

CLASS 225

2 4,630,764
96 4,630,765

CLASS 227

8 4,630,766

CLASS 228

122 4,630,767

CLASS 229

92.7 4,630,768

CLASS 232

1 D 4,630,769

CLASS 235

89 A 4,631,393

CLASS 236

34.5 4,630,770

CLASS 237

17 4,630,771

CLASS 238

159 4,630,772

CLASS 239

1 4,630,773
8 4,630,774
56 4,630,775
553.3 4,630,776
707 4,630,777

CLASS 241

1 4,630,778
4,630,779
46 B 4,630,780
159 4,630,781

CLASS 242

18 EW 4,630,782
56 A 4,630,783
56.1 4,630,784
72.1 4,630,785
96 4,630,786

CLASS 244

65 4,630,787
104 FP 4,630,788
135 R 4,630,789
169 4,630,790
173 4,630,791

CLASS 246

369 4,630,792

CLASS 248

102 4,630,793
309.1 4,630,794
318 4,630,795
648 4,630,796

CLASS 249

20 4,630,797
50 4,630,798

CLASS 250

201 4,631,394
4,631,395
4,631,396
4,631,397
216 4,631,398
221 4,631,399
4,631,400
227 4,631,401
231 R 4,631,402
237 G 4,631,403
4,631,404
266 4,631,405
327.2 4,631,407
338 4,631,406
339 4,631,408
361 R 4,631,409
363 R 4,631,410
374 4,631,411
381 4,631,412
458.1 4,631,413
474.1 4,631,414
497.1 4,631,415
548 4,631,416
578 4,631,417

CLASS 251

129.18 4,630,799
324 4,630,800

CLASS 252

8.5 M 4,631,136
8.514 4,631,137
8.555 4,631,138
49.3 4,631,139
62.56 4,631,140
95 4,631,141
184 4,631,142
299.62 4,631,143
301.4 R 4,631,144
321 4,631,145
522 R 4,631,146
4,631,147
609 4,631,148

CLASS 260

408 4,631,151
963 4,631,347

CLASS 261

4 4,631,152
52 4,631,153

CLASS 264

3.1 4,631,154
22 4,631,155
37 4,631,156
41 4,631,157
43 4,631,158
53 4,631,159
62 4,631,160
167 4,631,161
4,631,162
291 4,631,163

CLASS 266

216 4,630,801
225 4,630,802

CLASS 267

8 R 4,630,803
52 4,630,804
64.13 4,630,805
140.1 4,630,806
4,630,807
4,630,808
141.1 4,630,809
153 4,630,810

CLASS 269

10.55 F 4,631,379
118 4,630,811

CLASS 271

132 4,630,812
227 4,630,813
272 4,630,814
273 4,630,815

CLASS 272

70 4,630,816
73 4,630,817
4,630,818
113 4,630,819

CLASS 273

82 R 4,630,820
85 G 4,630,821
118 A 4,630,822
148 B 4,630,823
150 4,630,824
167 H 4,630,825
4,630,826
169 4,630,827
176 FB 4,630,828
186 A 4,630,829
240 4,630,830
292 4,630,831
374 4,630,832

CLASS 277

140 B1 4,429,885
188 A 4,630,833
212 FB 4,630,834
235 B 4,630,835

CLASS 279

19 4,630,836

CLASS 280

47.17 4,630,838
47.2 4,630,837
255 4,630,839
707 4,630,840
806 4,630,841
814 4,630,842

CLASS 281

30 4,630,843

CLASS 283

67 4,630,844
91 4,630,845

CLASS 285

21 4,630,846
29 4,630,847
55 4,630,849
308 4,630,848
322 4,630,850
341 4,630,851

CLASS 292

87 4,630,852
258 4,630,853
343 4,630,854

CLASS 294

81.21 4,630,855
81.53 4,630,856

CLASS 296

37.12 4,630,857
146 4,630,858
217 4,630,859
4,630,860

CLASS 297

44 4,630,861
167 4,630,862
219 4,630,863
232 4,630,864
284 4,630,865
361 4,630,866
452 4,630,867

CLASS 299

4 4,630,868
33 4,630,869

CLASS 303

24 A 4,630,870
113 4,630,871

CLASS 307

200 A 4,631,418
255 4,631,419
272 R 4,631,420
297 4,631,421
300 4,631,422
352 4,631,423
448 4,631,424
449 4,631,425
450 4,631,426
455 4,631,427
475 4,631,428
490 4,631,429

CLASS 310

12 4,631,430
13 4,631,431
14 4,631,432
89 4,631,433
112 4,631,434
156 4,631,435
322 4,631,436
369 4,631,437

CLASS 312

209 4,630,873

CLASS 313

359.1 4,631,438
402 4,631,439
403 4,631,440
408 4,631,441
414 4,631,442
417 4,631,443
420 4,631,444
467 4,631,445
634 4,631,446

CLASS 315

5 4,631,447
111.81 4,631,448
205 4,631,449
209 R 4,631,451
244 4,631,450
334 4,631,452
340 4,631,453
408 4,631,454

CLASS 318

37 4,631,455
140 4,631,456
254 4,631,457
4,631,458
4,631,459
280 4,631,460
4,631,461
318 4,631,462
558 4,631,463
563 4,631,464
565 4,631,465
696 4,631,466
798 4,631,467

CLASS 320

14 4,631,468

CLASS 322

42 4,631,469

CLASS 323

282 4,631,470
306 4,631,471
325 4,631,472

CLASS 324

71.4 4,631,483
72.5 4,631,473
73 R 4,631,474
102 4,631,475
103 R 4,631,476
207 4,631,477
4,631,478
212 4,631,479
309 4,631,480
320 4,631,481
454 4,631,482

CLASS 328

63 4,631,484

CLASS 329

50 4,631,485
4,631,486
4,631,487
4,631,488
110 4,631,489

CLASS 330

51 4,631,490
149 4,631,491
277 4,631,492
4,631,493
286 4,631,494
310 4,631,495

CLASS 331

1 A 4,631,496
4 4,631,497
9 4,631,498
11 4,631,499
51 4,631,500
143 4,631,501

CLASS 332

16 T 4,631,502

CLASS 333

24.1 4,631,503
25 4,631,504
33 4,631,505
224 4,631,506

CLASS 335

27 4,631,507
142 4,631,508

CLASS 336

92 4,631,509
135 4,631,510
180 4,631,511

CLASS 338

48 4,631,512

CLASS 339

17 CF 4,630,875
17 F 4,630,874
48 4,630,876
60 M 4,630,877
75 M 4,630,878
99 R 4,630,879
176 L 4,630,880
176 R 4,630,881
198 R 4,630,882

CLASS 340

52 R 4,631,513
4,631,514
62 4,631,515
76 4,631,516
326 4,631,517
333 4,631,366
347 CC 4,631,520
4,631,522
347 DA Re.32,313
4,631,518
347 DD 4,631,521
347 P 4,631,519
4,631,524
347 SY 4,631,523
365 S 4,631,525
396 4,631,526
539 4,631,527
545 4,631,528
619 4,631,529
679 4,631,530
701 4,631,531
703 4,631,532
721 4,631,533
825.5 4,631,534
856 4,631,535
857 4,631,536
870.17 4,631,537
870.18 4,631,538
870.29 4,631,539
870.38 4,631,540

CLASS 342

20 4,631,542
389 4,631,543

CLASS 343

5 DP 4,631,541
771 4,631,544
779 4,631,545
833 4,631,546
840 4,631,547

CLASS 346

1.1 4,631,548
4,631,549

4,631,550
108 4,631,551
136 4,631,552
140 R 4,631,553
4,631,554
4,631,555
4,631,556
4,631,557
4,631,558
160 4,631,559

CLASS 350

96.15 4,630,883
4,630,884
4,630,885
96.20 4,630,886
96.23 4,630,887
4,630,888
96.30 4,630,889
4,630,890
105 4,630,891
264 4,630,892
334 4,630,893
338 4,630,894
345 4,630,895
350 R 4,630,896
4,630,897
354 4,630,898
427 4,630,899
539 4,630,900
552 4,630,901
570 4,630,902
579 4,630,903
600 4,630,904
613 4,630,905

CLASS 351

159 4,630,906

CLASS 352

75 4,630,907

CLASS 353

94 4,630,908

CLASS 354

1 4,630,909
76 4,630,910
82 4,630,911
88 4,630,912
115 4,630,913
212 4,630,914
275 4,630,915
418 4,630,916
456 4,630,917

CLASS 355

3 R 4,630,918
3 SH 4,630,921
4 4,630,919
15 4,630,920
55 4,630,922

CLASS 356

301 4,630,923
316 4,630,924
318 4,630,925
357 4,630,926
372 4,630,927
374 4,630,928

CLASS 357

6 4,631,560
13 4,631,561
4,631,562
23.1 4,631,563
23.4 4,631,564
4,631,565
30 4,631,566
38 4,631,567
45 4,631,569
49 4,631,568
4,631,570
68 4,631,571
74 4,631,572
82 4,631,573

CLASS 358

12 4,631,574
30 4,631,575
65 4,631,576
75 4,631,577
80 4,631,578
4,631,579
88 4,631,580
93 4,631,581
98 4,631,582
125 4,631,583
141 4,631,584
148 4,631,585
4,631,586
4,631,587
149 4,631,588
171 4,631,589
185 4,631,590
190 4,631,591
213 4,631,592
4,631,593
231 4,631,594
243 4,631,595
256 4,631,596
258 4,631,597
280 4,631,598
285 4,631,599
320 4,631,600
335 4,631,601

CLASS 360

16 4,631,602
37.1 4,631,603
66 4,631,604
70 4,631,605
78 4,631,606
96.5 4,631,607
99 4,631,608
104 4,631,610
106 4,631,611
125 4,631,612
4,631,613
128 4,631,614
4,631,615
4,631,616
131 4,631,617
132 4,631,618
4,631,619
133 4,631,620
135 4,631,609

CLASS 361

13 4,631,621
45 4,631,622
86 4,631,623
89 4,631,624
94 4,631,625
104 4,631,626
153 4,631,627
154 4,631,628
4,631,629
212 4,631,630
306 4,631,631
315 4,631,632
321 4,631,633
358 4,631,634
383 4,631,635
385 4,631,636
413 4,631,637
415 4,631,638
417 4,631,639
422 4,631,640
424 4,631,641

CLASS 362

32 4,631,642
97 4,631,643
105 4,631,644
4,631,645
118 4,631,646
147 4,631,647
150 4,631,648
183 4,631,649
249 4,631,650
267 4,631,651

CLASS 363

16 4,631,652
17 4,631,653
21 4,631,654
50 4,631,655
123 4,631,656

CLASS 364

167 4,631,657
184 4,631,658
200 4,631,659
4,631,660
4,631,661
4,631,662
4,631,663
4,631,664
4,631,665
4,631,666
4,631,667
4,631,668
4,631,669
4,631,670
4,631,671
300 4,631,672
4,631,673
400 4,631,674
413 4,631,675
422 4,631,676
424 4,631,677
424.1 4,631,678
431.05 4,631,679
464 4,631,680
471 4,631,681
474 4,631,682
4,631,683
4,631,684
476 4,631,685
490 4,631,686
497 4,631,687
507 4,631,688
513 4,631,689
518 4,631,690
4,631,692
521 4,631,691
550 4,631,693
608 4,631,694
715 4,631,695
748 4,631,696
900 4,631,697
4,631,698
4,631,699
4,631,700
4,631,701
4,631,702
4,631,703

CLASS 365

126 4,631,704
182 4,631,705
215 4,631,706
226 4,631,707

CLASS 366

10 4,630,929
77 4,630,930
107 4,630,931
279 4,630,932

CLASS 367

2 4,631,708
4 4,631,709
103 4,631,710
149 4,631,711

CLASS 368

10 4,630,933
28 4,630,934
41 4,630,935
66 4,630,936
223 4,630,937

CLASS 369

44 4,631,712
54 4,631,713
59 4,631,714
68 4,631,715
75.2 4,631,716
276 4,631,717

CLASS 370

4 4,631,718
15 4,631,719
84 4,631,720
85 4,631,721

CLASS 371

9 4,631,722
10 4,631,723
21 4,631,724
39 4,631,725

CLASS 372

31 4,631,726
33 4,631,727
38 4,631,728
44 4,631,729
50 4,631,730
74 4,631,731
87 4,631,732

CLASS 374

44 4,630,938
135 4,630,939
148 4,630,940

CLASS 375

7 4,631,733
15 4,631,734
34 4,631,735
71 4,631,736
88 4,631,737
98 4,631,738

CLASS 376

300 4,631,164
333 4,631,165
435 4,631,166
446 4,631,167
4,631,168

CLASS 377

60 4,631,739
76 4,631,740

CLASS 378

10 4,631,741
113 4,631,742
138 4,631,743
4,631,744

CLASS 379

15 4,631,363
29 4,631,368
40 4,631,357
45 4,631,358
157 4,631,367
164 4,631,364
167 4,631,365
324 4,631,359
4,631,360
351 4,631,361
384 4,631,362

CLASS 381

15 4,631,745
35 4,631,746
51 4,631,747
4,631,748
103 4,631,749

CLASS 382

41 4,631,750
47 4,631,751

CLASS 384

1 4,630,941
8 4,630,942
39 4,630,944
45 4,630,872
133 4,630,943
320 4,630,945

CLASS 400

121 4,630,946
124 4,630,947
196.1 4,630,948
568 4,630,949
639.1 4,630,950
697.1 4,630,951

CLASS 401

48 4,630,952
83 4,630,953
123 4,630,954
4,630,955

CLASS 403

49 4,630,956
76 4,630,957
257 4,630,958
266 4,630,959
345 4,630,960

CLASS 404

1 4,630,961
2 4,630,962
75 4,630,963
96 4,630,964
107 4,630,965

CLASS 405

118 4,630,966
184 4,630,967
195 4,630,968
217 4,630,969
224 4,630,970
260 4,630,971
269 4,630,972
288 4,630,973
4,630,974

CLASS 406

85 4,630,975

CLASS 407

65 4,630,976

CLASS 408

83.5 4,630,977
159 4,630,978

CLASS 409

232 4,630,979
234 4,630,980

CLASS 410

91 4,630,981
102 4,630,982

CLASS 411

15 4,630,983
368 4,630,984
386 4,630,985

CLASS 414

24.6 4,630,986
32 4,630,987
327 4,630,988
401 4,630,989
462 4,630,990
478 4,630,991
744 R 4,630,992

CLASS 415

53 R 4,630,993
190 4,630,994

CLASS 416

7 4,630,995
16 4,630,996
90 A 4,630,997
134 A 4,630,998
167 4,630,999

CLASS 417

3 4,631,001
49 4,631,002
151 4,631,003
189 4,631,004
218 4,631,005
225 4,631,000
234 4,631,006
476 4,631,007
477 4,631,008

CLASS 418

15 4,631,009
61 B 4,631,010
68 4,631,011
70 4,631,012

CLASS 420

443 4,631,169
455 4,631,170
481 4,631,171
541 4,631,172

CLASS 422

28 4,631,173
56 4,631,174
135 4,631,175

CLASS 423

100 4,631,176
112 4,631,177
210 4,631,178
345 4,631,179
449 4,631,181
450 4,631,180
652 4,631,182
659 4,631,183

CLASS 424

49 4,631,184
4,631,185
61 4,631,186
70 4,631,187
81 4,631,188
85 4,631,189
4,631,190
88 4,631,191

CLASS 425

7 4,631,013
34 R 4,631,014
140 4,631,021
195 4,631,015
224 4,631,016
335 4,631,017
445 4,631,018
458 4,631,019
527 4,631,020

CLASS 426

69 4,631,192
330.4 4,631,193
535 4,631,194
548 4,631,195
580 4,631,196

CLASS 427

10 4,631,197
38 4,631,198
54.1 4,631,199
113 4,631,200
118 4,631,201
131 4,631,202
145 4,631,203
150 4,631,204
255.6 4,631,205
340 4,631,206
387 4,631,207
4,631,208
392 4,631,209

CLASS 428

13 4,631,210
35 4,631,211
36 4,631,212
53 4,631,213
68 4,631,214
105 4,631,215
106 4,631,216
118 4,631,217
131 4,631,218
4,631,219
133 4,631,220
166 4,631,221
172 4,631,222
4,631,223
246 4,631,224
250 4,631,225
270 4,631,226
283 4,631,227
316.6 4,631,228
343 4,631,229
412 4,631,230
413 4,631,231
4,631,232
420 4,631,233
428 4,631,234
518 4,631,235
558 4,631,236
621 4,631,237

CLASS 429

30 4,631,238
39 4,631,239
105 4,631,240
225 4,631,241

CLASS 430

58 4,631,242
114 4,631,243
137 4,631,244
175 4,631,245
271 4,631,246
281 4,631,247
313 4,631,248
325 4,631,249
329 4,631,250
548 4,631,251
551 4,631,252
569 4,631,253

CLASS 431

90 4,631,022
268 4,631,024
329 4,631,023

CLASS 432

13 4,631,027
15 4,631,025
133 4,631,029
138 4,631,026

CLASS 433

4 4,631,028
149 4,631,030
173 4,631,031

CLASS 435

7 4,631,254
37 4,631,255
68 4,631,256
4,631,257
99 4,631,258
172.3 4,631,259

CLASS 440

7 4,631,033
4,631,034
47 4,631,032
61 4,631,035
66 4,631,036
100 4,631,037

CLASS 441

8 4,631,042
18 4,631,043
114 4,631,044

CLASS 493

46 4,631,045
59 4,631,046
227 4,631,047

CLASS 494

13 4,631,048
71 4,631,049

CLASS 501

88 4,631,260

CLASS 502

65 4,631,261
4,631,262
159 4,631,263
243 4,631,264
259 4,631,265
324 — 4,631,266
439 4,631,267
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CLASS 514

15 4,631,270
23 4,631,271
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29 4,631,273
202 4,631,274
210 4,631,275
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239 4,631,277
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252 4,631,281
254 4,631,282
259 4,631,283
277 4,631,284
292 4,631,285
297 4,631,286

CLASSIFICATION OF PATENTS

307	4,631,287		CLASS 522		CLASS 525	220	4,631,325	492	4,631,339		CLASS 562
340	4,631,288	100	4,631,300	67	4,631,311	249	4,631,326	546	4,631,149	607	4,631,348
397	4,631,289		CLASS 523	221	4,631,312	256	4,631,327		CLASS 544		CLASS 568
450	4,631,290	122	4,631,301	250	4,631,313	259	4,631,328	171	4,631,340	789	4,631,349
	4,631,291		4,631,302	314	4,631,314		CLASS 528	189	4,631,341		CLASS 604
452	4,631,292	177	4,631,303	338	4,631,315	28	4,631,329	313	4,631,342	4	4,631,050
530	4,631,293	215	4,631,304	352	4,631,316	49	4,631,330		CLASS 546	9	4,631,051
557	4,631,294	400	4,631,305	383	4,631,317	96	4,631,331	279	4,631,343	22	4,631,052
558	4,631,295	457	4,631,306	432	4,631,318	117	4,631,332		CLASS 548	49	4,631,053
	CLASS 521		CLASS 524	437	4,631,319	170	4,631,333	146	4,631,344	54	4,631,054
65	4,631,296	269	4,631,307	452	4,631,320	202	4,631,334	147	4,631,345	82	4,631,055
77	4,631,299	272	4,631,308	478	4,631,321	353	4,631,335		CLASS 556	111	4,631,056
78	4,631,297	426	4,631,309	480	4,631,322	388	4,631,336	420	4,631,346	198	4,631,057
163	4,631,298	862	4,631,310	509	4,631,323	391	4,631,337			263	4,631,058
					CLASS 526	483	4,631,338			280	4,631,059
				212	4,631,324		CLASS 540			285	4,631,060
						310	4,631,150			318	4,631,061
										385 R	4,631,062

CLASSIFICATION OF DESIGNS

D2—	314	287,301		534	287,320		401	287,340		40	287,360		150	287,381	D24—	3	287,401
	318	287,302		539	287,321	D10—	30	287,341	D14—	53	287,361		155	287,382		10	287,402
	320	287,303	D7—	9	287,322		75	287,342			287,362		157	287,383		17	287,403
		287,304		12	287,323		96	287,343		62	287,363			287,384		34	287,404
	331	287,366		50	287,324	D11—	134	287,344		94	287,364			287,385		40	287,405
D3—	12	287,306			287,325		139	287,345		114	287,365		189	287,386		64	287,406
		287,307		346	287,326		151	287,346	D15—	12	287,367		191	287,387	D26—	3	287,407
	106	287,305		384	287,327		157	287,347		199	287,368		195	287,388		26	287,408
D4—	116	287,308	D8—	1	287,328	D12—	119	287,348	D16—	133	287,369			287,389		40	287,409
	119	287,309		14	287,329		140	287,349	D18—	7	287,370		204	287,390			287,410
		287,310		62	287,330		147	287,350		22	287,371		219	287,391		46	287,411
		287,311		98	287,331			287,351	D19—		287,372		221	287,392		60	287,412
	123	287,312		105	287,332		151	287,352		43	287,373		230	287,393		65	287,413
		287,313		373	287,333		192	287,353		89	287,374	D23—	18	287,394		139	287,414
		287,314	D9—	318	287,334			287,354	D21—	11	287,375		32	287,395	D27—	22	287,415
D6—	335	287,315		338	287,335			287,355		59	287,376		47	287,396	D28—	55	287,416
	349	287,316		341	287,336			287,356		65	287,377		55	287,397		76	287,417
	354	287,317		349	287,337		314	287,357		87	287,378		57	287,398		83	287,418
	429	287,318		355	287,338	D13—	30	287,358		109	287,379		71	287,399	D29—	16	287,300
	474	287,319		377	287,339		32	287,359		111	287,380		131	287,400	D32—	18	287,419

CLASSIFICATION OF PLANTS

P.—	7	5,835	18	5,836	30	5,837	34	5,838	43	5,839	49	5,840

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
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Canal Zone	7	Minnesota	27	Tennessee	47
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Connecticut	9	Missouri	29	Utah	49
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,630,474	4,630,692	4,631,435	4,630,955	4,631,580	4,631,264
	4,630,480	4,630,703	4,631,453	4,631,037	4,631,588	4,631,353
	4,630,539	4,630,730	4,631,463	4,631,082	4,631,636	4,631,363
	4,630,676	4,630,752	4,631,472	4,631,171	4,631,670	4,631,536
	4,630,683	4,630,763	4,631,474	4,631,316	4,631,737	4,631,573
	4,630,771	4,630,767	4,631,493	4,631,320	4,631,738	4,631,574
	4,631,121	4,630,790	4,631,498	4,631,335	4,631,750	4,631,587
	4,631,125	4,630,816	4,631,505	4,631,345	13 : 4,630,319	4,631,601
	4,631,631	4,630,824	4,631,516	4,631,354	4,630,455	4,631,648
04 :	4,630,323	4,630,825	4,631,524	4,631,383	4,630,717	4,631,655
	4,630,376	4,630,828	4,631,541	4,631,432	4,630,761	4,631,682
	4,630,385	4,630,829	4,631,568	4,631,528	4,630,913	4,631,745
	4,630,624	4,630,831	4,631,569	4,631,557	4,631,029	18 : 4,630,331
	4,630,672	4,630,838	4,631,572	4,631,621	4,631,604	4,630,443
	4,630,773	4,630,842	4,631,583	4,631,622	4,631,625	4,630,485
	4,630,898	4,630,843	4,631,586	4,631,634	15 : 4,630,326	4,630,506
	4,631,004	4,630,905	4,631,603	4,631,649	4,630,399	4,630,547
	4,631,092	4,630,907	4,631,613	4,631,681	4,630,562	4,630,657
	4,631,494	4,630,911	4,631,614	10 : 4,631,018	16 : 4,630,659	4,630,715
	4,631,532	4,630,923	4,631,647	4,631,111	17 : 4,630,384	4,630,743
	4,631,540	4,630,963	4,631,653	4,631,205	4,630,390	4,631,026
	4,631,570	4,630,978	4,631,657	4,631,244	4,630,417	4,631,044
	4,631,695	4,631,028	4,631,660	4,631,247	4,630,448	4,631,201
	4,631,733	4,631,041	4,631,666	4,631,602	4,630,457	4,631,279
05 :	4,630,964	4,631,060	4,631,673	11 : 4,631,186	4,630,461	4,631,339
	4,631,050	4,631,070	4,631,692	4,631,447	4,630,465	4,631,343
06 :	4,630,343	4,631,093	4,631,694	12 : 4,630,317	4,630,467	4,631,374
	4,630,367	4,631,094	4,631,727	4,630,346	4,630,497	4,631,595
	4,630,369	4,631,105	4,631,728	4,630,389	4,630,504	4,631,685
	4,630,423	4,631,113	4,631,729	4,630,391	4,630,530	19 : 4,630,420
	4,630,426	4,631,116	4,631,739	4,630,477	4,630,532	4,630,431
	4,630,427	4,631,123	4,631,740	4,630,576	4,630,536	4,630,526
	4,630,447	4,631,154	4,631,741	4,630,608	4,630,685	4,630,988
	4,630,473	4,631,191	08 : 4,630,397	4,630,615	4,630,695	4,631,624
	4,630,483	4,631,199	4,630,543	4,630,625	4,630,731	20 : 4,630,380
	4,630,510	4,631,202	4,631,073	4,630,640	4,630,733	4,630,991
	4,630,513	4,631,211	4,631,108	4,630,646	4,630,801	4,631,025
	4,630,517	4,631,235	4,631,160	4,630,656	4,630,830	4,631,530
	4,630,521	4,631,248	4,631,176	4,630,677	4,630,835	21 : 4,630,619
	4,630,540	4,631,257	4,631,192	4,630,709	4,630,837	4,631,217
	4,630,594	4,631,331	4,631,401	4,630,799	4,630,882	4,631,270
	4,630,600	4,631,332	4,631,534	4,630,844	4,630,984	4,631,300
	4,630,609	4,631,352	4,631,598	4,630,895	4,631,000	22 : 4,630,593
	4,630,622	4,631,365	4,631,605	4,631,008	4,631,007	4,630,636
	4,630,634	4,631,375	09 : 4,630,360	4,631,019	4,631,009	4,630,679
	4,630,638	4,631,385	4,630,362	4,631,020	4,631,052	4,630,694
	4,630,644	4,631,392	4,630,440	4,631,051	4,631,056	4,630,939
	4,630,650	4,631,393	4,630,572	4,631,119	4,631,131	4,631,175
	4,630,652	4,631,400	4,630,617	4,631,428	4,631,149	4,631,179
	4,630,675	4,631,416	4,630,655	4,631,483	4,631,161	4,631,258
	4,630,681	4,631,427	4,630,756	4,631,486	4,631,195	4,631,298
	4,630,684	4,631,429	4,630,809	4,631,496	4,631,197	4,631,700
	4,630,691	4,631,431	4,630,954	4,631,525	4,631,210	24 : 4,630,324

4,630,395
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4,631,184
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25 : 4,630,321
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26 : 4,630,338
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DESIGN PATENTS

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06 : 5,837
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24 : 5,835

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Donald J. Quigg, *Commissioner*

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Vol. 1073 Number 5

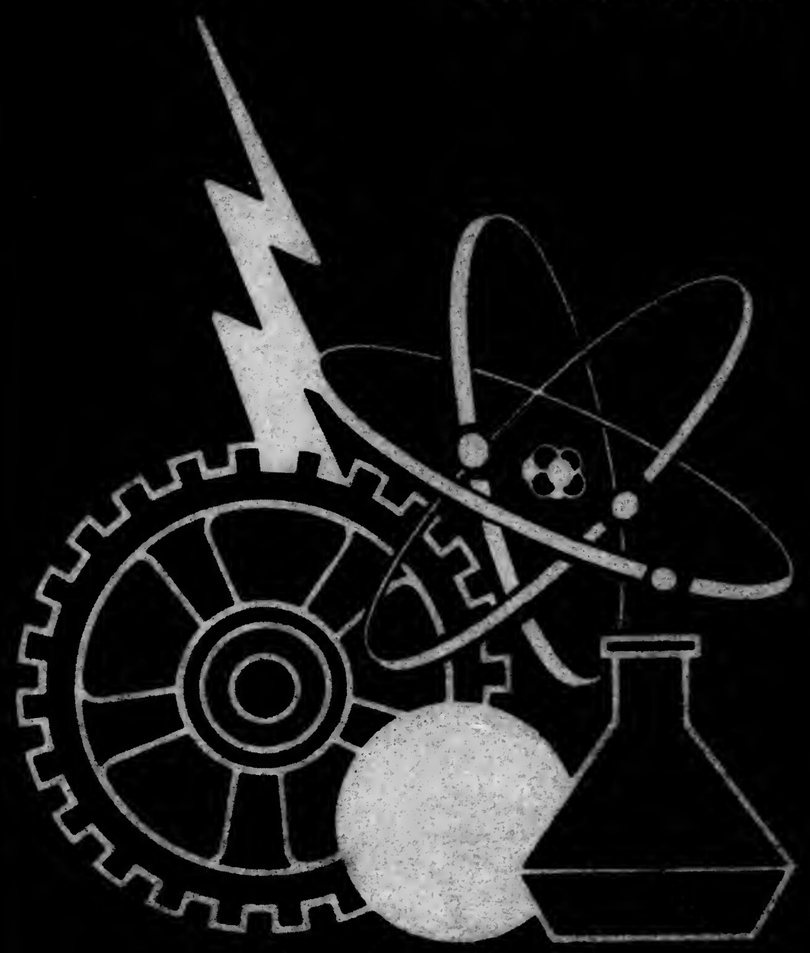
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 30, 1986



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 30, 1986 Volume 1073 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 27, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,422,183 through 4,423,522
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 12, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 31,795	06/553,051	1/8/85
(4,353,512)	(06/224,952)	(10/12/82)
4,353,138	06/295,080	10/12/82
4,353,158	06/247,771	10/12/82
4,353,161	06/274,961	10/12/82
4,353,182	06/226,400	10/12/82
4,353,200	06/300,778	10/12/82
4,353,209	06/217,716	10/12/82
4,353,210	06/264,757	10/12/82
4,353,243	06/230,817	10/12/82
4,353,327	06/275,381	10/12/82
4,353,349	06/216,795	10/12/82
4,353,350	06/242,464	10/12/82
4,353,351	06/235,238	10/12/82
4,353,377	06/271,318	10/12/82
4,353,379	06/241,432	10/12/82
4,353,380	06/252,723	10/12/82
4,353,381	06/239,120	10/12/82
4,353,382	06/240,882	10/12/82
4,353,464	06/257,513	10/12/82
4,353,496	06/227,544	10/12/82
4,353,509	06/258,439	10/12/82
4,353,515	06/221,026	10/12/82
4,353,525	06/288,436	10/12/82
4,353,532	06/278,831	10/12/82
4,353,536	06/231,491	10/12/82
4,353,537	06/248,875	10/12/82
4,353,545	06/239,904	10/12/82
4,353,549	06/225,243	10/12/82
4,353,550	06/233,673	10/12/82
4,353,584	06/238,073	10/12/82
4,353,593	06/257,976	10/12/82
4,353,639	06/266,977	10/12/82
4,353,673	06/301,240	10/12/82
4,353,690	06/282,963	10/12/82
4,353,719	06/223,787	10/12/82
4,353,736	06/229,246	10/12/82
4,353,743	06/217,650	10/12/82
4,353,756	06/217,728	10/12/82
4,353,768	06/306,840	10/12/82
4,353,777	06/255,495	10/12/82
4,353,825	06/236,029	10/12/82
4,353,846	06/321,766	10/12/82
4,353,849	06/275,373	10/12/82
4,353,855	06/219,430	10/12/82
4,353,865	06/257,216	10/12/82
4,353,873	06/257,265	10/12/82
4,353,898	06/283,454	10/12/82
4,353,903	06/225,265	10/12/82
4,353,906	06/230,540	10/12/82
4,353,909	06/305,159	10/12/82
4,353,910	06/325,292	10/12/82
4,353,913	06/224,584	10/12/82
4,353,918	06/219,195	10/12/82
4,353,919	06/254,539	10/12/82
4,353,927	06/264,346	10/12/82
4,353,943	06/291,549	10/12/82
4,353,960	06/238,766	10/12/82
4,353,968	06/283,522	10/12/82
4,353,974	06/237,012	10/12/82
4,353,989	06/226,132	10/12/82
4,354,019	06/329,283	10/12/82
4,354,219	06/249,863	10/12/82
4,354,242	06/216,725	10/12/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,477,745, Re. S.N. 854,670, Filed Apr. 18, 1986, Cl. 285/40, QUICK CONNECTION OF PIPE TO DUCTING, James W. Williams, et al., Owner of Record: *Allied Insulation Co., Huntington Beach, Calif.,* Attorney or Agent: Watson T. Scott, et al., Ex. Gp.: 351

4,121,507, Re. S.N. 546,692, Filed Oct. 28, 1986, Cl. 99/275, APPARATUS FOR MIXING A CARBONATED BEVERAGE, Alexander Kuckens, Owner of Record: *Inventor,* Attorney or Agent: Dale R. Small, Ex. Gp.: 240

4,216,552, Re. S.N. 885,521, Filed July 14, 1986, Cl. 4/548, SINK MOUNTED BATHING DEVICE, Richard C. Gurolnick, Owner of Record: *Inventor,* Attorney or Agent: George J. Netter, Ex. Gp.: 240

4,283,463, Re. S.N. 927,219, Filed Nov. 5, 1986, Cl. 428/512, MOLDED PRODUCTS OF POLYPROPYLENE, Akinobu Shiga, et al., Owner of Record: *Sumitomo Chemical Co., Ltd., Osaka, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 150

4,385,933, Re. S.N. 910,290, Filed Sept. 17, 1986, Cl. 106/98, METHOD OF PRODUCING LIGHT WEIGHT CEMENT FOR USE OF CEMENTATION OF OIL AND GAS WELLS, Sigve Skjeldal, Owner of Record: *Inventor,* Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 110

4,410,126, Re. S.N. 918,288, Filed Oct. 10, 1986, Cl. 228/180, MASS SOLDERING SYSTEM, Harold T. O'Rourke, Owner of Record: *Hollis Automation, Inc.,* Attorney or Agent: Oliver W. Hayes, et al., Ex. Gp.: 320

4,443,817, Re. S.N. 847,298, Filed Mar. 26, 1986, Cl. 358/167, CHROMA NOISE REDUCTION SYSTEM FOR QUADRATURE MODULATED COLOR TELEVISION PICTURE SIGNALS, Yves C. Faroudja, Owner of Record: *Inventor,* Attorney or Agent: David B. Hamilton, et al., Ex. Gp.: 260

4,465,441, Re. S.N. 896,679, Filed Aug. 14, 1986, Cl. 417/517, TWO-CYLINDER PUMP FOR HEAVY FLOWABLE MATERIALS, SUCH AS CONCRETE, Friedrich Schwing, Owner of Record: *Friedrich Wilh, Schwing GmbH, West Germany,* Attorney or Agent: James L. Young, et al., Ex. Gp.: 340

4,474,712, Re. S.N. 906,339, Filed Sept. 11, 1986, Cl. 123/200, CENTRAL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES, Rudolph Diener, Owner of Record: *Autoelektronik AG, Chur, Switzerland,* Attorney or Agent: E. Mickey Hubbard, et al., Ex. Gp.: 340

4,475,747, Re. S.N. 914,991, Filed Oct. 3, 1986, Cl. 604/4, PACKING FORM, Robert E. Ashby, Owner of Record: *Moore Business Forms, Inc.,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 330

4,477,035, Re. S.N. 913,719, Filed Sept. 30, 1986, Cl. 242/67.1R, WINDING A PACKAGE OF TAPE, Lawrence O'Connor, Owner of Record: *Kable Tapes Ltd., Manitoba, Canada,* Attorney or Agent: Stanley G. Ade, Ex. Gp.: 240

4,481,487, Re. S.N. 927,218, Filed Nov. 4, 1986, Cl. 331/117D, MONOLITHIC MICROWAVE WIDEBAND, Gailon E. Brehm, et al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.,* Attorney or Agent: Carlton H. Hoel, et al., Ex. Gp.: 250

4,483,642, Re. S.N. 923,819, Filed Oct. 27, 1986, Cl. 405/132, MINE STOPPING AND METHOD OF AND JACK FOR INSTALLING SAME, John M.

Kennedy, et al., Owner of Record: *Inventors,* Attorney or Agent: Irving Powers, et al., Ex. Gp.: 350

4,485,024, Re. S.N. 920,226, Filed Oct. 16, 1986, Cl. 252/62.560, PROCESS FOR PRODUCING A FERROFLUID AND A COMPOSITION THEREOF, Kyozaburo Furumura, et al., Owner of Record: *Nippon Seiko Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Louis E. Marn, et al., Ex. Gp.: 110

4,512,361, Re. S.N. 925,692, Filed Oct. 29, 1986, Cl. 137/355.27, HOSE STORAGE APPARATUS, Cosmo N. Tisbo, et al., Owner of Record: *Suncast Corp., Batavia, Ill.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 340

4,538,095, Re. S.N. 924,852, Filed Oct. 28, 1986, Cl. 315/244, SERIES-RESONANT ELECTRONIC BALLAST CIRCUIT, Ole K. Nilssen, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 260

4,557,415, Re. S.N. 916,397, Filed Oct. 7, 1986, Cl. 229/30, ICE CREAM CARTON, William H. Carr, Jr., et al., Owner of Record: *Container Corp. of America, Chicago, Ill.,* Attorney or Agent: Richard W. Carpenter, Ex. Gp.: 240

4,582,596, Re. S.N. 923,523, Filed Oct. 27, 1986, Cl. 209/166, FROTHERS DEMONSTRATING ENHANCED RECOVERY OF COARSE PARTICLES IN FROTH FLOTATION, Robert D. Hansen, et al., Owner of Record: *The Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Philip D. Shepherd, Ex. Gp.: 310

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Erratum

In the Official Gazette of Dec. 2, 1986 at 1073 OG 529, the notation "Patent Not Issued For This Number" refers to Patent Number 4,626,896.

The patent listed as 4,626,896 for 'OPTICAL FILTER FOR COLOR IMAGING DEVICE' issued to Katsuta, et al., is Patent Number 4,626,897.

Advisory Committee for Patents and Trademarks; Establishment

In accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2.) and General Services Administration Interim Rule on Federal Advisory Committee Management, 41 CFR Part 101-6, as amended, and after consultation with GSA, the Secretary of Commerce has determined that the establishment of the Advisory Committee for Patents and Trademarks is in the public interest in connection with the performance of duties imposed on the Department by law.

1. The Committee will advise the Patent and Trademark Office on broad policy issues involving both patents and trademarks, and the overall operation of the Office including matters concerning office-wide Automation programs.

2. The Committee will consist of at least 10 but no more than 18 members to be appointed by the Assistant Secretary and Commissioner of Patents and Trademarks to assure a balanced representation among patent and trademark attorneys, corporate executives, technical research directors, inventors, the judiciary, professional patent and trademark searchers, information specialists and publishers, automation experts, consumer groups, entrepreneurs, and educators. The Committee will function solely as an advisory body and in compliance with the provisions of the Federal Advisory Committee Act. Its charter will be filed under the Act, 15 days from the date of the publication of this notice.

Interested persons are invited to submit comments regarding the establishment of the Advisory Committee for Patents and Trademarks. Such comments, as well as any inquiries, may be addressed to the Executive Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce, Washington, D.C. 20231, phone: 703-557-3071, or the Department's Committee Management Analyst, phone: 202-377-4217.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Nov. 14, 1986.

[FR Doc. 86-26451 Filed 11-21-86; 8:45 am]
BILLING CODE 3510-16-M

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Rae Enterprises Ltd., Suitland, Md., Registration No. 990,458 for the mark "SOAK SOCKS", Canc. No. 14,968.

C. Lloyd Claff, assignee, by mesne assignment, of C. Lloyd Claff, Woods Hole, Mass., Registration No. 588,644, for the mark "AUTOTHERM", Canc. No. 15,616.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Endur Products, Inc., St. Louis, Mo., Reg. No. 647,339, for the mark "ENDUR", Canc. No. 15,387.

William Wataghani, d/b/a Afrika House, Los Angeles, Calif., Reg. No. 1,132,747, for the mark "CREATION FLAMME", Canc. No. 15,442.

National Heritage Resorts, Inc., Irvine, Calif., Reg. No. 1,288,361, for the mark "NATIONAL HERITAGE RESORTS", Canc. No. 15,459.

African First Shotter's, Inc., Rapid City, S.D., Reg. No. 1,023,934, for the mark "CONSERVATION HALL OF FAME INTERNATIONAL", Canc. No. 15,607.

Fishmaster Products, Inc., Tulsa, Okla., Reg. No. 906,576, for the mark "FISHMASTER", Canc. No. 15,712.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1986 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with A through D. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with A through D and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

Dec. 2, 1986.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Jan. 31, 1987:

Bjorge, Gerald, 1300 Alps Dr., McLean, Va. 22102.
Illich, Russell W., P.O. Box 15813, Arlington, Va. 22215.
Knoble, John L., 3411 N. 21st Ave., Arlington, Va. 22207.
McCourt, Conor D. M., 133 Richmond St., West Toronto, Ont., Canada M5H 2L7.
McKee, Christopher L., 2111 Jeff. Davis Hwy., #307N, Arlington, Va. 22202.
Paxton, John E., Smart & Biggar, 70 Gloucester St., Ottawa, Ont., Canada K1P 5Y6.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Dec. 3, 1986.

Status of PTO Services

The following is an update of the status of PTO services for November 1986:

Service Item	FY 1987 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	26
Trademarks	30	33**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	6 Hours
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	9
Current Mail Date being processed		Nov. 20, 1986
Certified Copies:		
Trademark Registrations	21	27
Applications-As-Filed	17	15***
File-Wrapper/Contents	N/A	12
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	24
Filing Reg. Certificates	Issue Date	2 days Late
Assignments:		
Patents	20	17
Trademarks	20	19
Avg. Days from Issue Fee Payment to Issue Date	90–100	115****
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	99% on Issue Date

* Unless otherwise noted.
** Monthly average reduced by 4 days.
*** The 5% of orders for which fiche are not on site are not included in calculations.
**** Interval from fee payment to issuance is increasing because of the budget cut which necessitated the printing of 4,000 fewer patents than originally planned in FY 86.

IMPROVEMENTS TO SERVICES

- *Requests for Color Copies of Utility Patents Having Color Drawing(s)* — As announced in the Official Gazette Notice published at 1070 O.G. 10 on Sept. 9, 1986, the Office will provide color copies of utility patents having color drawings upon receipt of a special request and fee. All requests for such copies must be submitted in the form of a letter. These special requests should be directed to:

  Mary Reed, Manager
  Public Service Center
  U.S. Patent and Trademark Office
  Washington, D.C. 20231

  The current cost for color copies is $7.50 per sheet of color drawing. All requests will be filled with a complete black and white copy of the patent and copies of the full number of color drawings associated with the patent. Example: A request for color copies of a utility patent with two sheets of color drawings would cost $16.50: $1.50 + ($7.50 × 2). Payment may be made by authorizing the charge to a deposit account or by check.

HELPFUL HINTS

- *Interviews With Patent Examiners* — Prior to filing, no interview is permitted; only search assistance may be given to the attorney, searcher or inventor.

  Prior to first action, an interview is ordinarily granted only in continuing or substitute applications; a request for an interview is untimely and will not be granted prior to first action in all other applications.

  After final rejection, an interview will not be denied merely because final Office action has been rendered. Normally, one interview after a final rejection is permitted if the examiner is convinced that disposal or clarification for appeal may be accomplished with only nominal further consideration. In requesting an interview after final rejection, the intended purpose and content of the interview must be presented briefly, either orally or in writing. Interviews merely to restate arguments of record or to discuss new limitations which would require more than nominal reconsideration or new search will be denied.

After a case is sent to issue, it is technically no longer under the jurisdiction of the primary examiner (37 CFR 1.312). Requests for interviews on cases already passed to issue should be granted only with specific approval of the Group Director upon a showing in writing of extraordinary circumstances.

The ideal time for personal interviews, during which time an interview is clearly available, is the "Conference Period", which is the time between the filing of applicant's thorough first response to the examiner's first action on the merits and a concluding action by the examiner.

Protestors are not permitted to participate in interviews in applications where the protest was filed after Dec. 8, 1981, and the examiner will not communicate in any manner with such protestors.

In reexamination proceedings, an interview with the owner is permitted after first action. Requests that reexamination requesters be permitted to participate in or attend interviews will be denied.

When an interference has been declared, all questions involved are to be determined *inter partes* and will not be discussed *ex parte*.

No interview will be conducted with an attorney who is not registered or who has been suspended or excluded from practice regarding an application unless the attorney is the applicant in the application.

Following the grant of a United States Patent, an examiner must refuse to express any opinion or view as to the invalidity of the patent, except on the record in the course of examining a reissue application or a reexamination proceeding. Even in the case of search assistance on an invention, if an examiner is aware that the invention has been patented in the United States, the searcher will be referred to the prosecution file history, and the examiner will make no comment on the appropriateness of the search conducted or the references cited.

Should any examiner fail to comply with the above guidlines, the matter would best be brought to the attention of the examiner's Group Director.

Direct questions to:

Al Lawrence Smith
Director, Group 350
(703) 557-3414

- *Responses Filed in International Applications during the International Stage* — The 18 month publication deadline for international applications filed under the Patent Cooperation Treaty (PCT) is critical. Therefore, it is in applicant's interest to respond timely to an invitation to correct a PCT Article 14 defect. An untimely response can result in the withdrawal of the international application under Article 14 and PCT Rule 26. If an extension to respond is needed, call the person who signed the invitation before the expiration of the time limit. The PTO will strictly comply with PCT Article 14 and Rule 26 in holding international applications withdrawn when responses are untimely or not filed.

  When corrections of PCT Rule 91 obvious errors in the description, claims or abstract are submitted together with corrections of deficits under PCT Article 14, the transmittal letter should clearly note the Rule 91 corrections. This is necessary because, under PCT Rule 91.1(e), the Receiving Office can authorize the rectification of obvious errors only in the Request (Form PCT/RO/101), while Searching Authority authorization is needed for obvious errors in the description, claims or abstract. When the transmittal letter clearly notes the Rule 91 corrections, Searching Authority authorization of any obvious errors in the description, claims or abstract can be expedited.

  Call Jane Corrigan on 557-2003 if you have questions concerning responses filed during the international stage for international applications under the PCT.

- *PTO Entering of Attorney Docket Number on Missing Part/Incomplete Notices* — In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

  The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an "attorney docket number". This number will be entered by the PTO under the Title of Invention on the Notices.

  If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response, but no change will be made by the Office until the Filing Receipt is issued.

  If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corp.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

Dec. 5, 1986.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 30, 1986

Re. 30,928	4,567,426	4,594,679	4,609,609
Re. 32,232	4,568,625	4,595,074	4,609,912
4,021,224	4,568,743	4,596,299	4,610,108
4,124,376	4,569,121	4,596,440	4,610,380
4,126,215	4,569,332	4,596,577	4,611,007
4,276,078	4,569,453	4,596,820	4,611,039
4,389,428	4,569,967	4,597,428	4,611,052
4,392,884	4,571,453	4,597,462	4,611,623
4,415,352	4,572,192	4,598,115	4,611,709
4,415,353	4,577,150	4,599,722	4,612,326
4,417,105	4,578,520	4,600,538	4,612,664
4,455,746	4,580,055	4,600,698	4,613,564
4,464,337	4,580,171	4,600,700	4,613,643
4,467,103	4,580,611	4,602,241	4,613,689
4,468,458	4,580,772	4,602,900	4,614,484
4,486,316	4,581,114	4,603,157	4,614,778
4,522,500	4,581,178	4,603,718	4,615,793
4,522,822	4,582,480	4,604,052	4,616,054
4,522,987	4,583,134	4,604,230	4,616,538
4,526,833	4,583,954	4,604,480	4,616,917
4,528,916	4,584,574	4,604,842	4,616,972
4,534,099	4,584,947	4,605,033	4,616,992
4,534,422	4,585,638	4,605,442	4,617,136
4,536,493	4,587,489	4,605,606	4,617,148
4,544,783	4,588,553	4,605,643	4,617,177
4,549,500	4,588,558	4,606,247	4,617,272
4,550,185	4,588,675	4,606,407	4,617,536
4,550,974	4,589,462	4,606,442	4,617,658
4,552,725	4,590,812	4,606,558	4,618,117
4,561,311	4,592,940	4,607,295	4,618,251
4,562,055	4,593,119	4,607,426	4,618,462
4,563,153	4,593,145	4,608,058	4,619,909
4,563,622	4,593,606	4,608,120	
4,564,910	4,594,146	4,608,511	
4,565,761	4,594,271	4,609,533	

Disclaimer

4,558,179.—*Raymond G. Bond,* Long Beach, Calif. MESSAGE PLAYBACK CONTROL SYSTEM FOR TELEPHONE ANSWERING MACHINE. Patent dated Dec. 10, 1985. Disclaimer filed Feb. 18, 1986, by the assignee, *Fortel, Inc.*

Hereby enters this disclaimer to all claims of said patent.

Dedication

4,310,488.—*Jurg Rahm,* Basel; *Lothar Waltz,* Ettingen, both of Switzerland. SAMPLE OR REAGENT CONTAINER FOR ANALYZERS. Patent dated Jan. 12, 1982. Dedication filed July 21, 1986, by the assignee, *Hoffmann-La Roche Inc.*

Hereby dedicates to the Public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 22, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-07-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,475,765 to 3,480,965, inclusive
Plant Patents ..... Numbers 2,937 to 2,944 inclusive

REEXAMINATIONS

DECEMBER 30, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,423,017 (605th)

SCREW ROTOR MACHINE AND ROTORS THEREFOR

Lauritz B. Schibbye, Saltsjo-Duvnas, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Reexamination Request No. 90/000,844, Aug. 28, 1985.

Reexamination Certificate for Patent No. 3,423,017, issued Jan. 21, 1969, Ser. No. 651,891, Jul. 7, 1967.

Filed Aug. 28, 1985, Ser. No. 651,891

Claims priority, application United Kingdom, Jul. 29, 1966, 34217/66

Int. Cl.[4] F01C *1/16;* **F04C** *2/16, 18/16*

U.S. Cl. 418—117



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13**, **19**, **34** and **40** is confirmed.

Claims **1–12**, **14–18**, **20–33**, **35–39**, **41** and **42** are cancelled.

[1. A pair of cooperating rotors having helical lands and intervening grooves with a wrap angle of less than 360° and adapted for rotation around parallel axes within a working space of a screw rotor machine, said working space having high pressure and low pressure ports and including at least two intersecting bores, whereby a pair of communicating groove portions form a chevron-shaped chamber having its base end disposed in a plane transverse to the axes of the rotors and adjacent to the high pressure port of the machine, one of said rotors being of female rotor type, i.e. formed in such a way that at least the major portions of the lands and grooves are located inside the pitch circle of the rotor and that the flanks of the lands are generally concave, the other one of said rotors being of male rotor type, i.e. formed in such a way that at least the major portions of the lands and grooves are located outside the pitch circle of the rotor and that the flanks of the lands are generally convex, in which in a plane transverse to the axes of the rotors the outline defining a first flank of each female rotor groove, forming the peripherally outer wall of one leg of said chamber, has at least a substantial portion thereof inside and adjacent to the pitch circle of said rotor disposed completely inside a circular arc passing through the radially innermost point of said substantial portion and having its centre in the point in which the pitch circle intersects with a radial line drawn from the centre of the rotor through the radially innermost point of said flank outline, that the outline defining the second flank of each female rotor groove, forming the peripherally inner wall of said leg of said chamber, has at least a substantial portion thereof inside and adjacent to the pitch circle of said rotor disposed so as to follow a curve defined by a radius vector swung from the point at which the pitch circle intersects with a radial line drawn from the centre of the rotor through the radially innermost point of said second flank outline, the length of said radius vector increasing continuously as the vector is swung from said radially innermost point of said substantial portion to said pitch circle, and that the outlines of the flanks of each male rotor land follow the envelopes developed by the female rotor flank outlines as the lands and grooves pass into and out of mesh.

B1 3,923,372 (606th)

FIBER OPTIC EXTRA ORAL OPERATORY LIGHT

Max Roland, Redwood City, Calif., assignor to MDT Instrument Company, Gardena, Calif.

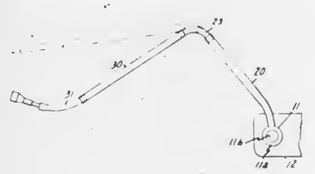
Reexamination Request No. 90/000,862, Sep. 18, 1985.

Reexamination Certificate for Patent No. 3,923,372, issued Dec. 2, 1975, Ser. No. 430,759, Jan. 4, 1974.

Continuation-in-part of Ser. No. 204,995, Dec. 6, 1971, abandoned. This application Sep. 18, 1985, Ser. No. 430,759

Int. Cl.[4] G02B *6/04*

U.S. Cl. 350—96.24



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

New claims **8–21** are added and determined to be patentable.

1. An extra oral operatory light comprising:

a fiber optic bundle with a proximal end connected to a housing and adapted to receive light from a light source within said housing, and a distal end connected to a light fixture and adapted to transmit light to said light fixture;

a conduit, housing said fiber optic bundle, including a first, relatively short, flexible segment with a distal end connected to said light fixture, a second relatively long, rigid segment with a proximal end connected to said housing, and alternate relatively long, rigid segments and relatively short, flexible segments between said first and second segments, each of said rigid segments being lighter in weight per unit length than said flexible segments; and

a coupling constituting means for connecting the proximal end of said second segment to said housing and structured to permit movement of the proximal end of said bundle in an arc around said light source without distorting the bundle.

B1 3,962,164 (607th)
SELF-EXTINGUISHING ACRYLONITRILE-BUTADIENE-STYRENE MOULDING COMPOSITION

Hans E. Praetzel, and Herbert Jenkner, both of Cologne, Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Fed. Rep. of Germany

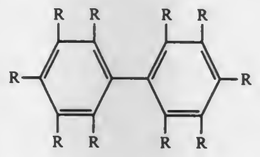
Reexamination Request No. 90/000,817, Jul. 8, 1985.
Reexamination Certificate for Patent No. 3,962,164, issued Jun. 8, 1976, Ser. No. 485,558, Jul. 3, 1974.
Continuation-in-part of Ser. No. 182,542, Sep. 21, 1971, Pat. No. 3,830,766. This application Jul. 8, 1985, Ser. No. 485,558
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1970, 2046795
Int. Cl.[4] C08K *5/59*
U.S. Cl. 524—373

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7** are cancelled.

[1. A self-extinguishing moulding composition comprising acrylonitrile-butadiene-styrene polymers and an additive comprising:

a. an aromatic compound having the formula



wherein R is selected from the group consisting of hydrogen, bromine, chlorine and alkyl having 1 to 3 carbon atoms; provided that at least two of the R's are bromine;

b. antimony trioxide or antimony oxychloride; and

c. an organochloro compound selected from the group consisting of chloroparaffins having 45 to 72 percent by weight chlorine, hexachlorocyclopentadiene and its dimer, and chlorinated polyvinyl chloride;

said aromatic bromine compound being present in amount of about 1 to 15 percent by weight; said antimony compound being present in amount of about 1 to 10 percent by weight; and said organochloro compound being present in amount of about 0 to 5 percent by weight.**]**

B1 4,102,565 (608th)
SLIT LAMP MICROSCOPE

Shiro Takizawa, Tokyo, and Shinicki Nishimura, Ageo, both of Japan

Reexamination Request No. 90/000,691, Dec. 19, 1984.
Reexamination Certificate for Patent No. 4,102,565, issued Jul. 25, 1978, Ser. No. 703,547, Jul. 8, 1976.
Filed Dec. 19, 1984, Ser. No. 703,547
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—214

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–5** are cancelled.

[1. A slit lamp microscope comprising:

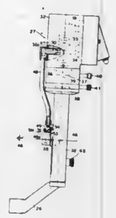
a first light source;

means defining a first optical path, having slit means disposed therein, for directing light from said first light source to a patient's eye in the form of a slit;

means defining a second optical path for directing light from said first light source to said patient's eye in the form of uniform illumination;

a second light source;

lens means interposed between said first and second light sources for directing light from said second light source along said first optical path;



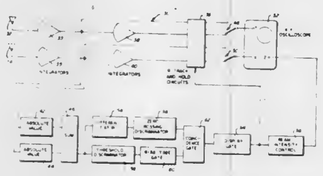
said second light source being disposed relative to said first light source such that the second light source does not interfere with the transmission of said light from said first light source along either of said first or second optical paths; and

optical means defining a microscope for investigating said patient's eye.**]**

B1 4,115,732 (609th)
DETECTION SYSTEM FOR LIGHTNING

Edmund P. Krider; Ralph C. Noggle, both of Tucson, Ariz., and Martin A. Uman, Gainesville, Fla., assignors to The University of Arizona Foundation, Tucson, Ariz.

Reexamination Request No. 90/000,951, Feb. 5, 1986.
Reexamination Certificate for Patent No. 4,115,732, issued Sep. 19, 1978, Ser. No. 732,365, Oct. 14, 1976.
Filed Feb. 5, 1986, Ser. No. 732,365
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—72



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–82** is confirmed.

1. A direction finder for determining the direction relative to said direction finder of lightning discharges to ground characterized by one or more strokes having a substantially vertical portion extending from the ground and one or more branches above the substantially vertical portion, said substantially vertical portion and said branches each producing a field, said direction finder comprising:

means for detecting the field produced by a stroke; and

means coupled to said detecting means and responsive only to the field generated by the substantially vertical portion of the stroke for generating an indication of the direction of said portion.

B1 4,131,716 (610th)
ACRYLIC ACID ESTERS OF POLYTHIODIALKANOLS AND RELATED COMPOUNDS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Reexamination Request No. 90/001,025, Jun. 5, 1986.
Reexamination Certificate for Patent No. 4,131,716, issued Dec. 26, 1978, Ser. No. 791,756, Apr. 28, 1977.
Filed Jun. 5, 1986, Ser. No. 791,756
Int. Cl.[4] C08F *2/50, 236/02*
U.S. Cl. 428—423.1

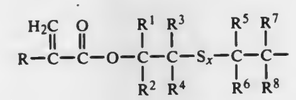
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

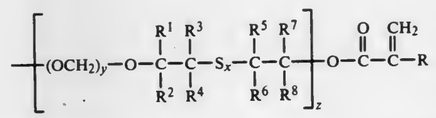
Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

New claims **4–6** are added and determined to be patentable.

1. A curable composition which comprises an acrylate terminated polyurethane prepolymer, a photosensitizer, and a compound of the formula



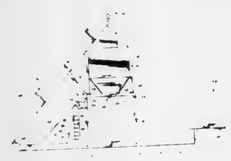


wherein R is hydrogen or methyl, R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are hydrogen, methyl, **[**or**]** ethyl, *or chloromethyl,* or each independently is hydrogen, methyl, ethyl, or chloromethyl, x is from about 2 to about 4, y is 0 or an integer of from 1 to 3, and z is **[**0 or is**]** *a non-zero number* sufficient to make a molecular weight of *up to* about 4000.

B1 4,248,359 (611th)
WEIGH-OUT SYSTEM FOR COLLAPSIBLE SURGE BIN

James D. Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Reexamination Request No. 90/000,849, Aug. 29, 1985.
Reexamination Certificate for Patent No. 4,248,359, issued Feb. 3, 1981, Ser. No. 951,373, Oct. 16, 1978.
Continuation-in-part of Ser. No. 912,501, Jun. 5, 1978. This application Aug. 29, 1985, Ser. No. 951,373
Int. Cl.[4] B67D *5/06*
U.S. Cl. 222—58



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claims **5** and **6** are added and determined to be patentable.

1. A collapsible surge bin for weighing and dispensing fluent material therefrom comprising:

a horizontal main frame;

a horizontal secondary frame pivotally mounted above said main frame on a plurality of legs, said plurality of legs each being pivotally connected at one end thereof to said main frame and at the other end thereof to said secondary frame so as to allow said secondary frame to be selectively lowered to rest on said main frame and raised to a position above said main frame;

a bin mounted on said secondary frame by a plurality of braces;

a plurality of load cells, one of said load cells being interposed between each of said braces and said secondary frame, said load cells each providing a signal corresponding to the weight borne by said load cell; and

means responsive to the sum of said signals from said load cells for dispensing material from said bin in its raised position.

B1 4,281,762 (612th)
IN-STORE COUPON AND METHODS

James C. Hattemer, Cincinnati, Ohio, assignor to Graphic Resources, Incorporated, Cincinnati, Ohio

Reexamination Request No. 90/000,430, Aug. 5, 1983.
Reexamination Certificate for Patent No. 4,281,762, issued Aug. 4, 1981, Ser. No. 130,629, Mar. 17, 1980.
Filed Aug. 5, 1983, Ser. No. 130,629
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—390



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–10** are cancelled.

[1. A coupon supply in elongated form comprising:

a carrier web of predetermined width and indeterminate length;

a plurality of separate base sheets on said web, and adhesive means on said base sheets for releasably holding said sheets on said web and for attaching said sheets to articles;

a plurality of separate top sheets, one top sheet disposed on each of said base sheets and said top sheets and said respective base sheets thereunder being co-extensive with each other, each top sheet having side portions adhered to respective side portions of the respective base sheets, and each top sheet further including a central coupon portion between said side portions free of adherence to its respective base sheet and removably attached to said side portions.**]**

B1 4,367,310 (613th)

BLENDS OF POLYCARBONATE WITH RUBBER AND MONOVINYLIDENE AROMATIC COPOLYMERS

David E. Henton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Reexamination Request No. 90/000,901, Nov. 1, 1985.
Reexamination Certificate for Patent No. 4,367,310, issued Jan. 4, 1983, Ser. No. 149,821, May 15, 1980.
Continuation-in-part of Ser. No. 35,584, May 3, 1979, Pat. No. 4,218,544. This application Nov. 1, 1985, Ser. No. 149,821
Int. Cl.[4] C08L *55/04, 35/06, 69/00, 9/00*
U.S. Cl. 525—67

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–6**, dependent on an amended claim, are determined to be patentable.

New claims **7–11** are added and determined to be patentable.

1. A heterogeneous blend comprising the following components: (1) a polycarbonate of a dihydric phenol blended with (2) a rubber component, (3) an anhydride copolymer of a monovinylidene aromatic monomer and an α,β-ethylenically unsaturated anhydride and (4) a compatible polymer of a polar monomer other than an anhydride; said rubber component containing a copolymer of a rubber polymer blocked or grafted with a portion of the anhydride copolymer and/or the polymer of the polar monomer wherein said block or graft copolymer is presentt in an amount sufficient to measurably increase the impact resistance of the blend, said polar monomer being a polymerizable ethylenically unsaturated organic compound which bears a polar group having a group moment in the range from about 1.4 to about 4 Debye units determined in accordance with Smyth, C. P., Dielectric Behavior and Structure, McGraw-Hill Book Company, Inc., New York (1955), said components being present in proportions such that the blend has (a) a Gardner Dart impact strength of at least about 160 inch-pounds, (b) a notched Izod impact strength of at least about 3 foot-pounds/inch of notch, (c) a heat resistance of at least about 240° F. as determined by ASTM D-648 (unannealed at 66 pounds per square inch) and (d) a processability (injection pressure) less than about 6600 pounds per square inch at a mold fill time of 2.5 seconds as determined by the test procedure for Injection Pressure set forth in footnote (10) of Table I hereof, *provided further that the anhydride copolymer additionally contains significantly less than 5 weight percent, if any, of an α,β-unsaturated nitrile comonomer.*

REISSUES

DECEMBER 30, 1986

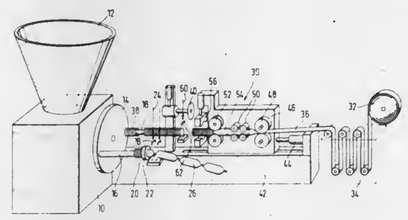
Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,315

PROCESS AND APPARATUS FOR AUTOMATED MANUFACTURE OF LINK SAUSAGES HAVING CASINGS FORMED OF SYNTHETIC TUBULAR MATERIAL

Gunter Kollross, Dornheim, Fed. Rep. of Germany, assignor to Teepak, Inc., Oak Brook, Ill.

Original No. 4,358,873, dated Nov. 16, 1982, Ser. No. 188,045, Sep. 17, 1980. Application for reissue Aug. 1, 1984, Ser. No. 636,494
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938371; Oct. 16, 1979, 2941872
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—33 **26 Claims**



20. An apparatus for the production of link sausages, comprising in combination:

shirring means for receiving an unshirred tubular length of sausage casing material and shirring said material to form folds in the axial direction,

a stuffing horn in proximity to the shirring means for receiving forcemeat and delivering the forcemeat into shirred tubular material,

automatic mechanical transfer means for positioning shirred tubular material from the shirring means to the stuffing horn,

means for positioning said stuffing horn with the shirred tubular material thereon at a location for receiving and delivering forcemeat into the tubular casing material for filling the tubular casing and pulling out the folds,

means for closing off filled sections of the tubular casing for forming separate sausage links,

the location of the stuffing horn during filling of said shirred tubular casing thereon being spaced from the location at which the shirring means forms a length of shirred tubular casing material, so that a further length of tubular casing material can be shirred by the shirring means while the first mentioned length of shirred tubular casing material is being filled with forcemeat and formed into the sausage links, and

means for mounting a source of flattened, unshirred tubular casing material and delivering it to the shirring means.

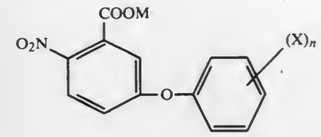
Re. 32,316

SUBSTITUTED PHENOXYBENZOIC ACIDS AND DERIVATIVES THEREOF

Robert J. Theissen, Westfield, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Original No. 3,929,455, dated Dec. 30, 1975, Ser. No. 396,630, Sep. 12, 1973. Continuation-in-part of Ser. No. 194,479, Nov. 1, 1971, Pat. No. 3,776,715, which is a division of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645. Application for reissue Sep. 14, 1979, Ser. No. 75,369
Int. Cl.[4] A01N *37/10*
U.S. Cl. 71—115 **6 Claims**

1. The method for controlling plant growth that comprises applying an herbicidal amount of an herbicidal compound having the formula:



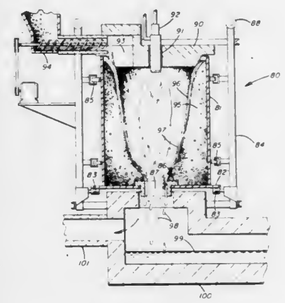
wherein X is halogen, n is 1 to 5, and M is alkali metal (Li, Na, K), **[**alkaline earth metal, a transition metal, ammonium, alkylammonium (C_1–C_{30}), alkanolammonium (C_1–C_3), alkyl (C_1–C_{30}) dialkanol (C_2–C_3) ammonium, dioxyalkylene (C_2–C_3) alkyl (C_1–C_{30})ammonium, dialkylammonium (C_1–C_{30}), trialkylammonium (C_1–C_{30}), alkoxyalkylammonium (C_2–C_6) dialkoxyalkylammonium (C_3–C_6), aminoalkylammonium (C_1–C_{30}), dialkylaminoalkylammonium (C_3–C_8), alkenylammonium (C_2–C_{22}), alkyl (C_1–C_{30}aminoalkyl (C_2–C_6) ammonium, alkenyl (C_2–C_{30}) aminoalkyl (C_2–C_6) ammonium, alkynyl (C_3–C_{12}) ammonium dialkenylammonium (C_4–C_{12}), cycloalkylammonium (C_3–C_6), alkyl (C_1–C_{30}) ammonium alkyl (C_2–C_6) ammonium, benzylammonium, anilinium, substituted anilinium, guanidinium or heterocyclicammonium (C_4–C_6).**]** *alkylammonium (C_1–C_4), or alkanolammonium (C_1–C_3).*

Re. 32,317

GLASS BATCH LIQUEFACTION

Gerald E. Kunkle, New Kensington, and Joseph M. Matesa, Plum Boro, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Original No. 4,381,934, dated May 3, 1983, Ser. No. 288,581, Jul. 30, 1981. Application for reissue May 2, 1985, Ser. No. 729,596
Int. Cl.[4] C03B *5/10*
U.S. Cl. 65—135 **74 Claims**



37. A method of liquefying glass batch in a vessel having an upper inlet portion, a lower outlet portion, and surrounding sidewalls comprising:

(a) insulating the vessel with a layer of glass batch defining a sloped cavity within the vessel;

(b) heating the cavity to liquefy a transient layer of the glass batch which flows on an underlying stable layer of batch to the outlet immediately upon liquefaction;

(c) replenishing the transient layer of glass batch at a rate sufficient to maintain the stable layer of batch at a sufficient

thickness to protect the vessel from undue thermal deterioration.

* * * * *

The questions raised in reexamination request No. 90/000,701, filed Dec. 31, 1984 have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 32,318

TIRE CURING BLADDER LUBRICANT

Louis F. Comper, deceased, late of Danville, and Robert F. Scheiderich, Danville, both of Va., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Original No. 4,359,340, dated Nov. 16, 1982, Ser. No. 208,612, Nov. 20, 1980. Application for reissue Nov. 15, 1984, Ser. No. 672,240

Int. Cl.[4] B28B *7/36*

U.S. Cl. 106—38.22 **5 Claims**

1. A lubricant composition comprising an aqueous emulsion consisting essentially of:

(i) about 20 to about 40 parts by weight polydimethylsiloxane characterized by having a viscosity in the range of about 12 million to about 28 million centistokes at 25° C.;

(ii) about [12 to about 20] *35 to about 70* parts by weight of at least one silane selected from (a) a methyl hydrogen silane, characterized by having a viscosity in the range of about 20 to about 40 centistokes at 25° C.,

(b) dimethyl hydrogen silane characterized by having a viscosity in the range of about 80 to about 120 centistokes at 25° C. and (c) methyl trimethoxy silane;

(iii) optionally, about 3 to about 12 parts by weight of a metal salt of an organic acid selected from at least one of zinc, magnesium, manganese and cobalt acetate, stearate, propionate and octoate;

(iv) about 10 to about 25 parts by weight surfactant for said polydimethylsiloxane and

(v) about 500 to about 1500 parts by weight water.

Re. 32,319

VITREOUS CARBON AND PROCESS FOR PREPARATION THEREOF

Louis L. Korb, and Phillip A. Waitkus, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Original No. 4,550,015, dated Oct. 29, 1985, Ser. No. 599,737, Apr. 12, 1984. Continuation-in-part of Ser. No. 477,235, Mar. 21, 1983, which is a continuation-in-part of Ser. No. 397,497, Jul. 12, 1982, abandoned, which is a continuation of Ser. No. 220,361, Dec. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,531, Jun. 21, 1979, abandoned. Application for reissue Nov. 19, 1985, Ser. No. 799,479

Int. Cl.[4] C01B *31/00*

U.S. Cl. 423—445 **37 Claims**

1. A process for preparing a vitreous carbon from a solid thermosettable intimate blend comprising 30–76 percent by weight of a finely divided carbonaceous particulate filler and 24–70 percent by weight of a finely divided phenolic resin mixture comprising 20–80 parts by weight of a phenolic-furfuraldehyde Novolak resin, which is fusible upon heating, and 20–80 parts by weight of a phenolic-aldehyde resol resin, which is thermosettable upon heating, the sum of said parts of Novolak and resol resins totaling 100 parts by weight, the aldehyde in said Novolak comprising at least 50 molar percent of furfuraldehyde, comprising the steps of:

(1) grinding said phenolic furfuraldehyde Novolak resin to a particle size of less than 40 mesh on a U.S. Standard sieve;

(2) grinding said phenolic-aldehyde resol resin to a particle size of less than 40 mesh on a U.S. Standard sieve;

(3) mixing said ground resins together with said finely divided carbonaceous powder to a homogeneous mixture;

(4) molding the resultant mixture at a temperature of 100°–180° C. and a pressure between 500 pounds per square inch and 8 tons per square inch; and

(5) heating the resultant molded product gradually up to a temperature of 600°–700° C. with the temperature increased at a rate of 1°–5° C. per hour, then above the range of 600°–700° C. at an increasing rate of 10°–50° C. per hour up to 800°–850° C. and thereafter at 20°–25° C. per hour up to a maximum temperature of 1800°–3000° C., which maximum temperature is held for at least 24 hours.

Re. 32,320

TiO_2 PIGMENT BEARING A COATING WITH CERIUM CATIONS AND SULFATE-, PHOSPHATE- OR SILICATE ANIONS AND LAMINATE AND COATING CONTAINING SAME

Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,461,810, dated Jul. 24, 1984, Ser. No. 481,925, Apr. 4, 1983. Application for reissue May 24, 1985, Ser. No. 737,501

Int. Cl.[4] B32B *27/42;* **C09C** *1/62, 3/00*

U.S. Cl. 428—530 **3 Claims**

1. A pigment of rutile TiO_2 particles bearing coatings consisting of alumina or alumina-silica, the particle surfaces having associated therewith [0.5–2%,] *0.17–2%,* by weight of the TiO_2, of cerium cations and a stoichiometric amount of sulfate-, phosphate or silicate anions.

3. A coating composition comprising

(a) a pigment according to claim 1,

(b) a film-forming material, and

(c) a liquid carrier.

Re. 32,321

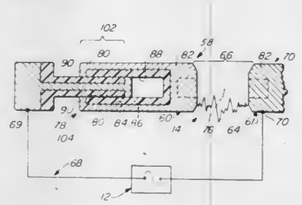
ELECTRIC SWITCH AND IMPROVED DEVICE USING SAME

Thomas J. Tobin, Northbrook, Ill., assignor to S&C Electric Company, Chicago, Ill.

Original No. 4,370,531, dated Jan. 25, 1983, Ser. No. 188,660, Sep. 19, 1980. Application for reissue Jan. 27, 1984, Ser. No. 574,361

Int. Cl.[4] H01H *33/06*

U.S. Cl. 200—82 B **30 Claims**



1. An electrical switch for opening a first current path in which the switch is included, comprising:

a pair of normally electrically interconnected contacts for carrying current in the first current path, the contacts being relatively movable apart along a fixed line of direction to break the electrical interconnection therebetween and to open the first current path, at least one of the interconnected contacts defining *at least a portion of* an enclosed chamber;

a terminal in the first current path;

means for

(a) electrically connecting a first of the contacts to the terminal when the contacts are electrically interconnected so that the terminal and contacts are in series in the first current path, and

(b) electrically insulating the first contact from the terminal *with a solid insulative material* as and when the contacts move apart, *wherein the electrically insulating means also constricts any arc formed between the first contact and the terminal as and when the contacts move apart*; and

ignitable means within the chamber for pressurizing the chamber upon ignition thereof to rapidly drive the contacts apart.

Re. 32,322

Patent Not Issued For This Number

PLANT PATENTS

GRANTED DECEMBER 30, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,841

ROSE PLANT—KEITOLI VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Aug. 1, 1984, Ser. No. 636,483

Int. Cl.[4] A01H *1/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the Shrub Class which possesses the following combination of characteristics:

(a) forms in abundance during the springtime on two year old wood small double blossoms which are empire rose shaded with geranium pink in coloration and which tend to be borne in clusters along the length of the stem,

(b) forms vigorous vegetation,

(c) exhibits a weeping or semi-pendulous growth habit,

(d) exhibits very good hardiness, and

(e) exhibits excellent disease resistance, substantially as herein shown and described.

5,842

ROSE PLANT JACADE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Apr. 23, 1984, Ser. No. 602,922

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its upright plant bearing clear pink blooms of heavy petal substance, spiral opening form, little fragrance, and moderately prickly stems.

5,843

ROSE PLANT NAMED 'CITY OF ROSEMEAD'

Joe J. Burks, Tyler, Tex., assignor to City of Rosemead, Rosemead, Calif.

Filed Mar. 7, 1985, Ser. No. 709,313

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class which is a sport of the rose known as "Poinsetta", substantially as shown and described, characterized particularly by heavily petalled flowers of Chrysanthemum crimson borne primarily one to a stem on a plant similar to its parent.

5,844

ROSE PLANT—MEIFULA VARIETY

Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 11, 1984, Ser. No. 659,838

Claims priority, application France, Oct. 12, 1983, 4209

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the fact that:

(a) from a physical point of view, the plant has medium green adult wood, an upright growth habit, and forms on long stems large, elegant very double blossoms of long duration which are of a velvet red coloration on the upper surface and of a cardinal red coloration on the under surface; and

(b) from a biological point of view, the plant has vigorous vegetation, and exhibits good disease resistance;

substantially as herein shown and described.

5,845

ZOYSIAGRASS PLANT 'EL TORO'

Victor B. Youngner, deceased, late of Riverside, Calif., by Violet E. Youngner, heir, assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 21, 1984, Ser. No. 673,633

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct variety of Zoysiagrass plant herein described and illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED DEC. 30, 1986

ERRATA

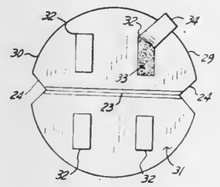
For CLASS	See PATENT NO.
073-276	4,631,939
073-332	4,631,940
123-025	4,632,067
175-019	4,632,191
206-292	4,632,301
175-325	4,632,468
354-481	4,632,542
422-202	4,632,587
530-306	4,632,780
379-400	4,633,038
379-032	4,633,039
379-253	4,633,040
379-354	4,633,041
379-284	4,633,042
379-033	4,633,043
379-284	4,633,042
379-033	4,633,043
379-433	4,633,044
381-155	4,633,045
370-032	4,633,046
365-096	4,633,429

PATENTS

GRANTED DECEMBER 30, 1986

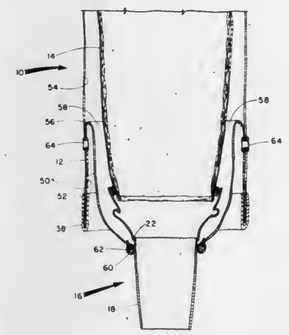
GENERAL AND MECHANICAL

4,631,752
DISPOSABLE GARMENT SHIELD
Eleanor Heyman, 23288 Morningside Dr., and Lois Nager, 22411 Twyckingham, both of Southfield, Mich. 48034
Filed Apr. 19, 1985, Ser. No. 724,839
Int. Cl.[4] A41D *27/12*
U.S. Cl. 2—56 **11 Claims**



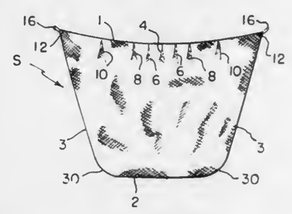
1. Disposable shield for preventing soiling of the portions of a garment directly below the armpits of a user comprising in combination:
(a) a single thin circular coated flat sheet of a highly absorbent fibrous paper material for absorbing the perspiration from the armpits of the user and the other side of said absorbent material having a coating means on one side of said sheet for preventing perspiration of the user from contacting said garment;
(b) adhesive means for attaching the shield to the garment of the user, said adhesive means being on the same side of said sheet as said coating means which prevents perspiration from contacting the garment of the user; and
(c) an embossed crease extending across the center of said flat sheet of material.

4,631,753
SLEEVE ATTACHMENT FOR MULTILAYERED PROTECTIVE COAT
Carolyn C. Ehring, West Caldwell, N.J., assignor to Cairns & Brother, Inc., Clifton, N.J.
Continuation-in-part of Ser. No. 651,801, Aug. 18, 1984, Pat. No. 4,543,670. This application Sep. 11, 1985, Ser. No. 774,904
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] A41D *3/02*
U.S. Cl. 2—85 **6 Claims**



1. In a multilayered protective coat for firefighters, a novel sleeve attachment comprising:
an outer shell sleeve having a cuff assembly including an annular cuff layer secured to said outer shell sleeve;
a thermal layer sleeve positioned within said outer shell sleeve having a first fastening strip circumferentially secured thereto; and
a wristlet assembly including a wristlet comprised of thermal insulative material and a sleeve member comprised of thermal, insulative material, said sleeve member secured to said wristlet, a second fastening strip circumferentially secured to said sleeve member to provide circumferential attachment between said sleeve member of said wristlet attachment assembly and said thermal layer sleeve.

4,631,754
NURSING SCARF
Barbara D. Ryan, 2529 Holkham Dr., Charlottesville, Va. 22901
Filed Dec. 14, 1984, Ser. No. 681,625
Int. Cl.[4] A41D *1/20*
U.S. Cl. 2—104 **1 Claim**

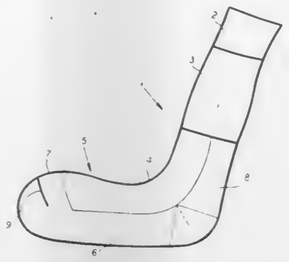


1. A method of nursing an infant which comprises providing a nursing scarf for the discreet nursing of an infant, said scarf being a single piece of material of generally trapezoidal shape having substantially parallel top and bottom edges and side edges which extend downwardly and inwardly from the top edge to the lower edge, the top edge including a plurality of spaced pleats along the top edge of the scarf in the central portion thereof to facilitate contouring of the scarf when the ends of the top edge are joined together for use, positioning the scarf so that it appears in front of the mother's chest area with the ends of the top edge of the scarf being joined together behind the mother's neck, placing the infant within the scarf adjacent the chest and nursing, the scarf being of such size, shape and contour as to conceal the infant as nursing proceeds while providing an opening for eye contact between the mother and infant.

4,631,755
KNITTED CLOTHING ARTICLE
Peter Zingg, Heerbrugg; Werner Mettier, Berneck, and Gottfried Lindner, St. Gall, all of Switzerland, assignors to Rohner Jacob AG, Rebstein, Switzerland
Filed Mar. 22, 1985, Ser. No. 715,187
Claims priority, application Switzerland, Mar. 27, 1984, 1551/84
Int. Cl.[4] A41B *11/00*
U.S. Cl. 2—239 **6 Claims**

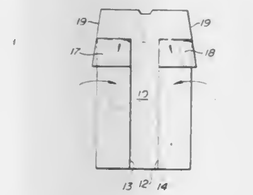
1. A sock having a leg portion and a foot portion connected to said leg portion and knitted with a base mesh of a nonfeltable yarn; and
a yarn layer knitted in said base mesh of said foot portion over at least a toe, sole and heel region thereof and consisting of feltable textile fibers forming loop pile meshes

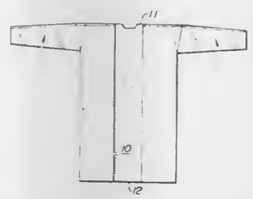
exclusively on an outside surface of said base mesh, said layer being felted to form a porous mat arranged exclu-



sively on the outside surface of said regions away from the body of the user.

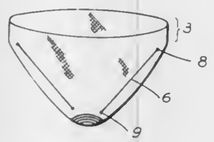
4,631,756
METHOD OF MAKING APPAREL
George W. Scrivens, Arlington, Tex., assignor to Surgikos Inc., Arlington, Tex.
Filed Feb. 11, 1985, Ser. No. 700,576
Int. Cl.[4] A41D *27/10*
U.S. Cl. 2—243 R **1 Claim**





1. A method of forming a sleeve on a garment comprising:
(a) providing a body portion of the garment comprising a generally rectangular piece of fabric having a top edge, a bottom edge and two opposing side edges;
(b) cutting the body portion on a cut line extending from a point on the top edge which is approximately one-half the distance between the longitudinal center line and a side edge at an angle from a line parallel to the longitudinal center line of from 15° to 30° to a second point which is at a location between one sixth and one-third the distance between the top edge and the bottom edge of the body portion of the garment;
(c) folding the body portion about a first line perpendicular to the top edge and passing through the second point;
(d) folding the body portion about a second line perpendicular to the side edges and passing through the second point to form a flap with an edge that forms a straight line with the cut line in the body portion of the garment;
(e) providing a sleeve portion of fabric, said sleeve portion having a top edge, a bottom edge and two opposing side edges of unequal length, affixing the longer of the side edges of said sleeve portion to the straight line formed on the body portion of the garment, folding the bottom edge of said sleeve and the attached flap to overlap the top edge of the sleeve and the body portion and joining the top edge and the bottom edge of the overlapped fabric together to form the sleeve on the garment.

4,631,757
METHOD FOR MANUFACTURING A PAIR OF BRIEFS AND BRIEFS MANUFACTURED ACCORDING TO THE METHOD
Claus Holck, Mellanvångsvågen 6 A, S-223 55 Lund, Sweden
Filed Apr. 17, 1984, Ser. No. 601,266
Claims priority, application Sweden, Apr. 19, 1983, 8302178
Int. Cl.[4] A41B *9/02, 9/04*
U.S. Cl. 2—402 **6 Claims**



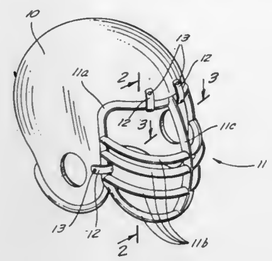
1. A method of manufacturing a pair of briefs by means of a circular knitting machine, comprising the steps of:
(a) knitting a blank in the shape of a bag having an upper essentially cylindric portion, an intermediate narrowing portion and a lower, essentially circular end portion; and
(b) cutting two leg hole cuts in said intermediate portion without removing any material, said cuts being straight lines positioned on a front side of the pair of briefs and extending essentially rectilinear from a lower point and upward and outward to an upper point essentially along a side edge of the blank, the lower point and the upper point being spaced a short distance inwardly of said side edge of the blank.

4. A pair of briefs comprising:
(a) a circular knit blank in the shape of a bag having an upper essentially cylindric portion, an intermediate narrowing portion and a lower, essentially circular end portion;
(b) said intermediate portion having two leg hole cuts, which have been cut without removing any material of the blank, said cuts being straight lines positioned on a front side of the pair of briefs and extending essentially rectilinear from a lower point and upwards and outwards to an upper point essentially along a side edge of the blank, the lower point and the upper point being spaced a short distance inwardly of said side edge of the blank.

4,631,758
PROTECTIVE HEADGEAR
Malcolm Newman, Huntington, and Carl J. Abraham, Great Neck, both of N.Y., assignors to Athletic Safety Products, Inc., Mineola, N.Y.
Filed Apr. 11, 1986, Ser. No. 850,587
Int. Cl.[4] A42B *1/08;* **A41D** *13/00*
U.S. Cl. 2—424 **4 Claims**

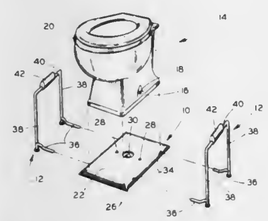
1. A protective headgear comprising:
(a) a helmet,
(b) a face mask, and
(c) means securing the face mask to the helmet,

(d) the face mask being formed of at least one bar of flexible material, the bar having a modified trapezoidal cross-sec-



tional shape, each base of the trapezoid being a circular arc tangent to the sides of the trapezoid.

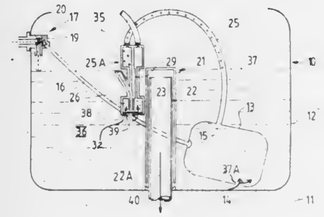
4,631,759
BASE HAVING REMOVABLE SIDE RAILS FOR ELEVATING A TOILET
Thaddeus B. Strasser, 613 Pierce St., Sandusky, Ohio 44870
Filed Jul. 23, 1984, Ser. No. 633,628
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—252 R **8 Claims**

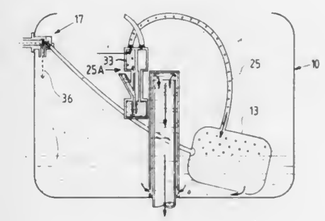


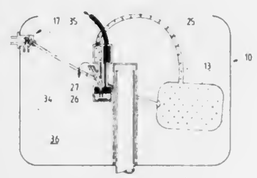
1. An apparatus for elevating a toilet by a predetermined amount above a floor having a drain comprising a base having a height equal to the amount by which it is desired to elevate the toilet above the floor, the base having an aperture formed therein for connecting the toilet to the drain, and at least one side rail removably secured to said base, said side rail including two horizontally-extending leg members adapted to be received in respective channels formed in said base, a vertically-extending support member connected to each of said leg members, and a horizontally-extending handrail portion connected between said support members.

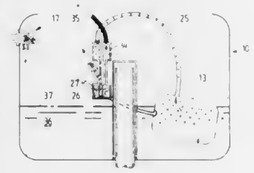
4,631,760
AUTOMATIC FLUSHING SYSTEM
Graham W. Leishman, 12 Hillgrove St., Upper Mt. Gravatt, Brisbane, Queensland, and Bruno Minissale, 5 Nielsen Street, Rochedale, Brisbane, Queensland, both of Australia
Filed Jul. 24, 1985, Ser. No. 758,276
Int. Cl.[4] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—300 **17 Claims**

1. An automatic flushing system for use with a toilet or urinal, comprising:
a tank having an inlet and a siphon outlet;
a hollow float disposed for substantially vertical motion in said tank, said float having a water access port and an air access port;
water flow control means including a valve mounted to said tank at said inlet for controlling the flow of water into said tank through said inlet;
first actuator means operatively connected to said valve and said float for closing said valve upon an attainment of a predetermined uppermost vertical position by said float and for opening said valve upon a descending of said float below said uppermost vertical position, said uppermost vertical position corresponding to an intermediate level of water in said tank;
air flow control means mounted at least indirectly to said tank and communicating with said float at said air access port for controlling the flow of air into and out of said float and for concomitantly controlling the flow of water out of and into said float, said air flow control means including sealing means communicating with said tank for establishing a water block to the passage of air from said float through said air access port upon the attainment of a





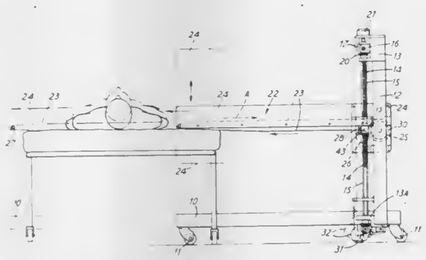




predetermined high level by water in said tank, said high level being above said intermediate level, said siphon outlet being adapted to begin siphoning water from said tank upon the attainment of a predetermined uppermost level of water in said tank, said uppermost level being at least as high as said high level; and
second actuator means operatively connected to said air flow control means for breaking said water block to initiate a flushing operation wherein water enters said float through said water access port, said float descends in said tank and thereby opens said valve, said water rises in said tank from said intermediate level to said high level and said uppermost level, whereby said blocking means estab-

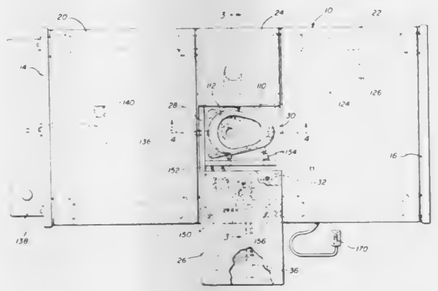
lishes said water block and water begins drains from said tank via said siphon outlet.

4,631,761
PATIENT TRANSFER TROLLEY
Hans J. Lederman, Bridgwater, Great Britain, assignor to Ganmill Limited, Taunton Somerset, United Kingdom
Filed Jun. 11, 1985, Ser. No. 743,494
Int. Cl.[4] A47B *83/04;* A61G *7/08*
U.S. Cl. 5—81 R **14 Claims**



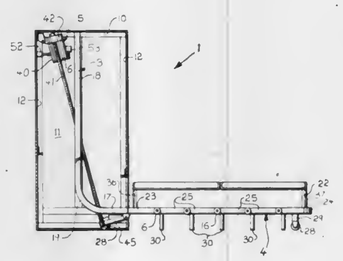
1. A patient transfer trolley, wheels supporting said trolley, means rotatably mounting rollers on said trolley, means to drive said rollers, an endless belt mounted on and driven by rollers, for transferring the patient, means for driving at least one trolley wheel, so arranged that as the endless belt is moved to move the patient, the driven wheels are also rotated so as to move the trolley at substantially the same speed as the endless belt is moving but in the opposite direction.

4,631,762
HOSPITAL BED WITH TOILET FACILITY
Mary B. Fugett, 617½ Anniston, Dr., Lexington, Ky. 40505
Filed May 10, 1985, Ser. No. 732,616
Int. Cl.[4] A61G *7/02*
U.S. Cl. 5—90 **9 Claims**



1. A hospital bed including a support frame incorporating head and foot mattress portions and an intermediate mattress portion disposed between said head and foot portions, said mattress portions being supported from said frame, one side of said intermediate portion being mounted from said frame for lateral outward and inward shifting of said one side of said intermediate portion from the corresponding side of said frame to outer and inner positions with an opening formed through said mattress inwardly of said one side and between the latter and the other side of said intermediate portion when said one side is in the outer position and closing said opening when said one side is in said inner position, an upwardly opening waste receiver supported from said frame beneath said intermediate portion in position for vertical registry with said opening when said one side is in said outer position, mounting means mounting said receiver from said frame for from said frame for vertical shifting relative thereto between a lowered position disposed below said mattress and a raised position projecting upwardly into said opening, reversible motor means including forward and reverse directions of operation, first and second drive means operatively connected with said one side and receiver, respectively, for outer and inward shifting of said one side to said outer and inner positions and for raising and lowering said receiver to said raised and lower positions, respectively, and control means including a pair of bed patient manually actuatable operators, said control means, upon actuation of one of said operators, including means operative to actuate said motor means in the forward direction of operation thereof and drivingly connect said motor means to said first drive means to shift said one side from said inner position to said outer position and, in response to said one side reaching said outer position, to momentarily interrupt operation of said motor means, disconnect said motor means from said first drive means and drivingly connect said motor means to said second drive means and thereafter reestablish operation of said motor means in the forward direction of operation thereof to raise said receiver from said lowered position to said raised position and to terminate operation of said motor means upon said receptable being elevated to said raised position, said control means, upon actuation of the other operator, including means operative to actuate said motor means in the reverse direction of operation thereof with said motor means drivingly connected to said second drive means to lower said receptacle to said lower position from said upper position and, in response to said receptacle reaching said lower position, to momentarily interrupt operation of said motor means and disconnect said motor means from said second drive means and drivingly connect said motor means to said first drive means and thereafter reestablish operation of said motor means in the reverse direction to shift said one side inwardly from said outer position to said inner position and terminate operation of said motor means in the reverse direction upon said one side being shifted to said inner position.

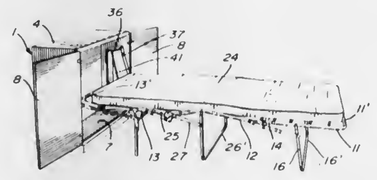
4,631,763
RETRACTABLE BED WITH A PIVOTED SCREW DRIVE
Morris Singer, 3712 W. 96th St., Overland Park, Kans. 66206
Continuation-in-part of Ser. No. 171,332, Jul. 23, 1980, Pat. No. 4,586,206. This application Feb. 14, 1985, Ser. No. 701,744
Int. Cl.[4] A47C *19/06*
U.S. Cl. 5—149 **15 Claims**



11. A retractable bed apparatus comprising:
(a) enclosure frame means;
(b) left and right guide tracks; each track including a short horizontal segment connected to an elongated vertical segment by an arcuate segment;
(c) a flexible mattress frame engaged with said tracks, said mattress frame having a retracted position wherein said mattress frame is received completely within said enclosure frame means and a sleeping position wherein said mattress frame is extended from said enclosure frame means;

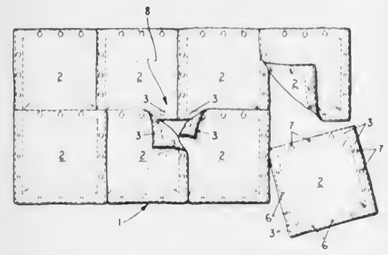
(d) a mattress affixed to said mattress frame;
(e) a motor bracket pivotally connected to said enclosure frame means;
(f) a rotary motor mounted on said bracket;
(g) an elongated threaded shaft extending from said bracket and drivingly engaged with said motor;
(h) a nut arm having a first end and an opposite second end; said first end being pivotally connected to said mattress frame and said second end having a threaded nut member formed thereon to receive said shaft in threaded engagement therein;
(i) motor control means connecting said motor to a source of power to selectively rotate said shaft to displace said mattress frame along said tracks to thereby effect the substantially complete extension of said mattress frame from said enclosure frame means and the retraction of said mattress frame into said enclosure frame means;
(j) said mattress frame having opposite head and foot ends and opposite lateral sides; and
(k) said mattress frame being oriented to be displaced in a direction perpendicular to said sides upon extension and retraction.

4,631,764
CONSOLE BED
Charles Moskowitz, 20400 NE. 15th Ct., Miami, Fla. 33179
Filed Jun. 12, 1984, Ser. No. 619,729
Int. Cl.[4] A47C *17/13, 17/48, 17/52*
U.S. Cl. 5—150 B **8 Claims**



1. A console bed comprising an upright console being of a general closed-box shape and having side walls and at least one door adapted to open outwardly; a collapsible bed foldable into said console in upright configuration from a rearmost horizontal extended position, outwardly of said console; said collapsible bed including a rectangular frame having a front end adjacent said console and an opposite rear end; said frame formed of three sections, a front section, a middle section and a rear section longitudinally connected to one another and defining a front and a rear junctures at either end of said middle section, folding means at the junctures of said sections, said middle and rear sections being foldable upwardly and then frontwardly to assure overlying relationship with said front section in folded configuration; first lock means to releasably keep said rear and middle sections in said overlying relationship; mounting means to pivotally mount said front section in said console; further including second lock means to releasably secure said frame in upright folded configuration in said console; pairs of transversely-aligned legs to support said frame; said folding means at both said front and rear junctions including, indentically on either side of the frame and at each of said junctures:
(a) a link member having an inverted U-shape profile and pivotally secured inwardly of its opposite ends to the adjacent ends of said sections;
(b) a leg pivotally secured about a first pivot at its upper end to the side of each section intermediate the ends thereof;
(c) a brace pivotally attached about a second pivot to the upper portion of each said leg at one end and having an orthogonal ear at its other end; said ear being pivotally secured to said link member intermediate the ends thereof;
(d) a tie bar having one end pivotally secured to one of said sections which is frontwardly of said link member, and its other end pivotally secured about a third pivot to said orthogonal ear, said first lock means being embodied by a toggle defined by said first, second and third pivot points; and legs arranged in pairs transversely of said frame, the lower ends of the legs of each pair being joined by a rigid transverse member, and wherein said mounting means comprises on each side of said frame: a mounting bracket secured to the inner surface of a side wall of said console and having a rearwardly-extending upper arm; a leg pivotally secured at its upper end to said front section on one side thereof; an elongated member extending in close parallel relationship along said one side of said front section, being secured thereto; a first L-shape frame support having one end pivotally secured to said upper arm and its other end pivoted to said elongated member intermediate the ends thereof; a second frame support having a slightly downwardly-bent rear end and an opposite front end pivoted to the lower end of said bracket; a stabilizing strut pivoted to said bent rear end and to the upper portion of said leg, wherein the elbow of said bent rear end is pivoted to the front end of said elongated member; and a biasing tension spring fixed to the upper portion of said bracket and to said second frame support adjacent the front end of the latter.

4,631,765
MODULAR COVERING AND A METHOD OF ASSEMBLING THE SAME
Susan D. Casey, 243 W. 72nd St. #7, New York, N.Y. 10023
Filed May 13, 1985, Ser. No. 732,964
Int. Cl.[4] A47G *9/06*
U.S. Cl. 5—417 **15 Claims**



1. A covering module comprising:
a pair of similarly shaped sheets of flexible material connected together in face-to-face relationship at a first location along adjacent marginal edges to form a pillow-like body, a strip of flexible material having an outer marginal edge connected in face-to-face relationship to at least one of said sheets adjacent said marginal edges thereof, said marginal edges and said outer marginal edge of said strip being folded back between said sheets toward a center of said body, said folded back marginal edges of said sheets and said folded back outer marginal edge of said strip being connected together in face-to-face relationship to said sheets at a second location closer to said center of said body than said first location, said sheets and said strip being connected together in face-to-face relationship at a third location closer to said center of said body than said second location.

4,631,766

NEONATAL INFANT SEAT

Caryl J. Semmler; Carol A. Cook, both of Dallas, and Jackie D. Smith, Lewisville, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Feb. 25, 1985, Ser. No. 705,732
Int. Cl.[4] A47D *13/00*
U.S. Cl. 5—431 **16 Claims**



1. A neonatal infant seat comprising:
a pad adapted to support a neonatal infant in a generally supine position, the pad having a central axis and a number of undulations disposed upwardly and downwardly relative to a generally horizontal reference plane passing through the pad, the pad including
a downwardly cupped, head-receiving cavity disposed proximate to one end of the pad along the central axis and configured to support the infant's head without impinging on the infant's ears and without flattening the infant's skull,
an upwardly-raised, neck-supporting cusp located adjacent the head-receiving cavity along the central axis to support the infant's neck to allow unrestricted breathing,
a descending back-supporting region disposed adjacent the neck-supporting cusp along the central axis, the back-supporting region being arcuate in cross-section transverse to the central axis,
upraised arm-receiving structure adjacent the back-supporting region in spaced relation on each side of the central axis,
the arm-receiving structure and back-supporting region cooperating to broadly support the infant without the formation of decubidy, and to provide unrestrained arm movement while biasing the infant into the supine position,
a downwardly-extending, arcuate buttocks-receiving hollow adjoining the back-supporting region and located along the central axis,
an upwardly-projecting, leg-containing structure located on each side of the buttocks-receiving hollow laterally spaced from the central axis,
an upwardly-oriented, knee-supporting ridge disposed along the central axis adjacent the buttocks-receiving hollow, and
a downwardly-inclined, calf and foot supporting area proximate to the knee-supporting ridge along the central axis.

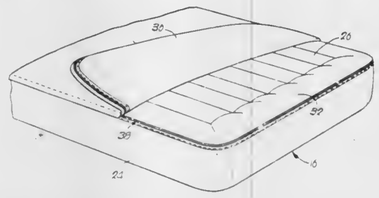
4,631,767

AIR FLOTATION MATTRESS

Myra J. Carr; Frances H. Brosig, both of Shawnee Mission, Kans., and Robert G. Gottlieb, Houston, Tex., assignors to KCJ Corporation, Shawnee Mission, Kans.

Filed Nov. 21, 1984, Ser. No. 673,575
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—449 **9 Claims**

1. An air flotation, ventilated mattress apparatus comprising:
means defining a lower, continuous, inflatable chamber having an air-permeable, flexible upper wall portion,
said upper wall portion being constructed for substantially uniform airflow therethrough over substantially the entire plan surface area of said upper wall portion;
air-permeable secondary wall means above said chamber upper wall portion and operably coupled with said chamber-defining means, said secondary wall means being constructed for substantially
uniform passage of air therethrough over substantially the entire plan surface area of said secondary wall means, said secondary wall means and upper wall cooperatively defining therebetween an inflatable compartment above said chamber; and
means for continuously introducing positive pressure air into said chamber in order to continuously maintain positive air pressure conditions throughout the entirety of said chamber during the entirety of operation of said mattress apparatus and to inflate both said chamber and compartment by passage of said air into said chamber and thence through said upper wall portion and thereby maintain



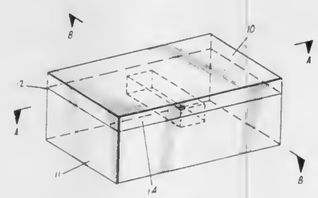
positive air pressure conditions in said compartment, and to cause said continuous passage of air through said secondary wall means,
said mattress apparatus being free of solid internal support structure for supporting a patient,
said air introduction means, upper wall portion and secondary wall means being cooperatively configured and arranged for continuous passage of sufficient positive pressure airflow through the chamber, upper wall portion, compartment, and secondary wall means for even, substantially uniform flow of air from said mattress apparatus so that a person lying atop the secondary wall means is supported by said pressurized air without the presence of weight-supporting structure within said mattress apparatus.

4,631,768

COMPOSITE BED MATTRESS

Peter J. Ferrall, Craigie, Australia, assignor to C. R. Diffen Transport Pty. Ltd., Australia

Filed Dec. 14, 1984, Ser. No. 681,646
Claims priority, application Australia, Feb. 29, 1984, PG3838
Int. Cl.[4] A47C *27/00, 27/14*
U.S. Cl. 5—464 **10 Claims**



1. A composite bed mattress comprising first lower resilient foam layer and a second upper resilient foam layer, said first foam layer being relatively firm compared to said second foam layer, said first and second foam layers being disposed in face to face contiguous relationship to one another, said first and said second foam layers having abutting major substantially planar surfaces across the across extent of the surfaces, wherein said first foam layer contains a single recess in its planar surface adjacent the second foam layer, said second foam layer has a single foam projection which is relatively soft compared to said first foam layer and which fits into said recess, and the region of the mattress containing said recess and said projection corresponds with the hip region of a person laying on the mattress, so that the region of the mattress corresponding with the hip region of a person laying on the mattress is relatively soft compared to all other regions of the mattress.

4,631,769

COMBINATION TOOL FOR OPENING, SEALING, AND PUNCTURING A PAINT CAN

Luther J. White, Rt. 3, Box 241, London, Ky. 40741

Filed Dec. 31, 1984, Ser. No. 687,982
Int. Cl.[4] B67B *7/44;* **B25F** *1/00*
U.S. Cl. 7—151 **6 Claims**



1. A tool used in conjunction with a can and a lid for sealing the can, the can having a generally U-shaped sealing channel with a peripherally extending bead, said lid having a downwardly extending impressed channel adapted to be inserted into said U-shaped sealing channel, said tool being adapted to pry said lid from said can, puncture said sealing channel to form holes therein, and seal said lid onto said can after said can has been used, said tool comprising:
(a) an elongated body having a first end, a second end, an upper surface, and an underside, said first end terminating in a sharp edge, said sharp edge comprising means for prying said lid from said can by inserting said sharp edge between said lid and said can bead;
(b) first and second prongs which are spaced apart from each other, both of said prongs extending downwardly from the underside of said elongated body, both of said prongs also having free ends inclined towards said first end of said body;
(c) means for piercing holes in said sealing channel when said lid is removed from said sealing channel, said means for piercing holes in said sealing channel comprising said second prong and a spike extending downwardly from the underside of said elongated body at a position located between said first and said second spaced apart prongs, said spike being angled and having a pointed tip which is inclined towards said second end of said elongated body, said spike being adapted to pierce said sealing channel of said can when a free end of said second prong is positioned under said can bead and the pointed end of said spike is forced through the can channel by leveraging said tool; and
(d) means for seating and sealing said lid in said sealing channel by pressing said lid into said sealing channel.

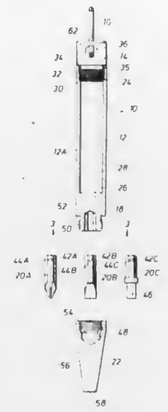
4,631,770

HAND TOOL/PROTECTIVE DEVICE

Michael L. Goldberg, 1617 Fannin St., Apt. #2909, Houston, Tex. 77002

Filed Dec. 16, 1985, Ser. No. 809,298
Int. Cl.[4] B25F *1/02*
U.S. Cl. 7—167 **14 Claims**

1. Apparatus adapted for alternative use as a protective weapon, a tool or a key holder, said apparatus comprising:
a hollow member having an open end and a closed end, said member having a chamber for storing at least one tool element,
a removable closure means received in the open end for sealing said chamber,
means for securing keys to said closure means,
means for removably securing said tool element axially outwardly from the closed end when said tool element is in an operating position,
a butt means securable on the closed end for providing a protective weapon, and



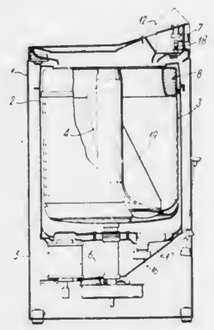
means for sealingly securing said butt means on the closed end.

4,631,771

CLOTHES WASHING MACHINES

Iain A. Anderson; Christopher J. Gaelic, and Phillipa L. Elliott, all of Mt. Wellington, New Zealand, assignors to Fisher & Paykel Limited, Mt. Wellington, New Zealand

Filed Feb. 26, 1985, Ser. No. 706,027
Claims priority, application New Zealand, Feb. 29, 1984, 207316; Feb. 29, 1984, 207319
Int. Cl.[4] D06F *33/02*
U.S. Cl. 8—158 **23 Claims**



1. A method of operating a clothes washing machine of the type which includes a container within which a spin tub is rotatably mounted, an agitator mounted within that spin tub, driving means including a reversible electric motor energized to drive said spin tub and agitator, said method comprising the steps of causing said spin tub to commence a spinning phase of the clothes washing cycle, accelerating the spin tub and its contents through the critical speed (lateral resonance speed) to a holding speed not greatly above that critical speed, and holding the speed at that holding speed for a sufficient length of time as to prevent or substantially reduce the creation of suds or foam caused by cleaning additives such as detergents in the washing liquid until conditions for suds forming have been substantially eliminated, applying increased power to said motor after said sufficient length of time has expired to accelerate said spin tub towards a further speed lower than a full spin speed, sensing whether there is excessive friction resisting attaining or maintaining said further speed under available

motor torque from the energized motor and then effecting further steps selected from either the step of maintaining said further speed, when attained, for a period of about 10 seconds and subsequently applying further increased power to said motor to cause the full speed spinning for a desired period of time and subsequently stopping spinning, or the step of switching off power to said motor in the event that said further speed is not reached or maintained under said available motor torque.

8. A clothes washing machine of the type which includes a container within which a spin tub is rotatably mounted, an agitator mounted within that spin tub, driving means including a reversible electric motor to drive said spin tub and agitator, wherein control means including sensing means are provided to cause said spin tub to commence a spinning phase of the clothes washing cycle, to cause the spin tub and its contents to accelerate through the critical speed (lateral resonance speed) to a holding speed not greatly above that critical speed, and to cause that holding speed to be maintained for a sufficient length of time as to prevent or substantially reduce the creation of suds or foam caused by cleaning additives such as detergents in the washing liquid until conditions for suds forming have been substantially eliminated, said control means causing said motor to be actuated to accelerate said spin tub after said sufficient length of time toward a further speed which is lower than the full spin speed, said sensing means sensing whether said further speed is attained within a predetermined time, attainment of said further speed resulting in said control means being actuated to cause said spin tub to be accelerated to full spin speed after holding said further speed for about 10 seconds and lack of said attainment resulting in said control means being actuated to switch off power to said motor.

4,631,772

TENSION ARCH STRUCTURE

Samuel G. Bonasso, 241 S. High St., Morgantown, W. Va. 26505

PCT No. PCT/US83/00619, § 371 Date Dec. 23, 1983, § 102(e) Date Dec. 28, 1983

PCT Filed Apr. 28, 1983, Ser. No. 568,219

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.⁴ E01D *11/00*

U.S. Cl. 14—20 **9 Claims**



1. A structural system for supporting a vertical load over a span comprising in combination:

(a) opposed end supports;

(b) a plurality of tension elements;

(c) each tension element strung between and fastened to said end supports with a predetermined sag;

(d) a plurality of compressive elements;

(e) each compressive element having a depth greater than the sag of the tension element;

(f) each compressive element supported by the tension elements;

(g) each compressive element having an upper surface at a predetermined height above the level of the tension element;

(h) each compressive element having a lower surface below the level of the tension element;

(i) each compressive element fitted in abutting relationship with the adjoining compressive elements;

(j) the end compressive elements fitted in horizontal abutting relationship with the end supports;

(k) the point of attachment of the tension elements to the end abutments being above the center of compressive force of the compressive elements at its interface with said end abutment;

whereby the load over the span is transmitted to the end supports in part through the compressive forces of the compressive element and in part through the tensile force of the tension element.

4,631,773

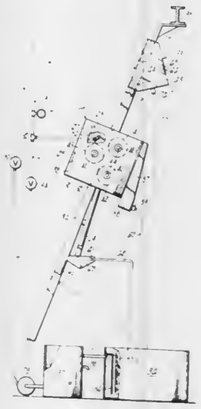
APPARATUS FOR REMOVING FINES FROM COPPER WIRES

Randall C. Graham, Nashville, Tenn., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 21, 1985, Ser. No. 789,813

Int. Cl.⁴ B21B *45/02;* **B21C** *43/00;* **A46B** *13/04*

U.S. Cl. 15—4 **7 Claims**



1. Apparatus for removing fines from the outer surfaces of a plurality of bare copper wires advancing generally upwardly in parallel, side-by-side relationship in a common plane and in the same direction, which apparatus comprises:

wire brushing means comprising first, second and third elongated brush rollers mounted transversely of the plane of advancement of the wires for brushing contact with the outer surfaces of the wires to remove fines therefrom; each of said rollers having a generally cylindrical outer brushing surface composed of a fur-like, fine pile material with radial fibrous hairs of a soft and flexible synthetic resin; said first and second rollers being disposed at one side of the plane of advancement of the wires and arranged in a spaced relationship such that said first roller is in brushing contact with the wires along an area above the area of brushing contact between the second roller and the wires; said third roller being disposed at the opposite side of the plane of advancement of the wires and arranged such that said third roller is in brushing contact with the wires along an area intermediate the areas of brushing contact of said first and second rollers with the wires; said rollers being mounted so that each of the wires advances past said rollers in a substantially straight line;

spray nozzle means disposed adjacent said first roller and directed to discharge a spray of liquid at the contact area between said first roller and the wires to flush fines from said first roller and to produce a flow of liquid onto said rollers which facilitates the brushing action of said rollers; and

means for simultaneously rotating said three rollers at such a speed as to throw off by centrifugal force the fines removed from the wires by said rollers; each of said rollers being rotated in a direction opposite to the direction of advancement of the wires.

4,631,774

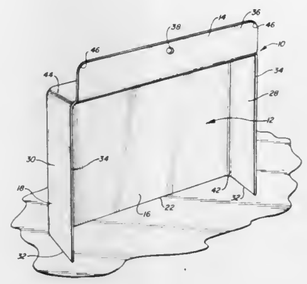
DUST COLLECTING APPARATUS

Alice M. Kania, 3901 W. 56th Pl., Chicago, Ill. 60629

Filed Jan. 18, 1985, Ser. No. 692,557

Int. Cl.⁴ A47L *13/52*

U.S. Cl. 15—257.1 **3 Claims**



1. An improved one-piece dust collecting apparatus of the type having a dust receiving pan with a flat bottom wall lying substantially in a first plane, a front substantially straight lip at a leading edge portion of the bottom weall and a dust-containing wall extending upwardly from the flat bottom wall and having first and second flat spaced side wall portions, each side wall portion having a free outer edge and a front edge and a handle associated with the pan to maneuver the pan, the improvement comprising:

said dust-containing wall extending transverse to and continuously around the bottom wall at all but the leading edge portion thereof;

said handle including a portion of said dust-containing wall and having a flat upper surface extending transverse to said portion of the dust-containing wall;

said front edges of the side walls and the front substantially straight lip residing substantially in a second plane transverse to the first plane containing the bottom wall,

said dust-collecting apparatus being open and unobstructed above the bottom wall and within the confines of the dust-containing wall, and

said outer edges of the side wall portions residing substantially within a third plane at right angles to the second plane and in coplanar relationship with the flat upper surface of the handle, said flat upper surface having a hanging aperture therethrough along the centerline of the dust collecting apparatus,

whereby the dust-collecting apparatus not only is self-standing by situation the front edges of the side wall portions and the lip of the bottom wall directly on a flat surface but also is stored flush against a wall surface by passing a hanger through the aperture in the flat upper surface with the outer edges and the flat upper surface of the handle presented flush to an upright wall surface.

4,631,775

HIGH SPEED FLOOR BURNISHER

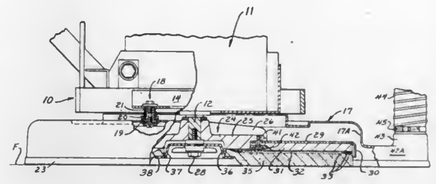
Gary E. Palmer, Roselle, Ill., and Mike J. Todd, Eagan, Minn., assignors to Hako Minuteman, Inc., Addison, Ill.

Filed Oct. 15, 1985, Ser. No. 787,269

Int. Cl.⁴ B24B *29/00;* **A47L** *11/14, 11/20*

U.S. Cl. 15—385 **11 Claims**

1. In a floor burnisher including a motor having a shaft rotating at high speed, an improved driver assembly comprising: a hub coupled to the shaft of said motor for rotation therewith; a flexible backing plate attached to said hub and extending radially outwardly thereof and defining an outer peripheral retainer flange extending downwardly therefrom; pad gripper means beneath the underside of said backing plate and attached to said hub for rotating therewith; and a burnishing pad engaging said gripper means and having an outboard edge immediately adjacent said retainer flange of said backing plate, said retainer flange at least partially encompassing said pad.



4,631,776

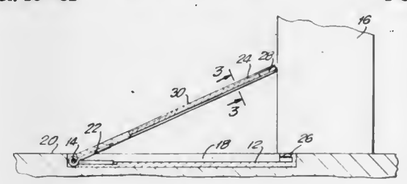
FOOT OPERATED DOOR CHECK

Mavis King, 8400 Shore Front Parkway, Rockaway Beach, N.Y. 11693

Filed May 31, 1985, Ser. No. 739,841

Int. Cl.⁴ E05F *5/02*

U.S. Cl. 16—82 **1 Claim**



1. A door check comprising a base plate and a check plate each provided with hinge components which form a hinge for hingedly connecting the base plate with the check plate, the check plate being pivotable upwardly to check a swinging door, the plates being substantially of the same shape, a spring mounted directly on the hinge to normally urge the two plates away from each other, said base plate having means for affixation to a base, a foot actuated sliding latch slidably maintained in a slot formed in the check plate, wherein said latch slides in said slot in a direction transverse to the hinge, a catch for said latch disposed on the base plate at an end remote from said hinge, said catch holding the check plate against the base plate when the latch is inserted in the catch, the spring biased check plate moving upwardly of the base plate when the latch is withdrawn from the catch.

4,631,777

GRAVITY DOOR HINGE

Hideaki Takimoto, Tokyo, Japan, assignor to Takigen Seizou Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 475,875, Mar. 16, 1983, abandoned. This application Jan. 7, 1985, Ser. No. 689,506

Claims priority, application Japan, Apr. 26, 1982, 57-59676[U]

Int. Cl.⁴ E05F *1/02*

U.S. Cl. 16—315 **5 Claims**

1. A gravity door hinge by which a door can be closed automatically by its own weight, comprising:

a cam having an inclined cam surface on the upper end thereof, said cam being inserted nonrotatably into a lower portion of an upward-opening socket which is provided in a fixed member, said cam having a horizontal seating surface at the upper part of the inclined cam surface;

an axial rod having its upper portion inserted nonrotatably into an axial hole provided in a rotational member; and

a cam follower which has an inclined cam surface on the lower end thereof, said cam follower being fitted nonro-

tatably around said axial rod by said axial rod being inserted into a central hole in said cam follower, so that said cam follower is located at a substantially middle position on said axial rod, the lower portion of said axial rod being fitted rotatably into an axial hole formed in the center of said inclined cam surface of said cam, so that said cam follower nonrotatably attached around said axial rod is inserted into and contacts directly the upper portion of said socket on top of said cam housed in the lower portion of said socket, and so that said inclined cam surfaces of



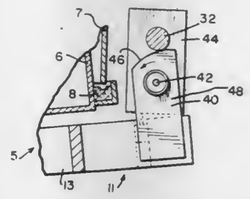
said cam and said cam follower are in close contact with each other, said cam follower having a horizontal seating surface at the lower part of the inclined cam surface, and wherein said rotational member is provided on the lower end thereof with a recess sized for receiving the upper part of said cam follower, said recess being formed concentric with said axial hole in said rotational member, said cam follower upper end being inserted into and closely fitted in said lower recess of the rotational member, and said upward-opening socket being formed so that the base thereof is completely closed.

4,631,778

SELF LOCKING DOOR RETARDER AND HINGE

Florian T. Kocon, Allentown, and Kurt A. Geiger, Danielsville, both of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed Jul. 25, 1985, Ser. No. 758,896
Int. Cl.[4] E05D *7/00*
U.S. Cl. 16—337 **10 Claims**



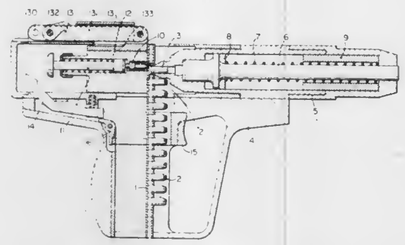
1. A hinge comprising a fixed hinge element, a movable hinge element and a hinge pin pivotally connecting the movable hinge element to the fixed hinge element; said movable hinge element including a first member rotatable about its own axis of rotation relative to the fixed hinge element and the hinge pin during initial pivotal movement of the movable hinge element; said first member including means for locking said first member to said hinge pin after said first member moves a predetermined amount so that further pivotal movement of said first element causes said first member and said hinge pin to rotate together relative to said fixed hinge about the longitudinal axis of the hinge pin.

4,631,779

ANIMAL SLAUGHTERING APPARATUS WITH ITS CARTRIDGE FEEDER ADVANCED AUTOMATICALLY, SIMULTANEOUSLY WITH THE RESETTING OF THE FIRING PIN

Gualtiero Castiello, Brescia, Italy, assignor to Berera & C. s.n.c., Reggio Emilia, Italy

Filed Apr. 11, 1985, Ser. No. 722,072
Int. Cl.[4] A22B *3/02*
U.S. Cl. 17—1 B **3 Claims**



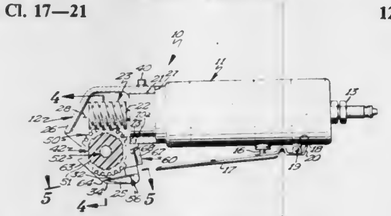
1. An animal slaughtering apparatus which comprises an explosion chamber (**3**), a cartridge strip feeder (**1**) aligned with said explosion chamber, a body (**4**) in the rear of said explosion chamber, a barrel (**5**) located in said body, a spike (**6**) moving forwardly in said barrel when a cartridge inserted in the explosion chamber is fired, a breech block (**12**) positioned forwardly of said explosion chamber and movable rearwardly and forwardly to close and to open said explosion chamber, said breech block carrying a firing pin (**10**) and a spring loaded striker element (**11**), means (**18, 20**) for advancing the cartridge feeder (**1**) stepwise simultaneously with the movement of said breech block, to obtain setting of the striker element (**11**) and the loading of a cartridge (**2**) into the explosion chamber by a single operation, after a cartridge has been fired, wherein said means for advancing the cartridge feeder (**18,20**) comprise a rocker lever (**18**) pivoted to the said breech clock (**12**) and having a first arm (**18'**) and a second arm (**18''**), a stationary cam (**21**) located in said body and a thrust pawl (**20**), said first arm being connected to said thrust pawl and being designed to engage and move said cartridge feeder (**1**), said second arm (**18''**) being designed to engage said stationary cam (**21**) in order to move said pawl (**20**) and simultaneously to move the feeder upwardly when the breech block is moved into the position for opening the explosion chamber (**3**).

4,631,780

HAND SKINNER DEVICE

Lyndon R. Leining, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed Apr. 26, 1985, Ser. No. 727,576
Int. Cl.[4] A22B *5/16*
U.S. Cl. 17—21 **12 Claims**



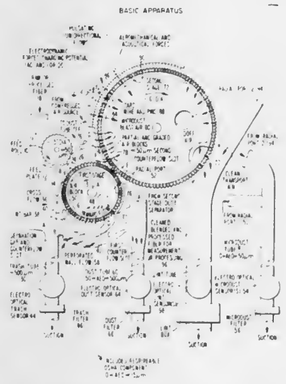
1. A hand skinning device comprising:
an elongate handle,
a housing mounted on one end of said handle including a horizontal lower wall portion and a pair of side wall portions,
a tooth roll assembly revolvably mounted on said housing including an elongate shaft and a tooth roll structure journaled on said shaft,
a blade positioned on said horizontal lower wall portion of said housing below said tooth roll assembly, and
clamping means engaging said housing and engaging and clamping said blade downwardly on the lower wall portion of said housing and engaging said shaft to releasably lock the same on the housing.

4,631,781

CONDITIONED GAS FLOW METHODS FOR PROCESSING AND CLEANING FIBER, INCLUDING AEROMECHANICAL AND ELECTRODYNAMIC RELEASE AND SEPARATION

Frederick M. Shofner, Knoxville, Tenn., assignor to ppm, Inc., Knoxville, Tenn.

Continuation of Ser. No. 716,175, Mar. 26, 1985, abandoned, which is a division of Ser. No. 552,061, Nov. 15, 1983, Pat. No. 4,512,060, which is a continuation-in-part of Ser. No. 428,608, Sep. 30, 1982, abandoned. This application Feb. 6, 1986, Ser. No. 826,903
Int. Cl.[4] D01B *3/00*
U.S. Cl. 19—200 **13 Claims**



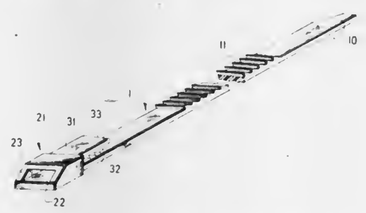
1. A method for cleaning fiber in a cleaning machine comprising deliberately applying during removal of particulate matter a gas flow conditioned as to a parameter selected from the group consisting of humidity, temperature, pressure, gas composition, free charge concentration, static charge, radioactive particle concentration, velocity and pressure fluctuations.

4,631,782

SELF-LOCKING FLAT CLAMPING BAND

Jan Gecs, Komarno, Czechoslovakia, assignor to Zavody Tazkeho Strojarstva, Narodny Podnik, Komarno, Czechoslovakia

Filed Dec. 31, 1984, Ser. No. 688,018
Claims priority, application Czechoslovakia, Dec. 30, 1983, 10200-83
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—16 PB **7 Claims**



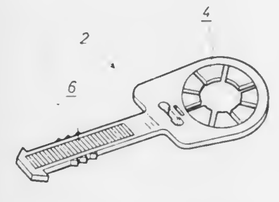
1. One-piece self-locking flat clamping band provided on its upper surface within its whole width with an operating toothing with a negative inclination of front sides of teeth, the band terminating on one end by a tail part and on the other end by a head with an opening for the introduction of the tail part of said band, the head being parallel with the band, a catch being provided on said head beyond the internal part of the head, a toothing with negative inclination of the front sides of teeth corresponding to the toothing on the band oriented in the opposite direction to that of said operating toothing being provided on the lower surface of said catch, both said toothings when mated forming a lock, said catch and that of the corresponding toothing situated thereon each having at least three teeth and having the same width as the band, the catch with its mating toothing being tilted toward the band so that after the lock has been formed the catch exerts a substantial pressure on the operating toothings.

4,631,783

HOLDING UNIT

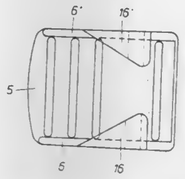
Yoshitoki Hayashi, Aichi, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Jun. 5, 1984, Ser. No. 617,540
Claims priority, application Japan, Jun. 21, 1983, 58-111686
Int. Cl.[4] F16L *3/12*
U.S. Cl. 24—16 PB **7 Claims**



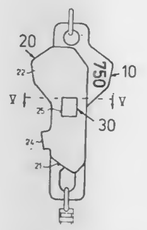
1. A holding unit for holding a tool and the like, said holding unit having first and second opposite faces, being elongate in a longitudinal direction thereof, and having a thickness that is everywhere substantially less than its longitudinal and transverse dimensions, said holding unit comprising:
a holding portion for holding a tool and comprising a plurality of resilient thin plates disposed substantially in a ring so as to form a central hole, said plates being separated by a plurality of slits extending substantially radially from said central hole toward an outer margin of said holding portion; and
a mounting portion for attaching said holding portion to an article, said mounting portion comprising a belt extending longitudinally of said holding unit, there being an elongated mounting hold through said mounting portion, disposed between said belt and said holding portion and extending transversely of said holding unit,
said belt comprising a plurality of teeth formed on opposite sides thereof corresponding to said first and second opposite faces of said holding unit,
there being an elongate recess formed in a face of said mounting portion corresponding to one of said first and second opposite faces of said holding unit, said elongate recess being spaced from and substantially parallel to said elongated mounting hole, a shelf member being disposed between said elongated mounting hole and said elongate recess and being substantially coextensive in length with said elongate recess, wherein said shelf member is integral with said mounting portion at first and second transverse ends of said shelf member,
said shelf member comprising means for engaging said belt when said belt is passed through said elongated mounting hole and for retaining said belt in said elongated mounting hole.

4,631,784
BUCKLE FOR SECURING A STRAP OR THE LIKE
Gerhard Fildan, Kriehubergasse 31, A-1050 Vienna, Austria
Filed Dec. 4, 1984, Ser. No. 677,821
Claims priority, application Austria, Dec. 5, 1983, 4238/83
Int. Cl.[4] A44B *11/12*
U.S. Cl. 24—170 **3 Claims**



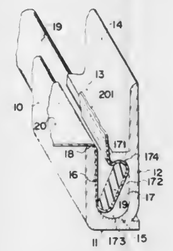
1. A buckle comprising a buckle body having a plate for receiving a band which is to be releasably fixed, said plate being provided on opposite sides with cheeks protruding from the plate at right angles thereto, said buckle also comprising an angled cover having a long arm and a short arm and pivoted to said cheeks directly at a bend between said arms at an axis lying in said bend, said long arm constituting an actuating lever and said short arm when the cover is in its closed position extending into a nonthroughgoing recess directly below said axis formed in said plate and open only toward said cover, said recess extending transversely to said band and through only part of the thickness of said plate, said recess having a depth tapering in a direction of swing of said short arm, and a slider secured to said band, said slider having an aperture for receiving said short arm, said short arm of said cover having a width which is slightly smaller than a spacing between said cheeks, said cheeks being provided with wedge-shaped projections spaced from said plate and which define between them a space which increases in width toward a forward end of the plate and also increases in width toward said plate, said projections overhanging said plate so that said band in said space passes between said projections and said plate.

4,631,785
CLASP FOR A CHAIN
Alois W. Riethmann, Toblerstrasse 60, 8044 Zurich, Switzerland
Filed Aug. 15, 1985, Ser. No. 765,649
Claims priority, application Switzerland, Sep. 5, 1984, 4234/84
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—232 R **4 Claims**



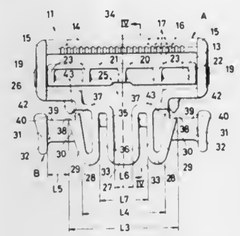
1. A clasp for a chain, comprising a casing,
a locking member resiliently supported in said casing and movable from a closed into an open position,
a spring member coupled to said locking member and operative to maintain said locking member in its closed position,
which casing is a flat shaped article bent to a U-form having two flanks,
which locking member has the shape of a flat plate and is pivotable between the flank sections of said casing around a pin located at a central area of said casing, has one end formed to have the shape of a hook, the opening of which being closed off by an edge section of said casing, and has an eyelet provided at the end opposite of said hook, said locking member having further a projection projecting out of said casing and acting as an operating member for inducing opening movement of said hook,
said pin comprising a rectangular cross-sectional shape and being supported in said casing in a nonrotatable manner,
and which said locking member is spring elastic and comprises a rectangular opening corresponding in shape to said pin and in which a side wall defining said rectangular opening is of a spring elastic property by the provision of at least one slot opening into said rectangular opening.

4,631,786
FRAME STRIP FOR RECEIVING THE EDGE OF A SHEET MATERIAL
Walter Curry, 337 Roberta Avenue, Winnipeg, Manitoba, Canada (R2K 0K5)
Continuation-in-part of Ser. No. 516,858, Jul. 25, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,059
Int. Cl.[4] A44B *21/00;* **E06B** *3/64*
U.S. Cl. 24—460 **7 Claims**



1. A frame strip for receiving an edge of a flexible sheet of material comprising an substantially rigid elongate strip member defining therein a continuous cavity of a constant cross section defined by a first side and an opposed second side, said first and second sides being substantially rigid, said first side extending from an outside surface of the strip member, said second side having a first side portion extending from an outside surface of the strip member in a direction parallel to and alongside said first side and spaced therefrom to define therebetween a channel, a second side portion extending in the same general direction as the first side and having a spacing from the first side greater than that of the first portion, an interconnecting portion joining the first and second portions and extending generally at right angles to the second portion, and a bottom portion interconnecting the first and second sides so as to define a locking area between said bottom portion, interconnecting portion, first side and second side, wherein a dimension of the second side portion from said bottom portion to said interconnecting portion is greater than the spacing between the second side portion and the first side, and a separate rigid elongate locking member dimensioned in a thickness direction such that it is thinner than and substantially equal to a width of the channel and in a width direction such that it is less wide than the dimension of the second side portion and wider than said spacing between the first side and the second side portion whereby the thickness of the member can just pass through the channel with the flexible material wrapped therearound into said locking area without flexing the sides thereof and can lock said material by wedging of said member against said first side and against said interconnecting portion.

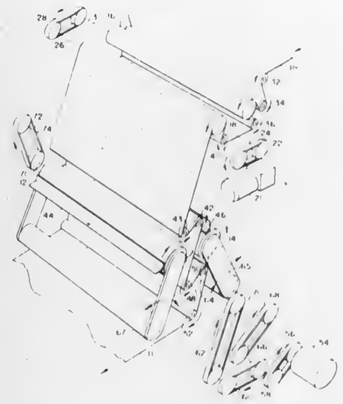
4,631,787
BUCKLE HAVING MANUALLY RELEASABLE INTERLOCKING MALE AND FEMALE PORTIONS
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Koygo Co., Ltd., Tokyo, Japan
Filed Jul. 11, 1985, Ser. No. 753,950
Claims priority, application Japan, Jul. 27, 1984, 59-114676[U]
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—616 **10 Claims**



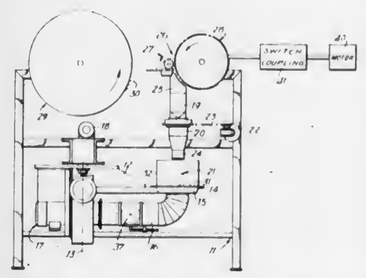
1. A buckle comprising:
(a) a male member of synthetic resin composed of a rectangular attachment for being attached to a fastening article, and a connecting portion secured to said attachment, said connecting portion comprising:
(1) a central base integral with said attachment along the length thereof;
(2) a pair of U-shaped resilient arms extending integrally from an intermediate portion of said central base with free ends extending toward the ends of said central base;
(3) a pair of engagement portions integral with said resilient bent arms, respectively, and having outwardly facing slanted surfaces, respectively; and
(4) a pair of grips joined to said engagement portions, respectively, and extending away from each other;
(b) a female member of synthetic resin composed of an attachment for being attached to a fastening article, and a tubular member integral with said attachment, said tubular member having a hollow portion for reception of said connecting portion therein, and fingers projecting perpendicularly to the plane of said U-shaped arms for locking engagement with end surfaces of said engagement portions, respectively; and
(c) each of said engagement portions having a tooth projecting from said end surface thereof toward said base, said central base having a pair of stop pawls disposed outwardly of said teeth and extending toward said end surfaces and beyond ends of said teeth.

4,631,788
APPARATUS FOR MECHANICALLY CONDITIONING TEXTILE MATERIALS
Louis Dischler, and Wolfgang K. F. Otto, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 23, 1985, Ser. No. 768,814
Int. Cl.[4] D06C *19/00, 15/14*
U.S. Cl. 26—25 **6 Claims**

1. Apparatus to mechanically soften a textile fabric comprising: a frame, a first flap roll rotatably mounted in said frame, a second flap roll spaced from said first flap roll and rotatably mounted in said frame, each of said flap rolls having at least two flaps connected thereto and extending outwardly therefrom, said flaps in each roll being out spaced from one another and out of phase with the corresponding flaps on the other of said flap rolls, a first fabric guide roll mounted on one side of said flap rolls to guide fabric between said flap rolls, a second fabric guide roll on the other side of said flap rolls to guide fabric away from said flap rolls, all of said rolls being mounted so that a plane through the axis of rotation of said guide rolls will cross at an angle from the perpendicular to a plane passing through the axis of rotation of said flap rolls, means to supply a fabric to be softened from said first fabric guide roll to said second fabric guide roll between said flap rolls and means connected to said flap rolls rotate both of said flap rolls in the same direction and at a greater velocity than the linear velocity of the fabric and to cause the flaps on each of said flap rolls to successively impact and shear the fabric being passed therebetween, a flap of one flap roll contacting one side of the fabric just after a flap on the flap other roll has released contact with the opposite side of the fabric passing between said flap rolls.



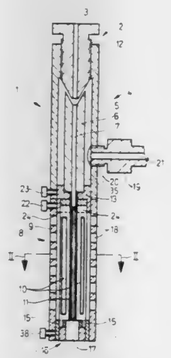
4,631,789
APPARATUS FOR THE PRODUCTION OF NEEDLED, SHAPED FIBROUS BODIES
Richard Dilo, Eberbach, Fed. Rep. of Germany, assignor to Oskar Dilo Maschinenfabrik KG, Eberbach, Fed. Rep. of Germany
Filed Nov. 10, 1983, Ser. No. 550,449
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243326
Int. Cl.[4] D04H *18/00*
U.S. Cl. 28—107 **6 Claims**



1. An apparatus for producing needled fibrous bodies of a predetermined geometrical form and height of fibrous material, particularly bodies used as padding elements in the clothing industry, comprising;
a perforated table with openings in its surface and movable between a first position A and a second position B;
a nozzle positioned above said perforated table at said position A for passing therethrough an air flow carrying individual fibers to form a fibrous heap on said table, said

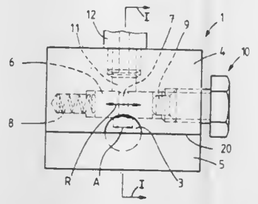
nozzle being movable enabling change of its position relative to said perforated table;
a tube, said nozzle being positioned at the end of said tube;
a vacuum casing and a pipe arranged beneath said perforated table, said casing being connected to a vacuum source via said pipe;
a needling device positioned to be above the perforated table when said table is in said position B, said needling device including a moving needle board having needles arranged to correspond with said openings in said perforated table; and
means for moving said table between said positions A and B and said nozzle relative to said table.

4,631,790
APPARATUS FOR TEXTURIZING OF THREADS OF ENDLESS FILAMENTS
Werner Nabulon, Rüdlingen, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland
Filed May 21, 1985, Ser. No. 736,374
Claims priority, application Switzerland, May 30, 1984, 2656/84
Int. Cl.⁴ D02G *1/12, 1/16*
U.S. Cl. 28—255 **9 Claims**



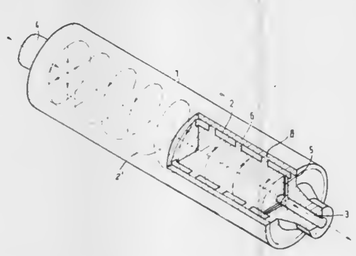
1. An apparatus for the texturizing of threads of endless filaments or the like by means of heated flowing media, comprising:
a thread infeed portion of suctionally drawing-in a thread;
a treatment portion following and adjoining said thread infeed portion;
said treatment portion being provided with a treatment chamber for heating the drawn-in thread;
a texturizing portion following and adjoining said treatment portion;
said texturizing portion comprising a slotted nozzle in which the heated thread is accumulated to form crimps in the thread;
said slotted nozzle being provided with lamellae producing slots of said slotted nozzle;
said lamellae having narrow faces, with one narrow face of each lamella confronting the accumulated thread and defining a thread-guiding face;
each of said lamellae having a substantially rectangular cross-section and being arranged in a radiating array;
each of said lamellae comprising a substantially flat steel portion which is rounded and possesses a rolled curvature and which is polished to a roughness value of at least 0.2 micrometer at said thread-guiding face thereof defined by said narrow face which confronts the accumulated thread; and
said rounded and polished thread-guiding face of each of said lamellae mitigating against wear thereof which would result in uncontrolled varying friction and texturizing conditions.

4,631,791
APPARATUS FOR INTERLACING A MULTI-FILAMENT YARN
Georg Symon, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland
Filed Dec. 11, 1984, Ser. No. 680,526
Claims priority, application Switzerland, Dec. 20, 1983, 6772/83
Int. Cl.⁴ D02J *1/08;* D02G *1/16*
U.S. Cl. 28—271 **15 Claims**



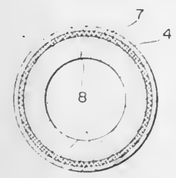
1. An interlacing apparatus for interlacing a multi-filament yarn, comprising:
means defining an interlacing passage having a direction of forwarding the yarn;
at least one blow nozzle opening into said interlacing passage at a predetermined angle with respect thereto for infeeding of a pressurized fluid medium;
means cooperating with said at least one blow nozzle to enable adjustment of said at least one blow nozzle such that said at least one blow nozzle is moved in a direction extending transverse to the direction of forwarding the yarn and such that said at least one blow nozzle is selectively movable both to-and-fro in said direction; and
said adjustments means including means for applying an opposing force to said at least one blow nozzle for assisting in said adjustment of said at least one blow nozzle in said direction extending transverse to the direction of forwarding the yarn.

4,631,792
COMPOSITE BODY
Karl-Friedrich Wesemann, Mulheim; Rainer Lenk, Duisburg; Klaus Kobusch, Krefeld, and Manfred Markan, Willich, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesselschaft, Duesseldorf, Fed. Rep. of Germany
Filed Aug. 19, 1983, Ser. No. 524,768
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231433
Int. Cl.⁴ B21B *31/08;* B60B *7/06*
U.S. Cl. 29—129 **12 Claims**



1. A composite body comprising a first metal element having a plurality of ridges delineating a surface plane; and a second metallic element having a surface situated in said surface plane, further having groove means on the side facing away from said surface plane, bottom portions of the groove means is fused with said ridge means.

4,631,793
FIBER REINFORCED METAL ALLOY AND METHOD FOR THE MANUFACTURE THEREOF
Yasuyuki Shintaku, Sennan, and Hisashi Hiraishi, Kyoto, both of Japan, assignors to Chugai Ro Co., Ltd. and Kubota, Ltd., both of Osaka, Japan
Continuation of Ser. No. 574,621, Jan. 27, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,558
Int. Cl.⁴ B22B *27/00*
U.S. Cl. 29—132 **1 Claim**



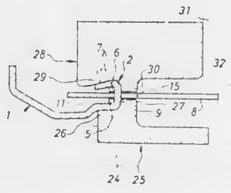
1. A hollow cylindrical metallic body which comprises a metal matrix and a composite material comprised of a generally pipe-like braided element of inorganic reinforcing fibers individually comprised of alumina, boron oxide and silica mixed in a predetermined mixing ratio, said metal matrix being positioned on each of the inner and outer peripheral surfaces of the braided element and infiltrated therethrough and being cast together with the braided element by the use of a centrifugal casting technique.

4,631,794
APPARATUS AND METHOD FOR EDDY CURRENT HEATING A ROLL IN A PAPER MACHINE
Jaakko Riihinen, Jyväskylä , Finland, assignor to Valmet Oy, Finland
Division of Ser. No. 560,394, Dec. 12, 1983. This application Jun. 3, 1985, Ser. No. 740,712
Claims priority, application Finland, Dec. 14, 1982, 824281
Int. Cl.⁴ B21B *31/08, 27/00*
U.S. Cl. 29—132 **3 Claims**



1. A calender roll for use in a paper machine adapted to be inductively heated by electromagnetically generated eddy currents, comprising
a tubular inner support frame having a radial thickness,
a heat insulation layer disposed on said tubular support frame and formed of magnetically non-conductive material, said heat insulation layer having a radial thickness in the range of between about 10 to 100 mm, and
an outer mantle disposed over said insulation layer and formed of ferromagnetic material, said outer mantle having a radial thickness in the range of between about 1 to 50 mm, and wherein
said radial thickness of said tubular inner support frame is substantially greater than the radial thickness of said heat insulation layer and said outer mantle,
said roll adapted to be heated by eddy currents applied exclusively from outside thereof and to confine said eddy current heating substantially within said mantle.

4,631,795
MANUFACTURING DEVICE OF A CLUTCH COVER ASSEMBLY
Mamoru Ookubo, Neyagawa; Takayuki Iwasaki, Ikoma, and Kenji Mieda, Hirakata, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan
Filed May 29, 1985, Ser. No. 738,789
Claims priority, application Japan, May 31, 1984, 59-112684
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—243.52 **2 Claims**



1. A manufacturing device for a clutch cover assembly having an annular clutch cover with a body having a surface and provided at the inner periphery with a plurality of projections, a diaphragm spring including openings through which the projections extend, and a pair of wire rings for diaphragm spring fulcrums, said wire rings being supported on opposite sides of the diaphragm spring by said projections, and the inner peripheries of the wire rings being supported by body portions of said projections between free ends of said projections and said clutch cover body; the manufacturing device comprising:
a lower die having a generally planar annular surface and a generally cylindrical lower projection body support disposed radially inside the annular surface, the annular surface being operable to support the lower surface of the clutch cover body with the wire rings and diaphragm spring mounted on the projections in such a position that said projections extend upwardly from the clutch cover body; the lower projection body support extending above the annular surface by a distance no greater than the sum of (a) the thickness of the clutch cover body beneath the wire ring and (b) the cross-sectional diameter of the wire ring and being operable to support radially inner sides of the portions of said projection bodies positioned below the diaphragm spring; and
an upper die adapted to be lowered to push down the free ends of the projections; having a generally frustoconical annular surface and a generally cylindrical upper projection body support disposed radially inside of the frustoconical surface, the frustoconical surface being upwardly concave and being operable to downwardly bend the free ends of the projections, which incline upwardly from the projection bodies, to predetermined positions; and the upper projection body support extending downwardly from the contiguous edge of the frustoconical surface by a distance no greater than the sum of (a) the thickness of the free ends of the projections above the wire ring and (b) the cross-sectional diameter of the wire ring, and being opera-

ble to support radially inner sides of portions of said projection bodies positioned above the diaphragm spring.

4,631,796

TORQUE SENSOR AND METHOD FOR MANUFACTURING THE SAME

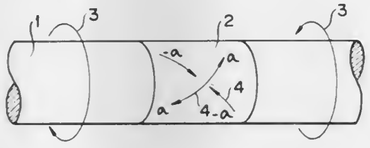
Koichiro Inomata; Takao Sawa, and Osamu Arakawa, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1983, Ser. No. 536,836

Claims priority, application Japan, Sep. 30, 1982, 57-171344; Sep. 30, 1982, 57-171346; Sep. 30, 1982, 57-171347

Int. Cl.⁴ B23P *11/02*; G01L *3/02*

U.S. Cl. 29—446 **9 Claims**



1. A method for manufacturing a torque sensor (i) which has a rotary shaft and a thin strip comprised of an amorphous magnetic alloy windingly fixed on the rotary shaft, said strip having a large magnetic strain constant, and (ii) which detects a torque in a non-contact style on the basis of a variation in magnetic properties of the thin strip, comprising the steps of (A) imparting an inductive magnetic anisotropy to said thin strip and then (B) windingly fixing the thin strip on the rotary shaft.

4,631,797

METHOD OF FORMING FORGED JOINTS

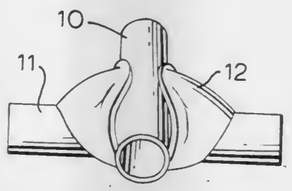
Stuart A. Hill, Claydon Forge Old Ipswich Road, Claydon, Suffolk, England

Filed May 23, 1983, Ser. No. 497,152

Claims priority, application United Kingdom, May 22, 1982, 8215001

Int. Cl.⁴ B23P *11/02*

U.S. Cl. 29—447 **8 Claims**



1. A method of forming a joint between two bars so as to extend with the axes of the bars at an angle to one another and using a tubular stub of a plastically-deformable material, which method comprises the steps of:

arranging the two bars at the required angular disposition but with a space therebetween;

positioning the tubular plastically deformable stub between the two bars with the axis of the stub substantially intersecting said axes of the two bars; and

pressing the two bars together thereby plastically to deform said stub so as to become at least partially formed around and interlocked with said two bars.

8. A method of forming a joint between two bars of circular cross-sectional shape of similar diameters, so as to extend with the axes of the bars at an angle to one another and using a tubular stub of a plastically-deformable metallic material of square cross-sectional shape and with an across-the-flats dimension substantially equal to twice the diameter of said bars, which method comprises the steps of:

arranging the two bars at the required angular disposition but with a space therebetween;

heating the metallic stub;

positioning the tubular plastically deformable stub between the two bars with the axis of the stub substantially intersecting said axes of the two bars;

pressing the two bars together thereby plastically to deform said stub so as to become at least partially formed around and interlocked with said two bars, the pressing being completed before the temperature of the stub has dropped significantly from its initial heated temperature; and

subjecting the joint to forced cooling to cause said stub to contract so as firmly to grip the two bars.

4,631,798

METHOD OF PRODUCING A RELEASE AGENT APPLICATOR

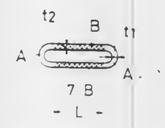
Takao Ogino; Hiroo Katsuya; Chiaki Kato; Sigelu Omori, all of Osaka; Satsuki Kawauchi, Shiga; Itsuro Kato, and Tsutomu Kato, both of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd. and Sharp Kabushiki Kaisha, both of Osaka, Japan

Continuation of Ser. No. 610,649, May 16, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,300

Claims priority, application Japan, May 19, 1983, 58-88944

Int. Cl.⁴ B23P *25/00*

U.S. Cl. 29—458 **3 Claims**



1. A method for producing a release agent applicator for use with a copying machine in which a release agent is applied onto a fixing roll in the copying machine through a porous wall polyethylene tetrafluoride tube, comprising the steps of:

(a) preparing said porous wall tube formed of polyethylene tetrafluoride;

(b) inserting a plate into said tube;

(c) pressing said tube against opposite sides of said plate to flatten and crush said tube wall against the opposite sides of said plate and partially close said pores in said porous tube that was flattened and crushed against said opposite sides of said plate while leaving open the pores in connecting edge portions between said opposite flattened sides of said porus tube wall;

(d) removing said plate from said flattened tube; and

(e) mounting said flattened and crushed tube within a support with an open pore connecting edge portion thereof exposed to permit release agent to flow through the open pores and onto said fixing roll.

4,631,799

COMBINED MOTORIZING AND DRILLING MACHINE

Bernard D. Campbell, Grand Rapids, Mich., assignor to Alexander Dodds Company, Grand Rapids, Mich.

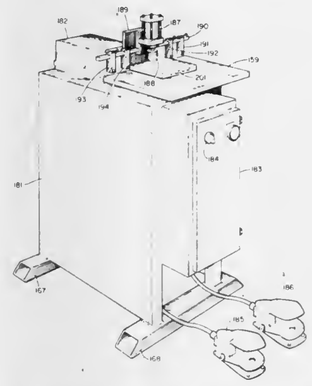
Filed Nov. 5, 1984, Ser. No. 668,634

Int. Cl.⁴ B23B *39/02*; B23P *13/02*

U.S. Cl. 29—558 **7 Claims**

1. A mortising and drilling machine having a main frame, a work-receiving table mounted on said main frame, routing means moveably mounted with respect to said main frame for axial movement with respect to work pieces received on said table, and for lateral movement in a direction normal to said axial movement, positioning means adapted to induce said axial and lateral movements, and control means adapted to coordinate said movements, wherein the improvement comprises:

a rotary routing cutter carried by said routing means, said routing cutter having an axial hole throughout its length, said routing means including a spindle rotatably mounted with respect to said frame, said spindle including clamping means for gripping said routing cutter, said spindle having an axial threaded recess inward from said clamping means,



and further including a tubular setscrew in threaded engagement with said recess to form an adjustable stop for determining the axial position of said cutter with respect to said spindle;

a drill slideably received in said hole, said drill being axially moveable within said setscrew:

rotary drive means for said drill; and

means for inducing relative axial movement between said drill and said routing cutter.

4,631,800

ELECTRONIC PARTS OUTFITTING DEVICE

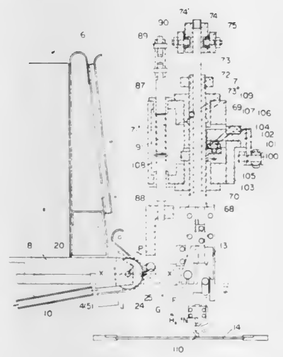
Taira Ishii, Kadoma; Yoshihiko Misawa; Yoshinobu Maeda, both of Katano, and Souhei Tanaka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

PCT No. PCT/JP83/00233, § 371 Date Mar. 20, 1985, § 102(e) Date Mar. 20, 1985, PCT Pub. No. WO85/00724, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 20, 1983, Ser. No. 717,274

Int. Cl.⁴ B23Q *41/00*

U.S. Cl. 29—564.6 **4 Claims**



1. An electronic parts mounting device, comprising:

a rotatable support, said rotatable support having a disc shape and a center of rotation;

a tape feeding means removably mounted on and transferred by said rotatable support, said tape feeding means holding and intermittently feeding electronic part assemblies to a first position along a moving path of said rotatable support, each of said electronic part assemblies having a plurality of electronic parts held at specified intervals along tapes;

clamping means, removably mounted on said rotatable support, for removably clamping said tape feeding means to said rotatable support;

an insertion head for removing a desired electronic part in said first position from an electronic part assembly, said insertion head holding and transferring said electronic part to a second position near the surface of a printed substrate, said second position being spaced from said first position and away from the moving path of said rotatable support;

guiding means, located below a bottom surface of said rotatable support in correspondence with said tape feeding means, for guiding tape scraps left over after said electronic parts have been removed from respective electronic part assemblies;

tape cutting means for cutting said tape scraps, said tape cutting means located adjacent said guiding means but between said guiding means and said center of rotation of said rotatable support such that said tape cutting means does not interfere with rotation of said rotatable support or said guiding means;

substrate support means, located below said insertion head, for moving a printed substrate in a plane to a desired position; and

drive control means, operably connected to at least said rotatable support and said substrate support means, for moving said rotatable support to a position where a specified tape feeding means can intermittently feed a desired electronic part to said first position and for moving said substrate support means to a position where it is desired to mount said electronic part on said printed substrate.

4,631,801

METHOD OF MAKING PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co. Ltd., Tokyo, Japan

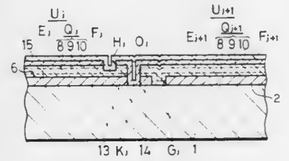
Continuation of Ser. No. 620,098, Jun. 13, 1984, Pat. No. 4,586,241, which is a division of Ser. No. 554,772, Nov. 23, 1983, Pat. No. 4,529,829. This application Sep. 17, 1985, Ser. No. 776,806

Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 29—572 **30 Claims**



1. A method of making a photoelectric conversion device in which a plurality n (where n is an integer layer than 2) of semiconductor elements U_1 to U_n are sequentially formed side by side on a substrate having an insulating surface and con-

nected in series one after another, the semiconductor element U_i (i=1, 1, . . . n) comprising a first electrode E_i and a second electrode F_i on a non-single-crystal semiconductor laminate member Q_i, the second electrode F_{j+1} (j=1,2. . . . (n−1) being connected via a coupling portion K_j to the first electrode E_j, comprising the steps of:

forming on the substrate sequentially arranged first electrodes E_1 to E_n;

forming on the substrate a non-single-crystal semiconductor laminate layer having formed therein at least one semiconductor junction to cover the first electrodes E_1 to E_n;

forming (n−1) sequentially arranged grooves O_1 to O_{n-1} in the non-single-crystal semiconductor laminate layer to form n sequentially arranged non-single-crystal semiconductor laminate members Q_1 to Q_n extending on the first electrodes E_1 to E_n, respectively, and to expose the first electrodes E_1 to E_{n-1} to the outside through the grooves O_1 to O_{n-1}, respectively;

forming a conductive layer which continuously extends on the non-single-crystal semiconductor laminate members Q_1 to Q_{n-1} to provide coupling portions K_1 to K_{n-1} which are connected to the first electrode E_1 to E_{n-1} through the grooves O_1 to O_{n-1}, respectively;

forming (n−1) sequentially arranged isolating grooves H_1 to H_{n-1} in at least the conductive layer by using a laser beam to form n sequentially arranged second electrodes F_1 to F_n separated by the isolating grooves H_1 to H_{n-1} and opposing the first electrodes E_1 to E_n through the non-single-crystal semiconductor laminate members Q_1 to Q_n, respectively, the second electrodes F_{j-1} (j=1, 2, . . . (n−1)) being connected to the first electrodes E_j through the coupling portions K_j;

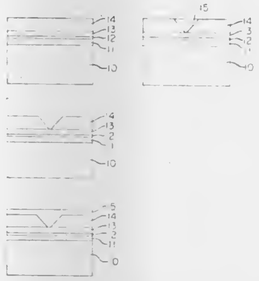
following the formation of the isolating grooves H_1 to H_{n-1} with a debburing or an etch using a gas or liquid.

4,631,802

PROCESS FOR THE PRODUCTION OF A SEMICONDUCTOR DEVICE

Hideki Hayashi, and Kenichi Kikuchi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 640,229, Aug. 13, 1984, Pat. No. 4,321,888, which is a continuation of Ser. No. 275,029, Jun. 18, 1981, abandoned. This application Mar. 25, 1985, Ser. No. 715,814
Claims priority, application Japan, Jun. 24, 1980, 55-85523
Int. Cl.⁴ H01L *21/36*
U.S. Cl. 29—576 E **1 Claim**



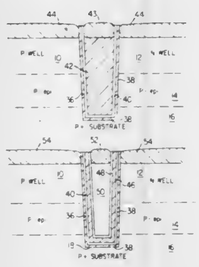
1. A process for making a semiconductor device, which comprises a step of growing epitaxially on the uppermost layer of a multilayer epitaxial wafer for composing a semiconductor laser a layer consisting of a semiconductor of different conductivity type from that of the uppermost layer, a step of etching the semiconductor layer only with anisotropic and selective etchant to give a cross section of V-type, a step of growing epitaxially another layer consisting of a semiconductor of different conductivity type from that of the semiconductor layer to form a flat surface, a step of etching the whole surface until the semiconductor layer is exposed except on the area of the V-type zone, and a step of forming ohmic electrodes on the semiconductor zone of V-type, the semiconductor layers positioned opposite each other across the semiconductor zone of V-type and the back surface of a substrate.

4,631,803

METHOD OF FABRICATING DEFECT FREE TRENCH ISOLATION DEVICES

William R. Hunter, Garland; Christopher Slawinski, Austin, and Clarence W. Teng, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 14, 1985, Ser. No. 701,465
Int. Cl.⁴ H01L *21/302, 21/76*
U.S. Cl. 29—576 W **14 Claims**



1. A method of forming an isolation trench in a semiconductor device, comprising the steps of:

forming a trench in a silicon body,

forming a layer of insulating material over the interior walls of said trench, said layer being sufficiently thin to prevent increase of stress within said trench,

forming an oxidation masking layer over said layer of insulating material,

removing said oxidation masking layer from predetermined portions of said silicon body,

filling the remainder of said trench with a body of oxidizable isolation material, and then

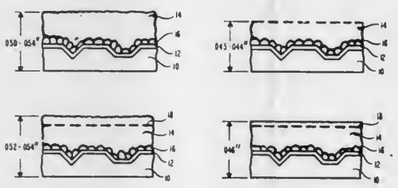
oxidizing said silicon body to form a layer of field oxide over said predetermined portions of said semiconductor body and the filled trench while simultaneously oxidizing a surface portion of said isolation material, said oxidation masking layer preventing undesirable oxidation and stress within the semiconductor material which might otherwise cause dislocation defects.

4,631,804

TECHNIQUE FOR REDUCING SUBSTRATE WARPAGE SPRINGBACK USING A POLYSILICON SUBSURFACE STRAINED LAYER

Pradip K. Roy, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1984, Ser. No. 680,344
Int. Cl.⁴ H01L *21/304, 21/316*
U.S. Cl. 29—576 W **15 Claims**



1. A method of depositing a thick polysilicon layer on a dielectrically isolated wafer to include within said thick polysilicon layer of localized strained subsurface layer, said subsurface layer for reducing the springback warpage associated with the subsequent substrate thinning of said dielectrically isolated wafer, the method comprising the steps of:

(a) depositing a first polysilicon layer on a top major surface of a dielectric isolated wafer to a predetermined polysilicon subsurface location;

(b) interrupting the deposition process of step (a) at said predetermined polysilicon subsurface location so as to create said localized strained subsurface polysilicon layer;

(c) completing the deposition initiated in step (a) over said strained subsurface polysilicon layer created in step (b) so as to form a thick polysilicon layer of a predetermined final height;

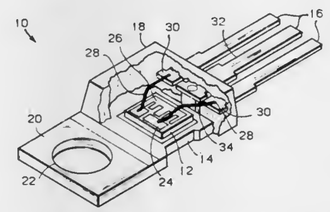
(d) grinding the surface of said thick polysilicon layer formed in step (c).

4,631,805

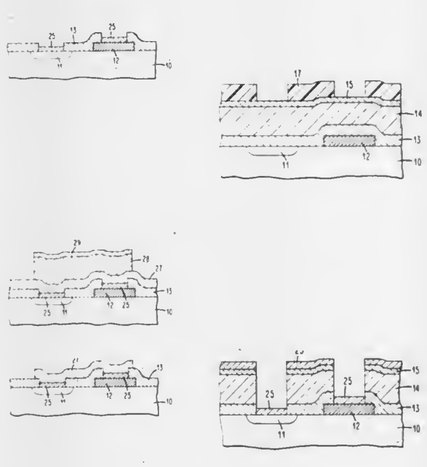
SEMICONDUCTOR DEVICE INCLUDING PLATELESS PACKAGE FABRICATION METHOD

Dennis R. Olsen, and Keith G. Spanjer, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 611,923, May 18, 1984, Pat. No. 4,596,374, which is a continuation of Ser. No. 246,784, Mar. 23, 1981. This application Jul. 22, 1985, Ser. No. 757,584
Int. Cl.⁴ H01L *23/48*
U.S. Cl. 29—588 **22 Claims**



1. A method for packaging a semiconductor device which comprises the steps of: providing a semiconductor die; providing a plateless copper alloy package bonding portion; providing a plateless copper alloy package lead portion; said bonding portion positioned with respect to said lead portion; applying a metal layer to a first side of said semiconductor die; bonding said metal layer to said bonding portion using a metal solder metallurgically compatible with said copper alloy and said metal layer; applying a patterned metal to a second side of said semiconductor die; ultrasonically bonding copper ribbon between said patterned metal and said package lead portion; and encapsulating said semiconductor die.



4,631,806

METHOD OF PRODUCING INTEGRATED CIRCUIT STRUCTURES

Paul E. Poppert, Acton; Marvin J. Tabasky, Peabody, and Eugene O. Degenkolb, Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 22, 1985, Ser. No. 736,881
Int. Cl.⁴ H01L *21/28, 21/312, 21/88*
U.S. Cl. 29—589 **5 Claims**

1. The method of producing interconnections in an integrated circuit structure comprising

providing an integrated circuit sturcture including a body of silicon and having a surface coated with a layer of an adherent nonconductive protective material of silicon dioxide, silicon nitride, or silicon dioxide and silicon nitride;

depositing masking material on the layer of protective material including the steps of depositing a layer of a planarizing material on said layer of protective material, and depositing a layer of silicon on said layer of planarizing material;

forming openings in said masking material and in said layer of protective material to expose contact areas on said surface of the integrated circuit structure;

depositing a first conductive material overlying the remainder of the masking material and the contact areas exposed at the openings in the masking material and in the protective material;

removing the remainder of the masking material and the first conductive material thereon leaving first conductive material on said contact areas;

depositing a second conductive material overlying said protective material and the first conductive material on said contact areas; and

selectively removing portions of said second conductive material to form conductive members overlying the first conductive material on said contact areas and overlying portions of said layer of protective material;

wherein said first conductive material is a metal which provides a barrier to diffusion of the second conductive material therethrough.

4,631,807

METHOD OF MANUFACTURING A PERMANENT-MAGNET FIELD ROTOR

Shigeki Kawada; Yoichi Amemiya; Masatoyo Sogabe, all of Hachioji, and Noboru Iwamatsu, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Feb. 11, 1985, Ser. No. 708,210
Claims priority, application Japan, Jun. 10, 1983, 58-102833
Int. Cl.⁴ H02K *15/02*
U.S. Cl. 29—598 **7 Claims**

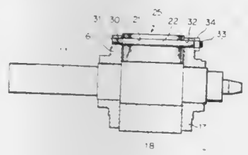
1. The method of manufacturing a permanent-magnet field rotor including a plurality of permanent magnets disposed in a radial fashion around said rotor, and yoke elements disposed between each two successive permanent magnets, comprising the steps of:

forming a number of same shaped thin plate members from sheet magnetic material, each plate member having a plurality of sectoral yoke element portions arranged in a radial fashion and peripheral link portions each linking outer circumferential edges of each two successive yoke element portions to one another so as to define therebetween a permanent magnet receiving slot area;

stacking a number of said plate members with said sectoral yoke element portions in alignment so that said slot areas form permanent magnet receiving slots therebetween;

inserting permanent magnets in said permanent magnet receiving slots;

fixing said stacked thin plate members firmly to each other by means of a pair of end plates disposed on opposite ends of said stacked thin plate members and rod means extending between and connected at opposite ends thereof to said end plates, respectively, said end plates being formed to have an outside dimension smaller than an inside dimension of said peripheral link portions; and





cutting out, in the stacked direction, a central portion amount of each of said peripheral link portions of said stacked thin plate members outside the dimension of said end plates, said cut out amount being less than the width of each of asid permanent magnets, the remaining portions of said link portions thereby forming portions of said yokes at opposite sides of each of said permanent magnets for retaining said magnets, said yokes thereby being composed of stacks of said sheet magnetic material separated from one another.

4,631,808

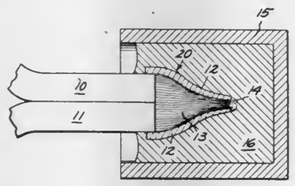
METHOD OF FORMING A SUPERCONDUCTIVE JOINT BETWEEN MULTIFILAMENT SUPERCONDUCTORS

Donald W. Jones, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1983, Ser. No. 530,926

Int. Cl.⁴ H01L *39/24*

U.S. Cl. 29—599 **11 Claims**



1. A method of joining at least two super-conductive conductors in which a plurality of superconductive filaments are embedded in a resistive matrix, said method comprising the steps of:

removing said resistive matrix from along a length of said at least two superconductive conductors at the ends thereof to expose said superconductive filaments;

juxtaposing said exposed superconductive conductors in a sleeve of supconductive material;

crimping said sleeve about said exposed superconductive filaments so as to produce a pinchoff region in said sleeve;

severing said sleeve at said pinchoff; and thermally fusing the exposed ends of said superconductive filaments to said sleeve.

4,631,809

PROCESS FOR MANUFACTURE CORES OF ELECTROMAGNET

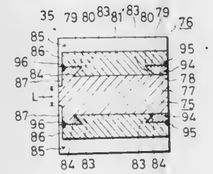
Toshiro Yokoi, Nagoya, Japan, assignor to Sanmeidenki Kabushikikaisha, Japan

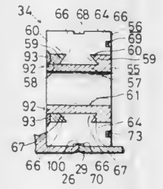
Filed Apr. 9, 1984, Ser. No. 597,872

Claims priority, application Japan, Jul. 4, 1983, 58-121456; Oct. 17, 1983, 58-193846

Int. Cl.⁴ H01F *7/06*

U.S. Cl. 29—607 **6 Claims**





1. A process for manufacturing a magnetic core of a circular cylindrical external form used in a space inside a cylindrical coil, comprising the steps of:

(a) preparing an engaging means which comprises two elements,

one element including a cylindrical body and a connecting portion formed on the outer circumferential surface at one end of said cylindrical body and provided with a conical locking surface opposed to said outer circumferential surface of said cylindrical body and directed toward one end of said cylindrical body, and

the other element being made in a ring-like form suitable for placement on the outer circumferential surface at the other end of the cylindrical body and directed toward the other end of said cylindrical body,

(b) preparing a plurality of core elements of a uniform thickness made of silicon steel sheets which are respectively provided at one edge portion thereof to be positioned close to the outer circumferential surface of said cylindrical body, with an engaging portion for insertion between the outer circumferential surface of said cylindrical body and the conical locking surface of the connecting portion in said one element, and with an engaging portion for insertion between the outer circumferential surface of said cylindrical body and a conical locking surface in said ring-like element,

(c) preparing a plurality of core elements made of magnetic steel sheets which are respectively provided, at one edge portion thereof to be positioned close to the outer circumferential surface of said cylindrical body, with an engaging portion for insertion between the outer circumferential surface of said cylindrical body and the conical locking surface in said ring-like element, and made thinner at the edges thereof to be positioned close to the outer circumferential surface of the cylindrical body and thicker at the opposite edges thereof,

(d) alternately arranging each of a plurality of said core elements made of silicon steel sheets and each of magnetic steel sheets radially one by one around said cylindrical body in direct contact with each other and simultaneously interposing one engaging portion on each of all the core elements between the outer circumferential surface of said cylindrical body and the conical locking surface of the connecting portion provided peripherally on said cylindrical body, and

(e) interposing the other engaging portion of each of said core elements between the outer circumferential surface of said cylindrical body and the conical locking surface in said ring-like element by placing the ring-like element on the other end of said cylindrical body and simultaneously fixing said ring-like element on said cylindrical body.

4,631,810

SOLID STATE CELL MANUFACTURE

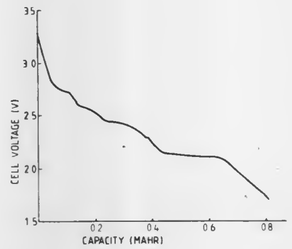
Alan Hooper, Nr Faringdon, and John M. North, Compton, Nr Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 9, 1984, Ser. No. 658,793

Claims priority, application United Kingdom, Oct. 19, 1983, 8328022

Int. Cl.⁴ H01M *4/04*

U.S. Cl. 29—623.5 **5 Claims**



1. A method of making a solid state electrochemical cell comprising an anode having lithium as its active material, a polymeric electrolyte, and a composite cathode in the form of a composite of an insertion electrode material or similarly active material in combination with a polymeric material, which method comprises the steps of

(i) preparing a solution of one of the polymeric electrolyte or the composite cathode material in a solvent at an elevated temperature, the polymer of the electrolyte and the composite cathode and the solvent having the properties that the polymer is readily soluble in said solvent at the elevated temperature, and sparingly soluble in said solvent at a lower temperature, and that immediate precipitation of the polymer does not occur on cooling the solution of the polymer in said solvent from the elevated temperature to the lower temperature;

(ii) cooling the polymer solution to the lower temperature and solution-casting the cooled polymer solution onto a film of the other of the polymeric electrolyte or the composite cathode followed by evaporation of the solvent to form a film of said one of the polymeric electrolyte or the composite cathode thereby to give a unitary electrolyte/-cathode film component; and

(iii) assembling said unitary electrolyte/cathode film component with an anode, to form a solid state electrochemical cell.

4,631,811

LOCKING DEVICE FOR ELECTRONIC PARTS

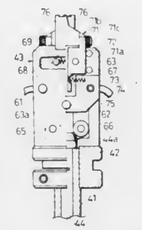
Tatsuo Shirouzu; Nobuhiro Sakata; Masaki Kono, and Saburo Inagaki, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 13, 1985, Ser. No. 775,595

Claims priority, application Japan, Sep. 14, 1984, 59-140227[U]

Int. Cl.⁴ H05K *3/30*

U.S. Cl. 29—705 **4 Claims**



1. A locking device for electronic parts comprising

a clinch head positioned opposing to the face of an electronic parts-mounting board from which face the lead wires of the parts are projecting,

an advance/retreat mechanism for advancing and retracting said clinch head relative to the board,

a rotary mechanism for turning said clinch head,

said clinch head having a pair of drive arms whose tips are driven in the opening or closing direction and clinch pawls pivoted on said drive arms,

said clinch pawls being forced by springs in the direction of further opening or closing relative to said drive arms, and

a detection mechanism for detecting the operation of each of said clinch pawls having moved a little in the direction opposing to the force of said spring as the result of each clinch pawl having abutted on the lead wire of the electronic parts.

4,631,812

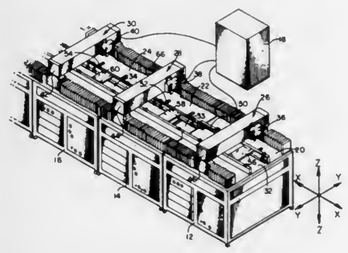
PROGRAMMABLE SUBSTRATE TRANSPORT FOR ELECTRONIC ASSEMBLY

David H. Young, North Wales, Pa., assignor to Quad Systems Corporation, Horsham, Pa.

Continuation-in-part of Ser. No. 609,018, May 10, 1984, which is a continuation-in-part of Ser. No. 460,560, Jan. 24, 1983, abandoned. This application Feb. 26, 1985, Ser. No. 705,684

Int. Cl.⁴ B23P *21/00, 19/00;* **B23Q** *15/00*

U.S. Cl. 29—714 **11 Claims**



1. An apparatus for the assembly of electronic components to a plurality of substrates each having differing sizes and shapes comprising:

(A) a first assembly module having:

a first assembly station to which substrates are directed and at which electronic components are assembled to them;

a first conveyor for directing substrates to and from said first assembly station; and

programmable means for positioning a component to be assembled with respect to substrates located at said first assembly station;

(B) a second assembly module in abutting relationship with respect to said first assembly module and cooperatively engaged with respect thereto having:

a second assembly station to which substrates are directed and at which said electronic components are assembled to them;

a second conveyor aligned with the first conveyor of said first assembly module for directing substrates from said first assembly module to and from said second assembly station; and

programmable means for positioning a component to be assembled with respect to said substrate located at said second assembly station; and

(C) control means for adjusting said first and said second conveyors in accordance with the predetermined width of each substrate wherein said first and said second assembly modules may be utilized for simultaneously assembling components to substrates of differing widths.

4,631,813

APPARATUS FOR ASSEMBLING HEAT EXCHANGERS

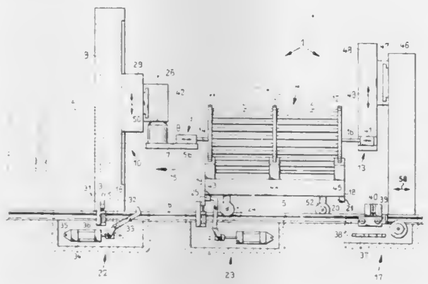
Manfred Daniels, Solingen, and Helmut Trimborn, Langenfeld, both of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht GmbH and Co., Solingen, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,501

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3430964

Int. Cl.⁴ B23P *15/26, 19/00;* **B21D** *39/08*

U.S. Cl. 29—727 **15 Claims**



1. Apparatus for joining tube end portions to end plates in a tube and plate heat exchanger comprising: carriage means for carrying an assembled but unjoined tube and plate heat exchanger, tool holder means for carrying tools for joining the tube end portions to the end plates of the heat exchanger carried by said carriage means, said tool holder means being movable transversely of and parallel to the longitudinal axis of the heat exchanger in facing relationship to an end plate, said tool holder means being movable transversely of the longitudinal axis of the heat exchanger to a clearance position outwardly of the heat exchanger for providing longitudinal movement of said carriage and a heat exchanger carried thereby past said tool holder means, and said tool holder means being movable between a pair of opposite working positions in which the tools carried thereby face in opposite directions.

4,631,814

DEVICE FOR INSERTING PRE-WOUND COILS IN THE SLOTS OF STATORS OF DYNAMO-ELECTRIC MACHINES

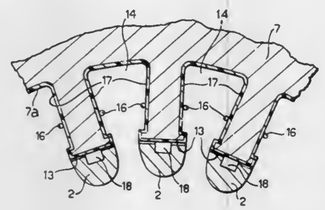
Giorgio Barrera, Turin, Italy, assignor to Officine Meccaniche Pavesi & C.S.p.A., Turin, Italy

Filed Dec. 31, 1984, Ser. No. 688,155

Claims priority, application Italy, Mar. 13, 1984, 67235 A/84

Int. Cl.⁴ H02K *15/10*

U.S. Cl. 29—736 **1 Claim**



1. A device for inserting pre-wound coils into stators having pole faces separated by slots, comprising:

an annular series of coil-guide bars for receiving the pre-wound coils to be inserted in the stator slots, said bars having free ends;

a series of key-guide bars surrounding the series of coil-guide bars whereby the stator bears on the free ends of the key-guide bars in such a way as to surround the coil-guide bars with the pole faces of the stator in engagement with the external faces of the coil-guide bars, and

a pusher member for sliding through the series of coil-guide bars to insert the coils in the slots of the stator,

each of said coil-guide bars having means for engaging with the stator only in correspondence with a respective pole face, said device further including orienting means for effecting the correct angular positioning of the stator, said orienting means being separated from said coil-guide bars and including terminal projections attached to said key-guide bars, said projections being for engaging the sides of the stator slots.

4,631,815

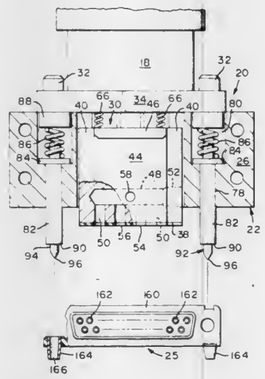
PICK-UP HEAD

Keith A. Bocchicchio, Middletown, and David L. Hall, Humelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1985, Ser. No. 811,143

Int. Cl.⁴ H05K *13/04*

U.S. Cl. 29—739 **6 Claims**



1. A pick-up head for use in picking up a workpiece having a pair of hollow rivets depending in spaced relationship from a lower surface thereof and opening into an upper surface thereof, and moving the workpiece towards a board to place said lower surface thereof, thereby to insert said rivets into predetermined holes in the board, the pick-up head comprising:

a body having a central vertical axis and upper and lower faces;

means on said upper face for attaching said body to a longitudinally movable shaft with said central axis coincident with the axis of the shaft;

first and second pins slidably mounted in said body and extending parallel to said central axis at positions spaced therefrom, said pins being disposed on opposite sides of said axis and having free end portions projecting below said lower face and terminating in tapered spigots for reception in said hollow rivets; and

a vacuum block slidably mounted for vertical movement in said body between said pins;

an evacuable manifold in said body having means for connection to an evacuating pump and opening between said free end portions, for engagement with the upper surface of said workpiece; and

first and second springs connected to said pins and said vacuum block, respectively, and against the action of which said pins and said vacuum block are movable upwardly in said body.

4,631,816

AUTOMATIC APPARATUS FOR MOUNTING ELECTRONIC PARTS

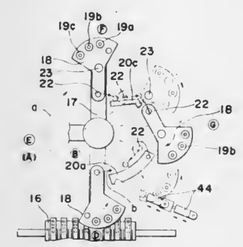
Takayuki Fujita, Hirakata; Shigetoshi Negishi, Suita, and Kunio Tanaka, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 15, 1985, Ser. No. 702,032

Claims priority, application Japan, Feb. 17, 1984, 59-28911

Int. Cl.⁴ H05K *3/32*

U.S. Cl. 29—740 **9 Claims**



1. An automatic apparatus for mounting electronic parts on a printed circuit board, comprising:

a turntable;

a plurality of mounting heads mounted in positions spaced at equal distances around said turntable;

a plurality of mounting chucks movably mounted on each of said mounting heads and each having a shape for picking up a different shape electronic part;

cam means disposed around the periphery of said turntable and engageable with said mounting heads for positioning one mounting chuck on each of said mounting heads in a position for picking up a desired part, carrying the part around the periphery of said turntable and mounting it on the printed circuit board; and

means connected to said mounting chucks to drive said mounting chucks to pick up an electronic part and to mount the electronic part picked up on the printed circuit board.

4,631,817

ONE-PIECE PIN INSERTION TOOL

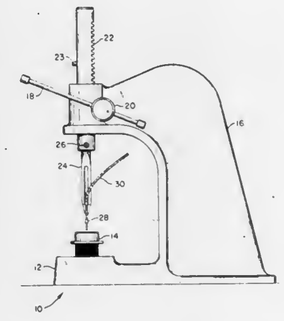
Timothy F. Bailey, Springfield, Mass., and David M. Landry, Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 412,651, Aug. 30, 1982, abandoned.

This application Mar. 6, 1985, Ser. No. 708,627

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—747 **3 Claims**



1. In fabricating a cable connector, a press for inserting an element attached to the end of a conductor into a cable connector where the outside diameter of the insulation on the conductor is less than or equal to the outside diameter of the element shank, comprising:

(a) a base for supporting the cable connector;

(b) means wrapping more than 180° around an element for holding an element attached to the end of a conductor thereby preventing lateral removal of the element, the holding means having:

i. a bore substantially the diameter of the shank of the element to be inserted, to receive the shank of the element;

ii. a substantially annular surface perpendicular to and surrounding the bore for butting against the shoulder of the element shank during insertion; and

iii. a slot to accommodate the conductor and insulation, smaller in width than the outside diameter of the shank of the element being inserted, the slot beginning at the substantially annular surface and extending along the bore at least the length of the shank;

(c) means for supporting the holding means from the base; and

(d) means slidably engaged with the support means for restraining the motion of the holding means substantially perpendicular to the base.

4,631,818

APPARATUS FOR APPLYING SLIDERS TO SEPARABLE SLIDE FASTENERS

Yuusei Sasa, Namerikawa, and Keiichi Yoshieda, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,640

Claims priority, application Japan, Sep. 26, 1984, 59-201037

Int. Cl.⁴ A41H *37/06*

U.S. Cl. 29—768 **6 Claims**

1. An apparatus for applying a slider to a separable slide fastener chain composed of a pair of slide fastener stringers having a box pin and an insertion pin, respectively, on inner confronting edges thereof, said apparatus comprising:

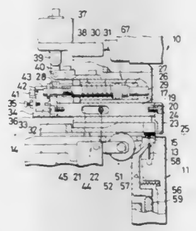
(a) a base;

(b) a slider holder mounted on said base for supporting the slider between the slide fastener stringers;

(c) a support block mounted on said base;

(d) a casing pivotably mounted on said support block;

(e) a slide rod slidably mounted in said casing for movement substantially along said slide fastener chain;
(f) a stopper mounted on said slide rod and normally positioned adjacent to a slider supporting end of said slider holder for engagement with said box pin and said insertion pin;
(g) a damper mounted in said casing and coupled to said slide rod for allowing said stopper to be displaced for a prescribed distance by both of said box and insertion pins;
(h) actuator means on said support block for angularly moving said casing to displace said stopper out of engagement with said box pin and said insertion pin;

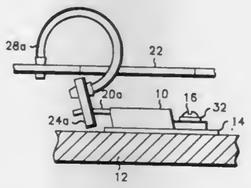


(i) switch means mounted on said casing and said slide rod for actuating said means to displace said stopper out of engagement with said box pin and said insertion pin in response to displacement of said stopper for said prescribed distance; and
(j) sensor means mounted on said casing and said slide rod for signalling improper positioning of at least one of said box and insertion pins in response to displacement of said stopper short of said prescribed distance.

4,631,819
LOW STRESS, TOLERANCE FREE METHOD FOR MOUNTING POWER DEVICES

David D. Lasier, Arlington Heights; John L. Meyer, Lake in the Hills, and Michael Sweda, Mt. Prospect, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 29, 1985, Ser. No. 738,638
Int. Cl.[4] H05K *3/39*
U.S. Cl. 29—840 **9 Claims**

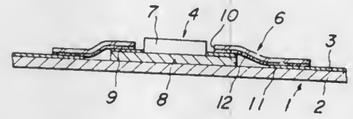


1. A method for mounting a power device residing on a geometrically shaped break-away area in a printed circuit board to a heat sink, comprising the steps of:
(a) mounting the power device within the break-away area of the circuit board;
(b) detaching the break-away area containing the power device; and
(c) attaching the power device mounted in said detached break-away area to the heat sink.

4,631,820
MOUNTING ASSEMBLY AND MOUNTING METHOD FOR AN ELECTRONIC COMPONENT

Yuji Harada, Tokyo, and Hayato Shinohara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,594
Claims priority, application Japan, Aug. 23, 1984, 59-175665; Aug. 23, 1984, 59-175666; Aug. 23, 1984, 59-175667
Int. Cl.[4] H05K *3/34, 1/18*
U.S. Cl. 29—840 **8 Claims**



1. A mounting assembly for an electronic component having a packaging portion and electrodes extending therefrom, said mounting assembly comprising
a supporting member for supporting one surface of the packaging portion and the electrodes of said electronic component;
a printed board including an insulating board and a wiring pattern on the surface thereof; and
a sheet connector including a flexible insulating sheet and a conducting layer affixed to a surface thereof, said conducting layer electrically connecting the wiring pattern on the surface of said printed board to electrodes of said electronic component, an opening being provided in said sheet connector having an area smaller than the area of the surface of said supporting member and larger than the area of said one surface of said packaging portion supported by said supporting member, the surface of said packaging portion opposite said one surface being exposed to the outside of the assembly.

6. A method of mounting an electronic component, having a packaging portion and electrodes extending therefrom, on a printed board having a wiring pattern formed thereon, said method comprising the steps of:
forming a sheet connector having an opening therein by disposing a conducting layer on a surface of a film-like insulating sheet;
supporting said electronic component on a supporting member having a conductive pattern formed on the surface thereof;
connecting electrically an electrode of said electronic component to the conductive pattern on said supporting member;
laying said sheet connector on said electronic component and said printed board so that said electronic component is positioned inside the opening in said sheet connector; and
connecting electrically said connecting layer to an electrode of said electronic component and to the wiring pattern on said printed board, thereby assembling said electronic component on said printed board.

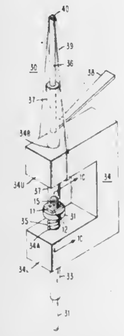
4,631,821
METHOD FOR JOINING METAL COMPONENTS TO A SUBSTRATE

David E. Houser, Apalachin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 458,375, Jan. 17, 1983, abandoned, which is a continuation of Ser. No. 223,190, Jan. 7, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,959
Int. Cl.[4] H05K *3/00*
U.S. Cl. 29—845 **3 Claims**

1. A method for connecting a metal pin and a ceramic substrate comprising:

forming a hole in a ceramic substrate large enough to receive the pin therein;
inserting a pin in the hole so that a first portion of the pin extends outwrad from one side of the substrate and a second portion of the pin extends outward from another side of the substrate;
restricting the axial movement of the pin by applying to the first portion of the pin restricting means for impeding the movement;
resiliently supporting an anvil member in contact with the end of the first portion of the pin;

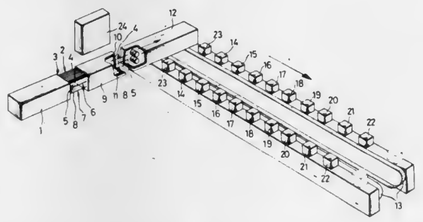


adapting the resilient support to resist axial movement of the anvil member and pin due to the effect of a striking force;
locating a hammer adjacent the end of the second portion of the pin;
providing a fixed amount of energy to the hammer to be applied to the end of the second portion of the pin; and
striking the end of the second portion of the pin with the hammer to produce a compressive stress in the pin exceeding the compression elastic limit of the pin and a tensile stress in the substrate less than the tensile stength of the sustrate, thereby causing permanent radial expansion of the pin against the surface of the hole in the substrate.

4,631,822
PROCESS FOR PRODUCING CABLES FITTED WITH ELECTRICAL CONNECTORS

Rudolf Reinertz, Wuppertal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,808
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325719
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—861 **10 Claims**

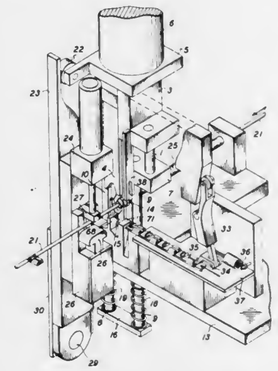


1. A process for production of cables fitted with electrical connectors, comprising:
simultaneously drawing off a first set of several cable strands of one type and a second set of several cable strands of a different type from a cable storer;
conducting said first set from said cable storer in a first transport plane, and conducting said second set from said cable storer in a second transport plane parallel to said first transport plane;
feeding a preselected number of cable strands of said first set to a first predetermined location, and feeding a preselected number of cable strands of said second set to a second predetermined location;
gripping said preselected cable strands of said first and second sets when at said predetermined first and second locations, and conveying said preselected cable strands onward to be cut to selected lengths;
cutting said preselected cable strands to selected lengths to provide cable pieces;
stripping at least one end of each cable piece of its insulation; and
fitting the stripped end of each cable piece with a connector so that there are a number of connector-fitted cable pieces of said one type and a number of connector-fitted cable pieces of said different type.

4,631,823
ELECTRICAL HARNESS MANUFACTURING METHOD AND APPARATUS

John C. Collier, York, and George B. Bakowicz, Harrisburg, both of Pa., assignors to Burndy Corporation, Norwall, Conn.

Continuation of Ser. No. 235,611, Feb. 19, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 587,842
Int. Cl.[4] H01R *43/04;* **B23P** *23/00*
U.S. Cl. 29—867 **19 Claims**



1. A process for producing an electrical harness comprising a plurality of electrical terminals sequentially connected along a length of insulted wire comprising:
providing a work station for use in attaching a terminal to the underlying wire conductor;
sequentially positioning terminal devices in operative position relative to the work station;
axially pushing a predetermined length of insulated wire conductor in a desired direction past the work station from a source of said conductor;
cutting and holding back the insulation of the wire without severing the underlying conductor at a point adjacent the work station;
gripping and pulling the wire, insulation and conductor, a disired amount in said desired direction through the work station in response to the cutting and holding back of the insulation such that the wire insulation upstream of the cutting of the wire is axially displaced and held back by the cutting step to expose the underlying ire conductor at the work station; and
attaching a terminal device to the exposed underlying wire conductor at said work station while said insulation is held back by said cutting step.

9. An apparatus for producing an electrical harness compris-

ing a plurality of electrical terminals sequentially connected along a length of insulated wire comprising:

a work station for use in attaching a terminal to the underlying wire conductor; means associated with said work station for sequentially positioning terminal devices in operative position relative to the work station;

pushing means operatively associated with said work station for axially pushing a predetermined length of insulated wire conductor in a desired direction past the work station from a source of said conductor;

cutting means operatively associated with said work station for cutting the insulation of the wire without severing the underlying wire conductor and for holding back the insulation during attachment of a terminal device to the underlying wire condutor;

gripping and pulling means operatively associated with the said work station and responsive to the movement of said cutting means toward the wire for gripping and pulling the wire, insulation and conductor, a desired amount in the said desired direction through said work station such that the wire insulation upstream of said cutting means is axially displaced and held back by said cutting means to expose the underlying wire conductor at said work station; and

means at said work station for attaching a terminal device to the exposed underlying wire conductor while said insulation is held back by said cutting means.

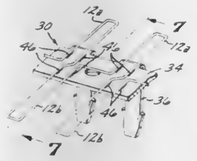
4,631,824

METHOD OF MANUFACTURING A MULTI-WIRE CONTACT ASSEMBLY

William H. King, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Jul. 11, 1985, Ser. No. 754,382
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—884 **16 Claims**





1. A method for manufacturing a contact assembly for an electronic component, comprising the steps of:

(1) providing a length of conductive wire formed into a continuous series of elongate loops each having a pair of legs joined at a closed end, said series or loops comprising first and second pluralities of loops extending laterally in opposite directions from a longitudinal axis, said second plurality being axially displaced from said first plurality such that each loop in said second plurality has a leg located axially between the legs of a loop in said first plurality, and each loop in said first plurality has a leg located axially between the legs of a loop in said second plurality;

(2) providing a strip of conductive metal having a plurality or spaced-apart prongs extending from one side thereof, the spacing between adjacent ones of said prongs being nominally equal to the spacing between adjacent loops in said first plurality of loops;

(3) bending said prongs to form an angle of slightly less than, or approximately equal to, 90 degrees with said strip;

(4) attaching said length of wire to said strip so that each of said first plurality of loops extends substantially horizontally from said strip substantially into the space previously occupied by one of said prongs prior to said bending step, each of said second plurality of loops thereby extending substantially horizontally outward from the side of said strip opposite said first plurality of loops;

(5) forming an upwardly convex radius in the legs of each of said first plurality of loops near the closed end thereof, and a downwardly convex radius in the legs of each of said second plurality of loops near the closed end thereof;

(6) cutting said strip to form a lateral flap underlying each of said second plurality of loops; and

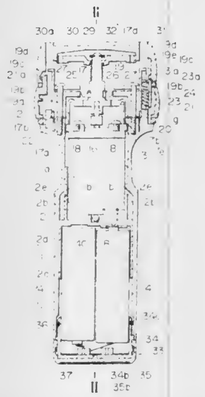
(7) folding each of said flaps approximately 180 degrees toward the side of said strip bearing said prongs, so that each of said second plurality of loops is superimposed onto one of said first plurality of loops, with one leg of each of said second plurality of loops interposed between the legs of one of said first plurality of loops, and one leg of each of said first plurality of loops interposed between the legs of one of said second plurality of loops, thereby forming a plurality of interconnected contact assemblies, each comprising a pair of interposed wire loops forming a multi-wire contact, and a prong conductively connected to said contact at an angle of approximately equal to, or slightly greater than, 90 degrees to form a terminal pin.

4,631,825

WASHABLE ELECTRIC SHAVER

Shunichi Kuriyama, and Yasuo Mitani, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 19, 1985, Ser. No. 702,492
Claims priority, application Japan, Feb. 20, 1984, 59-30731
Int. Cl.[4] B26B *19/10*
U.S. Cl. 30—43.92 **12 Claims**



1. A washable electric shaver, which comprises:

an outer casing, the outer casing defining a watertight compartment in the interior of the casing and including an upper portion;

a motor housed within the watertight compartment of the outer casing;

an oscillator at least partially housed within the watertight compartment, the oscillator being operatively coupled to the motor, the oscillator including an oscillating rod extending through a watertight opening formed in the upper portion of the casing;

an inner blade member mounted on the oscillating rod, the inner blade member including a plurality of inner blades, each inner blade having an outer edge;

an outer blade frame, the outer blade frame including an outer blade member, the outer blade frame being positionable relative to the inner blade member so that the outer edges of the inner blades slidingly engage the outer blade member;

the outer blade frame being longitudinally movable relative to the upper portion of the outer casing between a first position, wherein the outer blade frame is closely positioned adjacent to the upper portion of the outer casing, and a second position, wherein the outer blade frame is supported in a raised position above and substantially parallel to the upper portion of the casing to facilitate cleaning the shaver, the outer blade frame and the upper portion of the casing defining a gap therebetween when the outer blade frame is in said second position;

means for supporting the outer blade frame in said second, raised position above and substantially parallel to the upper portion of the casing;

means for biasing and effecting the longitudinal movement of the outer blade frame from said first position to said second position;

means for selectively activating the biasing and movement effecting means, the activating means being controllable by the user of the shaver;

means for limiting the longitudinal movement of the outer blade frame between the first position and the second position; and

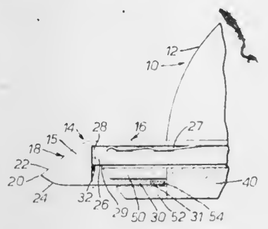
means for selectively retaining the outer blade frame to the supporting means.

4,631,826

HANDPIECE FOR SHEARING EQUIPMENT

Terence J. Parke, 11 Craigmore Pl., Melton, Victoria, Australia

Filed Oct. 13, 1983, Ser. No. 541,655
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—207 **20 Claims**



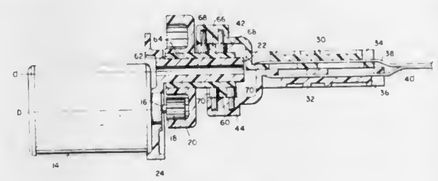
1. A cutting handpiece comprising a body portion having a combing means projecting therefrom for guiding material for cutting towards a blade assembly, said combing means including a plurality of generally parallel forwardly directed fingers having rounded tip portions at their respective free ends and having lower surfaces, at least some of the fingers having a bifurcated section in which an upper arm of the bifurcated section constitutes the shank of the finger and in which a lower arm defines an abutment means, there being a web portion connecting adjacent pairs of the abutment means to form a substantially flat U-shaped section, said blade assembly including a first movable cutting element resiliently carried by the combing means, a second movable blade means connected to the body portion so as to be opposed by the lower surfaces of the fingers, said second blade means being movable relative to the first cutting element, and the abutment means being spaced from the cutting element to define a space in which at least a portion of the blade means may move, said blade means and said cutting element being arranged to cooperatively engage with each other to cut material located between them in use.

4,631,827

ELECTRIC KNIFE DRIVE MECHANISM

Gregory E. Moores, Reistertown, Md., assignor to Black & Decker, Inc., Newark, Del.

Filed Jan. 9, 1985, Ser. No. 689,930
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—272 A **19 Claims**



1. An electric knife comprising:

(a) housing;

(b) drive gear means disposed in said housing for rotation about a drive axis;

(c) power means for selectively rotating said drive gear means;

(d) a pair of blade holders disposed in said housing in adjacent opposed relation for independent, linear reciprocation parallel to and on opposite sides of an output axis parallel to said drive axis; and

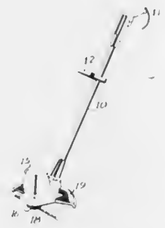
(e) one piece, integrally formed transmission means for translating rotation of said drive gear means into independent, opposite linear reciprocation of said blade holders, said transmission means comprising a tubular transmission shaft having an internal spur gear integrally formed at one end thereof and a cylindrical cam integrally formed at the other end thereof, said transmission shaft being mounted in said housing for rotation on said output axis with said internal spur gear operatively engaging said drive gear means.

4,631,828

CUTTING MEANS FOR ROTARY TRIMMER

Robert J. Burnett, Rte. #1, Box 73, Suches, Ga. 30572

Filed Jun. 20, 1985, Ser. No. 746,782
Int. Cl.[4] A01G *3/06*
U.S. Cl. 30—276 **1 Claim**



1. In combination, a trimmer comprising a support member, an engine carried on said support member, and a hub carried on said support member and drivingly connected to said engine so that operation of the said engine causes rotation of said hub, a plurality of flexible cutting members carried by said hub and extending in diametrically opposite directions therefrom, said trimmer being so constructed and arranged that said hub is normally horizontal and rotates about a vertical axis so that said cutting members operate in a generally horizontal plane, each cutting member of said plurality of cutting members

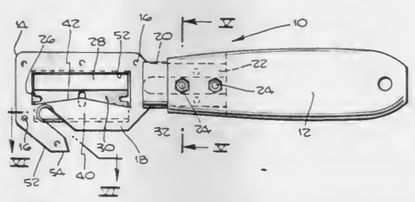
comprising a link chain including a plurality of single flat links and a plurality of pairs of flat links, said plurality of pairs of flat links alternating with said plurality of single flat links throughout the length of said cutting member, a plurality of pins, each pin of said plurality of pins connecting one end of one of said pairs of flat links to one end of one of said single flat links, said flat links being generally horizontal with said pins vertically disposed so that said link chain is flexible in a horizontal plane, each link of said plurality of single links having a greater width than the links of said pairs of links for defining a plurality of cutting edges, each cutting edge of said plurality of cutting edges being sharpened, a plurality of wear members, each wear member of said plurality of wear members being pivotally carried at the extending end of one of said cutting members and having a mass greater than the mass of one of said single links, means for pivotally fixing said cutting members to said hub in a single horizontal plane, said hub defining a smooth convex lower surface for preventing damage to vegetation engaged by said hub.

4,631,829

HAND-HELD SAFETY HOLDER FOR A SINGLE-EDGE RAZOR BLADE FOR CUTTING A SHEET OR STRAND

Gerry Schmidt, Newport Beach, and Michael McHugh, Huntington Beach, both of Calif., assignors to Pacific Handy Cutter, Inc., Costa Mesa, Calif.

Filed Sep. 3, 1985, Ser. No. 771,639
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—294 **10 Claims**



1. A hand-held safety holder for a single-edge razor blade, for cutting a thin sheet or strand, comprising:

an elongated member having proximal and distal ends, with a planar, blade-holding part disposed toward said distal end and a part for grasping with the hand disposed toward the other,

said planar part having about the same thickness as the guard of the razor blade and first and second sides,

said planar part having a rectangular aperture therethrough which is slightly larger than the guard of the razor blade for retaining the blade against movement in the plane of the planar part during cutting,

said planar part having an internal, blade-receiving recess which is slightly larger than the blade part of the razor blade, extending downward from said aperture, in the plane of said planar part, and between said first and second sides, said first side being relieved for a portion of its depth below said rectangular aperture to permit the insertion and removal of the blade part of the razor blade between said first and second sides, and to retain the blade therebetween against lateral movement during cutting,

said planar part having a slotted opening at the lower edge thereof, extending distally-inward to said recess to expose a portion of the cutting edge of the blade, to guide the sheet or strand into cutting contact with said exposed portion of the blade at an angle of incidence with respect to the blade when said knife is drawn across the edge of the sheet or strand, said slotted opening having a width and depth sufficient to permit the edgewise passage of the sheet or strand into said cutting contact with said blade and to prevent said cutting contact with any part of the hand,

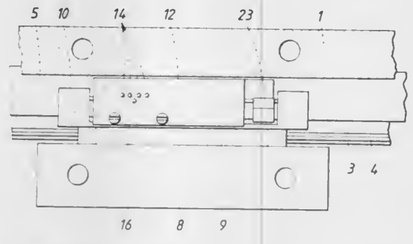
said planar part having an elongated finger with a tapered end extending proximally-outward therefrom, below said lower edge and parallel to said slotted opening, having a proximal edge coincident with the distal edge of said slotted opening, to hook the sheet or strand into initial engagement within said slotted opening.

4,631,830

INSTRUMENT FOR MEASURING LENGTHS

Heinz Rieder, St. Pantaleon, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Jun. 28, 1985, Ser. No. 750,530
Claims priority, application Austria, Jul. 3, 1984, 2138/84
Int. Cl.[4] G01B *11/02*
U.S. Cl. 33—125 R **7 Claims**



1. An instrument for measuring lengths, particularly to a sealed instrument for measuring lengths, comprising a carrier, a rule mounted on said carrier and provided with a scale, and an optoelectronic scanning unit, which is movable along said scale and comprises a scanning plate, light emitters and light receivers, also comprising an actuating member, which constitutes a feeler and is operable to move said scanning unit along said scale, and a correcting device including a deformable correcting template and a template follower for scanning said template and for adjusting the scanning plate relative to the actuating member in the direction of the scanning movement, characterized in that only the scanning plate is guided by said rule and is operatively connected by an adjusting mechanism to the template follower adjustable relative to the remaining parts of the scanning unit in dependence on the shape of the correcting template, said adjusting mechanism comprising a screw which extends along the scale and a nut which is arranged to rotate about the screw as the correcting template is scanned by the template follower.

4,631,831

TREAD DEPTH PROBE AND COMPUTER

William J. Bacher, Cedar Rapids, and Jeffrey J. Corpstein, Marion, both of Iowa, assignors to Bandag Licensing Corporation, Muscatine, Iowa

Filed Jan. 31, 1986, Ser. No. 824,814
Int. Cl.[4] G01B *3/28*
U.S. Cl. 33—169 B **5 Claims**

1. A hand held computer used to measure the tread groove depths having an electronic tread depth probe assembly having a retracted and an extended position and comprising,

(a) top and lower members forming the body of said computer,

(b) said tread depth probe assembly positioned within said computer body,

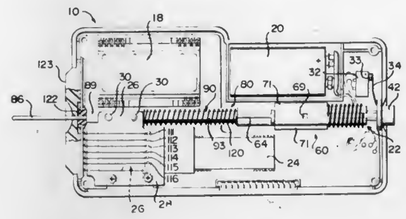
(c) said probe assembly having a stationary central member,

(d) a probe member is movably positioned in said central member and extending out its lower end,

(e) a probe release button member is movably positioned at the upper end of said central member,

(f) a pressure means acts between said button member and said central member to hold said button member in a retracted position,

(g) a pressure means acts between said probe member and said central member to hold said probe member in an extended position,



(h) said probe release button member has a securing means to hold said probe member in a retracted position, and,

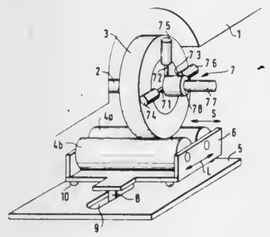
(i) said button member can be moved to a release position to release said securing means from said probe member permitting said probe member to move to its extended position.

4,631,832

DEVICE FOR MEASURING AXLE GEOMETRY OF MOTOR VEHICLES WITH THE WHEELS TURNING

Peter Schrammen, and Jürgen Weide, both of Kassel, Fed. Rep. of Germany, assignors to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,487
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514759
Int. Cl.[4] G01B *5/255*
U.S. Cl. 33—203.14 **7 Claims**



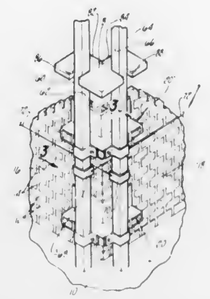
1. In a device for measuring axle geometry at the wheel axles of motor vehicles with the wheels turning, the device having at least two pairs of driven rotating cylinders on which the front or rear wheels of a vehicle can rest during use, a frame in which each pair is positioned, means mounting the frame on to a base plate, a sensing component positionable against the side of a wheel testing on a pair of the rotating cylinders and connected to a goniometer that determines the position of the sensing component in relation to a reference system that is fixed with respect to the device, the improvement wherein the means mounting the frame on the base plate includes a pivot located along the length of the motor vehicle and laterally spaced from the pair of rotating rollers and means permitting the frame to rotate freely on the base plate in a horizontal plane around said pivot and to shift freely in a direction L parallel to the length of the vehicle.

4,631,833

GUIDE BRACKET FOR BRICK LAYING

Henry Moye, 3023 Lippincott Blvd., Flint, Mich. 48507

Filed Jan. 9, 1985, Ser. No. 690,044
Int. Cl.[4] G01C *15/10*
U.S. Cl. 33—408 **15 Claims**



1. A guide assembly for constructing a brick corner in which the corner comprises a plurality of stacked brick layers spaced from each other by horizontally extending joints, said guide assembly comprising:

at least one guide bracket, said guide bracket having two wall sections which intersect at a predetermined angle, said wall sections adapted to flatly abut against opposite exposed sides of the corner,

said guide bracket having an elongated lip formed along an edge of and in a plane perpendicular to each wall section so that said lips are coplanar and intersect at said predetermined angle, said lips lying in a substantially horizontal plane and being adapted to be positioned in the horizontally extending joint between two layers of brick,

a pair of elongated rails, and

means for attaching said rails to said guide bracket so that said rails are spaced apart and parallel to each other and extend parallel to the corner.

4,631,834

COORDINATE MEASURING INSTRUMENT

Koji Hayashi; Susumu Yoshioka, and Noritsugu Ono, all of Utsunomiya, Japan, assignors to Mitutuoyo Mfg. Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00218, § 371 Date Aug. 29, 1985, § 102(e) Date Aug. 29, 1985, PCT Pub. No. WO85/04950, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 19, 1985, Ser. No. 776,056
Claims priority, application Japan, Apr. 20, 1984, 59-79754; Apr. 20, 1984, 59-79758
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—503 **18 Claims**

1. A coordinate measuring instrument wherein a work to be measured, which is mounted on the top surface of a table and a signal producing probe are moved in tridimensional directions relative to each other to directly or indirectly relate the both to each other, and the dimensions and configuration of said work are measured from relative displacement values between the both, characterized in that said measuring instrument comprises:

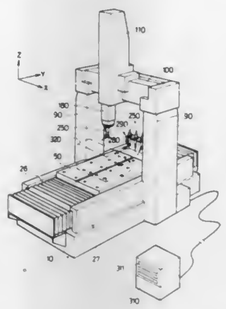
a table supported on a bedplate in a manner to be movable at least in the direction of Y-axis when the Y-axis is an axis incorporated in the horizontal plane out of three axes perpendicularly intersecting one another, including the X-, Y- and Z-axes;

a probe stocker fixed to said table, for erectingly holding a plurality of probe holders having signal producing probes different from one another;

a Z-axis structure provided on a beam member laterally

racked in parallel to the top surface of said table and supported in a manner to be slidable in the direction of Z-axis; and

a probe mounting-removing mechanism provided on said Z-axis structure and capable of mounting said signal producing probe thereto or removing same therefrom; whereby one signal producing probe selected from said plurality of signal producing probes held by said probe stocker can be automatically replaced and installed on said Z-axis structure.

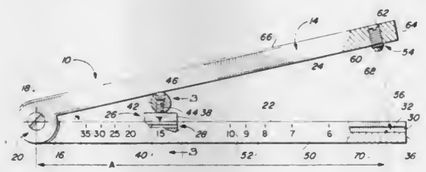


4,631,835

ADJUSTABLE ANGLE BLOCK APPARATUS

Bernaht C. Treppner, 4537 W. Gardenia Ave., Glendale, Ariz. 85301

Filed Aug. 12, 1985, Ser. No. 764,671
Int. Cl.⁴ G01B *3/30*
U.S. Cl. 33—536 **6 Claims**



1. An adjustable angle block apparatus comprising:

(a) an elongated base bar having a hinge end, an extending end and a longitudinal face surface;

(b) an elongated angel bar having a hinge end, an extending end and a longitudinal face surface;

(c) hinge means interconnecting the hinge ends of said base bar and said angle bar with the face surfaces thereof being in facing relationship with each other, said hinge means defining a pivot axis;

(d) said angle bar having an internally threaded bore proximate the extending end thereof at a known predetermined distance from the pivot axis defined by said hinge means and disposed transversely of said angle bar so as to open onto the face surface thereof;

(e) slot means formed at the extending end of said base bar and having a bottom surface which is parallel and recessed below the face surface of said base bar for receivingly supporting a gage means of known thickness dimension; and

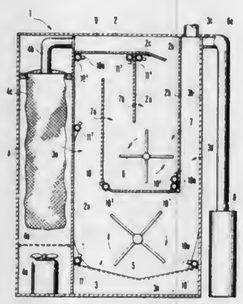
(f) a screw threadingly carried in the bore of said angle bar and having a contact member on the end thereof which is nearest to said base bar, said screw being threadingly adjusted so that the contact member thereof is in touching engagement with the bottom surface of the slot means defined by said base bar when said base bar and said angle bar have their facing surfaces in contiguous bearing engagement with each other, said screw having the contact member thereof in bearing engagement with the receivingly supported gage means to support said angle bar in an angular attitude determined by the thickness dimension of the received gage means.

4,631,836

METHOD OF ACTIVATING DOWN AND FIBER MATERIALS

Takuzo Iwata, Hirakata, Japan, assignor to Iwata Co. Ltd., Kyoto, Japan

Filed Jul. 30, 1985, Ser. No. 760,615
Claims priority, application Japan, Apr. 4, 1985, 60-71360
Int. Cl.⁴ F26B *3/10*
U.S. Cl. 34—2 **5 Claims**



1. A method of activating down and fiber materials having interiors and external surfaces, comprising the steps of:

applying ionized air to external surfaces of down and fiber materials via a plurality of nozzles coupled with at least one ozonizer;

applying immediately thereafter normal air to said external surface of the down and the fiber materials via a plurality of nozzles coupled with a compressed air source; and

repeating alternately the steps of applying ionized air and applying immediately thereafter normal air to said external surfaces of the down and fiber materials;

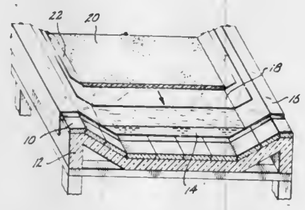
whereby said external surfaces of the down and fiber materials effectively recover their original elasticity but the down and fiber materials are prevented from being oxidized by the ionized air.

4,631,837

METHOD AND APPARATUS FOR DRYING FRUIT PULP AND THE LIKE

Richard E. Magoon, 8545 27th St. West, Tacoma, Wash. 98466

Filed May 31, 1985, Ser. No. 739,991
Int. Cl.⁴ F26B *3/20*
U.S. Cl. 34—9 **12 Claims**



1. A method of drying a product comprising the steps of:

(a) positioning a sheet of optically and infrared transparent material on a body of water so that a first surface of the sheet is in substantially uniform contact with an upper surface of the water and the sheet is supported by the buoyant force of the water;

(b) heating the water to maintain the water at a predetermined temperature; and

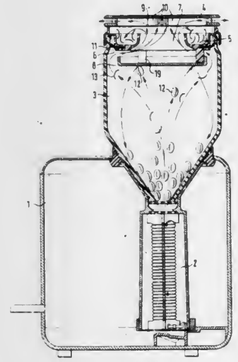
(c) placing the product to be dried on a second surface of the sheet.

4,631,838

DEVICE FOR A ROASTING CHAMBER FOR ROASTING GREEN COFFEE BEANS

Walter Eichler, Steinheim; Karlheinz Färber, Giengen, and Elisabeth Fischer, Kammeltal/Behlingen, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeraete GmbH, Munich, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,394
Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419250
Int. Cl.⁴ F26B *17/10*
U.S. Cl. 34—57 A **8 Claims**



1. Roasting chamber for roasting green coffee beans with a heated air current flowing from a lower air inlet region to an upper air outlet region of the roasting chamber, comprising a housing having an air outlet formed therein in said air outlet region, a roasting-waste settling chamber disposed below said air outlet in the air outlet region, said settling chamber being in the form of a substantially horizontal annular receiving trough having a substantially vertical central air inlet opening formed therein, an air-permeable and coffee-waste particle-impermeable filter above said receiving trough, and a supplemental cup-shaped trough disposed concentrically below said receiving trough, said cup-shaped trough having a larger diameter than said air inlet opening and having an edge region disposed at a distance from said receiving trough defining a radial air passage therebetween.

4,631,839

CLOSURE DEVICE, PARTICULARLY FOR REAR OPENING SKI BOOTS

Massimo Bonetti, Padova; Giuseppe Manente, Mestre-Venezia, and Abramo Mion, Mirano-Zianigo, all of Italy, assignors to E. A. Mion Ing. & Arch. Kairos S.N.C., Di M. Bonetti, G. Manente, Mirano-Zianigo, Italy

Filed Mar. 29, 1985, Ser. No. 717,960
Claims priority, application Italy, Apr. 3, 1984, 41548 A/84
Int. Cl.⁴ A43B *11/00, 5/04*
U.S. Cl. 36—50 **12 Claims**

1. A closure device, particularly for a rear opening ski boot comprising

a case for connection to one part of the boot,

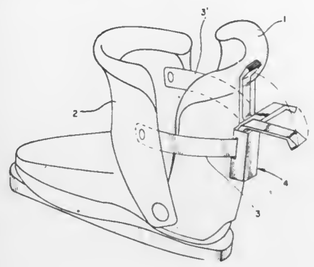
a shaft rotatably supported by said case,

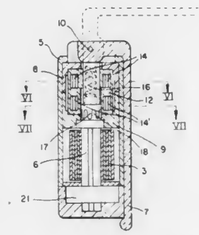
at least one traction element wound upon said shaft,

a lever pivotally mounted for winding said shaft, and

ratcheting means for converting oscillatory movement of said lever to unidirectional tensioning of said traction element, said means comprising

a first ratchet adapted to couple said lever to said shaft when said lever is moved in a first angular direction while allowing free movement of the lever in a second direction opposite the first, and





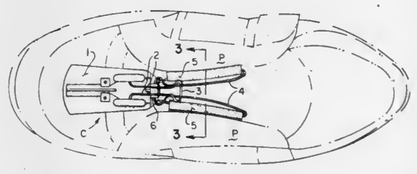
a second ratchet adapted to couple said shaft to said case to prevent reverse angular movement of said shaft when said lever is moved in said second direction while allowing forward angular movement of said shaft as the lever is moved in said first direction.

4,631,840

CLOSURE MEANS ATTACHMENT FOR FOOTWEAR

Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.

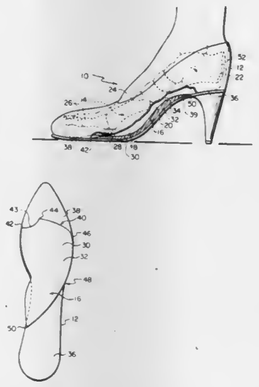
Filed Sep. 23, 1985, Ser. No. 779,039
Int. Cl.⁴ A43B *11/00*
U.S. Cl. 36—50 **3 Claims**



1. In a closure means attachment for footwear, incorporating a closure means, and of the type having a fastening device for holding the upper quarter portions proximate their upper edges of the footwear together and overlying the footwear tongue portion, and wherein said closure means incorporates structure means for securing the closure means to the footwear quarter portions, said structure means having a pair of wire arms cooperating with a spring means of the closure means, said spring means being of the type having pivotal movement with respect to the wire means to urge the closure means into closure, the improvement which comprises, substantially flexible means interconnecting the closure structure means to the proximate upper edges of the footwear quarter portions, said flexible

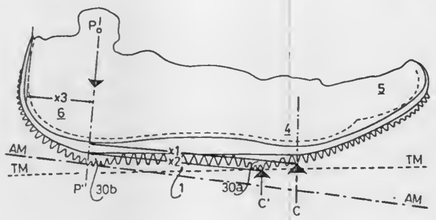
means comprising elastic means, said elastic means comprising a length of elastic means and extending substantially along the length of the wire arms and also along the adjacent upper edges of the footwear quarter portions, said wire arms being secured to the elastic means and cooperating with the spring means to secure the footwear into closure and to effect conformance of its quarter portions upon the instep of any foot located within the said footwear, said quarter portions of the footwear being formed incorporating a pair of liner materials, and the edges of the elastic means attaching with the quarter portions being affixed intermediate the pair of liner materials forming each quarter portion for the footwear, whereby upon manipulation of the closure structure means into closure upon the footwear the elastic means at their upper segments stretch to a greater dimension than the lower portions of the elastic means and thereby providing for a lowering of the closure structure means closer to the footwear tongue upon its manipulation into closure.

4,631,841
SHOE INSERT DEVICE
John L. Hickey, 2605 Roca Verde, Spring Valley, Calif. 92011
Filed Mar. 14, 1985, Ser. No. 711,829
Int. Cl.[4] A43B *7/22*
U.S. Cl. 36—91 **8 Claims**



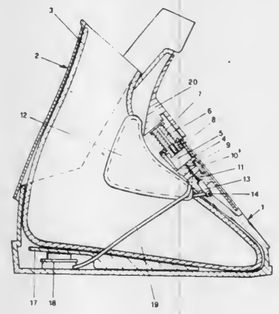
1. An insert device for a shoe designed to cushion the forefoot of a wearer, the device comprising:
- a one-piece pad of cushioning material shaped to conform to the contour of at least part of the shoe and terminating short of the heel area of the shoe;
- the pad having a forward generally flattened portion and a rearward arched portion which is thickened and shaped generally to conform to the arch of a wearer's foot in the shoe;
- the forward portion of the pad having a front edge which extends the full width of a wearer's toes in the shoe and which is curved generally to follow the curve of the base of a wearer's toes and lies within the sulcus of the toes;
- the rear portion of the pad terminating in a generally pointed area short of the heel of the foot and adjacent the inner edge of the shoe, the outer edge of the pad being curved to follow the outer edge of the shoe up to a region corresponding to the mid-shaft region of the outer metatarsal bone of the foot, and then curving rearwardly and inwardly to meet the rearmost portion of the pad.

4,631,842
SPORT SHOE SOLE PROVIDED WITH PEDESTALS
Tauno Koskela, Kaskitie 19, 00630 Helsinki 63, Finland
PCT No. PCT/FI84/00090, § 371 Date Jul. 29, 1985, § 102(e) Date Jul. 29, 1985, PCT Pub. No. WO85/02327, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 28, 1984, Ser. No. 763,438
Claims priority, application Finland, Nov. 28, 1983, 834351
Int. Cl.[4] A43B *13/00, 13/24*
U.S. Cl. 36—103 **16 Claims**



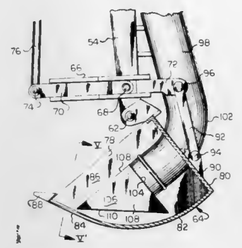
1. In a shoe sole of the type comprising a bottom portion having a first point located beneath a center of gravity of a wearer's heel and a second point of support for the wearer's ball of foot, said first and second points spaced a first distance apart, said bottom portion in a region between said first and second points generally conforming with the sole of the wearer's foot, the improvement comprising a first pedestal extending downwardly from said bottom portion at a location adjacent said second point but nearer to said first point than said second point by a second distance equal to 10 to 25 percent of said first distance so that the moment upon the wearer's foot is reduced during running.

4,631,843
REAR-ENTRY SKI BOOT
Giuseppe Annovi, Montebelluna, Italy, assignor to Dolomite S.p.A., Treviso, Italy
Filed Jul. 24, 1985, Ser. No. 758,319
Claims priority, application Italy, Aug. 6, 1984, 84120 A/84
Int. Cl.[4] A43B *5/04, 7/14, 19/00*
U.S. Cl. 36—119 **10 Claims**



1. A rear-entry ski boot comprising in combination:
a foot portion,
a leg portion pivotally connected to the foot portion,
an inflatable air pocket inside the foot portion, and
an air pump in fluid communication with said air pocket,
said pump comprising a first part affixed to said first portion and a second relatively moveable part engaged by said leg portion, whereby foot flexure by a wearer of the boot displaces air from said pump to inflate said air pocket.

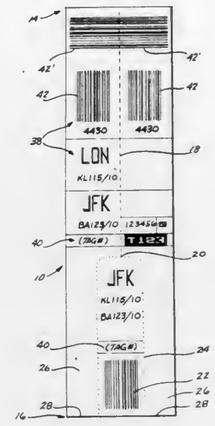
4,631,844
HYDRAULIC SHOVEL DREDGE SYSTEM
Troy M. Deal, 277 Trismen Ter., Winter Park, Fla. 32789
Filed Jul. 15, 1985, Ser. No. 754,992
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—58 **6 Claims**



1. A shovel dredge system comprising, in combination, a barge, a motor-driven pump mounted upon said barge having an outlet conduit and a suction conduit, power-driven shovel apparatus mounted upon said barge, said shovel apparatus including a bucket, a shovel bucket pivot mounted upon said shovel apparatus having an axis, said bucket being pivotally mounted upon said pivot, said bucket comprising a rear wall, a front wall, a bottom portion and side walls defining a receptacle having an open top, an opening defined in said rear wall, control means mounted on said barge controlling movement of said shovel apparatus and pivotal movement of said bucket upon said pivot, an evacuation conduit mounted on said shovel apparatus and fixed with respect to said bucket and extending into said bucket receptacle through said rear wall opening and having an inlet within said bucket, said shovel bucket bottom portion being of an arcuate configuration having a radius whose center is located at said shovel bucket pivot, said evacuation conduit inlet comprising a bell having a lower peripheral edge disposed adjacent said shovel bucket bottom portion, the spacing between said bell peripheral edge and said bucket bottom portion being substantially constant during pivoting of said bucket, said pump suction conduit being connected to said evacuation conduit whereby said pump suction conduit supplies said pump from said shovel bucket.

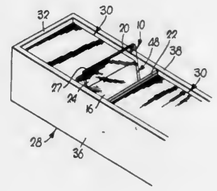
4,631,845
LUGGAGE TAG
Robert A. Samuel, Snohomish; Lauren W. Huseby, Lynnwood; Erick W. Weitkamp, Mukilteo, and Christopher A. Wiklof, Everett, all of Wash., assignors to Intermec Corporation, Lynnwood, Wash.
Filed May 17, 1985, Ser. No. 735,112
Int. Cl.[4] A44C *3/00*
U.S. Cl. 40—2 R **5 Claims**

1. A luggage tag attachable to the handle of a piece of luggage comprising:
- (a) an elongate strip of flexible material having a first end, a second end, a front, and a back;
- (b) a longitudinal fold line scored into the tag and extending from the first end of the tag to terminate at a point between the first end and the second end, the tag being foldable about the fold line;
- (c) a detachable ticket integrally formed in the center of the tag and extending from the terminus of the fold line to the second end of the tag;
- (d) tongues formed in the tag on each side of the detachable ticket, the detachable ticket and tongues being configured and arranged so that removal of the ticket from the tag allows passage of the handle between the tongues; and



- (e) joining means for joining one tongue to the other to enclose the handle thereby securing the tag to the handle.

4,631,846
TRANSPARENT SEPARATOR FOR A ROW OF INDEX CARDS OR THE LIKE
Heidi L. Schallberg, 6313 N. Bales, Kansas City, Mo. 64119
Filed Nov. 13, 1984, Ser. No. 670,908
Int. Cl.[4] B42F *17/02*
U.S. Cl. 40—380 **6 Claims**



1. In the field of library science wherein literary, artistic and other shelved collections of various materials are descriptively classified by rows of catalog cards maintained upright in open top, pull-out drawers each having a card-retaining rod, a V-shaped separator provided with:
- an elongated, transversely arcuate bight having a transverse, rod-clearing notch, a rectangular, rearmost, plate-like leg and a rectangular, forwardmost, plate-like leg,
- said legs being integral with and converging downwardly and inwardly as said bight is approached,
- each leg having an elongated uppermost edge,
- the distance between the bight and said edge of the rearmost leg being greater than the distance between the bight and said edge of the forwardmost leg, presenting a rectangular handle integral with the rearmost leg for use in manual insertion of the separator into a chosen drawer between and in engagement with a pair of preselected cards,
- said handle having a hole for use in suspending the separator from a suitable support at a point of use,
- there being an upwardly opening mouth between the legs for clearing the fingers of the user during insertion of the separator into the chosen drawer,
- said handle extending above the card which is proximal to and behind the rearmost leg, when the separator is inserted into the chosen drawer between said card and the next adjacent card,

said separator being rigid and said rearmost leg sloping upwardly and rearwardly from the bight when the separator is inserted between said cards for holding said proximal card tilted rearwardly,

said rearmost leg being transparent, permitting descriptive data on the front face of said tilted card to be viewed through the rearmost leg.

4,631,847

ENCAPSULATED ART

Laurence Colin, 142 Garth Rd., Scarsdale, N.Y. 10583

Filed Dec. 1, 1980, Ser. No. 211,260

Int. Cl.[4] G09F *19/00*

U.S. Cl. 40—407 **18 Claims**



1. A display comprising a first layer sandwiched between a base and a nonporous transparent second layer, said first layer being of a non-flowable kneadable material of putty-like consistency and having at least two colors in adjoining areas, and visible through said second layer, said kneadable material being spread by applying pressure to said material whereby a plurality of different shaped colored portions are created.

4,631,848

ROTARY INDICATING DEVICE

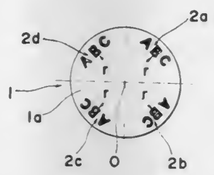
Hiroki Iwasa, Aichi; Kyozo Ohmi, Anjyo, and Tokuhiro Amano, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed May 21, 1985, Ser. No. 736,632

Claims priority, application Japan, May 23, 1984, 59-105381

Int. Cl.[4] A47F *1/06*

U.S. Cl. 40—427 **4 Claims**



1. A rotary indicating device which comprises a rotary base member having an indication surface, the indication surface including a plurality of indication regions each respectively representing the same images and formed thereon at approximately equal angular intervals about a rotary axis of said rotary base, at an equal radial distance from the rotary axis and in the same orientation with respect to the rotary axis, each indication region comprising a plurality of reflection faces arranged across the surface of the base member, the reflection faces of each indication region being inclined in substantially the same direction with respect to the rotary axis and also at the same angle with respect to the rotary axis and also at the same angle with respect to a standard plane perpendicular to the rotary axis, whereby, the reflection faces of each indication region reflects incident light toward the same direction at one rotated position.

4,631,849

COLLAPSIBLE DISPLAY STANDS

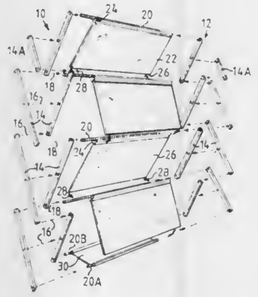
Michael R. Jeffery, Hertfordshire, England, assignor to Storvideers Limited, Royston, England

Filed Mar. 25, 1985, Ser. No. 715,733

Claims priority, application United Kingdom, May 31, 1984, 8413954

Int. Cl.[4] G09F *15/00*

U.S. Cl. 40—610 **10 Claims**



1. A collapsible display stand comprising:

a pair of matching side supports,

each side support comprising a series of articulated struts extensible from a compact collapsed condition to an upstanding criss-cross array,

a plurality of rods mounted between corresponding points of corresponding struts of the respective side supports,

said rods being so disposed that some said rods lie in each of at least two vertical planes in the extended condition of the side supports,

display members suspended from at least some of the rods, each display member being pivotally connected at one edge thereof to one said support rod and being unconnected at its other edges to allow free rotation of said member about the support rod from which it is suspended,

said display members being adapted to lie in a flat stack in the collapsed condition of the side supports and each to be elevated into an inclined position in which it rests against a rod below the one from which it is suspended in the extended condition of the side supports, and

means for locking the stand with the side supports in the extended condition, said locking means including devices operative automatically to rigidify the side supports when the stand is extended to an erected position.

4,631,850

APPARATUS FOR SORTING OUT DEFORMED OR BROKEN FISH HOOKS ON SO-CALLED TRAWL LINES

Bernard Chureau, 9 Rue du Fan, 44420 La Turballe, France

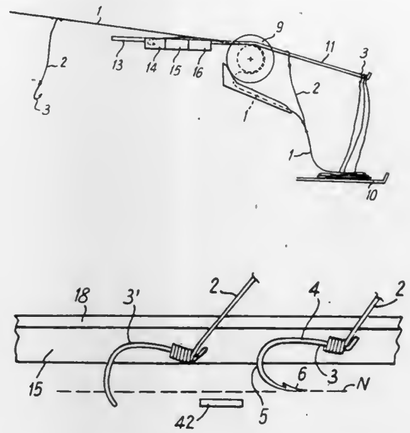
Filed Mar. 5, 1985, Ser. No. 708,423

Int. Cl.[4] A01K *79/00*

U.S. Cl. 43—4 **10 Claims**

1. An apparatus for sorting out deformed fish hooks on trawl lines, the fish hooks having a leader connected to a shank terminating in a curvature that terminates in a barb and a point, comprising a fish hook positioning device causing the fish hook to move, while being pulled by the leader and guided by its shank, in a slide the transverse section of which corresponds to the normal curvature of the fish hook when the shank is disposed in the axial direction of a channel of the slide in which opens a slot for the passage of the leader, the point and barb

circulating outside the slide, a first detector for detecting at least the presence of a fish hook of normal configuration, and



a selecting device under the control of said detector for deflecting a fish hook of abnormal configuration.

4,631,851

COMBINATION FISHING NET, WEIGHT SCALE AND LENGTH SCALE

Wendell P. Whiteburst, #5 Larkin Dr., Little Rock, Ark. 72212

Continuation-in-part of Ser. No. 658,202, Oct. 5, 1984. This application May 12, 1986, Ser. No. 862,473

Int. Cl.[4] A01K *71/00*

U.S. Cl. 43—7 **8 Claims**



1. A fishing implement combining a landing net, a fish weighing scale, and a fish measuring scale, said implement comprising:

flexible mesh net means adapted to at least temporarily manipulate and/or contain a fish, said net means having a periphery;

rigid hoop means for supporting said net means, said hoop means comprising a substantially circular body portion for engaging at least a portion of the periphery of said net, said body portion occupying a plane, and said hoop means terminating in a pair of substantially straight, adjacent end portions squeezed together in substantially parallel relation coplanar with said last mentioned plane to present a reduced diameter coupling end;

intermediate tube means having a diameter greater than the diameter of said coupling end for coaxially receiving said hoop means coupling end, said tube means having a predetermined length, a first end and an open second end spaced apart from said first end, and said tube means comprising a first transverse fastener extending through said first tube end and said reduced diameter coupling to rigidly operatively secure said hoop means to said tube means;

said intermediate tube means comprising a pair of cooperating, spaced apart elongated and aligned clearance slots disposed near said second end at a first distance apart from said hoop means coupling end, each of said slots having a length less than half of said predetermined length of said tube means;

expansible spring means coaxially disposed within said tube means, said spring means having a first terminal end secured within said tube means and penetrated by said first fastener means and a second terminal end extending toward said tube means open second end which terminates between said clearance slots whereby said spring means may be subsequently conveniently engaged in assembly;

elongated, unitary handle means of rigid, tubular construction for manipulating said implement, said handle means having a unitary diameter greater than said intermediate tube means diameter, and said handle means comprising an upper portion for providing a convenient manual grip and a spaced apart bottom portion adapted to coaxially receive said intermediate tube means in telescoping relation relative to said handle means;

assembly orifice means defined in said handle means and positioned such that, when said intermediate tube means is coaxially fitted within said handle means during assembly of said implement, said assembly orifice means will be aligned with said spring means second terminal end;

second fastener means operatively associated with said handle means bottom portion for extending transversely between said handle assembly orifice means and through said tube means slots, said second fastener means penetrating said second terminal end of said spring means to operatively capture same;

whereby said intermediate tube means and thus said hoop and mesh net may be coaxially withdrawn from said handle means against yieldable bias from said spring means and torsional displacement of said tube means relative to said handle means is resisted by said second fastener means;

slot-like window means defined in said handle means for permitting viewing of said tube means;

calibrated weight markings defined on said handle means adjacent said window means whereby to permit the visual determination of fish weight in response to the withdrawal of said tube means from said handle means when said net is used to handle a fish by looking through said window means to observe the position of said tube means relative to said weight markings, said calibrated markings beginning with a zero position;

said assembly orifice means being so positioned such that said second fastener means may be correctly attached in assembly without stretching the handle or tube against said spring means and said tube means second end will align with the zero point of said weight markings to provide correct tare weight; and,

said handle means comprises an elongated measuring scale for determining fish weight, said measuring scale extending from a zero point closely adjacent said bottom portion of said handle means so that length measurements may be made by moving the fish only a minimal distance from said hoop means.

4,631,852

DEVICE FOR CASTING A FISHING LURE

Edward Whritenour, 2611 River Rd., Manasquan, N.J. 08736

Filed Apr. 11, 1986, Ser. No. 850,546

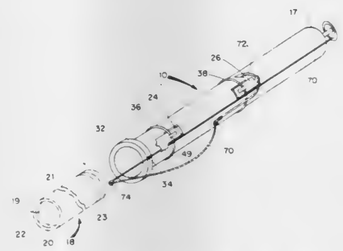
Int. Cl.[4] A01K *91/02*

U.S. Cl. 43—19 **6 Claims**

1. An improved rocket propelled fishing device having a hollow missile tube having a tapered, closed front end section, a hollow tubular middle section constituting a substantial length of said missile and of a size to contain a rocket motor inserted therein, and an open rear end section extending rearwardly of said middle section, a breech mechanism having a short barrel and including means for loading and firing a blank cartridge into the bore of said barrel, said barrel having its outer surfaces contoured to snugly fit inside said rear end

section of the missile tube and hold said tube axially aligned with said bore whereby the firing of the blank cartridge into said bore forces said tube from the end of said barrel and ignites the rocket motor which propels said tube along an extended flight pattern, said missile tube having a means for attaching a fishing line leader and line proximate to said tapered, closed front end section, wherein the improvement comprises:

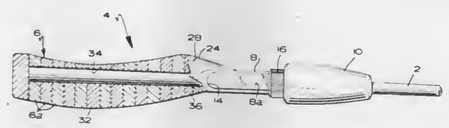
(a) a plurality of pivotly mounted clip tabs mounted on said hollow tubular middle section of said missile tube, said clip tabs pivotable between extended and retracted position, said clip tabs in said retracted position, lying closely adjacent to the exterior surface of said tube, said clip tab in said extended position projecting substantially perpendicular to said axis of said missile tube, said clip tab maintained in said retracted position by said rocket motor positioned within said middle section of said missile tube and said clip tab positioned in said extended position after ejection of said rocket motor,



(b) an annular flange positioned proximate to said open end section of said missile tube, said annular flange having a longitudinal indent therethrough in substantial alignment with said plurality of clip tabs for engaging said fishing leader,

(c) means for releasably mounting at least one fish hook and leader on said pivotably mounted clip tabs in cooperation with said longitudinal indent.

4,631,853
CONTOURED FISHING ROD HANDLE
John E. Brackett, Minneapolis, Minn., and Larry J. Dahlberg, Grantsburg, Wis., assignors to Fishing Designs, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 610,609, May 15, 1984, Pat. No. 4,577,432, which is a continuation of Ser. No. 302,634, Sep. 15, 1981, abandoned. This application Mar. 21, 1986, Ser. No. 842,309
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 **11 Claims**



1. A handle for a fishing rod comprising:

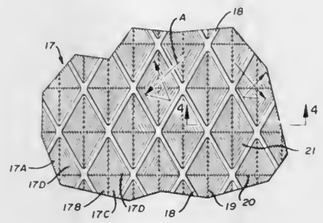
an elongated handle having a butt grip segment on the rear end thereof;

a reel seat segment on said handle located forwardly of said butt grip segment;

an outwardly curved, laterally offset projection on one side of said butt grip segment of said handle behind said reel seat segment; and

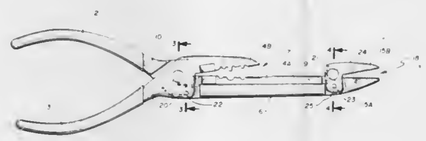
an outwardly curved, laterally offset complimentary projection on the same side of said reel seat segment of said handle as said butt grip segment projection, said complimentary projection merging with said curved projection on said butt grip segement as an extension thereof to define a continuous, smoothly contoured projection adapted to fit snuggly into the palm of the hand of the user when palming the butt grip, reel, and reel seat.

4,631,854
MULTI-REFLECTIVE FISHING LURE
Peter J. Rosko, 196 Old Oak Dr., Cortland, Ohio 44410
Filed Feb. 11, 1986, Ser. No. 828,343
Int. Cl.[4] H01K *85/00*
U.S. Cl. 43—42.34 **2 Claims**



1. A reflective fishing lure having a main body member; a plurality of depressions on the body member, said depressions having a diamond shape configurated by four opposing secondary surfaces within said depression; a multiplicity of edges on each opposing secondary surface, said edges being parallel to the abutting diamond shaped configuration; means to secure a fishing line and a hook to said body member.

4,631,855
MULTI-PURPOSE FISHERMAN'S DEVICE
Gary B. Ader, Spirit Lake, Iowa, assignor to Berkley and Company, Inc., Spirit Lake, Iowa
Filed Jul. 24, 1985, Ser. No. 758,659
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—53.5 **11 Claims**



1. A multi-purpose fisherman's device comprising:

a first lever arm, terminating at one end in a handle and terminating at the other end in an extended secondary base jaw element, and providing a primary base jaw element therebetween,

a second lever arm, terminating at one end in a handle and terminating at the other end in a primary upper jaw element,

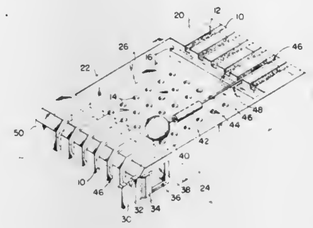
means for pivotally connecting the second lever arm to the first lever arm in proximity to the primary base jaw element so that the primary upper and base jaw elements cooperate to define primary jaws, operated by movement of the handles of the first and second lever arms relative to each other,

a movable jaw member, terminating at one end in a flange and terminating at the other end in a secondary upper jaw element,

a connecting link, pivotally connected between the second lever arm and the jaw member, and

means for pivotally connecting the jaw member to the first lever arm in proximity to the secondary base jaw element so that the secondary upper and base jaw elements cooperate to define a pair of secondary jaws, operated by movement of the handles of the first and second lever arms relative to each other.

4,631,856
HOOK AND LURE STORAGE DEVICE
Perry A. Born, 728 S. Devoe St., Olympia, Wash. 98501
Filed Oct. 7, 1985, Ser. No. 785,270
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.1 **1 Claim**



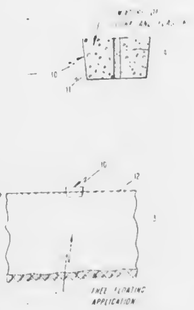
1. A pocket-sized holder for storing fishing rigs, each rig comprising leader having a hook at one end and a swivel at its other end, and lure and tubing strung on the leader between the hook and the swivel, the holder having front and back surfaces and comprising:

(a) hook holding means;
(b) lure and tubing storage zone;
(c) swivel securing means;
(d) top leader guide means;
(e) bottom leader guide means;
(f) compartment for storing leads;
(g) door for the said compartment;
(h) cutting blade;

wherein the storage zone is interposed between the hook holding means and the bottom leader guide means, the hook holding means has a plurality of parallel grooves in the upper surface of the holder and an anchoring slot for receiving the barbed ends of a plurality of hooks, the storage zone includes a recessed portion having a plurality of apertures, and the top and bottom leader guide means have a plurality of parallel groves extending from the front surface around to the back surface of the holder, each grove of the hook holding means being collinear with a groove in the top and bottom leader guides means, the door is mounted on one end of the compartment for reversible access to leads stored therein, the cutting blade is mounted on the door such that its cutting edge is exposed for cutting fishing line only when the door is in an open position, such that in use a fishing rig is stored in the holder by inserting the barbed end of the hook into the slot with the shank of the hook inserted into a groove in the hook holding means, drawing the leader around the top and bottom leader guide means by inserting the leader into the collinear grooves therein, placing the lure and the tubing into the storage zone, wrapping the remaining leader around the top leader guide means, and inserting the swivel into an aperture.

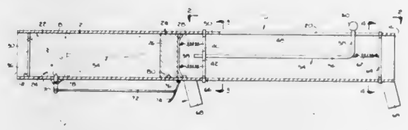
4,631,857
FLOATING ARTICLE FOR IMPROVED CONTROL OF AQUATIC INSECTS
Lawrence E. Kase, Baltimore, and Philip L. Branton, Fallston, both of Md., assignors to Summit Chemical Company, Baltimore, Md.
Continuation-in-part of Ser. No. 347,310, Feb. 9, 1982, abandoned. This application Oct. 25, 1983, Ser. No. 545,200
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—132.1 **8 Claims**

6. A floating dispenser for the sustained release of a larvicidal micro-organism consisting of *Bacillus thuringiensis* for the destruction of the mosquito or black fly larvae which breed on the surface of a body of water, comprising a unitary substantially homogenous non-layered molded article consisting of a plurality of cork granules, a molding plaster and the *Bacillus thuringiensis,* wherein the article comprises a substantially-toroidal slightly-tapered molded article having a central bore, whereby if desired, the article may be tethered or staked in a restrained-floating application, said larvicidal micro-organism further comprising a *Bacillus thuringiensis* Berliner var. *israelensis* and its accompanying proteinaceous parasporal particles which contain protoxin, wherein the article has a specific gravity of less than 1.0 and may be randomly and conveniently dispensed on to the surface of a body of water without regard



for the orientation of the article with respect to the surface of the water, wherein the article will continue to float on the surface of the water and will gradually disintegrate into a plurality of individual floating particles including cork granules substantially covered by the molding-type of plaster containing said larvicidal micro-organism, whereby a sustained release of the larvicidal micro-organism is achieved over a sufficient period of time and over a relatively wide area to destroy the larvae, and wherein all of the ingredients in the article are found in nature and are substantially bio-degradable and non-toxic to non-target organisms, and will not adversely affect the environment.

4,631,858
BUG CATCHER
Norman R. Kahle, W. 5150 Bruno Dr., Tomahawk, Wis. 54487
Filed Aug. 8, 1985, Ser. No. 763,638
Int. Cl.[4] A01M *5/02*
U.S. Cl. 43—134 **3 Claims**



1. A bug catcher comprising,

a tube having an open front end,

a piston slidable in the tube, between a rear retracted position and a front cocked position,

means for rapidly retracting the piston,

the piston being operable, in response to being slid to retracted position, for developing a vaccum in the tube for drawing in a bug through the open front end,

manually actuatable means for cocking the piston, connected to and movable with the piston, and extending through an elongated slot that runs substantially the length of a rear portion of the tube behind the piston retracted position and having a range of movement within the ends of the tube in the sliding movements of the piston,

means for releasably holding the piston in its cocked position, and

trigger means for manually releasing the piston.

4,631,859

INTEGRAL GRAVE MARKER AND FLOWER RECEPTACLE

Gary P. Letter, 113 Laurie Dr.; Raymond J. Letter, 35 Poinsettia Dr., both of Ormond Beach, Fla. 32074, and Eugene P. Letter, 47 Aspen St., Daytona Beach, Fla. 32014

Filed Oct. 22, 1984, Ser. No. 663,138

Int. Cl.⁴ A01G *5/00*

U.S. Cl. 47—41.1 **9 Claims**



1. An integrally combined grave marker and flower receptacle comprising:

a base slab of predetermined depth and having an uniformly cylindrical bore extending therethrough with first and second circular openings respectively disposed on opposing first and second surfaces of the slab;

an integral flower receptacle molded within said cylindrical bore and having a flat end flush with one said opposing surfaces of said slab; said integrally molded flower receptacle being partially shaped by the entire cylindrical surface of said bore forming a partial mold, such that said cylindrical surface of the bore is completely overlaid; whereby

said integrally molded flower receptacle being indivisible and bonded to the entire cylindrical surface and having no gaps therebetween such that the base slab and the flower receptacle are effectively one integral and indivisible unit, and a durable and theft proof construction is achieved.

4,631,860

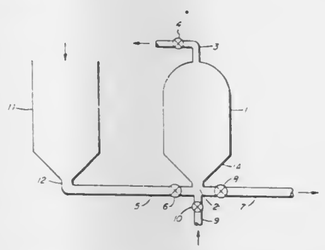
METHOD FOR PRE-GERMINATING SEEDS

Robert I. Broughton, 7623 Saskatchewan Drive, Edmonton, Alberta, Canada (T6G 2A6)

Filed Jun. 26, 1984, Ser. No. 624,729

Int. Cl.⁴ A01C *1/00*

U.S. Cl. 47—58 **9 Claims**



1. A method of causing formation of sprouts on seeds earlier than normal and improving crop yields resulting from said seeds which comprises the steps of:

(a) placing seeds in a sealed vessel and subjecting the seeds in said vessel to a pressure of less than atmospheric pressure for a selected period of time;

(b) releasing the pressure and mixing with water to form a slurry of water and seeds in the sealed vessel;

(c) subjecting said slurry of water and seeds in a sealed vessel to a gas pressure of greater than atmospheric pressure while maintained in said vessel, whereby the moisture content in said seeds is substantially increased from said combination of a pressure of less than atmospheric and a pressure of greater than atmospheric, and said seeds increase in size; and

(d) sowing said seeds, whereby germination of said seeds occurs within 24 hours of said treatment steps.

4,631,861

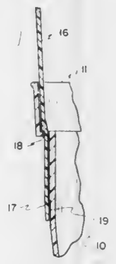
COMBINATION PLANT POT AND TRELLIS

David L. Wuthrich, 696 Crestview Dr., Twin Falls, Id. 83301

Filed Jun. 24, 1985, Ser. No. 748,213

Int. Cl.⁴ A01G *9/12*

U.S. Cl. 47—70 **3 Claims**



1. Combination portable plant pot and trellis comprising in combination:

a circular plant pot having a laterally extending circumferential flange member disposed along the upper edge of the pot;

trellis means having at least one elongate support member extending downwardly from the lower edge thereof for detachably mounting along the circumferential member of the plant pot;

attachment means for attaching the trellis means to the plant pot comprising in combination:

said downwardly extending support member having a first ledge means extending outwardly therefrom and a second ledge means extending inwardly therefrom at a point on the member below said first ledge means;

said plant pot having a first outwardly extending cooperating lip means adjacent to an aperture in said circumferential member adapted to receive and hold the first ledge means when the trellis downwardly extending support member is inserted into the aperture in the circumferential member; and

a second cooperating lip means disposed in the outer upwardly-extending side of the plant pot adapted to receive and hold the second ledge means of the trellis downwardly-extending support member.

4,631,862

SECURITY WINDOW GRATINGS WITH SAFETY LOCKS

Mike Gallardo, 16829 E. 14th St., San Leandro, Calif. 94578

Filed Jul. 9, 1984, Ser. No. 629,207

Int. Cl.⁴ E06B *3/68*

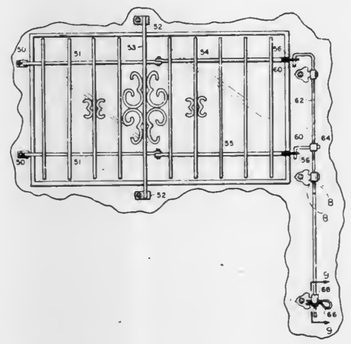
U.S. Cl. 49—56 **4 Claims**

1. A quick release security window grating locking and release apparatus located within the interior of a building, adjacent a window substantially covered by a rectangular security grating and below a normal reach of an intruder for the locking and the quick release of said grating, said grating having first and second end members, said first end members being hinged to a wall of the building, said locking and release apparatus including:

at least one end bar having the first end thereof secured at right angles to the second end member of said grating, the second end of said end bar terminating within the building and adjacent a side of the window;

a locking bar mounted adjacent the second end of said end bar, said locking bar being vertically slideable in bushing members attached to the wall of said building;

at least one hook section on said locking bar and extending



at substantially right angles to said locking bar to engage the second end of said end bar for preventing the security grating from being opened on its hinges;

a wall mounting bushing attached to the wall of said building at a location below the normal reach of a person reaching through said window, said wall bushing aligned to slideably receive said locking bar; and

a quick releasable retaining pin insertable through corresponding holes through said wall mounted bushing and said locking bar for coupling said locking bar to said wall mounted bushing.

4,631,863

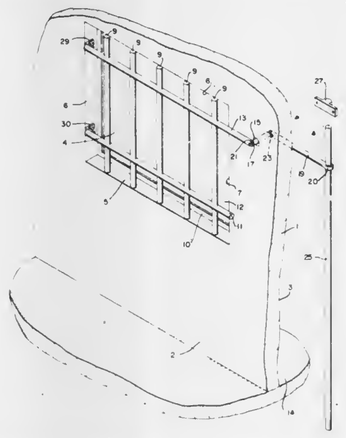
DOOR OR WINDOW GUARD SYSTEM

LeRoy L. White, 801 Delafield St., NE., Washington, D.C. 20017

Filed Aug. 15, 1984, Ser. No. 641,108

Int. Cl.⁴ E05B *65/10*

U.S. Cl. 49—141 **8 Claims**



1. A system for barring unauthorized access to a room through an opening in a wall of said room, said wall having an inner surface and an outer surface, said system comprising:

a grille assembly comprising a plurality of spaced-apart bars for placement over said opening, said bars including an elongated grille bar extendible past said window opening and along the outer surface of said wall;

hinge means connecting a side of said grille assembly to a vertical wall portion at said opening and adapted to permit the grille assembly to swing away from said opening in an outward, horizontal direction;

a port in said wall spaced from said opening and aligned with an extended portion of said elongated bar;

a horizontally extending connecting bar having inner and outer ends, said outer end connected to an extended portion of said elongated grille bar and said connecting bar adapted to extend through said port in said wall; and

an inner wall bar having first and second ends; means hingedly connecting said first end of said inner wall bar with said inner end of said connecting bar; and bar means cooperating with said second end of said inner bar for urging said inner wall bar against said inner surface and releasably securing said inner wall bar substantially parallel and in close proximity to the inner surface of said wall.

4,631,864

BOWDEN CABLE-WINDOW LIFTER, ESPECIALLY FOR MOTOR VEHICLES

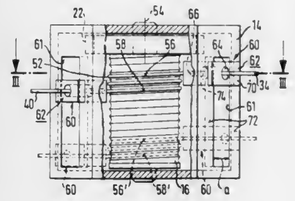
Manuel Barros, Coburg, Fed. Rep. of Germany, assignor to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,179

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432178

Int. Cl.⁴ E05F *11/48*

U.S. Cl. 49—352 **7 Claims**



1. A Bowden cable-window lifter comprising cable drive means including housing means and cable drum means having helical cable grooves and supported in said housing means, entrainment means carrying a window which is movably supported in the lifting direction at a guide means, and cable means starting from the cable drum means to the entrainment means and guided back to the drum means, at least one of the cable sections extending between the housing means and the guide means being guided in a Bowden casing means, connecting means supporting one Bowden casing end at the housing means, said Bowden casing end and the cable drum means being displaceably supported relative to one another in the direction of the drum axis in such a manner that with a rotation of the cable drum means, the instantaneous cable starting point of the cable section at the drum means assumes always essentially the same axial position in relation to the drum axis as the connecting means, wherein the connecting means is taken along by the cable drum means during rotation of the drum means, by direct engagement in the drum groove, and means movably supporting the connecting means at the housing means essentially parallel to the drum axis.

4,631,865

CONSTRUCTION OF DOOR IN MOTOR VEHICLE

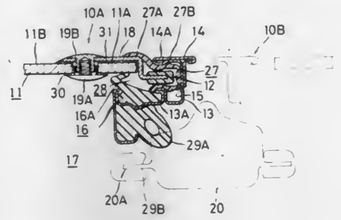
Masanao Motonami, Toyota; Eiji Hiramatsu, Nukata, and Daiichi Shiraishi, Seto, all of Japan, assignors to Toyoda Jidosha Kabushiki Kaisha, Japan

Filed Nov. 9, 1983, Ser. No. 550,045

Claims priority, application Japan, Nov. 11, 1982, 57-198034; Jan. 14, 1983, 58-4821

Int. Cl.⁴ E05F *11/38*

U.S. Cl. 49—374 **25 Claims**



1. A window assembly for a motor vehicle door, comprising:

a door glass having an end portion and an outer side surface;

at least one bracket having a first end and a second end, said first end being secured along said outer side surface of said door glass proximate said end portion and said second end projecting outwardly from said end portion in a direction substantially parallel to said outer surface of said door glass;

a door frame including a main body and a substantially vertically aligned guide portion projecting outwardly from said main body and having a guide groove open in the direction of said door glass;

at least one slide piece secured to said second end of said bracket and slidably positioned within said guide groove, to retain said outer side surface of said door glass substantially flush with an outer surface of said guide portion while said door glass is guided in the vertical direction along said guide groove;

a weather strip extending between said door glass and said door frame and positioned along said guide portion proximate the vehicle interior; and

a glass run mounted within said guide groove for firmly supporting and smoothly guiding said slide piece within said guide groove.

4,631,866

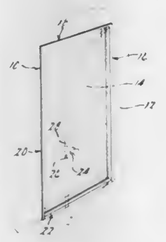
COMPOSITE NON-HANDED DOOR JAMB CONSTRUCTION

Ronald F. Otto, and John J. Kempel, both of West Branch, Mich., assignors to Garland Manufacturing Co., West Branch, Mich.

Filed Jun. 17, 1985, Ser. No. 745,862

Int. Cl.⁴ E06B *1/04*; E05D *7/02*

U.S. Cl. 49—504 **26 Claims**



1. A door jamb construction for mounting a hinged door to a building wall adapted to accommodate an entry lockset and a variety of deadbolt security devices, said door jamb adaptable for either right-hand or left-hand opening doors, comprising;

a header section,

a hinge jamb section,

a threshold,

a lock jamb section having an elongated center hole for receiving a sliding bolt of said deadbolt security device, a pair of entry lockset receiving holes displaced from the center of said lock jamb section such that one of said receiving holes is positioned in said lock jamb section on one side of said center hole and the other receiving hole is positioned on the other side of said center hole,

an entrance lockset receiving hole cover plate adapted to cover either of said entry lockset receiving holes, thereby enabling said lock jamb to be attached to either end of said header section providing right-hand opening or left-hand opening operation of said door, and

a deadbolt sliding bolt hole cover plate having one or more areas having removable center sections, said area defining a hole when said center section is removed and adapted to receive the sliding bolt of said deadbolt security device, said area being located asymmetrically with respect to the horizontal centerline of said deadbolt sliding bolt hole cover plate so that said deadbolt sliding bolt hole cover plate presents different positions of said area when in a first position as compared with a second inverted position, whereby said deadbolt sliding bolt hole cover plate accommodates a variety of types and configurations of said deadbolt security devices.

4,631,867

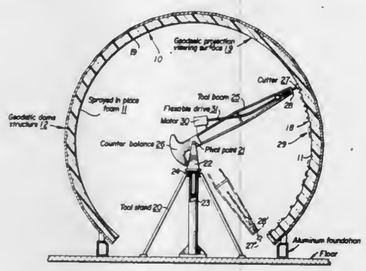
SPHERICAL PROJECTION-TYPE SCREEN FOR USE IN A VEHICLE SIMULATOR

John T. Reed, New Milford, Pa., assignor to The Singer Company, Binghamton, N.Y.

Division of Ser. No. 451,985, Dec. 21, 1982, Pat. No. 4,514,347. This application Feb. 19, 1985, Ser. No. 685,823

Int. Cl.⁴ B24B *5/00*

U.S. Cl. 51—2 R **9 Claims**



1. A geodesic dome manufactured for use as a spherical projection-type viewing surface in a vehicle simulator to present a maximum of realism matching substantially real world conditions, comprising:

a curved, substantially dome-shaped, projection screen formed of a single, one-piece layer of synthetic material with sufficient strength to be a free standing structure, and

means to remove a portion of the inner portion of said curved, substantially dome-shaped, one-piece layer of synthetic material to achieve a substantially smooth mathematically-derived surface,

so that the inner portion forming said viewing surface provides a one-piece, seamless screen for viewing a scene in said vehicle simulator.

4,631,868

METHOD AND AN APPARATUS FOR GRINDING A ROD-LIKE OBJECT

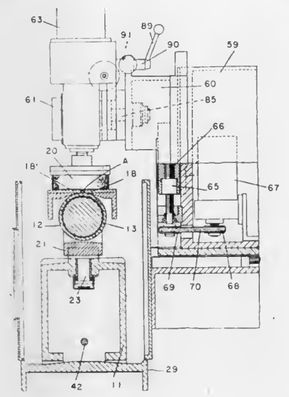
Nobuyuki Hirohata, Yakayama, Japan, assignor to Sanko Kikai Co., Ltd., Wakayama, Japan

Filed Dec. 4, 1984, Ser. No. 678,031

Claims priority, application Japan, Feb. 6, 1984, 59-20198

Int. Cl.⁴ B24B *41/06, 5/18*

U.S. Cl. 51—128 **14 Claims**



1. A method of grinding a rod-like object comprising:

supporting a rod-like object on top of a roll which is rotating about a horizontal axis;

guiding said rod-like object in a gap between a pair of guide plates which extend in a longitudinal direction that is parallel to a center axis of said rod-like object;

pressing said rod-like object down on said rotating roll by means of at least one vertically movable pressure roll which is rotating about a second horizontal axis to cause rotation of said rod-like object;

grinding said rod-like object by means of at least one vertically movable grinder which presses against said rod-like object with a constant pressure;

moving said rod-like object in said longitudinal direction to thereby accurately grind said rod-like object over the entire length thereof;

sensing a front end of said moving rod-like object by means of a first sensor which causes said vertically movable pressure roll to move towards said guide plates;

sensing said front end of said moving rod-like object by means of a second sensor which causes said vertically movable grinder to move towards said guide plates;

sensing a rear end of said moving rod-like object by means of a third sensor which causes said vertically movable grinder to move away from said guide plates; and

sensing said rear end of said moving rod-like object by means of a fourth sensor which causes said vertically movable pressure roll to move away from said guide plates.

4,631,869

AUTOMATIC WORKPIECE ENGAGING APPARATUS IN GRINDING MACHINES

Satoshi Miyatake, Kawagoe; Mitsuo Abe, Kiyose; Masao Kume, Tokyo; Toshihide Ogasawara, Kawagoe, and Hiroshi Umino, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Aug. 8, 1984, Ser. No. 638,690

Claims priority, application Japan, Aug. 9, 1983, 58-146022; Aug. 9, 1983, 58-146024

Int. Cl.⁴ B24B *49/00*

U.S. Cl. 51—165.71 **13 Claims**

1. An apparatus for automatically engaging a workpiece and a tool, each having preformed grooves, said apparatus comprising:

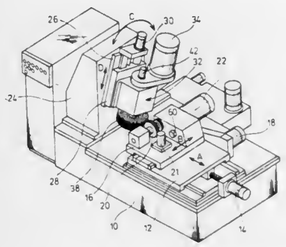
(a) a first rotational drive source operatively coupled to the tool to rotate the tool;

(b) a first pulse generator operatively coupled to said first rotational drive source to generate proportional to the speed of rotation of the tool and to generate a reference pulse at every complete rotation of the tool;

(c) a second rotational drive source controllable by a comparison control signal and operatively coupled to the workpiece to rotate the workpiece;

(d) a second pulse generator disposed in a confronting relation to the workpiece for generating a pulse at every passage of a workpiece groove near said second pulse generator:

(e) a first counter operatively coupled to said first and said second pulse generators for counting a reference count and a subsequent count, said reference count being the number of pulses generated from said first pulse generator



during the interval between said reference pulse generated from said first pulse generator and said pulse generated from said second pulse generator to which a reference workpiece is confronted, said subsequent count being the number of pulses generated from said first pulse generator during the interval between said reference pulse generated from said first pulse generator and a pulse generated from said second pulse generator to which a subsequent workpiece is confronted;

(f) a memory circuit operatively coupled to an output terminal of said first counter for storing said reference count; and

(g) a first comparator operatively coupled to an output terminal of said first counter and an output terminal of said memory circuit for comparing a subsequent count from said first counter for each subsequent workpiece rotated with said reference count from said memory circuit, outputting the comparison control signal based on said comparison for controlling said second rotational drive source.

4,631,870

CNC GRINDING MACHINE

Houng Sun, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-Chu Sheng, Taiwan

Filed Mar. 28, 1985, Ser. No. 717,005

Int. Cl.⁴ B24B *49/02*

U.S. Cl. 51—165.71 **1 Claim**

1. A CNC grinding machine for grinding a workpiece such as a gear or a cam, comprising:

a base located in a horizontal first plane formed by two perpendicular axes;

a work station capable of mounting thereon said workpiece, and driven by a first servomechanism to be capable of moving in said first plane and rotating about a third axis perpendicular to said first plane;

a column defined in a second plane perpendicular to said first plane and one of said two axes thereof;

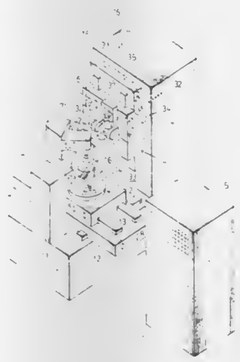
a grinding wheel driven by a second servomechanism to be capable of moving along a first line on said second plane;

said first line being rotatable about a fourth axis perpendicular to said second plane;

a CNC system including an NC controller and a computer for controlling said first and second servomechanism to work on said workpiece according to an initial grinding program;

a measuring probe mounted on said base driven by a third servomechanism controlled by said CNC system, and capable of moving along a second line perpendicular to said first plane;

a securing block mounted on said work station for ensuring that said workpiece is well secured thereon;



a grinding wheel dresser mounted on said securing block, and capable of moving and rotating in cooperation with said work station;

a measuring program contained in said CNC system for controlling the movements of said first and third servomechanisms to measure the working errors on said workpiece after a testgrinding for amending said initial grinding program; and

a wheel-dressing program contained in said CNC system for controlling the movements of said first and second servomechanisms to dress the grinding wheel as needed.

4,631,871

ABRASIVE FLUID JET APPARATUS

David H. Saunders, Cranfield, England, assignor to Fluid Engineering Products Limited, Milton Keynes, England

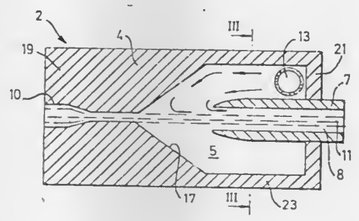
PCT No. PCT/GB83/00111, § 371 Date Dec. 12, 1983, § 102(e) Date Dec. 12, 1983, PCT Pub. No. WO83/03557, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 18, 1983, Ser. No. 568,204

Claims priority, application United Kingdom, Apr. 19, 1982, 8211224

Int. Cl.[4] B24C *5/04*

U.S. Cl. 51—439 **10 Claims**



1. Abrasive fluid jet apparatus comprising housing means defining a transfer space, outlet means defining an outlet aperture through an outlet end of said transfer space, jetting nozzle means at an inlet end of said transfer space for directing a fluid jet axially through said space toward said outlet aperture, inlet means spaced downstream of said jetting nozzle means for introducing a carrier fluid with entrained abrasive particulate solid material substantially tangentially into said transfer space so that said particulate flows along a sprial path, said particulate material being more dense than said carrier material so as to be substantially separable therefrom by centrifugal force, and guide means within said transfer space for causing said particulate material to concentrate more heavily toward said inlet end of said space than toward said outlet end and for causing carrier fluid with a high concentration of said particulate material to flow radially inward of said space near said inlet end and carrier fluid with a low concentration of said particulate material to flow radially inward of said space downstream from said high concentration, said guide means including an internal frusto-conical wall of said housing disposed at said inlet end of said transfer space and tapering inward toward said jetting nozzle means from downstream of said jetting nozzle means to facilitate the radial inward flow of said carrier fluid with a high concentration of said particulate material, whereby said particulate material becomes entrained in an outer layer of said fluid jet mainly toward said inlet end and a further layer composed principally of said carrier fluid forms around said outer layer of said jet.

4,631,872

NUCLEAR BLAST AND FALL-OUT SHELTER

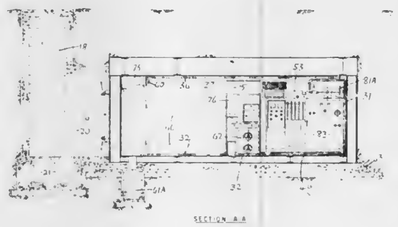
Nader D. Daroga, 80 Addiscombe Court Road, East Croydon, Surrey CR0 6TS, United Kingdom

Filed Jan. 6, 1984, Ser. No. 568,962

Claims priority, application United Kingdom, Jan. 12, 1983, 8300775

Int. Cl.[4] E04H *9/04*

U.S. Cl. 52—1 **12 Claims**



1. A nuclear blast and fall-out shelter having a chamber, oxygen supply means disposed within the chambers, a flowmeter and an automatic controller connected to the oxygen supply means for controlling the supply of oxygen, oxygen delivery ducting connected to the flowmeter for introducing the oxygen into the chamber, an intake ducting in the chamber for intake of air from the chamber, an air purifying means connected to the intake ducting for removing CO and CO_2 from the chamber air, air delivery ducting connected to the purifying means for delivering purified air to the chamber, means connected to the intake ducting to draw air through said air intake ducting and send the air through the purifying means and into said delivery ducting, means in the chamber for automatically measuring the proportion of CO and CO_2 in the air in the chamber and giving an alarm signal in case of danger, an air intake duct connected to the chamber for drawing external air into the chamber through said air intake duct, hand operated means connected to the intake duct for drawing external air into the chamber through said air intake duct, and over-pressure valve means connected to the chamber for controlling air pressure in said chamber.

4,631,873

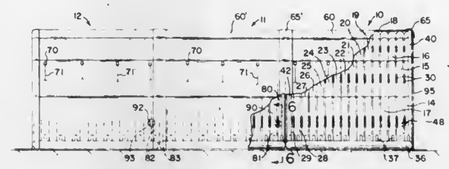
INFLATABLE SHELTER

James M. Parish, Wadsworth, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed May 6, 1985, Ser. No. 730,905

Int. Cl.[4] E04B *1/345*

U.S. Cl. 52—2 **12 Claims**



1. An inflatable shelter having at least two separate sections, each section having a series of inflatable arched tubes arranged transversely of said section, adjacent ones of said tubes in each section are interconnected, means interconnecting adjacent sections each of said sections having a roof cover sheet overlying the tubes in their respective sections, each of said covers has means for securing the section it overlies to an adjacent section, and anchoring means connected to said cover sheets for anchoring said cover sheets and sections to the ground supporting said inflatable shelter.

4,631,874

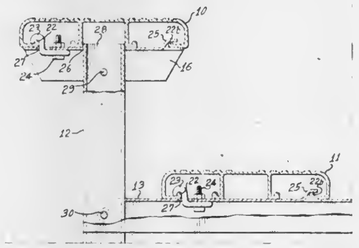
BLEACHER STRUCTURE

Jewell C. Griffin, Jr., Rte. #2, Box 89, Cottondale, Fla. 32202

Continuation of Ser. No. 457,002, Jan. 10, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 726,486

Int. Cl.[4] E04H *3/12;* **E04G** *5/08*

U.S. Cl. 52—8 **9 Claims**



1. In a bleacher structure having identical channel beams forming seat members and footrest members supported by an interconnected system of upright posts each having a rectangular cross section with their upper ends projecting through rectangular passageways in lateral cross support members, cross beams interconnecting adjacent posts, and diagonal members for stiffening the structure; said channel beams having an upper horizontal web portion and a plurality of spaced vertical leg portions depending from said web portion, including two outer leg portions positioned at the two outer extremities of said horizontal web portion, said leg portions terminating in lateral extending foot portions having lower bearing surfaces which are substantially coplanar, each said foot portion extending toward each other including an upwardly directed bead, said lateral cross support members and said cross beams each having upper bearing surfaces and lower surfaces therebeneath and an upwardly extending elongated tab having one end rigidly connected to and engaging respective said lateral cross support member or said cross beam and the opposite end being generally parallel to said lateral cross support member or said cross beam and positioned above said upper surfaces thereof and adapted to receive one of said beads in wedging engagement and pressing said one bead downwardly with its attached said foot portion being sandwiched against respective said upper surfaces of said cross support member or said cross beam, an elongated removable clip having two ends, one of said ends of said clip bearing directly upon said lateral cross support member or said cross beam and the other of said ends being adapted to receive the other of said beads and clamp said channel beam downwardly against said lateral support member or said cross beam, and fastening means to tighten said clip against lateral support member or said cross beam and simultaneously to urge said repsective other bead of said foot portion laterally outwardly into tight wedging engagement with said other end of said clip and pressing said other bead downwardly with its attached said foot portion being sandwiched against respective said upper surface of respective said cross support members or said cross beams.

4,631,875

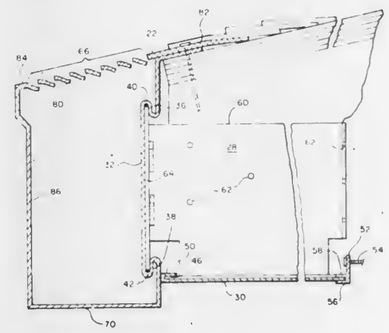
GUTTER ASSEMBLY AND METHOD OF INSTALLATION

Carlton D. Olson, Brule, Nebr., assignor to Eave-in-One, Inc., Brule, Nebr.

Filed Jul. 16, 1985, Ser. No. 755,353

Int. Cl.[4] E04D *13/06*

U.S. Cl. 52—12 **30 Claims**



1. A universal gutter assembly for use adjacent the roof edge of a structure having plural spaced rafters notwithstanding variations in at least one of the spacing, height, length and parallelism of the rafters to each other comprising:

an elongated gutter having a bottom and upstanding front and rear walls:

rearward facing bracket connecting means having mating channels carried by said rear wall continuously along the length thereof;

a plurality of mounting brackets each having forward facing gutter connecting means, rearward facing rafter mounting means, rearward facing wall mounting means, and forward facing soffit strip connecting means carried continuously along the length thereof;

said gutter connecting means being configured with upper and lower ends adapted for sliding engagement with said channels so that each of said brackets may be connected to said gutter at any selected position along the length thereof;

said rafter mounting means being substantially planar and extending rearwardly in a generally vertical plane for attachment to a generally vertical side of a rafter; and

said wall mounting means being configured for attachment to a wall of the roofed structure;

elongated soffit strip mounting means adapted to be mounted on said wall and having means for slidably receiving the rear edge of a soffit strip; and

an elongated soffit strip having a rearward facing lateral edge adapted to be slidably received by said elongated

soffit strip mounting means and a second lateral edge adapted to slidably receive the soffit strip connecting means of said mounting brackets.

4,631,876

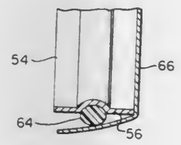
ORIFICE METERING FAN DEVICE

Arthur M. Saum, Waynesboro, Va., assignor to Saum Enterprises, Inc., Falls Church, Va.

Continuation of Ser. No. 532,496, Sep. 15, 1983, abandoned, which is a division of Ser. No. 269,755, Jun. 2, 1981, Pat. No. 4,420,969. This application Apr. 23, 1986, Ser. No. 854,707

Int. Cl.[4] E05C *21/00*; G01M *3/04*

U.S. Cl. 52—27 **18 Claims**



1. A panel device for temporary installation in building openings of substantially differing sizes to provide a generally airtight seal around its outer periphery by contact with the inner surfaces of said openings, the device comprising

a rigid, generally planar frame which is adjustable in size to conform closely with the inside surfaces of the building opening over part of its peripheral length, said frame enclosing an area less than that of the building opening, the periphery of said frame having a continuous, outward-facing concavity along its length, and having at intervals slidable, overlapping sections to provide frame size adjustment in each of two directions while maintaining continuity of the peripheral concavity,

an inner panel frame mounted within the planar frame generally coplanar with the planar frame, the inner panel frame having an opening of a size sufficient to snugly accommodate a frame device mounted within the opening,

one or more auxiliary inserts shaped to fit the areas in the building opening excluded by the frame,

a elastically deformable sealing means around the periphery of the frame, said sealing means being located partly within and extending outside of the peripheral concavity, said sealing means being compressible between the planar frame and the inner surface of the building opening, stretchable longitudinally and conforming slidably with the periphery of the planar frame over the range of size adjustment of said planar frame,

a thin, flexible, generally air-impermeable membrane of exterior dimensions greater than the frame and extending out to the periphery of the frame and around the sealing means, the membrane capable of being pressed by the sealing means against an interior surface of the building opening or an edge of an auxiliary corner insert, and

means to hold the frame in the building opening.

4,631,877

COLLAPSIBLE HUT

Edward J. Molodecki, 5 Foster Ave., Smith Falls, Ontario, Canada (K7A 1J9)

Filed Sep. 6, 1985, Ser. No. 773,045

Claims priority, application Canada, May 30, 1985, 482828

Int. Cl.[4] E04B *1/34*

U.S. Cl. 52—70 **12 Claims**

1. A collapsible hut, comprising:

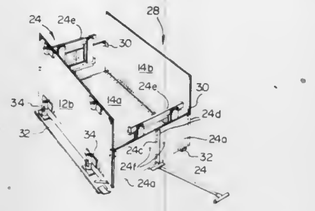
a plurality of separable sheet-shaped wall and roof components;

means for releasably securing said sheet-shaped wall and a roof components together in a first assembly as the walls and roof of a hut;

means for releasably securing a pair of said sheet-shaped wall components together in a second assembly as a floor and opposite side walls of a container;

ground engagement means for supporting said container for travel over the ground;

said wall and roof components each comprising sheet-



shaped panels with longitudinal edges and end edges, and means for connecting said panels to one another along adjacent longitudinal edges of said panels; and

means for securing end edges of said panels of each of said components to a longitudinal edge of one of said panels of an adjacent one of said components in said first assembly, so that said panels of each of said components are thereby held in a respective co-planar relationship by an adjacent one of said components.

4,631,878

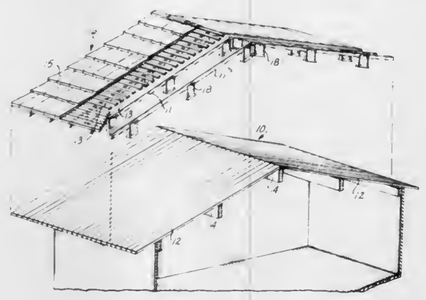
PEDESTAL AND FRAMING SYSTEM FOR SUPPLEMENTAL ROOF CONSTRUCTION

Larry W. Laramore, 22526 108th Ave. SE., Kent, Wash. 98031

Filed Dec. 19, 1984, Ser. No. 683,708

Int. Cl.[4] E04B *7/02*; E04G *25/08*

U.S. Cl. 52—90 **35 Claims**



1. A framing system for use in supporting a supplemental roof in superposed spaced relation to a primary roof of a building, said primary roof having a layer of boards overlying a plurality of framing members, comprising:

a plurality of like-configured pedestals positioned at spaced-apart locations on said layer of boards, each of said pedestals being disposed in superposed relation to a selected framing member of said primary roof, each of said pedestals having opposed first and second ends, the first end of each pedestal being oriented toward said layer of boards, the second end of each pedestal being oriented away from said layer of boards and having a channel that is adapted to receive a framing member of the supplemental roof, said pedestals being oriented so that the respective channels thereof are cooperatively aligned;

fastening means for connecting each of said pedestals, respectively, to the selected framing member of said primary roof; and

a supplemental framing member mounted in the aligned channels of said pedestals.

4,631,879

INTERIOR PANEL

Hiroshi Kobayashi, Tokyo; Jiro Kano, Kawasaki; Yoshio Kojima; Yoshitoyo Nishite, both of Yokohama, and Yutaka Tsuruta, Funabashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Taisei Corporation, Tokyo, both of, Japan

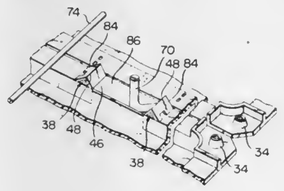
Filed Nov. 23, 1984, Ser. No. 674,088

Claims priority, application Japan, Nov. 24, 1983, 58-220987

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] E04B *1/00, 5/58*; E04F *17/00*; E04C *1/00*

U.S. Cl. 52—98 **13 Claims**



1. An interior panel which overlies the surface of a slab defining the inside space of a room to form the interior surface of the room so that a space to permit arrangement of signal transmission cables, power cables, and electric devices is secured between the interior panel and the slab surface, comprising:

a plurality of support members set up on the slab surface;

a panel member supported by the support members and suitably spaced apart from the slab surface;

a cable separator interposed between the panel member and the slab surface, the cable separator having the form of a plate with a stepped portion at the peripheral edge portion thereof supported on the support members so that the stepped portion faces upward, whereby the space between the panel member and the slab surface is divided into a first space defined between the panel member and the cable separator for the installation of the signal transmission cables and a second space defined between the cable separator and the slab surface for the installation of the power cables; and

bending means provided to at least one part of the stepped portion of the cable separator, whereby the stepped portion is partially bent to form an opening for connecting the first and second spaces.

4,631,880

ADJUSTABLE STAIRCASES

Charles L. Leicht, 384 South St., Toowoomba, Queensland, Australia (4350)

Filed Jan. 28, 1985, Ser. No. 695,392

Int. Cl.[4] E04F *11/00*

U.S. Cl. 52—105 **5 Claims**

1. An adjustable stairway assembly, when assembled, comprising a pair of spaced parallel stringers, a plurality of tread support brackets evenly spaced at intervals along the length of said stringers, tread members extending between said stringers and being supported by said support brackets and mounting brackets for pivotally mounting the upper ends of said stringers to an elevated surface, said stringers each comprising a C section channel member having an outwardly facing channel and an inwardly facing upright wall, each said upright wall having a plurality of respectively opposed circular apertures adjacent a lower edge of said wall and equally spaced along said lower edge at distances to define in an erected stairway the vertical separation between adjacent steps, a radial array of slotted apertures in said wall associated with each said circular aperture, each said tread support bracket having an upright wall surface and a horizontally inwardly extending tread support surface, said tread support bracket having adjacent a first end of said upright wall surface a cylindrical boss extending therefrom with a tab connected to and extending from an exposed end of said boss is a direction normal to said upright wall surface, said tread support bracket including a further



outwardly extending tab adjacent a second end of said upright wall surface whereby each said tread support bracket is pivotally locatable on said stringer by locating said cylindrical boss in said cylindrical aperture and each said tread support bracket is fixed in a desired horizontal position by locating said further tab in a selected one of said radial array of slotted apertures and said tab and said further tab are bent downwardly to fix said tread support bracket in place, said upper tread support surfaces including apertures to facilitate bolting of tread members thereto.

4,631,881

OFFICE SCREENS AND PARTITIONS

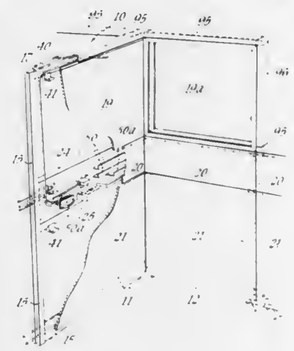
Michael D. Charman, Dartford, United Kingdom, assignor to Vickers Public Limited Company, London, England

Continuation-in-part of Ser. No. 751,046, Jul. 2, 1985, abandoned. This application Apr. 22, 1986, Ser. No. 854,476

Claims priority, application United Kingdom, Apr. 30, 1985, 8510909

Int. Cl.[4] E04F *19/06*

U.S. Cl. 52—220 **26 Claims**



1. A generally rectangular screen comprising:

a load-carrying frame forming a section of an eventual partition and defined by first and second posts along side edges of the screen and by a plurality of cross-rails extending between and connected to the posts with at least a top and a bottom cross-rail along top and bottom edges of the screen;

at least one cladding panel spanning between the posts and between pairs of the cross-rails; and

at least one cable carrier in the frame defining at least one cable channel open from above, said carrier extending generally parallel to the cross-rails between the first and second posts and with the sides of the cable channel having openings at the ends of the carrier giving cable access across an outer face of the posts to the channel in the line thereof;

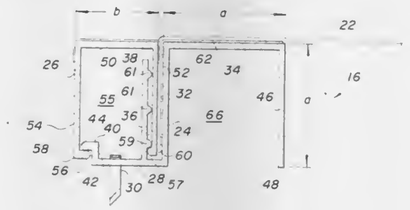
clip means demountably supporting the cladding panel at an outward clearance from the outer face of the posts so that cables laid in the cable carrier can pass therefrom across the outer face of the posts to adjoining portions of the eventual partition.

4,631,882

MOLDING STRIPS AND ASSEMBLY THEREOF FOR MOUNTING A FLEXIBLE COVERING ONTO A SUPPORT SURFACE

R. Gregg Sease, 6457 S. Heritage Place West, Englewood, Colo. 80111

Filed Feb. 26, 1985, Ser. No. 705,596
Int. Cl.[4] A47H *13/00*; E04B *1/00*
U.S. Cl. 52—222 **25 Claims**



1. A molding strip assembly adapted to secure an edge of a flexible covering to a surface to which the molding strip is attached, comprising:

a molding element having a relatively flat base wall operative to receive fastening elements for attaching said molding elements to said surface, a connecting wall extending upwardly from the base wall, a raised lip extending upwardly from the base wall in spaced relation to the connecting wall, a retaining wall extending upwardly from said base wall in closely spaced relation to the connecting wall to define a narrow groove therebetween, and a raised support wall connected to the connecting wall and supported thereby in spaced relation to the base wall; and

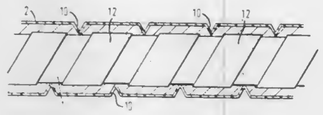
a locking member having a top wall and first and second side walls depending downwardly therefrom, said first side wall sized for insertion into said groove, said second side wall including locking means for engaging said lip to retain the locking member on said molding element with said first side wall in mated engagement with said groove, whereby the covering may be secured to said surface by training its edge across said support wall, along said connecting wall and into said groove after which the locking member is secured to said molding element so that the first side wall thereof traps the edge of the covering in said groove.

4,631,883

TENDONS FOR POST-TENSIONED PRE-STRESSED CONCRETE STRUCTURES

Alan J. Harris, London, and Gordon E. R. Wright, Great Missenden, both of England, assignors to PSC Freyssinet Limited, Buckinghamshire, England

Filed May 17, 1984, Ser. No. 611,199
Claims priority, application United Kingdom, May 25, 1983, 8314417
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 R **8 Claims**



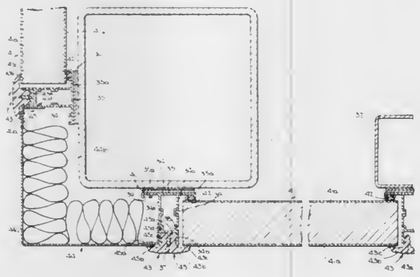
1. A prestressed concrete structure comprising an elongated tubular metal sheath formed with a helically extending rib projecting radially inwardly of said tubular sheath and defining a helically extending outer groove, concrete surrounding said sheath and occupying said outer groove to secure said sheath, a high tensil strength strand provided inside said sheath such that said helically shaped internal rib of said sheath is located in closely spaced radial relationship to the outer surface of said strand, said strand outer surface and said sheath defining a generally helically shaped channel therebetween, plastic material in said helically shaped channel, said material including at least first and second components which normally react with one another to set the material in a hardened state, containment means for isolating one of said first components from said second component, said containment means being readily frangible as a result of relative longitudinal motion between said strand and said sheath rib, and means for tensioning said strand to achieve such motion and rupture said containment means to secure the tensioned strand in place inside said tubular sheath.

4,631,884

BUILDING SYSTEM

Donald A. Reynolds, Gypsy Mead, Westcliffe Avenue, Baildon, Shipley, West Yorkshire, England

Continuation-in-part of Ser. No. 597,586, Apr. 9, 1984, abandoned, which is a continuation of Ser. No. 351,133, Feb. 22, 1982, abandoned. This application Feb. 11, 1986, Ser. No. 828,296
Claims priority, application United Kingdom, Feb. 21, 1981, 8105556
Int. Cl.[4] E06B *3/62*
U.S. Cl. 52—235 **6 Claims**



1. A low curtain walled building comprising:

(a) a foundation;

(b) a main steelwork including (i) a plurality of primary vertical columns mounted on and anchored to said foundation and spaced from one another along lines defining the periphery of the building, (ii) a plurality of sets of horizontal beams or girders secured to said primary vertical columns and defining the supports for at least one floor and the roof of the building, and (iii) a plurality of secondary vertical columns alternating with said primary vertical columns and secured to said horizontal beams or girders along said lines defining the building periphery, each said secondary vertical columns being located intermediate two adjacent primary vertical columns;

(c) an auxiliary framework supported by said main steelwork exteriorly thereof, said auxiliary framework including a plurality of elongated framework members each having (i) a hollow central support portion of substantially rectangular cross-section and having opposed side walls, (ii) a transverse web extending laterally of said central support portion at one of the longitudinal edges of the latter and to both sides thereof and defining a pair of flanges each juxtaposed to a respective one of said side walls, each of said flanges having at the surface thereof proximate to the associated side wall, a longitudinally extending recess structure defining a seat for a strip of sealing material, and (iii) a medial partition between the portions of said side walls at the other longitudinal edge of said central support portion and defining with said side walls a pair of longitudinal channels open in the direction away from said web, said framework members being arranged vertically and horizontally in a gridwork pattern, the vertical framework members being fastened at said flanges thereof each to a respective one of said primary and secondary vertical columns, and the horizontal framework members being fastened at said flanges thereof each at one end to a respective one of said primary vertical columns and at the other end to a respective next adjacent secondary vertical column, whereby the confronting side walls of the two horizontal and the two vertical central support portions of each set of four rectangularly arranged framework members together define a respective rectangular infill-receiving space;

(d) a plurality of rectangular generally planar infills to define the curtain walls of the building, one of the opposed faces of each infill providing the interior finish of the building walls and the other face of each infill providing the exterior finish of the building walls, each infill being seated on edge in a respective one of said spaces, with the lower edge of that infill supported by the associated lower horizontal central support portion, and with the peripheral edge region of said one face of each infill engaging the associated set of strips of sealing material seated in the respective recess structures of said flanges of said framework members; and

(e) elongated exterior finishing gasket means for each infill, each gasket means having (i) a foot portion received in a respective one of said channels, (ii) a transverse limb portion extending laterally from said foot portion exteriorly of said respective channel over the proximate marginal region of said other face of the associated infill, and (iii) a rib at the remote edge of said limb portion engaging and pressing against said other face of said associated infill, whereby each said finishing gasket means locks said associated infill in place in its respective space and seals the junctures between the edges of that infill and the associated four central support portions of said framework members.

4,631,885

INSULATED CONCRETE MASONRY UNIT

Anthony N. Iannarelli, 345 N. Washington St., Belchertown, Mass. 01007

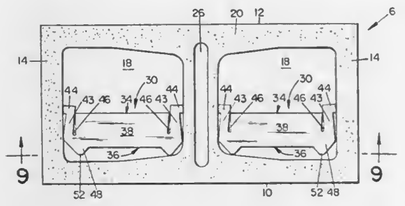
Filed Jan. 6, 1986, Ser. No. 816,334
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—405 **2 Claims**

1. In combination with a masonry block having cavities therein of varying longitudinal and transverse cross sectional dimensions,

an insulating liner formed from a frangible and compressible material and being insertable into a block cavity,

the liner having a longitudinal cross sectional dimension substantially equal to that of the block cavity and a transverse cross sectional dimension substantially less than that of the block cavity and having a central body with substantially parallel vertically-extending front and rear planar faces and side faces,

each side of the liner adjacent the side face being provided with a vertically-extending L-shaped rib projecting at each end of the central body forwardly and outboard of



the plane of the liner front face and then transversely outwardly and away from its outer end for embracing and being crushable upon any contact with a respective adjacent wall of the block cavity,

a vertically-extending notch extending into the liner inwardly a short distance from the liner front face in the region of the upper portion of the liner between each rib and the central liner body for permitting a yielding deflection of the rib upon contact with a respective adjacent wall of the block cavity, a pair of spaced vertically-extending outwardly-projecting projections on the liner rear face for bearing against a respective adjacent wall of the block cavity and allowing definition of an air space between the liner and said respective adjacent wall.

4,631,886

METHOD AND SYSTEM FOR THE FACING OF STRUCTURES

Kauko I. Vesterinen, Helsinki, Finland, assignor to Rakennus - Ja Konsulttitoimisto Risto Hukka Ky, Kerkonjoensuu, Finland

Filed Aug. 22, 1984, Ser. No. 643,078
Claims priority, application Finland, Aug. 23, 1983, 833015
Int. Cl.[4] E04B *1/38*; E04C *1/10, 2/08*
U.S. Cl. 52—410 **8 Claims**



1. A system for the facing of construction, said system consisting of several practically equalized proper panels forming a surface of the structure, said panels being fixed to an understructure (**14**) at such a distance as to leave space between said

panels and said understructure (**14**) for insulating means; each of said panels having a planar surface approximately parallel with said understructure (**14**) and at least one pair of opposing edgings (**2**), (**3**), one of the edgings of said one pair on each panel being designed for longitudinal interlocking engagement with an opposing edging (**2**), (**3**) extending from the panel surface (**1**) toward said understructure (**14**), said system comprising:

means for interlocking adjacent ones of said edgings (**2**), (**3**) of adjacent panels together when the angle between the panel surfaces (**1**) is changed, and at least one fastening device (**22**), (**23**) attached to a first fastening edging (**2**), that is turned away from another edging (**3**) interlocked with another panel, at a point along the length of said one edging (**2**), said fastening device having a profile complementary with the cross-sectional form of said first edging (**2**),

said at least one fastening device (**22**), (**23**) being considerably shorter than the length of said first edging (**2**) and being supported on said firt edging for adjustment in a transverse direction from the panel surface (**1**) for fixing each panel to the understructure (**14**), said fastening edgings (**2**), (**3**), being supported by at least one supporting bead positioned between said edgings (**2**), (**3**) at the inner surface (**2***a*), (**3***a*), of the panel, said bead (**10**) supporting opposite fastening edgings (**2**), (**3**) of the panel on opposite sides thereof, and preventing buckling of each panel surface (**1**) by supporting opposing surfaces of said panels.

4,631,887

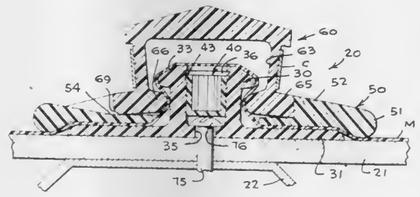
NON-PENETRATING ROOF MEMBRANE ANCHORING SYSTEM

Thomas F. Francovitch, 216 Circle Rd., Pasadena, Md. 21122

Filed Jan. 31, 1986, Ser. No. 825,132

Int. Cl.[4] **B32B** *7/08;* **E04B** *1/40;* **E04D** *5/14*

U.S. Cl. 52—410 **19 Claims**



1. A non-penetrating roof member anchoring system comprising:

a base member for attachment to a roof substrate comprising an enlarged head,

a membrane over said base member,

a disc outwardly and transversely of said head, and over said membrane,

a socket cap comprising a top overlying said head, an annular array of speed legs depending from said top, re-entrant feet carried by said legs remote from said top for cooperation with said head, means for permitting contraction of said legs and re-entrant feet,

the bottoms of said re-entrant feet engaging the top of said disc, and

means for contracting said legs to move said re-entrant feet beneath said head for resisting removal of said socket cap from said base member.

4,631,888

DEVICE FOR HOLDING A PANEL OR OTHER GENERALLY FLAT OBJECT ON A WALL

Jos Palmans, Sint-Huibrechts-Lille, Belgium, assignor to Alliance Enamelsteel Corporation N.V., Belgium

Filed Sep. 10, 1985, Ser. No. 774,308

Claims priority, application Luxembourg, Oct. 16, 1984, 85596

Int. Cl.[4] **E04B** *1/38*

U.S. Cl. 52—509 **1 Claim**



1. A panel fastener, which comprises:

a first bracket, the first bracket including a first portion, and a flat second portion joined perpendicularly to the first portion, the first portion including a flat main body and a pair of laterally projecting portions projecting above the level of the main body, the main body including a slot formed through the thickness thereof for mounting the fastener to a mounting surface, and each of the projecting portions defining with the main body a respective slot extending longitudinally of the first bracket and open laterally with respect thereto, the second portion including an aperture formed through the thickness thereof;

a second bracket adapted to mate with the first bracket to secure a panel to the first bracket, the second bracket including a first elongated member dimensioned to be received by the bracket aperture, and a second cross member joined to and extending transversely to the first member; and

a flat, locking plate for locking the fastener in position on the mounting surface, the locking plate being dimensioned to be slidingly received and retained by the slots defined by the projecitng portions and the main body, the locking plate including a slot formed through the thickness thereof and disposed to extend obliquely to the slot formed in the main body of the first bracket.

4,631,889

FIXING DEVICES

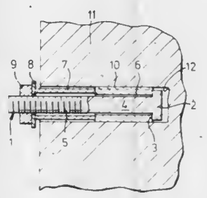
Ian R. Adam, Netherlee, and James Mallon, Armadale, both of Scotland, assignors to ITT Corporation, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,362

Claims priority, application United Kingdom, Dec. 17, 1982, 8236001

Int. Cl.[4] **E04B** *1/02*

U.S. Cl. 52—565 **8 Claims**



1. A fixing device comprising a rod having a first end and a second end, said first end to be secured in a bore of a structure,

and an anchoring device for the first rod end including a sleeve element of deformable material arranged on the rod, which sleeve element is radially expandable upon axial compression, and means for causing axial compression and thus radial expansion of the sleeve element in use of the fixing device, whereby to grip the bore wall, and wherein the sleeve member has at least one rib projecting from its radially outermost circumferential surface,

wherein each said first and second end is threaded and wherein the axial compression means comprise an internally threaded member, adapted for screwing on the first rod end, and a stop member inwardly of the first rod end, a sleeve element being arranged between the internally threaded member and the stop member, and wherein axial compression of the sleeve element in use of the fixing device is achieved by rotating the rod,

said fixing device forming a cavity wall tie, the first rod end being for securement in a first cavity wall leaf, said second rod end being for securement in a second cavity wall leaf, said device including means whereby there is a higher frictional connection between the internally threaded member and the sleeve element than between the stop member and the sleeve element such that during installation of the first rod end of the wall tie, radial expansion of the sleeve element, for anchoring the first rod end in the respective cavity wall leaf bore, can be achieved by rotation of the rod,

said device further including an anchoring device for the second rod end, which second rod end is threaded, comprising a further stop member on the second rod end adjacent the cavity between the leaves, a further internally threaded member adapted for screwing on the second rod end, a further sleeve element of deformable material arranged on the rod between the further stop member and the further internally threaded member, and wherein during installation the further sleeve element is radially expanded, after expansion of the sleeve element associated with the first rod end, by securing the further interally threaded member towards the further stop member.

4,631,890

MODULE ELEMENT, BUILDING CONSTRUCTION AND METHOD FOR ERECTING A BUILDING CONSTRUCTION

Imre Szombathelyi, Verecke u. 81, H-1025 Budapest, Hungary

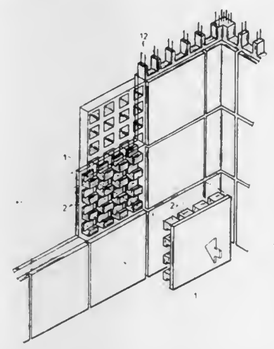
PCT No. PCT/HU84/00058, § 371 Date Sep. 17, 1985, § 102(e) Date Sep. 17, 1985, PCT Pub. No. WO85/02431, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 30, 1984, Ser. No. 770,862

Claims priority, application Hungary, Nov. 30, 1983, 4107/83

Int. Cl.[4] **E04B** *1/02*

U.S. Cl. 52—570 **5 Claims**



1. Building construction formed of module elements having a rectangular base plate on at least one side of which a plurality of coupling means is arranged in an equidistant manner in a horizontal as well as in a vertical direction, and each of the coupling means (**2**) having a U-shaped cross section with two legs (**3, 4**) and an interconnecting rib (**5**) between the legs (**3, 4**), and the first leg (**3**) being longer and narrower than the second leg (**4**) and is connected to the plate surface of the module element, and the second leg (**4**) being shorter and thicker than the first leg (**3**), and the distance between the legs (**3, 4**) at the rib (**5**) no greater than the least width of the second leg (**4**), the module elements being parallelly connected to each other by interconnecting the coupling means (**2**) of one module element with upwardly direction said second legs (**4**) with the coupling means (**2**) of the adjacent module element with downwardly directed said second legs, whereupon the second legs (**4**) of the one module element are disposed between the first and second legs (**3, 4**) of the adjacent module element.

4,631,891

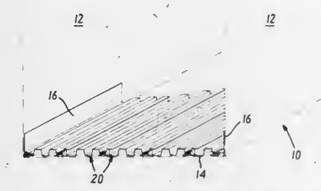
FLOOR CONSTRUCTION FOR CARGO CARRIERS

John Donavich, Des Plaines, Ill., assignor to Transamerica Distribution Services, Inc., Chicago, Ill.

Filed Jan. 9, 1985, Ser. No. 690,113

Int. Cl.[4] **B61D** *3/00;* **F04C** *1/30*

U.S. Cl. 52—588 **8 Claims**



1. For use in a cargo carrier having a floor, such as a truck, trailer, container, railway car or the like, a cargo supporting structure comprising an integrally formed panel, said panel having:

at least one longitudinally extending T-shaped member comprising a vertical web and a horizontal flange extending along the upper edge of said vertical web;

at least one longitudinally extending inverted U-shaped channel member parallel to said T-shaped member, said channel member having a pair of downwardly extending substantially vertical side walls; and

web means for resting on said floor of said cargo carrier interconnecting the lowermost edge of the vertical web of said T-shaped member and the lowermost edge of one of said side walls of said inverted U-shaped channel member nearest said vertical web along the entire lengths of said members, the uppermost surfaces of said T-shaped member and said inverted U-shaped channel member being cargo supporting surfaces.

4,631,892

COMPOSITE BEARING COLUMN

René-André Beck, Pully, Switzerland, assignor to BSA Rene Beck S.A., Pully, Switzerland

Filed Mar. 19, 1985, Ser. No. 713,626

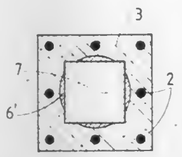
Claims priority, application Switzerland, Apr. 11, 1984, 1814/84

Int. Cl.[4] **E04C** *3/34*

U.S. Cl. 52—725 **6 Claims**

1. A composite bearing column, comprising a solid metallic core of circular or polygonal section free from reentrant reces-

ses, said core being at least partly embedded in an intermediate layer of mortar compatible both with metal and with concrete,



and an external concrete mass surrounding said intermediate layer.

4,631,893

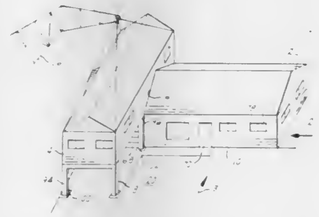
SINGLE STORY HOUSE ADDITION STRUCTURE AND METHOD

Sheldon Shacket, Southfield, and Robert Helfman, Franklin, both of Mich., assignors to Trus-Us Inc., Royal Oak, Mich.

Continuation-in-part of Ser. No. 580,134, Feb. 14, 1984, Pat. No. 4,480,420, which is a continuation of Ser. No. 461,024, Jan. 26, 1983, Pat. No. 4,449,334, which is a continuation-in-part of Ser. No. 430,854, Sep. 30, 1982. This application Aug. 13, 1984, Ser. No. 639,789

Int. Cl.[4] E04G *21/00*

U.S. Cl. 52—745 **9 Claims**



1. The method of expanding a pre-existing single story house structure having peaked roof structure to provide additional living space comprising cutting an opening in the roof of the pre-existing house structure, prefabricating a room sized dwelling unit, lifting the prefabricated room sized dwelling unit and positioning it in the opening in the peaked roof structure of the pre-existing house structure with a portion thereof extending outwardly away from the pre-existing house structure and supporting the prefabricated dwelling unit in position.

4,631,894

HARDWARE FOR PANEL DOORS

Torsti T. T. Jerila, West Covina, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed Apr. 26, 1982, Ser. No. 371,546

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—823 **46 Claims**

1. A framing member comprising:

a rigid flat side wall;

a rigid, flat, front wall along the front edge of the side wall and generally normal to the side wall; and

a third wall generally normal to the side wall and sapced from the front wall to form a channel sufficiently wide to receive the edge of a door panel and comprising a flexible deflection arm extending from a pivot position between the edges of the third wall toward the front wall and side wall which generates a force against the back face of a door panel at a position nearer the side wall than the edge of the front wall remote from the side wall when an edge of such a door panel is inserted in the channel, and



wherein the ratio of the width of the front wall to the width of the channel is no more than about 3:1.

4,631,895

CARTONING MACHINE WHICH WRAPS CARTONS ABOUT PREFORMED BLOCKS OF OBJECTS

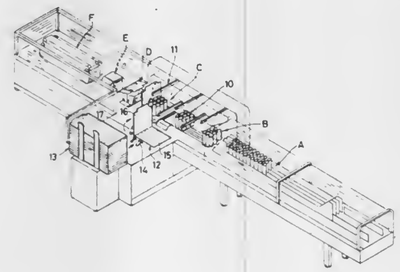
Aldo Ghiretti, Parma, and Antonio Pallotti, Bologna, both of Italy, assignors to O.C.M.E. S.p.A. Officina Costruzioni Meccaniche Emiliana, Parma, Italy

Filed Apr. 19, 1985, Ser. No. 724,902

Claims priority, application Italy, Apr. 27, 1984, 20710 A/84

Int. Cl.[4] B65B *11/22, 5/06*

U.S. Cl. 53—207 **8 Claims**



1. A cartoning machine for wrapping carton about preformed blocks of objects, comprising:

means for sequentially feeding blocks of objects in a feeding direction along a feed line;

carton folding means for initially folding a carton such that the carton has a horizontal portion and a vertical portion attached to a downstream end of said horizontal portion in said feeding direction;

a substantially horizontal slide table at an insertion station of said feed line;

means for selectively raising and lowering said slide table;

a lateral guide positioned at one lateral side of said feed line and positioned lower than said slide table in a raised position thereof;

means for laterally feeding said initially folded cartons to said insertion station from said one side thereof, such that said horizontal portion is fed between said slide table having one of said preformed blocks thereon and said lateral guide, and such that an upstream portion of said horizontal portion is positioned upstream of said lateral guide in said feeding direction; and

presser means for pushing said upstream portion of said horizontal portion below said lateral guide when said initially folded carton is in said insertion station,

whereby said horizontal portions of succeeding ones of initially folded cartons can partially overlap one another at said insertion station when said pushed upstream portion of said horizontal portion is positioned beneath said lateral guide.

4,631,896

METHOD, APPARATUS AND BLANK FOR PACKING AT LEAST ONE ARTICLE IN A SELF-SUPPORTING WRAPPING HAVING THE SHAPE OF A RECTANGULAR PARALLELEPIPED

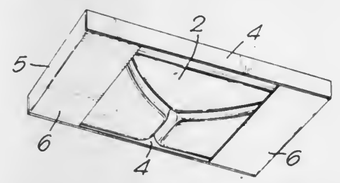
Petrus W. Van Der Zon, Zwijndrecht, Netherlands, assignor to Internationale Octrooi Maatschaapij "Octropa" B.V., Rotterdam, Netherlands

Filed Apr. 12, 1985, Ser. No. 722,382

Claims priority, application Netherlands, Apr. 18, 1984, 8401257

Int. Cl.[4] B65B *11/00*

U.S. Cl. 53—397 **11 Claims**



1. A method of packaging at least one article in a self-supporting wrapping blank of sheet material of the type having a central panel, a plurality of fold lines disposed about said panel and incisions in the sheet material to facilitate folding of the sheet material, comprising the steps of supporting the article on at least one support while disposing the blank substantially around the article and partially around the support by folding the sheet material so as to form at least one opening for accommodating the support, fastening the sheet material to form a complete package while maintaining said opening in the completed package and then moving the support to effect removal of the support from the packaging after the article has been wrapped therein.

4,631,897

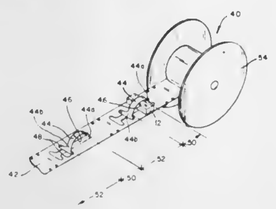
METHOD OF MAKING A TAPE CARRIER

Donald Slavicek, 1S-536 Westview La., Lombard, Ill. 60148

Division of Ser. No. 671,397, Nov. 15, 1984. This application Nov. 4, 1985, Ser. No. 795,037

Int. Cl.[4] B65B *13/02*

U.S. Cl. 53—399 **6 Claims**



1. A method of manufacturing a flexible substrate assembly from an endless source for an elongated flexible substrate including a plurality of spaced-apart component receiving regions, a plurality of solid components disposed on said substrate, one on each region, and a plurality of flexible strap means each having one end adjacent each region on one side thereof and joined a second end adjacent the opposite side of said region integrally joined by a connecting portion overlying said region to form a tube-like passageway for receiving and containing said components,

said method comprising the steps of:

(a) presenting a component receiving region of said substrate at a work station;

(b) striking the connecting portion of said flexible strap means from said substrate so that the first end remains attached to the substrate and the second end is a free end;

(c) placing said solid component on the component receiving region;

(d) positioning the free end of the strap means over the component:

(e) joining the free end of said strap means to said flexible substrate so as to form a tube-like passageway for receiving and containing one of said solid components;

(f) moving said flexible substrate so that the next component receiving region thereof is presented at said workstation; and

(g) repeating steps (a) thru (f).

4,631,898

PROCESS AND APPARATUS FOR CONTINUOUS WRAPPING OF PALLETIZED LOAD

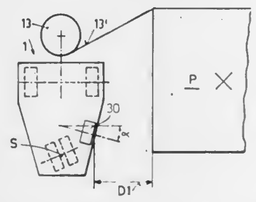
Dario Brambilla, Novara, Italy, assignor to Dario Manuli S.p.A., Mosezzo, Italy

Filed Nov. 16, 1984, Ser. No. 671,968

Claims priority, application Italy, Nov. 16, 1983, 23740 A/83

Int. Cl.[4] B65B *13/10*

U.S. Cl. 53—399 **10 Claims**



1. A process for continuous wrapping of palletized load with stretch-wrap film, in which a vehicle, provided with a steering means and moving freely around a load in a predetermined direction, follows a path determined by the contour of the load, said contour being detected by a distance-detecting device which sends signals to a processor which emits command signals to the vehicle steering means, wherein at least one wave train is sent for a preset time interval and the response echo is awaited for a maximum time interval; if no response is received within the maximum time interval, a command is sent to the steering means to steer at a predetermined angle in a set direction and another pulse train is sent; if, on the other hand, the response echo arrives within the maximum time interval, said response is evaluated according to an optimum time and a signal is sent to steer in the set direction whenever the response time is greater than the optimum time or in the opposite direction whenever the response time is less than the optimum time, another pulse train is sent until the vehicle has completed a preset number of revolutions around the load.

4,631,899

METHOD OF DISPENSING A METERED QUANTITY OF SNUFF AND OF PACKAGING THE INDIVIDUAL, METERED QUANTITIES OF SNUFF

Borge D. Nielsen, Odense, Denmark, assignor to Hermann Kruger's EFTF. A/S, Denmark

Filed Sep. 18, 1984, Ser. No. 651,814

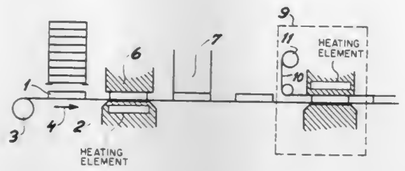
Claims priority, application Denmark, Sep. 20, 1983, 4280/83

Int. Cl.[4] B65B *1/26*

U.S. Cl. 53—433 **1 Claim**

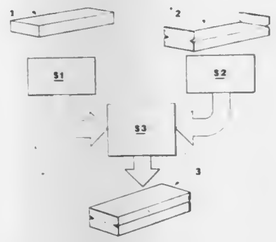
1. A method of dispensing metered quantities of snuff and of packaging the individual, metered quantities of snuff, comprising placing an upwardly and downwardly open frame, divided

by internal walls into a plurality of spaces of the same size, on a base sheet, attaching the base sheet to the underside of the frame, evenly distributing a metered quantity of snuff in the individual spaces in the frame, hermetically closing the frame



thus filled at the top by means of a top sheet and subjecting the thus filled frame to pressure below atmospheric so that the snuff is simultaneously shaped and packaged into a pill-shaped product which retains its shape upon unpackaging.

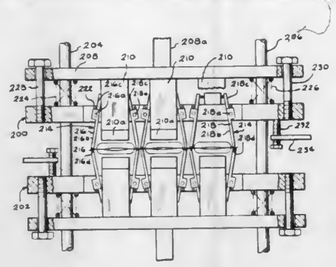
4,631,900
METHOD FOR PACKING BATCHES OF PRODUCTS, PACKETS OR BOXES IN CARTONS DIVISIBLE INTO SEVERAL COMPLETE UNITS
Riccardo Mattei, and Giancarlo De Martis, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy
Filed Feb. 28, 1985, Ser. No. 706,862
Claims priority, application Italy, Mar. 30, 1984, 3405 A/84
Int. Cl.⁴ B65B *35/30, 11/48*
U.S. Cl. 53—448 **4 Claims**



1. A method of forming a package of the type having at least two discrete packets where each packet has a plurality of edges and includes a plurality of individual items comprising the steps of:
arranging the items in a selected order for each packet,
wrapping each packet of items with a separate sheet of flexible wrapping material,
providing at least one flap of the wrapping material extending from a weakened tear line on one edge of each packet, and
joining the said flap of one packet to the exterior surface of the other said packet and joining the said flap of said other packet to the exterior surface of said one packet to form said package with said flaps being remote from one another on said package.

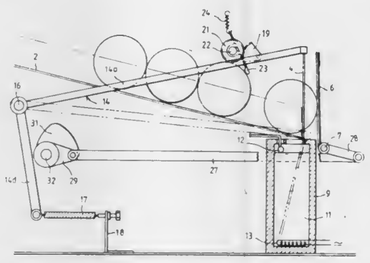
4,631,901
APPARATUS AND METHOD FOR PACKAGING A PRODUCT IN INDIVIDUAL PACKETS
Yun H. Chung, and Dennis E. Chung, both of Maumee, Ohio, assignors to MPR Corporation, Toledo, Ohio
Continuation-in-part of Ser. No. 450,275, Dec. 16, 1982, Pat. No. 4,545,180. This application Jan. 24, 1984, Ser. No. 573,492
Int. Cl.⁴ B65B *9/08, 43/10, 47/00, 7/06*
U.S. Cl. 53—455 **27 Claims**

1. A method of packaging a product in at least two sealed packets, comprising the steps of:
(a) forming a generally U-shaped channel member having spaced apart generally vertical sidewalls from a flexible sheet of packaging material;
(b) sealing the facing surfaces of the sidewalls at horizontally spaced apart locations to define at least two open top packets connected together;
(c) introducing a product into each of the open top packets;



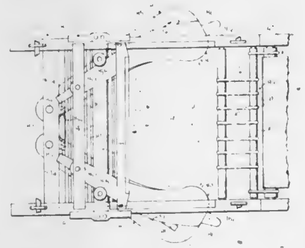
(d) pulling the upper corner portions of each of the connected together packets away from one another in a generally horizontal direction, thereby urging the upper marginal edges of the sidewalls of each of the packets toward one another; and
(e) sealing the upper marginal edges of the packets together to close each packet.

4,631,902
METHOD AND MACHINE FOR WRAPPING IN PARTICULAR FRUIT AND VEGETABLES WITH A FILM OF PLASTICS MATERIAL
Carmelo D'Urso, Le Chesnay, France, assignor to XEDA International, Le Chesnay, France
Filed Mar. 8, 1985, Ser. No. 710,305
Claims priority, application France, Mar. 12, 1984, 84 03765
Int. Cl.⁴ B65B *11/08*
U.S. Cl. 53—461 **15 Claims**



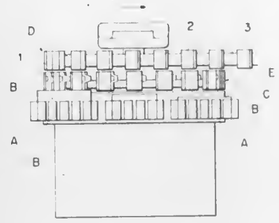
1. A method for wrapping a discrete product, in particular a product selected from fruit and vegetables, in a film of plastics material, said method comprising:
forming a liquid film of wrapping plastics material on support means by plunging said support means into a bath of molten plastics material and then withdrawing said support means from said bath;
feeding said product on an inclined surface and thereby bringing said product by gravity into contact with said film while said film still is in the liquid state, and thus deforming said film under the action of said product by passing said product through said support means until said product comes into contact with a pivotable flap beyond said support means; and
then progressively retracting said pivotable flap and causing said product to continue its travel through said support means and further deforming said film, such that said film closes around said product after the passage thereof completely through said support means so as to completely wrap said product.

4,631,903
WRAPPING MACHINE AND METHOD OF FOLDING WRAPPING FILM IN WRAPPING MACHINE
Yoshiyuki Takamura, Nagoya, Japan, assignor to Fuji Pack System Ltd., Nagoya, Japan
Filed Nov. 22, 1985, Ser. No. 801,168
Claims priority, application Japan, Nov. 30, 1984, 59-254797
Int. Cl.⁴ B65B *11/18*
U.S. Cl. 53—466 **6 Claims**



6. A method of folding wrapping film in a wrapping machine, said method comprising:
(a) a step of stretching a piece of wrapping film over a wrapping area;
(b) a step of pushing up an object to be wrapped from the lower side of said piece of wrapping film, thereby covering said object with said piece of wrapping film from the upper side thereof;
(c) a step of closing a pair of mounting members with respect to each other, said mounting members being able to be opened and closed with respect to each other, in a state wherein said object is covered with said piece of wrapping film, whereby said mounting members enter the space underneath said object to support said object thereon through said piece of wrapping film;
(d) a step of opening or moving said mounting members away from each other so as to separate from said object;
(e) a step of moving a rear folding member positioned below said mounting members so as to enter the space underneath said object as said mounting members separate from said object, whereby said object is transferred from said mounting members to said rear folding member, and at the same time, said object is placed on said rear folding member through said piece of wrapping film;
(f) a step of moving said rear folding member and a pair of lateral folding members under said object so that the rear and both lateral edge portions of said piece of wrapping film are gathered together tightly underneath said object; and
(g) a step of pushing out said object forwardly so as to be transferred to a front folding member so that said piece of wrapping film is also folded from the front side thereof by said front folding member, whereby the portions of said film folded from both lateral sides are overlaid on the portion of said film folded from the rear side, and the portion of said film folded from the front side is further laid thereon.

4,631,904
APPARATUS FOR COMPRESSING CIGARETTES
Tomizou Nagata, and Kazutaka Kobayashi, both of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corp., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 705,312
Claims priority, application Japan, Mar. 9, 1984, 59-043840
Int. Cl.⁴ B65B *63/02*
U.S. Cl. 53—529 **4 Claims**

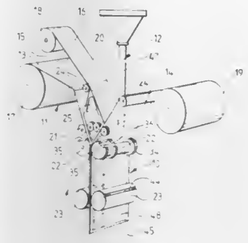


1. Apparatus for compressing cigarettes, comprising:
a stacking drum for grouping cigarettes to be compressed;
a continuously rotatable compression drum, said drum having an outer circumference;
a compression pocket mounted on said compression drum, said compression pocket having open ends opposite to each other, and including first and second L-shaped compression members disposed opposite to each other, said first and second L-shaped members each including a short segment and a long segment both segments extending in an axial direction of said drum, said first L-shaped member being movable in a first direction tangential to said outer circumference of said drum and said second L-shaped member being movable at an acute angle to said first direction;
rack and pinion means for moving said first and second L-shaped members in opposite directions with respect to each other to compress a cigarette bundle disposed in said pocket; and
conveyor means for conveying compressed cigarette bundles from said compression pocket to a packaging station.

4,631,905
BAG MAKING APPARATUS
John Maloney, Stoke-on-Trent, England, assignor to Johnsen, Jorgensen, Jaypak, Ltd., London, England
Continuation of Ser. No. 444,899, Nov. 18, 1981, Pat. No. 4,540,089, and a continuation of Ser. No. 541,829, Oct. 14, 1983, Pat. No. 4,557,377. This application Jun. 14, 1985, Ser. No. 744,859
Claims priority, application United Kingdom, Oct. 16, 1982, 8229625; Jan. 18, 1983, 8301279
Int. Cl.⁴ B31B *41/00;* **B65B** *29/10*
U.S. Cl. 53—554 **14 Claims**

1. Apparatus for use in making bags which comprise a sealed compartment made of relatively robust film material and a pocket made of relatively frangible film material secured in position within the compartment, and provided with an open mouth leading only into the pocket wherein the apparatus comprises:
(a) feeding means and bonding means,
(b) the feeding means arranged to feed a plurality of webs of the film material including both robust and frangible material along a transit path through the bonding means including confronting bonding members disposed at opposite sides of the web transit path,
(c) said bonding members being arranged to form bonded seams between the webs of film material to form the bags,
(d) bond interrupting means located in the web transit path between at least portions of two of the said confronting

members of the bonding means to prevent bonds being made to those surfaces of said webs of frangible material which abut the bond interrupting means so as to form the



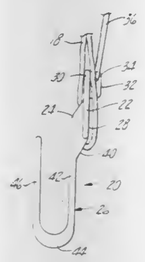
mouth of the pocket while allowing bonds to be made to the other surfaces of the said webs at each side of the bond interrupting means to complete the bag.

4,631,906

BRIDLE ARRANGEMENT FOR A HORSE OR LIKE ANIMAL

Rudolph J. Hermann, Sr., 250 Stoney Creek Rd., Lake Orion, Mich. 48035

Filed May 17, 1985, Ser. No. 735,375
Int. Cl.[4] B68B *1/04*
U.S. Cl. 54—8 **12 Claims**



1. A bridle arrangement for a horse or like animal comprising

a pair of mouth-pieces extending within the corners of the animal's mouth, each of said pair of mouth-pieces having a planar body having an outer face and an inner face;

a tubular member secured to said inner face of said planar body wherein said tubular member defines a throughbore;

an elongated tongue extending from said tubular member wherein said elongated tongue is substantially U-shaped;

a flange extending perpendicularly to said outer face of said planar body, said flange having an aperture therethrough;

strap means connected to said pair of mouth-pieces for mounting said bridle arrangement on the animal's head to position and maintain said pair of mouth-pieces within the animal's mouth;

a pair of snaffle rings detachably connected to said pair of mouth-pieces; and

control rein means connected to said snaffle rings for exerting pressure on said mouth-pieces to control the animal's movement.

4,631,907

HYDRAULIC LIFTING DEVICE FOR HARVESTING MACHINES

Wilhelm Zirps, Hemmingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,871
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415922
Int. Cl.[4] A01D *69/03*
U.S. Cl. 56—11.9 **13 Claims**



1. A hydraulic lifting apparatus for a harvesting machine having an undercarriage and a harvesting implement having weight, to raise and lower the harvesting implement, the lifting apparatus comprising: at least one lifting cylinder located between the harvesting implement and the undercarriage of the harvesting machine, said lifting cylinder having a lifting piston connected to the harvesting implement that bears a major portion of the weight of the harvesting implement; pump means for pumping a pressure medium; a first storage means for storing said pressure medium; a valve means for controlling a flow of pressure medium from said pump to said lifting cylinder; a first circuit of working lines for said flow of pressure medium, said circuit connecting said lifting cylinder to said valve means; at least one pressure medium storage tank arranged for suspension of the harvesting implement; a pressure line for said pressure medium, connecting said pumping means to said valve means; a reservoir for storing said pressure medium; a second circuit of pressure medium working lines running from said pressure line connecting said valve means to said reservoir; a pressure relief valve means connected in said second circuit of working lines so as to provide a pressure in said lifting cylinder; at least one stop valve means connected in said first circuit of working lines and said second circuit of working lines so that said pressure of said cylinder which is governed by said pressure relief valve means is connectable to said stop valve; and a switching valve means connected in said second circuit of working lines, said pressure relief valve means having a control pressure, said stop valve being closeable by said control pressure so that said first circuit of working lines is blocked and said control pressure is carried over siad switching valve in said second circuit of working lines to said stop valve.

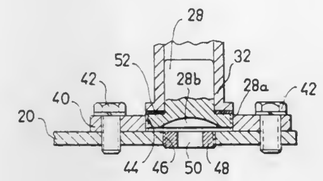
4,631,908

PICKER SPINDLE ASSEMBLY FOR COTTON PICKERS

David Raveh, 83A Einstein St., Haifa, Israel

Filed Mar. 21, 1985, Ser. No. 714,625
Claims priority, application Israel, Mar. 30, 1984, 71411
Int. Cl.[4] A01D *46/08, 46/18*
U.S. Cl. 56—50 **4 Claims**

1. A picker spindle assembly for cotton-pickers including: a plurality of vertically-extending picker bars each mounted to a pedestal flange via a bar pivot; each bar pivot carrying a plurality of horizontally-extending spindle pickers; and a mounting plate carried by said flange; each of said bar pivots being formed with an enlarged head which is externally threaded and received in a threaded opening formed in said mounting plate to permit vertical adjustment of the spindle pickers; said one end of each bar pivot being formed with a screw-driver slot to permit rotation of the bar pivot and, thereby, vertical adjustment of the spindle pickers carried thereby; said pedestal flange being formed with an opening therethrough for each bar pivot to provide access to said screw-driver slot thereof; and a threaded locking nut for each bar pivot locking it in an adjusted position; each of said openings formed in said pedestal flange being threaded and receiving said locking nut for locking its respective bar pivot in adjusted position; each of said locking nuts being formed with a central opening to provide access to said screw-driver slot of the respective bar pivot.

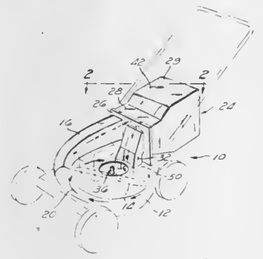


4,631,909

LAWN MOWER VACUUM APPARATUS

Frank E. McLane, 309 Regatta Way, Seal Beach, Calif. 90740

Filed Jul. 23, 1985, Ser. No. 758,093
Int. Cl.[4] A01D *35/22*
U.S. Cl. 56—202 **18 Claims**



1. A vacuum apparatus for a lawn mower, said lawn mower having a rotating blade and a deck enclosing said blade, said vacuum apparatus comprising:

a grass catcher removably secured to said lawn mower, said grass catcher having a front end and a rear end, said front end having an opening through which it is filled and emptied, said rear end disposed further from said mower than said front end;

an exhaust chute having an inlet port beneath said lawn mower deck and a discharge port located at said front end of said grass cather, said exhaust chute inlet port being located at a relatively high pressure region near the perimeter of the blade's circular cutting path so that grass clippings and other debris are carried through said exhaust chute and into said grass catcher by the an air flow created by the rotation of said blade, said exhaust chute discharge port oriented to direct said air flow towards the rear of said catcher to carry said clippings to said rear of said catcher;

a return chute having an inlet port located at said front end of said grass catcher, and a discharge port located beneath said deck, said return chute discharge port being disposed in a relatively low pressure region proximate to the rotational center of said blade, said grass catcher, exhaust chute and return chute formed of materials substantially impermeable to air, said opening of said grass catcher sealed to said exhaust chute discharge port and to said return chute inlet port to form an enclosed sealed passageway between said exhaust chute inlet port and said return chute discharge port, to permit said air flow through said exhaust chute to return to said mower through said return chute for recirculation through said passageway, thereby forming a closed circulatory loop; and

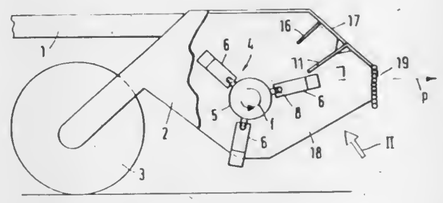
means for constricting the air flow through said return chute relative to the air flow out of said exhaust chute discharge port to cause substantial internal pressurization of said grass catcher.

4,631,910

MOWER, ESPECIALLY FOR GRASS AT AIRPORTS

Hans-Henning Doyen, Neustadt-Konigsbach, and Edgar Hühn, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Ing. Alfred Schmidt GmbH, St. Balsien and Flughafen Frankfurt/Main AG, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,219
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344987
Int. Cl.[4] A01D *50/00, 50/02, 69/08*
U.S. Cl. 56—505 **4 Claims**



1. A mower for cutting grass to predetermined height at airports, comprising

(a) a housing at least partially open at its front end and completely open at its bottom,

(b) a flail mower within the housing and having a horizontal shaft disposed perpendicular to the direction of movement of the mower, and individual swingably mounted chopping blades connected at one of their ends along the shaft and being axially non-displaceable, each chopping blade at its opposite end defining a V-shaped recess;

(c) said flail mower rotating, with reference to its upper motion, opposite to the direction of mowing;

(d) the flail mower rotating at more than 1500 rpm;

(e) a flat bed knife fixedly attached to the housing in front of, above the axis of rotation of and generally parallel to the flail mower;

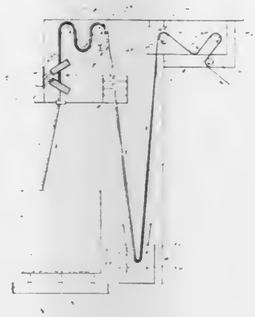
(f) the flat bed knife being at an angle of 20° to 60° above and with respect to a horizontal plane passing through the shaft axis of rotation, said bed knife terminating in V-shaped members of a shape complementary to the shape of the V-shaped recess of said chopping blades, said V-shaped recess defining envelope means of a size and related to the V-shaped members to permit rotation of said flail mower relative to said bed knife, said envelope means of said chopping blades during said relative rotation enveloping said V-shaped members of said bed knife as said chopping blades rotate past the fixed bed knife whereby the V-shaped members of the bed knife mesh with said envelope means of said chopping blades, said individual chopping blades being disposed in axially spaced apart relation along the shaft and being also angularly offset relative one another about a circumference of the shaft, said knife blade V-shaped members defining a plurality of tooth profiles spaced relative one another for alignment with and reception within the envelope means during rotation of the chopping blades.

4,631,911

APPARATUS FOR REMOVING TWIST FROM MOVING FABRIC AND METHOD FOR ACCOMPLISHING SAME

William O. Young, Jr., and Julian E. Hankinson, Jr., both of Spartanburg, S.C., assignors to Young Engineering Inc., Spartanburg, S.C.

Filed Jul. 10, 1984, Ser. No. 629,474
Int. Cl.[4] D04C *3/06, 29/00*; G01L *5/00*
U.S. Cl. 57—1 UN 25 Claims



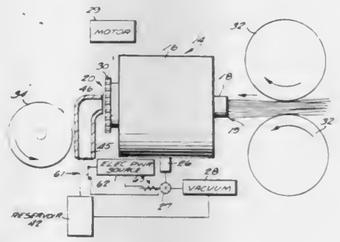
1. Apparatus for removing twist from a moving fabric in rope form comprising: a pair of freely rotatable elements located along opposite sides a path of fabric travel, each of said rotatable elements having fabric engagement means located therearound and following a helical path, said elements being diagonally disposed to each other along said path; and means to adjust said elements relative to a fabric passing therebetween, whereby fabric coming into engagement with said fabric engagement means inparts rotation to said elements while said fabric engagement means imparts rotation to said fabric.

4,631,912

INITIAL THREADING FOR VACUUM SPINNING

N. Page Hardy, Keysville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 9, 1985, Ser. No. 732,319
Int. Cl.[4] D01H *15/02, 5/28*; B65H *51/16*
U.S. Cl. 57—279 19 Claims



1. A threading apparatus comprising:
a vacuum reservoir having walls;
means for connecting said vacuum reservoir to a source of vacuum;
a vacuum tube having first and second open ends;
means for defining an opening in one of said reservoir walls; and
means for mounting said vacuum tube for rotation with respect to said reservoir so that said second open end of said tube is movable from a first, inoperative, position wherein it is spaced from said opening to a second, operative, position wherein it is in operative communication with said opening so that a vacuum is drawn through said tube first end into said reservoir and to said source of vacuum.

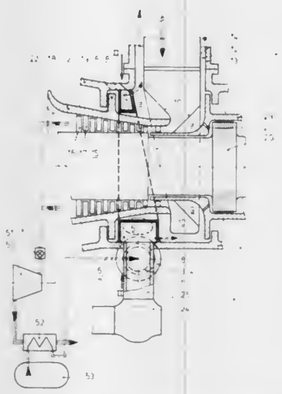
4. Threading apparatus associated with vacuum spinning apparatus;
said vacuum spinning apparatus comprising: an elongated hollow shaft having a longitudinal axis, a first end and a second end, a through-extending passageway from the first end to the second end, and at least a portion of the entire circumference of the shaft being perforated; means for mounting said shaft for rotation about a first axis; means for rotating said shaft about its axis; means for applying a vacuum, from a vacuum source, to the exterior of said shaft to draw air through said first end of said shaft, and said passageway, through said perforations; means for feeding textile fibers into said passageway from said first end of said shaft; and means for withdrawing formed yarn from said second end of said shaft; and
wherein said threading apparatus comprises; a vacuum tube having a first open end thereof, and mounted in operative association with said hollow shaft so that said vacuum tube is pivotally movable about an axis parallel to the longitudinal axis of the shaft from a first, inoperative position wherein the first open end thereof is spaced from said second end of said shaft, to a second, operative position wherein said first open end of said tube is adjacent said second end of said shaft, and in alignment with said passageway; and
means for operatively connecting said vacuum tube to a vacuum source when said vacuum tube is in its second, operative position.

4,631,913

AIR STORAGE GAS TURBINE

Franz Kreitmeier, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 29, 1985, Ser. No. 738,787
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424141
Int. Cl.[4] F02C *1/00*
U.S. Cl. 60—727 5 Claims



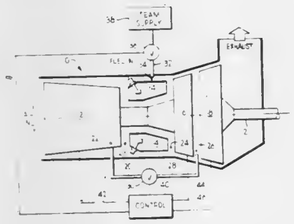
1. In an air storage gas turbine of the type including:
a turbine assembly including a bladed rotor, a vaned stator, a vane carrier casing from which the stator is suspended and a turbine inlet;
an outer casing disposed about said vane carrier casing and forming an intermediate space;
a combustion chamber supported by the external casing;
a hot gas duct means for communicating the combustion chamber with the turbine inlet, said hot gas duct means including a hot gas casing positioned substantially within the intermediate space so that the intermediate space substantially surrounds the hot gas casing; and
main air passage means for supplying air to said air storage gas turbine;
wherein the improvement comprises an inlet casing having upstream, downstream, and radially inner walls which are distinct from said outer casing and said vane carrier and forming an annular chamber in said intermediate space, said inlet casing having a lower half, an inner periphery and an outer periphery, said inner periphery surrounding the vane carrier casing, at least a major portion of said outer periphery being adjacent to the outer casing, said inlet casing communicated with said main air passage means through at least one radial inlet opening located in said lower half, said inlet casing having at least one axial outlet opening located at an outer circumferential edge of said annular chamber and communicating said annular chamber with the intermediate space, at least one control device and at least one rapid shut-down device provided at a location along said main air passage means.

4,631,914

GAS TURBINE ENGINE OF IMPROVED THERMAL EFFICIENCY

William R. Hines, Montgomery, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1985, Ser. No. 704,699
Int. Cl.[4] F02C *7/00*
U.S. Cl. 60—39.05 13 Claims



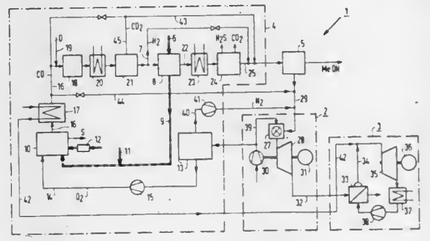
1. A gas turbine engine including, in operating fluid stream sequence, compression means, combustion means, a first turbine, and a second turbine, the engine comprising:
flow bypass means connected to the engine at a first engine position downstream of at least a portion of the compression means and upstream of a control area of the first turbine, and adapted to remove from the engine fluid stream a portion of operating fluid at a first pressure;
first injection means receiving fluid from the flow bypass means and connected to the engine at a second engine position downstream of the control area of the first turbine, the first injection means adapted to return to the engine fluid stream at least a portion of the operating fluid removed by the bypass means, the operating fluid at the second position being at a second pressure lower than the first pressure;
first valve means associated with the bypass means and with the first injection means to adjust the amount of fluid removed from the first position and injected at the second position;
second injection means connected to the engine at a third engine position between the first and second positions downstream of the compression means, to inject into the engine operating fluid high energy steam at a pressure greater than operating fluid pressure at the third position, the steam being injected in an amount substantially equivalent in mass flow to the removed fluid;
second valve means associated with the second injection means to adjust the amount of steam injected into the engine at the second injection means; and
control means responsive to engine operating characteristics to operate the first and second valve means to control the flow of fluid and steam, respectively, through the first and second valve means to maintain engine design fluid flow pressure and volume characteristics.

4,631,915

GAS TURBINE AND STEAM POWER-GENERATING PLANT WITH INTEGRATED COAL GASIFICATION PLANT

Hans Frewer, Marloffstein; Rainer Müller, Erlangen, and Ulrich Schiffers, Eckental, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 725,012
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415224
Int. Cl.[4] F02C *3/28*
U.S. Cl. 60—39.12 10 Claims



1. A gas turbine and steam power-generating plant with an integrated coal gasification plant and with a methanol synthesis plant, comprising a hydrogenating coal gasifier for partially converting coal containing sulfur in the presence of hydrogen into a gas containing principally hydrogen and methane and lesser amounts of carbon monoxide and hydrogen sulfide leaving residual coke containing sulfur, coal feed means for feeding coal containing sulfur into the hydrogenating coal gasifier, a hydrogen supply line connected to the hydrogenating coal gasifier for feeding hydrogen thereto, an exhaust gas line from the hydrogenating coal gasifier connected to a gas purifier for removal of hydrogen sulfide, connecting means for the transfer of purified gas containing principally hydrogen and methane from the gas purifier to a methanol synthesis plant for converting hydrogen and carbon monoxide into methanol, a coke line for conducting the residual coke from the hydrogenating coal gasifier to an iron bath gasifier having a molten iron body with slag floating thereon wherein the residual coke is oxidized with oxygen fed to the iron bath gasifier to produce a gas containing carbon monoxide and the sulfur contained in the residual coke is bound into the slag, a dosing device for feeding-in lime into the iron bath gasifier to aid in binding the sulfur in the slag, a slag outlet for the discharge of slag containing sulfur from the iron bath gasifier, an air separation plant into which air is fed and separated into an oxygen fraction and a nitrogen fraction, an oxygen line from the air separation plant to supply the oxygen fed to the iron bath gasifier to oxidize the residual coke therein to produce a gas containing carbon monoxide, a first exhaust gas line for conducting a portion of the gas containing carbon monoxide from the iron bath gasifier into a converting plant in which at least part of the gas containing carbon monoxide is reacted with steam to convert the carbon monoxide to hydrogen and carbon dioxide, a steam line leading into the converting plant for supplying the steam for reaction with carbon monoxide, a discharge line for conducting the exhaust gas containing hydrogen and carbon dioxide from the converting plant to a carbon dioxide scrubbing plant to remove said carbon dioxide leaving a gas containing principally hydrogen which goes to the hydrogen supply line, a second exhaust gas line for conducting another portion of the gas containing car-

bon monoxide from the iron bath gasifier into the methanol synthesis plant for reaction with hydrogen therein to produce methanol, a gas turbine with a combustion chamber coupled with an electric generator for generating electricity, an exhaust gas line of the methanol synthesis plant connected to the combustion chamber of the gas turbine to supply fuel for combustion in the combustion chamber, a compressor with a connecting air line for feeding combustion air to the combustion chamber, a nitrogen line leading from the air separation plant to feed nitrogen into the combustion chamber of the gas turbine to minimize nitrogen oxide emission, a steam power generating plant having a waste heat boiler for generating steam connected to an exhaust line from the gas turbine, a steam turbine connected to the waste heat boiler to receive steam to drive the steam turbine, a generator coupled with the steam turbine to generate electricity, and a condenser, pump and tank for recirculating steam condensate from the steam turbine to the waste heat boiler.

4,631,916

INTEGRAL BOOSTER/RAMJET DRIVE

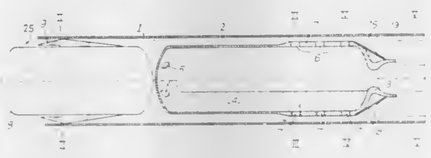
Gérard Le Tanter, Castelnau Medoc, and Bernard Luscan, Merignac, both of France, assignors to Societe Europeenne de Propulsion, France

Filed Jul. 2, 1984, Ser. No. 626,547

Claims priority, application France, Jul. 11, 1983, 83 11555

Int. Cl.[4] F02K *3/00, 7/00, 9/00*

U.S. Cl. 60—245 **13 Claims**



1. An integral booster ramjet missile drive comprising a single combustion chamber shared by a first, acceleration stage and a second, ramjet cruising stage, said chamber having a casing with a rear necked portion, said chamber housing a stored solid propellant used for missle acceleration, a converging-diverging nozzle optimally dimensioned for acceleration stage propulsion and at least one air inlet designed to open at the end of said acceleration stage to enable enough air to enter the combustion chamber to at least compensate for a drag force on the missile by a high-speed ejection of gases resulting from the combustion of ram air with the stored solid propellant, said drive further comprising at least one additional exhaust outlet forming an additional nozzle located at the downstream end of the combustion chamber, and means of closing said at least one additional exhaust outlet throughout the initial acceleration stage, such that said at least one additional outlet contributes, together with said converging-diverging nozzle, to exhausting the combustion gases during the ramjet cruising stage.

4,631,917

AIR VALVE FOR IMPROVING THE PERFORMANCE OF AN INTERNAL COMBUSTION ENGINE

Desmond E. Wales, 51 Drumbrae South, Edinburgh EH12 8SX, Scotland

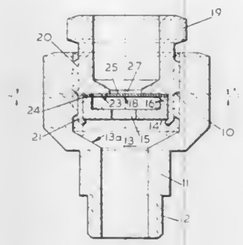
Filed Feb. 19, 1985, Ser. No. 702,459

Claims priority, application United Kingdom, Feb. 29, 1984, 8405277

Int. Cl.[4] F01N *3/00*

U.S. Cl. 60—293 **8 Claims**

1. An air valve for an internal combustion engine, said air valve comprising a valve body (**10,19**), a passage (**27**) in said body, valve means for normally closing said passage (**27**) to prevent egress therethrough of spent combustion products from said engine and for opening on creation of a pressure drop within the engine to permit air to flow through the passage (**27**) into the engine characterised in that said valve means comprises a flexible valve element (**18**) engageable with a valve seat (**26**) associated with said passage (**27**), said flexible valve element (**18**) being of substantially circular form and having a cut-out portion (**23**) therein which defines a central tongue forming a flap valve (**25**), and means for tensioning said flexible valve element (**18**) to assist effective operation of the valve



element (**18**), said tensioning means comprising a pair of opposed co-operating, angled surfaces (**17, 22**) associated with the valve body (**10, 19**) and engaging the periphery of the valve element (**18**) on assembly of the air valve in order to tension said valve element (**18**), the angle of said co-operating surfaces (**17, 22**) being about three quarters of a degree to the plane of the valve element (**18**) before it is tensioned.

4,631,918

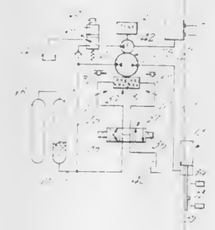
OIL-WELL PUMPING SYSTEM OR THE LIKE

Alan H. Rosman, Woodland Hills, Calif., assignor to Dynamic Hydraulic Systems, Inc., Canoga Park, Calif.

Filed Dec. 21, 1984, Ser. No. 684,860

Int. Cl.[4] F16H *39/46*

U.S. Cl. 60—372 **21 Claims**



1. Reciprocating mechanism comprising a hydraulic cylinder and a piston having a reciprocable stroke between head and tail ends of said cylinder, said piston including a rod extending through said tail end and adapted for connection to a load which biases said piston in the direction to one of said ends of said cylinder, said cylinder having a hydraulic-fluid port communicating with the cylinder end via which hydraulic pressure is operative in the direction opposed to said load bias; a hydraulic accumulator, a power integrator having first and second ports respectively connected to said cylinder port and to said accumulator, and a volume of hydraulic fluid self-contained within the included volume of said cylinder and integrator and accumulator to the extent at least sufficient to enable operation of said piston for more than the span of said stroke, said accumulator having a volume substantially in excess of said hydraulic-fluid volume and said accumulator being under gas pressure at a level at least sufficient to balance said load bias, said integrator further including a rotor having a torsionally responsive relation to port-to-port flow through the integrator; prime-mover means for continuously driving said rotor in one direction of hydraulic flow between said cylinder and said accumulator, first means responsive to piston displacement to one end of said stroke for reversing the direction of flow between said cylinder and said accumulator, second means responsive to piston displacement to the other end of said stroke, for again reversing the hydraulic flow between said cylinder and said piston for recycled reciprocation of said mechanism, a sump for accumulation of drained hydraulic fluid, and means including a sump pump with upper and lower sump-level switches for intermittently returning hydraulic fluid to said accumulator, thereby maintaining said self-contained volume as a constant, within limits of relatively small variation attributable to the respective operative sump levels of said switches.

4,631,919

HYDRAULIC SYSTEM FOR VEHICLE AUXILIARY AXLE

George A. Brennan, La Habra Heights, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed Jul. 5, 1984, Ser. No. 627,844

Int. Cl.[4] F15B *1/02;* **B62D** *61/12*

U.S. Cl. 60—413 **16 Claims**



1. A hydraulic system for operating a weight-load transferring mechanism having wheels on a frame mounted on a vehicle to allow the wheels to be moved into and out of engagement with the ground, comprising, a cylinder and piston means having a rod connected to the piston, said cylinder and rod connected between the vehicle and frame for causing movement of the frame to raise or lower the wheels upon selectively pressurizing a first end and a second end of said cylinder, a hydraulic pump and conduit means comprising a pressurized supply side and a return side, an accumulator having means continually connected to both said supply side and to said first end of said cylinder, a conduit means having a dump valve means connected between said supply side and said return side, pressure sensitive means responsive to the pressure in said accumulator for opening said dump valve means above a predetermined pressure, a directional control valve means selectively operable for connecting said supply side to said second end of said cylinder for raising the frame and wheels and for connecting said supply side to said first end of said cylinder for lowering and applying weight-load transferring force to the frame and wheels, and conduit means continually connecting said supply side to said directional control valve means and said accumulator.

4,631,920

CONTROLS FOR THE DRIVE OF A VEHICLE WITH DIFFERENTIAL SPEED STEERING

Hans H. Seelman, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

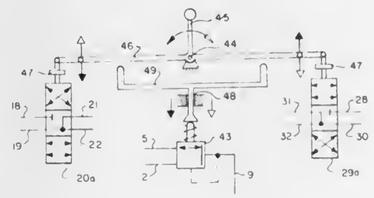
Division of Ser. No. 482,142, Apr. 5, 1983, Pat. No. 4,599,855.

This application Dec. 19, 1984, Ser. No. 683,594

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—421 **5 Claims**

1. In a control for the drive of a vehicle having differential-speed steering and having a hydrostatic drive unit on each side of the vehicle for operating the drive wheels and a final control element for each of the two drive units connected with a spring-loaded servo piston capable of sliding in an operating cylinder, the improvement comprising a pressure chamber on each side of the servo piston in the operating cylinder connected with each drive unit, means providing an arbitrarily adjustable control pressure on each servo piston, first control pressure pickoff means for controlling the forward and reverse travel connected with operating cylinders of the drive units of both sides of the vehicle, two additional second control pressure pickoffs, each assigned to one turning direction connected with the operating cylinder of each drive unit of the vehicle, each servo piston being capable of being acted upon on one side by the first control pressure pickoff means for controlling the direction and speed of travel, and, on the other side, may be acted upon by a second control pressure pickoff of the pair of pickoffs assigned to turning travel for controlling the turning radius, a pilot valve located in each connection line between a second control pressure pickoff assigned to turning travel and the operating cylinder of the corresponding drive unit, an arbitrarily actuable direction and speed selection lever operatively connected to said first pressure pickoff means, means for switching each said pilot valve as a function of the position of the arbitrarily actuable direction and speed selective lever, said pilot valve connecting the control pressure from the first pressure pickoff through the second control pressure pickoff assigned to turning travel with a pressure chamber of an operating cylinder of the drive unit, an arbitrarily actuable turn selection lever operatively connected to each second control pressure pickoff, means in each said second pickoff for controlling the control pressure through said pilot valve as a function of the position of the arbitrarily actuable turn selection lever to



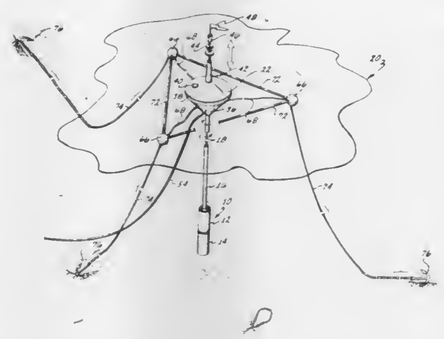
restrict the connection from the first pressure pickoff to the operating cylinder on the drive on the inside of the curve, whereby the other pressure chamber of said operating cylinder is acted upon by the control pressure from the first control pressure pickoff means that determines at least one of the speed and the direction of travel, said second control pressure pickoff assigned to one turning direction of the control pressure pickoff pair determining the direction and radius of turning reducing the control pressure in the said one chamber of the operating cylinder on the inside of the turn while the second control pickoff on the opposite side connected to the operating cylinder on the opposite side is unchanged and acted upon by the control pressure pickoff that determines the direction and speed of travel, each said second pickoff including means for first reducing the control pressure on said one pressure chamber of said operating cylinder and then sequentially connecting said control pressure to the other pressure chamber of the operating cylinder, each pilot valve being a 4-connection/3-position valve, where a pressure reducing valve of one of the second control pressure pickoffs assigned to one turning direction is connected to each connection of the one pair of connections of a pilot valve and each of the two other connections of this pilot valve is connected to a pressure chamber of the operating cylinder of the assigned drive unit, and wherein only one control pressure line is present for the control pressure determining the speed of travel and that the direction of travel is controlled by arbitrary actuation of the pilot valves.

4,631,921

FLOAT FOR WAVE ENERGY HARVESTING DEVICE

Hal R. Linderfelt, 5540A Sosiega, Laguna Hills, Calif. 92653

Filed Aug. 5, 1985, Ser. No. 762,445
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—501 13 Claims



1. A float for supporting a submerged device in a body of water which comprises:

a buoyant conical member capable of floating on said body of water with its base above the surface of said body of water and its apex submerged in said body of water;

a cap means for essentially sealing the interior of said conical member to ingress of water through said base of said conical member into said interior of said conical member, said cap means located on said base of said conical member;

device connecting means for pivotally and rotatively connecting said device to said conical member, said device connecting means located on said apex of said conical member whereby said device submerged in said body of water extends from the apex of said conical member;

said device connecting means includes pivoting means for pivotally connecting said device to said conical member whereby said device is capable of pivoting with respect to said conical member in response to movement of one of said device and said conical member with respect to the other of said device and said conical member under the influence of wave and tidal motion of said body of water;

said device connecting means further includes device rotating means for operatively rotatively connecting said device to said conical member whereby said device can rotate with respect to said conical member in response to rotational motion imparted to said device with respect to said conical member resulting from rotation of one of said device and said conical member with respect to the other of said device and said conical member;

electrical generating means for converting mechanical energy into electrical energy;

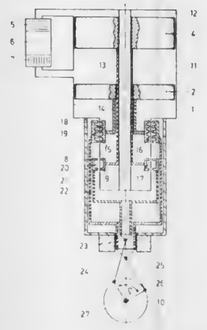
said device connecting means further includes a support means for movably supporting and positioning said electrical generating means within the interior of said conical member in operative association with at least a portion of said device extending into the interior of said conical member through said apex of said conical member, said support means operatively connected to said device pivoting means so as to pivot in conjunction with said pivoting means in response to movement of said conical member with respect to said device whereby, with respect to pivotal motion of said device with respect to said conical member, said electrical generating means is maintained in a fixed position with respect to said portion of said device extending into the interior of said conical member.

4,631,922

HEAT ENGINE

Jürgen Kleinwächter, Kandern; Hans Kleinwächter, Lörrach, and Otto Klaas, Mühlheim, all of Fed. Rep. of Germany, assignors to Bomin Solar GmbH & Co. KG, Lörrach, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,428
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502363; Mar. 12, 1985, 3508689
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—518 13 Claims



1. Heat engine, in particular a Stirling engine, comprising a displacement piston and a working piston which are coupled together in a housing sealed in a leak-proof manner against the outside so that they can oscillate in a linear direction, in which case the gas space between the displacement piston and the working piston is connected to the gas space between the displacement piston and the housing by way of a heater, a cooler and a regenerator arrangement to which an external source of heat may be connected, wherein one magnetic or magnetizable coupling device located within the housing is connected at least with the working piston and there is also a corresponding magnetic or magnetizable coupling device outside the housing which is movably mounted to coincide with the piston travel.

4,631,923

SOLENOID OPERATED CHECK VALVE

Douglas W. P. Smith, Port Coquitlam, Canada, assignor to Devron Engineering Limited, North Vancouver; Canada

Continuation of Ser. No. 544,237, Oct. 21, 1983, abandoned.
This application Dec. 9, 1985, Ser. No. 806,129
Int. Cl.[4] F16K *15/18;* F03G *7/06*
U.S. Cl. 60—530 6 Claims

1. An actuating system comprising:

a reservoir for storing substantially incompressible fluid;

heating means for heating and pressurizing said fluid within the reservoir;

a flexible actuator vessel adapted to expand and contract under the influence of pressure exerted by said fluid; and

a valve for selectively, fluidically coupling the flexible actuator vessel to the reservoir, said valve including:

a first passageway communicating with the reservoir;

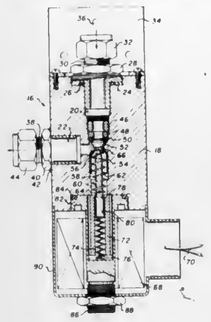
a second passageway communicating with the flexible vessel;

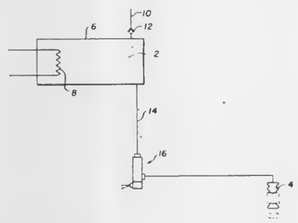
a valve seat formed between the two passageways;

a valve member to contact the valve seat;

a valve stem separate from the valve member; and

means for moving the valve stem between a first, extended position where it contacts the valve member to move the valve member onto the seat to close the valve when the heating means fails, to thereby maintain fluid pressure to the actuator vessel, and a second, retracted position wherein the valve member can move off the valve seat to open the valve once fluid pressure from the reservoir substantially equals the maintained fluid pressure to the vessel.



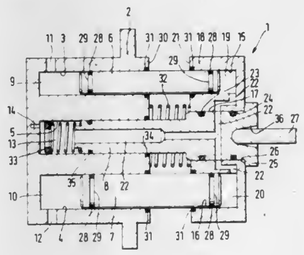


4,631,924

DUAL-CIRCUIT MASTER CYLINDER HAVING AUXILIARY PISTON AND YOKE WITH EQUALIZATION CHAMBERS FOR HYDRAULIC EQUALIZATION

Derek R. Lowe, Glashuetten, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,583
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321729
Int. Cl.[4] B60T *11/20, 11/28;* F15B *3/00, 7/08*
U.S. Cl. 60—562 6 Claims



1. A dual-circuit master cylinder for use in a hydraulic brake system of an automotive vehicle comprising:

a casing including three parallel bores, each closed on one end, two of said bores each including an outlet pressure connection communicating therewith proximate said closed ends, a third of said bores including an inlet duct communicating therewith at said closed end;

a normally open check valve associated with said duct;

two power pistons, each slidably received in a respective one of said two bores defining two power chambers, each of said power pistons having a portion thereof extending from said respective bore externally of said casing;

an auxiliary piston slidably received in said third bore defining an auxiliary chamber and having a portion thereof extending from said third bore externally of said casing and including means for being operatively connected to a brake actuator of said brake system;

a yoke affixed coaxially to said auxiliary piston for axial movement therewith at a position along the external portion of said auxiliary piston such that said yoke is axially spaced apart from said casing, said yoke including two cylindrical bores, each coaxially aligned with a respective one of said two bores in said casing and having a closed end and an open end said open end facing said casing;

the portion of each of said two pistons extending from said respective bore of said casing being slidably received in a respective one of said two cylindrical bores in said yoke defining two equalizing chambers in said yoke; and

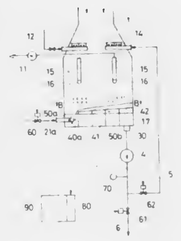
a passage in said auxiliary piston and said yoke connecting said auxiliary chamber to each of said two equalizing chambers.

4,631,925

APPARATUS FOR DEAERATING CONDENSATE IN A CONDENSER

Katsumoto Ohtake; Yoshikuni Ohshima; Yasuteru Mukai, and Isao Okouchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,164
Claims priority, application Japan, Feb. 14, 1984, 59-24392
Int. Cl.[4] F01K *9/00*
U.S. Cl. 60—688 9 Claims



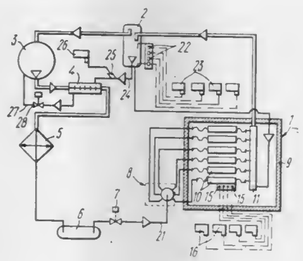
1. An apparatus for deaerating condensate in a condenser including condensing means for producing condensate by condensing steam expanded through a steam turbine and a hot well for storing the condensate, the apparatus further including means for extracting air from the condensing means, an open conduit, constructed in the hotwell, for permitting said condensate to flow to a covered conduit, said covered conduit constructed in the hotwell and covered so that said condensate cannot flow therein without passing through the open conduit, heating means for heating the condensate in said open conduit, recirculating means for recirculating the condensate from the hotwell into said condensing means, and means for spraying the recirculated condensate at the condensing means.

4,631,926

METHOD OF OBTAINING LOW TEMPERATURES AND APPARATUS FOR IMPLEMENTING THE SAME

Lev I. Goldshtein, ulitsa Uritskogo, 13, kv. 126; Valentin P. Kalashov, ulitsa Serafimovicha, 6, kv. 53; Jury P. Pleshkanovsky, ulitsa Ushinskogo, 12, kv. 26, all of Kiev; Vladimir F. Didenko, ulitsa Dimitrova, 22, korpus 1, kv. 11, Leningrad, and Boris S. Khaitin, bulvar Shevchenko, 58, kv. 31, Kiev, all of U.S.S.R.

Filed Aug. 26, 1985, Ser. No. 769,556
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—115 **4 Claims**



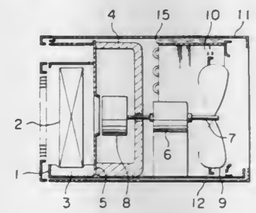
1. A method for providing low temperatures which comprises:
(a) pulse feeding a liquid refrigerant within a pressure range where boiling of the liquid refrigerant occurs;
(b) vaporizing the liquid refrigerant at a pressure within the pressure range to form a refrigerant vapor;
(c) compressing the refrigerant vapors;
(d) condensing the compressed refrigerant vapors to form a liquid refrigerant; wherein the pressure range is adjusted to provide a first temperature of the boiling liquid refrigerant above a final temperature of a refrigerated medium and adjusting the pressure range stepwise to provide a low temperature of the boiling liquid refrigerant below the final temperature of the refrigerated medium.

4,631,927

AIR CONDITIONER

Yasuhiko Hashimoto, Fujieda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,398
Claims priority, application Japan, May 25, 1984, 59-106248
Int. Cl.[4] F25B *47/00*
U.S. Cl. 62—280 **4 Claims**



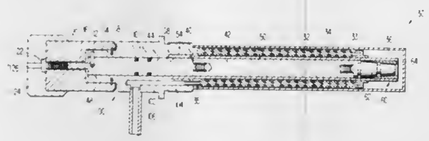
1. An air conditioning apparatus, comprising:
an air-blowing and water-scattering fan;
at least one condenser disposed on both sides of said fan in mutual confrontation, and
at least one guide member disposed contiguous with the top part of each of said condensers to enable drain water flowing on and along the ceiling surface of said apparatus to be uniformly distributed over substantially the entire width of said condensers on the top part thereof wherein said at least one guide member further comprises a plurality of guide members radially disposed on the ceiling surface toward the top part of each of said condensers along the axial length of each of said condensers at a position where the drain water begins to flow as a starting point so as to evenly distribute water onto each of said condensers.

4,631,928

JOULE-THOMSON APPARATUS WITH TEMPERATURE SENSITIVE ANNULAR EXPANSION PASSAGEWAY

Graham Walker, Scottsdale, Ariz., assignor to General Pneumatics Corporation, Orange, N.J.

Filed Oct. 31, 1985, Ser. No. 793,268
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 JT **35 Claims**



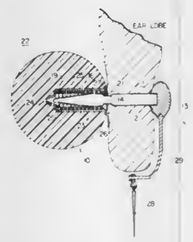
1. Joule-Thomson expansion valve apparatus, comprising first means supporting a substantially frustro-conical valve member at a base portion of said valve member; second means supporting and retaining a tapered valve seat circumferentially adjacent a lengthwise portion of said valve member, said valve seat converging along said lengthwise portion toward a free end of said valve member opposite said base portion of said valve member and of reduced diameter relative to said base portion of said valve member, whereby opposing peripheral surfaces of said valve member and said valve seat define an annular passageway converging toward a terminal annular expansion opening adjacent said free end of said valve member; means for introducing high pressure coolant fluid into said passageway at a location upstream of said expansion opening; and temperature responsive means for drawing said valve seat longitudinally toward said base portion of said valve member in response to decreases in temperature of said fluid in order to reduce the effective flow area of said passageway and for withdrawing said valve seat longitudinally away from said base portion of said valve member in response to increases in temperature of said fluid in order to increase the effective flow area of said passageway, whereby coolant fluid flow through said passageway is adjustable in response to changes in temperature of said fluid.

4,631,929

CLUTCH IN AND FOR JEWELRY ITEMS

Franklin D. Hollingworth, Salt Lake City, Utah, assignor to Marilyn G. Hollingworth, Salt Lake City, Utah

Filed Apr. 19, 1985, Ser. No. 724,891
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—13 **9 Claims**



1. A jewelry clutch constructed for adjustable mountings and including, in combination: a hollow body provided with an opening; a coil spring retained in said body in axial alignment with said opening, said coil spring having a series of turns and radially inturned opposite ends; a pin provided with a shank having opposite ends and an enlarged protuberance integral with one of said ends, the remaining end of shank having an extremity tapered portion converging toward said remaining end, said shank including an annular detent groove intermediate said ends, spaced from said protuberance, and said shank being straight and of substantially uniform radius between said groove and said extremity tapered portion, said annular groove being wider than and releasably receiving one of said inturned ends in a lost-motion detent connection, a portion of said shank between said groove and extremity tapered portion slidably frictionally engaging at least one of the complete coil spring turns between said spring ends, when said detent connection is engaged, whereby to restrict free sliding movement of said pin relative to said spring when said detent connection is engaged and yet accommodate adjustable mounting distances between said body and said protuberance.

4,631,930

EFFICIENCY MONITORING DEVICE FOR TEXTILE MACHINES AND THE LIKE

Alan Gutschmit, Troy, and John C. Queen, Monroe, both of N.C., assignors to Microtrak, Inc., Troy, N.C.

Filed Jan. 28, 1986, Ser. No. 823,389
Int. Cl.[4] D04B *35/00*; G07C *3/00*
U.S. Cl. 66—1 R **12 Claims**



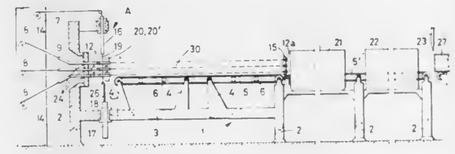
1. A device adapted for attachment in operative association with a single respective textile machine for monitoring and displaying the operating efficiency thereof, said device comprising means for attachment to switch means on the associated textile machine for monitoring operating and non-operating conditions thereof, means for continuously accumulating throughout all operating and non-operating conditions of the textile machine a value representing the total cumulative elapsed duration thereof from a selected starting point, means for progressively accumulating during each operating condition of the textile machine a value representing the total cumulative duration of the operating conditions from said selected starting point, means for accumulating during each non-operating condition of the textile machine a value representing the total duration of the prevailing non-operating condition, means for counting the total number of said non-operating conditions from said selected starting point, means for continuously calculating an operating efficiency value of the textile machine representing the proportion of said total cumulative operating duration value to said total cumulative elapsed duration value, means for continuously displaying an expression of the prevailing calculated operating efficiency value, means for displaying an expression of the prevailing accumulated non-operating duration value during each non-operating condition of the textile machine, mean for displaying an expression of said total number of non-operating conditions during each operating condition of the textile machine, and means for selectively clearing each said accumulating means to establish a new selected starting point, thereby to provide a ready indication at the textile machine of its operating efficiency over a given time period and of various parameters affecting operating efficiency.

4,631,931

MACHINE FOR CONTINUOUSLY FABRICATING BY TRIDIMENSIONAL KNITTING SECTION ELEMENTS OF COMPOSITE MATERIAL

Jean Banos, Merignac, France, assignor to Aerospatiale Societe Nationale Industrielle, France

Filed May 9, 1985, Ser. No. 732,443
Claims priority, application France, May 15, 1984, 84 07490
Int. Cl.[4] D04B *11/04, 35/36*
U.S. Cl. 66—83 **8 Claims**



1. An automatic machine for continuously fabricating by a tridimensional knitting, section elements of a composite material which are to be impregnated with a hardenable resin, comprising rods defining the outer shape of the desired section element and extending in a longitudinal direction of the section element, and a group of at least two knitting heads for depositing threads around said rods in two planes which are orthogonal to each other and perpendicular to said rods, said rods being thin hollow rods, and the machine further comprising a die formed by a plate for maintaining said hollow rods in a fixed manner parallel to one another in a configuration corresponding to the cross-sectional shape of the desired section element, means for feeding continuous longitudinal threads of the section element taut through said hollow rods, means for holding said threads taut, stop means for retaining in the same configuration one end of said threads issuing from the rods, said group of knitting heads being arranged in such manner as to deposit layers of continuous threads in two directions transverse to the direction of said rods in the vicinity of the ends of said rods, means for guiding the threads issuing from said rods in a continuous manner as said layers of threads are deposited by said knitting heads, means for packing and advancing the knitted section element thus obtained, a station for impregnating the section element with a resin, means for hardening said resin impregnating the section element, and severing means disposed in a path of the section element at any point of the section element for cutting the element.

4,631,932

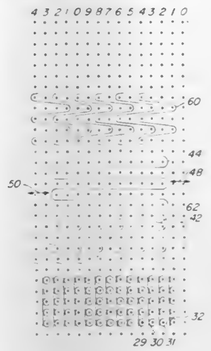
KNITTED WAISTBAND CURL-PREVENTING STRIP

Louis Sommers, Stroudsburg, Pa., assignor to S.R.C. Textiles, Inc., Stroudsburg, Pa.

Filed May 15, 1985, Ser. No. 734,297
Int. Cl.[4] D04B *23/08*
U.S. Cl. 66—192 **10 Claims**

1. A waistband curl-preventing strip, comprising:
a knitted strip of a predetermined width, said knitted strip being knitted from polyester or other like flexible yarn utilizing a predetermined number of closed chain stitch wales;
a transverse comparatively stiff monofilament inlaid through wale loops substantially transverse to the length of the strip and being positioned within the knitted strip so that it does not extend from lateral edge to lateral edge of the strip, but such that there is at least one wale on each side laterally to the monofilament stiffener; and
at least two sets of weft yarns, one set of weft yarns having weft yarns inlaid through at least three wale loops, except at the lateral edges, and then changing direction, the

second set of weft yarns having weft yarns inlaid through at least four wale loops, except at the lateral edges, and



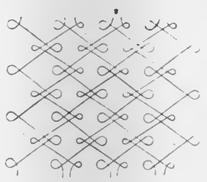
then changing direction whereby the wales forming the closed chain stitch and the monofilament stiffener are retained.

4,631,933

STITCH-BONDED THERMAL INSULATING FABRICS

Patrick H. Carey, Jr., Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 12, 1984, Ser. No. 660,282
Int. Cl.[4] D04B *23/10*
U.S. Cl. 66—192 **9 Claims**



1. A stable, thermal insulating fabric comprising a stitch-bonded, fibrous, nonwoven web of microfibers that average less than about 10 micrometers in diameter, said fabric having thermal resistance per basis weight of at least about 0.00030 $k.m^2/watt/g/m^2$ and air permeability of less than about 1 $m^3/sec/m^2$.

4,631,934

WASHING MACHINE

Shoichi Imanishi, Yokohama, and Yoshio Ikeda, Aichi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

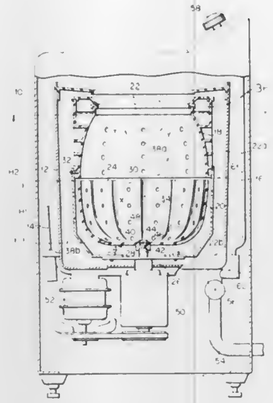
Continuation of Ser. No. 623,195, Jun. 21, 1984, abandoned. This application Feb. 12, 1986, Ser. No. 828,607
Claims priority, application Japan, Jun. 28, 1983, 58-116514
Int. Cl.[4] D06F *23/04*
U.S. Cl. 68—23 R **5 Claims**

1. A washing machine, comprising a rotatable tub for holding laundry to be washed and having:

(a) a rotatable lower tub section;

(b) stirring means located within said lower tub section for rotating said laundry located in said lower tub section, said stirring means being formed with a plurality of holes therein for allowing water to be removed therefrom; and

(c) a rotatable upper tub section, which includes means for causing vertical position shift of laundry contained therein formed from an inner wall of said upper tub section which gradually upwardly decreases in diameter from a lower portion to an upper-most portion, which upper-most portion is: (1) a position physically highest in vertical height from said lower tub section, and (2) a smallest diameter portion of said upper tub section, said causing means



forcing said laundry in said tub to shift position vertically when said upper tub section is rotated; and

means for independently rotating said upper tub section and said stirring means around a fixed vertical axis.

4,631,935

SECURITY DEVICE AGAINST ATTACK ON A LOCK

Daniel B. Rouzee, Vanves, France, assignor to Fichet-Bauche, France

Filed Feb. 15, 1985, Ser. No. 701,981
Claims priority, application France, Feb. 20, 1984, 8402523
Int. Cl.[4] E05B *63/00*
U.S. Cl. 70—1.5 **8 Claims**



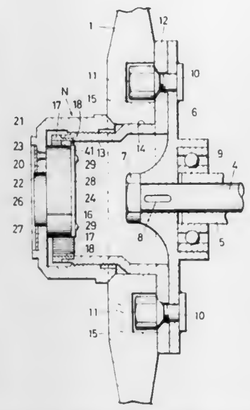
1. A security device against attacks on a lock which comprises a lock mechanism, a lock body, and a lock inlet adapted to receive a key, said device comprising a retained finger movable with respect to said lock body, return means adapted to act upon said finger to free the same under the action of an attack and to thus prevent the operation of the lock mechanism, and a member pivotally mounted on the lock body and having a first and second end portions, said first end portion retaining said movable finger, whereas the second end portion of said member is substantially geometrically identical with at least a portion of the lock inlet receiving the key.

4,631,936

CENTER LOCKING DEVICE OF BALL TRAIN TYPE FOR A DISC WHEEL OF MOTOR VEHICLE

Saburo Minami, Osaka, Japan, assignor to Osaka Kanagu Co., Ltd. and Speed Star Co., Ltd., both of Osaka, Japan

Filed Jul. 8, 1985, Ser. No. 752,730
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—167 **3 Claims**



1. A center locking device of the ball train type for a disk wheel which is connected to an axle by a flange with a threaded tube thereon and a cap nut, said locking device comprising:

an inner gear ring having pawls on its inner peripheral surface and integral with an end of the threaded tube;

a locking member mounted on the inner surface of the end plate of the cap nut, the locking member having arcuate peripheral portions corresponding to the shape of the inner gear ring, said locking member having a central recess therein and guide grooves extending from said central recess toward the periphery thereof and split groove at the outer end of each of the guide grooves and open at one end to a corresponding arcuate peripheral portion of the locking member;

a cam rotatably positioned in said central recess and having a plurality of recesses corresponding to the number of guide grooves and a plurality of projections corresponding to the number of guide grooves alternately spaced around said cam;

a plurality of balls in a train in each guide groove;

a leaf spring member positioned in each split groove and a push spring in each split groove engaged with the leaf spring for urging the leaf spring from a first position where one end of the leaf spring projects out of said split groove to engage a pawl on the inner periphery of said ring gear, and the ball on the outer end of the train of balls engaging with the leaf spring, when the train of balls is urged outwardly, to a second position in which the one end is withdrawn from the pawl when the train of balls is freed to move inwardly, whereby when said cam is rotated for causing the projections thereon to urge said trains on balls outwardly in said guide grooves, the one ends of said leaf springs are engaged with the pawls on the inner gear ring to block rotation of the cap nut, and when said cam is rotated for freeing the innermost balls of said trains of balls to move into the recesses in said cam, the leaf springs are urged by said push springs to disengage from said inner gear ring to free said cap nut; and

locking means having a rotating member connected to said cam for rotating said cam when said locking means is unlocked.

4,631,937

LOCK ASSEMBLY FOR CABINET DOORS

Jurgen Debus, Dietzholztal; Jugen Zachrai, Dillenburg; Helmut Butergerds, Eschenburg, and Manfred Wetzel, Ewersbach, all of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,065
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407700
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—207 **22 Claims**



1. Lock assembly apparatus for cabinet doors comprising a mounting plate **(10)** attachable to a door panel **(50)**, said mounting plate **(10)** having a vertically extending depression **(11)** in its front face sized to receive a hand lever **(25)** retainable in and releasable from said depression **(11)**, said hand lever **(25)** spring loaded with a spring **(28)** capable of pivotally ejecting said hand lever **(25)** from said depression **(11)**, said hand lever **(25)** pivotably connected to a rotatable operating shaft **(27)** of said lock assembly extending through said mounting plate **(10)** and extendable through said door panel **(50)**, said hand lever **(25)** pivotable about an axis perpendicular to the axis of rotation of said operating shaft **(27)**; a lock means **(20)** extendable through an opening **(52)** in said door panel **(50)** and installed in said mounting plate **(10)** separate from said depression **(11)** and said hand lever **(25)**, said lock means **(20)** controlling a slide **(15)** adjustably disposed in said mounting plate **(10)** which releases said hand lever **(25)** from and retains said hand lever **(25)** in said depression **(11)** by means of a detent element **(22)** projecting into a cutout **(30)** in said hand lever **(25)** facing said depression **(11)**, said detent element **(22)** provided with an annular groove **(24)** and a terminal cone-shaped latching tip **(49)** and said cutout **(30)** provided with a detent projection **(57)**, said annular groove **(24)** of said detent element **(22)** urged by said slide **(15)** to engage said detent projection **(57)** to retain said hand lever **(25)** in said depression **(11)** when said lock means **(20)** is in a locked position, and said slide **(15)** releasing said annular groove **(24)** of said detent element **(22)** from said detent projection **(57)** to release said hand lever **(25)** from said depression **(11)** by the action of said spring **(28)** when said lock means **(20)** is in an unlocked position.

4,631,938

ACCESSORY LOCKING DEVICE FOR A DOORKNOB HAVING A KEYHOLE THEREIN

Gordon E. Johnson, P.O. Box 778, Cando, N. Dak. 58324

Filed Jun. 17, 1985, Ser. No. 745,215
Int. Cl.[4] E05B *13/00*
U.S. Cl. 70—209 **14 Claims**

1. An accessory locking device for a doorknob having a

keyhole therein comprising first and second mateable shells for enclosing the doorknob and its keyhole, said shells having edges confronting each other when said shells are mated, first flange means extending longitudinally along a portion of the edge of said first shell and projecting outwardly therefrom, second flange means extending longitudinally along a portion of the edge of said second shell and projecting outwardly



therefrom, said first flange means having an exposed outer surface diverging in a direction away from said second flange means and away from said first shell, keeper means for slidably engaging both of the flange means on said shells, at least one of said flange means having an outwardly facing notch therein, and said keeper means having a bolt projectable inwardly into said notch to maintain said shells in their said mated relationship and thus prevent access to said keyhole.

4,631,939

LOCK WITH LOCKING ELEMENTS MOVABLE BY A MAGNETIC KEY

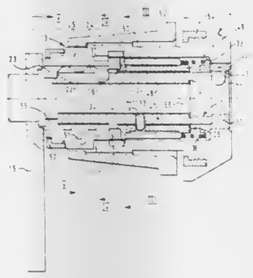
Leslie V. Herriott, Wolverhampton, United Kingdom, assignor to Lowe & Fletcher Limited, United Kingdom

Continuation of Ser. No. 470,596, Feb. 28, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,554

Claims priority, application United Kingdom, Mar. 6, 1982, 8206658

Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—276 **8 Claims**



1. A lock having a plurality of magnetic elements and members defining respective paths along which the magnetic elements can move;

hollow outer member means and an inner member disposed within the outer member means;

the inner member defining a key-receiving opening;

a first path in which a first of the magnetic elements can move between a releasing position and locking position;

the first path being defined by opposing slots in adjoining faces of the inner member and the outer member means;

a second path in which a second of the magnetic elements can move between a releasing position and a locking position;

the second path being defined by opposing slots in adjoining faces of the inner member and the outer member means;

the magnetic elements obstructing operation of the lock when in their locking positions but not when in their releasing positions;

the first magnetic element having a center which defines a first locus, as it moves in the first path;

the second magnetic element having a center which defines a second locus, as it moves in the second path;

the first locus and the second locus each lie in separate planes, and the planes intersect each other perpendicularly; and

the first locus is rectilinear and the second locus is curved.

3. A lock according to claim 1 in which the first path and the second path are positioned with respect to each other such that gravity will cause a magnetic element in one of the paths to assume a locking position at any geometric position at which the lock is placed.

4,631,940

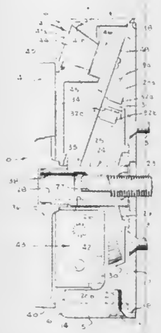
DIGITAL READOUT COMBINATION LOCK DIAL ASSEMBLY

Bert Krivec, and Gary R. Murphree, both of Lexington, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Mar. 29, 1985, Ser. No. 718,006

Int. Cl.⁴ E05B *1/00*

U.S. Cl. 70—332 **19 Claims**



1. A selectively illuminated digit display combination lock dial assembly to be coupled to a rotatable operating spindle of a plural tumbler wheel combination lock for dialing a lock opening combination of numbers, comprising a generally circular rotatable dial member for manual rotation through clockwise and counterclockwise plural revolutions to dial the numbers of the combination, a dial backup case to be mounted on a security container having a coupling member journaled for rotation therein providing means to be connected with said spindle and with said dial member for transferring rotation of the dial member to the spindle, the backup case having a sight passage and digit numeric generating and display device located outwardly of the dial member periphery to generate and visually display numbers signifying the dial member angular positions during dial rotation, encoder disc means rotated in correlation with said coupling means having plural light passing and intercepting zones and light emitting and sensing optic sensors adjacent said zones for producing electrical count signals signifying rotary position and direction of rotation of the dial member during movement thereof, electronic means responsive to said signals for counting said count signals and sensing direction of dial rotation to monitor and sense number of complete dial revolutions from a predetermined starting position in a first direction and activate the numeric display to show numeric dial positions upon reaching a first number of revolutions and to count and sense direction of rotation upon successive dial revolutions in opposite directions through a predetermined sequence and activate the numeric display to show numeric dial positions when predetermined numbers of revolutions are reached in the sequence.

4,631,941

CYLINDER LOCK WITH PERMISSIBLE SERVICE ENTRY

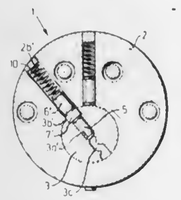
Bengt O. Sjunnesson, Oxie, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

Filed Dec. 20, 1984, Ser. No. 684,416

Claims priority, application Sweden, Dec. 22, 1983, 8307139

Int. Cl.⁴ F05B *35/10*

U.S. Cl. 70—337 **4 Claims**



1. A cylinder lock system, comprising: a cylinder plug (3) rotatably disposed in a cylinder housing (2) and having arranged therein a keyway (3c) and a row of pins (5) individually accommodated in a plurality of pin-channels (3a) for co-action with first and second rows of pin-channels (2a, 2b) defined in the cylinder housing and having individually arranged therein a plurality of spring-biased pins, said first row of pin-channels corresponding to a normal mode position of the lock, and said second rod of pin-channels being disposed at an angle to the first row and corresponding to a service mode position of the lock, a standard key (8) insertable into the keyway, and a service key (9) insertable into the keyway, wherein one of the pin-channels (2b') in said second row accommodates an intermediate pin (7') and an upper pin (6'), said intermediate pin having a larger diameter than upper pins (4) in the first row of pin-channels, a corresponding pin-channel (3a') in the cylinder plug (3) has a widened part (3b') at a radially outer end thereof for fully receiving said larger diameter intermediate pin (7'), said standard key is operable to rotate the cylinder plug in both the normal and service mode positions, said service key is operable to rotate the cylinder plug only in the service mode position, and the larger diameter of the intermediate pin blocks the entry thereof into a narrower first row pin-channel when the cylinder plug is rotated to the normal mode position by the service key to thereby latch the service key against withdrawal.

4,631,942

LOCK STRUCTURES

Rafael Sierra, 639 Alamitos Ave., Long Beach, Calif. 90802

Continuation-in-part of Ser. No. 543,690, Oct. 20, 1983, Pat. No. 4,590,777. This application Aug. 29, 1985, Ser. No. 770,780

Int. Cl.⁴ E05B *27/04*

U.S. Cl. 70—368 **1 Claim**

1. A lock comprising in combination:

a housing formed with a cylindrical cavity;

a cylindrical rotor disposed for rotation in said cavity, its axis substantially coincident with the axis of the cavity;

a plurality of bores formed in said housing each opening to said cavity;

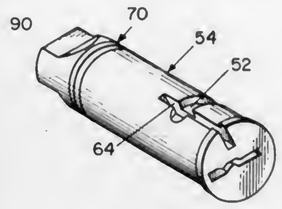
a like plurality of housing pins each disposed in a respectively associated one of the bores of the housing;

a plurality of rotor bores formed in said rotor; the bores of the rotor being axially aligned with respectfully associated ones of the bores of the housing in one relative position of the rotor and housing and the pins having a size to fit into the bores of the rotor;

the surface of the rotor being formed with a groove into which at least one, but less than all, of the bores of the rotor opens, the groove extending in an arc over a portion, at least, of the circumference of the rotor;

biasing means for urging the housing pins to extend into the bores of the rotor; and

means for forcing said housing pins against the urging of said biasing means to a position in which they are adjacent to, but not in, respectively associated ones of said bores of the



rotor whereby said rotor is free to rotate in said housing through said arc and is precluded from removal axially from said housing in which said housing bores and said housing pins are stepped to larger cross-sectional area at a point along their length away from said cavity; and which further comprises a second groove formed in the rotor parallel with the axis of the rotor such that it intersects said first mentioned groove but does not intersect said rotor bores.

4,631,943

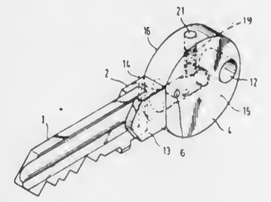
LOCKING KEY WITH MEMORY

Jost Hoener, Buhlackerstr. 19/B, 7801 Vöstetten, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,436

Int. Cl.⁴ E05B *41/00, 19/04*

U.S. Cl. 70—395 **13 Claims**



1. A locking key comprising:

a head member grippable by fingers of a user;

a shank member provided with a lock-operating bit, said shank member being rigid with a shaft rotatably lodged in a central bore of said head member, said shaft having an axis parallel to and situated completely between a pair of substantailly flat faces of said head member;

a holding pin in said head member, said pin disposed always perpendicular to said shaft faces and offset from said shaft axis, said pin engaging in a part-circular recess of said shaft for limiting the relative rotatability of said members to less than a full turn, said pin and said recess also maintaining said members in a fixed relative axial position; and

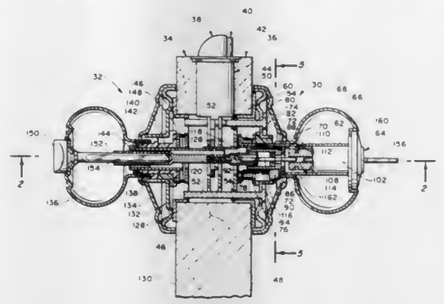
a spring-loaded detent inside said head engageable with a coacting formation for indexing said members in either of two limiting positions of relative rotation, said recess being a part-circular peripheral groove on said shaft with linear extremities of the groove occupied by said holding pin in respective limiting positions spaced a whole number of quandrants apart.

4,631,944

KNOB ASSEMBLY FOR DOORLATCHES INCLUDING FREE KNOB ROTATION AND FRONT END LOADING

Arnold C. Gater, Anaheim, and Thomas S. S. Hu, Corona, both of Calif., assignors to Kwikset Corporation, Anaheim, Calif.

Filed Sep. 20, 1984, Ser. No. 652,209
Int. Cl.⁴ E05B *55/06*
U.S. Cl. 70—472 **24 Claims**



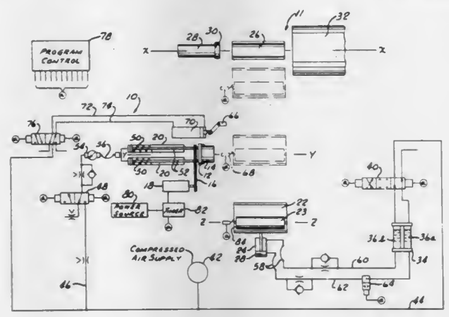
1. In a latch construction of the type for mounting in doors and the like and having a latch driving mechanism mounted within the door operably connected to exterior and interior operators for driving a latch bolt between extended and retracted positions projecting from a door edge; the improvements including: said exterior operator having an outer shell thereof mounted freely rotatable, a part of said exterior operator radially inwardly of said outer shell being directly rotationally disconnected from said outer shell, said outer shell terminating axially inwardly in a mounting collar; cam means adjacent said exterior operator mounting collar movable between engaged and disengaged positions, said cam means in engaged position interrupting said free rotation and transmitting movement from said exterior operator outer shell to said latch driving mechanism for driving said latch bolt, said cam means in disengaged position freeing said exterior operator outer shell for said free rotation; positioning means operably connected to said cam means for selectively shifting said cam means between said engaged and disengaged positions.

4,631,945

BILLET LUBRICATION APPARATUS

James E. Hulings, Zelienople; Robert P. Randall, Pittsburgh; Robert H. Maynard, Mars, and James Weiss, Wexford, all of Pa., assignors to TRACO, Pittsburgh, Pa.

Filed Nov. 22, 1985, Ser. No. 800,952
Int. Cl.⁴ B21C *23/32*
U.S. Cl. 72—43 **10 Claims**



1. In a metal extrusion apparatus wherein an extrusion press is utilized to extrude elongated forms from axially elongated metal billets, the combination for lubricating (a longitudinal) an axial end surface of such a billet comprising:

lubricant application means located adjacent such an extrusion press and adapted to carry a solid lubricating medium;

billet transfer means located adjacent such an extrusion press and adapted to transfer such a billet transversely of its own axial extent into such an extrusion press along a predetermined path of travel which includes a lubrication position whereat such billet axial end surface is located in axially aligned confronting relationship with the solid lubricating medium carried by said lubricant application means;

arresting means for arresting travel of said billet transfer means at said lubrication position; and

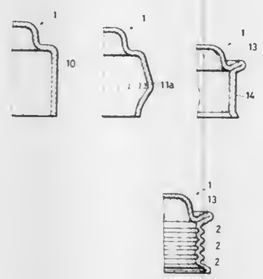
said lubricant application means including selectively operable linear drive means cooperable with said arresting means for advancing such lubricating medium axially into engagement with such an axial end surface of such an arrested billet and selectively operable rotary drive means for axial rotation of such lubricating medium during such axial movement and engagement thereof with such an axial end surface to provide for rotary application of such lubricating medium to such an axial end surface during transfer of such billet to such an extrusion press by said transfer means.

4,631,946

METHOD OF MANUFACTURING SHEET METAL MADE POLY-V PULLEYS

Misao Oda, Hyogo, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan

Filed Feb. 25, 1985, Ser. No. 704,745
Claims priority, application Japan, Mar. 2, 1984, 59-40758; Mar. 2, 1984, 59-40759; Mar. 2, 1984, 59-40760
Int. Cl.⁴ B21D *53/26;* **B21K** *1/42*
U.S. Cl. 72—68 **8 Claims**



1. A method of manufacturing sheet metal made poly-V pulleys with poly-V grooves having a uniform thickness which comprises the steps of:

forming a curvature on a peripheral wall of a cup-shaped blank, prior to any lug formation;

after said forming step, preliminarily forming a lug on the peripheral wall of said cup-shaped blank with the curvature, and simultaneously thickening said peripheral wall by pressing radially against the peripheral wall on which said curvature has been formed by means of an auxiliary forming roller possessing a lug forming concave part while holding the inner wall of the cup-shaped blank with a rotary inner die, rotating the cup-shaped blank and confining the blank in the radial direction; and then,

forming a plurality of V-grooves in a multiple arrangement on the thickened peripheral wall by squeezing between a V-groove preliminary forming roller possessing a plurality of V-groove forming ridges located at the outer side of the peripheral wall and a rotary inner die possessing a plurality of ridges located at the inner side of the peripheral wall while rotating the cup-shaped blank; and,

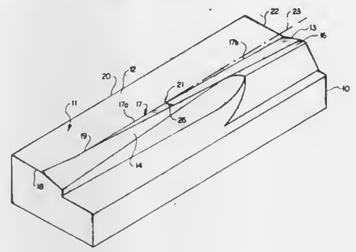
forming poly-V grooves by pressing a finishing roller possessing a plurality of finishing V-grooves to said plurality of V-grooves while rotating the cup-shaped blank.

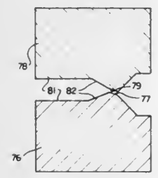
4,631,947

THREAD ROLLING DIES

Richard H. Corrette, Cleveland, Ohio, assignor to Colt Industries Operating Corp., Cleveland, Ohio

Filed Jan. 23, 1984, Ser. No. 573,019
Int. Cl.⁴ B21H *3/06*
U.S. Cl. 72—88 **7 Claims**





1. A pair of dies for threading fasteners with a cylindrical body and a point at one end thereof, each die comprising a die blank providing a working face extending from a start end to a finish end, each working face providing a G-surface and a rise angle surface intersecting one lateral edge of said G-surface along a heel line and angulated up from said G-surface at an angle substantially equal to the angle of said point, thread forming grooves on each G-surface and rise angle surface respectively operable to thread said cylindrical body and said point, said dies each providing a top of the rise surface intersecting said rise angle surface on the lateral edge thereof remote from said G-surface, said top of the rise surfaces being spaced and parallel to each other when said pair of dies operate and being angulated with respect to said G-surfaces, said top of the rise surfaces operating to break off tails projecting beyond said point.

4,631,948

ROLL STAND WITH BRACED AND OFFSET WORKING ROLLS

Wilfried Bald, Hilchenbach; Erich Stoy, Ratingen; Hans Römmen, Dormagen, and Friedrich Hollmann, Grevenbroich, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 595,947
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312008; Jun. 30, 1983, 3323641
Int. Cl.⁴ B21B *27/10, 31/18, 31/32*
U.S. Cl. 72—242 **7 Claims**

1. A rolling stand comprising:

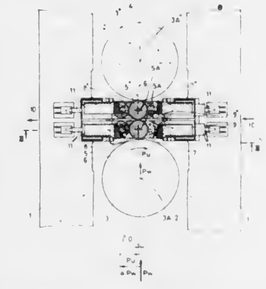
a support frame;

two pairs of vertically spaced journal blocks in the frame defining a pair of horizontal, parallel, and vertically spaced working-roll axes defining a vertical plane;

a pair of elongated small-diameter working rolls having roll necks rotatably mounted in the respective pairs of journal blocks about the respective axes, the working rolls having working surfaces defining, along at least an axial portion, a workpiece nip open perpendicular to the plane;

a pair of large-diameter backup rolls rotatably mounted in the frame about respective axes parallel to and vertically flanking the working-roll axes and defining a vertical plane offset from the working-roll plane, each backup roll bearing vertically on the respective working roll;

drive means operatively connected to the rolls for counter-rotating the rolls of each roll pair to draw an elongated workpiece of predetermined maximum width in a horizontal direction, generally perpendicular to the planes



through the nip and thereby exerting on the working rolls a horizontal force perpendicular to the planes and parallel to said horizontal direction, the working rolls having axially spaced end portions adjacent the respective journal blocks;

respective pushing elements engaged horizontally generally perpendicular to the planes against the end portions of the working surfaces beyond said workpiece nip of the working rolls, the working rolls being horizontally unsupported along said axial portion defining said workpiece nip; and

means including respective actuators engaging the pushing elements for pushing the elements horizontally generally perpendicular to the vertical roller planes against the end portions of the working rolls for holding and maintaining the two planes horizontally offset from each other.

4,631,949

METHOD OF LOADING BILLET IN THE INDIRECT EXTRUDING PRESS

Masahiro Iwata; Teruhito Shirai, and Toshio Watanabe, all of Oyama, Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 528,051, Aug. 31, 1983, abandoned. This application Oct. 2, 1985, Ser. No. 783,066
Claims priority, application Japan, Aug. 31, 1982, 57-151577
Int. Cl.⁴ B21C *31/00, 33/00*
U.S. Cl. 72—270 **3 Claims**

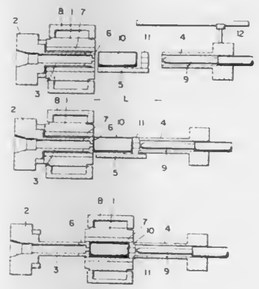
1. A method of loading a billet in an indirect extruding press including a container movable along a direction of a central axis thereof, said container being fitted to a casing and having a container sleeve disposed therewithin, a die stem fixed to an end platen disposed at one side of said container, a die having a die surface and being provided at an end of said die stem opposite said end platen, an extruding stem disposed at the other side of said container opposite said die stem and movable along said axial direction of said container; respective central axes of said container sleeve, said die stem and said extruding stem being coaxial, a dummy block slidably insertable within and fitting said container sleeve, said dummy block being provided at one end thereof with a connecting portion for

connecting said dummy block with a connecting end of said extruding stem, and a billet loader for supporting a billet to be loaded and said dummy block, said billet loader being movable in a direction transverse to said central axial direction of said container and disposed at said other side of said container, the method comprising the steps of:

moving said container toward and onto said die stem so that said die surface of said die is brought flush with an end of said container sleeve closest to said extruding stem;

supporting a billet to be loaded and said dummy block on said billet loader, said dummy block being located closest to said extruding stem with said connecting portion of said dummy block located closest to said end of said extruding stem, said billet being supported at a higher level than said dummy block so as to make respective central axes of said billet and said dummy block coaxial;

moving said billet loader into and within said indirect extruding press and opposite said die stem such that said



central axes of said billet and dummy block supported thereupon are made coaxial with said central axis of said container sleeve and extruding stem;

moving said extruding stem toward said die stem to bring said connecting end of said extruding stem into connecting contact with said connecting portion of said dummy block;

further moving said extruding stem, having said dummy block connected therewith, toward said die stem until said billet is held with its central axis maintained coaxial with that of said container sleeve and between said die surface of said die on said die stem and said dummy block connected with said extruding stem, without said billet entering said container sleeve;

withdrawing said billet loader from said indirect extruding press; and

moving said container towards said extruding stem so as to load said billet and said dummy block into said container sleeve therewithin.

4,631,950

PROGRESSIVE FORMER WITH REMOVABLE TOOLING

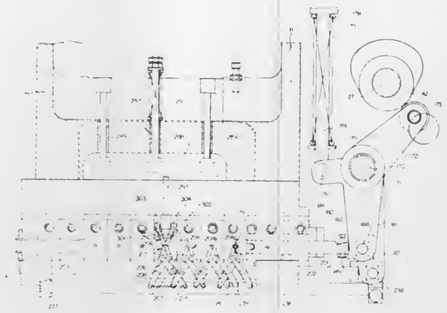
Thomas E. Hay; Robert E. Wisebaker, and Gaylen O. Kline, all of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Filed May 17, 1984, Ser. No. 611,521

Int. Cl.⁴ B21D *45/00*

U.S. Cl. 72—356 **18 Claims**

1. A progressive former for progressively forging workpieces, comprising a frame, a bolster reciprocable on said frame, a tool pack providing a tool pack base assembly removably mounted as a unit on said frame, tooling mounted on said tool pack base assembly cooperating to define a plurality of work stations, each work station providing a die means mounted on said tool pack base assembly in a fixed position, bearing means on said tool pack base assembly, and a tool means reciprocably mounted in said tool pack base assembly and guided by said bearing means, said tool and die means at said work stations cooperating to progressively forge a workpiece to a finished desired shape, and a releasable connection connecting said tool means to said bolster causing said tool means to reciprocate relative to their associated dies in re-



sponse to reciprocation of said bolster, said tool means being laterally positioned relative to said associated dies by said tool pack base assembly independent of said bolster, and a transfer operable to progressively position workpieces at said work stations.

4,631,951

ARRANGEMENT FOR TESTING A FLOW METER

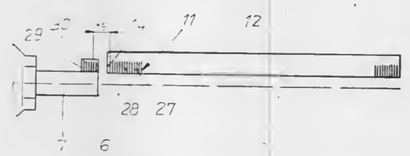
Jürgen Böhm, Mannheim/Wallst., Fed. Rep. of Germany, assignor to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,776

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428805

Int. Cl.⁴ G01F *25/00*

U.S. Cl. 73—3 **5 Claims**



1. An arrangement for testing a flow meter having at least one rotatable member and issuing a first train of electrical pulses proportionally to the extent of rotation of the rotatable member, comprising a measuring cylinder-and-piston unit including a cylinder, a piston slidably received in said cylinder and operative for displacing a fluid out of the latter, and a piston rod rigid with said piston and extending to the exterior of said cylinder, said unit being connected to the flow meter during testing to deliver the displaced fluid to the flow meter; means for correlating the number of pulses of the first train during a testing run to the number of complete revolutions of the rotatable member of the flow meter; means for generating a second train of electrical pulses proportionally to the extent of movement of said piston rod, including a stationary volume scale extending parallel and proximate to said piston rod and having a multitude of equidistant distancing markings, and sensing means mounted on said piston rod for joint movement therewith and operative for scanning said distancing markings and issuing the pulses of the second train in response to the detection thereof, said distancing markings being so arranged on said volume scale that said sensor encounters a first one thereof only after said piston rod has moved from its rest position through a predetermined initial distance; and means for utilizing the pulse of said second train that corresponds to said first distancing marking for triggering said correlating means.

4,631,952

RESISTIVE HYDROCARBON LEAK DETECTOR

Lee F. Donaghey, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 30, 1985, Ser. No. 770,910

Int. Cl.⁴ G01N *27/12*

U.S. Cl. 73—23 **20 Claims**



1. A resistivity sensor comprising:

sensor means for sensing an organic gas, liquid or vapor, said sensor means comprising an intimate admixture of electrically conductive particles and a material capable of swelling in the presence of said organic liquid, vapor or gas; and

means for electrically contacting said sensor means.

4,631,953

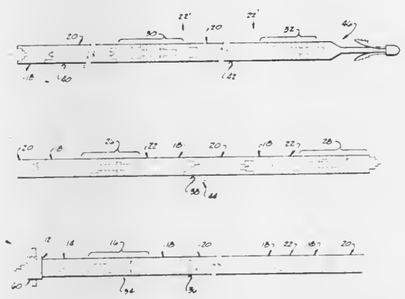
TUBING STRING TESTING DEVICE

Leon C. Chausse, P.O. Box 15186, Oklahoma City, Okla. 73115

Filed Mar. 5, 1986, Ser. No. 836,348

Int. Cl.⁴ G01M *3/28*

U.S. Cl. 73—49.5 **8 Claims**



1. A tubing string testing tool for testing the integrity of the tubing walls and connecting joints, comprising a plurality of individual, severable, sectional elements that can be combined in numerous combinations, said plurality of elements including a head element, not less than four axially spaced-apart packer elements, and an anchor means element for axially supporting said tool within said tubing string, each of said elements including means defining three separate fluid passage systems, said four axially spaced-apart packer assemblies, when said tool is positioned within said tubing string defining at least first, second and third annular test chambers at three axially spaced-apart locations along said tubing string, said first and third chambers comprising tubing wall test chambers, said second chamber comprising a joint test chamber, said three separate fluid passage systems including a first fluid system connected to each packer assembly for operating said packer assemblies, a second fluid system for providing water test conditions, and a third fluid system for providing gas test conditions, said three fluid passage systems extending from said head element downwardly along and within said tool so that each is isolated from one another and so that each fluid passage system extends downwardly beyond the second of said packer assemblies below said head element.

4,631,954

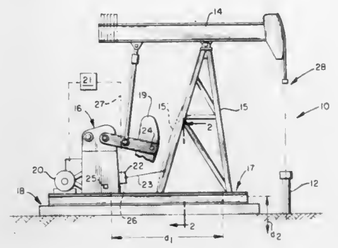
APPARATUS FOR CONTROLLING A PUMPJACK PRIME MOVER

Manuel D. Mills, P.O. Drawer 1073, Midland, Tex. 79701

Continuation-in-part of Ser. No. 442,848, Nov. 18, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 634,544

Int. Cl.⁴ F04B *49/00*; E21B *44/00*

U.S. Cl. 73—151 **19 Claims**



1. In a control system for the control of a prime mover of an oil well pumpjack apparatus which drives a downhole pump by means of a rod string, wherein the pumpjack unit includes structural components affixed to one another for reciprocating the rod string, the improvement comprising:

control means by which the prime mover is selectively energized and de-energized;

means measuring relative movement between said structural components, and converting the measurement into a pump-off signal which varies according to the magnitude of the movement;

said structural components include a gear box driven by the prime mover, a walking beam supported on a Samson post and oscillated by the gear box; said means measuring relative movement is connected to measure the change in distance between the Samson post and the gear box;

means storing said pump-off signal and when a plurality of pump-off signals which exceed a predetermined magnitude are accumulated, said control means is de-energized for a finite period of time and thereafter again energized.

4,631,955

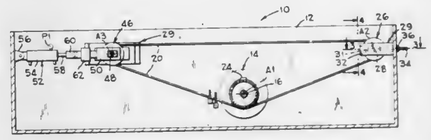
ROPE AND SHEAVE TESTING DEVICE AND METHOD

Charles A. Brolin, Cedar Rapids; James B. Sheets, Ames, and Ryan H. Benson, Cedar Rapids, all of Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 22, 1985, Ser. No. 757,566

Int. Cl.⁴ G01L *5/04*

U.S. Cl. 73—158 **33 Claims**



1. A testing device for testing at least a rope; the combination comprising:

means defining a single winch drum mounted for rotation about an axis;

a rope having opposite end portions anchored to said drum with one end portion wound on said single winch drum in one direction and the other end portion wound on the winch drum in the opposite direction;

a first sheave journaled for rotation about a first axis and receiving a first portion of said rope in a sheave groove;

at least one second sheave journaled for rotation about a

second sheave axis and receiving a second portion of said rope in a second sheave groove;

means for applying a tensioning force on said rope and on said first and second sheaves; and

power means connected to said drum for alternately and repeatedly driving said rope in opposite directions for evaluating the life of said rope.

4,631,956

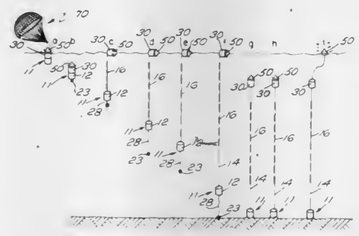
AIR DEPLOYED OCEANOGRAPHIC MOORING

Robert G. Walden, East Falmouth; Henri O. Berteaux, Falmouth, both of Mass.; Leslie W. Bonde, Potomac; David B. Dillon, Derwood, both of Md.; Eric J. Softley, Key Biscayne, Fla.; Thomas M. Popp, Langhorne, and Edgar A. Reed, 3rd, Ambler, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1984, Ser. No. 645,129

Int. Cl.[4] B63B *22/00*

U.S. Cl. 73—170 A **5 Claims**



1. An air deployable oceanographic mooring system comprising:

an anchor including a bottom finder, for suspension below part of said anchor during at least one phase of deployment, permanently attached to an anchor shell, by means of a first flexible line which is taut during said one phase, said anchor shell includes a second flexible line comprised of an aramid fiber mooring line connected to a sensor string, said anchor shell further includes a mooring line lockup mechanism connected to said first flexible line and said second flexible line, said mooring line lockup mechanism has means for inhibiting upon actuation the paying out of said second flexible line, said first flexible line prohibiting said actuation when taut;

a subsurface buoy connected to said second flexible line, said subsurface buoy including a microprocessor enclosed in a housing and surrounded by syntactic foam;

a surface float having a third flexible line attached to said subsurface buoy, said surface float including a transmitter and antenna enclosed in a housing and surrounded by syntactic foam with an embedded battery pack; and

a parachute system attached to said surface float.

4,631,957

METHOD FOR ALERTING PATIENTS WITH DISEASES AFFECTED BY CLIMATE, SUCH AS EPILEPSY AND MYOCARDIAL INFARCTION

Gerhard Ruhenstroth-Bauer, Gräefelfing, Fed. Rep. of Germany, assignor to Atmospheric Weather Analysis Systems, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,520

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310908

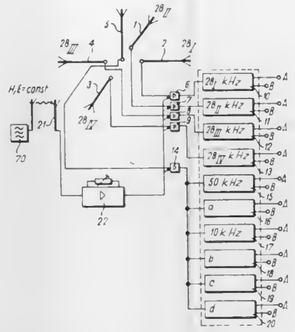
Int. Cl.[4] G01W *1/00*

U.S. Cl. 73—170 R **2 Claims**

1. A method for alerting patients with diseases affected by climate, such as epilepsy and myocardial infarction, to conditions conducive to attacks, comprising the steps of:

measuring the sinusoidal spheric pulses of a frequency of 28 kHz and 10 kHz;

ascertaining the pulse rate of said spheric pulses over a predetermined period of time;



determining the difference between the pulse rate of the spheric pulses at 28 kHz and those at 10 kHz; and

alerting a patient when the spheric pulses at a frequency of 28 kHz predominate over those at 10 kHz.

4,631,958

FORCE-BALANCE DRAG ANEMOMETER

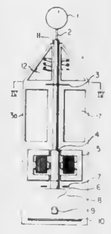
Roger Van Cauwenberghe, and Jiri Motycka, both of Toronto, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 19, 1984, Ser. No. 591,180

Claims priority, application Canada, Apr. 15, 1983, 425,988

Int. Cl.[4] G01P *5/02*; G01L *1/08*

U.S. Cl. 73—189 **6 Claims**



1. An anemometer for measuring the velocity of a fluid, said anemometer comprising a body, a shaft in said body, suspension means for said shaft in the form of a cruciform shaped diaphragm, a sphere on an outer end of said shaft, means for sensing deflection of said shaft, and an electromagnetic actuator for returning said shaft to a neutral position in response to signals from said means for sensing deflection of said shaft, whereby current applied to said electromagnetic actuator is proportional to the velocity of the fluid and can be measured to indicate the velocity of the fluid.

4,631,959

DRAG ANEMOMETER

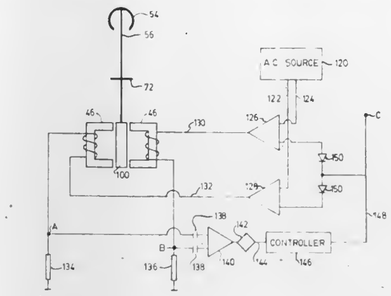
Jiri Motycka, Etobicoke, Canada, assignor to Metrex Instruments Ltd., Brampton, Canada

Filed Dec. 14, 1984, Ser. No. 682,208

Int. Cl.[4] G01W *1/02*; G01P *5/02*

U.S. Cl. 73—189 **18 Claims**

1. An anemometer for measuring the velocity of a fluid, comprising: a housing having an elongate shaft pivotally mounted therein and projecting therefrom, the shaft being moveable from a neutral position in response to drag forces thereon and returnable to a neutral position in response to electromagnetic forces thereon; a drag element mounted on the shaft exterior of the housing; electromagnetic means located adjacent to the shaft; position sensing means connected to the electromagnetic means for producing signals responsive



to the position of the shaft relative to the electromagnetic means; and controller means operatively connected between the position sensing means and the electromagnetic means for applying direct current to the electromagnetic means to return the shaft to said neutral position, the current applied to the electromagnetic means being proportional to the speed of the fluid impinging on the drag element.

4,631,960

ELECTRONIC RECORDING MANOMETER

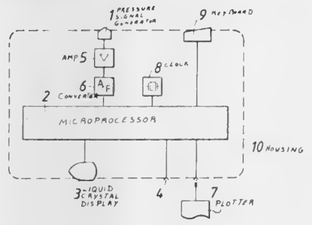
Johann Wögerbauer, Linz, Austria, assignor to Sprecher & Schuh Gesellschaft m.b.H., Linz, Austria

Filed Mar. 22, 1985, Ser. No. 714,818

Claims priority, application Austria, Mar. 29, 1984, 1051/84

Int. Cl.[4] G01L *9/00*; G01W *1/00*

U.S. Cl. 73—384 **5 Claims**



1. An electronic atmospheric pressure recording manometer adapted for use aboard a ship, which comprises the combination of

(a) a signal generator element emitting electrical output signals indicating prevalent atmospheric pressures,

(b) a microprocessor having an input receiving the output signals and a plurality of outputs delivering electrical output signals responsive to the signals received from the generator element, the microprocessor including

(1) a clock unit indicating passing time intervals during which the prevalent atmospheric pressure indicating signals are received and

(2) a memory unit storing a calender indicating respective dates on which the prevalent atmospheric pressure indicating signals are received for the clocked time intervals as well as predetermined geographical and meteorological data,

(c) a liquid crystal display connected to one of the microprocessor outputs for receiving the electrical output signals therefrom and having respective visual display fields optically displaying respective indicia in response to the received signals, the display fields including

(1) a digital display of the prevalent atmospheric pressure and

(2) a graphic display of a curve showing a development of atmospheric pressure changes over the clocked time intervals, and

(d) an acoustic warning device connected to another one of the microprocessor outputs for receiving the electrical output signals therefrom and responsive to be actuated if the rate of the atmospheric pressure drop exceeds a predetermined value between 0.5 and 5 mb/h.

4,631,961

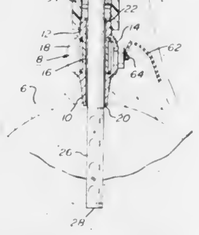
SAMPLING DEVICE FOR DETERMINING CONDITIONS ON THE INTERIOR SURFACE OF A WATER MAIN

Thomas L. Yohe, West Chester; Rodney M. Donlan, Ardmore, and Karl M. Kyriss, West Chester, all of Pa., assignors to Philadelphia Suburban Water Company, Bryn Mawr, Pa.

Filed Dec. 31, 1985, Ser. No. 815,407

Int. Cl.[4] G01N *17/00*

U.S. Cl. 73—866.5 **19 Claims**



1. In a water supply system comprising a pressurized water main, a sampling device for determining conditions on the interior surface of the main comprising:

closable access means providing access to the interior of the main;

a rod extendable into the interior of the water main through said closable access means;

said closable access means including means for preventing the escape of water from the interior of the main through said access means when the rod extends into the interior of the main; and

means for removably securing said rod to the main whereby pressure within the interior of the water main is prevented from forcing the rod out of the position in which it extends into the interior of the water main;

wherein said rod has a transverse passage and a ring removably held in said transverse passage, the rod being positionable, when extended into the interior of the main, so that the transverse passage extends parallel to the direction of water flow in the main.

4,631,962

ARTIFICIAL HEAD MEASURING SYSTEM

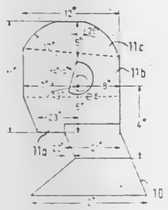
Klaus Genuit, Aachen, Fed. Rep. of Germany, assignor to Head Stereo GmbH, Kopfbezogene Aufnahmeund, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,878

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411236; Mar. 15, 1985, 3509376

Int. Cl.[4] H04S *1/00*

U.S. Cl. 73—585 **8 Claims**



1. In an artificial-head acoustic measuring system comprising: a construction including portions configured to appear as human shoulders, head and ears on both sides of the head with auditory canals and microphones disposed in the auditory canals, wherein at least the head portion comprises partial bodies corresponding to mean data of test persons with respect to dimensions and relative positions, the partial bodies comprising regular geometric bodies calibrated with respect to sound reflexion, diffraction and resonance behavior to define a reproducible artificial-head transmission function related to the outer geometric configuration of the construction.

4,631,963

METHOD FOR MEASURING ACOUSTIC ENERGY ANISOTROPY THROUGH CORE SAMPLES

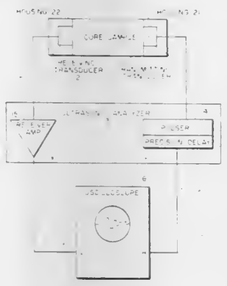
Eve S. Sprunt, Farmers Branch, and Larry D. Smallwood, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,796

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—594 **7 Claims**



1. A method for measuring acoustic energy anisotropy of a core sample from a subterranean formation, comprising the steps of:

(a) shaping said core sample to provide a plurality of pairs of parallel, planar outer surfaces about the length of said core sample,

(b) measuring acoustic travel time, attenuation, waveform or other acoustic properties through said core sample in each of the azimuthal directions through said core sample which are perpendicular to each of said pairs of parallel, planar outer surfaces, and

(c) comparing each of said measured acoustic properties to identify the azimuthal direction of any acoustic energy anisotropy through said core sample.

4,631,964

SHEAR ACOUSTIC ENERGY ANISOTROPY OF SUBSURFACE FORMATIONS

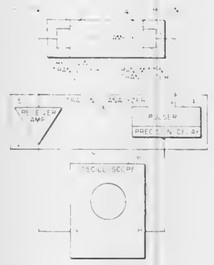
Eve S. Sprunt, Farmers Branch and Larry D. Smallwood, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,795

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—594 **8 Claims**



1. A method for measuring shear acoustic energy anisotropy of a core sample taken from a subterranean formation, comprising the steps of:

(a) shaping said core sample to provide a pair of planar outer surfaces along parallel spaced-apart planes,

(b) transmitting shear acoustic energy into said core sample from a first of said planar outer surfaces, said acoustic energy traveling through said core sample to the second of said planar outer surfaces in a transmission pattern having a first azimuthal direction within a plane parallel to said planar outer surfaces,

(c) receiving said acoustic energy at said second planar outer surface,

(d) repeating steps (b) and (c) for a plurality of differing azimuthal directions for said acoustic energy transmission through said core sample, and

(e) utilizing any differences in travel time, attenuation, waveform or other acoustic properties of said acoustic energy for said plurality of differing azimuthal directions of transmission patterns as a measure of the shear acoustic energy anisotropy characteristics of the subterranean formation from which said core sample was taken.

4,631,965

ACOUSTIC HOLOGRAPHY PROCESS AND APPARATUS USING A SPACE-LIMITED ULTRASONIC BEAM

Daniel De Vadder, Verrieres le buisson, and Robert Saglio, Antony, both of France, assignors to COMMISSARIAT a l'Energie Atomique, Paris, France

Filed Apr. 20, 1984, Ser. No. 602,367

Claims priority, application France, Apr. 29, 1983, 83 07166

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—602 **8 Claims**

1. A method for the acoustic holography of an area to be inspected in an object, and for identifying faults which may exist therein, wherein said method comprises:

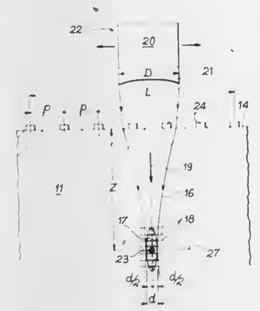
insonifying the area to be inspected by means of an ultrasonic transmitter producing a space-limited ultrasonic beam,

displacing said transmitter so as to successively insonify M areas, in a manner which insonifies the entire area to be inspected;

detecting any ultrasonic signals coming from the successively insonified areas and producing electrical signals in response to the ultrasonic beam, by means of several ultrasonic receivers having reciprocal spacings;

determining the characteristic, by comparison to the values of a reference beam similar to said ultrasonic beam, values of the detected ultrasonic signals; and

reconstructing the area to be inspected by means of said characteristic values wherein said reconstruction method comprises:



forming a main image of the fault and any possible secondary reflected images of said fault, thereof due to the said spacings, and providing a number of receivers which is predetermined in such a manner such that the distance between each secondary image and the main image exceeds the width of the areas insonified by said transmitter; and carrying out said reconstruction only in the insonified areas which have provided an ultrasonic signal, thereby eliminating any secondary images which may occur from the reconstruction of the area inspected.

4,631,966

DEVICE FOR THE SAMPLING AND MEASURING OF THE CONCENTRATIONS OF EXPIRED GASES

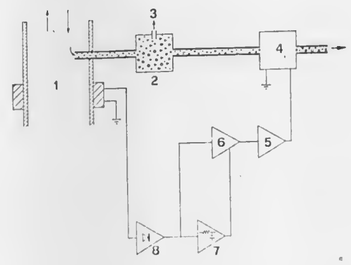
Siro Brugnoli, Via Valdieri, 31, 00135 Roma, Italy

Filed May 13, 1985, Ser. No. 733,434

Claims priority, application European Pat. Off., Apr. 1, 1985, 85830080.9

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—863.03 **5 Claims**



1. A device responsive to a ventilation signal for sampling and measuring gas concentrations in expired gases, said device comprising:

a mixing chamber having inlet means for receiving a flow of the expired gas defined by F(t), first outlet means for venting a sample flow of the expired gas defined by Fc(t), and second outlet means, wherein a proportionality factor K is defined by $K=F(t)/Fc(t)$;

a sampling pump connected to said second outlet means, said pump operating in phase with said ventilation signal to regulate said expired gas flows through said mixing chamber; and

control means for controlling said pump, wherein said control means includes a power amplifier, an integrator and a variable gain amplifier connecting said power amplifier and said integrator, said variable gain amplifier providing an electrical signal representative of said proportionality factor K, said factor depending on the gain of said variable amplifier, said integrator receiving said ventilation signal and varying said gain and therefore said proportionality factor whereby said sample flow Fc(t) is substantially constant.

4,631,967

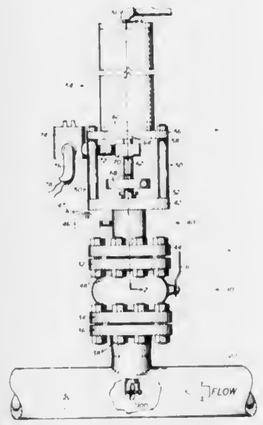
AUTOMATIC INSERTION DEVICE

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed May 17, 1985, Ser. No. 735,052

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—861.25 **32 Claims**



1. An apparatus to insert and remove a piston rod into and from a pressurized fluid pipeline through a valve mounted on a tee connected to the pressurized pipeline comprising:

(a) a spool having a first flange on one end and a second flange on the other end, said second flange being connected to said valve, said spool and said flanges being perforated by a longitudinal bore;

(b) an elongate cylinder having a flange on one end for detachable mounting of said cylinder;

(c) a plurality of elongate spacers with a first end releasably connected to said first flange of said spool and a second end releasably connected to said flange of said cylinder, said spacers positioning said cylinder in axial alignment with said longitudinal bore of said spool;

(d) a piston slidably mounted in said cylinder;

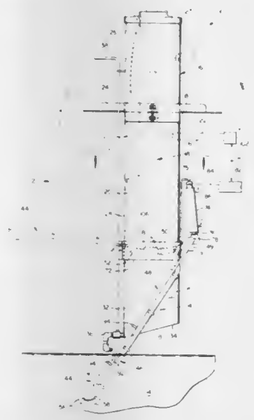
(e) said piston rod having a hollow axial passage, a first end removably connected to said piston, a second open end allowing access to said hollow passage and a port perforating said piston rod and communicating with said hollow passage, said piston rod extending through said longitudinal bore of said spool and said second end of said piston rod positioned for insertion and removal through said valve and said tee into and from said pressurized pipeline on reciprocation by said piston;

(f) means for limiting the depth of penetration of said second end of said piston rod into said pressurized pipeline including:

(i) a disk-shaped collar having a center hole to receive said piston rod;
(ii) said collar having a radial slot along the diameter thereof and through said center hole which divides said collar into two clam-shaped sections;
(iii) a threaded bolt passing through one of said clam-shaped sections into a threaded hole in the other of said clam-shaped sections, said bolt causing said clam-shaped sections to grip said piston rod when tightened and locking said collar to said piston rod; and
(iv) a first post and a second post mounted on said first flange of said spool on opposite sides of said longitudinal bore, said posts having circular shoulders to engage and support said collar which, when locked to said piston rod, limits the depth of penetration of said second end of said piston rod into said pressurized pipeline;

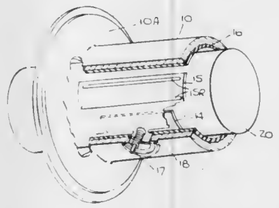
(g) seal means extending around said piston rod to prevent leakage of said fluid from said pressurized pipeline.

4,631,968
EFFLUENT SAMPLER
Norman L. Aske, P.O. Box 542, Westport, Oreg. 97016
Filed Jun. 10, 1985, Ser. No. 743,063
Int. Cl.[4] G01N *1/12*
U.S. Cl. 73—864.32 **9 Claims**



1. An apparatus for sampling an effluent stream flowing within a conduit having an aperture within a wall of the conduit, comprising:
an effluent collection container mounted accessibly within the conduit aperture, the container having an upper portion above the conduit wall to permit access within the container and a lower portion below the conduit wall;
sampling means mounted to the lower portion of the container for sampling the effluent stream periodically and depositing the periodic samples within the container to form a cumulative sample for a predetermined period; and
collecting means associated with the container for collecting a portion of the cumulative sample and delivering the portion to the upper portion of the container for analysis thereof.

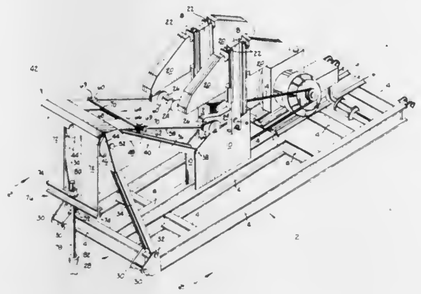
4,631,969
CAPACITANCE-TYPE ELECTRODE ASSEMBLIES FOR ELECTROMAGNETIC FLOWMETER
Roy F. Schmoock, Yardley, Pa., assignor to Fischer & Porter Company, Warminster, Pa.
Continuation-in-part of Ser. No. 655,519, Sep. 28, 1984, Pat. No. 4,567,777, which is a continuation-in-part of Ser. No. 536,275, Sep. 27, 1983, Pat. No. 4,497,212, which is a division of Ser. No. 398,809, Jul. 16, 1982, Pat. No. 4,420,982, which is a division of Ser. No. 174,609, Aug. 1, 1980, Pat. No. 4,358,963, which is a continuation-in-part of Ser. No. 75,037, Sep. 12, 1979, Pat. No. 4,253,340, which is a continuation-in-part of Ser. No. 811,276, Jun. 29, 1977, Pat. No. 4,181,018, which is a division of Ser. No. 771,420, Feb. 23, 1977, Pat. No. 4,098,118. This application Aug. 5, 1985, Ser. No. 762,527
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 **8 Claims**



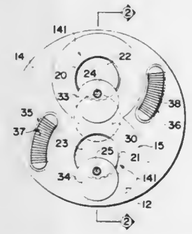
1. An electromagnetic flowmeter for metering the flow rates of fluids, the flowmeter comprising:
A. a cylindrical non-magnetic spool;
B. a pair of electrode assemblies disposed at diametrically-opposed positions within the spool, each assembly including a measuring electrode plate behind which is a shielding electrode plate, said plates being curved to conform concentrically to the curvature of the spool, said plates being encapsulated within a tubular insulating layer molded against the inner surface of the spool whereby the shielding electrode plate lies adjacent said surface, and the face of the measuring electrode plate is exposed, said shielding electrode plate being provided with insulating ribs which space it from the inner surface of the spool; and
C. a tubular liner of dielectric material having properties appropriate to the fluid being metered, said liner being received within the insulating layer to cover the faces of the measuring electrode plates, whereby each measuring electrode forms one plate of a capacitor whose dielectric is the liner and whose other plate is the fluid passing therethrough.

4,631,970
PUMPING UNIT
Dennis A. Pauls, Garden City, Kans., assignor to Jerden Industries, Inc., Garden City, Kans.
Filed Apr. 22, 1983, Ser. No. 487,522
Int. Cl.[4] F04B *47/02*
U.S. Cl. 74—44 **4 Claims**

1. A pumping unit for use at a well having a well head, comprising:
support means;
a pair of pitman arms, each of said pitman arms having a longitudinal axis and a first end portion and a second end portion;
means including crank arm means for causing movement said pitman arms, said means for causing movement connected to said support means and to said first end portion of each of said pitman arms;
a first strap having a width of at least inches and including a first end portion and a second end portion;
a second strap having a width of at least three inches and including a first end portion and a second end portion, said second strap being separate from and spaced from said first strap;
equalizer beam means being separate from each of said pitman arms and extending between said second end portion of each of said pitman arms, said pitman arms and said equalizer beam means cooperating with said first strap and said second strap to minimizer the bending stress applied to said means for causing movement during operation of the pumping unit;
connection means being separate from said equalizer beam means but engaging said equalizer beam means for use in interconnecting each of said first end portions of said first and second straps to said pitman arms and wherein each of said first and second straps contacts said equalizer beam means; and
reciprocating means connected to said second end portions of said first and second straps and adapted to move relative to the well, said reciprocating means including a polished rod and wherein all portions of said polished rod are positioned at an angle relative to said longitudinal axis of each of said pitman arms.

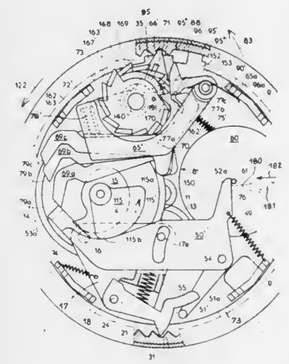


4,631,971
APPARATUS FOR DEVELOPING A PROPULSION FORCE
Brandson R. Thornson, Winnipeg, Canada, assignor to Fortune Ventures Inc., Winnipeg, Canada
Filed May 25, 1984, Ser. No. 614,051
Claims priority, application United Kingdom, Jun. 2, 1983, 8315114
Int. Cl.[4] F16H *33/02*
U.S. Cl. 74—84 R **14 Claims**



1. Apparatus for developing a propulsion force comprising two symmetrical bodies, support means mounting the bodies for rotation about parallel spaced first axes and driving means for synchronously rotating the symmetrical bodies about the respective axes in opposite directions, each body including a pair of planet masses, means mounting each planet mass on the respective body, said mounting means being arranged such that the respective mass can freely rotate eccentrically about a second axis parallel to the first and such that the second axis rotates with the body about the first and moves radially relative to the first in timed relation to the rotation of the body so as to move during each cycle of rotation of the body from a position of minimum spacing to a position of maximum spacing and back to the position of minimum spacing from the first, and means for cyclically inhibiting and releasing rotation of the planet mass about the respective second axis so as to cause the planet mass to pivot inwardly relative to the first axis whereby said releasing causing a force outwardly of the first axis with the bodies arranged such that a resultant force from said forces lies at right angles to a plane adjoining the axes.

4,631,972
PROGRAMMER CONTROL DEVICE
Francis Thomas, Cluses, France, assignor to Carpano et Pons, Cluses, France
Filed Jul. 6, 1984, Ser. No. 628,488
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] F16H *27/04*
U.S. Cl. 74—113 **17 Claims**



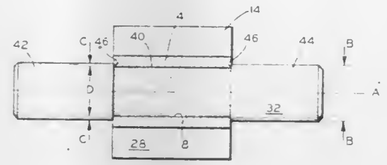
1. A programmer control device comprising:
a rotary program cam block capable of being driven in rotation by a step-by-step advancing device comprising an oscillating support for oscillating at each revolution of an advancing cam, said oscillating support supporting at a first advancing pawl capable of interacting, under the action of an elastic means, with a toothed movable body connected kinematically to said program cam block,
means for alternatively blocking and releasing the action of said advancing pawl on said toothed movable body, said blocking and release means comprising a blocking lever interacting with means for rocking the said blocking lever, during each to-and-fro movement of the advancing pawl, between two angular positions, namely a first angular position in which a part of the blocking lever is located in the path of said advancing of the blocking lever is located in the path of said advancing pawl to block the action of said pawl on the toothed movable body and a second angular position in which the said part of said blocking lever is not located in the path of the advancing pawl so as to release the action of said pawl on the toothed movable body,
and further comprising retention means actuatable to retain the blocking lever in a selected one of said positions at a moment when the said lever occupies the respective position and a restoring spring constantly tending to return the said lever to the other of said positions,
said toothed movable body interacting with said advancing pawl comprising a toothed ring integral with said cam block, on which is mounted rotatably at least one collar displaceable in rotation under the action of a second advancing pawl located on the same oscillating support as said first advancing pawl.

4,631,973

AXIAL RETENTION OF GEAR ON SHAFT

James M. Eley, Corinth, Miss., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 9, 1983, Ser. No. 473,480
Int. Cl.[4] B23P *11/02;* F16B *4/00*
U.S. Cl. 74—439 7 Claims



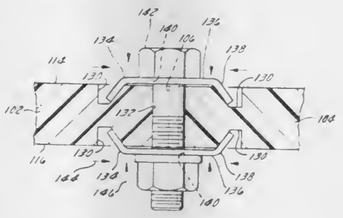
1. In an article of manufacture comprising a shaft and a gear fixed to the shaft, said gear having an axially extending bore therethrough wherein said shaft extends through said bore along a common axis; an improvement comprising: said shaft including a reduced diameter portion intermediate the ends of said shaft, wherein portions of said shaft positioned outboardwardly of said gear define axially opposed integral retention walls disposed orthogonally to said axis and juxtaposed against the sides of said gear for fixing said gear over said reduced diameter portion of said shaft.

4,631,974

POLYMERIC SPLIT SPROCKET WHEEL

James H. Wiegand, Franklin, and Thomas J. Casper, Waukesha, both of Wis., assignors to Envirex, Inc., Waukesha, Wis.

Filed Nov. 8, 1985, Ser. No. 796,143
Int. Cl.[4] F16H *55/12*
U.S. Cl. 74—450 18 Claims



1. A polymeric split sprocket wheel designed to be mounted on a rigid shaft and having two adjoining portions, each with two corresponding side faces, a split line at the junction of said portions and an outer rim having a plurality of radially projecting sprocket teeth and axially extending chain support portions, said wheel further comprising:

a hub portion with an axial bore and a shoulder portion extending axially from said hub portion on each of said side faces;

said axial bore having at least one slotted captive keyway in sprockets used for transmitting torque;

means for connecting said hub to said outer rim;

each of said side faces having at least one pair of tapered recesses constructed and arranged on either side of said split line;

clamping means designed to straddle said split line and draw together said adjoining portions of said wheel by exerting a clamping force on said pair of recesses; and

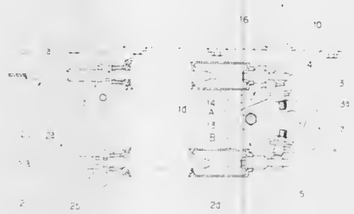
a circular clamping band constructed and arranged to fit around said shoulder portion of said hub.

4,631,975

TRANSMISSION OPERATING DEVICE

Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Sep. 11, 1985, Ser. No. 774,845
Claims priority, application Japan, Oct. 18, 1984, 59-219071; Nov. 2, 1984, 59-232070
Int. Cl.[4] G05G *9/16;* F16C *1/12*
U.S. Cl. 74—473 R 5 Claims



1. A transmission operating device comprising:

(a) a connecting arm of which both ends are connected with ends of two control cables, respectively, and having a first rotational center for rotating the connecting arm in a horizontal plane and a second rotational center for rotating the connecting arm in a vertical plane, and being constructed so that the connecting arm is rotated in the horizontal plane when the inner wires are pushed or pulled in the reverse direction with each other at the same time, and so that the connecting arm is rotated in the vertical plane when the inner wires are pushed or pulled in the same direction with each other at the same time;

(b) a member to be rotated together with the connecting arm, being provided with a splined perforation;

(c) a splined shaft being a part of an outer shaft of a transmission, and being inserted into the splined perforation, so that the rotaional motion of the connecting arm in the vertical plane is changed into a rotational motion of the outer shaft around an axis of the outer shaft; and

(d) a link mechanism being provided between the connecting arm and the outer shaft, so that the rotational motion of the connecting arm in the horizontal plane is changed into a sliding motion of the outer shaft in the direction of an axis of the outer shaft.

4,631,976

STEERING WHEEL

Kazushi Noda, Aichi, and Hiroshi Mitsunaga, Kadoma, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai; Matsushita Electric Industrial Co., Ltd., Kadoma and Toyota Jidosha K.K., Toyota, all of, Japan

Filed Sep. 26, 1985, Ser. No. 780,603
Claims priority, application Japan, Sep. 27, 1984, 59-202580; Sep. 27, 1984, 59-202579; Sep. 27, 1984, 59-202578; Sep. 28, 1984, 59-205349; Sep. 28, 1984, 59-205348; Sep. 28, 1984, 59-205347
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 18 Claims



1. An electrically-heated steering wheel, comprising:

a central boss, a steering ring located radially outwardly of said boss, and at least one spoke joining said boss with said steering ring, said steering wheel, and therefore said at least one spoke, having a front side adapted to face a vehicle driver and a rear side adapted to face away from the vehicle driver, said steering ring including a core bar having a covering, said steering ring having at least one grip portion adapted to be gripped by a respective hand of a driver especially while the steering wheel is in a null position corresponding to straight-ahead travel, each said grip portion being located adjacent to a respective said spoke about the circumference of said steering ring;

a layer of heat insulating material provided on said covering of said steering wheel so as to cover said at least one grip portion of said steering ring in the circumferential direction of said steering ring, throughout at least a radially outer portion of said steering ring;

at least one heating member comprising two superimposed generally L-shaped sheets of combustion-resistant material having a heater wire sandwiched between them so that a heating portion of said heater wire extends between corresponding one legs of said sheets, and leads for said heating portion extend from said heating portion between corresponding other legs of said sheets and terminate in means defining a connector for said heater wire;

a temperature sensor associated with at least one said heating member and having a lead juxtaposed with said lead for said heating portion of said heating member;

said heating member and said temperature sensor being disposed on said layer of heat insulating material on a respective said at least one grip portion so that said one legs of said sheets extend in the circumferential direction of said steering ring and so that said other legs of said sheets extent radially inwardly of said steering wheel along the side of a respective said at least one spoke;

a cover layer covering said at least one heating member, this cover layer extending sufficiently completely peripherally of said steering ring as to hold the respective said heating member in place; and

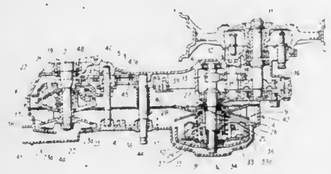
an electrical circuit adapted to obtain electrical power from an automotive electrical system and provide such electrical power to each said heater wire, this electrical circuit including a connector for connecting with the respective said connector of each said heater wire on the rear side of a respective said spoke and a temperature control constructed and arranged to receive indications of temperature from said temperature sensor and for providing electrical power to said heater wire in dependence upon such indications of temperature.

4,631,977

POWER TRANSMISSION CASING IN MOTORIZED TWO-WHEELED VEHICLE

Yoshinori Kawashima, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,215
Claims priority, application Japan, Sep. 20, 1982, 57-163388; Sep. 20, 1982, 57-142202[U]
The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.
Int. Cl.[4] F16H *57/04*
U.S. Cl. 74—606 A 4 Claims



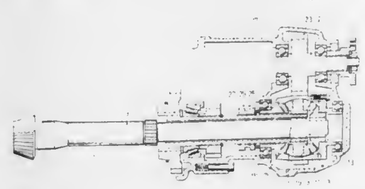
1. An improvement in a power transmission of the belt type having a transmission casing which includes a case and a cover, a drive shaft extending into said case, a drive pulley on said drive shaft, a driven shaft extending into said case, a driven pulley on said driven shaft, a belt extending over both said drive pulley and said driven pulley, and fan means on at least one of said shafts, the improvement comprising a partition plate extending the length of said casing dividing said casing into a case side compartment and a cover side compartment and wherein said belt and said fan means are positioned in said cover side compartment.

4,631,978

DEVICE FOR THE DISTRIBUTION OF MOTIVE POWER

Masao Teraoka, Tochigi, Japan, assignor to Tochigifujisangyo Kabushikigaisha, Tochigi, Japan

Filed Apr. 12, 1984, Ser. No. 599,478
Claims priority, application Japan, Apr. 13, 1983, 58-63787
Int. Cl.[4] F16H *1/44, 37/06, 37/08;* B60K *17/352*
U.S. Cl. 74—710.5 3 Claims



1. A device for the distribution of motive power comprising:

a hollow shaft receiving input power from the drive device;

a pinion shaft provided on the output side of said hollow shaft;

a pinion gear rotatably supported on said pinion shaft;

a pair of side gears meshed with said pinion gear;

a front wheel drive shaft integrally coupled to one of said side gears and passing through the center of said hollow shaft;

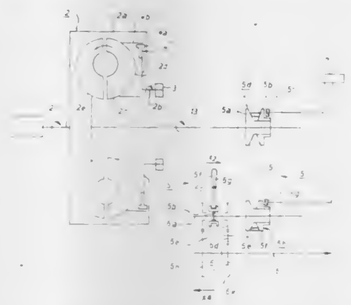
a differential case having an outer shell, a front and a rear end and being integrally formed with the outer side gear and enclosing said pinion shaft, pinion gear and side gears; a rear wheel drive shaft coupled to said differential case through a drive gear formed on the outer shell of the differential case and an input gear integrally connected to an end of said rear wheel drive shaft so as to mesh with the drive gear, said rear drive wheel drive shaft being located above said front wheel drive shaft.

4,631,979

POWER TRANSMISSION MECHANISM EQUIPPED WITH FLUID AND CENTRIFUGAL CLUTCH

Kazuhisa Tamura, Hirakata; Shigeru Takeshita, Neyagawa, and Takao Fukunaga, Hirakata, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jan. 5, 1984, Ser. No. 568,467
Claims priority, application Japan, Feb. 9, 1983, 58-20793
Int. Cl.⁴ F16H *47/00*
U.S. Cl. 74—730 **3 Claims**



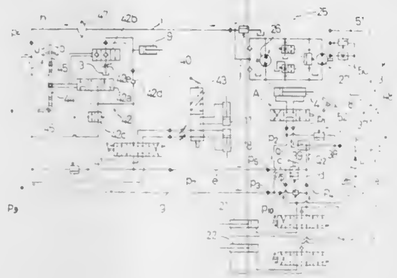
1. A power transmission mechanism equipped with a fluid coupling, an input shaft thereof interconnected to a power source being interconnected through the fluid coupling to an output shaft, and the output shaft being interconnected to a forward-rearward changeover mechanism including a speed changer; characterized in that said fluid coupling includes a shell, an impeller in said shell, a centrifugal clutch means in said shell for engaging said impeller and for driving said impeller when said shell is rotated by said input shaft at a speed above idle speed and for disengaging said impeller and the driving of said impeller when said shell is rotated by said input shaft at said idle speed, a turbine in said shell for standing idle in said shell when said centrifugal clutch means is disengaged and for drive by said impeller when said centrifugal clutch means is engaged and for driving said output shaft, said centrifugal clutch means comprising a support member fixed to said shell, a centrifugal shoe mounted on said support member for radial movement outwardly of said support member by centrifugal force and radial movement inwardly toward said support member, spring means for moving said shoe inwardly toward said support member when said shell is rotated at idle speed, a cylindrical casing fixed to said impeller radially outward from said shoe and having an engaging surface for engagement by said centrifugal shoe when said shell is rotated at a speed above idle speed and said centrifugal shoe is moved radially outward by centrifugal force, said forward-rearward changeover mechanism, including said speed changer, being driven by said turbine when said centrifugal clutch means is engaged with said engaging surface and standing idle when said centrifugal clutch means is disengage from said engaging surface and said turbine is standing idle.

4,631,980

HYDRAULIC CIRCUIT CONSTRUCTION FOR A TRACTOR HAVING A HYDRAULIC STEPLESS CHANGE SPEED APPARATUS

Shozo Ishimori, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

PCT No. PCT/JP83/00071, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03127, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 8, 1983, Ser. No. 552,034
Claims priority, application Japan, Mar. 9, 1982, 57-33478
Int. Cl.⁴ F16H *47/00*
U.S. Cl. 74—730 **5 Claims**



1. A hydraulic circuit construction for a tractor comprising:

a hydraulic stepless change speed means adapted to be driven by an engine through a main clutch and including a charge oil line;

a hydraulic pump adapted to be directly driven by the engine;

a single-acting hydraulic cylinder for operating a work implement;

flow priority valve means to divide pressure oil from the hydraulic pump into a control flow line and an excess flow line,

both the control flow line and the excess flow line being parallel-connected to the charge oil line, the control flow line joining an oil line leading to the charge oil line for passing pressure oil to the hydraulic stepless change-speed means; and

control circuit means disposed in said excess flow line for controllably regulating pressure oil flow to said single-acting hydraulic cylinder and having at least one oil line for passing therethrough unregulated flow of the pressure oil into the charge oil line.

4,631,981

MACHINE TOOL WITH TWO TOOL CHANGERS

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Filed Nov. 21, 1984, Ser. No. 673,939
Claims priority, application Japan, Nov. 21, 1983, 58-219287
Int. Cl.⁴ B23B *29/24*
U.S. Cl. 74—813 R **5 Claims**

1. A machine tool comprising: a machine frame;

a spindle head vertically movably supported on said machine frame;

a tool spindle carried by said spindle head for rotation about a horizontal axis;

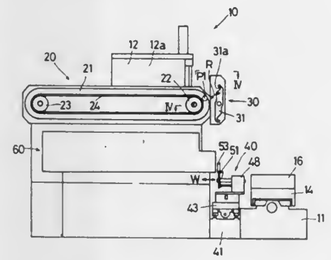
first small tool storage means for removably storing a plurality of tools;

pivotable tool exchange means for changing said tools between said tool spindle and said first small tool storage means;

second large tool storage means positioned separate from said first tool storage means for removably storing a plurality of tools, said second tool storage means being capable of moving said tools stored therein so as to index one of said tools to a tool removal position; and

tool transfer means for transferring said tool from said tool removal position of said second tool storage means so as to insert it into said tool spindle and for transferring an additional tool from said tool spindle so as to store said additional tool into said second tool storage means at said tool removal position wherein

said tools stored in the first small tool storage means comprise a plurality of small diameter tools, while said tools stored in the second large tool storage means comprise a plurality of large diameter tools;



said first tool storage means comprises means for horizontally storing said small diameter tools, while said second tool storage means comprises means for vertically storing said large diameter tools; and

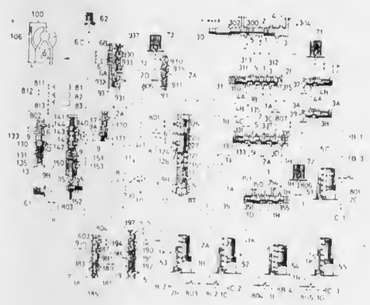
said second large tool storage means further comprises means for horizontally moving said large diameter tools, with the axes of said large diameter tools extending vertically, so as to index one of said large diameter tools to said tool removal position and for pivotally moving between vertical and horizontal positions one of said large diameter tools indexed to said tool removal position.

4,631,982

ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION CONTROL SYSTEM

Nobuaki Miki; Yoshikazu Sakaguchi; Kozo Mandokoro, all of Anjo, and Seitoku Kubo, Toyota, all of Japan, assignors to Aisin-Warner K.K., Anjo and Toyota Jidosha K.K., Toyota, both of, Japan

Filed Nov. 18, 1985, Ser. No. 798,726
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—869 **2 Claims**



1. An electronically controlled automatic transmission control system for controlling an automatic transmission for a vehicle comprising:

an electronic controller which receives and functions in response to input signals corresponding to the running conditions of the vehicle, such as running speed of the vehicle and degree of throttle opening and;

a hydraulic controller including a fluid pressure source, shift control valves for changing over connection of said fluid pressure source to respective hydraulic servomotors of frictional engaging mechanisms which engage, release or fix components of a gear train, solenoid valves adapted to be controlled by said electronic controller to change input signal pressures to said shift control valve and a manual selector valve capable of moving through predetermined set positions, namely, a neutral position (N-position), a drive position (D-position) and a reverse position (R-position) and adapted to connect said fluid pressure source selectively to said shift valves or said hydraulic servomotors; and

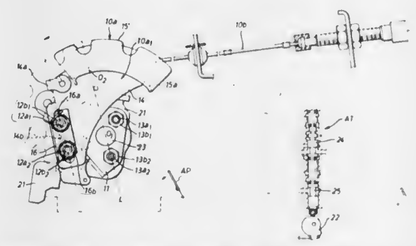
adapted to control the automatic transmission according to running of the vehicle including the set position of said manual selector valve, said solenoid valves being a first solenoid valve and a second solenoid valve, said shift control valves being first, second and third shift control valves, said first shift control valve being operated by said first solenoid valve to supply the pressurized fluid to or to drain the pressurized fluid from a predetermined hydraulic servomotor, said second and said third shift control valves being operated by said first shift control valve and said second solenoid valve so that said second shift control vlave is controlled according to an opening and closing operation of said second solenoid valve when a valve element of said first shift control valve is placed at one side of said first shift control valve due to an opening or closing operation of said first solenoid valve and said third shift control valve is controlled by the opening and closing operation of said second solenoid valve when valve element of said first shift control valve is placed at another side of said first shift control vlave due to closing or opening operation of said first solenoid valve, wherein when the manual selector valve is placed at the N-position, said input signal pressure is supplied to a 1-2 shift contol valve and the 1-2 shift control valve is held in a position for a first drive ratio.

4,631,983

LEVER MECHANISM FOR CABLE LINKAGE

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Filed Jul. 19, 1985, Ser. No. 756,605
Claims priority, application Japan, Jul. 19, 1984, 59-150120
Int. Cl.⁴ B60K *41/04*
U.S. Cl. 74—877 **7 Claims**



1. A lever mechanism for a cable linkage including a control lever mounted on a rotary shaft for rotation therewith, a base plate mounted on said rotary shaft and fixed to said control lever for rotation therewith, and a lever plate adjustably mounted at two points thereof on said base plate and being connected at one side of its outer peripheral portion to one end of said cable linkage, said lever plate being provided at its outer peripheral portion with a semicircular guide surface having a center of curvature located substantially at a rotation fulcrum

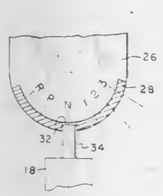
of said lever plate, wherein said cable linkage is supported on the semicircular guide surface of said lever plate, and said lever plate is displaceable on said base plate during the assembly process thereof to adjust the distance between the semicircular guide surface and the rotation fulcrum.

4,631,984

SPEED-SENSITIVE SHIFT CONTROL

Michael E. Jones, Wooster, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 21, 1985, Ser. No. 714,322
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—878 **5 Claims**



1. A speed-sensitive shift control for preventing an operator from shifting from and through a neutral position to a shift position engaging the gears of an engine transmission above a predetermined value of engine speed, said control comprising:

a gear selecting control arm moveably mounted to a frame and operably connected to said transmission, said control arm positionable along a plane by the operator from and through said neutral position to said shift position and from said shift position to and through said neutral position for operation of said transmission,

means for releasably locking said control arm at the neutral position, said means comprising a locking member having an arcuate surface extending therefrom in a direction substantially transverse to said plane and having an opening therein positioned to engage a pin that maintains a continuous sliding contact relationship with at least a portion of said arcuate surface while in at least a partially retracted condition and which locks the control arm at the neutral position by moving from the partially retracted condition to an extended condition within said opening when the engine speed is above the predetermined value and releases the control arm by disengaging from said opening by moving from said extended condition to said retracted condition when the engine speed is below the predetermined value,

an electrical power source,

electrical actuator means connectable to the power source and operable upon receipt of a first electrical actuating signal to move said pin from said retracted condition to said extended condition and upon receipt of a second electrical actuating signal to move said pin from said extended condition to said retracted condition,

engine speed sensing means operable to sense the engine speed and provide an electrical engine speed signal corresponding thereto,

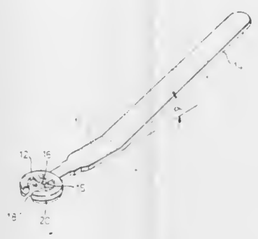
and means for receiving said speed signal and comparing said speed signal to the predetermined value and providing said first actuating signal to the actuator means when the speed signal is above the predetermined value and providing said second actuating signal to the actuator means when the speed signal below the predetermined value.

4,631,985

DEVICE FOR HOLDING A SCREW OR THE LIKE

Charles G. Roberts, Richmond, England, assignor to Handymate Limited, London, England

Filed Dec. 19, 1985, Ser. No. 811,107
Claims priority, application United Kingdom, Dec. 27, 1984, 8432645
Int. Cl.[4] B25B *23/08*; B25C *3/00*
U.S. Cl. 81—44 **6 Claims**



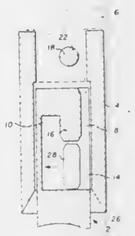
1. A device for holding a screw or the like (as herein defined) adjacent to a surface, said device comprising a body having a generally C-shaped recess, at least three resilient gripping elements directed inwardly of the recess and arranged so as to grip the screw resiliently, said recess opening into an edge of the body to enable the body subsequently to be disengaged from the screw.

4,631,986

STUD REMOVING AND TRANSFER ADAPTION MODE

Robert J. Dillabough, 21 Nadina, Kitimat, B.C., Canada (V8C-2A3)

Filed Jan. 31, 1985, Ser. No. 697,713
Int. Cl.[4] B25B *13/50*; C25D *17/00*
U.S. Cl. 81—53.2 **7 Claims**



1. In a system for pulling a stud electrode from its retaining base in a pot smelter for the smelting of aluminum by engaging an upper end of the stud with a spigot attached to a puller and twisting the stud with the puller to loosen it the improvement comprising:

(a) a pair of opposed first longitudinal channels on the exterior of the stud, open at an end of the stud;

a pair of opposed second longitudinal channels on the exterior of the stud, closed at the end of the stud and generally parallel to the first longitudinal channel;

a pair of opposed circumferential channels, each circumferential channel communicating one of said first with one of said second longitudinal channels at the ends of the first and second channels remote from the end of the stud;

(b) a socket mounted on the spigot to engage the stud comprising a generally cylindrical, hollow body to fit over the stud;

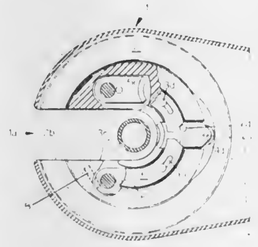
opposed internal teeth in the socket and positioned to engage the first longitudinal channels, to pass along the circumferential channels and to engage the second longitudinal channels whereby the stud may be turned to free it from the base and lifted with the teeth engaging the second longitudinal channels.

4,631,987

POWER TONGS

David A. Buck, 909 E. Bayou Pkwy., Lafayette, La. 70518

Filed Jul. 29, 1985, Ser. No. 760,257
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.14 **9 Claims**



1. A power tong for rotating a pipe to make up or break apart a threaded joint comprising:

(a) a frame having a throat for receiving pipe;

(b) a primary partial ring mounted on said frame for rotation relative to said frame about the pipe centerline, and having an opening therein, which is adapted to be aligned with said throat such that a pipe may be positioned within the aligned openings;

(c) cam surfaces on said primary ring opening toward the pipe centerline, generally symmetrical about a radial line extending in a direction opposite said opening from said pipe centerline, said surfaces so situated as to become progressively closer to said pipe centerline with each uniform amount of peripheral distance from said radial line in each peripheral direction;

(d) a secondary partial ring mounted for rotation about the pipe centerline, having an opening therein, which is adapted to be aligned with said throat such that a pipe may be situated therein, having a recess extending in the direction of said radial line with cam follower guiding surfaces to confine a cam follower free to move generally along said radial line;

(e) two pivots on said secondary ring with axes generally parallel to the pipe axis and situated approximately 120 peripheral degrees each side of said radial line;

(f) a cam follower and pipe gripping die combination situated in said cam follower guide surfaces for radial motion of such dimension that pipe gripping surfaces on a first end engage a pipe outer surface, when cam follower surfaces on a second end are in contact with said cam surfaces some peripheral distance from said radial line, due to relative rotation between said primary and said secondary ring;

(g) two pivoting pipe gripping die carriers situated to pivot about said pivots of such dimension that pipe gripping surfaces on a distal end engage the outer surface of a pipe, when the pipe is in the preferred position for rotation;

(h) linkage means to transmit motion between cooperating surfaces of said cam follower and cooperating surfaces of said pivoting pipe gripping die carriers, such that said pivoting elements are rotated from an open position, allowing pipe to be moved into and out of said throat when said cam follower is in a more radially outward position from the pipe to a position to grip said pipe when said cam follower is moved toward said pipe;

(i) means to forcefully rotate said primary partial ring relative to said secondary partial ring; and

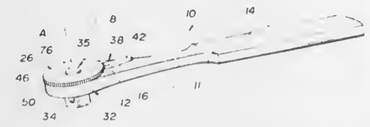
(j) to forcefully rotate said primary partial ring relative to said frame to rotate pipe.

4,631,988

REVERSIBLE RATCHET WRENCH INCLUDING DETENT MECHANISM

David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018

Continuation-in-part of Ser. No. 461,242, Jan. 26, 1983, Pat. No. 4,485,700. This application Nov. 27, 1984, Ser. No. 675,431
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—62 **22 Claims**



1. A reversible ratchet wrench comprising: a wrench body including a unitary head and a handle extending from the head; said head having oppositely facing surfaces defining the maximum thickness thereof and also including an opening extending between the oppositely facing surfaces; the opening having circular driver and pawl portions that overlap each other; a driver having a round ratchet portion received within the circular driver portion of the head opening and supported for rotation about a driving axis; said ratchet portion of the driver having teeth that extend continuously without interruption between the oppositely facing surfaces of the head; the driver also including a driving lug; a detent mechanism including a ball mounted for inward and outward movement on the driving lug of the driver; said detent mechanism also including a detent member that is spring biased on the driver to normally force the ball outwardly to retain a socket on the driving lug; said detent member being movable to permit inward movement of the ball in order to release any socket on the driving lug; a generally round pawl received within the pawl portion of the opening and supported for rotation about a pawl axis; said pawl having spaced teeth for selectively engaging the teeth of the ratchet portion of the driver to prevent rotation thereof with respect to the head in one direction or the other depending upon the pawl position; said pawl teeth extending continuously without interruption between the oppositely facing surfaces of the head to provide continuous uninterrupted engagement thereof with the teeth on the ratchet portion of the driver; the pawl having a tab for providing rotation thereof to change the direction of locking the driver against rotation; and means for maintaining the pawl teeth in engagement with the ratchet teeth on the driver to prevent rotation thereof in one direction or the other while permitting rotation of the driver in the opposite direction by ratcheting of the pawl.

4,631,989

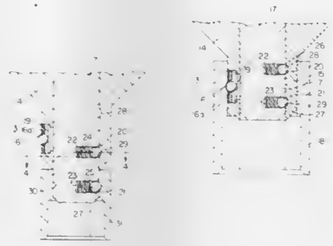
RATCHET HANDLE FOR USE INTERCHANGEABLY WITH SOCKET WRENCHES HAVING COUPLING MEANS OF DIFFERENT SIZES

Craig A. Trowbridge, 7151 Apache Dr., Sedalia, Colo. 80135, and Charles A. Trowbridge, Sedalia, Colo., assignors to Craig A. Trowbridge, Denver, Colo.

Continuation-in-part of Ser. No. 663,047, Oct. 19, 1984, abandoned. This application Jun. 3, 1985, Ser. No. 740,853
Int. Cl.[4] C22B *1/00*; C22C *1/00*
U.S. Cl. 81—62 **3 Claims**

1. A ratchet handle having a projection for engaging a detachable socket wrench having a coupling recess for receiving said projection, a spring pressed detent mounted in said projection for frictionally retaining a socket wrench thereon, said projection having an axial passage extending therethrough, a

bar slidably mounted within said passage in sliding engagement with said projection, the wall of said passage having two axially spaced and longitudinally aligned depressions therein, spring pressed detents mounted on said bar and spaced for concurrent engagement with said bar in respective ones of said two depressions, said bar having its end adjacent said projection shaped to fit in the wrench coupling recess of a detachable wrench socket smaller than the coupling recess of said first mentioned socket wrench, said bar being slidable outwardly of said projection and into a position wherein the one of said



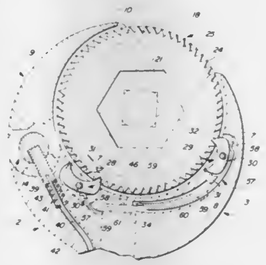
detents nearer the end of said bar lies outside said projection and the other of said detents engages the bar in the one of said depressions near the outer end of said projection to hold said bar in its outwardly extended position and wherein said one detent is positioned to engage and retain a socket placed on the outer end of said bar, whereby said ratchet handle may be used interchangeably with the sockets in two sets of sockets having wrench coupling recesses of respective different sizes and which fit on said projection and on said end of said bar respectively.

4,631,990

OPEN-ENDED RATCHET WRENCH

Matthew E. Hughes, 8511 Elmview Pl., Shreveport, La. 71108

Filed Aug. 2, 1985, Ser. No. 761,773
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—62 **9 Claims**



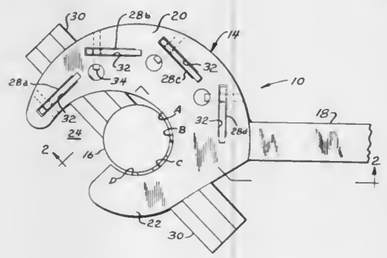
1. An open-ended ratchet comprising a handle; a center shaft projecting from said handle in fixed relationship; a handle sleeve concentrically located on said center shaft in rotatable relationship; a curved fixed jaw carried by one end of said handle sleeve, said fixed jaw having a first concave slot therein; a curved pivoting jaw pivotally attached to said fixed jaw, said pivoting jaw having a second concave slot therein; lock means provided in association with said pivoting jaw and said fixed jaw for locking said pivoting jaw with respect to said fixed jaw; insert means removably insertable in said first concave slot and said second concave slot of said fixed jaw and said pivoting jaw responsive to pivoting of said pivoting jaw on said fixed jaw; and a first pawl and a second pawl pivotally carried by said fixed jaw in spaced relationship, said first pawl and said second pawl each having a pair of pawl teeth provided thereon and adapted for alternately pivoting into said first concave slot; a contact post extending from the end of said center shaft near the periphery of said center shaft; a spring wrap extending from the end of said center shaft substantially in the center of said end of said center shaft; a first pawl contact extending from sliding engagement with said first pawl at one end to fixed connection to said contact post at a second end and a second pawl contact extending from sliding engagement with said second pawl at one end to fixed connection to said contact post at a second end; and a pawl spring provided in said first pawl contact, whereby said first pawl contact and said second pawl contact are displaced on said first pawl and said second pawl, respectively, and said pawl spring is stretched around said spring wrap repsonsive to rotation of said handle and said center shaft, for selective engagement with said insert means and ratcheting of said insert means with respect to said fixed jaw and said pivoting jaw.

4,631,991

RATCHET WRENCH FOR SCAFFOLDING SCREW JACK

W. Thomas Scott, Lisle, and Jerome Soukup, Brookfield, both of Ill., assignors to The Ceco Corporation, Oak Brook, Ill.

Continuation of Ser. No. 521,006, Aug. 8, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,817
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—90.1 **11 Claims**



1. A wrench for advancing a rotatable collar member of a screw jack along a vertically disposed jack lead screw, the collar member having at least one arm member extending radially outwardly therefrom, the wrench including:

(a) head means defining opposed first and second surfaces and having a passage adapted to receive the screw jack with either of said surfaces facing substantially downwardly;

(b) handle means connected to the head means for rotating the head means around the screw jack when said jack is in the passage;

(c) at least one flipper means for selectively engaging the jack arm member;

(d) means for attaching the flipper means for pivotal rotation on the head means such that the flipper means generally rotate downwardly below the head means, the pivotal flipper means defining a plane of rotation substantially perpendicular to said surfaces of the head means when the head means is positioned to receive the screw jack in said passage whereby rotation of the head means in a first direction forces said selective engagement of the arm member thereby causing the corresponding rotation of the collar member and rotation of the head means in the opposed second direction forces the flipper means to pivotally rotate upwardly above the head means thereby precluding both the selective engagement of the jack arm member and the rotation of the collar member;

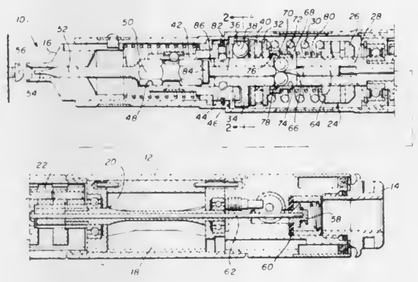
whereby said direction of rotation of the collar member determined by selectively positioning said first or second head means surface downwardly.

4,631,992

SCREWDRIVER

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 616,364, Jun. 1, 1984, abandoned. This application Mar. 10, 1986, Ser. No. 838,204
Int. Cl.[4] B25B *23/151*
U.S. Cl. 81—470 **3 Claims**



1. In an improved screwdriver that includes a housing, a pneumatic motor in said housing, a valve for controlling air to the motor, a tool bit driven by the motor, and a clutch interposed between the motor and tool bit, said clutch being operable in response to a predetermined torque imposed on said tool bit to effectively disengage said motor and tool bit, the improvement comprising:

drive means including a drive shaft connecting said clutch and motor, said shaft having a longitudinal bore extending therethrough and having a transverse slot therein intersecting said bore, said slot having a longitudinal dimension graater than the radius of said shaft;

a pair of balls disposed in said slot, each said ball having a diameter substantially equal to the radius of said shaft;

a valve rod movably located in said bore and having a first end engaging said valve and a second end engaging said balls;

a valve actuating pin extending through said shaft and having one end engaging the tool bit and the other end engaging said balls, said pin being movable in said shaft by said tool bit to move said balls and valve rod to a position opening said valve;

a sleeve member encircling said shaft adjacent to said slot, said sleeve member having a first portion of a diameter substantially equal to the outside diameter of said shaft whereby said balls are held in engagement, a second portion of a diameter slightly larger than said shaft whereby said balls can separate when adjacent thereto permitting said valve rod to move toward said tool bit and said valve to close stopping the air supply to said motor, and having a cam portion between said first and second portions, said cam portion including a frustoconical surface for engaging said balls; and,

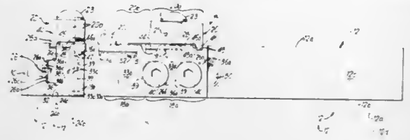
resilient means for biasing said sleeve member toward the position wherein said first portion is adjacent to said balls, the cam portion on said sleeve member engaging said balls to move said balls inwardly and downwardly in said slot and to move said rod downwardly resetting said screwdriver for additional operation.

4,631,993

GROOVING TOOL AND METHOD FOR MAKING SAME

Walter H. Kelm, Mt. Clemens, Mich., assignor to General Electric Company, Detroit, Mich.

Continuation of Ser. No. 948,884, Oct. 5, 1978, abandoned. This application May 22, 1981, Ser. No. 266,608
Int. Cl.[4] B23B *1/00, 29/04;* B26D *1/00*
U.S. Cl. 82—1 C **9 Claims**



1. A grooving tool assembly for machine tools such as lathes and the like, which comprises:

a relatively elongate shank adapted to be secured in a predetermined location on the machine tool with its front end generally exposed for positioning in proximity to a workpiece which is operatively mounted to the machine tool, said shank having a fixed reference surface and a corner-like cut-out defining a side-facing surface and a front-facing surface;

a tool bit head assembly adapted to be securely mounted to said shank, generally adjacent said cut-out at the front end of said shank, said head assembly including:

a tool bit insert having a cutting edge of predetermined length,

a support plate member adapted to provide a seat for the insert, said support plate formed with a mounting portion for mounting said support plate member to said shank and a blade portion adapted to provide a seat for the insert,

a clamp member adapted to be secured to said tooling assembly to clamp said insert in the seat in said blade portion, said clamp member including a base portion adapted to be fastened to said mounting portion of said support plate and an arm portion extending directly over the blade portion of said support;

a slot-like key-way formed in said side-facing surface of said shank and extending generally in the front-to-rear direction of said shank;

a key formed on and projecting outwardly from said mounting portion on said head assembly, said key being positioned and proportioned to correspond generally to said key-way and adapted to be interlockably received in said key-way when said head assembly is mounted to said shank;

locating means formed on said clamp for cooperating essentially only with said support plate member to position said arm portion in desired position over said insert, said locating means including:

a first rib formed on said base portion of said clamp member, extending adjacent a side edge thereof and projecting downwardly from its bottom, an edge of said first rib being adapted to abut said mounting portion of said support plate along a portion of the surface on which said key is formed,

a second rib formed on said base portion of said clamp member, extending adjacent another side edge thereof and projecting downwardly from its bottom, and

a slot-like recess formed in said mounting portion of said support plate, said recess adapted to receive said second rib when said clamp member is fastened to said support plate;

means for securing said support plate member to said shank;

means for securing said clamp to said support plate member;

a first identifiable location being formed on a front-to-rear extending edge of said key, said first identifiable location being located a fixed distance from the insert cutting edge; and

a second identifiable location being formed on the edge of said key-way which is adapted to abut said front-to-rear-extending edge of said key, said second identifiable location being essentially parallel to and located a determinable distance from the reference surface on said shank, the additive sum of said fixed distance and said determinable distance being equal to a desired cutting height between said cutting edge and said reference surface, such that any other head assembly formed with said fixed distance between its cutting edge and a position corresponding to said first identifiable location can be interchanged with said head assembly without altering said desired cutting height.

7. A method of forming tool parts for machine tools and the like, which comprises the steps of:

forming a cut-out in a relatively elongate shank having a longitudinal axis extending from its front to its back end, said cut-out providing a side-facing surface and permitting mounting of a tool bit head assembly adjacent the side-facing surface, the head assembly including a tool bit insert having a cutting edge, a support plate adapted to be mounted to the shank and to provide a seat for the tool bit insert, and clamp means adapted to retain the insert in its seat on the support plate, said clamp means including a clamping arm adapted to hold the insert against the seat;

providing attachment means associated between the cut-out portion of the shank and the head assembly for locating the cutting edge at a predetermined cutting height relative to the bottom surface of the shank by:

locating one identifiable edge of the portion of the attachment means formed on the shank at a first predetermined distance from the bottom of the shank,

locating the cutting edge at a fixed distance from a second identifiable edge of the portion of the attachment means formed on the head assembly, said one and second identifiable edges generally coinciding when the head assembly is mounted to the shank,

selecting the fixed distance and the first predetermined distance so as to add up to the predetermined cutting height relative to the bottom of the shank,

forming, as part of said attachment means, a key which projects from one of the side-facing surface of said cut-out portion in the shank and the surface of said head assembly which is adjacent said side-facing surface when mounted thereto, and

forming, as another part of the attachment means, a key-way in the other of the side-facing surface of said cut-out and said adjacent surface of said head assembly, the key-way corresponding substantially to the configuration of said key to permit a cooperating interlocking relation between the key and the key-way when the head assembly is mounted to the shank; and

forming a pair of mutually perpendicular edge members on said support plate and a pair of mutually perpendicular ribs projecting downwardly from the bottom of said clamp means for abutting said mutually perpendicular edge members to locate said clamping arm relative to the insert, such that a plurality of head assemblies can be formed, each having its cut-edge located said fixed distance from a position corresponding to said second identifiable edge on the portion of the attachment means formed thereon, to enable any of said head assemblies to be mounted to the shank yet automatically locate the cutting edge at said predetermined cutting height relative to said bottom reference.

4,631,994

ADJUSTABLE HOLDER FOR A CUTTING TOOL

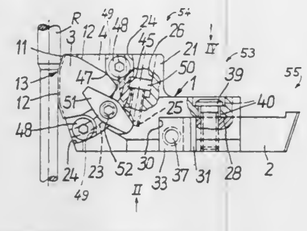
Willi Jester, Herten, and Norbert Reiter, Mettmann, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,433

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325286

Int. Cl.[4] B23B *29/10*

U.S. Cl. 82—36 R **6 Claims**



1. A tool assembly, comprising:

a cutting tool having a periphery which includes at least one pair of primary and secondary cutting edges that intersect at a point; and

an adjustable holder which includes

a basic element having a planar supporting face,

a receptacle element pivotably mounted on said basic element and having a planar supporting face which rests the supporting face of said basic element, said receptacle element having a recess with a contour corresponding to part of the periphery of said cutting tool,

screw means releasably connecting said receptacle element to said basic element, and

clamping means releasably mounting said cutting tool within the recess of said receptacle element,

wherein the supporting face of one of said basic and receptacle elements has an annular groove therein, and

wherein one of said basic and receptacle elements includes bearing means cooperating with the other of said basic and receptacle elements for forming a pivot bearing to rotate said receptacle element about an axis passing through the intersection of the primary and secondary cutting edges, said bearing means including an annular projection which is provided on the supporting face without said annular groove and which is positioned to slidably mate with said annular groove.

4,631,995

TOOLING APPARATUS

John J. Vroenen, 17744 Hinton Ave., Hesperia, Calif. 82345

Filed Nov. 18, 1985, Ser. No. 799,243

Int. Cl.[4] B23B *25/00*

U.S. Cl. 82—39 **15 Claims**

1. In a tooling apparatus for use with a machining lathe to support a work piece at a position displaced from the driven lathe chuck, the combination comprising:

base means for attachment to the lathe;

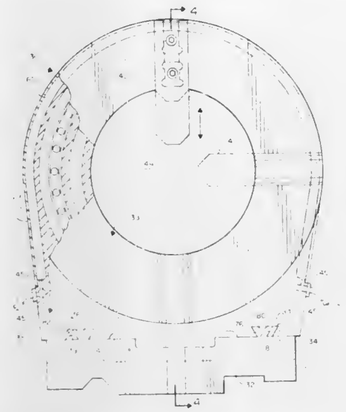
a yoke means adjustably secured to said base means, said yoke means having an enlarged diameter opening with bearing receiving surfaces formed therein and passage means in thermally conductive relation therewith;

an assembly rotatably mounted on said yoke means, said assembly having first and second plate members having interconnected hub portions within the enlarged opening of said yoke means to define, in conjunction with said yoke means, an annular compartment, said assembly having an enlarged diameter opening in the interconnected hub portions for passage therethrough of a work piece;

radially adjustable jaw means received within slot means in the surface of one of said first and second plate members for clamping engagement with the surface of the work piece;

bearing means received within said annular compartment and intercoupling said yoke means and said assembly;

means for sealing said annular compartment for enabling the providing of lubrication fluid to said bearing means;



means for pre-loading said bearing means; and

means for providing cooling fluid to said passage means within said yoke means for enabling flow of cooling fluid therethrough to cool the parts during rotation of said assembly, said assembly being driven by said work piece as said driven chuck is rotated.

4,631,996

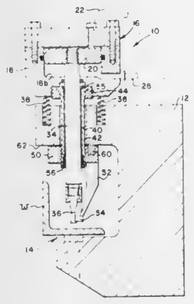
PUNCH PRESS WITH SELF-ADJUSTING STRIPPER

James M. Magnuson, Kankakee, Ill., assignor to Peddinghaus Corporation, Bradley, Ill.

Filed Oct. 28, 1985, Ser. No. 792,328

Int. Cl.[4] B26F *1/02*

U.S. Cl. 83—23 **12 Claims**



12. A method of punching a workpiece and stripping a punching tool therefrom, comprising the steps of:

providing a punch press having a frame, and double-acting fluid actuator having a cylinder and reciprocable piston means movable within the cylinder, wherein the cylinder is mounted on the frame for limited movement with respect thereto;

providing a punching tool carried by the piston means for reciprocation therewith;

providing a stripper member operatively connected to the cylinder for movement therewith relative to the press frame;

positioning a workpiece on the frame, and operating the actuator to move the piston means to drive the tool into the workpiece; and

operating the actuator to effect a return stroke of the piston means to withdraw the tool from the workpiece, whereby the cylinder and the stripper member first move relative to the frame toward the workpiece so that the stripper member engages the workpiece, with further operation of the actuator acting to withdraw the tool from the workpiece.

4,631,997

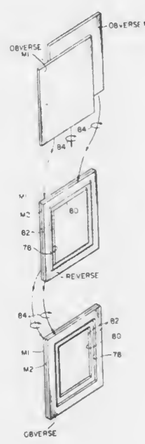
METHOD FOR SIMULTANEOUSLY CUTTING A PLURALITY OF PICTURE FRAME MATS

David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022

Division of Ser. No. 655,249, Sep. 28, 1984, Pat. No. 4,590,834. This application Feb. 18, 1986, Ser. No. 830,359

Int. Cl.[4] B26D *3/02, 7/02*

U.S. Cl. 83—29 **4 Claims**



1. The method of simultaneously cutting differently sized picture framing openings in at least two overlying picture frame mats with a single cutting apparatus having a plurality of relatively spaced cutters comprising

arranging the picture frame mats in their desired position of display with the obverse side of each mat being toward the viewer and the reverse side of each mat toward the object to be displayed and the front mat closer to the viewer having a larger opening than the rear mat closer to the display object,

rearranging said mats to a cutting position by reversing the order of said mats and rotating the same so their reverse sides are toward the viewer,

cutting both of said mats while they are in said cutting position in a cutting operation with the single cutting apparatus to cut picture frame openings in each of the mats to produce in the mat closer to the viewer a picture frame opening that is larger than the picture frame opening produced in the mat farther from the viewer,

and returning said mats from said cutting position to said desired position of display.

4,631,998

MANDREL APPARATUS

Alexander Borzym, 7469 Pebble Point Dr., West Bloomfield, Mich. 48033

Filed Jul. 1, 1985, Ser. No. 750,470

Int. Cl.[4] B23D *21/00*

U.S. Cl. 83—145 **14 Claims**

1. A mandrel apparatus for use with a tube cutting machine of the type including a tube cutting station and feed means for

feeding the tubing to be cut incrementally along a feed axis to and through the cutting station, said mandrel apparatus being adapted to be positioned at the exit side of the cutting station and including:

A. a mandrel assembly comprising:

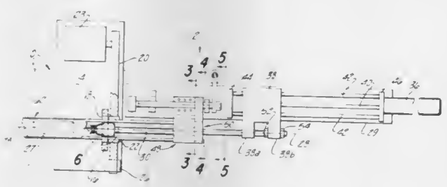
(1) a mandrel rod positioned along said feed axis, and

(2) plug means carried on the end of said rod nearest the cutting station and sized to fit within the tubing;

B. power means engaging the other end of said mandrel rod and operative to move said mandrel assembly along said axis between a cutting position in which said plug means is positioned at the cutting plane of the cutting station and a ready position in which the plug means is positioned down axis from the cutting station;

C. a stop member mounted for movement between:

(1) a stop position in which it is positioned across the tube path at a location along said feed axis between the ready position of said plug means and the cutting station, and



(2) a clear position in which it is clear of said path; and

D. a stripper member having a stripper surface positioned along said feed axis across said path down axis from said stop position of said stop member but no further down axis than said ready position of said plug assembly,

whereby the tubing may be advanced by the feed means along said axis from the cutting station into engagement at its leading edge with said stop member as said mandrel assembly is moved from its ready to its cutting position to position said plug means at the cutting plane and within the tubing whereafter, following cutting of the tubing and movement of said stop member to its clear position, said mandrel assembly may be moved toward its ready position to move the trailing edge of the cut tubing clear of the cutting station and move the leading edge of the cut tubing against said stripper surface and strip said cut tubing from said mandrel assembly as said mandrel assembly continues its movement to its ready position.

4,631,999

BOARD SAW

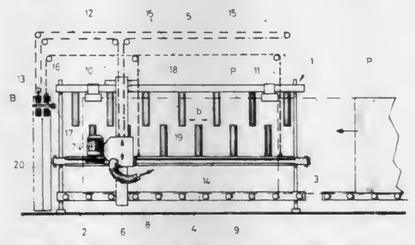
Ludwig Striebig, Lucerne, Switzerland, assignor to Striebig AG, Switzerland

Filed May 8, 1984, Ser. No. 608,344

Claims priority, application Switzerland, May 9, 1983, 2527/83

Int. Cl.⁴ B27B *5/06, 5/18*

U.S. Cl. 83—471.2 **6 Claims**



1. Apparatus for making horizontal and vertical cuts comprising: an upright frame; at least one motor-driven sawing unit supported by the upright frame displaceable in the vertical and horizontal direction; means for absorbing the weight of a board being cut by the sawing unit and for laterally displacing the board and parts cut from the board supported by a lower region of the frame; downwardly extending counterpressure means for absorbing the reaction forces in the board which occur during the sawing of the board supported by the frame; a vertically slidable support beam mounted on the upright frame and extending along the length of the frame for supporting the board during the displacement of the sawing unit in the horizontal direction; upwardly extending counterpressure means supported by the support beam for absorbing the reaction forces in the board; and means for coupling the vertical movement of the support beam with that of the sawing unit so that the horizontal cutting of the board always occurs in the region of support of the support beam.

4,632,000

CONTROL DEVICE FOR THE TRANSLATION AND DRIVING OF THE MOVABLE HEAD OF DIECUTTER MACHINES

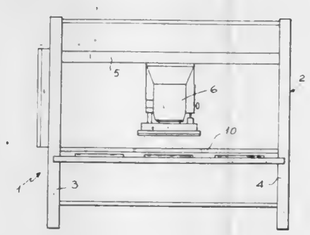
Emiliano Cantella, Vigevano, Italy, assignor to Atom S.p.A., Italy

Filed Apr. 25, 1985, Ser. No. 727,013

Claims priority, application Italy, May 7, 1984, 20828 A/84

Int. Cl.⁴ B26D *3/00, 7/26*

U.S. Cl. 83—534 **3 Claims**



1. A control device for controlling the translation and driving of a movable head of a die-cutting machine, which comprises:

a plurality of hand sensitive plate switches, the switches being operable in first and second operator selectable states, the die-cutting machine being responsive to the selected state of the switches wherein the state of the switches determine the translation and driving of the movable head; and

electronic circuit means for determining the execution of a desired operation by the movable head, the circuit means including a network of digital gates, the network being responsive to the state of the plate switches to effect movement of the movable head and operation of the die-cutting machine, the hand sensitive plate switches including a first switch for causing lateral translation of the movable head in one direction, and a second switch for causing lateral translation of the movable head in another direction opposite said one direction, the electronic circuit means being adapted to return the movable head to one of a starting position and a non-starting position upon completion of the die-cutting operation.

4,632,001

POLYPHONIC ELECTRONIC MUSICAL INSTRUMENT PERFORMING D/A CONVERSION OF TONE WAVESHAPE DATA

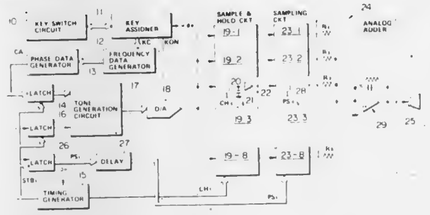
Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 17, 1984, Ser. No. 601,296

Claims priority, application Japan, Apr. 20, 1983, 58-68434

Int. Cl.⁴ G10H *1/18*

U.S. Cl. 84—1.01 **15 Claims**



1. An electronic musical instrument comprising:

a keyboard;

key assignment means for assigning a depressed key on said keyboard to one of a plurality of tone generation channels in time division at a first channel timing rate;

tone generation means for generating digital tone amplitude data in time division at a second channel timing rate for each of said channels;

digital to analog conversion means for separately converting said generated tones in time division into corresponding analog signals for each of said channels;

sample and hold means for sampling said analog signals for each of said channels at said second channel timing rate and holding each of the sampled signals for subsequent processing;

pitch synchronization means for sampling each of said analog signals held by said sample and hold means at a channel timing rate corresponding to the pitch of the depressed key associated with said sampled analog signal, and

wherein said second channel timing rate is slower than said first channel timing rate.

4,632,002

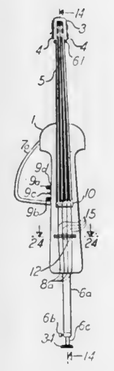
RIGIDLY CONSTRUCTED PORTABLE ELECTRIC DOUBLE BASS

Martin R. Clevinger, 5410 Telegraph Ave., Oakland, Calif. 94609

Filed Dec. 3, 1982, Ser. No. 446,557

Int. Cl.⁴ G10H *3/00*

U.S. Cl. 84—1.16 **20 Claims**



1. A string musical instrument of the bowable type having a plurality of strings which are spaced apart and generally parallel to one another, each string having a vibratile length, wherein vibration is substantially confined to the strings when the strings are set into motion by bowing or plucking them, wherein the instrument is played in an upright position with one end resting on the floor, the instrument comprising

a fingerboard which extends along a substantial portion of the strings so that different acoustical lengths of a selected string can be obtained when the selected string is "stopped" against the fingerboard at different points;

a substantially non-resonant body having rigidity to be resistant to the vibration imparted to a flexible bridge portion by the vibrating strings

wherein the body further includes a solid body portion for supporting the neck means and the pickup means and extension means which are pivotably mounted to the solid body portion and which are pivotable between a first and a second position for supporting the solid body portion with respect to the floor when in the first position, and which are folded against the solid body position when in the second position; and

neck means for supporting the fingerboard with respect to the strings and the body, wherein the neck means and the body are rigidly joined together over a substantial longitudinal distance, and further wherein the fingerboard extends along the entire neck means, so that substantially the entire length of the fingerboard is rigidly supported; and

pickup means supported in the vicinity of the strings and adjacent the body for transforming the string motion into electrical signals including means for substantially isolating the pickup means from the body;

wherein the vibration is confined substantially to the strings and flexible bridge so that the string motion is sustained for a maximum period of time following bowing or plucking of the strings.

4,632,003

MUSICAL INSTRUMENT SOUND QUALITY ENHANCEMENT DEVICE

William L. Kopp, 60 Miller Rd., New Oxford, Pa. 17350

Filed Jul. 15, 1985, Ser. No. 754,945

Int. Cl.⁴ G10D *1/08;* **G10G** *7/00;* **G10H** *3/18*

U.S. Cl. 84—1.16 **12 Claims**

1. A musical instrument sound quality enhancement device adapted to be detachably installed upon a musical instrument having a fret board mounted upon a hollow body disposing supportably therebetween a plurality of tensioned strings over a circular shaped sound hole opening in said hollow body and provided with an internally mounted acoustic electric pick-up head, comprising in combination said musical instrument, a circular shaped planer sound hole cover member having a topside planer surface and a parallelly spaced underside planer surface respectively with a circular dimension at least larger than that of said circular shaped sound hole opening to thereby provide a uniformily overlapping underside planer surface peripheral boundary adapted for supportable contact thereof about said circular shaped sound hole opening in said hollow body said underside surface being further provided with an integral pair of opposingly positioned underside set of spaced angularly outward and downward projecting pliable affixment fingers adapted to insertably engage said circular shaped sound hole opening and compressively conform by means of a resilient finger cam surface respectively provided upon each of said affixment fingers said underside planer surface peripheral boundary of said circular shaped planer sound hole cover member in sealable contact to said hollow body in which said circular shaped sound hole opening is disposed, and a semi-circular port opening provided in said circular shaped planer sound hole cover member said semi-circular port opening being adjustably occluded by means of a semi-circular pivot panel adapted to cooperatively rotate upon a pivot pintle in manually variable adjustment from a fully closed to a fully open position whereby in the fully closed position feedback

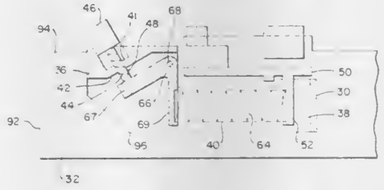
interference through said sound hole opening to said internally mounted acoustic electric pick-up head is eliminated and in a manually adjusted variably open to the fully open set position a corresponding variation in tonal character of said musical instrument is realized.

4,632,004

TREMOLO DEVICE FOR AN ELECTRIC GUITAR

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,743
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **20 Claims**



1. A tremelo device for a stringed instrument having a body, a neck, and a plurality of strings attached at first ends to the neck, which comprises:

base mounting plate means mounted on the body and having a rearward section, a forward section and an open center section, said base mounting plate means having a threaded aperture extending through said rearward section to said open center section, a spring adjusting threaded screw inserted in said threaded aperture and having an adjusting knob on one end and spring anchor means projecting into said open center section;

bridge plate means having a flange projecting therefrom into said open center section and a forward section having a pair of hinge pin receiving apertures formed therein;

pivot means for pivotally mounting said bridge plate means on said base mounting plate means, said pivot means including a pair of hinge posts extending from said base mounting plate means, each hinge post having an annular groove, and a pair of hinge pins seated in said hinge pin receiving apertures, each of said hinge pins having a projecting beveled edge; and

spring means for interconnecting said spring anchor means and said depending flange for urging said beveled edges of said hinge pins into said annular grooves in said hinge posts.

4,632,005

TREMOLO MECHANISM FOR AN ELECTRIC GUITAR

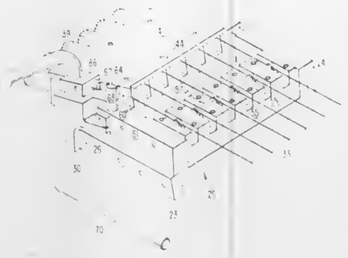
Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,501
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—313 **36 Claims**

1. A tremolo mechanism for adjusting the string tension in a stringed musical instrument, the instrument including a body, a neck portion, a plurality of strings each anchored at one end to said neck portion and extending over at least a portion of said neck portion and said body, the mechanism comprising:

a support attached to said body;

means pivotally mounted on said support for detuning said strings substantially evenly and for maintaining said strings in substantially the same pitch relative to each other when said detuning means is pivoted with respect to said support, including means for anchoring the other end of each said string, and pivot means having a pivot axis which is oblique with relation to a plane generally defined by said strings for simultaneously moving said strings by varying distances relative to each other when said detuning means is pivoted on said support; and



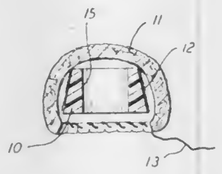
bridge means positioned between said detuning means and said neck.

4,632,006

REMOVABLE DRUMSTICK MALLET HEAD

Michael Ambroszewski, 41 Autumn St., E. Rochester, N.H. 03867

Filed Mar. 15, 1985, Ser. No. 712,550
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **5 Claims**



1. A combination drumstick comprising a drumstick having an enlarged handle end and a smaller end for hitting a drum, and a finger removable mallet head on said handle end comprising a hollow rubber truncated rubber cone resiliently engaging said handle end and a cover of a flexible soft sheet material drawn tightly over said rubber cone, the smaller top of said rubber cone being positioned against the inner central portion of said cover and said mallet head having a mushroom cap shape.

4,632,007

PAGE-TURNING DEVICE ASSEMBLED SUITABLY WITH ACTUATING MECHANISM

József Turcsány; Pál Gál, and István Borbás, all of Budapest, Hungary, assignors to Licencia Találmányokat Értékesitö Vállalat, Budapest, Hungary

Continuation of Ser. No. 445,297, Nov. 29, 1982, abandoned.
This application Jan. 15, 1985, Ser. No. 691,726
Claims priority, application Hungary, Nov. 27, 1981, 3555/81
Int. Cl.[4] G10G *7/00*
U.S. Cl. 84—487 **3 Claims**

1. A page turning device for turning pages of periodicals, newspapers, musical scores and the like, wherein the last page to be turned can be turned back to its original position, comprising:

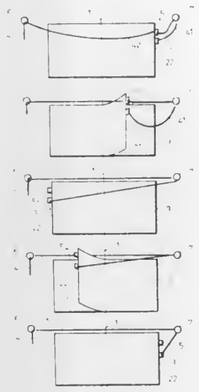
a stand for supporting said pages;

two eyelets fixed on said stand, one eyelet being located beside said pages on the turned-page side and the other eyelet being located beside said pages on the to-be-turned page side;

fastening elements releasably fixed to the side edges of the pages to be turned, said last page having two releasable fastening elements thereon whereas the remaining pages

to be turned have one releasable fastening element thereon;

a cord, one end of said core being connected to one of said two releasable fastening elements on said last page, said cord passing through said other eyelet and being connected to the other of said two releasable fastening ele-



ments on said last page, said cord being sequentially connected in reverse order to the pages preceding said last page to the first page to be turned, said cord then passing through said one eyelet; and

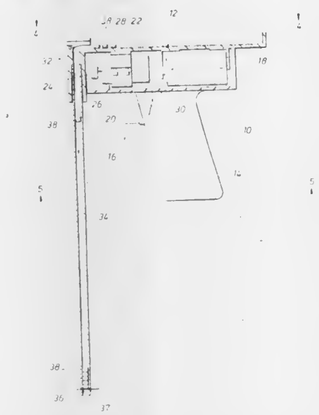
an actuating mechanism connected to the other end of said cord and operative to draw said cord through said eyelets toward said actuating mechanism.

4,632,008

METHOD AND APPARATUS TO FILL PRIMER FEED TUBES

Larry D. Horner, P.O. Box 1116, Seabrook, Tex. 77586

Filed Mar. 11, 1985, Ser. No. 710,595
Int. Cl.[4] F42B *33/00, 35/02, 33/10*
U.S. Cl. 86—24 **14 Claims**



1. An apparatus to orient and stack primers comprising:

(a) a hopper defined by a flat surface surrounded by an upstanding wall, said flat surface including a plurality of parallel slots formed in a portion thereof for facilitating the orientation of said primers in an upright position;

(b) handle means attached to said hopper enabling said apparatus to be held in one hand, said handle means including a frame and trigger;

(c) an adjustable gate including:

(i) a ramp for directing primers into an axial passageway extending through said gate;

(ii) stop means located above said ramp to prevent improperly oriented primers from entering said passageway;

(iii) deflector means for directing said primers into said passageway after leaving said ramp; and

(iv) chuck means for releasably receiving and gripping a primer tube and for positioning said tube in axial alignment with said passageway to receive said primers; and

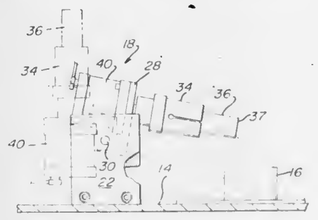
(d) vibrator means driven by an electric motor mounted in said frame and actuated by said trigger to agitate said primers on said hopper facilitating upright orientation of said primers and to speed passage of said primers into said tube.

4,632,009

APPARATUS FOR FEEDING POWDER

Thomas E. Dann, Parsons, Kans., assignor to Day & Zimmerman Inc., Philadelphia, Pa.

Filed Dec. 21, 1984, Ser. No. 684,831
Int. Cl.[4] F42B *33/02;* **B67D** *5/64;* **B65B** *21/02*
U.S. Cl. 86—31 **9 Claims**



5. Apparatus for feeding explosive powder to a receptacle comprising a tube opened at one end and closed at its other end, the inner surface of said tube being a smooth polished surface, means supporting said tube for pivotable movement between an upright position and a dispensing position, the longitudinal axis of said tube being generally horizontal in its dispensing position, a first fluid motor for oscillating said tube between said positions, a second fluid motor coupled to said tube to rotate the tube about its longitudinal axis repetitively in opposite directions when said tube is in its dispensing position for feeding powder from said open end of said tube, and a barricade within which said tube is supported on a wall thereof.

4,632,010

AIRBOC CHAFF DEPLOYMENT SYSTEM

Waymon Humphries, Beltsville, Md.; John Bryant, Woodbridge; Richard C. Eklund, Alexandria, both of Va.; Donald C. Hayes, Waldorf, and Peter Ferko, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1985, Ser. No. 718,399
Int. Cl.[4] F42B *13/04, 25/02*
U.S. Cl. 89—1.51 **8 Claims**

7. A method for detonating an AIRBOC comprising the steps of:

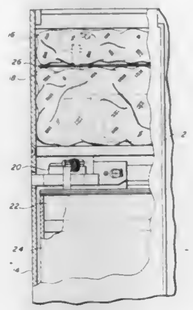
deploying a drogue chute;

delaying deployment of a main chute for a predetermined period of time;

deploying the main chute;

releasing a chaff payload from the AIRBOC when at least 40

lbs. of force are applied to a release mechanism in the AIRBOC by the main chute;



separating the chaff payload from the AIRBOC, detonating the chaff payload.

4,632,011

AUTOMATIC LOADER FOR AN ARMORED VEHICLE HAVING A ROTATABLE TURRET

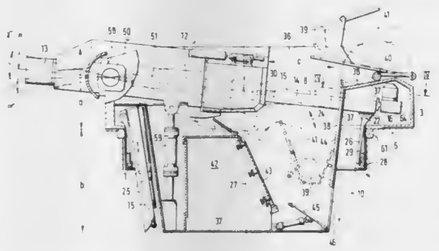
Josef Metz, Neuss; Manfred Pehker, Duesseldorf, and Erich Zielinski, Haan, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,677

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320241

Int. Cl.⁴ F41F *9/10*

U.S. Cl. 89—36.13 **4 Claims**



1. In an armored vehicle an improved automatic loader for transporting projectiles, said vehicle having a rotatable turret which has an upper most region visible from the outside, said projectiles being vertically stored in said vehicle and being movable in an endless circular band automatic magazine which is coaxial with respect to said turret and extends into said uppermost region to a position in the loading chamber of a large caliber weapon from which the projectile is slid into the gun barrel of the weapon by means of a rammer, the improvement comprising

(a) said endless band magazine is operatively mounted in said uppermost region in a trough of the armored vehicle which is disposed immediately below said uppermost region of the rotatable turret, said armored vehicle also includes a personnel chamber which is separated from said uppermost region and trough of said armored vehicle;

(b) a plurality of projectiles being stored in said magazine in a first vertical position, feeding means being operatively mounted in said armored vehicle to successively grasp projectiles stored in said magazine in said first position and transport them by means of a pivotal movement into a second loading position in said loading chamber;

said feeding means are pivotally mounted in said armored vehicle about a first horizontal shaft, and first driving means operatively connected to said feeding means for pivoting them about said first horizontal shaft;

(c) loading tray means operatively mounted in said armored vehicle, said feeding means operatively engaging said loading tray means which function also as partial ammunition containers for said magazine;

(d) a ring support is rotatably mounted in said armored vehicle, said loading tray means being operatively mounted on said ring support, the ring support is coaxial with respect to the turret axis and independently rotatable with respect thereto;

(e) said loading tray means are mounted equidistantly from each other along the circumferential periphery of said ring support; and

(f) said loading tray means are movable by said first driving means via said feeding means by being pivoted inwardly and upwardly toward the turret and ring support axis about a second support shaft from said first stored position directly into said second loading position.

4,632,012

FIRE CONTROL SYSTEM FOR MOVING WEAPON CARRIERS

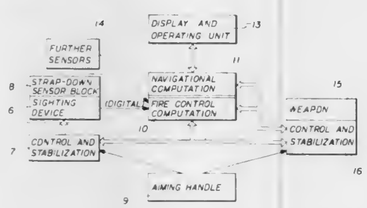
Christian Feige, Grafing, and Bertold Kirst, Merzhausen, both of Fed. Rep. of Germany, assignors to LITEF der Hellige GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,141

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332795

Int. Cl.⁴ F41G *5/16, 3/04*

U.S. Cl. 89—41.09 **4 Claims**



1. A fire control system for a moving weapon carrier of the type that includes a weapon and a sighting device comprising, in combination:

a. a single sensor apparatus for producing rotation and translation information in digital form, said apparatus being strapped down to said sighting device;

b. a digital computer for accepting said information, said computer being arranged to calculate and then to control a plurality of predetermined functions simultaneously, said plurality of functions including the primary stabilization of said sighting device and the secondary stabilization of said weapon;

c. means responsive to the output of said digital computer for stabilizing said sighting device; and

d. means responsive to the output of said digital computer for stabilizing said weapon.

4,632,013

RECIPROCATING PISTON FLUID POWERED MOTOR

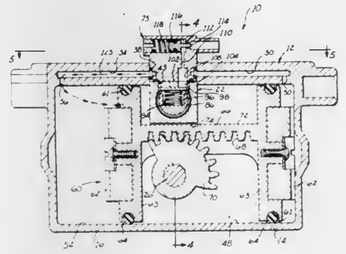
Richard Frigon, Michigan City, Ind., Alan K. Forsythe, Turkuala, Wash., assignors to Sprague Devices, Inc., Michigan City, Ind.

Filed Jun. 21, 1984, Ser. No. 623,080

Int. Cl.⁴ F01L *25/04*

U.S. Cl. 91—7 **7 Claims**

1. An oscillatory fluid powered motor including a motor housing formed of two similar cup-shaped parts secured together at their open ends to form an elongated bore, a piston unit having spaced piston heads slidable in said bore, a motor shaft journaled in said housing, drive transmission means connecting said motor shaft and said piston unit for rotationally driving the motor shaft in response to linear motion of the piston unit, said housing parts having complementary passages therein, a valve unit having a housing secured to and transverse of said motor housing bore, said valve housing having a bore, a valve spool slidable in said valve housing bore, said valve housing having passages communicating with said motor housing passages, the improvement comprising a manifold mounted on said valve housing and having a flat face, said manifold having passages formed therein communicating with said motor housing passages, said manifold having a fluid inlet



and a fluid outlet, a cavity formed in said valve housing for communication between said inlet and said valve housing bore, a valve slide mounted in and slidable with said valve spool and fitting within said cavity, said valve slide having a face in sliding contact with a face of said manifold, a face of said valve slide having a passage for selectively connecting said manifold and housing passages with said inlet and said outlet, said manifold passages being so arranged and communicating with said motor housing passages that said valve slide and said piston unit are caused to reciprocate in response to fluid pressure supplied at said inlet.

4,632,014

PNEUMATIC BOOSTER

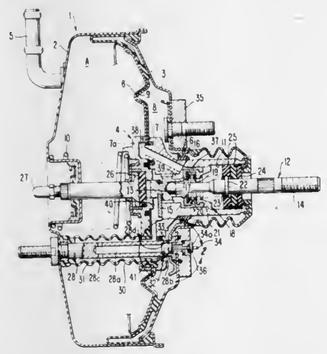
Mitsuhiro Endo, Kanagawa, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Apr. 17, 1985, Ser. No. 724,283

Claims priority, application Japan, Apr. 20, 1984, 59-58133[U]

Int. Cl.⁴ F15B *9/08*

U.S. Cl. 91—369 A **3 Claims**



1. A pneumatic booster comprising:

a casing having a front and a rear shell and a flexible diaphragm mounted between said shells and partitioning the interior of said casing into front and rear chambers;

means for permanently communicating said front chamber with a source of vacuum;

a power piston slidably mounted on said rear shell and further mounted on said flexible diaphragm;

an output rod connected to said power piston and extending through said front chamber to the outside of said booster;

an input rod slidably mounted on said power piston and extending rearward through said power piston;

a poppet valve mechanism mounted on said power piston;

passage means for connecting said poppet valve which said rear chamber, said poppet valve mechanism being operatively associated with said input rod for being operated by movement of said input rod to selectively connect said rear chamber with said front chamber or with atmospheric pressure;

a reinforcing rod means extending through said front and rear chambers and on which the power piston is slidably mounted, the opposite ends of said reinforcing rod being connected respectively to said front and rear shells, said reinforcing rod means having an axial bore therein forming a part of said passage means;

a cut-off valve in said bore in said reinforcing rod means for opening or closing said passage means; and

valve means operatively associated with said rear chamber for introducing atmospheric air from outside said booster into said rear chamber independently from said poppet valve mechanism.

4,632,015

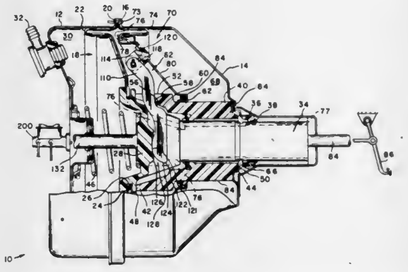
TANDEM BRAKE BOOSTER

Robert K. Wilson, Granger, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 29, 1984, Ser. No. 665,847

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—376 R **6 Claims**



1. In a tandem brake booster having first and second walls that move in opposite directions within a cavity to produce first and second output forces in response to an input force applied to a control member and a lever arrangement through which said second output force is presented to an output member and combined therein with said first output force to create a joint output force, the improvement comprising:

first and second arm means each of which has a first end connected to said second wall and a second end connected to said output member, each of said arm means having a first cam surface and a second cam surface;

a hub member having third and fourth cam surfaces thereon, each of the third and fourth cam surfaces having an apex located in a plane corresponding with the vertical center of output member, each of said third and fourth cam surfaces having symmetrical curved surfaces that extend from said apex; and

a cylindrical member having a first end and a second end, said first end having first and second slots that extend to fifth and sixth cam surfaces, respectively, on the cylindrical member, said fifth and sixth cam surfaces each having a curved surface thereon, said first arm means being located in said first slot and said second arm means being located in said second slot, said first cam surfaces on said

first and second arm means engaging said fifth and sixth cam surfaces, said second cam surfaces on said first and second arm means engaging said apex on said third and fourth cam surfaces, said second output force being transferred through said first and second arm means into said output member, said curved surface on said fifth and sixth cam surfaces modifying the lever ratio between said first and second ends of said first and second arm means thereof through which said second force is transmitted to said output member while said second cam surfaces on said first and second arm means engage said apex on said third and fourth cam surfaces to direct said second output force along a force vector substantially parallel to said output member to prevent the introduction of forces that may rotate said first wall and thereby reduce the effective value of the second output force.

4,632,016

APPARATUS FOR CONTROLLING AN ADJUSTABLE ARM

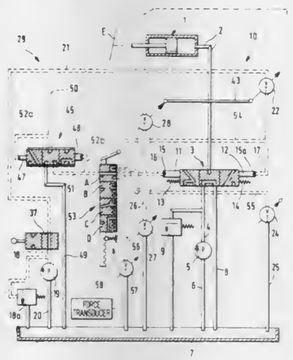
Heinz Schulte, Marktheidenfeld, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,380

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407781

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—461 **3 Claims**



1. An apparatus for controlling the position of an adjustable element and the forces applied thereto in response to command signals comprising the combination of

a source of fluid under pressure and a receiving tank;

an operating circuit including a bidirectionally operable multiple position valve for controlling the flow of pressurized fluid from said source to the adjustable element and first and second pressure responsive control devices for actuating said multiple position valve;

a control fluid circuit connected to operate said first and second devices, said control circuit including

first and second adjustable throttles connectable to said first control device, said first throttle being connected to said tank and said second being connected to said source, and

third and fourth adjustable throttles connected in series with each other between said tank and said pressure source, respectively, with the junction between said throttles connected to said second control device;

a pressure ratio valve connected to said pressure source and being connectable to said second control device;

a fifth adjustable throttle having one side connected directly to said tank;

a multi-port, multi-position main operating valve selectively positionable in accordance with the operational mode of the apparatus; and

means directly connecting different ones of the ports of said main operating valve respectively to said first throttle, said first and second control devices, the other side of said fifth throttle and said pressure ratio valve, the direct connections being constantly open for fluid flow.

4,632,017

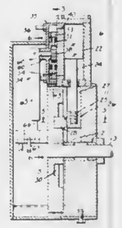
ENGINE

William S. Bokon, 6111 Geremander Ave., Rialto, Calif. 92376

Continuation of Ser. No. 419,349, Sep. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 188,826, Sep. 19, 1980, abandoned, which is a continuation of Ser. No. 945,683, Sep. 25, 1978, abandoned. This application Jul. 24, 1984, Ser. No. 633,456

Int. Cl.[4] F01B *1/06*

U.S. Cl. 91—481 **1 Claim**



1. An engine comprising:

a rotatable member;

means for supporting said member for rotation about an axis;

a cylinder extending outwardly from said axis;

a piston element reciprocal in said cylinder;

said member having a cam groove therein extending about said axis;

roller means movable by said piston element;

said roller means engaging in said groove;

a second cylinder extending outwardly from said axis;

a second piston element reciprocal in said second cylinder;

second roller means movable by said second piston element;

said second roller means engaging in said groove;

a third cylinder extending outwardly from said axis;

a third piston element reciprocal in said third cylinder;

third roller means movable by said third piston element;

said cylinders extending equiangularly about said axis;

fluid applying means for applying fluid under pressure to each of said cylinders whereby to move the piston element therein and cause said roller means movable by that piston element to rotate said member;

said fluid applying means comprising means for applying said fluid concurrently to a majority of said cylinders throughout each revolution of said member;

said fluid applying means further comprising means forming fluid intake ports communicating with the inner and outer ends of each of said cylinders;

means forming fluid exhaust ports communicating with said inner and outer ends of each of said cylinder;

a first valve element for each of said cylinders comprising a first slide valve slidable to cover one of said respective intake ports and uncover the other of said respective intake ports;

a second valve element for each of said cylinders comprising a second slide valve slidable to cover one of said respective exhaust ports and uncover the other of said exhaust ports;

a drive gear;

means operable by said member for rocking said drive gear;

means on one of said slide valve elements forming a rack gear meshing with said drive gear on one side of said drive gear; and

means on the other of said slide valve elements forming a second rack gear meshing with said drive gear on the opposite side of said drive gear whereby rocking of said drive gear causes movement of said slide valves in opposite directions.

4,632,018

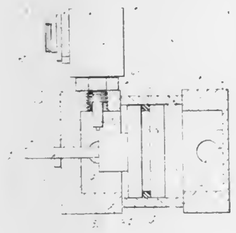
FLUID CYLINDER POSITION SENSOR MOUNTING APPARATUS

Robert K. Lymburner, 4075 Clinton River Dr., Clinton River Mobile Park, Mt. Clemens, Mich. 48043

Continuation of Ser. No. 500,460, Jun. 2, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,914

Int. Cl.[4] F01B *31/12*; G01L *7/00*

U.S. Cl. 92—5 R **6 Claims**



1. A position sensor mounting apparatus for attachment to a fluid operated, expansible cylinder of the type having a piston movably disposed within a chamber, and a threaded bore formed in the cylinder in communication with the chamber, the sensor mountable within the bore for detecting the position of the piston, the mounting apparatus comprising:

a housing having a first portion with an internal cavity and a second integral portion having a cross section smaller than the cross section of said first portion, a first annular shoulder formed between the first and second portions of the housing, a through bore formed in the second portion of the housing in communication with the cavity in the first portion, the through bore being adapted to receive and support the position sensor therein;

a coupling member including a first portion with a first cross section and a second integral portion having a second smaller cross section, an annular shoulder formed on the member between the first and second portions;

the coupling member having a bore formed therethrough for receiving the second portion of the housing and rotatably mounting the housing within the coupling member for free rotation within the coupling member without simultaneous longitudinal translation with respect to the coupling member;

a plurality of external threads formed on the second portion of the coupling member adapted to threadingly engage the threaded bore formed on the cylinder to fixedly mount the coupling member on the cylinder;

first seal means disposed between the coupling member and the cylinder for forming a fluid-tight seal therebetween; and

second seal means disposed between the coupling member and the housing to form a fluid-tight seal therebetween;

said second portion of said housing including an extension projecting past said plurality of external threads, a groove formed in said extension, a retaining ring snugly engaging said groove, said retaining ring abutting an end of said plurality of external threads; and

wherein said retaining ring prevents the separation of said coupling member from said housing while allowing free rotation of said housing relative to said coupling member, and when the plurality of threads are threadingly engaged in the threaded bore formed in the cylinder said retaining ring is hidden and cannot be removed, and the threaded bore on the cylinder positively retains said retaining ring against unintended removal.

4,632,019

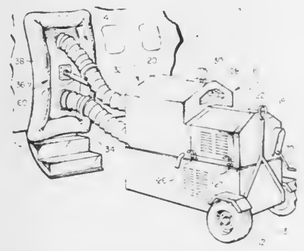
AIRPLANE AIRCONDITIONER

Gary D. Whiteman, 2630 Townsgate Rd., Westlake Village, Calif. 91361

Filed Nov. 28, 1984, Ser. No. 675,815

Int. Cl.[4] F24F *7/007*

U.S. Cl. 98—1 **6 Claims**



1. An aircraft pre-ventilation system comprising:

(a) a ventilator;

(b) fitting means spaced from the ventilator receivable in an opening of the aircraft;

(c) duct means extending between the ventilator and the fitting means for carrying air from the ventilator through the fitting means, through the aircraft opening and into the aircraft; and

(d) expandable expansion means connected to the fitting means, passage means communicating between the ventilator and the expansion means for carrying air from the ventilator into the expansion means to expand the expansion means against the opening in the aircraft to secure the fitting means to the opening in the aircraft.

4,632,020

AIR CONDITIONING SYSTEMS FOR A ROOM

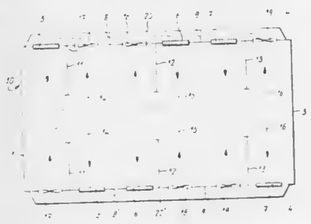
Gerke Houwer, Alphen a/d Rijn, Netherlands, assignor to Ingenieursbureau Macoma B.V., Middleburg, Netherlands

Filed Jun. 20, 1984, Ser. No. 622,448

Claims priority, application Netherlands, Jun. 21, 1983, 8302202

Int. Cl.[4] F24F *5/00*

U.S. Cl. 98—31.6 **24 Claims**



1. In a room of a building which can be employed for the cultivation of plants or to house animals, said room including walls, a floor and a ceiling and wherein an air conditioning system is provided to circulate air conditioned air therearound, the improvement wherein said air conditioning system includes at least two separation elements positioned in said room to extend in a vertical direction, each of said separation elements having opposite faces and opposite side edges, at

least one of said opposite side edges being spaced from the walls of said room, each of said separation elements forming a guide for air passing thereby, and

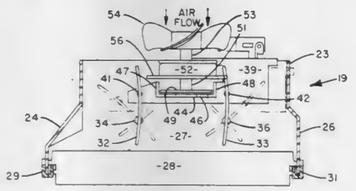
an air conditioning unit and a fan means respectively positioned adjacent the opposite faces of each of said separation elements, the air conditioning unit and fan associated with each separation element creating a horizontal flow of conditioned air around each separation element, the air conditioning unit and fan associated with each separation element being located such that adjacent air flows moving around adjacent separation elements move in parallel to one another..

4,632,021

AUTO-SET OSCILLATING LOUVER DESIGN

Theodore S. Bolton, Liverpool, and Robert J. Whitwell, Nedrow, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 30, 1985, Ser. No. 771,085
Int. Cl.[4] F24F *13/15*
U.S. Cl. 98—40.3 **9 Claims**



1. An improved air flow directing apparatus for an air conditioning system of the type having an air discharge opening with pivotable vanes mounted therein for directing the flow of discharge air into an adjacent space comprising:

vane pivoting means for pivoting the vanes in reciprocating fashion through a defined angle;

means including a preselector element for preselecfing a fixed angular orientation for the vanes by adjusting, independently of the position of the vanes at the time, the position of said preselector element to a position representative of said preselected orientation; and

stop means responsive to said preselecting means for automatically stopping the pivoting of the vanes when they subsequently arrive at said preselected fixed singular orientation.

4,632,022

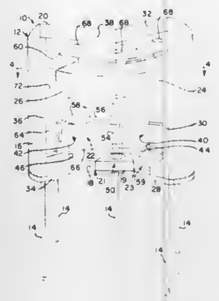
FUME HOOD FABRICATED FROM MODULES AND HAVING LATERALLY EXTENDING EXHAUST PORTS

William E. Baitinger, West Lafayette, Ind., and G. Thomas Saunders, Geneva, Ill., assignors to St. Charles Manufacturing Co., St. Charles, Ill.

Filed Feb. 25, 1985, Ser. No. 705,072
Int. Cl.[4] B08B *15/02*
U.S. Cl. 98—115.3 **18 Claims**

1. A fume hood for containing chemical reactions and exhausting undesired produced reaction gases and air contained therein, the fume hood comprising:

a plurality of like modules joined together in side by side abutment, each module having upstanding inner and outer back walls, a base and a top wall, the base and top wall extending inwardly from the back wall in coincidence respectively below and above one another, said inner and outer back walls defining a passageway coextensive with said outer back wall, the plurality of modules defining a chamber closed by said top walls, bases and back walls



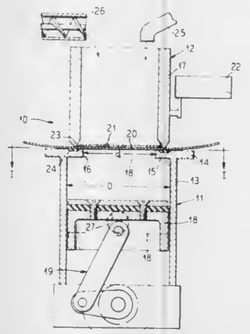
with said passageway defining exhaust means for exhausting said reaction gases and air from said chamber.

4,632,023

COFFEE BREWER

Alan M. King, 1750 The Boulevard, Montreal (Westmont), Canada

Filed Apr. 12, 1984, Ser. No. 599,712
Int. Cl.[4] A47J *31/32*
U.S. Cl. 99—302 P **5 Claims**



1. A beverage brewing machine, comprising in combination:

(a) an upper brewing chamber adapted to receive and hold hot water and a beverage material, and having an open lower end, said chamber having an internal height exceeding its transverse size;

(b) a filter normally closing said lower end and having such porosity as to conduct fluids, but not solids of said beverage material;

(c) a lower second chamber having an open upper end normally in registration with said open lower end, said chambers normally releaseably clamping said filter therebetween, said second chamber having a transverse size greater than said transverse size of said upper chamber; and

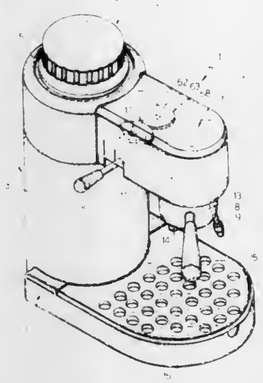
(d) a reciprocable piston in said second chamber for forcing air through said filter into said brewing chamber, and for withdrawing brewed beverage through said filter, said piston having an end surface area greater than that of said open upper end of said lower second chamber overlaid by said filter, said open upper end of said lower second chamber having a transverse size less than each of said transverse sizes of said upper and lower chambers.

4,632,024

COFFEE MACHINE

Virgino Cortese, Turin, Italy, assignor to Essegielle S.r.l., Turin, Italy

Filed Dec. 5, 1985, Ser. No. 806,250
Claims priority, application Italy, Sep. 23, 1985, 53835/85[U]
Int. Cl.[4] A47J *31/54*
U.S. Cl. 99—293 **9 Claims**



1. Coffee machine comprising a boiler, a heating source connected to the said boiler, a first outlet pipe extending from a bottom portion of the said boiler, a second outlet pipe extending from a top portion of the said boiler, a steam supply nozzle, a removable filtering cup containing sufficient ground coffee for producing at least one cup of drinking coffee, and a distributor located, on one side, between the said first and second pipes, and, on the other, between the said steam supply nozzle and the said filtering cup, characterised by the fact that the said distributor comprises a distribution chamber having a first and second inlet communicating with the said first and second pipes, and at least one first and second outlet communicating respectively with the said filtering cup and the said nozzle; and selecting means housed in mobile manner inside the said chamber for selectively assuming at least two distinct operating positions, in the first of which, the said first inlet communicates with the said first outlet, and in the second of which, the said second inlet communicates with the said second outlet; the size of the said boiler being such as to hold enough water for making at least twice the number of cups catered for by the ground coffee contained inside the said filtering cup.

4,632,025

STEAM PEELING APPARATUS

Peter W. C. van der Schoot, Groot-Ammers, Netherlands, assignor to Goudsche Machinefabriek B.V., CA Gouda, Netherlands

Filed Nov. 6, 1985, Ser. No. 795,389
Claims priority, application Netherlands, Nov. 13, 1984, 8403463
Int. Cl.[4] A23N *7/00*
U.S. Cl. 99—348 **4 Claims**

1. A steam peeling or cooking apparatus for produce or pulp, comprising:

a substantially cylindrical peeling vessel having a longitudinal axis and stationary during use with the longitudinal axis tilted, with respect to the vertical;

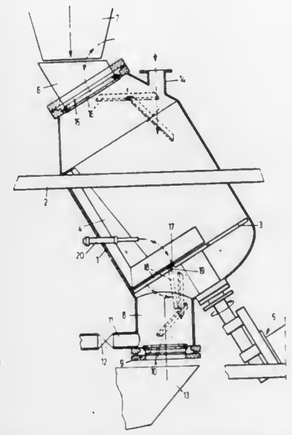
a grid fixedly disposed in the vessel and wherein the grid divides the vessel into a produce chamber and a condensate chamber,

at least one stirring arm disposed on one side of the grid facing the produce chamber and rotatable about the longitudinal axis,

a closable supply opening in the produce chamber receptive of product,

a steam supply and discharge opening in the produce chamber,

means forming a closable produce discharge opening in the grid in the lowest point thereof and including a valve



movable downwardly into the condensate chamber about an axis parallel to the plane of the grid,

means forming a closable discharge opening in the condensate chamber of the vessel vertically aligned with the produce discharge opening in the grid,

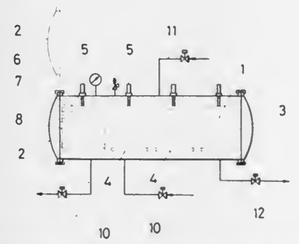
whereby condensate and produce are discharged from the vessel without the need for tilting or rotating the vessel.

4,632,026

TRAY PRESSING DEVICE IN A RETORT STERILIZER FOR COOKING FOODS

Tsutomu Yamamoto, Nara; Toshinori Murakami, Osaka; Yoshiaki Tokuda, Kyoto, and Tamio Nagai, Osaka, all of Japan, assignors to Hisaka Works, Ltd., Osaka and House Food Industrial Co. Ltd., Higashi, both of, Japan

Filed May 2, 1984, Ser. No. 606,392
Claims priority, application Japan, May 10, 1983, 58-70289
Int. Cl.[4] A47J *27/18*
U.S. Cl. 99—349 **1 Claim**



1. In a stationary retort sterilizer comprising a conveyor positioned toward a bottom of said sterilizer, a plurality of stacks horizontally disposed at predetermined positions on said conveyor in said sterilizer, said conveyor moving said stacks in and out of said sterilizer, each of said stacks comprising a plurality of vertically stacked trays, said trays each comprising a frame useable for stacking one tray on another and a tray surface for carrying pouched food or other food to be processed; the improvement comprising

a plurality of driving means disposed on said sterilizer;

air pressure means disposed outside of said sterilizer and connected to said plurality of driving means;

a plurality of perforated pressing plates, each positioned inside said sterilizer and within said frame of the uppermost tray of each stack, said perforations enabling circulation of sterilizing atmosphere to the food carried on the uppermost tray;

a plurality of shafts, each connecting a respective driving means to a respective pressing plate;

a pair of telescoping rods associated with each pressing plate, said pair being disposed on either side of each shaft, and having one end connected to said inside of said sterilizer and another end connected to said respective pressing plate;

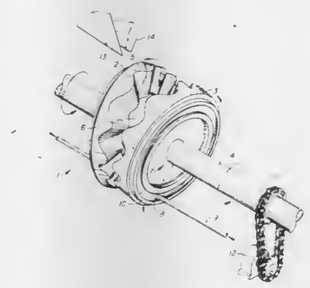
means for allowing said pressing plate to selectively and individually move downward under force of gravity to press downward the uppermost tray and cause said uppermost tray to apply downward pressure on the frames of the lower trays or on the food contained on the tray surfaces of the lower trays; and

means for causing said air pressure to be selectively applied to said plurality of driving means, thereby to selectively and individually move upward said pressing plates.

4,632,027
APPARATUS AND METHOD FOR COMPRESSING PLIABLE ARTICLES

Robert E. Gunnerson, Manteca, Calif., assignor to Sunsweet Growers, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 540,572, Oct. 7, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,062
Int. Cl.⁴ A23P *1/00*
U.S. Cl. 99—485 **4 Claims**



1. Apparatus for compressing a pitted prune along its longest dimension, comprising:

a pair of disks arranged in a substantially vertical V-shaped configuration, the opposing surfaces of said disks forming at least one pair of opposing recesses to accommodate said pitted prune,

means for rotating said disks about their centers at the same rate and in the same direction while maintaining said substantially vertical V-shaped configuration,

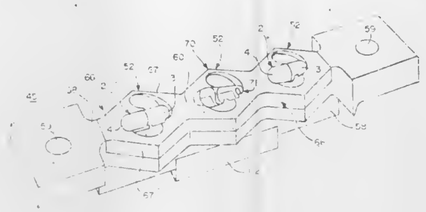
means for feeding said pitted prune into the space between said recesses at the point in the rotation where said recesses are located at the widest portion of said V and with said longest dimension parallel to the line connecting the centers of said disks, and

a flexible membrane connecting said disks and spanning the space between said recesses to define a pocket opening toward the rims of said disks, said membrane being sufficiently taut to maintain the orientation of said pitted prune as said disks rotate.

4,632,028
APPARATUS FOR ORIENTING AND PRINTING CAPSULES

E. Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057

Filed Nov. 20, 1984, Ser. No. 673,482
Int. Cl.⁴ B65G *47/24*; B41F *17/36*
U.S. Cl. 101—40 **50 Claims**



1. An apparatus for presenting a plurality of articles to a printing apparatus, comprising:

(a) a feed hopper for receiving said articles in random orientation;

(b) rectification means for receiving said articles from said feed hopper and for delivering said articles from said rectification means in a uniform orientation; and

(c) carrier means having a pocket formed in a surface thereof, for receiving uniformly oriented articles from said rectification means and for realigning said articles for presentation to said printing apparatus, wherein said pocket comprises:

(1) a pair of elongated recesses formed at an angle to one another and each lying in a plane generally parallel with the surface of said carrier means, each of said recesses being configured to receive one of said articles, wherein a first of said recesses is oriented so as to receive an article from said rectification means and a second of said recesses is oriented so as to present said article to said printing apparatus; and

(2) sloping surfaces connecting said pair of recesses so that an article received in said first recess is caused to be transported upon said sloping surfaces to said second recess as said carrier means progresses to said printing apparatus.

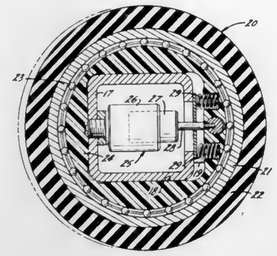
4,632,029
INKING MECHANISM FOR LETTERPRESS AND OFFSET PRINTING MACHINES

Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,257
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324448
Int. Cl.⁴ B41F *31/26, 31/14*; B41L *27/16*
U.S. Cl. 101—348 **3 Claims**

1. An inking mechanism for letterpress and offset printing machines comprising a vibrator consisting of a square, stationary carrier tube and a plurality of discs which are disposed side-by-side without gaps on said carrier tube and the width of each disc corresponds to a specific inking zone, each disc consisting of a middle part mounted movably on said carrier tube between extreme positions eccentric to the center of said carrier tube and having a circular outer periphery, and an outer ring rotatably mounted on said circular outer periphery of said middle part and having a covering, means for sealing the sides of adjacent discs, and electromagnet means disposed within said carrier tube for each disc, said electromagnet means having a plunger secured to a transverse rod disposed inside said middle part and guided rectilinearly in said carrier tube for driving the middle part on the stationary carrier tube between

said extreme eccentric positions whereby each said disc is movable individually and independently of the other discs

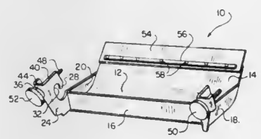


between a duct roller and a transfer roller according to the motion of the middle part on the stationary carrier tube.

4,632,030
PRINTING PRESS WASHER

William J. Laverick, Chula Vista, Calif., assignor to Wizer Equipment, Inc., National City, Calif.

Filed Apr. 1, 1985, Ser. No. 718,238
Int. Cl.⁴ B41L *41/06*; B41F *35/06*
U.S. Cl. 101—425 **3 Claims**



1. A cleaning device for attachment to a lithographic type printing press for cleaning ink from the rollers of the printing press, comprising:

an elongated open top trough defined by a generally rectangular bottom, a pair of generally parallel extending walls defining a forward wall and a rear wall respectively, and a pair of parallel end walls extending upwardly from said bottom;

said forward wall extending above said end walls upward and forward at about a forty-five degree angle to said bottom and having a top edge, and a generally flat rectangular resilient wiper blade mounted thereon and extending upward from said top edge thereof for wiping engagement with an ink roller;

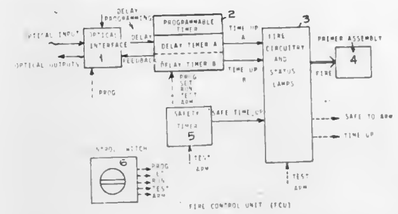
a pair of support brackets, one at each end of said trough, each bracket comprising an arm extending upward from one of said end walls and including hook means extending forwardly and down from said arm for hooking over and detachably hanging said trough to a tie bar of a printing press, each bracket including an outwardly extending portion overlapping a vertical edge of a side wall of a printing press frame; and

an adjusting screw mounted in the outwardly extending portion of each of said brackets above said hook means for engaging a vertical edge of a side wall of said printing press frame for adjusting said wiping blade into engagement with the lower oscillating ink roller of said printing press.

4,632,031
PROGRAMMABLE ELECTRONIC DELAY FUSE

Kenneth N. Jarrott, Royston Park, and Eric J. Parker, Vista, both of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

Filed Dec. 11, 1984, Ser. No. 689,057
Int. Cl.⁴ F42C *11/06*
U.S. Cl. 102—200 **10 Claims**



1. A programmable electronic delay fuse for initiating a firing after a programmed and accurate delay time has been chosen, characterised by:

(a) a fire control unit (FCU) with means to actuate firing means such as a pyrotechnic actuator or an electric detonator,

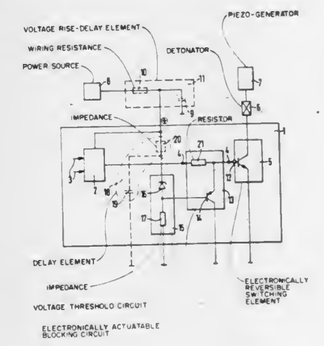
(b) a programming unit (PU) separate therefrom having means to program and test the said fire control unit (FCU), and

(c) optical coupling interface means on the said fire control unit (FU) and the said programming unit (PU) coupled to firing and status means on the said fire control unit (FCU) with command and test means on the said programming unit.

4,632,032
ELECTRONIC IGNITION CONTROL CIRCUIT

Udo Müller, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co, Nuremberg, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,924
Int. Cl.⁴ F42C *11/00*
U.S. Cl. 102—206 **5 Claims**



1. In an electronic ignition control circuit including a logic circuit powered by a power supply source for obtaining an ignition signal from a combination of ignition sensor signals; an electrical detonator means; and a switching element electronically switched by the ignition signal for clearing said detonator means; the improvement comprising: an electronically actuatable blocking circuit section connected ahead of a control input of said switching element; said blocking circuit section including a self-conductive shunt element connected in parallel with the control input of the switching element; and a rated

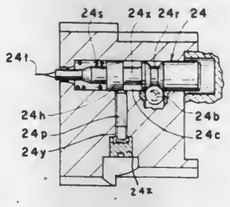
voltage-threshold circuit for blocking the control input from the power supply source.

4,632,033

DETONATOR FOR RIFLE GRENADES OR THE LIKE

Tsvi J. Gordon; Sorek Shmuel, and David Moseinco, all of Jerusalem, Israel, assignors to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

Filed Jun. 11, 1984, Ser. No. 619,358
Int. Cl.[4] F42C *15/02, 15/22*
U.S. Cl. 102—252 **3 Claims**



1. In a fuze included in an assembly of the type used in connection with a rifle to launch and carry the assembly together with explosives to a target whereat the explosives explode as a result of the striking of detonator means by a striker of the fuze which in the armed state is biased by a spring away from the detonator means and which as a result of the impact with a target is urged forward against the detonator means to thus initiate the detonation of the explosives, an improvement comprising:

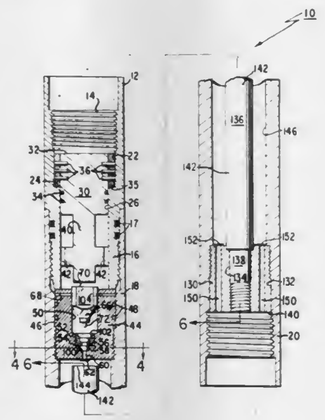
means for locking said striker once it has moved to a forward position irrespective of the presence or absence of detonator means ahead of it to prevent successive positioning of the striker in the forward position.

4,632,034

REDUNDANT DETONATION INITIATORS FOR USE IN WELLS AND METHOD OF USE

Edward A. Colle, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 8, 1984, Ser. No. 587,340
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—312 **8 Claims**



1. A method of firing a perforating gun having perforating charges therein, said perforating gun having perforating charges therein and being suspended from a tubing string in a well bore extending from the surface of the earth, the method comprising the steps of:

providing a weight actuated firing device on one end of the perforating gun;

providing a pressure actuated firing device on the other end of the perforating gun; and

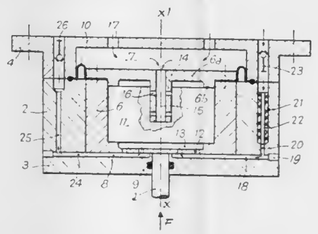
dropping a weight through said tubing string to impact the weight actuated firing device to actuate the firing device to cause the actuation of the perforating charges in said perforating gun.

4,632,035

ARMING METHOD AND DEVICES FOR FIRING A SUBMARINE WEAPON

Fernand M. Maillet, Saint-Tropez, France, assignor to Etat Francais represente par le Delegue General pour l'Armement, Paris Armees, France

Filed Dec. 5, 1984, Ser. No. 678,402
Claims priority, application France, Dec. 27, 1983, 83 20815
Int. Cl.[4] F42C *15/10, 15/32*
U.S. Cl. 102—420 **7 Claims**



1. A method for firing of an explosive load borne by a submarine weapon, comprising: exerting a differential pressure on a piston to shift said piston inside a cylindrical body to activate a bistable arming organ, wherein said cylindrical body is separated into a first chamber and a second chamber by said piston and wherein said first chamber is filled with sea water and said second chamber is filled with an aqueous sodium chloride solution having a different salt concentration than said sea water, whereby said differential pressure is created by osmotic pressure between said sea water and said aqueous sodium chloride solution.

4,632,036

SHAPED CHARGE

Konrad Ringel, Leinburg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,734
Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416467
Int. Cl.[4] F42B *11/22*
U.S. Cl. 102—476 **3 Claims**



1. In a shaped charge including plane side surfaces; a booster charge arranged above a main explosive charge, said booster charge extending in the longitudinal direction between the side surfaces of said shaped charge; the improvement comprising: a detonation transmitter being positioned on at least one end of the booster charge, said detonation transmitter having the direction of action thereof oriented as an extension of the longitudinal direction of the booster charge, said detonation transmitter comprising a metallic insert configured to form a projectile upon the detonation of the booster charge, and said insert being concavely curved at the side facing away from the booster charge.

4,632,037

MOBLE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 15, 1984, Ser. No. 610,343
Claims priority, application Austria, Aug. 19, 1983; 2970/83
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] E01B *27/17*
U.S. Cl. 104—7.2 **17 Claims**





1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast, which comprises

(a) a heavy main frame supported on undercarriages for continuous movement in an operating direction,

(b) a power plant and operating control means including a first motion-effecting means consisting of drive means for continuously advancing the main frame along the track in the operating direction and brake means for stopping the advance of the main frame, the power plant and the control means being carried by the min frame and at least one of the motion-effecting means being arranged to operate on at least one of the undercarriages,

(c) a lighter subframe means pivotally and longitudinally adjustably connected to the heavy main frame,

(1) the subframe means having a rear end, in the operating direction,

(d) tamping means mounted on the subframe means for tamping ballast in intermittent tamping cycles under respective ones of the ties at pointe of intersection of the two rails and the respective ties,

(e) track lifting and lining means associated with the two rails mounted on the subframe means ahead of the tamping means in the operating direction and being arranged on the subframe means between two undercarriages spaced in the direction of the track, at least one of said undercarriages wherebetween the tamping and track lifting and lining means are arranged being a further undercarriage supporting the subframe means on the track at the rear end thereof, the tamping means and track lifting and lining means being arranged adjacent the rear end,

(f) an operator's cab mounted on the main machine frame within the range of the further undercarriage and the tamping means and the track lifting and lining means being within visual sight of the operator's cab,

(g) track leveling and lining reference systems associated with the track lifting and lining means, and

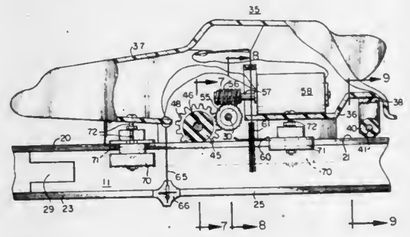
(h) a stop-and-go advancement effecting means for the subframe means tamping cycles, and arranged to operate on the further undercarriage, the stop-and-go advancement effecting means comprising at least one further motion-effecting means consisting of a drive means and a brake means.

4,632,038

MONORAIL VEHICULAR SYSTEM

David L. Lawrence, 831 W. Gillam Ave., Langhorne, Pa. 19047

Filed Apr. 30, 1984, Ser. No. 605,591
Int. Cl.[4] B61B *13/06;* **E01B** *25/08;* **B61C** *13/08*
U.S. Cl. 104—120 **4 Claims**



1. A monorail vehicular system for transporting vehicles on a track assembly, which is spaced above a supporting surface, the improvement which comprises

a track assembly having a metal top rail with a contact surface,

a rectanguarly shaped central panel of electrically insulating material to which said top rail is secured,

a lower metal rail secured to said central panel at the bottom thereof and having contact faces on each side,

a plurality of clips engaged with said lower rail and with bars carried on upright posts to support said rail from below,

said vehicle having a frame which is disposed above and along said top rail,

an idler roller at the rear of said vehicle rotatable mounted to said frame in contact with said top rail contact surface, of greater width than said rail and of substantially the same width as said frame,

a driving roller mounted to said frame in contact with said contact surface of said top rail, and of substantially the same width as said idler roller,

said idler roller and said driving roller being formed of electrically insulating material,

at least one pair of horizontally disposed, vertically spaced, stabilizing wheels mounted on vertical shafts secured to said frame at the front of said vehicle, and engaging opposite vertical side faces of said central panel, and

at least one pair of horizontally disposed, vertically spaced, stabilizing wheels mounted on vertical shafts secured to said frame at the rear of said vehicle, and engaging opposite vertical side faces of said central panel.

4,632,039

GUIDED CENTRAL GANTRY FOR RAILROAD PASSOVER PROTECTION

Wolfgang Küker, and Heinz Findeklee, both of Salzgitter, Fed. Rep. of Germany, assignors to Linke-Hofmann-Busch GmbH, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,058
Int. Cl.[4] B61D *17/22, 17/14, 17/02*
U.S. Cl. 105—801 **13 Claims**

1. A guided central gantry arrangement for a passover between two vehicles that are articulatedly connected to each

other and which have facing end surfaces and outer contours at their sides and top, comprising:

a pair of mirror symmetrical gantry parts each extending around the sides and top of the passover for closing the passover, each gantry part having an adapter frame with an outer contour which is parallel to and even with the outer contour of the vehicles when the vehicles are in a straight line relationship with each other;

connecting means connected between each gantry part and one of the vehicles for mounting each gantry part to its respective vehicle for lateral displacement;

a pair of first elastic peripherally sealing hollow sections, each first hollow section engaged between one of said adapter frames and one of the vehicle end surfaces;



a coupling frame mounted for relative movement to and between said adapter frames in a direction parallel to the straight line direction of the vehicles;

a pair of second elastic peripherally sealing hollow sections, each second hollow section being connected between one of said adapter frames and said coupling frame;

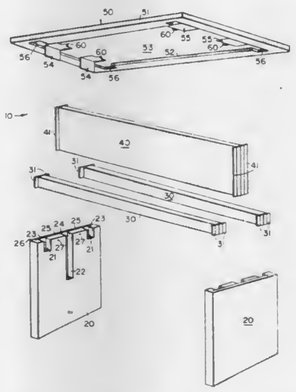
said first and second hollow sections each extending around the sides and top of the passover, said first hollow section being structured for a relatively small amount of movement between said adapter frames and the vehicle end faces for establishing a strong seal with respect to an outside of the passover between said adapter frames and the vehicles, said second hollow sections being structured for a relatively large amount of movement between said coupling frame and said adapter frames.

4,632,040

EXECUTIVE DESK WITH LOCKING FLAPS

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Jan. 27, 1986, Ser. No. 822,791
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—157 **9 Claims**



1. An executive desk kit assembly wherein said kit comprises:

pedestal means (**20**) being fabricated of a multiple layer corrugated fiberboard material,

said pedestal means (**20**) having a plurality of vertical groove means (**21, 22**) factory formed therein,

said pedestal means (**20**) further having a plurality of open slot means (**23, 24, 25**) formed at a top surface thereof,

wherein said executive desk kit further includes pedestal stabilizer means (**30, 40**), said pedestal stabilizer means having flap means (**31, 41**) formed at the ends thereof for slidable receipt into the slot means (**23, 24**) of the pedestal means (**20**) whereby the body portion of said pedestal stabilizer means (**30, 40**) is received in the vertical groove means (**21, 22**),

said executive desk kit further including a top means (**50**), said top means (**50**) being comprised of multiple factory pre-cut layers of corrugated fiberboard,

wherein at least one lower layer of said top means (**50**) has recessed area portions (**53, 56**) factory formed therein for fitting securely onto the lower desk base formed by said pedestal means (**20**) and said pedestal stabilizer means (**30, 40**),

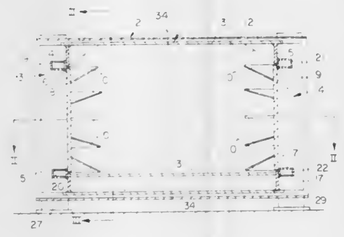
wherein one layer of said top means (**50**) has flap means (**54**) formed therein for folding into position for receipt by said slot means (**25**) of said pedestal means (**20**).

4,632,041

BLASTING CHAMBER

Johnny Ohlson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 19, 1984, Ser. No. 662,749
Int. Cl.[4] E05G *3/00;* **E06B** *9/00*
U.S. Cl. 109—1 S **9 Claims**



1. Apparatus for containing high pressure and fragments produced by an explosion comprising:

an inner chamber comprising a sheet steel cylindrical side wall and sheet steel end walls;

an outer jacket comprising an open-ended sheet steel cylindrical shell surrounding and spaced from said cylindrical side wall of said chamber; and

means for transmitting pressure loads from said end walls of said chamber to said cylindrical shell of said jacket.

4,632,042

INCINERATOR FOR THE HIGH SPEED COMBUSTION OF WASTE PRODUCTS

Shien F. Chang, 350 Fifth Ave., Suite 2822, New York, N.Y. 10118

Filed Oct. 30, 1985, Ser. No. 792,967
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—243 **17 Claims**

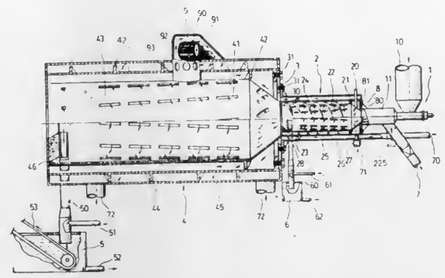
1. A high speed combustion incinerator comprising:

a burner which includes a fuel tank, a mixer, and a controller for controlling the amount of the fuel and the air flow;

a burner furnace;

an incinerator means which includes mainly an outer pipe, an intermediate pipe, and an inner pipe which are all of transverse cylindrical shape, wherein a neck portion on the right side of the inner pipe is of a truncated conical shape and is connected to the burning furnace;

a preheating chamber located on the outer pipe of the incinerator means; and



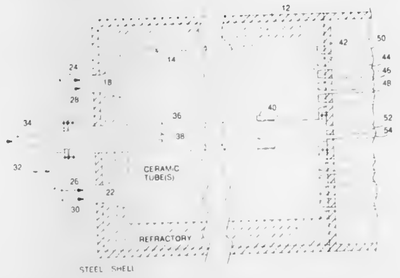
a conveyer located in the preheating chamber for conveying waste product to be burned into the incinerator means.

4,632,043

METHOD OF TREATING LOW-QUALITY ACID GAS AND FURNACE THEREFOR

Paul T. Pendergraft, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Jan. 9, 1985, Ser. No. 690,004
Int. Cl.[4] F23G *7/00*
U.S. Cl. 110—345 **12 Claims**



1. A method of maintaining reaction temperature in a Claus reaction furnace where an oxidant is reacted with a hydrogen sulfide containing gas containing a low hydrogen sulfide content comprising:

providing said furnace with primary and secondary reaction zones in heat exchange relationship;

passing said oxidant and said hydrogen sulfide containing gas to said primary reaction zone wherein said oxidant is reacted with said hydrogen sulfide containing gas;

passing fuel selected from the group consisting of hydrocarbons, hydrogen, and carbon monoxide, and mixtures thereof and oxidant to said secondary reaction zone wherein combustion takes place;

maintaining separate the reaction products of the primary and secondary reaction zones; and

recovering sulfur from the thus-maintained separate effluent from said primary reaction zone;

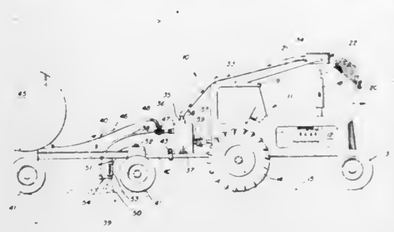
the heat of combustion in said secondary reaction zone raising the temperature of the gases in said primary reaction zone sufficiently to maintain stable oxidation conditions in said primary reaction zone.

4,632,044

MOBILE FERTILIZER DISTRIBUTOR

Sebree J. Allen, Rte. 2, Kevil, Ky. 42053

Filed Jan. 14, 1985, Ser. No. 691,429
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—7 **9 Claims**



1. A method of continuously fertilizing the soil, comprising the steps of:

(a) continuously collecting the hot gaseous products of combustion from the exhaust of an internal combustion engine of a motor vehicle moving over soil to be fertilized, in a collection chamber spaced from the exhaust of the internal combustion engine,

(b) collecting air from the ambient atmosphere in said chamber, and mixing said air with said hot gaseous products of combustion in said chamber to form a hot gaseous mixture,

(c) drawing said hot gaseous mixture from said collection chamber to a compressing station on said motor vehicle,

(d) subsequently compressing said hot gaseous mixture in said compressing station to concentrate, and to supply auxiliary heat to, said hot gaseous mixture, and

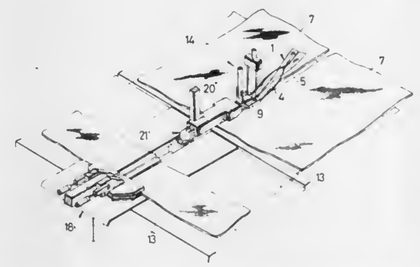
(e) continuously impregnating the soil over which said motor vehicle moves with said concentrated hot gaseous mixture from said compressing station.

4,632,045

SLIDER-MOVING UNIT IN APPARATUS FOR SEWING A SLIDE FASTENER TO A PAIR OF FABRIC PIECES

Hiroshi Yoshioka, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,602
Claims priority, application Japan, Mar. 8, 1985, 60-46118
Int. Cl.[4] D05B *3/12, 23/00*
U.S. Cl. 112—104 **2 Claims**



1. In an apparatus for sewing a slide fastener to a pair of fabric pieces, the slide fastener including a pair of stringers and a slider slidable on and along the stringers for opening and closing the slide fastener , the apparatus including a sewing station defined by a double-needle sewing machine mounted on a table, and a gripper mechanism disposed downstream of the sewing station and reciprocable along a first horizontal path for gripping a top end portion of the slide fastener sewn to

the pair of fabric pieces and for drawing the same from the sewing station,

a slider-moving unit comprising:

(a) a slider-holding mechanism disposed downstream of said sewing station and reciprocable for pulling the slider away from the sewing station, said slider-holding mechanism including

(1) a slide disposed below the first horizontal path and reciprocable along a second horizontal path parallel thereto,

(2) a slide catch carried on said slide and vertically movable between a raised position in which it projects into said first horizontal path for receiving the slider and a lowered position in which said slider catch is retracted from said first horizontal path, and

(3) a retainer carried on said slide catch and vertically movable with respect thereto for pressing the slider against said slider catch; and

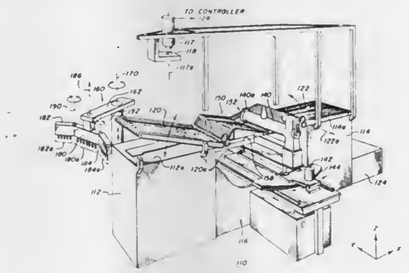
(b) a brake disposed adjacent to an upstream end of the reciprocating movement of said slider-holding mechanism for holding a bottom end portion of the slide fastener while the slider is being pulled by said slider-holding mechanism.

4,632,046

ASSEMBLY SYSTEM FOR SEAMED ARTICLES

David S. Barrett, Lowell; Arthur Ciccolo, Melrose; Donald C. Fyler, Cambridge, all of Mass.; F. Keith Glick, Colorado Springs, Colo.; John R. Lawson, Lincoln, Mass.; Jay A. Sampson, Belmont, Mass.; Frank J. Siraco, Malden, Mass.; Robert D. Whiteside, Watertown, Mass.; Daniel E. Whitney, Arlington, Mass., and George A. Wood, Lincoln, Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 4, 1985, Ser. No. 707,608
Int. Cl.[4] D05B *3/04*
U.S. Cl. 112—121.14 **21 Claims**



1. A limp material handling system, comprising:

a limp material manipulating system for selectively manipulating one or more layers of limp material, comprising:

A. a support assembly adapted to support said material on a reference surface,

B. a fold assembly including selectively operable:

i. means for gripping a curvilinear region of at least an uppermost layer of said material,

ii. means for:

(a) controlling the curvature of said gripped curvilinear region whereby said gripped curvilinear region has a selected contour,

(b) selectively translating and selectively rotating said gripped curvilinear region to a selected location overlying an associated curvilinear region of said reference surface, and

iii. means for releasing said gripped curvilinear region to said associated curvilinear region of said reference surface or the next uppermost layer of said material overlying said associated curvilinear region of said reference surface, and

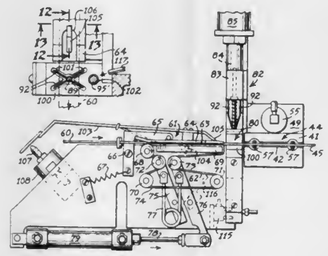
C. a controller including means for selectively controlling said fold assembly.

4,632,047

KNIFE ASSEMBLY FOR BELT LOOP TACKER

A. Matthew Seaman, Brentwood, Tenn., assignor to Cutters Exchange, Inc., Nashville, Tenn.

Filed Jul. 12, 1984, Ser. No. 630,189
Int. Cl.[4] D05B *37/04, 23/00*
U.S. Cl. 112—121.27 **12 Claims**



1. In an apparatus for securing a belt loop to a garment including a securing station, a belt loop forming station, and feed means for feeding an elongated web of belt loop material in a feeding direction and path toward the forming station, a knife assembly for cutting the web fed to the forming station, comprising:

(a) a knife member,

(b) means supporting said knife member for movement toward and transversely intersecting the path of the web in a cutting position, in advance of the belt loop forming station, for transversely securing said web into a leading web piece and a trailing web portion,

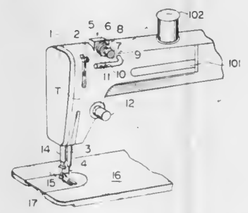
(c) said knife member being adapted, in said cutting position, to simultaneously trim the opposite trailing corners of said leading web piece and the opposite leading corners of said trailing web portion.

4,632,048

METHOD OF CONTROLLING UPPER THREAD IN SEWING MACHINE

Toru Matsubara, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 411,803, Aug. 26, 1982, abandoned. This application Jan. 17, 1985, Ser. No. 692,330
Int. Cl.[4] D05B *47/04, 49/00*
U.S. Cl. 112—262.1 **4 Claims**



1. A method of controlling an upper thread in a sewing machine comprising a needle holding said upper thread and being vertically movable in association with a spindle, a loop taker holding a bobbin case carrier having a lower thread and rotatable in association with said spindle for forming a lock stitch in a material in cooperation with said needle, and a thread take-up lever vertically movable in association with said spindle for selectively loosening and taking-up said upper thread, said method comprising the steps of:

rendering a restraining force to said upper thread by a thread holding device for selectively clamping said upper thread and preventing delivery of said upper thread to the thread take-up lever for a first period of time from a moment before the loop of the upper thread is passed through a space between a notch and a lug of a rotation restraining finger to a moment after the loop of the upper thread is released from a loop controlling tail of the loop taker, the restraining force preventing delivery of excess upper thread when a relatively high tension is applied to the loop of the upper thread as the loop is passed through the space and seized by the loop controlling tail;

rendering a tension to said upper thread by a thread tension device for stitch tightening for a second period of time from a moment after the upper thread is released from the loop controlling tail to a moment after stitch tightening is completed, the rendering of the tension by the thread tension device including disabling of said thread holding device and delivery of said upper thread under tension by said thread tension device; and

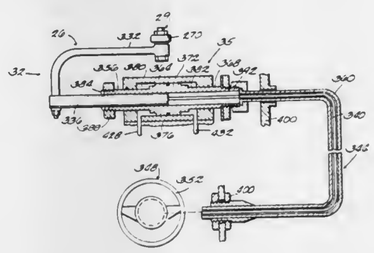
delivering upper thread from said supply during said second period of time without bending said thread in said thread holding device in a direction generally parallel to an axis of said thread holding device, a direction of delivery of said upper thread through said thread holding device being in a direction generally normal to said axle.

4,632,049

MARINE PROPULSION STEERING ASSIST DEVICE

Charles B. Hall, Ingleside, and Martin J. Mondek, Wonder Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 485,028, Apr. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 451,438, Dec. 20, 1982, Pat. No. 4,509,924. This application Nov. 6, 1984, Ser. No. 668,885
Int. Cl.[4] B63H *25/22*
U.S. Cl. 114—150 **38 Claims**



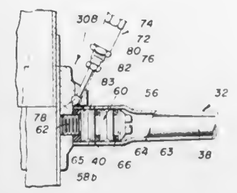
1. A marine propulsion device for use with a marine vehicle, said device comprising a propulsion unit pivotable about a first steering axis to steer the vehicle, fin means mounted on said propulsion unit and pivotable about a second steering axis for assisting in steering the vehicle, steering means for pivoting said propulsion unit about said first steering axis to steer the vehicle, said steering means including a steering member connected to said propulsion unit, and means for moving said steering member to pivot said propulsion unit, said moving means including a push-pull cable including a flexible housing, and hydraulic sensing means for sensing torque on said propulsion unit relative to said first steering axis so as to facilitate pivoting of said fin means in response to said torque, said hydraulic sensing means permitting lost motion between said flexible housing and said steering member, and said hydraulic sensing means sensing torque on the propulsion unit relative to the first steering axis by movement of said flexible housing relative to said steering member.

4,632,050

SPORTFISHING OUTRIGGERS

Herbert E. Rupp, 4761 Anchor Ave., Port Salerno, Fla. 33492

Filed Jan. 6, 1986, Ser. No. 816,330
Int. Cl.[4] B63B *35/14*
U.S. Cl. 114—255 **10 Claims**



1. In outriggers for sportfishing boats having a tubular mast including an inboard end and an outboard end, pivot means connected to said inboard end to permit said outrigger to move from a stowage position to a fishing position, a plurality of truss cables having an inboard end, an outboard end and a central section extending therebetween, said cables being positioned about and extending longitudinally of said mast to resist bending thereof and at least one spreader assembly carried by said mast comprising a plurality of tubular spreader arms each having an inboard end and an outboard end integral with a central body section, each said spreader arm being associated with one of said cables to forceably stand off said central section of said cable laterally from said mast, the improvements which comprise:

(a) spreader arms that each comprise:

a tubular socket on said inboard end,

a cable guide through which one of said cables passes, said guide being removably fitted into said outboard end of said arm, and

a frangible portion in said central body section contoured to break when said spreader arm is overloaded,

(b) spreader assemblies that comprise:

a collar sized to encircle said mast,

a plurality of posts, each threaded at one end into said collar and sized to tightly receive said tubular socket of one of said spreader arms to retain it extending radially outwardly from said collar,

said improvements:

protecting said mast from appreciable damage upon overloading of a spreader arm thereof,

enabling broken spreader arms to be replaced without alteration of said mast or removal of a spreader assembly from said mast and

enabling cable guides to be replaced without replacement of a spreader arm.

4,632,051

SEA ANCHOR

Frank P. Raymond, 184 Selleck St., Stamford, Conn. 06902, and Frank V. Snyder, Greenwich, Conn., assignors to F. P. Raymond, Stamford, Conn.

Filed May 15, 1985, Ser. No. 734,460
Int. Cl.[4] G01V *1/38*
U.S. Cl. 114—311 **4 Claims**

1. A new sea anchor for a vessel of a generally symmetrical geometric configuration as a hollow and truncated three dimensional body in which there is a base having a greater major transverse dimension than the transverse dimension of the truncated peak thereof and with an outer surface slanting inwardly from the base perimeter at an acute angle and having

(a) a wide mouth bottom with a strength member at the perimeter of the body base, said member being of a generally uniform weight throughout its perimeter,

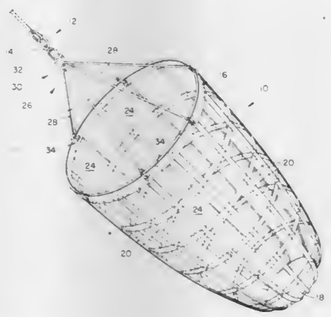
(b) a strong material forming said outer surface of and said

hollow generally truncated body attached to said wide mouth strength member and having orificial openings through said material to cause energy dissipation by the increased velocity thereof, said orificial openings being uniformly distributed throughout said outer surface between said base and peak,

(c) the area of said orificed openings being not greater than 75 percent of the surface area of said truncated body,

(d) the ratio of the major transverse dimension of the base of the truncated body to the height being in the range of 80 to 90 percent,

(e) a bridal means attached to said wide mouth strength



member arranged to meet at the longitudinal center line of said body and projecting in a direction opposite to said peak for joining to a single anchor line of said vessel with said meeting point being a distance from said strength member in the range of 1.8 to 2 times the diameter of said strength member, and

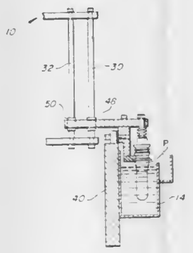
(f) said truncated peak end thereof is a second strength member and has no orifices and the area thereof is in the range of 15 to 25 percent of the projected transverse opening area of the base of said truncated hollow body whereby the anchor, having the dimensional relationships specified, is hydrodynamically stable as it is dragged through the water.

4,632,052
TORNADO EARLY WARNING DEVICE
Marion Green, P.O. Box 205, Kilbourne, La. 71253
Filed Jul. 12, 1985, Ser. No. 754,277
Int. Cl.[4] G01L *19/12*
U.S. Cl. 116—70 **1 Claim**



1. A mechanical alarm warning system responsive to a sudden drop in ambient pressure as experienced at the approach of a tornado comprising; an otherwise sealed container of air exposed to ambient pressure with an orifice, a biased plunger for obstructing said orifice and for allowing a rate of escape of air through said orifice when a drop in said ambient pressure occurs, and an alarm means for generating a sound by the escape of air from said container when said rate of escape of air exceeds a critical level as when said drop in ambient pressure overcomes said biased plunger means to tend to open said orifice.

4,632,053
APPARATUS FOR COATING CONTAINERS
James G. Villanueva, Snellville; John D. Matlack, Lilburn; Shelton E. Lewis, Norcross; John F. E. Pocock, Stone Mountain, and Charles A. Cole, Gainesville, all of Ga., assignors to Amoco Corporation, Chicago, Ill.
Division of Ser. No. 597,090, Apr. 5, 1984, Pat. No. 4,534,995.
This application Jul. 12, 1985, Ser. No. 754,415
Int. Cl.[4] B05C *3/10, 11/02*
U.S. Cl. 118—66 **5 Claims**



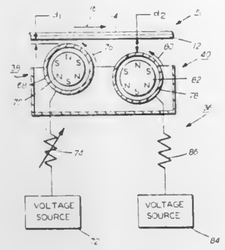
1. Apparatus for coating plastic containers comprising a stationary frame, a carousel having upper and lower platens rotatably mounted on said frame, means to drive said carousel, entrance and exit positions on said carousel, means to supply said containers to said entrance position, a cam mounted on said frame surrounding said carousel, a plurality of pairs of support rods mounted on radii of said carousel extending between upper and lower platens, a support arm mounted on each pair of support rods, a neck ring support mounted on each support arm, a cam follower mounted on each neck ring support adapted to ride upon said cam, a spring loaded plunger mounted on each support arm, means to feed serially containers to each said neck ring support at said entrance position, a coater tank having first and second ends on said frame located downstream of said entrance position, a depression on said cam downstream of first end of said coater tank, the follower on said support arm riding downwardly in said depression to dip a container into said coater tank a predetermined distance and to remove said container from said coater tank, an oven positioned on said frame around said cam downstream of said coater tank, means to remove a drop of liquid from the bottom of a coated container during passage through said oven, means to remove containers from said carousel at said exit position, and means to remove serially containers from each said neck ring support at said exit position.

4,632,054
DEVELOPMENT SYSTEM
Gary L. Whittaker, Penfield, and Mort Silverberg, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 10, 1985, Ser. No. 732,336
Int. Cl.[4] G03G *15/06*
U.S. Cl. 118—657 **12 Claims**

1. An apparatus for developing a latent image, including:

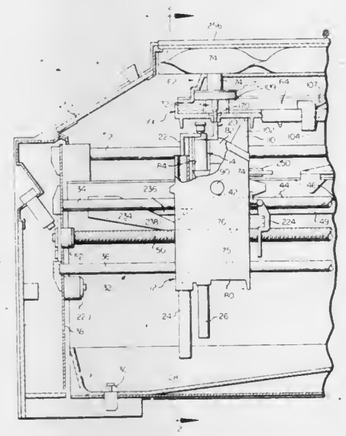
means for transporting marking particles into contact with the latent image at least two successive times;

operator adjustable means, coupled to said transporting means, for electrically biasing said transporting means to at least either a first electrical potential substantially optimizing development of solid areas with the marking particles during the first contact time or to a second electrical potential substantially suppressing development of solid areas with the marking particles during the first contact time; and



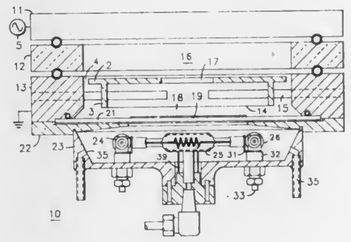
means, coupled to said transporting means, for electrically biasing said transporting means to an electrical potential substantially optimizing development of lines with the marking particles during the second contact time.

4,632,055
APPARATUS FOR TINTING SOFT CONTACT LENSES
Francis E. Ryder, and Fred E. Williams, both of Arab, Ala., assignors to Ryder International Corp., Arab, Ala. and National Patent Development Corp., New York, N.Y.
Filed Mar. 22, 1985, Ser. No. 715,095
Int. Cl.[4] B05C *3/109, 11/00*
U.S. Cl. 118—703 **20 Claims**



1. An apparatus for tinting a soft contact lens which is received in a fixture including inlet means and outlet means for directing predetermined fluids therethrough for engagement with predetermined surfaces of said contact lens to tint said lens, said apparatus comprising: carrier means for carrying said fixture therein in a predetermined orientation; guide means for defining a predetermined path of travel; motive means for propelling said carrier means along said predetermined path of travel; and a plurality of fluid application stations arranged along said path of travel, each fluid application station including fluid release means; said guide means including means for directing said carrier means along said predetermined path of travel under the influence of said motive means, and cam means for directing said carrier means in a direction generally orthogonal to said predetermined path of travel as said carrier means moves along said predetermined path of travel for sequentially aligning and operatively positioning the inlet means of said fixture with each said fluid release means in sequence as said carrier travels along said predetermined path of travel, for delivering a quantity of fluid to the fixture and the contact lens therein from each said fluid application stations.

4,632,056
CVD TEMPERATURE CONTROL
Robert W. Stitz, 2541 E. Carol Ave., Mesa, Ariz. 85204, and J. B. Price, 4413 N. 62nd St., Scottsdale, Ariz. 85251
Filed Aug. 5, 1985, Ser. No. 762,240
Int. Cl.[4] C23C *13/04*
U.S. Cl. 118—712 **8 Claims**



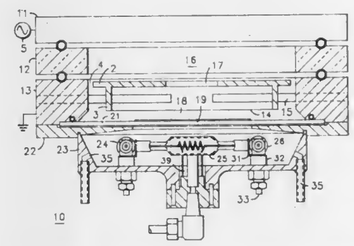
1. A chemical vapor deposition apparatus comprising:

means for enclosing a volume, said means including a thermally translucent window;

heating means adjacent the outside of said window for radiantly heating an article within said volume;

temperature sensing means within said heating means for detecting the amount of heat produced by said heating means.

4,632,057
CVD PLASMA REACTOR
J. B. Price, Scottsdale; Matthew L. Bunch, Phoenix, and Robert W. Stitz, Mesa, all of Ariz., assignors to Spectrum CVD, Inc., Phoenix, Ariz.
Filed Aug. 5, 1985, Ser. No. 762,231
Int. Cl.[4] C23C *13/04*
U.S. Cl. 118—719 **13 Claims**



1. Chemical vapor deposition apparatus comprising:

means for enclosing a predetermined volume;

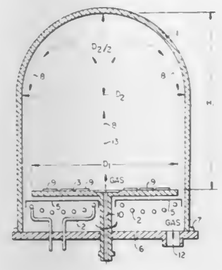
baffle means for dividing said volume into two chambers;

RF means coupled to a first of said chambers for generating a plasma therein, the second of said chambers for containing an article upon which a deposit is to be formed out of contact with said plasma;

heating means for directly heating said article by radiant energy; and

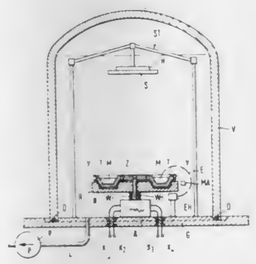
wherein said enclosing means comprise window means for providing a transmission path from said heating means to the interior of said second chamber; said heating means being on the outside of said window means.

4,632,058
APPARATUS FOR UNIFORM CHEMICAL VAPOR DEPOSITION
Robert E. Dixon, and James McDiarmid, both of San Jose, Calif., assignors to Gemini Research, Inc., Fremont, Calif.
Filed Feb. 27, 1984, Ser. No. 584,073
Int. Cl.⁴ C23C *16/24*
U.S. Cl. 118—725 **14 Claims**



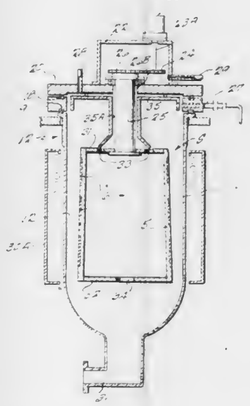
1. A bell jar enclosure and a susceptor for a chemical vapor deposition reactor, said susceptor arranged perpendicularly to a center line of said bell jar enclosure, and said enclosure and susceptor having a H_1/D_1 ratio in the range of 1.10–1.40 where H_1 is the height of said enclosure above said susceptor and D_1 is the diameter of said susceptor.

4,632,059
EVAPORATOR DEVICE FOR THE EVAPORATION OF SEVERAL MATERIALS
Georg Flatscher, Schneizlreuth, and Anton Beckerbauer, Nussdorf, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Continuation of Ser. No. 605,866, May 1, 1984, abandoned. This application Sep. 5, 1985, Ser. No. 773,517
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316554
Int. Cl.⁴ C23C *16/00*
U.S. Cl. 118—727 **1 Claim**



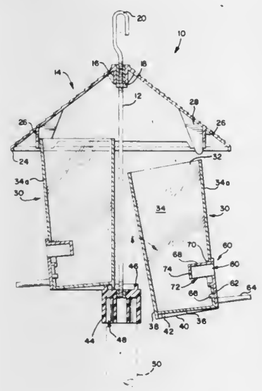
1. In an evaporator device of the type comprising a turntable and a jet heating device, the improvement comprising:
a hollow shaft which rotatably supports the turntable for rotation about a table axis;
a plurality of crucibles positioned on the turntable equidistant from the table axis, each positioned for rotation with respect to the turntable about a respective crucible axis, each of said crucible axes extending through the respective crucible, each of the crucible axes being spaced from and noncoincident with the table axis;
a plurality of crucible gears, each secured to a respective one of the crucibles so as to be concentric with the respective crucible axis;
a drive shaft positioned within the hollow shaft;
a drive gear secured to the drive shaft and engaged with the crucible gears such that rotation of the drive shaft causes each of the crucibles to rotate about the respective crucible axis; and
means for rotating the drive shaft to rotate the crucibles during operation of the jet heating device in order to obtain improved vaporization of materials contained in the crucibles;
means for rotating the hollow shaft to index the turntable to bring selected ones of the crucibles into alignment with the jet heating device, said jet heating device positioned outside of the crucibles such that rotation of the turntable successively brings each of the crucibles into alignemnt with the jet heating device;
wherein each of the crucibles is circular and is positioned on the turntable not to overlap the table axis;
wherein the turntable defines a planar upper surface which defines a plurality of frusto-conical recesses;
wherein each of the crucibles defines a respective frusto-conical lower surface positioned within a respective one of the recesses, said frusto-conical lower surfaces shaped to rotate freely within the respective recesses such that the recesses of the turntable both hold the crucibles in position and guide the crucibles in rotation;
wherein the drive gear is positioned adjacent the upper surface of the turntable, centered among the crucibles; and
wherein each of the crucible gears is exposed upwardly.

4,632,060
BARREL TYPE OF EPITAXIAL VAPOR PHASE GROWING APPARATUS
Taizan Goto, and Isao Sekiya, both of Numazu, Japan, assignors to Toshiba Machine Co. Ltd, Tokyo, Japan
Filed Mar. 12, 1985, Ser. No. 710,967
Claims priority, application Japan, Mar. 12, 1984, 59-35721[U]
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 118—730 **3 Claims**



1. A barrel-type epitaxial vapor phase growing apparatus comprising:
a bell jar having a reaction chamber defined therein,
a susceptor assembly mounted within said reaction chamber and having a plurality of plates for mounting wafers to be treated,
a seal plate forming a top cover of the bell jar,
rotary drive means mounted on said seal plate for rotating said susceptor assembly including a drive mechanism and a case for said mechanism,
a hanger rod connected between said drive means and said susceptor and rotatably mounted on the seal plate from which said rod is hung downwards, the lower portion of the hanger rod being located in said reaction chamber,
means for supplying purge gases to the inside of said case, and
baffle means for directing said purge gases along the circumferential surface of said hanger rod into said susceptor assembly so that said purge gases pass therethrough to the lower portion of said reaction chamber.

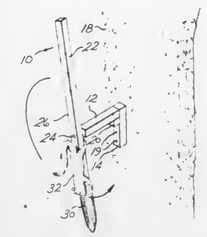
4,632,061
BIRDFEEDER
James E. Tucker, Batavia; Charles W. Lohmeyer, Barrington; John Beecher, III, Carpentersville, and James C. Stephen, Arlington Heights, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed May 14, 1985, Ser. No. 734,339
Int. Cl.⁴ A01K *39/01*
U.S. Cl. 119—51 R **17 Claims**



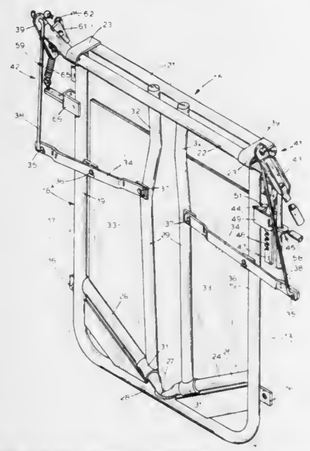
1. A multi-compartment birdfeeder comprising a center support member having a fixed roof at an upper end thereof and a compartment support member at a lower end and access means for birds to gain access to the compartment interior, means for supporting said center support member in a generally upright position, a plurality of substantially identical compartments each having an upper open end, said fixed roof having downwardly-depending abutment means along the periphery for slidably receiving an upper peripheral portion of each compartment, and support means on a lower end of each compartment received on said compartment support member so that each compartment can be inserted by producing sliding contact with the peripheral depending abutment means and moving compartment lower end onto compartment support member whereby each compartment is supported between said abutment means and said compartment support member and can be removed by simply lifting said compartment off said compartment support member and tilting it outwardly to disengage the upper portion from the abutment means.

4,632,062
SQUIRREL FEEDER
Jack E. Hubbard, 405 W. Lexington, Elkhart, Ind. 46516
Filed Jul. 17, 1985, Ser. No. 755,902
Int. Cl.⁴ A01K *5/00*
U.S. Cl. 119—51 R **1 Claim**

1. A squirrel feeder comprising a stationary frame adapted for connection to a support, said frame including a protruding member, a bar member having opposite ends pivotally connected intermediate said ends to said protruding frame member for rotation relative to the frame member about a generally horizontal pivot axis, a retainer means connected to and extending from only one said end of said bar member for securing a food item to said bar member, said bar pivot axis being located nearer said one bar member end than the other bar member end.



4,632,063
ANIMAL HOLDING GATE WITH AUTOMATIC CLOSING OPERATION
William D. Priefert, Mt. Pleasant, Tex., assignor to Priefert Mfg. Co., Inc., Mount Pleasant, Tex.
Filed Oct. 9, 1985, Ser. No. 785,614
Int. Cl.⁴ A61D *3/00*
U.S. Cl. 119—98 **5 Claims**



1. An animal holding gate comprising:
(a) an upright main frame having a pair of transversely spaced side members,
(b) an upright animal engaging member for each of said side members guidably supported on said main frame for movement laterally thereof,
(c) a transverse rock shaft rotatably mounted on said frame adjacent the upper ends of said side members for rocking movement in reversed directions,
(d) a lever system interconnecting each of said animal engaging members with said rock shaft whereby said animal engaging members are movable laterally relative to each other in response to a rocking movement of the rock shaft,
(e) yieldable means for urging said rock shaft in one direction to move the animal engaging members toward each other,
(f) means for releasably holding said engaging members in an animal entry position therebetween against movement toward each other,
(g) means for releasably locking said animal engaging members against movement away from each other,
(h) means for interconnecting said releasable holding means

and said releasable locking means with said main frame and rock shaft for concurrent release in response to movement of the rock shaft in an opposite direction, whereby no entry of an animal between said engaging members, said engaging members are urged to transmit through said lever systems a rocking movement to said rock shaft in said opposite direction,

(i) said releasable holding means including a rock arm on said rock shaft, a catch member on said frame, and an upright latch member having a series of notches in a side portion thereof, and

(j) means pivotally suspending the latch member from the rock arm for lateral movement away from the catch member to a suspended position therefor,

(k) said rock arm being manually movable to engage said latch member at a notch therein with said catch member to hold said animal engaging members in said animal entry position.

4,632,064

BOILER

Hisao Haneda, and Mamoru Araoka, both of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 760,979
Claims priority, application Japan, Nov. 30, 1984, 59-251987
Int. Cl.[4] F22B *33/00*
U.S. Cl. 122—1 A **2 Claims**



1. A duct system for exhausting combustion gas from a boiler comprising:

a gas discharge duct having an inlet adapted to be connected to a combustion gas outlet of a boiler;

a plurality of passages disposed within said gas discharge duct;

a first reheater disposed in a first one of said passages;

a second reheater disposed in a second one of said passages;

a superheater disposed in a third one of said passages;

a first convective evaporator disposed in said first one of said passages, said first reheater being disposed between said inlet and said first convective evaporator;

a second convective evaporator disposed in said second one of said passages, said second reheater being disposed between said inlet and said second convective evaporator; and

means for selectively adjusting a ratio of an amount of combustion gas flow through each of said passages.

4,632,065

THERMAL BAFFLE FOR WATER HEATERS AND THE LIKE

Hemant D. Kale, 5145 N. Kenton, Chicago, Ill. 60630

Filed Apr. 17, 1985, Ser. No. 724,348
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—13 R **15 Claims**



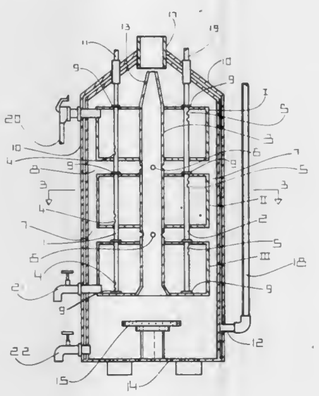
1. In a hot water heater having a vertical storage tank defined by a cylindrical side wall, a bottom wall and a curved top wall and having a non-compartmentalized internal storage area, means for heating water within the tank, a cold water inlet generally adjacent the bottom thereof, and a hot water outlet generally adjacent the the top thereof, the improvement comprising a single, stationary baffle fixed within the tank above the heating means in the upper two-thirds of the tank and transverse to the tank axis, said baffle foiling thermal currents within the tank.

4,632,066

MULTIPLE SEGMENT GAS WATER HEATER AND MULTIPLE SEGMENT GAS WATER HEATER WITH WATER JACKET

Fazil F. Kideys, 17 Agate Rd., E. Brunswick, N.J. 08816

Filed Jun. 7, 1985, Ser. No. 611,355
Int. Cl.[4] F22B *23/06*
U.S. Cl. 122—13 R **3 Claims**



1. A gas water heater having

(A) an annular water jacket surrounding a combustion chamber below and a vertically stacked, spaced multiple heat exchanger segments above, said multiple heat exchanger segments being spaced from said water jacket,

(B) a conical top wall, in extension of the water jacket, having a central opening forming an exhaust gas passage,

(C) a chimney being connected to said central opening of said top wall,

(D) each heat exchanger segment having a perforated water inlet pipe and a perforated water outlet pipe within said heat exchanger segments, said inlet and outlet pipes being vertically connected to other heat exchanger segments through water pipe,

(E) each heat exchanger segment having a central opening to receive a perforated exhaust flue pipe communicating to said combustion chamber and extending into said chimney, said perforations of the flue pipe being exposed between said heat exchanger segments in communication with space between heat exchanger segments and water jacket, said exhaust flue pipe having a constricted outlet within said chimney to form a venturi whereby additional exhaust gases can be induced into said chimney from the spaces between said heat exchanger segment and water jacket,

(F) an incoming cold water supply tube being connected at the top portion of the water jacket for preheating, a hot water pressure relief pipe being connected to the uppermost heat exchanger segment,

(G) a heated water outlet tube being connected to said perforated outlet water pipe of the uppermost exchanger segment, and

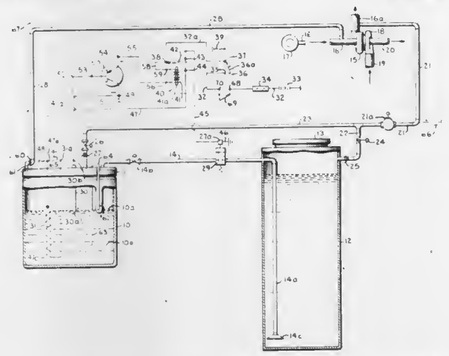
(H) a connecting tube making connection between said perforated inlet pipe of the uppermost heat exchanger segment and top portion of the water jacket whereby incoming water being preheated and circulated from water jacket to said connecting tube and into said heat exchanger segments.

4,632,067

VAPOR INJECTION DEVICE

Drexel T. Carlson, 2909 W. 93rd Street Ter., Leawood, Kans. 66206

Filed Dec. 2, 1985, Ser. No. 803,562
Int. Cl.[4] F02M *25/04*
U.S. Cl. 123—25 A **8 Claims**



1. In a vehicle engine system having a turbo air compressor (driven by the engine exhaust system hot gases) on the air intake line running from the air cleaner to the engine intake manifold, the improvement which comprises:

(1) a vapor generating container holding a first quantity of water based liquid;

(2) a water reservoir container holding a second quantity of water based liquid;

(3) a liquid transfer line from the lower portion of the reservoir container to the generating container;

(4) a vapor supply line from the upper portion of the generating container to the air intake line between the air cleaner and turbo compressor;

(5) an air pressurization line from the turbo compressor output, this line being divided into a first air line to the upper portion of the reservoir container and a second air line to the upper portion of the generating container;

(6) first and second valve controls on the liquid transfer line between the two said containers;

(7) a presure regulator valve on the air pressurization line from the turbo compressor output, a needle valve and a following disc check valve on the first air line from the air pressurization line to the upper portion of the reservoir container and a needle valve on the second air line from the air pressurization line to the generating container;

(8) a sensor in the vapor generating container for determining when the liquid level therein falls below a predetermined position to enable the provision of replenishment of liquid, as required, to the vapor generating container;

(9) heating or heater means in said generating container for heating the liquid therein to a temperature sufficient to generate substantially water particle free vapor therefrom, yet not boil the liquid;

(10) means for energizing the heating means to generate said vapor when the vehicle engine is running;

(11) means coupled with said sensor for:

(a) maintaining said heater energized and the first valve control closed so long as the liquid level in the generating container is above said predetermined level and in contact with said sensor to generate sufficient vapor to substantially increase the humidity of the incoming atmospheric engine combustion air, and

(b) shutting off said heater and opening said first valve control when said liquid level in the generating container is below said predetermined level and out of contact with said sensor;

whereby, first, when said heater is generating vapor in said generating container, air pressure through the second air line continuously forces vapor from said generating vessel through said vapor supply line into said air intake line and air pressure through the first air line simultaneously continuously pressurizes the reservoir container;

second, when said heater is shut off and the first valve control is opened, air pressure through said first air line drives liquid from said reservoir container to said generating container until said predetermined level is again reached, the sensor contacted, the heater is reenergized and the first valve control closed,

air further simultaneously and continuously being provided to said generating vessel through said second air line to continue vapor transmission, if such is present and, in any case, air flow into the air intake line through the vapor supply line,

increased output air pressure from the turbo compressor (caused by increase in turbine rpm caused by an increase in engine rpm) causing increased flow of air through the air pressurization line and second air line to the generator container.

4,632,068

MODULAR SLUDGE COLLECTION SYSTEM FOR A NUCLEAR STEAM GENERATOR

Robert H. Appleman; Jeffrey D. Bein, both of Pleasant Hills, and Frank S. Powaski, Irwin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1984, Ser. No. 613,673
Int. Cl.[4] F22B *1/02*
U.S. Cl. 122—34 **15 Claims**

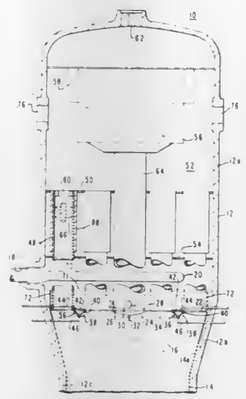
1. A sludge collection system for a vertically oriented nuclear steam generator wherein vapors produced in the steam generator pass through means for separating entrained liquid from the vapor prior to the vapor being discharged from the steam generator, said sludge collection system comprising;

an upwardly open chamber for collecting the separated liquid and feedwater entering the steam generator;

a plurality of upwardly open sludge collecting containers positioned within said chamber, wherein each of said containers includes a top rim encompassing an opening leading to the interior of each container;

a plurality of generally flat, perforated covers, each of said covers being positioned over one of said openings such

that a gap is formed between the cover and the adjacent top rim;



sludge agitating means on at least one of said containers; and

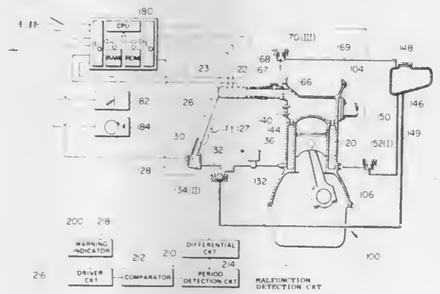
sludge removal means on at least one of said containers.

4,632,069

COOLING SYSTEM FOR AUTOMOTIVE ENGINE

Hirofumi Aoki, Chigasaki, and Yoshimasa Hayashi, Kamakura, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 26, 1985, Ser. No. 705,928
Claims priority, application Japan, Feb. 29, 1984, 59-38280
Int. Cl.⁴ F01P *3/22, 5/14*
U.S. Cl. 123—41.15 **13 Claims**



1. A cooling system for an internal combustion engine comprising:

a coolant jacket formed about structure of said engine subject to high heat flux;

a first parameter sensor, said first parameter sensor being disposed in said coolant jacket and arranged to sense the temperature of the liquid coolant therein;

a radiator in which coolant vapor is condensed to its liquid form, said radiator communicating with said coolant jacket via a vapor transfer conduit;

a device associated with said radiator for varying the rate at which coolant vapor is condensed to liquid form in said radiator;

means for returning liquid coolant from said radiator to said coolant jacket in a manner to maintain the level of liquid coolant in said coolant jacket above said structure subject to high heat flux and lower than the uppermost section of said coolant jacket so as to provide a vapor collection space above the surface of said liquid coolant; and

a circuit which monitors the operation of said liquid coolant returning means and which issues a signal upon the operational characteristics of said liquid coolant returning means indicating a malfunction in said cooling system.

3. A method of cooling an internal combustion engine comprising the steps of:

(a) introducing liquid coolant into a coolant jacket formed about structure of said engine subject to high heat flux in a manner to immerse said structure in a predetermined depth of liquid coolant;

(b) allowing the liquid coolant in said coolant jacket to boil;

(c) transferring the coolant vapor produced by the boiling in said coolant jacket from said coolant jacket to a radiator using a vapor transfer conduit;

(d) condensing the vapor to its liquid form in said radiator;

(e) returning liquid coolant from said radiator to said first coolant jacket using a coolant return arrangement in a manner to maintain said structure subject to high heat flux immersed to said predetermined depth of liquid coolant and define a vapor collection space within said coolant jacket;

(f) monitoring the operation of said liquid coolant returning means; and

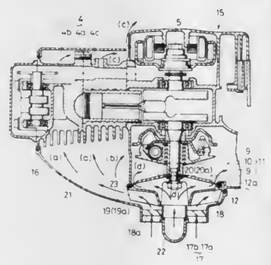
(g) issuing a signal upon said step of monitoring indicating that the operation characteristics of said coolant returning means deviates from a predetermined schedule.

4,632,070

DEVICE FOR COOLING ENGINE POWER UNIT

Takanori Onda; Hitoshi Yamamoto, and Masahiko Kimoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,557
Claims priority, application Japan, Dec. 19, 1984, 59-267776
Int. Cl.⁴ F01P *1/06*
U.S. Cl. 123—41.58 **5 Claims**



1. A device for cooling a power unit, comprising:

a pulley arranged to be rotated by an output shaft of an engine;

a belt hung about said pulley for transmitting a driving force of said engine;

a belt casing provided at one side of said engine for housing said pulley and said belt;

a shroud for covering said belt casing and said engine;

an exterior air inlet formed in said shroud opposite said pulley with said belt casing disposed between exterior air inlet and said pulley;

said belt casing including a partition wall provided between said exterior air inlet and said pulley to divide said exterior air inlet whereby said exterior air inlet communicates with both the outside and inside of said belt casing;

a first fan provided on one side of said partition wall opposite said shroud for sending exterior air to the outside of said belt casing; and

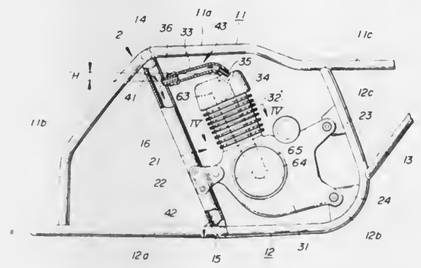
a second fan provided on the other side of said partition wall opposite said belt casing for sending exterior air to the inside of said belt casing, said first and second fans being connected to said output shaft.

4,632,071

ENGINE BREATHER DEVICE FOR MOTOR VEHICLE WITH RIDING SADDLE

Shokichi Arai, and Tadayoshi Fujii, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1985, Ser. No. 809,809
Claims priority, application Japan, Dec. 18, 1984, 59-192097[U]
Int. Cl.⁴ F01M *13/00*
U.S. Cl. 123—41.86 **5 Claims**



1. An engine breather device in a motor vehicle having a vehicle frame including longitudinal upper and lower frames, front and rear wheels rotatably supported on said vehicle frame, a handlebar mounted on said vehicle frame for steering said front wheels, a rider's saddle disposed on an upper portion of said vehicle frame, footsteps disposed on a lower portion of said vehicle frame, said engine breather device comprising:

substantially vertical pipe frame adapted to interconnect said upper and lower frames and having at least one opening;

an engine adapted to be mounted on said vehicle frame and having a crankcase and a cylinder projecting upwardly from said crankcase, said cylinder having a hole extending from the upper end thereof into said crankcase;

a breather tube providing communication between the interior of said vertical pipe frame and the interior of said crankcase through said hole in said cylinder; and

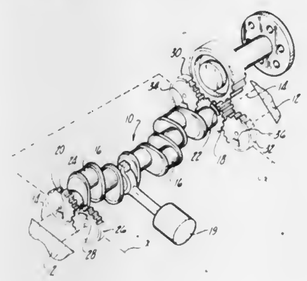
said breather tube being connected to said engine at a first position above the upper end of said cylinder and to said vehicle pipe frame at a second position lower than said first position.

4,632,072

LOW VIBRATION ENGINE CONSTRUCTION

William Brogdon, Daphne, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 3, 1984, Ser. No. 677,388
Int. Cl.⁴ F02B *75/06*
U.S. Cl. 123—56 R **11 Claims**



1. For use with an opposed eight piston engine having a housing, said pistons lying in a predetermined plane, an elongated crank shaft rotatably mounted in the housing, said crank shaft having four crank pins, a balancing arrangement for offsetting the primary couple imposed on the crank shaft by the piston reciprocation comprising:

a first counter weight attached to the crank shaft at a first predetermined angular position with respect to the crank pins of said crank shaft so that upon rotation of the crank shaft, said first counter weight rotates in a first plane,

a second counter weight attached to the crank shaft at a second predetermined angular position with respect to the crank pins of said crank shaft so that, upon rotation of the crank shaft, said second counter weight rotates in a second plane, said counter weights being axially spaced from each other,

a first idler means,

means for rotatably mounting said first idler means to said housing in a plane substantially coplanar with said first plane,

a second idler means,

means for rotatably mounting said second idler means to said housing in a plane substantially coplanar with said second plane,

means for rotatably driving said idler means in synchronism with said crank shaft,

wherein each of said idler means includes a weighted portion offset from its axis of rotation and at a predetermined angular position with respect to each other and to the crank shaft so that, upon rotation of said crank shaft, the magnitude of centrifugal force of said first counter weight and said first idler means is substantially equal to, but opposite in direction from, the centrifugal force of said second counter weight and said second idler means, said centrifugal forces lying in said predetermined plane, and

wherein said weighted portions and counter weights are angularly spaced with respect to said crank pins so that the couple generated by said centrifugal forces substantially offsets the primary couple.

4,632,073

CAMSHAFT MOUNTING MECHANISM FOR DOHC ENGINE OF MOTORCYLE

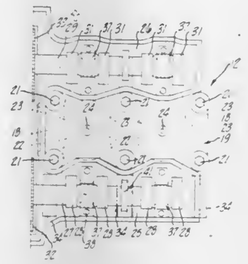
Yorio Futakuchi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

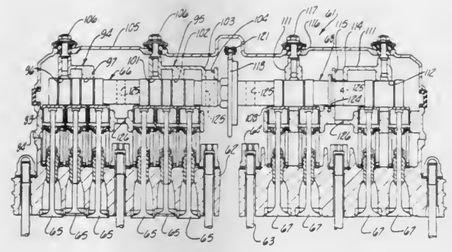
Filed May 16, 1984, Ser. No. 610,848
Int. Cl.⁴ F01L *1/02*
U.S. Cl. 123—90.27 **16 Claims**

1. In a camshaft arrangement for an overhead camshaft type internal combustion engine comprising a cylinder head assembly defining at least two combustion chambers and supporting a plurality of poppet valves for reciprocation, at least two of said poppet valves serving each of said combustion chambers, a camshaft journaled by said cylinder head assembly and having a plurality of spaced cam lobes thereon for actuating said valves with interposed bearing surfaces between the cam lobes associated with the valves serving each combustion chamber, said camshaft being rotatably supported by only said bearing surfaces, bearing cap means affixed to said cylinder head assembly and having bearing surfaces engaging said camshaft bearing surfaces for journaling said camshaft on said cylinder head assembly, at least one of said cam lobes being formed at one end of said camshaft and the camshaft does not extend beyond that one cam lobe, a thrust bearing comprising oppositely facing surfaces formed on said camshaft and spaced axially from the other of said bearing surfaces, and a thrust bearing groove formed in said cylinder head assembly other than said bearing cap means and spaced axially therefrom and cooperating with said camshaft thrust bearing surfaces for axially positioning said camshaft on said cylinder head assembly.

9. In a camshaft arrangement for an overhead camshaft type internal combustion engine comprising a cylinder head assembly supporting a plurality of poppet valves for reciprocation, a combustion chamber formed in part by said cylinder head assembly, at least three of said valves serving said combustion

chamber, and a camshaft journaled by said cylinder head assembly and having a plurality of spaced cam lobes therein for actuating said valves, the improvement comprising said camshaft being formed with at least three adjacent lobes each associated with a respective one of said three valves and a pair of spaced bearing surfaces each being interposed between the





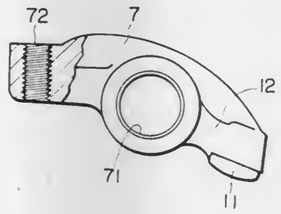
center one of said three lobes and the end one of said three lobes and a third bearing surface spaced axially away from said lobes, the means for journaling said camshaft comprising a single bearing cap fixed relative to said cylinder head assembly and having spaced bearing surfaces engaging respective of said pair of said camshaft bearing surfaces and said third bearing surface.

4,632,074

WEAR-RESISTANT MEMBER FOR USE IN INTERNAL COMBUSTION ENGINE AND METHOD FOR PRODUCING THE SAME

Kentaro Takahashi; Takeshi Hiraoka; Yoshikatsu Nakamura, and Masajiro Takeshita, all of Saitama, Japan, assignors to Nippon Piston Ring Co., Tokyo, Japan

Division of Ser. No. 122,902, Feb. 20, 1980, Pat. No. 4,583,502.
This application Sep. 30, 1985, Ser. No. 782,246
Claims priority, application Japan, Feb. 26, 1979, 54-20740
Int. Cl.⁴ F01L *3/02*
U.S. Cl. 123—90.39 **21 Claims**



1. A method for producing a wear-resistant member formed of a combination of a ferrous sintered body and a ferrous base body for use in an internal combustion engine comprising the steps of:

(a) compressing a ferrous powder mixture to provide a compressed powder body, said compressed body consisting of 0.5 to 7.0% by weight carbon, 0.1 to 5.0% by weight phosphorus, 8.0 to 30.0% by weight chromium, not more than 10% by weight of at least one material selected from the group consisting of nickel, copper, cobalt, tungsten and molybdenum, and the balance being iron, and having a porosity of 12 to 20% by volume at least 40% of which is pores having a pore size of not more than 300μ,

(b) mounting said compressed powder body on said ferrous base body to provide a combination member, said ferrous base body having a melting point higher than that of said compressed powder body,

(c) placing said combination member in a sintering furnace and heating said combination member to a temperature higher than the liquid-phase temperature of said compressed powder body and lower than the melting point of said ferrous base body so as to thus perform sintering of said compressed powder body,

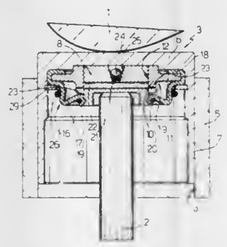
(d) continuously cooling said combination member to thereby produce a ferrous sintered body having a porosity of 0.2 to 10% by volume, at least 40% of which is sintering pores having a pore size of not more than 250μ, said sintered body being bonded to said ferrous base body by diffusing diffusion elements of said compressed powder body into said ferrous base body.

4,632,075

OILTIGHT HYDRAULIC TAPPET FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE VALVE

Domenico Camosso; Franco Colanzi, both of Turin, and Silvio Ragazzoni, Pino Torinese, all of Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Italy

Filed Jul. 8, 1985, Ser. No. 755,141
Claims priority, application Italy, Jul. 24, 1984, 67741 A/84
Int. Cl.⁴ F01L *1/24*
U.S. Cl. 123—90.58 **8 Claims**



1. Hydraulic tappet designed for assembly on a drive for controlling a valve on an internal combustion engine, the said tappet comprising a first cup member having a bottom wall and a cylindrical side wall and sliding axially in relation to the engine frame, and a second member sliding axially inside the said first member; the said first and second members combining to form a first chamber varying in volume and having an inlet duct for activating fluid, the said duct being controlled by an on-off member in such a manner that the said fluid flowing into the said chamber causes one of the said members to slide axially in relation to the other so as to vary the volume of the said chamber; characterized by the fact that it comprises a third annular member having a sleeve, inside the inner bore of which the said second member slides axially, and a ring projecting radially from the said sleeve and connected in fluidtight manner to the said side wall on the said first cup member in such a manner as to form the said first chamber between the said ring and the said bottom and side walls on the said first cup member, and characterised by the fact that it comprises a fourth

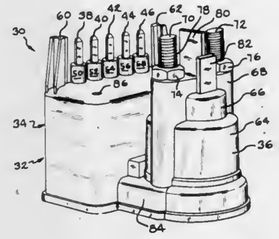
member made of flexible material and located essentially inside the said first cup member and outside the said sleeve on the said third annular member, the said fourth flexible annular member having a first and second annular edge connected in fluidtight manner respectively to the said ring on the said third member and to the side surface of the said second sliding member in such a manner as to form a second annular chamber for the said activating fluid connected hydraulically, via the said duct, to the said first chamber.

4,632,076

METHOD OF MAKING A CONTROL DEVICE FOR DIESEL ENGINES

Richard L. Morgan, Utica, and David A. Pickett, Monroe, both of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 398,006, Jul. 14, 1982, Pat. No. 4,442,804.
This application Jan. 12, 1984, Ser. No. 570,149
Int. Cl.⁴ F02P *5/00;* **F02B** *9/08*
U.S. Cl. 123—145 A **6 Claims**



1. A method of making a control device for diesel engines for energizing at least one glow plug when the engine is being started, comprising the steps of:

providing a conductor assembly;

embedding said conductor assembly in a mounting block of an insulating material, said mounting block defining a plurality of first apertures and a plurality of second apertures therein;

severing predetermined portions of said conductor assembly aligned with each said first aperture to define a plurality of circuit elements;

mounting at least a first temperature-actuated switch means and a second temperature-actuated switch means to predetermined ones of said circuit elements aligned with said second apertures; and then

providing a power relay means adapted to be connected to said conductor assembly and to said glow plug for energizing said glow plug.

4,632,077

WINDOW-IN-VANE INTERRUPTER AND SWITCH PLATE ASSEMBLY FOR IGNITION DISTRIBUTOR

Robert J. Novak, Mount Clemens, and Leonard J. Kronberger, Oak Park, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,757
Int. Cl.⁴ F02P *1/00*
U.S. Cl. 123—146.5 A **6 Claims**

1. An ignition distributor to work with an engine control computer, a coil, fuel injectors and the spark plugs of an internal combustion engine to supply high tension electrical energy to the spark plugs and to supply signals to the fuel injectors, the distributor comprising:

a distributor cap of a generally domed shape, the cap having spark towers to house electrodes for communication with the spark plugs of the internal combustion engine via wires, the cap also having a center coil tower to house a coil electrode for communication between the distributor and the coil of the internal combustion engine via a wire, the cap further housing other components within the distributor;

a bowl shaped lower housing to mate with the distributor cap;

drive coupling means connected to the lower housing for communication with the internal combustion engine such that rotational motion inside the engine results in proportional motion of the drive means;

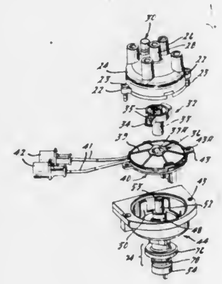
a shaft connected to the drive means, the shaft being mounted on the interior of the distributor to rotate about the central interior axis of the distributor;

a rotor mounted onto the shaft and in tight communication with it so as to rotate with the motion of the shaft;

the rotor further having an electrode for communication with the spark plug electrodes mounted in the spark tower as the rotor moves about the shaft;

an interrupter comprising a circular flange and mounted concentrically about the shaft and affixed to it such that motion of the shaft results in motion of the interrupter;

the interrupter further comprising metal vanes equal in number to the number of internal combustion chambers in the internal combustion engine;



a switch plate assembly comprising a generally circular structure concentrically mounted around the shaft of the distributor allowing the rotor, shaft and interrupter to rotate freely through its center;

the switch plate assembly further comprising two pairs of signal generators and sensors being fixed on the switch plate assembly;

the signal generators and sensors being positioned to leave a gap between each generator and its corresponding sensor to allow the rotating metal vanes on the interrupter to pass between;

the pairs of signal generators and sensors being positioned on the switch plate assembly perpendicular to its generally circular shape such that the generators and sensors protrude toward the plane of the flange of the interrupter and are spaced to allow the metal vanes on the interrupter to pass between each pair of signal generators and signal sensors as the vanes rotate with the interrupter, shaft and rotor;

the interrupter with at least one of the metal vanes having a window for providing a distinctive interruption to the signals generated thereby causing a unique signal to be received by the sensors indicative of the vane with a window.

4,632,078

ARRANGEMENT FOR FACILITATING CORRECT COUPLING BETWEEN DISTRIBUTOR AND DRIVING SHAFT USING ALIGNMENT MARKS

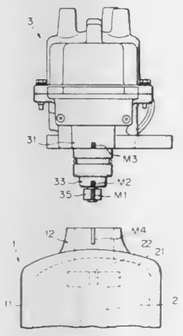
Yoshio Sasaki, and Masahiko Nishikawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 18, 1985, Ser. No. 777,321

Claims priority, application Japan, Sep. 26, 1984, 59-144226[U]

Int. Cl.⁴ F02P *7/02*

U.S. Cl. 123—146.5 A **3 Claims**



1. An arrangement for facilitating correct coupling between a distributor and a driving shaft using a plurality of alignment marks located either on the distributor or on a cylinder head, said plurality of alignment marks consisting of:

a first alignment mark provided on a coupling claw arranged at the end of a distributor shaft for coupling with a coupling groove at the end of a driving camshaft;

a second alignment mark provided on a housing boss of the distributor;

a third alignment mark provided on a housing body of the distributor; and

a fourth alignment mark provided on the end of the cylinder head accommodating the driving camshaft;

said second and third alignment marks arranged in a manner that said third and fourth alignment marks align when said first alignment mark on the coupling claw is aligned with said second alignment mark on the housing boss of the distributor and the coupling claw of the distributor is correctly coupled with the coupling groove of the driving camshaft.

4,632,079

DEVICE FOR AUTOMATICALLY RESTARTING THE ENGINE OF A MOTOR-VEHICLE AFTER SUDDEN BRAKING

Ettore Panizza, and Ercole Premoli, both of Turin, Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Jun. 13, 1985, Ser. No. 744,438

Claims priority, application Italy, Jun. 15, 1984, 67622 A/84

Int. Cl.⁴ F02N *11/08*

U.S. Cl. 123—179 B **7 Claims**

1. A device for controlling the operation of an internal combustion engine of a motor vehicle, comprising;

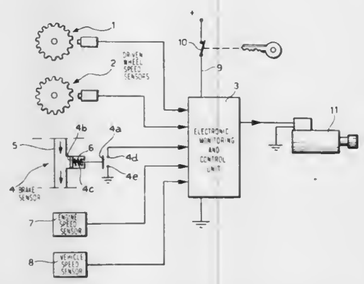
first electrical speed sensor means for association with at least one driven wheel of the motor vehicle and for providing electrical signals indicative of the speed of rotation of the wheel;

second electrical speed sensor means for providing electrical signals indicative of the speed of rotation of the engine;

third electrical speed sensor means for providing electrical signals indicative of the speed of the vehicle;

indicator means for indicating the condition of braking of a vehicle, and

an electronic monitoring and control unit connected to the said first, second and third speed sensor means and to the indicator means, and arranged to output a command signal usable to cause the actuation of a starter motor for the internal combustion engine when the signals provided by the said first, second and third speed sensor means and by the indicator means indicate that, following braking of the



motor vehicle, at least the driven wheel monitored has become locked, the internal combustion engine has stalled, the vehicle is still in motion, and the braking force has been at least partially reduced, so as to cause the driven wheels to be turned again and, consequently, the stability and correct handling of the motor vehicle to be regained.

4,632,080

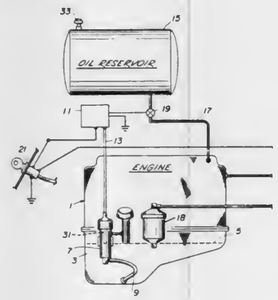
OIL ADDITION APPARATUS

Erwin E. Hurner, 320 Eighth St. West, West Fargo, N. Dak. 58078

Continuation-in-part of Ser. No. 658,400, Oct. 5, 1984, Pat. No. 4,542,718, which is a continuation-in-part of Ser. No. 561,839, Dec. 15, 1983, Pat. No. 4,475,498, and a continuation-in-part of Ser. No. 561,739, Dec. 15, 1983, Pat. No. 4,522,167, which is a continuation-in-part of Ser. No. 218,918, Dec. 22, 1980, Pat. No. 4,421,078, which is a continuation-in-part of Ser. No. 192,077, Sep. 29, 1980, abandoned. This application Sep. 17, 1985, Ser. No. 776,914

Int. Cl.⁴ F02B *77/08;* **F01M** *11/12*

U.S. Cl. 123—196 S **5 Claims**



1. In an internal combustion engine having an ignition system and a lubrication system to lubricate parts of said engine including an oil pan, the improvement, comprising:

a reservoir of fresh lubricating oil;

conduit means for establishing fluid communication between said reservoir and said oil pan;

valve means for opening and closing said conduit means; and

control means for said valve means to establish fluid communication between said reservoir and said oil pan responsive to deactication of said ignition system.

4,632,081

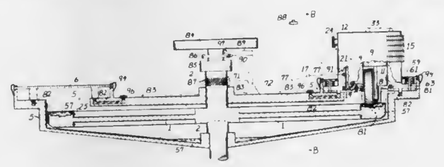
GIULIANI MODULAR ENGINE IMPROVEMENT

Robert L. Giuliani, P.O. Box 30862, Honolulu, Hi. 96820; Mark A. Giuliani, and Karen A. Giuliani, both of 45-310 Akimala Pl., Kaneohe, Hi. 96744

Filed Aug. 1, 1983, Ser. No. 519,089

Int. Cl.⁴ F02D *17/02;* **F02B** *75/26*

U.S. Cl. 123—198 F **19 Claims**



1. An apparatus for transmitting drive to a driven shaft, the combination comprising:

a first housing;

the first housing rotatably supporting the driven shaft;

the driven shaft comprising the crankless type;

at least one power unit of the internal combustion type;

the power unit including a casing, an output drive means, power generated by the internal combustion, a timing means for synchronizing the internal combustion with the output drive means, a second means for transmitting the power from the internal combustion to the output drive means;

a first connection means for operatively coupling the power unit to the first housing;

a second connection means for transmitting drive between the output drive means and the driven shaft;

a control unit;

a first set of indicators presented to the control unit, the first set indicating a first variable condition of the combination;

a second set of indicators presented to the control unit, the second set indicating a second variable condition of the combination;

the control unit adapted to receive and process at least the first and second sets;

the control unit further adapted to determine a result from the process; and

the control unit further adapted to communicate with the power unit for controlling said second connection means whereby at least the second communication is effected dependent upon the result of the control unit.

4,632,082

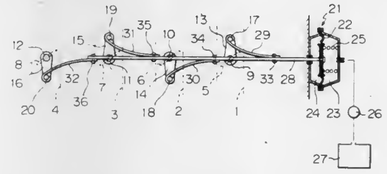
DEVICE FOR DRIVING A ROTARY VALVE

Kyo Hattori, Toyota, and Kazuhiro Sakurai, Gotenba, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 649,607, Sep. 12, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,790

Int. Cl.⁴ F02D *9/16*

U.S. Cl. 123—325 **17 Claims**



1. A rotary valve device comprising:

a plurality of gas passages;

a plurality of rotary valves arranged in said gas passages and aligned in a straight line, each of said rotary valves having a valve shaft;

a plurality of arms fixed onto said valve shafts, each of said arms having a tip;

an actuator for controlling the opening operation of said rotary valves; and

link means interconnecting said actuator to the tips of said arms and comprising a linearly movable straight portion, which extends straight along said straight line and is connected to said actuator, and a plurality of outwardly bending portions which have a resiliency and obliquely outwardly extending from said straight portion, each of said bending portions having an outer end connected to the tip of a corresponding arm

said arms comprising a first arm group and a second arm group which transversely and alternately extend in opposite directions with respect to said straight portion, said bending portions comprising a first group and a second group which transversely and alternately extend in opposite directions with respect to said straight portion.

4,632,083

INJECTION UNIT FOR INTERNAL COMBUSTION ENGINES FED WITH GASEOUS FUELS SUCH AS LIQUEFIED PETROLEUM GAS OR METHANE

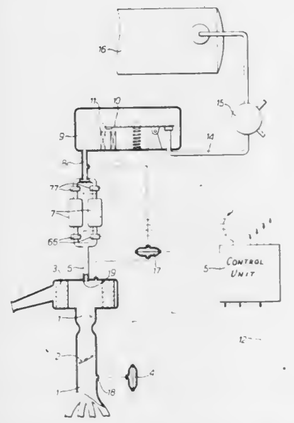
Medardo Reggiani, Reggio Emilia, Italy, assignor to MED di Reggiani Medardo, Reggio Emilia, Italy

Filed Feb. 13, 1985, Ser. No. 701,247

Claims priority, application Italy, Apr. 4, 1984, 46829 A/84

Int. Cl.⁴ F02B *43/00*

U.S. Cl. 123—527 **7 Claims**



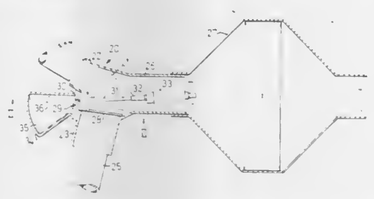
1. An injection unit for internal combustion engines fed with gaseous fuels such as liquefied petroleum gas or methane, said injection unit comprising, at least one volumetric measuring device for feeding on the average a determined volume of gaseous fuel during each engine cycle directly into an intake pipe system of said engine, upstream of a throttle valve of the engine; controlled expander unit means for feeding gaseous fuel to said volumetric measuring device at a pressure P_M equal to the sum of the the absolute pressures P_I and P_C existing respectively at the location at which the gaseous fuel is injected into said intake pipe system and a location in the intake manifold downstream of the throttle valve; and control means for controlling said volumetric measuring device and said controlled expander unit means in accordance with said pressures P_M, P_I, and P_C, and in accordance with the engine rotational speed.

4,632,084

VALVE FOR APPORTIONING PREHEATED AND NON-PREHEATED AIR TO AN INTERNAL COMBUSTION ENGINE

Sivert Eriksson, Partille, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Jun. 6, 1985, Ser. No. 741,822
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—556 **4 Claims**



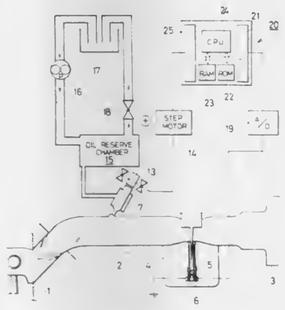
1. Valve for apportioning preheated and non-preheated air to an internal combustion engine, comprising a valve body having an inlet for preheated air, an inlet for non-preheated air, a common outlet from the valve leading to an intake conduit for the engine, and a thermostatically controlled flap valve mounted for pivotal movement about an axis that passes through the valve body, between extreme end positions in one of which a first flap portion on one side of said axis closes said inlet for preheated air and in the other extreme end position of which said first flap portion closes said inlet for non-preheated air, said valve flap having a second flap portion on the side of said axis opposite said first flap portion, said valve body having a balancing chamber which communicates on both sides of said axis with the portion of the interior of the valve body in which said first flap portion moves, said second flap portion being disposed in said balancing chamber and dividing said balancing chamber into two portions separated from each other by said second flap portion, said flap portions being of such dimensions and being so arranged that the forces exerted on the flap valve as a result of the air flow through the valve body give rise to oppositely directed torques of substantially the same magnitude.

4,632,085

LUBRICATING OIL SUPPLY CONTROLLER

Mitsukuni Misawa, Tokyo, and Osamu Sato, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,630
Claims priority, application Japan, Feb. 24, 1984, 59-33969
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 AD **4 Claims**



1. In a two-cycle engine for supplying a mixture of air and fuel to a combustion chamber, a lubricating oil supply controller for the two-cycle engine comprises:

fuel flow rate detecting means for detecting a supply flow rate of fuel which is a non-contact type electrometer provided at a main jet of a carbuetor;

lubricating oil supplying means for supplying a lubricating oil to an intake air passage; and

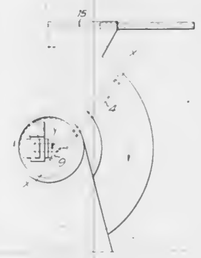
lubricating oil flow rate controlling means for controlling the lubricating oil supply flow rate of said lubricating oil supplying means in response to an input from said fuel flow rate detecting means.

4,632,086

ROTOR FOR CENTRIFUGAL LAUNCHING DEVICE

Léon L. Rutten, 29, rue Duvivier, 4000 Liege, Belgium

Continuation of Ser. No. 326,003, Nov. 30, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,013
Claims priority, application Belgium, Apr. 12, 1980, 2/58887
Int. Cl.[4] F41D *15/00*
U.S. Cl. 124—6 **2 Claims**



1. A rotor for a centrifugal launching device for launching projectiles, wherein the rotor is supported for rotation about an axis, the rotor comprising:

(a) a pair of circular cheeks defining a central space therebetween;

(b) a straight cylindrical gun barrel having a longitudinal axis in and being supported between and connected to the cheeks, the barrel having one end disposed within the central space and positioned adjacent the axis of rotation of the rotor, the one end including means for receiving and launching oblong projectiles through the barrel, the means for receiving the projectiles including a blade which tangentially engages each projectile as it is loaded from a direction defined by a second axis that is disposed perpendicular to the axis of rotation; and

(c) the axis of rotation of the rotor and the longitudinal axis of the gun barrel being geometrically disposed as two straight nonintersecting skew lines in a first plane and perpendicular to each other in a second plane.

4,632,087

ARCHERY ARROW SUPPORT DEVICE

Darrell W. Cline, 5227 Mays Branch, Lavalette, W. Va. 25535

Filed Sep. 17, 1984, Ser. No. 650,888
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—41 A **1 Claim**

1. An arrow support device for maintaining an arrow to be shot from an archery bow along a longitudinal axis of intended arrow flight so that the arrow can be fitted in contact with a bow string at a nocking point and be supported on said bow with said device clamping against the arrow shaft without further intervention by the archer, said device being adapted for mounting on the handle section of the archery bow, said device comprising:

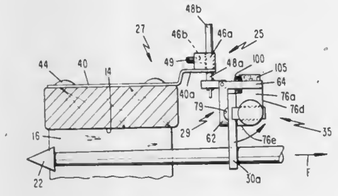
(a) a support bracket attachable to the handle section of the bow;

(b) a pivot frame pivotally connected to the support bracket along a first axis;

(c) clamping means connected to the pivot frame for clamping against said arrow shaft, said clamping means including a pair of jaws movable with said pivot frame about the first axis between (1) a first position wherein the jaws intersect the longitudinal flight axis of the arrow for clamping engagement with the arrow without transmitting appreciable tension to the bow string and (2) a second predetermined neutral position wherein the jaws and pivot frame pivot about the first axis so as to be sufficiently spaced to avoid interfering contact with the arrow as said arrow is being shot from said archery bow; and

(d) actuating means for (1) biasing said jaws into clamping engagement with said arrow, and (2) disengaging the jaws from said clamping engagement, wherein movement of said actuating means by the archer to disengage the jaws automatically causes the pivot frame and jaws to pivot into said predetermined neutral position, further including adjustment means for varying the spacing between said jaws to thereby enable said jaws to grip arrows of different diameters,

wherein said pivot frame is an L-shaped member having a pair of first and second mounting portions extending generally orthogonal to each other, said first mounting portion extending generally parallel to the longitudinal arrow flight axis in the neutral position and being pivotal through 90° of travel relative to the support bracket into the first position,



wherein said pair of jaws are vertically spaced from each other and pivotally connected at common or pivot ends thereof to the inner surface of the first mounting portion, opposite distal ends of said jaws projecting outward from the first mounting portion for pivotal movement in a plane extending parallel to the first portion, said distal ends having arrow gripping surfaces spaced from the pivot ends for proper positioning above and below the arrow when pivoted to the first position,

wherein said clamping means further includes a spring positioned to normally bias the jaws apart from each other, and said actuating means includes a jaw clamping mechanism having a pair of upper and lower members carried on a pivot shaft supported on the second mounting portion, said pivot shaft being rotatable about its longitudinal axis, said upper and lower members respectively engaging upper and lower inclined surfaces of the jaws so that rotation of said pivot shaft in a first direction causes the upper and lower members to slide along said inclined surfaces towards the distal ends, thereby causing the jaws to yield to movement of said upper and lower members and pivot towards each other for clamping against an arrow.

4,632,088

BALL THROWING APPARATUS

Norman R. Bruce, 5055 Dobrot Way, Central Point, Oreg. 97502

Filed Feb. 28, 1983, Ser. No. 470,430
Int. Cl.[4] F41B *15/00*
U.S. Cl. 124—78 **18 Claims**

1. Ball throwing apparatus comprising:

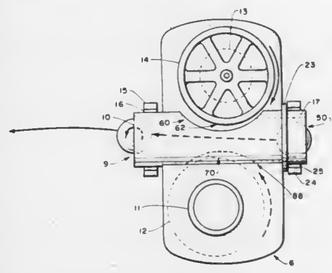
a standard;

barrel means having a feed end and a delivery end for aiming a ball;

means for rotatably mounting said barrel means on said standard for rotatable adjustment about the longitudinal axis of said barrel means;

means for propelling the ball comprising:

first and second drive wheels rotatably mounted on opposite sides of said barrel means, positioned substantially in a common plane substantially coincident with the longitudinal axis of said barrel means, and having respective peripheries for frictionally engaging a ball fed into said feed end;



drive means for rotating said wheels for propelling the ball out of said delivery end;

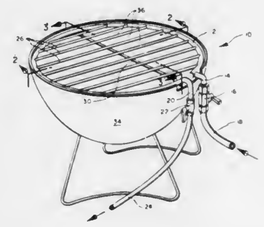
means for mounting said first wheel farther from said feed end than said second wheel, whereby the ball is ejected from said barrel means on a path diverging angularly from said longitudinal axis of said barrel means.

4,632,089

WATER CIRCULATED GRILL

Lawrence Wardell, 1474 East 6030, Salt Lake City, Utah 84121

Filed Dec. 18, 1984, Ser. No. 683,144
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 R **5 Claims**



1. A liquid circulated continuously cleaning food cooking grill comprising

a plurality of food support tubes arranged to form a grill for the support of food items placed directly thereon and for food drippings, water and steam to pass around and between adjacent tubes;

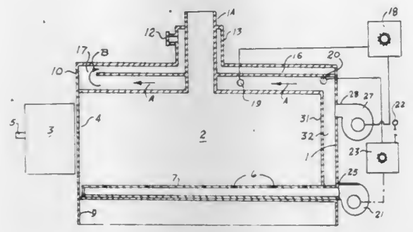
means interconnecting the interiors of the tubes to permit flow therethrough;

inlet means adapted to continuously supply cooling liquid under pressure into and through said tubes;

discharge means to receive liquid circulated through said tubes and to direct it from said grill whereby the liquid is continuously supplied cold to the inlet means and is discharged hot from the discharge means and is continuously flowed through the tubes to maintain the tubes in a sufficiently cooled condition to cause condensation thereon during cooking of food items placed thereon; and

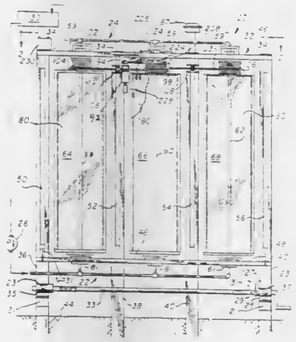
means supporting a heat source beneath said grill.

4,632,090
STOVE ARRANGEMENT
Marty York, P.O. Box F, Marrowbone, Ky. 42759
Filed Nov. 13, 1984, Ser. No. 670,874
Int. Cl.⁴ F24H *3/02*
U.S. Cl. 126—110 R **3 Claims**



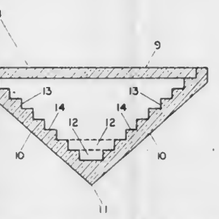
1. An improved solid fuel burning stove arrangement to heat a selected space including a housing defining a combustion chamber, an access door to said combustion chamber for providing fuel to the chamber, a tubular combustion air sparger located logitudinally in the bottom of the chamber and having a multiplicity of generally radially directed air flow apertures to direct air into solid fuel in the bottom of the chamber, first air supply means to supply air to said sparger to supply combustion air to said combustion chamber, means forming a plenum chamber in said housing to receive heat generated in said combustion chamber, first air inlet to said plenum chamber to receive air to be heated and a heated air outlet from said plenum chamber, an exhaust flue communication with said combustion chamber, second air supply means to supply air to said first air inlet; first control device to initiate operation of said first air supply means when the temperature in said space to be heated is below a selected temperature, second control means to initiate operation of said second air supply means when the temperature in said plenum means reaches a first selected plenum temperature and third control means to terminate operation of said first air supply means when the temperature at a selected location in said plenum chamber exceeds a second selected plenum temperature.

4,632,091
SOLAR ENERGY COLLECTOR APPARATUS AND METHOD
David B. Wiens, 206 S. Washington, Hillsboro, Kans. 67063
Continuation-in-part of Ser. No. 480,119, Sep. 27, 1982, abandoned, which is a continuation of Ser. No. 113,179, Jan. 18, 1980, abandoned. This application Nov. 1, 1984, Ser. No. 651,511
Int. Cl.⁴ F24J *2/38*
U.S. Cl. 126—425 **12 Claims**



1. A system for collecting solar energy comprising:
(A) frame supporting a conduit and reflector means, said reflector means focusing solar energy on said conduit means, wherein said conduit means heats fluid passing therethrough;
(B) motor means for turning said reflector means around said conduit means;
(C) electric control switching means directing control to either a holding circuit means or a tracking circuit means as a function of the position of said reflector means, both of said circuit means controlling said motor means,
i. the holding circuit means to hold said reflector means in a downward position when the solar energy is less than a predetermined amount, and then to direct said motor means to turn said reflector means to face where the sunrises are when the solar energy is greater than a predetermined amount,
ii. the tracking circuit means having control when the reflector means faces the sunrises, and when there is more solar energy than said predetermined amount to have the reflector face the sun, and further to rotate the reflector to a downward position when the solar energy is less than said predetermined amount, where upon said electric control switching means passes control back to said holding circuit means.

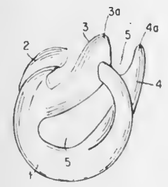
4,632,092
INSET SOLAR PRISM
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806
Filed May 8, 1986, Ser. No. 860,962
Int. Cl.⁴ F24J *3/02*
U.S. Cl. 126—440 **1 Claim**



1. An inset solar prism comprising in general a hollow transparent glass prism having a planar face which receives a rectangular beam and having two angular wedge faces which refract the beam to form two concentrated convergent rectangular beams, and comprising in particular;
a hollow transparent glass prism (**8**) having a planar face (**9**) and two angular wedge faces (**10**) opposite said planar face,
said planar face having two parallel edges and a centerline parallel to said edges,
each said angular wedge face having a common inner edge forming an apex (**11**) opposite said centerline,
each said angular wedge face having an outer edge parallel to said edge of said planar face and terminating in the vicinity thereof,
said prism having a prismatic plane bisecting said apex and occupying said centerline,
said prism having an elongate dimension of unspecified length parallel to said centerline,
said prism having a series of eight structural cavities (**12**) of graduated width defined by two opposed parallel sides (**13**) adjacent to and equidistant from said angular wedge faces, and defined by two opposed inset faces (**14**) parallel to said planar face and equidistant from said angular wedge faces,
said opposed sides being opaque,
said opposed sides being equal in depth,
said opposed faces being equal in width,
each said opposed side having an upper edge,
each said opposed face having an inner edge,

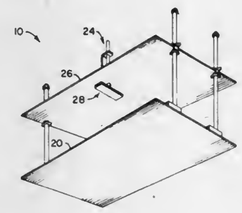
each said upper edge and each said inner edge terminating in a common line so as to form in combination a step.

4,632,093
SURGICAL RETRACTOR
Gastone Giorni, Sansepolcro, Italy, assignor to Brevetti Odontoiatrici S.n.c. di Miliani Maria Pia & C., Arrezo, Italy
Filed Jul. 1, 1985, Ser. No. 750,177
Claims priority, application Italy, Jul. 23, 1984, 1210 A/84
Int. Cl.⁴ A61B *1/00;* **A61C** *5/00*
U.S. Cl. 128—12 **8 Claims**



1. An odontological surgical retractor comprising a substantially annular body, a first, upwardly extending prong having a first end and a second free end, said first end of the first prong being attached to said annular body, a second prong having a first end and a second end, said first end of said second prong being attached to said annular body, said first and second prongs being separated by an opening, said retractor being adapted to be positioned over a dental group of teeth of a patient, said substantially annular body extending about less than 360° and having first and second free ends separated by a gap, said retractor having an interior surface defined by said annular body and said first and second prongs, said inner surface comprising a substantially flared funnel member.

4,632,094
ELECTRO-MECHANICAL HEART COMPRESSOR SYSTEM
August A. Thomas, 1321 Roxboro Rd., Baltimore, Md. 21237
Filed Mar. 25, 1985, Ser. No. 715,834
Int. Cl.⁴ A61H *7/00*
U.S. Cl. 128—52 **1 Claim**



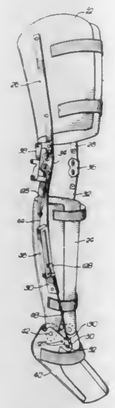
1. A system for use in cyclically compressing and releasing a human heart through the chest wall of a patient and having a plunger, means for quickly positioning the plunger relative the chest wall portion above the heart of a patient, means for reciprocating the plunger and cyclically pressing down and releasing said chest wall portion and thereby cyclically compressing and releasing the heart of the patient, the improvement comprising: the means for quickly positioning comprising: the system including an upper mounting plate, means affixing the means for reciprocating on the upper mounting plate with a portion of the plunger protruding downwardly, a lower mounting plate, a plurality of supports, means pivotally securing the plurality of supports to the lower mounting plate, means for detachably engaging each of said plurality of supports to the upper mounting plate; the means for detachably engaging including means for adjusting the height of said engaging; the means for quickly positioning further comprising an indicium on the lower mounting plate below said plunger, the means for detachably engaging including the means for pivotally securing permitting the plurality of supports to fold inwardly over the lower mounting plate, the upper mounting plate being substantially the same size as the lower mounting plate and having ends with slots therein, means for holding the plurality of supports in upright position, the plurality of supports when held in upright position being flexible outwardly past the upright position for springing back and fitting respectively into said slots, each support having screwthreads at an end thereof, the means for holding the plurality of supports in upright position including on each support a cylindrical nut receiving in a threaded hole transversely therethrough the screwthreads of the support, a square tube affixed to the lower mounting plate and containing the cylindrical nut rotatably therein, and the support being rotatable for screwing the threaded end down against the lower mounting plate, thereby holding the support upright.

4,632,095
PRESSURE-POINT ATTACHMENT FOR USE WITH ELECTRICAL HAND-HELD MASSAGERS
Robert P. Libin, Encino, Calif., assignor to Tamiko Inc., Encino, Calif.
Filed Nov. 5, 1984, Ser. No. 668,135
Int. Cl.⁴ A61H *7/00*
U.S. Cl. 128—67 **2 Claims**



1. A pressure point attachment designed to fit onto the vibrating head of an electrical massager where said attachment comprises:
(a) a circular disk having a front surface and a back surface,
(b) said front surface having a conical projection beginning on it's surface and extending outwardly,
(c) a resilient pressure point cover adhesively secured on said conical projection,
(d) means for selectively releasably attaching said disk to the vibrating head of said electrical vibrator for massaging selected body pressure points
(e) the means for attaching said disk to the vibrating head of said electrical vibrator consisting of a ledge extending downwardly at 90 degrees from substantially the entire periphery of said back surface of said disk and said ledge having a plurality of flexible gripping tabs thereupon for gripping the vibrating head,
(f) said vibrating head having a circumferential edge including means to retain said tabs on said edge, and
(g) said tabs further comprising a longitudinal ridge located on the inside surface of said tabs providing gripping pressure to said means to retain.

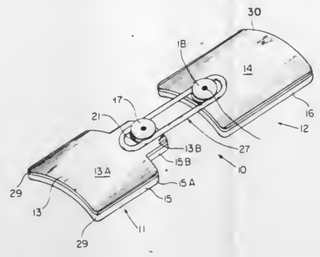
4,632,096
AUTOMATICALLY RELEASING KNEE BRACE
Adam I. Harris, 625 N. Arden Dr., Beverly Hills, Calif. 90210
Filed Aug. 12, 1985, Ser. No. 764,600
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 F **19 Claims**



1. An orthosis for the leg comprising:
a first elongate member adapted to be secured along the side of the upper part of the leg above the knee;
a second elongate member adapted to be secured along the side of the lower part of the leg below the knee;
a pivot means interconnecting one end of the first elongate member with one end of the second elongate member, said pivot means adapted for placement adjacent the knee at the side thereof for providing relative pivotal movement of the first and second elongate members about a generally horizontal axis at the knee when the upper and lower parts of the leg are moved relative to one another in a flexing or extending motion at the knee;
a locking means for locking said pivot means when the upper and lower parts of the leg are moved relative to one another in an extending motion a predetermined amount, said locking means restricting the motion of said first and second elongate members with respect to one another; and
means for unlocking said locking means so that said first and second elongate members may pivot about said axis and said upper and lower parts of the leg may be moved relative to one another in a flexing motion, said means responsive to a predetermined dorsiflexion of the ankle followed by a predetermined plantar flexion of the ankle during a single gait cycle.

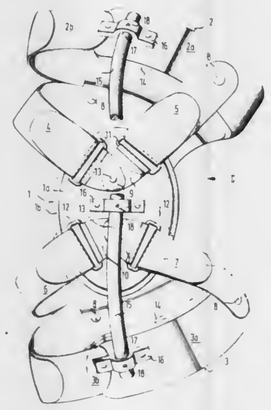
4,632,097
KNEE BRACE
Richard R. Brooks, 9160 Shanley La., Auburn, Calif. 95603
Filed May 13, 1985, Ser. No. 733,091
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **11 Claims**

1. A knee stabilizer for the support and protection of the knee joint which comprises:
a pair of first and second plates spaced one from the other, the first of which plates includes an arcuate shaped extension portion of a width less the width of said first plate, the extension portion extending axially in the direction toward said second plate,
said second plate and the extension portion of said first plate each have a fixed sheave pulley mounted on the top surfaces thereof, with a rigid endless belt encircling said pulleys wherein the endless belt is a non-resilient rigid tubing means adapted to lock against at least one of said pulleys to thereby lock said belt into a fixed position, upon



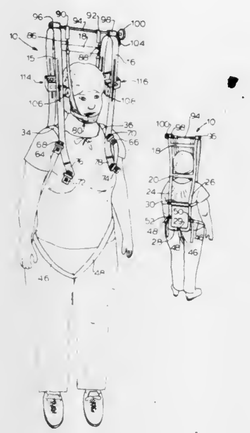
the application of force to one of said plates, and released from said fixed position upon the release of such force.

4,632,098
ORTHOPEDIC BRACE FOR KNEE JOINTS
Hans Grundei, and Ernst-Joachim Henssge, both of Lubeck, Fed. Rep. of Germany, assignors to S & G Implants GmbH, Fed. Rep. of Germany
PCT No. PCT/DE/8400264, § 371 Date Jul. 22, 1985, § 102(e) Date Jul. 22, 1985, PCT Pub. WO85/02537, PCT Pub. Date Jun. 20, 1985
This PCT application filed Dec. 6, 1984, Ser. No. 763,135
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344422
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 C **6 Claims**



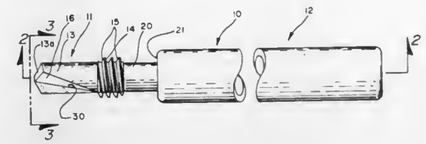
1. An orthopedic brace for splinting and for balancing the lateral instability of knee joints, characterised by a tie-plate (**1**) intended to be applied on the knee joint side having the preponderant instability and acted upon by elastic belt straps (**4**,**5**,**6**,**7**) which lead to fastening points (**8**) positioned offset above and below as well as laterally with respect to the tie-plate (**1**), the lines of action of two mutually adjacent belt straps in each case intersecting each other in the region of the tie-plate, and further characterised in that the fastening points (**8**) are provided on shackles (**2**;**3**) of which, once the orthopedic brace has been applied, the one (**2**) partially enflanks the thigh and the other (**3**) partially enflanks the lower part of the patient's leg, and of which the open portion may be overbridged by means of releasable straps (*2b*;*3b*).

4,632,099
EMERGENCY TRANSPORT NECK IMMOBILIZER
Leonard J. Mollo, Rte. 1, Box 1, Highway 20, Lumberbridge, N.C. 28357
Filed Jan. 17, 1985, Ser. No. 692,379
Int. Cl.[4] A61F *5/02, 5/04;* **A61H** *3/00*
U.S. Cl. 128—87 B **8 Claims**



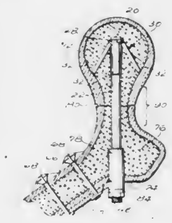
1. An emergency transport neck immobilizing brace, comprising:
(a) an integral rigid frame structure including:
(i) a pair of laterally-spaced curved shoulder support frame portions formed to fit, be supported on, and be secured to the shoulders of a person's body;
(ii) back frame portions extending from said shoulder support frame portions and forming open frame structure mountable behind and extending from the shoulders toward the pelvic region of said person's body; and
(iii) open support frame structure extending outwardly from said shoulder support frame portions opposite to the direction of extension of said back frame portions and including side frame structure formed to reside on opposite sides of and spaced outwardly from the head of said person's body;
(b) strap and connector means on said frame structure providing straps of adjustable length and associated connectors mounted in a manner enabling said frame structure to be stably secured to the shoulders and other selected portions of said person's body with said shoulder support frame portions engaged with the shoulders of the person's body and said back frame portions engaged with the back of said person's body;
(c) a head halter assembly mounted on said support frame structure including:
(i) a chin-engaging head halter;
(ii) a pair of laterally spaced straps secured to opposite sides of said halter; and
(iii) a mechanism operatively associated with said pair of halter straps for placing in traction the head of the person's body employing said brace; and
(d) a head-bracing assembly including a single pair of cushion means mounted on said side frame structure and adjustably engagable with opposite sides of the head of the person's body employing said brace in a manner effective to embrace the head for preventing lateral, forward and backward movement of the said person's head.

4,632,100
SUTURE ANCHOR ASSEMBLY
W. Karl Somers, and Marlowe E. Goble, both of Logan, Utah, assignors to Marlowe E. Goble, Cache County, Utah
Filed Aug. 29, 1985, Ser. No. 770,428
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 **15 Claims**



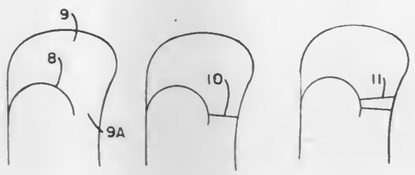
1. A suture anchor assembly comprising a cylindrically shaped anchor formed of a material suitable for implantation in a human body that includes both a drill means on one end thereof for boring, when turned, a hole in a bone mass, and a thread means that includes a plurality of thread flights formed in the anchor distal from said drill means end to turn into the bone mass following the drill means; means for securing a suture to said anchor to extend therefrom after said anchor is seated in the bone mass; and means for turning said anchor.

4,632,101
ORTHOPEDIC FASTENER
Yosef Freedland, 11871 Artesia Blvd., Artesia, Calif. 90701
Filed Jan. 31, 1985, Ser. No. 696,991
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YW **16 Claims**



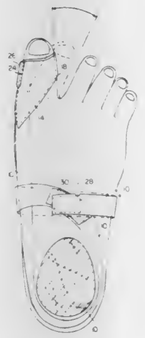
1. An implant device for fixating bones in a living body comprising a shaft having an elongate shank with inner deployment and outer securement ends and a lever actuating means at said outer deployment end, an elongate tubular sleeve with inner and outer ends engaged about and shiftable axially of said shank, pivot means defining a plurality of circumferentially spaced axes of rotation about said inner end of the sleeve and radially outwardly offset from said shank, a plurality of anchoring arms each mounted by said pivot means about one of said axes of rotation each arm includes a short lever projecting substantially radially inwardly from its axis of rotation into driving engagement with said actuating means and an elongate strut with inner and outer ends extending longitudinally outward from its axis of rotation and normally in a first position in substantial parallel juxtaposition with said sleeve, said arms are pivotally movable to move the struts to radially outwardly longitudinally inwardly inclined deployed second positions relative to the sleeve upon axial inward shifting of the shaft and actuating means relative to the sleeve; and fastening means releasably holding said shaft and sleeve in set relative longitudinal position and said struts in said second positions.

4,632,102
BONE WEDGE OSTEOTOMY METHOD
John E. Comparetto, P.O. Box 433, Nassawadox, Va. 23413
Division of Ser. No. 294,653, Aug. 20, 1981, Pat. No. 4,501,268.
This application Nov. 1, 1984, Ser. No. 667,424
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VY **9 Claims**



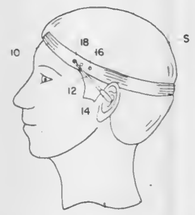
1. An osteotomy method comprising the steps of making a crecentric cut through one side of a bone, making a planar cut through the side of a bone opposite the side with the crecentric cut and extending the planar cut from the crecentric cut to the second side of the bone at an acute angle to a tangent to the convex side of the crecentric cut at an intersection of the crecentric cut and planar cut, forming a second planar cut spaced from the first planar cut and extending the second planar cut from the crecentric cut to the second side of the bone thereby forming a wedge at an acute angle to the convex side of the crecentric cut, removing the wedge and repositioning bone portions to adjoin the first and second planar cut areas and immobilizing and permitting the bone to heal.

4,632,103
BANDAGE TO REDUCE BUNION PAIN THEREWITH
B. Robert Fabricant, North Hills, and Eli Elias, Great Neck, both of N.Y., assignors to Barbara Ann Fabricant, North Hills, N.Y.
Filed Nov. 14, 1985, Ser. No. 797,985
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—157 **7 Claims**



1. A bandage, particularly for relief of bunion pain, comprising in combination,
a longitudinal elastic strip having a center region,
a first flap extending substantially at right angles outwardly in one direction from said longitudinal strip near one end thereof, having an inner side, and being formed with a substantially V-shaped notch,
tissue protection means provided on the inner side of said first flap,
a second flap extending outwardly near said one end of said strip in a direction opposite to said one direction,
first attachment means provided on at least one of said flaps so that said one of said flaps is attachable to the other of said flaps, while forming a loop therewith,
said strip having an end region opposite to said one end, said V-shaped notch facing said end region, said regions being separated from one another by a predetermined spacing, and
second attachment means provided at least on one of said regions for attaching said end region to said center region,
whereby said first flap is attachable to said second flap by said first attachment means, while looping around the hallux so that an apex of said V-shaped notch faces the second toe, permitting the strip to be wrapped dorsally around the posterior aspect of the calcaneous, thereafter to pass dorsally near the mid tarsal joint, and be wrapped around the lateral aspect, so that said end region of said strip may be attached to said strip center region by said second attachment means,
the spacing of said regions from one another being chosen so that the elastic strip, when under tension, opposes valgus forces acting on the hallux, and when the bandage is operatively applied to the foot of a patient, and separates the hallux from the second toe, while said tissue protection means protects any inflamed area of the first metatarsal joint even while said valgus forces act on the hallux, and substantially reduces bunion pain.

4,632,104
DEVICE FOR RELIEF OF HEADACHES
Robert P. Conrow, 120 Caribe Isle, Novato, Calif. 94947
Filed Sep. 16, 1985, Ser. No. 776,602
Int. Cl.[4] A61F *13/12*
U.S. Cl. 128—163 **6 Claims**

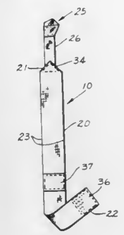


1. A device for relief of discomfort comprising:
a base member adapted to be fixed on the forward portion of the skull of a human subject;
an earpiece for gripping the ear of said subject; and
a tension member attached at one end thereof to said base member and carrying said earpiece on the other end thereof, said tension member being extended within its elastic limits to pull said ear forward.

4,632,105
HAND AND WRIST WRAP INCLUDING A THUMB LOOP
Carl S. Barlow, Sandpoint, Id., assignor to Barlow, Inc., Sandpoint, Id.
Filed Jan. 11, 1985, Ser. No. 690,780
Int. Cl.[4] A61F *13/10*
U.S. Cl. 128—165 **15 Claims**

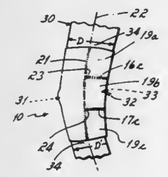
1. An elastic wrap, comprising:
an elongated elastic strap having a first end and a second end;
an anchor loop at the first of said ends including a frustum shaped sleeve formed to be received about the proximal phalanx of a wearer's thumb and having a reduced opening for receiving the distal knuckle of the thumb and an enlarged opening to receive the proximal knuckle of the thumb;
wherein the elastic strap includes a width dimension between opposed longitudinal sides and wherein the anchor loop is formed of an elastic section along the strap with a width dimension less than that of the strap and approximately equal to the length dimension of the proximal phalanx of the thumb;

wherein the frustum shaped sleeve is formed along an axis oriented at an oblique angle to the strap such that when the thumb loop is placed over the thumb, the elastic strap is oriented to extend across the hand transverse to the fingers;



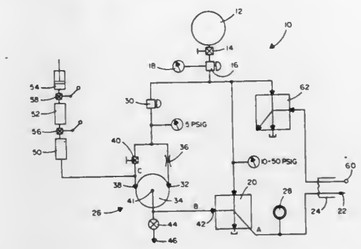
a first fastener member at the second end of the strap; and
a second fastener member along the elastic strap spaced toward the first strap end from the first fastener member.

4,632,106
STRETCHABLE TUBULAR BRACE FOR KNEE OR ELBOW AND METHOD OF CONSTRUCTION
Paul B. Gamm, Cincinnati, Ohio, assignor to Jung Corporation, Ohio
Filed Jan. 28, 1986, Ser. No. 823,311
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—165 **10 Claims**



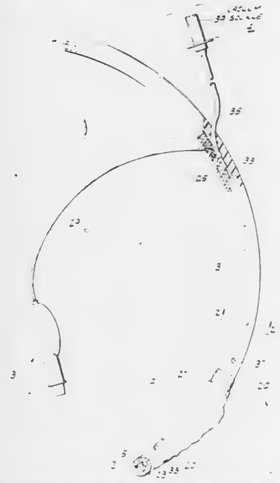
1. A brace for knee or elbow comprising
a sleeve of elastic material that is of generally tubular configuration, said sleeve having a curved configuration when it is viewed from the side and when not being worn, and
upper and lower transverse seam lines spaced one from the other on the inside surface of said sleeve, said seam lines closing elongated eye shaped openings in said sleeve which openings were cut out initially in order to provide the curved configuration, the spacing of said seam lines insuring that neither seam line overlies the fold line of the wearer's skin surface when the brace is being worn, thereby minimizing irritation of the wearer's skin at that skin fold line.

4,632,107
HIGH-FREQUENCY JET VENTILATOR
Kenneth C. Butler, Carmichael, Calif., assignor to Nimbus, Inc., Rancho Cordova, Calif.
Filed Jul. 11, 1985, Ser. No. 754,346
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—204.24 **17 Claims**



1. In an opposed vortex oscillator having an oscillator chamber and a plurality of fluid inlet conduits, the method of varying the frequency of said oscillator by varying the fluid capacitance of at least one of said inlet conduits.

4,632,108
TUBE AND MATERIAL FOR USE IN LASER SURGERY
James A. Geil, St. John, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed Feb. 21, 1985, Ser. No. 703,964
Int. Cl.[4] A61M *16/00;* **A62B** *9/06*
U.S. Cl. 128—207.14 **5 Claims**



1. A flexible, laser-resistant surgical tube for use in connection with laser surgery, said tube being defined by a tubular wall and comprising a polymeric materix generally non-reflective to laser radiation and having relatively poor thermal conductivity, said polymeric matrix having a laser-reflective filler embedded therein to retard laser radiation from buring through the polymeric matrix of the surgical tube, said filler constituting not more than about 35% by weight of said matrix and comprising spaced, finely divided particles uniformly distributed throughout said matrix, the density of said particles in said matrix being sufficient such that the particles overlap when viewed from the direction of the source of laser radiation, said particles including a dielectric core of a geometric shape to defocus, diffuse and disperse laser radiation impinging on the surface thereof, said particles further including a laser-reflective metallic surface coating encasing said core whereby said metallic coated particles retard burning of the matrix of said surgical tube by reflecting laser radiation and, by virtue of

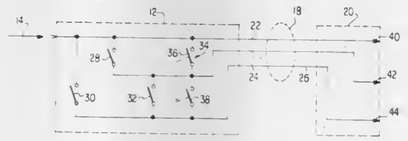
the shape of said particles, by defocusing, diffusing and dispersing laser radiation through out the adjacent matrix of the surgical tube and distributing heat therefrom about the periphery of said particles to the matrix adjacent thereto.

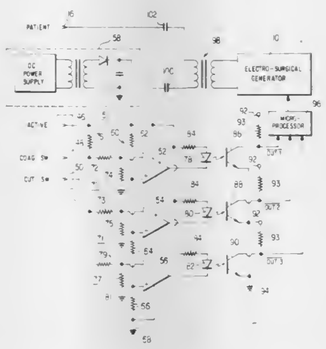
4,632,109

CIRCUITRY FOR PROCESSING REQUESTS MADE FROM THE STERILE FIELD OF A SURGICAL PROCEDURE TO CHANGE THE OUTPUT POWER LEVEL OF AN ELECTROSURGICAL GENERATOR

William G. Paterson, Longmont, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Dec. 11, 1984, Ser. No. 680,966
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 **9 Claims**





1. An electrosurgical generating system comprising:
an electrosurgical generator;
a handpiece including (a) an active electrode connected to said generator for applying electrosurgical current from the generator to a patient and (b) power changing means for changing the level of output power delivered from the generator to the patient; and
initializing means responsive to said power changing means for making an initial determination that said handpiece includes said power changing means and thus permit said power changing means to change said output power level only if said handpiece includes said power changing means.

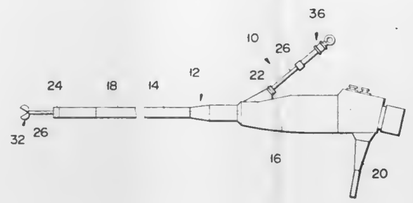
4,632,110

MEDICAL OPERATION INSTRUMENT FOR ENDOSCOPE

Kenichiro Sanagi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 770,955
Claims priority, application Japan, Sep. 28, 1984, 59-147110[U]
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **6 Claims**

1. An endoscope medical operation instrument for insertion into a coeliac cavity through the insertion channel of an endoscope, comprising:
a flexible sheath inserted into the insertion channel;
a medical operation section fitted to the distal end of the sheath so as to be inserted into the coeliac cavity;
a control wire movably inserted into the sheath and connected at one end to the medical operation section; and
a control section, fitted to the proximal end of the sheath and



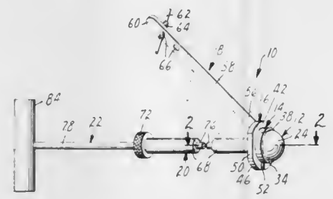
connected to the other end of the control wire, for controlling the medical operation section by pushing and pulling the control wire;
wherein at least the other end portion of the control wire, positioned near to the control section, is impregnated with a hardening agent to provide a hardened section.

4,632,111

ACETABULAR CUP POSITIONING APPARATUS

Karen M. Roche, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 21, 1985, Ser. No. 714,532
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **9 Claims**



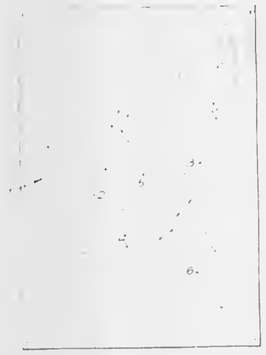
1. Apparatus suitable for positioning a prosthetic acetabular cup within an acetabulum, said cup having a recessed surface dimensioned to mate with a prosthetic femoral head, said apparatus comprising:
A. a pusher ball, for pressing the acetabular cup into the acetabulum, said pusher ball including an outer surface adapted to generally mate with said recessed surface of said acetabular cup;
B. a pusher arm including:
(1) a first end portion affixed to said pusher ball;
(2) an intermediate straight portion; and
(3) a second end portion opposite said first end portion;
C. a positioner flange having first and second major opposite surfaces;
D. a positioner arm including:
(1) a first end portion affixed to said flange;
(2) an intermediate straight portion; and
(3) a second end portion opposite said first end portion; and
E. means for removably engaging said flange with said intermediate straight portion of said pusher arm to face said first major surface of said flange with said pusher ball along said intermediate straight portion of said pusher arm, said removable engaging means comprising an edge surface connecting said first and second major surfaces of said flange and a portion of said edge surface extending from a first location on the periphery of said major surfaces generally tc the center of said major surfaces and back to a second location on the periphery of said major surfaces to define a slot dimensioned to receive a part of said intermediate portion of said pusher arm; and
F. adjustable means for releasably affixing:
(1) said flange faced with said pusher ball to define a predetermined angle between said intermediate straight portions of said pusher arm and said positioner arm; and
(2) said outer surface of said pusher ball generally mated with said recessed surface of said acetabular cup, so that said positioner flange and said positioner arm can be released and removed from said intermediate straight portion of said pusher arm while said pusher ball remains mated with said recessed surface of said acetabular cup to maintain uninterrupted pressure on said acetabular cup.

4,632,112

PROCEDURE FOR DRAINING FLUID FROM LUNGS

Hugoe R. Matthews, The Department of Thoracic Surgery, East Birmingham Hospital, Bordesley Green East, Birmingham B9 5ST, England

Filed Aug. 24, 1983, Ser. No. 525,923
Claims priority, application United Kingdom, Oct. 27, 1982, 8230714
Int. Cl.[4] A61F *17/32*
U.S. Cl. 128—305.3 **7 Claims**



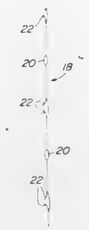
1. Apparatus for use in conducting a surgical procedure to remove fluid from a patient's lungs comprising in combination:
a scalpel for making a small cut through the patient's throat into the trachea, said scalpel being provided with stop means to limit the extent of its penetration to thereby prevent damage to the posterior of the trachea,
a stylet having a blunt, patient-end adapted for insertion into the trachea through the cut in a patient's throat;
an outer, flexible guide tube adapted for insertion into the trachea on said stylet so that one end of the guide tube is located within the trachea and the other end is located outside the trachea, the external diameter of the guide tube being substantially less than the internal diameter of the human trachea such that airflow through said trachea around said guide tube is substantially unimpeded, and the internal diameter of the guide tube being substantially the same as the external diameter of the stylet; and
a suction catheter adapted for insertion into the patient's lungs through said guide tube after removal of the stylet. the external diameter of said suction catheter being substantially the same as the internal diameter of the guide tube.

4,632,113

SUTURE FOR CARDIOVASCULAR SURGERY

Sariel G. G. Ablaza, 3600 Conshohocken Ave., Philadelphia, Pa. 19131

Filed Sep. 23, 1985, Ser. No. 778,894
Int. Cl.[4] A61L *17/00*
U.S. Cl. 128—335.5 **3 Claims**



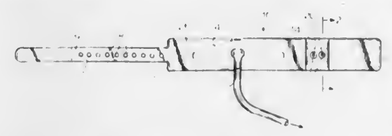
1. A surgical suture assembly comprising a ligature line, a series of backers arranged in spaced relationship to each other linearly of said line, said backers having streamlined contours and being fixed to said line, and a pair of surgical needles fixed to said line between each pair of adjacent backers, the needles of each pair being spaced from each other linearly of said line a sufficient distance to permit severance therebetween.

4,632,114

URETHRAL SPHINCTER CUFF

Donald A. Todd, White House Station, N.J., and Robert E. Fischell, Silver Spring, Md., assignors to C. R. Bard, Inc., Murray Hill, N.J. and The Johns Hopkins University, Baltimore, Md., a part interest

Filed Mar. 22, 1985, Ser. No. 715,157
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—346 **5 Claims**



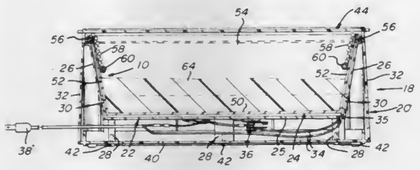
1. An inflatable urethral sphicter cuff adapted for application to a human urethra comprising in combination:
a belt having an inner face;
an occluding diaphragm mounted on the inner face of the belt and when in a substantially planar state being prestretched in substantially all lateral directions within the plane to always be under tension when in use so that it is free of wrinkles when the diaphragm is inflated and deflated whereby when the diaphragm circumference is reduced to its minimum value, with pressure on the urethra, the diaphragm remains under tension so that its surface is free of wrinkles, thereby providing a smooth diaphragm surface pushed against the urethra to reduce the possibility of local necrosis of the urethral tissue;
a coupling means for cooperating with a pressure source for selectively inflating and deflating the diaphragm;
whereby when the diaphragm is inflated the urethra will be squeezed and the patient is continent, and when the diaphragm is deflated the urethra is released and urine may flow therethrough.

4,632,115

PORTABLE HEAT TREATMENT SYSTEM AND REFILL UNIT THEREFOR

Ronald J. Bernardini, Ambler, Pa., assignor to Michael Litman, Philadelphia, Pa.

Filed Dec. 12, 1983, Ser. No. 560,345
Int. Cl.[4] D61H *33/00*
U.S. Cl. 128—370 **7 Claims**



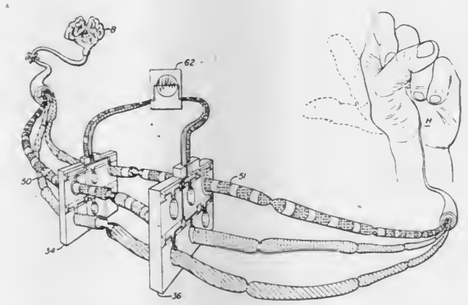
1. A refill unit usable in conjunction with a heating shoe of a portable heat treatment system to provide heat therapy to a part of the human body; characterized in that said unit includes a heat conductive container having a base and peripheral walls extending upwardly from said base to define an interior compartment, a material for treating parts of the human body only partially filling the compartment, said material being in a solid state at room temperature and being adapted to be melted within the heating shoe for use in providing heat treatment therapy to a part of the human body, opposed peripheral walls of said container each including an upper bent edge defining a handle-retaining channel, and a pair of handle members, each of said members extending through opposed ends of a respective channel and having a section between the opposed ends adapted to be engaged for the purpose of transporting said refill unit, said section of each handle member being positionable within the interior compartment of the container and being dimensioned to be above the level of the body treating material when positioned within said interior compartment.

4,632,116

MICROELECTRONIC AXON PROCESSOR

Joseph M. Rosen, #49 Peter Coutts Cir., Stanford, Calif. 94305, and Morton Grosser, 1016 Lemon St., Menlo Park, Calif. 94025

Continuation-in-part of Ser. No. 626,187, Jun. 29, 1984, abandoned. This application Feb. 6, 1986, Ser. No. 826,940
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—419 R **3 Claims**



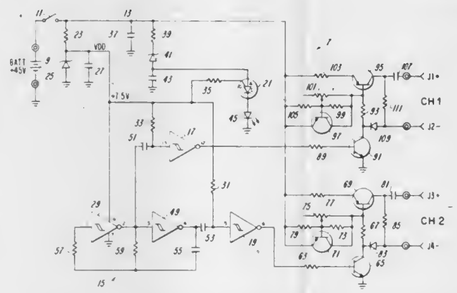
1. Apparatus for restoring normal function to a severed nerve fascicle, comprising;
a flat planar substrate perforated with a plurality of holes, each hole sized to accommodate one dominant axon;
at least two electrically conductive traces in ohmic contact with the inner surface of each said hole at discrete locations along the axial direction of said hole, thereby defining a proximal contact and a distal contact;
means for monitoring the potential at each said contact;
means for individually applying a blocking potential to at least one contact in each hole; and
means for communicating a stimulating potential between preselected pairs of proximal and distal contacts.

4,632,117

SIMPLIFIED TRANSCUTANEOUS NERVE STIMULATING DEVICE

Donald N. James, Estes Park, Colo., assignor to Staodynamics, Inc., Longmont, Colo.

Continuation of Ser. No. 406,606, Aug. 9, 1982, abandoned. This application Aug. 5, 1985, Ser. No. 762,522
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—421 **4 Claims**



1. A transcutaneous nerve stimulating device, comprising:
battery means;
oscillating means connected with said battery means, said oscillating means including first and second signal providing means with said first signal providing means providing first output pulses and said second signal providing means providing second output pulses that are timewise spaced in occurrence with respect to said first output pulses;
a first control transistor connected with said first signal providing means;
a first channel having first output means and first return means to be connected with a user;
a second channel having second output means and second return means to be connected with a user;
first and second capacitor means connected with said first and second output means, respectively;
first and second diode means connected with said first and second return means, respectively;
first constant current means including a first pair of transistors connected with said battery means, one of said transistors being a gate transistor responsive to said first control transistor the other of said pair being a regulating transistor cooperating with said gate transistor for providing a constant current at said first channel without use of inductive means, with said constant current being provided when said first control transistor is activated and otherwise isolating said first output means from said battery means;
a second control transistor connected with said second signal providing means; and
second constant current means including a second pair of transistors connected with said battery means, one of said transistors being a gate transistor responsive to said second control transistor the other of said pair being a regulating transistor cooperating with said gate transistor for providing a constant current at said second channel without use of inductive means, with said constant current being provided when said second control transistor is activated and otherwise isolating said second output means from said battery means;

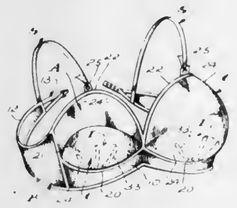
whereby only substantially rectangular pulses are provided to a user when connected with said first channel through said first capacitor means and said first output means with a return from said user being provided through said first return means and said first diode means, and whereby only substantially rectangular pulses are provided to said user when connected with said second channel through said second capacitor means and said second output means with a return from said user being provided through said second return means and said second diode means, said pulse output from said first channel being timewise spaced with respect to said pulse output from said second channel so that substantially complete isolation is established between said channels including isolation between said channels through said user when connected to receive said pulse outputs from said first and second channels.

4,632,118

BRASSIERE WITH STRESS BREAKER INSERTS

Sonia Garutso, 512 S. Carondelet - No. 217, Los Angeles, Calif. 90057

Filed Mar. 24, 1986, Ser. No. 842,796
Int. Cl.[4] A41C *3/10*
U.S. Cl. 128—477 **10 Claims**



1. In combination, a brassiere having a pair of laterally spaced, forwardly projecting, rearwardly opening concavo convex breast receiving cups of soft, flexible fabric with substantially laterally extending top and bottom edges with lateral inner and outer ends, a torso engaging band with opposite side portions joined with and extending laterally and rearwardly from the outer ends of the cups to a laterally extending rear portion of said band, brassiere cup inserts removably engaged within lower quadrant portions of said cups, each insert includes an elongate laterally extending flexible fabric panel with substantially laterally extending upper forward and lower rear edges, an elongate, flexible support base on and extending longitudinally of said lower rear edge and substantially conformed with and extending longitudinally of said bottom edge of its related cup, a plurality of elongate, flexible resilient reinforcing stays carried by the panel in lateral spaced relationship from each other and having lower rear ends stopped against the base and upper forward ends terminating adjacent said upper forward edge of the panel, the stay reinforced inserts conform to the adjacent portions of the brassiere cups and a wearer's breasts within the cups to direct the weight force of the wearer's breasts downwardly and rearwardly to the bottom edges of the cups and yieldingly urge and hold the wearer's breasts and the lower quadrant portions of the cups forwardly and upwardly.

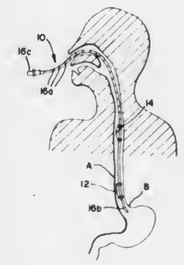
4,632,119

AMBULATORY ESOPHAGEAL PH MONITOR

Benjamin J. Reichstein, Wilmette, Ill., assignor to University of Health Sciences/The Chicago Medical School, North Chicago, Ill.

Filed Oct. 23, 1985, Ser. No. 790,359
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—632 **7 Claims**

1. A self-contained diagnostic pH monitor for preliminary screening of gastroesophageal reflux disease and suitable for esophageal intubation without restriction of patient movement and activity, the monitor determining duration of exposure to pH levels clinically significant for gastroesophageal reflux disease, the monitor omitting use of external power, light and data processing sources, comprising:
a nasoesophageal probe for selected esophageal intubation, the probe having a length permitting positioning of a distal end of the probe proximal to the gastroesophageal junction of the esophagus;
at least one semipermeable envelope, the envelope being carried near the distal end of the probe, the envelope



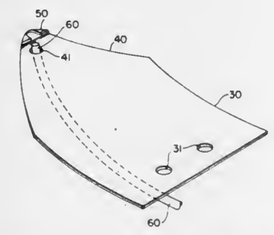
containing a composition including a cation exchange substance having an ionic dye bound thereto, the envelope being constructed of a material permeable to both hydronium ions and the ionic dye;
said composition substantially and irreversibly discoloring in response to extended exposure to a pH of 4 or less and upon withdrawal of the probe the composition in said envelope being colorimetrically analyzable to semi-quantitatively determine the duration of exposure to pH levels being clinically significant for preliminary screening of gastroesophageal reflux disease.

4,632,120

SUBKERATINOUS ELECTROENCEPHALOGRAPHIC PROBE

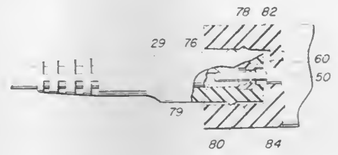
Gary W. Sherwin, South Huntingdon Township, Westmoreland County, and Edwin R. Mohan, Braddock Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,033
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **18 Claims**



1. A subkeratinous electroencephalographic probe, comprising:
electrode means for penetrating a keratinous layer of skin and contacting an epidermis as the probe is applied; and
spring means, integral with said electrode means, for providing a penetrating force to said electrode means to penetrate the keratinous layer without penetrating the epidermis and without causing bleeding.

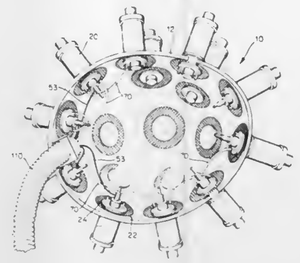
4,632,121
SAFETY MEDICAL CABLE ASSEMBLY WITH CONNECTORS
Robert E. Johnson, Irvine, and Philip H. Booker, III, El Toro, both of Calif., assignors to Tronomed, Inc., Irvine, Calif.
Filed Sep. 18, 1985, Ser. No. 777,213
Int. Cl.[4] A61B *5/04*; H01R *11/00*
U.S. Cl. 128—639 **14 Claims**



1. In a monitoring medical system for monitoring a physiological function of a patient including a transducer for providing electrical signals representative of a physiological function and a monitor for receiving electrical signals, the improvement of an electrical cable system comprising:
- a first cable unit having means for connection to a monitor, a first connector unit and a flexible electrical conduit interconnecting the connector with the monitor connection means;
- a second cable unit having a second connector unit, means for connection to a transducer and a second flexible electrical conduit interconnecting the second connector unit with the transducer connection means, one of the first and second connector units has a housing with a plurality of recesses and a plurality of tubular conductive terminal pins mounted entirely within the recesses, the other connector unit has a housing of a configuration to fit within a recess and has a conductive member with a terminal bore for receiving and establishing an electrical connection with a terminal pin, whereby a safety characteristic is provided to prevent connection of the transducer to an unauthorized electrical socket; and
- means for securing the first and second connector units together including a locking rim on the terminal pins of a larger diameter then the tubular configuration and a non-conductive thermoplastic annular locking ring mounted in the other connector unit before the terminal bore and having an opening of a lesser dimension than the locking rim and mounted to define an open space between the terminal bore of the conductive member and the locking ring to receive the locking rim.

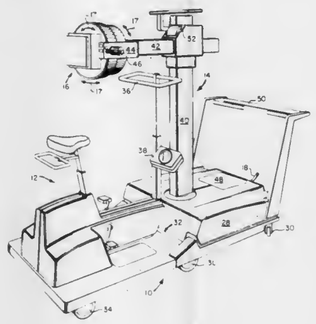
4,632,122
METHOD AND APPARATUS FOR CONDUCTING BRAIN FUNCTION DIAGNOSTIC TEST
Nils E. Johansson, 18 Pine Rd., Bedford Hills, N.Y. 10507; Emin Eralp, 11 Eastern Ave., Ossining, N.Y. 10562, and Turan M. Itil, 49 Tweed Blvd., Nyack, N.Y. 10960
Filed Apr. 24, 1985, Ser. No. 726,729
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—644 **13 Claims**

1. Apparatus for use in conjunction with an electroencephalographic (EEG) test, said apparatus comprising:
- a headset comprising a rigid helmet liner having an interior portion which is adapted to be accommodate the head of a subject to be EEG tested, said headset including a plurality of apertures provided at predetermined locations about said headset;
- a plurality of electrodes, each of said electrodes being resiliently suspended in at least one of the apertures provided in said headset by the use of a resilient material provided within said aperture and secured to both the electrode and the headset; and
- means for displacing the electrodes in a direction toward the interior of said headset and means for holding the displaced electrodes in a fixed, displaced position so as to provide constant physical and electrical contact with the



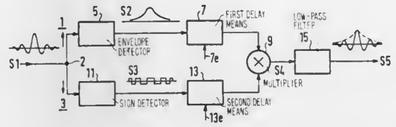
head of the subject in order that reliable EEG measurements may be taken.

4,632,123
RADIOACTIVITY DETECTION SYSTEM
Johan A. Govaert, and Joseph E. Town, both of Peabody, Mass., assignors to Baird Corporation, Bedford, Mass.
Division of Ser. No. 369,654, Apr. 19, 1982. This application May 10, 1984, Ser. No. 609,005
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—659 **3 Claims**



1. A radioactivity distribution system for stress analysis of a subject comprising:
- (a) an exercising means;
- (b) said exercising means being an exercise bike worked about a vertical axis passing through the heart of said subject;
- (c) mounting means secured on a platform and releasably connected to said exercising means;
- (d) said mounting means being separately three-dimensionally adjustable;
- (e) a radioactivity distribution detector secured on said mounting means for three dimensional adjustability thereof;
- (f) processing means separately mounted from said mounting means but being operatively coupled to said radioactivity distribution detector and including a display means for processing and presenting a representation of radioactivity distribution within said subject; and
- (g) a recording means for recording said representation of radioactivity distribution within said subject.

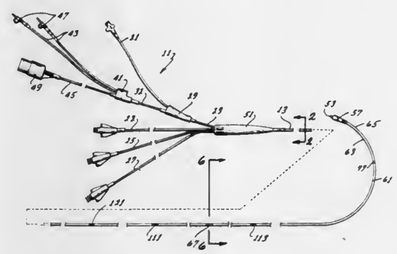
4,632,124
METHOD AND APPARATUS FOR DELAYING AN ULTRASOUND SIGNAL
Dietmar Hiller, Erlangen, and Ulrich Saugeon, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 26, 1985, Ser. No. 759,542
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1984, 3428046
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—660 **16 Claims**



1. A method for delaying an ultrasound signal, comprising the following steps:
- deriving from the ultrasound signal an envelope signal which represents the absolute value of the ultrasound signal;
- deriving from the ultrasound signal a sign signal which represents the sign of the ultrasound signal;
- delaying said envelope signal and said sign signal by approximately the same times in separate parallel circuit branches;
- producing an intermediate signal by multiplication of said delayed envelope signal with said delayed sign signal; and
- filtering the intermediate signal in a low-pass filter to thereby produce a delayed ultrasound signal

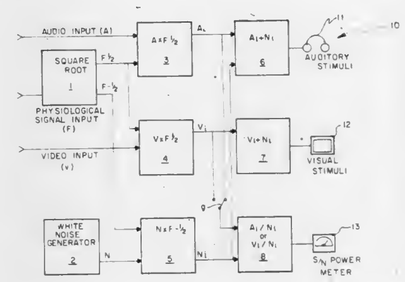
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4,632,125
RIGHT HEART EJECTION FRACTION AND CARDIAC OUTPUT CATHETER
William E. Webler, Santa Ana; Edward E. Elson, Anaheim, and Michael D. Quinn, El Toro, all of Calif., assignors to American Hospital Supply Corp., Deerfield, Ill.
Filed Jan. 13, 1984, Ser. No. 570,631
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 **18 Claims**



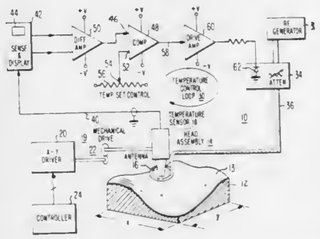
1. An apparatus for making temperature measurements within the pulmonary artery of a patient comprising:
- an elongated flexible tube sized to pass through a vein or an artery and into the heart, said tube having a longitudinal axis, proximal and distal ends and a distal end portion which includes said distal end;
- said distal end portion being curved with such curve having an inside and an outside;
- a temperature sensor;
- means for mounting the temperature sensor on said distal end portion of the tube with at least a portion of the temperature sensor displaced radially from the longitudinal axis of the tube and being at a location in a zone which extends circumferentially of the tube for about 150 degrees and which extends into the outside of the curve for about 30 degrees whereby the temperature sensor can obtain temperature information about a fluid adjacent the temperature sensor; and
- means for transmitting the temperature information proximally of the temperature sensor along the tube.

4,632,126
BIOFEEDBACK METHOD AND APPARATUS
Arturo Aguilar, Mexico City, Mexico, assignor to Leonard Bloom, Owings Mills, Md.
Filed Jul. 11, 1984, Ser. No. 629,777
Int. Cl.[4] A61B *5/04*; A63B *71/04*
U.S. Cl. 128—732 **20 Claims**



1. An apparatus for making unconscious and involuntary bodily responses perceptible to at least one sense of a subject in order for the subject to manipulate said responses by conscious mental control, comprising:
- first means for providing a physiological stimulus perceptible to at least one sense of the subject;
- second means for measuring the unconscious and involuntary bodily responses of the subject to the physiological stimulus;
- third means for generating a noise signal in response to the measurement of the unconscious and involuntary bodily responses of the subject; and
- fourth means for distorting the stimulus with the noise signal generated, thereby making said unconscious and involuntary bodily responses perceptible to at least one sense of the subject, so that said responses may be manipulated.

4,632,127
SCANNING MICROWAVE HYPERTHERMIA WITH FEEDBACK TEMPERATURE CONTROL
Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Jun. 17, 1985, Ser. No. 745,181
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—804 **14 Claims**



1. An apparatus for producing uniform hyperthermic temperature over a large vasculated tissue portion, comprising:
- an antenna;
- electrical signal generating means coupled to said antenna,

the power of said electrical signal generating means being controllable in response to a control signal applied at a control input terminal;

noncontacting temperature indicator means for generating a temperature signal instantaneously indicative of the temperature of tissue within its field of view;

controllable mounting and drive means coupled to said antenna and to said temperature indicator means for recurrently scanning said antenna and said temperature indicator means along a predetermined path over said portion of tissue to be heated whereby said tissue is heated in response to an electromagnetic field produced by said antenna in response to said electrical signal, but said tissue may not be uniformly heated because of variations in the vasculature or field absorption by the tissue, or for other reasons, and said temperature indicator means indicates the temperature of said portion of tissue; and

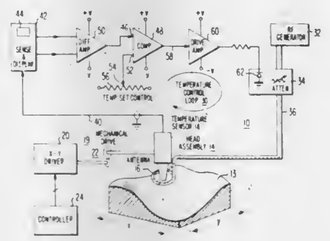
comparator means coupled to said temperature indicator means and to said control input terminal of said electrical signal generating means for comparing said temperature signal with a predetermined signal for generating said control signal for instantaneous control of said power for closing a feedback loop for adjusting said power instant by instant during said scanning for maintaining said tissue at a uniform temperature.

4,632,128

ANTENNA APPARATUS FOR SCANNING HYPERTHERMIA

Robert W. Paglione, and Oakley M. Woodward, both of Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 17, 1985, Ser. No. 745,690
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—804 **14 Claims**



1. An apparatus for heating comprising:

an antenna including at least one convolution of conductor having an axis, said antenna being adapted for being placed near a volume to be heated with said axis roughly normal to the surface of said volume, said antenna also being adapted for receiving radio frequency current in said at least one convolution of conductor for transducing the power represented by said current to a radio frequency field, said radio frequency field having a null on said axis in the vicinity of said at least one convolution of conductor;

reflecting and supporting means electromagnetically and mechanically coupled to said at least one convolution of conductor for directing said radio frequency field towards said surface and for supporting said at least one convolution of conductor; and

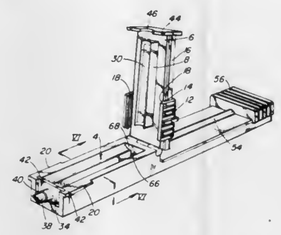
temperature signal sensing means mechanically coupled to said reflecting and supporting means for being supported at a position centered on said axis for sensing the temperature of said surface, whereby said temperature signal sensing means is located at a position of low radio frequency field intensity and has little effect on, and is little affected by, said radio frequency field.

4,632,129

CIGARETTE MAKING MACHINE

Arnold Kastner, 10220 Armand Lavergne, Montreal, Quebec, Canada

Filed May 21, 1985, Ser. No. 736,249
Claims priority, application Canada, Mar. 15, 1985, 476652
Int. Cl.[4] A24C *5/40, 5/42*
U.S. Cl. 131—70 **10 Claims**



1. A cigarette making machine of the type wherein a supply of tobacco is formed into elongate shape and then inserted into a preformed cigarette tube positioned on the machine, comprising

an elongate base having formed on its upper surface at one end a tobacco receiving and compacting recess and a cover for the tobacco recess having on its lower surface a tobacco compactor pivotally connected to the base and pivotable between open tobacco receiving and closed tobacco compacting positions,

the tobacco recess and the tobacco compactor defining therebetween when the cover is closed, an elongate cylindrical chamber for the forming of a supply of tobacco of similar shape therein,

releasable locking means slidably carried by the cover to secure the cover in closed tobacco compacting position with respect to the base,

a circular opening formed in an end wall of the base closing the tobacco recess and in axial alignment with the cylindrical chamber, and a hollow nipple of circular cross-section having an outer diameter to snugly receive an open end of a cigarette tube therearound projecting axially outwardly from around the opening,

the cover having a front wall which bears against the nipple when the cover is closed to hold a cigarette tube thereon during insertion of a supply of tobacco therein, and

an injection handle slidably and removably mounted on the upper surface of the base at its other end and to which is secured a tobacco insertion spoon having a concave upper surface and which is reciprocally movable, upon movement of the injection handle, from a position within the tobacco recess to a position projecting through and extending outwardly from the said circular opening and nipple and into a cigarette tube positioned thereon.

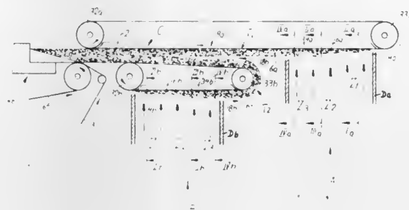
4,632,130

METHOD AND APPARATUS FOR MAKING A ROD-LIKE FILLER OF SMOKABLE MATERIAL

Uwe Heitmann, Hamburg; Heinz-Christen Lorenzen, Wentorf, and Wolfgang Steiniger, Börnsen, all of Fed. Rep. of Germany, assignors to Hauni-Werke Korber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 660,430
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337034
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.3 **27 Claims**

1. A method of forming a continuous rod-like filler from particles of smokable material, comprising the steps of accumulating the particles into discrete continuous first and second trough-shaped streams; merging said streams into a single continuous third stream having a tubular outer layer and a core whose density is less than that of the outer layer; and converting the third stream into a continuous rod-like filler having a



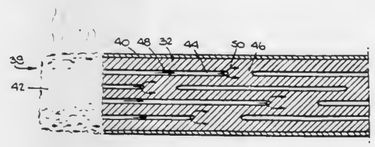
core of lesser density and an annular outer layer of greater density, said converting step including subjecting the third stream to the action of substantially radially oriented densifying forces.

4,632,131

FOAMED, EXTRUDED, COHERENT MULTISTRAND SMOKING ARTICLES

George H. Burnett; Gus D. Keritsis, both of Richmond; Richard A. Thesing, Glen Allen; Alline R. Wayte; Jose G. Nepomuceno, both of Richmond, and Alex S. Gergely, Powhatan, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 627,407, Jul. 3, 1984, abandoned. This application Jun. 3, 1985, Ser. No. 740,325
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—355 **43 Claims**



1. An extruded, coherent, multistrand, tobacco-containing, generally cylindrical smoking article comprising a plurality of co-extruded strands that extend generally along the longitude of the smoking article and are adhered to one another so as to leave flow passageways between the strands, which passageways extend generally along the longitude of the smoking article, the configuration of the strands and passageways providing sufficient heat transfer area or sufficient residence time or both for the hot gases drawn towards the proximal end of the smoking article by a smoker to cool and to exit the proximal end at a comfortable temperature for the smoker, the smoking article also comprising (a) from about 5 to about 98 wt. % of tobacco particles having a particle size of up to about 5 mesh, (b) from 0 to about 60 wt. % of a filler having a particle size of up to about 350 μm, (c) from 0 to about 1 wt. % of a residual foaming agent other than water, (d) from about 2 to about 40 wt. % of a binder selected from the group consisting of cellulosic binders, natural binders, modified natural binders, synthetic binders, and mixtures thereof, and (e) from about 5 to about 20 wt. % water, the article having a density within the range of from about 0,05 to about 1.5 g/cc.

4,632,132

TREATED END WRAP LAMINATE

William G. Bustance, and Robert E. Borey, both of Traverse City, Mich., assignors to Totally, Inc., Traverse City, Mich.

Filed Jan. 19, 1983, Ser. No. 459,055
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—7 **19 Claims**

1. A treated end wrap laminate for use in permanent hair waving comprising

an exterior sheet of impermeable flexible plastic;

an interior sheet of absorbent flexible paper impregnated with a hair waving solution counteractant and having a configuration corresponding to said exterior sheet; and

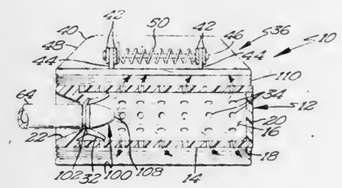
a middle layer of adhesive uniformly bonding said sheets together.

4,632,133

METHOD AND SYSTEM FOR THE APPLICATION OF HAIR TREATMENT SOLUTION

Luigi G. Losenno, 5733 Beard Ave. South, Edina, Minn. 55410

Filed Aug. 19, 1983, Ser. No. 524,577
Int. Cl.[4] A45D *2/12*
U.S. Cl. 132—33 G **22 Claims**



1. System for the application of hair treatment solution to the hair of a patron comprising, in combination: a plurality of hair curlers, with each of the hair curlers having a first end, a second end, an interior, and an exterior surface, with the exterior surface of each of the hair curlers allowing hair to be wrapped therearound; a source of pressurized, heated air including hair treatment solution suspended therein; retaining means removably attached to each of the hair curlers for creating a solution retaining volume, said retaining means having a generally cylindrical shape and a size such that it substantially encloses within said volume the hair curler and the hair wrapped thereon; means for introducing the pressurized, heated air including hair treatment solution suspended therein into the interior of the hair curlers when the hair is wrapped around the curler and within the solution retaining volume created by the removeable means; and means formed in each of the hair curlers for allowing release of the pressurized, heated air including the hair treatment solution from the interior of the hair curler through the exterior surface of the hair curler and into the hair wrapped around the hair curler and for retention within the solution retaining volume generally defined by the hair curler and the hair wrapped thereon.

4,632,134

ARTIFICIAL FINGERNAIL CONSTRUCTION

Georgianna Reid, Prairie Village, Kans., assignor to LaCuticle, Inc., Kansas City, Mo.

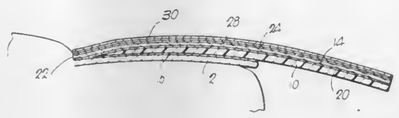
Continuation of Ser. No. 679,483, Dec. 7, 1984, abandoned. This application Apr. 1, 1986, Ser. No. 846,830
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 **6 Claims**

1. An artificial fingernail construction for attachment to a natural fingernail and comprising:

an artifical fingernail extension of size and shape to substantially cover said natural fingernail and extend outwardly therefrom;

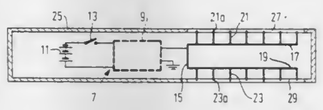
an adhesive for securing said extension to said natural fingernail in said substantially covering relationship;

a layer of linen conformably covering essentially the entire, normally uppermost, exposed surface of the extension and natural fingernail; and



an adhesive sealant coating said linen layer for bonding the linen layer to said extension and sealing the normally upper surface of the linen layer.

4,632,135
HAIR-GROOMING MEANS
Gerard J. Lenting, Groningen, and Roelof H. Sytsma, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 15, 1985, Ser. No. 691,596
Claims priority, application Netherlands, Jan. 17, 1984, 8400141
Int. Cl.⁴ A45D *44/18*
U.S. Cl. 132—85 **4 Claims**



1. A hair-grooming device comprising a hollow elongate holder; a comb or brush attachment fitted onto one end portion of the holder; a high-voltage source enclosed in the holder for ion-generation; an elongate conductive support mounted in and insulated from the holder and electrically connected to said high-voltage source, said support extending parallel to and opposite the attachment; at least one row of electrodes extending outwardly from said support toward the holder; and a slot-like opening in the holder adjacent the attachment for each row of electrodes, the electrodes in each row extending toward the corresponding opening for escape of the formed ions through such opening to the exterior of the holder.

4,632,136
MASCARA APPLICATION SYSTEM
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Nov. 2, 1983, Ser. No. 548,062
Int. Cl.⁴ A45D *40/26*
U.S. Cl. 132—83.7 **7 Claims**

1. A mascara application system, comprising:

a reservoir containing mascara fluent having a viscosity at ambient temperature in the range from about 1,500 poises to 25,000 poises; and



an applicator for immersion into said mascara fluent having a brush containing approximately 75 to 150 bristle strands per quarter inch of brush material.

4,632,137
UMBRELLA HANDLE WITH SNAP-LOCKED, SUBSTANTIALLY CONCEALED CARRYING RING
Jyll Exley, Deptford, N.J., and Thiebault Bouet, New York, N.Y., assignors to Yves Saint Laurent, Inc., New York, N.Y.
Filed Oct. 22, 1984, Ser. No. 663,441
Int. Cl.⁴ A45B *11/00*
U.S. Cl. 135—20 R **2 Claims**



1. An umbrella with an elongated round handle having at its bottom end a C-shaped carrying ring which pivots between open and closed positions, snap-locks in the closed position, and is substantially when closed but has a portion which extends radially just beyond the handle outline to facilitate snapping the ring away from its closed position, comprising:

an umbrella body including a folding canopy, folding ribs supporting the canopy and a center pole having an upper end which supports the ribs and canopy;

an elongated handle having a round sidewall and a bottom, said handle being secured to the lower end of the center pole to extend downwardly therefrom and substantially coaxially therewith, a C-shaped ring having bent-in free ends, and means for pivotally securing the ring to the lower end of the handle, and abutting means for limiting the pivotal range of the ring, whereby said ring is manually movable between a closed position, in which the ring is substantially coaxial with the handle and a substantial portion of the ring arc is substantially flush with the handle sidewall but a portion of the ring extends radially outwardly of the handle sidewall, and an open position, in which the ring axis ranges from being about parallel to being about perpendicular to the handle axis;

said means for pivotally securing the ring to the handle comprising a pair of oppositely facing wells which are defined adjacent the handle bottom portion, said bottom portion being integrally formed, said wells being substantially coaxial with the axis of the bent-in free ends of the C-shaped ring and being shaped and dimensioned to receive freely the bent-in ends of the C-shaped ring and to allow rotational motion of said bent-in ends within the wells as the ring pivots about said pivot axis and linear motion thereof along the well axis when the bent-in ends of the ring are forced apart to increase the ring diameter, wherein said pivot axis is immediately adjacent a tangent to the handle sidewall and is offset from the handle axis;

snap-locking means comprising a circumferential flange at the bottom of the handle defining a C-shaped circumferential groove which is substantially coaxial with the handle and matches the outline of the C-shaped ring and receives a substantial portion of the ring arc, but not the entire arc, to make the ring outline substantially flush with the handle sidewall, when the ring is in its closed position; and

said ring and snap-locking means being shaped and dimensioned to cause substantially less than the entire arc of the ring to make contact with the flange when the ring is being moved into or away from the closed position, and to cause a portion of the ring arc to extend radially outwardly of the handle sidewall when the ring is in the closed position, to thereby facilitate moving the ring from its closed to its open position by pushing down on the portion thereof which extends beyond the handle while retaining the appearance that the ring in the closed position is substantially flush with the handle sidewall.

4,632,138
PORTABLE SHELTER
Dennis V. Irwin, 4630 Macky Way, Boulder, Colo. 80303
Continuation-in-part of Ser. No. 472,029, Mar. 4, 1983, Pat. No. 4,554,937. This application Jun. 20, 1985, Ser. No. 746,724
Int. Cl.⁴ E04H *15/48*
U.S. Cl. 135—109 **12 Claims**

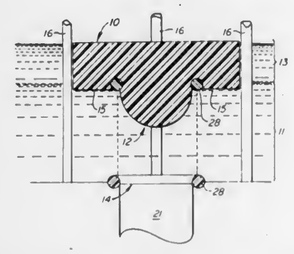


1. A portable, free-standing, shelter of generally frusto-conical configuration having a base and upwardly inclined sidewalls terminating in an open top, said sidewalls defined by a plurality of flexible sheet panel members, each panel member of generally polygonal configuration having top and bottom edges interconnected by upwardly convergent opposite sides; hinge means interconnecting adjoining sides of said panel members in hinged together relation; the bottom edges of said panel members defining the base of said shelter and the top edge of said panel members defining the open top of said shelter; each of said panel members being held in an extended stretched condition by a pair of crossed flexible rods which are diagonally mounted across each panel member at its opposite corners whereby each panel member is held in a self-supporting rigid configuration.

4,632,139
FLOW REGULATING DEVICE
John L. Delwichwe, c/o Exxon USA, Marine Department, P.O. Box 1512, Houston, Tex. 77001
Division of Ser. No. 291,355, Aug. 10, 1981, Pat. No. 4,458,714. This application Jul. 9, 1984, Ser. No. 628,821
Int. Cl.⁴ B01D *17/025*
U.S. Cl. 137—172 **2 Claims**

1. A device for regulating the flow of a first fluid and a second fluid through a flow aperture, the fluids being immiscible with each other and having different densities, the flow regulating device comprising

a moveable plug having a density which is less than the density of the denser fluid but greater than the density of the less-dense fluid so that the plug floats in the denser fluid and sinks in the less dense fluid, the plug being moveable between a first and a second position; the plug assuming the first position when the surface level, with respect to the flow aperture, of the denser fluid is greater than a predetermined amount, and, the plug assuming the second position when the surface level with respect to the flow aperture of the denser fluid is less than the predetermined amount; the plug permitting the flow of fluid through the flow aperture when the plug is located at the first position and blocking the flow of fluid through the flow aperture when the plug is located at the second position;

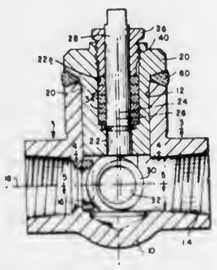


a base member which floats in the fluids present, the base member having the flow aperture and a plug aperture positioned therein, the moveable plug being positioned within the plug aperture;

pump means; and

switch means attached to the base member, for controlling the pump means, the switch means being actuated by the movement of the moveable plug from the first position to the second position, and deactuated by the movement of the moveable plug from the second position to the first position, the pump means being coupled to the flow aperture to draw the less dense fluid through the flow aperture upon actuation by the switch means.

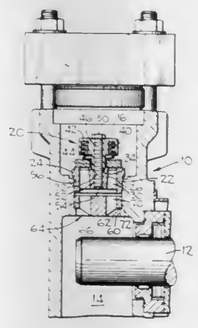
4,632,140
TOP ENTRY BALL VALVE
Bruce L. Harding, Holden, Mass., assignor to Smith Valve Corporation, Westboro, Mass.
Continuation-in-part of Ser. No. 561,887, Dec. 15, 1983, Pat. No. 4,548,384. This application Sep. 18, 1985, Ser. No. 777,290
Int. Cl.⁴ F16K *5/06*
U.S. Cl. 137—315 **12 Claims**



1. A ball valve comprising in combination: a valve body having a bonnet bore communicating with a through fluid bore; an unyielding valve seat fixed in said valve body at a location surrounding the axis of said fluid bore; a bonnet received in said bonnet bore, said bonnet having a stem bore extending therethrough; a stem journalled for rotation in said stem bore about an axis which remains coincident with the

stem bore axis, said bonnet being adjustable within said bonnet bore to shift the coincident stem bore and stem rotational axes transversely with respect to the axis of said fluid bore; a ball in said fluid bore, said ball having a through passageway and being fixed to said stem for rotation therewith, the center of said ball being offset with respect to the rotational axis of said stem, whereupon by selected adjustment of said bonnet and rotation of said stem during initial assembly of said valve, said ball may be located in a closed position against said valve seat; and means for fixing said bonnet in said bonnet bore, whereupon said ball subsequently may be operated between said closed position and an open position aligning said through passageway with said fluid bore by rotating said stem in relation to the thus fixed bonnet.

4,632,141
VALVE ARRANGEMENT
Steven W. Post, Jonesboro, Ark., assignor to FMC Corporation, Chicago, Ill.
Filed Sep. 20, 1985, Ser. No. 778,336
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—327 **2 Claims**



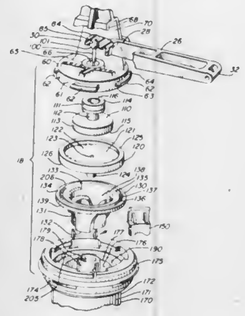
1. In a valve having a tapered body, said valve restrained in a bore of a host means, a central hub supported in said tapered body, said central hub having a threaded through bore, a threaded fastener carried in said threaded through bore of said central hub;

a valve spyder restrained in a bore of a host means adjacent to and inboard of said valve whereby said threaded fastener may project from said threaded through bore of said central hub to contact said valve spyder.

4,632,142
BALLCOCK ASSEMBLY
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Division of Ser. No. 688,730, Jan. 4, 1985, Pat. No. 4,562,859. This application Oct. 4, 1985, Ser. No. 784,384
Int. Cl.[4] F16K *47/02*
U.S. Cl. 137—437 **12 Claims**

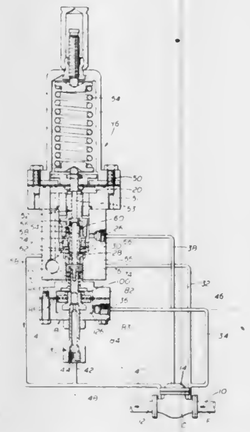
1. In a submerged ballcock valve for a reservoir tank having a lower wall upon which the ballcock valve is mounted, the ballcock valve including an upright intake tube for incoming water and an annular outlet channel spaced from and surrounding the water intake tube, the outlet channel terminating at a lower end spaced above the tank's lower wall, with a pair of outwardly directed diametric outlet ports communicating the outlet channel to the interior of the tank; the improvement comprising in combination:

a generally annular, flow-directing, silencer member, having an inner diameter that is greater than the exterior diameter of the intake tube, said silencer member being positioned in the annular outlet channel to surround the upper end of the intake tube and to extend downstream into the annular outlet channel, the interior surface of said flow-directing silencer member being shaped and arranged to provide a pair of spaced, inverted parabolic, flow-directing surfaces arranged to receive thereagainst the flow of liquid and together to funnel said flow of liquid axially downwardly



in a shaped stream that flows along the outside of the intake tube as a pair of diametric jets that are directed at said outlet ports, said funnelling being arranged to avoid turbulent splashing and spreading of the water that flows from the intake tube into said annular outlet, thereby to reduce noise generated by liquid flow.

4,632,143
PRESSURE BOOST ATTACHMENT FOR PILOT VALVES
Michael D. McNeely, Katy, Tex., assignor to Anderson, Greenwood & Co., Houston, Tex.
Filed Nov. 27, 1985, Ser. No. 802,324
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—488 **13 Claims**



1. A control assembly for controlling fluid flow through a control valve in a main flow line comprising:

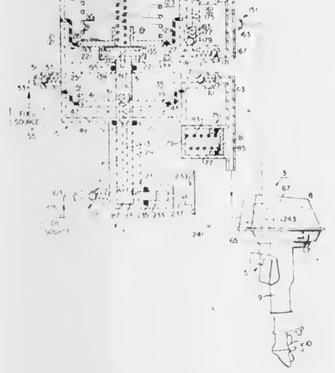
a pilot valve having a main bore therein including a first fluid chamber in fluid communication with the flow line on one side of the control valve for sensing the fluid pressure to be controlled, a second fluid chamber in fluid communication with the flow line on the other side of the control valve, and a third intermediate fluid chamber between said first and second fluid chambers in fluid communication with a fluid pressure responsive element in said control valve to effect movement thereof for changing fluid flow through said control valve;

a valve member within said main bore for controlling fluid flow between said intermediate chamber and said first and second fluid chambers, said valve member movable between positions blocking and permitting fluid flow between the intermediate fluid chamber and said second fluid chamber;

separate fluid pressure means associated with said pilot valve including a pair of auxiliary fluid chambers therein and a fluid pressure responsive member between said pair of auxiliary fluid chambers, one of said auxiliary fluid chambers being in continuous fluid communication with said first fluid chamber downstream thereof and the other of said auxiliary fluid chambers being in fluid communication with the main flow line; and

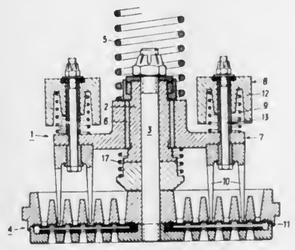
means operatively connecting said fluid pressure responsive member to said valve member of said pilot valve for actuating said valve member upon the reaching of a predetermined fluid pressure differential between said auxiliary chambers to permit fluid flow between said intermediate fluid chamber and said second fluid chamber.

4,632,144
COMBINED FLUID PRESSURE ACTUATED FUEL AND OIL PUMP
Frank J. Walsworth, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Division of Ser. No. 410,497, Aug. 23, 1982, Pat. No. 4,539,949, which is a continuation-in-part of Ser. No. 324,145, Nov. 23, 1981, Pat. No. 4,383,504, and a continuation-in-part of Ser. No. 314,224, Oct. 23, 1983, Pat. No. 4,473,340, and a continuation-in-part of Ser. No. 309,558, Oct. 8, 1981, Pat. No. 4,381,741. This application Jun. 27, 1985, Ser. No. 749,474
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—505.25 **1 Claim**



1. A valve construction comprising a housing, a wall movable in said housing so as to define a chamber which is variable in volume, said wall including therein a port affording flow through said wall, a valve member movable relative to said port between open and closed positions, said valve member being normally retained in said closed position during movement of said wall in the direction minimizing the volume of said chamber, a stationary member located for engagement with said valve member so as to initially displace said valve member from said closed position in response to wall movement minmizing the volume of said chamber, whereby to initially open said port, and spring means engaged with said valve member and compressed in response to movement of said valve member in the direction minimizing the volume of said chamber, said spring means being operable, after initial opening of said port, to displace said valve member to said open position, whereby to fully open said port.

4,632,145
LIFTING DEVICE FOR THE CLOSURE PLATE OF COMPRESSOR VALVES
Erich H. Machu, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria
PCT No. PCT/AT84/00011, § 371 Date Nov. 1, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO84/03542, PCT Pub. Date Sep. 13, 1984
PCT Filed Mar. 2, 1984, Ser. No. 680,336
Claims priority, application Austria, Mar. 3, 1983, 743/83
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—516.21 **13 Claims**



1. A lifting device for controlling the movement of the closure plate of a compressor valve, said compressor valve defining an axis line therethrough and providing a valve seat therein, said closure plate, when moved in a first direction along said axis line due to fluid pressure within said compressor valve, becoming seated in said valve seat to shut off fluid flow therethrough, and when moved in a second direction along said axis line, allowing fluid to pass through said valve seat, said lifting device comprising

a first gripper part which is connectable to said compressor valve so as to be movable toward and away from said compressor valve along said axis line,

a regulating spring in contact with said first gripper part to bias said first gripper part toward said compressor valve, and

a second gripper part which comprises a plurality of lift elements having lifting prongs which can contact said closure plate to move it in said second direction away from said valve seat, a plurality of tension screws which movably mount said lift elements with respect to said first gripper part and provide end stops to control the distance said lift elements can move relative to said first gripper part, and a plurality of damper springs for damping the relative movement of said lift elements relative to said first gripper part.

4,632,146
RELIEF VALVE
Raymond H. Looney, Tulsa, Okla., assignor to Baird Manufacturing Company, Tulsa, Okla.
Continuation of Ser. No. 593,847, Mar. 27, 1984, abandoned. This application Aug. 13, 1985, Ser. No. 765,558
Int. Cl.[4] F16K *17/06*
U.S. Cl. 137—539.5 **4 Claims**

1. A relief valve comprising:

(a) a body having an inlet in open communication with fluid pressure and an outlet intermittently in communication withthe inlet for venting of the fluid pressure from the interior of the body;

(b) an elongated tubular cage removably received within said body, said cage having at least one opening in the wall

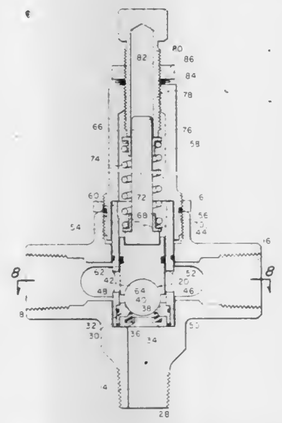
thereof intermediate the ends providing communication with said body outlet;

(c) a valve seat disposed within a first end of said cage;

(d) a ball disposed within the cage and engageable with the valve seat for providing a normally closed position for the valve;

(e) a ball keeper reciprocally disposed within said cage, the ball keeper being in contact at a first end with said ball, the ball keeper at the second end having an elongated cylindrical portion;

(f) a spring disposed within the cage and received on said cylindrical portion of said ball keeper for maintaining the ball keeper in contact with the ball;



(g) externally accessible hollow cap member secured to the body and receiving the second end of said cage therein, said hollow cap member having a threaded opening therein; and

(h) an externally threadable adjusting means threadably received in said cap member, one end thereof being in engagement with said spring for adjusting the force of the spring against the ball keeper whereby the valve is maintained in the closed position when the fluid pressure in the inlet means is less than the force of the spring, the adjusting means having an axial recess therein telescopically receiving and guiding said elongated cylindrical portion of said ball keeper, and wherein the valve can be easily disassembled by removing said cap member and said cage, said seat being retained by said cage.

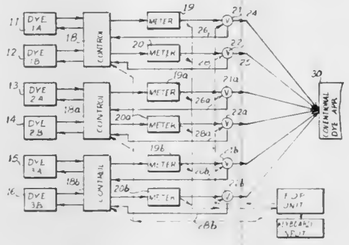
4,632,147

DYE COLOR CONTROL SYSTEM

Alvin W. Whaley, 2286 Dawnville-Beaverdale Rd., N.E., Dalton, Ga. 30720

Filed Nov. 26, 1984, Ser. No. 674,695
Int. Cl.⁴ D06B *23/00;* **F17D** *1/14, 3/01*
U.S. Cl. 137—563 **4 Claims**

1. A dyeing system for providing a color to a dyeing apparatus wherein said color comprises a mixture of a plurality of dyes, said dyeing system including a first tank containing a first dye, a first pump for removing said first dye from said first tank, a second tank containing a second dye, and a second pump for removing said second dye from said second tank, means for defining said color in terms of at least one of said first tank and said second tank and a flow rate, a first meter for receiving dye and measuring the flow rate of said dye, and a second meter for receiving dye and measuring the flow rate of said dye, a first return line, and a second return line, a first selector valve for selectively connecting said first meter to said dyeing apparatus so that said dye will flow from said meter to said dyeing apparatus and to said first return line, and a second selector valve for selectively connecting said second meter to said dyeing apparatus so that said dye will flow from said meter to said dyeing apparatus and to said second return line, the combination of said dye from said first meter and said dye from said second meter producing said color in said dyeing apparatus, the arrangement being such that said color is established by continuous flow of dyes through the meters and the return lines, and said selector valves are shifted to provide said color to said dyeing apparatus, and further including a plurality of groups of tanks, said first tank being a tank in a first group of said plurality of groups of tanks and said second tank



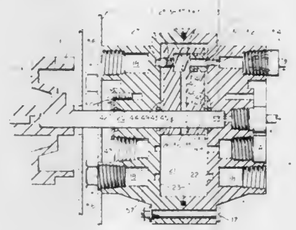
being a tank in a second group of tanks of said plurality of groups of tanks, said first group of tanks further including a third tank containing a third dye, a third pump for removing said third dye from said third tank, a third meter for receiving dye and measuring the flow rate of said dye, a third return line, and a third selector valve for selectively connecting said third meter to said dyeing apparatus so that said dye will flow from said meter to said dyeing apparatus and to said third return line, and control valve means for selectively directing said first dye to said first meter and said third meter, and for selectively directing said third dye to said first meter and said third meter.

4,632,148

HYDRAULIC DISTRIBUTION VALVE

Robert G. Stark, Sr., 735 N.E. 198th St., Seattle, Wash. 98155; Tom Stark, 551 Lakeside Dr., Sedro Wooley, Wash. 98284; Robert G. Stark, Jr., 5731 S.W. Idaho, Portland, Oreg. 97221, and Joseph W. Anderson, 9845 N.E. 22nd St., Bellevue, Wash. 98004

Filed Sep. 5, 1985, Ser. No. 773,374
Int. Cl.⁴ F16K *11/02*
U.S. Cl. 137—624.18 **16 Claims**



1. A hydraulic distribution valve comprising:

a housing having first and second substantially identical plastic shells joined at their peripheries;

a shaft journaled within the housing and extending through the first shell;

a rotor coupled to said shaft and rotatably disposed within a rotor chamber defined by the housing;

a plurality of cavities radially disposed within each shell, at least two of said cavities of the second shell having passageways for communicating with the rotor chamber;

an inlet defined by the second shell;

a gallery passing through a portion of the shaft and the rotor for communication between the inlet and a control port defined by the rotor; and

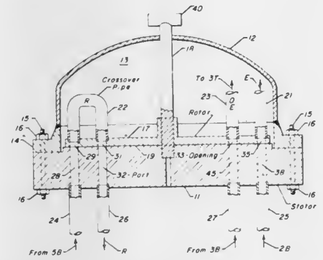
shaft rotation means for positioning the control port to permit communication between the inlet and a selected cavity passageway.

4,632,149

ROTARY VALVE FOR INTERCONNECTING CONDUITS

Anil R. Oroskar, Brookfield, and George Mack, Justice, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 10, 1984, Ser. No. 679,858
Int. Cl.⁴ F16K *11/074*
U.S. Cl. 137—625.15 **10 Claims**



1. A multiport rotary valve for accomplishing the interconnection between a plurality of conduits in a first and a second group of conduits in accordance with a previously determined cycle, conduits of the first group being simultaneously connected to conduits of the second group at each step of said cycle such that in a complete cycle, each conduit of the first group come into individual communication with every conduit of the second group by means of the valve, with any conduit communicating with no more than on other conduit at any one valve index position, comprising:

(a) a discoid stator having a substantially flat seating surface and a plurality of ports, which ports extend from the stator seating surface through the stator to communicate with said conduits, the number of ports being equal to the number of said conduits with one port communicating with each conduit to form a first group of ports and a second group of ports corresponding to said first and second groups of conduits, and the ports being disposed around an axis of rotation;

(b) a discoid rotor having a seating surface which is in fluid-tight contact with said stator seating surface which rotor rotates about said axis of rotation to various valve index positions in accordance with said previously determined cycle, where said axis passes through the center of both the rotor and stator and is normal to said seating surfaces, and which rotor has a plurality of openings, each opening extending from said rotor seating surface through the rotor to another surface of the rotor, the number of openings being equal to four times the number of conduits in the group having the most conduits, the openings being divided into a first and a second group with an equal number in each group where the first group of openings is associated with said first group of ports and the second group of openings is associated with said second group of ports and the openings are disposed about the axis of rotation such that in each index position, each port of said first group in the stator is in register with a different one of the openings of said first group of rotor openings, each port of said second group in the stator is in register with a different one of the openings of said second group of rotor openings and any openings in excess of the number of ports are sealed off at said seating surfaces; and

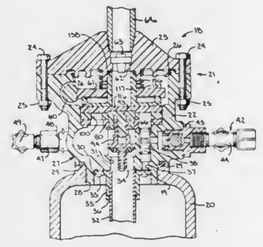
(c) a plurality of crossover pipes connected to the rotor, each crossover pipe communicating between two openings and completing a fluid transfer path between conduits of said first and second groups in accordance with said previously determined cycle, where that part of a fluid transfer path between a conduit and a crossover pipe comprises a port and an opening, with the number of crossover pipes being equal to twice the number of conduits in the group having the most conduits, and one half or fewer of the crossover pipes not serving as fluid transfer paths at any one time, and the crossover pipes arranged in a pattern such that in indexing through a whole of one of said previously determined cycles, the rotor rotates through 180 degrees.

4,632,150

WATER CONDITIONER ROTARY VALVE

John M. Gagas, Milwaukee, Wis., assignor to Erie Manufacturing Co., Milwaukee, Wis.

Filed Sep. 12, 1985, Ser. No. 775,447
Int. Cl.⁴ F16K *11/06;* **B01D** *35/00*
U.S. Cl. 137—625.46 **1 Claim**



1. A water conditioner rotary valve to be mounted to the open top of a mineral tank, comprising

a plastic valve body assembly having an inlet port, an outlet port, a brine port, a drain port and a substantially planar surface providing a series of circumferentially spaced passageways communicating with a lower opening into said mineral tank as well as said outlet, brine and drain ports,

a disc-shaped elastomeric seat member providing a series of apertures aligned with said circumferentially spaced passageways and communicating between first and second sides of said seat member with each side including in integral raised rib surrounding each of said apertures, each raised rib including first and second radially spaced annular members and a plurality of circumferentially spaced radial members whereby each aperture is surrounded by a pair of adjacent radial members and arc segments of said first and second annular members to form a valve seat for each of said apertures with said rib on said second side engaging said substantially planar surface of said valve body assembly to form a fluid tight seal therewith,

said valve body and said seat member providing an interlocking tab and groove to maintain said apertures of said seat member in alignment with said circumferentially spaced passageways of said body assembly,

a rotary plastic rotor assembly including

a disc-shaped valve plate member providing a series of openings communicating between first and second sides of said valve plate member including first and second oppositely and circumferentially spaced openings operatively connected to communicate with said inlet port and third and fourth oppositely and circumferentially spaced openings with said first and second openings circumferentially spaced from said third and fourth openings and

said first valve plate member side providing a substantially planar surface to slidably engage said raised rib provided by said seat member first side to form a fluid tight

seal with a selected aperture of said seat member in substantial alignment with one of said first through fourth openings of said valve plate member to permit fluid flow through a substantial alignment of said port and aperture and openings without leakage and

said second valve plate member side providing a butterfly shaped groove adjacent to a butterfly shaped ridge surrounding said third and fourth openings and

a cover member having an axial opening operatively communicating with said drain port and extending from a barrel shaped first end to a butterfly shaped second end having a butterfly shaped groove surrounded by a butterfly shaped lip to snugly engage said butterfly shaped ridge and said butterfly shaped groove, respectively, of said disc-shaped valve plate member to permit said disc-shaped valve plate member to rotate in unison with said cover member with minimal shear forces therebetween and said second end providing a pair of oppositely spaced radially extending channels to provide fluid communication between said third and fourth openings and said axial opening with said barrel shaped first end providing a series of circumferentially spaced radially extending projections,

drive means engaging said projections on said cover member first end to positively rotate said cover member and said valve plate member in unison to selectively align selected openings of said valve plate member with selected apertures in said seat member to provide a desired fluid flow through said rotary valve, and

spring means operatively connected to compress said valve plate member into firm engagement with said seat member and to maintain said seat member in firm sandwiched relationship between said valve plate member and said substantially planar surface provided by said body assembly.

4,632,151

NON-RETURN VALVES

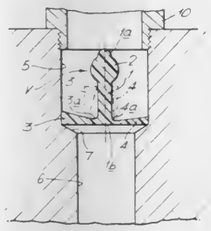
Brian H. Glover, Teddington, United Kingdom, assignor to Grundy (Teddington) Limited, Teddington, England

Filed Sep. 12, 1984, Ser. No. 649,602

Claims priority, application United Kingdom, Sep. 15, 1983, 8324763

Int. Cl.⁴ F16K *15/14*

U.S. Cl. 137—854 **3 Claims**



1. A non-return valve assembly for fluid flow comprising a valve body member having a through bore with an intermediate internal shoulder dividing said bore into axially spaced-apart first and second sections, said first section defining a fluid inlet and said second section defining a fluid outlet for forward fluid flow through said valve, a valve element comprising a one-piece moulding of a risilient rubber material positioned within said second section of the bore, said valve element including a substantially flat elongate rib lying transversely across a diameter of said second section of the bore and extending along the longitudinal axis thereof, said rib having upper and lower edges, said lower edge of said rib in abutment with said shoulder, a collar threadably engaging said second bore section and abutting said upper edge of said rib at a position axially opposed to said lower edge of said rib abutting said shoulder, said collar captively securing the one-piece valve element within said second section of the bore to retain said rib against axial and transverse deflection, a reinforcing protuberance extending along said rib adjacent said upper edge, said lower edge of the rib having self-supporting integral wings projecting laterally one from each side to define a circular planform, said wings having a periphery normally lying in abutment with said shoulder to close with bore, and said wings each having a zone of reduced thickness adjacent the juncture between the wings and rib whereby, with fluid flow in a direction from said first section to said second section said wings flex hingewise about said zones of reduced thickness to lie in juxtaposed relationship to said rib to open the bore and with fluid flow in a reverse direction from said second section to said first section the circular planform defined by the wings remain fully within the second section as the one-piece valve element remains captively secured within the second section.

4,632,152

WEFT HOLDING MEMBER IN WEFT TRANSPORT GRIPPERS FOR WEAVING LOOMS

Nello Pezzoli, Leffe, Italy, assignor to VAMATEX S.p.A., Villa Di Serio, Italy

Continuation of Ser. No. 658,802, Oct. 9, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,259

Claims priority, application Italy, Oct. 7, 1983, 23196 A/83

Int. Cl.⁴ D03D *47/20*

U.S. Cl. 139—448 **1 Claim**



1. In a weft carrying gripper for a weaving loom comprising a gripper body and a weft yarn holding member carried by the gripper body and rectilinearly reciprocable relative to the gripper body toward and away from a weft yarn gripping hook of said body alternately to grip and release a weft yarn between a head on said holding member and said hook of said body; the improvement in which said head includes a resilient metal lamina movable toward and away from said hook upon oscillation of said holding member, said lamina being integral with the forward end of the head and extending rearwardly in spaced relation to the head in a direction diagonal to the direction of rectilinear reciprocation of the holding member and terminating rearwardly in a free end, said lamina, upon engaging a weft yarn, bending about an axis transverse to the direction in which said head is moving at the time the lamina engages a weft yarn, said lamina having an operative position in which a substantial length of said lamina resiliently contacts the hook when said weft yarn holding member is fully seated in the hook and in which said length of lamina on the side opposite the hook is spaced from said holding member.

4,632,153

PICKING BAND WHEEL FOR A WEAVING MACHINE

Rudolf Heller, Zurich, and Heiner Kern, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 11, 1986, Ser. No. 828,313

Claims priority, application Switzerland, Feb. 11, 1985, 601/85

Int. Cl.⁴ D03D *47/12*

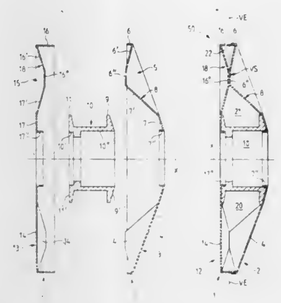
U.S. Cl. 139—449 **16 Claims**

1. A picking band wheel for a weaving machine comprising a hub;

a first wheel disc mounted on said hub, said disc including a main wall having a plurality of inwardly extending and circumferentially spaced pocket-like spoke parts therein,

each said spoke part including a transverse wall at a base thereof; and

a second wheel disc mounted on said hub to form a band receiving body with said first wheel disc, said second wheel disc including a main wall having a plurality of



inwardly extending and circumferentially spaced pocket-like spoke parts therein, each said spoke part of said second disc including a transverse wall at a base thereof disposed in abutting relation with a respective transverse wall of a spoke part of said first disc.

4,632,154

WEFT FEEDER FOR WEAVING LOOMS

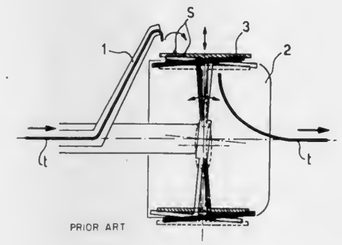
Bruno Maina, Valdengo, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

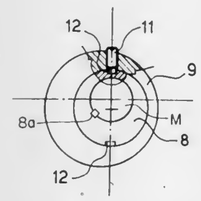
Filed May 28, 1985, Ser. No. 738,383

Claims priority, application Italy, Jun. 4, 1984, 22055/84[U]

Int. Cl.⁴ D03D *47/36*

U.S. Cl. 139—452 **2 Claims**





1. In a weft feeder for weaving looms, of the type wherein a rotating reel winds a reserve of weft yarn turns around a drum held stationary, and wherein means are provided to move forward said turns on the drum, keeping them mutually spaced, said means comprising a set of non rotating columns relative to said drum, said means being further adapted to cause said columns to partially and variably emerge from seats in the periphery of said drum, said means includes a feeder motor shaft, a skew bushing and a rotary bearing mounting said column; the improvement in which said bushing is formed of two hollow bodies, a key by which the first of said hollow bodies is keyed to the motor shaft, said first body being eccentric in respect of the drum axis, while the second body is rotatably mounted on the first body, and means to selectively lock said second body to said first body in one of two positions spaced at 180° in respect of the other, said second body having an outer surface which is cylindrical about an axis and inclined with respect to said drum axis.

4,632,155

ELECTROMAGNET FOR STOPPING THE UNWINDING OF THE WEFT YARN IN WEFT FEEDING DEVICES FOR WEAVING LOOMS

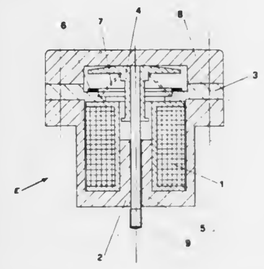
Bruno Maina, Valdengo, Italy, assignor to ROJ Electrotex, S.p.A., Biella, Italy

Filed Oct. 9, 1984, Ser. No. 658,803

Claims priority, application Italy, Oct. 7, 1983, 23187/83[U]

Int. Cl.⁴ D03D *47/36*

U.S. Cl. 139—452 **2 Claims**



1. In combination with a weft feeding device winding drum, means for selectively stopping the unwinding of a weft yarn from the drum, said means comprising a shank selectively movable toward and away from the drum into and out of the path of a weft yarn unwinding from the drum, a ferrous head secured to one end of the shank, an arresting plate, a damping element fixed to said plate in a position to be contacted by said head when said shank moves toward the drum, a return spring acting on the head to urge the head away from the damping element, an electromagnetic coil surrounding the shank and adapted to urge the head in a direction toward the drum against the action of the spring, the shank being in the form of a cable of stainless steel strands.

4,632,156

SKEINING APPARATUS

Geoffrey E. Whellams, Teeside Airport, Great Britain, assignor to Roberts Industries, Marine City, Mich.

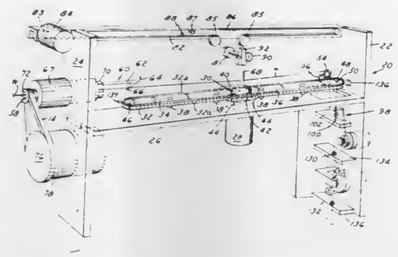
Continuation-in-part of Ser. No. 633,845, Jul. 24, 1984. This application Nov. 18, 1985, Ser. No. 798,894

Int. Cl.⁴ B65H *54/56*

U.S. Cl. 140—92.1 **10 Claims**

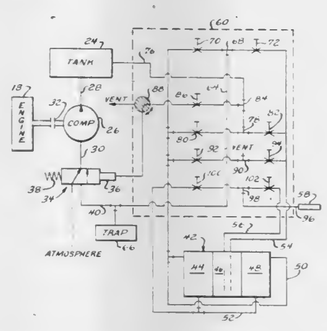
1. In a skeining machine having a looping member arranged to move in an elongated endless track having recurvate ends, and a pair of looping needles arranged within said path to have a filament looped thereon during revolution of the looping member about the path, one of said needles being a spinner needle mounted on a rotatable shaft at an acute angle extending away from the outer needle, and the spinner needle being disposed adjacent one of said recurvate ends of the looping member path, the invention characterized by the root of the

connection between the spinner needle and the rotatable shaft being disposed between the path of movement of the looping



member and the center of recurvature of the looping member path.

4,632,157
AIR COMPRESSOR OPERATED VACUUM SYSTEM FOR TIRE SERVICING VEHICLES
William J. Bunkofske, Ankeny, Iowa, assignor to Iowa Mold Tooling Company, Inc., Garner, Iowa
Filed Jun. 14, 1985, Ser. No. 745,292
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—38 **3 Claims**



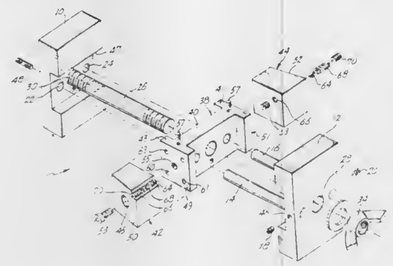
2. A service truck for servicing tires on off-the-road vehicles such as tractors or the like comprising:
a body having ground engaging wheels;
an engine on said body for providing propelling power for said truck;
an air compressor on said body and having an inlet and an outlet and being selectively drivable by said engine;
a compressed air tank on said body and connected to said outlet;
at least one liquid tank on said body adapted to receive tire liquid;
a fluid line adapted to be placed in communication with the interior of a tire to be serviced;
first valve means for selectively connecting said fluid line to said liquid tank;
a three way valve connected to said inlet for alternatively (a) establishing fluid communication between said inlet and the ambient and (b) establishing fluid communication between said liquid tank and said inlet;
means for selectively operating said three way valve; and
second valve means for selectively connecting said compressed air tank to said liquid tank to expel liquid therefrom through said fluid line.

4,632,158
POWER LIMITING HYDRAULIC SYSTEM
Thomas Q. Haeder, and Wally L. Kaczmarski, both of Lisbon, N. Dak., assignors to Clark Equipment Company, South Bend, Ind.
Filed Aug. 1, 1985, Ser. No. 761,265
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—34 E **6 Claims**



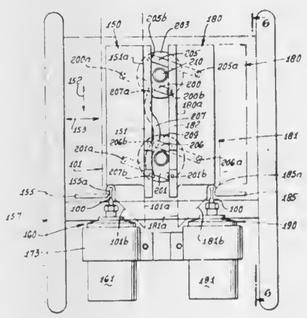
1. A hydraulic system for operating a tree processing implement which has at least one grabber arm for holding a tree, and at least one shear blade for severing the tree, comprising
a first hydraulic cylinder for operating said grabber arm,
a second hydraulic cylinder for operating said shear blade,
two hydraulic pumps for supplying pressurized fluid for jointly pressurizing said hydraulic cylinders for operating said grabber arm and said shear blade jointly during the first part of a work cycle of the implement, and
means responsive to an increase in the hydraulic pressure applied to said hydraulic cylinders to a predetermined amount for disconnecting one of said pumps from both said cylinders,
leaving the other pump operating both said arms.

4,632,159
CLAMP-ON MARKING TEMPLATE AND SAW GUIDE FOR MAKING DOVETAIL JOINTS
Marion L. Glasgo, 11010 SE. 297th, Auburn, Wash. 98002
Continuation-in-part of Ser. No. 586,873, Mar. 7, 1984, Pat. No. 4,531,559. This application Jul. 29, 1985, Ser. No. 760,272
Int. Cl.[4] B27F *1/00*
U.S. Cl. 144—85 **12 Claims**



1. A device for guiding a saw to form cuts in an edge of a board comprising:
(a) a template piece having at least one flat side for resting lengthwise upon said edge;
(b) guide blocks connected to the opposing ends of the template piece, one guide block being formed to have a surface oriented to guide a saw for cutting in a plane obliquely inclined to a plane that is parallel to the edge of the board upon which the template piece rests, the other guide block being formed to have a surface oriented to guide a saw for cutting in a plane obliquely inclined to any plane orthogonal to a plane that is parallel to the edge of the board upon which the template piece rests;
(c) parallel clamp plates connected to opposing sides of the template piece and extending along a pair of opposing sides of the board upon which the template piece rests; and
(d) clamp means operatively associated with the clamp plates for holding the device in a fixed position on the board.

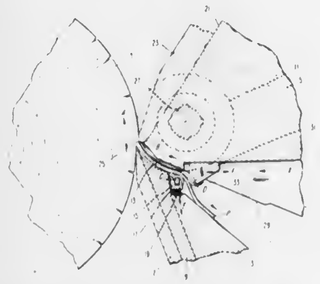
4,632,160
MOULDING ROUTING APPARATUS
M. Bosley Wright, 2501 Greenspring Valley Rd., Owings Mills, Md. 21117
Filed Apr. 4, 1985, Ser. No. 719,770
Int. Cl.[4] B27C *5/00*
U.S. Cl. 144—136 R **22 Claims**



1. In apparatus for cutting an insert groove in a longitudinally elongated moulding having a backside and mitred end, the combination comprising:
(a) a first base, and a first guide surface on the base to engage the back side of the moulding thereby to position the moulding directionally laterally,
(b) a first stop to engage and position the mitred end of the moulding, thereby to position the moulding longitudinally,
(c) clamp means movable to engage the positioned moulding and retain the moulding on the base,
(d) a first router and a rotary drive therefore, the router projecting into lapping relation with said mitred end of the moulding,
(e) means to displace the first router relative to the base to directionally sidewardly engage and penetrate the mitred end of the moulding, thereby to produce said groove,
(f) and means to relatively adjustably position the base and drive, laterally, thereby to relatively position the mitred end of the moulding relative to the router.

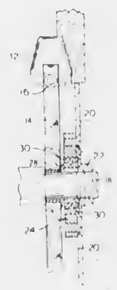
4,632,161
VENEER LATHE
Yoshimitsu Kajikawa; Keinosuke Souma; Kohei Ogaki; Tadashi Uzuka, and Yoshihiko Minato, all of Hakodate, Japan, assignors to Uruko Seisakusho Co., Ltd., Japan
Division of Ser. No. 430,500, Sep. 30, 1982, Pat. No. 4,494,590. This application Jan. 18, 1985, Ser. No. 692,693
Claims priority, application Japan, Oct. 27, 1981, 56-171876
Int. Cl.[4] B27L *5/02*
U.S. Cl. 144—213 **8 Claims**

1. A veneer lathe for peeling veneer from a log, said veneer comprising:
a knife mounted on a knife frame;
a pressure bar frame;
a plurality of spaced pressure bars retained on said pressure bar frame for applying pressure to said log, each said plurality of spaced pressure bars having a portion proximate said knife, the portions of said pressure bars nearest said knife being aligned substantially parallel thereto, thereby forming a gap between said knife and said pressure bars, said gap defining the thickness of said veneer;
a plurality of roller discs individually rotatably mounted along a common axis in the spaces between successive ones of said pressure bars;
means for rotating said roller dics at a peripheral speed greater than the peripheral speed of said log;
a guide face mounted on said knife frame adjacent said knife and havng a shape substantially corresponding to the periphery of said roller dics, thereby forming a curved path for said veneer peeled from said log;



a plurality of parallel-mounted, pressure rollers consecutively spaced along said knife frame adjacent said guide face, each of said plurality of pressure rollers being axially spaced from said roller discs, said pressure rollers continuing said path provided by said guide face and exerting forces on said veneer in a direction perpendicular to said axis of said roller discs; and
a plurality of parallel-mounted guide members mounted on said pressure bar frame and disposed along the path of said veneer after said pressure rollers, said guide members having a guide surface to exert a force on said veneer in a direction substantially perpendicular to the direction of force of said pressure rollers.

4,632,162
GUIDE ASSEMBLY FOR A MOLDING HEAD
Joseph Angeloni, 42 Electric St., Peckville, Pa. 18452
Filed Sep. 25, 1985, Ser. No. 779,880
Int. Cl.[4] B27G *13/00*
U.S. Cl. 144—229 **8 Claims**



1. A molding head and guide means for cutting molding comprising:
a rotary cutting means comprising a cutter plate having

means for removably attaching cutting blades of desired configuration thereto, the cutter plate having an opening in a center portion thereof for mounting on an arbor member of a machine;

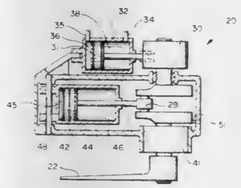
a follower assembly contacting the cutter plate and freely movable with respect thereto, the follower assembly comprising a follower disc and a hub for supporting the follower disc, wherein the hub is coaxial with and parallel to the cutter plate, and comprises a connecting portion for stationary attachment to the follower disc and a mounting means adapted for mounting the hub on an arbor, and wherein the follower disc comprises a plate coaxial with and parallel to the cutter plate having a peripheral edge for following a molding contour, a bearing member, and means for affixing the follower disc to the hub.

4,632,163

CUTTING SYSTEM FOR TREES, VEGETATION AND OTHER OBJECTS

Helmut E. Fandrich, 2461 Sunnyside Place, Abbotsford, British Columbia, Canada (V2T 4C4)

Filed Jul. 8, 1985, Ser. No. 752,617
Int. Cl.⁴ A01G *23/02*
U.S. Cl. 144—336 **19 Claims**



1. The method of powering a cutting blade through a cutting stroke comprising the steps of:

(a) coupling the blade to a reciprocable piston in a piston/-cylinder type accumulator containing a compressible potential energy storage medium;

(b) shifting the accumulator piston axially within the accumulator cylinder towards a top dead center position therein wherein the compressible potential energy storage medium is fully compressed;

(c) positively precluding reverse axial movement of the accumulator piston during step (b) so as to prevent expansion of the compressible potential energy storage medium;

(d) shifting the accumulator piston axially in the opposite direction past its top dead center position so as to permit rapid expansion of the compressible potential energy storage medium for rapidly driving the cutting blade through its cutting stroke;

(e) employing the inertial forces generated by the rapidly driven cutting blade and the coupling thereof to the accumulator piston to drive the accumulator piston in the opposite direction upon completion of the blade cutting stroke and thereby at least partially recompressing the compressible potential energy storage medium;

(f) shifting the accumulator piston axially within the accumulator cylinder towards a top dead center position therein wherein the compressible potential energy storage medium is again fully compressed; and,

(g) positively precluding reverse axial movement of the accumulator piston during steps (e) and (f) so as to prevent expansion of the compressible potential energy storage medium.

10. Apparatus for cutting trees, vegetation and other objects comprising, in combination:

(a) a cutting blade;

(b) an accumulator piston/cylinder combination for storing a compressible potential energy storage medium;

(c) means coupling said cutting blade to said accumulator piston for driving said blade through its cutting stroke during expansion of said compressible storage medium;

(d) a positioning mechanism coupled to said accumulator piston for positively shifting said piston in the opposite direction upon completion of its expansion stroke towards and past its top dead center position during a compression stroke while the potential energy storage medium is re-compressed;

(e) means for preventing movement of said acumulator piston in an expansion stroke until said piston passes its top dead center position; and,

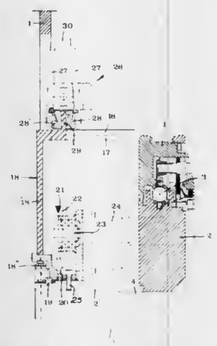
(f) operator controlled means for actuating said positioning mechanism to shift said accumulator piston towards and through its top dead center position.

4,632,164

ROTATION RING BARKER

Börje Persson, Norrala, Sweden, assignor to Söderhamns Verkstäder AB, Sweden

Filed Jul. 22, 1985, Ser. No. 757,261
Claims priority, application Sweden, Aug. 24, 1984, 8404217; May 9, 1985, 8502304
Int. Cl.⁴ B27L *1/00*
U.S. Cl. 144—341 **5 Claims**



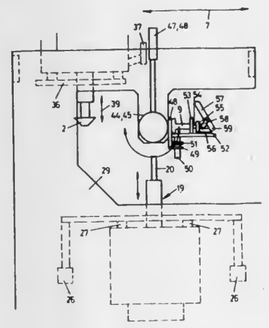
1. A rotation ring barker comprising; a stator, a rotor rotatably mounted on the stator, said rotor having an opening for lengthwise feeding along its axis of a log to be barked, a number of pivotal working tools operatively connected to the rotor, a spring mechanism for actuating each tool, each spring mechanism having means for normally striving to maintain the tool yieldingly urged against a log passing through the rotor for bark removal, the individual tools being jointly movable outwardly away from the log against the action of said spring mechanism, a ring operatively mounted between the rotor and the stator, said ring mounted on the rotor and normally operating at the same speed as the rotor, a transmission means for operatively connecting the ring with a drive member of at least one pump means mounted on the rotor, said ring being normally carried along with the rotor, the stator having a braking means for selectively reducing the speed of the ring in relation to the rotor speed, while permitting limited relative movement between said rotor and said ring, wherein said relative movement causes the drive member, via said transmission means, to rotate such that its pump means in turn transmits to the working tool a fluid force overcoming the pressure of the spring mechanism and causing the tool to swing outwardly away from the log.

4,632,165

METHOD AND APPARATUS FOR MILLING AND GROOVING WOODEN FRAMING MEMBERS ESP. HALVING JOINTS

Ludolf Stegherr, Donaustauger Strasse 30, 8400 Regensburg, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,532
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424680
Int. Cl.⁴ B27M *1/00*
U.S. Cl. 144—371 **9 Claims**



2. An apparatus for cutting pairs of bevels symmetrically arranged about the horizontal axis of a halving joint of a lattice frame portion or similar type of workpiece, and a groove-like recess between the two opposite pairs of bevels, the recess being cut into a third side of the workpiece connecting the two opposite bevelled sides, comprising

a frame;

guide means fastened to the frame; a cutting unit supported by said guide means, said cutting unit being horizontally movable across the apparatus and adjustable in height and including means for cutting said bevels;

a stationary tool clamp fastened to the frame for supporting the workpiece under pressure, which clamp positions the workpiece with respect to the tools, and which may be turned 180° around its longitudinal axis in such a manner that in both positions the upper edge of the workpiece has the same height level with respect to the cutting means; and a grooving unit which is fastened to the frame and which supports a grooving tool and a drive motor therefor, which grooving tool is arranged below the workpiece in such a manner that the grooving tool when turning engages the workpiece for cutting the groove.

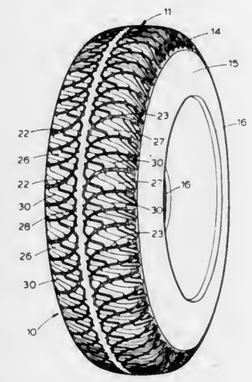
4,632,166

PNEUMATIC TIRES

Jean F. L. Fontaine, Buerden, and Maurice Graas, Luxembourg, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 13, 1985, Ser. No. 744,179
Claims priority, application European Pat. Off., Aug. 28, 1984, 84630121.6
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.⁴ B60C *11/04*
U.S. Cl. 152—209 R **10 Claims**

1. A pneumatic tire comprising a ground contacting tread portion with a mid-circumferential plane and a pair of lateral edges, said tread portion having a substantially continuous central rib at the mid-circumferential plane; primary lateral grooves located on each side of the rib extend from the rib circumferentially and axially outwardly to a respective lateral edge, the primary lateral grooves on each side of the rib being spaced apart from one another at the respective lateral edge while being interconnected at their axially inner end portions thereby forming isolated lands between pairs of circumferentially adjacent primary lateral grooves, the primary lateral grooves to one side and the other of the rib extending in circumferentially opposite directions so that pairs of primary lateral grooves extend diagonally across the tread portion in either a substantially "S" shaped or substantially "Z" shaped configuration; and a plurality of blades arranged to extend in circumferentially spaced substantially continuous blade paths



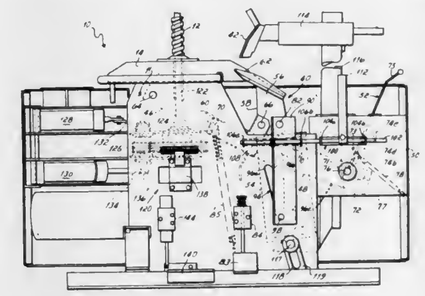
between the lateral edges in a diagonally opposite direction to the primary lateral grooves such that each primary lateral groove is intersected by a plurality of blade paths, some of the blade paths having axially inner portions which extend between circumferentially adjacent primary lateral grooves and which are widened out into secondary lateral grooves which divide each land into axially inner and outer parts, each secondary groove interconnecting directly with the axially inner end portion of a primary lateral groove.

4,632,167

LOWER BEAD BREAKER STROKE CONTROL APPARATUS

Curran N. Collins, Goshen, Ohio, assignor to Big Four Equipment, Inc., Maineville, Ohio

Filed Apr. 9, 1985, Ser. No. 721,300
Int. Cl.⁴ B60C *25/06*
U.S. Cl. 157—1.28 **9 Claims**



1. In power tire changing machine including a frame carrying a horizontal platform for supporting a wheeel mounting a tire having a lower bead, an apparatus for breaking the lower bead of the tire from the wheel, comprising:

a pivot arm pivotally mounted to the frame of the tire changing machine below the wheel and tire carried by the horizontal platform of the frame;

a lower bead breaker shoe pivotally mounted to said pivot

arm, said lower bead breaker shoe having an upper end disposed in an initial position below and radially outwardly spaced from the lower bead of the tire;

fluid motor means connected to said lower bead breaker shoe for moving said lower bead breaker shoe with a combined upward and radially inward motion relative to the tire and wheel so that said upper end of said lower bead breaker shoe engages the lower bead of the tire;

regulator means connected to said lower bead breaker shoe for selectively stopping said radially inward movement of said upper end of said lower bead breaker shoe at a predetermined point spaced from the wheel, while permitting continued upward movement of said upper end of said lower bead breaker shoe against the lower bead of the tire without contacting the wheel to break the lower bead of the tire from the wheel.

4,632,168

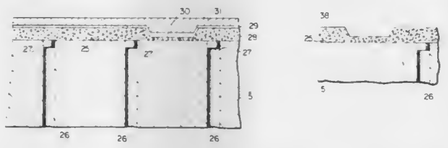
METHODS AND LINED MOLDS FOR CENTRIFUGAL CASTING

Charles H. Noble, 2307 Manassas Dr., Birmingham, Ala. 35213

Filed Sep. 22, 1983, Ser. No. 534,614

Int. Cl.[4] B22C *9/24*

U.S. Cl. 164—33 **18 Claims**



1. A method for producing tubular metal articles by centrifugal casting, comprising:

providing a rigid heat-conductive mold having an active mold surface of circular cross section transverse to the longitudinal axis of the mold; establishing a lining on the mold by supplying to the active surface of the mold, while the mold is rotating about it longitudinal axis, a binderless dry particulate refractory material,

at least 20% by weight of the particles of the refractory material being sharp angular particles,

at least 25% by weight of the particles of the refractory material being relatively large particles having a maximum dimension exceeding 75 microns,

a significant portion of the particles of refractory material having a particle size which is small in comparison to said relatively large particles,

the rate of rotation of the mold and the rate of supply of the particulate refractory material being such that, at the time of arrival of any increment of the particulate material at the mold surface or the surface of the forming lining substantially all of the particles are fixed in place by centrifugal force resulting from the mold rotation,

the lining thus established being characterized by having at least a primary portion which is in contact with the active surface of the mold, has a significant radial thickness, and throughout the radical thickness of which said angular particles and said larger particles are uniformly distributed; the step of establishing the lining including the step of densifying the lining by rotating the mold at a predetermined rate sufficient to apply to the refractory material a centrifugal force of such magnitude that the refractory material then has an equivalent specific gravity of at least 7.5 determined according to the formula

$$\text{Eq. Sp. Gr.} = \text{Actual Sp. Gr.} \times G$$

where G is determined by the formula

$$G = \frac{[(RPM)^2 \times D]}{70{,}400}$$

where D is the inner diameter of the lining in inches;

contouring the densified lining to the shape desired for the outer surface of the article to be cast; and

introducing molten casting metal into the lined mold while rotating the mold at a casting rate.

15. The method for centrifugally casting a hollow iron article which has at least one right circular cylindrical outer surface portion and at least one outwardly projecting annular flange which is of substantially larger outer diameter than the cylindrical outer surface portion, comprising

providing a rigid heat-conductive mold having an active mold surface of circular cross section transverse to the longitudinal axis of the mold;

establishing a lining on the mold by supplying to the mold a dry particulate refractory material,

at least 25% by weight of the particles of the refractory material having a maximum dimension exceeding 75 microns,

the mold being rotated to distribute the particulate refractory material over the active surface of the mold;

the step of establishing the lining including the step of densifying the lining by rotating the mold at a predetermined rate sufficient to apply to the refractory material a centrifugal force of such magnitude that that the refractory material has an equivalent specific gravity of at least 7.5 determined according to the formula

$$\text{Eq. Sp. Gr.} = \text{Actual Sp. Gr.} \times G$$

where G is determined by the formula

$$G + \frac{[(RPM)^2 \times D]}{70{,}400}$$

where D is the inner diameter of the lining in inches;

contouring the densified lining to shape the lining to a right circular cylindrical inner surface where the cylindrical outer surface portion of the cast article is to be formed and a groove where the outwardly projecting flange of the cast article is to be formed,

the radial thickness of the lining where the outer surface portion of the cast article is to be formed being thick in comparison to the radial thickness of the lining where the flange of the cast article is to be formed;

establishing a thin facing of particulate refractory material on the inner surface of the contoured lining with the facing extending over both the thicker and thinner portions of the lining,

the facing being thinner over the thicker portion of the lining and thicker over the thinner portion of the lining,

the particulate material of the facing having a thermal conductivity significantly less than that of the particulate material of the lining,

the thermal conductivity of the combined lining and facing being substantially uniform throughout the length of the lining; and

introducing molten casting metal into the line mold while rotating the mold at a casting rate, and allowing the casting metal to solidify,

the resulting cast article being characterized by containing graphite of uniform type and size throughout the length of the casting, including the flange of the cast article.

4,632,169

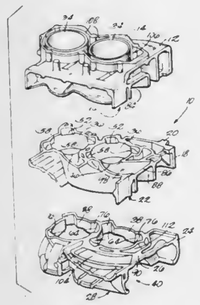
TWO CYCLE CYLINDER BLOCK FOAM PATTERN

Harold L. Osborn, Winthrop Harbor, and Roger B. Whipple, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 1, 1985, Ser. No. 729,522

Int. Cl.[4] B22C *7/02*

U.S. Cl. 164—45 **25 Claims**



17. A foam mold pattern for making an engine block in a lost foam casting process, said pattern comprising an upper portion, a middle portion attached to said upper portion, and a lower portion attached to said middle portion, and said foam mold pattern including an exterior, a first cylinder wall defining a first cylinder bore having an upper portion located in said pattern upper portion, a middle portion aligned with said first cylinder bore upper portion and located in said pattern middle portion, and a lower portion aligned with said first cylinder bore middle portion and located in said pattern lower portion, a second cylinder wall defining a second cylinder bore parallel to said first cylinder bore and having an upper portion located in said pattern upper portion, a middle portion aligned with said second cylinder bore upper portion and located in said pattern middle portion, and a lower portion aligned with said second cylinder bore middle portion and located in said pattern lower portion, a first exhaust port in said first cylinder wall communicating with said first cylinder bore and having an upper edge located in said pattern upper portion, a second exhaust port in said second cylinder wall communicating with said second cylinder bore and having an upper edge located in said pattern upper portion, a first inlet port in said first cylinder wall communicating with said first cylinder bore and having an upper edge loated in said pattern upper portion, a second inlet port in said second cylinder wall communicating with said second cylinder bore and having an upper edge located in said pattern upper portion, a first exhaust passage communicating between said first exhaust port and said exterior, and a second exhaust passage communicating between said second exhaust port and said exterior.

4,632,170

METHOD AND APPARATUS FOR MAKING PRECISION METAL CASTINGS

Andreas Pöhl, Haydnstrasse 5, 8077 Reichertshofen, Fed. Rep. of Germany

Filed Sep. 26, 1985, Ser. No. 780,331

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446139

Int. Cl.[4] B05B *7/22*

U.S. Cl. 164—250.1 **6 Claims**

1. A furnace for melting metal and casting the molten metal to form metal moldings, comprising:

(a) a melting chamber for melting the metal to be cast;

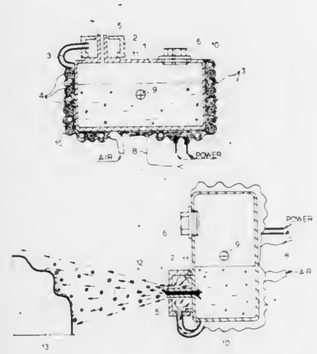
(b) means for heating the melting chamber comprising a heating element wound around the melting chamber;

(c) thermostat means for controlling operation of the heating element;

(d) a nozzle in fluid communication with an opening in said melting chamber, through which molten metal flows;

(e) air tube means wound around the melting chamber with the heating element;

(f) a source of compressed air in fluid communication with said air tube means;



(g) means for heating air in said air tube means, comprising said heating element;

(h) a sleeve surrounding said nozzle, in fluid communication with said air tube means; and

(i) an opening in said sleeve through which heated air from said air tube means is accelerated as it exits said sleeve, said opening being oriented so that air exiting and sleeve atomizes and carries molten metal from said nozzle.

4,632,171

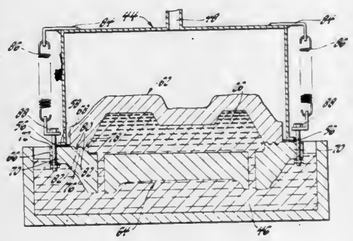
COUNTER-GRAVITY CASTING MOLD

Roger L. Almond, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 26, 1984, Ser. No. 654,404

Int. Cl.[4] B22D *18/06*

U.S. Cl. 164—255 **4 Claims**



1. Apparatus for shaping a metal article in a porous, bottom-gated, expendable, shell mold by the vacuum-induced, counter-gravity casting method wherein the mold is immersed in an underlying melt of said metal and evacuated to draw said melt up into said mold, said apparatus comprising:

a cope portion of said mold comprising a gas-permeable, resin-bonded-sand shell formed by molding against a cope-shaping pattern, said cope portion defining a mold cavity for shaping said article and having a peripheral edge defining a first sealing face on the underside of said cope portion between said edge and said cavity;

a drag portion of said mold comprising a resin-bonded-sand shell formed by molding against a drag-shaping pattern, said drag portion further defining said cavity and having a second sealing face on its topside surrounding said cavity;

an adhesive bonding and sealing said first and second sealing faces one to the other at a parting line therebetween;

a flange on said drag portion extending outboard said second sealing face beyond said peripheral edge, said flange having a substantially flat upper surface formed against said drag-shaping pattern at the time said drag portion was molded;

a vacuum chamber atop said drag portion but enclosing said cope portion, said chamber having a lip on its underside sealingly engaged with said upper surface of said flange; and

means for evacuating said chamber sufficiently to draw said melt up into said porous mold when it is immersed in said melt

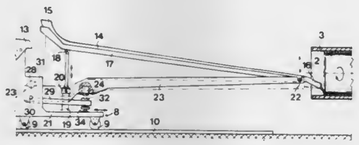
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4,632,172

CENTRIFUGAL PIPE CASTING WITH PROGRESSIVELY INCLINED AND RAISED POUR CHANNEL

Bernard Etienne, Pont a Mousson; Michel Francois, Nancy, and Michel Pierrel, Pont a Mousson, all of France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Mar. 13, 1985, Ser. No. 712,508
Claims priority, application France, Mar. 16, 1984, 84 04249
Int. Cl.⁴ B22D *13/02, 13/12*
U.S. Cl. 164—301 **7 Claims**



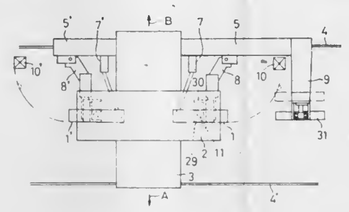
1. An apparatus for supplying liquid metal to a pipe centrifuging machine of the type having a revolving centrifugation mold (**3**), an elongate inclinable pour channel (**14**) having a spillway (**15**) at one end and a casting nose (**16**) at another, opposite end, a carriage (**8**) for moving the pour channel in axial translation relative to the mold, an elongate support cradle (**23**) heavily cantilevered with respect to the carriage, the cradle being articulated at one end to the pour channel proximate said opposite end thereof but displaced upstream from an outlet end of the casting nose, and a fluid cylinder (**19**) mounted to the support cradle proximate the spillway for inclining the channel upon terminating a delivery of liquid metal into the spillway, characterized by: means for mounting the cradle on the carriage in the manner of a balance beam, said mounting means including a horizontal journal (**27**) disposed in an upstream direction of the carriage, and adjustable fluid cylinder means (**24**) spaced downstream from said journal for raising an axis of articulation (**22**) between the pour channel and the support cradle as the channel is being inclined and in synchronism with such inclination to compensate for an otherwise lowering of the outlet end of the casting nose in consequence of inclining the channel, wherein the mounting means comprises an intermediate frame (**29**) pivotally mounted to the carriage by a pair of horizontal journals (**30**), and height adjustment means (**34**) disposed between the carriage and an end of said intermediate frame remote from the pair of journals, said upstream horizontal journal (**27**) being provided at an opposite end of the intermediate frame proximate said pair of journals.

4,632,173

LABOR SAVING APPARATUS FOR CONTINUOUS CASTING FACILITY

Hideo Kaneko, Kobe; Akira Murata, Kakogawa; Eiji Inoue, Motoyamaminami; Satoshi Satoh, Kobe; Shinji Shiraishi, and Shoichi Hiwasa, both of Kurashiki, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Kawasaki Steel Corporation, both of Kobe, Japan

Filed Feb. 28, 1985, Ser. No. 706,692
Int. Cl.⁴ B22D *11/10*
U.S. Cl. 164—417 **10 Claims**



1. In a continuous casting facility, a labor-saving apparatus, said facility including a plurality of casting moulds having an operator's side and a counter-operator's side opposite to the operator's side, a pair of rails, one of the pair of rails on each of the sides of the moulds, self-propelled tundish cars riding on the rails and each having a tundish, each tundish having a lower face, an immersion nozzle, and means for detachably mounting said immersion nozzle on the lower face; the apparatus comprising:

a plurality of trucks each running on the rail on the counter-operator's side and connectable to one of the tundish cars, and

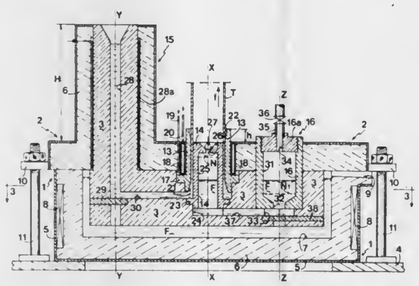
means mounted on each said truck for exchanging immersion nozzles of the tundish mounted on said one of the tundish cars.

4,632,174

DOUBLE BOILER FURNACE FOR VERTICAL ASCENDING PIPE CASTING

Michel Pierrel, Pont-à-Mousson, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed Nov. 26, 1985, Ser. No. 801,729
Claims priority, application France, Nov. 26, 1984, 84 18084
Int. Cl.⁴ B22D *11/04, 11/10*
U.S. Cl. 164—421 **15 Claims**



1. An installation for the continuous vertical ascending casting of iron pipes, comprising:

(a) an electrically heated furnace (**1**) for maintaining a bath of molten iron (F) therein at a desired temperature,

(b) a removable refractory cover (**2**) for closing an open top of the furnace,

(c) a plurality of graphite elements (**3**) carried by the cover, extending therebelow, and defining:

(1) a tubular die (**13**) and a coaxial hollow core (**14**) disposed within the die and defining therewith an annular casting channel,

(2) a feed device (**15**) for supplying molten iron to the casting channel, and

(3) an expansion vessel (**16**) communicating with a cavity (**25**) of the core for regulating the temperature thereof by controlling the level of molten iron within the cavity, and

(d) means (**18**) for cooling an outer surface of the die,

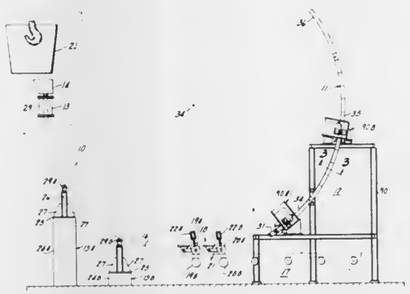
(e) wherein the graphite elements extending below the cover are substantially submerged in the bath of molten iron in the furnace when the cover is closed to define a double boiler arrangement for maintaining molten iron in the feed device, at an entry to the casting channel, in the expansion vessel and in the core cavity at a desired temperature.

4,632,175

CONTINUOUS CASTING MACHINE

James D. McVay, Youngwood, and Hermann Take, Pittsburgh, both of Pa., assignors to Continuous Casting Systems Inc., Pittsburgh, Pa.

Filed May 9, 1985, Ser. No. 732,503
Int. Cl.⁴ B22D *11/08, 11/128*
U.S. Cl. 164—426 **17 Claims**



1. A continuous casting machine for casting elongate metallic members includes a mold oriented generally vertically and having an arcuate passage with openings at its upper and lower ends, the curvature of the mold passage defining an arcuate casting path for the machine comprising points equidistant from the center of curvature of the mold passage.

a starting bar comprising a plurality of pivotally interconnected links, the pivotal connection between adjacent links defining pivot axes,

the pivot axes of the pivotally connected adjacent link pairs extending perpendicular to the axis of the casting path,

each of said links having first and second abutment surfaces at each end,

a plurality of spaced apart support means disposed generally below the said mold for supporting spaced apart points on said starting bar along the casting path with one end of said starting bar oriented generally vertically below the open lower end of the mold and the opposite end extending in generally horizontal direction, said starting bar being unsupported between said support means,

the first abutment surface on each link engaging the first abutment surface on the adjacent link to limit pivotal movement of the links outwardly relative to said center of curvature so that the unsupported portions of the starting bar define an arc whose radius of curvature is equal to that of the casting path,

the second abutment surface at the end of each link engages the second abutment surface on the adjacent link when the links pivot inwardly from said casting path and are out of engagement when the first abutment surface is engaged, whereby slight inward pivotal movement of the links out of alignment with the casting path is permitted but outward pivotal movement of the links is arrested when the curvature of the casting path is reached, so that said starting bar will have a free form corresponding to the casting path,

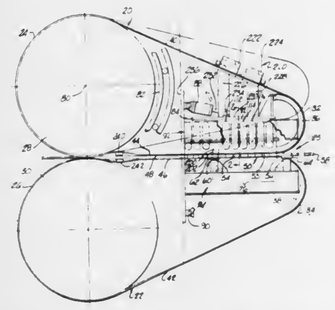
storage means located above the casting path and including first and second clamping means disposed in spaced apart relation along a continuation of the arcuate casting path for supportingly engaging spaced apart portions of said starting bar, the remaining portions of said starting bar being substantially self-supporting, and withdrawal means for moving said starting bar from a position below said mold into said storage means.

4,632,176

APPARATUS FOR CONTINUOUS STRIP CASTING OF ALUMINUM SHEET MATERIAL

Ronald A. Pearce, 2997 Pierson Way, Lakewood, Colo. 80215

Filed Apr. 19, 1985, Ser. No. 725,106
Int. Cl.⁴ B22D *11/06*
U.S. Cl. 164—481 **36 Claims**



1. Apparatus for casting a continuous strip of metallic sheet material having a rectangular, cross-sectional configuration defined by an upper flat surface, a lower flat surface and opposed side edge surfaces comprising:

an upper roll means and a lower roll means of a roll caster machine mounted in vertically spaced juxtaposition to define a thickness reducing gap therebetween and being rotatable relative to one another to enable a continuous strip of cast aluminum sheet material to be drawn therethrough and reduced in thickness while passing therethrough;

an upper arcuate guide means and a lower arcuate guide means mounted in vertically spaced juxtaposition on a support frame attached to said roll caster machine and being located upstream of said upper roll means and said lower roll means;

an upper continuous loop belt means operatively associated with and extending around said upper roll means and extending between said upper roll means and said upper arcuate guide means and being movable relative thereto and having a lower elongated straight horizontal portion extending between said upper roll means and said upper arcuate guide means and being movable toward said upper roll means and said lower roll means;

a lower continuous loop belt means operatively associated with and extending around said lower roll means and extending between said lower roll means and said lower arcuate guide means and being movable relative thereto and having an upper elongated straight horizontal portion extending between said lower roll means and said lower arcuate guide means and being movable toward said upper roll means and said lower roll means and being spaced a distance from said lower elongated straight portion of said

upper continuous loop belt means to provide an elongated channel therebetween having an outlet opening at said thickness reducing gap between said upper roll means and said lower roll means and an inlet opening between said upper arcuate guide means and said lower arcuate guide means;

dam means located adjacent opposite side edge portions of each of said continuous loop belt means at least at the beginning of said straight horizontal portion for forming a rectangular elongated forming cavity between said straight horizontal portion of said upper belt means and said straight horizontal portion of said lower belt means;

means for continuously rotating said upper roll means and said lower roll means and for continuously moving said upper belt means and said lower belt means and for continuously moving said dam means;

means for continuously feeding a supply of molten aluminum material into said inlet opening between said upper belt means and said lower belt means adjacent to said upper and lower arcuate guide means and transporting the aluminum material to said thickness reducing gap between said upper roll means and said lower roll means through said elongated forming cavity and said elongated channel; and

cooling means associated with each of said upper elongated straight portion of said upper continuous loop belt means and said lower elongated straight portion of said lower continuous loop belt means for cooling said molten aluminum material to form a continuous strip of cast aluminum sheet material to be drawn between said upper roll means and said lower roll means.

21. The method of continuous casting of a heated slab of metallic material comprising:

feeding molten metallic material from a source of molten metallic material into an elongated generally rectangular forming space defined by a pair of generally parallel horizontally extending continuous loop belt devices and a pair of continuous loop side dam devices;

causing uniform continuous synchronous movement of the belt devices and the dam devices in a horizontal direction from an inlet opening adjacent the source to a discharge opening to provide a generally rectangular length of metallic material therebetween which decreases in temperature from the inlet opening to the discharge opening;

continuously cooling the belt devices by applying a coolant to the belt devices at a first relatively high pressure and removing coolant at a second relatively low pressure to progressively remove heat from the metallic material during passage from the inlet opening to the outlet opening;

continuously maintaining surface contact between the belt devices and the upper and lower surfaces of the metallic material between the inlet opening and the outlet opening by applying a coolant pressure differential force on at least one of the belt devices to cause movement of the one belt device toward the other belt device;

continuously maintaining surface contact between the dam devices and the side surfaces of the metallic material during movement from the inlet opening to the outlet opening;

connecting one of the dam devices to at least one of the belt devices and positively outwardly displacing one of the dam devices to cause lateral stretching of the one of the belt devices to maintain continuous flat contact with a side surface of the metallic material;

directing the metallic material from the outlet opening to a pair of roller means located in juxtaposition to the outlet opening and causing the metallic material to pass between the pair of roller means; and

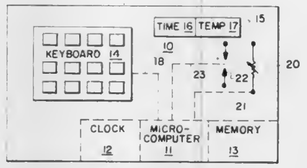
driving the belt devices and the dam devices and the roller devices in synchronization from a common power source.

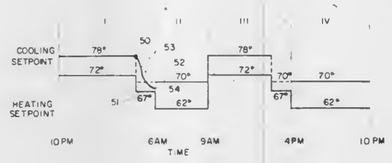
4,632,177.

CLOCK OPERATED THERMOSTAT HAVING AUTOMATIC CHANGEOVER AND OPTIMUM START

Thomas J. Beckey, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1985, Ser. No. 717,919
Int. Cl.⁴ G05D *23/00;* **F25B** *13/00*
U.S. Cl. 165—12 **9 Claims**





1. Clock thermostat means having automatic heat-cool changeover and optimum start functions, including: microcomputer means including real time clock means and memory means; data input means connected to said microcomputer means to input a sequence of desired heat and cool control temperature setpoints and times for a desired temperature control by said thermostat means; temperature sensor means including connection means to monitor temperature at said thermostat means; said connection means connected to said microcomputer means to communicate a temperature at said sensor means to said microcomputer means; said thermostat means further including switch means adapted to control heating and cooling equipment by said thermostat means; said microcomputer means and said memory means including automatic changeover program means and optimum start program means to insure an optimum operation of said thermostat means by starting a temperature change in advance of a time for said desired temperature control; and said program means maintaining a temperature differential of at least a determined amount between said heat and cool control temperature setpoints as the thermostat means switches through the sequence of desired heat and cool control temperature set points and to allow said program means to function without conflicting operation of said heating and cooling equipment.

4,632,178

INTERCOOLER FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 24, 1984, Ser. No. 664,324
Claims priority, application Japan, Oct. 26, 1983, 58-200353
Int. Cl.⁴ B60H *1/00;* **F28D** *15/00*
U.S. Cl. 165—39 **12 Claims**

1. In an arrangement having a passage through which heated fluid flows,

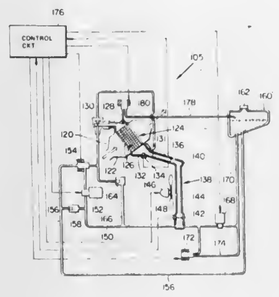
a device for cooling said heated fluid comprising:

first heat exchange means including a first heat exchanger exposed to said heated fluid for vaporizing liquid coolant;

second heat exchange means including a second heat exchanger for condensing coolant vapor formed in said first heat exchanger;

means responsive to a parameter which varies with the temperature of the fluid in said passage downstream of said first heat exchanger, said parameter responsive means increasing the heat exchange between said first heat exchanger and a cooling medium in contact with said first heat exchanger;

a first pump for pumping liquid coolant from said second heat exchanger to said first heat exchanger;



a reservoir;

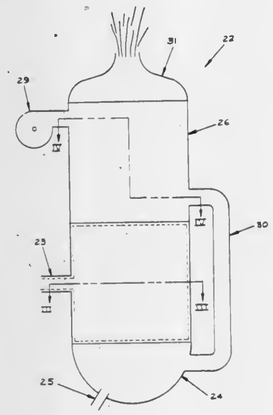
a first valve which controls fluid communication between said reservoir and one of said first and second heat exchangers, said first valve including means for opening and establishing fluid communication between said reservoir and said one of said first and second heat exchangers when said cooling device is not in use.

4,632,179

HEAT PIPE

Roelf J. Meijer, and Benjamin Ziph, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Division of Ser. No. 420,047, Sep. 20, 1982, Pat. No. 4,523,636.
This application Mar. 25, 1985, Ser. No. 715,687
Int. Cl.⁴ F28D *19/00;* **F24H** *3/12*
U.S. Cl. 165—47 **2 Claims**



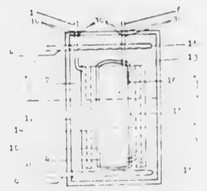
1. In combination, means forming a housing, means providing a source of heat in said housing, a heat pipe including a duct having at opposing ends an evaporator and a condenser; said evaporator being located adjacent said heat source for receiving heat therefrom; a wick capable of transporting liquid with capillary action lining internal surfaces of said heat pipe; and a heat transport medium contained by said heat pipe for transporting heat between said evaporator and said condenser, hollow fins lined with said wick and with a lining of coarse porous material capable of supporting compressive load, thereby increasing structural stiffness of said fings, said fins having substantially flat parallel sides and being arranged in a generally parallel spaced relation with each other to enable heating of the interiors of said fins from said heat source passing heat through and by said flat sides thereof, and wherein spaces within said hollow fins open to said evaporator allow liquid and vaporous forms of said heat transfer medium to communicate therebetween, a heat exchanger positioned adjacent said evaporator for receiving heat from said heat source that has passed through said evaporator, and means for moving air for combustion for said heat source through said heat exchanger for pre-heating prior to supply to said heat source, said evaporator being positioned between said heat source and said heat exchanger with flow spaces aligned for allowing products of combustion to flow from said heat source through said evaporator and heat exchanger respectively along a straight path, thereby to minimize obstruction to flow.

4,632,180

POTABLE WATER HEAT EXCHANGER

Robert J. Lauderdale, 25924 Peterman Ave., Hayward, Calif. 94545

Filed Mar. 4, 1986, Ser. No. 836,055
Int. Cl.⁴ F28F *11/00;* **F24H** *1/22*
U.S. Cl. 165—70 **5 Claims**



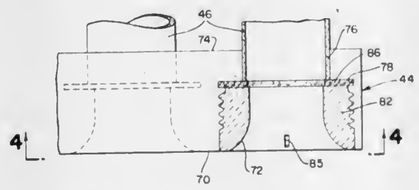
1. An indirectly heated potable water heater heated by boiler water providing a high output flow rate with complete safety, comprising, an outer heated boiler water tank, one or more vented metal sheet heat exchangers contained within said tank and heated by the boiler water, said one or more sheet heat exchangers being connected to vented pipes, whereby a highly efficient high flow rate potable water heater is provided.

4,632,181

CERAMIC HEAT EXCHANGER

Robert G. Graham, 2433 N. Nile Mile Rd., Sanford, Mich. 48657

Filed Mar. 3, 1983, Ser. No. 471,912
Int. Cl.⁴ F28F *9/02*
U.S. Cl. 165—158 **2 Claims**



1. An all ceramic heat exchanger assembly comprising:

(A) a ceramic wall defining an outer wall face and an inner wall face,

(B) a constant diameter threaded bore formed in said outer wall face and extending part way through said wall;

(C) a constant diameter smooth walled bore of smaller diameter than said threaded bore formed in said inner wall face in coaxial relation to said threaded bore and extending

part way through said wall to a location adjacent an inboard end of said threaded bore;

(D) an annular transverse shoulder extending between adjacent inboard ends of said threaded and smooth walled bores;

(E) an annular resilient gasket, having an outer diameter greater than the diameter of said smooth walled bore and an inner diameter less than the diameter of said smooth walled bore, positioned within said wall with one annular face thereof seated against said shoulder;

(F) an annular ceramic insert having an axial length substantially corresponding to the axial length of said threaded bore, a constant diameter threaded outer periphery, and a bell shaped inner periphery extending axially from end to end of the insert and tapering smoothly outwardly from an inboard diameter substantially corresponding to the inner diameter of said gasket to an outboard diameter substantially greater than its inboard diameter;

(G) said insert being threaded into said threaded bore to press an inboard annular end surface against the other annular face of said gasket and position an outboard annular end face substantially flush with said outer wall face; and

(H) a ceramic tube, having an outer diameter less than the diameter of said smooth walled bore and an inner diameter substantially corresponding to the inner diameter of said gasket and the inboard diameter of said bell shaped opening, received in said smooth walled bore with an inboard end abutting said one face of said gasket concentrically within the sealing engagement of said one gasket face with said shoulder.

4,632,182

HEAT EXCHANGER FOR GASES OF GREATLY DIFFERENT TEMPERATURES

Klaus Hagemeister, Munich, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,001

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242845

Int. Cl.[4] F28F *9/02*

U.S. Cl. 165—173 **23 Claims**



1. A heat exchanger for gases of greatly different temperatures wherein the cross and counterflow matrix to be exposed to the hot gas stream consists of a plurality of tubes of spear-shaped cross-sectioned tubular shapes having in cross-section a first dimension along a first direction and a second dimension less than said first dimension along a second direction substantially orthogonal to said first direction and formed to promote flow in a direction taken by the hot gas, said tubes being connected to at least one tubesheet which forms part of a tubular head designed to permit the entry and exit of a medium to and from the matrix, wherein

(a) the at least one tubesheet comprises layers;

(b) each layer comprises a row of heat exchanger matrix tubular shapes corresponding to said tubes and having first dimensions extending substantially in said first direction;

(c) each layer comprises two complementary sheet metal shells;

(d) the sheet metal shells preformed at least such that when joined together to form a layer, the sheet metal shells form adjacent wall sections and said matrix tubular shapes, and

(e) the sheet metal shells of a layer form between them recesses on the inner side of the tubesheet, said recesses communicate with said tubular shapes and extend in said first and said second directions.

4,632,183

INSERTION DRIVE SYSTEM FOR TREE SAVERS

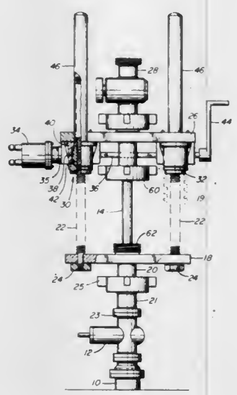
Roderick D. McLeod, 5104 125th St., Edmonton, Alberta, Canada (T6H 3V5)

Filed Dec. 5, 1984, Ser. No. 678,253

Claims priority, application Canada, Jan. 9, 1984, 444889

Int. Cl.[4] F21B *19/00*

U.S. Cl. 166—77 **5 Claims**



1. A drive system for inserting a mandrel tube into a well head tree saver, said system comprising:

a pair of spaced beam members including a first, lower beam member adapted to be mounted onto said tree saver and through which said mandrel tube is to be inserted;

a second, upper beam member parallel to and spaced above said first lower beam member;

a pair of mechanical jack assemblies interconnecting said upper and lower beam members and comprising a pair of parallel threaded shafts, one adjacent each end of said beam members and extending therebetween;

means on one of said beam members engaging the threads on said shafts;

an interconnected, double gear drive means, one engaging each of said jack assemblies, for moving said upper beam member relative to said lower beam member;

said mandrel tube being secured in said upper beam member and adapted to be driven into or out of said lower beam member and said tree saver in response to movement of said upper beam member by said jack assemblies; and

means on the upper and lower beam members for releasably locking the mandrel tube in place when said upper beam member has been moved to its lower position by said drive means.

4,632,184

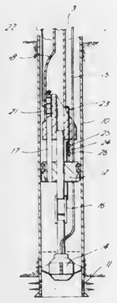
SUBMERSIBLE PUMP SAFETY SYSTEMS

James B. Renfroe, Jr., Valencia, Calif.; Rennie L. Dickson, Carrollton, and Roger D. Rion, The Colony, both of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Oct. 21, 1985, Ser. No. 789,724

Int. Cl.[4] E21B *43/12*

U.S. Cl. 166—105.5 **6 Claims**



1. A production system for a petroleum well comprising:

well packer means;

vent passageway means through said packer means;

vent valve means responsive to control fluid pressure and controlling flow through said vent passageway means;

tubing means extending through said packer means;

a safety valve in the tubing comprising,

tubular body means,

flowway means through the body means,

tubular valve actuator means slidably telescoped in the body means and providing a part of said flowway means,

piston means carried by said actuator means and having a sliding seal with said body means and responsive to control fluid pressure for moving said actuator means in a downward direction,

resilient means urging said actuator means in an upward direction,

main valve seat means surrounding said passageway means and positioned below the lower end of said actuator means when said resilient means is extended,

flapper valve means in the path of said actuator means and engageable with said main valve seat means to control flow through said passageway means,

port means in the body means below said main valve seat means providing a flowpath between the flowway means and the exterior of the body means when said flapper valve means is in engagement with said main valve seat means,

actuator seat means below said port means engaged by said actuator means when said actuator means is in its full valve open position responsive to control fluid pressure, and

seal means carried by one of said actuator seat means and said actuator means for sealing therebetween when said actuator means engages said actuator seat means to prevent flow through said port means; and

pump means in the tubing below said safety valve.

4,632,185

POLYMERFLOOD PROCESS

Ahmad Moradi-Araghi, and Duane H. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 31, 1985, Ser. No. 760,804

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—273 **17 Claims**

1. In a polymerflood process for the recovery of oil from subterranean oil reservoirs penetrated by spaced injection and production wells involving the sequential injection of aqueous polymer solution and aqueous drive wherein the polymer bears pendant hydrolyzable amide groups, the improvement is the inclusion in said polymer solution of a viscosity stabilizing amount of at least one compound capable of providing a concentration of ammonium cation sufficient to suppress hydrolysis of pendant hydrolyzable amide groups of said polymer thereby stabilizing the solution viscosity of said polymer solution.

4,632,186

WELL CEMENTING METHOD USING AN AM/AMPS FLUID LOSS ADDITIVE BLEND

Virgilio G. Boncan, and Richard Gandy, both of Spring, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Dec. 27, 1985, Ser. No. 814,350

Int. Cl.[4] E21B *33/14*

U.S. Cl. 166—293 **4 Claims**

1. A method of cementing a wellbore, comprising the steps of:

mixing together a hydraulic cement, water in an amount to produce a pumpable slurry, and a non-retarding fluid loss additive blend which comprises a copolymer of acrylamide and 2-acrylamido-2-methylpropane sulfonate, the sodium salt of naphthalene formaldehyde sulfonate, and polyvinylpyrrolidone polymer;

pumping said cement slurry to the desired location in said wellbore; and

allowing said cement slurry to harden to a solid mass.

4,632,187

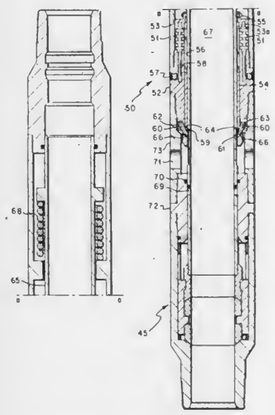
WELL SAFETY AND KILL VALVE

Thomas M. Deaton, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 613,439, May 24, 1984, Pat. No. 4,566,478, which is a continuation-in-part of Ser. No. 372,134, Apr. 27, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 783,671

Int. Cl.[4] E21B *34/10*

U.S. Cl. 166—323 **9 Claims**



1. A valve device for use in tubing above a packer set in casing above a well formation comprising:

(a) a housing connectable in well tubing and having a longitudinal flow passage therethrough and a flow passage through said housing wall intersecting said longitudinal flow passage;

(b) lower ball valve means controlling flow through said longitudinal flow passage;

(c) upper sleeve valve means controlling flow through said

housing wall flow passages between said valve device exterior and said longitudinal flow passage, said valve means cooperable such that when said upper valve means is in closed position, said lower valve means is in open position, and when said upper valve means is in open position, said lower valve means is in closed position;

(d) locking means for holding said valve means at one position and releasing said valve means for movement to another position;

(e) pressure responsive means for releasing said locking means; and

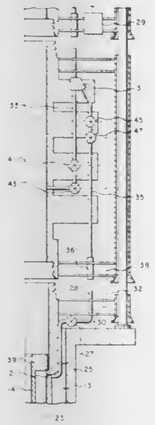
(f) operator means for operating said valve means between positions including an operator tube having a shoulder thereon, mounted for longitudinal movement in said housing, an internal shoulder in said housing and a spring disposed around said operator tube between said housing and operator tube shoulders, biasing said operator tube upwardly.

4,632,188

SUBSEA WELLHEAD APPARATUS

Frank J. Schuh, Plano, and John Karish, Houston, both of Tex., assignors to Atlantic Richfield Company, Plano, Tex.

Filed Sep. 4, 1985, Ser. No. 772,402
Int. Cl.[4] E21B *7/12*
U.S. Cl. 166—368 **2 Claims**



1. In a subsea wellhead apparatus for use at a bottom of a sea and the like and with a floating drilling rig with a subsea blowout preventer stack for permitting injection of a waste fluid containing noxious, or toxic, substances into a fractured formation penetrated by a drilled borehole while drilling and including:

a. a plurality of strings of conduit suspended in a borehole penetrating subterranean formations below the bottom defining respective annular spaces therebetween and having conventional drilling strings of conduit operable for drilling, and

b. a wellhead and accessories disposed above the bottom and sealingly connected with said plurality of strings of conduit so as to prevent unwanted invasion of fluids into said annular spaces;

the improvement comprising:

c. a first communicating aperture communicating with a first annular space intermediate a pair of said plurality of strings of conduit;

d. additional conduit means for fluid flow connected with said first communicating aperture and defining a sealed path for flow of the waste fluid;

e. remotely operable, high pressure flow control valve means interposed in said additional conduit means of element d. for controlling flow of the fluid to said annular space; and

f. remote control means for controlling said flow control valve; said remote control means being operably connected to said flow control valve and operable to open and shut said flow control valve responsive to a remote signal,

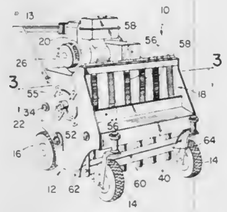
whereby said waste fluid can be injected into said annular space without having to transport said waste fluid back to a disposal site.

4,632,189

SOIL AERATING MACHINE

Salvatore J. Rizzo, 78 Arlington St., Meriden, Conn. 06450

Filed Oct. 4, 1984, Ser. No. 657,743
Int. Cl.[4] A01B *45/02, 35/20*
U.S. Cl. 172—22 **11 Claims**



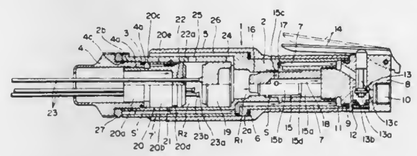
1. A soil aerating machine having a frame, means for supporting said frame to travel on the ground and advance along an aerating path, and a soil aerating mechanism supported on said frame and including a horizontally disposed cam shaft having as axis extending transversely of said path, a rocker arm shaft having an axis parallel to said cam shaft axis, a plurality of rocker arms, each rocker arm being supported by said rocker arm shaft for rocking movement relative to the axis of said rocker arm shaft and projecting forwardly from said rocker arm shaft, a plurality of vertically disposed tines equal in number to said rocker arms, each of said tines having a tubular soil penetrating portion at its lower end and being pivotally connected about a tine pivot axis to the forward end of an associated rocker arm for forward and rearward pivotal movement relative to said associated rocker arm and for generally vertical reciprocal movement between raised and soil penetrating positions in response to rocking movement of said associated rocker arm, a plurality of cams equal in number to said rocker arms and mounted in fixed position along said cam shaft, each of said cams being engageable with an associated one of said rocker arms, spring means for biasing said rocker arms into engagement with said cams and for biasing said tines in a forward direction, abutment means forward of said tines for striking engagement by said tines and drive means for rotating said cam shaft to move said tines between said raised and said soil penetrating positions, each of said tines upon entering the ground in moving from said raised position to its soil penetrating position being pivotally moved about said tine pivot axis and in a rearward direction to a rear position spaced a substantial distance rearward from said abutment surface in reponse to movement of said machine in a forward direction and along said aerating path, each of said tines upon leaving the ground in moving toward its raised position being abruptly pivoted in a forward direction by said biasing means into striking engagement with said abutment means to dislodge soil from said tubular soil penetrating portion thereof.

4,632,190

PNEUMATICALLY-OPERATED MULTI-NEEDLE CHISEL TOOL

Toshio Mikiya, 9-17, Todoroki 1-chome, Setagaya-ku, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,334
Claims priority, application Japan, Apr. 15, 1983, 58-55521[U]
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—133 **3 Claims**



1. A pneumatically actuated multi-needle type chisel tool comprising:

a hollow cylinder body;

a piston ram fitted for axially reciprocal movement in a rearward portion of said cylinder body;

an anvil fitted for axially reciprocal movement in an intermediate portion of the cylinder body, said anvil being positioned in front of said piston ram;

a needle holder fitted for axially reciprocal movement in a forward portion of the cylinder body, said needle holder being positioned in front of the anvil to define a first air space between a rear end face of the needle holder and a front end face of the anvil and having an outer peripheral forwardly facing shoulder surface;

a number of needle chisel journaled for axially reciprocal movement in said needle holder;

first air passage means formed in said cylinder body and opening into the rearward portion of the cylinder body to introduce compressed air thereinto for moving said piston ram to and fro;

second air passage means formed in said cylinder body and opening into the forward portion of the cylinder body to introduce compressed air thereinto for moving said needle holder rearwardly;

air port means formed through the wall of the cylinder body between the anvil and the needle holder for communicating said first air space with the atomosphere, said air port means being sized such that the air in said first air space is pressurized upon the anvil being rapidly moved forward by the impact from the piston ram, causing said pressurized air force to move the needle holder forwardly while preventing the anvil from direct impact on the needle holder and that the air in said first air space is also pressurized upon the needle holder being moved rearwardly to prevent the needle holder from direct impact on the anvil; and

a cylinder cap axially adjustably mounted to the forward portion of said cylinder body with a rear end face of said cap facing opposite to and spaced from the outer peripheral forwardly facing shoulder surface of the needle holder to define a second air space between the rear end face of said cap and the forwardly facing shoulder surface of the needle holder such that the air introduced into said second air space through said second air passage means during the forward movement of the needle holder is pressurized to prevent said shoulder surface from coming into abutment with the rear end face of the cap;

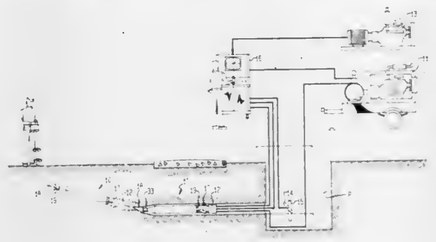
whereby the forward movement of the needle holder and the rearward movement of the anvil are effected only by the repulsive expanding power of the air generated between the holder and the anvil and the timing of retraction of the needle chisels is adjustable by varying the position of the cylinder cap relative to the forward portion of the cylinder body.

4,632,191

STEERING SYSTEM FOR PERCUSSION BORING TOOLS

William J. McDonald; Gerard T. Pittard; William C. Maurer; John H. Cohen, and Gregory C. Givler, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 5, 1985, Ser. No. 720,582
Int. Cl.[4] E21B *4/06, 7/06, 7/26, 44/00*
U.S. Cl. 175—19 **51 Claims**



1. A controllable percussion tool for drilling holes in the soil comprising

a cylindrical housing with a tapered front end,

a first means on said front end for applying a boring force to the soil,

a second means in said housing for applying a percussive force to said boring force applying means,

said first and second means being cooperable to apply an asymmetric boring force,

a rotatable sleeve member supported on the rear end of said housing,

a pair of fins supported on said rotatable sleeve member in circumferentially spaced relation and having fixed angular positions thereon,

said sleeve member and fins comprising a fin assembly, and

means cooperable with at least one component of said fin assembly to establish one position permitting said fin assembly to rotate freely on said housing during movement through the earth and another position fixed in relation to said housing to cause said housing to rotate on movement through the earth,

said boring means being operable to bore in a straight direction when said fin assembly is in said fixed position and to bore in a curved direction when said fin assembly is freely rotating.

4,632,192

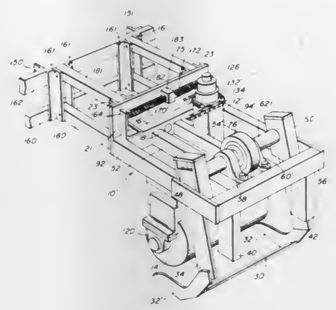
MULTIPLE-UNIT APPARATUS FOR LIFTING SOD

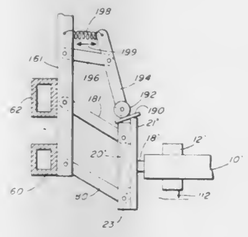
Thomas E. Hooks, 300 NE. 3rd St., Belle Glade, Fla. 33430

Filed Jul. 18, 1984, Ser. No. 631,921
Int. Cl.[4] A01B *45/04, 35/20*
U.S. Cl. 172—19 **6 Claims**

1. A multi-unit sod-lifting apparatus including a primary draft suspension supporting a plurality of individual sod-lifting apparatus units while drawing all of them in a sod-cutting path, said apparatus comprising first and second support means supporting first and second of said units from respective first and second locations which are spaced apart on said primary draft suspension, means supporting a third of said units from a third location on said primary draft suspension which is intermediate said first and second locations, said third unit support means including a subsidiary draft suspension coupled to said primary draft suspension via a parallelogram link which during use holds said subsidiary draft suspension spaced from said primary draft suspension with freedom to move up-and-down relative to said primary draft suspension and to said first and second units, and means effective during use for urging said subsidiary draft suspension downward relative to said primary draft suspension and to said first and second units, said latter

means including a pressure pad fixed to said subsidiary draft suspension, an arm fitted at one end with a roller and connected intermediate its ends via a link to said primary draft





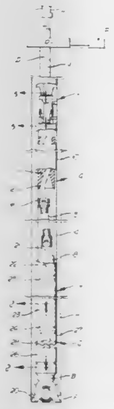
suspension, and resilient means between said primary draft suspension and the remaining end of said arm for urging said roller downwardly against said pressure pad.

4,632,193

IN-HOLE MOTOR WITH BIT CLUTCH AND CIRCULATION SUB

Bela Geczy, Glendale, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 6, 1979, Ser. No. 55,690
Int. Cl.⁴ E21B *4/02*
U.S. Cl. 175—65 **6 Claims**



1. An in-hole motor apparatus comprising: an in-hole fluid driven motor having a housing adapted to be connected at one end to a running pipe to receive motor fluid, and having a stator, a rotor and shaft rotatable in said housing in response to the flow of fluid through said housing, said shaft extending from the other end of said housing and adapted to be connected to a drill bit, a clutch between said housing and said shaft engageable for connecting said housing and shaft for mutual rotation, and a by-pass valve at said one end of said housing openable to by-pass fluid to the exterior of said housing, said clutch being operable to be disengaged by the pressure of fluid flowing through said motor.

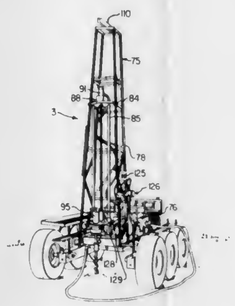
4. In the method of releasing a stuck bit driven by a fluid driven in-hole motor connected to a running pipe and having a clutch for connecting the running pipe to the bit and a circulation valve for by-passing the fluid above the in-hole motor to the annulus outside of the motor drill, the steps of opening said by-pass valve and circulating fluid through said by-pass valve responsive to said by-pass flow, engaging said clutch to transmit rotation from said running pipe to said bit, wherein said clutch is engaged by reducing the flow of fluid through the motor.

4,632,194

SELF-PROPELLED SAVERDRILL

Stuart A. Averill, 192 Powell Avenue, Ottawa, Canada (K1S 2A5); Lyle W. Hokanson, and David G. Kroeker, both of Winnipeg, Canada, assignors to Stuart A. Averill, Ottawa, Canada

Filed Oct. 31, 1984, Ser. No. 666,825
Claims priority, application Canada, Nov. 8, 1983, 440647
Int. Cl.⁴ E21B *17/18, 7/02;* **B62D** *61/10;* **F16B** *1/00*
U.S. Cl. 175—217 **48 Claims**



1. A vehicle frame comprising:
a first sub-frame;
a second sub-frame rotatably connected to one end of said first sub-frame for pivotal movement about the longitudinal axis of said first sub-frame;
a walking beam provided along opposite sides of said first sub-frame and disposed in parallel spaced-apart relation thereto;
means to pivotally connect each of said walking beams at a point intermediate along its length to said first sub-frame for independent pivotal movement of each walking beam about the transverse axis thereof; and
connecting means comprising a pair of mutually perpendicular sleeves adapted to slidably and rotatably engage and connect the respectively adjacent ends of said walking beams and said second sub-frame to permit the independent pivotal movement thereof about their respective, mutually perpendicular transverse axes.

4,632,195

ROOF DRILL SYSTEM

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., Chicago, Ill.

Filed Jun. 3, 1985, Ser. No. 740,574
Int. Cl.⁴ E21B *17/00*
U.S. Cl. 175—320 **7 Claims**



1. In a drill rod assembly for driving a mine bit, starter driver, drive extensions and the like, each having an acircular male drive with multiple axially extending faces to be received in a receiving acircular drive socket,
(a) first means on a drive shank and on a receiving drive socket to limit the axial reception of a shank into a recess and carry axial load of said parts in operation,
(b) one or more lobes extending radially from one or more of said faces spaced a predetermined distance from said first means on the insertion end of said drive shank,
(c) said acircular drive socket having axially extending ribs circumferentially spaced around the receiving socket to accommodate the insertion of said drive shank and said one or more lobes, and one or more undercuts formed in said ribs a similar predetermined distance from the receiving end of the receiving socket,
whereby upon insertion of said shank into a receiving socket relative rotation of said parts will move said one or more lobes into axial locking relationship with said one or more undercuts and move said axially entending faces of said shank into a rotative driving relationship with said ribs.

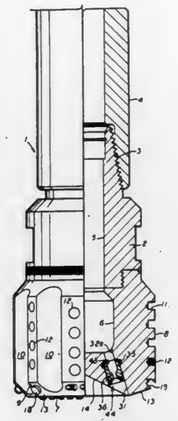
4,632,196

DRILL BIT WITH SHROUDED CUTTER

Mahlon Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 6,467,503, Feb. 18, 1983, abandoned. This application May 25, 1984, Ser. No. 614,232
Int. Cl.⁴ E21B *10/12*
U.S. Cl. 175—329 **2 Claims**

1. A cutting element positionable by interference fit in a recess of a drill bit body, said cutting element comprising:
a stud having a cylindrical side surface and an angularly oriented supporting surface disposed at a forward end of said stud, said supporting surface oriented at an acute angle relative to a longitudinal axis of said stud and intersecting said side surface,
a circular disc-shaped cutting element bonded to said supporting surface and comprising a carbide layer having a cutting surface thereon of polycrystalline diamond, said cutting element including a cylindrical peripheral surface, and
a separate reinforcing shroud bonded to said supporting surface behind said disc-shaped element, said shroud including a contact face engaging said peripheral surface of



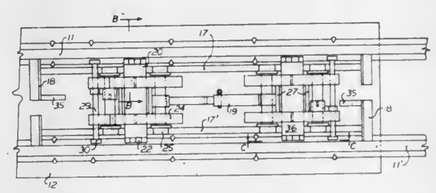
said disc-shaped element, and a cylindrical side surface arranged flush with said side surface of said stud to define a continuation thereof.

4,632,197

WEIGHING DEVICE

Michael J. Karpa, Box 408, Sta. B, Hamilton, Ontario, Canada (L8L 7W2)

Filed Jun. 18, 1985, Ser. No. 746,087
Int. Cl.⁴ G01G *19/04*
U.S. Cl. 177—163 **8 Claims**



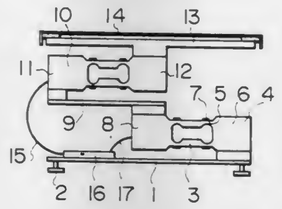
1. A device for weighing rail guided vehicles which comprises:
(a) at least one moveable weighing assembly comprised of one or more moveable carriages, each carriage having wheel supporting stirrups thereon, said stirrups positioned in internal alignment with a pair of originating rails to receive the flanges of a pair of oppositely aligned wheels from a rail guided vehicle on said originating rails and transfer the weight of said vehicle from said originating rails to said stirrups,
(b) said carriages having a means for securing or capturing said pair of oppositely aligned vehicle wheels thereon,
(c) said carriages being moveable after said securing or capturing to adjust said moveable assembly to the distance between the wheels of the vehicle being weighed,
(d) means for determining the weight on said stirrups of said moveable carriage, and
(e) means for transferring the weight of said vehicle from said stirrups back to said originating rails.

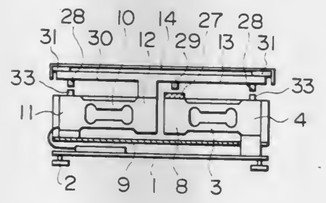
4,632,198

MULTI-RANGE LOAD CELL WEIGHING INSTRUMENT

Mitsuo Uchimura, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,481
Claims priority, application Japan, Oct. 17, 1984, 59-217580
Int. Cl.[4] G01G *3/14, 3/08;* **G01L** *1/22*
U.S. Cl. 177—211 **5 Claims**





1. In a multi-range load cell weighing instrument of the type which has two load cells including a high weighing load cell positioned adjacent a base and a low weighing load cell positioned adjacent a tray, the improvement wherein said load cells are located substantially at a same height and in an opposing relationship relative to each other such that the center lines along the length thereof substantially coincide with the center line of said tray, and wherein it comprises an upper base mounted in an opposing relationship to said tray on said low weighing load cell, the other end of said upper base being connected to said high weighing load cell, a tray frame directly connected to said low weighing load cell on which said tray is placed, and a center stopper located at a position of said tray frame opposed to and a short distance from said high weighing load cell so that said load cells are contacted when weight is received by said tray causing said center stopper to move said short distance.

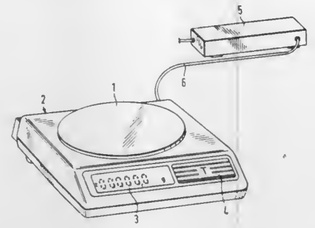
4,632,199

ELECTRONIC BALANCE FOR USE IN POTENTIALLY EXPLOSIVE AREAS

Jürgen Ober; Franz-Josef Melcher, both of Hardegsen, and Erich Knothe, Bovenden, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,439
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3437959
Int. Cl.[4] G01G *21/28*
U.S. Cl. 177—238 **7 Claims**

1. Electronic balance for use in potentially explosive areas, including a weighing system, an electronic evaluation unit and a digital display unit, the improvement comprising in that the weighing system, the electronic evaluation unit and the digital display unit are housed in the balance housing and constructed to be intrinsically safe with regard to explosions, and a power unit for supplying electric power to the weighing system, the evaluation unit and the display unit is located outside the electronic balance housing (**2**, **12**, **20**, **22**) and is connected by an intrinsically safe construction to the electronic balance housing



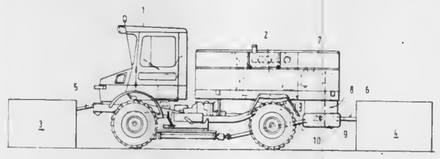
via an explosion-proof line (**6**, **16**, **26**) and plug connections (**19**).

4,632,200

DRIVE SYSTEM ON A CARRIER VEHICLE FOR VARIOUS IMPLEMENTS ATTACHED ON THE FRONT OR REAR

Hans-Henning Doyen, Neustadt-Konigsbach, and Edgar Hühn, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Ing. Alfred Schmidt GmbH, Balsien and Flughafen Frankfurt/Main AG, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,093
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344987
Int. Cl.[4] B60K *25/02*
U.S. Cl. 180—53.7 **6 Claims**



1. Drive system on a carrier vehicle for various front or rear attachments for landscape maintenance in summer as well as winter service, in which for powering said various attachments a carrier vehicle is provided with motor means comprising a vehicle motor and an auxiliary motor, one of said motors being a driving means for the powering of one of said attachments via a front drive connection, the improvement consisting in that for powering another of said attachments comprising first and second pairs of rear-located mowing units, the auxiliary motor by way of a rear drive connection to a power distributor powers respective drive connection means for powering said first and second pairs of rear-located mowing units, said vehicle motor and said auxiliary motor being adapted for concurrent operation.

4,632,201

LATCH MECHANISM FOR A BATTERY HOLDER

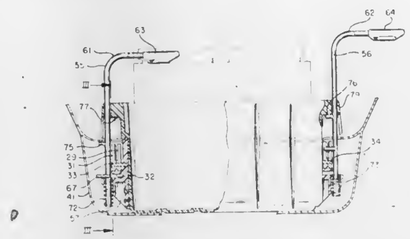
Ronald D. Kay, 3513 Hazeline, Fort Worth, Tex. 76103

Division of Ser. No. 609,458, May 11, 1984, Pat. No. 4,548,433. This application Oct. 22, 1985, Ser. No. 790,091
Int. Cl.[4] B60R *18/02*
U.S. Cl. 180—68.5 **5 Claims**

1. A battery case, comprising:

a container having an opening for receiving a battery, said container having side walls, opposing end walls, and a bottom;

a pair of latch dogs pivotally mounted on a pivot rod located on the exterior of each of said opposing end walls of said container, each of said dogs having a curved end region adapted to contact a curved work surface of an associated stop member, said dogs being pivotable between a release position in which said curved end regions are apart from said work surfaces to allow relative movement between said container and said stop member and an engaged position in which said curved end regions contact said work surfaces; and



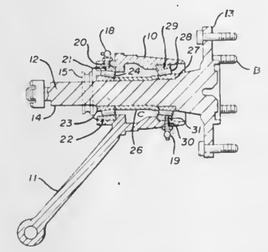
a tension bar reciprocally mounted on an exterior portion of each of said opposing end walls, each of said tension bars having a pivot region for contacting and pivoting said latch dogs between said released and engaged positions in response to reciprocation of said tension bar.

4,632,202

BEARING LUBRICATION FOR SPINDLES IN VEHICLES

Gerald S. Narbut, 4865 Warwick South, Canfield, Ohio 44406

Filed Aug. 15, 1985, Ser. No. 765,662
Int. Cl.[4] B60B *35/18*
U.S. Cl. 180—70.1 **4 Claims**



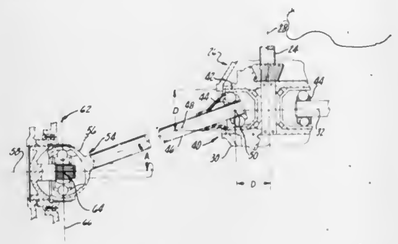
1. An improvement in a motor vehicle drive spindle and housing therefor having bearing receiving recesses therein, support arms on said housing and bearing assemblies provided on said drive spindle and seated in said recesses, said bearing assemblies including pairs of bearing races having inner opposed surfaces and a plurality of circumferentially spaced roller bearings positioned between said inner opposed surfaces of said pairs of bearing races; the improvement comprising the combination of lubricant passageways formed in one of each of said opposed pairs of bearing races in communication with said roller bearings and secondary lubricant passageways formed in said housing in spaced relation to said support arms and in communication with said recesses and positioned for registry with said lubricant passageways in said bearing races, and means on the exterior of said housing communicating with said secondary lubricant passageways for facilitating the introduction of lubricant thereinto whereby the inner opposed surfaces of said bearing races and the roller bearings therebetween may be directly lubricated by lubricant supplied to said means on the exterior of said housing.

4,632,203

INDEPENDENT WHEEL SUSPENSION SYSTEM USING THRUST BEARING CONSTANT VELOCITY UNIVERSAL DRIVE JOINTS AS SUSPENSION MEMBERS TO MINIMIZE WHEEL CAMBER

Werner Krude, Grosse Pointe Park, Mich., assignor to GKN Automotive Components Inc., Southfield, Mich.

Filed Mar. 5, 1984, Ser. No. 586,011
Int. Cl.[4] B60K *20/00*
U.S. Cl. 180—73.3 **7 Claims**



1. An independent wheel suspension system for a vehicle having an engine adapted to provide a driving torque, a chassis, vehicle support means for resiliently supporting said chassis for displacement relative to a driving surface, and a wheel assembly for each wheel having a vertical center plane through the center thereof and a wheel axis substantially perpendicular to said vertical center plane, said wheel assembly having a camber angle relative to said vertical center plane adapted to undergo a change of chamber as said wheel assembly undergoes movement relative to said vertical center plane, said independent wheel suspension system comprising:

differential means comprising a differential housing, a differential input at an engine end of said differential housing adapted to be coupled to said engine so as to receive said driving torque therefrom about a differential input axis, said differential housing having a pair of lateral sides on opposite sides of said differential input axis, each said lateral side having a differential output axis therethrough, said differential means being adapted to redirect said driving torque from said differential input axis to said differential output axis and being supported by said vehicle support means to position said differential input axis substantially perpendicular to said wheel axis;

an inboard constant velocity universal joint connected within each lateral side of said differential housing and having an outer joint member rotatable about said differential output axis, an outboard constant velocity universal joint connected to each said wheel assembly and having a joint member rotatable about said wheel axis, and a drive shaft coupling said inboard constant velocity universal joint and said outboard constant velocity universal joint adapted to translate torque therebetween along a drive axis and coupling both the lateral thrust load and a driving torque, said inboard and said outboard constant velocity universal joints each having a respective inboard and outboard joint articulation point intersected by said drive axis and, respectively, by said differential output axis and said wheel axis, said inboard and said outboard joint articulation points establishing a swing arm length therebetween, said inboard joint articulation point being located along said differential output axis at an inboard joint offset from said differential input axis and establishing a first pivot bearing, and said outboard joint articuclatio point being located in a predetermined position along said wheel axis at an outboard joint offset relative to said vertical center plane; and

arm means coupling said wheel assembly and said chassis to define a swing axis and having arm pivot means establishing a second pivot bearing for said swing axis therethrough, said arm pivot means adapted to allow a move-

ment of said wheel assembly relative to said vehicle support means about said swing axis, and said arm pivot means being located on said vehicle support means so that said swing axis and said drive axis establish a predetermined drive-to-swing axis angle therebetween and so that said swing axis and said wheel axis establish a predetermined wheel-to-swing axis offset angle therebetween;

whereby, said swing arm length is maximized thereby minimizing the change of camber so as to produce predetermined vehicle driving, steering, and handling characteristics.

4,632,204

POWER ASSISTED STEERING SYSTEM

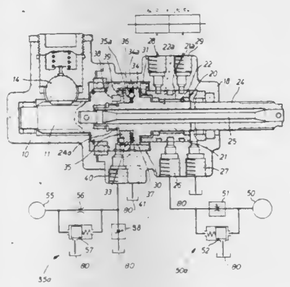
Susumu Honaga; Mikio Suzuki; Yoshiharu Inaguma, all of Kariya; Hiroki Sato, Toyota; Kenichi Kikuchi, Toyota, and Masato Tanabe, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1985, Ser. No. 747,921

Claims priority, application Japan, Jun. 29, 1984, 59-137586

Int. Cl.⁴ B62D *5/08*

U.S. Cl. 180—142 **6 Claims**



1. A power assisted steering system for an automotive vehicle having a primary hydraulic pump assembly driven by a prime mover of the vehicle for supply of fluid under pressure, a secondary hydraulic pump assembly for supply of fluid under pressure in proportion to the vehicle speed, a hydraulic power cylinder operatively connected to the steerable road wheels of the vehicle, a servo valve assembly including an input member operatively connected to the steering wheel of the vehicle, an output member operatively connected to said power cylinder, valve means for controlling the supply of fluid under pressure from said primary hydraulic pump assembly to said power cylinder in response to relative rotation between said input and output members, and a reaction mechanism associated with said servo valve assembly and connected to said secondary hydraulic pump assembly to effect a resistance to relative rotation between said input and output members in accordance with a hydraulic pressure applied thereto from said secondary hydraulic pump assembly,

wherein said secondary hydraulic pump assembly is unitedly assembled with said primary hydraulic pump assembly to be driven by the prime mover of the vehicle and comprises first control valve means for controlling the quantity of fluid applied to said reaction mechanism from said secondary hydraulic pump assembly in a constant amount, and second control valve means for controlling the pressure of fluid controlled by said first control valve means in accordance with the vehicle speed.

4,632,205

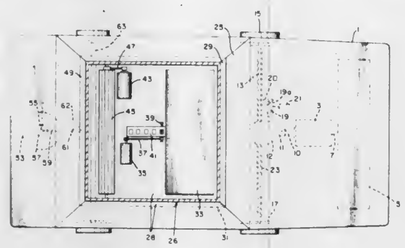
COMBINED GENERATOR AND BRAKE SYSTEM FOR LAND VEHICLES

Mike W. Lewis, P.O. Box 65, Stephenville, Tex. 76401

Filed Sep. 13, 1983, Ser. No. 531,712

Int. Cl.⁴ B60K *9/00*

U.S. Cl. 180—165 **3 Claims**



1. A combined generator and brake system for use with land vehicles comprising:

means for defining an air channel extending from the front to the rear of the vehicle;

door means for closing an inlet end of the air channel so as to minimize air resistance of the vehicle, said door means having an inlet door at an opening at the inlet of said air channel end;

a movable plate positioned for movement through the opening to said air channel;

means for opening said door means and for moving said movable plate from a retracted position to an extended position, said movable plate in the extended position exerting a braking force on the vehicle and directing air into the inlet end of the air channel; and

generator means associated with said air channel for generating electricity from the movement of air through said air channel.

4,632,206

WATER-COOLED ENGINE COOLER FOR VEHICLE

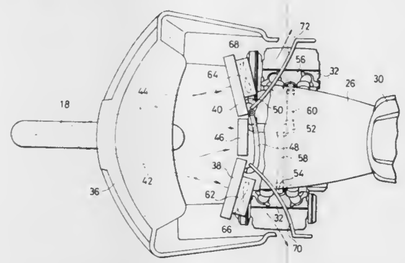
Shigehisa Morinaka, Kawagoe, and Katsusuke Komuro, Chofu, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,982

Claims priority, application Japan, Aug. 24, 1984, 59-128428[U]

Int. Cl.⁴ B60K *11/04*

U.S. Cl. 180—229 **4 Claims**



1. A water-cooled engine cooler of the divided type for a vehicle having a saddle-type seat, comprising two radiators provided on the opposite sides the centerline of a vehicle between a front wheel and a water-cooled engine, said two radiators having respective axes extending at right angles to their front surfaces, which axes intersect at a position forward of the radiators, and a pair of guides, each of which is disposed rearwardly of one of said radiators and projecting outwardly obliquely to the centerline of the vehicle for leading air discharged through said radiators toward the sides of the vehicle.

4,632,207

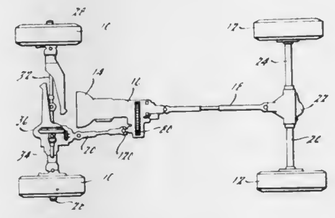
MECHANISM TO ENGAGE PART TIME DRIVE SYSTEM IN A MOVING VEHICLE

Thomas S. Moore, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 539,203, Oct. 5, 1983. This application Sep. 5, 1985, Ser. No. 772,816

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—247 **10 Claims**



1. A drive system for a vehicle having a first and a second set of wheels comprising:

an engine;

a transmission connected to the engine adapted to produce a range of drive ratios;

a rotatably mounted driving member having a first clutch surface connected to the transmission output and continuously driveably connected to the first set of wheels;

a rotatably mounted driven member having a second clutch surface;

lockup means moveable to an engagement position where the driving member and driven member are driveably connectable and moveable to a disengagement position where said connection is released, said connection being made when the speeds of the driving member and driven member so permit, including a hub on which a third clutch surface is formed continuously engaged with either the first clutch surface or the second clutch surface and adapted to engage selectively either the second clutch surface or the first clutch surface with which the hub is not continuously engaged, a collar, stop means fixed to the collar for moving the collar and hub as a unit away from the engagement position and for permitting movement of the hub relative to the collar in the engagement position, and spring means for resiliently urging the hub toward the stop means and for resiliently urging the third clutch surface into engagement with either the second clutch surface or the first clutch surface with which the hub is not continuously engaged;

actuating means for moving the lockup means collar to the engagement position and to the disengagement position;

means for accelerating the driven member toward the speed of the driving member and within a range of speed that permits the lockup means to connect the driving member and the driven member;

means for driveably connecting the driven member to the second set of wheels; and

means for driveably disconnecting the driven member and the second set of wheels.

4,632,208

VEHICLE BRAKING SYSTEM

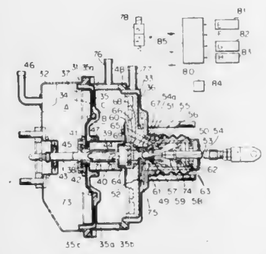
Toshio Takayama, Kanagawa; Hiromi Ando, Tokyo, and Yukio Matsumoto, Kanagawa, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 18, 1984, Ser. No. 683,196

Claims priority, application Japan, Dec. 20, 1983, 58-195547[U]; Dec. 20, 1983, 58-195550[U]

Int. Cl.⁴ B60T *7/12*

U.S. Cl. 180—271 **9 Claims**



1. A vehicle braking system comprising:

at least one wheel brake;

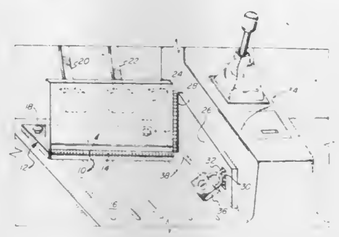
a master cylinder for generating hydraulic pressure;

a pipe line connecting said master cylinder to said at least one wheel brake;

a tandem type pneumatic booster including a hollow main body, a front flexible diaphragm disposed in said main body, a front power piston secured to said front flexible diaphragm and forming a front vacuum chamber and a front pressure chamber, an output shaft connected to said front power piston and adapted to actuate said master cylinder, a partition wall in said main body separating said front pressure chamber from a rear vacuum chamber, means for maintaining fluid communication between said front vacuum chamber and said rear vacuum chamber, a rear diaphragm disposed in said main body, a rear power piston secured to said rear diaphragm and separating said rear vacuum chamber from a rear pressure chamber, means attached to said rear power piston for selectively communicating said rear pressure chamber with said rear vacuum chamber and a source of air at atmospheric pressure, and an input rod connected to said rear power piston; and

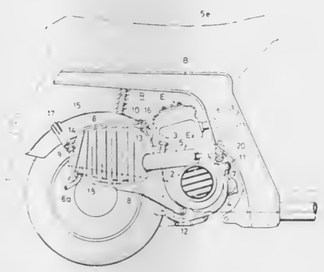
selector valve means for intercepting communication between said front pressure chamber and said rear pressure chamber, said selector valve means including tubing connected between said front pressure chamber and said rear pressure chamber, a selector valve disposed in said tubing, at least one sensor selected from the group consisting of a vehicle speed sensor, a gas pedal sensor, a seat belt attachment sensor and a steering wheel touch sensor, said at least one sensor for sensing an operating condition of a vehicle and a controller, connected to said selector valve and said at least one sensor, for actuating said selector valve in response to a predetermined operating condition of the vehicle, said selector valve when in the non-actuated condition permitting air flow between said front pressure chamber and said rear pressure chamber and when in the actuated condition preventing air flow from said front pressure chamber to said rear pressure chamber but permitting air flow at atmospheric pressure from said rear pressure chamber to said front pressure chamber.

4,632,209
ANTI-THEFT DEVICE FOR AUTOMOBILES
Theodore C. Russell, 30 Coleman Rd., West Haven, Conn. 06516
Filed Sep. 3, 1985, Ser. No. 772,173
Int. Cl.[4] B60R *25/00*; B62H *5/00*
U.S. Cl. 180—287 **11 Claims**



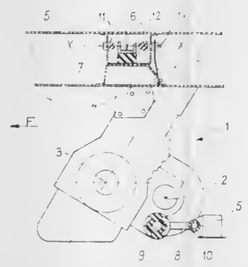
1. An anti-theft locking device for immobilizing the foot pedal assembly normally necessary for operation of an automobile, said device comprising in combination:
a first rigid plate hingably attached to the floor of the automobile adjacent the foot pedal assembly and adapted to be raised from a stored position abutting said floor to an upwardly inclined immobilizing position in contact with said foot pedal assembly;
a second rigid plate hingably attached to said first rigid plate and adapted to be folded under said first rigid plate in the stored position of the latter and to be moved to a position in which to brace said first rigid plate securely in position when the latter is in the immobilizing position; and
locking means adapted to secure said second rigid plate in the brace position when said device is activated to immobilize said foot pedal assembly.

4,632,210
ENGINE EXHAUST SYSTEM AND SUPPORTING APPARATUS FOR TWO-WHEELED/THREE WHEELED VEHICLE
Hitoshi Yamamoto; Masayoshi Baba, and Eiichi Iwao, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 4, 1983, Ser. No. 455,458
Claims priority, application Japan, Jan. 8, 1982, 57-1474
Int. Cl.[4] B62K *11/04*
U.S. Cl. 180—309 **7 Claims**



1. In a wheeled vehicle including an engine mounted to a frame of the vehicle, an engine exhaust port disposed at a rearward portion of the engine, and circular cooling means mounted to the engine forward of the exhaust port, an exhaust system comprising:
a muffler mounted rearwardly of the engine; and
an exhaust pipe having one end connected to the exhaust port and another, opposite end coupled to a muffler inlet, wherein the exhaust pipe is disposed proximate to the cooling means and is curved to extend around at least 240° of an outer periphery of the cooling means, such that air currents circulated by the cooling means cool the exhaust pipe efficiently.

4,632,211
ANTI-TILT DEVICE FOR A MOTOR-DRIVE UNIT OF A MOTOR VEHICLE
Robert Le Salver, Chanteloup les Vignes, and Dominique Poupard, Chaville, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly-sur-Seine, both of, France
Filed Oct. 24, 1983, Ser. No. 544,714
Claims priority, application France, Oct. 27, 1982, 82 17988; Apr. 1, 1983, 83 05455
Int. Cl.[4] B62D *21/00*
U.S. Cl. 180—312 **7 Claims**

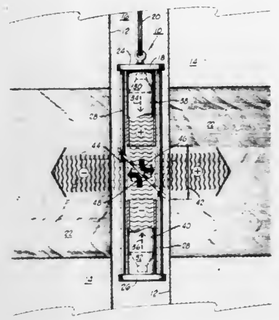


1. An anti-tilt device for a motor-drive unit which has an axis of rotation and pertains to a motor vehicle which has a structure, on which structure the unit is elastically suspended, said device comprising a forward speed abutment of low flexibility and a reverse speed abutment of low flexibility one of said abutments being fixed relative to said structure, cach abutment being interposed, in a direction perpendicular to said axis of rotation, between two bearing elements one of which bearing elements is connected to a first support which is part of the motor-drive unit whereas the other bearing element is connected to a second support which is part of said structure, one of the bearing elements of at least one of the abutments being mounted to be movable relative to its support and being maintained spaced from its support by a predetermined distance in a direction perpendicular to said axis of rotation, by means of a pre-stressed elastically yieldable means of high flexibility having one end connected to the support relative to which said at least one bearing element is movably mounted, the highly flexible prestressed elastically yieldable means being operable when the device experiences displacements smaller than the predetermined distance, the low flexiblity abutment being operable when the device experience displacements greater than the predetermined distance.

4,632,212
APPARATUS FOR GENERATING SEISMIC VIBRATION ENERGY IN A BOREHOLE
William M. Benzing, Oklahoma City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Oct. 20, 1982, Ser. No. 435,414
Int. Cl.[4] G01V *1/40*
U.S. Cl. 181—106 **8 Claims**

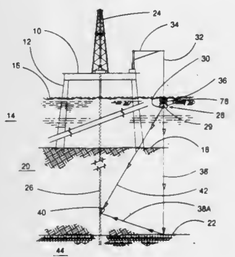
1. A signal generating apparatus for use in fluid-filled boreholes, comprising:
a frame for suspension in said borehole;
a tube having first and second ends and disposed in said frame a first acoustic energy source mounted in said first end to direct energy to a central point;

a second acoustic energy source mounted in said second end to direct energy to said central point;
an energy deflector plate disposed at 45 degrees to and along



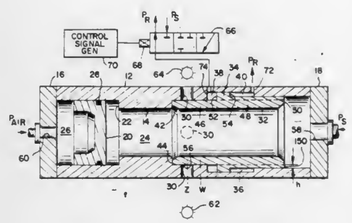
the axis of said tube central point at an equal angle to each of said and
means for energizing said first and second acoustic energy sources.

4,632,213
SEISMIC SOURCE SYSTEM FOR USE IN WATER COVERED AREA
Samuel N. Domenico, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.
Filed Feb. 28, 1983, Ser. No. 470,665
Int. Cl.[4] G01V *1/40, 1/04, 1/38*; H04R *1/02*
U.S. Cl. 181—106 **2 Claims**



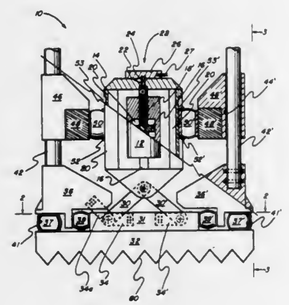
1. An apparatus for reflecting acoustic wave energy in water in phase in a downwardly directed beam and for attenuating upwardly and horizontally traveling acoustic wave energy from an acoustic wave energy source suspended in the water wherein seismic sensor means are supported in a wellbore in the vicinity of the acoustic wave energy source comprising:
gas releasing means for releasing gas into said water and for forming a body of water containing rising gas bubbles above and laterally around the acoustic wave energy source, wherein the gas releasing means comprises a plurality of coaxial horizontal circular pipes arranged vertically with spaces between adjacent pipes, in the shape of a paraboloid, with its vertical axis through the position of the acoustic wave energy source and being concaved downwardly, each of said pipes having a plurality of perforations; and
means to supply said pipes with pressurized gas.

4,632,214
SEISMIC SOURCE FOR USE UNDERWATER
John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics, Rochester, N.Y.
Filed Mar. 13, 1980, Ser. No. 129,871
Int. Cl.[4] G01V *1/137, 1/38*
U.S. Cl. 181—120 **14 Claims**



1. A source of seismic pulse signals which injects free liquid columns into an underwater environment to generate vapor cavities, the collapse of which produces the seismic pulses, said source comprising a housing having an internal chamber, means for storing energy due to the force of pressurized liquid in said chamber, at least one jet forming aperture in said housing through which pressurized liquid can be released to form said free liquid column, a valve member disposed in porting relationship with said aperture, and means for moving said valve member to open said aperture to initiate the liquid column and to close said aperture to terminate said liquid column while maintaining said aperture open for a time duration which is long compared to said duration of said seismic pulse at half the maximum amplitude thereof.

4,632,215
DUAL-MODE HYDRAULIC VIBRATOR
Richard C. Farris, Dickinson, Tex., assignor to Litton Resources Systems, Inc., Alvin, Tex.
Filed Apr. 20, 1984, Ser. No. 602,559
Int. Cl.[4] G01V *1/047, 1/133*
U.S. Cl. 181—114 **4 Claims**



1. A dual-mode vibrator assembly mounted on a support vehicle, for alternatively generating P waves or S waves in the earth, said vibrator assembly having a shaker assembly disposed above a base plate, means for compliantly coupling said base plate to a plurality of columns and a lifting-jack means for raising and lowering said base plate relative to said support vehicle, comprising:
a rigid member interconnecting said plurality of columns and said lifting jack means to said means for compliantly coupling said base plate; and
linkage means for coupling said shaker assembly to said base

plate in a first configuration to generate P waves, and for coupling said shaker assembly to said base plate and to said rigid member in a second configuration to generate S waves;

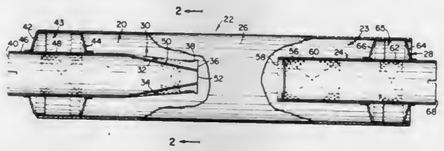
said linkage means including a first and a second linkage-bar set, each set having a first and a second linkage bar and each linkage bar having a first and a second end, said first end of said first and second linkage bar in each set coupled to said shaker assembly; and

said linkage means further including a strap for coupling said second end of said first and second linkage bar in each set to said base plate in said first configuration for generating P waves, and on the alternative, for coupling said second end of said first linkage bar in each set to said base plate and for coupling said second end of said second linkage bar in each set to said rigid member in said second configuration for generating S waves.

4,632,216
MUFFLER APPARATUS AND METHOD FOR MAKING SAME

Wayne M. Wagner; Timothy A. Bethke, both of Apple Valley, and Steven D. Schmeichel, Inver Grove Heights, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jun. 27, 1984, Ser. No. 624,935
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—255 **8 Claims**



1. A muffler, comprising:

a housing having an endlessly curving wall, said housing also having opposite end baffles and first and second intermediate baffles attached to said wall, said wall and said intermediate baffles forming an expansion chamber;

an inlet tube attached to one of said end baffles and said first intermediate baffle, said inlet tube having inlet and outlet ends, said inlet tube including a closure at the outlet end and means upstream from the outlet end for communicating gaseous fluid to said expansion chamber; and

an outlet tube attached to one of said end baffles and said second intermediate baffle, said outlet tube having inlet and outlet ends, said inlet end including shape means for increasing sound attenuation of gaseous fluids entering said outlet tube and reducing volume occupied by said outlet tube thereby increasing expansion chamber volume to further enhance sound attenuation within said expansion chamber, said shape means of said outlet tube including a plurality of connected, partial ovals proceeding from a circular cross-sectional shape near said outlet end along a constricted portion to a throat cross-sectional area which connects with a flared portion leading to the inlet end of said outlet tube.

4,632,217
AUTOMATICALLY ADJUSTABLE CLIMBING HARNESS

John H. Markwell, P.O. Box 53, Seneca Rocks, W. Va. 26884, and Kyle Isenhart, Rt. 2, Box RS1, Little Hocking, Ohio 45742

Filed Mar. 25, 1985, Ser. No. 715,370
Int. Cl.[4] A62B *35/00*
U.S. Cl. 182—3 **7 Claims**

1. A climbing seat harness constructed from a single length of woven fabric webbing having plural transverse slots defined therein, said harness comprising

a pair of leg loops, each formed by passing a respective end of the webbing freely through one of its own slots, whereby each loop is readily adjustable by pulling on the respective end, and

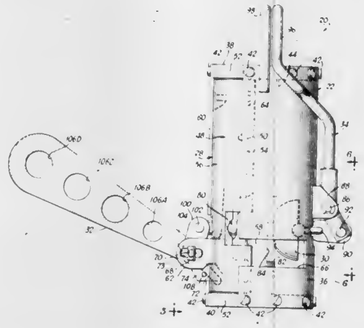


a load-supporting central web segment at the front portion of the harness interconnecting the webbing slots forming the leg loops, whereby application of load to said segment transfers force to the legs without constricting the leg loops.

4,632,218
SLIDING DESCENT DEVICE

Randy R. Hannan, 5137 S. Whipple, Chicago, Ill. 60632, and Timothy E. Mulcahy, 2650 W. 85th St., Chicago, Ill. 60652

Filed Sep. 20, 1985, Ser. No. 778,397
Int. Cl.[4] A62B *1/16, 35/00*
U.S. Cl. 182—5 **11 Claims**



1. A sliding descent device for controlling movement down a rope comprising:

a housing;

a rope receiving channel within said housing and defining an axial rope path extending axially through said housing;

said housing including a generally cylindrical side wall, said channel being defined within a tubular member supported coaxially within said side wall,

a brake member movable with respect to said housing and into said channel for applying a braking force to a rope in said axial path;

a lateral rope entry path extending radially through said side wall and tubular member throughout the axial extent of said housing from said channel to the exterior of said housing and permitting a medial rope segment to move radially relative to said housing from the exterior of said housing into said axial path; and

a closure structure mounted for movement with respect to said housing between a closed position wherein said lateral entry path is blocked and an open position wherein said laterial entry path is unobstructed;

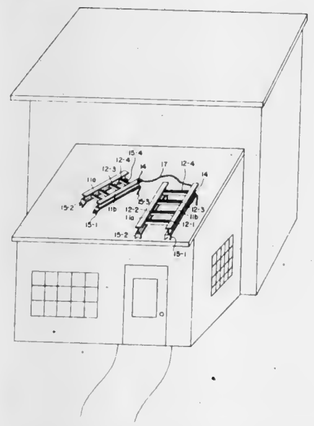
said closure structure including a tube segment coaxial with

and in telescoped rotational relationship with said tubular member and including a cylindrical segment coaxial with and in telescoped rotational relationship with said side wall;

4,632,219
ROOF LADDER

Paul H. Rayer, P.O. Box 4866, Woodland Park, Colo. 80866

Filed Aug. 12, 1985, Ser. No. 765,071
Int. Cl.[4] E06C *5/36, 1/36*
U.S. Cl. 182—45 **3 Claims**



1. A roof ladder having parallel spaced apart rails connected by a plurality of rungs spaced apart and running transversely between said rails;

said ladder provided with pointed members which can protrude from one face of said ladder to engage a sloping surface;

said ladder also provided with means for attaching a rope, chain, or cable; and

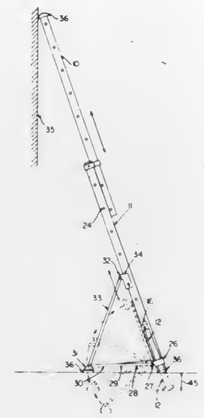
each of said rungs provided with first and second surfaces for supporting a user, said first surface oriented to be horizontal when said ladder is at a steep inclination angle and said second surface oriented to be horizontal when said ladder is at a shallow inclination angle.

4,632,220
SAFETY LADDER

John E. Murrell, 32 Wakehurst Parkway, Seaforth, N.S.W. 2092, Australia

Filed Oct. 15, 1985, Ser. No. 787,360
Int. Cl.[4] E06C *7/42, 1/16*
U.S. Cl. 182—111 **4 Claims**

1. A safety ladder of extended length comprising two parallel stiles providing the sides of the ladder and which are liable to bow under load; spaced parallel rungs extending between the stiles; foldable outriggers associated with the lower end-portions of respective stiles; upper and lower hinged-together spars providing each of said outriggers; two pivots providing parallel horizontal pivotal axes connecting the free ends of the upper and lower spars of each outrigger respectively to upper and lower connections provided on the associated stiles, said pivots constraining movement of the associated outrigger to a single vertical plane which makes an acute angle with the plane containing the stiles while allowing the outrigger to be moved from a folded position at which it lies against the associated stile to an operating position at which it extends forwardly from the plane of the stiles to provide an additional ground support for the ladder; a clamp on said upper connection releasable to allow the connection to be slid to different positions along the stile when the outrigger is being moved between its two positions and tightenable to clamp the connection to the stile at any chosen position; and an adjustable flexible but inextensible stabilizing connection extending from the outer

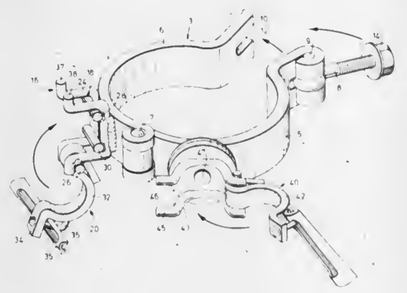


end of each outrigger to a position displaced from the associated stile and at the lower end of the ladder to prevent "walking" movement of the lower end of the stiles of the ladder away from the wall when a workman is ascending the ladder.

4,632,221
BRACING CLAMP FOR SHORING STRUCTURES

Joseph S. Stanford, 2300 Finch Ave. West, Unit 41, Weston, Ontario M9M 2Y3, Canada

Filed Jun. 18, 1984, Ser. No. 621,550
Int. Cl.[4] E04G *1/16;* **F16B** *7/00*
U.S. Cl. 182—179 **10 Claims**



1. Connector for shoring structures and the like, comprising:

a first band, arranged in two parts which are pivotedly connected to be movable to allow the band to be fitted onto and around a vertical column;

a first means for tightening the two parts of the first band together so that the band grips the column;

a second band, secured to the first band, and arranged in two parts that are movable to allow the second band to be fitted onto and around a first brace of smaller section than the column;

a second means for tightening the two parts of the second band together so that the second band grips the first brace independently of the means for tightening the first band;

a third band, secured to the first band independently of the second band, and arranged in two parts that are movable to allow the third band to be fitted onto and around a further brace of smaller section than the column; and

a third means for tightening the two parts of the third band together so that the third band grips the further brace, independently of the first means for tightening the first band, and independently of the second means for tightening the second band;

said second and third bands are positioned on opposite sides of the pivotal connection

wherein said second band is spaced, in the circumferential sense relative to the column, at right angles to the said third band;

wherein said second and third bands are each at substantially the same height, relative to said first band;

and wherein the axis of the column and the axis of said first brace are spaced slightly apart from each other at right angles to each other when viewed from above, and wherein the axis of the column and the axis of said further brace are space slightly apart from each other at right angles to each other when viewed from above;

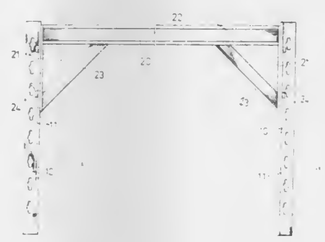
whereby said column and said first and further braces may be placed with their respective axes all mutually perpendicular one to another, when viewed from above along the axis of said column, and said axes substantially intersect one another at said connector.

4,632,222

SCAFFOLD WITH LOCKING MEANS

Eugene Chen, No. 41, Sanshe Rd., ShenKang Hsiang, Taichung, Taiwan

Filed Jan. 23, 1986, Ser. No. 821,603
Int. Cl.[4] E04G *1/08, 1/20;* **A47F** *5/00*
U.S. Cl. 182—179 **5 Claims**



1. A scaffold comprising:

vertical strut means with L-shaped cross-section having attachment holes provided at intervals along its length, each of said attachment holes being of an oblong shape with an expanded circular mid-portion;

shelf support means including horizontal bar means with L-shaped cross-section to be disposed transversely between said vertical strut means, vertical mounting pieces with L-shaped cross-section supporting the ends of said horizontal bar means and adapted to be attached to and abut with said vertical strut means, and inclined brace means connected to said vertical mounting pieces and said horizontal bar means, said vertical mounting pieces having mounting hook means to engage in said attachment holes of said vertical strut means;

shelf means to be disposed on said shelf support means; and

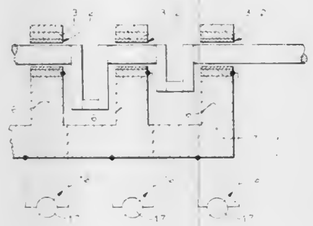
an improvement having a locking means which includes a bracket member fixed to said vertical mounting piece and having a face opposing said vertical mounting piece, and a bent spring plate to be held releaseably between said face and said vertical mounting piece, said spring plate having a first end bearing against said said vertical mounting piece and a second end bearing against said face, said first end having a first protrusion adapted to be projected and fitted snugly in said expanded circular mid-portion of one of said attachment holes when said vertical mounting piece is placed to abut with said vertical strut means in assembly, wherein said vertical mounting piece is provided with a first opening through which said first protrusion will projects into said expanded circular mid-portion of said attachment hole.

4,632,223

METHOD AND DEVICE FOR MONITORING LUBRICATION POINTS IN BEARINGS

Otto Maurer, Wörth, and Werner Schaller, Blieskastel, both of Fed. Rep. of Germany, assignors to Schaller-Automation Industrielle Automationstechnik KG, Blieskastel, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,951
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338420
Int. Cl.[4] F01M *1/18, 11/10*
U.S. Cl. 184—6.1 **4 Claims**



1. A device for monitoring a lubrication film at contact spots between a rotary shaft of one electrically conductive material and a sleeve bearing of another electrically conductive material and insulated from said shaft by the lubrication film, comprising an electric circuit including a wiper contact connected to said shaft, said lubrication film, said sleeve bearing, a bearing housing and an outer connection lead connected to said wiper so as to close said electric circuit; said bearing sleeve having two bearing shells, said rotary shaft forming with said bearing shells a junction of a thermo-electric element which, upon occurrence of a break in said lubrication film at said contact spots, generates by friction heat, occurring between said shaft and said sleeve, a thermoelectric voltage differential which causes a signal current in said electric circuit, said current being used as an alarm or shut-down signal, said electric circuit further including a low-impedance resistance connected in said outer connection lead, a resistance value of said resistance being substantially smaller than that of an electric contact resistance between said shaft and said bearing sleeve at a contact spot of the lubrication film.

4,632,224

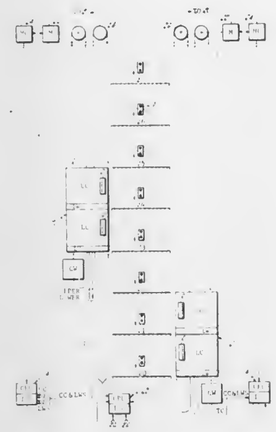
MULTICOMPARTMENT ELEVATOR CALL ASSIGNING

Frederick H. Nowak, Southington, and John C. Luce, Milford, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 12, 1985, Ser. No. 722,953
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—29 R **4 Claims**

1. An elevator comprising a plurality of double-deck cars servicing a plurality of landings in a building; drive means associated with each car; hall call means and car call means in each deck for registering call; group processing means for controlling operation of the drive means; car position means for indicating to the group processing means the position of each car; and means providing to the group processing means a signal indicating the load in each deck; characterized in that said group processing means comprises:

signal processing means for providing a first signal that manifests the summation of various response factors for each car if each of the decks were assigned a hall call made on the hall call means, each factor representing a deck's ability to service the hall call under a condition based upon the current operating condition of the car to which the deck is attached; for providing a second signal assigning an additional response factor to the lagging deck of the car with the most favorable summation of response



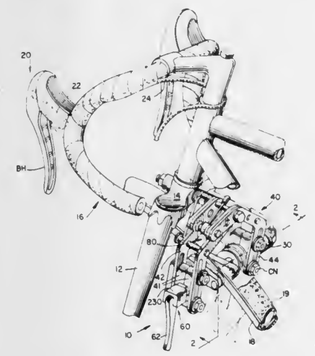
factors; for providing a third signal which manifests the sum of various response factors for each deck on said car based on the current operating condition of the decks; for providing a fourth signal for selecting for the call assignment the deck on said car with the most favorable summation of response factors.

4,632,225

BRAKE DEVICE FOR BICYCLES

William R. Mathauser, 3000 "B" Ave., Anacortes, Wash. 98221

Filed May 8, 1985, Ser. No. 731,737
Int. Cl.[4] B62L *1/14*
U.S. Cl. 188—24.18 **19 Claims**



1. A brake device for bicycles comprising:

a pair of brake pads for braking engagement with a bicycle wheel;

yoke means pivotally mounted from the frame of the bicycle for operatively holding said brake pads;

release means for permitting said yoke means to open wider than normal;

parking brake means connected to one of said brake pads for permitting locking of the brake structure when the bicycle is stopped and/or unattended;

said release means including an off-center cam structure for effecting said opening of said yoke means wider than normal; and

said off-center cam structure being mounted between pairs of said yoke means so that when said cam structure is in one extended position the yoke means are opened wider than normal.

4,632,226

ANTI-FALLING DEVICE WITH RAPID INTRODUCTION AND WITHDRAWAL OF THE CORD IN ANY POSITION OF THIS LATTER

Albert Koch, "Doux Sejour", 67860 Lutzelhouse, France

Filed Jan. 28, 1985, Ser. No. 695,371
Claims priority, application France, Jan. 26, 1984, 84 01349
Int. Cl.[4] A62B *1/14;* **A63B** *27/00*
U.S. Cl. 188—65.1 **5 Claims**



1. In an anti-falling device adapted for rapid insertion and withdrawal of a retaining cord, comprising a case (**1**), a lockable cover means (**6**) on the case, a blocking mechanism (**2**) within the case which coacts with a retaining cord (**3**) selectively to block or release the cord, and means (**4**) for joining the case (**1**) to a security member; the improvement comprising lugs (**9**) on one side of the cover means (**6**), hinges (**8**) on a side of the cover means opposite the lugs (**9**), recesses (**10**) in a wall of the case (**1**), the cover means (**6**) being slidably mounted on said hinges (**8**) to move between a first position in which the lugs (**9**) register with the recesses (**10**) allowing the cover to open and a second position in which the lugs are out of registry with the recesses, two locks (**11**) for releasably maintaining the cover means in said second position thereby to maintain the cover means closed, said two locks being releasable sequentially upon sliding movement of the cover means from said second position toward said first position, and means for holding said locks, when released, open during movement of said cover means toward said first position such that one said lock (**11**) must be released and held open by the last-named means prior to the time that the other said lock is released and held open by the last-named means.

4,632,227

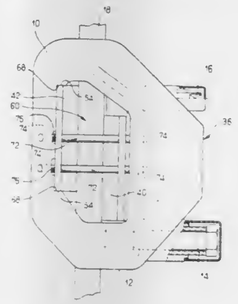
PAD AND TORQUE SUPPORT ASSEMBLY FOR DISC BRAKE

Jean-Claude Méry, Pavillons-sous-Bois; Jean-Paul Sauvée, Aubervilliers, and Alain Thioux, Chennevieres, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Dec. 7, 1984, Ser. No. 679,176
Claims priority, application France, Dec. 15, 1983, 83 20093
Int. Cl.[4] F16D *65/06*
U.S. Cl. 188—73.32 **4 Claims**

1. A friction pad and torque support assembly for a disc brake, comprising axially inner and outer friction pads, a caliper sliding on a fixed support member by means of at least one axial pillar disposed parallel to an axis of the disc, a brake actuator acting directly upon the inner friction pad, and the friction pads being circumferentially offset relative to a radial

plane passing through an axis of the brake actuator, characterized in that the inner and outer friction pads are identically shaped, each of said friction pads having two radially spaced-apart and coplanar pairs of surfaces for anchoring and sliding engagement by the respective pad, the coplanar pairs of surfaces disposed symmetrically with respect to a middle axis of the respective friction pad, only one pair of said radially spaced-apart and coplanar pairs of surfaces of each friction pad being in anchoring and sliding engagement, the two radially spaced-apart pairs of surfaces comprising a first pair of radially outer surfaces and a second pair of radially inner surfaces, only the second pair of radially inner surfaces of the inner friction pad in anchoring and sliding engagement with a pair of com-



plementary-shaped inner radial surfaces on said support member, only the first pair of radially outer surfaces of the outer friction pad in anchoring and sliding engagement with a pair of complementary-shaped outer radial surfaces on said caliper, the identically shaped friction pads being interchangeably mountable on the support member and caliper without the possibility of incorrect mounting thereof, and further comprising retaining means formed by at least one rod disposed radially outwardly of said disc and supported by the caliper, the friction pads each having at least two openings therethrough and the rod extending through aligned but different ones, relative to the respective two openings, of the openings of the circumferentially offset friction pads.

4,632,228

CYLINDER PISTON DEVICE

Wilhelm Oster, Eitelborn, and Horst Eisenhauer, Laudert, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,976

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419364

Int. Cl.[4] **F16F** *9/50*

U.S. Cl. 188—282 **5 Claims**

1. A cylinder piston device comprising:

a cylinder member (**1**) having an axis, a cylindrical wall (**1***a*) about said axis, and two end walls (**1***c*, **1***d*), a cavity (**6**, **7**) being defined within said cylinder member (**1**);

a piston rod member (**4**) extending through at least one (**1***c*) of said end walls along said axis and being sealingly guided for axial movement through a guiding and sealing unit (**12**) adjacent said one wall (**1***c*),

a piston unit (**3**) connected to said piston rod member (**4**) within said cavity (**6**, **7**) and sealingly guided on an inner cylindrical face (**1***b*) of said cyulindrical wall (**1***a*), said piston unit (**3**) defining two working chambers (**6** and **7**) within said cavity (**6**, **7**);

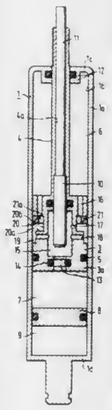
a passage system in said piston unit (**3**) interconnecting said working chambers (**6** and **7**), said passage system including in series arrangement a first passage system section (**20**, **19**, **17**, **18**) and a second passage system section (**13**), said first passage system section (**20**, **19**, **17**, **18**) having a flow cross-sectional area variable in response to the direction of axial movement of said piston rod member (**4**), said second passage system section (**13**) being closeable by a closure member (**10**) controlled from outside said cylinder piston unit;

a body of pressurized fluid within said cavity (**6**,**7**) in both said working chambers (**6** and **7**);

said first passage system section (**20**, **19**, **17**, **18**) comprising within a piston member (**3***a*) of said piston unit two separate channel systems (**17**, **18**) in parallel, namely a first channel system (**20**, **17**) and a second channel system (**19**, **18**);

a throttling valve member (**21**) being associated with said second channel system (**19**, **18**) for opening and closing said second channel system (**19**, **18**) in response to the direction of axial movement of said piston rod member (**4**);

said throttling valve member being annular and housed in an annular throttling member receiving groove (**20**) of said piston unit (**3**) and being axially movable within said annular throttling member receiving groove in response to the direction of axial movement of said piston rod member (**4**);



the second channel system (**19**, **18**) having one end opening into one end face (**20***a*) of said annular throttling member receiving groove, said one end of said second channel system (**19**, **18**) being closeable by said annular throttling valve member (**21**) and said second channel system (**19**, **18**) comprising both an interconnecting groove (**19**) in said piston unit (**3**) radially open towards said cylinder wall (**1***a*) and opening into said one end face (**20***a*) of said annular throttling member receiving groove and at least one first radial channel (**18**) extending from said interconnecting groove (**19**) radially inward of said piston unit (**3**);

and the first channel system (**20**, **17**) comprising at least one first radial channel (**17**) extending from said throttling member receiving groove (**20**) in a radial direction within said piston unit axially spaced from said radial channel (**18**) of the second channel system;

and said throttling member receiving groove (**20**) having an annular surface (**20***b*) opposed to a radially inner circumferential face (**21***a*) of said annular throttling valve member (**21**), the diameter of said annular surface (**20***b*) being smaller than the diameter of said inner circumferential face (**21***a*) of said annular throttling valve member (**21**).

4,632,229

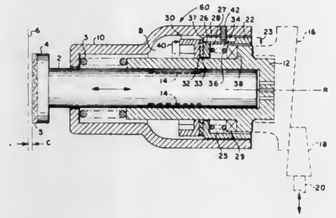
AUTOMATIC BRAKE SLACK ADJUSTER

Charles W. Kleinhagen, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 23, 1985, Ser. No. 790,676

Int. Cl.[4] **F16D** *65/56*

U.S. Cl. 188—196 D **9 Claims**



1. An automatic slack adjuster for maintaining a substantially constant clearance between a rotatable braking surface and a braking member of a brake assembly in a brake released condition, said assembly of the type including an elongate thrust member having a longitudinal axis and moveable axially in opposite directions within a housing chamber and operative to move the braking member against and away from the braking surface upon respective application and release of the brake by an operator, said thrust member having at least a portion of an outer surface thereof threadingly engaged with threads of an adjustment nut disposed coaxially thereabout that is adapted upon rotation to advance the thrust member in a direction and for a distance necessary to maintain the desired clearance between the braking member and the braking surface in the brake released condition, and said slack adjuster comprising:

a drive member having a rotational axis disposed within the housing coaxially about the adjusting nut and both rotatable and moveable axially with respect thereto, said drive member having torque transmitting means and at least one helical groove extending axially along a surface thereof facing towards the housing at a preselected inclination angle from the rotational axis thereof,

a reaction member disposed coaxially about the adjusting nut in spaced-apart relationship to the drive member, said reaction member having torque receiving means facing towards the drive member torque transmitting means and secured to the adjustment nut by engagement means adapted to prevent axial movement with respect thereto in addition to an ability to rotate the adjustment nut at least in a direction causing the thrust member to maintain the desired clearance between the braking member and the braking surface upon application of the brake by an operator,

means for biasing the drive member axially toward the reaction member and maintaining a constant engaged relationship between the drive member torque transmitting means and reaction member torque receiving means and providing a preselected substantially constant biasing force therebetween,

a drive pin member extending from the housing into the drive member groove and adapted to be impinged upon by a wall of the groove upon axial movement of the drive member upon application of the brake by the operator and impart a rotational torque thereto that is a function of the groove inclination angle and causes the drive member to rotate in a direction enabling the thrust member to advance to maintain the desired clearance between the braking member and the braking surface in addition to an axial force thereagainst in a direction opposite to the direction of the biasing force that is proportional to the rotational torque and to be impinged upon by an opposite wall thereof upon opposite axial movement of the drive member upon release of the brake by the operator and impart a counter-rotational torque thereto that is a function of the groove inclination angle and causes the drive member to rotate in an opposite direction in addition to an axial force thereagainst in the direction of the biasing force that is proportional to the counter-rotational torque,

and said biasing force and said helical groove inclination angle selected such that the biasing force is sufficiently greater than the opposite axial force upon application of the brake by the operator to provide a net axial force of the drive member torque transmitting means against the reaction member torque receiving means sufficient to enable the rotational torque of the drive member to be transmitted to the reaction member and cause the reaction member to rotate the adjustment nut an angular amount sufficient to advance the thrust member the axial distance required to maintain the desired clearance between the braking member and the braking surface up to the point of engagement therebetween at which the opposite axial force upon the drive member increases to diminish the net axial force of the drive member torque transmitting means against the reaction member torque receiving means sufficiently to prevent the rotational torque from being transmitted from the drive member to the reaction member resulting in a slipping engagement therebetween with rotation of the drive member in an opposite direction upon release of the brake by the operator being unable to rotate the adjustment nut in an opposite direction due to at least one of said reaction member engagement means and combination of said torque receiving means and said torque transmitting means being adapted to rotate the adjustment nut only in the direction causing the thrust member to advance to maintain the desired clearance between the braking member and the braking surface.

4,632,230

VALVE SYSTEM FOR A HYDRAULICALLY CONTROLLED STARTING FRICTION CLUTCH

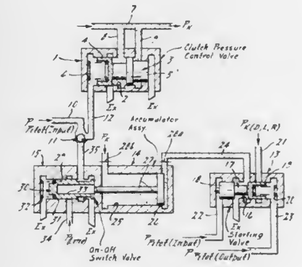
Manfred Bilharz, Bergheim; Fritz Henken, Pulheim; Hartmut Röper, Bochum; Martin Taal, Pulheim; Peter Heider, Weilerswist; Ernst Kohl, Cologne, and Dietmar Schubert, Hennef, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 7, 1985, Ser. No. 698,995

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404378

Int. Cl.[4] **F16D** *25/14, 43/284*

U.S. Cl. 192—0.033 **4 Claims**



1. In a control valve system for a fluid pressure operated clutch, a slip control valve circuit comprising a clutch pressure regulator valve, a startup valve, a pressure source communicating with said startup valve, an accumulator assembly comprising a movable accumulator piston element, one side of said accumulator piston element communicating with said startup valve, means for subjecting a variable clutch input speed signal to one side of said startup valve and means for subjecting the

opposite side of said startup valve to a variable clutch output speed signal, a switch valve means for distributing a pressure to said regulator valve to increase the pressure level in said clutch, said startup valve responding to a calibrated difference in the magnitudes of said input speed signal and said output speed signal to distribute pressure to said accumulator assembly thereby causing said accumulator piston element to become displaced and to trigger the operation of said switch valve.

4,632,231

METHOD OF CONTROLLING THE STARTING OF A VEHICLE HAVING AUTOMATIC CLUTCH

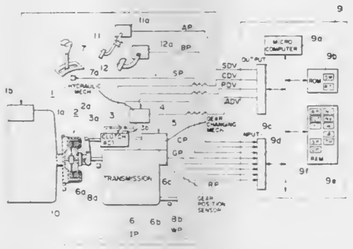
Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa, and Makoto Uriuhara, Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,610

Claims priority, application Japan, Jun. 30, 1983, 58-118461; Jun. 30, 1983, 58-118462

Int. Cl.⁴ B60K *41/02*

U.S. Cl. 192—0.076 **2 Claims**



1. A method of controlling the starting of a vehicle having an engine, an automatic clutch, and an electronic control system, comprising the steps of:

(a) controlling the clutch to be engaged,

(b) detecting the number of r.p.m. of the engine;

(c) detecting the extent of engagement of the clutch;

(d) determining a limit number of r.p.m. of the engine corresponding to the detected extent of engagement of the clutch; and

(e) stopping the engagement of the clutch when the number of r.p.m. of the engine detected in step (b) is less that the limit number of r.p.m.

4,632,232

SINGLE LEVER REMOTE CONTROL-THROTTLE DWELL AND FRICTION MECHANISM

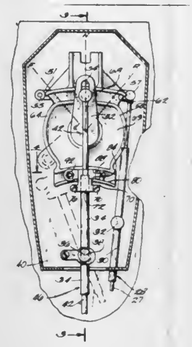
Richard P. Kolb, Gages Lake, and Anthony P. Prince, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 2, 1984, Ser. No. 627,117

Int. Cl.⁴ B60K *41/02*

U.S. Cl. 192—0.096 **20 Claims**

1. A single lever control for operating the clutch and throttle of a marine engine, said control comprising a support, a first member mounted on a pivot on said support, a second member mounted for movement with said first member about said pivot and for axial movement relative to said first member, clutch operating means movable as said members are moved about said pivot between first and second positions, said second member being connected to the engine throttle to actuate the throttle when said second member moves axially, means operable only when said members are moved beyond said first and second positions for moving said second member axially relative to said first member, and friction means carried on said support and engageable with said second member for resisting



axial movement of said second member relative to said first member.

4,632,233

TORQUE CONVERTER EQUIPPED WITH LOCKUP CONTROL UNIT

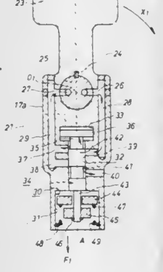
Takao Fukunaga, Hirakata, and Akira Inoue, Suita, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Jun. 8, 1984, Ser. No. 618,789

Claims priority, application Japan, Jun. 13, 1983, 58-90802[U]

Int. Cl.⁴ F16D *33/02, 43/284*

U.S. Cl. 192—3.3 **2 Claims**



1. A torque converter equipped with a lockup control unit for controlling engaging and disengaging of a hydraulic clutch in the torque converter utilizing a feed pump for circulating oil in the torque converter as a hydraulic power supply for the hydraulic clutch, said lockup control unit including control valve means disposed in a hydraulic supply path between the torque converter and the feed pump and rotationally coupled to an output shaft of an engine associated with the torque converter for quickly increasing pressure of the circulating oil to engage the hydraulic clutch when engine rotational speed exceeds a prescribed value by opening and closing depending on a change in centrifugal force exerted on said control valve means, said control valve means comprising a control valve body, a governor valve slideably mounted in said control valve body having a small weight on one end thereof acted upon by centrifugal force and a piston portion on the other end thereof acted upon by hydraulic pressure from the feed pump, said piston portion balancing said small weight during rotation, and said governor valve being adapted to send a prescribed pressure to the torque converter when the engine rotational speed is below said prescribed value, and a large weight slideably mounted in said control valve body associated with said one end of said governor valve and overlapping said small weight so as to move radially outwardly with said small weight to further open said control valve means when the engine rotational speed exceeds said prescribed value.

4,632,234

CONTROL SYSTEM FOR A DOUBLE CLUTCH OF A POWER-SHIFTABLE MOTOR VEHICLE TRANSMISSION

Meinrad Bardoll, Gaggenau, and Kurt-André Leibold, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.f. Porshe Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,749

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343827

Int. Cl.⁴ B60K *41/22;* **F16D** *25/10*

U.S. Cl. 192—3.58 **17 Claims**



1. A control system for a double clutch of a motor vehicle change speed transmission operable to be shifted as a function of load, comprising two clutch means each coordinated to several speeds and operable to connect the individual speeds with an engine shaft, an electro-hydraulic control means for hydraulically actuating the clutch means in response to pressure in a clutch pressure channel, an electronic control means electrically controlling the electro-hydraulic control means, a speed selector lever means, the electronic control means being responsive to signals of the speed selector lever means, means for manually actuating the clutch means by way of a clutch pedal which acts on the electro-hydraulic control means, wherein the electro-hydraulic control means includes a transmitter cylinder means connected with the clutch pedal, a receiver cylinder means, a hydraulic line connecting the transmitter cylinder means with the receiver cylinder means, an electro-hydraulic pilot pressure regulator means influenced by the electronic control means, and a hydraulic pressure regulator means including control slide valve means operable to valve the clutch pressure channel to control the amount of clutch actuation and by connecting and isolating the clutch pressure channel to a return channel leading to a reservoir tank and a pressure feed channel wherein said receiver cylinder means includes a longitudinally displaceable piston operable to engage by way of spring means and a plunger means at one side of the control slide valve means whereas the clutch actuating pressure is determined by the electronic control means acting by way of the pilot pressure regulator means on the other side of the control slide valve means.

4,632,235

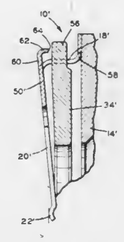
CLUTCH WITH CANTILEVERED BELLEVILLE SPRING

Richard A. Flotow, Butler; Ronald E. Heymann, and Martin E. Kummer, both of Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jul. 26, 1985. Ser. No. 759,192

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—70.27 **3 Claims**



1. In a push-type friction disc clutch assembly including a flywheel, a pressure plate, a driven disc positioned intermediately of said flywheel and said pressure plate and adapted for selective frictional engagement of said flywheel, a radially extending Belleville diaphragm spring having outer and inner peripheral portions, said clutch further including a release bearing in constant engagement with said inner peripheral portion; an improvement characterized by said clutch further comprising a mounting portion integrally joined to said diaphragm spring at said outer peripheral portion, said mounting portion rigidly secured to said flywheel, said mounting portion comprising an axially extending portion affixed to said outer peripheral portion, whereby said Belleville diaphragm spring is contilevered from said mounting portion, and subjected only to bending deflectin to effect clutch engagement and release upon axial movement of said release bearing, wherein said clutch further comprises a plurality circumferentially spaced slots in said mounting portion, a plurality of pressure plate contact extension portions extending radially through said slots, and a plurality of pressure plate contact lugs extending radially outwardly of said diaphragm spring for selective engagement and disengagement of said extension portions by said axial movement of said release bearing.

4,632,236

ELECTROMAGNETIC CLUTCH HAVING HIGH TORQUE TRANSFER

Takatoshi Koitabashi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Nov. 10, 1983, Ser. No. 550,492

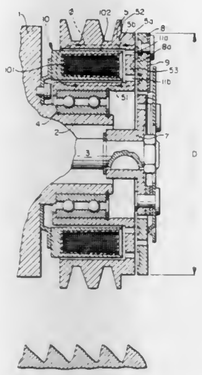
Claims priority, application Japan, Nov. 10, 1982, 57-170814[U]; Jan. 26, 1983, 58-9294[U]

Int. Cl.⁴ F16D *27/14*

U.S. Cl. 192—84 C **11 Claims**

1. In an electromagnetic clutch comprising a first rotatable member rotatably supported on a first bearing, said first rotatable member being provided with at least one annular groove along an outer surface thereof for receiving a belt rotatably connecting said first rotatable member to an external driving source, said first rotatable member further having an axial end magnetic frictional surface, a second rotatable member rotatably supported on a second bearing, an annular magnetic member being supported on said second rotatable member so as to be capable of limited axial movement and having an axial end magnetic frictional surface which faces said axial end magnetic frictional surface of said first rotatable member with an axial gap therebetween, and electromagnetic means associated with one of said rotatable members and said annular magnetic member for attracting the other of said rotatable members, the improvement comprising one of said axial end frictional magnetic surfaces having a thin layer portion at an axial end face

thereof and the other of said axial end frictional magnetic surface being finished to form a rough surface with a plurality of uniformly formed peaks and valleys, said thin layer portion being formed of a material which can be readily shaved or



worn off during operation of said electromagnetic clutch to form particles which accumulate in said peaks and valleys, whereby the accumulation of said particles in said peaks and valleys increase the torque transfer rate of said electromagntic clutch.

4,632,237

FRICTION CLUTCH FOR A VEHICLE

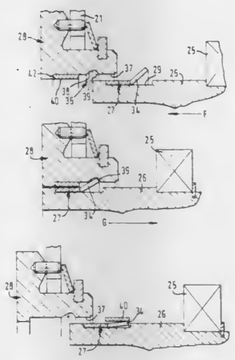
Ian C. Maycock, and Derek Hodgson, both of Leamington Spa, England, assignors to Automotive Products plc, Leamington Spa, England

Filed Nov. 16, 1983, Ser. No. 552,257

Claims priority, application United Kingdom, Nov. 19, 1982, 8233091

Int. Cl.⁴ F16D *19/00, 21/00*

U.S. Cl. 192—98 **13 Claims**



1. A friction clutch for a vehicle which includes a clutch release mechanism comprising a first member, a second member, a detent arranged to locate the first member relative to the second member by moving the first member in one direction relative to the second member whereby a clutch release force subsequently applied to said first member in an opposite direction will be transmitted to said second member to release the clutch, and detent release means which enables the detent to be released by initially urging said first member further in said one direction relative to said second member so that the first and second members can thereafter be separated by subsequently moving said first member in said opposite direction relative to the second member, said detent release means remaining with said detent upon separation of said first and second members.

4,632,238

APPARATUS FOR ARRANGING ONCOMING ARTICLES, IN PARTICULAR CONTAINERS, INTO PLURAL ARTICLE ROWS

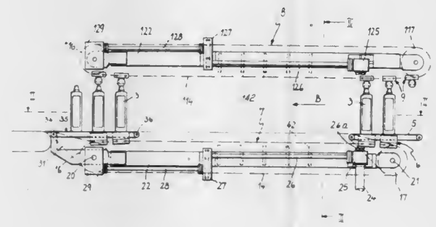
Roberto Risi, Casalecchio di Reno, Italy, assignor to MA.CO Engineering S.r.l., Bologna, Italy

Filed May 7, 1984, Ser. No. 608,002

Claims priority, application Italy, May 10, 1983, 3417 A/83

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—365 **1 Claim**



1. An apparatus for arranging oncoming articles, in particular containers, into plural article rows, comprising

a top conveyor and a bottom conveyor having superimposed adjacent portions moving in the same direction and each provided with transversally extending guides,

article supporting top and bottom elements slidably mounted on the guides of said top and bottom conveyors respectively and operative to engage each individual article at the top and bottom,

said adjacent portions having converging initial sections and diverging end sections to cause juxtaposed ones of said supporting and clamping elements to move to and away from each other for holding and releasing the articles,

a pair of parallel belts arranged at the initial section of said bottom conveyor and a plurality of receiving decks each comprising a pair of parallel belts arranged at the end section of said bottom conveyor, the belts of each pair defining a gap permitting said support elements to move between them for engaging the articles along said converging section and for releasing the articles on said receiving decks,

a plurality of guide members each leading to a respective receiving deck,

controllable switch members arranged aligned to said pair of parallel belts forming said initial section, means for controlling each said switch member and diverting said supporting and clamping elements holding said articles along said guide members, each said switch member comprising a diverting needle pivoted at one end and said control means comprising a two arm lever pivotally supported rocker arm-fashion, a radial cam, means for driving said radial cam, a rod connecting said needle to one arm of said lever and a pneumatic cylinder mounted on the opposite arm of said lever and having a piston rod operative to engage said radial cam.

4,632,239

SCRAPER-CHAIN CONVEYOR CHANNEL SECTION

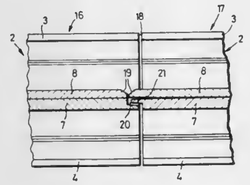
Gunther-Dietmar Schoop, Ottmarsbocholt; Franz Roling, Nordkirchen; Dieter Gründken; Manfred Redder, both of Lünen; Hartmut Schewinski, Kamen-Westick, and Michael Sauer, Werne-Stockum, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,055

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325794

Int. Cl.⁴ B65G *19/28*

U.S. Cl. 198—735 **11 Claims**



1. A scraper-chain conveyor comprising a plurality of channel sections joined together end-to-end in such a manner as to permit limited articulation therebetween in the horizontal and vertical directions, each channel section having a pair of side walls connected together by a floor plate, wherein the floor plate of each channel section comprises an upper plate and a lower plate, the lower plates of the channel sections overlapping one another, and means defined by said overlapping lower plates for effecting vertical play between adjacent channel sections, at the interfaces between adjacent channel sections, and the upper plates of the channel sections substantially abutting one another near said interfaces and wherein one end of each lower plate is formed with an upwardly-open recess, and the other end of each lower plate is provided with a tongue projecting outwardly thereof at the top of the lower plate whose shape complements that of said recess, and the depth of the recess being in excess of the thickness of said tongue such that the tongues project within adjacent recesses with a predetermined amount of vertical play.

4,632,240

ASSEMBLY FOR THE PACKAGING AND APPLICATION OF A VARNISH-TYPE SUBSTANCE

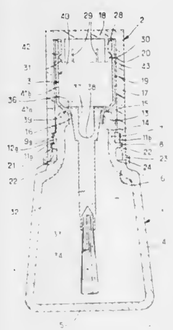
Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Aug. 28, 1984, Ser. No. 645,157

Claims priority, application France, Sep. 12, 1983, 83 14476

Int. Cl.⁴ A45D *44/18*

U.S. Cl. 206—15.2 **14 Claims**



1. In an assembly for the packaging and application of a volatile substance or a substance including volatile components, the said assembly comprising:

(a) a storage container for enclosing the said substance;

(b) a neck to said storage container having a rim;

(c) a removable closure device adapted to be assembled on the storage container;

(d) an applicator adapted to be fixed to the closure device;

(e) a lower part of the applicator adapted to enter the atorage container when the closure device is assembled on the storage container;

(f) a leaktight sealing means to ensure the sealing of the storage container when the closure device, with the applicator fixed thereto, is assembled on said storage container;

the improvement wherein:

(g) the leaktight sealing means comprises a collar integral with the applicator and positioned around an axis that extends through said applicator, said collar abutting the rim of the storage container neck when the closure device is assembled on the storage container and being pressed against that rim by a resilient wall connecting the collar to the closure device, said wall comprising first and second parts, the first part being ajacent to the said collar and capable of being resiliently distorted between the collar and the second part, said second part including first fixing means and the closure device including second fixing means, said first and second fixing means being mutually complementary to fix the closure device to the applicator, and

(h) means are provided for ensuring a preselected angular positioning of the closure device on the storage container when said closure device and storage container are assembled together;

said second part of the wall connecting the collar to the closure device being sunstantially perpendicular to said collar; said second part of the wall being cylindrical and having a free edge zone, wherein said closure device incorporates a cylindrical liner wall facing said second wall part in the assembled position at least in the edge zone of the second wall part, and wherein holding means are provided on one of said facing wall surfaces of said closure device and the said second part for holding against the other of said facing wall surfaces and for preventing rotation of the applicator relative to said closure device.

4,632,241

PORTABLE DISPLAY BAG WITH SUPPORT MEANS

C. Duncan Brough, Summit, N.J., and Thomas W. Carroll, Wantagh, N.Y., assignors to F. Schumacher & Co., New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,534

Int. Cl.⁴ B65D *5/50*

U.S. Cl. 206—44 B **3 Claims**

1. A portable display bag assembly comprising:

(a) a generally upright stand means;

(b) a foldable portable display bag separate from the stand means for use in the transporting and displaying of flat materials such as fabrics, wallpaper, rugs and the like;

said foldable bag comprising:

(i) a foldable fabric cover having integral flaps and fastening means for closing said flaps, said cover capable of displaying the materials when the flaps are open and completely enclosing the materials when the flaps are closed;

(ii) median support means attached to the cover along the width of the display bag at a point approximately intermediate the length of the display bag, said cover folding over the median support means to position the display bag in a folded carrying mode;

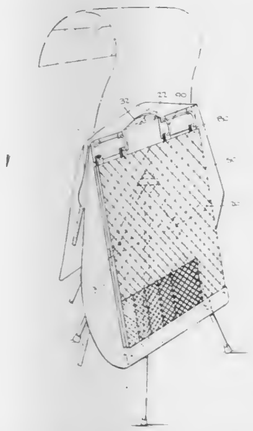
(iii) carrying means attached to the median support for transporting the display bag in a folded carrying mode;

(iv) end support means attached to the cover along the width of the display bag at an end of the length of the display bag, said end support means including a mount-

ing handle for mounting the display bag onto a projection of the stand means when the display bag is in an unfolded extended display mode;

(v) a plurality of generally flat pieces of display material having lengths substantially greater than the length of the display bag when in its folded carrying mode;

(vi) at least a pair of tab means attached to each piece of said display material, each of said tabs including an aperture therein and having a slitted opening communicating with said aperture;



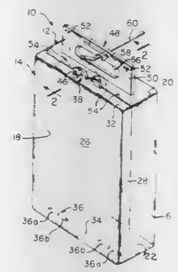
(vii) a plurality of support bars each of which is attached only at both of its ends to the ends support means in the direction of the length of the display bag, at least a pair of said support bars receiving said pair of tab means for supporting the pieces of display material, whereby the pieces of display material may be flipped over the end support and the top of the stand means for successive display when the display bag is in its extended display mode.

4,632,242

DISPLAY PACKAGE HAVING A RETRACTABLE HANGER

Kwang H. Choi, New York, N.Y., and Sun H. Hong, Seoul, Rep. of Korea, assignors to C. Itoh & Co. (America) Inc., New York, N.Y., by said Kwang H. Choi

Filed Jun. 6, 1985, Ser. No. 742,051
Int. Cl.[4] B65D *25/22*
U.S. Cl. 206—45.34 **12 Claims**



1. A display package comprising:

a container having at least first and second side walls and a top wall, said top wall having a slot therein;

a hanger positioned in said slot and sized for sliding movement in said slot relative to said container;

said hanger having upper and lower tab means projecting outwardly thereof, said tab means being positioned and sized relative to the dimensions of said slot to limit movement of said hanger between (a) a protracted position wherein said lower tab means engage a bottom surface of said top wall to prevent complete withdrawal of said hanger from said container in normal use and (b) a retracted position wherein said upper tab means engage a top surface of said top wall to prevent complete insertion of said hanger in said container in normal use; and

said hanger further having a hook engaging opening positioned between said upper and lower tab means to suspend the package for display when said hanger is in its protracted position.

9. A display package comprising:

a container having at least first and second side walls and a top wall, said top wall having an elongated slot extending longitudinally along said wall;

a hanger comprising an elongated plate having length and width dimensions slightly less than the corresponding length and width dimensions of said slot, said plate being positioned in said slot for sliding movement therein relative to said container;

said plate having a plurality of upper and lower lateral tabs spaced longitudinally along said plate and positioned adjacent respective upper and lower edges thereof, said tabs projecting outwardly from at least one of the sides of said plate by an amount to engage opposite portions of said top wall to limit sliding movement of said plate between (a) a protracted position wherein said lower tabs engage a bottom surface of said top wall to prevent complete withdrawal of said plate from said container in normal use and (b) a retracted position wherein said upper tabs engage a top surface of said top wall to prevent complete insertion of said plate in said container in normal use; and

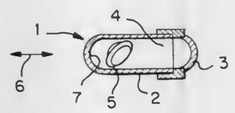
said plate further having an elongated hook engaging opening positioned between said upper and lower tabs, the upper edge of said hook engaging opening having a recess portion adapted to position the hook received in said opening to suspend the package for display when said hanger is in its protracted position.

4,632,243

BATCH PACK FOR SILVER FILINGS FOR THE PREPARATION OF DENTAL AMALGAM

Ernst Muhlbauer, Dorpfeldstieg 3, 2000 Hamburg 52, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 557,472, Dec. 2, 1983, Pat. No. 4,537,303. This application Jun. 12, 1985, Ser. No. 743,826
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303838; Feb. 22, 1985, 3506345
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] B65D *25/08*
U.S. Cl. 206—219 **12 Claims**



1. A dental vibration mixing capsule for vibration mixing a dental amalgam comprising:

a capsule having a fully closed mixing chamber and adapted for vibratory mixing motion;

a first package portion having a foil pocket containing a predetermined amount of powdery dental component comprising a briquette of silver filings compressed to a density of not more than approximately 8 g/cm^3; said foil pocket being comprised of a foil material adapted to rupture and discharge said predetermined amount of powdery dental component in said mixing chamber during vibration mixing and the foil having a specific gravity at least five time less than the specific gravity of the powdery dental component, said first package portion being disposed in said mixing chamber; and

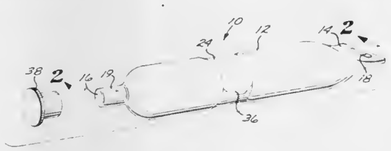
a second package portion having a foil pocket containing a predetermined amount of liquid dental component coordinated to said predetermined amount of powdery component to form a dental amalgam of fixed predetermined proportions of said liquid dental component and powdery dental component, said foil pocket being comprised of foil material adapted to rupture and discharge said predetermined amount of the liquid dental component in said mixing chamber during vibration mixing, said second package portion being disposed in said mixing chamber whereby said predetermined portion of the powdery dental component is separated from said liquid dental component during storage and said predetermined portion of the powdery dental component admixes with said predetermined portion of the liquid dental component to form an amalgam of said fixed predetermined proportions of said liquid dental component and said powdery dental component during mixing vibration of said capsule housing.

4,632,244

MULTIPLE CHAMBER FLEXIBLE CONTAINER

Boris Landau, 20121 Imperial Cove La., Huntington Beach, Calif. 92646

Filed Feb. 19, 1986, Ser. No. 831,718
Int. Cl.[4] B65D *25/08, 27/08*
U.S. Cl. 206—219 **20 Claims**



7. A flexible container for separately storing first and second materials and selectively allowing said first and second materials to be intermixed, said container comprising:

an elongate, hollow receptacle having a closed proximal end, and a closed distal end, with an interior surface and an exterior surface extending between said proximal and distal ends;

a hollow member disposed in said receptacle between said proximal and distal ends, said hollow member having an external circumference which is smaller than the internal circumference of said receptacle; and

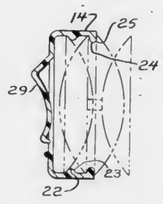
removable sealing means for providing an openable, fluid-tight seal between the exterior surface of said hollow member and the interior surface of said receptacle, said seal thereby dividing said receptacle into a distal chamber containing a first material and a proximal chamber containing a second material, whereby the removal of said sealing means opens said seal to provide a passage between said proximal and distal chambers, so that said first and second materials can become intermixed.

4,632,245

DISPLAY AND TRANSPORT MEDIUM FOR A HAND HELD DEVICE SUCH AS A YO-YO

Nathan Lerner, Chicago, Ill., assignor to Donald F. Duncan, Tucson, Ariz.

Filed Feb. 1, 1985, Ser. No. 697,485
Int. Cl.[4] B65D *85/20*
U.S. Cl. 206—315.1 **2 Claims**



1. A display and transport medium for a yo-yo, comprising:

a face receiving cavity defined by one or more outwardly projecting wall members;

an outer circumferential nub located near the outer edge of said cavity and projecting radially inwardly from said wall members, said outer nub defining a circumference somewhat less than the outermost circumference of one face of a convex face, flat groove type yo-yo and adapted to snap over the outermost circumference of said convex yo-yo face;

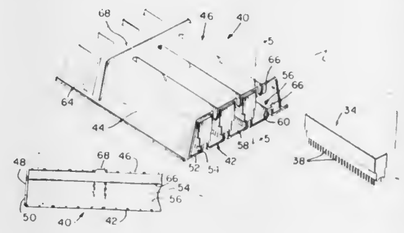
an inner circumferential nub located along the surface of said wall members inwardly of said outer nub and projecting radially inwardly from said wall members, said inner nub defining a circumference somewhat less than the outermost circumference of one face of a flat faced, concave groove type yo-yo and adapted to snap over the outermost circumference of said flat yo-yo face; and a hook-like projection extending outwardly from said cavity for attachment to a carrier and disposed such that the medium is oriented in a vertical plane and the opening of the face receiving cavity faces essentially in a horizontal plane.

4,632,246

PACKAGE FOR CARD EDGE CONNECTORS

Scott A. Brutosky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 703,794, Feb. 21, 1985. This application Jun. 18, 1986, Ser. No. 875,834
Int. Cl.[4] B65D *81/00*
U.S. Cl. 206—328 **2 Claims**



1. A tray for supporting electrical connectors of the type having an elongated dielectric housing member with which electrical terminals are secured, the electrical terminals having terminal pins extending outwardly from a bottom surface of the housing member, said tray comprising:

a thin sheet of formed plastic material having side walls, an open end, a wall at another end, a floor, and a top wall,

said floor having thereon a plurality of parallel, spaced-apart, upwardly extending connector support means for receiving said connectors thereon with said terminals extending down on opposite sides of said means without engaging said floor; and

a plurality of parallel spaced-apart spacer means on said top wall and facing respective spaces between said connector support means so that a connector, positioned on a connector support means, extends up between adjacent spacer means.

4,632,247

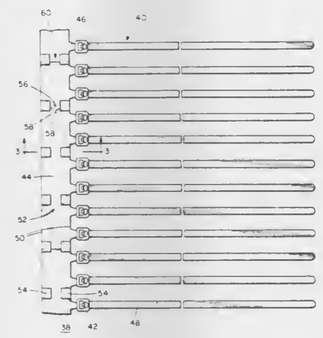
TOOL FOR THE AUTOMATIC INSTALLATION OF DISCRETE CABLE TIES PROVIDED ON A CONTINUOUS RIBBON OF CABLE TIES

Roy A. Moody, Flossmoor, and John J. Bulanda, New Lenox; both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Division of Ser. No. 444,495, Nov. 24, 1982. This application Nov. 15, 1984, Ser. No. 671,642

Int. Cl.[4] B65D *69/00, 71/00*

U.S. Cl. 206—343 **17 Claims**



1. A ribbon of cable ties for installation by a cable tie installation tool, comprising:

a strip portion extending the length of said ribbon;

a plurality of cable ties each having a locking head portion and a strap portion;

connecting means for connecting said strip portion to the heads of said cable ties; and

alignment means integral with said strip portion being positioned along the length of said strip portion, said alignment means comprising two projecting surfaces each respectively being located towards opposing edges of the planar surface of said strip portion, said projecting surfaces having inner opposing sides that define two alignment edges at least one of said alignment edges being positioned parallel to a longitudinal axis of said strip portion, whereby said alignment means is adapted to cooperate with means in the tool to laterally position said ribbon in the tool for accurate removal of individual cable ties from said strip portion.

4,632,248

SOUND/VIDEO-RECORDING TAPE STORING DEVICE

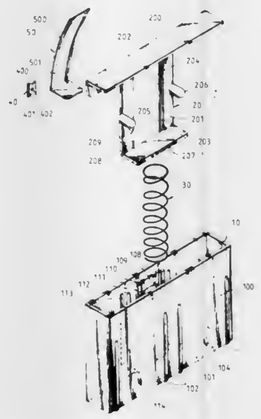
Feng-mei Hsu, 3rd Floor, No. 15, Lane 142, Chunghsin Road, Sec. 4, Sanchung City, Taipei Hsien, Taiwan

Filed Jul. 29, 1985, Ser. No. 760,071

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 **5 Claims**

1. An article storing device comprising a case with an open front, a drawer received in said open front holding said article, means for connecting said drawer to the interior of said case for movement relative thereto, means for biasing said drawer for movement exteriorly of said case, means located on the bottom of said drawer and on a cooperating wall of the case



and including oppositely located cam surfaces relative to a pivot point responsive to inward movement for locking said drawer in a closed position interiorly of said case, said cam surface responsive to further inward movement for unlocking said drawer.

4,632,249

LATERAL PACKAGING FOR THE GROUPING AND HOLDING TOGETHER OF SUPERPOSED ARTICLES

Michel Blot, "La Blotinière" - 6 rue de La Barboire, Moricq - 85750 - Angles, France

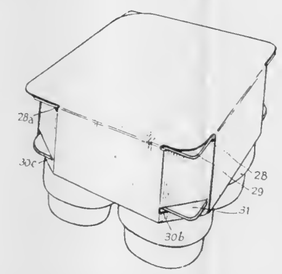
PCT No. PCT/FR84/00113, § 371 Date Dec. 21, 1984, § 102(e) Date Dec. 21, 1984, PCT Pub. No. WO84/04288, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 20, 1984, Ser. No. 694,396

Claims priority, application France, Apr. 22, 1983, 83 06683

Int. Cl.[4] B65D *73/00, 21/00*

U.S. Cl. 206—431 **3 Claims**



1. Packaging for grouping and holding together, in a suspended and vertically spaced relationship, vertically stacked upper and lower arrays of articles having rims with corners, said packaging comprising:

a lateral band having a plurality of sides defined by folding lines, said lateral band defining an upper and a lower series of parallel and vertically spaced slots for engaging the corners of the rims of said articles, said slots being disposed on the sides of the band and extending generally perpendicularly from said folding lines;

a panel for covering said upper array of articles, said lateral band being interconnected at an upper part thereof by said panel;

said upper series of slots being disposed at an upper edge of the lateral band adjacent to said panel and operable to receive the corners of the rims of the upper array of articles, said lower series of slots being operable to receive the corners of the rims of the lower array of articles.

4,632,250

MAGNETIC SHIELDING MEMBERS

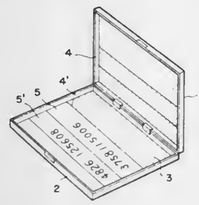
Shu Ueda; Joe Narumiya, both of Sayama, and Kenji Misawa, Nagoya, all of Japan, assignors to Dynic Corporation, Kyoto, Japan

Filed Jul. 19, 1984, Ser. No. 632,530

Claims priority, application Japan, Jul. 22, 1983, 58-132830; Mar. 27, 1984, 59-42851[U]

Int. Cl.[4] B65D *85/84*

U.S. Cl. 206—524.2 **8 Claims**



1. A magnetic shielding device, comprising;

a main body and a lid fitted to said main body to allow a magnetic recording member to be contained in said main body when said lid is in a closed position;

each of said main body and said lid comprising at least two spaced sheets of ferromagnetic material, and

spacing means for supporting said adjacent ferromagnetic sheets so that the total sum of the spacings between adjacent ferromagnetic sheets each of said main body and said lid is larger than 0.5 mm;

wherein a magnetic field external of said main body and said lid when closed is substantially attenuated when passing inside said main body in the vicinity of a contained magnetic recording member.

4,632,251

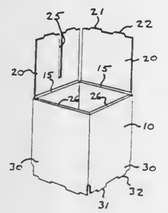
STORAGE CUBE

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Dec. 26, 1985, Ser. No. 813,547

Int. Cl.[4] B65D *5/48, 5/14*

U.S. Cl. 206—577 **5 Claims**



1. A storage cube assembly kit comprising:

a main body portion **(10)** having first and second ends formed as a part thereof,

wherein said first end of said main body portion **(10)** has a plurality of elongated flap means **(20)** formed thereon, said flap means being foldable to an inner region of said main body portion **(10)** by means of factory pre-cut score lines **(15)**,

wherein the flap means **(20)** on the first end of said main body portion have tab means **(21,22)** formed thereon and wherein at least one of said flap means **(20)** has elongated open slot means **(25)** formed therein,

wherein said second end of said main body portion **(10)** has a plurality of shortened flap means **(30)** formed thereon, said shortened flap means **(30)** being foldable to an inner region of said main body portion **(10)** by means of factory pre-cut score lines **(16)**,

wherein said shortened flap means **(30)** have tab means **(31,32)** formed thereon, said shortened flap means **(30)** being solid and devoid of any slot means,

said storage cube assembly kit further including a divider means **(40)** having flap means **(41)** formed thereon, wherein said divider means **(40)** and said flap means **(41)** are sized so as to fit between said elongated open slot means **(25)** formed on said first end flap means **(20)** and the inner region of said main body portion **(10)** upon folding of said first end flap means **(20)** into the inner region of said main body portion,

said storage cube assembly kit further including a trap pad means **(50)** having recessed portion means **(51, 52)** formed thereon, said recessed portion means **(51, 52)** being sized to cooperatively interfit with said tab means **(21, 22)** formed on the flap means **(20)** on the first end of said main body portion **(10)**,

and means wherein, upon assembly, the tab means **(31, 32)** formed on said shortened flap means **(30)** act to securely retain said trap pad means **(50)** in its desired position of interfitting relation with said tab means **(21, 22)** formed on the flap means **(20)** on the first end of said main body portion **(10)**.

4,632,252

MAIL SORTING SYSTEM WITH CODING DEVICES

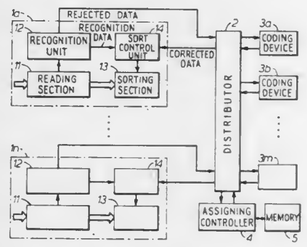
Kazuhito Haruki, Kanagawa; Masanori Iwamoto, Tokyo, and Masuo Tamada, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jan. 14, 1985, Ser. No. 690,965

Claims priority, application Japan, Jan. 12, 1984, 59-4024

Int. Cl.[4] B07C *1/00, 3/20*

U.S. Cl. 209—546 **4 Claims**



1. A mail sorting system comprising:

N number of sorting devices, each sorting device having reading means for obtaining address images of successively conveyed mail, recognition means responsive to said reading means for recognizing the address images and generating destination codes, said recognition means further indentifying address images which cannot be recognized by said recognition means and generating rejected data corresponding to the unrecognized address images, and sorting means for sorting the mail in response to the destination code;

M number of coding devices, each coding device having monitoring means for displaying the unrecognized address images generated by said recognition means and input

means for enabling an operator to input a correct destination code;

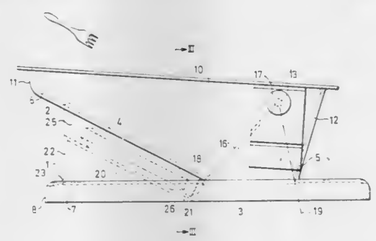
control means coupled between said sorting devices and said coding devices for distributing the rejected data generated by said recognition means to selected coding devices and for transferring the destination code entered by said input means to said sorting means from which the rejected data originated, said control means including control table means for storing and updating a control table containing control information related to the frequency of rejected data in each of said sorting devices and the processing capability of said coding devices, said control means being responsive to the control information in the control table for selectively processing the rejected data to maximize the mail handling capability of said plurality of mail sorters and assigning one of said coding devices to display the rejected data in accordance with the processing capability of said coding devices.

4,632,253

APPARATUS FOR SEPARATING CUTLERY FROM RESTAURANT WASTE

Peter Strömgren, Villagatan 22, S-114 32 Stockholm, Sweden; Jan Hellman, and Sören Hullberg, both of 5. chemin des Fleurettes, 1007 Lausanne, both of Switzerland

Filed Dec. 6, 1984, Ser. No. 678,872
Claims priority, application Sweden, Dec. 27, 1983, 8307176
Int. Cl.[4] B07C *5/344*
U.S. Cl. 209—570 **6 Claims**



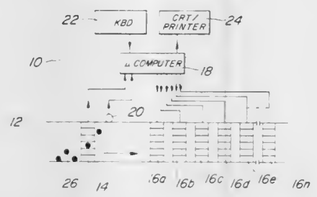
1. Apparatus for separating cutlery from restaurant waste, comprising a chute for the waste, an inductive type probe (**4**) with associated evaluation logic for sending an electrical switching signal when an item of cutlery passes along the chute, a hopper (**1**) forming the chute and adapted to be placed over the opening of a container intended for the waste; a sloping surface (**2**) arranged in the hopper, onto which the waste is tipped and at the lower portion of which there is an opening (**3**); a flap (**16**) arranged in the hopper and pivotable between two positions, namely a first position (**18**) for closing off the opening (**3**) and a second position (**19**) for uncovering the opening; and drive means (**17**) controlled by the electrical switching signal, for pivoting the flap between the first and second positions; the probe (**4**) being placed under the sloping surface (**2**), the position of the probe (**4**) relative to the sloping surface being such that the time it takes for an item of cutlery to glide along the surface is balanced against the time it takes from the probe (**4**) detecting an item of cutlery until the flap (**16**) assumes the first closing position (**18**) after having pivoted from its second position, so that the former time is longer than the latter time, said hopper being upwardly provided with a funnel-like portion (**6**) which is open upwards, and downwardly the hopper has a substantially flat collar portion (**7**) connected to the funnel-like portion and which is adapted to be removably placed on the upper edge of the waste container.

4,632,254

METHOD FOR ADJUSTING WEIGHT BREAKS REACTIVE TO CHANGES IN DISTRIBUTION OF OBJECT WEIGHT

Stephen D. Scopatz, Three Rivers, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 584,373, Feb. 28, 1984, abandoned. This application Dec. 12, 1984, Ser. No. 680,875
Int. Cl.[4] B07C *5/28*
U.S. Cl. 209—592 **14 Claims**



1. A method for automatically adjusting plural successive weight cutoff values defining plural successive weight breaks into which articles are to be classified according to their weight for use in an article sorting machine of the type having a scale over which the articles are transported for providing article weight data, a controller receiving and processing the article weight data and classifying the articles into ones of the weight breaks, and plural discharge stations having means responsive to the controller for discharging each article at a selected one of the discharge stations for packaging, the method comprising the steps of

(a) providing values indicative of the desired average weight of the articles to be classified in each weight break;

(b) computing values indicative of the actual average weight of the articles classified into each weight break based upon the weight data provided by the scale;

(c) computing the differences between successive weight break cutoff values, each difference corresponding to a weight break and defining a gap width;

(d) computing the difference between the desired average weight and the actual average weight for each weight break;

(e) performing a first adjustment to the magnitude of the weight cutoff values by an amount determined by the magnitude of the differences between the desired average weights and actual average weights, the result of the first adjustment defining preliminary modified weight cutoff values;

(f) performing a second adjustment to the magnitude of the weight cutoff values by an amount determined by the magnitude of the gap widths, the result defining final modified weight cutoff values;

(g) discharging the articles at selected ones of the discharge stations based upon the modified weight cutoff values and the actual weight of the articles.

4,632,255

FOLDABLE CLOTHES HANGER

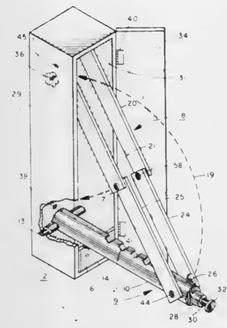
William D. Kennedy, 2201 Westbury Ct., SW., Decatur, Ala. 35603

Filed Apr. 18, 1985, Ser. No. 724,415
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—1.3 **5 Claims**

1. A foldable clothes hanger comprising:

a recantagular receptacle having an upper and a lower end, parallel long sides, parallel short sides connected to said long sides, a back portion connected to each of said sides, said back portion having mounting holes in the upper and lower ends thereof, an open side opposite said back portion, a partial front wall attached to the lower open side of said receptacle, and a door pivotally connected to one of said long sides so as to selectively open and close said open side;

a cylindrical arm having an inner end and an outer end, said arm being pivotally attached at its inner end to the lower end of said receptacle so as to be rotatable into and out of the open side of said receptacle, and being supported by said partial front wall while in its outward position;



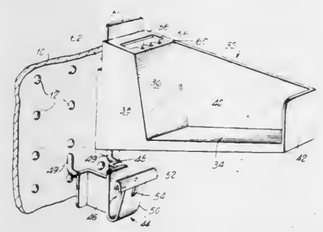
a pair of hinged support elements each pivotally attached at one end to opposite sides of the outer end of said cylindrical arm and pivotally attached at opposite ends to the inside of said parallel long sides adjacent the upper end of said receptacle whereby said support elements may be folded along with said arm completely within said receptacle and closed therein by said door.

4,632,256

ADJUSTABLE ARTICLE DISPLAY APPARATUS

Vincent J. Gambello, 90 Prospect Ave., Hackensack, N.J. 07601

Filed Oct. 17, 1983, Ser. No. 542,595
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—50 **1 Claim**



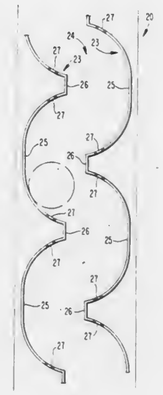
1. Article Display Apparatus for use with a carrier board including in combination a plurality of mounting brackets each having a lug means for detachably affixing said mounting bracket to said carrier board, a plurality of support components, each adapted to be carried on a mounting bracket in any one of a plurality of lateral positions, said support components cooperating to support at least one article, means for releasably locking each support component on a mounting bracket on one of said lateral positions, thereby permitting said adjustments of the lateral spacing of such support components, said means for releasably locking each support component on a mounting bracket in a plurality of positions comprises a plurality of laterally spaced notches formed in said support component, a boss carried on said mounting bracket and means for resiliently urging said boss into any of said notches.

4,632,257

ARTICLE DISPENSING MECHANISM FOR A VENDING MACHINE

Hideo Negishi; Mitsuyuki Obokata, and Shigeharu Katayama, all of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jan. 7, 1985, Ser. No. 689,319
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—59.2 **11 Claims**



1. In an article dispensing mechanism for a vending machine including a pair of side plates facing one another at a predetermined spacing and at least one pair of serial cusp-shaped vertical panels disposed transversely between said side plates, said panels facing each other to define a serpentine track, the improvement comprising said vertical panels having a plurality of projections horizontally extending from each side surface, each side plate having a plurality of elongate holes located so that an outer portion of said projections penetrates and extends through said holes, said projections having an outer edge, and said outer portions of said projections are twisted to place said outer edge of said projections in contact with said side plates and fix said vertical panels to said side plates.

4,632,258

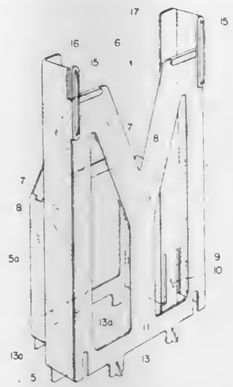
RECEPTACLE HOLDER OR STAND FOR A KITCHEN UTENSIL

Jurgen Borner, 5561 Landscheid-Niederkail, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 639,905
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 8323644[U]
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—70.6 **12 Claims**

1. A receptacle for a kitchen utensil of the type which is of flat rectangular form carrying a cutting knife and which is constructed to accommodate a cutting insert, for cutting food articles such as fruits and vegetables into strips, said receptacle comprising a frame which includes a base portion of rectangular cross section open at an upper end thereof and constructed to receive said utensil strictly by longitudinal insertion of said utensil vertically downward through said upper end and to permit withdrawal of said utensil vertically upward through said upper end, said base portion having sidewalls configured to conform laterally to said utensil to hole said utensil upright, at least of one of said sidewalls carrying a manually displaceable tongue portion with a detent directed inwardly of said base portion, said tongue portion being movable transversely to the insertion direction of said utensil, with said detent being located intermediate the longitudinal ends of said one sidewall in a position such that on insertion of said utensil a leading

longitudinal end of said utensil inserts past said detent, said detent further being disposed to engage said utensil behind said



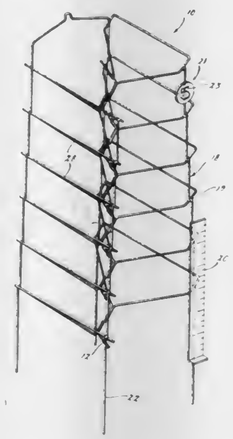
leading end along an intermediate lengthwise portion of said utensil to prevent withdrawal of said utensil from said receptacle.

4,632,259

STORAGE DEVICE

Douglas A. Cameron, 1714 Bedford Sq., Rochester, Mich. 48064

Filed Feb. 11, 1985, Ser. No. 586,779
Int. Cl.[4] A47F *5/01*
U.S. Cl. 211—119 **19 Claims**



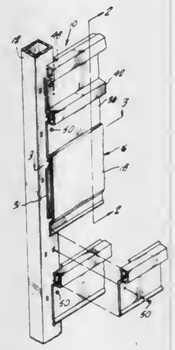
1. A storage device comprising:
a frame having a plurality of alternating directional portions, said frame comprised of a single elongated frame member having said alternating directional portions,
a plurality of shelf means on said elongated frame member at said alternating directional portions for providing for a plurality of support surfaces; and
a plurality of support members secured to said plurality of shelf means for providing rigidity of said shelf means on said frame.

4,632,260

ASSEMBLABLE PANEL FOR A RACK

John P. Hart, Lakewood, and John D. Krummell, Irvine, both of Calif., assignors to John D. Krummell, Irvine, Calif.

Filed May 4, 1984, Ser. No. 607,143
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—189 **11 Claims**



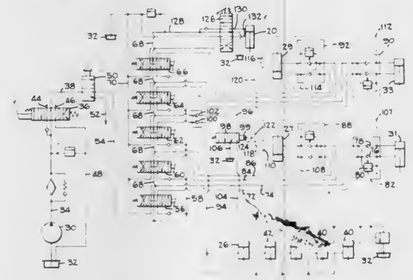
1. A rack having a plurality of vertical members and horizontal members, assemblable means to enclose at least one side of said rack, said assemblable means including the plurality of interlocking pieces which may be selectively assembled into a panel of different sizes depending on the needs of the user, said interlocking pieces including means for engaging at least one of said interlocking pieces with each said horizontal member, and means to removably attach said interlocking pieces to said rack.

4,632,261

HYDRAULIC CIRCUIT FOR SELF-UNDECKING CRANE

Leon L. Cuhel, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 487,638, Apr. 22, 1983, abandoned.
This application May 7, 1985, Ser. No. 731,753
Int. Cl.[4] B66C *23/26, 23/78;* **F15B** *11/00*
U.S. Cl. 212—175 **2 Claims**



1. A hydraulic circuit for a self-undecking crane having a carrier, a separable upper and retractable legs with extendable jacks, each jack having a head end which is pressurized for extension thereof for elevating, the upper relative to said carrier, said legs being manually pivoted above a vertical axis between a stowed position inboard of and on either side of said upper and a deployed position in which the legs are remote from the upper and extend horizontally, and a hydraulic pump for supplying fluid pressure comprising:
hydraulic cylinder means connected at one end to the upper and at the other end to said legs to rotate the legs about an axis transverse of the upper between said deployed position and a vertical operative position capable of supporting the upper;
hydraulic cylinder control means for directing fluid pressure to said hydraulic cylinder means;
jack control means for extending said jacks; and
isolation valve means responsive to pressure in the head end of said jacks for blocking communication between said hydraulic cylinder valve and said hydraulic cylinder means,
whereby said legs can be rotated from said vertical position to said deployed position only when there is an absence of pressure in the head end said jacks.

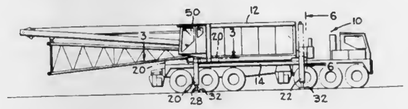
2. A hydraulic circuit for a self-undecking crane having a carrier, a separable upper including a load handling means mounted thereon, and retractable legs with extendable jacks, each jack having a head end which is pressurized for extension thereof, for elevating the upper relative to said carrier, said legs being positioned laterally on each side of said carrier and each leg being pivoted from said upper about a horizontal, fore and aft extending axis; comprising:
hydraulic cylinder means operatively connected between the upper and each leg for pivoting the leg between a stowed position in which each leg is positioned inboard of the upper extending vertically upward and an operative position outboard of said upper extending vertically downward;
hydraulic cylinder control means for directing fluid pressure to said hydraulic cylinder means;
jack control means for extending said jacks; and
isolation valve means responsive to pressure in the head end of said jacks for blocking communication between said hydraulic cylinder valve and said hydraulic cylinder means,
whereby said legs can be pivoted from said vertical position to said deployed position only when there is an absence of pressure in the head end of said jacks.

4,632,262

CRANE UNDECKING ARRANGEMENT

David W. Olsen, Palo; Leroy L. Wittman, Marion; Marvin E. Evenson, Cedar Rapids, and Gary W. Kappel, Ely, all of Iowa, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 487,629, Apr. 22, 1983, abandoned.
This application Jun. 13, 1985, Ser. No. 744,650
Int. Cl.[4] B66C *23/78*
U.S. Cl. 212—189 **7 Claims**



1. A retractable leg structure for undecking a crane's upper from its carrier comprising:
a first beam affixed to said upper;
a pin carried by said first beam;
a second beam pivotally attached to said pin;
a tubular member affixed said to second beam to define an L-shaped leg, said leg being moveable on said pin between a stowed position in which said tubular member is adjacent said upper and projects upward and a vertical operative position in which said tubular member is outboard of said upper and projects downward adjacent the ground;
a bell crank independently rotatable on said pin;
a first hydraulic ram having a first end pivotally attached to said first beam and a second end pivotally attached to said bell crank;
a second hydraulic ram having a first end pivotally attached to said second beam and a second end pivotally attached to said bell crank, whereby extension of both said rams will orient said leg in its stowed position and retraction thereof will orient said leg in its operative position;
an extendable jack member secured to said tubular member; and means engageable with said first beam assuring said tubular member is oriented vertically upon retraction of said rams.

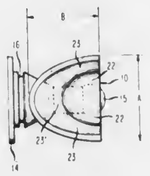
3. A retractable leg structure for undecking a crane's upper from its carrier comprising:
a box member having a circular cross section and a longitudinal axis affixed to said upper;
a beam retained within said box and rotatable about said longitudinal axis relative thereto;
an L-shaped leg, including a tubular member having a free end, hinged to said beam, said leg being manually swingable about said hinged connection between a stowed position in which said tubular member is oriented horizontal and inboard of said upper and a deployed position in which said tubular member is horizontal and outboard of said upper;
lock pin means for selectively securing said leg in one of said deployed and stowed positions;
an extendable jack secured to the free end of said tubular member;
a crank arm attached to said beam;
and a hydraulic ram pivotally attached at one end to said crank arm and at the other end to said upper for moving said leg between said deployed position and an operative position wherein said tubular member is oriented vertically adjacent the ground.

4,632,263

NIPPLE FOR A BABY WHO HAS A CLEFT IN ITS HARD PALATE

Gloria B. Gertzman, 103 Bayard St., New Brunswick, N.J. 08901

Filed Jan. 30, 1985, Ser. No. 696,505
Int. Cl.[4] A61J *11/00, 11/04*
U.S. Cl. 215—11 R **6 Claims**

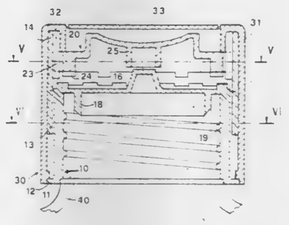


1. A nipple for feeding a baby who has a cleft in its hard palate comprising:
(a) a flexible hollow tube having first and second ends,
(b) a discharge opening at said first end,
(c) means for attaching said second end to a bottle such that the hollow portion of said tube is in fluid communication with the interior of the bottle, and
(d) an extension from said tube comprising:
(1) a convex section shaped to fit against the baby's hard palate and a portion of the soft palate, at least a portion of said convex section being located between said discharge opening and said attachment means, said convex section being attached to said tube along the entire portion of the convex section located between the discharge opening and the attachment means, and
(2) a parabolic concave channel adapted to cover both the inner and outer surfaces of the front and lateral gums of the baby's upper jaw, the apex of said parabolic channel being located between said attachment means and said convex section.

4,632,264
PLASTIC CAP HAVING A SEAL AND BEING CHILD-PROOF

Santagiuliana Evans, Vicenza, Italy, assignor to Taplast S.n.c., Vicenza, Italy

Filed Dec. 12, 1985, Ser. No. 808,090
Claims priority, application Italy, Dec. 13, 1984, 85668 A/84
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—220 6 Claims

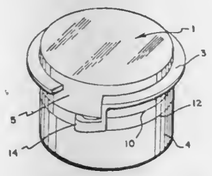


1. A safety opening cap, including an inside element (**10**) which is screwed on the neck (**40**) of a bottle, a virtually cylindrical outside element (**30**) being coaxial with the inside element and a push-button (**20**) being inserted through the top of the outside element (**30**), characterized by the fact that the untightening of said cap from the bottle only occurs by rotating the outside element (**30**) while pressing the push-button (**20**) at the same time in its axial direction, the transmission of the rotation of the outside element (**30**) to the inside element (**10**) being insured by means of pairs of cogged rims (**32, 23**; **24, 16**) acting between the outside element (**30**) and the push-button (**20**) and between the push-button (**20**) and the inside element (**10**).

4,632,265
PRESS-ON CAP AND SEAL

Benjamin A. Cochrane, 181 Sonora Ave., Danville, Calif. 94526

Continuation-in-part of Ser. No. 507,342, Jun. 24, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,534
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—232 23 Claims

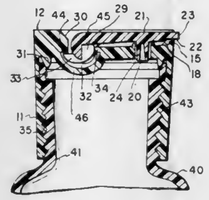


1. In a sealed container having a neck with a neck finish comprising annular groove means about its outer wall and a snap-on plastic cap cooperatively seated on said neck with a top disc and a skirt downwardly dependent from the peripheral edge of said disc and received over said neck and having annular bead means with inclined sidewalls projecting inwardly from the inside wall of said skirt seated in said annular groove means, the improvement comprising: two, spaced-apart score lines located beneath said annular bead means, forming a weakened tear band between said two score lines, a tear tab laterally extending from said weakened tear band, and a discontinuous annular lip located axially intermediate said top disc and said score lines, immediately axially above said tear tab and extending about a portion of the outer periphery of said skirt opposite said annular bead means with a discontinuous portion immediately above said tear tab.

4,632,266
CONTAINER CAP

Otto Osswald, 515 Ocean Ave. #703, Santa Monica, Calif. 90402

Filed Feb. 24, 1986, Ser. No. 832,252
Int. Cl.[4] B65D *47/06*
U.S. Cl. 215—235 7 Claims

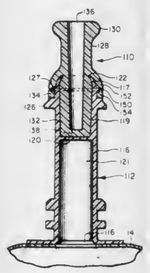


1. For use in combination with a container having an internal cavity for receiving a substance and a container neck defining a passage therethrough, a container cap comprising:
- a generally cylindrical barrel defining a first and a second end adapted to receive and be secured to said container neck;
- a substantially planar sealing surface extending across said first end and defining a tab recess defining a pouring aperture and having first and second substantially parallel sidewalls, said sidewalls each defining respective first and second inwardly facing spherical ball surfaces;
- a substantially planar tab configured to be received within said tab recess and defining a first and a second end, said first end defining a pair of hinge flanges each of which define an outwardly facing concave spherical socket receiving said ball surfaces to form a hinge about which said tab is pivotable between a first position within said tab recess and a second position removed from said tab recess;
- at least one tine extending outwardly from said second end of said tab; and
- at least one groove defined in said tab recess and positioned with respect to said tine such that each of said tine extends into one of said grooves.

4,632,267
OVERMOLDED PORT CLOSURE

Thomas A. Fowles, McHenry, and Brian C. Green, Vernon Hills, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 13, 1984, Ser. No. 670,501
Int. Cl.[4] B65D *41/32*
U.S. Cl. 215—253 17 Claims

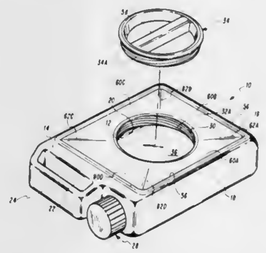


1. A port and closure assembly for a solution container comprising:
- a molded tubular port for providing access to fluid within the solution container, the tubular port including an elongated bore, an outer wall defining the bore, and a rib circumscribing the outer wall;
- an overmolded closure for removably sealing the tubular port, including a stem, a sleeve member and a gripping member, the sleeve member extending down the outer wall of the port past the rib, the sleeve being scored along a line circumscribing the sleeve; and
- the scored line cooperating with the rib to provide a band that circumscribes a portion of the outer wall of the tubular port after the overmolded closure is removed from the tubular port.

4,632,268
DISPOSABLE OIL DRAIN PAN AND CONTAINER COMBINATION

Edward R. Melzi, 3310 Ivanhoe La., Garland, Tex. 75042, and Arie N. Sharon, 1014 Wake Dr., Richardson, Tex. 75081

Continuation-in-part of Ser. No. 496,593, May 20, 1983, Pat. No. 4,513,865. This application Apr. 29, 1985, Ser. No. 728,257
Int. Cl.[4] B65D *25/40, 81/36, 21/02*; F16N *31/00*
U.S. Cl. 220—1 C 4 Claims



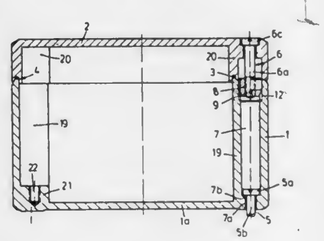
1. A container for collecting and storing a liquid such as motor oil and the like comprising a container body having a bottom panel and a top panel, said bottom and top panels being joined by sidewall panels thereby defining an interior reservoir, said top panel having a pour spout portion and a closure cap removably secured to said pour spout, and one of said sidewall panel members having an inwardly sloping recessed panel portion and a large diameter opening formed in said panel portion providing drainage access into said reservoir, and a large diameter closure cap removably secured to the sidewall portion of said sidewall panel member bounding said access opening said recessed panel portion having an annular shoulder which projects downwardly into said interior reservoir, said shoulder having an annular face and a threaded portion for engaging said large diameter cap, and said large diameter cap having threads and grooves for engaging the threaded portion of said shoulder; said closure cap having a radially projecting, annular lip disposed for surface engagement against said annular face to form an annular seal when said closure cap is advanced to the limit of its threaded engagement with the threaded shoulder of said drainage opening.

4,632,269
WATERPROOF ELECTRICAL ENCLOSURES

Friedhelm Rose, 55 Cache Cay, Vero Beach, Fla. 32963

Filed Mar. 10, 1986, Ser. No. 837,964
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1985, 8512613[U]
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.8 6 Claims

1. In waterproof electrical enclosures having a box-like base part, defined by a bottom and a plurality sides normal to the bottom joined at corners therein, for mounting to a support surface and a sealing cover with corners corresponding to said corners of said base part for attachment by corner fasteners to the base part, the improvement which comprises in combination:
- a single base part channel extending through each corner of said base part normal to said bottom,
- each of said base part channels having:
  - an upper section of first cross-sectional size,
  - a lower section of second cross-sectional size smaller than said upper section, and
  - a ledge adjacent the base of said second section that serves to capture the head of a fastener inserted in said channel to mount said enclosure on a support surface,
- a single cover channel extending normally through each corner of said cover,
- each of said cover channels having:



  - an upper section of first cross-sectional size, and
  - a lower section of second cross-sectional size larger than said upper section and at least as large as said first cross-sectional size of said base part channel,
- fasteners fitted through said cover channels having a shaft of size permitting it to pass through said upper section of said cover channel,
- a connection piece fitted to the lower end of said shaft of each of said fasteners which is of cross-section greater than said cross-section of said upper section of said cover channel, and
- means to fix each said connection piece in said upper section of a respective base part channel.

4,632,270
FUEL SUPPLY PORT STRUCTURE OF FUEL TANK FOR VEHICLE

Michiaki Sasaki, Hadano; Norio Sasaki, and Nariaki Nishida, both of Zama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

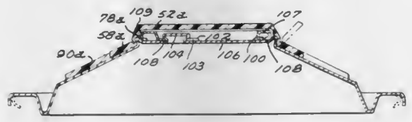
Filed Oct. 5, 1984, Ser. No. 657,899
Claims priority, application Japan, Oct. 12, 1983, 58-190200
Int. Cl.[4] B65B *1/04*
U.S. Cl. 220—86 R 10 Claims



1. A fuel supply port structure of a fuel tank for use in vehicles comprising a filler tube with a neck portion and a fuel supply gun guide disposed within said filler tube, said fuel supply gun guide having an opening at the lower end thereof and a shutter plate having a cutout portion at one end thereof and pivotally connected at the other end thereof close to said opening so as to open and close said opening, said opening

adapted to receive a fuel gun inserted therethrough to abut onto a portion of said shutter plate, and said portion of said shutter plate being raised toward said opening from the peripheral portion thereof.

4,632,271
RESEALABLE CONTAINER CLOSURE
Robert L. Taylor, Chester; Danny R. Sink, and Daniel F. Cudzik, both of Chesterfield County, all of Va., assignors to Reynolds Metals Company, Richmond, Va.
Continuation-in-part of Ser. No. 657,624, Oct. 4, 1984, Pat. No. 4,574,975, which is a continuation-in-part of Ser. No. 653,469, Sep. 20, 1984, abandoned, which is a continuation of Ser. No. 547,424, Oct. 31, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 810,570
Int. Cl.[4] B65D *51/22*
U.S. Cl. 220—258 **20 Claims**



1. A closure device for a can comprising a metallic end wall having an openable panel and a flexible closure element, said openable panel being substantially surrounded by a beaded flange means that flares outwardly relative to said opening, said beaded flange means including an exterior surface portion, said end wall including a wall portion surrounding said flange means with said wall portion extending at a selected angle relative to said exterior surface portion of said flange means,

said flexible closure element having a central panel, a lever portion and a connecting portion connecting said central panel with said lever portion, said lever portion being initially formed in a first position, when said central panel is generally horizontally disposed, as a generally upwardly directed frustoconical skirt portion and having, as viewed in vertical cross-section, a nose at its connection with said connecting portion, said metallic end wall and said closure element being constructed and arranged such that, upon positioning said closure element over said openable panel of said metallic end wall and moving said lever portion to a second position including, when said central panel is generally horizontally disposed, moving said lever portion to a generally downwardly directed position, said nose portion will engage at least a continuous annular part of said exterior surface portion of said flange means, said closure element being out of contact with a major portion of the inner surface of said flange means,

said wall portion of said metallic end wall having a substantially frustoconical annular section extending outwardly from said flange means and said lever portion having a smooth surface section which intimately engages said substantially frustoconical annular section of said end wall when said lever portion is moved to said second position so as to substantially prevent ingress of dirt and the like between said lever portion in said second position and said annular section of said end wall.

4,632,272
LID STRUCTURE HAVING FASTENING MEANS
Leonard H. Berenfield, Wyoming; Haron W. Wise, Montgomery, and Paul G. Bordner, Pickerington, all of Ohio, assignors to Berenfield/Midwest Corporation, Mason, Ohio
Filed Mar. 22, 1985, Ser. No. 714,904
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **7 Claims**

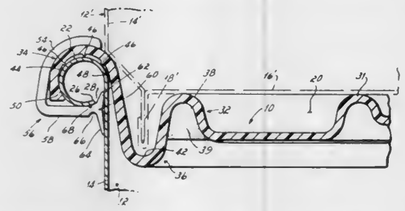
1. A flexible, plastic lid for sealing a container having an open top formed with a lip, comprising:

a center portion;

an annular, inner curl connected to said center portion;

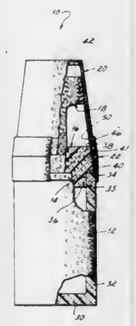
an annular, intermediate curl extending radially outwardly from said inner curl;

an annular, outer curl extending radially outwardly from said intermediate curl, said outer curl having a curved inner surface formed with at least one annularly projecting ridge, said outer curl being adapted to flex and stretch over said lip of said container so that said inner surface including said projecting ridge engages said lip forming a seal therebetween, said container includes a closed bottom formed with an annular rim, said inner curl being formed with a convex outer surface, said outer curl being formed with a convex outer surface and said intermediate curl



being formed with a convex outer surface spaced vertically below said outer surfaces of said inner and outer curls, said inner curl surface spaced below said outer curl surface, said lid permitting stacking of a second container atop said container sealed by said lid wherein said bottom rim of said second container is adapted to be received within said intermediate curl, said intermediate curl positioning said second container so that said outer wall of said second container substantially aligns with said outer wall of said sealed container beneath, the weight of said second container thereby being supported by said outer wall of said sealed container beneath to protect said lid from damage.

4,632,273
DISPOSABLE INSULATED CONTAINER
Richard Rhine, Carthage, Mo., assignor to Ellen M. Rhine, Carthage, Mo. and Mary R. Streets, Overland Park, Kans.
Filed Sep. 6, 1985, Ser. No. 773,311
Int. Cl.[4] B65D *41/16*
U.S. Cl. 220—411 **7 Claims**



1. A disposable insulated container and drinking cup combination, said combination comprising

an insulated container manufactured from plastic foam material, said container having a closed bottom, a side wall, and an open top,

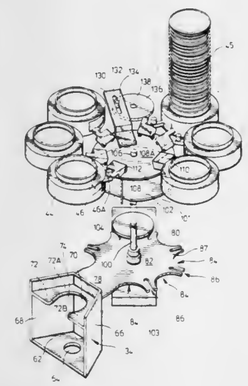
an insulated manufactured from plastic foam material, said lid having a top section, a bottom section, and a shoulder at the intersection of said top and bottom sections, said

bottom section being press fit into the open top of said container with said shoulder being engaged with the top edge of said side wall of said container, at least a portion of said lid having an upwardly and inwardly tapered peripheral surface,

at least one inverted drinking cup mounted upon the top of said lid, said drinking cup having an inner tapered surface engaged with said tapered surface of said lid, and

securement means for sealingly securing said cup, lid and container in an assembled relationship, said cup and lid being removable from said container only upon breakage and removal of said securement means from said combination.

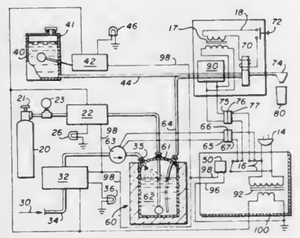
4,632,274
BEVERAGE DISPENSER
Manfred Garbe, 9 Downing Street, Downsview, Ontario, Canada
Filed Jun. 20, 1984, Ser. No. 622,488
Claims priority, application Canada, Aug. 3, 1983, 433802
Int. Cl.[4] G07F *13/10*
U.S. Cl. 221—96 **32 Claims**



1. A cup dispenser, comprising:

a plurality of stationary cup carrying magazines or stacks, each magazine surmounting a dispenser mechanism for discharging the lowermost cup from the stack or magazine, an activator arm secured to each dispenser which arm is movable across relative to the dispenser to discharge the lowermost cup from the stack or magazine and thereafter be returned to its original position, a plurality of actuator arms, one for each activator arm of each dispenser mechanism, each actuator arm being movable from a position spaced from the activator arm to a position proximate the activator arm, only one actuator arm being pivotable to a position proximate the activator arm at any one time, means to activate only one actuator arm to move to a position proximate the activator arm, and means to activate the actuator arm to engage the activator arm to cause the activator arm to move relative to the dispenser to discharge the lowermost cup from the magazine or stack, a cup carrier movable from a discharge station to a position below the dispenser mechanism and stack or magazine from which the lowermost cup is to be discharged, prior to the dispenser mechanism discharging the lowermost cup from the stack or magazine, the cup carrier to receive the cup from the stack or magazine and to be reciprocated to the discharge station and means to reciprocate the cup carrier from the discharge station to the position below the dispenser mechanism to be activated to discharge the lowermost cup, and back to the discharge station.

4,632,275
PALATABILITY STABILIZER
Charles K. Parks, P.O. Box 998, Abilene, Tex. 79604
Filed Sep. 21, 1984, Ser. No. 653,874
Int. Cl.[4] B67D *1/00*
U.S. Cl. 222—25 **16 Claims**



1. A palatability stabilizer for use in a postmix fountain machine of the type requiring connection to a pressurized carbon dioxide supply, a water supply, and a drink flavor supply and of the type having a carbonator for connection to said carbon dioxide supply through a carbon dioxide supply line and for connection to said water supply through a water supply line, said carbonator for producing carbonated water, a mixing valve for connection to said flavor supply and connected to said carbonator for mixing a carbonated fountain drink prior to dispensing it, and an electrical power source connected to said carbonator and said mixing valve, said palatability stabilizer comprising:

(a) carbon dioxide pressure actuated means connected to said carbon dioxide supply line and to said power source for automatically disconnecting power to said carbonator and said mixing valve when the carbon dioxide pressure is below a predetermined carbon dioxide pressure, wherein said carbon dioxide pressure actuated means for disconnecting power further comprises:

(i) a carbon dioxide pressure-sensing electrical switch attached to said carbon dioxide supply line for sensing pressure therein between said carbon dioxide supply and said carbonator, and

(ii) at least one relay electrically connected to said electrical power source through said carbon dioxide pressure switch for activation thereby, said relay having means therein for disconnecting power from said carbonator and said mixing valve when said relay is activated by said carbon dioxide pressure switch, thereby disabling the drink machine with properly proportioned drink components therein before the carbonated water in said carbonator is inadequately carbonated; and

(b) water pressure actuated means connected to said water supply line and to said power source for automatically disconnecting power to said carbonator and said mixing valve when the water pressure is below a predetermined water pressure.

4,632,276
LIQUID DISPENSING DEVICE
Yukio Makino, Kabushikigaisha Towa Japan 29-5, Ikebukuro Honcho 4-chome, Toshima-ku, Tokyo, Japan
Filed Dec. 19, 1984, Ser. No. 683,502
Claims priority, application Japan, Dec. 30, 1983, 58-200545[U]; Dec. 30, 1983, 58-200547[U]
Int. Cl.[4] B67B *7/50*; B65D *83/14*
U.S. Cl. 222—80 **2 Claims**

1. A liquid dispensing device of the type in which the liquid is dispensed under the force of a liquefied pressurized gas comprising:

a cask holding a liquid to be dispensed;

a tubular bomb holder in the form of a cylindrical upper cap having a bottom and fitted about a mouth of the cask and

adapted for performing a longitudinal movement relative to said cask;

a lower cap member fitted to a lower open end of said holder and holding a bomb in tight lateral and vertical engagement therewith and in cooperation with said bomb holder;

a hollow cylinder securely fitted to an inner peripheral end of said bomb holder at a distance from the bottom of said holder;

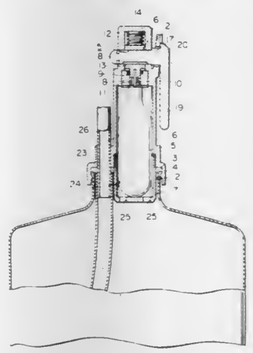
a block slidably received within a cylindrical blind bore of said bomb holder at a position above said cylinder;

a transverse through-hole in said slidable block and said holder;

an operating angle lever having a horizontal projecting portion and a depending portion, said horizontal projecting portion being fitted in said through-hole in said block and acting as a cam adapted for cooperating with the sides of said through-hole which latter acts as a cam follower;

said slide block having a lower extension in the form of a stem slidably received in said hollow cylinder and carrying a stationary needle surrounded by a stationary sealing member both fixed relative to said stem, said needle and the sealing member being disposed at the lower end of said slide block such that, in a bomb stoppering position of said angle lever, the lower end face of the seal projects a small distance from the end face of the stem and the tip of the needle projects a small distance from the lower end face of said seal;

means for resiliently urging said slide block downwards;



through-apertures in said lower cap member for communicating the interior of said bomb holder with the interior of the cask;

fluted passage means on an inner surface of said holder and on the outer surface of said bomb; and dispensing hose means for dispensing the liquid out of said cask;

said needle being movable along with said seal therearound with movement of said slide block brought about by the camming action of said horizontal projecting portion of said operating lever on the through-hole in the slide block without wobbling by virtue of a sliding fit of said stem within said cylinder and tight lateral and vertical engagement of said bomb with said bomb holder;

said horizontal projecting portion having a cam profile such that, in a first position of the depending portion of the operating lever, corresponding to said bomb stoppering position, said needle lies above a top cover of said bomb, in a second position thereof, the needle just completes forming a profiled discharge orifice in the top cover of the bomb, the sealing member then tightly sealing the orifice thus formed in the bomb cover, and, in a third position thereof intermediate between said first and second positions, said needle and the sealing member are disposed slightly above the bomb cover to permit discharge of pressurized gas from said bomb through said fluted passage means and said through-apertures to thereby discharge the liquid through said dispensing hose means out of said cask.

4,632,277

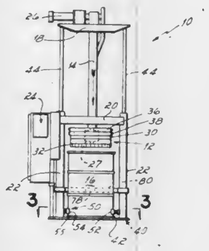
BULK MELTER HAVING DRUM HOLD-DOWN DEVICE

Richard M. Pallante, Norcross, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 19, 1984, Ser. No. 632,490

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.2 **1 Claim**



1. Apparatus for melting and dispensing solid thermoplastic material, comprising

a base plate,

a platen assembly mounted above said base plate, said platen assembly comprising a follower, a heating platen located beneath said follower, and a pump for pumping heated thermoplastic material from the underside of said follower,

motor means mounted upon said base plate and operable to move said platen assembly downwardly into a drum resting upon the top of said base plate,

a drum hold-down mechanism for preventing said drum from lifting from said base plate upon removal of said platen assembly from said drum, which hold-down mechanism comprises,

a pair of mounting plates fixedly secured to said base plate, said mounting plates being located on opposite sides of said base plate,

a hold-down plate movably mounted upon each of said mounting plates,

spring means operable between each of said mounting plates and hold-down plates for biasing said hold-down plates inwardly toward one another,

each of said hold-down plates having a generally V-shaped recess formed thereon and engageable with the peripheral surface of a drum resting atop said base plate to center said drum related to said hold-down mechanism, and

each of said hold-down plates having a tapered leading edge engageable with a drum as a drum is inserted between said mounting plates, said tapered leading edges of said hold-down plates being operable as cam surfaces to force said hold-down plates apart as said drum is inserted therebetween.

4,632,278

DISPENSING CYLINDER WITH CYLINDRICAL HEATER

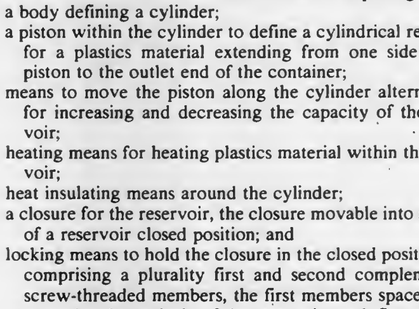
Michael J. Donaldson, Ottawa, Canada, assignor to Northern Teleco M Limited, Montreal, Canada

Filed Nov. 27, 1985, Ser. No. 802,410

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.5 **4 Claims**

1. A dispensing container for dispensing molten plastics material, the container defining a cylinder and comprising a piston movable along the cylinder to change the volume of a cylindrical reservoir for plastics material on one side of the piston, the reservoir having an outlet for molten plastics material and the piston having means to move it along the cylinder and in sealing engagement with cylinder walls which define the reservoir, the container also including a cylindrical heater which is disposed within and extends axially of the container



while passing through and in sealing engagement with the piston so as to be disposed within the cylindrical reservoir, the piston moving along and in sealing engagement with the heater as the piston moves along the cylinder.

4,632,279

MANUALLY PORTABLE CONTAINER

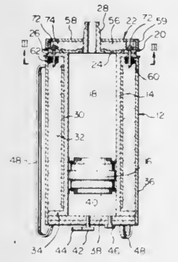
Michael J. Donaldson, Ottawa; Leonard J. Charlebois, Kanata, and Kevin J. Bailey, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 22, 1985, Ser. No. 800,836

Claims priority, application Canada, Jun. 28, 1985, 485913

Int. Cl.[4] B67D *5/62;* **B65D** *88/54;* **B32B** *35/00;* **B29B** *9/00*

U.S. Cl. 222—146.5 **5 Claims**



1. A manually portable container for dispensing molten plastics material, the container having an outlet end with an outlet nozzle at the outlet end and further comprising:

a body defining a cylinder;

a piston within the cylinder to define a cylindrical reservoir for a plastics material extending from one side of the piston to the outlet end of the container;

means to move the piston along the cylinder alternatively for increasing and decreasing the capacity of the reservoir;

heating means for heating plastics material within the reservoir;

heat insulating means around the cylinder;

a closure for the reservoir, the closure movable into and out of a reservoir closed position; and

locking means to hold the closure in the closed position and comprising a plurality first and second complementary screw-threaded members, the first members spaced-apart around and exteriorly of the reservoir, each first member engageable with a second member through aligned slots in the body and closure with the closure in the closed position and with the first members slidably held within guides provided upon the body to allow movement of the engaged members along the slots, the closure slots having narrow and wide sections with the engaged members holding the closure in the closed position when located through the narrow slot sections and permitting closure movement out of the closed position when the engaged members are in the wide slot sections by movement of the closure away from the second members.

4,632,280

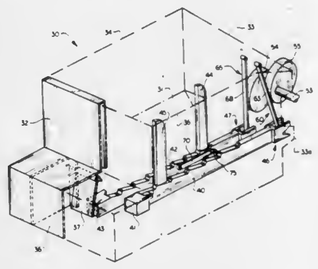
ICE DISPENSING MECHANISM

Harold S. Mawby, Belding; Duane H. Harris, Gowen, and Myrne E. Fryover, Lakeview, all of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 25, 1984, Ser. No. 654,233

Int. Cl.[4] G01F *11/00, 11/14*

U.S. Cl. 222—275 **11 Claims**



1. An ice dispensing mechanism comprising:

a bin for storing ice pieces, the bin having a floor, a front wall, a rear wall, and a pair of opposed sidewalls, the bin including at its front end an aperture through which the ice pieces are expelled from the interior of the bin;

a pair of elongated, side-by-side ice rams mounted in the bin for pushing the ice pieces through the aperture, the ice rams reciprocating along parallel lines, one of the ice rams moving linearly toward the front of the bin as the other moves linearly toward the rear thereof; and

drive means for moving the ice rams relative to the bin and to each other, the drive means including a drive mechanism for alternately moving the rams toward the front of the bin and a separate return mechanism interconnecting said ice rams and operated by the front moving ram to drive the other ram toward the rear of the bin for alternately moving the rams toward the rear of the bin.

4,632,281

MAGNADRUM PUMP ASSEMBLY

Robert E. Wold, Troy, Mich., assignor to Johnstone Pump Company, Troy, Mich.

Filed Mar. 29, 1984, Ser. No. 594,750

Int. Cl.[4] B67D *5/42*

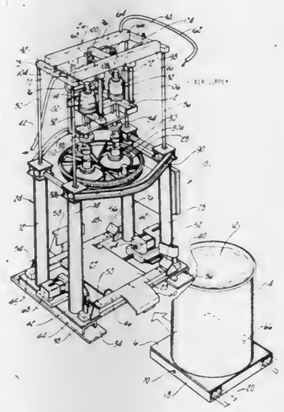
U.S. Cl. 222—389 **24 Claims**

18. In a liquid dispensing system of the type comprising a ram plate and means for urging the plate downwardly into the open top of an upright container to bear against the container walls and apply pressure to a liquid in the container;

an annular edge seal of pliable material seated on the peripheral edge of the plate and coacting with the interior side walls of the container when the plate entered therein to form a sealed relationship therewith, said edge seal having, as a one-piece unit, a hollow upper portion, a solid lower portion, and a middle connector portion joining the upper and lower portions, the middle connector portion, taken relative to said plate, being of reduced radial dimension, said lower portion having a beveled outside lower edge flaring radially outwardly from bottom to top thereof and operative to act on the container opening

upon entering same to center the plate relative to the container axis upon initial entry.

19. In a liquid dispensing system of the type which includes a ram plate, support and elevator means for supporting and urging the plate into an upright, open-ended container to bear against the container walls and apply pressure to a liquid in the container, a pump and an air motor driving the pump to draw the liquid from the container, and air supply and exhaust paths for said air motor, the improvement wherein:



(A) said support means is constituted at least in part by a hollow beam of rigid structural material having a pneumatically sealed interior hollow, an air inlet to said hollow, and an air outlet from said hollow;

(B) the hollow of said beam defines an air conduit between said inlet and said outlet; and

(C) means connecting said motor to one of said inlet and outlet whereby said air conduit forms a part of an air supply or exhaust path for said motor,

whereby said beam perform both structural and air conduit functions.

4,632,282

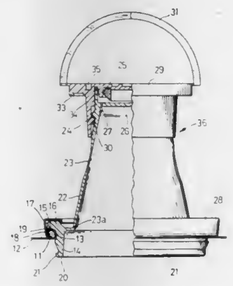
SPOUT ASSEMBLY

Hirohisa Nagashima, 718 Ohnohara, Shimo-akasaka, Kawagoe-shi, Saitama-ken, Japan

Filed Mar. 2, 1984, Ser. No. 585,798

Int. Cl.[4] B65D *5/06*

U.S. Cl. 222—529 **6 Claims**



1. A spout assembly adapted to be fastened to a spout assembly fitting portion of a container for pouring a material in the container through the spout assembly, comprising:

a spout section adapted to be fastened to the container, said spout section including a ring fitting portion to be placed above the spout assembly fitting portion and having a circular upper surface, a lower surface, an outer portion extending downwardly and radially outwardly from the circular upper surface, diameter of the outer portion increasing as the outer portion extends downwardly to thereby form a tapered outer surface, and an inner portion adjacent the outer portion, an overhang extending downwardly and radially outwardly from the outer portion of the ring fitting portion, diameter of the overhang increasing as the overhang extends downwardly, a concave groove formed in the ring fitting portion inside the overhang, said concave groove extending upwardly from the lower surface of the ring fitting portion to provide and maintain flexibility of the overhang, a spout base extending downwardly from the lower surface of the inner portion of the ring fitting portion beyond the overhang so that the spout assembly fitting portion is securely retained between the overhang and the spout base, said spout base having a plurality of pieces extending outwardly from the spout base to prevent the spout base from being removed from the spout assembly fitting portion, a tubular portion integrally connected to the upper portion of the spout base and having an outer end and first engaging means adjacent to the outer end, said tubular portion being flexible so that the tubular portion extending outwardly from the spout base can be folded to be substantially situated under the ring fitting portion, and a sealing diaphragm integrally formed with the tubular portion adjacent to the outer end of the tubular portion,

an annular ring to be placed over the ring fitting portion and the overhang of the spout section so that the spout section can be securely connected to the spout assembly fitting portion of the container, and

a cap member including a top wall portion adapted to be placed above the outer end of the tubular portion, a cylindrical portion integrally connected to the top wall portion and extending downwardly therefrom, said cylindrical portion having a second engaging means engaging the first engaging means when the cap member is fastened to the tubular portion, and a handle portion integrally formed with the cap member, said handle portion being disposed around the top wall portion when not used and being oriented upwardly from the top wall portion when used, the diameter of the handle portion, when the handle portion is not used, being smaller than the inner diameter of the ring fitting portion of the spout section and being substantially located inside the ring fitting portion so that one of the containers fitted with one of the spout assemblies can be stacked on another of the containers likewise fitted with one of the spout assemblies without interference by the handle portion of the spout assembly of the lower of the stacked containers, the diameter of the top wall portion being larger than the diameter of the tubular portion of the spout section so that when the tubular portion is folded, the top wall portion seals around the tubular portion.

4,632,283

MOLTEN METAL DISCHARGING DEVICE

Kazumi Arakawa, Anjo; Masuo Sugie, Tokoname; Takashi Watanabe, Chiryu; Takumi Nishio, Toyota; Toshio Kawamura, Takahama; Tsutomu Nagahata, Osaka, and Takashi Matsushita, Wakayama, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Feb. 17, 1984, Ser. No. 581,510

Claims priority, application Japan, Nov. 2, 1983, 58-206477; Nov. 2, 1983, 58-206478; Nov. 2, 1983, 58-206480

Int. Cl.[4] B22D *41/08*

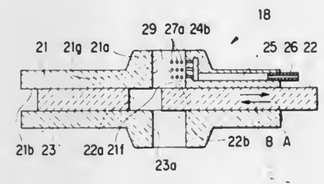
U.S. Cl. 222—600 **27 Claims**

21. A molten metal discharging device comprising:

a stationary plate adapted to be mounted at a bottom portion of a container accomodating molten metal, the stationary plate having a molten metal passage bore for permitting the molten metal from the container to be discharged therethrough, and

a slide plate slidable along a lower face of the stationary plate and adapted to open or close the passage bore by being slidably displaced relative to that stationary plate, in which

the stationary plate comprises a gas supply member made of refractory material and constituting a part of a circumferential wall of the passage bore, the gas supply member being disposed only on one side of the circumferential wall in the sliding direction of the slide plate over a predetermined range in a circumferential direction of the passage bore, and a main body of the stationary plate made of dense refractory material to which said gas supply member is tightly fitted,



the gas supply member has a plurality of gas supply hole means for permitting the supply of the gas into said passage bore, and

the stationary plate has a chamber communicated with the plurality of gas supply hole means so as to supply the gas to the plurality of gas supply hole means substantially at a same level of pressure and a gas introduction hole for introducing the gas from an outside into the chamber.

4,632,284

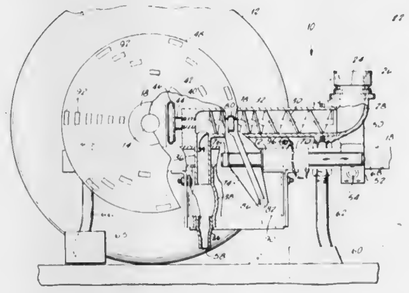
SEEDING DEVICE

Fernando Erazo, Closter, N.J., and Richard W. Conant, West Southport, Me., assignors to Nepera Inc., Harriman, N.Y.

Filed Apr. 23, 1984, Ser. No. 603,144

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—615 **10 Claims**



1. A seeding device for delivery of seed carried in a fluid delivery substance comprising,

a housing,

storage means on said housing for retaining a supply of seed in said fluid delivery substance,

metering means operatively connected to said storage means to transport said seed in said fluid delivery substance to a delivery outlet,

means to selectively vary said metering means to control the quantity of said seed in said fluid delivery substance dispensed from said delivery outlet,

means to eject said fluid delivery substance in spaced pulsed batches including a pump tube and a pump nozzle, the pump nozzle being closely received by the pump tube and reciprocatingly slidable therein, the pump tube being in fluid communication with the delivery outlet and wherein the fluid delivery substance is retained within the pump tube and nozzle to be ejected at predetermined spaced intervals,

drive means associated with the housing to move the housing and the metering means along an area to be seeded, the drive means including a wheel support for rolling contact with the ground and means operatively interconnecting the wheel support to the pump nozzle to cause the pump nozzle to slide reciprocatingly within the pump tube thereby ejecting the fluid delivery substance at the predetermined spaced intervals, and

the means operatively interconnecting the wheel support to the pump nozzle including a cam means coupled to the wheel support for rotation therewith, a rocker arm pivotally secured to the housing, a cam follower carried by the rocker arm and positioned for contact with the cam means and wherein rotation of the cam means effects pivoting movement of the rocker arm from a first position to a second position, and means operatively interconnecting the rocker arm to the pump nozzle for effecting movement of the pump nozzle within the pump tube upon pivotal movement of the rocker arm between the first and second positions, wherein movement of the rocker arm from the first position to the second position effects discharge of the fluid delivery substance from the pump nozzle.

4,632,285

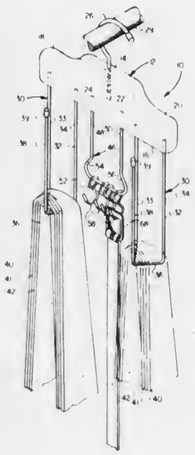
CONVERTIBLE NECKTIE AND BELT HANGER APPARATUS

Richard F. Dillingham, 4309 Shady Hill, Dallas, Tex. 75229

Filed Feb. 22, 1985, Ser. No. 704,638

Int. Cl.[4] A47G *25/74*

U.S. Cl. 223—88 **7 Claims**



7. A necktie and belt hanger apparatus comprising:

an elongated generally planar support member;

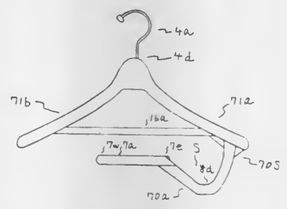
necktie hanger means connected to and depending from said support member, said necktie hanger means including a pair of formed wire hanger members each including at least first and second spaced apart hanger bars for receiving therebetween a plurality of neckties hung between said hanger bars in stacked relationship, belt hanger means connected to and depending from said support member and including a plurality of belt hook members each having a body and a tip projecting from said body in the same

direction as the spacing between said hanger bars so that said support member can be mounted on a vertical wall with said hook means and said hanger bars oriented to receive and permit removal of neckties and belts or the like with respect to said apparatus.

4,632,286
CLOTHES HANGER

Hisashi Koyama, 22/401, Syakusonji-cho, 25-banchi, Hirakata-shi, Osaka-fu 573, Japan

PCT No. PCT/JP83/00212, § 371 Date Mar. 1, 1984, § 102(e) Date Mar. 1, 1984, PCT Pub. No. WO84/00100, PCT Pub. Date Jan. 19, 1984
Continuation of Ser. No. 589,072, Mar. 1, 1984, abandoned. This PCT application Jul. 1, 1983, Ser. No. 807,208
Claims priority, application Japan, Jul. 1, 1982, 57-115163
Int. Cl.[4] A47G *25/16, 25/30*
U.S. Cl. 223—88 **21 Claims**



1. A garment hanger comprising a hook means for engaging a supporting means; a trouser mounting means for supporting a pair of trousers, said trouser mounting means including a trouser mounting member adapted to support a pair of trousers folded thereover and having a first and a second end which are spaced apart by a predetermined distance; a connecting means for rigidly connecting said hook means and said trouser mounting means, said connecting means having first, second and third portions, said first portion connected to and extending downwardly from said trouser mounting member, said third portion connected to and extending downwardly from said hook member, said second portion connecting said first and third portions below said trouser mounting member and proximate said first end of said trouser mounting, said hook means and said connecting means cooperating to support said trouser mounting means centrally below said hook means, when said hook means engages said supporting means, with said trouser mounting member disposed horizontally, said first and second portions of said connecting means defining a recess below said horizontally disposed trouser mounting member, said recess centered on said first end of said trouser mounting member and having an upper part and a lowermost point; and first holding means for engaging and holding said trousers against slippage with respect to said trouser mounting member when said second end of said trouser mounting member is lowered with respect to said first end of said trouser mounting member, said first holding means disposed proximate said first end of said trouser mounting member so as to engage said trousers only when said second end of said trouser mounting member is lowered with respect to said first end of said trouser mounting member.

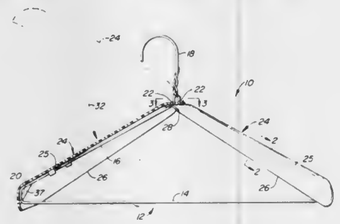
4,632,287
ACCESSORY FOR GARMENT HANGER

Alice K. Bevelander, P.O. Box 2656, Carmel, Calif. 93923

Filed Feb. 24, 1986, Ser. No. 832,118
Int. Cl.[4] A41D *27/22*
U.S. Cl. 223—98 **1 Claim**

1. In a garment hanger, unit having a hook segment and a pair of inclined side segments secured to the hook segment and extending outwardly and downwardly therefrom in opposed directions, the improvement comprising:

a shoulder-supporting member for an inclined side segment of the garment hanger, the member adapted to be removably mounted on the garment hanger in overlying relationship to an inclined side segment and adapted to extend laterally from the corresponding inclined segment to present a garment-engageable, convex upper surface throughout a major portion of its length, the width of each member progressively increasing as the outer end of the member is approached, each member having a substantially spherical outer surface portion at the outer end thereof, the inner end of each member being flat and having an opening therethrough for removably receiving the hook segment of the garment hanger; and

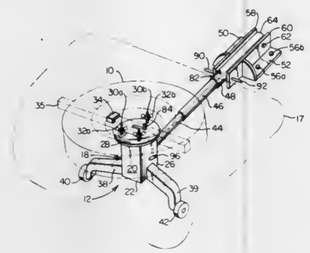


means on the member for stabilizing the member when it overlies the corresponding inclined side segment, said stabilizing means including a pair of projections secured to the inner surface of the member and spaced from the outer end of the member and spaced from each other longitudinally of the member so that the projections can frictionally engage the adjacent inclined side segment at longitudinally spaced locations thereon, the projections having flat outer faces for engaging respective, opposite side surface portions of the inclined side segment for receiving and thereby releasably holding the inclined side segment intermediate the ends thereof, there being a pair of oppositely facing spaced, flat elements at the outer end of each member on the inner surface thereof to present a slot therebetween for receiving and thereby positioning substantially the entire outer end of the corresponding side segment relative to the member.

4,632,288
TIRE CARRIER

Roy M. Bullock, 4023 Morse Rd., Columbus, Ohio 43219

Filed Oct. 4, 1985, Ser. No. 784,619
Int. Cl.[4] B62D *43/00*
U.S. Cl. 224—42.12 **15 Claims**



1. A carrier for a spare tire adaptable to be mounted in the trunk of a vehicle, which comprises:

a carriage assembly having a support body which is adapted to mount a spare tire;

wheel means on said carriage assembly which wheel means is adapted to engage the floor of said trunk;

support means which is adapted to be mounted in said vehicle;

telescoping means having one end attached to said support means and the other end attached to said carriage means, wherein said telescoping means is movable towards and away from a retracted position, and said carriage assembly is stored when said telescoping means is in said retracted position;

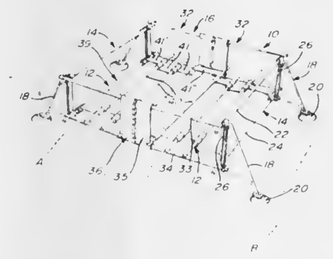
means for restraining vertical movement of said carriage assembly when said telescoping means is in said retracted position; and

locking means for retaining said carriage assembly in said stored position.

4,632,289
AUTO COLLAPSIBLE LOAD CARRIER

Gilles Morissette, 7950 Jacques Rousseau Street, Apt. 403, Rivière-des-Prairies, Canada H1E 1J6

Filed Sep. 23, 1985, Ser. No. 779,024
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—314 **4 Claims**

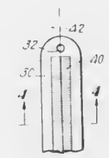


1. A collapsible roof top rack for erection on hard top motor vehicles, comprising: a quadrangular open frame defining a flooring, two end walls and two side walls with the erected rack adapted to be disposed with its end walls transverse to the motor vehicle, securing members mounted to the ends of the end walls to releasably connect the frame to the vehicle roof, with the flooring spaced above said roof; each side wall consists of two similar rigid side wall sections, of substantially equal length, each pivotally interconnected by a hinge member at their adjacent ends and also pivoted to the respective ends of the end walls at the outer ends thereof, said flooring consisting of two flooring sections comprising a plurality of spaced parallel flooring rods extending parallel to the end walls, band-like links pivotally spacedly interconnecting adjacent flooring rods but allowing folding of the latter against the inside of the respective end walls in accordeon-like fashion, and also pivotally interconnecting the outermost rod of each flooring section to the associated end wall; a connector band-like link pivoted to the centermost rod of one flooring section and releasably engageable with the centermost rod of the other flooring section; each end wall comprising a top and a bottom transverse end wall rod and two end wall straps rigidly interconnecting said top and bottom end wall rods at the end portions thereof, the flooring rods of each flooring section, in their folded position, nesting between and in the plane of the top and bottom end wall rods; each side wall section comprises a top and a bottom run respectively, pivotally connected to the top and bottom end wall rods, said hinge member including two hinge leaves and a hinge pin pivotally interconnecting said two hinge leaves, the two hinge leaves consisting of a band-like member folded at the top and bottom edge to surround and be secured to the respective top and bottom runs of the side wall sections, each hinge leaf having a notch adjacent the bottom run of the side wall section, said notch engageable by the end of the centermost rod of each flooring section to interlock said side wall section with said flooring section, wherein disengagement of said centermost rod from said notch allows folding of said flooring sections against said end walls.

4,632,290
SURGICAL STAPLER APPARATUS

David T. Green, Norwalk, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Aug. 17, 1981, Ser. No. 293,111
Int. Cl.[4] A61B *17/10*
U.S. Cl. 227—19 **12 Claims**



1. An anvil for clinching the ends of a U-shaped surgical staple in a surgical stapler comprising: a main channel formed in the surface of the anvil and having a longitudinal axis transverse to the longitudinal axis of the base of the U-shaped surgical staple to be clinched against the anvil, the length of the main channel being at least several times greater than the cross sectional dimension of the staple measured parallel to the longitudinal axis of the main channel, the main channel including a plurality of subordinate secondary channels formed in the surface of the main channel, each secondary channel having a longitudinal axis transverse to the longitudinal axis of the main channel and extending lengthwise across the width of the main channel, the secondary channels being laterally immediately adjacent and substantially parallel to one another, the width of each secondary channel being substantially less than the length of the main channel, the depth of each secondary channel measured from the bottom of the main channel to the bottom of the secondary channel being substantially less than the depth of the main channel measured from the top of the main channel to the bottom of the main channel so that all parts of all of the secondary channels, including the boundaries between laterally adjacent secondary channels, are recessed within the main channel, and the width and depth of each secondary channel being great enough to receive and guide the end of the staple substantially parallel to the longitudinal axis of the secondary channel during clinching of the staple.

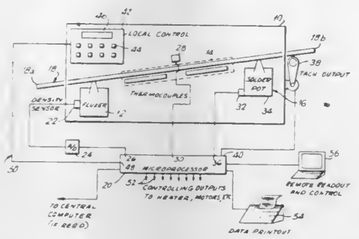
4,632,291
AUTOMATIC WAVE SOLDERING MACHINE

Armin Rahn, St-Jean-Sur-Richelieu; William H. Down, Brossard; Marcel Drouin, St.-Hubert; Matthew J. Rudzicz, Montreal; John F. Buszard, Ste-Anne de Bellevue; Elie Makhoul, Carignan, and Ralph W. Woodgate, Brewster, all of Canada, assignors to Electrovert Ltd., Canada

Filed Feb. 28, 1983, Ser. No. 470,494
Int. Cl.[4] B23K *3/04;* H05K *3/34;* H05B *7/16*
U.S. Cl. 228—9 **17 Claims**

1. A heater for use in heating circuit boards to a predetermined temperature in a machine having a conveyor which carries the circuit boards through a soldering section of the machine, the heater comprising first heater means adjacent the conveyor for applying a first quantity of heat to the circuit boards, temperature sensing means adjacent the conveyor and deriving signals indicative of the temperature of the circuit boards as they exit from the first heater means, second heater means adjacent the conveyor and downstream of the first heater means for applying a second quantity of heat to the circuit boards, and control means having an input for setting

said predetermined temperature, an input supplied by the signals from the temperature sensing means, a control output at which are derived control signals controlling the second quantity of heat supplied by the second heater means to change the temperature of the circuit boards so that as they exit from the second heater means they are approximately at the predetermined temperature, the control means also including means for selectively storing data corresponding to thermal characteristics of the circuit boards and processing means for converting the signals from the temperature sensing means to adjusted signals as a function of said thermal characteristics of the boards, the adjusted signals representing the temperature of the boards.

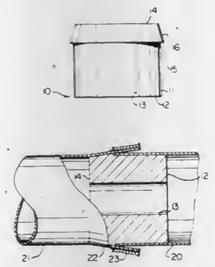


4,632,292

METHOD OF JOINING PIPES BY EXPLOSIVE WELDING USING DISINTEGRATING ANVIL

Bohdan Gnyra, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 376,007, May 7, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,538
Claims priority, application Canada, May 11, 1981, 377288
Int. Cl.⁴ B23K *20/08*
U.S. Cl. 228—107 **10 Claims**



1. A method of joining an inner metal pipe with an outer surrounding metal tubular portion by means of explosive welding which comprises placing a contact anvil inside the inner pipe to support the said inner pipe during welding and then subjecting the pipe and tubular portion to explosion welding such that the surface of the inner pipe is joined metallurgically with the inner surface of the outer tubular portion, characterized in that the anvil consists essentially of a hydrated aluminum sulphate which contains about 50% to about 55% water of crystallization.

4,632,293

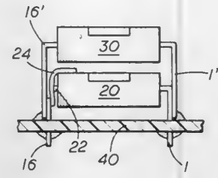
METHOD OF UPGRADING MEMORY BOARDS

Dov Y. Feinstein, 1669 S. Voss #880, Houston, Tex. 77057

Filed Sep. 3, 1985, Ser. No. 771,656
Int. Cl.⁴ B23K *31/02;* **H05K** *3/00, 3/34*
U.S. Cl. 228—119 **7 Claims**

1. The method of upgrading memory boards by bypassing a first soldered memory chip by an upward pin compatible second memory chip having a larger memory capacity, which comprises:

cutting at least one of the power supply pins of said first memory chip at the closest point to the body of said first memory chip;



insulating said cut pins from the part of the pins which remain attached to the body of said first memory chip;

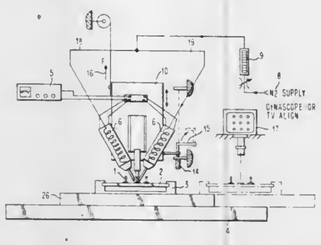
placing said second memory chip on top of said first memory chip so that the pins of said second memory chip touch the corresponding pins of said first memory chip and soldering all adjacent pair of pins together.

4,632,294

PROCESS AND APPARATUS FOR INDIVIDUAL PIN REPAIR IN A DENSE ARRAY OF CONNECTOR PINS OF AN ELECTRONIC PACKAGING STRUCTURE

William O. Druschel, Granite Springs; Alexander Kostenko, Hopewell Junction, and Rolf G. Meinert, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,823
Int. Cl.⁴ B23K *31/00*
U.S. Cl. 228—119 **11 Claims**



1. A method for removing a defective connector pin having a brazed joint, where a brazed joint is defined as the mechanical and electrical joining of a connector pin and a package contact pad by a solder that melts at a lower temperature than that of the joined metals, where said defective connector pin having a brazed joint may be any one of a plurality of connector pins arranged in an array of closely spaced connector pins contained in an integrated circuit package structure,

said packaging structure comprising,

a substrate having a first planar surface and a second planar surface oppositely disposed from said first planar surface, said first planar surface containing n arrays of closely spaced contact pads, where n is a positive integer greater than one, said second planar surface of said substrate containing an array of closely spaced package contact pads,

passive wiring circuit means contained at least in part in said substrate for interconnecting said contact pads of said n arrays of contact pads contained on said first planar surface of said substrate and said package contact pads of said array of package contact pads contained on said second planar surface of said substrate,

n interconnected integrated circuit chips, each of said n interconnected integrated circuit chips having a first planar surface and a second planar surface oppositely disposed from said first planar surface, each of said n interconnected integrated circuit chips having an array of chip contact pads on said first planar surface thereof, said array of chip contact pads of each of said n interconnected integrated circuit chips respectively corresponding to and electrically connected to one of said n arrays of contact pads contained on said first planar surface of said substrate, each of said n arrays of chip contact pads providing electrical contact to the integrated circuits contained on the chip corresponding thereto, and

each of said package contact pads of said array of closely spaced package contact pads having a connector pin brazed thereto by a brazed joint,

said method comprising the following steps:

(a) placing said packaging structure with said array of closely spaced connector pins extending in an upward direction in a fixture movable in first and second orthogonal directions within a plane;

(b) moving said fixture containing said packaging structure to accurately position a connector pin to be removed under a controllable connector pin gripper mechanism, said controllable connector pin gripper mechanism being moveable up and down in a direction perpendicular to the second planar surface of said substrate containing said array of closely spaced connector pins brazed thereto, said gripper mechanism having pin gripper means for gripping said connector pin to be removed;

(c) lowering the controllable pin gripper mechanism to a position where the upper portion of said connector pin to be removed is encompassed by the pin gripper means of the controllable connector pin gripper mechanism;

(d) gripping the connector pin to be removed with the pin gripper means of the controllable connector pin gripper mechanism;

(e) subjecting said controllable connector pin gripper mechanism including said pin gripper means to a relatively constant fixed upper force of predetermined magnitude; and

(f) utilizing a hot gas nozzle having a section removed at the end next to said pin gripper means, placing the nozzle close to the connector pin to be removed and inbetween adjacent connector pins subjecting the brazed joint of said connector pin to a controlled stream of heated gas, whereby when the solder of the brazed joint of the connector pin reaches, or closely approaches the reflow temperature of the braze material the connector pin to be removed will be separated from the associated package contact pad.

4,632,295

REDUCTION ATMOSPHERE WORKPIECE JOINING

Vlasta A. Brusic, Amawalk; Peter J. Elmgren, Binghamton; Charles J. Owen, Owego; David W. Sissenstein, Jr., Endwell, and Helen L. Yeh, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1985, Ser. No. 764,710
Int. Cl.⁴ B23K *35/36*
U.S. Cl. 228—123 **23 Claims**

1. A process for joining a workpiece to a substrate which comprises:

a. applying solder to the area of said substrate where the workpiece is to be joined, or to said workpiece, or to both;

b. applying to at least a portion of the area of said substrate where the workpiece is to be joined, a material selected from the group of dihydric alcohols, polyhydric alcohols, ether derivatives thereof, or mixtures thereof;

c. positioning a workpiece on said substrate in contact with at least a portion of said material;

d. heating the resulting assembly in a reducing atmosphere; and

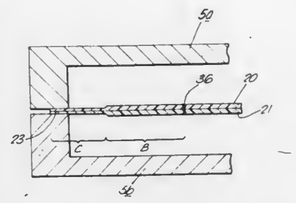
e. thereby joining said workpiece to said substrate.

4,632,296

FORMING OF STIFFENED PANELS

Martin H. Mansbridge; John Norton; Paul W. Beazley-Long, and David J. Irwin, all of Bristol, England, assignors to British Aerospace PLC, London, England

Filed May 3, 1985, Ser. No. 730,078
Claims priority, application United Kingdom, May 5, 1984, 8411611
Int. Cl.⁴ B23K *31/00;* **B23P** *11/02*
U.S. Cl. 228—157 **16 Claims**



1. A method of forming a stiffened panel having, when formed, spaced upper and lower surfaces and internal stiffeners extending therebetween, at least some of the stiffeners being required to be located at specified, generally irregular positions within the formed panel, the panel being formed from first and second metal sheets, at least the first sheet being capable of both superplastic deformation and diffusion bonding, and also provided with at least one control region of different thickness compared with other regions of the sheet, including the steps of:

attaching the sheets together at a series of attachment lines and the control region or regions being in predetermined relationship with one another,

placing the attached sheets in a mould and heating to within that temperature range within which superplastic deformation and diffusion bonding takes place,

urging those areas of the first sheet between the attachment lines away from the second sheet by a common differential pressure at a rate within that range of strain rates at which superplastic deformation occurs to form a series of cavities between the two sheets such that peripheral parts of those areas urged away from the second sheet form side walls of neighbouring cavities and become diffusion bonded together to provide internal stiffeners of the finished panel, whereby the selective positioning of said control region or regions tends to equalize any unequal strain rates of superplastic deformation of regions of the first sheet forming adjacent cavities of the series such that the internal stiffeners adopt the specified positions in the formed panel.

4,632,297

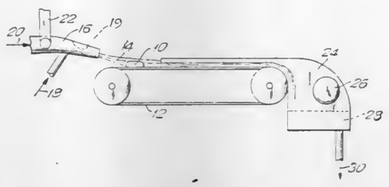
METHOD AND APPARATUS FOR FEEDING SHAPE-WELDED WORKPIECES IMMEDIATELY AFTER FORMATION

Bodo Hermann, Bottrop, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,608
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420376
Int. Cl.⁴ B23K *9/04*
U.S. Cl. 228—222 **5 Claims**

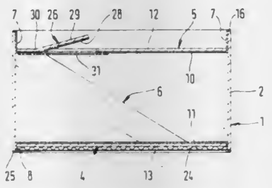
1. A process for cooling the surface of a workpiece which is built up by welding, comprising: directing an air and water mixture stream against the surface of the workpiece such that

a laminar flow of air and water is achieved over the surface; and sucking off the water from the surface before it reaches its



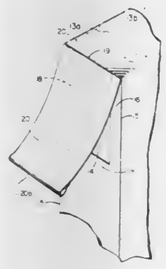
boiling point using an air flow rate sufficient to prevent the formation of steam at the surface of the workpiece.

4,632,298
PACKING CONTAINER
Walter Schellenberg, Diepoldsau, Switzerland, assignor to Sandherr Packungen AG, Diepoldsau, Switzerland
Filed Feb. 6, 1986, Ser. No. 826,729
Claims priority, application Switzerland, Apr. 24, 1985, 01751/85
Int. Cl.[4] B65D *3/10, 5/00, 13/00*
U.S. Cl. 229—5.5 **9 Claims**



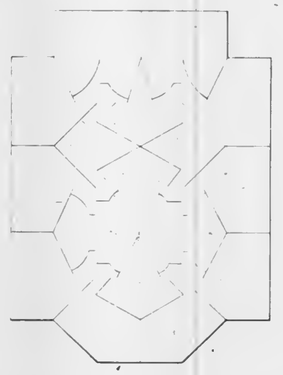
1. A packing container having a cylindrical container body made from a coated cardboard material and container bases fixed to its two ends and which with a cylindrical border region are in contact with the inner face of the container body, at least one of the container bases comprising an aluminium foil and having a tear-open grip, wherein there is a cardboard plate fixed to the aluminium foil portion stretched over the open cross-section of the container body and thereby reinforcing said portion of a container base.

4,632,299
RECLOSABLE CONTAINER
Albert E. Holmberg, 5316 Interlachen Blvd., Edina, Minn. 55436
Filed Jun. 3, 1985, Ser. No. 740,412
Int. Cl.[4] B65D *43/00*
U.S. Cl. 229—7 R **3 Claims**



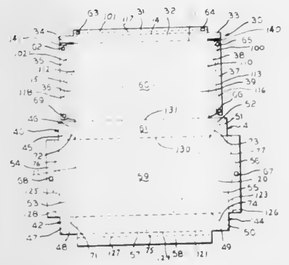
1. A reclosable container comprising,
a container body including side panels and top and bottom panels, all interconnected after filling to sealingly enclose a product therewithin,
one of said panels having a discharge opening formed therein with a closure flap hinged at a peripheral portion of said opening,
panel portions surrounding said opening to provide flap attachment portions,
reusable, pressure-sensitive adhesive tape connected to the hinged closure flap and overlying said attachment panel portions when said flap is in closed position to combine with said flap to removably, sealingly close said opening,
said attachment panel portions having an adhesive repellant layer on the surface to permit sealing enagement with the pressure-sensitive adhesive tape but permitting removal of the tape from the attachment portions without delaminating the panel surface,
and a second reusable pressure-sensitive adhesive tape having an adhesive repellant on the back side thereof and removably applied to the first mentioned tape and being of substantially equal width therewith and removably adhered to the outer surface of said flap to permit separation therefrom and removal from the under side of the outer tape to expose a fresh adhesive surface for continued resealing between the exposed adhesive surfaces of the outer tape and the flap attachment portions of the container.

4,632,300
CONTAINER PARTITION
John R. Bartlett, Columbus, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 5, 1985, Ser. No. 762,476
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—15 **16 Claims**



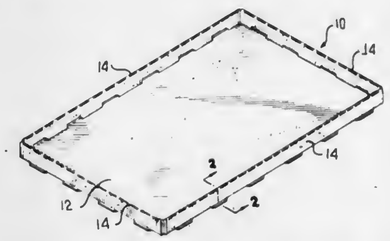
1. A compartmented multi-cell one-piece container partition to hold segregated articles having contact points in a box comprising, a rectangular planar horizontally disposed blank of foldable sheet material cut and folded, the blank being so constructed and arranged that there is means to provide vertically disposed segments forming separator walls defining a plurality of separator cells to separate the segregated articles at their contact points with the erected partition having a length and width equal to the planar blank and not exceeding the inside length and width of the box, each of said vertically disposed segments having a top and a bottom end and each segment being folded from the blank along a hinge line disposed intermediate the top and bottom ends of each segment, the vertically disposed segments being so constructed and arranged that adjacent segments cooperate to form a cell for one of the articles, whereby the segments extend above and below the plane of the blank to form walls of the separator cells, there being at least two sets of said hinge lines aligned longitudinally along the blank.

4,632,301
STORAGE CONTAINER BLANK
Donald H. Slack, Highland Park, Ill., assignor to Lincoln Packaging Corp., Highland Park, Ill.
Filed May 28, 1985, Ser. No. 737,694
Int. Cl.[4] B65D *5/24*
U.S. Cl. 206—292 **13 Claims**



1. A storage container blank for articulation into a wedding gown box container for the long term storage of gowns in a manner which prevents the entry of dust and other contaminants into the storage container thus preserving the gown, said storage container means comprising:
lower panel means;
bottom lower side panel means operably attached for articulation to the bottom of said lower panel means along a substantially continuous bottom lower side panel fold edge;
first lower side panel means operably attached for articulation to a first side of said lower panel means along a substantially continuous first lower side panel fold edge;
second lower side panel means operably attached for articulation to a second side of said lower panel means along a substantially continuous second lower side panel fold edge;
said first lower side panel means being substantially opposite said second lower side panel means along said lower panel means;
connection panel means operably attached for articulation to the top of said lower panel means along a substantially continuous lower connection panel fold edge;
said lower panel means, bottom lower side panel means, first lower side panel means, connection panel means and said second lower side panel means being articulated so as to form the lower storage container cavity means;
upper panel means operably attached for articulation to the top of said connection panel means along a substantially continuous upper connection panel fold edge;
top upper side panel means operably attached for articulation to the top of said upper panel means along a substantially continuous top upper side panel fold edge;
first upper side panel means operably attached for articulation to a first side of said upper panel means along a substantially continuous first upper side panel fold edge;
second upper side panel means operably attached for articulation to a second side of said upper panel means along a substantially continuous second upper side panel fold edge;
said first upper side panel means being substantially opposite said second upper side panel means along said upper panel means;
top upper interlocking panel means operably attached for articulation to the top side of said top upper side panel means along substantially continuous top upper interlocking panel fold edge;
first upper interlocking panel means operably attached for articulation to the first side of said first upper side panel means along a substantialy continuous first upper interlocking panel fold edge;
second upper interlocking panel means operably attached for articulation to the second side of said second upper side panel means along a substantially continuous second upper interlocking panel fold edge;
said first upper interlocking panel means being substantially opposite said second upper interlocking panel means along said upper panel means;
one or more corner tab means operably attached at the first edge of said top upper side panel means and the second edge of said top upper side panel means for articulation and connection with adjacent upper side panel means to form rigid sides for an upper storage container cover as well as substantially sealing corners formed therebetween.
said top upper interlocking panel means, first upper interlocking panel means and second upper interlocking panel means being articulated into a position overlapping said top upper side panel means, first upper side panel means and second upper side panel means respectively, thereby being capable of accepting the interposition of said corner tab means so as to lock the articulated panels so as to form the upper storage container cover as a substantially rigid structure with substantially restrained downwardly projecting side panel members;
said upper storage container cover with said downwardly projecting side panel members covering in an overlying fashion the entirety of said lower storage container cavity means;
one or more contaminant barrier means operably interposed upon articulation between one or more of said bottom lower side panel means, first lower side panel means, connection panel means and said second lower side panel means for operably sealing the juxtaposed regions respectively created among same upon articulation of the bottom lower side panel means, first lower side panel means, connection panel means and said second lower side panel means so as to preclude the migration of dust dirt and other contaminants into said lower storage container cavity.

4,632,302
SHALLOW WALL BAKING TRAY
Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.
Filed Sep. 30, 1981, Ser. No. 307,100
Int. Cl.[4] B65D *5/20*
U.S. Cl. 229—171 **4 Claims**



1. A blank for forming a tray having upstanding side walls, said blank comprising a central base panel having a plurality of edges, inner and outer sidewall panels extending along at least certain of said edges and formed integral with said central base panel, each of said outer sidewall panels being connected along an inner edge thereof to a respective inner sidewall panel along an outer fold line and having a free outer edge, each of said inner sidewall panels being connected to said base panel along an inner fold line, and said inner fold line being interrupted by a plurality of C-shaped cuts formed in the respective inner

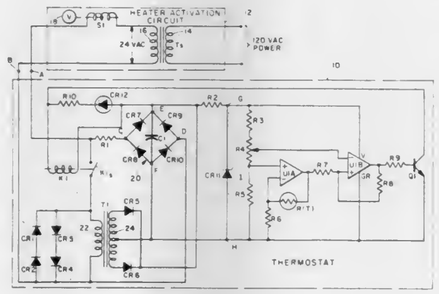
sidewall panel and opening towards said base panel, said C-shaped cuts defining locking flaps projecting from said base panel for engaging a respective outer sidewall panel free edge, said base panel having an upper surface, and each outer sidewall panel being folded beneath a respective inner sidewall panel and being bonded thereto, each outer sidewall panel underlying said locking flaps formed in said respective inner sidewall panel and outer edge portions of said base panel.

4,632,303

ELECTRONIC THERMOSTAT WITH SWITCHED POWER CONVERTER

John N. Roditis, 315 Zoda La., Vista, Calif. 92083

Filed Oct. 25, 1985, Ser. No. 791,299
Int. Cl.⁴ F23N *5/20*
U.S. Cl. 236—10 **11 Claims**



1. An electronic thermostat for controlling the energization of a heater activation circuit comprising:

bistate sensor means responsive to the environmental temperature for generating a corresponding environmental temperature signal, and for generating a predetermined reference signal in response to an operator's input and for, while in a first state changing to a second state when said environmental temperature signal has a predetermined relationship with said reference signal, and for, while in said second state changing to said first state when said environmental temperature signal has said predetermined relationship with said reference signal, said sensor means providing a control signal when in said second state;

power supply means for receiving and controlling the flow of alternating current in a heater activation circuit and for providing uninterrupted power at a predetermined voltage level to said sensor means, said power supply means including:

a. first control means for receiving said alternating current, for controlling said alternating current at a first predetermined level as a first control current and for converting said first control current into a first unidirectional current provided at a first output to said sensor means, said first control means comprising a full wave rectifier having a pair of rectifier inputs and a pair of rectifier outputs, said rectifier inputs connecting said rectifier in series with a heater activation circuit and said rectifier outputs connected to said sensor means, and a current limiting resistor connected in series between one of said rectifier inputs and a heater activation circuit;

b. second control means for controlling said alternating current at a second predetermined level as a second control current and for converting a portion of said second control current into a second unidirectional current provided at a second output coupled to said sensor means, said second control current being greater than said first control current;

c. switch means coupled to said first and second control means and responsive to said control signal for respectively coupling said first and second control currents to said first and second control means respectively during said first and second states; and

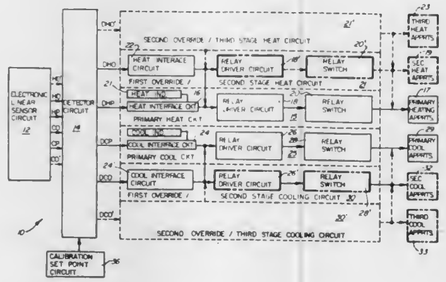
wherein a heater activation circuit is de-energized during said first state and energized during said second state.

4,632,304

ELECTRONIC THERMOSTAT

Alfred T. Newell, III, Birmingham, Ala., and Edward L. Nichols, III, Clearwater, Fla., assignors to A. T. Newell Co. Inc, Birmingham, Ala.

Filed Feb. 28, 1984, Ser. No. 584,398
Int. Cl.⁴ F23N *5/20*
U.S. Cl. 236—46 R **29 Claims**



1. An electronic thermostat, comprising:

means for preselecting a set temperature;

means for sensing temperature;

primary means for actuating a temperature altering apparatus at least until a first deactuation temperature different from said set temperature is detected by said temperature sensing means in the event the sensed temperature reaches the set temperature; and

override means for actuating said same apparatus to the same extent as said primary means for actuating the apparatus in the event the sensed temperature reaches an override temperature which is different from said set temperature by a preselected temperature increment at least until a second deactuation temperature is detected by said temperature sensing means including,

means for generating an override detection signal in response to the sensed temperature reaching the override temperature, and

means for producing an override actuation signal a preselected override time delay period after said override detection signal is generated,

said override actuation signal producing means and the primary actuation signal producing means sharing a common driver circuit for producing an actuation signal on an output thereof in response to either of said primary and override detection signals, and

each of said primary and override actuation signal producing means including a portion of a time delay circuit uniquely associated therewith, both of which portions are connected to a common remaining portion of each time delay circuit association with the driver circuit.

4,632,305

EXPANSION VALVE

Kenichi Fujiwara, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 10, 1985, Ser. No. 774,522
Claims priority, application Japan, Sep. 12, 1984, 59-190860
Int. Cl.⁴ F25B *41/04*
U.S. Cl. 236—92 B **5 Claims**

1. An expansion valve associated with an evaporator in a refrigerating system, said valve comprising:

a valve housing provided with an inlet port and an outlet port, and provided therein with a refrigerant passage communicating said inlet portion to said outlet port;

a closure cap secured to said valve housing;

diaphragm means disposed in said valve housing, said diaphragm means including a first and a second diaphragm members which are spaced from each other to define a first working chamber therebetween, said diaphragm means cooperating with said closure cap to define a second working chamber therebetween, and said first diaphragm member being affected by a refrigerant pressure;

a remote sensing bulb for sensing a temperature of the refrigerant leaving said evaporator, said bulb being disposed in an outlet portion of said evaporator;

a capillary tube communicating said second working chamber to said bulb;

spring means disposed in said valve housing, which is loaded to urge said first diaphragm member on against the movement of said diaphragm means towards said spring means;

a valve element disposed in said refrigerant passage, said valve element being moved by a difference between an urging force of said spring means and an force caused by the movement of said diaphragm means to change an opening degree of said refrigerant passage;

an inert gas filling said first working chamber with a pressure level higher than a pressure level caused by said spring means against said diaphragm means; and

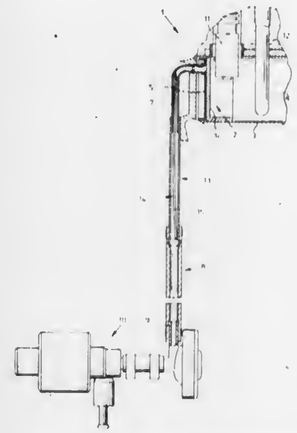
a working gas filling said second working chamber, said capillary tube and said bulb, said working gas moving said diaphragm means as the temperature of the working gas increases, said working gas in said second working chamber having a first gas pressure keeping said second diaphragm member apart from said closure cap when the temperature of refrigerant sensed by said bulb is higher than a predetermined level, whereby said diaphragm means move to change the opening degree of said refrigerant passage in accordance with the first gas pressure in said second working chamber, and said working gas in said second working chamber having a second gas pressure when the temperature of refrigerant sensed by said bulb is lower than said predetermined level, against which second gas pressure said spring means urges said second diaphragm member to keep in contact with said closure cap, whereby said first diaphragm member moves to change the opening degree of said refrigerant passage in accordance with a gas pressure in said first working chamber regardless of the temperature of refrigerant.

4,632,306

HEATER, IN PARTICULAR AN AUXILIARY HEATER FOR VEHICLES

Jochen Bleeker, Gauting, and Johann Sondermeier, Krailling, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,621
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403916
Int. Cl.⁴ B60H *1/02*
U.S. Cl. 237—12.3 C **12 Claims**



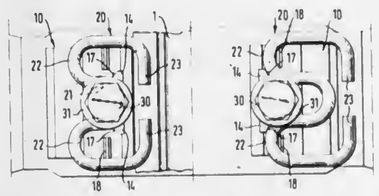
1. A heater, in particular an auxiliary heater for motor vehicles, with a burner which is located in a combustion chamber to which liquid fuel is supplied by a metering pump and a fuel supply line, wherein a throttle is provided in the fuel supply line between the metering pump and the burner as a means for damping of the fuel volume flow between the metering pump and the burner and, at the same time, minimizing vapor bubble formation in the supply line wherein the throttle is an elongated throttle element.

4,632,307

ARRANGEMENT FOR FASTENING RAILS TO SLEEPERS

Friedhelm Weber, Neuenrade, Fed. Rep. of Germany, assignor to Vossloh - Werke GmbH, Werdohl, Fed. Rep. of Germany

Filed Nov. 28, 1984, Ser. No. 675,539
Int. Cl.⁴ F01B *9/04*
U.S. Cl. 238—265 **6 Claims**



1. An arrangement for fastening rails to sleepers, having bolt means, guide plates adapted to be disposed to the sides of the respective rail, and substantially w-shaped elastic clips, said clips independent of any other structure in said arrangement, said guide plates and said clips adapted to be connected by said bolt means, the lower surface of the guide plate similarly contoured to the upper surface of the sleeper to prevent lateral motion of the guide plate with respect to the sleeper, said guide

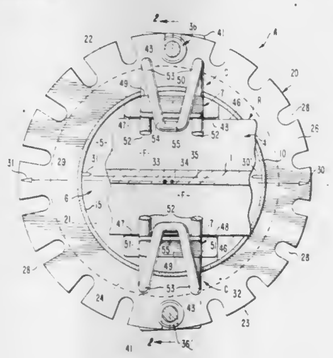
plates having a rib on their upper side extending parallel to the rail on the side of the guideplate between the bolt means and the rail, a curved middle portion of said w-shaped clip adapted to embrace a shank of said bolt means when pressed into said guide plate in the installed position, said middle portion when in the installed position adapted to seat and come in contact with the rib of said guide plate as a boundary for the stress path, and wherein the width of the cross-section of the rib is a seating region for the clip wherein the clip contacts and exerts pressure upon a portion of the guideplate on the opposite side of the bolt from the rail, the inside of the rib portion of said guide plate closely aligned with the mating rails to prevent lateral motion of said rail with respect to the sleeper.

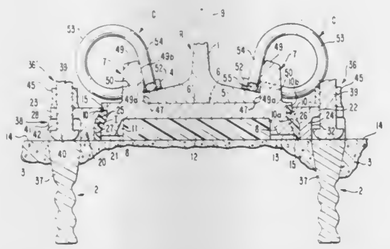
4,632,308

ADJUSTABLE RAIL FASTENER ASSEMBLY

Richard L. Fischer, Bolingbrook, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Oct. 25, 1985, Ser. No. 791,519
Int. Cl.[4] E01B *9/48, 9/66, 9/68*
U.S. Cl. 238—265 **25 Claims**





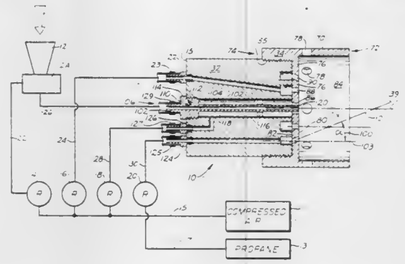
1. A rail fastener assembly for attaching a rail base to a foundation comprising, a seat member disposed atop the foundation and having an upwardly directed rail platform adapted to receive the rail base, said seat member including an outer peripheral wall, a clamp ring having an outer edge and provided with a seat-receiving opening including an inner wall, said inner wall surrounding said seat member outer peripheral wall, a plurality of angularly spaced apart fastener-receiving openings through said clamp ring adjacent said ring outer edge, fasteners disposed through at least a pair of spaced apart ones of said fastener-receiving openings, said fasteners including means on the one hand anchoring said fasteners relative to said foundation and on the other hand urging said clamp ring toward said foundation to clamp said seat member in a substantially fixed position, said clamp ring seat-receiving opening being eccentric relative said plurality of fastener-receiving openings whereby said clamp ring is angularly displaceable to vertically align selected ones of said fastener-receiving openings with said foundation anchoring means, and a pair of spring clips each having alternate portions respectively engaging said seat member and resiliently bearing down upon said rail base.

4,632,309

METHOD AND APPARATUS FOR SPRAY COATING

James Reimer, Alvin, Tex., assignor to Plastic Flamecoat Systems, Inc., Houston, Tex.

Filed Sep. 11, 1984, Ser. No. 649,836
Int. Cl.[4] B05C *5/04*
U.S. Cl. 239—8 **13 Claims**



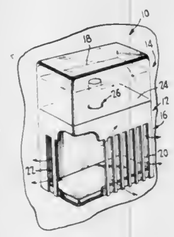
11. A method for spraying molten particles, comprising:
establishing a central flow substantially of powdered feedstock along a longitudinal axis;
establihsing a first annular fluid flow of propelling air radially outwards of and about said central flow;
establishing a second annular fluid flow of burn air radially outwards of and about said central flow and said first annular flow;
establishing a third annular fluid flow of inflammable gas radially outwards of and slanting radially inwards towards said central flow and said first and second annular flows;
establishing a fourth annular fluid flow of ambient atmospheric air substantially perpendicular to and toward said longitudinal axis radially outwards of and about said central flow and said first, second and third annular flows; and
igniting said gas.

4,632,310

AUTOMATIC DOOR-ACTIVATED AIR FRESHENER

Tim R. Konicek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 27, 1984, Ser. No. 655,173
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—43 **8 Claims**



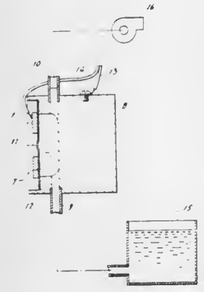
1. A motion activated air freshener comprising an upper liquid reservoir and a lower distributor, a liquid passage between said reservoir and said distributor for gravity supplying liquid from said reservoir into said distributor; and a motion actuated, normally closed valve in said liquid passage for permitting momentary liquid flow from said reservoir through said liquid passage in response to movement of said air freshener, said valve includes an over center, pivotly mounted valve member temporarily moveable to a centered position in response to motion of said air freshener, said valve includes said liquid passage defining a valve passage of greater length than width, a valve member positioned in said valve passage and pivotly mounted on a pivot having an axis in the direction of said width, said valve member having a major portion of the weight thereof positioned above said pivot whereby said valve member normally assumes a tilted position, said valve member and said valve passages being of related cross sections such that when said member is in a tilted position, said valve member fills and closes said valve passage and when said valve member is upright there is clearance in said valve passage around said valve member for limited liquid flow through said valve package.

4,632,311

ATOMIZING APPARATUS EMPLOYING A CAPACITIVE PIEZOELECTRIC TRANSDUCER

Shinichi Nakane, Yamatokoriyama; Naoyoshi Maehara, and Kazushi Yamamoto, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 20, 1983, Ser. No. 563,522
Claims priority, application Japan, Dec. 20, 1982, 57-224259; Dec. 20, 1982, 57-224266; Jan. 18, 1983, 58-6322; Feb. 22, 1983, 58-27929; Sep. 2, 1983, 58-162225
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] B05B *3/14*
U.S. Cl. 239—101 **11 Claims**



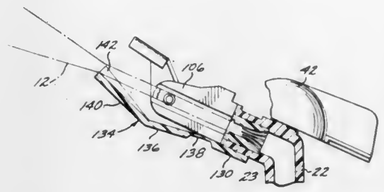
1. An atomizing apparatus comprising:
a body defining a chamber for holding liquid therein;
means for supplying the liquid into said chamber;
a nozzle member secured to said body as a front vibrating member defining part of the wall of said chamber, said nozzle member having at least one nozzle opening;
a capacitive piezoelectric transducer secured to said nozzle member for producing pressure rises in said liquid to cause the portion of the liquid which is in proximity to said nozzle opening to be ejected therethrough to the outside;
a resonant circuit including an inductance element and said piezoelectric transducer; and
an amplifier connected with said resonant circuit to form a self-oscillating loop therewith for amplifying the signal in said loop.

4,632,312

IMPACT DRIVE SPRINKLER

Kenneth W. Premo, Fullerton, and Billy J. Hobbs, Jr., Upland, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.

Filed Dec. 14, 1984, Ser. No. 681,566
Int. Cl.[4] B05B *3/02, 3/08;* **F16B** *7/10;* **F16H** *21/18*
U.S. Cl. 239—230 **76 Claims**



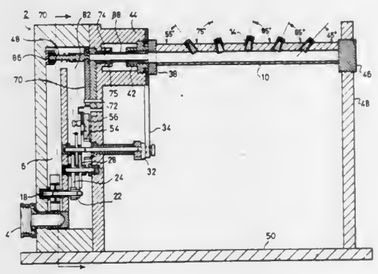
60. An impact drive sprinkler for connection to a water supply riser or the like, comprising:
a sprinkler body having a lower riser tube and an upper, outwardly directed range tube cooperatively defining a water flow path for receiving water from the water supply riser and for guiding the water through said sprinkler body for projection as a water stream outwardly from said range tube;
journal bearing means for mounting said sprinkler body onto the water supply riser for rotation with respect to the water supply riser and about a central axis of said riser tube;
impact drive means mounted on said sprinkler body for interrupting the water stream and for impact engagement with the sprinkler body to drive said sprinkler body in a forward rotational direction in a succession of relatively small steps about said riser tube central axis; and
a one-piece water stream diffuser and range deflector movably mounted on said sprinkler body for independent adjustment of droplet size and projected range of the water stream projected from said range tube.

4,632,313

MULTIPLE CHAMBER SPRINKLER

Isaac Rinkewich, 12 Fishman Maimon Street, Tel-Aviv, Israel

Filed Oct. 21, 1983, Ser. No. 544,360
Claims priority, application Israel, May 5, 1983, 68597
Int. Cl.[4] B05B *3/16*
U.S. Cl. 239—242 **9 Claims**



1. A sprinkler comprising a housing including an inlet connectable to a source of pressurized water, a first water distribution tube having a plurality of nozzles spaced along its length, a second, parallel water distribution tube having a plurality of nozzles spaced along its length, and an oscillating drive for

cyclically oscillating said two chambers about a horizontal axis;

said plurality of nozzles of said first water distribution tube being oriented at different angles with respect to said horizontal axis than said plurality of nozzles of said second water distribution tube;

said sprinkler further including water-steering means for selectably steering the inletted water first to said first water distribution tube for a first period of the oscillating cycle of the sprinkler in order to produce a given spray pattern determined by the angles of the nozzles of said first water distribution tube, and then to said second water distribution tube, for a second period, different from said first period, in order to produce a different spray pattern determined by the angles of said nozzles of said second water distribution tube,

said oscillating drive comprising an impeller rotated by the water flowing through the inlet, a shaft rotated by said impeller, and a crank rotated by said shaft and coupled to said water distributor tubes to oscillate them during the rotation of said shaft;

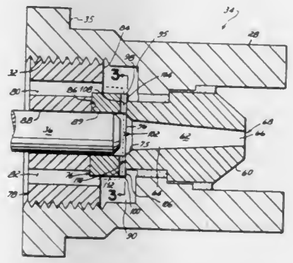
whereby all said nozzles are supplied with water for only their respective periods of the drive cycle and may therefore have a larger diameter for a given water pressure thereby increasing the sprinkler range and decreasing wind and evaporation losses.

4,632,314

ADHESIVE FOAM GENERATING NOZZLE

James C. Smith, Lorain, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 436,012, Oct. 22, 1982, Pat. No. 4,533,701. This application Jun. 5, 1985, Ser. No. 741,451
Int. Cl.⁴ B05B *7/04*
U.S. Cl. 239—433 **20 Claims**



1. A nozzle assembly for forming a liquid/gas solution into a foam, the gas being maintained under pressure in solution in the liquid, said nozzle assembly comprising:

a nozzle formed with a fluid conduit;

means defining a turbulence zone communicating with said fluid conduit;

channel means having at least two input ends and two outlet ends discharging into said turbulence zone;

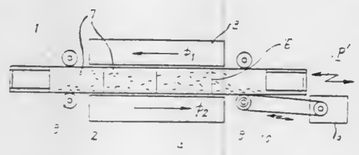
means communicating with a source of liquid/gas solution for conveying the liquid/gas solution to each of said input ends of said channel means, a separate stream of liquid/gas solution being formed at each of said input ends of said channel means, said separate streams of liquid/gas solution moving toward one another along said channel means and impacting together at said turbulence zone causing agitation of said liquid/gas solution within said fluid conduit, a pressure lower than the pressure required to maintain the gas completely in solution in the liquid but greater than atmospheric pressure being maintained within said fluid conduit while the agitated liquid/gas solution enters said fluid conduit so that the gas at least begins to leave solution to form the foam within said fluid conduit.

4,632,315

METHOD AND APPARATUS FOR ELECTROMAGNETICALLY CRUSHING, MIXING AND STIRRING SUBSTANCES BY EMPLOYING A MECHANICAL DRIVER

Yasuo Watanabe, and Hideomi Kanno, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1982, Ser. No. 436,693
Claims priority, application Japan, Oct. 30, 1981, 56-174010
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.⁴ B02C *17/00*
U.S. Cl. 241—26 **5 Claims**



1. An apparatus for electromagnetically processing substances comprising:

an elongated container having two opposed generally parallel sides for receiving working pieces responsive to a magnetic field and substances to be processed,

a first shifting magnetic field generator adjacent to one side of the container producing a magnetic field which shifts in one direction within the container and a second shifting magnetic field generator adjacent to the opposite side of the container producing a magnetic field which shfits in the opposite direction within the container, the first and second shifting magnetic field generators being effective to impart a violent random motion to the working pieces due to electromagnetic force applied by said shifting magnetic field generators to thereby crush, mix and stir the substances to be processed; and

a mechanical driving means for imparting a relative motion to said container between said first and second shifting magnetic field generators in a direction generally parallel to the shifting directions of said shifting magnetic fields, to thereby substantially maintain random motion of said working pieces.

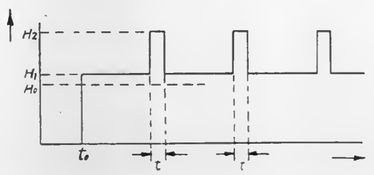
4,632,316

METHOD AND APPARATUS FOR ELECTROMAGNETICALLY CRUSHING, MIXING AND STIRRING SUBSTANCES BY CHANGING THE ELECTROMAGNETIC FIELD INTENSITY LEVEL

Yasuo Watanabe, and Mitsuhiro Nakamura, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1982, Ser. No. 436,694
Claims priority, application Japan, Oct. 30, 1981, 56-174011
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.⁴ B02C *17/00*
U.S. Cl. 241—26 **5 Claims**

1. A method for processing substances electromagnetically in a container having two opposed generally parallel sides using working pieces responsive to a magnetic field for crushing, mixing and stirring substances contained in said container comprising causing said working pieces to generate a violent random motion due to electromagnetic force using two shifting magnetic field generators producing magnetic fields which shift in opposite directions and act on the work pieces from opposite sides of the container, the magnetic fields having a first intensity level slightly greater than the minimum magnetic field intensity required to generate random motion of said working pieces in said shifting magnetic field, and providing periodic changes in the magnetic field intensity level from said



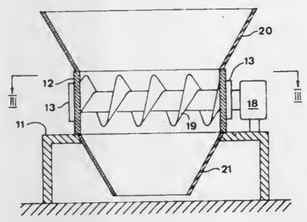
first magnetic field intensity level to substantially zero intensity for said shifting magnetic field in a cyclic manner, to thereby substantially maintain random motion of said working pieces.

4,632,317

METHOD AND DEVICE FOR DISINTEGRATING COARSE MATERIAL

Harry W. Wexell, Floravägen 6, S-802 28 Gävle, and Franz B. Wroblewski, Granitvägen 8, S-828 00 Söderhamn, both of Sweden

PCT No. PCT/SE82/00208, § 371 Date Feb. 8, 1983, § 102(e) Date Feb. 8, 1983, PCT Pub. No. WO82/04449, PCT Pub. Date Dec. 23, 1982
PCT Filed Jun. 11, 1982, Ser. No. 466,350
Claims priority, application Sweden, Jun. 12, 1981, 81039694
Int. Cl.⁴ B02C *18/16*
U.S. Cl. 241—30 **21 Claims**



1. A method for producing the disintegration of material, which method comprises:

rotating at least two generally adjacent, generally parallel co-operating screws, each of said screws having threads which have disintegrating edges which are active in the direction of advancement of the thread during rotation and arranged so that each screw has a direction of thread advancement which is opposite to that of any immediately adjacent screw, and;

placing the material to be desintegrated in contact with the screws whereby the disintegrating edges of the threads grip and cut into the material to be disintegrated, in opposite directions.

4,632,318

KNIFE FEED SYSTEM IN ROTARY DRUM CUTTER

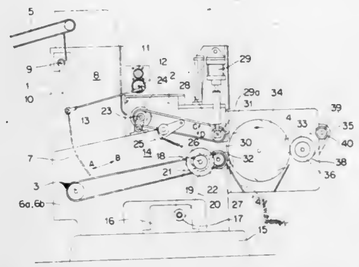
Kounosuke Hyuga, Kanagawa, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,210
Claims priority, application Japan, Mar. 21, 1984, 59-052245
Int. Cl.⁴ B02C *18/18, 25/00*
U.S. Cl. 241—37 **5 Claims**

1. A rotary drum cutter including a knife feed system, said rotary drum cutter having a rotary drum disposed in proximity to a shredding port through which raw material is urged, and a plurality of knives arranged in predetermined intervals on said rotary drum, said knives each having a cutting edge spaced from said shredding port, said knives being movable by a predetermined distance to keep constant the spacing between said cutting edge of each knife and said shredding port, said knife feed system including:

knife feed means attached to a support portion for each of said knives on said rotary drum;

drive means for driving said knife feed means, said drive means being provided separately from said rotary drum;



transmission means disposed between said knife feed means and drive means for transmitting power from said drive means to said knife feed means; and

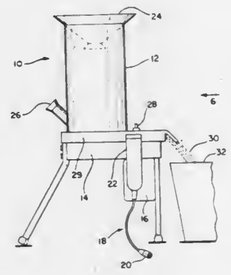
pulse control means connected to said drive means for generating operating pulses for operating said drive means, said control means setting and changing the number of times of operation of said drive means per unit time.

4,632,319

CABLE CONNECTOR INTERLOCK ARRANGEMENT FOR ELECTRIC SHREDDERS

Gerald Schlund, Wiesbaden; Leonhard Hagedorn, Niederneisen, both of Fed. Rep. of Germany; A. David Hahn, Arnold, Md., and Charles E. Fishpaugh, Madison, Conn., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 12, 1985, Ser. No. 764,905
Int. Cl.⁴ B02C *18/12, 25/00*
U.S. Cl. 241—37.5 **20 Claims**



1. An electric device, comprising:

an electric motor drivingly connected to an operating member;

a removable container associated with and shielding said operating member, said operating member being exposed when said container is removed from the electric device;

motor socket means for connection of electrical power to said motor;

cable socket means for plugging to said motor socket means for supplying electrical power thereto;

stop means for preventing removal of said container from said device when said cable socket means and said motor socket means are plugged together, and for allowing removal of said container when said cable socket means

and said motor socket means are moved relative to each other to become unplugged;

coupling means for mechanically coupling said cable socket means to said container, and for allowing relative movement between said cable socket means and said motor socket means when said container is in position shielding said operating member to enable said cable socket means and said motor socket means to be plugged together and unplugged; and

said coupling means comprising a member secured to said container and connected via a lost-motion connection to said cable socket means.

4,632,320

APPARATUS FOR DISSOLVING AND SORTING WASTE PAPER

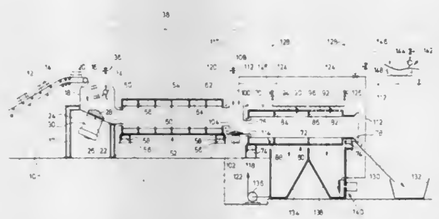
Emil Holz, Eningen, and Hagen Hutzler, Reutlingen, both of Fed. Rep. of Germany, assignors to Hermann Finckh Maschinenfabrik GmbH, Pfullingen, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,676

Claims priority, application European Pat. Off., Jun. 9, 1984, 84106628.5

Int. Cl.⁴ B02C *17/02*

U.S. Cl. 241—46.17 **10 Claims**



1. Apparatus for recovering fibers from a stream of waste paper flowing therethrough, comprising:

a first drum, mounted for rotation about a substantially horizontal axis, for steeping and partially disintegrating said waste paper, said first drum having an inlet opening for said waste paper at a first end, an outlet opening at a second end and an at least substantially closed circumferential wall;

drive means for rotating the first drum;

a second drum, mounted for rotation about a substantially horizontal axis and located downstream of said first drum, for further disintegrating said waste paper and for sorting out fibrous material comprising said fibers, said second drum having an inlet opening at a first end, an outlet opening at a second end, and first and second sorting zones arranged one behind the other relative to the first and second ends of said second drum, each of said sorting zones having a perforated circumferential wall providing screen openings, said openings of said first sorting zone being smaller than those of said second sorting zone;

drive means for rotating the second drum;

means for introducing said waste paper and water into the first drum through its inlet opening;

mixing means for mixing steeped and partially disintegrated waste paper leaving the outlet opening of said first drum;

means for connecting said mixing means with the first sorting zone of the second drum;

means for collecting a fibrous suspension passing through the screen openings of the second sorting zone; and

suspension return means comprising a defiberizing device connecting said collecting means to said mixing means located upstream of said first sorting zone and downstream of said first drum.

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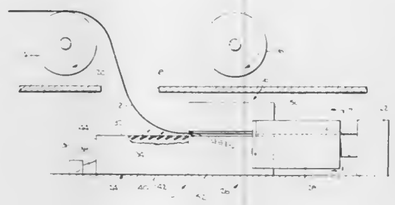
AIR CONVEYOR FOR PLASTIC FILM

Richard Danler, Corvallis, Oreg., assignor to Oerlikon Motch Corporation Div. Jetstream Systems Co., Hayward, Calif.

Continuation of Ser. No. 577,432, Feb. 6, 1984, abandoned, Ser. No. 343,129, Jan. 27, 1982, abandoned, and Ser. No. 152,910, May 23, 1980, abandoned. This application Jun. 14, 1985, Ser. No. 745,289

Int. Cl.⁴ B02C *23/18*

U.S. Cl. 241—62 **7 Claims**



1. An air conveyor for conveying plastic scrap film comprising: an entrance section at least as wide as the film being conveyed, said entrance section having a perforated deck plate and a plenum chamber cooperating to generate air jets for moving the film along the perforated deck, means for supplying pressurized air to said plenum chamber, a pleater section comprising confronting air conveyor sections having deck plate surfaces defining a generally sinusoidal gap therebetween positioned over and under said film web for conveying and reducing the width of the film as it is conveyed, the deck plate surfaces being nested W-shaped surfaces, and means for grinding the film.

4,632,322

CONDIMENT DISPENSER

Kurt H. Beilstein, Langenselbold, Fed. Rep. of Germany, assignor to Hofmann GmbH, Fed. Rep. of Germany

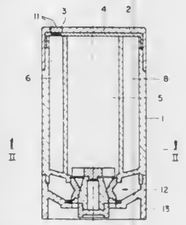
Division of Ser. No. 486,333, Apr. 19, 1983, Pat. No. 4,530,470. This application Jun. 21, 1985, Ser. No. 747,415

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214293; Dec. 6, 1982, 3245065

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—169.1 **4 Claims**



1. A condiment dispenser comprising a tubular housing, a plurality of juxtaposed condiment compartments, and a mill chamber, the condiment compartments arranged about said mill chamber, said condiment compartments being separated from each other and from said mill chamber by dividing walls, and a condiment mill connected to said mill chamber for material to be ground by said mill and provided with an outlet for ground material located at a lower end face of the dispenser, said condiment mill being provided with a rotable ring relative to said housing, the lower end face of said ring forming the

base surface of the condiment dispenser, and a cover releasably secured to said housing, said cover covering the mill chamber as well as said plurality of condiment compartments, said cover defining sprinkling apertures located on the upper end face of the dispenser, said sprinkling apertures located to cooperate with each condiment compartment so condiments can be discharged from said condiment compartments via said cover, said cover further including a closure means associated with each aperture for closing said end aperture.

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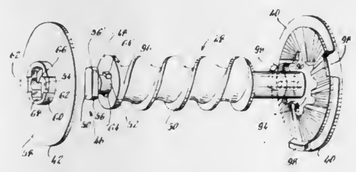
FOOD GRINDER

Alvaro H. Roa, and Jaime Cuartas, both of Medellin, Colombia, assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 30, 1983, Ser. No. 537,820

Int. Cl.⁴ B02C *7/14*

U.S. Cl. 241—247 **9 Claims**



1. A manually driven food crusher employing a husing having, below a food entrance, a food crushing chamber in which a food transport is located in the form of a screw that is so shaped and effectively tapered as to crush food force to move towards a discharge opening of the chamber by the screw, an inner grinder disk mounted across the discharge opening and an outer grinder disk located adjacent the inner disk and mounted to rotate relative thereto to grind food between the disks as the food emerges from the discharge opening into space between the disks, comprising:

an inner grinder disk the improvement that is shaped to be removably mountable in a stationary position to the housing;

an outer grinder disk that is shaped to be removably mounted to the screw and means affixed to the outer disk for rotational drive thereof; and

means affixed to one end of the screw and having a preferentially shaped hole extending therethrough for releasably engaging the means affixed to the outer disk with positive axial retention and positive rotational drive in one direction of rotation by the screw, while enabling release between the screw and the outer disk upon screw rotation opposite to said one direction of rotation said latter means including a tip affixed to an axial end surface of the screw, said tip being shaped to pass through said hole at a particular rotational position of the screw while extending over one outer disk surface that faces away from the screw upon rotation of the screw in said one direction.

4,632,324

STRAND STORING AND DELIVERING DEVICE

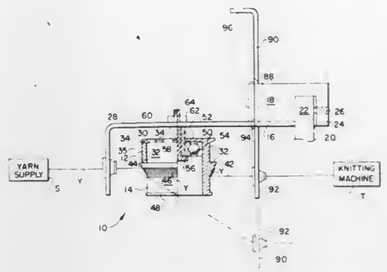
Alan Gutschmit, Troy, N.C., assignor to Mayer & Cie. GmbH & Co., Albstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 441,116, Nov. 12, 1982, Pat. No. 4,506,429. This application Dec. 17, 1984, Ser. No. 682,439

Int. Cl.⁴ B65H *51/20, 51/24*

U.S. Cl. 242—47.01 **25 Claims**

1. A device for transiently storing and delivering a traveling strand to a textile machine or the like, comprising strand storage means having a circumferential portion about and from which said strand may be wound and unwound, and means for timed positive driving rotation of said strand storage means, said driving means including pulley means operatively associated with said strand storage means for driving rotation thereof and belt means for training about a portion of said pulley means for driving rotation thereof, said pulley means including an annular belt engaging surface and a plurality of radially extending teeth equally spaced circumferentially about said pulley means adjacent only one side of said belt engaging surface, and said belt means including a plurality of notches formed along



only one edge thereof at equal spacings corresponding to said radial teeth and shaped to compatibly mesh with said radial teeth, said belt means being non-endless and having two opposite end portions and a splice fixing said two end portions to one another with the respective notches to each said end portion in register with one another.

4,632,325

APPARATUS FOR UNWINDING A NONWOVEN FIBROUS WEB FROM A ROLL THEREOF

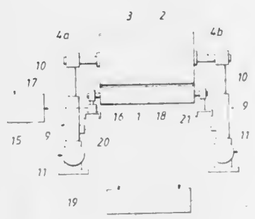
Günther Feyerl, Linz; August Kalteis, Traun, and Karl Meyer, Linz, all of Austria, assignors to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Dec. 1, 1983, Ser. No. 556,913

Claims priority, application Austria, Dec. 22, 1982, 4630/82

Int. Cl.⁴ B65H *16/02, 18/26*

U.S. Cl. 242—55 **4 Claims**



1. In apparatus for unwinding a nonwoven fibrous web from a roll thereof, which comprises a roll core which extends axially through said roll and has journal means protruding from said roll at least at one end thereof,

roll-bearing means for supporting said roll on the underside of its periphery whereby the roll exerts a contact pressure on the roll-bearing means,

core-mounting means adapted to rotatably mount said journal means and being adjustable in elevation relative to said roll-bearing means,

a controller, and

positioning drive means for adjusting said core-mounting

means in elevation relative to said roll-bearing means under the control of said controller,

the improvement comprising

signal-generating means including a sensor directly sensing the contact pressure exerted by the roll on the roll-bearing means and generating an actual-value signal corresponding to the sensed contact pressure between said roll and said roll-bearing means,

means connecting a first input of said controller to said sensor to receive said actual-value signal, a second input of said controller receiving a desired-value signal corresponding to a predetermined contact pressure, and

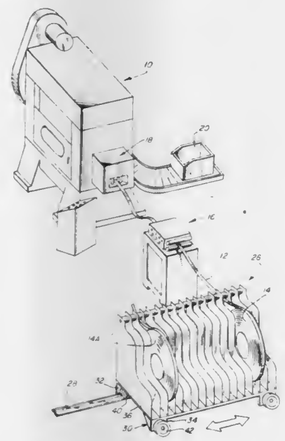
said controller being operable to control said positioning drive means for adjusting said core-mounting means in response to any difference between said actual-value and desired-value signals to maintain the predetermined contact pressure between said roll and said roll-bearing means.

4,632,326

COIL HANDLING APPARATUS

Robert A. Boote, Ithaca, and Timothy G. Meddaugh, Candor, both of N.Y., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 3, 1985, Ser. No. 772,136
Int. Cl.[4] B21C *47/18*
U.S. Cl. 242—55.3 **3 Claims**



1. Apparatus for handling coiled strip material and delivering said strip material to a punch press for producing products therefrom, comprising:

a plurality of side-by-side cradle-like coiled strip material supporting means, each having a pair of spaced rigid plates, the spacing between some pairs of plates being different from the spacing between other pairs of plates so as to accommodate different widths of strip material;

a plurality of circularly arranged rollers journaled between each pair of spaced plates to permit a coil of strip material thereon to rotate when a portion is withdrawn;

pinch roll means carried by each pair of spaced plates to restrain the free end of a coil of strip material supported therebetween;

a generally rectangular frame for supporting said plurality of cradle-like coiled strip material supporting means;

each said cradle-like coiled strip material supporting means being removably connected to said frame and being replaceable with another cradle-like coiled strip material supporting means;

roller means on said frame; and

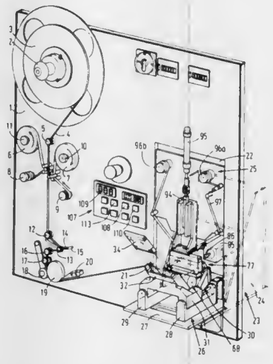
means to move said frame and said supported cradle-like coiled strip material means on said roller means to operating position relative to said punch press.

4,632,327

APPARATUS FOR FILLING A CASSETTE WITH A LENGTH OF MAGNETIC TAPE

Hendrik K. Kreeft, and Adrianus F. Teunissen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,755
Claims priority, application Netherlands, Oct. 17, 1983, 8303566
Int. Cl.[4] B31F *5/06*; B65H *21/00*
U.S. Cl. 242—56 R **15 Claims**



1. An apparatus for filling a cassette with a length of magnetic tape, which cassette comprises two adjacent reels which are connected to a length of leader tape, which apparatus comprises:

a cassette holder for holding the cassette to be filled, which cassette holder is movable between at least two positions,

a splicing table for supporting a leading and a trailing end portion of the magnetic tape and for supporting the leader tape, which table is provided with three rectangular vacuum pads which are arranged aligned to each other, a first one of said vacuum pads being arranged on a stationary first block of the splicing table and a second and a third vacuum pad being arranged adjacent each other on a second block of the splicing table, which second block is pivotable about a block pivotal axis to bring the second or the third vacuum pad alternately in line with the first vacuum pad.

an extraction member for drawing the length of leader tape wound around the reels out of the cassette and positioning the leader tape on the splicing table,

a cutting member for cutting the leader tape into two parts and severing a length of magnetic tape having both a leading and a trailing end,

a splicing assembly for resplicing the magnetic-tape leading and trailing end positioned on the splicing table to the ends of the parts of leader tape formed by the cutting member, and

a winding member for winding the length of magnetic tape and leader tape into the cassette in cooperation with one of the reels,

characterized in that

the cassette holder is pivotable about a holder pivotal axis between a first position straight above the splicing table for cooperation with the winding member and a second position, in which it is inclined relative to the splicing table and in which the splicing assembly is operable,

the holder pivotal axis is disposed at least substantially in a plane through the block pivotal axis, which plane bisects the width of the first vacuum pad, and

the holder pivotal axis extends at least substantially parallel to the block pivotal axis between the block pivotal axis and the upper surface of the first vacuum pad.

4,632,328

INFLATABLE MANDREL AND METHOD THEREFOR

Marshall E. Bishop, Richwood, W. Va., and Duane E. Thewlis, Norton, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,942
Int. Cl.[4] B65H *75/24*
U.S. Cl. 242—72 B **6 Claims**



1. In an inflatable tubular mandrel supported upon a cylindrical surface and having a pair of membranes defining an inflation chamber, the inflation chamber continuosly surrounding the cylindrical surface, one such membrane contacting the cylindrical surface, the membranes being formed of a plurality of plies coated on at least one surface with a rubberizing compound crosslinked to produce unitary membranes of crosslinkably co-adhered plies, one ply in the cylindrical surface contacting membrane having a surface in direct contact with the cylindrical surface, the improvement comprising: the direct contact ply being a fabric ply coated by the rubberizing compound on one surface only and being uncoated on an obverse surface, the uncoated obverse surface opposing the cylindrical surface.

4,632,329

THERMAL BARRIER DEVICE FOR WINTER RECREATION SURFACES

William G. Burley, Peterson Dr., Johnstown, Pa. 15905

Continuation of Ser. No. 538,432, Oct. 3, 1983, abandoned. This application Aug. 9, 1985, Ser. No. 763,895
Int. Cl.[4] B65H *16/00, 75/40*
U.S. Cl. 242—86.52 **10 Claims**



1. In a thermal barrier device for reducing heat transfer to and from an exposed ice surface and comprising a flexible, heat insulative cover deployable onto and harvestable from said ice surface in combination with a reel means for unwinding and winding of said cover, respectively, during the deploying and harvesting thereof, the improvement comprising:

plural sections of said cover, each of said sections having a length terminating in opposite ends, a width terminating in opposite edges, and a thickness, and means for connecting to an endwise adjacent section to form a series of sections;

means for connecting an end of a terminal section of said series to said reel means;

said reel means being mounted on a vehicle repositionable relative to said ice surface such that edgewise adjacent portions are deployable and harvestable in accordance with repositioning of said reel means;

handle means, attached to said cover, for grasping by an individual in order to guide said flexible cover during said unwinding and winding;

means for driving a spool of said reel means in forward and reverse by remote control to accomplish said unwinding and winding; and

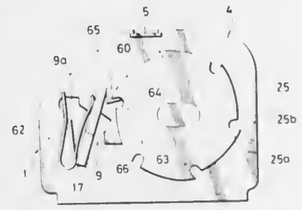
wherein said reel means is operable from a remote location in order that said individual can accomplish said deploying and harvesting.

4,632,330

AUTOMATIC LOCKING RETRACTOR

Hiroyuki Salto, Chigasaki, and Takeo Ueda, Fujisawa, both of Japan, assignors to NSK-Warner K. K., Japan

Filed May 24, 1985, Ser. No. 737,446
Claims priority, application Japan, Jun. 1, 1984, 59-80436[U]; Aug. 9, 1984, 59-121414[U]
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.4 D **1 Claim**



1. An automatic locking retractor comprising:

a casing;

support means provided with the casing;

a take-up spindle for winding a webbing thereon, said take-up spindle being supported on the casing and rotatable in a webbing-winding and webbing-releasing direction and biased in the webbing-winding direction;

a latch plate equipped with teeth comprising interlocking faces oriented toward the webbing-releasing direction, and rotatable as a unitary member with the take-up spindle;

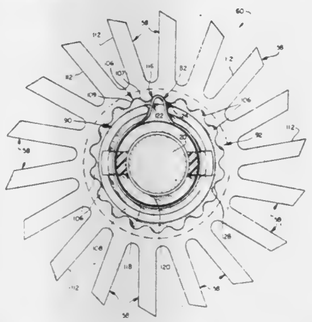
a lock member movable between a locking position, where the lock member is brought into engagement with any one of the interlocking faces so that the take-up spindle is prevented from rotating in the webbing-releasing direction but is allowed to rotate in the webbing-winding direction, and a non-locking position where the lock member is maintained out of engagement with any of the interlocking faces;

control means for guiding the lock member from the non-locking position to the locking position when the webbing has been rewound subsequent to its release over at least a predetermined length thereof, said control means comprising a cam member supported on the support means adjacent to the latch plate and movable within a predetermined range, one of said latch plate and cam member being provided with a magnetic material and the other comprising a material which can be magnetically attracted, and said support means being provided with a protrusion and said cam member being provided with a slot capable of receiving the protrusion therein and having a longitudinal length longer than the longitudinal length of the protrusion to permit movement of said protrusion within said slot to allow movement of said cam within said predetermined range; and

sensing means for sensing each rewinding of the webbing at least over the predetermined length thereof to maintain the lock member at the non-locking position;

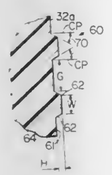
wherein said protrusion has a rectangular cross-sectional shape and said slot has a rectangular shape.

4,632,331
RETRACTOR ASSEMBLY
Anthony S. Bracnik, Penetanguishene, and Keith D. Charlton, Midland, both of Canada, assignors to TRW Canada Limited, Toronto, Canada
Filed Aug. 19, 1985, Ser. No. 767,483
Int. Cl.[4] B60R *22/40;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **10 Claims**



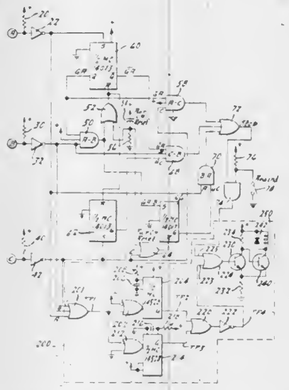
1. A safety belt retractor comprising a rotatable element around which a safety belt may be wound, a ratchet wheel fixedly connected with said rotatable element and having a plurality of teeth disposed in an annular array, a locking pawl movable between a disengaged condition spaced from said ratchet wheel and an engaged condition engaging the teeth on said ratchet wheel to hold said rotatable element against rotation, a pilot pawl gear having a plurality of teeth disposed in an annular array, said teeth on said pilot pawl gear being disposed in a predetermined angular orientation relative to said teeth on said ratchet wheel, a pilot pawl movable between a disengaged condition spaced from said pilot pawl gear and an engaged condition engaging teeth on said pilot pawl gear, means for effecting movement of said locking pawl from the disengaged condition toward the engaged condition upon movement of said pilot pawl from the disengaged condition to the engaged condition, and connector means connected with said ratchet wheel and pilot pawl gear for allowing relative rotation to occur between said ratchet wheel and pilot pawl gear with a corresponding change in the angular relationship between the teeth on said ratchet wheel and the teeth on said pilot pawl gear upon movement of said pilot pawl to the engaged condition during rotation of said rotatable element, said connector means including means for re-establishing the predetermined angular relationship between the teeth on said ratchet wheel and the teeth on said pilot pawl gear after relative rotation between said ratchet wheel and pilot pawl gear has ceased.

4,632,332
TEXTILE BOBBIN
Arnold S. Newman, 4170 Cove La., Glenview, Ill. 60025
Continuation-in-part of Ser. No. 444,618, Nov. 26, 1982, Pat. No. 4,519,557. This application Mar. 4, 1985, Ser. No. 707,813
Int. Cl.[4] B65H *75/10, 75/20*
U.S. Cl. 242—118.3 **1 Claim**



1. A plastic textile bobbin for winding yarn comprising a hollow frusto-conical body having an exterior surface tapered from a circular base end to a relatively smaller truncated end, said exterior surface having a continuous, helical outwardly-extending ridge having a generally trapezoidal cross-section defined by opposed inclined flat walls tapered toward each other and an outer flat wall interconnecting said flat inclined walls, said inclined flat walls producing opposite face angles of about 30° with respect to a plane extending peripendicular to an axis through the center of said bobbin, said ridge having a height of about 0.005 inch and said outer flat wall having a width greater than the height of said ridge.

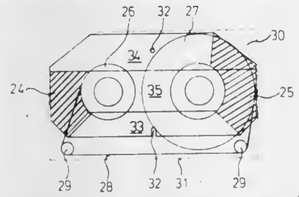
4,632,333
CIRCUIT FOR SENSING THE ROTATION STOP OF A TAKE-UP REEL IN A TAPE TRANSPORT MECHANISM
Gerald W. Tarpley, Jr., Romulus, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Apr. 3, 1985, Ser. No. 719,617
Int. Cl.[4] B65H *26/00;* **G11B** *15/32*
U.S. Cl. 242—186 **5 Claims**



2. A rotation sensing circuit for a reel-to-reel type tape deck comprising:
- means for supplying electrical power to the tape deck drive mechanism;
- means connected between said supply means and said drive mechanism for switchably controlling said power to said drive mechanism;
- means associated with at least one of said reels for providing a cyclical signal in response to the rotation of said associated reel;
- first means responsive to a positive change characteristic of said cyclical rotation signal for providing a first relatively high level DC signal output for a first predetermined period of time;
- second means responsive to a negative change characteristic of said cyclical rotation signal for providing a second relatively high level DC signal output for a second predetermined period of time; and
- means connected to said first and second means to provide a third relatively high level DC signal only when said first or second signals are present.

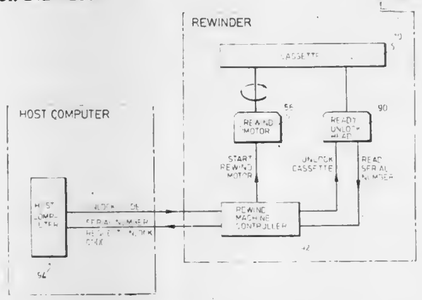
4,632,334
TAPE CASSETTE, IN PARTICULAR A MAGNETIC TAPE CASSETTE, AND A REEL SUPPORT LINER THEREFOR
Norbert Schaeffer, Deidesheim; Dietmar Pfefferkorn, Hemsbach; Roland Sold, Mutterstadt; Uwe Brinkmann, Kehl; Ludwig Kreitner, Heppenheim, all of Fed. Rep. of Germany, and Roland Sigwalt, Obenheim-Benfeld, France, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 27, 1986, Ser. No. 844,670
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 8509882[U]
Int. Cl.[4] G03B *1/04;* **G11B** *15/32, 23/04*
U.S. Cl. 242—199 **18 Claims**

1. A tape cassette, in particular a magnetic tape cassette, comprising a cassette housing having top and bottom walls and front and back walls and at least one flangeless reel contained therein, said reel having an external diameter, and onto which reel the magnetic tape is wound into a tape roll and/or from which it is unwound, and at least two substantially rectangular liners being provided one on each side of the reel of wound tape between the latter and the top and bottom walls, respectively, said liners comprising peripheral bent-over liner portions which are bent over at an angle to and in a direction toward the central plane of the cassette and which exert a resilient pressure on the tape roll(s), said bent-over liner portions consisting in a back liner portion exerting a resilient pressure on a tape roll region facing the back wall of the cassette and a front liner portion exerting a resilient pressure on a tape roll region near the front wall of the cassette, wherein each of the liners has at least two substantially longitudinal folds which limit said back and front bent-over liner portions, said folds being arranged at a distance equal to or smaller than the external diameter of the reel and intended for contacting the inner surfaces of said top and bottom walls of the cassette,



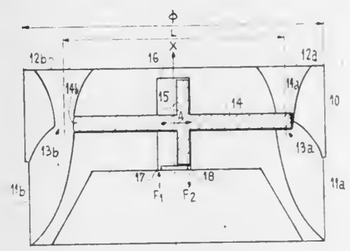
and the two folds limit a middle part between them, and wherein
- by said liners bearing with said folds, arranged at said distance from one another, against the respective inner surface of the top and bottom walls, and
- by said peripheral liner portions bent over at a certain angle towards the central plane of the cassette and exerting said resilient pressure on the tape roll,
- a bending force is produced on said middle part of each liner which as a result arches towards said reel(s) and exerts a pressure force thereon, which pressure force has a minimum value when acting on an empty reel and a maximum value when acting on a reel carrying a full tape roll.

4,632,335
TAPE CASSETTE REWINDING MACHINE
Edward J. Dickson, The Terrace, 70 Mutual Street, Toronto, Ontario, Canada M5B 2B1, and Richard J. Armstrong, 17 Alcorn Avenue, Toronto, Ontario, Canada M4V 1E5
Filed Mar. 24, 1986, Ser. No. 842,793
Int. Cl.[4] G11B *15/32, 23/04*
U.S. Cl. 242—200 **9 Claims**



1. A machine for releasing the releasable locking means of a tape or wire cassette, the cassette having a casing and reels mounted for rotation within the casing and being connectable to a rotable drive shaft to transfer tape from the take up reel to the supply reel, the said cassette being characterized by releasable locking means for locking one of its reels against rotation with respect to its casing in only one direction when operative, said locking means being releasable to render it inoperative and to permit its respective reel free rotation in either direction with respect to its casing, said locking means including rollers in an annular roller cage and being releasably by entry of roller operating means into said roller cage in accordance with an unlock code;
- the said machine comprising:
- a read-head underlying the cassette location on the machine for reading a serial number on a cassette;
- a host computer with storage for cassette serial numbers and for unlock codes one related to each serial number for a plurality of cassettes;
- an unlock head having roller operating means, said roller operating means being responsive to receipt of an unlock code for the cassette in the machine from the host computer to actuate the roller operating means to enter the roller cage of a cassette in the machine and engage the rollers in the roller cage of a cassette in the machine to move all rollers to an inoperative position and release the reel for rotation with respect to the cassette in either direction;
- said host computer being responsive to receipt of a serial number read from said read head to transmit the unlock code for the serial number received to said unlock head;
- a rewind motor operable to rewind the tape from the reel on the free shaft to the reel on the drive shaft when the unlock head frees the take up reel for rotation.

4,632,336
LATERAL GAS JET PILOTING DEVICE
Roger Crepin, Ville D'Avray, France, assignor to Brandt-Armements, Paris, France
Filed Dec. 15, 1983, Ser. No. 561,801
Claims priority, application France, Dec. 17, 1982, 82 21227
Int. Cl.[4] F42B *15/033;* **F02K** *9/80*
U.S. Cl. 244—3.22 **11 Claims**



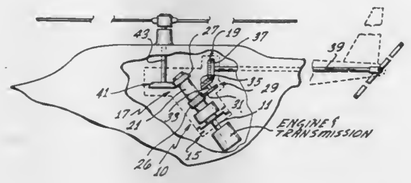
1. A lateral gas jet piloting device comprising:
a housing;
means in said housing defining a pair of mutually independent gas flow ducts, said ducts being mutually opposite a central portion of said housing, each of said ducts having one end communicating with a source of gas under pressure and another end defining a gas nozzle;
a sliding bar in said housing, said sliding bar having ends extendable into a portion of each of said ducts, said bar being slidable in a direction transverse to gas flow in said ducts at said portions, the length of said bar being such that when one of said bar ends is in one of said ducts the other of said bar ends is not in the other of said ducts, said ends of said bar when in said ducts being shaped to present a non-aerodynamic surface to gas flow in said ducts for blocking said ducts, whereby said bar forms a bistable gas flow valve; and
means for sliding said bar between two stable position wherein gas flow in one of said ducts is completely blocked.

4,632,337

HELICOPTER ROTOR TRANSMISSION SYSTEMS

Richard E. Moore, Los Angeles, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Continuation-in-part of Ser. No. 303,962, Sep. 21, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,607
Int. Cl.⁴ B64C *27/12*
U.S. Cl. 244—17.19 **5 Claims**



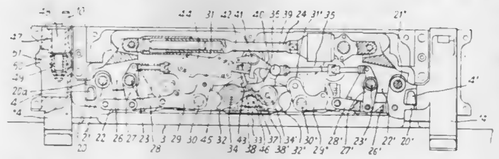
1. An improvement in a helicopter having a substantially constant speed engine comprising:
a main speed rotor system;
a tail thrust means for generating at least a side thrust on said helicopter;
a first multiple speed transmission having its input coupled to said engine and its output coupled to a selected one of said main rotor system and said tail thrust means; and
a second multiple speed transmission having an input coupled to said engine, said first multiple speed transmission having an output coupled to said selected one of said main rotor system and tail thrust means, said second multiple speed transmission having an output coupled to the other one of said main rotor system and tail thrust means,
whereby rotational speed of said selected one of said main rotor system and said tail thrust means is driven with an arbitrarily selected rotational speed in order to optimize the flight envelope of said helicopter.

4,632,338

UNDER AIRCRAFT LOAD CARRYING AND RELEASE DEVICE WITH TRIPLE ROLLER ESCAPEMENT

Jean Hasquenoph, deceased, late of Lagny sur Marne (by Simone Hasquenoph, legal representative), and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Nov. 26, 1984, Ser. No. 675,039
Claims priority, application France, Nov. 29, 1983, 83 19041
Int. Cl.⁴ B64C *1/22*
U.S. Cl. 244—137 A **8 Claims**



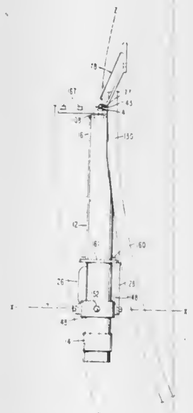
1. A device for carrying and fixing loads under aircraft, which comprises:
two pivoted independent hooks, each adapted to be engaged by a suspension ring of the load,
bearing means disposed in the vicinity of each hook,
means for raising said hooks in order to apply the load suspended to the hooks against said bearing means,
a cam tripping mechanism for controlling and locking each of the two hooks, which comprise associated with each hook a linkage connected to the hook and terminated by a pivoting lever bearing a roller adapted to co-act with rotating cam means, and a pivoting lever associated with a tripping spring and adapted in a released position of the tripping spring to engage said rotating cam means for the escapement of the rollers and the opening of the hooks, said pivoting lever bearing a supplementary roller adapted to engage a pivoting stop for compressing said tripping spring,
and a control electromagnet acting on said pivoting stop to rotate same from its position compressing said tripping spring to the position releasing this spring.

4,632,339

SPACECRAFT PAYLOAD EJECTION MECHANISM

Mark S. Yuan, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 24, 1984, Ser. No. 685,700
Int. Cl.⁴ B64G *1/22*
U.S. Cl. 244—158 R **14 Claims**



1. An ejection mechanism for imparting an ejection force to a substantially constant locus of points on a payload ejected from a spacecraft comprising:
a rod having a contact end for being placed in abutting contact with the substantially constant locus of points;
a housing in which the rod is slideably mounted for securing the rod to the spacecraft and for permitting movement of the rod relative to the spacecraft, the housing having a first aperture from which the rod protrudes during ejection of the payload;
first and second compressible cylindrical springs;
means for causing the first and second springs to drive the contact end of the rod towards the locus of points upon release of the first and second springs to impart translational and rotational motion to the payload; and
means for permitting the contact end of the rod to substantially maintain abutting contact with the locus of points as the rod is driven towards the locus of points and the payload is ejected from the spacecraft.

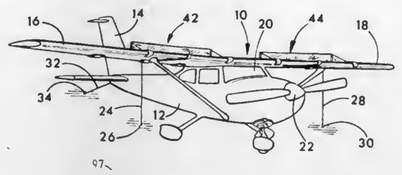
4,632,340

DEVICE FOR PROTECTING PARKED AIRCRAFT

Michael J. Duea, 13173 Glenhurst Ave. S., Savage, Minn. 55378

Filed Jul. 12, 1985, Ser. No. 754,253
Int. Cl.⁴ B64C *3/58*
U.S. Cl. 244—198 **9 Claims**

6. A spoiler for protecting parked aircraft comprising a wind deflecting strip of flexible foldable sheet material, a framework of stiff material connected to the wind deflecting strip to support it in an extended stretched condition and mounting means connected to the strip to secure the strip to the top of the wing of the aircraft, the framework supporting the spoiler comprises (a) a stiff elongated member extending longitudinally of the spoiler and (b) a plurality of longitudinally spaced apart transversely extending strut members at right angles to the longitudinally extending member secured to the spoiler for reinforcing it and holding it in an extended position and means for releasably and removably connecting said strut members to the elongated member to facilitate disassembly and storage thereof.

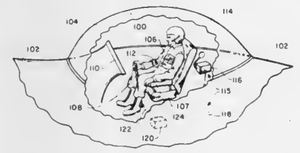


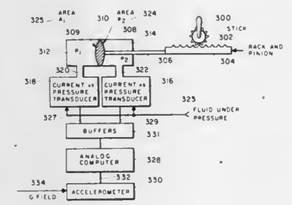
4,632,341

STABILIZING FORCE FEEDBACK IN BIO-ACTUATED CONTROL SYSTEMS

Daniel W. Repperger, Vandalia; Donald G. McCollor, Springboro, and William G. Gruesbeck, Gettysburg, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1985, Ser. No. 698,963
Int. Cl.⁴ B64C *13/04*
U.S. Cl. 244—230 **10 Claims**





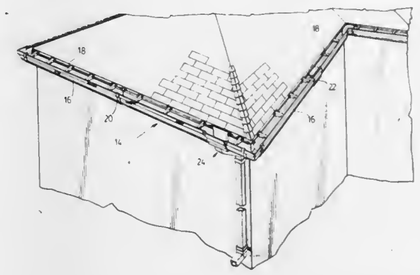
1. Aircraft lateral tracking improvement apparatus comprising:
aircraft maneuvering controls located adjacent a pilot supporting seat in an aircraft cockpit apparatus;
means for conveying a prescribed lateral course to be tracked and a tracking error signal to said pilot;
means for generating a signal representing the incurred G force acceleration of said aircraft along an axis lateral of said pilot;
means including predetermined twelve to fifteen Hertz frequency agonistic to antagonistic muscle transfer tremor attenuation means for generating a maneuvering control bias electrical signal in response to said lateral G force acceleration signal; and
bias force transducer means connected with said maneuvering controls and responsive to said bias electrical signal for applying a muscle tremor attenuation lateral bias force supplementary to one of said agonistic and antagonistic muscle forces to said maneuvering controls.

4,632,342

GUTTER SYSTEM

James Skinner, Mississauga, Canada, assignor to Daymond, division of Redpath Industries Limited, Mississauga, Canada

Filed Dec. 12, 1984, Ser. No. 680,887
Int. Cl.⁴ E04D *13/06*
U.S. Cl. 248—48.2 **41 Claims**



1. A gutter system of thermoplastics expandable and contractable material for mounting to a wall, the gutter system comprising a plurality of gutter sections for being joined together and a plurality of hanger brackets for mounting the sections to the wall, each hanger bracket comprising a mounting plate for mounting the hanger bracket to the wall, a beam secured to the mounting plate and extending therefrom to an end remote the mounting plate, a downwardly opening channel carried by the beam proximate the mounting plate, the channel having a reduced or restricted mouth portion for receiving and securing a resiliently deformable lip carried on the top of the rear wall of each gutter section which lip deforms when pressed through the mouth of the channel into the channel and resiliently restores for locking in the channel, the gutter comprising front and rear walls and a bottom, the top of the rear wall carrying a resiliently deformable lip for being inserted and secured in the channel by being pressed through the restricted channel mouth portion into the channel to restore therein to its normal configuration and be precluded from being removed until resiliently depressed to be removed through the channel mouth, complementary fastening elements at the end of the beam remote the mounting plate and on top of the front wall of the gutter for securing together, and a raised bead or projection on the inner surface of the rear wall extending in the same direction as the lip carried on the top of the rear wall and spaced therefrom whereby when the lip is in the channel, and the complementary fastening elements secured, the beam portion proximate the mounting plate of each hanger bracket engages the bead or projection on the rear wall of the gutter to rigidify the structure and permit ease of expansion and contraction of the gutter sections relative to the hanger brackets supporting the gutter sections, and the mounting plate spaces the rear wall of the gutter sections from the wall to which the gutter system is secured to ease expansion and contraction of the gutter sections.

4,632,343

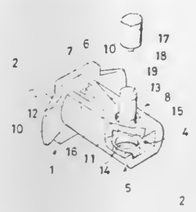
FASTENING DEVICE FOR BUNDLING BAND

Koji Watanabe, Fujisawa, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 30, 1985, Ser. No. 739,591
Claims priority, application Japan, Jun. 5, 1984, 59-82494[U]
Int. Cl.⁴ F16L *3/08*
U.S. Cl. 248—73 **7 Claims**

1. A fastening device for a bundling band, comprising (i) a grommet provided with a tubular insertion part incorporating therein a hollow inner passage for admitting opposite ends of a bundling band, a flange part formed at one end of said insertion part as extended from the outer wall of said insertion part, and a supporting part projected from said outer wall as opposed to

the rear side of said flange part, said insertion part being provided on one of the opposite outer wall surfaces thereof with a pin extending transversely outwardly therefrom to a length greater than the distance between said opposite outer wall surface and connected at the base portion thereof with the outer wall through a thin-walled peripheral part and on the



other opposite outer wall surface thereof with a perforation formed therein in a diameter greater than the diameter of said pin and (ii) a punch provided at the leading end thereof with a projection of a diameter smaller than the diameter of said pin and adapted to drive the pin into the perforation of said grommet and adapted to enlarge the end of the pin struck by said punch.

4,632,344

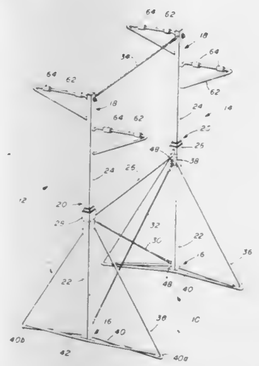
ADJUSTABLE AND COLLAPSIBLE TRIANGULATED TENSION SUPPORT STRUCTURE

Donald Lang, 382 Franklin St., and Joseph S. Shortlidge, 340 Franklin St., both of Cambridge, Mass. 02139

Filed Jan. 29, 1985, Ser. No. 695,906

Int. Cl.[4] F16M *11/32*

U.S. Cl. 248—165 **18 Claims**



1. A triangulated tension support structure comprising:

a first linear means having a base portion, an end portion and an intermediate portion therebetween;

a second linear means having a base portion, an end portion and an intermediate portion therebetween;

a linear compression means positioned between and connected to the intermediate portion of said first and second linear means to form therewith a generally "H"-shaped planar structure and with each such connection permitting rotational movement of the corresponding linear means about a rotational axis normal to the plane of said generally "H"-shaped structure;

a first tensioning member connected between the intermediate portion of said first linear means and the base portion of said second linear means;

a second tensioning member between the intermediate portion of said second linear means and the base portion of said first linear means, said first and second tensioning members diagonally crossing each other in a generally "X" configuration and lying in the plane formed by said first and second linear means and said linear compression means; and,

an adjustable tensioning member extending between and connected to the end portions of said first and second linear means whereby the tensioning of said adjustable tensioning member produces rotation of each one of said linear means about its rotationai axis to spread apart the base portions of said first and second linear means thereby putting said diagonally crossed first and second tensioning members under tension and said linear compression means under compression to produce a rigid structure without slack between and among the components thereof.

4,632,345

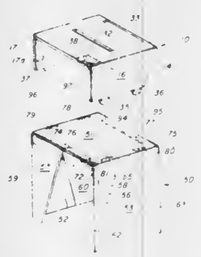
COLLAPSABLE TABLE AND SUPPORT TABLE

Keith A. Barley, 806 E. Oklahoma, Ponca City, Okla. 74601

Filed Sep. 27, 1985, Ser. No. 780,850

Int. Cl.[4] F16M *11/00*

U.S. Cl. 248—174 **5 Claims**



1. A collapsable table for supporting a heavy apparatus comprising

(a) a reinforced top formed of a rectangularly shaped center panel means with an end panel means folded along a first edge of said center panel means against said center panel means thereby forming a double thickness panel;

(b) first and second reinforced support means each formed of a side panel means with a second side panel folded against the inner surface of said side panel means including means to secure said second side panel, each of said first and second reinforced support means attached along support fold lines along the second and third edge of said center panel means; so that each of said reinforced support means can be folded to a position substantially perpendicular to said center panel means;

(c) positioning means attached to the remaining edge of said center panel means for rigidly posititioning said first and second reinforced support means in said substantially perpendicular position by folding said positioning means along said remaining edge into engagement with said first and second reinforced support means; and

(d) means for locking said positioning means to each of said first and second reinforced support means

whereby said first and second reinforced support means will be rigidly secured in substantially perpendicular relationship to said center panel means.

4,632,346

SUPPORT PEDESTAL

Fred D. Wilson, 10902 Holly Springs, Houston, Tex. 77042

Filed Jul. 30, 1984, Ser. No. 635,917

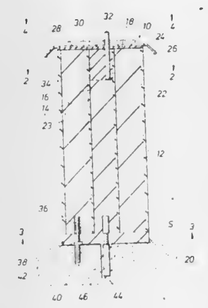
Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—176 **13 Claims**

1. An electrically insulative chemically resistant support pedestal for heavy mechanical objects having base structures defining locator openings and being adapted for location at a predetermined height above a support floor, said support pedestal comprising:

(a) a body of electrically insulative and chemically resistant epoxy material defining upper and lower surfaces and having side wall means, said epoxy body having a height less than said predetermined height and defining a passage extending through said body and intersecting said upper and lower surfaces;

(b) adjustable support means extending downwardly from said lower surface of said body for supporting said body



above the level of said support floor with said lower surface thereof located in spaced relation with said support floor, said adjustable support means leveling said body to position said upper surface thereof in supporting and aligned registry with the base structure of a mechanical object to be supported thereby; and

(c) locator pin means being retained by said body and projecting above said upper surface, said locator pin being oriented in substantially vertical position for registry with a locator opening of said base structure.

4,632,347

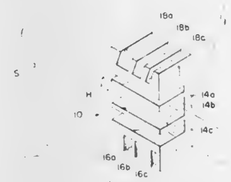
HOLDER FOR KITCHEN UTENSILS AND COMPLEMENTING STAND

Donald Jurgich, P.O. Box 1575, Poulsbo, Wash. 98370

Filed May 3, 1985, Ser. No. 730,762

Int. Cl.[4] F16B *5/12*

U.S. Cl. 248—213.2 **8 Claims**



1. A device for holding the handle of a cooking utensil such as a spoon or whisk, comprising:

a holder body having a central set of channels and two end sets of channels, the channels of one of the end sets being sloped relative to the other end set and the channels of both end sets extending crosswise of the holder body relative to the channels of the central set, each channel of the three sets being exposed at its ends and along one side and having a different width than each other channel in the same set; and

the channels in the central set being located between the end sets and being adapted to selectively receive the handle of a utensil, and the channels in the end sets being adapted to selectively fit over the rim of a container with the utensil projecting over the container from the central set.

4,632,348

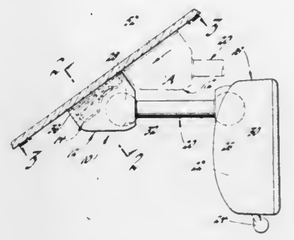
MOUNTING ARRANGEMENT FOR A MIRROR

William A. Keesling, Middletown, and William J. Metzger, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1985, Ser. No. 808,276

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—222.1 **3 Claims**



1. A mounting arrangement for connecting a mirror assembly to an automobile windshield, said mounting arrangement comprising a mirror support member, a base member adapted to be adhesively bonded to said automobile windshield and having a shoulder formed thereon, said mirror support member and said base member each having a top edge and a pair of side edges, each of the side edges of said base and said mirror support having cooperating tongue and groove portions whereby said mirror support member can be placed into mating engagement with said base member until the top portions of the base member and mirror support member contact each other and provide a stop, said mirror support member having a cavity formed therein so when combined with said base member a pocket is provided which is accessible from the bottom end of said mirror support member, a spring clip located in said cavity for preventing said mirror support member from being removed from said base member, said spring clip having a body retained by said cavity in said mirror support member, a pair of bow-shaped spring arms integral with said body and serving to apply a biasing force against said base member, and a T-shaped lock bar integral with said body and normally engaging said shoulder on said base member to prevent movement of said mirror support member in an upward direction and being movable out of engagement with said shoulder by a tool inserted into said pocket so as to allow said mirror support member to be removed from said base member.

4,632,349

SUPPORT ASSEMBLY

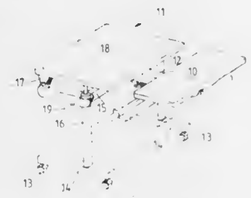
Kenneth D. Anstey, Mt. Gravatt, Australia, assignor to Anstey Pty. Ltd., Acacia Ridge, Australia

Filed Mar. 20, 1985, Ser. No. 713,838

Claims priority, application Australia, Mar. 21, 1984, PG4168

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—281.1 **32 Claims**



1. A support assembly for supporting a control device relative to a fixed support including:

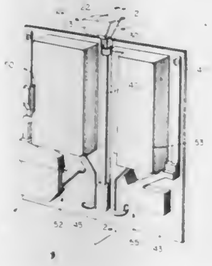
support means for supporting the control device;

attachment means for attachment of the support assembly to the fixed support;
linkage means pivotally interconnecting each of the support means and attachment means;
pivotal mounting means pivotally attaching the linkage means to the support means;
fluid operated means for actuating movement of the linkage means wherein said support means may move in a direction spaced from the fixed support, said fluid operated means being pivotally attachable to the attachment means and to the pivotal mounting means, and including a cylinder mounted on a piston rod, whereby relative movement may occur between the cylinder and the piston rod upon compression or expansion of fluid within the cylinder; and
control means for controlling the fluid operated means accessible to a person sitting on the support means, said control means comprising a control lever or pedal operatively associated therewith so as to cause said compression or expansion of fluid within the cylinder.

4,632,350
ROTATABLE AND VERTICALLY ADJUSTABLE DISPENSER SUSPENSION MEANS

Bruce Brown, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 22, 1984, Ser. No. 663,290
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—295.1 **15 Claims**



1. A vertically adjustable hanger for supporting a dispenser for adding a chemical to a toilet tank on a vertical wall member of said toilet tank at a predetermined height selected by the user, said dispenser having a predetermined thickness, and said hanger comprising:
(a) a bayonet member having attachment means on its upper end for attachment to said wall member and vertical adjustment means, said attachment means being rotatable between a predetermined non-obstructive storage position and a hanging position, and said attachment means effectively increasing the predetermined thickness of said dispenser when rotated from said storage position to said hanging position;
(b) a channel means on said dispenser, said channel means having a predetermined length, width and thickness, said vertical adjustment means of said bayonet member interacting with said channel means to provide vertical adjustability of said bayonet member within said channel means and to secure said bayonet member at a desired adjustment height, whereby the vertical position of said dispenser may be adjusted among a plurality of vertical adjustment heights as desired by advancing or retracting said bayonet member within said channel means in a direction generally parallel to its length; and
(c) vertical control means on said bayonet member to prevent substantial vertical movement of said bayonet member within said channel means except when said attachment means is in hanging position and to limit vertical movement of said bayonet member to a predetermined distance necessary to permit rotation of said attachment means from storage position to hanging position without interference between said attachment means and other dispenser structure.

4,632,351
FINGER RING HOLDER WITH RETRACTABLE RETAINERS

Robert E. Coon, 2567 N. 400 West, Layton, Utah 84041

Filed Jun. 7, 1985, Ser. No. 742,470
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—309.2 **9 Claims**

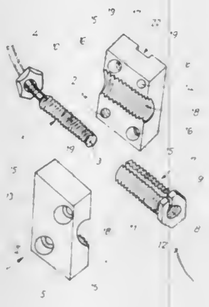


1. A finger ring retainer comprising:
an elongate stem sized to accept a finger ring therearound; and
normally extended retractable means preventing the removal of the ring from the stem, said means being retractable by pressure exerted by the tip of the finger directed along the longitudinal axis of the stem, when the finger is in position for moving the ring therefrom directly onto the stem.

4,632,352
MOUNT FOR A PROXIMITY SENSOR

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 677,801
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3344010
Int. Cl.[4] H03K *17/945*
U.S. Cl. 248—313 **10 Claims**

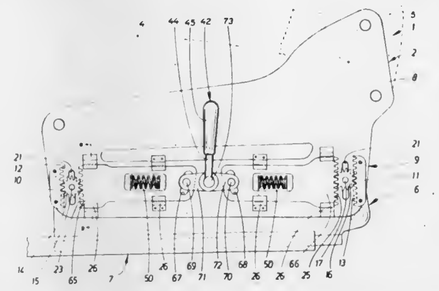


1. A mounting for proximity sensors comprising a circularly cylindrical sensor housing having a surface which has an external thread, a bush split along its entire length and having an externally threaded surface and a threaded bore into which the proximity sensor housing is screwed, a clamping jaw structure comprising a pair of seperable clamping jaws and defining a clamping jaw threaded recess therebetween, said bush being displaceable in the threaded clamping jaw recess in a longitudinal direction for adjusting the proximity sensor housing.

4,632,353
SEAT ADJUSTMENT DEVICE IN PARTICULAR FOR VEHICLE SEATS

Bertil A. Mattson, Gothenburg, Sweden, assignor to Broderna Hammarstedt Verkstads AB, Sweden

Continuation of Ser. No. 622,167, Jun. 19, 1984, abandoned. This application Apr. 23, 1986, Ser. No. 857,526
Claims priority, application Sweden, Jun. 20, 1983, 8303505
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—396 **1 Claim**

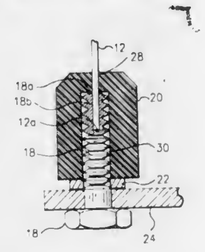


1. Seat adjustment device for adjusting the elevational position of the seat, said seat having a frame with an upper part to support bodies, resting surfaces carried by said upper part, a lower part, and a foundation supporting said lower part, said device comprising a mechanism connecting the upper part and the lower part including four gear wheels carried on a first of said upper and lower parts by means of two shafts extending between two opposite sides of said part, said gear wheels being carried at the outer ends of the shafts with each side of said first part being provided with two gear wheels each connected to one of said shafts and with an intermediate space between them, members operably connected with each of said shafts for rotating them, cog tracks carried by the other of said upper and lower parts, each cog track being in permanent engagement with a corresponding gear wheel outside of the intermediate space at said opposite sides of the first part and having its longitudinal direction extending in a substantially vertical direction, such that by rotating said gear wheels they are moved along their corresponding cog tracks and cause movement of the upper part in relation to the lower part in elevational direction for elevational adjustment of the resting surfaces, locking means for each gear wheel in the form of an additional cog track, the additional cog tracks being disposed in said intermediate space and each additional cog track being disposed in an opposedly directed position in relation to the respective first mentioned cog track for the gear wheel, the additional cog track being movable into and out of engagement with its respective gear wheel and immovable in its longitudinal direction in relation to its respective first mentioned cog track by also being attached to the other of said parts, means for moving each additional cog track into and out of engagement with its respective gear wheel so that the respective gear wheel can be released for moving along its respective first mentioned cog track when its additional cog track is out of engagement therewith and locked against rotation when its additional cog track is in engagement therewith, each additional cog track being arranged on a plate which is slidably carried on a side of the other of said parts, said plate being slidable in said intermediate space in a direction generally perpendicular to the longitudinal direction of its respective first mentioned cog track to and from an engagement position with its respective gear wheel which is generally diametrically opposed to the engagement position of the gear wheel in regard to its respective first mentioned cog track, in each intermediate space there being provided a pivotable maneuverable operating member with the member of each side being connected by means of a pivoting shaft to the member of the other side to be pivoted simultaneous therewith, each of said plates being connected to the operating member of its respective side by means of a cam-like surface cooperating with a follower pin, the cam-like surfaces of each plate having a first portion forming a circular path for the pin, the center of said path being co-axial with the center of the pivoting shaft, and a second portion forming a curve extending towards said center of the shaft from one end of the first portion, the first portions extending in the same direction from a line crossing said center of the shaft and the second portions extending from said line in the opposite direction, so that, when the operating member is pivoted in one direction, one follower pin for one plate of each of the respective sides will follow the circular path without moving the respective plate while the other pin will follow the curve thus actuating its respective plate which moves to unlock the respective gear wheels connected to the same shaft at one end of the seat and reverse when the operating member is pivoted in the other direction.

4,632,354
FLEXIBLE SAFETY MAST MOUNTING

Joseph S. Asciutto, 1718 E. Madison Ave., El Cajon, Calif. 92021

Filed Aug. 8, 1985, Ser. No. 763,521
Int. Cl.[4] B62J *27/00*
U.S. Cl. 248—539 **12 Claims**



1. A mounting assembly for a mast having a base end and a free end comprising:
a mast support member having a socket opening to receive and anchor the mast base end and having means for attachment to a structure;
a grip collar for encircling the base end of the mast and the support member and for detachably securing the mast to the support member;
said grip collar made of a relatively hard and resilient material for receiving both the base end of the mast and the support member by a press fit functioning to dampen any oscillation of the mast;
whereby in the event of damage to the mast, the mast can be disconnected and reconnected to the support member by the press fitting connection of the grip collar.

4,632,355
PNEUMATIC SEAT SUPPORT WITH LINKAGE AND HORIZONTAL SHOCK ABSORBERS

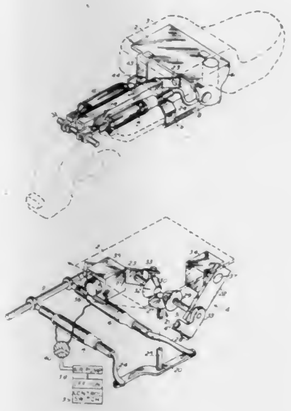
Scipio Thomas, 4444 N. Division, Davenport, Iowa 52806

Filed Jan. 14, 1985, Ser. No. 691,290
Int. Cl.[4] B62J *1/02*
U.S. Cl. 248—584 **3 Claims**

1. A pneumatic support for a seat comprising:
a seat frame to which said seat is to be attached for support,
a main frame of said support to be connected to a vehicle,
guiding members connected between said seat frame and said main frame to retain said seat frame substantially horizontal while permitting in a vertical direction free

reciprocal travel of said seat frame relative to said main frame,

a linkage having first, second, and third levers, and gear means coupling said first lever to said second and third levers, each of said second and third levers having an inner end connected to said gear means, said first lever having an intermediate point connected to said gear means and in response to rotation about said point rotating said second and third levers within a limited angle in unison for maintaining outer ends of said second and third levers even at heights determined by rotative positions of said first lever,



means pivotally connecting respective spaced points of said seat frame to said outer ends of said second and third levers,

said first lever having first and second ends to be restrained for determining the height of said seat frame,

a first elongated pneumatic shock absorber positioned substantially horizontal and connected between said main frame and said first end of said first lever, and

an elongated spring means positioned substantially horizontal and connected between said main frame and said second end of said first lever, said first pneumatic shock absorber and said elongated spring means cooperating to provide resilient support for said seat.

4,632,356

VERTICALLY ADJUSTABLE SHOCK-ABSORBING MOUNTING DEVICE

Erich Munz, Weststrasse 11, D - 5204 Lohmar 1 - Geber, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,835

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414888; Dec. 5, 1984, 3444237

Int. Cl.[4] F16M *3/00*

U.S. Cl. 248—638 **14 Claims**

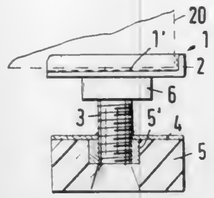
1. A vertically adjustable, shock-absorbing mounting device for supporting an object, which comprises

(a) a foundation body including a metallic cover plate,

(b) a support plate having an underside and a supporting surface for the object, the support plate including

(1) a ledge protruding from the support surface at no more than two adjoining sides of the support plate for engaging and retaining the object on the supporting surface against rotation in relation thereto, and

(c) a threaded spindle having an upper end connected with the underside of the support plate and a lower end connected with the cover plate, one of the spindle ends being in threaded connection and the other spindle end being in locking connection with the respective plate whereby rotation of the threaded spindle adjusts the spacing between the foundation and the support plate while the



object is held against rotation by the retaining engagement with the ledge.

4,632,357

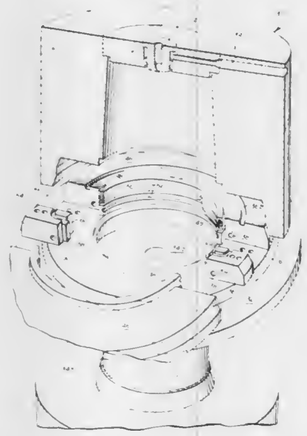
MOLD FOR MAKING A BUCKET WITH BAIL

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Filed Dec. 12, 1984, Ser. No. 680,736

Int. Cl.[4] B29C *39/34, 45/26*

U.S. Cl. 249—58 **15 Claims**



1. In a mold assembly for making a bucket having a pivotable handle secured at opposed sides of said bucket plus integrally molded handle handle retention chambers, said handle terminating at each end in an enlargement positioned within one of said handle retention chambers, said handle retention chambers each being defined by walls having a first slot opening extending thereacross through which said handle extends, said first slot opening being of insufficient size to allow removal of the enlargement from the handle retention chamber, said mold assembly comprising openable and closable first and second mold halves defining a first molding chamber between them of the shape of said bucket and including handle retention chamber-defining means, said means including opposed, movable mold members capable of end-to-end abutment in a molding position, and a spaced relation in a mold-open position to permit removal of a bucket molded therein, said mold members defining inner molding chambers formed between them in their end-to-end abutting relation for molding said enlargements on the handle ends, and gates means communicating between the first and inner molding chambers, said mold nembers also having means for forming said first slot in buckets molded in said mold halves, and means for moving only in substantially linear motion said mold members between said end-to-end abutment and spaced relation.

4,632,358

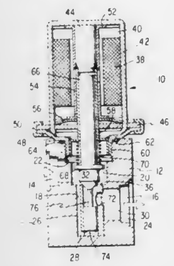
AUTOMOTIVE AIR CONDITIONING SYSTEM INCLUDING ELECTRICALLY OPERATED EXPANSION VALVE

Charles D. Orth, Lake Forrest, and Robert J. Torrence, Addison, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 631,663, Jul. 17, 1984, abandoned. This application May 16, 1985, Ser. No. 734,936

Int. Cl.[4] F16K *31/02*

U.S. Cl. 251—117 **11 Claims**



1. An electrically operated expansion valve for use in an automotive air conditioning system comprising:

a valve body formed with an internal bore extending into said body from one end thereof, an inlet port generally transverse to and intersecting said bore, and an outlet port generally transverse to and intersecting said bore, said inlet and outlet ports being offset relative to each other along the major axis of said bore, with said inlet port being closer to said one end of said valve than said outlet port;

a hollow sleeve member tightly fitted within said bore in the region of said outlet port, said sleeve member being formed with a valve seat on one end thereof and an opening through its wall to provide communication between the interior of said sleeve member and said outlet port, said sleeve member being further formed with an exterior channel extending the length of said sleeve member substantially opposite said opening;

a solenoid mounted on said one end of said valve body, said solenoid having a movable plunger extending into said internal bore, the end of said plunger which extends into said internal bore being formed as a valve member to cooperate with said valve seat to control the flow through said inlet and outlet ports, energization of said solenoid causing said plunger to move outward from said valve body;

spring means for yieldably biasing said plunger inward of said valve body;

means for pressure balancing said valve; and

means for providing at least a minimum flow through said inlet and outlet ports independent of the condition of said solenoid.

4,632,359

LOW NOISE FLOW CONTROL VALVE

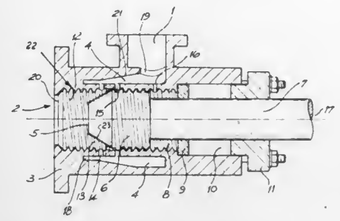
Allan D. Tooth, Penshurst, Australia, assignor to International Combustion Australia Limited, New South Wales, Australia

Filed Apr. 1, 1985, Ser. No. 718,116

Int. Cl.[4] F16K *47/02*

U.S. Cl. 251—126 **6 Claims**

1. A fluid control valve assembly comprising a body; a cylindrical bore in said body extending to an outlet; an entry passage extending to said bore; a spool extending longitudinally into said bore so as to have an end portion located therein, said end portion providing a bluff end face and a threaded section formed on a longitudinal pheripheral surface of spool adjacent said face; a chamber formed in said entry passage and adapted to resonate at a predetermined frequency, said chamber terminating in a blind passage which provides a standing wave; a plurality of inner passages extending between said chamber and bore, at least one said inner passages being tuned to resonate at a frequency close to said predetermined frequency, a further one of a said end passages being located



upstream of said one inner passage so as to deliver fluid to said threaded section so that the fluid delivered thereto is caused to spin; and wherein said outlet is tuned to a frequency close to said predetermined frequency.

4,632,360

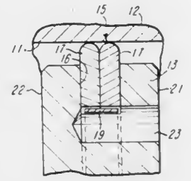
BUTTERFLY TYPE VALVE SEAL

Dennis W. DeSalve, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Aug. 14, 1981, Ser. No. 292,997

Int. Cl.[4] F16K *25/00*

U.S. Cl. 251—175 **4 Claims**



1. A butterfly type valve element in disc form controlling flow of a fluid through a valve accomodating bore, said valve element having a peripheral groove, plural split ring seals in a face to face relation installed independently of one another in said groove to substantially fill said groove in a longitudinal sense, inner peripheries of said seals being spaced radially outwardly from the bottom of said groove, means for admitting pressure fluid to said groove at a location radially inwardly of the inner peripheries of said seals, and means in said groove radially inwardly of the inner peripheries of said seals and overlying the joint or joints between said seals utilizing the pressure of admitted pressure fluid in said groove to apply a radially expanding pressure substantially uniformly to said ring seals and without a loss of fluid pressure through said joint or joints.

4,632,361

SCHEDULED FLUID CONTROL VALVE

Douglas A. Callison, Des Moines, Iowa, assignor to Callison & Associates Limited Partnership, Urbandale, Iowa

Division of Ser. No. 461,120, Jan. 26, 1943. This application Sep. 9, 1985, Ser. No. 773,578

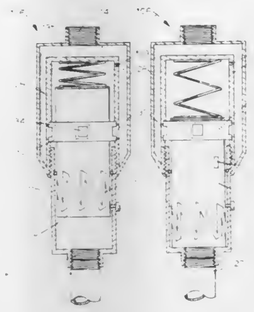
Int. Cl.[4] F16K *31/528*

U.S. Cl. 251—230 **2 Claims**

1. A scheduled fluid control valve comprising:

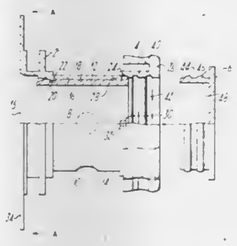
(a) a generally cylindrical housing having an upstream inlet portion and a fluid supply attached to said inlet portion and a downstream outlet portion which is a generally cylindrical jacket having at least one throughbore port,

(b) a cylinder relatively movable with respect to said housing,
(c) a stationary annular gasket having at least one radially directed port, coinciding with a port of said outlet portion of said housing, providing a fluid-tight seal between said inlet portion and said outlet portion,



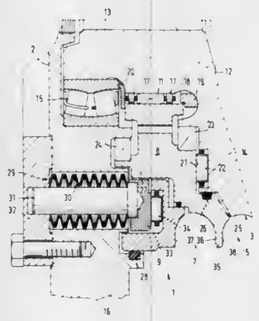
(d) at least one throughbore port in said cylinder which can be selectively brought into fluid communication with one of said ports of said annular gasket as said cylinder is slidably and sealably movable within said gasket, and
(e) groove and follower means for producing relative movement of said cylinder with respect to said annular gasket for selectively moving said ports into and out of through-flow alignment in a preestablished sequence.

4,632,362
TAP
Anthony J. Lucking, London, England, assignor to Waddington & Duval Limited, England
Filed Jan. 27, 1984, Ser. No. 574,540
Claims priority, application United Kingdom, Feb. 16, 1983, 8304244
Int. Cl.⁴ F16K *5/04*
U.S. Cl. 251—310 **4 Claims**



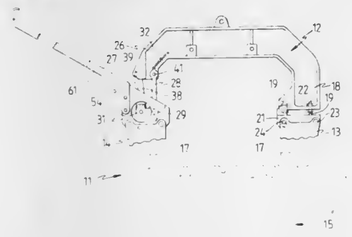
1. A tap for dispensing a liquid from a container, said tap comprising
a body member attachable to said container, said body having a cylindrical sleeve portion that defines a tap inlet and a first liquid outlet hole,
a tap member having a cylindrical spigot portion that defines a second liquid outlet hole, said body member's sleeve portion receiving said tap member's spigot portion in a liquid tight fit therein while permitting said spigot portion to turn relative to sleeve portion, said second outlet hole being alignable with and misalignable from said first outlet hole by turning said spigot portion for permitting and preventing, respectively, liquid flow out of said container when said tap is attached to said container,
structure that defines a liquid inlet hole in said tap member's spigot portion, said inlet hole communicating through said tap member and said tap inlet in said body member with the interior of said container, and said inlet hole being positioned exteriorly of said container when said tap is attached to said container in order to permit initial filling of said container through said tap if desired, and
a removable plug received in said tap member's inlet hole to prevent liquid flow out of said inlet hole when said tap is attached to said container and said container is filled with liquid, said plug being temporarily removable from exteriorly of said container to permit initial filling of said container through said tap, inlet in said body member when said first and second outlet holes are misaligned, and said plug being insertable from exteriorly of said container into sealed relation with said tap member's inlet hole after filling of said container through said tap to permit or prevent liquid flow out of said container by aligning or misaligning said first and second outlet holes,
said tap member comprising one of at least two ridges and grooves adjacent the outer end of said cylindrical spigot portion, and said plug comprising the other of at least two ridges and grooves, the ridges and grooves on said tap member and said plug cooperating to provide at least a temporary connection therebetween when only one ridge is interengaged in one groove but cooperating to provide a liquid seal tight connection therebetween when both ridges are interengaged in both grooves.

4,632,363
WINCH HAVING A DRIVE DISC CONNECTABLE TO A ROPE DRUM IN DEPENDENCE UPON THE LOAD APPLIED TO THE ROPE
Egon Frommherz, Steinen, Fed. Rep. of Germany, assignor to Rotzler GmbH & Co. Spezialfabrik für Seilwinden und Hebezeuge, Steinen, Fed. Rep. of Germany
Filed Aug. 2, 1985, Ser. No. 762,107
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428875
Int. Cl.⁴ B66D *1/14, 1/26*
U.S. Cl. 254—309 **11 Claims**



1. A winch comprising:
a frame housing;
at least one rope drum assembly mounted in said frame housing and including;
a rope drum rotatably mounted in said housing and defining groove means for guiding a rope thereon;
a drive disc disposed adjacent said rope drum and defining a run-out groove for the rope;
bearing means for rotatably journalling said drive disc on said rope drum so as to cause said drive disc and said rope drum to conjointly define an interface region therebetween;
free runner means for establishing an operative connection between said drive disc and said rope when the rope is pulled out under load from said run-out groove and for interrupting said operative connection when the rope becomes unloaded, said free runner means being a free runner assembly including a free runner disposed in said interface region for developing a frictive engaging force between said drive disc and said rope drum in response to an adequate tension applied to the rope so as to cause said drive disc to rotate with said rope drum for running out the rope; and, tightening means for pressing against the rope as it is run out from said run-out groove.

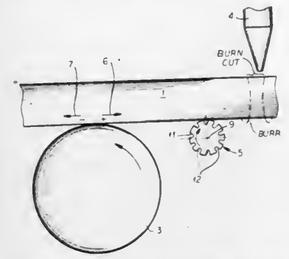
4,632,364
BUNDLE CONDUCTOR STRINGING BLOCK GATE
Karl E. Smith, Bessemer, Ala., assignor to Bethea Electrical Products, Inc., Birmingham, Ala.
Filed Mar. 8, 1985, Ser. No. 709,806
Int. Cl.⁴ B66D *1/36;* H02G *1/02*
U.S. Cl. 254—405 **7 Claims**



1. In a bundle conductor stringing block including a yoke, a first vertical frame member rigidly attached to said yoke, a second vertical frame member spaced from said first vertical frame member, and a transversely extending shaft mounted between said vertical frame members carrying a plurality of rotatably mounted sheaves, wherein said yoke and said second vertical frame member define a passageway therebetween from the exterior of said block to the interior of said block, the improvement comprising:
(a) means for aligning said yoke and said second vertical frame member mounted therebetween transversely of said passageway including:
(i) an alignment gate pivotally mounted on said yoke internally of said block for movement into engagement with said second vertical frame member, and
(ii) means for releasably securing said alignment gate in engagement with said second vertical frame member in response to the entry of a lead line into said passageway with said alignment gate having a retention cam roller mounted thereon, said cam roller being engaged by said means for releasably securing said alignment gate; and
(b) gate means pivotally mounted to said second vertical frame member movable selectively to a first open position and to a second closed load bearing position responsive to the movement of a lead line within said passageway from the exterior of said block to the interior of said block.

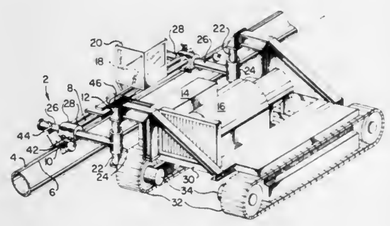
4,632,365
APPARATUS FOR THE TORCH CUTTING OF A STEEL STRUCTURAL SHAPE
Rolf Peddinghaus, Deterbergerstr. 25, 5828 Ennepetal, Fed. Rep. of Germany
Filed Feb. 28, 1986, Ser. No. 834,797
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507087
Int. Cl.⁴ B23K *7/00*
U.S. Cl. 266—48 **8 Claims**

1. In an apparatus for cutting a steel structural shape workpiece, comprising a roller conveyor, at least one driven feed roller, a cutting torch mounted behind said driven feed roller in a positive feed direction, and a burr removal device, wherein said workpiece, when lying on said roller conveyor, is movable in said positive feed direction and a negative feed direction opposite to said positive feed direction, and said cutting torch is movable transversely to said positive and said negative feed directions, and wherein further said burr removal device is



positioned so as to be under said workpiece, the improvement wherein said burr removal device comprises a burr-removal shaft with a milling member, which is mounted downstream of said driven feed roller in said positive feed direction, and said burr-removal extends over the entire width of said roller conveyor.

4,632,366
LINE TRAVEL NORMALIZER
Douglas L. Sprung, Camano Island, Wash., assignor to Pipemakers, Inc., Calgary, Canada
Filed Nov. 1, 1984, Ser. No. 667,362
Int. Cl.⁴ C21D *9/08*
U.S. Cl. 266—87 **11 Claims**



1. A normalizer for linear welds in continuous lengths of pipes made from flat metal strip comprising:
(a) an induction heater to lie selectively over a weld in the pipe being normalized for applying heat to the weld;
(b) a mounting assembly for the induction heater;
(c) a power source for the induction heater;
(d) electrical control means for the induction heater to control the power from the power source to the induction heater;
(e) mechanical means to continuously coordinate the elevation and lateral placement of the mounting assembly and induction heater with respect to those of the pipe;
(f) mechanical control means to enable continuous control of the lateral placement of the mounting assembly and induction heater with respect to the pipe weld to be normalized and to ensure proper placement of the induction heater over the weld;
(g) spacer means to permit adjustable spacing of the induction heater a predetermined distance from the pipe weld to be normalized and provide a predetermined constant air gap between the induction heater and that weld;
(h) carriage means on which elements (a) through (g) of the normalizer are mounted for movably transporting these elements along the pipe to be normalized; and
(i) drive and steering means for the carriage means.

4,632,367

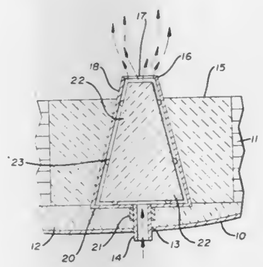
DEVICE FOR INTRODUCING GAS INTO MOLTEN METAL

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 662,831, Oct. 19, 1984, Pat. No. 4,538,795. This application Aug. 26, 1985, Ser. No. 769,413

Int. Cl.⁴ C21C *5/48*

U.S. Cl. 266—220 **6 Claims**



1. In a device for introducing gas into a mass of molten metal in a container, the improvement which comprises a refractory plug and an open ended shell positioned thereabout in spaced relation thereto and defining an opening around said refractory plug, a pocket block having a passageway extending vertically therethrough, said pocket block adapted to form a portion of a refractory lining in said container for said molten metal, said container having an opening therein in registry with said passageway in said pocket block, said refractory plug and said shell positioned in said passageway in said pocket block with said shell and refractory plug extending outwardly of and above said passageway in said pocket block in protecting relation to said refractory plug with respect to molten metal introduced into said container and so as to form a hot metal dam protecting said opening around said refractory plug.

4,632,368

CONTINUOUS CASTING TUNDISH WITH POST-REFINING TREATMENT REACTOR FUNCTIONS

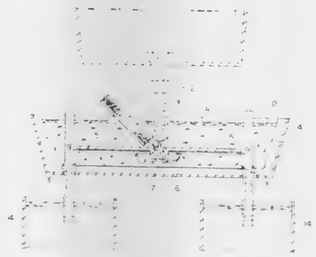
Maurizio Podrini, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Apr. 17, 1985, Ser. No. 724,298

Claims priority, application Italy, May 8, 1984, 48151 A/84

Int. Cl.⁴ C21B *3/04*

U.S. Cl. 266—229 **5 Claims**



1. A horizontally elongated continuous casting tundish having a horizontally elongated horizontal baffle intermediate its height, a hole through the baffle for the downward flow of molten metal, the solid portion of said baffle occupying the majority of the horizontal area of the baffle, the space below the baffle communicating at at least one end of the baffle with the space above the baffle, said hole and said at least one end being spaced apart and said baffle between said hole and said at least one end closing off the space below said baffle from the space above said baffle, and at least one casting hole through the bottom of the tundish, whereby at least a portion of the molten metal moves downwardly through the first-mentioned hole, then below the baffle to said at least one end, then above and lengthwise of the baffle, and downwardly through said casting hole.

4,632,369

COIL-ANNEALING SPACER

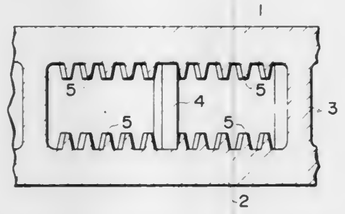
Senju Takara, Kitakyushu, and Yoshihiro Tanaka, Tokuyama, both of Japan, assignors to Toyo Kohan Co., Ltd, Tokyo and Tobata Iron Works Co., Ltd., Fukuoka, both of, Japan

Filed Jun. 7, 1985, Ser. No. 742,180

Claims priority, application Japan, Jun. 11, 1984, 59-120438

Int. Cl.⁴ C21D *9/673*

U.S. Cl. 266—262 **4 Claims**



1. A coil-annealing spacer which comprises a pair of upper and lower discs, each having a round hole in the central portion thereof, and longitudinal ribs disposed between the discs and secured thereto and extended radially or spirally radially from the round hole of each disc toward the periphery, wherein heat transfer fins are arranged on at least one inner wall of a gas passage defined by said upper and lower discs and said longitudinal ribs along the flow of an atmosphere gas.

4,632,370

HYDRAULICALLY-DAMPED MOUNT

Gerd-Heinz Ticks, Waldmichelbach, and Volker Grassmuck, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,854

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330462

Int. Cl.⁴ F16F *9/08*

U.S. Cl. 267—8 R **20 Claims**

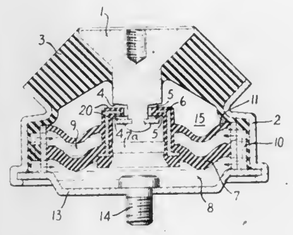
1. A mount for hydraulically damping vibrational motion, comprising:

a pedestal and a mounting bracket for connecting the mount between an object to be mounted with the mount and a support therefor;

a resilient pad connecting the pedestal and the mounting bracket for the vibrational motion therebetween;

diaphragm means for flexibly enclosing a working space and an expansion space for an hydraulic fluid with at least one throttle opening for the hydraulic fluid therebetween, the diaphragm means being connected to the mounting bracket and spaced from the resilient pad sufficiently so as not to engage the resilient pad upon flexure thereof with the hydraulic fluid;

bumper shoulders operatively connected to the pedestal and spaced from each other in the direction of the vibrational motion; and



counter shoulders operatively connected to the diaphragm means and spacedly positioned between the bumper shoulders for engagement thereby upon sufficient amplitude of the vibrational motion, the bumper shoulders and the counter shoulders being outside the working and expansion spaces for the hydraulic fluid enclosed by the diaphragm meas.

4,632,371

GAS SPRING OF VARIABLE SPRING FORCE

Winfried Wirges, Koblenz; Leo Lauderbach, Steinbach, and Willi Schäfer, Koblenz, all of Fed. Rep. of Germany, assignors to Stabilus GmbH, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,977

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410309

Int. Cl.⁴ F16F *9/14*

U.S. Cl. 267—64.28 **11 Claims**



1. A gas spring comprising a working cylinder (**1**) having an axis and defining a cavity (**8, 9**) therein;

a plunger member (**3, 4**) extending inwardly and outwardly of said cavity (**8, 9**) and defining a first working chamber (**8**) within said cavity (**8, 9**), said plunger member (**3, 4**) being axially movable with respect to said working cylinder (**1**) inwardly and outwardly of said cavity (**8, 9**);

a mass of gas within saids first working chamber (**8**), the pressure of said gas being responsive to the axial position of said plunger member (**3, 4**) with respect to said working cylinder (**1**);

gas exchange means for selectively increasing and decreasing the mass of gas contained within said first working chamber (**8**), said gas exchange means comprising

a gas exchange chamber (**10**) fixed with respect to said working cylinder (**1**);

exchange passage means extending between said first working chamber (**8**) and said gas exchange chamber (**10**);

exchange valve means (**14**) within said exchange passage means; and

exchange operating means separated from said plunger member (**3, 4**) further characterized in that

said gas exchange chamber (**10**) accommodates a pumping piston (**12**) movable between an innermost position adjacent said first working chamber (**8**) and an outermost position remote from said first working chamber (**8**), said pumping piston (**12**) defines a pumping chamber (**10***a*) within said exchange chamber (**10**), said pumping chamber (**10***a*) is adjacent said exchange valve means (**14**), said pumping piston (**12**) is provided with suction valve means (**12***a*) permitting aspiration of air into said pumping chamber (**10***a*) on outward movement of said pumping piston (**12**) and closing said pumping chamber (**10**) on inward movement of said pumping piston (**12**), said exchange valve means (**14**) is of the check-valve type and is closed in response to the pressure within said first working chamber (**8**) exceeding the pressure within said pumping chamber (**10***a*) and is opened in response to the pressure within said pumping chamber (**10***a*) exceeding the pressure within said first working chamber (**8**);

said pumping piston (**12**) is provided with a pump operating member (**13***a*) outside said gas exchange chamber (**10**) and with an exchange valve actuating pin (**16**) opening said exchange valve means (**14**), when said pumping piston (**12**) is in or adjacent its innermost position; and

said pumping pistion (**12**) comprises manually operable bleed valve means (**17, 18**) for connecting said pumping chamber (**10***a*) with atmosphere.

4,632,372

RUBBER VIBRATION INSULATOR

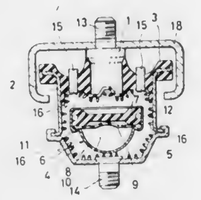
Zenji Nakajima, Okazaki; Shuichi Okamoto, and Motoo Kunihiro, both of Tsu, all of Japan, assignors to Toyo Rubber Industry Co., Osaka and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 4, 1985, Ser. No. 707,779

Claims priority, application Japan, Mar. 7, 1984, 59-33375[U]

Int. Cl.⁴ F16F *15/04*

U.S. Cl. 267—140.1 **6 Claims**



1. A rubber vibration insulating device, comprising:

a boss member,

a cylindrical body;

an annular elastic member interposed between and sealingly interconnecting said boss member and one end of said cylindrical body;

a plate member sealingly secured to an opposite end of said cylindrical body whereby a sealed chamber having a variable volume is defined and surrounded hermetically by the foregoing elements, said sealed chamber housing internally thereof a capsule comprising an external shell which consists of a rubber plate and a plate body joined

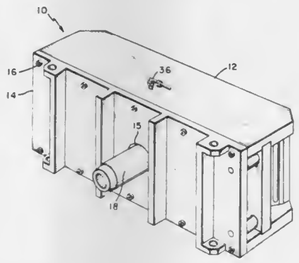
together and a diaphragm transversely provided inside said shell thereby forming an air sub-chamber surrounded by said diaphragm and said plate body and a liquid sub-chamber surrounded by said diaphragm and said rubber plate, said rubber plate having means defining an orifice extending through said rubber plate for providing communication between said liquid sub-chamber and said sealed chamber, said sealed chamber being filled with a liquid so that said liquid passes through said orifice between said sealed chamber and said liquid sub-chamber, said capsule being wholly surrounded by said liquid in said sealed chamber and floatingly suspended in said liquid.

4,632,373

FIXTURE

Roland G. Caron, Brookfield, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Dec. 20, 1985, Ser. No. 811,255
Int. Cl.⁴ B29C *27/08*; B23Q *1/00*
U.S. Cl. 269—50 **8 Claims**



1. A fixture comprising:
a housing including an apertured cover plate;
a first plate disposed movably in said housing;
a second plate disposed movably in said housing, said second plate superposed on said first plate and having a coupling means extending through the aperture of said cover, said coupling means being of a smaller size than said aperture to provide for limited motion of said coupling means relative to said aperture;
first means for providing fluid under pressure in the space between said cover plate and said second plate and between said second plate and said first plate for enabling said second plate to undergo floating motion whereby to cause said coupling means to engage a workpiece in predetermined relation, and
second means for providing fluid under pressure in the space between said housing and said first plate for causing said first plate responsive to such pressurized fluid to be forced into contact with said second plate and said second plate into intimate contact with said cover plate for retaining the position of said coupling means in said predetermined relation with the workpiece.

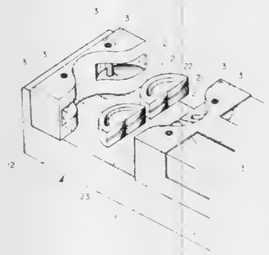
4,632,374

VISE WITH SLIDING MOVABLE CLAMP SURFACE

Tai-Her Yang, 5-1, Tai-Pin Street, Kuang-Hwa Li, Si-Hu Jenn, Chang-Hwa Hsien, Taiwan

Continuation of Ser. No. 310,113, Dec. 15, 1981, abandoned.
This application Sep. 14, 1984, Ser. No. 643,324
Int. Cl.⁴ B25B *1/20*
U.S. Cl. 269—261 **2 Claims**

1. In a vise assembly including a substantially planar base having an end portion, an upwardly-extending portion formed integrally with the end portion of the planar base and perpendicularly thereof, a first vise member mounted on the base and disposed against the upwardly-extending portion of the base, and a second vise member mounted on the base for movement towards and away from the first vise member in a direction substantially longitudinally of the base, the improvement which comprises, in combination, each of the vise members having a pair of convex vise faces separated by a concavely curved notch therebetween, each of the convex vise faces having a substantially semi-circular blind channel formed therein and opening into the concavely curved notch, each of the channels being defined within a pair of planes which are substantially parallel to each other and to the planar base, a movable clamp piece within each of the channels and extending partially into the concavely curved notch, each of the clamp pieces being substantially semi-circular in plan outline, a fixed pin carried by each of the convex vise faces and extending through the respective channel therein perpendicularly of the base, each of the clamp pieces having an arcuate slot formed therein to receive a respective pin, each of the arcuate



slots extending substantially the full semi-circular extent of the respective clamp piece, each of the clamp pieces being adapted to move independently of the other clamp pieces and about a respective rotational axis eccentrically of its respective pin, each of the clamp pieces having a planar clamping face, wherein a total of four clamp pieces are provided and are arranged in two pairs, one pair for each vise member, wherein the clamp pieces in each vise member are co-planar and are arranged laterally of each other, each clamp member having a given radius, and the rotational centers of an adjacent pair of clamp members being separated by a maximum of two given radii plus sliding clearance, whereby a cylindrical workpiece whose diameter is only slightly larger than the sliding clearance may be gripped upright by the four clamp members substantially perpendicularly of the planar base of the vise assembly.

4,632,375

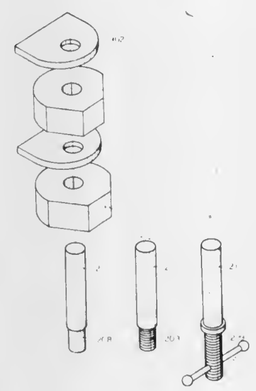
SERVO-CLAMPING DEVICE

Tai-Her Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed Dec. 22, 1983, Ser. No. 564,319
Int. Cl.⁴ B25B *1/24*
U.S. Cl. 269—262 **3 Claims**

1. In a clamping device, wherein a pair of clamping jaw groups are mounted on a base, wherein one of the clamping jaw groups is movable in a direction towards and away from the other clamping jaw group to clamp a workpiece therebetween, and wherein at least the other of the clamping jaw groups includes a pair of movable clamping jaws arranged laterally of one another, the improvement comprising each movable clamping jaw being multi-layered and including at least a pair of movable clamping claws spaced vertically of one another, the base of the clamping device having an upwardly-extending base member, and means for mounting each movable clamping claw in the multi-layered movable clamping jaw in the other of the clamping jaw groups for pivotal movement on the base, said mounting means including a post extending upwardly from the base of the clamping device, each movable clamping claw having a central hole for receiving the post, each movable clamping claw including a rearward portion having a substantially semi-circular plan outline, the upwardly-

extending base member having a pair of vertically-spaced substantially semi-circular channels formed therein for receiving the respective semi-circular rearward portions of the movable clamping claws, respectively, each of the movable clamping claws further having a forward multi-faceted portion including at least a pair of planar clamping faces arranged transversely of one another, and a non-movable supporting ring member interposed between the pair of movable clamping



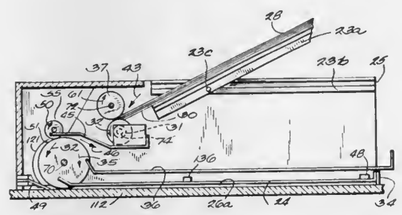
claws, the supporting ring member having a central hole formed therein for receiving the post, the supporting ring member further having a forward portion extending substantially inwardly of the multi-faceted planar faces of the respective movable clamping claws, and the supporting ring member still further having a rearward portion provided with a flat edge for bearing against the upwardly-extending base member between the channels formed therein.

4,632,376

DRIVE MECHANISM FOR DOCUMENT COPIER

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Filed Nov. 22, 1985, Ser. No. 800,756
Int. Cl.⁴ B65H *5/06*
U.S. Cl. 271—4 **6 Claims**



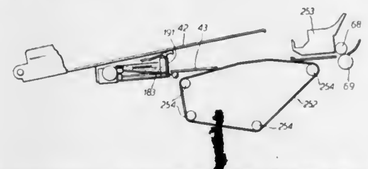
1. A document feeder, for a copying device, including:
a frame including a bottom and a top
said top being pivotal to a position at an angle with the bottom to provide an inclined document support,
said bottom having an opening therein with edges constructed and arranged to lie upon the top of the copying device,
a feed wheel arranged to rotate in one direction whereby to remove the bottom document of a stack of documents placed upon the inclined support,
a retard member arranged to prevent the remainder of the documents in the stack from advancing when the bottom document is removed from the stack,
a drive wheel adapted to rotate at a faster peripheral speed than the feed wheel so as to pull the document from between the feed and retard wheel,
means for rotating the drive wheel in the opposite direction whereby to remove the copied document from the top of the copying device, and
a receiving tray to accept the removed and copied document.

4,632,377

BOTTOM SHEET SEPARATOR-FEEDER

Keith D. W. Browse, Beds, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,332
Claims priority, application United Kingdom, Jun. 8, 1983, 8315733
Int. Cl.⁴ B65H *5/26*
U.S. Cl. 271—9 **6 Claims**



1. Sheet handling apparatus including first and second paper trays having a common bottom sheet separator-feeder in which said trays are relatively movable for operatively associating said trays one at a time with the sheet-feeder, said sheet separator-feeder including vacuum feed means extending through at least the front end of each tray when it is associated therewith for acquiring and advancing the bottom sheet in a stack in the tray, air injection means disposed adjacent the front of the tray to inject air into the front end of said stack, and blower means for creating negative pressure at said vacuum feed means and for creating positive pressure at said air injection means, characterised by means for varying the air pressure at the air injection means relative to the sheet acquisition pressure at the vacuum feed means depending upon which tray is associated with said sheet feeder, and wherein said first tray is mounted for movement between a lowered, operative position in which it is seated within the second tray and operatively associated with said sheet separator-feeder and a raised, inoperative position in which it is spaced over said second tray and the latter is operatively associated with the sheet separator-feeder, said air injection pressure being reduced relative to said sheet acquisition pressure when said first tray is in its raised position; and including a common blower for creating negative pressure at the vacuum feed means and for creating positive pressure at the air injection means, duct means extending between said blower and said air injection means, a pressure relief valve in said duct means and means for controlling said pressure relief valve to be open when said first tray is in raised position and closed when said first tray is in lowered position, said first tray being adapted to engage said pressure relief valve to close it when said first tray is in its lowered position.

4,632,378

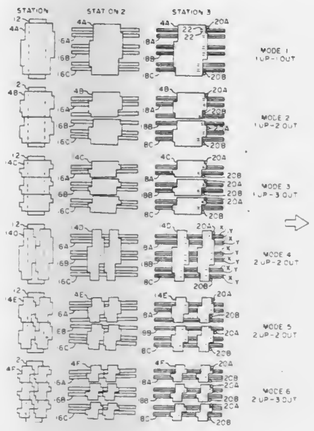
METHOD AND APPARATUS FOR STACKING SERIALLY ADVANCING PARALLEL STREAMS OF BLANKS

Louis M. Sardella, Cockeysville, Md., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Feb. 7, 1985, Ser. No. 699,208
Int. Cl.⁴ B65H *29/36*
U.S. Cl. 271—202 **11 Claims**

1. Apparatus for stacking a stream of serially advancing blanks comprising:
timed conveyor means for serially advancing and releasing said blanks from beneath said conveyor means, said timed conveyor means having first and second operable positions and, when in said first operable position, having means to advance serially spaced ones of said blanks at a

constant velocity and, when in said second operable position, having a first means for advancing a second blank of pairs of blanks in said stream at a constant velocity and a second means for advancing a first blank in said pairs at a velocity initially equal to and then faster than said constant velocity to create a longitudinal space between otherwise adjoining said first and second blanks;



stop means adjacent a discharge end of said timed conveyor means for stopping the advance of said blanks upon their release by said timed conveyor means; and

receiving means beneath said timed conveyor means upon which said blanks are stacked following release by said conveyor means.

4,632,379

DEVICE FOR FEEDING INDIVIDUAL SHEETS TO AN OFFICE MACHINE

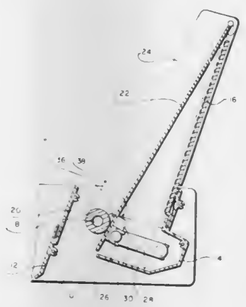
Friedhelm Steinhilber, Saline 29, D - 7210 Rottweil, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 746,794

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422794

Int. Cl.⁴ B65H *1/08, 7/04*

U.S. Cl. 271—127 **3 Claims**



1. A device for feeding individual sheets to an office machine having a frame which can be put into operation only if sheets are present in a magazine and only if a pressure plate is pressing said sheets against a sheet separating device comprising a magazine for receiving stacked sheets, a separating device which catches a first sheet of the stack, a movable mounted pressure plate which rests against the back of said stack under force and presses it against said separating device, characterized in that a first and a second switch are united in one switch which is located on the rear of said pressure plate and comprises a lever for actuation which extends through the pressure plate and makes contact with the stack, said lever having another portion which contacts a stop on the frame when the plate is completely moved away from the separating device.

4,632,380

PAPER FEEDING APPARATUS

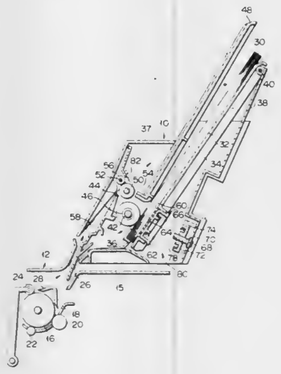
Yoshiaki Ono, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,783

Claims priority, application Japan, Jul. 31, 1984, 59-160596

Int. Cl.⁴ B65H *1/12*

U.S. Cl. 271—127 **8 Claims**



1. A paper feeding apparatus comprising:

a paper-supply roller;

movable plate means opposed to the paper-supply roller for carrying thereon a plurality of paper sheets in a pile and urging the paper sheets toward the paper-supply roller;

at least one opening formed in the movable plate so as to substantially face the paper-supply roller;

a plurality of backup members protruding into said at least one opening so as to be movable in a direction crossing a sheet carrying surface of the movable plate; and

urging means provided for each backup member and urging each backup member toward the paper-supply roller with an individually settable urging force to press the paper sheets placed on the movable plate against the paper-supply roller whereby the paper-supply roller delivers the paper sheets one after another.

4,632,381

PROCESS AND APPARATUS FOR TRANSFERRING A SHEET OF MATERIAL FROM ONE ASSEMBLY TO ANOTHER

Jean P. Cuir, 36 Av de Brigode, and Gérard Cuir, 23 Allée des Champs, both of 59650 Villeneuve d'Ascq, France

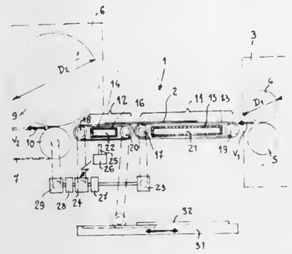
Filed May 20, 1983, Ser. No. 496,658

Claims priority, application France, May 27, 1982, 8209704

Int. Cl.⁴ B65H *5/34*

U.S. Cl. 271—270 **8 Claims**

1. Apparatus for transferring sheets delivered from a delivery assembly, such as a printing or cutting machine, having a specific linear output speed V_1, said sheets being conveyed to a receiver assembly to which the sheets are to be delivered at a given linear speed V_2 and in register, comprising at least first and second successive conveyors (**11, 12**) arranged between the delivery assembly and the receiver assembly such that, with equal contact surfaces, a sheet has a coefficient of adhesion which is higher on the second conveyor than on the first conveyor and arranged such that a sheet simultaneously is on both of said first and second conveyors, and means for adjusting the speed of the second conveyor, at one time, to that of the first conveyor and, at another time, to that of the receiver assembly to which the second conveyor delivers the sheet, and further comprising a detector for monitoring the position of a sheet disposed on the second conveyor, a controller responsive



to said detector for controlling the speed of the motor-driven means of the second conveyor, and said detector being operatively connected to control said controller to modify the speed of the second conveyor when the adhesion of a sheet to the second conveyor is greater than the adhesion of the sheet to the first conveyor.

4,632,382

ROLLER ENGAGING AND DISENGAGING DEVICE

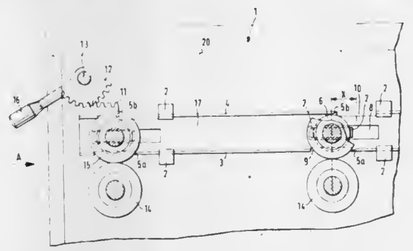
Hans Heist, Weisbaden; Dieter Toepfer, Heidenrod; Sylvia Britzke, Wiesbaden, and Eberhard Schoernig, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,538

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3436980; Aug. 28, 1985, 3530680

Int. Cl.⁴ B65H *5/06;* **B30B** *3/04*

U.S. Cl. 271—273 **22 Claims**



1. A device for engaging and disengaging horizontally-arranged pairs of rollers for transporting sheet-like materials in a transport direction, comprising:

a plurality of first, horizontal, rollers having first and second axial ends;

first and second bearings for rotatingly supporting each of the first and second axial ends;

first and second side plates for supporting the plurality of first rollers;

a plurality of second, horizontal rollers rotatingly supported in the side plates, wherein said first rollers are arranged to move between a first position engaging the second rollers and a second position not engaging the second rollers;

a vertical guide corresponding to each bearing for vertically guiding the bearing, and disposed in one of the side walls;

first and second slide members corresponding to the first and second axial ends, wherein the slide members include an upper web, a lower web and a wall, wherein the slide members are slidably supported on the side walls;

a first recess disposed in one of the lower web and the upper web corresponding to each of the first and second axial ends;

a second recess disposed in the other of the lower web and the upper web corresponding to each of the first and second axial ends, wherein each first recess is separated from a corresponding second recess by a first axial distance; and

means for sliding the sliding member between a third position wherein the bearings are disposed in the first recesses and the first rollers are in the first position, and a fourth position wherein the bearings are disposed in the second recesses and the first rollers are in the second position.

4,632,383

TRAINING TOOL FOR PROMOTING GRIP

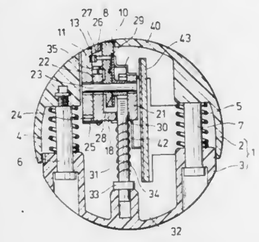
Kiyohiko Tsuzuki, Nagano, Japan, assignor to Kabushiki Kaisha Tsuzuki Seisakujo, Nagano, Japan

Filed Jan. 17, 1984, Ser. No. 571,669

Claims priority, application Japan, Jan. 21, 1983, 58-8943

Int. Cl.⁴ A63B *5/00;* **A61B** *5/22*

U.S. Cl. 272—67 **7 Claims**



1. A training tool for promoting grip characterized in that it comprises:

a case of approximately spherical shape constituted by a pair of shell pieces of approximately hemispherical shape positioned with their open sections facing each other and connected with each other by elastic materials so as to be able to shift relatively to each other and to return to the original position by spring action;

a pair of windows which are located parallel to each other on the surface of said spherical case;

a rack which is supported on one of said shell pieces within said case so as to be able to shift in the axial direction in connection with the relative shift of said shell pieces;

a pinion which is caught by said rack so as to be able to rotate within said case;

a grip indicator dial which is supported within said case rotatably in connection with said pinion, said dial has a circular face positioned under one of said pair of windows, and a grip-scale provided on said circular face so that said scale may be read through said window;

a target-grip setting dial which is provided parallel to said grip indicator dial within said case so as to be held at any prescribed rotational position, said setting dial has a circular face positioned under the other of said pair of windows, and has a target-grip scale provided on said setting dial circular face; and

an informer circuit which comprises a conductive contactor piece positioned on said grip indicator dial and a conductive piece positioned on said target-grip setting dial so as to be brought into contact with said contactor piece when said pair of shell pieces have been appropriately shifted toward each other, said circuit is capable of being put into operation when said contactor piece has come into contact with said conductive piece.

4,632,384

HAND HELD EXERCISE DEVICE

George M. Bright, 525 Page Ave., NE., Atlanta, Ga. 30307

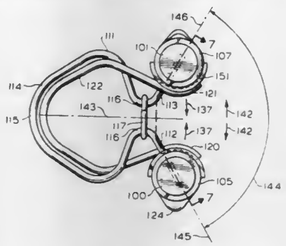
Continuation of Ser. No. 516,589, Jul. 25, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 830,253

Int. Cl.⁴ A63B *11/08*

U.S. Cl. 272—68 **17 Claims**

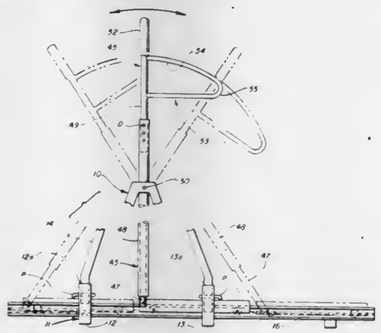
16. An exerciser comprising a pair of spaced opposing parallel handles of a size to allow gripping by a hand of a user of the exerciser, said handles being provided at their sides with open-

ings extending radially and inwardly and situated adjacent to the ends of said handles, said openings extending from the surface of said handles inwardly in radial directions toward the axes of said handles, a pair of torsion springs including loops projecting beyond corresponding sides of the handles in planes



substantially normal to the handle axes, said loops having intermediate portions converging toward each other and having means connected thereto for restraining expansion of said torsion springs, and further including outwardly divergent end portions received and anchored within said radially extending opening of said handles.

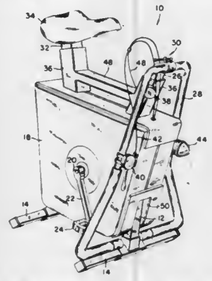
4,632,385
WALKING EXERCISE APPARATUS
Alexander Geraci, 5221 North Lind Ave., Chicago, Ill. 60630
Filed Sep. 13, 1985, Ser. No. 776,138
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—70 **7 Claims**



1. An exercise apparatus comprising a supporting frame assembly with a base section and a pair upstanding lateral members disposed on opposite sides of said base section, a pair of spaced foot support platforms mounted for guided parallel reciprocal movement on said base section and interconnected for relative movement only in opposite reciprocal directions, upwardly extending arm support means pivotally mounted at about the mid-point thereof one on each of said upstanding lateral members of the supporting frame assembly, and each of said arm support means having the lower end thereof pivotally connected to one of said foot support platforms for simultaneous reciprocal movement of the upper ends thereof in a direction opposite to the movement of said foot support platform connected therewith.

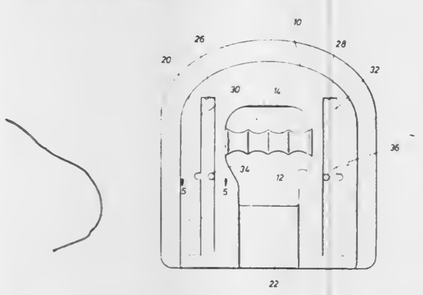
4,632,386
FOLDABLE EXERCISE CYCLE
Charles R. Beech, Lincolnton, N.C., assignor to Allegheny International Exercise Co., Lincolnton, N.C.
Filed Jan. 30, 1985, Ser. No. 696,618
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **12 Claims**

1. A foldable exercise cycle comprising a frame having legs supporting a housing, exercising means carried by said housing, a first upwardly directed height adjustable member supporting a handlebar, a second upwardly directed height adjustable member supporting a seat, means for rotatably anchoring said handlebar to said first member, means for receiving a substantial portion of said first and second members within said housing, means for releasably anchoring said first and second members at a selected height, and means for pivotally receiving substantially all of said legs within said housing, said last named means comprising means defining an opening through



which an associated leg slidingly pivots as said leg passes therethrough, whereby said cycle may be converted from an erect operating position to a compact storage position by pushing the legs into the housing, by lowering the first and second members, and by rotating the handlebar about the housing.

4,632,387
EXERCISE ENHANCING DEVICE
Horacio J. Guzman, 15702 Craighurst, Houston, Tex. 77059
Filed Jun. 4, 1984, Ser. No. 616,497
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—116 **5 Claims**



1. An exercise enhancing device for use in an individual's physical workout in an aquatic environment, including:

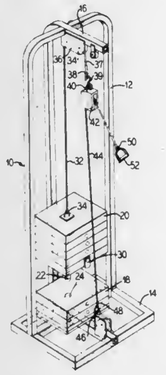
a substantially rectangular paddle member having an outer periphery spaced from and surrounding a central opening with a hand gripping member disposed in said opening and mounted substantially in the center of said rectangular paddle member for grasping by a person desiring to exercise using said paddle member, said paddle member having a pair of substantially parallel outer surfaces within said periphery for providing the exercise enhancing water pressure resistance to movement of said paddle member in either direction perpendicular to the plane of said substantially parallel surfaces, movement of said paddle member parallel to said outer surfaces providing a minimum of water pressure resistance to enable selective muscle exercise enhancement;

said central opening extending to a portion of said periphery to provide clearance for the arm of the user hand grasping said gripping member while;

an arm brace secured to said paddle member bridging said opening for engaging the arm of the and grasping said gripping member to rigidly fix said paddle member relative to the gripping hand of the user in an exercise enhancing position; and

said paddle member having a thicker portion adjacent said periphery and extending continuously about said periphery from adjacent one of said parallel outer surfaces to adjacent the other of said parallel outer surfaces to form a substantially U-shaped thicker portion of said paddle outwardly of and substantially surrounding said central opening for forming scoops on said outer surfaces for increasing the water resistance to movement of said paddle member through said water.

4,632,388
EXERCISING SYSTEM WITH CABLE, PULLEYS AND WEIGHTS
John J. Schleffendorf, 2312 Crescent Ave., Waukegan, Ill. 60085
Filed Jan. 14, 1985, Ser. No. 691,010
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **3 Claims**



1. An exercise apparatus for muscle development comprising:

(a) a selectively variable vertically movable weight;

(b) first cable means attached at a first end to said weight centrally thereof for lifting said weight;

(c) first pulley means mounted solely by a first selectably detachable connection directly to a second end of said first cable means;

(d) a second pulley means supported by a fixed frame and receiving said first cable;

(e) a second cable means wrapped around said first pulley means;

(f) one end of said cable means terminating in a grasping means;

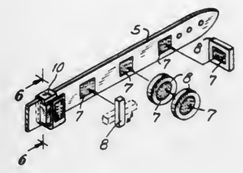
(g) said grasping means being graspable by a user to operate on said second cable and said first pulley means, and the other end of said second cable having a second selectably detechable connection with a fixed anchor means;

(h) said weight means being free to move vertically relatively to said frame when a user's force is applied to said grasping means; and

(i) the axis of said first pulley being free to be moved in a direction which has components that are simultaneously parallel to and transverse to the direction of weight movement; whereby the application of a user's non-vertical force to said grasping means causes said first pulley means to move in a direction having vertical and horizontal components relative to said frame as said first pulley means moves about said second pulley means.

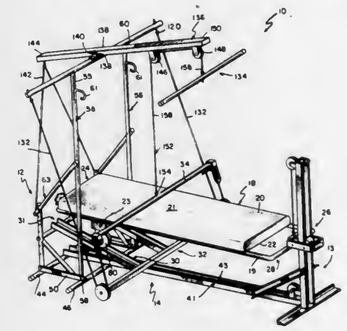
4,632,389
SPORT AND HEALTH ACCESSORIES WEIGHT SYSTEM
Ernest Moss, 157-16 13th Ave., Beechhurst, N.Y. 11357
Filed Aug. 10, 1984, Ser. No. 639,492
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 **6 Claims**

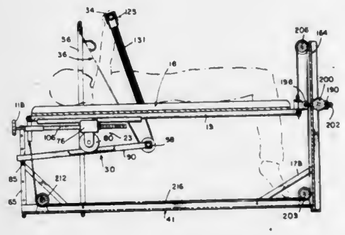
1. A weight device comprising, in combination, at least one weight element of sufficient weight for use in aerobic exercise and having top and bottom surfaces, with a hook or loop fastener material on the top of the weight element and a hook or loop fastener material on the bottom, and at least one strap having a hook or loop fastener material on both sides thereof,



for wrapping the strap about the weight element and depending the weight from the body of a user.

4,632,390
WEIGHT LIFTING MACHINE
Michael L. Richey, 322 E. Sycamore, Galveston, Ind. 49632
Filed Nov. 2, 1984, Ser. No. 667,839
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—120 **18 Claims**





17. A exercising device comprising an elongated frame means having a first upstanding means adjacent a first end and second upstanding means adjacent a second end,

the first upstanding means pivotally supporting, above the lower end thereof, a first end of a platform means for movement of a second end of the platform means in a generally vertical arc, with the second end of the platform means being disposed between the first and second upstanding members,

a bench means having a first end and a second end, and carriage means disposed therebelow, said carriage means being supported on said platform means for supporting a first end of the bench means,

means for supporting said second end of the bench means on said second upstanding means to permit vertical movement of said second end of said bench means,

first flexible means having one end coupled to the frame

means above the bench means with the other end coupled to an exercise bar means disposed above said bench means, with the middle portion of said flexible means passing around means mounted to said platform means, and

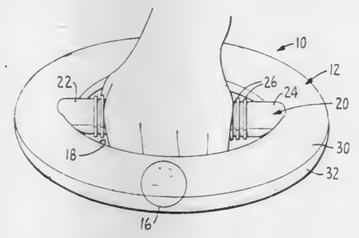
second flexible means having one end coupled to either the second end of the bench means or to said means for supporting the second end of said bench means and passing around means mounted on said second upstanding means above said bench means and continuing downward around means on said frame means below said bench means and with the other and fixed to either said platform means, said carriage means, or said bench means thereabout.

4,632,391

PORTABLE EXERCISING DEVICE

Zeki Orak, 68 Cumberland, San Francisco, Calif. 94110

Filed Apr. 9, 1984, Ser. No. 598,206
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—128 **5 Claims**



1. An exercise apparatus comprising:

a toroidal member having a circular cross-section of a diameter to facilitate gripping, said member further having a sealed uniform inner chamber of circular cross-section;

an elongated handle extending linearly across the toroidal member and connected thereto to provide an alternate gripping means; and

a spherical body located within said sealed inner chamber, with the diameter of said spherical body being slightly less than the diameter of the chamber to produce continuous sound upon rotation thereby permitting the user to gauge the speed of rotation of said body, and with said body having a fixed weight and a density greater than the material forming the toroidal member such that at rest, the apparatus is easy to carry, but upon rotation, the angular momentum of the body is sufficient to create resistance to movement in the plane of rotation of the body thereby providing exercise.

4,632,392

EXERCISE APPARATUS INCLUDING TETHERED MASS CONFINES FOR MOVEMENT ON HORIZONTAL TRACK

Ronald G. Peyton, 2935 Sope Creek Dr., Marietta, Ga. 30067, and William D. McLeod, 7102 Moon Rd., Columbus, Ga. 31904

Filed Jun. 24, 1982, Ser. No. 391,556
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—128 **2 Claims**

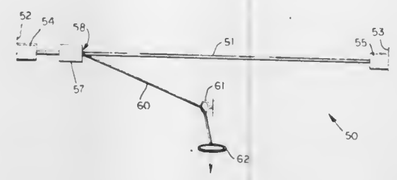
2. An apparatus for exercising muscles of a body part, comprising:

a mass confined for movement along a horizontal track, said mass being movable along a horizontal path having first and second ends spaced apart along said track;

handle means for engaging said body part; and

flexible interconnecting means, extending between said mass and said handle means, for loading muscles of said body part alternately and repeatedly with primarily acceleration and deceleration forces;

said connecting means when operative being pulled by said body part such that the net component of force exerted on said mass by said body part horizontally along said track is



greater than the net component of said force in any plane perpendicular to said track;

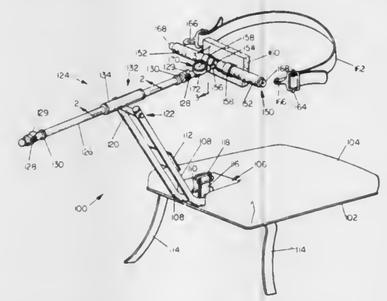
said interconnecting means comprising a flexible tether passing through a tether guide positioned adjacent to and intermediate the ends of said horizontal path of said mass.

4,632,393

MULTI-PURPOSE EXERCISING APPARATUS

Andrew J. Van Noord, 1434 Hillsboro, SE., Grand Rapids, Mich. 49506

Filed Jan. 4, 1985, Ser. No. 688,706
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **17 Claims**



1. A multi-purpose exercise apparatus comprising:

a portable structural frame for providing a fixed base support while the exercise apparatus is in use, and having body-positioning means to position one portion of a user's body;

an exercise bar assembly comprising a sleeve member, an elongated tube slidably received throught said sleeve member, and means Providing frictional resistance to movement of said elongated tube through said sleeve member;

means for mounting said exercise bar assembly to said structural frame;

an elongated reactive member axially movable with respect to said elongated tube, and at least partially received within one end of said tube;

force measuring means mounted to said elongated tube for visually indicating to said user the relative magnitude of force applied between said sleeve member and said elongated tube;

force applying means coupled to said reactive member adapted to be selectively positioned relative to said user so as to bear against said user's upper frontal region, back or upper legs, or to be releasably gripped by said user's hands for exerting axially-directed forces on said elongated tube relative to said sleeve member in response to forces exerted by said user; and

said force-measuring means comprises means for coupling said elongated reactive member to said elongated tube so that the displacement of said tube relative to said reactive member is proportional to the magnitude of force applied to said exercise bar assembly by said user.

15. A multi-purpose exercise apparatus comprising:

a portable structural frame having a base for providing a fixed base support while the exercise apparatus is in use and sleeve support means extended upwardly and forwardly of said base;

body-positioning means on said base support providing a seat on which the user can sit;

an exercise bar assembly comprising a sleeve member, an elongated tube slidably received through said sleeve member, and means providing frictional resistance to movement of said elongated tube through said sleeve member;

an elongated reactive member axially movable with respect to said elongated tube, and at least partially received within one end of said tube;

means for pivotably mounting said sleeve member to said sleeve support means;

force applying means coupled to said reactive member so that said elongated tube can be moved reciprocably through said sleeve member by movement of a user's body in engagement with said force applying means; and

means for coupling said elongated reactive member to said elongated tube so that displacement of said tube relative to said reactive member is proportional to the magnitude of force applied to said exercise bar assembly by said user.

4,632,394

ATHLETIC SWING PLANE TRAINER

James A. Ryan, 3615 N. Grand Oaks Ct., Gurnee, Ill. 60031

Filed Jan. 2, 1985, Ser. No. 688,449
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E **4 Claims**



1. A tethered ball apparatus for suspension from a backstop, the backstop having substantially vertical side wall panels and substantially horizontal overhead panels attached to the side panels, the side panels and overhead panels being of chain-link mesh, said apparatus comprising an inelastic cord having a ball attached at one of its ends and a hook attached at its other end, said hook having a portion thereof configured for interengagement with the chain-link mesh of the overhead panel, of said backstop;

a ball harness attaching said ball to said one end of said inelastic cord, the harness comprising a plurality of non-stretchable fabric straps interfastened by stitching and pile and loop fasteners, with integral tabs for engaging said cord;

a plurality of targets movably positioned upon said vertical panels;

a transverse inelastic cord having one of its ends connected to said ball harness and its other end connected to one of said vertical panels;

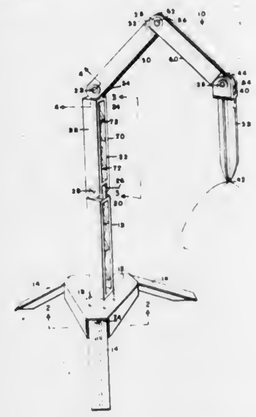
means of raising and positioning said hook upon said overhead panel, said means comprising a fork affixed to a pole, said fork having means for supporting said hook so that said hook can be attached to said overhead panel, and said fork having means for attachment to said cord and hook and detachment from said cord and hook after said hook is attached to said overhead panel for suspending said cord and ball therefrom.

4,632,395

FOOTBALL PLACE/FIELD GOAL KICKING DEVICE

David H. Ferrebee, 112 Eady Ct., Elyria, Ohio 44035

Filed Nov. 7, 1984, Ser. No. 669,219
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—55 B **2 Claims**



1. A football kick training device comprising:

(a) a support base including an aperture centrally located thereon;

(b) an elongated support post, said support post constructed of two elongated sidewalls held together in a spaced relationship by a plurality of criss-crossed members, said support member terminating at one end in a tongue type configuration and including an aperture therethrough on said tongue ending;

(c) a plurality of arm elements pivotally secured to said support post, said arm elements constructed of two elongated sidewalls held together in a spaced relationship to each other by a plurality of crisscrossed members, said arm members terminating at one end in a groove type configuration and at the other end in a tongue like configuration, said groove ends and tongue ends provided with apertures therethrough; and

(d) a football engaging arm element pivotally secured to one end of one of said arm members, said football engaging arm element terminating at one end in a tongue for pivotal connection with said terminating arm element and terminating at its other end in the form of a tapered end for engaging a football.

4,632,396

BOWLING BALL

Wilson G. Taylor, P.O. Box 146, San Gabriel, Calif. 91776

Filed Nov. 14, 1983, Ser. No. 551,367
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—63 A **7 Claims**

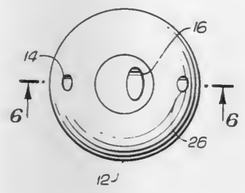
1. A bowling ball comprising:

a spherical body of suitable size, weight and construction for use as a bowling ball;

a first hole extending into said body from the surface thereof and suitable for the insertion of a bowler's thumb therein; and

a second hole extending into said body from the surface

thereof and suitable for the insertion of two fingers therein, said second hole being elongated to accept said fingers in a side by side relationship and presenting to said fingers on the side of said second hole closest to said first hole a concave finger contact surface that in cross-section



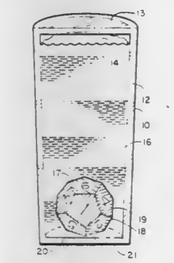
forms part of an ellipse, said second hole having a longitudinal axis and being oriented such that said axis is bissected by a line proceeding perpendicular to said axis from the center of said first hole, whereby lifting forces generated at said second hole are merged into a single force directed toward said first hole.

4,632,397

AMUSEMENT CHANCE DEVICE

Bernard W. Rivkin, Poway, Calif., assignor to P.P.M.D. Inc., Poway, Calif.

Filed Feb. 1, 1985, Ser. No. 697,561
Int. Cl.[4] A63F *9/04*
U.S. Cl. 273—145 CA **9 Claims**



1. An amusement chance device comprising:
(a) a closed, walled, transparent container; defining a hollow chamber;
(b) a transparent viscous liquid substantially filling said chamber including an air bubble greater in size than the distance between the chamber wall and the included game piece;
(c) a multifaceted game piece in said chamber, said game piece having a specific gravity greater than that of the viscous liquid, indicia on the facets;
(d) the size of the game piece being dimensioned relative to the horizontal cross sectional size of the chamber to constrict passage of the fluid between the game piece and the container wall as the game piece falls through the liquid.

5. An amusement chance device comprising:
(a) a closed walled transparent container defining a hollow chamber;
(b) a transparent viscous liquid substantially filling said chamber;
(c) a multifaceted magnetic game piece in said chamber, said game piece having a specific gravity greater than said liquid, indicia on the facets;
(d) the size of the game piece being dimensioned relative to the horizontal cross sectional size of the chamber to constrict passage of the fluid between the game piece and the container wall as the game piece falls through the liquid;
(e) a magnet attached to at least one of the opposing ends on the outside of the container for holding the game piece against the inner surface of said one container end by magnetic attraction, said magnet being movably mounted whereby it may be moved away from said container end to release said game piece allowing it to fall through said liquid.

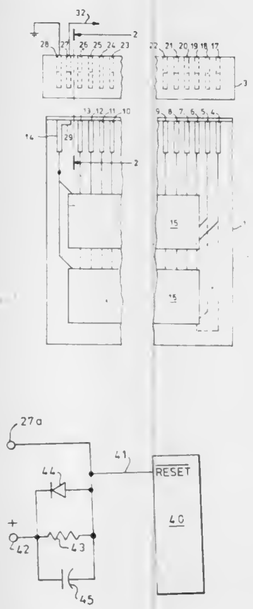
6. An amusement chance device comprising:
(a) a closed, walled, transparent container defining a hollow chamber;
(b) a transparent viscous liquid substantially filling said chamber;
(c) a plurality of multifaceted game pieces in said chamber, each of said game pieces having a specific gravity greater than that of the liquid and indicia on its facets;
(d) said game pieces incorporating magnetic material and being polarized to have the same magnetic polarity over their entire exterior surface whereby said game pieces will repel each other to prevent them from stacking one upon another.

4,632,398

RESET SYSTEM FOR MICROCOMPUTER USING PROGRAM CARTRIDGES

Joseph W. Freeman, Columbia, Tenn., and Gary E. Webb, Lake Worth, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1983, Ser. No. 522,894
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—148 B **4 Claims**



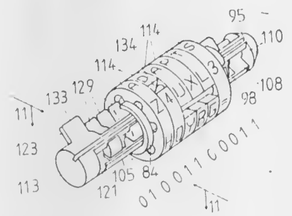
1. A reset system for a microcomputer using program cartridges in which each cartridge includes a printed circuit board carrying a plurality of elongated parallel edge connectors of predetermined width extending from one edge of the board, and the microcomputer includes a socket having contact elements for slidably engaging successive longitudinal areas of corresponding edge connectors on insertion of the cartridge into, and on withdrawal of the cartridge from, the socket, and in which one of the edge connectors includes an arm portion of said predetermined width extending into a portion of the board which would normally be occupied by an adjacent edge connector, at a position for transient widthwise engagement by a corresponding socket contact element on said insertion and on said withdrawal to transiently connect said corresponding socket contact element to a first socket element contact in slidable engagement with said one of the edge connectors through said arm portion, means coupling a reset potential to said first socket contact element and means coupling said corresponding socket contact element to a reset input of a microprocessor in said microcomputer thereby to reset the microcomputer on said insertion and on said withdrawal.

4,632,399

MANIPULATIVE CHALLENGE

Zelany R. Bern, Ste. 306, 1559 Rockville Pike, Rockville, Md. 20852

Filed Sep. 11, 1984, Ser. No. 649,475
Claims priority, application Iceland, Sep. 12, 1983, 2852; Sep. 12, 1983, 2853; New Zealand, Oct. 3, 1983, 205838; Iceland, Sep. 6, 1984, 2942
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—155 **21 Claims**



1. A manipulative puzzle
which comprises a first member and a second member,
which comprises a set of annular elements, and which displays a form
in which said elements are coaxially pinned,
in which said members are mutually engaged longitudinally of the common axis of said elements,
in which said second member is pivoted for rotation in relation to said first,
and in which said members penetrate common zones in line lengthwise of said axis, in each of which zones there is a barrier extending from one of said members to rotationally limit the one of said elements, if any, which is installed in the zone,
whereby, given said form, certain rotations of said second member relative to said first permit respective rotations of an exclusive lot of said elements, the make-up of which lot is variable by movements of said elements, each from one of said zones to another,
whereas the number of said elements in said set is more than two.

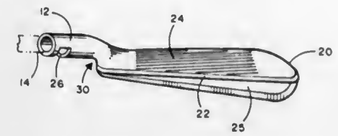
4,632,400

GOLF CLUB HEAD

David D. Boone, 21501 Rushford, El Toro, Calif. 92630

Filed Jun. 21, 1985, Ser. No. 747,811
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—164 **1 Claim**

1. A head for a golf club iron comprising:
a hosel adapted for connection to a golf club shaft;
a ball hitting member of substantially trapezoidal configuration defined by a sole, a toe, generally vertical, straight heel line and a straight topline, said hosel being integral with said hitting member along said heel line, at least a portion of said heel line adjacent said topline being free of said hosel and defining one side of a gap between said



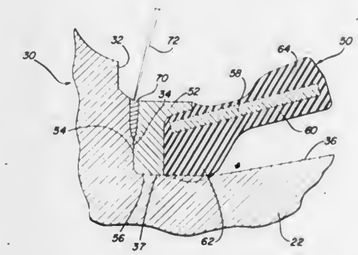
hosel and said hitting member, and wherein extensions of said topline and said heel line intersect at an acute angle.

4,632,401

HERMETICALLY WELDED BELLEVILLE SEAL FOR ROCK BITS

Nareshchandra J. Kar, Westminster, and Cary A. Roth, Huntington Beach, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 628,068, Jul. 5, 1984, Pat. No. 4,560,175.
This application May 17, 1985, Ser. No. 735,401
Int. Cl.[4] F16J *15/34;* F16C *33/78;* B23P *19/04*
U.S. Cl. 277—1 **5 Claims**



1. A method of hermetically welding a portion of a belleville seal disposed between a rotatable member and journal bearing comprising the steps of:
positioning a first inner annular metal portion of said belleville seal over said journal bearing, said annular metal portion of said belleville seal and said journal bearing forming a circumferential interface therebetween,
mounting said journal bearing with the belleville seal in place on the journal bearing in a rotatable welding fixture,
aligning a welding apparatus adjacent said welding fixture to direct a high-energy welding beam from said welding apparatus at the circumferential interface between said belleville seal and said journal bearing mounted in said welding fixture,
activating said welding apparatus, and
continuously welding said metal portion of said belleville seal to said journal bearing through 360° of said interface by rotating said journal bearing in said welding fixture while said welding beam tracks said interface thereby hermetically welding said metal portion of said belleville seal to said bearing journal.

4,632,402

SHAFT SEAL WITH BOTH HYDROSTATIC AND HYDRODYNAMIC PRESSURE PARTS

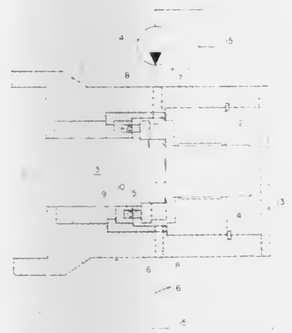
Guido J. E. Daeyaert, Mortsel, Belgium, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 7, 1984, Ser. No. 669,324
Claims priority, application Sweden, Dec. 1, 1983, 8306626
Int. Cl.[4] F16J *15/34, 15/48*
U.S. Cl. 277—15 **1 Claim**

1. In a gas pumping apparatus in which gas is pumped from a gas inlet end to a gas outlet end in a pump chamber defined

within a stationary housing, by pumping means carried by a rotary shaft having its end rotatably supported in a slider bearing, a combined hydrostatic and hydrodynamic pressure seal for said shaft for preventing leakage of gas from said pump chamber, characterized by:

(a) mechanical sealing means carried by said stationary housing forming a hydrostatic resilient seal between said stationary housing and said pump chamber;



(b) a lubricant chamber defined between said mechanical sealing means and said slider bearing for supplying lubricant fluid to said slider bearing and to said mechanical sealing means; and

(c) means for supplying lubricant fluid into said lubricant chamber under pressure sufficient to counteract the pressure exerted by the gas on said seal.

4,632,403

STERN TUBE SEAL DEVICE PROVIDING A SEAL ABOUT A ROTATABLE SHAFT

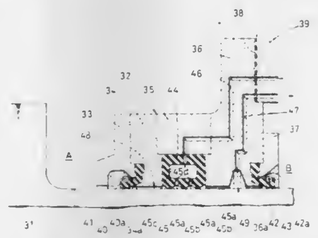
Kenichiro Ishitani; Takashi Unseki, both of Tokyo; Saburo Amiboshi, and Eiichi Kawamura, both of Saitama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Eagle Industry Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 593,331, Mar. 26, 1984, Pat. No. 4,534,569. This application Feb. 15, 1985, Ser. No. 701,978

Claims priority, application Japan, Sep. 27, 1983, 58-148206[U]; Sep. 27, 1983, 58-148207[U]

Int. Cl.⁴ F16J *15/40, 15/48*

U.S. Cl. 277—27 **8 Claims**



1. A stern tube seal device for providing a seal about a rotatable shaft, comprising an annular casing means disposed about the outer periphery of a rotatable shaft, a pair of spaced lip seal means mounted in said casing means and engaging said shaft, said casing means having a recess intermediate said pair of spaced lip seal means, a resilient ring seal means disposed in said recess, and pressure fluid feed line means feeding pressure fluid to said ring seal means, said ring seal means comprising a resilient ring member having a hollow interior, said pressure fluid feed line means feeding pressure fluid to said hollow interior, said ring member having generally V-shaped portions juxtaposed to said shaft and forming troughs therebetween, said ring member having passages for passing said pressure fluid from said hollow interior to said troughs.

4,632,404

SEAL FOR ROLLING BEARING

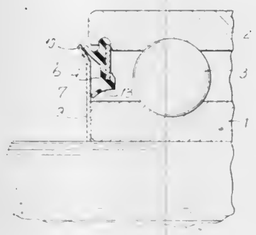
Kurt Feldle, Würzburg, and Karl-Friedrich Kaschube, Niederwerrn, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 772,025

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 8426383[U]

Int. Cl.⁴ F16C *33/78;* **F16J** *15/32*

U.S. Cl. 277—68 **7 Claims**



1. In a seal for a rolling bearing comprised of inner and outer bearing rings defining an inner space therebetween and rolling elements arranged to roll between said rings, the seal being affixed to the outer bearing ring, the seal having a plurality of axially outwardly directed sealing lips, and a centrifuge plate affixed to the inner bearing ring and arranged to rotate therewith, the sealing lips engaging under the axially inner surface of the centrifuge plate facing said rolling elements, the improvement wherein the centrifuge plate has a radially outer free end substantially in axial alignment with the bearing outer ring and has a first portion adjacent said inner bearing ring that extends substantially directly in the radial direction and a second portion depending therefrom and extending to said free end that is axially outwardly inclined.

4,632,405

DEVICE FOR FORCING PISTON RING RADIALLY OUTWARDLY

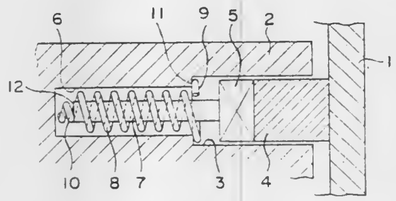
Minoru Kawane, Ichikawa, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 9, 1986, Ser. No. 849,952

Claims priority, application Japan, Apr. 15, 1985, 60-54727[U]; Apr. 15, 1985, 60-54728[U]

Int. Cl.¹ F16J *9/06*

U.S. Cl. 277—150 **4 Claims**



1. A device for forcing a piston ring radially outwardly wherein a piston ring is accomodated in a circumferential groove at an outer cylindrical surface of a piston and a coiled spring and a plunger rod are inserted into a radial hole formed on said piston, whereby reaction force of said coiled spring causes a plunger to force the piston ring against a bore wall of a cylinder, comprising the coiled spring having one end greater in diameter than said radial hole for engagement with an edge surface of said hole while the other end of said coiled spring is smaller in diameter than said plunger rod and is engaged with a free end of said plunger rod, and the plunger rod extending in uncompressed state through said coiled spring into said radial hole.

4,632,406

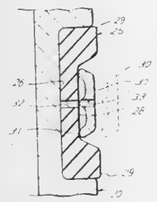
APPARATUS IN WHICH AN ANNULAR RING IS CARRIED WITHIN A GROOVE ABOUT ONE MEMBER FOR SLIDABLY ENGAGING THE CYLINDRICAL SURFACE OF ANOTHER MEMBER

Neil H. Akkerman, Kingwood, Tex., assignor to AVAA International Corp., Houston, Tex.

Continuation-in-part of Ser. No. 225,395, Jan. 15, 1981, Pat. No. 4,477,104. This application Sep. 7, 1982, Ser. No. 415,391

Int. Cl.⁴ F16J *15/06*

U.S. Cl. 277—188 A **52 Claims**



1. Apparatus comprising first and second members adapted to be telescopically disposed with respect to one another, said first member having a circumferential groove thereabout which is opposite a cylindrical surface of the second member when said members are telescopically disposed, a first ring assembled within the groove and having a recess in its side adjacent at least one annular surface thereof which protrudes from the groove for sliding engagement axially with respect to the cylindrical surface of the second member, and a second ring having a circumferential shape which permits it to be moved axially of the first member and into a position opposite the recess in the first ring, said second ring being of a material which is radially distortible into the recess but relatively non-elastic so that, when so distorted, it will retain said first ring within said groove.

4,632,407

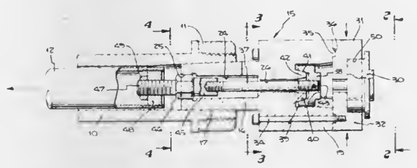
INSIDE/OUTSIDE CHUCKING DEVICE

Donald R. Maxam, 12737 Moore Park, Studio City, Calif. 91604, and Allen B. Maxam, 924 N. Ontario, Burbank, Calif. 91505

Filed Nov. 10, 1983, Ser. No. 550,599

Int. Cl.⁴ B23B *31/10*

U.S. Cl. 279—121 **13 Claims**



1. A workpiece holding device for a lathe wherein the lathe is provided with a collet actuating unit and accompanying spindle, said workpiece holding device comprising a base unit having a shank adapted to be mounted on said spindle and a set of radially movable elements comprising a plurality of circumferentially disposed individual segments of said shank, said segments being subject to movement between workpiece holding and workpiece releasing postures for both inside and outside engagement with a workpiece, a set of work-holding members having one workpiece capability, said set of workpiece holding members comprising a separate jaw for each segment, each jaw and corresponding segment comprising a workpiece engaging assembly, and removable means of attachment between each jaw and the respective segment, a separate actuator element for said base unit having a range of alternative axial movement outwardly and inwardly relative to the collet actuating unit and accompanying spindle and an actuating engagement with said workpiece engaging assembly, and means on said actuator element for providing an attachment to said collet actuating unit, each jaw being removable from the respective segment for replacement with a jaw of another set of workpiece holding members which has another workpiece engaging capability, a cam structure on the interior of said set of segments having a cam track thereon and a cam on said actuator positioned for engagement with said cam track in a direction effecting radially inward movement of said workpiece engaging assemblies whereby said jaws engage in a radially inwardly direction against said workpiece.

4,632,408

SKI FOR THE HANDICAPPED

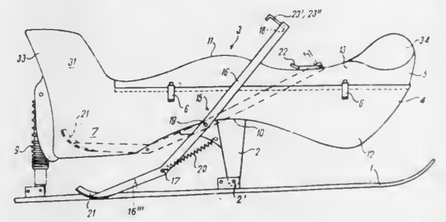
Hans Olpp, Urach, and Heini Braun, Deggingen, both of Fed. Rep. of Germany, assignors to GFL Formteile-und Larmschutz Technik GmbH & Co., Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,688

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 8337324[U]; Jan. 28, 1984, 8402458[U]; European Pat. Off., Sep. 21, 1984, 84111311.1

Int. Cl.⁴ B62B *13/04*

U.S. Cl. 280—12 K **26 Claims**



1. A ski for the handicapped, comprising:

a mono-ski

a seating shell supported on the mono-ski, said seating shell including at least one seating area having a high side panel and a high back panel and a leg supporting area situated in front of the seating shell in the longitudinal direction of the ski for supporting the legs, said seating shell being extended integrally from the seating area to the leg supporting area, said leg supporting area having a knee supporting region for the backs of the knees, and a feet supporting region provided in the front of the seating shell, said knee supporting region being elevated with respect to the seating region and said feet supporting region being lower than the knee supporting region; and

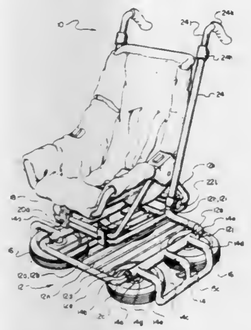
a tow and supporting bar assembly including supporting parts pivotably supported at both sides on the seating shell for pivoting between a readiness position and a skiing position, said supporting parts having ends in engagement with the ground to prevent tipping of the ski in the readiness position of the supporting parts relative to the seating shell, a tow bar holder disposed on the front upper end of the tow and supporting bar assembly and releasing means for releasing the tow bar holder from engagement with a T-bar.

4,632,409

COMBINATION AUTOMOBILE INFANT SEAT AND BABY STROLLER ASSEMBLY

Patricia A. Hall, 2072 Shadybrook Ct., and Alexander Ratony, 2076 Shadybrook Ct., both of Thousand Oaks, Calif. 91362

Filed Mar. 26, 1984, Ser. No. 593,551
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—30 **8 Claims**



1. A combination automobile infant seat and baby stroller assembly comprising:
(a) a carriage base assembly configured in the shape of a rectangle,
(b) a set of retractable wheel and fender assemblies where an assembly is attached to each side of said carriage base assembly and where each of said retractable wheel and fender assemblies have a means to be maintained in an extended wheels down position and in a retracted wheels up position,
(c) means for retracting and extending the wheels on said retractable wheel and fender assembly,
(d) a handlebar steering assembly attached to said carriage base assembly comprised of a tubular section where the bottom end of the tubular section is rigidly attached to the back section of said carriage base assembly,
(e) an infant seat attachment base attached to said handebar steering assembly, comprised of a tubular structure having means to be adjustably attached to said handlebar steering assembly, the means to adjust said infant seat attachment base comprises a set of infant seat positioning devices comprised of an adjustable horizontally oriented sleeve and a vertically oriented sleeve where the horizontal sleeve is attached to the tubular structure of said infant seat attachment base and where the vertical sleeve is attached to the bottom tubular section of said handlebar steering assembly,
(f) a plurality of adjustable infant seat adapters attached to the tubular structure of said infant seat attachment base where said adapters allow usage of various configurations of infant seats,
(g) an infant seat attached to said infant seat adapters, and
(h) said infant seat adapters attached to said infant seat attachment base.

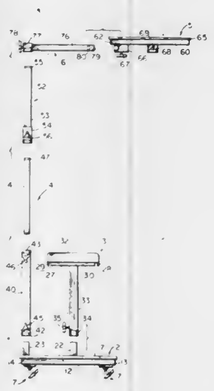
4,632,410

COMBINATION TOOL CADDY AND STOOL

John F. Bainbridge, P.O. Box 45, Marcellus, Mich. 49607, and James R. Bainbridge, Cass County, Mich., assignors to John F. Bainbridge, Marcellus, Mich.

Filed May 30, 1985, Ser. No. 739,172
Int. Cl.[4] B25H *5/00*
U.S. Cl. 280—32.5 **48 Claims**

1. A combination tool caddy and stool, comprising:
a base adapted to be supported on a generally horizontal work surface, and including a central portion thereof and a marginal portion thereof disposed outwardly of said central portion;
a seat having a normally horizontally oriented upper surface shaped to support a seated user thereon, and a pedestal including an upper end thereof connected with said seat, and a lower end thereof connected with and upstanding from the central portion of said base to support said seat on said base at a predetermined position above said base;
a tray having a normally horizontally oriented upper surface shaped to support articles thereon;
a support, comprising a vertically oriented, rigid post having a lower end thereof connected with and upstanding from the marginal portion of said base;



means for adjustably mounting said tray on said support, comprising:
a rigid support arm having first and second ends;
means for connecting the second end of said tray support arm with said vertical post to support said tray in a cantilevered fashion from said vertical post;
means for releasably connecting said tray with said tray support arm, whereby said tray can be bodily detached from said tray support arm and independently transported to various work sites; and wherein
said tray support arm is adapted for grasping to form a handle to facilitate transporting said base between various work sites.

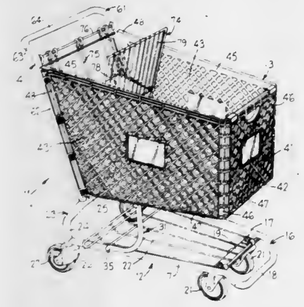
4,632,411

SHOPPING CART WITH PLASTIC BASKET

Ronald L. Badger, Battle Creek, Mich., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed May 1, 1985, Ser. No. 729,323
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—33.99 R **13 Claims**

1. A shopping cart comprising:
a wheeled base assembly including a substantially U-shaped base member provided with front and rear pairs of rollers mounted thereon, and a substantially U-shaped basket support fixed to and projecting upwardly from said base member substantially midway between the front and rear ends thereof, said U-shaped basket support including a top substantially horizontally extending support element which extends transversely of said base member and a pair of upright legs which are fixed to said support element adjacent the opposite ends thereof and project downwardly for fixed securement to the legs of said U-shaped base member;
a handle assembly fixed to said base assembly adjacent the rearward end thereof and projecting upwardly therefrom, said handle assembly including a downwardly directed substantially U-shaped handle member having a horizontal and substantially transversely extending handle part which at opposite ends is fixed to a pair of downwardly projecting elongated legs which at their lower ends are fixedly interconnected to said base assembly;
an upwardly opening basket assembly mounted on and fixedly connected to said base and handle assemblies, said basket assembly including a one-piece plastic basket member having a pair of upright side walls fixedly and integrally joined to bottom and front walls which extend therebetween;
a reinforcing portion formed integrally with and extending transversely across the bottom wall of said basket member substantially midway between the front and rear ends thereof, said reinforcing portion being positioned directly over and supportingly engaged on said support element, and fastener means extending between said support element and said reinforcing portion for fixedly securing same together;



said base assembly including a rear substantially U-shaped upright which is fixed to the rear end of said U-shaped base member and extends transversely thereacross, said rear U-shaped upright including a rear cross member which extends substantially horizontally and transversely between the legs of said base member and is spaced upwardly a substantial distance thereabove; and
said handle assembly including a lower cross member which extends transversely between and is fixedly connected to the legs of said handle member substantially adjacent the lower free ends thereof, said lower cross member being positioned approximately directly over and in abutting engagement with the rear cross member, said lower and rear cross members extending generally parallel with one another, and means for fixedly and rigidly securing said lower and rear cross members together.

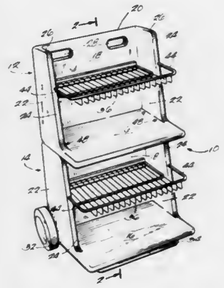
4,632,412

COMBINATION HAND TRUCK AND DISPLAY STAND

Donald D. Nasgowitz, Milwaukee, Wis., assignor to DCI Marketing, Milwaukee, Wis.

Filed Jan. 18, 1985, Ser. No. 692,396
Int. Cl.[4] B62B *1/00*
U.S. Cl. 280—47.26 **20 Claims**

1. A combination hand truck and display stand comprising
a lower unit including a generally planar base, a generally planar rear wall extending upwardly from said base and having an upper edge, a pair of generally planar side walls extending upwardly from said base and having upper edges and forward edges, a portion of said lower unit base extending forwardly of said lower unit side walls, a top wall parallel to said base and integrally connected to said upper edges of said side walls and of said rear wall, and means for supporting said hand truck and display stand for movement over a supporting surface,
an upper unit including a generally planar base, a generally planar rear wall extending upwardly from said base, a pair of generally planar side walls extending upwardly from said base and having upper edges and forward edges, a portion of said upper unit base extending forwardly of said upper unit side walls, and means for facilitating hand manipulation of said hand truck and display stand, and
means for releasably connecting said upper unit to said lower unit such that said base of said upper unit is supported by said top wall of said lower unit,



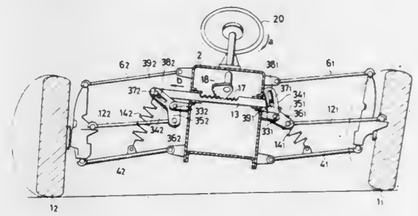
said upper and lower units being constructed such that said upper unit can be inverted and nested with said lower unit with said upper edges of said upper unit side walls mating with said forwardly extending portion of said lower unit base, with said forward edges of said lower unit side walls mating with said forward edges of said upper unit side walls, and with the forwardly extending portion of said upper unit base mating with said upper edges of said lower unit side walls.

4,632,413

BODY BANKING SUSPENSION APPARATUS FOR A VEHICLE

Haruyasu Fujita, Tokyo; Kenji Honma, and Masao Ogawa, both of Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,210
Claims priority, application Japan, Feb. 22, 1984, 59-30382; Feb. 24, 1984, 59-33970; Feb. 24, 1984, 59-33971; Feb. 25, 1984, 59-33336
Int. Cl.[4] B60G *21/00*
U.S. Cl. 280—112 A **11 Claims**

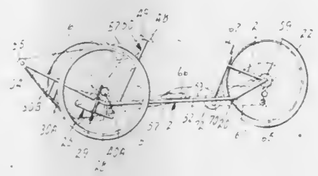


1. A suspension apparatus for a vehicle provided between a pair of right and left wheels of the vehicle and the vehicle body characterized in that one end portion of a suspension spring at a vehicle body side is secured to a movable member associated with a steering operation member for movement, the other end portion of the suspension spring is connected to a suspension arm, a lever member pivotally connected to the vehicle body is connected to said movable member, and a tie rod is connected to said lever member, so that when the vehicle makes a turn, the vehicle body is caused to decline toward the turning center side according to the steering operation.

4,632,414
LAND VEHICLE PROPELLED BY SIMULATED ROWING MOTION

Mark W. Ellefson, 1545 Bluff Creek Dr., Chaska, Minn. 55318

Filed Jun. 22, 1984, Ser. No. 623,511
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—246 7 Claims



1. A wheeled vehicle with an oar-type drive assembly capable of simulating a rowing motion, comprising:

(a) a main frame having front wheels journaled from each side thereof, said front wheels being steeringly connected to each other, the steering thereof being operative by foot pedals mounted on said frame, each of said foot pedals being pivotally attached to said main frame and having attached to each of said foot pedals a cable in operative connection with separate steering arms, each of said steering arms being separately fixedly attached to a rotatable spindle assembly attached to each of said front wheels and to separate tie rod arms, each of said tie rod arms being attached to a common tie rod therebetween, whereby movement of one of said foot pedals causes equal reaction to each of said front wheels;

(b) a drive wheel journaled from the rearward portion of said frame;

(c) a rowing member pivotally attached to said frame at one end of said member and having oar handles extending outwardly from the opposite end of said member, said rowing member being operatively connected to said drive wheel to effect the rotation thereof in a forward direction;

wherein said rowing member is attached by cable to a flanged drum having said cable wound thereon, said flanged drum being mounted on a jack shaft attached to said main frame; a one-way ratchet mechanism operatively connecting said drum and said drive wheel, said rowing member being capable of pulling said cable to effect rotation of said drum and drive wheel in a forward direction, and means for returning said drum and said cable to their original position;

wherein said means for returning said drum and said cable to their original positions includes an elastic member wound on said drum in a direction opposite to the direction in which said cable in wound on said drum, one end of said elastic member being operatively attached to said main frame, whereby upon unwinding said cable from said flanged drum by a pulling action of said rowing member, said elastic member is correspondingly wound upon said flanged drum, thereby increasing tension in said elastic member such that when said pulling action of said rowing member ceases, said elastic member seeks to release tension therein, thereby causing said cable to rewind on said flanged drum as said rowing member is returned to its original position.

4,632,415
FORK ENDS AND HUB OF BICYCLE

Wang San Hai, No. 3, 1 Alley, 658 Lane, Chung-Shan Rd., Taoyuan, Taiwan

Filed Oct. 29, 1984, Ser. No. 665,738
Int. Cl.[4] B62K *25/02*
U.S. Cl. 280—279 1 Claim



1. A hub and fork ends of a bicycle comprising:

a pair of fork ends each formed on the lower portion of each leg of a front fork of a bicycle and each fixed with an annular bearing shell;

a pair of annular bearings each fixed within an inside cylindrical hole of a respective one of each said annular bearing shell;

a hub having spokes of a bike wheel; and

a spindle formed with a male-threaded end to be fixed by a nut on the fork ends;

the improvement which comprises:

each said annular bearing including: an outer race fixed within said annular bearing shell and formed with an annular hole therein and extending an annular rib from the central portion of said annular outer race; an inner race comprising a first ring which is formed with a central hole for receiving said spindle, a male-threaded portion and an annular groove thereon, and a second ring which is formed with a female-threaded hole engaged with said male-threaded portion of said first ring and another annular groove which forms a common ball seating surface with said annular groove of said first ring within said annular hole of said outer race to define a pair of ball retaining spaces with said annular hole of said outer race as separated by said annular rib of said outer race; and

a plurality of balls movably arranged within said pair of ball retaining spaces;

said hub formed with several transverse grooves through a central hole in said hub; and

said spindle formed with several lengthy extensions corresponding to said transverse grooves so that after passing said spindle through said pair of annular bearings and said hub, said hub with a bike wheel can be instantly fitted on the fork ends by said nut.

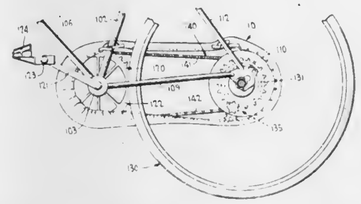
4,632,416
FLEXIBLE PROTECTIVE COVER FOR THE DRIVE TRAIN ELEMENTS OF A BICYCLE

Scott H. Zelenetz, 19 Waverly Pl., Lawrence, N.Y. 11559

Filed Jul. 24, 1985, Ser. No. 758,381
Int. Cl.[4] B62J *13/04*
U.S. Cl. 280—289 G 14 Claims

1. A flexible protective cover adapted for use with a bicycle which is not in use and which includes a frame having a right side and a left side, a front wheel, a rear wheel having at least one sprocket gear, a front driver mechanism and an endless drive chain, the frame including a hub, a seat tube which extends upwardly from said hub, an angle bar which extends upwardly from said hub, right and left lower struts which extend rearwardly of said hub, said right and left lower struts having respective right and left mounting brackets at their rearward ends, and right and left seat stays which extend upwardly from said respective mounting brackets; said front driver mechanism including a crank arm which extends through said hub, at least one drive sprocket attached to said crank arm so as to be located on the right side of said frame, and pedals attached to the opposite right and left ends of said crank arm; said rear wheel being attached between said mounting brackets, said endless drive chain being wrapped around a portion of said at least one drive sprocket, said at least one sprocket gear, and having upper and lower runs,

said flexible protective cover comprising an elongated main panel part and a skirt part, said elongated main part and said skirt part providing said flexible protective cover

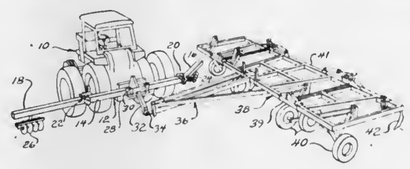


with upper and lower elongated perpheral edges and front and rear peripheral edges and said skirt part providing said flexible protective cover with elasticized upper and lower inner edges and elasticized front and rear inner edges, said flexible protective cover bing divided into a front portion which is adapted to extend over most of said drive sprocket(s) of the bicycle and the associated portion of the endless drive chain, a rear portion which is adapted to extend over most of said sprocket gear(s) and the associated portion of the endless drive chain, and a middle portion which is adapted cover the upper and lower runs of the endless drive chain, said elongated main panel part having an opening therein through which the pedal attached to the right side of the crank arm can pass, and said skirt part including two generally U-shaped openings for respectively extending around said seat tube and said seat stay of said bicycle frame and attachment means for closing said two generally U-shaped openings.

4,632,417
BI-FOLD HINGE FOR A FOLDING TOOLBAR

Gary D. Hodapp, Mankato, Minn., assignor to Hiniker Company, Mankato, Minn.

Filed Jul. 23, 1985, Ser. No. 758,102
Int. Cl.[4] A01B *73/00*
U.S. Cl. 280—411 C 24 Claims



1. For use in a folding toolbar mounted to a traction vehicle pulling a drawn toolbar aft of said folding toolbar, said folding toolbar including a center toolbar and an outer wing toolbar, a bi-fold hinge for pivotally coupling said center and outer wing toolbars comprising:

an inner hinge assembly securely mounted to an end of the center toolbar;

an outer hinge assembly securely mounted to an end of the outer wing toolbar;

a center hinge assembly pivotally coupled to said inner and outer hinge assemblies;

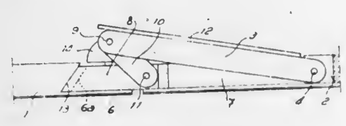
locking means for engaging and rigidly coupling said inner and center hinge assemblies wherein the combination of said outer hinge assembly and the outer wing toolbar mounted thereto are free to pivot about the end of the center toolbar in a first direction, or for engaging and rigidly coupling said center and outer hinge assemblies wherein the combination of said center and outer hinge assemblies and the outer wing toolbar mounted thereto is free to pivot about the end of the center toolbar in a second direction, wherein said first and second directions are generally transverse; and

single displacement means coupled to said center toolbar and to the bi-fold hinge for pivotally displacing said outer toolbar in said first direction when said locking means engages said inner and center hinge assemblies or in said second direction when said locking means engages said center and outer hinge assemblies.

4,632,418
COLLAPSIBLE SKI

Manuel Brue Moya, and Juan Escolies Bordoy, both of Via Augusta 203, Barcelona, Spain

Filed Jun. 19, 1984, Ser. No. 622,294
Claims priority, application Spain, Jun. 23, 1983, 273.128[U]; Jun. 11, 1984, 279.918[U]
Int. Cl.[4] A63C *5/02*
U.S. Cl. 280—603 3 Claims



1. A collapsible ski comprising a skate having a front portion and a rear portion each having respective ends, connecting means pivotally joining said ends, said connecting means being located in the area of said ski where the boot of the user is placed in use, said connecting means including two parallel first strips each having opposite ends, said rear portion of said skate having spaced notches each receiving one of said opposite ends of a said strip on pivot means in each said notch, said connecting means including a second pair of strips each having first and second ends, each other of said opposite ends of said first strips being pivotally connected respectively to a said first end of a said second strip, said front portion of said skate having side edges and, adjacent said end thereof, a spindle disposed inwardly from said side edges, said second ends of said second strips being pivotally connected to said spindle, said first and second strips extending substantially parallel to one another when said ski is folded and unfolded, said rear portion having a pair of parallel arms each terminating in a bevel surface and disposed outwardly of said strips, said front portion of said skate having adjacent said spindle a pair of spaced bevel surfaces complementary to said bevel surfaces of said arms, said arms having a length such that, when said ski is fully unfolded said respective pairs of bevel surfaces will engage one another, said first strips having top edges on which is mounted a plate which, is the unfolded condition of said ski, will lie substantially flush with the surface of said front and rear portions, said ski including locking means for maintaining said portions in the unfolded position.

4,632,419

SKI BINDING

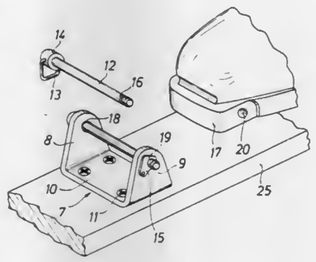
Reinhold Zoor, Munich, Fed. Rep. of Germany, assignor to Heinrich Wunder GmbH & Co. KG., Dachau, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,617

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406430; Oct. 15, 1984, 3437725

Int. Cl.[4] A63C *9/10*

U.S. Cl. 280—614 **19 Claims**



1. The combination of a ski boot having a sole with a toe portion and a heel portion and a ski binding for touring as well as cross country skiing, said binding comprising a toe iron directly affixed to the ski and having a single toe retaining means, said toe retaining means engaging a first part of the toe portion of the sole with the bottom of the toe portion of the sole being at a first level above the top surface of the ski so that the boot can pivot with reference to the toe iron about an axis extending substantially transversely of the ski during touring and cross country skiing, and said toe retaining means engaging a second part of the toe portion of the sole with the bottom of the toe portion of the sole being at a lower second level above the top surface of the ski during downhill skiing, said binding further comprising means for releasably holding the heel portion of the sole only when said toe retaining means is engaging said second part of the toe portion during downhill skiing, said holding means being affixed directly to the ski.

4,632,420

COLLAPSIBLE BABY CARRIAGE

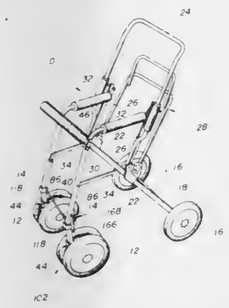
Takeshi Miyagi, Osaka, Japan, assignor to Zojirushi Baby Co., Ltd., Osaka, Japan

Filed Jan. 23, 1985, Ser. No. 694,165

Claims priority, application Japan, Jan. 23, 1984, 59-10795; Jan. 23, 1984, 59-7974[U]

Int. Cl.[4] B62B *3/02*

U.S. Cl. 280—642 **2 Claims**



1. A collapsible baby carriage comprising front leg bars, rear leg bars, a transverse connector bar extending between and connected at both ends thereof to upper ends of said front and rear leg bars to connect said front and rear leg bars together, a handle bar having spaced apart lower ends, embracing members each of which is secured to a respective one of said lower ends of said handle bar for detachably embracing one of said rear leg bars at an intermediate portion thereof, auxiliary bars each of which has a lower end fixed on a respective one of said embracing members, elbow rests each of which is pivotally connected at one end thereof to an upper end of a respective one of said auxiliary bars and at the other end thereof to a corresponding upper end of one of said rear leg bars, anchoring link bars each of which is pviotally connected at one end thereof to an intermediate portion of one of said front leg bars and at the other end thereof to a lower portion of one of said auxiliary bars, each of said anchoring link bars having a saw-toothed anchoring edge at a central portion thereof, a spring-loaded lock bar means including a lock bar for resiliently engaging and disengaging with said anchoring edge so as to resiliently hold a respective one of said rear leg bars in a working position, a lock bar receiving member pivotally attached to a side of each said anchoring edge for resiliently holding said lock bar in an engaged position, a manipulation means for disengaging said lock bar from each said anchoring edge of said anchoring link bars, and an L-shaped link bar pivotally connected at one end thereof to a lower portion of said respective one of said rear leg bars and at the other end thereof to a lower portion of a corresponding one of said auxiliary bars whereby said L-shaped link bar extends along said respective one of said rear leg bars and a corresponding one of said auxiliary bars when in the working position.

4,632,421

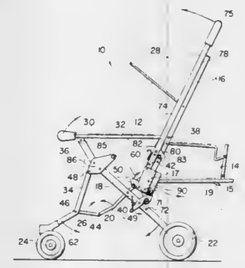
FOLDING BABY CARRIAGE WITH DOUBLE LOCK

Louis Shamie, 972 Dean St., Brooklyn, N.Y. 11233

Filed Feb. 19, 1986, Ser. No. 831,148

Int. Cl.[4] B62B *7/08*

U.S. Cl. 280—642 **16 Claims**



1. A carriage having a foldable frame and lock combination, comprising:

a first frame member;

a second frame member;

a cross member pivotally connected to said first and second frame members at pivotal connections therewith;

said first, second and cross members being movable between an open position with said first and second members spaced from each other and with a portion of said cross member disposed adjacent a portion of said first member which is spaced from the pivotal connection between said first and cross members, and a closed position with said first and second members disposed adjacent each other and said portion of said first cross members spaced from each other, said cross member moving in a closing direction, with movement from said open to said closed position;

a first latch pivotally connected to one of said first and second frame members;

first engagement means connected to the other of said first and second frame members and engaged with said first latch to hold said first, second and cross members in said open position, and disengageable from said first engagement means in said closed position;

holding means for holding said first latch in a position out of engagement with said first engagement means;

a second latch pivotally connected to one of said first and cross members at said portions thereof;

second engagement means connected to the other of said first and cross members adjacent said portion thereof, engaged with said second latch to hold said first, second and cross members in said open position, and disengaged from said second engagement means in said closed position;

first biasing means connected to said first latch for biasing said first latch into a position of engagement with said engagement means; and

second biasing means connected to said second latch for biasing said second latch into a position for engagement with said second engagement means;

wherein, when said first, second and cross members are moved from said open position to said closed position, said first latch is pivoted against said first biasing means into engagement with said holding means for holding said first latch away from said first engagement means, and thereafter said second latch is pivoted against said second biasing means out of engagement with said second engagement means for permitting movement of said first, second and cross members into said closed position.

4,632,422

ANTI-ROLL TORSION BAR (STABILIZER) FOR THE RUNNING GEAR OF VEHICLES

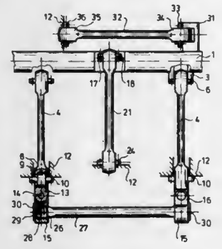
László Csordás; Gyula Maros; József Németh, all of Budapest; Gyula Rózsa, Körmend, and János Urbantsok, Budapest, all of Hungary, assignors to Autólpari Kutató és Fejleszto Vállalat and IKARUS Karosszéria és Jármügyár, both of Budapest, Hungary

Filed Dec. 26, 1984, Ser. No. 686,515

Claims priority, application Hungary, Dec. 30, 1983, 4531/83

Int. Cl.[4] B60G *9/02*

U.S. Cl. 280—689 **2 Claims**



2. In a vehicle including a chassis, an axle having a longitudinal axis, resilient suspension means mounting said axle on said chassis for providing for a springing vertical displacement of said axle relative to said chassis, and an anti-roll torsion bar assembly including two spaced draw bars each having a longitudinal axis, first pivot means for individually pivotally securing each said draw bar to said axle, second pivot means for individually securing each said draw bar to said chassis, said first and second pivot means being arranged for allowing a swinging motion of each said draw bar in a plane perpendicular to said longitudinal axis of said axle; said anti-roll torsion bar assembly further including a torsion bar arranged spaced from and parallel to said axle and having a longitudinal axis, and coupling means for connecting said torsion bar to said draw bars; the improvement wherein said coupling means comprises

(a) a separate distance piece associated with each said draw bar at a location externally of a zone between said first and second pivot means;

(b) third pivot means for pivotally attaching each said distance piece to a respective said draw bar; said third pivot means having a pivotal axis oriented perpendicularly to a plane generally defined by said longitudinal axes of said draw bars and said torsion bar; and

(c) torsion bar receiving means formed in the separate distance pieces for securing said torsion bar, at spaced locations thereof, to said distance pieces; said torsion bar receiving means including

(1) means for holding said torsion bar non-rotatably relative to each said distance piece; and

(2) means for holding said torsion bar longitudinally displaceable relative to at least one of said distance pieces.

4,632,423

STRUCTURE FOR MOUNTING STABILIZER IN VEHICLE SUSPENSION

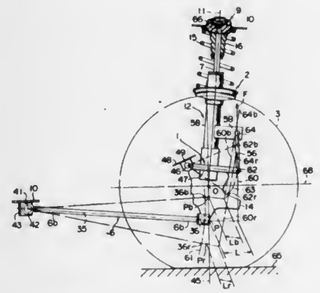
Haruhiko Tanahashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 9, 1985, Ser. No. 721,409

Claims priority, application Japan, Mar. 1, 1985, 60-29611[U]; Apr. 3, 1985, 60-70359

Int. Cl.[4] B60G *19/00*

U.S. Cl. 280—689 **3 Claims**



1. A stabilizer construction for a suspension of a vehicle having a vehicle body and wheels, said suspension including a bearing means for rotationally supporting one of said wheels, a cylinder-piston type shock absorber extending along a substantially vertically arranged longitudinal axis thereof with a cylinder member thereof supporting said bearing means and firmly connected therewith and a piston member thereof extending upwardly from said cylinder member and being supported from said vehicle body, and a means for guiding the combination of said cylinder member and said bearing means to be movable up and down relative to said vehicle body for bounding and rebounding, said guiding means including a suspension member pivotably connected to said vehicle body at one end thereof and to said combination of said cylinder member and said bearing means at another end thereof so as to apply a force to said combination of said cylinder member and said bearing means along a line extending in a longitudinal direction of said vehicle body for restricting forward and rearward movement of said combination of said cylinder member and said bearing means in said longitudinal direction of said vehicle body, said stabilizer construction comprising:

a stabilizer having a central bar portion mounted to said vehicle body so as to extend transversely relative to said longitudinal direction of said vehicle body and an arm portion extending from one end of said central bar portion substantially at a right angle relative thereto,

a link, and

a bracket extending from the combination of said cylinder member and said bearing means to a free end thereof transversely spaced from the longitudinal axis of said shock absorber, a free end of said arm portion of said stabilizer being pivotably connected with one end of said

link while another end of said link is pivotably connected with said bracket at a portion thereof adjacent said free end thereof so that bounding and rebounding movement of said combination of said cylinder member and said bearing means relative to said vehicle body from a neutral position thereof causes twisting of said central bar portion of said stabilizer,

wherein, as viewed in a direction transverse to said longitudinal direction of said vehicle body, said arm portion of said stabilizer is positioned to cross said shock absorber longitudinal axis so that said central bar portion and said free end of said arm portion thereof are located on opposite sides of said shock absorber longitudinal axis,

wherein said arm portion of said stabilizer extends to be substantially at a right angle to the longitudinal axis of said shock absorber when said combination of said cylinder member and said bearing means is at a neutral position of said bounding and rebounding relative to said vehicle body,

wherein the pivotable connection between said arm portion of said stabilizer and said link is positioned above a point of intersection between a vertical line passing through a center of rotation of said one wheel supported by said bearing means and said line along which said force for restricting forward and rearward movement of said combination of said cylinder member and said bearing means relative to said vehicle body is applied, and

wherein the pivotable connection between said link and said bracket is positioned above said pivotable connection between said link and said arm portion of said stabilizer.

4,632,424

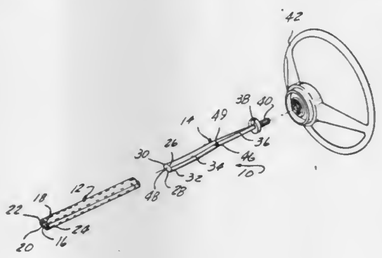
ENERGY ABSORPTION APPARATUS

George R. Morris, 6543 E. Abain Rd., Monroe, Mich. 48161

Filed Oct. 22, 1984, Ser. No. 663,426

Int. Cl.[4] B60R *21/02*

U.S. Cl. 280—777 **2 Claims**



1. An energy absorption apparatus comprising:

first and second telescopingly engagable members;

a longitudinally extending helix formed along the longitudinal axis of the second member for causing forced engagement along the overlapping surfaces of the first and second members as the second member is urged into the first member by an external force;

the first member having a through bore extending longitudinally therethrough for receiving the second member in an increasing friction fit as the second member helically twists into the first member.

4,632,425

PASSENGER RESTRAINT SYSTEM

Mary A. Barratt, 25300 S. Schoenborn Rd., Mulino, Oreg. 97042

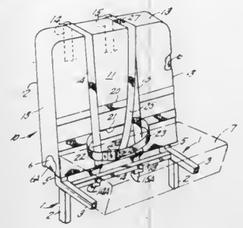
Filed Jul. 8, 1985, Ser. No. 752,641

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—801 **12 Claims**

1. A passenger restraint system for a vehicle attachable to the seat back of the vehicle seat structure, said system comprising,

a seat back envelope having front and rear panels for snug overlying engagement with the seat back and having a lower edge for positioning adjacent the lower terminus of the seat back, and



webbing stitched to said seat back envelope and including free webbing segments, body restraint means carried by said free webbing segments and equipped with closure means for positioning of the restraint means about the passenger.

4,632,426

INSTALLATION FOR ADJUSTING A HINGE POINT OF A VEHICLE SAFETY BELT

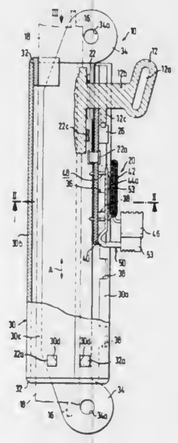
Claus Dallwig, Rodental, and Hans-Joachim Volk, Ebersdorf/-Frohnlach, both of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,973

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317957

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—808 **51 Claims**



1. An installation for the adjustment of a hinge point of a safety belt in a vehicle, comprising rail means fixed at the vehicle, slide means displaceable along said rail means and determining the hinge point, detent means selectively securing the slide means at the rail means in at least two detent positions, said detent means including a detent element displaceably supported at the slide means between a detent position with engagement into a detent aperture provided in the rail means and coordinated to the respective detent position and a release position out of engagement with the detent aperture, spring means for prestressing the detent element into the detent position, manual actuating means operatively connected with the detent element for moving the detent element into the disengaging position, said detent element and said manual actuating means being displaceable in different directions, and guide means providing a motion step-down for coupling the detent element and the manual actuating means with each other.

4,632,427

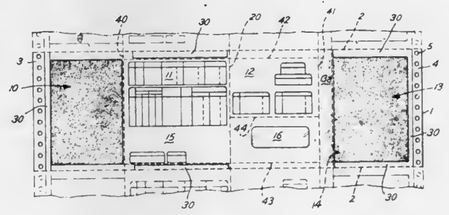
COMBINED MAILER AND RETURN ENVELOPE

Gordon Angus, Toronto, Canada, assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 6, 1983, Ser. No. 482,573

Int. Cl.[4] B41L *1/20, 5/04;* **B65D** *27/10, 27/06*

U.S. Cl. 282—11.5 R **15 Claims**



1. A two-way envelope unit suitable for use in continuous form formatting, comprising, a single rectangular sheet, with that single sheet having a transverse central line of weakness, separable line-hole bearing side margins parallel to said central line of weakness, and a top and bottom margin, a data receiving panel and a pair of return envelope panels for use when folded as an envelope, the return envelope panel comprising part of the single sheet and disposed between said central line of weakness and each of said side margins, each data receiving panel being adjoined to each return envelope panel along a line of separation parallel to said central line of weakness, sealing means disposed on one side of said sheet along the top margin of at least one of said data receiving panels and at least one of said return envelope panels, along the bottom margin of at least one of said data receiving panels and at least one of said return envelope panels, and along a side edge of at least one of said panels adjacent one of said side margins whereby, when the single sheet is folded about said central line of weakness, said data receiving panels overlie one another and said return envelope panels form an envelope by overlying one another and said lines of separation are offset to define an adhesive bearing return envelope flap, said top and bottom margins being free of sealing means at said return envelope flap.

4,632,428

COMBINATION MEDICAL DATA, IDENTIFICATION AND HEALTH INSURANCE CARD

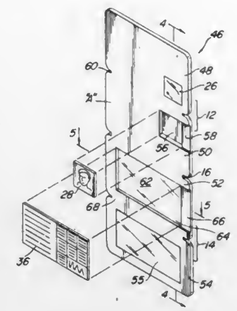
Steven P. Brown, P.O. Box 15786, Philadelphia, Pa. 19103

Filed Feb. 6, 1984, Ser. No. 577,267

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—76 **14 Claims**

1. An eye and machine readable medical data, identification and health insurance card, comprising a first generally rectangular card-like member providing thereon a pair of oppositely disposed card faces, a second generally rectangular card-like member providing thereon another pair of oppositely disposed card faces, said card-like members being formed from an integral piece of plastic polymeric material; plastic polymeric self-hinge means interconnecting said card-like members to that said card-like members can selectively be disposed in coplanar relationship or superimposed upon each other; said card-like members comprising pairs of card elements superimposed in face-to-face relation when the card is operatively disposed, said card elements of respective card-like members being hingedly interconnected by self-hinge means disposed at respective edges of said card element; and at least one of the card elements of one of said card-like members having means



thereon for retaining an insert within and operatively in association with said one of said card-like members.

4,632,429

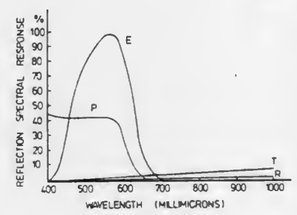
METHOD OF RENDERING DOCUMENTS RESISTANT TO PHOTOCOPYING AND ANTI-COPYING PAPER THEREFOR

Norman A. Gardner, and Michael P. Voticky, both of Montreal, Canada, assignors to Nocoi Inc., New York, N.Y.

Continuation-in-part of Ser. No. 443,819, Nov. 23, 1982, Pat. No. 4,522,429, which is a continuation-in-part of Ser. No. 379,674, May 19, 1982, abandoned. This application Mar. 16, 1983, Ser. No. 475,791

Int. Cl.[4] B41M *3/14*

U.S. Cl. 283—91 **18 Claims**



1. A document having substantially non-translucent information appearing thereon, with at least a portion of the information being located on a front face of a portion of the document, said front face portion having a colour with a reflection spectral response which is effectively zero for light with a wavelength below about 625 millimicrons and less than about 1% up to about 1,000 millimicrons so as to render said document portion substantially incapable of being photocopied in an information-readable manner, and said document portion being capable of transmitting visible light from the rear face to the front face to cause sufficient contrast between the substantially non-translucent information and the transmitted light to enable the information to be read by a human eye viewing the front face of the document when visible light is transmitted through the document from the rear face to the front face thereof.

7. A method of rendering a document with information thereon resistant to photocopying, said method comprising applying substantially non-translucent information to a front face of a document, coloring said front face with a color with a reflection spectral response which is effectively zero for light with a wavelength below about 625 millimicrons and less than about 1% up to about 1,000 millimicrons so as to render the document substantially incapable of being photocopied in an information-readable manner, and said document being capable of transmitting visible light from a rear face to the front

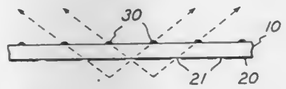
face to cause sufficient contrast between the substantially non-translucent information and the transmitted light to enable the information to be read by a human eye viewing the front face of the document when visible light is transmitted through the document from the rear face to the front face thereof.

4,632,430

SECURE AND SELF-VERIFIABLE IMAGE

Ralph C. Wicker, 194 Oxford St., Rochester, N.Y. 14607

Filed May 8, 1984, Ser. No. 608,116
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—91 **11 Claims**



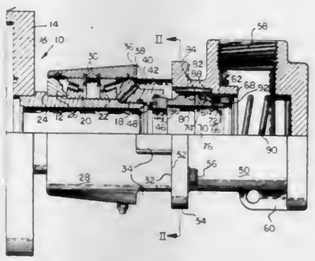
1. A secure and self-verifying image comprising:
a. said image being formed on an array of uniformly spaced dots occupying up to about 15% of the total area of said image and disposed on an image side of a pellucid stratum at least 0.05 mm thick;
b. a dark screen parallel with and spaced from said dot array on a screen side of said pellucid stratum, said dark screen having an array of apertures with the same uniform spacing as said array of dots and occupying up to about 15% of the total area of said dark screen; and
c. said dots being offset from the axes of said apertures so that said image is viewable only by light passing obliquely through said stratum at an angle that intersects said arrayed apertures and said arrayed dots.

4,632,431

SECTIONAL ROTARY JOINT

Donald G. McCracken, Horton, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 23, 1984, Ser. No. 633,656
Int. Cl.[4] F16L *27/00*
U.S. Cl. 285—13 **1 Claim**



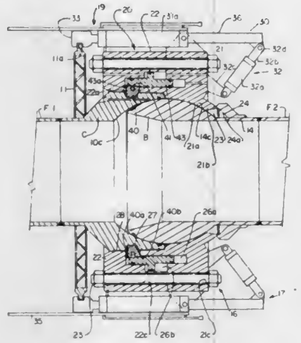
1. A rotary joint characterized by its ease of maintenance and self-aligning seals comprising, in combination, a supprot member including a tubular sleeve having an axis, an inner end and an outer surface, a bearing housing radially aligned with and surrounding said sleeve coaxial thereto having an inner end, anti-friction bearings within said housing engaging said sleeve outer surface, said anti-friction bearings comprising a pair of axially spaced roller bearings having tapered races, the taper angle of said bearings being in opposite axial directions to resist axial forces imposed on said bearings, a bearing retainer coaxially threadedly mounted upon said sleeve inner end having an inner end engaging said bearings and axially positioning said bearings on said sleeve regulating the compressive forces imposed on said bearings and an outer end axially extending beyond said sleeve inner end, locking means defined on said bearing retainer selectively controlling rotation of said retainer on said sleeve inner end, a first annular seal coaxially mounted upon said bearing retainer outer end and keyed thereto having a radial face, a seal housing axially aligned with said bearing housing and having an open end engaging said bearing housing inner end, a conduit port defined in said seal housing, theaded bolts mounting said seal housing upon said bearing housing inner end, an annular seal retainer axially displaceable within said seal housing and coaxial with said sleeve axis, a plurality of axially extending pins mounted in said sleeve housing radially spaced from and equally angularly spaced about said sleeve axis, a plurality of axially extending recesses defined in said seal retainer each loosely receiving a pin, a concentric annular recess defined in said seal retainer, a second annular seal mounted within said seal retainer annular recess coaxial with said first seal having a radial face engaging said first seal face in a rotative sealing relationship, said pins and associated recesses preventing rotation of said seal retainer relative to said seal housing and permitting said second seal face to align itself with said first seal face, said bearing housing inner end and seal housing open end being radial and planar and substantially aligned with the plane of the faces of said first and second seals, spring means within said seal housing axially biasing said seal retainer and said second seal toward said first seal, an annular seal assembly within said seal housing and axially movable therein sealingly interposed between said seal retainer and said seal housing, said seal assembly including an annular seal ring of synthetic plastic material haivng an inner oblique surface and an outer end, an annular oblique surface defined upon said seal retainer engaging said seal ring oblique surface, said spring means comprising a compression spring operatively interposed between said seal housing and said outer end of said annular seal ring biasing said annular seal ring toward said first seal.

4,632,432

REMOTE BALL CONNECTOR

Bobby J. Reneau, Houston, Tex., assignor to Gripper, Inc., Houston, Tex.

Filed May 9, 1984, Ser. No. 608,384
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—24 **18 Claims**



1. Apparatus for connecting together first and second flowline members comprising:
a female member adapted to be connected to a first flowline;
a male member adapted to be connected to a second flowline;
said male member including a ball portion having an exterior convex configuration of a sphere;
said female member having a cup portion which is a concave interior portion partially in the configuration of a sphere to receive said ball portion of said male member;
one of said male or female members having an attachment member;

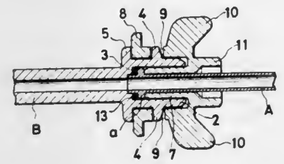
the other of said male or female members having a hydraulic flange assembly mounted therewith;
guide means mounted with said hydraulic flange assembly for guiding said hydraulic flange assembly and said other member mounted therewith into a position of initial alignment with said one member;
said guide means further including alignment means for pulling said male and female members together and into substantially final alignment such that said ball member is positioned within said cup member;
final locking means mounted with said hydraulic flange assembly and forming a part thereof for moving from said hydraulic flange assembly into locked engagement with said one member; and
mount means mounting said hydraulic flange assembly on said other member for limited movement of the hydraulic flange assembly with respect to said other member to cooperate with said guide means to align said male and female members.

4,632,433

DEVICE FOR CONNECTING TUBES

Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 4, 1985, Ser. No. 772,313
Claims priority, application Japan, Sep. 7, 1984, 59-135094[U]
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—38 **5 Claims**



1. A device for connecting together tubes or pipes comprising a cylindrical male coupler mounted on one end of a first tube or pipe, and a cylindrical female coupler mounted on one end of a second tube or pipe and having an inner cylindrical portion capable of receiving said male coupler, said male coupler having at least one engagement projection provided on its outer periphery, said female coupler being provided with at least one helical engagement notch opening axially at one end of said female coupler and forming an inlet for said engagement notch for receiving said at least one engagement projection, and at least one locking projection on said male coupler engaging in said inlet with said male coupler and said female coupler fully engaged to lock said couplers against unauthorized separation.

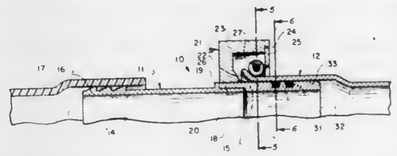
4,632,434

COUPLING MEANS FOR TUBULAR MEMBERS

Robert H. Proctor, Baltimore, and Ronald C. Hardesty, Sykesville, both of Md., assignors to Murray Corporation, Cockeysville, Md.

Filed Jul. 8, 1985, Ser. No. 752,602
Int. Cl.[4] F16L *37/00*
U.S. Cl. 285—39 **1 Claim**

1. A coupling means for a pair of tubular members, comprising, in combination, an inner tubular member having a longitudinal axis, the inner tubular member including a first tube having an inner end and further having an annular radially-extending shoulder formed thereon and spaced from the end thereof, the inner tubular member further including a second tube press-fitted over the end of the first tube and having an end bearing against the shoulder, an outer tubular member disposed coaxially of the longitudinal axis and having an end adapted to be slidably telescopically received at least partially over the second tube of the inner tubular member, a substantially-cylindrical spring housing having a flanged base of substantially increased cross-section, said housing being press-fitted to the end of the second tube of the inner tubular member at a position substantially adjacent to the shoulder of the first tube, the spring housing further having an outer annular wall formed integrally with the base and spaced radially from the second tube of the inner tubular member substantially concentrically of the longitudinal axis thereof, the annular wall of the spring housing having an end portion with an annular inner ledge formed thereon, an annular washer flange press-fitted on the annular inner ledge and extending therefrom radially inwardly thereof towards the second tube of the first tubular member, spaced therefrom, and substantially perpendicularly to the longitudinal axis thereof, an upwardly-inclined annular flange on the end of the outer tubular member and adapted to be received past the annular washer flange and within the spring housing when the outer tubular member is telescopically slidably received over the second tube of the inner tubular member, the upwardly-inclined annular flange being arranged on an axis transverse to the annular washer flange, an annular garter spring trapped within the spring housing and arranged to be disposed between the annular washer flange and the upwardly-inclined annular flange on the outer tubular member, thereby retaining the outer tubular member on the inner tubular member, whereby the implement may be inserted between the annular washer flange and the outer tubular member and into the spring housing to displace the annular garter spring, thereby allowing the outer tubular member to be slidably removed from the second tube of the inner tubular member, the second tube having a pair of axially spaced-apart external annular grooves formed thereon beyond the end of the first tube, respective sealing rings carried by the grooves, and the outer tubular member having an inner diameter in sealing engagement with the respective rings outwardly of the spring housing.

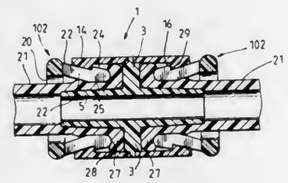


4,632,435

TUBING CONNECTOR SYSTEM

Mark Polyak, Minnetonka, Minn., assignor to American Medical Systems, Inc., Minnetonka, Minn.

Filed Dec. 27, 1984, Ser. No. 686,980
Int. Cl.[4] F16L *33/22*
U.S. Cl. 285—243 **16 Claims**



1. A connector assembly for connecting to flexible tubing, said connector assembly comprising:
(a) a connector body having a central passageway for fluids and a generally cylindrical portion arranged to engage the interior of said flexible tubing;
(b) a clamping ring having inner and outer surfaces;
said clamping ring having a passageway enabling said

clamping ring to encircle said tubing and enabling said clamping ring to slide along said tubing, after said tubing has engaged said generally cylindrical portion of said connector body, until said inner surface of said clamping ring engages said tubing;

said inner surface having a substantially blunt surface enabling said inner surface to apply a compressive force upon said tubing against said cylindrical portion once said inner surface has engaged said tubing, without causing said tubing to contact sharp edges; and

(c) a securement device to engage the outer surface of said clamping ring and to secure said clamping ring to said connector body, said securing of said clamping ring to said connector body enabling said inner surface of said clamping ring to apply said compressive force to said tubing causing said tubing to be clamped onto said generally cylindrical portion;

said clamping ring insertable between said connector body and said securement device allowing said connector assembly to be arranged to enable a substantially linear compressive force, applied substantially parallel to the longitudinal axis of said generally cylindrical portion, to engage said clamping ring to said connector body and said securement device.

4,632,436

DEVICE FOR CONNECTING TUBES OR THE LIKE

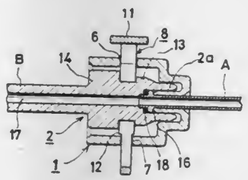
Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 4, 1985, Ser. No. 772,367

Claims priority, application Japan, Sep. 7, 1984, 59-135095[U]

Int. Cl.⁴ F16L *37/14*

U.S. Cl. 285—305 **4 Claims**



1. A device for connecting tubes or the like, comprising a male coupler provided on one end of a tube or a pipe to be connected, said male coupler having a cylindrical engagement portion having a tapered end and also having engagement projections formed on its outer periphery, a female coupler provided on one end of another tube or pipe, said female coupler having a diameter capable of receiving said male coupler and also having radially penetrating windows, and a lock member having two legs with elasticity provided therebetween, said lock member being inserted through said windows of said female coupler and said male coupler being inserted in said female coupler to cause said engagement projections to pass through said lock member, whereby the male and female couplers are held in engagement, said legs at an entering end being tapered toward one another and joined at an apex and having retaining projections adjacent said apex and preventing withdrawal through a respective window, said legs further having locking projections spaced from said retaining projections away from said apex and limiting insertional movement through said respective window, said legs being joined at a remote end by a plate-like push member for manual engagement resiliently to spread said legs to permit withdrawal of said male coupler from said lock member.

4,632,437

PIPE COUPLING

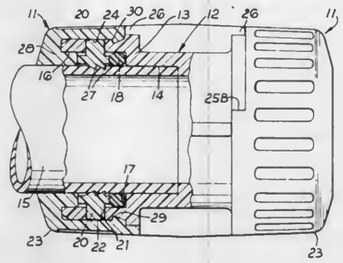
Anthony R. Robson, Windy Ridge, Trundle Lane, Fishlake, near Doncaster, and George M. Marsden, Robin Hill, Manor Drive, Cadeby, Doncaster DN5 7SP, both of England

Filed Oct. 21, 1985, Ser. No. 789,745

Claims priority, application United Kingdom, Apr. 3, 1985, 8508757

Int. Cl.⁴ F16L *37/00*

U.S. Cl. 285—310 **12 Claims**



1. A pipe coupling having a socket with an inner internal portion for location of an inserted pipe, and an outer internal portion of larger diameter, and a gripping ring also located in the outer internal portion of the socket and adapted to prevent withdrawal of the inserted pipe from the socket, said gripping ring being formed with an internal diameter not less than that of the inner internal portion and with a plurality of integral projections extending into corresponding apertures in the outer internal portion, and having camming portions projecting from the radially outer ends of the projections, the outside of the socket being provided with an encircling member rotatable on the socket and having an internal profile with corresponding camming portions for predetermined interference with those of the gripping ring projections upon rotation of the encircling member from an initial position in which the respective camming portions are out of engagement, to apply predetermined radial pressure to the projections on the gripping ring to cause it to contract into gripping engagement with the inserted pipe.

4,632,438

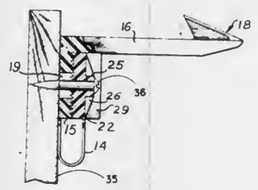
ADJUSTABLE SAFETY LATCH WITH INOPERABLE POSITION

James C. McKinney, 8850 North Mount Dr., Alpharetta, Ga. 30201

Continuation-in-part of Ser. No. 696,076, Jan. 29, 1985. This application Jul. 12, 1985, Ser. No. 754,609

Int. Cl.⁴ E05C *19/06*

U.S. Cl. 292—87 **6 Claims**



1. A safety latch in combination with a closure for a cabinet for preventing access to a cabinet or the like by preventing full opening of said closure for said cabinet, said safety latch including a hook carrying member receivable on said closure adjacent to a movable edge thereof, said hook carrying member including a base plate disposable on said closure, and a hook extending therefrom, said base plate defining an opening therethrough, securing means extending through said opening in said base plate, said opening in said base plate being larger than said securing means so that said base plate can move along the surface of said closure relative to said securing means, placement means for locating said base plate on said closure, said placement means defining a second plate having a hole generally centrally thereof for rotatably receiving said securing means, said securing means engaging said placement means for holding said placement means against said base plate and said base plate against said closure, said base plate disposed between said closure and said second plate, and means carried by said placement means for preventing relative rotation between said base plate and said placement means, said hook member extending generally perpendicularly from said base plate for selective engagement with said cabinet, said hook member being sufficiently resilient to be forcefully bent for disengagement from said cabinet, the arrangement being such that said placement means is rotatable on said securing means and said base plate is slidable relative to said placement means for varying the position of said hook with respect to said closure, said opening in said base plate being of such size as to allow placement of said hook so that rotation of said latch about said securing means will prevent said hook from engaging said cabinet.

4,632,439

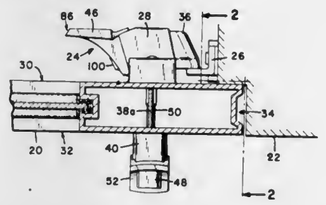
DOOR LATCHING APPARATUS

Cardell E. Miller, Hudson, Wis., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Dec. 18, 1984, Ser. No. 683,176

Int. Cl.⁴ E05C *1/12*

U.S. Cl. 292—166 **1 Claim**



1. A door latching apparatus for reversibly latching a screen door having a first surface, a second surface and a longitudinal edge to a screen door frame having a strike, comprising:

(a) a slidable nose bolt suitable for engaging the strike;

(b) a first housing suitable for operatively connecting to the screen door on the screen door's first surface proximate the door's longitudinal edge and configured to slidably support said nose bolt;

(c) a first handle operatively connected to said first housing for sliding said nose bolt from a first position to a second position, wherein when said door latching apparatus is connected to the door said first position is normally associated with a latched state and said second position is normally associated with an unlatched state;

(d) an adjustment trunnion in operative contact with said first handle;

(e) an adjustment screw having a screw axis threadedly engaged with said adjustment trunnion and operatively engaged with said nose bolt, wherein rotation of said adjustment screw about said screw axis alters said first and second positions of said nose bolt so that said nose bolt is operatively engaged with the strike when it is in said first position and said nose bolt is operatively disengaged from said strike when said nose bolt is in said second position;

(f) a second housing suitable for operatively connecting to the screen door on the door's second surface proximate the door's longitudinal edge;

(g) a second handle operatively connected to said second housing proximate the second surface of the door;

(h) a spindle having first and second ends and a spindle axis, said first end of said spindle including a cam surface and a spindle ear, said cam surface being operatively disposed relative to said first handle, wherein said second handle and said spindle are suitable for transmitting axial and rotational unlatching forces in relation to said spindle axis, wherein said cam surface of said first end of said spindle is configured to operatively act on said first handle in response to axial or rotational unlatching forces; and

(i) a lock lever having a locked position and an unlocked position operatively connected to said first housing, said lock lever forming a recess suitable for capturing said spindle ear to substantially prevent axial or rotational movement of said spindle, wherein said lock lever is movable to said unlocked position upon movement of said first handle.

4,632,440

DEVICE FOR LOCKING A MOBILE PANEL WITH DOUBLE SECURITY

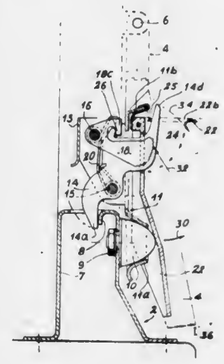
Robert Adrian, Salon, and Maurice Goulin, Lambesc, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Dec. 18, 1984, Ser. No. 683,170

Claims priority, application France, Dec. 19, 1983, 8320285

Int. Cl.⁴ E05C *3/04*

U.S. Cl. 292—229 **1 Claim**



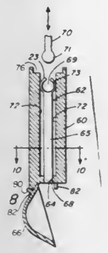
1. In a fixed structure having a mobile panel pivotedly fixed on said structure, said panel being mobile between an opened position and a closed position, a device for locking said mobile panel, comprising a plate integral with the panel and having a conical hole, as well as a conical stop integral with the fixed structure and which enters the plate hole when the panel is in the closed position, said device further comprising a locking bush or locking flange integral with the fixed structure, a support mounted on the panel, a bolt mounted in pivotal manner on the support and able to engage in the locking bush when the panel is in said closed position, elastic means drawing the bolt towards a disengaged position of the locking bush and a pawl mounted in pivotal manner on the support and able to lock the bolt in an engaged position, elastic means moving the pawl into said locking position thereof, a safety cover mounted in pivotal manner on the support, said cover being able to prevent the manipulation of the bolt and the pawl, wherein the safety cover has a window, whereof one face locks the active locking surface of the bolt, when the latter is in the closed position.

4,632,441

SCOOP FOR SOLIDS

Raymond R. Dunlap, Uxbridge, Mass., assignor to Zymark Corporation, Hopkinton, Mass.

Filed Dec. 3, 1984, Ser. No. 677,392
Int. Cl.[4] B66F *9/00*
U.S. Cl. 294—1.1 **14 Claims**



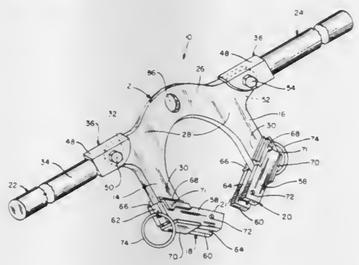
1. A molded one-piece scooping apparatus comprising a scoop, hinge means and an operating rod; said scoop being pivotally mounted by said hinge means on said operating rod;
wherein said scoop is pivotally mounted on said hinge means between a first, open position, and a second, closed position;
wherein a bottom and leading edge of said scoop, in said open position, forms a wedge means for penetrating particulate solids to be scooped;
and wherein at least one surface of said scoop forms a bearing surface for pivoting said scoop into said closed position as said scoop is moved through said solids to be scooped and where said hinge means forms means to retain solids in said scoop when said scoop is in said closed position.

4,632,442

CONDUIT CARRYING DEVICE

Thomas W. Gerding, 5805 Hawkins-Fuchs Rd., St. Louis, Mo. 63129

Filed Sep. 27, 1985, Ser. No. 780,802
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—16 **22 Claims**



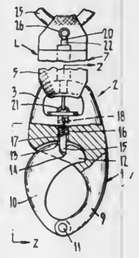
1. A conduit carrying device for grasping and carrying elongated elements, said device comprising a frame member having laterally spaced first and second leg members defining a space therebetween, each of said leg members having a longitudinal axis, means defining a channel associated with at least one of said leg members, said channel means having a longitudinal axis located such that said axis is angularly related with respect to the longitudinal axis of its associated leg member, a closure member slidably positioned within said channel means, said closure member being slidably movable between a first open position to admit an element to be carried to the space defined by said leg members and a second closed position to restrict egress of an element from said space, said closure member being normally urged towards its second closed position and being movable to its first open position in response to an upward force exerted thereagainst and gripping means associated with said frame member to facilitate gripping and carrying said device with such element positioned within the space defined between said leg members.

4,632,443

SAFETY SHACKLES

Clifton L. Miller, and Nigel R. Plumridge, both of Tasmania, Australia, assignors to Millridge Safety Developments Pty. Ltd., Tasmania, Australia

PCT No. PCT/AU84/00135, § 371 Date Mar. 5, 1985, § 102(e) Date Mar. 5, 1985, PCT Pub. No. WO85/00414, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 12, 1984, Ser. No. 717,244
Int. Cl.[4] B66C *1/36*
U.S. Cl. 294—82.34 **11 Claims**



1. A combination shackle and line comprising:
a body;
a closure member connected to the body for movement between open and closed positions;
latch means supported by the body for movement between a first position to hold the closure member in the closed position, and a second position to allow the closure member to move from the closed position to the open position;
an elongated, flexible shackle line including a first longitudinal end having first and second sections;
the body including means connecting said first and second sections to the body and holding the first and second sections apart to form an end opening in the shackle line, said end opening being located in the body;
a release line having a first end connected to the latch means, and extending therefrom through the end opening in the shackle line and longitudinally through the shackle line; and
a handle connected to a second end of the release line to pull the release line along the shackle line to thereby move said latch means from the first position to the second position.

4,632,444

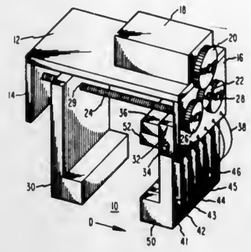
ROBOT HAND

Miguel R. Martinez, Mercer County, and William A. Dischert, Burlington County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 3, 1985, Ser. No. 730,060
Int. Cl.[4] B25J *15/00*
U.S. Cl. 294—86.4 **12 Claims**

1. A robotic hand for grasping an object and sensing its shape, said hand comprising:
a first array of fingers;

means for grasping said object against at least some of the fingers in said first array; and



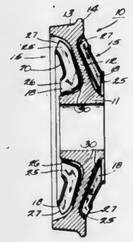
a first means for producing an electrical signal identifying when the object contacts each of at least some of the fingers.

4,632,445

COOLING DEVICE FOR RAILWAY WHEELS

Adolph Giesl-Gieslingen, Vienna, Austria, and Harry G. Jackson, Wauwatosa, Wis., assignors to Harry G. Jackson, Jr., Wauwatosa, Wis.

Filed Oct. 11, 1985, Ser. No. 786,678
Int. Cl.[4] B60B *17/00*
U.S. Cl. 295—1 **11 Claims**



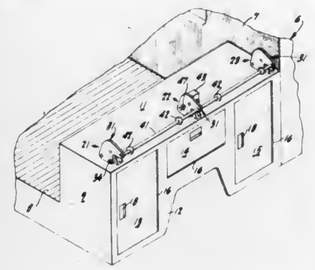
1. A cooling apparatus for attachment to railway car wheels having an annular wheel plate with a hub attached to the inner diameter of said wheel plate and a rim secured to its outer diameter and wherein the wheel is stopped by forcing a brake block against the rim of the wheel to produce the braking action; a plurality of vanes extending radially along the face of the wheel plate between the hub and the rim, each vane having an inner edge adjacent to the face of the wheel plate and extending therefrom to present an outer edge that is displaced from the wheel plate; the improvement comprising an annular cover plate extending about said wheel plate and abutting the outer edges of the vanes to form fully enclosed passages between the vanes with the inner diameter of said annular cover plate being spaced from the hub of the wheel to form a first opening for each channel at the hub of the wheel and its outer diameter being spaced from the rim of the wheel to form a second opening adjacent to the rim of the wheel with all of such openings extending along the entire space between the vanes so that rotation of the wheel will produce an unimpeded air stream flowing without interference through each of said passages with the air entering the passage at the opening adjacent to the hub and exhausting from the opening adjacent to the rim after it impinges upon the rim at the end of the passage to carry heat away from the rim.

4,632,446

LOCKING DEVICE FOR A PICKUP STORAGE BOX DOOR

Clinton C. Douglass, 908 San Carlos St., Bakersfield, Calif. 93308

Filed Apr. 5, 1985, Ser. No. 720,446
Int. Cl.[4] B60R *5/00*; H02K *1/00*
U.S. Cl. 296—37.6 **2 Claims**



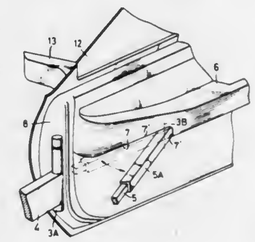
1. For use with a pickup truck body having a storage box with a top panel and with a side panel carrying a door adapted to swing outwardly in a predetermined path, a combination comprising:
a. a mounting adapted to be secured to said top panel;
b. a lever;
c. a bar secured to said lever;
d. and means for pivoting said lever on said mounting for turning movement between a first position with said lever and bar in said path of said swing and a second position with said lever and said bar out of said path;
one of said mounting and said lever including a single aperture, the other of said mounting and said lever including two apertures,
and means adapted to pass through said single aperture and either one of said two apertures for holding said lever against pivoting relative to said mounting; said holding means passing through said single aperture and one of said two apertures in said first position and passing through said single aperture and the other of said two apertures in said second position.

4,632,447

SIDE DOOR HINGE MECHANISM IN A MOTOR VEHICLE

Kazuhiro Nomura, Anjou, and Masayuki Nomura, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 8, 1984, Ser. No. 638,788
Claims priority, application Japan, Aug. 9, 1983, 58-123460[U]
Int. Cl.[4] B60J *5/04, 9/00*; E05D *3/06*
U.S. Cl. 296—153 **18 Claims**



10. A hinge mechanism for a vehicle door comprising:
a vehicle body including a fender section and a door section,

said fender section positioned adjacent to said door section and also forward of said door section as defined relative to the length of the vehicle body, said door section including an arm rest having a recessed section defined along the vehicle interior by a contour line extending along at least a forward portion of said arm rest;

support means extending between said door section and said vehicle body for providing primary support for said door section, said support means including a support arm and first pivot means for pivotally connecting said support arm to said vehicle body and said door section, wherein said first pivot means includes a first shaft means for pivotally mounting said support arm on said vehicle body and second shaft means pivotally mounting said door section on an end of said support arm opposite said first shaft means;

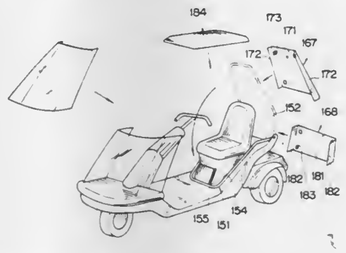
control means extending between said door section and said vehicle body for guiding said door section when said door section is opened and closed, said control means including a control arm means and second pivot means mounted at opposite ends of said control arm means for pivotally connecting said control arm means to said vehicle body and to said door section, said second pivot means enabling said control arm means to pivot with said support arm when said door section is opened and closed, said control arm having a cross-sectional dimension enabling said control arm means to be aligned substantially within said recessed section when said door is closed.

4,632,448

LIGHT MOTOR VEHICLES

Akio Yagasaki, Tokyo, and Masaki Watanabe, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,573
Claims priority, application Japan, Oct. 26, 1982, 57-188472; Oct. 26, 1982, 57-188473; Oct. 26, 1982, 57-188475
Int. Cl.[4] B62J *17/04*
U.S. Cl. 296—218 **15 Claims**



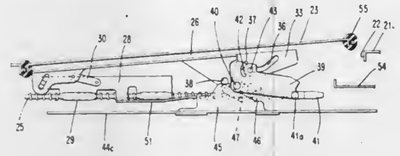
1. A light motor vehicle, comprising:
a vehicle body;
a driver's seat arranged on said vehicle body;
a wind shield disposed in front of said driver's seat;
a set of fittings for defining a cabin;
said fittings including at least a roof member;
support means for supporting the rear end of said roof member;
said wind shield having an upper end thereof detachably connectable with the front end of said roof member so as to support the front end of said roof member;
said vehicle body being provided with an accommodation space for accommodating said fittings; and
said support means and said roof member being movable between a standing position behind said driver's seat and a lying position below said driver's seat.

4,632,449

SLIDING ROOF FOR VEHICLES

Mitsuyoshi Masuda, Nagoya, Japan, assignor to Aisin Seiki Kabushika Kaisha, Japan

Continuation of Ser. No. 547,251, Oct. 31, 1983, abandoned. This application Jan. 13, 1986, Ser. No. 819,000
Claims priority, application Japan, Nov. 1, 1982, 57-165877[U]
Int. Cl.[4] B60J *7/053, 7/19, 7/05*
U.S. Cl. 296—222 **2 Claims**



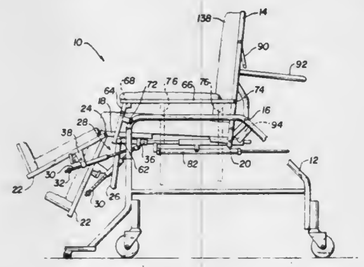
1. A sliding roof for opening and closing an opening in the roof of a vehicle, the sliding roof having a panel and a sliding assembly attached to each side of the panel, the sliding assembly comprising:
a bracket depending from the panel;
a front shoe pivotally supported on a front end of said bracket;
a plate affixed to a rear portion of said bracket;
a guide slot formed on a rear end of said plate, said guide slot having a horizontal portion and an inclined portion;
a rear shoe pivotally connected to said plate;
a guide link having a roller pin and a pivot pin, said guide link rotatably supporting said roller pin at the front end of said guide link and supporting said pivot pin at the rear of said guide link, said pivot pin connecting said rear shoe to the rear end of the said guide link allowing said guide link to pivot relative to said rear shoe;
a guide pin formed on said guide link and slidably engaging said guide slot;
an engaging pin located near the rear end of said bracket;
a guide rail disposed beneath the roof of the vehicle for guiding said front shoe, said rear shoe and said engaging pin;
drive cable means to impart movement to said rear shoe along said guide rail; and
a stationary block positioned on said guide rail and having a pair of horizontally displaced inclined grooves, one in the path of said engaging pin and the remaining one in the path of said roller pin.

4,632,450

CONVERTIBLE WHEELCHAIR/LITTER

Donald H. Holdt, Cambridge, Md., assignor to Cambridge Technologies, Inc., Cambridge, Md.

Filed Nov. 21, 1984, Ser. No. 673,850
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—84 **15 Claims**



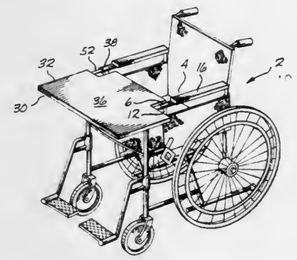
1. In a convertible wheelchair/litter having chair and litter configurations, the combination comprising a seat portion located at a seat height in the chair configuration of said wheelchair/litter and located at a litter height in the litter configuration of said wheelchair/litter, said litter height being above said seat height, linkage means to permit motion of said wheelchair/litter between said chair and litter configurations, automatically operating cushion cylinder means associated with said linkage means and said seat portion, said cushion cylinder means comprising means to automatically cushion the downward motion of said linkage means and of said seat portion from said litter height down to said seat height, and said cushion cylinder means comprising means to automatically cause said cushion cylinder means to have substantially no effect on said linkage means when said linkage means and said seat portion are moved upwardly from said seat height to said litter height.

4,632,451

WHEELCHAIR TABLE AND DESK ATTACHMENTS

Henry D. Lee, 207 W. Orchard, Selah, Wash. 98942

Filed Feb. 10, 1986, Ser. No. 827,512
Int. Cl.[4] A47B *83/02*
U.S. Cl. 297—153 **12 Claims**



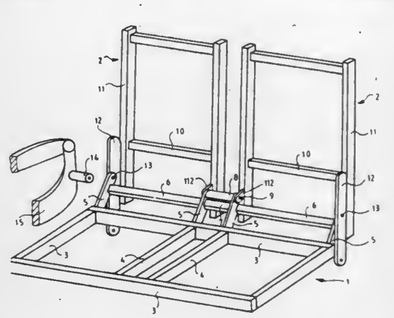
1. An attachment for a wheelchair or the like of the type having an armrest structure on each side thereof, comprising;
a rigid generally planar member positionable in front of an occupant of the wheelchair; said member having a substantially horizontal surface;
a pair of substantially vertical mounting flanges secured to each side of said horizontal surface and having aligned openings extending laterally therethrough;
an elongated member extending rearwardly along said horizontal surface between each pair of flanges; each such elongated member having an opening extending laterally therethrough aligned with the openings in the corresponding flanges;
means for adjustably securing each elongated member to the corresponding flanges, said means comprising a bolt extending through the aligned openings in each pair of flanges and the corresponding elongated member; means for securing each bolt to the corresponding flanges; and adjusting means for releasably securing each elongated member against lateral movement along the corresponding bolt, said adjusting means being releasable to permit the elongated member to be slid laterally along the bolt to adjust the distance between the elongated members to the distance between said armrest structures; and
attaching means carried by each elongated member for releasably attaching such elongated member to a front portion of the corresponding armrest structure.

4,632,452

TWO-ABREAST PASSENGER SEAT

Ignaz Vogel, Karlsruhe, Fed. Rep. of Germany, assignor to Ignaz Vogel GmbH & Co. KG, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,867
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—232 **5 Claims**



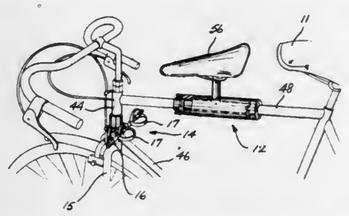
1. A two-abreast passenger seat for vehicles, said seat comprising a rectangular seat frame constructed of front and rear tubes of rectangular cross-section and joined together by cross-tubes such that their narrower sides are at top and bottom, seat backs pivotally linked to said seat frame and also consisting of rectangular frame structures with cushion overlays, said rectangular seat frame having a rear frame tube and outer and inner joint supports attached to its rear frame tube such that said joint supports are angled upwardly at approximately 45° with respect to a plane defined by the frame with reinforcement tubes laterally extending between them approximately at the top end of the joint supports and an internally threaded cross-bar connected between said inner joint supports, said seat back frame structures including side and center frame members and having forwardly projecting stiffening lug members mounted to the side frame members at their lower forward end thereof and forwardly projecting lugs mounted to the center frame members with said stiffening members and said forwardly projecting lugs being pivotally supported on said upwardly angled joint supports.

4,632,453

AUXILIARY SUPPORT SYSTEM FOR BICYCLE PASSENGER

John D. Robbin, and John W. Robbin, both of 16913-26th SW., Seattle, Wash. 98166

Filed Oct. 15, 1984, Ser. No. 660,643
Int. Cl.[4] B62J *7/00*
U.S. Cl. 297—243 **10 Claims**



1. An auxiliary support system for a bicycle passsenger wherein the bicycle has a substantially vertical tubular neck in which the fork supporting the front wheel is mounted, a substantially horizontal tubular frame member joined to the neck at the upper end of the neck and extending to the vicinity of the primary seat, and an inclined tubular frame member joined to

the neck at the lower end of the neck and extending to the vicinity of the bicycle pedals, comprising:

a footrest assembly attachable to the neck and including an elongated support element, the footrest assembly being constructed and arranged so that the elongated support element extends substantially orthogonally to the longitudinal axis of the neck when the footrest assembly is attached to the neck;

harness means attached to the support element for securing the passenger's feet adjacent to the support element, the harness means comprising:

two pairs of mounting devices, one pair slidably attached to the support element at each end thereof:

a pair of base straps, each base strap connected at its ends between one pair of the mounting devices;

two pairs of extension straps, one extension strap connected at one end to each mounting device;

a pair of instep straps, each instep strap connected to extend between one pair of the extension straps at each end of the support element, the instep straps having adjustment means for adjusting their length between the extension straps, the instep straps being configured and arranged to secure the instep portion of the passenger's foot adjacent to the support element;

a pair of heel straps, each heel strap connected to extend between the extension straps between points proximal to where the extension straps connect to the instep straps, the heel straps having adjustment means for adjusting their length between the extension straps, the heel straps configured and arranged to secure the heel portion of a passenger's foot adjacent to the support element; and

a connector strap adjustably attached between the pair of base straps for connecting the base straps together in slidable movement about the support element; and

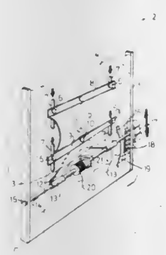
a seat mount assembly mountable to the horizontal tubular frame member for affixing an auxiliary bicycle seat thereto.

4,632,454

VEHICLE SEAT INTENDED, FOR EXAMPLE, FOR SUCH AUTOMOBILE VEHICLES AS CARS, TRAINS AND AIRPLANES

Michel S. Naert, Västra Frölunda, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Oct. 29, 1984, Ser. No. 666,223
Claims priority, application Sweden, Nov. 9, 1983, 8306169
Int. Cl.⁴ A47C *7/46*
U.S. Cl. 297—284 **7 Claims**



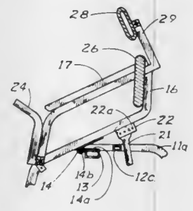
1. A vehicle seat having a back-rest having therein a lumbar support device in the form of a horizontally elongated rectangular flexible plate, means mounting the plate for vertical movement as a whole relative to the back-rest and for maintaining the plate in any of a plurality of vertically adjusted positions relative to the back-rest, and means for selectively moving opposite horizontal edges of the plate toward and away from each other thereby to cause the plate to bow forwardly outwardly to a greater or lesser extent.

4,632,455

CHAIR WITH OCCUPANT ASSISTING FEATURES

Robert E. Schiller, 13616 N. 43rd St., Apt. #155, Phoenix, Ariz. 85032, and Chester R. Harris, Jr., 9204 Sprague St., Omaha, Nebr. 68134

Filed Mar. 21, 1985, Ser. No. 714,481
Int. Cl.⁴ A47C *1/02*
U.S. Cl. 297—326 **15 Claims**



1. A chair with occupant-assisting feature, comprising:

a ground-supported frame having a transversely-oriented beam affixed thereto intermediate the front and back of said frame at seat level;

a seat affixed to said beam for pivotal movement about the longitudinal axis thereof;

wherein said frame is open in front to allow said seat to pivot frontwards to a nearly vertical orientation and has means for restricting its backwards pivot to a sitting orientation; and

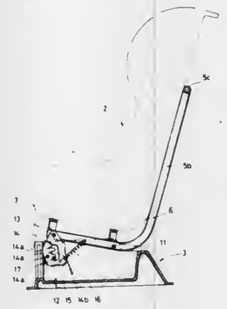
wherein the location on said seat where it is affixed to said beam is such that its weight fore and aft of said location will enable a person sitting down in, or arising from, said seat to do so from a substantially standing position to a sitting position, or vice-versa, respectively, by a minimal movement of his or her upper body backwards or forwards, respectively.

4,632,456

CHILDREN'S AUTOMOBILE-MOUNTED SAFETY SEAT

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed May 13, 1985, Ser. No. 733,988
Claims priority, application Japan, May 28, 1984, 59-78984[U]
Int. Cl.⁴ A47D *1/10*
U.S. Cl. 297—328 **5 Claims**



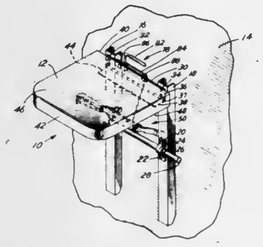
1. A children's automobile-mounted safety seat comprising body support means including a seat portion (2) and a backrest portion constructed as an integral unit for supporting a child's body, base means (3) for rotatably supporting said seat portion (2) of said body support means, said base means including wall means enclosing a hollow space inside said base means, journal means (10, 11) for said seat portion (2) positioned in a rear lower region of said seat portion and in a rear region of said hollow space inside said base means, and reclining adjustment means (12, 15, 16, 17) positioned below a front lower region of said seat portion (2) and in a front zone of said hollow space inside said base means, whereby said reclining adjustment means are enclosed by said seat portion and by said base to be substantially out of reach to a child sitting in said safety seat, said base means comprising a front section providing an access (19) into said hollow space for manipulating said reclining adjustment means.

4,632,457

COLLAPSIBLE SEAT

James W. Hofrichter, and Harold J. VanDuser, both of Reedsburg, Wis., assignors to Seats Incorporated, Reedsburg, Wis.

Filed Oct. 15, 1985, Ser. No. 787,630
Int. Cl.⁴ A47C *1/02*
U.S. Cl. 297—335 **8 Claims**



1. An improved collapsible seat comprising in combination:

(a) a seating portion having a first and a second end;

(b) means for supporting the seating portion;

(c) means for rotatably connecting the first end of the seating portion to the seat supporting means;

(d) a support arm assembly providing means for collapsibly interconnecting the seating portion and seat support means, the assembly including a first foldable brace, a second foldable brace, and a center bar interconnecting the first and second foldable braces, each foldable brace having a fit arm rotatably connected at one end to the seating portion and a second arm rotatably connected to the support means, the first arm also being rotatably secured to the second arm, the center bar having a first end opposite a second end, the first end being cooperative with the first foldable brace to limit movement of the first brace outwardly from the seat supporting means, and the second end being cooperative with the second foldable brace to limit movement of the second brace outwardly from the supporting means;

(e) a puller mounted at a distance from the center bar on the support arm assembly; and

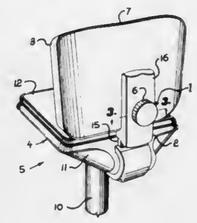
(f) a flexible, tensioning member connecting the puller to the center bar whereby when the operator pulls the puller, the tensioning member moves the center bar to fold the foldable members and allow the second end of the seating portion to rotate with respect to the seat supporting means.

4,632,458

CHAIR BACK HEIGHT ADJUSTMENT MECHANISM

Jerry C. Brown, Lenexa, and Kenneth W. Hamilton, Overland Park, both of Kans., assignors to Fixtures Manufacturing Corporation, Kansas City, Mo.

Filed May 20, 1985, Ser. No. 736,294
Int. Cl.⁴ A47C *1/00;* **F16M** *11/00*
U.S. Cl. 297—353 **6 Claims**



1. A chair structure comprising:

(a) chair base means including a chair seat and chair leg means;

(b) a single telescoping chair back support post assembly including an elongated standard extending upwardly from said chair base means and an elongated chair back support bracket having a chair back member attached thereto;

(c) one of said standard and said bracket being an inner post member and the other being an outer post member, said inner post member being slidably received within said outer post member;

(d) a slot formed along said inner post member;

(e) a rack gear formed along said slot within said inner post member;

(f) gear bearing means positioned within said outer post member and extending through said slot into said inner post member;

(g) a gear member rotatably supported in said gear bearing means within said inner post member, said gear member having a pinion gear portion meshed with said rack gear and having a worm gear portion;

(h) a chair back adjustment shaft rotatably supported on said outer post member and extending through said gear bearing means, said shaft including a manually operable knob at a first end and including a second end positioned within said inner post member; and

(i) worm threads formed on said second end of said shaft and meshed with said worm gear portion of said gear member whereby rotation of said knob rotates said gear member to translate said bracket in relation to said standard thereby varying the height of said chair back.

4,632,459

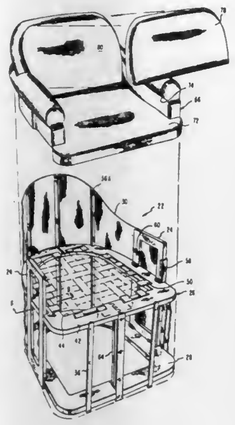
PORTABLE UPHOLSTERED FURNITURE

Herbert Herschlag, 68-15 Groton St., Forest Hills, N.Y. 11375

Filed Apr. 30, 1984, Ser. No. 605,564
The portion of the term of this patent subsequent to Jun. 30, 2003, has been disclaimed.
Int. Cl.⁴ A47C *7/00*
U.S. Cl. 297—440 **18 Claims**

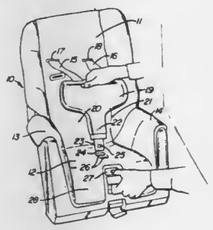
1. Portable upholstered furniture defined by a laterally foldable frame having a pair of laterally collapsible side frames and a pair of medially foldable cross assemblies of a generally parallelogram form in their generally vertical cross-sectional projections extending therebetween, at least one generally transversely flexible band of fabric or the like encircling the side frames and the cross assemblies, and a cushioned bonnet like upper assembly settable downwardly onto said frame, at least one of the encircling band and the frame being provided

with at least one vertically extending strut member supporting a portion of the cushion assembly, and at least one of the band



and the frame carrying support means for supporting at least one of said cross assemblies.

4,632,460
SEAT BELT FASTENER
Paul K. Meeker, Kent, and Mark A. Sedlack, Cuyahoga Falls, both of Ohio, assignors to Gerber Products Company, Fremont, Mich.
Filed Oct. 10, 1985, Ser. No. 786,408
Int. Cl.[4] B60R *21/00*
U.S. Cl. 297—467 **7 Claims**



1. A multiposition latch for securing a safety belt to a seat, comprising:

a tongue extending from said safety belt, terminating in a loop;

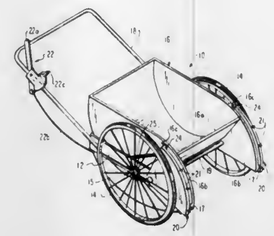
a plunger containing a longitudinal row of hooks which extend upward, each said hook adapted to engage said loop;

a longitudinal channel in said seat to receive said plunger;

a plurality of slots in said seat opening into said channel, each said slot adapted to receive said tongue, said slots equal in number and spacing to said hooks; and

means for biasing said plunger to a position in which said hooks are aligned with said slots.

4,632,461
DUMP CART
Ralph A. Randolph, P.O. Box 36, Bushnell, Nebr. 69128
Filed Sep. 13, 1985, Ser. No. 775,788
Int. Cl.[4] B60P *1/04*
U.S. Cl. 298—2 **7 Claims**



1. A wheeled dump cart comprising:

(a) a U-shaped frame member;

(b) two wheels supporting said frame, wherein one said wheel is rotatably mounted on each side of said frame;

(c) a box member carried by said frame and being pivotably connected thereto; said box member including a detent on the outer edge thereof;

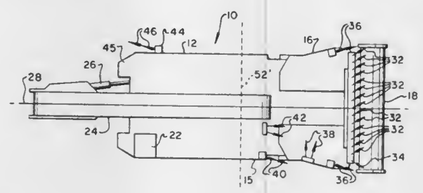
(d) a handle member connected to said frame;

(e) a pie-shaped cam member having an inner end and a curved outer edge, wherein said cam member is pivotably connected to said frame and is adapted to pivot from a normally raised position downwardly to a ground-engaging position;

(f) actuating means operable from said handle member for causing said cam member to pivot downwardly;

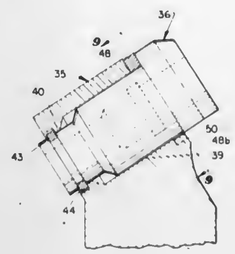
(g) engagement means comprising a finger, carried by said cam member, which is adapted to engage said detent on said box member and cause said box member to pivot forwardly relative to said frame as said cam member pivots downwardly.

4,632,462
CONTINUOUS MINER-MOUNTED MINE VENTILATION SYSTEM
William M. Poling, Price, Utah, assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Jul. 26, 1984, Ser. No. 634,515
Int. Cl.[4] E21C *35/22*
U.S. Cl. 299—12 **21 Claims**



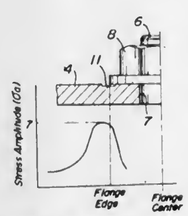
12. In a method for removing methane and dust from a mine area during operation of a continuous mining machine, by spraying water through a plurality of sprayfans positioned on the front of said mining machine to direct intake air toward and across the front of said mining machine and exhausting said intake air containing said methane and dust from said mining area, an improvement comprising: spraying water through a reverse sprayfan positioned on a rear portion of said mining machine in a generally conical pattern toward the rear of said mining machine and generally toward an exhaust zone to direct said intake air containing said methane and dust toward said exhaust zone.

4,632,463
COMBINED BASE MEMBER AND BIT HOLDER WITH PROTECTED RETAINER
Lester J. Sterwerf, Jr., Harrison, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio
Filed Aug. 3, 1984, Ser. No. 637,319
Int. Cl.[4] E21B *10/00*
U.S. Cl. 299—91 **36 Claims**



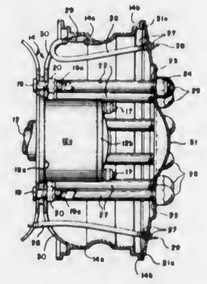
1. In combination: a base member having a perforation to receive a bit holder, a bit holder to be inserted in said perforation, a retaining means for securing said bit holder in said base member, said retaining means being mountable on said bit holder, said base member being provided with a front face and a rear face, said perforation extending from said front face to said rear face, that part of said perforation adjacent said base member rear face being configured to cooperate with and at least partially receive and protect said retaining means, said bit holder having a head provided with a rear face adapted to engage said base member front face and a rear portion having exterior means to receive said retaining means, said bit holder being of a length to expose said exterior means for reception of said retaining means when said bit holder head rear face engages said base member front face, said bit holder also having a forward portion adjacent said head rear face; a spacer means being adapted to be inserted between said bit holder head rear face and said base member front face about said forward portion; whereby when said spacer is so inserted, said bit holder is positioned within said base member perforation such that said retaining means is at least in part received in and protected by said part of said base member perforation.

4,632,464
RIMMED WHEELS FOR USE IN VEHICLES WHEEL WITH STRESS RELIEF GROOVE FOR HUB BOLT
Satoru Okamoto, and Hiroshi Ito, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 18, 1984, Ser. No. 683,293
Claims priority, application Japan, Dec. 22, 1983, 58-240830
Int. Cl.[4] B60B *3/04, 11/06, 23/00*
U.S. Cl. 301—11 R **5 Claims**



1. A rimmed wheel for use in vehicles comprising; a disk portion, a plurality of straight circle bolt holes formed in said disc portion at given intervals along a pitch circle coaxial to the disc portion, hub bolts and flanged hexagon nuts mounting the disc portion to the vehicle, said hub bolts having threaded legs , said disc portion provided with an arcuate groove for mitigating contact pressure between the disc portion and a flanged hexagon nut at a position corresponding to an outer flanged edge of each of the flanged hexagon nuts and along at least an outer region of the pitch circle, said arcuate groove being formed by die hobbing and having a narrow width extending inside and outside of a radius of the outer flanged edge.

4,632,465
HUB CAP MOUNTING FOR DRIVE WHEELS OF HEAVY ROAD VEHICLES AND METHOD OF INSTALLATION
Veigh X. Cummings, 5040 Three Fountain's Cir., Salt Lake City, Utah 84107
Continuation-in-part of Ser. No. 652,118, Sep. 20, 1984, abandoned. This application Sep. 6, 1985, Ser. No. 773,026
Int. Cl.[4] B60B *27/06*
U.S. Cl. 301—108 S **13 Claims**

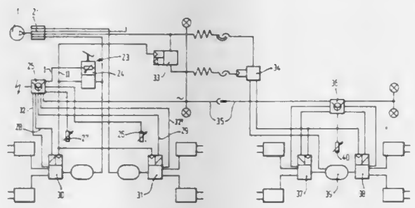


6. A hub cap and drive wheel assembly on a drive axle of a heavy road vehicle having an axle wheel hub, wherein a recessed drive wheel is secured to the drive axle by means of a circular series of lug bolts extending through respective lug-bolt-receiving holes in the axle wheel hub, said lug bolts having a series of wheel securement lug nuts securing the wheel to the axle and externally threaded, free ends extending beyond said securement lug nuts, respectively, adjacent to the bottom of the wheel recess, said assembly including extenders for said lug bolts for the sole purpose of holding a hub cap in place to close said wheel recess and having one set of ends internally threaded and screwed onto said free ends of the lug bolts, respectively, and having lengths sufficient to place their opposite ends adjacent to a plane through the outer peripheral margin of the wheel rim, said opposite ends of the extenders being externally threaded; a wheel hub cap covering said wheel recess and having a series of extender-receiving holes therethrough which accommodate said externally threaded ends of the extenders; and hub cap securement nuts screwed onto said externally threaded ends of the extenders to hold said hub cap firmly in place.

4,632,466
DUAL-CIRCUIT PRESSURE MEDIUM BRAKE SYSTEM
Ingolf Grauel, Vaihingen; Günter Kulke, Esslingen; Egbert Müller, Hochdorf, and Werner Stumpe, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 8, 1982, Ser. No. 415,858
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209592
Int. Cl.[4] B60T *13/10*
U.S. Cl. 303—7 **4 Claims**

1. A compressed air brake system for a tractor-trailer combination comprising a tractor braking system for controlling front and rear fluid actuated brake cylinders, pedal-actuated, dual-circuit brake control means (23, 24) actuatable to cause an electrical signal to be delivered to a control element means (25) interposed in a primary control brake circuit (I) of the tractor braking system whereupon said control element means (25)

sends an electrical signal to respective electrically actuated elements of a pair of dual-controllable relay valves (**30, 31**) disposed for controlling said front and rear brake cylinders, said relay valves being connected to separate and independent first and second fluid pressure medium tanks, respectively, said first pressure medium storage tank supplying fluid only to said front tractor brake cylinders and said second pressure medium storage tank supplying fluid only to said rear tractor brake cylinders, a secondary control brake circuit (II) of the tractor braking system, without interposition of any said control element means (**25**), operable upon failure of said primary brake circuit (I) to deliver compressed air from fluid supply pump means (**1**) directly to said dual-controllable relay valves (**30, 31**) via a fluid pressure valve of said dual-circuit brake means



(**23, 24**) to actuate fluid pressure actuated elements of said dual-controllable relay valves (**30, 31**) delivering fluid pressure from said first and second fluid pressure medium tanks to said tractor front and rear brake cylinders, respectively, a trailer braking system including fluid brake cylinders actuatable by said dual-circuit brake means (**23, 24**) to control dual-controllable relay valves (**37, 38**) connected to a common supply pressure medium tank (**39**), wherein the combination further includes a tractor-trailer control means (**33**) disposed between said dual-circuit brake control means (**23, 24**) and a trailer brake element means (**34**) for actuation of said trailer brake cylinders via said trailer relay valves (**37, 38**), the trailer braking system including additional electric control element means (**36**) between said tractor control element means (**25**) and said trailer dual-controllable relay valves (**37, 38**).

4,632,467

BRAKE SYSTEM WITH BRAKE SLIP CONTROL

Dieter Kircher, and Ivica Batistic, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

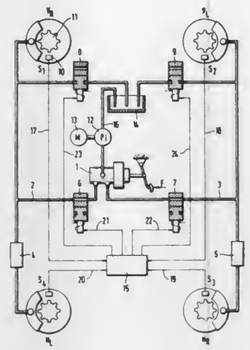
Continuation of Ser. No. 597,728, Apr. 6, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,944

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314802

Int. Cl.⁴ B60T *8/10*

U.S. Cl. 303—111 **10 Claims**

1. A brake system with brake slip control for automotive vehicles comprising one front wheel and one rear wheel assigned to one joint braking pressure control channel; each individual wheel being equipped with a sensor for determination of the wheel rotational behaviour, said sensor generating output signals being electronically combined and processed to control braking pressure modulators; said modulators regulating a hydraulic fluid flow through a pair of control channels; two fluid circuits diagonally connected via correlated control channels; said channels rerouting the fluid flow from front wheel brakes to vehicle rear wheel brakes when road traction at the front wheels decreases below a predetermined level for a specified period of time wherein the brake slip control is solely dependent upon the rotational behaviour of the rear wheels when said road traction at said front wheels decreases below said predetermined level for said specified period of time and wherein the brake slip control is solely dependent



upon the rotational behavior of the front wheels when the road traction at the front wheels exceeds a predetermined level.

4,632,468

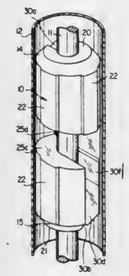
GUIDE FOR WELL PUMP SUCKER ROD

James A. Wilson, and Robert L. Heinonen, both of Dallas, Tex., assignors to Double-E Inc., Dallas, Tex.

Filed May 8, 1985, Ser. No. 732,361

Int. Cl.⁴ F16C *29/02*

U.S. Cl. 175—325 **17 Claims**



1. A well pump sucker rod guide comprising:

a substantially cylindrical elastic body having a longitudinal bore along an axis conincident with the longitudinal axis of said body;

said body having a transverse mounting slot extending from a side of said body into said body intersecting said bore and dividing said body into opposite end portions;

said body having two longitudinal mounting slots;

each of said end portions of said body having one of said longitudinal mounting slots opening through a side of said body into said longitudinal bore and opening at one end into said transverse mounting slot and at the other end thereof through the adjacent end of said body;

said longitudinal mounting slots being aligned radially in the same directions as said transverse slot;

one of said longitudinal mounting slots opening through one side of said body and the other of said longitudinal mounting slots opening through the opposite side of said body;

each of said mounting slots being defined by side guide surface walls sloping radially in converging relation toward said longitudinal bore and sloping longitudinally in converging relation away from said transverse mounting slot and toward the end of said body through which each of said respective longitudinal mounting slots open.

4,632,469

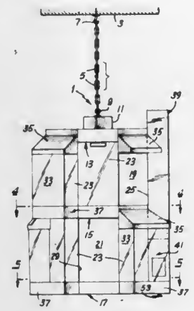
HOUSING FOR DISPLAYING ARTICLES

David V. Lampman, 439 Madison St., Wilkes-Barre, Pa. 18705

Filed Nov. 7, 1984, Ser. No. 668,902

Int. Cl.⁴ A47F *3/00*

U.S. Cl. 312—114 **9 Claims**



1. An improved housing for displaying articles comprising:

(a) a plurality of transparent panels disposed in a polygonal configuration for forming the sidewalls of the housing;

(b) a first primary framework forming the top of the housing;

(c) a second primary framework forming the bottom of the housing;

(d) at least one bay section extending outwardly from the peripheries of the first and second primary frameworks, the bay section being defined by a roof, a plurality of transparent panels and a second framework;

(e) the sidewalls and primary frameworks collectively defining an interior compartment;

(f) at least one opening in the sidewalls for permitting the placement of articles within and the removal of articles from the interior compartment; and

(g) means for supporting the housing at a desired vertical position.

4,632,470

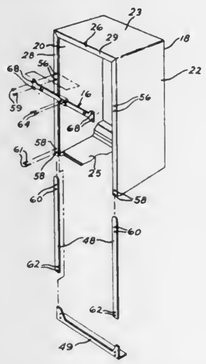
REFRIGERATOR CABINET AND METHOD OF ASSEMBLY

Thomas E. Jenkins, and Donald S. Cushing, both of Louisville, Ky., assignors to General Electric, Louisville, Ky.

Filed Jun. 28, 1985, Ser. No. 749,821

Int. Cl.⁴ F25D *11/00*

U.S. Cl. 312—214 **8 Claims**



5. A refrigerator cabinet of the type having an outer metal shell with side walls connected by a top wall forming upper front corners and a front face, an inner liner and a partition separating a freezer and fresh food compartments;

said front face including inwardly extending parallel side wall portions connected by a top wall portion;

said side wall portions each being bent upon itself to provide a first wall portion forming a first recess between said side wall portion and said first wall portion and a second wall portion forming a second recess between said first and second wall portions;

said side wall portions and said first wall portions having a first vertically spaced pair of aligned apertures generally located in the area of said partition, and a second pair of vertically spaced aligned apertures arranged in a lower end of said side wall portions and said first wall portions;

a frame structure including an elongated mounting bracket arranged vertically in said first recess between each of said side wall portions and said first wall portions, including a pair of vertically spaced openings at each end communicating with said pairs of vertically spaced aligned apertures in said side wall portions and said first wall portions of said front face;

a first cross member having end portions arranged in said second recesses including a pair of fastener openings in each end portion spaced vertically apart a distance such that when aligned with said first vertically spaced pair of said aligned apertures said outer metal shell will have the correct cabinet width;

a second cross member extending between said side wall portions including a vertically spaced pair of fastener openings in each end thereof spaced to align with said second pair of vertically spaced aligned apertures;

securing means insertable through said vertically spaced apertures for drawing said cross member and elongated mounting brackets relative to said first wall portions and said side wall portions for securely holding said cross members substantially perpendicular to said side walls to thereby insure that said cabinet side walls are maintained in a substantially square relationship.

4,632,471

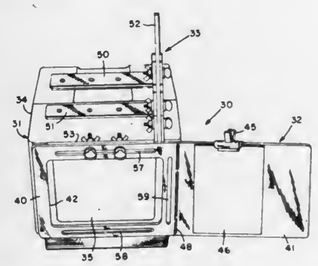
COMPUTER VIDEO WORK STATION WITH COPYHOLDER

Andres H. Visnapuu, 2965 Scarborough, Cleveland Hts., Ohio 44118

Filed May 3, 1984, Ser. No. 606,690

Int. Cl.⁴ A47B *97/02*

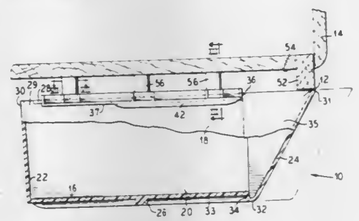
U.S. Cl. 312—233 **30 Claims**



1. In combination, a CRT monitor including a CRT screen and a housing; a copyholder including a display framing panel of generally rectangular shape and formed from sheet material, said display framing panel having formed therein a window generally corresponding in size and shape to said CRT screen, and a copyholding panel of generally rectangular shape joined along a side thereof to an adjacent side of said display framing panel for extension from said adjacent side of said display framing panel, said copyholding panel being formed from sheet material and having front copy support surface means for supporting copy thereon; and means for mounting said copy-

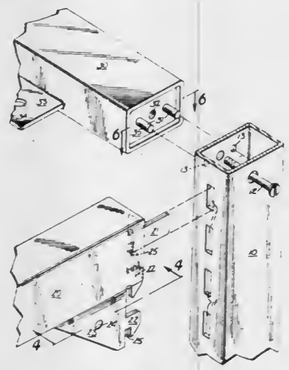
holder with respect to said housing of said monitor with said window of said display framing panel positioned in front of and generally parallel to said CRT screen to permit viewing of said screen through said window.

4,632,472
UNDERHANGING DRAWER SYSTEM
Elly Bross, Quebec, Canada, assignor to The Stanbel Group, Montreal, Canada
Filed Nov. 19, 1984, Ser. No. 673,031
Int. Cl.[4] A47B *88/04*
U.S. Cl. 312—246 **1 Claim**



1. A slidable drawer system mounted beneath a stationary shelf comprising:
a drawer member having a bottom wall and a perimeter of upstanding sidewalls, a rear wall and a front wall;
said side walls having an outwardly projecting flange at a top end thereof;
said front wall extending the entire width and height of said drawer member to provide a closed front end to said drawer member;
said front wall extending downwardly below a bottom surface of said bottom wall to form a lip along a bottom edge of said front wall to assist manual grasping of said drawer member;
a pair of guide rails, each rail mounted to a bottom side of said shelf to slidingly receive said flange of one of said sidewalls;
said guide rails having a plurality of horizontal mounting pads, horizontal ledges on which said flanges slide, and a vertical support portion between said mounting pads and said ledges;
said mounting pads projecting horizontally inwardly from said vertical support portion above said ledges also projecting horizontally inwardly, said ledges having gaps therein below said pads to provide access for said pads;
said shelf having an underhang and said system further including a plurality of spacer members each formed as a tube for use with said fasteners to space said rails below said shelf underhang and cut to size to permit said drawer member to clear said underhang as it is slid forwardly on said rails;
at least one of said guide rails having a downwardly and rearwardly projecting resilient finger formed integrally therewith near a front end of said rail which is engagable with said rear wall to prevent said drawer member from being completely slid forwardly on said rails to a point of disengagememt between said rails and said flanges, but which can be deflected to disengage from said rear wall to permit selected disengagement between said rails and said flanges;
fastening means comprising threaded fasteners to secure said guide rails to said bottom side of said shelf;
said gide rails having aperatures in said mounting pads receiving said fasteners, said apertures in at least one of said rails being formed as lateral slots to permit slight lateral adjustment of said rails as they are being secured to said bottom side of said shelf;
said front wall extending laterally beyond said side walls to be approximately even with said flanges and including two short side walls leading from the lateral edges of said front wall rearwardly to a pair of short transverse walls to join with said side walls, said transverse walls forming a stop engageable with a front end of said guide rails to prevent excessive rearward movement of said drawer;
whereby, said drawer member can be slid on said rails between a forward accessible position and a rearward concealed position.

4,632,473
CABINET ASSEMBLY
Richard C. Smith, Minneapolis, Minn., assignor to R. C. Smith Company, Minneapolis, Minn.
Filed Oct. 24. 1983, Ser. No. 544,525
Int. Cl.[4] A47B *47/03*
U.S. Cl. 312—257 SK **10 Claims**

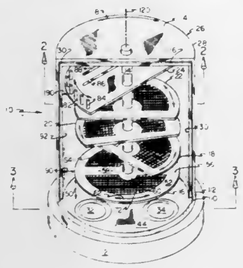


2. A cabinet framework comprising:
a vertical post having vertically spaced slots in a wall thereof;
a first crossbar having an end terminating in a prong receivable in one of the slots of the vertical post, the prong including means for locking the post and crossbar together in response to vertical movement of the crossbar with respect to the post;
a second crossbar, disposed at right angles to the post and the first crossbar, and including engagement means engageable with the post for preventing rotational and vertical movement of the second crossbar with respect to the post; and
a bolt extending through the post into the second crossbar for fastening the second crossbar to the post, the bolt positioned adjacent the edge of the prong in a locked position to prevent vertical movement of the prong and thus to retain the first crossbar in the locked position.

4,632,474
JEWELRY STORAGE DEVICE
Evelyn Ingersoll, 1200 S. 7th West, Salt Lake City, Utah 84104
Filed Dec. 14, 1984, Ser. No. 681,670
Int. Cl.[4] A47B *49/00;* **A47F** *3/10*
U.S. Cl. 312—305 **13 Claims**

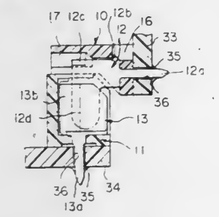
1. A personal article storage apparatus comprising:
a base;
a shaft in mechanical association therewith and extending upwardly from said base;
a shelf mounted to said shaft, said shelf having a mesh as a substantial portion of its surface with said mesh being formed of intersecting lattice members to form a plurality of apertures sized to receive a pin-like post of an article to be stored and to support said article on the lattice members; and

a first housing member and a second housing member mechanically associated therewith, said first and second housing members together being sized to surround said shelf, and said first housing member being mounted alternatively and selectively to said base and said second housing member to open to provide access to said shelf,



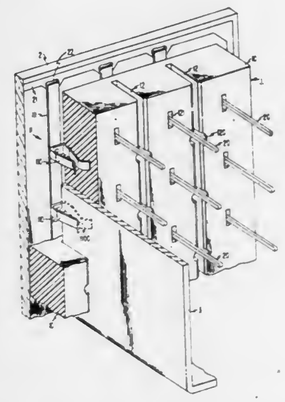
wherein said first and second housing members are each semicircular-like in cross-section to form a truncated cylinder-like structure, and wherein one of said housing members is slidably mounted to said base and sized to snugly and slidably move around the other housing member.

4,632,475
HINGED ELECTRICAL CONNECTOR
Akira Tomita, Yamato, Japan, assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 665,325, Oct. 26, 1980, abandoned.
This application May 5, 1986, Ser. No. 861,657
Claims priority, application Japan, Nov. 11, 1983, 58-211085
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—4 **7 Claims**



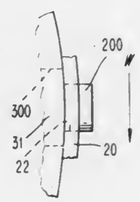
1. An electrical connector for hingedly and electrically connecting printed circuit boards together enabling the boards to be positioned at a right angle or to be positioned substantially coplanar, comprising:
first and second dielectric housings, the first housing having first electrical contacts secured therein and the second housing having second electrical contacts secured therein, the first and the second electrical contacts having matable contact sections electrically connecting the electrical contacts together when the first and second dielectric housings are mounted to each other;
a flexible arm spaced from and parallel to each end wall of the first housing, the flexible arm having a projection with an inclined surface which extends therefrom in the direction of the end wall; and
a U-shaped recess provided on each end wall of the second housing, side walls of the recess being perpendicular to a circuit board mounting surface of the second housing, the recess having an inner surface, a portion of which is inclined, and a hole within the inner surface such that as mounting of the first housing to the second housing occurs, each projection of the first housing slides along the inner surface of the respective recess of the second housing causing the arm to bend outward allowing the projection to be snap-fitted into the hole, thereby hingedly connecting the first and second housings together enabling the first and second housings to be movable relative to each other when the first and second electrical contacts are electrically connected to respective printed circuit boards thereby enabling the printed circuit boards to be positioned at a ring angle or to be positioned in a substantially coplanar position.

4,632,476
TERMINAL GROUNDING UNIT
Howard C. Schell, Westerville, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Aug. 30, 1985, Ser. No. 771,040
Int. Cl.[4] H01R *13/52*
U.S. Cl. 339—14 R **12 Claims**



1. Apparatus for use with a backplane of equipment mounting apparatus to interconnect contact terminals and a shielding member of a connector with pin terminals and ground paths of the backplane comprising
insulating means for receiving the pin terminals to mount said insulating means on the backplane with the pin terminals extending outward therefrom to engage the connector contact terminals, and
means positioned in said insulating means between columns of the pin terminals for slidably receiving and interconnecting the connector shielding member with the backplane ground paths to shield the connector engaged with the backplane.

4,632,477
GROUNDING DEVICE
Monroe E. Alger, 10309 Godwin Dr., Manassas, Va. 22110
Filed Mar. 11, 1985, Ser. No. 710,122
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **5 Claims**



1. In a flush-mount wall receptacle including a body of

electrically non-conductive material adapted to extend behind the surface of a wall, an electrically conductive ground plate adapted to lie substantially in the plane of the wall surface, and a plurality of electrically conductive sockets mounted in said body for connection with an electrical connector, one of said sockets comprising a ground socket for connection with a ground wire, said ground socket having an end wall spaced from the ground plate and a ground wire clamping plate spaced from the end wall to define an opening for receiving a ground wire, and a clamping screw extended through said end wall for engaging a ground wire positioned in said opening to clamp the wire against the clamping plate, the improvement comprising:

an extension integral with the clamping plate and extending at one end into contact with said ground plate for grounding the ground socket to the ground plate.

4,632,478

CONTACT OF CONNECTOR

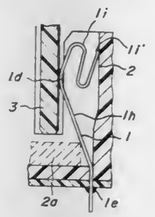
Hiroshi Kozai; Morio Suzuki, both of Hadano; Matsuo Katoh, Utsunomiya, and Toshiaki Suzuki, Mooka, all of Japan, assignors to Hitachi, Ltd. and Daiichi Denshi Kogyo Kabushiki Kaisha, both of, Japan

Filed Feb. 26, 1985, Ser. No. 705,541

Claims priority, application Japan, Mar. 2, 1984, 59-29224

Int. Cl.⁴ H05K *1/00*

U.S. Cl. 339—17 LC **7 Claims**



1. A contact of a connector formed of an enlongated resilient material comprising, an inner end fixed to a connector housing and a midway to be in contact with a mating contact of another connector to be connected to the first mentioned connector, said contact including a substantially straight portion extending from a contacting portion of said midway to said fixed inner end and an outer portion extending from said contacting portion to a distal end of said contact, said outer portion being bent in generally s-shaped configuration and said distal end abutting against a surface of said connector housing said abutting distal end being movable along said connector housing in a direction opposite to the direction of insertion of said mating contact.

4,632,479

SAFETY TERMINAL FOR ELECTRICAL EXTENSION CORD

Sol M. Jacobson, Floral Park, N.Y., assignor to Gem Electric Manufacturing Co., Inc., Hauppauge, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,572

Int. Cl.⁴ H01R *13/44*

U.S. Cl. 339—36 **5 Claims**

1. A safety type terminal for an electrical extension cord, said terminal comprising:

an elongated body of electrically non-conductive elastomeric material;

pairs of female contact means of electrically conductive material located within said body, the pairs of contact means being spaced apart longitudinally of the body and the contact means of each pair being spaced apart transversely of the body;

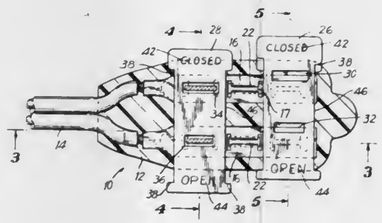
means providing pairs of prong-admitting passageways from their mouths on an exterior surface of said body to said pairs of female contact means located internally of said body;

said terminal further including elongated rectilinear safety guards of electrically nonconductive stiff material, each of which is arranged in line with and beneath the mouths of a different pair of contact means;

means providing pairs of prong-passing openings through said safety guards, the spacing between said openings matching the transverse spacing between the passageways of the body for each pair of female contact means;

means independently mounting said safety guards within said body for non-biased reciprocal sliding movement relative thereto transversely to the length of the body in response to manual manipulation by a user between stop means defining:

a closed position of said safety guards in which the openings of each safety guard are disaligned with the passageways of the body and the safety guard blocks passage of electrical prongs through said body passageways and into engagement with said female contact means, and



an open position of said safety guards in which the openings of each safety guard are aligned with the passageways of said body, to thereby permit passage of electrical prongs through said body passageways and into engagement with said female contact means;

said mounting means defining a cavity within the body for each safety guard and spaced by said body from the exterior surfaces of said body, each said cavity snugly and frictionally receiving the associated safety guard, so that the safety guards will remain in any position in the body to which they manually are slid; and

each safety guard having manually manipulative portions on opposite ends thereof, each such portion projecting beyond the side surface of said body to permit the user to press the proper such portion.

4,632,480

QUICKLY RELEASEABLE CONNECTORS

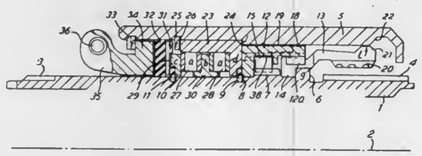
Brian J. Carpenter, Ramsgate, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 19, 1985, Ser. No. 746,421

Claims priority, application United Kingdom, Jun. 23, 1984, 8416087

Int. Cl.⁴ H01R *13/635*

U.S. Cl. 339—45 M **10 Claims**



1. A quickly releaseable connector for functional connection with a receiving connector, said releaseable connector having a generally annular outer member rotatable coaxially about an inner member which carries a functional connecting part, a retaining member between said members rotatably located for rotation with the outer member and extending around an inner portion of at least one segmental element to trap and retain said portion substantially in engagement with the inner member, the inner portion of said segmental element being thereby also axially positioned but angularly moveable relative to the longitudinal axis of said releaseable connector, said segmental element having a screw threaded part and being keyed for rotation with the outer member to be mutually cooperable with a screw thread of the receiving connector, said annular member and segmental element having interacting cam surfaces whereby axial movement of the annular member from a first locking position to a second release position permits pivoted angular movement of said element out of engagement with the screw thread of the receiving connector for releasing the receiving connector, and a spring carrier carrying spring means acting axially between said inner member and said outer annular member in a sense to retain the outer member in the locking position, said spring carrier being located between a stop carried by the inner member and said annular retaining member, and being normally biased against said annular retaining member.

4,632,481

ELECTRICAL PRESSURE CONTACT

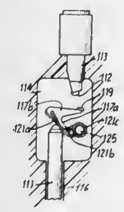
Yves Le Magourou, Ermont, France, assignor to Societe d'Exploitation des Procedes Marechal (SEPM), Paris, France

Continuation-in-part of Ser. No. 519,868, Aug. 3, 1983, Pat. No. 4,516,819, and a continuation-in-part of Ser. No. 722,916, Apr. 15, 1985, abandoned. This application May 9, 1985, Ser. No. 732,294

Claims priority, application France, Aug. 9, 1982, 82 13891; Mar. 21, 1985, 85 04198

Int. Cl.⁴ H01R *13/635*

U.S. Cl. 339—46 **23 Claims**



1. A pressure contact for establishing an electrical connection between a movable conductive connector-pin rigidly attached to a support and a stationary contact element electrically connected to an input terminal and located within a plug socket chamber when said connector-pin is axially introduced into said plug socket chamber, said support and said plug socket chamber including means for guiding said connector-pin into said plug socket chamber, said pressure contact comprising:

(a) a rigid and movable conductive member for location within said plug socket chamber which pivots about at least one axis in response to continued axial movement of a free end of said connector-pin, said conductive member being adapted to contact said stationary contact element, said conductive member including a heel having an exterior surface which is in contact with said free end of said connector-pin as it moves longitudinally through said chamber, said conductive member further comprising a contact element mounted thereon;

(b) means for guiding said conductive member as it moves through said chamber until said conductive member is released causing said contact element mounted on said conductive member to establish substantially instantaneous contact with said stationary contact element; and

(c) resilient means for biasing said heel against the free end of said connector-pin as said connector-pin is introduced into said chamber.

4,632,482

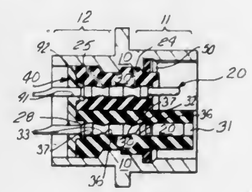
CONTACT FOR AN ELECTRICAL CONNECTOR

Stephen Punako, Bainbridge; David O. Gallusser, Oneonta, and Carl R. Joslyn, Unadilla, all of N.Y., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 402,524, Jul. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 368,594, Apr. 15, 1982, Pat. No. 4,447,110. This application Jun. 28, 1985, Ser. No. 750,646

Int. Cl.⁴ H01R *13/44*

U.S. Cl. 339—59 M **3 Claims**



1. In combination with an electrical connector of the type including: a housing having a forward portion and a rearward portion; a plurality of elongated electrical cylindrical contacts with each having a forward mating portion, an intermediate mounting portion and a rearward wire receiving portion; and means for releasably mounting said contacts in said housing including an insert having a plurality of cylindrical bores therin, each said bore having a central portion for receiving the mounting portion of a respective contact, the improvement wherein:

the connector includes a dielectric plate having a tower extending therefrom and seated in the insert,

each contact includes a rearwardly facing shoulder that is abuttable against a face of the tower and the intermediate mounting portion of each said contact has two longitudinally spaced annular grooves and the central portion of each said bore has two longitudinally spaced and radially inwardly projecting wall portions with each said wall portion being adapted to seat within one respective annular groove,

each said groove having a first surface facing rearwardly and a second surface facing forwardly with each of said surfaces being acutely angled from the central axis of said contact with the angle of the first surface and the second surface, respectively, being about 30° and 15° from the central axis of said contact,

each said wall portion having a first mating surface and a second mating surface with the first and second mating surfaces being acutely angled to engage, respectively, with the first and second surface of one said annular groove, and

each said bore in said insert has a diameter less than that of said contact.

4,632,483

ELECTRICAL TERMINAL

Pierre Verin, Dampmart, France, assignor to Microdot Inc., Darien, Conn.

Continuation of Ser. No. 464,623, Feb. 7, 1983, abandoned, which is a continuation of Ser. No. 229,558, Jan. 29, 1981, abandoned. This application Jul. 26, 1985, Ser. No. 759,369

Int. Cl.⁴ H01R *13/633*

U.S. Cl. 339—74 R **1 Claim**

1. An electrical connector comprising

a generally tubular female terminal having an opening of rectangular cross section at one end thereof for the recep-

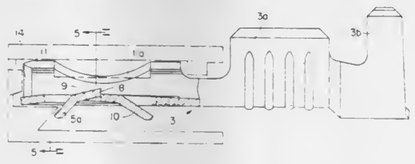
tion of a male terminal and means at the other end thereof for mechanically engaging and electrically connecting an electrical conductor,

a male terminal of generally rectangular cross section complementary to the opening in said female terminal so as to be receivable therein, said male terminal having an aperture therein,

said female terminal having a lower wall portion with a generally U-shaped cutout comprising spaced generally parallel slots and a connecting slot therein defining a central tab,

the connecting slot of said U-shaped cutout being disposed adjacent the one end of said female terminal and orientated generally parallel to a plane containing the opening therein whereby said central tab is cantilevered from the other end of said female terminal,

a latching tab on said central tab extending inwardly of the tubular cross section and away from the opening in said



female terminal for engagement in the aperture in said male terminal,

said central tab having a release tab on a free end portion thereof extending outwardly of the tubular section of said female terminal and in a direction toward the one end thereof, and

an insulating sleeve covering said female terminal and having a wedge-shaped abutment thereon, one surface of said abutment defining a cam surface extending generally parallel to said release tab and engageable therewith upon initial movement of said sleeve relative to said female terminal toward the other end thereof, an opposite surface of said abutment being juxtaposed to an outer surface of the lower wall portion of said female terminal, the abutment on said insulating sleeve effecting outward displacement of the latching tab on the central tab on said female terminal and disengagement thereof from said male terminal upon movement of said sleeve toward the other end of said female terminal.

4,632,484

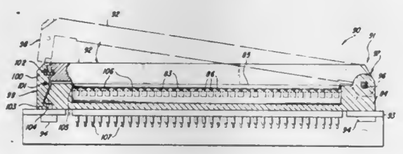
CONNECTOR FOR CERAMIC HYBRID CIRCUITS FOR WELL-LOGGING TOOLS AND METHOD FOR CONNECTING CERAMIC HYBRID CIRCUITS FOR USE IN WELL-LOGGING TOOLS

Paul L. Sinclair, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 403,597, Jul. 30, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,832

Int. Cl.⁴ H01R *9/09*

U.S. Cl. 339—75 MP **9 Claims**



1. A connector for a ceramic hybrid circuit to operatively associate the circuit to a cartridge chassis within a well-logging tool intended for use in a well borehole, comprising:

a base member adapted to be secured to the cartridge chassis and including means for positioning the ceramic hybrid circuit with respect to the base member to prevent gross movement of the ceramic hybrid circuit under severe shock conditions, said positioning means comprising a recessed support surface which generally conforms to the outer configuration of the ceramic hybrid circuit when the ceramic hybrid circuit has experienced its greatest expansion due to increased temperature conditions in the borehole;

a latch member engageable with the base member; and

a plurality of electrically conductive contact pins for supporting and contacting the ceramic hybrid circuit between the base member and the latch member, said plurality of pins being disposed in the recessed support surface and extending outwardly therefrom, each of said pins having an elongate housing member supported by the base member, a contact member mounted on the housing member and axially slidable with respect thereto toward an extended position in which the end of the contact member protrudes from the housing member to contact the hybrid circuit and a spring mounted between the housing member and the contact member to urge the latter towards said extended position,

the springs of the contact pins having a spring force sufficient to exert a combined force upon the ceramic hybrid circuit to sufficiently restrain the ceramic hybrid circuit to prevent damage thereto from contact scrubbing action, shock and vibration forces exerted upon the well-logging tool which are imparted to the partidge chassis, and to maintain the cermaic hybrid circuit in low resistance electrical contact with the contact pins.

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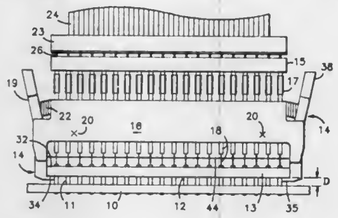
ELECTRICAL CIRCUIT TESTING APPARATUS

Kenneth C. Brown, 2137 W. Peralta, and Carl E. Wheeler, 644 S. San Jose, both of Mesa, Ariz. 85202

Filed Jun. 6, 1985, Ser. No. 741,938

Int. Cl.⁴ H01R *13/639*

U.S. Cl. 339—75 M **7 Claims**



1. An electrical circuit testing apparatus for mating with an integrated circuit socket having a mating surface substantially parallel to a mounting surface, said apparatus comprising:

a nonconductive base having a mating face, and further comprising a header and a spacer wherein said header is movable relative to said spacer;

first and second J-shaped members positioned on opposing sides of said base and projecting away from said base substantially perpendicular to the mating face of said base, wherein each of said J-shaped members has a finger portion projecting toward the other of said J-shaped members, and said J-shaped members and finger portions thereof are formed together with said spacer into an integral unit, said finger portions being for engaging the mounting surface of the integrated circuit socket;

a plurality of spring probes connected to said base in a spaced apart relationship and projecting away from said base substantially perpendicular to the mating face of said base, said spring probes being for contacting the mating surface of the integrated circuit socket, wherein said spring probes are rigidly attached to said header and comprise a contact portion and a cylinder portion, said contact portion being axially movable with respect to said cylinder portion, and said cylinder portion being positioned substantially within holes in said spacer and axially moveable relative to said spacer; and

the apparatus additionally comprises a fastener slideably affixed one of said spacer and said header for releasably securing said header at a predetermined position relative to said spacer.

4,632,486

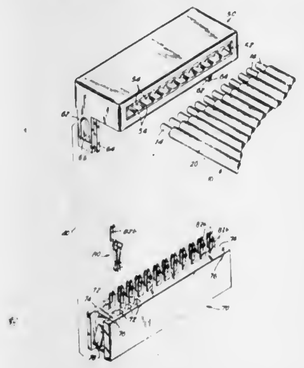
INSULATION DISPLACEMENT COAXIAL CABLE TERMINATION AND METHOD

Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1985, Ser. No. 739,031

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 339—99 R **7 Claims**



1. A method for mechanically and electrically attaching a cable termination to the end of a cable assembly having (1) a plurality of co-planar, parallel, laterally spaced signal wires, each signal wire being enclosed in a first insulating sheath and having (a) an associated parallel ground wire in the plane of the signal wires outside the first insulating sheath and (b) a conductive sheath surrounding the ground wire and the first insulating sheath, and (2) a second insulating sheath surrounding all of the conductive sheaths, the ends of the conductive sheaths being recessed from the ends of the signal wires, the method comprising the steps of:

inserting the end of the cable assembly in a first housing member;

securing the cable assembly to the first housing member;

bringing the first housing member together with a second housing member having a plurality of parallel, laterally spaced insulation displacement contacts extending from the second housing member in two parallel rows, the insulation displacement contacts in one row being signal wire contacts for respectively electrically contacting the signal wires, and the insulation displacement contacts in the other row being ground wire contacts for respectively electrically contacting the ground wires, the first and second housing members being brought together by relative motion of the housing members along a termination axis transverse to the plane of the signal wires and parallel to the insulation displacement contacts so that each signal wire contact displaces the insulation surrounding a respective one of the signal wires beyond the end of the associated conductive sheath and makes electrical contact with that signal wire, and so that each ground wire contact displaces the insulation and conductive sheath surrounding a respective one of the ground wires and makes electrical contact with that ground wire; and

securing the first and second housing members together.

4,632,487

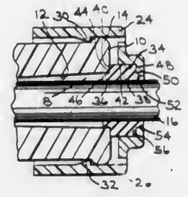
ELECTRICAL LEAD RETAINER WITH COMPRESSION SEAL

Lucian G. Wargula, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 13, 1986, Ser. No. 818,652

Int. Cl.⁴ H01R *13/52, 13/56*

U.S. Cl. 339—103 B **7 Claims**



1. An electrical lead retainer with compression seal comprising:

a terminal receptacle post having an opening defined by an annular collar and an inner cylindrical sidewall and having an exterior sidewall with snap-lock receiving means;

an insulated electrical wire inserted into said opening in said post;

a compressible annular grommet around said wire and engaging said annular collar; and

a cap around said wire and having releasable snap-lock means engaging said snap-lock receiving means to hold said cap on said post and compressing said grommet, and having an internal annular recess of substantially the same diameter as the outer diameter of said grommet and receiving said grommet to restrict expansion of the outer diameter of said grommet upon compression of the latter by said cap against said annular collar and instead cause expansion of said grommet inwardly against said wire to provide a seal which prevents moisture from creeping along said wire within said post and also to tightly grip said wire and prevent said wire from being pulled out of said post.

4,632,488

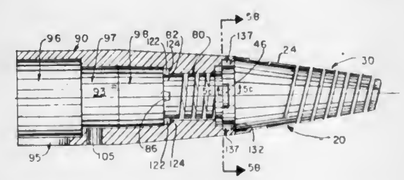
CORD STRAIN RELIEF DEVICE

Eric L. Long, Northbrook, and Keith A. Rosborough, Lagrange, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Jun. 8, 1984, Ser. No. 618,710

Int. Cl.⁴ H01R *13/56, 13/58*

U.S. Cl. 339—103 R **9 Claims**



1. An electrical connector comprising:

(a) a housing having therein: compartment means disposed adjacent a forward end of the housing for receiving an electrical device, and an array of ratchet teeth disposed circumferentially about an inner wall portion of the housing located rearwardly of said forward end; and

(b) a member having at one end thereof a cord clamping component integrally joined through an intermediate bushing component to a cord strain relief component disposed at the other end of said member, said cord clamping component being disposed within the housing

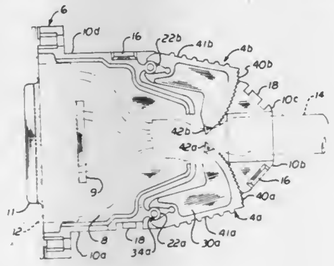
and having integral clamping means disposed for operation in response to movement of said bushing component, said bushing component having integral locking means including a pawl disposed within the housing for ratchet engagement with the array of ratchet teeth, said bushing component also having integral resilient releasing means provided on a portion of said bushing component extended externally of said housing and integrally connected to said pawl for disengaging said locking means and releasing said clamping means.

4,632,489

HOOD FOR ELECTRONIC CABLE CONNECTOR

Michael J. Skinner, Tampa, Fla., assignor to Custom Cable Assemblies, Inc., Tampa, Fla.

Filed Nov. 27, 1985, Ser. No. 802,532
Int. Cl.⁴ H01R *13/58*
U.S. Cl. 339—103 R **16 Claims**



1. A hood for receiving and partially enclosing an electronic cable connector and for grippingly engaging a portion of an electronic cable connected to such connector, said hood comprising

a housing for receiving and partially enclosing said cable connector, said housing having two spaced apart and generally opposed first side portions with lateral edge portions extending therebetween, with a first aperture through a first said lateral edge portion for receiving said cable connector and a second aperture through a second said lateral edge portion for defining a cable channel and receiving said cable portion therethrough while restraining within said housing the movement of said cable transverse to the length of said cable, said housing comprising two mating housing portions each including one of said first side portions and part of said lateral edge portions;

housing portion joining means engageable with said housing portions for maintaining said housing portions in mating engagement with one another;

at least one pivot support carried by at least one said housing portion and spaced from said cable channel, said pivot support having a pivot axis extending generally normal to said one housing portion first side portion;

detent means carried by at least one said housing portion and spaced from said pivot support, said housing detent means comprising a group of generally parallel ridges extending generally parallel to and in a direction toward said pivot support axis and outwardly of one of said lateral edge portions of at least one said housing portion; and

at least one gripper element pivotably receivable onto said housing portion pivot support and comprising a member having

a first portion carrying pivot means pivotally engaging said housing portion pivot support and having a predetermined pivot axis; and

a second generally opposing portion carrying detent engaging means for resiliently engaging said housing portion detent means when said gripper element is pivotally supported said housing portion pivot support and having an outer extremity thereof for engaging said cable portion;

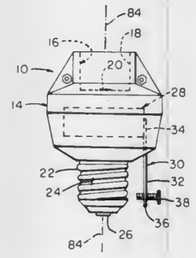
said gripper element being pivotable about said housing portion pivot support inwardly of said housing portions into gripping engagement with said cable portion.

4,632,490

TOUCH CONTROL CONNECTOR FOR LAMPS

Lee Von Gunten, Prospect Heights, Ill., assignor to Tri-Lite Electronics, Inc., Northbrook, Ill.

Filed Nov. 21, 1985, Ser. No. 800,322
Int. Cl.⁴ H01R *13/50*
U.S. Cl. 339—154 L **4 Claims**



1. A touch control adapter for a lamp having a socket member with interior contacts for engagement with corresponding contacts on an electric lamp, the socket member also having an outer metal sheath, and the lamp including metal portions which, with said socket sheath, are contiguous, and form a continuous electrically conductive path to the socket sheath, said adapter comprising,

a body having a base including a male screw and a center contact,

the body also having a top socket for receiving the base of a light bulb, and including a female screw shell and a center contact,

said center contacts being interconnected,

the adapter incorporating an electronic control unit electrically interposed between said male screw and female screw,

the adapter also incorporating a clamp for securing the adapter to the lamp socket, including a sensor bracket having an inner end in the body of the adapter and mechanically mounted therein and having electronic connection with the electronic control unit therein, independently of electrical circuitry through the light bulb, and having a free end extending outwardly from the body and adjacent the socket sheath when the adapter is in the lamp socket, and

a securing screw in the free end of the sensor bracket operable on turning thereof for electrically and clampingly engaging said socket sheath.

4,632,491

WIRE RETAINING ASSEMBLY

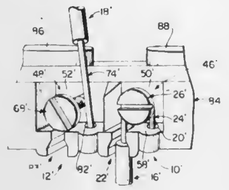
David L. Lutz, North Branford, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 485,317, Apr. 15, 1983, abandoned.
This application Jul. 26, 1985, Ser. No. 759,495
Int. Cl.⁴ H01R *13/50*
U.S. Cl. 339—164 M **25 Claims**

1. In an electrical device having a front, a rear, a right side and a left side; a substantially planar portion on one of the sides having a threaded bore perpendicular thereto; and a screw having a threaded shank adapted to be threaded into the threaded bore substantially perpendicularly to the planar portion and extending outwardly therefrom for electrical connec-

tion to a conductor having an exposed wire, the improvement comprising:

means, extending outwardly from said planar portion, defining an anchoring opening for receiving and surrounding the end of the exposed wire on the conductor to restrict movement of the wire in all directions transverse to its longitudinal axis,



said anchoring opening comprising a bore having a diameter slightly larger than the diameter of said exposed wire,

said bore having a longitudinal portion which is co-planar with said planar portion,

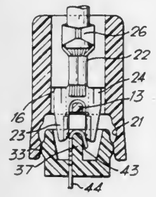
said anchoring opening being located above the planar portion and extending outwardly therefrom.

4,632,492

ELECTRICAL CONNECTOR ASSEMBLY

Hiromi Yamada, Yokosuka, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 341,954, Jan. 22, 1982, Pat. No. 4,474,418. This application Sep. 17, 1984, Ser. No. 651,549
Claims priority, application United Kingdom, Jan. 24, 1981, 8102192
The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.
Int. Cl.⁴ H01R *13/05*
U.S. Cl. 339—176 M **8 Claims**



1. An electrical connector, comprising:

a first insulating housing member having a contact-receiving cavity, a supporting rib member located in said contact-receiving cavity, a first electrical contact member extending upwardly from a base of said housing having a first section and a second section, said first section secured in said housing member and said second section being a formed flat metal strip turned back in a substantially inverted U-shape to define a contact section in the form of a resilient hook member disposed about and receiving said supporting rib member in said contact-receiving cavity as a free fit with a free end of the hook member spaced from the rib; with the uppermost portions of the resilient hook being curved about and engageably supported by the upper surface of the rib; and

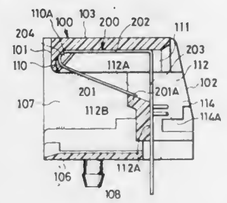
a second insulating housing member matable with said first housing member, a second electrical contact member secured in said second insulating housing member, said second electrical contact member having a forked contact section that includes contact surfaces along opposing surfaces that electrically engage respective surfaces of said resilient hook member there along in an interference fit within said contact-receiving cavity when said first and second housing members are mated.

4,632,493

ELECTRIC CONNECTOR RECEPTACLE AND A METHOD OF PRODUCING THE SAME

Shuichi Matsuzaki, Chofu, and Akira Nakazawa, Yokohama, both of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,239
Claims priority, application Japan, Apr. 1, 1985, 60-68660
Int. Cl.⁴ H01R *13/40*
U.S. Cl. 339—176 M **7 Claims**



1. In an electric connector receptacle of the type comprising: an insulating housing which has a plug inserting end, a rear end on the side opposite thereto, a plug inserting hole that stretches inwardly from said plug inserting end, and four side walls surrounding said plug inserting hole; and a plurality of contacts arranged at intervals in said insulating housing; wherein each of said contacts has a spring contact portion which aslantly stretches in said plug inserting hole toward said rear end from one of said side walls to the opposing side wall at a position adjacent to said plug inserting end, has an intermediate portion which stretches from said plug inserting end toward said rear end along said one side wall, and has a mounting portion which stretches vertically from one of said side walls to said opposing wall at a position adjacent to the rear end, and wherein said plug inserting hole has such a size as to accept the plug connector which has a plurality of contact members that come into engagement with said spring contact portions, the improvement wherein, said insulating housing has a plurality of compartment grooves which receive, from the side of said rear end, the connecting portions of said spring contact portions and said intermediate portions of said contacts at positions adjacent to said plug inserting end inside the one side wall, has contact inserting holes that lead from said rear end to said plurality of compartment grooves, and further has a plurality of vertical mounting grooves near said rear end to receive said mounting portions of said contacts from the side of said rear end, and wherein the front ends of said vertical mounting grooves serve as positioning grooves which receive the ends of said spring contact portions of said contacts and place them in position.

4,632,494

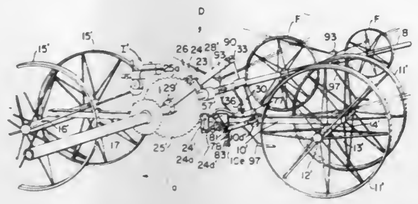
LINEAR MOVING IRRIGATING APPARATUS

Stephen D. Newell; Stephen B. Rowe, both of DuBois, and John M. Bukousky, Sykesville, all of Pa., assignors to Alco Industries, Inc., Valley Forge, Pa.

Continuation of Ser. No. 392,645, Jun. 28, 1982, abandoned.
This application Mar. 17, 1986, Ser. No. 840,539
Int. Cl.⁴ B05B *3/18*
U.S. Cl. 239—184 **15 Claims**

10. A self-propelled irrigating mover apparatus for movement along a field between opposite length portions thereof having a wheeled frame and sprinkler means, the improvement which comprises, a hydraulic jack operatively mounted on the wheeled frame and having stroking arm means actuated thereby to advance the frame along the field, means for supplying water under positive fluid pressure to said jack, valve means connected between said water supplying means and said

jack for actuating said jack under water pressure to forwardly advance the mover apparatus along the field, and additional valve means controlled by torque resistance to the forward



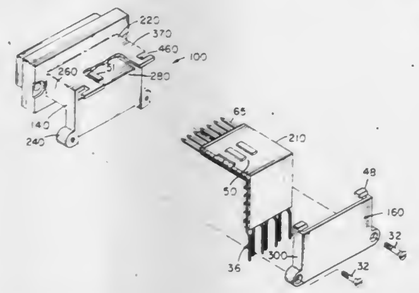
advance of the mover apparatus along the field as applied to said stroking arm for positively cutting-off the supply of positive fluid pressure to said jack and de-energizing it.

4,632,495

RIGHT-ANGLE MODULAR CONNECTOR WITH TWO-PART HOUSING

Lev B. Furman, York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 30, 1985, Ser. No. 729,102
Int. Cl.⁴ H01R *13/512*
U.S. Cl. 339—210 M **6 Claims**



1. A right angle connector comprising:

housing means formed of a receiving means having a substantially L-shaped longitudinal cross section, upstanding side walls, a rear portion providing a rear opening for a wiring arrangement, a front portion providing a front opening for connection to said wiring arrangement and a floor portion to which said front portion, said side walls and said rear portion are connected, said floor portion including a pair of substantially perpendicular intersecting surfaces within said housing means,

insulator module means having a plurality of substantially L-shaped passageways for laterally aligning wiring of said wiring arrangement,

cover means mountable on at least one of said side walls for substantially closing said housing means and enclosing said module means therein, said cover means including a substantially flat inner surface facing the interior of the housing means, and

locking means for locking said module means longitudinally and laterally within said housing means,

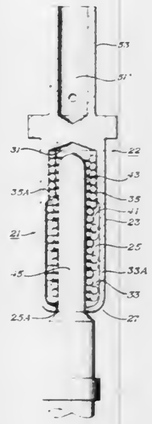
said locking means comprising a ribbed structure projecting from said module means and a plurality of channels on at least one internal surface of said housing means for engaging said ribbed structure.

4,632,496

CONNECTOR SOCKET

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Continuation of Ser. No. 535,838, Sep. 26, 1983, abandoned. This application Oct. 8, 1985, Ser. No. 786,143
Int. Cl.⁴ H01R *13/11*
U.S. Cl. 339—256 S **5 Claims**



4. An electrical connector comprising:

a socket means having an opening formed therein from a first end,

said opening of said socket means comprises first and second portions located along its length,

the wall of at least said second portion of said opening of said socket means being formed of electrical conducting material,

said first portion of said opening of said socket means having a cross-sectional area greater than that of said second portion of said opening of said socket means,

said first portion of said opening of said socket means being located next to said first end of said socket means and said second portion of said opening of said socket means being spaced away from said first end of said socket means,

a metallic coil spring located in said first and second portions of said opening of said socket means and engaging said wall of said second portion of said socket means,

said coil spring having a central opening formed by the inside structure of its coils for receiving an electrical pin means by way of said first end of said opening of said socket means,

said coil spring having offset portions along its length relative to the axis of its central opening,

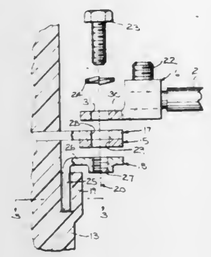
when said coil spring is located in said first and second portions of said opening of said socket means, said coils of said coil spring in said second portion of said opening of said socket means are held by said wall of said second portion of said opening of said socket means in positions such that said electrical pin means will not engage the coils of said coil spring in said second portion of said opening of said socket means, but said offset portions of said coil spring in said first portion of said opening of said socket means will engage said pin means in said first portion of said opening of said socket means when said pin means is located in said central opening of said coil spring.

4,632,497

TERMINAL ASSEMBLY FOR ELECTRICAL APPARATUS

Gerd C. Boysen, Greenfield, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 18, 1985, Ser. No. 777,277
Int. Cl.⁴ H01R *4/34*
U.S. Cl. 339—263 R **8 Claims**



1. A terminal assembly for electrical apparatus having an insulating base, the combination comprising:

a stationary terminal which mounted to the insulating base and which extends outward from one wall of the base, the stationary terminal having an opening therein;

a pocket formed on the wall of the base adjacent the stationary terminal;

a captive threaded fastener slidably retained within the pocket and including a first arm which extends outward from the wall of the base, said first arm having a threaded opening formed therein which is aligned with the opening in said stationary terminal; and

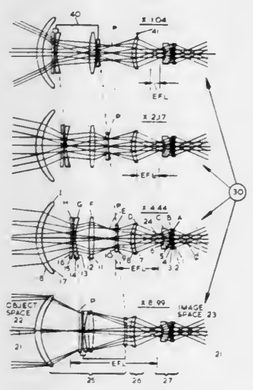
a male fastener which extends through the opening in the stationary terminal and into threaded engagement with the threaded opening in the captive threaded fastener.

4,632,498

VARIABLE MAGNIFICATION INFRARED OBJECTIVE LENS ASSEMBLY

Iain A. Neil, Strathblane, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Continuation of Ser. No. 548,144, Nov. 1, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 783,312
Claims priority, application United Kingdom, Nov. 23, 1982, 8233434
Int. Cl.⁴ G02B *13/14, 15/15*
U.S. Cl. 350—1.2 **8 Claims**



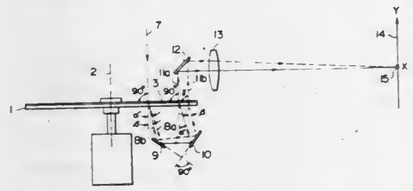
1. An infrared objective lens assembly comprising a four-component zoom system arranged to accept from object space input radiation in the infrared waveband and a one-component collecting system arranged to form a real image from radiation delivered thereto by said zoom system, the components of said zoom and collecting system being formed by lens elements the refractive surfaces of which intercept a common optical axis, and wherein with respect to said collecting system the first and third components of said zoom system each have negative optical power and are mounted on a common carriage so as to be selectively positionable along said optical axis, the second and fourth components of said zoom system each have positive optical power and are fixedly positioned on said optical axis whereby said zoom system is optically-compensated and of variable effective focal length, said third zoom-system component being movable between a first location proximal to said fourth zoom-system component which first location establishes the lowest magnification factor of the zoom system and a second location, proximal to said second zoom-system component, which second location establishes the highest magnification factor of the zoom system, said zoom system being unstopped so that movements of the first and third zoom-system components give rise to movements in the axial position of the pupil formed by the assembly prior to the real image, said pupil moving between a lowest-magnification-factor position lying intermediate the collecting system and the first zoom-system component and a highest-magnification-factor position lying intermediate the third zoom-system component and the fourth zoom-system component, and said fourth zoom-system component comprises a lens element having an aspheric refractive surface, the refractive surfaces of all other lens elements of the zoom system being non-aspheric.

4,632,499

LIGHT BEAM SCANNING APPARATUS

Masaru Noguchi, and Hiromi Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 9, 1983, Ser. No. 560,004
Claims priority, application Japan, Dec. 10, 1982, 57-216741; Dec. 10, 1982, 57-216742
Int. Cl.⁴ G02B *26/08*
U.S. Cl. 350—6.2 **5 Claims**



1. A light beam scanning apparatus comprising:

a rotatable plate provided with at least one plane diffraction grating;

a light beam source for emitting a light beam incident on one of said plane diffraction gratings so that the plane of incidence is a plane in which the rotation axis of said rotatable plate lies;

an optical system for reflecting the light beam diffracted by said one plane diffraction grating comprising a plane reflection surface normal to said plane of incidence for reflecting and guiding said light beam again to said plane diffraction grating; and

a focusing lens for focusing the light beam diffracted again by said one plane diffraction grating onto a scanning surface;

whereby said scanning surface is scanned with the focused light spot as said rotatable plate is rotated and;

wherein said light beam source emits a light beam having a wavelength of approxiamtely one-half of a grating period of said plane diffraction grating and an angle of incidence on said plane diffraction grating of 0°, and said optical system for reflecting and guiding said light beam again to

said plane diffraction grating is arranged to reflect the light beam diffracted by said plane diffraction grating and guide said light beam again to said plane diffraction grating so that the component of said guide light beam projected on said plane of incidence is antiparallel with respect to the component of said diffracted light beam projected on said plane of incidence.

4,632,500

ROTATABLE MIRROR ARRANGEMENT FOR GENERATING A SCANNING BEAM WHICH IS DISPLACED IN STEPS PARALLEL TO ITSELF

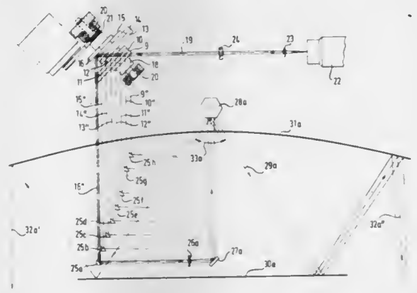
Günter Fetzer, Gundelfingen, Fed. Rep. of Germany, assignor to Erwin Sick GmbH, Waldkirch, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,484

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324746

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.5 **7 Claims**



1. A rotary mirror assembly for dividing a generally continuous incident beam of light into a plurality of parallel spaced apart scanning beams; said assembly comprising:

(a) a rotary body mounted for rotation about an axis of rotation;

(b) a plurality of mirrors secured to said body and projecting radially therefrom with each of said mirrors presenting a mirrors displaced axially and anuglarly; each of said mirrotation; said mirrors arranged on said body with adjacent mirrors displaced axially and anularly; each of said mirrors being axially spaced from adjacent mirrors by the same predetermined axial spacing; each of said mirrors covering only an angular segment of a plane perpendicular to said axis with adjacent mirrors being angularly displaced for a light beam impinging a mirror to leave said mirror as said body rotates and impinge an adjacent mirror;

(c) means for rotating rotating said body about said axis;

(d) light beam generating means for projecting a generally continuous incident beam of light in a constant straight line with said beam reflecting off of each of said mirror surfaces as said body rotates with reflected light from each of said mirror surfaces comprising said plurality of parallel spaced-apart scanning beams; and

(e) said light beam generating means disposed for said incident beam to project at an angle with said rotational axis and to impinge upon only one mirror of said plurality of mirrors at a time near a radially outer edge of said one mirror and with said incident beam and reflected scanning beams cooperating to define a scanning plane parallel to and spaced from said axis; and said incident beam intersecting a plane perpendicualr to said scanning plane at a point dividing in half a distance between farthest axially displaced mirrors of said assembly.

4,632,501

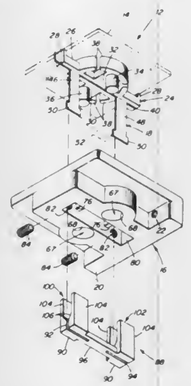
RESONANT ELECTROMECHANICAL OSCILLATOR

Paul E. Glynn, Braintree, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Feb. 16, 1984, Ser. No. 580,657

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.6 **22 Claims**



1. A resonant electromechanical oscillator comprising

a base portion,

a driven portion,

electromagnetic drive means including cooperating armature and coil portions on said base and driven portions,

a cantilevered, sheet-form flexural suspension having first and second ends and supporting said driven portion at a position spaced from said base portion for oscillation about an axis in the plane of said sheet, and

first coupling means coupling said first end of said sheet-form suspension to said base portion, and second coupling means coupling said second end of said sheet-form suspension to said driven portion, at least one of said coupling means being adjustable to select the effective length of said sheet-form suspension while maintaining a predetermined spacing between said base and driven portions.

4,632,502

DRIVE SYSTEM FOR AN OSCILLATING MIRROR MOVABLE ABOUT AN AXIS OF OSCILLATION IN OPTICAL INSTRUMENTS

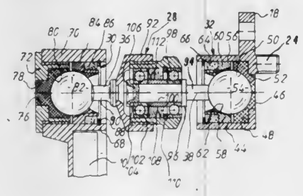
Hans Kordulla, Singen, and Reiner Eckhardt, Überlingen, both of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetchnik GmbH, Überlingen, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,689

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301274

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.6 **5 Claims**



1. Drive system for an oscillating mirror movable about an axis of oscillation in optical instruments characterized by

(a) a driving member which rotates about a driving axis and means for rotating said driving member, and

(b) a coupler between the driving member and the oscillating mirror, which coupler

(b_1) at one end is pivoted at the oscillating mirror outside the axis of oscillation through an universally movable joint,

(b_2) at the other end is pivoted at the driving member outside the driving axis through a universally movable joint;

(b_3) consists of two portions rotatable one relative to the other about the longitudinal axis of the coupler, of which portions one is pivoted at the oscillating mirror and the other one is pivoted at the driving member, and

(b_4) in which the universally movable joints are formed as ball-and-socket joints,

the driving axis extending outside the plane which is perpendicular to the axis of oscillation and extends through the pivotal point of the coupler at the oscillating mirror.

4,632,503

OPTICAL SCANNING DEVICE

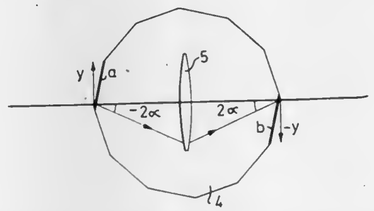
Lars Karlsson, Täby, Sweden, assignor to Pharos AB, Lidingo, Sweden

Filed Apr. 18, 1985, Ser. No. 724,447

Claims priority, application Sweden, Apr. 26, 1984, 8402294

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.8 **5 Claims**



1. An optical scanning device for effecting an optical scan over an area in at least one dimension, comprising:

a rotatable polygon having a plurality of reflective facets uniformly disposed around the periphery thereof;

a light-beam detector placed at the end of a beam path within the scanning device;

stationary optical elements possessing beam deflecting properties placed relative to the rotatable polygon to pass and re-pass the beam path against the polygon such that the extension of the reflection onto a facet on the polygon positioned nearest to the detector is small in relation to the extension of the facet, the stationary optical elements being arranged to pass the beam path for reflection against the polygon at least three times, the stationary optical elements permitting the beam path for the reflection located nearest to the detector and each reflection against the polygon to substantially follow the movement of the polygon in the rotational direction of the polygon for effecting a substantially complete extension over each facet against which a reflection takes place, and the stationary optical element further effecting mutual reproductions between facets with reflections of substantially complete extension on diametrically opposed facets at a magnification of approximately −1.

4,632,504

METHOD OF COUPLING TWO OPTICAL ELEMENTS TO FORM AN OPTICAL DATA TRANSMISSION DEVICE, AND DEVICE THUS OBTAINED

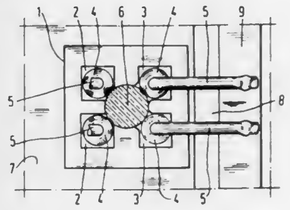
Jacques C. Thillays, Herouville St Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,483

Claims priority, application France, Mar. 2, 1983, 83 03418

Int. Cl.⁴ G02B *6/42*

U.S. Cl. 350—96.20 **4 Claims**



4. An optical data transmission device comprising:

an optoelectronic component having at least three metal contact pads on a surface of a semiconductor body;

a partly spherical bead bonded to each metallic contact pad, each bead bonding a wire to the contact pad, each bead having a cross-section parallel to the surface of the semiconductor body, said bead cross-sections being larger than cross-sections of the wires parallel to the surface of the semiconductor body, said beads circumscribing a circular zone having a diameter;

an optical fiber having an end with a diameter equal to the diameter of the circular zone, the end of the optical fiber being arranged in the circular zone between the beads and in contact with the metallic contact pads;

an opaque plastic envelope enclosing the optoelectronic component and the end of the optical fiber.

4,632,505

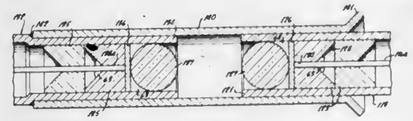
OPTICAL FIBER CONNECTOR

Terrence W. Allsworth, Manhattan Beach, Calif., assignor to The Deustsch Company Electronic Components Division, Los Angeles, Calif.

Continuation-in-part of Ser. No. 540,793, Oct. 11, 1983, abandoned. This application Apr. 25, 1984, Ser. No. 603,560

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **15 Claims**



9. An optical fiber connector comprising

a first unit, said first unit including

a first external shoulder means,

a first forward tubular part,

a first spherical lens received in said first tubular part with a press fit for thereby retaining said first spherical lens in said first tubular part and centering said first spherical lens relative to the longitudinal axis of said first tubular part,

a first fiber guide means received in said first tubular part with a press fit rearwardly of said first spherical lens for thereby retaining said first guide means in said first tubular part, said first guide means having an opening aligned with the center of said first spherical lens,

a first transparent disc of predetermined index of refraction and predetermined thickness in said first forward

tubular part interposed between said first spherical lens and said first guide means,

one end of said first disc at its center engaging said first spherical lens, leaving a space between remaining portions of said first disc and said first spherical lens, and the other end of said first disc engaging one end of said first guide means,

and an optical indexing fluid occupying said space,

a first optical fiber extending into said first unit,

said first optical fiber being received in said opening in said first guide means and having an end abutting said first disc whereby said first optical fiber is aligned with the center of said first spherical lens and said end of said first fiber is spaced a predetermined distance from said first spherical lens,

a first connector body including means engageable with said first shoulder means for removably retaining said first unit,

a second unit, said second unit including

a second external shoulder means,

a second forward tubular part,

a second spherical lens received in said second tubular part with a press fit for thereby retaining said second spherical lens in said second tubular part and centering said second spherical lens relative to the longitudinal axis of said second tubular part,

a second fiber guide means received in said second tubular part with a press fit rearwardly of said second spherical lens for thereby retaining said second guide means in said second tubular part, said second guide means having an opening aligned with the center of said second spherical lens,

a second transparent disc of predetermined thickness and predetermined index of refraction in said second forward tubular part interposed between said second spherical lens and said second guide means,

one end of said second disc at its center engaging said second spherical lens, leaving a space between remaining portions of said second disc and said second spherical lens, and the other end of said second disc engaging said second guide means,

and an optical indexing fluid occupying said space,

a second optical fiber extending into said second unit,

said second optical fiber being received in said opening in said second guide means and having an end abutting said second disc, whereby said second optical fiber is aligned with the center of said second spherical lens and said end of said second optical fiber is spaced a predetermined distance from said second spherical lens,

a second connector body including means engageable with said second shoulder means for removably retaining said second unit,

a sleeve engaging and coaxial with said first tubular part, said sleeve extending around and slidably and complementarily receiving said second tubular part for thereby aligning said first and said second tubular parts, and positioning said first and said second spherical lenses opposite from each other,

and means for detachably interconnecting said first and said second connector bodies.

4,632,506

OVERHEAD FLEXIBLE ELECTRIC CONDUCTOR

John E. Taylor, Berkshire, England, assignor to BICC Public Limited Company, London, England

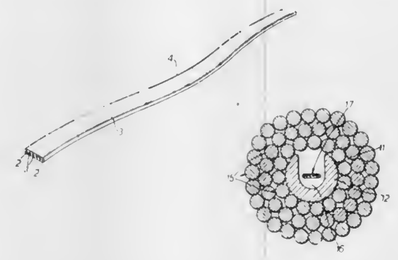
Filed Jun. 14, 1984, Ser. No. 620,427

Claims priority, application United Kingdom, Jun. 17, 1983, 8316494

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **21 Claims**

1. An overhead flexible electric conductor comprising at least one layer of helically wound bare elongate elements of metal or metal alloy, at least one elongate compartment within and extending throughout the length of the flexible conductor and, loosely housed in the elongate compartment, at least one optical fibre ribbon structure comprising a plurality of optical fibres and at least one flexible elongate reinforcing element of substantially resilient material arranged side by side and embedded in an elongate body of plastics material, wherein the resilient reinforcing element of the optical fibre ribbon structure is pre-set in such a form that the ribbon structure as a whole follows a path of smoothly curved undulations whose



axes of curvature lie transverse to the longitudinal axis of the ribbon structure and the arrangement being such that if, when the flexible conductor is installed or is in service, the undulating ribbon structure is subjected to a tensile force, the ribbon structure will straighten in a lengthwise direction against the action of the undulating resilient reinforcing element thereby reducing the tensile force otherwise applied to the optical fibres and, when the tensile force is removed, the ribbon structure will return towards its original undulating form.

4,632,507

CABLE-TO-REPEATER JOINING DEVICE FOR UNDERWATER OPTICAL FIBER CABLE

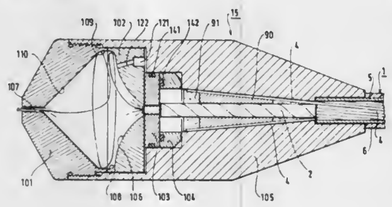
Georges Mignien, Leulinghen Bernes, and Didier Fasquel, Calais, both of France, assignors to Les Cables de Lyon, Clichy, France

Filed Sep. 11, 1984, Ser. No. 649,408

Claims priority, application France, Sep. 16, 1983, 83 14764

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **3 Claims**



1. Device for facilitating joining an underwater optical fiber cable and a repeater comprising a fiber-feed-in-cable, said underwater cable consisting of an optical core containing optical fibers, a multiple steel wire strength member, a copper tube swaged onto said strength member and an insulating sheath, one end of said underwater cable being secured in a jointing block by means of a tapered ferrule and hard-setting resin filler, said fiber-feed-in-cable comprising an optical core containing optical fibers, said device comprising a slack chamber positioned between said jointing block and said repeater for storing surplus lengths of optical fiber, said slack chamber having an underwater optical fiber cable side and a fiber-feed-in-cable side and comprising on the underwater-fiber-cable side a storage canister having an axial feed through and a convex bulged internal annular wall whose radius of curvature is equal to or larger than the minimum acceptable radius of curvature capable of preventing overly looping of the optical

fibers in contact therewith to the extent of causing breakage of said optical fibers, and on the fiber-feed-in-cable side a plug facing said storage canister having a conical internal surface, the internal wall of said storage canister further including, radially outwardly of the convex bulge surface portion, a concave transition surface and wherein, the conical internal surface of said plug terminates near the periphery of said plug in a cylindrical transition surface.

4,632,508

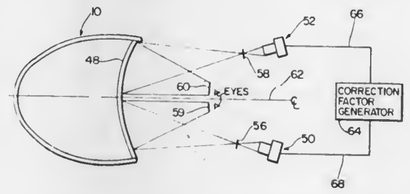
WINDSCREEN DEVIATION CORRECTING PILOT DISPLAY

John J. Connelly, Northpoint, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,760

Int. Cl.⁴ G02B *5/32, 27/10*

U.S. Cl. 350—174 **1 Claim**



1. A virtual image display for an aircraft having a windscreen characterized by a symmetrically oriented center line, the display comprising:

a light transmissive optical combining element laterally positioned across the windscreen and attached thereto, the combining element being a straight plate including diffraction means serving as a reflecting lens for collimating rays of light impinging thereon;

first image generating means located within the cockpit of the aircraft for projecting a virtual image of preselected symbols on the right side of the combining element, with respect to the centerline;

second image generating means located within the cockpit of the aircraft for projecting a virtual image of separate preselected symbols on the left side of the combining element, with respect to the centerline, the right and left virtual images being contiguous;

a pilot's head being locatable in a space where the field of view of each eye through the combining element including the superposition of an observed object appearing outside the windscreen and the virtual image appearing on the same side of the centerline as that eye thereby avoiding either of the pilot's eyes from seeing the virtual image appearing on an opposite side of the centerline.

4,632,509

GLARE-SHIELDING TYPE REFLECTOR

Shinya Ohmi, Anjo; Hiroshi Itoh, Ohbu; Tsuyoshi Fukada, Nagoya; Yasutoshi Suzuki, Ohbu, and Kunihiko Hara, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1984, Ser. No. 671,612

Claims priority, application Japan, Nov. 29, 1983, 58-225271

Int. Cl.⁴ G02F *1/133;* G02B *5/124*

U.S. Cl. 350—283 **6 Claims**

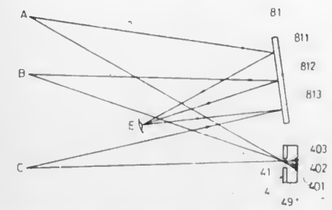
1. A glare-shielding type reflector comprising:

a reflecting block having a mirror for reflecting incident light rays which impinge upon said reflecting block at different angles;

a plurality of glare-shielding layers individually formed on an incident side of said mirror said layers being driven individually;

a driving means for individually driving said plurality of glare-shielding layers by application of an electric field thereto;

a photosensor means for detecting incident angle and intensity of each of said incident rays reflected on said mirror through each of said glare-shielding layers; and



a control means for generating a control signal to allow said driving means to drive at least one of said glare-shielding layers in response to said incident angles of incident rays.

4,632,510

MOUNTING AND DEMOUNTING DEVICE OF OPTICAL UNIT

Yukio Miki, and Takeshi Egawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

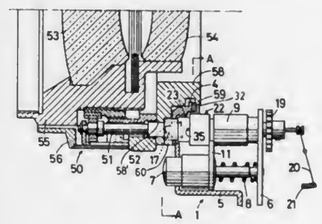
Continuation of Ser. No. 379,719, May 19, 1982, Pat. No. 4,534,621. This application May 29, 1985, Ser. No. 739,000

Claims priority, application Japan, May 21, 1981, 56-77518

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.⁴ G02B *7/04, 7/08*

U.S. Cl. 350—257 **4 Claims**



1. An engaging and disengaging device for an optical main instrument which includes a rotatable driving shaft and an interchangeable optical instrument which is mountable on and demountable from said optical main instrument by rotation thereof relative to said optical main instrument and which includes a rotatable driven shaft engageable with said driving shaft and a focusing optical system connected with said driven shaft, said device comprising

a first mount member of said interchangeable optical instrument, formed with a first mount face and a first throughhole through which said driven shaft extends in the direction of the optical axis of said interchangeable optical instrument,

a second mount member of said optical main instrument, formed with a second mount face and a second throughhole through which said driving shaft extends in the direction of the optical axis of said optical main instrument, said second mount face being brought into contact with said first mount face with said interchangeable optical instrument mounted on said optical main instrument,

an urging means for urging said driving shaft from a retracted position where said driving shaft retracts behind or projects a little behind said second mount face to a projecting position where said driving shaft projects largely beyond said second mount face, said driving shaft

being engageable with said driven shaft when moved to said projecting position,

a locking means capable of locking said driving shaft in its retracted position against the action of said urging means, and

a detection means for detecting the state of the mounting and demounting of said interchangeable optical instrument on and from said optical main instrument to automatically release the locking of said driving shaft by said locking means immediately prior to completion of the mounting until immediately after start of the demounting.

4,632,511

SHIELD FOR A KEYBOARD

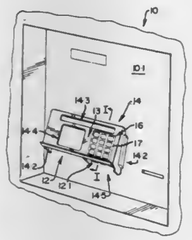
Franklin S. Louw, P.O. Box 1258, Bedfordview, Transvaal Province, South Africa

Filed Mar. 11, 1985, Ser. No. 710,146

Claims priority, application South Africa, Mar. 21, 1984, 84/2110; Sep. 10, 1984, 84/7101

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—276 R **5 Claims**



1. A shield mountable in relation to the keyboard of an automatic banking facility so as to shield at least some of the keys of the keyboard from the view of bystanders when such keys are being operated by a patron, the shield including an opaque top panel; and mounting means for mounting the panel with clerance in spaced relationship relative to the said keys to provide an access opening for the fingers of a patron to operate the keys.

4,632,512

VARIABLE LASER ATTENUATOR

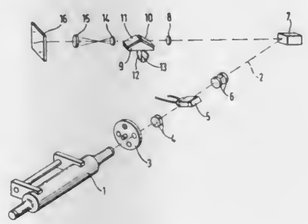
Thomas Haerig, Kelkheim, and Michael Plaot, Eschborn, both of Fed. Rep. of Germany, assignors to Mergenthaler Linotype GmbH, Eschborn, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,678

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319151

Int. Cl.⁴ G02B *5/20*

U.S. Cl. 350—316 **5 Claims**



1. In a typographical composing and printing machine of the type wherein a laser light beam is employed to illuminate a recording medium, and said machine including a variable laser light attenuator for varying the intensity of the laser light beam, the improvement comprising, in combination in sequence, a filter wheel positioned in front of the laser light source, said filter wheel having a plurality of different filters, each filter capable of absorbing a predetermined amount of light different from that of the other filters, and said wheel being rotatable such that a selected filter can be placed in the path of light whereby rough attenuation of the light can be initially conducted, with said filter wheel being a first member making up a part of said laser light attenuator, lens means positioned for focusing said laser light beam onto modulator means provided for modulating the focused laser light beam, diverging lens means for spreading the laser light beam from said modulator means onto mirror means provided for diverting said laser light beam, collimating means arranged for collimating the diverted laser light beam from said mirror means, a second member making up part of said laser light attenuator for further attenuating the laser light beam from said collimating means, wherein said second member comprises holding means holding a pair of plane-parallel glass plates arranged in a mutually inclined relationship in said holding means in the path of the laser light beam, said inclination being such that the angle of incidence of the laser light beam on said plates is the Brewster Angle, and rotating means for rotating said holding means and plates assembly about the axis of the incident laser light beam for causing elective attenuation of the intensity of said laser light beam to a desired value.

4,632,513

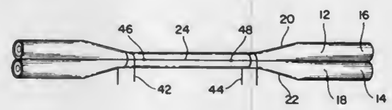
METHOD OF MAKING A POLARIZATION-INSENSITIVE, EVANESCENT-WAVE, FUSED COUPLER WITH MINIMAL ENVIRONMENTAL SENSITIVITY

David W. Stowe, Buffalo Grove, and Paul M. Kopera, Franklin Park, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 498,436, May 26, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,044

Int. Cl.⁴ G02B *6/26*

U.S. Cl. 350—320 **18 Claims**



1. A method of making a polarization-insensitive optical coupler comprising the steps of:

(a) etching first and second longitudinal segments of first and second single-mode optical fibers so that each fiber has an outer cladding having a low index of refraction relative to the index of refraction of a nearly exposed core of each of the first and second single-mode optical fibers;

(b) maintaining the first and second single-mode optical fibers in parallel juxtaposition with one another along a portion of each of the first and second longitudinal segment, said maintaining step comprising the substeps of:

(b1) wrapping portions of the first and second longitudinal segments with a material which will not substantially deform the nearly exposed cores of the first and second single-mode optical fibers;

(b2) gluing the nearly exposed cores of the first and second single-mode optical fibers together with glue while the nearly exposed cores are wrapped;

(b3) curing the glue; and

(b4) unwrapping the nearly exposed cores;

(c) fusing together the portions of the first and second longitudinal segments maintained in parallel juxtaposition to form a coupling region; and

(d) rigidly encapsulating the nearly exposed cores of the first and second single-mode optical fibers while maintaining the parallel juxtaposition of the first and second longitudinal segments.

4,632,514

COLOR LIQUID CRYSTAL DISPLAY APPARATUS

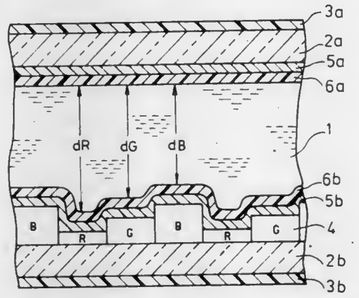
Tetsu Ogawa, Kyoto; Seiichi Nagata, Sakai, and Sadayoshi Hotta, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 29, 1985, Ser. No. 696,170

Claims priority, application Japan, Jan. 31, 1984, 59-16552; Jan. 31, 1984, 59-16553; Jan. 31, 1984, 59-16554

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 F **21 Claims**



1. A color liquid crystal display apparatus comprising:

a cell having two substrates forming a closed space therebetween, at least one of said two sheets being transparent, said closed space having many minute parts of different gaps,

a plural of color filters of different spectral transmittance characteristics corresponding to said many minute parts of different gaps, formed on at least one of said two substrates,

electrodes formed on said substrate for selective impressing of potentials across gaps of said cell, and

a liquid crystal layer confined in said closed space thereby having different thicknesses corresponding to different kinds of said color filters.

4,632,515

HETEROCYCLICALLY SUBSTITUTED ETHANES AND THEIR USE IN LIQUID CRYSTAL MATERIALS AND DEVICES

George W. Gray, Cottingham, and Beatrice M. Nicholas, South Harrow, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

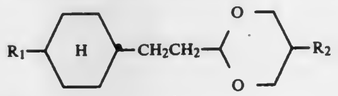
Filed Jan. 4, 1985, Ser. No. 688,987

Claims priority, application United Kingdom, Jan. 11, 1984, 8400665

Int. Cl.⁴ C09K *19/34*; G02F *1/13*; C07D *239/26, 319/06*

U.S. Cl. 350—350 R **4 Claims**

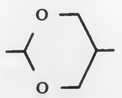
1. A heterocyclically substituted ethane having a formula:



wherein



represents a trans - 1,4 disubstituted cyclohexyl ring;



represents a trans - 2, 5 disubstituted 1, 3 - dioxan ring;

R_1 represents an alkyl group having from 1 to 15 carbon atoms and

R_2 represents an alkyl group having from 1 to 15 carbon atoms.

4,632,516

ELECTROCHROMIC ELEMENT

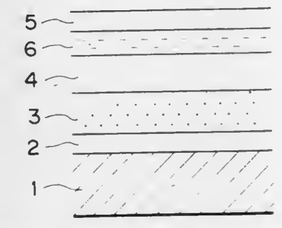
Kazuya Ishiwata, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,827

Claims priority, application Japan, Dec. 25, 1982, 57-234819

Int. Cl.⁴ G02F *1/17*

U.S. Cl. 350—357 **22 Claims**



1. An electrochromic element, characterized in that an electrochromic layer is interposed between first and second electrodes, each being made of an electrically conductive film, and that said electrochromic layer is formed by evaporating cobalt carbonate.

4,632,517

CRYSTALLINE COLLOIDAL NARROW BAND RADIATION FILTER

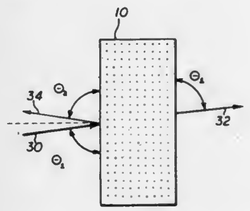
Sanford A. Asher, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 559,437, Dec. 8, 1983. This application Jun. 21, 1984, Ser. No. 622,842

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.⁴ G02B *26/00, 5/18*; G01J *3/44*

U.S. Cl. 350—362 **15 Claims**



1. A filtering device for separating a narrow wavelength band from a broader spectrum of electromagnetic radiation comprising:

a crystalline colloidal structure having a pair of substantially planar and parallel outer surfaces, said crystalline colloidal structure comprising a dispersion of electrically charged particles in a selected solvent wherein the refrac-

tive index of said selected solvent is within 0.1 of the refractive index of said electrically charged particles and having a lattice structure which has a lattice spacing and a degree of order sufficient to Bragg diffract greater than about 90% of the intensity of a wavelength band less than 50 Å in width while passing greater than about 50% of the intensity of wavelengths adjacent to said wavelength band, and

cell means for containing said crystalline colloidal structure, said cell means including substantially transparent wall members which are adjacent to the outer surfaces of said crystalline colloidal structure and being formed of material which is substantially non-leeching of adjacent ions.

4,632,518

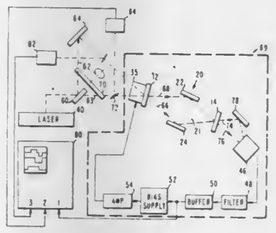
PHASE INSENSITIVE OPTICAL LOGIC GATE DEVICE

Stephen M. Jensen, El Segundo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 636,448, Jul. 31, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,243

Int. Cl.⁴ G02F *1/01*; G02B *5/30*

U.S. Cl. 350—385 **26 Claims**



1. An optical logic gate device comprising:

optical path means for providing a closed optical path;

launch means for launching at least two light beams into said optical path means, each launched light beam propagating in linearly independent modes, whereby the interaction between said beams is independent of the relative phase between said beams;

phase shift varying means for varying the phase shifts of said launched light beams by varying the optical path lengths of said beams in accordance with the intensities of said beams; and

output means for providing an output signal representative of the intensity of at least one of said launched light beams and independent of the relative phase between said beams.

4,632,519

ZOOM LENS INCLUDING A WIDE ANGLE OF VIEW

Tomowaki Takahashi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,989

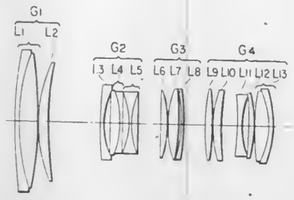
Claims priority, application Japan, Jul. 6, 1983, 58-122856; Jul. 6, 1983, 58-122857

Int. Cl.⁴ G02B *15/14*

U.S. Cl. 350—427 **15 Claims**

1. A zoom lens including a wide angle of view and having a wide magnification change area, said zoom lens having, in succession from the object side, a first lens group of positive refractive power, a second lens group of negative refractive power, a third lens group of positive refractive power and a fourth lens group of positive refractive power and wherein when zooming is to be effected from the wide angle end to the telephoto end, said first lens group and said fourth lens group are monotonously moved toward the object side and at the same time, said third lens group is monotonously moved toward the object side by an amount of movement 0.4–0.8 as great as the amount of movement of said first and fourth lens groups and said second lens group is moved toward the object side in the vicinity of at least the wide angle end, said zoom lens satisfying the following condition:

$$4.5 < f_1/-f_2 < 6.5$$



where f_1 is the focal length of said first lens group and f_2 is the focal length of said second lens group.

4,632,520

PLASTIC OBJECTIVE LENS SYSTEM ADAPTED FOR CORRECTION FOR TEMPERATURE

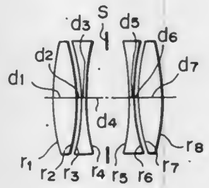
Hiromitsu Yamakawa, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed May 15, 1984, Ser. No. 610,435

Claims priority, application Japan, May 16, 1983, 58-86427

Int. Cl.⁴ G02B *17/08*

U.S. Cl. 350—446 **4 Claims**



1. A plastic objective lens system adapted for correction for temperature comprising at least one convex lens constituted of a plastic material exhibiting a relatively small absolute value of the coefficient of change in refractive index with temperature, and at least one concave lens constituted of a plastic material exhibiting an absolute value of the coefficient of change in refractive index with temperature, which is larger than said absolute value of the coefficient of change in refractive index with temperature of the plastic material constituting said convex lens, said plastic objective lens system satisfying the condition (1);

$$1 > \frac{dn1}{dt} / \frac{dn2}{dt} > 0 \qquad (1)$$

wherein dn1/dt and dn2/dt respectively denote the coefficients of change in refractive index with temperature of the plastic materials constituting said convex lens and said concave lens.

4,632,521

NEAR-ANASTIGMATIC COMPACT COLLIMATOR

Dietrich G. Korsch, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 15, 1984, Ser. No. 621,089

Int. Cl.⁴ G02B *17/06*

U.S. Cl. 350—505 **3 Claims**



1. A near-anastigmatic compact collimator for focusing light rays and the like on a focal plane, the collimator comprising:

a primary mirror having a concave surface for receiving light rays thereon;

a secondary mirror having a concave surface for receiving the reflected rays from the primary mirror; and

a tertiary mirror having a convex surface for receiving reflected rays from the secondary mirror and reflecting the final image focusing rays onto the focal plane, the tertiary mirror disposed between the primary and secondary mirror and attached to the primary and secondary mirrors for providing a compact threemirror collimator, the mirrors rotationally symmetric to an optical axis through the center of the collimator, the mirrors disposed on the collimator so that a straight line perpendicular to the optical axis would intersect all three mirrors.

4,632,522

OPTICAL SYSTEM OF VARIABLE MAGNIFICATION AND A METHOD FOR VARYING MAGNIFICATION OF THE SAME

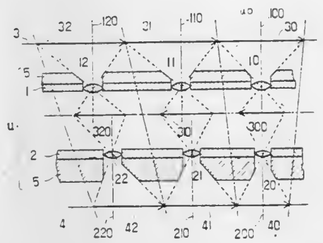
Yusuke Ishitani, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1984, Ser. No. 665,357

Claims priority, application Japan, Oct. 31, 1983, 58-205686; Oct. 31, 1983, 58-205687

Int. Cl.⁴ G02B *7/02*; G03B *27/52*

U.S. Cl. 350—570 **10 Claims**



1. An optical system of variable magnification comprising at least one multilens unit having a plurality of arrays of lenses positioned in spaced vertical relationship, each of said arrays of lenses having a plurality of identical lenses arranged in one or more rows, each row comprising an optical unit plane which contains coplanar optical axes of the lenses in each row of said arrays of lenses in said multilens unit, and each of the optical axes of the lenses in a row of lenses is non-colinear with each of the corresponding lenses in the next positioned row of lenses within an optical unit plane said optical system adapted to rotate around the axis of the center line of an optical unit plane to a predetermined position.

4,632,523

SUPPORTING SYSTEM FOR A TELESCOPE MIRROR

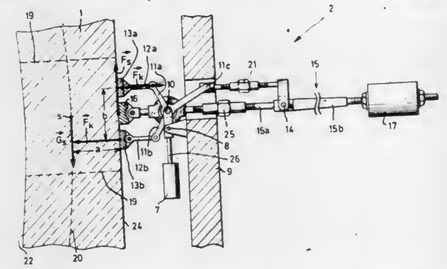
Ernst-Dieter Knohl, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 802,227

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444265

Int. Cl.⁴ G02B *5/08*

U.S. Cl. 350—611 **8 Claims**



1. A supporting system for a telescope mirror defining a plane, the supporting system comprising: a plurality of astatic load-relieving devices mounted at the rear side of the mirror and assigned to respective portions of the mirror for taking up the respective weight components of the mirror acting in said plane and corresponding to said portions, each of said portions having a center of gravity and each of said load-relieving devices including:

first force transmitting means for acting on said mirror outside of said center of gravity to apply a supporting force to the mirror portion corresponding to said device so as to cause the weight component of said mirror portion and said supporting force to conjointly define a first moment; and,

second force transmitting means for applying a compensating second moment to said mirror portion for counteracting said first moment and causing said supporting force to effectively act in said plane.

4,632,524

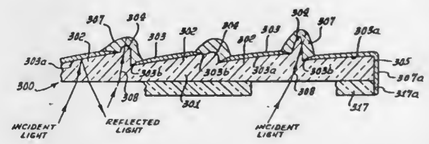
ELIMINATION OF INTERNAL REFLECTIONS AND DIFFRACTIONS FROM JUNCTURES IN, AND AT THE PERIPHERY OF A SEGMENTED MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Division of Ser. No. 642,179, Aug. 20, 1984, which is a continuation-in-part of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a division of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951. This application Nov. 15, 1985, Ser. No. 798,334

Int. Cl.⁴ G02B *5/08, 1/10, 7/18*

U.S. Cl. 350—613 **3 Claims**



1. In a transparent molded segmented mirror having individual sectors on a transparent molding and comprising a myriad of reflecting adjacent surfaces at the back side of the mirror away from the viewer, said surfaces oriented to produce, in the eyes of the viewer, one virtual image, or separate virtual images from separate portions of such molded mirror, there being

a network of zones separating the individual reflecting surfaces, the improvement comprising

(a) a material coating said zones and which includes a light absorber,

(b) whereby undesirable reflections from said zones are substantially reduced,

(c) said reflecting surfaces forming multiple groups of said surfaces, one group located at a central portion of the mirror, and other groups located at left and right portions of the mirror, and including metallizing material on the molding and defining said reflecting surfaces and characterized in that the thickness of the metallizing material is substantially reduced to define feather edges at and about peripheries of the sectors,

(d) said mirror having transparent solid structure extending across and rearwardly of said myriad of surfaces,

(e) said solid structure having a surface toward the viewer which has one of the following configurations:

(N_1) convex, rearwardly,

(N_2) flat rearwardly

(N_3) V-shaped with apex facing rearwardly

(N_4) flat rearwardly, two offset sections angled relative to one another

(N_5) convex rearwardly in two offset sections separated by a third section that is flat rearwardly

(N_6) flat and convex rearwardly in two laterally spaced sections separated by a third section that is flat rearwardly.

4,632,525

SIDE-MIRROR DRIVING APPARATUS

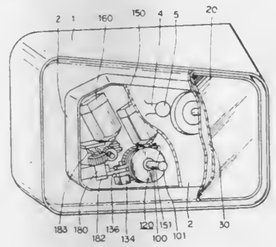
Mikio Hayashi, Oubu, and Kouzi Kawasumi, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 6, 1985, Ser. No. 805,906

Claims priority, application Japan, Dec. 11, 1984, 59-262446

Int. Cl.[4] G02B *7/18, 5/08;* A47G *1/24*

U.S. Cl. 350—634 **6 Claims**



1. A side-mirror driving apparatus comprising:

a casing;

a supporting shaft having a supporting portion at an end thereof and fixed to said casing;

a mirror swingably supported at said supporting shaft supporting portion;

at least one lever having a longitudinal axis disposed in said casing and swingably linked to a rear surface of said mirror at one end thereof; and

at least one driving means drivingly connected to said lever for reciprocating said lever along with the longitudinal axis thereof so as to incline said mirror, wherein said driving means includes:

a first rotating member rotatably held on said casing;

a first motor for rotating said first rotating member;

a second rotating member rotatably and movably coupled to said casing in such a manner that said second rotating member reciprocates along with the longitudinal axis of said lever,

said first rotating member being connected to said second rotating member in such a manner that the rotation of said first rotating member is transmitted to said second rotating member; a second motor;

linkage means drivingly so connected between said second rotating member and said second motor that the rotation of said second motor makes said second rotating member reciprocate along with the longitudinal axis of said lever;

driving connection means drivingly so connected between said lever and said second rotating member that at least one of the rotation and the reciprocation of said second rotating member makes said lever reciprocate along with the longitudinal axis of said lever; and

a set position stopping mechanism, operated in response to the operation of said linkage means for deenergizing said second motor to stop said mirror at a desired position.

4,632,526

SUPPORT STRUCTURE FOR A SPECTACLES FRAME AND FRONT INTENDED TO BE ADAPTED THERETO

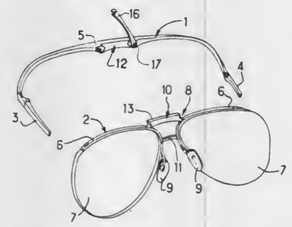
Bernard Lhospice, Blois, France, assignor to Essilor International (Campagnie Generale d'Optique), Creteil, France

Filed Oct. 31, 1984, Ser. No. 666,891

Claims priority, application France, Dec. 19, 1983, 83 20275

Int. Cl.[4] G02C *5/02*

U.S. Cl. 351—124 **8 Claims**



1. A spectacle-frame assembly comprising

a support structure comprising

substantially rigid support bar means with two ends

spectacle sides mounted to said two ends, respectively, of said support bar means,

said support bar means including a median portion which extends between said two ends of said support bar means and which has an inner side thereof directed toward the face of a user when said assembly is worn by the same,

said inner side of said median portion being provided with holding recess means having two ends defined by at least two projecting portions of said support bar means,

a pivot pin provided on said inner side of the median portion at a location adjacent to one end of said recess means

a locking lever pivotally mounted at one of its ends on said pivot pin, said lever being displaceable between an unlocking position wherein it renders said holding recess means accessible and a locking position wherein said lever closes said holding recess means by bridging over said inner side of said median portion of the support bar means, and

a projecting stopmember provided on said inner side of the median portion at a location adjacent to the opposite end of said recess means, and engageable by the opposite end of said lever to lock the latter in said locking position; and

a front structure provided with at least one spectacle-glass and detachably assembled to said support structure, said front structure being provided with a protruding portion adapted to be detachably engaged in said holding recess means and to be locked therein by said locking lever when said lever is in said locking position, respective peripheral ends of said protruding portion being at least partially complementary to said ends of said holding recess means.

4,632,527

ANTI-STATIC OPHTHALMIC LENSES

Jon D. Masso, Whitinsville, and Donald D. Carmelite, Shrewsbury, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jun. 3, 1983, Ser. No. 500,997

Int. Cl.[4] G02C *7/02;* B05D *5/12;* B32B *3/00*

U.S. Cl. 351—166 **54 Claims**



1. An anti-static abrasion-resistant optical element having a percent transmittance for visible light of at least 60% comprising:

(a) an organic polymeric plastic substrate;

(b) a conductive metal layer comprising chromium having a thickness of between 25 and 35 Angstroms applied to at least one surface of said plastic substrate; and

(c) an abrasion-resistance silica-polyorgano siloxane layer overcoating said conductive layer.

4,632,528

METHOD FOR DETERMINING REFRACTIVE INDEX OF AN OBJECT

Hisakazu Yoshino; Kazutoshi Takagi, and Yoshitaka Torii, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

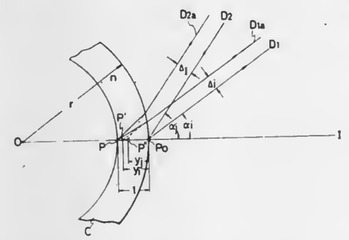
Continuation of Ser. No. 412,176, Aug. 27, 1982, abandoned.

This application Apr. 15, 1985, Ser. No. 722,991

Claims priority, application Japan, Aug. 31, 1981, 56-136595

Int. Cl.[4] A61B *3/10;* G01N *21/41*

U.S. Cl. 351—211 **4 Claims**



1. A method for determining a refractive index of an object to be measured comprising steps of:

illuminating the object along an illuminating axis with a slit pattern of light to form an optical section in the object;

determining a first apparent thickness (Y_i) of the object by observing the optical section along a first direction which has an angle α_i with respect to said illuminating axis in a plane which is perpendicular to said optical section and including said illuminating axis;

determining a second apparent thickness (Y_j) of the object by observing the optical section along a second direction which has an angle α_j with respect to said illuminating axis in said plane said angle α_j being different from said angle α_i; and

calculating the refractive index (n) of the object from said first and second apparent thicknesses (Y_i, Y_j) in accordance with the following formulae:

$$M_i = \sin \alpha_i \left(1 - \frac{Y_i}{r}\right)$$

$$M_j = \sin \alpha_j \left(1 - \frac{Y_j}{r}\right)$$

$$N_i = \alpha_i - \sin^{-1} M_i$$
$$N_j = \alpha_j - \sin^{-1} M_j$$

$$a = \left[\left(\frac{\sin N_i}{M_i}\right)^2 - \left(\frac{\sin N_j}{M_j}\right)^2\right]^2$$

$$b = \sin^2 N_i \sin^2 N_j \left(\frac{1}{M_i^2} + \frac{1}{M_j^2}\right) + \left(\frac{\sin^2 N_i}{M_i^2} + \frac{\sin^2 N_j}{M_j^2}\right)(\cos N_i \cdot \cos N_j - 1)$$

$$c = (\cos N_i - \cos N_j)^2$$

$$N = \sqrt{2\left(\frac{\sqrt{b^2 - ac} - b}{a}\right)}$$

where r is the radius of curvature of the front side of the object to be measured.

4,632,529

ACCESSORY FOR USE WITH AN OVERHEAD PROJECTOR

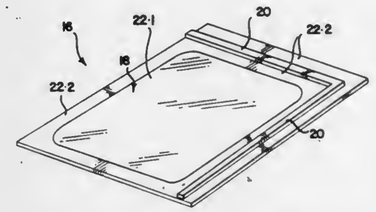
Wilfred Levin, 26 Doordrft Road, Constantia, 7800, South Africa

Filed Mar. 15, 1985, Ser. No. 712,135

Claims priority, application South Africa, Mar. 16, 1984, 84/1983

Int. Cl.[4] G03B *21/64*

U.S. Cl. 353—122 **4 Claims**



1. An accessory for use with an overhead projector, the accessory comprising a removable platen having a generally rectangular, transparent, or translucent central portion and an opaque peripheral portion bounding the central portion, the platen forming in use an upwardly facing support surface for supporting thereon two or more superimposed rectangular transparencies to be projected by light shining from the projector through said central portion and the transparencies; the platen being provided, along each of two adjacent sides of said central portion, in the region of said peripheral portion and spaced inwardly from the corresponding edge of the platen, with a locating formation which protrudes upwardly from said support surface, the locating formations being adapted and arranged to locate the transparencies in register with each

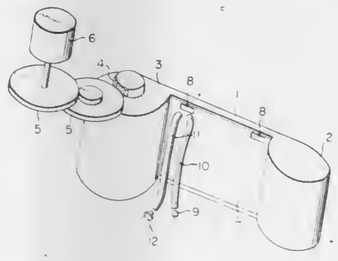
other and with respect to said central portion and the upper surface of the platen on opposite sides of each of said locating formations being flat and otherwise uninterrupted by protrusions; and each one of the locating formations defining an outwardly facing rectilinear guide surface intersecting said support surface and extending substantially the entire length of the corresponding side of said central portion.

4,632,530

AUTOMATIC FILM WINDING SYSTEM

Hiroshi Iwata, Nara, and Katsuji Ishikawa, Osaka, both of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Feb. 4, 1981, Ser. No. 231,436
Claims priority, application Japan, Feb. 15, 1980, 55-18080
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.11 **4 Claims**



1. An automatic film winding system for winding film having a series of spaced perforations along an edge thereof, said system comprising:

(a) a film advancing means comprising a film winding means drivingly coupled through a reduction gear means to an electric motor, for advancing film along a given path;

(b) an optical perforation sensing means comprising:

a light source disposed remote from said path;

a light sensor disposed remote from said path;

a first optical guide means extending transversely of said path, one end of said first optical guide means being optically coupled to said light source and the other end thereof being positioned adjacent and on one side of said path at a predetermined point past which a series of perforations of a film passes; and

a second optical guide means extending transversely of said path, one end of said second optical guide means being optically coupled to said light sensor and the other end thereof being positioned adjacent and on said one side of said path at said predetermined point so that said light sensor receives the light reflected from the surface of the film or through a perforation thereof; and

(c) a power supply control circuit including

a first switching circuit adapted to be closed when a shutter release button is depressed;

a power supply adapted to be selectively connected to or disconnected from said light sensor through said first switching circuit;

a shutter or exposure control circuit adapted to be selectively connected to or disconnected from said power supply through said first switching circuit and further adapted to deliver the output signal which lasts as long as a shutter is opened; an arithmetic unit adapted to receive the outputs from said light sensor and said shutter or exposure control circuit;

a second switching circuit responsive to the output from said arithmetic unit for controlling the power or current supply to said electric motor and said light source;

a time constant circuit responsive to the output from said arithmetic unit for controlling said first switching circuit; and

a third switching circuit connected in parallel with said electric motor and responsive to the output from said arithmetic unit for applying the electric brake to said electric motor, said power supply circuit being responsive to both the outputs from said first switching circuit, said shutter or exposure control circuit and said light sensor, thereby controlling the power supply to said electric motor, said light source and said light sensor; said power supply control circuit being so designed and constructed that in response to the depression of said shutter release button said power supply control circuit connects said power supply to said light sensor and when one exposure operation has been completed, said power supply control circuit connects said power supply to said electric motor and said light source and in response to the output from said light sensor said power supply control circuit disconnects said power supply from said light sensor, said electric motor and said light source;

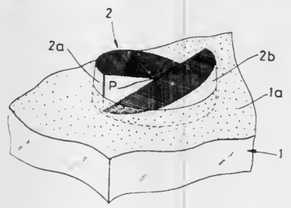
whereby in response to the detection of one or more perforations of the film at said predetermined point, the length of the film advanced is determined.

4,632,531

FOCUSING SCREEN

Yutaka Ichihara, Yokohama; Nobutaka Magome, Kawasaki; Yutaka Iizuka, Fujisawa; Shuji Kunimatsu, and Tomonari Inaba, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,224
Claims priority, application Japan, Oct. 22, 1984, 59-221790; Oct. 22, 1984, 59-221791
Int. Cl.[4] G03B *13/20*
U.S. Cl. 354—200 **14 Claims**



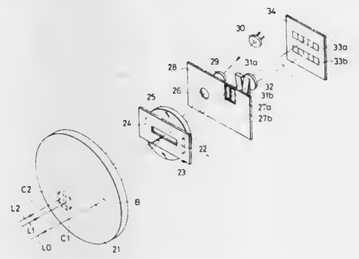
1. A focusing screen in a split image coincidence type range finder provided with an objective lens forming an imaging plane, comprising a plurality of light diffusing portions each of which has a surface inclined with respect to said imaging plane, a number of minute depressions being formed on said inclined surface, said depressions being arranged in the form of a matrix along a first direction and a second direction intersecting each other and symmetrical with respect to a fixed direction parallel to said inclined surface and said imaging plane, each of said depressions being of a pyramidic shape having as the base a parallelogram having first and second sides parallel to said first direction and third and fourth sides parallel to said second direction and extended in said fixed direction, each of said depressions being arranged so that each side of said parallelogram is common to a side of another adjacent parallelogram.

4,632,532

FOCUS DETECTING APPARATUS

Susumu Matsumura, Yokohama; Takashi Kawabata, Kamakura; Tokuichi Tsunekawa, Yokohama, and Yuichi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 666,681, Oct. 31, 1984, abandoned.
This application Jul. 29, 1985, Ser. No. 759,939
Claims priority, application Japan, Nov. 2, 1983, 58-206297
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **18 Claims**



1. A focus detecting apparatus for detecting the focus state of an objective lens, including:

a light source;

a projecting optical system for projecting a light produced by said light source onto an object through a first area of the pupil of said objective lens;

a light-receiving optical system for forming a plurality of object images on the basis of lights passing through second and third areas of the pupil of said objective lens;

a sensor for sensing said object images to obtain a signal necessary for detecting the focus state of said objective lens; and

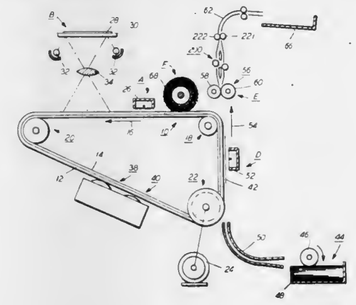
a field lens disposed near the predetermined imaging plane of said objective lens, said projecting and light-receiving optical systems being disposed rearward of the image of the pupil of said objective lens formed by said field lens.

4,632,533

OFF-SET NIP ROLL DECURLER

Dale W. Young, North Chili, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1985, Ser. No. 718,605
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SH **9 Claims**



1. An apparatus for decurling sheet material, including:

first and second guide baffle means for receiving sheets to be decurled;

partition means positioned within said first and second baffles, said partition means having dual beveled surfaces adapted to direct sheets received by said first and second guide baffle means into one of two paths depending on the direction and amount of curl in the sheets;

off-set nip means for receiving sheets being transported in either of said two paths and driving the sheets at a predetermined angle; and

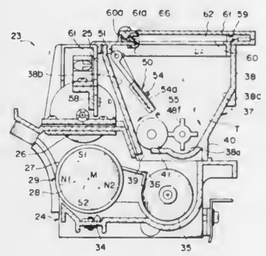
output baffle means positioned adjacent said off-set nip, said output baffle means having a beveled edge adapted to work in combination with said off-set nip means to apply reverse bending to sheets as they are driven into said beveled edge of said output baffle means by said off-set nip means.

4,632,534

DEVELOPING APPARATUS

Mamoru Shimono, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 15, 1984, Ser. No. 661,189
Claims priority, application Japan, Oct. 19, 1983, 58-195718
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD **17 Claims**



1. A developing apparatus comprising:

a casing storing a developing agent;

a developing agent carrier disposed in the casing and carrying the developing agent on the surface thereof;

a first lever rockable within a vertical plane in the casing and having an elongate body, and a detecting section which is wider than the elongate body, and disposed at the distal end of the elongate body to engage the surface of the developing agent stored in the casing, said first lever being adapted to hang by gravity in accordance with the amount of the developing agent;

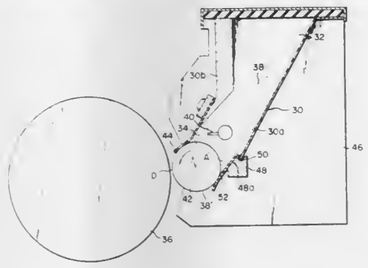
at least a second lever disposed parallel to said first lever so as to be able to rock together with the first lever, said second lever including an elongate body and a detecting section formed on the distal end of the elongate body so as to be wider than the elongate body;

a shaft extending in the horizontal direction and rotatably supported in the casing, said first and second levers being fixed to the shaft;

shaft position sensing means, operatively coupled to the shaft, for sensing the angular portion of the shaft and for producing an empty signal when the shaft moves to a predetermined angular position; and

means for reciprocally rotating the shaft periodically between two positions, thereby causing the first lever and the second lever to agitate the developing agent within the casing.

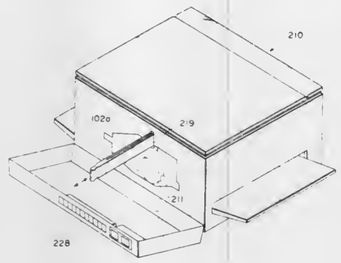
4,632,535
DEVELOPING DEVICE
Niroo Nagata, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 25, 1985, Ser. No. 727,260
Claims priority, application Japan, Apr. 27, 1984, 59-85638
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD **9 Claims**



1. A developing device which develops a latent image formed on an image carrier by a nonmagnetic developing agent, comprising:
developing agent storage means for storing a nonmagnetic developing agent therein, said storage means having an opening on the lower side;
developing agent carrying means disposed between the image carrier and the opening of the storage means and having a feed zone covering a substantial portion of a surface to which the nonmagnetic developing agent is frictionally attached, said carrying means being adapted to carry the nonmagnetic developing agent from the storage means to the image carrier upon rotational movement of the surface;
a layer forming member pressed against the surface of the carrying means to form a layer of the nonmagnetic developing agent from the storage means on the surface of the carrying means; and
a recovery member pressed against the surface of the carrying means so as to allow collection into the storage means of that portion of the nonmagnetic developing agent frictionally attached to the carrying means by the layer forming member which portion is delivered to the recovery member without having been used for development, and to prevent the nonmagnetic developing agent from flowing out of the storage means,
wherein the feed zone extends completely from the recovery member to the layer forming member,
wherein said recovery member has a slant such that the nonmagnetic developing agent delivered from the storage means is guided to the side of the carrying means, one end of the recovery member being attached to the storage means, and the other end of the recovery member being located outside the storage means so as to be in plane contact with the carrying means at the middle portion of the recovery member.

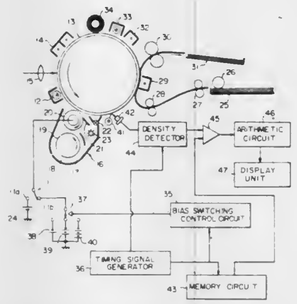
4,632,536
COPYING APPARATUS AND AN OPTICAL ASSEMBLY USABLE THEREWITH
Hiraku Sonobe, Yokohama; Hiroyuki Miyake, Kawasaki, and Akihiro Kashiwabara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 9, 1984, Ser. No. 658,607
Claims priority, application Japan, Oct. 11, 1983, 58-188339; Oct. 11, 1983, 58-188340
Int. Cl.[4] G03G *15/00;* **G03B** *27/52*
U.S. Cl. 355—3 R **15 Claims**

1. A copying apparatus, comprising:
means for moving an original to be copied;
means for illuminating the original;
a photosensitive member movable through an exposure station wherein said photosensitive member is exposed to an image of the original and an image transfer station having transferring means;
means for feeding a transfer material toward said transfer station;



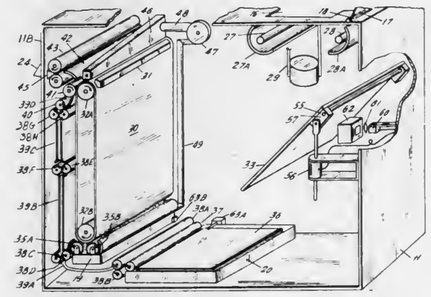
an optical assembly for forming a light image of the original on said photosensitive member, wherein said optical assembly includes a plurality of small imaging elements arranged in a direction transverse with the optical axes of said imaging elements;
means for detachably supporting said optical assembly; and
means for detecting an imaging magnification of said supported optical assembly.

4,632,537
ELECTROPHOTOGRAPHIC APPARATUS
Chikara Imai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Apr. 10, 1985, Ser. No. 721,855
Claims priority, application Japan, Apr. 13, 1984, 59-074614
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—14 D **6 Claims**



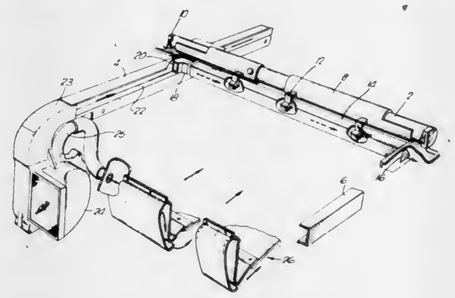
1. An electrophotographic apparatus comprising:
(a) a cyclically operable photosensitive body;
(b) means for forming a latent image on said photosensitive body;
(c) a developing unit having a developing electrode supplied with a prescribed developing bias voltage for developing said latent image into a toner image with a two-ingredient developing agent;
(d) means for transferring the toner-image from said photosensitive body to a transfer sheet;
(e) means for controlling the density of toner in said two-ingredient developing agent;
(f) means for selectively establishing a checking mode; and
(g) means for applying a plurality of different developing bias voltages to said developing electrode in said checking mode to enable said developing unit to develop a region of said photosensitive body having a uniform surface potential into toner amount detecting regions on said photosensitive body.

4,632,538
VIDEO TERMINAL AND PRINTER
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Christian Grund, 707L Eagle Heights, Madison, Wis. 53703
Filed Oct. 25, 1984, Ser. No. 664,529
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **17 Claims**



14. Apparatus for printing hard copy of documents comprising:
(a) first means, including xerographic image receiving means, for retaining an electrostatic charge capable of being selectively discharged upon exposure to light,
(b) power operated means for driving said image receiving means in a fixed path and means for uniformly charging same,
(c) second means for selectively applying particulate printing material to the charged surface of said image receiving means in accordance with the charge pattern thereof,
(d) third means for transferring particles of said printing material disposed on said charged surface in the pattern in which they are disposed, to the surface of a print receiving means,
(e) fourth means for fusing and bonding the particles transferred to said surface of said print receiving means in the pattern they are applied to said surface,
(f) fifth and sixth means for selectively applying respective light patterns to said surface of said print receiving means for selectively discharging respective portions of the charge on the charged surface of said image receiving means,
(g) said fifth means including means for supporting a document, means for scanning said document with light and directing reflections of such light against the charged surface of said receiving means to selectively discharge same,
(h) said sixth means including a laser, means for deflection controlling and modulating the beam of said laser to cause said laser beam to intersect a select portion of the surface of said image receiving means for selectively discharging same,
(i) a mirror means disposed between said fifth means, said sixth means and said xerographic image receiving means for directing light from either said fifth means or said sixth means to the surface of said image receiving means,
(j) means for selectively moving said mirror between at least two positions, at one of which positions said mirror operates to receive and reflect light from a document supported by said fifth means and wherein, when said mirror is moved to another of such positions, light may be passed from said laser without intersecting said mirror, and
(k) means for transferring particles from said first means to a print receiving surface.

4,632,539
AIR-COOLED APPARATUS
Stephen Temple, Cambridge, Great Britain, assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 28, 1985, Ser. No. 749,698
Claims priority, application United Kingdom, Jul. 2, 1984, 8416788
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—30 **2 Claims**

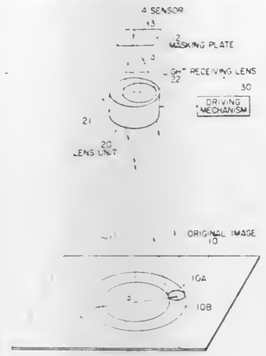


1. An improved apparatus for scan/illuminating a document lying in an object plane comprising:
an illumination lamp assembly including an elongated illumination lamp, an air passage conduit adjacent to, and extending the length of the lamp, and at least one heat exchanger having one end in thermal contact with the lamp and the other end extending into said conduit,
said lamp assembly adapted to move along at least one guide means located in a plane beneath and parallel to said object plane, said guide means having a longitudinally extending recess formed along at least a part of its length,
a scoop member connected to one end of said lamp assembly and adapted to move therewith, said scoop member being in thermal communication with said guide means recess and with the interior of the conduit, and
means for introducing cool air into said guide means recess at a point remote from said lamp assembly, whereby said cool air travels along said recess and is directed by said scoop member into said conduit thereby serving to cool said heat exchanger member.

4,632,540
AUTOMATIC EXPOSURE DEVICE IN CAMERA FOR MICROFILM
Koji Shiga, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 19, 1985, Ser. No. 810,710
Claims priority, application Japan, Dec. 19, 1984, 59-268103
Int. Cl.[4] G03B *27/74, 27/80*
U.S. Cl. 355—68 **8 Claims**

1. An automatic exposure device for microfilm camera which exposes original images on microfilm, comprising a lens unit made of an opaque material which is arranged on an optical axis perpendicular to the original image and which is inserted therein with a light receiving lens at a position eccentric from the optial axis, a driving mechanism which rotates the lens unit about the optical axis, and a sensor which detects

density at a photometric spot of the original image focused by the light receiving lens, so that the entire original image is



photometrically measured for its density by the rotation of the lens unit to determine the exposure.

4,632,541

METHOD OF USING PHOTOGRAPHIC MONTAGE TO MAKE PORTRAIT PHOTOS IN PARTICULAR

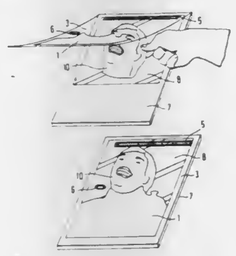
Kristina Hendrikx, Camphausenstr. 10, D-4000 Dusseldorf, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 635,150

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327163

Int. Cl.⁴ G03B *27/02*

U.S. Cl. 355—79 **9 Claims**



1. A method for preparing a montage having variable rapidly interchangeable elements, comprising the steps of:
(a) applying an opaque background scene to a flat, solid substrate,
(b) applying a correctly scaled base photographic element for being fitted into the background scene onto a transparent sheet of material,
(c) providing an opaque backing to the element on the reverse side of the transparent sheet which exactly matches the outline of the element,
(d) mounting on an opaque substrate a series of identically scaled second photographic elements scaled to fit said first mentioned element and any one of which can be fitted to said base photographic element to provide a scaled composite unitary whole,
(e) cutting out each of the second elements from the substrate along their outline,
(f) removably mounting the transparent sheet with the base photographic element onto the substrate containing the background such that it covers the substrate with the base photographic element correctly positioned against the background which shows through the transparent sheet around the photographic base element,
(g) selecting one of the cut-out second photographic elements and placing it on the substrate and under the transparent sheet in correct registery with the base photographic element to provide a complete scaled composite unitary figure.

4,632,542

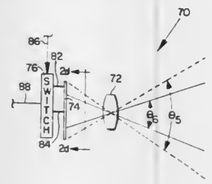
EXPOSURE CONTROL SYSTEM HAVING DUAL MODE PHOTODETECTOR

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1985, Ser. No. 729,989

Int. Cl.⁴ G03B *7/099*

U.S. Cl. 354—481 **4 Claims**



1. In an exposure control system for a camera having an adjustable focus objective lens and adapted to control the amount of light from a scene incident upon photosensitive film during exposure sequences, the improvement comprising:
means for evaluating scene light including a photodetector system having an acceptance angle, a photosensitive surface for providing an electrical output signal that varies in accordance with the amount of radiant energy incident on said photosensitive surface and an optical system for collecting scene light within a particular acceptance angle and for directing said collected light onto said photosensitive surface;
means for adjusting said photodetector system between a first arrangement and a second arrangement wherein its said acceptance angle differs from that in its said first arrangement including a diffuser movably mounted between a first position where it increases the size of said acceptance angle and a second position where it does not change the size of said acceptance angle and means coupling said objective lens to said diffuser for moving said diffuser between its said first and second positions in response to objective lens focusing movement to thereby change the acceptance angle of said photodetector system;
means for making a pre-exposure evaluation of scene light utilizing said diffuser in its said first position and for then subsequently making an evaluation of scene light while the photosensitive film is being exposed to scene light utilizing said diffuser in its said second position and producing a control signal responsive thereto; and
means responsive to said pre-exposure evaluation of scene light for providing either for selecting one of a plurality of alternately available operational exposure parameters during an exposure sequence of said camera and further responsive to said control signal for terminating the exposure of the photosensitive film to scene light.

4,632,543

OPTICAL RADAR SYSTEM FOR VEHICLES

Hiroshi Endo, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 13, 1984, Ser. No. 579,694

Claims priority, application Japan, May 6, 1983, 58-79141

Int. Cl.⁴ G01C *3/08, 1/00;* **G01B** *11/26;* **G01P** *3/36*

U.S. Cl. 356—5 **24 Claims**



1. An optical radar system for a vehicle, comprising:
(a) first means for transmitting a search beam toward possible objects in a road along which the equipped vehicle is travelling;
(b) second means for automatically repeatedly scanning the search beam in a scan having a variable central angle with respect to a central axis of said first means, said variable central angle depending on the direction of the vehicle's movement so as to scan parallel to and across the road surface;
(c) third means for receiving a reflection of the search beam reflected by an object present on the road; and
(d) fourth means for determining the disiance from the vehicle to the object on the basis of the timing relationship between the transmitted search beam and the received reflection.

4,632,544

OPTICAL CABLE TESTING

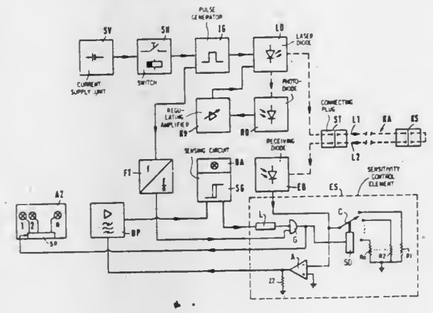
Ernst Form, Sulzbach/Murr, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 746,501

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422513

Int. Cl.⁴ G01N *21/84, 21/88*

U.S. Cl. 356—73.1 **4 Claims**



1. Method for testing an optical cable having a proximate end and a remote end, the cable being composed of a selected number of cable units, each of given length, connected together in series, and the cable containing at least two optical conductors extending between the proximate and remote ends of the cable, the method serving to monitor light transmission and undue attenuation increases caused by defects, based upon the known attenuation of one cable unit which is not defective, comprising:
optically conductively connecting together two of the optical conductors at the remote end of the cable;
supplying a succession of light pulses to a first one of the two optical conductors at the proximate end of the cable so that the light pulses traverse the first one of the two optical conductors to the remote end of the cable and then traverse the other one of the two optical conductors from the remote end to the proximate end of the cable;
deriving from the light arriving at the proximate end of the cable via the other one of the two optical conductors an electrical signal proportional in value to the arriving light intensity;
supplying the electrical signal to a sensitivity control element switchable between a plurality of different sensitivity levels corresponding in number to the maximum possible number of cable units in the cable, with each sensitivity level corresponding to the light intensity attenuation produced by a respective number of cable units, such that at a given sensitivity level the sensitivity control element produces an output signal which exceeds a given value when the two optical conductors are free of defects and the number of connected cable units is equal to or less than the number of units corresponding to the given sensitivity level, and which does not exceed the given value when the number of connected cable units is greater than the number of units corresponding to the given sensitivity level;
monitoring the output signal produced by the sensitivity control element while switching the sensitivity control element to successive sensitivity levels, starting from the level of lowest sensitivity and proceeding to the level of highest sensitivity;
counting the number of sensitivity levels to which the sensitivity control element is switched until the output signal exceeds the given value; and
displaying the number of sensitivity levels which have been counted, whereby
a display of a number of counted sensitivity levels which is greater than the selected number of cable units is an indication of a defect in the cable.

4,632,545

DEVICE FOR TESTING THE BEAM-SETTING OF MOTOR VEHICLE HEADLIGHTS

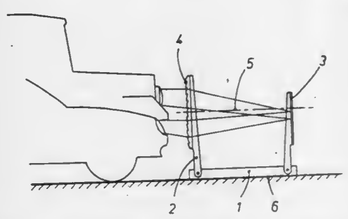
Rudi Schael, Weilstrasse 15, D-6330 Wetzlar 21, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 702,075

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405634

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 356—121 **7 Claims**



1. A test device for setting motor-vehicle headlights comprising a lens imaging a headlight to be tested onto a test surface, wherein:
(a) said lens (**4**) is provided having a diameter large enough to pass the light of said headlight having low, normal and high mountings;
(b) said lens (**4**) corrected over the entire height against spherical abberation;
(c) said lens (**4**) held by a lens holder (**2**) mounted on a base

plate (1) and providing an optical axis parallel to a surface of said base plate; and

(d) said test surface (3) mounted onto the said base plate (1) at a distance approximately s' from said lens (4) and said optical axis is about perpendicular to said test surface where s' is determined from the formula:

$$(1/s')=(1/f)+(1/s)$$

wherein s=the distance from said motor-vehicle headlights where the light is required to strike the road; and f' is the focus of said lens (4) whereby the test result is independent of the particular headlight elevation.

4,632,546

GROOVED SURFACE DEFECT DETECTION APPARATUS

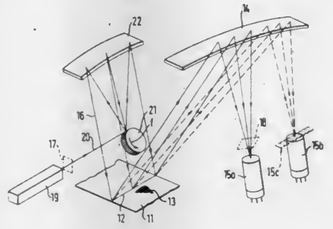
Erwin Sick, and Christoph Schenk, both of Icking, Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 599,890

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314620

Int. Cl.⁴ G01N *21/89*

U.S. Cl. 356—237 **9 Claims**



1. Fault detection apparatus for the surface of a flat article of the type having a series of grooves which extend at least substantially parallel to one another, the grooves configured to produce light diffraction with pronounced diffraction orders, the apparatus comprising:

a laser for generating a laser beam;

a first optical system including a rotating mirror wheel against which the laser beam is directed to produce a scanning laser beam, the scanning laser beam directed against the surface of the flat article at an acute angle to said surface to scan along a scanning line generally perpendicular to the grooves;

a second optical system arranged to gather diffracted light from the surface of the flat article of the zero diffraction order and at least the first diffraction order;

the ratio of the wavelength of the laser beam to a grid constant of the grooves in the surface of the flat article being chosen to generate at most zero, first and second diffraction orders; and

a photoelectric receiving arrangement, including a separate photoreceiver for each diffraction order, for generating an error signal on the occurrence of deviation of the diffracted light from a normal value.

4,632,547

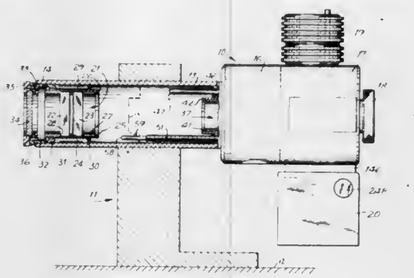
AUTOCOLLIMATING ALIGNMENT TELESCOPE

Irwin Kaplan, East Northport, and William B. Schneider, Syosset, both of N.Y., assignors to Broomer Research Corporation, Islip, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,550

Int. Cl.⁴ G01C *1/00*

U.S. Cl. 356—247 **31 Claims**



1. An autocollimating alignment telescope, comprising:

(a) an elongated tubular barrel;

(b) stationary objective lens means mounted in the barrel;

(c) first reticle means mounted in the barrel away from the objective lens means;

(d) movable focusing lens means mounted in the barrel away from the objective lens means and forming therewith an optical axis, said focusing lens means being axially movable among a range of alignment positions and a focused collimating position;

(e) drive means operatively coupled to the focusing lens means for axially moving the same, in an alignment telescope mode of operation, to a selected one of the alignment positions in which the focusing lens means and the objective lens means focus light from at least one exterior target onto the first reticle means, said drive means being further operative for positioning the focusing lens means in the focused collimating position in an autocollimating mode of operation;

(f) energizable light source means mounted on the barrel and operative, when energized, for emitting light in the autocollimating mode of operation;

(g) second reticle means mounted on the barrel adjacent the light source means;

(h) means for directing light emitted from the energized light source means through the second reticle means, the focusing lens means in the collimating position, and the objective lens means to an exterior light-reflecting target which reflects the emitted light impinging thereon, at least a portion of the light reflected off the light-reflecting target being focused by the objective lens means and the focusing lens means in the collimating position onto the first reticle means in the autocollimating mode of operation;

(i) eyepiece means mounted on the barrel, and operative for enabling a viewer to view the light focused on the first reticle means in either mode of operation; and

(j) automatic switching means operatively coupled to the light source means and the focusing lens means for automatically energizing the light source means when the focusing lens means is moved by the drive means to the collimating position, and for automatically deenergizing the light source means when the focusing lens means is moved by the drive means to any one of the alignment positions, whereby the emitted light is automatically lit during the autocollimating mode of operation and is automatically extinguished during the alignment telescope mode of operation.

4,632,548

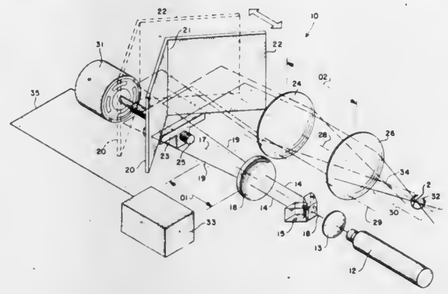
PROJECTION LENS SCANNING LASER VELOCIMETER SYSTEM

William D. Gunter, Jr., San Jose, and Anemarie De Young, Berkeley, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 18, 1985, Ser. No. 692,745

Int. Cl.⁴ G01P *3/36*

U.S. Cl. 356—28.5 **9 Claims**



1. A Doppler velocimeter comprising an afocal lens system with an optical axis, a light emitting means for producing parallel light beams, a reflector positioned behind said afocal lens system to direct the light beams antiparallel to their emitted direction along said optical axis, an input lens positioned in the so defined light path between said light emitting means and said afocal lens system, said reflector being movable to and fro relative to said afocal lens system in opposite directions that are parallel to said afocal lens system optical axis to vary the optical distance between said input lens and said afocal lens system and to produce a movable focus of crossed light beams with interference fringes where the crossbeam angle and focal volume are constant and the fringes are parallel for any relative movement of said reflector.

4,632,549

METHOD FOR MEASURING SPECTRA OF MATERIALS

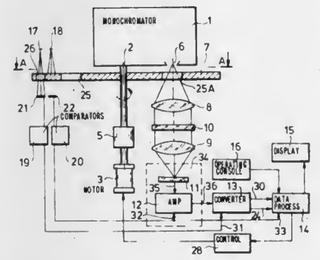
András Czabaffy; Károly Kaffka; Loránd Horváth, and Béla Nádai, all of Budapest, Hungary, assignors to Kozponti Elelmiszeripari Kutato Intezet, Hungary

Filed Apr. 14, 1983, Ser. No. 485,049

Claims priority, application Hungary, Apr. 14, 1982, 1139/82

Int. Cl.⁴ G01J *3/42*

U.S. Cl. 356—300 **13 Claims**



1. A method for measuring the spectrum of a material comprising the steps of

irradiating a sample of the material to be tested successively by radiations of different wavelengths of the spectrum to be measured;

measuring and storing spectrum signals produced by an intensity measuring unit in response to the radiation reflected or transmitted by the sample irradiated;

measuring and storing zero level signals produced by the intensity measuring unit in the unradiated condition of the sample at least two times in the course of said spectrum signal measurements;

calculating correction values for the stored spectrum values by interpolation based on the stored zero level values; and

subtracting from the stored spectrum values the respective calculated correction values to produce corrected spectrum values.

4,632,550

MEASURING METHOD FOR A TIME RESOLVED EMISSION SPECTRUM OR A TIME RESOLVED EXCITATION SPECTRUM

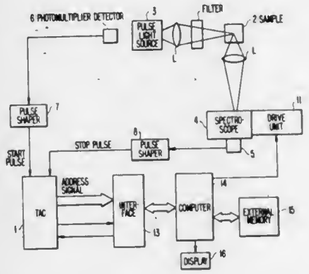
Kiyoaki Hara; Issei Yokoyama, and Natsuki Yoshida, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 5, 1984, Ser. No. 657,963

Claims priority, application Japan, Oct. 13, 1983, 58-191722

Int. Cl.⁴ G01J *3/443*

U.S. Cl. 356—311 **3 Claims**



1. A measuring method for a time resolved emission spectrum or a time resolved excitation spectrum, wherein, when emission transient waveforms from a pulse-excited sample are measured by a time correlation photon counting method, said emission transient waveforms are measured at every optimum wavelength in a problematical emission spectrum region, and said measured emission transient waveforms are stored in a memory means in order and at every wavelength, and after all of said transient waveforms at said respective wavelengths are measured, said time resolved emission spectrum or said time resolved excitation spectrum is produced on the basis of all of said stored emission transient waveform data.

4,632,551

PASSIVE SAMPLING INTERFEROMETRIC SENSOR ARRAYS

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 11, 1984, Ser. No. 619,119

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—345 **25 Claims**

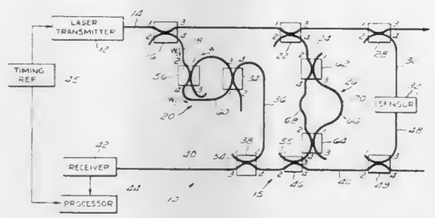
1. A fiber optic sensor array, comprising:

a transmit fiber;

transmitter means for applying temporal and frequency modulated light signals to said transmit fiber;

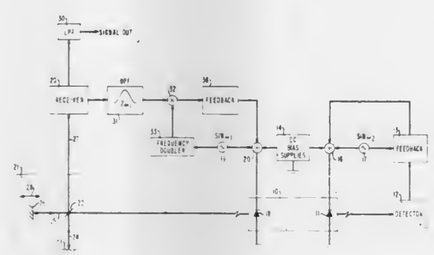
a plurality of passive fiber optic interferometric sensors coupled to said transmit fiber, said plurality of passive fiber optic interferometric sensors being spaced apart from one another to receive light pulses sequentially at predetermined times from said transmitter means, each of said passive fiber optic interferometric sensors being responsive to a predetermined physical parameter; and

means for monitoring said plurality of passive fiber optic interferometric sensors to detect changes in the physical



parameters to which said passive fiber optic interferometric sensors are responsive.

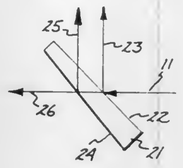
4,632,552
CLEAVED-COUPLED-CAVITY-LASER-DRIVEN SYSTEM FOR MEASURING SMALL SIGNALS
Nils A. Olsson, New Providence, and Yan-Chi Shi, Parsippany, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 6, 1985, Ser. No. 708,962
Int. Cl.[4] G01B *9/02*; H01S *3/13*
U.S. Cl. 356—345 **7 Claims**



1. In a signal sensing system including a laser-driven optical interferometric sensor of signals, the improvement comprising
a cleaved-coupled-cavity semiconductor laser having a modulator section and a laser section,
means for stabilizing said modulator section for operation below a lasing threshold thereof and at a local peak excursion in the light output versus modulator section current characteristic thereof,
means, responsive to light output of said laser section, for energizing said sensor to produce an interference light beam having intensity variations corresponding to variations in said signals, and
means, responsive to said interference beam, for stabilizing said laser section for operation above a lasing threshold thereof and at maximum sensitivity of said sensing means.

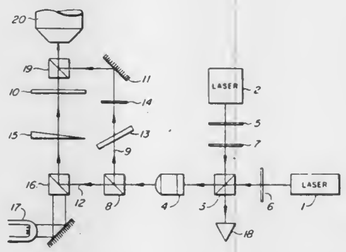
4,632,553
SILICON BEAMSPLITTER
D. Warren Vidrine, and Charles R. Anderson, both of Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.
Filed Feb. 25, 1985, Ser. No. 705,095
Int. Cl.[4] G01J *3/45*; G02B *27/14*
U.S. Cl. 356—346 **10 Claims**

1. In an interferometer spectrometer of the type having a source of infrared analytical radiation, a fixed reflector, a moving reflector and beamsplitter means for directing said analytical radiation to said reflectors, the improvement



wherein said beamsplitter is a wedge-shaped semiconductor material.

4,632,554
MULTIPLE FREQUENCY LASER INTERFERENCE MICROSCOPE
Thomas H. Pearce, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada
Filed Dec. 6, 1983, Ser. No. 558,590
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **14 Claims**

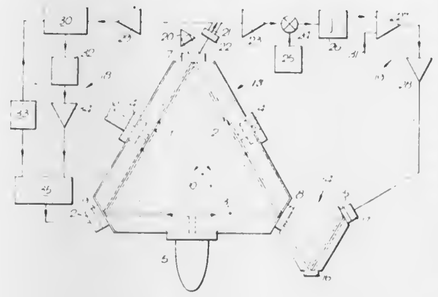


7. In a method for making optical determinations by laser interferometry the improvement comprising:
providing a beam of coherent laser light containing at least two parallel polarized selected frequencies, splitting said beam into a sample beam which passes through a stationary sample under determination and a reference beam which bypasses said sample, causing said sample beam and said reference beam to interfere so as to produce an interferogram containing more colours than there are frequencies in said beam.

4,632,555
RING LASER GYROSCOPES
Alan R. Malvern, Berkshire, England, assignor to British Aerospace PLC, London, England
Filed Aug. 25, 1983, Ser. No. 526,280
Claims priority, application United Kingdom, Aug. 26, 1982, 8224582
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **10 Claims**

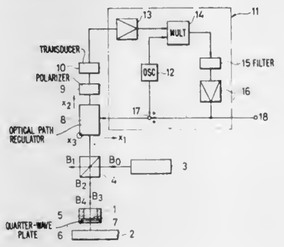
1. A ring laser gyroscope comprising:
a primary, active ring resonator;
a secondary, passive ring resonator having a path length substantially less than that of the primary ring and external to the primary ring but optically coupled to the primary ring for enhancing a desired single longitudinal resonance mode of the primary ring;
path length varying means connected to the secondary ring for adjusting the path length around the secondary ring;
photo-sensitive means connected to said primary ring for forming an output signal indicative of the laser radiation propagating around the primary ring, the photo-sensitive means being responsive for said output signal to include an

inter-mode heterodyne component corresponding to the beat between said desired longitudinal resonance mode and any adjacent, undesired longitudinal resonance mode which may appear within the primary ring; and
path length control means connected between the photosensitive means and the path length varying means and opera-



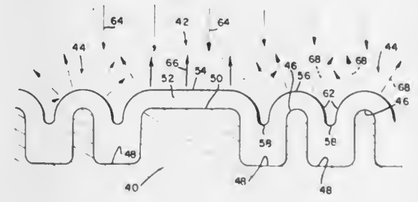
ble for sensing the presence of said inter-mode heterodyne component within the output signal from the photo-sensitive means and for forming a path length varying means control signal which is dependent upon said component and which causes the path length of the secondary ring to be varied to suppress said component and hence also said undesired longitudinal resonance mode.

4,632,556
METHOD AND APPARATUS FOR OPTICALLY MEASURING CLEARANCE CHANGE
Toshio Akatsu, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 7, 1983, Ser. No. 540,157
Claims priority, application Japan, Oct. 22, 1982, 57-184526
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—351 **9 Claims**



1. A method of optically measuring a change in a clearance formed between two members by radiating a light beam onto the two members and utilizing light reflected from the two members, the method comprising the steps of: attaching an optical element for changing the plane of polarization of light to one of the two members; irradiating the other member with coherent linearly polarized light through the optical element; obtaining a light beam reflected from the optical element; obtaining a light beam reflected from the other member and passed through the optical element and having a plane of polarization normal to the plane of polarization of the light beam reflected from the optical element; passing the two reflected light beams through optical-path regulation means including an electrooptical crystal member having a variable refractive index which varies in dependence upon an applied voltage, and polarizing means; applying a radio-frequency voltage to the optical-path regulation means; causing the two reflected light beams to interfere with each other; converting the intensity of the interference light to an electric signal; feeding a voltage signal generated in response to the electrical signal back to the optical-path regulation means through a control circuit so that a difference between the optical paths of the two reflected light beams is maintained constant, the control circuit including a first circuit for generating an output voltage which compensates for a change of the difference between the optical paths of the two reflected light beams in accordance with the electrical signal and the radio-frequency voltage, a second circuit for generating the radio-frequency voltage, and an adder for adding the output voltage of the first circuit and the radio-frequency voltage of the second circuit for providing the voltage signal to be applied to the optical-path regulation means; and measuring the change in the clearance between the two members from the output voltage of the first circuit.

4,632,557
ALIGNMENT TARGET IMAGE ENHANCEMENT FOR MICROLITHOGRAPHY PROCESS
Thomas K. Thompson, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Jan. 23, 1985, Ser. No. 694,096
Int. Cl.[4] G01B *11/27*
U.S. Cl. 356—401 **9 Claims**



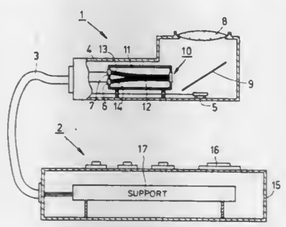
1. An alignment target comprising:
a substrate;
a flat target region of a light reflecting characteristic on said substrate; and
a contrast region of a plurality of peaks and valleys contiguous to said target region of a light scattering characteristic on said substrate;
the lateral area of said contrast region being substantially greater than the lateral area of said target region to enhance the contrast of said target region.

4,632,558
COLOR ANALYZER
Egbertus J. P. Maassen, and Franciscus A. M. M. van Meel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1984, Ser. No. 595,778
Claims priority, application Netherlands, Apr. 6, 1983, 8301198
Int. Cl.[4] G01J *1/00*; G03B *27/80*
U.S. Cl. 356—404 **5 Claims**

1. In a color analyzer for determining exposure time required for printing color photo negatives by an enlarger, said analyzer comprising
a measuring unit including at least one photoelectric cell for measuring characteristic values of blue, green, and red measured for a test print as electrical signals S_{BO}, S_{GO}, and S_{RO}, said measuring unit receiving light signals from the enlarger,
a control unit electrically connected to said at least one photoelectric cell in said measuring unit, said control unit including electrical circuit means for determining exposure time t relative to a quantity of light measured by said

at least one photoelectric cell, said electrical circuit means including a time indicating device, and said control unit including memory means for storing at least said electrical signals,

the improvement comprising said at least one photoelectric cell generating electric signals S_B, S_G, and S_R representative of color components blue, green, and red for a color photo negative in said enlarger, and



said electrical circuit means of said control unit controlling said exposure time t to a value

$$t = 3t_o/[(S_B/S_{BO})+(S_G/S_{GO})+(S_R/S_{RO})]$$

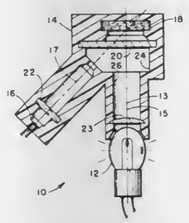
where t_o is the exposure time for said test print.

4,632,559

OPTICAL READHEAD

Albert Brunsting, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 445,203, Nov. 29, 1982, abandoned. This application Feb. 21, 1985, Ser. No. 704,767
Int. Cl.⁴ G01J *3/51*; G01N *21/47*
U.S. Cl. 356—416 **9 Claims**



1. Apparatus for measuring nonspecular reflected light which comprises a light source, means for supporting a specimen having a surface the reflectance of which is to be measured upon exposure to light emitted from said light source, and means for detecting light reflected from the surface of the specimen, wherein the apparatus is characterized by:

means defining a light illuminating transmission path in which the light source is located at one end thereof and the means for supporting the specimen having a surface the reflectance of which is to be measured is located at the opposite end thereof, said light illuminating transmission path containing a lens in front of said light source;

a light trap positioned at the end of the light illuminating transmission path opposite said light source and in front of said means for supporting the specimen having a surface the reflectance of which is to be measured; and

means defining a light detection transmission path in which said light trap is located at one end and means for detecting light reflected from a surface of a specimen the reflectance of which is to be measured is located at the opposite end of said light detection transmission path;

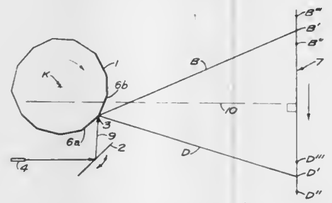
wherein the combined effect of the lens and the light trap prevents specular reflected light from being transmitted through said light trap to said means for detecting light.

4,632,560

METHOD AND APPARATUS FOR IMPROVED INSPECTION OF CONTINUOUS WEBS

Horace C. Stringfield, 110 Lakeside Ave., Pompton Lakes, N.J. 07442

Continuation of Ser. No. 602,737, Apr. 23, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,079
Int. Cl.⁴ G01N *21/84*
U.S. Cl. 356—431 **9 Claims**



1. An improved apparatus for inspecting successive impressions on a moving target web, comprising:

(i) linear target support means,

(ii) a rotatable member having a plurality of light reflecting surfaces successively presented by its rotary movement to receive and reflect successive light rays from the impressions on the moving target web during their movement throughout the observable pattern,

(iii) means for rotating said rotatable member in time relation with the moving target web to produce a sweeping scanning angle whereby when the light rays reflected by the rotatable member are viewed, the impressions on the target web at the end of the sight lines which define the sweeping scanning angle will appear substantially stationary, and

(iv) means for continuously maintaining exact correspondence of the sweeping scanning angle to one repeat length of the target web.

4,632,561

EVALUATION OF SURFACE AND SUBSURFACE CHARACTERISTICS OF A SAMPLE

Allan Rosencwaig, Danville, and Jon Opsal, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Filed Apr. 30, 1985, Ser. No. 728,759
Int. Cl.⁴ G01N *21/47*
U.S. Cl. 356—432 **12 Claims**

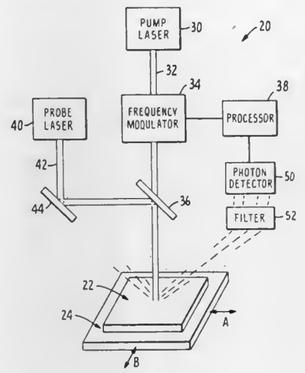
1. An apparatus for evaluating surface and subsurface features in a sample comprising:

a periodic excitation source for supplying energy to the surface of the sample;

a radiation probe beam;

means for directing said probe beam within at least a portion of the area on the surface of the sample which is being periodically excited such that a portion of said probe beam is scattered from the periodically excited area;

means for monitoring intensity changes of the scattered probe beam radiation and generating an output signal corresponding thereto; and



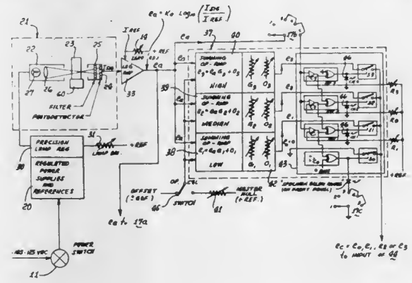
means for processing the output signal corresponding to the measured intensity changes of the scattered probe beam to evaluate the sample.

4,632,562

SPERM DENSIMETER

James N. Dupree, South El Monte, and Jack E. Peterson, West Covina, both of Calif., assignors to Dupree, Inc., Chino, Calif.

Division of Ser. No. 605,123, Apr. 30, 1984. This application Aug. 9, 1985, Ser. No. 764,099
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 356—436 **7 Claims**



1. A method of measuring density of sperm in a sample, including the steps of:

measuring the optical absorbance of a diluent-filled cuvette to obtain a measured output and adjusting the measured output to a null for standardizing the measurement;

measuring the optical absorbance of a sample specimen to provide an analog absorbance signal which varies as a function of sperm density in the sample specimen;

providing said analog absorbance signal as input to at least three summing channels as summing signals defining a line having slope and vertical offset;

changing the slope and vertical offset of each of said summing signals by multiplying the summing signal by a first amount and adding a second amount to the product, to provide changed signals;

determining the level of said analog absorbance signal and selecting one of said changed signals as a selected analog output signal; and

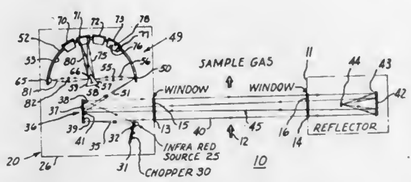
displaying the selected analog output signal as a direct indication of density.

4,632,563

IN-SITU GAS ANALYZER

Harry C. Lord, III, Pasadena, Calif., assignor to The Syconex Corporation, San Dimas, Calif.

Continuation-in-part of Ser. No. 470,146, Feb. 28, 1983, abandoned. This application Jun. 12, 1984, Ser. No. 619,818
Int. Cl.⁴ G01N *21/35*
U.S. Cl. 356—437 **23 Claims**



1. In an instrument for measuring the concentration of a gas in a stream of other gases, utilizing a beam of spectral energy which has passed through or emanated from at least some part of said stream, an analyzer comprising:

a plurality of gas cells spaced apart from one another;

an initial reflector;

a rotatable deflector, comprising a pair of deflecting reflectors rotatably carried by it, said deflecting reflectors forming an angle with one another, the center of rotation of said deflector lying inside said angle;

means for rotating said deflector;

a spectral source or a spectral detector, said cells, initial reflector, rotatable deflector and source or detector being fixedly located relative to one another such that fixed beam segments of said beam are formed between the initial reflector and the rotatable deflector, and between the rotatable deflector and the source or detector, and an angularly movable beam segment of said beam is formed between each of the deflecting reflectors of the rotatable deflector and the locus of said cells which movable beam segments can be moved from cell to cell as the consequence of rotation of the rotatable deflector, a first of said movable beam segments extending from one of said deflecting reflectors to said cell locus, and the other of said movable beam segments extending from the said locus to the other of said deflecting reflectors; and

reflecting means adjacent to each said cell for reflecting the beam from one of said movable beam segments to the other, after the beam has passed through the cell at least once.

4,632,564

APPARATUS FOR REMOVING MOISTURE AND VOLATILES FROM MOLDING PARTICULATE PLASTIC MATERIAL FEED

Jaroslav J. Kopernicky, Bramalea, Canada, assignor to Mapro Inc., Georgetown, Canada

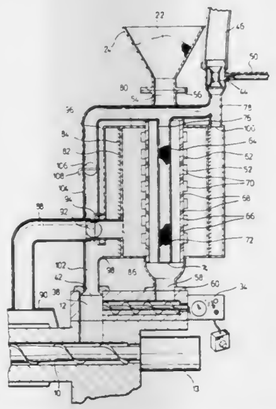
Division of Ser. No. 578,879, Feb. 10, 1984, Pat. No. 4,591,467, which is a continuation-in-part of Ser. No. 517,580, Jul. 27, 1983, abandoned. This application May 8, 1985, Ser. No. 731,982
Claims priority, application Canada, Jul. 22, 1983, 433,017
Int. Cl.⁴ B29B *7/60, 7/84*
U.S. Cl. 366—75 **7 Claims**

1. Apparatus for removing volatiles from plastic material being fed and plasticized for molding by an elongated plasticizing screw which rotates in a heated barrel, the barrel having a common opening through which the particulate plastic material is received and the volatiles are removed, the screw having a plasticizing portion and a conveying portion, the conveying portion extending upstream from the plasticizing portion to said opening in the barrel, comprising:

(i) means for preheating the particulate plastic material to remove moisture as it is fed to said opening in the barrel,

(ii) controlled supply means for feeding the particulate plas-

tic material through said opening in the barrel, whereby the rate of feed is controlled to only partially fill the barrel with particulate material adjacent said opening, the controlled supply means comprising uncontrolled feed means connected to supply particulate plastic material to flow control means, the flow control means comprising a rotary valve means mounted in the feed passage below the feed means, the valve means having a plurality of pitched blades extending around a hollow central duct which leads upwardly to the suction means and controlled means for rotating the blades, whereby particulate plastic material flows downwardly between the blades when they are rotated in a horizontal plane at a controlled rate and the hot volatiles are removed upwardly through the hollow central duct, and



(iii) suction means connected to apply sufficient suction to remove hot volatiles which are released through opening in the barrel as the particulate plastic material gradually is melted by the heat and shearing forces as it is compressed by the screw,

whereby the interruption of flow of the particulate material into said barrel opening by bridging of the particulate material across said barrel opening is avoided.

4,632,565

APPARATUS FOR BLENDING PARTICULATE SOLIDS

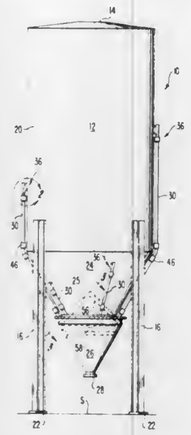
William J. Mahoney, Jr., Williamsport, Pa., assignor to The Young Industries, Inc., Muncy, Pa.

Filed Oct. 29, 1984, Ser. No. 665,645

Int. Cl.[4] B01F *5/00, 15/02*

U.S. Cl. 366—113 **20 Claims**

1. An apparatus for blending particulate materials comprising means defining an upper chamber for holding a supply of particulate material, said material holding means having at least one wall, said wall of said material holding means having at least two outlet ports spaced vertically and about a perimeter of said material holding means for receiving therethrough particulate material from said upper chamber by gravity flow, means defining a lower chamber for blending particulate materials, said material blending means having at least one wall, said wall of said blending means having at least two inlet ports, conduits disposed externally of said material holding means and said material blending means, each intercommunicating one of said outlet ports and one of said inlet ports for conveying a stream of particulate material from said upper chamber to said lower chamber by gravity flow, valve means disposed in said material blending means, movable between closing and



opening positions relative to said inlet ports, and means for operating said valve means.

4,632,566

ICE-CREAM MAKING MACHINE

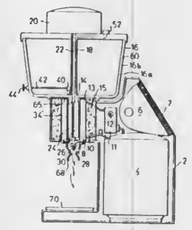
Ruben Masel, 16 Hatzabar Street, Kiron, and George Valdshtein, Holon, both of Israel, assignors to Ruben Masel, Kiron, Israel

Filed Sep. 25, 1985, Ser. No. 779,979

Claims priority, application Israel, Sep. 26, 1984, 73082

Int. Cl.[4] A23G *9/00*

U.S. Cl. 366—149 **20 Claims**



1. An ice-cream making machine, comprising:

a receptacle for making liquid ingredients to be used for making ice-cream;

an ice-cream outlet;

a cooling duct having an inner face along which the ingredients from the receptacle are conveyed to said ice-cream outlet;

an air inlet into said cooling duct;

a rotor including a plurality of blades rotatably driven within said cooling duct and effective to atomize the liquid ingredients as atomized particles mixed in air and to direct them against the inner face of said cooling duct;

cooling means for cooling said cooling duct to a temperature below 0° C. for instantly freezing the atomized particles when contacting the inner face of said cooling duct

and a valve for controlling the rate of flow of the air from said air inlet to said cooling duct, to vary the density of the ice-cream produced.

4,632,567

VESSEL FOR RECEIVING, TRANSPORTING AND MIXING VISCOUS, ESPECIALLY HIGHLY VISCOUS, LIQUIDS

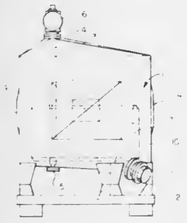
Georg F. Vock, Münster, and Lutz Küter, Steinfurt, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,568

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 8411325

Int. Cl.[4] B01F *7/18*

U.S. Cl. 366—276 **10 Claims**



1. A vessel for receiving, transporting and mixing viscous, especially highly viscous, liquids, having an essentially square cross-section with first, second, third and fourth quadrants, a center defined by an intersection of said four quadrants, a drive shaft arranged offset relative to said center of the vessel in said first quadrant, a mixing paddle located on said shaft, and having means for driving said paddle in a to-and-fro movement, said vessel having a given height and said paddle having a height which is less than said given height, said shaft arranged vertically and centrally in said first quadrant, said third quadrant located opposite said first quadrant having an outer corner sloping inwards from a top edge of said vessel towards an underside of said vessel defining a triangular wall surface, and a discharge connection for said vessel located on an underside of said triangular wall surface widening downwards.

4,632,568

STATIC MIXING COLUMN

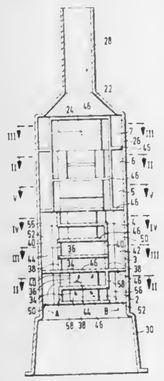
Edgar F. Emele, Augsburg, and Nikolaus Brugner, Ziemetshausen, both of Fed. Rep. of Germany, assignors to Ritter-Plastic GmbH, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 739,030

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420290

Int. Cl.[4] B01F *5/00*

U.S. Cl. 366—337 **9 Claims**



1. A static-mixing column for installation in a housing, for mixing of a plurality of liquid or pasty components of material received from reservoirs, comprising a plurality of tiers arranged one on top of another to form a column-like structure having an axis, where the plurality of tiers are open towards the circumferential periphery of the column, each tier having:

an entrance having at least two passage openings through which the material enters the tier;

at least two flow-division chambers at least partially positioned above one another and at least partially overlapping one another, each flow-division chamber having an input connected to a respective one of the passage openings through which the material enters the flow-division chamber, a flow-division wall placed for being contacted by the material flowing through the flow division chamber for dividing the incoming material, and two output openings through which the divided material exits the flow-division chamber; and

an exit having mixing chambers positioned at and connected to the output openings of the flow-division chambers for mixing the material leaving the flow-division chambers;

where successive tiers are progressively shifted angularly with respect to each other around the axis of the column in the same direction of rotation, such that the mixing chambers of a lower tier are in communication with the passage openings of the next upwardly adjacent tier.

4,632,569

TIMEPIECE WITH CALENDAR

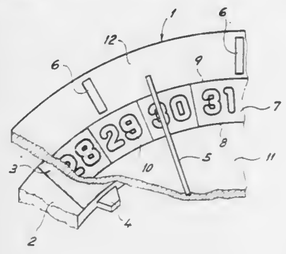
Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Lengnau, Switzerland

Filed Dec. 13, 1985, Ser. No. 808,696

Claims priority, application Switzerland, Dec. 14, 1984, 05947/84

Int. Cl.[4] G04B *19/20*

U.S. Cl. 368—35 **19 Claims**



1. A calendar timepiece including a dial over which are displaced at least a minutes hand and an hours hand and under which is disposed a calendar mechanism comprising at least one date ring on which is placed an index, said dial including an annular zone of transparent material through which appears said date ring with its index and said dial bearing indications relating to the date.

4,632,570

TIMER FOR USE IN INTERVAL TRAINING

Terry D. Kelsey, Portland, Oreg., assignor to Mark Chan, Portland and Kevin Drew, McMinnville, both of, Oreg.

Filed Sep. 6, 1985, Ser. No. 773,313

Int. Cl.[4] G04F *8/00*

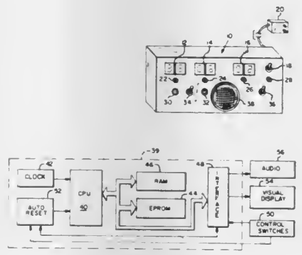
U.S. Cl. 368—107 **10 Claims**

1. A timer, comprising:

(a) countdown timing means for measuring the duration of each respective exercise period and rest period of a workout including a predetermined number of sequential sets, said predetermined number optionally being greater than one, each said set comprising a respective exercise period

of time and each set except a final set including a respective subsequent rest period of time;

(b) countdown time display means for displaying visibly, during each said exercise period, a digital indication of the amount of time remaining in said exercise period, and for displaying visibly, during each said rest period, a digital indication of the amount of time remaining in said rest period;



(c) presettable countdown set counter means responsive to said countdown timing means, for determining the completion of each exercise set and calculating the number of exercise sets of said predetermined number remaining uncompleted in a workout; and

(d) set count display means, responsive to said set counter means, for displaying a digital indication of the number of sets remaining uncompleted during said workout.

4,632,571

ELECTRONIC WATCH MODULE ABLE TO ADAPT THE POLARITY OF A CELL TO THAT OF THE WATCH CIRCUIT

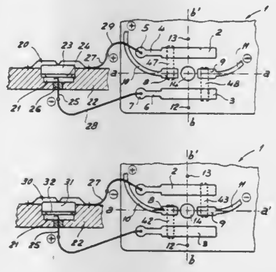
Philippe Morata, Bienne, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Granges, Switzerland

Filed Feb. 21, 1986, Ser. No. 831,765

Claims priority, application Switzerland, Feb. 22, 1985, 814/85

Int. Cl.⁴ G04B *1/00*

U.S. Cl. 368—203 **2 Claims**



1. An electronic watch module comprising (a) a first printed circuit having first and second conductive areas arranged to be respectively connected to a pair of electrodes of a cell and third and fourth conductive areas respectively connected to a pair of terminals of an electronic circuit, and (b) a second printed circuit, having conductive areas, arranged to cooperate with the first printed circuit in either of two set and identifiable positions such that, in the first position, the conductive areas of the second printed circuit connect the first area to the third and the second to the fourth and that, in the second position, the conductive areas of the second printed circuit connect the first area to the fourth and the second to the third, thereby enabling said electronic circuit to be supplied, in the first position of the second printed circuit, by a cell whose electrodes have one polarity and, in its second position, by a cell whose electrodes have a reverse polarity.

4,632,572

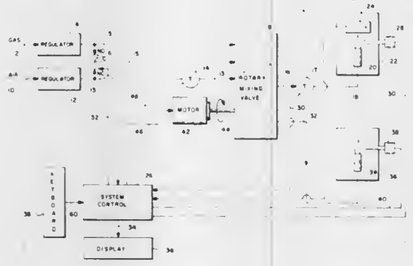
IMPURITY COMPENSATION FOR COLORIFIC CONTENT ANALYZER

William B. Kude, Plymouth, and A. Noel J. Pearman, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 433,181, Oct. 6, 1982, Pat. No. 4,511,262. This application Nov. 19, 1984, Ser. No. 672,726

Int. Cl.⁴ G01N *25/22*

U.S. Cl. 374—37 **14 Claims**



1. A method of determining the heating value of impure gaseous fuels containing an unknown amount of a known additional constituent of interest (impurity) comprising the steps of:

establishing a first mixture of the impure fuel and air of known proportions;

oxidizing said first mixture of known proportions;

sensing the products of combustion of said mixture with a sensor having an output with a peak sensitivity at a known percentage composition of a known control constituent in the products of oxidation;

adjusting the proportions of impure fuel and air in said first mixture based on the output of said sensor until said control constituent is at said known percentage;

determining the fuel to air ratio of said first mixture at said control constituent percentage from a known relationship between the heating value of the fuel and the amount of oxygen required for stoichiometric oxidation thereof;

establishing a second mixture of said impure fuel and air of known proportions into which a known additional amount of said impurity is introduced;

oxidizing said second mixture of known proportions;

sensing the products of combustion of said second mixture with said sensor;

adjusting the proportions of impure fuel and air in said second mixture based on the output of said sensor until said control constituent is at said known percentage;

determining the fuel to air ratio of said second mixture in the manner of said first mixture;

determining the heating value of said impure fuel from a known relationship between the stoichiometric fuel to air ratios of both of said first and second mixtures and the heating value of said gaseous fuel and the heating value (positive or negative) of said impurity.

4,632,573

LINEAR MOTION BALL BEARING

Katsutoshi Itoh, Yamatotakada, Japan, assignor to Tsubakimoto Precision Products Co., Ltd., Osaka, Japan

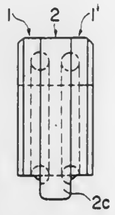
PCT No. PCT/JP85/00173, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO86/02417, PCT Pub. Date Apr. 24, 1986

PCT Filed Apr. 5, 1985, Ser. No. 804,653

Claims priority, application Japan, Oct. 11, 1984, 59-211514

Int. Cl.⁴ F16C *31/06*

U.S. Cl. 384—43 **1 Claim**



1. A linear motion ball bearing comprising:

upper and lower generally C-shaped members each having a generally C-shaped groove of approximately semi-circular cross-section formed in one face thereof, the C-shaped groove comprising a return path and two reversing paths, one adjacent to each end of the return path, each reversing path having an end connected to the adjacent end of the return path, and an opposite end, said opposite ends of the reversing paths being opposed to each other, and each C-shaped member having a gap between said opposed ends of the reversing paths of its grooves, the gap being adapted to receiving a leg portion of a bearing body, and the grooved faces of the upper and lower C-shaped members facing and being spaced from each other;

an intermediate member located between the upper and lower members, said intermediate member having upper and lower grooved faces, a portion of the groove in each face being generally C-shaped and semi-circular in cross-section, and confronting the generally C-shaped groove of one of the upper and lower members to provide a substantially enclosed generally C-shaped ball circulation path of circular cross-section, the intermediate member also having a portion of the groove in each of its faces connecting the ends of the C-shaped groove portion in each face, said connecting portion having an approximately quarter-circular cross-section, and the intermediate member having a central opening surrounded by said grooves in the upper and lower grooved faces thereof, said opening being adapted to receive a leg portion of a bearing body; and

a bearing body extending through said opening of the intermediate member and being received in the gaps of the upper and lower members, said bearing body having load-bearing, ball-receiving grooves;

the quarter-circular portions of the grooves in the intermediate member being opposed to the grooves of the bearing body, whereby balls in said load bearing grooves are retained therein by said quarter-circular groove portions.

4,632,574

APPARATUS FOR FLUIDIC SUPPORT

James L. Wilson, San Antonio, Fla., and Robert C. Folweiler, Bedford, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

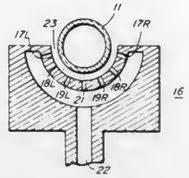
Filed Jan. 2, 1985, Ser. No. 688,226

Int. Cl.⁴ F16C *32/02, 32/06;* C03B *40/04*

U.S. Cl. 384—12 **11 Claims**

1. A fluid bearing comprising a structure having a hemicylindrical concave upper surface with solely one radially extending recess formed therein so that solely one radially extending end wall is formed at each axial end of said recess;

said concave upper surface having a plurality of radially



disposed orifices oriented along said recess, said orifices being symmetrically disposed therealong; and

means for applying fluid to said orifices interior to said structure.

4,632,575

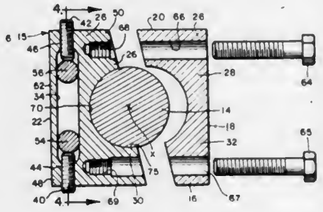
CYLINDER-MOUNTING BRACKET

Ronald W. Alverth, Lombard, and Donald H. Busam, Oak Forest, both of Ill., assignors to The Mako-Tek Corporation, Downers Grove, Ill.

Filed Sep. 9, 1985, Ser. No. 773,551

Int. Cl.⁴ F16C *23/00*

U.S. Cl. 384—258 **8 Claims**



1. Means for mounting a shaft of a printing press cylinder and the like from a pair of upright supports in parallelism with an associated cylinder comprising:

a pair of identical brackets each having a base section and a mating clamping section attachable thereto, the mating sections having semi-cylindrical concavities opposing each other in assembled position of said sections and defining a shaft-admitting bore,

each bracket having means for adjustment horizontally in a first mounted position on its associated support and for vertical adjustment in a second mounted position on its associated support,

one of said brackets being mounted on one support in said first position and the other bracket being mounted on the other support in said second position,

each bracket having a parting line between its sections disposed in an axial plane of the bore therein,

the bracket mounted in the first position having the concavity in its base section facing upwardly and the bracket mounted in said second position having the concavity in its base portion facing laterally and disposing a lower portion thereof in a location sufficient to cup under one end of a shaft placed thereon and hold said shaft within the laterally facing concavity while the other end of the shaft is placed in the upwardly facing concavity of the base portion of the bracket disposed in said first position to facilitate assembly of the clamping sections with the respective base sections.

4,632,576

BEARING UNITS

Hubert W. T. Neal, Luton, England, assignor to SKF (U.K.) Limited, Bedforshire, England

Filed May 6, 1985, Ser. No. 730,812

Claims priority, application United Kingdom, May 10, 1984, 8411972

Int. Cl.⁴ F16C *23/06*

U.S. Cl. 384—537 **10 Claims**



1. A bearing unit adapted to be fitted in a housing having an end wall providing an abutment for the bearing unit, the bearing unit comprising an outer annular bearing member and an inner annular bearing member, the two bearing members being rotatably mounted relative to one another by rolling elements between the two members, and one of said bearing members having a side face and a plurality of projections spaced symmetrically around the bearing member and extending axially beyond said side face so that the projections engage the end wall of the housing upon fitting of the bearing unit into the housing, wherein each projection comprises an arched portion adapted to collapse progressively with permanent deformation of the arched portion when the projection is compressed between said one bearing member and the end wall of the housing during the fitting of the bearing unit into the housing, whereby the projections function as a spacer between the bearing unit and the end wall of the housing during operation of the bearing unit, the width of which spacer being substantially constant and determined by the axial force exerted on the bearing unit during the fitting of the bearing unit into the housing.

4,632,577

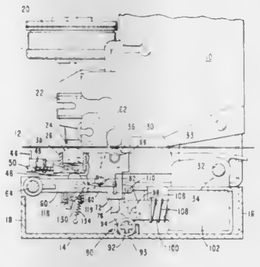
RECORD MEDIA THICKNESS COMPENSATING MECHANISM

Robert A. Brull, Dryden; Alan H. Walker, Barton, and William V. McFall, Dryden, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 16, 1985, Ser. No. 776,243

Int. Cl.⁴ B41J *11/08*

U.S. Cl. 400—56 **20 Claims**



1. Record media thickness compensating mechanism for use in a printer having an operating print head, the mechanism comprising a

first arm assembly pivotally supported from the printer and carrying a platen opposite the print head,

first camming means pivotally supported from the printer and operably associated with the first arm assembly,

means for rotating the first camming means for moving the platen toward and away from the print head during respective printing and non-printing conditions,

second camming means pivotally supported from the printer, a

second arm assembly pivotally supported from the printer and carrying a record media feed roller opposite a pressure roller for advancing record media and for providing a gap between the feed roller and the pressure roller,

linkage means comprising a lost motion type arrangement operably connecting the first arm assembly and the second arm assembly for providing a gap between the print head and the platen that is substantially equal to the gap between the pressure roller and the feed roller, and

means operably associated with the first and second camming means for maintaining the platen in position during printing operation.

4,632,578

COMPUTERIZED PRINTING SYSTEM

William A. Cuff, Sylmar, and Jerrold P. Lefler, Encino, both of Calif., assignors to Digitext, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 250,785, Apr. 3, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 502,532

Int. Cl.⁴ B41J *3/26, 3/516*

U.S. Cl. 400—91 **11 Claims**



1. A method of translating a plurality of shorthand strokes, representative of written and spoken material, into text, the shorthand strokes being generated according to a preselected shorthand system, the method of translating comprising the steps of:

(a) storing a dictionary of a preselected shorthand system in a computer, the dictionary including text definitions for a predefined set of shorthand strokes;

(b) then producing a computer readable record of the shorthand stroke representations of said material in accordance with said preselected shorthand system, the preselected shorthand system including means for locating at least one first level pointer in the record, each first level pointer having an unambiguous definition in said dictionary;

(c) then applying the computer readable record to the computer for translating said shorthand strokes, the step of applying the record to the computer comprising the steps of:

(1) comparing the record against the dictionary to identify at least one portion of the record whose translation to text is a first level pointer;

(2) starting with the stroke immediately following the identified first level pointer, successively combining strokes and comparing each combination against the dictionary for locating the longest unambiguous match, the longest located unambiguous match defining a translatable portion of the record and further defining a next level pointer; and

(3) repeating step (2) using each next level pointer in place of said first level pointer until said record is substantially translated.

4,632,579

PRINTING SYSTEM IN DOT PRINTER

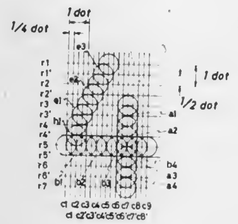
Hirokuni Takano; Tadao Shimizu, and Osamu Izaki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 633,986, Jul. 25, 1984, abandoned. This application Dec. 26, 1985, Ser. No. 815,280

Claims priority, application Japan, Jul. 26, 1983, 58-135228; Sep. 21, 1983, 58-173163

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—121 **3 Claims**



1. A method for printing characters by aggregated dots with a dot printer, comprising the steps of:

generating a basic dot matrix pattern with dots in rows and integer columns;

generating a second dot matrix pattern from the basic dot matrix pattern with all dots of the second dot matrix pattern being between and in overlapping relation to said dots in said integer columns of the basic matrix pattern;

said step of generating a second dot matrix pattern including the steps of:

generating a dot of said second dot matrix pattern between each adjacent two dots of said basic dot matrix pattern which are positioned in the same integer column, only when said generated dot is positioned between and overlaps said two dots in the same integer column;

generating a dot of said second dot matrix pattern between each two dots of said basic dot matrix pattern which are positioned in adjacent integer columns and in adjacent rows;

generating a dot of said second dot matrix pattern between each three dots of said basic dot matrix pattern which are positioned in three consecutive integer columns and two adjacent rows in a substantially isosceles triangular configuration, such that the generated dot is positioned between and overlaps said three dots;

synthesizing and editing dots of said basic dot matrix pattern and said second dot matrix pattern to form a synthesized dot matrix pattern; and

printing dots of said synthesized dot matrix pattern on a printing medium with at least two printing passes.

3. A method for printing characters by aggregated dots with a dot printer, comprising the steps of:

(a) generating a basic dot matrix pattern with dots in rows and integer columns;

(b) generating an auxiliary dot matrix pattern as part of said basic dot matrix pattern corresponding to row and integer column positions where addition of certain interpolated dots are to be inhibited;

(c) generating a second dot matrix pattern from the basic dot matrix pattern with all dots of the second dot matrix pattern being between and in overlapping relation to said dots in said integer columns of the basic matrix pattern and corresponding to said interpolated dots;

(d) synthesizing and editing dots of said basic dot matrix pattern and said second dot matrix pattern to form a synthesized dot matrix pattern;

(e) printing dots of said synthesized dot matrix pattern on a printing medium with at least two printing passes by a printing device; and

(f) inhibiting the supply of dots of said second dot matrix pattern in correspondence with said auxiliary dot matrix pattern, when two dots of said second dot matrix pattern are generated in association with dots of said basic dot matrix pattern which are in consecutive rows and consecutive integer columns.

4,632,580

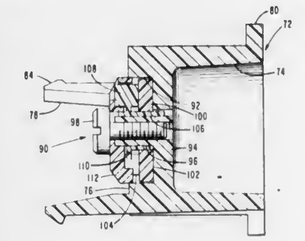
DOT MATRIX PRINT HEAD DAMPENING MECHANISM

Robert L. Wirth; Kenneth W. Hanna, both of Ithaca, and Hillis L. Wilson, Groton, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 25, 1985, Ser. No. 715,868

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **19 Claims**



1. A wire matrix print head comprising a

housing portion, a

plurality of print wires extending through said housing portion and movable from a non-printing position to a printing position,

means for actuating the print wires from the non-printing to the printing position,

means for supporting the actuating means in position relative to the housing portion to provide an operating arrangement of the print wires,

armature means operable associated with the actuating means and with the print wires for operating the print wires from the non-printing to the printing position,

means engageable with said supporting means and with said housing portion for securing thereof and including a hollow cylindrical portion at one end of said engageable means, and

means including a dampening member coupled with said engageable means and seated in said hollow cylindrical portion and plunger means having a sleeve portion extending through said dampening member and including a plurality of individual elements hinged to said sleeve portion and integral therewith and engaging said dampening member for providing dampening for the print wires upon return from the printing to the non-printing position.

4,632,581

SERIAL PRINTER HAVING TRIGGER MECHANISM

Kiyoshi Ito, and Taro Takekoshi, both of Shiojiri, Japan, assignors to Seiko Epson Corporation, Suwa, Japan

Filed Nov. 13, 1984, Ser. No. 670,699

Claims priority, application Japan, Nov. 10, 1983, 58-211657; May 11, 1984, 59-94923; May 22, 1984, 59-102846

Int. Cl.⁴ B41J *1/46, 1/54*

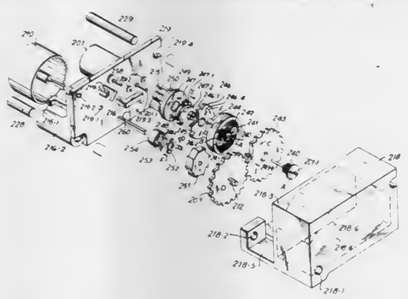
U.S. Cl. 400—187 **35 Claims**

1. A trigger mechanism for use with a serial printer comprising:

a hammer;

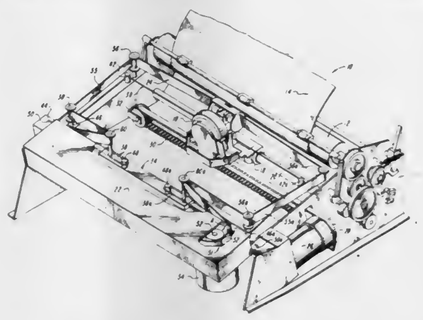
a type wheel stack including at least two print wheels each having a plurality of peripherally positioned types, the type wheel stack being mounted for rotation about an axis and for shifting along the axis;

a prime mover;
first transmission means for rotating the type wheel stack;
second transmission means for shifting the type wheel stack to position a selected type wheel in front of the hammer;
third transmission means for driving the hammer to effect printing;
first switching means for selectively coupling power from the prime mover to the first transmission means;
second switching means for selectively coupling power from the first transmission means to the second transmission means when the first transmission means is being driven;



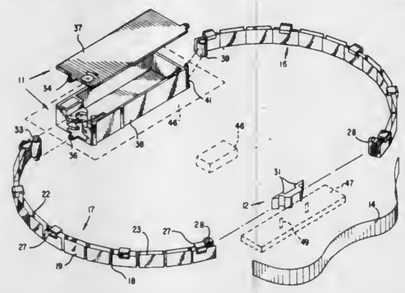
third switching means for coupling power from the prime mover to the third transmission means;
first trigger means for triggering the first switching means;
second trigger means for triggering the second switching means and;
third trigger means for triggering the third switching means, the first and the third trigger means including a common trigger magnet, the third trigger means being triggerable after the triggering and release of the first trigger means, the second trigger means being independent of the first and third trigger means.

4,632,582
RIBBON FEED MECHANISM PROVIDING A CONSTANT RELATIVE VELOCITY BETWEEN RIBBON AND PRINT HEAD
Eric A. Houston, Cambridge, Mass., assignor to Centronics Data Computer Corp., Hudson, N.H.
Filed Feb. 22, 1985, Ser. No. 704,257
Int. Cl.[4] B41J *33/08, 33/38*
U.S. Cl. 400—232 **3 Claims**



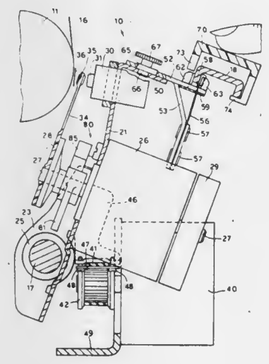
1. A ribbon feed mechanism for a printer designed to print on paper having a frame, and a platen comprising:
traversable print head means adjacent the platen, for printing on paper overlaying the platen;
driving means for selectively driving said print head means along a print line according to designated locations;
a ribbon that is supported on the printer frame;
ribbon supply means for storing said ribbon;
ribbon take-up means, which take-up means is able to take up said ribbon at a constant lineal speed;
ribbon guide means for guiding said ribbon from said ribbon supply means, to a position adjacent the platen and between said print head means and the platen, and then to said ribbon take-up means; and
mechanical coupling means for maintaining a constant relative velocity between the portion of said ribbon adjacent to said platen and said print head means comprising:
a shuttle;
a mechanical linkage means that drives the shuttle in a direction opposite to that of the print head means and at one-half the speed of the print head means comprising;
a pair of inelastic bands attached to said print head means, which bands extend away from the print head along opposite, substantially co-linear paths substantially parallel to said print line, around a first and second pair of freely rotatable pulleys fixed to the frame, around a pair of freely rotatable pulleys attached to said shuttle, and terminating at points stationary relative to the frame, spaced apart a distance sufficient to allow the shuttle to travel at least one-half the maximum travel range of said print head means; and
means for creating a ribbon path which trains the ribbon through the shuttle after the ribbon has been guided from the ribbon supply means and before said ribbon is supported adjacent to said platen, and then trains the ribbon adjacent said platen and then through the shuttle again before the ribbon is taken up by said take-up means, such that the ribbon forms a pair of loops on either side of the shuttle, such that as the shuttle moves, the length of ribbon in the loop toward which the shuttle moves decreases and the length of ribbon in the opposite loop increases by an amount equal to the amount of the decrease of the first loop.

4,632,583
FLEXIBLE LEADER
Dennis P. Nash, Deerfield Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 1, 1984, Ser. No. 656,816
Int. Cl.[4] B41J *35/04*
U.S. Cl. 400—248 **10 Claims**



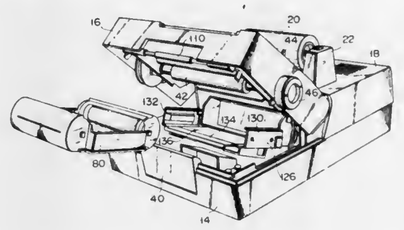
1. A flexible leader for guiding a ribbon in a ribbon supply apparatus comprising:
a U-shaped channel having two sides and a bottom wherein a first one of the sides is continuous and a second one of the sides and the bottom are discontinuous so that bending of the channel occurs in one direction only; and
a plurality of substantially vertical raised ridges on the inside of at least one of the sides of the channel whereby frictional contact between the ribbon and the leader is reduced without a reduction in the flexibility of the leader.

4,632,584
SERIAL PRINTER
Raffaele Becchi, Ivrea, and Felice Giacone, Giaveno, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Mar. 28, 1984, Ser. No. 594,274
Claims priority, application Italy, Mar. 30, 1983, 67354 A/83
Int. Cl.[4] B41J *11/22, 25/28, 5/22;* **B65D** *63/00*
U.S. Cl. 400—356 **6 Claims**



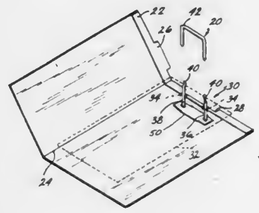
1. A serial printer comprising:
a platen;
a fixed guide disposed below said platen and parallel thereto;
a fixed bar disposed in front of said platen and parallel thereto;
a printer carriage having a front portion and a rear portion;
means for slidably mounting said rear portion of said print carriage on said fixed guide;
a sliding element mounted on said front portion of said print carriage and cooperating with said fixed bar for holding said print carriage normally leaned against said fixed bar in an operative printing position with respect to said platen;
means for translating said print carriage along said fixed guide from a rest position towards a plurality of printing positions along said platen when said carriage is in said operative printing position; and
a release member mounted on said fixed bar for cooperating with said sliding element when said print carriage is in said rest position for selectively disconnecting said sliding element from said bar and allowing an automatic swing of said print carriage about said fixed guide from said operative position to a service position,
wherein said sliding element comprises a slider member cooperative with said fixed bar and a first flexible blade substantially parallel to said fixed bar and having a first end connected to said front portion of said print carriage and a second end connected to said slider member,
wherein said first flexible blade is normally in a rest position in which said slider member cooperates with said fixed bar, and
wherein said flexible blade is flexible by means of said release member from its rest position to an actuated position in which said slider member is disengaged from said fixed bar.

4,632,585
IMAGE FORMING APPARATUS
Yasuyuki Oyamatsu, Yokohama; Masashi Uematsu, Tokyo, and Hiroshi Sakai, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 13, 1985, Ser. No. 711,484
Claims priority, application Japan, Mar. 14, 1984, 59-48608
Int. Cl.[4] B41J *15/04*
U.S. Cl. 400—613 **3 Claims**



1. An image forming apparatus for forming an image, in response to an image signal, on a sheet supplied from a wound roll of sheets to a sheet conveyance path, comprising:
a body including a first body portion having a head responsive to said image signal, a second body portion rotatable with respect to said first body portion between at least a lowered and a raised position and including a platen, said platen defining at least a portion of said sheet conveyance path, and a third body portion disposed adjacent to said second body portion and secured to the first body portion, the second body portion covering said portion of the conveyance path when at said lowered position and exposing said portion of the conveyance path when rotated away from said first body portion to said raised position, the second portion defining a feeding port for feeding sheets to said portion of the sheet conveyance path and an exhausting port for exhausting sheets from said portion of the sheet conveyance path after said head forms an image thereon;
a ribbon cassette including a ribbon impregnated with ink; and
a ribbon cassette holder, provided between the first body portion and the second body portion, for detachably supporting the ribbon cassette, said ribbon cassette holder being exposed between the first and second body portions when the second body portion is rotated with respect to the first body portion to said raised position.

4,632,586
FILE FOLDER DOCUMENT HANDLING SYSTEM
Glenn A. Erickson, 25101 Rivendell, El Toro, Calif. 92630
Filed Jun. 4, 1985, Ser. No. 741,151
Int. Cl.[4] B42F *13/00*
U.S. Cl. 402—7 **7 Claims**



1. An improvement in a document file folder which comprises:

a flat elongated member, said member having first and second ends and side edges, said member formed of a metallic material which is capable of repeatedly being deformed from an existing configuration to a new configuration and retaining said new configuration;

attaching means associated with said elongated member, said attaching means for fixedly attaching to said file folder a central portion of said elongated member wherein said central portion of said member is located intermediate the ends of said member;

said attaching means comprises an elongated flat attaching strip having first and second holes located adjacent to its ends along its elongated direction, said flat elongated member passing through said first and said second holes in said attaching strip with said central portion of said elongated member located on one side of said attaching strip and the remaining portion of said flat elongated member positioned on the other side of said flat attaching strip;

said flat attaching strip includes an adhesive material located on said side of said attaching strip wherein sid central portion of said elongated flat member is located;

each of said ends of said member crimped so as to bring the side edges of said flat member toward one another in a spaced parallel relationship and to form a protrusion portion on each of the ends of said member which extends beyond the plane of said flat member on one of the flat sides of said member, said protrusion portions being essentially U-shaped in cross section and having an elongated central channel, said elongated central channel having an axis which extends along the elongated dimensions of said channel with said axis of said channel lying along the elongated dimension of said member, the outside width of said member between its side edges along said protrusion portions being narrower than the width of said member between its side edges along the remainder of said member;

an element, said element having a first arm, a second arm and a connecting section which joins said first and said second arms, said first and said second element arms extending in a parallel space relationship from said connecting section in the same direction from said connecting section;

each of said first and said second arms of said element having a hollow open end, each of said hollow open ends of said element arms being sized and shaped to accept and temporarily retain one of said ends of said member.

4,632,587

REACTOR CONSTRUCTION

Frohmut Vollhardt, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,759

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332049; Dec. 8, 1983, 3344423

Int. Cl.[4] F28D *21/00*

U.S. Cl. 422—202 **6 Claims**

1. A reactor comprising, a vertically elongated cylindrical housing, a heat exchanger within said housing, including an outer heat exchanger wall of finned tubes and an interior array of vertically extending heat exchanger tubes each having upper and lower horizontally extending end portions, said finned tubes of said outer heat exchanger wall having top and bottom header portions into which said upper and lower horizontally extending portions of said heat exchanger tubes extend respectively, an upper header ring connected to said top header portions, a lower header ring connected to said bottom header portions, a gas permeable floor in a lower portion of said housing connected to said heat exchanger wall above said lower header ring and below said lower horizontally extending end portions, a catalyst bed supported on said floor and filling the spaces between said heat exchanger tubes and said finned tubes of said outer heat exchanger above said floor, said housing having a removable cover of a diameter larger than said outer heat exchanger wall and said floor permitting said heat exchanger wall with said floor, said heat exchanger tubes and said catalyst bed to be lifted out of said housing, each of said heat exchanger tubes having a plurality of radially extending fins, each heat exchanger tube mounted in said housing such that each fin engages an adjacent heat exchanger tube in a



manner such that said heat exchanger tubes and fins togehter form closed vertical passages in said housing for said catalyst, each heat exchanger tube having a plurality of radially extending pins which extend into said passages and extend symmetrically outwardly form said heat exchanger tubes to project from said heat exchanger tubes at different levels.

4,632,588

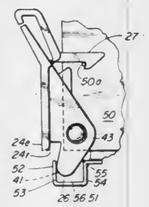
LATCHING LEVER FOR PRINTED CIRCUIT BOARDS

Michael H. Fitzpatrick, Sunnyvale, Calif., assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1985, Ser. No. 701,228

Int. Cl.[4] B25G *3/00;* **F16D** *1/00*

U.S. Cl. 403—16 **8 Claims**



1. A latching lever for use with an object for aiding the entry of said object into a mating apparatus, for securing said object in said mating apparatus, and for aiding the removal of said object from said mating apparatus, the latching lever including a body portion for pivotal connection to said object, about a pivot point, an actuation member being connected by a resilient hinge to the body portion remote from the pivot point and a hooked portion solidly connected to and protruding from the actuation member for engaging a projection attached to said object, the actuation member being for moving the hooked portion relative to the body portion so as to selectively disengage said hooked portion from said projection, the latching lever being characterized in that the resilient hinge comprises:

a first section near the hooked portion and a second section being thinner and more flexible than the first section.

4,632,589

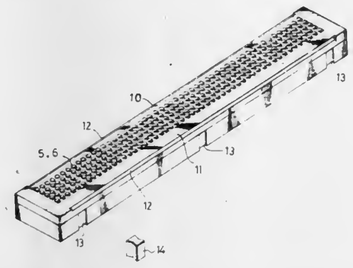
SOLDER-FREE CIRCUIT BASE PLATE

William Hsiu, 294, 11th Fl., Chang An E. Rd., Sec. 2, Taipei, 104, Taiwan

Filed Nov. 25, 1985, Ser. No. 802,115

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—24 **1 Claim**



1. A solder-less circuit base plate for the mounting of integrated circuit boards comprising at least two rectangular plates having a top surface into which are formed a plurality of cylindrical insertion holes arranged in a grid pattern, notched formed into said plates at the junction of the top and the long sides, borders between said grid of said insertion holes and the edges of said plate, said border being wider on one long side of said plate then on the other long side, and a plurality of mortises formed in the long sides of said plate, whereby butterfly tennons inserted into said mortises join individual plates together and whereby the distances between said grids can be adjusted by selection of the width of the adjacent margins.

4,632,590

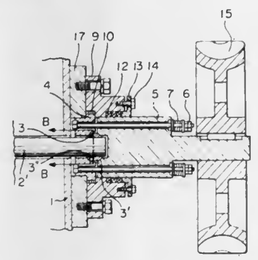
CONNECTING STRUCTURE FOR CONNECTING A CERAMIC SHAFT TO A METALLIC SHAFT

Yoshihiro Tsuchimoto, Musashino, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,451

Int. Cl.[4] F16B *9/00, 7/02*

U.S. Cl. 403—30 **6 Claims**



1. In a connecting structure between a metallic shaft and a ceramic chaft, connecting means comprising:

at least one arc body fixed to said ceramic shaft about at least a portion of the circumference of said ceramic shaft, both ends of said arc body in a direction of an axis of said ceramic shaft having a first taper with a sense such that an axial width of said arc body increases toward said ceramic shaft;

a metallic ring having at an axial end thereof a second taper shaped to mate with said first tapers, said ring being fitted on said ceramic shaft with said second taper engaging one of said first tapers with surface contact;

a metallic shaft having at one end thereof a third taper shaped to mate with said first tapers, said metallic shaft being positioned coaxially with said ceramic shaft and with said third taper engaging the other of said first tapers; and

spring means for elastically pressing said metallic shaft and said ring towards one another with a predetermined spring force, whereby said ceramic shaft is clamped with a predetermined force which is a function of said spring force.

4,632,591

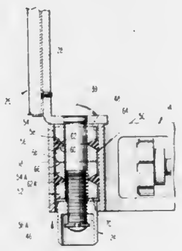
RADIALLY EXPANDABLE O-RING CONNECTOR

Eugene H. Fullenkamp, Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jun. 18, 1984, Ser. No. 621,836

Int. Cl.[4] F16B *7/16*

U.S. Cl. 403—227 **7 Claims**



1. In combination, an apparatus defining a channel and a holder slidably mounted in said channel and securable at selected positions therein, said holder including a socket having a cylindrical inner wall and a bracket adapted to carry a piece of equipment, said bracket carrying a tongue which is longitudinally slidable into a first end of said socket, said tongue comprising:

a pin carried at a first end thereof by said bracket and projecting coaxially into said first end of said socket,

first and second elastic O-rings slidably mounted coaxially on said pin in longitudinally spaced relationship in said socket,

first and second surface-defining means disposed coaxially around said pin within said socket on opposite sides of said first O-ring,

said first and second surface-defining means including first and second rigid bevels, respectively, said bevels directed toward one another and engageable with an inner diameter of said first O-ring, the latter disposed within a first annular space defined by said first and second bevels,

at least said second surface-defining means being movable relative to said pin along a longitudinal axis of said pin,

third and fourth surface-defining means disposed coaxially around said pin within said socket on opposite sides of said second O-ring,

said third and fourth surface-defining means including third and fourth rigid bevels, respectively, said last-named bevels directed toward one another and engageable with an inner diameter of said second O-ring, the latter disposed within a second annular space defined by said third and fourth bevels,

said third and fourth surface-defining means being movable relative to said pin along said longitudinal axis of said pin, and

means defining a threaded knob threadedly mounted on a second end of said pin and rotatable thereon in a first direction to cause said first O-ring to ride-up on said first and second bevels, and said second O-ring to ride up on said third and fourth bevels, such that said first and second O-rings become radially outwardly expanded from a re-

laxed state into frictional engagement with said socket wall while confined substantially within the limits of said first and second annular spaces, respectively,

said knob-defining means projecting from a second end of said socket so as to be accessible for being manually gripped and rotated,

said first and second O-rings, said first, second, third, and fourth surface-defining means, and said knob-defining means being sized to pass freely longitudinally into and from said first end of said socket while secured on said pin and with said first and second O-rings disposed in a relaxed state.

4,632,592

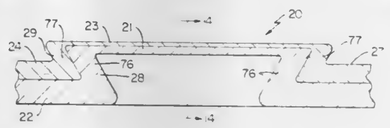
LEAKPROOF JOINT CONSTRUCTION AND METHOD AND APPARATUS FOR MAKING THE SAME

James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 410,438, Aug. 23, 1982, Pat. No. 4,531,279. This application May 20, 1985, Ser. No. 735,540

Int. Cl.⁴ F16B *5/00*

U.S. Cl. 403—285 **2 Claims**



1. In a leakproof joint construction for a pair of members disposed in abutting relation and having a substantially rectangular part of one of said members deformed into an adjacent substantially rectangular part of the other of said members so that said parts of said members are disposed completely beyond the plane of the outer surface of said other member while respectively being integrally interconnected to the remainder of said members by substantially straight sided tubular portions of said members, said parts being interlocked together by an outward staking of one pair of opposed sides of said tubular portion of said part of said one member into said tubular portion of said other member by a compaction of said parts, the improvement wherein said one pair of opposed sides of said one member and a corresponding one pair of opposed sides of said tubular portion of said other member each are initially deformed so as to be disposed at an acute angle relative to said plane of said other member and the other pair of opposed sides of said one member and the corresponding other pair of opposed sides of said tubular portion of said other member each are initially deformed so as to be substantially at a right angle relative to said plane of said other member, said one pair of opposed sides of said one member and said corresponding one pair of opposed sides of said other member each having been toggled over center when staked so as to be disposed at an obtuse angle relative to said plane of said other member while said other pair of opposed sides of said one member and said corresponding other pair of opposed sides of said other member each remain substantially at said right angle to said plane of said other member.

4,632,593

PIN LOCK INSERT HOLDER

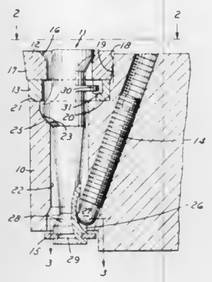
Daniel R. Stashko, Holly, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 705,189, Feb. 25, 1985, abandoned. This application Apr. 11, 1985, Ser. No. 722,068

Int. Cl.⁴ B23B *27/16*

U.S. Cl. 403—316 **20 Claims**

1. Pin lock insert holder comprising, tool holder body having insert shoulder and seat, apertured insert engaging said shoulder, pin aperture means in said body extending substantially normal to said seat including offset fulcrum means, lock pin means having longitudinally spaced opposed projection means for engaging respectively said fulcrum means and said apertured insert, means acting on its end for tilting said lock pin means in a plane extending through said opposed projec-



tion means to hold said insert against said shoulder, and interengaging flat surface means between said respective lock pin and pin aperture means extending parallel to the plane of tilting and preventing relative rotation.

4,632,594

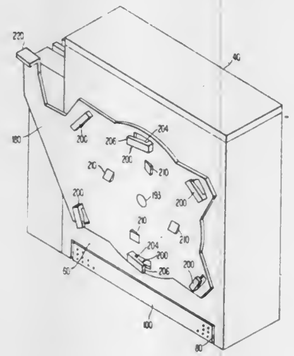
COUPLING APPARATUS

Mark J. Del Tufo, Basking Ridge, and George J. Nagle, Phillipsburg, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 24, 1985, Ser. No. 748,193

Int. Cl.⁴ F16B *21/00;* **H01R** *13/62*

U.S. Cl. 403—322 **23 Claims**



1. A coupling arrangement comprising:

a first assembly having a first end wall, portions of said first wall being formed with first and second pluralities of apertures therein;

a second assembly having a second end wall;

manually actuable means pivotally mounted to said second wall, for engaging said first plurality of apertures and drawing said first and second walls towards each other after having brought said manually actuable means into an interfitting relation with said first plurality of apertures and thereafter having rotated said manually actuable means in a first direction from a first position to a second position, and

wherein said manually actuable means further includes ejection means for assisting a separation of first and second walls upon a subsequent rotation of said manually actuable means in a second direction from said second position to said first position.

4,632,595

QUICK-CHANGE COUPLER

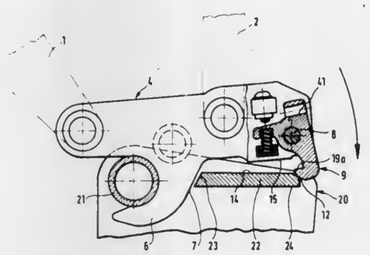
Hans Schaeff, Seestr. 172, 7183 Langenburg, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,414

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312442

Int. Cl.⁴ F16B *21/02*

U.S. Cl. 403—330 **27 Claims**



1. A quick change coupler for tool using equipment, comprising:

(a) a movable support frame having front and rear end portions associated with the equipment and including hook means proximate said front end portion and said hook means having a hook jaw and a backside;

(b) latch means pivotally secured to said support frame and rearwardly spaced from said hook means, said latch means including a latch arm pivotal between a latched and an open position;

(c) receiving means having front and rear end portions associated with a tool;

(d) cross-pipe means secured to said receiving means proximate said front end portion of said receiving means and adapted for being received in said hook jaw; and,

(e) stop means secured to said receiving means and rearwardly spaced from said cross-pipe means and forming a passage therebetween for receiving said hook means and including a first surface proximate said receiving means front end portion for cooperating with said backside and a second surface proximate said receiving means rear end portion for cooperating with said latch means;

(g) whereby receipt of said cross-pipe means in said hook jaw causes said first surface to engage said hook backside so that said latch arm may be pivoted into said latched position by engagement with said second surface and to thereby secure the tool to said support frame.

4,632,596

ONE SHOT COUPLING

Hermann Boehne, Salem, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 765,252

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431504

Int. Cl.⁴ F16D *1/06*

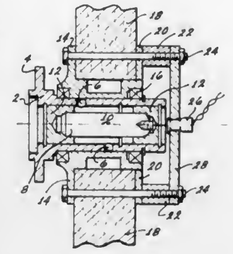
U.S. Cl. 403—345 **12 Claims**

1. One shot coupling for the transmission of torque from a first, fast rotating shaft to another second shaft or hub, comprising:

the first shaft being a hollow shaft having several radially outwardly oriented perforations or bores and being inserted in said hub or second shaft with relatively small clearance;

means containing a friction medium and being disposed and held in the interior of said hollow shaft; and

means for providing controlled release of the friction medium in said container independent from commencement of rotation of the first shaft, the friction medium being radially outwardly dispersed, passing through said perfo-



rations and in between said hollow shaft and said hub or second shaft to effect coupling in between.

4,632,597

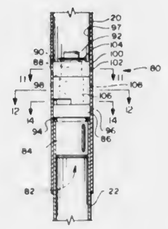
RELEASABLE LOCKING ASSEMBLY

Eivind Clausen, and Michael G. Allsop, both of Bellingham, Wash., assignors to Allsop, Inc., Bellingham, Wash.

Filed May 19, 1982, Ser. No. 379,765

Int. Cl.⁴ F16B *2/04*

U.S. Cl. 403—351 **3 Claims**



1. A releasable locking assembly comprising:

a. a first outer tubular member having a longitudinal center axis and an inwardly facing generally cylindrical first surface defining a longitudinally aligned opening;

b. a second member adapted to fit within said first member so as to be movable between a first locked position and a second freely rotating position, said second member having an upper end and a lower end, and comprising:

1. a first centering disc means at a first lower axial location having a second peripheral cylindrical surface fitting closely against the first surface of the first tubular member so as to be concentric therewith;

2. an offset mounting cylinder means at a second axial location above said first location, said offset mounting cylinder means having a third outer cylindrical surface of a diameter less than that of the second cylindrical surface of the first centering disc means, and a center axis offset from said longitudinal center axis;

3. a concentric mounting cylinder means at a third axial location above said second axial location and having a center axis concentric with said longitudinal center axis;

c. a locking sleeve mounted around said offset mounting cylinder means at an axial location between said first centering disc means and said concentric mounting cylinder means, so as to be rotatable about the center axis of the offset mounting cylinder means, said locking sleeve having a fourth outer cylindrical surface having a center axis offset from the center axis of the offset mounting cylinder means, said locking sleeve being rotatable relative to said second member between a first release position where the fourth surface is in closer alignment with the second sur-

face, and a second locking position where said fourth surface is further from alignment with the second surface and in wedging engagement with said first surface;

d. said locking sleeve having an outwardly pressing yielding surface means positioned to be in substantially constant yielding engagement with said first surface and to create a frictional force between said first outer tubular member and the locking sleeve sufficient to prevent relative rotational movement between the first outer tubular member and the locking sleeve while there is relative rotational movement between the first and second members;

e. a second centering disc means removably mounted around said concentric mounting cylinder means and having a fifth peripheral cylindrical surface fitting closely against the first surface of the first tubular member so as to be concentric therewith, and retaining said locking sleeve in position around said offset mounting cylinder means;

f. said yielding surface means comprising a resilient member which is urged outwardly into engagement with the first surface of the outer tubular member, said yielding surface means further comprising a finger positioned at said third surface, with said finger pressing outwardly into engagement with said first surface; and

g. said locking sleeve being formed with a generally tangentially aligned slot to form said finger, and said finger has an outer end with an outwardly protruding portion to engage said first surface.

4,632,598

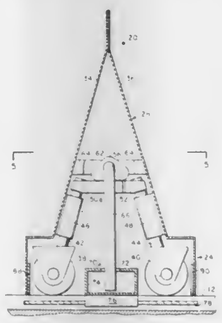
MOVABLE ROADWAY BARRIER

David B. Richards, 33465 Caliban Dr., Fremont, Calif. 94536

Filed Jul. 15, 1985, Ser. No. 755,950

Int. Cl.⁴ E01F *13/00, 15/00*

U.S. Cl. 404—6 **6 Claims**



1. A movable barrier comprising

a base support adapted to engage a supporting surface,

a generally upright wall member attached to said base support,

means for raising and lowering said barrier comprising

a set of barrier support wheels,

a lever arm,

means connected between one end of said lever arm and said set of barrier support wheels for moving said wheels in an upward and downward direction relative to said base support upon actuation of said lever arm,

means for moving said barrier in a lateral direction comprising

means for moving said lever arm in one direction to lower said wheels and raise said base support above the supporting surface to support said barrier on said support wheels and simultaneously applying a lateral force to said barrier sufficient to move said barrier in a lateral direction on said wheels, and

means for moving said lever arm in a reverse direction to raise said wheels and lower said base support to engage the supporting surface.

4,632,599

ROLLER DRUM OF A SOIL COMPACTING MACHINE

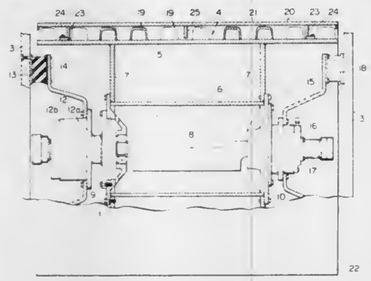
Hisanori Sadahiro, Kawagoe, Japan, assignor to Sakaijuhkogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,949

Claims priority, application Japan, Jul. 26, 1983, 58-116112[U]; Aug. 19, 1983, 58-127958[U]

Int. Cl.⁴ E01C *19/23*

U.S. Cl. 404—124 **2 Claims**



2. A roller drum comprising a unitary primary roller drum; a plurality of split roller segments having an inner surface, the split roller segments capable of being mounted around the primary roller drum to form an auxiliary outer drum, each split roller segment having a configuration formed by dividing a circular cylinder wall in the axial direction and having at least one discontinuously spiral mounting portion on end extending radially outwardly from the inner surface and in a spiral manner along the inner surface of the auxiliary roller drum segment, the discontinuous spiral mounting portion capable of being attached to the primary roller drum.

4,632,600

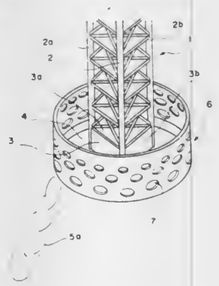
MOVABLE FIXED-TYPE SEMI-SUBMERGED CONSTRUCTION

Soichi Ito, Tsu, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,086

Int. Cl.⁴ E02B *3/04, 17/00*

U.S. Cl. 405—30 **4 Claims**



1. A movable fixed-type semi-submerged construction, said construction comprising

a plurality of legs each including a plurality of posts connected in the form of a truss, the plurality of legs adapted to support a superstructure,

a plurality of plates attached to lower parts of said posts,

a spat tank mounted on lower ends of said posts, and

a scouring preventing structure including a cylindrical circumferential wall formed with a number of holes therethrough, said cylindrical circumferential wall being arranged at a lower part of each of said legs so as to encircle an outer side of said spat tank, said holes formed in a lower part of each said circumferential wall being greater in diameter than said holes formed in an upper part of each said circumferential wall for lowering a flow velocity of water around said construction and for reducing formation of a horseshoe vortex to prevent scouring of the sea bottom below and around said legs.

4,632,601

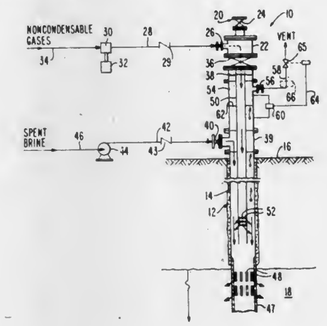
SYSTEM AND METHOD FOR DISPOSAL OF NONCONDENSABLE GASES FROM GEOTHERMAL WELLS

James T. Kuwada, 5601 Sierra Ave., Richmond, Calif. 94805

Filed Nov. 1, 1985, Ser. No. 794,201

Int. Cl.⁴ G21F *9/24*

U.S. Cl. 405—128 **22 Claims**



1. A system for disposing of gases from a geothermal well which are noncondensable at ambient conditions comrising:

a wellhead casing having a fluid inlet and adapted to be placed into the ground to provide a first fluid path for directing waste water from ground level to a water injection zone below ground level;

means coupled with the casing for providing a second fluid path extending longitudinally of the first path, said second path-forming means having inlet means for receiving noncondensable gases for flow along said second path, the length of the second path being at least of a value corresponding to the depth in the wellhead casing which provides a static waste water head pressure equal to the gas partial pressure required to dissolve at least a portion of the noncondensable gases into the waste water; and

means for pressurizing the noncondensable gases before they flow along said second path.

4,632,602

CHEMICAL DUMP SITE CONTAINMENT FLOOR

Vahak S. Hovnanian, Suite 12, Village Mall, Freehold, N.J. 07728

Filed Mar. 23, 1984, Ser. No. 592,886

Int. Cl.⁴ E02C *3/00*

U.S. Cl. 405—128 **9 Claims**

1. A liquid impervious floor apparatus for placement under an existing contaminated site and formed from a plurality of elongated interlockable floor elements, said elongated interlockable floor elements comprising:

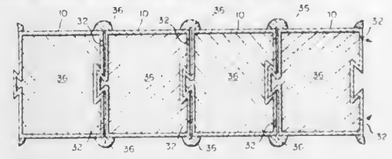
an elongated body section;

male projection means running substantially along the length of said elongated body section;

female indentation means also running substantially along the length of said elongated body section for making sliding, interlockable contact with male projection means;

a hollow, fluid conductable interior channel running the length of said elongated body section; and,

aperture means located in the vicinity where interlockable elements are adjacent to each other for communicating said interior channel with the area where said interlockable elements are adjacent to each other,



whereby a floor can be formed under an existing contaminated site by sliding one floor element past the other so that the male projection means on each floor element interlockingly engages the female indentation means of the next adjacent floor element until the floor is of the desired width.

4,632,603

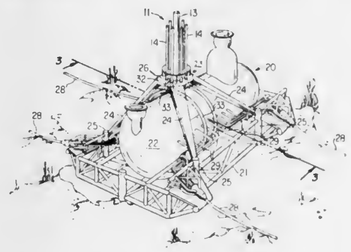
MARINE RISER BASE SYSTEM

Benton F. Baugh, Houston, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 25, 1985, Ser. No. 727,167

Int. Cl.⁴ B63C *11/00;* **E02D** *21/00*

U.S. Cl. 405—210 **5 Claims**



1. A marine riser base system comprising:

a fluid-tight hull positioned on the marine bottom;

a support member comprising;

a platform;

means for securing said platform above said hull;

means on said platform adapted for securing the lower end of a marine riser to said platform;

flowline connector means on said platform adapted to be connected to the lower end of a flowline carrier by said marine riser; and

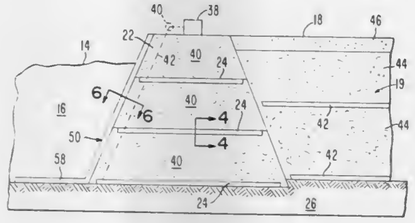
a means for fluidly connecting said flowline connector means on said platform to the interior of said hull through a point on the lower side of said hull; said means comprising:

a length of rigid pipe having a circularly-curved portion conforming substantially to the surface of said hull and spaced therefrom; said pipe having one end fixed to said platform and having said flowline connector means thereon and having its other end fixed to the lower side of said hull where said other end penetrates said hull.

4,632,604
FROZEN ISLAND AND METHOD OF MAKING THE SAME

Andy M. McKelvy, Danville, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Aug. 8, 1984, Ser. No. 638,792
Int. Cl.[4] E02D *21/00, 23/16*
U.S. Cl. 405—217 **63 Claims**



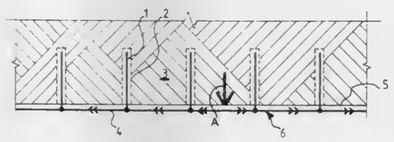
1. An island in an arctic climate for placement in a body of water above the permafrost comprising:

an upright body adapted to be placed on the upper surface of a soil layer on the permafrost and to extend upwardly therefrom through the water and to a location above the upper level of the water, said body being of a freezable material, there being a heat exchanger adapted to be placed at and along the interface between the body and the soil layer in laterally extending heat exchange relationship to the body and the soil layer, said heat exchanger including a heat conductive panel having laterally extending fluid passages adapted to receive a flow of coolant therethrough for freezing said body and said soil layer to form a stabilized, monolithic construction.

4,632,605
METHOD AND APPARATUS FOR REINFORCING AND CONSOLIDATING EARTH STRUCTURES

Michael C. Tucker, Brisbane, Australia, assignor to Gearhart Australia Limited, Queensland, Australia, a part interest

PCT No. PCT/AU83/00167, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01978, PCT Pub. Date May 24, 1984
PCT Filed Nov. 16, 1983, Ser. No. 629,089
Claims priority, application Australia, Nov. 16, 1982, PF6836
Int. Cl.[4] E21D *20/00*
U.S. Cl. 405—259 **22 Claims**

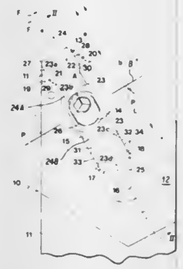


1. A method of supporting and confining an earth formation wherein a plurality of anchor members are anchored into spaced boreholes in an exposed surface of the earth formation, each anchor member having connected thereto a tensile element lying against the surface of the earth formation and extending away from such anchor member towards an adjacent borehole, which method comprises connecting a free end of each tensile element to a captive portion of an adjacent tensile element connected to an anchor member anchored in such adjacent borehole, each tensile element being connected to the respective tensile element to form a substantially continuous tensile member extending linearly over the surface of the earth formation whereby in use such substantially continuous tensile member operates to distribute a load applied by the earth formation as a tensile stress in such substantially continuous tensile member along the connected tensile elements, and wherein a plurality of the anchor members and thereto connected tensile elements each is formed by a respective elongate U-shaped steel member bent intermediate its ends to form an L-shaped member having a first arm in the form of a closed loop and a second arm in the form of two free ends, the first arm forming the tensile element and the second arm forming the anchor member.

4,632,606
CUTTING TOOL AND CUTTING INSERT

Stig E. V. Lagerberg, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Sep. 6, 1985, Ser. No. 773,011
Claims priority, application Sweden, Sep. 26, 1984, 8404814
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—104 **10 Claims**



7. An indexable cutting insert adapted to be mounted to a shank, said insert including:

a body of elongate configuration including a main axis extending between first and second ends of said body, and a minor axis extending perpendicular to said major axis, said insert being configured symmetrically about both said main and minor axes,

first and second cutting edge means carried at said first and second ends, respectively, each said cutting edge means including at least a portion thereof oriented obliquely relative to said main axis,

a hole formed in said body midway between said ends and situated along said main and minor axes, said hole adapted to receive a fastener for securing the insert to the shank,

a pair of first centering surfaces disposed on opposite sides of said axis intermediate said first cutting edge means and said hole, said first centering surfaces facing generally toward said second cutting edge means, said first centering surfaces extending non-parallel to said main axis and non-parallel to each other and adapted to contact correspondingly located localizing surfaces on the shank to center said insert, said first centering surfaces oriented symmetrically relative to said main axis,

a pair of second centering surfaces disposed on opposite sides of said main axis intermediate said hole and said second cutting edge means and facing generally toward said first cutting edge means, said second centering surfaces extending non-parallel to said main axis and non-parallel to each other and adapted to contact said correspondingly located localizing surfaces on the shank after said insert has been reversed, said second centering surfaces oriented symmetrically relative to said main axis,

said first and second pairs of centering surfaces oriented symmetrically relative to said minor axis,

a pair of first abutment surfaces formed on respective outside peripheral edges of said body and disposed on opposite sides of said main axis intermediate said first cutting edge means and said hole, said first abutment surfaces oriented symmetrically and parallel relative to said main axis,

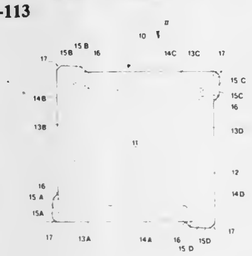
a pair of second abutment surfaces formed along outside peripheral edges of said body and disposed on opposite sides of said main axis intermediate said hole and said second cutting edge means and adapted to bear against correspondingly located support surfaces on said shank in response to said first cutting edge means being acted upon by lateral forces,

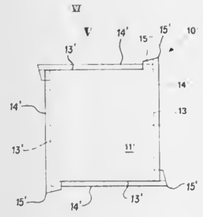
said first abutment surfaces being coplanar with respect to associated ones of said second abutment surfaces located on the same side of said main axis.

4,632,607
INDEXABLE CUTTING INSERT

Glenn G. E. Pantzar, Årsunda, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Mar. 14, 1985, Ser. No. 711,524
Claims priority, application Sweden, Mar. 28, 1984, 8401713
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—113 **7 Claims**





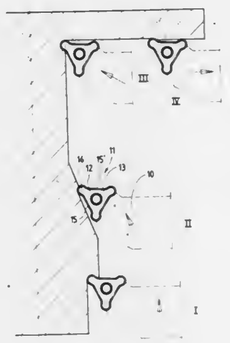
1. An indexable cutting insert comprising upper and lower faces interconnected by four side surfaces, the intersection between said side surfaces and said upper face forming four main cutting edges each coinciding with an imaginary line; said imaginary lines intersecting to form a square, intersecting pairs of said imaginary lines defining four cutting corners; each said side surface including a projection disposed at one of said cutting corners whereby there are four said projections each disposed at one of said corners such that each projection is associated with two of said main cutting edges forming the respective corner; a first of such pair of main cutting edges being formed on said side surface carrying such projection, and a second of such pair of main cutting edges formed on the other side surface which forms such corner; each projection projecting transversely relative to its associated first main cutting edge and parallel to its associated second main cutting edge; each projection forming a minor cutting edge disposed outside of said square; each minor cutting edge being joined to and extending at an angle relative to its associated second main cutting edge; each minor cutting edge defining an active cutting edge when its associated first and second main cutting edges are inactive and active, respectively, so that said minor cutting edge maintains such inactive main cutting edge spaced from a workpiece being cut.

6. An indexable cutting insert comprising upper and lower faces interconnected by four side surfaces, the intersection between said side surfaces and said upper and lower faces forming four edges along said upper face and four edges along said lower face, each of said edges coinciding with an imaginary line, said four imaginary lines along said upper face intersecting to form an upper square and said four imaginary lines along said lower face intersecting to form a lower square of the same size as said upper square, two opposed ones of said edges of said upper face defining main cutting edges, and two opposed ones of said edges of said lower face defining main cutting edges which are offset by ninety degrees relative to said main cutting edges of said upper face, each of said main cutting edges of said upper face intersecting a non-cutting one of said edges of said upper face to form therewith a corner, each of said main cutting edges of said lower face intersecting a non-cutting one of said edges of said lower face to form therewith a corner, each said side surfaces including a projection disposed at one of said corners whereby there are four said projections each disposed at one of said corners such that two of said projections are associated with two of said corners of said upper edge and the other two of said projections being associated with two corners of said lower edge and being offset by ninety degrees relative to said two corners of said upper edge, each projection being formed on the side surface which carries said non-cutting edge associated with such projection; each projection projecting transversely relative to its associated non-cutting edge and parallel to its associated main cutting edge; each projection forming a minor cutting edge disposed outside of said square of its respective face; each minor cutting edge being joined to and extending at an angle relative to its associated main cutting edge; each minor cutting edge defining an active cutting edge when its associated main cutting edge is active, so that said minor cutting edge maintains its associated non-cutting edge spaced from a workpiece being cut.

4,632,608
CUTTING INSERT

Sven G. Blomberg, Arsunda; Sven G. Berter, and Lars T. Pettersson, both of Gävle, all of Sweden, assignors to Santrade Limited, Luzern, Switzerland

Filed May 8, 1985, Ser. No. 731,878
Claims priority, application Sweden, May 14, 1984, 8402580
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—114 **10 Claims**



1. Cutting insert for longitudinal turning, inwards copy-turning, turning of grind reliefs, and outwards copy turning, said insert comprising at least one cutting corner, and two main cutting edges oriented at an acute angle relative to one another and extending to said cutting corner, said cutting corner including a cutting edge which extends from a junction with one of said main cutting edges to a junction with the other main cutting edge and being symmetrical relative to an imaginary bisector of said cutting corner, a section of each said main cutting edge located immediate adjacent the junction with said

corner cutting edge being substantially straight. the width of the corner cutting edge being such that imaginary extensions of said straight sections form chords in an imaginary circle which is inscribed in said cutting corner such that said circle touches said corner cutting edge in at least one place on each side of said bisector.

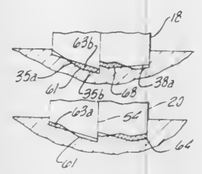
4,632,609
ROTARY CUTTING TOOL
Frank Johne, Lohne, Fed. Rep. of Germany, assignor to J. Kuhn GmbH & Co. Prazisionswerkzeug K.G., Dorsten, Fed. Rep. of Germany
Filed Dec. 20, 1984, Ser. No. 684,252
Int. Cl.[4] B23B *29/02*
U.S. Cl. 408—197 **14 Claims**



1. In a rotary cutting tool having a tool body with a longitudinal axis of rotation and a front face, a bearing surface on the front face of the tool body, at least one cutter carrier having a cutter thereon and an underside engaging against the bearing surface on the tool body, cooperatively interengaging tooth formations on the bearing surface of the tool body and on the underside of the at least one cutter carrier in the form of parallel teeth extending in a direction at right angles to a plane in which the axis of rotation of the cutting tool lies so that the at least one cutter carrier is adjustable with respect to the front face of the tool body in a direction parallel to the direction in which the teeth extend and guided by the teeth, an oblong hole through at least one cutter carrier, and a clamping screw having a shank extending through the oblong hole and engaging in a cooperating threaded hole in the tool body for clamping the at least one cutter carrier in any adjusted position, the improvement wherein:

said teeth have a cross-sectional shape in the form of saw teeth having steep tooth flanks with respect to a datum plane of the bearing surface, said steep tooth flanks on the tool body being on the side of the teeth facing in the direction of the median plane of the tool body in which the axis of rotation lies and which passes through the bearing surface parallel to the direction in which the teeth extend, and inclined tooth flanks on the other side of the teeth extending at a substantially lesser angle with respect to said datum plane than said steep tooth flanks, the angle of said steep tooth flanks with respect to said datum plane being of a degree sufficient to cause said teeth on the cutter carrier and tool body to be pressed toward the engaging position when the cutting tool is in use and minimize tipping of said cutter carrier with respect to the tool body.

4,632,610
ANNULAR HOLE CUTTER
Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504
Continuation of Ser. No. 522,181, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 423,704, Sep. 27, 1982, abandoned. This application Oct. 15, 1985, Ser. No. 787,039
Int. Cl.[4] B23B *41/02, 51/00*
U.S. Cl. 408—204 **46 Claim:**



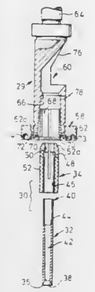
1. An annular hole cutter comprising a cutter body having a generally circular cylindrical side wall provided with a plurality of cutting teeth spaced circumferentially around the lower end thereof, a plurality of flutes extending upwardly around the side wall from the lower end thereof, each tooth being connected with the next adjacent tooth by a circumferentially extending web adjacent the inner periphery of the side wall, said webs being juxtaposed radially with said flutes, each flute having circumferentially spaced leading and trailing side walls and a circumferentially extending inner wall which defines the radially outer face of said web, the alternate teeth having a radially inner cutting edge formed on said web, gullet means on said web extending upwardly from each of said inner cutting edges and opening radially outwardly into the adjacent flute, all of the teeth having a radially outer cutting edge, said radially outer cutting edges being defined by the lower end of the trailing side wall of the adjacent flute. the radially outer cutting edge of each of said alternate teeth being staggered circumferentially rearwardly from the inner cutting edge of the tooth in relation to the direction of rotation of the cutter, each tooth having a radially inner back-off face which inclines downwardly and radially outwardly and a radially outer back-off face which inclines downwardly and radially inwardly, said back-off faces intersecting in a generally circumferentially extending crest which, at its forward end, intersects the radially outer cutting edge, the radially outer back-off faces of said alternate teeth being relieved upwardly relative to the radially outer back-off faces of the teeth intermediate said alternate teeth, the radially inner back-off face of said intermediate teeth being relieved upwardly relative to the inner back-off faces of said alternate teeth, the extent of said relief being such that the outer cutting edge of each of said alternate teeth cuts a chip only along a radially inner portion thereof and the outer cutting edge of each of said intermediate teeth cuts a chip only along the radially outer portion thereof whereby the chips cut by all of the outer cutting edges have a width less than the radial depth of the flutes.

4,632,611
PAPER DRILL
Robert J. Burns, Waterloo, Canada, assignor to Dexter-Lawson Products Limited, Cambridge, Canada
Filed Apr. 27, 1984, Ser. No. 604,665
Int. Cl.[4] B23B *51/04*
U.S. Cl. 408—205 **9 Claims**

1. A paper drill for use in a paper drilling machine having at least one spindle for receiving the drill, the spindle having a cylindrical cavity open at an outer end thereof and through which a paper drill can be inserted into the cavity and means for exerting a radially inwardly directed clamping force on the drill to retain the drill in the spindle; wherein the drill comprises:

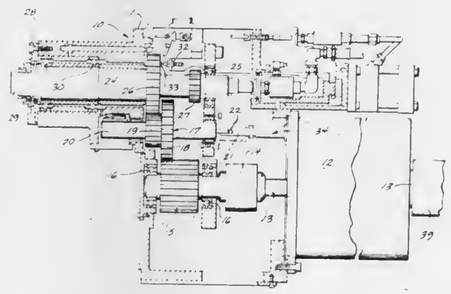
a cutting bit of hollow generally cylindrical form having an annular cutting edge at a first end thereof, and,

a hollow cylindrical sleeve for receiving said bit and being itself adapted to be received in said spindle, said sleeve being separate from said bit and having an internal cylindrical cavity shaped to closely receive a second end portion of said bit opposite said first end, said cavity extending from an opening at an outer end of the sleeve to an



internal shoulder against which said second end portion of the bit abuts when the bit and sleeve are fully assembled, the sleeve having an external generally cylindrical surface shaped to fit within a said drill spindle of a paper drilling machine and extending to a flat annular surface surrounding said opening at the outer end of the sleeve, the sleeve being radially inwardly compressible in response to a said radially inwardly directed clamping force exerted by said spindle and being adapted to frictionally grip said bit sufficiently securely to permit transmission of drilling torque from said spindle to said bit in use.

4,632,612
SPINDLE ORIENTATION APPARATUS
Richard J. Loerch, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.
Filed Aug. 26, 1985, Ser. No. 769,424
Int. Cl.[4] B23Q *5/20;* **B23B** *47/04*
U.S. Cl. 409—231 **7 Claims**



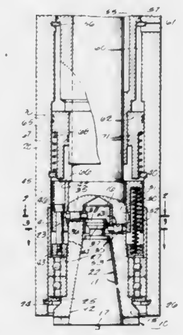
1. In a machine tool, apparatus for selectively driving a rotatable first member mounted in a frame comprising a rotatable second member; means for controllably driving said second member; means for generating a first signal indicating the angular position of said second member relative to said frame as said second member rotates; means for locking said first member in one of a plurality of discrete angular orientations with respect to said second member and then rotating said first member in synchronism with said second member; and means for sensing the angular orientation of said first member with respect to said second member when said first and second members are synchronously rotating, wherein said sensing means comprisies:

means for generating a second signal to provide notice that said first member is in a specified angular position relative to said frame;

means for storing a plurality of values of said first signal, each of said stored values comprising an expected value of said first signal when said first member is corresponding one of said plurality of discrete angular orientations with respect to said second member and in said specified angular position relative to said frame; and

means for comparing the actual value of said first signal when said second signal occurs with said stored values and selecting the discrete angular orientation corresponding to the stored value which is closest to said actual value as being the actual orientation of said first member with respect to said second member.

4,632,613
SPINDLE TOOL RETENTION AND EJECTION MECHANISM
Kenneth A. Wollermann, 8400 Northwest Hwy., Mukwonago, Wis. 53149
Filed Aug. 26, 1985, Ser. No. 769,393
Int. Cl.[4] B23B *31/06, 31/26*
U.S. Cl. 409—233 **10 Claims**



1. A tool retention and ejection mechanism for a spindle having an axial socket for receiving a tool that is provided with a rearwardly extending retention knob; a plurality of locking pins spaced about the spindle in a plane that is transverse to the axis of the spindle and slidable radially relative to the spindle in position to be moved into engagement with the retention knob for retaining the tool tightly in the socket of the spindle; a cylindrical cam encircling the periphery of the spindle while floating relative thereto and slidable therealong to engage said locking pins and shift them toward the axis of the spindle for engaging the retention knob to draw its associated tool into the socket of the spindle and lock it therein; and means for actuating said cylindrical cam.

4,632,614

COMPOSITE TOOL UNIT FOR CHIP-REMOVING MACHINING

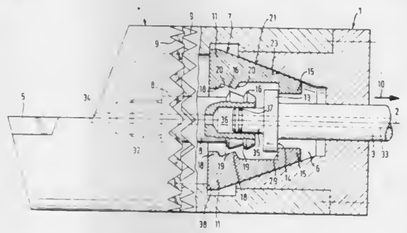
Gerhard Rall, Sommerhalde 72, D-7142 Marbach; Günther Hertel, Mörikestrasse 24; Karl G. Hertel, Kneippstrasse 12,, both of D-8500 Nürnberg, and Hermann Kastner, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Gerhard Rall, Marbach, Del.X, by said Hermann Kastner

Filed Jul. 29, 1983, Ser. No. 527,257

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228521; Nov. 27, 1982, 3243948; Mar. 19, 1983, 3309922

Int. Cl.[4] B23B *29/12;* **B23C** *5/26*

U.S. Cl. 409—233 **20 Claims**



1. A composite tool unit, having opening and closure positions, for coupling a cutting member to a machine tool, comprising

a tool shank having a longitudinal axis and a recess in the frontal face thereof, said recess including a peripheral wall with at least two axially spaced inner conical faces, the diameters of each of said inner conical faces being greatest at the ends thereof closest to the frontal face of said tool shank;

a drawbar, connectable to a power drive of said machine tool, mounted within said tool shank and displaceable along the longitudinal axis thereof, said drawbar having a first annular radial outwardly projecting projection at a portion thereof located within said recess;

a tool head for supporting said cutting member at one end, the other end of said tool head being longitudinally clampable against the frontal face of said tool shank, said tool head when clamped being centered about said longitudinal axis and non-rotatable with respect to said tool shank;

a pulling shank attached to said tool head and projecting therefrom for insertion in the recess of said tool shank, said pulling shank including axially spaced second annular radial outwardly projecting projections for positioning within said recess, each of said projections having an external conical face on the side of said second projection facing said tool head, the diameters of each of said external conical faces being greatest at the ends thereof furthest from the frontal face of said tool shank; and

a chuck having a plurality of individual clamping jaws extending parallel to the longitudinal axis of said tool shank and coaxial with said drawbar, said clamping jaws being disposed within said recess surrounding the first annular radial projection on said drawbar and the second annular radial projection on said pulling shank when said pulling shank is inserted in said recess, said clamping jaws having a first set of radially inwardly projecting projections at the end of said recess adjacent said drawbar and a second set of axially spaced inwardly projecting projections at the end of said recess adjacent said pulling shank, each of said second set of projections on said clamping jaws having an internal conical face on the side thereof furthest from said tool head corresponding to the external conical faces on the projections on said pulling shank, the diameters of each of the internal conical faces on said clamping jaws being greatest at the end thereof furthest from the frontal face of said tool shank, said clamping jaws further having axially spaced outer conical segments corresponding to the inner conical faces on the peripheral wall of said recess,

whereby, when said unit is in its opening position said clamping jaws are resiliently expanded to permit withdrawal of said pulling shank from said recess; and when said unit is moved from its opening to its closure position said drawbar is displaced in the axial direction away from said tool head so that said first outwardly projecting projection on said drawbar contacts said first set of inwardly projecting projections on said clamping jaws to translate said clamping jaws in the axial direction parallel to said longitudinal axis away from said tool head, and the axially spaced outer conical segments on said clamping jaws slide on the axially spaced inner conical faces on the peripheral wall of said recess to move said clamping jaws radially inward until in the closure position the second set of inwardly projecting projections on said clamping jaws contact the flanks of the second outwardly projecting projection on said pulling shank to clamp said tool head non-rotatably to the frontal face of said tool shank.

4,632,615

MACHINE TOOLS

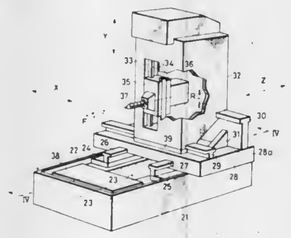
Motohisa Yamamura, Yamaguchi, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Feb. 11, 1985, Ser. No. 700,235

Claims priority, application Japan, Feb. 9, 1984, 59-22216

Int. Cl.[4] B23C *1/00;* **B23B** *39/02*

U.S. Cl. 409—235 **6 Claims**



1. A machine tool comprising:

a supporting bed (**21**);

a first pair of guide rails (**26, 27**) mounted on said supporting bed and extending in a first (Z) direction relative to a workpiece to be machined by said machine tool;

a table (**28**) slidably supported by said first pair of guide rails for moving in said first direction;

a second pair of guide rails (**20, 30**) mounted on said table and extending in a second (X) direction;

a column member (**32**) slidably supported by said second pair of guide rails for moving in said second direction;

a spindle head (**35**) slidably supported by said column member for moving in a third (Y) direction;

a tool (**37**) removably mounted on said spindle head for machining said workpiece during relative movement in said first direction between said tool and said workpiece; and

a rear one (**30**) of said second pair of guide rails relative to said workpiece having a height substantially greater than the other (**29**) of said second pair of guide rails, whereby a first distance substantially along said third direction between said tool and said rear one of said guide rails is less than a second distance substantially along said third direction between said tool and said other of said guide rails.

4,632,616

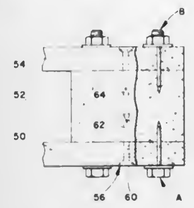
SIMULATED BOLT

Kenneth C. Sidoti, 17601 Mapleboro Rd., Maple Heights, Ohio 44137

Filed Dec. 17, 1984, Ser. No. 682,330

Int. Cl.[4] F16B *15/02*

U.S. Cl. 411—480 **8 Claims**



1. A simulated bolt assembly for use in giving the appearance of a bolted construction in a wood or wood-like structure which is fastened together by a separate fastening means, the assembly comprising:

a simulated bolt head portion having a first fastener shank extending therefrom, said head portion including a bolt head and an adjacent washer, which are secured together; and,

a simulated bolt end portion having a second fastener shank extending therefrom, said end portion including a threaded bolt shank, a nut adjacent to said bolt shank and a washer positioned adjacent said nut, said nut, bolt shank and washer being secured together, and said bolt head and end portions being opposite ends of the bolt assembly, said first and second fastener shanks being designed to hold the bolt head portion and bolt end portion to an associated structure so that it appears as if the associated structure has a bolted construction.

4,632,617

METHOD AND SYSTEM FOR INSTALLING A LAYERED VESSEL ON LOCATION

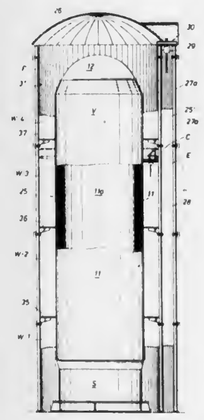
Raymond E. Pechacek, and Eugene J. Clay, both of Houston, Tex., assignors to Hahn & Clay, Houston, Tex.

Division of Ser. No. 209,846, Nov. 24, 1980, Pat. No. 4,432,128.

This application Jul. 12, 1983, Ser. No. 513,110

Int. Cl.[4] E04G *21/14*

U.S. Cl. 414—10 **7 Claims**



1. A building system for the erection of a layered vessel at a final location, comprising:

a self supporting, generally cylindrical, vertical frame including a plurality of vertically spaced, annular work stations;

an elevator mounted with said frame for raising plates which form the layers of such layered vessel to said work stations;

a positioning crane mounted with at least one of said work stations, said positioning crane including means for moving said plates from the vicinity of said elevator adjacent to said work station into position for welding onto the vessel being contructed; and

said self supporting frame including a plurality of vertical supports circumferentially spaced about the base of the vessel being built, at least some of said vertical supports being formed of a plurality of hollow tubular members for containing utility lines for serving the utility needs at said various work stations.

4,632,618

FEED STORAGE FOR DRILL RODS FOR A LONG-HOLE DRILLING APPARATUS

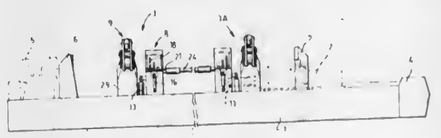
Onni Issakainen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Continuation of Ser. No. 488,737, Apr. 26, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,642

Claims priority, application Finland, May 26, 1982, 821875

Int. Cl.[4] E21B *19/14*

U.S. Cl. 414—22 **7 Claims**



1. A feed storage for drill rods for a long-hole drilling apparatus, said feed storage comprising

a magazine provided with

fixed guides for storing the drill rods in the direction parallel to each other;

a delivery opening defined by said guides for transferring drill rods one at a time in and out of the guides;

a feed device provided with gripping means extending in between the drill rods positioned in the guides for feeding the drill rods in the guides towards and away from said delivery opening;

a transfer device having at least one transfer arm provided with gripping jaws and mounted pivotably on a pivot shaft, said pivot shaft fixed with respect to said magazine so that said gripping jaws are displacable transversally with respect to the axial direction of the drill rods between the delivery opening of the guides and drilling axis of the drilling apparatus;

said feed storage further comprising

the guides of the magazine form between themselves at least one straight feed chute for guiding the drill rods having their axes in the same plane;

the feed device having at least one pair of feed plates carrying out simultaneous movements in opposite directions;

at least one pair of the feed plates of the feed device is comb-shaped, said feed plates of said pair mounted side by side on separate pivot shafts of two crankshafts located at a distance from each other and extending perpendicularly to the plane of the feed plates so that the feed plates are simultaneously displaceable in opposite directions with respect to each other along concentric circular arcs;

edges of the feed plates facing the guides provided with notches, said notches separated by the gripping cams for the drill rods, said gripping cams of each feed plate extend into the feed chute of the guides when the pivot shafts of said feed plates rotate towards the guides and locate out-

side the feed chute when said pivot shafts rotate away from the guides; and

the transfer arm is pivoted so that the gripping jaws are displaced along a circular arc between the delivery opening of the guides and the drilling axis.

4,632,619

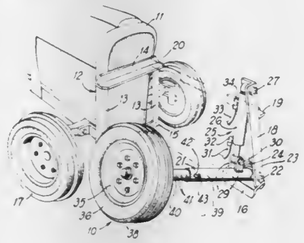
APPARATUS FOR UNROLLING BALED HAY

Frank W. Kennedy, P.O. Box 456, Cassville, Ga. 30123

Filed Jul. 15, 1985, Ser. No. 754,984

Int. Cl.[4] A01D *87/12*

U.S. Cl. 414—24.6 **14 Claims**



1. An apparatus for unrolling baled hay which is mounted onto a vehicle having tires and which utilizes the rotation of one tire of the vehicle to unroll the baled hay, comprising:

a. a support frame;

b. means for mounting said support frame onto a vehicle;

c. an axle pivotally attached at one end in a substantially parallel relationship to said frame and having a journal means at its other end;

d. a support arm mounted onto said frame for supporting said axle;

e. a single wheel mounted onto said journal means; and

f. adjustment means for raising and lowering said wheel and said axle whereby said wheel can be selectively positioned to contact said tire of said vehicle so that the rotation of said tire causes said wheel to rotate in the opposite rotational direction of said tire, said wheel contacting and unrolling the baled hay.

4,632,620

APPARATUS FOR STACKING PALLETS ON WHICH ARTICLES, PREFERABLY LARGE SACKS, HAVE BEEN DEPOSITED

Winfried Wiggers, Rheine, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

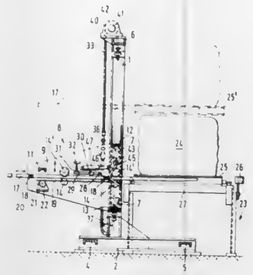
Filed May 9, 1985, Ser. No. 732,257

Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417876

Int. Cl.[4] B65G *57/30*

U.S. Cl. 414—95 **7 Claims**

1. Apparatus for stacking articles, particularly pallets on which articles having a substantially flat surface, preferably large sacks, have been deposited, comprising: spaced apart parallel tines, which constitute lifting arms and which are adapted to extend under the pallets or into openings thereof and are mounted on a slide, which is movable in vertical tracks and adapted to be lifted and lowered by drive means, wherein the vertical tracks are connected to a stationary base frame, the tines are extensible and retractable and guided in guide means at longitudinally spaced positions relative to a tine and supported on a slide, and deflection sensing means carried by the slide and positioned above and in contact with at least one of the tines between the guide means for detecting deflection of an intermediate portion of the at least one tine under load, and



a conveyor for the articles to be stacked is disposed below the tines when they have been extended.

4,632,621

COMPONENT STACK FEED DEVICE

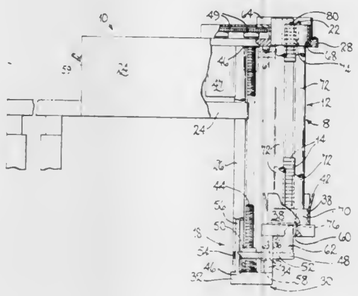
Michael J. Cable, Maldon, England, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 15, 1984, Ser. No. 660,907

Claims priority, application United Kingdom, Oct. 14, 1983, 8327560

Int. Cl.[4] B65G *59/02*

U.S. Cl. 414—118 **13 Claims**



1. A device for presenting electronic components to a pick-up head of a component placement machine, said device comprising: support means for mounting a removable magazine in which components are stacked one on top of another so that an uppermost one of the components can be removed from its stacked uppermost pick-up position within the magazine by the pick-up head, lifting means arranged to raise the stack of components in the removable magazine mounted on the support means wherein the removable magazine includes a guide portion having a passage shaped in cross-section to receive the components so that they are stacked one on another, a lower end portion extending partially across the passage to prevent components escaping from the lower end portion, a slot extending lengthwise down to and including the lower end portion, whereby the lifting means is introduced into the slot from the lower end when the magazine is mounted on the support means, said lifting means being operative upon receipt of an appropriate signal, and detector means for detecting whether or not an uppermost component carried in the removable magazine mounted on the support means is at its stacked uppermost pick-up position and signalling the lifting means to raise the stack until a component is detected at the pick-up position.

4,632,622

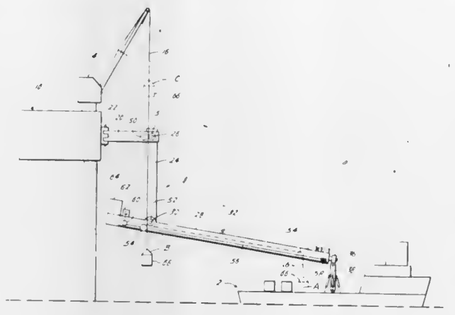
MARINE CARGO TRANSFER DEVICE

James S. Robinson, 2421 Westcreek La., Houston, Tex. 77027

Filed Feb. 28, 1983, Ser. No. 470,320

Int. Cl.[4] B65G *67/62*

U.S. Cl. 414—139 **13 Claims**



1. An apparatus for transferring cargo between first and second bodies which are movable relative to each other where a hoist for raising and lowering cargo through a hoist line is mounted on one of the bodies, comprising linkage means for connecting the two bodies, pivot means for pivotally connecting the linkage means to the bodies and having motion compensation means for accommodating relative movement between the bodies; and

trolley means movable along at least a portion of the linkage means for supporting the hoist line, and moving the hoist line along the linkage means between the two bodies so that cargo connected to the hoist line can be moved along the linkage means from one of the bodies to the other one;

the linkage means including a first arm pivotally connected to the first body for pivotal movement through a horizontal plane, a second arm pivotally connected to the first arm for pivotal movement through a vertical plane, and a third arm pivotally connected to the second arm for pivotal movement through a vertical plane;

and secondary platform means carried by the linkage for providing a substantially horizontal planar work surface below an end portion of the third arm in the vicinity of its connection to the second arm.

4,632,623

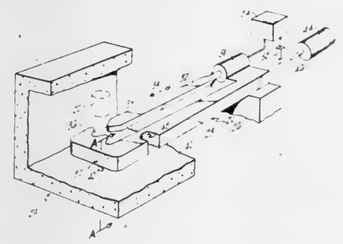
WORKPIECE MANIPULATOR FOR A HOT ENVIRONMENT

John R. Naumec, Willimantic, Conn., and Peter H. Kaverud, Columbus, Ga., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 15, 1984, Ser. No. 660,751

Int. Cl.[4] B25J *15/02*

U.S. Cl. 414—148 **9 Claims**



1. A manipulator apparatus useful for gripping a workpiece located on a workpiece holding surface in a high temperature environment comprising:

a structure having means for gripping the workpiece, and having a gas flow path for carrying gas;

a sensor attached to the structure for sensing the proximity of the gripping means to the workpiece holding surface; the sensor connected into the gas flow path, allowing continuous flow of gas there-along at all times during use to thereby cool the sensor, and altering the flow of gas according to the proximity of the gripping means to the surface; and a means for detecting a change in the flow or pressure of gas within the flow path due to alteration in the flow path by the sensor, the detector means providing a signal in response thereto; and the gripping means being responsive to the signal provided by the detector means.

4,632,624

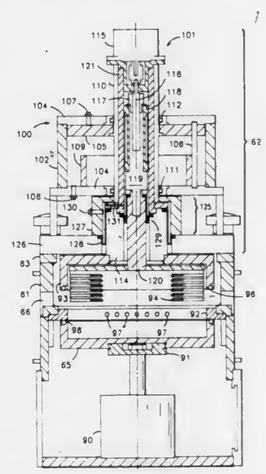
VACUUM LOAD LOCK APPARATUS

Ninko T. Mirkovich, Novato, and John Zajac, San Jose, both of Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Mar. 9, 1984, Ser. No. 588,027

Int. Cl.[4] C23C *14/00*

U.S. Cl. 414—217 **9 Claims**



1. A load lock apparatus comprising:

a plate having a central aperture and vents for connecting said aperture to an evacuation system;

a lower bell jar adapted to seal to said plate around said aperture;

an upper ball jar adapted to seal to said plate around said aperture; and

a wafer cassette adapted to be enclosed between said upper and lower bell jars.

4,632,625

AIRCRAFT-TOWING TRACTOR

Reinhard Schuller, Munich, and Gerhard Koch, Neugermering, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,405

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318077

Int. Cl.[4] B60P *3/06;* **B62D** *49/00;* **B64F** *1/22*

U.S. Cl. 414—429 **7 Claims**

1. An aircraft-towing tractor comprising:

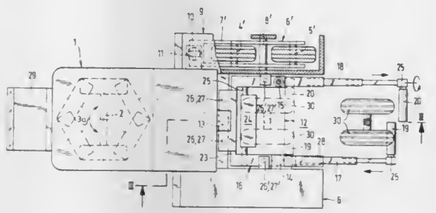
an elongated tractor chassis displaceable along the ground and formed at a rear end with a fork element defining a rearwardly open fork opening;

rear wheels flanking the opening of the tractor;

a U-shaped frame disposed in said opening and having

a pair of rearwardly extending parallel shanks telescopingly extendable out of said opening, each of said shanks having a gripper member swingably mounted on an end thereof for displacement between a raised position wherein said gripper members are generally parallel and spaced to clear a nosewheel assembly of an aircraft parked immediately behind the frame on extension of said shanks and an aligned position in which said gripper members are axially aligned with each other and can engage behind said assembly, and

a transverse connecting bar bridging the shanks at a forward end of the frame and provided with a shoe parallel to the bar and engageable backwardly with the assembly;



means for sequentially extending the shanks in the raised position of the gripper members to displace same backward past the assembly and for then rotating the arms into the aligned position with the assembly laterally flanked by the shanks and also behind the bar and ahead of the aligned gripper members;

a pin extendable axially from one of the gripper members into the other gripper member in the aligned position of same to lock same together; and

means for retracting the shanks with the gripper members in the aligned position and locked together by the pin for drawing the assembly engaged within the frame into said opening; and

a shoe carried on the frame, extending parallel to said bar, and rearwardly engageable with said assembly upon the drawing of said assembly into said opening by said members.

4,632,626

TRAILER FOR LOADING AND HAULING AGRICULTURAL BINS

Kenneth E. O'Shea, 2251 Road #9 NW., Quincy, Wash. 98848

Filed Mar. 11, 1985, Ser. No. 710,583

Int. Cl.[4] B60P *1/18*

U.S. Cl. 414—476 **3 Claims**



3. In an elongate trailer for loading and hauling a plurality of agricultural bins in elongate array, the invention comprising:

a unitary trailer frame having elongate opposed side beams, conveyer structures associated with the side beams to move bins thereover, and tongue means for releasable and movable interconnection to a powering vehicle;

similar opposed laterally extending wheel structure supported on each elongate side beam to aid locomotion of the trailer and to move the trailer frame vertically relative to a supporting surface, each said wheel structure having, cylinder brackets carried by the side beams at a spaced distance laterally therefrom, said brackets having two perpendicular portions parallel to said beam,

hydraulic cylinders carried by each cylinder bracket extending rearwardly thereof,

linear beam-like wheel arms pivotably carried by a coaxial transverse pipe support carried by said opposed side beams and extending laterally therefrom,

said coaxial pipe support also supporting one end of each bracket via a hole portion and the other end being supported by the trailer frame,

pneumatic wheels journaled on rearward portions of the wheel arms to extend laterally therefrom, and

each wheel arm having a medial upwardly extending cylinder bracket to pivotably interconnect the associated hydraulic cylinder to allow that associated hydraulic cylinder to move the wheel arm about its pivot.

4,632,627

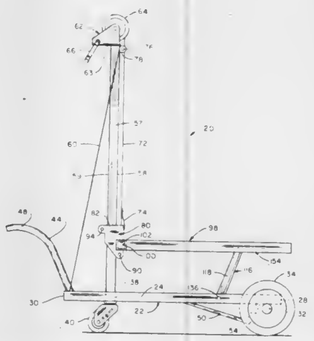
LOADER, TRANSPORT AND WORKTABLE CART

Elmer Swallows, 628 N. Locust, Dexter, Mo. 63841

Filed Apr. 8, 1985, Ser. No. 721,212

Int. Cl.[4] B65G *7/00*

U.S. Cl. 414—490 **4 Claims**



1. A cart comprising a base having a front and a back, front and back wheels mounted on the base adjacent respectively the front and back thereof, a platform, means connected to the base for supporting the platform while permitting the platform to move generally vertically relative to the base, means to move the platform generally vertically relative to the base, means to hold the platform in a generally horizontal position when the front and rear wheels are on a generally horizontal surface, and means for tilting the platform downwardly toward the back thereof so that when the back of the base is raised thereby tilting the cart about the front wheels, the platform is generally horizontal, including at least two cables connectable between the front of the base and the front of the platform to permit the front of the cart to be lifted by the application of an upward force applied to the front of the platform, wherein the platform comprises a pair of side rails having front and rear ends, a rear cross rail connected to the rear ends of the side rails, a front cross rail connected to the front ends of the side rails, and a plurality of intermediate rails between and parallel to the side rails and connected to the rear and front cross rails, wherein each cable has one end connected to a tension spring and a second end spaced from the tension spring, the tension spring being positioned within and anchored to said side rails to normally draw the cables within the side rails, a hole in the bottom of each side rail through which its respective cable extends, a stop on the second end of each cable, the stops being larger than the holes thereby preventing the second ends of the cables from passing into the hollow side rails, and means on the base defining retainers for the stops when the cables are pulled from the hollow side rails to releasably retain the second ends of the cables in the said retainers.

4,632,628

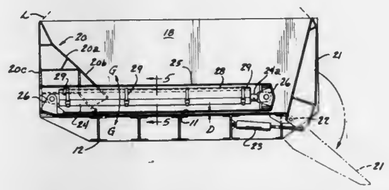
SIDE-EJECTION VEHICLE

Ralph H. Kress, Peoria, and Jackson C. Medley, Brimfield, both of Ill., assignors to Kress Corporation, Brimfield, Ill.

Continuation of Ser. No. 701,652, Feb. 14, 1985, abandoned, which is a continuation of Ser. No. 441,536, Nov. 15, 1982, abandoned. This application Oct. 24, 1985, Ser. No. 790,774

Int. Cl.[4] B60P *1/16*

U.S. Cl. 414—513 **8 Claims**



1. A side ejection mechanism for discharging a payload of material to the side of a vehicle comprising:

a substantially horizontal and smooth load bed free of structure;

substantially parallel front and rear walls fixed to and extending upwardly from the load bed, the front and rear walls each further comprising only a single ridged, horizontal rail substantially adjacent the load bed, the rails being substantially parallel and facing one another;

an ejection ram laterally translatable between a retracted position at one side of the load bed and an extended position at the other, the ejection ram comprising a ram face substantially perpendicular to and extending substantially between the front and rear walls and a pair of laterally spaced rollers at each end to mate with and roll along each of the ridged horizontal rails, the rollers of each pair being substantially longitudinally aligned with the counterpart rollers of the other pair to form a substantially horizontal, rectangular configuration which permits lateral translation of the ejection ram from one side of the load bed to the other without cocking or tipping, the longitudinal spacing of each pair of rollers relative to the ram face being such that the ram may traverse substantially the entire load bed, the bottom edge of the ejection ram being substantially linear and closely adjacent the smooth load bed to scrape the load bed during the translation of the ram;

one single stage hydraulic cylinder for actuating the ejection ram between its retracted and extended positions, the cylinder being mounted substantially horizontally substantially adjacent the load bed and acting on the ejection ram at substantially its mid-point, the ejection ram further comprising a hollow tube extending substantially horizontally and laterally from the ejection ram face at substantially its mid-point, the hydraulic cylinder being connected between the side of the load bed which corresponds to the retracted position of the ejection ram and the end of the tube remote from the ram face, the actuation of the hydraulic cylinder resulting in the actuation of the ejection ram, the tube serving to isolate at least a portion of the cylinder rod from material in the load bed.

4,632,629

WHEEL LIFT APPARATUS FOR TOWING VEHICLES

Roger D. Kooima, 224 N. Milwaukee, Canton, S. Dak. 57013

Filed Aug. 12, 1985, Ser. No. 765,254

Int. Cl.[4] B60P *3/12*

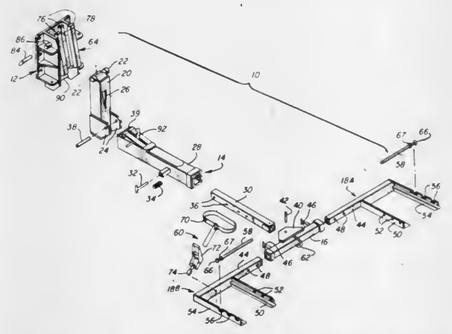
U.S. Cl. 414—563 **12 Claims**

4. A lifting apparatus for a tow truck or other towing vehicle for engaging and lifting a vehicle to be towed, comprising:

means for mounting the apparatus on the tow truck;

boom means extending rearwardly of the mounting means and including means for engaging the vehicle; and

complementary interengaging means between the mounting means and the front end of the boom means for guiding upward lifting movement of the boom means relative to the mounting means and for effecting angular upward movement of the free end of the boom means greater than the upward movement of the front end of the boom means, said complementary interengaging means including forwardly inclined, upwardly extending ramp means on said mounting means, the ramp means being of generally uniform cross section along the length thereof and being defined by a pair of inwardly opening parallel slots, a generally vertical post member of generally uniform cross section disposed at the front end of the boom means, a pair of follower rollers mounted directly to the upper end of the post member, one of said roller members being engageable within each of said inwardly opening slots for riding upwardly therealong and said rollers defining the pivot axis of the post member, and fixed fulcrum means on the mounting means at the base of the inclined ramp means



for bearing against the front side of said vertical post member of the boom means, whereby angular upward tilting movement of the boom means is effected in response to said relative upward lifting movement of the boom means with said rollers defining both the upward guide means for the boom and the pivot point for the boom.

10. In a wheel lift towing apparatus for the rear end of a tow truck or other towing vehicle for engaging the wheels of a vehicle to be towed, the apparatus including boom means extending rearwardly of the towing vehicle, and carriage means on the free end of the boom means for engaging the wheels of the vehicle to be towed and for lifting the vehicle, an improvement in said carriage means comprising at least one fork-like structure having a pair of arms positionable on the inner and outer sides of a wheel, the outer arm having notch means for the insertion thereinto of a wheel engaging member in a direction transversely of the arm, said notch means comprising a generally L-shaped notch having a vertical leg portion for receiving the wheel engaging member downwardly thereinto and a horizontal leg portion for locking the wheel engaging member against vertical movement.

4,632,630

FORKLIFT ATTACHMENT

Clyde M. Maki, Hartford, Wis., and Herbert Homann, Mississauga, Canada, assignors to Koehring Company, Brookfield, Wis.

Continuation-in-part of Ser. No. 491,071, May 3, 1983, abandoned. This application Apr. 20, 1984, Ser. No. 603,185

Int. Cl.[4] E02F *3/36*

U.S. Cl. 414—700 **1 Claim**

1. A fork extension attachment for a boom-type forklift

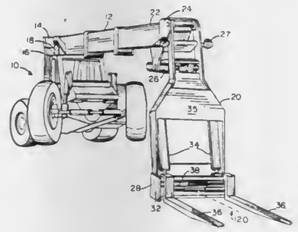
wherein said boom has its inner end pivotally connected to a vehicular body, said attachment comprising

an extension portion having its inner end pivotally connected to the outer end of said boom to allow pivotal movement of said extension in a vertical plane and

a fork assembly having at least two horizontally spaced tines, the assembly having its inner end pivotally connected adjacent the outer end of said extension portion to allow pivotal movement of said fork assembly in a vertical plane,

said fork assembly including at least two tines mounted on a carriage for horizontal movement on said carriage relative to each other,

power means for moving said tines independently of each



other or in unison, with each of said tines movable from an extreme outboard position to a position beyond the centerline of said carriage,

leveling means for releasably maintaining said fork assembly in a substantially horizontal position, said leveling means comprising an electrical pendulum switch operatively connected to means for providing hydraulic fluid to hydraulic cylinder means used to position said fork assembly about said pivot point, and

the pendulum of said pendulum switch swings in a path substantially parallel to the longitudinal axes of said tines and said pendulum switch is mounted in such a manner that an upward tilt of approximately two degrees for said tines is detected as being substantially horizontal by said pendulum switch.

4,632,631

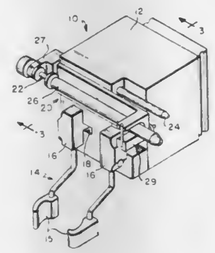
MULTIPLE-FUNCTION HAND

Raymond R. Dunlap, Uxbridge, Mass., assignor to Zymark Corporation, Hopkinton, Mass.

Continuation-in-part of Ser. No. 355,349, Mar. 8, 1982, Pat. No. 4,488,241, which is a continuation-in-part of Ser. No. 328,727, Dec. 8, 1981, Pat. No. 4,510,684. This application May 23, 1984, Ser. No. 613,162

Int. Cl.⁴ B25J *15/00*

U.S. Cl. 414—736 **6 Claims**



1. A multiple-function hand for rotatable attachment to a robot arm, said hand comprising at least two tools thereon, at least a first of said tools being mounted for normal use at an angle substantially normal to the angle at which a said second tool is mounted for use, and wherein each said tool is operably connected to two linear-operating means mounted in said hand, said linear-operating means being mounted parallel to one another and wherein said first tool is a gripper means and said second tool is a syringe.

4,632,632

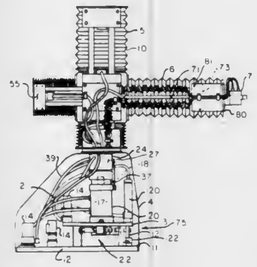
PROGRAMMABLE INDUSTRIAL ROBOT HAVING SIMPLIFIED CONSTRUCTION

Raymond J. Simone, St. Louis, Mo., assignor to Automation Equipment Company, St. Louis, Mo.

Filed Aug. 30, 1983, Ser. No. 527,839

Int. Cl.⁴ B25J *9/00*

U.S. Cl. 414—744 A **10 Claims**



1. In a robot including a base plate having a first surface and a second raised surface, the raised surface defining a platform, a rotary drive device mounted to said platform, the rotary drive device having a shaft extending downwardly from said platform, the improvement comprising stop system means for defining first and second end of travel positions for said robot, at least one intermediate stop movably positioned with respect to said platform, and means for permitting said robot to reach said intermediate stop position regardless of the direction of approach of said robot toward said intermediate stop position, said last mentioned means including a stop having a material thickness, said last mentioned means further providing compensation for the material thickness of said stop so that said robot comes to a precise intermediate stop position repeatedly regardless of the direction of approach toward said intermediate stop position.

4,632,633

APPARATUS FOR LOADING CYLINDRICAL ARTICLES ONTO PALLETS

Kenneth F. C. Avey, Epping, England, assignor to W&C Pantin Ltd., Epping, England

Filed Nov. 28, 1984, Ser. No. 675,935

Claims priority, application United Kingdom, Oct. 25, 1984, 8427037

Int. Cl.⁴ B65G *65/00*

U.S. Cl. 414—787 **6 Claims**

1. Apparatus for loading cylindrical articles such as kegs onto a pallet so that the articles lie on their sides in a plurality of rows, the apparatus comprising

(i) means providing a loading station,

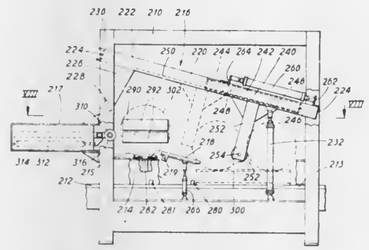
(ii) means for moving an empty pallet to the loading station,

(iii) means for assembling a row of articles at an assembly location adjacent the loading station and at a level higher than the upper surface of a pallet at the loading station,

(iv) a ramp arranged to extend from the assembly location to a pallet at the loading station,

(v) pusher means for pushing a row of articles onto the ramp whereby the articles roll down the ramp under their own weight onto the pallet, and

(vi) a transfer mechanism having a carriage and a transfer member, the carriage being movable toward and away from said assembly location and movable between a lower position in which the transfer member is able to engage articles on the ramp and an upper position where the transfer member is clear of articles on the ramp and clear of articles on the pallet at the unloading station, and the



transfer member further including means for moving the carriage to enable the transfer member to engage in turn each row of articles pushed onto the ramp and control the movement of the articles down the ramp.

4,632,634

SYSTEM FOR FIXING THE STATOR NOZZLES TO A POWER TURBINE CASING

Costantino Vinciguerra, Florence, and Leonardo Arrighi, Pisa, both of Italy, assignors to Nuova Pignone S.p.A., Florence, Italy

Filed Sep. 26, 1984, Ser. No. 654,559

Claims priority, application Italy, Oct. 3, 1983, 23110 A/83

Int. Cl.⁴ F01D *25/24;* **B21K** *3/00*

U.S. Cl. 415—139 **6 Claims**



1. A power turbine, comprising:

a power turbine stator casing;

a shroud connected with said stator casing, said shroud having a radial dovetail guide in the front surface thereof;

means for locking said shroud to said stator casing;

a nozzle sector having a radial fork and an abutting wall of a radial projection adapted to receive a key;

a key which connects said shroud with said radial fork of said nozzle sector, wherein said key comprises two diverging vertical flanges at the rear part thereof which are inserted into said radial dovetail guide in the front surface of said shroud, a vertical projecting guide nose which cooperates as an axially directed shoulder element with said abutting wall of said radial projection of said nozzle sector, a parallel pad on each of two opposing side faces of said key which pads slightly project laterally from said key and contact opposing surfaces of said radial fork; and

spring means for biasing said two diverging flanges of said key against said dovetail guide to inhibit removal of said key by a compressive force between said diverging flanges and said dovetail guide.

4,632,635

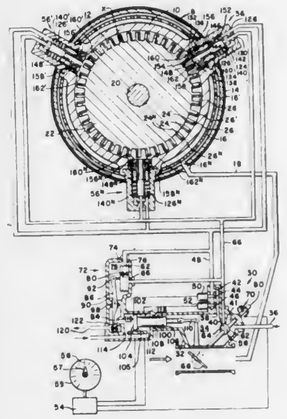
TURBINE BLADE CLEARANCE CONTROLLER

David C. Thoman; Russell C. Perkey, both of Mishawaka, and James M. Eastman, South Bend, all of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 24, 1984, Ser. No. 686,166

Int. Cl.⁴ F01D *11/00, 25/12*

U.S. Cl. 415—14 **14 Claims**



1. In a turbine engine having an engine housing with a chamber therein, a shaft located in said engine housing and extending into said chamber, a plurality of blades attached to said shaft and rotatable within said chamber, each of said blades having a tip that extends to a position adjacent the engine housing to define a desired clearance therebetween, said clearance being affected by operating engine parameters comprising temperature, pressure, engine speed, the improvement comprising:

a first source of fluid having a fluid pressure (P_1);

a valve housing having a supply chamber connected to said first source of fluid, said valve housing having first and second exit ports;

a nozzle having a head with a first cavity connected to said first exit port and a second cavity connected to said second exit port, said head having a first opening for connecting said first cavity with a recess in said chamber of the engine housing and a second opening for directly connecting said second cavity with said chamber of the engine housing, said first exit port restricting the flow of said first fluid from said supply chamber to establish a fluid pressure (P_2) in the fluid communicated to said first cavity, said first fluid continually flowing from said first cavity into said first recess;

a valve located in said supply chamber and movable with respect to said second exit port to control the flow of said first fluid therethrough to said second cavity, each tip of said blade restricting the flow of said first fluid from said opening to establish a fluid pressure (P_2') in said second cavity, said fluid pressure (P_2') being directly dependent on the clearance between the tip of said blade and said engine housing and the position of said valve with respect to said second exit port; and

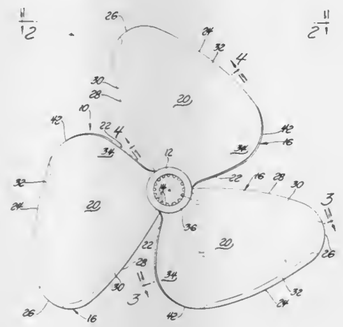
means responsive to a difference in fluid pressure (P_2-P_2') in said first and second conduits for producing an operational signal, said valve being responsive to a change in said operational signal created as the fluid pressure P_2' changes by moving to modify the flow of said first fluid through said second exit port to substantially nullify said difference in pressure (P_2-P_2') by allowing the fluid pressure (P_2') to equal the fluid pressure (P_2), said valve controlling the flow of a second fluid to a manifold surrounding said engine housing, said second fluid counter-

acting the affect of said engine parameters by cooling said engine housing and reestablishing said desired clearance.

4,632,636
PROPELLER WITH BLADES HAVING REGRESSIVE PITCH

William H. Smith, Warren, Mich., assignor to Edward H. Smith, Port Charlotte, Fla.

Filed May 27, 1983, Ser. No. 498,931
Int. Cl.⁴ B63H *1/26*
U.S. Cl. 416—223 R **27 Claims**



1. A propeller (10) comprising: a hub (12) having a center axis and a plurality of blades (16) extending substantially radially from said hub (12), each blade (16) having a leading edge (22), a tail edge (26), and a working face (20) on one side of said blade (16), characterized by each of said blades (16) including a body portion including said working face (20) having a regressive pitch that continually falls away from said leading edge (22) to said tail edge (26 so that as said leading edge (22) cuts an imaginary helix during rotation about the center axis, successive next adjacent positions on said working face from said leading edge (22) to said tail edge (26) cut imaginary helixes with progressively decreasing lead angles relative to the center axis.

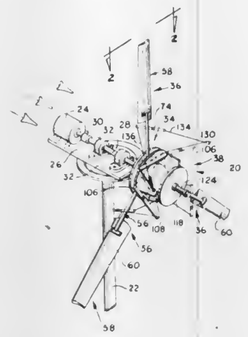
15. A method of making a propeller (10) including the steps of; forming a hub (12) having a center axis and a plurality of blades (16) each having a leading edge (22) and a tail edge (26) and a working face (20) with each of said blades extending substantially radially from the hub (12) and continually curving the working face (20) of each blade (16) from the leading edge (22) to the tail edge (26) to define a regressive pitch of the blade (16) so that as the leading edge (22) cuts an imaginary helix during rotation about the center axis, successive next adjacent positions on the working face from the leading edge (22) to the tail edge (26) cut imaginary helixes with progressively decreasing lead angles relative to the center axis.

4,632,637
WIND TURBINE

Ray F. Traudt, Englewood, Colo., assignor to Analytics, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 270,221, Jun. 4, 1981, abandoned. This application Jun. 7, 1984, Ser. No. 618,047
Int. Cl.⁴ F03D *7/04*
U.S. Cl. 416—41 **15 Claims**

1. A wind turbine device having a main rotatable driven shaft, a plurality of elongated blades operatively mounted on said main shaft for unitary rotation with the main shaft, said blade extending substantially radially away from said main shaft and adapted to fold downwind under naturally occurring forces and simultaneously feather in direct response to the folding movement, and means associated with the blades for

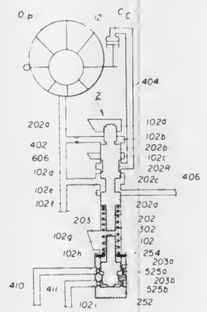


increasing the rate of fold relative to the rate of feather as the speed of rotation increases.

4,632,638
REGULATOR VALVE FOR HYDRAULIC CONTROL SYSTEM INCLUDING VARIABLE DISPLACEMENT PUMP

Takashi Shibayama, Chigaskai, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 28, 1984, Ser. No. 655,678
Claims priority, application Japan, Oct. 6, 1983, 58-185993
Int. Cl.⁴ F04B *49/00*
U.S. Cl. 417—218 **1 Claim**



1. In a hydraulic control system for an automotive automatic transmission,

an automatic transmission actuated by hydraulic fluid;

a variable capacity pump for supplying hydraulic fluid under pressure for actuating the automatic transmission, said pump having a control arrangement including a control chamber which varies the capacity of said pump in response to the pressure prevailing therein;

a pressure regulator valve for regulating the output of said pump by draining off some of the fluid discharged by said pump and developing a control pressure, said regulator valve including a bore formed with:

a first port which receives the output of said pump,

a second port which fluidly communicates with said control chamber, and

a drain port,

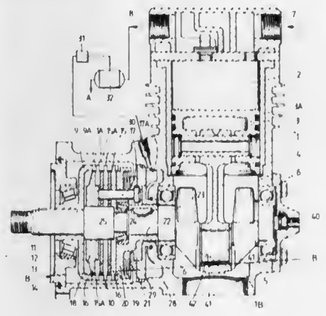
said regulator valve further including a spool which is reciprocatively disposed in said bore and which is formed with first and second lands, said first land defining a first variable orifice between said first and second ports and said second land defining a second variable orifice between said second and drain ports; and

a fixed flow restriction within said bore, for restricting fluid communication between said first and second ports and said second and drain ports, said fixed flow restriction being defined between the wall of said bore and a first portion of said spool which extends between said first and second lands, said portion having a diameter which is selected with respect to the diameter of that portion of the bore in which it is disposed so as to define a gap having a maximum width of 1.5 mm.

4,632,639
AIR COMPRESSOR WITH PRE-LOADED SPRING CLUTCH

Paul Beaumont, Gwent, Scotland, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 25, 1985, Ser. No. 715,465
Claims priority, application United Kingdom, Mar. 30, 1984, 8408227; Jul. 26, 1984, 8419062
Int. Cl.⁴ F04B *49/08*
U.S. Cl. 417—223 **6 Claims**



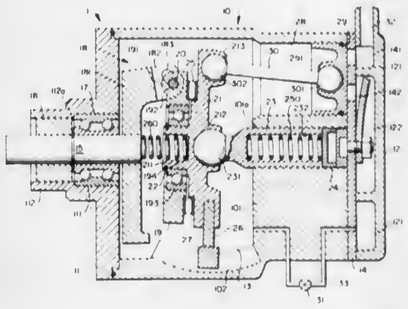
1. An air compressor comprising at least one comprssor element operable by drive means to effect compression of air within a space, a clutch for transmitting drive from the drive means to the compressor element when compression is required, and a spring device operable normally to urge the clutch into engagement, the spring device being pre-loaded by at least one screw member arranged to apply a compressive force across the spring device and also to maintain the clutch in assembled condition wherein the clutch is of the multi-plate type having interleaved driving and driven plates of which the driving plates are rotatable with a drive input shaft, the screw member passing axially through the driven clutch plates and being threadedly engaged at one end in a non-driven clutch member, the other end of the screw member engaging thrust means acting on the spring device, the spring device acting between said thrust means and another clutch member disposed at the side of the clutch plates remote from the non-driven clutch member.

4,632,640
WOBBLE PLATE TYPE COMPRESSOR WITH A CAPACITY ADJUSTING MECHANISM

Kiyoshi Terauchi, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Feb. 21, 1985, Ser. No. 703,902
Claims priority, application Japan, Feb. 21, 1984, 59-29653
Int. Cl.⁴ F04B *1/12*
U.S. Cl. 417—269 **8 Claims**

1. In a refrigerant compressor including a compressor housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block, a piston slidably fitted within each of the cylinders, a driving mechanism including a wobble plate for reciprocating the pistons, an input drive rotor and a drive shaft connected to said input rotor to drive said input drive rotor, a front end plate on said compressor housing for rotatably supporting said drive shaft, a rear end plate disposed on the opposite end of the compressor housing having a suction chamber and a discharge chamber, said wobble plate having a first side facing said front end plate and a second opposite side facing said rear end plate, the crank chamber and the suction chamber connected by a passageway and control means for controlling the opening and closing of the passageway, the improvement comprising said driveshaft extending into said crank chamber and terminating at an inner terminal end on said first side of said wobble plate, said input



drive rotor having a rotor member fixed on said inner terminal end of said drive shaft, a slant plate formed with a sloping surface in close proximity to said wobble plate, said wobble plate having a annular boss at its center portion extending into a central bore formed through a center portion of said slant plate, a bearing being disposed in a gap between said central bore and said annular boss for rotatably supporting said slant plate on said wobble plate, hinge means for hinging said slant plate to said rotor member in a manner to vary the slant angle thereof, and a supporting member axially slidable in said cylinder block and coupled to said second side of said wobble plate to support said wobble plate for nutational motion.

4,632,641
PUMP ARRANGEMENT FOR HYDRAULIC INSTALLATIONS

Georg Liska, Durlach-Zimmerbach, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen 1, Fed. Rep. of Germany

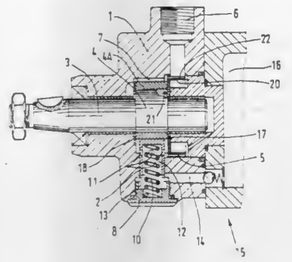
PCT No. PCT/EP83/00155, § 371 Date Apr. 24, 1984, § 102(e) Date Apr. 24, 1984, PCT Pub. No. WO84/01003, PCT Pub. Date Mar. 15, 1984
PCT Filed Jun. 15, 1983, Ser. No. 604,659
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231878
Int. Cl.⁴ F04B *1/04*
U.S. Cl. 417—273 **9 Claims**

1. A pump having suction flow means leading thereto;

a suction flow opposing means in said suction flow means which comprises a centrifugal impeller disposed to produce opposition to said suction flow for reduction thereof with speed increase of said centrifugal impeller for discharge regulation of said pump; and means whereby the speed of said centrifugal impeller increases with the speed of said pump.

7. The combination of a pump having a suction side and a centrifugal impeller in series connection with said suction side and a fluid source, and comprising means operative to effect pump regulation inversely to the speed of said centrifugal impeller for decreasing the discharge of said pump with increasing speed of said centrifugal impeller, said pump being of multi-piston type comprising a cam (4) mounted on a drive shaft (3) for actuating pumping pistons:

the improvement wherein said centrifugal impeller comprises a member (**20**) rotative with said shaft and having



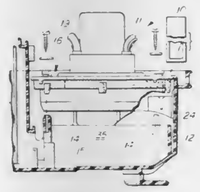
elements (**22**) effecting a countercurrent in said suction side upstream of said pump.

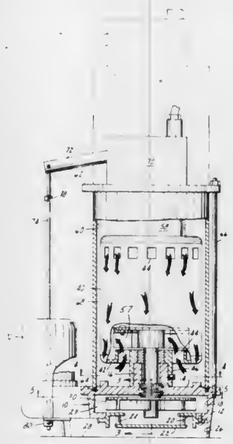
4,632,642

MOTOR-FAN MOUNTING SYSTEM FOR CANISTER VACUUM CLEANER

Earl E. Meister, III, Danville, Ky., and Bruce E. Stewart, Maplewood, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 24, 1985, Ser. No. 747,891
Int. Cl.[4] F04C *29/00;* **H02K** *5/24*
U.S. Cl. 417—363 **20 Claims**





1. In a vacuum cleaner having a base and a motor-fan assembly, the improvement comprising:

support means on the base defining upstanding support posts having upper distal ends;

a resilient mounting ring;

a rigid mounting plate;

mounting means removably securing the motor-fan assembly to the mounting plate;

cooperating means on said rigid mounting plate and resilient mounting ring for mounting said mounting plate to the mounting ring including openings in said mounting plate and portions of said mounting ring aligned with and extending through said openings, said mounting ring engaging said mounting plate below and above said plate at disaligned positions at opposite edge portions of the associated opening for effectively clamping the mounting plate therebetween; and

securing means securing the mounting ring to said upper distal ends of the posts to mount the motor-fan assembly resiliently to said posts to be spaced substantially above said base to provide air flow upwardly to said motor-fan assembly.

4,632,643

SUMP PUMP

Axel L. Nielsen, 1316 E. Elza, Hazel Park, Mich. 48030

Filed Feb. 14, 1985, Ser. No. 701,776
Int. Cl.[4] F04B *39/06*
U.S. Cl. 417—367 **2 Claims**

1. A submersible sump pump assembly adapted to be supported on the floor of a sump and to be submerged in water as it rises in the sump, comprising an impeller housing having a flat generally horizontal top wall provided centrally thereof with an upward tubular extension, an impeller in said housing for pumping water in said sump to a discharge pipe, a motor having a drive shaft extending downwardly through said tubular extension and connected to said impeller, said motor having a casing provided with a vertically elongated cylindrical side wall, a top wall and a bottom wall provided with a central tubular downward extension of smaller diameter than said side wall telescoped with said extension of the top wall of the impeller housing and constituting the sole support for said motor, said bottom wall of said casing being spaced above said top wall of said impeller housing, said motor casing having an annular series of air inlet ports in its bottom wall surrounding said extensions and an annular series of air outlet ports at its upper end, means within said motor casing for circulating cooling air upwardly therethrough, a vertically elongated cylindrical, sealed air chamber in which said motor is received, said air chamber comprising a vertically extending cylindrical shell adapted to be submerged in and contacted by water in said sump, said cylindrical shell being spaced uniformly from the side wall of said motor casing at a short distance to define an unobstructed 360° vertically elongated lateral air passage of total cross-section only sufficient to provide air flow therethrough without substantial restriction while providing maximum heat transfer from said motor casing through the air to the wall of said chamber, said air chamber having a top wall spaced above and completely separated from said top wall of said motor casing to provide for a volume of air in unobstructed 360° communication with said lateral air passage, the top wall of said impeller housing forming the bottom wall of said air chamber and being spaced beneath the bottom wall of said motor casing to provide an annular bottom air passage between the portions of the bottom wall of said motor casing and top wall of said impeller housing surrounding said telescoping extensions in unobstructed 360° communication with said lateral air passage, cooling air flow exteriorly of the motor casing being downwardly through said lateral air passage and then inwardly through said bottom air passage.

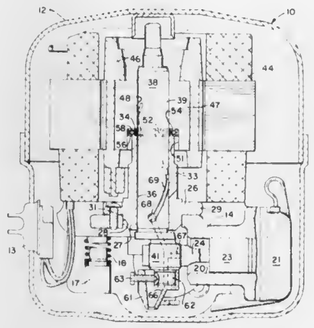
4,632,644

REFRIGERATION COMPRESSOR

Jack F. Fritchman, Cullman, Ala., assignor to White Consolidated, Inc., Cleveland, Ohio

Filed Jul. 20, 1984, Ser. No. 632,707
Int. Cl.[4] F04B *35/04;* **H02K** *5/00*
U.S. Cl. 417—415 **7 Claims**

1. A hermetic refrigeration compressor comprising a shell, a cylinder block mounted in said shell, a single piston and cylinder means on said cylinder block, a stator mounted on said cylinder block, a bearing hub on said cylinder block defining a vertical bearing bore, said bearing hub having an end face at the top thereof around said vertical bore, a crankshaft journaled in said vertical bore and arranged to reciprocate said piston in said cylinder, said crankshaft having an upper end extending upwardly above said bearing hub, a rotor secured on



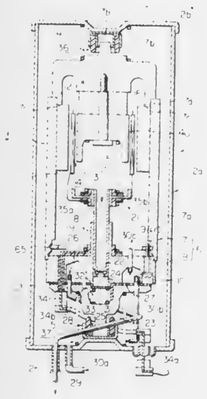
said crankshaft upper end concentric with said stator, a thrust surface carried by said crankshaft above said end face, and a ball thrust bearing between said thrust surface and the end face on said bearing hub, said ball thrust bearing having a plastic cage loosely positioning a plurality of balls equidistantly and said balls rolling against flat washers on both sides of said cage, said balls occupying a space of less than twenty percent of a full complement of balls in abutting contact.

4,632,645

VIBRATING COMPRESSOR

Naoya Kawakami, and Yoshiaki Fujisawa, both of Nitta, Japan, assignors to Sawafuji Electric Co., Ltd., Japan

Filed Nov. 12, 1985, Ser. No. 797,243
Claims priority, application Japan, Nov. 22, 1984, 59-247296
Int. Cl.[4] F04B *17/04, 21/04;* **H02K** *33/00*
U.S. Cl. 417—417 **7 Claims**



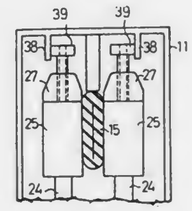
1. A vibrating compressor having a cup-shaped external iron core comprising a bottom and an cylindrical part; a closing member closing the open end face of said external iron core cylindrical part; a permanent magnet disposed inside said external iron core; an internal iron core having a cylindrical magnetic pole for forming a magnetic path, together with said external iron core, with respect to said permanent magnet; and a driving coil vibratably supported by a mechanical vibrating system and disposed within an annular magnetic gap between said external iron core and said internal iron core; said driving coil driving a piston connected thereto when an alternating current is fed to said driving coil, and characterized in that said permanent magnet consists of a high residual magnetic flux density magnet, as represented by an alnico magnet, and a high coercive force magnet, as represented by a ferrite magnet; said high residual magnetic flux density magnet being disposed in between said bottom of said external iron core and said internal iron core; and said high coercive force magnet being disposed in between said cylindrical part of said external iron core and said internal iron core.

4,632,646

SQUEEZE PUMP

Noboru Iwata, Gifu. Japan, assignor to Daiichi Engineering Co., Ltd., Gifu, Japan

Continuation-in-part of Ser. No. 440,214, Aug. 2, 1982, Pat. No. 4,492,538. This application Jul. 9, 1984, Ser. No. 628,705
Claims priority, application Japan, Dec. 13, 1980, 55-176235; Mar. 25, 1981, 56-44490; Jul. 6, 1981, 56-105354; Jul. 23, 1981, 56-116270; PCT Int'l Appl., Jul. 30, 1982, PCT/JP81/00364
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—477 **4 Claims**



1. A squeeze pump adapted to transfer a slurry with solid materials therein, comprising:

a resilient tube at least partly curved along an imaginary circle, the slurry with solid materials being adapted to be transferred through the tube,

a semi-circular casing, said resilient tube being situated along the inside of the semi-circular casing so that the resilient tube is partly curved along the imaginary circle, said semi-circular casing having two support rails situated in the inner periphery of the casing parallel to the resilient tube at both sides thereof,

a rotary arbor situated in the center of the imaginary circle so that the curved portion of the resilient tube is equidistantly away from the rotary arbor, said rotary arbor being adapted to be rotated by power means, and

at least one pair of means connected to the arbor for pressing the resilient tube, each pressing means including a support shaft extending outwardly from the arbor toward the resilient tube, a presser roll freely rotationally connected to the support shaft and having a main body and a tapered head, the two support shafts of the pressing means being spaced apart on the rotary arbor to allow the two pressing means to face each other so that the innermost planes of the main bodies of the respective presser rolls always facing each other are parallel and are spaced apart at a distance about twice as great as the thickness of the wall of the resilient tube to allow the presser rolls on the support shafts to nip and press the resilient tube equally from two sides of the tube to provide a wide nipping angle defined between two inner surfaces of the resilient tube pressed by the pressing means, and a support roll rotationally connected to the outer end of each presser roll so that when the presser rolls press the tube, the support rolls engage the support rails to cause the tube to be pressed evenly by

the presser rolls, said presser rolls, when the rotary arbor is rotated, gradually nipping the tube from a portion close to the rotary arbor to a portion away from the rotary arbor across the entire width of the tube by means of the tapered heads so that the solid materials contained in the slurry are pushed gradually away from the tapered heads to prevent the solid materials from being nipped by the main bodies and then pressing the tube completely by means of the main bodies, whereby the solid materials in the slurry are not substantially nipped by the main bodies of the presser rolls to provide a smooth transfer of the slurry with solid materials by means of the main bodies of the presser rolls.

4,632,647

SIDE ENTRY DOWN HOLE PUMP FOR OIL WELLS

Jack Rowlett, Rte. 2, Paola, Kans. 66071

Filed Jun. 3, 1985, Ser. No. 740,498

Int. Cl.[4] F04B *7/04, 21/04;* **F16J** *9/00*

U.S. Cl. 417—498 **13 Claims**



1. A submersible pump for pumping fluid from an oil well, said pump comprising:

a pump barrel in the well having a closed bottom end and a side surface provided with a fluid inlet port spaced above said bottom end but located below the level of the fluid in the well, said pump barrel defining a pump chamber therein between said bottom end and said inlet port;

a pump element received in said barrel for reciprocating movement carrying the pump element past said inlet port during upstrokes and downstrokes of the pumping element, said pump element presenting a flow passage having an inlet for receiving fluid from said pump chamber;

seal means on said pump element for sealing same to said pump barrel, said seal means being located above said inlet port in an open position of the pump to admit fluid through said port and into said pump chamber under the influence of gravity and said seal means being located below said inlet port in a closed position of the pump to seal the pump chamber from said port and apply pressure to the fluid in said chamber during downstrokes of said pump element therein;

a pumping string connected to said pump element for effecting reciprocation of same in said barrel, said pumping string presenting a flow channel communicating with said flow passage to deliver fluid to the surface of the well during downstrokes of the pump element in the flow chamber;

a check valve between said flow passage and flow channel permitting fluid flow upwardly therebetween but preventing fluid flow downwardly therebetween; and

a fluid discharge port in the side of said pump barrel at a location above said inlet port and above said seal means in all positions thereof for discharging from the pump barrel fluid trapped above said seal means.

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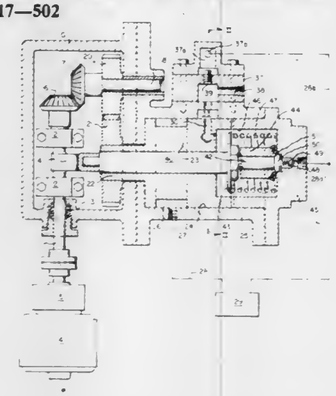
GREASE PUMPS

Thomas S. Goyne, Box 75, Helfenstein, Pa. 17939

Filed Jun. 24, 1985, Ser. No. 748,329

Int. Cl.[4] F04B *39/08, 9/04;* **F16N** *25/04*

U.S. Cl. 417—502 **5 Claims**



1. A high pressure grease pump for pumping grease at low volumes over extended periods comprising a drive housing, a shaft rotatably journaled therein, drive means for rotating said shaft at a preselected speed, eccentric drive means in said shaft intermediate its ends, a pump housing fixed to said drive housing, a cylindrical distributor is said pump housing rotatable in a well in said pump housing on an axis transverse to said shaft, drive connecting means connecting said drive shaft and distributor for rotation of the distributor, a plurality of discharge passages in said housing circumferentially spaced around the distributor for sequentially receiving grease under pressure from the distributor, a cylindrical axial passage extending through the distributor, a piston axially movable in said cylindrical axial passage having one end operatively engaging said eccentric drive means on the shaft and the other end having a reciprocably movable pump piston, a pump barrel surrounding said pump piston, passage means delivering grease under pressure from said pump barrel to said cylindrical distributor, a grease reservoir supplying grease to said pump barrel and manifold means connecting at least one of said plurality of discharge passages with at least one gland to be pressurized and said manifold means connecting the remaining discharge passages which are not connected to a gland to be returned with the grease reservoir, wherein the pump barrel is integrally formed on an end cap for the pump housing and is surrounded by a well in said cap having resilient means acting on the pump piston normally urging it toward the eccentric drive means.

4,632,649

GAS JET PUMP

Udo Segebrecht, and Siegfried Auschrat, both of Heiligenstedten, Fed. Rep. of Germany, assignors to Sihi GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

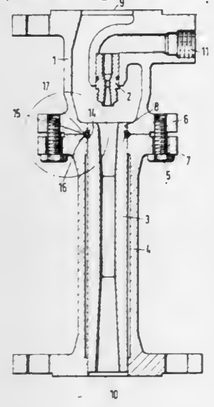
Filed Jul. 23, 1985, Ser. No. 758,208

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427645

Int. Cl.[4] F04F *5/00*

U.S. Cl. 417—151 **7 Claims**

1. A gas jet pump having a housing (1) including a fuel inlet (11), a fuel nozzle (2) connected to the fuel inlet, and an entrained fluid inlet (9), a pump outlet (10), a mixing nozzle holder (4), a flange connection (5, 6, 7) between the housing and the mixing nozzle holder, and a mixing nozzle (3) between the fuel nozzle and the outlet, with a mounting being provided in the flange connection for the mixing nozzle, which mounting comprises a clamping groove formed by both flanges (6, 7) in their parting plane, wherein the holder for the mixing nozzle (3) comprises an annular groove (14) in the periphery of the mixing nozzle (3) and a ring (15) made of elastic material



inserted into the annular groove (14), which ring (15) is enclosed under tension in the annular space formed by the annular groove (14) and the clamping groove, whereby the ring fixes the axial position of the mixing nozzle and provides a seal between the mixing nozzle and the housing, the mixing nozzle and the nozzle holder, and the housing and the nozzle holder.

4,632,650

VACUUM PUMP HAVING AN EVACUATED GEAR CHAMBER

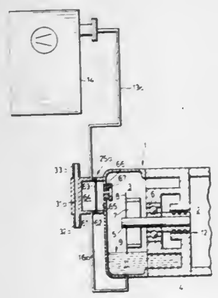
Peter Frieden; Hans-Peter Kabelitz, both of Cologne; Karl-Heinz Ronthaler, Zülpich, and Jörg Thielicke, Cologne, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,914

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344953

Int. Cl.[4] F04C *18/18, 29/02;* **B01D** *46/00;* **F16J** *15/447*

U.S. Cl. 418—95 **18 Claims**



1. In a vacuum pump having an evacuation chamber, a gear chamber, a partition separating said evacuation chamber from said gear chamber, a rotary pump shaft extending through said partition and having one end connected to an impeller arranged for rotation in said evacuation chamber and having another, opposite end extending into said gear chamber and connected to a gear therein, a shaft bearing surrounding said pump shaft and received in said partition, a labyrinth seal surrounding said pump shaft and received in said partition for sealing said evacuation chamber from said gear chamber, and oil sump means defined in said gear chamber accommodating oil therein; the improvement comprising

(a) an auxiliary vacuum pump;

(b) a vacuum conduit maintaining communication between said gear chamber and said auxiliary vacuum pump for generating a vacuum in said gear chamber by said auxiliary vacuum pump;

(c) an oil separating element continued in said vacuum conduit for separating oil entrained by gases drawn by said auxiliary vacuum pump from said gear chamber; and

(d) a return conduit maintaining communication between said oil separating element and said oil sump means for returning oil, separated by said oil separating element, to said oil sump means.

4,632,651

HYDRAULICALLY CONTROLLED EXTRUDER INJECTION MOLDING UNITS FOR THE PROCESSING OF RUBBER

Helmcke von der Ohe, Achim-Uesen, and Wolfgang Koliwer, Achim, both of Fed. Rep. of Germany, assignors to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,279

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320520

Int. Cl.[4] B29C *45/77*

U.S. Cl. 425—135 **7 Claims**



1. A hydraulically controlled extruder injection molding unit for processing rubber substances comprising a plasticization unit driven by a hydromotor for plasticizing said rubber substances at a dynamic pressure, an injection molding unit having a hydraulic working cylinder and a piston assembly, said hydraulic working cylinder and piston assembly defining two surge chambers, a first chamber for driving said piston assembly at an injection molding pressure and at a subsequent pressure and a second chamber for return of said piston assembly, a hydraulic pump for activating said hydromotor and said hydraulic working cylinder, said hydraulic pump controlled in dependence of one or more control valves, said control valves comprising injection molding pressure, injection speed of said piston assembly, said subsequent pressure and said dynamic pressure and hydraulic control means comprising a measured value pick-up means for measuring a position of said piston assembly, a pressure control valve capable of being switched on a line leading to said second surge chamber of said hydraulic working cylinder for said piston return, a pressure valve

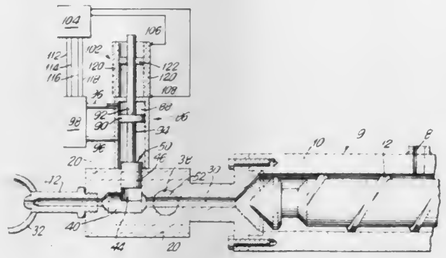
which is proportionally controlled and is capable of being switched on a line leading to said first surge chamber, and a control system for the control of the proportionally controlled pressure valve, said control system capable of adding an instantaneous value of said dynamic pressure to a preselected dynamic pressure as a correcting dimension upon a change of an output signal from said measured value pick-up means whereby plasticization of said rubber substances occurs under a corrected dynamic pressure.

4,632,652

DRAW-BACK VALVE ASSEMBLY FOR AN INJECTION MOLDING APPARATUS

John J. Farrell, Greenbrook, N.J., assignor to Wedco Inc., Bloomsbury, N.J.

Filed May 1, 1985, Ser. No. 727,683
Int. Cl.⁴ B29C *45/77*
U.S. Cl. 425—137 **2 Claims**



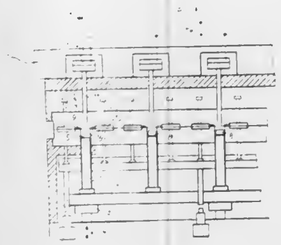
1. In an injection molding apparatus including a barrel for holding molten plastic material, a first passage connected at one end with said barrel for receiving hot plastic material from said barrel, a second passage communicating with an opposite end of said first passage for receiving molten with the first passage for supplying said material to a mold, a cylinder, a third passage connected at one end with said cylinder and connected at another end with said second passage, a piston in said cylinder, movable by pressure means in one direction, and movable by pressure means in another direction to exert a suction action in said cylinder, said third passage and said second passage for drawing molten material in said second passage back into said third passage and said cylinder, and a valve means in said first passage for opening and closing said first passage, the improvement which comprises means for controlling the pressure in said cylinder for at least one predetermined postion of said piston in the cylinder, comprising a positioner connected to said piston and movable in relation to said cylinder in a linear path, a linear position potentiometer disposed adjacent said linear path of said positioner, a comparator electrically connected to said potentiometer, a servovalve electrically connected to said comparator and pneumatically connected to said cylinder, and a voltage source connected to said potentiometer and said comparator, said comparator having at least one variable resistor electrically connected at one end thereof to said voltage source and at another end thereof to an amplifier, said amplifier being electrically connected to said servo-valve.

4,632,653

PRESS WITH A PLURALITY OF INJECTION PLUNGERS

Werner Plocher, Horb, Fed. Rep. of Germany, assignor to Maschinenfabrik Lauffer GmbH & Co. KG., Horb, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,591
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336173
Int. Cl.⁴ B29C *3/00;* **B29F** *1/06*
U.S. Cl. 425—149 **4 Claims**



1. A press for simultaneously producing a plurality of moldings of plastics, particularly for producing packages of semiconductor circuits, comprising a plurality of injection plungers; at least one injection mold having a plurality of filling pots to be filled with a plastics material, a plurality of channels each connected to the associated pot and a plurality of cavities each connected to the associated channel, each of said injection plungers forcing a heated molding material in the associated pot and through the associated channel into the associated cavity; the injection plungers being provided with a common drive for simultaneously forcing said plungers into the associated pots; and a plurality of pressure-compensating pistons each adjoining a respective pot of said injection mold and each being associated with each of the injection plungers, said injection plungers and respective compensating pistons associated therewith being located opposite each other on a common axis and being laterally spaced from the mold cavities; hydraulic actuating means for actuating said compensating pistons; and means to cause a retreat of said compensation pistons in such a manner that, when a predetermined maximum pressure is reached in the respective pot each of the compensating pistons slightly retreats independently from the other compensating pistons to cause a pressure reduction in said pot.

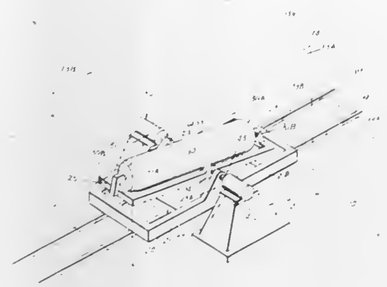
4,632,654

ROTATIONAL MOLDING APPARATUS

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Jul. 13, 1983, Ser. No. 513,433
Int. Cl.⁴ B29C *5/04*
U.S. Cl. 425—150 **15 Claims**

1. Rotational molding apparatus comprising in combination:
(a) an oven having parallel side walls,
(b) a shuttle mold assembly including a movable first support,
(c) first motor operated drive means for moving said first support into and out of said oven,
(d) said mold assembly including a rotational mold and a mold support supported for pivotal movement about a plurality of axes on said first support,
(e) second motor operated drive means supported fixed with respect to said oven and operable for pivotally driving a mold which is supported on said first support,
(f) coupling means associated with said second motor operated drive means and said first support for coupling and uncoupling said second drive means with respect to said first mold support to permit said second drive means to drive said mold in pivotal movement on said first support while disposed thereby in said oven,
(g) means for predeterminately locating said first support in said oven, and



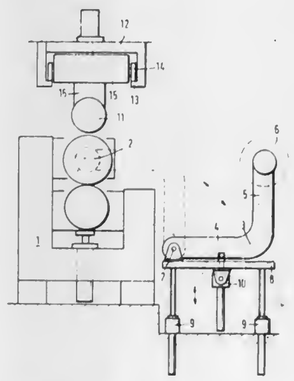
(h) power operated means for driving said coupling means in a manner to effect driving coupling between said second drive means and said mold support when said shuttle mold assembly is predeterminately located on said first support in said oven to permit said second motor operated drive means to rotate said rotational mold within said oven.

4,632,655

EMBOSSING CALENDER FOR THERMOPLASTICS FILMS

Helmut Benkwitz, Lehrte, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,395
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422091
Int. Cl.⁴ B29C *43/24, 43/46*
U.S. Cl. 425—186 **4 Claims**



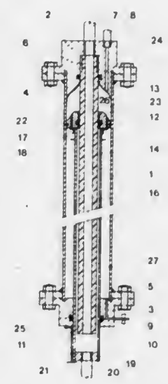
1. An embossing calender for thermoplastics films comprising a support structure having upper and lower regions, at least one holder means diplaceably mounted on said support structure, embossing roller means detachably and rotatably mounted on each said holder means, said support structure defining a working position for a selected one of said holder means and said embossing roller means mounted thereon, means for locking said selected one of said holder means in said working position on said support structure, said holder means being disposed above said selected embossing roller means in said working position, said support structure further including guide rail means disposed in sai ver region of said structure, said guide rail means extending substantially parallel to the axis of rotation of said embossing roller means and projecting beyond each of said embossing roller means in said working position by a distance corresponding at least to the axial length of said embossing roller means, said guide rail means defining a displacement path for said at least one holder means, wheel means mounted on each said holder means and engageable on said guide rail means, and bearing means rotatably mounting each said embossing roller in each said holder; rotatable counter-roller means disposed adjacent said embossing roller in said working position and defining, with said embossing roller, passage means for said film to be embossed, support means rotatably supporting said counter-roller, said support means defining a working position for said counter-roller adjacent said embossing roller, pivotal counter-roller displacement means associated with said support means, and holder members formed on said displacement means whereby pivotal movement of said displacement means causes said holder members to move selectively into and out of engagement with said counter-roller to move said counter-roller selectively into and out of said working position.

4,632,656

APPARATUS FOR THE MANUFACTURE OF MOLECULARLY ORIENTED PLASTIC PIPES

Klaas Eygelaar, Hoorn; Jaap Karreman, and Peter Karreman, both of Enkhuizen, all of Netherlands, assignors to Draka Polva B.V., Amsterdam, Netherlands

Filed May 7, 1985, Ser. No. 731,229
Claims priority, application France, May 7, 1984, 84 07182
Int. Cl.⁴ B29C *49/08, 55/22*
U.S. Cl. 425—529 **6 Claims**



1. Apparatus for the manufacture of molecularly oriented plastic pipes by radial expansion of a pipe section, comprising a tubular mould the transverse dimensions of which correspond to those of the pipe to be produced and which is equipped with a device for admitting a fluid under pressure into a region of the mould intended to receive the pipe section to be radially expanded, a member for closing and grasping one end of the pipe section in the mould, a tubular sleeve which opens into the mould by an open end facing the closing and grasping member and which has transverse dimensions corresponding to those of the pipe section which it is intended to receive and a means for producing a controlled relative axial displacement of the sleeve in relation to the closing and grasping member, for moving them and for gradually extracting the pipe section from the sleeve and in which the open end of the sleeve is equipped with an annular plunger mounted so as to slide in the mould and incorporating a surface arranged at the exit of the sleeve extending towards the inner wall of the mould and generally frustoconical in shape, characterised in

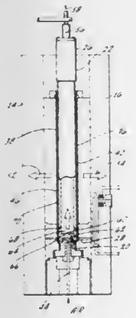
that the said surface is widened out in a direction away from the closing and grasping member.

4,632,657

APPARATUS AND METHOD FOR INJECTION MOLDING OF ELONGATED HOLLOW PLASTIC CONTAINER WALLS

Joseph B. Potoczky, 8975 Burke Ave., South Gate, Calif. 90280

Division of Ser. No. 53,962, Jul. 2, 1979, Pat. No. 4,289,726.
This application Apr. 24, 1981, Ser. No. 257,363
The portion of the term of this patent subsequent to Sep. 30, 2001, has been disclaimed.
Int. Cl.[4] B29F *1/14*
U.S. Cl. 425—556 3 Claims



1. Apparatus for injection molding an elongated hollow plastic article said apparatus comprising:

(a) A pair of mold halves which, when brought together define a cavity closed at one end and said mold halves providing (i) a sprue through which molten plastic material may be injected into the cavity under pressure, (ii) an opening at the other end of said cavity through which one end of a mold core may extend axially out of said cavity and (iii) core centering means at the closed end of the cavity, said centering means providing a passage through which air under pressure may be admitted at said end of the cavity;

(b) A core disposable in said cavity with one end of said core extending in a close fit through said opening in the mold halves, the walls of said core being spaced from the inner walls of the mold halves defining said cavity;

(c) Means for injecting molten plastic material under high pressure through said sprue to fill the spacing between the walls of said core and the inner walls of said mold halves defining said cavity;

(d) Means for cooling said injected molten plastic material;

(e) Means to effect a separation of said mold halves from each other;

(f) Means to apply a force directed axially and of said opening in the mold halves to enable said core to be withdrawn from a plastic article formed after said injection molding;

(g) A source of air under pressure for admission through the passage in the centering means; and

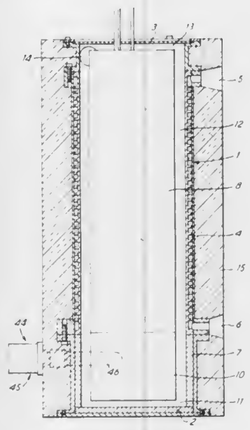
(h) Means to eject the formed article from the mold halves.

4,632,658

APPARATUS WITH BURNER AND HEAT EXCHANGER

Jorgen H. Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 550,376, Nov. 11, 1983, abandoned.
This application Jul. 19, 1985, Ser. No. 756,596
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243399
Int. Cl.[4] F23D *11/44*
U.S. Cl. 431—208 15 Claims



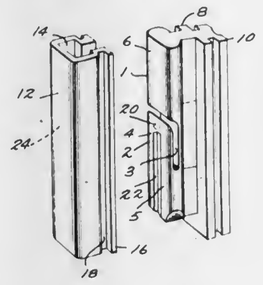
1. A burner and heat exchanger combination comprising first means defining a hollow cylinder having a first end, a second end and a cylindrical wall extending between the ends of the cylindrical wall, said first means including a heat exchanger that in part is defined by said cylinder wall, an end wall closing the first end of the cylinder wall, a cylindrical shaped shell insert within the cylinder wall in concentric spaced relation thereto to provide an annular gap therewith and having a first terminal end spaced from said end wall to provide a fluid passage space from within the insert to said gap and an opposite end, a transversely extending partition having a combustion chamber side and an opposite housing chamber side, said transversely extending partition being joined to said insert between the ends of the insert, the insert and partition providing a combustion chamber that opens toward said end wall and a housing chamber on the opposite side of the partition from the combustion chamber, said partition having a central opening, said insert having a burner tube extending between said partition and said first terminal end, a central starting phase vapour burner mounted by the partition to extend toward the insert opposite end, said vapour burner including a gasifying tubular member forming a central fuel preparing chamber and having a discharge mouth in proximity to said partition central opening, heating apparatus for heating said tubular member, means forming an air passage system which surround said tubular member and has an annularly shaped mouth in fluid communication with said combustion chamber through said partition central opening for supplying air of combustion to the combustion chamber, tube means for admitting drops of liquid fuel to said fuel preparing chamber remote from the tubular member mouth, means closing said fuel preparing chamber to the admission of fluids thereto other than through said tubular member mouth and tube means, said tubular member mouth serving to admit air to said fuel preparation chamber during start up and to expel a fuel mixture from said fuel preparation chamber during start up, said tubular member having a glow zone adjacent to the tubular member mouth that is heated by said heating apparatus for igniting said expelled fuel mixture, and an operating phase main fuel and air supply system for supplying a fuel-air mixture between the insert and cylinder wall adjacent to the burner tube, said first means having an outlet adjacent to its second end opening to the gap.

4,632,659

PRECISION ATTACHMENT FOR SECURING DENTAL PROSTHESES

Harry Schiwiora, Pforzheim, and Willi Ahr, Birkenfeld, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 607,131, May 4, 1984, abandoned. This application Apr. 23, 1985, Ser. No. 726,236
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316606
Int. Cl.[4] A61C *13/265*
U.S. Cl. 433—181 2 Claims



1. An attachment device for detachably securing a dental prosthesis in the mouth of a patient comprising a male matrix member and a female matrix member for receiving said male matrix member, said male matrix member including a portion insertable into said female member, said portion including a wall having a middle section, a gingival section on one side of said middle section and an occlusal section on the opposite side of said middle section, said female matrix member having a body including a channel shaped to closely fit over said portion of the said male member, said wall of said portion of said male member having formed therein a slot with a tongue forming one side of said slot, said tongue being bendable to change the size of said slot to provide resistance to relative movement between said male and female members, said insertable portion having a selected length and said middle section comprising from 20 to 40 percent of said selected length, said occlusal section comprising between 30 to 55 percent of said selected length, said gingival section comprising between 20 to 45 percent of said selected length, and said body of said female member having a length to substantially cover said insertable portion whereby ingress of foreign material into said slot when said prosthesis is in use will be substantially prevented.

4,632,660

PROSTHETIC DENTISTRY

Adrain S. Jurim, 3 Wood Rd., Great Neck, N.Y. 11024

Filed Apr. 26, 1983, Ser. No. 488,884
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—215 12 Claims

1. A method of etching a porcelain veneer facing for use in prosthetic dentistry to improve the adhesion thereof to a natural or virgin tooth of a dental patient, which method comprises:

forming a porcelain veneer facing of the desired shape and form;

covering the portions of said porcelain veneer facing which will be visible in the patient's mouth with a protective waxy material which has a strong affinity for porcelain and is impervious to acid:

contacting said porcelain veneer facing with an aqueous acidic solution for a period of time sufficient to effect a reaction between said solution and said porcelain veneer facing to produce an etching on the unprotected areas of said porcelain veneer facing; and

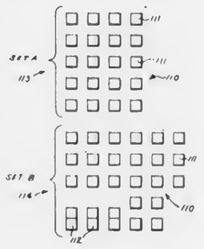
removing said protective waxy material from said porcelain veneer facing.

4,632,661

METHODS FOR STRUCTURALLY PERFORMING DIFFERENTIAL CALCULUS

Vernon J. Mortensen, Coeur d'Alene, Id., assignor to Mortensen Educational Products, Inc., Chatsworth, Calif.

Filed Oct. 29, 1985, Ser. No. 792,438
Int. Cl.[4] G09B *19/02*
U.S. Cl. 434—188 9 Claims



1. A method for structurally differentiating between a plurality of ordered sets of numbers, each ordered pair of numbers having a first value and a second value which is a function of said first value, the differential of said function being the determined value; said method using a plurality of parallelogrammic structural elements which are manipulated to derive the determined value, the parallelogrammic structural elements having an associated number or parallelogram units equal to the product of two adjacent sides of the parallelogrammic structural element; comprising:

constructing a first parallelogram from a plurality of said structural elements; said first parallelogram having a first side length equal in length to the first value of a first ordered set of numbers; said first parallelogram having a second side angled with respect to said first side, and having a second side length which when multiplied times the first side length results in a product parallelogrammic unit value which does not exceed the second value of said first ordered set of numbers;

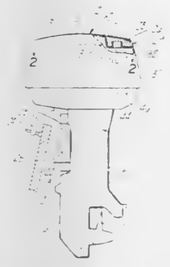
constructing a first set of structural elements including said first parallogram and a first remainder portion having parallelogrammic structural elements defining a remainder quantity of parallelogram units equal to the difference between said second value of the first ordered set of numbers and said product parallelogrammic unit value;

constructing a second set of structural elements associated with a second ordered set of numbers, including a second parallelogram and a second remainder portion; the total parallelogrammic unit value sum of the second rectangle and the second remainder portion being equal to the second value of the second ordered set of numbers; the second parallelogram being defined by third and fourth side lengths, said third side length being equal to said first side length of said first parallelogram; said second remainder portion being equal in parallelogrammic unit value to said first remainder portion;

measuring the parallelogrammic unit difference between said second parallelogram and said first parallelogram to determine a parallelogrammic unit difference; and

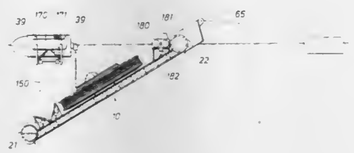
identifying the change in parallelogrammic unit value between said first and second parallelograms per change in the length between said second and fourth sides.

4,632,662
MOUNTING STRUCTURE FOR AN ELECTRONIC PARTS UNIT OF AN OUTBOARD ENGINE
Kenichi Handa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Apr. 9, 1984, Ser. No. 598,382
Claims priority, application Japan, Apr. 12, 1983, 58-62996
Int. Cl.[4] B63H *21/30*
U.S. Cl. 440—52 10 Claims



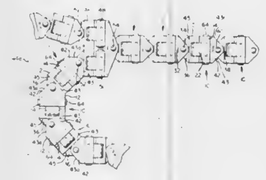
10. A mounting arrangement for an electronic component of an outboard motor comprising an internal combustion engine having a main component defining a cylinder block, an outer cowling surrounding said internal combustion engine, an induction system air inlet formed in said outer cowling, the improvement comprising said electronic component being mounted in proximity to said air inlet within said outer cowling upon said main component for passage of induction air across said electronic component.

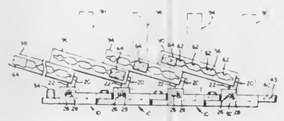
4,632,663
MOORING AND TRANSFER SYSTEM AND METHOD
William L. Kiely, Cypress, and Kristen I. Pedersen, Houston, both of Tex., assignors to Sofec, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 578,586, Feb. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 503,638, Jun. 13, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,325
Int. Cl.[4] B63B *22/02*
U.S. Cl. 441—5 24 Claims



12. A method of retrieving an offshore bulk fluid transfer system for a sea floor comprising the steps of:
connecting positioning lines to a first end and a second end of a base of the system,
tensioning the lines to assure proper position of the base during the ascension of the base to the sea surface,
deballasting a buoyancy tank disposed at the first end of the base to raise the end to a substantially vertical position,
deballasting a buoyancy tank disposed at the second end of the base to raise the first end to the sea surface,
deballasting the buoyancy tank disposed at the second end of the base further to rotate the second end to the sea surface for surface towing of the base, and
jetting water between the base and the sea floor to break engagement between the base and the sea floor.

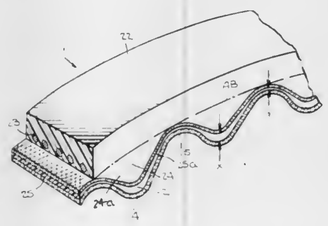
4,632,664
TOPPLING GAME APPARATUS
Eugene P. Manning, P.O. Box 471, Gresham, Oreg. 97030
Filed May 23, 1985, Ser. No. 737,812
Int. Cl.[4] A63H *33/04*
U.S. Cl. 446—2 13 Claims





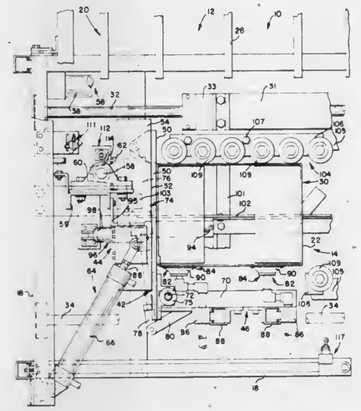
1. A toppling game apparatus comprising:
a plurality of base members;
coupling means for connecting said base members together;
a plurality of toppling members, at least one of said toppling members being pivotally attached to each of said base members, said toppling members each comprising a substantially planar structure having a hollow interior; and
weight means associated with said toppling members to control the weight distribution and toppling rate of said toppling members, said weight means comprising a weight member and wherein each toppling member includes means for mounting said weight member in a selected one of a plurality of positions within said hollow interior.

4,632,665
POWER TRANSMISSION BELT AND METHOD
William A. Skura, Naugatuck, Conn., assignor to Uniroyal Power Transmission Company, Inc., Middlebury, Conn.
Continuation-in-part of Ser. No. 471,923, Mar. 2, 1983, Pat. No. 4,514,179. This application Mar. 15, 1985, Ser. No. 712,574
The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.
Int. Cl.[4] F16G *1/28*
U.S. Cl. 474—205 22 Claims



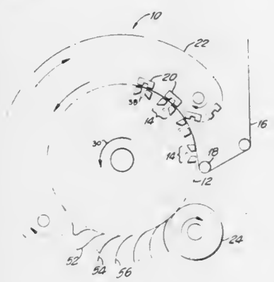
1. A positive drive belt for operating with toothed pulleys, comprising an elastomeric body, a reinforcing tensile member embedded in said body, teeth on at least one surface of said body, said teeth having tip regions spaced from said reinforcing member, said teeth being separated by land areas, a fabric cover on the outer surface of the belt teeth and land areas, a suspended reinforcing means within each tooth separated from the outer surface of the tooth and from the outer surface of the land areas by a cushion layer of elastomeric material, said cushion layer having a thickness varying between a first given thickness in the region of the land areas to a second substantially greater given thickness in the tooth tip regions, whereby the outer surface of the belt is free to flex as the belt engages its pulleys while the inner portions of the belt teeth are structurally reinforced against tooth shear, said fabric cover comprising warp and weft yarns and locking means cooperating with said warp and weft yarns for substantially locking them with respect to each other at the intersections thereof for dimensionally substantially stabilizing said fabric cover, said locking means at least partially obstructing the interstices of said fabric cover whereby said interstices are substantially free of said elastomeric material, said fabric cover cooperating with said teeth and with said suspended reinforcing means such that the spring rate of each fabric covered tooth having suspended reinforcing means is greater than 1.2 times and less than 3 times the spring rate of such tooth without said fabric cover, without said cushion layer and without said suspended reinforcing means.

4,632,666
CARTON ERRECTOR APPARATUS
Lawrence W. Ulrich, Cicero, and Connie W. Walker, Bolingbrook, both of Ill., assignors to Durable Packaging, Chicago, Ill.
Continuation-in-part of Ser. No. 590,073, Mar. 15, 1985, Pat. No. 4,579,551. This application Oct. 25, 1985, Ser. No. 791,445
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] B31B *1/80, 5/74*
U.S. Cl. 493—23 24 Claims



1. Carton erecting apparatus for setting up and bottom closing of cartons which are supplied to the apparatus as knocked-down carton blanks having side and end panels and top and bottom flaps formed integral therewith; said apparatus comprising:
(a) a carton blank storage section having a magazine means for storing and urging knocked-down carton blanks in a substantially vertical orientation with their bottom flaps lowermost towards a carton set-up section positioned adjacent to said carton blank storage section;
(b) said carton set-up section including a carton opening assembly for receiving a carton blank from said magazine means in a substantially vertical orientation and setting up said carton blank in a tubular form, said carton opening assembly having a folding arm and a pivot arm, said folding arm being secured to a first substantially vertical shaft pivotal about a substantially vertical and movable between a first position generally parallel to the side panel of said knocked-down carton blank in said magazine means and a second position generally perpendicular to the side panel of said knocked-down carton blank, said pivot arm being secured to a second substantially vertical shaft pivotally secured to said folding arm and movable between a first position substantially parallel to said folding arm and a second position substantially perpendicular to said folding arm, said carton opening assembly having a first means for moving said folding arm between its first and second positions, said carton opening assembly having a second means for moving said pivot arm between its first and second positions, said carton opening assembly having a grasping means associated with said pivot arm for grasping a side panel of said carton blank from said magazine means when said pivot arm and said folding arm are in their respective first positions such that upon subsequent movement of said pivot arm and said folding arm into their respective second positions an end panel of said carton blank contacts comprising means associated with said folding arm for urging said carton blank into a set-up tubular form;
(c) said apparatus having a bottom flap folding section positioned adjacent said carton set-up section, said bottom flap folding section having a bottom flap folding means associated therewith for infolding the bottom flaps of the set-up carton; and
(d) a carriage assembly having a substantially horizontal carriage plate mounted in said bottom flap folding section for movement through a substantially horizontal plane by a third means connected to said carriage plate between a first position within said bottom flap folding section and a second position extending into said carton set up section and comprising means for receiving and delivery of the set-up carton into said bottom flap folding section without interferring with the operation of said carton opening assembly.

4,632,667
ENCODING MEANS AND METHOD FOR A BAG MAKING APPARATUS
James A. McDonald, Palos Heights, Ill.; David E. Gledhill, Glastonbury, Conn., and Peter P. Savich, Longmeadow, Mass., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Nov. 27, 1984, Ser. No. 675,277
Int. Cl.[4] B31B *23/16, 23/64, 23/88*
U.S. Cl. 493—187 10 Claims



6. A bag making machine for making plastic bags from a two-ply web of thermoplastic material comprising:
a. a rotatable cylinder
b. a purality of identical bag making work stations equally spaced about said cylinder, each of said work stations having a pair of surfaces extending parallel to the rota-

tional axis of said cylinder for receiving a web laid onto said surfaces and which surfaces together define the periphery of said cylinder;

c. means at each of said work stations for severing and sealing the thermoplastic web supplied to the machine and laid onto said web receiving surfaces;

d. at least one of said web receiving surfaces at each of said work stations having a plurality of vacuum ports for holding the web to said web receiving surfaces, said vacuum ports having a configuration which defines a code that differentiates each of said work stations one from another; and

e. said vacuum ports comprising code impressing means for impressing said code in the web held against said web receiving surfaces, thereby providing each bag made by the machine with a code impression which is an indicant of only a particular one of said work stations.

4,632,668

VENTRICULAR CATHETER

John K. Wilson, Jr., and Tae S. Park, both of Charlottesville, Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Dec. 31, 1984, Ser. No. 688,003
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—8 **24 Claims**



1. An adjustable ventricular catheter, comprising:

(a) a proximal cannula having a lumen and having first and second ends with said second end being further provided with internal locking means;

(b) a distal cannula provided with a lumen, said distal cannula adapted to slide within said lumen of said proximal cannula in a telescopic relation, said distal cannula having first and second ends wherein said second end is closed and is provided with perforations, said first end having external locking means;

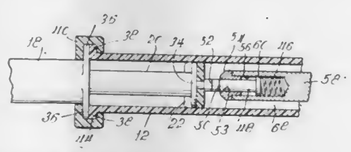
(c) removable means, slideably received within the proximal cannula and extending to the distal cannula, for slideably adjusting the distal cannula within the proximal cannula, whereby one may set a desired length of the distal cannula extending beyond the second end of the proximal cannula with a maximum extension achieved by extending the second end of the distal cannula beyond the second end of the proximal cannula to a point where the internal locking means cooperates with the external locking means thereby providing further extension.

4,632,669

PRESSURE INDICATING MEDICAL INJECTION GUN

Cornelius M. Phipps, Sr., Glen Ellyn; Cornelius M. Phipps, Jr., and Hal A. Phipps, both of St. Charles, all of Ill., assignors to Plastic Specialties, Inc., Glen Ellyn, Ill.

Filed May 7, 1984, Ser. No. 607,967
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—118 **13 Claims**



1. A pressure indicating injection device for use with a syringe having a body for holding fluid, a discharge outlet and a plunger adapted for discharging fluid fromsaid syringe body into a balloon-type catheter, said device comprising:

a generally pistol-shaped frame having a hand-grip portion, and a barrel-like portion for holding the syringe, including attachment means for removably attaching the syringe body, and bracket means slidably arranged within said barrel-like portion and being attachable to said plunger at one side thereof whereby to facilitate axially advancing said plunger;

advancing means coupled to said bracket means and capable of axially urging said bracket means to thereby advance said plunger and discharge fluid through said discharge outlet, said advancing means including: a coupling shaft at a second side of said bracket means wherein forward movement toward said attachment means urges the plunger of said syringe forwardly to thereby effect a discharge of fluid from said syringe into said catheter; said coupling shaft meeting a resilient element at an end thereof opposite said bracket means; a ratchet shaft arranged with said barrel-like portion generally co-axially with said coupling shaft and having an end cylinder chamger for holding said resilient element and into which said coupling shaft is disposed so as to meet and thereby compress said resilient element upon forward advancement thereof, said ratchet shaft having ratchet teeth generally along one side thereof; the ratchet shaft being incrementally movable by means of a reciprocating ratchet arm, the ratchet arm being actuated by a spring biased trigger, the trigger being arranged with the hand grip portion of the frame whereby to be capable of being squeezed by the user's hand and provide mechanical advantage facilitating the advancement of the plunger against increasing pressure, and a ratcht shaft catch arm preventing back sliding of the ratchet shaft intermediate incremental advances caused by the ratchet arm; and

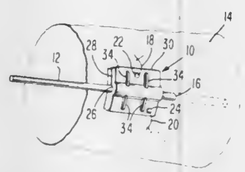
pressure indicating means associated with said advancing means and being responsive to the increasing resistance of advancement of said syringe plunger as fluid discharges into said catheter and indicating the back pressure thereof.

4,632,670

SUTURE TAB

Richard L. Mueller, Jr., Athens, Tex., assignor to Argon Medical Corp., Athens, Tex.

Filed Apr. 4, 1985, Ser. No. 719,850
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—174 **2 Claims**



1. An improved suture tab of the type which includes a central opening which surrounds a catheter that has been inserted into a patient and holds the catheter in place along the body of said patient by means of a suture which passes through both said suture tab and said patient, wherein the improvement comprises:

(a) said suture tab being made of plastic and having a base which is substantially rectangular in shape when viewed from above, said central opening extending from a connecting edge of said suture tab, tunnel-like through to an opposing edge of said suture tab;

(b) a slit which extends from said central opening out through said connecting edge of said suture tab base, said slit extending between said one edge of said suture tab and said opposing edge of said suture tab, whereby there is a layer of flexible material, when viewed from above, which extends between said central opening and said connecting edge and overlies said base, said layer of flexible material being capable of lifting to receive a catheter within said central opening, a pair of substantially aligned openings in the material on either side of said slit, whereby a single suture serves to simultaneously close said slit, thereby securing said suture tab to said catheter, to hold said suture tab in place on said patient, and to hold said catheter along the body of said patient;

(c) an opening which extends through said layer of flexible material and the portion of said base which extends between said central opening and said connecting edge; and

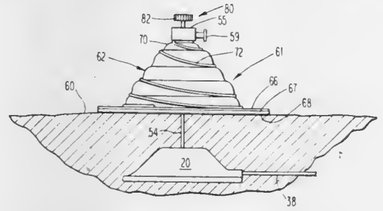
(d) at least one stiffening gusset which extends above said slit from said layer of flexible material to the material on the outside of said central opening, said at least one stiffening gusset serving to help keep said central opening closed.

4,632,671

CONDUIT ANCHOR ADAPTED TO RECEIVE STYLET

Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203

Filed Apr. 12, 1985, Ser. No. 722,329
The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—174 **10 Claims**



4. A transcutaneous fluid delivery system which comprises:

(a) a fluid receptacle for subcutaneous surgical implantation in a living body, said receptacle including fluid inlet and outlet means;

(b) an elongated hollow fluid delivery conduit adapted at one end for supercutaneous connection to a supply of the fluid, an other end thereof being adapted for subcutaneous penetration of said receptacle; together with

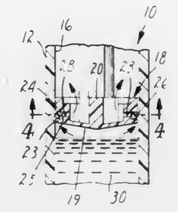
(c) an anchor for securing said conduit on the body which includes a resilient protective boot having a plurality of concentric annular rings with inside and outside peripheries and stacked using said conduit as an axis beginning with a base ring carrying adhesive for attachment to the skin of the body and ending with a terminal ring to be attached to said conduit, each ring in said stack being flexibly connected to the next adjacent ring alternately at said inside and outside peripheries to provide shock-absorbing extension and compression along said axis, and including means, when said terminal ring is attached to said conduit, to urge said protective boot into a compressed state along said axis and said conduit into said body, together with a penetrable resealable septum in said anchor for inserting a stylet into said anchor and through said hollow conduit.

4,632,672

SELF VENTING SYRINGE PLUNGER

James R. Kvitrud, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 7, 1985, Ser. No. 785,071
Int. Cl.[4] A61B *5/14*
U.S. Cl. 604—222 **4 Claims**



1. In a syringe comprising a barrel having front and rear ends, and a through opening including a cylindrical portion defined by a cylindrical inner surface opening through the rear end of the barrel; a plunger adapted to be inserted in said cylindrical portion having front and rear surfaces, and a groove around its periphery defined by spaced front and rear generally radially extending walls of the plunger and a cylindrical bottom wall of the plunger extending between the front and rear walls; and a resiliently elastic O-ring within the groove around the plunger, said O-ring having a circular cross section with a predetermined diameter adapted to be compressed between the bottom wall of the plunger and the cylindrical inner surface of the syringe, with the front and rear walls defining the groove spaced at a distance exceeding said predetermined diameter to afford sliding relative movement between said O-ring and said bottom wall to move said front wall or said rear wall adjacent the O-ring, the improvement wherein:

said plunger has a through passageway from said bottom wall to the rear surface of said plunger, said passageway being adjacent said rear wall, having a dimension from said rear wall to the edge of said passageway farthest from said rear wall measured axially along said bottom wall that is less than said predetermined diameter of said O-ring, and being so sized that (1) upon insertion of said plunger front surface first into said cylindrical portion, said O-ring will move to a position adjacent said rear wall and allow air to escape from said through opening through said passageway to afford seating said plunger against material in said through opening; (2) when the pressure that caused such seating of the plunger is released, the plunger will rebound slightly within the barrel, causing the plunger to move relative to said O-ring to position said front wall closely adjacent the O-ring with the passageway spaced from beneath the O-ring so that the O-ring makes an air tight seal between the plunger and the barrel; and (3) when pressure is again applied to the plunger to press the material out of the barrel, the plunger will again move relative to the O-ring to position said rear wall against the O-ring with the O-ring over the passageway, however, the O-ring will sufficiantly seal the passageway to restrict escape of a significant amount of the material through the passageway.

4,632,673

PIERCEABLE PORT FOR CONTAINERS

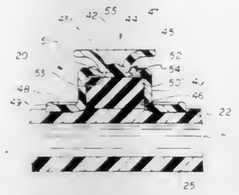
Juha K. Tiitola, Pirkkala; Juhani A. Ikonen, Tampere; Heikki S. Suominen, Tampere, and Juha A. Henttonen, Tampere, all of Finland, assignors to Hantaaki Oy, Tampere, Finland

Continuation of Ser. No. 504,544, Jun. 15, 1983, abandoned.
This application Jul. 15, 1985, Ser. No. 754,687
Int. Cl.[4] B65D *41/32, 41/50, 41/62*
U.S. Cl. 604—415 **20 Claims**

1. A port structure pierceable by a hollow needle for providing fluid communication with the interior of a container for

medicinal liquids or the like, said port comprising in combination:

a sterile pad of resealable material for sealing a puncture caused by penetration of said pad with said needle;



a cover of thin flexible plastic film sealingly adhered to a base member and defining therewith a sealed enclosure for said pad, said film being sufficiently thin and flexible to conform substantially to the shape of said pad; and,

a tear strip of thin flexible plastic film having a portion thereof adhered to said thin-film cover so as to form a removable tear-off tab comprised of said thin-film tear strip and a portion of said thin-film cover adhered thereto, said adhered cover portion being removable as part of said tab and being defined by a wall-thinning indentation extending inwardly toward said pad;

said tear strip further having a gripping portion which overlies and is free in relation to said thin-film cover,

said tab being connected to an unadhered portion of said thin-film cover along a tearable joint provided by said wall-thinning indentation of substantially less tear strength than either said tab or the unsecured portion of said thin-film cover,

said port structure combination having a total thickness substantially equal to the sum of the thicknesses of said pad, said thin-film cover and said thin-film tear strip,

said sealed enclosure maintaining the sterility of said pad until said tab is removed,

and the removal of said tab exposing a sterile portion of said pad to permit piercing of said pad by said needle to provide said fluid communication.

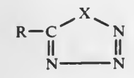
4,632,674

DIESEL FUEL CONTAINING A TETRAZOLE OR TRIAZOLE CETANE IMPROVER

David J. Martella, Plainsboro, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 27, 1985, Ser. No. 813,988
Int. Cl.[4] C10L *1/10*
U.S. Cl. 44—57 **7 Claims**

1. A liquid fuel adapted for use in a diesel engine containing a cetane number increasing amount of at least one fuel soluble additive compound represented by the structural formula:



(I)

wherein X represents a member selected from the group consisting of —O—, and >NR′, and wherein R and R′ independently are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, hydroxy, amino, alkoxy, hydroxyalkyl, alkaryl, and aralkyl.

4,632,675

PROCESS FOR STABILIZATION OF COAL LIQUID FRACTIONS

Geoffrey Davies, Lexington, and Ahmed El-Toukhy, Dorchester, both of Mass., assignors to Northeastern University, Boston, Mass.

Filed Aug. 10, 1984, Ser. No. 640,012
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—72 **13 Claims**

1. A process for stabilizing coal liquid fractions with respect to viscosity increases and gum deposition, comprising:

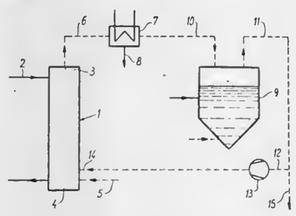
adding cyclohexanol to a coal liquid fraction at a level of from 5 to 25% by weight of the coal liquid, and storing said liquid coal-cyclohexanol mixture in a sealed container.

4,632,676

METHOD AND DEVICE FOR STRIPPING AMMONIACAL WATER COUNTERCURRENTLY WITH STEAM

Wilhelm Mosebach, Kamen-Methler, and Dieter Breidenbach, Waltrop, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Recklinghausen, Fed. Rep. of Germany

Continuation of Ser. No. 241,011, Mar. 6, 1981, abandoned. This application Dec. 14, 1982, Ser. No. 449,827
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1980, 3009060
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—50 **3 Claims**



1. A method for stripping ammoniacal water using a stripper (**1**) having a sump (**4**) at the bottom thereof and a head (**3**) at the top thereof, the head adapted to receive ammoniacal water (**2**) and the sump adapted to discharge water after it has been stripped, a saturator (**9**) having an inlet (**10**) for receiving a stripper gas component from the stripper head and an inlet for supplying sulfuric acid to the stripper gas component, the saturator having an outlet for ammonium sulfate at the bottom thereof and an outlet (**11**) for vapor at the top thereof, comprising the steps of:

supplying steam (**5**) to the stripper sump and in countercurrent flow with ammoniacal water in the stripper to strip ammonia from the ammoniacal water using the stream;

supplying ammoniacal water to the stripper head to form, with the countercurrent flow steam, stripper gas;

removing condensate from the stripper gas in a heat exchanger (**7**);

feeding the stripper gas less condensate to the saturator inlet (**10**) for receiving stripper gas;

supplying sulfuric acid to the saturator over the sulfuric acid inlet to form ammonium sulfate and a vapor;

removing the ammonium sulfate from the saturator over the ammonium sulfate outlet;

compressing an amount of vapor (**13**) from the saturator vapor outlet;

conveying the compressed saturator vapor (**14**) to the stripper sump in an uncooled state, the amount of saturator vapor augmenting the supply of steam to the stripper sump to save the steam and so that the sump is at a temperature of about 110° C. and the ammonia is stripped by saturated steam;

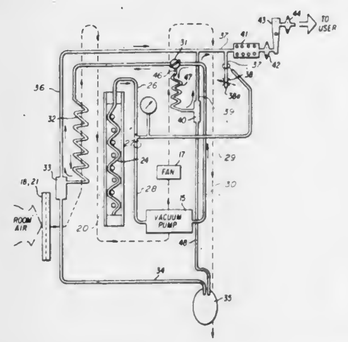
discharging (**15**) a remainder of the saturator vapor which has not been compressed so as to maintain the amount of saturator vapor supplied to the stripper sump at a constant level; the amount of saturated vapor augmenting the supply of steam to the stripper sump representing a savings in energy of steam to the stripper sump which is greater than energy required to compress the amount of vapor from the saturator vapor outlet.

4,632,677

HIGH HUMIDITY OXYGEN ENRICHER APPARATUS

Richard H. Blackmer, 109 Oakwood Dr., Scotia, N.Y. 12302

Filed Oct. 27, 1981, Ser. No. 315,444
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 **6 Claims**



1. An oxygen enriching apparatus having humidity control means, comprising:

housing means having an ambient air inlet;

a membrane cell stack supported in the housing for increasing the proportion of oxygen and water vapor in air passed therethrough;

pump means in the housing for causing ambient air to permeate through the membrane stack;

air circulation means for causing air to enter said housing, to circulate over the membrane stack and to circulate over the pump means to cool the pump means;

first and second condenser coils supported in the housing, the first condenser coil being disposed in the path of the ambient air entering the housing and being connected to receive at least a portion of oxygen-enriched air which has

passed through the membrane stack, whereby some of the moisture is condensed out of the oxygen-enriched air;

said second condenser coil being supported in the path of air from the air circulation means which has passed over the pump means and been warmed thereby, and being connected to receive at least a portion of the oxygen-enriched air from the membrane stack, the humidity of the air leaving the second condenser coil being higher than that leaving the first coil because of the higher temperature thereof;

both said condenser coils being connected with water separators to remove excess water from the air exiting the coils; and

a proportioning valve connected with the coils to cause desired relative amounts of air from the two coils to flow to delivery tubing to the user, depending upon the humidity desired in the delivery air.

4,632,678

AIR REGENERATOR USING AN OXYGEN JET VENTURI

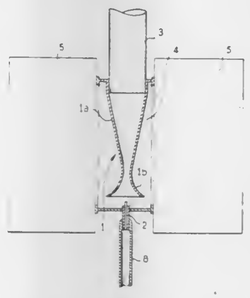
Max Cosyns, Brussels, Belgium, and Ruben Gomez, 64560 Licq-Atherey, France, assignors to Charles Baumert, Lucq de Bearn and Ruben Gomez, Licq-Atherey, both of, France

Filed Nov. 13, 1985, Ser. No. 797,591

Claims priority, application France, Nov. 13, 1984, 84 17308

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—180 **6 Claims**



1. An air regenerator having a cartridge (5) absorbing the carbon dioxide comprising a venturi (1) ensuring the suction of air through the cartridge by means of a nozzle (2) emerging axially upstream of the constricted section of the venturi and connected to a pressurized oxygen supply, characterized in that the mouthpiece of the nozzle is formed by a relatively thin wall (13) in which is bored a calibrated orifice (15) and whose thickness at the position of the bore is at most equal to the diameter of the orifice, so that at the outlet of the nozzle the molecules of the oxygen jet are reorientated and the distribution of the velocities becomes anisotropic, different from the distribution according to Maxwell's function.

4,632,679

CLEANING AIR MANIFOLD WITH BACK DRAFT DAMPER

William J. Klimczak, Anoka, Minn., assignor to Carter-Day Co., Minneapolis, Minn.

Filed Sep. 23, 1985, Ser. No. 778,903

Int. Cl.[4] B01D *46/04*

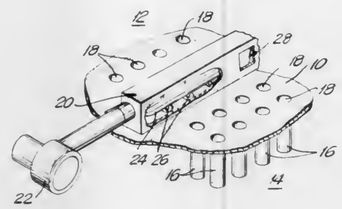
U.S. Cl. 55—284 **3 Claims**

1. In a gas filter apparatus of the type which has a manifold which furnishes cleaning air to the mouth openings of bag filters so that the cleaning air passes from the open mouths of the bags into the bags and dislodges dirt which has previously accumulated on the outside of the bags, the improvement comprising:

a cleaning air manifold structure with a plurality of exit openings in a pattern which matches the pattern of mouth openings of bags within the filter apparatus, and which is located so the manifold exit openings are adjacent to and in alignment with the bags' mouth openings;

blower means interconnected with and furnishing air to the cleaning air manifold structure;

a plurality of air jets adjacent to the exit openings of the cleaning air manifold structure, each air jet located so its jet discharge of air coincides with the air from a manifold exit opening;



high pressure air manifold means interconnecting the air jets and supplying them with high pressure air, and also interconnected with a source of high pressure air; and

back draft damper means connected to the cleaning air manifold and allowing a unidirectional flow of air, into the cleaning air manifold, when the air pressure inside the cleaning air manifold is below the air pressure outside it.

4,632,680

PLANAR SIDED AIR SHAPING INSERTS FOR FILTER BAGS

William J. Klimczak, Anoka, Minn., assignor to Carter-Day Co., Minneapolis, Minn.

Filed Oct. 28, 1985, Ser. No. 792,265

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—302 **6 Claims**



1. An air shaping insert for filter bag mouths of a multiple bag filter assembly in which the filter bags extend from a tube sheet which separates a dirty air region from a filtered air region and in which the bag mouths open into the filtered air region, the insert comprising:

a sealing means which holds the filter bag onto the tube sheet so that the filter bag seals around a hole in the tube sheet and restricts air flow through the tube sheet to air which passes through the bag mouth;

an insert disc concentric with the sealing means and slideably attached to it so that the insert disc may be rotated relative to the sealing means, the insert disc including an opening;

an insert body attached at the opening of the insert disc, determining the configuration of the opening and extending into the filter bag, the insert body being formed of planar sides extending transverse to the tube sheet, and the insert body having straight-sided cross sections.

4,632,681

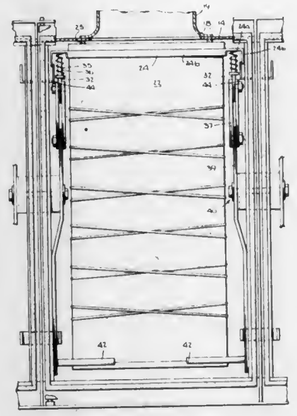
LOCKING APPARATUS FOR FILTER ELEMENTS

David E. Brunner, Waterloo, Canada, assignor to Wheelabrator Corporation of Canada, Ltd., Milton, Canada

Filed Apr. 29, 1985, Ser. No. 727,725

Int. Cl.[4] B01D *46/12*

U.S. Cl. 55—493 **7 Claims**



1. Apparatus for releasably locking at least one filter element into sealing engagement with a tube sheet in a dust collector filter housing about a corresponding number of flow through apertures in the tube sheet, said apparatus comprising:

a pair of rails for supporting the filter elements;

a pair of locking bars;

means mounting said locking bars for movement between a first position spaced from the tube sheet and a second position adjacent said tube sheet;

resilient means supported on said locking bars for pressing portions of the filter elements away from said rails and into sealing engagement with a surface of said tube sheet such that the filter elements are dependent therefrom when said locking bars are in said second position; and

means for shifting said locking bars between said first and second positions.

4,632,682

CARTRIDGE-TYPE OIL SEPARATOR AIR FILTER

Hans Erdmannsdörfer, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 822,288

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 8501736[U]

Int. Cl.[4] B01D *39/08*

U.S. Cl. 55—498 **8 Claims**

1. An oil-separating air filter assembly with an interchangeable filter cartridge adapted for the removal of the oil from an oil-entraining air flow, the filter assembly comprising in combination:

a separator head defining a vertical center axis for the assembly and an axially upwardly oriented end face;

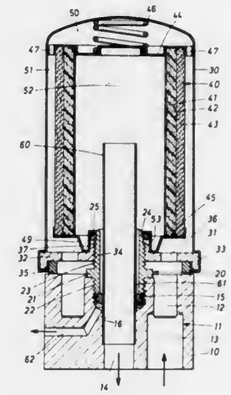
an inlet channel arranged in the separator head radially outside the assembly center axis and an outlet channel arranged in the separator head in alignment with the assembly center axis, both of said channels having openings in the end face of the separator head,

a closed filter cartridge adapted to be clamped against the end face of the separator head, the filter cartridge having on its lower side an axial end wall forming a seal with said end face, said axial end wall having separate inlet and outlet passages which lead from the inlet and outlet channels of the separator head to the inside of the filter cartridge;

means defined by the filter cartridge and by the separator head for removably clamping the filter cartridge to the separator head; and

a tubular separator element arranged inside the filter cartridge, at a radial distance from the interior wall of the filter cartridge, the separator element including a lower end disc forming a seal with the axial end wall of the filter cartridge, so as to connect the space inside the separator element to said outlet passage and outlet channel and to connect the space between the separator element and the interior wall of the filter cartridge to said inlet passage and inlet channel, the separator element having an air-permeable filter wall between said two spaces which, when traversed by the oil-entraining air flow, traps and coalesces the oil, the coalesced oil collecting above the lower end disc of the separator element under the influence of gravity; and wherein

the filter cartridge comprises a cartridge shell and an end cover attached thereto, the cartridge shell surrounding the tubular separator element and enclosing said element on its upper axial side, the axial end wall of the filter cartridge being formed by said cartridge end cover;



the means for clamping the filter cartridge to the separator head includes a pair of cooperating male and female threaded members defined by the filter cartridge and the separator head and arranged in axial alignment with the assembly center axis, the male threaded member having a central axial bore;

the outlet channel in the separator head includes an outlet bore and a standpipe extending axially upwardly from the outlet bore, through the bore of the male threaded member, to a point which is located a distance above the space where the coalesced oil collects; and

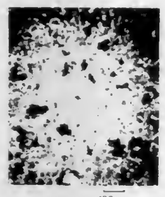
the separator head and the axial end wall of the filter cartridge define a drain channel leading from the separator head to the space inside the separator element where the coalesced oil collects, the drain channel being arranged radially outside the standpipe, an axial portion of the drain channel extending through the male threaded member.

4,632,683

EXHAUST GAS PURIFYING FILTER AND PRODUCTION OF THE SAME

Masanori Fukutani, Nagoya; Naoto Miwa, Tsushima; Kazuyuki Ito, Nishio, and Keiji Ito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 21, 1985, Ser. No. 800,396
Claims priority, application Japan, Nov. 24, 1984, 59-248498
Int. Cl.[4] B01D *39/20*
U.S. Cl. 55—523 **10 Claims**



1. An exhaust gas purifying filter having a multiplicity of inward passages parallel to the axis of the filter in which said inward passages being open at the one axial end and blocked at the other axial end, a multiplicity of outward passages parallel to the axis of the filter in which said outward passages being open at one axial end and blocked at the other axial end, and having porous partition walls placed between said inward passages and said outward passages and separating said inward passages and said outward passages from one another,

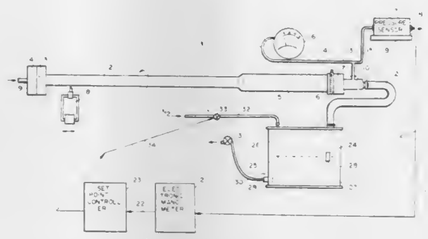
which comprises the surface of said partition wall exposed to at least the inward passage has superficial pores communicating with internal pores in said partition wall, said superficial pores being composed of small pores having a diameter of 5 to 40 μm and large pores having a diameter of 40 to 100 μm, the number of said small pores being 5 to 40 times that of said large pores.

4,632,684

METHOD OF AND APPARATUS FOR MAKING OPTICAL PREFORMS FROM TUBULAR BODIES

Kamran Karbassiyoon, Roanoke; Philip E. Foster, Botetourt; Francis I. Akers, and Daniel G. Fletcher, both of Roanoke, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 31, 1984, Ser. No. 636,210
Int. Cl.[4] C03B *37/012, 37/07*
U.S. Cl. 65—2 **4 Claims**



1. A method comprising the steps of:

providing a tubular glass body having a through passage and being suitable for use in making optical fiber;

collapsing the tubular body into a solid optical fiber preform by passing heating means along the length of the tubular body a plurality of times so that the diameter of the passage is reduced each time;

supplying a gaseous medium at superatmosphere pressure into one end of the passage and through the passage and discharging the gaseous medium at the other end of the passage through a gas conduit during at least one pass of the heating means;

supplying a pressure control gas at a location downstream of the other end of said passage through said conduit so that the pressure of said control gas acts at said other end of such passage and exerts a back pressure at said other end of said passage on the gaseous medium flowing through said passage;

detecting the difference in pressure between the resulting gas mixture of control gas and gaseous medium downstream of the other end of said passage and the ambient pressure acting on the outside of said tubular member; and

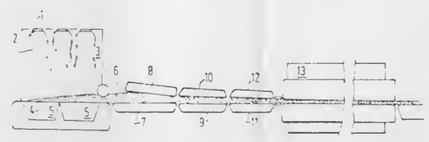
adjusting the supply of said pressure control gas to maintain said pressure difference substantially constant whereby the difference between the gas pressure inside said tubular member and said ambient pressure is also maintained substantially constant.

4,632,685

APPARATUS FOR FORMING OF FELTS WHICH HAVE AN ISOTROPIC STRUCTURE

Alain Debouzie, 37 Rue Racine, 76650 Petite Couronne; Francois Bouquet, Rue Edouard Vaillant, 60290 Rantigny, and Alain De Meringo, 155 Boulevard Saint-Germain, 75006 Paris, all of France

Filed Feb. 15, 1985, Ser. No. 702,070
Int. Cl.[4] C03B *37/10*
U.S. Cl. 65—9 **6 Claims**



1. An apparatus for the continuous formation of felts from fibers of a glass material coated with a binder composition which are distributed onto a receiving member retaining the fibers, comprising at least three pairs of conveyors as compacting means, adopted for progressively passing a fiber felt therebetween, each having a speed independently controlled to allow at least two longitudinal compression steps, said first pair compressing the felt in its thickness, the passage from the first pair to the second pair of conveyors effecting a first longitudinal compression, and the passage from the second pair to the third pair of conveyors effecting a second longitudinal compression of the felt.

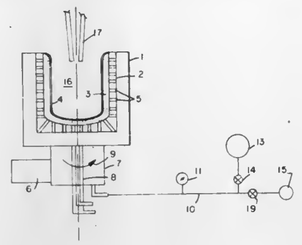
4,632,686

METHOD OF MANUFACTURING QUARTZ GLASS CRUCIBLES WITH LOW BUBBLE CONTENT

David R. Brown, Beverly, Mass.; Charles E. Frost, Jr., Exeter, and Kenneth A. White, Raymond, both of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 24, 1986, Ser. No. 832,614
Int. Cl.[4] C03B *19/04*
U.S. Cl. 65—18.1 **3 Claims**

1. The method of making a quartz glass crucible of low bubble content comprising the steps of preparing a mold having holes therethrough through which a vacuum can be drawn, disposing the mold on a rotatable spindle through which a vacuum can be drawn, rotating the mold while drawing a vacuum on the interior of the mold through said holes, pouring granular quartz material into the mold to form a first layer thereof on the interior of the mold, pouring quartz material finer than said granular quartz material into the mold to form a second layer thereof on the first layer, applying heat to the interior of the mold to melt and fuse the quartz material to form a crucible, and removing the crucible from the mold.

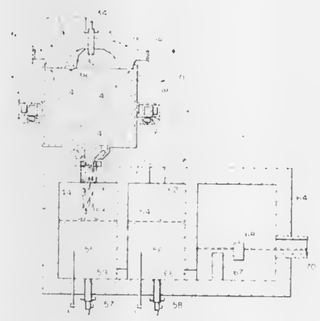


4,632,687

METHOD OF MELTING RAW MATERIALS FOR GLASS OR THE LIKE USING SOLID FUELS OR FUEL-BATCH MIXTURES

Gerald E. Kunkle, New Kensington; Henry M. Demarest, Natrona Heights, and Larry J. Shelestak, Bairdford, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 25, 1985, Ser. No. 748,639
Int. Cl.[4] C03B *5/10*
U.S. Cl. 65—27 **40 Claims**



1. A method of liquefying glass batch or the like comprising: contacting pulverulent glass batch material with a solid or liquid fuel having an ash content, the fuel being provided in an amount sufficient to supply a major portion of the energy required to liquefy the batch material, combusting the fuel so as to liquefy the batch material, and mixing the ash from the combusted fuel into the liquefying batch at the region of combustion sufficiently rapidly that substantially all of the ash is incorporated into the liquefying batch and flows from the combustion zone entrained therein, whereby buildup of ash deposits in the combustion zone is substantially avoided.

4,632,688

APPARATUS AND METHOD FOR TREATING GLASS SHEETS

Donald D. Rahrig, Toledo, and Richard D. Schave, Perrysburg, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

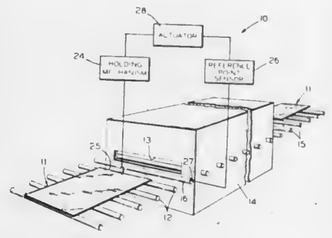
Filed Nov. 8, 1985, Ser. No. 796,403
Int. Cl.[4] C03B *25/06*
U.S. Cl. 65—29 **22 Claims**

1. A method for synchronizing the movement of the leading edge of a glass sheet entering a roller hearth furnace with a predetermined point on a rotating roller over which said glass sheet will pass comprising:

a. identifying a reference point associated with said rotating roller;

b. holding said glass sheet at a preselected location adjacent said rotating roller; and

c. releasing said glass sheet from said preselected location when said reference point is in a predetermined spatial relationship with respect to said glass sheet leading edge whereby said glass sheet will engage said rotating roller at said predetermined point thereon.



10. An apparatus for reducing thickness variations in a laminated assembly including glass sheets heat treated in a furnace in which single glass sheets pass through the furnace in sequence on a plurality of rollers comprising:

means for holding each of a sequence of glass sheets at an entrance to a furnace;

means for defining a reference point associated with a rotating roller adjacent said entrance of the furnace; and

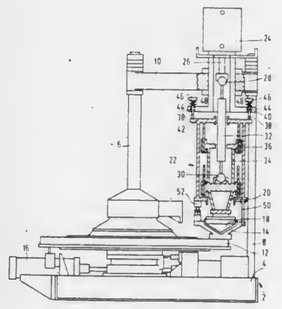
means for sensing the position of said reference point and for actuating said means for holding to release one of said glass sheets each time said reference point is in a predetermined spatial relationship with respect to said entrance and said glass sheet.

4,632,689

METHOD OF PRESSING AN ARTICLE OF A THERMOPLASTIC MATERIAL AND APPARATUS FOR MANUFACTURING AN ARTICLE OF A THERMOPLASTIC MATERIAL BY PRESSING

Hans C. De Willigen; Willem van der Hoek, and Piet C. J. van Rens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 670,530, Nov. 9, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,737
Claims priority, application Netherlands, Nov. 10, 1983, 8303854
Int. Cl.[4] C03B *11/16*
U.S. Cl. 65—78 **6 Claims**



1. A method of molding an article of a thermoplastic mate-

rial in which a charge of molten material is deposited in mold and the central axis of the mold is brought into alignment with the central axis of a pressing plunger, after which the plunger and the mold are moved towards each other to carry out a pressing operation while the axial alignment of the mold and the plunger is maintained, characterized in that maintenance of the axial alignment of the plunger and the mold is interrupted towards the end of the pressing, but before the extreme pressing position of the plunger and mold is reached, sufficiently to permit a slight lateral adjustment of the plunger relative to the mold.

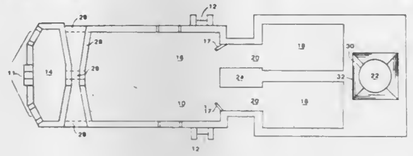
3. An apparatus for manufacturing an article of a thermoplastic material by pressing, in a mold, a charge of thermoplastic material in molten form, which apparatus comprises at least one mold, a plunger for cooperating with said mold and which is secured to a plunger support supported in a guide mechanism axially movable by a drive means and a frame supporting said mold and said guide mechanism, characterized in that said guide mechanism is movably connected to said frame and said apparatus comprises coupling means for rigidly coaxially coupling the guide mechanism to the mold while bringing the plunger to the mold until just before the extreme pressing position of the plunger and the mold is reached, said coupling means then permitting a slight lateral adjustment of the guide mechanism relative to the mold.

4,632,690

HAZARDOUS WASTE REMOVAL METHOD AND APPARATUS

Robert E. Colwell, Jr., 2025 Post Rd., Vienna, Va. 22180, and Glenn L. Shira, 8110 Hillcrest Dr., Manassas, Va. 22111

Filed Jun. 4, 1985, Ser. No. 741,246
Int. Cl.[4] C03B *5/04*
U.S. Cl. 65—134 **17 Claims**



5. In a regenerator type glass furnace having a melting chamber, a refining chamber, a doghouse, a plurality of checkers chambers and a stack, a process for neutralizing hazardous or toxic waste material comprising the steps of:

generating a flame in a combustion chamber immediately above said melting chamber, said flame directly impinging on a surface of molten mass contained in said melting chamber and said molten mass being largely comprised of raw materials for making glass;

injecting into said molten mass in said melting chamber solid or sludge type hazardous or toxic waste material through said doghouse;

continuing heating said molten mass by said flame while circulating said molten mass in said melting chamber;

transferring said molten mass from said melting chamber to said refining chamber upon destruction of certain hazardous or toxic waste material embodied therein; and

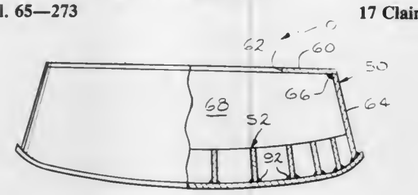
recovering a resultant glass product from said refining chamber.

4,632,691

COMPLEXLY CURVED MOLD

Quintin R. Smith, 317 E. Fourth St., and Kellen R. Smith, 760 Brokate Rd., both of Port Clinton, Ohio 43452

Filed Dec. 20, 1985, Ser. No. 811,544
Int. Cl.[4] C03B *23/035*
U.S. Cl. 65—273 **17 Claims**



1. A mold for forming plastic material into a desired shape comprising, in combination,

a lattice-type support having a first plurality of strips and a second plurality of strips intersecting said first plurality of strips, said first and said second strips secured to one another and cooperatively conforming to a surface of such desired shape, and

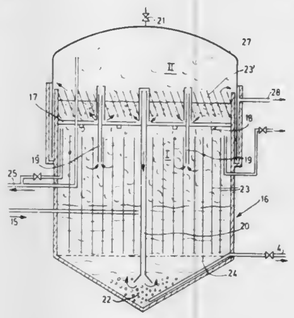
a plurality of plates secured to one another and to said lattice work support, each of said plates conforming to a portion of said surface of such desired shape.

4,632,692

PROCESS AND INSTALLATION FOR SIMULTANEOUSLY PRODUCING COMPOST AND BIOGAS FROM ORGANIC WASTE

Yves Lebesgue, Vigny, and Alexandru Zeana, Creteil, both of France, assignors to Societe Multibio, France

Filed Aug. 24, 1984, Ser. No. 644,193
Int. Cl.[4] C05F *7/04*
U.S. Cl. 71—10 **10 Claims**



1. A process for the simultaneous treatment of solid or semi-solid organic waste and liquid organic waste with a view to the simultaneous production of compost and biogas, wherein said liquid organic waste is subjected to a liquid-solid separation, the liquid phase from this separation is subjected to anaerobic fermentation in at least one closed digester, the solid phase from said liquid-solid separation is mixed with said solid or semi-solid organic waste, the resulting mixture is subjected to aerobic fermentation at the periphery of said digester and in contact therewith and mud, clarified liquid and gas are respectively discharged from said digester whereas compost from the aerobic fermentation of said solid or semi-solid waste is recovered at the periphery of said digester wherein said digester is characterized by two superimposed compartments, an upper compartment at low pressure and a lower compartment at high pressure, said compartments communicating together through at least one lateral pipe and through a central siphon, means being provided for lowering the pressure of the lower compartment when the liquid reaches a predetermined level therein.

5. An installation for the simultaneous treatment of solid or semi-solid organic waste and liquid waste with a view to the simultaneous production of compost and biogas, comprising: means for separating the liquid organic waste into a solid phase and a liquid phase; at least one closed digester; means for introducing said liquid phase into said digester; means for mixing said solid phase with said solid or semi-solid waste; means for bringing the resulting mixture to the periphery of said digester in contact therewith; and means for discharging respectively from said digester the gas which is formed therein by anaerobic fermentation and the sludges which are deposited therein and finally the clarified liquid phase wherein said digester is characterized by two superimposed compartments, an upper compartment at low pressure and a lower compartment at high pressure, said compartments communicating together through at least one lateral pipe and through a central siphon, means being provided for lowering the pressure of the lower compartment when the liquid reaches a predetermined level therein.

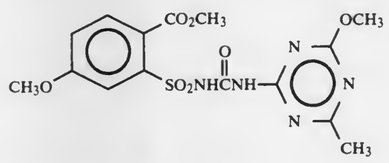
4,632,693

HERBICIDAL SULFONAMIDES

Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 613,412, May 24, 1984. This application Feb. 14, 1985, Ser. No. 699,869
Int. Cl.[4] A01N *43/66;* **C07D** *251/42, 251/16*
U.S. Cl. 71—93 **5 Claims**

1. An agriculturally suitable composition for controlling the growth of undesired vegetation postemergence in wheat comprising an effective amount of the compound of the formula



and at least one of the following: surfactant, solid or liquid diluent.

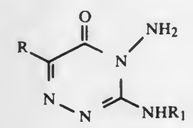
4,632,694

ASYMMETRICAL TRIAZINE SALTS

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1985, Ser. No. 740,031
Int. Cl.[4] A01N *43/707;* **C07D** *253/06*
U.S. Cl. 71—93 **16 Claims**

1. A storage stable herbicidal mixture consisting essentially of a herbicidal effective amount of an agriculturally suitable salt of a first compound selected from



wherein

R is C_1-C_8 alkyl; and

R_1 is C_1-C_3 alkyl

and a herbicidally effective amount of a second compound selected from N-(cyclopropylmethyl)-α,α,α-trifluoro-2,6-dinitro-N-propyl-p-toluidine or α,α,α-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine in an aqueous solvent.

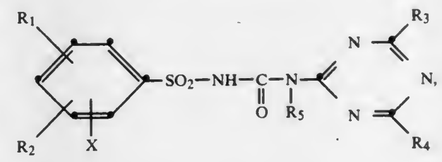
4,632,695

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS AS HERBICIDES AND PLANT GROWTH REGULANTS

Rolf Schurter, Binningen; Rudolph C. Thummel, Courgenay; Werner Töpfl, Dornach; Willy Meyer, Riehen, and Dieter Dürr, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 717,638, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 574,421, Jan. 27, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,168
Claims priority, application Switzerland, Feb. 4, 1983, 643/83-2
Int. Cl.[4] C07D *251/46, 251/52;* **A01N** *43/70, 43/66*
U.S. Cl. 71—93 **14 Claims**

1. An N-phenylsulfonyl-N'-triazinylurea of the formula



wherein

R_1 is hydrogen, halogen, or $COOC_1$-C_5alkyl

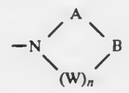
R_2 is hydrogen, or halogen,

R_3 is C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy,

R_4 is hydrogen, halogen, C_1-C_3 alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, C_2-C_4alkoxyalkyl, amino, C_1-C_3alkylamino or di-C_1-C_3alkylamino,

R_5 is hydrogen or methyl

X is $-NR_6R_7$, $-N(SO_2CH_3)_2$ or



wherein

A is —CO— or —SO_2—,

B is C_1-C_4 alkylene or C_2-C_4alkenylene,

W is —CO— or —SO_2—,

n is 0 or 1,

R_6 is unsubstituted C_3-C_7cycloalkyl or C_5-C_7cycloalkenyl, or C_2-C_6alkenyl substituted by halogen, cyano or $-COOR_{11}$; or R_6 is $-COR_8$ or $-COCOC_1$-C_3alkyl,

R_7 is hydrogen, C_1-C_4alkyl, C_3-C_7cycloalkyl or $-SO_2CH_3$,

R_8 is hydrogen, C_3-C_7cycloalkyl, C_1-C_5haloalkyl or C_2-C_5alkoxyalkyl and

R_{11} is hydrogen, C_1-C_5haloalkyl, C_2-C_5alkoxyalkyl, C_2-C_6alkenyl, C_2-C_4haloalkenyl or C_2-C_4alkynyl.

13. A method of selectively controlling weeds pre- and post-emergence in crops of useful plants, which comprises treating the crops or the area where the crop is grown with an effective amount of a N-phenylsulfonyl-N'-triazinylurea of claim 1.

4,632,695

DICHLOROQUINOLINE DERIVATIVES FOR USE AS HERBICIDES

Helmut Hagen, Frankenthal; Juergen Markert, Mutterstadt, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

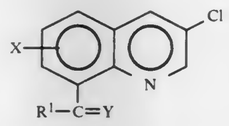
Division of Ser. No. 349,675, Feb. 17, 1982, Pat. No. 4,497,651. This application Dec. 27, 1984, Ser. No. 686,747

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108873

Int. Cl.⁴ A01N *43/42;* **C07D** *215/48*

U.S. Cl. 71—94 **4 Claims**

1. A dichloroquinoline derivative of the formula



I

where X is chlorine in the 5-, 6- or 7-position, Y is oxygen, and R^1 is halogen.

2. A herbicide containing a compound of the formula I as set forth in claim 1 and a solid or liquid carrier.

3. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with an effective amount of a compound of the formula I as set forth in claim 1.

4,632,697

ARYLOXYPHENOXY BENZAMIDE HERBICIDES AND METHODS OF USE

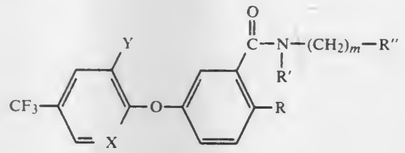
Sreeramulu Nagubandi, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 25, 1985, Ser. No. 704,989

Int. Cl.⁴ A01N *43/40;* **C07D** *211/88;* **C07F** *9/06*

U.S. Cl. 71—94 **9 Claims**

1. A substituted pyridyloxyphenoxy benzamide having the formula



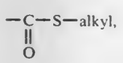
in which

X is nitrogen;

Y is chlorine, bromine, fluorine, iodine, methyl, cyano or hydrogen;

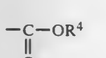
R is nitro, hydrogen or halogen;

R′ is hydrogen, CH_3, lower alkyl having 1–10 carbon atoms, $SCCl_3$,



or $—PO_3R^3{}_2$ wherein R^3 is hydrogen, alkyl having 1–10 carbon atoms, or a herbicidally acceptable salt;

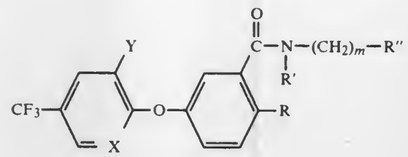
R″ is cyano, —C≡CH,



wherein R^4 is hydrogen, alkyl having 1–10 carbon atoms, or an equivalent of base such as a salt; and

m is 0, 1, 2 or 3.

7. A method for controlling undesirable weed pests which comprises applying to the locus wherein control is desired a herbicidally effective amount of a compound having the formula



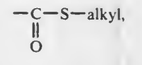
in which

X is nitrogen;

Y is chlorine, bromine, fluorine, iodine, methyl, cyano or hydrogen;

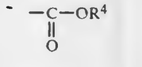
R is nitro, hydrogen or halogen;

R′ is hydrogen, CH_3, lower alkyl having 1–10 carbon atoms, $SCCl_3$,



or $—PO_3R^3{}_2$ wherein R^3 is hydrogen, alkyl having 1–10 carbon atoms, or a herbicidally acceptable salt;

R″ is cyano, —C≡CH,



wherein R^4 is hydrogen, alkyl having 1–10 carbon atoms, or an equivalent of base such as a salt; and

m is 0, 1, 2 or 3.

4,632,698

BIOCIDAL 2-ARYL-1,3-CYCLOPENTANEDIONE ENOL ESTER COMPOUNDS

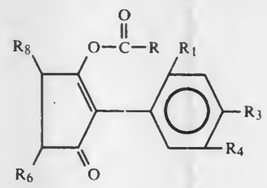
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 528,936, Sep. 2, 1983, Pat. No. 4,551,547, which is a continuation of Ser. No. 205,650, Nov. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 944,996, Sep. 22, 1978, abandoned. This application Aug. 19, 1985, Ser. No. 766,782

Int. Cl.⁴ A01N *37/02, 37/10*

U.S. Cl. 71—106 **14 Claims**

1. An acaricidal or herbicidal composition comprising an acceptable carrier and as the active toxicant an acaricidally or herbicidally effective amount of a compound of the formula:



wherein:

R is C_1–C_{15} linear alkyl, C_1–C_{15} branched alkyl or phenyl;

R_1 is alkyl or halogen;

R_3 and R_4 are individually hydrogen, alkyl or halogen;

R_6 is hydrogen, alkyl or alkylene; and

R_8 is hydrogen or R_6 and R_8 together form a six-membered alkylene ring.

4,632,699

PROCESS FOR PREPARING ZINC POWDER FOR ALKALINE BATTERIES

Marcel L. Meeus, Lommel; Yvan A. J. Strauven, Neerpelt, and Luc A. J. Groothaert, Overpelt, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Hoboken, Belgium

Filed Apr. 3, 1985, Ser. No. 719,417

Claims priority, application Luxembourg, Apr. 17, 1984, 85322

Int. Cl.⁴ C22C *1/04, 18/00*

U.S. Cl. 75—0.5 B **16 Claims**

1. A process for preparing a zinc base powder containing mercury for alkaline batteries, comprising the steps of

(a) preparing an homogeneous molten bath composed of zinc, mercury and possibly other elements,

(b) preparing from said molten bath an alloy powder with substantially homogeneous particles; and

(c) making said alloy powder to react with metallic mercury and/or with a mercury compound, thereby producing an alloy powder enriched with mercury.

4,632,700

METHOD AND APPARATUS FOR HOLDING OR INCREASING THE TEMPERATURE IN A METAL MELT

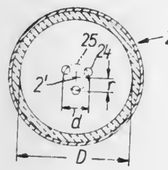
Hans J. Behber, Mülheim; Dieter Neuschütz, Essen, and Heinrich-Otto Rosser, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Oct. 8, 1985, Ser. No. 785,592

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437333; Nov. 30, 1984, 3443740

Int. Cl.⁴ C22B *4/00*

U.S. Cl. 75—10.14 **15 Claims**



1. Method for supplying thermal energy to a metal melt present in a receiving vessel after having been discharged from a melting furnace, the receiving vessel having a central axis and a circular inner wall, said method comprising disposing at least two plasma torches above the melt in the receiving vessel to each direct a transferred electric arc at the melt; and operating the torches with alternating current, so that current flows through the melt between the arcs, and with a gas which is inert to the metal melt, while cooling the torches with water, for causing each arc to impinge on a respective area at the surface of the melt such that the center of each impingement area has a distance from the central axis of the vessel which is not greater than 3/10 of the radius of the inner wall of the vessel at the height of the surface of the melt.

4,632,701

PROCESS FOR THE RECOVERY OF SILVER FROM A RESIDUE ESSENTIALLY FREE OF ELEMENTAL SULPHUR

Roman M. Genik-Sas-Berezowsky, Edmonton, and Donald R. Weir, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

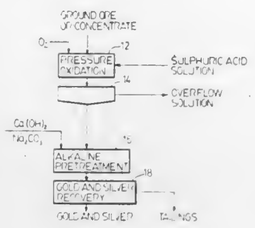
Filed Mar. 4, 1985, Ser. No. 707,710

Claims priority, application Canada, Sep. 27, 1984, 464180

Int. Cl.⁴ C22B *11/04*

U.S. Cl. 75—118 R **19 Claims**

1. A process for the recovery of silver from a residue essentially free of elemental sulphur obtained by acidic pressure oxidation leaching of iron-containing sulphidic material, said residue containing less than about 10% by weight of elemental sulphur compared to the sulphur in the sulphidic material, comprising forming a slurry of the residue with lime at a temperature of at least about 80° C. to raise the pH of the slurry to at least about 9, maintaining the slurry at said temperature for from about 0.5 to about 4 hours, and subjecting the resultant slurry to silver recovery treatment.



4,632,702

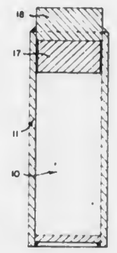
MANUFACTURE AND CONSOLIDATION OF ALLOY METAL POWDER BILLETS

Vincent N. DiGiambattista, Pittsburgh, Pa., assignor to Worl-Tech Limited, Pittsburgh, Pa.

Continuation of Ser. No. 787,686, Oct. 15, 1985, and a continuation-in-part of Ser. No. 428,280, Sep. 29, 1982, abandoned. This application Apr. 9, 1986, Ser. No. 849,794

Int. Cl.⁴ G22F *1/00*

U.S. Cl. 75—228 **13 Claims**



1. The method of producing dense billets of metal powder comprising loading the powder into a container formed from a metal having a lower resistance to deformation than the metal of the billet, compacting the powder in the container to a tap density of about 80% of theoretical, covering the powder in the container with an inner plate not attached to the container, covering the inner plate with a cover plate and attaching it to the container, both plates being made of metal having a lower resistance to deformation than the metal of the billet and having thicknesses several times that of the container wall, heating the filled container to a temperature below the melting point of the container and the metal powder, and hot extruding the filled container cover plate first whereby the inner plate is partially extruded against the powder so as to raise the density of the extruded billet to substantially 100% of theoretical.

4,632,703

RECORDING LIQUID

Shoji Koike, Yokohama; Tsuyoshi Eida, Ichikawa; Masatsune Kobayashi; Yasumasa Yokoyama, both of Yokohama, and Tomoko Komori, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

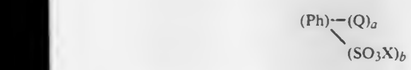
Filed Mar. 23, 1984, Ser. No. 592,546

Claims priority, application Japan, Mar. 29, 1983, 58-51389

Int. Cl.[4] C09D *11/02*

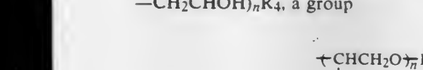
U.S. Cl. 106—22 **20 Claims**

1. A recording liquid comprising a recording agent, water and a water-soluble organic solvent as essential components, wherein said recording agent comprises at least one of the dyes represented by the formula (A) shown below:



(A)

wherein (Ph) represents a phthalocyanine skeleton at the center of which a metal atom may be coordinated, X represents an alkali metal or NH_4, a and b each independently represent an integer of 1 to 3 satisfying the relation of $2 \leqq a+b \leqq 4$, Q represents a group $-SO_2OR_1$ or a group $-SO_2NR_2R_3$, where R_1 represents an alkyl or an alicyclic group having not more than 15 carbon atoms which may be branched or an aralkyl group having not more than 15 carbon atoms, R_2 and R_3 each independently represent a group $-CH_2CH_2O)_nR_4$, a group $-CH_2CHOH)_nR_4$, a group



an alkyl or alicyclic group having not more than 15 carbon atoms which may be branched, or an amino acid salt radical, n is an integer of 0 to 12, and R_4 is H, CH_3 or CH_2OH.

4,632,704

PROCESS FOR THE PREPARATION OF HIGH YIELD PIGMENTS

Fridolin Bäbler, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1985, Ser. No. 825,292

Claims priority, application Switzerland, Feb. 6, 1985, 524/85

Int. Cl.[4] C04B *14/00*

U.S. Cl. 106—288 Q **9 Claims**

1. A process for the preparation of high yield pigments of the series of the diketopyrrolopyrroles, quinacridones, isoindolinones and isoindolines by protolysis of the pigment salt obtained by treating the crude pigment with a strong base or of the pigment salt obtained in the course of the synthesis, which process comprises treating said pigment salt, in an organic solvent, with water such that the organic solvent is simultaneously removed during the protolysis.

4,632,705

PROCESS FOR THE ACCELERATED CLEANING OF THE RESTRICTED AREAS OF THE SECONDARY SIDE OF A STEAM GENERATOR

Allen J. Baum, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1984, Ser. No. 591,638

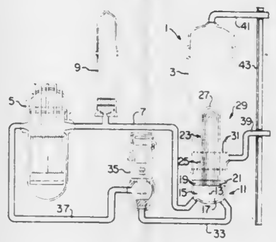
Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—3 **10 Claims**

1. A process for cleaning the restricted areas of the secondary side of a steam generator, through which heat transfer tubes of the primary side of the steam generator pass, said restricted areas including the crevices between heat transfer tube legs and the tubesheet, and the crevices between the heat transfer tubes and tube support plates, with an aqueous solution of an organic cleaning agent which will solubilize deposits collected in said secondary side, comprising:

(a) heating the interior of the secondary side of the steam generator, containing an aqueous organic cleaning agent solution to an elevated temperature by passage of heated fluid through the primary side of the steam generator and heat transfer tubes passing through said secondary side, while maintaining said secondary side at an initial pressure which will prevent boiling of the aqueous organic cleaning agent solution at said elevated temperature;

(b) reducing the pressure in the secondary side of the steam generator, while maintaining said heating, so as to cause localized flashing and boiling of the aqueous organic cleaning agent solution therein, such that the concentration of said aqueous organic cleaning agent is increased in the region of all said restricted areas;



(c) maintaining said reduced pressure in the secondary side of the steam generator, while maintaining said heating, for a period of time sufficient to concentrate said solution in all said restricted areas relative to the remainder of the bulk solution in the secondary side of the steam generator;

(d) increasing the pressure in the secondary side of the steam generator to at least said initial pressure;

(e) maintaining said aqueous organic cleaning solution in said secondary side of the steam generator, for a period of time sufficient to solubilize said deposits; and

(f) withdrawing said aqueous organic cleaning agent solution containing solubilized deposits from the secondary side of said steam generator.

4,632,706

CONTROLLED PROCESS FOR THE SURFACE TREATMENT OF METALS

Dieter J. Müeller, Marl, and Hans-Juergen Busse, Schermbeck, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,196

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 33335266

Int. Cl.[4] C23F *7/08;* **B05D** *7/14;* **C23G** *5/00*

U.S. Cl. 148—6.15 R **5 Claims**



1. In a process for the surface treatment of metals in a substantially non-aqueous liquid bath in a treatment tank open to the ambient atmosphere of humidity-containing air, said treatment tank having a heatable lower zone, an upper cooling zone and at least one condensate channel, said bath containing an organic solvent and chemically reactive component, said process comprising heating the bath during the surface treatment, thereby evolving vapor from said bath, cooling said vapor to condense both resultant bath vapor and water from the humidity in the air, passing resultant condensate to a phase separator to separate an organic phase from an aqueous phase, said aqueous phase containing both solvent and the chemically reactive component, withdrawing said aqueous phase from the phase separator and recycling said organic phase to the treatment tank, and adding a readjustment solution to said bath to make up for losses of components therein,

the improvement which comprises passing the aqueous phase from the phase separator to an overflow tank; adjusting the components, except for water, in the readjustment solution to obtain the same proportion of the same components in the overflow tank, the water in said readjustment solution being adjusted to have a lower concentration than the water concentration in said overflow tank and a sufficiently high concentration to avoid localized concentrations of the chemically reactive component in the bath, withdrawing from said overflow tank sufficient aqueous phase to maintain a constant volume of liquid in the treatment tank, and also recycling overflow aqueous phase from the overflow tank to the treatment tank.

4,632,707

PROTECTIVE ATMOSPHERE PROCESS FOR ANNEALING AND/OR HARDENING FERROUS METALS

Robert H. Shay, Kutztown; Kerry R. Berger, Lehighton, both of Pa., and Thomas S. Bannos, Cumberland, R.I., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 9, 1985, Ser. No. 721,335

Int. Cl.[4] C21D *1/06, 1/26*

U.S. Cl. 148—16.5 **5 Claims**

1. In the heating of ferous metal articles at elevated temperatures under a controlled furnace atmosphere a heat treatment selected from the group of annealing, subcritical annealing, and hardening in which the improvement comprises heating said ferrous metal article under an atmosphere prepared by forming a mixture of from 0.1 to about 5% by volume dimethyl ether, balance nitrogen and introducing said mixture into said furnace to reduce, decarburization and recarburization of the surface of said articles.

4,632,708

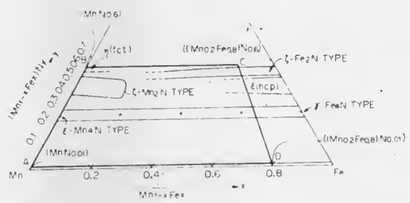
ANNEALING SEPARATOR USED IN THE FINISHING ANNEALING STEP FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET

Toyohiko Konno; Yozo Suga, both of Kitakyushu; Motoharu Nakamura, Himeji, and Hajime Komatsu, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,296

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—113 **5 Claims**



1. An annealing separator used in a finishing-annealing step for producing a grain-oriented electrical steel sheet, containing magnesia, characterized by including, based on 100 parts by weight of said magnesia, from 0.2 to 20 parts by weight of ferromanganese nitride or manganese nitride which consists of a composition $(Mn_{1-x}Fe_x)N_y$ having x and y values corresponding to A, B, C and D, and falling within a region surrounded by A, B, C and D shown in the appended FIG. 1.

3. A finishing annealing method for producing a grain-oriented electrical steel sheet, wherein an annealing separator containing magnesia is applied to a cold-rolled and then decarburized annealed sheet, and then said sheet is annealed to generate secondary recrystallization and to form a forsterite film thereon, characterized by including, based on 100 parts by weight of said magnesia, from 0.2 to 20 parts by weight of ferromanganese nitride or manganese nitride which consists of a composition $(Mn_{1-x}Fe_x)N_y$ having x and y values corresponding to A, B, C, and D and falling within a region surrounded by A, B, C, and D shown in the appended FIG. 1.

4,632,709

PROCESS FOR PREVENTING MELT-BACK IN THE PRODUCTION OF ALUMINUM-CONTAINING LASER DEVICES

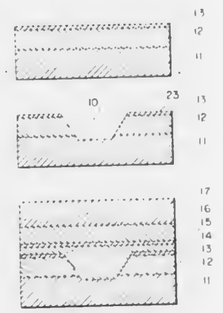
Mototaka Taneya; Sadayoshi Matsui; Mitsuhiro Matsumoto, all of Tenri, and Hiroshi Hayashi, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,707

Claims priority, application Japan, Oct. 2, 1984, 59-206930

Int. Cl.[4] H01L *21/208*

U.S. Cl. 148—171 **4 Claims**



1. A process for the production of semiconductor devices comprising:

(1) forming a thin semiconductor film containing no aluminum on a first semiconductor layer containing aluminum successively on a substrate,

(2) forming one or more channels on said thin semiconductor film, said channels reach or go through said first semiconductor layer, to produce a channeled substrate for the succeeding crystal growth thereon, and

(3) attaining the epitaxial growth of crystalline layers on said channelled substrate by the use of a crystal growth solution having a supersaturation which is high enough to prevent said first semiconductor layer from undergoing meltback.

4,632,710

VAPOR PHASE EPITAXIAL GROWTH OF CARBON DOPED LAYERS OF GROUP III-V MATERIALS

H. Barteld Van Rees, Newton Upper Falls, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 10, 1983, Ser. No. 493,172

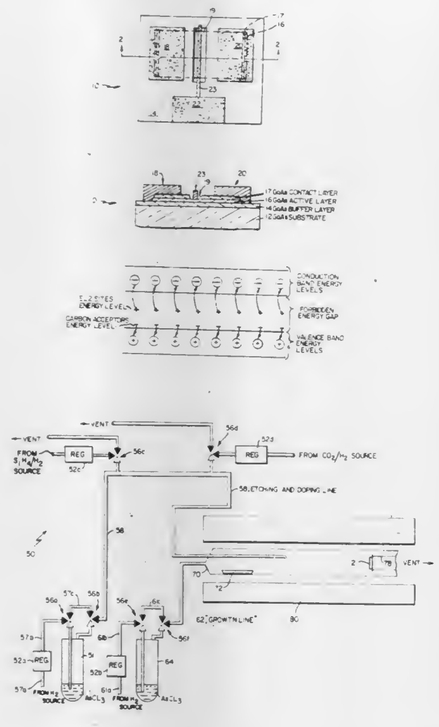
Int. Cl.[4] H01L *21/205, 21/84*

U.S. Cl. 148—175 **7 Claims**

1. A method of forming a carbon doped layer of Group III–V material comprising the steps of:

growing the Group III–V layer by directing a vapor flow

comprising components of said Group III–V material towards a substrate and condensing out of said vapor stream onto said substrate the Group III–V material;



controllably introducing a predetermined concentration of carbon dioxide in said vapor stream during growth of the Group III–V material to provide the carbon doped layer of Group III–V material.

4,632,711

VAPOR PHASE EPITAXIAL GROWTH METHOD OF ZINC SELENIDE AND ZINC SELENIDE-SULPHIDE BY ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION

Shigeo Fujita, Kyoto; Yoshinobu Matsuda, Ashiya, and Akio Sasaki, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 1, 1985, Ser. No. 707,143
Claims priority, application Japan, Apr. 9, 1984, 59-71610
Int. Cl.⁴ H01L *21/365, 29/22*
U.S. Cl. 148—175 **2 Claims**

1. A method for epitaxially growing a zinc selenide single crystal or a zinc selenide-sulphide mixed single crystal by organometallic chemical vapor deposition epitaxial growth, comprising the steps of:

providing a mixture of zinc alkyl and hydrogen selenide, or a mixture of zinc alkyl, hydrogen selenide and hydrogen sulphide, as starting materials for growing a zinc selenide or a zinc selenide-sulphide single crystal, respectively;

supplying said starting materials to a reaction vessel, said reaction vessel having a substrate on which the crystal is to be grown, at a rate of 10^{-3} to 10^{-6} mole per min of the zinc alkyl and 10^{-2} to 10^{-6} mole per min of hydrogen selenide or a mixture of hydrogen selenide and hydrogen sulphide, the molar ratio of the zinc alkyl to hydrogen selenide or to the mixture of hydrogen selenide and hydrogen sulphide being within the range of 1/100 to 10/1; and

growing a zinc selenide or a zinc selenide-sulphide epitaxial crystal on the said substrate at a temperature between 180° and 320° C.

4,632,712

REDUCING DISLOCATIONS IN SEMICONDUCTORS UTILIZING REPEATED THERMAL CYCLING DURING MULTISTAGE EPITAXIAL GROWTH

John C. C. Fan, Chestnut Hill; Bor-Yeu Tsaur, Arlington; Ronald P. Gale, Bedford, and Frances M. Davis, Framingham, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 531,549, Sep. 12, 1983, abandoned. This application Dec. 4, 1984, Ser. No. 678,364
Int. Cl.⁴ H01L *21/20, 21/322, 21/324*
U.S. Cl. 148—175 **10 Claims**



1. A method of forming a semiconductor material as an epitaxial layer upon a dissimilar substrate with a reduced number of dislocations in the material, the method comprising:

(a) depositing from a vapor phase a portion of the material upon the substrate;

(b) changing the temperature of the deposited portion without substantial melting or plastic deformation of the deposited portion to induce stress therein and thereby trap dislocations;

(c) depositing another portion of the material; and

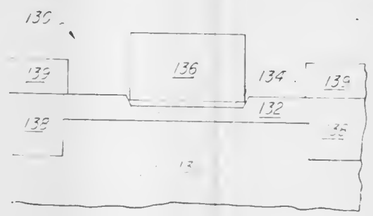
(d) repeating the steps of changing the temperature and depositing further portions of the material until a reduction in dislocations is achieved.

4,632,713

PROCESS OF MAKING SCHOTTKY BARRIER DEVICES FORMED BY DIFFUSION BEFORE CONTACTING

Shiban K. Tiku, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1985, Ser. No. 761,219
Int. Cl.⁴ H01L *21/225*
U.S. Cl. 148—188 **7 Claims**



1. A method of raising the barrier height of a metal-semiconductor contact wherein said semiconductor is doped a first conductivity type, comprising the steps of:

(a) forming a thin layer of a conductivity type opposite said first type on said semiconductor by rapid thermal diffusion of dopant from a surface of said semiconductor; and

(b) depositing said metal on said thin layer to form said contact.

4,632,714

MICROCELLULAR COMPOSITE ENERGETIC MATERIALS AND METHOD FOR MAKING SAME

M. Taylor Abegg, Salt Lake City, and John A. Peterson, Brigham City, both of Utah, assignors to Megabar Corporation, Ogden, Utah

Filed Sep. 19, 1985, Ser. No. 777,832
Int. Cl.⁴ C06B *45/00*
U.S. Cl. 149—2 **52 Claims**

1. A castable composite explosive, propellant, flare, or gas generator, comprising in combination: a substantially water-free, stable emulsion of molten inorganic oxidizer salt(s), immiscible hydrocarbon fuel(s) and surfactant(s), the fuel(s) and surfactant(s) forming the continuous phase in which the oxidizer phase in dispersed in the form of discrete cells which solidify upon cooling without material disruption of the fuel phase continuum, the surfactants being selected for their capacity to form an emulsion at process temperatures which retains substantial fuel phase continuity during solidification, the oxidizer phase being at least 75% by weight of the emulsion, the final product being solid, firm or rigid; wherein water may be present as water of hydration or because of the hygroscopic nature of the ingredients and is limited to 3% maximum by weight of the composition.

4,632,715

LOW BURN RATE MOTOR PROPELLANT

Donald D. Curtis, San Jose, Calif., assignor to The United States as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 10, 1985, Ser. No. 807,429
Int. Cl.⁴ C06B *45/10*
U.S. Cl. 149—19.5 **8 Claims**

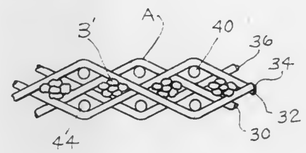
1. A low burn rate motor propellant comprised of hexanedioldimerate polymer, hydroxyl terminated polybutadiene and cyclotetramethylene tetranitramine.

4,632,716

WOVEN LOW PERMEABILITY FABRIC AND METHOD

Richard W. Smith, Greenville, S.C., assignor to Wangner Systems Corporation, Greenville, S.C.

Filed Jun. 8, 1983, Ser. No. 502,325
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—148 **4 Claims**



1. A method of constructing a woven fabric for a dryer section of a papermaking machine to provide a fabric having a desired low fabric permeability comprising:

weaving a plurality of warp elements with a first plurality of weft elements to define a first fabric layer;

weaving a second plurality of weft elements with said warp elements to define a second fabric layer;

weaving a third plurality of weft elements with said warp elements to define an intermediate fabric layer between said first and second fabric layers;

selecting each said weft element of said third plurality of weft elements in said intermediate layer to be a cabled multi-filament element comprising a number of individual low-melt polymeric monofilament strands twisted together in spiraled undulations providing a soft texture for closer beating-up of said third plurality of weft elements in said intermediate layer of fabric during weaving; and

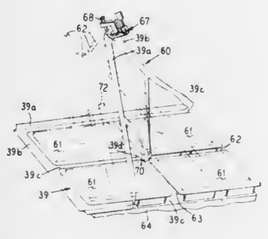
heating said fabric and twisted low-melt monofilament strands of said cabled multi-filament elements woven therein causing said twisted low-melt monofilament strands of said cabled multi-filament elements to expand and more completely fill and occupy said shed spaced of said intermediate fabric layer to reduce the permeability of the fabric and provide a low permeability fabric characteristic.

4,632,717

METHOD OF MAKING BOOK STYLE ALBUMS

Herbert Graetz, Chicago, Ill., and Ronald C. Unterreiner, Cape Girardeau, Mo., assignors to Blair Industries, Inc., Scott City, Mo.

Continuation-in-part of Ser. No. 601,949, Apr. 19, 1984, Pat. No. 4,555,290. This application Aug. 29, 1985, Ser. No. 770,795
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.⁴ B29C *3/04*
U.S. Cl. 156—245 **17 Claims**



1. The method of making book style albums which comprises forming an elongated run of stiff thermoplastic sheet material, thermoforming said run into multiple album blanks having peripheral margins and transverse and longitudinal intersecting margins between the albums, successively advancing the blanks through in-line stations which apply individual covers, continuous covers, printed inserts, and transparent cover films to the blanks, by-passing selected stations to provide desired types of album cover arrangements, welding the blanks and the covers together, severing the margin material of the blanks from the albums, stripping the severed margin material from the albums, conveying the individual albums to an inspection and closing station, and discharging the finished albums.

4,632,718

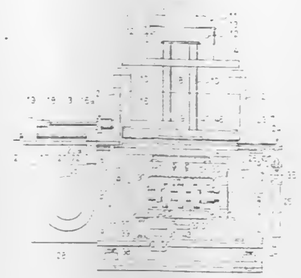
FRAME SEPARATOR WITH POSITIONING PIN

Katsuo Shimizu, Urawa, Japan, assignor to Seiei Kohsan Co., Ltd., Urawa, Japan

Continuation-in-part of Ser. No. 621,790, Jun. 18, 1984, abandoned. This application Feb. 11, 1986, Ser. No. 828,597
Int. Cl.⁴ B32B *31/16*
U.S. Cl. 156—352 **4 Claims**

1. A frame separator, composed of a work stocker which holds laminated work of strips; a work-pressing mechanism which continuously presses the work within the work stocker; a separating mechanism which strips away the laminated work piece by piece from the lowest part thereof; and a pusher mechanism which pushes outside the stripped work from the work stocker; and wherein the separating mechanism is installed with a detector which finds out double sheets of the

strips and stops operation of the pusher; and the separator is installed at its work exit end with a positioning pin of go-



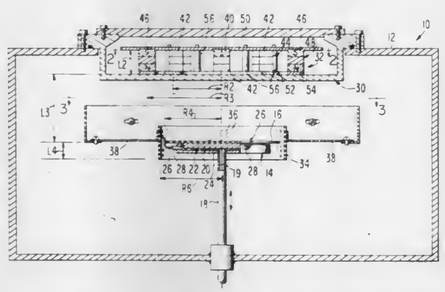
in-and-out of a taper shape which positions end points of the work pushed out by the pusher.

4,632,719

SEMICONDUCTOR ETCHING APPARATUS WITH MAGNETIC ARRAY AND VERTICAL SHIELD

Robert Chow, Fremont, and Steven D. Downey, Burlingame, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 18, 1985, Ser. No. 777,382
Int. Cl.⁴ B44C *1/22;* **C03C** *15/00;* **H01L** *21/306;* **C23F** *1/02*
U.S. Cl. 156—345 **7 Claims**



1. An apparatus for etching a face of a semiconductor wafer in an RF field comprising:

a chamber capable of being substantially evacuated of atmospheric gases;

means for introducing Argon gas into said chamber;

a means for connecting said means for holding to a source of RF power;

an electrical shield surrounding the wafer in said chamber, said shield being in close proximity to edge of the wafer and extending above and below the wafer;

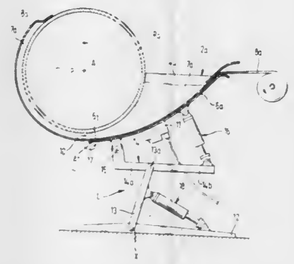
means for inducing a magnetic field in close proximity to the face of the wafer being etched, said means for inducing a magnetic field including means for forming at least two concentric coplanar rings of plasma between the surface of the wafer being etched and an opposing wall of said chamber.

4,632,720

APPARATUS FOR PREPARING AN ANNULAR BODY OF A HYDRAULICALLY SETTING MASS

Adolf Meyer, Leimen-Lingental; Manfred Pfeifer, Wiesloch-Baiertal, and Uwe Kraeft, Wiesloch, all of Fed. Rep. of Germany, assignors to Heidelberger Zement AG, Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 463,571, Feb. 3, 1983, Pat. No. 4,472,335, which is a continuation-in-part of Ser. No. 212,579, Dec. 3, 1980, abandoned. This application May 16, 1984, Ser. No. 610,782
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948638
Int. Cl.⁴ B31C *1/00*
U.S. Cl. 156—429 **3 Claims**



1. An apparatus for coating a circumferential wall of an iron or steel pipe with a wet, hydraulically setting mass, said hydraulically setting mass, containing uniformly distributed fibers to form a felt-like structure during rotation of the pipe about a longitudinal axis thereof, said apparatus comprising

(a) a storage roll of a carrier band, said carrier band having a free end affixed to the pipe wall whereby the carrier band is tensioned and wound around the pipe wall during rotation of the pipe,

(b) a guide sheet member supporting the carrier band between the storage roll and an adjacent portion of the pipe wall laterally thereof, the wall portion and the supported carrier band constituting two opposite walls of a funnel-shaped storage and delivery container for the wet mass, and

(1) a lower edge of the guide sheet member and the pipe wall portion defining a discharge slot for the wet mass between the two opposite walls of the funnel-shaped container,

(c) means for mounting the wall of the funnel-shaped container constituted by the supported carrier band yieldingly movable in relation to the opposite container wall constituted by the pipe wall portion, and

(d) an adjusting roll engaging the pipe wall portion at the lower edge of the guide sheet member to hold the size of the discharge slot at a constant width during the coating.

4,632,721

APPARATUS FOR APPLYING LABELS TO CONTAINERS

Wolfgang W. Hoffmann, Modesto, and Svatoboj Otruba, Ceres, both of Calif., assignors to Kris-Tech Corporation, Modesto, Calif.

Filed Oct. 7, 1985, Ser. No. 785,074
Int. Cl.⁴ B65C *9/02, 9/18*
U.S. Cl. 156—458 **8 Claims**

1. Container labeling apparatus comprising:

a rotatably mounted label transport drum;

a first pad carried on said drum operative to grip the leading edge of a container label;

a second pad carried on said drum operative to grip the trailing edge of a container label;

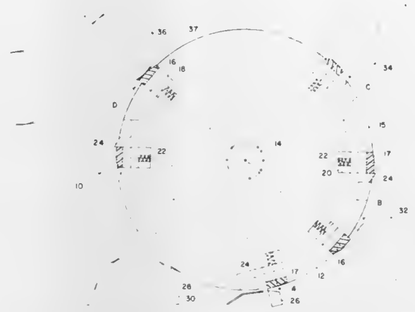
means for continuously feeding a web of label material onto said drum with its leading edge held by said first pad;

a main label-cutting knife mounted on said drum to rotate therewith;

a complementary label cutting member mounted adjacent said drum;

said main knife extending radially from said drum immediately following said second gripping pad to sever a label as it moves past said complementary cutting member;

at least one glue applicator for applying adhesive to a label pressed against it;



means for positioning each of said label-gripping pads radially outward beyond said main label-cutting knife to press against a glue applicator, during the movement thereof past said glue applicator;

container conveyor means for moving containers; and

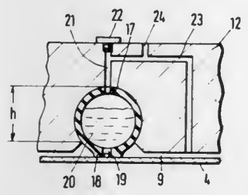
means for transferring a label from said drum to a container on said conveyor.

4,632,722

ARRANGEMENT FOR APPLYING A SURFACE PRESSURE UPON MOVABLE WORKPIECES

Werner Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Theodor Hymmen, Bielefeld, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 747,933
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424599
Int. Cl.⁴ B30B *5/06, 15/34*
U.S. Cl. 156—555 **18 Claims**



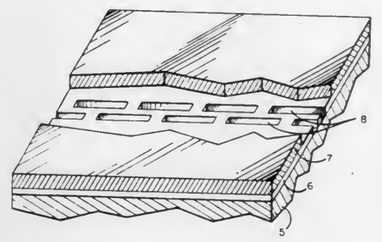
1. An arrangement for applying a surface pressure to movable workpieces, comprising at least one rotatable pressing band having a working run arranged to act on a workpiece; means forming a pressure chamber which accommodates a pressure gas applying a pressure to said pressing band, said means including a part of said working run of said pressing band, a pressing plate spaced from said working run in a direction opposite to the workpiece and having an edge, and a sealing member provided on said edge of said pressing plate and having a surface which abuts against said pressing band; means for supplying a liquid lubricant to said pressing band, said liquid lubricant supplying means including at least one liquid lubricant guiding part provided in said sealing member, and at least one liquid lubricant discharging opening provided in said surface of said sealing member.

4,632,723

ORIENTATION FILTERING FOR CRYSTALLINE FILMS

Henry I. Smith, Sudbury; Harry A. Atwater, Somerville; Carl V. Thompson, Watertown, and Michael W. Geis, Acton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 31, 1983, Ser. No. 481,096
Int. Cl.⁴ C30B *13/06*
U.S. Cl. 156—617 R **5 Claims**



1. A method of forming a crystalline film with a modified distribution of crystallographic orientations upon a substrate, the method comprising:

(a) depositing a film to be processed upon the surface of a substrate;

(b) etching a pattern of crystallization barriers in the film; and

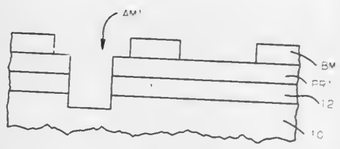
(c) heating the film to induce recrystallization, whereby the pattern of barriers will prevent the growth of non-conforming orientations.

4,632,724

VISIBILITY ENHANCEMENT OF FIRST ORDER ALIGNMENT MARKS

Donald G. Chesebro, Colchester, and Robert W. Sweetser, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1985, Ser. No. 767,316
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **B29C** *17/08*
U.S. Cl. 156—626 **10 Claims**



1. A method for providing first order alignment between sequential critical masking steps used to process layers formed on a semiconductor substrate, comprising the steps of:

forming alignment marks on respective ones of said layers upon which respective ones of said critical masking steps are carried out, said alignment marks being formed as said layers are etched through critical masks used in said respective critical masking steps; and

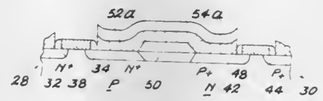
selectively enhancing selected ones of said alignment marks by etching said alignment marks through a block mask for a predetermined period of time.

4,632,725

METHOD FOR INTERCONNECTING THE ACTIVE ZONES AND/OR THE GATES OF A C/MOS INTEGRATED CIRCUIT

Joël Hartmann, Claix, and Pierre Jeuch, Seyssins, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Mar. 15, 1985, Ser. No. 712,218
Claims priority, application France, Mar. 19, 1984, 84 04204
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 16 Claims



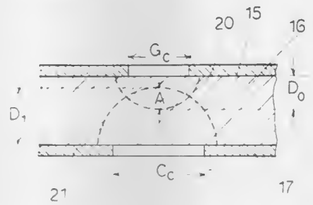
1. A method for interconnecting the active zones and for interconnecting gates and active zones formed in a substrate of a C/MOS integrated circuit comprising the following successive stages, after forming the constituent elements of said integrated circuit with the exception of the first connection level:
depositing directly onto the complete circuit a coating of a first conductive material,
depositing on said coating of said first conductive material a coating of a second material which is different from said first conductive material,
forming a mask on the second material coating representing the image of the first connection level to be formed.
eliminating that part of said second material coating which is free from said mask,
eliminating that part of said first conductive material coating which is free from the remainder of said second material coating, and
eliminating said mask.

4,632,726

MULTI-GRADED APERTURE MASK METHOD

Roland Thoms, Mullheim, Fed. Rep. of Germany, assignor to BMC Industries, Inc., St. Paul, Minn.

Filed Jul. 13, 1984, Ser. No. 630,776
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—644 9 Claims



1. The process of forming a plurality of openings in an aperture mask having a center and a periphery area comprising:
applying a layer of etchant resist to opposite surfaces of an aperture mask material;
determining an over-etch factor for the aperture mask;
laying out a pattern of openings in the etchant resist on one side of the aperture mask;
laying out a pattern of openings in the etchant resist on the opposite side of the aperture mask wherein the size of the openings on one side of the mask in the etchant resist increase while the size of the openings in the etchant resist on the opposite side decrease;
etching the aperture mask material through the openings in the etchant resist.

4,632,727

COPPER ETCHING PROCESS AND SOLUTION

Norvell J. Nelson, Palo Alto, Calif., assignor to Psi Star, Hayward, Calif.

Filed Aug. 12, 1985, Ser. No. 764,582
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—656 10 Claims

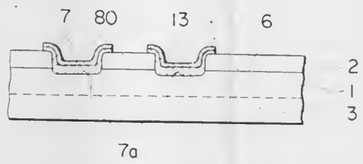
1. In a process for etching copper: contacting the copper with an aqueous solution of nitric acid, a polymer, a surfactant, and a sulfonic acid of an alkane having no more than four carbon atoms per molecule.

4,632,728

METHOD OF MANUFACTURING A GLASS PASSIVATION TYPE SEMICONDUCTOR DEVICE

Minoru Kawakami, Fukuoka City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,645
Claims priority, application Japan, Nov. 16, 1984, 59-242765
Int. Cl.[4] H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—659.1 1 Claim



1. In a method of manufacturing a glass passivation type semiconductor device wherein a silicon semiconductor substrate of a first conductivity type is formed with a p-n junction by diffusing an impurity of a second conductivity type thereinto, recesses which reach the p-n junction are provided to expose the p-n junction in the recesses, and the exposed parts of the p-n junction are covered with a low-melting glass; a method of manufacturing a glass passivation type semiconductor device characterized in that, using a printing mask, a glass is deposited on a whole surface of a wafer except for an outer periphery of the wafer or predetermined parts thereof necessary for alignment at a subsequent step, with the glass films at the bottoms of said recesses and the p-n junction parts being rendered at least 10 μm thick, and that unnecessary portions of said glass films are thereafter removed by etching, using a photoresist as a mask.

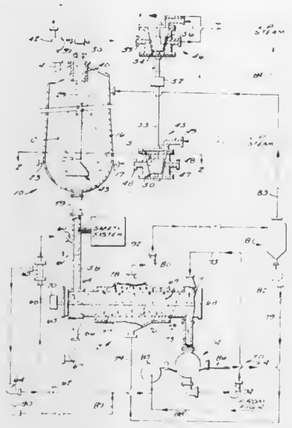
4,632,729

CHIP PRESTEAMING AND AIR WASHING

Oliver A. Laakso, Haralyn (West), #2 Middle Road, Smiths Parish, Bermuda (3-18)

Filed May 1, 1984, Ser. No. 605,915
Int. Cl.[4] D21C 3/26
U.S. Cl. 162—17 11 Claims

1. A method of treating comminuted fibrous cellulosic material prior to digestion thereof, utilizing a vertical presteaming vessel having a plurality of nozzles uniformly radially spaced around the circumference thereof, and a central tube having a plurality of uniformly radially spaced fluid introduction pipes, comprising the steps of continuously and sequentially:
(a) heating the material by subjecting it to low pressure steam in a first stage by: selectively introducing low pressure steam in a sequential manner to the nozzles and pipes so that the direction of flow of steam introduced by a nozzle at any given point in time is generally in the same linear direction as steam introduced by a pipe at that same moment in time, and wherein the nozzles and pipes through which steam introduction occurs are continuously changed in a circumferentially sequential manner;
(b) passing the material through conduit means to a second stage remote from said first stage and removing air from the heated material in a manner distinct from said heating, and without introducing additional heat, in said second stage; and



(c) passing the heated, deaerated material to a digesting stage.

4,632,730

METHOD FOR INCREASING THE ABSORPTION RATE OF PAPER

Hasan Ulubay, Kreuzau, and Horst Schürmann, Duren, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Apr. 29, 1985, Ser. No. 727,737
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 3416043
Int. Cl.[4] D21H 3/08, 5/24
U.S. Cl. 162—111 17 Claims

1. A method for increasing the absorption rate of aqueous media of paper, comprising adding carboxylic acid esters of carboxylic acids with 8 to 30 carbon atoms and at least one member selected from the group consisting of ethoxylated and/or propoxylated primary and/or secondary alcohols with 12 to 40 carbon atoms, ethoxylated and/or propoxylated alkyl phenols, ethoxylated and/or propoxylated amines, and ethoxylated and/or propoxylated amides, with a degree of ethoxylation or propoxylation of 5 to 50, during the manufacture of said paper.

2. A method for increasing the absorption rate of aqueous media of paper, comprising adding polyethers, obtained from the reaction of long chain epoxides with 8 to 30 carbon atoms with at least one member selected from the group consisting of ethoxylated and/or propoxylated primary and/or secondary alcohols with 12 to 40 carbon atoms, ethoxylated and/or propoxylated alkyl phenols, ethoxylated and/or propoxylated amines, and ethoxylated and/or propoxylated amides, with a degree of ethoxylation or propoxylation of 3 to 50, during the manufacture of said paper.

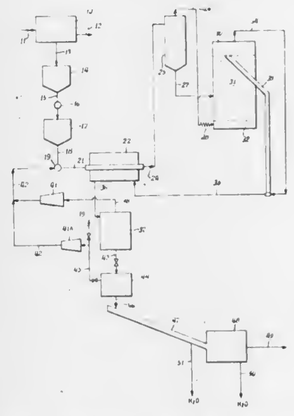
4,632,731

CARBONIZATION AND DEWATERING PROCESS

William W. Bodle, Deerfield; Francis S. Lau, Downers Grove, and Michael C. Mensinger, Darien, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 26, 1985, Ser. No. 748,978
Int. Cl.[4] C10F 5/04, 5/06
U.S. Cl. 201—4 18 Claims

1. A process for beneficiating, dewatering and carbonizing high moisture content carbonaceous solids comprising the steps of:
introducing said carbonaceous solids having a moisture content of about 75 weight percent and less through a pressure feeding means to a pressurized pneumatic transport stream;
passing said carbonaceous solids in said pneumatic transport stream to a first solids/gas separation means;
separating said carbonaceous solids from the gas comprising said pneumatic transport stream and passing said separated carbonaceous solids to a fluidized bed carbonization zone within a fluidized bed contactor and passing separated gas comprising said pneumatic transport stream to said fluidized bed to provide fluidizing gas;
carbonizing said carbonaceous solids in said fluidized bed at elevated temperatures producing carbonized solids;



withdrawing said carbonized solids and said fluidizing gas from said fluidized bed contactor;
conveying said carbonized solids in said pneumatic transport stream comprising said fluidizing gas to a second solids/gas separation means, separating said carbonized solids from said conveyed pneumatic transport stream comprising said fluidizing gas and recycling separated gas from said second solids/gas separation means to said pneumatic transport stream upstream of said first solids/gas separation means; and
passing said carbonized solids separated in said second solids/gas separation means to a mechanical dewatering means and mechanically dewatering said carbonized solids in said mechanical dewatering means so as to produce beneficiated, dewatered, carbonized solids product.

4,632,732

ION-SELECTIVE MEASURING ELECTRODE DEVICE AND METHOD FOR MEASURING HYDROGEN ION

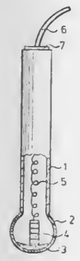
Agner Fog, Copenhagen, and Sven H. K. Atlung, Holte, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

PCT No. PCT/DK83/00035, § 371 Date Nov. 15, 1983, § 102(e) Date Nov. 15, 1983, PCT Pub. No. WO83/03304, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 15, 1983, Ser. No. 557,161
Claims priority, application Denmark, Mar. 15, 1982, 1132/82
Int. Cl.[4] G01N 27/36, 27/46
U.S. Cl. 204—1 T 17 Claims

1. An ion selective measuring electrode device comprising an ion selective element having metal ions which during operation of the electrode device are exchanged with other ions of a species to which the ion selective element shows selectivity, the metal ions being of a species different from said other ion species, said ion selective element comprising a glass mem-

brane, an electrical connection, and a solid material for providing electrical contact between the ion selective element and the electrical connection, the solid material comprising a solid crystalline material for incorporating or giving off ions of said metal ion species as an intercalation electrode.

17. A method for measuring the hydrogen ion concentration in an electrolyte comprising using a solid material as an intercalation electrode, at least a portion of said solid material comprising a solid crystalline material which incorporates or liberates ions of a metal ion species and is electronically conductive, said solid material incorporated in an ion selective measuring electrode device, wherein said ion selective measuring electrode device has an ion selective element which contains ions of said metal ion species and shows selectivity towards hydrogen ions, said ion selective measuring electrode device further comprising an electrical connection,



and wherein said solid crystalline material incorporated in said ion selective measuring electrode device acts as a contact material between said ion selective element and said electrical connection so that as the hydrogen ions are incorporated into said ion selective element, said metal ions are displaced and transferred into said solid crystalline material and electrons necessary for neutralizing the electrical charge in said solid material attributable to the transferred metal ions flow into said solid material from said electrical connection, and when the hydrogen ions are liberated from said ion selective element, the metal ions are transferred from said solid crystalline material to said ion selective element and the resulting excess electrons in said crystalline material flow back into said electrical connection;

and determining the potential difference between said measuring electrode and a reference electrode.

4,632,733

METHOD FOR MANUFACTURING ONE-SIDE ELECTROGALVANIZED STEEL STRIP

Terumasa Jinba; Shiro Fukunaka; Tatsuro Anan, and Nobuo Shiotani, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,615
Int. Cl.⁴ C25D *7/06*
U.S. Cl. 204—28 **2 Claims**



1. A method for manufacturing a one-side electrogalvanized steel strip, which comprises:

continuously causing a steel strip to travel through an electrogalvanizing bath in an electrogalvanizing tank; arranging at least one electrode plate in said electrogalvanizing bath in said electrogalvanizing tank in parallel to a one-side surface to be electrogalvanized of said travelling steel strip; causing an electric current to flow between said at least one electrode plate and said travelling steel strip through said electrogalvanizing bath to electrogalvanize said one-side surface of said travelling steel strip; arranging at least one spray nozzle toward the other surface not electrogalvanized of said travelling steel strip which has passed through said galvanizing tank over the entire width of said steel strip; ejecting liquid from said at least one spray nozzle onto said other surface not electrogalvanized of said travelling steel strip to wet said other surface of said travelling steel strip; arranging at least one brush roll in close proximity to said at least one spray nozzle on the same side as said at least one spray nozzle relative to said travelling steel strip, said at least one brush roll having a rotation axis parallel to the width direction of said travelling steel strip and extending over the entire width of said steel strip, said at least one brush roll being in contact with said other surface not electrogalvanized of said travelling steel strip; and rotating said at least one brush roll to eliminate contamination caused by the deposition of an electrogalvanizing solution on said other surface not electrogalvanized of said travelling steel strip;

characterized in that:

said liquid ejected from said at least one spray nozzle is any one of an aqueous solution containing a weak acid within the range of from 0.1 to 5.0 wt. % and a saturated monovalent alcohol solution having a number of carbon atoms of up to 5.

4,632,734

PROCESS FOR ELECTROCHEMICALLY OR CHEMICALLY COATING NIOBIUM

Holger Mix, Hamburg, Fed. Rep. of Germany, assignor to Deutsche Lufthansa AG, Cologne, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,177
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410243
Int. Cl.⁴ C25D *5/38*
U.S. Cl. 204—32.1 **6 Claims**

1. A process for electrochemically or chemically metal coating niobium, comprising

(a) blast treatment of a niobium work piece with aluminium oxide,

(b) treating the blast prepared work piece of step (a) with an alkaline cyanide bath,

(c) subjecting the treated work piece of step (b) to a preliminary electrolytic nickel deposition treatment using an acidic nickel chloride bath,

(d) subjecting the treated work piece of step (c) to another treatment with an alkaline cyanide bath, and thereafter

(e) undertaking an electrochemical or chemical coating treatment with a metal.

4,632,735

PROCESS FOR THE ELECTROLYTIC COLORING OF ALUMINUM OR ALUMINUM ALLOYS

José L. Gazapo Santa-Olalla, and Juan Gonzalez Feliu, both of Alicante, Spain, assignors to Empresa Nacional del Aluminio, S.A., Madrid, Spain

Continuation-in-part of Ser. No. 149,310, May 13, 1980, abandoned. This application Jan. 31, 1985, Ser. No. 697,111
Claims priority, application Spain, Jul. 4, 1979, 482.210
Int. Cl.⁴ C25D *11/22*
U.S. Cl. 204—37.6 **4 Claims**

1. A process for the electrolytic colouring of an aluminum or aluminum alloy substrate, which process comprises the following steps:

(a) subjecting the substrate to an anodic oxidizing process in a sulphuric acid solution to produce an anodic layer having a thickness of from 3 to 30 microns;

(b) subjecting the anodized substrate to an alternating current, in a metal salt solution having a pH of greater than 0.8, applying different anodic and cathodic peak voltages to modify the anodic layer, with the proviso that the substrate is not coloured during this step, a voltage being applied which has an effective value of from 7 to 35 volts, the cathodic peak voltage being from 2 to 15 volts and always being less than the anodic peak voltage, this step being conducted for a period of time from 15 seconds to 30 minutes; and

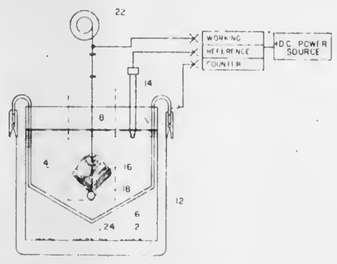
(c) subjecting the substrate modified in accordance with step (b) to an alternating current, in a metal salt solution having a pH of greater than 0.8, at an applied voltage of from 7 to 25 volts for a period of time from 2 to 30 minutes, to colour the substrate.

4,632,736

ELECTROLYTIC PREPARATION OF TIN

Richard M. Westfall, 4838 Stuart St., Denver, Colo. 80212

Continuation of Ser. No. 391,982, Jun. 25, 1982, abandoned. This application May 21, 1985, Ser. No. 736,465
Int. Cl.⁴ C25C *1/00*
U.S. Cl. 204—59 M **13 Claims**



1. A process for electrolytically producing single crystal tin comprising the steps of:

forming a bath containing cations of tin and anions selected from the group consisting of sulfate anions, fluoride anions, chloride anions, bromide anions, hydrogen ions, and stable cations having a reduction potential below that of the tin cations;

immersing a cathode and an anode into said bath, said cathode being shaped in a manner to be capable of providing for nucleation of tin cations on said cathode along at least one crystalline twinning plane;

passing an electrical current between said anode and said cathode at an applied cathodic potential above the critical overpotential for the composition of said bath; and

reducing said tin cations at said cathode by the application of said electrical current to thereby form a single crystal tin deposit at the cathode.

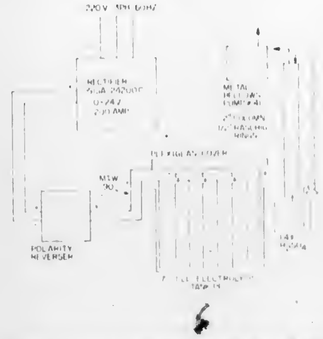
4,632,737

ELECTROLYTIC REDUCTION OF NITRATE FROM SOLUTIONS OF ALKALI METAL HYDROXIDES CONTAMINATED BY OXIDIZING TRANSITION METAL IONS

Albert B. Mindler, Princeton, N.J., assignor to International Hydronics Corporation, Rocky Hill, N.J.

Filed Feb. 28, 1986, Ser. No. 834,538
Int. Cl.⁴ C25B *1/14*
U.S. Cl. 204—98 **15 Claims**

1. A method of converting an aqueous solution of alkali metal nitrate or nitrite salt contaminated with a transition metal ion capable of oxidizing nitrite to nitrate, to the corresponding alkali metal hydroxide in an alkali metal hydroxide solution, in an electrolytic cell in which direct current is imposed between anodes and cathodes in said cell, thereby producing oxygen gases at said anodes and alkali metal hydroxide at said cathodes, which further comprises adding to said solution at least



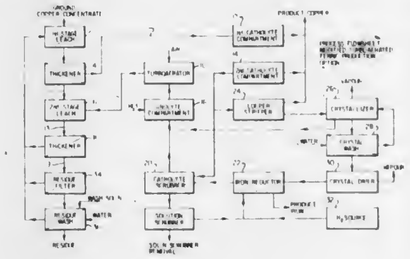
one equivalent of bismuth ion relative to the equivalents transition metal ion present.

4,632,738

HYDROMETALLURGICAL COPPER PROCESS

Morris J. V. Beattie; William G. Bacon, and Rein Raudsepp, all of Vancouver, Canada, assignors to Great Central Mines Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 414,726, Sep. 3, 1982, abandoned. This application May 2, 1984, Ser. No. 606,322
Int. Cl.⁴ C25C *1/12*; C22B *15/08, 15/00*
U.S. Cl. 204—107 **21 Claims**



1. In a novel hydrometallurgical process for the recovery of copper from sulphide copper concentrate containing copper and iron involving the use of electrowinning cells having anolyte and catholyte chambers, the improvement comprising increasing the efficiency of the electrowinning cells by using a solution-impermeable cation exchange membrane to separate the anolyte and the catholyte chambers in the electrowinning cells and operating the anolyte chambers of the cells at hydrogen chloride levels above about 1 Mole H^+ to thereby maintain the copper and iron in solution as copper chloride and iron chloride complexes so that they do not pass through the membrane.

4,632,739

ELECTROLYTIC CELL HEAD WITH REPLACEABLE INSERT AND METHOD OF PROTECTING THE SAME

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

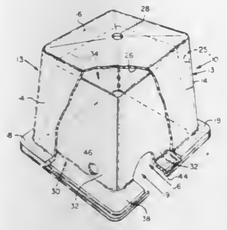
Filed Jul. 19, 1985, Ser. No. 756,741
Int. Cl.⁴ C25B *1/26, 9/00*
U.S. Cl. 204—128 **17 Claims**

16. A method of inhibiting corrosion of the inner side wall surfaces of an electrolytic cell head housing during the electrolytic process comprising:

directing bubbles of gaseous reaction products rising

through the liquid electrolyte into the cell head housing inwardly of said inner side wall surfaces whereby said bubbles cannot contact and scour said side wall surfaces before rising to the liquid surface;

said directing of said bubbles comprising inserting a generally tubular shield into the cell head housing inwardly of said side wall surfaces and sealing the lower ends of said



housing and shield from the passage of fluid therebetween, whereby the rising bubbles are forced inwardly of and out of contact with said inner side wall surfaces, thereby subjecting the shield to corrosion rather than the side walls and rendering the useful life of the housing substantially longer than the useful life of the shield; and

periodically replacing the tubular shield without replacing the housing so as to prolong the useful life of the housing.

4,632,740

APPARATUS AND METHOD FOR DECONTAMINATING METALLIC COMPONENTS OF A NUCLEAR ENGINEERING INSTALLATION

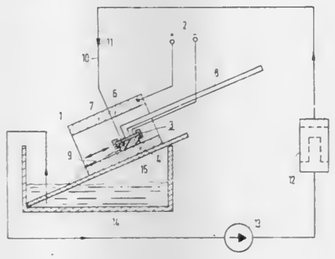
Hermann Operschall, Lauf, and Hubert Stamm, Nuremberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,717

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343396

Int. Cl.⁴ C25F *3/16, 7/00*

U.S. Cl. 204—129.46 **15 Claims**



1. Apparatus for performing a method of decontaminating metallic components of a nuclear engineering installation by electropolishing with electrodes and an electrolyte liquid travelling in a circulatory loop during the decontamination, comprising a filter having a pore width of at most 1.5 μm, the electrolyte liquid being an aqueous solution of phosphoric acid and having an electrolyte concentration of from 8 to 15 percent by weight.

4,632,741

SYNTHESIS OF ALKYL PHOSPHINATE SALTS AND BIS(ALKYL) PHOSPHINATE SALTS

Stephen F. Wolf, St. Paul, and Chung-Tsing Liu, Bloomington, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 647,918, Sep. 6, 1984, Pat. No. 4,590,014. This application Mar. 10, 1986, Ser. No. 838,097

Int. Cl.⁴ B01J *19/12*

U.S. Cl. 204—157.73 **9 Claims**

1. A method for the preparation of a mono(alkyl) phosphinate salt or a bis(alkyl) phosphinate salt by the reaction of an olefinic material with an alkali metal hypophosphite in the presence of a photoinitiator comprising:

(a) simultaneously adding the olefinic material and essentially all of the photoinitiator to an about 40°–80° C. aqueous alcoholic solution of the hypophosphite while irradiating the hypophosphite solution with ultraviolet light, to form a reaction medium; and

(b) irradiating the reaction medium with ultraviolet light while maintaining the reaction medium at about 40°–80° C. for a period of time effective to afford an about 80–100% yield of the phosphinate salt.

4,632,742

PROCESS FOR THE DECOMPOSITION AND DECONTAMINATION OF ORGANIC SUBSTANCES AND HALOGENATED TOXIC MATERIALS

Pietro Tundo, Turin, Italy, assignor to Sea Marconi Technologies S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 517,781, Jul. 27, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 711,404

Claims priority, application Italy, Mar. 10, 1983, 19992 A/83

Int. Cl.⁴ B01J *19/08, 19/10, 19/12*

U.S. Cl. 204—158.21 **14 Claims**

1. A method for the decomposition of an halogenated organic compound which comprises reacting said compound with a reagent which consists of: component (a) at least one member selected from the group consisting of polyethyleneglycols, Nixolens ®, alcohols, polyhydroxy compounds, said polyethyleneglycols and alcohols having the formula

$$R\left[\begin{array}{c} R_1 \\ | \\ O(C)_x \\ | \\ R_2 \end{array}\right]_n OH$$

wherein:

X is 2;

n is zero or an integer from 2 to 400;

R is a linear or branched C_1–C_4 alkyl when n=0; or is hydrogen, linear or branched C_1–C_{20} alkyl, aryl, aralkyl or acyl when n—2–400; R_1 and R_2, which are the same or different, are hydrogen, linear or branched C_1–C_4 alkyl, C_5–C_8 cycloalkyl unsubstituted or substituted, unsubstituted or substituted aryl;

Nixolens ® being liquid compounds obtained from the condensation between propylene oxide and ethylene oxide, said polyhydroxy compound having the general formula

$$\left[\begin{array}{c} CH-CH_2 \\ | \\ OR_3 \end{array}\right]_n$$

wherein n is a number between 100 and 10,000 R_3 is hydrogen linear or branched C_1–C_6 alkyl; component (b) a weak base, or, when Nixolen ® are used, alkali or alkaline earth metal alkoxides; component (c) an oxidizing agent or a source of free radicals.

4,632,743

METHOD FOR EXAMINING CELLS BY ELECTROPHORESIS

Chikao Yoshikumi, Kunitachi; Kenichi Matsunaga, Tokyo; Haruhisa Hayashi, Tokyo, and Yoshiharu Oguchi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 389,549, Jun. 17, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 568,951

Claims priority, application Japan, Jul. 9, 1981, 56-107399

Int. Cl.⁴ G01N *27/26*

U.S. Cl. 204—183.3 **10 Claims**

1. A diagnostic method for determining an electrophoretic property of lymphocytes comprising

measuring in an automatic electrophoretic apparatus a predetermined electrophoretic property of untreated lymphocytes taken from the peripheral blood or lymph tissues of humans or animals being diagnosed to obtain a pattern, said peripheral blood or lymph tissues being suspended in a physiological solution having an ionic strength of 0.11 to 0.21 at a concentration of 0.5×10^6 to 20×10^6 lymphocytes per ml of said physiological solution, and

comparing the thus-obtained pattern of the electrephoretic property with a pattern of the same electrophoretic property of corresponding normal lymphocytes.

4,632,744

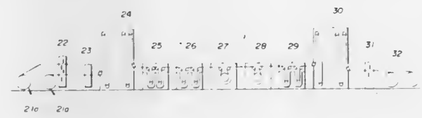
DEVICE FOR METAL STRIP ELECTROLYTIC PROCESSING

Shinjiro Murakami; Hiroshi Horyoda; Tetsuya Kohama, all of Kurashiki; Tamotsu Mizuta, Chiba; Shinjiro Ishikawa, Kurashiki; Shuji Iwamoto, Kurashiki, and Asaharu Kibata, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Feb. 27, 1986, Ser. No. 833,966

Int. Cl.⁴ C25D *7/06*

U.S. Cl. 204—206 **22 Claims**



1. A device for electrolytic processing or treatment comprising:

an electrolytic tank defining a path through which a metal strip passes, and an electrolytic bath containing an electolytic solution, said tank being made up of first and second separable sections;

an electric current supply means diposed in said metal strip path for supplying electric current during electrolytic processing;

guide means for retaining said metal strip within said path in said tank and driving said metal strip to move through said electrolytic bath; and

means, associated with said first and second sections, for assembling and separating same.

4,632,745

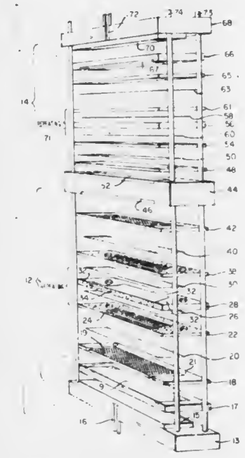
ELECTRODEIONIZATION APPARATUS

Anthony J. Giuffrida, N. Andover; Anil D. Jha, and Gary C. Ganzi, both of Lexington, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 628,930, Jul. 9, 1984, abandoned. This application Aug. 2, 1985, Ser. No. 762,804

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—301 **10 Claims**



1. Electrodeionization apparatus adapted to remove ions from a liquid which comprises:

a cathode compartment at a first end of said apparatus,

an anode compartment at an end of said apparatus opposite said first end,

a plurality of alternating ion depletion compartments and ion concentration compartments positioned between said cathode compartment and said anode compartment,

each of said ion depletion compartments comprising a spacer and a plurality of subcompartments formed by a plurality of ribs extending along the length of each of said ion depletion compartments each of said subcompartments containing an ion exchange solid composition, each of said subcompartments having a width defined by the distance between said ribs of between about 0.3 and 4 inches and a thickness between about 0.05 and 0.25 inches and wherein the thickness of said subcompartments is defined by the distance between an anion permeable membrane and a cation permeable membrane,

said anion permeable membrane and said cation permeable membrane being bonded to each of said ribs, along the length of said ribs, and to said spacer,

each of said concentration compartments being free of ion exchange solid composition,

means for passing a first liquid to be purified through said ion depletion compartments,

means for passing a second liquid for accepting ions from said first liquid, through said concentration compartments,

means for applying an electrical voltage between an anode in said anode compartment and a cathode in said cathode compartment and,

means for recovering purified liquid from said depletion compartment.

4,632,746

ELECTROCHEMICAL CELL WITH THIN WIRE ELECTRODE

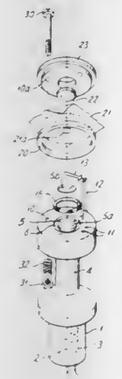
Imanuel Bergman, Sheffield, England, assignor to National Research Development Corp., London, England

Filed Dec. 3, 1985, Ser. No. 804,139

Claims priority, application United Kingdom, Dec. 6, 1984, 8430803

Int. Cl.⁴ G01N *27/30, 27/50*

U.S. Cl. 204—415 **6 Claims**



1. An electrochemical cell comprising: a container,
a wall member at least in part permeable to a desired species, the wall member closing the container,
an electrolyte, and an electrode immersed in the electrolyte, characterised in that
the electrode is of, or is fed by, wire thinner than 0.2 mm diameter,
the length of the wire in contact with the electrolyte is limited by a resilient sealing ring compressed between the container and the wall member, wherein the ring, the container and wall member define a volume containing the electrolyte and into which the wire protrudes, and
said wire is in the form of a loop having two ends, both of which are disposed outside said volume.

4,632,747

HYDROTREATING PROCESS EMPLOYING CATALYSTS COMPRISING A SUPPORTED, MIXED METAL SULFIDE IRON PROMOTED MO AND W

Teh C. Ho, Bridgewater; Archie R. Young, II, Montclair; Allan J. Jacobson, Princeton, and Russell R. Chianelli, Somerville, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 28, 1984, Ser. No. 687,538

Int. Cl.⁴ C10G *71/00, 45/04*

U.S. Cl. 208—18 **28 Claims**

8. A process for hydrotreating a hydrocarbon feed which comprises contacting said feed at a temperature of at least about 150° C. and in the presence of hydrogen with a catalyst obtained by compositing a quantity of inorganic refractory oxide support material with one or more precursor salts and heating said composite at elevated temperature of at least about 150° C., in the presence of sulfur or sulfur bearing compounds and under oxygen-free conditions for a time sufficient to form said catalyst, wherein said precursor salt contains a tetrathiometallate anion of Mo, W or mixture thereof and a cation comprising at least one promoter metal selected from the group consisting of (a) divalent iron and (b) mixtures of divalent iron with one or more metals selected from the group consisting of divalent Ni, Co, Mn, Cu, and Zn wherein said divalent promoter metal or metals are chelated by at least one neutral, nitrogen-containing polydentate ligand, L, said contacting occurring for a time sufficient to hydrotreat at least a portion of said feed.

4,632,748

CRACKING PROCESS

Brent J. Bertus, and Chia-Min Fu, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jan. 22, 1985, Ser. No. 693,565

Int. Cl.⁴ C10G *11/18;* **B01J** *38/56*

U.S. Cl. 208—120 **22 Claims**

1. In a cracking process wherein a hydrocarbon-containing feed is contacted with a zeolite-containing cracking catalyst in a cracking zone under cracking conditions and at least a portion of the zeolite-containing catalyst is removed from the cracking zone, contacted with treating fluid comprising steam, and then recycled back to the cracking zone, the improvement comprising employing in the treating fluid an orgainc compound selected from hydrocarbons containing at least 5 carbon atoms per molecule and a molecular weight of no more than 100, in an amount sufficient to reduce the adverse effect that the steam has on the surface of the cracking catalyst.

4,632,749

FLUID CATALYTIC CRACKING HYDROCARBON CONVERSION PROCESS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 474,998, Mar. 14, 1983, abandoned. This application Sep. 7, 1984, Ser. No. 648,432

Int. Cl.⁴ C10G *11/05*

U.S. Cl. 208—120 **5 Claims**

1. A process for fluid catalytic cracking of a hydrocarbon oil which comprises contacting said oil at fluid catalytic cracking conditions with a catalyst consisting of silica, a rare earth metal component and a dealuminated zeolitic aluminosilicate having a SiO2/Al2O3 molar ratio of from 4.5 to 35, the essential X-ray powder diffraction pattern of zeolite Y, an ion exchange capacity of not greater than 0.070, a unit cell dimension a_0 of from 24.20 to 24.45 A, a surface area of at least 350 m^2/g (B-E-T), a sorptive capacity for water vapor at 25° C. and a p/p_o value of 0.10 of less than 4.00 weight percent and a Residual Butanol Test value of not more than 0.40 weight percent.

4,632,750

PROCESS FOR COAL BENEFICIATION BY FROTH FLOTATION EMPLOYING PRETREATED WATER

Phillip E. McGarry, Palmerton, Pa., assignor to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 20, 1985, Ser. No. 778,327

Int. Cl.⁴ B03D *1/14*

U.S. Cl. 209—166 **8 Claims**

1. In a process for the beneficiation of coal by froth flotation comprising surface treating particulate coal with a polymerizable monomer, a polymerization catalyst and a liquid organic carrier thereby rendering said particulate coal hydrophobic and oleophilic and introducing said surface treated particulate coal to a froth flotation vessel containing a water wash medium thereby resulting in a froth phase and an aqueous phase, the improvement comprising pre-treating said water wash medium prior to introducing said surface treated particulate coal with an organic carboxylic acid or alkalai metal or ammonium salt thereof.

4,632,751

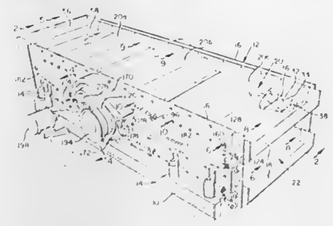
SHAKER SCREEN

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Division of Ser. No. 441,627, Nov. 15, 1982, Pat. No. 4,529,510. This application Feb. 19, 1985, Ser. No. 703,183

Int. Cl.⁴ B07B *1/34, 1/36;* **F16H** *33/00;* **B65G** *27/20*

U.S. Cl. 209—326 **4 Claims**



1. A vibrating screen apparatus comprising
a support frame;
a screening basket mounted on said support frame for vibratory movement and having opposite ends and sides,
said screening basket having upright side walls;
a screening deck on said basket;
a pair of cross bars extending through said screening basket and having cross bar ends projecting outwardly from the sides thereof;
means securing said cross bars to said screening basket for providing an integral vibrating unit;
side beam means on both sides of the basket comprising a rhombus shaped central plate extending parallel to and spaced from the side wall, a peripheral wall formed integral with said central plate and extending around the periphery of said central plate and longitudinal sway braces secured between the peripheral wall and the ends of said basket;
means securing the central plate to the projecting ends of said cross bars also in an integral vibrating unit with said cross bars and screening basket;
a pair of tubes extending between said screen basket side walls;
a pair of cross shafts, each shaft within one of said tubes, extending through said screening basket and projecting beyond at least one side wall of said screening basket,
journeled support means connected to said central plate for supporting said cross shafts;
a pair of gears on said projecting end of said pair of shafts meshing together to provide opposite rotation of said shafts;
power means driving said shafts;
and a disc-like weight secured to each of said shafts,
said weights being semi-circular in shape and being of different mass to provide an oval vibrating stroke to said screening basket upon rotation of said shafts.

4,632,752

APPARATUS FOR COOLING AND GRANULATION OF THERMOPLASTIC STRANDS

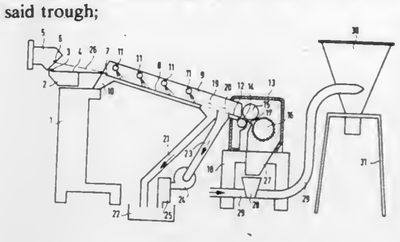
Friedrich Hunke, Westring 38, D-8754 Grossostheim 2, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,207

Int. Cl.⁴ B01D *35/28;* **B29C** *47/88*

U.S. Cl. 210—173 **17 Claims**

1. A device for cooling and granulating molten thermo-plastic strands which energe from nozzles, and for producing dried granulate, which comprises
a slanted drainage trough having an upper end disposed below the nozzles;
a granulator disposed beyond the lower end of said drainage trough for receiving said strands from said trough; and
means for providing a flow of coolant on said trough;
and about said strands emerging from said nozzles moving on said trough;



said drainage trough having before its lower end in the drainage direction, two successive portions with means allowing the unimpeded drainage of said coolant, with said first portion connected to a drain and the second portion having means for providing an air stream in a gravitational direction through said trough.

4,632,753

STRAINER BASKET PROVIDED WITH AT LEAST ONE TUBULAR SIGHTING NET OPEN AT EITHER ENDS

Finn V. Jacobsen, Vejle, and Peter Jensen, Bjert, both of Denmark, assignors to Schmidt & Jessen A/SD, Denmark

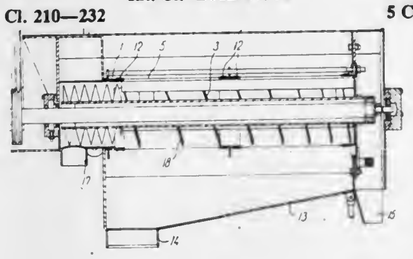
PCT No. PCT/DK85/00020, § 371 Date Oct. 28, 1985, § 102(e) Date Oct. 28, 1985, PCT Pub. No. WO85/03884, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 27, 1985, Ser. No. 797,677

Claims priority, application Denmark, Feb. 29, 1984, 1423/84

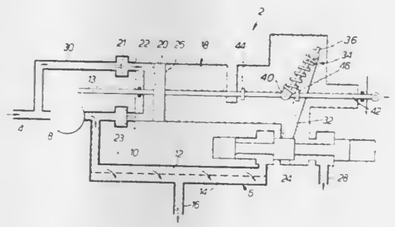
Int. Cl.⁴ B01D *45/14*

U.S. Cl. 210—232 **5 Claims**



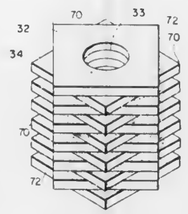
1. A strainer basket comprising at least one sighting net which can be easily mounted and demounted including:
at least one tubular sighting net open at each end,
at least two retaining rings located at different ends of the sighting net,
a clamping ring associated with each retaining ring adapted to surround said retaining ring, for securing the sighting net between the retaining ring and the clamping ring when said clamping ring is positioned to surround said retaining ring, and
guiding means for said each clamping ring for permitting the clamping ring to be movable axially across its respective retaining ring and being in this position pivotal in relation to the guiding means for abutment against at least one axial stop contained on the guiding means.

4,632,754
DESALINATION APPARATUS
Robert S. Wood, Gosport, United Kingdom, assignor to Plessey Overseas Limited, Ilford, United Kingdom
Filed Oct. 11, 1983, Ser. No. 540,762
Claims priority, application United Kingdom, Oct. 12, 1982, 8229133
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—257.2 6 Claims



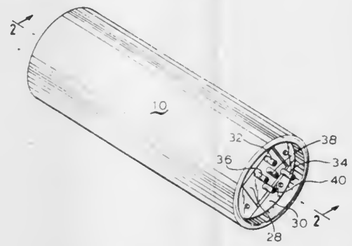
1. Reverse osmosis liquid filtration apparatus, which apparatus comprises an inlet conduit, a reverse osmosis chamber, a pump for pumping liquid to be filtered from the inlet conduit to the reverse osmosis chamber, a reverse osmosis membrane positioned in the reverse osmosis chamber and dividing the reverse osmosis chamber into a first portion in communication with said inlet conduit for containing concentrated unfiltered liquid and a second portion for containing filtered liquid that has passed through the reverse osmosis membrane, a first outlet conduit which extends from the second portion of the reverse osmosis chamber and which is for the filtered liquid, a reservoir, reservoir separator means movable within the reservoir for dividing the reservoir into a first reservoir portion and a second reservoir portion, a second outlet conduit extending from the first portion of the reverse osmosis chamber for concentrated unfiltered liquid, and valve means in the form of a unitary plate valve including a housing having a plurality of outlets and a plurality of inlets communicating with the first portion of the reverse osmosis chamber, with the first reservoir portion, with the second reservoir portion, and with the second outlet conduit, and a rotatable plate member within said housing to provide communication between selected ones of said inlets and selected ones of said outlets for controlling the flow of liquids to and from the first portion of the reverse osmosis chamber and to and from the reservoir, the reservoir separator means and the valve means acting in co-operation in use of the apparatus on a forward movement of the reservoir separator member to allow unfiltered liquid to enter the first reservoir portion on a first side of the reservoir separator means and to substantially simultaneously expel from the second reservoir portion and through the valve means concentrated unfiltered liquid on a second side of the reservoir separator means, and the reservoir separator means acting in use of the apparatus on a return movement of the reservoir separator means and to cause the unfiltered liquid in the first reservoir portion on the first side of the reservoir separator means to enter the first portion of the reverse osmosis chamber to flush the first portion of the reverse osmosis chamber to wash concentrated unfiltered liquid from the first portion of the reverse osmosis chamber through the valve means and into the second reservoir portion on the second side of the reservoir separator means, which concentrated unfiltered liquid is then expelled from the second reservoir portion through the valve means and from the apparatus via the second outlet conduit on the next repeated forward movement of the reservoir separator means.

4,632,755
STACKED FILTER CARTRIDGE
Howard T. DeGraffenried, Rte. 3, Box 9, Henryetta, Okla. 74437
Filed Nov. 13, 1984, Ser. No. 670,591
Int. Cl.[4] B01D *29/46*
U.S. Cl. 210—314 11 Claims



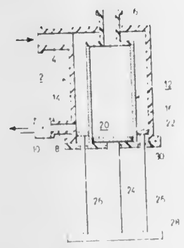
1. A fluid filter cartridge comprising:
a plurality of filter pads, each pad having means defining an axial hole therein, opposite faces and a plurality of substantially straight edges not exceeding six in number, adjacent edges of the pad forming the corners,
said pads being stacked one on top of the other such that the holes are aligned,
the exterior shape of each pad being complementary to the exterior shape of an adjacent pad in the stack, and
said pads being staggered in the stack such that the exterior shape of adjacent pads do not coincide and the corners of the pads extend radially beyond the straight edges of adjacent pads in the stack so that each pad has both edge surfaces and face surfaces exposed.

4,632,756
MULTIPLE BUNDLE SEPARATORY MODULE
Myron J. Coplan, Natick; Friedhelm Bilewski, Medway; Robert Sebring, Westwood, all of Mass., and Daniel K. Schiffer, Neenah, Wis., assignors to Albany International Corp., Menands, N.Y.
Continuation of Ser. No. 410,527, Aug. 23, 1982, abandoned.
This application Oct. 26, 1984, Ser. No. 665,090
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—323.2 8 Claims



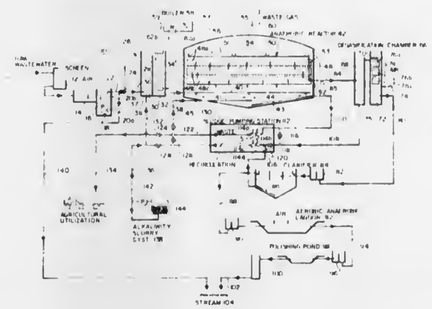
1. A separatory module comprising a plurality of bundles of hollow fiber membranes formed as helically wound self supporting annulus potted at one end including, a cylindrical impervious pressure shell, a cluster of said bundles within said shell having their axis parallel to but displaced from the shell axis, a base member provided with cavities to receive the potted ends of said bundles, said bundle being supported and secured only by said one end, a back-up disc disposed to support internal hydraulic thrust on said potted bundle ends, fluid feed means for admission of pressurized feed into said pressure shell and for distributing feed fluid uniformly to said bundles in said pressure shell, means for collecting and removing permeate passing through said fiber membrances coupled to said potted ends of said bundles, and means for collecting and removing concentrated non-permeated feed fluid from said bundles.

4,632,757
FILTERS CLEANABLE BY REVERSE FLUSHING
Peretz Rosenberg, Moshav Beit Shearim, Israel
Filed Sep. 25, 1985, Ser. No. 779,922
Claims priority, application Israel, Oct. 4, 1984, 73165
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—411 17 Claims



1. A filter capable of being cleaned by reverse flushing, comprising a housing including a fluid inlet, a fluid outlet, a flushing outlet, and a filter body disposed within the housing; characterized in that said housing includes blocking members disposed on opposite faces of said filter body and axially spaced from each other to define a reverse flushing passageway from the fluid inlet to the flushing outlet through the portion of the filter body between said axially-spaced blocking members, at least one of said blocking members being movable axially of the filter body to reverse flush the complete length of the filter body.

4,632,758
ANAEROBIC WASTEWATER TREATMENT SYSTEM
Thomas E. Whittle, Harrisburg, Pa., assignor to Commonwealth Engineering & Technology, Inc., Harrisburg, Pa.
Filed Sep. 6, 1985, Ser. No. 773,840
Int. Cl.[4] C02F *3/28;* C12P *5/02*
U.S. Cl. 210—603 13 Claims



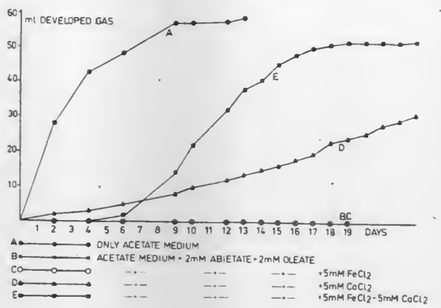
1. Anaerobic apparatus for treating wastewater, said apparatus comprising:
(a) a reactor for receiving and treating the wastewater in an anaerobic process, said reactor having a bottom and a top;
(b) media disposed within said reactor having a plurality of surfaces for receiving bacteria, which consume the waste in the wastewater by an anaerobic digestion process to produce methane and a biological sludge;
(c) storage means disposed in said bottom for storing biological sludge;
(d) first means for introducing the wastewater into said reactor at a point intermediate said media and said bottom, whereby the wastewater is forced up and over said surfaces of said media and into contact with the bacteria;
(e) second means disposed at a point intermediate said top and said media for withdrawing the treated wastewater;
(f) settling means coupled to said second means for receiving the treated wastewater and for permitting settlement of the biological sludge to a bottom thereof, said bottom coupled by a conduit to introduce the biological sludge into said storage means, whereby the population of the methane gas producing bacteria within said reactor is increased and the efficiency of the anaerobic digestion process within said reactor to produce methane is improved;
(g) degassing means coupled to said second means to receive and degas the reactor effluent and is coupled to said settling means to supply degassed reactor effluent thereto, whereby the efficiency of the biological sludge settlement within said settling means is improved;
(h) third means disposed in communication with said storage means for withdrawing the biological sludge from said reactor; and
(i) means disposed at said top for collecting the methane.

6. The method of operating an anaerobic apparatus comprising:
(a) a reactor for receiving and treating wastewater in an anaerobic process, said reactor having a bottom and a top;
(b) a medium disposed within said reactor having a plurality of surfaces for receiving bacteria, which consume the waste in the wastewater by an anaerobic digestion process to produce methane and biological sludge; and
(c) storage means disposed in said bottom for storing biological sludge, the method comprising the step of:
1. heating the wastewater to a temperature of 85° to 100° F.;
2. thereafter, introducing the heated wastewater into said reactor at a point intermediate said media and said storage means;
3. directing the wastewater up and over said surfaces of said media and into contact with the bacteria to produce methane in accordance with the anaerobic digestion process;
4. withdrawing the wastewater after a hydraulic detection time at a point intermediate said top and said media;
5. treating the withdrawn wastewater from the reactor to remove gas therefrom, to enhance the settlement of the biological sludge substantially unimpeded by the presence of gas in the reactor effluent;
6. permitting sludge to settle from the withdrawn wastewater; and
7. introducing a selective amount of the settled sludge into and storing the sludge in said storage means of said reactor for a solids retention time in excess of said hydraulic detection time, whereby the population of the methane gas producing bacteria within said reactor is increased and the efficiency of the anaerobic digestion precess to produce methane is enhanced.

4,632,759
WASTEWATER TREATMENT METHOD
Per-Erik Andersson, Sundsvall, and Thomas G. Welander, Malmö, both of Sweden, assignors to Purac Aktiebolag, Lund, Sweden
Filed Mar. 29, 1985, Ser. No. 717,871
Claims priority, application Sweden, Apr. 11, 1984, 8402017
Int. Cl.[4] C02F *3/28;* C12P *5/02*
U.S. Cl. 210—603 10 Claims

1. A method of treating wastewater containing resin acids and/or fatty acids or sodium salts of these acids from the manufacture of cellulose pulp comprising the steps of (i) anaerobically treating said wastewater in at least one methane fer-

mentation step and (ii) adding to the wastewater metal salts which contain at least one cation from the group iron and



aluminum and also contain at least one cation from the group calcium and magnesium.

4,632,760

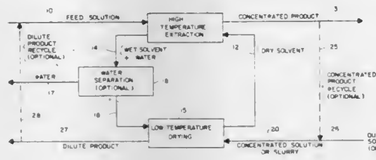
METHOD OF TREATING AQUEOUS SOLUTIONS

Donald N. Hanson, 522 Moraga Way, Orinda, Calif. 94563, and Scott Lynn, 2646 San Antonio Dr., Walnut Creek, Calif. 94598, assignors to Donald N. Hanson, Orinda and Scott Lynn, Walnut Creek, both of, Calif.

Continuation of Ser. No. 567,764, Jan. 3, 1984, abandoned, and a continuation-in-part of Ser. No. 178,870, Aug. 18, 1980, Pat. No. 4,430,227. This application Sep. 11, 1985, Ser. No. 774,953

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—642 **10 Claims**



1. A method of treating an aqueous solution of non-volatile ionic solute to concentrate the solution or to crystallize the solute, said method comprising:

(a) providing a high-temperature extraction zone and a low-temperature extraction zone each of which is adapted for direct, intimate contact between two separate liquid phases,

(b) providing a polar, organic solvent having low solubility for water at ambient temperatures and having an enhanced solubility for water at an elevated temperature, said polar organic solvent being stable and unreactive with the aqueous solution and solute and with the equipment employed and having low solvent power for the solute,

(c) causing continuous, intimate contact between such aqueous solution and such solvent in the high-temperature extraction zone at an elevated temperature T_1 and continuously withdrawing from such zone a stream of wet solvent and a product which is (1) a stream of more highly concentrated aqueous solution, (2) a saturated solution which may contain crystallized solute or (3) crystallized solute substantially free from water,

(d) cooling the effluent stream of wet solvent,

(e) causing continuous, intimate contact in said low-temperature extraction zone at a temperature T_2 which is lower than T_1 between the thus cooled wet solvent and a drying medium which is an aqueous solution, an aqueous slurry or a solid thereby absorbing water from the wet solvent and producing a drier solvent,

(f) continuously withdrawing from the low-temperature extraction zone drier solvent and an aqueous solution, and

(g) reheating the drier solvent stream withdrawn in step (f) and using it in step (c).

4,632,761

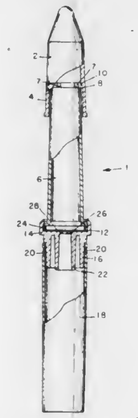
CENTRIFUGAL MICROCONCENTRATOR AND METHODS FOR ITS USE

William F. Bowers, Topsfield, and Peter N. Rigopulos, Boxford, both of Mass., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,208

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—650 **66 Claims**



22. A method for concentrating macromolecules from a solution without filtering to dryness comprising:

(a) filling the sample reservoir of an apparatus with a macromolecular solution, said apparatus comprising:

a sample reservoir;

a filtrate cup situated below the sample reservoir;

a filter means separating the sample reservoir from the filtrate cup, said filter means comprising:

a semipermeable membrane; and

a support for said membrane, said support having one or more filtrate ducts to allow for passage of filtrate from the membrane into the filtrate cup, said filtrate duct or ducts being offset sufficiently inward from the edge of the membrane to enable filtration to stop and a concentrated macromolecular final retentate volume to be obtained when the apparatus is used in a fixed angle centrifuge rotor and the retentate meniscus reaches the centrifugal radial level of the outermost edge of the outermost filtrate duct;

means for providing a liquid tight seal between the periphery of the sample reservoir, the membrane, and the membrane support;

means for attaching the filter means to the filtrate cup; and means for attaching the sample reservoir to the filter means;

(b) placing the apparatus in a fixed angle centrifuge rotor so that during centrifugation the centrifugal force vector is always at an angle to the membrane surface; and

(c) obtaining a concentrated macromolecular final retentate volume by centrifuging the apparatus until the retentate meniscus reaches the centrifugal radial level of the outermost edge of the outermost filtrate duct and filtration stops.

4,632,762

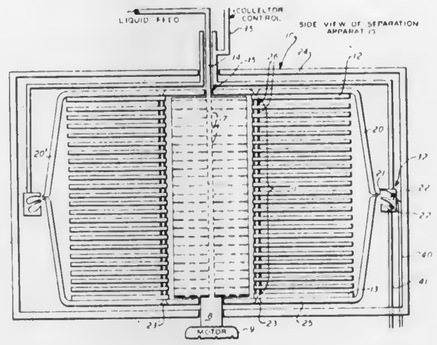
CENTRIFUGAL CHROMATOGRAPHY

Arnold Ramsland, 121 S. Kingman Rd., South Orange, N.J. 07079

Filed May 28, 1985, Ser. No. 738,297

Int. Cl.[4] B01D *15/08;* **C02F** *1/28*

U.S. Cl. 210—657 **8 Claims**



1. A chromatographic process which comprises: separating the major component of a mixture of two or more liquids having different affinities for electrostatic charge while precluding the need for utilizing a mobile phase by applying at least partially an electrostatic charge to a flat, smooth, non-absorbent disk, rotating said disk in a horizontal plane, feeding a mixture of at least two such liquids on to the inner surface of said disk and collecting the respective liquids thrown from the outer edge of the rotating disk at different time intervals.

4,632,763

PROCESS FOR TREATING PHOTOGRAPHIC WASHING WATERS

Ubbo Wernicke, Cologne, and Heinz Meckl, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 744,993

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424064

Int. Cl.[4] C02F *1/42*

U.S. Cl. 210—670 **4 Claims**

1. A process for treating photographic washing waters containing hexacyanoferrate ions with a weakly basic anion exchange resin of the acrylic type with tertiary amino groups as binding groups in the protonated form wherein the photographic washing waters are contacted with said resin, thereby adsorbing the hexacyanoferrate ions onto the resin, then contacting the resin with a dilute aqueous alkaline solution for removing the hexacyanoferrate ions and then protonating the resin with an aqueous solution of a dihydrogen phosphate.

4,632,764

SLUDGE DEWATERING PROCESS USING MULTIPLE LAYER PLATE

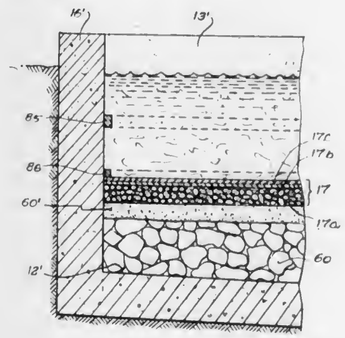
Morris M. Riise, Miami Beach, Fla., assignor to International Sludge Reduction Company, Fort Lauderdale, Fla.

Continuation of Ser. No. 379,758, May 19, 1982, abandoned, Division of Ser. No. 202,241, Oct. 30, 1980, Pat. No. 4,382,862, which is a continuation of Ser. No. 098,887, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 930,529, Aug. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 739,602, Nov. 8, 1976, abandoned. This application Jul. 11, 1984, Ser. No. 629,722

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.[4] C02F *1/52;* **B01D** *23/02*

U.S. Cl. 210—702 **7 Claims**



1. In a process for dewatering sludge on a filter plate, wherein the improvement comprises the following steps in combination:

(a) placing the sludge on a stratum of a filter plate having multiple layers, the filter plate comprising a stratum and a lower support layer,

i. the stratum comprising particles of sand and an epoxy for rigidly bonding the particles together to define the stratum, the particles being of sizes that do not impede high volume percolation, and the epoxy being present in an amount that does not impede high volume percolation;

ii. the lower support layer comprising aggregate material and an epoxy for rigidly bonding the aggregate material together to define the lower support layer, the aggregate material being of sizes that are greater than the sizes of the particles in the stratum and that does not impede high volume percolation, and the epoxy being present in an amount that does not impede high volume percolation; the multiple layers of the filter plate being monolithically bonded together with an epoxy and the filter plate being of sufficient structural strength to support mobile mechanized sludge removal means;

(b) permitting filtrate from the sludge to percolate through the filter plate until the sludge is dewatered to an extent making it removable by sludge removal means; and

(c) removing the dewatered sludge from the stratum by sludge removal means.

4,632,765

PROCEDURE FOR THE CONSOLIDATION OF SLUDGE

Dirk De Neef, Ferdinand Verbiestlaan 34, 2520 Edegem, Belgium

Filed Aug. 13, 1985, Ser. No. 765,149

Claims priority, application Belgium, Oct. 25, 1984, 2/60527

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—717 **5 Claims**

1. A process for hardening and rendering sludge non-

phytotoxic which comprises mixing the sludge with an alkali metal silicate, a calcium compound if one is not already inherently present, and a non-phytotoxic organic compound hardener having more than 12 carbon atoms; said calcium compound being selected to form an insoluble calcium silicate and said ingredients added in sufficient quantities to form a spadeable and durable composition whereby said alkali metal silicate and calcium compound react to form an insoluble calcium silicate precipitate therein which, together with the organic hardener renders the sludge hardened and non-phytotoxic.

4,632,766

METHOD OF TREATMENT OF WASTE WATER OBTAINED IN A GASIFICATION PLANT DURING WASHING OF RAW GAS

Bernhard Firnhaber; Adolf Linke, both of Essen, and Rolf Wetzel, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,554

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3328989

Int. Cl.⁴ C02F *1/72*

U.S. Cl. 210—752 **13 Claims**



1. A method of treatment of waste water obtained in a direct washing of a gas with water in a plant for a gasification of gas, comprising the steps of treating waste water in a settling tank to obtain a clarified water, which is recycled to the plant, and a concentrated slime-containing water; subjecting said concentrated slime-containing water to oxidation only with an oxygen-carrying medium at the temperature from 20° C. to 80° C. in at least two oxidation stages; and conveying a resultant slime-containing water produced in said oxidation stages for further treatment, wherein an exhaust air is obtained in said oxidation step, said exhaust air being partially recycled into at least one of said oxidation stages.

4,632,767

ANTISTATIC AGENTS FOR SYNTHETIC FIBERS

Masatsugu Saiki, Okazaki; Yoshio Imai, and Makoto Takagi, both of Gamagori, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Gamagori, Japan

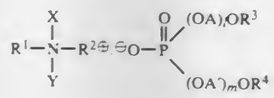
Filed Nov. 26, 1985, Ser. No. 801,941

Claims priority, application Japan, Jun. 14, 1985, 60-130243

Int. Cl.⁴ D06M *11/00*

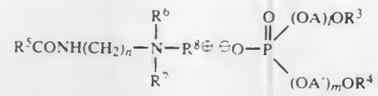
U.S. Cl. 252—8.8 **4 Claims**

1. An antistatic agent for synthetic fibers comprising 5–50 weight percent of quaternary ammonium alkyl phosphate which is shown by the formula (I) or (II) below and contain 1 weight percent or less of by-product alkali metal halides and 50–95 weight percent of alkali metal salt of saturated alkyl phosphate with 50% or more of alkyl groups with 18 or more carbon atoms;



(I)

-continued



(II)

where R^1 and R^5 are alkyl group or alkenyl group with 8–18 carbon atoms, R^2, R^6, R^7 and R^8 are each alkyl group with 1–3 carbon atoms, R^4 is hydrogen or alkyl group or alkenyl group with 8–18 carbon atoms, R^5 is alkyl group or alkenyl group with 7–17 carbon atoms, X is alkyl group with 1–3 carbon atoms or a group shown by $-(AO)_qH$, Y is alkyl group with 1–3 carbon atoms or a group shown by $-(A'O)_rH$, AO and A'O are respectively the same as OA and OA' in the formulas (I) and (II), q and r are integers in the range of 2–40 such that $q+r=4$–42. OA and OA' are single oxyethylene or oxypropylene group or block or random connected mixture thereof, l and m are 0 or integers in the range of 1–20 such that $l+m=0$–20, and n is 2 or 3.

4,632,768

CLAY FABRIC SOFTENER AGGLOMERATES

Neil J. Atkinson, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 6, 1985, Ser. No. 741,761

Claims priority, application United Kingdom, Jun. 11, 1984, 8414877

Int. Cl.⁴ D06M *11/00, 11/06, 13/46;* **C11D** *3/12*

U.S. Cl. 252—8.8 **4 Claims**

1. A clay fabric softener consisting essentially of clay particles in the form of agglomerates, said agglomerates being substantially coated with from about 0.1 to about 3% of a dispensing aid selected from the group consisting of: water-soluble quaternary ammonium salts of the general formula $R_1R_2R_3R_4N^+X^-$ wherein R_1 is C_8–C_{20} alkyl and R_2, R_3 and R_4 are each C_1–C_4 short-chain alkyl and X is an anion and mixtures thereof which provide a slight but sufficient binding/coating action to allow the agglomerates to survive the initial influx of water in a detergent dispenser.

2. A granular detergent composition comprising detersive surfactants, characterized in that it contains from 1–20% by weight of clay softener in the form of agglomerates according to claim 1.

4,632,769

ETHYLENE COPOLYMER VISCOSITY INDEX IMPROVER-DISPERSANT ADDITIVE USEFUL IN OIL COMPOSITIONS

Antonio Gutierrez, Mercerville; Darrell W. Brownawell; Ricardo Bloch, both of Scotch Plains, and Jack E. Johnston, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1984, Ser. No. 679,471

Int. Cl.⁴ C10M *133/16*

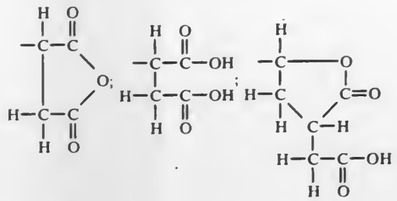
U.S. Cl. 252—48.6 **19 Claims**

1. An oil soluble composition useful as a V.I.-dispersant for lubricating oil, comprising the reaction product of:

(a) an oil soluble ethylene copolymer comprising from about 15 to 90 wt. % ethylene and about 10 to 85 wt. % of one or more C_3 to C_{28} alpha-olefin, having a number average molecular weight within a range of about 5,000 to 500,000, and grafted with an ethylenically unsaturated carboxylic acid material having 1 to 2 carboxylic acid groups or anhydride groups;

(b) from about 1 to 2 mole equivalents per mole of (a) of an alkylene or oxyalkylene amine having at least two primary amine groups; and,

(c) from about 0.1 to 4 mole equivalents per mole of (a) of a carboxylic acid of the formula RX where R is an aliphatic hydrocarbyl group of 22 to 28 carbon atoms and X is selected from the group consisting of



and $-S(CH_2)_nCOOH$ where n is 1 to 3.

4,632,770

POLYCARBOXYLIC ACID ESTER DRAWING AND IRONING LUBRICANT EMULSIONS AND CONCENTRATES

Steven R. Slanker, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 22, 1986, Ser. No. 821,368

Int. Cl.⁴ C10M *173/00*

U.S. Cl. 252—49.5 **6 Claims**

1. A concentrate useful for preparing an oil-in-water emulsion lubricant used in the drawing and ironing of ferrous and non-ferrous metals comprising:

Ingredient	% by weight
Adipic acid having at least 70% by weight of its carboxylic acid groups esterified with a C_4–C_{30} monohydric alcohol	50–90
Water-in-oil emulsifying agent having an HLB number of at least 8	.5–30
Polyglycol co-emulsifier	0–8
Phosphate corrosion inhibitor	.0–3
Copper corrosion inhibitor	0–2

4,632,771

NORMALLY LIQUID C_{14} TO C_{18} MONOALKYL CATECHOLS

Thomas V. Liston, San Rafael; Warren Lowe, El Cerrito, and Vernon R. Small, Rodeo, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 641,910, Aug. 17, 1984, abandoned. This application Mar. 14, 1985, Ser. No. 711,797

Int. Cl.⁴ C10M *129/00, 137/10*

U.S. Cl. 252—32.7 E **8 Claims**

1. A normally liquid alkyl catechol consisting essentially of a monoalkyl catechol wherein the alkyl substituent is a mixture of at least three of C_{14}, C_{15}, C_{16}, C_{17}, and C_{18} alkyl groups wherein said alkyl is derived from a linear alpha-olefin and with the proviso that the C_{18} alkyl content is less than 20% percent.

4,632,772

MILD ANTIMICROBIAL DETERGENT COMPOSITION

Michael E. Garabedian, Arlington, and Jerry L. Tims, Euless, both of Tex., assignors to Dexide, Inc., Fort Worth, Tex.

Filed Feb. 22, 1982, Ser. No. 350,591

Int. Cl.⁴ C11D *3/44, 3/48*

U.S. Cl. 252—106 **2 Claims**

1. An antimicrobial detergent composition comprising:

(a) an alkylaryl ethoxylated sulfonate surfactant in an amount from 12 to 17 weight percent of total composition;

(b) a foam builder in an amount from 1.8 to 6 weight percent of total composition, said foam builder comprising from about 1.5 to about 4.0 weight percent lauric diethanolamide, and from 0.3 to about 2.0 weight percent myristic diethanolamide, said percents based on weight of total composition;

(c) a moisturizer/emollient in an amount from 4.5 to 10.2 weight percent, said moisturizer/emollient comprising from about 4 to about 9.0 weight percent petrolatum, and from 0.2 to about 2.0 weight percent lanolin alcohol, said percents based on weight of total composition;

(d) an ethylene glycol monostearate thickener in an amount from 0.1 to 0.4 weight percent based on weight of total composition;

(e) parachloro metaxylenol from 2.0 to 3.25 weight percent based on total composition;

(f) plus sufficient acid to adjust the pH in the range of from about 4.5 to about 6.5; and

(g) the balance being water.

4,632,773

METHOD OF MAKING A CONTACT LENS MATERIAL WHICH MAY BE IDENTIFIED

Charles W. Neefe, 811 Scurry St., Big Spring, Tex. 79720

Filed Apr. 29, 1986, Ser. No. 857,177

Int. Cl.⁴ C09K *11/02;* **G02C** *7/04*

U.S. Cl. 252—301.35 **20 Claims**

1. A method of making a contact lens material which is identifiable from similar contact lens materials by the step of selecting a fluorescent colored pigment comprised of an organic fluorescent dye in solid state solution in a transparent amorphous organic resin particle adding the selected fluorescent color pigment in the amount of from 0.0003 to 0.009 parts by weight to the lens monomer mixture, polymerizing the lens monomer mixture to form a solid contact lens blank, making a contact lens from the solid contact lens blank, placing the contact lens convex surface on a dark surface, in the absence of visible light irradiating the lens with ultraviolet light, allowing the colored fluorescent light emanating from within the lens to be concentrated at the lens edge by reflecting between the lens polished optical surfaces, allowing the colored fluorescent light to exit the lens at the lens edge, identifying the lens material by observing the selected color of the fluorescent colored light visible at the lens edge.

4,632,774

PROCESS FOR REFORMING ALCOHOLS

Joseph R. Fox, Solon; Frederick A. Pesa, Aurora, and Benedict S. Curatolo, Maple Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 14, 1983, Ser. No. 531,965

Int. Cl.⁴ C01B *3/22*

U.S. Cl. 252—373 **15 Claims**

1. A process for reforming alcohols to synthesis gas comprising contacting an alcohol in the absence of steam with the catalyst comprising a carbide of a metal selected from iron, cobalt, manganese and mixtures thereof, at a reaction temperature of about 200° C. to about 600° C.

4,632,775

PROCESS FOR THE INTERCALATION OF GRAPHITIC CARBON EMPLOYING SULFUR TRIOXIDE

Ilmar L. Kalnin, Millington; Harris A. Goldberg, Colonia, and George J. Breckenridge, Jr., Clark, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 28, 1985, Ser. No. 737,769

Int. Cl.⁴ H01B *1/04*

U.S. Cl. 252—502 **19 Claims**

1. In a process for forming an intercalated electrically conducting composition comprising reacting graphite in a reaction zone under anhydrous conditions with a reactant selected from the group consistng of:

(a) a sulfur-containing reactant selected from the group consisting of fluorosulfonic acid, chlorosulfonic acid, and mixtures thereof,

(b) a halide reactant selected from the group consisting of boron trihalide, a tetrahalide of a Group IV element, a pentahalide of a Group V element, and mixtures thereof, and

(c) mixtures of (a) and (b);

the improvement of additionally providing in said reaction zone during at least a portion of said reaction while at a temperature of approximately 20° to 90° C. a sulfur trioxide reactant which is capable of aiding the increase in the electrical conductivity of the graphite with the proviso that when reactant (a) is present with said sulfur trioxide as a binary mixture the molar ratio is approximately 5:1 to 50:1, when reactant (b) is present with said sulfur trioxide as a binary mixture the molar ratio is approximately 0.05:1 to 1:1, and when reactants (a) and (b) are present with said sulfur trioxide as a ternary mixture the molar ratios are approximately 10:1:1 to 100:0.1:1.

4,632,776

AMBIENT-PRESSURE ORGANIC SUPERCONDUCTOR

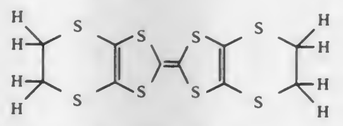
Jack M. Williams, Downers Grove; Hsien-Hau Wang, Willowbrook, and Mark A. Beno, Woodridge, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 738,808, May 29, 1985. This application Apr. 18, 1986, Ser. No. 853,324

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—518 **4 Claims**

1. A superconductor comprising a first layer of a compound with superconductor properties having the formula $(ET)_2MX_2$ where ET is bis(ethylenedithio)tetrathiafulvalene as shown by the formula



where M is a metal, X is a halide, and MX_2 is symmetrical; and a second supporting layer of a conductive metal.

4,632,777

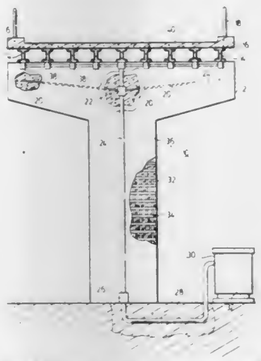
CATHODIC PROTECTION COATING COMPOSITION

John P. Nicholson, R.R. #5, Orangeville, Ontario, Canada (L9W 2Z2)

Filed Feb. 23, 1984, Ser. No. 583,059

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **14 Claims**



1. A cathodic protection system for reinforced concrete structures having reinforcing steel embedded in concrete, said system comprising:

an electrically conductive coating composition applied in fluid form over an outer surface of the concrete, said coating composition when dry comprising a permeable binder material through which moisture permeates preventing entrapment of moisture in the reinforced concrete structure, and a predetermined amount of electrically conductive filler material selected from the group consisting of petroleum coke, metallurgical coke, calcined petroleum coke, fluid petroleum coke, acetylene black graphite, natural graphite and flake graphite, and uniformly distributed in said binder material whereby said coating composition has a predetermined value of resistivity, said coating composition protecting said reinforced concrete structure from corrosion when electrical energy flows through the coating composition; and,

a source of DC electrical energy not greater than 30 mA per square foot being connected between the reinforcing steel and the electrically conductive coating composition such that the electrically conductive coating composition is anodic with respect to the reinforcing steel.

4,632,778

PROCEDURE FOR CERAMIZING RADIOACTIVE WASTES

Jukka K. Lehto; Jorma K. Miettinen, and Olli Heinonen, all of Helsinki, Finland, assignors to Imatran Voima Oy, Finland

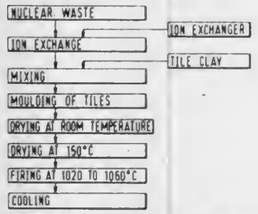
PCT No. PCT/FI83/00037, § 371 Date Dec. 20, 1983, § 102(e) Date Dec. 20, 1983, PCT Pub. No. WO83/03919, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 26, 1983, Ser. No. 574,152

Claims priority, application Finland, Apr. 30, 1982, 821536

Int. Cl.⁴ G21F *9/28, 9/12, 9/16*

U.S. Cl. 252—629 **6 Claims**



1. Method of transforming radioactive waste into ceramic, which comprises the steps of

first mixing a waste from radioactive waste solution with an inorganic ion exchanger selected from the group consisting of titanates, niobates, zirconates, and zirconium dioxides, and mixtures thereof,

after said first mixing is completed, mixing the resulting inorganic ion exchanger loaded with the waste with a ceramizing material selected from the group consisting of red clay, kaolin, montmorillonite, feldspar, illite, and quartz, and mixtures thereof,

adding water to the thus-formed mixture, to form a further mixture thereof,

forming shaped tiles of the thus-formed further mixture,

drying said tiles, and

firing the thus-dried, shaped tiles in a kiln, without pressing of the same, at a temperature at which ceramic formation takes place, whereby shaped, ceramic tiles of radioactive waste are formed for subsequent disposal.

4,632,779

RADIOACTIVE WASTE PELLETS IN SOLIDIFIED FORM AND A PROCESS FOR FORMING THE SAME

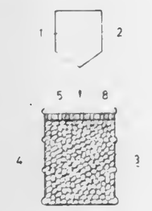
Hiroko Mizuno; Makoto Kikuchi, both of Hitachi; Susumu Horiuchi, Mito, and Shin Tamata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,195

Claims priority, application Japan, May 30, 1983, 58-95377

Int. Cl.⁴ G21F *9/16*

U.S. Cl. 252—629 **16 Claims**



1. Radioactive waste pellets in solidified form, comprising:

a container having a top opening portion;

radioactive waste pellets filling said container to closely adjacent said top opening;

a cover disposed in said top opening of said container to generally cover said waste pellets and being freely movable within said container to rest upon said waste pellets;

a solidified liquid filler comprising sodium silicate completely filling the remainder of said container and solidifying said radioactive waste pellets;

said pellets including at least light waste pellets having specific gravities smaller than the specific gravity of said filler when it is liquid;

said cover having a weight greater than the bouyancy of said light waste pellets within said filler when said filler is liquid;

said cover having filler injection port means of a shape and size to prevent the outward passage of any of said waste pellets prior to being solidified within said filler; and

said injection port means being of a size and shape sufficient to pass said filler liquid therethrough to substantially completely fill the interstices between said pellets when said filler is liquid, whereby the pellets may be placed within said container, said cover may be placed upon said pellets and said liquid filler poured through said ejection port means to completely fill the remainder of the container prior to solidifying and without said light pellets lifting up said cover or passing through said ejection port means, so that said filler solidifies the pellets within said container, closes said ejection port means and securely attaches said cover to said container and pellets.

4,632,780

N-TERMINAL FRAGMENT OF HUMAN PRO-OPIOMELANOCORTIN AND PROCESS THEREFOR

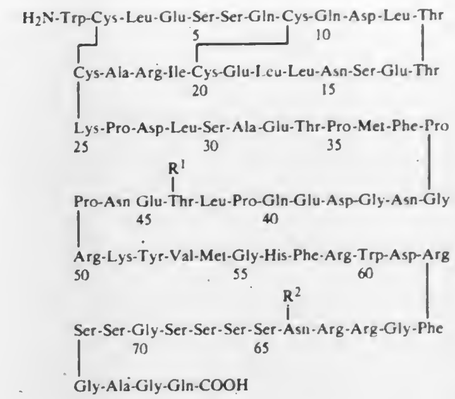
Nabil G. Seidah, 274 Corot St., Ile des Soeurs, Verdun, Quebec, Canada (H3E 1K7), and Michel Chretien, 176 Berkley St., St. Lambert, Quebec, Canada

Filed Jul. 10, 1981, Ser. No. 281,928

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 530—306 **2 Claims**

1. The N-terminal fragment of human proopiomelanocortin, viz., the glycopeptide of the formula I



in which the disulfide bridges are indicated by the symbol ⌐¬, R^1 represents a glycosyl residue attached to threonine in position **45** of an O-glycosidic linkage and containing glucosamine and galactosamine in a ratio of about 1:2, and R^2 represents a glycosyl residue attached to asparagine in position **65** by an N-glycosidic linkage and containing glucosamine and galactosamine in a ratio of about 3:1;

having the following amino acid composition and integer values: Asp+Asn=Asx (8), Thr (4), Ser (10), Glu+Gln=Glx (10) Pro (5), Gly (7), Ala (3), Cys (4), Val (1), Met (2), Ile (1), Leu (6), Tyr (1), Phe (3), His (1), Lys (2), Trp (2), Arg (6);; and having a peak of absorption at 280 nm eluted at 32–34 percent 2-propanol and 68–66 percent 0.02M triethylammonium formate when subjected to HPLC on a micro-Bondapak C-18 ® column wit a gradient of 20 percent to 60 percent 2-propanol over 80 minutes at a flow rate of 1 milliliter per minute, as well as an apparent molecular weight of 16000–18000 as determined by SDS-polyacrylamide gel electrophoresis.

4,632,781

LIQUID CRYSTAL DYE COMPOUND

Yasutaka Shimidzu, Toyonaka; Hirohito Kenmochi, Takatsuki; Toshihiko Ueno, and Chizuka Tani, both of Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Nippon Electric Co., Ltd., Tokyo, both of, Japan

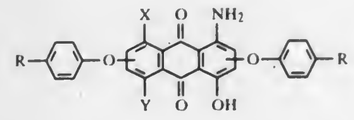
Division of Ser. No. 330,487, Dec. 14, 1981, Pat. No. 4,505,549. This application Dec. 24, 1984, Ser. No. 685,536

Claims priority, application Japan, Jan. 12, 1981, 56-3677

Int. Cl.⁴ C07C *97/26, 96/25*

U.S. Cl. 260—380 **4 Claims**

1. An anthraquinone compound represented by the following general formula:



wherein one of X and Y is amino group and the other is hydroxyl group; and R is alkyl group having 3 to 9 carbon atoms, lower alkoxy, lower alkylthio, phenyl, phenyl-substituted lower alkyl, phenyloxy, phenylthio, phenyl-substituted lower alkyloxy, halogen, or a group



in which R_1 and R_2 are hydrogen, lower alkyl, or phenyl, wherein the benzene ring in substituents R, R_1 and R_2 is unsubstituted or substituted with a lower alkyl or a lower alkoxy and the alkyl chain in substituents R, R_1 and R_2 is unsubstituted or substituted with a lower alkoxy.

4,632,782

OXIDIZING AN ORGANIC COMPOUND

Tatsuyoshi Komatsu, Kamakura; Shigeaki Numata; Katsuhiko Hioki, both of Yokohama, and Toshihiko Sumino, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Limited, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,790
Claims priority, application Japan, May 26, 1983, 58-91452
Int. Cl.[4] C07C *50/08, 50/12*
U.S. Cl. 260—396 R **7 Claims**

1. A process for oxidizing an oxidizable organic compound by ceric sulfate dissolved in an aqueous sulfuric acid solution, wherein the organic compound is oxidized (1) by means of a ceric sulfate-aqueous sulfuric acid solution or a cerous sulfate-containing ceric sulfate-aqueous sulfuric acid solution in which the molar concentration (mol/liter) of ceric sulfate is (i) at least the molar concentration of cerium (ions) contained in the molecules of cerous sulfate at the maximum solubility of cerous sulfate in an aqueous sulfuric acid solution at the final sulfuric acid concentration (exclusive of ceric sulfate and cerous sulfate) and at the temperature under the oxidation reaction conditions and (ii), at most the saturated molar concentration of ceric sulfate in said aqueous sulfuric acid solution, (2) under a condition such that at the end of the oxidation reaction, the concentration of ceric sulfate is maintained at a level capable of dissolving cerous sulfate which is present at a concentration of at least the maximum solubility of cerous sulfate in said aqueous sulfuric acid solution.

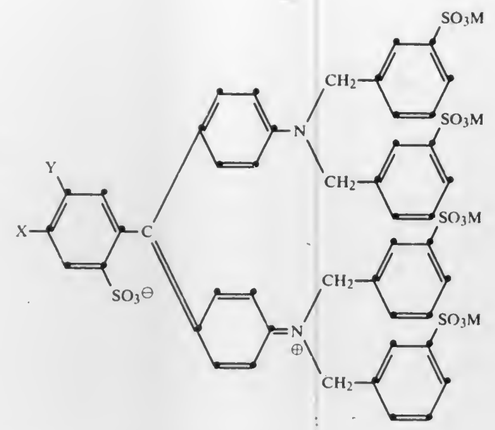
4,632,783

TRIPHENYLMETHANE DYESTUFFS

William M. Hung, Cincinnati, Ohio, and Patrick J. Jefferies, Fort Mitchell, Ky., assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 559,999, Dec. 9, 1985, Pat. No. 4,536,367.
This application May 13, 1985, Ser. No. 732,988
Int. Cl.[4] C09B *11/10*
U.S. Cl. 260—394 **4 Claims**

1. A triphenylmethane compound having the formula



in which
X represents hydrogen or the group SO_3M;
Y represents hydrogen or hydroxy; and
M represents an alkali metal cation, an ammonium cation or an alkaline earth metal cation.

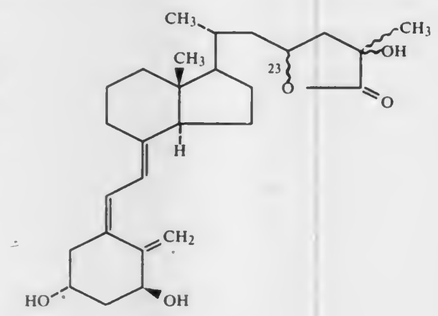
4,632,784

PROCESS FOR THE PREPARATION OF 1α,23,25-TRIHYDROXYCHOLECALCIFEROL-26-OIC ACID 23,26-LACTONE

Enrico G. Baggiolini, North Caldwell; Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

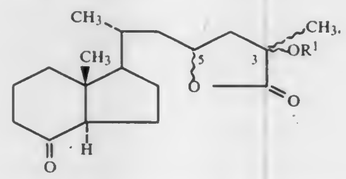
Continuation-in-part of Ser. No. 461,835, Jan. 23, 1983, abandoned. This application Jul. 30, 1984, Ser. No. 635,686
Int. Cl.[4] C07J *3/00*
U.S. Cl. 260—397.2 **6 Claims**

1. A process for the preparation of 1α,23,25-trihydroxycholecalciferol-26-oic acid 23,26-lactone of the formula



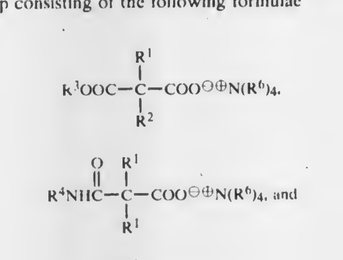
I

which comprises the steps of
(a) reacting a compound of the formula



II

wherein R^1 is hydrogen, tri-lower alkylsilyl, aryl-di-lower alkylsilyl, diaryl-lower alkylsilyl or triarylsilyl, with a compound of the formula



III

wherein R^2 is lower alkyl or aryl, to yield a compound of the formula

IV

wherein R^1 and R^2 are previously described, and
(b) removing the protecting groups from whereby there is obtained the corresponding compound of formula I.

4,632,785

THERMALLY ACTIVABLE TRIMERIZATION CATALYST

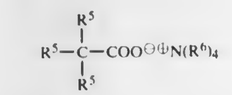
Edward A. Barsa, Cheshire, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 522,127, Aug. 11, 1983, Pat. No. 4,540,781.
This application Jul. 1, 1985, Ser. No. 750,634
Int. Cl.[4] C07C *87/30*
U.S. Cl. 260—501.15 **8 Claims**

1. A thermally activable organic isocyanate trimerization catalyst comprising a carboxylic acid salt selected from the group consisting of the following formulae

(Ia)

(IIa)



(IIIa)

wherein R^1 in (Ia) is alkyl having 2 to 8 carbon atoms, inclusive, and each R^1 in (IIa) is independently selected from alkyl having 2 to 8 carbon atoms, inclusive, R^2 is a highly branched alkyl having 3 to 8 carbon atoms, inclusive, R^3 is selected from the group consisting of hydrogen, alkyl and aryl, R^4 is selected from the group consisting of alkyl, aryl, aralkyl, and cycloalkyl, each R^5 is independently selected from aryl, and wherein each one of the four R^6 radicals is independently selected from the group consisting of alkyl, aralkyl, cycloalkyl, and radicals having the formula

(IV)

wherein R^7 is selected from the group consisting of hydrogen and methyl and n is a number of from 1 to 4 provided that no more than one R^6 radical has the formula (IV).

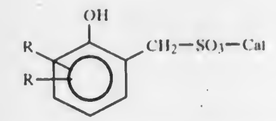
4,632,786

SULFOMETHYLATED PHENOLIC MATERIAL USEFUL IN POST PRIMARY OIL RECOVERY

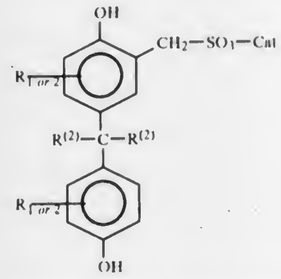
Paul R. Stapp, and Jerry E. Pardue, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 382,042, May 25, 1982, Pat. No. 4,469,604.
This application Jul. 20, 1984, Ser. No. 632,936
Int. Cl.[4] C07C *143/24*
U.S. Cl. 260—512 C **5 Claims**

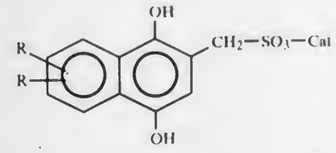
1. Sulfomethylated alkyl phenol compound chosen from among the group consisting of sulfomethylated alkyl phenol having the formula



sulfomethylated alkylated bis-phenol having the formula



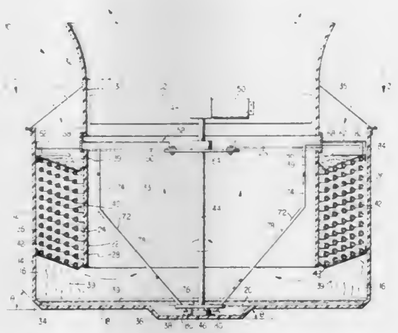
and, sulfomethylated alkylated naphthol having the formula



wherein, in each of the formulas above, R is alkyl or alkenyl having up to 30 carbon atoms, with the proviso that at least 1 radical R has 6 to 30 carbon atoms,
$R^{(2)}$ is H or CH_3,
Cat is selected from the group consisting of —Na, —K and $—NHR_3^{(1)}$, wherein $R^{(1)}$ is hydrogen, alkyl having 1 to 3 carbon atoms, or hydroxy alkyl with 2 or 3 carbon atoms.

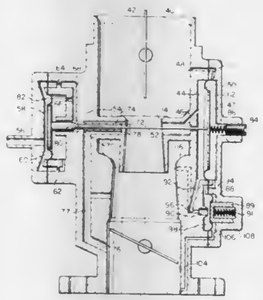
with the further proviso that the total number of carbon atoms per molecule is 13 to about 40.

4,632,787
EVAPORATIVE HEAT EXCHANGER
Robert T. Tippmann, 9837 St. Joe Rd., Fort Wayne, Ind. 46815
Filed Oct. 30, 1985, Ser. No. 792,925
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—30 **11 Claims**



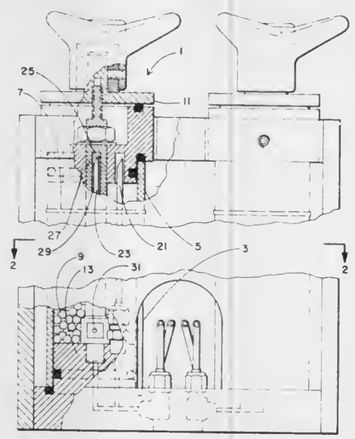
1. A heat exchange apparatus for fluids comprising:
(a) an outer casing member having a bottom wall enclosing one end thereof,
(b) an inner casing member having an outer surface spaced from said outer casing and defining with said outer casing a first chamber with an inlet opening at one end and an outlet opening at the other end disposed above said bottom wall, said inner casing member having an inner surface defining a second chamber having an outlet opening and an inlet opening adjacent to the outlet opening of said first chamber,
(c) wetted surface means located in said first chamber, and
(d) fan means superimposed above both said first and second chambers, said fan means having blade means common to both said first and second chambers and capable of simultaneously pushing air into said inlet opening of said first chamber, over said wetted surface means and pulling said air out said outlet opening of said second chamber when rotated.

4,632,788
CARBURETOR FUEL FEED SYSTEM WITH BIDIRECTIONAL PASSAGE
James S. Jones, 45 Crown Pl., Richardson, Tex. 75080
Filed Jun. 25, 1985, Ser. No. 748,477
Int. Cl.[4] F02M *7/04*
U.S. Cl. 261—41.5 **12 Claims**



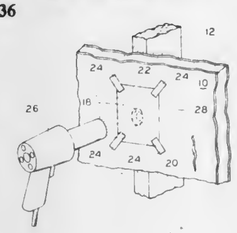
1. In a carburetor having an air inlet, an outlet, throttling means for controlling the flow through a main air path, and a venturi for reading air velocity through the carburetor located between the throttling means and the air inlet, the improvement comprising a bidirectional passage between the venturi and an area downstream of the throttling means for allowing free movement of air either from the venturi to the area downstream of the throttling means or from the area downstream of the throttling means to the venturi, the direction of air movement being dependent on the pressure relationship between the venturi and the area downstream of the throttling means, and having means for receiving metered fuel into the bidirectional passage and allowing metered fuel to blend with air moving through the bidirectional passage and meet with the main air path either at the area downstream of the throttling means or at the venturi, wherein the means for receiving metered fuel comprises a tubular section extending into the bidirectional passage adjacent the venturi and providing a confined area of high velocity where fuel meets with air when the flow is from the venturi to the area downstream of the throttling means.

4,632,789
GAS HUMIDIFICATION APPARATUS
Philip L. Reid, Rte. 2, Box 422, Duncan, S.C. 29334
Filed Jan. 31, 1985, Ser. No. 696,733
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—63 **1 Claim**



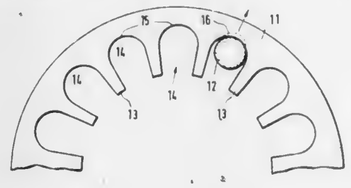
1. An apparatus for humidifying first and second gases for supplying such gases to means for measuring the transmission of one gas into the other gas comprising:
a pair of generally vertically oriented hollow cylindrical columns, each column comprising:
a top closure on each said column;
a bottom closure on each said column whereby each said column, said top closure, and said bottom closure define a volume within each said column which may be filled to a predetermined level with a liquid;
water and beads within said volume up to said predetermined level;
said bottom closure defining an entrance port and an exit port;
an entrance conduit communicating with said entrance port and extending vertically above said predetermined level;
a shroud covering said entrance conduit and defining an opening into said column below said predetermined level;
an exit conduit communicating with said exit port and passing through said column within the hollow thereof to a point vertically above said predetermined level;
whereby gases to be humidified enter each said column through said entrance port, travel upwardly through said entrance conduit, contact said shroud and move downwardly through said shroud and through said opening in said shroud, bubbles upwardly through said water and said beads within said column above said predetermined level, then enters said exit conduit and proceeds downwardly through said column and said exit conduit and out through said exit port;
a first source of gas communicating with an entrance port of one of said columns comprising;
a pressurized tank of said first gas communicating with means for dividing a flow of said first gas into two parts,
conduit means communicating a first part of said first gas to a first mass flow controller,
conduit means communicating between said first mass flow controller and said entrance port of said first column,
conduit means receiving the second part of said first gas in communication with a second mass flow controller,
means joining said second mass flow controller and said exit port of said first column to combine said humidified first gas and said first gas whereby the combined first gas has a controlled humidity by varying the flow through said first and second mass flow controllers,
a source of a second gas communicating with said entrance port of the other column comprising;
a pressurized tank of said second gas communicating with means for dividing a flow of said second gas into two parts,
conduit means communicating a first part of said second gas to a third mass flow controller,
conduit means communicating between said third mass flow controller and said entrance port of said second column,
conduit means receiving a first part of said second gas in commnication with a fourth mass flow controller,
means joining said fourth mass flow controller and said exit port of said second column to combine said humidified second gas and said second gas whereby the combined second gas has a controlled humidity by varying the flow through said third and fourth mass flow controllers.

4,632,790
REPAIR METHOD FOR DRYWALLS AND LIKE CONSTRUCTION MATERIALS
André Bernard, Mount Kisco, N.Y., assignor to Meric Industries, Inc., New York, N.Y.
Filed Apr. 11, 1985, Ser. No. 722,840
Int. Cl.[4] B32B *35/00*
U.S. Cl. 264—36 **5 Claims**



5. For masking a crack in a drywall or plaster surface of a dwelling, a repair method using heat shrinkable plastic film, said method comprising the steps of placing a repair patch of said heat shrinkable plastic film over said crack, applying heat to said patch while exerting a pressure normal thereto so as to cause a contraction in size in said patch while exerting a pressure normal thereto so as to cause a contraction in size in said patch which totally removes all wrinkles therefrom simultaneously with said pressure maintaining said contact between said patch and said surface, whereby said patch firmly attaches itself to said surface while manifesting therein a wrinkle-free appearance to thereby effectively mask from view said crack in said surface.

4,632,791
METHOD FOR PRODUCING FLUID FLOW REGULATORS
Wolf D. Keppel, Chicago, Ill., and Reinhard C. Mannesmann, Wartaweil 38 b, 8036 Herrsching, Fed. Rep. of Germany, assignors to Reinhard Carl Mannesmann, Herrsching, Fed. Rep. of Germany
Filed Jan. 18, 1984, Ser. No. 571,699
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302759
Int. Cl.[4] B29C *33/00*
U.S. Cl. 264—40.1 **12 Claims**



1. A method for producing fluid flow regulators, which regulators include a housing having interengaging inner and outer housing members, said inner members being in the form of a substantially axial core portion, a plurality of protuberances on said core portion, an elastically deformable sealing member surrounding said core portion and constituting fluid flow passages in cooperation with said protuberances, said sealing member being variably pressed against said protuberances and changing the cross section of said fluid flow passages in response to increasing and decreasing differential pressure values on the medium flow through the regulator, said method comprising the steps of:
(a) preparing a casting mould for the parts comprising the profiled core, said casting mould being formed with spaced webs which define therebetween hollow chambers corresponding to the protuberances on the core portion, and making a sample regulator;
(b) measuring the flow characteristics comprising flow rate/differential pressure P for the sample;
(c) fixing a desired value for the flow rate and matching the regulator to this desired value by adapting the casting mould in accordance with the measured flow characteristics, wherein the matching and adaptation of the casting mould is performed in accordance with the following rules:
(d) if the flow characteristic of the sample rises with increasing differential pressure P above the desired value and if after passing through a maximum it drops again below the desired value, one or several of the hollow chambers of the casting mould will be made radially deeper so that the height of the protuberances is increased;
(e) if the flow characteristics of the sample rise with increasing differential pressure P above the desired value and after passing through a maximum drops to a relative minimum above the desired value and thereupon rises again, the webs disposed between the hollow chambers of the casting mould will be made radially shorter so that the recesses disposed between the protuberances of the core will become less deep;
(f) if the flow characteristic rises with increasing differential pressure P above the desired value and after passing through a maximum drops below the desired value and then rises again above the desired value, one or several of the hollow chambers of the casting mould will be laterally

enlarged at the closed end thereof so that the protuberances of the core will become wider in a circumferential direction.

4,632,792

METHOD OF MANUFACTURING FOAM INSULATED TANK

Keith R. Clark, Montgomery, Ala., assignor to Rheem Manufacturing Company, Montgomery, Ala.

Filed Feb. 25, 1985, Ser. No. 705,226
Int. Cl.[4] B28B *7/30;* **B29C** *39/10, 39/26, 67/22*
U.S. Cl. 264—45.2 **6 Claims**



1. A method of manufacturing a multiple layer water tank of the type including an inner wall, an intermediate layer of expanded foam material and an outer wall comprising the steps of:

(a) forming a flexible, expandable bag in a configuration which may be affixed to the inner wall, said bag having an elongate shape defined by sides, a closed bottom end, and an open top end, said bag also having at least one relief opening in a side with a diversion shunt formed in the bag above the opening, intermediate the opening and the top end;

(b) forming voids in the flexible bag by sealing a passage through the bag to define a passage through the final intermediate layer to thereby facilitate assembly connections through the outer wall and, insulating material and inner wall;

(c) positioning the flexible bag on the inner wall to define at least a portion of a mold form between the inner wall and outer wall;

(d) aligning the void of the flexible bag with a connection on the inner wall;

(e) positioning the outer wall about the inner wall and flexible bag to define a space between the inner wall and outer wall, said space being generally annular and closed at the bottom between the inner and outer walls;

(f) orienting an opening through the outer wall with the flexible bag void;

(g) at least partially filling the flexible bag with an expandable foam material;

(h) waiting for foam material in the flexible bag to expand and engaging the bag with the inner wall and the outer wall of the tank to thereby define, at least in part, a mold form in the space between the walls; and

(i) further filling the flexible bag and diverting expandable foam material through the relief opening by means of the diversion shunt thereby filling the space between the walls while preventing foam material to fill the void.

4,632,793

METHOD OF FABRICATING HOT PRESSED SILICON NITRIDE BILLETS

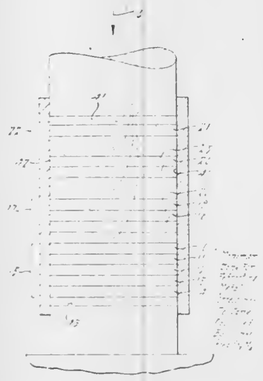
Andre Ezis, Grosse Ile; Elaine C. Beckwith, Riverview, and Warren B. Copple, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 635,943, Jul. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 444,246, Sep. 30, 1982, abandoned. This application Apr. 3, 1986, Ser. No. 848,845
Int. Cl.[4] C04B *35/58*
U.S. Cl. 264—58 **11 Claims**

1. A method of hot pressing ceramic plates in a pressing assembly having a constraining side wall aligned with the direction of pressing, comprising:

(a) preparing a plurality of said plates, each having a thickness to width ratio in the range of 1:3 to 1:40 and a density in the range of 50–80% of full theoretical;

(b) stacking a multiple number of said plates directly on top of one another within groups, except for the interposition of a compliant release coating between plates, and stacking a plurality of said groups with rigid force transmitting spacer plates therebetween into a pressure assembly in such a manner that the groups and spacer plates are stacked in an alignment along the direction of pressure to be applied and in contact with said contraining side wall, said groups having a progressively decreasing number of



constituent plates so that for a group residing in a zone of pressing that will experience the least movement along said pressure direction the number of plates in the group is greatest and for a group residing in a zone of pressing that will experience the most movement along said pressure direction the number of plates in the group is the smallest; and

(c) hot pressing said stacked groups of plates under pressure and temperature to densify each of said plates to at least 95% of theoretical density with a compression ratio of 1.2:1 to 2:1.

4,632,794

PROCESS FOR MANUFACTURING WHISKER PREFORM FOR COMPOSITE MATERIAL

Shigeto Mori, and Minoru Fukazawa, both of Nagoya, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,934
Claims priority, application Japan, Dec. 25, 1982, 57-226545
Int. Cl.[4] B28B *1/26*
U.S. Cl. 264—87 **3 Claims**

1. A process for manufacturing a whisker preform for a composite material having a density of 0.283–0.70 g/cm^3, comprising the steps of:

(1) compressing a whisker as a raw material consisting of SiC single crystals having a diameter of 0.1–5 μm and a length of 10–500 μm;

(2) dispersing the compressed whisker in water or an organic solvent in the absence of a binder, the amount of the water or organic solvent being 7–200 times as much by weight as the amount of the whisker;

(3) passing the resultant dispersion through a sieve having a mesh of 32–100;

(4) filtering said dispersion; and

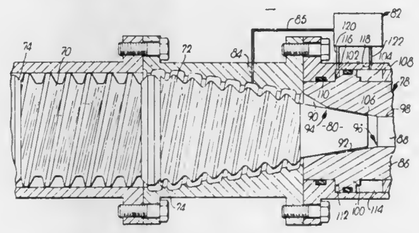
(5) drying the residual wet whisker cake directly or after compression to said desired density.

4,632,795

METHOD AND APPARATUS FOR EXTRUSION PROCESSING OF CELLULOSE BEARING MATERIALS

Gordon R. Huber, and Bobbie W. Hauck, both of Sabetha, Kans., assignors to Wenger Manufacturing, Inc., Sabetha, Kans.

Continuation of Ser. No. 444,807, Nov. 26, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,138
Int. Cl.[4] B29B *7/42*
U.S. Cl. 264—115 **7 Claims**



1. An extruder, comprising:

an elongated, tubular barrel including an inlet end and an outlet end and presenting an inner surface along the length thereof;

die means adjacent said outlet end; and

an elongated, axially rotatable, flighted screw situated within said barrel, said screw including an inlet section adjacent said inlet end, a compression section adjacent said outlet end and die, and a transition section between the inlet and outlet sections,

said compression section including at least a pair of respective, outwardly extending helical flight means thereon,

said transition section having respective, outwardly extending first and second helical flight means thereon,

said first and second flight means of said transition section each having a series of helical portions, with the portions of the first and second flight means alternating along the length of the transition section,

the outer periphery of said first flight means being closely adjacent said inner surface of said barrel,

the outer periphery of at least a portion of said second flight means being spaced further from said inner surface of said barrel than said periphery of said first flight means, with the depth of said second flight means gradually and progressively increasing until the outer periphery of the second flight means equals that of the first flight means, and both of said peripheries are closely adjacent said inner surface of said barrel.

4. A method of producing a defiberated product suitable for the manufacture of fiber board or the like, said method comprising the steps of:

providing a quantity of rough, coarse material selected from the group consisting of wood and wood-derived materials and having a moisture content of from about 5 to 75 percent by weight;

passing said material into the elongated barrel of an extruder, and axially rotating the extruder screw to convey said material along the length of the barrel,

said conveying step including the steps of gradually increasing the shear and compression forces exerted on said material as the material passes along the length of said barrel, developing a temperature within said extruder barrel of from about 212° F. to 650° F., developing a pressure within said barrel of from about 200–5000 psi; and

extruding the material through a restricted orifice die assembly, said assembly including structure defining an elongated compression zone of decreasing cross-sectional area along the length thereof, and a rotatable element situated within said compression zone,

said extrusion step comprising the steps of passing said material through said compression zone while simultaneously rotating said element therewithin, and adjusting the effective dimensions of said restricted orifice in response to pressure conditions within said barrel, so as to produce said defiberated product.

4,632,796

METHOD OF MANUFACTURING A SANDWICH WALL PANEL BY MOLDING

Jean M. M. Moulet, Verdun, France, assignor to Groupement pour l'Industrialisation du Batiment "G.I.B.A.T.", Verdun, France

Filed Jan. 6, 1986, Ser. No. 816,423
Int. Cl.[4] B28B *1/16*
U.S. Cl. 264—253 **4 Claims**

1. A method of manufacturing a sandwich wall panel by molding, formed from an inner bearing wall portion, an outer freely expandable wall portion and an insulating insert sheet, said wall portions being joined together by means of one or more elongate connecting elements and being held at a distance from each other by means of one or more rigid spacers interposed between said wall portions, characterized in that it consists in:

positioning at the bottom of a horizontal mold said rigid spacers (**11**) which have two opposite faces (**12, 13**), parallel to the bottom of the mold, as well as a slanting face (**17**) joining said opposite faces (**12, 13**) together and turned outwardly of the mold, each spacer (**11**) being held away from the bottom of a mold by a distance substantially equal to the thickness of said inner wall portion (**15**) by means of a support (**27**), the slanting faces (**17**), of said spacers (**11**) all being oriented in the same direction;

disposing each connecting element (**20**) so that it rests on the slanting face (**17**) of the spacer, relative positioning means between said connecting element (**20**) and said spacer (**11**) being provided;

casting said inner wall portion (**15**) at the bottom of the mold;

placing on this wall portion said insulating sheet (**16**) in which localized recesses have been formed which are filled by said spacers (**11**); and

casting said outer wall portion (**14**) on the insulating sheet (**16**).

4,632,797

PROCEDURE FOR MANUFACTURING A BRAKE BLOCK

Matti Tapanainen, Laanitie 6 B, 72600 Keitele, Finland

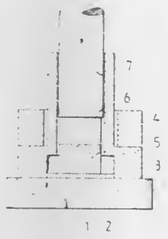
PCT No. PCT/FI83/00005, § 371 Date Sep. 23, 1983, § 102(e) Date Sep. 23, 1983, PCT Pub. No. WO83/02651, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 25, 1983, Ser. No. 548,862

Claims priority, application Finland, Jan. 16, 1982, 820248

Int. Cl.⁴ B29C *43/20*

U.S. Cl. 264—260 2 Claims



1. A method of manufacturing a brake block having a brake block body, comprising the steps of: placing the brake block body in a mold having a cavity of a certain width and height; placing on said body a first layer of a friction material of a certain hardness, of a width smaller than that of said cavity so as to leave a space laterally thereof, and of a height greater than that of said cavity; placing on said first layer a second layer of a friction material of a lower hardness than that of said first layer and of a width substantially corresponding to that of said first layer; and applying pressure and heat on said first and second layers in such a manner that the first layer will flow outwardly into and substantially fill the space to form a relatively hard margin of the brake block and will adhere to said brake body, and the second layer will partially flow into a central portion only of the first layer to form a relatively soft friction surface of the brake block surrounded by the relatively hard margin.

4,632,798

ENCAPSULATION OF ELECTRONIC COMPONENTS WITH ANISOTROPIC THERMOPLASTIC POLYMERS

Nancy C. Eickman, Mountainside; Charles E. McChesney, Monmouth Junction; Gary E. Williams, Short Hills, and Hyun-Nam Yoon, Summit, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 517,870, Jul. 27, 1983, abandoned. This application Jun. 18, 1984, Ser. No. 619,608

Int. Cl.⁴ B29C *45/14*

U.S. Cl. 264—272.17 34 Claims

1. A method for imperviously encapsulating on a relatively expeditious basis an electronic component using a novel composition incorporating a thermoplastic polymer which forms an anisotropic melt phase comprising:

(1) introducing the electronic component to be encapsulated within a mold cavity,

(2) completely filling the mold cavity surrounding said electronic component by injection at an elevated temperature of a molding composition comprising (a) a molten thermoplastic melt processable polymer which is capable of forming an anisotropic melt phase, has a weight average molecular weight of approximately 4,000 to 25,000, and which is substantially incapable of further chain growth upon heating as evidenced by an increase in the weight average molecular weight of no more than 15 percent when heated in an inert atmosphere for 30 minutes while at a temperature of 340° C., and (b) approximately 40 to 80 percent by weight based upon the total weight of the molding composition of a particulate inorganic material substantially uniformly dispersed in component (a) which is capable of decreasing the volumetric coefficient of thermal expansion and increasing the thermal conductivity of component (a),

(3) cooling the contents of the mold cavity to allow said molding composition to solidify and to form an impervious package around said electronic component, and

(4) removing said resulting imperviously encapsulated electronic component from said mold cavity.

4,632,799

METHODS FOR FORMING TUBULAR CLOSED-ENDED ARTICLES OF THERMOFORMABLE POLYMER MATERIAL

David A. Dick, Wantage; Rickworth Folland, Farringdon; Desmond P. Smith, Oxfordshire, and Glyn Staines, Swindon, all of England, assignors to Metal Box p.l.c., Reading, England

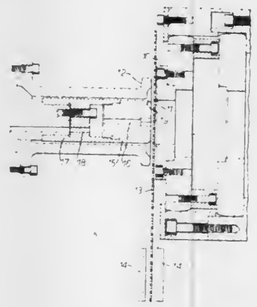
PCT No. PCT/GB84/00078, § 371 Date Nov. 9, 1984, § 102(e) Date Nov. 9, 1984, PCT Pub. No. WO84/03657, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 13, 1984, Ser. No. 672,249

Claims priority, application United Kingdom, Mar. 14, 1983, 8306936

Int. Cl.⁴ B29C *51/08, 51/10, 51/42*

U.S. Cl. 264—292 8 Claims



1. A method of forming a tubular article with a closed end from a thermoformable polymer material which is a crystallisable polymer material, comprising the steps of pre-heating at least a portion of the sheet of that crystallisable, thermoformable polymer material to a temperature above the glass transition temperature of the polymer but below its melting point and below that temperature at which rapid crystallisation of the polymer material begins, clamping an annular region of the sheet surrounding the said portion, forcing a punch through the plane of the sheet, centrally within an annular die with a clearance between the punch and die, so as to draw the heated portion of the sheet into tubular form without exerting compressive stresses on the drawn sheet between the side of the punch and the die, maintaining the punch at a temperature below the glass transition temperature of the polymer, and moving the punch at a speed of at least ½ meter per second to effect the drawing.

4,632,800

PROCESS FOR PRODUCING A THIN FILM HAVING AT LEAST ONE MONOMOLECULAR LAYER OF NON-AMPHIPHILIC MOLECULES

André Barraud, Bures-sur-Yvette; Annie Ruaudel, Verriéres le Buisson, and Michel Vandevyver, Chatenay Malabry, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 9, 1985, Ser. No. 732,279

Claims priority, application France, May 10, 1984, 84 07213

Int. Cl.⁴ B05D *1/20;* B29C *41/00*

U.S. Cl. 264—298 14 Claims

1. A process for producing a thin film having at least one monomolecular layer of nonamphiphilic molecules A, which comprises the steps of:

(a) combining said non-amphiphilic molecules A with amphiphilic molecules B thereby forming a complex of molecules A and B, said amphiphilic molecule B being depositable on a support in the form of the monomolecular layer by the Langmuir-Blodgett method;

(b) forming on the surface of the liquid employed in the Langmuir-Blodgett technique a monomolecular layer of the thus obtained complex; and

(c) transferring the thus formed monomolecular layer to a rigid support.

4,632,801

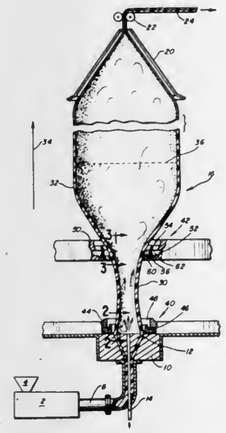
BLOWN FILM EXTRUSION

Laurence E. Dowd, Arlington Heights, Ill., assignor to Norchem, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 598,255, Apr. 9, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 779,397

Int. Cl.⁴ B29C *47/88*

U.S. Cl. 264—566 8 Claims



1. In a method of making polyolefin film comprising the steps of extruding molten polyolefin material through an annular die to form a tubular film, withdrawing said tubular film from said die in a machine direction, and expanding said tubular film in a direction transverse to said machine direction by maintaining a positive gas pressure therein, said tubular film defining first and second regions generally coaxial with said die, said first region being adjacent said die and extending therefrom in said machine direction and having a maximum diameter substantially equal to the diameter of said die, said second region extending in said machine direction from said first region at a point of intial expansion of said film and having a diameter substantially greater than those of said die and said first region with a frost line located downstream in said machine direction from said point of initial expansion, the improvement wherein said polyolefin material is selected from homopolymers of ethylene made under high pressure conditions, copolymers of ethylene and one or more members of the group consisting of vinyl acetate and butyl acrylate made under high pressure conditions, and high density copolymers of ethylene and 1-olefins having three to eight carbon atoms made under low pressure conditions, said polyolefin material having an elongational viscosity of at least about 350,000 poise at 190° C., and which is substantially independent of applied stress at the temperature of extrusion and wherein a first air ring coaxial with said die and said tubular film is positioned about said tubular film adjacent said die to provide air flow in a direction parallel to said machine direction to stabilize said film without allowing substantial expansion thereof, and a second air ring is positioned about said tubular film at said point of initial to provide suction force in said transverse direction to assist in said expansion and cooling and maintain the stability of said film.

4,632,802

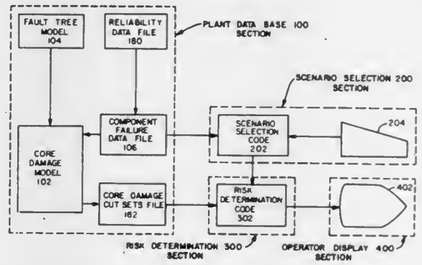
NUCLEAR PLANT SAFETY EVALUATION SYSTEM

John J. Herbst, West Hartford; Richard G. Sider, Granby; Robert E. Jaquith, Somers, and Christoffel H. Meijer, Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 16, 1982, Ser. No. 418,891

Int. Cl.⁴ G21C *7/36*

U.S. Cl. 376—216 7 Claims



1. In a nuclear power plant having a reactor core, a multiplicity of plant components for providing reactor safety functions including reactor shutdown, reactor coolant inventory control, reactor coolant pressure control, reactor core heat removal, and reactor coolant heat removal, and a plant control room including means for generating a status signal indicative of the availability of at least some of said components, an improved safety evaluation system comprising:

means for storing a plant-specific data base including component level core damage logic paths and the failure probability of each component, said logic paths being in the form of constituent cutsets, each of said cutsets consisting of a representation of an initiating event and the necessary component failures that would prevent an adequate plant response to avoid core damage;

means for selecing plant condition scenarios by modifying at least one of said component failure probabilities to represent plant components actually or potentially unavailable;

means responsive to the means for storing a plant-specific data base and the means for selecting plant condition scenarios, for associating a risk figure of merit with the change in the core damage occurrence rate resulting from the unavailable components, said means for associating a risk figure of merit including a computer implemented program for determining the core damage occurrence rate according to

$$W = \sum_{i=1}^{N} w_i$$

where W is the sum of the cutset occurrence rates, N equals the number of core damage cutset, and wherein

$$w_i = \lambda_i \prod_{j=1}^{N_c} q_{ij}$$

where λ_i is the initiating event occurrence rate and q_{ij} is the failure probability of component j during the period of time that the cutset i scenario is in progress; and

means for displaying the figure of merit relative to a base reference value, including a console screen having means

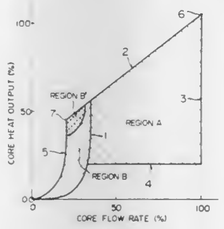
for projecting a graph representing the risk figure of merit over a period of at least several days preceding and following the present moment of interest, said graph including a base line indication of the risk figure of merit associated with the nominal availability of all components.

4,632,803

OPERATING METHOD OF BOILING WATER REACTOR

Yasunori Bessho, Hitachi; Sadao Uchikawa, Katsuta, and Motoo Aoyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,760
Claims priority, application Japan, Sep. 6, 1982, 57-155044
Int. Cl.⁴ G21C *7/06*
U.S. Cl. 376—238 **4 Claims**



1. A method of controlling an operation of a boiling water reactor having a core heat output thereof controlled by operating control rods to insert or withdraw the control rods and by regulating a core flow rate delivered by a circulating pump without effecting shutdown of the reactor comprising the steps of:

inserting, when the core flow rate is decreased due to a trip of the circulating pump, at least one control rod, which has been fully withdrawn or inserted to a depth smaller than 12/24 of a core height, to a depth not smaller than 3/24 and not greater than 12/24 of the core height; and

withdrawing, when the core flow rate is decreased due to a trip of the circulating pump, at least one control rod, which has been inserted to a depth greater than 13/24 of the core height, to a depth not smaller than 13/24 of the core height.

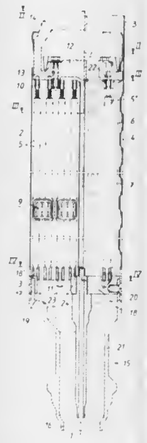
4,632,804

FUEL ASSEMBLY FOR A BOILING WATER REACTOR

Anders Wallander; Bo Borrman, both of Västeras, and Arne Mansson, Surahammar all of Sweden, assignors to Ab Asea Atom, Vasteras, Sweden

Filed Jul. 18, 1984, Ser. No. 632,074
Claims priority, application Sweden, Aug. 4, 1983, 8304263
Int. Cl.⁴ G21C *3/32*
U.S. Cl. 376—444 **3 Claims**

1. A fuel assembly for a boiling water reactor, comprising a plurality of vertical fuel rods (**5**), a fuel channel (**2**) enclosing said fuel rods and having a vertical centre axis (**1**) and an approximately rectangular cross-section, an inlet sleeve (**15**) secured to a lower end portion of said fuel channel, and a supporting device supported by said inlet sleeve and arranged to support said fuel rods, said fuel channel (**2**) being divided into four sub-channels (**8**) by means of a hollow stiffening device (**6**) secured to said fuel channel (**2**), having a cruciform cross-section and running along at least the active lengths of said fuel rods, each of said sub-channels (**8**) surrounding a bundle of fuel rods which comprises about ¼ of the total number of fuel rods in the fuel assembly, each one of said fuel rod bundles comprising a bottom tie plate (**11**), a top tie plate (**10**), means (**22, 23**) for achieving a tensile-force transmitting connection between said tie plates and a plurality of spacer devices (**9**) arranged axially one after the other, wherein said supporting device comprises a horizontal supporting plate (**18**) formed with an approximately rectangular circumference, said supporting plate being inserted into said inlet sleeve (**15**) and being provided with four through-going supporting plate holes (**19**), which are each arranged in a corresponding quadrant of said supporting plate (**18**), each bottom tie plate (**11**) having an upper portion with a downwardly-directed contact surface (**24**) resting on said supporting plate (**18**), and a non-round lower portion which is surrounded by a non-round guide



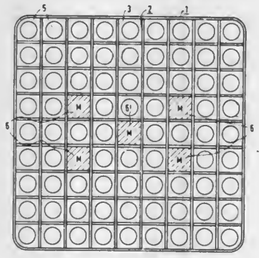
portion of said supporting plate hole (**19**), said guide portion for the major part being defined by a first closed vertical cylindrical surface, said non-round lower bottom tie plate portion for the major part being defined by second closed, vertical cylindrical surface, said cylindrical surfaces being adapted to each other in shape in such a way that no mentionable freedom of rotation or freedom of horizontal movement of said non-round lower bottom portion with respect to said guide portion exists.

4,632,805

FUEL ASSEMBLY WITH SQUARE CROSS SECTION FOR WATER-COOLED NUCLEAR REACTORS

Peter Suchy, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,512
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309449
Int. Cl.⁴ G21C *3/32*
U.S. Cl. 376—446 **5 Claims**



1. Fuel assembly with a square cross section for water-cooled nuclear reactors, the fuel assembly having fuel rods disposed in a square array prescribed by spacers defining square grid meshes, comprising rods without fuel disposed,

instead of the respective fuel rods, at individual positions of the square array distant from the marginal edge of the fuel-assembly cross section, for varying moderation ratio of the fuel assembly, said rods without fuel having a square cross section smaller than the cross section of the respective grid meshes only by a clearance sufficient for assembling said rods without fuel in the respective grid meshes and disassembling said rods without fuel from the respective grid meshes.

4,632,806

COPPER ALLOY HAVING HIGH RESISTANCE TO OXIDATION FOR USE IN LEADS ON SEMICONDUCTOR DEVICES

Masaki Morikawa, Iwatsuki; Hideaki Yoshida, Kasukabe, and Kunio Kishida, Ohmiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Division of Ser. No. 529,593, Sep. 6, 1983, Pat. No. 4,525,434. This application Dec. 17, 1984, Ser. No. 682,374
Claims priority, application Japan, Oct. 19, 1982, 58-183554
Int. Cl.⁴ C22C *9/02, 9/06*
U.S. Cl. 420—479 **2 Claims**

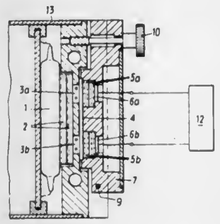
1. A Cu alloy having high resistance to oxidation for use in leads on semiconductor devices, which consists essentially of 7–15% Mn, 10–25.5% Zn, 0.2–10% Ni, 0.1–3% Al, 0.2–3% of Sn, the percentage being by weight, with the balance being Cu and incidental impurities.

4,632,807

OPTICAL SENSOR FOR FLUORESCENCE MEASUREMENTS

Hermann Marsoner, Steinberg, Austria, assignor to AVL AG, Schaffhausen, Switzerland

Filed Dec. 21, 1983, Ser. No. 563,931
Claims priority, application Austria, Dec. 28, 1982, 4712/82
Int. Cl.⁴ G01N *21/62*
U.S. Cl. 422—68 **7 Claims**



1. An optical sensor apparatus which has an operating mode and a non-operating mode and when in its operating mode can measure the partial pressure of a particular gas in a liquid or gaseous sample medium and when in its operating mode comprises

a sample chamber for containing the liquid or gaseous sample medium which contains a particular gas whose partial pressure is to be measured, said sample chamber having first and second opposite sides,

a separate reference chamber for containing a reference medium, said reference chamber having first and second opposite sides,

a light source for radiating excitation light toward the first side of each of said sample chamber and said reference chamber,

a unitary excitation filter positioned between said light source and the first side of both said sample chamber and said reference chamber, said unitary excitation filter covering the first side of both said sample chamber and said reference chamber and functioning to filter the excitation light from said light source which passes to each of said sample chamber and said reference chamber,

a single fluorescent sensor element positioned to cover the second sides of both said sample chamber and said reference chamber, said single fluorescent sensor element including a first portion and a second portion and a first side and a second side, the first side of said first portion facing said sample chamber and the first side of said second portion facing said reference chamber, and the second sides of both first and second portions facing away from said sample chamber and said measuring chamber respectively,

first and second separate emission filter means located on the second side of said single fluorescent sensor element, said first and second emission filter means having first sides which face said single fluorescent sensor element and second sides facing away therefrom, the first side of said first emission filter means facing the second side of said first portion of said single fluorescent sensor element and the first side of said second emission filter means facing the second side second portion of said single fluorescent sensor element, and

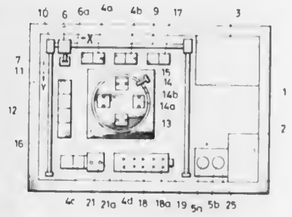
first and second photodetectors respectively located on the second sides of said first and second emission filter means, said optical sensor apparatus operating such that rays of excitation light from said light source will pass through different areas of said unitary excitation filter, then through each of said sample chamber and said reference chamber, then into said first and second portions of said single fluorescent sensor element, thereby generating fluorescent radiation which is quenched in said first and second portions by the respective sample medium and reference medium, the fluoresent radiation generated in said first and second portions of said single fluorescent sensor element respectively then passing through said first and second emission filter means and respectively to said first and second photodetectors.

4,632,808

CHEMICAL MANIPULATOR

Masahiro Yamamoto; Hiroshi Tanaka, and Chihiro Watanabe, all of Tokyo, Japan, assignors to Science and Technology Agency, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,280
Claims priority, application Japan, Apr. 15, 1983, 58-66716; Apr. 21, 1983, 58-70419; May 20, 1983, 58-88735
Int. Cl.⁴ G01N *35/00, 35/02, 37/00*
U.S. Cl. 422—72 **2 Claims**



1. A chemical manipulator comprising, in a housing, a centrifugal separator capable of accommodating at least more than one reaction container, a mixer device thermostatic device, a dryer for drying said reaction containers, a reagent supplying device for supplying a reagent to said reaction containers, a transporting device located in an upper portion of said housing having means for moving said reaction containers in a three-dimensional fashion, including guide rails in the X-direction and the Y-direction at a right angle thereto, for movement of said container in said upper portion of said housing and conveying said containers while being located relative to said centrifugal separator, said mixer device, said thermostatic device, said dryer and said reagent supplying device, and a controller for

controlling said centrifugal separator, said mixer device, said thermostatic device, said dryer, said reagent supplying device and said transporting device,

wherein said mixer device comprises an eccentric shaft supported on a base bed and a first motor for rotatably driving said eccentric shaft, a swinging base plate swingingly supported on said base bed through a resilient member and pivotally supported on said eccentric shaft, a swinging case provided integral with said swinging base plate, a reaction container accommodating portion formed on said swinging case, a position detecting means for detecting a rotated position of said eccentric shaft, and a second motor for rotatably driving said eccentric shaft to a predetermined position in accordance with a signal of said detection means, characterized in that when said first motor stops, said swinging case is rested at a predetermined position by said second motor.

4,632,809

APPARATUS FOR THE CRYSTALLIZATION/SEPARATION OF MATERIAL MIXTURES

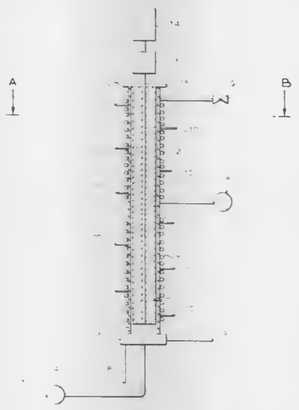
Wilfried Otto, Wolfenbüttel; Hatto Papendieck, Erkerode; Harald Konradt, Wolfenbüttel, and Claus-Henning Röder, Braunschweig, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,559

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317537

Int. Cl.[4] B01D *9/04*

U.S. Cl. 422—254 **15 Claims**



1. Apparatus for the crystallization/separation of a material mixture, comprising:

a vertical crystallization column having an upper end and a lower end and an inner surface, a cooling coil and a heating coil positioned therearound, upper and lower covering plates, a feeding-in conduit connected to said column for feeding said material mixture into said column, at least one withdrawal conduit connected to said column; a feeding element connected with said feeding conduit and a withdrawal element connected with said at least one withdrawal conduit;

drive motor means located along said vertical crystallization column; and

a rotating aisle member including a plurality of fins which are constructed and arranged on said aisle member so as to distribute said material mixture into substantially segmented-shaped chambers of approximately equal size, and said aisle member being disposed in said vertical crystallization column and connected to said drive means so as to be driven by said drive means and being disposed about the central axis of said vertical crystallization column.

4,632,810

METHOD FOR TREATING WASTE GAS TO SEPARATE AND RECOVER GYPSUM AND DUST THEREIN

Naoharu Shinoda; Atsushi Tatani; Naohiko Ukawa; Masakazu Onizuka, all of Hiroshima, and Taku Shimizu, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,117

Claims priority, application Japan, Feb. 28, 1984, 59-35177

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **2 Claims**

1. A process of treating waste gas which includes, dust and SO_2, comprising the steps of:

(a) spraying a slurry mainly containing dust into waste gas on the upstream side of a dry dust collector,

(b) removing coarse dust and dried solid material resulting from spraying in step (a) while the waste gas flows through said dry dust collector, thereafter introducing the waste gas into a wet type absorbing unit, feeding said wet type absorbing unit with at least one of calcium hydroxide and calcium carbonate which serve as absorbent, thus removing SO_2 in the waste gas and fine dust in the wet type absorbing unit, said fine dust being such that it has passed through said dry dust collector,

(c) blowing air into an absorbing liquid tank in which absorbing liquid to be fed to the wet type absorbing unit is stored, oxidizing said absorbing liquid to produce gypsum and preparing absorbing liquid in which a second slurry of fine dust particles and gypsum particles is contained, and

(d) separating first slurry and second slurry from the thus prepared absorbing liquid while the latter is kept in the stirred state with a partition disposed in the absorbing liquid tank, said first slurry including mainly gypsum particles and said second slurry including mainly fine dust particles, thereafter taking out both of the first and second slurry separately from the absorbing liquid tank, and delivering said second slurry to step (a) without requiring treatment of drainage waste water and sludge in the process.

4,632,811

CRYSTALLINE SILICOPHOSPHOALUMINATE MCM-3

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,661, Dec. 19, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,185

Int. Cl.[4] C01B *25/36, 33/28*

U.S. Cl. 423—306 **16 Claims**

1. A synthetic crystalline material having a composition as follows:

$$vA:M_{x/m}{}^{m+}:(AlO_2)_{1-y}{}^{-}:(PO_2)_{1-x}{}^{+}:(SiO_2)_{x+y}:N_{y/n}{}^{n-}:w(H_2O)$$

wherein M is a cation of valence m, N is an anion of valence n, A is occluded organic directing agent and solvent, v is the number of moles of A, w is the number of moles of H_2O and x and y are numbers of from greater than -1 to less than $+1$ which satisfy the relationships:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) if the atomic ratio of Al/P is greater than 1, then $x+y$ is greater than 0.001 and $y+0.6x$ is less than 0.4, and

(4) if the atomic ratio of Al/P is less than 1, then $x+y$ is greater than 0.001 and $x+0.5y$ is less than 0.5,

which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1-A of the specification.

4,632,812

PROCESS FOR MAKING ALKALI METAL PHOSPHATE SOLUTIONS CONTAINING LITTLE VANADIUM

Johannes-Wilhelmus Kinneging, Middelburg; Wouter Roos, Nisse; Bernardus J. Damman, Middelburg; Andries Jelsma, Goes, all of Netherlands, and Raban von Schenck, Hofheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,700

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1984, 3437685

Int. Cl.[4] C01B *25/16, 15/16, 25/26*

U.S. Cl. 423—309 **9 Claims**

1. In the process for making alkali metal phosphate solutions having low contents of vanadium from phosphoric acids containing vanadium values by reducing the vanadium contained in the acids with the aid of reductants, precipitating the reduced vanadium in the presence of ferrous ions by subjecting the phosphoric acids to neutralization in two stages with an alkali metal hydroxide and/or carbonate and separating the resulting precipitate from the alkali metal phsophate solutions obtained the improvement, which comprises: adding to the phosphoric acids reductants which establish therein a negative redox potential, neutralizing the acids in the first neutralization stage to an alkali metal/phosphorous-molar ratio between 0.85 and 1.0 maintaining this molar ratio over a period of at least 10 minutes without separating the precipitates formed, thereafter increasing the alkali metal/phosphorus-molar ratio to 1.9 to 2.1 in the second neutralization stage and separating jointly the precipitates yielded in the two neutralization stages from the alkali metal phosphate solutions obtained.

4,632,813

PROCESS FOR THE PRODUCTION OF WATER SOLUBLE AMMONIUM PHOSPHATES

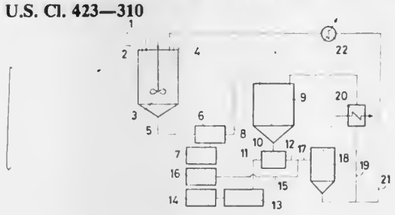
Filippo Anastasi; Guido Anania; Vito Cultrera, and Giuseppe Carfi', all of Gela, Italy, assignors to Enichem Agricolutra, Palermo, Italy

Filed Apr. 11, 1985, Ser. No. 722,315

Claims priority, application Italy, Apr. 18, 1984, 20586 A/84

Int. Cl.[4] C01B *25/28*

U.S. Cl. 423—310 **14 Claims**



1. Process for the production of water soluble ammonium phosphates, comprising

(a) reacting ammonia and untreated wet process phosphoric acid having a P_2O_5 concentration of from 30 to 54%, at a pH of from 4 to 4.5 or 7.5 to 8 and a temperature of from 80° to 95° C., for a period of from 10 to 30 minutes;

(b) filtering under high temperature conditions the reaction suspension, separating the impurity-containing sludges from an aqueous solution of ammonium phosphate;

(c) cooling and crystallizing the ammonium phosphate aqueous solution; and

(d) separating the formed crystals of ammonium phosphate from the mother liquor.

4,632,814

PROCESS FOR STABILIZING PHOSPHORIC ACID

Steven J. Dougherty, Sumner, Wash., and Ray E. Barker, Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 20, 1985, Ser. No. 811,335

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—321 R **14 Claims**

1. A process for removing sludge-forming components from a wet process phosphoric acid comprising the steps of contacting the acid in a pressure vessel with high pressure carbon dioxide at a pressure of at least about 600 psig, aging the carbon dioxide treated acid until sludge-forming components precipitate and separating said precipitated sludge-forming components from said acid.

4,632,815

CRYSTALLINE LAYERED SILICATE

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 541,618, Oct. 13, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 682,492

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **2 Claims**

1. A crystalline layered silicate having an X-ray diffraction pattern exhibiting the values of Table I of the specification and a composition as synthesized on an anhydrous basis in terms of moles of oxides per mole of silica, expressed by the formula:

$$\underset{SiO_2}{(0.01-10)R_2O:(0-2)M_{2/n}O:(0-2.5)Al_2O_3:100}$$

wherein R is at least one cation of an organic directing agent selected from the group consisting of tert-butyl-trimethylanalinium hydroxide, tert-butyl-trimethylanalinium halide, N-methyl-3,5-dimethylpyridinium hydroxide, N-methyl-3,5-dimethylpridinium halide, $[(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3]_1(X^-)_2$, where X is a halide and mixtures thereof, M is at least one cation selected from the group consisting of alkali and alkaline earth metals and mixtures thereof and n is the valence of M.

4,632,816

PROCESS FOR PRODUCTION OF SILANE

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 449,486, Dec. 13, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,947

Int. Cl.[4] C01B *33/04*

U.S. Cl. 423—347 **51 Claims**

1. A process for the production of silane wherein silicon tetrafluoride is reacted in an inert liquid reaction exclusively with sodium aluminum tetrahydride, potassium aluminum tetrahydride, or a mixture of sodium aluminum tetrahydride and potassium aluminum tetrahydride.

4,632,817

METHOD OF SYNTHESIZING DIAMOND

Shuji Yazu; Kazuo Tsuji, and Akito Yoshida, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 28, 1985, Ser. No. 717,074

Claims priority, application Japan, Apr. 4, 1984, 59-67855; Mar. 15, 1985, 60-52942

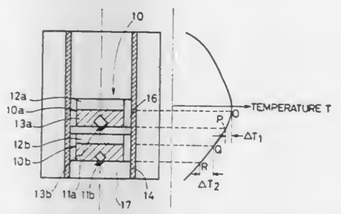
Int. Cl.[4] C01B *31/06*

U.S. Cl. 423—446 **13 Claims**

1. A method of synthesizing diamond under diamond-stable superhigh pressure and temperature by employing carbon sources, solvent metals for dissolving said carbon sources and seed crystals to grow diamond crystals, said method comprising the steps of:

preparing a synthesizing vessel divided into at least two synthesizing chambers by one or more partition layers;

placing said solvent metals which are different from each other in eutectic temperature with respect to carbon, in the respective at least two synthesizing chambers of said synthesizing vessel, placing said carbon sources to be in contact with highest-temperature portions of said solvent metals and placing said seed crystals in contact with low-



est-temperature portions of said solvent metals in respective ones of said divided synthesizing chambers, and

growing diamond crystals in said solvent metals in respective ones of said divided synthesizing chambers, said growing step including providing a temperature gradient from a high temperature to a low temperature across said at least two synthesizing chambers.

4,632,818

PRODUCTION OF SULFUR FROM AN OXYGEN ENRICHED CLAUS SYSTEM

Michael S. K. Chen, Zionsville; W. Patrick Hegarty, Allentown, both of Pa., and Dipak J. Sampat, Aurora, Colo., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 657,322, Oct. 3, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,687

Int. Cl.⁴ C01B *17/04;* **F23L** *7/00;* **G05D** *23/13*

U.S. Cl. 423—574 R **13 Claims**

1. In a process for recovering sulfur from a feed gas containing 60 mole % or greater of hydrogen sulfide wherein the gas stream is partially combusted with an oxygen-enriched gas in a Claus reaction furnace zone, a combustion effluent is cooled with the attendant condensation separation of sulfur in a condensation zone and the remaining effluent stream is further treated, the improvement comprising introducing a temperature moderating stream of fluid sulfur into the reaction furnace zone to moderate the temperature of the oxygen enriched reaction furnace zone.

4,632,819

PROCESS FOR REMOVING HYDROGEN SULFIDE FROM EXHAUST GAS AND FOR PRODUCING SULFUR BY THE CLAUS PROCESS

Herbert Fischer, Lollar, and Manfred Kriebel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,594

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415722

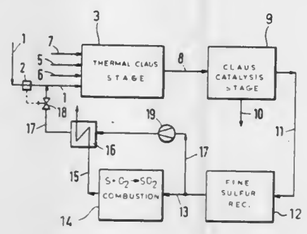
Int. Cl.⁴ B01D *53/36;* **C01B** *17/04*

U.S. Cl. 423—574 R **6 Claims**

1. In a process for removing hydrogen sulfide from an H_2S-containing feed gas by the Claus process and for producing elemental sulfur, wherein the feed gas is partially burnt with an oxygen-containing gas in a thermal Claus process plant having at least one combustion chamber in which a temperature in the range of 850° to 1350° C. is maintained, a process gas produced in said combustion chamber is passed through a Claus catalysis plant from which sulfur is withdrawn, exhaust gas from the Claus catalysis plant is supplied to a desulfurizing plant, and exhaust from said desulfurizing plant is at least partially subject to a thermal aftertreatment to convert sulfur compounds contained in the exhaust gas from the desulfurizing plant to SO_2 to produce an SO_2-containing exhaust gas, the improvement which comprises in combination:

the rate of supply of the H_2S-containing feed gas in said thermal Claus process plant is measured;

a recycle gas consisting of recycled exhaust gas from the desulfurizing is admixed with said H_2S-containing feed gas when the thus-measured feed rate of the latter is below a limit in the range from 20 to 35% of a total feed gas rate which is permissible for the thermal Claus process plant;



the recycle gas is thus admixed at such a rate that the rate of the mixed feed and recycle gases exceeds that limit;

the recycle gas is heated to 200° to 400° C. before it is mixed with the feed gas; and

interrupting admixture of said exhaust gas with said feed gas and subjecting all said exhaust gas to said thermal aftertreatment as long as the rate of said feed gas exceeds said limit.

4,632,820

NOVEL RADIOACTIVE ESTRATRIENES

Alain Jouquey; Gaëtan Touyer; Jean Salmon, and Michel Mouren, all of Paris, France, assignors to Roussel Uclaf, Paris, France

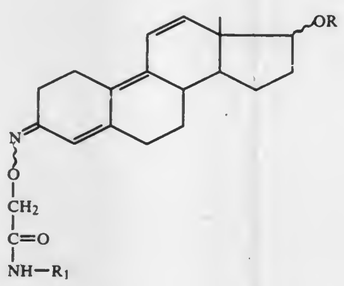
Filed Dec. 12, 1983, Ser. No. 560,184

Claims priority, application France, Dec. 13, 1982, 82 20845

Int. Cl.⁴ A61K *49/00, 43/00*

U.S. Cl. 424—1.1 **17 Claims**

1. A radioactive $\Delta^{4,9,11}$-estratriene marked with iodine 125 or 131 having the formula



I

wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and acyl of an organic carboxylic acid of 2 to 12 carbon atoms, R_1 is the reminder of an amino acid of the formula R_1NH_2 or a derivative thereof being marked with iodine 125 or 131 and the wavy lines indicate the —OR is in the α- or β-position and the oximido group is in the syn or anti position.

11. A process comprising administering to warm-blooded animals a radioimmunological dose of a compound of claim 1 and determining the amount of $\Delta^{4,9,11}$-estratriene-17β- and 17α-ol-3-one in the animal or human biological liquids and tissues and alimentation.

4,632,821

MAGNESIUM TRISILICATE SUITABLE FOR PREPARATION OF MEDICAMENT ADSORBATES OF DECONGESTANTS

David Peters, Long Valley; John Denick, Jr., Newton, and Anil K. Talwar, Long Valley, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 516,002, Jul. 20, 1983, Pat. No. 4,581,232. This application Dec. 19, 1985, Ser. No. 810,961

Int. Cl.⁴ A61K *9/18, 33/12*

U.S. Cl. 424—15 **7 Claims**

1. A medicament adsorbate which comprises magnesium trisilicate having a surface area of at least 400 m^2/g and having a flake-like structure with multiple interstitial spaces, and containing adsorbed therein from about 1% to about 20% by weight of the adsorbate of a medicament drug wherein the medicament drug is selected from the group of decongestant materials consisting of phenylephrine hydrochloride, phenylpropanolamine hydrochoride, pseudoephedrine, ephedrine and mixture thereof.

4,632,822

MAGNESIUM TRISILICATE SUITABLE FOR PREPARATION OF MEDICAMENT ADSORBATES OF ANTIASMATICS

David Peters, Long Valley; John Denick, Jr., Newton, and Anil K. Talwar, Long Valley, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 516,002, Jul. 20, 1983, Pat. No. 4,581,232. This application Dec. 19, 1985, Ser. No. 810,812

Int. Cl.⁴ A61K *9/18, 33/12*

U.S. Cl. 424—15 **7 Claims**

1. A medicament adsorbate which comprises magnesium trisilicate having a surface area of at least 400 m^2/g and having a flake-like structure with multiple interstitial spaces, and containing adsorbed therein from about 1% to about 20% by weight of the adsorbate of a medicament drug wherein the medicament drug is selected from the group of antitasmatics consisting of aminophyline, epinephrine, theophylline, and mixtures thereof.

4,632,823

MAGNESIUM TRISILICATE SUITABLE FOR PREPARATION OF MEDICAMENT ADSORBATES OF APPETITE SUPPRESSANTS

David Peters, Long Valley; John Denick, Jr., Newton, and Anil K. Talwar, Long Valley, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 516,002, Jul. 20, 1983, Pat. No. 4,581,232. This application Dec. 19, 1985, Ser. No. 810,960

Int. Cl.⁴ A61K *9/18, 33/12*

U.S. Cl. 424—15 **7 Claims**

1. A medicament adsorbate which comprises magnesium trisilicate having a surface area of at least 400 m^2/g and having a flake-like structure with multiple interstitial spaces, and containing adsorbed therein from about 1% to about 20% by weight of the adsorbate of a medicament drug wherein the medicament drug is the appetite suppressant caffeine.

4,632,824

COMPOSITIONS APPLIED IN THE MOUTH

Kazuo Hirota, Tokyo; Shoji Akahane, Higashikurume, and Kentaro Tomioka, Chofu, all of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,817

Claims priority, application Japan, Jun. 6, 1983, 58-99522

Int. Cl.⁴ A61K *9/68, 7/16, 7/24, 7/26*

U.S. Cl. 424—49 **4 Claims**

1. In a method of treatment of teeth to prevent tooth decay of the surface of teeth on which Streptococcus mutans plaque causing dental caries forms, the improvement over traditional "tooth black", which blackens the teeth, which consists of the step of applying to said teeth a toothpaste, powder, gel, mouthwash, or gargle composition comprising a tannic acid derivative which is sparingly soluble in water, wherein said tannic acid derivative is selected from the group consisting of tannic acid—protein combinations, tannic acid—formaldehyde combinations and acetyl tannic acid in an amount effective to inhibit dental plaque formation.

4,632,825

STABLE ANTIPLAQUE DENTIFRICE

Robert J. Ferlauto, Jr., Edison, and Kathleen M. Yuhasz, Fords, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 648,926, Sep. 10, 1984, abandoned. This application Apr. 25, 1986, Ser. No. 855,654

Int. Cl.⁴ A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 **3 Claims**

1. A process of preparing a cosmetic and chemically stable aqueous fluoride-containing antiplaque dentifrice comprising a quaternary ammonium antiplaque compound, a betaine surfactant, flavor, glycerin and/or sorbitol humectant, and a nonionic gelling agent, which comprises the formation of two separate gel phases, an oil gel phase consisting essentially of the quaternary ammonium compound, the betaine surfactant and flavor; and a water gel phase consisting essentially of water, humectant and gelling agent; dissolving a fluorine-containing compound in the formula amount of water prior to the addition of the water to the humectant and gelling agent in the formation of the water gel phase; combining said two separate gel phases into a single gel phase; and adding a dental abrasive to said combined single gel phase or said water gel phase prior to the addition of the oil gel phase.

4,632,826

POLISHING COMPOSITION AND DENTIFRICE

Walter Plöger, Hilden; Hans-Jürgen Klüppel, Duesseldorf, and Franz Förg, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,412

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425152

Int. Cl.⁴ A61K *7/16, 7/18*

U.S. Cl. 424—52 **25 Claims**

1. A tooth cream, suitable for daily use, for removing stain caused by the consumption of tobacco, tea and mixtures thereof from the surfaces of teeth and to polish and clean the surface of said teeth, without producing any deep scratches or damage by daily use to the surfaces of the teeth, said tooth cream containing, as the essential stain removing component dentifrice polishing agent consisting essentially of

(a) 100 parts by weight of silica polishing agent consisting essentially of at least one of

(i) silica hydrogel, and

(ii) precipitated silica; and

(b) 2 to 15 parts by weight of weakly calcined alumina polishing agent consisting essentially of

(i) 10 to 50% by weight of gamma aluminum oxide and

(ii) 50 to 90% by weight of alpha aluminum oxide,

4,632,827

PEST CONTROL COMPOSITIONS

Manfred Schlosser, Lausanne, and Jakob Brassel, Lupsingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1985, Ser. No. 736,002
Claims priority, application Switzerland, May 25, 1984, 2572/84; Apr. 29, 1985, 1813/85
Int. Cl.[4] A61K *31/74;* A01N *25/00*
U.S. Cl. 424—78 17 Claims

1. A composition for controlling Cydia pomonella, which composition contains a compound of the formula



wherein R_1 and R_2 independently of one another are each C_1-C_6-alkyl and R_3 is C_1-C_6-alkyl or phenyl, together with suitable carriers, solvents, diluents and/or formulation auxiliaries.

4,632,828

PHARMACEUTICAL COMPOSITION

Fabio Carli, Turin, Italy, assignor to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Feb. 6, 1985, Ser. No. 698,784
Claims priority, application United Kingdom, Feb. 8, 1984, 8403360
Int. Cl.[4] A61K *31/56*
U.S. Cl. 424—80 14 Claims

1. A process for loading a water-swellable, water-insoluble polymer with methylhydroxyprogesterone acetate, which process comprises:

preparing and grinding a mixture of said polymer and methylhydroxyprogesterone acetate.

8. A pharmaceutical composition comprising a water-swellable, water-insoluble polymer loaded with the methylhydroxyprogesterone formulation prepared as described in claim 1, 2 or 3.

4,632,829

SEX PHEROMONE COMPOSITION FOR SOUTHWESTERN CORN BORER

Paul A. Hedin; Frank M. Davis; Joseph C. Dickens; Marcus L. Burks, and Thomas G. Bird, all of Starkville, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 8, 1985, Ser. No. 785,639
Int. Cl.[4] A01N *35/00, 25/00*
U.S. Cl. 424—84 6 Claims

1. A method of attracting southwestern corn borer male moths to a trap comprising employing as a lure on said trap a sex pheromone composition consisting essentially of Z9-Hexadecenal in an amount of about 16–26% by weight, Z11-Hexadecenal in an amount of about 56–85% by weight, and Z13-Octadecenal in an amount of about 6–10% by weight.

4,632,830

ORAL VACCINE FOR IMMUNIZATION AGAINST ENTERIC DISEASE

Samuel B. Formal, Kensington; Louis S. Baron, Silver Spring, and Dennis J. Kopecko, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1981, Ser. No. 289,013
Int. Cl.[4] A61K *39/112;* C12N *1/20*
U.S. Cl. 424—92 7 Claims

1. A genetic hybrid derivative, having deposit accession number ATTC 31904, of an attenuated galactose epimeraseless mutant strain of *S. typhi* and a non-typhoid protective antigen carried thereby, wherein the non-typhoid protection antigen is the form I antigen of *Shigella sonnei* and the genetic hybrid derivative strain expresses both *S. typhi* and *S. sonnei* antigens.

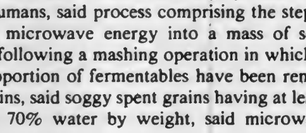
4,632,831

USES OF METHYL PHENYL PENTANOL DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF CONSUMABLE MATERIALS

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 681,656, Dec. 14, 1984. This application Oct. 4, 1985, Ser. No. 784,057
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] A23L *1/235*
U.S. Cl. 426—3 5 Claims

1. A process for augmenting or enhancing the grapefruit aroma or taste of a foodstuff or chewing gum comprising the step of adding to said foodstuff or chewing gum from about 0.1 ppm up to about 50 ppm by weight based on the total weight of said foodstuff or chewing gum of a 2-methyl-4-phenyl-1-pentanol derivative defined according to the structure:



wherein R is hydrogen or acetyl.

4,632,832

INSTANT CREAMING POWDER

Shigeo Okonogi, Tokyo; Kunisuke Kuwahara, Yokohama; Mamoru Tomita, Yokohama; Tsutomu Kudo, Yokohama; Takashi Suzuki; Toshio Tomimura, both of Chiba; Kaichiro Takahashi, Kawagoe, and Tomokazu Obayashi, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,786
Claims priority, application Japan, Aug. 15, 1984, 59-169296
Int. Cl.[4] A23L *1/19*
U.S. Cl. 426—96 8 Claims

1. An instant creaming powder enriched with flavor and/or color comprising:

(1) instant creaming powder, and

(2) at least 0.2 to 10 percent by weight of a mixture of fine particles having a particle size of 0.3 to 3 times the average particle size of said instant creaming powder (1), said mixture of said fine particles comprising a saccharide hydrolyzate and a saccharide-containing flavoring and/or coloring material.

4,632,833

METHOD OF MAKING FOOD FROM SPENT GRAINS

James J. Gannon, P.O. Box 1609, Hemlock Farms, Hawley, Pa. 18428

Division of Ser. No. 899,171, Apr. 24, 1978, Pat. No. 4,464,402. This application Jul. 31, 1984, Ser. No. 623,593
The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.
Int. Cl.[4] A23L *1/10;* A23J *1/12*
U.S. Cl. 426—242 18 Claims

1. The process of making, from soggy spent barley grains containing water and fats and oils, a high-protein food product edible by humans, said process comprising the steps of:

directing microwave energy into a mass of soggy spent grains following a mashing operation in which a substantial proportion of fermentables have been removed from the grains, said soggy spent grains having at least approximately 70% water by weight, said microwave energy being sufficiently intense to vaporize water associated with said spent grains:

continuing the application of microwave energy to dry the spent grains until the water content thereof is reduced to approximately 5 to 10% by weight;

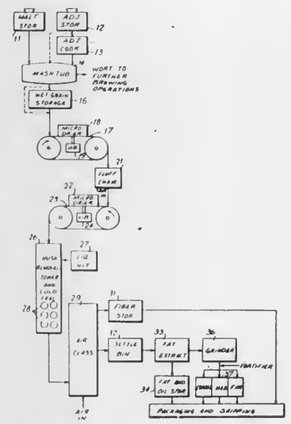
removing the substantially dry spent grains from the path of microwave transmission;

subjecting the substantially dried granular material to temperature sufficiently cold to embrittle the granular material;

applying mechanical pressure to the grains of the granular material to fracture husks therefrom;

separating the dried spent grains into a grain portion and a husk portion; and

thereafter applying, to the grain portion of the dried spent grains, a volatile solvent of the fats and oils to remove said fats and oils therefrom.



4,632,834

PROCESS FOR PRODUCING FROZEN SWEET POTATO PRODUCTS

Carson B. Barnes, Spring Hope, N.C., assignor to Farm Pak Products Inc., Spring Hope, N.C.

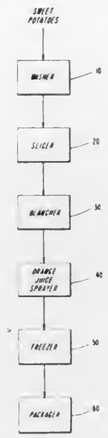
Filed Dec. 20, 1982, Ser. No. 451,047
Int. Cl.[4] A23L *1/216, 1/272*
U.S. Cl. 426—262 10 Claims

1. A process for producing a frozen sweet potato product comprising the steps of:

slicing sweet potatoes;

blanching the sweet potato slices in hot water;

cooling the blanched sweet potatoes to below 80° F.,



applying orange juice to the blanched and cooled sweet potato slices; and

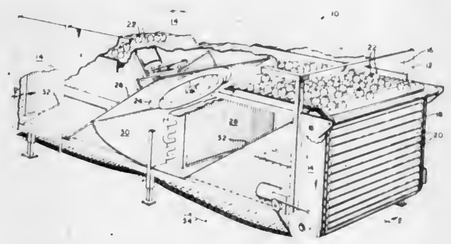
thereafter freezing the sweet potato slices.

4,632,835

FRUIT WAX DRYING PROCESS

James X. Norris, 507 Harris Ave., Selah, Wash. 98942

Filed Jan. 30, 1984, Ser. No. 575,419
Int. Cl.[4] A23B *7/16*
U.S. Cl. 426—302 13 Claims



1. A method of drying volatile liquid solvent containing wax-base coatings on fruit, comprising the steps of:

a. providing a substantially closed chamber having a conveyor path of selected width along which said fruit, to which said coating has been applied in a liquid form, is advanced;

b. transporting said fruit carrying said liquid coating and in a spaced relationship to each other through the chamber along the conveyor path;

c. cooling a drying gas to a temperature below that of said fruit; and

d. directing a stream of said cooled gas within the chamber onto said fruit, thereby causing evaporation of said liquid solvents from said coating.

4,632,836

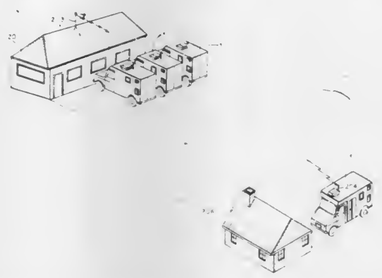
PIZZA PREPARATION AND DELIVERY SYSTEM

Maxwell T. Abbott, Rose Hill; Gary S. Streepy; John R. Paulus, both of Wichita; Ricardo Barrera, Rose Hill, and David E. Brewer, Wichita, all of Kans., assignors to Pizza Hut, Inc., Wichita, Kans.

Filed Apr. 12, 1984, Ser. No. 599,497

Int. Cl.[4] A23L *1/10;* **B60P** *3/00*

U.S. Cl. 426—302 **6 Claims**



1. A method for preparing pizza in a pizza delivery vehicle, comprising:

providing a pizza delivery vehicle comprising: means for receiving pizza delivery orders; a refrigerated pie case with uncooked pizza dough stored therein; a preparation station equipped with a variety of topping ingredients; and an oven;

while in transit, receiving a pizza delivery order;

while in transit, removing the pizza dough from the pie case;

selecting topping ingredients in accordance with the pizza delivery order from the preparation station;

assembling the dough and topping ingredients to form an uncooked pizza;

while in transit, placing the pizza in the oven at a selected temperature; and

removing the pizza from the oven after a selected cooking time.

4,632,837

PROCESS FOR THE PRODUCTION OF CONCENTRATED EXTRACTS FROM PLANTS

Erwin Schütz, Palling; Heinz-Rüdiger Vollbrecht, Stein; Klaus Sandner, Trostberg; Theodor Sand, and Peter Mühlnickel, both of Holzminden, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg and Haarmann & Reimer GmbH, Holzminden, both of, Fed. Rep. of Germany

Continuation of Ser. No. 375,646, May 6, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 652,152

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119454

Int. Cl.[4] A23L *1/28*

U.S. Cl. 426—425 **9 Claims**

1. Process for the production of a concentrated extract of odor and aroma components from fresh plants or plant parts containing these components, comprising the steps of completely isolating the flavor and aroma components by extracting in a single stage extraction, plants or plant parts having a water content of 30% or more, with carbon dioxide at supercritical pressure and at a temperature of from 0° to 40° C., and then separating the concentrated extract at sub-critical temperature and sub-critical pressure.

4,632,838

PROCESS FOR PREPARING FRENCH FRIED POTATO STRIPS

Michael G. Doenges, Newberg, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.

Filed Aug. 20, 1985, Ser. No. 767,791

Int. Cl.[4] A23L *1/217*

U.S. Cl. 426—441 **12 Claims**

1. A method of preparing french fried potato strips suitable for finish frying comprising the steps of:

cutting raw potatoes into strips;

blanching the strips a first time to at least partially gelatinize the same;

cooling the strips a first time;

blanching the strips a second time;

partially drying the strips in ambient air for a period of time sufficient to cause a weight loss of about 8 to 12%;

parfrying the strips in oil a first time;

cooling the strips a second time;

parfrying the strips in oil a second time; and then freezing the strips.

4,632,839

PROCESS FOR MANUFACTURING SOYMILK PRODUCTS WITH WHEAT GERMS

Yozo Morohoshi, Hiratsuka, Japan, assignor to Hidekatsu Kuroyanagi, Kanagawa, Japan

Filed Aug. 5, 1985, Ser. No. 762,283

Claims priority, application Japan, Sep. 3, 1984, 59-183987; Nov. 14, 1984, 59-239688

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—573 **13 Claims**

1. A process for manufacturing soybean milk products with wheat germs, which comprises:

(a) mixing a dispersion of wheat germs with a soy dispersion, wherein the mixing ratio of wheat germs in the wheat germ dispersion and soybeans in the soy dispersion is 1 to 150 parts by weight to about 100 parts by weight, to produce a mixture;

(b) heating said mixture to a temperature sufficient to remove the odor of the wheat germs;

(c) boiling said mixture in a steam cooker;

(d) filtering said mixture, and

(e) coagulating the mixture by adding nigari or an arificial coagulant.

4,632,840

PROCESS FOR PREPARATION OF DRESSINGS COMPRISING W/O/W TYPE MULTIPLE EMULSIONS

Yasuyuki Takahashi; Shigeru Aizawa; Shigeru Tamai; Toshiro Yoshida, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 610,853, May 16, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,181

Claims priority, application Japan, Mar. 2, 1984, 59-38668

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.[4] A23L *1/24*

U.S. Cl. 426—602 **2 Claims**

1. A process for preparing dressings comprising W/O/W two multiple emulsions which comprises mixing an oil phase containing an emulsifier selected from the group consisting of monoerucin, dierucin and polyglycerol polycondensed ricinoleic acid ester with an aqueous phase containing an amount of vinegar effective to season said dressing and agitating the mixture to obtain said dressing.

4,632,841

LOW FAT SPREADS CONTAINING EMULSION DISRUPTORS

Daniel W. Parke, Henrietta, N.Y., and Kenneth S. Baker, Tenafly, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 619,749, Jun. 11, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,213

Int. Cl.[4] A23D *3/00, 3/02*

U.S. Cl. 426—604 **24 Claims**

1. An edible water-in-oil emulsion, solid at refrigerator temperatures, comprising:

(i) from about 30 to 80% oil as the continuous phase, wherein said oil has:

(a) a solids content of 14 maximum at 10° C.,

(b) a solids content of 6.0 to 8.5 at 21.1° C., and

(c) a solids content of 0.7 to 2.8 at 33.3° C.;

(ii) from about 70 to 20% water as the dispersed phase; and

(iii) from about 10 to 75 parts per million, by weight of the total emulsion, of a nonionic emulsion disruptor with an HLB from 9 to 20.

4,632,842

GLOW DISCHARGE PROCESS FOR PRODUCING IMPLANTABLE DEVICES

Theodore Karwoski, and Yasuo Matsuzawa, both of Nashua, N.H., assignors to Atrium Medical Corporation, Hollis, N.H.

Filed Jun. 20, 1985, Ser. No. 747,011

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—2 **25 Claims**



1. A method of producing a tubular vascular prosthesis having a substantially non-thrombogenic inside surface and a biocompatible outside surface, said method comprising the steps of:

A. placing an elongate organic tubular substrate defining pores and having a selected outside diameter within a tubular reaction vessel;

B. establishing a flow of a fluorine-containing gas through said tubular substrate at a subatmospheric pressure;

C. permitting a portion of said gas to diffuse through said pores in transit through said tube;

D. applying an RF field to a portion of the volume of gas within said reaction vessel to produce glow discharge; and

E. inducing relative motion of said RF field and said tubular substrate to deposit along the length of said substrate a substantially non-thrombogenic, polymerized, cross-linked coating bonded to the inside surface of said substrate having a first F/C atomic ratio and a biocompatible, polymerized, cross-linked coating bonded to the outside surface of said substrate having an F/C atomic ratio lower than said first ratio wherein deposition of said polymerizable coating is controlled by controlling the pressure and flow rates of said gas and the field strength of said RF field.

4,632,843

PROCESS FOR THE PREPARATION OF SOLID PHARMACEUTICAL PRODUCTS

Claus H. Pich, and Thomas Moest, both of Moorrege, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,714

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306250

Int. Cl.[4] A61K *9/48, 33/14*

U.S. Cl. 427—3 **2 Claims**

2. Solid pharmaceutical pellets containing one or more active compounds or assistants in the form of spherical single crystal with diameters of 0.1-3 mm.

4,632,844

OPTICAL PRODUCT HAVING A THIN FILM ON THE SURFACE

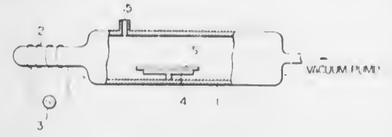
Kenji Yanagihara, Yokohama; Tetsuo Itoh, Machida; Mituo Kimura, Yokohama, and Masahiro Niinomi, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 694,996

Claims priority, application Japan, Feb. 4, 1984, 59-19198

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **15 Claims**



1. An optical product which utilizes the transmission, refraction or reflection of light and which has a thin film on its surface obtained by subjecting a mixed gas comprising oxygen and a hydrocarbon compound having at least one double bond in a molar ratio of the hydrocarbon compound to oxygen ranging from 0.1-10 to plasma polymerization in the presence of an optical product, thereby forming on said surface of the optical product a thin film of a reaction product of said plasma polymerization.

4,632,845

PROCESS FOR THE FABRICATION OF THERMAL PRINTING BOARDS IN MULTILAYER THICK-FILM TECHNOLOGY

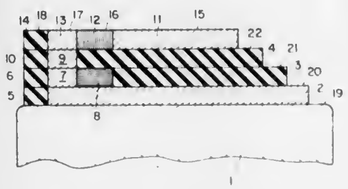
Günther Obstfelder, Weinheim-lützelsachsen; Gerhard Kreutze, Neckarsteinach, and Winfried Lüttig, Heiligkreuzsteinach, all of Fed. Rep. of Germany, assignors to F+O Electronic Systems GmbH & Co., Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,176

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241225

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **16 Claims**



1. A method for the fabrication of a thermal printing board

with electronic circuit elements or circuits in multilayer thick-film technology on a substrate, wherein at least one thick-film conducting layer is printed onto said substrate in the form of liquid or pastry mixture of materials and then heat-treated, the method comprising the steps of:

(a) depositing a first insulation layer on said first thick-film conducting layer;

(b) abrasively finishing the surface of said first insulation layer to provide at least the same surface conditions thereon as on the surface of said substrate;

(c) forming successively further insulation and conducting layers such that a conducting pathway is provided between the first thick-film conducting layer and a thick-film resistive layer;

(d) after each formation of said successive layers, abrasively finishing the surface of said formed layer to provide at least the same surface conditions as on the surface of said substrate; and

(e) depositing a thick-film resistive layer on the uppermost abrasively-finished insulating layer.

4,632,846

PROCESS FOR PREPARATION OF GLAZED CERAMIC SUBSTRATE AND GLAZING COMPOSITION USED THEREFOR

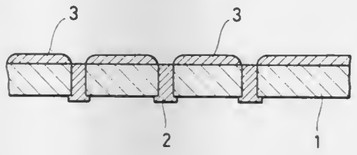
Hiroshi Fujinaka, and Masami Terasawa, both of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Sep. 13, 1985, Ser. No. 775,859

Claims priority, application Japan, Sep. 17, 1984, 59-195333; Sep. 21, 1984, 59-199133; Sep. 21, 1984, 59-199134; Sep. 27, 1984, 59-203175

Int. Cl.⁴ H05K *3/28*

U.S. Cl. 427—96 **9 Claims**



1. A process for the preparation of a glazed ceramic substrate, which comprises coating the entire surface of a ceramic substrate having a metallized metal portion with a paste of a glazing composition having a repellency to the metallized metal portion in the molten state, and sintering the paste-coated surface of the substrate in a reducing atmosphere to melt the glazing composition and cause the molten composition present on the metallized metal portion to migrate to the surface of the ceramic substrate, whereby a glazing layer is formed on the entire surface of the ceramic substrate exclusive of the metallized metal portion.

4,632,847

IN SITU POLYMERIC MEMBRANE FOR ISOLATING HAZARDOUS MATERIALS

Henry L. Lomasney; John G. Grawe, both of New Orleans, and Vikram K. Sheth, Kenner, all of La., assignors to Isotek Corporation, New Orleans, La.

Filed Feb. 6, 1985, Ser. No. 698,692

Int. Cl.⁴ B08B *7/00;* **B65B** *33/00*

U.S. Cl. 427—154 **46 Claims**

1. A process for isolating asbestos within an area, comprising the steps of

applying a liquid polymer composition in aqueous dispersion to the surfaces to be protected,

allowing the liquid polymer composition to coalesce into a water insensitive and insoluble seamless, bladder-like membrane which adheres to the surface to provide a high integrity receptacle capable of receiving and sustaining an influx of bulk asbestos, and which can be removed intact by physically peeling from the surface to which it has been applied,

peeling the membrane from the surface, and

compacting the peeled membrane to form a package of sufficient integrity to retain any entrapped asbestos throughout a disposal process.

4,632,848

COMPOSITION AND PROCESS FOR FORMING A TEMPORARY PROTECTIVE COATING ON AN ARTICLE AND ARTICLE SO-PROTECTED

Serge Gosset, Lestrem; Jean-Claude Lumaret, Bethune; Francis Fortunato, Tourcoing, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, France

Division of Ser. No. 620,381, Jun. 13, 1984, abandoned, which is a continuation of Ser. No. 389,756, Jun. 18, 1982, abandoned.

This application Feb. 11, 1985, Ser. No. 700,071

Claims priority, application France, Jun. 23, 1981, 81 12339

Int. Cl.⁴ B05D *1/36;* **C09K** *3/00*

U.S. Cl. 427—154 **12 Claims**

1. Process for forming on an article a temporary protective coating comprising the successive steps of applying an aqueous solution comprising at least one solubilized starch or starch derivative and at least one wetting agent, the solubilized starch being a starch selected from the group consisting of starches from any source, natural or hybrid, comprising potatoes, manioc, corn, waxy corn, corn with a high amylose content, wheat, rice, the solubilized starch derivative being selected from the group consisting of starches, except dextrins, modified physically by gelatinization, by cooking-extrusion or heat-extrusion treatments and/or chemically, by oxidation, enzymatic or acid hydrolysis, alkalinization, esterifiction and etherification and of evaporation the water by natural or forced drying.

4,632,849

METHOD FOR MAKING A FINE POWDER OF A METAL COMPOUND HAVING CERAMIC COATINGS THEREON

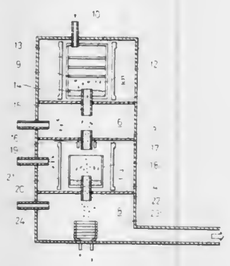
Masahiro Ogawa, Toyoake, and Susumu Abe, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 18, 1985, Ser. No. 692,423

Claims priority, application Japan, Jan. 19, 1984, 59-07966

Int. Cl.⁴ B05D *7/00*

U.S. Cl. 427—215 **10 Claims**



1. A method for preparing a finely powdered product of a metallic compound coated with a ceramic, comprising the steps of:

(a) providing a gaseous mixture of at least one metal vapor, which constitutes one element of said metallic compound, in a carrier gas;

(b) passing said gaseous mixture through a nozzle, thereby rapidly cooling said gaseous mixture by adiabatic expansion of the mixture, into an atmosphere comprising a gas containing the other element of said metallic compound by utilizing the pressure difference between the gaseous mixture and said atmosphere, said atmosphere being heated to a temperature not greater than 0.8 times as low as the melting point of the metal of said metal vapor so that both of said elements react with each other as the rapid cooling of the mixed gases occurs, thereby forming a vapor containing said metallic compound in a fine powder form;

(c) passing the vapor of finely divided metallic compound through a second vapor of a metal or metal compound of said ceramic, thereby resulting in deposition of the metal or metal compound of the ceramic on the finely powdered metallic compound; and

(d) oxidizing the deposited second metal or metal compound to a ceramic coating.

4,632,850

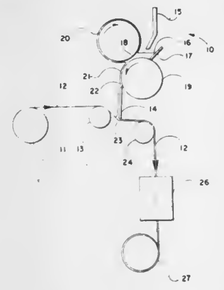
CARPET COATING METHOD AND APPARATUS

John G. Tillotson, 1311 Dana Dr., Dalton, Ga. 30720

Filed May 2, 1985, Ser. No. 730,068

Int. Cl.⁴ B05D *3/12;* **B05C** *3/02;* **D06B** *1/00;* **D06F** *35/00*

U.S. Cl. 427—356 **15 Claims**



1. A method for applying a liquid or semi-liquid coating material to the back of a carpet, comprising the steps of:

forming said coating material into a layer on a substantially horizontal rotating coating roll;

transferring said layer of coating material from said coating roll to the upper edge of an applicator blade by contacting said upper edge of said blade against said coating roll;

flowing said coating material under the effect of gravity from said upper edge of said blade to the lower edge of said blade;

transferring said coating material onto said back of said carpet by contacting said lower edge of said blade against said back of said carpet; and

simultaneous with said step of transferring said coating material onto said back of said carpet, spreading said coating material onto said back of said carpet by moving said carpet past said lower edge of said blade.

4,632,851

CONTINUOUS AUTODEPOSITION METHOD WITH BATH STABILIZATION

Ronald W. Broadbent, Ardsley, and Ellsworth A. Stockbower, Lansdale, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Apr. 22, 1985, Ser. No. 725,470

Int. Cl.⁴ B05D *1/18*

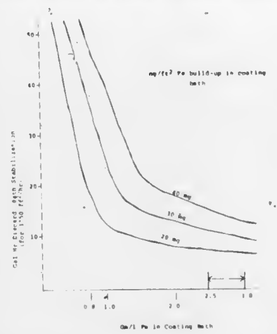
U.S. Cl. 427—435 **18 Claims**

1. A method for the continuous autodeposition of a polymer onto a steel substrate to provide a uniform continuous coating thereupon, comprising

(a) immersing the substrate in an autodeposition coating bath having a concentration of polymer solids below about 4% v/v;

(b) replenishing the active ingredients of the bath as they are consumed by addition of said ingredients to the bath at a replenishment rate sufficient to maintain the concentrations thereof substantially at their original levels; and

(c) stabilizing the bath by continuously or intermittently discarding a predetermined volume of the bath and replacing said volume with an equal volume of water at a discard rate which maintains a substantially constant concentration of iron in said bath wherein said predetermined volume being discarded is in addition to that volume of the bath which is removed by dragout due to coated substrate removal from the bath.



4,632,852

PROCESS FOR ELECTROLESS COPPER PLATING

Haruo Akahoshi, Hitachi; Kanji Murakami, Mito; Mineo Kawamoto; Motoyo Wajima, both of Hitachi; Rituji Toba, Hadano; Shoji Kawakubo, Ibaraki, and Akio Tadokoro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 746,099

Claims priority, application Japan, Jun. 18, 1984, 59-123657; Jun. 22, 1984, 59-127475

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 427—437 **31 Claims**

1. A process for electroless copper plating in an electroless copper plating solution containing a copper salt, a complexing agent for the copper salt, a reducing agent for the copper salt, and a pH-adjusting agent, which comprises adding at least one of soluble inorganic silicon compounds and soluble inorganic germanium compounds as an additive to the electroless copper plating solution and conducting electroless copper plating by injecting an oxygen-containing gas into the plating solution or by adding an oxidizing agent to the plating solution or by both injection of the oxygen-containing gas and addition of the oxidizing agent.

4,632,853

DOUBLE GLASS COVERING AND PROCESS FOR ITS MANUFACTURE

Simone M. De Vrij, Deurne, Belgium, assignor to Atlas Isolaties, personenvennootschap met beperkte aansprakelijkheid, Deurne, Belgium

Filed Dec. 7, 1983, Ser. No. 558,812

Claims priority, application Belgium, Dec. 9, 1982, 2/59945

Int. Cl.⁴ E06B *3/24*

U.S. Cl. 428—34 **18 Claims**

1. A double glass set comprising:

a first glass plate;

a second glass plate;

a spacer disposed between said plates and along a periphery thereof, said spacer having lateral sides adhered to the glass plates through a layer of an adhesive material forming an airtight seal between the spacer and the glass plates, the spacer being formed from hollow metallic members, having a rectangular cross-section, wherein each spacer member has an outside wall provided with a rib in the

form of an L, said L-shaped rib having a free leg oriented towards the second glass plate, wherein the spacer members are connected by corner pieces, one of which is electrically insulating and all the others of which are electrically conductive; and



means for controlling the spacing between the spacer and the corresponding adjacent face of the glass plate, at both sides of the spacer.

4,632,854

WEB OF PACKAGING MATERIAL WITH A SHEET OF PLASTICS

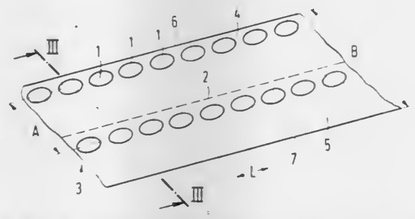
Ingemar Ohlsson, Malmö, Sweden; Finn T. Madsen, Birkeröd, and Steffen Kjaerbye, Farum, both of Denmark, assignors to Tetra Pak Developpement S.A., Pully-Lausanne, Switzerland

Filed May 31, 1985, Ser. No. 740,014

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420622

Int. Cl.⁴ B31B *1/16;* B32B *3/04*

U.S. Cl. 428—36 **9 Claims**



1. A web of packaging material made of heat sealable plastic sheeting with a longitudinal center line which can be folded at the longitudinal center line in such a way that the two resultant web halves are superimposed and cover one another, characterized in that a row of cover portions of approximately equal size, made of a material which is stiffer than the sheeting and which can be welded to it, is sealed onto the outer surface of each web half in the direction of the longitudinal center line, with equal longitudinal spacings between the cover portion, and further characterized in that the rows of cover portions are arranged eccentric to the longitudinal center of the web.

4,632,855

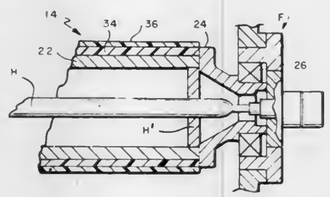
HEAT-RESISTANT ROLL AND METHOD OF MAKING SAME

Thomas J. Conlon, P.O. Box 398, Natick, Mass. 01760, and William J. Leahy, P.O. Box 951, Cotuit, Mass. 02635

Filed May 23, 1985, Ser. No. 737,327

Int. Cl.⁴ H05B *1/00*

U.S. Cl. 428—36 **7 Claims**



1. A roll of the type having a core and a heat-resistant elastomeric cover on the core, said roll being characterized by a flexible silazane resin polymer coating reacted with and bonded to said cover.

4,632,856

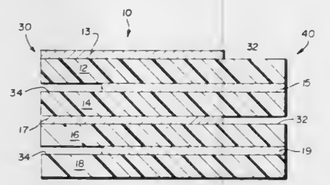
MULTILAYER THIN FILM ELECTRICAL DEVICES FREE OF ADHESIVE

Michael A. Marcus, and Edward D. Morrison, both of Kodak Park, Rochester, N.Y. 14650

Filed Feb. 6, 1985, Ser. No. 698,974

Int. Cl.⁴ B32B *3/00, 15/08*

U.S. Cl. 428—172 **8 Claims**



1. A laminate useful in thin film electrical devices, comprising alternating layers of electrically conductive metal and an orientable polymer film, each layer of metal being integrally bonded to both adjacent layers of film, said laminate

(a) having a thickness for each polymer film that does not exceed about 25 μm, and a resisitivity of each metal layer of from about 1 to about 4 ohms/square, and

(b) being generally free of adhesive between adjacent layers of polymeric film,

said metal layers of the laminate extending across only a fraction of the width of the adjacent polymer film layers, so as to leave exposed a side margin of said dielectric film layers, such side margin being the same side margin for every other one of said polymer film layers, and the opposite side margin for those in between,

and further including electrode metal along the side edges of said layers, the electrode metal at each side bonding together every other metal layer that extends to said each side.

4,632,857

ELECTROLESSLY PLATED PRODUCT HAVING A POLYMETALLIC CATALYTIC FILM UNDERLAYER

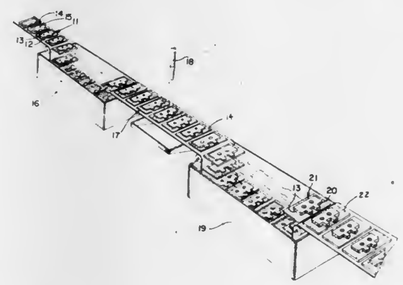
Glenn O. Mallory, Jr., Los Angeles, Calif., assignor to Richardson Chemical Company, Des Plaines, Ill.

Continuation of Ser. No. 558,323, Jan. 24, 1984, abandoned, which is a division of Ser. No. 360,382, Mar. 22, 1982, abandoned, which is a continuation of Ser. No. 224,675, Jan. 13, 1981, abandoned, which is a continuation of Ser. No. 107,781, Dec. 28, 1979, abandoned, which is a division of Ser. No. 5,169, Jan. 22, 1979, Pat. No. 4,232,060, which is a continuation-in-part of Ser. No. 788,598, Apr. 18, 1977, abandoned, which is a division of Ser. No. 473,147, May 24, 1974, Pat. No. 4,019,910.

This application Aug. 8, 1985, Ser. No. 763,881

Int. Cl.⁴ H05K *3/18*

U.S. Cl. 428—209 **14 Claims**



1. An electrolessly plated product that is a board having a circuitry pattern and insulating portions between conductive portions of the circuitry pattern, said product having been produced according to a method comprising:

catalyzing substantially only a non-catalytic metal surface that is non-catalytic to nickel or cobalt by rendering said metal surface catalytic to nickel or cobalt, said metal surface being said conductive portions of the circuitry pattern, said catalyzing including:

bathing said board having the circuitry pattern with the non-catalytic metal surface with a polymetallic catalyzing agent aqueous bath to transform said metal surface conductive portions into a catalyzed metal surface that is catalytic to nickel or cobalt, said aqueous bath including a deposition-enhancing metal selected from the group consisting of nickel, cobalt and combinations thereof, and a secondary metal selected from the group consisting of tin, molybdenum, copper, tungsten and combinations thereof, said catalyzing agent bath further including an ester complex of a polyhydric compound and a boron reducing agent for cations of said metals included in the catalyzing agent bath, said bathing being under slightly acidic to generally alkaline conditions and being for a period of time sufficient to nucleate said non-catalytic metal surface conductive portions with an adherent catalytic polymetallic film from said polymetallic catalyzing agent bath and insufficient to deposit a generally continuous plating film thereonto;

rinsing said thus bathed board with an aqueous rinsing agent to provide a preferentially catalyzed board that has said bath substantially completely rinsed from said insulating portions of the board, and said adherent catalytic polymetallic film remains on the conductive portions of the circuitry pattern as a deposit laid down in the presence of said ester complex of a polyhydric compound and includes each of said deposition-enhancing metal, said secondary metal, and boron of said reducing agent; and

electrolessly plating an overplate onto substantially only said catalyzed metal surface and not onto said insulating portions, said electroless overplate including a metal selected from the group consisting of nickel, cobalt and alloys including nickel and/or cobalt.

4,632,858

FILLER FLEECE MATERIAL AND METHOD OF MANUFACTURING SAME

Jürgen Knoke, Weinheim; Helmut Jäger, Fürth; Ludwig Dekant, Weinheim, and Dieter Groitzsch, Hirschberg, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 30, 1984, Ser. No. 666,568

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405669

Int. Cl.⁴ B32B *31/26;* D04H *1/48*

U.S. Cl. 428—287 **13 Claims**

1. A filler fleece material comprising a laminate having a central fleece containing thermoplastic bonding fibers and a cover fleece, said cover fleece having a specific weight of 4 to 20 g/m² and consisting of at least 60% of thermoplastic bonding fibers which melt at the same or a lower temperature than the bonding fibers of the central fleece, said cover fleece having a thin and smooth porous surface formed by thermofusion without pressure in a gauged gap.

7. A method for producing a filler fleece material as a laminate from a central fleece containing thermoplastic fibers, and a cover fleece, comprising

(a) in the same operation as the depositing of the central fleece, forming a laminate by depositing a cover fleece thereon as a fiber sliver with a specific weight of 4 to 20 g/m² and a thermoplastic bonding fiber content of at least 60%, the melting point of the bonding fibers being equal to or less than that of the fiber of the central fleece;

(b) heating the laminate for thermal consolidation of the central fleece, and then

(c) smoothing the cover fleece surface by thermofusion without pressure in a gauged gap.

4,632,859

REINFORCED SILICONE MODIFIED EPOXY TAPE BACKING

Austin A. Wolfrey, Boxford, and Samuel C. Temin, Needham, both of Mass., assignors to The Kendall Company, Boston, Mass.

Filed Aug. 3, 1984, Ser. No. 637,466

Int. Cl.⁴ B32B *27/12, 27/38;* C09J *7/04*

U.S. Cl. 428—288 **13 Claims**

1. A tape backing material useful for a pressure sensitive tape comprising:

a non-woven fabric material; and

a siliconized epoxy resin coated onto said fabric material, said siliconized epoxy resin being the reaction product of an epoxy resin with the organic portion of a polysiloxane containing at least two carbinol groups.

4,632,860

WATERPROOF BREATHABLE FABRIC

John P. D'Antonio, Hockessin, Del., and Joseph F. Murphy, Matawan, N.J., assignors to D'Antonio, Hockessin, Del.

Continuation-in-part of Ser. No. 585,455, Mar. 2, 1984, abandoned. This application Mar. 13, 1985, Ser. No. 711,299

Int. Cl.⁴ B32B *27/08, 27/10;* C09J *7/02*

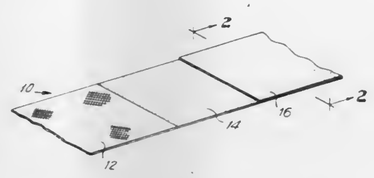
U.S. Cl. 428—290 **12 Claims**

1. A waterproof, moisture-breathable, and hypoallergenic fabric comprising:

a moisture-absorbent, non-macerating hypoallergenic substrate formed from natural or synthetic fibers, the moisture absorbency of said substrate being provided by the inherent moisture absorbency of the fiber selected and the attractive capillarity of the formed substrate;

an acrylic polymer basecoat coated onto said substrate, said basecoat having sufficient viscosity when applied to pre-

vent strikethrough when said basecoat is applied to said substrate; and



a topcoat selected from the group consisting of polyether urethane and silicone latex coated onto said basecoat, whereby said fabric can maintain prolonged direct contact with skin without causing maceration.

4,632,861

BLEND OF POLYETHYLENE AND POLYPROPYLENE

George Vassilatos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 788,351, Oct. 22, 1985, which is a continuation-in-part of Ser. No. 686,917, Dec. 27, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,238

Int. Cl.[4] C08L *23/06, 23/12;* **D04H** *1/04*

U.S. Cl. 428—296 **8 Claims**

1. A process for the production of a fiber which comprises melt spinning at a temperature in the range of 205° to 265° C. and at a speed of greater than 1740 meters/min a blend consisting essentially of low density polyethylene and crystalline polypropylene wherein the polyethylene amounts to 65 to 95% by weight of the blend and has a density in the range of 0.90 to 0.92 g/cm^3, a melting temperature of less than 107° C. and a melt index of at least 25, and the polypropylene amounts to 5 to 35% by weight of the blend and has a melt flow rate of at least 3 and a ratio of weight-to-number average molecular weight of at least 4.

4,632,862

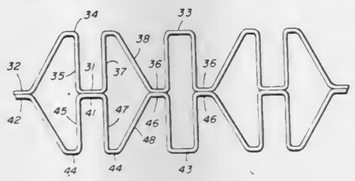
I-BEAM HONEYCOMB MATERIAL

Stephen J. Mullen, 12 Winthrop Ave., Beverly, Mass. 01915

Filed Mar. 1, 1985, Ser. No. 707,379

Int. Cl.[4] B32B *3/26, 3/28*

U.S. Cl. 428—116 **4 Claims**



1. In an open-cell honeycomb web comprisng at least a pair of similar sheets having corrugations in the shape of major flat surfaces formed therein and displaced relative to each other whereby said major flat surfaces of each of said sheets abut each other, the combination wherein each of said major flat surfaces has a central portion thereof depressed to form matching sub-flat surfaces parallel to and connected to said major flat surfaces by walls substantially perpendicular to said flat surfaces, the undepressed portions of said major flat surfaces being joined together and said sub-flat surfaces being joined together whereby a series of I-beams are formed each said I-beam being disposed within one of said open cells comprising said honeycomb web.

4,632,863

GREEN-HOUSE CURTAIN

Göran Henningsson, Kinna, Sweden, assignor to Ludvig Svensson International B.V., Ljzuidland, Netherlands

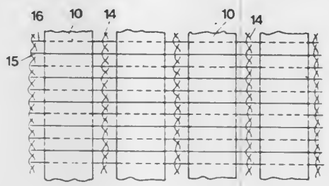
PCT No. PCT/SE83/00389, § 371 Date Jul. 3, 1984, § 102(e) Date Jul. 3, 1984, PCT Pub. No. WO84/01969, PCT Pub. Date May 24, 1984

PCT Filed Nov. 9, 1983, Ser. No. 629,822

Claims priority, application Sweden, Nov. 10, 1982, 8206399

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—225 **8 Claims**



1. A green-house curtain comprising spaced strips of a flexible sheet material running in one direction, a longitudinal direction, of the curtain and which are interconnected by means of textile threads in a yarn framework, the strips being selected from a group consisting of heat radiation reflecting and heat radiation absorbing material, wherein the yarn framework includes transverse connection threads connected to spaced longitudinal connection threads, the longtudinal connection threads being located only on one side of a plane containing the strips, respective transverse connection threads being located on opposite sides of said plane so as to extend respectively across opposite surfaces of the strips, and the transverse threads on the other side of said plane extending through the spaces between adjacent strips for connection to the longitudinal threads wherein one surface of each strip is metalized and low-emissive, and the other surface is heat absorbing.

4,632,864

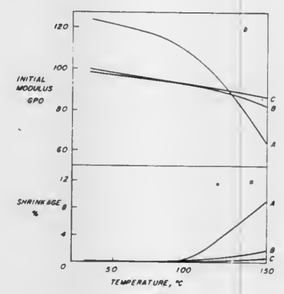
FIBER FOR REINFORCING PLASTIC COMPOSITES AND REINFORCED PLASTIC COMPOSITES THEREFROM

David S. Cordova, Richmond, and Stanley D. Lazarus, Petersburg, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 13, 1984, Ser. No. 630,612

Int. Cl.[4] B05D *3/02;* **B32B** *7/00, 27/34, 27/36*

U.S. Cl. 428—265 **19 Claims**



1. A high tenacity reinforcing polyester fiber characterized by a thermal shrinkage of up to about 11 percent, an elongation of from about 10 to 28 percent, and a modulus after cure of at least about 60 grams per denier, for reinforcing plastic composites, said fiber being treated with a composition comprising a vinyl chloride copolymer having a glass transition temperature of greater than about 60° C.; to enhance compatibility of the fiber and a resin matrix.

4,632,865

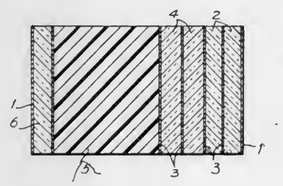
MULTI-LAYER INTUMESCENT-ABLATOR ENDOTHERMIC FIRE RETARDANT COMPOSITIONS

Avi Tzur, Englewood, N.J., assignor to Mediavault Inc., Englewood Cliffs, N.J.

Filed Nov. 13, 1985, Ser. No. 797,623

Int. Cl.[4] B32B *3/26, 5/18*

U.S. Cl. 428—304.4 **22 Claims**



1. An insulatjon material for use in heat protective devices which comprises a structure having two or more layers, arranged so that the external layer has a higher melting temperature or temperature of dehydration than any layer, said external layer comprising:

an inorganic salt selected from the group consisting of $Al_2(SO_4)_3.16$–$18H_2O$, $AlNH_4(SO_4)_2.24H_2O$, $KAl(SO_4)_2.12H_2O$, and $MgSO_4.7H_2O$, and,

a binder selected from the group consisting of natural rubber, neoprene rubber, silicone rubber, polyester resin, epoxy resin, phenolic resin and hydraulic cement.

4,632,866

MAGNETIC RECORDING MEDIUM

Yuichi Kubota, Komoro, and Akio Watanabe, Sendai, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,145

Claims priority, application Japan, Apr. 5, 1984, 59-68169; Apr. 6, 1984, 59-68529

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—328 **5 Claims**

1. In a magnetic recording medium comprising a substrate coated with a magnetic paint composition having magaetic powder dispersed in a binder,

the improvement wherein the magnetic powder is a mixture of (a) magnetic metal particles and (b) magnetic iron carbide particles and/or magnetic metal particles having an iron carbide coating on the surface thereof, with the weight ratio of (a) to (b) being in the range between 97:3 and 20:80.

4,632,867

MAGNETIC RECORDING MEDIUM

Sadamu Kuse, Mino, and Seigi Kawarai, Ashiya, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 8, 1985, Ser. No. 752,857

Claims priority, application Japan, Jul. 9, 1984, 59-141883

Int. Cl.[4] G11B *5/68*

U.S. Cl. 428—323 **8 Claims**

1. A magnetic recording medium which comprises a base film having a front and back surface, a magnetic layer provided on said front surface of said base film and a back coat layer provided on said back surface of said base film, said back coat layer comprising graphitized carbon black powder having an average particle size of from 20 to 200 mμ and a binder therefor said graphitized carbon black comprising particles having an integral core portion and a graphitized surface layer around said core portion, the thickness of said graphitized layer being from 5 to 50 % of the particle size.

4,632,868

MAGNETIC RECORDING MEDIA

Takahito Miyoshi, Odawara; Masaaki Fujiyama, Minamiashigara, and Akihiro Matsufuji, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,568

Claims priority, application Japan, Jun. 21, 1984, 59-126350

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—328 **5 Claims**

1. A magnetic recording medium comprising a nonmagnetic support substrate and a magnetic layer provided thereon by a binder, characteristic in that said magnetic layer contains (1) a ferromagnetic alloy powder having a specific surface area (S_{BET}) of no less than 45 m^2/g and (2) copper oleate in an amount of no less than 0.001 part by weight per 100 parts by weight of said ferromagnetic alloy powder.

4,632,869

RESIN COMPOSITION, OPAQUE FILM AND METHOD OF PREPARING SAME

Hee C. Park, Fairport; Jeffrey J. O'Brien, Walworth, and Christopher R. Fosmire, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,087

Int. Cl.[4] B32B *3/26, 31/16*

U.S. Cl. 428—315.5 **13 Claims**

5. An opaque, biaxially oriented polymeric film structure comprising:

a thermoplastic polymer matrix material within which is located a strata of voids; and

positioned at least substantially within at least a substantial number of each of said voids is at least one spherical void-initiating solid particle of polybutylene terephthalate which is phase distinct and incompatible with said matrix material, the void occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void.

8. The film structure of claim 5 having on at least one surface thereof a void-free thermoplastic skin layer.

4,632,870

MAGNETIC RECORDING MEDIUM

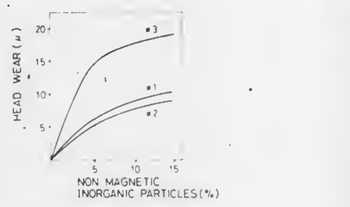
Shigeru Takamatsu, Komoro; Yuji Ishihara, Saku, and Masahiro Takizawa, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,193

Claims priority, application Japan, Feb. 20, 1984, 59-28722

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—329 **2 Claims**



1. A magnetic recording medium comprising a plastic base and a magnetic coat formed thereon which comprises a ferromagnetic powder dispersed in a resin binder, said magnetic coat also containing finely divided nonmagnetic particles of the composite oxide of zinc and aluminum having a spinel

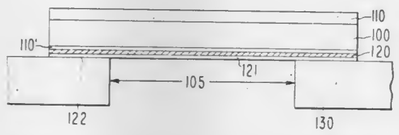
structure and the general formula $ZnAl_2O_4$ and having an average particle diameter of 0.1 to 0.7 μm as measured by electron microphotography.

4,632,871

ANODIC BONDING METHOD AND APPARATUS FOR X-RAY MASKS

Marcos Karnezos, Palo Alto; Howard H. Nakanos, Sunnyvale, and Armand P. Neukermans, Palo Alto, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 16, 1984, Ser. No. 580,600
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—336 **18 Claims**



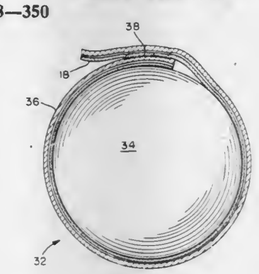
1. A mask structure for X-ray lithography comprising:
a thin flat X-ray transmissive membrane selected from the group consisting of boron nitride, boron carbide, silicon nitride, silicon carbide, including a working area for forming an absorber pattern and a peripheral area for support thereof;
a rigid support frame having a flat surface for supporting said membrane outwardly of the working area; and
interface means interposed between the membrane and the flat surface of the support frame for facilitating anodic bonding of the membrane to the support frame without the use of adhesive material so as to provide an extremely flat, stable membrane surface, said interface means being anodically bonded to the flat surface of the support frame.

4,632,872

RELEASABLE ADHESIVE SHEET MATERIAL

Nicholas D. Gallagher; Richard S. Sternasty, and Richard A. James, all of Troy, Ohio, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 502,793, Jun. 9, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,827
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—350 **12 Claims**



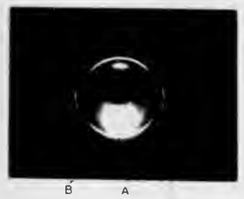
1. A self-adherent, nondelaminating adhesive sheet material consisting essentially of,
(a) a fibrous base web, having a first side and an opposite side,
(b) a first coating on said first side of said base web forming a substantially continuous coating, and
(c) an adhesive coating on said coated base web covering and in contact with said first coating at all times or located on said opposite side but in either location positioned so as to be in contact with said first coating at least where said adhesive sheet material is placed in overlapping contact with itself,
wherein said first coating has a greater affinity for said adhesive than for said base web, whereby when opposite surfaces of said adhesive sheet material are placed in overlapping contact with each other, said first coating predominately adheres to said adhesive, and the surfaces separate upon application of peel force without substantially delaminating said base web.

4,632,873

ULTRAFINE FIBER OF AN ETHYLENE TETRAFLUORIDE COPOLYMER AND A PROCESS FOR PRODUCING IT AND A POROUS MEMBRANE THEREOF

Toshiya Mizuno; Nobuhiro Moriyama; Naohiro Murayama, and Shigeru Saitoh, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,112
Claims priority, application Japan, Apr. 1, 1983, 58-55205; Apr. 1, 1983, 58-55206
Int. Cl.[4] D02G *3/00;* **B32B** *27/00*
U.S. Cl. 428—364 **2 Claims**



1. An ultra-fine fiber comprising an ethylene tetrafluoride copolymer, said copolymer comprising an ethylene tetrafluoride monomer copolymerized with a fluorine-containing ethylenic monomer, wherein said fiber has an orientation degree (π) of at least 0.6 and an average fineness of 0.0001 to 0.9 denier.

4,632,874

FILAMENT COHERENCY ENHANCING COMPOSITION AND TEXTILE YARNS COATED THEREWITH

James L. Smith, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,283
Int. Cl.[4] B32B *27/00;* **C08K** *5/34, 5/52*
U.S. Cl. 428—394 **20 Claims**

1. A substantially homogeneous aqueous composition for use in imparting coherency to textile filaments, comprising an emulsifiable textile finishing oil and water dissipatable polymer at a weight ratio of from about 19/1 to about 5/1 and water comprising from about 90 to about 70 wt. % of the total composition wherein said water dissipatable polymer comprises the reaction products of (a), (b), (c) and (d) from the following components or ester forming or esteramide forming derivatives thereof:
(a) at least one difunctional dicarboxylic acid;
(b) from about 4 to about 25 hole percent based on a total of all acid, hydroxyl and amino equivalents being equal to 200 mole percent, of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to aromatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;
(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two

$$—CH_2—OH$$

groups of which at least 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula:

$$H(OCH_2—CH_2)_nOH$$

n being an integer of between 2 and about 20; and
(d) from none to at least one difunctional reactant selected from a hydroxycarboxylic acid having one $—CH_2—OH$, an aminocarboxylic acid having one —NRH group, an amino-alcohol having one

$$—CR_2—OH$$

group and one —NRH or mixtures thereof, and wherein each R is an H atom or an alkyl group of 1 to 4 carbon atoms.

4,632,875

METHOD OF FORMING A POLYAPHRON

Stanley M. Barnett; Joan M. Lausier, both of Wakefield, and Samuel J. Montalto, Westerly, all of R.I., assignors to The Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

Filed Apr. 24, 1984, Ser. No. 603,455
Int. Cl.[4] B32B *25/00, 27/00;* **A61K** *9/00;* **A01N** *25/26*
U.S. Cl. 428—402.22 **12 Claims**



1. A method for forming a polyaphron which includes:
forming a colloidal gas emulsion, the gas phase comprising between 40–90% voids and having a mean bubble-sized diameter of between 1 μm–1 mm;
displacing the gas phase with an immiscible liquid phase, the liquid phase after displacement comprising between 80–98% by volume of the polyaphron and the liquid phase being substantially in the form of droplets the droplets having a mean bubble diameter size of between 1 μm–1 mm. and further the disperse liquid phase being discontinuous.

4,632,876

CERAMIC SPHEROIDS HAVING LOW DENSITY AND HIGH CRUSH RESISTANCE

James A. Laird, St. Joseph, Wis., and Warren R. Beck, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 12, 1985, Ser. No. 743,980
Int. Cl.[4] B05D *7/00*
U.S. Cl. 428—404 **6 Claims**

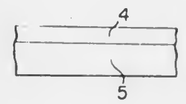
1. Fired ceramic spheroids having:
A. a core:
1. made from raw materials comprising about:
a. 50 to 99.8 parts by weight mineral particulates,
0.1 to 50 parts by weight silicon carbide, and
0.1 to 15 parts by weight binder;
2. wherein the mineral particulates comprise a mineral mixture which has a fired density of less than about 2.9 grams per cubic centimeter when fired above about 1100° C. and includes at least one mineral having chemically bound water or sulphur, in a form which is not substantially water soluble, in amounts sufficient to yield 0.5 to 5.0 weight percent water or 0.04 to 2.0 weight percent sulfur in the total mass of mineral particulates;
3. wherein the binder is characterized by adhering the raw materials together after they are converted to spheroids but before they are fired;
4. said core having a plurality of closed air cells; and
B. an outer shell, surrounding the core, comprising a metal oxide selected from aluminum oxide and magnesium oxide; said fired ceramic spheroids having a fired density less than about 2.2 grams per cubic centimeter.

4,632,877

LAMINATED SAFETY GLASS

Hiroyuki Watanabe; Hiroshi Washita, both of Yokohama, and Toshio Ichiki, Kawasaki, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,296
Claims priority, application Japan, Nov. 29, 1983, 58-223246
Int. Cl.[4] B32B *27/40*
U.S. Cl. 428—409 **15 Claims**



1. Transparent or translucent laminated safety glass having an at least two-layered structure, in which one outer layer is a relatively soft synthetic resin layer and the other outer layer is a hard substrate layer, said relatively soft synthetic resin layer comprising: a surface layer of a reformed polyurethane type thermoplastic resin obtained by impregnating a polymerizable compound containing a polymerizable unsaturated group into a polyurethane type thermoplastic resin and polymerizing the compound; and an inner layer of a polyurethane type thermoplastic resin which is continuous or non-continuous with said surface layer.

4,632,878

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Hiroshi Hashimoto, both of Kanagawa; Akiyoshi Hashimoto; Teruo Nakagawa, both of Aichi, and Hiroyuki Kato, Aichi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

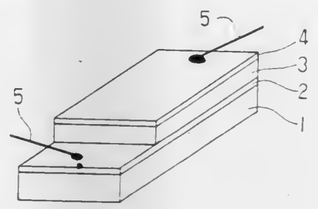
Filed Aug. 21, 1985, Ser. No. 768,007
Claims priority, application Japan, Aug. 21, 1984, 59-172349
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—425.9 **10 Claims**

1. A magnetic recording medium prepared by the process comprising (1) coating a magnetic coating composition mainly containing ferromagnetic particles and a binder on a support and (2) irradiating the resulting support with electron beams, wherein the binder contains a compound represented by the following formula,

$$A—DI—[(—B—C—)_m—B—DI—]_N—A$$

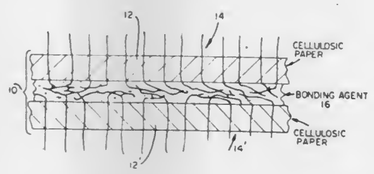
wherein A represents a radical of a hydroxy compound containing at least one isocyanurate ring and at least one (meth)acryloyl group; DI represents a radical of an organic diisocyanate compound; B represents a radical of a polyol having at least two hydroxy groups; C represents a radical of a polybasic acid having at least two carboxy groups; m is a number of 1 to 7; and N is a positive number of 7 or less.

4,632,879
MOISTURE SENSOR
Junichi Tanaka, Tenri; Hisatoshi Furubayashi, Yamatokoriyama; Masanori Watanabe, Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Apr. 27, 1984, Ser. No. 604,389
Claims priority, application Japan, Apr. 30, 1983, 58-77802
Int. Cl.[4] B32B *27/30*
U.S. Cl. 428—522 2 Claims



1. A moisture sensor comprising a substrate, a bottom electrode formed on said substrate, a moisture sensitive film formed on said bottom electrode and a moisture permeable electrode formed on said moisture sensitive film, said moisture sensitive film being formed by high crystallizable polyvinyl alcohol which is heat treated thereby attaining a linear relationship between the impedance and the relative humidity ranging from 0% to 90% of the relative humidity.

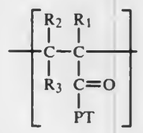
4,632,880
DENTAL ADHESIVE DEVICE AND METHOD OF PRODUCING SAME
Herbert Lapidus, Ridgefield, Conn., assignor to Combe Incorporated, White Plains, N.Y.
Continuation-in-part of Ser. No. 236,889, Feb. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 346,640, Feb. 8, 1982, abandoned, and a continuation-in-part of Ser. No. 508,381, Jul. 29, 1983, Pat. No. 4,503,116. This application Jan. 17, 1985, Ser. No. 692,407
Int. Cl.[4] B32B *13/00;* A61C *5/06*
U.S. Cl. 428—523 8 Claims



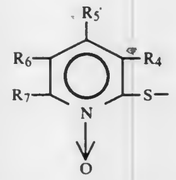
1. A new dental adhesive product comprising a laminate of superimposed fiber webs, each web comprising a thin paper wherein one face of one of said papers being dry heat bonded to an opposing face of the other of said papers by a thin sheet of thermoplastic ethylene oxide polymer located between said papers, the bonding of said ethylene oxide polymer by the application of dry heat and pressure, whereby the ethylene oxide polymer both bonds the fibrous face of said papers when dry and becomes a dental fixative in use in a wearer's mouth.

4,632,881
PYRITHIONE-CONTAINING BIOACTIVE POLYMERS AND THEIR USE IN PAINT AND WOOD PERSERVATIVE PRODUCTS
Samuel I. Trotz, Orange, and Theodore H. Fedynyshyn, Branford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.
Division of Ser. No. 784,930, Oct. 7, 1985, which is a division of Ser. No. 660,208, Oct. 12, 1984, Pat. No. 4,565,856. This application Feb. 26, 1986, Ser. No. 832,960
Int. Cl.[4] B27K *3/40*
U.S. Cl. 428—541 4 Claims

1. A wood product preserved against degradation with an effective wood-preserving amount of a bioactive polymer comprising moieties having the formula:

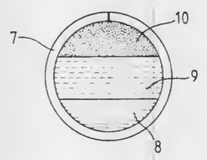


wherein R_1, R_2 and R_3 are individually selected from hydrogen and alkyl groups having from 1 to 4 carbon atoms; and PT represents the pyrithione moiety which is defined as



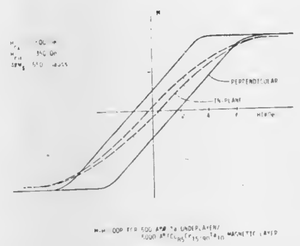
wherein R_4, R_5, R_6 and R_7 are individually selected from hydrogen, a lower alkyl group having from 1 to about 8 carbon atoms, a lower alkoxy group having from 1 to about 8 carbon atoms, a nitro group and a halo group.

4,632,882
FILLER WIRE
Alexander Werner, Glattbrugg, and Heinz Pfenninger, Volketswil, both of Switzerland, assignors to Schweissindustrie Oerlikon Buhrle AG, Zurich, Switzerland
Filed Apr. 17, 1985, Ser. No. 724,021
Claims priority, application European Pat. Off., Apr. 18, 1984, 84104383
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] B23K *35/40, 35/24;* B23B *15/16, 15/18*
U.S. Cl. 428—558 4 Claims



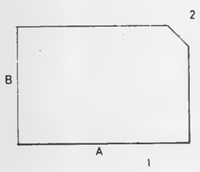
1. A filler wire formed with a random length which comprises a tubular metal covering and a pulverulent material filling therein surrounded by said tubular metal covering, wherein the pulverulent filling comprises at least two material components which are arranged in at least two superimposed layers.

4,632,883
VERTICAL RECORDING MEDIUM WITH IMPROVED PERPENDICULAR MAGNETIC ANISOTROPY DUE TO INFLUENCE OF BETA-TANTALUM UNDERLAYER
James K. Howard, Morgan Hill, and Mohammad T. Moshref, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 22, 1985, Ser. No. 725,977
Int. Cl.[4] H01F *10/30*
U.S. Cl. 428—611 6 Claims



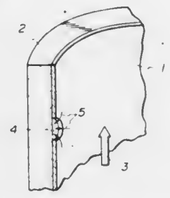
1. A magnetic recording disk for vertical recording comprising a film of beta-tantalum (β-Ta) on a suitable substrate and a magnetic film of an alloy including cobalt and chromium according to the formula $(CoCr)_yX_{100-y}$ on the β-Ta film, wherein the alloy is of hexagonal crystalline structure with its C-axis oriented generally perpendicular to the substrate, wherein the amount of element X in the alloy is greater than approximately 2 atomic percent, and wherein the element X is selected from the group consisting of Ti, Nb, Mo, Ta, and W.

4,632,884
MARKED SINGLE-CRYSTAL III-V GROUP COMPOUND SEMICONDUCTOR WAFER
Osamu Shikatani, and Jun Yamaguchi, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan
Filed Nov. 19, 1984, Ser. No. 672,882
Claims priority, application Japan, Nov. 24, 1983, 58-181255[U]
Int. Cl.[4] H01L *21/304*
U.S. Cl. 428—642 1 Claim



1. A rectangular single-crystal wafer of a III-V group compound for semiconductor manufacture having an indexing mark for an operator to recognize the front and back surfaces to orient a face for etching, said indexing mark comprising one corner cut off the rectangle so that the position of the cut off corner may be used to orient the desired surface.

4,632,885
ALUMINUM BASE ALLOY CLAD MATERIAL FOR USE IN HEAT EXCHANGERS
Zenichi Tanabe, Nagoya; Toshiyasu Fukui, Toyoake; Teruo Uno, Nagoya, and Hiroshi Ikeda, Toyoake, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan
Continuation of Ser. No. 168,216, Jul. 10, 1980, abandoned. This application Mar. 11, 1982, Ser. No. 356,988
Claims priority, application Japan, Jul. 23, 1979, 54-92610
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—654 10 Claims



1. A clad material for use in heat exchangers, comprising: an aluminum alloy core and a cladding on one surface of said core, said aluminum alloy core being made of a first alloy consisting essentially of 0.01 to 2.0 wt. % magnesium and the balance is aluminum, said cladding being made of a second alloy consisting essentially of 0.02 to 2.0 wt. % of magnesium, from 0.02 to 0.5 wt. % of tin and the balance is aluminum.

4,632,886
SULFIDIZATION OF COMPOUND SEMICONDUCTOR SURFACES AND PASSIVATED MERCURY CADMIUM TELLURIDE SUBSTRATES
Towfik H. Teherani, Plano, and Arturo Simmons, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 28, 1984, Ser. No. 656,057
Int. Cl.[4] B32B *9/00;* C25D *9/06*
U.S. Cl. 428—698 16 Claims

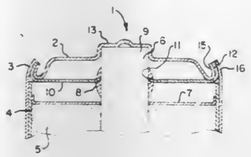
1. A method of passivating a mercury cadmium telluride substrate, comprising the steps of:
(a) providing a mercury cadmium telluride substrate,
(b) cleaning a surface of said substrate; and
(c) anodically growing a sulfide layer on the cleaned surface of said substrate.

15. A passivated mercury cadmium telluride substrate which comprises:
(a) a mercury cadmium telluride substrate; and
(b) a layer of a sulfide on a surface of said substrate formed with components of said substrate.

4,632,887
GALVANIC PRIMARY CELL
Gerd Jung, Ellwangen, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Jun. 27, 1985, Ser. No. 750,008
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425170
Int. Cl.[4] H01M *2/02*
U.S. Cl. 429—181 14 Claims

1. For use in a galvanic primary cell having a cylindrical metal casing as the negative electrode, a positive depolarization electrode placed concentrically around a carbon conductor rod, a separator positioned between the metal casing and the depolarization electrode, and an electrolyte, an improved sealing means comprising:
a sealing washer having a central opening and made of a flexible, foamed plastic material, and placed in a space above the depolarization electrode and between the carbon rod and the metal casing such that the carbon rod

extends in sealed fashion through the central opening of the washer; and



a positive cap, the rim of which rests on the periphery of the sealing washer so that the sealing washer is clamped between the rim of the cap and the metal casing.

4,632,888

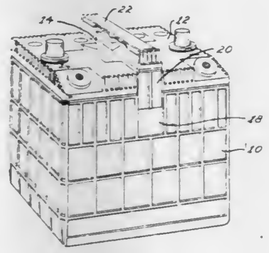
BATTERY CARRYING HANDLE

William H. Kump, Mendota Heights, and Joseph J. Jergl, Minneapolis, both of Minn., assignors to GNB Incorporated, Mendota Heights, Minn.

Filed Aug. 30, 1985, Ser. No. 770,944

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—187 **14 Claims**



1. An assembly for a recessible carrying handle for a battery wherein said assembly comprises:

(a) an elongated recess in said cover top surface;

(b) elongated recesses in opposing side wall surfaces, which side recesses communicate with the ends of said cover top recess;

(c) a pair of tongues projecting from the side walls of and into each said side recess;

(d) a generally U-shaped handle having two limbs connected by a cross piece;

(e) a pair of grooves in the sides of each said handle limb, which grooves are adapted to slidably receive said tongues; and

(f) a pair of slots in said grooves, which slots are adapted to allow passage of said tongues in and out of said grooves.

4,632,889

LITHIUM COMPOSITE ANODE

George E. McManis; Aaron N. Fletcher, and Dan E. Bliss, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1985, Ser. No. 751,357

Int. Cl.[4] H01M *4/58*; B22D *19/14*

U.S. Cl. 429—218 **6 Claims**

1. A method of manufacturing a lithium composite anode for thermal batteries comprising the steps of:

preparing a homogeneous lithium alloy;

grinding said alloy into a powder;

melting elemental lithium onto the surface of said powder to form a uniform heterogeneous mixture;

cooling said mixture to ambient to form an ingot; and

configuring said ingot into an anode.

4,632,890

ANODE METAL TREATMENT AND USE OF SAID ANODE IN CELL

Chih-Chung Wang, Lexington, Mass., assignor to Duracell Inc., Bethel, Conn.

Filed Jun. 28, 1985, Ser. No. 749,688

Int. Cl.[4] H01M *4/04*

U.S. Cl. 429—218 **18 Claims**



1. A method for making an electrochemical cell, with reduced gassing, with said cell having a polycrystalline metal anode, comprised of individual particles of said polycrystalline metal, and being subject to gassing, said method comprising the steps of:

(a) reducing the number of grains in each of said polycrystalline metal particles to one third or less of the original number of grains without general change in the shape of the individual particles;

(b) forming said individual polycrystalline metal particles, with reduced number of grains, into an anode for said cell; and

(c) placing said formed polycrystalline metal anode into said cell.

4,632,891

PROCESS FOR THE PRODUCTION OF IMAGES

Christopher P. Banks, Saffron Walden, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1985, Ser. No. 779,914

Claims priority, application United Kingdom, Oct. 4, 1984, 8425124; Dec. 19, 1984, 8432106

Int. Cl.[4] G03C *5/00, 1/52, 1/495, 1/71*

U.S. Cl. 430—18 **20 Claims**

1. A process for the production of an image on a substrate which comprises

(i) inserting the substrate as an electrode into a liquid composition comprising

(A) a cationically polymerizable material,

(B) a polymerizing agent for (A) which is activated by an electric current, and

(C) a photosensitive material,

(ii) passing an electric current through the liquid composition between the substrate and another electrode, such that a photosensitive layer of essentially solid, polymerized material is deposited on the surface of the substrate,

(iii) removing the substrate from the liquid composition,

(iv) exposing the photosensitive layer to actinic radiation in a predetermined pattern so as to effect a difference in solubility between exposed parts and unexposed parts of the layer, and

(v) removing more soluble parts of the layer by treatment with a solvent, leaving less soluble parts of the layer on the substrate.

4,632,892

PHOTOSENSITIVE MEMBER WITH RESIN HAVING LOW OLIGOMER CONTENT IN CHARGE TRANSPORT LAYER

Yuichi Yashiki; Hideki Anayama, both of Yokohama, and Masaaki Hiro, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,934

Claims priority, application Japan, Nov. 1, 1983, 58-203724

Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—58 **13 Claims**

1. An electrophotographic photosensitive member comprising at least a charge generation layer and a charge transporting layer, characterized in that the charge transport layer comprises a charge-transporting material and a resin which contains at least 95% by weight of components of molecular weights of 500 or higher.

4,632,893

ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING SELECTED DITHIOKE TOPYRROLOPYRROLES

Alain C. Rochat, Fribourg; Abul Iqbal, Ettingen; Rémy Jeanneret, Allschwil, and Jin Mizuguchi, Marly, all of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Dec. 31, 1985, Ser. No. 815,327

Claims priority, application Switzerland, Jan. 3, 1985, 14/85

Int. Cl.[4] G03G *5/14*

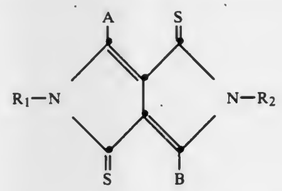
U.S. Cl. 430—58 **4 Claims**

1. Electrophotographic recording material comprising at least of

one conductive support,

one layer which when subjected to exposure generates charges, and

one charge transporting layer, at least one of which layers contains at least one compound of formula (1)



(1)

wherein A and B are identical or different alkyl, aralkyl or cycloalkyl groups or carbocyclic or heterocyclic aromatic radicals, R_1 and R_2 are hydrogen atoms or substituents which do not impart solubility in water.

4,632,894

PHOTOCONDUCTIVE DEVICE HAVING PHOTOCONDUCTIVE LAYER CONTAINING HYDROXYL RADICALS

Kunio Ohashi; Tadashi Tonegawa, both of Nara; Shoichi Nagata, Yamatokoriyama, and Masatsugu Nakamura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1985, Ser. No. 706,669

Claims priority, application Japan, Feb. 28, 1984, 59-39147; Mar. 2, 1984, 59-40938; Mar. 2, 1984, 59-40939; Mar. 5, 1984, 59-42662; Mar. 5, 1984, 59-42663; Mar. 5, 1984, 59-42664; Mar. 14, 1984, 59-49675; Mar. 14, 1984, 59-49676

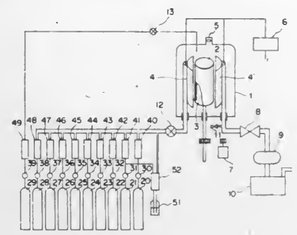
Int. Cl.[4] G03G *5/04, 5/08, 15/08*; B05D *5/12*

U.S. Cl. 430—84 **3 Claims**

1. A photoconductive device comprising:

a conductive substrate; and

a photoconductive layer applied on the conductive substrate, which photoconductive layer is made of amorphous silicon containing at least hydrogen;



wherein the photoconductive layer contains hydroxy radicals.

4,632,895

DIFFUSION OR SUBLIMATION TRANSFER IMAGING SYSTEM

Ranjana C. Patel, Bishops Stortford; John H. A. Stibbard, Harlow; Michael G. Fisher, Epping, and Terence W. Baldock, Harlow, all of Great Britain, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 21, 1985, Ser. No. 767,741

Claims priority, application United Kingdom, Aug. 23, 1984, 8421398; Aug. 23, 1984, 8421400

Int. Cl.[4] G03C *5/54, 7/02, 1/727*

U.S. Cl. 430—201 **15 Claims**

1. A process for forming an image which comprises imagewise exposing to radiation of selected wavelength a carrier element comprising, as image forming components, in one or more imaging layers coated on a support a bleachable dye in reactive association with iodonium ion thereby bleaching the dye in exposed areas to form a positive image, and thereafter transferring the positive dye image to a receptor which is either a receptor layer present on the carrier or a separate receptor element by

(i) heating the carrier element to a sufficient temperature to allow the dye image to sublime to the receptor thereby forming an image on the receptor, or

(ii) providing a liquid medium between the positive dye image and receptor for a sufficient time to allow transfer of the dye image to the receptor.

4,632,896

PROCESSING SOLUTION FOR SILVER COMPLEX DIFFUSION TRANSFER PROCESS COMPRISING AMINO ALCOHOLS

Yasuo Tsubai, and Koji Okazaki, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,521

Claims priority, application Japan, Sep. 20, 1984, 59-197820; Sep. 20, 1984, 59-197821; Sep. 20, 1984, 59-197823; Sep. 20, 1984, 59-197824; Oct. 25, 1984, 59-225270; Jan. 23, 1985, 60-11704; Jan. 23, 1985, 60-11705

Int. Cl.[4] G03C *5/54, 5/30, 5/38*

U.S. Cl. 430—249 **23 Claims**

1. An aqueous processing solution for silver complex diffusion transfer process which contains at least one amino-alcohol having a pKa value of less than 9 and at least one amino alcohol having a pKa value of 9 or more, said pKa values being as determined in a 50 wt % aqueous ethanol solution at 25° C.

15. A silver complex diffusion transfer process which comprises imagewise exposing a silver halide emulsion layer and developing it with the processing solution of claim 1 in the presence of a developing agent and a solvent for silver halide to transfer the thus produced imagewise silver complex to an image receiving material.

4,632,897

PHOTOPOLYMERIZABLE RECORDING MATERIAL SUITABLE FOR THE PRODUCTION OF PHOTORESIST LAYERS

Helmut Barzynski, Bad Durkheim; Albrecht Eckell, Frankenthal; Albert Elzer, Otterstadt; Uwe Klinsmann, Mannheim; Reinhold J. Leyrer, Ludwigshafen, and Axel Sanner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 406,436, Aug. 9, 1982, abandoned. This application Dec. 27, 1983, Ser. No. 565,929

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131448

Int. Cl.[4] G03C *1/70, 1/76*

U.S. Cl. 430—260 10 Claims

1. A dry film resist which comprises a temporary, dimensionally stable base and a dry, photosensitive layer which is solid at room temperature and consists of a photopolymerizable recording material consisting essentially of a mixture which is soluble or at least dispersible in an organic solvent and contains

(a) at least one thermoplastic vinyl polymer as the binder, which polymer contains from 0.05 to 3% by weight, based on said polymer, of amino and/or imino group-containing comonomer units,

(b) at least one low molecular weight, ethylenically unsaturated, photopolymerizable compound which is compatible with the binder (a) and

(c) at least one photopolymerization initiator.

2. A dry film resist which comprises: (1) a temporary, dimensionally stable base; (2) a dry, photosensitive layer which is solid at room temperature, and (3) a cover sheet applied to that surface of the photosensitive layer which faces away from the temporary base (1), the adhesion of this sheet to the photosensitive layer being less than that of the temporary base to said layer, said photosensitive layer (2) constituting photopolymerizable recording material consisting essentially of a mixture which is soluble or at least dispersible in an organic solvent and contains

(a) at least one thermoplastic vinyl polymer as the binder which polymer contains from 0.05 to 3% by weight, based on said polymer of amino and/or imino group-containing comonomer units,

(b) at least one low molecular weight ethylenically unsaturated, photopolymerizable compound which is compatible with the binder (a), and

(c) at least one photopolymerizable initiator.

4,632,898

PROCESS FOR FABRICATING GLASS TOOLING

Robert V. Fister, Hilton, and James R. Pledger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,411

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—313 8 Claims

1. A process for fabricating glass tooling with a featured surface, said process comprising the steps of:

coating a polished surface of a glass blank with a continuous metal coating;

applying a photoresist layer to the metal coating;

exposing the photoresist layer so as to create therein a desired pattern latent image;

developing the latent image, leaving certain portions of the metal coating uncovered and other portions thereof still covered by remaining portions of the photoresist layer;

etching away said uncovered portions of the metal coating, leaving corresponding portions of the glass blank uncovered and other portions thereof covered by a mask including said other portions of the metal coating still covered by said remaining portions of the photoresist layer;

removing said remaining portions of the photoresist layer from said other portions of the metal coating;

plasma etching into said uncovered portions of the glass blank while said other portions thereof are covered by said other portions of the metal coating; and

removing said other portions of the metal coating from said other portions of the glass blank;

thereby leaving the glass blank etched in accordance with said desired pattern and clear of said mask, to provide said glass tooling with said featured surface for use as a durable master in a subsequent molding process.

4,632,899

PHOTOPOLYMERIZABLE IMAGE-RECORDING PROCESS OF PRODUCING A VISIBLE IMAGE

Keiji Takeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1984, Ser. No. 677,453

Claims priority, application Japan, Dec. 1, 1983, 58-227437; Dec. 2, 1983, 58-228228; Dec. 5, 1983, 58-229376; Feb. 7, 1984, 59-20539

Int. Cl.[4] G03C *1/66*

U.S. Cl. 430—292 14 Claims



1. An image-recording process which comprises (1) using a photopolymerizable element comprising a polymerizable vinyl monomer and/or a polymerizable prepolymer containing at least one vinyl group, a photopolymerization initiator and a dye capable of being bleached with said vinyl monomer and/or prepolymer or a dye precursor capable of producing said bleachable dye upon heating, (2) conducting imagewise exposure to polymerize said photopolymerizable element, and (3) heating said photopolymerizable element to a temperature between 80° and 200° C. for a period of 3 seconds to 120 seconds, in order to (a) bleach the dye with non-polymerized monomer and/or non-polymerized prepolymer remaining in areas not exposed or exposed in an amount insufficient to cause polymerization, or (b) bleach the dye produced from the dye precursor upon heating, wherein said dye precursor capable of producing said bleachable dye upon heating is a two-component color forming substance consisting of a color former and a color developer and said dye capable of being bleached is a dye obtained by heating said two-component color forming substance or subjecting said two-component color forming substance to solution reaction to form a color.

4,632,900

PROCESS FOR THE PRODUCTION OF IMAGES AFTER ELECTRODEPOSITION OF POSITIVE PHOTORESIST ON ELECTRICALLY CONDUCTIVE SURFACE

Christopher G. Demmer, Cherry Hinton; Edward Irving, Burwell, both of England, and Ewald Losert, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 7, 1985, Ser. No. 708,998

Claims priority, application United Kingdom, Mar. 7, 1984, 8405958; Dec. 1, 1984, 8430376

Int. Cl.[4] G03F *7/36;* H05K *3/06*

U.S. Cl. 430—323 19 Claims

1. A process for the production of an image which comprises

(i) applying by electrodeposition a positive photoresist comprising a molecule having a salt-forming group onto a substrate having an electrically conductive surface whereby an adherent, substantially uniform layer consisting essentially of a positive photoresist composition is electrodeposited on said surface,

(ii) exposing the electrodeposited layer to actinic radiation in a predetermined pattern, such that exposed areas of the electrodeposited layer become more soluble in a developer than unexposed areas, and

(iii) removing exposed areas by contact with a developer.

4,632,901

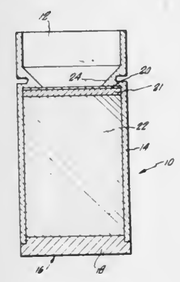
METHOD AND APPARATUS FOR IMMUNOASSAYS

Gunars E. Valkirs, San Marcos; Newton C. Owen, Encinitas, and Philip A. Levinson, San Diego, all of Calif., assignors to Hybritech Incorporated, San Diego, Calif.

Filed May 11, 1984, Ser. No. 609,395

Int. Cl.[4] G01N *33/53, 33/543*

U.S. Cl. 435—5 16 Claims



8. An immunoassay process for the detection of a target antigen in a liquid sample employing as an assay device an apparatus comprising:

(a) a first member which is a porous membrane or filter and to which is bound an antibody against the target antigen which member has upper and lower surfaces, the sample being applied to the upper surface, and wherein the antibody is bound within an area smaller than the area of the member to which the sample is applied; and

(b) a second member which is a body of absorbent material having a surface over which the first member is placed and having capillaries therethrough in a direction generally transverse to the surface over which the first member is placed, which capillaries are in communication with the pores on the lower surface of the first member so as to draw liquid added to the upper surface which has permeated the first member into the capillaries of the second member, the capillary communication between said first and second member having been established prior to, and maintained during, addition of liquids to the apparatus in the immunoassay process;

the process comprising adding the sample and other reagents used in the assay to the upper surface of the first member and detecting antigen bound to the antibody on the first member.

4,632,902

METHOD FOR DETECTING BIOLOGICAL ACTIVITY IN A BODY FLUID

John R. Waters, Towson, and Rodney Broman, Fallston, both of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 527,144, Aug. 29, 1983, abandoned, which is a continuation of Ser. No. 294,857, Aug. 20, 1981, abandoned. This application Jan. 3, 1985, Ser. No. 688,276

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 12 Claims

1. A method for detecting biological activity in a body fluid sample which may contain antimicrobial material wherein:

(a) a growth medium is inoculated with a body fluid sample

(b) the inoculated growth is cultured under conditions conducive to the occurrence of normal metabolic processes for a period of time sufficient to cause production of metabolic byproducts, and

(c) the metabolic byproducts are monitored to detect biological activity,

(d) the improvement comprising incorporating into said growth medium an effective amount of a resin capable of isolating any antimicrobial material present in said body fluid sample without hindering biological activity during said culturing period.

4,632,903

ENZYME MODIFIED SOY PROTEIN FOR USE AS AN EGG WHITE SUBSTITUTE

Columbus O. L. Boyce, Brewster, N.Y.; Raymond P. Lanzilotta, Moss Beach, Calif., and Theodore M. Wong, Bethel, Conn., assignors to Novo Laboratories, Inc., Wilton, Conn.

Filed Dec. 28, 1984, Ser. No. 687,171

Int. Cl.[4] C12P *21/06;* A23J *3/02*

U.S. Cl. 435—69 5 Claims

1. A process for enzymatically modifying soy protein which comprises hydrolyzing to a degree of hydrolysis in the range of 0.25–2.5 an aqueous suspension of a concentrated soy protein with a *Mucor meihei* or *Mucor pusillus* microbial rennet in concentration ranging from 0.5 to 10 KRU per gm of soy protein at a substrate concentration of between 5 and 20% w/w soy protein at pH 3–6.5, then deactivating the enzyme and thereafter recovering the enzyme modified soy protein from the suspension.

4,632,904

IMMOBILIZED ENZYME COMPOSITES HAVING CARRIERS DERIVATIZED WITH AN ORGANOTITANATE

Siu-Leung Lee, Painted Post, N.Y., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Dec. 27, 1983, Ser. No. 565,299

Int. Cl.[4] C12N *11/14, 11/02, 11/10, 11/12*

U.S. Cl. 435—176 12 Claims

1. An immobilized enzyme composite comprising:

(a) an insoluble carrier;

(b) an enzyme; and

(c) an alkoxy organotitanate coupling compound which couples the enzyme to the carrier said alkoxy organotitanate having the following general formula: $(R_1O).Ti.-(OXR_2Y)_3$ wherein R_1 represents the aliphatic part of a monoalkoxy group; R_2 is selected from the group consisting of isoheptadecyl, phenyl, and ethylene; X symbolizes a binding group which connects titanium to R_2, wherein X is selected from the group consisting of carboxyl, phenyl, sulfonyl, and pyrophosphate linkage; Y is selected from the group consisting of methacrylic, acrylic, amino, mercapto, hydroxyl, and hydrogen groups; and either R_2 or Y can be absent but not both.

4,632,905

MICROBIAL SULFHYDRYL OXIDASE

Robert L. Starnes, West Haven; Dennis M. Katkocin, Danbury; Carl A. Miller, Ridgefield, and Robert J. Strobel, Jr., Norwalk, all of Conn., assignors to Novo Laboratories, Inc., Wilton, Conn.

Filed May 29, 1985, Ser. No. 738,764

Int. Cl.[4] C12N *9/02;* C12R *1/66*

U.S. Cl. 435—189 8 Claims

1. The sulfhydryl oxidase elaborated by *Aspergillus sojae* said sulfhydryl oxidase being characterized by a pH optimum of about pH 6.5 and a temperature optimum of about 42° C.

4,632,906
BIODESULFURIZATION OF CARBONACEOUS MATERIALS

Elva P. Kopacz, Chicago, Ill., assignor to Atlantic Richfield Company, Plano, Tex.

Filed Nov. 29, 1984, Ser. No. 676,346
Int. Cl.[4] C12R *1/07*; C10G *32/00*
U.S. Cl. 435—282 **3 Claims**

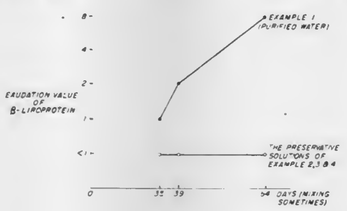


1. A method for reducing the sulfur content of a sulfur-containing carbonaceous material comprising contacting a sulfur-containing carbonaceous material in an aqueous medium with a microorganism *Bacillus sulfasportare* per American Type Culture Collection number 39909.

4,632,907
PRESERVATIVE SOLUTION FOR FIXED AVIAN ERYTHROCYTES FOR THE VIRAL HEMAGGLUTINATION TEST

Akihiko Sato, Osaka, and Kunihiro Nakajima, Nara, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 19, 1985, Ser. No. 766,940
Claims priority, application Japan, Aug. 31, 1984, 59-183039
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—10 **4 Claims**



1. A preservative solution of fixed avian erythrocytes for viral hemagglutination testing consisting essentially of:
about 8 to 12% (V/V) of fixed avian erythrocytes;
about 0.01 to about 0.2% (W/V) of a preventative agent against the growth of bacteria selected from the group consisting of sodium azide and thimerosol;
a stabilizer selected from the group consisting of 0.01 to about 1.0% (W/V) albumin, about 5 to 10% (V/V) glycerol and about 5 to 10% (V/V) dimethyl sulfoxide; and
purified water selected from the group consisting of distilled water and ion-exhanged water.

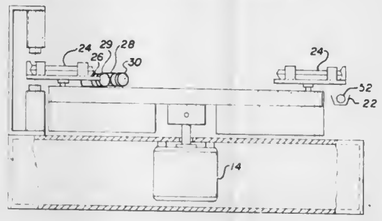
4,632,908
HEATING SYSTEM FOR ROTATING MEMBERS

Steven G. Schultz, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 3, 1984, Ser. No. 606,787
Int. Cl.[4] G01K *11/12*; G01N *21/00*; G09F *11/04*
U.S. Cl. 436—157 **23 Claims**

1. A method for heating a rotating article having a temperature sensing and indicating element mounted thereon comprising the steps of:
(a) illuminating the temperature sensing and indicating element with a light source,
(b) measuring the change in light reflected from the temperature sensing and indicating element, wherein the temperature sensing and indicating means is adapted to reflect light as a function of the temperature of the article, and
(c) energizing a strobe light in response to the measurement of step (b) and in synchronism with the rotation of the article to radiate energy onto the article to heat the same.

4. An apparatus for heating a rapidly rotating article, comprising in combination an article equipped with temperature sensing and indicating means rotatably supporting said article to be heated thereon, and means for heating said article, said heating means comprising:
(a) strobe means for emitting radiant heating energy positioned to radiate heating energy onto said article to be heated along a portion of its path of rotation;



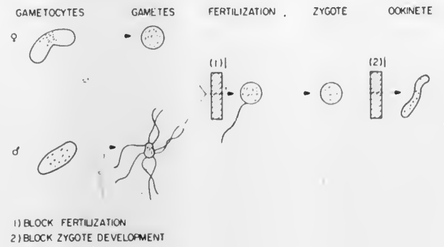
(b) a light source positioned to illuminate said temperature sensing and indicating means positioned on said article during a portion of the rotation of said article, the temperature sensing and indicating means being adapted to reflect radiant energy as a function of the temperature of the article:
(c) light detector means to detect changes in the light reflected from the temperature sensing and indicating means and generate a signal in response to the detected change in reflected light; and control means to energize the strobe means in response to the signal generated by the light detector means whereby the light detector means senses light reflected by the temperature sensing and indicating means as a measure of the temperature of the article and in response to the reflected light generates a signal to the control means proportional to the level of reflected light and whereby said control means energizes the strobe means to heat the article in response to a signal from the light detector means which is indicative of a predetermined temperature of the article.

4,632,909
MONOCLONAL ANTIBODIES WHICH BLOCK INFECTIVITY OF MALARIAL PARASITES TO MOSQUITOES

Richard Carter, Kensington, and Louis H. Miller, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,235
Int. Cl.[4] G01N *33/536*; C12N *5/00*; A61K *39/395*; C12P *21/00*
U.S. Cl. 436—542 **12 Claims**

1. A process for blocking transmission of malaria parasites comprising providing anti-parasitic monoclonal antibodies IIC5-B10 and IA-3-B8 which specifically bind to an antigen on the surface of extracellular gametes of said malaria parasites,



and feeding said monoclonal antibodies to mosquitoes in a blood meal containing gametocytes of the malaria parasites.

4,632,910
SINTERED MATERIAL OF SILICON NITRIDE FOR CUTTING TOOLS AND PROCESS THEREFOR

June-Gunn Lee; Young-Wook Kim; Tae-Hee Park; Long Chol, all of Seoul; Sang-Ho Lee, and Kam-Yong Jang, both of Taejon, all of Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed May 29, 1985, Ser. No. 738,950
Claims priority, application Rep. of Korea, May 29, 1984, 2968/84
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 **6 Claims**

1. A sintered material based on silicon nitride consisting essentially of 2 to 10 percent by weight of yttrium oxide, 1 to 5 percent by weight of aluminium oxide. 10 to 40 percent by weight of titanium carbide coated with titanium nitride and the balance of silicon nitride which has been subjected to hot pressing at elevated temperatures of 1600° C. to 1800° C.

3. A process for preparing a sintered material based on silicon nitride comprising sintering and hot isostatic pressing a mixture of 2 to 10 percent by weight of yttrium oxide, 1 to 5 percent by weight of aluminium oxide and 10 to 40 percent by weight of titanium carbide coated with titanium nitride in powder form at elevated temperatures of 1600° C. to 1800° C.

4,632,911
SHAPE-SELECTIVE PHOTOASSISTED HETEROGENOUS CATALYST COMPOSITIONS

Theodore P. Goldstein, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 668,785, Nov. 6, 1984, abandoned, which is a division of Ser. No. 368,550, Apr. 15, 1982, Pat. No. 4,495,041. This application Oct. 30, 1985, Ser. No. 793,489
Int. Cl.[4] B01J *29/04*, *29/06*
U.S. Cl. 502—62 **7 Claims**

1. A photoassisted heterogenous catalytic composition comprising a zeolite having an organic dye sensitizer photoassisting species within its structure.

2. The composition of claim **1** wherein the photoassisting species includes an organic dye sensitizer selected from the group consisting of crystal violet, sodium-9, 10-anthrequinone-2-sulfuric acid, C.I. Acid Red 12, d, l, mandelic acid, acridine dyes, astrazone orange G, astrazone pink FG, erythrosine B and rosolic acid.

3. The composition of claim **1** wherein the photoassisting species comprises less than about one percent by weight of the zeolite composition.

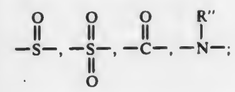
4,632,912
POLYMER SUPPORTED ZIEGLER-NATTA CATALYSTS

Stephen A. Bedell, Lake Jackson, Tex.; William R. Howell, Jr., Midland, Mich., and William M. Coleman, III, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

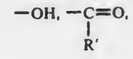
Filed Dec. 10, 1985, Ser. No. 807,419
Int. Cl.[4] C08F *4/62*, *4/64*, *4/68*
U.S. Cl. 502—122 **4 Claims**

1. A polymer supported Ziegler-Natta catalyst resulting from contacting for a time sufficient to form a compound or a complex
(A) (1) at least one organic polymeric material to which has been covalently bonded (2) one or more dihydric phenolic compounds; which has been prepared by reacting a halogenated organic polymeric material with said dihydric phenolic compound; with
(B) at least one compound of an element from the transition metal, lanthanide or actinide series represented by the formula $Tm(OR)_xX_{y-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; Tm is an element from the transition metal, lanthanide or actinide series; X is a halogen; x has a value from zero to a value equal to the valence of the element Tm and y has a value equal to the valence of the element Tm; and
wherein components (A-1) and (A-2) are employed in amounts which provides a ratio of moles of (A-2) per halogen atom contained in a halogenated component (A-1) of from about 1:1 to about 30:1 and components (A) and (B) are employed in an amount which provides a ratio of moles of polyhydric aromatic compound per atom of Tm of from about 1:1 to about 10:1.

2. A catalyst of claim **1** wherein
(i) the dihydric phenolic compound is represented by the formulas (I-IX) in the specification wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms, —O—, —S—, —S—S—,



each A′ is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R is independently



or a hydroxyl substituted hydrocarbyl or a hydroxyl substituted hydrocarbyloxy group having from 1 to about 20 carbon atoms; each R′ is independently hydrogen, hydroxyl or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; each R″ is independently hydrogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10; each X is independently a hydroxyl group, a nitro group, a nitrile group, a hydrocarbyl group, a hydrocarbyloxy group, a hydroxyl substituted hydrocarbyl or a hydroxyl substituted hydrocarbyloxy group each such groups having from 1 to about 20 carbon atoms or a halogen; m has an average value of from about 0.01 to about 6; each n independently has a value of zero or 1; n′ has a value of 3; each x independently has a value of from zero to 2; each y independently has a value of from zero to 4 and z has a value of from zero to 3;
(ii) in component (B), Tm is Ti, Zr or V;
(iii) components (A-1) and (A-2) are employed in an amount which provides a ratio of moles of (A-2) per halogen atom contained in halogenated component (A-1) of from about 1:1 to about 10:1; and
(iv) components (A) and (B) are employed in an amount which provides a ratio of moles of polyhydric aromatic

compound per atom of titanium of from about 1:1 to about 5:1.

4,632,913

BORON PHOSPHATE CATALYST FOR THE PRODUCTION OF DIENES FROM ALDEHYDES

Wen-Liang Hsu, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 761,728, Aug. 2, 1985, Pat. No. 4,587,372. This application Jan. 22, 1986, Ser. No. 821,294

Int. Cl.⁴ B01J *21/02, 21/18, 22/24*

U.S. Cl. 502—202 **2 Claims**

1. An improved aldehyde dehydration catalyst, the improvement characterized in that boron phosphate is combined with from 0.1 to 10 mole percent ammonium carbonate or ammonium bicarbonate, based on moles of boron, and then calcined.

4,632,914

METHOD OF PREPARING A HYDROCRACKING CATALYST

Beatriz Arias, Caracas; Humberto Kum, Los Teques, and Roberto Galiasso, San Antonio de los Altos, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 393,500, Jun. 29, 1982, Pat. No. 4,499,202. This application Feb. 12, 1985, Ser. No. 700,640

Int. Cl.⁴ B01J *21/04, 23/28, 27/18*

U.S. Cl. 502—211 **10 Claims**

1. A method for the preparation of a hydrocracking catalyst which comprises blending bauxite having a particle size less than about 500 microns and having a composition with the following ranges in weight percent:

Al=22–47%
Fe=5–28%
Si=1–13%
Ti=1–7%

with from about 1 to about 7 weight percent (based on the weight of bauxite) of a molybdenum salt, with from about 1 to about 8 weight percent phosphoric acid, and sufficient water to produce a paste of rheology suitable for extrusion, extruding said blend to form extrudable pellets having a diameter no greater than about ⅛ inch, drying the extruded pellets in two stages: a first stage at room temperature for a time period of about 8 to about 72 hours and a second stage at a temperature of about 60° to about 120° C. (about 140° to about 248° F.) for a time period of about 8 to about 72 hours, and thereafter calcining the dried pellets at a temperature of about 300° to about 600° C. (about 572° to about 1112° F.) for a time period of about 3 to about 24 hours to produce dried and calcined pellets having a molybdenum and phosphorus concentration at the pellet surface that is greater than the molybdenum and phosphorus concentration within the body of the pellet and a pore volume wherein 20 percent to 65 percent of the pores have a radius of more than about 200 Angstroms and 8 percent to 40 percent of the pores have a radius of more than about 1000 Angstroms.

4,632,915

IRON/LITHIUM—PROMOTED CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

Robert A. Keppel, Chesterfield, and Victoria M. Franchetti, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 28, 1985, Ser. No. 791,655

Int. Cl.⁴ B01J *27/198, 27/185;* **C07D** *307/34*

U.S. Cl. 502—209 **5 Claims**

1. A catalyst for the production of maleic anhydride by the partial oxidation of non-aromatic hydrocarbons which consists essentially of phosphorus, vanadium and oxygen and a promoter component containing each of iron and lithium, the catalyst having an (iron+lithium)/vanadium atom ratio from about 0.0025 to about 0.0080, with the proviso that the iron/vanadium atom ratio is from about 0.0010 to about 0.0040 and the lithium/vanadium atom ratio is from about 0.0015 to about 0.0040, and with the further priviso that the iron/lithium atom ratio is from about 0.30 to about 1.30.

4,632,916

FUMED SILICA MODIFIED CATALYST

Tom A. Bither, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 15, 1985, Ser. No. 754,752

Int. Cl.⁴ B01J *27/198, 27/182*

U.S. Cl. 502—209 **14 Claims**

1. An improved vanadium/phosphorus oxide catalyst for vapor phase oxidation of n-butane to maleic anhydride;

said catalyst being prepared by the process comprising:

(a) contacting in an aqueous or organic liquid medium a vanadium species substantially of valence +4 with a sufficient amount of a phosphorus species, to form a catalyst precursor which will generate a P/V atom ratio in the range of from about 0.9:1.0 to about 1.3:1.0 in the catalyst;

(b) blending the catalyst precursor with an organic pore modifying agent in an amount of from about 3 to about 5% by weight of the precursor and with fumed silica having a surface area of at least about 150 m^2/g in an amount of from about 0.05 to about 0.20% by weight of the catalyst precursor; and

(c) heating the resulting combination to generate the catalyst.

4,632,917

PSEUDOOLIGOSACCHARIDES WITH AN α-GLUCOSIDASE-INHIBITING ACTION, THEIR USE AND PHARMACEUTICAL PRODUCTS

László Vértesy, Eppstein; Rudolf Bender, Kronberg; Hans-Wolfram Fehlhaber, Idstein, and Karl Geisen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

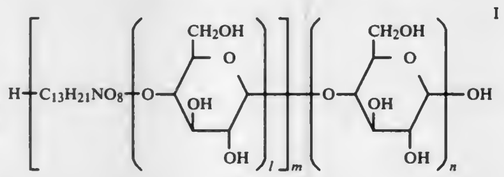
Filed Sep. 3, 1985, Ser. No. 771,610

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432431

Int. Cl.⁴ A61K *31/73;* **C08B** *37/00*

U.S. Cl. 514—54 **7 Claims**

1. A pseudooligosaccharide of the formula I



I

in which

l=1 or 2

m=1, 2 or 3 and

n denotes an integer from 1 to 20

and a physiologically acceptable salt thereof with an acid.

6. A method for the treatment of diabetes, prediabetes and adiposity, wherein an effective amount of a compound as claimed in claim 1 is administered.

4,632,918

NOVEL β-LACTAM ANTIBIOTICS

Rolf Angerbauer; Michael Boberg; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

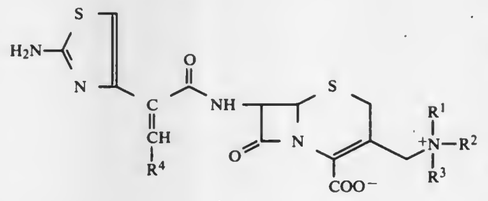
Filed May 6, 1985, Ser. No. 730,979

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419012

Int. Cl.⁴ A61K *31/545;* **C07D** *501/46*

U.S. Cl. 514—202 **13 Claims**

1. A β-lactam compound of the formula



in which

R^1, R^2 and R^3 each independently is a C_1–C_6-aliphatic radical optionally substituted by hydroxyl, amino, carboxy, cyano, nitro, C_1–C_6-alkoxy, C_1–C_6-alkoxycarbonyl or halo,

or in which

R^1 has the aforementioned meaning, and

R^2 and R^3 together with the N atom, form a pyrrolidinium, piperidinium, piperazinium, morpholinium, pyrrolinium, pyrazolidinium, indolinium, isoindolinium, oxazolidinium, thiazolidinium or thiomorpholinium radical which is optionally substituted by C_1–C_6-alkyl which itself is optionally substituted by hydroxyl, carboxyl, cyano, nitro, amino, halogen, C_1–C_6-alkoxy, C_1–C_6-alkoxycarbonyl, formyl, C_1–C_6-alkoxycarbonyl, carbamyl, sulpho, C_1–C_6-alkylamino and dialkylamino, C_1–C_6-alkylcarbonylamino, C_1–C_6-alkylthio, C_1–C_6-alkylsulphinyl, C_1–C_6-alkylsulphonyl, phenyl, naphthyl or pyridyl, and

R^4 is a lower alkyl radical, lower cycloalkyl radical, phenyl, dichlorophenyl, trichlorophenyl, hydroxycarbonylphenyl, hydroxycarbonyl-C_1–C_6-alkylphenyl, pyridyl, aminothiazolyl, hydroxycarbonyl, hydroxycarbonyl-C_1–C_4-alkyl, lower alkoxycarbonyl or C_1–C_4-alkylsulphonyl.

12. A method of combating bacteria which comprises applying to the bacteria or a bacterial habitat an antibacterially effective amount of a compound according to claim 1.

4,632,919

PROCESS FOR PROLONGING RECALCIFICATION, PROTHROMBIN AND THROMBIN TIMES OF PLASMA

Charles R. Spillert, West Orange, N.J.; Corinne Devereux, Bronxville, N.Y., and Eric J. Lazaro, Jersey City, N.J., assignors to University of Medicine & Dentistry of N.J., Newark, N.J.

Filed Sep. 27, 1984, Ser. No. 655,145

Int. Cl.⁴ A61K *31/635, 31/505*

U.S. Cl. 514—158 **8 Claims**

1. A process for treating a warm-blooded animal to prolong at least one of recalcification, prothrombin or thrombin time of plasma which comprises administering to a warm-blood animal in need of such treatment (a) at least one member selected from the group consisting of 5-methyl-3-sulfanil-amidoisoxazole and a salt of 5-methyl-3-sulfanilamidoisoxazole with a pharmaceutically acceptable base and (b) at least one member selected from the group consisting of 2,4,-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine and a salt of 2,4-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine with a pharmaceutically acceptable acid, said components (a) and (b) being administered in an amount effective to prolong at least one of recalcification, prothrombin or thrombin time.

4,632,920

PROCESS FOR TREATING A WARM-BLOODED ANIMAL FOLLOWING BURN INJURY

Charles R. Spillert, West Orange, N.J.; Corinne Devereux, Bronxville, N.Y., and Eric J. Lazaro, Jersey City, N.J., assignors to University of Medicine & Dentistry of New Jersey, Newark, N.J.

Filed Sep. 27, 1984, Ser. No. 655,079

Int. Cl.⁴ A61K *31/635*

U.S. Cl. 514—158 **9 Claims**

1. A process for treating a warm-blooded animal following burn injury which comprises administering to said warm-blooded animal (a) from about 1 to about 30 parts selected from the group of 5-methyl-3-sulfanilamidoisoxazole and a salt of 5-methyl-3-sulfanilamidoisoxazole with a pharmaceutically acceptable base and (b) from about 30 to about 1 part selected from the group of 2,4-diamino-5-(3,4,5-trimethoxybenzyl)-pyrimidine and a salt of 2,4-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine with a pharmaceutically acceptable acid.

4,632,921

PROCESS FOR THE PRODUCTION OF READILY SOLUBLE 5-AMINOSALICYLIC ACID PREPARATIONS

Kurt H. Bauer, Hermann-Herder-Strasse 9, 7800 Freiburg, Fed. Rep. of Germany

Continuation of Ser. No. 451,975, Dec. 21, 1982, Pat. No. 4,540,685. This application Jul. 26, 1985, Ser. No. 759,423

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151196

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ A61K *31/40, 31/61, 31/195*

U.S. Cl. 514—163 **19 Claims**

1. A process for preparing a stable and readily soluble pharamaceutical preparation for oral and rectal application based on 5-aminosalicylic acid for use in the treatment of Crohn's disease and ulcerative colitis which comprises mixing (1) a pharmaceutically acceptable solid or liquid carrier and (2) a dry mixture comprising 5-aminosalicylic acid and a mixture of pharmaceutically acceptable alkaline materials comprising a first member selected from alkali and ammonium carbonates and bicarbonates and a second member selected from lysine, arginine, choline and glycine, the mol ratio of said first and second members being such that said mixture of pharmaceutically acceptable alkaline materials gives a pH of 8–12 in a 1.0% aqueous solution, the concentration of said mixture of pharmaceutically acceptable alkaline materials in the dry mixture being 0.5–3.0 mols per mol of 5-aminosalicylic acid.

4,632,922

OXOMORPHOLINYL DIMER AND RESCUE OF ANTHRACYCLINE AND MITOMYCIN C DAMAGE

Steven D. Averbuch, Rockville; Nicholas R. Bachur, Towson, both of Md.; Giorgio Gaudiano, and Tad H. Koch, both of Boulder, Colo., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C. and University of Colorado Foundation, Inc., Colo.

Filed Oct. 24, 1985, Ser. No. 791,120

Int. Cl.⁴ A61K *31/535;* **C07D** *265/32*

U.S. Cl. 514—236 **2 Claims**

1. Bi(3,5-dimethyl-5-hydroxymethyl-2-oxiomorpholin-3-yl) compound.

2. A method of protecting mammals against anthracycline or mitomycin C induced tissue damage comprising administering to said mammals a protective amount of bi(3,5-dimethyl-5-hydroxymethyl-2-oxomorpholin-3-yl) in a pharmaceutically acceptable carrier.

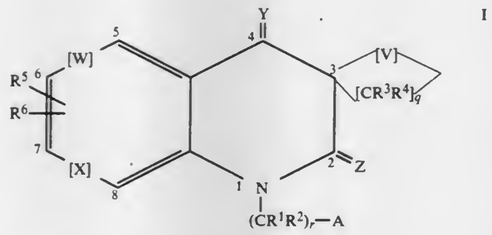
4,632,923

SUBSTITUTED HETERO SPIRO PYRIDINE DERIVATIVES AS ANTI-ALLERGY AND ANTI-INFLAMMATORY AGENTS

David J. Blythin, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Aug. 15, 1984, Ser. No. 641,076
Int. Cl.[4] A61K *31/495;* C07D *513/20*
U.S. Cl. 514—247 29 Claims

1. A compound having the structural formula I:



I

wherein

X and W both represent N;

Y and Z may be the same or different and are O or S;

R^5 and R^6 may be the same of different and are hydrogen, alkyl having from 1 to 6 carbon atoms, halo, nitro, alkoxy having from 1 to 6 carbon atoms trifluoromethyl, alkylthio having 1 to 6 carbon atoms or cyano;

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl having 1 to 6 carbon atoms, CH_2OH, CO_2R^7 {wherein R^7 is hyrogen or alkyl having 1 to 6 carbon atoms} or hydroxy; provided that only one group on any carbon atom can be —OH and such carbon atom is not adjacent to a heteroatom;

V is oxygen, $S(O)_n$ {wherein n is 0, 1 or 2}, N—R^8, {wherein R^8 is hydrogen, alkyl having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 7 carbon atoms, sulfonylalkyl having from 1 to 6 carbon atoms, carboalkoxy having from 2 to 7 carbon atoms, $CONH_2$, phenyl, pyridyl of which the last two may be substituted with up to three of any of the following substituents, Q: hydroxy, alkyl having from 1 to 6 carbon atoms, halo, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having from 3 to 6 carbon atoms, $S(O)_nR^a$ {wherein n is defined herein an R^a is alkyl having from 1 to 6 carbon atoms}, $NHSO_2R^a$ {wherein R^a is defined herein}, $NHSO_2CF_3$, $NHCOCF_3$, SO_2NH_2, COR^b {wherein R^b is OH, NH_2 or OR^a {wherein R^a is defined herein)}, O—B-COR^b {wherein B is alkylene having from 1 to 4 carbon atoms and R^b is defined herein}, or $NHCOR^c$ {wherein R^c is hydrogen, alkyl having from 1 to 6 carbon atoms, COR^d (wherein R^d is hydroxy or alkoxy having from 1 to 6 carbon atoms) or NHR^e (wherein R^e is hydrogen or alkyl having from 1 to 6 carbon atoms)}};

r is 0, 1 or 2;

q is an integer of from 2 to 6; and

A is phenyl, naphthyl, indenyl, indanyl, pyridyl, pyrimidyl, pyrazinyl, furyl, thienyl, imdiazolyl, thiazolyl or oxazolyl any of which may be substituted with up to three substituents, Q as defined herein.

25. A pharmaceutical composition for treating inflammation which comprises a compound having structural formula I as defined in claim 1 in combination with a pharmaceutically acceptable carrier.

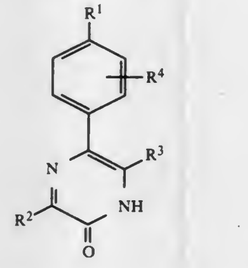
4,632,924

5-(4-SUBSTITUTED)PHENYL-2-PYRAZINONES

John C. Emmett, Welwyn, and Robert A. Slater, Letchworth, both of England, assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Nov. 30, 1984, Ser. No. 677,006
Claims priority, application United Kingdom, Dec. 2, 1983, 8332313
Int. Cl.[4] C07D *241/08;* A61K *31/495*
U.S. Cl. 514—255 10 Claims

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

R^1 is cyano; a group —COR^5 wherein R^5 is hydrogen, C_{1-6}alkyl or C_{1-6}alkoxy; or R^1 is a group —$CONR^6R^7$ wherein R^6 and R^7 are independently hydrogen, C_{1-6}alkyl or benzyl; and

R^2, R^3 and R^4 are independently hydrogen or C_{1-4}alkyl.

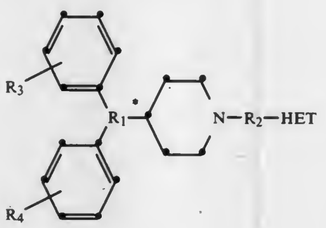
4,632,925

N-SUBSTITUTED DIPHENYLPIPERIDINES AND ANTIOBESITY USE THEREOF

John G. Mullin, Jr., Hawthorne; Richard W. Kierstead, North Caldwell, and Joseph Triscari, Bloomfield, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

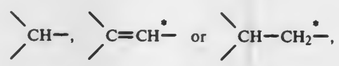
Filed Oct. 7, 1985, Ser. No. 785,113
Int. Cl.[4] A61K *31/505, 31/445;* C07D *211/68, 239/02*
U.S. Cl. 514—256 20 Claims

1. A compound of the formula



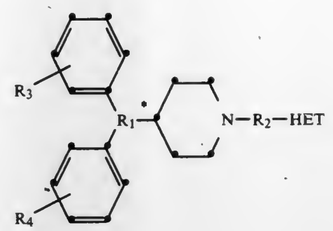
I

wherein R_1 is



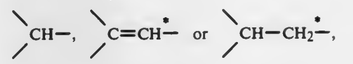
the asterisk denotes the bonding orientation to the piperidine moiety; R_2 is alkylene or —CO—$(CH_2)_n$— wherein n is 0 to 11; R_3 and R_4, independently, are hydrogen, halogen or lower alkoxy; and HET is pyridinyl, pyrimidinyl or imidazolyl, or a salt thereof with a pharmaceutically acceptable acid.

15. A method of treating obesity which comprises administering to a host requiring such treatment an effective amount of a compound of the formula



I

wherein R_1 is



the asterisk denotes the bonding orientation to the piperidine moiety; R_2 is alkylene or —CO—$(CH_2)_n$— wherein n is 0 to 11; R_3 and R_4, independently, are hydrogen, halogen or lower alkoxy; and HET is pyridinyl, pyrimidinyl or imidazolyl, or a salt thereof with a pharmaceutically acceptable acid.

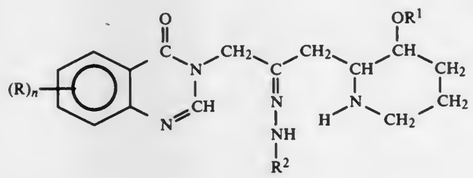
4,632,926

QUINAZOLINONE DERIVATIVES WHICH ARE ACTIVE AGAINST COCCIDIOSIS

Silvio Giarda, Novara; Pietro Cesti, Trecate; Giovanni Confalonieri, Monza, and Paolo Piccardi, Milan, all of Italy, assignors to VETEM S.p.A., Milan, Italy

Filed Jul. 6, 1983, Ser. No. 511,264
Claims priority, application Italy, Jul. 6, 1982, 22245 A/82
Int. Cl.[4] A61K *31/505;* C07D *401/06*
U.S. Cl. 514—259 10 Claims

1. A compound of formula:



(I)

in which

R is halogen;

n is 1 or 2;

R^1 is selected from the group consisting of hydrogen and C_1–C_4 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1–C_8 alkyl, phenyl substituted by C_1–C_4 alkyl and phenyl substituted by halogen.

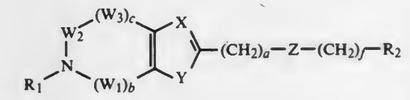
4,632,927

BICYCLIC NITROGEN HETEROCYCLIC ETHERS AND THIOETHERS, AND THEIR PHARMACEUTICAL USES

Henry F. Campbell, Lansdale; Donald E. Kuhla, Doylestown; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa.; assignors to William H. Rorer, Inc., Fort Washington, Pa.

PCT No. PCT/US83/01119, § 371 Date Mar. 20, 1984, § 102(e) Date Mar. 20, 1984, PCT Pub. No. WO84/00544, PCT Pub. Date Feb. 16, 1984
PCT Filed Jul. 21, 1983, Ser. No. 595,564
Int. Cl.[4] C07D *217/02;* A61K *31/44*
U.S. Cl. 514—272 12 Claims

1. A compound of the formula



wherein:

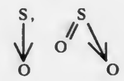
W_1 is CH_2 or CHR;

W_2 and W_3 are independently CH, CH_2, CHR_3 or CR_3;

X is $(CH)_{3-d}$, when Y is $(CH)_d$;

Y is $(CH)_d$, when X is $(CH)_{3-d}$;

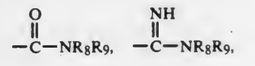
Z is O, S,



or CH_2;

and wherein:

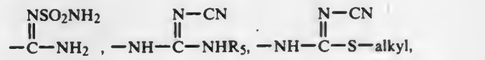
R is alkyl, halo, alkoxy, hydroxy, hydroxyalkyl, haloalkyl,

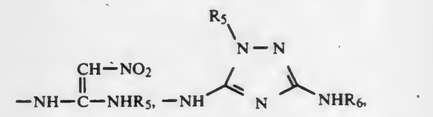


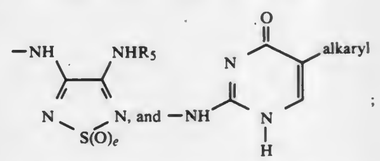
or —$(CH_2)_n$—NR_8R_9;

R_1 is H, alkyl, acyl, haloalkyl, alkoxy alkyl, hydroxyalkyl, aminoalkyl, mono- and di-alkylamino alkyl, or together with W_1 forms a carbon-nitrogen double bond;

R_2 is selected from the group consisting of NH_2, CN,







R_3 is alkyl, halo, alkoxy, hydroxy, hydroxy alkyl, haloalkyl, aminoalkyl, mono- and di-alkylamino alkyl, amino, alkylamino, or dialkylamino;

R_4 is H, alkyl, or acyl;

R_5 is H or alkyl;

R_6 is H, alkyl or acyl;

R_8 and R_9 are each independently H or alkyl or together with the nitrogen atom to which they are attached form a

5, 6 or 7 membered ring which may include an additional heteroatom of N, O or S;

and wherein:

a is 0 or 1;
b is 1 or 2;
c is 0 or 1;
d is 0, 1, 2 or 3;
e is 1 or 2;
f is 1, 2, 3 or 4;
n is 0, 1, 2 or 3 provided that b+c=2;

or an acid addition salt thereof.

4,632,928

PYRAZOLE DERIVATIVES WITH AN ERGOLINE SKELETON, THEIR ACID ADDITION SALTS, AND A PROCESS FOR THE PREPARATION THEREOF

Tivadar Rettegi; Erzsébet Magó née Karácsony; Lajos Toldy; József Borsy; Ilona Berzétei; András Rónai; Aliz Druga, and György Cseh, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

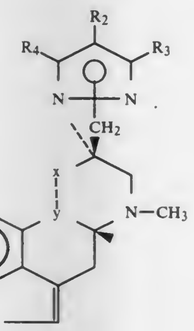
Filed May 30, 1984, Ser. No. 615,387

Claims priority, application Hungary, Mar. 6, 1983, 2001/83

Int. Cl.[4] C07D *457/02;* A61K *31/48*

U.S. Cl. 514—288 **5 Claims**

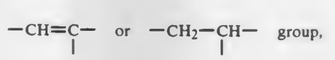
1. A pyrazole with an ergoline skeleton of the formula (I)



I

wherein

x . . . y stands for a



group,

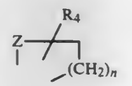
R is a hydrogen atom or methyl group,

R_1 stands for a hydrogen atom, C_{1-4} alkyl, carbethoxy or pyridyl-group,

R_2 stands for a hydrogen atom, C_{1-4} alkyl or, allyl,

R_3 stands for a hydrogen atom, C_{1-4} alkyl or, hydroxy group, furthermore

R_2 and R_3 may stand together for a group of formula (II),



II

wherein

Z stands for a methylene, carbonyl, hydroxymethylene or hydroxyiminomethylene group,

R_4 stands for a hydrogen atom or one or two C_{1-4} alkyl group(s), and

n is 1 or 2,

and pharmaceutically acceptable salts thereof.

4,632,929

METHOD OF HYPERTENSIVE TREATMENT USING PHENYL-ALKYLENE-2-PYRIDYL DERIVATIVES

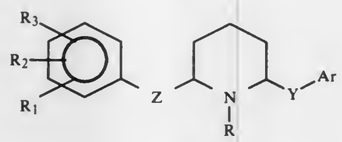
John T. Suh, Greenwich, Conn.; Rack H. Chung, deceased, late of Clifton Park, N.Y. (by Betsy Y. Chung, executrix); Nai-Yi Wang, East Windsor, N.J., and Jeffrey N. Barton, New York, N.Y., assignors to USV Pharmaceutical Corp., Tuckahoe, N.Y.

Division of Ser. No. 692,602, Jan. 17, 1985, Pat. No. 4,569,941, which is a continuation of Ser. No. 477,460, Mar. 21, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 788,175

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—317 **4 Claims**

1. A method for treating hypertension, which comprises administering to a patient in need of said treatment a therapeutically effective amount for treating hypertension of a composition comprising in combination with a pharmaceutically acceptable carrier a compound of the formula:

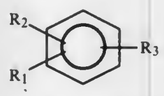


or a pharmaceutically acceptable acid addition salt thereof wherein,

Z and Y are each alkylene containing one to about five carbon atoms in the principal chain or said alkylene substituted with OH, or alkanoyloxy;

each of R_1, R_2 and R_3 is independently H, alkyl, halo, alkoxy, alkylsulfinyl, alkylmercapto, cyano, carboxy, carbalkoxy, sulfamoyl, trifluoromethyl, hydroxy, hydroxyalkyl, or lower-alkanoyloxy; or R_1 and R_2, when taken together, form a methylenedioxy or —O—CO—O—;

Ar is



wherein, R_1, R_2 and R_3 are as herein described; and

R is H, alkyl, cycloalkyl, alkenyl, alkynyl, carbalkoxy, or $CONR_4R_5$ wherein each of R_4 and R_5 is H or alkyl; wherein the total number of carbon atoms in each hydrocarbyl group is up to 6.

4,632,930

ANTIHYPERTENSIVE ALKYL-ARYLIMIDAZOLE, THIAZOLE AND OXAZOLE DERIVATIVES

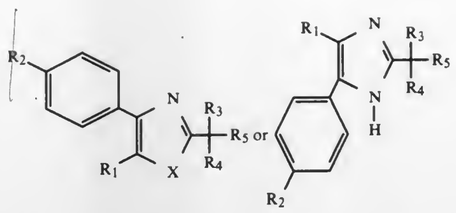
David J. Carini, and Ruth R. Wexler, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1984, Ser. No. 676,938

Int. Cl.[4] A61K *31/425, 31/42, 31/415;* C07D *277/28, 277/26, 277/24, 277/22, 263/32, 233/64*

U.S. Cl. 514—365 **45 Claims**

1. A compound having the formula:

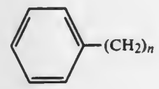


(I) (Ia)

wherein

X is NH, S or O;

R_1 is a straight or branched chain alkyl of 1–7 carbon atoms, a straight or branched chain alkylene or alkyne of 2–7 carbon atoms, said alkyl, alkylene or alkyne optionally mono-, di- or tri-substituted with F, Cl or Br, cycloalkyl, cycloalkenyl, or cycloalkylalkyl of 3–7 carbon atoms, or



where n is 1 or 2;

R_2 is C_1–C_2 alkyl $S(O)_m$ where m is 0, 1 or 2, C_1–C_2 alkoxy, cyano, acetyl or NO_2;

R_3 and R_4 independently are CF_3, CF_2H, CF_2Cl, $CFCl_2$, CF_3CF_2 or $CF_3CF_2CF_2$;

R_5 is OR_7 or NHR_7 where R_7 is H, alkyl of 1–3 carbon atoms, or



where R_8 is alkyl of 1–3 carbon atoms, phenyl or phenyl monosubstituted with F, Cl, Br, NO_2, CF_3, C_1–C_2 alkyl, or C_1–C_2 alkoxy, with the proviso that when R_5 is NHR_7 then X is NH; or a pharmaceutically suitable salt thereof.

31. A method of treating hypertension in a mammal comprising administering to the mammal an antihypertensive amount of a compound of claim 1.

4,632,931

7-OXABICYCLOHEPTANE SUBSTITUTED AMIDE-SULFONAMIDE PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

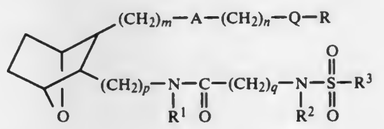
Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 25, 1985, Ser. No. 780,127

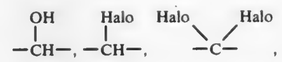
Int. Cl.[4] A61K *31/39;* C07D *307/00*

U.S. Cl. 514—382 **15 Claims**

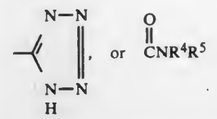
1. A compound having the structure



including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; Q is —CH=CH—, —CH_2—,



or a single bond; R is CO_2H, CO_2alkyl, CO_2 alkali metal, CO_2 polyhydroxyamine salt, —CH_2OH,



wherein R^4 and R^5 are the same or different and are H, lower alkyl, hydroxy, lower alkoxy or aryl at least one of R^4 and R^5 being other than hydroxy and lower alkoxy; p is 1 to 4; R^1 is H or lower alkyl; q is 1 to 12; R^2 is H or lower alkyl; and R^3 is, lower alkyl, aryl, arylalkyl, cycloalkyl or cycloalkylalkyl wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, hydroxy, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio;

aryl alone or as part of another group is phenyl or naphthyl which is unsubstituted or is substituted with 1 or 2 lower alkyl groups, halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups;

$(CH_2)_m$, $(CH_2)_n$ and $(CH_2)_p$ may independently contain 1 or 2 lower alkyl or halo substituents; and

$(CH_2)_q$ may contain 1 to 2 halo, hydroxy, amino, alkylamino, arylamino, amido, thioamido, thiol, alkylthio, arylthio, cyano or nitro substituents.

11. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,632,932

ANTIMYCOTIC AGENTS

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Graham Holmwood; Erik Regel, both of Wuppertal, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 549,868

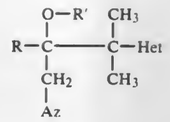
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242236

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/41*

U.S. Cl. 514—383 **21 Claims**

1. A pharmaceutical composition containing as an antimycotic agent, an antimycotically effective amount of a compound of the formula



in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl,

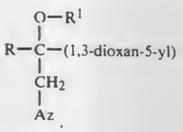
Het represents dioxolan-2-yl or 1,3-dioxanyl, each of which is optionally substituted by identical or different substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methyl or -ethyl with 5 to 7 carbon atoms in the cycloalkyl part, or cyclohexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R′ represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms,

or an addition product thereof with an acid or metal salt and an inert pharmaceutical carrier.

2. A pharmaceutical composition containing as an antimycotic, an antimycotically effective amount of a compound of the formula



in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl,

the 1,3-dioxolan-5-yl is optionally substituted by identical or different substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methyl or -ethyl with 5 to 7 carbon atoms in the cycloalkyl part, or cyclohexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R′ represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms,

or an addition product thereof with an acid or metal salt and an inert pharmaceutical carrier.

4,632,933

SULFUR-CONTAINING IMIDAZOLE DERIVATIVES

Joachim Gante, Darmstadt-Arheilgen; Helmut Prücher, Heppenheim; Helmut Wahlig, Darmstadt, and Volkmar Rudolph, Seeheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

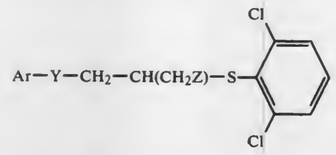
Filed Feb. 24, 1984, Ser. No. 583,552

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306646

Int. Cl.⁴ C07D *233/60;* **A61K** *31/415*

U.S. Cl. 514—399 **7 Claims**

1. A sulfur-containing imidazole derivative of the formula



wherein Ar is phenyl substituted by one chloro atom; Y is O; and Z is 1-imidazolyl; or a physiologically acceptable acid addition salt thereof.

4. An antimycotic composition comprising an amount of a compound of claim **1** effective as an antimycotic and a pharmaceutically acceptable carrier.

6. A method of achieving an antimycotic effect in a patient comprising administering an antimycotic effective amount of a compound of claim **1** to the patient.

7. A method of achieving an antibacterial effect in a patient comprising administering an antibacterial effective amount of a compound of claim **1** to the patient.

4,632,934

IMIDAZOLE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Kinji Iizuka; Keniji Akahane; Denichi Momose; Yukio Kamijo, and Yukiyoshi Ajisawa, all of Nagano, Japan, assignors to Kissei Pharmaceutical Co., Ltd. and Ono Pharmaceutical Co., Ltd., both of, Japan

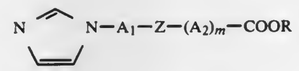
Filed Aug. 21, 1979, Ser. No. 68,365

Claims priority, application Japan, Aug. 21, 1978, 53-101549

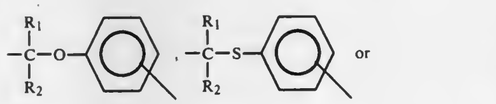
Int. Cl.⁴ C07D *233/54;* **A61K** *31/415*

U.S. Cl. 514—399 **43 Claims**

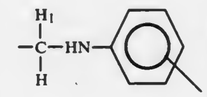
1. An imidazole derivative of the formula:



wherein R is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, A_1 and A_2, which may be the same or different, each is an alkylene group or an alkenylene group having 1 to 8 carbon atoms, m is 0 or 1, and Z is



or



wherein R_1 and R_2, which may be the same or different, each is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and the terminal carbon atom bonded to the hetero atom of Z may be bonded to A_1 or A_2 or COOR group (in case of m being 0); and pharmaceutically acceptable salts thereof.

40. A method of alleviating inflammation, hypertension, thrombus, cerebral apoplexy, or asthma in mammals which comprises administering a therapeutically effective amount of at least one imidazole derivative as claimed in claim **1**.

4,632,935

OMEGA-(HYDROXY-, ETHER AND ESTER)-ALKYL-2-AMINO-CYCLOALKYL- AND CYCLOALKENYL AMIDES AS ANALGESICS

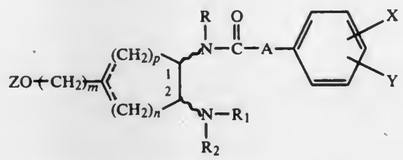
Lester J. Kaplan, Irvine, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 30, 1984, Ser. No. 615,448

Int. Cl.⁴ A61K *31/40, 31/445;* **C07D** *207/06, 207/20*

U.S. Cl. 514—429 **14 Claims**

1. A compound of the formula



(I)

where p is a whole number integer, 0, 1, 2, 3 or 4 and n is a whole number integer 0, 1, 2, 3 or 4, so that the resulting cycloaliphatic ring containing them has 5, 6 or 7 carbon atoms;

m is 3 or 4;

A is $-(CH_2)_q$ where q is a whole number integer 0 to 4 or $-CH(CH_3)-$;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, $-NH_2$, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy and C_1 to C_3-carboxyacylamino;

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken together with the nitrogen to which they are bonded complete a ring selected from the group consisting of pyrrolidinyl, pyrrolyl, 3-pyrrolinyl, 3-azabicyclo[3.1.0]-hexan-3-yl and 3-azabicyclo[3.2.0]heptan-3-yl;

Z is selected from the group consisting of hydrogen, C_1 to C_3-alkyl, and C_1 to C_3-alkanoyl,

and perforated lines in the cycloaliphatic ring denote the option of a saturated cycloaliphatic ring, and mixed or separated cycloalkenyl rings at one of the two indicated positions of that cycloaliphatic ring; or a pharmaceutically acceptable salt thereof.

13. A method for alleviating pain in a warm-blooded animal which comprises administering to an animal suffering pain an analgesically effective amount of a compound of claim **1** in a pharmaceutical dosage unit form.

4,632,936

INSECTICIDAL COMPOSITIONS

Clive J. Boase, Sawston, and Howard B. Dawson, St. Ives, both of England, assignors to FBC Limited, England

Continuation of Ser. No. 571,606, Jan. 17, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 743,269

Claims priority, application United Kingdom, Jan. 22, 1983, 8301794

Int. Cl.⁴ A01N *43/30, 47/10, 25/00*

U.S. Cl. 514—465 **2 Claims**

1. An insecticidal composition which comprises a solution of a carbamate insecticide selected from the group consisting of bendiocarb and propoxur in one or more organic solvents in admixture with finely divided pyrogenic silica having a particle size of 5 to 50 nanometers, and wherein the insecticide is present in an amount of 0.2 to 1% w/v and the silica is present in an amount of 0.5 to 2% w/v.

4,632,937

DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

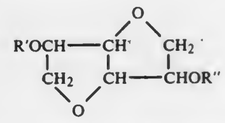
Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas, Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649. This application Dec. 27, 1985, Ser. No. 813,865

Int. Cl.⁴ A61K *7/16, 9/20*

U.S. Cl. 514—470 **8 Claims**

1. A method for inhibiting the formation of plaque and calculus on relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of the throat, mouth, teeth and gums by dissolving and chewing a chewable tablet composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R′ and R″ are individually selected from alkyl radicals selected from the group consisting of $-CH_3$, $-C_2H_5$, $-C_3H_7$, $-C_4H_9$ or $-H$ wherein R′ or R″ is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

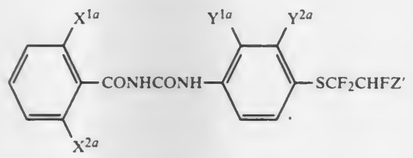
4,632,938

THIOPHENYLUREAS, THEIR PRODUCTION AND USE

Hiroshi Nagase, Kawanishi, and Yasuo Sato, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1985, Ser. No. 706,297
Claims priority, application Japan, Feb. 27, 1984, 59-36882
Int. Cl.[4] A01N *47/34*; C07C *127/22*
U.S. Cl. 514—594 **9 Claims**

1. A compound of the formula:



wherein X^{1a} is F or Cl; X^{2a} is F or Cl in the case of X^{1a} being F, or hydrogen or Cl in the case of X^{1a} being Cl; Y^{1a} is Br, Cl, F or methyl; Y^{2a} is hydrogen, Cl or methyl; and Z′ is F or Cl.

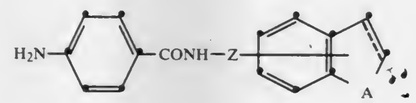
4,632,939

ANTICONVULSANT AGENTS

Edward E. Beedle, and David W. Robertson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 15, 1985, Ser. No. 711,929
Int. Cl.[4] A61K *31/165*; C07C *103/28*
U.S. Cl. 514—619 **13 Claims**

1. A compound of the Formula



wherein
Z is a bond, $-CH_2-$, or $-CHCH_3-$;
A is $-CH_2-$, or $-CH_2CH_2-$; and
represents a single or double bond;
and
pharmaceutically acceptable acid addition salts thereof.

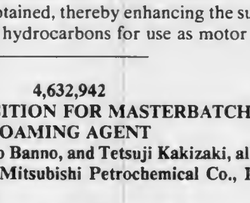
4,632,940

N-SUBSTITUTED 1-(4′-ALKYLSULFONYLPHENYL)-2-AMINO-1,3-PROPANEDIOLS, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, HAVING LOCAL ANESTHETIC ACTIVITY

Dario Chiarino, Monza; Angelo Carenzi, Busto Arsizio; Davide Della Bella, Milan, and Mario Fantucci, Piazza Brembana, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Filed Aug. 3, 1984, Ser. No. 637,575
Claims priority, application Italy, Aug. 5, 1983, 22448 A/83
Int. Cl.[4] A61K *31/135, 31/495*; C07D *241/04*
U.S. Cl. 514—648 **8 Claims**

1. A compound of Formula



(I)

wherein
R is an alkyl group having from 1 to 4 carbon atoms;
n is 0 or 1;
A is an alkyl group having from 2 to 6 carbon atoms;
R1 is hydrogen or an alkyl group having from 1 to 6 carbon atoms;
R2 is an alkyl group having from 1 to 6 carbon atoms, a phenoxyalkyl group, a mono- or di-phenylalkyl radical where the alkyl group has from 1 to 6 carbon atoms and the phenyl moiety can be substituted by one or two substituents, equal or different between them, which are selected from the group consisting of halogen, 1–4 C alkyl and 1–4 C alkoxy,
and pharmaceutically acceptable salts thereof with organic and inorganic pharmaceutically acceptable acids.

7. A method of anesthetizing comprising administering an anesthetically effective amount of a compound of claim **1**.

4,632,941

ENHANCED CATALYST AND PROCESS FOR CONVERTING SYNTHESIS GAS TO LIQUID MOTOR FUELS

Peter K. Coughlin, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 625,372, Jun. 27, 1984, Pat. No. 4,579,830. This application Nov. 18, 1985, Ser. No. 798,963
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—714 **30 Claims**

1. A process for the enhanced catalytic conversion of synthesis gas comprising carbon monoxide and hydrogen to C_5^+ hydrocarbon mixtures advantageous for use as liquid motor fuels comprising contacting said synthesis gas with a Fischer-Tropsch catalyst composition comprising cobalt, with or without thorium promotion, admixed with an additive component taken from the group consisting of molybdenum, tungsten and combinations thereof, said additive component being present in an amount within the range of from about 1% to about 50 mole % based on the total amount of cobalt and said additive component in said composition, whereby the presence of said additive component increases the olefinic content of the hydrocarbon products obtained, thereby enhancing the suitability of the resulting liquid hydrocarbons for use as motor fuels.

4,632,942

RESIN COMPOSITION FOR MASTERBATCH OF FOAMING AGENT

Ryouichi Ito; Yoshihiro Banno, and Tetsuji Kakizaki, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,616
Claims priority, application Japan, Oct. 31, 1983, 58-202509
Int. Cl.[4] C08J *9/06*
U.S. Cl. 521—92 **16 Claims**

1. A foam molding material comprising a resin composition for a masterbatch of foaming agent, comprising:
(A) 100 parts by weight of a resin component comprising
(i) 100 to 20% by weight of a modified resin having an aromatic vinyl monomer unit content of 5 to 70% by weight, said aromatic vinyl monomer unit being obtained by subjecting an ethylene polymer resin or propylene polymer resin and an aromatic vinyl monomer to graft polymerization, and
(ii) 0 to 80% by weight of an ethylene polymer resin or propylene polymer resin, and
(B) 1 to 50 parts by weight of a chemical foaming agent and a matrix resin selected from the group consisting of polystyrene, acrylonitrile-butadiene-styrene copolymer, polycarbonate, modified polyphenylene oxide, polyphenylene oxide, acrylonitrile-styrene resin, 6-nylon, 6,6-nylon, polybutylene terephthalate and polyethylene terephthalate.

4,632,943

POLYURETHANE FOAMS PREPARED FROM ALKYL DIALKANOL AMINE-CONTAINING POLYOLS

Jerram B. Nichols, Alvin, Tex., assignor to Dow Chemical Company, Freeport, Tex.

Continuation-in-part of Ser. No. 643,594, Aug. 23, 1984, abandoned. This application Apr. 22, 1985, Ser. No. 725,608
Int. Cl.[4] C08G *18/14, 18/32*
U.S. Cl. 521—129 **17 Claims**

1. An active hydrogen containing composition comprising
(a) at least one polyahl, which is not a dialkanol tertiary amine, having at least three active hydrogens per molecule
(b) a minor amount of water, and
(c) a dialkanol tertiary amine in an amount sufficient to improve the flowability of a foaming reaction mixture prepared from the active hydogen containing composition and a polyisocyanate from about 2 to about 40% compared to a like reaction mixture prepared in the absence of the dialkanol tertiary amine, wherein the isocyanate reactive materials in said active hydrogen containing composition have an average functionality of at least about 3.0.

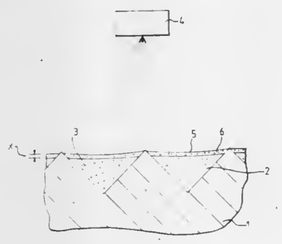
11. In a process for preparing a polyurethane foam comprising reacting a polyahl and a polyisocyanate in the presence of water whereby a polyurethane foam is obtained, the improvement comprising conducting said reaction in the presence of a dialkanol tertiary amine in an amount sufficient to improve the flowability of the foaming reacting polyahl and polyisocyanat from about 2 to about 40% compared to a like reaction mixture prepared in the absence of the dialkanol tertiary amine, and wherein the average functionality of all isocyanate-reactive materials employed in said reaction is at least about 3.0.

4,632,944

POLYMERIZABLE FLUID

William H. Thompson, Dublin, Ireland, assignor to Loctite Corporation, Newington, Conn.

Filed Oct. 15, 1982, Ser. No. 434,538
Claims priority, application United Kingdom, Oct. 15, 1981, 8131136
Int. Cl.[4] B05D *3/06*; C08F *2/50*
U.S. Cl. 522—11 **12 Claims**



1. A polymerisable fluid for application as a pre-applied coating on at least one of two mating surfaces and for subsequently sealing and locking said two mating surfaces after assembly thereof, wherein the polymerisable fluid contains the following components which allow two mechanisms for the initiation of polymerisation, a first of the mechanisms being initiatable by radiation:
(a) at least one free radical curable monomer or oligomer
(b) a photoinitiator capable of initiating the first mechanism to initiate polymerisation of the said monomer or oligomer upon exposure to ultraviolet or visible radiation
(c) a second free radical polymerisation initiator capable of initiating the second mechanism to initiate polymerisation of said polymer or oligomer
(d) an activator for the initiator (c), said second initiation mechanism being inhibited from activation by exposure to ultraviolet or visible radiation but being initiatable as a consequence of assembly of said two mating surfaces and
(e) an opacifier which has the capacity to obstruct the transmission of the radiant energy of the said polymerisation initiating radiation to the extent that the radiation incident on a surface of the fluid in said pre-applied coating is extinguished near the said surface and initiates polymerisation by said first mechanism only in a surface layer of the fluid to form a dry-to-touch crust thereon while the fluid beneath the crust remains in a fluid state ready for polymerisation by said second mechanism upon assembly of said two mating surfaces.

4,632,945

ANAEROBIC SEALANT UNAFFECTED BY WATER CONTAMINATION

Maria L. Garcia, Newington, and Bernard M. Malofsky, Bloomfield, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed May 31, 1985, Ser. No. 740,142
Int. Cl.[4] C09J *3/14*
U.S. Cl. 523—176 **14 Claims**

1. In a curable composition comprising an acrylate or methacrylate monomer, a hydroperoxide or perester initiator, and accelerator having $-SO_2NHCO-$ functionality and a transition metal co-accelerator, the improvement that the transition metal co-accelerator comprises a source of copper ion at a level of 0.1–10 ppm copper and an iron salt or a ferrocenyl compound at an iron level in excess of the copper level, said iron level being between 0.5 and 60 ppm iron based on total composition weight.

9. In a process for impregnating an article with an anaerobically curable sealant, the process characterized by a suceptability to contamination of the sealant with water, the improvement comprising that the sealant is a composition as in claim **1**.

4,632,946

HALOGEN-FREE FLAMEPROOFED THERMOPLASTIC MOLDING MATERIAL

Volker Muench, Ludwigshafen; Juergen Hambrecht, Heidelberg; Adolf Echte, Ludwigshafen; Karl H. Illers, Otterstadt, and Johann Swoboda, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,620
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401835
Int. Cl.[4] C09K *21/14*; C08K *5/16, 5/52*; C08L *61/06*
U.S. Cl. 523—179 **10 Claims**

1. A halogen-free flameproofed thermoplastic molding material, comprising one or more halogen-free thermoplastic resins of homopolymers of styrene or copolymers of styrene and acrylonitrile in which some of the styrene component can be replaced by alkylated styrene (A) and one or more further halogen-free components wherein the thermoplastic resin
(A) is present in an amount of from 30 to 90% by weight, and the said molding material contains, as further components,
(B) from 1 to 50% by weight of one or more phenol/aldehyde resins,
(C) from 1 to 50% by weight of one or more nitrogen-containing organic compounds selected from the group con-

sisting of the triazines, triazolidines, ureas, guanidines, guanamines, aminoacids, peptides their derivatives and salts thereof, and

(D) from 3 to 50% by weight of one or more phosphorus-containing organic compounds selected from the group consisting of the phosphines, phosphine oxides, phosphinous acids, phosphinic acids, phosphates, hypophosphites hypodiphosphates and amides of phosphinic acid, of phosphonic acid and of phosphoric acid, the percentages in each case being based on the molding material consisting of A+B+C+D.

4,632,947

METHOD OF PRODUCING A POLYTETRAFLUORETHYLENE MATERIAL

Peter Wölki, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Norton Pampus GmbH, Willich, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,094

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1985, 3500061

Int. Cl.⁴ C08K *9/04;* **C08L** *27/12*

U.S. Cl. 523—206 **11 Claims**

1. A process for producing a composite material of filler-reinforced polytetrafluoroethylene (PTFE) resin, said process comprising the steps of:

(a) coating a plurality of filler particles with a coating material having a viscosity at the softening temperature of PTFE not greater than 5×10^9 pascal seconds, said coating material being selected from the group consisting of perfluoroalkoxy copolymer (PFA), tetrafluroethylene-perfluoropropylene copolymer (FEP), and mixtures of PFA and FEP;

(b) mixing the coated filler particles from part (a) with PTFE;

(c) shaping the mixture from part (b) into the desired shape of the final composite; and

(d) heating the shaped mixture from part (c) to a temperature at least as high as the softening point of PTFE so as to form a coherent composite.

4,632,948

VINYL CHLORIDE RESIN COMPOSITION AND MOLDED PRODUCTS USING SAME

Tetsuya Yamada, Yotsukaidoshi; Shigehiro Koga, Ichiharashi; Kazuyoshi Imai, and Kazuo Inaba, both of Fujinomiyashi, all of Japan, assignors to Chisso Corporation, Osakafu and Nihon Plast Co., Ltd., Shizuokaken, both of, Japan

Filed Nov. 30, 1984, Ser. No. 676,850

Claims priority, application Japan, Dec. 14, 1983, 58-235279

Int. Cl.⁴ C08K *3/40*

U.S. Cl. 523—219 **9 Claims**

1. A low density and low luster vinyl chloride resin composition having a superior abrasion resistance and a good microballoon-retainability, which composition comprises 100 parts by weight of a vinyl chloride copolymer including 97.0 to 99.95% by weight of a vinyl chloride component and 3.0 to 0.05% by weight of a polyethylene glycol diacrylate or a polyethylene glycol dimethacrylate, each having a number of ethylene glycol polymerization units of 2 to 50, and having an average polymerization degree of 600 to 3,000, 5 to 100 parts by weight of microballoons having a specific gravity of 0.15 to 0.8, a particle diameter of 5 to 300μ and a compressive strength of at least 70 Kg/cm^2, 1 to 20 parts by weight of a polyvinyl acetate having an average polymerization degree of 100 to 1,500 and 30 to 150 parts by weight of a plasticizer and wherein vinyl chloride is present in said vinyl chloride component in an amount of at least 50% by weight based on the weight of the total copolymer.

4,632,949

FLAME RETARDING AGENTS FOR POLYCARBONATES

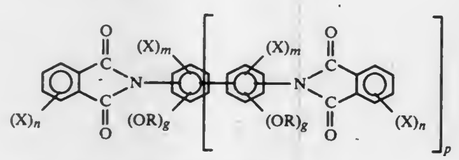
Sivaram Krishnan, Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1984, Ser. No. 687,783

Int. Cl.⁴ C08K *5/34;* **C07D** *209/48*

U.S. Cl. 524—94 **14 Claims**

1. The compound



wherein X is a halogen atom, R is a C_1-C_4 alkyl, g is 1 to 5, n is an integer from 0 to 4, m is either 0 or 1 and p is 1.

4,632,950

SCORCH RESISTANT, CROSSLINKABLE COMPOSITION CONTAINING MIXTURE OF COPPER AND METAL DITHIOCARBAMATES

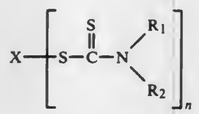
Chester J. Kmiec, Williamsville, and Michael F. Novits, Buffalo, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 9, 1985, Ser. No. 773,713

Int. Cl.⁴ C08K *5/48, 5/39;* **C09K** *15/32*

U.S. Cl. 524—202 **8 Claims**

1. A scorch resistant, crosslinkable composition comprising 100 parts by weight of a polymeric thermoplastic and/or elastomeric material selected from the group of ethylene-propylene terpolymers, ethylene-propylene co-polymers, 1,4-polybutadiene, chlorinated polyethylene, and polyethylene, about 0.1 to about 10 parts by weight of an organic peroxide free radical initiator selected from dialkyl peroxides or diperoxyketals, and from about 0.001 to about 2.0 parts by weight of a mixture of at least two salts of disubstituted dithiocarbamic acid, wherein one salt is based on copper and the other salts have the structure



wherein X is selected from zinc, lead, nickel, bismuth, cadmium, selenium, and tellurium, n is an integer of 2 to 4, and R_1 and R_2 are independently selected from alkyl of 1 to 7 carbons, the weight ratio of non-copper salt(s) to copper based salt is 1:1 to 20:1, and the weight ratio of organic peroxide to the salts is 100:1 to 5:1.

4,632,951

METAL OXIDES ON ORGANIC, HALOGEN-CONTAINING CARRIERS AS FLAMEPROOFING AGENTS

Karl Fuhr, Krefeld; Friedemann Müller, Neuss, and Theobald Eicher, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 746,590

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424147

Int. Cl.⁴ C08K *9/02, 3/20;* **C09D** *3/48;* **C08L** *23/00*

U.S. Cl. 524—204 **8 Claims**

1. A finely-divided metal oxide-containing preparation, in which preparation one or more metal oxides in a quantity of from 2 to 20% by weight based on the total quantity, is present as surface covering on an organic, halogen-containing carrier material.

4,632,952

COATING COMPOSITIONS MADE OF PLASTISOLS OR ORGANOSOLS AND PROCESS FOR IMPROVING THE ADHESION OF THESE COMPOSITIONS TO METALLIC SUBSTRATES

Harald Bühler, and Bernhard Statt, both of Hanau, Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 615,302

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319849

Int. Cl.⁴ C09D *7/12, 5/02, 3/74;* **B05D** *7/14*

U.S. Cl. 524—217 **11 Claims**

1. In a plastisol or organosol coating composition containing a polyaminoamide as an adhesive agent the improvement comprising including based on the entire composition 0.2–5 weight % of a hydrophobic silica whereby the ability to adhere to a metallic base is improved.

4,632,953

SELF-EXTINGUISHING POLYCARBONATE COMPOSITION

Giovanni Dozzi, Montese, Italy, assignor to Enichem Polimeri S.p.A., Sassari, Italy

Filed Mar. 3, 1986, Ser. No. 835,541

Claims priority, application Italy, Mar. 12, 1985, 19862 A/85

Int. Cl.⁴ C08K *5/17*

U.S. Cl. 524—239 **4 Claims**

1. Composition of self-extinguishing polycarbonate comprising, in mixture, a non halogenated aromatic polycarbonate, and a mixture of additives conferring self-extinguishment characteristics to said polycarbonate, formed by: (a) a salt of alkaline metal, of alkaline-earth metal or of zinc, or mixed salt of these metals, of ethylene-diaminotetraacetic acid; (b) a phenol-terminated oligomer of polycarbonate from tetrabromobisphenol-A, or decabromo-diphenyl oxide; and (c) polytetrafluoroethylene; wherein additives (a), (b) and (c) are present in amounts of from 0.2 to 1.5 parts by weight per each 100 parts by weight of polycarbonate, the weight ratio of additive (b) to additive (a) varying within the range of from 1/1 to 16/1, and the weight ratio of additive (ç) to additive (a) varying within the range of from 0.5/1 to 6/1.

4,632,954

HALOGEN-CONTAINING RUBBERS AND A METHOD FOR THEIR MANUFACTURE

Albert J. Dalhuisen, Sunnyvale, Calif., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 27, 1985, Ser. No. 749,260

Int. Cl.⁴ C08K *5/18*

U.S. Cl. 524—240 **12 Claims**

1. A method of improving the heat aging properties of a vulcanized chloroprene rubber comprising adding an effective amount of a compound selected from the group consisting of anthranilic acid, meta aminobenzoic acid, para aminobenzoic acid, alkali metal salts of these acids, esters of these acids, halogen substituted alkali metal salts of these acids, halogen substituted anthranilic acid, halogen substituted meta aminobenzoic acid, halogen substituted para aminobenzoic acid, amino naphthoic acids, salts of amino naphthoic acids, esters of amino naphthoic acids, halogen substituted amino naphthoic acids, halogen substituted salts of amino naphthoic acids, amino phenyl alkyl carboxylic acids, amino phenyl alkyl carboxylic acid salts, esters of amino phenyl alkyl carboxylic acids, halogen substituted amino phenyl alkyl carboxylic acids, halogen substituted amino phenyl alkyl carboxylic acid salts and corresponding diphenyl compounds to said chloroprene rubber prior to vulcanization, and then vulcanizing.

4,632,955

EMULSIFIABLE POLYETHYLENE PARAFFIN BLEND COMPOSITION

Gregory A. Cook, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1985, Ser. No. 792,073

Int. Cl.⁴ C08K *5/01;* **C08L** *91/06*

U.S. Cl. 524—275 **3 Claims**

1. Emulsifiable polyethylene-paraffin blend compositions, said blend compositions having a viscosity of about 95 to 2600 cp at 150° C. and an acid number of about 15 to 17 milligrams KOH/gm, said blend composition comprising

(a) about 35 to 47 weight % of an ether soluble fraction having a viscosity of about 1 to 20 cp at 125° C. and a density of 0.895 to 0.900 g/cc;

(b) about 33 to 39 weight % of a hexane soluble fraction having a viscosity of 1300 to 4000 cp at 125° C. and a density of 0.938 to 0.941 g/cc; and

(c) about 20 to 26 weight % of a hexane insoluble fraction having a viscosity of 12,000 to 100,000 cp at 150° C. and a density of 0.939 to 0.946 g/cc.

4,632,956

STABILIZER SYSTEMS FOR ABS PLASTICS AND ABS ALLOYS

Hans-Jürgen Kress, Krefeld; Herbert Eichenauer, Dormagen; Karl-Heinz Ott, Leverkusen; Jochen Schoeps, Krefeld, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

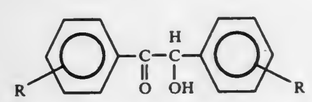
Filed Sep. 11, 1985, Ser. No. 774,730

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434939

Int. Cl.⁴ C08K *5/07*

U.S. Cl. 524—359 **3 Claims**

1. A thermoplastic molding composition which is comprised of a plastic and from 0.05 to 2%, by weight, based on the plastic of a heat stabilizing benzoin derivative corresponding to the following general formula:



wherein R independently represents hydrogen, halogen or C_1-C_6 alkyl, said plastic to be stabilized comprised of:

I—from 100 to 20 parts, by weight, of:

A—from 5 to 100%, by weight, of a graft copolymer comprising:

A1—from 10 to 95%, by weight, of a mixture comprising:

A1.1—from 50 to 90%, by weight, of styrene, α-methyl styrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof; and

A1.2—from 50 to 10%, by weight, of (meth)acrylonitrile, methyl methacrylate, maleic acid anhydride, N-substituted maleimide or mixtures thereof; onto

A2—from 90 to 5%, by weight, of a rubber having a glass transition temperature T_G of 0° C.; or less and

B—from 95 to 0%, by weight, of a thermoplastic copolymer comprising:

B1—from 90 to 50%, by weight, of styrene, α-methyl styrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof; and

B2—from 50 to 10%, by weight, of (meth)acrylonitrile, methyl methacrylate, maleic acid anhydride, N-substituted maleimide or mixtures thereof; and

II—from 0 to 80 parts, by weight, of an aromatic polycarbonate.

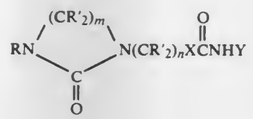
4,632,957

ETHYLENICALLY UNSATURATED ETHYLENE AND PROPYLENE UREAS CONTAINING ALKYLENE UREA GROUPS OR ALKYLENE URETHANE GROUPS, USEFUL IN COATING COMPOSITIONS

David A. Welsh, Monroeville, and Rostyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 646,733
Int. Cl.[4] C07D *233/34, 239/10;* **C08L** *31/06*
U.S. Cl. 524—548 **11 Claims**

1. A compound having the formula:

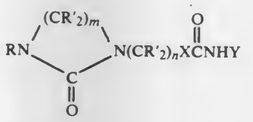


wherein
m is two or three;
n is an integer from one to four;
R is selected from the group consiting of:
alkyl having one to six carbon atoms,
hydrogen,
$HOCH_2$— and
$R''O(CH_2)_a$—, wherein a is an integer from one to six and R'' is an alkyl having from 1 to 6 carbon atoms;
each R′ in each CR'_2 unit of the $(CR'_2)_m$ group and of the $(CR'_2)_n$ group is independently selected from the group consisting of —H and alkyl having one to four carbon atoms;
X is selected from the group consisting of —O— and



and
Y is a free radical polymerizable unsaturated moiety selected from the group consisting of (meth)acrylic-containing monoisocyanate residues, styrene-containing monoisocyanate residues, maleic type monoisocyanate residues and fumaric type monoisocyanate residues.

5. A latex comprising the polymerization product of the compound having the formula:



wherein
m is two or three;
n is an integer from one to four;
R is selected from the group consisting of:
alkyl having one to six carbon atoms,
hydrogen,
$HOCH_2$— and
$R''O(CH_2)_a$—, wherein a is an integer from one to six and R'' is an alkyl having from 1 to 6 carbon atoms;
each R′ in each CR'_2 unit of the $(CR'_2)_m$ group and of the $(CR'_2)_n$ group is independently selected from the group consisting of —H and alkyl having one to four carbon atoms;
X is selected from the group consisting of —O— and



and
Y is a free radical polymerizable unsaturated moiety selected from the group consisting of (meth)acrylic-containing monoisocyanate residues, styrene-containing monoisocyanate residues, maleic type monoisocyanate residues and fumaric type monoisocyanate residues and comonomers containing free radical polymerizable unsaturation.

4,632,958

NBR/SILICATE BLENDS

John R. Eshbach, and Ronald S. Lenox, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 16, 1985, Ser. No. 776,653
Int. Cl.[4] C08L *9/00*
U.S. Cl. 524—574 **18 Claims**

1. A process for preparing pulverulent NBR particles which can be utilized to form high tensile strength materials, which process comprises coprecipitating, via the use of an aluminum cation as a coprecipitating agent, NBR latex and a water soluble silicate from an aqueous suspension wherein the suspension has a temperature within the range of from about 0° C. to about 50° C. and a pH ranging from about 7 to about 10, wherein further said pH is achieved by using ammonium hydroxide as a base, to thereby form said NBR particles.

4,632,959

MODIFIED POLYOLEFIN COMPOSITION

Riichiro Nagano, Hiroshima, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 651,894
Claims priority, application Japan, Sep. 19, 1983, 58-171183
Int. Cl.[4] C08L *51/00*
U.S. Cl. 525—70 **17 Claims**

1. A modified polyolefin composition having good adhesion to both polar substances and polyolefins comprising
(A) 50 to 99 parts by weight of a modified polyolefin having an intrinsic viscosity (η) of 0.5 to 10 dl/g and a degree of crystallization of at least 20% selected from the group consisting of polyolefins modified with styrene hydrocarbons, polyolefins modified with unsaturated epoxy compounds, polyolefins modified with unsaturated silane compounds, halogenated polyolefins and hydroxyl group-containing polyolefins, wherein the polyolefins modified with styrene hydrocarbons are styrene hydrocarbon-grafted polyolefins produced by reacting a polyolefin and a styrene hydrocarbon in the heat-molten state or in the form of a solution in the presence of a radical initiator, and
(B) 1 to 50 parts by weight of a thermoplastic polymer selected from the group consisting of polyisobutylene and polyhexene-1 having a flexural modulus of less than 100 kg/cm^2, a glass transition temperature of not higher than 0° C. and a weight average molecular weight of at least 400,000.

4,632,960

RESIN COMPOSITION COMPRISING A THERMOSETTING RESIN COMPONENT AND A FUNCTIONAL, RUBBERY COPOLYMER COMPONENT

Hozumi Sato; Tatsuaki Matsunaga; Shin-ichiro Iwanaga, all of Yokkaichi; Hiroji Enyo, Suzuka; Yoshiaki Kawamura, and Yasuhiko Takemura, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,347
Claims priority, application Japan, Aug. 17, 1984, 59-170390; Sep. 12, 1984, 59-189733
Int. Cl.[4] C08L *63/00*
U.S. Cl. 525—117 **20 Claims**

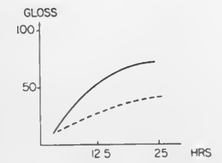
1. A resin composition comprising 100 parts by weight of a thermosetting resin selected from the group consisting of an epoxy resin, a phenol resin, a urea resin and a melamine resin and 1 to 100 parts by weight of a functional, rubbery copolymer of one of the following types:
(I) a copolymer comprising monomer units of (i) from 1 to 20% by weight of least one monomer containing a substituent selected from the group consisting of epoxy, hydroxyl, carboxyl and amino groups, (ii) from 15 to 20% by weight of acrylonitrile and (iii) from 40 to 80% by weight of butadiene, isoprene or a mixture thereof;
(II) a copolymer comprising monomer units of (i) from 1 to 20% by weight of at least one monomer containing a substituent selected from the group consisting of epoxy, hydroxyl, carboxyl and amino groups, (ii) from 40 to 99% by weight of an alkyl(meth)acrylate, an alkoxyalkyl(meth)acrylate or a mixture thereof and (iii) from 0 to 30% by weight of other monomers copolymerizable with the monomers (i) and (ii);
(III) a copolymer comprising monomer units of (i) from 1 to 20% by weight of at least one monomer containing a substituent selected from the group consisting of epoxy, hydroxyl, carboxyl and amino groups, (ii) from 15 to 50% by weight of acrylonitrile, (iii) from 20 to 60% by weight of butadiene, isoprene or a mixture thereof and (iv) from 5 to 65% by weight of an alkyl(meth)acrylate, an alkoxyalkyl(meth)acrylate or a mixture thereof;
said copolymer being produced by one of the following methods:
(a) emulsion polymerizing the monomers which constitute said copolymer in the presence of an emulsifier consisting of 1 to 15 parts by weight of a nonionic surface active agent and 0 to 10 parts by weight of an ionic surface active agent per 100 parts by weight of the monomers, the weight ratio of the ionic surface active agent to the nonionic surface active agent being 0–2.0:1, recovering unreacted monomers, adding a metal-free electrolyte to the resulting polymer emulsion, heating the resulting mixture to precipitate a copolymer and then drying the copolymer;
(b) emulsion polymerizing the monomers which constitute said copolymer in the presence of an ionic surface active agent as an emulsifier, recovering unreacted monomers, adding to the resulting polymer emulsion a metal-free electrolyte and a nonionic surface active agent, heating the resulting mixture to precipitate a copolymer, and then drying the polymer;
(c) emulsion polymerizing the monomers which constitute said copolymer in the presence of a nonionic surface active agent as an emulsifier at a temperature lower than the cloud point of the nonionic surface active agent and then heating the resulting polymer latex to a temperature not lower than said cloud point to coagulate the latex without the addition of a coagulent.

4,632,961

COLORED BASE COMPOSITION AND PAINT COMPOSITION CONTAINING THE SAME

Kouichi Tsutsui; Hirotoshi Umemoto, both of Kyoto, and Shoji Ikeda, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 9, 1983, Ser. No. 522,254
Int. Cl.[4] C08F *82/80*
U.S. Cl. 525—162 **7 Claims**



1. A non-aqueous colored base composition consisting essentially of an organic liquid, a dispersing water-insoluble amphoteric resin and a pigment, said amphoteric resin obtained by the addition or condensation reaction of (A) an acidic resin and (B) a basic resin or basic low molecular weight compound selected from the group consisting of prepolymers of basic resins, hydroxylamine compounds, amino acids, and primary or secondary amine compounds and mixtures of the basic resin and low molecular weight compound; said acid resin (A) bearing both an electron acceptant group and a functional group selected from the group consisting of (1) a group containing an active hydrogen atom, an active alkoxyl group and combinations of said active hydrogen and active alkoxyl group and (2) a group which is reactive with either an active hydrogen atom, an active alkoxyl group or reactive with both an active hydrogen and an active alkoxyl group and wherein said basic resin (B) bears both an electron donative group and a functional group selected from either (a) a group containing an active hydrogen, an active alkoxyl group and mixtures of an active hydrogen and active alkoxyl group or (b) a group which is reactive with an active hydrogen or an active alkoxyl group and mixtures of said reactive groups.

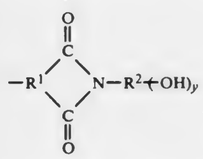
4,632,962

HYDROXYL GROUP GRAFT MODIFIED POLYOLEFINS

Robert R. Gallucci, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 24, 1984, Ser. No. 685,544
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—282 **9 Claims**

1. Hydroxyl group graft modified polyolefins having grafts consisting essentially of chemically combined units of the formula:



II

wherein, R^1 is a substituted or unsubstituted, trivalent, aromatic or aliphatic organic residue of from 2–15 carbon atoms, R^2 is a substituted or unsubstituted di-, tri-, or tetra- valent, aromatic or aliphatic organic residue of from 1–15 carbon atoms and y is 1, 2, or 3.

4,632,963

HALOGENATED BUTYL RUBBER

Irwin J. Gardner, Scotch Plains; James V. Fusco, Red Bank; Neil F. Newman, Edison; Ronald C. Kowalski, New Providence; William M. Davis, Edison, all of N.J., and Francis P. Baldwin, Coupeville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 5, 1984, Ser. No. 597,187
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—332.3 **8 Claims**

1. An improved halogenated butyl rubber having a conjugated diene unsaturation content of less than 0.25 mole %, a halogen content of at least 0.6 wt. %, and at least 20 mole % of the halogen being in a primary allylic configuration.

4,632,964

FLEXIBLE FINISHES FROM BRANCHED ALIPHATIC POLYESTER URETHANES AND A MELAMINE CROSSLINKER

Lili W. Altschuler, Wynnewood, Pa., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1985, Ser. No. 717,160
Int. Cl.[4] C08F *283/04, 20/00;* **C08G** *18/38, 18/42*
U.S. Cl. 525—456 **8 Claims**

1. A coating composition that forms a clear flexible finish comprising about 50–80% by weight of film forming binder and about 20–50% by weight of an organic solvent for the binder; wherein the binder consists essentially of about

(1) 50–70% by weight, based on the weight of the binder, of an ungelled branched polyester urethane having a hydroxyl number of about 10–200 and a weight average molecular weight of about 6,000–30,000; wherein the polyester urethane is the reaction product of a hydroxyl terminated branched polyester and a polyisocyanate; wherein the polyester is the esterification product of an aliphatic glycol, a polyhydric alcohol having at least three hydroxyl groups, and aliphatic dicarboxylic acid and

(2) 30–50% by weight, based on the weight of the binder, of a fully methylated and butylated melamine formaldehyde crosslinking agent containing about 50% methylated groups and about 50% butylated groups and having a degree of polymerization of about 1–3.

4,632,965

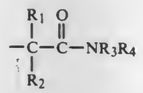
CURABLE AMIDOALKYLAROMATIC COMPOSITIONS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 301,170, Sep. 11, 1981, Pat. No. 4,517,131. This application Apr. 16, 1985, Ser. No. 723,971
Int. Cl.[4] C08G *59/44*
U.S. Cl. 525—484 **20 Claims**

1. A thermosettable composition comprising:

(1) an amidoalkyl aromatic compound, a partially amidoalkylated hydroxyaromatic compound, or a mixture thereof, with the proviso that each amidoalkyl moiety independently is represented by the formula:



wherein R_1, R_2, R_3 and R_4 are independently H or C_1–C_{10} alkyl;

(2) at least one epoxy resin; and, optionally,

(3) a copolymerization catalyst.

4,632,966

THERMOSETTING RESIN COMPOSITION OF AN ALLYLATED NOVOLAK AND A BIS-MALEIMIDE

Shuichi Kanagawa, Osaka; Hisao Takagishi, Kyoto; Teruho Adachi, Hirakata, and Kunimasa Kamio, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 10, 1985, Ser. No. 793,531
Claims priority, application Japan, Oct. 15, 1984, 59-215387; Jul. 9, 1985, 60-151036; Jul. 23, 1985, 60-163738; Jul. 23, 1985, 60-163739
Int. Cl.[4] C08G *8/30, 8/36*
U.S. Cl. 525—502 **15 Claims**

1. A thermosetting resin composition comprising an N,N'-bismaleimide compound and an allylated phenol novolak resin having partially or wholly allyl-etherified phenolic hydroxyl groups and substantially no nucleus-substituted allyl group.

4,632,967

NONHYGROSCOPIC, ANIONIC PENTACOORDINATE SILICATE

William B. Farnham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

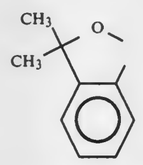
Division of Ser. No. 397,212, Jul. 12, 1982, Pat. No. 4,447,628. This application Jan. 16, 1984, Ser. No. 571,079
Int. Cl.[4] C08F *2/00*
U.S. Cl. 526—194 **8 Claims**

1. Acrylate monomer polymerization process wherein the nonhygroscopic, anionic, pentacoordinate silicate of the formula



wherein

R^1 and R^2 are both aryl or one is aryl and the other is C_{1-4} alkyl, or R^1 and R^2 taken together are



Y is CF_3 or, when R^1 and R^2 are taken together, CH_3;
X is F, CN or N_3 when Y is CF_3;
X is F when Y is CH_3;
$M^{\oplus}$ is $(R^3)_4N^{\oplus}$, $[(R^4)_2N]_3S^{\oplus}$ or $Cs^{\oplus}$ when X is F;
$M^{\oplus}$ is $(R^5)_4N^{\oplus}$ when X is CN:
$M^{\oplus}$ is $[(R^4)_2N]_3S^{\oplus}$ or $(R^5)_4N^{\oplus}$ when X is N_3;
aryl is phenyl, phenyl substituted with F, C_{1-4} alkyl or C_{1-4} alkoxy or naphthyl;
R^3 is C_{1-4} alkyl;
R^4 is C_{1-2} alkyl or $(R^4)_2$ is $—CH_2—_5$; and
R^5 is C_{2-4} alkyl
is used as the catalyst.

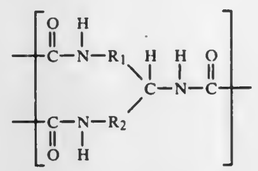
4,632,968

CONTACT LENS AND PROCESS FOR PREPARATION THEREOF

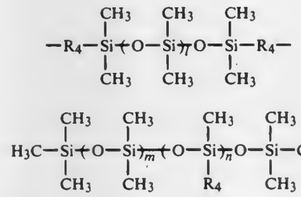
Mitsuru Yokota; Tsutomu Goshima, and Shuji Fujioka, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP85/00009, § 371 Date Sep. 3, 1985, § 102(e) Date Sep. 3, 1985, PCT Pub. No. WO85/03138, PCT Pub. Date Jul. 18, 1985
PCT Filed Jan. 11, 1985, Ser. No. 776,203
Claims priority, application Japan, Jan. 11, 1984, 59-2031
Int. Cl.[4] C08F *30/08*
U.S. Cl. 526—279 **8 Claims**

1. An oxygen-permeable contact lens consisting essentially of a polymer having an organic polysiloxane skeleton and a three-dimensional crosslinked structure, said polymer comprising structural units comprising (A) a residue represented by the following formula:



wherein R_1 and R_2 each stand for an organic residue, (B) a residue connected to residue (A) comprising at least one compound selected from the group consisting of unsaturated carboxylic acids, monoalkyl esters of unsaturated dicarboxylic acids, monoalkyl and dialkyl esters of unsaturated tricarboxylic acids, hydroxyalkyl esters of unsaturated carboxylic acids, acrylamide, methacrylamide, vinyl ethers, and styrene derivatives having an active hydrogen atom, (C) a polydimethylsiloxane residue connected to residue (A) modified with an active hydrogen-containing functional group, which is represented by the following general formula:



wherein l and m stand for an integer of 0 to 200, n is an integer of 1 to 200, and R_4 stands for

$—(CH_2)_pO—$, $—(CH_2)_pNH—$, $—(CH_2)_pS—$, $—(CH_2)_p—$,

$—(CH_2CH_2O)_q—(CH_2CH—O)_r—$ or $—(CH_2)_sO(CH_2CH_2O)_t—$ (CH₃ on the CH)

in which p is an integer of 1 to 30, q and r stand for an integer of 0 to 30, s is an integer of 1 to 25 and t is an integer of 0 to 30, copolymerized with (D) a residue of at least one compound selected from the group consisting of alkyl esters of acrylic acid, alkyl esters of methacrylic acid, fluorine-containing acrylates, fluorine-containing methacrylates, acrylates and methacrylates having an alicylic hydrocarbon group, aryl acrylates and methacrylates, halogen-containing aryl acrylates and methacrylates, styrene, styrene derivatives, dialkyl esters of unsaturated dicarboxylic acids and trialkyl esters of tricarboxylic acids wherein unit (A) connects an organic polysiloxane skeleton to a skeleton consisting of the residue of unit (D) through unit (B).

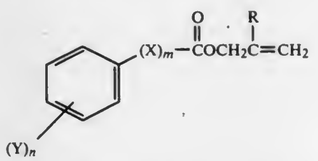
4,632,969

RESIN FOR HIGH-REFRACTIVITY LENSES

Katsuyoshi Sasagawa; Masao Imai, and Kimio Kanno, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

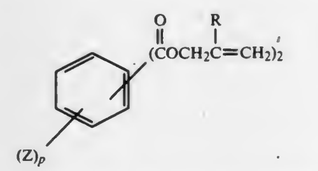
PCT No. PCT/JP83/00219, § 371 Date Mar. 2, 1984, § 102(e) Date Mar. 2, 1984
PCT Filed Jul. 7, 1983, Ser. No. 598,321
Claims priority, application Japan, Nov. 25, 1982, 57-205451
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] C08F *220/22, 228/02*
U.S. Cl. 526—286 **3 Claims**

1. A resin for high-refractivity lenses, formed by copolymerizing by heating in the presence of a radial polymerization initiator 20 to 90 weight percent of at least one unifunctional monomer selected from the group of compounds represented by the following general formula (I):



(I)

wherein X means an oxygen or sulfur atom, Y denotes a chlorine or bromine atom, R is a hydrogen or a methyl group, m is 0 or 1 and n stands for an integer of 1–5, with 10 to 80 weight percent of at least one bifunctional monomer selected from the group of compounds represented by the following general formula (II):



(II)

wherein Z is a hydrogen, chlorine or bromine atom, R means a hydrogen atom or a methyl group and p stands for an integer of 1–4.

4,632,970

EPOXY RESIN COMPOSITION

Misao Hiza, Hiratsuka; Hajime Yamazaki, Hadano, and Shigeo Omote, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,701
Claims priority, application Japan, Apr. 1, 1985, 60-68766
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—27 **9 Claims**

1. An epoxy resin composition comprising:

(a) a urethane modified epoxy resin obtained by reacting a compound having both epoxy and hydroxy groups with a urethane bond containing compound having an isocyanate group at the end thereof, which is obtained from (i) an organopolysiloxane compound having a molecular weight of 500 to 10000 and having at least two hydroxy groups per one molecule in the main chain or side chain thereof and (ii) a polyisocyanate compound; and

(b) an active organic curing agent.

4,632,971

THERMALLY STABLE CAPPED THERMOPLASTIC PHENOLIC RESIN

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 15, 1985, Ser. No. 755,260
Int. Cl.[4] C08G *59/68*
U.S. Cl. 528—88 **6 Claims**

1. A thermally stable, thermoplastic phenolic resin prepared by reacting

(I) (A) the reaction product of

(1) at least one epox average of more than one vicinal epoxy group per molecule with

(2) one or more polyhydric phenols; and optionally

(B) one or more polyhydric phenols; with

(II) a material having only one vicinal epoxy group per molecule or mixture of such materials;

in the presence of an effective quantity of a suitable catalyst and wherein the components are present in quantities which provide an equivalent ratio of component (I-A-1) to component (I-A-2) of from about 0.7:1 to about 0.95:1, the ratio of phenolic hydroxyl equivalents of component (I-B) to the phenolic hydroxyl equivalents of component (I-A) is from about 0:1 to about 20:1, and the ratio of epoxy equivalents from component (II) to phenolic hydroxyl equivalents in component (I) is from about 0.9:1 to about 1.1:1.

4,632,972

IMIDE FUNCTIONAL POLYPHENOLS; THERMOSETTABLE COMPOSITIONS CONTAINING SAME AND CURED PRODUCTS THEREFROM

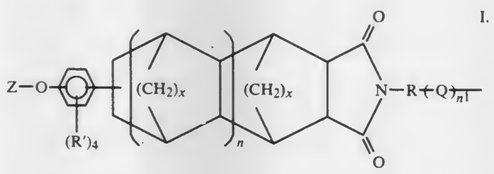
Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

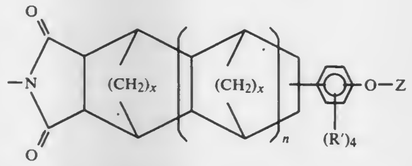
Division of Ser. No. 679,529, Dec. 7, 1984, Pat. No. 4,555,563.
This application Sep. 9, 1985, Ser. No. 773,893
Int. Cl.[4] C08G *59/26*
U.S. Cl. 528—96 **21 Claims**

1. A polyepoxide composition resulting from reacting

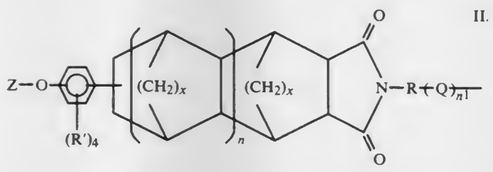
(A) any one or a combination of any two or more of the materials represented by the following formulas (I) and (II)

I.

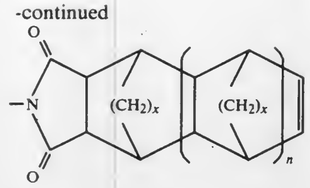




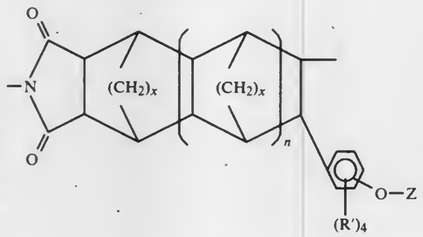
II.

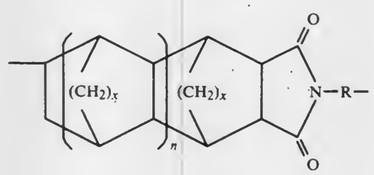


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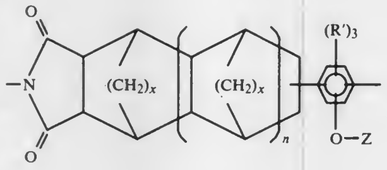


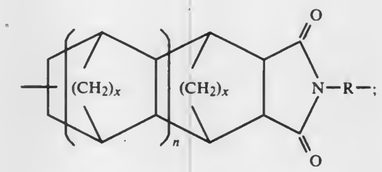
wherein each Q is independently



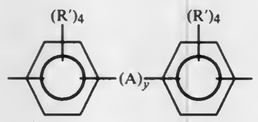


or

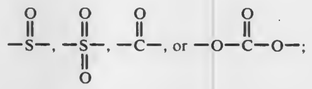




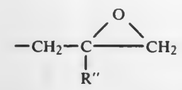
each R is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, or a



group; each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbon atoms, —S—, —S—S—, —O—,



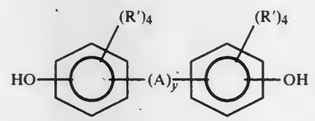
each R′ is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 3 carbon atoms; each R″ is hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; Z is a group represented by the formula



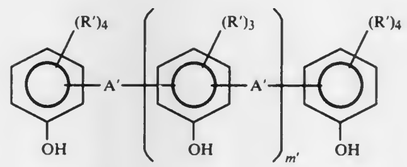
wherein R″ is hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms; each x has a value of zero or 1; each y has a value of zero or 1; each n independently has an average value from zero to about 20, and n^1 has a value from zero to about 10; with

(B) at least one material represented by the following formulas (VII), (VIII), (IX) or (X)

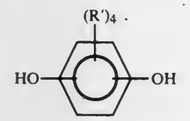
VII.



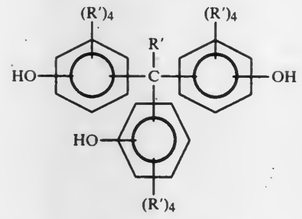
VIII.



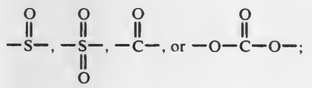
IX.



X.



wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms, —S—, —S—S—, —O—,



each A′ is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each y independently has a value of zero or 1; each R′ is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 4 carbon atoms; m′ has a value from 0.001 to about 10; and y has a value of zero or 1;

wherein components (A) and (B) are employed in quantities which provides a phenolic hydroxyl to epoxide ratio of from about 0.01:1 to about 0.99:1.

4,632,973

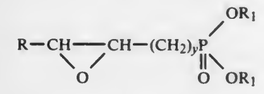
METHOD OF IMPROVING FLAME RESISTANCE OF EPOXY RESINS AND RESULTING COMPOSITIONS

H. Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 18, 1985, Ser. No. 789,898
Int. Cl.[4] C08G *59/20*
U.S. Cl. 528—98 **24 Claims**

1. In a method for imparting flame resistance to a cured epoxy resin prepared by reacting an uncured di- or polyepoxide with a curing agent wherein the di- or polyepoxide has a backbone which contains a functional substituent which is reactive with an oxirane group, the improvement which comprises:

(a) reacting an oxirane group containing phosphonate of the formula:



wherein the oxirane group is reactive with the functional substituent, R is hydrogen or a lower alkyl group, R_1 is a lower alkyl, and y is 1, 2 or 3 in admixture with the uncured di- or polyepoxide; and

(b) reacting the admixture at elevated temperatures to produce the cured epoxy resin which is flame resistant.

4,632,974

IMIDE FUNCTIONAL POLYPHENOLS; THERMOSETTABLE COMPOSITIONS CONTAINING SAME AND CURED PRODUCTS THEREFROM

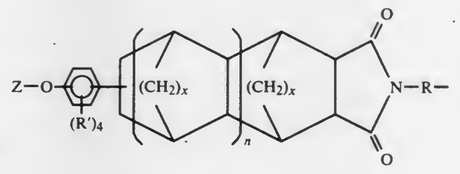
Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

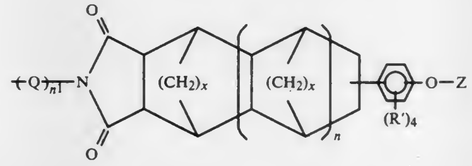
Division of Ser. No. 679,529, Dec. 7, 1984, Pat. No. 4,555,563.
This application Sep. 9, 1985, Ser. No. 773,758
Int. Cl.[4] C08G *73/08*
U.S. Cl. 528—170 **46 Claims**

1. A curable composition comprising

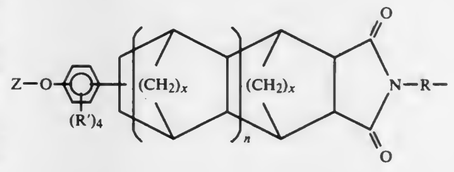
(A) any one or a combination of any two or more of the materials represented by the following formulas (I) and (II)

I.

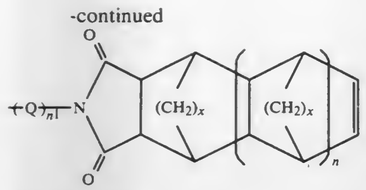




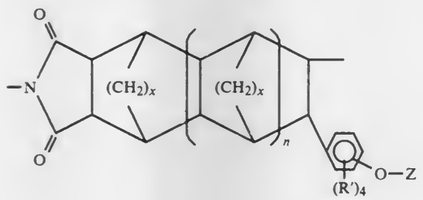
II.

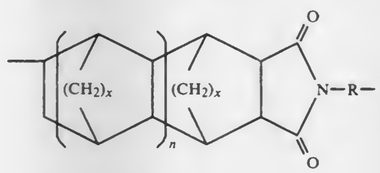


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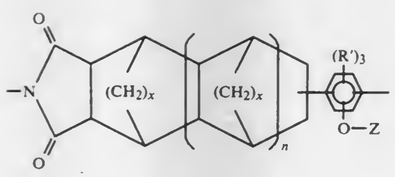


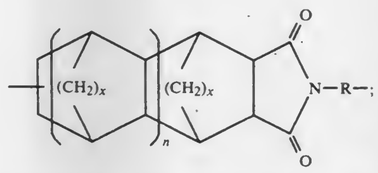
wherein each Q is independently



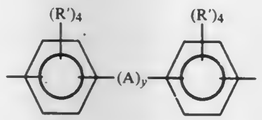


or

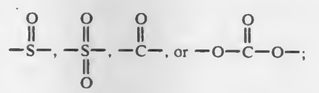




each R is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, or a



group; each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbon atoms, —S—, —S—S—, —O—,



each R′ is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 3 carbon atoms; each R″ is hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; Z is —C≡N; each x has a value of zero or 1; each y has a value of zero or 1; each n independently has an average value from zero to about 20, and n^1 has a value from zero to about 10;

(B) a curing quantity of at least one curing agent therefor.

4,632,975

POLYFUNCTIONAL ACRYLATE DERIVATIVES OF CAPROLACTONE-POLYOLS

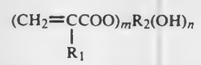
John A. Cornell, West Chester, Pa., and Steven J. Kubisen, Jr., North Brunswick, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 578,423, Feb. 9, 1984, abandoned. This application Sep. 19, 1985, Ser. No. 777,870

Int. Cl.⁴ C08G *63/76*

U.S. Cl. 528—354 **5 Claims**

1. A process for the preparation of polyfunctional acrylate derivatives of caprolactone-polyols characterized by the structural formula:



wherein R_1 is hydrogen or methyl, R_2 is the residue of a caprolactone-polyol, m is an integer of 2 to 6, and n is an integer of 0 to 2, with the proviso that m+n is greater than or equal to 3 and m is greater than n, comprising the steps of:

(a) reacting acrylic acid or methacrylic acid with a caprolactone-polyol for a period of from about 3 to 8 hours at a temperature of from about 60° to 120° C. in the presence of from about 0.1 to about 5% by weight of a strong acid catalyst, and from 50 parts per million to about 2% by weight of a polymerization inhibitor for the acrylic or methacrylic acid, said reacting being conducted with simultaneous sparging of air or oxygen through the reaction mixture to produce a reaction product comprising said polyfunctional acrylate derivative;

(b) vacuum stripping said reaction product comprising said polyfunctional acrylate derivative, while sparging said air or oxygen therethrough; and

(c) recovering said polyfunctional acrylate derivative.

4,632,976

PROCESS FOR THE CONTINUOUS DISCHARGE OF A SLURRY

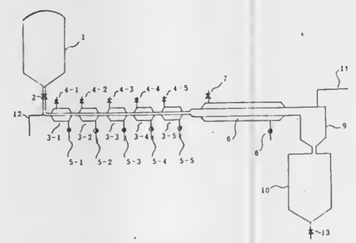
Tadashi Asanuma, Takaishi; Tatuo Ohoka, Izumi, and Nobutaka Uchikawa, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 724,635

Claims priority, application Japan, Apr. 16, 1984, 59-74892

Int. Cl.⁴ C08F *6/00, 6/24*

U.S. Cl. 528—497 **4 Claims**



1. A process for continuously discharging a slurry which comprises:

(a) transferring a slurry of solid polymer particles and a diluent from a first zone maintained under pressures sufficient for holding said diluent in the liquid phase, into a heat piping, said heat piping consisting of a heat tube covered with two or more divisional heating jackets, said diluent consisting of at least one hydrocarbon or halogenated hydrocarbon which are gaseous under normal temperature and pressure, and,

(b) subsequently separating and recovering the substantially dried solid polymer particles and the vapor of the evaporated diluent from a second zone substantially maintained under atmospheric pressure,

the improvement wherein the amount of discharge of the slurry is controlled by means of:

(i) varying the number of the heating jackets in which steam is introduced, and

(ii) separately introducing and controlling the amount of a liquid hydrocarbon or halogenated hydrocarbon into the heat tubing, said liquid hydrocarbon and halogenated hydrocarbon being gaseous at normal temperature and under normal pressure.

4,632,977

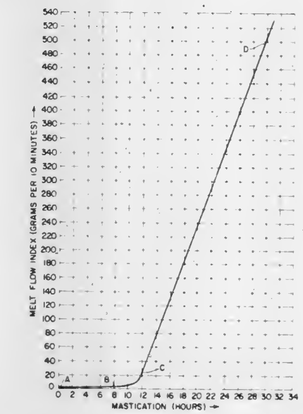
METHOD OF PLASTICIZING THERMOPLASTIC POLYMERS

John Riazi, Akron, Ohio, assignor to The Hygenic Corporation, Akron, Ohio

Filed Jun. 1, 1984, Ser. No. 616,053

Int. Cl.⁴ C08J *3/18;* **A61C** *5/02*

U.S. Cl. 528—502 **10 Claims**



1. A process for the plasticization of thermoplastic polymers selected from the group consisting of gutta-percha, balata and synthetic transpolyisoprene having an unprocessed melt flow index falling within the range of approximately 0.2 to 0.8 grams per 10 minutes and being devoid of plasticizers, solvents or other chemical processing aids comprising the steps of:

masticating said polymer with sufficient shear to heat the polymer;

applying additional heat to said polymer as it is masticated in an amount sufficient to raise the temperature of said polymer to about 295°0 F.; and,

discontinuing the mastication of said polymer when the melt index reaches approximately a 500 gram flow per 10 minutes.

4,632,978

6-SERINE, DES-19-LEUCINE CALCITONIN

Jay K. Seyler, Bourbonnais, and Ronald C. Orlowski, Frankfort, both of Ill., assignors to Armour Pharmaceutical Corp., Fort Washington, Pa.

Filed Oct. 15, 1985, Ser. No. 787,202

Int. Cl.⁴ C07K *7/36*

U.S. Cl. 530—307 **7 Claims**

1. A peptide having the structure:

Cys—Ser—Asn—Leu—Ser—Ser—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Gln—Thr—
—Tyr—Pro—Arg—Thr—Asn—Thr—Gly—Ser—
—Gly—Thr—Pro—NH_2.

4,632,979

THERAPEUTIC LHRH ANALOGS

David H. Coy, New Orleans, La., and Jacques-Pierre Moreau, Upton, Mass., assignors to Tulane Educational Fund, New Orleans, La.

Filed Jun. 18, 1984, Ser. No. 621,673

Int. Cl.⁴ C07K *7/20*

U.S. Cl. 530—313 **4 Claims**

1. The compound having the formula N-Ac-Sarc-His-Trp-Ser-Tyr-D-Phe-Leu-Arg-Pro-$NHCH_2CH_3$.

4,632,980

OZONE DECONTAMINATION OF BLOOD AND BLOOD PRODUCTS

Yuan C. Zee, Davis, Calif., and David C. Bolton, Staten Island, N.Y., assignors to Immunologics, San Francisco, Calif.

Filed Apr. 3, 1985, Ser. No. 719,187

Int. Cl.⁴ A61K *35/14, 35/16;* **C07K** *3/08, 3/12*

U.S. Cl. 530—380 **6 Claims**

1. A method for freeing blood and blood components of viable enveloped viruses while retaining the physiological characteristics of the blood or blood component, said method comprising:

contacting said blood or blood product in an aqueous medium with an enveloped virus inactivating amount of ozone under mild conditions for a sufficient time to inactivate all enveloped viruses present; and

isolating the blood or blood component free of viable enveloped viruses.

4,632,981

HUMAN ANTITHROMBIN III

Susan C. Bock, Palo Alto, and Richard M. Lawn, San Francisco, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 403,600, Jul. 30, 1882, Pat. No. 4,517,294. This application Feb. 1, 1985, Ser. No. 697,178

Int. Cl.⁴ C07K *15/06, 15/14;* **C12N** *1/20;* **C12P** *21/02*

U.S. Cl. 530—393 **4 Claims**

1. A human antithrombin III that is essentially free of native endogenous substances and unaccompanied by associated native glycosylation as a product of genetically altered cell culture.

4,632,982

TRIPHENYLMETHYL AZO AND HYDRAZINO SUBSTITUTED PYRIDAZINES

Carlo Farina, Valsolda; Giorgio Pifferi, Milan, and Mario Pinza, Corsico, all of Italy, assignors to I.S.F. S.p.A., Milan, Italy

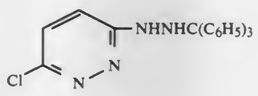
Division of Ser. No. 600,407, Apr. 16, 1984, Pat. No. 4,575,552. This application Feb. 20, 1986, Ser. No. 831,434

Claims priority, application Italy, Apr. 28, 1983, 20813 A/83

Int. Cl.[4] C07C *107/04;* **C07D** *237/12, 237/20*

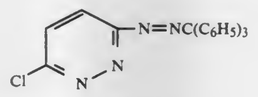
U.S. Cl. 534—753 **4 Claims**

1. A compound of the structure:



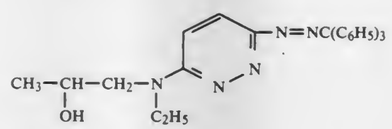
(II)

2. A compound of the structure:



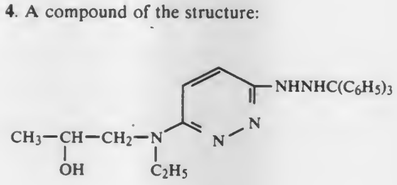
(III)

3. A compound of the structure:



(IV)

4. A compound of the structure:



(V)

4,632,983

PYRIDONE DYES CONTAINING A OXYDIAZONE SUBSTITUENT

Gunther Lamm, Hassloch, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

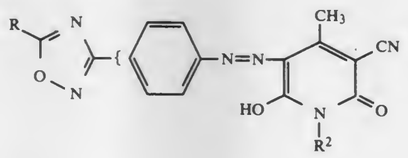
Filed Dec. 5, 1983, Ser. No. 558,297

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244960

Int. Cl.[4] C07C *107/06*

U.S. Cl. 534—772 **2 Claims**

1. A compound of the formula



wherein

R is C_3-C_{17}-alkyl, or phenoxymethyl, and

R^2 is hydrogen, C_1-C_6-alkyl or allyl, wherein R^2 is not hydrogen if R is phenoxymethyl.

4,632,984

PROCESS FOR THE PRODUCTION OF CATIONIC STARCH

Yoshiki Matsunaga, Sagamihara; Toshiaki Sugiyama, Hatano, and Eikichi Maekawa, Samukawamachi, all of Japan, assignors to Kyoritsu Yuki Co., Ltd., Japan

Filed Jul. 24, 1985, Ser. No. 758,268

Claims priority, application Japan, May 2, 1985, 60-94937

Int. Cl.[4] C08B *31/08*

U.S. Cl. 536—50 **6 Claims**

1. A process for the production of cationic starch comprising the step of reacting starch having cyanoethyl groups with hydroxylamine or the salts thereof to amidoximate the reaction product.

4,632,985

3-ACYLAMINO-2-OXO-1-AZETIDINESULFONIC ACIDS

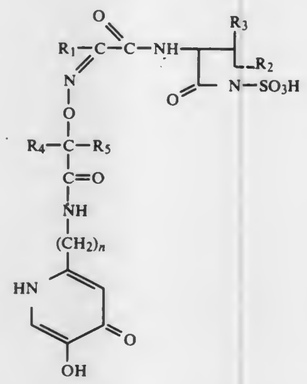
David Kronenthal, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 3, 1985, Ser. No. 740,605

Int. Cl.[4] C07D *401/14, 401/12, 417/14, 413/14*

U.S. Cl. 540—355 **11 Claims**

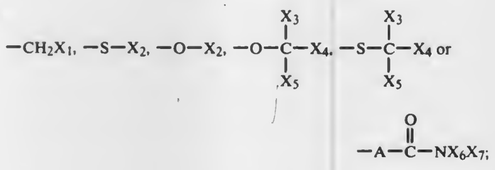
1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is phenyl, substituted phenyl, 2-amino-4-thiazolyl, 5-amino-3-(1,2,4-thiadiazolyl), 2-amino-4-oxazolyl, 2-amino-4-imidazolyl, or 2-amino-6-pyridyl;

R_2 and R_3 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle or one of R_2 and R_3 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl,

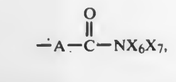


R_4 and R_5 are the same or different and each is hydrogen or alkyl, or R_4 and R_5 together with the carbon atom to which they are attached are cycloalkyl;

n is 0 or 1;

X_1 is azido, amino, hydroxy, carboxyl, alkoxycarbonyl,

alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



—S—X_2, or —O—X_2;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)-carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkyl-carbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

A is —CH=CH—, —$(CH_2)_m$—, —$(CH_2)_m$—O—, —$(CH_2)_m$—NH— or —CH_2—S—CH_2—; and

m is 0, 1 or 2; and wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkanoyloxy, aminocarbonyl, or carboxy groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazoyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups; and

the term "substituted amino" refers to a group having the formula —NX_8X_9 wherein X_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and X_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

4,632,986

PROCESS FOR PURIFYING THIOCARBAMYLSULFENAMIDES

Enrique G. Reynes, Middleburg Heights, and John O. Leising, Avon Lake, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Filed Jul. 29, 1985, Ser. No. 760,225

Int. Cl.[4] C07C *155/02;* **C07D** *265/30*

U.S. Cl. 544—85 **6 Claims**

1. A method for recovering and purifying a thiocarbamylsulfenamide reaction product of an amine and a monohaloamine reacted with carbon disulfide from a solution thereof in an organic solvent, comprising adding to said solution an aqueous caustic selected from the group consisting of aqueous sodium hydroxide, potassium hydroxide, lithium hydroxide, calcium hydroxide, magnesium hydroxide, barium hydroxide and sodium carbonate, in concentrations from about 0.2 to about 2 percent in water, to provide about 0.02 ± 0.25 mol equivalents of caustic per mol of thiocarbamylsulfenamide, said caustic solution being at a temperature of about 30° to about 90° C., to flash off the solvent, separating the thiocarbamylsulfenamide present suspended in a slurry of the water phase from the water, and drying the thiocarbamylsulfenamide.

4,632,987

PROCESS FOR THE PREPARATION OF TRIARYLMETHANE COMPOUNDS

Michihiro Tsujimoto, Tachikawa; Hiroyuki Akahori, Yokosuka; Kiyoharu Hasegawa, Kamakura, and Makoto Asano, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

PCT No. PCT/JP83/00133, § 371 Date Dec. 2, 1983, § 102(e) Date Dec. 2, 1983, PCT Pub. No. WO83/03840, PCT Pub. Date Nov. 10, 1983

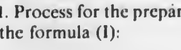
PCT Filed Apr. 28, 1983, Ser. No. 562,587

Claims priority, application Japan, Apr. 28, 1982, 57-70218

Int. Cl.[4] C09B *11/10;* **C07D** *209/04, 265/30, 209/18*

U.S. Cl. 544—86 **6 Claims**

1. Process for the preparation of a triarylmethane compound of the formula (I):



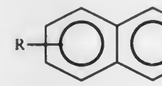
(I)

wherein A is a benzene compound as defined by formula (II) below or a naphthalene compound as defined by formula (III) below and Q—R is a benzene compound as defined by formula (IV) below or a naphthalene compound as defined by formula (V) below, which comprises: reacting a benzene compound of formula (II):



(II)

or a naphthalene compound of formula (III):



(III)

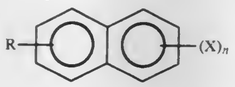
wherein X is a lower alkoxy group, an —NR_1R_2 group, in which R_1 and R_2 are each a lower alkyl group, phenyl group or benzyl group, a morpholino group or a pyrrolidinyl group, R is a hydrogen atom, a halogen atom or a cyclohexyl group, and n is an integer of 1 to 3, with a formamide or formanilide compound in the presence of an acid catalyst selected from the group consisting of phosphorus oxychloride, phosphorus oxy-

bromide, phosgene and thionyl chloride, to form an aromatic aldehyde; adding water to the reaction mixture containing the aromatic aldehyde and thereby hydrolyzing the acid catalyst; and uninterruptedly reacting, in the resultant mixture, the aromatic aldehyde with a benzene compound of formula (IV):



(IV)

or a naphthalene compound of the general formula:



(V)

wherein X is an $-NR_1R_2$ group, in which R_1 and R_2 are each a lower alkyl group, phenyl group or benzyl group, a morpholino group or a pyrrolidinyl group, R is a hydrogen atom, a halogen atom, a lower alkyl group or a cyclohexyl group, and n is an integer of 1 to 3, thereby forming the triarylmethane compound at a high yield and in a high purity.

4,632,988

PROCESS FOR PREPARING N-POLYTHIODIMORPHOLINES

Angelo Bergomi, Akron, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 30, 1985, Ser. No. 728,915
Int. Cl.⁴ C07D *295/22*
U.S. Cl. 544—85 **9 Claims**

1. A process for the preparation of N-polythiodimorpholine wherein morpholine and elemental sulfur in an alcohol mixture are oxidized with an alkali metal hypohalite or an alkaline earth metal hypohalite to yield N-polythiodimorpholines.

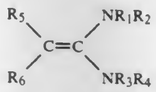
4,632,989

ISOCYANURATE PREPARATION

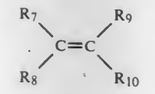
Dale F. Regelman, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 587,429, Mar. 8, 1984, Pat. No. 4,536,490. This application May 28, 1985, Ser. No. 737,837
Int. Cl.⁴ C07D *251/34*
U.S. Cl. 544—193 **10 Claims**

1. In a method for the trimerization of an organic isocyanate in the presence of a trimerization catalyst the improvement which comprises employing as said catalyst a composition comprising a solution of the product obtained by reacting, in an inert solvent, substantially equimolar proportions of a ketene-aminal and an olefin having the respective formulae (I) and (II)



(I)



(II)

wherein R_1, R_2, R_3, and R_4 when taken separately are independently selected from the group consisting of lower-alkyl, aralkyl, cycloalkyl, and, when taken together as R_1 with R_2 and R_3 with R_4 with the respective nitrogen atoms to which they are attached represent independently heterocyclic groups having 6 or 7 ring atoms wherein the heterocyclic radical contains at least the basic valence ring nitrogen and optionally containing one or more additional hetero atoms selected from the group consisting of nitrogen, oxygen, and sulfur, R_5 and R_6 are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, R_7 and R_8 when taken separately are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, provided that R_7 and R_8 are not both hydrogen at the same time, and, R_7 and R_8, when taken together with the carbon atom to which they are attached represent a cyclic hydrocarbon group having 5 or 6 carbon atoms in the ring, and R_9 and R_{10} represent the same or different electron withdrawing groups.

4,632,990

ERGOLINE CARBOXAMIDES

Luigi Bernardi, Milan; Enzo Brambilla, Mariano Comense; Laura Chiodini, Busto Arsizio; Enrico di Salle; Daniela Ruggieri, both of Milan; Osvaldo Sapini, Gallarate, and Aldemio Temperilli, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Apr. 13, 1983, Ser. No. 484,477
Claims priority, application United Kingdom, Apr. 13, 1982, 8210697
Int. Cl.⁴ A61K *31/48;* **B07D** *457/06;* **C07D** *239/42*
U.S. Cl. 544—329 **11 Claims**

1. An ergoline selected from the group consisting of N-(2',6'dimethyl-4'-pyrimidyl)-6-methylergolinc-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-1,6-dimethylergoline-8β-carboxamide, N-(4'-pyrimidyl)-6-methylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-2,6-dimethylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-6-propylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-6-allylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-6-isopropylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-1-methyl-6-allylergoline-8β-carboxamide, N-(2',6'-dimethyl-4'-pyrimidyl)-6-methylergoline-8α-carboxamide, and N-(2',6'-dimethyl-4'-pyrimidyl)-6-propylergoline-8α-carboxamide.

4,632,991

PROCESS FOR PRODUCTION OF ZINC 2-MERCAPTOPYRIDINE-N-OXIDE

Manfred Maurer, Kirchheim; Winifried Orth, Hassloch, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Continuation of Ser. No. 395,660, Jul. 6, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 695,410
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127863
Int. Cl.⁴ C07D *213/89*
U.S. Cl. 546—6 **7 Claims**

1. A process for the preparation of the zinc salt of 2-mercaptopyridine-N-oxide in a readily filterable, washable and easily suspendable form comprising reacting in the absence of a surfactant an aqueous solution of an alkali metal salt of 2-mercaptopyridine-N-oxide and an aqueous solution of a water soluble zinc salt at a temperature in the range of 35° to 100° C. in the presence of 10 to 50% by weight of an at least partially water soluble organic solvent based on the weight of the sodium 2-mercaptopyridine-N-oxide solution to form a precipitate of crystalline zinc-2-mercaptopyridine-N-oxide, recovering said crystals and optionally comminuting the crystals.

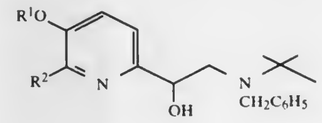
4,632,992

INTERMEDIATES FOR PREPARING PIRBUTEROL AND ANALOGS

Berkeley W. Cue, Gales Ferry, and Stephen S. Massett, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 500,210, Jun. 2, 1983, Pat. No. 4,477,671, Division of Ser. No. 340,172, Jan. 18, 1982, abandoned, which is a division of Ser. No. 232,923, Feb. 9, 1981, abandoned. This application Aug. 16, 1984, Ser. No. 641,539
Int. Cl.⁴ C07D *213/65, 491/056*
U.S. Cl. 546—116 **2 Claims**

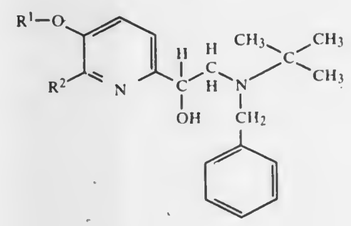
1. A compound of the formula



wherein

R^1 is benzyl and R^2 is hydrogen or methyl; or

R^1 and R^2 are taken together and are



4,632,993

PROCESS FOR MAKING 2-GUANIDINO-4-(2-METHYL-4-IMIDAZOLYL) THIAZOLE DIHYDROBROMIDE

Berkeley W. Cue, Jr., Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 11, 1984, Ser. No. 659,749
Int. Cl.⁴ C07D *277/46, 233/70*
U.S. Cl. 548—198 **6 Claims**

1. A process for the preparation of 2-guanidino-4-(2-methyl-4-imidazolyl)thiazole dihydrobromide which comprises the steps of:

(a) bromination of 2-methyl-4-acetylimidazole with substantially one molar equivalent of Br_2 in the presence of at least one molar equivalent of HBr in a reaction-inert solvent at 30° to 90° C.;

(b) reaction of the resulting acidic slurry or solution of 2-methyl-4-(bromoacetyl)imidazole with substantially one molar equivalent of N-amidinothiourea at 35°–100° C. in the same or another reaction-inert solvent; and

(c) isolation of said dihydrobromide salt from the resulting reaction mixture.

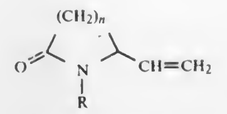
4,632,994

PROCESS FOR DECOMPOSING N-OXIDE DERIVATIVES PRODUCING 5-VINYL-2-PYRROLIDONES

Aldo Trani, Milan, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

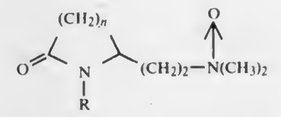
Filed Nov. 4, 1983, Ser. No. 549,365
Int. Cl.⁴ C07D *207/263*
U.S. Cl. 548—543 **5 Claims**

1. In the process of preparing a 5-vinyl-2-pyrrolidinones of the formula



I

wherein R is hydrogen, a C_1-C_4 alkyl, or benzyl and n is the integer which comprises decomposing a N-oxide derivative of the formula



II

wherein R and n are as defined above at a temperature of at least 100° C., the improvement wherein a suitable organic solvent and an alkali metal hydroxide or carbonate are present.

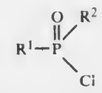
4,632,995

PROCESS FOR THE PREPARATION OF PHENYL- AND THIENYL-CHLOROPHOSPHANE DERIVATIVES

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,539
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313921
Int. Cl.⁴ C07D *333/30;* **C07F** *9/42*
U.S. Cl. 549—6 **4 Claims**

1. A process for the preparation of an organic chlorophosphane, which comprises reacting an organic phosphorus oxychloride with an organic phosphane at an elevated temperature, wherein the organic phosphorus oxychloride is a compound of the formula I



(I)

in which R^1 is phenyl, phenyl substituted by 1 or 2 alkyl or halo groups or by the CF_3 group, or a thienyl group, and R^2 is an aliphatic radical or Cl, and triphenylphosphane is the organic phosphane.

4,632,996

ORGANOPALLADIUM ADDITIONS TO ALKENYL- AND METHYLENECYCLOPROPANES AND ALKENYL- AND METHYLENECYCLOBUTANES

Richard C. Larock, Ames, Iowa, and Sudarsanan Varaprath, Midland, Mich., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 5, 1985, Ser. No. 762,407
Int. Cl.⁴ C07F *15/00*
U.S. Cl. 549—209 **9 Claims**

1. A method of preparing (pi-allyl)palladium compounds by organopalladium addition to alkenyl- or methylenecyclopropanes or alkenyl- or methylenecyclobutanes, comprising:

reacting an organomercurial salt selected from the group consisting of alkyl organomercurials, vinyl organomercurials, aryl organomercurials and 2-furylmercuric chloride, with an alkenyl- or methylenecyclopropane, or an alkenyl- or methylenecyclobutane, in the presence of a palladium(II) salt to form a (cycloalkylcarbinyl)palladium intermediate which undergoes ring-opening and subsequent

palladium migration to yield the desired (pi-allyl)palladium compound.

4,632,997

METHOD FOR PREPARING CIS-BICYCLO[3.3.0]OCTYLIDENE DERIVATIVE

Masakatsu Shibasaki, Tokyo; Mikiko Sodeoka, and Yuji Ogawa, both of Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

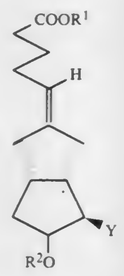
Filed Feb. 8, 1985, Ser. No. 700,003

Claims priority, application Japan, Feb. 10, 1984, 59-22011; Mar. 28, 1984, 59-58457

Int. Cl.⁴ C07C *51/36, 67/303;* **C07D** *309/10;* **C07F** *7/18*

U.S. Cl. 549—214 **9 Claims**

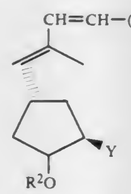
1. A method for preparing a cis-bicyclo[3.3.0]octylidene derivative represented by the formula:



wherein R^1 is a hydrogen atom or an alkyl group; R^2 is a hydrogen atom or a protective group for hydroxyl group; and Y is

$$-CH_2OR^3 \text{ or } -X-\underset{\displaystyle OR^3}{\underset{|}{CH}}-R^4;$$

where R^3 is a hydrogen atom or a protective group for hydroxyl group; R^4 is a hydrogen atom or a straight, branched or cyclic alkyl group, alkenyl group or alkynyl group; and X is a group represented by CH=CH or C≡C,
which comprises carrying out the catalytic hydrogenation reaction of a (1-alkenyl)-cis-bicyclo[3.3.0]octene derivative represented by the formula:



wherein R^1, R^2 and Y have the same meanings as defined above,
with hydrogen gas in the presence of a metal carbonyl compound or its complex represented by the formula:

$$Mw(CO)x(H)y(R)z$$

wherein M is a metal element of the group VIB; R is a π ligand or a phosphine ligand; w is 1 or 2; x is an integer of 3 to 6; y is 0 or 1; and z is 0 or an integer of 1 to 3.

9. The method for preparing a cis-bicyclo[3.3.0]octylidene derivative according to claim **1**, wherein at least one of R^2 and R^3 is selected from the group consisting of a tetrahydropyranyl group, a t-butyldimethylsilyl group, a 1-ethoxyethyl group, a diphenyl-t-butylsilyl group, a methoxymethyl group, a 1-methyl-1-methoxyethyl group, a 4-methoxytetrahydropyranyl group, a methyl group, a benzyl group, a benzoyl group, an acetyl group, a β-methoxyethoxymethyl group, and a triethylsilyl group.

4,632,998

METHOD OF MIXING A FINELY DIVIDED LIQUID WITH A GAS TO PRODUCE A MIXTURE WITH THE LIQUID IN EXCESS OF ITS EXPLOSIVE LIMIT

Rolf Geissen, Mörfelden-Walldorf, and Wolfgang Siebert, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,331

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336022

Int. Cl.⁴ C07D *307/89*

U.S. Cl. 549—248 **4 Claims**

1. In a process for reacting a reaction mixture of a finely divided liquid selected from the group which consists of ortho-xylene and naphthalene and air in a catalyst-containing reaction zone containing a catalyst and under conditions such that phthalic anhydride is produced as a reaction product and wherein the mixture of said liquid and air is at least at the explosive limit concentration of the liquid in the mixture, the improvement which comprises the steps of:

(a) in a first mixing zone spaced from said reaction zone and free from catalyst, mixing a first portion of said finely divided liquid and air to produce a first mixture having a concentration of said liquid in said first mixture which is close to but below said explosive limit concentration;

(b) feeding said first mixture into a second mixing zone free from catalyst and located between said first mixing zone and said catalyst-containing reaction zone and directly preceding said reaction zone in a flow direction of the mixture, and mixing said first mixture with a second portion of said finely divided liquid in said second mixing zone to produce said reaction mixture and with a concentration of said liquid in said reaction mixture exceeding the explosive limit concentration; and

(c) directly feeding the reaction mixture upon its formation in said second mixing zone, directly preceding said reaction zone, into said reaction zone for contact with catalyst therein to produce phthalic anhydride.

4,632,999

PROCESS FOR THE PREPARATION OF OXIRANES

Rudolf Zerbes, Wuppertal, Fed. Rep. of Germany; Siegfried W. Linke, Seoul, Rep. of Korea; Karl H. Mohrmann, and Wolf Reiser, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

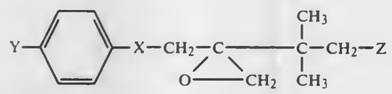
Continuation of Ser. No. 603,524, Apr. 24, 1984, abandoned. This application Oct. 22, 1985, Ser. No. 789,987

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315524

Int. Cl.⁴ C07D *301/02*

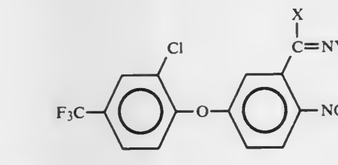
U.S. Cl. 549—519 **15 Claims**

1. A process for the preparation of an oxirane of the formula



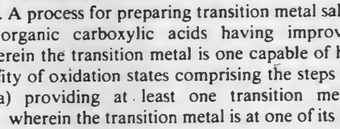
(I)

ps in which
Y represents chlorine,
X represents oxygen and
Z represents hydrogen
which comprises contacting dimethyl sulphoxide with dimethyl sulphate at a temperature of at least 100° C., whereby to form trimethyloxosulphonium methyl sulphate of the formula



(II)

and thereafter, without isolating said trimethyloxosulphonium methyl sulphate, contacting the trimethyloxosulphonium methyl sulphate with a ketone of the formula



(III)

in which
X, Y and Z have the meanings indicated above, in the presence of a base and in the presence of an inert organic diluent, at a temperature between 0° C. and 60° C.

4,633,000

2-NITRO-5-(SUBSTITUTED-PHENOXY) PHENYLALKANONE OXIME AND IMINE DERIVATIVES AS HERBICIDES

Robert J. Theissen, Bridgewater, N.J., assignor to Rhone Poulenc Agrochimie, Lyons, France

Division of Ser. No. 117,731, Feb. 1, 1980, Pat. No. 4,551,171. This application Jun. 14, 1984, Ser. No. 620,480

Int. Cl.⁴ C07D *303/08;* **C07C** *79/46, 131/00*

U.S. Cl. 549—551 **4 Claims**

1. Herbicidal compounds of the formula:

wherein:
X is selected from the group consisting of hydrogen, alkoxy of 1 to 6 carbons, alkyl of 1 to 6 carbons;
Y is selected from the group consisting of N-alkylaminocarboxy and N,N-dialkylaminocarboxy where each alkyl group is of 1 to 6 carbons, epoxyalkoxy where the alkoxy is of 3 to 6 carbons.

4,633,001

PREPARATION OF TRANSITION METAL SALT COMPOSITIONS OF ORGANIC CARBOXYLIC ACIDS

Paul L. Cells, Cleveland, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Dec. 18, 1984, Ser. No. 682,783

Int. Cl.⁴ C07F *9/00, 11/00*

U.S. Cl. 556—44 **22 Claims**

1. A process for preparing transition metal salt compositions of organic carboxylic acids having improved properties wherein the transition metal is one capable of having a multiplicity of oxidation states comprising the steps of

(a) providing at least one transition metal compound wherein the transition metal is at one of its higher positive oxidation states,

(b) reducing said transition metal compound with at least one reducing agent forming an intermediate containing the transition metal in a lower positive oxidation state,

(c) reacting said intermediate with at least one organic carboxylic acid to form the transition metal salt of said carboxylic acid, and

(d) mixing said transition metal salt formed in step (c) with (i) at least one antioxidant, or (ii) at least one additional metal salt wherein the additional metal is more electronegative than the transition metal, or (iii) mixtures of (i) and (ii).

4,633,002

AMINOFUNCTIONAL POLYSILOXANE COMPOUNDS AND METHOD OF PREPARATION THEREFOR

Charles Piskoti, Grand Blanc, Mich., assignor to Charles Piskoti, Grand Blanc, Mich.

Filed Aug. 21, 1984, Ser. No. 642,885

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—411 **15 Claims**

1. A process for the preparation of an aminofunctional organosilicone compound comprising: reacting a silanol terminated organo-silicone compound with an aminofunctional silane compound in the presence of a catalytic amount of an organo-metallic compound.

4,633,003

SILOXANE MONOMERS FOR OPHTHALMIC APPLICATIONS

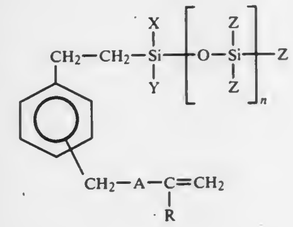
Joseph J. Falcetta, and Joonsup Park, both of Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Nov. 25, 1985, Ser. No. 801,259

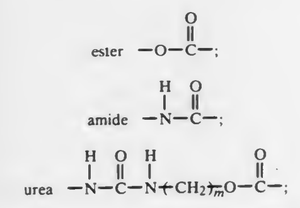
Int. Cl.⁴ C07F *7/08, 7/10*

U.S. Cl. 556—419 **8 Claims**

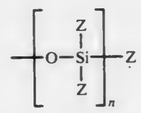
1. A siloxane monomer having the formula:



wherein,
(1) "A" is selected from the group consisting of:



where m is a number and is from 2–4;
(2) R is hydrogen or methyl;
(3) X and Y are selected from the group consisting of C_1 to C_5 alkyl groups, phenyl groups and W groups;
(4) W is a group of the structure



(5) Z is selected from the group consisting of C_1 to C_5 alkyl groups and phenyl groups; and
(6) n is an integer from zero to five.

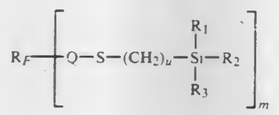
4,633,004

FLUOROSILANES AND PROCESS FOR THEIR PREPARATION

Bernard Boutevin, Montpellier, and Yves Pietrasanta, Meze, both of France, assignors to Atochem, France

Filed Nov. 12, 1985, Ser. No. 797,002
Claims priority, application France, Nov. 13, 1984, 84 17279
Int. Cl.⁴ C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—419 **10 Claims**

1. Fluorosilanes having the formula:



(I)

wherein R_1 is halogen or an alkoxy group, R_2 and R_3 are each hydrogen, a halogen, an alkoxy group, an alkyl group, or an aryl group; u is two or three; m is one or two; R_F is a partially or completely fluorinated hydrocarbon; and Q is a bivalent group having at least one oxygen atom.

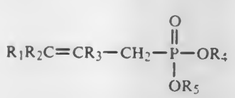
4,633,005

METHOD FOR THE PREPARATION OF ALLYL PHOSPHONATE DIESTERS

David Nalewajek, West Seneca, and David S. Soriano, Cheektowaga, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

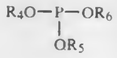
Filed Jul. 2, 1984, Ser. No. 627,141
Int. Cl.⁴ C07F *9/40*
U.S. Cl. 558—125 **19 Claims**

1. A process for the preparation of an allylic phosphonate diester compounds of the formula:

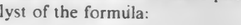


which comprises reacting an allylic compound of the formula:

and a phosphite ester of the formula:



in the presence of one or more phosphonated transition metal catalyst of the formula:



wherein:

X is halo or hydroxy;

M is a d^8 transition metal cation;

R_1, R_2 and R_3 are the same or different and are hydrogen or alkyl; and

R_4, R_5 and R_6 are the same or different and are alkyl, cycloalkyl, aralkyl, or alkaryl, either unsubstituted or substituted with one or more substituents which are inert under the process conditions.

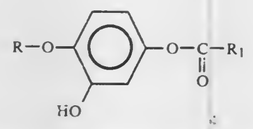
4,633,006

3-HYDROXY-4-ALKYLOXYPHENYL ALIPHATIC CARBOXYLATES

Ronald E. Barnett, Suffern; Jed A. Riemer, Scarsdale, and Paul R. Zanno, Port Chester, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 566,637, Dec. 29, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,576
Int. Cl.⁴ C07C *69/75, 69/28, 69/74, 69/753, 69/608*
U.S. Cl. 560—1 **27 Claims**

1. As a sweetener in edible foodstuffs, a compound of the formula:



wherein R is methyl, ethyl or propyl; and R_1 is alkyl excluding the specific structures of methyl and tertiary butyl, alkenyl, alkadienyl, cycloalkyl, excluding the specific structure of 1-methylcyclopropyl, cycloalkenyl, cycloalkadienyl, bicycloalkyl or bicycloalkenyl; the total number of carbon atoms in R_1, being not greater than 12, the total number of ring carbon atoms in said cycloalkyl, cycloalkenyl, cycloalkadienyl, bicycloalkyl and bicycloalkenyl being not greater than 7; and salts thereof.

14. 3-hydroxy-4-methoxyphenyl cycloheptanecarboxylate.

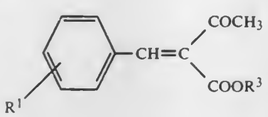
4,633,007

PREPARATION OF BENZYLIDENE COMPOUNDS

Michael Preiss, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,503
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508533
Int. Cl.⁴ C07C *143/525, 79/38, 121/76, 69/738*
U.S. Cl. 560—014 **6 Claims**

1. A process for the preparation of a benzylidene compound of the formula

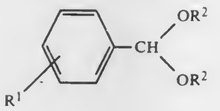


in which

R^1 is hydrogen or one or two substituents independently selected from the group consisting of nitro, cyano, halogen, SO_3H, alkyl, alkoxy and fluorinated alkyl, each with 1 to 4 C atoms and two or three fluorine substituents, and

R^3 is alkyl with 1 to 10 C atoms, which is optionally interrupted by an oxygen in the chain or is optionally substituted by fluorine, chlorine, hydroxyl or a methylbenzylamine group,

comprising reacting an acetal of the formula



in which

R^2 each independently is alkyl with 1 to 6 C atoms, which is optionally substituted by phenyl, or the two radicals R^2 conjointly form an alkylene radical with 1–4 C atoms, with a β-ketocarboxylic acid ester of the formula

in the presence of an acid at a temperature between about 40° and 120°.

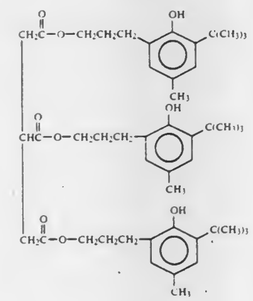
4,633,008

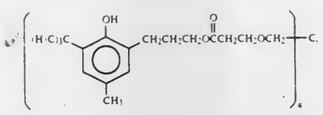
ANTI-OXIDANT PHENOL DERIVATIVES

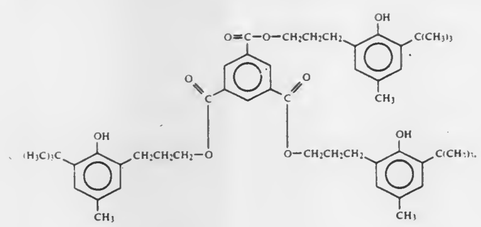
Akiyoshi Oonishi; Kenji Tanaka, both of Yokkaichi; Makoto Tadeka, Ami; Kazuhiko Konno, Ami, and Masaki Saito, Ami, all of Japan, assignors to Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, Japan

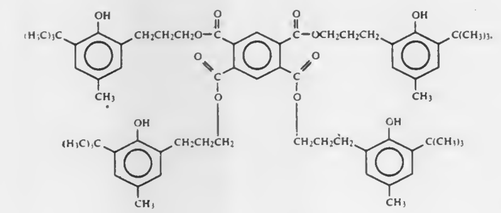
Filed Feb. 29, 1984, Ser. No. 584,636
Claims priority, application Japan, Mar. 15, 1983, 58-42694; Jul. 6, 1983, 58-122568
Int. Cl.⁴ C08K *5/36;* **C07C** *65/04, 149/20*
U.S. Cl. 560—15 **10 Claims**

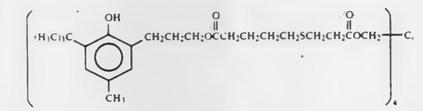
1. A phenol derivative having one of the following formulae:

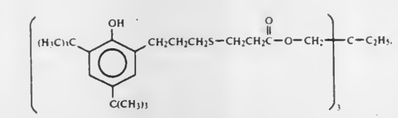




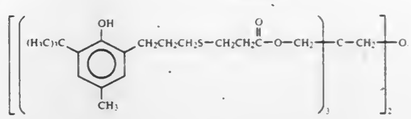


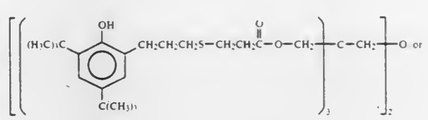


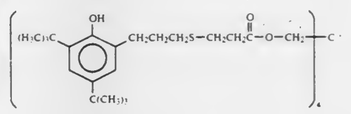




-continued







4,633,009

SYNTHESIS OF METHYL N-METHYLANTHRANILATE

David I. Lerner, Teaneck, N.J., assignor to Frizsche Dodge & Olcott Inc., New York, N.Y.

Filed Jun. 18, 1985, Ser. No. 745,894
Int. Cl.⁴ C07C *101/54*
U.S. Cl. 560—19 **2 Claims**

1. A process for the production of methyl N-methylanthranilate which comprises the reductive alkylation of methyl anthranilate with formaldehyde and hydrogen in the presence of a hydrogenation and a solid acid catalyst, the reductive alkylation reaction being carried out at a temperature in the range from about 0° C. to about 150° C. and under superatmospheric hydrogen pressure in a range from about 1 atmosphere to about 15 atmospheres.

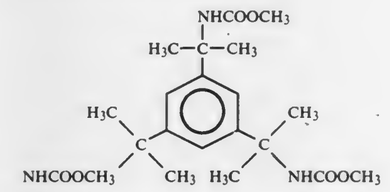
4,633,010

TERTIARY ARALKYL TRIURETHANE

Balwant Singh, and Peter S. Forgione, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,681
Int. Cl.⁴ C07C *125/077, 119/048*
U.S. Cl. 560—25 **1 Claim**

1. A compound of the formula:



4,633,011

PROCESS FOR THE PREPARATION OF (±)-3A-6,6,9A-TETRAMETHYLPERHYDRONAPHTO[2,1-B]FURAN

George H. Büchi, and Hans Wüest, both of Cambridge, Mass., assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 638,791, Aug. 8, 1984. This application Mar. 10, 1986, Ser. No. 838,089
Int. Cl.⁴ C07C *69/74*
U.S. Cl. 560—119 **2 Claims**

1. Methyl-2-allyloxy-3,4,4a,5,6,7,8,8a-octahydro-5,5,8a-trimethyl-1-trans-naphthalenecarboxylate.

2. Methyl 1-allyl-perhydro-5,5,8a-trimethyl-1-trans-naphthalenecarboxylate.

4,633,012

LIQUID CRYSTAL COMPOUND

Masaaki Taguchi; Takamasa Harada, both of Tokyo, and Hitoshi Suenaga, Hyogo, all of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo and Teikoku Chemical Industry Co., Ltd., Osaka, both of, Japan

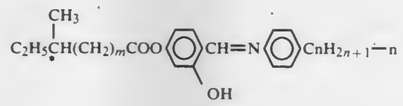
Filed Jun. 10, 1985, Ser. No. 743,094

Claims priority, application Japan, Jul. 3, 1984, 59-137492

Int. Cl.[4] C09K *3/34; G02F 1/13*

U.S. Cl. 560—138 **2 Claims**

1. A liquid crystal compound represented by the following general formula:



wherein m is a number from 0 to 10, n is a number from 5 to 14, and C having an asterisk indicates an asymmetric carbon atom.

4,633,013

PREPARATION OF α-HALOACETOACETIC ESTERS

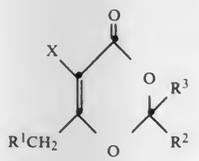
Robert J. Clemens, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,450

Int. Cl.[4] C07C *67/00, 67/333, 67/716, 67/732*

U.S. Cl. 560—174 **5 Claims**

1. A process for the preparation of an alkali metal salt of an α-haloacetoacetic ester comprising reacting an alkali metal alkoxide with a substituted 5-halo-4H-1,3-dioxin-4-one having the formula:



wherein R^1 is hydrogen, chloro, bromo, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 4 carbon atoms, phenyl, p-nitrophenyl or a heteromoiety selected from the group consisting of phenylthio and anilino; R^2 and R^3 are alkyl groups containing 1 to 6 carbon atoms, phenyl, p-nitrophenyl, o-chlorophenyl and collectively an alkylene group and X is a chloro or bromo group at a temperature of about −40° C. to about 50° C.

4,633,014

SUBSTITUTED 3-HYDRAZINOPROPIONATES

Gunar A. Bremanis, Jurmala; Ivars Y. Kalvinsh, Salaspils; Irene B. Antsena, Riga; Edmund Y. Lukevits, Riga; Maris M. Veveris, Riga; Valeryans Y. Kauss, Rizhsky raion Adazhi; Peter T. Trapentsier, and Edvards E. Liepinsh, both of Riga, all of U.S.S.R., assignors to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi Ssr

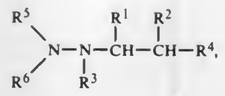
Filed Jul. 6, 1984, Ser. No. 628,240

Claims priority, application U.S.S.R., Jul. 13, 1983, 3620453

Int. Cl.[4] C07C *157/05, 157/07, 157/09, 153/057, 133/02, 127/15, 127/17, 127/19*

U.S. Cl. 562—556 **4 Claims**

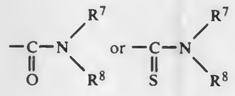
1. A substituted 3-hydrazinopropionate of the general formula



wherein

R^1 and R^2 are individually selected from the group consisting of H, C_1-C_4 alkyl and $COOCH_3$;

R^3 is



wherein

R^7 and R^8 are individually selected from the group consisting of H, C_1-C_4 alkyl, allyl and phenyl;

R^4 is —C≡N or —COR^{10} in which R^{10} is OR^{11} wherein R^{11} is selected from the group consisting of H, C_1-C_8 alkyl and alkali metal, or $NR^{12}R^{13}$ wherein R^{12} and R^{13} are individually selected from the group consisting of H and C_1-C_4 alkyl; and

R^5 and R^6 are individually C_1-C_4 alkyl.

4,633,015

PRODUCTION OF ADIPIC ACID FROM 1,4-DISUBSTITUTED-2-BUTENE

Albert S. C. Chan, St. Charles, and Donald E. Morris, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 9, 1984, Ser. No. 669,910

Int. Cl.[4] C07C *27/02, 51/09, 55/14*

U.S. Cl. 562—590 **19 Claims**

1. A process for the production of adipic acid from 1,4-dialkoxy-2-butene comprising carbonylating a solution of 1,4-dialkoxy-2-butene in an aprotic polar non-basic solvent selected from the group consisting of nitriles, 1,4-dimethoxy-2-butene, methylene chloride and bis(2-methoxyethyl)ether at 80°–140° C. in the presence of a catalyst selected from the group consisting of palladium halides and nickel halides thereby forming dialkyl hex-3-enedioate and hydrogenating the said dialkyl hex-3-enedioate to form alkyl adipate, and subsequently hydrolyzing the dialkyl adipate to adipic acid.

4,633,016

DIPHENYLAMINE AGE RESISTERS FOR RUBBER

Hans-Josef Buysch, Krefeld; Josef Witt, Cologne, and Zsolt Szentivanyi, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

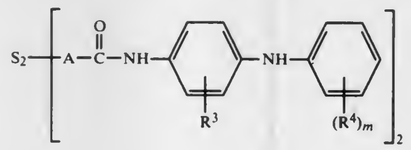
Filed Aug. 6, 1985, Ser. No. 762,850

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430510

Int. Cl.[4] C07C *149/41, 149/437, 149/42*

U.S. Cl. 564—154 **3 Claims**

1. A compound corresponding to the general formula

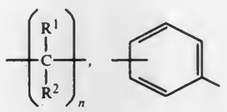


wherein

R^3 represents H or CH_3,

R^4 represents $C_{7\text{-}20}$ aralkyl,

A represents a two-bonded group having one of the following structures:



R^1 and R^2 represent H or $C_{1\text{-}4}$ alkyl,

m represents 1 or 2 and

n represents an integer from 1 to 12.

4,633,017

N-HYDROXY PROTECTING GROUPS AND PROCESS FOR THE PREPARATION OF 3-ACYLAMINO-1-HYDROXY-2-AZETIDINONES

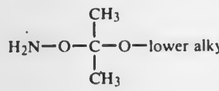
Richard H. Mueller, Lawrenceville, N.J.; Jakob-Matthias Drossard, Regensburg, and Peter H. Ermann, Donaustauf, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 637,260, Aug. 3, 1984, Pat. No. 4,581,170. This application Oct. 24, 1985, Ser. No. 791,008

Int. Cl.[4] C07C *83/00*

U.S. Cl. 564—301 **2 Claims**

1. A compound having the formula



4,633,018

PROCESS FOR SEPARATING ISOMERS OF TOLUENEDIAMINE

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1985, Ser. No. 811,623

Int. Cl.[4] C07C *85/26*

U.S. Cl. 564—424 **13 Claims**

1. A process for separating a feed mixture comprising 2,4 toluenediamine and 2,6-toluenediamine, said process comprising contacting said mixture at adsorption conditions with an adsorbent comprising an X type zeolite, cation exchanged with a cation from the group Ni, Ca, Ba, K and Na, a Y type zeolite exchanged with a cation from the group Ca and Ni cations or an L type zeolite exchanged with a K cation, thereby selectively adsorbing one of said toluene diamine isomers, removing the remainder of said mixture from said adsorbent, and then recovering said adsorbed toluene diamine isomer by desorption at desorption conditions with a desorbent material comprising a lower alcohol or an amine.

4,633,019

α-AMINOALKYLSULFUR COMPOSITIONS

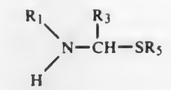
Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves, and Bernardus A. O. Alink, St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 301,620, Sep. 14, 1981, abandoned. This application May 18, 1984, Ser. No. 611,579

Int. Cl.[4] C07C *149/24*

U.S. Cl. 564—501 **4 Claims**

1. A compound of the formula



where R_1 is an alkyl, cycloalkyl or hydroxyalkyl group of 1 to 18 carbon atoms, R_3 is an alkyl group of 1 to 4 carbon atoms and R_5 is an alkyl group of 1 to 18 carbon atoms.

4,633,020

PERFLUORO-KETO-YLIDS AS PRECURSORS OF POLYCHLOROKETONES, 1,2-DIKETONES AND QUINOXALINES

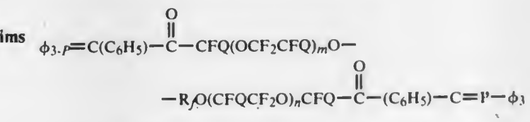
Keith B. Baucom, Gainesville, Fla., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 497,006, May 23, 1983, Pat. No. 4,546,184. This application Oct. 2, 1985, Ser. No. 783,178

Int. Cl.[4] C07F *9/50*

U.S. Cl. 568—13 **1 Claim**

1. A keto-ylid having the general formula:



wherein Rf is $(CF_2OCF_2)_z$ where z is 1 to 20; Q is F or CF_3; and m and n are independently selected from 0–18.

4,633,021

OLEFIN HYDROFORMYLATION

Ronnie M. Hanes, Milford, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,871

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **29 Claims**

1. In a process for the hydroformylation of olefins for the preparation of aldehydes, by reacting carbon monoxide and hydrogen with an olefin, in the presence of an ionic metal complex catalyst where the ionic charge is on either the metal or on a ligand, at a temperature in the range of between about 80° and about 300° C. and a pressure in the range of between about 400 and about 2000 psig, the improvement comprising performing the reaction in a polar solvent selected from the group consisting of N-substituted amides, glycols, polyglycols, mono lower alkyl ethers of glycols, dimethyl sulfoxide and sulfolane and recovering the aldehyde by extraction with a hydrocarbon solvent.

4,633,022

PROCESS FOR PREPARATION OF TRISUBSTITUTED PHENOLS

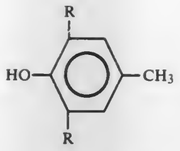
Nicholas P. Greco, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 16, 1985, Ser. No. 776,398

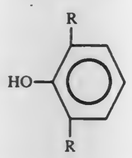
Int. Cl.[4] C07C *37/50, 39/06, 41/01, 43/205*

U.S. Cl. 568—660 **14 Claims**

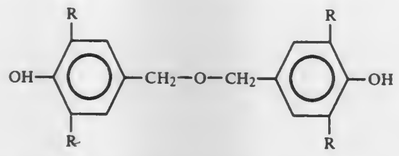
10. A process for the preparation of trisubstituted phenols of the formula:



wherein the R groups are the same or different and are selected from 1 to 12 carbon alkyl, which comprises reacting a 2,6-dialkyl substituted phenol of the formula:



wherein the R groups are as previously defined, with formaldehyde in the presence of an inert gas, a solvent consisting essentially of methyl alcohol, and a tertiary amine catalyst wherein the phenol and formaldehyde are present in substantially equimolar proportions and the tertiary amine is present in a catalytic amount, to form a bis ether of the formula:



wherein the R groups are as previously defined, and subjecting said bis ether to hydrogenolysis in the presence of a hydrogenolysis catalyst, an amine over hydrogenolysis inhibitor and a solvent at a temperature between about 100° C. and about 130° C. at a pressure between about 5 psi and about 500 psi of hydrogen for a time sufficient to prepare said trisubstituted phenol.

4,633,023

FLUOROACRYLATE ESTER, POLYMER THEREOF, AND PROCESS OF MAKING THE SAME

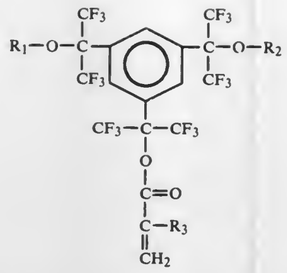
James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to Geo-Centers, Inc., Newton Upper Falls, Mass.

Division of Ser. No. 705,880, Feb. 26, 1985, Pat. No. 4,578,508. This application Jan. 2, 1986, Ser. No. 815,561

Int. Cl.⁴ C07C *43/20, 41/00, 43/02*

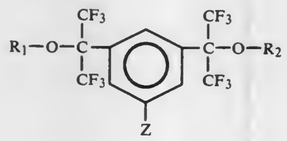
U.S. Cl. 568—662 **4 Claims**

1. A compound comprising a first intermediate for making a fluoroacrylate ester of the formula:



(IV)

wherein R_1 and R_2 are independently selected from the group consisting of saturated aliphatic hydrocarbons having from 1 to about 3 carbon atoms and R_3 is selected from the group consisting of hydrogen and methyl, said first intermediate having the formula:



(I)

wherein Z is selected from the group consisting of lithium and MgX, where Mg is magnesium and X is a halogen.

4,633,024

PROCESS FOR PRODUCING AROMATIC HYDROXY COMPOUND

Ryuzo Ueno, Nishinomiya; Kazuyuki Sakota, Kobe; Yoshiyuki Naito, Shiga, and Mitsuyuki Kishimoto, Yokkaichi, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 487,459, Apr. 22, 1983, abandoned. This application May 1, 1985, Ser. No. 728,453

Claims priority, application Japan, Apr. 23, 1982, 57-67209

Int. Cl.⁴ C07C *37/04*

U.S. Cl. 568—738 **7 Claims**

1. In a process for producing an aromatic hydroxy compound which comprises reacting an alkali metal salt of a corresponding aromatic sulfonic acid with an alkali metal hydroxide in a reaction medium, the improvement which comprises using as the reaction medium at least one member selected from the group consisting of diarylalkanes, complete and partial hydrogenation products of diarylalkanes, triaryls, complete and partial hydrogenation products of triaryls, triarylalkanes, and complete and partial hydrogenation products of triarylalkanes, wherein the aromatic ring structure of said aromatic sulfonic acid is a naphthalene or diphenyl ring.

4,633,025

METHOD FOR PREPARING (+)R-2-METHYL-HEXANE-1,2-DIOL

Paul F. Corey, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

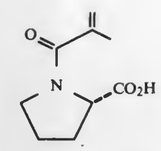
Continuation-in-part of Ser. No. 723,576, Apr. 15, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 817,068

Int. Cl.⁴ C07C *29/00, 31/20*

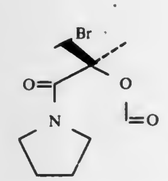
U.S. Cl. 568—866 **6 Claims**

1. A method for preparing (+)R-2-methyl-hexane-1,2-diol comprising:

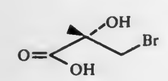
(a) reacting methacryloyl chloride with L-proline in the presence of a base forming an amide of the formula:



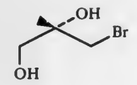
(b) reacting said amide with N-bromo-succinimide in an aprotic polar solvent forming a bromolactone of the formula:



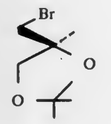
(c) hydrolyzing said bromolactone with aqueous hydrobromic acid forming a bromo-acid of the formula:



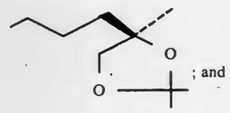
(d) reducing said bromo-acid with a mixture of borane-tetrahydrofuran forming a bromodiol of the formula:



(e) treating said bromodiol with dimethoxy-propane and toluenesulfonic acid forming an acetonide of the formula:



(f) reacting said acetonide with dipropyl cuprate forming an alkylation product of the formula:



; and

(g) reacting said alkylation product with acidic, aqueous tetrahydrofuran to effect formation of (+)R-2-methyl-hexane-1,2-diol.

4,633,026

PROCESS FOR PREPARING RING-HALOGENATED VINYL AROMATIC MONOMERS

Charles H. Kolich, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

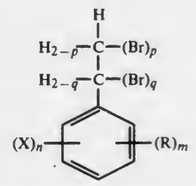
Continuation-in-part of Ser. No. 468,061, Feb. 22, 1983, abandoned. This application Oct. 1, 1984, Ser. No. 656,432

Int. Cl.⁴ C07C *17/34*

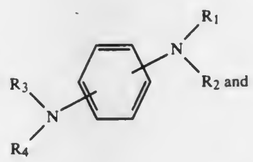
U.S. Cl. 570—200 **20 Claims**

1. A process for preparing ring-halogenated vinyl aromatic monomers comprising:

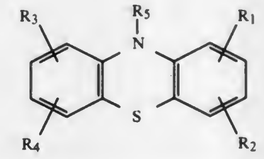
(a) reacting in the presence of air a ring-halogenated bromoethyl aromatic compound having the following structure:



wherein p is 0 or 1, q is 0 or 1, and p+q=1; n is an integer from 1-5, m is 0, 1 or 2, and m+n=5; is halogen; and, R is a $C_{1\text{-}12}$ alkyl group, with a strong aqueous alkali base in the presence of a poly(ethylene glycol) catalyst and an amine polymerization inhibitor selected from the group consisting of the structure:



and



wherein R_1, R_2, R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen and C_1 to C_{10} alkyl;

(b) separating the aqueous and organic phases; and

(c) recovering said ring-halogenated vinyl aromatic monomer from said organic phase.

4,633,027

PROCESS FOR CONVERTING OLEFINS TO GASOLINE, DISTILLATE AND ALKYLATE LIQUID HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,373

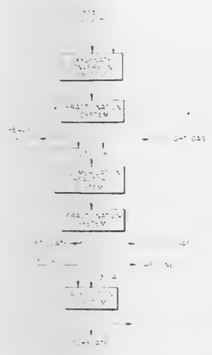
Int. Cl.⁴ C07C *2/00*

U.S. Cl. 585—314 **4 Claims**

1. A continuous catalytic process for converting olefinic feedstock comprising ethylene and C_3+ olefins to heavier liquid hydrocarbon product comprising the steps of

prefractionating the olefinic feedstock to obtain a gaseous stream rich in ethylene and an olefinic stream containing C_3+ olefin;

contacting a major portion of the C_3+ stream from the prefractionating step with shape selective medium pore zeolite oligomerization catalyst in a distillate mode catalytic reactor zone at elevated temperature and pressure to provide a heavier hydrocarbon effluent stream comprising distillate, gasoline and lighter hydrocarbons;



fractionating the effluent stream to recover distillate, gasoline and C_3–C_4 hydrocarbon stream containing isobutane;

further reacting isobutane from the C_3–C_4 hydrocarbon stream with a second portion of C_3+ olefin from the prefractionating step in an alkylation reactor zone in the presence of acid alkylation catalyst to produce C_7+ alkylate.

4,633,028

PROCESS FOR CONVERTING OXYGENATES TO ALKYLATED LIQUID HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,367
Int. Cl.⁴ C07C *1/20, 2/00*
U.S. Cl. 585—331 **16 Claims**

1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature to convert at least a portion of the feedstock oxygenate predominantly to C_2–C_4 olefins and a minor fraction containing C_5+ hydrocarbons;

(b) cooling and separating effluent from step (a) to provide an aqueous liquid byproduct stream, a heavy hydrocarbon liquid stream and a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

(c) compressing at least a portion of the olefinic light hydrocarbon stream to condense a C_3+ liquid olefinic hydrocarbon stream rich in C_3–C_4 olefins and recovering an ethene-rich gaseous stream;

(d) contacting the light hydrocarbon vapor stream from step (c) with a liquid hydrocarbon sorbent stream in a sorption tower under conditions to selectively sorb the major amount of C_3+ hydrocarbon components from said light vapor stream to provide a C_3+ sorbate stream rich in C_3–C_4 olefins.

(e) fractionating C_3+ sorbate to provide C_5+ gasoline and a C_3–C_4 olefin stream;

(f) further reacting the C_3–C_4 olefin stream from step (e) with isoparaffin in a secondary alkylation stage with liquid phase acid catalyst to convert at least a portion of C_3–C_4 olefins to a heavier C_7+ liquid hydrocarbon product stream comprising alkylate gasoline;

(g) recycling ethene for further catalytic conversion in the primary catalytic stage; and

(h) recycling a portion of alkylate gasoline to step (d) for use as lean sorbent.



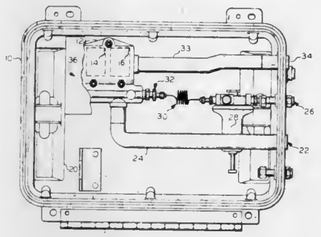
ELECTRICAL

4,633,029

APPARATUS AND METHOD FOR USE IN THERMOELECTRIC POWER GENERATION

George C. Tillett, Jr., and Gary V. Holland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 7, 1985, Ser. No. 699,287
Int. Cl.⁴ H01L *35/00*
U.S. Cl. 136—205 **18 Claims**



1. A thermoelectric generator apparatus comprising:

a hollow shell member having an interior surface and an exterior surface, said interior surface defining a cavity;

a hollow cartridge member disposed within said cavity, at least a portion of said cartridge member having an interior surface which defines a combustion chamber, said cartridge member also having an exterior surface and first and second radially extending generally annular flanges, each flange being in contact with said shell member interior surface around at least a portion of its circumference so as to define a generally annular space between said flanges and between said shell member interior surface and said cartridge member exterior surface;

a means for introducing a mixture of fuel and oxidant gas into said combustion chamber;

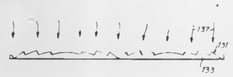
at least one thermoelectric element in direct thermal contact with the exterior surface of said shell member such that substantially no air spaces exist between said shall member exterior surface and said at least one thermoelectric element, said at least one thermoelectric element being adapted for generating electrical energy when receiving heat from said shell member.

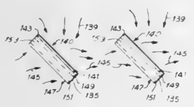
4,633,030

PHOTOVOLTAIC CELLS ON LATTICE-MISMATCHED CRYSTAL SUBSTRATES

Melvin S. Cook; Saddle River, N.J., assignor to Holobeam, Inc., Ridgewood, N.J.

Filed Aug. 5, 1985, Ser. No. 762,200
Int. Cl.⁴ H01L *31/06, 25/02, 27/14*
U.S. Cl. 136—246 **32 Claims**





22. An array of monolithic multijunction photovoltaic cells comprising a plurality of monolithic multijunction photovoltaic cells each of which has first and second faces and each of which has first and second component photovoltaic cells responsive to a respective one of first and second ranges of radiation wavelengths; and means for dividing incident radiation into first radiation with wavelengths in the first range of radiation wavelengths and second radiation with wavelengths in the second range of radiation wavelengths, directing the first radiation to the first faces, and directing the second radiation to the second faces.

27. The array of claim 22 wherein each of said monolithic multijunction photovoltaic cells comprises a crystal substrate composed of material having a structure belonging to the cubic crystal system, said crystal substrate having on one surface thereof an ordered plurality of curved-surface regions, and wherein said first and second component photovoltaic cells each incorporate crystal material having a structure belonging to the cubic crystal system, the crystal material which at least one of said first and second component photovoltaic cells incorporates having a lattice constant different from the lattice constant of the material of which said crystal substrate is composed, and further including a layer of crystal material having a structure belonging to the cubic crystal system disposed between said one crystal substrate surface and said at least one of said first and second component photovoltaic cells, said crystal material of which layer is composed having a lattice constant which is graded in magnitude from an initial compatible value on the side of said layer which is proximate to said one crystal substrate surface to a final compatible value on the side of said layer which is proximate to said at least one of said first and second component photovoltaic cells.

4,633,031

MULTI-LAYER THIN FILM, FLEXIBLE SILICON ALLOY PHOTOVOLTAIC CELL

William J. Todorof, 20442 Sun Valley Dr., Laguna Beach, Calif. 92651

Continuation-in-part of Ser. No. 422,944, Sep. 24, 1982, Pat. No. 4,479,027, and a continuation-in-part of Ser. No. 621,249, Jun. 15, 1984. This application Oct. 22, 1984, Ser. No. 663,313
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.⁴ H01L *31/06*
U.S. Cl. 136—249 **16 Claims**



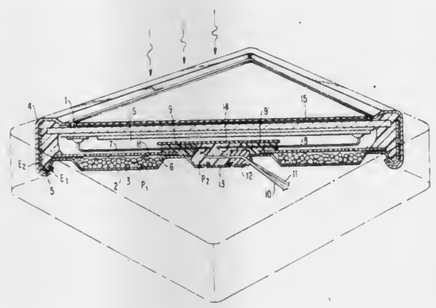
1. A multiple junction photovoltaic cell comprising a front and a rear cell, said cells being formed of ceramic metallic glass alloys of silicon having different band gaps and being positioned one in front of the other with a thin optically transparent lattice matching layer optically and electrically coupling them in series, and with electrical contact members on the front of the front cell and on the rear of the rear cell for operating the two cells in series, one of said cells has a band gap in the range of 1.35 to 1.65 electron volts and the other has a band gap in the range from 0.9 to 1.35 electron volts.

4,633,032

PACKAGE CONFIGURATION OF SOLAR CELL ELEMENTS

Hikofumi Oido, Katano; Yoshitake Hayashi, Kawachinagano, and Minoru Yamamoto, Saijyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 13, 1985, Ser. No. 701,192
Claims priority, application Japan, Feb. 15, 1984, 59-26310
Int. Cl.⁴ H01L *31/00*
U.S. Cl. 136—251 **16 Claims**



1. A package configuration of a solar cell, comprising in combination:
- a glass substrate having a first surface adapted to be exposed to incoming sunlight;
- a solar cell element formed on a second surface opposite said first surface;
- a backplate in spaced opposed relationship to said second surface and defining an empty space between said backplate and said second surface of said glass substrate;
- a frame connecting said glass substrate and said backplate at the peripheral portions thereof;
- a sealing resin layer sealed around the inside of said frame and sealed between the peripheral portions of said backplate and said glass substrate and extending around the periphery of said empty space for isolating said empty space from the surrounding atmosphere;
- a layer of desiccant disposed on said backplate and having a surface exposed to said empty space for adsorbing moisture which may penetrate said package configuration and enter said empty space; and
- electrically conductive wires connected to said solar cell element and extending to the outside of said solar cell for outputting electric energy generated by said solar cell element.

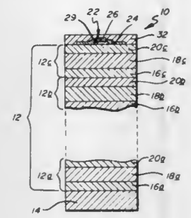
4,633,033

PHOTOVOLTAIC DEVICE AND METHOD

Prem Nath, Rochester; Timothy J. Barnard, Lake Orion, and Dominic Crea, Mt. Clemens, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 8, 1985, Ser. No. 699,523
Int. Cl.⁴ H01L *31/06, 31/18*
U.S. Cl. 136—256 **35 Claims**

1. A photovoltaic device comprising:
- a substrate;
- a semiconductor body having opposed first and second surfaces, said second surface disposed on said substrate;
- current collention means disposed in superposed relationship with the first surface of said semiconductor body, for collecting and carrying current generated by the photovoltaic device;
- a layer of low electrical condutivity current flow restricting material having a sheet resistance of at least 300 ohms/-square disposed beneath at least a portion of said current collection means for restricting the flow of electrical current between at least a portion of said current collention means and the underlying portions of said semiconductor body, those portions of the semiconductor body not having said current collection means superposed thereupon being substantially free of said low conductivity material; and,



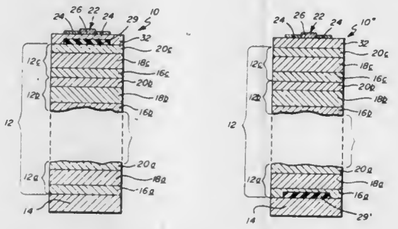
- a transparent, electrically conductive layer overlying and in electrical contact with at least a portion of the first surface of said semiconductor body and-said current collection means.

4,633,034

PHOTOVOLTAIC DEVICE AND METHOD

Prem Nath, Rochester; Timothy J. Barnard, Lake Orion, and Dominic Crea, Mt. Clemens, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 8, 1985, Ser. No. 699,524
Int. Cl.⁴ H01L *31/06, 31/18*
U.S. Cl. 136—256 **27 Claims**



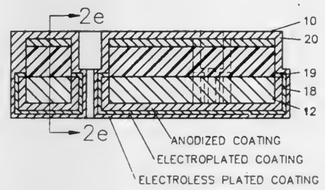
1. In a semiconductor device including: a substrate; a semicond-uctor body having a first surface thereof disposed on said substrate; a layer of transparent, electrically conductive material overlying, and in electrical conductive material overlying, and in electrical contact with, at least a portion of the second surface of the semiconductor body; and, current collection means disposed atop said layer of transparent, conductive material, and comprised of a bus-grid structure including a plurality of grid fingers for collecting current from the transparent conductive layer, and a bus bar structure in electrical communication with said grid fingers for carrying the current collected thereby; the improvement comprising:
- a pattern of electrical current flow restricting material disposed between the transparent conductive layer and the substrate, said pattern corresponding to, and disposed beneath, substantially all of the bus bar structure of the superjacent current collection means, whereby the flow of electrical current between said bus bar structure and regions of the substrate disposed therebeneath is substantially eliminated.

4,633,035

MICROWAVE CIRCUIT BOARDS

Rodger P. McMonagle, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 397,546, Jul. 12, 1982, Pat. No. 4,525,247.
This application Nov. 9, 1984, Ser. No. 669,995
Int. Cl.⁴ H05K *1/03*
U.S. Cl. 174—68.5 **11 Claims**



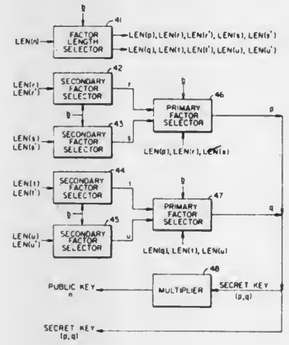
1. A circuit board structure comprising:
- a laminate of dielectric material sandwiched between a first relatively thick layer of aluminum and a second relatively thin layer of copper;
- at least one through-hole in the laminate;
- a coating of conductive metal electroplated on all outer or exposed surfaces of said aluminum, said outer or exposed surfaces of said aluminum being anodized prior to electrodeposition of the conductive metal; and
- a coating of conductive electroless deposited metal on all outer or exposed surfaces of the relatively thin copper layer, the electroplated aluminum and the dielectric material, including any portions thereof defining the walls of the through-holes.

4,633,036

METHOD AND APPARATUS FOR USE IN PUBLIC-KEY DATA ENCRYPTION SYSTEM

Martin E. Hellman, 730 Alvarado Ct., Stanford, Calif. 94305, and Carl E. Bach, Albany, Calif., assignors to Martin E. Hellman, Stanford, Calif.

Filed May 31, 1984, Ser. No. 615,634
Int. Cl.⁴ H04L *9/00*
U.S. Cl. 178—22.11 **24 Claims**



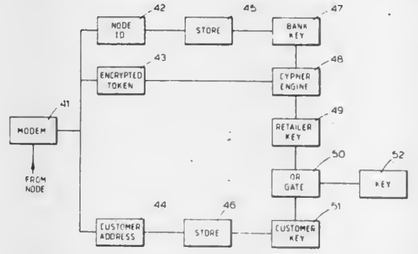
14. For use in connection with an apparatus employing a public key n and a secret key comprising primary factors p and q where $n=pq$ wherein said public key is a digital signal used for authenticating, enciphering, or authenticating and enciphering data and the secret key is used for signing, deciphering, or signing and deciphering the data, a method for generating said secret key and said public key such that recovery of said secret key from said public key is computationally infeasible, said method comprising:
- establishing a length of said public key based on a desired security level;
- establishing lengths of p-related secondary factors and p-related tertiary factors, q-related secondary factors and q-related tertiary factors which factors are functions of said secret key p and q;
- choosing a tentative p value as one of said primary factors;
- choosing a tentative q value as one of said primary factors;
- testing said tentative p value for suitability as a part of said secret key based on two p-related secondary factors and two p-related tertiary factors, each one of said p-related tertiary factors and said p-related secondary factors being functions of said tentative p value;
- testing said tentative q value for suitability as a part of secret key based on two q-related secondary factors and two q-related tertiary factors, each one of said q-related tertiary factors and said q-related secondary factors being functions of said tentative q value; and
- presenting said public key and said secret key as digital electronic signals to an output utilization means.

4,633,037

GENERATION OF IDENTIFICATION KEYS

Stephen C. Serpell, Ipswich, England, assignor to British Telecommunications public limited company, London, England

Filed Feb. 21, 1984, Ser. No. 581,898
Claims priority, application United Kingdom, Feb. 22, 1983, 8304876; Feb. 22, 1983, 8304877
Int. Cl.⁴ H04L *9/00*
U.S. Cl. 178—22.14 **14 Claims**



1. A method for automatically establishing a transaction key at predetermined first and second stations in a system having a multitude of similar first and second stations joined by means of a telecommunication link and including but a single intermediate or nodal data processing station connected between said predetermined first and second stations, without revealing said transaction key at said nodal station, said method comprising the steps of:

(a) at the predetermined first station
- (i) combining first data available at both said predetermined first and second stations with second data available at the first station and the nodal station, to generate the transaction key for use in encrypting further data to be transmitted to said second station,
- (ii) transmitting to the nodal station third data identifying the first station, the second station and the address of the first data at the predetermined second station;

(b) at the nodal station
- (i) accessing nodal storage means using the identity of the predetermined first station as an address to retrieve

pre-stored data corresponding to said second data used in step (a) (i),

(ii) accessing nodal storage means using the identity of the predetermined second station as address to retrieve an encryption key characteristic of said second station,

(iii) producing an encrypted label by encrypting the pre-stored data retrieved in step (b) (i) with the encryption key retrieved in step (b) (ii),

(iv) transmitting to the second station the identity of said nodal station;

(c) at the predetermined second station

(i) accessing storage means located at the second station using the identity of the nodal station as address to retrieve an encryption key characteristic of the predetermined second station,

(ii) decrypting the label with the key retrieved in step (c) (i),

(iii) accessing storage means located at the second location using the address of the first data transmitted from the first station,

(iv) combining the data retrieved in step (c) (iii) with the decrypt from step (c) (ii) in a replication of step (a) (i) to generate said transaction key at said second station;

wherein, in a correct operation of the sequence, the data retrieved in step (c) (iii) is the same as the first data used in step (a) (i), and the decrypt obtained in step (c) (ii) is the same as the second data used in step (a) (i),

whereby the transaction key produced in step (c) (iv) is the same as the transaction key produced in step (a) (i).

4,633,038

SUPPLY CIRCUIT FOR A VARIABLE LOAD, PARTICULARLY FOR A LINE CIRCUIT IN TELEPHONE SYSTEMS

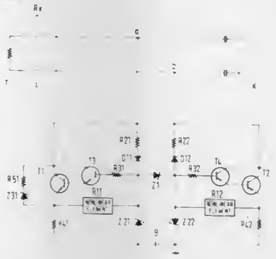
Jürgen Zanzig, Weil der Stadt, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,649

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237681

Int. Cl.[4] H04M *1/76, 19/00*

U.S. Cl. 379—400 **6 Claims**



1. A transistor feed circuit including transistors each having an emitter, a collector and a base, for a variable load and with differently acting output resistance, particularly for a subscriber line in telephone systems, comprising:

a first terminal of a supply-voltage source connected via a series combination of the collector-emitter path of a first transistor and a first emitter resistor to a first terminal of a load resistor and to a first wire of said subscriber line connected to a telephone subscriber; a second terminal of said supply-voltage source connected via a series combination of the emitter-collector path of a second transistor and a second emitter resistor to a second terminal of said load resistor and to a second wire of said subscriber line, wherein the bases of said two transistors are interconnected via a series combination of the base-emitter path of a third transistor, a fourth resistor, a first zener diode, a fifth resistor, and the base-emitter path of a fourth transistor, wherein the collectors of said first and third transistors are electrically interconnected, wherein the collectors of said second and fourth transistors are interconnected, and wherein a junction of said fourth resistor and said first zener diode is coupled to said first terminal of said supply-voltage source through a sixth resistor, and a junction of said fifth resistor and said first zener diode to a second terminal of said supply-voltage source through a seventh resistor, such that a series combination of an eighth resistor and a second diode is inserted between said first terminal of said load resistor a junction of the fourth resistor and the first zener diode that a series combination of a ninth resistor and a third diode is inserted between the second terminal of the load resistor and a junction of the fifth resistor and the first zener diode, and that the sixth resistor and the sixth resistor are designed as nonlinear elements having a linearly rising current-voltage characteristic in the low-voltage range and a constant current-voltage characteristic in the higher-voltage range.

4,633,039

MASTER-SLAVE MICROPROCESSOR CONTROL CIRCUIT

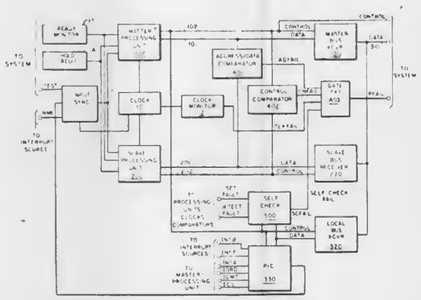
James R. Holden, Chicago, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

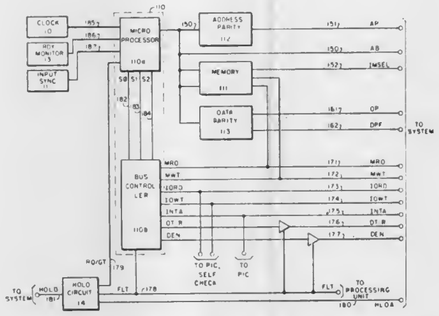
Continuation of Ser. No. 220,935, Dec. 29, 1980, abandoned.

This application Apr. 11, 1984, Ser. No. 599,122

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 379—32 **15 Claims**





1. A processor control circuit for use in a telephone switching system, said telephone switching system being operative to provide external address data and control signals and an interrupt signal, said processor control circuit comprising:

first processing means operated to generate a first group of internal address, data and control signals;

second processing means operated in sychronism with said first processing means to generate a second group of internal address, data and control signals; and

comparison means connected to said first and second processing means, operated in response to miscomparison between said first and second groups of internal address, data and control signals to generate a processor failure signal;

said first and second processing means operated in a master-slave arrangement, wherein only said first group of internal address, data control signals is applied to said telephone switching system, and wherein said first and second processing means are both operated to receive said external address, data and control signals;

whereby said second processing means is operated as a receive-only processing means with respect to said telephone switching system;

a master bus transceiver connected to said first processing means;

a slave bus transceiver connected to said second processing means;

a system data bus connected to said master and slave bus transceivers;

said master bus transceiver operated in response to a first predetermined pattern of said first group of internal address and control signals to transfer said first group of internal data signals to said system data bus;

a local bus transceiver connected to said system data bus and said first processing means; and

an input-output device connected to said local bus transceiver and said first processing means;

said local bus transceiver operated in response to a second predetermined pattern of said first group of internal address and control signals to transfer data from said system data bus to said local bus transceiver;

said input-output device operated in response to a third predetermined pattern of said first group of internal address and control signals to transfer data from said local bus transceiver to said input-output device;

said input-output device further operated in response to a fourth predetermined pattern of said first group of internal address and control signals to transfer data to said local bus transceiver;

said local bus transceiver operated in response to a fifth predetermined pattern of said first group of internal address and control signals to transfer data from said input-output device to said system data bus;

said master bus transceiver operated in response to a sixth predetermined pattern of said first group of internal address and control signals to transfer data from said system data bus to said first processing means;

said slave bus transceiver operated in response to a first predetermined pattern of said second group of internal address and control signals to transfer data from said system data bus to said second processing means;

said input-output device comprising:

a programmable interrupt controller connected to said telephone switching system and said first processing means, operated in response to said data from said local bus transceiver to arrange an interrupt recognition sequence; said programmable interrupt controller further operated in response to said interrupt signal to generate an interrupt received signal; said first processing unit further operated in response to said interrupt received signal to generate an interrupt acknowledge signal; said programmable interrupt controller further operated in response to said interrupt acknowledge signal and said fourth pattern of said first group of internal address and control signals to transfer interrupt identification data to said local bus transceiver.

4,633,040

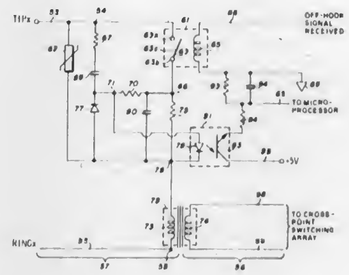
PERSONAL BRANCH EXCHANGE SYSTEM

Austin H. Lesea, San Jose, Calif., assignor to Candela Electronics, Inc., Sunnyvale, Calif.

Filed Oct. 25, 1984, Ser. No. 664,774

Int. Cl.[4] H04M *3/02, 3/22*

U.S. Cl. 379—253 **13 Claims**



6. In a personal branch exchange (PBX) system, improved interface circuitry to couple a pair of extension lines in the PBX system to a system control unit for the PBX system, comprising:

(a) means to transmit ringing signals through a light-emitting diode;

(b) means electromagnetically coupled to the light-emitting diode to permit conduction of ringing current to the pair of extension lines only in response to emissions from the light-emitting diode; and

(c) audio signal transmission means separately coupled to the pair of extension lines for transmitting externally initiated voice-modulated dc audio signals therethrough in the absence of ringing signals.

4,633,041

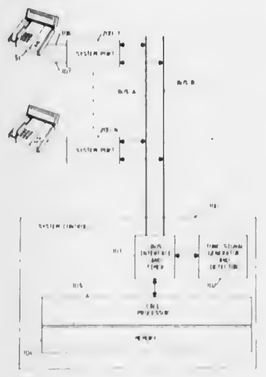
STATION SET DIRECTORY ASSISTANCE ARRANGEMENT

Richard H. Bolvie, Middletown; Alexander Feiner, Rumson; Michele S. Rabinowitz, Middletown; Rickens T. Szeto, Eatontown, and Barry J. Weinbaum, Ocean, all of N.J., assignors to AT&T Information Systems Inc., Middletown, N.J.

Filed Apr. 9, 1984, Ser. No. 598,497

Int. Cl.[4] H04M *1/276, 1/56, 3/50*

U.S. Cl. 379—354 **18 Claims**



1. An arrangement for providing directory information at a telephone station set having a plurality of keypad buttons operative for causing the generation of respective keypad signals, each of said signals corresponding to an individual character, said arrangement comprising,

a stored directory for storing a plurality of records, each of said records including an information field and a string of characters,

means responsive to receipt of each signal of a sequence of said keypad button signals for forming a sequence of characters comprising the character corresponding to the received signal and the characters respectively corresponding to each previously received signal, and

means responsive to each said sequence of characters for transferring to said station set the information field of one of said records having a string of characters matching said each sequence of characters.

4,633,042

ELECTRONIC MICRO-CONTROLLER CONVERSION MODULE FOR STEP BY STEP SWITCHING APPARATUS

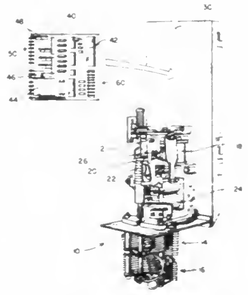
Gary C. Fields, and Mark E. Stamos, both of Oakland, Calif., assignors to Electrotel, Inc., Ballinger, Tex.

Filed Jul. 26, 1984, Ser. No. 634,696

Int. Cl.[4] H04Q *3/02*

U.S. Cl. 379—284 **14 Claims**





9. A method for electronic digital control of a step by step switch assembly characterized by a two-motion step by step switch responsive to at least two consecutive trains of stepping pulses, including a wiper shaft supporting at least one wiper contact and mechanically biased to return to and remain at an index position, a lineal motion generating magnet for stepping said wiper shaft in a forward linear direction among lineal contact row positions of spaced apart contact rows during a first operation wherein a contact row position level reached by the wiper is in accordance with the number of stepping pulses in the first of said trains, a rotary motion generating magnet for stepping said wiper shaft during a second operation in a rotary direction among available spaced apart positions of contacts of the row selectted during said first operation until a selected contact is reached by the wiper in accordance with the number of pulses of the second of said trains, and a release magnet for returning said shaft to said index position during a third operation of said switch, said method comprising the steps of:

receiving control signals including said trains,

actuating said lineal motion generating magnet, said rotary motion generating magnet and said release magnet by selectively passing control currents therethrough by electronic switch means, and

operating a digital microcontroller in accordance with a control program so that said microcontroller receives and processes said pulse trains and commands said electronic switch means to operate said magnets in response to precise control pulses generated in response to said pulse trains and in accordance with said program.

4,633,043

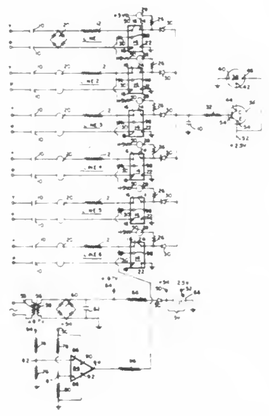
APPARATUS FOR USE WITH KEY TELEPHONE SYSTEMS

Robert L. Yount, Zephyrhills, Fla., assignor to GTE Service Corporation, Stamford, Conn.

Filed Feb. 14, 1986, Ser. No. 829,585

Int. Cl.[4] H04Q *5/18*

U.S. Cl. 379—33 **7 Claims**



1. For use with a key telephone system disposed at a location remote from a telephone central office, said system being connected to said office by at least one telephone line, said office transmitting an alternating ringing voltage along said line to said system when an incoming call to the system is to be placed on said line, said system normally being actuated by electrical power supplied thereto from a first source disposed at said location and being deactuated when said power is not so supplied, said system, in the presence of the ringing voltage, providing a visual signal and an audible alarm when actuated and producing neither said signal nor said alarm when deactuated:

apparatus disposed at said location and associated with said system to produce a substitute signal and a substitute alarm in the presence of the ringing voltage when the system is deactuated, said apparatus comprising:

an electrically powered lamp for displaying said substitute signal when a first voltage is applied thereto;

an electrically powered device for sounding said substitute alarm when a second voltage is supplied thereto;

a second source; and

means coupled to said first and second sources, said line, said lamp and said device, said means, when the system is deactuated in the presence of the ringing voltage, producing the first and second voltages and applying same to said lamp and device respectively to cause said substitute signal to be displayed and said substitute alarm to be sounded.

4,633,044

TELEPHONE HANDSET COMPRISING AN ADAPTER RESILIENTLY FIXED FOR A TRANSMITTER OR A RECEIVER TO A HOUSING THEREFOR

Suemitsu Nakajima, Kawasaki, Japan, assignor to Nitsuko, Ltd., Kawasaki, Japan

Filed Dec. 17, 1984, Ser. No. 682,279

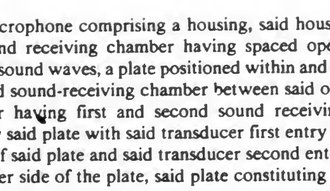
Claims priority, application Japan, Jan. 12, 1984, 59-1739[U]; Jan. 12, 1984, 59-1740[U]

Int. Cl.[4] H04M *1/03, 1/04*

U.S. Cl. 379—433 **6 Claims**

1. In a telephone handset comprising a housing having a pair of side walls and a pair of longitudinal ends for housing a transmitter and a receiver adjacent said longitudinal ends, respectively, and a cup-shaped adapter for receiving each of said transmitter and said receiver in contact therewith, said adapter having a peripheral wall around a center axis, the improvement wherein:

said housing comprises a boss supporting member at one of said longitudinal ends and a pair of pin supporting members adjacent the respective side walls and spaced from said boss supporting member so as to receive one of the adapters for said tranmitter and said receiver between said boss supporting member and said pin supporting members, each pin supporting member having a hole formed therethrough;



said one of the adapters comprising a boss extended from said peripheral wall away from said center axis and further comprising a pair of arms which extend from said peripheral wall in the opposite direction from said boss on both sides of a central line passing through said boss and said center axis, each arm comprising a pin near a free end thereof, the pins of the respective arms being directed away from each other, said boss being supported by said boss supporting member, and said arms being interposed between said pin supporting members with said pins being received in said holes of the respective pin supporting members.

4,633,045

DIFFERENTIAL MICROPHONE

Bruce Bartlett, Elkhart, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Feb. 13, 1985, Ser. No. 701,386

Int. Cl.[4] H04R *1/34*

U.S. Cl. 381—155 **3 Claims**



1. A microphone comprising a housing, said housing defining a sound receiving chamber having spaced openings for receiving sound waves, a plate positioned within and extending across said sound-receiving chamber between said openings, a transducer having first and second sound receiving entries carried by said plate with said transducer first entry located at one side of said plate and said transducer second entry located at the other side of the plate, said plate constituting means for delaying sound waves from a microphone user entering one of said transducer entries.

4,633,046

ADAPTIVE ECHO CANCELLER

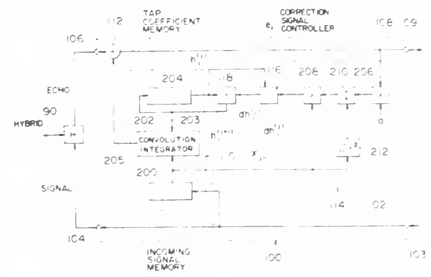
Seishi Kitayama, Tokyo; Tsutomu Washida, Saitama; Yuzo Fukushi, and Yoshinori Ito, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Japan and NEC Corporation, Japan

Filed Feb. 16, 1984, Ser. No. 580,922

Claims priority, application Japan, Feb. 18, 1983, 58-24709

Int. Cl.[4] H04B *3/20*

U.S. Cl. 370—32.1 **3 Claims**



1. An adaptive echo canceller for cancelling echo signals in communication paths, comprising:

an echo estimator for adaptively producing estimated echo signals using incoming signals, said echo estimator comprising a transversal filter including a tap coefficient memory for storing therein a tap coefficient signal;

a subtracter adapted to subtract said estimated echo signals from echo signals;

a tap coefficient correction signal generator for producing a tap coefficient correction signal as a function of said incoming signals and the output of said subtracter;

a tap coefficient signal controller, coupled to said tap coefficient correction signal generator and to said tap coefficient memory, for generating a controlled tap coefficient correction signal as a function of the tap coefficient correction signal and said tap coefficient signal; and

a tap coefficient updating adder, coupled to said tap coefficient signal controller and to said tap coefficient memory, for adding said controlled tap coefficient correction signal and said tap coefficient signal stored in said tap coefficient memory for generating an adjusted tap coefficient signal.

4,633,047

ISOLATOR SWITCH WITH INTERLOCK

Thomas W. Mennell, Scarborough, England, assignor to Y.S. Securities Limited, Leeds, England

Filed Dec. 20, 1984, Ser. No. 684,014

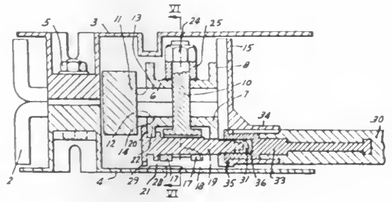
Claims priority, application United Kingdom, Dec. 24, 1983, 8334481

Int. Cl.[4] H01H *9/20*

U.S. Cl. 200—50 R **13 Claims**

1. An electrical isolator comprising an insulated housing, having an access opening therein, an input conductor and an output conductor mounted at spaced-apart locations within the housing, a bridging contact, means mounting the bridging contact within the housing for movement between an open position out of engagement with at least one of the conductors and a closed position in engagement with both conductors, an insulating shroud fully shielding that part of the bridging contact accessible through the access opening of the housing, and manually operable pressure-applying means associated with the bridging contact and such that the pressure-applying means may be operated when the bridging contact is in the

closed position to control the bridging contact between a tightened condition wherein contact pressure is applied between the bridging contact and the conductors without the use of springs and a free condition wherein the contact pressure is reduced.



10. An electrical isolator according to claim 1 and including interlock means preventing control of the bridging contact between the free and tightened conditions unless the bridging contact is in either the closed or the open position.

4,633,048

JACK WITH A SWITCH

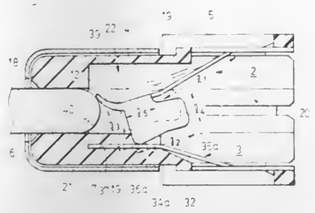
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Oct. 21, 1985, Ser. No. 789,600

Claims priority, application Japan, Dec. 30, 1984, 59-201440[U]

Int. Cl.⁴ H01R *33/96*

U.S. Cl. 200—51.1 **8 Claims**



1. A jack with a switch comprising:

a jack body made of an insulating material and having a contact housing cavity formed therein, said jack body having an insertion hole formed in a front end face of said jack body in communication with said contact housing cavity, for receiving a contact pin of a plug;

a guide ridge formed integrally with an inner wall of said jack body to extend in the direction of plug insertion in flush relation with an inner surface of said insertion hole;

a fixed electrical contact mounted in said contact housing cavity on an inner wall surface thereof, said fixed contact being so disposed in said cavity that at least a portion of said fixed contact will oppose a peripheral portion of said plug contact pin in spaced relation to said contact pin when said contact pin is inserted into said insertion hole;

a movable electrical contact disposed in said contact housing cavity in opposing relation to said fixed contact, said movable contact comprising a support portion fixedly mounted in said contact housing cavity and a movable plate portion which extends from said support portion toward said insertion hole and is resiliently movable inside said contact housing cavity;

a pair of holding parts formed at a free end of said movable plate portion integrally therewith, said pair of holding parts extending toward said fixed contact in a U-shape configuration and defining contact portions which are normally held in contact with said fixed contact by a resilient force of said movable plate portion when said contact pin is not inserted into said insertion hole, said pair of holding parts also defining a pair of flaps which extend toward said support portion for resiliently holding therebetween said contact pin when said contact pin is inserted into said insertion hole; and

a pin receptor formed integrally with said movable plate portion to extend obliquely across the axis of said insertion hole from the free end of said movable plate portion in a direction away from said holding parts so that as said contact pin is inserted into said insertion hole, an end portion of said contact pin slidably pushes against said pin receptor to laterally displace said movable plate portion against the resilient force thereof away from said fixed contact to disengage said contact portions of said holding parts from said fixed contact and to hold said contact pin between said pair of flaps.

4,633,049

GAS-BLAST SWITCH

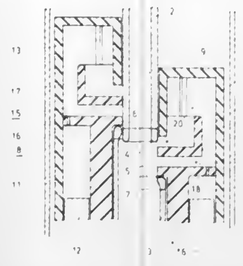
Friedrich Pinnekamp, Siggenthal-Station, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 12, 1985, Ser. No. 775,402

Claims priority, application Switzerland, Sep. 20, 1984, 4502/84

Int. Cl.⁴ H01H *33/88*

U.S. Cl. 200—148 A **5 Claims**



1. Gas-blast switch having two switch pieces (2, 3), which are movable relative to one another along an axis in a housing (1), filled with insulating gas, and define an arc-quenching zone (4) during switch-off, an insulating body (8) defining the arc-quenching zone (4), a channel which is located in the insulating body (8) and connects the arc-quenching zone (4) with a storage chamber (9), and a compression device, the compression chamber (10) of which can be connected with the storage chamber (9), characterised in that the compression chamber (10) and the storage chamber (9) are connected to one another via a flow narrow point (18) which, during switch-off forms a free jet (19) of insulating gas, and that the flow narrow point (18) is aligned and arranged in such a way that a boundary surface (21) of the free jet (19) separates a first partial piece (16) of the channel, which partial piece (16) is connected with the arc-quenching zone (4), from a partial piece (17) connected with the storage chamber (9) and accomodating the free jet (19).

4,633,050

NICKEL/INDIUM ALLOY FOR USE IN THE MANUFACTURE OF ELECTRICAL CONTACT AREAS ELECTRICAL DEVICES

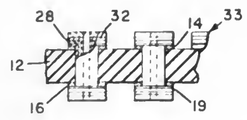
George J. Samuels, Syracuse, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 605,435, Apr. 30, 1984, abandoned. This application Mar. 26, 1985, Ser. No. 714,848

Int. Cl.⁴ C25D *3/56;* **H01H** *1/02*

U.S. Cl. 200—268 **25 Claims**

1. An improved electrical device having improved electrical contact areas, said device of the type having one or more insulating positions and one or more electrical conductive portions, said contact areas in electrical connection with one or more of said conductive portions and adapted to engage and form mating surfaces with one or more electrical contact areas of one or more other electrical devices to provide electrical connection between said one or more conductive portions of



said device, and said other devices, the improvement comprising electrical contact areas electroplated with a nickel/indium alloy consisting essentially of from about 0.1 to about 9 weight percent indium based on the total weight of the alloy and from about 99.9 to about 91 percent by weight nickel on the aforementioned basis.

4,633,051

STABLE CONDUCTIVE ELEMENTS FOR DIRECT EXPOSURE TO REACTIVE ENVIRONMENTS

Donald M. Olson, Scottsdale, Ariz., assignor to Advanced Semiconductor Materials America, Inc., Phoenix, Ariz.

Filed Nov. 23, 1983, Ser. No. 554,978

Int. Cl.⁴ H05B *6/10*

U.S. Cl. 219—10.49 R **13 Claims**

1. A conductive apparatus capable of being heated by R.F. energy or by direct coupling to a source of electrical energy while being exposed to reactive environments comprising a body of alpha silicon carbide, said body also comprising a minor fraction of homgeneously-dispersed conductive particle means for controlling the electrical conductivity of said body without substantially increasing the porosity of said body.

4,633,052

MICROWAVE OVEN WITH DISPOSABLE LINER BAG

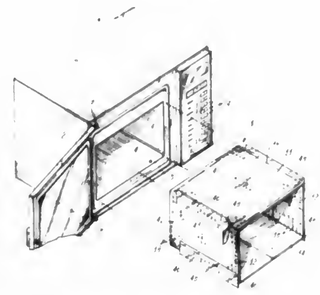
Jerry E. Beavers, P. O. Box 457, Tangerine, Fla. 32777, and Jim C. Layland, 5381 Skelly Sq., Orlando, Fla. 32806

Filed Aug. 26, 1985, Ser. No. 769,090

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 E **11 Claims**

1. In a microwave oven including a cabinet having walls defining a generally rectangular cooking chamber with a front opening, a door supported by said cabinet for movement between a closed position covering said opening and an open position providing access to said chamber, and means for producing microwave energy within said chamber when said door is in said closed position, the improvement comprising a disposable liner bag for said chamber, said liner bag being formed of a liquid absorbing and fire retardant paper material, said liner bag having fold lines for collapsing said bag between a generally flat collapsed position and an erected box-like open position, said liner bag being generally the same size as said chamber when said liner bag is in said open position and having means defining an opening adjacent said door, and patches of pressure sensitive adhesive on the outer surface of said liner



bag for releasably attaching said liner bag in said open position to said walls defining said oven chamber.

4,633,053

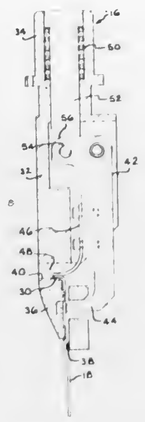
ELECTRICAL DISCHARGE MACHINE WITH AUTOMATICALLY REPLACEABLE ELECTRODES

Jayadeva R. Puthran, Ann Arbor, Mich., assignor to Raycon Corporation, Ann Arbor, Mich.

Filed May 27, 1982, Ser. No. 382,831

Int. Cl.⁴ B23H *1/00, 7/26;* **B65H** *1/02, 5/00*

U.S. Cl. 219—69 E **10 Claims**



7. In an electrical discharge machine an electrode holder movable toward and away from a conductive workpiece, said holder comprising a body having upper and lower ends and locating means in the lower end of said body operable to receive an electrode, a clamping arm pivotally-mounted on said body for movement between a clamping position, in which said arm engages the electrode and clamps it against said locating means, and a releasing position, in which said arm is removed from contact with said electrode allowing it to be released, and pivot means operable to pivot said clamping arm between said clamping and releasing position, and further including a spring strip secured to said clamping arm operable upon movement of said arm from said clamping position to said releasing position to engage the electrode to thereby remove it from contact with said body and eject it from said holer.

4,633,054

RESISTANCE WELDING METHOD

Edward P. Patrick, Murrysville, and J. Richard Auhl, Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 24, 1984, Ser. No. 583,120
Int. Cl.[4] B23K *11/16*
U.S. Cl. 219—118 18 Claims

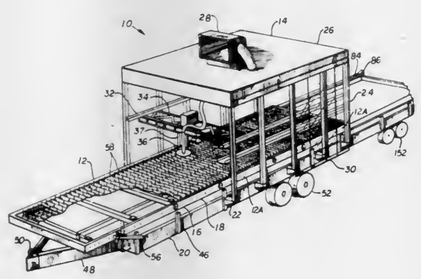
1. A resistance welding method, including the steps of contacting electrodes to two parts to be welded together, faying the two parts at a location to be welded, and passing electrical current between the electrodes and through said location, wherein the improvement comprises performing, on the parts, the steps of roughening a surface of each of the parts to be welded for decreasing heat generation where an electrode makes contact and providing a uniform coating and a uniform surface resistance at the fayed location for generating heat to form a nugget without expulsion.

4,633,055

PLASMA CUTTING SYSTEM

James A. Conley, 280 Meadow St., Meadville, Pa. 16335

Filed Mar. 18, 1985, Ser. No. 713,045
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PC 17 Claims



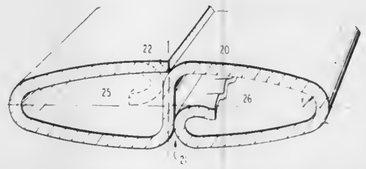
1. A plasma cutting system comprising:
a plasma arc cutting means,
a generally elongated system frame having a first side and a second side,
said system frame having a first support area and a second support area,
spaced upwardly extending laterally and longitudintally spaced posts along side of said second support area,
a first gantry track attached to said posts along said first side of said second area and a second gantry track attached to said posts along said second side of said area,
said first gantry track and said second gantry track being spaced above said system frame,
a rolling table and roller means supporting said rolling table on said generally rectangular elongated system frame,
work support means on said rolling table,
cutting support means,
said cutting support means comprising a laterally extending gantry frame supported on said gantry tracks above said system frame and extending from said first gantry track to said second gantry track,
moving means for moving said cutting support means laterally and longitudinally of said rolling table,
said plasma arc cutting means being supported on said cutting support means above said rolling table,
positioning means on said rolling table for positioning said rolling table on said system frame selectively at a loading position overlying said first area to a cutting position overlying said second area,
and said spaced posts providing open spaces between them for access to work supported on said rolling table in said cutting position,
said cutting position being beneath said plasma arc cutting means.

4,633,056

METHOD FOR MANUFACTURING SPECIAL-SECTION TUBES FOR TUBULAR HEAT EXCHANGERS AND TUBES PROVIDED BY SUCH METHOD

Werner Schlosser, Munich, Fed. Rep. of Germany, assignor to MTU Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,555
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321392; Jun. 20, 1983, 3322130; Jul. 30, 1983, 3327660
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 ED 8 Claims



1. A method for manufacturing special-section tubes having an oval cross section and a cross web for tubular heat exchangers, comprising the steps of gradually profiling an endless metal strip to shape the same into the intended tube section, wherein, starting with a flat planar metal strip, a substantially rectangular Z-contour is first shaped with long free legs joined by a short Z-web, thereafter at least one end of the free legs is given an approximately 180° joining bend near the free end wherein the distance between the free end and the long leg, after bending, is less than the length of the Z-web, and, whereupon both free Z-legs are then bent about a point approximately midway along the legs through approximately 180° so that the first joining bend will abut an outward portion of the Z-web and wherein the bent free end extends substantially parallel to and spaced from the long free leg at its juncture to the Z-web.

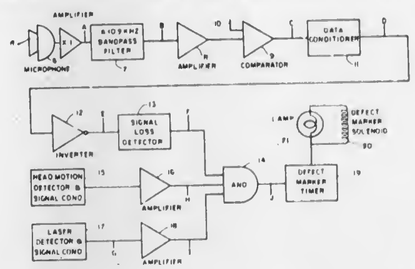
4,633,057

LASER WELDER FAULT DETECTOR

Craig A. Wilson, Shelton; Stephen J. Curry, Trumbull; Kenneth Struzek, Northford, and Ralph Falcigno, Milford, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Aug. 22, 1985, Ser. No. 768,558
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC 6 Claims

1. A laser welder fault detector for use with an intermittently energized laser head that is movable relative to metal sheets to be welded and positioned relative to the sheets to discharge energy for welding the sheets together, the energy discharge producing acoustic signals having a low amplitude when defective welds are being produced and a relatively greater amplitude when normal welds are being produced comprising:
a microphone for detecting the acoustic signals associated with the energy discharge and producing an output signal;
an impedance matching amplifier for amplifying the output signal from said microphone and producing another output signal;
a low frequency narrow bandpass filter having a low frequency narrow bandpass of about 6 KHz to about 9 KHz connected to said impedance matching amplifier for receiving and passing only that portion of said impedance matching amplifier output signal generated by acoustic signals received by said microphone in the range of about 6 KHz to about 9 KHz;
means for amplifying the signals passed by said bandpass filter;
a comparator for comparing the signals from said last named



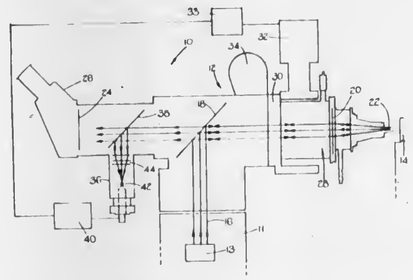
means with a signal pattern characteristic of the formation of normal welds and for producing an output signal indicating whether the comparison was favorable or unfavorable;
a data conditioner for shaping the output signal from said comparator;
means for inverting the shaped signals produced by said data conditioner;
a signal loss detector for producing an output signal when the inverted signal from said inverter indicates formation of a faulty weld; and
means activated by the last named output signal for recording the location of the faulty weld.

4,633,058

LASER MACHINING APPARATUS

Godfrey D. Jones, Syston, England, assignor to Preci-Spark Limited, England

Filed Jan. 20, 1983, Ser. No. 459,470
Claims priority, application United Kingdom, Jan. 21, 1982, 8201739
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LK 12 Claims



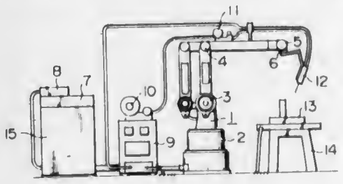
1. A method for burning a plurality of holes in a workpiece with a laser beam focused through a lens means having an axis substantially parallel to the laser beam, the lens means being supported by a first member and a second member wherein the first member is movable in a first direction substantially perpendicular to the axis of the laser beam and wherein the second member is movable in a first direction in accordance with the movement of the first member and the second member is movable in a second direction at a right angle to a direction substantially perpendicular to the axis of the laser beam, comprising of the steps of:
aligning the lens means axis with the work piece such that the axis is substantially normal to the surface of the work piece;
directing a prefocused laser beam through the lens means such that the prefocused laser beam extends substantially parallel to the lens means axis;
focusing the perfocused laser beam to a focal point adjacent the workpiece with a focusing lens;
moving the focusing lens in the first direction and second direction by adjustment of the first and second members, respectively to direct the focal point to a first preselected location for burning a first hole through the work piece; and
moving the focusing lens in a first direction and second direction by adjustment of the first and second members, respectively to direct the focal point to a second preselected location for burning a second hole through the work piece without moving the prefocused laser beam relative the work piece.

4,633,059

METHOD AND APPARATUS FOR WELDING LINE TRACER CONTROL

Shinichi Sarugaku, Narashino, and Masao Tsuji, Funabashi, both of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of, Japan

Filed Dec. 5, 1984, Ser. No. 678,285
Claims priority, application Japan, Dec. 9, 1983, 58-231332
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.22 18 Claims



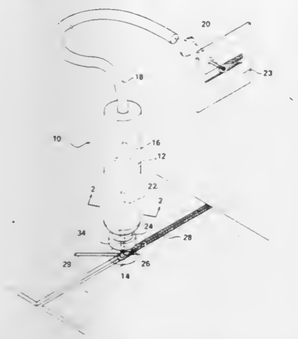
10. A method for tracing a weld line, comprising:
moving a mechanism for giving a relative movement to a welding torch along a desired path;
storing predetermined weld main path vector information for giving relative movement to said welding torch along said weld line and predetermined swing vector information for giving swing movement to said welding torch;
detecting the amount of an electrical parameter of an arc of said welding torch;
calculating a correction amount for a correction vector based upon a deviation between said detected amount and a preset reference amount;
generating information on said correction vector formed by said correction amount and by a direction of said correction vector determined independently of information on the actual position of the welding torch on the basis of said swing vector information; and
controlling said mechanism so as to move said welding torch along said weld line, in accordance with information composed of said weld main path vector information, said swing vector information and said correction vector information.

4,633,060

WELDING TORCH WITH ARC LIGHT REFLECTOR

Stephen S. Gordon, Tarzana, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,890
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.01 **3 Claims**



2. In an electric arc welding torch comprising an electrode coaxially extending from a housing and through a surrounding gas cup, said housing having an internal viewing system consisting of optics which focuses the weld scene of the electrode arc onto an image transmission means, the improvement comprising:

an arc light reflector with an upper circular opening portion fitted onto the end portion of said gas cup,

said arc light reflector having an internal generally conical section portion extending outwardly from the upper circular opening portion to its lower edge,

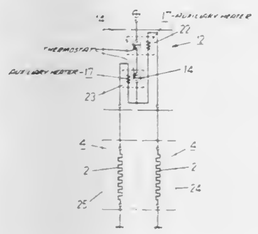
said internal generally conical section portion being highly reflective so as to serve as a mirror which reflects the bright arc light back onto the darker areas of the weld area and thereby provide a more detailed image for the internal viewing system.

4,633,061

THERMOSTATICALLY CONTROLLED ELECTRIC SEAT HEATERS FOR VEHICLES

Tomio Arikawa, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00414, § 371 Date Jul. 18, 1984, § 102(e) Date Jul. 18, 1984, PCT Pub. No. WO84/01885, PCT Pub. Date May 24, 1984
PCT Filed Nov. 16, 1983, Ser. No. 634,108
Claims priority, application Japan, Nov. 18, 1982, 57-175006[U]; Jul. 4, 1983, 58-121857
Int. Cl.[4] H05B *1/02, 3/34;* B60H *1/22*
U.S. Cl. 219—202 **3 Claims**



1. A vehicle seat heater comprising:

a seat heater main body adapted to be mounted on at least one of a seat cushion part and a seat back part of a vehicle seat, said seat heater main body including a pair of electric warming heaters;

temperature control means for stopping the flow of electricity to said electric warming heaters when the temperature of said seat heater main body exceeds a predetermined level, said control means being covered by a heat insulation material and adapted to be disposed at location separate from said seat heater main body, said control means including:

a pair of auxiliary heaters each respectively coupled to a different one of said pair of electric warming heaters and adapted to be energized and deenergized simultaneously with the associated electric warming heater, said auxiliary heaters being covered by said heat insulation material; and

a pair of thermostatic switches coupled in series, each thermostatic switch being in heat exchange relationship with a different one of said auxiliary heaters, for stopping said flow of electricity to said warming heater and said auxiliary heaters; said thermostatic switches being covered by said heat insulation material; and

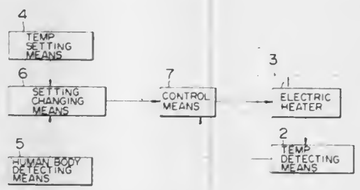
coupling means for coupling said thermostatic switches to said electric warming heaters.

4,633,062

ELECTRIC BLANKET

Yayoi Nishida, Yamatokoriyama, and Katsumi Ishii, Sakurai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 21, 1985, Ser. No. 789,508
Claims priority, application Japan, Oct. 30, 1984, 59-228107
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—212 **3 Claims**



1. An electric blanket comprising:

a blanket proper having disposed therein an electric heater and temperature detecting means for detecting an temperature of said electric heater;

temperature setting means for establishing a desired temperature setting of said electric heater;

human body detecting means for detecting the presence or absence of a human body;

setting changing means responsive to signals from said temperature setting means and said human body detecting means to change said temperature setting; and

control means responsive to a difference between signals from said temperature detecting means and said setting changing means to control the flow of current to said electric heater.

4,633,063

VENTED HEATING ELEMENT FOR STERILE CUTTING AND WELDING TOGETHER OF THERMOPLASTIC TUBES

Frank M. Willis, Wenonah, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1984, Ser. No. 686,755
Int. Cl.[4] B29C *27/06;* H05B *3/10;* B26D *7/10*
U.S. Cl. 219—243 **19 Claims**

1. In a heating element for sterile welding of first and second thermoplastic tubes together transversely of the axis of each tube, the heating element having:

an outer layer formed of a folded sheet of metal, the folded edge being the heating edge of the heating element;

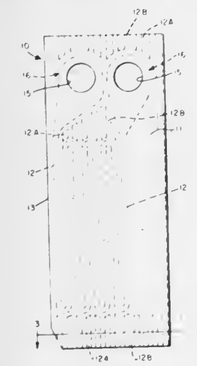
a resistor disposed inside said folded sheet of metal, the resistor having terminals for reception of electric current;

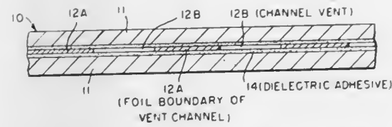
dielectric adhesive between the folded sheet of metal and the resistor to electrically insulate the resistor from the folded sheet of metal and bond the resulting structure together;

the improvement comprising:

channels located within the adhesive between the resistor and the sheet of metal and along at least one unfolded edge of the folded sheet of metal for venting entrapped gas from the heating element during heating, the channels having a predetermined cross-sectional area and a predetermined length so that the pressure driven flow of entrapped gas passing through the channels is greater than the pressure-generating vaporization rate of the trapped gases within the heating element to prevent the entrapped gas from reaching a pillowing pressure within the heating element.

11. In an apparatus for forming a sterile connection between two thermoplastic tubes which comprises a heatable cutting means, a pair of mounting blocks adapted to receive and hold the two tubes, means to provide movement between said blocks and said cutting means to a position such that the cutting means is between said blocks and traversing where the blocks are adapted to receive tubes, means adapted to realign said blocks to a position where two different tube ends are aligned with and facing each other, and means to separate said blocks together;





the cutting means comprising a heating element having an outer layer formed of a folded sheet of metal, the folded edge being the heating edge of the heating element; a resistor disposed inside said folded sheet of metal, the resistor having terminals for reception of electric current; dielectric adhesive between the folded sheet of metal and the resistor to electrically insulate the resistor from the folded sheet of metal and bond the resulting structure together;

the improvement which comprises:

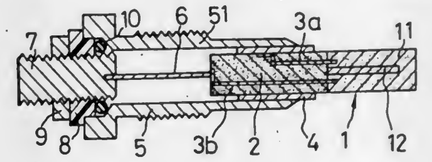
channels located within the adhesive between the resistor and the sheet of metal and along at least one unfolded edge of the folded sheet of metal for venting entrapped gas from the heating element during heating, the channels having a predetermined cross-sectional area and a predetermined length so that the pressure driven flow of entrapped gas passing through the channels is greater than the pressuregenerating vaporization rate of trapped gas to prevent the entrapped gas from reaching a pillowing pressure within the heating element.

4,633,064

SINTERED CERAMIC ELECTRIC HEATER WITH IMPROVED THERMAL SHOCK RESISTANCE

Morihiro Atsumi; Hitoshi Yoshida, both of Okazaki; Novuei Ito, Nukata, and Kinya Atumi, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed May 30, 1985, Ser. No. 739,474
Claims priority, application Japan, May 30, 1984, 59-110109
Int. Cl.[4] H05B *3/12;* F02P *19/02*
U.S. Cl. 219—270 **4 Claims**



1. A ceramic heater comprising:

a ceramic heater element formed of a ceramic sintered body which generates heat upon receiving an electric current;

a support member formed of an electrically insulating ceramic sintered body supporting said ceramic heater element;

a current supply means for supplying an electric current to said ceramic heater element;

said ceramic heater element comprising a central portion and an outer portion having a U-shaped cross-section and covering said central portion; each of said central portion and said outer portion being formed of a sintered body of a mixture of electrically conductive ceramic powder having an average particle diameter of not more than 2 μm and 35 to 75 mol% of electrically insulating ceramic powder, said central portion and said outer portion having the same composition as each other; in said central portion the average particle diameter of said electrically conductive ceramic powder being equal to or larger than that of said electrically insulating ceramic powder; in said outer portion the average particle diameter of said electrically conductive ceramic powder being not more than one half of that of said electrically insulating ceramic powder; and said outer portion being integrally sintered with said central portion, the specific resistance of said central portion being not less than 1.7 times as large as that of said outer portion.

4,633,065

CONVECTION COOKING APPARATUS

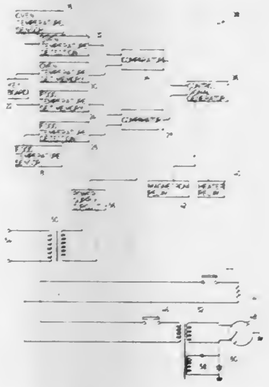
Masafumi Takazume, Osaka, and Kazuhiko Ishikawa, Kashiwara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 443,698, Nov. 22, 1982, abandoned.
This application Mar. 25, 1985, Ser. No. 715,290
Claims priority, application Japan, Nov. 26, 1981, 56-176285[U]
Int. Cl.[4] H05B *11/00*
U.S. Cl. 219—400 **1 Claim**

1. A convection cooking apparatus comprising:

a convection heater which is intermittently energized to maintain the oven temperature at a desired value;

a magnetron which is intermittently energized to alternate with said convection heater;
power supply means for providing power to said convection heater and said magnetron;
a keyboard panel for introducing a desired oven temperature at which the cooking operation should be performed, and a desired food temperature at which the cooking operation should be completed;
a first memory for storing said desired oven temperature introduced from said keyboard panel;
a second memory for storing said desired food temperature introduced from said keyboard panel;
oven temperature measuring means for measuring an actual oven temperature;
a first comparator for comparing said actual oven temperature measured by said oven temperature measuring means with said desired oven temperature stored in said first memory;
a first control system for intermittently energizing said



heater in response to an output signal developed from said first comparator for maintaining the actual oven temperature around said desired oven temperature;
food temperature measuring means for measuring an actual food temperature;
a second comparator for comparing said actual food temperature measured by said food temperature measuring means with said desired food temperature stored in said second memory; and
a second control system for terminating the cooking operation in response to an output signal developed from said second comparator so that the cooking operation is terminated when said actual food temperature reaches said desired food temperature, said output signals from the first and second comparators being applied to a control signal generator for controlling the power supply to the convection heater and the magnetron, whereby microwave heating and convection heating are conducted in an alternative manner until a preset temperature is reached in the atmosphere of the apparatus.

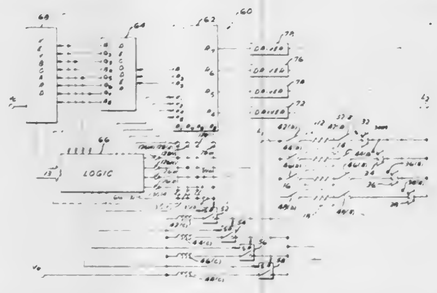
4,633,066
THERMOSTATICALLY CONTROLLED DUAL MODE ELECTRIC WATER HEATING RECEPTACLE
Tien-Song Chang, 2, Ground Floor, Lane 221, Jin Ping Rd., Chung Ho City, Taipei Hsien, Taiwan
Filed Nov. 5, 1984, Ser. No. 668,326
Int. Cl.⁴ H05B *1/02, 3/60*
U.S. Cl. 219—437 **14 Claims**

1. An electric water heater including a receptacle adapted to receive and contain a quantity of water, electric heating means in said receptacle for heating the water, said heating means comprising an anode member and a cathode member in juxtaposition to the anode member, means for connecting the anode and cathode members to a source of current, at least one of the members having means formed therein for the passage of water therethrough, whereby the current flowing through the water from the anode member to the cathode member heats the water, the anode member having separate first and second portions, said connecting means initially connecting both portions of said anode member and said cathode member to the source of current, thermally-responsive switch means responsive to the temperature of the water in the receptacle for dis-



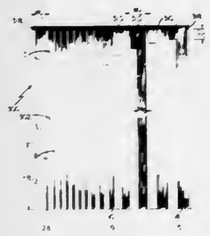
connecting one of the portions of the anode member upon attainment of a predetermined water temperature within the receptacle, thereby providing a "hi" and a "lo" heat position, first means associated with said connecting means and said anode and cathode members for indicating that the electric water heater is in operation, and second means disposed in said receptacle for sensing that an insufficiently low water level is in the receptacle, thereby indicating that water must be added to the receptacle.

4,633,067
TOUCH CONTROL ARRANGEMENT FOR AN ELECTRICAL APPLIANCE
Thomas R. Payne, and David A. Schneider, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Aug. 22, 1984, Ser. No. 643,251
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—483 **13 Claims**



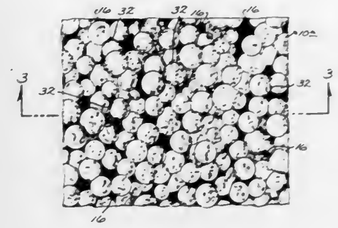
1. A control circuit for an appliance of the type incorporating an electrical load adapted for energization by an external power supply said circuit comprising:
input means comprising a plurality of user actuable switch means including a first condition selection switch means and a second condition selection switch means;
an electronic controller for controlling energization of said electrical load in accordance with user actuation of said input means, said controller including scanning means operative to periodically enable at least some of said switch means including said first condition selection switch means to detect user actuation thereof;
means for constantly enabling said second condition selection switch means;
a power control relay operative in a first state to enable energization of the electrical load by the external power supply and in a second state to prevent energization of the load;
electronic latch circuit means switchable between a first state and a second state, said latch circuit means being effective in its first state to establish said first state for said relay and in its second state to establish said second state for said relay;
said first condition selection switch means being operative when actuated and enabled to switch said latch means to its first state;
said second condition selection switch means being operative when actuated to switch said latch circuit means in its second state independent of said scanning means.

4,633,068
ELECTRICAL HEATING DEVICE
Frederick G. J. Grise, Osterville, Mass., assignor to Flexwatt Corporation, Canton, Mass.
Filed Feb. 15, 1984, Ser. No. 580,472
Int. Cl.⁴ H05B *3/16*
U.S. Cl. 219—543 **19 Claims**



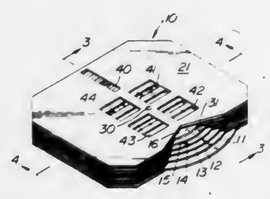
2. In an electrical heating device comprising
an electrically insulating substrate,
a pair of spaced-apart, generally parallel elongated conductors, and
a semi-conductor pattern carried on said substrate, said pattern being electrically connected to and extending between said conductors,
that improvement wherein the portion of said pattern within a first area of said heating device is arranged to produce a first watt density when a predetermined voltage is applied across said
the portion of said pattern with a second area of said heating device is arranged to produce a second and different watt density when said voltage is applied across said conductors, and
said semi-conductor pattern including a plurality of spaced-apart bars extending between and electrically connected to said conductors, each of said bars including a first portion having a first resistance per unit length and a second portion having a second and different resistance per unit length, said first portions of each of said bars being within said first area and said second portions of said bars being within said second area.

4,633,069
HEAT-EXCHANGER
Peter G. Berg, Attleboro Falls; Vishwa Shukla, North Attleboro; Bernard M. Kulwicki, Foxboro, and Thomas C. Conlan, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 21, 1985, Ser. No. 789,579
Int. Cl.⁴ H05B *3/12*
U.S. Cl. 219—553 **4 Claims**



1. A body comprising a ceramic electrical resistance material of positive temperature coefficient of resistivity adapted to display a sharp increase in resistivity when heated to a selected temperature having passages extending through the body between opposite ends of the body for passing fluid through the passages in heat-exchange relationship to the body, and means electrically contacting spaced-apart portions of the body for directing electrical current through the body to self-heat the body, characterized in that the body accommodates a multiplicity of openings therein interconnected with each other for defining a plurality of said passages of intercommunicating serpentine configuration varying in cross-section along the length thereof entwined with each other within the body for providing improved heat-transfer between the body and a fluid passed through the body passages.

4,633,070
INFORMATIONAL DEVICE ADAPTED TO CONVERT BINARY TO DECIMAL NUMERALS
Arthur J. Merkh, 1 Driftwood Way, Gibbsboro, N.J. 08026
Filed Oct. 31, 1985, Ser. No. 793,249
Int. Cl.⁴ G06C *3/00*
U.S. Cl. 235—88 M **12 Claims**



1. A binary to decimal converter comprising a base, an array of decimal numerals imprinted on said base, a stack of sheets on said base overlying said array, mounting means mounting said sheets for movement relative to each other and said base, and window formations in said sheets configured for alignment with decimal numerals of said array, said sheets each corresponding to a respective binary place, and said window formation of each sheet being configured for alignment in one position of movement with only the corresponding decimal numerals of each binary place in combination with said corresponding decimal numeral.

4,633,071

METHOD AND APPARATUS FOR RAPID MANUAL TRANSFER OF DATA FROM STANDARDIZED FORMS

Jeffrey S. Talan, 325 W. 100th St., New York, N.Y. 10025

Filed Jun. 15, 1984, Ser. No. 621,058
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—487 7 Claims



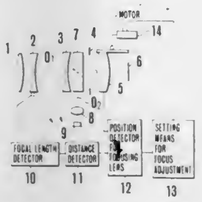
1. A method for transferring data from a plurality of preprinted or standardized forms comprising the steps of aligning the forms in a stack on a stable support, attaching a clear overlay to said support such that the forms reside between the support and the overlay, manually drawing a symbol or indication on the overlay in the position of the data to be transferred from the forms, identifying the location of data on the preprinted forms under the clear overlay, thereby retrieving or transferring the data and removing the forms one at a time without substantial movement of the overlay.

4,633,072

FOCUS APPARATUS FOR ZOOM LENS SYSTEM WITH DISTANCE DETECTION

Muneharu Sugiura, and Akira Tajima, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 519,686, Aug. 2, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 815,743
Claims priority, application Japan, Aug. 5, 1982, 57-136703
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 5 Claims



1. A focusing apparatus for a zoom lens system comprising:
(a) a zoom lens optical system having an object end and image end and defining an optical axis;
(b) a focusing optical system arranged behind the image end of said zoom lens optical system for adjusting the focus;
(c) means for detecting focal length information by zooming of said zoom lens optical system;
(d) distance measuring means for measuring an object distance, said distance measuring means having a range finding element at a position displaced from the optical axis of said zoom lens optical system;
(e) means receptive of an output signal from said focal length information detecting means and an output signal from said object distance measuring means for computing an amount of movement of said optical system for adjusting the focus to an in-focus position; and
(f) means for driving said focusing optical system on the basis of the signal of said computing means.

4,633,073

DATA CORRECTING DEVICE IN AN AUTOMATIC FOCUS DETECTING SYSTEM

Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,736
Claims priority, application Japan, Feb. 24, 1983, 58-28599
Int. Cl.[4] G01J *1/36*
U.S. Cl. 250—201 4 Claims



1. A data correcting device in an automatic focus detecting system in which a focus detection is effected by the provision of a pupil dividing means adjacent to a pupil of an image forming lens for forming object images, by the reception of two individual object images formed by different light paths and separated by the pupil dividing means on a photoelectric converting means comprising a plurality of picture elements for the generation of output signals which correspond to the amount of light received by the picture elements for converting the two object images into corresponding photoelectric output signals, and which is effected by the detection of the relative position of the two object images by the utilization of the photoelectric output signals, wherein said data correcting device comprises a means for calculating the reciprocal numbers of the photoelectric output signals corresponding to the respective picture elements, said reciprocal numbers being obtained by the application of light with a uniform brightness distribution on to said photoelectric converting means, said data correcting device further comprising a means for multiplying the photelectric output signals with the reciprocal values obtained from the respective picture elements in order to correct the photelectric output signals of the photoelectric converting means.

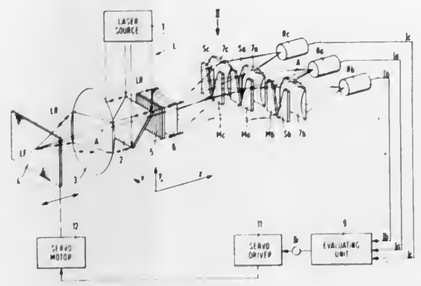
4,633,074

METHOD AND APPARATUS FOR FOCUSING A BEAM OF LIGHT ON AN OBJECT

Rino E. Kunz, Steinmaur, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Jun. 1, 1984, Ser. No. 616,254
Claims priority, application Switzerland, Jun. 1, 1983, 2987/83
Int. Cl.[4] G01J *1/20;* G01C *3/08*
U.S. Cl. 250—201 36 Claims

18. Apparatus for focusing a beam of light, in particular a laser beam, which produces a spot on an object impacted by the beam of light, comprising a combination of two mutually complementary focusing systems which evaluate light reflected from the beam spot on the object and which use independent criteria to determine a state of focus, wherein one



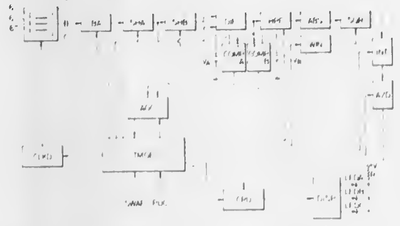
focusing system performs continuous setting and resetting of focus and the other focusing system periodically calibrates said first system.

4,633,075

SIGNAL ACCUMULATING TIME CONTROL METHOD AND APPARATUS FOR A SIGNAL ACCUMULATING TYPE RADIATION SENSING DEVICE

Shinji Sakai; Nobuhiko Shinoda; Takao Kinoshita, all of Tokyo, and Kazuya Hosoe, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 392,757, Jun. 28, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 705,047
Claims priority, application Japan, Jul. 8, 1981, 56-106341
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 7 Claims



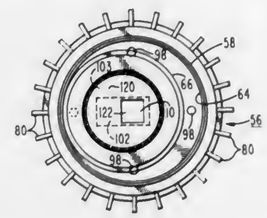
1. A radiation sensing system comprising:
(A) accumulation type radiation sensing means which produces an electrical indication by accumulating incident radiation over an accumulation time;
(B) discrimination means for discriminating the value of said electrical indication produced by said sensing means, said discrimination means discriminating that said sensing means is in a first state when an accumulating value indicated by said electrical indication is larger than a first value and said means discriminating that said sensing means is in a second state when said accumulation value is smaller than a second value; and
(C) control means for controlling the accumulation time of said sensing means, said control means decreasing said accumulating time when said discrimination means discriminates that said sensing means is in said second state, and increasing said accumulation time when said discrimination means discriminates that said sensing means is in said first state, wherein the amount of increase or decrease in said accumulation time is controlled so as to become a half of the previous increase or decrease in said accumulation time set by said control means until the accumulation time reaches a proper value.

4,633,076

INTENSIFIED CHARGE-COUPLED IMAGE SENSOR HAVING A HEADER ASSEMBLY WITH AN ECCENTRICALLY DISPOSED CCD SUPPORT ASSEMBLY THEREIN

Gilbert N. Butterwick, Upper Leacock Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1985, Ser. No. 705,722
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT 2 Claims



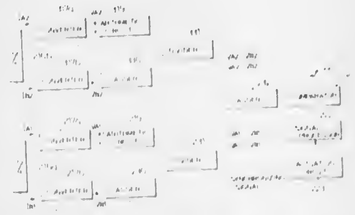
1. In an intensified charge-coupled image sensor having a longitudinally extending optical axis, said sensor comprising
an image intensifier section including an envelope having therein a photoemissive cathode for emitting photoelectrons in a pattern corresponding to the intensity of radiation incident thereon, and
a header assembly including a charge-coupled device for receiving photoelectrons from said cathode, an insulative header and a header flange attached between said insulative header and said image intensifier section, wherein the improvement comprising
said header assembly including
an annular support flange coaxially disposed within said header flange, said support flange having a projection that abutts said insulative header, and
a charge-coupled device support assembly eccentrically disposed within and attached to said annular support flange, said support assembly including means for tensioning said charge-coupled device and for exposing at least a portion of said device to photoelectrons from said cathode, said exposed portion being centered about said optical axis.

4,633,077

PHOTOELECTRIC SWITCH WITH LIMIT SETTING MEANS TO PREVENT DISABLEMENT WHEN THE AMPLIFIER IS SATURATED

Motoo Ikari, Kyoto; Yoshiaki Kanbe, Nara; Yoshihiko Okuda, Ikoma; Yuki Yorifuji, Osaka; Hitoshi Miyashita, Hirakata, and Haruhiko Momose, Hachioji, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 23, 1984, Ser. No. 582,888
Claims priority, application Japan, Feb. 28, 1983, 58-32355
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 L 9 Claims



1. A photoelectric switch comprising means including a light source for emitting a light beam, means including a lens

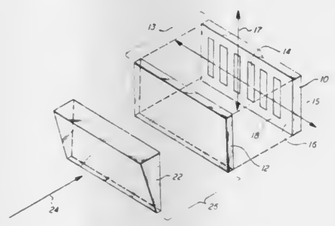
for receiving said beam after reflection by an object to be detected in a manner which provides trigonometric measurement of distance to said object, a position detecing element on which said reflected and received beam is incident as a condensed spot for generating two different received-light signals, means for amplifying said two signals and for discriminating whether or not said object is present in a detecting area, and limit setting means which, when the dynamic range of said amplifying means is saturated, sets a predetermined operational level greater than zero with which said signals are to be compared, to thereby prevent said distance measurement from being disabled depending on a position of the object.

4,633,078

OPTICAL INTERFERENCE ELIMINATOR

Alan Ferber, Hillside, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 23, 1985, Ser. No. 757,996
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **8 Claims**



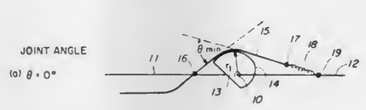
1. Apparatus for preventing interference artifacts in the photometric output curve of a spectrophotometer utilizing a photodiode array as photometric detector, comprising, in combination:
- optical means disposed with a longitudinal axis parallel to the axis passing through the center points of all the pixels of said array;
- said optical means possessing constant cross section in said longitudinal direction;
- said optical means being transparent to radiation throughout a preselected wavelength range of interest;
- said optical means having varying thickness in the transverse direction parallel to the long axis of each of said pixels; and
- said optical means being disposed to intercept the monochromator optical beam before incidence on the active face of said array.

4,633,079

FIBER OPTICS AS AN ANGULAR SENSOR

Harry Rieger, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1985, Ser. No. 749,340
Int. Cl.[4] G01B *11/26*; G01D *5/34*
U.S. Cl. 250—227 **10 Claims**



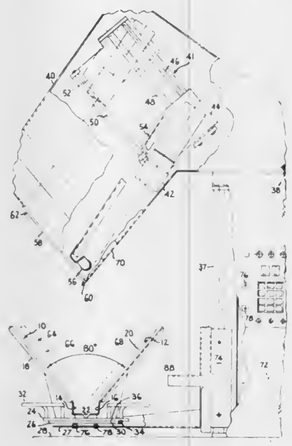
1. An apparatus for sensing the angular position of an articulatory joint having first and second arms comprising:
- means mounted on the first arm of the articulatory joint for providing a snail-shell-like curved surface;
- means for providing illuminating light;
- means affixed on the snail-shell-like curved surface and connected to the second arm and disposed in a partially contiguous abutment on a portion of the snail-shell-like curved surface providing means to receive illuminating light therethrough from the illuminating light providing means for changing its attenuation of light passed therethrough in proportion to the degree of angular bending thereof about the snail-shell-like curved surface providing means; and
- means disposed to receive illuminating light from the illuminating light providing means that has passed through the attenuation changing means for producing a signal representative of the attenuation of the illuminating light as the articulatory joint is rotated thereby indicating the angle of rotation.

4,633,080

DOCUMENT SCANNER HAVING AN IMPROVED BOOK SUPPORT ASSEMBLY

Hugh Wilman, 76 Mount Grace Road, Potters Bar, Hestfordshire, and James Brotton, 1 Moss Drive, Haslingfield, Cambridgeshire, both of England

Filed Nov. 4, 1983, Ser. No. 549,252
Claims priority, application United Kingdom, Nov. 5, 1982, 8231675
Int. Cl.[4] G03B *27/00*; H04N *1/036*
U.S. Cl. 250—234 **13 Claims**



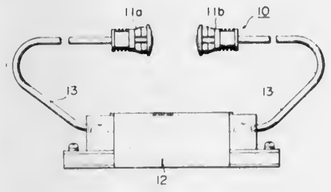
1. A document scanner for scanning a page of a book comprising:
- (1) a housing having a wedge section at least one face of which comprises a window which can be positioned against the page of the book, with the ridge of the wedge in the fold of the book;
- (2) lamp means within the housing for illuminating the page positioned against the window;
- (3) a scanner movable within the housing to scan an illuminated page which is visible through said window to generate an electrical video signal corresponding to the information carried by the page;
- (4) a V-shaped trough in which a book will rest and forming a book support movably attached to the housing, the angle of the trough corresponding to the included angle of the wedge shaped housing and aligned therewith so that a book resting in the trough can be sandwiched between the faces of the wedge and the sides of the trough; and
- (5) drive means for effecting relative movement between the housing and the trough to permit movement sufficiently apart to enable insertion or removal of the book from the trough and alternatively to effect movement of the housing and trough closely together to sandwich the book therebetween for scanning.

4,633,081

PHOTOELECTRIC SWITCH

Hirosi Hiramatu, Osaka, Japan, assignor to Hokuyo Automatic Co., Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,221
Claims priority, application Japan, Nov. 18, 1983, 58-179033[U]
Int. Cl.[4] H01J *5/02*
U.S. Cl. 250—239 **14 Claims**



1. A photoelectric switch comprising:
- a photoelectric means for producing a light path, said photoelectric means includes
  - light projector means having a light projecting element, and
  - light receiver means having a light receiving element for receiving the light emitted from said light projector means;
- control unit for energizing said photoelectric means to detect the interruption of said light path established between said light projector means and said light receiver means; and
- mounting means for mounting one of said light projector and light receiver means, each said mounting means including
  - holder means for holding said element inside said holder means, said holder means includes a front end and a back end,
  - hook means disposed on the outside of said holder means in a slideable fashion, said hook means includes a first end which has an annular base, and a second end which has a variable large diameter part, wherein said annular base of said first end has a diameter smaller than said variable large diameter part of said second end, and
  - spring means for pressing said hook means on said holder means toward said front end of said holder means.

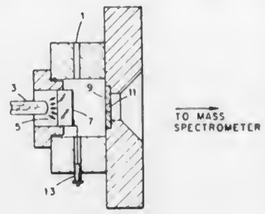
4,633,082

PROCESS FOR MEASURING DEGRADATION OF SULFUR HEXAFLUORIDE IN HIGH VOLTAGE SYSTEMS

Isidor Sauers, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 23, 1985, Ser. No. 726,564
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 **2 Claims**

1. A process for detecting by-products from electrically induced degradation of SF_6 in high voltage systems comprising:
- at a pressure within said reaction cell sufficient to cause electron attachment to SF_6, placing an SF_6 gas to be tested in an ion-molecule reaction cell having a cathode at a first end, an anode opposite said cathode at a second end, a pin hole aperture incorporated into said anode that opens into a negative ion mass spectrometer that is at a lower pressure than is said reaction cell;
- producing thermal electrons at said cathode thereby ionizing molecules of said SF_6 gas in the vicinity of said cathode to form SF_6^- ions;
- applying an electrical field in said reaction cell to induce the transfer of said SF_6^- ions from said cathode to said anode resulting in the formation of by-product ions from intervening by-product molecules having a high affinity for fluoride ions;



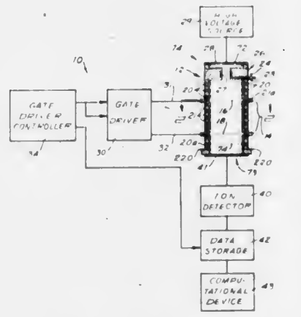
- introducing a combination of said SF_6^- ions and said by-product ions into said pin hole aperture thereby effecting flow of said combination of ions from said reaction cell to said negative ion mass spectrometer; and
- detecting said by-product ions using negative ion mass spectrometry techniques.

4,633,083

CHEMICAL ANALYSIS BY TIME DISPERSIVE ION SPECTROMETRY

Fritz J. Knorr, Moscow, Id.; Randy L. Eatherton, Pullman, Wash.; William F. Siems, Spokane, Wash., and Herbert H. Hill, Jr., Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Wash.

Filed Apr. 18, 1985, Ser. No. 724,514
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 **20 Claims**



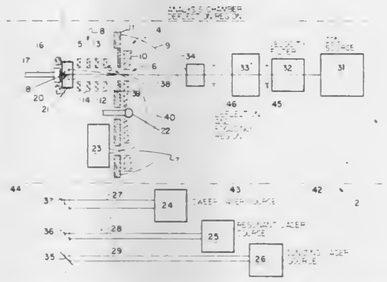
1. A method for producing data useful in analyzing a sample to identify constituent molecules contained therein; comprising:
- ionizing molecules of the sample to produce ions;
- controllably admitting pulses of said ions into a drift region during gate open periods which reoccur at a variable frequency;
- forcing admitted ions through the drift region by applying an electric field thereto;
- detecting ions which exit from the drift region during said gate open periods;
- varying the duration of said gate open periods and said frequency at which ion pulses are admitted, over relevant ranges of times and frequencies, respectively;
- recording data indicative of a quantity of ions detected exiting the drift region during said gate open periods.

4,633,084

HIGH EFFICIENCY DIRECT DETECTION OF IONS FROM RESONANCE IONIZATION OF SPUTTERED ATOMS

Dieter M. Gruen, Downers Grove; Michael J. Pellin, Oak Brook, and Charles E. Young, Westmont, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1985, Ser. No. 691,825
Int. Cl.⁴ G01N *23/00*
U.S. Cl. 250—306 **24 Claims**



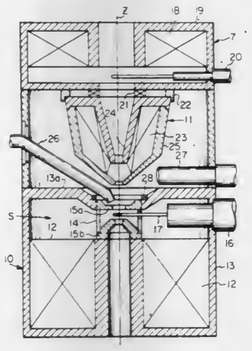
1. A method for the quantitative analysis of a component in a sample comprising the steps of:
bombarding the sample with a beam of energetic particles or photons to produce ion and neutral atom groups emanating in a direction away from the sample,
selectively accelerating the ions in the ion group emanating from the sample for separation from the neutral atom group,
directing one or more laser energy pulses at the neutral atom group to convert the neutral atoms to ions by laser initiated resonance ionization spectroscopy,
causing the ionized neutral atoms to be selectively deflected with respect to the emanating ions to form a deflected beam of ionized neutral atoms, and
detecting the ionized neutral atoms in the deflected beam as a measure of the quantity of said component in the sample.

4,633,085

TRANSMISSION-TYPE ELECTRON MICROSCOPE

Takeshi Tomita; Yoshiyasu Harada, and Kimio Ohi, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,778
Claims priority, application Japan, Apr. 17, 1984, 59-77110
Int. Cl.⁴ H01J *37/141, 37/252, 37/26*
U.S. Cl. 250—311 **3 Claims**



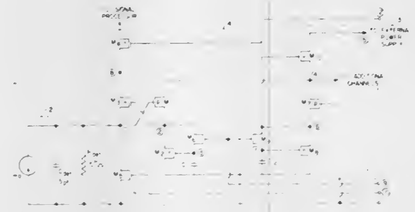
1. In a transmission-type electron microscope having a TEM mode and an analysis mode said microscope including an objective lens, an electron gun for emitting an electron beam, and a plurality of stages of focusing lenses mounted therebetween,
the focusing lens of the final stage which is on the side of the objective lens having a yoke leg which is on the side of the objective lens taking a conic form which tapers toward the objective lens, and
the objective lens having a yoke leg which is on the side of the focusing lenses being provided with a centrally positioned conic recess, said objective lens yoke leg not being shared with another lens whereby in the TEM mode the final stage focusing lens may be adjusted independently of the objective lens to form the electron beam at about the back focal plane of the objective lens in the TEM mode and for providing minimum focusing during the analysis mode.

4,633,086

INPUT CIRCUIT FOR INFRARED DETECTOR

William J. Parrish, Hope Ranch, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,425
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 250—338 **19 Claims**



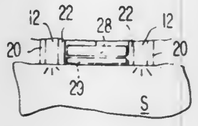
1. An input circuit for a multichannel infrared detection system comprising a bias network connectable to the output of an external power supply, and a plurality of detector channels, each of said channels being connectable to a dedicated detector element and having at least one semiconductor device commonly connected to said bias network, said detector channels and said bias network being formed on a common semiconductor substrate, said bias network including circuitry to reduce power level variations present in the output from the external power supply and to thereby generate a low level bias signal, said bias signal being sufficient to bias at least one detector channel semiconductor device in each detector channel into a linear region of operation.

4,633,087

NEAR INFRARED APPARATUS FOR MEASUREMENT OF ORGANIC CONSTITUENTS OF MATERIAL

Glenn K. Rosenthal, Germantown; Jeffrey D. Stephens, and Robert D. Rosenthal, both of Gaithersburg, all of Md., assignors to Trebor Industries, Inc., Gaithersburg, Md.

Filed Apr. 24, 1985, Ser. No. 726,658
Int. Cl.⁴ G01J *1/00*
U.S. Cl. 250—341 **28 Claims**



1. A near infrared quantitative instrument for measuring a fat/oil-containing sample material, comprising:

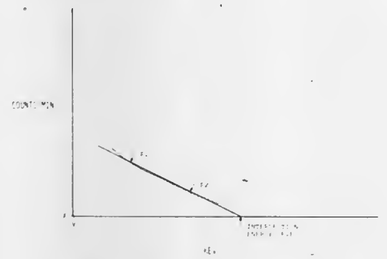
(a) means for providing at least one point source of near infrared radiation;
(b) a tube having a wall portion, the wall portion comprising a material which is capable of transmitting near infrared radiation; the material having a composition which does not substantially or inconsistently absorb near infrared radiation, the tube having first and second ends, the point source means being positioned at the first end of said tube for transmitting near infrared radiation through the wall portion of said tube, the tube being of a sufficient length that near infrared radiation from point source means positioned at the first end of the tube will emerge substantially uniform at the second end of the tube; the second end of the tube for positioning against the said sample material; the second end of the tube peripherally defining a generally central area;
(c) a near infrared radiation detector positioned for detecting near infrared radiation entering the generally central area peripherally defined by the second end of the tube, the detector being capable of providing an electrical signal upon detection of near infrared radiation;
(d) means for preventing near infrared radiation from the wall of the tube from impinging directly on said detector;
(e) means for shielding the outside of the tube from ambient light;
(f) means connected to the detector for amplifying an electrical signal provided by said detector; and
(g) means for data processing and readout, the data processing and readout means being connected to the amplifier means and being capable of processing the amplified signal and providing a readout indicative of the percent fat in the sample material.

4,633,088

REVERSE SUM QUENCH MEASUREMENT USING A LIQUID SCINTILLATION COUNTER

Donald K. Jones, Schaumburg; John D. Tomisek, Evergreen Park, and Harry M. Young, Barrington, all of Ill., assignors to Packard Instrument Co., Inc., Downers Grove, Ill.

Filed Apr. 8, 1985, Ser. No. 721,265
Int. Cl.⁴ G01T *1/204*
U.S. Cl. 250—369 **11 Claims**



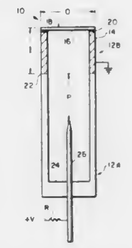
1. A scintillation counting system for use with a test sample containing one or more radioactive isotopes and a scintillator which converts energy emitted by radioactive decay of the isotopes into an optical event which comprises:
transducer means for converting each optical event into an electrical pulse proportional thereto;
elimination means connected to said transducer means for eliminating pulses which are not related to the decay of an isotope;
quantizing means connected to the elimination means for identifying a parameter of each pulse passed by the elimination means; and
means for determining a quench-indicating parameter including processing means connected to said quantizing means for (a) receiving and storing parameter data related to each nuclear event; (b) for determining a spectrum of the number of pulses at various energy levels; (c) for ascertaining a curve representing the cumulative area under the spectrum starting at the high energy end of the spectrum; (d) for fitting a function to the curve; and (e) for locating the endpoint of the spectrum by identifying the location where the function intersects the zero axis for the number of pulses.

4,633,089

HAND HELD RADIATION DETECTOR

Antonio Wijangco, Forest Hills, N.Y., assignor to Life Codes Corp., Elmsford, N.Y.

Filed May 3, 1984, Ser. No. 606,623
Int. Cl.⁴ G01T *1/18*
U.S. Cl. 250—374 **7 Claims**



1. A hand-held radiation detector for measuring localized radiation at extremely low levels, the detector comprising:
a housing including two peripherally engaged, axially extending, tubular members, one of said members being entirely insulative, the other of said members being metallic;
a radiation window at one end of said metallic tubular member, said window including a metallic portion in electrical contact with said metallic tubular member;
a sealed chamber defined by said housing, said chamber being filled with gas;
a needle within said chamber serving as an anode, said metallic tubular member and the metallic portion of said radiation window serving as a cathode;
a voltage means connected between said anode and cathode;
the point of the needle being located entirely within the portion of the chamber defined by said insulative tubular member and axially spaced from the other end of said metallic tubular member such that the electric field lines emanating from the radiation window, including those at the periphery, are forced into the amplifying region, which immediately surrounds the point of said needle, whereby efficient electron multiplication occurs responsive to radiation entering said chamber.

4,633,090

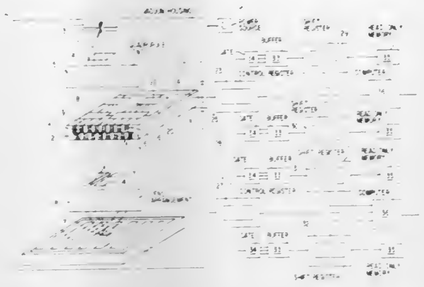
METHOD AND APPARATUS FOR PARTICLE IRRADIATION OF A TARGET

Eberhard Hahn, Jena, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed May 31, 1984, Ser. No. 615,971
Claims priority, application German Democratic Rep., Jul. 1, 1983, 2526616
Int. Cl.⁴ H01J *37/302*
U.S. Cl. 250—492.2 **15 Claims**

6. In an apparatus for the particle irradiation of a target having first and second modulation stages for modulating an electron beam; the improvement comprising a comb electrode for each of said modulation stages located at a first line focus of the electron beam, and, in order to set the magnitude of the

potential difference on the electrodes of the comb electrode, means are provided connected to the electronic circuits and



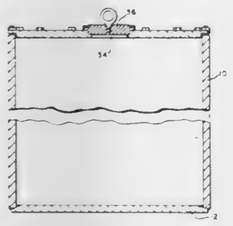
activated by an external control logic, for applying different potentials to the electrodes.

4,633,091

CONTAINER FOR THE STORAGE, TRANSPORTATION AND ULTIMATE DISPOSAL OF LOW LEVEL NUCLEAR WASTES

David H. Kurasch, Penn Hills; George V. B. Hall, Bethel Park, both of Pa.; Stephen C. Cossel, and Paul A. Miskimin, both of Carlsbad, N. Mex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1984, Ser. No. 659,991
Int. Cl.[4] G21F *5/02*
U.S. Cl. 250—506.1 **4 Claims**



1. A cylindrical cask-like container adapted for the on-site storage, later shipment, and permanent disposal of low-level-radiation nuclear waste material, said cask-like container facilitating the handling and storage of such waste material while minimizing transfer of material and possible exposure which can be encountered in handling and shipping such material, said container comprising:

a hollow right-circular cylindrical steel body member with the thickness of said hollow steel body member being predetermined to reduce at the outer surface of said container the radiation that is generated by the waste material the cask-like container is adapted to retain to a predetermined, safe level;

a steel bottom portion of said cask-like container having a circular configuration of predetermined dimensions slightly smaller than that of said hollow right-circular body member, and a thickness similar to that of said hollow right-circular body member, a recessed annular-conformed portion of predetermined dimensions formed about the upper periphery of said bottom portion member and forming a ledge at the inner dimension thereof, said bottom portion member when interfitted into the bottom of said hollow right circular-member forming with the exterior surface of said right-circular member a recessed ledge of predetermined dimensions, and said ledge formed at the inner dimension of said recessed annular conformed portion of said bottom member spaced a small predetermined distance from the inner surface of said hollow right-circular body member, and the formed exterior and interior ledges comprising high strength weld sites which join both the exterior surfaces and interior surfaces of said hollow right-circular steel body member and said steel circular bottom member;

a steel top member portion of said cask-like container having a circular configuration of predetermined dimensions slightly larger than the exterior dimensions of said hollow cylindrical body member and a thickness similar to that of said hollow right-circular body member, the bottom portion of said top member having a recessed annular conformed portion of predetermined dimensions about the periphery thereof so that the bottom portion of said top member interfits into the top section of said hollow cylindrical member, the top surface of said hollow right-circular member also having a recessed annular section at the inner portion thereof, gasket means which is resistant to radiation generated by said waste material, said gasket means retained in the formed annular recessed portions proximate the top of said container to form a seal between the interfitted top member portion and the upper surface of said hollow right cylindrical member, and said top member affixed to said hollow right-circular member by a plurality of bolt means extending through said top portion and into said hollow right-circular member to compress said gasket means and form a hermetic seal therebetween and retain the waste material adapted to be stored in said cask-like container; and

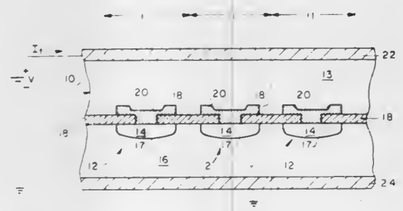
spaced heavy eyelet-type members affixed to the top portion of said top member to enable said cask-like container and top member to be lifted and handled.

4,633,092

LIGHT SENSING DEVICE

David J. Statt; Badhri Narayan, and Peter M. Zeitzoff, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,720
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—578 **5 Claims**



1. A light sensing device for detecting localized exposure conditions, said device comprising:

(a) a semiconductive substrate including a PN junction defining a junction diode having a predetermined reverse breakdown voltage and a capacitance that is functionally related to said junction;

(b) a layer of photoconductive material interposed between an electrode of said diode and a transparent electrode, to define a capacitive element, serially connected to said diode, having a capacitance that is functionally related to the thickness of said photoconductive layer;

(c) means for applying a voltage aross to said PN junction and to said capacitive element, the voltage being divided in accordance with the respective capacitances of said junction and said capacitive element, the capacitances being selected such that charge is transferred from said photoconductive material to said junction, in response to the impinging of light on said photoconductive material,

until the amount of charge accumulated at said junction produces a voltage corresponding to the predetermined breakdown voltage of said diode; and

(d) detector means, responsive to the charging of the PN junction reaching the diode reverse breakdown voltage, for producing an output signal indicating that a predetermined amount of light has impinged on said photoconductive layer.

4,633,093

METHOD OF FEEDBACK-CONTROLLING IDLING SPEED OF INTERNAL COMBUSTION ENGINE

Yutaka Otobe, Shiki, and Takahiro Iwata, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,265
Claims priority, application Japan, Jan. 18, 1984, 59-6772
Int. Cl.[4] F11D *15/10;* **F02D** *9/02*
U.S. Cl. 290—40 R **4 Claims**



1. An idling speed feedback control method for use with an internal combustion engine having electrical load equipment and a generator for supplying electric power to said electrical load equipment, said generator being driven by said engine, wherein an idling speed feedback control amount is effected as a function of the difference between an actual engine speed and a target idling speed, said method comprising the steps of detecting a generating state signal representing the generating state of said generator; determining an electrical load correction value as a function of the detected generating state signal; determining the amount of charge of the electrical load correction value during a time period starting at or before the time when the electrical load correction value changes and ending at the time at or after the electrical load correction value changes; modifying said electrical load correction value in accordance with the magnitude of the amount of the change; and correcting the idling speed feedback control amount as a function of the modified electrical load correction value.

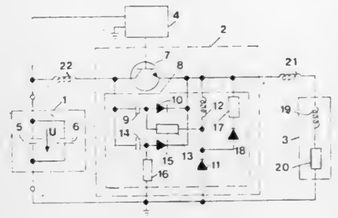
4,633,094

ELECTRONIC SWITCHING APPARATUS

Ivan Knudsen, Bjerringbro, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 6, 1985, Ser. No. 763,050
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429488
Int. Cl.[4] H01H *3/26;* **H02M** *1/18;* **G05F** *1/56*
U.S. Cl. 307—140 **6 Claims**

1. A changeover discharge circuit for an electronic circuit of the type having a semiconductor switching element in series with a DC source and an inductive load and having means for alternately turning said switching element on and off, said changeover discharge circuit comprising, a first capacitor and a first diode in series relative to each other and together in shunt with said switching element, said first diode having the same pass direction as said switching element, a commutation choke coil and a recovery diode in series relative to each other and in shunt with said inductive load, and a discharge resistor having one side thereof between said first capacitor and said first diode and the other side thereof between said choke coil and said recovery diode, said changeover discharge circuit



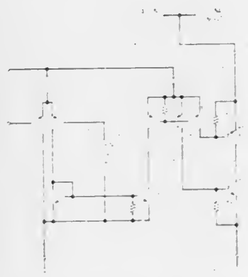
operating upon the switching on of said switching element to delay the initiation of the discharge of said first capacitor until the commutation of load current in said choke coil has substantially terminated.

4,633,095

MONOLITHIC SEMICONDUCTOR INTEGRATED A.C. SWITCH CIRCUIT

Yuji Komatu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,680
Claims priority, application Japan, Apr. 1, 1982, 57-54706
Int. Cl.[4] H03K *17/60, 3/26*
U.S. Cl. 307—255 **9 Claims**



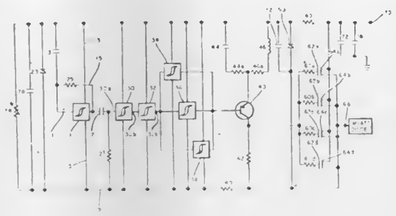
7. An electronic switch circuit comprising a switch terminal; a reference potential terminal; a switch control terminal; a first transistor having an emitter connected to said switch terminal, a base, and a collector; a second transistor having an emitter connected to said reference potential terminal, a base, and a collector connected to the collector of said first transistor; and a drive circuit coupled to said switch control terminal and supplying drive currents to the bases of said first and second transistors in response to a first state at said switch control terminal; said drive circuit controlling the bases of said first and second transistors to place said first and second transistors in an off state in response to a second state at said switch control terminal; said drive circuit including a current mirror circuit having a current input terminal, a first current output terminal connected to the base of said first transistor, and a second current output terminal connected to the base of said second transistor, said drive circuit further including an input circuit coupled between said current input terminal and said switch control terminal, said input circuit producing an input current to said current input terminal in response to said first state at said switch control terminal.

4,633,096

HIGH CURRENT DIODE PULSE MODULATOR

Allen F. Podell, Palo Alto, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 4, 1983, Ser. No. 549,368
Int. Cl.[4] H03K *3/01, 5/01*
U.S. Cl. 307—268 8 Claims



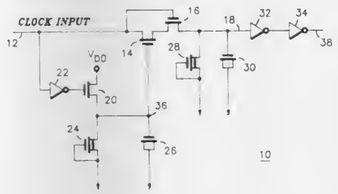
1. A high current compact pulse generator comprising:
a free-running oscillator;
a first Schmitt trigger;
a first capacitor connected in series between said free-running oscillator and the input of said first Schmitt trigger;
resistor means for rapidly discharging said capacitor;
a plurality of Schmitt triggers having their inputs coupled in parallel to the output of said first Schmitt trigger;
a drive transistor having an emitter and a collector connected across a voltage source and its base connected to the outputs of said plurality of parallel Schmitt triggers;
current amplifying means comprising a plurality of power transistors each having a source and a drain connected in parallel across said voltage source and a gate coupled to the collector of said drive transistor; and
an output node connected to one of the source or drain of each of said plurality of parallel power transistors.

4,633,097

CLOCK MONITOR CIRCUIT AND METHOD

B. Chris Dewitt, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 17, 1983, Ser. No. 552,885
Int. Cl.[4] H03K *5/13, 5/19, 17/56*
U.S. Cl. 307—269 2 Claims



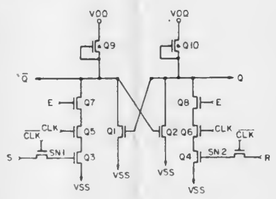
1. A clock monitor circuit for providing an output signal indicative of the presence of a clock signal which oscillates between first and second predetermined voltage levels, said monitor circuit comprising:
first charge storage means;
charging means, coupled to said first charge storage means and for receiving said clock signal, said charging means charging said first charge storage means at a first predetermined rate when said clock signal is at said first voltage level;
first discharging means, coupled to said first charge storage means, for continuously discharging said first charge storage means at a second predetermined rate which is less than said first predetermined rate;
first coupling means for receiving said clock signal and coupled to said first charge storage means, said first coupling means coupling said clock signal to a second node when the voltage on said first charge storage means exceeds a predetermined threshold voltage level;
second charge storage means;
second coupling means for receiving said clock signal and coupled to said second node, said second coupling means coupling said second node to said second charge storage means when said clock signal is at said second predetermined voltage level, said second charge storage means being charged by said clock signal via said second node;
second discharging means, coupled to said second charge storage means, for continuously discharging said second charge storage means at a third predetermined rate independent of said first and second predetermined rates; and
buffer means for providing an output signal indicative of the voltage on said second charge storage means.

4,633,098

FLIP-FLOP CIRCUIT WITH BUILT-IN ENABLE FUNCTION

Syed T. Mahmud, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed May 20, 1985, Ser. No. 736,045
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—279 1 Claim



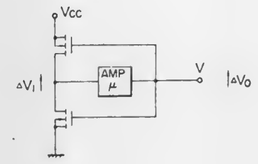
1. A flip-flop with a built-in enable function whereby said flip-flop can maintain its state through a number of clock cycles determined by an enable signal, comprising:
(a) a flip-flop having trigger means with clock inputs responsive to clock signals and having set and reset inputs so that during the application of a set signal to a set input, the occurrence of a first low to high logic level transition of a clock signal applied to a clock input will set said flip-flop to one state and during the application of a reset signal to said reset input, the occurrence of a second low to high logic level transition of said clock signal will set said flip-flop to another state opposite to said one state;
(b) said flip-flop having two complementary output nodes connected to said trigger means, a first one of said output nodes for setting said flip-flop in response to a set input and a second one of said output nodes for resetting said flip-flop in response to a reset input;
(c) said flip-flop having a first transistor responsive to said clock signal and a second transistor in series with said first transistor responsive to said set or reset signal; and
(d) a third transistor, responsive to the logic level at an enable input, coupled between said second transistor and an output node to prevent clock pulses from triggering said flip-flop by disconnecting said second transistor from said output node during the time period between at least two successive low to high logic level transitions of said clock signal, whereby said flip-flop can be prevented from switching during said time period.

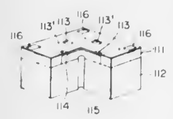
4,633,099

FEEDBACK CIRCUIT FOR A SEMICONDUCTOR ACTIVE ELEMENT SENSOR

Masanori Tanabe, Hitachi, and Kanji Kawakami, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,332
Claims priority, application Japan, Nov. 24, 1982, 57-204668
Int. Cl.[4] H03K *3/353, 5/153;* H01L *27/20;* G01L *1/22*
U.S. Cl. 307—308 5 Claims







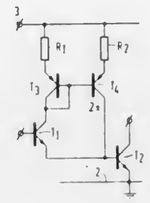
1. A semiconductor sensor comprising:
a main FET having a channel responsive to a change in physical quantity to be detected, wherein said physical quantity is a quantity representing mechanical variation;
impedance means which is connected in series with said main FET to form the load thereof;
negative feedback means for negatively feeding back the change in potential at a connection point where said main FET is coupled to said impedance means to the gate of said main FET; and
an output terminal for receiving an output signal based upon said potential change fed from said negative feedback means,
wherein said main FET is an insulated-gate FET and said negative feedback means includes first amplifying means having a voltage amplification factor larger than unity, said output signal being obtained by amplifying said potential change,
further wherein said load is an insulated-gate FET having a conductivity type which is different from that of said main FET,
and further wherein said insulated-gate FET constituting said main FET and said insulated-gate FET constituting said load are coupled to have their source and drains connected in series with one another between first and second predetermined potentials, and wherein said first amplifying means is coupled to feed back the change in potential at said connection point of said FETs to the gates of both the main FET and the insulated-gate FET constituting the load.

4,633,100

DARLINGTON TRANSISTOR ARRANGEMENT

Adrianus J. M. van Tuijl, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,066
Claims priority, application Netherlands, Feb. 29, 1984, 8400635
Int. Cl.[4] H03K *3/26;* H03F *3/04*
U.S. Cl. 307—315 4 Claims



1. A Darlington transistor arrangement comprising an input transistor having a collector, a base and an emitter and an output transistor having a collector, a base and an emitter, the emitter of the input transistor driving the base of the output transistor, characterized in that the collector of the input transistor is connected to the input of a current amplifier circuit which amplifies the collector current of the input transistor and supplies it to an output which is connected to the base of the output transistor, the current amplifier circuit is a current mirror circuit comprising an input-current path which is connected to the collector of the input transistor and which comprises the series arrangement of the collector-emitter path of a first transistor and a first resistor, and an output current path which is connected to the base of the output transistor and which comprises the series arrangement of the collector-emitter path of a second transistor, whose base-emitter junction is arranged in parallel with the base-emitter junction of the first transistor, and a second resistor, and the ratio of the resistance value of the first to the second resistor is larger than the ratio of the emitter area of the second to the emitter area of the first transistor.

4,633,101

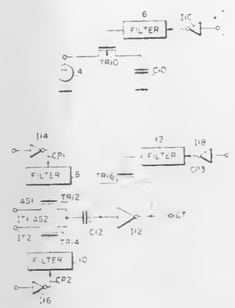
SEMICONDUCTOR SAMPLE AND HOLD SWITCHING CIRCUIT

Eiji Masuda, Kawasaki, and Kenji Matsuo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 421,073, Sep. 22, 1982. This application May 17, 1985, Ser. No. 735,291.
Claims priority, application Japan, Oct. 31, 1981, 56-173788
Int. Cl.[4] H03K *17/06, 19/003, 19/096, 17/687*
U.S. Cl. 307—353 10 Claims

1. In a semiconductor circuit comprising input means for receiving an input voltage; output means; a reference voltage terminal; pulse signal generating means for generating a pulse signal; a switching MOS transistor having a gate connected to receive said pulse signal and a channel connected between said input and output means, which switching MOS transistor operates in a conductive or nonconductive mode for executing a switching operation in response to the pulse signal from said pulse signal generating means; and first capacitive means, connected between said input means and said reference voltage terminal, for receiving an input signal applied to said input means when said switching MOS transistor is in conductive mode and for holding a voltage corresponding to the input voltage and a feedthrough error voltage from said pulse signal delivered to said first capacitive means through the gate-channel path of said switching MOS transistor after said switching MOS transistor switches from a conductive to a nonconductive mode, the improvement comprising:

means for reducing said feedthrough error voltage comprising a low-pass filter circuit coupled between the gate of said switching MOS transistor and said pulse signal generating means and having a time constant selected to reduce undershoot and overshoot components of said pulse signal.

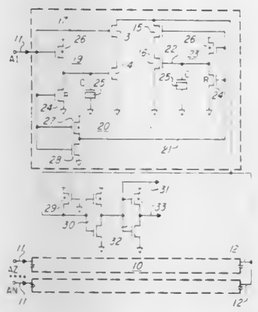


4,633,102

HIGH SPEED ADDRESS TRANSITION DETECTOR CIRCUIT FOR DYNAMIC READ/WRITE MEMORY

Jimmie D. Childers, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 9, 1984, Ser. No. 628,886
Int. Cl.[4] H03K *5/153;* **G11C** *8/00*
U.S. Cl. 307—354 **7 Claims**



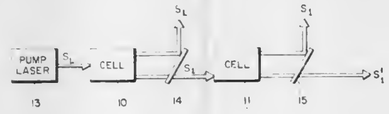
1. A transition detector circuit comprising:
an input terminal, and an inverter having an input connected to said input terminal and producing an inverted input;
an output node, and a pull-up resistance connecting said output node to a voltage supply;
a first logic circuit having first and second transistors each including a gate and a source-to-drain path, said source-to-drain paths connected in series and the series-connected source-to-drain paths connected between said output node and reference potential; means connecting said gate of the first transistor to said input terminal; and a first delay circuit coupling said gate of the second transistor to said input terminal;
a second logic circuit having third and fourth transistors each including a gate and a source-to-drain path, said source-to-drain paths of the third and fourth transistors connected in series and the series-connected source-to-drain paths connected between said output node and reference potential; means connecting said gate of the third transistor to said inverted input; and a second delay circuit coupling said gate of the fourth transistor to said inverted input,
wherein each of said first and second delay circuits comprises a P-channel transistor and an N-channel transistor, each having a source-to-drain path and a gate, the source-to-drain paths being connected in series across a voltage supply, the gates being connected together to input of the respective delay circuit, and juncture of the source-to-drain paths connected to an output of the respective delay circuit and a capacitor connected in parallel with the source-to-drain path of the N-channel transistor.

4,633,103

TWO CELL STIMULATED RAMAN SCATTERING FREQUENCY CONVERSION LASER

Howard A. Hyman, Belmont, and Daniel W. Trainor, Reading, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed May 4, 1983, Ser. No. 491,341
Int. Cl.[4] H03F *7/00*
U.S. Cl. 307—426 **9 Claims**



1. Laser apparatus for converting a beam of radiation from a laser at a different wavelength comprising:
(a) means for producing a first pump laser output beam of first frequency;
(b) first cell means filled with a first molecular or atomic gas for receiving said first pump laser beam and transparent thereto, said first gas when irradiated by a pump laser beam at said first frequency producing via SRS a first first-Stokes laser beam of second frequency containing at least a substantial portion of the energy of laser beams produced in said first cell means;
(c) first means for directing said first pump laser beam into and through said first cell means, said first pump laser beam undergoing SRS to produce said first first-Stokes laser beam of second frequency;
(d) first filter means for receiving said first first-Stokes laser beam and said pump laser beam from said first cell and transmitting substantially only said first first-Stokes laser beam;
(e) second cell means filled with a second molecular or atomic gas for receiving said first first-Stokes laser beam and transparent thereto, said second gas when irradiated by a laser beam at said second secondary frequency producing via SRS a second first-Stokes laser beam of third frequency containing at least a substantial portion of the energy of laser beams produced in said second cell means;
(f) second means for directing said first first-Stokes laser beam into and through said second cell means, said first first-Stokes laser beam undergoing SRS to produce said second first-Stokes laser beam of third frequency; and
(g) second filter means for receiving said second first-Stokes laser beam and first first-Stokes laser beam from said second cell and transmitting substantially only said second first-Stokes laser beam.

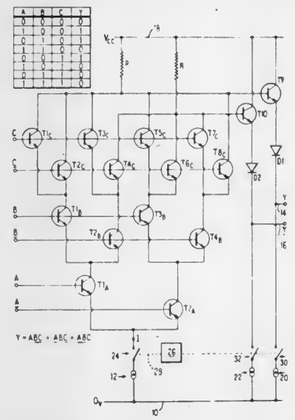
4,633,104

BIPOLAR TRANSISTOR LOGIC CIRCUITS

Andrew M. Mallinson, Salem, N.H., assignor to Ferranti plc, Cheshire, England

Filed Sep. 14, 1984, Ser. No. 650,649
Claims priority, application United Kingdom, Sep. 15, 1983, 8324710
Int. Cl.[4] H03K *19/082, 19/086, 19/20, 19/21*
U.S. Cl. 307—454 **8 Claims**

1. A bipolar transistor logic circuit having differential inputs and two output lines constituting a differential pair, said logic circuit comprising:
at least three gating combinations, each gating combination comprising an associated pair of switching transistors having their emitters connected together;
said gating combinations arranged in a symmetrical hierarchical arrangement with a plurality of constituent levels, the highest level having only one gating combination;
a constant current source;
for the gating combination of the highest level of the hierarchical arrangement, the emitters being connected to said constant current source;
for each gating combination of each other constituent level of the hierarchical arrangement, the emitters being connected to a collector of an associated pair of switching transistors of the adjacent higher level of the hierarchical arrangement;
the two collectors of the associated pair of switching transistors of the highest level of the hierarchical arrangement, and at least one collector of each associated pair of switching transistors of each level of the hierarchical arrangement, except the lowest level, being connected individually to the emitters of an associated pair of switching transistors of the adjacent lower level of the hierarchical arrangement;
the differential inputs to the logic circuit being connected to transistor bases, with different differential inputs being supplied to different constituent levels of the hierarchical arrangement;
said circuit being arranged, such that, in response to the differential inputs a corresponding differential output is provided on the output lines, the two output lines being at least coupled, selectively, to the collectors of associated pairs of switching transistors of at least the lowest level of the hierarchical arrangement, all the collectors of the associated pairs of switching transistors of the lowest level of the hierarchical arrangement being coupled selectively to one or the other of the two output lines; and
switching means for controlling said constant current source to enable the logic circuit to be driven ON and OFF.



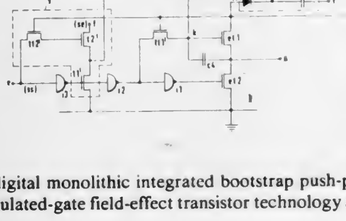
4,633,105

BOOTSTRAP TYPE OUTPUT CIRCUIT

Akira Tsujimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo

Filed Dec. 27, 1984, Ser. No. 686,863
Claims priority, application Japan, Dec. 27, 1983, 58-250110
Int. Cl.[4] H03K *5/135, 19/017, 19/096, 4/58*
U.S. Cl. 307—482 **13 Claims**

1. In a bootstrap type output circuit of the type having a delay section having a first series circuit of first and second field effect transistors coupled between power voltage sources, a second series circuit of third and fourth field effect transistors coupled between said power voltage sources, the gate of said first transistor receiving a first input signal, the gates of said second and third transistors receiving a second input signal, and means for connecting the gate of said fourth transistor to the intermediate junction of said first series circuit, a delay output signal from said delay section being the signal at the intermediate junction of said second series circuit; and a buffer section having a bootstrap capacitor and means for operatively charging said capacitor in response to said delay output signal, the improvement comprising, means for operatively setting the level of said gate of said fourth transistor to the level of said first input signal in response to said delay output signal.

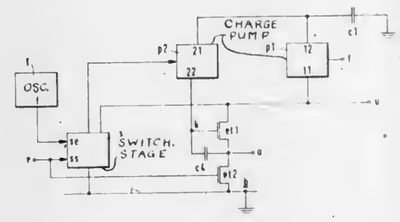


4,633,106

MOS BOOTSTRAP PUSH-PULL STAGE

Reiner Backes, Freiburg, and Friedrich Schmidtpott, Gundelfingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

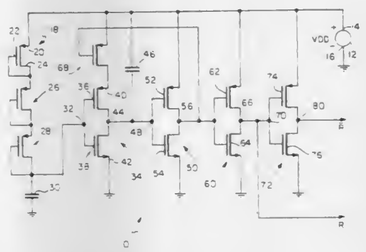
Filed May 25, 1984, Ser. No. 614,295
Claims priority, application European Pat. Off., May 27, 1983, 83105252.7
Int. Cl.[4] H03K *4/24, 4/58, 17/10, 19/096*
U.S. Cl. 307—578 **12 Claims**



1. A digital monolithic integrated bootstrap push-pull stage using insulated-gate field-effect transistor technology and comprising:
an input terminal;
first and second enhancement-mode output-stage transistors having their drain-source paths connected in series be-

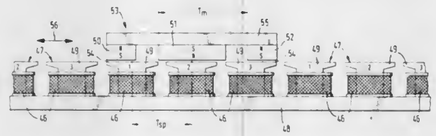
tween a supply voltage terminal and a ground terminal, the drain source path of said first transistor connected to said supply voltage terminal said second transistor having its gate connected to said input terminal;
an output terminal coupled to the junction of said first and second transistors;
a bootstrap capacitor having a first terminal connected to the gate of said first transistor whereby a bootstrap node is formed, and having a second terminal connected to a circuit point which follows the potential at the output of the bootstrap push-pull stage;
a first charge pump circuit having a first clock input terminal for receiving clock signals, a first direct-voltage terminal connected to said supply voltage terminal, and a second direct-voltage terminal having a voltage polarity opposite to that of the supply voltage;
a second charge pump circuit having a first direct-voltage terminal having a voltage polarity opposite to that of the supply voltage and coupled to said first charge pump second direct voltage terminal, a second direct-voltage terminal connected to said bootstrap node, and a second clock input terminal for receiving clock signals; and
a switching stage having a third input terminal coupled to said input terminal and having a third clock input terminal for receiving said clock signals and having a clock output terminal for coupling said clock signals to said second clock input terminal via said clock output terminal if the input signal to said bootstrap push-pull stage at said input terminal is at a logic level assigned to the supply voltage at said supply voltage terminal.

4,633,107
CMOS POWER-UP RESET CIRCUIT FOR GATE ARRAYS AND STANDARD CELLS
Steven R. Norsworthy, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Nov. 20, 1984, Ser. No. 673,386
Int. Cl.⁴ H03K *17/22*
U.S. Cl. 307—594 **22 Claims**



1. A power-up reset circuit, comprising
means coupled to a source voltage potential for sensing the source voltage potential and providing a time-delayed signal at an output in response thereto;
a threshold detection inverter having an input coupled to the output of the time delay means and having power supply terminals and an output;
a feedback switch coupled in series with the threshold detection inverter's power supply terminals between the source voltage potential and a source voltage reference;
a wave-shaping circuit having an input coupled to the output of the threshold detection inverter for providing a reset signal at an output;
means for coupling the input of the wave-shaping circuit to the source voltage potential to permit a voltage at the input of the wave-shaping circuit to follow the source voltage potential during an initial rise of the source voltage potential; and
means for coupling an output of the wave-shaping circuit to an input of the feedback switch.

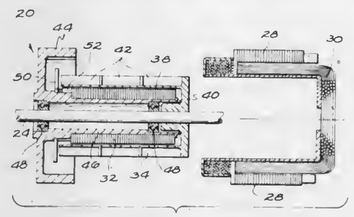
4,633,108
DIRECT CURRENT LINEAR MOTOR
Johann von der Heide, Mönchweiler, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany
Continuation of Ser. No. 583,094, Feb. 23, 1984, abandoned, which is a continuation of Ser. No. 272,922, Jun. 12, 1981, abandoned. This application Jul. 22, 1985, Ser. No. 757,919
Claims priority, application Switzerland, Jun. 12, 1980, 4519/80
Int. Cl.⁴ H02K *41/00*
U.S. Cl. 310—12 **12 Claims**



1. A brushless direct current linear motor, particularly for use in data processing drive systems, said motor having a stationary portion and an armature and comprising:
a permanent magnetic system formed of a plurality of permanent magnet poles disposed linearly adjacent each other and being alternately magnetized;
a ferromagnetic structure formed of at least one slotted flux-carrying member and a plurality of coils connected into a three independent-coil type winding, the coils disposed linearly adjacent each other on the flux-carrying member, the coils being energized in cyclic sequence and each said coil separately surrounding a substantially T-shaped pole of the at least one flux-carrying member between adjacent slots thereof; and
a flat air gap defined between and separating said permanent magnetic system and said ferromagnetic structure;
the ratio of the coil pitch of said ferromagnetic structure to the magnetic pitch of the permanent magnetic system being 2:3 irrespective of the number of coils;
said permanent magnetic system and said ferromagnetic structure being linearly moveable relative to each other in their longitudinal direction, the axis of each said coil of said ferromagnetic structure extending perpendicular to the direction of relative movement and the permanent magnet poles being alternately magnetized in a direction perpendicular to the direction of relative movement.

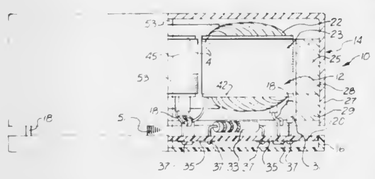
4,633,109
ELECTRONICALLY COMMUTATED, COLLECTORLESS DIRECT-CURRENT MOTOR
Josef Feigel, Landshut, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Oct. 23, 1985, Ser. No. 790,548
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438747
Int. Cl.⁴ H02K *37/00*
U.S. Cl. 310—68 R **18 Claims**

1. An electronically commutated, collectorless direct current motor comprising, in combination:
a stator comprised of an external magnetic yoke, a stator winding and an internal magnetic yoke;
a rotor rotationally arranged between the stator winding and the internal magnetic yoke, the rotor being a permanent magnet rotor and designed in the form of a cup-shaped hollow cylinder comprised of a non-magnetic material and mechanically connected to a motor shaft;
an insulating body employed in the fabrication of the stator winding, said insulating body having a first side and a second side;
a disk-shaped ring connected to said insulating body and having a plurality of annularly arranged, axially extending slotted portions on said first side, the number of said slotted portions being a multiple of the number of pole pairs of said motor;
a pair of sidewalls mechanically connected to each of said slotted portions for structurally supporting a plurality of phase windings of the stator winding outside each slotted portion and between said sidewalls of adjacent slotted



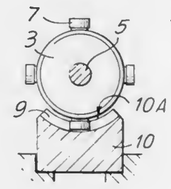
portions and on a portion of a tubular section of said first side; and
a slot-shaped opening formed within each of said slotted portions between each pair of sidewalls for receiving one of a plurality of teeth of said external magnetic yoke for completing the magnetic circuit of the stator, the second side of said insulating body further including a plurality of openings communicating with a plurality of vertically directed slots and a plurality of bridges in said disk-shaped ring for providing a distribution path for said phase windings.

4,633,110
MOTOR WITH STATOR ON PRINTED CIRCUIT ASSEMBLY
Jerry J. Genco, Kingston, and Norman Smith, Woodstock, both of N.Y., assignors to Rotron, Inc., Saugerties, N.Y.
Filed Mar. 20, 1985, Ser. No. 714,099
Int. Cl.⁴ H02K *3/50, 21/22*
U.S. Cl. 310—71 **12 Claims**



12. A motor comprising:
a stator core;
a rotor mounted for rotation relative to the stator core;
at least one stator winding wound on the stator core for generating a magnetic field for driving the rotor;
a plurality of terminals having first ends extending away from the stator core and second ends ecured to the stator core, each terminal having a tang at a medial portion of said terminal between said two ends;
the winding having ends welded beneath tangs of preselected terminals and without encircling said terminals;
a printed circuit board;
motor energization circuit means on the printed circuit board;
openings in the board conforming in size and location to the terminal first ends, said openings receiving the terminal first ends therethrough; and
conductors on the side of the board remote from the stator having solder connections to the preselected terminals on the stator core and to electrical connection means of components of the circuit means.

4,633,111
ACTUATOR OF LINEAR MOTION, WITH A RACK-LIKE MEMBER AND A ROTATING MEMBER
Mario Gonzi, Via Montarfoni 65, Ponticino-Laterina, Italy (52020)
Filed Apr. 29, 1985, Ser. No. 728,190
Claims priority, application Italy, May 8, 1984, 9393 A/84
Int. Cl.⁴ H02K *7/12*
U.S. Cl. 310—80 **9 Claims**

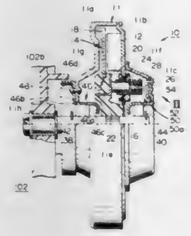


1. A kinematic mechanism comprising in combination a first member mounted for rotation about a central axis, said first member supporting a coplanar array of radially projecting fingers with said fingers having radially outer ends located on a circle centered on said axis in a plane normal to said axis, said fingers being circumferentially spaced about said circle, a second member having opposite side edges and a concave cylindrical surface extending between said side edges, said cylindrical surface having a plurality of adjacent channels formed therein which channels extend from one of said side edges to the other of said side edges crossing the generatrices of said cylindrical surface, said channels in succession in one direction that is parallel to said generatrices having their respective ends that intersect said one side edge centered about a respective plane that is normal to the generatrices of said cylindrical surface and that passes through the center of the end of the next adjacent channel in said succession which last mentioned channel end intersects said other side edge, the inclination, at any point along its length, of the longitudinal axis of each of said channels relative to said generatrices being selected to provide a predetermined desired motion, said inclination at the end of each of said channels that intersects said one side edge being the same as the inclination of the next adjacent channel in said succession at its respective end that intersects said other side edge, and means supporting said two members with said generatrices parallel to said central axis of said first member and with at least one of said finger outer ends engaged in one of said channels, said means supporting one of said two members for linear movement along a path parallel to said generatrices, the arrangement being such that as said first member rotates an advancing finger end enters one of said channels before the leading finger end exits from the adjacent channel.

4,633,112
FLAT ELECTRIC MOTOR WITH ADJUSTABLE BEARING SUPPORT
Shiyuichi Miyake, Sano, Japan, assignor to Nihon Radiator Co., Ltd., Japan
Filed Jun. 24, 1985, Ser. No. 748,351
Claims priority, application Japan, Jun. 26, 1984, 59-94588[U]; Jun. 29, 1984, 59-96760[U]
Int. Cl.⁴ H02K *5/16, 7/08*
U.S. Cl. 310—90 **11 Claims**

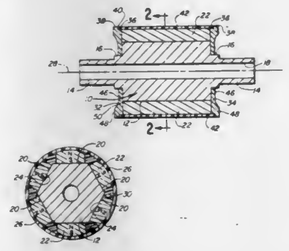
1. An electric motor comprising:
a casing;

a drive shaft passing through said casing and rotatable about the axis thereof relative to said casing;
an armature unit mounted on said drive shaft to rotate therewith;
a commutator attached to said armature unit to move therewith;
electric brushes arranged in slidable contact with said commutator to provide electric connection therebetween;



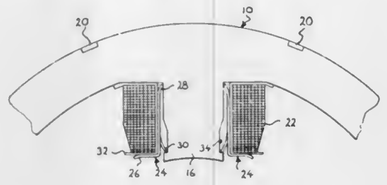
two annular bearings which are connected to said casing to bear two axially spaced portions of said drive shaft; and
a resiliently mounted support for one of said annular bearings and an adjustable fastening means for adjusting the location of said support to adjust the position of said one bearing relative to said casing.

4,633,113
SIDE PLATE CONSTRUCTION FOR PERMANENT MAGNET ROTOR
Navinchandra R. Patel, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Oct. 16, 1985, Ser. No. 788,163
Int. Cl.[4] H02K *21/14*
U.S. Cl. 310—156 **7 Claims**



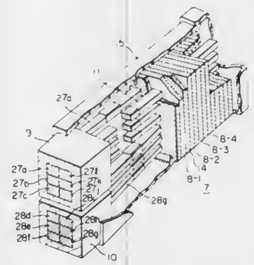
1. A permanent magnet rotor for use in a dynamo electric machine comprising:
a rotor hub defining an intended axis of rotation;
a plurality of circumferentially spaced magnets on said hub;
filler material disposed between adjacent ones of said magnets;
axially spaced opposed side plates on said hub sandwiching said magnets and said filler material, each said side plate having a stepped periphery including an axially inner, generally cylindrical surface of substantially the same diameter as the hub with the magnets and filler material in place and an axially outer, generally cylindrical surface of a greater diameter than said same diameter to define a radially outward opening annular recess; and
a generally cylindrical body of cured fibrous material in said recess and having an outer diameter equal to said greater diameter.

4,633,114
MOTOR COIL RETENTION APPARATUS
Kenneth R. Reynolds, Erie, Pa., assignor to General Electric Company, Salem, Va.
Filed Sep. 26, 1985, Ser. No. 780,152
Int. Cl.[4] H02K *1/18*
U.S. Cl. 310—194 **12 Claims**



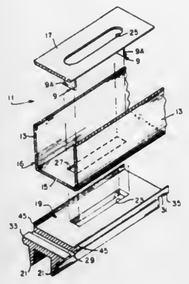
5. A mounting arrangement for a commutating coil on a commutating pole in a direct current electric motor, the coil being pre-formed to a desired shape, a predetermined number of coil turns, and having a central aperture for sliding onto the pole, the mounting arrangement comprising a retention structure associated with each side of the pole and a plurality of unitary L-shaped clip members of spring-like elastic material each having a first arm sized to slip between a side of the pole and an inner surface of the coil, a second arm of each pole of the clip members extending outwardly from the pole and overlapping a surface of the coil whereby the coil is pressed downward onto the pole, and means on each of the first arms contacting the retention structure on the pole whereby the clips are retained on the pole.

4,633,115
APPARATUS FOR CONNECTING CONDUCTOR STRANDS WITH TRANSPOSITION IN ELECTRICAL ROTARY MACHINE
Toshio Saitoh; Noriyoshi Takahashi; Masaki Sato, and Masatoshi Watanabe, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 7, 1985, Ser. No. 709,140
Claims priority, application Japan, Mar. 9, 1984, 59-43816
Int. Cl.[4] H02K *3/14*
U.S. Cl. 310—213 **4 Claims**



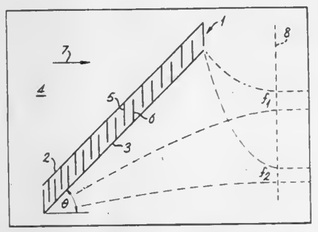
1. In an electrical rotary machine having a winding of multiple-strand conductors, an apparatus for connecting conductor strands with transposition, comprising a plurality of electrically conductive connector rods respectively connected to ends of the individual strands of the conductors, a plurality of electrically conductive plates arrayed face-to-face in a longitudinal direction of said connector rods, each plate having passages through which said connector rods extend across the plate, and means for electrically connecting a selected pair of the connector rods to a selected one of said plates at its passages through which said paired rods extend, while insulating said paired rods from other connector rods.

4,633,116
SUB-SLOT COVER FOR DYNAMOELECTRIC MACHINE
Scott K. Derderian, Salem, Mass., assignor to General Electric Company, Lynn, Mass.
Filed Oct. 31, 1985, Ser. No. 793,407
Int. Cl.[4] H02K *3/48*
U.S. Cl. 310—214 **16 Claims**



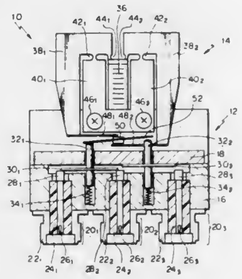
1. In a dynamoelectric machine including a rotor, a plurality of axially extending slots and sub-slots in the rotor for receiving electrical conductors, means in each slot for electrically insulating the conductors from the rotor comprising:
a substantially U-shaped insulating member having an axially extending base and a pair of axially and radially extending legs, said legs extending along sides of the slot between the conductors and the rotor with said base adjacent at least one of the sub-slots; and
a sub-slot cover having a first portion for positioning adjacent the sub-slot for supporting said base of said insulating member and having a second portion latchably attachable to said first portion through said base.

4,633,117
SLANTED AND CHIRPED SURFACE ACOUSTIC WAVE DEVICES
Paul D. Bloch; Michael E. Barnard, and Edward G. S. Paige, all of Oxford, England, assignors to National Research Development Corp., London, England
Filed Aug. 30, 1984, Ser. No. 645,769
Claims priority, application United Kingdom, Aug. 30, 1983, 8323178
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 B **20 Claims**



1. A surface acoustic wave device comprising:
a substrate having a surface;
a conductive layer deposited on the surface of the substrate to form a slanted chirped transducer with fingers having lengths short enough that when an excitation signal is applied to the transducer, a surface acoustic wave signal is generated in the transducer and is focused to a position on the surface of the substrate spaced from the transducer, this position on the substrate being dependent on the frequency of the signal, and being in different locations on the surface for different frequencies.

4,633,118
PIEZOELECTRICALLY ACTUATED HIGH-SPEED MICROWAVE SWITCH
Yuhei Kosugi, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed May 23, 1985, Ser. No. 737,626
Claims priority, application Japan, May 28, 1984, 59-108099
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **15 Claims**



1. A microwave switch for selectively connecting a first selection terminal and a second selection terminal to a common terminal, comprising:
a first stationary selection contact and a second stationary selection contact which respectively constitute the first and second selection terminals;
a stationary common contact constituting the common terminal which is located between said first and second stationary selection contacts;
a first movable center conductor and a second movable center conductor located respectively between said common contact and said first selection contact and between said common contact and said second selection contact for shorting the stationary common contact and one of the first and second selection contacts;
a first movable rod and a second movable rod for carrying respectively said first and second center conductors;
an electroexpansive element which is variable in length responsive to a voltage applied from the outside;
a first lever and a second lever, each having a first and a second end, and being connected said electroexpansive element at said first end for magnifying a displacement of said electroexpansive element;
a first flexible member and a second flexible member mounted respectively on said second ends of the first and second levers in parallel to and opposing each other with the end of one flexible member adjacent the end of the other flexible member;
a connecting member for connecting said adjacent ends of said first and second flexible members and being displaceable in a rotational motion responsive to a displacement of the flexible members; and
a moveable rod driving member for moving the first and second movable rods in opposite directions to each other responsive to the rotational motion of said connecting member.

4,633,119

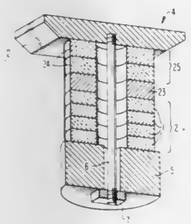
BROADBAND MULTI-RESONANT LONGITUDINAL VIBRATOR TRANSDUCER

Stephen C. Thompson, Euclid, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 626,784, Jul. 2, 1984, abandoned. This application Jun. 14, 1985, Ser. No. 744,739

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—325 **8 Claims**



1. A longitudinal electromechanical transducer, comprising:
a head section comprising:
N head masses, where N is an integer greater than or equal to two; and
N-1 compliant means, fixed between said head masses in a laminar structure, for coupling said head masses;
electromechanical transducers, fixed to said head section, for providing electromechanical conversion; and
a tail mass fixed to said electromechanical transducer means, said transducer allowing resonant vibration at at least N resonances within the operating band of said transducer.

4,633,120

ELECTROSTRICTION TRANSDUCER COMPRISING ELECTROSTRICTION LAYERS OF AXIALLY VARIED THICKNESSES

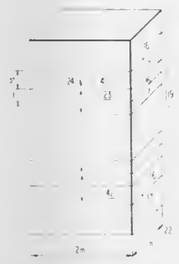
Eiichi Sato; Izumu Fukui; Osamu Inui; Takeshi Yano; Sadayuki Takahashi, and Atsushi Ochi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,113

Claims priority, application Japan, Oct. 19, 1983, 58-195739

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—328 **7 Claims**



1. In an electrostriction transducer comprising:
a column of an electrostriction material having an axis,
first-type and second-type internal electrodes disposed in said column to divide said column into a plurality of electrostriction layers stacked on one another along said axis,
a first and a second protection layer contiguous axially outwardly of said column, and
a first and a second external electrode connected respectively to the first-type and second-type internal electrodes for supplying a voltage to all of said internal electrodes to produce electric fields in said plurality of electrostriction layers parallel to said axis and to produce an elongation of said column, the improvement comprising:
first and second end electrostriction layer means, each said means being disposed between said column of electrostriction material and a respective one of said protection layers with a second-type internal electrode and a first-type internal electrode, respectively, disposed therebetween, for reducing stresses concentrated at the interface between said column of electrostriction material and said respective protection layers, each of said first and second electrostriction means comprising a layer of electrostriction material having a thicker thickness than any of said electrostriction layers in said column of electrostriction material.

4,633,121

COMB-SHAPED PIEZOELECTRIC DRIVE DEVICE

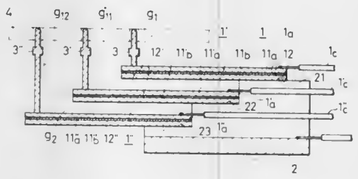
Yasuhiko Ogawa, No. 322-1, Oaza Kurigashima, Takenezawa-machi, Shioya-gun, Tochigi; Kazuhiko Nakayama, Namiki 3-chome 505, No. 1211, Oaza Sasagi, Sakura-mura, Niihari-gun, Ibaraki, and Minoru Yasuda, Aichi, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi; Yasuhiko Ogawa, Tochigi and Kazuhiko Nakayama, Ibaraki, all of, Japan

Filed May 20, 1985, Ser. No. 736,043

Claims priority, application Japan, May 29, 1984, 59-108759

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—332 **3 Claims**



1. A comb-shaped piezoelectric drive device for displaying raised letters for the blind comprising:
a plurality of comb-shaped piezoelectric units each comprising: a plurality of strip-shaped drive members extending from an integral common base part; a first metal electrode layer formed on one main surface of each of said drive members, said first metal electrode layers of each of said drive members being electrically insulated from one another; and an electrically continuous common metal electrode layer formed on the other main surface of said drive members;
a plurality of seats provided in the form of steps on a base board, said piezoelectric units being fixed to respective ones of said seats through base parts on said other main surfaces on which said common metal electrode layers are formed;
a plurality of pins, each of said pins being fixed to a free end portion of a respective one of said drive members; and
a rigid plate having holes therein through which ends of said pins are selectively protruded upon selective application of a voltage between said common metal electrode layers and said first electrode layers.

4,633,122

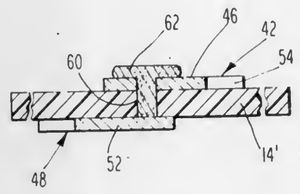
MEANS FOR ELECTRICALLY CONNECTING ELECTRODES ON DIFFERENT SURFACES OF PIEZOELECTRIC POLYMERIC FILMS

Peter F. Radice, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 18, 1985, Ser. No. 745,986

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **10 Claims**



1. A piezoelectric transducer comprising
a piezoelectric polymer film,
a ground electrode with lead deposited on one surface of said film,
a signal generating electrode with lead deposited on other surface of said film, said leads being deposited in staggered relationship on said film and extending substantially parallel to each other in same direction,
means for facilitating electrical connections to said leads by electrically disposing said leads on same surface of said film, said means comprising,
said film having a channel provided therethrough, said channel piercing one of said leads to form a pierced lead,
conductive material affixed to said film over said channel to provide a linking lead on opposite surface of said film carrying said pierced lead, said conductive material coating sidewalls of said channel to effect continuity of said conductive material between said pierced lead and said linking lead,
said conductive material being resilient, durable and rubber-like and comprising a polymer matrix having a conductive metal embedded therein selected from the group consisting of silver, nickel and copper, said ground electrode with lead and said signal generating electrode with lead consisting of said conductive material, and
other means for connecting said leads on same surface of said film to electrical connectors.

4,633,123

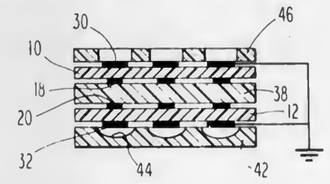
PIEZOELECTRIC POLYMER KEYBOARD APPARATUS

Peter F. Radice, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 29, 1985, Ser. No. 738,710

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **5 Claims**



1. In a keyboard switch including a pair of poled piezoelectric films having metallic electrodes disposed thereon, said switch comprising
a pair of electrically insulating substrates having a plurality of spaced identical cut-out openings in each,
said pair of poled piezoelectric films each having a plurality of ground electrodes deposited on one surface thereof and a plurality of signal generating key electrodes deposited over other surface,
each of said substrates having one of said grounded electrode surfaces adhered thereto over said openings, said key electrodes and ground electrodes being in substantial registration with openings in substrate associated therewith, said key electrodes having leads connecting individual rows on one piezoelectric film disposed orthogonally to leads connecting individual columns on other of said piezoelectric film,
an insulating sheet disposed between said piezoelectric films, said films having their key electrode surfaces in face-to-face relationship, the improvement to said switch comprising:
said ground electrodes and said key electrodes having thicknesses ranging between about 5 to 7 microns and comprised of finely divided electrically conductive metal embedded in a polymer matrix whereby said electrodes and polymer film may be successfully deflected and strained millions of times.

4,633,124

MOUNT FOR QUARTZ CRYSTAL RESONATOR

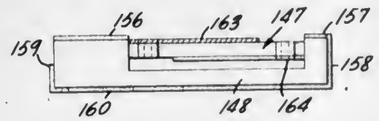
Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,446

Claims priority, application Japan, Mar. 16, 1982, 57-41158; Mar. 16, 1982, 57-41159

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—348 **17 Claims**



1. A coupling quartz crystal resonator unit comprising: a resonator including a resonant portion having opposed relatively short sides and opposed relatively long sides and being provided with a pair of exciting electrodes on its surface, and a pair of supporting portions connected to respective ones of said short sides and each having a mount portion; a pedestal supporting and fixing said mount portions of the resonator; a pair of electrode terminals disposed on the same side of the pedestal and connected to respective ones of said pair of exciting electrodes; a stem; and two lead wires passing through the stem and having ends electrically and mechanically secured to said pair of electrode terminals of the pedestal; said pedestal having rececesses which are covered at least in part by respective ones of the pair of electrode terminals and in which are disposed at least either said mount portions of the resonator or said ends of the lead wires.

4,633,125

VENTED 360 DEGREE ROTATABLE VESSEL FOR CONTAINING LIQUIDS

Henry G. Blosser, East Lansing; Gabe F. Blosser, Haslett; Emanuel B. Jemison, Lansing, all of Mich., and John R. Purcell, San Diego, Calif., assignors to Board of Trustees Operating Michigan State University, East Lansing, Mich.

Filed May 9, 1985, Ser. No. 732,394

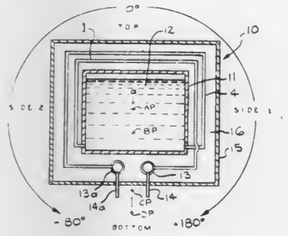
Int. Cl.⁴ H05H *13/00*

U.S. Cl. 313—62 **11 Claims**

1. A 360° rotatable, vented apparatus for containing a liquid which comprises:
(a) a vessel having an inside defining a chamber for confining

the liquid on the inside of the vessel, having an outside and having top, side and bottom positions relative to the liquid to be provided in the chamber and having a pivot axis for rotation of the vessel between +180 and −180 degrees in a plane on either side of the top position at 0 degrees of the vessel;

(b) support means mounted on the outside of the vessel for rotating the vessel on the pivot axis; and



(c) multiple conduit means mounted around the vessel in the plane of rotation, each conduit means having two open ends, one end leading inside the vessel and the other end on the outside of the vessel, wherein the conduit means are mounted around the outside of the vessel on the top and both side portions, wherein liquid traps are provided in some of the conduit means, wherein vapors from the liquid are vented from the other open ends of the conduit means in the angular range between −180 to +180 degrees from the top position at 0 degrees.

4,633,126

ELECTRIC REFLECTOR LAMP

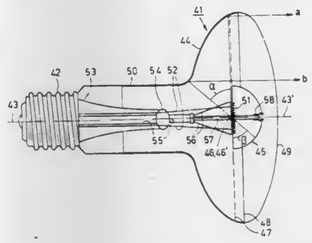
Henricus F. J. I. Giller, and Jacobus A. E. W. Heijboer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 504,549, Jun. 15, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 814,524

Claims priority, application Netherlands, Jul. 23, 1982, 8202971

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 313—113 **22 Claims**



1. A glare-free electric reflector lamp, comprising:

a closed glass lamp envelope, having a concave internally-mirror-coated wall portion having an apex, said mirror-coated portion having a shape which defines an optical axis, a focus and a focal plane situated within the lamp envelope; a tubular wall portion extending from the apex of the mirror-coated wall portion to the exterior; and a translucent wall portion arranged opposite the mirror-coated wall portion, said wall portions forming part of one blow molding,

a concave curved mirror facing said mirror-coated wall portion, substantially coaxial therewith, and having its center of curvature substantially coinciding with the focus of the mirror-coated wall portion, those portions of said mirror-coated wall portion and said concave curved mirror, which cooperate to throw light rays onto said translucent wall portion, together having a total solid angle surrounding the focus of at least 1.5 π sr, and

a light source disposed within said envelope, surrounding said focus,

characterized in that said mirror-coated wall portion extends substantially from said tubular portion to beyond said focal plane,

said concave curved mirror is a hemispheric mirror which forms a mask, and at least substantially completely prevents light rays originating from said light source from reaching said translucent wall portion without being reflected at least once, and,

said hemispheric mirror is a metal reflector body mounted within said lamp envelope, having a largest external diameter, transverse to the axis, which is smaller than the internal diameter of said tubular lamp envelope portion,

whereby substantially all light rays passing through said translucent wall portion pass generally in the same direction as said axis.

4,633,127

ELECTRIC LAMP HAVING A STRONGLY COLORED LAMP ENVELOPE

Johannes H. H. Beurskens, and Christiaan Prozeé, both of Weert, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,548

Claims priority, application Netherlands, Feb. 10, 1983, 8300498

Int. Cl.⁴ H01K *1/32;* **H01J** *5/16*

U.S. Cl. 313—112 **4 Claims**

1. An electric lamp having the same apparent color under incident as with transmitted light, comprising a glass lamp envelope sealed in a vacuum-tight manner, a light source arranged within said envelope, and a light-scattering pigmented powder layer, comprising at least one cadmium compound, electrostatically applied to the inner surface of said envelope,

characterized in that said powder layer further comprises as an effective part of the pigment a cadmium-free compound which has the same color as said cadmium compound, and which has insufficient coloring power by itself to produce the same color for incident as for transmitted light.

4,633,128

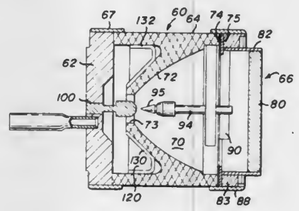
SHORT ARC LAMP WITH IMPROVED THERMAL CHARACTERISTICS

Roy D. Roberts, Newark, and Robert L. Miner, Palo Alto, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed May 17, 1985, Ser. No. 735,380

Int. Cl.⁴ H01J *61/30, 5/16*

U.S. Cl. 313—113 **8 Claims**



1. An improved lamp of the short arc type comprising:

a generally cylindrical body formed of an opaque dielectic ceramic material having a concave cavity formed therein defining a curved, reflecting wall symmetical about a central axis of the lamp;

a transparent window assemby sealing mounted across the mouth of said concave cavity such that pressurized gas is maintained in said cavity;

a pair of electrodes mounted within said cavity to extend along said central axis with the distal ends of said electrodes being spaced apart a distance to define a short arc gap at the focal point of said curved reflecting wall;

a base plate sealingly secured to the cylindrical body at the end opposite said mouth of said concave cavity; and

a convex space formed within the ceramic body behind said reflecting wall symmetrically about said central axis, the reflecting wall portion of the ceramic body separated from an outer cylindrical wall of the ceramic body by the convex space and the reflecting wall and the outer cylindrical wall joined at the opening of said concave cavity, the distance between the reflecting wall and the outer cylindrical wall is greater at the rear of said concave cavity and less toward the front of said concave cavity, said space having a shape such that said reflecting wall is relatively thin near the focal point of said concave cavity and relatively thicker radially outward from said central axis.

4,633,129

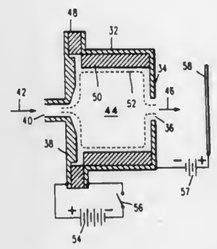
HOLLOW CATHODE

Jerome J. Cuomo, Lake Lincolndale, N.Y.; Harold R. Kaufman, Fort Collins, Colo., and Stephen M. Rossnagel, White Plains, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 729,028

Int. Cl.⁴ H01J *43/08*

U.S. Cl. 313—153 **9 Claims**



1. In an electron beam apparatus, the improvement which comprises a hollow cathode structure comprising an outer enclosure, having at one end thereof a wall, said wall having an aperture therethrough for electron beam emission, a second wall at the opposite end of said enclosure, the enclosure and walls defining an interior chamber, means for admitting an ionizable gas into said chamber, the interior surface of said chamber, exclusive of said end walls, having a low work function electron emissive coating thereon which readily emits electrons under bombardment by ions from said gas, and means for ionizing the gas within said chamber whereby high energy electrons are emitted from said surface by secondary emission effects and low energy electrons released by collision between said high energy electrons and gas ions are emitted through the aperture.

4,633,130

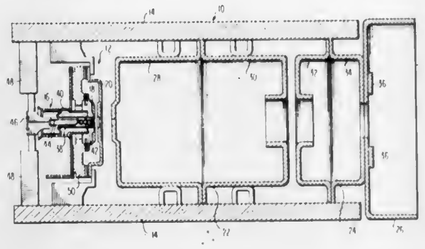
MULTIBEAM ELECTRON GUN HAVING A TRANSITION MEMBER AND METHOD FOR ASSEMBLING THE ELECTRON GUN

Harry E. McCandless, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,261

Int. Cl.⁴ H01J *29/50*

U.S. Cl. 313—417 **10 Claims**



1. In a multibeam electron gun for a cathode-ray tube comprising a plurality of cathode assemblies and at least two spaced successive electrodes having aligned apertures therethrough for passage of a plurality of electron beams, said cathode assemblies and said electrodes being individually held in position from a common ceramic member, said ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, said electrodes being attached to said first major surface and said cathode assemblies being attached to said second major surface

the improvement wherein a first transition member is attached to said metallized pattern on said first major surface of said ceramic member, said first transition member including stress reducing means, and at least one of said electrodes is attached to said transition member.

4,633,131

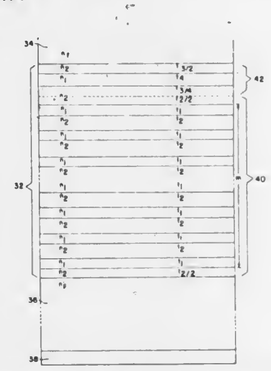
HALO-REDUCING FACEPLATE ARRANGEMENT

Jacob Khurgin, Croton-on-Hudson, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,631

Int. Cl.⁴ H01J *29/28, 29/89*

U.S. Cl. 313—474 **5 Claims**



1. In a monochromatic cathode ray tube having a faceplate arrangement including a faceplate consisting essentially of a transparent material, an internal screen consisting essentially of a light scattering luminescent material for emitting light radiation in a band encompassing a predetermined wavelength λ_0 and extending from a lower wavelength λ_0- to an upper wave-

length λ_0+, when excited by an electron beam, and an electrically-conductive reflective layer disposed on an inner surface of the screen, the improvement comprising a compound optical filter disposed between the screen and the faceplate, said optical filter including:

(a) a first portion comprising a multilayer interference edge filter having a cutoff wavelength of λ_0+ for light rays received from the screen which are perpendicular to said edge filter, and having a cutoff wavelength of λ_0- for light rays received from the screen which are incident to said edge filter at angles greater than a predetermined angle θ_H, which light rays would significantly contribute to halo; and

(b) a second portion comprising a multilayer matching filter for matching the optical impedances of the faceplate and the edge filter.

4,633,132

SELF-ADHERING CATHODE RAY TUBE BASE

Gary T. Marks, Phelps; Charles H. Rehkopf, and Fred L. Sorensen, both of Seneca Falls, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,519
Int. Cl.⁴ H01J *5/54;* **H01R** *33/76*
U.S. Cl. 313—477 R **5 Claims**



1. A self-adhering cathode ray tube base comprising:

a bottom portion defining a circular array of apertures for mating with an array of cathode ray tube connector pins extending from the bottom of the neck of the tube, each aperture surrounded by a wall upstanding from the bottom portion, and first and second ones of the apertures being slot-shaped; and

a cylindrical portion upstanding from the central portion of the bottom portion, for forming a protective cover for an exhaust tubulation extending from the bottom of the neck;

characterized in that a third one of the apertures has a smaller opening than that of its associated pin, and the two slot-shaped apertures oriented to have their long axes intersect the approximate location of the third aperture to form an angle with a line bisecting both the third aperture and the array, the angle within the range of about 20 to 30 degrees.

4,633,133

FLUORESCENT LAMPS HAVING IMPROVED LAMP SPECTRAL OUTPUT AND MAINTENANCE AND METHOD OF MAKING SAME

John M. Flaherty, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 13, 1984, Ser. No. 671,133
Int. Cl.⁴ H01J *61/35*
U.S. Cl. 313—489 **6 Claims**

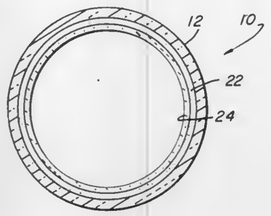
1. A fluorescent lamp comprising:

a tubular, hermetically sealed, glass envelope;

electrodes sealed in the ends of said envelope;

an arc generating and sustaining medium including mercury within said envelope;

a phosphor coating adhering to the interior surface of said envelope; and



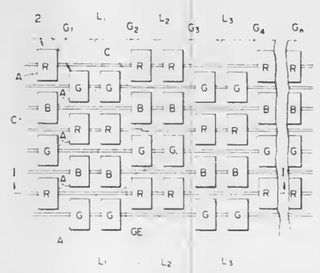
a spectral output and maintenance improving non-particulate film overlying said phosphor wherein said film consists of yttrium oxide and at least one activator.

4,633,134

COLOR FLUORESCENT DISPLAY DEVICE HAVING ANODE CONDUCTORS IN ZIG-ZAG PATTERN

Takao Kishino, and Tadashi Mizohata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Sep. 18, 1984, Ser. No. 651,708
Claims priority, application Japan, Sep. 22, 1983, 58-174160
Int. Cl.⁴ H01J *31/20*
U.S. Cl. 313—497 **7 Claims**



1. A color fluorescent display device having plural electrodes including at least one cathode electrode mounted in an evacuated envelope, comprising:

a plurality of control electrodes arranged in parallel in a column direction opposite the cathode electrode; and

segment anodes including anode conductors arranged opposite to each of said control electrodes, wherein each control electrode has the anode conductors opposite thereto arranged in zig-zags beneath the respective control electrode, wiring conductors each connecting said anode conductors in a same row together and phosphors of red, green and blue luminous colors respectively deposited on said anode conductors in a descending order and in a repeated manner every three anode conductors.

4,633,135

STARTING AID FOR HIGH PRESSURE SODIUM VAPOR LAMP

Robert B. Akins, Warrensville Hts., Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,456
Int. Cl.⁴ H01J *17/44*
U.S. Cl. 313—594 **1 Claim**

1. A high pressure metal vapor lamp comprising:

an outer vitreous envelope enclosing an inner arc tube having thermionic electrodes sealed into its ends and containing a charge of vaporizable metal and inert starting gas; and

a capacitive starting aid comprising a light elongated metal member of a stiff wire having a camber or slight arching concave toward the arc tube, said elongated metal member being supported by a thermally deformable arm attached to a frame member within said outer envelope, said frame member being connected to one of its said electrodes;



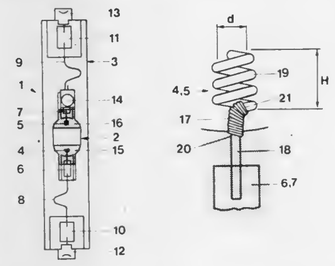
said arm being arranged to swing in a plane normal to the arc tube and to press said elongated member lengthwise against the arc tube so that said camber of said elongated member is substantially flattened out when the arm presses the wire against the arc tube at room temperture and, said elongated member is swung away from said arc tube when heated by the operation of said lamp.

4,633,136

HIGH-PRESSURE DISCHARGE LAMP WITH LOW POWER INPUT

Dietrich Fromm, Warngau; Helmut Klingshirn, Munich; Achim Gosslar, Munich, and Jurgen Heider, Munich, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Apr. 13, 1983, Ser. No. 484,568
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214642
Int. Cl.⁴ H01J *61/06, 61/36*
U.S. Cl. 313—623 **19 Claims**



1. A high-pressure discharge lamp having a power input of less than 100 W, comprising:

an arc tube (**2, 22**);

a filling, in said arc tube, including mercury, metal halides, and at least one rare gas;

two emitterless electrodes (**4,5; 23,24**) of refractory metal;

a seal means, hermetically sealing the electrodes in the arc tube; and

means for facilitating starting of the lamp, including an electrode arrangement wherein

each electrode (**4,5; 23,24**) is an elongated electrode element having

a first, essentially straight, shank portion (**18,29**) located adjacent the seal means, and

a second portion (**19, 30**), formed as a coil which extends from said shank portion and faces the discharge arc, and having adjacent coil turns which are configured to inhibit heat transfer between adjacent coil turns by being so placed that adjacent coil turns do not touch each other, said first (**18, 29**) and second (**19, 30**) portions comprising a single wire element.

4,633,137

GLAZE POLISHED POLYCRYSTALLINE ALUMINA MATERIAL

Curtis E. Scott, Eastlake, and Charles I. McVey, Twinsburg, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,858
Int. Cl.⁴ C04B *35/10;* **H01J** *61/30*
U.S. Cl. 313—636 **14 Claims**



1. An optically transparent sintered polycrystalline alumina body with opposing major surfaces and having but one of said major surfaces selectively glaze polished so as to reduce the high spots on the individual surface alumina grains without materially introducing low spots at the grain boundaries for increased optical transmission upon glaze removal and wherein the individual alumina surface grains have been preferentially etched in certain crystalline axis directions, said glaze polished surface being further substantially devoid of contamination from impurities otherwise contained in the polycrystalline alumina body being polished or transferred to said polished surface from contaminated glaze medium and with said glaze polish producing improved optical transmission at a lesser removal of the polycrystalline alumina material.

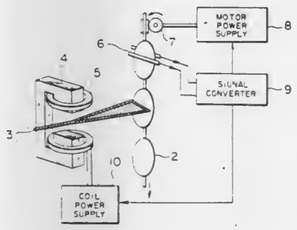
8. An improved high intensity electric discharge lamp comprising a light transmissive envelope having electrodes sealed into its ends and containing an ionizable medium for producing said discharge, wherein the improvement comprises utilizing as the light transmissive envelope a tube consisting essentially of optically transparent sintered polycrystalline alumina with inner and outer opposing major surfaces having only said outer major surface selectively glaze polished so as to reduce the high spots on the individual surface alumina grains without materially introducing low spots at the grain boundaries for increased optical transmission upon glaze removal and wherein the individual alumina surface grains have been preferentially etched in certain of the crystalline axis directions, said glaze polished surface being further substantially devoid of contamination from impurities otherwise contained in the polycrystalline alumina body being polished or transferred to said polished surface from contaminated glaze medium and with said glaze polish producing improved optical transmission at a lesser removal of the polycrystalline alumina material.

4,633,138

ION IMPLANTER

Katsumi Tokiguchi, Machida; Osami Okada, Chofu; Noriyuki Sakudo, Ome, and Hidemi Koike, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,393
Claims priority, application Japan, Sep. 10, 1984, 59-187900
Int. Cl.⁴ G21K *5/00;* **H01J** *7/24*
U.S. Cl. 315—111.81 **4 Claims**



1. An ion implanter, in which the ion beam is swept in one direction by means of a beam scanner and a carrier, on which a plurality of wafers are mounted along at least one row, is moved in the direction substantially perpendicular to the scanning with the beam along a straight line so that ions are implanted uniformly into each of the wafers, comprising:

a beam sweep width control means for controlling the beam sweep width in such a manner that the area scanned with the ion beam by sweeping it coincides substantially with the shape of the wafers in which ions are to be implanted; and

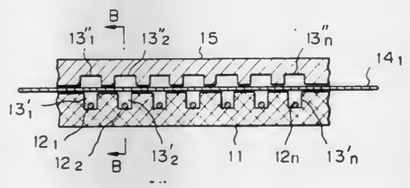
a carrier speed control means for controlling the carrier speed, depending on the beam sweep width so that the dose of ions implanted in the wafers is uniform.

4,633,139

PLASMA DISPLAY SYSTEM

Joichi Endo; Takashi Komatsu, and Toshio Tohkura, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,338
Claims priority, application Japan, Nov. 8, 1983, 58-208354
Int. Cl.⁴ G09G *3/10*
U.S. Cl. 315—169.4 **5 Claims**



1. A plasma display system comprising:

a flat display panel comprising a plurality of parallel cathode electrodes and a plurality of parallel anode electrodes positioned perpendicular to and crossing said cathode electrodes disposed in a gasfilled space sealed by a back plate and a transparent front plate, a crossing between each of said cathode electrodes and each of said anode electrodes defining a discharge cell, visible light produced by gaseous discharge at a crossing being visible through said transparent front plate and said cathode electrodes,

a switching circuit having a first group of switches for supplying either one of two DC potentials to said cathode electrodes and a second group of switches for supplying either one of two DC currents to said anode electrodes,

said first group of switches supplying either a first potential which is high enough to cause discharge of a second potential which is insufficient to cause discharge, only one cathode electrode at a time receiving said first potential, while other cathode electrodes receive said second potential, and said first potential being supplied sequentially to all said cathode electrodes,

said second group of switches supplying either a first current which is high enough to provide strong visible discharge in a cell or a second current which is lower than said first current but is high enough to provide weak seed discharge, when the related crossing cathode electrode is at said first potential,

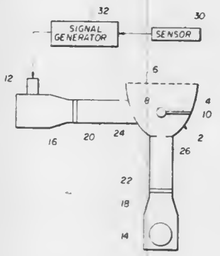
wherein cells along a cathode electrode which is supplied with said first potential discharge to provide visible light at crossings with anode electrodes supplied with said first current according to picture pattern data, and discharge weakly at crossings with anode electrodes supplied with said second current to provide excited seed particles for firing adjacent cells, thereby avoiding the need for separate seed electrodes.

4,633,140

ELECTRODELESS LAMP HAVING STAGGERED TURN-ON OF MICROWAVE SOURCES

Donald Lynch, Gaithersburg; Mohammad Kamarehi, Rockville, and Michael G. Ury, Bethesda, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Dec. 24, 1984, Ser. No. 686,042
Int. Cl.⁴ H05B *41/16, 41/24*
U.S. Cl. 315—248 **7 Claims**



1. A method of operating a microwave powered electrodeless light source comprised of a bulb containing an ionizable medium which is disposed in a microwave chamber which is fed by two microwave sources, comprising the steps of,

exciting one of said microwave sources by supplying electrical power to it, and

after said bulb is ignited, exciting the other of said microwave sources by supplying electrical power to it.

2. A microwave powered electrodeless light source comprising,

a microwave chamber,

a bulb containing an ionizable medium disposed in said chamber,

first and second microwave energy generating means,

means for coupling the microwave energy generated by said microwave energy generating means to said chamber,

means for exciting said first microwave energy generating means to provide microwave energy to said bulb for igniting said bulb, and

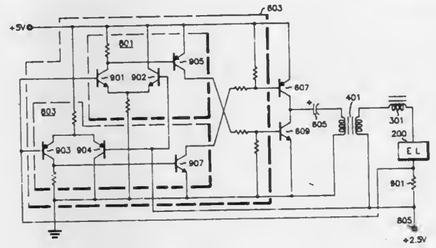
means for exciting said second microwave energy generating means after said bulb has been ignited to provide microwave energy to said bulb during the operation thereof in addition to the energy provided by said first microwave energy generating means.

4,633,141

LOW VOLTAGE POWER SOURCE POWER INVERTER FOR AN ELECTROLUMINESCENT DRIVE

Paul J. Weber, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1985, Ser. No. 706,818
Int. Cl.⁴ G05F *1/00;* **H05B** *37/02, 39/04, 41/36*
U.S. Cl. 315—307 **14 Claims**



1. A power inverter especially suited for an electroluminescent device having an impedance of real and imaginary components, converting low voltage direct current (DC) power to high voltage alternating current (AC) power, comprising:

means responsive to an AC signal, for alternately switching between positive and negative polarities of the low voltage DC power to generate low voltage AC power;

means for conjugately matching the imaginary component of the electroluminescent device impedance to produce a resonant circuit;

means for increasing the magnitude of said low voltage AC power to a high voltage and coupling said high voltage AC power to said resonant circuit;

means, coupled to a fraction of the voltage magnitude of the low voltage DC power, for sampling the current in said resonant circuit and for generating a feedback signal in phase with said high voltage AC power; and

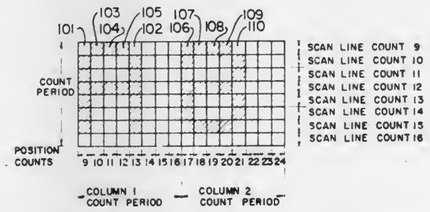
means, responsive to said feedback signal, for generating said AC signal at a frequency determined by said resonant circuit.

4,633,142

MULTIBEAM GRAPHIC DISPLAY SYSTEM UTILIZING BIT MAPPING MEMORY

J. Nathaniel Marshall, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,760
Int. Cl.⁴ G06K *15/20;* **H01J** *31/16*
U.S. Cl. 315—365 **11 Claims**



1. A high definition bit-mapped page display system utilizing a shaped beam and aperture comprising:

(a) first means for generating shaped electron beams in a cathode ray tube (CRT) wherein said first means further comprise a CRT tube having at least one cathode, and a heater for each cathode, a focusing electrode, an anode, and a CRT screen coated with a material sensitive to electron impingement; a biasing grid for controlling beam strength, said biasing grid split to comprise at least two sections, each section having a small hole for permitting electrons to pass therethrough, the electrons through the holes forming separate beams individually controllable to be scanned across the screen in adjacent raster scan lines and optically combined on the screen in forming each character; an accelerator for accelerating electrons and having an oblong opening for permitting electrons that pass through the holes in said biasing grid to also pass through the oblong opening in said accelerator; shaping means for shaping the emitted electrons to a predetermined shape; and blocking means having an aperture operative for selectively blocking all or a portion of the shaped beam from passing through, with portions of the beam passing through separate portions of the aperture forming adjacent raster scan lines which are optically combined on the screen in forming each character;

(b) second means for generating bit patterns for said shaped electron means, said second means being character generators typically comprising read only memories (ROMs), programmable read only memories (PROMs), or erasable programmable read only memories (EPROMs); and,

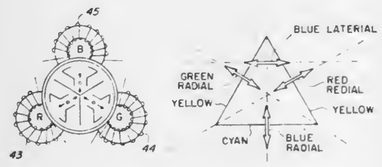
(c) third means coupled to said second and first means for controlling said shaped beams.

4,633,143

CONVERGENCE CORRECTION APPARATUS FOR DELTA-GUN COLOR CATHODE RAY TUBE DISPLAYS

Richard I. McCartney, Jr., West Carrollton, Ohio, assignor to Sperry Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,573
Int. Cl.⁴ G09G *1/04;* **H01J** *29/70*
U.S. Cl. 315—368 **12 Claims**



1. A method for achieving convergence correction of a delta-gun cathode ray tube display having a display screen and primary deflection means responsive to signals for deflecting the beams of said guns in a rectilinear coordinate system of said display screen, said method comprising:

a. deriving a set of convergence correction equations in terms of said coordinate system, of the form $i=a_0+a_1x-^2+a_2y^2\pm a_3xy$, each equation having coefficients peculiar to the angular location of at least one of said guns relative to said screen coordinate system,

b. implementing said equations in circuits responsive to said deflection means signals and including a plurality of variably adjustable means corresponding to each coefficient of each of said equations,

c. positioning a convergence correction symbol having linear elements related to the relative positions of said guns at discrete positions in said screen coordinate system, each of said elements characterized by a predetermined color composite of at least two color guns,

d. separately adjusting said coefficient adjusting means of each equation to effect convergence of the gun beams associated with each element of said symbol at each of said discrete symbol positions and,

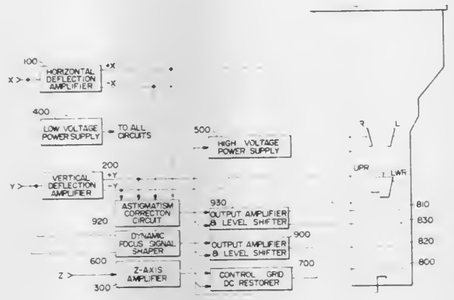
e. selecting the boundary locations of said coordinate system such that each equation coefficient (a_0, a_1, a_2, a_3) is changed only when the variable (x, y) it multiplies has a value of zero.

4,633,144

DYNAMIC FOCUS SIGNAL SHAPER

Barry A. McKibben, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 20, 1984, Ser. No. 642,231
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **18 Claims**



1. A dynamic focusing signal shaper for generating a signal for adjusting focus in the corners of a cathode-ray-tube screen, the shaper comprising:

a source of horizontal deflection signal,

a source of vertical deflection signal,

means for summing the horizontal and vertical deflection signals,

means for differencing the horizontal and vertical deflection signals,

a first multiplier for multiplying the output of the summing means,

a second multiplier for multiplying the output of the differencing means, and

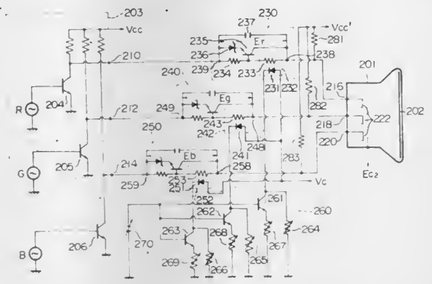
means for adding the outputs of the first and second multipliers and outputting the focus adjustment signal.

4,633,145

BRIGHTNESS CONTROL CIRCUIT FOR DISPLAY APPARATUS WITH COLOR PICTURE TUBE

Michitaka Osawa; Yuichiro Kimura, and Hiroyuki Miyajima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,681
Claims priority, application Japan, May 27, 1983, 58-92301
Int. Cl.[4] H01J *29/52;* **H04N** *9/64, 5/235*
U.S. Cl. 315—383 **17 Claims**



1. A brightness control circuit for use in a display apparatus including a color display tube having first, second and third cathodes supplied with video signals corresponding to red, green and blue colors, and first, second and third color display tube drive circuits for supplying drive signals corresponding to said video signals to said first, second and third cathodes; comprising:

first voltage regulating means including a first photocoupler having a first photodetector provided between said first color display tube drive circuit and the first cathode of said color display tube for adjusting a DC voltage between the output end of said first color display tube drive circuit and said first cathode in response to a first externally applied voltage regulating signal supplied through said first photocoupler;

second voltage regulating means including a second photocoupler having a second photodetector provided between said second color display tube drive circuit and the second cathode of said color display tube for adjusting a DC voltage between the output end of said color display tube drive circuit and said second cathode in response to a second externally applied voltage regulating signal supplied through said second photocoupler;

third voltage regulating means including a third photocoupler having a third photodetector provided between said third color display tube drive circuit and the third cathode of said color display tube for adjusting a DC voltage between the output end of said third color display tube drive circuit and said third cathode in response to a third externally applied voltage regulating signal supplied through said third photocoupler; and

regulating signal generating means for generating said first, second and third voltage regulating signals to be supplied to said first, second and third voltage regulating means.

4,633,146

DRIVE CIRCUIT FOR MULTIPLE SCAN RATE HORIZONTAL DEFLECTION CIRCUIT

William E. Babcock, Warren, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 9, 1983, Ser. No. 524,143
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—395 **5 Claims**



1. A resonant retrace horizontal deflection circuit operable at first and second selectable horizontal scan rates comprising:

means providing a drive signal having a first signal amplitude in response to the selection of said first selectable horizontal scan rate and having a second signal amplitude in response to the selection of said second selectable horizontal scan rate; and

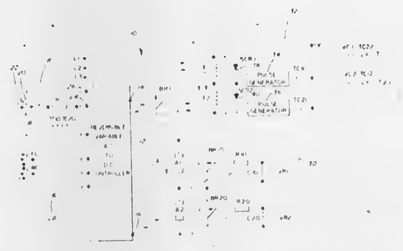
output means incorporating a deflection winding and a switching transistor having a base terminal coupled to said drive signal providing means, said switching transistor responsive to said drive signal for causing switching of said switching transistor between saturated and nonconductive states in order to provide horizontal deflection current in said deflection winding defining trace and retrace intervals, said first and second signal amplitudes determining the length of the transition interval when said switch transistor switches between said saturated and said nonconductive states.

4,633,147

ELECTRIC POWERED VEHICLE AND METHOD OF PROPELLING THE SAME

Bonne W. Posma, Youngstown, N.Y., and Rowland A. Hill, Wortland, Ky., assignors to National Mine Service Company, Pittsburgh, Pa.

Filed Apr. 3, 1985, Ser. No. 719,258
Int. Cl.[4] B61C *15/12*
U.S. Cl. 318—52 **25 Claims**



1. An electric powered vehicle or the like comprising:

a first mechanical drive system for a first side of said vehicle;

a second mechanical drive system for a second side of said vehicle;

a first DC motor and a second DC motor respectively coupled to said first mechanical drive system and second mechanical drive system;

a source of DC power on said vehicle;

said first DC motor having a first field and a first armature, said second DC motor having a second field and a second armature;

said first field, said first armature, said second field, and said second armature being connected in a series circuit with said source of power;

sensing means for sensing a loss of traction for said first mechanical drive system;

switch means for disabling said first motor from said series circuit in response to said sensing means, and

timing means for maintaining said disconnecting of said first motor for a predetermined time.

24. A method of providing propulsion for an electric powered vehicle of the type which includes a first mechanical drive system for a first side of said vehicle; a second mechanical drive system for a second side of said vehicle; a first DC motor and a second DC motor respectively coupled to said first mechanical drive system and said second mechanical drive system; a source of DC power on said vehicle; said first DC motor having a first field and a first armature; said second DC motor having a second field and a second armature; and said first field, said first armature, said second field, and said second armature being connected in a series circuit with said source of power; said method comprising the steps of:

sensing a loss of traction of said first mechanical drive system;

disabling said first motor from said series circuit after sensing loss of traction for said first mechanical drive system, and

maintaining disabling of said first motor for a predetermined time.

4,633,148

LINEAR DRIVE MOTOR MULTIPLE CARRIER CONTROL SYSTEM

Bryan P. Prucher, Clarkston, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 25, 1985, Ser. No. 695,028
Int. Cl.[4] H02K *41/02*
U.S. Cl. 318—135 **10 Claims**

1. A multiple carrier transportation system for moving units over a predetermined course, comprising:

an underground track which spans the course;

a plurality of carriers engaging the track for movement along the course, each of said carriers having means for carrying at least one of the units to be moved along the course; and

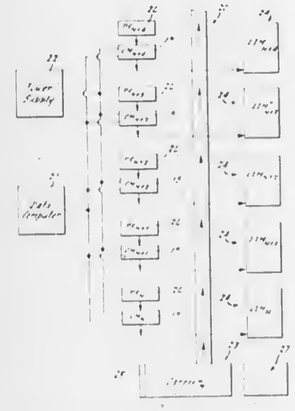
a control loop associated with each of said carriers, each of said control loops including

an elongated reaction plate attached to the carrier such that the reaction plate generally spans the length of the carrier;

a linear induction motor fixed in position along the track for generating the thrust necessary to propel the carrier along a portion of the track, the thrust being produced by the interaction between the reaction plate of the carrier and the electromagnetic field generated by linear induction motor adjacent to the carrier reaction plate;

a position sensor fixed in position along the track;

a plurality of position indicators mounted in alignment along the length of the carrier such that the position indicators



will pass by the position sensor during movement of the carrier along the track and cause the position sensor to produce a feedback signal indicative of the position of the carrier;

a control module for controlling the movement of the carrier in response to the feedback signal from the position sensor, computer means being associated with the control module for determining the velocity and acceleration of the carrier, for comparing these velocity and acceleration values to a set of velocity and acceleration curves stored in the memory of the computer means, and for generating a control signal for controlling the voltage supplied to the linear induction motor from a power supply source, said control module including firing means for regulating the magnitude of the electrical power supplied to the linear induction motor and switching means for controlling the transmission and sense of the electrical power to the linear induction motor such that the linear induction motor is capable of generating both forward and reverse thrust.

4,633,149

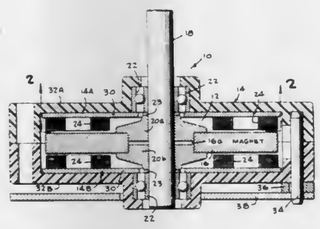
BRUSHLESS DC MOTOR

Raymond E. Welterlin, Cary, N.C., assignor to Buehler Products, Inc., Raleigh, N.C.

Filed Sep. 10, 1985, Ser. No. 774,752
Int. Cl.[4] H02K *29/08*
U.S. Cl. 318—254 **9 Claims**

1. An axial air gap sub-fractional horsepower brushless DC motor of the pancake type for use with electronic computers and the like, comprising a rotor assembly including a disc-like permanent magnet of annular cylindrical configuration concentric with a center axis, a shaft concentric with said axis, and

magnet supporting means secured to the shaft and coupled to the permanent magnet in the region adjacent the inner diameter edge portion thereof supporting the permanent magnet rigidly in a plane perpendicular to said center axis, the permanent magnet having a plurality of pairs of magnetic poles of alternating polarity and axially magnetized, a stator formed of two identical stator component sub-assemblies located on opposite sides of the permanent magnet in flanking relation to said permanent magnet with the permanent magnet sandwiched therebetween; said stator component sub-assemblies each including a thin disc-like annular backing plate member made of laminated soft magnetic material, a plurality of coils supported thereon of generally trapezoidal shape arranged in a circular path concentric with said axis, and a hall effect sensing



element located along said circular path between one pair of circumferentially adjacent coils, and circuit means carried by said plate member providing coil-to-coil connections; a pair of generally cup shaped housing halves of non-magnetic material and of similar configuration assembled on opposite sides of the rotor and the pair of identical stator component sub-assemblies for encasing the rotor and said stator component sub-assemblies therein, and circuit means assembled thereon providing a driver circuit for the motor, the motor being arranged to be multi-phase, and the two stator component sub-assemblies being shifted circumferentially in angular orientation relative to each other whereby coils belonging to one phase face a pole on the permanent magnet and coils belonging to another phase are shifted by an appropriate electrical angle relative thereto.

4,633,150

DRIVING CIRCUIT FOR BRUSHLESS DC MOTORS

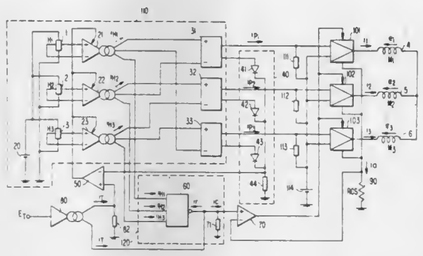
Toshio Inaji, Mino; Hiroshi Minakuchi, Shiga, and Yoshiaki Igarashi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 3, 1985, Ser. No. 804,259

Claims priority, application Japan, Dec. 25, 1984, 59-277169; Jun. 24, 1985, 60-137255

Int. Cl.⁴ H02P *6/02*

U.S. Cl. 318—254 **17 Claims**



1. A driving circuit for a brushless DC motor, comprising:

a magnetic pole position detecting circuit for detecting postions of magnetic poles of a rotor magnet of the motor and delivering polyphase signals indicative of the positions;

a rectifier adder circuit for producing a sum of positive or negative portions of the polyphase signals from the magnetic pole position detecting circuit;

an instruction signal producing circuit for producing a torque instruction signal instructing a torque to be produced by the motor;

a first error amplifier for adjusting a gain of the magnetic pole position detecting circuit so as to make an output signal from the rectifier adder circuit be proportional to the torque instruction signal;

a power supply circuit responsive to the polyphase signals for supplying currents to polyphase armature coils of the motor;

a current detecting means for detecting the currents supplied to the armature coils;

a modulating signal producing circuit for modulating the currents supplied to the armature coils; and

a second error amplifier for adjusting a gain of the power supply circuit so as to make an output signal from the current detecting means equal to an output signal from the modulating signal producing circuit.

4,633,151

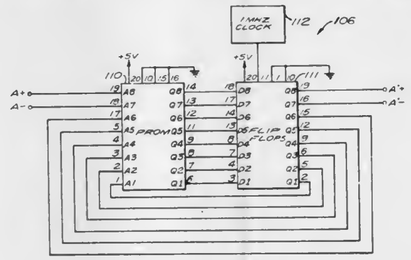
SERIES CONNECTED TRANSISTOR PROTECTION CIRCUIT

James C. Crook, Raleigh, N.C., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 547,637, Nov. 1, 1983, abandoned. This application Oct. 24, 1984, Ser. No. 664,300

Int. Cl.⁴ H02K *29/06*

U.S. Cl. 318—254 **9 Claims**



1. A motor control system comprising:

an electric motor which includes a stator having windings and a rotor;

commutation control means, responsive to the position of said rotor relative to said stator for providing output signals;

series connected transistor pairs connected between terminals of a power supply for applying electric currents to the windings of said motor;

protection circuit means for each of said transistor pairs, responsive to said output signals from said commutation control means for providing delayed control signals to the associated series transistor pair which under conditions that would otherwise cause simultaneous conduction of said series connected transistors, and wherein said protection circuit operates according to a comparison of the present state of said output signals to their previous state.

4,633,152

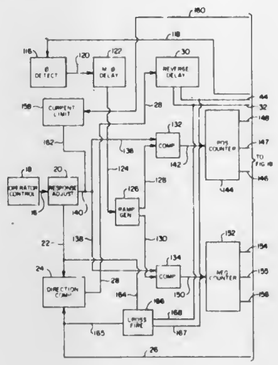
DIRECT CURRENT MOTOR CONTROLLER

Aaron V. Farr, Logan, Utah, assignor to Abex Corporation, Stamford, Conn.

Filed Nov. 29, 1984, Ser. No. 676,038

Int. Cl.⁴ H02P *5/06*

U.S. Cl. 318—257 **42 Claims**



1. A control circuit for controlling the operation of a direct current motor by select application of a three phase alternating current line input of given frequency to the armature thereof through solid-state forward and reverse designated switches selectively gated by phase responsive gate signals comprising:

command means for providing command signals of polarity and value corresponding with a selected direction and speed;

armature responsive means for deriving armature signals corresponding with the instantaneous value of voltage applied to said armature;

forward enable logic means for providing said forward gate signals in the presence of predetermined forward enable inputs for gating said forward designated switches;

reverse enable logic means for providing said reverse gate signals in the presence of predetermined reverse enable inputs for gating said reverse designated switches;

first input stage means for comparing said command signals and said armature signals and for providing an output representing the difference therebetween;

integrator stage means responsive to said first input stage means output and having a select time constant for deriving a response adjusted output with a polarity defining directional characteristic;

mixing means for directing select portions of said armature signals and said response adjusted output in common to said first input stage means; and

directional comparator means for receiving said response adjusted output and said armature signals and responsive to forward and reverse conditions thereof to provide a first of said forward enable inputs in the presence of said forward conditions and to provide a first of said reverse enable inputs in the presence of said reverse conditions.

4,633,153

POWER WINDOW CONTROL WITH TAPE DRIVE TENSION RELEASE

Dennis P. Thornton; John S. Maceross, both of Centerville; Jeff A. Foust, Farmersville, and Keith R. Cook, Beavercreek, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1986, Ser. No. 832,439

Int. Cl.⁴ H02P *1/22*

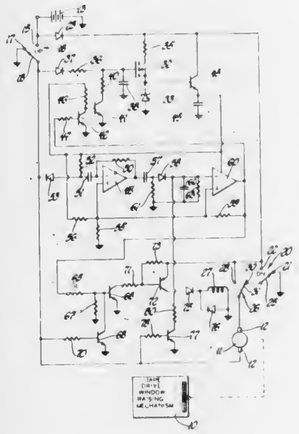
U.S. Cl. 318—280 **2 Claims**

1. Motor control apparatus for a motor driven vehicle power window mechanism including a flexible drive element adapted to drive the window in a predetermined direction by being placed in tension by the motor, the motor being of the type having a commutator and producing a detectable ripple in its operating current as the successive commutator bars pass the brushes during motor rotation, the motor control apparatus comprising, in combination:

an electric power source;

an operator controlled switch having first and second operative conditions and being effective, only while in the first operative condition, to connect the electric power source to the motor for activation thereof in a first direction to drive the window, through the flexible drive element in tension, in the predetermined direction;

an electrically controlled switch having activated and deactivated conditions and being normally in the deactivated condition, the electrically controlled switch, when in its activated condition, being effective to connect the electric



power source to the motor in reverse for activation thereof in a second direction and thus relieve the tension of the flexible drive element;

circuit means responsive to movement of the operator controlled switch to its second operative condition following a predetermined duration thereof in its first operative condition to detect pulses of the ripple in the motor operating current and integrate these pulses to produce an output voltage therefrom generally proportional to motor rotation, to provide continuous maintenance of the electrically controlled switch in its activated condition during the integration and to switch the electrically controlled switch to its deactivated condition when the output voltage reaches a predetermined level, whereby the motor may be reliably driven in the reverse direction by an amount sufficient to relieve drive tension but insufficient to produce unwanted reverse movement of the window.

4,633,154

BRAKING METHOD, BRAKING CIRCUIT AND SPEED CONTROL APPARATUS FOR A DC MOTOR

Junji Maeda, Kyoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 26, 1984, Ser. No. 675,067

Claims priority, application Japan, Dec. 2, 1983, 58-228863

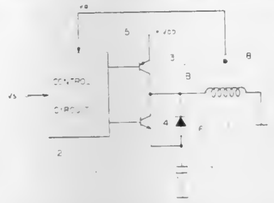
Int. Cl.⁴ H02P *3/10*

U.S. Cl. 318—373 **7 Claims**

1. A method of braking a pulse-driven DC motor which comprises:

charging a capacitor connected to a winding of said DC motor having a counter electromotive force generated in said winding of said DC motor after a driving pulse is fed

to said winding, said capacitor being charged with a reverse polarity with respect to said driving pulse, and



applying plugging to said DC motor by feeding said counter electromotive force charged in said capacitor to said winding during an absence of said driving pulse.

4,633,155

NUMERICAL CONTROL SYSTEM

Hidetsugu Komiya, and Mitsuo Kurakake, both of Hino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

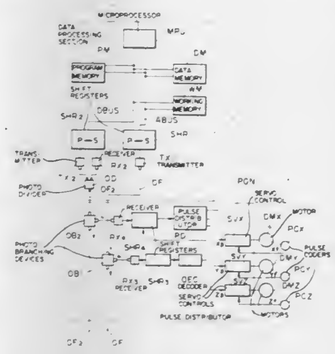
PCT No. PCT/JP81/00342, § 371 Date Aug. 23, 1982, § 102(e) Date Aug. 23, 1982, PCT Pub. No. WO82/02259, PCT Pub. Date Jul. 8, 1982

Continuation of Ser. No. 413,335, Aug. 23, 1982. This PCT application Nov. 18, 1981, Ser. No. 783,815

Claims priority, application Japan, Dec. 26, 1980, 55-188766

Int. Cl.⁴ G05B *1/06*

U.S. Cl. 318—640 **2 Claims**



1. A numerical control system for controlling a machine, comprising:

a data processing section for processing data signals;

a bus comprising an optical fiber cable operatively connected to said data processing section, said bus transferring therethrough the data signals in the form of bit serial light signals; and

functional block means, operatively connected to said bus, for controlling the machine in dependence upon the data signals from said data processing section, comprising:

a photo branching device operatively connected to said optical fiber cable;

a receiver, operatively connected to said photo branching device, for converting the bit serial light signals delivered thereto by said photo branching device into a serial electric signal; and

a shift register, operatively connected to said receiver, for converting the serial electric signal delivered by said receiver into a parallel electric signal.

4,633,156

STEPPING MOTOR ASSEMBLY

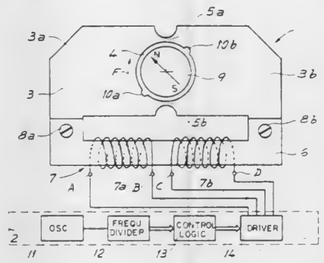
René Besson, Neuchâtel, Switzerland, and Yves Guérin, St. Louis, France, assignors to ETA S.A., Fabriques d'Ebauches, Grenchen, Switzerland

Filed Apr. 22, 1985, Ser. No. 725,733

Claims priority, application Switzerland, May 4, 1984, 2180/84

Int. Cl.⁴ H02P *8/00*

U.S. Cl. 318—696 **10 Claims**



1. A motor assembly comprising a stepping motor having a rotor, a stator, coil means born by the stator and a control circuit for applying motor drive pulses of low frequency to the coil means to operate the motor at low speed and of high frequency to operate the motor at high speed wherein said coil means comprises n ($n \geqq 2$) windings and said control circuit is arranged and adapted to connect the n windings in series when low frequency drive pulses are applied thereto and in parallel when high frequency pulses are applied thereto.

4,633,157

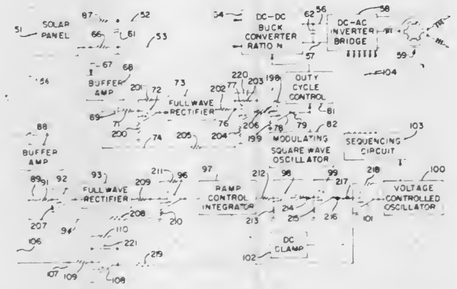
CONTROL SYSTEM FOR PERMANENT MAGNET SYNCHRONOUS MOTOR

August L. Streater, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Aug. 27, 1984, Ser. No. 644,333

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—723 **17 Claims**



1. A stabilization system for a permanent magnet synchronous motor that does not include a rotor starting cage or winding and is unstable at above a boundary frequency, said boundary frequency being approximately the frequency where the motor reactance is substantially equal to the motor resistance, the motor being connected to a power supply including a dc source and an inverter between the source and the motor, the inverter producing an ac output voltage for powering the motor, and the motor during operation thereof having a power angle that is a function of the motor torque, said system comprising sensing means adapted to be connected to said supply for sensing any cyclical variations in the power angle, and

control means connected to said sensing means and adapted to be connected to said supply for modulating the level of said ac output voltage and thereby generating an ac component of torque that leads in phase the power angle variations at the natural frequency of the rotor and stabilizes the motor at above said boundary frequency.

4,633,158

CONTROL SYSTEM FOR AN AC MOTOR

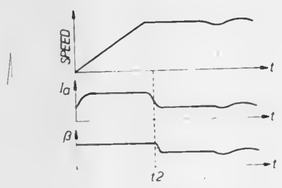
Akio Hirata, Fuchu, and Yosio Naito, Tama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1984, Ser. No. 667,468

Claims priority, application Japan, Nov. 5, 1983, 58-206878; May 4, 1984, 59-88358

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—723 **3 Claims**



1. A control system for controlling the operation of an AC motor, comprising:

converter means for converting an AC current from a power source into a DC current;

phase control means for controlling said converter means;

reactor means for smoothing a DC current output from said converter means;

inverter means for converting the smoothed DC current output into an AC current output, said inverter means adapted to drive said AC motor by means of said AC current output;

means for detecting an overlapped angle of said AC current signal supplied to said converter means;

rate detector means for at least detecting the acceleration-deceleration rate of said AC motor;

overlapped angle setter means for setting an overlapped angle of said inverter means to a specified value; and

means for controlling a control lead angle of said inverter means in accordance with the overlapped angle set by said overlapped angle setter means when an acceleration-deceleration rate of said AC motor detected by said rate detector means exceeds a specified value and for controlling the control lead angle to be substantially constant when said acceleration-deceleration rate drops below said specified value.

4,633,159

CHARGING CIRCUIT

Hironobu Sakaue, Shijonawate, and Kaoru Furukawa, Hikone, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 24, 1985, Ser. No. 726,780

Claims priority, application Japan, Jun. 11, 1984, 59-119295

Int. Cl.⁴ H02J *7/10*; H02M *5/458*

U.S. Cl. 320—39 **6 Claims**

1. A charging circuit comprising:

a transformer to which a rectified source voltage is applied and having primary, secondary, and feedback windings, wherein said feedback winding is coupled in a positive feedback relationship to said primary winding;

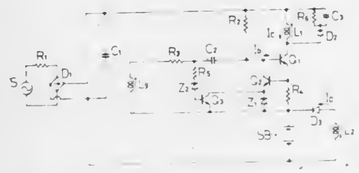
a switching transistor having an emitter, a base, and a collector wherein said base is connected to said feedback winding of said transformer and said collector is connected to said primary winding of said transformer;

a bypass transistor having an emitter, a base, and a collector wherein said base is connected to the emitter of the switching transistor forming a junction, and said collector is connected to the base of the switching transistor;

a current detecting resistor connected at an end to said junction and connected at another end to a point between the secondary winding and feedback winding of the transformer;

a first constant voltage means connected between the emitter of the bypass transistor and the feedback winding of the transformer;

a voltage switching transistor having an emitter, a base, and a collector wherein said emitter is connected to a point



between the secondary and feedback windings of the transformer, and said collector is connected to a point between the emitter of the bypass transistor and the first constant voltage means;

a second constant voltage means inserted between the base of said voltage switching transistor and a junction between the base of said switching transistor and said feedback winding, and

a storage battery connected to said secondary winding of said transformer through a diode connected thereto in normal direction with respect to a charging current induced in the secondary winding during non-conduction of said switching transistor.

4,633,160

SELF-EXCITED ALTERNATOR

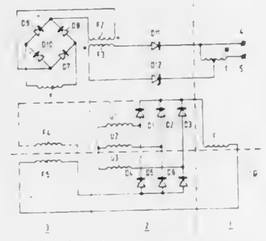
Gary Graham, Adelaide, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1985, Ser. No. 694,726

Claims priority, application Australia, Jan. 27, 1984, PG3374

Int. Cl.⁴ H02P *9/10*

U.S. Cl. 322—20 **14 Claims**



1. A self-excited alternator of the brushless type, having a rotating field which is excited by an alternating current exciter whose rotating armature is mounted to rotate with the rotating field winding of the alternator and is permanently connected to the field winding of the alternator via field rectifier means also mounted to rotate with the field winding,

characterized in that the exciter has one or more exciter stator primary windings and one or more rotary exciter secondary windings connected via rotary field rectifier means to the rotary main field winding of the alternator and,

primary excitation direct current for the exciter is derived,

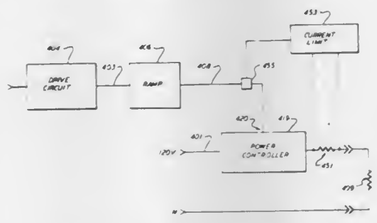
via magnetic coupling from a rotary auxiliary magnetic field produced by a feedback winding connected in series with the main field winding and mounted to rotate therewith, by rectification of the current induced into an auxiliary stator secondary winding located within the auxiliary magnetic field, the magnetic circuit coupling the rotary feedback winding with the auxiliary stator secondary winding being common with that of the exciter.

4,633,161

IMPROVED INDUCTORLESS PHASE CONTROL DIMMER POWER STAGE WITH SEMICONDUCTOR CONTROLLED VOLTAGE RISE TIME

Michael Callahan, 201 E. 85 St., New York, N.Y. 10024; John K. Chester, 34 Bergen St., New York, N.Y. 11201, and Robert M. Goddard, 330 First Ave., New York, N.Y. 10009

Filed Aug. 15, 1984, Ser. No. 640,978
Int. Cl.⁴ H05B *37/02*
U.S. Cl. 323—242 **15 Claims**



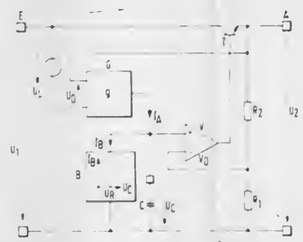
1. Electronic dimming apparatus comprising a semiconductor power controlling means for coupling a lamp load to an alternating current source, and for variable controlling the average power supplied to said lamp load by adjusting the relative proportion of substantially each half-cycle of the alternating current waveform in which said semiconductor power controlling means is in a substantially conductive versus a substantially non-conductive power condition; said semiconductor power controlling means having a control input and adapted to modulate the instantaneous amplitude of the voltage or current supplied to said lamp load under the active control of said control input, said semiconductor power controlling means further having an inherent minimum duration required for a transition between one and the other of its substantially conductive and substantially non-conductive power conditions in response to a stepped change between a value at its control input producing the one and a value producing the other of said power conditions; means for triggering responsive to at least a first input condition corresponding to a desired average power to be supplied to said lamp load and further responsive to the zero-crossing of said alternating current waveform, said means for triggering having at least one output, and producing at least one change in condition at said output substantially corresponding to the phase angle of said alternating current waveform of said half-cycle at which said semiconductor power controlling means must change from one of said power conditions to the other of said power conditions to supply said desired average power to said lamp load; means for transition control responsive to said output of said means for triggering and having an output coupled to said control input of said power controlling means, for controlling the duration of the change between said value at said control input of said power controlling means producing the one and said value producing the other of said power conditions, such that the power condition of said semiconductor power controlling means is gradually changed between one and the other of said power conditions over a period greater than said inherent minimum duration and less than the remaining portion of said half-cycle, whereby the electro-magnetic interference product of said transition is decreased, and wherein the voltage across said lamp load during said transition is controlled to maintain a substantially stable rate of voltage change despite variations in the impedance of said lamp load.

4,633,162

SERIES VOLTAGE REGULATOR EMPLOYING A VARIABLE REFERENCE VOLTAGE

Joachim G. Melbert, Steinhöring, Fed. Rep. of Germany, assignor to SGS-ATES Deutschland Halbleiter Bauelement GmbH, Grafing, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,738
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341344
Int. Cl.⁴ G05F *1/56*
U.S. Cl. 323—275 **24 Claims**



1. A series voltage regulator having a regulating transistor arranged with its emitter-to-collector path in a series arm of the regulator, the base of this regulating transistor being controlled by a differential amplifier which compares a voltage proportional to the regulator output voltage with a reference voltage, wherein

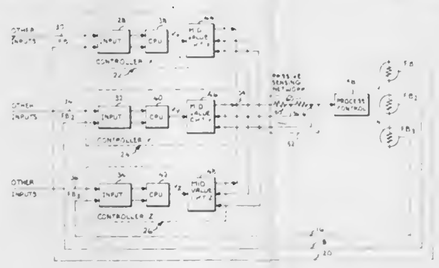
the reference voltage is available from a capacitor to which a voltage limiting circuit which limits the reference voltage to a maximum level is associated and which is connected to the output of a transconductance circuit whose output current depends on the difference between the input voltage and the output voltage of the series voltage regulator.

4,633,163

MID-VALUE CIRCUIT AND CONTROL SYSTEM

Edward J. Dillon, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Oct. 15, 1984, Ser. No. 660,779
Int. Cl.⁴ G05F *1/44*
U.S. Cl. 323—277 **15 Claims**



1. Circuitry for developing an output signal for application to a load which output signal is proportional to the middle valued of three input signals comprising:

(a) three resistive bridge networks each having a common resistor included as one leg thereof;

(b) means to selectively supply electrical current to each of said bridge networks whereby current exists in said common resistor and whereby there is produced said output signal for said load;

(c) means to connect said bridge networks to said load for the application of said output signal to said load;

(d) means to develop a condition signal representing the value of an electrical condition associated with said output signal; and,

(e) individual control means associated with each of said bridge networks for controlling the electrical current supplied to its associated bridge network, said control means comprising;

(1) means responsive to said condition signal and to a respective one of said input signals to develop an error signal representative of the difference therebetween,

(2) means connected to the associated bridge network for providing an imbalance signal representative of the amount of voltage imbalance of that bridge network,

(3) summing means for combining said error signal and said imbalance signal to yield a control signal, and,

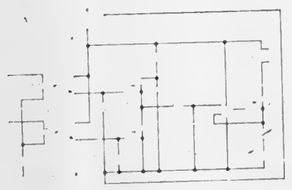
(4) means responsive to said control signal for controlling the electrical current supplied to said bridge network.

4,633,164

MICROPROCESSOR CONTROLLED CONSTANT CURRENT CIRCUIT

Donald F. Kaiser, Parsippany, N.J., assignor to Beckman Industrial Corporation, Cedar Grove, N.J.

Filed Dec. 20, 1985, Ser. No. 811,405
Int. Cl.⁴ G05F *3/24*
U.S. Cl. 323—312 **16 Claims**



1. Apparatus for generating a constant current, comprising:

storage means for storing a voltage corresponding to said constant current, and having an input and an output;

constant voltage supply means for supplying a constant voltage;

first high off-state impedance means for connecting said constant voltage supply means to said input in response to a first actuation signal;

second high off-state impedance means for connecting said input to discharge means in response to a second actuation signal;

actuation means for supplying said first actuation signal to said first high off-state impedance means and said second actuation signal to said second high off state impedance means thereafter; and

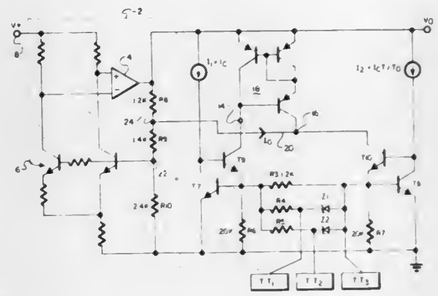
voltage-to-current conversion means connected to said output and having a high input impedance, for converting said voltage stored in said storage means to said constant current.

4,633,165

TEMPERATURE COMPENSATED VOLTAGE REFERENCE

Steven M. Pietkiewicz, Fremont, and Derek F. Bowers, Sunnyvale, both of Calif., assignors to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Aug. 15, 1984, Ser. No. 640,995
Int. Cl.⁴ G05F *3/20*
U.S. Cl. 323—314 **14 Claims**



1. A temperature compensated voltage reference circuit, comprising:

a voltage reference circuit adapted to generate an output reference voltage which varies with temperature,

a passive impedance element,

means for generating a current through the impedance element which varies with temperature in a manner complementary to the temperature variance of the output reference voltage, said current generating means comprising:

means for establishing a first current which is substantially temperature-invariant,

means for establishing a second current which varies with temperature,

first and second circuit means having output voltages which vary with their respective input currents,

means for applying the first and second currents as input currents to the first and second circuit means, respectively, and

means for applying the output voltage differential between the first and second circuit means across the passive impedance element, and

means responsive to said generated current for adjusting the output reference voltage to substantially compensate for its temperature dependence.

4,633,166

BUFFER CIRCUIT SUITABLE FOR LOW VOLTAGE OPERATION

William A. Cole, Mossley, Canada, assignor to Linear Technology Inc., Burlington, Canada

Filed Oct. 7, 1985, Ser. No. 785,139
Claims priority, application Canada, Oct. 9, 1984, 464986
Int. Cl.⁴ G05F *3/16*
U.S. Cl. 323—315 **10 Claims**

1. A buffer circuit adapted for operation at a low supply voltage and comprising:

(a) first, second and third transistors each having a base, emitter and collector, said transistors being selected from NPN and PNP types, said first and second transistors being of one type and said third transistor being of the other type,

(b) first and second terminal means adapted for connection to a power supply,

(c) input signal terminal means connected to the base of said first transistor, the emitter of said first transistor being

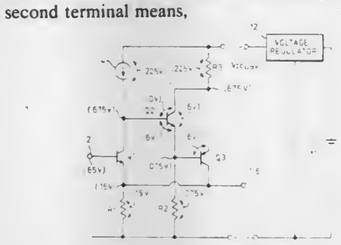
connected through a first resistance means to said first terminal means,

(d) current source means connected between the collector of said first transistor and said second terminal means for loading said first transistor,

(e) the collector of said first transistor being connected to the base of said second transistor,

(f) the emitter of said second transistor being connected through second resistance means to said first terminal means,

(g) the collector of said second transistor being coupled to said second terminal means,



(h) the emitter of said second transistor being connected to the base of said third transistor,

(i) the collector of said third transistor being connected to output terminal means and also to the emitter of said first transistor,

(j) the emitter of said third transistor being connected through third resistance means to said second terminal means,

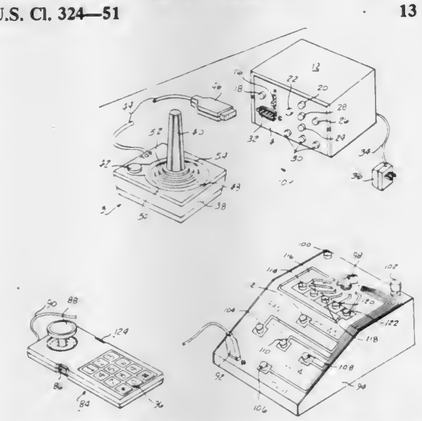
so that an input signal applied to said input signal terminal will cause a corresponding signal at said output terminal means.

4,633,167

TESTER FOR ELECTRICAL JOY STICK CONTROLLERS

Melvin M. Kitts, 5870 Ziegler, Taylor, Mich. 48180

Filed Jan. 30, 1984, Ser. No. 574,893
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 **13 Claims**



1. Apparatus for testing an electrical controller of the type including first and second control portions, said first control portion including a control element which is manually shiftable about a central axis between a plurality of positions distributed around said axis, a plurality of electrical switches respectively associated with said positions and each operated by the shifting of said control element to the associated position, said second control portion including at least one electrical switch which is manually operable independent of the shifting of said control element, said electrical controller further including a keyboard having a plurality of key switches, each of said key switches being connected in discrete circuits yielding an output signal equivalent to the output from one to four of said switches respectively associated with said positions around the control element including serially connected diodes, comprising:

a support;

a plurality of indicator lamps respectively associated with said plurality of electrical switches, said indicator lamps being mounted on said support at positions distributed about a reference point and correlated to the positions of said plurality of switches about said central axis;

at least one electrically energizable visual indicating element and an audible indicating element mounted on said support and associated with said one switch;

a source of electrical power;

first electrical circuit means for coupling said power source with said plurality of switches and said indicator lamps;

second electrical circuit means for coupling said power source with said one switch and said indicating element;

third circuit means connecting said indicators and said discrete circuits of the key switches wherein continuity of the discrete circuits may be checked by depressing one of said key switches and comparing the indicators activated with correlated indicators associated with the key switch depressed; and

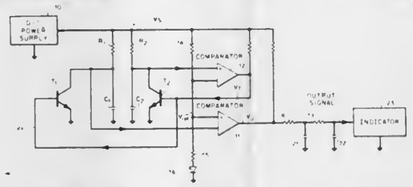
fourth circuit means for testing said discrete circuits of the key switches including means for reversing current flow direction for checking said serially connected diodes in said discrete circuits to determine if such diodes prevent current flow in one direction by depressing one of the key switches and comparing the indicators activated with correlated indicators associated with the key switch depressed.

4,633,168

MEASURING SYSTEM FOR DETERMINING THE REACTANCE RATIO OF A PAIR OF REACTIVE DEVICES

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 30, 1984, Ser. No. 676,981
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—60 CD **1 Claim**



1. A measuring system for comparing first and second unknown capacitors to determine the ratio of their capacitances, comprising:

means for simultaneously, and slowly, charging the first and second unknown capacitors, starting at time t_0, from the same relatively low voltage level to the same relatively high reference voltage level $V_{ref.}$, each of the first and second capacitors being charged through a series-connected resistor toward the output voltage of a d-c power supply which output voltage is substantially greater than the reference voltage $V_{ref.}$, the reference voltage being produced by a voltage divider connected across the d-c power supply and thereby being directly proportional to, and varying in step with variations of, the power supply voltage, the first capacitor having a charge time constant, determined by its capacitance and the resistance of its series-connected resistor, substantially shorter than the charge time constant of the second capacitor, which is determined by its capacitance and its series-connected resistance, so that the first capacitor charges to the reference voltage $V_{ref.}$, at time t_1, long before the second capacitor reaches the reference voltage at the later time t_2, the time duration from t_0 to t_1 thereby being a function of the capacitance of the first capacitor while the time duration from t_0 to t_2 is a function of the capacitance of the second capacitor;

means for simultaneous, and rapidly, discharging the first and second capacitors, at time t_2, back to the low voltage level by turning on a pair of substantially identical first and second transistors each of which is shunt-connected across a respective one of the first and second capacitors,

the second capacitor, its shunt-connected second transistor and its series-connected resistor being included in an oscillating circuit which produces periodically-recurring triggering pulses to turn said first and second transistors on to effect rapid discharging of the first and second capacitors, the triggering pulses being produced in the oscillating circuit by a voltage comparator which compares the voltage across the second capacitor to the reference voltage $V_{ref.}$, the period of the triggering pulses thereby being a function of the capacitance of the second capacitor and being equal to the time duration from t_0 to t_2;

another voltage comparator which compares the voltage across the first capacitor to the reference voltage $V_{ref.}$ to detect when the first capacitor charges to the reference voltage, thereby to determine the time duration from t_0 to t_1,

said other voltage comparator producing a periodically-recurring rectangular wave whose duty cycle represents the ratio of the capacitances of the first and second unknown capacitors, the rectangular wave having pulse components each of which has a pulse width equal to the time duration from t_0 to t_1 while the period of the rectangular wave is equal to the time duration from t_0 to t_2;

an averaging circuit for producing, from said periodically-recurring rectangular wave, an output signal having an amplitude which is proportional to the ratio of the capacitances of the first and second unknown capacitors;

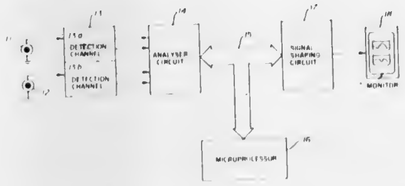
and indicating means, responsive to said output signal, for providing an indication of the value of the capacitance ratio of the first and second unknown capacitors.

4,633,169

BLOOD PARTICLE ANALYZER

Philippe L. Degrave, Viroflay, and Jean P. Lepage, Margny les Compiègnes, both of France, assignors to Kontron Holding AG, Zurich, Switzerland

Filed Jun. 28, 1984, Ser. No. 625,754
Claims priority, application Switzerland, Jul. 8, 1983, 3769/83
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—71.1 **6 Claims**



4. A device for analyzing particles in suspension in a fluid having a conductivity different from that of the particles, said device having a pulse detector which includes the following circuits:

(a) a differentiation circuit to produce a first auxiliary signal the waveform of which corresponds to the first derivative with respect to time of the waveform of each pulse;

(b) a first comparator connected to the output of the differentiation circuit to detect a first instant (t_1) at which the first auxiliary signal exceeds a predetermined first threshold level (S_1), and to supply a corresponding output signal;

(c) a counter connected to the output of the first comparator to produce as an output signal a pulse the duration of which defines a predetermined time interval (To) starting from the said first instant (t_1);

(d) a second comparator connected to the output of the differentiation circuit to detect a second instant (t_2) at which the first auxiliary signal exceeds a second predetermined threshold level (S_2), which is larger than the first threshold level (S_1), and to provide a corresponding output signal; and

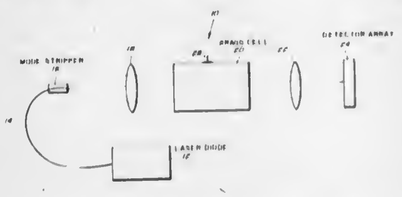
(e) a logical circuit connected to the outputs of the first and second comparators and of the counter, and intended to control the consideration of pulses received at the input of the differentiation circuit as pulses of zero amplitude if the second instant (t_2) falls within the time interval (To) defined by the counter.

4,633,170

BRAGG CELL SPECTRUM ANALYZER

William K. Burns, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,659
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 K **7 Claims**



1. A method for determining the component wavelengths of an RF signal comprising:

aiming light possessing a poor spatial quality from a miniature semiconductor laser diode having low power requirements into a single mode optical fiber;

conducting the light through the optical fiber;

stripping away unwanted modes of the light being conducted through the optical fiber so a near gaussian spatial light beam is emitted by the optical fiber;

exciting a Bragg cell with an RF signal passing through a transducer attached to the Bragg cell;

introducing the light emitted by the optical fiber into the Bragg cell so the light is diffracted by the excited Bragg cell whose refraction index is determined by the RF signal; and

focusing the diffracted light onto a detector array, the detector array being situated so that that position where the diffracted light is focused on the detector array corresponds to a unique RF frequency wavelength.

4,633,171

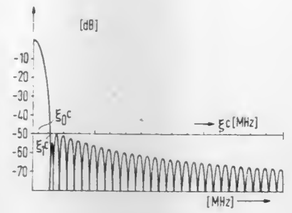
WINDOW FUNCTION FOR AN APERTURE WINDOW

Eckhard Storck, and Ulrich Wolff, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,948
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404810
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 K **6 Claims**

1. A Bragg cell spectral analyzer aperture window, comprising: aperture window means for apodization of diffraction, thereat and comprising a window function (A(x)) defining a spatial intensity distribution over a specific spatial coordinate (x) to be impressed on radiation passing through the aperture window means except for a prescribable standardization factor, the window function A(x) being defined by

$A(x) =$



-continued

$$\begin{cases} \dfrac{\cosh^{-1}\left(\sqrt{10^k}\right) I_1\left(\sqrt{1-(2x/D)^2}\cdot\cosh^{-1}\left(\sqrt{10^k}\right)\right)}{D\sqrt{1-(2x/D)^2}} + \\ \quad \frac{1}{2}\left(\delta\left(x+\frac{D}{2}\right)+\delta\left(x-\frac{D}{2}\right)\right) \quad \text{for } |x| \leqq \frac{D}{2} \\ 0 \qquad\qquad \text{for } |x| > \frac{D}{2} \end{cases}$$

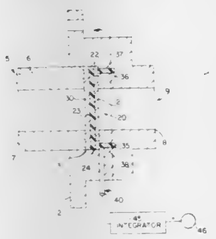
Where $I_1(\ldots)$ denotes the modified Bessel function of the first kind and first order, k is a prescribable number which defines a target level of apodization, D denotes an aperture width of the aperture along the spatial coordinate (x), and $\delta(\ldots)$ denotes Dirac's delta function.

4,633,172

IN-LINE BEAM CURRENT MONITOR

Carl A. Ekdahl, Jr., and Charles A. Frost, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 13, 1984, Ser. No. 670,777
Int. Cl.[4] G01R *19/00*
U.S. Cl. 324—126 **10 Claims**



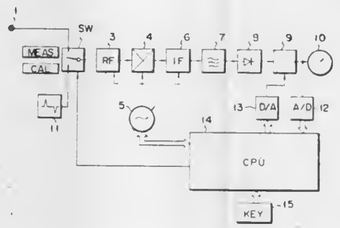
1. An in-line intense relativistic electron beam (IREB) current monitor comprising:
a tube having an electrically conductive wall surrounding an open passage for carrying an IREB, said tube including an input end for receiving a high energy IREB current and an output end for receiving a total return current consisting of low energy plasma current I_p and wall current I_w;
filter means for passing the IREB current from said input end to said output end through said open passage and for diverting the current I_p from said passage;
means for combining the diverted current I_p and the current I_w; and
means for measuring the combined currents.

4,633,173

APPARATUS FOR MEASURING A SIGNAL LEVEL

Toshihiro Kashiwagi, Ebina, Japan, assignor to Anritsu Electric Company Limited, Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 715,069
Int. Cl.[4] G01R *1/02, 19/00, 35/00*
U.S. Cl. 324—130 **10 Claims**



1. An apparatus for measuring a signal level comprising:
a high-frequency amplification section for amplifying a signal to be measured;
a local oscillator for generating a predetermined local oscillation signal;
a frequency conversion section for mixing an output from said high-frequency amplification section and an output from said local oscillator to generate an intermediate frequency signal;
an intermediate frequency amplification section for amplifying, at a predetermined passband, the intermediate frequency signal supplied from said frequency conversion section;
an indication section for indicating an output from said intermediate frequency amplification section;
a reference signal generator for generating harmonic pulses having a uniform level at a spectral interval substantially equal to or larger than the predetermined passband, the uniform level being used to calibrate a level of the signal to be measured;
frequency setting means for setting a frequency of the signal to be measured;
first switching means for switching an input to said high-frequency amplification section to an output side of said reference signal generator in accordance with the frequency set by said frequency setting means;
control means for controlling a local oscillation frequency of said local oscillator so as to set the indicated value at said indication section to a maximum value while an output from said reference signal generator is supplied to said high-frequency amplification section, and for controlling a gain of an amplification section such that the indicated value at said indication section is set to a predetermined indicated value while said local oscillator is being operated to provide the maximum value; and
second switching means for switching the input to said high-frequency amplification section to an input side of the signal to be measured after gain control is performed by said control means.

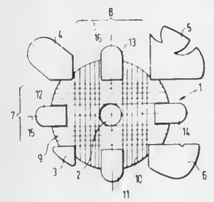
4,633,174

CROSSED-COIL ROTATING-MAGNET MEASURING INSTRUMENT

Christian Lindig, Kelkheim, and Roland Duffait, Eschborn, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,654
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328860
Int. Cl.[4] G01R *11/30, 11/36*
U.S. Cl. 324—143 **2 Claims**

1. A crossed-coil rotating-magnet measuring instrument comprising an approximately cylindrical core configured as a winding form, on which a first coil and a second coil are wound crossed one over the other, the second coil being disposed in the region of ends of the winding form over the first coil and thereby having a greater height of winding than the latter, and there being mounted in the core a rotating magnet having a pointer shaft extending out of an extension on the core, the instrument including an improvement comprising
spacer means disposed on the core for guiding turns of the coils in a planar configuration alongside the extension of



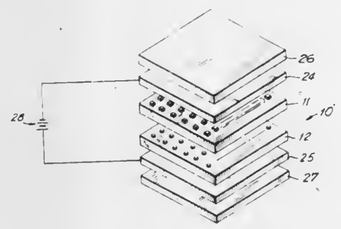
the core, each turn of the coil lying in a rectangular plane, and wherein
said core is asymmetrical, asymmetry of the core being characterized by an enlarged diameter in a winding region of the first coil, the diameter of the core being enlarged as compared with the diameter of a winding region of the second coil so as to equalize the average lengths of turns of the first coil and the second coil, thereby improving linearity in measurements employing rotations of said magnet over a plurality of quadrants.

4,633,175

TESTING METHOD AND APPARATUS FOR ELECTRONIC COMPONENTS

Kim Ritchie, Myrtle Beach, S.C.; Lonnie Hopkins, and John Galvagni, both of Colorado Springs, Colo., assignors to AVX Corporation, Great Neck, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,519
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F **9 Claims**



1. The method of simultaneously processing electronic devices such as capacitors which comprises the steps of providing first and second stretchable elastomeric insulating matrices each having a multiplicity of throughgoing apertures formed therein, introducing said electronic devices into said apertures of said first matrix in such manner that said devices are frictionally supported in said apertures and opposed terminals of said devices are exposed at opposite surfaces of said matrix, introducing replaceable fuse members into the apertures of said second matrix in such manner that said fuse members are frictionally supported in said apertures and opposite terminals of said fuse members are exposed at opposite surfaces of said second matrix, superposing said first and second matrices in such manner that each terminal of a fuse in said second matrix engages against a respective terminal of a device in said first matrix, interposing said superposed matrices between first and second yieldable electrodes, one said electrode being in conductive contact with a terminal of each of said devices and the other of said electrode being in conductive contact with a terminal of each of said fuses, and thereafter subjecting said devices to testing conditions while simultaneously causing a voltage to be applied across said electrodes.

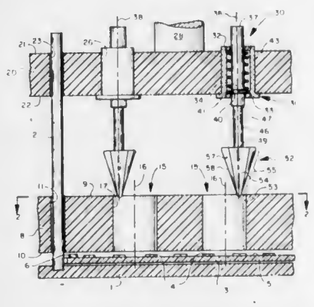
5. Apparatus for stress testing of capacitors having end terminations comprising first and second generally planar stretchable elastomeric matrices, said matrices each being provided with a multiplicity of through-going apertures, the apertures of one said matrix being aligned with the apertures of the other said matrix, the apertures of said first matrix each being sized to accommodate and removeably frictionally retain a capacitor while exposing the said end terminations of said capacitors at opposite sides of said matrix, the apertures of said second matrix being each sized to accommodate and removeably frictionally retain a fuse therein with distal portions of said fuses exposed at opposite sides of said matrix, first and second generally planar electrode means superposed over said first and second matrices respectively in overlying relation of said apertures, electrical current means connected to said electrode means for developing a voltage across said electrode means, and means for urging said electrode means toward each other to thereby press a distal end of the fuses in one said matrix against a termination of the capacitors in the other said matrix and simultaneously press the noninterengaged ends of said fuses and terminations into electrical contact with a respective one of said electrodes.

4,633,176

TEST FIXTURE INCLUDING DEFLECTABLE PROBES

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Jun. 20, 1984, Ser. No. 622,520
Int. Cl.[4] G01R *31/22, 15/12*
U.S. Cl. 324—158 P **14 Claims**



1. A fixture for use in a printed wiring board test system, comprising:
a printed wiring board including a first side surface;
a plurality of test points formed on said printed wiring board first surface;
a frame for holding said printed wiring board, said board positioned within said frame;
a test probe mounting plate movably attached to said frame, said mounting plate parallel to said printed wiring board, proximate to said printed wiring board side surface, and movable in a direction toward said printed wiring board;
a plurality of test probes attached to said mounting plate and extending perpendicularly therefrom in a direction toward said printed wiring board, said probes each attached in a predetermined location along a test probe axis perpendicular to said printed wiring board, each probe including
a rigid probe mount attached to said mounting plate said mount including a central bore including an axis parallel to said test probe axis,

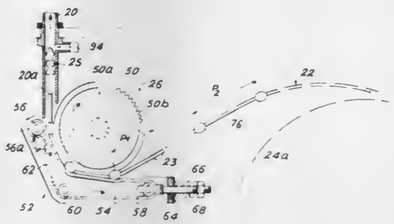
a probe shaft, said shaft slidably positioned within said mount central bore, including a first end near said printed wiring board,
a probe test head attached to said shaft first end,
a flexible member positioned intermediate each said probe shaft and said test head, said member resiliently positioning said head in alignment with said test probe axis,
a probe locating template of planar construction positioned intermediate said printed wiring board and said probe mount,
a plurality of apertures formed in said template, each aperture associated with a corresponding test probe and having a central axis displaced from said test probe axis,
whereby said mounting plate is moved in a direction toward said printed wiring board and said probe test heads are deflected and engage a corresponding one of said test points.

4,633,177

DEVICE FOR CHECKING BENT TUBES BY A PROBE, SUCH AS A PNEUMATICALLY PROPELLED EDDY-CURRENT PROBE

Bernard David, Gif sur Yvette; Michel Pigeon, Bures sur Yvette, and Claude Vienot, Fontenay-sous-Bois, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 13, 1984, Ser. No. 570,652
Claims priority, application France, Jan. 18, 1983, 8300692
Int. Cl.⁴ G01N *27/87;* **G01R** *33/12;* **B65H** *51/00;* **G21C** *17/00*
U.S. Cl. 324—220 **11 Claims**



1. Apparatus for inspecting curved tubes, such as helical heat exchanger tubes, comprising a sealed enclosure, a probe comprising a cable having floaters of larger diameter than the cable fixed thereto at lengthwise spaced intervals and having at a front end thereof a sensing head comprising electrical induction windings that are connectable with measuring apparatus by means of conductors extending along the cable, a rotatable cable winding means located within said enclosure to which the rear end of the cable is connected and about which the cable is normally coiled, connecting means through which said cable can pass for providing a sealed connection between said enclosure and one end of a tube to be inspected, and means for introducing into said enclosure a pressure fluid which flows through said connecting means and the tube to be inspected and is exhausted from the other end of said tube and whereby the probe is propelled through said tube from said one end thereof towards said other end, said apparatus being characterized by:

A. a pulley confined to rotation in said enclosure at a location between said cable winding means and said connecting means and having a peripheral groove in which said cable is receivable;
B. deceleration means for controlledly retarding rotation of said pulley to prevent its rotational speed from exceeding a predetermined value; and
C. cable engaging means for maintaining the cable engaged in said groove in the pulley around a substantial portion of the periphery thereof so that the speed at which the probe is propelled through a tube to be inspected is controlled by the speed at which the pulley is permitted to rotate, said cable engaging means comprising

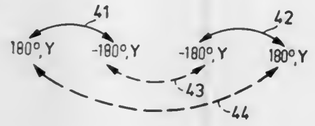
(1) an endless belt,
(2) a plurality of rollers about which said belt is trained and which are arranged to define a stretch of the belt that embraces said portion of the periphery of the pulley and engages the cable at the side thereof that is opposite the pulley, and
(3) means for maintaining said stretch of the belt under yielding lengthwise tension that accommodates passage of floaters between the belt and the pulley.

4,633,178

PROCESS FOR THE EXCITATION OF A SAMPLE FOR NMR TOMOGRAPHY

Bernhard Ströbel, Waldbronn, and Dieter Ratzel, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,807
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414635
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **1 Claim**



1. Process for the excitation of a sample for NMR tomography, in which the sample is exposed to a homogenous magnetic field and in addition to a selection gradient and is excited by a 90° selection pulse, whereafter the selection gradient is replaced by a phase coding gradient of limited time duration and a read gradient, the selection gradient, the phase coding gradient and the read gradient being mutually perpendicular to each other, and wherein finally the sample, after the ending of the phase coding gradient and with prevailing read gradient, is irradiated with a sequence of 180° pulses, whereby a plurality of core induction signals is generated in the form of so-called spin echos, characterized in that the phase position and, thus, the sense of rotation induced by the 180° pulses is reversed after every two pulses so that each pulse of the sequence is adjacent in time to one pulse inducing rotation in the same sense and one pulse inducing rotation in the opposite sense.

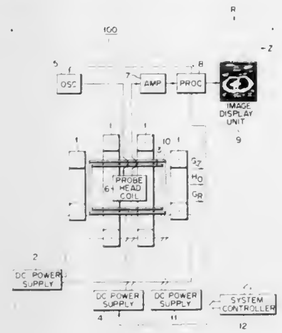
4,633,179

MAGNETIC RESONANCE IMAGING APPARATUS USING SHIM COIL CORRECTION

Hiroshi Sugimoto, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1985, Ser. No. 712,183
Claims priority, application Japan, Mar. 15, 1984, 59-50002
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **7 Claims**

1. An imaging apparatus for examining an object having a longitudinal axis and a cross-sectional slice perpendicular thereto, by nuclear magnetic resonance, comprising:
magnetic means for applying to said object a steady magnetic field along said longitudinal axis;
first coil means, which is arranged along said longitudinal axis, for applying to said object a first gradient field, which in conjunction with said steady magnetic field provides a predetermined field in said cross-sectional slice of said object, the field direction of said first gradient field being parallel to that of said steady magnetic field and the absolute value of the field strength value of said first gradient field increasing linearly in opposite directions from said cross-sectional slice along said longitudinal axis;
probe head coil means for applying RF pulses to said cross-sectional slice in a direction perpendicular to said longitudinal axis so as to excite nuclei therein which are being subjected to said predetermined field, and for detecting nuclear magnetic resonance signals derived from said cross-sectional slice;
second coil means for applying a second gradient field to said cross-sectional slice so as to define a projection angle of said nuclear magnetic resonance signals, the field direction of said second gradient field being perpendicular to said steady magnetic field and the strength of said second gradient field varying linearly, orthogonal to said first gradient field;
signal processing means for receiving said nuclear magnetic resonance signals from said probe head means, and for processing said received nuclear magnetic resonance signals by use of a two-dimensional Fourier transformation to produce an image of said cross-sectional slice; and,
correction coil means having at least first and second coil pairs, said first coil pair generating in conjunction with said steady magnetic field a first correction magnetic field so as to correct homogeneity of magnetic field components of said steady magnetic field having even-numbered higher order terms in said longitudinal axis, and said second coil pair generating in conjunction with said steady magnetic field a second correction magnetic field so as to correct uniformity of magnetic field components of said steady magnetic field in a direction perpendicular to said longitudinal axis, and also uniformity of magnetic field components of said first coil pair in said direction perpendicular to said longitudinal axis.

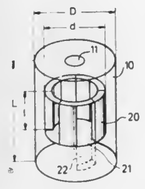


4,633,180

CAVITY RESONATOR

Reinhard Biehl, Karlsruhe; Dieter Schmalbein, Marxzell-Burbach, and Günther Laukien, Rheinstetten-Forchheim, all of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 567,960
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300767
Int. Cl.⁴ G01R *33/08*
U.S. Cl. 324—316 **11 Claims**



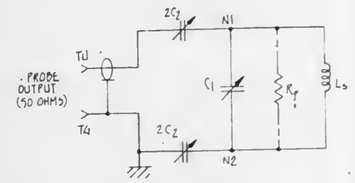
1. A microwave resonator for generating magnetic dipole transitions in a sample of material under investigation, said resonator comprising:
a microwave cavity resonator formed from electrically conductive material and defined by end faces and lateral walls the physical dimensions of which determine the natural resonant frequency of the cavity resonator at a given microwave resonant mode, said end faces extending in a perpendicular direction to a first coordinate z and said lateral walls extending in a parallel direction thereto;
a sample tube containing said sample and being arranged along said coordinate z and further extending through an aperture in one of said end faces;
coupling means for coupling microwave energy into said cavity resonator to establish a mode of operation, determined by said microwave resonant mode, in which magnetic flux lines are concentrated along said sample and electric flux lines extending therearound; and
electrically conductive means arranged within said cavity resonator, said electrically conductive means having conductive paths along said electric flux lines and being effective to reduce the natural frequency of said cavity resonator leading to a high filling factor whereby large volume cavity resonators normally required at low frequencies can be made smaller in size.

4,633,181

APPARATUS AND METHOD FOR INCREASING THE SENSITIVITY OF A NUCLEAR MAGNETIC RESONANCE PROBE

Joseph A. Murphy-Boesch, San Francisco, and Alan P. Koretsky, Oakland, both of Calif., assignors to Regents of the University of Calif., Berkeley, Calif.

Filed Aug. 11, 1983, Ser. No. 522,150
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—322 **45 Claims**



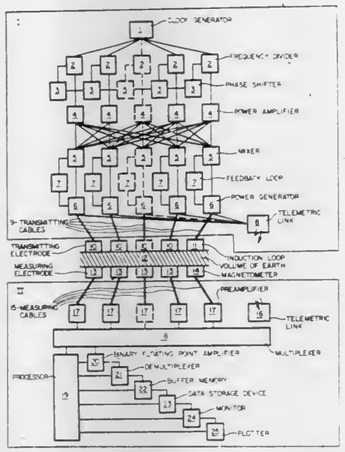
1. A nuclear magnetic resonance probe circuit having an improved quality factor in the presence of coil-to-ground parasitics encountered in nuclear magnetic resonance analysis of a specimen, comprising:
a sample coil having a nominal inductance, the sample coil being positioned in close proximity to the specimen;
a tuning circuit element connected to the sample coil, the sample coil and tuning circuit element substantially forming a resonant circuit tuned to a selected Larmor frequency; and
a balanced impedance circuit means connected to the sample coil and tuning circuit element for controlling the voltage across the sample coil in the presence of leakage current from the sample coil through the specimen to ground in a manner to balance the leakage currents as seen from the ends of the sample coil, thereby reducing the influence of coil-to-ground parasitics additional to any coil-to-ground parasitic attributable solely to leakage current directly from the sample coil to ground.

4,633,182

METHOD AND SYSTEM FOR DIRECT PROSPECTING OF HYDROCARBON DEPOSITS

Jan Dzwinel, Cracow, Poland, assignor to Instytut Gornictwa Naftowego i Gazownictwa, Cracow, Poland

Filed Jan. 18, 1984, Ser. No. 572,165
Claims priority, application Poland, Mar. 3, 1983, 240884
Int. Cl.[4] G01V *3/08*
U.S. Cl. 324—335 **2 Claims**



2. An electrical geophysical system for direct and diagnostic prospecting of hydrocarbon deposits consisting of a transmitting part and a receiving/processing part connected to each other through the air via a telemetric link and through the earth by a transmitting array and a receiving array, the transmitting array consisting of an arrangement of transmitting electrodes arranged in a star pattern and transmitting induction loop(s), and the receiving array consisting of an arrangement of receiving electrodes arranged in a star pattern and magnetometers, characterized in that;

(a) the transmitting part has four to eight independent frequency dividers controlled by a clock generator, frequency dividers being connecting to mixers through phase shifters and power amplifiers and providing to the mixers electric currents having four to eight independent frequency bands, and

the mixers are connected to power generators and induce in each of the power generators independent combinations of frequency bands, thus allowing many different combinations of frequencies to be produced;

the power generators are independently connected to various electric transmitting circuits, thus allowing many different combinations of transmitting circuit connections to be employed, said circuits comprising the arrangement of transmitting electrodes and transmitting induction loop(s) spread out on the earth's surface in such a way that the cables laid down to connect the power generators to the transmitting electrodes form a star, with two adjacent arms of said star forming two sides of a transmitting induction loop;

(b) the receiving part has

receiving electrodes and receiving magnetometers which are laid out such that one receiving electrode and the three receiving magnetometers are located at the center of each transmitting induction loop, and the other receiving electrodes are located at the midpoint of each side of each transmitting induction loop, said receiving electrodes and receiving magnetometers forming numerous combinations of receiving circuits;

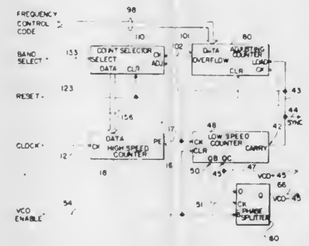
filters which filter the signals received by the receiving circuits, and multiplexer which multiplexes said signals connected to binary floating point amplifier controlled by processor, processor also controlling the operation of demultiplexer and buffer memory, through which said signals pass in turn, and data storage device, in which said signals are recorded, and processor also performing, using programs stored on data storage device, pattern recognition and cluster analysis which creates patterns of the measured signals which characterize known hydrocarbon deposits and known barren locations, these patterns being stored on data storage device, whereafter the signals recorded over prospecting locations are classified according to said storage patterns in processor, the results of this classification being recorded on data storage device and presented on a monitor and a plotter which are connected to processor and data storage device.

4,633,183

CONSTANT RESOLUTION FREQUENCY SYNTHESIZER

Dale A. Heatherington, Alpharetta, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 28, 1985, Ser. No. 706,663
Int. Cl.[4] H03L *7/18*
U.S. Cl. 328—14 **8 Claims**



1. A frequency synthesizer for generating an output signal at a predetermined frequency comprising:

a counter including a first predetermined number of high speed stages having count control inputs, and a second predetermined number of low speed stages;

output means connected to at least one of said low speed stages for providing said output signal;

input means for accepting an externally provided frequency control code; and

adjusting means responsive to said output signal and said frequency control code for providing correction information to a count selector during each occurrence of a predetermined number of cycles of said output signal;

said count selector being responsive to said frequency correction information to provide a first count control signal to said count control inputs for a first fraction of said predetermined number of cycles of said output signal, and a second count control signal to said count control inputs for a second fraction of said predetermined number of cycles of said output signal.

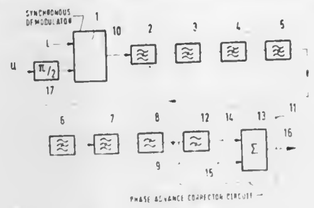
4,633,184

DEVICE FOR GENERATING A SIGNAL CORRESPONDING TO A VARIABLE MAGNITUDE ASSOCIATED WITH THE REACTIVE POWER OF AN ARC FURNACE IN ORDER TO CONTROL A REACTIVE POWER COMPENSATOR

Patrick Charles, Mareil sur Mauldre, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Apr. 8, 1985, Ser. No. 720,932
Claims priority, application France, Apr. 6, 1984, 84 05506
Int. Cl.[4] H02J *3/18*
U.S. Cl. 328—55 **4 Claims**

1. Device for generating a signal corresponding to a variable magnitude associated with the reactive power of an arc furnace in order to control a reactive power compensator, comprising a reactive power or voltage demodulator, a set of filters connected in series to the output of said demodulator and comprising at least three active bandstop filters having a bandwidth $\pm F$ relative to frequencies of $2f_0$, $4f_0$ and $6f_0$ and at least two narrowband active bandstop filters having a bandwidth of substantially ± 2 Hz relative to frequencies of f_0 and $3f_0$, where f_0 is the supply frequency and F is approximately $f_0/2$, and a phase advance corrector circuit operative in the frequency band 0–F connected to the output of said set of filters.

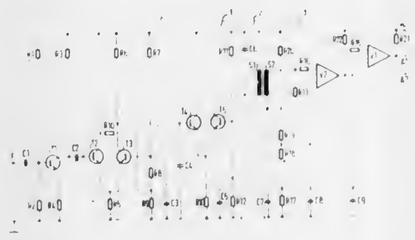


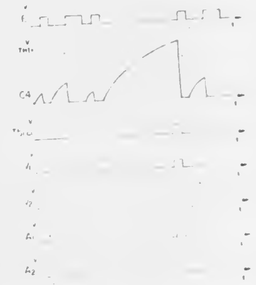
4,633,186

DIGITAL SIGNAL PATTERN RECOGNITION CIRCUIT

Manfred Wiegel, Stuttgart, and Harald Dorr, Ludwigsburg, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 4, 1985, Ser. No. 688,789
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400691
Int. Cl.[4] H03K *25/02;* **H03M** *5/10*
U.S. Cl. 328—119 **5 Claims**





1. Circuit arrangement for recognizing an identification signal in the form of a digital signal containing periodically recurring sections having a predetermined duration and a predetermined bit pattern in the form of a string of successive like bits, comprising;

a frequency discriminator, which responds to the periodicity of said periodically recurring sections, and from whose output voltage a control signal corresponding to a received identification signal is derived;

a time discriminator, coupled to the input of said frequency discriminator, which receives said digital signal at its input and provides a pulse to said frequency discriminator only if successive like bits were received for a period of time characteristic of sections of an identification signal, wherein said time discriminator gives the pulse a duration equal to the duration of the reception of successive like bits, and wherein said frequency discriminator output voltage has an amplitude which corresponds to the duration of said pulses and, thus, to the duration of the periodically recurring sections of the identification signal if the pulses applied to the frequency discriminator recur at the repetition rate characteristic of an identification signal; and

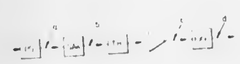
a comparator which distinguishes different identification signals characterized by sections of different length by comparing the output voltage of the frequency discriminator with predetermined reference voltages.

4,633,185

CHIRP SIGNAL GENERATOR FOR PULSE COMPRESSION RADAR

Hugh McPherson, Tweeddale, and John P. Blakely, Edinburgh, both of Scotland, assignors to Ferranti plc, Cheshire, England

Filed Oct. 6, 1983, Ser. No. 539,558
Claims priority, application United Kingdom, Oct. 16, 1982, 8229617
Int. Cl.[4] H03K *5/159;* **H03C** *3/00, 3/28*
U.S. Cl. 328—56 **4 Claims**



1. A chirp signal generator which includes:

a pulse generator for generating a single impulse,

a first surface acoustic wave delay line responsive to said impulse to produce an output signal comprising several cycles of energy at a predetermined frequency,

a threshold circuit operable to pass only that portion of said output signal which exceeds a preset amplitude, and

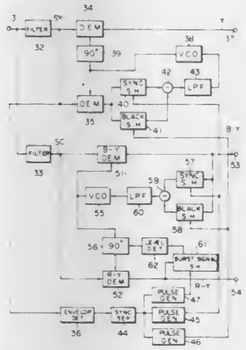
a second surface acoustic wave delay line having said predetermined frequency as its centre frequency and responsive to the output of the threshold circuit to deliver a frequency modulated pulse comprising a chirp signal.

4,633,187

AM SYNCHRONOUS DETECTING CIRCUIT

Yoshikazu Nishimura, Yoshimi Yasukouchi, and Hisao Asakura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,561
Claims priority, application Japan, Apr. 27, 1984, 59-85733
Int. Cl.⁴ H03D *3/06*
U.S. Cl. 329—50 **11 Claims**



1. A demodulating circuit for an amplitude-modulated video signal, comprising,

an input terminal to be supplied with an input video signal comprising at least a modulated carrier signal amplitude-modulated by an information signal, said modulated carrier signal having a predetermined phase;

oscillator means for generating a first demodulating carrier the phase of which is displaced from that of said modulated carrier signal by 90°, and a second demodulating carrier which has the same phase as that of said modulated carrier signal;

a first synchronous demodulator for demodulating said input signal with said first demodulating carrier;

a second synchronous demodulator for demodulating said input signal with said second demodulating carrier;

a level detector for detecting the level of a predetermined portion of the demodulated output of said first synchronous demodulator;

a control circuit supplied with the output of said level detector and producing a feedback signal for controlling said oscillator means so that the phase of said second demodulating carrier is synchronous with that of said modulated carrier signal; and

an output terminal connected to said second synchronous demodulator for receiving the demodulated information signal from said second synchronous demodulator.

4,633,188

MIXER/AMPLIFIER CIRCUIT

Shigetoshi Matsuta, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

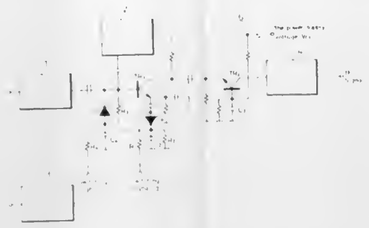
Filed Nov. 20, 1985, Ser. No. 800,054
Claims priority, application Japan, Nov. 21, 1984, 59-246847
Int. Cl.⁴ H03F *3/19*
U.S. Cl. 330—51 **3 Claims**

1. A mixer/amplifier circuit for selectively mixing a first input signal with a local oscillator signal or amplifying a second input signal, said mixer/amplifier circuit comprising:

(a) a transistor;

(b) a first circuit arrangement responsive to a first switching signal for enabling said transistor to operate as a grounded-base transistor to amplify the second input signal supplied to the emitter thereof; and

(c) a second circuit arrangement responsive to a second switching signal for enabling said transistor to operate as a



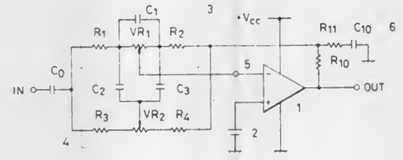
grounded-emitter transistor to mix the first input signal supplied to the base thereof with the local oscillator.

4,633,189

NF TONE CONTROL CIRCUIT

Yasuo Kawakami, and Katsushi Kitamura, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,822
Claims priority, application Japan, Oct. 15, 1984, 59-155498[U]
Int. Cl.⁴ H03F *1/34*
U.S. Cl. 330—97 **3 Claims**



1. In an NF tone control circuit including an operational amplifier, a feedback loop for feeding back an output voltage of said operational amplifier to an input thereof, and a variable impedance circuit provided between an input terminal of said tone control circuit and said input of said operational amplifier and also in said feedback loop, the improvement comprising: a voltage divider circuit connected between an output of said operational amplifier and a reference potential and dividing only an a.c. component of said output voltage of said operational amplifier, said voltage divider circuit comprising first and second resistors connected in series between said output of said operational amplifier and said reference potential and a capacitor connected between the series connection of said first and second resistors and said reference potential, and means for feeding the divided voltage from said voltage divider circuit to an input of said operational amplifier.

4,633,190

VOLTAGE AND CURRENT SOURCE FLUCTUATION COMPENSATOR AND METHOD

Robert E. Malm, Pacific Palisades, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Continuation-in-part of Ser. No. 667,515, Nov. 1, 1984, abandoned. This application Jul. 30, 1985, Ser. No. 760,704
Int. Cl.⁴ H03F *1/30*
U.S. Cl. 330—149 **7 Claims**

1. A voltage and current source fluctuation compensator for use with an electronic signal amplifier of the type having a signal input port and signal output port and an operating point and having a plurality of power supply inputs to which a plurality of power supply sources are connected, comprising

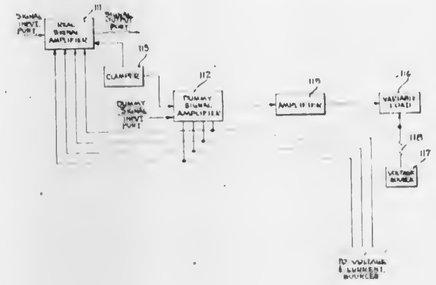
a dummy signal amplifier having input circuitry substantially identical to the signal amplifier, and having a signal input port and a signal output port and an operating point,

said dummy signal amplifier being connected to the supply sources in substantially the same manner as the signal amplifier is connected to the supply sources,

a compensation amplifier,

a variable load connected to one of the supply sources,

the compensation amplifier amplifying changes in the output of the dummy amplifier,



the variable load loading down one of the supply sources in response to the output by the compensation amplifier,

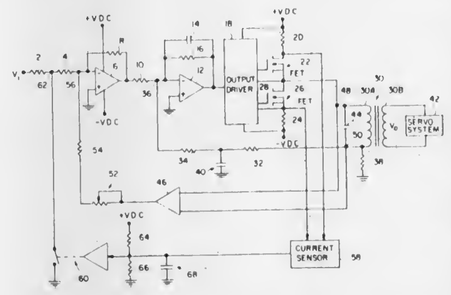
the loading down of said one of the supply sources by the variable load compensates for variations in the power supply sources and substantially removes variations in the signal output from the output of the dummy signal amplifier and the electronic signal amplifier caused by the variations in the power supply sources.

4,633,191

TRANSFORMER ISOLATED HIGH VOLTAGE, HIGH POWER AMPLIFIER SYSTEM

Jacob H. Malka, Fair Lawn, and Philip J. Thurakal, New Milford, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 22, 1985, Ser. No. 768,272
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 330—275 **14 Claims**



1. A transformer isolated high voltage, high power amplifier system, characterized by:

amplifief means for receiving a system input signal and for providing an output signal;

driver means connected to the amplifier means and responsive to the output signal for providing a driver signal;

a transformer including a primary winding connected to the driver means for receiving the driver signal and a secondary winding for providing a system output signal;

first means connected to the transformer primary winding and to the amplifier means for preventing saturation of the transformer; and

second means connected to the driver means and to the amplifier means for minimizing input/output signal cross-over and phase shift.

4,633,192

INTEGRATED CIRCUIT OPERATING AS A CURRENT-MIRROR TYPE CMOS AMPLIFIER

Kenji Anami, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,645
Claims priority, application Japan, May 18, 1983, 58-88402
Int. Cl.⁴ H03F *3/16*
U.S. Cl. 330—277 **5 Claims**



1. An integrated circuit operating as a current-mirror type CMOS amplifier, the integrated circuit comprising:

a first P-channel FET whose source is connected to a power supply with a gate and a drain thereof being connected to a first node;

a first N-channel FET whose drain is connected to the first node with a gate thereof being connected to a first input terminal and with a source thereof being earthed;

a first inverter constituted by the first P-channel FET and the first N-channel FET;

a second P-channel FET whose source is connected to a power supply with a gate thereof being connected to the first node and with a drain thereof being connected to a second node;

a second N-channel FET whose drain is connected to the second node with a gate thereof being connected to a second input terminal and with a source thereof being earthed;

a second inverter constituted by the second P-channel FET and the second N-channel FET; and

the conductance of the first P-channel FET being smaller than that of the second P-channel FET, and the conductance of the first N-channel FET being smaller than that of the second N-channel FET.

4,633,193

CLOCK CIRCUIT SYNCHRONIZER USING A FREQUENCY SYNTHESIZER CONTROLLED BY A FREQUENCY ESTIMATOR

Dominick Scordo, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1985, Ser. No. 805,124
Int. Cl.⁴ H03L *7/14*
U.S. Cl. 331—1 A **14 Claims**

1. Apparatus for generating an estimate of the frequency of an incoming reference timing signal comprising:

an oscillator for generating an output signal having a fixed frequency and corresponding period;

means for generating a sampled input phase signal by sampling the phase of said incoming reference timing signal with said oscillator output signal; and

a digital phase-locked loop including

means for algebraically combining said sampled input phase signal with a local phase signal to obtain a phase error

signal which is the algebraic difference between said sampled input phase signal and said local phase signal,

loop compensation filter means supplied with said phase error signal for generating an estimate signal representative of a frequency difference between said incoming reference timing signal frequency and said oscillator output signal frequency, and

integrator means supplied with said estimate signal for generating said local phase signal, wherein said local phase signal is phase-locked to said incoming reference timing signal.

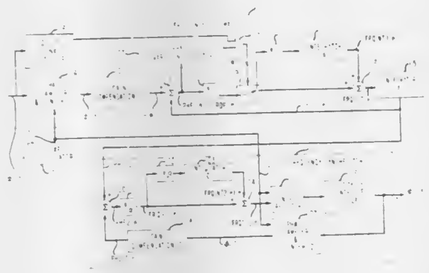
6. Apparatus for generating an output timing signal comprising:

an oscillator for generating an output signal having a fixed frequency and corresponding period;

means for generating a sampled input phase signal by sampling the phase of an incoming reference timing signal with said oscillator output signal;

a first digital phase-locked loop including

means for algebraically combining said sampled input phase signal with a local phase signal to obtain a first phase error signal which is the algebraic difference between said sampled input phase signal and said local phase signal,



first loop compensation filter means supplied with said first phase error signal for generating an estimate signal representative of a frequency difference between said incoming reference timing signal frequency and said oscillator output signal frequency, and

integrator means supplied with said estimate signal for generating said local phase signal, wherein said local phase signal is phase-locked to said incoming reference timing signal; and

a second digital phase-locked loop including

a digitally controlled oscillator responsive to a frequency control signal for generating said output timing signal,

means for generating a sampled output phase signal by sampling the phase of said output timing signal with said oscillator output signal,

means for algebraically combining said sampled output phase signal with said local phase signal to obtain a second phase error signal which is the algebraic difference between said local phase signal and said sampled output phase signal,

second loop compensation filter means supplied with said second phase error signal for generating said frequency control signal, wherein said output timing signal is phase-locked to said local phase signal.

4,633,194

DIGITAL FREQUENCY DIVIDER SUITABLE FOR A FREQUENCY SYNTHESIZER

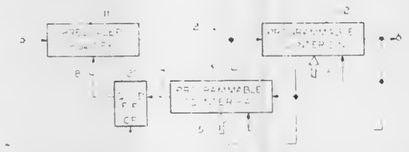
Hiroyuki Kikuchi, Tokyo; Atsushi Iwata, Saitama; Takashi Matsuura, and Yoshiharu Shigeta, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Japan and Nippon Electric Co., Ltd., Japan

Filed Jun. 25, 1981, Ser. No. 277,396

Claims priority, application Japan, Jul. 7, 1980, 55-92933

Int. Cl.⁴ H03L *7/18;* **H03K** *21/00*

U.S. Cl. 331—25 **9 Claims**



1. A digital frequency divider comprising first prescaling counter means for frequency dividing an input signal by selecting either a first or a second frequency-division factor in response to a first control signal, said first counter means having a cycle time t_c, second counter means for generating a desired output signal by frequency dividing the output of said first counter means by a third frequency-division factor, third counter means for frequency dividing the output of said first counter means by a fourth frequency-division factor, said third counter means introducing a transmission delay time t_A, said fourth frequency-division factor being smaller than said third frequency-division factor, and switching control means for converting the output of said third counter means into a signal which is synchronized with the output of said first prescaling counter means and for returning the converted signal to said first counter means as said first control signal, said switching means introducing a transmission delay time t_D, said frequency divider operating so that $t_A < t_c$ and $t_{ps} + t_D < t_c$ where t_{ps} is the set up time required for switching the frequency division factor of the first counter means.

4,633,195

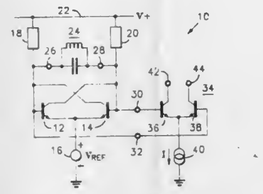
BALANCED OSCILLATOR WITH CONSTANT EMITTER VOLTAGE LEVEL

W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1985, Ser. No. 800,231

Int. Cl.⁴ H03B *5/08;* **H03C** *3/00*

U.S. Cl. 331—117 R **12 Claims**



1. A balanced oscillator including frequency determining means connected between first and second terminals, comprising:

first and second transistors each having first, second and control electrodes, said first electrodes being connected together, said control electrode of said first transistor being coupled both to the first terminal and said second electrode of said second transistor, said control electrode of said second transistor being coupled both to the second terminal and said second electrode of said first transistor;

current source means for supplying operating current to said first and second transistors; and

voltage reference means for supplying a predetermined and fixed voltage at said connected first electrodes of said first and second transistors.

9. In a balanced modulator having first and second inputs and including an oscillator providing a differential oscillator signal at the first and second inputs, the improvement comprising said oscillator including;

first and second transistors each having first, second and control electrodes, said first electrodes being connected together, said control electrode of said first transistor being coupled both to the first terminal and said second electrode of said second transistor, said control electrode of said second transistor being coupled both to the second terminal and said second electrode of said first transistor;

current source means for supplying operating current to said first and second transistors; and

voltage reference means for supplying a predetermined and fixed voltage at said connected first electrodes of said first and second transistors.

4,633,196

DELTA MODULATOR/DEMODULATOR WITH IMPROVED TRACKING OF RAPIDLY VARYING WAVEFORMS

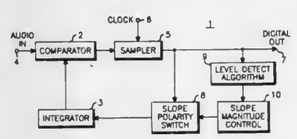
Nahum Peled, Rishon Le-Zion, and Shmuel Frenkel, Azor, both of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

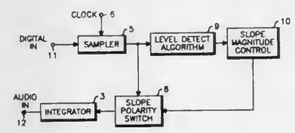
Filed Apr. 18, 1985, Ser. No. 724,387

Claims priority, application United Kingdom, Apr. 19, 1984, 8410350

Int. Cl.⁴ H03K *7/00, 9/00*

U.S. Cl. 332—11 D **5 Claims**





1. A delta modulator/demodulator comprising:

a sampler circuit for providing a clocked digital output signal;

an integrator circuit for integrating a ramp signal whose sign is dependent on said clocked digital output signal so as to provide an analogue signal; and

continuously variable slope circuitry for providing said ramp signal and including means for monitoring said clocked digital output signal and for providing an output signal dependent thereon, means responsive to said output signal for generating said ramp signal having a slope dependent on said output signal, and squaring means for squaring said ramp signal, whereby the sensitivity of the variable slope circuitry is increased such that said analogue signal provided by said integrator circuit has a faster response to said clocked digital output signal.

4,633,197

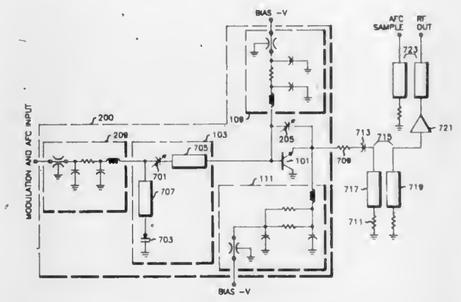
SINGLE RESONANT TANK MODULATED OSCILLATOR

Jan P. Vanderspool, II, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1985, Ser. No. 717,427

Int. Cl.⁴ H03C *3/08, 3/09*

U.S. Cl. 332—16 T **9 Claims**



1. An angle modulatable oscillator for generating radio frequencies angle modulated with an applied modulation signal, comprising:

an active device disposed in a circuit arrangement of associated capacitive and inductive impedance components whereby oscillation at a center frequency occurs;

a signal variable impedance means forming a significant impedance component in said circuit arrangement, adjusted to a predetermined operating point and producing a nonlinear change over a band of frequencies about said center frequency with the applied modulation signal;

a modulation predistorter means coupled to said signal-variable impedance means for compensating said nonlinear change so as to effect a predetermined change simultaneously over said band of frequencies about said center frequency with the applied modulation signal; and

a frequency controller means, generating a frequency correction signal applied to said signal variable impedance means to maintain said operating point and correct temperature induced impedance changes in said signal-variable impedance means, thereby maintaining said oscillator center frequency and said predetermined change essentially constant over temperature.

4,633,198

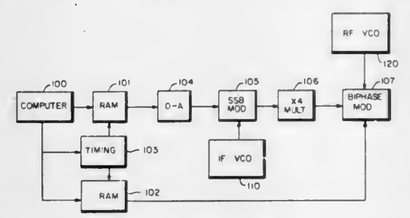
FLEXIBLE (MULTI-MODE) WAVEFORM GENERATOR

Paul W. Goetz, Phoenix, Ariz., and Kim R. Merley, Rio Rancho, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 12, 1986, Ser. No. 838,855

Int. Cl.⁴ H03C *3/00;* **G01S** *13/00*

U.S. Cl. 332—22 **4 Claims**



1. A waveform generator comprising:

a digital-to-analog converter which receives a first control signal and a digital waveform signal and outputs an analog waveform signal and said first control signal;

a first oscillator which outputs on intermediate frequency carrier signal;

a first modulator which receives said first control signal and said analog waveform signal from said digital-to-analog converter, said first modulator also receiving said intermediate frequency carrier signal from said first oscillator, said first modulator producing an output signal by modulating said intermediate frequency carrier signal with said analog waveform signal when said first control signal directs it to modulate, said first modulator producing an output signal which equals said analog waveform signal when said first control signal directs it not to modulate;

a second oscillator which outputs a radio frequency carrier signal;

a second modulator which receives said radio frequency carrier signal from said second oscillator and said output signal produced by said first modulator, said second modulator also receiving a second control signal, said second modulator producing an output signal by biphase modulating said radio frequency carrier signal with said output signal produced by said first modulator when directed to modulate by said second control signal, said second modulator producing an output signal equalling the output signal of the first modulator when said second control signal directs it not modulate; and

a control means which produces said digital waveform signal and said first and second control signals, said control means sending said first control signal and said digital waveform signal to said digital-to-analog converter, said control means sending said second control signal to said second modulator.

4,633,199

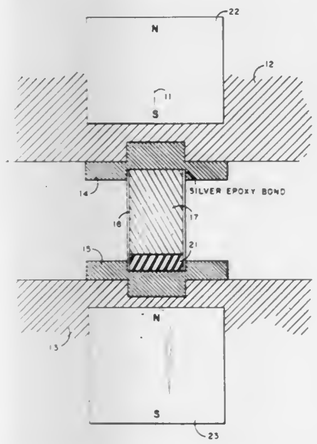
HIGH POWER CIRCULATING

Robert Stevens, Melrose, and Thomas Rosa, Danvers, both of Mass., assignors to Alpha Industries, Inc., Woburn, Mass.

Filed Dec. 5, 1984, Ser. No. 678,298

Int. Cl.⁴ H01P *1/39*

U.S. Cl. 333—1.1 **8 Claims**



1. In a microwave circulator having opposed metal transformers exhibiting circular symmetry in contact with opposed conducting broad walls of intersecting waveguides embracing a junction axis the improvement comprising,

a cylindrical ferrite core in thermal conducting contact with one of said metal transformers,

and a solid cylindrical insulating member filling the space between said ferrite core and the other of said metal transformers.

4,633,200

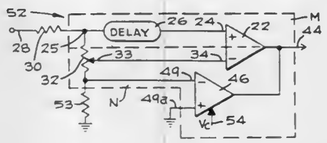
VOLTAGE CONTROLLED EQUALIZER

Alan J. Adler, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 29, 1985, Ser. No. 695,994

Int. Cl.⁴ H03H *11/06*

U.S. Cl. 333—28 R **21 Claims**



1. A voltage controlled equalizer having an amplitude versus frequency response characteristic, comprising:

a first signal path comprising a delay means having an input coupled to receive an input signal to be equalized and to provide known phase shifts thereof within a predetermined frequency range, and an amplifier means having a first input coupled to an output of said delay means; and

a second signal path in parallel with the first signal path coupled to provide a signal of opposite polarity with respect to a polarity provided by said first input of said amplifier means, said second signal path having a control means having an input coupled to said input of the delay means and an output coupled to an output of said amplifier means and having a control input coupled to receive a control signal to adjust the gain of said second signal path, thereby adjusting the amplitude versus frequency response characteristic of said equalizer.

4,633,201

ROTARY WAVEGUIDE SWITCH HAVING MAGNETIC MEANS FOR AN ACCURATE POSITIONING THEREOF

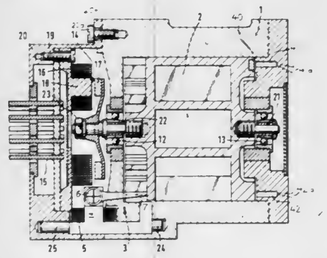
Gerd Ruff, Heidelberg, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,901

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346449; May 5, 1984, 3416704

Int. Cl.⁴ H01P *1/10*

U.S. Cl. 333—106 **11 Claims**



1. In a wavelength switch including housing walls defining a switch housing; said housing walls comprising a hollow cylindrical wall portion; at least two waveguide terminals provided in said housing walls and opening into said hollow cylindrical wall portion at a predetermined distance from one another as viewed circumferentially around said hollow cylindrical wall portion; a rotor supported for rotation in a space surrounded by said hollow cylindrical wall portion; at least one waveguide element contained in said rotor for coupling to one another at least two waveguide terminals in a predetermined angular operating position of said rotor wherein said waveguide element is in alignment with said at least two waveguide terminals; the improvement comprising

(a) motor means coupled to said rotor for turning said rotor to a coarse position adjacent a desired precise operating position in which said alignment is of high accuracy;

(b) a blocking member movably mounted in said housing and having a blocking position in which it is situated in a rotary path of said rotor at a location so as to abut said rotor in said desired precise operating position thereof and a withdrawn position in which it is situated withdrawn from said rotary path so as to allow rotation of said rotor freely past said desired precise operating position;

(c) means for moving said blocking member into, and maintaining it in, said blocking position upon said rotor reaching said coarse position;

(d) means for moving said blocking member into and maintaining it in, said withdrawn position upon movement of said rotor towards said coarse position; and

(e) magnetic means carried by said rotor and said blocking member for turning said rotor by magnetic attraction between said rotor and said blocking member from said coarse position into an abutting relationship with said blocking member, whereby said rotor assumes said desired precise operating position; said magnetic attraction being effective solely in said blocking position of said blocking member.

4,633,202

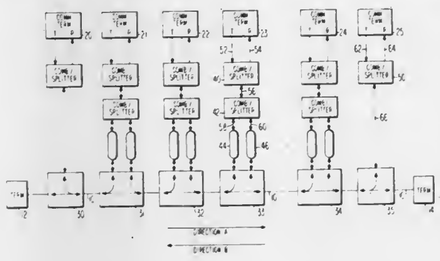
LOCAL AREA NETWORK SYSTEM WITH CONSTANT TAP LEVEL

Philip C. Basile, Gloucester County, N.J., and Eugene J. Kennedy, Lower Bucks County, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 24, 1984, Ser. No. 685,724

Int. Cl.⁴ H01P *5/16;* **H03H** *7/48*

U.S. Cl. 333—109 **8 Claims**



1. In a system for providing interconnections among N communications terminals, said system including a cable having first and second end terminations, and N taps serially interconnecting said cable between said end terminations for coupling said N communications terminals to said cable, wherein N−2 of said N taps are not adjacent said first or said second end terminations, each one of said N−2 taps comprising first and second directional couplers serially interconnected with each other and with said cable, said first directional coupler for coupling one of said communications terminals corresponding to said one of said N−2 taps to said cable for bidirectional communication with other communications terminals corresponding to taps disposed along said cable in a first direction toward said first end termination, said second directional coupler for coupling said one of said communications terminals corresponding to said one of said N−2 taps to said cable for bidirectional communication with other communications terminals corresponding to taps disposed along said cable in a second direction toward said second end termination, said first and second directional couplers being separately connected to said cable at said one of said N−2 taps and each directional coupler introducing a fixed signal power loss through said cable, said power loss being substantially equal among all of said directional couplers; an apparatus for equalizing the signal power level received at each of said N communications terminals, said apparatus comprising:

means for attenuating signal power coupled between each one of said directional couplers and said corresponding communications terminal, each of said attenuating means including a first and a second attenuator, said first attenuator being coupled between said first directional coupler and said corresponding communications terminal and said second attenuator being coupled between said second directional coupler and said corresponding communications terminal, said first and second attenuators providing a selectable signal power loss therethrough, wherein said selectable power loss is determined by N, by the ordinal number indicating the position of a tap including said one directional coupler counted from the end termination toward which said one directional coupler communicates, and by said fixed signal power loss introduced by each of said directional couplers through said cable.

4,633,203

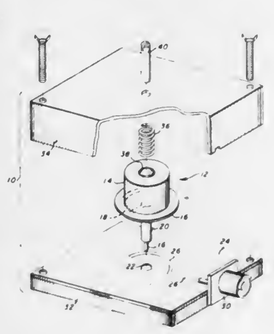
COMBINED MICROSTRIPLINE PHASE SHIFTER AND ELECTRIC FIELD PROBE

Michael E. Nowak, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1986, Ser. No. 834,984

Int. Cl.⁴ H01P *1/18, 7/06, 5/07*

U.S. Cl. 333—161 **6 Claims**



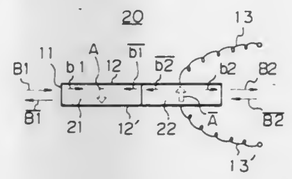
1. A combined probe and phase-shifting device for a waveguide or resonant cavity, comprising:

probe means for sampling a portion of an electric field from the waveguide or resonant cavity, including a first microstrip transmission member having a substantially arcual shape coupled to a conductor;

second microstrip transmission member constructed and arranged on a substrate and having a substantially arcual shape, said probe means and said substrate being constructed and arranged such that said first and second microstrip transmission members are positioned in radial symmetry to a central axis defined by said conductor and at least a portion of said transmission members overlap;

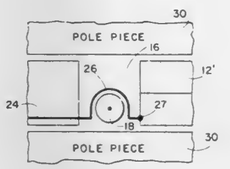
whereby the device operates to conduct said sampled electric field through said centrally positioned conductor and said probe means may be rotatably varied to increase or decrease the overlapping portion of said first and second microstrip transmission members, thereby changing the phase of the sampled electric field.

4,633,204
MECHANICAL FILTER
Takashi Gounji, Yokohama; Shinichi Yamamoto, Kawasaki; Teruo Kawatsu, Oyama; Yoshiro Tomikawa, Yonezawa; Masashi Konno, Yonezawa, and Toshiharu Ogasawara, Yonezawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 26, 1985, Ser. No. 769,606
Claims priority, application Japan, Aug. 29, 1984, 59-178268; Jan. 28, 1985, 60-012617
Int. Cl.⁴ H03H 9/56, 9/58
U.S. Cl. 333—186 17 Claims



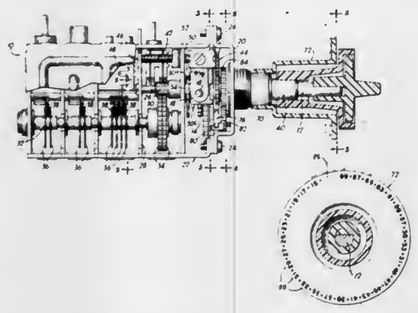
1. A mechanical filter including at least one vibrator, comprising:
a piezoelectric ceramic plate, formed as a rectangular parallelepiped with mutually perpendicular length, width and thickness axes, polarized substantially along the thickness axis, said piezoelectric ceramic plate divided along the length axis into a plurality of polarized regions aligned with each other, each two adjacent regions polarized in different directions; and
an electrode pair, attached to opposing surface of said piezoelectric ceramic plate substantially perpendicular to the thickness axis, for inducing an alternating current electric field therebetween, both electrodes in said electrode pair contacting more than one of said polarized regions and said at least one vibrator vibrating in a longitudinal mode by compression and elongation along the length axis.

4,633,205
LOOP COUPLED YIG RESONATOR
Keith E. Jones, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Nov. 25, 1985, Ser. No. 801,280
Int. Cl.⁴ H01P 7/06
U.S. Cl. 333—219 7 Claims



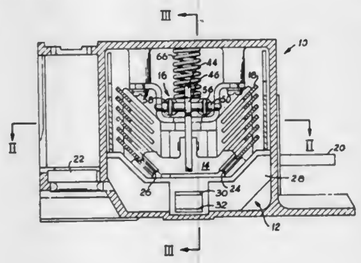
1. An improved loop coupled YIG resonator of the type having a YIG resonator situated within a cavity of a housing, a coupling loop passing through the cavity partially encircling the YIG resonator, the coupling loop being grounded at one end and connected at the other end to a transmission line within the housing, and an electromagnet having a pole piece adjacent the cavity, wherein the improvement comprises the coupling loop being formed of three sections, a loop section partially encircling the YIG resonator, and two end sections, each end section forming an impedance matching transmission line with the transmission line within the housing to minimize the parasitic series inductance of the end sections at high frequencies.

4,633,206
EXPANDED DIAL ARRANGEMENT FOR 56 CHANNEL UHF TUNER
Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian Licensing Laboratory, Bloomington, Ind.
Filed Jun. 24, 1985, Ser. No. 748,239
Int. Cl.⁴ H03J 5/06
U.S. Cl. 334—47 5 Claims



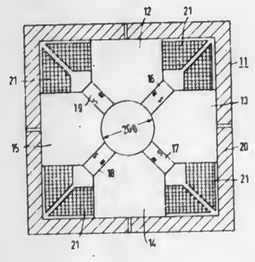
1. A UHF tuner having a continuously variable main tuning shaft rotation of which is effectively selectively to receive 70 channels in the UHF television band, a station selector shaft, detent means for establishing 24 detented UHF channel positions of said selector shaft for each revolution thereof, first gear means interconnecting said selector shaft and said main tuning shaft, stop means for limiting rotation of said selector shaft to 56 detented channel positions beginning at the lowest frequency UHF channel in said UHF band, a UHF dial indicator shaft concentric with said station selector shaft and carrying a UHF dial having channel indications corresponding to said 56 UHF channels, and second gear means interconnecting said station selector shaft and said UHF dial indicator shaft, said second gear means providing a gear reduction ratio between said station selector shaft and said dial indicator shaft of approximately 2:44 to 1 so that said 56 UHF channel indications on said UHF dial extend over substantially one complete revolution of said UHF dial.

4,633,207
CAM FOLLOWING BRIDGE CONTACT CARRIER FOR A CURRENT LIMITING CIRCUIT BREAKER
David P. McClellan, Snellville, Ga.; John M. Brown, Westminster, Md., and Gustave E. Heberlein, Jr., Delafield, Wis., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Apr. 1, 1985, Ser. No. 718,692
Int. Cl.⁴ H01H 75/00
U.S. Cl. 335—16 13 Claims



1. A current limitng circuit breaker comprising:
a stationary contact assembly having dual contacts; a contact bridge movable between an open position at which the contact bridge is spaced from the stationary contacts and a closed position at which the contact bridge and the stationary contacts are in abutting contact;
a moveable one-piece contact carrier having a cam surface with a predetermined slope and being connected to the contact bridge for biasing the contact bridge toward the closed position; and
means for mechanically reducing the biasing force on the contact bridge in response to a preselected amount of movement of the contact bridge , said means including a carrier roller and a spring engaging the carrier roller and urging the carrier roller against the cam surface of the contact carrier.

4,633,208
MAGNETIC MULTI-POLE ARRANGEMENT OF THE NTH ORDER
Erich Voss, Bad Neustadt/Saale, and Hermann Wollnik, Fernwald, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany
Filed May 29, 1984, Ser. No. 614,917
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321117
Int. Cl.⁴ H01F 7/00, 1/00
U.S. Cl. 335—210 6 Claims



1. A magnetic multi-pole arrangement of the n-th order to control a trajectory of a charged particle characterized by:
said multi-pole arrangement comprises a stator of a three-phase, n-pole alternating current machine, said stator having a stator yoke with a plurality of grooves therein into which a typical three-phase stator winding is inserted; each phase of said three-phase winding includes two separate coil sets, with these coil sets having one branch in a groove or group of grooves included within an azimuth angle θ and the other branch in a groove or group of grooves included within an azimuth angle $-\theta$;
the individual phase coils of said three-phase stator winding are connected to a direct current voltage source, inducing a phase current to flow in each said phase coils so that a first current is caused to pass through one of the coil sets, such that the product of the current and the number of windings of that coil set is proportional to:

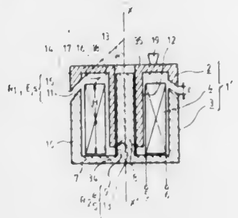
$$\sum_{n=k}^{\infty} a(i \cdot w)_{2n} \cdot \cos(n\theta)$$

and a second current is caused to pass through the other coil set, such that the product of the second current and the number of windings of that coil set is proportional to:

$$\sum_{n=k}^{\infty} b(i \cdot w)_{2n} \cdot \sin(n\theta);$$

where i is the respective phase current;
w, the number of turns in the respective phase coil;
n corresponds to the order of the multi-pole arrangement;
θ is the azimuthal angle, measured at a center of said stator, containing the grooves into which the phase coils are inserted; and
a and b are coefficients given by the ratio b/a, which gives the orientation of each pole of the multi-pole arrangement with respect to the azimuth angle $\theta=0$.

4,633,209
DC ELECTROMAGNET, IN PARTICULAR FOR AN ELECTRIC SWITCHING APPARATUS
Elie Belbel, Epinay sur Seine; Christian Bataille, Chatou, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France
Filed Jul. 19, 1985, Ser. No. 756,622
Claims priority, application France, Jul. 24, 1984, 84 11704
Int. Cl.⁴ H01F 3/00, 7/08
U.S. Cl. 335—261 6 Claims



1. An electromagnetic actuator energizable from a direct-current source, comprising: an elongate plunger of magnetizable material; a hollow tube of magnetizable material for slidably receiving an outer cylindrical surface portion of said plunger and guiding its movement along the longitudinal axis of said tube; an energizing coil coaxially arranged with said tube and said cylindrical surface portion; a pot-like frame of magnetizable material providing a predetermined magnetizable path of flux generated by said coil and lodging said plunger, said tube and said coil, said frame comprising a movable member and a fixed member having respective peripheral tubular portions with respective edge poles facing each other for defining an annular peripheral air-gap, the said magnetic path serially closing through the said peripheral air-gap and through a further elongate air gap defined between said cylindrical surface portion and the said hollow tube for causing actuation of the plunger to a working position under conditions where said coil is energized, the length of the said further elongate air gap parallel to the said axis being substantially larger than the maximum thickness of the said peripheral air gap parallel to the said axis; and means for returning the plunger to a rest position under conditions where said coil is de-energized.

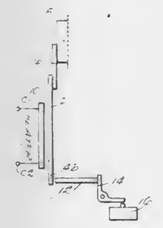
4,633,210
THERMAL OVERLOAD RELAY WITH IMPROVED RESPONSE
Edward A. Mallonen, New Berlin, and William A. Autio, Menomonee Falls, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Nov. 4, 1985, Ser. No. 778,639
Int. Cl.⁴ H01H 61/00, 71/22
U.S. Cl. 337—101 8 Claims

1. A thermal overload relay with improved response for monitoring an electrical system current comprising:
a heat sink mounting member;
a thermal member supported at one end in cantilever manner on said heat sink mounting member so as to have a supported end and a free end;
said thermal member comprising a main bimetal section at its free end and a reverse bimetal section at its supported end

coupled in heat transfer relationship with respect to one another and said heat sink mounting member and arranged so that said main bimetal section bends in the tripping direction and said reverse bimetal section bends in the substractive direction in response to temperature change therein to reduce the net deflection for ambient temperature compensation under normal operating conditions and gradual small overload conditions;

switch means effective when tripped for protecting said electrical system from overload current;

a heater in proximity to said main bimetal section responsive to said system current for heating said main bimetal section so as to provide a temperature differential between said main and reverse bimetal sections although said reverse bimetal section is subject to some conduction temperature rise above ambient temperature due to thermal



conduction from said main bimetal section thereinto and therethrough to said heat sink mounting member;

and means coupling the free end of said main bimetal section to said switch means so that when said system current exceeds a predetermined value on said gradual small overload conditions said net deflection will be of sufficient magnitude to trip said switch means and when said system current rises faster to an abnormally high value so as to exceed said predetermined value by a large amount said reverse bimetal section has insufficient time to incur a substantial amount of said conduction temperature rise and consequent subtractive deflection due to said heat sink thereby providing a net deflection greater than said gradual overload net deflection to cause a quicker trip of said switch means to provide an improved response time for abnormally high overloads.

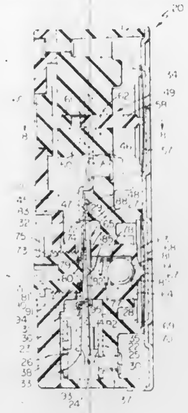
4,633,211

ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold A. McIntosh, Crestline, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 24, 1985, Ser. No. 694,350
Int. Cl.[4] H01H *37/52*
U.S. Cl. 337—338 **22 Claims**

1. In an electrical switch construction having a support means carrying a pair of spaced apart first and second fixed contacts and a movable switch blade unit carrying contact means for being disposed in contact with said first fixed contact and out of contact with said second fixed contact when said switch blade unit is in a first position thereof and for being disposed in contact with said second fixed contact and out of contact with said first fixed contact when said switch blade unit is in a second position thereof, said switch blade unit comprising a first flexible switch blade means having opposed ends one of which is secured to said support means and the other of which carries a first part of said contact means for making or breaking contact with said first fixed contact and a second flexible switch blade means having opposed ends one of which is secured to said first switch blade means to be carried thereby and the other of which is spaced from said other end of said first switch blade means and carries a second part of said contact means for making or breaking contact with said second fixed contact, the improvement wherein said first switch blade means has abutment means for engaging said second switch blade means with an impact force when said switch blade unit is being moved from said second position



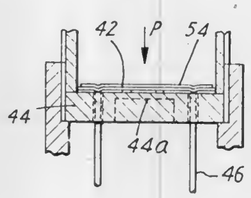
thereof to said first position thereof and a contact welded condition exists between said second fixed contact and said second part of said contact means.

4,633,212

ELECTRICAL STRAIN GAUGE

Harvey R. Johnson, 14 Hickling Dr., Bury St Edmund, Suffolk, England

Filed Feb. 8, 1984, Ser. No. 578,218
Claims priority, application United Kingdom, Feb. 9, 1983, 8303555
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—2 **6 Claims**



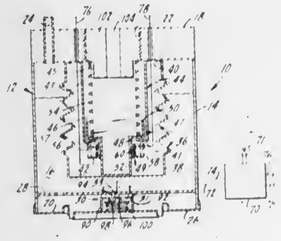
1. An electrical strain gauge comprising a metallic substrate having an essentially smooth surface, and including a plurality of apertures extending through the substrate to said surface, electrically non-conductive plugs bonded into said apertures, conducting leads extending through said plugs so as to be isolated from the substrate and projecting to said surface of the substrate, said leads having ends terminating flush with said surface, an electrically non-conductive layer bonded to said surface, said non-conductive layer having at least one discontinuity therein at the location of said ends of said leads projecting to said surface, a thin-film deposit bonded to said non-conductive layer forming a strain-responsive electrical circuit element insulated by said non-conductive layer from the metallic substrate, portions of said thin-film deposit forming said circuit element overlying said at least one discontinuity of the non-conductive layer so as to establish direct electrical contact between the leads and the thin-film deposit forming said circuit element bonded to said non-conductive layer, a deposit of conductive material in local areas overlying, and in direct contact with, respective portions of the thin-film deposit circuit element which overlay said ends of said leads, and a protective layer overlying and encapsulating the thin-film deposit circuit element.

4,633,213

PRESSURE TEMPERATURE SENSOR

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 1, 1985, Ser. No. 729,339
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—60 **8 Claims**



1. A pressure-temperature sensor means for a fluid flow system which sensor comprises:

a housing defining a fluid-filled enclosure and having a wall, an open end, a closed end, a sealed fluid passage and a through-bore;

a signal circuit including a signal means;

a mounting plate positioned in said enclosure having at least a first and second electrical contact mounted therein;

a flexible diaphragm operator having a first switch means with a bias means mounted on and operable by said diaphragm which contacts said first and second electrical contacts, which are coupled to said signal circuit by a first and second conduit means, respectively;

a bellows operator defining a reference cavity with a bellows closed end and a bellows open end, the open end coincident with said housing closed end, which seals said reference cavity;

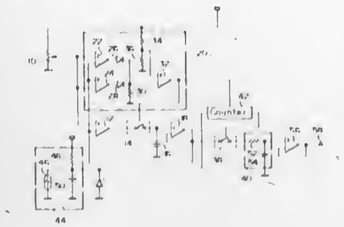
a normally open second switch means having a casing defining a switch port, a contact carrier with a protuberance extending through said switch port to engage said bellows operator and having a third electrical contact mounted on said protuberance in said bellows cavity, a fourth electrical contact means slidably mounted on said protuberance between said casing and said third electrical contact means with a compressible operating means between said third and fourth electrical contacts which third and fourth contacts are coupled to said signal circuit by a third conduit and fourth conduit respectively, said bellows cavity communicating with said housing through-bore to provide a reference pressure to said bellows cavity; said first switch means being operable by said diaphragm operator to open said first and second electrical contacts to energize said signal means and said second switch means operable by said bellows operator to contact said casing with said fourth contact and further operable to provide contact between said third and fourth contacts, which switch closing completes said signal circuit to energize said signal means.

4,633,214

DEVICE FOR DETECTING CENTER OF STEERING ANGLE IN VEHICLE

Hiroshi Miyata, and Kazumasa Nakamura, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 2, 1984, Ser. No. 576,480
Claims priority, application Japan, Feb. 7, 1983, 58-18628
Int. Cl.[4] B60Q *1/40, 1/42*
U.S. Cl. 340—73 **3 Claims**



1. A device for detecting the center of a steering angle in a vehicle, comprising:

a steering angle sensor provided on a vehicle steering mechanism for electrically detecting a steering angle;

a temporary storing position for temporarily storing a center value calculated in response to an output from said sensor through a first switch;

a comparison circuit for comparing the center value stored in said temporary storage portion with an output from said steering angle sensor to ON-OFF operate the first switch;

a center storage portion for taking out the center value in the temporary storage portion through a second switch to store same; and

a distance measuring portion controlled by the comparison circuit, for ON-OFF operating said second switch after a lapse of a predetermined running distance upon ON-operation of said first switch;

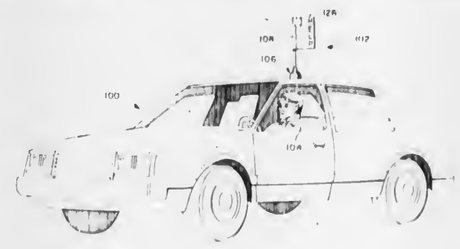
said center storage portion including an integration circuit having a resistor and a capacitor.

4,633,215

DISABLED MOTOR VEHICLE HELP SUMMONING DEVICE

Harry N. Anders, Vandalia, and William E. Ballard, Lewisburg, both of Ohio, assignors to Stoneburg Manufacturing, Inc., Lewisburg, Ohio

Filed Apr. 22, 1985, Ser. No. 725,854
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—84 **5 Claims**



1. A help summoning device for use on a disabled motor vehicle comprising:

a base housing including means for securing said housing to said vehicle, a compartment for receiving at least one battery, and a first pin socket mast mounting member, said

first pin socket including electrical connections to said battery;

a telescopically extendable elongated mast including at least two sections axially collapsible to substantially the length of one section but remaining elongated once extended, said mast being hollow and including a second pin socket at the base of the lowermost mast section which can be coupled to said first pin socket of said base housing and a bulb socket secured to the upper end of the uppermost mast section and extending outwardly therefrom with electrical wires extending through said hollow mast and interconnecting said second pin socket in the base of said mast to said bulb socket;

a flasher bulb connected into said bulb socket;

a brightly colored rigid flag secured to the uppermost mast section with a portion of the flag being relieved around said bulb and bulb socket; and

a lens fitted around said bulb and bulb socket and engaging the upper end of said mast and the relieved portion of said flag whereby said flag and mast portion of said device can be collapsed to substantially the length of said uppermost mast section with said base housing being positioned onto said rigid flag for storage in a generally rectangular box which can be fitted within the glove compartment or under the seat of said vehicle, said mast being extended and coupled to said base housing via said first and second pin sockets and said base being secured to the roof of said vehicle to summon help by means of said flag and said flasher bulb which commences operation upon coupling said mast to said base housing.

4,633,216

DATA DISPLAY UNIT FOR A BICYCLE

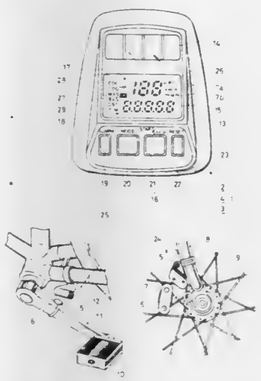
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan

Filed Jan. 18, 1985, Ser. No. 692,931

Claims priority, application Japan, Jan. 20, 1984, 59-6737[U]

Int. Cl.⁴ G01P *3/48, 3/54;* **B62J** *3/00, 6/00*

U.S. Cl. 340—134 **9 Claims**



1. A running data display unit for a bicycle, comprising:

wheel revolution detecting means located in association with a wheel of a bicycle in a manner in which no load is applied to said wheel, said wheel revolution detecting means providing pulses signal according to the number of revolutions of said wheel;

running data calculating means coupled to said revolution detecting means, by which running data including the running speed, the running distance, the average speed, and the maximum speed of a bicycle are calculated based on said pulses signal provided from said revolution detecting means;

running data calculation start and stop selecting means coupled to said running data calculating means for starting or stopping the calculation of running data by said running data calculating means;

liquid crystal display means coupled to said running data calculating means for selectively displaying the running data calculated by said running data calculating means, a speed unit in association with said running data being displayed in said display means;

said liquid crystal display means comprising an area assigned for digital display of numeric data having a plurality of figures and a decimal point indicating to be positioned between specified figures out of said plurality of figures of said numeric data, so that specified data out of said running data can be displayed;

decimal point indication selecting means coupled to said running data calculating means and said liquid crystal display means, by which said decimal point indication is given in a first position between specified figures if a numerical value of said specified data calculated by said running data calculating means is less than a predetermined numerical value and said decimal point indication is selected automatically to be given in a second position between specified figures if a numerical value of said specified data exceeds said predetermined numerical value.

4,633,217

COMMUNICATION APPARATUS

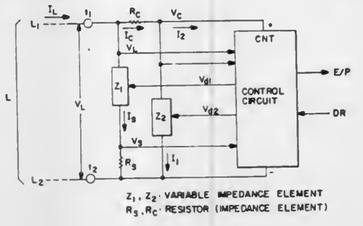
Shinichi Akano, Shibuya, Japan, assignor to Yamatake Honeywell, Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,923

Claims priority, application Japan, Jun. 4, 1984, 59-113010; Sep. 12, 1984, 59-189706

Int. Cl.⁴ H04M *11/04*

U.S. Cl. 340—310 A **21 Claims**



1. A communication apparatus for receiving both power and a control signal over the same transmission line, the transmission line having first and second wires, and for transmitting data over said transmission line, said apparatus comprising:

a first terminal for connection to said first wire;

a second terminal for connection to said second wire;

a first variable impedance element;

a receiving impedance element;

first connecting means for connecting said first variable impedance element and said receiving impedance element in series and to said first and second terminals;

a second variable impedance element;

a series impedance element;

second connecting means for connecting said second variable impedance element and said series impedance element in series and to said first and second terminals; and,

control circuit means connected to said first variable impedance element for controlling said first variable impedance element to stabilize a transmission line voltage across said first and second terminals to a constant value and connected to said second variable impedance element for controlling said second variable impedance element to stabilize a current flowing through said series impedance element to a constant value so that data and power can be received, said control circuit means simultaneously controlling said first and second variable impedance elements to maintain said current flowing through said series impedance element constant while transmitting data over said transmission line.

4,633,218

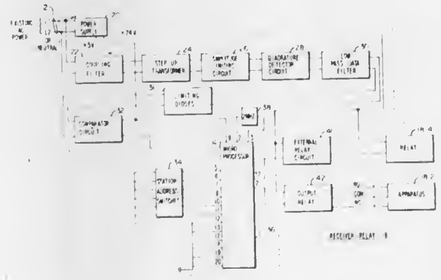
APPARATUS FOR RECEIVING LOW LEVEL DIGITAL SIGNALS TRANSMITTED OVER POWER LINES

Boyd H. Palsgrove, Minnetonka; Max Hendrickson, Forest Lake, and Harry A. Cohen, Golden Valley, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1983, Ser. No. 562,646

Int. Cl.⁴ H04B *3/54*

U.S. Cl. 340—310 A **10 Claims**



1. A power line carrier system includes a central controller and a plurality of receiver relays, all coupled in common to an alternating current (AC) power line, said central controller transmitting information over said AC power line in the form of high frequency signals, each of said plurality of receiver relays having apparatus for receiving and converting said high frequency signals to digital signals, said apparatus comprising:

first means coupled to said AC power line for receiving said high frequency signals, said first means comprising capacitor means and inductor means tuned to a midpoint between first and said second frequencies of said high frequency signals for tapping off said first frequency signal and said second frequency signal from said AC power line;

second means coupled to said first means for increasing the amplitude of said high frequency signals, said second means comprising transformer means for increasing the voltage amplitude of said first frequency signal and said second frequency signal;

third means coupled to said second means for clipping off the top and bottom of said high frequency signals;

quadrature detector means coupled to said third means for receiving the first frequency signal of said high frequency signals representative of a binary ONE and receiving the second frequency signal of said high frequency signals representative of a binary ZERO and generating a corresponding binary ONE signal and a binary ZERO signal;

fourth means coupled to said quadrature detector means for generating a voltage signal in a first state representative of said binary ONE signal and generating said voltage signal in a second state representative of said binary ZERO signal; and

fifth means coupled to said fourth means and responsive to a sequence of said voltage signals in said first and said second states representative of said information for performing a function of specified by said information.

4,633,219

INTEGRABLE ANALOG-TO-DIGITAL CONVERTER

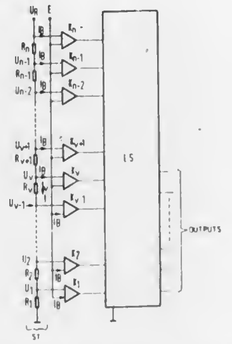
Bernhard Zojer, and Reinhard Petschacher, both of Villach, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,561

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405438

Int. Cl.⁴ H03M *1/00*

U.S. Cl. 340—347 AD **1 Claim**



1. Analog-to-digital converter, comprising a voltage divider (ST) having n series-connected resistors (R_ν; $\nu = 1, 2, \ldots n$), divider points between said resistors (R_ν) and an end receiving a d-c reference voltage (U_R) versus a base point potential, n identical comparators (K_ν) each having a first input receiving an analog signal to be processed, a second reference input each being connected to a respective one of said divider points, and an output, a common control logic circuit (LS) connected to said outputs of said comparators (K_ν) for furnishing a digital signal corresponding to the analog signal to be processed, each of said resistors (R_ν) being connected between one of said divider points which divider point is applied to that one of said comparators (K_ν), which is associated with a given (ν^{th}) output code, and another of said divider points assigned to the next lower output code, and each of said resistors (R_ν) having a resistance value satisfying the condition:

$$R_\nu^2 + \left[\sum_{k=1}^{n-\nu}\{(k+1)\cdot R_{\nu+k}\} - \sum_{k=1}^{\nu} R_k - (U_R/I_B)\right]\cdot R_\nu +$$

$$\left[((U_R - U_{\nu-1})/I_B) - \sum_{k=1}^{n-\nu}(k+1)R_{\nu+k}\right]\cdot \sum_{k=1}^{\nu} R_k -$$

$$(U_{\nu-1}/I_B)\cdot \sum_{k=1}^{n-\nu} R_{\nu+k} = 0,$$

where I_B is the maximum current flowing through said second reference inputs of said comparators, and U_ν is the desired value of said reference voltage at said comparators.

4,633,220

DECODER USING PASS-TRANSISTOR NETWORKS

Patrick A. Burgess, Pocatello, Id., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Nov. 29, 1984, Ser. No. 676,366

Int. Cl.⁴ H03K *19/82*

U.S. Cl. 340—347 DD **4 Claims**

1. A digital decoder circuit comprising:

a plurality of N input terminals for receiving N binary input signals, where N is a positive integer;

a plurality of 2^N output terminals for providing a selected

one of 2^N decoded output signals in response to said input signals;

2^M pass transistor AND gate cells having 2^M output leads, where M is a positive integer less than N, for decoding M of said N input signals to provide 2^M output signals on said 2^M output leads;

2^L pass transistor AND gate cells having 2^L output leads, where L is equal to N minus M, for decoding the L input



signals of said N input signals not decoded by said 2^M pass transistor AND gate cells, to provide 2^L output signals on said 2^L output leads; and

a 2^M by 2^L matrix of pass transistor AND gate cells having 2^M input leads connected to said 2^M output leads of said 2^M AND gate pass transistor cells, having 2^L input leads connected to said 2^L output leads of said 2^L pass transistor AND gate cells, and having 2^N output leads connected to said 2^N output terminals.

4,633,221

DUAL SLOPE ANALOG-TO-DIGITAL CONVERTER WITH AUTOMATIC, SHORT CYCLE RANGE DETERMINATION

Peter D. Bradshaw, Sunnyvale, and Lee L. Evans, Atherton, both of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Continuation of Ser. No. 544,572, Oct. 24, 1983, abandoned. This application Oct. 9, 1985, Ser. No. 786,175

Int. Cl.⁴ H03M *1/18*

U.S. Cl. 340—347 NT **7 Claims**

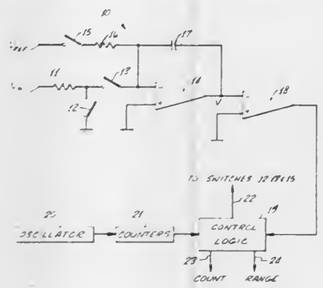
1. In a dual slope analog-to-digital converter of the type having an overall conversion cycle which includes an integrate phase during which a capacitor is charged with an unknown current, proportional to an unknown voltage, for a fixed period of time, a deintegrate phase where said capacitor is discharged with a known current for a variable period of time, said unknown voltage being directly proportional to said variable period of time, and an output phase in which a digital output value corresponding to said unknown voltage is output by said converter, and said converter further having means for measuring said variable period of time, a method for determining said unknown voltage comprising the steps of:

(a) establishing a plurality of timing ranges, each differing from at least one other by one order of magnitude;

(b) using the shortest timing range as the fixed period of time during a first integrate phase;

(c) determining, at the end of a first deintegrate phase, whether said variable period of time is greater or less than a predetermined minimum period of time;

(d) before the output phase is completed, using the next longer timing range as the fixed period of time during a second integrate phase if said variable period of time at the



end of said first deintegrate phase is less than said predetermined minimum period of time;

(e) determining, at the end of a second deintegrate phase, whether said variable period of time is greater or less than said predetermined minimum period of time; and

(f) repeating steps (d)–(e) for each of said timing ranges until said variable period of time, at the end of a deintegrate phase, is greater than said predetermined minimum period of time;

wherein, the shortest timing range resulting in a variable period of time in excess of the predetermined minimum period of time is determined prior to the completion of the overall conversion cycle.

4,633,222

CLOCK SHAPING CIRCUIT AND METHOD

Andrew G. F. Dingwall, Bridgewater Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 1, 1985, Ser. No. 782,579

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 SH **11 Claims**



1. In an analog-to-digital (A/D) converter which requires a minimum period of time, T_{sM}, for accurately sampling a signal, and a minimum period of time, T_{cM}, for accurately converting the sampled signal into meaningful data, and wherein an incoming clock signal (CL_I) is applied to the converter for generating a sampling interval (T_S) and a conversion interval (T_C) during each cycle of the incoming clock signal, and wherein the incoming clock signal has a frequency, f, with a period

$T = 1/f$; where f may vary over wide range, whereby T may be less than $T_{sM}+T_{cM}$, the improvement comprising:

means within said analog-to-digital converter responsive to said incoming clock signal and to its frequency for producing an asymmetrical sampling clock signal skewed in a direction to increase the ratio of the conversion interval to the sampling interval for frequencies which exceed $1/(T_{sM}+T_{cM})$.

4,633,223

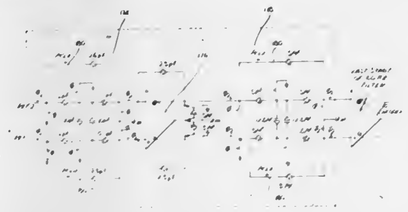
DC OFFSET CORRECTION CIRCUIT UTILIZING SWITCHED CAPACITOR DIFFERENTIAL INTEGRATOR

Daniel Senderowicz, Berkeley, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 311,144, Oct. 13, 1981, Pat. No. 4,574,250. This application May 28, 1985, Ser. No. 738,265

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 CC **1 Claim**



1. A circuit for automatic nulling of dc offset voltages in combination with a comparator in an analog-to-digital encoder comprising:

a first capacitive voltage divider being coupled to differential reference voltages, said differential reference voltages generated from said comparator, wherein said differential reference voltages being indicative of a dc offset of a signal coupled to said encoder;

a first switched capacitor differential integrator having its differential input coupled to said first capacitive voltage divider to integrate said differential reference voltages with a first long time constant;

a second capacitive voltage divider coupled to differential outputs of said first integrator; and

a second switched capacitor differential integrator having its differential inputs coupled to said second capacitive voltage divider to integrate said outputs of said first integrator with a second long time constant;

whereby a differential signal is produced by said circuit to slowly adjust an average of said differential reference voltages to zero.

4,633,224

ABSOLUTE AND INCREMENTAL OPTICAL ENCODER

Gregory H. Gipp, and John F. Szentes, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 6, 1985, Ser. No. 730,888

Int. Cl.⁴ G02F *7/00*

U.S. Cl. 340—347 P **8 Claims**

1. An apparatus for detecting the position of a movable element, comprising:

a scale having first and second opposed sides and a plurality of discrete tracks, each track having a plurality of optically transmissive and opaque sections arranged in a preselected pattern, one of said tracks alternating between said opaque and optically transmissive sections at a rate greater than twice any of the remaining tracks, said scale being connected to and movable with said movable element along a preselected pathway;

a source of electromagnetic radiation positioned adjacent the first side of said scale and directed generally toward said scale pathway;

a plurality of sensing means each delivering a preselected signal in response to a selected one of said optically transmissive and opaque sections of the respective track being positioned intermediate said source of electromagnetic radiation and said corresponding sensing means; and

processing means for receiving said signals, calculating an absolute position in response to receiving signals corresponding to the remaining tracks, and an incremental position in response to receiving signals corresponding to said one track, setting said incremental position to a minimum value in response to an increase in said absolute position irrespective of the calculated incremental position, setting said incremental position to a maximum value in response to a decrease in said absolute position irrespective of the calculated incremental position, and delivering an enhanced position signal in response to a combination of said absolute and incremental positions.

4,633,225

IMPEDANCE LINE MATCHING DEVICE USING FEEDBACK

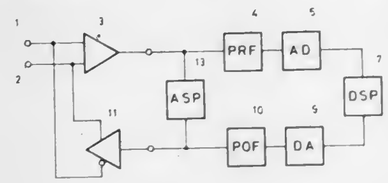
Toshio Hayashi, and Youichi Maeda, both of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,179

Claims priority, application Japan, Mar. 11, 1983, 58-41327; Dec. 16, 1983, 58-238217

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 C **14 Claims**



1. A two terminal impedance circuit which has two terminals at which an analogue voltage appears, comprising:

analogue to digital converter means for converting an analogue voltage at the two terminals into digital signals;

digital processing means, which receives as input the output digital signals from said analogue to digital converter means, for processing the digital signals using a first filtering transfer function to produce output signals;

digital to analogue converter means for converting the output digital signals from said digital processing means into analogue signals, the output from said digital to analogue converter means being connected to said two terminals to form a first feedback loop;

analogue processing means, which receives as input an analog voltage appearing at said two terminals, for processing the analog signals using a second filtering transfer function to produce output signals; and

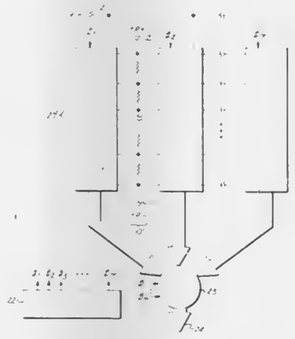
means for superposing the output from said analog processing means with the output from said digital to analogue converter means, such superposed outputs being coupled to said two terminals to form a second loop, so that a low frequency component of the signals appearing at said two terminals is coupled to said first feed back loop and a high frequency component thereof is coupled to said second feed back loop.

4,633,226

MULTIPLE CHANNEL ANALOG-TO-DIGITAL CONVERTERS

William C. Black, Jr., 2131 Country Club Pkwy., Cedar Rapids, Iowa 52403

Filed Dec. 17, 1984, Ser. No. 682,159
Int. Cl.[4] H03K *13/08, 3/86*
U.S. Cl. 340—347 AD 37 Claims



1. An analog-to-digital converter system for converting magnitudes of sequential selected points of at least one analog input signal into corresponding digital code representations, said system having a plurality of signal conversion channels each of which can provide, separately, signal representations corresponding to respective said analog input signal points, if permitted to do so, with any said signal representation chosen depending substantially on where said magnitude of said analog input signal point occurs with respect to a range of magnitudes, said system comprising:

a signal conversion channel decision means having a plurality of portions at least one of which occurs in only one of said signal conversion channels such that said portion provides said signal representation for that signal conversion channel, said signal conversion channel decision means having a signal input for receiving said analog input signal and having a plurality of reference signal inputs such that each said signal conversion channel decision means portion associated with one of said signal conversion channels can provide any said signal representation for that channel depending on whether said magnitude of said corresponding analog input signal point exceeds any, some or all magnitudes of reference signals occuring at said reference inputs if reference signals of various magnitudes are supplied to said reference inputs; and

a multiple signal provision means having a plurality of inputs and a plurality of outputs, said multiple signal provision means outputs each having available thereon a secondary reference signal of a selected magnitude if a primary reference signal is provided to at least some of said multiple signal provision means inputs where said multiple signal provision means outputs are connected to said signal conversion channel decision means reference signal inputs in such a manner that any secondary reference signal occurring on such a said multiple signal provision means output is supplied to that said signal channel conversion decision means reference signal input connected thereto.

4,633,227

PROGRAMMABLE KEYBOARD FOR A TYPEWRITER OR SIMILAR ARTICLE

Walter A. Menn, Stamford, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 7, 1983, Ser. No. 559,128
Int. Cl.[4] G01G *3/00*
U.S. Cl. 340—365 VL 9 Claims



1. A programmable keyboard apparatus for allowing a user to select any one of a predetermined number of keyboard arrangements to enable the entry of alphanumeric data via said keyboard, said aparatus comprising:

a plurality of fixed input keys arranged in rows and columns according to a standard typewriter keyboard format each said key includes a top surface having a straight top edge from which extends a partial circular section with said circular section containing more than 180 degrees;

separate indicating areas, each one associated with one of said keys and positioned proximate to each key in said format for selectively displaying a proper symbol associated with said key and indicative of a character to be provided by said key according to said keyboard arrangements, each said separate indicating area including a transparent window positioned proximate said straight top edge of said associated key;

means, associated with said indicating areas, for selecting any one of said predetermined number of arrangements to cause each indicating area to display that symbol associated with that character to be furnished by said key according to said selected keyboard arrangement, said selector means including a switch capable of being moved into any one of a predetermined number of positions indicative of selecting a particular keyboard arrangement; and

means, coupled to said switch, for moving a predetermined distance upon a movement of said switch said means including an elongated slide member having parallel longitudinal slots one for each row of keys with each slot positioned over an associated row of keys and having areas between said slots that are positioned beneath said transparent windows in each of said rows, and indicia means coupled to said slide with said indicia being indicative of said symbols whereby when said means is moved, said slide moves to cause a selected symbol to appear in said window indicative of said character to be provided.

4,633,228

ENTRY ERROR ELIMINATION FOR DATA SYSTEMS

Willis A. Larson, North Andover, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 2, 1984, Ser. No. 606,428
Int. Cl.[4] H04Q *4/00;* G06F *3/02*
U.S. Cl. 340—365 E 4 Claims

1. A keyboard switch assembly of the type comprising a power supply, a polling means, a scanner, a plurality of polled conductors which are connected to the polling means, a plurality of scanned conductors which are connected to the scanner, and a plurality of switch sites, each switch site having an associated polled conductor and an associated scanned conductor adjacent thereto, an individual switch at each switch site for connecting the associated polled conductor to the associated scanned conductor, each switch having first and second conditions, one of the conditions being closed and the other condition being open, and an analyzer which determines the condition of each switch during polling scanning, the switch assembly being characterized in that:

each individual switch has a dedicated individual switch resistor in series therewith and each scanned conductor has a scanned conductor resistor between the scanned conductor and one side of the power supply,

the analyzer has the ability to determine, when a signal is received indicating that a predetermined individual switch is in the first condition, whether the signal is a true signal which passed through the predetermined individual switch and is effected by the dedicated individual switch resistor of the predetermined individual switch and scanned conductor resistor of the associated scanned conductor of the predetermined individual switch or



alternatively the signal is a false signal which passed through a group of other individual switches which are in the first condition at the instant of scanning and the false signal is effected by the dedicated individual switch resistors of the group of other individual switches

the switch assembly comprising a substrate and a flexible membrane which extends parallel to, and is spaced from the substrate, the flexible membrane and the substrate having opposed surfaces on which the polled conductors, the scanned conductors, the individual switches, the dedicated individual switch resistors, and the scanned conductor resistors are provided, the scanned conductors, the polled conductors, the individual switches, the dedicated individual switch resistors, and the scanned conductor resistors are of conductive ink.

4,633,229

ELECTRONIC OUTDOOR WARNING SIREN

Joel G. Iacono, Dyer, and Ronald J. Koval, Gary, both of Ind., assignors to Federal Signal Corporation, Oak Brook, Ill.

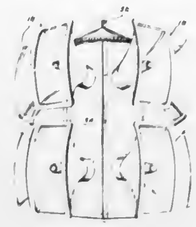
Filed Jul. 12, 1982, Ser. No. 397,221
Int. Cl.[4] G08B *3/00;* H04R *5/00;* H05K *5/00*
U.S. Cl. 340—391 9 Claims

1. An electronic outdoor warning siren system, which comprises:

speaker mounting means for supporting a plurality of speakers;

a plurality of speakers connected to said speaker mounting means and arranged in a common horizontal plane;

electronic tone generator means for driving adjacent speakers of said plurality of speakers with signals of different frequency so each speaker will operate at a frequency different from a speaker adjacent thereto in the same



horizontal plane, whereby the uniformity of sound distribution is enhanced.

4,633,230

COOKING, FIRE, AND BURGLAR ALARM SYSTEM

Wee M. Tam, 777 Clay St. #17, San Francisco, Calif, 94108

Filed May 4, 1984, Ser. No. 607,232
Int. Cl.[4] G08B *19/00*
U.S. Cl. 340—521 21 Claims



1. A cooking, fire, and burglar alarm system comprising:

first electrical sensor means connected to an arm for sensing the temperature of a cooking container and converting said temperature to first electrical signals;

first amplifier means connected to said arm for amplifying said first electrical signals;

first comparator means connected to said amplifier for comparing said amplified signals with an adjustable stable reference signal, and generating either low or high control voltage;

second electrical sensor means connected to a pair of low temperature electrical wires for sensing the temperature of environment and converting said temperature to second electrical signals;

second amplifier means connected to said wires for amplifying said second electrical signals;

second comparator means connected to said second amplifier means for comparing said second electrical signals with a stable reference signal, and generating another either low or high control voltage;

first independent operation means connected to said first comparator means and said second comparator means for providing independent operations of cooking alarm sensing mode and environment alarm sensing mode, said independent operation means further connected to a first control circuitry which examines and conditions said control voltages and another said control voltages;

a low frequency oscillator means connected to said control circuitry for generating low frequency driving voltages, said low frequency oscillator means further connected to a multiple position switch means which can be operated

manually to select said driving voltage of different frequencies according to different positions of said multiple position switch, said multiple position switch further connected to said comparator, negative power supply reference voltage, said stable reference signal, said adjustable stable reference signal, a timer, and positive power supply reference voltage, for providing burglar panic, cooking sensor for fire sensing, temperature sensing cooking, timing cooking, and fire panic;

a burglar alarm sensing means for providing normal electrical signals when said sensing means is not violated, and providing abnormal electrical signals when said sensing means is violated, said normal electrical signals and abnormal electrical signals further being examined and conditioned by a second control circuit which is connected to said burglar alarm sensing means;

an automatic reset and turn off means connected to said control circuit for providing starting monitoring operations of said burglar alarm sensing means at the beginning when the power of said system is turned on, enabling alarming for at least a preset timing period when any of the normal conditions of said burglar alarm sensing means has been violated, and disabling alarming and restarting monitoring operations of said burglar alarm sensing means when said normal conditions of said burglar alarm sensing means have been restored;

second independent operation means connected to said low frequency oscillator means and to said automatic reset and turn off means for providing independent operations of said cooking alarm sensing and fire alarm sensing modes, and of burglar alarm sensing mode; and

a drive circuit means connected to said second independent operation means for generating driving power to an audible means which produces audible alarm signals.

4,633,231

MONITORING ARRANGEMENT

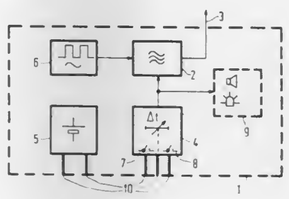
Ernst A. Kilian, Bremen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,078

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407345

Int. Cl.⁴ G08B *1/08;* **H04Q** *7/00*

U.S. Cl. 340—539 **16 Claims**



1. An apparatus for monitoring the time duration of a person within a given closed region comprising: a portable transmitter assembly to be carried by the person to be monitored for emitting electromagnetic energy and comprising, an energy source, a timing member which, when the transmitter is handed to the person at a first point, is adjusted to a given time duration determined by the normal travel time between said first point and a second point, said timing member being operative, after termination of the adjusted time duration, to energize a transmitter stage to transmit a given information signal, and at least one receiver which, when the transmitted given information signal is received, activates an indication device.

4,633,232

ALARM DEVICE

Frederic P. Nelson, 17 S. 1st St. #1402A, Minneapolis, Minn. 55401, and John R. Jamieson, Minneapolis, Minn., assignors to Frederic P. Nelson, Minneapolis, Minn.

Filed Mar. 30, 1984, Ser. No. 595,424

Int. Cl.⁴ G08B *13/00, 13/08, 13/14*

U.S. Cl. 340—542 **13 Claims**



1. A personal alarm device comprising:

a housing;

a battery and an electrically-operated alarm in the housing;

a switch in the housing biased to closed position;

an energizing circuit for the alarm including the battery and the switch;

a hand-held releasable member outside of and adjacent a side wall of the housing and having a portion projecting inwardly through the housing into operative engagement with the switch and biased away from the housing by reason of the biasing force of the switch;

the housing having an opening therein spaced from the releasable member and adjacent the switch for the reception of a removable key member; and

a key member slidably insertable through the opening into operative engagement with the switch and with the inwardly projecting portion of the hand-held releasable member to hold the switch in switch open position against its bias and to retain the releasable member against the side wall of the housing, the switch tending to move to closed position to energize the alarm and the hand-held releasable member tending to move away from the housing when the key member is withdrawn, said hand-held releasable member being engageable by the hand of a user to hold the releasable member against the housing and to prevent closure of the switch.

4,633,233

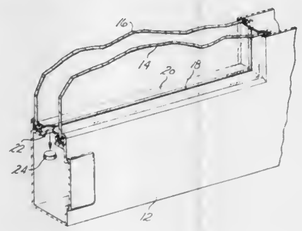
WINDOW SECURITY DEVICE

John M. Marshall, 202 S. Michigan St., South Bend, Ind. 46601, and James D. Hall, South Bend, Ind., assignors to John M. Marshall, South Bend, Ind.

Filed Feb. 19, 1985, Ser. No. 702,584

Int. Cl.⁴ G08B *13/00*

U.S. Cl. 340—550 **2 Claims**



1. In combination, a window security device and a window, said window having spaced apart glazing panels, a substantial vacuum formed between said glazing panels, said security device comprising an electric activator circuit positioned within said vacuum, said activator circuit adapted for connection to an alarm, and activation means for breaking said circuit and activating said alarm when said vacuum is disrupted, said activation means including a conductive seal means for completing said circuit and maintaining said vacuum, said seal means in contact with said activator circuit wherein distrubing one of said glazing panels activates said alarm, a spacer plate positioned between said window glazing panels, said spacer plate having a hole formed therethrough, said activator circuit including a continuous strip of conductive tape overlying said spacer plate, said tape interrupted at said hole, said conductive seal means including a plate member having a centrally located continuous conductive annulus, said plate member having a standby position adjacent said hole wherein said annulus seals said hole to maintain said vacuum, said annulus containing said conductive tape to complete said circuit when said plate is in its said standby position.

4,633,234

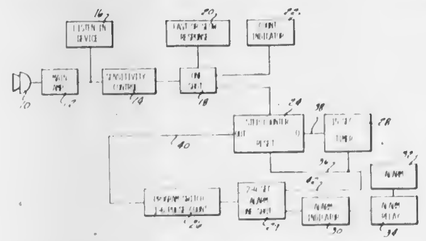
SONIC DETECTOR HAVING DIGITAL SAMPLING CIRCUIT

David G. Gagnon, Warren, Mich., assignor to Audio Sentry Manufacturing, Inc., Fraser, Mich.

Continuation of Ser. No. 420,179, Sep. 20, 1982, abandoned. This application Nov. 22, 1985, Ser. No. 801,380

Int. Cl.⁴ G08B *13/00*

U.S. Cl. 340—566 **12 Claims**



1. An intrusion detection alarm device, comprising:

a microphone;

means for converting the output of said microphone into a plurality of electrical pulses;

means for discretely counting said pulses; and

means for producing an alarm when a prescribed number of said pulses have been counted by said counting means.

4,633,235

OPTICAL CABLE SECURITY SYSTEM WITH STANDBY AND AUTOMATIC RE-ARMING FEATURES

Charles S. DeGennaro, 31 Pierce St., Hudson, Mass. 01749

Filed Dec. 20, 1984, Ser. No. 684,072

Int. Cl.⁴ G08B *13/18*

U.S. Cl. 340—568 **20 Claims**

1. A system for securing articles, the system comprising

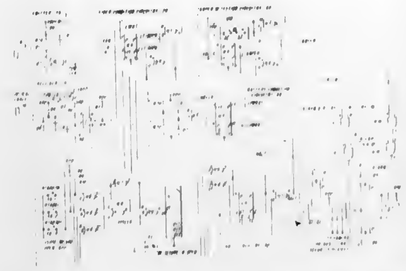
an optically transmissive, flexible cable capable of attachment to said articles, said cable comprising:

a plurality of links; and a plurality of separable connectors, each connector joining two links together to permit optical transmissions therethrough;

a transmitter connected to said cable, for transmitting optical pulses into said cable;

a receiver connected to said cable for receiving the pulses from said transmitter after passage through said cable; and

control means connected to the receiver for detecting perturbations in the received pulses and activating an indicator in response thereto; for allowing stand-by operation wherein the indicator is disabled while one or more connectors are separated for authorized purposes and for



automatically re-arming the system when the connectors are re-engaged.

4,633,236

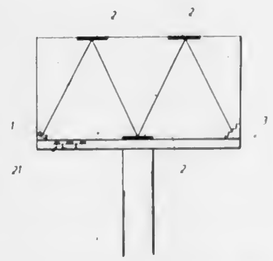
MAILBOX

Holger Buhl, Birkerød, Denmark, assignor to Buhl Automatic, V/Holger Buhl, Birkerød, Denmark

Filed Jun. 21, 1985, Ser. No. 747,306

Int. Cl.⁴ G08B *13/16*

U.S. Cl. 340—569 **7 Claims**



1. A mailbox comprising an indicator indicating the presence of mail, if any, said indicator including a transmitting and receiving transducer adapted to transmit ultrasonic waves within the mailbox and to receive reflections of ultrasonic waves from the mailbox in order to detect possible alterations in the reflected ultrasonic waves, said ultrasonic waves following one or more predetermined paths in the mailbox unless the ultrasonic waves are scattered or absorbed by means of mail in the mailbox, wherein one and the same ultrasonic transducer is used both for transmitting and receiving of said ultrasonic waves.

4,633,237

PATIENT BED ALARM SYSTEM

Kenneth A. Tucknott, 18701 Stratford Rd., Minnetonka, Minn. 55345, and Martin N. Sorenson, Maple Grove, Minn., assignors to Kenneth A. Tucknott, Mound, Minn.

Filed Jul. 11, 1984, Ser. No. 629,591

Int. Cl.⁴ G08B *23/00*

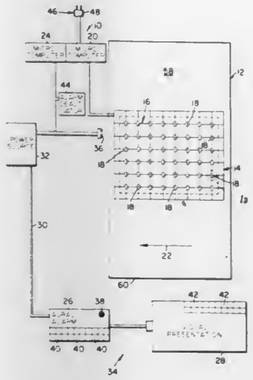
U.S. Cl. 340—573 **13 Claims**

1. Apparatus for discerning the impending, undesired vacation of a bed in a hospital, nursing home, or other institution, by a person confined to the bed, comprising:

a matrix having a plurality of sensors positionable on the bed in which the person is confined so that, when the person is in a safe location on the bed, certain first defined combinations of said sensors will perceive the presence of the person's anatomy, and, when the person is in a location on the bed wherein he is approaching vacating the bed, cer-

tain second defined combinations of said sensors will perceive the presence of the person's anatomy;

means for discriminating whether a first or second defined combination of sensors is perceiving the presence of the person's anatomy;



alarm means, for alerting monitoring personnel; and

means, responsive to said discriminating means, for actuating the alarm means when a second defined combination of sensors is perceiving the presence of the person's anatomy.

4,633,238

TEMPERATURE LIMITER FOR A GLASS-CERAMIC COOKING UNIT

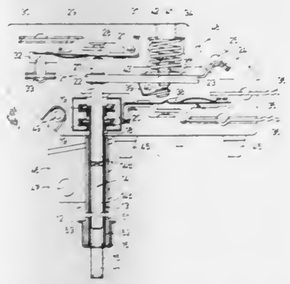
Gerhard Goessler, Oberderdingen; Eugen Wilde, Knittlingen; Willi Essig, Boeblingen, and Edgar Hanss, Waldbronn, all of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,530

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333645; Mar. 22, 1984, 3410442

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—593 **12 Claims**



1. A temperature limiter for a glass-ceramic cooking unit, comprising:

a substantially rod-shaped sensor which has an outer tube containing an inner rod with a different coefficient of expansion, the inner rod comprising a number of component rods, the inner rod actuating a signal switch disposed in a base to indicate a heating state potentially harmful to users of the glass-ceramic cooking surface, and the inner rod actuating via a pivotable lever a circuit breaker also disposed in the base for switching the heating system of the glass-ceramic cooking unit off at a limiting temperature potentially harmful to the cooking unit, the limiting temperature lying just below a permissible temperature of the glass-ceramic cooking surface, the outer tube being rigidly connected to the base and the actuating point of the signal switch lying on the axis of the inner rod, so that the inner rod directly actuates the signal switch, and force being transmitted from the lever to the circuit breaker by an adjusting screw and a flat-head rivet which is attached to the free end of a drag lever attached to the lever and has at least one flat bearing surface and is disposed resiliently between the adjusting screw and the actuating point of the circuit breaker.

4,633,239

INTEGRATED CIRCUIT PACKAGE HOLDER

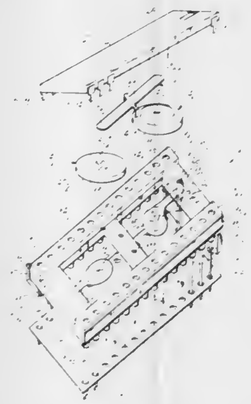
Georges Nalbanti, 68, rue de Tournaisis, Elancourt 78310 Maurepas, France

Filed Sep. 21, 1984, Ser. No. 652,977

Claims priority, application France, Sep. 23, 1983, 83 15150

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—636 **41 Claims**



2. Apparatus for holding an integrated circuit package (2) having conductive pins (20) connected therewith, comprising

(a) a holder (1) for holding the integrated circuit package, said holder containing a recess (14);

(b) a plurality of conductor pins (10) arranged beneath said holder and being connected with the pins of the integrated circuit package via a plug connection; two predetermined pins of said holder conductor pins being connected with two supply pins of the integrated circuit package;

(c) a removable spare power source (4) arranged within said holder recess and including terminals connected between said two predetermined conductor pins; and

(d) monitoring means (7) for detecting a voltage lower than a predetermined source discharge threshold across said source terminals, said monitoring means including

(1) an oscillator (70) controlled by the voltage across said source terminals for producing an output signal corresponding with said voltage; and

(2) display means (72) activated by said output signal from said oscillator in response to a voltage across said source terminals lower than said predetermined threshold.

4,633,240

LIGHTENED CIRCUIT BREAKER

Raul Guim, and Aurelio R Guim, both of Coral Gables, Fla., assignors to Guim Industries, Inc., Coral Gables, Fla.

Filed Dec. 5, 1984, Ser. No. 678,398

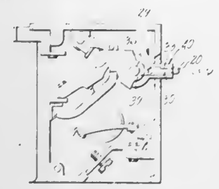
Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—638 **4 Claims**

1. An improved circuit breaker including a three position switch assembly and having an illuminated overload indicator, the improvement comprising:

A. battery means mounted on said circuit breaker;

B. secondary switch means activated by the movement of the lever of said circuit breaker so that said secondary switch means is closed when said lever is in the conventional overload position and open in the other two positions; and



C. conductor means mounted on said circuit breaker and connecting said battery to said indicator having said secondary switch means in series so that the circuit may be interrupted and reestablished thereby illuminating said indicator when an overload condition occurs.

4,633,241

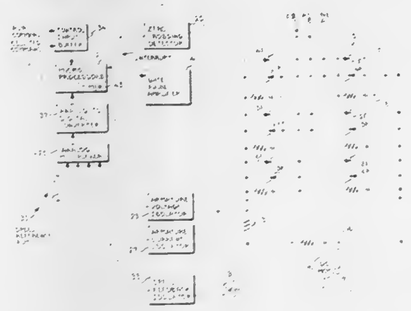
METHOD OF AUTOMATED IN-PLACE SCR TESTING

Jordan B. Casteel, Charlottesville; John D. D'Atre, Earlysville; Allen M. Ritter, Charlottesville, and Kenneth W. Wadding, Earlysville, all of Va., assignors to General Electric Company, Charlottesville, Va.

Filed Nov. 20, 1984, Ser. No. 673,684

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—645 **5 Claims**



1. A method of detecting shorted controllable switching devices in a bridge rectifier supplying a load, the bridge rectifier being supplied by an AC source. the method comprising the steps of:

detecting the zero crossings of the AC source voltage;

sequentially switching each of the controllable switching devices of the rectifier to the conducting state, before the zero crossing of the AC source voltage associated with the forward conduction of the controllable switching device, so that only one controllable switching device is intended to be conductive at a time;

measuring the DC output voltage of the rectifier after each of the controllable switching devices is switched to the conductive state; and

providing an indication of a shorted controllable switching device when the DC output voltage measured after any of the controllable switching devices is switched to the conductive state is greater than a predetermined value.

4,633,242

ROW CONDUCTOR SCANNING DRIVE CIRCUIT FOR MATRIX DISPLAY PANEL

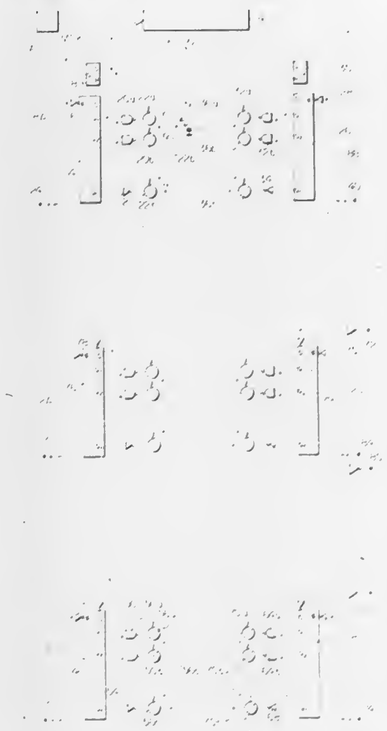
Fukuo Sekiya, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,089

Claims priority, application Japan, Dec. 17, 1982, 57-220048

Int. Cl.[4] G09G *3/02*

U.S. Cl. 340—719 **4 Claims**



1. A row conductor drive circuit for a matrix display device, said matrix display device including a plurality of row conductors and a plurality of column conductors formed on a substrate thereof, said row conductor drive circuit comprising: control and timing signal generating circuit means, and;

at least a first row conductor drive circuit section for successively applying output signals to scan a first set of said row conductors in a fixed sequence and a second row conductor drive circuit section for successively applying output signals to scan a second set of said row conductors, each of said row conductor drive circuit sections comprising first and second shift registers each comprising a plurality of shift register stages, with outputs from corresponding stages of said first and second shift registers in each of said row conductor drive circuit section being coupled in common to respective ones of said row conductors;

each of said row conductor drive circuit section including control means for setting one of said shift registers thereof in an operative condition and the other set of shift registers thereof in an inoperative conditions, and monitor means for detecting defective operation by said shift register thereof which is currently set in the operative condition;

each of said shift registers of said first row conductor drive circuit section being coupled to receive a timing signal from said timing and control signal means for initiating shifting operation thereby, and each of said shift registers

of said second row conductor drive circuit section being coupled to a row conductor which is the last to be scanned by said first row conductor drive circuit section in said scanning sequence, for receiving a scanning signal acting to initiate shifting operation thereby.

4,633,243

METHOD OF STORING CHARACTERS IN A DISPLAY SYSTEM

Jack E. Bresenham, Winchester; Ronald J. Bowater, Romsey; Adrian C. Gay, Fareham, and Norman R. Sheen, Winchester, all of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,675

Claims priority, application European Pat. Off., Jun. 30, 1983, 83303790.6

Int. Cl.⁴ G06F *3/153, 3/14;* G09G *1/10*

U.S. Cl. 340—732 **2 Claims**



1. A method of storing characters in a display system having a display device with an orthogonal matrix of addressable points and drawing said stored characters on said display device, comprising the steps of:

representing each character as a succession of strokes each constrained to lie in one of eight fundamental directions of the matrix, and, except for a first stroke, each starting at an end of a previous stroke;

storing each such stroke in a binary coded form which includes a first binary number defining an angular direction of said stroke, a second binary number defining a number of matrix steps from one point to a next point along said stroke, and a third binary number defining a visibility characteristic of said stroke;

storing a character rotation code;

storing a binary representation of a terminator code to indicate that a current character has been completed;

testing a predetermined binary bit of said character rotation code for an odd integer multiple of forty-five degrees;

increasing said second binary number defining a number of matrix steps in a stroke by an integer multiple thereof if said testing step determines an odd integer multiple of forty-five degrees in said character rotation code.

4,633,244

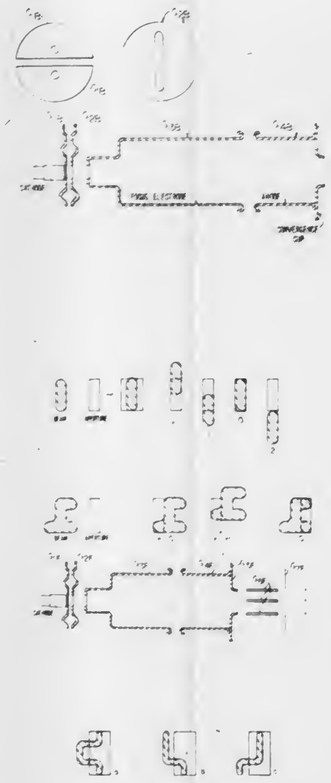
MULTIPLE BEAM HIGH DEFINITION PAGE DISPLAY

Thomas O. Holtey, Newton, and J. Nathaniel Marshall, Boston, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,929

Int. Cl.⁴ G09G *1/08*

U.S. Cl. 340—736 **1 Claim**



1. A high definition raster display system having a display screen comprising means for generating at least one shaped electron beam and means for directing said at least one shaped electron beam to the display screen;

blocking means for selectively deflecting said at least one shaped electron beam through an aperture to illuminate any one or multiple ones of a plurality of raster lines;

a plurality of first circuit means for generating a plurality of signals representative of an image to be displayed on the display screen, said plurality of first circuit means including a plurality of character generators, each character generator for generating signals for a portion of a charater to be displayed on the display screen; and

second circuit means coupled to the first circuit means for combining the signals from the plurality of first circuit means to control the blocking means for blocking portions of said at least one shaped electron beam.

4,633,245

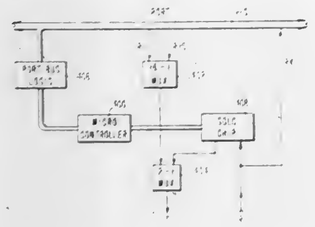
LOCAL AREA NETWORK INTERCONNECT SWITCHING SYSTEM

Marion L. Blount, Mahopac; Brent T. Hailpern, Katonah, both of N.Y.; Robert A. Heller, Morgan Hill, Calif.; Lee W. Hoevel, Yorktown Heights, N.Y., and Gene E. Trivett, Portola, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,197

Int. Cl.⁴ H04Q *1/00, 11/00*

U.S. Cl. 340—825.03 **9 Claims**



1. A system for connecting a plurality of intelligent terminals to each other through a central non-blocking switch to a partitioned general purpose memory, said system comprising: a plurality of intelligent terminals; one or more storage units partitioned into a plurality of shared modules, there being at least one of said modules for each of said terminals; said central non-blocking switch connecting said plurality of intelligent terminals to said storage units, said switch controlling communication between any of said terminals, such that after initiation of communication between any two of said plurality of terminals point to point non-multiplexed communication channels are established between said any two communication terminals via said non-blocking switch, and between any of said terminals and one or more of said shared modules.

4,633,246

TIME DIVISON MULTIPLEX RING

J. Richard Jones, and Alan B. Mann, both of Raleigh, N.C., assignors to FiberLAN, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 569,282, Jan. 9, 1984, abandoned. This application Nov. 29, 1984, Ser. No. 663,360

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.05 **10 Claims**

1. A ring type data communications network comprising:

(a) at least three nodes, each node containing a multiplexer and a demultiplexer, a means to transmit data and an alarm means for transmitting alarm signals;

(b) main and standby transmission paths connecting said nodes into a ring type transmission circuit;

(c) a first transmitter and receiver at each node in the main transmission path adapted to transmit and receive data and alarm signals in a first direction;

(d) a second transmitter and receiver at each node in the standby path normally unbridged one to another, adapted to transmit and receive data and alarm signals in a second direction opposite from said first direction;

(e) a bridging means in each node for forming a transmission path between the transmitter and receiver on the standby transmission path of each node responsive only to a first predetermined alarm signal originating from the alarm means in the node containing said bridging means;

(f) at least one switching means at each node responsive to the presence of a second predetermined alarm signal to switch the data and alarm means at each node from a connection where all transmission is utilized from the main transmission path to a connection whereby data and alarm signals are utilized from said standby path; and



(g) a multiplexer at each node to multiplex transmissions and a demultiplexer to demultiplex receptions.

4,633,247

REMOTE CONTROL SYSTEM FOR SELECTIVELY ACTIVATING AND INACTIVATING EQUIPMENT

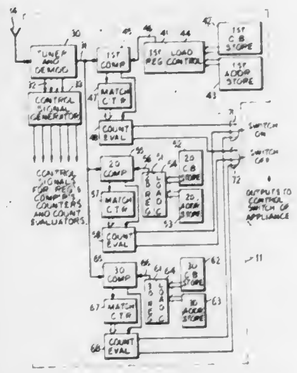
Wilhelm Hegeler, Bad Salzdetfurth, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Aug. 29, 1985, Ser. No. 770,696

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407389

Int. Cl.⁴ H04Q *7/00, 9/14;* G06F *11/00*

U.S. Cl. 340—825.69 **8 Claims**



1. Remote control system for selectively controlling switching on and switching off of electrical circuits by a transmitter at a location distant from the locations of a plurality of receivers each associated with an electric circuit which is to be switched on and off, said transmitter being equipped to broadcast to said receivers, and said receivers being equipped to receive control messages each consisting of binary digital signals and containing a control command and an address for selecting at least one of said receivers for response to said control command, and further comprising:

means at said transmitter for incorporating in each control message eight data bits comprising seven addsress bits

(D1–D7) and one control bit (D0) and seven check bits (C1–C7), said seven check bits being derived from said eight data bits by a Nordstrom-Robinson code utilizing said control bit non-cyclically in coding while said address bits are used cyclically, whereby all said check bits are inverted for transmission with a predetermined sign of said control bit, and for transmitting said check bits one immediately after another and said control bit immediately after said check bits, and

means at each of said receivers including three registers, each for comparing incoming data bits with sets of data bits respectively designating three different addresses to which the receiver is to respond, one for individual response, one for response in a group composed of less than all said receivers and one for response in the group composed of all said receivers, and for also comparing received check bits with check bits relating to the addresses served by the register, said receivers also containing means for determining the number of bit identities in comparisons of a set of seven check bits and for determining the number of bit identities in comparison of a set of seven address bits, and for thereby determining whether said receiver is selected for response and which of two opposite possible commands is to be performed.

4,633,248

WELL LOGGING INSTRUMENT INCLUDING SHOCK ISOLATION SYSTEM

Tony M. Small, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1984, Ser. No. 632,493
Int. Cl.⁴ G01V *1/00*
U.S. Cl. 340—853 **13 Claims**



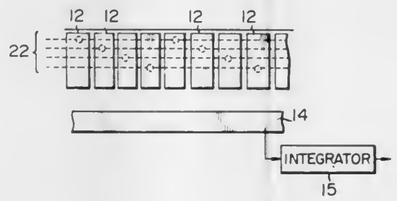
1. A downhole logging tool having an external pressure housing which may be subjected to shock or vibration, and which encloses and supports electronic components carried interiorly on a support wafer, and including a system for mounting electronic components in the housing which system comprises an electronic support wafer having an edge thereon of finite width and a circumferential retaining groove therein and wherein the edge is adapted to be spaced from and at approximately right angles to the inside surface of the pressure housing, and a spring member positioned therebetween with the axis of said spring member extending parallel to the edge of said support wafer, said spring member being received against the edge of said wafer wherein said spring member is made of repetitive turns and the turns thereof, in cross-section transverse to the axis of the spring member are oval turns, and wherein said spring member has a bias tending to position one side of said spring member toward said housing and the opposite side toward said support wafer.

4,633,249

DISPLACEMENT DETECTOR UTILIZING CHANGE OF CAPACITANCE

Kohji Sasaki, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,869
Claims priority, application Japan, May 18, 1983, 58-087218; May 18, 1983, 58-087219
Int. Cl.⁴ G08C *19/10*
U.S. Cl. 340—870.37 **5 Claims**



1. A displacement detector utilizing changes in capacitance comprising a base, a stator plate fixed to the base and a moving plate facing the stator plate and slidingly provided on the base, a plurality of transmitting electrodes provided on the stator plate and arranged at equal distances on its surface and a receiving electrode zonally arranged in parallel with transmitting electrodes on the stator plate, and connecting electrodes provided on the moving plate facingly arranged to span over both the transmitting electrodes and the receiving electrode, and an alternating current voltage having respectively different phases applied to and over one pair of opposite phase electrodes of the transmitting electrodes and wherein the displacement of the moving plate is determined in accordance with the output signal of the receiving electrode, the improvement comprising noise protective electrodes conductively connected with said receiving electrode on said stator plate at a position on a reverse surface of the stator plate corresponding to at least one side of the transmitting electrodes in the pairs of the opposite phase electrodes of the transmitting electrodes which mixes and cancels noise mixed into said receiving electrode from an input portion on one side of said transmitting electrodes of the pairs of opposite phase electrodes with an auxiliary signal induced by an other side of the transmitting electrodes.

4,633,250

COPLANAR ANTENNA FOR PROXIMATE SURVEILLANCE SYSTEMS

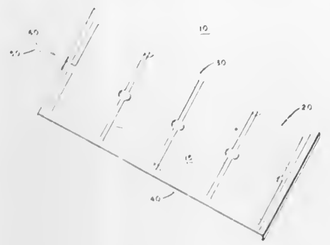
Philip M. Anderson, III, Chatham, N.J., and John J. Torre, Monroe, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 7, 1985, Ser. No. 689,271
Int. Cl.⁴ G01S *13/00*; G08B *13/14*
U.S. Cl. 342—27 **7 Claims**

1. A coplanar antenna system, comprising:

(a) interrogating means adapted to generate time varying magnetic field components within a region proximate thereto, and comprising two coils, each enclosing a unique region, said coils being adapted to be driven on and off with respect to each other and having a configuration such that said components, when produced vertical to the plane of the coils, and located thereabove within an area approximated by the coils' perimeter, have near zero net resultant magnetic field; and

(b) receiving means adapted to detect magnetic field components within a region proximate to said antenna system and comprising at least one coil configured to detect



components having a preselected net resultant magnetic field.

4,633,251

METHOD AND APPARATUS FOR IDENTIFYING RADAR TARGETS

Ian L. M. McGeoch, Southerns, 37 Bayley Street, Castle Hedingham, Halstead, Essex C09 3DG, and William B. Stawell, Taylers Farmhouse, Aldsworth, Cheltenham, Gloucestershire GL7 2PF, both of England

Filed Sep. 15, 1983, Ser. No. 532,730
Claims priority, application United Kingdom, Sep. 18, 1982, 8226640
Int. Cl.⁴ G01S *13/80*
U.S. Cl. 342—44 **10 Claims**





1. A method of identifying a selected radar target from a plurality of other such targets which method comprises:

transmitting from a base station an initial interrogation radar signal;

receiving the initial interrogation radar signal at the selected radar target and said other such radar targets;

applying said signal to a responder of each said radar target thereby causing the responder to generate a monitor response signal with a pulse separation not less than the duration of an identification signal;

receiving at each said radar target one or more monitor response signals from the responders of any other said radar targets;

detecting at each said radar target any monitor response signals received partly overlapping the monitor response signal of any of said radar targets and setting a garble flag means thereat;

detecting at said base station any garbling between monitor response signals received from the selected radar target and any other such radar target;

transmitting from said base station a suppression radar signal for suppressing any radar target having garble flag means conditions different from the garble flag means condition of said selected radar target;

receiving said suppression radar signal at at least one said other such radar target and suppressing such radar target;

repeating, if necessary, the suppression radar signal transmission until all said other such radar targets have been suppressed;

transmitting from the base station a first, identification signal seeking, interrogation radar signal;

receiving the first interrogation radar signal at the target, applying said interrogation radar signal to the responder thereof, thereby causing the responder to generate a first identification signal containing a first portion of data concerning the specific individual identity of the target;

transmitting the first identification signal from the target;

receiving the first identification signal at the base station;

transmitting from the base station, in response to receipt of said first identification signal, at least a second, identification signal seeking, interrogation radar signal;

receiving the at least second interrogation radar signal at the target, applying said second interrogation radar signal to the responder, thereby causing the responder to generate at least a second identification signal containing additional data concerning the specific individual identity of the target;

transmitting the at least second identification signal from the target;

receiving the at least second identification signal at the base station; and

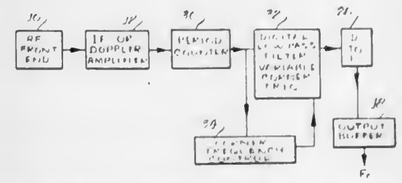
processing the identification signals received by the base station so as to produce a signal containing all of the data concerning the specific individual identity of the target.

4,633,252

RADAR VELOCITY SENSOR

Wesley J. Bachman, Auburn, and Steven G. Stone, Girard, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Aug. 29, 1983, Ser. No. 527,001
Int. Cl.⁴ G01S *13/62*
U.S. Cl. 342—99 **27 Claims**



1. A digital tracking, variable Q bandpass filter apparatus for digitally processing doppler variations in an IF signal from a doppler radar transceiver representing the velocity of a vehicle or other object and comprising: period counter means responsive to said IF signal for developing a digital period signal corresponding to the period of each of selected cycles of said IF signal to thereby convert the IF signal from the time domain to the frequency domain, and low pass filter means having a selectable effective corner frequency and coupled for response to said digital period signal for producing a filtered signal which substantially follows said digital period signal thereby substantially simultaneously tracking and filtering said IF signal.

4,633,253

MOVING TARGET INDICATION SYSTEM

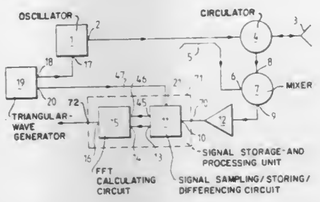
Andrew G. Stove, Reigate, and Richard P. Vincent, Horsham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,226

Claims priority, application United Kingdom, Jul. 16, 1982, 8220704

Int. Cl.⁴ G01S *13/54, 13/34*

U.S. Cl. 342—162 **3 Claims**



1. A moving target indication system comprising an aerial for transmitting a signal, a variable-frequency oscillator having an output coupled to the aerial, means for repeatedly sweeping the output frequency of said oscillator in opposite directions between first and second values, a mixer circuit having a first input to which the output of said oscillator is coupled and having a second input coupled to an aerial for receiving reflections of the transmitted signal from any targets, and a signal storage and processing arrangement having an input to which an output of the mixer circuit is coupled, said signal storage and processing arrangement comprising means for producing an output signal which is representative of any waveforms which would be obtained by subtracting from each other waveforms produced by the mixer circuit arising from the sweeps of the oscillator frequency between said first and second values in the one direction and waveforms produced by the mixer circuit arising from the sweeps of the oscillator frequency between said first and second values in the opposite direction after the latter waveforms have been put into time-reversed form, said output signal having a frequency representing the range of a respective moving target, and having a modulated amplitude which varies at a rate representing the radial velocity of said target.

4,633,254

CIRCUIT ARRANGEMENT FOR POST-DETECTION SUPPRESSION OF SPURIOUS RADAR ECHOES

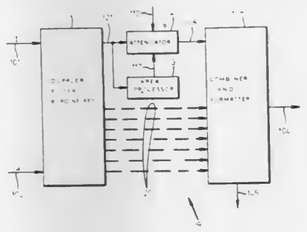
Ennio Giaccari, Rome, Italy, assignor to Selenia, Industrie Eletroniche Associate, S.p.A., Rome, Italy

Filed Jul. 8, 1983, Ser. No. 512,413

Claims priority, application Italy, Jul. 7, 1982, 48782 A/82

Int. Cl.⁴ G01S *13/44*

U.S. Cl. 342—91 **8 Claims**



1. In a monopulse radar for the surveillance of a space conceptually divided in azimuth into a multiplicity of angular sectors each encompassing a multiplicity of zones from which echoes of outgoing radar pulses are successively receivable in the course of a range sweep, each sector encompassing a predetermined number of sweeps, said space being periodically scanned by an antenna supplying incoming echoes to a receiver for conversion into signals fed to a load to indicate the position of a pulse-reflecting target.

the combination therewith of a suppressor of spurious echoes inserted between said receiver and said load, said suppressor comprising:

Doppler-filter means connected to said receiver for generating an output pulse in the presence of an incoming echo from a target with a radial velocity lying in a predetermined speed range:

adjustable attenuation means interposed between said Doppler-filter means and said load; and

processing means connected to said Doppler-filter means in parallel with said attenuation means for determining the number of output pulses generated in the sweeping of each zone and adjusting said attenuation means to reduce the amplitudes of output pulses passed to said load, in response to echoes originating at a given zone, with increasing density of the echoes from said given zone,

wherein said processing means comprises storage means for registering separate pulse counts for all the zones of a sector; first comparison means operative upon the last sweep of a sector to compare each pulse count registered in said storage means with a predetermined first threshold; memory means coupled to said first comparison means and provided with a multiplicity of cells for the preservation of an indication of pulse density of respective zones based upon the relationships of the corresponding pulse counts with said first threshold, the contents of all cells assigned to the zones of a given sector being updated on the last sweep of the same sector during recurrent antenna scans; and second comparison means connected to said memory means for readjusting said attenuation means, during traversal thereof by an output pulse due to an echo from a given zone, on the basis of the relationship of the contents of the corresponding cell with a predetermined second threshold.

4,633,255

METHOD FOR SEA SURFACE HIGH FkEQUENCY RADAR CROSS-SECTION ESTIMATION USING DOPLER SPECTRAL PROPERTIES

Dennis B. Trizna, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1983, Ser. No. 495,215

Int. Cl.⁴ G01S *13/50*

U.S. Cl. 342—192 **13 Claims**

13. A method for estimating the high frequency radar cross-section of a target comprising the steps of:

scattering high frequency Doppler radar signals onto a sea surface including a target and receiving echo returns in response thereto;

correlating said echo returns over an integration time period to obtain a Doppler spectrum of said echo returns;

identifying a target spectral line, an approach Bragg spectral line, a recede spectral line, and a zero Doppler frequency continuum level in said Doppler spectrum;

estimating the radar cross-section $\sigma^{\circ}(\theta)$ of said sea surface; and

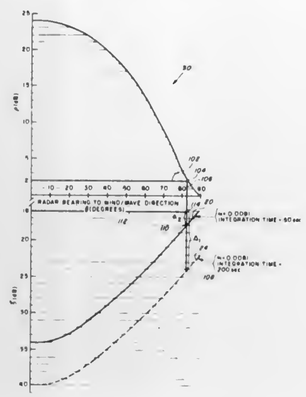
determining the radar cross-section of said target σ_T from said radar sea surface cross-section $\sigma^{\circ}(\theta)$ by:

determining the area of the scattering cell illuminated by said scattered Doppler radar signals from the pulse length and beam width of said Doppler radar signals;

adding said radar sea surface cross-section $\sigma^{\circ}(\theta)$ to said area of said scattering cell to determine the sea surface scattering cross-section σ_{SEA};

comparing said approach and recede Bragg spectral lines in said Doppler spectrum to determine the Bragg spectral line having the maximum amplitude;

measuring the amplitude difference β between the maximum amplitude Bragg spectral line and the amplitude of said target spectral line; and



substracting the amplitude difference β from said sea surface scattering cross-section σ_{SEA} to determine the radar cross-section σ_T of said target.

4,633,256

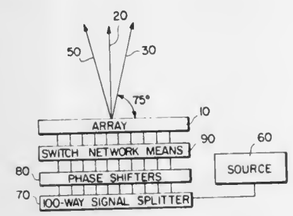
METHOD AND APPARATUS FOR FOUR-BEAM RADAR

Russell B. Chadwick, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 10, 1984, Ser. No. 680,114

Int. Cl.⁴ H01Q *3/26*

U.S. Cl. 342—368 **3 Claims**



1. A four-beam radar apparatus comprising:

means for generating a driving signal;

means connected to said generating means, for splitting said driving signal into $4n^2$ driving signals where n is a nonzero positive integer;

$4n^2$ phase shifters divided in a predetermined fashion into n^2 phasing groups of four phase shifters apiece for generating predetermined phase shifts;

$4n^2$ array elements arranged in a $2n \times 2n$ square matrix divided in a predetermined fashion into n^2 element groups of four array elements apiece;

n^2 switching means respectively associated with one of said n^2 phasing groups and one of said n^2 element groups for selectably and alternately interconnecting said four elements in said element group and said four phase shifters in said phasing group in one of four alternate predetermined interconnections;

said $4n^2$ array elements being arranged at positions $(\pm j, \pm k)$ where j and k are positive integers between one and n inclusively;

each ordered coordinate pair j, k determining one of said n^2 element groups; and

each ordered pair j, k determining one of said phasing groups, the four phase shifts being created by said group being determined by the product of a unit phase shift times $\pm x$ or $\pm y$, where x equals $(j+k-1)$, and where y equals $(j-k)$.

4,633,257

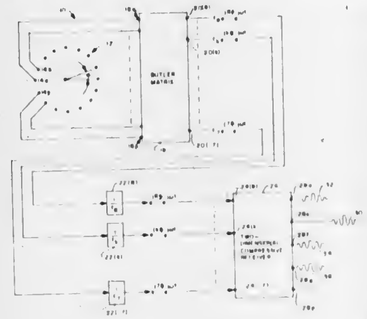
ACQUISITION SYSTEM EMPLOYING CIRCULAR ARRAY

John T. Apostolos, Merrimack, N.H.; Robert P. Boland, Wilmington, Mass., and Chester E. Stromswold, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 14, 1983, Ser. No. 551,664

Int. Cl.⁴ G01S *5/04, 3/16;* **G06G** *7/19*

U.S. Cl. 342—445 **8 Claims**



1. A method of finding the direction of a signal source whose signals are sensed by a circular array of antenna elements, the method comprising the steps of:

A. generating the spatial Fourier transformation of a signal ensemble having the phase relationship of the outputs of the circular array, thereby generating spatial-frequency components;

B. generating corrected components by applying to each spatial-frequency component a correction function that differs substantially only in the absence of the physical-angle-dependent phase factor from the inverse of the antenna pattern resulting when the antenna elements radiate signals whose phases advance with element position at the spatial frequency associated with that spatial-frequency component; and

C. performing a spatial Fourier transformation on the resulting ensemble of corrected components, the radial direction of the source of a given portion of the transform thereby being indicated by its spatial frequency.

4,633,258

PHASE SLOPE EQUALIZER

Chuck K. Mok, Beaconsfield, and Alain Martin, Vaudreuil, both of Canada, assignors to SPAR Aerospace Limited, Ontario, Canada

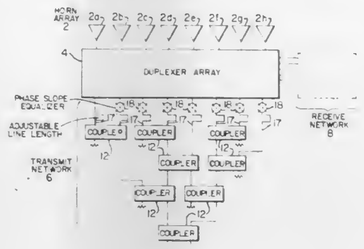
Filed Jun. 7, 1984, Ser. No. 618,446

Int. Cl.⁴ H01Q *3/22, 13/00;* **H01P** *7/06*

U.S. Cl. 342—373 **31 Claims**

1. A feed network for a microwave antenna of the type having a plurality of individual antenna components connected respectively to individual feed lines and sending or receiving signals in predetermined phase offsets relative to one another, the relative lengths of the feed lines being selected to define the predetermined phase offsets in the region of the midband frequency, each feed line having a phase shift/frequency response characteristic, the slope of which is determined by the length of the feed line, the network including, in at least each feed line which has a lesser said slope than the feed line, the phase shift/frequency response characteristic of which, has the greatest slope, a phase slope equalizer having a substantially

constant slope phase shift/frequency response curve extending from a positive phase shift through zero phase shift in the region of the midband frequency to a negative phase shift, the



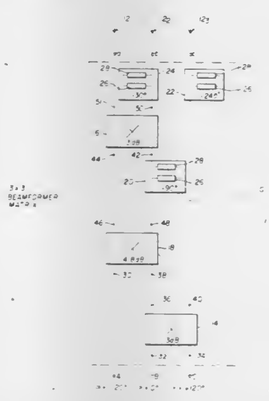
slope of the phase shift/frequency response curve of each phase slope equalizer being equal to the difference in slope between the feed line containing the phase slope equalizer and the line with the greatest slope.

4,633,259

LOSSLESS ORTHOGONAL BEAM FORMING NETWORK

Peter D. Hrycak, Millersville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1984, Ser. No. 629,530
Int. Cl.⁴ H01Q *3/22, 3/24*
U.S. Cl. 342—373 **16 Claims**



1. A non-binary orthogonal beam forming network for a plurality of antenna elements and where amplitude and phase characteristics exhibit substantially constant response over a relatively broad frequency range comprising:

at least one six port junction having three input ports and three output ports and including first and second 3-dB quadrature couplers and a 4.8-dB coupler and both of said input ports of said first 3-dB coupler forming said three input ports of said six port junction,

one of said output ports of said first 3-dB coupler being coupled to the other of said input ports of said 4.8-dB coupler,

−90° fixed phase shift means coupling the other of said output ports of said first 3-dB coupler to one of said input ports of said second 3-dB coupler, said −90° phase shift means comprising at least two parallel sections of coupled strip transmission lines mutually connected at one end,

one of said output ports of said 4.8-dB coupler being coupled to the other of said input ports of said second 3-dB coupler,

−240° fixed phase shift means coupling the other said output port of said third coupler to an output port forming one of said output ports of said six port junction, said −240° phase shift means also comprising at least two parallel sections of coupled strip transmission lines mutually connected at one end,

−30° fixed phase shift means coupling one output port of said second 3-dB coupler to another output port forming the second of said three output ports of said six port junction, said −30° phase shift means also comprising at least two parallel sections of coupled strip transmission lines mutually connected at one end, and

the other of said output ports of said second 3-dB coupler forming the remaining output port of said three output ports of said six port junction,

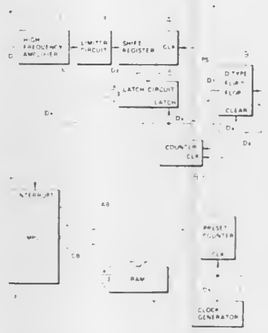
whereby a non-binary matrix is formed providing a 120° phase progression.

4,633,260

LORAN-C SIGNAL RECEIVING APPARATUS

Hiroshige Fukuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 4, 1984, Ser. No. 657,662
Claims priority, application Japan, Oct. 7, 1983, 58-187804; May 18, 1984, 59-99733
Int. Cl.⁴ G01S *1/24*
U.S. Cl. 342—389 **15 Claims**



1. A system for identifying a particular carrier wave cycle in individual Loran-C pulses of a received Loran-C signal in a Loran-C receiving apparatus, comprising:

(a) means for measuring the envelope of the carrier wave peaks of the received Loran-C signal over a known portion of a Loran-C pulse including said particular cycle; said envelope measuring means including:

(i) first means for converting the received Loran-C signal into a binary signal, the two levels of which indicate a received signal amplitude above an below a fixed threshold level, respectively;

(ii) second means for sampling the converted signal a first predetermined number of times;

(iii) third means for storing each sampled Loran-C signal value of each sampled Loran-C pulse received from a master and at least two secondary transmission stations constituting one Loran-C chain in corresponding memory addresses;

(iv) fourth means for integrating the sampled Loran-C signal value in each memory address over a second predetermined number of sample cycles;

(v) fifth means for sequentially comparing the contents of each of the memory addresses with a reference level so as to find a first address corresponding to the first time point at which the Loran-C signal level is distinguishable from background noise;

(vi) sixth means for reading the contents of a plurality of memory addresses, the corresponding time points of which are immediately subsequent to and in phase with the time point corresponding to said first address; and

(vii) seventh means for deriving the envelope which best fits the values of the first and subsequent addresses;

(b) means for storing a reference envelope corresponding to said known portion; and

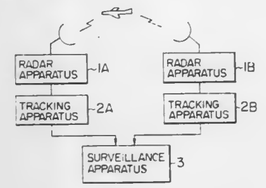
(c) means for comparing the measured envelope and the reference envelope and identifying said particular cycle of the received Loran-C pulse on the basis of the results of the comparison.

4,633,261

METHOD AND APPARATUS FOR CORRELATING TARGET TRACK DATA

Michitaka Kosaka, Sagamihara, and Shoji Miyamoto, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,352
Claims priority, application Japan, Oct. 8, 1982, 57-176144
Int. Cl.⁴ G01S *5/02, 13/00, 15/00*
U.S. Cl. 342—430 **7 Claims**



1. A method of correlating target track data for deciding whether data obtained from two sensor sites are from the same target or from different targets, each of said data including a plurality of parameters, comprising the steps of:

first step of preparing a plurality of reference values which are determined in accordance with a combination of minimum values of likelihood ratio functions for each of said parameters;

second step of obtaining the log-likelihood ratio of numerical values obtained from said two sensor sites with reference to a pair of first parameters whose space density distribution is most sparse;

third step of comparing the log-likelihood ratio obtained in said second step with a first reference value which is the minimum of said plurality of reference values, and determining that said data are from different targets, when the log-likelihood ratio is larger than said first reference value; and

fourth step of accumulating the log-likelihood ratio of each of the parameter values from that of a pair of parameters whose space density parameter is sparse in order, comparing the accumulated value with the reference value selected from said plurality of reference values, said selected reference value corresponding to the number of times of said accumulation, and determining that said data are from different targets when the accumulated value exceeds the reference value;

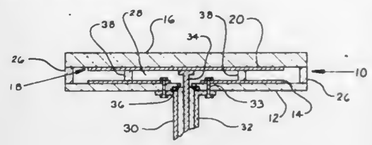
whereby, when the accumulated value of the log-likelihood ratio with respect to all parameters to be compared has not exceeded the reference value which has the maximum value, it is determined that said data are from the same target.

4,633,262

MICROSTRIP ANTENNA WITH PROTECTIVE CASING

G. Robert Traut, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Sep. 27, 1982, Ser. No. 424,833
Int. Cl.⁴ H01Q *1/38*
U.S. Cl. 343—700 MS **7 Claims**



1. A microstrip antenna including:

a first glass plate;

first conductive means on one surface of said first plate defining a ground plane for a microstrip antenna;

a second glass plate spaced from said first glass plate, said space between said glass plates being hermetically sealed;

second conductive means on one surface of said second plate defining a microstrip antenna circuit pattern, said pattern comprising a plurality of transmission lines and radiating elements;

said first and second conductive means being on interior facing surfaces of the first and second plates; and

spacer means for maintaining said first and second plates in spaced apart relation and defining a space between said plates.

4,633,263

CORONA MODE ELF ANTENNA SYSTEM

Saul Altshuler, 608 15th St., Manhattan Beach, Calif. 90266

Filed Sep. 7, 1984, Ser. No. 648,544
Int. Cl.⁴ H01Q *1/28*
U.S. Cl. 343—706 **13 Claims**



1. An antenna system suitable for radiating information in the ELF range comprising:

an extended conductor; and

means for coupling an ELF voltage to the conductor;

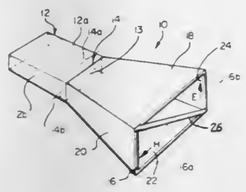
the relationship between the conductor size and voltage being such that the electric field immediately adjacent at least a portion of the conductor exceeds the air breakdown field strength, producing corona without corona discharge to increase the effective diameter of the antenna conductor.

4,633,264

HORN ANTENNA

Kazuyoshi Imazeki, and Seiji Kayama, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,522
Claims priority, application Japan, Feb. 17, 1983, 58-025965
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—786 10 Claims



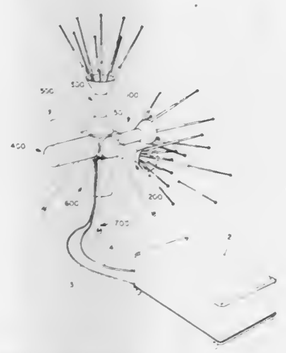
1. A horn antenna comprising: a horn of the type including a rectangular throat, a rectangular opening located in a plane parallel to and spaced apart from said throat and having at least one dimension larger than a corresponding dimension of said rectangular throat, four wall portions joining said rectangular throat and said rectangular opening; said walls meeting each other to define respective corners of said horn along lines joining respective corners of said throat and said opening; and a relatively thin, straight, elongate electrically conductive member disposed so as to extend completely across any one diagonal across said horn from any point along one corner thereof to any point along a diagonally opposite corner thereof, from and including said rectangular opening to and including said rectangular throat.

4,633,265

LOW FREQUENCY/HIGH FREQUENCY OMNIDIRECTIONAL ANTENNA FORMED OF PLURAL DIPOLES EXTENDING FROM A COMMON CENTER

Harold A. Wheeler, Smithtown, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,108
Int. Cl.[4] H01Q *21/26*
U.S. Cl. 343—797 22 Claims



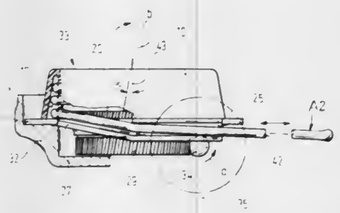
12. An antenna comprising:
(a) a first set of at least two mutually nonparallel dipoles for operation over a first common frequency band, each of the dipoles having a central feed port;
(b) a junction box with conductive walls;
(c) each of the dipoles having an inner end connected to said box and a free outer end;
(d) first means for connecting each feed port through a junction in the box to a receiver for the first common frequency band;
(e) a second set of at least two mutually nonparallel dipoles for operation over a second frequency band, each of the dipoles having a central feed port;
(f) each of the dipoles of said second set having an inner end connected to said box and a free outer end; and
(g) second means for connecting each feed port through a junction in the box to a receiver for the second common frequency band.

4,633,266

ELECTRICALLY PROJECTABLE TELESCOPIC ROD ANTENNA, PARTICULARLY FOR AUTOMOTIVE INSTALLATION

Reinhard Alf, and Kurt Klinkwitz, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,377
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338511
Int. Cl.[4] H01Q *1/10, 1/32*
U.S. Cl. 343—903 20 Claims



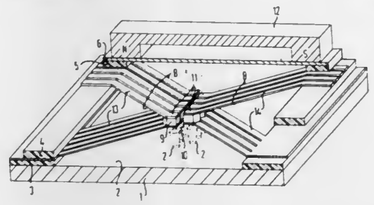
1. A telescopic rod antenna, particularly for automotive installation, and unitary drive combination having
a telescopic antenna unit (A; A1, A2);
an electric motor (35) to project, or retract, a first part (A2) telescopically within a second part (A1) of the antenna unit;
a flexible elongated element (42) located within said second part (A1) and coupled to the first part (A2) of the antenna, said elongated element and said antenna parts together constituting a readily replaceable unit;
a wind-up drum (10) to receive the flexible elongated element (42);
means (23) for guiding the flexible elongated element (42) to the wind-up drum (10), for winding thereon, upon retracting movement of the first antenna part (A2) within the second antenna part (A1), and
comprising, in accordance with the invention,
a drive coupling (13; 29, 34) rotatably coupling the drum (10) to the motor;
a slip clutch (111–119) acting between the wind-up drum and the output of the drive coupling (13; 29, 34);
a gear ring (20) located on the wind-up drum (10) and positioned in a space (17) thereon, within which the elongated element (42) winds on the drum; and
gearing teeth (41) formed on the elongated element (42) and engaged by the gear ring (20) of the wind-up drum for, selectively,
projection, from the wind-up space (17), of the elongated element (42) upon rotation of the wind-up drum in a given direction, and
wind-up, within the wind-up space (17), of the elongated element (42), on the wind-up drum (10), upon rotation of the motor (35) in reverse direction, said rotation being coupled to the wind-up drum (10) by the drive coupling (13; 29, 34).

4,633,267

ARRANGEMENT FOR THE EJECTION OF INDIVIDUAL DROPLETS FROM DISCHARGE OPENINGS OF AN INK PRINTER HEAD

André H. Meinhof, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,095
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445720
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 10 Claims



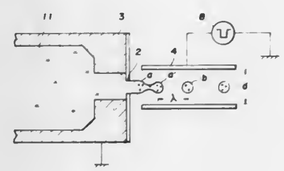
1. In an arrangement for the ejection of individual droplets from discharge openings of an ink printer head having comprising individually selectable drive elements allocated to the discharge openings, said drive elements, fashioned as conductor loops, proceeding in an ink chamber and including a movable middle part in the region of the ink channel, whereby said ink chamber is formed by a base member containing said discharge openings, by lateral walls and by a cover, as well as including a magnet system whose field lines penetrate said conductor loops, the improvement comprising each conductor loop having both its ends secured mutually insulated at one side of said ink chamber such that webs of said conductor loops extend arrow-like into said ink chamber and form a U-shaped, movable middle part in the region of said ink channel and said magnet system having field lines that penetrate said webs in the immediate proximity of said U-shaped, movable middle parts.

4,633,268

INK JET PRINTER

Yoshihiko Miroku, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 726,014
Claims priority, application Japan, May 23, 1984, 59-104005
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 9 Claims



1. An ink jet printer of the type in which ink jet means for jetting ink drops serially from a nozzle of an ink head thereby, and means for directing the ink drops towards a record medium, and wherein said ink drops are allowed to adhere to said record medium at prescribed positions, whereby a desired image is formed on said record medium, comprising:
parallel electrodes for charging, in response to video signals applied to said parallel electrodes, said respective ink drops jetted from said nozzle passing through a gap defined between said parallel electrodes, and
deflection electrodes for deflecting said parallel drops charged by passing through the gap of said parallel electrodes in response to a quantity of electric charge thereon to locate said ink drops at desired positions on said record medium,
the gap between said parallel electrodes being determined relative to the spacing between successive ink drops such that an ink drop to be charged is not substantially affected by the charge of the preceding ink drop which has already been charged.

4,633,269

METHOD AND APPARATUS FOR HEATING THERMAL HEAD

Tomohisa Mikami, Machida, and Tsugio Noda, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 703,986, Feb. 21, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 851,261
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 15 Claims



1. A thermal printer comprising
a heat generating element for heating a recording medium to provide a selected one of a plurality of recording tones for each of a plurality of successive recording periods,
control means for controlling said heat generating element to provide a respective recording signal corresponding to each said selected recording tone for each respective recording period, for stopping said providing of each said recording signal to allow the temperature of said heat generating element to fall below a first predetermined value, and for subsequently providing a heating change compensation signal to said heat generating element for returning said heat generating element to a second predetermined temperature at the end of each said recording period,
wherein, after each said recording signal is stopped by said control means, the temperature history of said heat generating element is effectively independent of the respective history of recording.

4,633,270

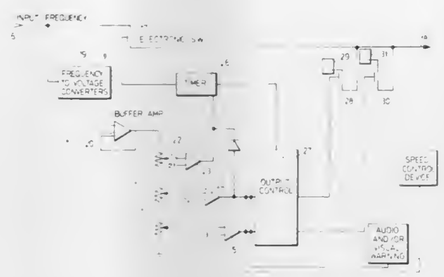
TRANSPORTATION EQUIPMENT RECORDER FOR HIGHLIGHTING OPERATING PARAMETERS OUTSIDE OF PRESET LIMITS

Hermann Ruhl, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Continuation of Ser. No. 486,388, Apr. 19, 1983, abandoned, and Ser. No. 486,207, Apr. 18, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,923
Claims priority, application Canada, Apr. 22, 1982, 401496
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—49 16 Claims

1. An operating parameter measuring and recording system for transportation equipment, said system including means for measuring value of at least one operating parameter, means for providing a recorded value in analogue fashion on a recording medium for the operating parameter and means for readily identifying discrepancies between the measured value when

outside of a preset limit and the recorded value when differing from the measured value, said means for identifying discrepancies comprising electronic measuring and signalling means settable to a preselected input value for the operating parameter and providing an output signal when the measured, as opposed to the recorded value for the operating parameter



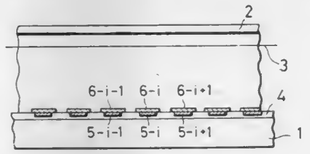
reaches the preselected input value, said system further comprising recording means responsive to said electronic measuring and signalling means for providing a highlighted visual indication of such output signal directly on the recording medium for recognition of differences between the recorded and the measured value.

4,633,271

OPTICAL WRITING DEVICE

Hideo Segawa, Tokyo; Toshiyuki Inokuchi; Takashi Shibaguchi, both of Yokohama, and Fumio Asano, Itabashi, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 8, 1983, Ser. No. 530,231
Claims priority, application Japan, Sep. 9, 1982, 57-157284
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—107 R **10 Claims**



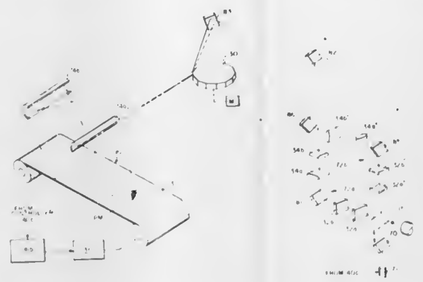
1. An optically writing device comprising:
a substrate;
a plurality of first electrodes provided on said substrate as arranged in the form of an array;
a like plurality of light emitting elements each mounted on said plurality of first electrodes, each of said light emitting elements being capable of emitting light by absorbing energy from electrons impinging thereon;
a second electrode for emitting electrons disposed spaced apart and not making physical contact with, a predetermined distance away from said substrate and extending generally in parallel with the array of said plurality of first electrode;
means for enclosing at least said plurality of light emitting elements and said second electrode; and
means mounted on said substrate for driving said plurality of first electrodes selectively in accordance with an image signal supplied thereto.

4,633,272

LASER PRINTING APPARATUS HAVING A MULTIPLE FORMATTED OUTPUT

James A. Hardy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,171
Int. Cl.[4] G01D *9/42, 9/00;* **G02B** *26/08;* **G03B** *27/52*
U.S. Cl. 346—108 **8 Claims**



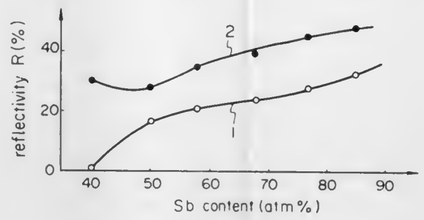
1. In a multi-format laser printer which includes a rotating polygon having mirror facets for line scanning a beam of gaussian laser light across a photosensitive member movable in a page scan direction at an image zone, the improvement comprises:
(a) first and second optical systems each effective when the optical path of the beam passes therethrough for forming a different line scan length on a photosensitive member, each of said optical systems including a cylindrical mirror disposed between the polygon and the image zone and effective to operate on the beam to provide pyramidal error correction by making the operative polygon facet and the image zone optically conjugate in the page scan direction;
(b) means in each of said first and second optical systems preceding the polygon and effective to operate on the beam to form in the line scan direction a beam waist and position such beam waist adjacent to the image zone; and
(c) means for establishing the beam path through a selected one of the optical systems.

4,633,273

INFORMATION RECORDING MEDIUM INCLUDING ANTIMONY-SELENIUM COMPOUNDS

Kenjiro Watanabe, Tokyo; Susumu Sakamoto, Chiba, and Junichi Akamatsu, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,037
Claims priority, application Japan, Jan. 26, 1984, 59-12431
Int. Cl.[4] G01D *9/00, 15/10*
U.S. Cl. 346—135.1 **8 Claims**



1. An optical information recording medium comprising a substrate, a thin film information recording layer formed on said substrate, said film being composed of an SbSe compound containing from 58–85 atomic % Sb, said layer being reversibly changeable between a crystalline phase and an amorphous phase to thereby record information by the difference in optical characteristics between said crystalline phase and said amorphous phase.

4,633,274

LIQUID EJECTION RECORDING APPARATUS

Hiroto Matsuda, Ebina, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,807
Claims priority, application Japan, Mar. 30, 1984, 59-60594; Mar. 30, 1984, 59-60566
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **17 Claims**



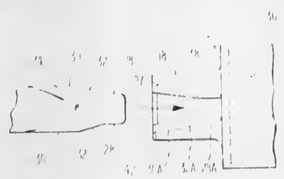
1. A liquid tank containing liquid to be supplied to a recording head mountable thereon, said liquid tank comprising:
means for mounting said recording head thereon,
a port through which said liquid is supplied to said recording head; and
means for transmitting an electrical signal to said recording head.

4,633,275

MEANS FOR MOUNTING A PEN ON A CHART RECORDER

James R. Hubbard, Moorestown, and Frank V. Idell, Camden, both of N.J., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Continuation of Ser. No. 537,334, Sep. 29, 1983. This application Sep. 20, 1985, Ser. No. 778,287
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **8 Claims**



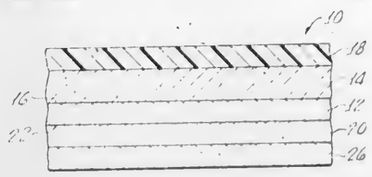
1. An instrument pen including a pen body, a writing nib mounted at the forward end therof, and a pen arm-receiving mounting member at the rearward end thereof, the pen arm mounting member defining a slot extending longitudinally away from said pen body,
said slot having two relatively short length segments, with parallel edges
a first forward segment being of less width than a second rearward segment, said segments being connected by a symmetrical tapered segment,
said slot thereby being adapted to be securely mounted by engagement along its full length, with a relatively short sliding movement and relatively little force on a flat blade pen arm having a forward tongue portion with two relatively short length segments correspondingly sized and shaped with respect to said two segments of said slot.

4,633,276

THERMOSENSITIVE RECORDING LABEL

Tomoo Shibata, Irvine, and Wissam J. Jurdi, Corona, both of Calif., assignors to Ricoh Electronics, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 614,287, May 25, 1984, Pat. No. 4,577,204. This application Aug. 29, 1985, Ser. No. 770,600
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—200 **10 Claims**



1. A thermosensitive recording label for use on beef products wrapped with plastic film comprising:
a substrate;
a thermosensitive color-forming layer disposed on one side of said substrate, said thermosensitive color-forming layer comprising a colorless or light-colored leuco dye and acidic substance capable of causing said leuco dye to undergo color formation upon heating of the thermosensitive recording label;
a protective layer disposed on said thermosensitive color-forming layer;
a pressure-sensitive hot melt adhesive layer disposed on another side of said substrate, said pressure-sensitive hot melt adhesive being absent sufficient modifying resin, selected from the group consisting of terpene resin, rosin resins, hydrocarbon resins, phenolic resins and ketone aldehydes, to prevent migration thereof into the thermosensitive color-forming layer, resulting in bleeding of the color formation in the thermosensitive color-forming layer; and,
a releasable backing sheet disposed on said pressure-sensitive hot melt adhesive layer.
a releasable backing sheet disposed on said pressure-sensitive hot melt adhesive layer.

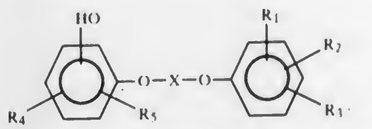
4,633,277

HEAT-SENSITIVE RECORDING MATERIAL

Toshitake Suzuki, Amagasaki; Fumio Hama, Osaka, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,252
Claims priority, application Japan, Jun. 26, 1984, 59-132455
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—216 **3 Claims**

1. A heat-sensitive recording material comprising a base sheet and a heat-sensitive record layer formed over the base sheet and comprising a colorless or pale-colored basic dye and a color developing material capable of forming a color when contacted with the dye, the recording material being characterized in that the heat-sensitive record layer contains as the color developing material at least one compound represented by the formula



(I)

wherein X is straight- or branched-chain alkylene group having 1 to 4 carbon atoms, R_1, R_2, R_3, R_4 and R_5 are each hydrogen atom, halogen atom, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, phenyl group

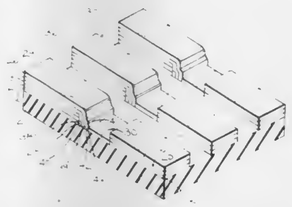
or benzyl group, or R_1 and R_2, R_2 and R_3, and R_4 and R_5, when taken together, may form an aromatic ring, and when R_4 and R_5 taken together form an aromatic ring, the hydroxy group on the benzene ring to which R_4 and R_5 are attached may be substituted on the aromatic ring formed by R_4 and R_5.

4,633,278

HORIZONTALLY LAYERED MOMOM NOTCH TUNNEL DEVICE

Robert W. Lade, Milwaukee; James A. Benjamin, Waukesha, and Herman P. Schutten, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1984, Ser. No. 683,728
Int. Cl.⁴ H01L *49/02*
U.S. Cl. 357—6 **9 Claims**



1. An MOMOM tunnel device comprising:
an insulating substrate;
first and second horizontal coplanar metal layers on said substrate, said first metal layer being oxidizable metal, said second metal layer being non-oxidizable metal;
a first horizontal insulating layer on said first and second metal layers;
a third horizontal metal layer on said first insulating layer, said third metal layer being non-oxidizable metal;
a generally vertical notch cut through said layers to said substrate providing left and right sections of said third metal layer, left and right sections of said first insulating layer, and left and right respective said first and second metal layers with facing edges spaced by said notch;
an oxidized tip formed at said facing edge of said first metal layer;
a fourth metal layer over said oxidized tip and over said left section of said third metal layer;
a second insulating layer over said fourth metal layer; and
a fifth horizontal metal layer extending along said substrate across the bottom of said notch between said second insulating layer and said facing edge of said second metal layer, an M-O-M-O-M structure being provided by: said first metal layer - said oxidized tip - said fourth metal layer - said second insulating layer - said fifth and second metal layers.

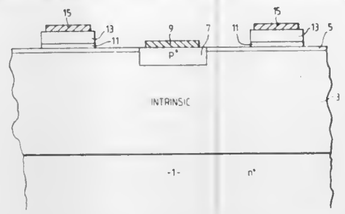
4,633,279

SEMICONDUCTOR DEVICES

Leslie G. Hipwood, 70 Locket Road, Wealdstone, Harrow, Middlesex, England HA3 7NE

Filed Dec. 6, 1984, Ser. No. 678,664
Claims priority, application United Kingdom, Dec. 12, 1983, 8333130
Int. Cl.⁴ H01L *29/161*
U.S. Cl. 357—16 **7 Claims**

1. A semiconductor switching device comprising: a substrate of n-type conductivity; a body of substantially intrinsic semiconductor material carried on said substrate; a hot electron emitter arranged to inject hot electrons into said body, when a bias potential is applied between said emitter and said substrate, with an energy sufficient to generate electron-hole pairs in said body by collision of injected electrons with valence electrons; and a region of p-type conductivity semiconductor material contiguous with said body to which, when appropriately biassed with respect to said substrate, generated holes will diffuse.

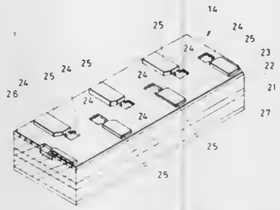


4,633,280

UNIT OF LIGHT EMITTING DIODE ARRAYS

Hiromi Takasu, Tottori, Japan, assignor to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

Filed Jul. 10, 1985, Ser. No. 753,393
Claims priority, application Japan, Jul. 20, 1984, 59-151722
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **13 Claims**



1. A unit of light emitting diode arrays comprising:
a substrate of a first conductivity type;
a plurality of regions of a second conductivity type formed in the surface of said substrate to emit light corresponding to a dot shape, each of said plurality of regions including a dot-shaped portion and a portion protruding laterally to the dot-shaped portion having narrower width than the dot-shaped portion; and
light intercepting electrodes in ohmic contact covering partially said respective protruding portions of the second conductivity type.

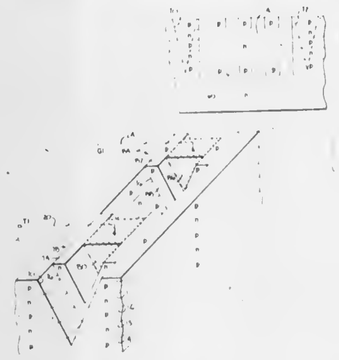
4,633,281

DUAL STACK POWER JFET WITH BURIED FIELD SHAPING DEPLETION REGIONS

James A. Benjamin, Waukesha, Wis.; Robert W. Lade, Fort Myers, Fla., and Herman P. Schutten, Milwaukee, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,431
Int. Cl.⁴ H01L *29/80*
U.S. Cl. 357—22 **3 Claims**

1. A bidirectional power JFET for AC operation comprising:
a semiconductor substrate of one conductivity type comprising a thin flat wafer lying in a horizontal plane and having top and bottom horizontal major surface;
a left set of a plurality of horizontal layers of alternating conductivity type semiconductor material vertically stacked in said substrate, the horizontal layers of said one conductivity type defining a plurality of horizontal channels extending left-right and interdigitated with horizontal layers of the other conductivity type and forming a plurality of respective horizontal interface channel junctions therewith;
a right set of a plurality of horizontal layers of alternating conductivity type semiconductor material vertically stacked in said substrate and spaced rightwardly of said left stack, the horizontal layers of said one conductivity type defining a plurality of horizontal channels extending left-right and interdigitated with horizontal layers of the other conductivity type and having a plurality of respective horizontal interface channel junction therewith;
a common drift region of said one conductivity type in said substrate between and separating said left and right stacks, and providing a horizontal left-right conduction path through said common drift region between said left and right stacks;
first main terminal means operatively coupled to the left end of said channels in said left stack;
second main terminal means operatively coupled to the right end of said channels in said right stack;
a source of alternating voltage impressed across said first and second main terminal means;
first gate terminal means operatively coupled to said other conductivity type horizontal layers in said left stack;
second gate terminal means operatively coupled to said other conductivity type horizontal layers in said right stack;
first gate voltage bias means connected to said first gate terminal means and applying a gating bias potential to said other conductivity type horizontal layers in said left stack, such that for a first polarity of said first gate bias means,



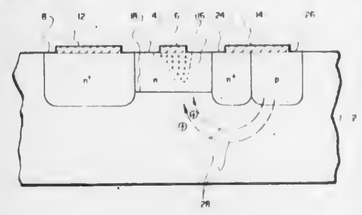
said channel junctions of said left stack are forward biased and depletion regions therearound shrink vertically toward said channel junctions to open a conductive horizontal left-right current path through said channels between said first main terminal means and said common drift region, and
such that for a second polarity of said first gate bias means, said channel junctions of said left stack are reverse biased and depletion regions therearound expand vertically from said channel junctions to close said horizontal current path and block conduction between said first main terminal means and said common drift region;
second gate voltage bias means connected to said second gate terminal means and applying a gating bias potential to said other conductivity type horizontal layers of said right stack,
such that for a first polarity of said second gate bias means, said channel junctions of said right stack are forward biased and depletion regions therearound shrink vertically toward said channel juctions to open a conductive horizontal current path through said channels between said second main terminal means and said common region, and
such that for a second polarity of said second gate bias means, said channel junctions of said right stack are reverse biased and depletion regions therearound expand vertically away from said channel junctions to close said horizontal current path and block conduction between said main terminal means and said common drift region;
a lower row of field shaping depletion regions of said other conductivity type in said common drift region substantially horizontally coplanar with the bottom layers of said stacks and buried in said substrate and spaced above said bottom horizontal major surface;
an upper row of field shaping depletion regions of said other conductivity type in said common drift region substantially horizontally coplanar with the top layers of said stacks and disposed at said top horizontal major surface and symmetrically aligned with said lower row of field shaping depletion regions;
said upper and lower rows of depletion regions providing straightening of field lines therebetween to reduce gradient curvature crowding and increase voltage blocking capability and providing symmetrical operation regardless of polarity to thus enable symmetric bidirectional current flow through said drift region between said left and right stacks and to enable symmetric OFF state voltage blocking capability.

4,633,282

METAL-SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH A PARTIAL P-TYPE DRAIN

Chien-Ping Lee, Pasadena, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 4, 1982, Ser. No. 432,463
Int. Cl.⁴ H01L *29/48, 29/06, 29/80, 29/12*
U.S. Cl. 357—22 **6 Claims**



1. An improvement in a metal-semiconductor field-effect transistor (MESFET) having:
a pair of spaced apart n^+-type regions on a semi-insulating GaAs substrate, a source contact on one of said n^+-type regions and a drain contact on the other of said n^+-type regions, an n^--type channel between said pair of spaced apart n^+-type regions, and a Schottky-metal gate contact on said channel;
said improvement comprising a p-type region adjacent said other n^+-type region, said p-type region not extending under either said source or said gate contacts, and
an ohmic contact on said p-type region for applying a positive bias to said p-type region which is at least equal to the positive bias applied to said drain contact.

4,633,283

CIRCUIT AND STRUCTURE FOR PROTECTING INTEGRATED CIRCUITS FROM DESTRUCTIVE TRANSIENT VOLTAGES

Leslie R. Avery, Huntedon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 11, 1985, Ser. No. 710,271
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.13 **12 Claims**

1. A protection circuit for protecting an integrated circuit against voltage transients, comprising:
a signal input terminal;
a first source of reference potential;
conductive means for connecting the terminal to the integrated circuit to be protected;

a first circuit connected between the conductive means and the first source of reference potential including a pair of coupled opposite conductivity type transistors, a first emitter-base shunt resistor coupled between the emitter and base of one of said transistors, a Zener diode coupled to said transistors, said first circuit protecting the integrated circuit against negative voltage transients more negative than the breakdown voltage of the Zener diode; and



a second circuit connected between the conductive means and the first source of reference potential including a pair of coupled opposite conductivity type transistors, said second circuit protecting the integrated circuit against positive voltage transients more positive than a threshold voltage that is independent of said Zener diode breakdown voltage.

4,633,284

THIN FILM TRANSISTOR HAVING AN ANNEALED GATE OXIDE AND METHOD OF MAKING SAME

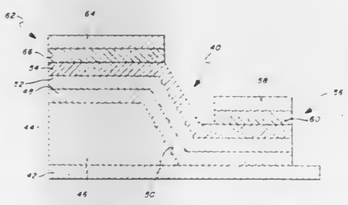
Gregory L. Hansell, Ann Arbor, Mich.; Zvi Yaniv, Beer-Sheva, Israel, and Vincent D. Cannella, Detroit, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 8, 1983, Ser. No. 549,979

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.7 **18 Claims**



1. A thin film field effect transistor formed on a substantially planar surface, said transistor comprising:

a gate electrode formed on at least a portion of said substantially planar surface, said gate electrode including a surface portion which is non-parallel to said planar surface;

a pair of lateral surface portion adjacent said non-parallel surface portion and extending in respective opposite directions from said non-parallel surface portion;

a layer of insulating material overlying said non-parallel surface portion of said gate electrode and extending laterally therefrom in opposite directions;

a semiconductor material overlying at least that portion of said layer of insulating material overlying the non-parallel surface portion of the gate electrode; and

a source electrode overlying a respective one of said lateral surface portions and a drain electrode overlying the other said lateral surface portion, said drain and source electrodes being in electrical connection with said semiconductor material.

4,633,285

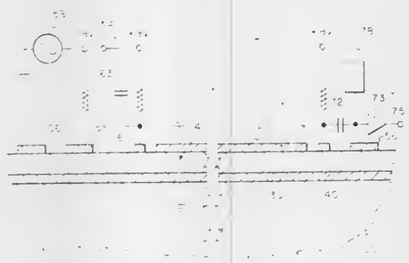
ACOUSTIC CHARGE TRANSPORT DEVICE AND METHOD

Billy J. Hunsinger, Mahomet, and Michael J. Hoskins, Urbana, both of Ill., assignors to University of Illinois, Ill.

Continuation-in-part of Ser. No. 406,751, Aug. 10, 1982. This application Jul. 21, 1983, Ser. No. 515,846

Int. Cl.⁴ H01L *29/84*

U.S. Cl. 357—26 **37 Claims**



1. A semiconductor device, comprising:

a support layer;

a layer of piezoelectric semiconductor material disposed over said support layer;

a conductive barrier layer disposed over a region of said piezoelectric semiconductor material and defining a channel in the piezoelectric semiconductor material beneath the barrier layer;

transducer means disposed on said piezoelectric semiconductor material for receiving a transducer energizing signal and establishing a surface acoustic wave in said piezoelectric semiconductor material that propagates through the channel;

means, other than said transducer means, for injecting into the channel an input electrical charge signal; and

means for extracting a delayed version of the input electrical signal from the channel after said input electrical signal has been carried along by the surface acoustic wave.

4,633,286

MULTIPLE GAP OPTICALLY ACTIVATED SWITCH

Lawrence J. Bovino, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1984, Ser. No. 596,966

Int. Cl.⁴ H01L *27/14*

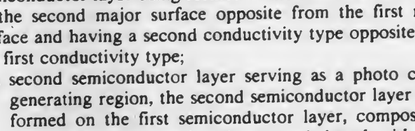
U.S. Cl. 357—30 **8 Claims**

1. A dual gap switch comprising:

a semiconductor wafer with two broad substantially parallel surfaces on opposite sides thereof and connected by a narrow edge surface;

a pair of spaced contacts located on one of said broad surfaces, said pair of contacts located to prevent surface conduction therebetween;

a bridging electrode located on the other of said broad surfaces so that it overlaps and bridges the said two spaced



contacts, whereby if a voltage is applied between said contacts a pair of gaps will be formed between each of the spaced contacts and said bridging electrode; and

means for forming charge carriers within said gaps independently of said pair of spaced contacts, whereby the formation of said charge carriers within said gaps will rapidly reduce the resistance between said spaced contacts and said bridging electrode to close said switch.

4,633,287

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE

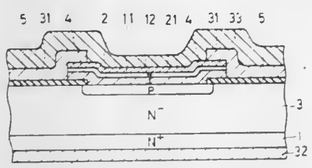
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Aug. 9, 1983, Ser. No. 521,546

Claims priority, application Japan, Aug. 9, 1982, 57-138225; Aug. 13, 1982, 57-141500

Int. Cl.⁴ H01L *27/14, 31/00*

U.S. Cl. 357—30 **124 Claims**



1. A semiconductor photoelectric conversion device comprising;

a substrate serving as a collector region, the substrate being composed of single-crystal semiconductor and having a first conductivity;

a first conductive layer serving as a collector electrode, the first conductive layer being formed on the first major surface of the substrate;

a first semiconductor layer serving as a base region, the first semiconductor layer being formed in the substrate on the side of the second major surface opposite from the first major surface and having a second conductivity type opposite from the first conductivity type;

a second semiconductor layer serving as a photo carrier generating region, the second semiconductor layer being formed on the first semiconductor layer, composed of non-single-crystal semiconductor and doped with a recombination center neutralizer and having an I conductivity type;

a third semiconductor layer serving as an emitter region, the third semiconductor layer being formed on the second semiconductor layer and composed of non-single-crystal semiconductor and having the first conductivity type; and

a second conductive layer serving as an emitter electrode, the second conductive layer being formed on the third semiconductor layer.

4,633,288

LIGHT-TRIGGERABLE THYRISTOR HAVING LOW LIGHT POWER REQUIREMENT AND HIGH CRITICAL VOLTAGE RISE RATE

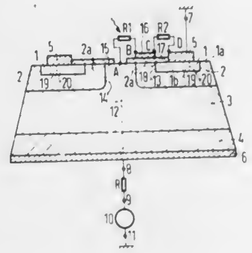
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,750

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226624

Int. Cl.⁴ H01L *29/74, 31/08, 31/10*

U.S. Cl. 357—38 **8 Claims**



1. In a thyristor of the type in which a semiconductor body has a boundary surface and comprises an n emitter extending to the boundary surface and contacted by a cathode electrode, a p base adjacent the n emitter, an n base adjacent the p base and a p emitter adjacent the n base and contacted by an anode electrode, in which a p projection of the p base and an n projection of the n base extend adjacent one another up to the boundary surface, in which a gate electrode is carried over and insulated from the p projection, the improvement therein comprising:

an illuminatable, light-sensitive first resistor for triggering the thyristor connected to the gate electrode and to a contact point of the n projection in a space charge zone produced at the pn junction with the p projection in the inhibiting condition of the thyristor; and

a second resistor connected between the gate electrode and the cathode electrode.

4,633,289

LATCH-UP IMMUNE, MULTIPLE RETROGRADE WELL HIGH DENSITY CMOS FET

John Yuan-Tai Chen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 12, 1983, Ser. No. 531,546

Int. Cl.⁴ H01L *27/02*

U.S. Cl. 357—42 **6 Claims**

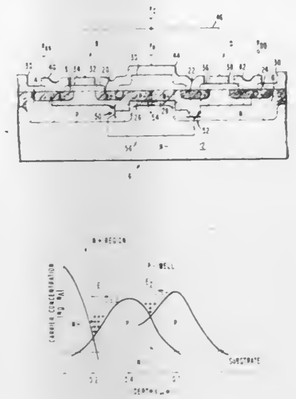
1. A CMOS comprising:

(a) a substrate;

(b) a well region within and adjacent a surface of said substrate, said well region having a multiple retrograde doping density profile comprising two retrograde peaks; and

(c) source and drain regions within said well region and adjacent the surface of said substrate, said source and drain regions having associated therewith a greater density of residual defects than average within said well region, said defects being generally associated with the deepest portions of said source and drain regions and the immediately underlying portions of said regions, respec-

tively, the double retrograde doping profile extending for substantially the entire depth of the well below the source



and drain region with a doping density sufficient to substantially inhibit latch-up of the FET.

4,633,290

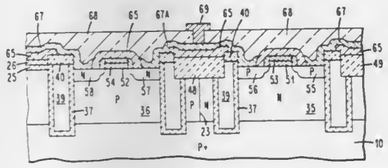
MONOLITHIC CMOS INTEGRATED CIRCUIT STRUCTURE WITH ISOLATION GROOVES

Paul E. Poppert, Acton; Marvin J. Tabasky, Peabody, and Eugene O. Degenkolb, Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 687,409, Dec. 28, 1984, Pat. No. 4,593,459. This application Feb. 28, 1986, Ser. No. 834,713

Int. Cl.⁴ H01L *27/02, 27/04, 29/06, 29/04*

U.S. Cl. 357—42 **5 Claims**



1. A substrate for the fabrication of semiconductor integrated circuit devices therein comprising

a body of semiconductor material having an underlying layer of one conductivity type and having a first section of one conductivity type and a second section of the opposite conductivity type at a surface of the body;

said first and second sections being contiguous at a junction and said first and second sections being contiguous said underlying layer at an interface parallel with said surface;

a first isolated sector of said first section encircled by first barriers extending from said surface to said underlying layer;

a second isolated sector of said second section encircled by second barriers extending from said surface to said underlying layer;

each of said first and second barriers being of semiconductor fill material enclosed by nonconductive protective material; and

a region of adherent nonconductive protective material inset in said first and second sections at said junction and extending between said first and second barriers.

4,633,291

HIGH-GAIN SEMICONDUCTOR DEVICE WITH CAPACITIVE COUPLING

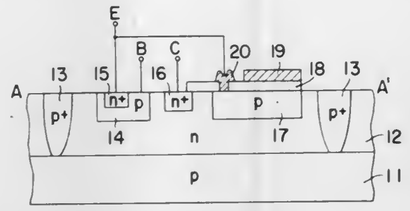
Takeshi Koyama, Zushi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 28, 1984, Ser. No. 584,506

Claims priority, application Japan, Mar. 1, 1983, 58-33439

Int. Cl.⁴ H01L *29/72, 27/02, 29/06*

U.S. Cl. 357—51 **10 Claims**



1. A semiconductor device comprising:

(a) an npn-transistor formed within an n-type region surrounded by an isolation region, and connected in common collector manner;

(b) an oxide film capacitor comprising a p-type region formed within said n-type region, an oxide film formed on said p-type region, and a metal layer formed on said oxide film; and

(c) an element for electically connecting said p-type region of said oxide film capacitor to the emitter region of said npn-transistor and for deriving signals therefrom.

4,633,292

SEMICONDUCTOR COMPONENT WITH PLANAR STRUCTURE

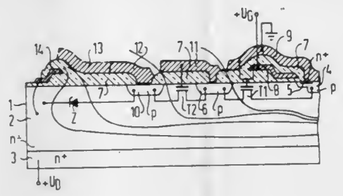
Christine Fellinger; Ludwig Leipold, and Jenö Tihanyi, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 498,015, May 25, 1983. This application Feb. 10, 1986, Ser. No. 828,575

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220250

Int. Cl.⁴ H01L *29/40*

U.S. Cl. 357—53 **10 Claims**



1. Planar semiconductor component comprising a substrate of a first conduction type having a surface, a contacted zone of opposite conduction type planarly embedded in and emerging to the surface of the substrate and having a control electrode overlapping a part of the contacted zone, an insulating layer disposed on the surface, and at least two protective ring zones of the opposite conduction type disposed between the edge of the substrate and the contacted zone; at least two conducting layers, each contacting a respective one of said ring zones, said conducting layers being electrically insulated from said substrate and covering the part thereof that reaches the surface; at least one further conducting layer covering the substrate at the part thereof that reaches the surface between the contacted zone and the protective ring zone nearest the contacted zone;

and wherein the distance between adjacent protective ring zones is less than the distance between the contacted zone and the protective ring zone nearest thereto; and wherein the distance from each protective ring zone, in direction toward the edge of the substrate, to the next protective ring zone is less than the distance to the nearest protective ring zone in direction toward the contacted zone.

4,633,293

HIGH DEFINITION TELEVISION SIGNAL FOR FILM-TELEVISION STANDARDS CONVERSION SYSTEM

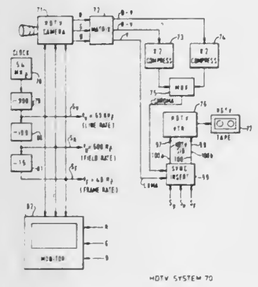
Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 13, 1984, Ser. No. 639,662

Claims priority, application United Kingdom, Sep. 26, 1983, 8325689; Apr. 26, 1984, 8410659

Int. Cl.⁴ H04N *11/20, 7/01*

U.S. Cl. 358—11 **13 Claims**



1. A high definition television system for generating a video signal suitable for conversion to a first television format having N_1 raster lines per frame and a frame rate of F_1 frames per second, to a second television format having N_2 raster lines per frame and a frame rate of F_2 frames per second, and to a third format for film that has a film frame rate of F_3 frames per second, where N_1, N_2, F_1, F_2, F_3 are positive numbers, said system comprising: first means for producing a video signal representing a raster, wherein the video lines of said signal represent raster lines that are oriented perpendicular to the orientation of the raster lines in said first or second television formats and including second means for developing synchronizing signals for use by said first means for generating said video lines at a video line rate that yields an integral number of said video lines in the time duration of a frame of each of the first and second television formats and of the third, film format and for arranging said video lines into fields having a field rate that is the lowest common multiple of the frame rates F_1, F_2 and F_3.

4,633,294

METHOD FOR REDUCING THE SCAN LINE VISIBILITY FOR PROJECTION TELEVISION BY USING A DIFFERENT INTERPOLATION AND VERTICAL DISPLACEMENT FOR EACH COLOR SIGNAL

Joseph S. Nadan, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 7, 1984, Ser. No. 678,609

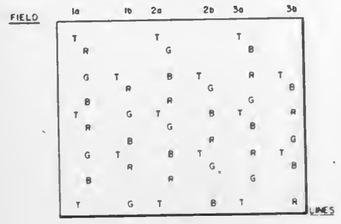
Int. Cl.⁴ H04N *9/31*

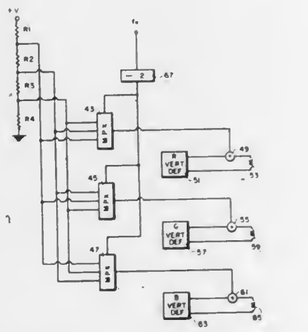
U.S. Cl. 358—11 **8 Claims**

1. A method for reducing the scan line visibility in the display for a projection television receiver, which receiver includes three projection devices for projecting the three color signals red, green and blue, each projecting device generating a raster of scanning lines, said rasters being converged with each other in superposition at a display screen for forming a desired display image, said method comprising the steps:

storing, for each color signal, at least one television scanning line of a video signal to be displayed;

deriving, for each color signal, an output television scanning line from said stored television line and a succeeding television line using a separate relationship for each color signal;





repeating said storing and deriving steps for forming each output television line to be projected; and

vertically displacing the displayed raster lines for each of said projection devices such that the raster lines from said projection devices are not in superposition.

4,633,295

COLOR TELEVISION TRANSMISSION AND DATA STORAGE SYSTEM, RESPECTIVELY WITH TIME-DIVISION MULTIPLEX ENCODING AND DATA GENERATOR AND DATA RECEIVER SUITABLE THEREFOR

Leendert J. van de Polder, and Sing L. Tan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,317

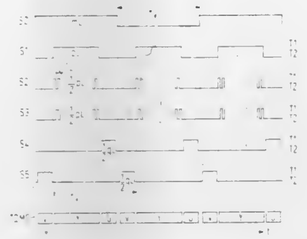
Claims priority, application Netherlands, Mar. 22, 1983, 8301013

Int. Cl.⁴ H04N *11/06, 11/20, 11/04*

U.S. Cl. 358—12 **10 Claims**

1. A color television transmission and data storage system, respectively, with time-division multiplex encoding, the system comprising a data generator, at least one data receiver and a transmission channel arranged between the generator and the receiver, this data generator comprising a signal source for producing signals containing luminance, chrominance, synchronizing and identification information and an encoding circuit for time-division multiplex encoding of at least a portion of said signals, after having been subjected or not subjected to time compression, this encoding circuit having an output for supplying a time-division multiplex encoded signal for transmission via the transmission channel, the data receiver comprising a decoding circuit coupled to said transmission channel and being complementary to said encoding circuit, for

supplying signals containing at least luminance and chrominance information which largely corresponds to the data produced by the signal source in the data generator, characterized in that the encoding circuit supplies from its output a time-division multiplex encoded signal which contains, during a number of p line periods of a field period, the luminance information substantially noncompressed and during a number of q other line periods, compressed chrominance information associated



with this luminance information and comprising in numbers of ½q line periods of a field period always one out of two compressed chrominance information components occuring in each line period, a number (p+q) being less than a number of m line periods which form a field period, the chrominance information being on average compressed in relation to the luminance information by a factor which is substantially equal to or less than q/p.

4,633,296

OMISSION AND SUBSEQUENT ESTIMATION OF ZERO SEQUENCY COEFFICIENTS OF TRANSFORMED DIGITIZED IMAGES TO FACILITATE DATA COMPRESSION

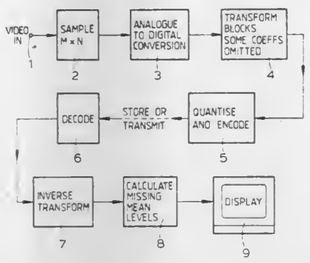
Wai K. Cham, Loughborough; Roger J. Clarke, Burton on the Wolds, and Richard C. Nicol, Ipswich, all of England, assignors to British Telecommunications public limited company, Great Britain

Filed Oct. 14, 1983, Ser. No. 541,932

Claims priority, application United Kingdom, Oct. 14, 1982, 8229420

Int. Cl.⁴ H04N *5/16, 11/02*

U.S. Cl. 358—12 **24 Claims**



1. A method of processing an array of picture elements of an image comprising the steps of:

(1) producing an array of samples representing the picture elements of said picture element array,

(2) subjecting sub-arrays of said sample array corresponding to blocks of said image to a two-dimensional transformation to produce associated sets of coefficients,

(3) removing the zero sequency coefficients from at least some of said sets of coefficients to produce corresponding reduced sets of coefficients,

(4) subjecting the reduced sets of coefficients corresponding to each block to the inverse of said two-dimensional transformation to produce sub-arrays of restored samples,

(5) reproducing said image from the restored samples, and

(6) calculating values for the mean levels of the blocks of the reproduced image so as to minimize visible brightness and/or colour changes between adjacent blocks of said reproduced image.

4,633,297

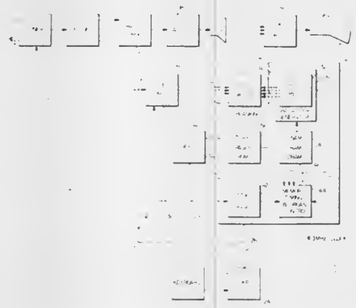
TELEVISION RECEIVER HAVING TELETEXT PROCESSOR WITH ROM FOR ON-SCREEN MESSAGE

Peter C. Skerlos, Arlington Heights; Thomas J. Zato, Palatine, and Gary A. Jones, Arlington Heights, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 1, 1985, Ser. No. 718,572

Int. Cl.⁴ H04N *9/00*

U.S. Cl. 358—22 **10 Claims**



1. A video system comprising:

a TV including microprocessor control means for generating an on-screen message display command;

a TTX processor including character generator means and dispay memory means for receiving, decoding and displaying TTX encoded data; and

a ROM in said TTX processor for storing an on-screen message in TTX encoded form;

whereby said encoded on-screen message may be loaded from said ROM to said display memory means for display as TTX data in response to the generation of said display command by said microprocessor control means.

4,633,298

DIGITALLY CONTROLLED PHASE LOCKED LOOP SYSTEM HAVING COARSE AND FINE LOCKING MODES

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,827

Int. Cl.⁴ H04N *9/64, 9/66, 11/04*

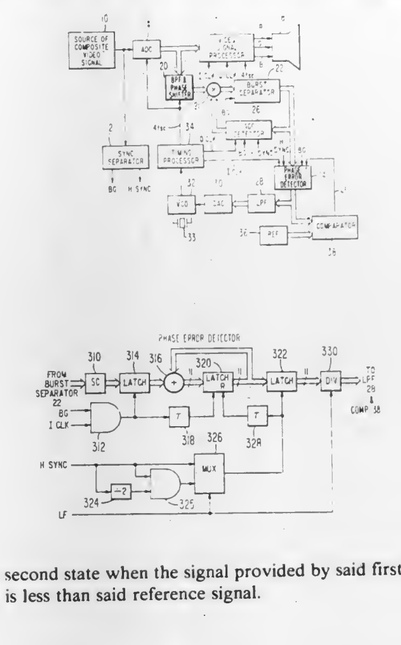
U.S. Cl. 358—25 **10 Claims**

3. In a digital signal processing system including a source of sampling clock signal and a source of digital samples representing a reference signal having a predetermined frequency and phase, a phase locked loop system comprising:

first means including an accumulator responsive to a control signal for summing a first predetermined number of said digital samples where the control signal is in a first state and for summing a second predetermined number of said digital samples when the control signal is in a second state;

a source of reference level signal; and

a comparator for developing said control signal, being in said first state when the signal provided by said first means is greater than said reference signal and being in said



second state when the signal provided by said first means is less than said reference signal.

4,633,299

COLOR TEMPERATURE CONTROL CIRCUIT USING SATURATION LEVEL DETECTOR

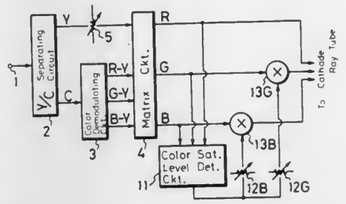
Yutaka Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,717

Claims priority, application Japan, Oct. 21, 1983, 58-197242

Int. Cl.⁴ H04N *9/64, 9/20*

U.S. Cl. 358—29 **15 Claims**



1. A color television receiver comprising:

a color cathode ray tube having a screen;

color saturation level detecting means for detecting a color saturation level of a color signal selected from a group of three color signals and producing an output in accordance with the detected color saturation level; and

color temperature control means responsive to said output for increasing at least a blue color component of an image displayed on said screen of said color cathode ray tube in accordance with an increase of the detected color saturation level.

4,633,300

COLOR INFORMATION DETECTING DEVICE

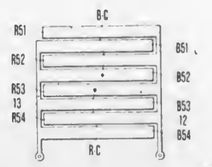
Shinji Sakai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Oct. 18, 1984, Ser. No. 662,258

Claims priority, application Japan, Oct. 21, 1983, 58-197753

Int. Cl.⁴ H04N *9/04*

U.S. Cl. 358—41 **29 Claims**



15. An image sensing device, comprising:

(a) a plurality of detecting means for detecting and providing an output of information on a color light different from a color light information to be detected by other detecting means, said detecting means each having a plurality of light receiving faces, said light receiving faces being arranged on about the same plane independently of each other with their centers of sensitivity distribution arranged to overlap each other;

(b) computing means for computing the outputs of said plurality of detecting means relative to each other and providing an output;

(c) a color image sensor arranged to convert an optical image into a picture signal output including color or chroma signal components; and

(d) control means for controlling the balance among the color or chroma signal components of the output of said color image sensor on the basis of the output of said computing means.

4,633,301

METHOD AND APPARATUS WITH WHITE BALANCING CORRECTION FOR SEPARATING A COLOR SIGNAL AND ITS COMPLEMENT

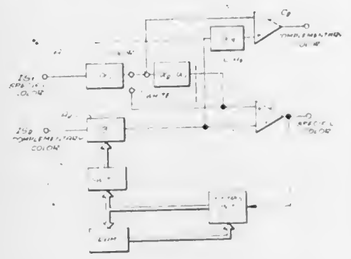
Hiroyuki Saitoh, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,805

Claims priority, application Japan, Jul. 30, 1982, 57-134405

Int. Cl.⁴ G03F *3/08;* **H04N** *9/73;* **G01J** *3/46, 3/50*

U.S. Cl. 358—75 **14 Claims**



1. A method for processing an image signal in which an image signal of a specific color is separated from a light signal containing image information of picture elements in a scanning line, said method comprising the steps of:

splitting said light signal into a first light signal containing image information of the specific color and a second light

signal containing image information of the complementary color with respect to said specific color;

photoelectrically converting said first and second light signals to first and second electrical signals corresponding respectively thereto;

applying a white balancing correction to said first and second electrical signals by adjusting the level of at least one of said electrical signals with the adjustment determined for each picture element by adjusting the relative levels of said first and second electrical signals corresponding to the picture elements in a scanning line of a reference area so that said first and second electrical signals are equal to each other for each picture element in the scanning line; and

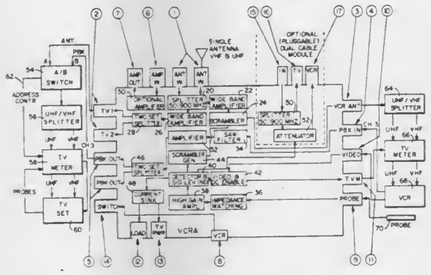
producing said image signal of the specific color from said two electrical signals to which said white balancing correction has been applied by comparing said first electrical signal and said second electrical signal to each other for each picture element and producing a signal in response to said comparison, said signal having a value for a picture element for which said first electrical signal exceeds second electrical signal that differs from the value for a picture element for which said second electrical signal exceeds said first electrical signal.

4,633,302

VIDEO CASSETTE RECORDER ADAPTER

Joseph A. Damoci, Beltsville, Md., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 1, 1985, Ser. No. 781,855
Int. Cl.[4] H04N *17/04, 17/06;* H04H *9/00*
U.S. Cl. 358—84 **6 Claims**



1. Apparatus for controlling the rf signal paths to and from a source of rf signals, a tv, a VCR and tv audience meters associated therewith for improved metering of the viewing of a tv and VCR combination, comprising:

antenna input means for receiving input of rf signals;

splitter means for splitting the rf signals into a tv signal path and a normally disabled VCR path;

detector means for detecting the erase signal of the VCR; and

means for enabling the VCR signal path in response to the means for detecting the erase signal.

4,633,303

TWO-DIMENSIONAL BANDWIDTH COMPENSATING CIRCUIT FOR AN ENDOSCOPE USING A SOLID STATE IMAGE PICK-UP DEVICE

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,452
Claims priority, application Japan, Aug. 31, 1984, 59-183082
Int. Cl.[4] A61B *1/04, 1/06;* H04N *5/14*
U.S. Cl. 358—98 **5 Claims**

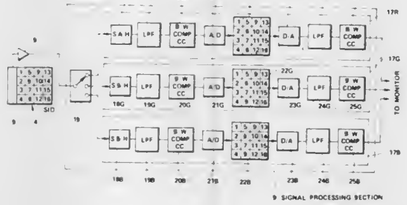
1. In an endoscope having an insertion part insertable into a body cavity and the like, illuminating means provided at a front end of said insertion part for projecting illuminating light onto a subject to be imaged, an image-forming optical system arranged at said front end of said insertion part for forming an image of a subject, imaging means including a solid state image pick-up device having a two-dimensional array of a plurality of photoelectric picture elements arranged at a focal plane of said image-forming optical system for picking-up a subject image formed by said image-forming optical system, and display means for displaying subject image signals from said imaging means on a display monitor,

a two-dimensional bandwidth compensating circuit provided in operable connection between said imaging means and said display means for compensating for deterioration of image signal resolution from said imaging means occurring in the two dimensions of said two-dimensional array of picture elements of said imaging means due to two-dimensional finiteness of the optical apertures of said picture elements, said two-dimensional bandwith compensating circuit comprising:

first reading means in operable connection with said two-dimensional array of picture elements of said imaging means for time-serially reading-out signals from said picture elements thereof along a first array dimension of said two-dimensional array of picture elements;

sample-hold circuit means in operable connection with said first reading means for sampling and holding said time-serially read-out signals output from said first reading means;

first low pass filter means in operable connection with an output of said sample-hold circuit means for eliminating higher harmonics from signals output from said sample-



hold circuit means, said first low pass filter means having a sharp cutoff characteristic at a first Nyquist threshold frequency determined by the array pitch in a first dimension of said of said two-dimensional array of picture elements of said imaging means;

first bandwidth compensating means in operable connection with an output of said first low pass filter means for compensating for bandwidth deterioration of signals output from said first low pass filter means occurring near said first Nyquist threshold frequency;

analog-to-digital conversion means in operable connection with an output of said first bandwidth compensating means for converting signals output from said first bandwidth compensating means into digital signal values corresponding thereto;

frame memory means in operable connection with an output of said analog-to-digital conversion means for storing said digital signal values;

second reading means in operable connection with said frame memory means for time-serially reading-out said stored digital signal values from said frame memory along a second array dimension of said two-dimensional array of picture elements;

digital-to-analog conversion means in operable connection with said second reading means for converting said time-serially read-out digital signal values into analog signal values corresponding thereto;

second low pass filter means in operable connection with an output of said digital-to-analog conversion means for eliminating higher harmonics from said analog signal values, said second low pass filter means having a sharp cutoff characteristic at a second Nyquist threshold frequency determined by the array pitch of said picture elements in a second dimension of said two-dimensional array of picture elements; and

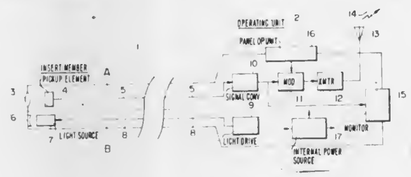
second bandwidth compensating means in operable connection with an output of said second low pass filter means for compensating for bandwidth deterioration of signals output from said secon low pass filter means occurring near said second Nyquist threshold frequency, and outputting two-dimensionally bandwidth-compensated image signals for application to said display means.

4,633,304

ENDOSCOPE ASSEMBLY

Tatsuo Nagasaki, Musashino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,421
Claims priority, application Japan, Aug. 27, 1983, 58-156859
Int. Cl.[4] H06N *7/18*
U.S. Cl. 358—98 **5 Claims**



1. An endoscope assembly comprising:

a flexible insert member adapted to be inserted into a body cavity and an operating unit physically connected to said insert member;

said insert member including therewithin electrically energized illuminating means for illuminating an object to be observed and an image pickup element for receiving an optical image of said object and converting said optical image to electrical signals;

connecting means in said insert member to electrically connect said image pick element and said illuminating means with said operating unit;

said operating unit including therewithin signal conversion means connected to said connecting means for converting said image pickup element electrical signals to image signals, and modulating means connected to said signal converting means for modulating a carrier wave with said image signals; and

transmitting means in said operating unit connected to said modulating means, including a transmitting antenna, for transmitting said image signals via said modulated carrier wave.

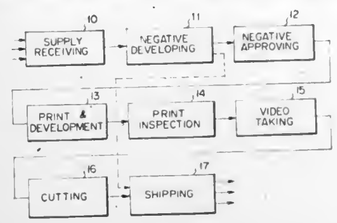
4,633,305

METHOD OF RECORDING IMAGE SIGNALS OF PHOTOGRAPHIC PICTURES

Keiji Nakayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 14, 1985, Ser. No. 797,904
Claims priority, application Japan, Nov. 19, 1984, 59-244196
Int. Cl.[4] H04N *7/18, 5/781*
U.S. Cl. 358—101 **6 Claims**

1. A method of recording image signals of photographic pictures, wherein said photographic pictures are printed onto a roll-shaped print paper from negatives, said roll-shaped print paper is print-developed in a state of a roll shape to provide a rolled shaped print recorded therein with said photographic pictures, and said roll-shaped print is cut from one frame to another, characterized in that said photographic pictures formed on said roll-shaped print are successively taken by a video camera before being cut from one frame to another, and



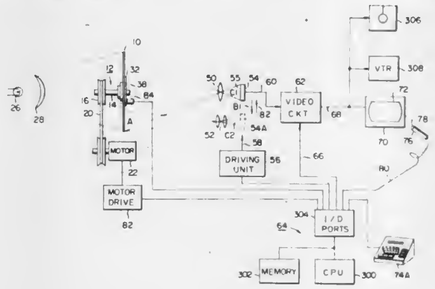
the image signals of said photographic pictures are recorded into a recording medium.

4,633,306

ARRANGEMENT FOR PRODUCING VISUAL IMAGES RECORDED ON A DISK OF FILM

Mikio Utsugi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Oct. 17, 1983, Ser. No. 542,395
Claims priority, application Japan, Oct. 19, 1982, 57-182170
Int. Cl.[4] H04N *5/253;* G02B *7/11*
U.S. Cl. 358—102 **15 Claims**



1. An arrangement for producing visual images recorded on an image recording medium comprising:

supporting means for detachably supporting a rotary disk-like image recording medium having frames of visual images recorded thereon;

first driving means for driving said supporting means to rotate the image recording medium;

imaging means for imaging the image recording medium to produce video signals associated therewith;

image visualizing means interconnected to said imaging means for visualizing the video signals as a reproduced image;

control means; and

input means interconnected to said control means for receiving instructions;

said imaging means being adapted to selectively take a first status, in which said imaging means picks up a relatively broader area of the image recording medium including the entire area of the image recording medium, and a second status, in which said imaging means picks up a relatively smaller area of the image recording medium including a frame of images recorded on the image recording medium;

said control means being operative in response to the first status instructed by said input means to control said imaging means into the first status, and in response to a desired frame recorded on the image recording medium being designated by said input means to control said imaging means into the second status, said control means controlling, in the second status, said first driving means to rotate

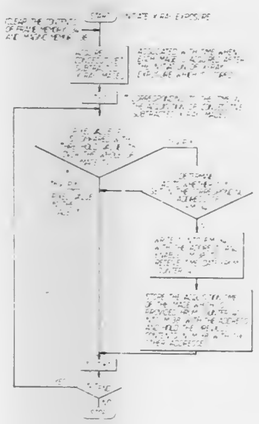
the image recording medium so that the designated frame is transporated to an imaging position where the designated frame is imaged by said imaging means.

4,633,307

DIGITAL SUBTRACTION FLUOROGRAPHIC METHOD AND APPARATUS

Michitaka Honda, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 5, 1985, Ser. No. 772,861
Claims priority, application Japan, Sep. 13, 1984, 59-190700
Int. Cl.[4] H05G *1/64*; H04N *5/32*
U.S. Cl. 358—111 **4 Claims**



1. A method for producing video signals representing phase difference images from X-ray images of a subject, which phase difference images are produced during a time period in which a contrast medium is flowing in the vessel of the subject, after intravenous injection of the contrast medium in the subject, comprising:

acquiring a sequence of X-ray images in the form of video signals starting at the beginning of a pre-contrast period and continuing through a post-contrast period;

producing difference video signals by performing a subtraction between the video signals of the pre-contrast images and the video signals of the post-contrast images;

converting the difference video signals to pixel image data representative of the intensity of contrast medium at the respective pixels in the difference video signals;

comparing the value of the pixel image data of the difference image with a predetermined threshold intensity value;

determining, for each pixel, time data related to the time period until the intensity of the respective pixel image data reaches the predetermined threshold intensity value after acquiring a sequence of X-ray images; and

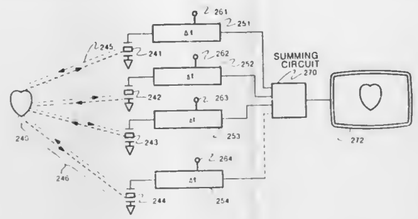
converting said time data for each pixel into visible televison images representing the distribution of contrast medium in the vessel in relation to the time period it takes for each pixel to attain said predetermined threshold intensity value.

4,633,308

AMPLITUDE INSENSITIVE DELAY LINES IN AN ACCOUSTIC IMAGING SYSTEM

John N. Dukes, Los Altos Hills; Richard A. Baumgartner, Palo Alto; Ian Bennett, Palo Alto; Richard D. Pering, Palo Alto, all of Calif., and George A. Fisher, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 5, 1984, Ser. No. 628,063
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—112 **12 Claims**



1. In an acoustic imaging system, a combination comprising:

a plurality of delay circuits, each delay circuit comprising a plurality of unclocked cascaded saturating circuit elements;

a plurality of transducing means for receiving acoustic pulses and transforming them into pulse width modulated signals each transducing means being coupled to an associated delay circuit from the plurality of delay circuits and each transducing means coupling the electrical pulses onto its associated delay circuit; and,

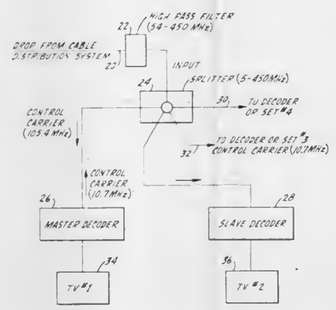
a summing means coupled to the plurality of delay circuits for resistive summing electrical signals from the plurality of delay circuits.

4,633,309

CABLE TELEVISION MASTER/SLAVE DECODER CONTROL

Tony C. Li, Rancho Bernardo, and Graham S. Stubbs, Poway, both of Calif., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed May 6, 1985, Ser. No. 731,564
Int. Cl.[4] H04N *7/167*
U.S. Cl. 358—122 **11 Claims**



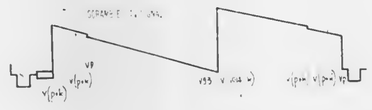
1. A method of controlling the operation of slave decoders in a cable TV distribution system having a central control computer; in which each subscriber location having a slave decoder also has a master decoder; in which there is a control message connection between each master decoder and its associated slave decoder(s); and in which the central control computer can address each master decoder and each slave decoder, including the step of periodically sending from the central control computer a deauthorization message for all slave decoders, which message is preceded by an inhibit message directed to all master decoders, which inhibit message prevents the receipt of the deauthorize message by all slave decoders which are connected, by a control message connection, with a master decoder.

4,633,310

METHOD AND DEVICE FOR SECURE TRANSMISSION AND OF TELEVISION PICTURES

Christian J. F. Gautier, Le Boulais, 35690 Acigne, France

Filed Mar. 19, 1984, Ser. No. 590,708
Claims priority, application France, Mar. 21, 1983, 83 05076
Int. Cl.[4] H04N *7/167*
U.S. Cl. 358—119 **10 Claims**



1. A process for scrambling and unscrambling a useful signal comprising a sampled line of video signals, said process comprising the steps of:

(a) dividing at least one part of said useful signal into segments which are adjacent, each one of the segments comprising at least two samples, the dividing point between the two segments being defined in a pseudo-random manner synchronously in the transmission and the reception;

(b) transmitting one of the segments in a reversed manner; and

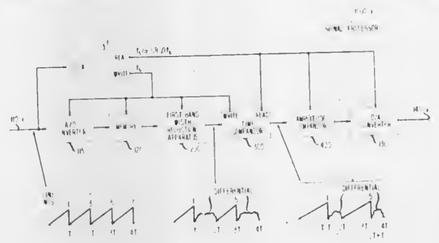
(c) upon reception, returning said reversed segment into the original direction.

4,633,311

SIGNAL PROCESSOR (SYSTEM) FOR REDUCING BANDWIDTH AND FOR MULTIPLEXING A PLURALITY OF SIGNALS ONTO A SINGLE COMMUNICATIONS LINK

Pat L. Gordon, Austin, Tex.; Barin G. Haskell, Tinton Falls, and Robert L. Schmidt, Wanamassa, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 276,876, Jun. 24, 1981, abandoned. This application Feb. 17, 1983, Ser. No. 467,312
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **4 Claims**



1. A signal processor comprising:

an input terminal adapted to receive a regularly occurring signal, said regularly occurring signal including a plurality of signal portions occurring over a sequence of prefixed time intervals, said plurality including first, second, and third successive signal portions occurring over, respectively, first, second, and third time intervals;

processing means for processing said regularly occurring signal; and

extending means for extending a signal processed by said processing means toward an output terminal, characterized in that

said processing means includes means for reducing the bandwidth of said regularly occurring signal, said bandwidth reducing means including means for arithmetically combining at least three of the signal portions, including said first, second, and third signal portions, of said plurality to produce a signal portion having a bandwidth smaller than that of said second portion, and

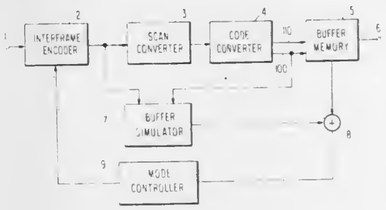
said extending means includes means for extending said first signal portion and said bandwidth reduced signal portion in place of said second signal portion.

4,633,312

INTERFRAME ENCODING SYSTEM HAVING A BUFFER SIMULATOR

Tooru Yasuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,662
Claims priority, application Japan, Aug. 23, 1984, 59-174057; Aug. 23, 1984, 59-175481
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—136 **3 Claims**



1. An interframe encoding system comprising encoding means for performing interframe predictive encoding of a video signal to generate a predictive encoded signal; scan converting means for converting the predictive encoded signal into a scan converted signal of a predetermined block; code converting means for converting an effective picture element in the scan converted signal into a variable-length code and an ineffective picture element therein into a run length code to generate a code-converted signal; buffer memory means for storing the code-converted signal and for generating a buffer memory occupancy signal by calculating the quantity to be occupied by the code-converted signal; simulating means for generating a simulation signal by calculating, on the basis of said predictive encoded signal and said code-converted signal, the quantity of information stored in said scan converting means; means responsive to said buffer memory occupancy signal and said simulation signal for generating a compensated buffer memory occupancy signal; and mode controlling means responsive to the compensated buffer memory occupancy signal for controlling the generation of said predictive encoded signal.

4,633,313

METHOD AND APPARATUS FOR TRANSFERRING DATA FOR DIGITALLY CONTROLLING VIDEO EQUIPMENT

Takao Mogi, and Masayuki Suematsu, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 7, 1986, Ser. No. 816,831
Claims priority, application Japan, Jan. 18, 1985, 60-6979
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **11 Claims**

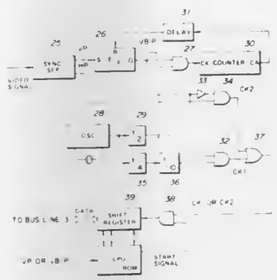
1. A method for transferring data in digitally controlled

video equipment of the kind for use in displaying a video signal and having a digital processing unit, at least one digitally controlled circuit, and an internal bus, comprising the steps of:

producing a first clock pulse signal having a first frequency;

producing a second clock pulse signal having a second frequency less than said first frequency;

determining vertical blanking periods of the video signal; and



transferring data between the digital processing means and said at least one digitally controlled circuit in the video equipment via the internal bus using the first clock pulse signal having the first frequency during the vertical blanking periods and using the second clock pulse signal having the second frequency during all periods of time other than the vertical blanking periods.

4,633,314

SHADING CORRECTION DEVICE

Masami Kurata, and Hiroyuki Saitoh, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1983, Ser. No. 513,732

Claims priority, application Japan, Jul. 20, 1982, 57-126863

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—163 **17 Claims**



1. A shading correction device for use with a photoelectric image scanner in which the picture signal level for a reference all white image is different at different locations along a scan line, comprising:

means for establishing multibit correction data by determining the degree of attenuation of said picture signal level required at each picture element location along said scan line that can make the level of said picture signal for said reference white image be substantially constant along the entire scan line, said determination being made by an iteration process repeated over several successive scans of said all white image with the individual constituent bits of said correction data being acquired on respective successive iteration scans;

a memory;

means for writing said established multibit correction data in said memory;

read control means for sequentially reading the correction data from said memory synchronized with the scanning of an image; and

a variable attenuator for performing a level correction of said picture signal at each picture element location based on the correction data read by said read control means.

4,633,315

RECEIVER FOR RF-SIGNALS COMPRISING A PAIR OF PARALLEL SIGNAL PATHS

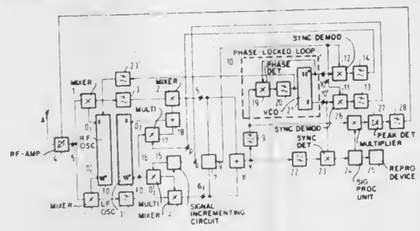
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,646

Claims priority, application Netherlands, Apr. 1, 1983, 8301179

Int. Cl.[4] H04N *5/14, 5/44*

U.S. Cl. 358—188 **33 Claims**



1. A receiver for receiving a signal modulated on an RF-carrier, said receiver comprising a pair of signal paths arranged in parallel between an RF-input and superposition circuit means and including, arranged in succession, a pair of first mixing stages for mixing down a frequency of the received modulated RF-carrier to a low frequency, mixing signals being applied in a phase quadrature relationship to these first mixing stages from an RF-tuning oscillator, a pair of filtering elements at the output of the first mixing stages for modulated carrier signal selection and a pair of second mixing stages for up-converting the frequency of the selected modulated carrier, mixing signals being applied, also in a phase quadrature relationship, to these second mixing stages from a fixed LF-oscillator, these second mixing stages being connected to inputs of the superposition circuit means, the superposition circuit means being arranged between outputs of the two signal paths and producing a first and a second output signal, wherein said second output signal, relative to the first output signal, is mirror-inverted around the frequency of the fixed LF-oscillator, and one of said first and second output signals being applied to a carrier selection circuit, one side of which is connected to a carrier input of a first synchronous demodulator and to a carrier input on a second synchronous demodulator via 90°-phase shifting means, and the other of said first and second output signals is applied to signal inputs of the first and second synchronous demodulators, the first and second synchronous demodulators being connected to an amplitude control input and to a phase control input, respectively, of a controllable balancing arrangement via respective low-pass filters, this controllable balancing arrangement comprising an amplitude control circuit and a phase control circuit for mutually balancing the amplitudes and phases of the signals in the two signal paths.

4,633,316

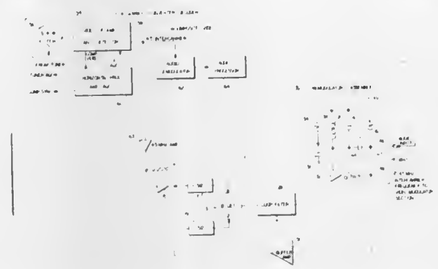
STABLE LOW COST 4.5 MHZ REMODULATOR

Dennis E. Burke, Elk Grove Village, and John A. Lund, McHenry, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 14, 1984, Ser. No. 671,271

Int. Cl.[4] H04N *5/62*

U.S. Cl. 358—197 **6 Claims**



1. In combination:

means for receiving and detecting a television signal to provide a received 4.5 MHz intercarrier sound signal and a baseband audio signal recovered therefrom;

remodulator means for regenerating a 4.5 MHz intercarrier signal for modulation by said audio signal;

a voltage controlled oscillator in said remodulator means having a nominal frequency of 4.5 MHz for developing said regenerated 4.5 MHz intercarrier signal; and

a phase lock loop including a phase detector having an output coupled to said voltage controlled oscillator, a first input supplied with said received 4.5 MHz intercarrier signal, and a second input coupled to the output of said voltage controlled oscillator;

whereby said regenerated 4.5 MHz intercarrier signal is stabilized by said received 4.5 MHz intercarrier sound signal.

4,633,317

ELECTRO-OPTICAL DETECTOR SYSTEM

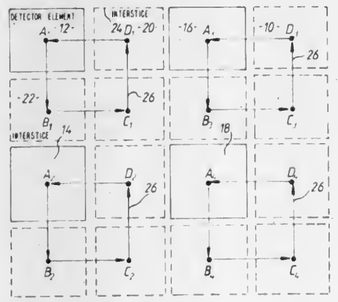
Bernd Uwira, Constance; Hans Kordulla, Singen, and Johann-Friedrich Egger, Überlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Gerätetechnic GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,619

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323956

Int. Cl.[4] H01J *3/11*

U.S. Cl. 358—213 **5 Claims**



1. Electro-optical detector system for the generation of electronic picture information, comprising:

(a) a charge-coupled mosaic detector having a plurality of rectangular detector elements having first and second sides, said detector elements being arranged in columns parallel to said first sides and rows parallel to said second sides,

(b) the detector elements of each of said columns defining first interstices therebetween, the widths of said interstices being substantially equal to the lengths of said first sides,

(c) the detector elements of each of said rows defining second interstices therebetween, the widths of said second interstices being substantially equal to the length of said second sides,

(d) imaging means for forming an image of a field of view on said mosaic detector whereby each of said detector elements provides picture information, and

(e) image displacement means cyclically acting on said imaging means for displacing said image relative to said mosaic detector along a closed rectangular trajectory, said image displacement means comprising means for displacing each point of said image relative to said mosaic detector, during each cycle, quickly from one corner of a rectangle, the sides of which are equal and parallel to said first and second sides, to an adjacent corner, and means for holding said image stationary between such displacements for a time interval substantially larger than the time required for each of said displacements from one corner to the next one.

4,633,318

PROTECTION CIRCUIT FOR A TELEVISION CAMERA PREAMPLIFIER

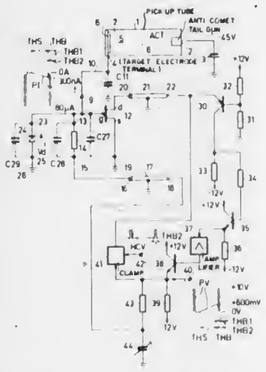
Pieter B. Dielhof, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 458,798, Jan. 18, 1983, abandoned. This application Sep. 17, 1985, Ser. No. 777,554

Claims priority, application Netherlands, Feb. 19, 1982, 8200669

Int. Cl.[4] H04N *5/228*

U.S. Cl. 358—223 **4 Claims**



1. In a television camera comprising:

a pick-up tube having an anti-comet tail gun and a pick-up terminal at which picture signals are produced, the amplitude of such picture signals being within a predetermined range during line scanning periods and having peaks exceeding such range during portions of line blanking periods which alternate with said line scanning periods;

a preamplifier having an input terminal which is DC-connected to said pick-up terminal to receive said picture signals and an output terminal at which it is adapted to produce camera output signals in response to said picture signals, such preamplifier becoming saturated in response to said picture signal peaks and thereafter returning to the unsaturated state after a time interval dependent on the

amplitude of such picture signal peaks relative to a predetermined saturation level;

and a clamping circuit connected to said preamplifier for applying clamping signals thereto during the portions of the line blanking periods following the portions thereof in which said picture signal peaks occur, such clamping signals being effective when said preamplifier is unsaturated to cause said preamplifier to maintain the camera output signals produced thereby at a predetermined blanking voltage level during such following portions of the line blanking periods;

a circuit for increasing the rate at which said preamplifier returns to the unsaturated state following the portions of the line blanking periods in which it saturates in response to said picture signal peaks, such circuit comprising:

an insulated gate FET comprised in said preamplifier, such FET having a source electrode and a gate electrode which constitutes the input terminal of said preamplifier, said picture signals being produced across said gate and source electrodes; and

a diode connected across said gate and source electrodes, said diode having a predetermined threshold voltage at which it becomes conductive and a relatively low voltage drop there-across while it is conductive; such threshold voltage exceeding the maximum amplitude of the picture signals during line scanning periods, whereby said diode remains nonconductive during such periods; and such threshold voltage being lower than said picture signal peaks, whereby said diode becomes conductive upon occurrence of said picture signal peaks across said gate and source electrodes;

the relatively low voltage drop across said diode when it is conductive limiting the voltage produced at the input terminal of said preamplifier by said picture signal peaks, thereby enabling said preamplifier to return to the unsaturated state prior to the portion of the line blanking periods in which said clamping signals are produced.

4,633,319

METHOD AND APPARATUS FOR DETECTING FOCUSING IN AN IMAGE PICKUP DEVICE

Akio Izumi, and Hideyuki Tanaka, both of Yokosuka, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Jul. 19, 1985, Ser. No. 757,133

Claims priority, application Japan, Aug. 8, 1984, 59-166071

Int. Cl.⁴ H04N *5/232*

U.S. Cl. 358—227 **9 Claims**



1. A method for adjusting the focused state of an adjustable optical system using an analog video signal which represents an image of an object to be focused on an image detection plane of an image pickup device through said adjustable optical system, said method comprising the steps of deriving from the analog signal a pair of comparison signals which differ from one another by at least one of a predetermined time shift and a predetermined average level shift, comparing said two signals, determining the time during which the instantaneous value of one of the two exceeds the other, and adjusting the optical system for minimizing the said time.

4,633,320

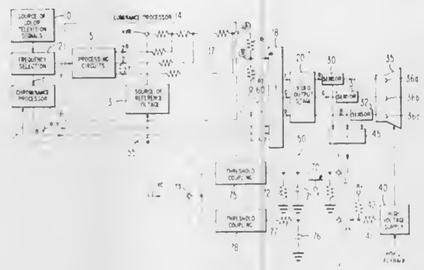
VIDEO SIGNAL PROCESSOR WITH AUTOMATIC KINESCOPE BEAM CURRENT LIMITER

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 8, 1984, Ser. No. 587,583

Int. Cl.⁴ H04N *5/68, 9/16*

U.S. Cl. 358—243 **7 Claims**



1. A video signal processing system comprising:

a source of digital video signals with information bearing bits defining plural video signal information levels including black image representative level;

image display means responsive to video signals from said source;

control means for developing a control signal representative of the magnitude of excessive currents conducted by said display means greater than a threshold level;

means for coupling said control signal to said video signal source for controlling the magnitude of said video signals to limit excessive currents conducted by said display means, said video signal black level being subject to varying undesirably in accordance with variations of said controlled video signal;

means for producing a compensation signal with a magnitude related to the magnitude of said control signal; and

means for DC coupling said compensation signal to said video signal source for substantially negating said variations of said video signal black level.

4,633,321

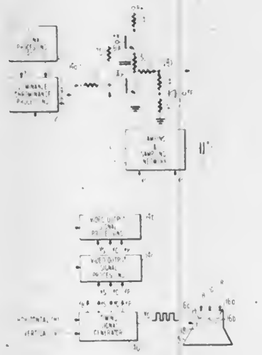
AUTOMATIC KINESCOPE BIAS CONTROL SYSTEM

James C. Tallant, II, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 23, 1985, Ser. No. 726,331

Int. Cl.⁴ H04N *5/68, 9/16*

U.S. Cl. 358—243 **7 Claims**



1. In a video signal processing and display system including

an image display device having an intensity control assembly including an intensity control electrode, and a source of video signals, including image trace and retrace intervals, coupled to said intensity control electrode via a video signal path; apparatus for automatically controlling an operating parameter of said display device comprising:

means for providing an auxiliary signal during a display device operating parameter monitoring interval including said image trace and retrace intervals;

means for coupling said auxiliary signal to said intensity control assembly to induce current conduction by said intensity control assembly, the magnitude of said induced current being related to the condition of said operating parameter of said display device;

means for providing a control signal related to the magnitude of said induced current; and

means for coupling said control signal to said video signal path for modifying the bias of said display device in a direction to maintain a desired condition of said display device operating parameter; wherein

said auxiliary signal exhibits a first amplitude during said image trace intervals included within each said monitoring interval for developing said induced current, and a second amplitude during said image retrace intervals included within each said monitoring interval for precluding development of said induced current.

4,633,322

SCREEN TO BE DISPOSED IN FRONT OF A CATHODE RAY SCREEN, COMPRISED BY MONOFILAMENTS FORMING MICROMESHES AND HAVING, ON ONE SURFACE, A TRANSLUCENT FILM

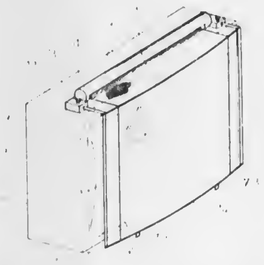
Denise G. Fourny, 19 Bd de Suisse, Monte Carlo, Monaco

Filed Feb. 13, 1985, Ser. No. 701,196

Claims priority, application France, Feb. 20, 1984, 84 02640; Aug. 17, 1984, 84 13004

Int. Cl.⁴ H04N *5/72*

U.S. Cl. 358—252 **15 Claims**



1. Device for positioning an automatically removable filter in front of a cathode ray screen, when it is lit up, comprised by a sheet of a textile material woven with micromeshes, comprising an automatic roller (**2**), securement means (**5**) (**15**) for said roller to a television set (**3**), guiding and holding means (**8**, **9**, **27**, **28**) for the filter (**1**), and securement means (**7A**, **7B**, **30**) for the filter (**1**) either by its end (**6**) or by its sides.

4,633,323

PICTURE/SOUND RECORDER WITH HINGED FLAT PICTURE SCREEN

Ottmar Haberkern, Reuchlinstrasse 24, D-6200 Wiesbaden, and Horst Kahl, Kirchstr. 13, D-6148 Heppenheim, both of Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,221

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344211

Int. Cl.⁴ H04N *5/64*

U.S. Cl. 358—254 **7 Claims**



1. A device for video and sound reproduction and for recording sound and video comprising: a pair of housings bound together by a pair of hinges, one of said pair of housings having a picture reproducer for displaying a picture in an opening, another of said pair of housings having a speaker mounted in each of said pair of hinges, said other housing having a sound and picture receiving unit and further having controls and auxiliary sockets extending through a wall of said other housing.

4,633,324

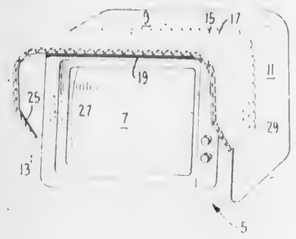
CRT SHIELD

James E. Giulie, 150 Commercial St., Sunnyvale, Calif. 94086

Filed Jan. 23, 1985, Ser. No. 694,036

Int. Cl.⁴ H04N *5/64*

U.S. Cl. 358—255 **1 Claim**



1. An adjustable light shield for a CRT in an enclosure, comprising in combination:

a. a plurality of thin strips lying side by side in parallel relationship, said strips being made of a solid material and lying at right angles to the face of a CRT, and extending lengthwise out past the face of said CRT;

b. a flexible material holding said strips in alignment and permitting said plurality of strips to bend about the longitudinal axis of said strips so that said strips will conform to and lie against virtually any surface in which said CRT is enclosed and whereby said shield can be rolled up for storage,

c. said strips covering the top and both sides of said enclosure.

4,633,325

ADAPTIVE PREDICTIVE ENCODING AND/OR DECODING APPARATUS

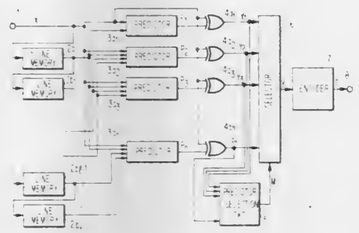
Touru Usubuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,539

Claims priority, application Japan, Sep. 1, 1983, 58-160774; Sep. 1, 1983, 58-160775

Int. Cl.⁴ H04N *1/00, 7/12*

U.S. Cl. 358—260 **12 Claims**



1. An adaptive predictive encoding apparatus comprising:

means for generating a plurality of predictive values P_1, P_2, - - - , P_n with respect to a quantized value X of a picture element x from quantized values of neighboring picture elements to said picture element x, a plurality of picture elements Y_1, Y_2, - - - , Y_n having the same phase relationship as said picture element x to their corresponding neighboring picture elements on a two-dimensional screen-period pattern, and the neighboring picture elements to said plurality of picture elements Y_1, Y_2, - - - , y_n;

means for obtaining predictive error signals Y_1, Y_2, - - - , Y_n from said quantized value X and said plurality of predictive values P_1, P_2, - - - , P_n;

means for comparing the mis-predictions obtained from said predictive error signals for the already scanned picture elements to provide a comparison result;

means for generating a selection signal in response to said comparison result;

means for selecting one from said plurality of predictive error signals Y_1, Y_2, - - - , Y_n to provide a predictive error signal Y in response to said selection signal; and

means for encoding said predictive error signal Y to produce an encoded signal;

wherein said means for generating a plurality of predictive values P_1, P_2, - - - , P_n comprises,

a plurality of series connected one line memories (*2a, 2b,* - - - , *2b'*), including a first memory receiving said quantized value x;

a plurality or predictors (*3a*$_1$, - - - , *3a*$_n$), each predictor having a plurality of inputs and producing a different predictive value (P_1, P_2, - - - , P_n) according to a different predictive method, one input to each predictor receiving said quantized value X, the remaining inputs to each of said predictors being connected to the outputs of selected ones of said series connected one line memories.

4,633,326

FASCIMILE COMMUNICATION SYSTEM WITH DESIRED IMAGE QUALITY

Toshiaki Endoh, Tanashi, and Yasuhiro Yamazaki, Hiratsuka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,187

Claims priority, application Japan, Oct. 6, 1983, 58-185907

Int. Cl.⁴ H04N *1/40, 1/00*

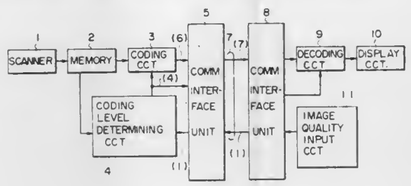
U.S. Cl. 358—280 **4 Claims**

1. A facsimile communication system connected to a transmission path comprising:

memory means for temporarily storing image signals to be transmitted;

interface means coupled to the transmission path for transmitting a coded image signal to the transmission path and for receiving an image quality signal from a receiving side of the transmission path;

coding level determining means coupled to the memory means and the interface means for determining a coding



level in correspondence to said image quality signal in accordance with a predetermined coding algorithm for each image readout from the memory means to be transmitted; and

encode means coupled to said memory means, said coding level determining means and said interface means for encoding said each image by the use of the coding level to provide said coded image signal, which is transmitted to said transmission path through said interface means.

4,633,327

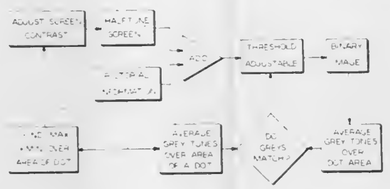
ENHANCEMENT HALFTONING

Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 10, 1983, Ser. No. 550,330

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—283 **9 Claims**



1. A method for selectively enhancing a portion of a digital halftone image in a system having a screen function with a variable parameter, the parameter capable of being changed to continuously or discretely vary the contrast of the screen for image enhancement, said image including a plurality of pixel elements, comprising the steps of:

(a) scanning a portion of the image to determine the maximum and minimum grey scale levels within said portion,

(b) determining the difference between the maximum and minimum grey scale levels within said portion, and

(c) changing the parameter to selectively vary the contrast of the screen in response to the difference between the maximum and minimum grey scale levels for enhancement of said portion of the digital halftone image.

4,633,328

PICTURE SCANNING AND RECORDING METHOD

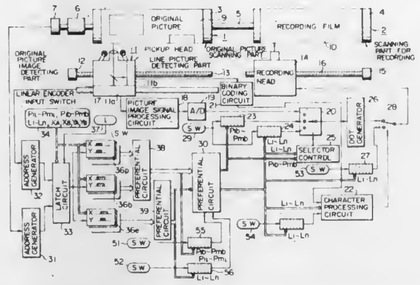
Isao Saito, Shiga, and Noriyuki Shimano, Kyoto, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1985, Ser. No. 716,679

Claims priority, application Japan, Jun. 29, 1984, 59-132987

Int. Cl.⁴ H04N *1/21, 1/23, 1/40*

U.S. Cl. 358—296 **8 Claims**



1. A picture scanning and recording method including photoelectrically scanning an original picture, which contains picture patterns of continuous tone in combination with line pictures such as characters or graphics, providing two types of image-detecting photoelectric means in order to record reproduced halftone images for the picture patterns and reproduced line picture images of high resolution for the line pictures respectively, and outputting two types of picture signals to the recording side, which comprises:

designating in advance, in the original picture, picture pattern regions to be reproduced as the halftone images, line picture regions to be reproduced as the line picture images and border regions surrounding the respective picture pattern regions respectively with the coordinate values of representative points in the respective regions; setting in advance line picture tint data and border tint data, which are required to record desired tint patterns corresponding respectively to the line picture regions and border regions, for the line picture regions and border regions respectively; upon photoelectrically scanning the original picture, selecting picture signals corresponding to the scanned regions on the basis of the coordinate values of each scanning point and the coordinate values of the representative points in the respective regions, and outputting the thus-selected picture signals to the recording side; and at the same time, at an area where two or more of the designated picture regions are overlapped, selecting picture signals having higher preference on the basis of a preset order of preference.

4,633,329

INFORMATION SIGNAL RECORDING MEDIUM AND REPRODUCING APPARATUS THEREFOR

Hiroyuki Sugiyama, Isehara; Nobuaki Takahashi, Yamato; Takeshi Shibamoto, Sagamihara; Hideo Sato, Yokohama; Mitsuo Kubo, Yamato; Koji Tanaka, Tokyo; Tsuneo Furuki, Yamato, and Fujio Suzuki, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

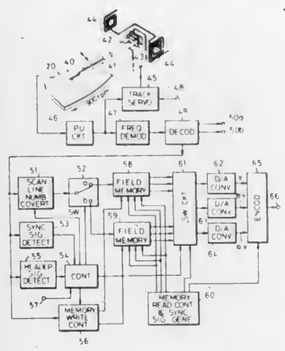
Filed Sep. 30, 1983, Ser. No. 537,529

Claims priority, application Japan, Oct. 4, 1982, 57-174297

Int. Cl.⁴ H04N *9/491*

U.S. Cl. 358—310 **5 Claims**

1. An information signal recording medium having a spiral track on which an information signal is pre-recorded, said information signal including picture element data and being time-sequentially recorded on said spiral track in terms of said picture element data which amount to one field, the pre-recorded information signal being picked up and reproduced by a reproducing element which scans over said spiral track, said picture element data which amount to one field being made up of a plurality of picture element data of a first field and a plurality of picture element data of a second field out of picture element data which are obtained by subjecting an analog video signal of one frame to a digital pulse modulation, said analog video signal of one frame being made up of said first and second fields which constitute one picture, said information signal comprising divided picture element data groups and header signals of which one is added to a beginning of each



of the picture element data groups, said divided picture element data groups being obtained by dividing said picture element data which amount to one field in terms of a predetermined number of rows or columns of picture element data groups which are adjacent to each other in said one picture, each of said header signals at least including synchronizing signals and codes for specifying addresses in memory circuits within a reproducing apparatus where specific picture element data out of said divided picture element groups are to be stored.

4,633,330

DIGITAL RECORDING AND REPRODUCING APPARATUS FOR TELEVISION SIGNAL

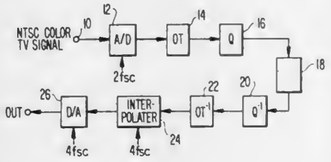
Chojuro Yamamitsu, Kawanishi; Ichiro Ogura, Hirakata; Kunio Suesada, Ikoma, and Akira Iketani, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1984, Ser. No. 620,732

Claims priority, application Japan, Jun. 22, 1983, 58-113270

Int. Cl.⁴ H04N *9/80*

U.S. Cl. 358—310 **18 Claims**



1. A digital recording and reproducing apparatus for television signal comprising;

sampling means for sampling a television signal with upper limit frequency fc at a frequency lower than $2 \cdot f_c$ and for producing a signal quantized into N bits;

orthogonal transformation means for orthogonally transforming to a data block which is composed of adjacent L sampling points out of the above quantized sampling points;

quantizing means for quantizing the orthogonally trans-

formed signal into average M bits (M ≦ N) per sampling point;
recording means for recording the television signal obtained by said quantizing means onto a recording medium;
reproduction means for reproducing the recorded television signal from the recording medium;
inverse quantizing means having the inverse quantizing characteristics of said quantizing means for inversely quantizing the television signal reproduced by the reproduction means;
orthogonal inverse transformation means having the inverse transformation characteristics of said orthogonal transformation means for inversely transforming orthogonally the inversely quantized signal; and
interpolating means for synthesizing an interpolating signal from the adjacent sampling points with respect to this inversely orthogonally transformed television signal and for interpolating the reproduction signal by the interpolating signal.

4,633,331

INFORMATION SIGNAL DELAY SYSTEM UTILIZING RANDOM ACCESS MEMORY

Michael P. McGrady, Pembroke Pines; Leonard A. Brand, Jr., and Hunt K. Brand, both of Lantana, all of Fla., assignors to Picotrin Technology, Inc., Lantana, Fla.

Filed Jun. 6, 1985, Ser. No. 741,941
Int. Cl.[4] G11B *5/00*
U.S. Cl. 360—7 **10 Claims**



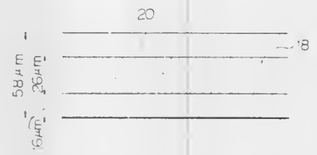
1. Apparatus for attachment to an operator-actuated audio tape recorder to enable a real-time audio signal to be selectively recorded on a delayed basis, comprising:
a microphone for receiving the audio signal and producing an electrical signal related thereto;
means for converting the electrical signal into a digital signal;
a solid-state memory device having a plurality of addressable storage locations for storing the digital signal;
an address generator for sequentially addressing each of said storage locations in synchronism with the digital signal from said converting means;
control means for causing said memory device to read out information stored at an addressed location and subsequently store the digital signal from said converting means at that location;
synthesizing means for receiving digital information read out of said memory device and converting said information into an analog signal; and
output means for connection to an audio tape recorder to couple the analog signal from said synthesizing means to the recorder.

4,633,332

MULTI-MODE MAGNETIC RECORDING SYSTEM AND MULTI-MODE MAGNETIC RECORDING AND PLAYBACK SYSTEM FOR VTR

Seiji Higurashi, Chiba; Atsushi Miyashita, Tokyo, and Kaoru Kobayashi, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Jan. 4, 1984, Ser. No. 567,977
Claims priority, application Japan, Jan. 11, 1983, 58-2570
Int. Cl.[4] H04N *5/783*
U.S. Cl. 360—10.3 **15 Claims**



1. A magnetic recording system in multiple tape speed modes for a video tape recorder comprising:
a rotatable body around which a magnetic recording tape is wound over a predetermined angular range;
a plurality of rotary video signal recording heads mounted on said rotatable body at predetermined relative distances and performing a recording function in at least two tape speed modes which include a first mode and a second mode; and
a pair of rotary audio signal recording heads mounted on the rotatable body at a predetermined distance from each other and having azimuth angles which are different from azimuth angles of the video signal recording heads;
the audio signal recording heads being arranged to perform a recording function in common in the first and second modes such that audio signals are written in audio tracks on the running magnetic recording tape at a first track pitch in the first mode and at a second track pitch in the second mode;
the video signal recording heads being arranged to write video signals in video tracks on the magnetic recording tape after the audio signals are written in the audio tracks by the audio signal recording heads, the video signal recording head being further arranged to write the video signals at a first track pitch in the first mode and at a second track pitch in the second mode and such that a center of the audio tracks and a center of the video tracks substantially coincide with each other so that the audio and video tracks are finally superposed.

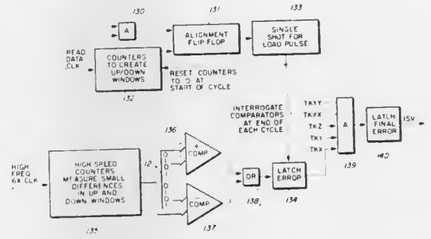
4,633,333

DETECTION OF INSTANTANEOUS SPEED VARIATIONS IN A TAPE DRIVE

Alfred W. Blanco; Judson A. McDowell, and David A. Yeary, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1985, Ser. No. 748,377
Int. Cl.[4] G11B *27/36, 27/22*
U.S. Cl. 360—31 **3 Claims**

1. In a multiple track digital recording system, apparatus for detecting unacceptable instantaneous speed variations in tape media comprising, for each of a preselected group of data tracks:
oscillating means for providing an oscillating signal in response to data signals recorded on said media, said oscillating means providing a signal of a frequency corresponding to a rate at which said data signals are received;
first counting means for dividing each said oscillating signal into a first portion and a second portion, said first portion providing a count up window and said second portion providing a count down window;
second counting means for counting in a first direction in response to said first group of signals and in an opposite direction in response to said second group of signals;
means for providing a high frequency input signal to said second counting means;
means for resetting said first counting means and said second counting means at the beginning of a data signal, said resetting means also providing the count of said second counting means to a comparator;
means for setting said comparator to a predetermined reference value;



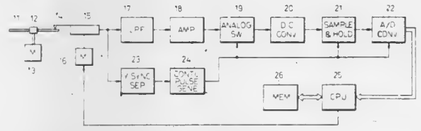
means for providing an error signal from said comparator when said count exceeds said reference value; and
said digital recording system further comprising an AND gate for receiving error signals from each comparator associated with a preselected track, said AND gate providing a final error signal only when all said comparators provide an error signal thereby indicating an unacceptable instantaneous speed variation.

4,633,334

TRACKING CONTROL APPARATUS USING DIGITIZED VERTICAL SYNCHRONIZING SIGNAL

Ken Miyazaki, Yokohama, and Shoichi Okazaki, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 27, 1984, Ser. No. 686,931
Claims priority, application Japan, Dec. 28, 1983, 58-247453
Int. Cl.[4] H04N *5/781;* **G11B** *5/56, 21/10*
U.S. Cl. 360—33.1 **9 Claims**



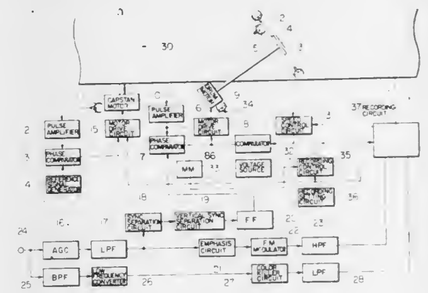
1. A tracking control apparatus for a rotary recording medium reproducing apparatus, said tracking control apparatus comprising:
reproducing means including a reproducing element for reproducing a frequency modulated video signal from a rotary recording medium, said rotary recording medium being recorded with said frequency modulated video signal on concentric tracks formed on a recording surface thereof;
moving means including a motor responsive to a control signal for moving said reproducing element in a radial direction of said rotary recording medium;
extracting means for extracting a vertical blanking period portion of an output reproduced frequency modulated video signal of said reproducing means;
sample and hold means for sampling and holding a D.C. level of an output vertical blanking period portion of said extracting means and for obtaining a digital value indicative of the sampled and held D.C. level;
memory means for storing the digital value; and
control means for controlling a write-in and a read-out with respect to said memory means, said control means supplying a control signal to said moving means to move said reproducing element to a plurality of positions which are mutually separated by predetermined minute quantities with respect to one track pitch and writing a plurality of digital values into said memory means which plurality of digital values are obtained from said sample and hold means when said reproducing element assumes said plurality of positions, said control means obtaining a maximum digital value from among said plurality of digital values stored in said memory means and supplying to said moving means a control signal for moving said reproducing element to a position where said maximum digital value is obtainable.

4,633,335

MAGNETIC RECORDING SYSTEM FOR TIME-LAPSE MAGNETIC VIDEO RECORDER

Makoto Yamamoto, Katsuta; Takashi Kubota, Mito, and Katsumi Mikamo, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,844
Claims priority, application Japan, Mar. 25, 1983, 58-48790
Int. Cl.[4] H04N *5/782*
U.S. Cl. 360—35.1 **8 Claims**



1. A magnetic recording system comprising:
tape moving means for intermittently moving a magnetic tape;
intermittent recording means for recording of about one field of video signals in the width direction of said magnetic tape by at least one of a plurality of rotary magnetic heads when said magnetic tape is stopped, and for stopping the recording of said video signals when said magnetic tape is moved;
head driving means for rotating said rotary magnetic heads at a predetermined rotary speed; and
control means for controlling said head driving means to control the rotary speed of said rotary magnetic heads so that said intermittent recording means enables recording of about one field of said video signals on said magnetic tape for a period which is an integral multiple of a horizontal scanning period when said magnetic tape is stopped.

4,633,336

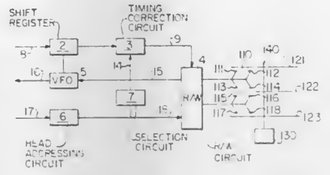
MAGNETIC RECORDING APPARATUS

Tsuneo Horie, Odawara; Shoji Ozaki, Ohi, and Takikazu Takeuchi, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,490
Claims priority, application Japan, Sep. 19, 1983, 58-171127
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—45 **46 Claims**

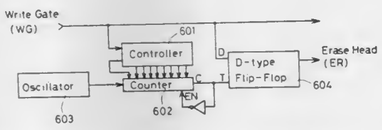
1. An information recording apparatus, comprising:
means for supplying data to be recorded;

transducer means for performing operations of recording the data on information recording media;
means for selecting said transducer means;
means for establishing outputs to control timing of operations of said transducer means according to predetermined characteristics of individual elements of said transducer



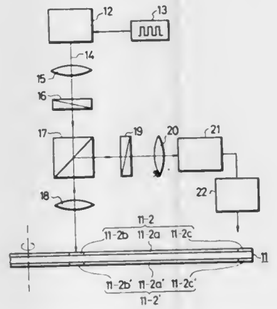
means, and for providing said output during selection of corresponding ones of said transducer means;
timing correction means for controlling timing of the operations according to said output; and
recording control means for supplying the data from said data supplying means to said transducer means according to the timing controlled by said timing correction means.

4,633,337
FLOPPY DISK DRIVING WITH SUITABLE ON-DELAY AND OFF-DELAY TIMING
Nobuyuki Horie, Yamarokoriyama; Yoshiki Nishioka, Tenri; Noriaki Sakamoro, Nara; Toshiaki Fujikawa, and Toshihiro Yamanaka, both of Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 25, 1985, Ser. No. 715,292
Claims priority, application Japan, Mar. 30, 1984, 59-64399
Int. Cl.[4] G11B *5/02, 5/09*
U.S. Cl. 360—57 **3 Claims**



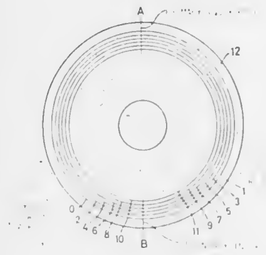
1. A floppy disk driving circuit for writing information onto and reading information from a floppy disk having a plurality of concentric information storage tracks each identified by identification fields, comprising:
read/write means including a read/write head operatively disposed adjacent said floppy disk for storing information on a selected said track thereof, said read/write head being positioned in juxtaposition to a selected said track;
means for developing a write gate signal, said write gate signal enabling said read/write means to write information onto said selected said track of said floppy disk;
digital memory means for storing time interval data associated with each one of said plurality of tracks at a plurality of addresses associated therewith, said time interval data associated with said selected said track being developed as an output of said memory means;
oscillator means for developing clock pulses;
counter means enabled by the development of said write gate signal, for counting said clock pulses developed by said oscillator means, said counter means developing an erase enable output after a selected number of clock pulses have been counted, said counter means being operatively connected to said read only memory means and having a variable division ratio set by said time interval data provided by said memory means to thereby determine said selected number;
an erase head for tunnel erasing said selected said track; and
flip-flop means responsive to said write gate signal and said erase enable output for developing a control output to drive said erase head, said flip-flop means developing said control output upon receipt of said write gate signal and said erase enable output and terminating development of said control output when both said write gate signal and erase enable output are not developed;
said drive circuit thereby driving said erase head to perform tunnel erasing on the entirety of said information storage track except said information field.

4,633,338
MAGNETO-OPTICAL RECORDING AND REPRODUCING APPARATUS HAVING A MAGNETIZATION DIRECTION DETECTING APPARATUS FOR A MAGNETIC RECORDING MEDIUM
Noboru Sato, and Kenjirou Watanabe, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
PCT No. PCT/JP84/00424, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01144, PCT Pub. Date Mar. 14, 1985
PCT Filed Sep. 5, 1984, Ser. No. 732,041
Claims priority, application Japan, Sep. 5, 1983, 58-162817
Int. Cl.[4] G11B *5/02, 5/127, 7/00*
U.S. Cl. 360—59 **5 Claims**

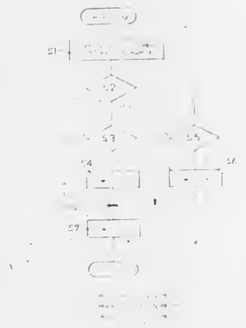


1. A magneto-optical recording and reproducing apparatus having a direction of magnetization detecting apparatus of a magnetic recording medium, characterized in that a rectilineally polarized laser light beam is projected onto a perpendicular magnetization layer of the magnetic recording medium which has been previously magnetized in a first direction, a reflected light beam from said laser light beam from said perpendicular magnetization layer is detected after passing through an analyzer to a photo detecting element, and a means for detecting the direction of the magnetization of said perpendicular magnetization layer by the output signal level of said photo detecting element, and the polarity of a magnetic field is changed by said means for detecting the direction of magnetization.

4,633,339
Patent Not Issued For This Number



4,633,340
MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH MEANS FOR INCREASING AMOUNT OF INFORMATION TO BE STORED IN A MAGNETIC MEMORY DISK
Yuji Hayakawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Filed Nov. 14, 1985, Ser. No. 797,865
Claims priority, application Japan, Nov. 19, 1984, 59-243583
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—69 **9 Claims**



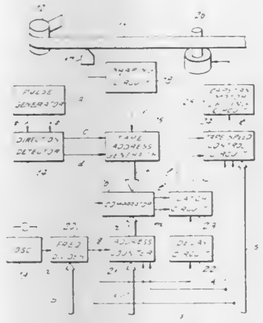
1. A boosted-capacity magnetic-recording and reproducing apparatus compatible with a host device to which is connectable a standard-capacity magnetic recording and reproducing apparatus which includes (a) a first magnetic disk having a multiplicity of first annular recording tracks which are concentric with an axis of rotation of the disk and which are identified with respective serial track numbers, (b) a first disk drive for rotating the first magnetic disk about its axis of rotation at a first rate, (c) a first magnetic head, (d) a first positioning device for moving the first magnetic head radially of the first magnetic disk to position the first magnetic head on a selected one of the first annular recording tracks which is identified with the corresponding serial number designated by the host device, and (e) first control means for recording or reproducing information on or from the selected recording track through the magnetic head after the magnetic head is positioned at the selected recording track, said boosted-capacity recording and reproducing apparatus comprising:
A second magnetic disk having a multiplicity of second annular recording tracks each of which is equally divided into a plurality of sectoral recording tracks, said sectoral recording tracks being identified with respective sectoral track numbers which are equal to said serial track numbers;
a second disk drive for rotating said second magnetic disk at a second rate which is equal to said first rate divided by the number of division of each of said second annular recording tracls;
a second magnetic head;
indexing means for detecting said sectoral recording tracks of said second magnetic disk, said indexing means generating an indexing signal when each of boundaries between said sectoral recording tracks adjacent to each other in a circumferential direction of said second magnetic disk passes a predetermined position during each rotation of said second magnetic disk;
a second positioning device for moving said second magnetic head radially of the second magnetic disk to position the second magentic head on one of said second annular recording tracks which includes the sectoral recording track identified with one of said sectoral track numbers which is equal to the serial track number designated by said host device; and
second control means, responsive to said indexing signal, for recording or reproducing information on or from said sectoral recording track identified with said one of the sectoral track numbers.

4,633,341

TAPE ADDRESS ADJUSTING APPARATUS FOR VIDEO TAPE RECORDER

Toru Sekiguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 12, 1984, Ser. No. 619,858
Claims priority, application Japan, Jun. 13, 1983, 58-105321
Int. Cl.[4] G11B *15/52*
U.S. Cl. 360—73 8 Claims



1. A tape address synchronizing apparatus for a video tape recorder comprising:

tape address signal producing means for producing an actual tape address signal in accordance with the speed that a tape moves past a tape head, said actual tape address signal having an address resolution effective to divide each frame period of a video signal associated with said video tape recorder into a plurality of time sections;

means for generating a first clock signal having a fixed frequency;

frequency dividing means for frequency-dividing said first clock signal to produce a second clock signal, the dividing ratio of said frequency dividing means being capable of being modified in response to a reference tape speed signal;

reference address signal producing means for producing a reference address signal by counting said second clock signal, said reference address signal having an address resolution effective to divide each said frame period of a video signal associated with said video tape recorder into a plurality of time sections;

means for comparing said actual tape address signal with said reference address signal to deliver a tape speed control signal in response to the comparison result; and

capstan driving means for rotating a capstan driving said tape at a speed determined by said tape speed control signal.

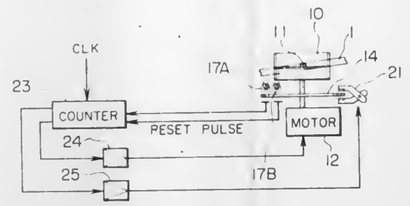
4,633,342

ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING DEVICE

Takahiro Kato, Saitama, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,317
Claims priority, application Japan, Aug. 18, 1984, 59-172160
Int. Cl.[4] G11B *5/52*
U.S. Cl. 360—75 9 Claims

1. A rotary head type meagnetic recording and reproducing device in which a rotary head is used to trace a plurality of inclined tracks on a magnetic tape to record or reproduced data, comprising: means for detecting a rotational angular position of said rotary head; means for stopping rotation of said rotary head at a predetermined rotational angular position thereof while said tape is being run at a high speed; and means for reproducing data recorded in a predetermined part of an



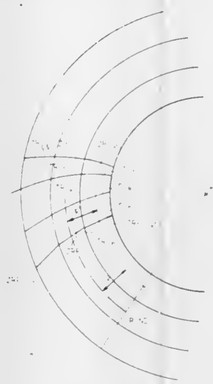
inclined track when said rotary head has been stopped by said stopping means.

4,633,343

METHOD OF AND APPARATUS FOR WRITING DATA ON A RECORDING MEDIUM AND THE MEDIUM SO PRODUCED

Christian Maury, Voisins le Bx; Jean Lequien, Hargeville, and Denis Pinson, Goupillieres, all of France, assignors to Cii Honeywell Bull, France

Filed Dec. 31, 1984, Ser. No. 688,442
Claims priority, application France, Dec. 30, 1983, 83 21064
Int. Cl.[4] G11B *5/00, 20/20, 21/08*
U.S. Cl. 360—76 20 Claims



1. A method of writing data on a recording medium, wherein the data are written on a plurality of tracks by a write system including a transducer and an actuator which moves the transducer to a position facing the medium along a first given curve, the data being defined by at least one transition between two physical states of two elementary adjacent areas of the medium, said medium including a reference indicator relative to which each transition is defined by a predetermined phase, wherein at least part of the transitions along a second, predetermined curve are aligned, the method comprising:

(a) writing a reference transition on a given track with a reference phase;

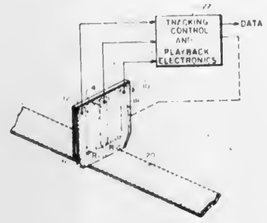
(b) writing each transition of the second curve with a reference phase which is a function of the position of the track where the transition is written on the medium and of geometric parameters of the write system formed of the actuator, the transducer and the medium.

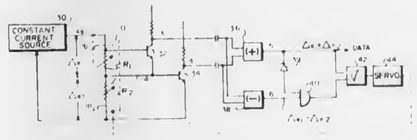
4,633,344

UNAMBIGUOUSLY TRACKING A DATA TRACK IN RESPONSE TO SIGNALS DERIVED FROM THE TRACK DATA ITSELF

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1985, Ser. No. 737,985
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 10 Claims





1. Magnetic recording playback apparatus comprising

a. a field sensing magneto-resistive playback head having first and second serially connected magneto-resistive elements, said playback head being disposed for cooperative relationship with fields associated with signals recorded in a track of a magnetic recording medium,

b. circuit means, with first and second input means, for producing a signal corresponding to the difference between signals applied to its two input means,

c. servo means for providing relative positioning between said playback head and said recording medium track,

d. means for applying to the first of said circuit means input means a signal corresponding to the signal field sensed by said first magneto-resistive element,

e. means for applying to the second of said circuit means input means a signal corresponding to the signal field sensed by said second magneto-resistive element, and

f. means for applying a signal corresponding to the output of said circuit means to said servo means when the signal field sensed by said playback head has, substantially, a single given predetermined polarity.

4,633,345

POSITIONING MISALIGNED DISK HEADS

Don S. Keener, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 24, 1985, Ser. No. 737,623
Int. Cl.[4] G11B *5/55, 5/56*
U.S. Cl. 360—77 11 Claims

1. In a rotating disk storage system, a method of preparing servo controls for positioning a transducing head assembly in alignment with recording tracks on the disks comprising:

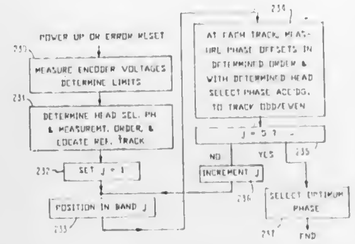
setting said system in a calibrating mode;

applying a plurality of different electrical signals sequentially to said servo controls as positioning references; said signals varying periodically as said head assembly is moved relative to the enclosure of said system and being staggered in phase relative to each other by phase increments corresponding to fractions of the space between consecutive said recording tracks;

for each said signal application, commanding a series of calibrating movements of said head assembly relative to said tracks;

measuring offsets of the head assembly from centers of tracks nominally located at positions corresponding to destinations of said calibrating movements;

comparing offset measurements obtained for all of said applied signals over respective movements;



selecting one of said signals having the least average offset over all of its respective movements;

coupling the selected signal to the servo controls as an exclusive seek positioning reference; and

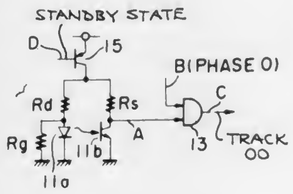
setting said system to a normal operating mode for conducting normal transducing operations relative to said disks, with said selected signal thereafter controlling seek movements.

4,633,346

MAGNETIC HEAD POSITIONING DEVICE FOR A FLEXIBLE DISK

Masaru Sasaki, Kanagawa, and Shin Isozaki, Kamakura, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,404
Claims priority, application Japan, Jun. 20, 1984, 59-126896
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—78 5 Claims



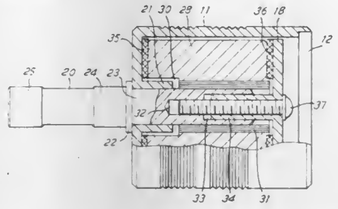
1. A head positioning apparatus comprising a carriage for moving a magnetic head to a specified position of data tracks in a storage medium, a means for producing excitation pulses, a step motor means for driving said carriage in response to said excitation pulses, a light shielding plate mounted on said carriage, a light-emitting element, a light-sensitive element opposing two said light-emitting element through said light shielding plate and a position-judging means for judging the position of said magnetic head depending on said excitation pulses of the step motor and a signal of said light-sensitive element generated when light is shielded by said light-shielding plate, said head positioning apparatus characterized in that said light-emitting element and said light-sensitive element are connected to a power source through a common switching element and the position-judging means output a signal, when said switching element is turned off, which is the same signal as if said light-sensitive element were sensing light.

4,633,347

MAGNETIC TAPE TRANSPORTS

Warwick A. Higgins, Bridgewater, England, assignor to EMI Limited, Hayes, England

Filed Dec. 20, 1983, Ser. No. 563,612
Int. Cl.⁴ G11B *5/008, 15/00*
U.S. Cl. 360—90 **13 Claims**



1. A magnetic tape transport including a damped inertia roller, said inertia roller comprising:
an outer substantially cylindrical hollow shell;
a flywheel rotatably mounted within said shell to be co-axial with said shell, said flywheel comprising a substantially solid cylinder with two end faces;
a resilient damping material wherein said shell is mechanically coupled to said flywheel by means of said resilient damping material such that, in operation, the inertia and the damping of the roller are effective in reducing tape flutter in said tape transport;
said resilient damping material including a first substantially flat washer made of said resilient damping material and a second substantially flat washer made of said resilient damping material, said outer cylindrical shell having at least one substantially closed end, said flywheel being coupled to said cylindrical shell by said first washer being sandwiched between said substantially closed end and an end face of said flywheel, and said second washer being sandwiched between the other end face of said flywheel and a retaining member.

4. A damped inertia roller for a magnetic tape transport comprising:
an outer substantially cylindrical hollow shell having at least one substantially closed end;
a flywheel rotatably mounted within said shell to be co-axial with said shell, said flywheel comprising a substantially solid cylinder having two end faces;
a retaining member;
a resilient damping means for mechanically coupling said shell to said flywheel such that the inertia and the damping of said roller are effective in reducing tape flutter in said tape transport;
said resilient damping means including a first substantially flat washer made of resilient damping material, and
a second substantially flat washer made of said resilient damping material wherein said first washer being sandwiched between said substantially closed end of said outer cylindrical shell and one of said end faces of said flywheel, and said second washer being sandwiched between the other of said end faces of said flywheel and said retaining member.

4,633,348

EJECTION MECHANISM FOR TAPE PLAYER

Kazuki Takai, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,712
Claims priority, application Japan, Dec. 31, 1982, 57-228292; Jan. 7, 1983, 58-000458
Int. Cl.⁴ G11B *5/008, 15/00*
U.S. Cl. 360—96.5 **6 Claims**

1. In an ejection mechanism for a tape cassette player having vertically disposed drive shafts for engaging the spool bores of said cassette when said cassette is moved in a downward direction thereonto, said ejection mechanism being operable to accept a cassette partially inserted into a forward or front portion of said mechanism onto a pack guide and urged to the rear thereof by the operator, said player including a frame positively fixed with respect to movable elements of said ejection mechanism, said ejection mechanism including a guide arm pivotally mounted on said frame and coupled to raise said pack guide to an ejecting position responsively to a rotation of said guide arm; a pack stopper mounted for front-to-rear motion along said guide arm; an ejection link pivotally mounted on said guide arm; an inversion spring coupling said ejection link to said pack stopper and disposed to withdraw a partially inserted cassette engaging said pack stopper further onto said pack guide or to urge said pack stopper to eject said cassette according to the angular position of said ejection link; an ejection member mounted for reciprocating front-to-rear motion and having associated therewith first biasing means for biasing said ejection member forward; an operation member disposed proximate to said ejection member and mounted for reciprocating front-to-rear motion and having associated



therewith second biasing means for biasing said operation member forward; a connection member coupled to rotate said ejection link by reciprocating motion of said operation member; releasable latch means for lockingly coupling said ejection member and operation member together as a coupled pair in the forward positions thereof, latch release means for actuating said latch means to a released condition at a terminal portion of the rearward stroke of said coupled pair to release said operation member to be urged to said forward position by said second biasing means to rotate said ejection link to assist in the ejection of said cassette, said ejection member and said guide arm being coupled so that during an initial portion of the rearward motion of said ejection member said guide arm is pivoted to raise said pack guide to said ejecting position, the improvement comprising:
lost motion coupling means associated with said latch means for allowing said initial portion of the rearward stroke of said ejection member to occur before said releasable latch means couples said ejection member and operation member together.

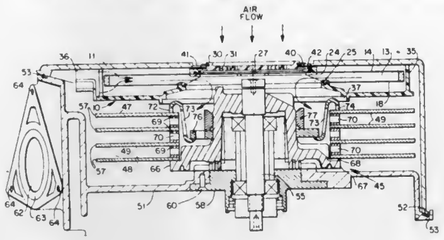
4,633,349

DISK DRIVE AIR FILTER ASSEMBLY

John L. Beck, Byron; Daniel L. Good, and Daniel R. Stacer, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,752
Int. Cl.⁴ G11B *17/02, 17/32;* **B01D** *39/08, 50/00*
U.S. Cl. 360—97 **6 Claims**

1. A recirculating air filter assembly for a disk drive which includes frame and cover elements for enclosing the transducer head positioning actuator and rotating disk assemblies comprising:
a support member including an annular wall;
a pair of spaced substantially parallel recirculating filter media supported on and extending radially inwardly from opposite axial ends of said support member annular wall;
plenum wall portions at each side of, spaced from and surrounding said support member and said pair of annular filter media forming a plenum chamber;
inlet opening means in said plenum wall portions beyond the periphery of said support member to admit air to said plenum; and
central outlet means adjacent an axial end of the disk assembly, said outlet extending through a plenum wall and communicating with the space defined by the support



member annular wall and said filter media and isolated from the plenum chamber portion communicating with said inlet means.

4,633,350

INFORMATION STORAGE SYSTEM WITH READILY REMOVABLE HIGH CAPACITY DISK DRIVE UNIT

George E. Hanson, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Jan. 17, 1984, Ser. No. 571,389
Int. Cl.⁴ G11B *5/012, 33/02*
U.S. Cl. 360—98 **6 Claims**

3. In a disk drive information storage system, a fixed base unit for the transmission of signals for operating a disk drive, and a disk drive module for containing a disk drive, and for detachable coupling with said fixed base unit to form a complete disk drive system, said disk drive module having first and second mounting lug means for effecting an interengagement of the disk drive module with the fixed base unit, said fixed base unit having first retainer means for receiving said first lug means with the disk drive module in a tilted orientation while accomodating a pivotal movement of the disk drive module about said first retaining means toward a fully assembled position, and second latching type retainer means aligned with the second lug means in the tilted orientation of the disk drive module such that the second lug means are latched by the second retainer means as the disk drive module is pivoted about the first retainer means into the fully assembled position, said lug means and said retainer means being operable to secure said disk drive module in said fully assembled position solely by manipulation of said disk drive module as a whole.

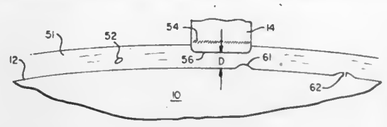
4,633,351

METHOD AND APPARATUS FOR HYDRODYNAMIC MAGNETIC RECORDING

Andrew M. Bardos, Indian Harbour Beach; Jon E. Holmes, West Melbourne, and Mark F. Duchesne, Indian Harbour Beach, all of Fla., assignors to Harris Graphics Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 519,759, Aug. 2, 1983, abandoned. This application Aug. 7, 1985, Ser. No. 763,258
Int. Cl.⁴ G11B *5/60, 15/64*
U.S. Cl. 360—102 **36 Claims**

1. For use in a recording apparatus wherein a prescribed characteristic of a recording medium is established by a transducer coupled therewith, a method of controlling the coupling of said transducer to said medium comprising the step of:



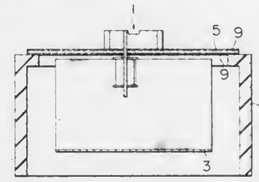
forming a liquid bearing between the surface of said recording medium and said transducer, said liquid being of the type that will effectively readily evaporate without leaving a residue.

4,633,352

MAGNETIC FIELD NOISE SHIELD FOR A MAGNETIC HEAD

Toshiaki Mizoguchi; Shinichiro Wadaya; Kunihiro Hashimoto, and Shinichi Takase, all of Iruma, Japan, assignors to Ye Data Incorporated, Tokyo, Japan

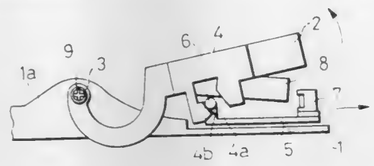
Continuation of Ser. No. 405,152, Aug. 4, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 717,485
Claims priority, application Japan, Sep. 17, 1981, 56-145589
Int. Cl.⁴ G11B *5/48*
U.S. Cl. 360—104 **20 Claims**



1. A magnetic head, comprising:
a head piece; and
a gimbal spring having a first portion, and a second portion elastically movably supported by and connected to said first portion, said head piece being mounted on said second portion so that said head piece is movably directly supported on said second portion, said second portion of said gimbal being formed of a layer of low electrical resistance metal and a material having a resistivity substantially greater than that of said layer of metal, said layer being oriented and positioned sufficiently close to said head piece so as to shield said head piece from magnetic field noise.

15. A magnetic head, comprising
a head piece, and
a gimbal spring having a first portion, a second portion elastically supported by and connected to said first portion, said head piece being mounted on said second portion so that said head piece is movably directly supported on said second portion, said second portion of said gimbal being formed of a layer of low electrical resistance metal and a metal material having a resistivity substantially greater than that of said layer of metal, said layer and said metal material being oriented and positioned sufficiently close to said head piece, so as to shield said head piece respectively from first and second ranges of frequency of magnetic field noise, the second range of frequencies being higher than the first range of frequencies.

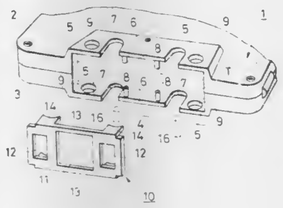
4,633,353
CASSETTE LID STOP DEVICE IN A CASSETTE TAPE RECORDER
Norimasa Komatsu, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Sep. 12, 1983, Ser. No. 531,599
Claims priority, application Japan, Sep. 13, 1982, 57-137616[U]
Int. Cl.⁴ G11B *5/54*
U.S. Cl. 360—105 **4 Claims**



1. In a cassette tape recorder wherein a cassette lid urged in an opening direction is pivotably mounted on a chassis and a cassette inserted in said cassette lid is moved to a position opposed to a magnetic head by closing said cassette lid, said heat being mounted on a head base and said head is further adapted to be movable towards and away from said position of the cassette in said cassette lid,

said cassette lid being provided with a cam portion which, when said cassette lid is closed, comes into contact with an engagement portion of said movable head base to move said head up to said position, wherein the improvement comprises said cassette lid being further provided with a stopper portion which, when said cassette lid is opened, comes into abutment with said engagement portion of said head base to stop the opening motion of said cassette lid temporarily until said head moves away from said position.

4,633,354
MAGNETIC TAPE CASSETTE
Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 20, 1984, Ser. No. 602,613
Claims priority, application Japan, Apr. 26, 1983, 58-61452[U]
Int. Cl.⁴ G11B *23/02, 15/32, 23/04;* **G03B** *1/04*
U.S. Cl. 360—132 **5 Claims**

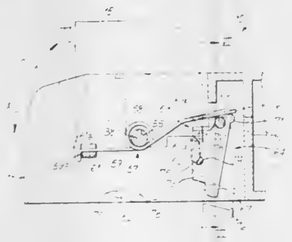


1. In a magnetic tape cassette having a pair of reference holes near a front opening provided in a front surface thereof, which holes extend through said cassette, the improvement wherein:

said front opening comprises a single hole opening, said single hole opening including cut portions extending toward the front surface of said cassette from said reference holes, and

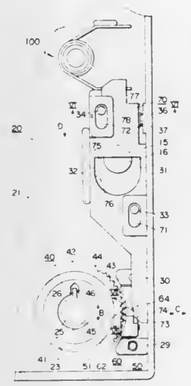
a frame member having a plurality of holes for receiving a magnetic head and tape guides, and means for detachably engaging said frame member within said opening, said frame member having protrusions which, when engaged with said cut portions, form forward peripheries of said reference holes, said frame member being removable from said opening to permit withdrawal of the magnetic tape within said cassette when said tape is employed with a tape player of a type requiring tape withdrawal, and being engageable within said opening when said tape is to be employed with a tape player of a type not requiring tape withdrawal.

4,633,355
VIDEO TAPE CASSETTE WITH EASY ASSEMBLY OF ITS LID AND REEL BRAKES
Masayuki Harada, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 17, 1984, Ser. No. 651,452
Int. Cl.⁴ G11B *23/08*
U.S. Cl. 360—132 **9 Claims**



1. A tape cassette comprising upper and lower housing portions assembled together to define a housing of substantially rectangular configuration having end walls and an opening along a side of said housing between said end walls, said upper and lower housing portions have substantially rectangular top and bottom walls, respectively, and flanges along the margins of said top and bottom walls engaging each other at a plane of separation substantially parallel with said top and bottom walls when said housing portions are brought together in a direction normal to said plane for defining a peripheral structure of the housing which includes said end walls, reels rotatably contained in said housing and having tape wound thereon, guide means in said housing leading said tape between said reels in a run extending across said opening, lid means having ears at its opposite ends with pivot pins extending from said ears to define a pivot axis, said flange of at least said upper housing portion having cutouts in the edge thereof to receive and locate said pivot pins in respect to said housing and thereby mounting said lid means for movement about said pivot axis between an open position exposing said run of the tape for withdrawal from said housing and a closed position in which said lid means covers said tape run, coil spring means including a coil portion disposed on one of said pivot pins and angularly displaced leg portions extending from said coil portion, substantially diametrically opposed first and second spring anchor means located on the one of said ears from which said one pivot pin extends and being tentatively engageable with said leg portions of the coil spring means for initial positioning of the latter relative to said lid means, said coil portion urging said leg portions angularly apart in one direction and against said first and second anchor means, and third anchor means disposed on said flange of the upper housing portion and having an oblique surface and a normal anchor surface, one of said leg portions being movable against the force of said coil portion away from the respective one of said first and second anchor means and being deflected by said oblique surface onto said normal surface of said third anchor means when assembling said lid means in respect to said one portion of the housing, whereupon said spring means urges said lid means to said closed position relative to said housing.

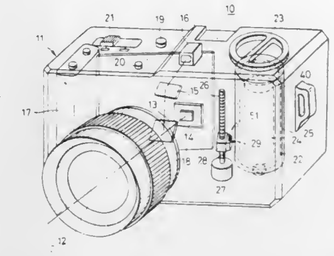
4,633,356
MAGNETIC DISC CARTRIDGE WITH COUNTER DISPLAY SECURED AGAINST INADVERTENT DISPLACEMENT
Kenji Takahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 29, 1984, Ser. No. 626,526
Claims priority, application Japan, Jun. 30, 1983, 58-100256
Int. Cl.⁴ G11B *23/03, 5/016, 5/012*
U.S. Cl. 360—133 **8 Claims**



1. A magnetic disc cartridge comprising a jacket; a magnetic flexible disc rotatably accommodated in said jacket; a window cut in said jacket and permitting the insertion of a magnetic head of an apparatus for recording and reproducing signals on the disc; a counter display member rotatably mounted in said jacket and being co-axially surrounded on the upper side of the jacket by a graduated display scale, said counter display member having a keyhole-like aperture forming a radially orientated pointer cooperating with said display scale; and elastically and permanently acting click and pawl arrangement including a first series of teeth formed on a section of a flange-like portion of said counter display member and a click fixed to said jacket and elastically engaging the teeth of said first series of teeth; a second series of teeth on an adjacent section of said flange-like portion; and a blocking device which engages said second series of teeth and thereby keeps the counter display member in a firmly locked position as soon as the cartridge is mechanically disconnected from said apparatus having the magnetic head.

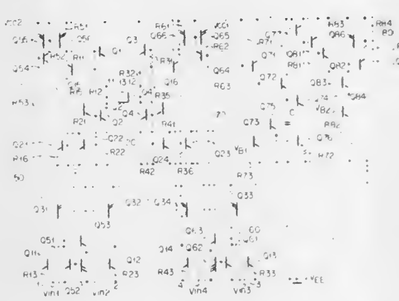
4,633,357
TUBULAR RECORDING MEDIUM HAVING A FLEXIBLE MAGNETIC RECORDING SURFACE
Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan
Filed Dec. 30, 1982, Ser. No. 454,649
Claims priority, application Japan, Jan. 10, 1982, 57-2089; Mar. 1, 1982, 57-31945
Int. Cl.⁴ G11B *5/76*
U.S. Cl. 360—136 **18 Claims**

1. A recording medium designed to operate with a recording and/or reproducing apparatus comprising a rotational motor having a rotary shaft and recording and/or reproducing means, said recording medium comprising: a main body comprising a flexible recording carrier in the form of a sheet or film, said recording carrier having a hollow cylindrical-shape which is open at one end thereof and comprising a recording surface around a peripheral surface thereof and a hollow interior with a surface which is parallel to the peripheral surface; and a support member fixedly supporting the other end of said main body so as to maintain a circular shape therefor, said support member having a central hole for detachably engaging with the rotary shaft of said motor to provide axial and radial positioning of said main body with respect to said rotary shaft, said recording medium being rotated by said motor while maintaining a predetermined minute gap between said main body and a rotation stabilizing member which has a cylindrical surface substantially parallel to said main body, said cylindrical surface extending in an axial direction of said main body, said



rotation stabilizing member being provided in said recording and/or reproducing apparatus, said motor being provided within said rotation stabilizing member and a tip end of said rotary shaft of said motor projects from said rotation stabilizing member as an engaging part, said central hole of said support member engaging with said engaging part in a state in which said motor and said rotation stabilizing member are disposed within the hollow interior of said main body.

4,633,358
H-SWITCH CIRCUIT WITH AN OVERCURRENT PROTECTION CIRCUIT
Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaishi, Japan
Continuation of Ser. No. 471,695, Mar. 3, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 703,445
Claims priority, application Japan, Mar. 4, 1982, 57-34463
Int. Cl.⁴ H02H *7/08*
U.S. Cl. 361—31 **8 Claims**



6. A driving circuit with an overcurrent protection circuit comprising:

a driving circuit means, including a plurality of output transistors each having an emitter, base and collector, for driving a load;

means for supplying input signals to the bases of said output transistors to control the ON/OFF state of said output transistors;

a plurality of overcurrent-detecting circuits each connected to a corresponding one of said plurality of output transistors and responsive to the base-emitter voltage of said corresponding one of said output transistors whereby an output signal is generated upon detecting that an overcur-

rent flows through said corresponding one of said output transistors;

a logic circuit including a plurality of switching transistors with current paths between a connection line and a reference potential line and which are respectively rendered conductive in response to output signals from said plurality of overcurrent detecting circuits;

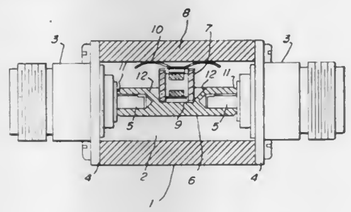
means connected to said connection line for supplying a turn-off control signal to said means for supplying input signals for a preset period of time, beginning after the potential on said connection line becomes equal to that on said reference potential line, to cause said means for supplying input signals to supply turn-off signals to said output transistors, said means for supplying input signals again supplying input signals to the bases of said output transistors after said preset period of time has elapsed.

4,633,359

SURGE ARRESTER FOR RF TRANSMISSION LINE

N. Peter Mickelson, Buxton, and Edward H. Shively, Raymond, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 27, 1984, Ser. No. 655,127
Int. Cl.⁴ H02H *9/06*
U.S. Cl. 361—119 **4 Claims**



1. A surge arrester for coaxial RF transmission lines comprising a metal body having a longitudinal hole therethrough and having a coaxial connector at each end of the metal body, a continuous smooth one-piece center conductor axially disposed in said hole and connected at its ends to said coaxial connectors, the center conductor being substantially cylindrical except for a flat surface at about its center, the center conductor having chamfers at its ends in order to minimize susceptance of the arrester, and a gas discharge tube orthogonally disposed and spring mounted between said center conductor and said metal body, the longitudinal hole having one diameter, the substantially cylindrical center conductor having another diameter, the ratio of the diameter of the center conductor to the diameter of the longitudinal hole being such as to provide a minimal VSWR value.

4,633,360

STATION PROTECTOR

Nils P. Mickelson, Raymond, Me., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 461,765, Jan. 28, 1983, abandoned. This application May 17, 1984, Ser. No. 664,111
Int. Cl.⁴ H02H *3/22, 9/06*
U.S. Cl. 361—119 **5 Claims**

1. A station protector comprising:

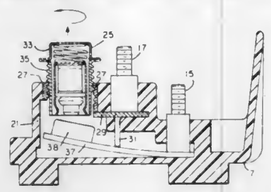
a base member of electrical insulator material;

mounting means formed in said member mounting an arrester cartridge comprising a threaded metal shell, an arrester and a cage;

grounding means affixed to said base member and fromed to connect to a circuit ground and to said arrester cartridge;

a line terminal affixed to said base member and formed to connect to a circuit; and

an electrically conductive cantilever spring formed to ground the line terminal to the grounding means in the absence of the arrester, cage and shell, and to connect the line terminal to the arrester cartridge when the complete



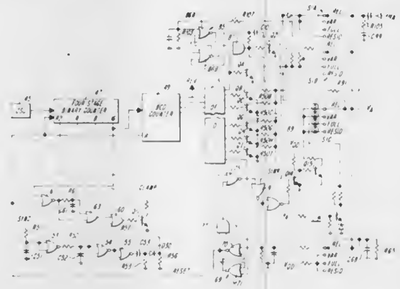
arrester cartridge is properly mounted in the mounting means.

4,633,361

CHUCK CONTROL FOR A WORKPIECE HOLDING ELECTROMAGNET

Roger B. Ela, Spencer, and Dominic F. Pignataro, Shrewsbury, both of Mass., assignors to Walker Magnetics Group, Inc., Worcester, Mass.

Filed Oct. 1, 1984, Ser. No. 656,312
Int. Cl.⁴ B25B *11/00;* **H01F** *13/00*
U.S. Cl. 361—145 **13 Claims**



1. Apparatus for generating a sequence of energizations for a winding of an electromagnet used for securing a magnetizable workpiece, the apparatus comprising:

control switching means for switching the energization of the winding of the electromagnet between states corresponding to full, variable, residual, and zero states of magnetization;

means for initially fully energizing the winding of said electromagnet when said control switching means is initially switched to a residual state;

timing means associated with said means for fully energizing the winding of said electromagnet, said timing means allowing said electromagnet to reach said full state of magnetization for a selected period of time before being reduced to said residual state of magnetization when said control switching means is switched to said residual state.

4,633,362

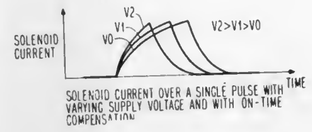
SOLENOID DRIVEN METERING PUMP SUPPLY VOLTAGE COMPENSATION CIRCUIT

David N. Saunders, North Berwick, Me., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 9, 1985, Ser. No. 806,583
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—152 **12 Claims**

1. A compensation circuit for solenoid driven apparatus for supplying voltage to said solenoid, said voltage varying within normal operating range from nominal, said circuit comprising

means for applying said voltage to said solenoid for an on-time energizing pulse period wherein duration of said



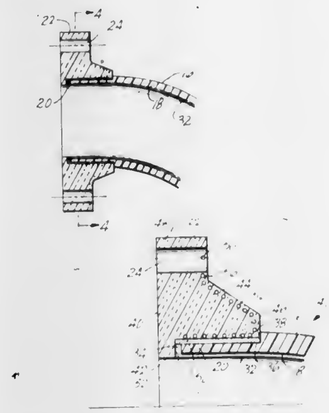
period is in substantial inverse relationship to said normal operating range variations from nominal of said supply voltage.

4,633,363

CONDUCTIVE FLANGED FITTING

Dalton W. Bordner, Fullerton, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Aug. 5, 1985, Ser. No. 762,713
Int. Cl.⁴ H05F *3/00;* **F16L** *11/12*
U.S. Cl. 361—215 **3 Claims**



1. In a pipeline, a conductive flanged fitting attached at its ends to the pipeline, the fitting comprising:

a non-conductive conduit having an inside and an outside surface;

a conductive liner disposed along and lining the inside surface, the liner turned outwardly and disposed over one of the conduit ends;

a grounded conductive flange secured over the one conduit end for coupling the conduit to the pipeline, the flange providing a conductive pathway to ground static charges from the liner; and

a conductive adhesive securing the flange to the conduit one end and liner and conducting static charges therebetween.

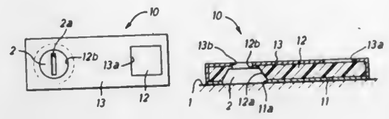
4,633,364

STATIC SHOCK ELIMINATOR

Mitsuo Nakamura; Sumihiro Kaga, both of Kariya, and Toshitaka Tanahashi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1985, Ser. No. 770,093
Claims priority, application Japan, Aug. 28, 1984, 59-180184; Oct. 3, 1984, 59-207730
Int. Cl.⁴ H05F *3/00*
U.S. Cl. 361—216 **5 Claims**

1. A static shock eliminator adapted for use in attachment to a conductive grounding object such as a metallic door knob, handle or key cylinder, comprising a high resistance plate formed in a rectangular shape to be engaged at one end portion thereof with said conductive grounding object, said high resistance plate having a first surface to be brought into contact with a person and a second surface to be adhered to a surface



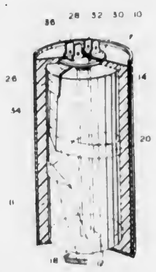
of a member on which said conductive grounding object is mounted, and an insulation layer integrally formed on said first surface of said high resistance plate in such a manner that said first surface is exposed only at a portion spaced from said conductive grounding object at a predetermined distance.

4,633,365

METALLIZED CAPACITOR WITH PROTECTIVE INTERRUPTER DEVICE AND METHOD OF MAKING THE SAME

Robert M. Stockman, Brookfield Center, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

Filed Mar. 5, 1985, Ser. No. 708,356
Int. Cl.⁴ H01G *1/11, 1/14*
U.S. Cl. 361—272 **5 Claims**



1. The method of making a metallized film capacitor with a protective interrupter device which is wound using at least two metallized films on a core to form at least one capacitor section comprising the steps of:

metallizing the ends of the capacitor section;

connecting one of said ends to a first externally mounted terminal;

connecting a very thin elecrically conductive strip to the other metallized end and running said conducting strip over the surface of said section and encircling said section near the mid-point between the ends thereof to a second externally mounted terminal; and

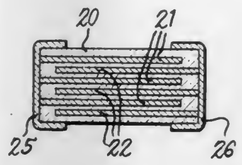
embedding said electrically conducting strip and said capacitor section in a rigid encapsulant whereby said strip is integrated within the encapsulant and will tear or separate on any swelling or cracking of the encapsulant.

4,633,366

LAMINAR ELECTRICAL COMPONENT WITH MAGNESIUM ORTHOBORATE

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 7, 1985, Ser. No. 763,388
Int. Cl.[4] H01G *4/10*
U.S. Cl. 361—321 **22 Claims**



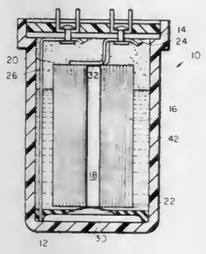
13. A laminar electrical component having a first dense sintered ceramic layer comprised of from 85 to 100 mole % magnesium orthoborate; and at least one fired continuous conductive film adhered to said one layer.

4,633,367

PRESSURE SENSITIVE FAULT CURRENT INTERRUPTER FOR METALLIZED FILM CAPACITORS WITH OIL IMPREGNATE

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,784
Int. Cl.[4] H01G *1/06, 9/00*
U.S. Cl. 361—272 **7 Claims**



1. A metallized film AC capacitor having a pressure sensitive fault interrupter wherein said capacitor includes a metallized foil capacitor section, rolled around an arbor and having a core therein, contact bridges to one electrode of the capacitor section on each end thereof, a connecting tab to one contact bridge, a case, potting material to secure said capacitor section within said case at the top and bottom thereof, a liquid filling between the top and bottom potting material, and connecting terminals for said tabs in a cover for said case, wherein said fault interrupter comprises:

a diaphragm mechanically and electrically connected to one of said contact bridges at the end of capacitor roll remote from said cover;

a tab connection to said diaphragm, said tab connecting said diaphragm to one terminal on the cover of said case; a tape positioned over the top of said core, at the end opposite said diaphragm;

said capacitor section with said diaphragm connected thereto by an electrical and mechanical bond being positioned within said case;

a potting material disposed around the base of said capacitor roll and diaphragm attached thereto within said case;

a liquid inserted into said case covering approximately two-thirds to three-fourths of said capacitor roll;

a potting material placed over said liquid to hermetically seal the top of said capacitor roll to said cover;

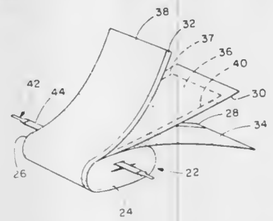
said diaphragm secured to the bottom of said capacitor roll within said case leaving an air gap between said diaphragm and the base of said case such that said diaphragm may be depressed by gaseous pressure to break the electrical contact between said diaphragm and one contact bridge without the possibility of a restrike within 48 hours.

4,633,368

MULTIPLE FUNCTION INTEGRATED CAPACITOR

W. Richard Frederick, Mundelein, Ill., assignor to Integrated Power Components, Wood Dale, Ill.

Filed Oct. 31, 1985, Ser. No. 794,245
Int. Cl.[4] H01G *4/38, 7/00*
U.S. Cl. 361—328 **18 Claims**



1. A multiple capacitive function wound capacitor comprising:

a winding having a pair of ends and including a first, a second and a third insulative layer with each of said layers extending substantially from one end of said winding to the other end of said winding;

a first electrode disposed between said first and second insulative layers;

a second electrode disposed between said second and third layers;

a third electrode positioned on the side of said third layer away from said second electrode, one of said electrodes extending to said one end of said winding and short of the other end of the winding, another of said electrodes terminating short of said one end and extending to said other end, and the remaining electrode extending intermediate said ends and terminating short of each of said ends;

a conductive tab electrically connected to said remaining electrode and extending beyond said one winding end, said tab being insulated at the location where it passes said one end;

conductive means at least partially covering said winding one end, making electrical contact with multiple turns of said one electrode and including a lead; and

conductive means at least partially covering said winding other end, making electrical contact with multiple turns of the other electrode and including a lead, whereby said capacitor integrates three capacitive elements.

4,633,369

POWER FACTOR CORRECTION CAPACITOR

John Lapp, Franklin; Larry B. Hackney, Milwaukee, Wis.; Marco J. Mason, Racine, all of Wis., and David W. Anderson, Greenwood, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

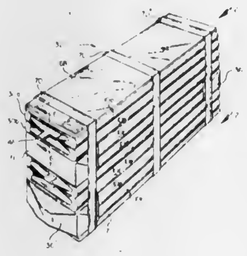
Filed Feb. 12, 1985, Ser. No. 700,865
Int. Cl.[4] H01G *4/38;* **A44B** *21/00*
U.S. Cl. 361—328 **10 Claims**

1. A power factor correction capacitor, comprising:

one capacitor pack formed from two sheets of foil sandwiching at least one sheet of dielectric, one sheet of foil having two opposite edges and said one sheet of dielectric having two opposite edges with one of the edges of said one sheet of foil extending beyond the adjacent edge of said one sheet of dielectric and the adjacent edge of the other sheet of foil;

clip means, piercing said one edge of said one sheet of foil, for electrically terminating said one sheet of foil in said one capacitor pack;

a second capacitor pack formed from two sheets of foil sandwiching at least one sheet of dielectric film, one sheet of foil having two opposite edges and said sheet of film having two opposite edges with one of the edges of said



one sheet of foil in said second capacitor pack extending beyond the adjacent edge of said sheet of film and beyond the adjacent edge of the other sheet of foil in said second pack and with said one edge [illegible] adjacent to said one edge of said one sheet of f [illegible] one capacitor pack; and

wherein said clip means pierce [illegible] edge of said sheet of foil in said one capacitor p [illegible] said one edge of said one sheet of foil in said s[illegible]apacitor pack,

whereby one of the sheets [illegible] foil in said one capacitor pack is electrically connected to one of the sheets of foil in said second capacitor pack.

4,633,370

CHIP-LIKE ELECTRONIC COMPONENT SERIES

Mitsuro Hamuro; Kimiharu Anao, and Keiichi Shimamaki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 4, 1985, Ser. No. 707,581
Claims priority, application Japan, Mar. 5, 1984, 59-31790[U]
Int. Cl.[4] B65D *75/24*
U.S. Cl. 361—380 **16 Claims**



1. A chip-like electronic component series comprising:

a tape (**1, 11**) extending in a longitudinal direction and having a plurality of cavities (**5, 15**) formed therein and distributed along said tape in said longitudinal direction;

a plurality of chip-like electronic components (**2, 2a, 2b, 12**) received in respective ones of said cavities; and

cover means (**3, 13**) for covering said cavities to retain said electronic components therein,

each of said cavities being configured for selectively accommodating said components in a plurality of orientations within said cavity;

each of said cavities further comprising a relatively flat receiving portion (**7, 17**) being defined by an opening end portion extending along the surface of said tape, a side surface extending away from the opening end portion of said cavity and having a first height as measured in a direction away from said tape, a bottom surface (**6, 16**) extending from said side surface and along said tape in said longitudinal direction, and at least one projecting receiving portion (**8, 18**) projecting from a part of said bottom surface of said flat receiving portion, and having a second height which is greater than said first height.

4,633,371

HEAT PIPE HEAT EXCHANGER FOR LARGE SCALE INTEGRATED CIRCUITS

John S. Nagy, Los Altos, and Jolson K. Fang, Sunnyvale, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Sep. 17, 1984, Ser. No. 650,683
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—385 **21 Claims**



1. A packaging apparatus conducting heat from an integrated circuit to a cooling medium, comprising:

heat pipe means, including a heat pipe, with a proximal end and a distal end mounted with said proximal end in good heat transfer relation with an integrated circuit for conducting heat away from the integrated circuit to said distal end;

plenum means causing the cooling medium to flow across said distal end for removing heat from said heat pipe means;

at least one cooling fin formed on said heat pipe means adjacent to said distal end; and

flow guide means bonded to said at least one cooling fin for guiding the flow of the cooling medium between said plenum means and said distal end, said flow guide means substantially enclosing said at least one cooling fin such that at least one channel is defined adjacent to said heat pipe means, said channel defining a flow path for the flow of the cooling medium, the flow path extending substantially between said distal end and said proximal end.

4,633,372

POLYOXOMETALATE-MODIFIED CARBON ELECTRODES AND USES THEREFOR IN CAPACITORS

James L. Calahan, Norwich, N.Y.; Edward A. Cuellar, Shaker Heights, Ohio; Michael J. Desmond, Cleveland Heights, Ohio, and John C. Currie, Novelty, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 26, 1985, Ser. No. 769,925
Int. Cl.[4] H01G 9/00; C25B 11/14
U.S. Cl. 361—433 25 Claims



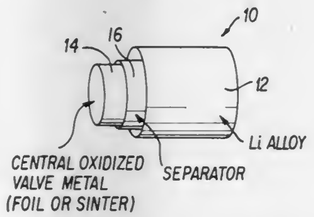
13. An energy storage device comprising a pair of electrodes electrically isolated from each other, an electrolyte in contact with the electrodes, and means for collecting electrical current therefrom; at least one electrode comprising an activated carbon electrode having a polyoxometalate compound absorbed therein.

4,633,373

LITHIUM/VALVE METAL OXIDE/VALVE METAL CAPACITOR

Jeffrey Phillips, Denver, Colo., assignor to United Chemi-Con, Inc., Rosemont, Ill.

Filed Dec. 14, 1984, Ser. No. 681,462
Int. Cl.[4] H01G 9/00; H01M 6/18
U.S. Cl. 361—433 24 Claims



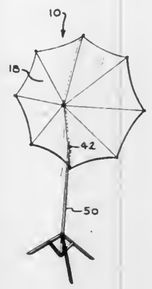
1. An electrical capacitor comprising a negative lithium or lithium alloy electrode; a positive electrode formed from a metal coated with a barrier metal oxide, said metal selected from the group consisting of aluminum, tantalum, niobium, zirconium and titantium; a physical separator material separating the positive and negative electrodes and capable of allowing ionic travel from one electrode to the other; and a lithium ion-containing, non-aqueous electrolyte contacting and compatible with both electrodes.

4,633,374

PHOTOGRAPHIC LIGHT DIFFUSER

Thomas A. Waltz, Toledo, and John E. Shirilla, Youngstown, both of Ohio, assignors to The F. J. Westcott Co., Toledo, Ohio

Filed Feb. 4, 1985, Ser. No. 697,921
Int. Cl.[4] F21V 17/02
U.S. Cl. 362—17 39 Claims



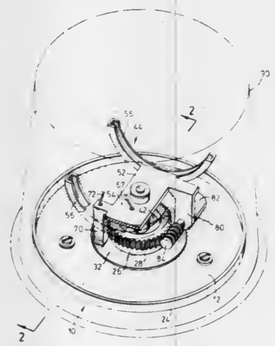
1. A photographic light diffuser comprising:
a support rod having a first end and a second end;
a frame structure connected to said first end of said support rod, said frame extending radially away from said support rod to form a substantially parabolic structure around said support rod, said frame structure defining an opening around said support rod when said frame is in an open position, said second end of said support rod extending from said opening of said substantially parabolic frame;
a cover including a translucent fabric panel and a reflective fabric panel, said translucent fabric panel being positioned on said frame, said translucent panel substantially covering said substantially parabolic frame, said reflective fabric panel extending from said second end of said support rod to said opening defined by said frame, said reflective panel being joined to said translucent panel at said opening to enclose said support rod;
a closeable opening positioned in said cover to provide access to the interior of said light diffuser.

4,633,375

FLASHING LAMP CONSTRUCTION

Paul A. Tres, Toronto, Canada, assignor to Dominion Automotive Industries Inc., Toronto, Canada

Filed Jan. 27, 1986, Ser. No. 822,848
Claims priority, application Canada, Oct. 4, 1985, 492245
Int. Cl.[4] F21J 21/30
U.S. Cl. 362—35 6 Claims



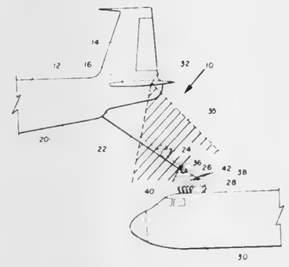
1. A flashing lamp for vehicles, comprising:
a base adapted to be secured to an underlying support, the base having an upstanding integral boss defining a worm gear, the base and the boss being of electrically non-conductive material,
a frame,
at least one lamp supported on said frame,
first means mounting said frame for rotation about the axis of said worm gear,
a motor supported from said frame,
a worm directly rotated by said motor and engaging said worm gear,
and second means by which to provide electrical power to said motor and said at least one lamp.

4,633,376

ADVANCED FUEL RECEPTACLE LIGHTING SYSTEM FOR AERIAL REFUELING

Frank J. Newman, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 15, 1985, Ser. No. 754,778
Int. Cl.[4] B64D 47/02, 39/00
U.S. Cl. 362—62 5 Claims



1. An advanced fuel receptacle lighting system mounted on a tanker aircraft for aiding the refueling of a receiver aircraft, the lighting system comprising:
a first black light adapted for mounting on a first tanker aircraft stabilizer;
a second black light adapted for mounting on a second tanker aircraft stabilizer, the black lights illuminating an area below and behind a fuel boom and a ruddervator of the tanker aircraft; and
fluorescent color markings attached to a fuel receptacle area on the receiver aircraft, the markings illuminated by the black lights for enhancing the refueling of the receiver aircraft by the tanker aircraft by improving the visual cues of depth perception of a boom operator.

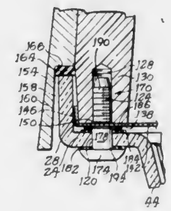
4,633,377

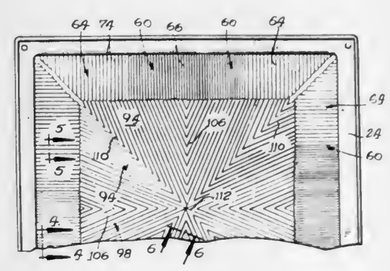
LIGHTING FIXTURE WITH SQUARE BEAM PATTERN

Edward T. Mackiewicz, Chicago, Ill., assignor to Kenall Manufacturing Company, Chicago, Ill.

Filed Sep. 16, 1985, Ser. No. 776,680
Int. Cl.[4] F21V 5/02
U.S. Cl. 362—309 25 Claims

1. A molded plastic, light-distributing diffuser for attachment to a lamp housing of an electrical lighting fixture,
said diffuser comprising an inverted truncated pyramid and a fluted multi-planar cap surmounting said pyramid at its truncated end and joined thereto along end edges thereof,
said truncated pyramid having a rectangular base and a plurality of sides, each of said sides extending from and projecting inwardly of bounding perimetric base lines of said base to define at intersecting terminating end edges thereof remote from said base and at a truncated end of said pyramid a subtended rectangle having sides of lesser dimensions than corresponding sides of said base,
said rectangle at said truncated end of said pyramid defining a polygon extending in a plane spaced from and paralleling said base and coaxial therewith,
each of said sides being generally of a trapezoidal configuration and each being formed with a fluted light-dispersing pattern on a principal surface thereof,
each said pattern comprising a plurality of spaced parallel ribs defining a laterally distributed array of groove-like channels extending normally of said base line of said base and embracing a planar expanse of each of said sides of said pyramid,
said ribs being curved at outwardly projecting surfaces thereof and being arrayed in zones characterized by a pattern including ribs having lesser and greater radii of transverse curvature,
said zones being arranged symmetrically with respect to a center line of each of said sides extending normally of each of said base lines of said sides, and
flange means for connecting said diffuser to a lamp housing,





said cap being vaulted to project outwardly toward an apex of said pyramid, and said cap including four interconnected, generally-triangular panels angularly disposed to one another to define a dish opening upwardly toward said truncated end of said pyramid,
each of said panels having a base edge abutting a corresponding edge of a respective one of said sides of said truncated pyramid, and each of said panels having side edges with each of said side edges in contact with side edges of each of said panels thereadjacent to define a quadri-faceted end closure for said diffuser,
each of said panels being divided along a center line extending from an apex of said cap to a corresponding base edge of each of said panels, and
each of said panels being formed with dual, laterally-adjacent arrays of fluted channels, said fluted channels of said arrays being angled to converge and to intersect along said center line of each of said panels and along said side edges of adjacent said panels.

4,633,378

DEVICE FOR SUPPORTING LAMP SHADE ON LAMP SOCKET

George F. Reisman, Fort Lee, N.J., assignor to Charm-Glo Mfg. Co., Inc., Paterson, N.J.

Filed Jul. 26, 1985, Ser. No. 759,339
Int. Cl.[4] F21V *17/00*
U.S. Cl. 362—353 16 Claims



1. A device for supporting a lamp shade on a lamp socket comprising,
(1) an outer rim adapted to be secured to the lamp shade,
(2) an inner rim secured to the outer rim,
(3) a first set of fingers extending from the inner rim and terminating in a first set of socket engaging end means,
(4) a second set of fingers extending from the inner rim and terminating in a second set of socket engaging end means and
(5) the first set of socket engaging end means for engaging a first lamp socket of a size falling within a first range of sizes and the second set of socket engaging end means for engaging at least a second lamp socket of a size falling within a second range of sizes which is different from said first range.

4,633,379

DC-DC CONVERTER HAVING FEEDBACK TYPE SWITCHING VOLTAGE CONVERTING CIRCUIT

Takashi Oda; Takashi Ohyagi, and Toshihiro Mori, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,413
Claims priority, application Japan, Sep. 30, 1983, 58-180384
Int. Cl.[4] H02M *3/338*
U.S. Cl. 363—19 5 Claims



1. A DC-DC comprising:
feedback type switching voltage converting means for converting a DC input voltage to an output voltage in accordance with a control voltage provided at a feedback input thereof;
constant current supply means responsive to the output of said switching voltage oonverting means for producing a constant current;
voltage stabilizing and picking-up means responsive to said constant current for stabilizing the output voltage of said switching voltage converting means and pickup up the output voltage to provide a feedback voltage; and
feedback means for providing said feedback voltage to said feedback input as said control signal.

4,633,380

APPLIED VOLTAGE DETECTING DEVICE FOR ELECTRIC POWER CONVERTOR

Hiroshi Kashiwazaki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1985, Ser. No. 737,876
Claims priority, application Japan, May 28, 1984, 59-108116
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—54 8 Claims



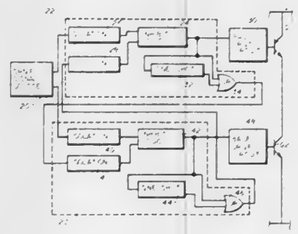
1. In an applied voltage detecting device for an electric power convertor which detects forward and backward voltages applied to a power convertor consisting of semiconductor power control rectification elements and converts and produces detection signals down to low level signals, the improvement comprising:
a detecting circuit for producing a detection voltage when a forward voltage is applied to said power convertor and a detection voltage when a backward voltage is applied thereto, while providing said detection signals with a relative potential difference;
a single optical transmission circuit for converting both of said detection voltages into optical signals and picking up said optical signals; and
a discrimination circuit for discriminating whether said electric signals are the forward detection voltage or the backward detection voltage from the potential difference of said electric signals.

4,633,381

INVERTER SHOOT-THROUGH PROTECTION CIRCUIT

Anand Upadhyay, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1985, Ser. No. 705,663
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 17 Claims



1. A protection circuit for preventing simultaneous conduction of first and second switching devices having main current path electrodes connected in series across a voltage source, comprising:

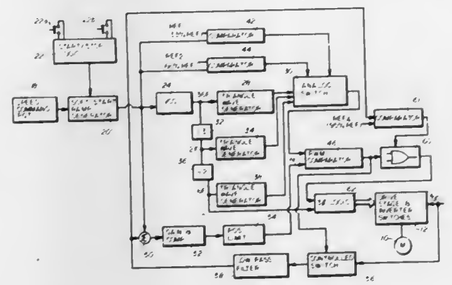
means for developing complementary first and second drive signals; and
first and second means coupled to the drive signal developing means but not coupled to a main current path electrode of either switching device for controlling the first and second switching devices, respectively, in response to the drive signals, each of the controlling means including an inhibit logic circuit having first and second inputs which receive the drive signal and an inhibit signal developed by the other controlling means, respectively, the inhibit logic circuit generating a control signal to turn on the respective switching device only when the drive signal is present and the inhibit signal from the other controlling means is not present and means for generating the inhibit signal which is coupled to the inhibit logic circuit of the other control means, such inhibit signal being generated during the time that the control signal is generated and for a predetermined time period thereafter.

4,633,382

INVERTER CONTROL SYSTEM

Anand Upadhyay, and Lawrence W. Messenger, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1985, Ser. No. 705,662
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—132 3 Claims



1. A control for an inverter in a variable speed AC motor drive, the inverter converting a DC input voltage into an AC output for energizing a motor, the frequency of the AC output and hence the speed of the motor being controlled in accordance with an input command, comprising:
a voltage controlled oscillator (VCO) coupled to the input command for generating an oscillator signal at an integer multiple of the output frequency of the inverter;
a first triangle wave generator coupled to the output of the VCO for generating a first triangle waveform at a frequency equal to the frequency of the oscillator signal;
a first divide-by-n circuit coupled to the output of the VCO for reducing the frequency thereof so that the output of the first divide-by-n circuit is a signal at a frequency equal to an integer multiple of the output frequency;
a second triangle wave generator coupled to the output of the first divide-by-n circuit for generating a second triangle wave at a frequency equal to the frequency of the output of the divide-by-n circuit;
an analog switch having inputs coupled to the outputs of the first and second triangle wave generators, a control input and an output;
means coupled to the control input of the analog switch for developing a signal indicative of whether the inverter output frequency is greater than a predetermined frequency;
means coupled to the output of the analog switch for modulating the inverter output with a pulse width modulating signal derived from one of the triangle waveforms selected in accordance with the signal coupled to the control input of the analog switch;
means for maintaining a linear relationship between inverter output voltage and output frequency in a particular range of output frequencies; and
means for maintaining inverter output voltage constant when the inverter output frequency is above the particular range including means for operating the inverter in a full on mode when the inverter output frequency is above a predetermined frequency.

4,633,383

METHOD OF SUPERVISING OPERATING STATES OF DIGGING MACHINES

Yoshio Omachi, and Eisaku Yamada, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,210
Claims priority, application Japan, Apr. 21, 1983, 58-70214
Int. Cl.[4] H02M *5/22*; B65F *9/00*; G05B *19/18*
U.S. Cl. 364—167 10 Claims



1. A method of supervising operating states of a digging machine comprising the steps of:
providing indices representing the ground surface to be digged and an object of known length;
picking up said indices by a television camera located to one side of said digging machine so as to scale said television camera image to actual size and enable a target digging line to be set on rectangular coordinates based on the picked up indices;
picking up with said television camera at least one mark applied to a predetermined portion of said digging machine so as to detect the position of said mark on said rectangular coordinates;
calculating the position of an out of camera view cutting edge of said digging machine on said rectangular coordinates taking the position of said mark as reference;
storing the calculated position of said cutting edge in a picture image memory device;
graphically displaying said target digging line in a monitor television screen visible to the operator of said digging machine; and
graphically displaying a locus of movement of said cutting edge on said monitor television screen by using the contents of said picture image memory device.

4,633,384

SEQUENCE ABNORMALITY CHECK SYSTEM IN PROGRAMMABLE CONTROLLER

Katsuaki Kusumi, Hachiouji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

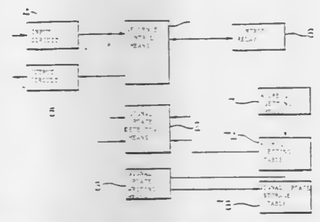
PCT No. PCT/JP84/00227, § 371 Date Jan. 8, 1985, § 102(e) Date Jan. 8, 1985, PCT Pub. No. WO84/04610, PCT Pub. Date Nov. 22, 1984

PCT Filed May 4, 1984, Ser. No. 695,362

Claims priority, application Japan, May 9, 1983, 58/79354

Int. Cl.⁴ G06F *15/46, 11/00*

U.S. Cl. 364—184 **3 Claims**



1. A sequence abnormality check system in a programmable controller including a sequence circuit with elements, each element having an operational state and an associated logic level representative of the actual signal for the element, comprising:

address setting means for providing an address for each element of the sequence circuit;

an address setting table for storing the addresses provided by said address setting means and for storing the operational state corresponding to the addresses;

a signal update storage table for storing the logic levels representative of the actual signals for the elements;

signal update detecting means for generating an output when an operational state of an element stored in said address setting table is different from the logic level representative of the actual signal for the element;

signal update writing means for writing into said signal update storage table an address and the logic level representative of the actual signal associated with the element having a differing operational state detected by said signal update detecting means, for writing a mark representing a last updated signal denoting the address as the last updated address, and for updating the differing operational state to correspond to the logic level representative of the actual signal; and

display means, for displaying in response to said address means providing an address to said address setting table, the addresses and the logic levels stored in said signal update storage table, thereby checking a cause of the failure.

4,633,385

METHOD AND APPARATUS FOR CONTROLLING AN OPERATION SEQUENCE OF MACHINERY

Tomohiro Murata, Ebina; Norihisa Komoda, Kawasaki, and Koichi Haruna, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,226

Claims priority, application Japan, May 2, 1983, 58-77985; May 2, 1983, 58-77987

Int. Cl.⁴ G06F *9/00, 15/00*

U.S. Cl. 364—191 **17 Claims**

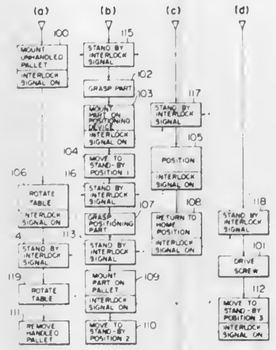
1. A method for controlling an operation sequence in a control system for controlling a series of operations in an operation sequence including synchronization and exclusion, by combining pretaught or preprogrammed unit operations for an automatic machine, such as a robot, said control system comprising:

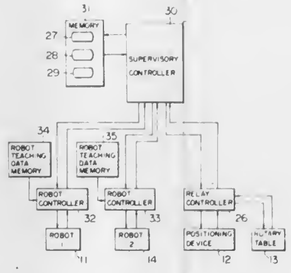
first memory means for storing a start sequence of the unit operations to be synchronized or excluded, including control programs having a designated execution order;

second memory means for storing an operation status of the unit operations; and

third memory means for storing an operation command for starting the unit operations;

said method comprising the steps of:





(a) determining the unit operations to be started by looking up the execution order of control programs included in the start sequence of the unit operations and the operation status stored in said first and second memory means; and

(b) reading out the corresponding operation command from said third memory means to sequentially start the unit operation.

4,633,386

DIGITAL SIGNAL PROCESSOR

Stephen Terepin, Farnborough, England, assignor to Schlumberger Measurement & Control (U.K.) Ltd., Farnboroug, England

Filed Apr. 6, 1984, Ser. No. 597,295

Claims priority, application United Kingdom, Apr. 9, 1983, 8309696

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—200 **7 Claims**

1. A digital signal processor comprising:

(a) signal processor circuit elements comprising:

a serial access data memory having at least two data channels;

multiplier means arranged to multiply at least three variables

by respective coefficients and sum the products, including means arranged to detect overflow in an output signal of the multiplier means and substitute predetermined saturation values for said output signal;

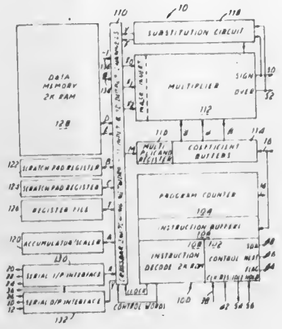
at least two shift registers;

input interface means;

output interface means;

(b) a crossbar switching network arranged selectively to interconnect said circuit elements; and

(c) a control circuit arranged to respond to each of a plurality of predetermined instructions to control the crossbar network to interconnect said circuit elements in corresponding predetermined ways, whereby a selected sequence of instructions supplied to the control circuit causes said circuit elements to be interconnected by the crossbar network in a selected sequence of ways chosen to effect a desired signal processing function.



4,633,387

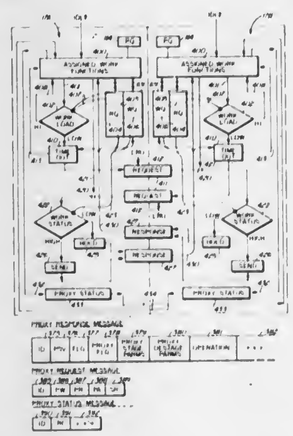
LOAD BALANCING IN A MULTIUNIT SYSTEM

Michael H. Hartung; Arthur H. Nolta; David G. Reed, and Gerald E. Tayler, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1983, Ser. No. 469,680

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—200 **8 Claims**



5. In a machine-implemented method of operating a plurality of programmable units, each programmable unit having a plurality of asynchronous work-performing portions, message means coupling all of said programmable units for enabling communications therebetween, said asynchronous work performing portions performing similar work such that asynchronous work of a first programmable unit can be performed by a second of said programmable units;

the improvement including the steps of:

in each said programmable units maintaining a work queue for scheduling work to be done in the respective asynchronous portion of said programmable units;

sensing said work queue in said first programmable unit for determining whether or not a light load condition prevails; if no such light load condition prevails, continuing to operate said asynchronous portion independent of said second programmable unit;

upon sensing said relatively light load condition, sending a message to said second programmable unit via said message means requesting that work on said work queue of said second unit be transferred to said first programmable unit;

in said second programmable unit, responding to said message, examining its said work queue and if a given work level exists, sending an identification of predetermined work via said message means to said first programmable unit;

performing said predetermined work in said first programmable unit as if such predetermined work was being done by said second programmable unit; and

upon completion of said predetermined work by said first programmable unit, in said first programmable unit sending a completion message to said second programmable unit and in said second programmable unit post processing said predetermined work as if completed within said second programmable unit.

4,633,388

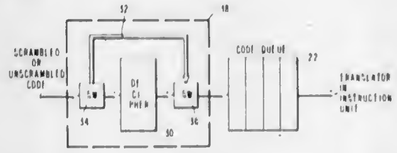
ON-CHIP MICROPROCESSOR INSTRUCTION DECODER HAVING HARDWARE FOR SELECTIVELY BYPASSING ON-CHIP CIRCUITRY USED TO DECIPHER ENCRYPTED INSTRUCTION CODES

Ming-Yee Chiu, Mt. Laurel, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Jan. 18, 1984, Ser. No. 571,771

Int. Cl.⁴ G06F *12/14, 5/00;* **H04L** *9/00*

U.S. Cl. 364—200 **6 Claims**



1. A microprocessor formed on an integrated circuit and adapted to execute the instructions of a specific instruction set, each instruction in said set being defined by a prescribed, digital instruction code, said microprocessor comprising, in combination:

(a) means, having a plurality of first inputs and responsive to said instruction codes applied to said first inputs, for executing the instructions defined by said instruction codes;

(b) instruction code queuing means, having a plurality of first outputs each connected to one of said first inputs of said instruction executing means, for receiving, storing and applying successive instruction codes to said first inputs, said queuing means including a decoder means for translating enciphered instruction codes into said prescribed, digital instruction codes; and said decoder means including

(1) deciphering means for converting instruction codes; and

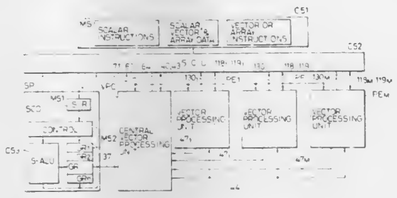
(2) bypassing means, connected to said deciphering means, for directing enciphered instruction codes through said deciphering means and directing non-enciphered instruction codes around said deciphering means and said bypassing means including switching means, arranged to receive instruction codes, for selecting a path for said instruction codes either to said deciphering means or around said deciphering means; and said switching means is responsive to said instruction codes for selecting said path.

4,633,389

VECTOR PROCESSOR SYSTEM COMPRISED OF PLURAL VECTOR PROCESSORS

Yoshikazu Tanaka, Kitaadachi, and Shunichi Torii, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,963
Claims priority, application Japan, Feb. 3, 1982, 57-14989
Int. Cl.[4] G06F *15/347, 15/16*
U.S. Cl. 364—200 **14 Claims**



1. A vector processor system comprising:

(a) a main storage;

(b) a plurality of processor means connected to said main storage each of which includes:

(b1) a plurality of vector registers each for holding a set of vector elements;

(b2) vector operation means connected to said vector registers for performing an operation on inputs sequentially provided thereto to provide sequential outputs as a result of the operation on the inputs;

(b3) vector refer control means connected to said main storage and said vector registers for accessing said main storage to transfer vector elements between said main storage and said vector registers;

(b4) an instruction register connected to said main storage to hold an instruction fetched therefrom; and

(b5) vector instruction control means connected to said main storage and responsive to an instruction fetched therefrom for efffecting sequential reading of vector elements from one of said vector registers designated by an instruction held by said instruction register to said vector operation means or to said main storage, and for effecting sequential writing of vector elements provided by said vector operation means or fetched from said main storage by said vector refer control means into one of said vector registers designated by the said instruction;

(c) wherein said vector instruction control means in one of said plurality of processor means is connected to said main storage to respond to a first kind of instruction fetched from said main storage; and said vector instruction control means in other one of said plurality of processing means are connected to said main storage to receive in parallel and respond to the same instruction of a second kind of instruction fetched from said main storage.

4,633,390

MICROPROGRAM CONTROL SYSTEM

Nobuyuki Yoshida, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 16, 1981, Ser. No. 254,762
Claims priority, application Japan, Apr. 25, 1980, 55-55021
Int. Cl.[4] G06F *9/14*
U.S. Cl. 364—200 **3 Claims**

1. A microprogram control system for executing macroinstructions, each macroinstruction including an operation code, comprising:

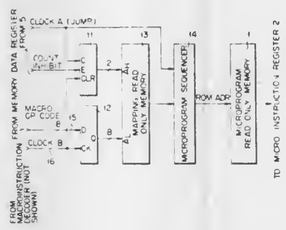
(a) a microprogram read only memory, having an output at which a microinstruction is provided, for storing microinstructions including JUMP instructions, which compose a plurality of microprogram routines given ones of which correspond to given macroinstructions, each microprogram routine ending with a JUMP instruction;

(b) a microinstruction register, coupled to receive and store the microinstruction provided at the output of said microprogram read only memory, said microinstruction register having an output at which the microinstruction is provided;

(c) a decoder, coupled to receive and decode the microinstruction provided at the output of said microinstruction register, and having an output at which a signal is provided each time a JUMP instruction is decoded;

(d) latch circuit means, having a first input for receiving an operation code of a macroinstruction to be executed and having a second input for receiving a signal indicating that the macroinstruction to be executed has been decoded, and having an output at which the operation code is provided, for storing the operation code, said latch circuit means being latched in response to the signal at said first input each time a new macroinstruction is decoded;

(e) means for supplying input addresses, having a first input coupled to receive the signal at the output of said decoder and having a second input coupled to the second input of said latch circuit means and having an output at which an input address is provided, including:



(i) counting means, coupled so as to increment its count in response to the signal at the first input of said means for supplying and coupled so as to clear in response to the signal at the second input of said means for supplying, said counting means generating an output count appearing as higher order bits of the input address, whereby said counting means is incremented at least once during execution of the macroinstruction; and

(ii) means for coupling the output of said counting means with the output of said latch circuit means so that the operation code appears as lower order bits of the input address;

(f) a mapping read only memory, for storing start addresses of a plurality of microprogram routines, having an input coupled to receive the input address output by the means for supplying and having an output at which the start address of a next microprogram routine is provided, so that said plurality is indexed by the output of said means for supplying; and

(g) microprogram sequence control means, having an input coupled to the output of said mapping read only memory and coupled to said microprogram read only memory, for reading said microprogram read only memory.

4,633,391

EXTENDED INDEX FOR DIGITAL INFORMATION STORAGE AND RETRIEVAL DEVICE

John P. Rundell, Broomfield, Colo., assignor to Storage Technology Partners II, Louisville, Colo.

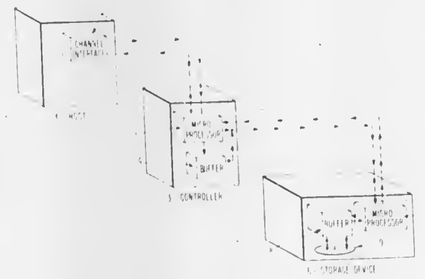
Filed Oct. 21, 1983, Ser. No. 544,329
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—200 **6 Claims**

1. A method for indexing and searching user data recorded in block format on an information recording disk having an index band and a plurality of user bands, each of the user bands having a plurality of user data tracks within which the respective blocks of user data are recorded, wherein the disk is disposed within an information storage device, including a microprocessor and a random access memory, in communication with and responsive to instructions from a host computer, the method comprisisng the steps of:

validating first an instruction from the host computer to write a block of user data to a predesignated user band, said first validating step including the steps of checking for the availability of recordable space within said predesignated user band, issuing an error instruction to the host computer upon the contingency of no available recordable space within said predesignated user band, and otherwise assigning to said block of user data a first key value that is indicative of a plurality of preselected identifying factors, including the identity of the particular user band upon which said block of user data will be recorded, which are unique to said block of user data;

writing first said block of user data with an associated header containing said first key value to said predesignated user band;

validating second an instruction from the device, issued upon the occurrence of said first writing step, to write to the index band a third key value, said second validating step including the steps of checking for the presence within the index band of a second key value associated



with said predesignated user band, and determining the lower of said first and second key values, said second key value constituting said third key value when said second key value is both present within the index band and lower than said first key value, otherwise, said first key value constituting said third key value;

writing second said third key value on the index band;

entering a plurality of lowest key values into a plurality of index registers within the random access memory, each of said plurality of index registers corresponding to a respective one of said plurality of preselected identifying factors, and each of said plurality of lowest key values representing at least one of said plurality of preselected identifying factors while corresponding to a part of said third key value associated with the respective user bands;

searching said index registers, upon the occurrence of an instruction from the host computer, for a fourth key value, said fourth key value constituting the largest of said plurality of lowest key values entered into said index registers which is less than or equal to a target key value denominated by the host computer; and

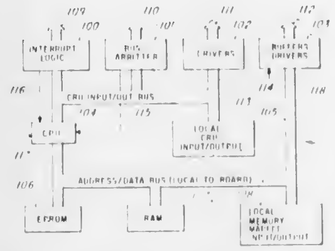
informing the host computer that the particular user band on which the target key value was recorded has been identified.

4,633,392

SELF-CONFIGURING DIGITAL PROCESSOR SYSTEM WITH LOGICAL ARBITER

Geoffrey P. F. Vincent; Nicholas K. D. Ing-Simmons; John McGrath, all of Bedford, England, and Marvin C. Conrad, Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 365,728, Apr. 5, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 725,512
Int. Cl.[4] G06F *9/02*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising:

an information bus for transferring data;

a logical arbiter memory means connected for transfer of data to and from said information bus, for storing therein a global function table of function names together with their corresponding information bus access address; and

a plurality of function modules each connected for transfer of data to and from said information bus in response to function requests, each function module having (1) function means to perform at least one computational function in response to a corresponding function request on said information bus directed to a corresponding information bus access address, each such computational function having a corresponding function name, and (2) initialization means actuated upon each initial application of electric power to said function module for assigning an information bus access address for access to each such computational function via said information bus, said information bus access address assigned to a particular function name dependent upon the order of initialization of said function module, and for transmitting via said information bus said function name and said corresponding information bus access address of each such computational function to said logical arbiter memory means for storage in said global function table.

4,633,393

GENERIC KEY FOR INDEXING AND SEARCHING USER DATA IN A DIGITAL INFORMATION STORAGE AND RETRIEVAL DEVICE

John P. Rundell, Adams County, Colo., assignor to Storage Technology Partners II, Louisville, Colo.

Filed Oct. 21, 1983, Ser. No. 544,328
Int. Cl.[4] G06F *7/28*
U.S. Cl. 364—200 **16 Claims**

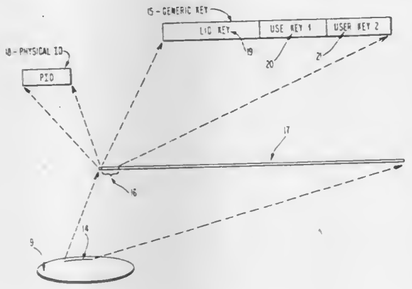
1. A method for indexing and searching user data recorded in block format on an information recording disk having an index band and a plurality of user bands, each of the user bands having a plurality of user data locations within which the respective blocks of user data are recorded, wherein the disk is disposed within an information recording system including a host central processing unit and a system storage device, said method comprised of the steps of:

assigning from the host central processing unit a generic Key to a block of user data to be recorded, said generic Key having a plurality of specific user Keys contained therein:

transmitting said block of user data with an associated header containing said generic Key to the system storage device for recording, said device having a means for index storage, a means for sorting said index storage means, and a means for searching said index storage means;

writing said block of user data along with its generic Key in a user data location specified by the host central processing unit;

recording on the disk in a predetermined location specified for index recording, said generic Key and the location on the band where said block of user data was recorded;



selecting one of said plurality of specific user keys in said generic Key as the basis for a search for a given block of user data identified by a target key;

transmitting to the device said target Key;

sorting said index storage means in a sequential order based upon the value of the selected one of said plurality of specific user Keys;

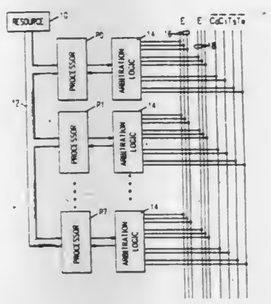
searching the sorted index storage means for said target key to determine the location on the disk where the specific user key associated with the user data sought is located.

4,633,394

DISTRIBUTED ARBITRATION FOR MULTIPLE PROCESSORS

Christos J. Georgiou, White Plains, N.Y., and Anders P. Ravn, Lyngby, Denmark, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 24, 1984, Ser. No. 603,276
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 **18 Claims**



1. A distributed method of arbitrating access to a shared resource among N stations that may request said access, comprising the steps of:

associating 2 $\log_2 N$ shared variables with each station in first and second sets of equal size, the association in either set being unique and defining a prioritization among said stations;

asserting at least one shared variable in said first set for a station requesting access;

examining at least one shared variable in said second set for assertion of said variables;

assigning access to said requesting station if all said variables of said second set are determined by said examination to be non-asserted;

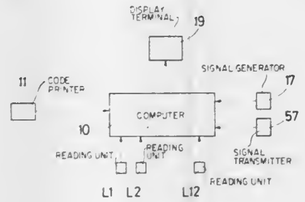
releasing access of at least one variable of said first set if a variable of said second set determined by said examination to be asserted belongs to a second set of a station of higher priority.

4,633,395

METHOD FOR CHECKING SHEETS OF BILLS DURING THEIR PRODUCTION

Runwalt Kuehfuss, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Switzerland

Filed Nov. 18, 1982, Ser. No. 442,655
Claims priority, application Switzerland, Dec. 11, 1981, 7916/81
Int. Cl.[4] G06K *3/00;* **G06F** *15/24*
U.S. Cl. 364—403 **10 Claims**



10. A method for checking sheets of bills during their manufacture, the manufacture of the sheets of bills including a series of successive bill manufacturing operations, the bill manufacturing operations including a bill printing operation, a serial numbering operation, and a sheet cutting operation in which at least one edge of each sheet is removed, the sheets being arranged in stacks prior to each bill manufacturing operation, the method comprising the steps of;

printing the sheets with bill prints in the bill printing operation;

applying a consecutively numbered code to at least one edge of each sheet prior to the completion of the printing operation;

storing the codes;

inspecting the sheets to control the quality of the bill prints;

applying a serial number to each bill print of each sheet in the serial numbering operation;

cutting the sheets into bills and trimming the at least one edge of each sheet having the consecutively numbered code to remove the code from each sheet;

reading the code applied to each sheet at least once after the completion of each operation and prior to the beginning of the next successive operation;

storing the read codes; and

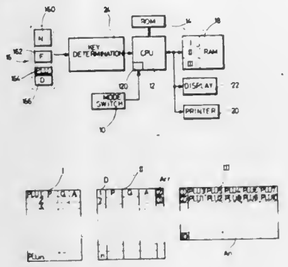
comparing the read codes with the previously stored codes to determine if the read codes correspond with the previously stored codes.

4,633,396

AUTOMATIC COMPLEX REGISTRATION IN A ELECTRONIC CASH REGISTER

Kensaku Komai, Yamatokoriyama, and Eiji Yoshida, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1984, Ser. No. 613,213
Claims priority, application Japan, May 27, 1983, 58-94677
Int. Cl.[4] G06F *15/02, 13/06*
U.S. Cl. 364—405 **2 Claims**



1. An automatic complex registration control system in an electronic cash register for registering information related to commodities from a plurality of departments, each of the commodities having an assigned price look up; PLU, code number, comprising:

a plurality of department keys that instruct a registration operation when a commodity related to one of the plurality of departments is purchased;

department memory means for storing unit cost information of each commodity that is related to the respective ones of said plurality of department keys, said department memory means including a memory area which stores at least one automatic complex registration number with each automatic complex registration number being assigned to at least one of said plurality of department keys said automatic registration number being accessible when said one of said plurality of department keys to which it is assigned is accessed;

price look up (PLU) memory means for storing unit cost information of each commodity defined by each of the PLU code numbers;

complex registration memory means for storing at least one list of PLU code numbers, each list of PLU code numbers having a said automatic complex registration number that is stored in said department memory means;

accessing means for accessing said department memory means in accordance with instructions from said plurality of department keys;

determination means for determining whether an automatic complex registration number is stored in said memory area at a position accessed by said accessing means, said position corresponding to an actuated one of said plurality of department keys; and

read out means, responsive to a determination output from said determination means, for reading out,

said automatic complex registration number stored in said memory area of said department memory means at said position corresponding to said actuated one of said plurality of department keys,

a list of PLU code numbers stored in said complex registration memory means at a position related to said automatic complex registration number read out from said department memory means, and

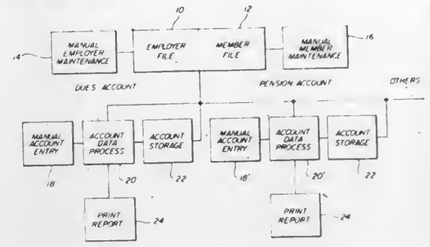
said unit cost information stored in said price look up (PLU) memory means in response to said list of PLU code numbers read out from said complex registration memory.

4,633,397

UNION MEMBER ACCOUNTS MANAGEMENT SYSTEM

Richard Macco, 102 Warren Dr., Aberdeen, N.J. 07747

Filed Dec. 24, 1984, Ser. No. 685,986
Int. Cl.[4] G06F *15/30, 15/21*
U.S. Cl. 364—406 **5 Claims**



1. In combination, in a system for processing and supervising one or more individual union member accounts comprising at least a dues account, wherein contribution to said accounts are provided by members and employers; the improvement in said system comprising:

first data file magnetic storage means for storing current information characterizing each employer including each employer's formula for contribution to a member's account, each employer's formula for delinquency in contributions to a member's account;

second data file magnetic storage means for storing current information characterizing each member including each member's employer, each member's formula for contribution to a member's account, each member's status with respect to whether said member is active, retired or suspended;

first manual entry means for maintaining said first data file magnetic storage means;

second manual entry means for maintaining said second data file magnetic storage means;

at least one member account data file magnetic storage means for storing transactions with respect to said account;

account manual entry means for entering transactions from a member contribution and an employed contribution into said member account data file magnetic storage means;

operator activated account data processing means for operating on said first and second data file magnetic storage means and said member account data file magnetic storage means to generate individual account balances for individual members and each employer and to generate account delinquencies for each member and each employer; and limited access means provided to at least one of said manual entry means using a password system.

4,633,398

ATTENUATION COMPENSATED EMISSION RECONSTRUCTION WITH SIMULTANEOUS ATTENUATION FACTOR EVALUATION

Grant T. Gullberg, Waukesha, and Norbert J. Pelc, Wauwatosa, both of Wis., assignors to General Electric Company, Waukesha, Wis.

Filed Dec. 7, 1983, Ser. No. 558,922
Int. Cl.[4] G06F *15/62*
U.S. Cl. 364—414 **10 Claims**

8. A method of reconstructing emission projection signals to produce a pixelized image of distributed emission sources in an attenuating medium, said method comprising the steps of

(a) specifying a set of attenuation coefficients relating to the respective pixels in the image space,

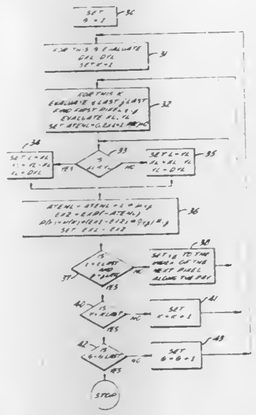
(b) collecting a set of emission projection signals,

(c) for a projection along a particular ray determining the

attenuation factor from the attenuation coefficient for a first pixel intersected by the ray,

(d) establishing a partial projection based on the projection signals and the attenuation factor determined in step (c),

(e) iterating steps (c) and (d) along the ray to complete the projection corrected for attenuation of the pixels through which the ray passed.



(f) repeating steps (c), (d) and (e) for the rays associated with the remaining set of projection signals, and

(g) alternately and iteratively projecting and back projecting in accordance with steps (c), (d) and (e) to produce an emission image corrected at least in part for attentuation.

4,633,399

METHOD OF SEISMIC DATA ENHANCEMENT USING A PHASE OF RECTIFIED TRACE SEISMIC PARAMETER

Beverly Stebens; Roger K. Parsons; Robert T. Baumel; Donna K. Terral, all of Ponca City, Okla., and Matthew J. Yedlin, Vancouver, Canada, assignors to Conoco Inc., Ponca City, Okla.

Filed Mar. 5, 1984, Ser. No. 574,059
Int. Cl.⁴ G01V *1/28*
U.S. Cl. 364—421 **5 Claims**



1. The method of developing a specific seismic data parameter from seismic trace data, comprising:

receiving processed seismic trace data for a selected plane of investigation;

rectifying said seismic trace data;

producing the Hilbert transform of said rectified trace data;

determining the instantaneous phase using Hilbert transformed rectified data; and

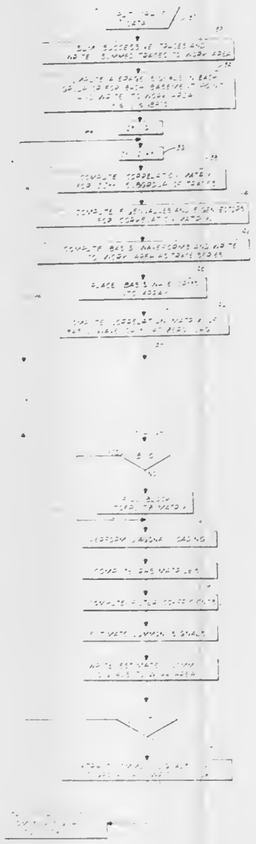
interpreting geological significance of the plane of investigation using instantaneous phase of the rectified and transformed data.

4,633,400

METHOD FOR WAVEFORM FEATURE EXTRACTION FROM SEISMIC SIGNALS

Chittibabu Chittineni, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 21, 1984, Ser. No. 685,037
Int. Cl.⁴ G06K *9/48*
U.S. Cl. 364—421 **18 Claims**



1. A method for processing seismic signal data comprising:

inputting seismic signal data in at least one groups of related trace signals;

summing and determining average signals for a selected number of successive traces in each of said at least one groups;

determining the correlation matrix for the at least one groups and constructing plural orthonormal basis waveforms;

estimating the common signals of said at least one groups of a linear combination of selected ones of said orthonormal basis waveforms; and

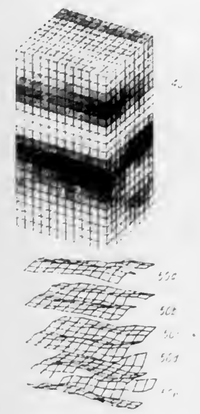
outputting the common signals as a noise reduced representation of said at least one groups of seismic signal data.

4,633,401

METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING PAIRS OF TURNINGS RELATED TO THE SAME SEISMIC EVENT IN ADJACENT SEISMIC TRACES

Bruce E. Flinchbaugh, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1984, Ser. No. 669,505
Int. Cl.⁴ G01V *1/30*
U.S. Cl. 364—421 **12 Claims**



7. A method of determining pairs of turnings in adjacent seismic traces of a three-dimensional seismic volume having stored parameters including the (N+1)th derivatives of the trace at each turning, comprising the steps of:

(a) comparing the parameters of the turnings in a first trace with the parameters of the turnings in a second trace;

(b) comparing the parameters of the turnings in the second trace with the parameters of the turnings in the first trace;

(c) detecting the differences between the parameters of the turnings of the first trace and the parameters of the turnings of the second trace, and vice versa;

(d) pairing those turnings having the smallest differences thereby designating the mutual nearest neighbor pairs of turnings; and

(e) repeating steps (a), (b), (c), and (d) for all of the traces in the three-dimensional seismic section.

4,633,402

METHOD AND APPARATUS FOR AUTOMATICALLY PRODUCING REPRESENTATIONS OF THREE-DIMENSIONAL HORIZONS FROM PROCESSED SEISMIC DATA

Bruce E. Flinchbaugh, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

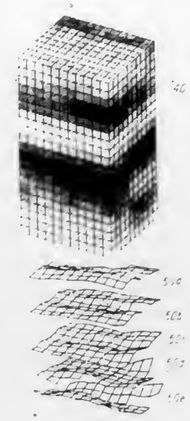
Filed Nov. 8, 1984, Ser. No. 669,502
Int. Cl.⁴ G01V *1/30*
U.S. Cl. 364—421 **23 Claims**

15. A method of automatically producing representations of three-dimensional recommended horizons from processed seismic data in the form of digital traces, comprising the steps of:

(a) identifying events in the digital traces;

(b) determining pairs of identified events that tentatively lie in the same horizon represented in a first format;

(c) reformatting at least one horizon, represented in a second format; and



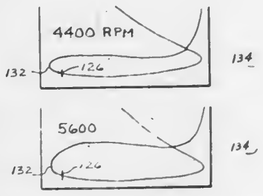
(d) storing the second format as a representation of the recommended horizon.

4,633,403

ENGINE VALVE TIMING

Thomas W. Asmus, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 5, 1984, Ser. No. 596,979
Int. Cl.⁴ F01L *1/34*
U.S. Cl. 364—431.05 **3 Claims**



1. A method for selecting optimum engine valve timing events for an internal combustion engine to maximize idle fuel economy and smoothness without significant reduction of engine performance at rated speed and at full load, comprising the steps of:

generating data to plot an expanded open-valve portion of an engine cylinder pressure-volume diagram for a series of different camshaft configurations and phasings of valve events over the expected useful engine speed range, particularly at rated speed and full load;

selecting camshafts and valve events from the series of expanded open valve diagrams of the engine at rated speed and under full load, a desirable exhaust valve opening event which occurs before the bottom dead center piston position just sufficiently to produce an efficient early evacuation of burned combustion products from the cylinder, characterized in the expanded pressure-volume plots by a rapid decrease in cylinder pressure adjacent the bottom dead center piston position and following the expansion and thereafter a substantially constant low pressure plot during the open exhaust valve evacuation cycle portion when the piston moves towards the top dead center position;

selecting from the series of expanded open valve diagrams of the engine at rated speeds and under full load conditions a

desirable exhaust valve closing event occurring adjacent to and after the top dead center piston position just sufficiently to produce a substantially complete evacuation of the burned combustion products from the cylinder, characterized in the expanded pressure-volume plots by a substantially horizontal plot representing a relatively constant pressure as the piston moves past the top dead center position, thus avoiding an undesirable rapid increase in pressure before the top dead center position is attained by the piston which increase is an unfavorable indicator of the exhaust valve closing event phased too early in the engine cycle;

selecting from the series of expanded open valve diagrams of the engine plotted under substantially idle and no load conditions, a desirable intake valve opening event, occurring before the selected exhaust valve closing event just sufficiently to produce efficient filling of the combustion chamber with a charge of fuel and air without substantial leakage of combustion products back into the cylinder characterized in the expanded pressure-volume plots by a substantially horizontal plot of constant pressure between the piston's top dead center position and the piston's bottom dead center position, thus avoiding an undesirable substantial decrease in cylinder pressure at and immediately after the top dead center position which is an unfavorable indicator of the intake valve opening event phased too late in the engine cycle.

4,633,404

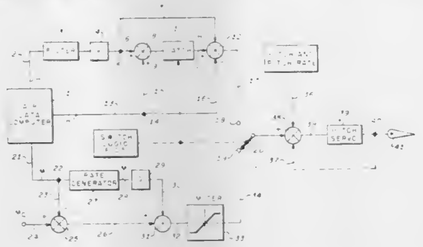
AUTOMATIC DECELERATION OF AIRCRAFT DURING DESCENT

Jeffrey A. Greeson, and Terry L. Zweifel, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed May 20, 1983, Ser. No. 496,767

Int. Cl.⁴ G06F *15/48, 15/50;* **G06G** *7/70, 7/76*

U.S. Cl. 364—433 **12 Claims**



1. Deceleration control apparatus for an aircraft flight control system including servo means for controlling aircraft pitch attitude, comprising

a. An airspeed hold subsystem for controlling said servo means,

b. An altitude capture and hold subsystem for controlling said servo means,

c. Means for commanding a new airspeed less than an existing commanded airspeed, said existing commanded airspeed being held by said airspeed hold subsystem, and

d. switching means responsive to the difference between said commanded new airspeed and said existing commanded airspeed for severing said airspeed hold subsystem from control of said servo means and substituting said altitude capture and hold subsystem therefor.

4,633,405

COPYING MACHINE WITH AUTOMATIC RESETTING CONTROL FEATURES

Masazumi Ito, Toyohashi; Yutaka Irie; Yoshikazu Ikenoue, both of Toyokawa, and Minoru Nakamura, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1984, Ser. No. 630,513

Claims priority, application Japan, Jul. 15, 1983, 58-130133

Int. Cl.⁴ G05B *9/02;* **G03G** *15/00*

U.S. Cl. 364—184 **12 Claims**



1. A control apparatus for copying machines or the like comprising:

means for permitting a user to vary the operating conditions of the machine from a set of predetermined standard operating conditions;

means for resetting operating conditions for the machine automatically to standard conditions upon lapse of a specified period of time after the completion of an operation of the machine or after a predetermined input procedure by the user,

a key device associated with the machine for permitting the operation of the machine,

means for detecting whether the machine operation is permitted by the key device, and

means for effecting the autoresetting function to reset the operating conditions to the standard conditions when the detecting means detects that the machine has been brought out of the operation permitted state by the key device, irrespective of any lapse of the specified period of time for the autoresetting.

4,633,406

DIGITAL DATA PROCESSING SYSTEM METHOD FOR MAKING A GENERAL CALL

Lawrence H. Katz, Oregon City, Oreg.; Douglas M. Wells, Chapel Hill, N.C., and Richard G. Bratt, Wayland, Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 493,900, Aug. 10, 1983, abandoned, which is a division of Ser. No. 222,531, May 22, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,731

Int. Cl.⁴ G06F *9/44*

U.S. Cl. 364—200 **11 Claims**

1. In a digital computer system including

(A) memory means for storing and for providing data including instruction sequences in response to memory signals including addresses specifying locations in said memory mean, and

(B) processing means for providing said memory signals and for performing operations by executing an instruction sequence and responding to the instructions thereof, said operations including a call operation suspending the execution of a current instruction sequence and commencing the execution of a new instruction sequence,

means for performing a call operation in response to an internal condition of said processor means comprising:

fault handling means in said processor means responsive to said internal condition for providing data representing an address of an instruction sequence; and

general call operation execution means in said processor means responsive to said fault handling means for receiving at least said provided data, for suspending the execution of the current instruction sequence, and for commencing the execution of a new instruction sequence the address of which is represented by said provided data.

4,633,407

METHOD AND DEVICE FOR TARGET TRACKING OF LAND VEHICLES

Bernd Freienstein; Ernst Peter Neukirchner; Otmar Pilsak, all of Hildesheim, and Dietmar Schlögl, Sibesse, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

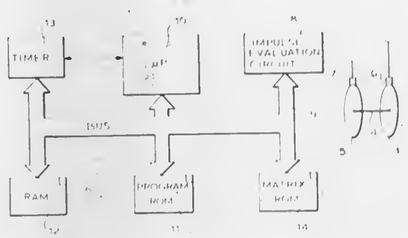
PCT No. PCT/DE83/00177, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01823, PCT Pub. Date May 10, 1984

PCT Filed Oct. 21, 1983, Ser. No. 616,230

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241023

Int. Cl.⁴ G06F *15/50*

U.S. Cl. 364—450 **3 Claims**



2. A device for tracking position of a land vehicle by means of a planimetric dead reckoning navigation, comprising two impulse transmitters for detecting rotations of two wheels on a vehicle axis, a computing device for evaluating signals from said impulse transmitters and computing the travel path and the travel direction from the evaluated signals; a timer for counting the time of the detection evaluation of said signals; and means for storing a set of predetermined factors; and correction means for selecting a corresponding correction factor in said set based on the three variables corresponding to the sum of rotations of one of said wheels, the difference between the rotations of said wheels and the time required for the detection and evaluation of said rotations; said correction means corrects the computed travel direction by said selected corresponding correction factor.

4,633,408

PROGRAM-CONTROLLED EDGE GRINDING MACHINE FOR GLASS PANES WITH A PROGRAM-CONTROLLED ROTATABLE GRINDING HEAD

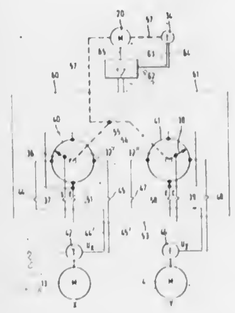
Heinz-Josef Reinmold; Horst Mucha, both of Aachen, and Heinz-Dieter Friedrich, Stolberg, all of Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Aubervilliers, France

Filed Jan. 9, 1984, Ser. No. 569,155

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301170

Int. Cl.⁴ B24B *9/10*

U.S. Cl. 364—474 **12 Claims**



1. A grinding apparatus for grinding the edge of a glass pane including a slide movement through input control of an information carrier in an X-Y coordinate system, a grinding tool, a grinding head, a mount for mounting said grinding tool on said slide adapted for movement with said grinding tool in opposite longitudinal directions, said apparatus characterized by a motor for driving said grinding head through a 360° turn during the course around said glass pane to maintain the axis of movement of said mount and grinding tool in a constant fixed position relative substantially to each increment of an edge of said glass pane as said grinding tool grinds said edge, and means providing an output signal for controlling said motor and the angular position of said grinding head, said output signal of said controlling means being responsive to and derived from signals taken from said information carrier for path control of said slide in said X-Y coordinate system.

4,633,409

NUMERICAL CONTROL DEVICE

Katsuhide Sekikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,472

Claims priority, application Japan, May 23, 1983, 58-90273

Int. Cl.⁴ G06F *15/46;* **G05B** *9/00*

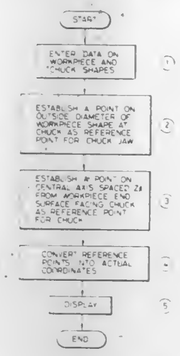
U.S. Cl. 364—474 **3 Claims**

1. A numerical control device comprising:

a controller for controlling a machine tool having first and second holder mechanisms for jointly holding a workpiece; and

a graphic display unit coupled to said controller for displaying the workpiece as held by said first and second holder

mechanisms in accordance with data indicative of dimensional details of said workpiece, dimensional details of said



first holder mechanism, and dimensional details of said second holder mechanism entered into said controller.

4,633,410

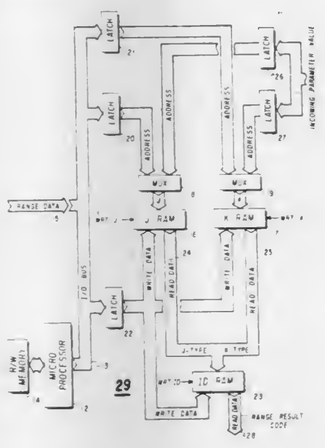
METHOD AND APPARATUS FOR DETERMINING IF A DIGITAL VALUE LIES WITHIN A RANGE

Richard A. Nygaard, Jr., and Fredrick J. Palmer, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 392,980, Jun. 28, 1982, Pat. No. 4,554,632. This application Jul. 23, 1985, Ser. No. 758,183

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—481 **21 Claims**



1. Apparatus for determining if a digital value encoded by logic signals lies within a range, comprising:

first memory means, addressed by a first portion of the digital value, for storing in its various locations type codes determined in accordance with the range and for producing at a first output a first type code stored in the location addressed by the first portion;

second memory means, addressed by a second portion of the digital value, for storing in its various locations type codes determined in accordance with the range and for producing at a second output a second type code stored in the location addressed by the second portion; and

third memory means coupled to the first and second outputs and addressed by the first and second type codes, for storing in its various locations symbols indicative of whether or not the digital value lies within the range and for producing at a third output the symbol stored in the location addressed by the first and second type codes.

4,633,411

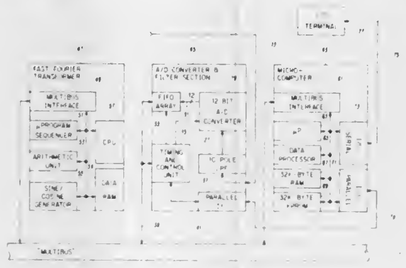
LINK QUALITY ANALYZER

David H. Bliss, Cedar Rapids, Iowa, and Joseph C. Whited, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,656

Int. Cl.⁴ H04B *3/46, 17/00;* **G06F** *15/332*

U.S. Cl. 364—481 **21 Claims**



1. A line quality analyzer for measuring the quality of communication links in a communications system comprising:

means for transmitting information over a selected communication link;

means for generating a plurality of signal tones and coupling those tones for transmission by said means for transmitting over said communication link;

means for receiving said plurality of transmitted tones and any noise on said communication link to obtain a received signal;

means for time domain sampling said received signal to obtain a set of N blocks of digitized samples with each block having M samples, where M and N are integers;

Fast Fourier Transform means for transforming the blocks of M digitized samples from the time domain to the frequency domain; and

measuring means for detecting the frequency spreads for each of the plurality of transmitted tones and for detecting the multipath time delay spreads represented by received envelopes of at least each tone pair contained within the plurality of transmitted tones to obtain link quality parameters representing the quality of said communication link.

20. A method of measuring the quality of communication links between a transmitting station and a receiving station comprising:

transmitting a plurality of signal tones over a communication link;

receiving the plurality of transmitted tones and link noise to obtain a received signal;

time domain sampling said received signal to obtain a set of N blocks of digitized samples with each block having M samples;

transforming the blocks of M digitized samples from the time domain to the frequency domain; and

measuring the transformer signals to obtain link quality parameters representing the quality of said communication link for N blocks of M samples where M and N are positive integers, said measuring step including:

indexing the transformed signals according to frequency to obtain a power spectrum of the plurality of signal tones and link noise in sets of sample time,

measuring the frequency offset of each of the plurality of tones from the power spectrum,

accumulating the power spectrum of subsequent reception of the plurality of tones and link noise to obtain an accumulated spectrum,

storing each power spectrum of each set of plurality of tones and link noise as well as the frequency offset, and

measuring link quality parameters from the accumulated spectra, each tone power spectrum and the frequency offset, said step of measuring the link quality parameters further including:

obtaining an average frequency offset for each tone,

obtaining an RMS frequency offset value for each tone,

obtaining amplitude correlation coefficients for each of the plurality of transmitted tones from the M blocks of N samples,

detecting frequency spreads for each of the plurality of transmitted tones from the N blocks of M samples,

detecting received envelopes of each tone of the plurality of transmitted tones,

detecting multipath time delay spreads as indicated by the received envelopes of each tone pair contained within the plurality of transmitted tones,

detecting multipath time delay spread as indicated by the received envelopes of each of the tone triplets contained within the plurality of transmitted tones,

detecting the second and third harmonics for each of the plurality of transmitted tones, and

measuring intermodulation products due to pairs of members of the plurality of transmitted tones.

4,633,412

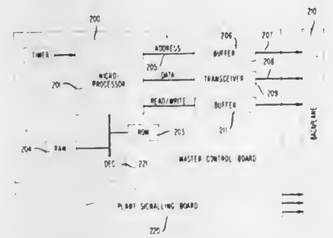
OPTION PROTOCOL ARRANGEMENT FOR STORED PROGRAM RECTIFIER CONTROLLER

Harry K. Ebert, Jr., Whippany; Henry E. Menkes, Montville; Thomas V. Papathomas, Madison, and Chitra R. Venkatram, Morris Township, Morris County, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 26, 1984, Ser. No. 604,042

Int. Cl.⁴ G05B *19/02;* **G06F** *15/46;* **H02M** *7/08*

U.S. Cl. 364—493 **9 Claims**



1. A power plant control system comprising:

master control means for monitoring the status of a power plant system,

option acceptance means including:

a plurality of input means for accepting independent circuit modules and coupling them to the master control means, each circuit module including:

processor means for responding to an option request and alerting the master control means of an option call,

memory means including a stored program for executing the option request and having an address recognizable to the master control means, and

circuit connection means for coupling the memory means to the master controller.

4,633,413

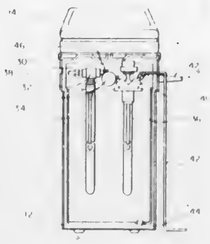
DIGITAL DILUTION APPARATUS AND METHOD

Robert Caveney, San Jose; Dana Gilliam, Sunnyvale; Melvin Chan, Daly City, and Michael Bailey, Santa Cruz, all of Calif., assignors to Cavro Scientific Instruments, Sunnyvale, Calif.

Filed Jul. 28, 1983, Ser. No. 518,217

Int. Cl.⁴ G06F *15/42;* **B67D** *5/30*

U.S. Cl. 364—500 **25 Claims**



1. Digital dilution apparatus comprising:

processor means including memory means for storing a series of programmed instructions which correspond to operator-controlled general dilution processing requests,

keyboard input means having a plurality of function display indicators where each of said indicators corresponds to a specified liquid sample processing function for communicating said operator-controlled general dilution processing requests to said processor means,

output means,

said processor means responsive to said dilution processing requests for generating a series of communications to said output means inquiring of the specific nature of said processing requests,

said input means responsive to said series of communications for entering operator-controlled repeatable specified processing mode of operation requests to said processor means such that actuation of one of said function indicators serves to generate repeatable specific processing requests,

said processor means responsive to said entered requests for processing said specified repeatable dilution processing requests.

4,633,414

ROBOT OPERATION CONTROL SYSTEM

Yuhiko Yabe, Kasukabe; Hideo Uzuhashi, and Yoshiaki Yoshikawa, both of Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,616

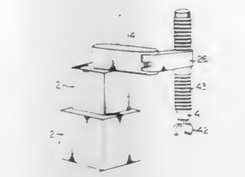
Claims priority, application Japan, Nov. 26, 1982, 57-206186; Mar. 14, 1983, 58-40688

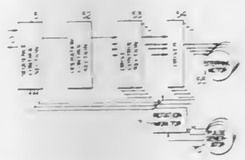
Int. Cl.⁴ G05B *19/42;* **B25J** *9/00, 13/00*

U.S. Cl. 364—513 **4 Claims**

1. A robot operation control system comprising control section means, a plurality of drivers which are driven by pulse signals from said control section means, and a plurality of stepping motors which are respectively driven on the basis of outputs from an associated one of said drivers to control the point-to-point movement of an arm, said control section means including a sequence control section, an operation control section and a plurality of drive control sections, said seqence control section applying signals representative of a target point to said operation control section in accordance with a prescribed sequence, said operation control section applying signals representative of directions and angles by which axes of the arm are rotated to said drive control sections, and said drive control sections being arranged in accordance with

respective axes of the arm to apply the pulse signals representative of speeds dependent on predetermined acceleration/deceleration to said drivers, respectively, so that the arm is moved to the target point.



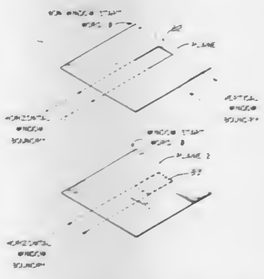


4,633,415

WINDOWING AND SCROLLING FOR A CATHODE-RAY TUBE DISPLAY

Anthony B. Vink, Canton; Edward F. Asam, Ann Arbor, and Dewayne J. Ferris, Brighton, all of Mich., assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 11, 1984, Ser. No. 619,373
Int. Cl.[4] G06F *3/14*; G09G *1/00*
U.S. Cl. 364—521 **5 Claims**



1. A control circuit for producing an independent, scrollable display region on the face of a cathode-ray tube (CRT) in a bit-mapped data display system, said control circuit comprising:

a first vertical boundary detection means for detecting the beginning of said independent display region along a vertical axis;

a second vertical boundary detection means for detecting the finish of said independent display region along said vertical axis;

a first horizontal boundary detection means for detecting the beginning of said independent display region along a horizontal axis;

a second horizontal boundary detection means for detecting the finish of said independent display region along said horizontal axis;

control means responsive to said first and second vertical boundary detection means and to said first and second horizontal boundary detection means for producing a binary signal having a first value indicative of said independent display region existing and having a second value indicative of said independent display region not existing;

first memory address means for generating a sequence of addresses pertaining to said independent display region;

second memory address means for generating a sequence of addresses not pertaining to said independent display region; and

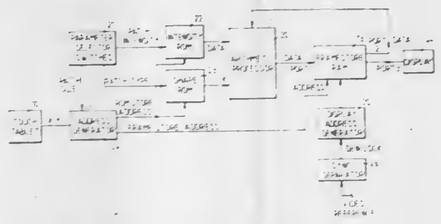
memory address selection means for selecting, in response to said binary signal, either a memory address from said first memory address means pertaining to said independent display region or a memory address from said second memory address means not pertaining to said independent display region.

4,633,416

VIDEO IMAGE CREATION SYSTEM WHICH SIMULATES DRAFTING TOOL

Ian C. Walker, Newbury, England, assignor to Quantel Limited, Newbury, England

Continuation of Ser. No. 641,544, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 326,293, Dec. 1, 1981, Pat. No. 4,514,818. This application Jul. 29, 1985, Ser. No. 761,305
Claims priority, application United Kingdom, Dec. 4, 1980, 8038887
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] H04N *1/22*; G09G *1/16*
U.S. Cl. 364—521 **34 Claims**



1. A video image creation system comprising:

drafting means operable by an operator to designate points on a desired image;

means for producing first signals representing a characteristic to be imparted to the image at said points;

a store having storage locations corresponding to points on the image;

processing means for producing for each point designated by said drafting means a new image signal which is a function of said first signal and of a previous image signal for the same point derived from the location in said store corresponding to the respective point;

means for storing the new image signal at the location in said store corresponding to the respective point; and

means for reading image signals from said store to produce an image corresponding to the stored signals.

33. A video image creation system comprising drafting means operable by the operator to designate desired strokes in an image, video image display means, processing means responsive to said drafting means to derive image signals which when applied to said display means will produce an image of said desired strokes, said processing means being such that said image signals cause the intensity and/or colour of the desired strokes to vary across the width of the strokes, and means for applying said video signals to said display to create an image.

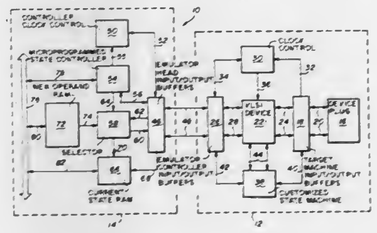
34. A video image creation system comprising drafting means operable by the operator to designate positions on a desired shape, video image display means, processing means responsive to said drafting means for producing for each position designated by said drafting means a group of image signals relating to a patch of image points, the signals of the said group having different values to simulate the distribution of a video characteristic over said patch, means for applying such groups of image signals to said display means in such a manner as to produce for each designated point a patch of image points on the display exhibiting said distribution of a video characteristic.

4,633,417

EMULATOR FOR NON-FIXED INSTRUCTION SET VLSI DEVICES

Darrell L. Wilburn, Saratoga, and John R. Mick, Los Altos Hills, both of Calif., assignors to Step Engineering, Sunnyvale, Calif.

Filed Jun. 20, 1984, Ser. No. 622,691
Int. Cl.[4] G06G *7/48*; G01R *15/12*
U.S. Cl. 364—550 **16 Claims**



6. A device for emulating a VLSI device in a target machine comprising:

an emulator controller including a microprogrammable state controller, which is programmed for controlling the transmission of instructions and control signals to a VLSI device and the reception of data from the VLSI device and the target machine, connected to a multiplexer means, such that a first output of sai microprogrammable state controller is a first input to said multiplexer means a means for storing new operands connected to said multiplexer means such that an output of said means for storing new operands is a second input ot said multiplexer means, a data bus connected to an output of said multiplexer mcans, a data/address bus connected to a second output of the microprogrammable state controller, a means for storing current state data, connected to said data bus and said data/address bus, a means for locating data in the current state data storage means, connected intermediate said microprogrammable state controller and said current state data storage means, which is controlled by the microprogrammable state controller, a means for generating timing signals for the timing of switching circuits in the emulator controller and a means for controlling and varying a clock microcycle type connected to the means for transmitting signals, instructions and data between the emulator controller and the emulator head;

an emulator head including a VLSI device, a means for inputting data and instructions into the VLSI device, a means for bi-directionally inputting and outputting signals from the VLSI device, a means for controlling clock signals to the VLSI device such that either the target machine or the means for controlling and varying a clock microcycle type supplies the clock signals, a means for connecting the input means to a trace device, a means for connecting the bi-directional input and output means to a trace device, and a means for inputting control signals into the VLSI device;

a means for transmitting signals, instructions and data between the emulator controller and the emulator head; and

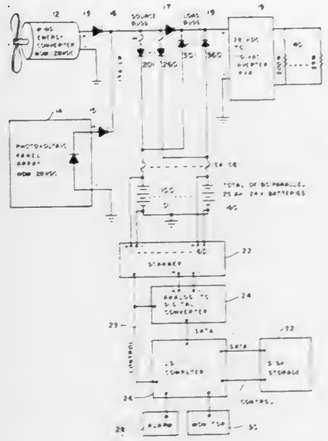
a means for connecting the emulator head to a target machine such that the VLSI device in the target machine is effectively replaced by the emulator head.

4,633,418

BATTERY CONTROL AND FAULT DETECTION METHOD

Wayne S. Bishop, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,865
Int. Cl.[4] G06F *15/20*; G01N *27/46*
U.S. Cl. 364—554 **4 Claims**



1. The method of monitoring the condition of a battery by monitoring at least one parameter, wherein the battery comprises a plurality of units, each unit comprising a given number of cells connected in a given manner, said method comprising the steps of:

scanning the units and measuring and storing the value of said parameter for each unit,

deriving a mean value of the parameter and determining the individual deviation from said mean value for each unit,

calculating a standard deviation using the individual deviations,

determining a tolerance value equal to a given number times the standard deviation,

comparing the value of the parameter for each unit with said tolerance and flagging any values which differ from the mean by more than said tolerance,

displaying the value of said parameter for each unit and highlighting any value which is out of limit,

making a decision as to whether there were any out of limit values flagged, if not then initiating another scan, or if any value has been flagged then actuating an alarm.

4,633,419

ANGLE MEASURING DEVICE

Masaaki Niiho; Masato Hara, and Eiji Takasugi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 7, 1984, Ser. No. 586,923
Claims priority, application Japan, Mar. 7, 1983, 58-32436[U]; Mar. 7, 1983, 58-32437[U]; Mar. 22, 1983, 58-41019[U]
Int. Cl.[4] G06F *15/20*; G01B *7/30*
U.S. Cl. 364—559 **5 Claims**

1. An angle measuring device comprising:

a disc rotating at a constant speed;

a reference point provided for said disc, said reference point being fixedly secured a housing;

a reference region including said reference point;

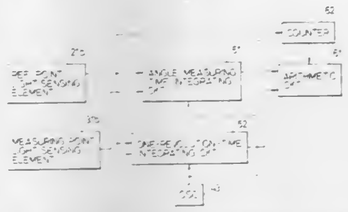
an angle measuring arm concentric with said disc and rotatable;

first and second measuring points provided on said arm in

such a manner that said first and second measuring points are positioed symmetrically with respect to the center of rotation of said arm;

arithmetic means for multiplying a ratio of an angle measuring time required for said disc to turn from said reference point to said first or second measuring point to a one-revolution time required for said disc to make one complete rotation through 360°;

determining means for determining whether or not said first measuring point is in said reference region;



change-over means for switching measuring operations in such a manner that when said first measuring point is in said refernce region a period of time required for said disc to turn from said reference point to said second measuring point is measured and when said first measuring point is out of said reference region a period of time required for said disc to turn from said reference point to said first measuring point is measured; and

measured angle correcting means for subtracting 180° from a measured angle when said first measuring point is in said reference region.

4,633,420

PROFILE MEASUREMENT APPARATUS USING RADIATION

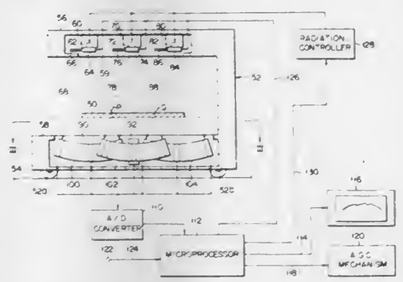
Kazunori Masanobu, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 442,646, Nov. 18, 1982, abandoned. This application Oct. 11, 1985, Ser. No. 786,357

Claims priority, application Japan, Nov. 26, 1981, 56-189540

Int. Cl.⁴ G01N *23/16, 23/22;* **G01B** *15/02*

U.S. Cl. 364—563 **10 Claims**



1. A profile measurement apparatus for measuring a thickness of a strip which is conveyed in a predetermined direction, comprising:

(a) a plurality of stationary radiation sources disposed in an approximately linear manner and spaced apart from one surface of said strip, for simultaneously and continuously producing a plurality of radiation beams of sector shapes in a direction substantially perpendicular to a travelling direction of the strip along the width of the strip, at least two of the radiation bemas being offset with respect to each other in the travelling direction, and the radiation beams in combination being simultaneously and continuously incident along a substantially linear surface area along the entire width of said one surface of said strip and at least partially transmitted through said strip;

(b) a plurality of multi-channel detectors disposed to be spaced apart from the other surface of said strip and respectively corresponding to said plurality of radiation sources, for respectively and independently receiving the radiation beams of sector shapes which are continuously radiated from said radiation sources and which are transmitted through said strip to become incident on the corresponding one of the multi-channel detectors, and for producing first profile signals corresponding to intensities of said incident radiation beams and to thickness at the substantially linear surface area radiated by the radiation beams; and

(c) operating means, connected to said multi-channel detectors, for producing an image signal indicating a sectional shape at the substantially linear surface area of said strip in accordance with the first profile signals, whereby the entire surface of said strip is scanned with the sector-shaped radiation beams and hence a section of said strip along the entire width thereof is continuously measured.

4,633,421

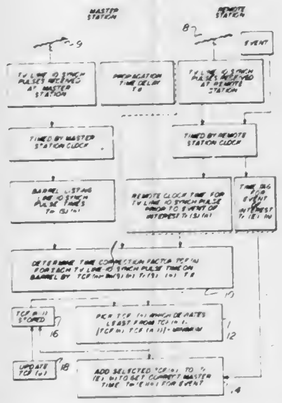
METHOD FOR TRANSPOSING TIME MEASUREMENTS FROM ONE TIME FRAME TO ANOTHER

Charles W. Watson, Jr., North Wales, Pa., and Christopher M. Siegl, Beltsville, Md., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 23, 1983, Ser. No. 565,087

Int. Cl.⁴ G04F *15/46;* **G04C** *11/02;* **G08C** *15/08;* **H04L** *7/02*

U.S. Cl. 364—569 **5 Claims**



1. A method for correlating time tags associated with events of interest detected at any of a plurality of remote stations in a digital data acquisition system having a master station connected to receive data from said plurality of remote stations where said time tags represent the data gathered at the remote stations indicating the time of occurrence of each of said events as obtained by reference to an unsynchronized clock at the remote station detecting the occurrence of the event and the correlation is to time as kept by a clock at the master station, to make possible a time ordering of events at different remote stations, comprising the steps of:

maintaining at said master station a list of line **10** synch pulse times from a single television station as determined from the master clock for a predetermined number of line **10** synch pulses previous to the last most recent line **10** synch pulse received;

transmitting at each of a sequence of interrogatory periods (n) and periodic update periods (u) from said master to said remote stations message requesting information on time tagged events at said remote stations;

producing and transmitting to said master during said interrogatory periods (n) at each remote station in response to said messages a signal constituting a reply message incorporating as a first signal the time tags, Tr(E)(n), for the events information requested, and as a second signal the line **10** synch times at the remote stations, Tr(S)(n), for the line **10** synch pulse previous to each of the events;

producing at said master station a third signal, Td, representative of the difference in propagation time from the TV transmitter to the remote station as compared with the master station;

producing at each interrogatory period at said master station a time correction factor, TCF(n), as a function of said second and third signals in accordance with the equation

$$TCF(n) = Tm(S)(n) - Tr(S)(n) - Td.$$

where Tm(S)(n) is the time established from said list for the line **10** synch pulse identified by the signal Tr(S)(n), said time Tm(S)(n) being identified on said list as that one which causes the resulting correction factor, TCF(n), to deviate from the previous correction factor, TCF(n−1), by a minimum as compared with the correction factors corresponding to the other times on said list;

periodically updating the said previous correction factor, TCF(n−1) used to obtain the value of the present correction factor, TCF(n), to compensate for the drift of the clocks at the remote stations with reference to the master station;

summing for each event said time correction factor and the first signal, representing the time tag Tr(E)(n), to produce a signal representing the correct timing of the events with reference to the master clock; and

recording said correct timing signal for each event to provide a basis for time ordering a sequence of events occurring at different remote stations.

4,633,422

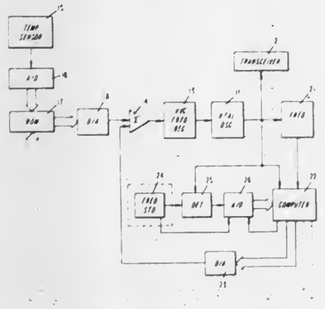
APPARATUS FOR AND METHOD OF COMPENSATING FOR VARIATIONS DUE TO AGING

Frank M. Brauer, Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jul. 26, 1983, Ser. No. 517,428

Int. Cl.⁴ G01C *25/00;* **G01F** *25/00*

U.S. Cl. 364—571 **26 Claims**



1. Apparatus for compensating for variations due to aging in resonant frequency characteristics of an electromechanical resonator, said compensating apparatus comprising an oscillator including the resonator, means responsive to the number of cycles generated by the oscillator for deriving a first signal indicative of the amount of time that the oscillator has been operating, computer means responsive to the first signal for deriving a second signal having a value indicative of a correction factor for the resonator aging, and means for controlling the frequency of the oscillator in response to the value of the second signal.

4,633,423

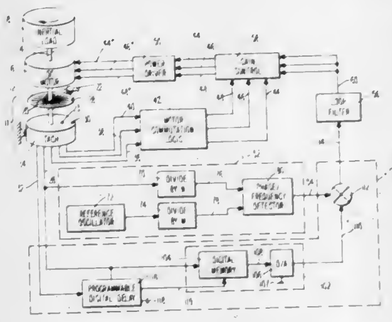
COHERENT ERROR SUPPRESSION IN DIGITAL TACHOMETERS AND THE LIKE

Roger G. Bailey, Lafayette, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Mar. 27, 1984, Ser. No. 593,723

Int. Cl.⁴ G05B *11/01*

U.S. Cl. 364—571 **18 Claims**



1. An improved velocity control system for a member moved by a drive means comprisng:

encoder means for dividing a movement of the member into a plurality of substantially regularly spaced sequential segments;

sensing means cooperating with the encoder means for generating a high output signal of sequential pulses, each pulse being generated in conjunction with the member traversing a single segment and the frequency of the sequential pulses being indicative of velocity of the member;

means for generating a reference pulse signal, the frequency of pulses of the reference signal representing a desired instantaneous velocity of the member;

error sensing means responsive to the high output signal and the reference pulse signal for generating an error signal indicative of the difference between velocity indicated by the high output signal and a desired instantaneous velocity;

correction means responsive to said pulses of the high output signal for generating a predetermined coherent error correction signal of varying value in synchronization with the movement of said member, the value of the correction signal being the same each time the moving member is traversing the same segment; and

means combining the error signal and the correction signal for generating a corrected error signal having a diminished coherent error component in comparison with said error signal, the drive means being responsive to the corrected error signal.

4,633,424

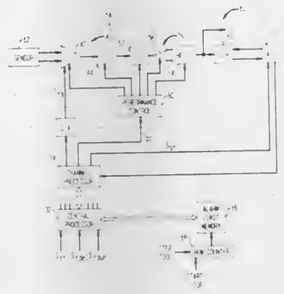
PROGRAMMABLE MULTI-CHANNEL TOOL MONITOR WITH MULTIPLE ALARM LIMITS AND SENSOR TARING

Rolf Norberg, Gavle, Sweden, and Tomas Svensson, Lauberschausen, Fed. Rep. of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

Division of Ser. No. 552,434, Nov. 16, 1983. This application Sep. 10, 1985, Ser. No. 774,434

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—571 **7 Claims**



1. Apparatus for taring the output of a transducer which produces an electrical output signal, comprising:

signal conditioning means which receives said electrical output signal and produces an analog output signal;

means for deriving a reference tare value from said output signal of said conditioning means;

means for determining a low resolution approximation of said reference tare value and for producing a biasing signal that is applied to said conditioning means to cause said analog output signal to be tared by a factor corresponding to the magnitude of said biasing signal;

means for producing a high resolution digital output signal corresponding to the analog output signal of said conditioning means;

means for generating a high resolution digital tare signal correspoinding to the difference between said reference tare value and said approximation thereof; and

means for subtracting said digital tare signal from said digital output signal to obtain a fully tared transducer signal.

4,633,425

SWITCHED CAPACITOR FILTER UTILIZING A DIFFERENTIAL INPUT AND OUTPUT CIRCUIT

Daniel Senderowicz, Berkeley, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 311,144, Oct. 13, 1981, Pat. No. 4,574,250. This application May 28, 1985, Ser. No. 738,281

Int. Cl.⁴ G06G *7/02;* **G06F** *7/38;* **H03H** *7/28, 7/14*

U.S. Cl. 364—825 **5 Claims**



1. An integrated circuit for filtering signals by having cascaded switched capacitor differential sampling filters comprising:

transmit means for converting an analog input signal to a digital transmit signal, said transmit means comprises;

(a) an anti-aliasing filter coupled to said analog input and providing an oversampled filtering;

(b) a transmit core filter coupled to said anti-aliasing filter;

(c) a highpass filter coupled to said transmit core filter;

(d) an encoder coupled to said highpass filter and having a balanced differential input for generating said digital transmit signal;

whereby power supply rejection and signal-to-noise ratios are improved.

4,633,426

METHOD AND APPARATUS FOR DETECTING A BINARY CONVOLUTED CODED SIGNAL

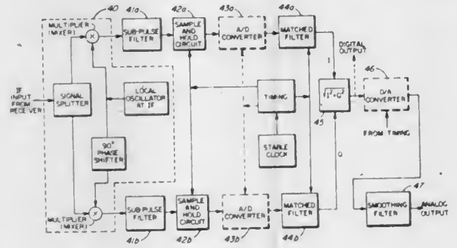
Gerald O. Venier, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 295,369, Aug. 24, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 646,454

Claims priority, application Canada, Aug. 27, 1980, 359107

Int. Cl.⁴ H03H *17/04;* **G06F** *15/336;* **H03D** *1/00*

U.S. Cl. 364—724 **14 Claims**



14. A method of detecting, in a plurality of stages, a convoluted coded signal having a plurality of code levels ranging from a low level, high repetition rate code to a high level, low repetition rate code comprising the steps of:

a. separating in-phase and quadrature components of a convoluted coded signal,

b. separately storing the elements of the components of the convoluted coded signals,

c. tapping the stored elements at intervals defined by a specified convoluted code level to obtain two sets of samples,

d. multiplying the samples, each with a polarity coefficient determined by the polarity of a related convoluted code element to obtain two sets of translated samples,

e. separately summing the two sets of translated samples to obtain output signals, and

f. combining the sums to obtain a complex output signal.

4,633,427

ADVANCED CUBE PROCESSOR

Richard P. Bocker, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1984, Ser. No. 626,506

Int. Cl.⁴ G06G *7/16*

U.S. Cl. 364—822 **10 Claims**

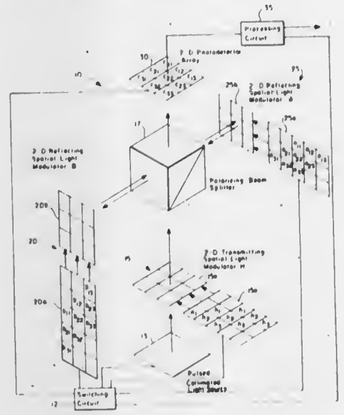
1. An apparatus capable of electrooptically performing triple-matrix multiplication, including an H-matrix of optically encoded information of numbers in diagonal form comprising:

a source of pulsed collimated light;

first means aligned to be illuminated by pulsed collimated light from the source for providing the H-matrix of optically encoded information of numbers arranged in diagonal form that are laterally shifted each time the source is pulsed;

second means disposed to be illuminated by the same pulsed collimated light from the source after the first H-matrix providing means has been illuminated thereby for providing a second matrix of optically encoded information of numbers;

third means disposed to be illuminated by the same pulsed collimated light from the source after the first H-matrix providing means and the second matrix providing means have been illuminated thereby for providing a third matrix of optically encoded information of numbers, wherein the second matrix providing means and the third matrix providing means are oriented and coupled to be mutually



orthogonally displaced with respect to one another to optically align different encoded information of numbers each time the light source is pulsed to enable an arithmetic processing thereof;

means disposed in an optically aligned relationship with the first H-matrix providing means, the second matrix providing means and the third matrix providing means for adding successively arithmetically processed encoded information of numbers of the first H-matrix providing means, the second matrix providing means and the third matrix providing means.

4,633,428

OPTICAL MATRIX-VECTOR MULTIPLICATION

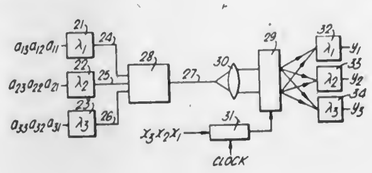
Kevin C. Byron, Bishop's Stortford, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed Jan. 24, 1985, Ser. No. 694,247

Claims priority, application United Kingdom, Feb. 25, 1984, 8404966

Int. Cl.⁴ G06G *7/16;* **G02B** *6/10, 5/18*

U.S. Cl. 364—841 **9 Claims**



1. An optical matrix-vector multiplier, for multiplying a matrix comprising m rows and n columns of components by a vector with n components whereby to form an m-component vector, comprising m light-emitting devices each capable of producing light at a different respective wavelength, a collimating lens, an acousto-optic modulator capable of being driven in response to each of the n components of the vector, and m integrating photodetectors each responding to a different one of said wavelengths, and wherein in use light is produced by each of said light-emitting devices in turn and directed to said acousto-optic modulator, for modulation thereby, by the collimating lens, which lens is common to all of the light-emitting devices, the photodetectors being disposed to detect the modulated light.

4,633,429

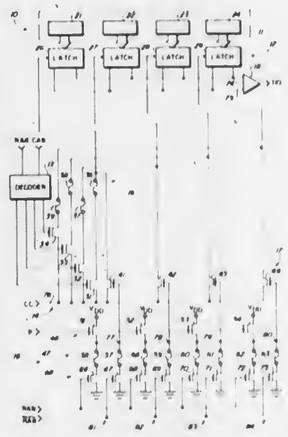
PARTIAL MEMORY SELECTION USING A PROGRAMMABLE DECODER

Alan J. Lewandowski, and Jerry D. Moench, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,008

Int. Cl.⁴ G11C *17/00, 13/00*

U.S. Cl. 365—96 **11 Claims**



1. In a memory having a plurality of substantially equal memory array portions in which each provides a data bit to a corresponding data latch in response to a first portion of an address and a first decoder for selecting any one of the data latches in response to a second portion of the address; a circuit for implementing a partial memory in which data is selected only from a predetermined subset of the plurality of memory array portions, comprising:

a programmable second decoder, coupled to the data latches, for, when programmed, selecting only from among data latches which correspond to the predetermined subset of memory array portions in response to a sub-portion of the second portion of the address, and for being disabled when not programmed; and

disabling means, coupled to the first decoder, for enabling or permanently disabling the first decoder, said first decoder being permanently disabled by the disabling means if said second decoder is programmed;

whereby said memory provides data only from the predetermined subset of array portions when said second decoder is programmed.

4,633,430

CONTROL STRUCTURE FOR A DOCUMENT PROCESSING SYSTEM

James L. Cooper, Tyngsboro, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Oct. 3, 1983, Ser. No. 538,726

Int. Cl.⁴ G06Z *15/00*

U.S. Cl. 364—900 **16 Claims**

8. In an information processing system including keyboard

means for entering document data and document manipulation commands, processor means for operating upon said documents and means for displaying said documents, means for controlling operations of said system, comprising:

document memory means for storing segments of a document being operated upon,

document control means, including

buffer means for transferring said document data between said document memory means and said keyboard and display means,

document access means for storing and providing

information identifying the locations in said document memory means of segments of a said document currently being operated upon, and

information identifying the locations in said buffer means of said document data to be transferred between said document memory means and said keyboard and display means,

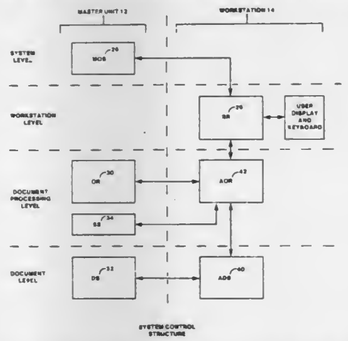
document manipulation means, including

memory means for storing and providing document operations to be performed upon said document segments and said document data,

supervisory control means, including

system supervisory operation memory means for storing and providing supervisory operation routines for controlling supervisory operations of said system, and

means responsive to operation of said keyboard means for



providing operation vectors identifying document operations to be performed upon said document data and said document segments and supervisory operations to be performed by said system,

said processor means being responsive to said operation vectors for reading and performing corresponding said document operation and supervisory operation routines, and

responsive to said document operation routines for reading said location information from said document access means for locating said document segments and data to be operated upon in said document memory means and said buffer means.

wherein,

the only routines which perform operations upon said document segments residing in said document memory means are said document operation routines,

said document operation routines access said document segments and data residing in said document memory means and said buffer means only through said location information residing in said document access means, and

said document segments and data transferred between said document memory means and said keyboard and display means only through said buffer means,

said supervisory control means further including

keystroke processing means, including

means for accepting and classifying keystroke inputs from said keyboard means, and

state table means for storing said operation vectors,

said state table means responsive to state information and to operation of said classifying means for relating said state information and said keystroke classifications to said corresponding operation vectors and providing said corresponding operation vectors to be written into an execution pointer means, and

stack means for storing state information identifying state of execution of said document operation and supervisory operation routines,

said processor means being responsive to execution of said routines for writing said state information identifying state of execution of said routines into said stack means and reading said state information identifying state of execution of said routines from said stack means, including

supervisory stack means for storing type of routine information and said operation vector of said current document operation routine and the operation vectors of interrupted said document operation routines, and

document operation stack means for storing certain of said interrupted document operation routines, and

control interface means, including

execution pointer means for storing said operation vectors,

said processor means being responsive to said keyboard inputs and to said execution of said current routine for writing said operation vectors into said execution pointer means and reading said operation vectors from said execution pointer means, and

said state table means.

4,633,431

ARRANGEMENT FOR COUPLING DIGITAL PROCESSING UNITS

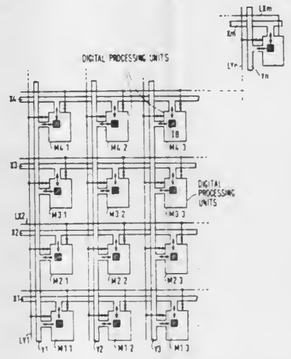
Albrecht Bar, Buckenhof, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 486,060

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215080

Int. Cl.⁴ G06F *15/16, 11/00*

U.S. Cl. 364—900 **9 Claims**



1. An arrangement for coupling digital processor modules, particularly of a redundantly operating multiprocessor system, comprising:

a first external bus system having a first group and a second group of at least two external busses each, the modules being coupled in matrix-fashion to said first and second groups such that each module is coupled to one of the busses in the first group and one of the busses in the second group and no module is coupled to the same two busses;

first bidirectional coupling means in each module which is provided with direction control means for controlling the direction of data through said coupling means said coupling means coupling the respective external busses coupled to the module to an internal bus of said module and thus also to each other; and

at least one status line means accompanying each external bus coupled to each of the modules associated with the bus, a state of a selected one of said status line means associated with a bus in each of said first and second groups being determined by one of the modules transmitting as an originating module to said selected status lines means a status signal for controlling the coupling direction of the coupling means in each of the remaining modules coupled to at least one of said selected status line means so that a signal transmitted from the originating module to the selected busses in each of the first and second groups is supplied via the respective coupling means to the busses not coupled to said originating module, thereby supplying said signal from the originating module to all busses of said external bus system.

4,633,432

SYSTEM FOR TRANSFERRING DOCUMENT DATA TO NON-VOLATILE MEMORY IN A WORD PROCESSING APPARATUS

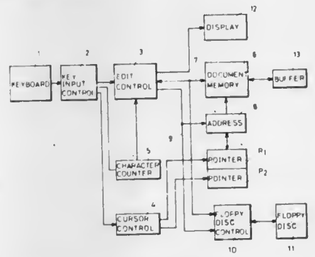
Kozo Kitamura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 415,380, Sep. 7, 1982, abandoned. This application Aug. 19, 1985, Ser. No. 767,066

Claims priority, application Japan, Sep. 11, 1981, 56-144380

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—900 **3 Claims**



1. A document data storage system in a word processing apparatus comprising:

input means for introducing document data into said word processing apparatus by actuation of character keys;

temporary memory means, responsive to said input means, for temporarily storing said document data entered into the word processing apparatus;

permanent nonvolatile memory means for permanently memorizing said document data;

transfer means for transferring said document data temporarily stored in said temporary memory means to said permanent nonvolatile memory means;

character counter means, responsive to each actuation of a said character key, for developing a count indicative of the number of character keys actuated while introducing said document data into said word processing apparatus; and

control means, responsive to the count developed by said character counter means, for activating said transfer means when said count reaches a predetermined number to transfer a batch of the data produced by the predetermined number of character key actuations to said permanent nonvolatile memory means, thereby updating said document data memorized in said permanent nonvolatile memory means said control means resetting said character counter means each time said transfer means is enabled to transfer a said batch of said data, each said batch containing less data than the data storage capacity of said temporary memory means, whereby the batches of the document data stored in said temporary memory means are periodically transferred to said permanent nonvolatile memory means to update the data stored therein and preclude loss of batches so transferred in the event of a power failure.

4,633,433

DISPLAY SYSTEM FOR DISPLAYING MAPS HAVING TWO-DIMENSIONAL ROADS

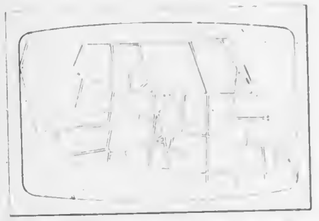
Irvin M. Miller, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,628

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—900 **10 Claims**





1. In a method for displaying drawings which consists of intersecting line segment representations, a method for converting input data defining one-dimensional line segment representations having length but no width into data defining two-dimensional representations having length and width, comprising the steps of:

generating definitions of pairs of lines parallel to the lines defined by the input data;

identifying points of intersection of the lines defined by said generated definitions; and

combining the identified points of intersection with the generated definitions to establish the end points of said pairs of lines, said pairs of lines comprising the two-dimensional representations.

4,633,434

HIGH PERFORMANCE STORAGE UNIT

James H. Scheuneman, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,130

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—900 **5 Claims**

1. A memory resource synchronously communicative with a plurality of requesters for the reading and writing of addressable data stores operative in a manner such that said memory resource does synchronously communicate with at least one of said plurality of requestors at a first interface communication cycle time T_x while simultaneously synchronously communicating with at least another one of said plurality of requesters at a different second interface communication cycle time T_y, $T_x = T_y$, said interface communication cycle time being defined as that time between successive synchronous receipts of a request signal plus accompanying address and data and control information from a single requestor, which is equivalent to defining said interface communication cycle time as that time interval during which synchronous communication of information transpires, said memory resource operative for said

synchronously communicating at a plurality of different interface communication cycle times comprising:

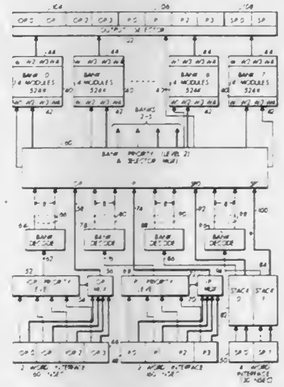
a multi-phase basic master clock of a phase time period which divides integrally into each said different interface communication cycle times;

storage memory banks containing data, and honoring requests to read or write such data only upon a fixed phase of said multi-phase master clock, and performing such requests during a fixed read/write cycle time which is not in an integral relationship to at least one of said interface communication cycle times T_x or T_y;

synchronization means for receiving the synchronous communications of each of said plurality of requestors and for presenting such communications as requests to said storage memory banks upon said fixed phase of said multi-phase master clock;

resynchronization means for receiving, at said fixed read/write cycle time after said fixed phase of said multi-phase master clock, results of either read data or write acknowledgement from said storage memory banks, and for resynchronizing said results and communicating such to appropriate communicating said requestors WHEREIN said receiving performed by said resynchronization means is always immediately timely effective to free said storage memory banks for further use by said receiving of said results regardless that said communicating said results to said requestors needs transpire at said plurality of different interface communication times;

whereby said memory resource has not only communicated to a plurality of requestors at a plurality of different interface communication cycle times but has done so, via said synchronization means and said resynchronization means, in a manner which accorded that said storage memory banks do always perform requests to read or write such data during said fixed read/write cycle time which is not in simultaneous integral relationship to at least one of said interface communication cycle times.



4,633,435

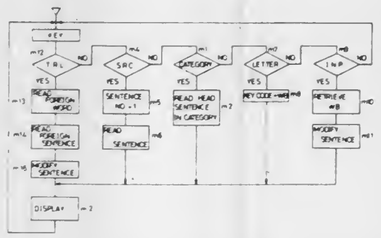
ELECTRONIC LANGUAGE TRANSLATOR CAPABLE OF MODIFYING DEFINITE ARTICLES OR PREPOSITIONS TO CORRESPOND TO MODIFIED RELATED WORDS

Masafumi Morimoto, Yamatokoriyama; Michihiro Noda, Nara; Shigenobu Yanagiuchi, and Yasuko Yanagiuchi, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 314,033, Oct. 22, 1981, abandoned.
This application Jul. 22, 1985, Ser. No. 757,206
Claims priority, application Japan, Oct. 28, 1980, 55-151884
Int. Cl.⁴ G06F *15/38*
U.S. Cl. 364—900 **5 Claims**

1. In an electronic language translator of the type in which a plurality of first sentences in a first language are stored in a first sentence memory area in a first language memory means, at least a portion of the first sentences having first selected words therein replaceable by first replacement words stored in a first word memory area in the first language memory means, the first replacement words being retrieved by an access means connected to the first language memory means to form first new sentences, the plurality of first sentences further having first related words that are grammatically associated with the first selected words and wherein a like plurality of equivalent translated second sentences having second selected words and second related words, and second replacement words in a second language are stored in a second sentence memory area and a second word memory area in the second language memory means respectively, from which a like plurality of translated second new sentences in the second language that are equivalent to the first new sentences in the first language, are accessed from the second language memory means, the second new sentences being retrieved and outputted by a second access means, wherein the improvement comprises:

the first and second language memory means each further storing coded information relating to the respective replacement words and a grammatical association between the related words and the respective replacement words in



the first and second new sentences retrieved by the first and second access means from the respective language memory means,

first means, responsive to the coded information in the first language memory means, for automatically changing the related words in a sentence when a first selected word is replaced by a first replacement word, the related words being changed in accordance with their grammatical association to the respective replacement words to produce a new sentence in which the grammatical association of the replacement words and the related words is correct in the first language, and

second means, responsive to the coded information in the second language memory means, for automatically changing the related words in a sentence when a second selected word is replaced by a second replacement word, the related words being changed in accordance with their grammatical association to the respective replacement words to produce a new sentence in which the grammatical association of the replacement words and the related words is correct in the second language.

4,633,436

REAL-TIME RUB-OUT ERASE FOR AN ELECTRONIC HANDWRITING FACILITY

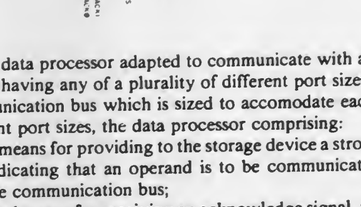
Gregory A. Flurry, Austin, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,389
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 364—900 **8 Claims**

1. In an electronic handwriting facility comprising a central processor unit, an all points addressable display, and an electronic tablet and stylus, said handwriting facility simulating writing with a pen or pencil and paper and generating an electronic document by periodically sending to the central processing unit the absolute location of the stylus in relation to the tablet, mapping each location point to the display coordinate system, and storing the points in a point list, the improvement comprising a real-time rub-out erase feature for the handwriting facility comprising the steps of

establishing a grid over the write area on the tablet to delineate the write area into a plurality of grid boxes,

storing in a grid table the starting and ending points of line segments within each of said grid boxes, said grid table being updated whenever a point is added to said point list,



setting the system to erase mode and displaying an erase cursor on said display showing the relative location of said stylus to the electronic tablet,

searching only the segments and points in the grid boxes touched by the erase cursor during erasure,

updating said point list and said grid table after erasure, and

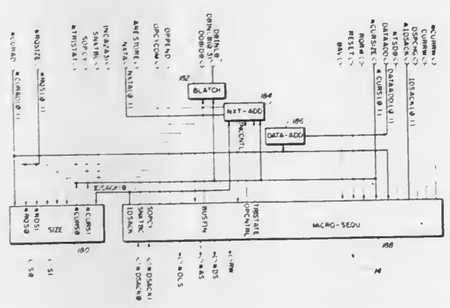
updating said display to provide a real-time display of the erasure.

4,633,437

DATA PROCESSOR HAVING DYNAMIC BUS SIZING

David S. Mothersole, Austin, Tex.; Lester M. Crudele, Groton, Mass.; James L. Tietjen, and Robert R. Thompson, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1984, Ser. No. 624,660
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—900 **18 Claims**



1. A data processor adapted to communicate with a storage device having any of a plurality of different port sizes using a communication bus which is sized to accomodate each of the different port sizes, the data processor comprising:

first means for providing to the storage device a strobe signal indicating that an operand is to be communicated using the communication bus;

second means for receiving an acknowledge signal, provided by the storage device in response to the strobe signal, indicating that the storage device is prepared to communicate the operand with the data processor using a portion of the communication bus corresponding to a selected one of the different port sizes; and

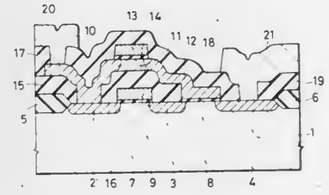
third means for communicating the operand between the data processor and the storage device in as many units of the selected port size as are required to completely communicate the operand, using the portion of the communication bus which corresponds to the selected port size.

4,633,438

STACKED SEMICONDUCTOR MEMORY

Hitoshi Kume, Musashino; Takaaki Hagiwara, Nishitama; Masatada Horiuchi, Koganei; Toru Kaga, Urawa; Yasuo Igura, Kokubunji, and Akihiro Shimizu, Mitaka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Micro Computer Engineering Ltd., both of Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,027
Claims priority, application Japan, Dec. 19, 1983, 58-237776
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—51 **10 Claims**



6. A semiconductor memory including:

a semiconductor substrate;

a first region used as a source region or a drain region, a second region used as a drain region and a source region, and a third region used as a drain region or a source region on one major surface of said substrate;

a first insulating film formed on said surface of said substrate between at least said first and second regions;

a first electrode formed on said first insulating film;

a second insulating film formed on said surface of said substrate between at least said second region and said third region;

a second electrode formed on said second insulating film;

a third insulating film formed on said first electrode and extending from an area above said first region to an area above said second region;

a semiconductor layer formed over said third insulating film, one edge of said semiconductor layer electrically being connected to said first region and the other edge of said semiconductor layer electrically being connected to said second electrode;

a fourth insulating film formed on a part of said semiconductor layer; and

a third electrode formed on said fourth insulating film.

4,633,439

SUPERCONDUCTING READ-ONLY MEMORIES OR PROGRAMABLE LOGIC ARRAYS HAVING THE SAME

Yutaka Harada, Kodaira, and Toshikazu Nishino, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

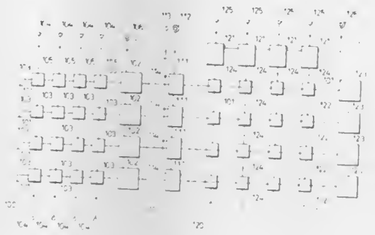
Filed Jul. 20, 1983, Ser. No. 515,514
Claims priority, application Japan, Jul. 21, 1982, 57-125697; Jul. 21, 1982, 57-125698; Jul. 23, 1982, 57-111002[U]; Jul. 23, 1982, 57-111003[U]
Int. Cl.⁴ G11C *11/44, 17/02;* **H03K** *19/95*
U.S. Cl. 365—162 **8 Claims**

1. A superconducting programable logic array comprising:

(a) first bit lines arranged in parallel to one another and each including a plurality of line portions, a first terminal of each first bit line being connected to an ac voltage source having a predetermined phase and a second terminal thereof being grounded;

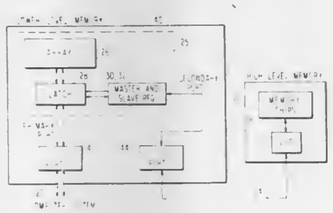
(b) first Josephson junctions respectively connecting two neighboring line portions of said plurality of first bit lines and respectively having predetermined programed states;

(c) first word lines arranged to cross said first bit lines and each connected to one of said Josephson junctions belonging to each of said first bit lines for controlling electric states of the Josephson junctions it is connected to in response to an applied input signal;
(d) second bit lines arranged in parallel to one another and each including a plurality of line portions, a first terminal of each second bit line being connected to an ac voltage source having said predetermined phase and a second terminal thereof being grounded;
(e) second Josephson junctions respectively connecting two neighboring line portions of said plurality of second bit lines, and respectively having predetermined programed states;
(f) second word lines each provided in correspondence to one of said first bit lines, arranged to cross said second bit



lines and each connected to one of said Josephson junctions belonging to each of said second bit lines for controlling electric states of the Josephson junctions it is connected to in response to an applied control signal;
(g) a plurality of gate means connected to said first bit lines, said second word lines and an ac voltage source having said predetermined phase, said gate means including means for inverting signals from respective first bit lines and for supplying the inverted signals to second word lines which respectively correspond to said first bit lines as a control signal in response to a timing signal applied to said gate means which is out of phase with the predetermined phase; and
(h) output means connected to said second bit lines for deriving signals corresponding to predetermined programable states of said second Josephson junctions from said second bit lines.

4,633,440
MULTI-PORT MEMORY CHIP IN A HIERARCHICAL MEMORY
Francis J. Pakulski, Shelburne, Vt., assignor to International Business Machines, Armonk, N.Y.
Filed Dec. 31, 1984, Ser. No. 687,807
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 **3 Claims**



1. A hierarchical memory system having at least two levels comprising a first and second memory chip, the first memory chip being the higher level memory and the second chip being the lower level memory,
said second chip comprising:
a memory array with a primary buffer;
master and slave registers as a secondary buffer, connected to the primary buffer, said slave register being bidirectionally coupled for data transfer to the master register and to said first memory chip;
said system further comprising:
means for serially transferring an entire row of memory information between the first chip and the slave register on said second chip in a selected direction;
means for simultaneously transferring in a random access an entire row of memory information between said memory array and said primary buffer in a selected direction;
means for transferring information between the master register and the slave register; and
means for accessing of said master and slave registers from outside said second chip.

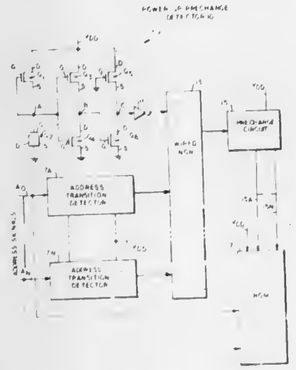
4,633,441
DUAL PORT MEMORY CIRCUIT
Shoji Ishimoto, Tokyo, Japan, assignor to NEC, Tokyo, Japan
Filed Sep. 28, 1984, Ser. No. 655,497
Claims priority, application Japan, Sep. 29, 1983, 58-181092
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 **16 Claims**



1. A dual port memory comprising a memory cell array including memory cells arranged in rows and columns; a random access peripheral circuit for performing a random access operation with respect to said cell array in response to row and column address information; and a series access peripheral circuit performing consecutive access operations with respect to the columns of said array in response to shift pulses; said serial access circuit including a selection circuit for selecting one of said columns to be accessed, a counter circuit, means responsive to the output of said counter circuit for controlling said selection circuit, means for setting the counting value of said counter at an optional value and means for consecutively advancing the state of said counter circuit from said optional value in response to said shift pulses.

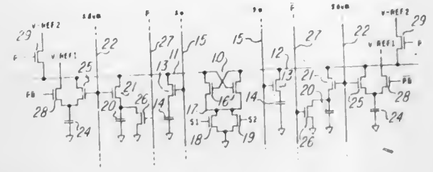
4,633,442
PROTECTIVE CIRCUITRY FOR A READ ONLY MEMORY
Michael N. Borghese, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Feb. 4, 1985, Ser. No. 697,992
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **2 Claims**
1. In combination with a monolithic read only memory

wherein, on start-up, elements must be biased before extant address signals are effective, the improvement comprising:
(a) precharge circuitry connected to the output bit lines of the read only memory; and
(b) actuating means for the precharge circuitry including monolithic circuitry for producing, when a biasing voltage is first applied and for a predetermined interval thereafter, a first signal at a logic zero level, means for inverting the first signal to a second signal at a logic one level, and logic circuits responsive to the second signal and to the extant address signals to control the precharge circuitry wherein the monolithic circuitry comprises:
(i) a first p-channel and a first n-channel field effect transistor, each having a gate, drain and source electrode, the gate and drain electrodes of the first p-channel field effect transistor being connected so that that transistor may simulate a resistor and the source and drain electrodes of the first n-channel field effect transistor may simulate a capacitor;



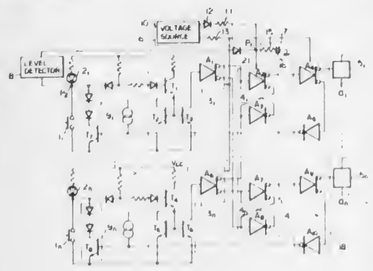
(ii) means connecting the biasing voltage to the drain electrode of the first p-channel field effect transistor, the gate and source electrodes of the first p-channel field effect transistor to the gate electrode of the first n-channel field effect transistor and the drain and the source electrodes of the first n-channel transistor to ground to produce, when the biasing voltage is first applied, a time-varying voltage at the gate electrode of the first n-channel field effect transistor, said time-varying voltage changing exponentially from ground potential to a voltage approximating the bias voltage; and
(iii) level conversion means, responsive to the level of the time-varying voltage, to produce a voltage essentially at the bias voltage as long as the time-varying voltage is below a predetermined level intermediate ground potential and the biasing voltage and thereafter, as long as the biasing voltage is applied, a voltage at a level approximating ground potential.

4,633,443
DYNAMIC READ/WRITE MEMORY CIRCUITS WITH EQUAL-SIZED DUMMY AND STORAGE CAPACITORS
Jimmie D. Childers, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jul. 9, 1984, Ser. No. 628,888
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **9 Claims**
1. A semiconductor memory device comprising:
an array of rows and columns of storage cells, each storage cell having a storage capacitor,
at least one row of dummy cells adjacent said array of storage cells, each dummy cell having first and second dummy capacitors, a first access transistor connecting the first dummy capacitor to a column line and a second access transistor connecting the second dummy capacitor to said column line,
addressing means for activating one of said rows of storage cells and activating said row of dummy cells at a first time in an operating cycle,



precharge means coupled to said first and second dummy capacitors at a time prior to said first time in and operating cycle, and decoupled from said dummy capacitors at said first time and for a period thereafter, to thereby precharge said first and second dummy capacitors to different voltages.

4,633,444
SWITCH CIRCUIT PROVIDED WITH MEANS FOR SETTING UP THE INITIAL CONDITION THEREOF
Koichi Nakayama, Saitama, and Yoshito Tanaka, Kawagoe, both of Japan, assignors to Toko, Inc., Tokyo, Japan
Filed Sep. 30, 1983, Ser. No. 537,825
Claims priority, application Japan, Oct. 6, 1982, 57-151811[U]; Jan. 18, 1983, 58-5028[U]
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—228 **7 Claims**



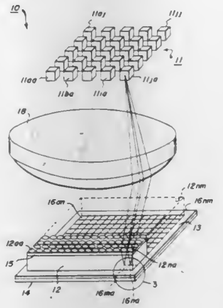
1. A switch circuit, comprising,
a signal input stage comprising an array of a plurality of switches;
a storage circuit for storing a signal derived from said signal input stage;
means for changing over a signal source on the basis of the memory at said storage circuit; and
means for causing the terminals of a predetermined one of said switches at said signal input stage to be shorted when main power supply, which has once been interrupted, is restored in the case where the memory at said storage circuit is cleared, so that a signal is generated at said signal input stage, thereby setting a predetermined one of the elements of said storage circuit to cause the remaining ones of the switches to be turned off, while at the same time resetting the remaining ones of the elements of said storage circuit, whereby said storage circuit is placed under an initial condition.

4,633,445

ERASEABLE SOLID STATE OPTICAL MEMORIES

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1984, Ser. No. 681,776
Int. Cl.[4] G11C *13/04*
U.S. Cl. 365—234 **6 Claims**



1. In a solid state optical memory having a photoemitter array including a plurality of selectively and individually energizeable photoemitters, and a photodetector array including a plurality of photosensors; the improvement comprising

an eraseable optical recording medium optically interposed between said photoemitter array and said photodetector array, said recording medium being optically programmable and eraseable in situ for eraseably storing optically addressable data in position to be read out selectively by said photosensors in response to the selective energization of said photoemitters, and

imaging means optically aligned between said photoemitter array and said recording medium for imaging all of the photoemitters of said photoemitter array in parallel onto said recording medium at a plurality of spaced apart locations,

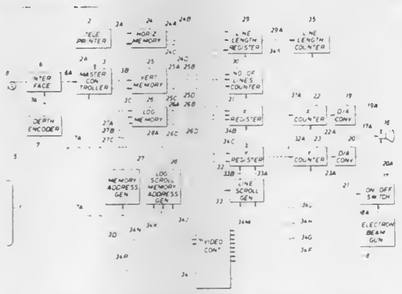
whereby said memory is optically partitioned into a plurality of memory sectors, and each of said sectors is optically subdivided to provide a plurality of selectively illuminable memory cells.

4,633,446

SCROLLING WELL LOGGING DATA DISPLAY METHOD AND APPARATUS

Burice E. Kesner, Stafford, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 272,402, Jun. 10, 1981, abandoned, which is a continuation of Ser. No. 30,058, Apr. 13, 1979, abandoned. This application Jul. 28, 1983, Ser. No. 518,246
Int. Cl.[4] G01V *1/34*
U.S. Cl. 367—69 **3 Claims**



1. A method of generating on a viewing screen a continuously scrolling display of a logging curve and a depth line in relation to movement of a logging instrument within a borehole, comprising:

generating digital representations of first coordinate pairs, each corresponding to a point on said curve;

generating digital representations of second coordinate pairs, each corresponding to a point on said line;

sequentially positioning an electron beam in response to said digital representations at first and second discrete locations on said screen corresponding to each said first coordinate pair s;

sequentially positioning an electron beam in response to said digital representations at second discrete locations on said screen corresponding to each said second coordinate pairs;

intensifying said beam when positioned at said first and second discrete locations to generate a first display of said curve;

intensifying said beam when positioned at said second discrete locations to generate a first display of said line;

generating digital representations of third coordinate pairs each comprising:

an x coordinate from one of said first pairs; and

the corresponding y coordinate from said one of said first pairs modified by a preselected magnitude;

generating digital representations of fourth coordinate pairs each comprising:

an x coordinate from one of said second pairs; and

the corresponding y coordinate from said one of said second pairs modified in response to said digital representations of third coordinate pairs;

sequentially positioning said electron beam in response to said digital representations of third coordinate pairs at third discrete locations on said screen corresponding to each said third coordinate pair;

sequentially positioning said electron beam in response to said digital representations of fourth coordinate pairs at fourth discrete locations on said screen corresponding to each said fourth coordinate pair;

intensifying said beam when positioned at said third locations to generate a second display of said curve whereby said second display of said curve is displaced relative to that of said first display of said curve by a distance corresponding to said magnitude; and

intensifying said beam when positioned at said fourth locations to generate a second display of said line whereby said second display of said line is displaced relative to that of said first display of said line in response to the displacement of said second display of said curve.

4,633,447

RESPONSE WAVEFORM CHARACTERIZATION OF GEOPHYSICAL DATA

John H. Bodine, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

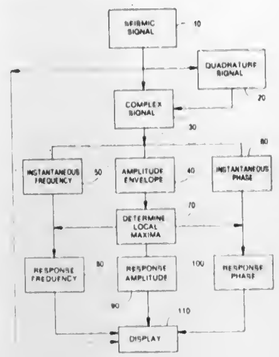
Filed Dec. 3, 1984, Ser. No. 677,143
Int. Cl.[4] G01V *1/34*; G06F *15/36*
U.S. Cl. 367—70 **24 Claims**

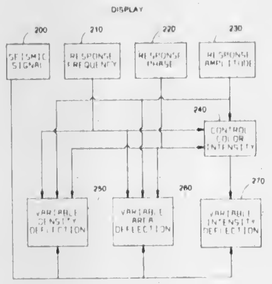
1. A method of processing seismic signals for empirical interpretation comprising steps of:

(a) forming a complex signal from a selected portion of the seismic signals;

(b) locating maxima in the amplitude envelope of the complex signals;

(c) determining a measure of at least one instantaneous attribute of the complex signal for each corresponding maxima in the amplitude envelope; and





(d) displaying the measure of at least one instantaneous attribute as a constant across the envelope width of the amplitude envelope.

4,633,448

THREE-DIMENSIONAL DISPLAY OF ADJACENT SEISMIC SECTIONS

Gerard D. Koeijmans, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,347
Int. Cl.[4] G01V *1/34*
U.S. Cl. 367—72 **10 Claims**

1. Apparatus for displaying seismograms in a three-dimensional presentation of subsurface formations of a segment of the earth from which said seismograms were obtained comprising:

a digital computer for generating from said seismograms arrays of digital words representing seismic sections, each word in each array representing the amplitude of reflected seismic energy as a function of distance along a line of exploration and depth of the reflector;

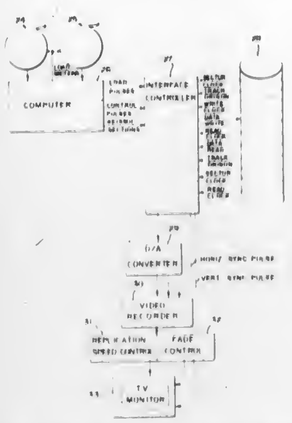
a digital memory for storing said arrays;

an interface controller for storing said arrays in said memory and for retrieving the words of each array in a sequence such that said depth corresponds with horizontal sweep of a television raster;

a digital to analog converter for converting the retrieved words to video signals;

a video recorder for recording said video signals in a sequence representing successive, adjacent, seismic sections; and

a video monitor, the video signals from said recorder being applied to said monitor to display the recorded sequence



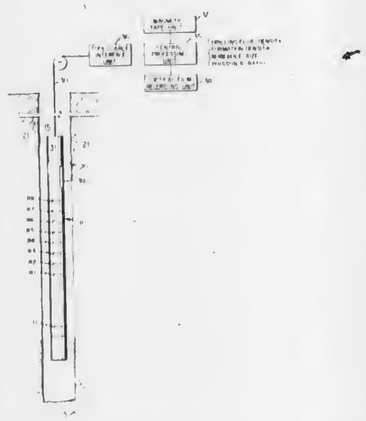
of adjacent seismic sections whereby a visual impression of movement through subsurface formations is produced.

4,633,449

METHOD AND APPARATUS FOR INDIRECT DETERMINATION OF SHEAR VELOCITY FROM GUIDED MODES

John D. Ingram, #1 W. 11th Pl., and Olive Y. Liu, 1818 Haver St., both of Houston, Tex. 77006

Filed Oct. 15, 1982, Ser. No. 434,644
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—75 **17 Claims**



1. A method of estimating shear wave slowness of formations traversed by a borehole from acoustic log data including guided wave comprising the steps of:

generating acoustic energy at a point in the borehole,

receiving that acoustic energy as acoustic signals in the form of full waveforms, which include as a portion thereof waveforms representing guided waves, at each of at least four receiver stations spaced one from the other and from the point at which said acoustic energy was generated,

windowing each of said full waveforms to identify those portions representing a guided wave,

determining the phase velocity and frequency of the guided

wave from that portion of the full waveform representing the guided wave,

measuring the values for formation density, drilling fluid density, drilling fluid slowness, borehole diameter, and Poisson's ratio,

establishing a multi-dimensional matrix comprised of given ranges of assumed values of guided wave frequency, Poisson's ratio, drilling fluid slowness, drilling fluid density, formation density, guided wave phase velocity and borehole diameter,

fitting the measured values to the multi-dimensional matrix to obtain an estimate of shear wave slowness at that point in the borehole, and

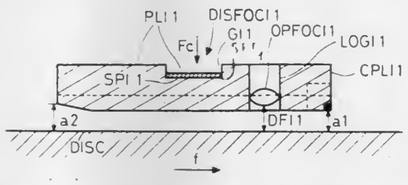
recording the estimate as a function of depth.

4,633,450

OPTICAL FOCUSING APPARATUS FOR THE READING OF A DATA MEDIUM MOVING PAST IT

Catherine Gueugnon, Paris, France, assignor to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Jan. 19, 1984, Ser. No. 572,016
Claims priority, application France, Jan. 25, 1984, 83 01089
Int. Cl.[4] G11B *11/00, 7/00*
U.S. Cl. 369—13 **16 Claims**



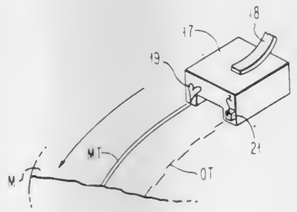
1. An optical system for reading data on a surface of a moving data medium, comprising a main body having first and second slides and a groove therebetween, means for supporting the main body to fly above the surface of the data medium such that the distance between the main body and the surface remains constant, and an optical device for focusing a beam of light onto said surface, the optical device being integrally mounted in the interior of the first slide within a housing such that the distance between the optical device and the surface is greater than or equal to a flight altitude of a predetermined location of the main body with respect to said surface.

4,633,451

OPTICAL SERVO FOR MAGNETIC DISKS

Kie Y. Ahn, Chappaqua, and Thomas H. DiStefano, Bronxville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 394,012, Jun. 30, 1982, abandoned. This application Jan. 2, 1985, Ser. No. 686,634
Int. Cl.[4] G11B *13/04, 11/10, 5/58, 7/08*
U.S. Cl. 369—14 **8 Claims**



1. A system including

a magnetic recording disk carrying a magnetic recording disk medium and means for reading said magnetic recording disk medium,

said medium carrying a layer of magnetic material and including a servo track layer separate from the magnetic material which is encoded with servo information which is read optically by an optical laser transducer which is modulated in its operating characteristics in response to optical reflectivity variations of the surface of said medium,

said servo track layer being deposited above said magnetic material,

a slider means for carrying a magnetic recording head and said optical laser transducer, said slider being adapted for aerodynamic suspension over said medium,

said optical laser transducer being carried by said slider which directs a laser beam towards said servo information on said medium,

said disk medium including a reflector for said laser beam, said reflector comprising said servo track layer of said medium with spots thereon forming servo tracks and said spots carrying said servo information,

said reflector reflecting said beam towards said optical laser transducer, said servo information being read optically by said optical laser transducer which is modulated in its operating characteristics in response to optical reflectivity variations of the surface of said medium, said variations affecting the lasing functions of said optical laser transducer producing fluctuations in the operating characteristics of said optical laser transducer,

said servo information including a pattern of servo indicia serving to modulate optical feedback from said reflector,

said optical laser transducer being mounted on a slider spaced from said medium by less than about 1000 micrometers,

said optical laser transducer being adapted to receive retroreflective light directly from said medium without the assistance of optical elements such as lenses,

said optical laser transducer including a back facet, an optical sensor being juxtaposed with said back facet of said optical laser transducer to sense the modulation of operation of said optical laser transducer.

whereby said servo information interacts with said medium employing variations in the optical characteristics of said medium to modulate the operation of said laser as a function of said reflectivity, and

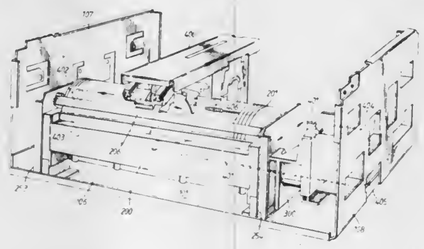
said optical sensor detects said modulation.

4,633,452

AUTOCHANGER TYPE DISC PLAYER

Takao Shimbo, Yokohama, and Hiroto Kurokawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 26, 1984, Ser. No. 686,392
Claims priority, application Japan, Dec. 27, 1983, 58-244463
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—39 **8 Claims**



1. An autochanger type disc player for automatically accessing, playing, and restoring a predetermined disc or a number of discs stored therein, the autochanger type disc player comprising:

a chassis including a disc storage section;

means for storing a plurality of discs upright and parallel to each other within said disc storage section, said disc storage means including a plurality of disc holding portions and means for allowing discs to go out of or come into said disc holding portions;

disc playback means mounted on said chassis;

disc transferring means slidably mounted on said chassis and movable along said disc holding portions of said disc storage means for transferring a disc between a predetermined disc holding portion of said disc storage means and said disc playback means, said disc transferring means confronting at least said predetermined disc holding portion, and including a port for receiving or supplying the disc from or to said predetermined disc holding portion; and

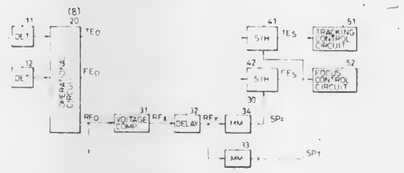
disc retention means mounted on said disc transferring means for confronting said disc holding portions not confronted by said disc transferring means and for blocking discs from coming out therefrom.

4,633,453

OPTICAL DISC PLAYERS

Hiroshi Ogawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,783
Claims priority, application Japan, Feb. 28, 1983, 58-32585
Int. Cl.[4] G11B *7/095*
U.S. Cl. 369—44 **3 Claims**



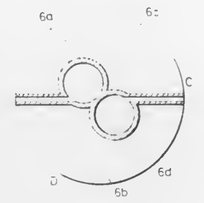
1. An optical disc player for reproducing an information signal recorded in the form of pits arranged in a record track on a disc, comprising; light source means for generating a light beam, optical means for directing the light beam from said light source means to the disc to be modulated by the record track and reflected thereat, photodetecting means for receiving a reflected light beam from the disc to produce in response to the received light beam an output from which a reproduced information signal can be obtained, and control circuit means including a first circuit portion for generating a tracking error signal from the output of said photodetecting means when a beam spot formed by the light beam on the disc is positioned on the pit and a second circuit portion for generating a focus error signal from the output of said photodetecting means when the beam spot formed by the light beam on the disc is positioned on a plane portion between the pits, and, wherein said first circuit portion comprises first operational circuit means for producing from the output of said photodetecting means a first signal having a level corresponding to the position of the beam spot formed by the light beam on the disc in relation to the record track when the beam spot on the disc is positioned on the pit, first pulse generating means for producing a first sampling pulse when the beam spot on the disc is positioned on the pit, and first sampling and hold means for causing said first signal to be subjected to sampling by said first sampling pulse so as to hold the level of the sampled segment of said first signal until the next sampling occurs so as to produce the tracking error signal.

4,633,454

OPTICAL INFORMATION PICKUP APPARATUS

Yoshiyuki Tsukai, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,308
Claims priority, application Japan, Feb. 15, 1983, 58-21331[U]
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 **5 Claims**



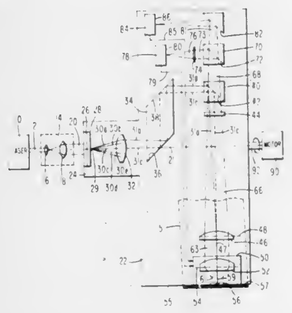
1. An optical information pickup apparatus for detecting information recorded on a recording medium in a form of tracks and for producing a focus servo signal and a tracking servo signal, comprising: means for producing a single light beam; means for directing said light beam onto said recorded medium; and a light sensing element, said light sensing element comprising first and second light sensing surfaces which are positioned symmetrically about a line which intersects at 45° a line on said light sensing element corresponding to a tracking direction on said recorded medium and at least a third light sensing surface surrounding said first and second light sensing surfaces, said light sensing element being disposed in a path of a return beam reflected from said recorded medium.

4,633,455

HEADWHEEL FOR A MULTIPLE BEAM OPTICAL TAPE PLAYBACK SYSTEM

Kenneth C. Hudson, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 25, 1985, Ser. No. 715,404
Int. Cl.[4] G11B *7/135*
U.S. Cl. 369—45 **18 Claims**



1. A headwheel for use in a system for retrieving information stored on an information-bearing surface of an optical tape, said headwheel comprising:

support means having a generally cylindrical outer surface, said support means being rotatable about a central axis thereof;

said optical tape being helically wrapped about a portion of said support means such that said information-bearing surface is adjacent said outer surface;

means responsive to a collimated beam of light directed

along said central axis for splitting said beam into a plurality of light beams;

means for directing said plurality of beams into respective diffraction limited spots on said information-bearing surface of said optical tape; and

means for detecting the intensity of light reflected from said diffraction limited spots on said information-bearing surface.

4,633,456

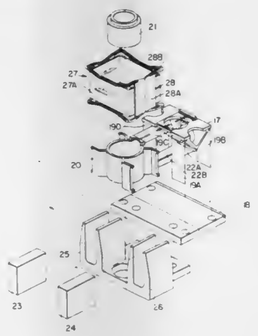
TWO AXIS ELECTROMAGNETIC ACTUATOR

Francis S. Luecke, Byron, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,166

Int. Cl.[4] G11B *7/08*

U.S. Cl. 369—45 **7 Claims**



1. A two axis electromagnetic actuator comprising:

a movable armature,

first and second yokes,

first and second permanent magnets fixed to one extension of each of said first and second yokes, producing two uniform magnetic flux fields of opposite directions across a first and a second air gap,

a first coil wound around said movable armature in a generally circular fashion so that the individual conductors form a thin web oriented along a first axis and a portion of which intersects substantially all of the flux field area in the region of said first and second air gaps,

a second coil wound around said movable armature in such a way that the individual conductors form a second web oriented along a second axis, which is perpendicular to and lies within a plane common to said first axis, said second thin web intersects substantially all of the flux field area in the region of said first and second air gaps,

a spring carrier,

first spring support means fixed to said armature and said carrier and oriented to flex only in a direction to permit motion of said armature within said air gaps along a first axis,

second spring support means fixed to said carrier and a base member and oriented to flex only in a direction to permit motion of said carrier and said armature within said air gaps along a second axis which is perpendicular and lies within a plane common to said first axis, and

said first and second spring support means oriented relative to each other so that flexure of one spring support means places flexure stress on the other spring support means only in its direction of flexure.

4,633,457

OPTICAL INFORMATION READING APPARATUS

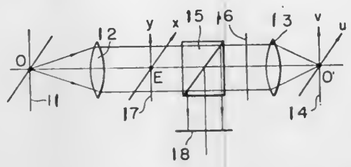
Kimiaki Yamamoto, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 334,364, Dec. 24, 1981, abandoned. This application Jun. 20, 1984, Ser. No. 622,395

Claims priority, application Japan, Dec. 27, 1980, 55-188794

Int. Cl.[4] G11B *7/125, 7/18*

U.S. Cl. 369—116 **2 Claims**



1. In an optical information reading apparatus comprising a light source, a collimator lens for making light rays from said light source parallel, an objective for collecting said parallel light rays on a disk having thereon an information track, a condenser lens for collecting reflected light rays from said disk, and a detector for detecting the light rays collected by said condenser lens, an improvement comprises a filter arranged between said collimator lens and objective and having a transmission factor larger in the direction along said track than that in the direction intersecting at right angles with said track to arrange so that the light intensity distribution in the direction along said track of a beam spot to be formed on said disk by collecting said parallel light rays through said objective is larger than that in the direction intersecting at right angles with said track.

4,633,458

DISC-SHAPED, OPTICALLY-READABLE INFORMATION CARRIER HAVING A PROTECTIVE EDGE AND/OR CENTER PART

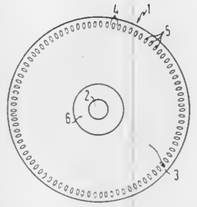
Volkmar Tiefensee, Hanover, Fed. Rep. of Germany, assignor to Polygram GmbH, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,398

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322131

Int. Cl.[4] G01D *15/32;* **G11B** *7/00*

U.S. Cl. 369—275 **6 Claims**



1. In a disc-shaped, high storage density optically-readable information carrier of the type having an access of rotation, and in which an information microstructure is carried on a surface of the carrier in an annular first region concentric of and spaced from the axis of rotation by a second region, in which the carrier has a read-out surface for receiving a light beam, and in which a protective structure is carried by and projects from the read-out surface in a third region located about the first region, the improvement comprising:

a further protective structure carried on and projecting from the read-out surface in the second region, said further protective structure comprising a plurality of angularly-spaced radially-extending members.

4,633,459

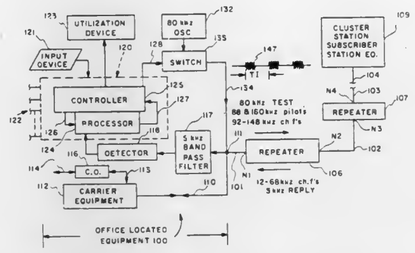
REPEATER FOR CARRIER SUBSCRIBER COMMUNICATION SYSTEM

Tom L. Blackburn, San Jose, Calif., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 10, 1984, Ser. No. 680,207

Int. Cl.[4] H04J *1/16, 3/14*

U.S. Cl. 370—13 **17 Claims**



1. Repeater apparatus for use in a carrier subscriber communication system in which pluralities of cables and repeaters are alternately connected in series between office and subscriber terminal located carrier equipment, comprising:

first and second ports;

first and second frequency selective means electrically connected between said first and second ports and operative for passing signal frequencies in first and second frequency bands between said first and second and said second and first ports, respectively;

first generating means for generating reply pulses having a reply frequency that is within said second frequency band;

third frequency selective means operative for passing test pulses having a test signal frequency that are applied to said first port and for rejecting signal frequencies in the first and second frequency bands; said test signal frequency being outside the first and second frequency bands;

first detector means for detecting test pulses that are passed by said third frequency selective means; and

processor means responsive to a first prescribed number of detected test pulses for coupling a first predetermined number of reply pulses from said first generating means to said first port.

4,633,460

TIME DIVISION SWITCHING SYSTEM

Taihei Suzuki, Kodaira; Takashi Morita; Hirotoshi Shirasu, both of Yokohama; Hiroshi Kuwahara, Kodaira, and Eiichi Amada, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,406

Int. Cl.[4] H04Q *11/04*

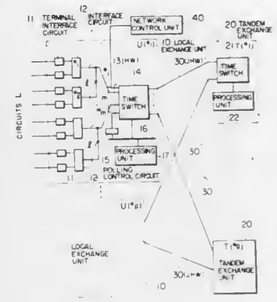
U.S. Cl. 370—58 **9 Claims**

1. A time division switching system for effecting interconnection between selected ones of a plurality of terminal circuits, comprising:

(a) a plurality of local exchange units each connected to a respective group of terminal circuits, each local exchange unit including a plurality of terminal interface means connected to respective ones of a group of terminal circuits for carrying out a predetermined processing for said terminal circuits, a plurality of local highways, multiplexing means connecting respective groups of said terminal interface means to respective ones of said local highways for effecting time division multiplexing of signals on said local highways, a first time switch connected to said local highways for time switching signals between said local highways during respective time slots of a repetitive time frame, control means connected to said first time switch for sending and receiving control information to and from said terminal interface means on said local highways and for controlling said first time switch;

(b) a plurality of junctor highways each connected to a respective one of said first time switches in said plurality of local exchange units; and

(c) at least one tandem exchange unit including a second time switch connected to said plurality of junctor highways for switching between said junctor highways during respective time slots of a repetitive time frame and control



means for controlling said second time switch on the basis of control information received on said junctor highways from said local exchange units;

wherein said first time switch in each local exchange unit transmits during each time slot on a respective local highway signals in the form of a plurality of signal channels, particular ones of said signal channels being assigned to carry control information and other signal channels being assigned to carry data signals for said terminal circuits.

4,633,461

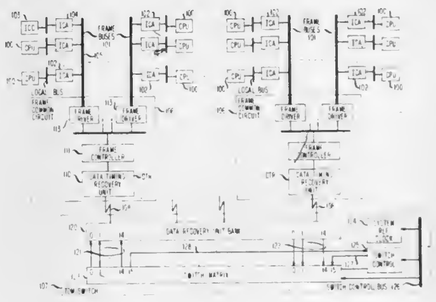
SWITCHING CONTROL FOR MULTIPLE STAGE TIME DIVISION SWITCH

Randall G. Banton, Red Bank; Rajiv Bhatia, Marlboro; Donald B. Grust, Sea Bright; David R. Johnson, Point Pleasant; Joseph G. Kneuer, Fair Haven; Kuang-Shin Lin, Aberdeen; Henry S. McDonald, Summit, all of N.J.; David A. Poppe, New Brighton, Minn.; Jeffrey W. Reedy, Durham, N.C., and Richard T. Wurth, Ocean, N.J., assignors to AT&T Information Systems Inc. and Bell Telephone Laboratories, Incorporated, both of Holmdel, N.J.

Filed Jul. 8, 1985, Ser. No. 752,672

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—58 **5 Claims**



1. In a multiple stage time division switching system wherein stages are interconnected by multichannel communication paths and certain stages are connected by way of other multichannel paths to a plurality of terminating circuits that ex-

change data with assigned channels on the paths connected thereto, each stage including interconnecting means responsive to switching data for interconnecting channels on paths to other channels on paths connected thereto whereby terminating circuits may communicate by way of channels interconnected by a plurality of the stages,

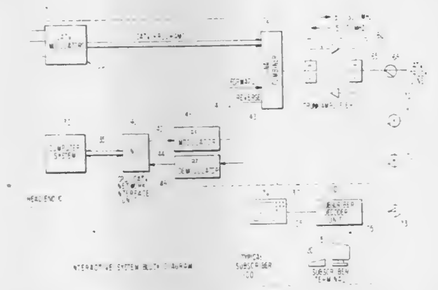
a processor for generating and exchanging switching data, the processor being arranged to communicate by way of one of the terminating circuits so that the processor may be assigned to exchange switching data with at least a defined one of the channels on the communication path interconnecting the one terminating circuit and the certain stage connected thereto, and means for rendering said interconnecting means included in each stage responsive to the switching data on the defined channel.

4,633,462

MULTIPLE ACCESS COMMUNICATION ON A CATV REVERSE CHANNEL

John E. Stifle; Donald A. Lee, and Donald L. Bitzer, all of Urbana, Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Jul. 18, 1983, Ser. No. 514,906
Int. Cl.[4] H04J *3/02, 3/16, 3/24*
U.S. Cl. 370—85 **26 Claims**



1. A method of multiple access communication for communicating information from a plurality of transmitters coupled over a common communication link to a receiver location comprising:

transmitting from a transmitter, with information to transmit, at an arbitrary time, over said communication link,

initiating a sequence of retransmissions at said transmitter, said sequence terminating on receipt of an acknowledgement from said receiver, wherein at least some of said sequential retransmissions are spaced by increasingly longer delays.

4,633,463

RADIO COMMUNICATION SYSTEM

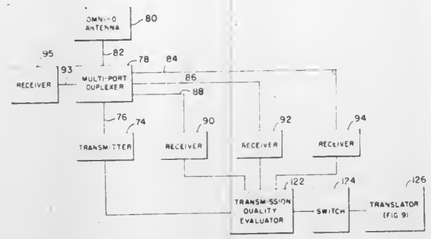
Alfred Mack, Little Silver, N.J., assignor to Canadian Marconi Corporation, Montreal, Calif.X

Filed Mar. 28, 1984, Ser. No. 594,113
Int. Cl.[4] H04J *3/16;* **H04Q** *7/00;* **H04B** *1/00*
U.S. Cl. 370—95 **10 Claims**

1. A communication system comprising:

(a) a plurality of central stations each including an omnidirectional antenna, a transmitter, each such central station transmitter transmitting at a frequency different from all other such central station transmitters, each said central station further having receivers operating at the frequencies of the transmitters of other system central stations and at least one further receiver for a remote station assigned to such central station, said further receiver operating at the transmitting frequency of such remote station;

(b) each said remote station including a directional antenna directed toward the central station to which such remote station is assigned and having a transmitter operating at a distinct transmitting frequency and a receiver operating at the frequency of its assigned central station transmitter; and



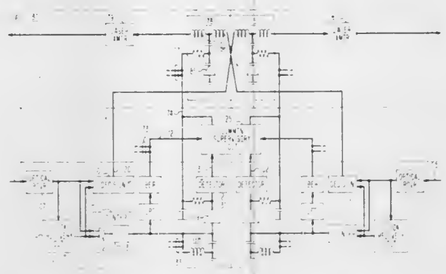
(c) received signal quality evaluation means for each said central station for collectively indicating the transmission and reception quality of each central station-to-central station communication path provided by said omnidirectional antennas.

4,633,464

CONTROL SIGNALLING ARRANGEMENT FOR A DIGITAL TRANSMISSION SYSTEM

Cleo D. Anderson, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1983, Ser. No. 521,377
Int. Cl.[4] H04J *3/12;* **H04B** *9/00*
U.S. Cl. 370—111 **5 Claims**



1. A control signaling arrangement for a pulse transmission system having a main data stream including frames of data, each frame including plural blocks of data, the main data stream including a block parity channel carrying block parity signals, one parity bit per block, through at least one line repeater; the arrangement comprising

means for generating a control signal including a command code word having a plurality of bits;

means for sampling each bit of the command code word and inserting a different one of several samples of each bit of the command code word of the control signal in each of several periodically spaced bit positions of the block parity channel, each one out-of-N of the blocks of said main data stream containing one of the sample bits of the command code word;

means located at the line repeater and responsive to the main data stream for recovering from the main data stream information carried by the block parity signals and including the control signal and the block parity error signals;

means responsive to the recovered information for separating the control signal including the command code word from the recovered information; and

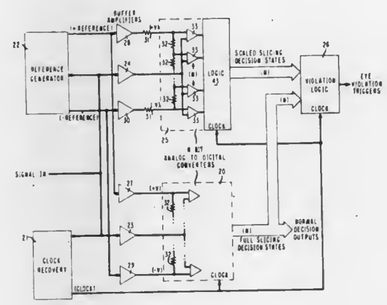
means responsive to the recovered information for separating the block parity error signals from the recovered information.

4,633,465

EYE VIOLATION DETECTORS

Theodore A. Fitch, Cliffwood Beach, and Michael L. Steinberger, Colts Neck, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 27, 1985, Ser. No. 716,563
Int. Cl.[4] G06F *11/00;* **H04B** *17/00*
U.S. Cl. 371—6 **13 Claims**



1. An eye violation detector comprising:

an input terminal for receiving an input signal encoded to assume a different one of a plurality of N states for each of N possible sample values at a predetermined period of time;

first (**20**) decision means responsive to a received input signal and each of a first and a second reference signal representative of the positive and negative d-c amplitude variations of the received input signal for generating a digital output signal representative of the encoded state of the input signal during each predetermined transition time period between normal encoded changes in state;

second decision means (**25, 31**) responsive to a received input signal and a predetermined scaled value of each of the first and second reference signals for generating a digital output signal representative of the encoded state of the input signal relative to the scaled reference signals during each predetermined transition period between normal encoded changes in state; and

violation logic means (**26**) responsive to predetermined bits in the output signals of the first and second decision means for detecting, during a predetermined instant of time substantially in the center of each predetermined transition time period between state changes, whether a pseudo error has occurred and for generating an output signal representative of such pseudo error detection.

4,633,466

SELF TESTING DATA PROCESSING SYSTEM WITH PROCESSOR INDEPENDENT TEST PROGRAM

Gerald E. Laws, and Keith E. Diefendorff, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

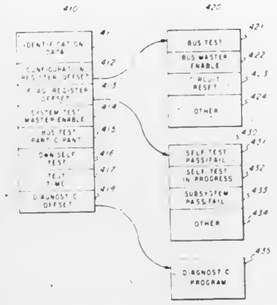
Filed May 1, 1984, Ser. No. 605,752
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16 **12 Claims**

1. A self testing data processing system comprising:

a communications bus having a plurality of connection slots for bidirectional communication between said slots;

at least one nonintelligent data processing circuit, each nonintelligent data processing circuit connected to one of said slots and having a test memory means connected to and readable from said communications bus, said test memory means having a diagnostic program, written in an intermediate level interpretable test language, stored therein for testing said nonintelligent data processing circuit; and

at least one intelligent data processing circuit connected to said communications bus and having an interpreter program and a testing means, said interpreter program for interpreting said intermediate level interpretable test language, and said testing means, including data processing means for executing programs stored in memory, for testing said at least one nonintelligent data processing circuit via said communications bus by recall, interpretation and execution of said test program stored in said test memory means.

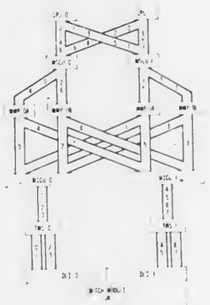


4,633,467

COMPUTER SYSTEM FAULT RECOVERY BASED ON HISTORICAL ANALYSIS

Mark J. Abel, Middleburg Heights, Ohio; Chi L. Kwan, Naperville, Ill.; Philip V. Polli, Elk Grove Village, Ill., and Michael T. Veach, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 26, 1984, Ser. No. 634,461
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—16 **12 Claims**



1. In a computer system comprising a processing unit (CPU), a peripheral unit (SM), and at least one interface unit (MSCU, MMP, MICU, TMS, DLI) connecting the processing unit to the peripheral unit, and in which prescribed ones of the units include means for generating and returning error report messages to the processing unit in response to detections of prescribed error conditions, a software implemented method for controlling the processing unit to identify a faulty system unit, said method comprising the steps of

in response to receipt of an error report identifying a predefined error condition and one of the prescribed units generating the error report, generating an initial list of predetermined fault probability weights for the system units,

aging a history list containing fault weights generated by the

next-mentioned step as a result of receipt of a last error report by reducing the fault weights for each unit in the history list according to a first prescribed algorithm based on elapsed time since receipt of the last error report,

generating a new history list by individually combining the fault weights in the initial list with the fault weights in the aged history list for each unit according to a second prescribed algorithm, and

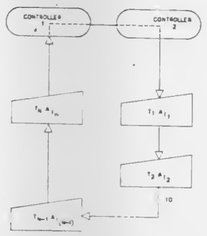
selecting as faulty unit that unit having the largest fault weight in the new history list that also has a non-zero fault weight in the initial list.

4,633,468

DETECTING AND RECOVERING FROM FAULT CONDITION IN A SERIAL LOOP DATA TRANSMISSION SYSTEM

Ralph O. Skatrud, Raleigh, N.C., and Chester L. Storm, Hillsville, Va., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,489
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—22 **10 Claims**



1. In a data transmission system having a plurality of terminal stations serially connected to a loop communications media and at least one control station connected to the loop and in series with the terminal stations, a method for determining and broadcasting a fault condition in said system comprising the steps of:

at the control station

(a) generating and transmitting a first control message operable for initiating a predetermined sequence of events in terminal stations connected to said serial loop;

at each active terminal station

(b) monitoring the loop for detecting said first control message;

(c) for active terminal stations not receiving the first control message, generating and transmitting a second control message having an indicia for identifying an issuing terminal station;

(d) monitoring the loop and receiving the second control message;

(e) examining the received second control message and if the indicia in said received second control message and the indicia of the receiving terminal station satisfy a predetermined criteria retransmitting the second control message with the indicia being that of the terminal station whose indicia satisfies the criteria;

(f) deactivating the transmitter of the terminal station of step (e) only if the stations indicia was not in a retransmitted second control message;

(g) repeating steps (d-f) at all terminal stations downstream from the terminal station in step (e); and

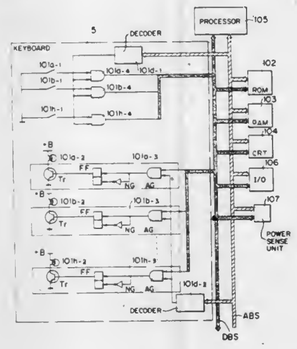
(h) issuing a third control message indicating the presence of a fault in said communications system from the terminal station whose indicia and that of an incoming second control message satisfy the predetermined criteria.

4,633,469

METHOD OF INDICATING DIAGNOSTIC RESULTS

Hajimu Kishi, and Kunio Tanaka, both of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP83/00336, § 371 Date Jun. 8, 1984, § 102(e) Date Jun. 8, 1984, PCT Pub. No. WO84/01639, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 11, 1983, Ser. No. 619,560
Claims priority, application Japan, Oct. 13, 1982, 57-179351
Int. Cl.[4] G01R *31/28*; G06F *11/00*
U.S. Cl. 371—29 **6 Claims**



1. A method of indicating the results of diagnosing an apparatus which performs prescribed processing under the control of a control program using input information entered from a keyboard having a plurality of keys, each of which is equipped with a lamp, and which carries out various diagnostic tests in accordance with a diagnostic program, comprising the steps of:

establishing correspondence between each diagnostic test and each lamp;

starting the diagnostic program, executing various diagnostic processes on the basis of the diagnostic program; and

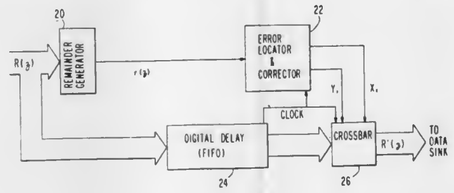
lighting the lamp corresponding to the diagnostic process when a result of the diagnostic process is determined to represent a malfunction.

4,633,470

ERROR CORRECTION FOR ALGEBRAIC BLOCK CODES

Lloyd R. Welch, La Canada, and Elwyn R. Berlekamp, Berkeley, both of Calif., assignors to Cyclotomics, Inc., Berkeley, Calif.

Filed Sep. 27, 1983, Ser. No. 536,951
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **2 Claims**



1. The method of correcting as many as i errors encountered in an information unit received by a digital communication terminal, said information unit algebraically encoded as a polynomial in a variable z, said code, a systematic code having a distance d and generator polynomial G (z), $i<d/2$, said information unit comprising message symbols and redundancy symbols, said method comprising the steps of:

(a) retaining at least said message symbols of said information unit temporarily,

(b) forming the remainder polynomial r(z) of the received information unit, mod G (z),

(c) decomposing the polynomial r(z) into a rational function of two polynomials, $F(z)=N(z)/W(z)$, the degree of $N(z)<$ the degree of W(z) and degree W(z) no more than the maximum number of correctable errors, said polynomial W (z) of degree δ and having roots corresponding to said error locations and said polynomial N(z) of degree less than δ

(d) determining the roots X_i of W(z) whereby the field locations $X_i=\alpha^i$ for message symbol errors are determined in powers of a primitive element α of the code,

(e) obtaining the corrected value Y_i of each said erroneous symbol corresponding to root X_i from a relation $Y_i=f(X_i)$ $N'(X_i)/W'(X_i)$, said $f(X_i)$ dependent only upon said G(z),

(f) retrieving said information unit and substituting said corrected value(s) corresponding to error locations X_i to form a corrected information unit, and

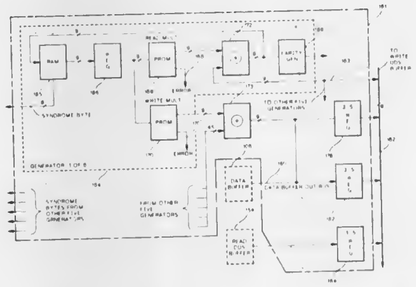
(g) transmitting said corrected information unit to a data sink.

4,633,471

ERROR DETECTION AND CORRECTION IN AN OPTICAL STORAGE SYSTEM

S. Robert Perera, and Michael J. O'Keeffe, both of Boulder County, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Sep. 19, 1983, Ser. No. 533,827
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **17 Claims**



1. In a data processing system wherein digital data is stored by writing the data on storage media, and wherein said data may be subsequently retrieved by reading the data from the storage media, and further wherein, for error detection and correction purposes, the data is encoded with a Reed-Solomon code prior to writing it on the media and decoded after it is read from the media, a shared system for encoding and decoding the data, said system comprising:

storage means for storing at least a byte of data;

exclusive-or means for performing the modulo two addition of first and second data bytes, presented at first and second input ports thereof, the sum of which is a sum data byte that is coupled to an input port of said storage means;

first multiplication means coupled to an output port of said storage means for generating a first product data byte that is the product of the data byte stored in said storage means and other prescribed data;

second multiplication means coupled to the output port of said storage means for selectively generating a second product data byte that is the product of the data byte stored in a said storage means and other prescribed data;

means for coupling the first product data byte to the first input port of said exclusive-or means, whereby said first product data byte comprises one of the two data bytes summed by said exclusive-or means;

data byte combination means for generating a combined data byte as a prescribed function of a plurality of secondary data bytes presented thereto, one of said secondary data bytes comprising said second product data byte; and

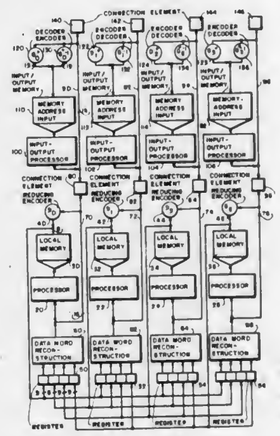
select means for selecting the select input data byte presented to the second input port of said exclusive-or means, said select means being adapted to choose the select input data byte from: (1) a data byte to be recorded on the storage media, or (2) a data byte read from the media.

4,633,472

MULTIPROCESSOR COMPUTER SYSTEM COMPRISING N PARALLEL OPERATING COMPUTER MODULES, AND COMPUTER MODULE FOR USE IN SUCH A MULTIPROCESSOR COMPUTER SYSTEM

Thijs Krol, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,839
Claims priority, application Netherlands, Oct. 20, 1982, 8204038
Int. Cl.[4] G06F *11/16*; H03M *13/00*
U.S. Cl. 371—40 **6 Claims**



1. A multiprocessor computer system, comprising n synchronously controlled parallel operating computer modules, each of which is localized in its own fault isolation area, each computer module comprising:

a processor module;

a data channel which is connected to a data connection of the processor module;

a reducing encoder which is connected to the data channel in order to form a code symbol from a data word received from said data channel so that said encoders of the modules processing said data word form, on the basis of a data word comprising k data symbols, a code word consisting of $k+1 \leqq n < 3k$ code symbols of a code incorporating a simultaneous correction capability in at least two code symbols;

a memory module comprising a first data input which is connected to a first data output of the associated reducing encoder, and to a relevant second data output of each memory module of the respective computer modules;

and a data word reconstruction module which is connected via an interconnection network, to the relevant second data outputs of the memory modules of the various computer modules in order to receive a relevant code symbol of a code word from each computer module in order to construct a data word therefrom, the data word reconstruction module comprising a third data output which is

connected to said data connection and to said data channel, said data channel also comprising a second data connection for external data input/output, wherein each computer module further comprises:

a second data channel which is connected in series with said second data connection and which comprises a third data connection;

an input/output memory module which is connected, at least when a generator matrix (G_i) of the associated reducing encoder maps a data bit on more than one code bit to the second data channel by way of a second nonreducing encoder and a third data input and a decoder which is associated with the second encoder, the following relations existing between the generator matrix (G_i) of a reducing encoder, at least in so far as this encoder maps a data bit on more than one code bit, the generator matrix (G_i^*) of the second encoder, and the generator matrix (G_i^{*-1}) of the decoder:

$[G_i^*]\cdot[G_i^{*-1}]=[I]$, the identity matrix;

$[F]=[G_i]\cdot[G_i^{*-1}]$,

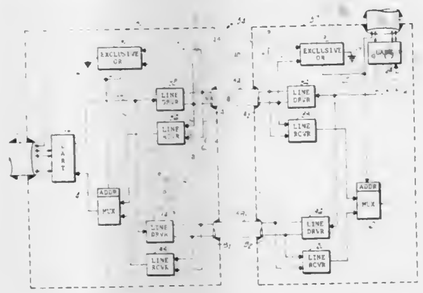
in which each column of [F] written as consisting of bits, comprises at the most one "1" and for the remainder exclusively "zeroes", each row of [F] containing at least one "1", so that in the relevant computer module a bit of a data word encoded in the input/output memory is mapped on at the most one bit of the code symbol which can be formed from that data word.

4,633,473

FAULT TOLERANT COMMUNICATIONS INTERFACE

Michael Ratchford, East Granby; Richard L. Bue, West Hartford, and Alexander Charov, Moodus, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 2, 1984, Ser. No. 637,187
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—68 **2 Claims**



1. Apparatus for providing half-duplex transmission of user digital data signals between two user signal transceivers, comprising:

first and second transmission lines, each having first and second conductors adapted to receive, individually, a serial bit digital signal;

network means, one for each signal transceiver, each network including

universal asynchronous receive and transmit (UART) means, for converting user data signals from the transceiver into apparatus serial bit signals, and for reconverting apparatus serial bit signals into user data signals for presentation to the transceiver;

line driver means, one associated with each said transmission line, each converting said apparatus serial bit signals from said UART into two opposite polarity serial bit signals for presentation to a related one of said first and second conductors of said associated transmission line;

line receiver means, one associated with each said transmission line, each converting said opposite polarity serial bit signals received from said first and second conductors of said associated transmission line to an apparatus serial bit signal;

fault monitor means, connected at first and second signal inputs thereof to said first and second conductors of said first transmission line, for providing a bistable fault signal having an enable state, in response to the simultaneous presence and, alternately, the simultaneous absence of said opposite polarity serial bit signals on said first and second conductors, said fault signal having an alarm state at all other times; and

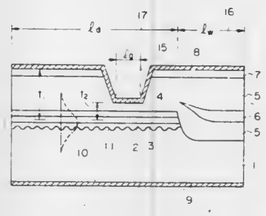
signal multiplexer means, responsive to said apparatus serial bit signals from said line receiver means at first and second inputs thereof, and responsive to said fault signal at an address input thereof, for presenting said apparatus serial bit signal from said line receiver associated with said first transmission line to said UART in the presence of said fault signal enable state, and for presenting said apparatus serial bit signal from said line receiver associated with said second transmission line to said UART in the presence of said fault signal alarm state.

4,633,474

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

Shigeyuki Akiba, Tokyo; Katsuyuki Utaka, Musashino; Kazuo Sakai, Tokyo, and Yuichi Matsushima, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,244
Claims priority, application Japan, Dec. 9, 1983, 58-231356
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—19 **2 Claims**



1. In a distributed feedback semiconductor laser having a light emitting layer, a semiconductor layer adjoining the light emitting layer having periodic corrugations extending in a direction of travel of light in the light emitting layer, metal electrodes on opposite sides of the semiconductor for injection of electrical current into said light emitting layer for performing of laser oscillation in the light emitting layer, wherein the improvement comprises a part of at least one of the metal electrodes being disposed in a position relative to a region of the semiconductor laser where light is essentially distributed in the thickness direction of the laser and effectively developing a TM mode suppression.

4,633,475

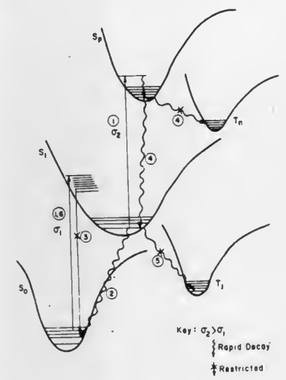
OPTICAL LIMITER

Donald J. Harter, Piscataway; Michael L. Shand, Morristown; Yehuda B. Band and Harold Samelson, both of Elizabeth, all of N.J.

Filed Jun. 10, 1983, Ser. No. 502,908
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—25 **14 Claims**

1. An apparatus comprising a laser for producing a beam having a certain wavelength and, in the laser beam path, an optical limiter comprising a material that has a ground state, a first excited state, and a second excited state of higher energy than the first excited state, and has, at said certain wavelength,

(a) a cross section for excitation from the first excited state that is greater than the cross section for excitation from the ground state to the first excited state;



(b) substantially no decay from the first excited state to states that have decay times longer than the time for decay from the first excited state to the ground state; and

(c) rapid decay from the second excited state to the first excited state,

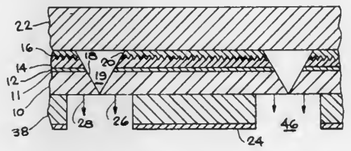
whereby an optical limiter absorption coefficient at said certain wavelength increases with increasing intensity.

4,633,476

SEMICONDUCTOR LASER WITH INTERNAL REFLECTORS AND VERTICAL OUTPUT

Donald R. Scifres, San Jose, and Gary L. Harnagel, Palo Alto, both of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Filed Nov. 16, 1984, Ser. No. 672,297
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **20 Claims**



1. A heterostructure semiconductor laser comprising a plurality of layers of semiconductor materials, one or more of said layers forming a horizontally disposed light emitting active layer capable of lasing, said active layer having spaced apart lateral ends,

optical feedback means integrated within said laser in internal proximity to said active layer for forming a laser cavity reflecting light in said active layer,

mirror-like surfaces forming said spaced apart lateral ends, inclined at an angle greater than the angle of total internal reflection relative to said active layer to deflect a portion of the light from said cavity vertically out of said active layer, and

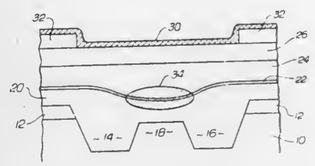
pumping means communicating energy to said active layer for production of laser radiation therein.

4,633,477

SEMICONDUCTOR LASER WITH BLOCKING LAYER

Charles B. Morrison; Luis Figueroa, and Andre Burghard, all of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jul. 20, 1984, Ser. No. 632,767
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **47 Claims**



1. In a semiconductor laser diode operable at high power and brightness levels, a structure comprising:

a semiconductor substrate having at least two parallel channels formed in one of its surfaces;

a first inactive cladding semiconductor layer of the same polarity type material as the substrate, overlying the substrate;

a second inactive cladding semiconductor layer of the opposite polarity type material;

an active semiconductor layer disposed between the first and second inactive layers;

a blocking layer of opposite polarity type material to the substrate, disposed between the substrate and the first inactive layer, but only in regions outside of the substrate channels, and not in regions overlying or between the channels; and

means for applying a bias voltage between the inactive layers, to produce optical gain in the device, wherein said means for applying a bias voltage includes a metallization layer extending over the substrate channels;

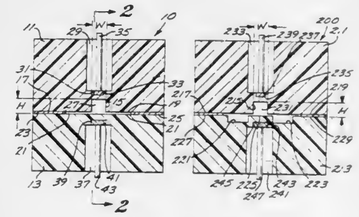
whereby the blocking layer and the multiple channel structure together provide a current focusing mechanism that concentrates current flow through and between the channels, and thereby improves performance characteristics.

4,633,478

HIGH EFFICIENCY RF EXCITED GAS LASER WITH TRANSVERSE DISCHARGE EXCITATION

Paul F. Robusto, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 17, 1985, Ser. No. 745,570
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—83 **25 Claims**



1. A laser structure comprising:

means for defining an elongated laser cavity suitable for containing a laser gas and maintaining a laser exciting discharge in the laser gas, said laser cavity having a longitudinal dimension and a cross section perpendicular to said longitudinal dimension; and

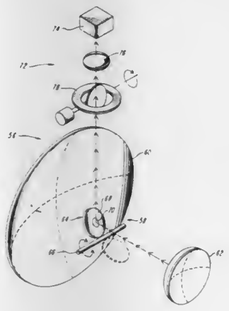
a pair of opposing electrodes disposed in the proximity of and extending along said laser cavity longitudinal dimension for providing a laser excitation field within said cavity and respectively having an electrode dimension that is generally parallel to a corresponding cross sectional dimension of said laser cavity, said electrode dimension of at least one of said opposing electrodes being less than said laser cavity cross sectional dimension, said electrodes producing a laser exciting discharge within a predetermined region of said laser cavity and providing for laser energy with optimum efficiency.

4,633,479

ALIGNMENT SYSTEM FOR A CONFOCAL UNSTABLE LASER RESONATOR

Milton B. Trageser, Winchester, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 13, 1984, Ser. No. 640,504
Int. Cl.⁴ H01S *3/08*
U.S. Cl. 372—107 **5 Claims**



1. An alignment system for a confocal unstable laser resonator having a concave primary reflector and a spaced-apart convex secondary reflector defining such an optical cavity having a magnification factor "M", an optical aperture, and an optical axis that optical energy received by the optical aperture of the optical cavity oscillates between the cavity reflectors, where for each round trip oscillation "n" between the cavity reflectors, the received optical energy defines a corresponding one of plural optical energy annular beams respectively having a spot size inversely proportional to "M^n" and a magnification proportional to "M^n", for non-negative integer values of "n", comprising:

means for extracting two received optical energy annular beams of selected different magnification and corresponding spot size out of said optical cavity; and

means optically coupled to said extracting means and responsive to said at least two received optical energy annular beams of selected different magnification and spot size for detecting the degree of relative co-axial mis-alignment therebetween.

4,633,480

LIQUID COOLED COVER FOR ELECTRIC ARC FURNACE

Karl R. Bleimann, Matthews, N.C., assignor to Fuchs Systems, Inc., Salisbury, N.C.

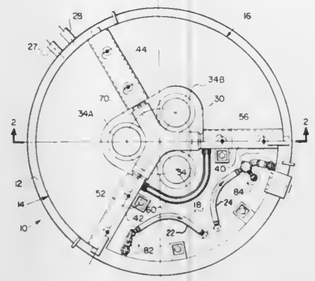
Filed Aug. 16, 1984, Ser. No. 641,524
Int. Cl.⁴ F27D *1/12*
U.S. Cl. 373—74 **11 Claims**

1. A water-cooled cover for an electric arc furnace, comprising:

a. a peripheral tubular member adapted for water flow therethrough;

b. a plurality of equally spaced cantilevered beam supports fixed to said peripheral member, extending inwardly and inclined upwardly from said peripheral member;

c. an equal number of water-cooled panels suspended from and between, and insulated from said cantilevered support beams and from each other by high temperature resistant, electrically resistant insulation;



d. means connected to a water source and to said peripheral ring for introducing and removing cooling water to and from said peripheral ring;

e. water conduit means connecting said peripheral ring and each of said water-cooled panels;

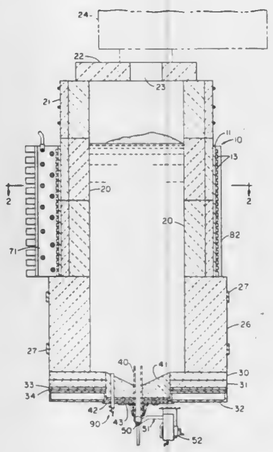
f. each of said water-cooled panels being adapted to surround no more than one electrode no more than about 300°.

4,633,481

INDUCTION HEATING VESSEL

Ronald L. Schwenninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1984, Ser. No. 656,386
Int. Cl.⁴ F27D *11/06*
U.S. Cl. 373—152 **5 Claims**



1. Apparatus for heating molten material comprising:

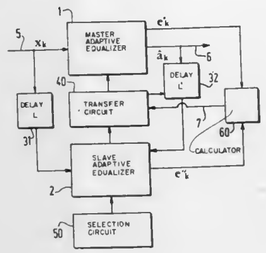
a vessel adapted to hold a body of molten material, a coil extending around the vessel and adapted to receive alternating electric current and to establish a magnetic field within the vessel, a turn of the coil being configured as a sheath having extended continuous area bearing against exterior side portions of the vessel, the coil turn serving as the primary binding for the vessel portions faced thereby.

4,633,482

METHOD OF AND ARRANGEMENT FOR DETERMINING THE OPTIMUM POSITION OF THE REFERENCE TAP OF AN ADAPTIVE EQUALIZER

Hikmet Sari, Creteil, France, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1984, Ser. No. 671,381
Claims priority, application France, Nov. 14, 1983, 83 18027
Int. Cl.⁴ H04B *3/14*
U.S. Cl. 375—14 **6 Claims**



1. A method of determining the optimum position of the reference tap of a master adaptive equalizer which adapts itself to variations in the transmission characteristics of a channel of a digital transmission system for transmitting data symbols x_k which are in general complex, such adaptation being effected by modifying sets of coefficients of a transversal filter comprised in the master adaptive equalizer and which modify the transmitted data symbols, characterized in that simultaneously with the operation of the master adaptive equalizer and in consecutive analyzing periods:

a selection is made, in a slave adaptive equalizer, of the position of a reference tap of a transversal filter therein and the coefficients of such filter are subsequently adapted, such selection and adaptation being in accordance with a selection algorithm and an adaptation algorithm, respectively;

a comparison is made between the symbols supplied by the master and slave adaptive equalizers in accordance with an error criterion; and

in the case in which the error criterion indicates that the adaptation provided by the slave adaptive equalizer results in less symbol error than the adaptation provided by the master adaptive equalizer, the reference position and the coefficients of the transversal filter of the slave adaptive equalizer are transferred to the transversal filter of the master adaptive equalizer.

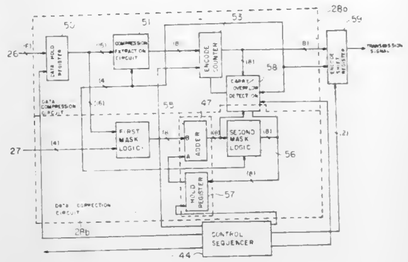
4,633,483

NEAR-INSTANTANEOUS COMPANDING PCM INVOLVING ACCUMULATION OF LESS SIGNIFICANT BITS REMOVED FROM ORIGINAL DATA

Susumu Takahashi, and Hiroyuki Kanzaki, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,199
Claims priority, application Japan, Mar. 31, 1983, 58-056197; Jul. 7, 1983, 58-123960; Aug. 16, 1983, 58-149418; Aug. 25, 1983, 58-155509; Sep. 5, 1983, 58-163042; Sep. 27, 1983, 58-178890; Feb. 6, 1984, 59-019743
Int. Cl.⁴ H03M *7/30*
U.S. Cl. 375—25 **19 Claims**

15. A data transmission system comprising: means for accumulating removed bits when PCM or DPCM encoded data are subject to a near-instantaneous companding system, means for adding a carry of the accumulated removed data to transmission data to thereby transmit said carry, a detection circuit for detecting whether the transmission data, obtained by shifting the encoded data in accordance with a scale value, has a bit status comprising a most significant bit of the value "0" and all



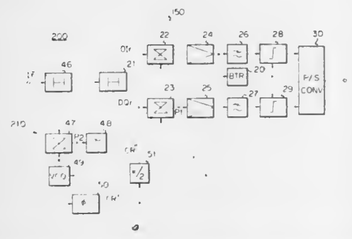
other bits of the value "1", and means for changing said scale value when said bit status of the transmission data is detected.

4,633,484

RECEIVER UNIT IN RADIO COMMUNICATION SYSTEM

Yukio Takeda, Zama; Hiroshi Nakamura, Sagamihara, and Eisuke Fukuda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 23, 1984, Ser. No. 674,314
Claims priority, application Japan, Nov. 30, 1983, 58-224441
Int. Cl.⁴ H04B *1/68, 15/00*
U.S. Cl. 375—77 **6 Claims**



1. A receiver unit in a radio communication system in which a transmitter unit outputs transmission data, modulated in accordance with a multilevel quadrature amplitude modulation method and containing a leakage carrier by addition of a direct current offset signal to one of quadrature components forming the transmission data. to said receiver unit via a transmission line, said receiver unit comprising:

means for receiving the transmission data in a received signal;

means for branching the received signal into first and second signal components containing the transmission data, each signal component including the leakage carrier with a phase difference of $\pi/2$ radian between the leakage carrier in the first and second signal components;

first channel means for demodulating the first signal component, including:
- a first synchronous detection circuit operatively connected to said branching means; and
- a first discriminator operatively connected to said first synchronous detection circuit;

second channel means for demodulating the second signal component, including:
- a second synchronous detection circuit, operatively connected to said branching means, for producing a first output signal having a noise component; and
- a second discriminator, operatively connected to said second synchronous detection means, for producing a second output signal; and

carrier recovery means for generating first and second reference carriers and for cancelling the noise component contained in the first output signal, comprising:

a control circuit, operatively connected to thq second synchronous detection circuit and the second discriminator, for providing a direct current component representing a phase difference between the leakage carrier and the second reference carrier, including:
- a digital-to-analog converter, operatively connected to receive the second output signal from the second discriminator, for producing a third output signal;
- an adder, having a first input operatively connected to receive the first output signal from the second synchronous detection circuit and a second input operatively connected to receive the third output signal from said digital-to-analog converter, for subtacting the third output signal from the first output signal; and
- a low-pass filter operatively connected to said adder; and

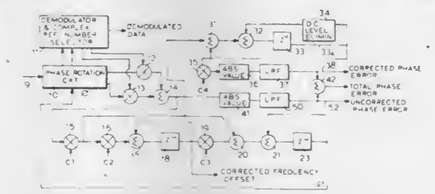
a phase-locked loop circuit, operatively connected to said low-pass filter and to the first and second synchronous detection circuits in said first and second channel means, respectively, for minimizing the phase difference and for providing the first and second reference carriers, having the phase differencd of $\pi/2$ radian, to the first and second synchronous detection circuits, respectively.

4,633,485

ADAPTIVE NOISE SUPPRESSION FOR DIGITAL MODEMS

William L. Betts, St. Petersburg, and Edward Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Mar. 8, 1985, Ser. No. 709,562
Int. Cl.[4] H03D *1/04*; H04B *1/10*; H04L *7/00*
U.S. Cl. 375—99 **2 Claims**



1. In the receiver section of a modem for receiving quadrature amplitude modulated (QAM) signals, a phase tracking loop comprising:

coordinate rotation means for rotating said QAM signals to form rotated QAM signals by an average phase error signal;

demodulator and complex reference number selector means for demodulating said rotated QAM signals and for selecting complex reference numbers corresponding to said rotated QAM signals;

instantaneous phase error signal generating means for generating an instantaneous phase error signal corresponding to said rotated QAM signals and said complex reference numbers;

multiplying means for multiplying said instantaneous phase error signal by a gain signal to produce a multiplied error signal;

means for generating a corrected error signal by averaging said multiplied error signal;

means for generating said gain signal including a comparator for comparing the corrected phase error signal to a preselected threshold value for varying said gain in accordance with said threshold; and

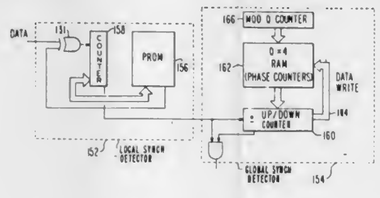
averaging means of averaging said corrected error signal to generate said average phase error signal.

4,633,486

METHOD AND APPARATUS FOR SYNCHRONIZATION BY COHERENT REINFORCEMENT

Elwyn R. Berlekamp, and Po Tong, both of Berkeley, Calif., assignors to Cyclotomics, Inc., Berkeley, Calif.

Division of Ser. No. 518,213, Jul. 28, 1985, Pat. No. 4,559,625.
This application Oct. 4, 1985, Ser. No. 784,831
Int. Cl.[4] H04L *7/08*
U.S. Cl. 375—116 **4 Claims**



1. The method of determining a synchronization condition defined by periodically transmitting a synchronization symbol comprising c bits in addition to an information block comprising M bits, said M+c bits comprising M+c phases of the transmission period for the block, comprising the steps of

(a) associating a respective finite capacity counter with each phase for measuring the relative probability that each said phase marks the synchronization condition,

(b) comparing each c bits of said M+c bits with a representation of said synchronization symbol,

(c) incrementing that phase associated counter corresponding to a specific bit of the c bit pattern currently compared upon the result of said comparing step establishing congruence of said c bit pattern with said representation, or

(d) decrementing that phase associated counter corresponding to a specific bit of the c bit pattern currently compared, upon the result of said comparing step establishing non-congruence of said c bit pattern with said representation, and,

(e) generating a synchronization signal upon overflow of any one of said phase associated counters.

4,633,487

AUTOMATIC PHASING APPARATUS FOR SYNCHRONIZING DIGITAL DATA AND TIMING SIGNALS

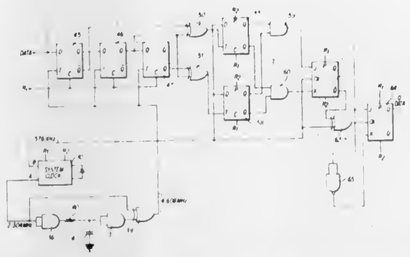
Robert Goeb, Spotswood, and Nathaniel L. Silber, Cedar Grove, both of N.J., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 17, 1985, Ser. No. 691,978
Int. Cl.[4] H04L *7/04*
U.S. Cl. 375—118 **21 Claims**

1. An automatic phasing apparatus for establishing a fixed phase relationship between an incoming digital data signal and a first and a second input timing signal which signals as received have an arbitrary but fixed phase relationship therebetween, comprising:

first means responsive to said first input timing signal for generating a synchronized timing signal having a greater repetition rate than said first input timing signal,

timing generator means having a first input responsive to said data signal and a second input responsive to said synchronized timing signal to provide at an output, thereof, first and second pulse signals with said first pulse signal indicative of a first given delay between a given transition of said data signal and said synchronized timing signal, and with said second pulse signal indicative of a second given delay, between said data and said synchronized timing signal



sampling means responsive to said first and second pulse signals for sampling said second input timing signal within a single cycle according to said given delays to provide at an output a logic signal indicative of a transition of said second input timing signal which is farthest delayed in time from said given transition of said data signal and

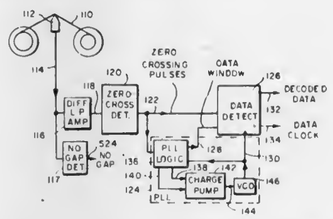
output generating means responsive to said logic signal and said data signal to provide a regenerated data signal always having a fixed phase relationship to said first and second input timing signals.

4,633,488

PHASE-LOCKED LOOP FOR MFM DATA RECORDING

Robert A. Shaw, Longmont, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 13, 1984, Ser. No. 670,825
Int. Cl.[4] H04L *7/02*; G11B *5/09*
U.S. Cl. 375—120 **9 Claims**



1. A phase-locked loop for use with an input signal identifying the times of a series of events comprising:

(A) error means for generating an error signal,

(B) clock generating means connected to said error means and responsive to the error signal for producing a clock signal,

(C) timing means connected to said clock generating means and responsive to the clock signal for producing timing signals which define a data window, a clock window, a comparison time within the data window, and a comparison time within the clock window,

(D) comparison means connected to receive the input signal and connected to said timing means for determining whether the time of each event occurs in the data window or in the clock window,

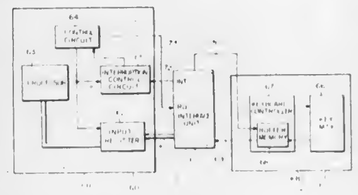
said error means being connected to said timing means and to said comparison means and connected to receive the input signal, and being arranged to adjust the error signal as a function of the time difference between the time of each event and the comparison time in the window in which the event occurs.

4,633,489

INTERFACE UNIT INSERTED BETWEEN A DATA TRANSFER UNIT AND A PROCESSOR UNIT

Shizuo Morishita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613.287
Claims priority, application Japan, May 24, 1983, 58-90905
Int. Cl.[4] H04L *23/00*
U.S. Cl. 375—121 **9 Claims**



1. An interface unit adapted to be inserted between a data transmitter unit and a receiver unit comprising:

a clock signal terminal through which a clock signal generated by a clock generator is applied to said transmitter unit,

a shift register receiving data which is n bits long, with the first bit being a start bit having a predetermined characteristic and the remaining bits being input data bits, said data transferred from the data transmitter unit in response to said clock signal,

a first circuit coupled to said shift register and generating a first signal in response to said first bit, said first bit being inputted to said first circuit after said remaining bits are set in said shift register, said first signal being applied to said receiver unit for indicating a start of data input, and said first signal being used to inhibit clock application to said transmitter unit, and

a second circuit for receiving a control signal from said receiver unit and for generating a second signal in response to said control signal, said control signal being applied to said second circuit after said receiver unit has received said remaining bits of said shift register in response to said first signal, said second signal being used to reset said shift register and to remove the inhibition of said clock application to said transmitter unit.

4,633,490

SYMMETRICAL OPTIMIZED ADAPTIVE DATA COMPRESSION/TRANSFER/DECOMPRESSION SYSTEM

Gerald Goertzel, White Plains, and Joan L. Mitchell, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,981
Int. Cl.[4] H04B *1/66*
U.S. Cl. 375—122 **17 Claims**

1. A data compression/transfer/decompression system operating to transfer a stream of data, which may be designated n=1, 2 . . . N−1, N and repeating n=1, 2 . . . N−1, N, compressed according to a selected data compression model, characterized by

(a) data input means;

(b) first state generator means (b), connected to said data input means (a), for providing a binary decision bit signal for binary decision n, and a state signal, which may be a multi-bit signal, for binary decision n;

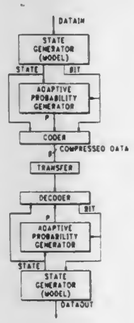
(c) first adaptive probability generator means, connected to

said state generator means (b), responsive to a previously developed statistic value developed during binary decisions 1 . . . (n−1), to state signal n and to bit signal n to provide an updated probability statistic for use in decisions subsequent to binary decision n, and to provide probability signal n as output;

(d) coder means, connected to said first state generator means (b) and to said first adaptive probability generator means (c), responsive to state signal n and binary decision bit signal n provided by said first adaptive probability generator means (c), to generate a compressed data group for transfer;

(e) transfer means connected to said coder means;

(f) decoder means, connected to said transfer means (e), to second state generator means (h) and to second adaptive probability generator means (i), responsive to a compressed data transfer signal group, to destination state



signal n and to destination adaptive probability signal n to provide decompressed signals for binary decision n;

(g) output means, for providing at the destination a data stream of decompressed data corresponding to the data stream at said input means,;

(h) second state generator means, connected to said output means (g), to said decoder means (f) and to second adaptive probability generator means (i), providing for binary decision n, a destination state signal n, which may be a multi-bit signal, and responsive to said decoder output destination bit signal n to provide output data to said output means (g);

(i) second adaptive probability generator means, connected to said second state generator means (h) and to said decoder means (f), responsive to said destination bit signal and to said destination state n to provide an updated probability statistic for use in decisions subsequent to binary decision n, and to provide probability signal n as output.

4,633,491

CIRCUIT FOR ELECTROTHERMAL LEVEL MEASUREMENT COMPENSATED FOR AMBIENT TEMPERATURE

Frank Kühnel, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,168

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408824

Int. Cl.⁴ G01F *23/24*

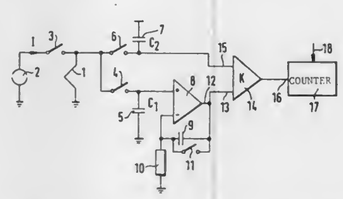
U.S. Cl. 377—20 **9 Claims**

1. In a circuit for electrothermal measurement of the level of a liquid within a container with compensation for ambient temperature, which circuit has a switchable source of constant current for energizing a resistance probe, a comparator which compares an initial voltage V_0 appearing at the resistance probe at the start of a heating period with a heating voltage V_1 appearing at the end of a heating period, an improvement providing the measurement by a counting operation, the improvement comprising

an integrator comprising a resistor and a capacitor connected together in an integrating circuit,

a counter, said comparator having a first input terminal connected to an output terminal of said integrator, and an output terminal providing a control signal coupled to said counter for starting and stopping a counting of said counter; and

a plurality of sample-and-hold circuits connected to said probe for sampling voltage developed thereat in response



to the application of current to the probe by the current source, a first of said sample-and-hold circuits being connected to an input terminal of said integrator for applying thereto a sample of voltage V_0 at the beginning of a heating interval, and a second of said sample-and-hold circuits being connected to a second input terminal of said integrator, for applying thereto a sample of voltage V_1 at the end of the heating interval; and wherein

said counter begins counting backward upon actuation of said comparator by a signal of said second sample-and-hold circuit, and terminates counting upon actuation of said comparator by an output signal of said integrator.

4,633,492

PLASMA PINCH X-RAY METHOD

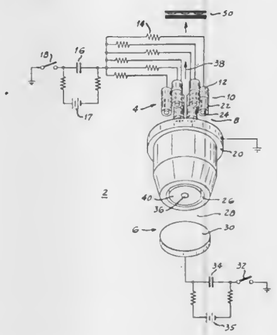
Arnold Weiss, Minneapolis, Minn.; Herman P. Schutten; Louis Cartz, both of Milwaukee, Wis.; Gordon B. Spellman, Mequon, Wis.; Stanley V. Jaskolski, Sussex, Wis., and Peter H. Wackman, deceased, late of Wauwatosa, Wis. (by Connie M. Wackman, Personal Representative), assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 420,558, Sep. 20, 1982, Pat. No. 4,536,884. This application Sep. 13, 1984, Ser. No. 650,903

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

Int. Cl.⁴ H01J *35/00;* **H05B** *31/22*

U.S. Cl. 378—119 **8 Claims**



1. A method of producing X-rays comprising:

generating vapor directly from solid material in a first region;

communicating said vapor to a second region in spaced axial paths; and

generating X-rays in said second region by passing a high current axially through said vapor causing magnetic field plasma pinching radially inwardly;

repeatably generating plasma vapor directly from said solid material by passing high current along said solid material, said plasma generating current being separate from said X-ray generating current.

4,633,493

DENTAL INSTRUMENT FOR OPTIMAL POSITIONING OF AN X-RAY FILM SUPPORT, ESPECIALLY FOR USE IN THE X-RAYING OF FRONT TEETH

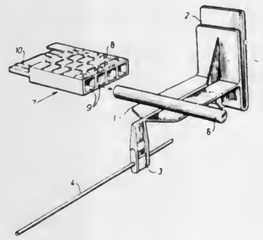
Enok S. R. Lindén, Teatergatan 4, S-582 22 Linköping, Sweden

Filed Oct. 17, 1984, Ser. No. 661,756

Claims priority, application Sweden, Oct. 27, 1983, 83059105

Int. Cl.⁴ G03B *42/02;* **A61B** *6/14*

U.S. Cl. 378—168 **3 Claims**



1. A dental instrument for positioning an X-ray film in the X-raying of teeth, especially front teeth, comprising:

(a) an elongate planar bridge member (1) configured to be partially inserted into a patient's oral cavity,

(b) a film holder (2) disposed on an inner end of tne bridge member for removably mounting an X-ray film perpendicular to a longitudinal axis of the bridge member,

(c) an X-ray camera alignment rod (4),

(d) means (3) disposed on an outer end of the bridge member for mounting the alignment rod parallel to and offset from the bridge member axis such that the alignment rod extends outwardly from the oral cavity,

(e) an elongate support arm (6) rigidly mounted to an intermediate portion of the bridge member, transverse to the longitudinal axis thereof, and having opposite ends extending outwardly from opposite sides of the bridge member, said support arm being:

(1) positioned on the bridge member so as to be clamped between teeth in the upper and lower jaw of the patient in such a manner as to enable a limited rotation of the film holder about a longitudinal axis of the support arm, and

(2) sufficiently spaced from the film holder along the longitudinal axis of the bridge member to extend the holder into the oral cavity a sufficient distance to enable a film mounted in the holder to be oriented parallel to a longitudinal axis of a tooth being X-rayed, and

(f) bite block means (7) optionally engageable with an end of the support arm for permitting rotation of the support arm about its longitudinal axis, said bite block means having a plurality of spaced support arm engagement positions to enable the distance within the oral cavity between the film holder (2) and the tooth being X-rayed to be selectively varied.

4,633,494

METHOD OF CONTROLLING THE POSITIONING OF A PATIENT WITH RESPECT TO AN X-RAY DEVICE AND INSTALLATION FOR CARRYING OUT SUCH METHOD

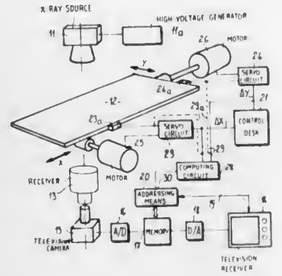
Remy Klausz, Neuilly sur Seine, France, assignor to Thomson-CGR, Paris, France

Filed Feb. 25, 1985, Ser. No. 704,851

Claims priority, application France, Feb. 28, 1984, 84 03040

Int. Cl.⁴ A61B *6/08*

U.S. Cl. 378—205 **11 Claims**



1. A method of controlling the positioning of a patient with respect to an X-ray installation comprising a patient supporting table, an X-ray source an X-ray receiver, means for controlling the relative displacements of said X-ray source and said table, sensor means for measuring the said relative displacements, a visualization system including an image memory for receiving digital information representing an X-ray image, and means for displaying said image, said method comprising the steps of acquiring an image by briefly actuating said visualization system, stiring said image, reproducing said image within a determined frame of said displaying means, relatively moving said x-ray source and said table to a desired longitudinal (x) and lateral (y) position, and inducing relative decentering of said frame and said image, in order to reproduce the image that would be observed if an xray were taken at the said desired position.

4,633,495

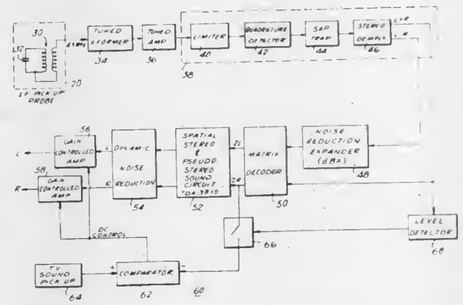
TV STEREO ADAPTER

Larry Schotz, Cedarburg, Wis., assignor to Recoton Corporation, Long Island City, N.Y.

Filed Jul. 23, 1985, Ser. No. 758,042

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—3 **17 Claims**

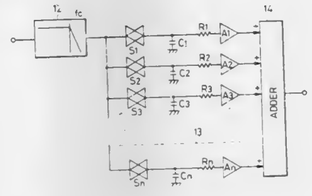


1. A TV stereo adapter for use with a television receiver to detect and decode stereophonic audio signals that are transmitted with composite television signals, said adapter comprising:

IF pick-up means physically separate from said television

receiver for picking up spurious IF audio signals normally generated by said television receiver;
stereo detecting means for detecting from said IF audio signals monophonic and stereophonic components that are transmitted with said composite television signals;
coupling means tuned to the IF carrier frequency of the picked up IF audio signals and connected between said IF pick-up means and said stereo detecting means for supplying said picked up IF audio signals at said IF carrier frequency to said stereo detecting means;
stereo decoding means responsive to the detected components for decoding left-channel and right-channel audio signals therefrom; and
output means for providing left-channel and right-channel signals adapted to drive sound transducing means.

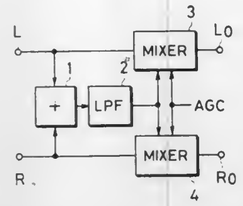
4,633,496
LOW-PASS FILTER CIRCUIT
Kiyoshi Ohtaki, and Kohji Ishida, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Japan
Filed Jul. 13, 1984, Ser. No. 630,607
Claims priority, application Japan, Jul. 30, 1983, 58-139853
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—4 **4 Claims**



1. A circuit for receiving and demodulating an FM stereo composite signal comprising:
demodulator means for demodulating an FM stereo composite signal to produce a first demodulated signal which includes the left channel signal and signals at the subcarrier frequency and at least one of its harmonics, and a second demodulated signal which includes the right channel signal and signals at the subcarrier frequency and at least one of its harmonics;
clocking pulse signal producing means for producing clock pulses at a frequency n times the subcarrier frequency, where n is an integer greater than one;
a set of n sample-and-hold circuits each of said sample-and-hold circuits connected to receive said first demodulated signal;
means for successively and cyclically applying a different one of said clocking pulses to each of said n sample-and-hold circuits so that each sample-and-hold circuit samples the first demodulated signal at the subcarrier frequency but at a different phase; and
an adder for adding the sampled outputs of said n sample-and-hold circuits to produce at the output of the adder only the left channel signal, the signals at the subcarrier frequency and its harmonics being suppressed.

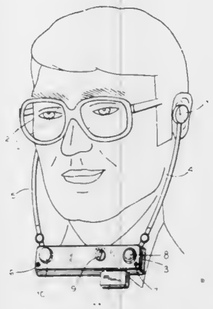
4,633,497
SEPARATION CONTROL CIRCUIT
Toshihito Ichikawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Japan
Filed Aug. 16, 1985, Ser. No. 766,315
Claims priority, application Japan, Aug. 17, 1984, 59-171126
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—10 **5 Claims**

1. A separation control circuit comprising: an adder for summing first and second channel signals of a stereophonic signal; a single low-pass filter for passing only a low-frequency component of a sum signal produced by said adder; first and second mixing means for mixing an output of said low-pass filter with said first and second channel signals, respectively, of



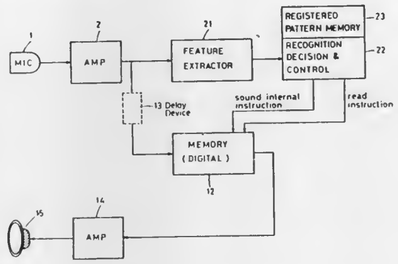
said stereophonic signal; and means for controlling a mixing ratio imparted by said mixing means in response to a field strength of a received signal.

4,633,498
INFRARED HEADPHONES FOR THE HEARING IMPAIRED
Egon F. Warnke, and Klaus Willemsen, both of Wedemark, Fed. Rep. of Germany, assignors to Sennheiser Electronic KG, Wedemark, Fed. Rep. of Germany
Filed Jul. 9, 1984, Ser. No. 628,750
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 3325031
Int. Cl.[4] H04R *5/00, 1/10*
U.S. Cl. 381—23.1 **7 Claims**



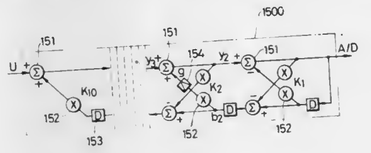
1. An infrared headphone for the hearing impaired comprising two sound reproducers mechanically joined by an elbow, said elbow containing an electronic circuit which receives infrared signals and converts said infrared signals into audio signals, said elbow also containing two microphones and two microphone amplifiers, said electronic circuit and said amplifier connected in such a way that signals from said electronic circuit and signals from said amplifier may be selectively mixed and conducted to said sound reproducers; said microphones being arranged at a distance from each other in said elbow such that said microphones lie symetrically with respect to a median plane bisecting the head of a person wearing said headphone, thereby said microphones being equidistant from the mouth of a person wearing said headphone; said microphones and said microphone amplifiers being connected such that the signals from one microphone are conducted to said sound reproducers in counter-phase to the signals from the other microphone, thereby suppressing the reproduction of sound eminating from the mouth of the person wearing said headphone.

4,633,499
SPEECH RECOGNITION SYSTEM
Yoshiki Nishioka, Tenri; Mitsuhiro Hakaridani, and Hiroyuki Iwahashi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 8, 1982, Ser. No. 433,522
Claims priority, application Japan, Oct. 9, 1981, 56-161399
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—43 **3 Claims**



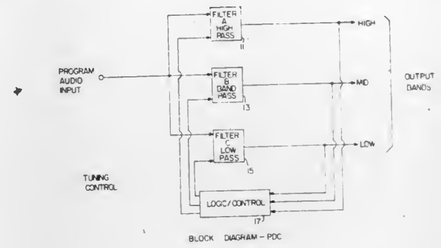
1. In a speech recognition system having input means for inputting a speaker's words; analyzing means for analyzing and converting the distinctive features of that speaker's method of speech into a distinctive features pattern; memory means for storing the distinctive features; and comparison means for comparing voice patterns to be recognized with previously stored reference patterns,
an improvement comprising: memory means for temporarily storing the input voice data and its time interval and; reproduction means controlled by the time interval for audibly outputting the input voice data so that the speaker can determine whether his intended speech was correctly patterned and stored timewise by the recognition system.

4,633,500
SPEECH SYNTHESIZER
Norimasa Yamada, and Masahiro Hibino, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 17, 1983, Ser. No. 476,287
Claims priority, application Japan, Mar. 19, 1982, 57-45085
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **6 Claims**



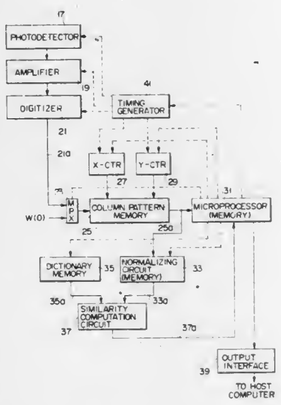
1. A partial auto correlation type speech synthesizer, comprising; a lattice-type multi-stage digital filter which comprises a digital tone source signal generating circuit. an adder/subtractor, a delay unit and a multiplier, for extracting a predetermined frequency spectrum component from a exciting signal, and an increasing circuit for slightly increasing the absolute value of a multiplication result for a coefficient K parameter multiplier in a predetermined state of said lattice-type multistage filter, for synthesizing and outputting a sustained sinusoidal waveform or a damped oscillation waveform of long attenuation time.

4,633,501
PROGRAM DEPENDENT CROSSOVER FILTER (PDC)
Donn R. Werrbach, 930 Kaheka St., Honolulu, Hi. 96814
Filed Apr. 15, 1985, Ser. No. 723,375
Int. Cl.[4] H04B *1/66*
U.S. Cl. 381—100 **1 Claim**



1. A program dependent crossover filter system comprising:
a. tunable filter means including a tunable control means for producing more than one frequency band output where band crossover frequencies are tuned by a control signal;
b. detector means to detect band output levels;
c. comparator means to compare adjacent band output levels and produce output thereof;
d. control filter means to convert output of the comparator means to usable tuning control signal(s); and
e. interface means to couple the tuning control signal(s) of the control filter means to the tunable control means.

4,633,502
OPTICAL RECOGNIZING APPARATUS
Hiromi Namba, Tokorozawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 27, 1985, Ser. No. 749,209
Claims priority, application Japan, Jun. 29, 1984, 59-134857
Int. Cl.[4] G06K *9/34*
U.S. Cl. 382—9 **6 Claims**



1. An optical recognizing apparatus comprising:
a pattern memory for storing the patterns of characters and the pattern of an underline, which are obtained by photoelectrically converting underlined characters printed on a sheet of paper;
underline detecting means for detecting the patterns of the underline by scanning the patterns in said pattern memory, and for storing the positions of the detected underline patterns;

underline erasing means for writing white data in the underline pattern region of said pattern memory to erase the underline pattern in accordance with the positions stored in said underline detecting means;

recognizing means for reading the character patterns from said pattern memory wherein the underline pattern has been erased by said underline erasing means, and for recognizing the character patterns read from said pattern memory; and

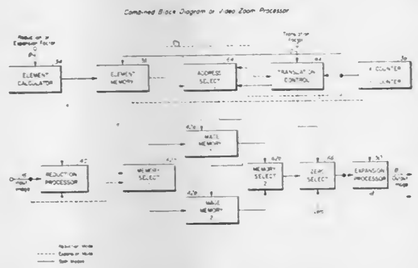
means for editing and producing the positions of underline pattern supplied from said underline detecting means and the recognition result supplied from said recognizing means.

4,633,503

VIDEO ZOOM PROCESSOR

Daryl E. Hinman, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1984, Ser. No. 591,157
Int. Cl.[4] G06K *9/42;* **H04N** *1/04*
U.S. Cl. 382—47 **3 Claims**



1. A video zoom processor which comprises:

an image input;

an image output;

a translation factor input;

an element calculator having a reduction factor input and having an output;

an element memory having a first input connected to the output of the element calculator, having a second input, and having first, second, third and fourth outputs;

an address select having a first input connected to the second output of the element memory, having second and third inputs, and having first and second outputs;

a translation control having a first input connected to the first output of the element memory, having a second input connected to the translation factor input, having a third input, having a first output, and having a second output connected to the third input of the address select;

a counter having an output connected to the second input of the element memory, to the second input of the address select, and to the third input of the translation control;

a reduction processor having a first input, having a second input connected to the fourth output of the element memory, having a third input, and having an output;

a first memory select having a first input connected to the output of the reduction processor, having a second input connected to the image input, and having first and second outputs;

a first image memory having a first input connected to the first output of the first memory select, having a second input connected to the first output of the address select, and having an output;

a second image memory having a first input connected to the second output of the first memory select, having a second input connected to the second output of the address select, and having an output;

a second memory select having a first input connected to the output of the first image memory, having a second input connected to the output of the second image memory, having a first output, and having a second output connected to the third input of the reduction processor;

a zero select having a first input connected to the first output of the second memory select, having a second input connected to the first output of the translation control, having a zero input, and having an output; and

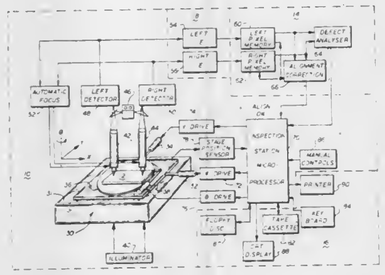
an expansion processor having a first input connected to the output of the zero select, having a second input connected to the third output of the element memory, and having an output connected to the image output.

4,633,504

AUTOMATIC PHOTOMASK INSPECTION SYSTEM HAVING IMAGE ENHANCEMENT MEANS

Mark J. Wihl, Tracy, Calif., assignor to KLA Instruments Corporation, Santa Clara, Calif.

Filed Jun. 28, 1984, Ser. No. 625,903
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—54 **7 Claims**



1. Optical inspection apparatus for detecting defects in a visually perceptible pattern, comprising:

image acquisition means for inspecting said pattern on a pixel-by-pixel basis and developing digital data signals corresponding to each pixel thereof;

image enhancement means for converting the digital data signal value corresponding to each said pixel into a corrected signal value by operating on said digital data signal with a two dimensional digital finite impulse response filter means, the spacial coefficients of which are selected to inversely correspond to measurable degradation inherent in said image acquisition means, whereby each said corrected signal value is more closely representative of the actual pixel data than is the corresponding input digital data signal value, said filter means including

column buffer means for outputting pixel data signals corresponding to the data contained in each column of an n×n array of pixel data surrounding a pixel inspected by said image acquisition means,

column weighted summer means for multiplying each said pixel data signal in a particular column of said array by predetermined co-efficients corresponding to the position of the pixel data in said array and for adding the products thereof of each said column to form n column data signals,

delay line means for time delaying in a predetermined manner the said n column data signals, and

row summation means for summing the said n column data signals to develop an enhanced data signal representing the said inspected pixel;

defect detection means for receiving said corrected signal values and determining whether or not defects appear in said pattern; and

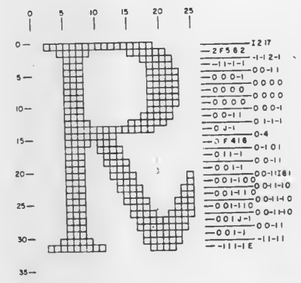
data recording means for recording and/or displaying any defects detected by said defect detection means.

4,633,505

CHARACTER COMPRESSION TECHNIQUE

Sidney W. Marshall, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1984, Ser. No. 674,209
Int. Cl.[4] G06K *9/48*
U.S. Cl. 382—56 **8 Claims**



1. A method for compression encoding the digital representation of a character having a boundary, the encoding including escape codes, the character being recreated over a plurality of consecutive scanlines, the location of the boundary on three consecutive scanlines being x_1, x_2, and x_3, including the steps of

predetermining the second difference for each intersection of a character boundary with a scanline,

providing the second difference $(x_2-x_1)-(x_3-x_2)$ of the location of the boundary for relatively small second differences,

representing by an escape code the starting locations for the new character boundaries relative to the last position in the scanline generated, and

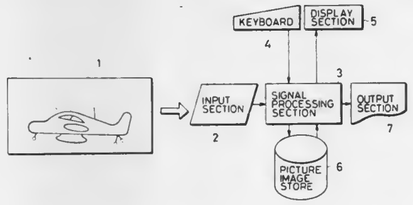
using an escape code to terminate the extension of character boundaries into the next scanline.

4,633,506

PICTURE IMAGE FILE DEVICE

Hiroshi Kato, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,900
Claims priority, application Japan, Oct. 3, 1983, 58-184911
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—56 **8 Claims**



1. A picture image file device for updating picture image signals corresponding to a picture in an original document in order to represent a different picture in a revised document, the pictures in said original and revised documents each being organized into a set of divisions corresponding to different physical areas of said documents such that each division of said original document corresponds to a division of said revised document, said picture image file device comprising:

input means for scanning said original document and said revised document and for generating said picture image signals corresponding to both said original and revised documents;

a signal storage section including a complete document file;

signal processing means, coupled to said signal storage section and to said input means, including means for grouping said picture image signals for said original document into subgroup signals each corresponding to a different one of said divisions of said original document, means for causing said signal storage section to store said original document subgroup signals into a complete document file, means for grouping the picture image signals for said revised document into revised document subgroup signals each corresponding to a different one of said divisions of said revised document, means for comparing original document subgroup signals and revised document subgroup signals for corresponding divisions of said documents, and means for causing said signal storage section to store in said complete file any of said revised document subgroup signals which are different from said corresponding original document subgroup signals and to restore in said complete file those of said original document subgroup signals which are not different from said corresponding revised document subgroup signals; and

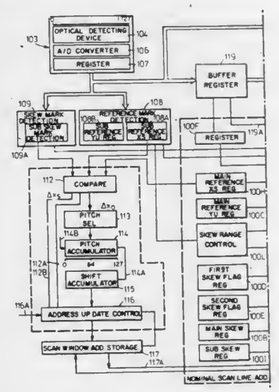
means for entering instructions to control said signal processing means.

4,633,507

APPARATUS FOR READING MARK SHEETS

Anthony T. Cannistra, 13 Holiday Dr., Woodstock, N.Y. 12498; Masuyoshi Kida, A-209 Koyo-Mansion 360-9 Katase, Fujisawa, Kanagawa, Japan; Min-Hsiung G. Tung, 2519 Lawton Bluff, Matthews, N.C. 28105, and Tatsuyuki Ushiroda, 906 Shonandai-Kyodo Building, 7 Kameino, Fujisawa, Kanagawa, Japan

Filed Sep. 16, 1983, Ser. No. 533,315
Claims priority, application Japan, Sep. 17, 1982, 57-161096
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—61 **4 Claims**



1. Apparatus for reading a mark sheet fed in a mark sheet path, said mark sheet being provided with plural mark rows, each of which includes a reference mark, a skew detection mark and mark writing regions between said reference mark and said skew detection mark, which reads said mark sheet by use of predetermined nominal scan window addresses for scanning said mark writing regions to read information in said mark writing regions, said apparatus comprising:

means for scanning said reference mark and said skew detection mark in a first mark row of said mark sheet to detect a distance along said first mark row between said reference mark and said skew detection mark in said first mark row;

means for modifying said nominal scan window addresses by distributing a difference between said detected distance and a nominal distance over said nominal scan window

addresses to form actual scan window addresses for said first mark row;
means for scanning said mark writing regions in said first mark row by use of said actual scan window addresses;
means for detecting shift of said reference mark position in a second mark row in the direction of said mark row with respect to said apparatus to shift said actual scan window addresses by the detected shift amount to form actual scan window addresses for second mark row; and
means for scanning said mark writing regions in said second mark row by use of said actual scan window addresses for said second mark row.

4,633,508

DEVICE FOR UNITING COMPONENTS ONE TO ANOTHER

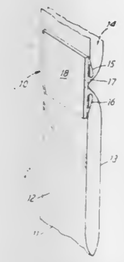
Bernard Sanders, St. Peter, Channel Islands, assignor to Beiersdorf A.G., Hamburg, Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,282

Claims priority, application United Kingdom, Aug. 25, 1983, 8322884

Int. Cl.⁴ B65D *33/16*

U.S. Cl. 383—95 **5 Claims**



1. A device for uniting a first component and a second component one to another, said first component being of flexible material having a first surface and a second surface reverse to said first surface and said first component having spaced substantially parallel folds defining an elongate gap, said device comprising said folds and a membrane having pressure sensitive contact adhesive thereon, the membrane being united with said folds such that said membrane bridges said gap and said gap is of dimension transverse to a longitudinal axis of said gap such that, when said second surface of said first component is located adjacent said second component, said adhesive is spaced from contact with said second component but is contactable therewith by deforming a portion of said second component or a portion of said membrane into said gap.

4,633,509

PROCESS FOR SELECTING A CONTROL CHANNEL IN A MOBILE RADIO STATION OF A RADIO TRANSMISSION SYSTEM

Stefan Scheinert, Nuremberg, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

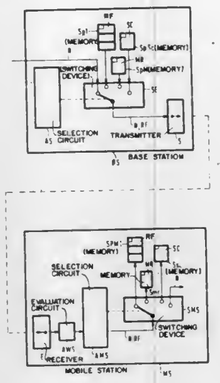
Filed Dec. 16, 1983, Ser. No. 562,383

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246741

Int. Cl.⁴ H04B *7/26*

U.S. Cl. 455—33 **16 Claims**

1. A process for selecting a control channel for a mobile radio station (MS) in any zone of a radio communication system having a plurality of base radio stations respectively located in respective zones, communication between the mobile radio station (MS) and any of such base stations being effected over any of a plurality of communication channels which comprise at least one control channel allocated to each base station; such process comprising transmission by a base station (BS) at variable intervals of time, on each control channel allocated to it of references (RF) which identify the control channels (CCH) which are allocated to the other base stations;



the content of each such reference (RF) being at least the channel number (cnr) of the control channel (CCH) identified thereby.

4,633,510

ELECTRONIC CIRCUIT CAPABLE OF STABLY KEEPING A FREQUENCY DURING PRESENCE OF A BURST

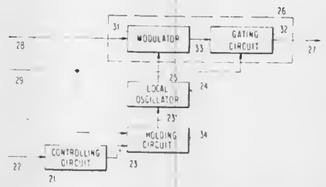
Fumiaki Suzuki; Toshiyuki Takeda, both of Tokyo; Takeo Inoue, and Shigeo Nakajima, both of Kanagawa, all of Japan, assignors to NEC Corporation and Nippon Telegraph & Telephone Public Corporation, both of, Japan

Filed Dec. 28, 1984, Ser. No. 687,343

Claims priority, application Japan, Dec. 28, 1983, 58-245435

Int. Cl.⁴ H04B *1/00*

U.S. Cl. 455—69 **4 Claims**



1. In an electronic circuit comprising controlling means responsive to a frequency deviation signal for producing a frequency control signal, frequency producing means responsive to said frequency control signal for producing a local oscillation signal of a variable frequency, and burst generating means for generating a burst in response to an input signal, said local oscillation signal, and a burst control signal which is present during the presence of said input signal and which has a beginning and an end, said burst appearing between the beginning and the end of said burst control signal, the improvement wherein said circuit further comprises:
holding means responsive to said frequency control signal and said burst control signal and coupled to said controlling means and said frequency producing means for holding the frequency control signal received before the beginning of said burst control signal to keep said frequency of the local oscillation signal invariable until the end of said burst control signal.

4,633,511

SIGNAL TRANSMISSION AND RECEPTION SYSTEM

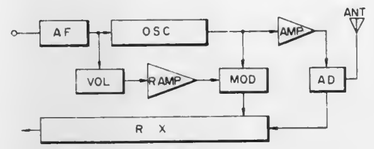
Daisuke Koga; Masahide Tamura, and Yukio Naito, all of Kanagawa, Japan, assignors to Toyo Communication Equipment Co., Samukawa, Japan

Filed Aug. 23, 1984, Ser. No. 643,834

Claims priority, application Japan, Aug. 24, 1983, 58-155327; Jul. 28, 1984, 59-158485

Int. Cl.⁴ H04B *1/40*

U.S. Cl. 455—86 **2 Claims**



1. In a signal transmission and reception system of the type having a receiver of the superheterodyne type and having a transmitter including a transmission oscillator which is modulated by a modulation signal, the improvement comprising:
adjusting means for level adjusting and phase inverting said modulation signal;
means for modulating an output of said modulated transmission oscillator by the modulation signal level adjusted to a required value and phase inverted by said adjusting means to cancel the modulation signal component of said output of said transmission oscillator, and wherein;
a mixer in said receiver, said mixer being supplied with the output of said means for modulating as a local oscillator signal.

4,633,512

AMPLITUDE-MODULATED TRANSMITTER WITH CONTROLLED CARRIER VALUE

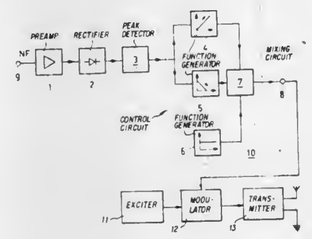
Bohumil Kyrian, Unterbözberg, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 24, 1984, Ser. No. 633,927

Claims priority, application Switzerland, Aug. 12, 1983, 4408/83

Int. Cl.⁴ H04B *1/02*

U.S. Cl. 455—108 **10 Claims**



1. An amplitude-modulating transmitter having a control system, comprising:
a plurality of means for varying a carrier value (T) along a static characteristic (SK) as a function of modulation levels (P) between a maximum carrier value (T_{max}) and a minimum carrier value (T_{min}) which is greater than zero and occurs in a region of the most frequently occurring values of the modulation levels (P), said plurality of means comprising,
first means for forward-controlling said carrier value (T) along said static characteristic proportionally to said modulation levels (P) above a first modulation level value (P_1),
second means for controlling the carrier such that with vanishing modulation levels (P), there remains a residual carrier value (R) which is greater than said minimum carrier value (T_{min}), and
third means for controlling the carrier such that said carrier value (T) is initially reduced along said static characteristic (SK), with increasing modulation levels (P), starting from said residual carrier value (R), to said minimum carrier value (T_{min}).

4,633,513

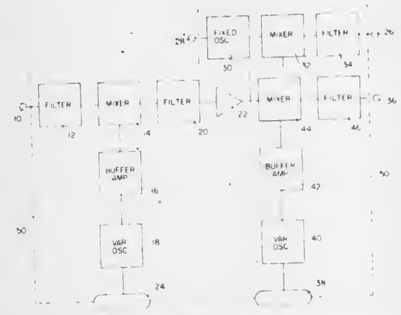
METHOD AND APPARATUS FOR CONVERTING TELEVISION SIGNALS

William H. Taney, Royersford, Pa., assignor to Berko Technology Corporation, Limerick, Pa.

Filed May 31, 1984, Ser. No. 616,016

Int. Cl.⁴ H04B *1/26*

U.S. Cl. 455—131 **5 Claims**



1. An apparatus for receiving a television signal of one frequency and for transmitting the television signal at another frequency, comprising:
a first continuously variable tuner for selecting a television signal of a first frequency and converting said television signal to an intermediate frequency;
reference output means, connected to receive the output of said first continuously variable tuner, for converting the output of said first variable tuner from said intermediate frequency to a reference frequency in response to an enabling signal;
switch means, connected to said reference output means, for generating said enabling signal upon actuation; and
a second continuously variable tuner, connected to receive the output of said first variable tuner, for transmitting the television signal at a second television signal frequency, whereby television signals of one frequency can be converted to a second frequency.

4,633,514

KEYBOARD CONTROLLED TELEVISION RECEIVER

Mark Fimoff, Hoffman Estates, and Thomas J. Zato, Palatine, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 5, 1984, Ser. No. 668,109

Int. Cl.⁴ H04B *1/16, 9/00*

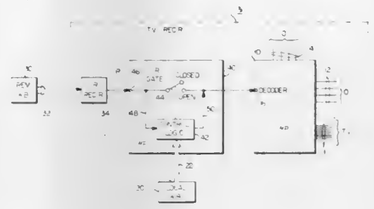
U.S. Cl. 455—151 **3 Claims**

1. In combination:
a television receiver having a plurality of controllable functions;
remote keyboard means for generating remote digitally coded signals in the form of bursts of IR energy for selectively controlling said functions;
IR receiver means for receiving said IR signals and generating therefrom coded data streams;
first microprocessor means having a decoder input for receiving said coded data streams, determining therefrom

the corresponding function and for controlling performance of that function;

local keyboard means for generating similar digitally coded data streams for selectively controlling said functions when applied to said decoder input;

second microprocessor means having arbitration means



including gate means for selectively coupling said data streams from said remote keyboard means and from said local keyboard means to said decoder input; and

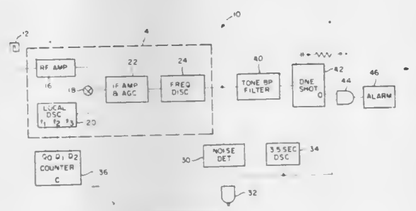
said arbitration means assuring the absence of one of said coded data streams before operating said gate means to couple to other of said coded data streams to said decoder input.

4,633,515

EMERGENCY BROADCAST ALERT DETECTOR

Harry B. Uber, Kootenai County, Id., and George Staschek, Jr., Spokane County, Wash., assignors to Harry B. Uber, Post Falls, Id.

Filed Apr. 9, 1984, Ser. No. 598,210
Int. Cl.[4] H03J 7/24; H04B 1/16
U.S. Cl. 455—166 **4 Claims**



1. In an emergency warning system in which an "alert" tone, indicative of an emergency condition, is transmitted by at least one of several stations on respective transmission frequencies, an emergency broadcast alert detector comprising:

(a) a radio receiver having an audio signal output and a tuner scanning among said transmission frequencies, sand tuner having:

a local oscillator including a crystal substantially controlling the frequency of said local oscillator signal, said local oscillator signal further including a plurality of reactive elements connected to said crystal and a plurality of diodes connected with some of said reactive elements in a manner that switches the reactance of the respective reactive elements between two states, depending upon whether or not current is flowing through said diodes, said diodes being connected to respective frequency selection inputs of said local oscillator so that the frequency of said local oscillator signal is pulled from the resonant frequency of said crystal by said reactive elements being switched by current flowing from said frequency selection inputs through said diodes;

a mixer receiving the output of said local oscillator and a transmitted signal, said mixer selecting a transmitted signal having a frequency equal to the sum of or difference between a fixed intermediate frequency and said local oscillator frequency;

a decoder connected to the output of said mixer, said decoder generating as said audio output a signal corresponding to the modulation on the transmitted signal selected by said local oscillator;

a clock generator producing a clock signal adapted to cause said tuner to scan from one transmission frequency to the next;

a sequencer having a clock input and outputs connected to the frequency selection inputs of said local oscillator, said sequencer sequentially applying combinations of logic levels to said local oscillator responsive to clock pulses applied to said clock input; and

a gate having its output connected to the clock input of said sequencer and inputs receiving said clock signal from said clock generator and a disable signal to gate said clock signal to the clock input of said sequencer when said disable signal is not being generated;

(b) a noise detector connected to the audio output of said radio receiver, said detector generating said disable signal except when said noise detector detects noise at said audio output, thereby indicating that no signal is being transmitted on the transmission frequency selected by said tuner, whereby said tuner continues to scan among said transmission frequencies until said tuner tunes to a station that is transmitting a signal;

(c) a tone detector connected to the audio output of said radio receiver, said tone detector generating an alarm signal when said "alert" tone is present at said audio output; and

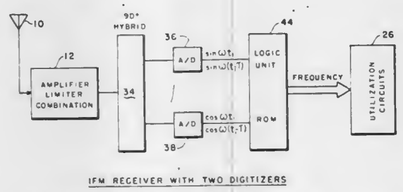
(d) an alarm connected to said tone detector, said alarm generating a visual or audible alarm responsive to receipt of said alarm signal.

4,633,516

INSTANTANEOUS FREQUENCY MEASUREMENT RECEIVER WITH DIGITAL PROCESSING

James B. Y. Tsui, Centerville, Ohio, assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1985, Ser. No. 739,413
Int. Cl.[4] H04B 17/00
U.S. Cl. 455—226 **3 Claims**



IFM RECEIVER WITH TWO DIGITIZERS

1. An instantaneous frequency measurement receiver comprising an RF section, a 90° hybrid coupled to the RF section to split the RF signal into signals on sine and cosine lines, converter means coupled to the sine and cosine lines to convert the analog signals on the sine and cosine lines into digital format, a logic unit coupled to outputs of the converter means, said logic unit having means for storing at a time t_1 the digital signals A and B, and for storing at a time $(t_1+\tau)$ the digital signals C and D, where

$$A=\sin \omega t_1$$

$$B=\cos \omega t_1$$

$$C=\sin (\omega t_1-\omega \tau)$$

$$D=\cos (\omega t_1-\omega \tau),$$

digital means in said logic unit to perform the operations

$$E=-BC+AD$$

$$F=BD+AC$$

$$G=\tan^{-1}(E/F)$$

$$\omega=G/\tau$$

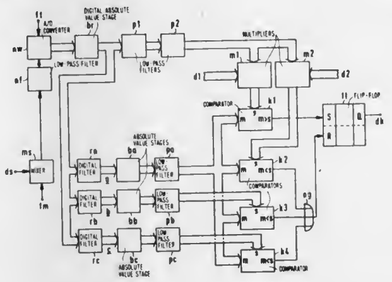
and to provide an output for frequency in digital format as a function of ω.

4,633,517

CIRCUIT FOR DECODING TRAFFIC INFORMATION MESSAGE TONE SIGNALS

Heinrich Pfeifer, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 21, 1985, Ser. No. 736,633
Claims priority, application European Pat. Off., Jun. 1, 1984, 84106270.6
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—228 **2 Claims**



1. A circuit for decoding traffic information message tone signals each having a message tone frequency, marking a traffic information message, said tone signals being contained, in the form of a carrier amplitude-modulated therewith, in a received broadcast signal demodulated with a conventional radio receiver, said circuit comprising:

means responsive to the demodulated broadcast signal for deriving, by further demodulation and analog-to-digital conversion, a digital signal in the baseband;

a first signal path to which said digital signal is applied for each message tone frequency;

second and third signal paths to which said digital signal is applied for frequencies differing from said message tone frequency by a maximum of +1% and −1%, respectively;

each of said first, second and third signal paths including a tandem arrangement of a digital filter tuned to the respective frequency, the digital filters for all of said first, second and third paths having the same bandwidth and the same resonant rise, a digital absolute-value stage, and a digital low-pass filter having an upper cutoff frequency lower than twice the message tone frequency;

a series combination of a first additional digital low-pass filter and a second additional low-pass filter receiving said digital signal, said first additional low-pass filter having an upper cutoff frequency equal to that of the digital low-pass filters, and said second additional digital low-pass filter, having an upper cutoff frequency equal to the frequency corresponding to the transient-time constant of the tuned filters;

first, second, third and fourth digital comparators, each having a minuend input and a subtrahend output, said first digital comparator having a minuend-greater-than-subtrahend output, said second, third and fourth digital comparators each having a minuend-smaller-than-subtrahend output, said first signal path being coupled to the minuend inputs of said first, second, third, and fourth digital comparators, the subtrahend inputs of said third and fourth comparators being connected to the outputs of said second signal path and said third signal path, respectively;

a first constant multiplier coupling the output of said second additional low-pass filter to said first comparator subtrahend input;

a second constant multiplier coupling the output of said second additional low-pass filter to said second comparator subtrahend input;

an RS flip-flop having its S input coupled to the minuend-greater-than-subtrahend output of said first comparator and providing the message tone signal at its Q output;

an OR gate coupling the minuend-smaller-than-subtrahend outputs of said second, third, and fourth comparators to the R input of said RS flip-flop; and wherein

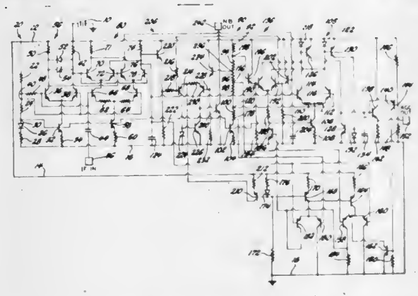
said first constant multiplier has a constant smaller than one, said constant being equal to the nominal modulation factor of the message tone signal; said second constant multiplier having a constant smaller than one, said constant being equal to a presettable fraction of the nominal modulation factor.

4,633,518

AGC VOLTAGE GENERATOR WITH AUTOMATIC RATE SWITCHING

Richard A. Kennedy, and Fredrick A. Aldridge, both of Russiaville, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1985, Ser. No. 751,061
Int. Cl.[4] H04B 1/16; H03G 3/20
U.S. Cl. 455—242 **4 Claims**



1. An AGC voltage generating circuit for an AM radio comprising, in combination:

a product detector adapted to receive an IF signal modulated by an AF signal and synchronously detect the AF signal;

a low pass filter adapted to derive from the product detector a filtered voltage indicating the average IF signal strength;

a reference voltage generating circuit ratiometrically related to the product detector through a common DC power supply and effective to generate high, medium and low reference voltages ratiometrically related to each other, the medium reference voltage corresponding to a desired average IF signal strength and the high and low reference voltages defining a voltage window about the medium reference voltage;

comparator means effective to compare the filtered voltage from the low pass filter with the high, medium and low reference voltages from the reference voltage generating circuit;

a capacitor;

voltage translation means connected to the capacitor and responsive to the voltage thereon to output an AGC voltage;

voltage limiting means adapted to limit the voltage on the capacitor to a predetermined maximum voltage;

first and second current sources responsive to the comparator means, the first current source being adapted to change the charge on the capacitor in a first direction when the filtered voltage exceeds the medium reference voltage and the second current source being adapted to change the charge on the capacitor in the opposite direction when the filtered voltage is less than the medium reference voltage; and

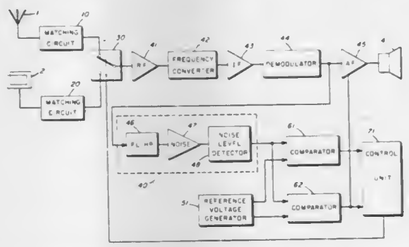
current source control means responsive to the comparator means to increase the current output of the first and second current sources when the filtered voltage is outside the voltage window defined by the high and low reference voltages relative to the output when the filtered voltage is within the voltage window, whereby the capacitor charge changes at a faster rate for faster AGC voltage change when the average IF signal strength is outside a predetermined range.

4,633,519

DIVERSITY RECEPTION SYSTEM IN A PORTABLE RADIO APPARATUS

Akio Gotoh; Kazuo Yamamoto, and Tuguo Ishikawa, all of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 2, 1984, Ser. No. 595,703
Claims priority, application Japan, Mar. 31, 1983, 58-53518
Int. Cl.⁴ H04B *7/08*
U.S. Cl. 455—277 **6 Claims**



5. In a portable or mobile radio receiver for receiving a radio signal, a diversity reception system comprising:

an electric-field-type antenna to intercept the radio signal;

a magnetic-field-type antenna to intercept the radio signal;

switching means responsive to a control signal for selectively connecting either said electric-field-type antenna or said magnetic-field-type antenna to the receiver;

received level detecting means in the receiver for generating a received level signal representative of the level of the intercepted radio signal;

reference level generating means for generating a first reference signal representative of a first reference level and a second reference signal representative of a second reference level smaller in magnitude than the first reference level; and

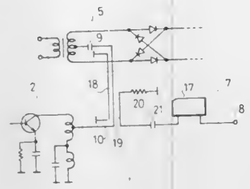
comparison means connected to said received level detecting means and said reference level generating means for generating the control signal in response to a comparison of the relative magnitudes of the received level signal, the first reference signal, and the second reference signal, said comparison means generating the control signal only when the magnitude of the level of the intercepted radio signal is not greater than the magnitude of the first reference level.

4,633,520

PRESCALER INPUT CIRCUIT

Mitsunari Okazaki, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 10, 1984, Ser. No. 569,672
Claims priority, application Japan, Jan. 11, 1983, 58-2021[U]
Int. Cl.⁴ H04B *1/26*
U.S. Cl. 455—319 **7 Claims**



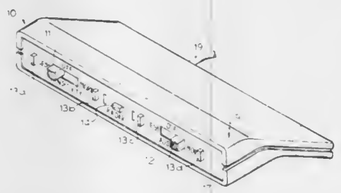
1. An improved prescaler input circuit for a frequency converter unit of the type having a local oscillator circuit providing a local oscillation frequency signal to a mixer through an injection lead and a prescaler unit providing a frequency divided output signal from the local oscillation frequency signal, wherein the improvement comprises a coupling loop for inductively coupling the injection lead carrying the local oscillation frequency signal to the prescaler unit, said coupling loop including an input line having one end connected to the prescaler unit and the other end grounded through a resistor, and an earth line in proximity to said injection lead for providing impedance matching for said injection lead, thereby preventing mutual interference between said mixer and said prescalar.

4,633,521

REMOTE RADAR DETECTOR CONTROL UNIT

James P. Liautaud, 70 Bluff Rd., Cary, Ill. 60013

Filed Oct. 17, 1983, Ser. No. 542,589
Int. Cl.⁴ H05K *5/03, 11/00*
U.S. Cl. 455—345 **20 Claims**



1. A remote radar detector control unit for use with a remotely located receiver, comprising:

control means electrically connected to function with the receiver;

a housing containing the control means and having a front head portion and a rearwardly protruding mounting surface portion;

the front head portion having upper and lower substantially parallel surfaces and the mounting surface portion having substantially parallel upper and lower mounting surfaces;

an angle defined by a first plane parallel to at least one of the upper and lower surfaces of the front head portion and a second plane parallel to at least one of the upper and lower surfaces of the mounting surface portion being greater than 10° and less than 90° so that the housing is compatible with a first position mounting or an inverted second position mounting; and

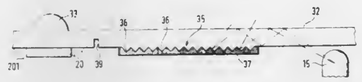
a thickness between the upper and lower surfaces of the front head portion being at least approximately twice as great as a thickness between the upper and lower surfaces of the mounting surface portion.

4,633,522

APPARATUS FOR EMITTING AND RECEIVING LIGHT SIGNALS, MORE PARTICULARLY INFRARED SIGNALS

Koichi Yamamoto, and Yoshihisa Fujioka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,804
Claims priority, application Japan, Jan. 24, 1984, 59-7163[U]
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—603 **7 Claims**



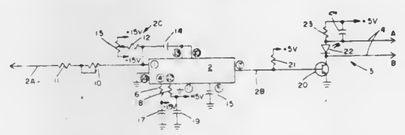
1. Apparatus having a light emitting arrangement for sending out light signals, more particularly infrared signals, to at least one device receiving such signals, and having a light receiving arrangement for picking up corresponding light signals from at least one device emitting such light signals, the apparatus further comprising a planar plate behind which the light emitting arrangement and the light receiving arrangement are mounted and spaced a substantial distance from each other, the plate being transparent or translucent to the light emitted from the light emitting arrangement and to the light to be received by the light receiving arrangement and having at least one surface, in the area between the light emitting arrangement and the light receiving arrangement, which is roughened so as to impede the passage of light rays from the light emitting arrangement to the light receiving arrangement within said plate.

4,633,523

OPTICAL ANALOG DATA LINK WITH SIMPLE SELF-TEST FEATURE

Richard L. Witkover, Commack, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 1, 1984, Ser. No. 575,732
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—608 **2 Claims**



1. A communications circuit for optically transmitting analog data free of excessive ripple comprising a V/F converter having an input line for receiving an analog voltage signal from a source of voltage, said V/F converter having an output and being effective to produce a predetermined minimum carrier frequency at said output responsive to receipt of a zero voltage signal on said input line, an optical transmitter connected to receive voltage pulses from said output and operable to produce flashes of light at frequencies varying in proportion to variations in the frequency of said voltage pulses, an optical transmission link connected to transmit said flashes of light, an optical receiver connected to receive flashes of light from said transmission link and operable to produce a chain of voltage pulses the frequency of which varies in proportion to variations in the frequency of said received flashes of light, and a F/V converter, the foregoing components of said circuit all being operatively connected in a series circuit in the order set forth thereby to cause the V/F converter to be effective to receive from said source of voltage an analog voltage signal on said input line and to generate in addition to said predetermined minimum carrier frequency a high carrier frequency that corresponds to the frequency of said flashes of light, thereby to enable the optical transmission link to transmit analog data at said higher carrier frequency, and to enable the F/V converter to produce an output voltage having a minimum amplitude proportional to said predetermined minimum carrier frequency; said communications circuit being connected in combination with indicator means that are operatively connected to receive the output voltage from said F/V converter and that are effective to indicate the absence of said minimum amplitude of voltage in the output of said F/V converter, responsive to interruption of transmission of the carrier frequency over the optical transmission link.

4,633,524

GENERATION OF PULSES OF ELECTROMAGNETIC RADIATION BY USE OF THE INDUCED MODULATIONAL INSTABILITY

Akira Hasegawa, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 23, 1984, Ser. No. 602,694
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—612 **24 Claims**



1. Method comprising producing a sequence of pulses of electromagnetic radiation of nominal wavelength λ_o, the sequence of pulses comprising a first pulse and a second pulse, the second pulse having a width and a predetermined spacing from the first pulse, with no pulse between the first and the second pulse, the method comprising

(i) coupling, at a coupling location, radiation of nominal wavelength λ_o into a transmission medium, the transmission medium having anomalous dispersion in a spectral region, the radiation propagating through the transmission medium from the coupling location to an output location, the length of propagation in the medium to be termed the length of the medium, the method characterized in that

(ii) λ_o is a wavelength in the spectral region of anomalous dispersion of the transmission medium, and the radiation is amplitude modulated cw radiation,

(iii) the amplitude of the radiation coupled into the transmission medium comprises a sequence of amplitude peaks, the sequence of amplitude peaks comprising a first peak and, spaced therefrom and having a width, a second peak, with no peak between the first and the second peak, the spacing between the first and the second peak being substantially equal to the predetermined spacing between the first and the second pulse, the first and the second peak, after propagation through the transmission medium being termed the first and the second pulse, respectively, and

(iv) the length of the medium is such that the width of the second pulse is at least 10% less than the width of the second peak.

4,633,525

LIGHT-EMITTING DIODE DEVICE FOR SUPPRESSING THERMAL TIME-CONSTANT EFFECTS

Grégoire Eumurian, Argenteuil, France, assignor to Thomson CSF, Paris, France

Filed Dec. 12, 1983, Ser. No. 560,115

Claims priority, application France, Dec. 14, 1982, 82 20965

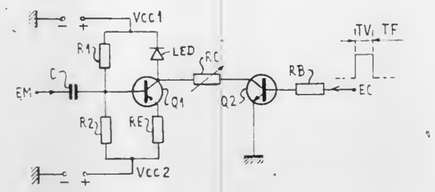
Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—613 **10 Claims**

1. A device for controlling a light-emitting diode, said diode having emission periods and non-emission periods, comprising:

means for turning-on and modulating said diode, said turning-on means having a first input terminal for receiving a modulation signal, said diode being forward-biased by said turning-on means and providing a photon emission modulated in accordance with said modulating signal; and

means for turning-off said diode, said turning-off means having a second input terminal for receiving a control pulse signal to control said non-emission periods, said turning-off means reverse-biasing said diode and including adjustable means for adjusting the electric power dissipated in the reverse-biased diode to be substantially equal in value to the electric power dissipated in the forward-biased diode thus ensuring a diode junction temperature



during non-emission periods substantially equal to the diode junction temperature during emission periods and preventing a thermal time constant effect at said diode.

DESIGN PATENTS

GRANTED DEC. 30, 1986

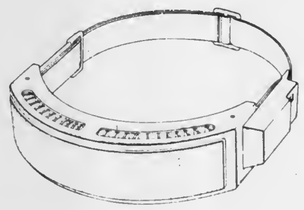
ERRATA

For CLASS	See PATENT NO.
D29-022	287,424
D01-116	287,430

DESIGNS

DECEMBER 30, 1986

287,420
THERMO ELECTRIC COOLING HEAD-BAND
Hiromi Wada, Hachiouzi; Syuuhei Tsuchihashi, Sayama, and Syouzi Kawashima, Miyashiro, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 16, 1984, Ser. No. 641,340
Claims priority, application Japan, Apr. 20, 1984, 59-15801
Term of patent 14 years
U.S. Cl. D2—512



287,421
KNITTED CAP
David M. Scaggs, 3308 Llewellyn Field Rd., Olney, Md. 20832
Filed Dec. 31, 1984, Ser. No. 687,924
Term of patent 14 years
U.S. Cl. D2—249



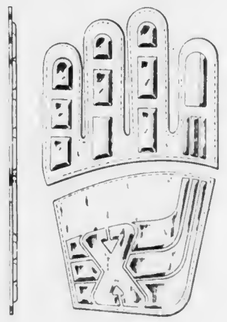
287,422
SHOE UPPER
Bruce MacGregor, Lake Oswego, and James K. Tong, Beaverton, both of Oreg., assignors to Pensa, Inc., Portland, Oreg.
Filed Dec. 17, 1985, Ser. No. 809,748
Term of patent 14 years
U.S. Cl. D2—314



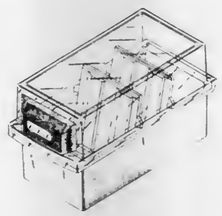
287,423
SOCK
David S. Good, and Daniel H. Good, both of 1634 19th Ave., NE., Hickory, N.C. 28601
Filed Jul. 15, 1985, Ser. No. 755,001
Term of patent 14 years
U.S. Cl. D2—331

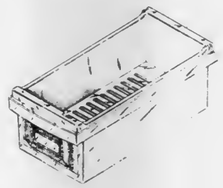


287,424
GLOVE PAD
Remo Berlese, 31036 Ospedaletto di Istrana, Via Castellana, 90 Zona Ind., Treviso, Italy
Filed Sep. 21, 1984, Ser. No. 653,951
Term of patent 14 years
U.S. Cl. D29—22

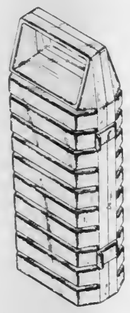


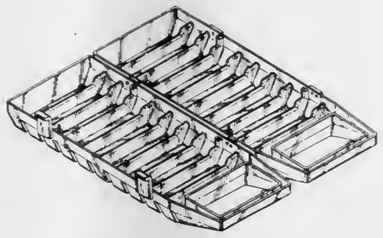
287,425
DISKETTE STORAGE CONTAINER
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H, Eferding, Austria
Filed Aug. 10, 1983, Ser. No. 522,182
Term of patent 14 years
U.S. Cl. D3—35



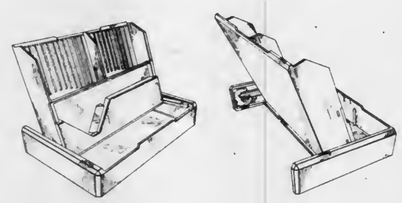


287,426
CASSETTE CARRIER
Kenneth V. Godfrey, London, England, assignor to Paton Tupper Interiors (Proprietary) Limited, Durban, South Africa
Filed Jun. 14, 1984, Ser. No. 620,596
Claims priority, application United Kingdom, Feb. 3, 1984, 1017690
Term of patent 14 years
U.S. Cl. D3—35

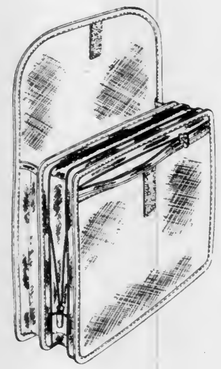




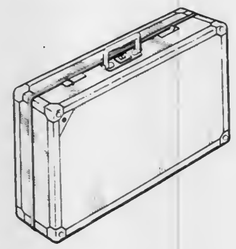
287,427
DISKETTE STORAGE CASE
W. Robert Worrell, Hopkins, Minn., assignor to Norwesco Inc., Minneapolis, Minn.
Filed Mar. 12, 1985, Ser. No. 710,849
Term of patent 14 years
U.S. Cl. D3—35



287,428
PORTFOLIO
Eckhard Knoepké, Norwalk, Conn., assignor to Samsonite Corporation, Denver, Colo.
Filed Apr. 12, 1984, Ser. No. 599,310
Term of patent 14 years
U.S. Cl. D3—52



287,429
LUGGAGE
Hartmut H. Esslinger, Altensteig, Fed. Rep. of Germany, assignor to Louis Vuitton S.A., Paris, France
Filed Apr. 19, 1984, Ser. No. 601,997
Claims priority, application France, Oct. 20, 1983, 833817
Term of patent 14 years
U.S. Cl. D3—76



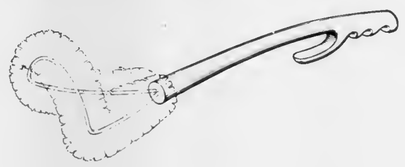
287,430
SCRUB BRUSH WITH WRAP AROUND SPONGE
Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566
Filed Feb. 4, 1985, Ser. No. 697,851
Term of patent 14 years
U.S. Cl. D4—116



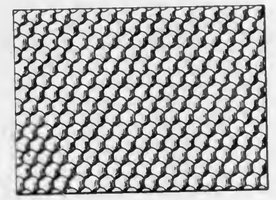
287,431
PAINT ROLLER
Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 9, 1983, Ser. No. 473,439
Claims priority, application Japan, Sep. 10, 1982, 57-41578
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—123



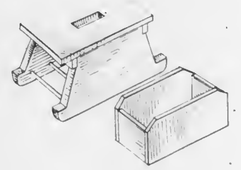
287,432
COMMODE BRUSH HANDLE
Fred W. Grant, 3177 Terrace Ct., Apt. H, Norcross, Ga. 30092
Filed Sep. 24, 1984, Ser. No. 653,583
Term of patent 14 years
U.S. Cl. D4—138



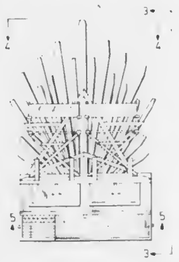
287,433
EMBOSSED PATTERN FOR PAPER TISSUE
Berne Ellers, Höganäs, Sweden, assignor to Dry Forming Processes in Europe AB, Orkelljunga, Sweden
Filed Jan. 8, 1985, Ser. No. 689,709
Term of patent 14 years
U.S. Cl. D5—53



287,434
COMBINED STOOL AND TOOL HOLDER FOR A GARDENER
William G. Wolfe, and Marjorie E. Wolfe, both of 141 Lockwood Rd., Riverside, Conn. 06878
Filed Dec. 22, 1983, Ser. No. 564,517
Term of patent 14 years
U.S. Cl. D6—336



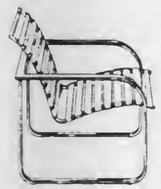
287,435
SHOE SHINE STAND
Shellee A. Broncucia, 120 E. 70th Ave., Denver, Colo. 80221
Filed Jul. 16, 1984, Ser. No. 632,792
Term of patent 14 years
U.S. Cl. D6—336



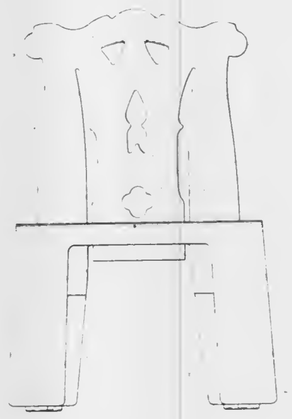
287,436
CHAIR
Niels Diffrient, Ridgefield, Conn., assignor to Hauserman, Inc., Cleveland, Ohio
Filed Jun. 8, 1984, Ser. No. 618,743
Term of patent 14 years
U.S. Cl. D6—367



287,437
CHAIR FRAME
Richard Frinier, Longbeach, and Eugene A. Criqui, Covina, both of Calif., assignors to Brown Jordan Company, El Monte, Calif.
Continuation of Ser. No. 400,317, Jul. 21, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 726,181
Term of patent 14 years
U.S. Cl. D6—373



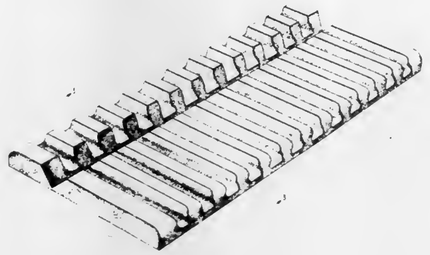
287,438
CHAIR
Robert Venturi, Philadelphia, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed Nov. 1, 1983, Ser. No. 547,739
Term of patent 14 years
U.S. Cl. D6—380

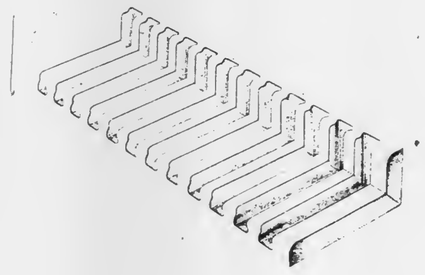


287,439
SOFA OR SIMILAR ARTICLE
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 15, 1984, Ser. No. 662,436
Term of patent 14 years
U.S. Cl. D6—381

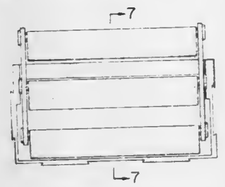


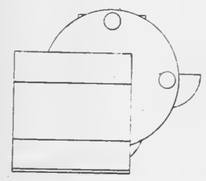
287,440
STORAGE RACK FOR CASSETTES OR THE LIKE
Jon W. Taylor, Bldg. 14, Apt. 12, Netcong Heights, Netcong, N.J. 07857
Filed Mar. 11, 1983, Ser. No. 474,300
Term of patent 14 years
U.S. Cl. D6—407





287,441
ROTATABLE STORAGE UNIT
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Aug. 20, 1984, Ser. No. 642,349
Term of patent 14 years
U.S. Cl. D6—456

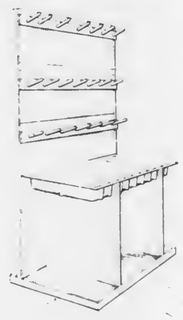




287,442
LATHE TOOL HOLDER OR THE LIKE
John D. Arthur, 14404 Plummer St., Panorma City, Calif. 91402
Filed Jul. 30, 1984, Ser. No. 635,532
Term of patent 14 years
U.S. Cl. D6—461



287,443
DISPLAY RACK FOR FLATWARE
James F. Norling, Denver, and John E. Polich, Lakewood, both of Colo., assignors to The Verticel Company, Englewood, Colo.
Filed Aug. 10, 1984, Ser. No. 640,149
Term of patent 14 years
U.S. Cl. D6—467



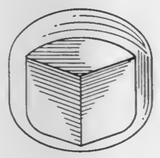
287,444
DISPLAY RACK FOR DINNERWARE
James F. Norling, Denver, and John E. Polich, Lakewood, both of Colo., assignors to The Verticel Company, Englewood, Colo.
Filed Aug. 10, 1984, Ser. No. 640,150
Term of patent 14 years
U.S. Cl. D6—474



287,445
TABLE
David Estreich, New York, N.Y., assignor to Pace Collection, Inc., Long Island City, N.Y.
Filed Jun. 18, 1984, Ser. No. 621,431
Term of patent 14 years
U.S. Cl. D6—480



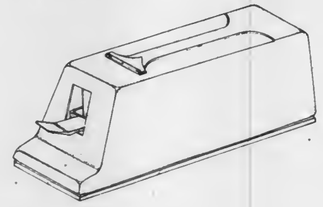
287,446
CORNER PROTECTOR FOR PREVENTING INJURY
John T. Cowle, 39 Hodder St., East Brighton, Victoria, Australia
Filed Jan. 25, 1982, Ser. No. 342,041
Claims priority, application Australia, Sep. 14, 1981, 85220
Term of patent 14 years
U.S. Cl. D6—491



287,447
TOOTHBRUSH HOLDER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,357
Term of patent 14 years
U.S. Cl. D6—534

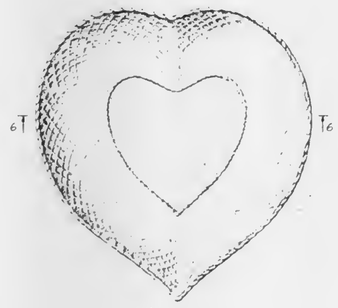


287,448
SOAP TAPE DISPENSER
Byung E. Yoo, Daegu, Rep. of Korea, assignor to Sam Woo Trading Co., Ltd., Kimpo, Rep. of Korea
Filed Dec. 10, 1984, Ser. No. 679,689
Claims priority, application Rep. of Korea, Jul. 16, 1984, 84-8361
Term of patent 14 years
U.S. Cl. D6—542



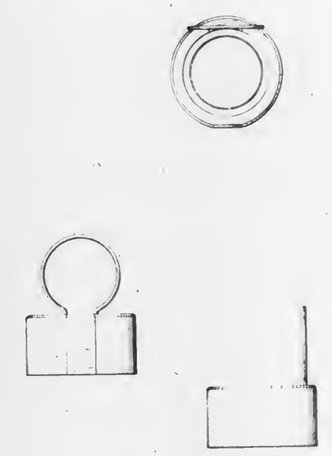


287,449
TRAY
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 4, 1984, Ser. No. 616,938
Term of patent 14 years
U.S. Cl. D7—5

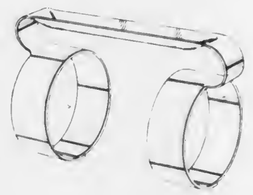




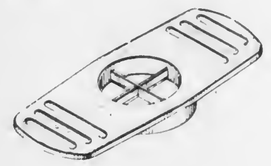
287,450
DRINK HOLDER
Kazumi Sakai, Tokyo, Japan, assignor to Car-Mate Mfg. Co. Ltd., Tokyo, Japan
Filed Sep. 6, 1984, Ser. No. 647,976
Term of patent 14 years
U.S. Cl. D7—70



287,451
VACUUM BOTTLE HANDLE
David L. Schrock, R.R. #2, Box 33A, Garden City, Mo. 64747
Filed Mar. 9, 1984, Ser. No. 587,822
Term of patent 14 years
U.S. Cl. D7—70



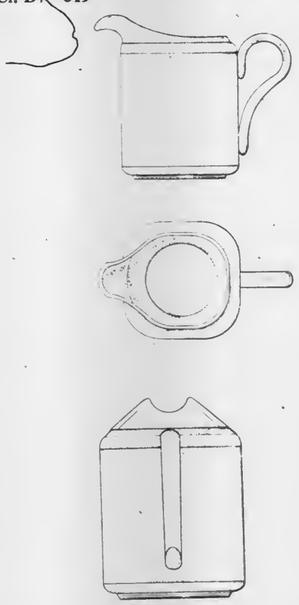
287,452
VEGETABLE SLICER
Ralph Stern, Oakland, N.J., assignor to Wecolite Company, Inc., Teaneck, N.J.
Filed Mar. 26, 1984, Ser. No. 593,138
Term of patent 14 years
U.S. Cl. D7—106



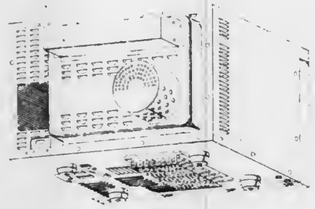
287,453
HANDLE FOR AN ARTICLE OF FLATWARE
Henry Bouilhet, Garches, France, assignor to La Société Orfevrerie Christofle, Paris, France
Filed Sep. 26, 1984, Ser. No. 654,675
Claims priority, application Switzerland, May 4, 1984, DM/003707
Term of patent 14 years
U.S. Cl. D7—152



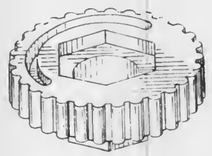
287,454
CREAM PITCHER
Katsuhiro Ohtake, Mie, Japan, assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Oct. 11, 1984, Ser. No. 659,617
Term of patent 14 years
U.S. Cl. D7—319



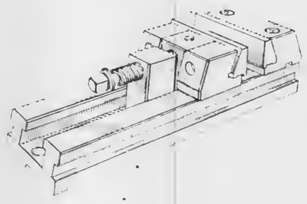
287,455
MICRO-WAVE OVEN
Shigeo Ito, Nagoya, Japan, assignor to Brother Kogyo K.K., Aichi, Japan
Filed Feb. 28, 1984, Ser. No. 585,225
Claims priority, application Japan, Sep. 9, 1983, 58-39461
Term of patent 14 years
U.S. Cl. D7—351



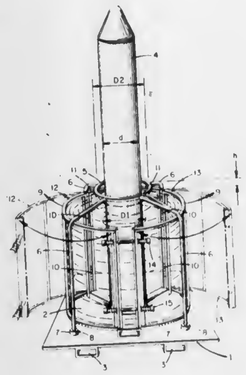
287,456
HEXAGONAL INSTALLATION KEY FOR A FLOW METER
Duane M. Kobos, LaPorte, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Jun. 20, 1984, Ser. No. 622,482
Term of patent 14 years
U.S. Cl. D8—24



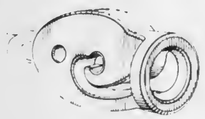
287,457
VICE
Marinko Listes, Laval, Canada, assignor to Monorail Industries Limited, Montreal-Nord, Canada
Filed Jan. 18, 1983, Ser. No. 458,934
Term of patent 14 years
U.S. Cl. D8—74



287,458
ADJUSTABLE LOCKING HANDLE
Giorgio Decursu, Milan, Italy, assignor to Elesa S.p.A., Milan, Italy
Filed Jan. 27, 1984, Ser. No. 574,300
Claims priority, application Italy, Aug. 4, 1983, U.S. Cl. D9—300 22589/83[U]
Term of patent 14 years
U.S. Cl. D8—308



287,459
WATER SKI ROPE CONNECTOR
Richard W. Donalies, Hoffman Estates, Ill., assignor to Midwest Marine Development Corporation, Hoffman Estates, Ill.
Filed Jun. 12, 1984, Ser. No. 619,801
Term of patent 14 years
U.S. Cl. D8—382



287,460
ROCK ANCHOR
Charles J. MacKarvich, Atlanta, Ga., assignor to Tie Down Engineering, Inc., Atlanta, Ga.
Filed Sep. 28, 1984, Ser. No. 655,244
Term of patent 14 years
U.S. Cl. D8—388



287,461
LOTION DISPENSING BOTTLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,355
Term of patent 14 years



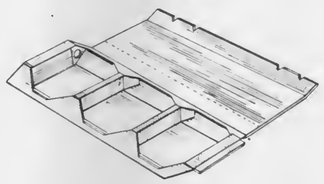
287,462
LOTION DISPENSING BOTTLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Sep. 11, 1984, Ser. No. 649,360
Term of patent 14 years
U.S. Cl. D9—300



287,463
CONTAINER FOR KNITTING NEEDLES
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co. Ltd., Osaka, Japan
Filed Oct. 25, 1983, Ser. No. 545,351
Claims priority, application Japan, Aug. 18, 1983, 58-3582
Term of patent 14 years
U.S. Cl. D9—303



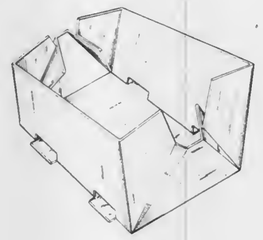
287,464
COMPARTMENTED BOX
Duane R. Mode, Bloomington, Minn., assignor to Waldorf Corporation, St. Paul, Minn.
Continuation of Ser. No. 480,267, Mar. 30, 1983. This application Dec. 14, 1984, Ser. No. 681,905
Term of patent 14 years
U.S. Cl. D9—346



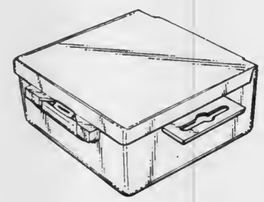
287,465
CONTAINER FOR LIQUIDS
Kenneth A. Latta, 7011 Silverleaf La., Houston, Tex. 77088
Filed Aug. 22, 1984, Ser. No. 643,179
Term of patent 14 years
U.S. Cl. D9—390



287,466
PACKAGING CONTAINER
Robert B. Gardner, Shelby, N.C., assignor to Container Corporation of America, Chicago, Ill.
Filed Jun. 6, 1983, Ser. No. 501,273
Term of patent 14 years
U.S. Cl. D9—414



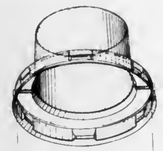
287,467
CONTAINER WITH A HINGED LID
John D. Mallon, Tiburon, Calif., assignor to All State Fasteners Co., Ltd., Inc., San Francisco, Calif.
Filed Aug. 27, 1984, Ser. No. 644,430
Term of patent 14 years
U.S. Cl. D9—415



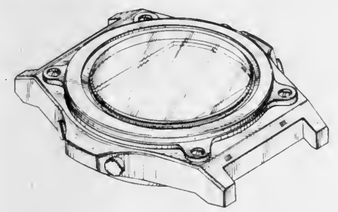
287,468
DISPOSABLE CUP HOLDER BLANK
Joseph R. Drago, 8533 Capistrano, Canoga Park, Calif. 91304
Filed Jun. 21, 1984, Ser. No. 622,970
Term of patent 14 years
U.S. Cl. D9—433



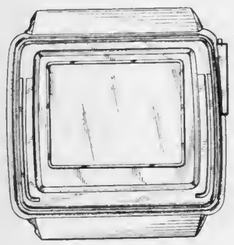
287,469
CLOSURE CAP
Royal Weinberger, Clifton, N.J., assignor to North American Systems, Inc., Bedford Heights, Ohio
Filed Apr. 16, 1984, Ser. No. 600,445
Term of patent 14 years
U.S. Cl. D9—435



287,470
CASE FOR A WRISTWATCH
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Aug. 3, 1984, Ser. No. 637,363
Term of patent 14 years
U.S. Cl. D10—30



287,471
WATCH CASE
Shinji Sato, and Hiroshi Tsukida, both of Shiojiri, Japan, assignors to Shiojiri Kogyo Kabushiki Kaisha, Nagano, Japan
Filed Nov. 14, 1984, Ser. No. 671,378
Claims priority, application Japan, May 17, 1984, 59-20014
Term of patent 14 years
U.S. Cl. D10—38



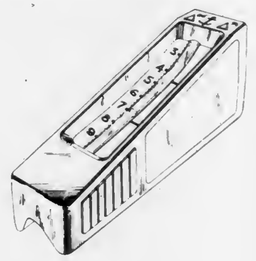
287,472
WATCH
Jean-Marie Hotz, Frinvillier, Switzerland, assignor to Omega SA, Bienne, Switzerland
Filed Nov. 23, 1984, Ser. No. 674,434
Claims priority, application Switzerland, May 24, 1984, 74082
Term of patent 14 years
U.S. Cl. D10—39



287,473
ELECTRONIC THERMOMETER
Koichi Ueno, Tokyo, Japan, assignor to Toshiba Glass Co., Ltd., Shizuoka, Japan
Filed Sep. 5, 1984, Ser. No. 647,472
Claims priority, application Japan, Mar. 8, 1984, 59-8958
Term of patent 14 years
U.S. Cl. D10—57



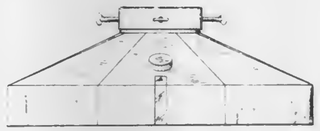
287,474
ANCHOR LINE SCOPE MEASURING DEVICE
Paul A. Odegard, 183 Box Mountain Dr., Vernon, Conn. 06066
Filed Dec. 15, 1983, Ser. No. 561,814
Term of patent 14 years
U.S. Cl. D10—69



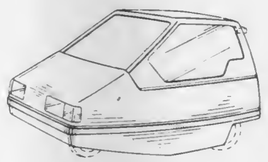
287,475
DEPTH GAUGE
David J. Jordan, 2505 W. Iola, Broken Arrow, Okla. 74012
Filed Sep. 28, 1984, Ser. No. 655,416
Term of patent 14 years
U.S. Cl. D10—70



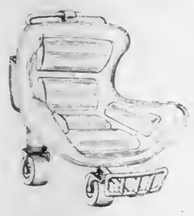
287,476
TREE STAND
Timothy W. Craft, 212 Greenwood Dr., Mars, Pa. 16046, and William M. Shepard, 7 Gentle Ct., Fenton, Mo. 63026
Filed Feb. 6, 1984, Ser. No. 577,638
Term of patent 14 years
U.S. Cl. D11—130.1



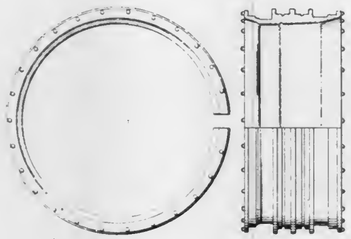
287,477
MOTOR VEHICLE BODY
Tadabumi Takasu, 3315 Laurel Canyon Blvd., Studio City, Calif. 91604
Filed Mar. 20, 1984, Ser. No. 591,674
Term of patent 14 years
U.S. Cl. D12—85



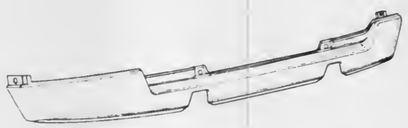
287,478
STROLLER
Nancy J. Miles, 824 Ken Way, Anaheim, Calif. 92805
Filed Sep. 20, 1984, Ser. No. 652,128
Term of patent 14 years
U.S. Cl. D12—129



287,479
BEADLOCK FOR INFLATABLE TIRES
Mason C. Winfield, Orchard Park, N.Y., assignor to Astronics Corporation, Orchard Park, N.Y.
Filed Jan. 23, 1984, Ser. No. 573,296
Term of patent 14 years
U.S. Cl. D12—153



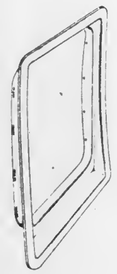
287,480
BALANCE PANEL FOR AN AUTOMOBILE
Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,651
Term of patent 14 years
U.S. Cl. D12—181



287,481
BALANCE PANEL FOR AN AUTOMOBILE
Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,653
Term of patent 14 years
U.S. Cl. D12—181



287,482
INTERIOR WINDOW FRAME FOR RECREATIONAL VEHICLES
Glen R. Unzicker, 50773 County Rd. No. 11, Elkhart, Ind. 46514
Filed Apr. 13, 1984, Ser. No. 600,000
Term of patent 14 years
U.S. Cl. D12—183

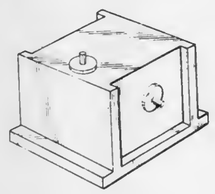


287,483
TWIN ENGINE JET AIRCRAFT
Russell P. O'Quinn, Long Beach, and Irven H. Culver, Playa Del Rey, both of Calif., assignors to Flight Concepts Limited Partnership, Englewood, Colo.
Filed May 19, 1983, Ser. No. 496,190
Term of patent 14 years
U.S. Cl. D12—342

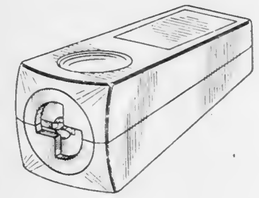




287,484
ELECTRODE HOUSING OR THE LIKE
Guy F. Rodomista, Natick, Mass., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 13, 1984, Ser. No. 620,357
Term of patent 14 years
U.S. Cl. D13—11



287,485
SAFETY LOCK FOR AN ELECTRICAL PLUG
Merlin L. Hamer, 724 Prospect St., La Jolla, Calif. 92037, and Wayne T. Mitchell, 1864 Lake Dr., Cardiff-by-the-Sea, Calif. 92007
Filed Sep. 27, 1984, Ser. No. 655,147
Term of patent 14 years
U.S. Cl. D13—28

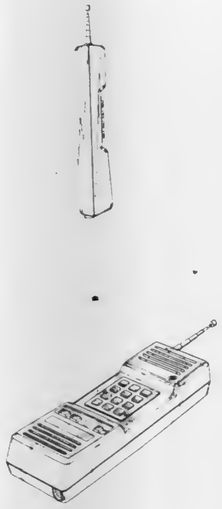


287,486
CONTROL PANEL WITH DISPLAY
Henry A. Points, Oakley, and Nicholas F. Talesfore, Los Gatos, both of Calif., assignors to General Electric Company, San Jose, Calif.
Filed Apr. 11, 1984, Ser. No. 598,970
Term of patent 14 years
U.S. Cl. D13—35





287,487
CORDLESS TELEPHONE
Yoshio Sasaki; Toshio Nishimura, and Kei Matsuda, all of Kawasaki, Japan, assignors to Nitsuko Limited, Kanagawa, Japan
Filed Oct. 15, 1984, Ser. No. 660,879
Claims priority, application Japan, Jun. 29, 1984, 59-26567
Term of patent 14 years
U.S. Cl. D14—53

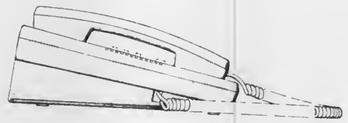


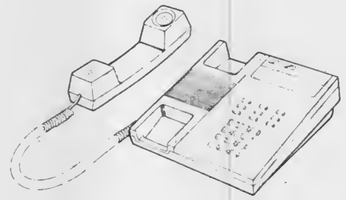
287,488
TELEPHONE
Guillermo F. Brignole, Pasadena; Thomas P. Eisenstadt, Canoga Park, and Robert E. Lee, Westlake Village, all of Calif., assignors to TeleQuest, San Diego, Calif.
Filed Apr. 16, 1984, Ser. No. 600,528
Term of patent 14 years
U.S. Cl. D14—53



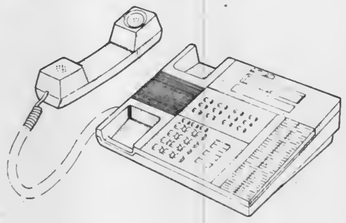


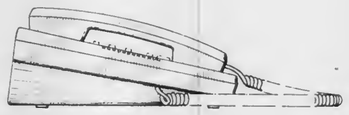
287,489
HANDSET AND STAND TELEPHONE UNIT
Akira Sekiguchi, Tokyo, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1984, Ser. No. 678,874
Claims priority, application Japan, Aug. 28, 1984, 59-35860; Aug. 28, 1984, 59-35861
Term of patent 14 years
U.S. Cl. D14—53





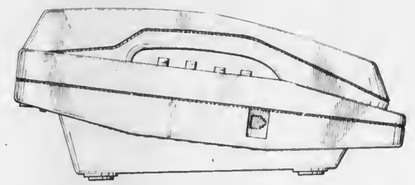
287,490
HANDSET AND STAND TELEPHONE UNIT
Akira Sekiguchi, Tokyo, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1984, Ser. No. 679,122
Claims priority, application Japan, Aug. 28, 1984, 59-35857; Aug. 28, 1984, 59-35858; Aug. 28, 1984, 59-35859
Term of patent 14 years
U.S. Cl. D14—53



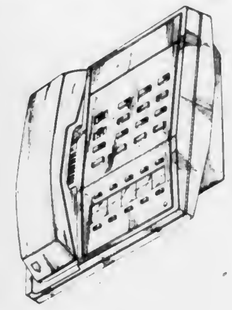


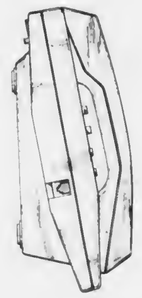
287,491
TELEPHONE SET
Wilbert C. Brown, Fairfield; Eric K. Babbitt, Shelton, both of Conn., and Roger J. Tosto, Yorktown Heights, N.Y., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Apr. 13, 1984, Ser. No. 600,100
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—53



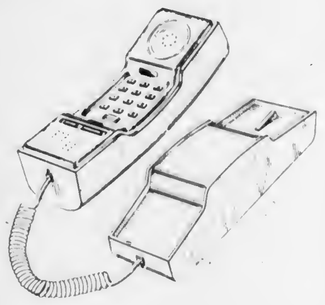


287,492
TELEPHONE SET
Wilbert C. Brown, Fairfield; Eric K. Babbitt, Shelton, both of Conn., and Roger J. Tosto, Yorktown Heights, N.Y., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Jun. 4, 1984, Ser. No. 617,171
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—53

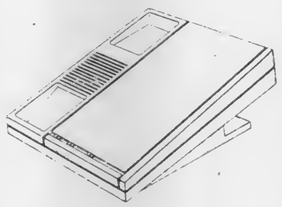


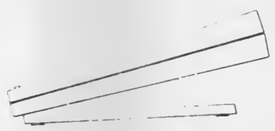


287,493
HANDSET TELEPHONE AND STAND UNIT
Michael Young, Flushing, N.Y., assignor to International Quartz Ltd., Kowloon, Hong Kong
Filed May 24, 1984, Ser. No. 614,104
Term of patent 14 years
U.S. Cl. D14—53

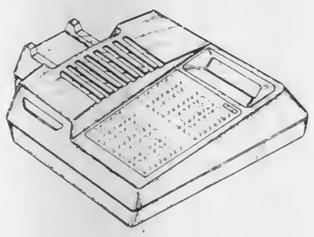


287,494
TELEPHONE STAND
David C. Danielson, New Canaan, Conn., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Information Systems, Morristown, N.J.
Filed Jan. 6, 1986, Ser. No. 816,486
Term of patent 14 years
U.S. Cl. D14—60

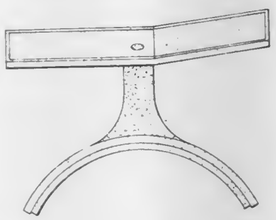




287,495
DESK TELEPHONE HOUSING
Michael Mitchell, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.
Filed Dec. 10, 1984, Ser. No. 680,012
Term of patent 14 years
U.S. Cl. D14—60

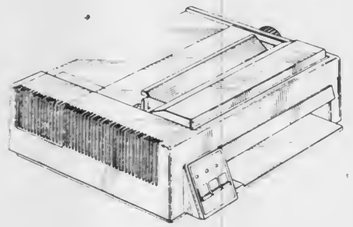


287,496
TELEPHONE HANDSET SHOULDER REST
James C. Bricker, Waynesville, Ohio, assignor to Applied Technology and Ethics Corporation, Norwood, Ohio
Filed Aug. 13, 1984, Ser. No. 640,453
Term of patent 14 years
U.S. Cl. D14—65

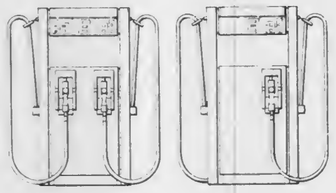




287,497
PRINTER
Douglas E. Goodner, Matthews, and David V. Iorio, Harrisburg, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1984, Ser. No. 659,743
Term of patent 14 years
U.S. Cl. D14—111

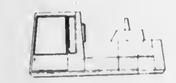


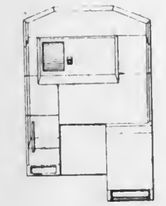
287,498
FUEL DISPENSER
Glenn W. Monigle, Golden, and David W. Roecker, Denver, both of Colo., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Aug. 10, 1984, Ser. No. 639,561
Term of patent 14 years
U.S. Cl. D15—9.2



287,499
BODY OF EXCAVATOR
Takehiko Takamatsu, Yokohama, and Kazuo Kurihara, Tokyo, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Nov. 9, 1984, Ser. No. 669,987
Term of patent 14 years
U.S. Cl. D15—30







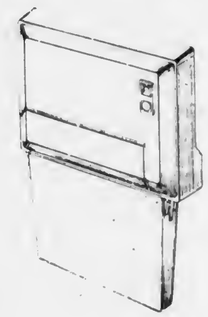
287,500
UNLOADER ATTACHMENT FOR A POULTRY PROCESSING MACHINE
Ronnie M. Conner, Dahlonega, and Grover S. Harben, Jr., Gainesville, both of Ga., assignors to Centennial Machine Company, Inc., Gainesville, Ga.
Filed Jun. 15, 1984, Ser. No. 621,175
Term of patent 14 years
U.S. Cl. D15—139



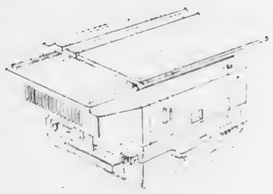
287,501
SPEEDOMETER CABLE GREASE FITTING
Scott V. Davis, Rte. 1, Box 761, Haslet, Tex. 76052
Filed May 16, 1983, Ser. No. 495,122
Term of patent 14 years
U.S. Cl. D15—150



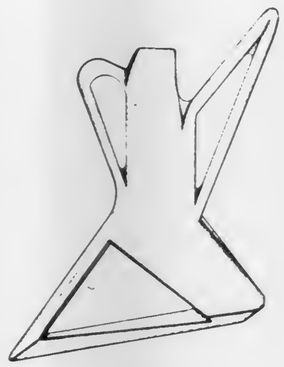
287,502
PHOTOGRAPHIC CAMERA BACK OR SIMILAR ARTICLE
June C. Fichter, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 10, 1984, Ser. No. 680,073
Term of patent 14 years
U.S. Cl. D16—10



287,503
ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1984, Ser. No. 626,991
Claims priority, application Japan, Jan. 7, 1984, 59-127
Term of patent 14 years
U.S. Cl. D16—31



287,504
GUITAR BODY
Andrew L. Desrosiers, 65 Amity St., Cohoes, N.Y. 12047
Filed Feb. 27, 1984, Ser. No. 583,586
Term of patent 14 years
U.S. Cl. D17—20



287,505
FLUTE AND PICCOLO PLAYER'S LYRE
George T. Koprivica, 147 E. Alton Ave., East Alton, Ill. 62024
Continuation-in-part of Ser. No. 494,001, May 12, 1982, Pat. No. Des. 280,417. This application Nov. 10, 1983, Ser. No. 550,309
Term of patent 14 years
U.S. Cl. D17—99



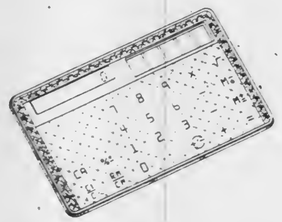
287,506
COMBINED CALCULATOR AND DESK TIDY
Chun W. Lung, Kwai Chung, Hong Kong, assignor to Cyberman Consultant Company Limited, Kwai Chung, Hong Kong
Filed Jul. 18, 1984, Ser. No. 631,875
Claims priority, application United Kingdom, Jan. 27, 1984, 1017542
Term of patent 14 years
U.S. Cl. D18—2



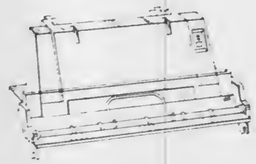
287,507
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko, and Yuji Harada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 557,938
Claims priority, application Japan, Jul. 7, 1983, 58-29604
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7



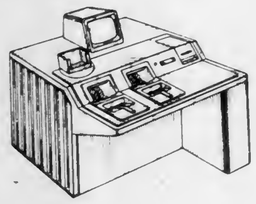
287,508
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko, and Kaname Suwa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1983, Ser. No. 558,003
Claims priority, application Japan, Jul. 25, 1983, 58-32619
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7



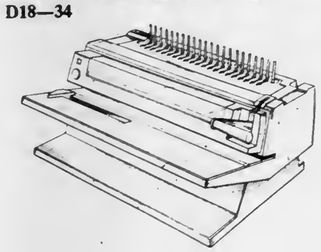
287,509
PAPER FEEDER FOR PRINTER
Richard Nibley, and Makoto Takemura, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 19, 1984, Ser. No. 672,782
Claims priority, application Japan, Jun. 4, 1984, 59-22887
Term of patent 14 years
U.S. Cl. D18—22



287,510
BANK NOTE COUNTING/SHREDDING MACHINE
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan
Filed Jun. 4, 1984, Ser. No. 616,702
Claims priority, application Japan, Dec. 5, 1983, 58-52370
Term of patent 14 years
U.S. Cl. D18—34

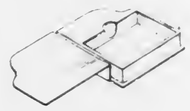


287,511
COMBINED PUNCH AND BINDER
Roger M. Scharer, Des Plaines, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Jun. 5, 1984, Ser. No. 617,589
Term of patent 14 years
U.S. Cl. D18—34

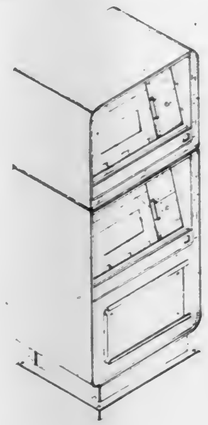


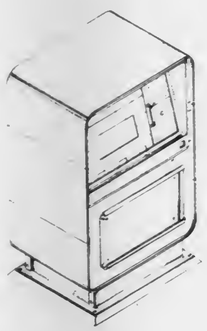
287,512
NOTE PAD HOLDER
William J. Shaw, Los Angeles, Calif., assignor to Small World Greetings, Inc., Los Angeles, Calif.
Filed Jun. 15, 1984, Ser. No. 621,199
Term of patent 14 years
U.S. Cl. D19—92





287,513
NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Mar. 7, 1984, Ser. No. 587,698
Term of patent 14 years
U.S. Cl. D20—6

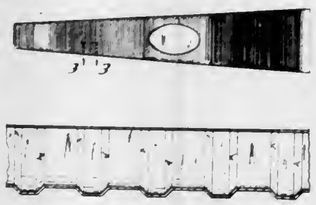




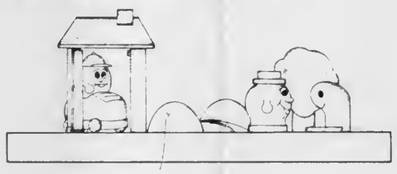
287,514
ESCAPE SYMBOL
Robert N. Hellmer, 538 New York Ave., Dunedin, Fla. 33528, and Robert J. Smallwood, 7030 Snowflake, San Antonio, Tex. 78238
Filed Nov. 7, 1983, Ser. No. 549,390
Term of patent 14 years
U.S. Cl. D20—31



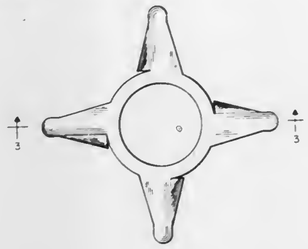
287,515
WALL SIGN
Ronald G. Gransden, Eltham Heights, England, assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 18, 1983, Ser. No. 476,698
Claims priority, application United Kingdom, Sep. 22, 1982, 1008829
Term of patent 14 years
U.S. Cl. D20—42



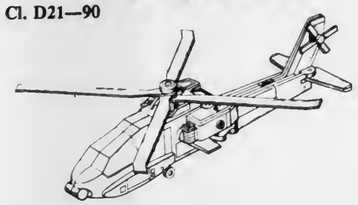
287,516
SLOTTED BOARD WITH INTEGRAL SLOT CAR AND INTEGRAL SLOT FIGURES
Robert Fieldhouse, 3626 Breezemont Dr., Sarasota, Fla. 33582
Filed Apr. 5, 1984, Ser. No. 597,047
Term of patent 14 years
U.S. Cl. D21—59

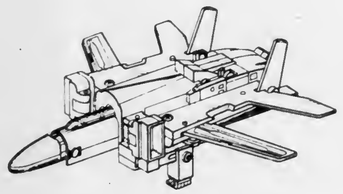


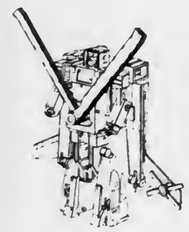
287,517
BOOMERANG
Michael K. Larson, R.R. 1, Box 157B, Waverly, Lancaster County, Nebr. 68462
Continuation-in-part of Ser. No. 427,803, Sep. 29, 1982. This application May 2, 1984, Ser. No. 606,227
Term of patent 14 years
U.S. Cl. D21—82



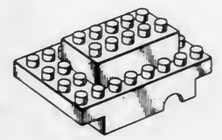
287,518
RECONFIGURABLE HELICOPTER TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 27, 1984, Ser. No. 655,328
Claims priority, application Japan, May 22, 1984, 59-20709
Term of patent 14 years
U.S. Cl. D21—90



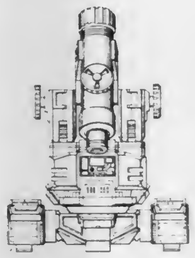


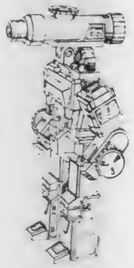


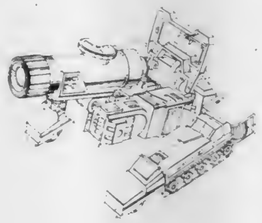
287,519
TOY CONSTRUCTION PIECE
Tokuo Takahashi, 11-26 Okubo 2-chome, Shinjuku-ku, Tokyo, Japan
Filed Sep. 16, 1983, Ser. No. 532,849
Claims priority, application Japan, Jun. 6, 1983, 58-23901
Term of patent 14 years
U.S. Cl. D21—108



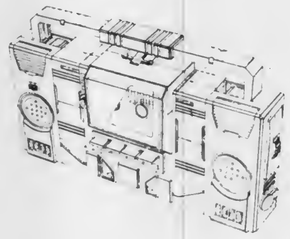
287,520
RECONFIGURABLE MICROSCOPE TOY
Hideaki Yoke, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 11, 1984, Ser. No. 649,471
Claims priority, application Japan, May 30, 1984, 59-22184
Term of patent 14 years
U.S. Cl. D21—109



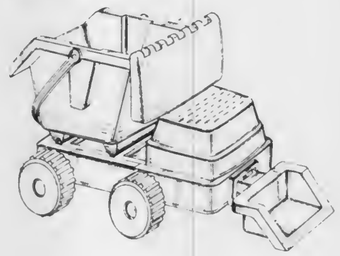




287,521
RECONFIGURABLE RADIO CASSETTE RECORDER TOY
Hiroyuki Obara, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 11, 1984, Ser. No. 649,439
Claims priority, application Japan, May 30, 1984, 50-22207
Term of patent 14 years
U.S. Cl. D21—112



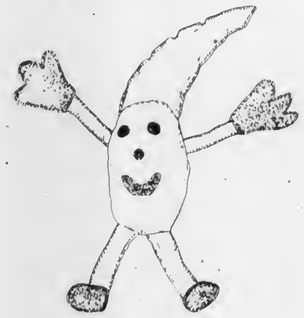
287,522
TOY DUMP TRUCK
Martin Blumenthal, 99 Longview Ave., Chatham, N.J. 07928
Filed Sep. 19, 1983, Ser. No. 533,370
Term of patent 14 years
U.S. Cl. D21—134



287,523
TOY HIPPOPOTAMUS
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,179
Term of patent 14 years
U.S. Cl. D21—148



287,524
DOLL
Justice C. Rines, 13 Spaulding St., Concord, N.H. 03301
Filed Dec. 21, 1983, Ser. No. 564,036
Term of patent 14 years
U.S. Cl. D21—176



287,525
EXERCISING WEIGHT
Gregory W. Durward, 3466 West 18th Avenue, Vancouver, British Columbia, Canada V6S 1A7
Filed May 16, 1984, Ser. No. 610,777
Term of patent 14 years
U.S. Cl. D21—196



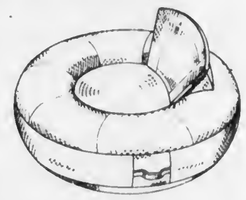
287,526
BARBELL
Keith P. Brockett, and Laverne A. Brockett, both of Apt. C-6, Greengate Garden Apt., Greensburg, Pa. 15601
Filed Jun. 8, 1984, Ser. No. 618,899
Term of patent 14 years
U.S. Cl. D21—197



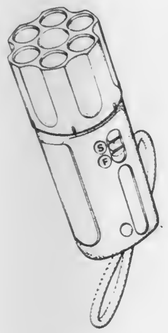
287,527
GOLF CLUB GRIP
Karsten Solheim, 501 Wakonda La., Phoenix, Ariz. 85023
Filed Jan. 20, 1984, Ser. No. 572,407
Term of patent 14 years
U.S. Cl. D21—222



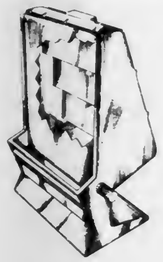
287,528
INFLATABLE SEAT
Charles Maxwell, 2995 Altamont Cresc., W. Vancouver, British Columbia, Canada V7V 3C2, and Terry Wiens, 1814 196th St., Langley, British Columbia, Canada V3A 4P4, assignors to Tireless Furniture, Inc., San Diego, Calif.
Filed Apr. 16, 1984, Ser. No. 600,485
Term of patent 14 years
U.S. Cl. D21—237



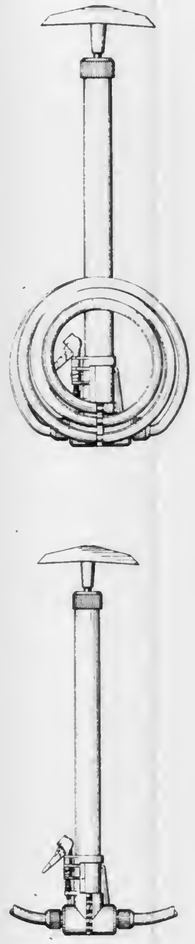
287,529
EMERGENCY PYROTECHNIC SIGNALLING DEVICE
Hanns-Juergen Diederichs, Jr., Grande, Fed. Rep. of Germany, assignor to Nico-Pyrotechnic Hanns-Juergen Diederichs GmbH & Co. KG, Hamburg, Fed. Rep. of Germany
Filed Jan. 20, 1984, Ser. No. 572,667
Term of patent 14 years
U.S. Cl. D22—112



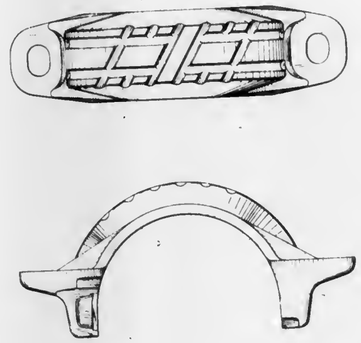
287,530
TARGET
Larry R. Magnuson, Muskegon, Mich., assignor to Tolcon Steel Corporation, Grand Rapids, Mich.
Filed Mar. 27, 1984, Ser. No. 593,860
Term of patent 14 years
U.S. Cl. D22—113



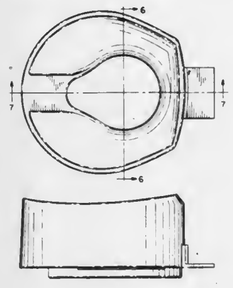
287,531
HAND PUMP
David J. Evans, Hamilton, New Zealand, assignor to D. J. Evans Design Limited, Hamilton, New Zealand
Filed Nov. 7, 1983, Ser. No. 549,311
Term of patent 14 years
U.S. Cl. D23—14



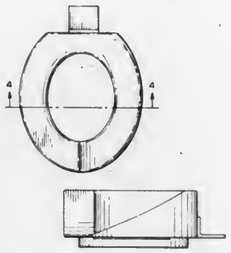
287,532
COUPLING
Robert E. Jones, Berkley Heights, N.J., and Emerson Purkapile, Chicago, Ill., assignors to Victaulic Company of America, Easton, Pa.
Filed Apr. 17, 1984, Ser. No. 600,573
Term of patent 14 years
U.S. Cl. D23—43



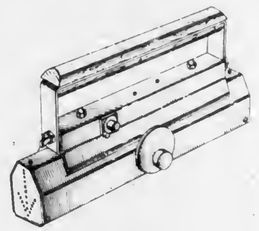
287,533
RAISED SUPERIMPOSED TOILET SEAT OR THE LIKE
John Broeils, Wycoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.
Filed Sep. 23, 1982, Ser. No. 421,843
Term of patent 14 years
U.S. Cl. D23—71



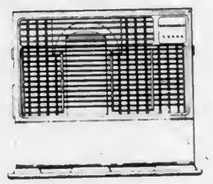
287,534
RAISED SUPERIMPOSED TOILET SEAT OR THE LIKE
John Broeils, Wycoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.
Filed Sep. 23, 1982, Ser. No. 422,468
Term of patent 14 years
U.S. Cl. D23—71



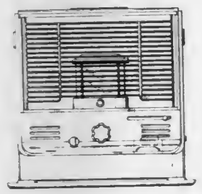
287,535
COMBINED INFRARED HEATING DEVICE AND BODY THEREOF
Hans C. Allbäck, Sjöbo, Sweden, assignor to Utveckling AB Carmen, Sjobo, Sweden
Filed May 25, 1984, Ser. No. 614,238
Claims priority, application Sweden, Nov. 28, 1983, 83-3103
Term of patent 14 years
U.S. Cl. D23—77



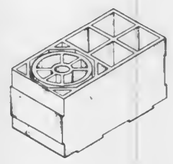
287,536
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Oct. 26, 1983, Ser. No. 545,576
Claims priority, application Japan, Apr. 26, 1983, 58-17780
The portion of the term of this patent subsequent to Oct. 28, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—122



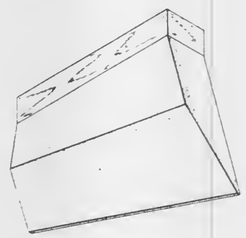
287,537
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Oct. 26, 1983, Ser. No. 545,575
Claims priority, application Japan, Apr. 26, 1983, 58-17779
The portion of the term of this patent subsequent to Sep. 2, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—124



287,538
COSMETIC ORGANIZER OR SIMILAR ARTICLE
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Aug. 27, 1984, Ser. No. 644,367
Term of patent 14 years
U.S. Cl. D28—73



287,539
FOAM SPONGE BROOM HEAD
Frank G. Wilson, Malvern, and William A. Patton, Newtown, both of Pa., assignors to Kendo Products Co., Inc., Paoli, Pa.
Filed Jun. 17, 1983, Ser. No. 505,318
Term of patent 14 years
U.S. Cl. D32—50



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. T. Newell Co. Inc: *See—*
Newell, Alfred T., III; and Nichols, Edward L., III, 4,632,304, Cl. 236-46.00R.
Ab Asea Atom: *See—*
Wallander, Anders; Borrman, Bo; and Mansson, Arne, 4,632,804, Cl. 376-444.000.
AB Volvo: *See—*
Eriksson, Sivert, 4,632,084, Cl. 123-556.000.
Naert, Michel S., 4,632,454, Cl. 297-284.000.
Abbott Laboratories: *See—*
Schultz, Steven G., 4,632,908, Cl. 436-157.000.
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., to Pizza Hut, Inc. Pizza preparation and delivery system. 4,632,836, Cl. 426-302.000.
Abe, Mitsuo: *See—*
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, 4,631,869, Cl. 51-165.710.
Abe, Susumu: *See—*
Ogawa, Masahiro; and Abe, Susumu, 4,632,849, Cl. 427-215.000.
Abegg, M. Taylor; and Peterson, John A., to Megabar Corporation. Microcellular composite energetic materials and method for making same. 4,632,714, Cl. 149-2.000.
Abel, Mark J.; Kwan, Chi L.; Polli, Philip V.; and Veach, Michael T., to AT&T Bell Laboratories. Computer system fault recovery based on historical analysis. 4,633,467, Cl. 371-16.000.
Abex Corporation: *See—*
Farr, Aaron V., 4,633,152, Cl. 318-257.000.
Ablaza, Sariel G. G. Suture for cardiovascular surgery. 4,632,113, Cl. 128-335.500.
Abraham, Carl J.: *See—*
Newman, Malcolm; and Abraham, Carl J., 4,631,758, Cl. 2-424.000.
Ackley, E. Michael. Apparatus for orienting and printing capsules. 4,632,028, Cl. 101-40.000.
Acme General Corporation: *See—*
Jerila, Torsti T. T., 4,631,894, Cl. 52-823.000.
Adachi, Teruho: *See—*
Kanagawa, Shuichi; Takagishi, Hisao; Adachi, Teruho; and Kamio, Kunimasa, 4,632,966, Cl. 525-502.000.
Adam, Ian R.; and Mallon, James, to ITT Corporation. Fixing devices. 4,631,889, Cl. 52-565.000.
Ader, Gary B., to Berkley and Company, Inc. Multi-purpose fisherman's device. 4,631,855, Cl. 43-53.500.
Adler, Alan J., to Ampex Corporation. Voltage controlled equalizer. 4,633,200, Cl. 333-28.00R.
Adrian, Robert; and Goulin, Maurice, to Societe Nationale Industrielle et Aerospatiale. Device for locking a mobile panel with double security. 4,632,440, Cl. 292-229.000.
Advanced Semiconductor Materials America, Inc.: *See—*
Olson, Donald M., 4,633,051, Cl. 219-10.49R.
Aeroquip Corporation: *See—*
McCracken, Donald G., 4,632,431, Cl. 285-13.000.
Aerospatiale Societe Nationale Industrielle: *See—*
Banos, Jean, 4,631,931, Cl. 66-83.000.
Agfa Gevaert Aktiengesellschaft: *See—*
Wernicke, Ubbo; and Meckl, Heinz, 4,632,763, Cl. 210-670.000.
Aguilar, Arturo, to Bloom, Leonard. Biofeedback method and apparatus. 4,632,126, Cl. 128-732.000.
Ahn, Kie Y.; and DiStefano, Thomas H., to International Business Machines Corporation. Optical servo for magnetic disks. 4,633,451, Cl. 369-14.000.
Ahr, Willi: *See—*
Schiwiora, Harry; and Ahr, Willi, 4,632,659, Cl. 433-181.000.
Air Products and Chemicals, Inc.: *See—*
Chen, Michael S. K.; Hegarty, W. Patrick; and Sampat, Dipak J., 4,632,818, Cl. 423-574.00R.
Shay, Robert H.; Berger, Kerry R.; and Bannos, Thomas S., 4,632,707, Cl. 148-16.500.
Aisin Seiki Kabushika Kaisha: *See—*
Masuda, Mitsuyoshi, 4,632,449, Cl. 296-222.000.
Aisin-Warner K.K.: *See—*
Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, 4,631,982, Cl. 74-869.000.
Aizawa, Shigeru: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,632,840, Cl. 426-602.000.
Ajisawa, Yukiyoshi: *See—*
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.
Akahane, Keniji: *See—*
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.
Akahane, Shoji: *See—*
Hirota, Kazuo; Akahane, Shoji; and Tomioka, Kentaro, 4,632,824, Cl. 424-49.000.
Akahori, Hiroyuki: *See—*
Tsujimoto, Michihiro; Akahori, Hiroyuki; Hasegawa, Kiyoharu; and Asano, Makoto, 4,632,987, Cl. 544-86.000.
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, to Hitachi, Ltd. Process for electroless copper plating. 4,632,852, Cl. 427-437.000.
Akamatsu, Junichi: *See—*
Watanabe, Kenjiro; Sakamoto, Susumu; and Akamatsu, Junichi, 4,633,273, Cl. 346-135.100.
Akano, Shinichi, to Yamatake Honeywell. Communication apparatus. 4,633,217, Cl. 340-310.00A.
Akatsu, Toshio, to Hitachi, Ltd. Method and apparatus for optically measuring clearance change. 4,632,556, Cl. 356-351.000.
Akers, Francis I.: *See—*
Karbassiyoon, Kamran; Foster, Philip E.; Akers, Francis I.; and Fletcher, Daniel G., 4,632,684, Cl. 65-2.000.
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Distributed feedback semiconductor laser. 4,633,474, Cl. 372-19.000.
Akins, Robert B., to General Electric Company. Starting aid for high pressure sodium vapor lamp. 4,633,135, Cl. 313-594.000.
Akkerman, Neil H., to AVAA International Corp. Apparatus in which an annular ring is carried within a groove about one member for slidably engaging the cylindrical surface of another member. 4,632,406, Cl. 277-188.00A.
Aktiebolaget Bofors: *See—*
Ohlson, Johnny, 4,632,041, Cl. 109-1.00S.
Akzo NV: *See—*
Ulubay, Hasan; and Schurmann, Horst, 4,632,730, Cl. 162-111.000.
Albany International Corp.: *See—*
Coplan, Myron J.; Bilewski, Friedhelm; Sebring, Robert; and Schiffer, Daniel K., 4,632,756, Cl. 210-323.200.
Alcan International Limited: *See—*
Gnyra, Bohdan, 4,632,292, Cl. 228-107.000.
Alco Industries, Inc.: *See—*
Newell, Stephen D.; Rowe, Stephen B.; and Bukousky, John M., 4,632,494, Cl. 239-184.000.
Alcon Laboratories, Inc.: *See—*
Falcetta, Joseph J.; and Park, Joonsup, 4,633,003, Cl. 556-419.000.
Aldridge, Fredrick A.: *See—*
Kennedy, Richard A.; and Aldridge, Fredrick A., 4,633,518, Cl. 455-242.000.
Alexander Dodds Company: *See—*
Campbell, Bernard D., 4,631,799, Cl. 29-558.000.
Alf, Reinhard; and Klinkwitz, Kurt, to Robert Bosch GmbH. Electrically projectable telescopic rod antenna, particularly for automotive installation. 4,633,266, Cl. 343-903.000.
Alger, Monroe E. Grounding device. 4,632,477, Cl. 339-14.00R.
Alink, Bernardus A. O.: *See—*
Thompson, Neil E. S.; Redmore, Derek; and Alink, Bernardus A. O., 4,633,019, Cl. 564-501.000.
Allegheny International Exercise Co.: *See—*
Beech, Charles R., 4,632,386, Cl. 272-73.000.
Allen-Bradley Company, Inc.: *See—*
Boysen, Gerd C., 4,632,497, Cl. 339-263.00R.
Allen, Sebree J. Mobile fertilizer distributor. 4,632,044, Cl. 111-7.000.
Alliance Enamelsteel Corporation N.V.: *See—*
Palmans, Jos, 4,631,888, Cl. 52-509.000.
Allied Corporation: *See—*
Anderson, Philip M., III; and Torre, John J., 4,633,250, Cl. 342-27.000.
Carpenter, Brian J., 4,632,480, Cl. 339-45.00M.
Cordova, David S.; and Lazarus, Stanley D., 4,632,864, Cl. 428-265.000.
Malka, Jacob H.; and Thurakal, Philip J., 4,633,191, Cl. 330-275.000.
Morgan, Richard L.; and Pickett, David A., 4,632,076, Cl. 123-145.00A.
Nalewajek, David; and Soriano, David S., 4,633,005, Cl. 558-125.000.
Punako, Stephen; Gallusser, David O.; and Joslyn, Carl R., 4,632,482, Cl. 339-59.00M.
Samelson, Harold, 4,633,475, Cl. 372-25.000.
Samuels, George J., 4,633,050, Cl. 200-268.000.
Thoman, David C.; Perkey, Russell C.; and Eastman, James M., 4,632,635, Cl. 415-14.000.
Wilson, Robert K., 4,632,015, Cl. 91-376.00R.

Allsop, Inc.: *See—*
Clausen, Eivind; and Allsop, Michael G., 4,632,597, Cl. 403-351.000.

Allsop, Michael G.: *See—*
Clausen, Eivind; and Allsop, Michael G., 4,632,597, Cl. 403-351.000.

Allsworth, Terrence W., to Deustsch Company Electronic Components Division, The. Optical fiber connector. 4,632,505, Cl. 350-96.210.

Almond, Roger L., to General Motors Corporation. Counter-gravity casting mold. 4,632,171, Cl. 164-255.000.

Alpha Industries, Inc.: *See—*
Stevens, Robert; and Rosa, Thomas, 4,633,199, Cl. 333-1.100.

Alps Electric Co., Ltd.: *See—*
Komatsu, Norimasa, 4,633,353, Cl. 360-105.000.
Matsuta, Shigetoshi, 4,633,188, Cl. 330-51.000.
Okazaki, Mitsunari, 4,633,520, Cl. 455-319.000.
Shirouzu, Tatsuo; Sakata, Nobuhiro; Kono, Masaki; and Inagaki, Saburo, 4,631,811, Cl. 29-705.000.

Altschuler, Lili W.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Flexible finishes from branched aliphatic polyester urethanes and a melamine crosslinker. 4,632,964, Cl. 525-456.000.

Altshuler, Saul. Corona mode ELF antenna system. 4,633,263, Cl. 343-706.000.

Aluminum Company of America: *See—*
Patrick, Edward P.; and Auhl, J. Richard, 4,633,054, Cl. 219-118.000.

Alverth, Ronald W.; and Busam, Donald H., to Mako-Tek Corporation, The. Cylinder-mounting bracket. 4,632,575, Cl. 384-258.000.

Amada, Eiichi: *See—*
Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, 4,633,460, Cl. 370-58.000.

Amano, Tokuhiro: *See—*
Iwasa, Hiroki; Ohmi, Kyozo; and Amano, Tokuhiro, 4,631,848, Cl. 40-427.000.

Ambroszewski, Michael. Removable drumstick mallet head. 4,632,006, Cl. 84-422.00S.

Amchem Products, Inc.: *See—*
Broadbent, Ronald W.; and Stockbower, Ellsworth A., 4,632,851, Cl. 427-435.000.

Amdahl Corporation: *See—*
Nagy, John S.; and Fang, Jolson K., 4,633,371, Cl. 361-385.000.

Amemiya, Yoichi: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,631,807, Cl. 29-598.000.

American Cyanamid Company: *See—*
Singh, Balwant; and Forgione, Peter S., 4,633,010, Cl. 560-25.000.

American Hospital Supply Corp.: *See—*
Webler, William E.; Elson, Edward E.; and Quinn, Michael D., 4,632,125, Cl. 128-692.000.

American Medical Systems, Inc.: *See—*
Polyak, Mark, 4,632,435, Cl. 285-243.000.

American Microsystems, Inc.: *See—*
Burgess, Patrick A., 4,633,220, Cl. 340-347.0DD.

American Optical Corporation: *See—*
Masso, Jon D.; and Carmelite, Donald D., 4,632,527, Cl. 351-166.000.

American Radionic Co., Inc.: *See—*
Stockman, Robert M., 4,633,365, Cl. 361-272.000.

Ameron, Inc.: *See—*
Bordner, Dalton W., 4,633,363, Cl. 361-215.000.

Amiboshi, Saburo: *See—*
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,632,403, Cl. 277-27.000.

Amoco Corporation: *See—*
Bodine, John H., 4,633,447, Cl. 367-70.000.
Pendergraft, Paul T., 4,632,043, Cl. 110-345.000.
Villanueva, James G.; Matlack, John D.; Lewis, Shelton E.; Pocock, John F. E.; and Cole, Charles A., 4,632,053, Cl. 118-66.000.

AMP Incorporated: *See—*
Bocchicchio, Keith A.; and Hall, David L., 4,631,815, Cl. 29-739.000.
Brutosky, Scott A., 4,632,246, Cl. 206-328.000.
Kita, Gerald K., 4,632,495, Cl. 339-210.00M.
Larson, Willis A., 4,633,228, Cl. 340-365.00E.
Tomita, Akira, 4,632,475, Cl. 339-4.000.
Yamada, Hiromi, 4,632,492, Cl. 339-176.00M.

Ampex Corporation: *See—*
Adler, Alan J., 4,633,200, Cl. 333-28.00R.

Analytics, Inc.: *See—*
Traudt, Ray F., 4,632,637, Cl. 416-41.000.

Anami, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Integrated circuit operating as a current-mirror type CMOS amplifier. 4,633,192, Cl. 330-277.000.

Anan, Tatsuro: *See—*
Jinba, Terumasa; Fukunaka, Shiro; Anan, Tatsuro; and Shiotani, Nobuo, 4,632,733, Cl. 204-28.000.

Anania, Guido: *See—*
Anastasi, Filippo; Anania, Guido; Cultrera, Vito; and Carfi', Giuseppe, 4,632,813, Cl. 423-310.000.

Anao, Kimiharu: *See—*
Hamuro, Mitsuro; Anao, Kimiharu; and Shimamaki, Keiichi, 4,633,370, Cl. 361-380.000.

Anastasi, Filippo; Anania, Guido; Cultrera, Vito; and Carfi', Giuseppe, to Enichem Agricolutra. Process for the production of water soluble ammonium phosphates. 4,632,813, Cl. 423-310.000.

Anayama, Hideki: *See—*
Yashiki, Yuichi; Anayama, Hideki; and Hiro, Masaaki, 4,632,892, Cl. 430-58.000.

Anders, Harry N.; and Ballard, William E., to Stoneburg Manufacturing, Inc. Disabled motor vehicle help summoning device. 4,633,215, Cl. 340-84.000.

Anderson, Charles R.: *See—*
Vidrine, D. Warren; and Anderson, Charles R., 4,632,553, Cl. 356-346.000.

Anderson, Cleo D., to AT&T Bell Laboratories. Control signalling arrangement for a digital transmission system. 4,633,464, Cl. 370-111.000.

Anderson, David W.: *See—*
Lapp, John; Hackney, Larry B.; Mason, Marco J.; and Anderson, David W., 4,633,369, Cl. 361-328.000.

Anderson, Greenwood & Co.: *See—*
McNeely, Michael D., 4,632,143, Cl. 137-488.000.

Anderson, Iain A.; Gaelic, Christopher J.; and Elliott, Phillipa L., to Fisher & Paykel Limited. Clothes washing machines. 4,631,771, Cl. 8-158.000.

Anderson, Joseph W.: *See—*
Stark, Robert G., Sr.; Stark, Tom; Stark, Robert G., Jr.; and Anderson, Joseph W., 4,632,148, Cl. 137-624.180.

Anderson, Philip M., III; and Torre, John J., to Allied Corporation. Coplanar antenna for proximate surveillance systems. 4,633,250, Cl. 342-27.000.

Andersson, Per-Erik; and Welander, Thomas G., to Purac Aktiebolag. Wastewater treatment method. 4,632,759, Cl. 210-603.000.

Ando, Hiromi: *See—*
Takayama, Toshio; Ando, Hiromi; and Matsumoto, Yukio, 4,632,208, Cl. 180-271.000.

Angeloni, Joseph. Guide assembly for a molding head. 4,632,162, Cl. 144-229.000.

Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Novel β-lactam antibiotics. 4,632,918, Cl. 514-202.000.

Angus, Gordon, to Moore Business Forms, Inc. Combined mailer and return envelope. 4,632,427, Cl. 282-11.50R.

Annovi, Giuseppe, to Dolomite S.p.A. Rear-entry ski boot. 4,631,843, Cl. 36-119.000.

Anritsu Electric Company Limited: *See—*
Kashiwagi, Toshihiro, 4,633,173, Cl. 324-130.000.

Anstey, Kenneth D., to Anstey Pty. Ltd. Support assembly. 4,632,349, Cl. 248-281.100.

Anstey Pty. Ltd.: *See—*
Anstey, Kenneth D., 4,632,349, Cl. 248-281.100.

ANT Nachrichtentechnik GmbH: *See—*
Form, Ernst, 4,632,544, Cl. 356-73.100.

Antsena, Irene B.: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.

Aoki, Hirofumi; and Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for automotive engine. 4,632,069, Cl. 123-41.150.

Aoyama, Motoo: *See—*
Bessho, Yasunori; Uchikawa, Sadao; and Aoyama, Motoo, 4,632,803, Cl. 376-238.000.

Apostolos, John T.; Boland, Robert P.; and Stromswold, Chester E., to Sanders Associates, Inc. Acquisition system employing circular array. 4,633,257, Cl. 342-445.000.

Appleman, Robert H.; Bein, Jeffrey D.; and Powaski, Frank S., to Westinghouse Electric Corp. Modular sludge collection system for a nuclear steam generator. 4,632,068, Cl. 122-34.000.

Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,632,456, Cl. 297-328.000.

Arai, Shokichi; and Fujii, Tadayoshi, to Honda Giken Kogyo Kabushiki Kaisha. Engine breather device for motor vehicle with riding saddle. 4,632,071, Cl. 123-41.860.

Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, to Toshiba Ceramics Co., Ltd.; and Sumitomo Metal Industries, Ltd. Molten metal discharging device. 4,632,283, Cl. 222-600.000.

Arakawa, Osamu: *See—*
Inomata, Koichiro; Sawa, Takao; and Arakawa, Osamu, 4,631,796, Cl. 29-446.000.

Araoka, Mamoru: *See—*
Haneda, Hisao; and Araoka, Mamoru, 4,632,064, Cl. 122-1.00A.

Argon Medical Corp.: *See—*
Mueller, Richard L., Jr., 4,632,670, Cl. 604-174.000.

Arias, Beatriz; Kum, Humberto; and Galiasso, Roberto, to Intevep, S.A. Method of preparing a hydrocracking catalyst. 4,632,914, Cl. 502-211.000.

Arikawa, Tomio, to Matsushita Electric Industrial Co., Ltd. Thermostatically controlled electric seat heaters for vehicles. 4,633,061, Cl. 219-202.000.

Armour Pharmaceutical Corp.: *See—*
Seyler, Jay K.; and Orlowski, Ronald C., 4,632,978, Cl. 530-307.000.

Armstrong, Richard J.: *See—*
Dickson, Edward J.; and Armstrong, Richard J., 4,632,335, Cl. 242-200.000.

Armstrong World Industries, Inc.: *See—*
Eshbach, John R.; and Lenox, Ronald S., 4,632,958, Cl. 524-574.000.

Arrighi, Leonardo: *See—*
Vinciguerra, Costantino; and Arrighi, Leonardo, 4,632,634, Cl. 415-139.000.

Asahi Glass Company Ltd.: *See—*
Tsuchimoto, Yoshihiro, 4,632,590, Cl. 403-30.000.
Watanabe, Hiroyuki; Washita, Hiroshi; and Ichiki, Toshio, 4,632,877, Cl. 428-409.000.

Asahi Kogaku Kogyo K.K.: *See—*
Niiho, Masaaki; Hara, Masato; and Takasugi, Eiji, 4,633,419, Cl. 364-559.000.

Asakura, Hisao: *See—*
Nishimura, Yoshikazu; Yasukouchi, Yoshimi; and Asakura, Hisao, 4,633,187, Cl. 329-50.000.

Asam, Edward F.: *See—*
Vink, Anthony B.; Asam, Edward F.; and Ferris, Dewayne J., 4,633,415, Cl. 364-521.000.

Asano, Fumio: *See—*
Segawa, Hideo; Inokuchi, Toshiyuki; Shibaguchi, Takashi; and Asano, Fumio, 4,633,271, Cl. 346-107.00R.

Asano, Makoto: *See—*
Tsujimoto, Michihiro; Akahori, Hiroyuki; Hasegawa, Kiyoharu; and Asano, Makoto, 4,632,987, Cl. 544-86.000.

Asanuma, Tadashi; Ohoka, Tatuo; and Uchikawa, Nobutaka, to Mitsui Toatsu Chemicals, Inc. Process for the continuous discharge of a slurry. 4,632,976, Cl. 528-497.000.

Asciutto, Joseph S. Flexible safety mast mounting. 4,632,354, Cl. 248-539.000.

Asher, Sanford A., to University of Pittsburgh. Crystalline colloidal narrow band radiation filter. 4,632,517, Cl. 350-362.000.

Aske, Norman L. Effluent sampler. 4,631,968, Cl. 73-864.320.

Asmus, Thomas W., to Chrysler Motors Corporation. Engine valve timing. 4,633,403, Cl. 364-431.050.

AT&T Bell Laboratories: *See—*
Abel, Mark J.; Kwan, Chi L.; Polli, Philip V.; and Veach, Michael T., 4,633,467, Cl. 371-16.000.
Anderson, Cleo D., 4,633,464, Cl. 370-111.000.
Ebert, Harry K., Jr.; Menkes, Henry E.; Papathomas, Thomas V.; and Venkatram, Chitra R., 4,633,412, Cl. 364-493.000.
Fitch, Theodore A.; and Steinberger, Michael L., 4,633,465, Cl. 371-6.000.
Gordon, Pat L.; Haskell, Barin G.; and Schmidt, Robert L., 4,633,311, Cl. 358-133.000.
Hasegawa, Akira, 4,633,524, Cl. 455-612.000.
Olsson, Nils A.; and Shi, Yan-Chi, 4,632,552, Cl. 356-345.000.
Roy, Pradip K., 4,631,804, Cl. 29-576.00W.
Schell, Howard C., 4,632,476, Cl. 339-14.00R.
Scordo, Dominick, 4,633,193, Cl. 331-1.00A.

AT&T Information Systems Inc.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.
Boivie, Richard H.; Feiner, Alexander; Rabinowitz, Michele S.; Szeto, Rickens T.; and Weinbaum, Barry J., 4,633,041, Cl. 379-354.000.

Athletic Safety Products, Inc.: *See—*
Newman, Malcolm; and Abraham, Carl J., 4,631,758, Cl. 2-424.000.

Atkinson, Neil J., to Procter & Gamble Company, The. Clay fabric softener agglomerates. 4,632,768, Cl. 252-8.800.

Atlantic Richfield Company: *See—*
Kopacz, Elva P., 4,632,906, Cl. 435-282.000.
Poling, William M., 4,632,462, Cl. 299-12.000.
Schuh, Frank J.; and Karish, John, 4,632,188, Cl. 166-368.000.

Atlas Copco Aktiebolag: *See—*
Daeyaert, Guido J. E., 4,632,402, Cl. 277-15.000.

Atlas Isolaties, personenvennootschap met beperkte aansprakelijkheid: *See—*
De Vrij, Simone M., 4,632,853, Cl. 428-34.000.

Atlung, Sven H. K.: *See—*
Fog, Agner; and Atlung, Sven H. K., 4,632,732, Cl. 204-1.00T.

Atmospheric Weather Analysis Systems: *See—*
Ruhenstroth-Bauer, Gerhard, 4,631,957, Cl. 73-170.00R.

Atochem: *See—*
Boutevin, Bernard; and Pietrasanta, Yves, 4,633,004, Cl. 556-419.000.

Atom S.p.A.: *See—*
Cantella, Emiliano, 4,632,000, Cl. 83-534.000.

Atrium Medical Corporation: *See—*
Karwoski, Theodore; and Matsuzawa, Yasuo, 4,632,842, Cl. 427-2.000.

Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Sintered ceramic electric heater with improved thermal shock resistance. 4,633,064, Cl. 219-270.000.

Atumi, Kinya: *See—*
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, 4,633,064, Cl. 219-270.000.

Atwater, Harry A.: *See—*
Smith, Henry I.; Atwater, Harry A.; Thompson, Carl V.; and Geis, Michael W., 4,632,723, Cl. 156-617.00R.

Audio Sentry Manufacturing, Inc.: *See—*
Gagnon, David G., 4,633,234, Cl. 340-566.000.

Auhl, J Richard: *See—*
Patrick, Edward P.; and Auhl, J. Richard, 4,633,054, Cl. 219-118.000.

Auschrat, Siegfried: *See—*
Segebrecht, Udo; and Auschrat, Siegfried, 4,632,649, Cl. 417-151.000.

Autio, William A.: *See—*
Mallonen, Edward A.; and Autio, William A., 4,633,210, Cl. 337-101.000.

Autoipari Kutato es Fejleszto Vallalat: *See—*
Csordas, Laszlo; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.

Automation Equipment Company: *See—*
Simone, Raymond J., 4,632,632, Cl. 414-744.00A.

Automobiles Citroen: *See—*
Le Salver, Robert; and Poupard, Dominique, 4,632,211, Cl. 180-312.000.

Automobiles Peugeot: *See—*
Le Salver, Robert; and Poupard, Dominique, 4,632,211, Cl. 180-312.000.

Automotive Products plc: *See—*
Maycock, Ian C.; and Hodgson, Derek, 4,632,237, Cl. 192-98.000.

AVAA International Corp.: *See—*
Akkerman, Neil H., 4,632,406, Cl. 277-188.00A.

Avco Corporation: *See—*
Wilson, Craig A.; Curry, Stephen J.; Struzek, Kenneth; and Falcigno, Ralph, 4,633,057, Cl. 219-121.0LC.

Avco Everett Research Laboratory, Inc.: *See—*
Hyman, Howard A.; and Trainor, Daniel W., 4,633,103, Cl. 307-426.000.

Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., to United States of America, Health and Human Services; and University of Colorado Foundation, Inc. Oxomorpholinyl dimer and rescue of anthracycline and mitomycin C damage. 4,632,922, Cl. 514-236.000.

Averill, Stuart A.; Hokanson, Lyle W.; and Kroeker, David G., to Averill, Stuart A. Self-propelled saverdrill. 4,632,194, Cl. 175-217.000.

Avery, Leslie R., to RCA Corporation. Circuit and structure for protecting integrated circuits from destructive transient voltages. 4,633,283, Cl. 357-23.130.

Avey, Kenneth F. C., to W&C Pantin Ltd. Apparatus for loading cylindrical articles onto pallets. 4,632,633, Cl. 414-787.000.

AVL AG: *See—*
Marsoner, Hermann, 4,632,807, Cl. 422-68.000.

AVX Corporation: *See—*
Ritchie, Kim; Hopkins, Lonnie; and Galvagni, John, 4,633,175, Cl. 324-158.00F.

B. F. Goodrich Company, The: *See—*
Bishop, Marshall E.; and Thewlis, Duane E., 4,632,328, Cl. 242-72.00B.
Parish, James M., 4,631,873, Cl. 52-2.000.

Baba, Masayoshi: *See—*
Yamamoto, Hitoshi; Baba, Masayoshi; and Iwao, Eiichi, 4,632,210, Cl. 180-309.000.

Babcock, William E., to RCA Corporation. Drive circuit for multiple scan rate horizontal deflection circuit. 4,633,146, Cl. 315-395.000.

Babler, Fridolin, to Ciba-Geigy Corporation. Process for the preparation of high yield pigments. 4,632,704, Cl. 106-288.00Q.

Bach, Carl E.: *See—*
Hellman, Martin E.; and Bach, Carl E., 4,633,036, Cl. 178-22.110.

Bacher, William J.; and Corpstein, Jeffrey J., to Bandag Licensing Corporation. Tread depth probe and computer. 4,631,831, Cl. 33-169.00B.

Bachman, Wesley J.; and Stone, Steven G., to Dickey-john Corporation. Radar velocity sensor. 4,633,252, Cl. 342-99.000.

Bachur, Nicholas R.: *See—*
Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., 4,632,922, Cl. 514-236.000.

Backes, Reiner; and Schmidtpott, Friedrich, to ITT Industries, Inc. MOS bootstrap push-pull stage. 4,633,106, Cl. 307-578.000.

Bacon, William G.: *See—*
Beattie, Morris J. V.; Bacon, William G.; and Raudsepp, Rein, 4,632,738, Cl. 204-107.000.

Badger, Ronald L., to United Steel & Wire Company. Shopping cart with plastic basket. 4,632,411, Cl. 280-33.99R.

Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. Process for the preparation of 1α,23,25-trihydroxycholecalciferol-26-oic acid 23,26-lactone. 4,632,784, Cl. 260-397.200.

Bailey, Kevin J.: *See—*
Donaldson, Michael J.; Charlebois, Leonard J.; and Bailey, Kevin J., 4,632,279, Cl. 222-146.500.

Bailey, Michael: *See—*
Caveney, Robert; Gilliam, Dana; Chan, Melvin; and Bailey, Michael, 4,633,413, Cl. 364-500.000.

Bailey, Roger G., to Storage Technology Corporation. Coherent error suppression in digital tachometers and the like. 4,633,423, Cl. 364-571.000.

Bailey, Timothy F.; and Landry, David M., to Combustion Engineering, Inc. One-piece pin insertion tool. 4,631,817, Cl. 29-747.000.

Bainbridge, James R.: *See—*
Bainbridge, John F.; and Bainbridge, James R., 4,632,410, Cl. 280-32.500.

Bainbridge, John F.; and Bainbridge, James R., to Bainbridge, John F. Combination tool caddy and stool. 4,632,410, Cl. 280-32.500.

Baird Corporation: *See—*
Govaert, Johan A.; and Town, Joseph E., 4,632,123, Cl. 128-659.000.

Baird Manufacturing Company: *See—*
Looney, Raymond H., 4,632,146, Cl. 137-539.500.

Baitinger, William E.; and Saunders, G. Thomas, to St. Charles Manufacturing Co. Fume hood fabricated from modules and having laterally extending exhaust ports. 4,632,022, Cl. 98-115.300.

Baker, Kenneth S.: *See—*
Parke, Daniel W.; and Baker, Kenneth S., 4,632,841, Cl. 426-604.000.

Bakowicz, George B.: *See—*
Collier, John C.; and Bakowicz, George B., 4,631,823, Cl. 29-867.000.

Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,633,298, Cl. 358-25.000.

Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Hollmann, Friedrich, to SMS Schloemann-Siemag AG. Roll stand with braced and offset working rolls. 4,631,948, Cl. 72-242.000.

Baldock, Terence W.: *See—*
Patel, Ranjana C.; Stibbard, John H. A.; Fisher, Michael G.; and Baldock, Terence W., 4,632,895, Cl. 430-201.000.

Baldwin, Francis P.: *See—*
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.

Ballard, William E.: *See—*
Anders, Harry N.; and Ballard, William E., 4,633,215, Cl. 340-84.000.

Bandag Licensing Corporation: *See—*
Bacher, William J.; and Corpstein, Jeffrey J., 4,631,831, Cl. 33-169.00B.

Banks, Christopher P.; and Irving, Edward, to Ciba-Geigy Corporation. Process for the production of images. 4,632,891, Cl. 430-18.000.

Banno, Yoshihiro: *See—*
Ito, Ryouichi; Banno, Yoshihiro; and Kakizaki, Tetsuji, 4,632,942, Cl. 521-92.000.

Bannos, Thomas S.: *See—*
Shay, Robert H.; Berger, Kerry R.; and Bannos, Thomas S., 4,632,707, Cl. 148-16.500.

Banos, Jean, to Aerospatiale Societe Nationale Industrielle. Machine for continuously fabricating by tridimensional knitting section elements of composite material. 4,631,931, Cl. 66-83.000.

Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., to AT&T Information Systems Inc.; and Bell Telephone Laboratories, Incorporated. Switching control for multiple stage time division switch. 4,633,461, Cl. 370-58.000.

Bar, Albrecht, to Siemens Aktiengesellschaft. Arrangement for coupling digital processing units. 4,633,431, Cl. 364-900.000.

Bardoll, Meinrad; and Leibold, Kurt-Andre , to Dr. Ing.h.c.f. Porshe Aktiengesellschaft. Control system for a double clutch of a power-shiftable motor vehicle transmission. 4,632,234, Cl. 192-3.580.

Bardos, Andrew M.; Holmes, Jon E.; and Duchesne, Mark F., to Harris Graphics Corporation. Method and apparatus for hydrodynamic magnetic recording. 4,633,351, Cl. 360-102.000.

Barker, Ray E.: *See—*
Dougherty, Steven J.; and Barker, Ray E., 4,632,814, Cl. 423-321.00R.

Barley, Keith A. Collapsable table and support table. 4,632,345, Cl. 248-174.000.

Barlow, Carl S., to Barlow, Inc. Hand and wrist wrap including a thumb loop. 4,632,105, Cl. 128-165.000.

Barlow, Inc.: *See—*
Barlow, Carl S., 4,632,105, Cl. 128-165.000.

Barnard, Michael E.: *See—*
Bloch, Paul D.; Barnard, Michael E.; and Paige, Edward G. S., 4,633,117, Cl. 310-313.00B.

Barnard, Timothy J.: *See—*
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,033, Cl. 136-256.000.
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,034, Cl. 136-256.000.

Barnes, Carson B., to Farm Pak Products Inc. Process for producing frozen sweet potato products. 4,632,834, Cl. 426-262.000.

Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., to General Foods Corporation. 3-hydroxy-4-alkyloxyphenyl aliphatic carboxylates. 4,633,006, Cl. 560-1.000.

Barnett, Stanley M.; Lausier, Joan M.; and Montalto, Samuel J., to Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, The. Method of forming a polyaphron. 4,632,875, Cl. 428-402.220.

Baron, Louis S.: *See—*
Formal, Samuel B.; Baron, Louis S.; and Kopecko, Dennis J., 4,632,830, Cl. 424-92.000.

Barr & Stroud Limited: *See—*
Neil, Iain A., 4,632,498, Cl. 350-1.200.

Barratt, Mary A. Passenger restraint system. 4,632,425, Cl. 280-801.000.

Barraud, Andre ; Ruaudel, Annie; and Vandevyver, Michel, to Commissariat a l'Energie Atomique. Process for producing a thin film having at least one monomolecular layer of non-amphiphilic molecules. 4,632,800, Cl. 264-298.000.

Barrera, Giorgio, to Officine Meccaniche Pavesi & C.S.p.A. Device for inserting pre-wound coils in the slots of stators of dynamo-electric machines. 4,631,814, Cl. 29-736.000.

Barrera, Ricardo: *See—*
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., 4,632,836, Cl. 426-302.000.

Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., to Charles Stark Draper Laboratory, Inc., The. Assembly system for seamed articles. 4,632,046, Cl. 112-121.140.

Barros, Manuel, to Brose Fahrzeugteile GmbH & Co. KG. Bowden cable-window lifter, especially for motor vehicles. 4,631,864, Cl. 49-352.000.

Barsa, Edward A., to Dow Chemical Company, The. Thermally activable trimerization catalyst. 4,632,785, Cl. 260-501.150.

Bartlett, Bruce, to Crown International, Inc. Differential microphone. 4,633,045, Cl. 381-155.000.

Bartlett, John R., to Owens-Illinois, Inc. Container partition. 4,632,300, Cl. 229-15.000.

Barton, Jeffrey N.: *See—*
Suh, John T.; Chung, Rack H., deceased; Wang, Nai-Yi; and Barton, Jeffrey N., 4,632,929, Cl. 514-317.000.

Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klinsmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel, to BASF Aktiengesellschaft. Photopolymerizable recording material suitable for the production of photoresist layers. 4,632,897, Cl. 430-260.000.

BASF Aktiengesellschaft: *See—*
Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klinsmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel, 4,632,897, Cl. 430-260.000.
Hagen, Helmut; Markert, Juergen; and Wuerzer, Bruno, 4,632,696, Cl. 71-94.000.
Lamm, Gunther, 4,632,983, Cl. 534-772.000.
Muench, Volker; Hambrecht, Juergen; Echte, Adolf; Illers, Karl H.; and Swoboda, Johann, 4,632,946, Cl. 523-179.000.
Pich, Claus H.; and Moest, Thomas, 4,632,843, Cl. 427-3.000.
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.

BASF Farben & Fasern A.G.: *See—*
Vock, Georg F.; and Kuter, Lutz, 4,632,567, Cl. 366-276.000.

Basile, Philip C.; and Kennedy, Eugene J., to RCA Corporation. Local area network system with constant tap level. 4,633,202, Cl. 333-109.000.

Bataille, Christian: *See—*
Belbel, Elie; Bataille, Christian; and Lauraire, Michel, 4,633,209, Cl. 335-261.000.

Batistic, Ivica: *See—*
Kircher, Dieter; and Batistic, Ivica, 4,632,467, Cl. 303-111.000.

Baucom, Keith B., to SCM Corporation. Perfluoro-keto-ylids as precursors of polychloroketones, 1,2-diketones and quinoxalines. 4,633,020, Cl. 568-13.000.

Bauer, Kurt H. Process for the production of readily soluble 5-aminosalicylic acid preparations. 4,632,921, Cl. 514-163.000.

Baugh, Benton F., to Mobil Oil Corporation. Marine riser base system. 4,632,603, Cl. 405-210.000.

Baum, Allen J., to Westinghouse Electric Corp. Process for the accelerated cleaning of the restricted areas of the secondary side of a steam generator. 4,632,705, Cl. 134-3.000.

Baumel, Robert T.: *See—*
Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., 4,633,399, Cl. 364-421.000.

Baumert, Charles: *See—*
Cosyns, Max; and Gomez, Ruben, 4,632,678, Cl. 55-180.000.

Baumgartner, Richard A.: *See—*
Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., 4,633,308, Cl. 358-112.000.

Baxter Travenol Laboratories, Inc.: *See—*
Fowles, Thomas A.; and Green, Brian C., 4,632,267, Cl. 215-253.000.

Bayer Aktiengesellschaft: *See—*
Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,632,918, Cl. 514-202.000.
Buysch, Hans-Josef; Witt, Josef; and Szentivanyi, Zsolt, 4,633,016, Cl. 564-154.000.
Fuhr, Karl; Muller, Friedemann; and Eicher, Theobald, 4,632,951, Cl. 524-204.000.
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, 4,632,932, Cl. 514-383.000.
Kress, Hans-Jurgen; Eichenauer, Herbert; Ott, Karl-Heinz; Schoeps, Jochen; and Pischtschan, Alfred, 4,632,956, Cl. 524-359.000.
Preiss, Michael, 4,633,007, Cl. 560-014.000.
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,632,999, Cl. 549-519.000.

BBC Brown, Boveri & Company, Limited: *See—*
Kreitmeier, Franz, 4,631,913, Cl. 60-727.000.
Kyrian, Bohumil, 4,633,512, Cl. 455-108.000.
Pinnekamp, Friedrich, 4,633,049, Cl. 200-148.00A.

Beattie, Morris J. V.; Bacon, William G.; and Raudsepp, Rein, to Great Central Mines Ltd. Hydrometallurgical copper process. 4,632,738, Cl. 204-107.000.

Beaumont, Paul, to Lucas Industries Limited. Air compressor with pre-loaded spring clutch. 4,632,639, Cl. 417-223.000.

Beavers, Jerry E.; and Layland, Jim C. Microwave oven with disposable liner bag. 4,633,052, Cl. 219-10.55E.

Beazley-Long, Paul W.: *See—*
Mansbridge, Martin H.; Norton, John; Beazley-Long, Paul W.; and Irwin, David J., 4,632,296, Cl. 228-157.000.

Bebber, Hans J.; Neuschutz, Dieter; and Rosser, Heinrich-Otto, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for holding or increasing the temperature in a metal melt. 4,632,700, Cl. 75-10.140.

Becchi, Raffaele; and Giacone, Felice, to Ing. C. Olivetti & C., S.p.A. Serial printer. 4,632,584, Cl. 400-356.000.

Bechtel International Corporation: *See—*
McKelvy, Andy M., 4,632,604, Cl. 405-217.000.

Beck, H. Nelson, to Dow Chemical Company, The. Method of improving flame resistance of epoxy resins and resulting compositions. 4,632,973, Cl. 528-98.000.

Beck, John L.; Good, Daniel L.; and Stacer, Daniel R., to International Business Machines Corporation. Disk drive air filter assembly. 4,633,349, Cl. 360-97.000.

Beck, Rene-Andre , to BSA Rene Beck S.A. Composite bearing column. 4,631,892, Cl. 52-725.000.

Beck, Warren R.: *See—*
Laird, James A.; and Beck, Warren R., 4,632,876, Cl. 428-404.000.

Beckerbauer, Anton: *See—*
Flatscher, Georg; and Beckerbauer, Anton, 4,632,059, Cl. 118-727.000.

Beckey, Thomas J., to Honeywell Inc. Clock operated thermostat having automatic changeover and optimum start. 4,632,177, Cl. 165-12.000.

Beckman Industrial Corporation: *See—*
Kaiser, Donald F., 4,633,164, Cl. 323-312.000.

Beckwith, Elaine C.: *See—*
Ezis, Andre; Beckwith, Elaine C.; and Copple, Warren B., 4,632,793, Cl. 264-58.000.

Becton, Dickinson and Company: *See—*
Waters, John R.; and Broman, Rodney, 4,632,902, Cl. 435-29.000.

Bedell, Stephen A.; Howell, William R., Jr.; and Coleman, William M., III, to Dow Chemical Company, The. Polymer supported Ziegler-Natta catalysts. 4,632,912, Cl. 502-122.000.

Beech, Charles R., to Allegheny International Exercise Co. Foldable exercise cycle. 4,632,386, Cl. 272-73.000.

Beecher, John, III: *See—*
Tucker, James E.; Lohmeyer, Charles W.; Beecher, John, III; and Stephen, James C., 4,632,061, Cl. 119-51.00R.

Beedle, Edward E.; and Robertson, David W., to Eli Lilly and Company. Anticonvulsant agents. 4,632,939, Cl. 514-619.000.

Beiersdorf A.G.: *See—*
Sanders, Bernard, 4,633,508, Cl. 383-95.000.

Beilstein, Kurt H., to Hofmann GmbH. Condiment dispenser. 4,632,322, Cl. 241-169.100.

Bein, Jeffrey D.: *See—*
Appleman, Robert H.; Bein, Jeffrey D.; and Powaski, Frank S., 4,632,068, Cl. 122-34.000.

Belbel, Elie; Bataille, Christian; and Lauraire, Michel, to La Telemecanique Electrique. DC electromagnet, in particular for an electric switching apparatus. 4,633,209, Cl. 335-261.000.

Bell Telephone Laboratories, Incorporated: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

Bender, Rudolf: *See—*
Vertesy, Laszlo ; Bender, Rudolf; Fehlhaber, Hans-Wolfram; and Geisen, Karl, 4,632,917, Cl. 514-54.000.

Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., to Eaton Corporation. Dual stack power JFET with buried field shaping depletion regions. 4,633,281, Cl. 357-22.000.

Benjamin, James A.: *See—*
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,633,278, Cl. 357-6.000.

Benkwitz, Helmut, to Hermann Berstorff Maschinenbau GmbH. Embossing calender for thermoplastics films. 4,632,655, Cl. 425-186.000.

Bennett, Ian: *See—*
Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., 4,633,308, Cl. 358-112.000.

Beno, Mark A.: *See—*
Williams, Jack M.; Wang, Hsien-Hau; and Beno, Mark A., 4,632,776, Cl. 252-518.000.

Benson, Ryan H.: *See—*
Brolin, Charles A.; Sheets, James B.; and Benson, Ryan H., 4,631,955, Cl. 73-158.000.

Benzing, William M., to Conoco Inc. Apparatus for generating seismic vibration energy in a borehole. 4,632,212, Cl. 181-106.000.

Berenfield, Leonard H.; Wise, Haron W.; and Bordner, Paul G., to Berenfield/Midwest Corporation. Lid structure having fastening means. 4,632,272, Cl. 220-324.000.

Berenfield/Midwest Corporation: *See—*
Berenfield, Leonard H.; Wise, Haron W.; and Bordner, Paul G., 4,632,272, Cl. 220-324.000.

Berera & C. s.n.c.: *See—*
Castiello, Gualtiero, 4,631,779, Cl. 17-1.00B.

Berg, Peter G.; Shukla, Vishwa; Kulwicki, Bernard M.; and Conlan, Thomas C., to Texas Instruments Incorporated. Heat-exchanger. 4,633,069, Cl. 219-553.000.

Berger, Kerry R.: *See—*
Shay, Robert H.; Berger, Kerry R.; and Bannos, Thomas S., 4,632,707, Cl. 148-16.500.

Bergman, Imanuel, to National Research Development Corp. Electrochemical cell with thin wire electrode. 4,632,746, Cl. 204-415.000.

Bergomi, Angelo; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Process for preparing N-polythiodimorpholines. 4,632,988, Cl. 544-85.000.

Berkley and Company, Inc.: *See—*
Ader, Gary B., 4,631,855, Cl. 43-53.500.

Berko Technology Corporation: *See—*
Taney, William H., 4,633,513, Cl. 455-131.000.

Berlekamp, Elwyn R.; and Tong, Po, to Cyclotomics, Inc. Method and apparatus for synchronization by coherent reinforcement. 4,633,486, Cl. 375-116.000.

Berlekamp, Elwyn R.: *See—*
Welch, Lloyd R.; and Berlekamp, Elwyn R., 4,633,470, Cl. 371-37.000.

Bern, Zelany R. Manipulative challenge. 4,632,399, Cl. 273-155.000.

Bernard, Andre , to Meric Industries, Inc. Repair method for drywalls and like construction materials. 4,632,790, Cl. 264-36.000.

Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, to Farmitalia Carlo Erba S.p.A. Ergoline carboxamides. 4,632,990, Cl. 544-329.000.

Bernardini, Ronald J., to Litman, Michael. Portable heat treatment system and refill unit therefor. 4,632,115, Cl. 128-370.000.

Berteaux, Henri O.: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.

Berter, Sven G.: *See—*
Blomberg, Sven G.; Berter, Sven G.; and Pettersson, Lars T., 4,632,608, Cl. 407-114.000.

Bertus, Brent J.; and Fu, Chia-Min, to Phillips Petroleum Co. Cracking process. 4,632,748, Cl. 208-120.000.

Berzetei, Ilona: *See—*
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Csch, Gyorgy, 4,632,928, Cl. 514-288.000.

Bessho, Yasunori; Uchikawa, Sadao; and Aoyama, Motoo, to Hitachi, Ltd. Operating method of boiling water reactor. 4,632,803, Cl. 376-238.000.

Besson, Rene ; and Guerin, Yves, to ETA S.A., Fabriques d'Ebauches. Stepping motor assembly. 4,633,156, Cl. 318-696.000.

Bethea Electrical Products, Inc.: *See—*
Smith, Karl E., 4,632,364, Cl. 254-405.000.

Bethke, Timothy A.: *See—*
Wagner, Wayne M.; Bethke, Timothy A.; and Schmeichel, Steven D., 4,632,216, Cl. 181-255.000.

Betts, William L.; and Zuranski, Edward, to Paradyne Corporation. Adaptive noise suppression for digital modems. 4,633,485, Cl. 375-99.000.

Beurskens, Johannes H. H.; and Prozee, Christiaan, to U.S. Philips Corp. Electric lamp having a strongly colored lamp envelope. 4,633,127, Cl. 313-112.000.

Bevelander, Alice K. Accessory for garment hanger. 4,632,287, Cl. 223-98.000.

BFGoodrich Company, The: *See—*
Reynes, Enrique G.; and Leising, John O., 4,632,986, Cl. 544-85.000.

Bhatia, Rajiv: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

BICC Public Limited Company: *See—*
Taylor, John E., 4,632,506, Cl. 350-96.230.

Bichl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, to Bruker Analytische Messtechnik GmbH. Cavity resonator. 4,633,180, Cl. 324-316.000.

Big Four Equipment, Inc.: *See—*
Collins, Curran N., 4,632,167, Cl. 157-1.280.

Bilewski, Friedhelm: *See—*
Coplan, Myron J.; Bilewski, Friedhelm; Sebring, Robert; and Schiffer, Daniel K., 4,632,756, Cl. 210-323.200.

Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, to Ford Motor Company. Valve system for a hydraulically controlled starting friction clutch. 4,632,230, Cl. 192-0.033.

Bird, Thomas G.: *See—*
Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., 4,632,829, Cl. 424-84.000.

Bishop, Marshall E.; and Thewlis, Duane E., to B. F. Goodrich Company, The. Inflatable mandrel and method therefor. 4,632,328, Cl. 242-72.00B.

Bishop, Wayne S., to United States of America, Air Force. Battery control and fault detection method. 4,633,418, Cl. 364-554.000.

Bither, Tom A., Jr., to Du Pont de Nemours, E. I., and Company. Fumed silica modified catalyst. 4,632,916, Cl. 502-209.000.

Bitzer, Donald L.: *See—*
Stifle, John E.; Lee, Donald A.; and Bitzer, Donald L., 4,633,462, Cl. 370-85.000.

Black & Decker, Inc.: *See—*
Moores, Gregory E., 4,631,827, Cl. 30-272.00A.
Schlund, Gerald; Hagedorn, Leonhard; Hahn, A. David; and Fishpaugh, Charles E., 4,632,319, Cl. 241-37.500.

Black, William C., Jr. Multiple channel analog-to-digital converters. 4,633,226, Cl. 340-347.0AD.

Blackburn, Tom L., to GTE Communication Systems Corporation. Repeater for carrier subscriber communication system. 4,633,459, Cl. 370-13.000.

Blackmer, Richard H. High humidity oxygen enricher apparatus. 4,632,677, Cl. 55-158.000.

Blair Industries, Inc.: *See—*
Graetz, Herbert; and Unterreiner, Ronald C., 4,632,717, Cl. 156-245.000.

Blakely, John P.: *See—*
McPherson, Hugh; and Blakely, John P., 4,633,185, Cl. 328-56.000.

Blanco, Alfred W.; McDowell, Judson A.; and Yeary, David A., to International Business Machines Corporation. Detection of instantaneous speed variations in a tape drive. 4,633,333, Cl. 360-31.000.

Blaupunkt-Werke GmbH: *See—*
Hegeler, Wilhelm, 4,633,247, Cl. 340-825.690.

Bleeker, Jochen; and Sondermeier, Johann, to Webasto-Werk W. Baier GmbH & Co. Heater, in particular an auxiliary heater for vehicles. 4,632,306, Cl. 237-12.30C.

Bleimann, Karl R., to Fuchs Systems, Inc. Liquid cooled cover for electric arc furnace. 4,633,480, Cl. 373-74.000.

Bliss, Dan E.: *See—*
McManis, George E.; Fletcher, Aaron N.; and Bliss, Dan E., 4,632,889, Cl. 429-218.000.

Bliss, David H., to Rockwell International Corporation. Link quality analyzer. 4,633,411, Cl. 364-481.000.

Bloch, Paul D.; Barnard, Michael E.; and Paige, Edward G. S., to National Research Development Corp. Slanted and chirped surface acoustic wave devices. 4,633,117, Cl. 310-313.00B.

Bloch, Ricardo: *See—*
Gutierrez, Antonio; Brownawell, Darrell W.; Bloch, Ricardo; and Johnston, Jack E., 4,632,769, Cl. 252-48.600.

Blom, C. James, to Roxor Corporation. Elimination of internal reflections and diffractions from junctures in, and at the periphery of a segmented mirror. 4,632,524, Cl. 350-613.000.

Blomberg, Sven G.; Berter, Sven G.; and Pettersson, Lars T., to Santrade Limited. Cutting insert. 4,632,608, Cl. 407-114.000.

Bloom, Leonard: *See—*
Aguilar, Arturo, 4,632,126, Cl. 128-732.000.

Blosser, Gabe F.: *See—*
Blosser, Henry G.; Blosser, Gabe F.; Jemison, Emanuel B.; and Purcell, John R., 4,633,125, Cl. 313-62.000.

Blosser, Henry G.; Blosser, Gabe F.; Jemison, Emanuel B.; and Purcell, John R., to Board of Trustees Operating Michigan State University. Vented 360 degree rotatable vessel for containing liquids. 4,633,125, Cl. 313-62.000.

Blot, Michel. Lateral packaging for the grouping and holding together of superposed articles. 4,632,249, Cl. 206-431.000.

Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., to International Business Machines Corporation. Local area network interconnect switching system. 4,633,245, Cl. 340-825.030.

Blythin, David J., to Schering Corporation. Substituted hetero spiro pyridine derivatives as anti-allergy and anti-inflammatory agents. 4,632,923, Cl. 514-247.000.

BMC Industries, Inc.: *See—*
Thoms, Roland, 4,632,726, Cl. 156-644.000.

Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, The: *See—*
Barnett, Stanley M.; Lausier, Joan M.; and Montalto, Samuel J., 4,632,875, Cl. 428-402.220.

Board of Regents, The University of Texas System: *See—*
Semmler, Caryl J.; Cook, Carol A.; and Smith, Jackie D., 4,631,766, Cl. 5-431.000.

Board of Trustees Operating Michigan State University: *See—*
Blosser, Henry G.; Blosser, Gabe F.; Jemison, Emanuel B.; and Purcell, John R., 4,633,125, Cl. 313-62.000.

Boase, Clive J.; and Dawson, Howard B., to FBC Limited. Insecticidal compositions. 4,632,936, Cl. 514-465.000.

Boberg, Michael: *See—*
Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,632,918, Cl. 514-202.000.

Bocchicchio, Keith A.; and Hall, David L., to AMP Incorporated. Pick-up head. 4,631,815, Cl. 29-739.000.

Bock, Susan C.; and Lawn, Richard M., to Genentech, Inc. Human antithrombin III. 4,632,981, Cl. 530-393.000.

Bocker, Richard P., to United States of America, Navy. Advanced cube processor. 4,633,427, Cl. 364-822.000.

Bodenseewerk Geratetchnik GmbH: *See—*
Kordulla, Hans; and Eckhardt, Reiner, 4,632,502, Cl. 350-6.600.

Bodenseewerk Geratetechnic GmbH: *See—*
Uwira, Bernd; Kordulla, Hans; and Egger, Johann-Friedrich, 4,633,317, Cl. 358-213.000.

Bodine, John H., to Amoco Corporation. Response waveform characterization of geophysical data. 4,633,447, Cl. 367-70.000.

Bodle, William W.; Lau, Francis S.; and Mensinger, Michael C., to Institute of Gas Technology. Carbonization and dewatering process. 4,632,731, Cl. 201-4.000.

Boehne, Hermann, to Dornier GmbH. One shot coupling. 4,632,596, Cl. 403-345.000.

Boeing Company, The: *See—*
Korsch, Dietrich G., 4,632,521, Cl. 350-505.000.
Newman, Frank J., 4,633,376, Cl. 362-62.000.

Bohm, Jurgen, to Bopp & Reuther GmbH. Arrangement for testing a flow meter. 4,631,951, Cl. 73-3.000.

Boivie, Richard H.; Feiner, Alexander; Rabinowitz, Michele S.; Szeto, Rickens T.; and Weinbaum, Barry J., to AT&T Information Systems Inc. Station set directory assistance arrangement. 4,633,041, Cl. 379-354.000.

Bokon, William S. Engine. 4,632,017, Cl. 91-481.000.

Boland, Robert P.: *See—*
Apostolos, John T.; Boland, Robert P.; and Stromswold, Chester E., 4,633,257, Cl. 342-445.000.

Bolton, David C.: *See—*
Zee, Yuan C.; and Bolton, David C., 4,632,980, Cl. 530-380.000.

Bolton, Theodore S.; and Whitwell, Robert J., to Carrier Corporation. Auto-set oscillating louver design. 4,632,021, Cl. 98-40.300.

Bomin Solar GmbH & Co. KG: *See—*
Kleinwachter, Jurgen; Kleinwachter, Hans; and Klaas, Otto, 4,631,922, Cl. 60-518.000.

Bonasso, Samuel G. Tension arch structure. 4,631,772, Cl. 14-20.000.

Boncan, Virgilio G.; and Gandy, Richard, to Hughes Tool Company. Well cementing method using an AM/AMPS fluid loss additive blend. 4,632,186, Cl. 166-293.000.

Bonde, Leslie W.: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.

Bonetti, Massimo; Manente, Giuseppe; and Mion, Abramo, to E. A. Mion Ing. & Arch. Kairos S.N.C., Di M. Bonetti, G. Manente. Closure device, particularly for rear opening ski boots. 4,631,839, Cl. 36-50.000.

Booker, Philip H., III: *See—*
Johnson, Robert E.; and Booker, Philip H., III, 4,632,121, Cl. 128-639.000.

Boone, David D. Golf club head. 4,632,400, Cl. 273-164.000.

Boote, Robert A.; and Meddaugh, Timothy G., to Emerson Electric Co. Coil handling apparatus. 4,632,326, Cl. 242-55.300.

Bopp & Reuther GmbH: *See—*
Bohm, Jurgen, 4,631,951, Cl. 73-3.000.

Borbas, Istvan: *See—*
Turcsany, Jozsef; Gal, Pal; and Borbas, Istvan, 4,632,007, Cl. 84-487.000.

Bordner, Dalton W., to Ameron, Inc. Conductive flanged fitting. 4,633,363, Cl. 361-215.000.

Bordner, Paul G.: *See—*
Berenfield, Leonard H.; Wise, Haron W.; and Bordner, Paul G., 4,632,272, Cl. 220-324.000.

Borey, Robert E.: *See—*
Bustance, William G.; and Borey, Robert E., 4,632,132, Cl. 132-7.000.

Borg-Warner Corporation: *See—*
Venema, Harry J., 4,633,168, Cl. 324-60.0CD.
Venema, Harry J., 4,633,213, Cl. 340-60.000.

Borghese, Michael N., to Raytheon Company. Protective circuitry for a read only memory. 4,633,442, Cl. 365-203.000.

Born, Perry A. Hook and lure storage device. 4,631,856, Cl. 43-57.100.

Borner, Jurgen. Receptacle holder or stand for a kitchen utensil. 4,632,258, Cl. 211-70.600.

Borrman, Bo: *See—*
Wallander, Anders; Borrman, Bo; and Mansson, Arne, 4,632,804, Cl. 376-444.000.

Borsy, Jozsef: *See—*
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Cseh, Gyorgy, 4,632,928, Cl. 514-288.000.

Borzym, Alexander. Mandrel apparatus. 4,631,998, Cl. 83-145.000.

Bosch-Siemens Hausgeraete GmbH: *See—*
Eichler, Walter; Farber, Karlheinz; and Fischer, Elisabeth, 4,631,838, Cl. 34-57.00A.

Bouet, Thiebault: *See—*
Exley, Jyll; and Bouet, Thiebault, 4,632,137, Cl. 135-20.00R.

Bouquet, Francois: *See—*
Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain, 4,632,685, Cl. 65-9.000.

Bourns, Inc.: *See—*
King, William H., 4,631,824, Cl. 29-884.000.

Boutevin, Bernard; and Pietrasanta, Yves, to Atochem. Fluorosilanes and process for their preparation. 4,633,004, Cl. 556-419.000.

Bouyoucos, John V., to Hydroacoustics. Seismic source for use underwater. 4,632,214, Cl. 181-120.000.

Bovino, Lawrence J., to United States of America, Army. Multiple gap optically activated switch. 4,633,286, Cl. 357-30.000.

Bowater, Ronald J.: *See—*
Bresenham, Jack E.; Bowater, Ronald J.; Gay, Adrian C.; and Sheen, Norman R., 4,633,243, Cl. 340-732.000.

Bowers, Derek F.: *See—*
Pietkiewicz, Steven M.; and Bowers, Derek F., 4,633,165, Cl. 323-314.000.

Bowers, William F.; and Rigopulos, Peter N., to W. R. Grace & Co. Centrifugal microconcentrator and methods for its use. 4,632,761, Cl. 210-650.000.

Boyce, Columbus O. L.; Lanzilotta, Raymond P.; and Wong, Theodore M., to Novo Laboratories, Inc. Enzyme modified soy protein for use as an egg white substitute. 4,632,903, Cl. 435-69.000.

Boysen, Gerd C., to Allen-Bradley Company, Inc. Terminal assembly for electrical apparatus. 4,632,497, Cl. 339-263.00R.

Brackett, John E.; and Dahlberg, Larry J., to Fishing Designs, Inc. Contoured fishing rod handle. 4,631,853, Cl. 43-23.000.

Bracnik, Anthony S.; and Charlton, Keith D., to TRW Canada Limited. Retractor assembly. 4,632,331, Cl. 242-107.40A.

Bradshaw, Peter D.; and Evans, Lee L., to Intersil, Inc. Dual slope analog-to-digital converter with automatic, short cycle range determination. 4,633,221, Cl. 340-347.0NT.

Brambilla, Dario, to Dario Manuli S.p.A. Process and apparatus for continuous wrapping of palletized load. 4,631,898, Cl. 53-399.000.

Brambilla, Enzo: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.

Brand, Hunt K.: *See—*
McGrady, Michael P.; Brand, Leonard A., Jr.; and Brand, Hunt K., 4,633,331, Cl. 360-7.000.

Brand, Leonard A., Jr.: *See—*
McGrady, Michael P.; Brand, Leonard A., Jr.; and Brand, Hunt K., 4,633,331, Cl. 360-7.000.

Brandt-Armements: *See—*
Crepin, Roger, 4,632,336, Cl. 244-3.220.

Branson Ultrasonics Corporation: *See—*
Caron, Roland G., 4,632,373, Cl. 269-50.000.

Branton, Philip L.: *See—*
Kase, Lawrence E.; and Branton, Philip L., 4,631,857, Cl. 43-132.100.

Brassel, Jakob: *See—*
Schlosser, Manfred; and Brassel, Jakob, 4,632,827, Cl. 424-78.000.

Bratt, Richard G.: *See—*
Katz, Lawrence H.; Wells, Douglas M.; and Bratt, Richard G., 4,633,406, Cl. 364-200.000.

Brauer, Frank M., to Cincinnati Electronics Corporation. Apparatus for and method of compensating for variations due to aging. 4,633,422, Cl. 364-571.000.

Braun, Heini: *See—*
Olpp, Hans; and Braun, Heini, 4,632,408, Cl. 280-12.00K.

Breckenridge, George J., Jr.: *See—*
Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., 4,632,775, Cl. 252-502.000.

Breidenbach, Dieter: *See—*
Mosebach, Wilhelm; and Breidenbach, Dieter, 4,632,676, Cl. 55-50.000.

Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi Ssr. Substituted 3-hydrazinopropionates. 4,633,014, Cl. 562-556.000.

Brennan, George A., to Challenge-Cook Bros., Incorporated. Hydraulic system for vehicle auxiliary axle. 4,631,919, Cl. 60-413.000.

Bresenham, Jack E.; Bowater, Ronald J.; Gay, Adrian C.; and Sheen, Norman R., to International Business Machines Corporation. Method of storing characters in a display system. 4,633,243, Cl. 340-732.000.

Brevetti Odantoiatrici S.n.c. di Miliani Maria Pia & C.: *See—*
Giorni, Gastone, 4,632,093, Cl. 128-12.000.

Brewer, David E.: *See—*
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., 4,632,836, Cl. 426-302.000.

Bridgestone Corporation: *See—*
Okamoto, Satoru; and Ito, Hiroshi, 4,632,464, Cl. 301-11.00R.

Bright, George M. Hand held exercise device. 4,632,384, Cl. 272-68.000.

Brinkmann, Uwe: *See—*
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.

British Aerospace PLC: *See—*
Malvern, Alan R., 4,632,555, Cl. 356-350.000.
Mansbridge, Martin H.; Norton, John; Beazley-Long, Paul W.; and Irwin, David J., 4,632,296, Cl. 228-157.000.

British Telecommunications public limited company: *See—*
Cham, Wai K.; Clarke, Roger J.; and Nicol, Richard C., 4,633,296, Cl. 358-12.000.
Serpell, Stephen C., 4,633,037, Cl. 178-22.140.

Britzke, Sylvia: *See—*
Heist, Hans; Toepfer, Dieter; Britzke, Sylvia; and Schoernig, Eberhard, 4,632,382, Cl. 271-273.000.

Broadbent, Ronald W.; and Stockbower, Ellsworth A., to Amchem Products, Inc. Continuous autodeposition method with bath stabilization. 4,632,851, Cl. 427-435.000.

Broderna Hammarstedt Verkstads AB: *See—*
Mattson, Bertil A., 4,632,353, Cl. 248-396.000.

Brogdon, William, to Teledyne Industries, Inc. Low vibration engine construction. 4,632,072, Cl. 123-56.00R.

Brolin, Charles A.; Sheets, James B.; and Benson, Ryan H., to FMC Corporation. Rope and sheave testing device and method. 4,631,955, Cl. 73-158.000.

Broman, Rodney: *See—*
Waters, John R.; and Broman, Rodney, 4,632,902, Cl. 435-29.000.

Brooks, Richard R. Knee brace. 4,632,097, Cl. 128-80.00C.

Broomer Research Corporation: *See—*
Kaplan, Irwin; and Schneider, William B., 4,632,547, Cl. 356-247.000.

Brose Fahrzeugteile GmbH & Co. KG: *See—*
Barros, Manuel, 4,631,864, Cl. 49-352.000.
Dallwig, Claus; and Volk, Hans-Joachim, 4,632,426, Cl. 280-808.000.

Brosig, Frances H.: *See—*
Carr, Myra J.; Brosig, Frances H.; and Gottlieb, Robert G., 4,631,767, Cl. 5-449.000.

Bross, Elly. to Stanbel Group, The. Underhanging drawer system. 4,632,472, Cl. 312-246.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hayakawa, Yuji, 4,633,340, Cl. 360-69.000.

Brotton, James: *See—*
Wilman, Hugh; and Brotton, James, 4,633,080, Cl. 250-234.000.

Brough, C. Duncan; and Carroll, Thomas W., to F. Schumacher & Co. Portable display bag with support means. 4,632,241, Cl. 206-44.00B.

Broughton, Robert I. Method for pre-germinating seeds. 4,631,860, Cl. 47-58.000.

Brown, Bruce, to Procter & Gamble Company, The. Rotatable and vertically adjustable dispenser suspension means. 4,632,350, Cl. 248-295.100.

Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., to GTE Products Corporation. Method of manufacturing quartz glass crucibles with low bubble content. 4,632,686, Cl. 65-18.100.

Brown, Jerry C.; and Hamilton, Kenneth W., to Fixtures Manufacturing Corporation. Chair back height adjustment mechanism. 4,632,458, Cl. 297-353.000.

Brown, John M.: *See—*
McClellan, David P.; Brown, John M.; and Heberlein, Gustave E., Jr., 4,633,207, Cl. 335-16.000.

Brown, Kenneth C.; and Wheeler, Carl E. Electrical circuit testing apparatus. 4,632,485, Cl. 339-75.00M.

Brown, Steven P. Combination medical data, identification and health insurance card. 4,632,428, Cl. 283-76.000.

Brownawell, Darrell W.: *See—*
Gutierrez, Antonio; Brownawell, Darrell W.; Bloch, Ricardo; and Johnston, Jack E., 4,632,769, Cl. 252-48.600.

Browse, Keith D. W., to Xerox Corporation. Bottom sheet separator-feeder. 4,632,377, Cl. 271-9.000.

Bruce, Norman R. Ball throwing apparatus. 4,632,088, Cl. 124-78.000.

Brue Moya, Manuel; and Escolies Bordoy, Juan. Collapsible ski. 4,632,418, Cl. 280-603.000.

Brugner, Nikolaus: *See—*
Emele, Edgar F.; and Brugner, Nikolaus, 4,632,568, Cl. 366-337.000.

Brugnoli, Siro. Device for the sampling and measuring of the concentrations of expired gases. 4,631,966, Cl. 73-863.030.

Bruker Analytische Messtechnik GmbH: *See—*
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,633,180, Cl. 324-316.000.

Bruker Medizintechnik GmbH: *See—*
Strobel, Bernhard; and Ratzel, Dieter, 4,633,178, Cl. 324-309.000.

Brull, Robert A.; Walker, Alan H.; and McFall, William V., to NCR Corporation. Record media thickness compensating mechanism. 4,632,577, Cl. 400-56.000.

Brunner, David E., to Wheelabrator Corporation of Canada, Ltd. Locking apparatus for filter elements. 4,632,681, Cl. 55-493.000.

Brunsting, Albert, to Miles Laboratories, Inc. Optical readhead. 4,632,559, Cl. 356-416.000.

Brunswick Corporation: *See—*
Wargula, Lucian G., 4,632,487, Cl. 339-103.00B.

Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., to International Business Machines Corporation. Reduction atmosphere workpiece joining. 4,632,295, Cl. 228-123.000.

Brutosky, Scott A., to AMP Incorporated. Package for card edge connectors. 4,632,246, Cl. 206-328.000.

Bryant, John: *See—*
Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, 4,632,010, Cl. 89-1.510.

BSA Rene Beck S.A.: *See—*
Beck, Rene-Andre , 4,631,892, Cl. 52-725.000.

Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, 4,632,932, Cl. 514-383.000.

Buchi, George H.; and Wuest, Hans, to Firmenich SA. Process for the preparation of (±)-3a-6,6,9a-tetramethylperhydronaphto[2,1-b]furan. 4,633,011, Cl. 560-119.000.

Buck, David A. Power tongs. 4,631,987, Cl. 81-57.140.

Bue, Richard L.: *See—*
Ratchford, Michael; Bue, Richard L.; and Charov, Alexander, 4,633,473, Cl. 371-68.000.

Buehler Products, Inc.: *See—*
Welterlin, Raymond E., 4,633,149, Cl. 318-254.000.

Buhl Automatic, V/Holger Buhl: *See—*
Buhl, Holger, 4,633,236, Cl. 340-569.000.

Buhl, Holger, to Buhl Automatic, V/Holger Buhl. Mailbox. 4,633,236, Cl. 340-569.000.

Buhler, Harald; and Statt, Bernhard, to Degussa AG. Coating compositions made of plastisols or organosols and process for improving the adhesion of these compositions to metallic substrates. 4,632,952, Cl. 524-217.000.

Bukousky, John M.: *See—*
Newell, Stephen D.; Rowe, Stephen B.; and Bukousky, John M., 4,632,494, Cl. 239-184.000.

Bulanda, John J.: *See—*
Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Timian, Steven S.; and Waltasti, Stephen A., 4,632,247, Cl. 206-343.000.

Bullock, Roy M. Tire carrier. 4,632,288, Cl. 224-42.120.

Bunch, Matthew L.: *See—*
Price, J. B.; Bunch, Matthew L.; and Stitz, Robert W., 4,632,057, Cl. 118-719.000.

Bunkofske, William J., to Iowa Mold Tooling Company, Inc. Air compressor operated vacuum system for tire servicing vehicles. 4,632,157, Cl. 141-38.000.

Burgess, Patrick A., to American Microsystems, Inc. Decoder using pass-transistor networks. 4,633,220, Cl. 340-347.0DD.

Burghard, Andre: *See—*
Morrison, Charles B.; Figueroa, Luis; and Burghard, Andre, 4,633,477, Cl. 372-46.000.

Burke, Dennis E.; and Lund, John A., to Zenith Electronics Corporation. Stable low cost 4.5 MHz remodulator. 4,633,316, Cl. 358-197.000.

Burks, Marcus L.: *See—*
Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., 4,632,829, Cl. 424-84.000.

Burley, William G. Thermal barrier device for winter recreation surfaces. 4,632,329, Cl. 242-86.520.

Burlington Industries, Inc.: *See—*
Hardy, N. Page, 4,631,912, Cl. 57-279.000.

Burndy Corporation: *See—*
Collier, John C.; and Bakowicz, George B., 4,631,823, Cl. 29-867.000.

Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., to Philip Morris Incorporated. Foamed, extruded, coherent multistrand smoking articles. 4,632,131, Cl. 131-355.000.

Burnett, Robert J. Cutting means for rotary trimmer. 4,631,828, Cl. 30-276.000.

Burns, Robert J., to Dexter-Lawson Products Limited. Paper drill. 4,632,611, Cl. 408-205.000.

Burns, William K., to United States of America, Navy. Bragg cell spectrum analyzer. 4,633,170, Cl. 324-77.00K.

Burroughs Corporation: *See—*
Del Tufo, Mark J.; and Nagle, George J., 4,632,594, Cl. 403-322.000.

Busam, Donald H.: *See—*
Alverth, Ronald W.; and Busam, Donald H., 4,632,575, Cl. 384-258.000.

Busse, Hans-Juergen: *See—*
Mueller, Dieter J.; and Busse, Hans-Juergen, 4,632,706, Cl. 148-6.15R.

Bustance, William G.; and Borey, Robert E., to Totally, Inc. Treated end wrap laminate. 4,632,132, Cl. 132-7.000.

Buszard, John F.: *See—*
Rahn, Armin; Down, William H.; Drouin, Marcel; Rudzicz, Mathew J.; Buszard, John F.; Makhoul, Elie; and Woodgate, Ralph W., 4,632,291, Cl. 228-9.000.

Butergerds, Helmut: *See—*
Debus, Jurgen; Zachrai, Jugen; Butergerds, Helmut; and Wetzel, Manfred, 4,631,937, Cl. 70-207.000.

Butler, Kenneth C., to Nimbus, Inc. High-frequency jet ventilator. 4,632,107, Cl. 128-204.240.

Butterwick, Gilbert N., to RCA Corporation. Intensified charge-coupled image sensor having a header assembly with an eccentrically disposed CCD support assembly therein. 4,633,076, Cl. 250-213.0VT.

Buysch, Hans-Josef; Witt, Josef; and Szentivanyi, Zsolt, to Bayer Aktiengesellschaft. Diphenylamine age resisters for rubber. 4,633,016, Cl. 564-154.000.

Byron, Kevin C., to Standard Telephones and Cables Public Limited Company. Optical matrix-vector multiplication. 4,633,428, Cl. 364-841.000.

C. Itoh & Co. (America) Inc.: *See—*
Choi, Kwang H.; and Hong, Sun H. (said Kwang H. Choi assors. to), 4,632,242, Cl. 206-45.340.

C. R. Bard, Inc.: *See—*
Todd, Donald A.; and Fischell, Robert E., 4,632,114, Cl. 128-346.000.

C. R. Diffen Transport Pty. Ltd.: *See—*
Ferrall, Peter J., 4,631,768, Cl. 5-464.000.

Cable, Michael J., to USM Corporation. Component stack feed device. 4,632,621, Cl. 414-118.000.

Cairns & Brother, Inc.: *See—*
Ehring, Carolyn C., 4,631,753, Cl. 2-85.000.

Calahan, James L.; Cuellar, Edward A.; Desmond, Michael J.; and Currie, John C., to Standard Oil Company, The. Polyoxometalate-modified carbon electrodes and uses therefor in capacitors. 4,633,372, Cl. 361-433.000.

Calgon Corporation: *See—*
Dalhuisen, Albert J., 4,632,954, Cl. 524-240.000.

Callahan, Michael; Chester, John K.; and Goddard, Robert M. Improved inductorless phase control dimmer power stage with semiconductor controlled voltage rise time. 4,633,161, Cl. 323-242.000.

Callison & Associates Limited Partnership: *See—*
Callison, Douglas A., 4,632,361, Cl. 251-230.000.

Callison, Douglas A., to Callison & Associates Limited Partnership. Scheduled fluid control valve. 4,632,361, Cl. 251-230.000.

Cambridge Technologies, Inc.: *See—*
Holdt, Donald H., 4,632,450, Cl. 297-84.000.

Cameron, Douglas A. Storage device. 4,632,259, Cl. 211-119.000.

Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, to RIV-SKF Officine di Villar Perosa S.p.A. Oiltight hydraulic tappet for controlling an internal combustion engine valve. 4,632,075, Cl. 123-90.580.

Campbell, Bernard D., to Alexander Dodds Company. Combined motorizing and drilling machine. 4,631,799, Cl. 29-558.000.

Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Bicyclic nitrogen heterocyclic ethers and thioethers, and their pharmaceutical uses. 4,632,927, Cl. 514-272.000.

Canada, Her Majesty the Queen in right of: *See—*
Venier, Gerald O., 4,633,426, Cl. 364-724.000.

Canadian Marconi Corporation: *See—*
Mack, Alfred, 4,633,463, Cl. 370-95.000.

Canadian Patents and Development Limited: *See—*
Van Cauwenberghe, Roger; and Motycka, Jiri, 4,631,958, Cl. 73-189.000.

Candela Electronics, Inc.: *See—*
Lesea, Austin H., 4,633,040, Cl. 379-253.000.

Cannella, Vincent D.: *See—*
Hansell, Gregory L.; Yaniv, Zvi; and Cannella, Vincent D., 4,633,284, Cl. 357-23.700.

Cannistra, Anthony T.; Kida, Masuyoshi; Tung, Min-Hsiung G.; and Ushiroda, Tatsuyuki. Apparatus for reading mark sheets. 4,633,507, Cl. 382-61.000.

Canon Kabushiki Kaisha: *See—*
Harada, Yuji; and Shinohara, Hayato, 4,631,820, Cl. 29-840.000.
Ishiwata, Kazuya, 4,632,516, Cl. 350-357.000.
Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, 4,632,703, Cl. 106-22.000.
Matsuda, Hiroto, 4,633,274, Cl. 346-140.00R.
Matsumura, Susumu; Kawabata, Takashi; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,632,532, Cl. 354-403.000.
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,633,075, Cl. 250-201.000.
Sakai, Shinji, 4,633,300, Cl. 358-41.000.
Sonobe, Hiraku; Miyake, Hiroyuki; and Kashiwabara, Akihiro, 4,632,536, Cl. 355-3.00R.
Sugiura, Muneharu; and Tajima, Akira, 4,633,072, Cl. 250-201.000.
Yashiki, Yuichi; Anayama, Hideki; and Hiro, Masaaki, 4,632,892, Cl. 430-58.000.

Cantella, Emiliano, to Atom S.p.A. Control device for the translation and driving of the movable head of diecutter machines. 4,632,000, Cl. 83-534.000.

Carenzi, Angelo: *See—*
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,632,940, Cl. 514-648.000.

Carey, Patrick H., Jr., to Minnesota Mining and Manufacturing Company. Stitch-bonded thermal insulating fabrics. 4,631,933, Cl. 66-192.000.

Carfi', Giuseppe: *See—*
Anastasi, Filippo; Anania, Guido; Cultrera, Vito; and Carfi', Giuseppe, 4,632,813, Cl. 423-310.000.

Carini, David J.; and Wexler, Ruth R., to Du Pont de Nemours, E. I., and Company. Antihypertensive alkyl-arylimidazole, thiazole and oxazole derivatives. 4,632,930, Cl. 514-365.000.

Carino, John W.: *See—*
Strange, Thomas F.; and Carino, John W., 4,633,367, Cl. 361-272.000.

Carl Freudenberg, Firma: *See—*
Knoke, Jurgen; Jager, Helmut; Dekant, Ludwig; and Groitzsch, Dieter, 4,632,858, Cl. 428-287.000.
Ticks, Gerd-Heinz; and Grassmuck, Volker, 4,632,370, Cl. 267-8.00R.

Carl Still GmbH & Co. KG, Firma: *See—*
Mosebach, Wilhelm; and Breidenbach, Dieter, 4,632,676, Cl. 55-50.000.

Carl-Zeiss-Stiftung: *See—*
Knohl, Ernst-Dieter, 4,632,523, Cl. 350-611.000.

Carli, Fabio, to Farmitalia Carlo Erba S.p.A. Pharmaceutical composition. 4,632,828, Cl. 424-80.000.

Carlson, Drexel T. Vapor injection device. 4,632,067, Cl. 123-25.00A.

Carmelite, Donald D.: *See—*
Masso, Jon D.; and Carmelite, Donald D., 4,632,527, Cl. 351-166.000.

Caron, Roland G., to Branson Ultrasonics Corporation. Fixture. 4,632,373, Cl. 269-50.000.

Carpano et Pons: *See—*
Thomas, Francis, 4,631,972, Cl. 74-113.000.

Carpenter, Brian J., to Allied Corporation. Quickly releaseable connectors. 4,632,480, Cl. 339-45.00M.

Carr, Myra J.; Brosig, Frances H.; and Gottlieb, Robert G., to KCJ Corporation. Air flotation mattress. 4,631,767, Cl. 5-449.000.

Carrier Corporation: *See—*
Bolton, Theodore S.; and Whitwell, Robert J., 4,632,021, Cl. 98-40.300.

Carroll, Thomas W.: *See—*
Brough, C. Duncan; and Carroll, Thomas W., 4,632,241, Cl. 206-44.00B.

Carter-Day Co.: *See—*
Klimczak, William J., 4,632,679, Cl. 55-284.000.
Klimczak, William J., 4,632,680, Cl. 55-302.000.

Carter, Richard; and Miller, Louis H., to United States of America, Health and Human Services. Monoclonal antibodies which block infectivity of malarial parasites to mosquitoes. 4,632,909, Cl. 436-542.000.

Cartz, Louis: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.

Casey, Susan D. Modular covering and a method of assembling the same. 4,631,765, Cl. 5-417.000.

Casper, Thomas J.: *See—*
Wiegand, James H.; and Casper, Thomas J., 4,631,974, Cl. 74-450.000.

Casteel, Jordan B.; D'Atre, John D.; Ritter, Allen M.; and Wadding, Kenneth W., to General Electric Company. Method of automated in-place SCR testing. 4,633,241, Cl. 340-645.000.

Castiello, Gualtiero, to Berera & C. s.n.c. Animal slaughtering apparatus with its cartridge feeder advanced automatically, simultaneously with the resetting of the firing pin. 4,631,779, Cl. 17-1.00B.

Caterpillar Inc.: *See—*
Gipp, Gregory H.; and Szentes, John F., 4,633,224, Cl. 340-347.00P.

Caveney, Robert; Gilliam, Dana; Chan, Melvin; and Bailey, Michael, to Cavro Scientific Instruments. Digital dilution apparatus and method. 4,633,413, Cl. 364-500.000.

Cavitt, Michael B., to Dow Chemical Company, The. Thermally stable capped thermoplastic phenolic resin. 4,632,971, Cl. 528-88.000.

Cavro Scientific Instruments: *See—*
Caveney, Robert; Gilliam, Dana; Chan, Melvin; and Bailey, Michael, 4,633,413, Cl. 364-500.000.

Ceco Corporation, The: *See—*
Scott, W. Thomas; and Soukup, Jerome, 4,631,991, Cl. 81-90.100.

Celanese Corporation: *See—*
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, 4,632,798, Cl. 264-272.170.
Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., 4,632,775, Cl. 252-502.000.

Cells, Paul L., to Mooney Chemicals, Inc. Preparation of transition metal salt compositions of organic carboxylic acids. 4,633,001, Cl. 556-44.000.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Podrini, Maurizio, 4,632,368, Cl. 266-229.000.

Centronics Data Computer Corp.: *See—*
Houston, Eric A., 4,632,582, Cl. 400-232.000.

Cesti, Pietro: *See—*
Giarda, Silvio; Cesti, Pietro; Confalonieri, Giovanni; and Piccardi, Paolo, 4,632,926, Cl. 514-259.000.

CGEE Alsthom: *See—*
Charles, Patrick, 4,633,184, Cl. 328-55.000.

Chadwick, Russell B., to United States of America, Commerce. Method and apparatus for four-beam radar. 4,633,256, Cl. 342-368.000.

Challenge-Cook Bros., Incorporated: *See—*
Brennan, George A., 4,631,919, Cl. 60-413.000.

Cham, Wai K.; Clarke, Roger J.; and Nicol, Richard C., to British Telecommunications public limited company. Omission and subsequent estimation of zero sequency coefficients of transformed digitized images to facilitate data compression. 4,633,296, Cl. 358-12.000.

Chan, Albert S. C.; and Morris, Donald E., to Monsanto Company. Production of adipic acid from 1,4-disubstituted-2-butene. 4,633,015, Cl. 562-590.000.

Chan, Mark: *See—*
Kelsey, Terry D., 4,632,570, Cl. 368-107.000.

Chan, Melvin: *See—*
Caveney, Robert; Gilliam, Dana; Chan, Melvin; and Bailey, Michael, 4,633,413, Cl. 364-500.000.

Chang, Shien F. Incinerator for the high speed combustion of waste products. 4,632,042, Cl. 110-243.000.

Chang, Tien-Song. Thermostatically controlled dual mode electric water heating receptacle. 4,633,066, Cl. 219-437.000.

Charlebois, Leonard J.: *See—*
Donaldson, Michael J.; Charlebois, Leonard J.; and Bailey, Kevin J., 4,632,279, Cl. 222-146.500.

Charles, Patrick, to CGEE Alsthom. Device for generating a signal corresponding to a variable magnitude associated with the reactive power of an arc furnace in order to control a reactive power compensator. 4,633,184, Cl. 328-55.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.
Trageser, Milton B., 4,633,479, Cl. 372-107.000.

Charlton, Keith D.: *See—*
Bracnik, Anthony S.; and Charlton, Keith D., 4,632,331, Cl. 242-107.40A.

Charm-Glo Mfg. Co., Inc.: *See—*
Reisman, George F., 4,633,378, Cl. 362-353.000.

Charman, Michael D., to Vickers Public Limited Company. Office screens and partitions. 4,631,881, Cl. 52-220.000.

Charov, Alexander: *See—*
Ratchford, Michael; Bue, Richard L.; and Charov, Alexander, 4,633,473, Cl. 371-68.000.

Chausse, Leon C. Tubing string testing device. 4,631,953, Cl. 73-49.500.

Chen, Eugene. Scaffold with locking means. 4,632,222, Cl. 182-179.000.

Chen, Michael S. K.; Hegarty, W. Patrick; and Sampat, Dipak J., to Air Products and Chemicals, Inc. Production of sulfur from an oxygen enriched claus system. 4,632,818, Cl. 423-574.00R.

Chesebro, Donald G.; and Sweetser, Robert W., to International Business Machines Corporation. Visibility enhancement of first order alignment marks. 4,632,724, Cl. 156-626.000.

Chester, John K.: *See—*
Callahan, Michael; Chester, John K.; and Goddard, Robert M., 4,633,161, Cl. 323-242.000.

Chevron Research Company: *See—*
Donaghey, Lee F., 4,631,952, Cl. 73-23.000.
Liston, Thomas V.; Lowe, Warren; and Small, Vernon R., 4,632,771, Cl. 252-32.70E.

Chianelli, Russell R.: *See—*
Ho, Teh C.; Young, Archie R., II; Jacobson, Allan J.; and Chianelli, Russell R., 4,632,747, Cl. 208-18.000.

Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, to Zambon S.p.A. N-substituted 1-(4'-alkylsulfonylphenyl)-2-amino-1,3-propanediols, pharmaceutical compositions containing them, having local anesthetic activity. 4,632,940, Cl. 514-648.000.

Childers, Jimmie D., to Texas Instruments Incorporated. High speed address transition detector circuit for dynamic read/write memory. 4,633,102, Cl. 307-354.000.

Childers, Jimmie D., to Texas Instruments Incorporated. Dynamic read/write memory circuits with equal-sized dummy and storage capacitors. 4,633,443, Cl. 365-203.000.

Chiodini, Laura: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.

Chisso Corporation: *See—*
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, 4,632,948, Cl. 523-219.000.

Chittineni, Chittibabu, to Conoco Inc. Method for waveform feature extraction from seismic signals. 4,633,400, Cl. 364-421.000.

Chiu, Ming-Yee, to Siemens Corporate Research & Support, Inc. On-chip microprocessor instruction decoder having hardware for selectively bypassing on-chip circuitry used to decipher encrypted instruction codes. 4,633,388, Cl. 364-200.000.

Choi, Kwang H.; and Hong, Sun H., to C. Itoh & Co. (America) Inc., by said Kwang H. Choi. Display package having a retractable hanger. 4,632,242, Cl. 206-45.340.

Choi, Long: *See—*
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.

Chow, Robert; and Downey, Steven D., to Varian Associates, Inc. Semiconductor etching apparatus with magnetic array and vertical shield. 4,632,719, Cl. 156-345.000.

Chretien, Michel: *See—*
Seidah, Nabil G.; and Chretien, Michel, 4,632,780, Cl. 530-306.000.

Chrysler Motors Corporation: *See—*
Asmus, Thomas W., 4,633,403, Cl. 364-431.050.
Novak, Robert J.; and Kronberger, Leonard J., 4,632,077, Cl. 123-146.50A.
Prucher, Bryan P., 4,633,148, Cl. 318-135.000.

Chugai Ro Co., Ltd.: *See—*
Shintaku, Yasuyuki; and Hiraishi, Hisashi, 4,631,793, Cl. 29-132.000.

Chung, Betsy Y., executrix: *See—*
Suh, John T.; Chung, Rack H., deceased; Wang, Nai-Yi; and Barton, Jeffrey N., 4,632,929, Cl. 514-317.000.

Chung, Dennis E.: *See—*
Chung, Yun H.; and Chung, Dennis E., 4,631,901, Cl. 53-455.000.

Chung, Rack H., deceased: *See—*
Suh, John T.; Chung, Rack H., deceased; Wang, Nai-Yi; and Barton, Jeffrey N., 4,632,929, Cl. 514-317.000.

Chung, Yun H.; and Chung, Dennis E., to MPR Corporation. Apparatus and method for packaging a product in individual packets. 4,631,901, Cl. 53-455.000.

Chureau, Bernard. Apparatus for sorting out deformed or broken fish hooks on so-called trawl lines. 4,631,850, Cl. 43-4.000.

Ciba Corning Diagnostics Corp.: *See—*
Lee, Siu-Leung, 4,632,904, Cl. 435-176.000.

Ciba-Geigy Corporation: *See—*
Babler, Fridolin, 4,632,704, Cl. 106-288.00Q.
Banks, Christopher P.; and Irving, Edward, 4,632,891, Cl. 430-18.000.
Demmer, Christopher G.; Irving, Edward; and Losert, Ewald, 4,632,900, Cl. 430-323.000.
Rochat, Alain C.; Iqbal, Abul; Jeanneret, Remy; and Mizuguchi, Jin, 4,632,893, Cl. 430-58.000.
Schlosser, Manfred; and Brassel, Jakob, 4,632,827, Cl. 424-78.000.
Schurter, Rolf; Thummel, Rudolph C.; Topfl, Werner; Meyer, Willy; and Durr, Dieter, 4,632,695, Cl. 71-93.000.

Ciccolo, Arthur: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.

Cii Honeywell Bull: *See—*
Maury, Christian; Lequien, Jean; and Pinson, Denis, 4,633,343, Cl. 360-76.000.

Cii Honeywell Bull (Societe Anonyme): *See—*
Gueugnon, Catherine, 4,633,450, Cl. 369-13.000.

Cincinnati Electronics Corporation: *See—*
Brauer, Frank M., 4,633,422, Cl. 364-571.000.

Cincinnati Mine Machinery Company, The: *See—*
Sterwerf, Lester J., Jr., 4,632,463, Cl. 299-91.000.

Citizen Watch Company Limited: *See—*
Sekiya, Fukuo, 4,633,242, Cl. 340-719.000.

Clarion Co., Ltd.: *See—*
Takai, Kazuki, 4,633,348, Cl. 360-96.500.

Clark Equipment Company: *See—*
Haeder, Thomas Q.; and Kaczmarski, Wally L., 4,632,158, Cl. 144-34.00E.

Clark, Keith R., to Rheem Manufacturing Company. Method of manufacturing foam insulated tank. 4,632,792, Cl. 264-45.200.

Clarke, Roger J.: *See—*
Cham, Wai K.; Clarke, Roger J.; and Nicol, Richard C., 4,633,296, Cl. 358-12.000.
Clausen, Eivind; and Allsop, Michael G., to Allsop, Inc. Releasable locking assembly. 4,632,597, Cl. 403-351.000.
Clay, Eugene J.: *See—*
Pechacek, Raymond E.; and Clay, Eugene J., 4,632,617, Cl. 414-10.000.
Clegg, John E. Inset solar prism. 4,632,092, Cl. 126-440.000.
Clemens, Robert J., to Eastman Kodak Company. Preparation of α-haloacetoacetic esters. 4,633,013, Cl. 560-174.000.
Clevinger, Martin R. Rigidly constructed portable electric double bass. 4,632,002, Cl. 84-1.160.
Cline, Darrell W. Archery arrow support device. 4,632,087, Cl. 124-41.00A.
Cochrane, Benjamin A. Press-on cap and seal. 4,632,265, Cl. 215-232.000.
Cohen, Harry A.: *See—*
Palsgrove, Boyd H.; Hendrickson, Max; and Cohen, Harry A., 4,633,218, Cl. 340-310.00A.
Cohen, John H.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,632,191, Cl. 175-19.000.
Colanzi, Franco: *See—*
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,632,075, Cl. 123-90.580.
Cole, Charles A.: *See—*
Villanueva, James G.; Matlack, John D.; Lewis, Shelton E.; Pocock, John F. E.; and Cole, Charles A., 4,632,053, Cl. 118-66.000.
Cole, William A., to Linear Technology Inc. Buffer circuit suitable for low voltage operation. 4,633,166, Cl. 323-315.000.
Coleman, William M., III: *See—*
Bedell, Stephen A.; Howell, William R., Jr.; and Coleman, William M., III, 4,632,912, Cl. 502-122.000.
Colgate Palmolive Company: *See—*
Ferlauto, Robert J., Jr.; and Yuhasz, Kathleen M., 4,632,825, Cl. 424-52.000.
Colin, Laurence. Encapsulated art. 4,631,847, Cl. 40-407.000.
Colle, Edward A., Jr., to Halliburton Company. Redundant detonation initiators for use in wells and method of use. 4,632,034, Cl. 102-312.000.
Collier, John C.; and Bakowicz, George B.; to Burndy Corporation. Electrical harness manufacturing method and apparatus. 4,631,823, Cl. 29-867.000.
Collins, Curran N., to Big Four Equipment, Inc. Lower bead breaker stroke control apparatus. 4,632,167, Cl. 157-1.280.
Colt Industries Operating Corp.: *See—*
Corrette, Richard H., 4,631,947, Cl. 72-88.000.
Colvin, David S. Reversible ratchet wrench including detent mechanism. 4,631,988, Cl. 81-62.000.
Colwell, Robert E., Jr.; and Shira, Glenn L. Hazardous waste removal method and apparatus. 4,632,690, Cl. 65-134.000.
Combe Incorporated: *See—*
Lapidus, Herbert, 4,632,880, Cl. 428-523.000.
Combustion Engineering, Inc.: *See—*
Bailey, Timothy F.; and Landry, David M., 4,631,817, Cl. 29-747.000.
Herbst, John J.; Sider, Richard G.; Jaquith, Robert E.; and Meijer, Christoffel H., 4,632,802, Cl. 376-216.000.
Commissariat a l'Energie Atomique: *See—*
Barraud, Andre ; Ruaudel, Annie; and Vandevyver, Michel, 4,632,800, Cl. 264-298.000.
David, Bernard; Pigeon, Michel; and Vienot, Claude, 4,633,177, Cl. 324-220.000.
Dé Vadder, Daniel; and Saglio, Robert, 4,631,965, Cl. 73-602.000.
Hartmann, Joel; and Jeuch, Pierre, 4,632,725, Cl. 156-643.000.
Commonwealth Engineering & Technology, Inc.: *See—*
Whittle, Thomas E., 4,632,758, Cl. 210-603.000.
Commonwealth of Australia, The: *See—*
Jarrott, Kenneth N.; and Parker, Eric J., 4,632,031, Cl. 102-200.000.
Comparetto, John E. Bone wedge osteotomy method. 4,632,102, Cl. 128-92.0VY.
Conant, Richard W.: *See—*
Erazo, Fernando; and Conant, Richard W., 4,632,284, Cl. 222-615.000.
Confalonieri, Giovanni: *See—*
Giarda, Silvio; Cesti, Pietro; Confalonieri, Giovanni; and Piccardi, Paolo, 4,632,926, Cl. 514-259.000.
Conlan, Thomas C.: *See—*
Berg, Peter G.; Shukla, Vishwa; Kulwicki, Bernard M.; and Conlan, Thomas C., 4,633,069, Cl. 219-553.000.
Conley, James A. Plasma cutting system. 4,633,055, Cl. 219-121.0PC.
Conlon, Thomas J.; and Leahy, William J. Heat-resistant roll and method of making same. 4,632,855, Cl. 428-36.000.
Connelly, John J., to Grumman Aerospace Corporation. Windscreen deviation correcting pilot display. 4,632,508, Cl. 350-174.000.
Conoco Inc.: *See—*
Benzing, William M., 4,632,212, Cl. 181-106.000.
Chittineni, Chittibabu, 4,633,400, Cl. 364-421.000.
Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., 4,633,399, Cl. 364-421.000.
Conrad, Marvin C.: *See—*
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,633,392, Cl. 364-200.000.
Conrow, Robert P. Device for relief of headaches. 4,632,104, Cl. 128-163.000.
Continuous Casting Systems Inc.: *See—*
McVay, James D.; and Take, Hermann, 4,632,175, Cl. 164-426.000.
Control Data Corporation: *See—*
Damoci, Joseph A., 4,633,302, Cl. 358-84.000.
Cook, Carol A.: *See—*
Semmler, Caryl J.; Cook, Carol A.; and Smith, Jackie D., 4,631,766, Cl. 5-431.000.
Cook, Gregory A., to Eastman Kodak Company. Emulsifiable polyethylene paraffin blend composition. 4,632,955, Cl. 524-275.000.
Cook, Keith R.: *See—*
Thornton, Dennis P.; Maceross, John S.; Foust, Jeff A.; and Cook, Keith R., 4,633,153, Cl. 318-280.000.
Cook, Melvin S., to Holobeam, Inc. Photovoltaic cells on lattice-mismatched crystal substrates. 4,633,030, Cl. 136-246.000.
Coon, Robert E. Finger ring holder with retractable retainers. 4,632,351, Cl. 248-309.200.
Cooper Industries, Inc.: *See—*
Lapp, John; Hackney, Larry B.; Mason, Marco J.; and Anderson, David W., 4,633,369, Cl. 361-328.000.
Cooper, James L., to Wang Laboratories, Inc. Control structure for a document processing system. 4,633,430, Cl. 364-900.000.
Coplan, Myron J.; Bilewski, Friedhelm; Sebring, Robert; and Schiffer, Daniel K., to Albany International Corp. Multiple bundle separatory module. 4,632,756, Cl. 210-323.200.
Copple, Warren B.: *See—*
Ezis, Andre; Beckwith, Elaine C.; and Copple, Warren B., 4,632,793, Cl. 264-58.000.
Cordova, David S.; and Lazarus, Stanley D., to Allied Corporation. Fiber for reinforcing plastic composites and reinforced plastic composites therefrom. 4,632,864, Cl. 428-265.000.
Corey, Paul F., to Miles Laboratories, Inc. Method for preparing (+)R-2-methyl-hexane-1,2-diol. 4,633,025, Cl. 568-866.000.
Cornell, John A.; and Kubisen, Steven J., Jr., to Union Carbide Corporation. Polyfunctional acrylate derivatives of caprolactone-polyols. 4,632,975, Cl. 528-354.000.
Corpstein, Jeffrey J.: *See—*
Bacher, William J.; and Corpstein, Jeffrey J., 4,631,831, Cl. 33-169.00B.
Corrette, Richard H., to Colt Industries Operating Corp. Thread rolling dies. 4,631,947, Cl. 72-88.000.
Cortese, Virgino, to Essegielle S.r.l. Coffee machine. 4,632,024, Cl. 99-293.000.
Cossel, Stephen C.: *See—*
Kurasch, David H.; Hall, George V. B.; Cossel, Stephen C.; and Miskimin, Paul A., 4,633,091, Cl. 250-506.100.
Cosyns, Max; and Gomez, Ruben, to Baumert, Charles; and Gomez, Ruben. Air regenerator using an oxygen jet venturi. 4,632,678, Cl. 55-180.000.
Coughlin, Peter K., to Union Carbide Corporation. Enhanced catalyst and process for converting synthesis gas to liquid motor fuels. 4,632,941, Cl. 518-714.000.
Coutin, Pierre F.: *See—*
Hasquenoph, Jean, deceased; and Coutin, Pierre F., 4,632,338, Cl. 244-137.00A.
Coy, David H.; and Moreau, Jacques-Pierre, to Tulane Educational Fund. Therapeutic LHRH analogs. 4,632,979, Cl. 530-313.000.
Crea, Dominic: *See—*
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,033, Cl. 136-256.000.
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,034, Cl. 136-256.000.
Crepin, Roger, to Brandt-Armements. Lateral gas jet piloting device. 4,632,336, Cl. 244-3.220.
Crook, James C., to Kollmorgen Technologies Corporation. Series connected transistor protection circuit. 4,633,151, Cl. 318-254.000.
Crown International, Inc.: *See—*
Bartlett, Bruce, 4,633,045, Cl. 381-155.000.
Crudele, Lester M.: *See—*
Mothersole, David S.; Crudele, Lester M.; Tietjen, James L.; and Thompson, Robert R., 4,633,437, Cl. 364-900.000.
Cseh, Gyorgy: *See—*
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Csordas, Laszlo ; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, to Autoipari Kutato es Fejleszto Vallalat; and IKARUS Karosszeria es Jarmugyar. Anti-roll torsion bar (stabilizer) for the running gear of vehicles. 4,632,422, Cl. 280-689.000.
Cuartas, Jaime: *See—*
Roa, Alvaro H.; and Cuartas, Jaime, 4,632,323, Cl. 241-247.000.
Cudzik, Daniel F.: *See—*
Taylor, Robert L.; Sink, Danny R.; and Cudzik, Daniel F., 4,632,271, Cl. 220-258.000.
Cue, Berkeley W.; and Massett, Stephen S., to Pfizer Inc. Intermediates for preparing pirbuterol and analogs. 4,632,992, Cl. 546-116.000.
Cue, Berkeley W., Jr., to Pfizer Inc. Process for making 2-guanidino-4-(2-methyl-4-imidazolyl) thiazole dihydrobromide. 4,632,993, Cl. 548-198.000.
Cuellar, Edward A.: *See—*
Calahan, James L.; Cuellar, Edward A.; Desmond, Michael J.; and Currie, John C., 4,633,372, Cl. 361-433.000.
Cuff, William A.; and Lefler, Jerrold P.; to Digitext, Inc. Computerized printing system. 4,632,578, Cl. 400-91.000.

Cuhel, Leon L., to FMC Corporation. Hydraulic circuit for self-undecking crane. 4,632,261, Cl. 212-175.000.
Cuir, Gerard: *See—*
Cuir, Jean P.; and Cuir, Gerard, 4,632,381, Cl. 271-270.000.
Cuir, Jean P.; and Cuir, Gerard. Process and apparatus for transferring a sheet of material from one assembly to another. 4,632,381, Cl. 271-270.000.
Cultrera, Vito: *See—*
Anastasi, Filippo; Anania, Guido; Cultrera, Vito; and Carfi', Giuseppe, 4,632,813, Cl. 423-310.000.
Cummings, Veigh X. Hub cap mounting for drive wheels of heavy road vehicles and method of installation. 4,632,465, Cl. 301-108.00S.
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., to International Business Machines Corporation. Hollow cathode. 4,633,129, Cl. 313-153.000.
Curatolo, Benedict S.: *See—*
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., 4,632,774, Cl. 252-373.000.
Currie, John C.: *See—*
Calahan, James L.; Cuellar, Edward A.; Desmond, Michael J.; and Currie, John C., 4,633,372, Cl. 361-433.000.
Curry, Stephen J.: *See—*
Wilson, Craig A.; Curry, Stephen J.; Struzek, Kenneth; and Falcigno, Ralph, 4,633,057, Cl. 219-121.0LC.
Curry, Walter. Frame strip for receiving the edge of a sheet material. 4,631,786, Cl. 24-460.000.
Curtis, Donald D., to United States of America, Navy. Low burn rate motor propellant. 4,632,715, Cl. 149-19.500.
Cushing, Donald S.: *See—*
Jenkins, Thomas E.; and Cushing, Donald S., 4,632,470, Cl. 312-214.000.
Custom Cable Assemblies, Inc.: *See—*
Skinner, Michael J., 4,632,489, Cl. 339-103.00R.
Cutters Exchange, Inc.: *See—*
Seaman, A. Matthew, 4,632,047, Cl. 112-121.270.
Cyclotomics, Inc.: *See—*
Berlekamp, Elwyn R.; and Tong, Po, 4,633,486, Cl. 375-116.000.
Welch, Lloyd R.; and Berlekamp, Elwyn R., 4,633,470, Cl. 371-37.000.
Czabaffy, Andras; Kaffka, Karoly; Horvath, Lorand; and Nadai, Bela, to Kozponti Elelmiszeripari Kutato Intezet. Method for measuring spectra of materials. 4,632,549, Cl. 356-300.000.
Daeyaert, Guido J. E., to Atlas Copco Aktieboiag. Shaft seal with both hydrostatic and hydrodynamic pressure parts. 4,632,402, Cl. 277-15.000.
Dahlberg, Larry J.: *See—*
Brackett, John E.; and Dahlberg, Larry J., 4,631,853, Cl. 43-23.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, 4,632,478, Cl. 339-17.0LC.
Daiichi Engineering Co., Ltd.: *See—*
Iwata, Noboru, 4,632,646, Cl. 417-477.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Saito, Isao; and Shimano, Noriyuki, 4,633,328, Cl. 358-296.000.
Dalhuisen, Albert J., to Calgon Corporation. Halogen-containing rubbers and a method for their manufacture. 4,632,954, Cl. 524-240.000.
Dallwig, Claus; and Volk, Hans-Joachim, to Brose Fahrzeugteile GmbH & Co. KG. Installation for adjusting a hinge point of a vehicle safety belt. 4,632,426, Cl. 280-808.000.
Dalton, Michael J. Conduit anchor adapted to receive stylet. 4,632,671, Cl. 604-174.000.
Damman, Bernardus J.: *See—*
Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, 4,632,812, Cl. 423-309.000.
Damoci, Joseph A., to Control Data Corporation. Video cassette recorder adapter. 4,633,302, Cl. 358-84.000.
Dana Corporation: *See—*
Eley, James M., 4,631,973, Cl. 74-439.000.
Flotow, Richard A.; Heymann, Ronald E.; and Kummer, Martin E., 4,632,235, Cl. 192-70.270.
Danfoss A/S: *See—*
Knudsen, Ivan, 4,633,094, Cl. 307-140.000.
Petersen, Jorgen H., 4,632,658, Cl. 431-208.000.
Daniels, Manfred; and Trimborn, Helmut, to Th. Kieserling & Albrecht GmbH and Co Apparatus for assembling heat exchangers. 4,631,813, Cl. 29-727.000.
Danler, Richard, to Oerlikon Motch Corporation Div. Jetstream Systems Co. Air conveyor for plastic film. 4,632,321, Cl. 241-62.000.
Dann, Thomas E., to Day & Zimmerman Inc. Apparatus for feeding powder. 4,632,009, Cl. 86-31.000.
D'Antonio: *See—*
D'Antonio, John P.; and Murphy, Joseph F., 4,632,860, Cl. 428-290.000.
D'Antonio, John P.; and Murphy, Joseph F., to D'Antonio. Waterproof breathable fabric. 4,632,860, Cl. 428-290.000.
Dario Manuli S.p.A.: *See—*
Brambilla, Dario, 4,631,898, Cl. 53-399.000.
Daroga, Nader D. Nuclear blast and fall-out shelter. 4,631,872, Cl. 52-1.000.
Data General Corporation: *See—*
Katz, Lawrence H.; Wells, Douglas M.; and Bratt, Richard G., 4,633,406, Cl. 364-200.000.
D'Atre, John D.: *See—*
Casteel, Jordan B.; D'Atre, John D.; Ritter, Allen M.; and Wadding, Kenneth W., 4,633,241, Cl. 340-645.000.
David, Bernard; Pigeon, Michel; and Vienot, Claude, to Commissariat a l'Energie Atomique. Device for checking bent tubes by a probe, such as a pneumatically propelled eddy-current probe. 4,633,177, Cl. 324-220.000.
Davies, Geoffrey; and El-Toukhy, Ahmed, to Northeastern University. Process for stabilization of coal liquid fractions. 4,632,675, Cl. 44-72.000.
Davis, Frances M.: *See—*
Fan, John C. C.; Tsaur, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 4,632,712, Cl. 148-175.000.
Davis, Frank M.: *See—*
Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., 4,632,829, Cl. 424-84.000.
Davis, William M.: *See—*
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.
Dawson, Howard B.: *See—*
Boase, Clive J.; and Dawson, Howard B., 4,632,936, Cl. 514-465.000.
Day & Zimmerman Inc.: *See—*
Dann, Thomas E., 4,632,009, Cl. 86-31.000.
Daymond, division of Redpath Industries Limited: *See—*
Skinner, James, 4,632,342, Cl. 248-48.200.
DCI Marketing: *See—*
Nasgowitz, Donald D., 4,632,412, Cl. 280-47.260.
De La Rue Giori S.A.: *See—*
Kuehfuss, Runwalt, 4,633,395, Cl. 364-403.000.
Deal, Troy M. Hydraulic shovel dredge system. 4,631,844, Cl. 37-58.000.
Deaton, Thomas M., to Otis Engineering Corporation. Well safety and kill valve. 4,632,187, Cl. 166-323.000.
Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain. Apparatus for forming of felts which have an isotropic structure. 4,632,685, Cl. 65-9.000.
Debus, Jurgen; Zachraf, Jugen; Butergerds, Helmut; and Wetzel, Manfred, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Lock assembly for cabinet doors. 4,631,937, Cl. 70-207.000.
Degenkolb, Eugene O.: *See—*
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,631,806, Cl. 29-589.000.
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,633,290, Cl. 357-42.000.
DeGennaro, Charles S. Optical cable security system with standby and automatic re-arming features. 4,633,235, Cl. 340-568.000.
DeGraffenried, Howard T. Stacked filter cartridge. 4,632,755, Cl. 210-314.000.
Degrave, Philippe L.; and Lepage, Jean P., to Kontron Holding AG. Blood particle analyzer. 4,633,169, Cl. 324-71.100.
Degussa AG: *See—*
Buhler, Harald; and Statt, Bernhard, 4,632,952, Cl. 524-217.000.
Degussa Aktiengesellschaft: *See—*
Schiwiora, Harry; and Ahr, Willi, 4,632,659, Cl. 433-181.000.
Dekant, Ludwig: *See—*
Knoke, Jurgen; Jager, Helmut; Dekant, Ludwig; and Groitzsch, Dieter, 4,632,858, Cl. 428-287.000.
Della Bella, Davide: *See—*
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,632,940, Cl. 514-648.000.
Del Tufo, Mark J.; and Nagle, George J., to Burroughs Corporation. Coupling apparatus. 4,632,594, Cl. 403-322.000.
Delwichwe, John L. Flow regulating device. 4,632,139, Cl. 137-172.000.
Demarest, Henry M.: *See—*
Kunkle, Gerald E.; Demarest, Henry M.; and Shelestak, Larry J., 4,632,687, Cl. 65-27.000.
De Martis, Giancarlo: *See—*
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De Meringo, Alain: *See—*
Debouzie, Alain; Bouquet, Francois; and De Meringo, Alain, 4,632,685, Cl. 65-9.000.
Demmer, Christopher G.; Irving, Edward; and Losert, Ewald, to Ciba-Geigy Corporation. Process for the production of images after electrodeposition of positive photoresist on electrically conductive surface. 4,632,900, Cl. 430-323.000.
De Neef, Dirk. Procedure for the consolidation of sludge. 4,632,765, Cl. 210-717.000.
Denick, John, Jr.: *See—*
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,821, Cl. 424-15.000.
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,822, Cl. 424-15.000.
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,823, Cl. 424-15.000.
Dennis, Mahlon, to Strata Bit Corporation. Drill bit with shrouded cutter. 4,632,196, Cl. 175-329.000.
Derderian, Scott K., to General Electric Company. Sub-slot cover for dynamoelectric machine. 4,633,116, Cl. 310-214.000.
Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Crystalline silicophosphoaluminate MCM-3. 4,632,811, Cl. 423-306.000.
DeSalve, Dennis W., to United Aircraft Products, Inc. Butterfly type valve seal. 4,632,360, Cl. 251-175.000.

Desmond, Michael J.: *See—*
Calahan, James L.; Cuellar, Edward A.; Desmond, Michael J.; and Currie, John C., 4,633,372, Cl. 361-433.000.
Deustsch Company Electronic Components Division, The: *See—*
Allsworth, Terrence W., 4,632,505, Cl. 350-96.210.
Deutsche ITT Industries GmbH: *See—*
Pfeifer, Heinrich, 4,633,517, Cl. 455-228.000.
Deutsche Lufthansa AG: *See—*
Mix, Holger, 4,632,734, Cl. 204-32.100.
De Vadder, Daniel; and Saglio, Robert, to COMMISSARIAT a l'Energie Atomique. Acoustic holography process and apparatus using a space-limited ultrasonic beam. 4,631,965, Cl. 73-602.000.
Devereux, Corinne: *See—*
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,919, Cl. 514-158.000.
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,920, Cl. 514-158.000.
De Vrij, Simone M., to Atlas Isolaties, personenvennootschap met beperkte aansprakelijkheid. Double glass covering and process for its manufacture. 4,632,853, Cl. 428-34.000.
Devron Engineering Limited: *See—*
Smith, Douglas W. P., 4,631,923, Cl. 60-530.000.
De Willigen, Hans C.; van der Hoek, Willem; and van Rens, Piet C. J., to U.S. Philips Corporation. Method of pressing an article of a thermoplastic material and apparatus for manufacturing an article of a thermoplastic material by pressing. 4,632,689, Cl. 65-78.000.
Dewitt, B. Chris, to Motorola, Inc. Clock monitor circuit and method. 4,633,097, Cl. 307-269.000.
Dexide, Inc.: *See—*
Garabedian, Michael E.; and Tims, Jerry L., 4,632,772, Cl. 252-106.000.
Dexter-Lawson Products Limited: *See—*
Burns, Robert J., 4,632,611, Cl. 408-205.000.
De Young, Anemarie: *See—*
Gunter, William D., Jr.; and De Young, Anemarie, 4,632,548, Cl. 356-28.500.
Dick, David A.; Folland, Rickworth; Smith, Desmond P.; and Staines, Glyn, to Metal Box p.l.c. Methods for forming tubular closed-ended articles of thermoformable polymer material. 4,632,799, Cl. 264-292.000.
Dickens, Joseph C.: *See—*
Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., 4,632,829, Cl. 424-84.000.
Dickey-john Corporation: *See—*
Bachman, Wesley J.; and Stone, Steven G., 4,633,252, Cl. 342-99.000.
Dickson, Edward J.; and Armstrong, Richard J. Tape cassette rewinding machine. 4,632,335, Cl. 242-200.000.
Dickson, Rennie L.: *See—*
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Didenko, Vladimir F.: *See—*
Goldshtein, Lev I.; Kalashov, Valentin P.; Pleshkanovsky, Jury P.; Didenko, Vladimir F.; and Khaitin, Boris S., 4,631,926, Cl. 62-115.000.
Diefendorff, Keith E.: *See—*
Laws, Gerald E.; and Diefendorff, Keith E., 4,633,466, Cl. 371-16.000.
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Muller, Udo, 4,632,032, Cl. 102-206.000.
Diehl GmbH & Co.: *See—*
Ringel, Konrad, 4,632,036, Cl. 102-476.000.
Dielhof, Pieter B., to U.S. Philips Corporation. Protection circuit for a television camera preamplifier. 4,633,318, Cl. 358-223.000.
DiGiambattista, Vincent N., to Worl-Tech Limited. Manufacture and consolidation of alloy metal powder billets. 4,632,702, Cl. 75-228.000.
Digital Equipment Corporation: *See—*
Shaw, Robert A., 4,633,488, Cl. 375-120.000.
Digitext, Inc.: *See—*
Cuff, William A.; and Lefler, Jerrold P., 4,632,578, Cl. 400-91.000.
Dillabough, Robert J. Stud removing and transfer adaption mode. 4,631,986, Cl. 81-53.200.
Dillingham, Richard F. Convertible necktie and belt hanger apparatus. 4,632,285, Cl. 223-88.000.
Dillon, David B.: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.
Dillon, Edward J., to General Electric Company. Mid-value circuit and control system. 4,633,163, Cl. 323-277.000.
Dilo, Richard, to Oskar Dilo Maschinenfabrik KG. Apparatus for the production of needled, shaped fibrous bodies. 4,631,789, Cl. 28-107.000.
Dingwall, Andrew G. F., to RCA Corporation. Clock shaping circuit and method. 4,633,222, Cl. 340-347.0SH.
di Salle, Enrico: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.
Dischert, William A.: *See—*
Martinez, Miguel R.; and Dischert, William A., 4,632,444, Cl. 294-86.400.
Dischler, Louis; and Otto, Wolfgang K. F., to Milliken Research Corporation. Apparatus for mechanically conditioning textile materials. 4,631,788, Cl. 26-25.000.
DiStefano, Thomas H.: *See—*
Ahn, Kie Y.; and DiStefano, Thomas H., 4,633,451, Cl. 369-14.000.
Dixon, Robert E.; and McDiarmid, James, to Gemini Research, Inc. Apparatus for uniform chemical vapor deposition. 4,632,058, Cl. 118-725.000.
Dr. Ing.h.c.f. Porshe Aktiengesellschaft: *See—*
Bardoll, Meinrad; and Leibold, Kurt-Andre , 4,632,234, Cl. 192-3.580.
Dr. Johannes Heidenhain GmbH: *See—*
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Dodson, Stuart A.: *See—*
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Doenges, Michael G., to Lamb-Weston, Inc. Process for preparing french fried potato strips. 4,632,838, Cl. 426-441.000.
Dolomite S.p.A.: *See—*
Annovi, Giuseppe, 4,631,843, Cl. 36-119.000.
Domenico, Samuel N., to Standard Oil Company (Indiana). Seismic source system for use in water covered area. 4,632,213, Cl. 181-106.000.
Dominion Automotive Industries Inc.: *See—*
Tres, Paul A., 4,633,375, Cl. 362-35.000.
Donaghey, Lee F., to Chevron Research Company. Resistive hydrocarbon leak detector. 4,631,952, Cl. 73-23.000.
Donaldson Company, Inc.: *See—*
Wagner, Wayne M.; Bethke, Timothy A.; and Schmeichel, Steven D., 4,632,216, Cl. 181-255.000.
Donaldson, Michael J., to Northern Teleco M Limited. Dispensing cylinder with cylindrical heater. 4,632,278, Cl. 222-146.500.
Donaldson, Michael J.; Charlebois, Leonard J.; and Bailey, Kevin J., to Northern Telecom Limited. Manually portable container. 4,632,279, Cl. 222-146.500.
Donavich, John, to Transamerica Distribution Services, Inc. Floor construction for cargo carriers. 4,631,891, Cl. 52-588.000.
Donlan, Rodney M.: *See—*
Yohe, Thomas L.; Donlan, Rodney M.; and Kyriss, Karl M., 4,631,961, Cl. 73-866.500.
Dornier GmbH: *See—*
Boehne, Hermann, 4,632,596, Cl. 403-345.000.
Dorr, Harald: *See—*
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Double-E Inc.: *See—*
Wilson, James A.; and Heinonen, Robert L., 4,632,468, Cl. 175-325.000.
Dougherty, Steven J.; and Barker, Ray E., to International Minerals & Chemical Corp. Process for stabilizing phosphoric acid. 4,632,814, Cl. 423-321.00R.
Douglass, Clinton C. Locking device for a pickup storage box door. 4,632,446, Cl. 296-37.600.
Dow Chemical Company, The: *See—*
Barsa, Edward A., 4,632,785, Cl. 260-501.150.
Beck, H. Nelson, 4,632,973, Cl. 528-98.000.
Bedell, Stephen A.; Howell, William R., Jr.; and Coleman, William M., III, 4,632,912, Cl. 502-122.000.
Cavitt, Michael B., 4,632,971, Cl. 528-88.000.
Hefner, Robert E., Jr., 4,632,965, Cl. 525-484.000.
Hefner, Robert E., Jr.; and White, Mary N., 4,632,972, Cl. 528-96.000.
Hefner, Robert E., Jr.; and White, Mary N., 4,632,974, Cl. 528-170.000.
Nichols, Jerram B., 4,632,943, Cl. 521-129.000.
Regelman, Dale F., 4,632,989, Cl. 544-193.000.
Dowbenko, Rostyslaw: *See—*
Welsh, David A.; and Dowbenko, Rostyslaw, 4,632,957, Cl. 524-548.000.
Dowd, Laurence E., to Norchem, Inc. Blown film extrusion. 4,632,801, Cl. 264-566.000.
Down, William H.: *See—*
Rahn, Armin; Down, William H.; Drouin, Marcel; Rudzicz, Matthew J.; Buszard, John F.; Makhoul, Elie; and Woodgate, Ralph W., 4,632,291, Cl. 228-9.000.
Downey, Steven D.: *See—*
Chow, Robert; and Downey, Steven D., 4,632,719, Cl. 156-345.000.
Doyen, Hans-Henning; and Huhn, Edgar, to Ing. Alfred Schmidt GmbH; and Flughafen Frankfurt/Main AG. Mower, especially for grass at airports. 4,631,910, Cl. 56-505.000.
Doyen, Hans-Henning; and Huhn, Edgar, to Ing. Alfred Schmidt GmbH; and Flughafen Frankfurt/Main AG. Drive system on a carrier vehicle for various implements attached on the front or rear. 4,632,200, Cl. 180-53.700.
Dozzi, Giovanni, to Enichem Polimeri S.p.A. Self-extinguishing polycarbonate composition. 4,632,953, Cl. 524-239.000.
Draka Polva B.V.: *See—*
Eygelaar, Klaas; Karreman, Jaap; and Karreman, Peter, 4,632,656, Cl. 425-529.000.
Dresser Industries, Inc.: *See—*
Eckman, Richard E., 4,631,992, Cl. 81-470.000.
Kesner, Burice E., 4,633,446, Cl. 367-69.000.
Drew, Kevin: *See—*
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Drossard, Jakob-Matthias: *See—*
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Drouin, Marcel: *See—*
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Druschel, William O.; Kostenko, Alexander; and Meinert, Rolf G., to International Business Machines Corporation. Process and apparatus for individual pin repair in a dense array of connector pins of an electronic packaging structure. 4,632,294, Cl. 228-119.000.
DuBois, R. Clark. Drive mechanism for document copier. 4,632,376, Cl. 271-4.000.
Duchesne, Mark F.: *See—*
Bardos, Andrew M.; Holmes, Jon E.; and Duchesne, Mark F., 4,633,351, Cl. 360-102.000.
Duea, Michael J. Device for protecting parked aircraft. 4,632,340, Cl. 244-198.000.
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Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., to Hewlett-Packard Company. Amplitude insensitive delay lines in an accoustic imaging system. 4,633,308, Cl. 358-112.000.
Duncan, Donald F.: *See—*
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Dunlap, Raymond R., to Zymark Corporation. Scoop for solids. 4,632,441, Cl. 294-1.100.
Dunlap, Raymond R., to Zymark Corporation. Multiple-function hand. 4,632,631, Cl. 414-736.000.
Du Pont de Nemours, E. I., and Company: *See—*
Altschuler, Lili W.; and Simms, John A., 4,632,964, Cl. 525-456.000.
Bither, Tom A., Jr., 4,632,916, Cl. 502-209.000.
Carini, David J.; and Wexler, Ruth R., 4,632,930, Cl. 514-365.000.
Farnham, William B., 4,632,967, Cl. 526-194.000.
Hasircoglu, Alexander W., 4,632,486, Cl. 339-99.00R.
Hillemann, Craig L., 4,632,693, Cl. 71-93.000.
Tocker, Stanley, 4,632,694, Cl. 71-93.000.
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Dupree, Inc.: *See—*
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Dupree, James N.; and Peterson, Jack E., to Dupree, Inc. Sperm densimeter. 4,632,562, Cl. 356-436.000.
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Ulrich, Lawrence W.; and Walker, Connie W., 4,632,666, Cl. 493-23.000.
Duracell Inc.: *See—*
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D'Urso, Carmelo, to XEDA International. Method and machine for wrapping in particular fruit and vegetables with a film of plastics material. 4,631,902, Cl. 53-461.000.
Dynamic Hydraulic Systems, Inc.: *See—*
Rosman, Alan H., 4,631,918, Cl. 60-372.000.
Dynic Corporation: *See—*
Ueda, Shu; Narumiya, Joe; and Misawa, Kenji, 4,632,250, Cl. 206-524.200.
Dzwinel, Jan, to Instytut Gornictwa Naftowego i Gazownictwa. Method and system for direct prospecting of hydrocarbon deposits. 4,633,182, Cl. 324-335.000.
E. A. Mion Ing. & Arch. Kairos S.N.C., Di M. Bonetti, G. Manente: *See—*
Bonetti, Massimo; Manente, Giuseppe; and Mion, Abramo, 4,631,839, Cl. 36-50.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Goessler, Gerhard; Wilde, Eugen; Essig, Willi; and Hanss, Edgar, 4,633,238, Cl. 340-593.000.
E. R. Squibb & Sons, Inc.: *See—*
Kronenthal, David, 4,632,985, Cl. 540-355.000.
Mueller, Richard H.; Drossard, Jakob-Matthias; and Ermann, Peter H., 4,633,017, Cl. 564-301.000.
Nakane, Masami, 4,632,931, Cl. 514-382.000.
Eagle Industry Co., Ltd.: *See—*
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,632,403, Cl. 277-27.000.
Eastman, James M.: *See—*
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Clemens, Robert J., 4,633,013, Cl. 560-174.000.
Cook, Gregory A., 4,632,955, Cl. 524-275.000.
Fister, Robert V.; and Pledger, James R., 4,632,898, Cl. 430-313.000.
Haroy, James A., 4,633,272, Cl. 346-108.000.
Jeffers, Frederick J., 4,633,344, Cl. 360-77.000.
Smith, James L., 4,632,874, Cl. 428-394.000.
Statt, David J.; Narayan, Badhri; and Zeitzoff, Peter M., 4,633,092, Cl. 250-578.000.
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Eaton Corporation: *See—*
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Jones, Michael E., 4,631,984, Cl. 74-878.000.
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Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,633,278, Cl. 357-6.000.
Mallonen, Edward A.; and Autio, William A., 4,633,210, Cl. 337-101.000.
Orth, Charles D.; and Torrence, Robert J., 4,632,358, Cl. 251-117.000.
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.
Eave-in-One, Inc.: *See—*
Olson, Carlton D., 4,631,875, Cl. 52-12.000.
Ebert, Harry K., Jr.; Menkes, Henry E.; Papathomas, Thomas V.; and Venkatram, Chitra R., to AT&T Bell Laboratories. Option protocol arrangement for stored program rectifier controller. 4,633,412, Cl. 364-493.000.
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Muench, Volker; Hambrecht, Juergen; Echte, Adolf; Illers, Karl H.; and Swoboda, Johann, 4,632,946, Cl. 523-179.000.
Eckell, Albrecht: *See—*
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Economics Laboratory, Inc.: *See—*
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Egger, Johann-Friedrich: *See—*
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Eichler, Walter; Farber, Karlheinz; and Fischer, Elisabeth, to Bosch-Siemens Hausgeraete GmbH. Device for a roasting chamber for roasting green coffee beans. 4,631,838, Cl. 34-57.00A.
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, to Celanese Corporation. Encapsulation of electronic components with anisotropic thermoplastic polymers. 4,632,798, Cl. 264-272.170.
Eida, Tsuyoshi: *See—*
Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, 4,632,703, Cl. 106-22.000.
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Ekdahl, Carl A., Jr.; and Frost, Charles A., to United States of America, Energy. In-line beam current monitor. 4,633,172, Cl. 324-126.000.
Eklund, Richard C.: *See—*
Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, 4,632,010, Cl. 89-1.510.
Ela, Roger B.; and Pignataro, Dominic F., to Walker Magnetics Group, Inc. Chuck control for a workpiece holding electromagnet. 4,633,361, Cl. 361-145.000.
Electrotel, Inc.: *See—*
Fields, Gary C.; and Stamos, Mark E., 4,633,042, Cl. 379-284.000.
Electrovert Ltd.: *See—*
Rahn, Armin; Down, William H.; Drouin, Marcel; Rudzicz, Matthew J.; Buszard, John F.; Makhoul, Elie; and Woodgate, Ralph W., 4,632,291, Cl. 228-9.000.
Eley, James M., to Dana Corporation. Axial retention of gear on shaft. 4,631,973, Cl. 74-439.000.
Eli Lilly and Company: *See—*
Beedle, Edward E.; and Robertson, David W., 4,632,939, Cl. 514-619.000.
Elias, Eli: *See—*
Fabricant, B. Robert; and Elias, Eli, 4,632,103, Cl. 128-157.000.
Ellefson, Mark W. Land vehicle propelled by simulated rowing motion. 4,632,414, Cl. 280-246.000.
Elliott, Phillipa L.: *See—*
Anderson, Iain A.; Gaelic, Christopher J.; and Elliott, Phillipa L., 4,631,771, Cl. 8-158.000.
Elmgren, Peter J.: *See—*
Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., 4,632,295, Cl. 228-123.000.
Elson, Edward E.: *See—*
Webler, William E.; Elson, Edward E.; and Quinn, Michael D., 4,632,125, Cl. 128-692.000.
El-Toukhy, Ahmed: *See—*
Davies, Geoffrey; and El-Toukhy, Ahmed, 4,632,675, Cl. 44-72.000.

Elzer, Albert: *See—*
Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klinsmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel. 4,632,897, Cl. 430-260.000.

Emele, Edgar F.; and Brugner, Nikolaus, to Ritter-Plastic GmbH. Static mixing column. 4,632,568, Cl. 366-337.000.

Emerson Electric Co.: *See—*
Boote, Robert A.; and Meddaugh, Timothy G.. 4,632,326, Cl. 242-55.300.

EMI Limited: *See—*
Higgins, Warwick A., 4,633,347, Cl. 360-90.000.

Emmerich, Kenneth C., to Fansteel Inc. Roof drill system. 4,632,195, Cl. 175-320.000.

Emmett, John C.; and Slater, Robert A., to SmithKline Beckman Corporation. 5-(4-substituted)phenyl-2-pyrazinones. 4,632,924, Cl. 514-255.000.

Empresa Nacional del Aluminio, S.A.: *See—*
Gazapo Santa-Olalla, Jose L.; and Gonzalez Feliu, Juan. 4,632,735, Cl. 204-37.600.

Endo, Hiroshi, to Nissan Motor Company, Limited. Optical radar system for vehicles. 4,632,543, Cl. 356-5.000.

Endo, Joichi; Komatsu, Takashi; and Tohkura, Toshio, to OKI Electric Industry Co., Ltd. Plasma display system. 4,633,139, Cl. 315-169.400.

Endo, Mitsuhiro, to Tokico Ltd. Pneumatic booster. 4,632,014, Cl. 91-369.00A.

Endoh, Toshiaki; and Yamazaki, Yasuhiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Fascimile communication system with desired image quality. 4,633,326, Cl. 358-280.000.

Energy Conversion Devices, Inc.: *See—*
Hansell, Gregory L.; Yaniv, Zvi; and Cannella, Vincent D., 4,633,284, Cl. 357-23.700.
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,033, Cl. 136-256.000.
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,633,034, Cl. 136-256.000.

Enichem Agricolutra: *See—*
Anastasi, Filippo; Anania, Guido; Cultrera, Vito; and Carfi', Giuseppe, 4,632,813, Cl. 423-310.000.

Enichem Polimeri S.p.A.: *See—*
Dozzi, Giovanni, 4,632,953, Cl. 524-239.000.

Envirex. Inc.: *See—*
Wiegand, James H.; and Casper, Thomas J., 4,631,974, Cl. 74-450.000.

Enyo, Hiroji: *See—*
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, 4,632,960, Cl. 525-117.000.

Eralp, Emin: *See—*
Johansson, Nils E.; Eralp, Emin; and Itil, Turan M., 4,632,122, Cl. 128-644.000.

Erazo, Fernando; and Conant, Richard W., to Nepera Inc. Seeding device. 4,632,284, Cl. 222-615.000.

Erdmannsdorfer, Hans, to Filterwerk Mann & Hummel GmbH. Cartridge-type oil separator air filter. 4,632,682, Cl. 55-498.000.

Erickson, Glenn A. File folder document handling system. 4,632,586, Cl. 402-7.000.

Erie Manufacturing Co.: *See—*
Gagas, John M., 4,632,150, Cl. 137-625.460.

Eriksson, Sivert, to AB Volvo. Valve for apportioning preheated and non-preheated air to an internal combustion engine. 4,632,084, Cl. 123-556.000.

Ermann, Peter H.: *See—*
Mueller, Richard H.; Drossard, Jakob-Matthias; and Ermann, Peter H., 4,633,017, Cl. 564-301.000.

Erwin Sick GmbH: *See—*
Fetzer, Gunter, 4,632,500, Cl. 350-6.500.

Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin; and Schenk, Christoph, 4,632,546, Cl. 356-237.000.

Escolies Bordoy, Juan: *See—*
Brue Moya, Manuel; and Escolies Bordoy, Juan, 4,632,418, Cl. 280-603.000.

Eshbach, John R.; and Lenox, Ronald S., to Armstrong World Industries, Inc. NBR/silicate blends. 4,632,958, Cl. 524-574.000.

Essegielle S.r.l : *See—*
Cortese, Virgino, 4,632,024, Cl. 99-293.000.

Essex Group, Inc.: *See—*
Graham, Randall C., 4,631,773, Cl. 15-4.000.

Essig, Willi: *See—*
Goessler, Gerhard; Wilde, Eugen; Essig, Willi; and Hanss, Edgar, 4,633,238, Cl. 340-593.000.

Essilor International (Campagnie Generale d'Optique): *See—*
Lhospice, Bernard, 4,632,526, Cl. 351-124.000.

ETA S.A., Fabriques d'Ebauches: *See—*
Besson, Rene ; and Guerin, Yves, 4,633,156, Cl. 318-696.000.
Morata, Philippe, 4,632,571, Cl. 368-203.000.

Etat Francais represente par le Delegue General pour l'Armement: *See—*
Maillet, Fernand M., 4,632,035, Cl. 102-420.000.

Ethyl Corporation: *See—*
Kolich, Charles H., 4,633,026, Cl. 570-200.000.
Marlett, Everett M., 4,632,816, Cl. 423-347.000.

Etienne, Bernard; Francois, Michel; and Pierrel, Michel, to Pont-a-Mousson S.A. Centrifugal pipe casting with progressively inclined and raised pour channel. 4,632,172, Cl. 164-301.000.

Eumurian, Gregoire, to Thomson CSF. Light-emitting diode device for suppressing thermal time-constant effects. 4,633,525, Cl. 455-613.000.

Evans, Lee L.: *See—*
Bradshaw, Peter D.; and Evans, Lee L., 4,633,221, Cl. 340-347.0NT.

Evans, Santagiuliana, to Taplast S.n.c. Plastic cap having a seal and being child-proof. 4,632,264, Cl. 215-220.000.

Evenson, Marvin E.: *See—*
Olsen, David W.; Wittman, Leroy L.; Evenson, Marvin E.; and Kappel, Gary W., 4,632,262, Cl. 212-189.000.

Exley, Jyll; and Bouet, Thiebault, to Yves Saint Laurent, Inc. Umbrella handle with snap-locked, substantially concealed carrying ring. 4,632,137, Cl. 135-20.00R.

Exxon Chemical Patents Inc.: *See—*
Martella, David J., 4,632,674, Cl. 44-57.000.

Exxon Research & Engineering Co.: *See—*
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.
Gutierrez, Antonio; Brownawell, Darrell W.; Bloch, Ricardo; and Johnston, Jack E., 4,632,769, Cl. 252-48.600.
Ho, Teh C.; Young, Archie R., II; Jacobson, Allan J.; and Chianelli, Russell R., 4,632,747, Cl. 208-18.000.

Eygelaar, Klaas; Karreman, Jaap; and Karreman, Peter, to Draka Polva B.V. Apparatus for the manufacture of molecularly oriented plastic pipes. 4,632,656, Cl. 425-529.000.

Ezis, Andre; Beckwith, Elaine C.; and Copple, Warren B., to Ford Motor Company. Method of fabricating hot pressed silicon nitride billets. 4,632,793, Cl. 264-58.000.

F. J. Westcott Co., The: *See—*
Waltz, Thomas A.; and Shirilla, John E., 4,633,374, Cl. 362-17.000.

F. Schumacher & Co.: *See—*
Brough, C. Duncan; and Carroll, Thomas W., 4,632,241, Cl. 206-44.00B.

Fabricant, B. Robert; and Elias, Eli, to Fabricant, Barbara Ann. Bandage to reduce bunion pain therewith. 4,632,103, Cl. 128-157.000.

Fabricant, Barbara Ann: *See—*
Fabricant, B. Robert; and Elias, Eli, 4,632,103, Cl. 128-157.000.

Falcetta, Joseph J.; and Park, Joonsup, to Alcon Laboratories, Inc. Siloxane monomers for ophthalmic applications. 4,633,003, Cl. 556-419.000.

Falcigno, Ralph: *See—*
Wilson, Craig A.; Curry, Stephen J.; Struzek, Kenneth; and Falcigno, Ralph, 4,633,057, Cl. 219-121.0LC.

Fan, John C. C.; Tsaur, Bor-Yeu; Gale. Ronald P.; and Davis, Frances M., to Massachusetts Institute of Technology. Reducing dislocations in semiconductors utilizing repeated thermal cycling during multistage epitaxial growth. 4,632,712, Cl. 148-175.000.

Fandrich, Helmut E. Cutting system for trees, vegetation and other objects. 4,632,163, Cl. 144-336.000.

Fang, Jolson K.: *See—*
Nagy, John S.; and Fang. Jolson K., 4,633,371, Cl. 361-385.000.

Fansteel Inc.: *See—*
Emmerich, Kenneth C., 4,632,195, Cl. 175-320.000.

Fantucci, Mario: *See—*
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,632,940, Cl. 514-648.000.

Fanuc Ltd.: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,631,807, Cl. 29-598.000.
Kishi, Hajimu; and Tanaka, Kunio, 4,633,469, Cl. 371-29.000.
Komiya, Hidetsugu; and Kurakake, Mitsuo, 4,633,155, Cl. 318-640.000.
Kusumi, Katsuaki, 4,633,384, Cl. 364-184.000.

Farber, Karlheinz: *See—*
Eichler, Walter; Farber, Karlheinz; and Fischer, Elisabeth, 4,631,838, Cl. 34-57.00A.

Farina, Carlo; Pifferi, Giorgio; and Pinza, Mario, to I.S.F. S.p.A. Triphenylmethyl azo and hydrazino substituted pyridazines. 4,632,982, Cl. 534-753.000.

Farm Pak Products Inc.: *See—*
Barnes, Carson B., 4,632,834, Cl. 426-262.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.
Carli, Fabio, 4,632,828, Cl. 424-80.000.

Farnham, William B., to Du Pont de Nemours, E. I., and Company. Nonhygroscopic, anionic pentacoordinate silicate. 4,632,967, Cl. 526-194.000.

Farr, Aaron V., to Abex Corporation. Direct current motor controller. 4,633,152, Cl. 318-257.000.

Farrell, John J., to Wedco Inc. Draw-back valve assembly for an injection molding apparatus. 4,632,652, Cl. 425-137.000.

Farris, Richard C., to Litton Resources Systems, Inc. Dual-mode hydraulic vibrator. 4,632,215, Cl. 181-114.000.

Fasquel, Didier: *See—*
Mignien, Georges; and Fasquel, Didier, 4,632,507, Cl. 350-96.230.

FBC Limited: *See—*
Boase, Clive J.; and Dawson, Howard B., 4,632,936, Cl. 514-465.000.

Federal Paper Board Co., Inc.: *See—*
Manizza, Guelfo A., 4,632,302, Cl. 229-171.000.

Federal Signal Corporation: *See—*
Iacono, Joel G.; and Koval, Ronald J., 4,633,229, Cl. 340-391.000.

Fedynyshyn, Theodore H.: *See—*
Trotz, Samuel I.; and Fedynyshyn, Theodore H., 4,632,881, Cl. 428-541.000.

Fehlhaber, Hans-Wolfram: *See—*
Vertesy, Laszlo ; Bender, Rudolf; Fehlhaber, Hans-Wolfram; and Geisen, Karl, 4,632,917, Cl. 514-54.000.

Feige, Christian; and Kirst, Bertold, to LITEF der Hellige GmbH. Fire control system for moving weapon carriers. 4,632,012, Cl. 89-41.090.

Feigel, Josef, to Standard Elektrik Lorenz Aktiengesellschaft. Electronically commutated, collectorless direct-current motor. 4,633,109, Cl. 310-68.00R.

Feiner, Alexander: *See—*
Boivie, Richard H.; Feiner, Alexander; Rabinowitz, Michele S.; Szeto, Rickens T.; and Weinbaum, Barry J., 4,633,041, Cl. 379-354.000.

Feinstein, Dov Y. Method of upgrading memory boards. 4,632,293, Cl. 228-119.000.

Feldle, Kurt; and Kaschube, Karl-Friedrich, to SKF GmbH. Seal for rolling bearing. 4,632,404, Cl. 277-68.000.

Fellinger, Christine; Leipold, Ludwig; and Tihanyi, Jeno, to Siemens Aktiengesellschaft. Semiconductor component with planar structure. 4,633,292, Cl. 357-53.000.

Ferber, Alan, to Perkin-Elmer Corporation, The. Optical interference eliminator. 4,633,078, Cl. 250-216.000.

Ferko, Peter: *See—*
Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, 4,632,010, Cl. 89-1.510.

Ferlauto, Robert J., Jr.; and Yuhasz, Kathleen M., to Colgate Palmolive Company. Stable antiplaque dentifrice. 4,632,825, Cl. 424-52.000.

Ferrall, Peter J., to C. R. Diffen Transport Pty. Ltd. Composite bed mattress. 4,631,768, Cl. 5-464.000.

Ferranti plc: *See—*
Mallinson, Andrew M., 4,633,104, Cl. 307-454.000.
McPherson, Hugh; and Blakely, John P., 4,633,185, Cl. 328-56.000.

Ferrebee, David H. Football place/field goal kicking device. 4,632,395, Cl. 273-55.00B.

Ferris, Dewayne J.: *See—*
Vink, Anthony B.; Asam, Edward F.; and Ferris, Dewayne J., 4,633,415, Cl. 364-521.000.

Fetzer, Gunter, to Erwin Sick GmbH. Rotatable mirror arrangement for generating a scanning beam which is displaced in steps parallel to itself. 4,632,500, Cl. 350-6.500.

Feyerl, Gunther; Kalteis, August; and Meyer, Karl, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Apparatus for unwinding a nonwoven fibrous web from a roll thereof. 4,632,325, Cl. 242-55.000.

Fiat Auto S.p.A.: *See—*
Panizza, Ettore; and Premoli, Ercole, 4,632,079, Cl. 123-179.00B.

FiberLAN, Inc.: *See—*
Jones, J. Richard; and Mann, Alan B., 4,633,246, Cl. 340-825.050.

Fichet-Bauche: *See—*
Rouzee, Daniel B., 4,631,935, Cl. 70-1.500.

Fickert, Werner: *See—*
Maurer, Manfred; Orth, Winifried; and Fickert, Werner, 4,632,991, Cl. 546-6.000.

Fields, Gary C.; and Stamos, Mark E., to Electrotel, Inc. Electronic micro-controller conversion module for step by step switching apparatus. 4,633,042, Cl. 379-284.000.

Figueroa, Luis: *See—*
Morrison, Charles B.; Figueroa, Luis; and Burghard. Andre, 4,633,477, Cl. 372-46.000.

Fildan, Gerhard. Buckle for securing a strap or the like. 4,631,784, Cl. 24-170.000.

Filterwerk Mann & Hummel GmbH: *See—*
Erdmannsdorfer, Hans, 4,632,682, Cl. 55-498.000.

Fimoff, Mark; and Zato, Thomas J., to Zenith Electronics Corporation. Keyboard controlled television receiver. 4,633,514, Cl. 455-151.000.

Findeklee, Heinz: *See—*
Kuker, Wolfgang; and Findeklee, Heinz, 4,632,039, Cl. 105-801.000.

Firmenich SA: *See—*
Buchi, George H.; and Wuest, Hans, 4,633,011, Cl. 560-119.000.

Firnhaber, Bernhard; Linke, Adolf; and Wetzel, Rolf, to Krupp-Koppers GmbH. Method of treatment of waste water obtained in a gasification plant during washing of raw gas. 4,632,766, Cl. 210-752.000.

Fischell, Robert E.: *See—*
Todd, Donald A.; and Fischell, Robert E., 4,632,114, Cl. 128-346.000.

Fischer, Elisabeth: *See—*
Eichler, Walter; Farber, Karlheinz; and Fischer, Elisabeth, 4,631,838, Cl. 34-57.00A.

Fischer, Herbert; and Kriebel, Manfred, to Metallgesellschaft AG. Process for removing hydrogen sulfide from exhaust gas and for producing sulfur by the Claus process. 4,632,819, Cl. 423-574.00R.

Fischer & Porter Company: *See—*
Schmoock, Roy F., 4,631,969, Cl. 73-861.120.

Fischer, Richard L., to Portec, Inc. Adjustable rail fastener assembly. 4,632,308, Cl. 238-265.000.

Fisher, George A.: *See—*
Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., 4,633,308, Cl. 358-112.000.

Fisher, Michael G.: *See—*
Patel, Ranjana C.; Stibbard, John H. A.; Fisher, Michael G.; and Baldock, Terence W., 4,632,895, Cl. 430-201.000.

Fisher & Paykel Limited: *See—*
Anderson, Iain A.; Gaelic, Christopher J.; and Elliott, Phillipa L., 4,631,771, Cl. 8-158.000.

Fishing Designs, Inc.: *See—*
Brackett, John E.; and Dahlberg, Larry J., 4,631,853, Cl. 43-23.000.

Fishpaugh, Charles E.: *See—*
Schlund, Gerald; Hagedorn, Leonhard; Hahn, A. David; and Fishpaugh, Charles E., 4,632,319, Cl. 241-37.500.

Fister, Robert V.; and Pledger, James R., to Eastman Kodak Company. Process for fabricating glass tooling. 4,632,898, Cl. 430-313.000.

Fitch, Theodore A.; and Steinberger, Michael L., to AT&T Bell Laboratories. Eye violation detectors. 4,633,465, Cl. 371-6.000.

Fitzpatrick, Michael H., to Northern Telecom Limited. Latching lever for printed circuit boards. 4,632,588, Cl. 403-16.000.

Fixtures Manufacturing Corporation: *See—*
Brown, Jerry C.; and Hamilton, Kenneth W., 4,632,458, Cl. 297-353.000.

Flaherty, John M., to GTE Products Corporation. Fluorescent lamps having improved lamp spectral output and maintenance and method of making same. 4,633,133, Cl. 313-489.000.

Flatscher, Georg; and Beckerbauer, Anton, to Dr. Johannes Heidenhain GmbH. Evaporator device for the evaporation of several materials. 4,632,059, Cl. 118-727.000.

Fletcher, Aaron N.: *See—*
McManis, George E.; Fletcher, Aaron N.; and Bliss, Dan E., 4,632,889, Cl. 429-218.000.

Fletcher, Daniel G.: *See—*
Karbassiyoon, Kamran; Foster, Philip E.; Akers, Francis I.; and Fletcher, Daniel G., 4,632,684, Cl. 65-2.000.

Flexwatt Corporation: *See—*
Grise, Frederick G. J., 4,633,068, Cl. 219-543.000.

Flinchbaugh, Bruce E., to Texas Instruments Incorporated. Method and apparatus for automatically determining pairs of turnings related to the same seismic event in adjacent seismic traces. 4,633,401, Cl. 364-421.000.

Flinchbaugh, Bruce E., to Texas Instruments Incorporated. Method and apparatus for automatically producing representations of three-dimensional horizons from processed seismic data. 4,633,402, Cl. 364-421.000.

Flotow, Richard A.; Heymann, Ronald E.; and Kummer, Martin E., to Dana Corporation. Clutch with cantilevered Belleville spring. 4,632,235, Cl. 192-70.270.

Flughafen Frankfurt/Main AG: *See—*
Doyen, Hans-Henning; and Huhn, Edgar, 4,631,910, Cl. 56-505.000.
Doyen, Hans-Henning; and Huhn, Edgar, 4,632,200, Cl. 180-53.700.

Fluid Engineering Products Limited: *See—*
Saunders, David H., 4,631,871, Cl. 51-439.000.

Flurry, Gregory A., to International Business Machines Corp. Real-time rub-out erase for an electronic handwriting facility. 4,633,436, Cl. 364-900.000.

FMC Corporation: *See—*
Brolin, Charles A.; Sheets, James B.; and Benson, Ryan H., 4,631,955, Cl. 73-158.000.
Cuhel, Leon L., 4,632,261, Cl. 212-175.000.
Olsen, David W.; Wittman, Leroy L.; Evenson, Marvin E.; and Kappel, Gary W., 4,632,262, Cl. 212-189.000.
Post, Steven W., 4,632,141, Cl. 137-327.000.

F+O Electronic Systems GmbH & Co.: *See—*
Obstfelder, Günther; Kreutze, Gerhard; and Luttig, Winfried, 4,632,845, Cl. 427-96.000.

Fog, Agner; and Atlung, Sven H. K., to Radiometer A/S. Ion-selective measuring electrode device and method for measuring hydrogen ion. 4,632,732, Cl. 204-1.00T.

Folland, Rickworth: *See—*
Dick, David A.; Folland, Rickworth; Smith, Desmond P.; and Staines, Glyn, 4,632,799, Cl. 264-292.000.

Folweiler, Robert C.: *See—*
Wilson, James L.; and Folweiler, Robert C., 4,632,574, Cl. 384-12.000.

Fontaine, Jean F. L.; and Graas, Maurice, to Goodyear Tire & Rubber Company, The. Pneumatic tires. 4,632,166, Cl. 152-209.00R.

Ford Motor Company: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.
Ezis, Andre; Beckwith, Elaine C.; and Copple, Warren B., 4,632,793, Cl. 264-58.000.
Moore, Thomas S., 4,632,207, Cl. 180-247.000.
Tarpley, Gerald W., Jr., 4,632,333, Cl. 242-186.000.

Forg, Franz: *See—*
Ploger, Walter; Kluppel, Hans-Jurgen; and Forg, Franz, 4,632,826, Cl. 424-52.000.

Forgione, Peter S.: *See—*
Singh, Balwant; and Forgione, Peter S., 4,633,010, Cl. 560-25.000.

Form, Ernst, to ANT Nachrichtentechnik GmbH. Optical cable testing. 4,632,544, Cl. 356-73.100.

Formal, Samuel B.; Baron, Louis S.; and Kopecko, Dennis J., to United States of America, Army. Oral vaccine for immunization against enteric disease. 4,632,830, Cl. 424-92.000.

Fortunato, Francis: *See—*
Gosset, Serge; Lumaret, Jean-Claude; Fortunato, Francis; and Huchette, Michel, 4,632,848, Cl. 427-154.000.

Fortune Ventures Inc.: *See—*
Thornson, Brandson R., 4,631,971, Cl. 74-84.00R.

Fosmire, Christopher R.: *See—*
Park, Hee C.; O'Brien, Jeffrey J.; and Fosmire, Christopher R., 4,632,869, Cl. 428-315.500.

Foster, Philip E.: *See—*
Karbassiyoon, Kamran; Foster, Philip E.; Akers, Francis I.; and Fletcher, Daniel G., 4,632,684, Cl. 65-2.000.

Fourny, Denise G. Screen to be disposed in front of a cathode ray screen, comprised by monofilaments forming micromeshes and having, on one surface, a translucent film. 4,633,322, Cl. 358-252.000.
Foust, Jeff A.: *See—*
Thornton, Dennis P.; Maceross, John S.; Foust, Jeff A.; and Cook, Keith R., 4,633,153, Cl. 318-280.000.
Fowles, Thomas A.; and Green, Brian C., to Baxter Travenol Laboratories, Inc. Overmolded port closure. 4,632,267, Cl. 215-253.000.
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., to Standard Oil Company, The. Process for reforming alcohols. 4,632,774, Cl. 252-373.000.
Franchetti, Victoria M.: *See—*
Keppel, Robert A.; and Franchetti, Victoria M., 4,632,915, Cl. 502-209.000.
Francois, Michel: *See—*
Etienne, Bernard; Francois, Michel; and Pierrel, Michel, 4,632,172, Cl. 164-301.000.
Francovitch, Thomas F. Non-penetrating roof membrane anchoring system. 4,631,887, Cl. 52-410.000.
Franklin Electric Co., Inc.: *See—*
Streater, August L., 4,633,157, Cl. 318-723.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Hansmann, Johann, 4,632,037, Cl. 104-7.200.
Frederick, W. Richard, to Integrated Power Components. Multiple function integrated capacitor. 4,633,368, Cl. 361-328.000.
Freedland, Yosef. Orthopedic fastener. 4,632,101, Cl. 128-92.0YW.
Freeman, Joseph W.; and Webb, Gary E., to International Business Machines Corporation. Reset system for microcomputer using program cartridges. 4,632,398, Cl. 273-148.00B.
Freienstein, Bernd; Neukirchner, Ernst Peter; Pilsak, Otmar; and Schlogl, Dietmar, to Robert Bosch GmbH. Method and device for target tracking of land vehicles. 4,633,407, Cl. 364-450.000.
Frenkel, Shmuel: *See—*
Peled, Nahum; and Frenkel, Shmuel, 4,633,196, Cl. 332-11.00D.
Frewer, Hans; Muller, Rainer; and Schiffers, Ulrich, to Kraftwerk Union Aktiengesellschaft. Gas turbine and steam power-generating plant with integrated coal gasification plant. 4,631,915, Cl. 60-39.120.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Bebber, Hans J.; Neuschutz, Dieter; and Rosser, Heinrich-Otto, 4,632,700, Cl. 75-10.140.
Jester, Willi; and Reiter, Norbert, 4,631,994, Cl. 82-36.00R.
Frieden, Peter; Kabelitz, Hans-Peter; Ronthaler, Karl-Heinz; and Thielicke, Jorg, to Leybold-Heraeus GmbH. Vacuum pump having an evacuated gear chamber. 4,632,650, Cl. 418-95.000.
Friedrich, Heinz-Dieter: *See—*
Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, 4,633,408, Cl. 364-474.000.
Frigon, Richard, to Sprague Devices, Inc. Reciprocating piston fluid powered motor. 4,632,013, Cl. 91-7.000.
Fritchman, Jack F., to White Consolidated, Inc. Refrigeration compressor. 4,632,644, Cl. 417-415.000.
Frizsche Dodge & Olcott Inc.: *See—*
Lerner, David I., 4,633,009, Cl. 560-19.000.
Fromm, Dietrich; Klingshirn, Helmut; Gosslar, Achim; and Heider, Jurgen, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High-pressure discharge lamp with low power input. 4,633,136, Cl. 313-623.000.
Frommherz, Egon, to Rotzler GmbH & Co. Spezialfabrik fur Seilwinden und Hebezeuge. Winch having a drive disc connectable to a rope drum in dependence upon the load applied to the rope. 4,632,363, Cl. 254-309.000.
Frost, Charles A.: *See—*
Ekdahl, Carl A., Jr.; and Frost, Charles A., 4,633,172, Cl. 324-126.000.
Frost, Charles E., Jr.: *See—*
Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., 4,632,686, Cl. 65-18.100.
Fryover, Myrne E.: *See—*
Mawby, Harold S.; Harris, Duane H.; and Fryover, Myrne E., 4,632,280, Cl. 222-275.000.
Fu, Chia-Min: *See—*
Bertus, Brent J.; and Fu, Chia-Min, 4,632,748, Cl. 208-120.000.
Fuchs Systems, Inc.: *See—*
Bleimann, Karl R., 4,633,480, Cl. 373-74.000.
Fugett, Mary B. Hospital bed with toilet facility. 4,631,762, Cl. 5-90.000.
Fuhr, Karl; Muller, Friedemann; and Eicher, Theobald, to Bayer Aktiengesellschaft. Metal oxides on organic, halogen-containing carriers as flameproofing agents. 4,632,951, Cl. 524-204.000.
Fuji Electric Co., Ltd.: *See—*
Izumi, Akio; and Tanaka, Hideyuki, 4,633,319, Cl. 358-227.000.
Watanabe, Yasuo; and Kanno, Hideomi, 4,632,315, Cl. 241-26.000.
Watanabe, Yasuo; and Nakamura, Mitsuhiro, 4,632,316, Cl. 241-26.000.
Fuji Pack System Ltd.: *See—*
Takamura, Yoshiyuki, 4,631,903, Cl. 53-466.000.
Fuji Photo Film Co., Ltd.: *See—*
Miyoshi, Takahito; Fujiyama, Masaaki; and Matsufuji, Akihiro, 4,632,868, Cl. 428-328.000.
Nakayama, Keiji, 4,633,305, Cl. 358-101.000.
Noguchi, Masaru; and Ishikawa, Hiromi, 4,632,499, Cl. 350-6.200.
Oishi, Kengo; and Suzuki, Osamu, 4,633,354, Cl. 360-132.000.
Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, 4,632,878, Cl. 428-425.900.
Shiga, Koji, 4,632,540, Cl. 355-68.000.
Takeda, Keiji, 4,632,899, Cl. 430-292.000.
Utsugi, Mikio, 4,633,306, Cl. 358-102.000.
Fuji Photo Optical Co., Ltd.: *See—*
Yamakawa, Hiromitsu, 4,632,520, Cl. 350-446.000.
Fuji Xerox Co., Ltd.: *See—*
Kato, Hiroshi, 4,633,506, Cl. 382-56.000.
Kurata, Masami; and Saitoh, Hiroyuki, 4,633,314, Cl. 358-163.000.
Miroku, Yoshihiko, 4,633,268, Cl. 346-75.000.
Saitoh, Hiroyuki, 4,633,301, Cl. 358-75.000.
Fujii, Tadayoshi: *See—*
Arai, Shokichi; and Fujii, Tadayoshi, 4,632,071, Cl. 123-41.860.
Fujikawa, Toshiaki: *See—*
Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoro, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, 4,633,337, Cl. 360-57.000.
Fujimori, Hiroyoshi: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,633,303, Cl. 358-98.000.
Fujinaka, Hiroshi; and Terasawa, Masami, to Kyocera Corporation. Process for preparation of glazed ceramic substrate and glazing composition used therefor. 4,632,846, Cl. 427-96.000.
Fujioka, Shuji: *See—*
Yokota, Mitsuru; Goshima, Tsutomu; and Fujioka, Shuji, 4,632,968, Cl. 526-279.000.
Fujioka, Yoshihisa: *See—*
Yamamoto, Koichi; and Fujioka, Yoshihisa, 4,633,522, Cl. 455-603.000.
Fujisawa, Yoshiaki: *See—*
Kawakami, Naoya; and Fujisawa, Yoshiaki, 4,632,645, Cl. 417-417.000.
Fujita, Haruyasu; Honma, Kenji; and Ogawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Body banking suspension apparatus for a vehicle. 4,632,413, Cl. 280-112.00A.
Fujita, Shigeo; Matsuda, Yoshinobu; and Sasaki, Akio, to Sumitomo Chemical Company, Limited. Vapor phase epitaxial growth method of zinc selenide and zinc selenide-sulphide by organometallic chemical vapor deposition. 4,632,711, Cl. 148-175.000.
Fujita, Takayuki; Negishi, Shigetoshi; and Tanaka, Kunio, to Matsushita Electric Industrial Co., Ltd. Automatic apparatus for mounting electronic parts. 4,631,816, Cl. 29-740.000.
Fujitsu Limited: *See—*
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.
Mikami, Tomohisa; and Noda, Tsugio, 4,633,269, Cl. 346-76.0PH.
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,632,806, Cl. 420-479.000.
Takeda, Yukio; Nakamura, Hiroshi; and Fukuda, Eisuke, 4,633,484, Cl. 375-77.000.
Fujiwara, Kenichi, to Nippondenso Co., Ltd. Expansion valve. 4,632,305, Cl. 236-92.00B.
Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Fujiyama, Masaaki; and Matsufuji, Akihiro, 4,632,868, Cl. 428-328.000.
Fukada, Tsuyoshi: *See—*
Ohmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, 4,632,509, Cl. 350-283.000.
Fukazawa, Minoru: *See—*
Mori, Shigeto; and Fukazawa, Minoru, 4,632,794, Cl. 264-87.000.
Fukuda, Eisuke: *See—*
Takeda, Yukio; Nakamura, Hiroshi; and Fukuda, Eisuke, 4,633,484, Cl. 375-77.000.
Fukuhara, Hiroshige, to Nissan Motor Company, Limited. Loran-C signal receiving apparatus. 4,633,260, Cl. 342-389.000.
Fukui, Izumu: *See—*
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, 4,633,120, Cl. 310-328.000.
Fukui, Toshiyasu: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Uno, Teruo; and Ikeda, Hiroshi, 4,632,885, Cl. 428-654.000.
Fukunaga, Takao; and Inoue, Akira, to Kabushiki Kaisha Daikin Seisakusho. Torque converter equipped with lockup control unit. 4,632,233, Cl. 192-3.300.
Fukunaga, Takao: *See—*
Tamura, Kazuhisa; Takeshita, Shigeru; and Fukunaga, Takao, 4,631,979, Cl. 74-730.000.
Fukunaka, Shiro: *See—*
Jinba, Terumasa; Fukunaka, Shiro; Anan, Tatsuro; and Shiotani, Nobuo, 4,632,733, Cl. 204-28.000.
Fukushi, Yuzo: *See—*
Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, 4,633,046, Cl. 370-32.100.
Fukutani, Masanori; Miwa, Naoto; Ito, Kazuyuki; and Ito, Keiji, to Nippondenso Co., Ltd. Exhaust gas purifying filter and production of the same. 4,632,683, Cl. 55-523.000.
Fullenkamp, Eugene H., to Hill-Rom Company, Inc. Radially expandable O-ring connector. 4,632,591, Cl. 403-227.000.
Fuller Company: *See—*
Kocon, Florian T.; and Geiger, Kurt A., 4,631,778, Cl. 16-337.000.
Furubayashi, Hisatoshi: *See—*
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,632,879, Cl. 428-522.000.
Furukawa Aluminum Co., Ltd.: *See—*
Iwata, Masahiro; Shirai, Teruhito; and Watanabe, Toshio, 4,631,949, Cl. 72-270.000.
Furukawa, Kaoru: *See—*
Sakaue, Hironobu; and Furukawa, Kaoru, 4,633,159, Cl. 320-39.000.

Furuki, Tsuneo: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.
Fusco, James V.: *See—*
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.
Fusion Systems Corporation: *See—*
Lynch, Donald; Kamarehi, Mohammad; and Ury, Michael G., 4,633,140, Cl. 315-248.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Kishino, Takao; and Mizohata, Tadashi, 4,633,134, Cl. 313-497.000.
Futakuchi, Yorio, to Yamaha Hatsudoki Kabushiki Kaisha. Camshaft mounting mechanism for DOHC engine of motorcyle. 4,632,073, Cl. 123-90.270.
Fyler, Donald C.: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.
G-C Dental Industrial Corporation: *See—*
Hirota, Kazuo; Akahane, Shoji; and Tomioka, Kentaro, 4,632,824, Cl. 424-49.000.
G.D. Societa per Azioni: *See—*
Mattei, Riccardo; and De Martis, Giancarlo, 4,631,900, Cl. 53-448.000.
Gaelic, Christopher J.: *See—*
Anderson, Iain A.; Gaelic, Christopher J.; and Elliott, Phillipa L., 4,631,771, Cl. 8-158.000.
Gagas, John M., to Erie Manufacturing Co. Water conditioner rotary valve. 4,632,150, Cl. 137-625.460.
Gagnon, David G., to Audio Sentry Manufacturing, Inc. Sonic detector having digital sampling circuit. 4,633,234, Cl. 340-566.000.
Gal, Pal: *See—*
Turcsany, Jozsef; Gal, Pal; and Borbas, Istvan, 4,632,007, Cl. 84-487.000.
Gale, Ronald P.: *See—*
Fan, John C. C.; Tsaur, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 4,632,712, Cl. 148-175.000.
Galiasso, Roberto: *See—*
Arias, Beatriz; Kum, Humberto; and Galiasso, Roberto, 4,632,914, Cl. 502-211.000.
Gallagher, Nicholas D.; Sternasty, Richard S.; and James, Richard A., to Kimberly-Clark Corporation. Releasable adhesive sheet material. 4,632,872, Cl. 428-350.000.
Gallardo, Mike. Security window gratings with safety locks. 4,631,862, Cl. 49-56.000.
Gallucci, Robert R., to General Electric Company. Hydroxyl group graft modified polyolefins. 4,632,962, Cl. 525-282.000.
Gallusser, David O.: *See—*
Punako, Stephen; Gallusser, David O.; and Joslyn, Carl R., 4,632,482, Cl. 339-59.00M.
Galvagni, John: *See—*
Ritchie, Kim; Hopkins, Lonnie; and Galvagni, John, 4,633,175, Cl. 324-158.00F.
Gambello, Vincent J. Adjustable article display apparatus. 4,632,256, Cl. 211-50.000.
Gamm, Paul B., to Jung Corporation. Stretchable tubular brace for knee or elbow and method of construction. 4,632,106, Cl. 128-165.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Closure means attachment for footwear. 4,631,840, Cl. 36-50.000.
Gandy, Richard: *See—*
Boncan, Virgilio G.; and Gandy, Richard, 4,632,186, Cl. 166-293.000.
Ganmill Limited: *See—*
Lederman, Hans J., 4,631,761, Cl. 5-81.00R.
Gannon, James J. Method of making food from spent grains. 4,632,833, Cl. 426-242.000.
Gante, Joachim; Prucher, Helmut; Wahlig, Helmut; and Rudolph, Volkmar, to Merck Patent Gesellschaft mit beschrankter Haftung. Sulfur-containing imidazole derivatives. 4,632,933, Cl. 514-399.000.
Ganzi, Gary C.: *See—*
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., 4,632,745, Cl. 204-301.000.
Garabedian, Michael E.; and Tims, Jerry L., to Dexide, Inc. Mild antimicrobial detergent composition. 4,632,772, Cl. 252-106.000.
Garbe, Manfred. Beverage dispenser. 4,632,274, Cl. 221-96.000.
Garcia, Maria L.; and Malofsky, Bernard M., to Loctite Corporation. Anaerobic sealant unaffected by water contamination. 4,632,945, Cl. 523-176.000.
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., to Exxon Research & Engineering Co. Halogenated butyl rubber. 4,632,963, Cl. 525-332.300.
Gardner, Norman A.; and Voticky, Michael P., to Nocoi Inc. Method of rendering documents resistant to photocopying and anti-copying paper therefor. 4,632,429, Cl. 283-91.000.
Garland Manufacturing Co.: *See—*
Otto, Ronald F.; and Kempel, John J., 4,631,866, Cl. 49-504.000.
Garutso, Sonia. Brassiere with stress breaker inserts. 4,632,118, Cl. 128-477.000.
Gas Research Institute: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,632,191, Cl. 175-19.000.
Gater, Arnold C.; and Hu, Thomas S. S., to Kwikset Corporation. Knob assembly for doorlatches including free knob rotation and front end loading. 4,631,944, Cl. 70-472.000.
Gaudiano, Giorgio: *See—*
Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., 4,632,922, Cl. 514-236.000.
Gautier, Christian J. F. Method and device for secure transmission and of television pictures. 4,633,310, Cl. 358-119.000.
Gay, Adrian C.: *See—*
Bresenham, Jack E.; Bowater, Ronald J.; Gay, Adrian C.; and Sheen, Norman R., 4,633,243, Cl. 340-732.000.
Gazapo Santa-Olalla, Jose L.; and Gonzalez Feliu, Juan, to Empresa Nacional del Aluminio, S.A. Process for the electrolytic coloring of aluminum or aluminum alloys. 4,632,735, Cl. 204-37.600.
Gearhart Australia Limited: *See—*
Tucker, Michael C., 4,632,605, Cl. 405-259.000.
Gecs, Jan, to Zavody Tazkeho Strojarstva, Narodny Podnik. Self-locking flat clamping band. 4,631,782, Cl. 24-16.0PB.
Geczy, Bela, to Smith International, Inc. In-hole motor with bit clutch and circulation sub. 4,632,193, Cl. 175-65.000.
Geiger, Kurt A.: *See—*
Kocon, Florian T.; and Geiger, Kurt A., 4,631,778, Cl. 16-337.000.
Geil, James A., to Sherwood Medical Company. Tube and material for use in laser surgery. 4,632,108, Cl. 128-207.140.
Geis, Michael W.: *See—*
Smith, Henry I.; Atwater, Harry A.; Thompson, Carl V.; and Geis, Michael W., 4,632,723, Cl. 156-617.00R.
Geisen, Karl: *See—*
Vertesy, Laszlo ; Bender, Rudolf; Fehlhaber, Hans-Wolfram; and Geisen, Karl, 4,632,917, Cl. 514-54.000.
Geissen, Rolf; and Siebert, Wolfgang, to Metallgesellschaft AG. Method of mixing a finely divided liquid with a gas to produce a mixture with the liquid in excess of its explosive limit. 4,632,998, Cl. 549-248.000.
Gem Electric Manufacturing Co., Inc.: *See—*
Jacobson, Sol M., 4,632,479, Cl. 339-36.000.
Gemini Research, Inc.: *See—*
Dixon, Robert E.; and McDiarmid, James, 4,632,058, Cl. 118-725.000.
Genco, Jerry J.; and Smith, Norman, to Rotron, Inc. Motor with stator on printed circuit assembly. 4,633,110, Cl. 310-71.000.
Genentech, Inc.: *See—*
Bock, Susan C.; and Lawn, Richard M., 4,632,981, Cl. 530-393.000.
General Electric: *See—*
Jenkins, Thomas E.; and Cushing, Donald S., 4,632,470, Cl. 312-214.000.
General Electric Company: *See—*
Akins, Robert B., 4,633,135, Cl. 313-594.000.
Casteel, Jordan B.; D'Atre, John D.; Ritter, Allen M.; and Wadding, Kenneth W., 4,633,241, Cl. 340-645.000.
Derderian, Scott K., 4,633,116, Cl. 310-214.000.
Dillon, Edward J., 4,633,163, Cl. 323-277.000.
Gallucci, Robert R., 4,632,962, Cl. 525-282.000.
Gullberg, Grant T.; and Pelc, Norbert J., 4,633,398, Cl. 364-414.000.
Hines, William R., 4,631,914, Cl. 60-39.050.
Jones, Donald W., 4,631,808, Cl. 29-599.000.
Kelm, Walter H., 4,631,993, Cl. 82-1.00C.
Payne, Thomas R.; and Schneider, David A., 4,633,067, Cl. 219-483.000.
Reynolds, Kenneth R., 4,633,114, Cl. 310-194.000.
Scott, Curtis E.; and McVey, Charles I., 4,633,137, Cl. 313-636.000.
General Foods Corporation: *See—*
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,633,006, Cl. 560-1.000.
General Motors Corporation: *See—*
Almond, Roger L., 4,632,171, Cl. 164-255.000.
Keesling, William A.; and Metzger, William J., 4,632,348, Cl. 248-222.100.
Kennedy, Richard A.; and Aldridge, Fredrick A., 4,633,518, Cl. 455-242.000.
Thornton, Dennis P.; Maceross, John S.; Foust, Jeff A.; and Cook, Keith R., 4,633,153, Cl. 318-280.000.
General Pneumatics Corporation: *See—*
Walker, Graham, 4,631,928, Cl. 62-514.0JT.
General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi; and Kayama, Seiji, 4,633,264, Cl. 343-786.000.
General Scanning, Inc.: *See—*
Glynn, Paul E., 4,632,501, Cl. 350-6.600.
General Signal Corporation: *See—*
Watson, Charles W., Jr.; and Siegl, Christopher M., 4,633,421, Cl. 364-569.000.
Genik-Sas-Berezowsky, Roman M.; and Weir, Donald R., to Sherritt Gordon Mines Limited. Process for the recovery of silver from a residue essentially free of elemental sulphur. 4,632,701, Cl. 75-118.00R.
Genuit, Klaus, to Head Stereo GmbH, Kopfbezogene Aufnahmeund. Artificial head measuring system. 4,631,962, Cl. 73-585.000.
Geo-Centers, Inc.: *See—*
Griffith, James R.; and O'Rear, Jacques G., 4,633,023, Cl. 568-662.000.
Geo. A. Hormel & Co.: *See—*
Leining, Lyndon R., 4,631,780, Cl. 17-21.000.
Georgiou, Christos J.; and Ravn, Anders P., to International Business Machines Corp. Distributed arbitration for multiple processors. 4,633,394, Cl. 364-200.000.

Geraci, Alexander. Walking exercise apparatus. 4,632,385, Cl. 272-70.000.

Gerber Products Company: *See—*
Meeker, Paul K.; and Sedlack, Mark A., 4,632,460, Cl. 297-467.000.

Gerding, Thomas W. Conduit carrying device. 4,632,442, Cl. 294-16.000.

Gergely, Alex S.: *See—*
Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., 4,632,131, Cl. 131-355.000.

Gertzman, Gloria B. Nipple for a baby who has a cleft in its hard palate. 4,632,263, Cl. 215-11.00R.

Gewerkschaft Eisenhutte Westfalia: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.

GFL Formteile-und Larmschutz Technik GmbH & Co.: *See—*
Olpp, Hans; and Braun, Heini, 4,632,408, Cl. 280-12.00K.

Ghiretti, Aldo; and Pallotti, Antonio, to O.C.M.E. S.p.A. Officina Costruzioni Meccaniche Emiliana. Cartoning machine which wraps cartons about preformed blocks of objects. 4,631,895, Cl. 53-207.000.

Giaccari, Ennio, to Selenia, Industrie Eletroniche Associate, S.p.A. Circuit arrangement for post-detection suppression of spurious radar echoes. 4,633,254, Cl. 342-91.000.

Giacone, Felice: *See—*
Becchi, Raffaele; and Giacone, Felice, 4,632,584, Cl. 400-356.000.

Giarda, Silvio; Cesti, Pietro; Confalonieri, Giovanni; and Piccardi, Paolo, to VETEM S.p.A. Quinazolinone derivatives which are active against coccidiosis. 4,632,926, Cl. 514-259.000.

Giesl-Gieslingen, Adolph; and Jackson, Harry G., to Jackson, Harry G., Jr. Cooling device for railway wheels. 4,632,445, Cl. 295-1.000.

Giller, Henricus F. J. I.; and Heijboer, Jacobus A. E. W., to U.S. Philips Corporation. Electric reflector lamp. 4,633,126, Cl. 313-113.000.

Gilliam, Dana: *See—*
Caveney, Robert; Gilliam, Dana; Chan, Melvin; and Bailey, Michael, 4,633,413, Cl. 364-500.000.

Giorni, Gastone, to Brevetti Odantoiatrici S.n.c. di Miliani Maria Pia & C. Surgical retractor. 4,632,093, Cl. 128-12.000.

Gipp, Gregory H.; and Szentes, John F., to Caterpillar Inc. Absolute and incremental optical encoder. 4,633,224, Cl. 340-347.00P.

Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., to Millipore Corporation. Electrodeionization apparatus. 4,632,745, Cl. 204-301.000.

Giuliani, Karen A.: *See—*
Giuliani, Robert L.; Giuliani, Mark A.; and Giuliani, Karen A., 4,632,081, Cl. 123-198.00F.

Giuliani, Mark A.: *See—*
Giuliani, Robert L.; Giuliani, Mark A.; and Giuliani, Karen A., 4,632,081, Cl. 123-198.00F.

Giuliani, Robert L.; Giuliani, Mark A.; and Giuliani, Karen A. Giuliani modular engine improvement. 4,632,081, Cl. 123-198.00F.

Giulie, James E. CRT shield. 4,633,324, Cl. 358-255.000.

Givler, Gregory C.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,632,191, Cl. 175-19.000.

GKN Automotive Components Inc.: *See—*
Krude, Werner, 4,632,203, Cl. 180-73.300.

GKN-Stenman AB: *See—*
Sjunnesson, Bengt O., 4,631,941, Cl. 70-337.000.

Glasgo, Marion L. Clamp-on marking template and saw guide for making dovetail joints. 4,632,159, Cl. 144-85.000.

Gledhill, David E.: *See—*
McDonald, James A.; Gledhill, David E.; and Savich, Peter P., 4,632,667, Cl. 493-187.000.

Glick, F. Keith: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.

Glover, Brian H., to Grundy (Teddington) Limited. Non-return valves. 4.632,151, Cl. 137-854.000.

Glynn, Paul E., to General Scanning, Inc. Resonant electromechanical oscillator. 4,632,501, Cl. 350-6.600.

GNB Incorporated: *See—*
Kump, William H.; and Jergl, Joseph J., 4,632,888, Cl. 429-187.000.

Gnyra, Bohdan, to Alcan International Limited. Method of joining pipes by explosive welding using disintegrating anvil. 4,632,292, Cl. 228-107.000.

Goble, Marlowe E.: *See—*
Somers, W. Karl; and Goble, Marlowe E., 4,632,100, Cl. 128-92.000.

Goddard, Robert M.: *See—*
Callahan, Michael; Chester, John K.; and Goddard, Robert M., 4,633,161, Cl. 323-242.000.

Goeb, Robert; and Silber, Nathaniel L., to ITT Corporation. Automatic phasing apparatus for synchronizing digital data and timing signals. 4,633,487, Cl. 375-118.000.

Goertzel, Gerald; and Mitchell, Joan L., to International Business Machines Corporation. Symmetrical optimized adaptive data compression/transfer/decompression system. 4,633,490, Cl. 375-122.000.

Goessler, Gerhard; Wilde, Eugen; Essig, Willi; and Hanss, Edgar, to E.G.O. Elektro-Gerate Blanc u. Fischer. Temperature limiter for a glass-ceramic cooking unit. 4,633,238, Cl. 340-593.000.

Goetz, Paul W.; and Merley, Kim R., to United States of America, Air Force. Flexible (multi-mode) waveform generator. 4,633,198, Cl. 332-22.000.

Gogniat, Paul, to Montres Rado S.A. Timepiece with calendar. 4,632,569, Cl. 368-35.000.

Goldberg, Harris A.: *See—*
Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., 4,632,775, Cl. 252-502.000.

Goldberg, Michael L. Hand tool/protective device. 4,631,770, Cl. 7-167.000.

Goldshtein, Lev I.; Kalashov, Valentin P.; Pleshkanovsky, Jury P.; Didenko, Vladimir F.; and Khaitin, Boris S. Method of obtaining low temperatures and apparatus for implementing the same. 4,631,926, Cl. 62-115.000.

Goldstein, Theodore P., to Mobil Oil Corporation. Shape-selective photoassisted heterogenous catalyst compositions. 4,632,911, Cl. 502-62.000.

Gomez, Ruben: *See—*
Cosyns, Max; and Gomez, Ruben, 4,632,678, Cl. 55-180.000.

Goncalves, Antonin L., to L'Oreal. Assembly for the packaging and application of a varnish-type substance. 4,632,240, Cl. 206-15.200.

Gonzalez Feliu, Juan: *See—*
Gazapo Santa-Olalla, Jose L.; and Gonzalez Feliu, Juan, 4,632,735, Cl. 204-37.600.

Gonzi, Mario. Actuator of linear motion, with a rack-like member and a rotating member. 4,633,111, Cl. 310-80.000.

Good, Daniel L.: *See—*
Beck, John L.; Good, Daniel L.; and Stacer, Daniel R., 4,633,349, Cl. 360-97.000.

Goodyear Tire & Rubber Company, The: *See—*
Bergomi, Angelo; and Tazuma, James J., 4,632,988, Cl. 544-85.000.
Fontaine, Jean F. L.; and Graas, Maurice, 4,632,166, Cl. 152-209.00R.
Hsu, Wen-Liang, 4,632,913, Cl. 502-202.000.

Gordon, Pat L.; Haskell, Barin G.; and Schmidt, Robert L., to AT&T Bell Laboratories. Signal processor (system) for reducing bandwidth and for multiplexing a plurality of signals onto a single communications link. 4,633,311, Cl. 358-133.000.

Gordon, Stephen S., to United States of America, National Aeronautics and Space Administration. Welding torch with arc light reflector. 4,633,060, Cl. 219-130.010.

Gordon, Tsvi J.; Shmuel, Sorek; and Moseinco, David, to State of Israel, Ministry of Defence, Israel Military Industries, The. Detonator for rifle grenades or the like. 4,632,033, Cl. 102-252.000.

Goshima, Tsutomu: *See—*
Yokota, Mitsuru; Goshima, Tsutomu; and Fujioka, Shuji, 4,632,968, Cl. 526-279.000.

Gosset, Serge; Lumaret, Jean-Claude; Fortunato, Francis; and Huchette, Michel, to Roquette Freres. Composition and process for forming a temporary protective coating on an article and article so-protected. 4,632,848, Cl. 427-154.000.

Gosslar, Achim: *See—*
Fromm, Dietrich; Klingshirn, Helmut; Gosslar, Achim; and Heider, Jurgen, 4,633,136, Cl. 313-623.000.

Goto, Taizan; and Sekiya, Isao, to Toshiba Machine Co. Ltd. Barrel type of epitaxial vapor phase growing apparatus. 4,632,060, Cl. 118-730.000.

Gotoh, Akio; Yamamoto, Kazuo; and Ishikawa, Tuguo, to Tokyo Shibaura Denki Kabushiki Kaisha. Diversity reception system in a portable radio apparatus. 4,633,519, Cl. 455-277.000.

Gottlieb, Robert G.: *See—*
Carr, Myra J.; Brosig, Frances H.; and Gottlieb, Robert G., 4,631,767, Cl. 5-449.000.

Goudsche Machinefabriek B.V.: *See—*
van der Schoot, Peter W. C., 4,632,025, Cl. 99-348.000.

Gould Inc.: *See—*
Stowe, David W.; and Kopera, Paul M., 4,632,513, Cl. 350-320.000.
Thompson, Stephen C., 4,633,119, Cl. 310-325.000.

Goulin, Maurice: *See—*
Adrian, Robert; and Goulin, Maurice, 4,632,440, Cl. 292-229.000.

Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, to Fujitsu Limited. Mechanical filter. 4,633,204, Cl. 333-186.000.

Govaert, Johan A.; and Town. Joseph E., to Baird Corporation. Radioactivity detection system. 4,632,123, Cl. 128-659.000.

Goyne, Thomas S. Grease pumps. 4,632,648, Cl. 417-502.000.

Graas, Maurice: *See—*
Fontaine, Jean F. L.; and Graas, Maurice, 4,632,166, Cl. 152-209.00R.

Graetz, Herbert; and Unterreiner, Ronald C., to Blair Industries, Inc. Method of making book style albums. 4,632,717, Cl. 156-245.000.

Graham, Gary, to U.S. Philips Corporation. Self-excited alternator. 4,633,160, Cl. 322-20.000.

Graham, Randall C., to Essex Group, Inc. Apparatus for removing fines from copper wires. 4,631,773, Cl. 15-4.000.

Graham, Robert G. Ceramic heat exchanger. 4,632,181, Cl. 165-158.000.

Graphic Controls Corporation: *See—*
Hubbard, James R.; and Idell, Frank V., 4,633,275, Cl. 346-140.00R.

Grassmuck, Volker: *See—*
Ticks, Gerd-Heinz; and Grassmuck, Volker, 4,632,370, Cl. 267-8.00R.

Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, to Robert Bosch GmbH. Dual-circuit pressure medium brake system. 4,632,466, Cl. 303-7.000.

Grawe, John G.: *See—*
Lomasney, Henry L.; Grawe, John G.; and Sheth, Vikram K., 4,632,847, Cl. 427-154.000.

Gray, George W.; and Nicholas, Beatrice M., to Secretary of State for Defence in Her Britannic Majesty'Government of the United Kingdom of Great Britain and Nothern Ireland, The. Heterocyclically substituted ethanes and their use in liquid crystal materials and devices. 4,632,515, Cl. 350-350.00R.

Great Central Mines Ltd.: *See—*
Beattie, Morris J. V.; Bacon, William G.; and Raudsepp, Rein, 4,632,738, Cl. 204-107.000.

Greco, Nicholas P., to Koppers Company, Inc. Process for preparation of trisubstituted phenols. 4,633,022, Cl. 568-660.000.

Green, Brian C.: *See—*
Fowles, Thomas A.; and Green, Brian C., 4,632,267, Cl. 215-253.000.

Green, David T.; and Noiles, Douglas G., to United States Surgical Corporation. Surgical stapler apparatus. 4,632,290, Cl. 227-19.000.

Green, Marion. Tornado early warning device. 4,632,052, Cl. 116-70.000.

Greeson, Jeffrey A.; and Zweifel, Terry L., to Sperry Corporation. Automatic deceleration of aircraft during descent. 4,633,404, Cl. 364-433.000.

Gretag Aktiengesellschaft: *See—*
Kunz, Rino E., 4,633,074, Cl. 250-201.000.

Griffin, Jewell C., Jr. Bleacher structure. 4,631,874, Cl. 52-8.000.

Griffith, James R.; and O'Rear, Jacques G., to Geo-Centers, Inc. Fluoroacrylate ester, polymer thereof, and process of making the same. 4,633,023, Cl. 568-662.000.

Gripper, Inc.: *See—*
Reneau, Bobby J., 4,632,432, Cl. 285-24.000.

Grise, Frederick G. J., to Flexwatt Corporation. Electrical heating device. 4,633,068, Cl. 219-543.000.

Groitzsch, Dieter: *See—*
Knoke, Jurgen; Jager, Helmut; Dekant, Ludwig; and Groitzsch, Dieter, 4,632,858, Cl. 428-287.000.

Groothaert, Luc A. J.: *See—*
Meeus, Marcel L.; Strauven, Yvan A. J.; and Groothaert, Luc A. J., 4,632,699, Cl. 75-0.50B.

Grosser, Morton: *See—*
Rosen, Joseph M.; and Grosser, Morton, 4,632,116, Cl. 128-419.00R.

Grote & Hartmann GmbH & Co. KG: *See—*
Reinertz, Rudolf, 4,631,822, Cl. 29-861.000.

Groupement pour l'Industrialisation du Batiment "G.I.B.A.T.": *See—*
Moulet, Jean M. M., 4,632,796, Cl. 264-253.000.

Gruen, Dieter M.; Pellin, Michael J.; and Young, Charles E., to United States of America, Energy. High efficiency direct detection of ions from resonance ionization of sputtered atoms. 4,633,084, Cl. 250-306.000.

Gruesbeck, William G.: *See—*
Repperger, Daniel W.; McCollor, Donald G.; and Gruesbeck, William G., 4,632,341, Cl. 244-230.000.

Grumman Aerospace Corporation: *See—*
Connelly, John J., 4,632,508, Cl. 350-174.000.
Parrish, William J., 4,633,086, Cl. 250-338.000.

Grund, Christian: *See—*
Lemelson, Jerome H.; and Grund, Christian, 4,632,538, Cl. 355-14.00R.

Grundei, Hans; and Henssge, Ernst-Joachim, to S & G Implants GmbH. Orthopedic brace for knee joints. 4,632,098, Cl. 128-80.00C.

Grundken, Dieter: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.

Grundy (Teddington) Limited: *See—*
Glover, Brian H., 4,632,151, Cl. 137-854.000.

Gruppo Lepetit S.p.A.: *See—*
Trani, Aldo, 4,632,994, Cl. 548-543.000.

Grust, Donald B.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

GTE Communication Systems Corporation: *See—*
Blackburn, Tom L., 4,633,459, Cl. 370-13.000.
Holden, James R., 4,633,039, Cl. 379-32.000.
Reimer, William A., 4,633,176, Cl. 324-158.00P.

GTE Laboratories Incorporated: *See—*
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,631,806, Cl. 29-589.000.
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,633,290, Cl. 357-42.000.
Wilson, James L.; and Folweiler, Robert C., 4,632,574, Cl. 384-12.000.

GTE Products Corporation: *See—*
Brown, David R.; Frost, Charles E., Jr.; and White, Kenneth A., 4,632,686, Cl. 65-18.100.
Flaherty, John M., 4,633,133, Cl. 313-489.000.
Mickelson, N. Peter; and Shively, Edward H., 4,633,359, Cl. 361-119.000.
Mickelson, Nils P., 4,633,360, Cl. 361-119.000.

GTE Service Corporation: *See—*
Yount, Robert L., 4,633,043, Cl. 379-33.000.

GTE Valeron Corporation: *See—*
Stashko, Daniel R., 4,632,593, Cl. 403-316.000.

Guerin, Yves: *See—*
Besson, Rene ; and Guerin, Yves, 4,633,156, Cl. 318-696.000.

Gueugnon, Catherine, to Cii Honeywell Bull (Societe Anonyme). Optical focusing apparatus for the reading of a data medium moving past it. 4,633,450, Cl. 369-13.000.

Guim, Aurelio R: *See—*
Guim, Raul; and Guim, Aurelio R, 4,633,240, Cl. 340-638.000.

Guim Industries, Inc.: *See—*
Guim, Raul; and Guim, Aurelio R, 4,633,240, Cl. 340-638.000.

Guim, Raul; and Guim, Aurelio R, to Guim Industries, Inc. Lightened circuit breaker. 4,633,240, Cl. 340-638.000.

Gullberg, Grant T.; and Pelc, Norbert J., to General Electric Company. Attenuation compensated emission reconstruction with simultaneous attenuation factor evaluation. 4,633,398, Cl. 364-414.000.

Gunnerson, Robert E., to Sunsweet Growers, Inc. Apparatus and method for compressing pliable articles. 4,632,027, Cl. 99-485.000.

Gunter, James C., to Robertshaw Controls Company. Leakproof joint construction and method and apparatus for making the same. 4,632,592, Cl. 403-285.000.

Gunter, William D., Jr.; and De Young, Anemarie, to United States of America, National Aeronautics and Space Administration. Projection lens scanning laser velocimeter system. 4,632,548, Cl. 356-28.500.

Gutierrez, Antonio; Brownawell, Darrell W.; Bloch, Ricardo; and Johnston, Jack E., to Exxon Research & Engineering Co. Ethylene copolymer viscosity index improver-dispersant additive useful in oil compositions. 4,632,769, Cl. 252-48.600.

Gutschmit, Alan; and Queen, John C., to Microtrak, Inc. Efficiency monitoring device for textile machines and the like. 4,631,930, Cl. 66-1.00R.

Gutschmit, Alan, to Mayer & Cie. GmbH & Co. Strand storing and delivering device. 4,632,324, Cl. 242-47.010.

Guzman, Horacio J. Exercise enhancing device. 4,632,387, Cl. 272-116.000.

Haarmann & Reimer GmbH: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.

Haberkern, Ottmar; and Kahl, Horst. Picture/sound recorder with hinged flat picture screen. 4,633,323, Cl. 358-254.000.

Hackney, Larry B.: *See—*
Lapp, John; Hackney, Larry B.; Mason, Marco J.; and Anderson, David W., 4,633,369, Cl. 361-328.000.

Haeder, Thomas Q.; and Kaczmarski, Wally L., to Clark Equipment Company. Power limiting hydraulic system. 4,632,158, Cl. 144-34.00E.

Haerig, Thomas; and Plaot, Michael, to Mergenthaler Linotype GmbH. Variable laser attenuator. 4,632,512, Cl. 350-316.000.

Hagedorn, Leonhard: *See—*
Schlund, Gerald; Hagedorn, Leonhard; Hahn, A. David; and Fishpaugh, Charles E., 4,632,319, Cl. 241-37.500.

Hagemeister, Klaus, to Motoren- und Turbinen-Union Munchen GmbH. Heat exchanger for gases of greatly different temperatures. 4,632,182, Cl. 165-173.000.

Hagen, Helmut; Markert, Juergen; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Dichloroquinoline derivatives for use as herbicides. 4,632,696, Cl. 71-94.000.

Hagiwara, Takaaki: *See—*
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Hahn, A. David: *See—*
Schlund, Gerald; Hagedorn, Leonhard; Hahn, A. David; and Fishpaugh, Charles E., 4,632,319, Cl. 241-37.500.

Hahn & Clay: *See—*
Pechacek, Raymond E.; and Clay, Eugene J., 4,632,617, Cl. 414-10.000.

Hahn, Eberhard, to Jenoptik Jena GmbH. Method and apparatus for particle irradiation of a target. 4,633,090, Cl. 250-492.200.

Hailpern, Brent T.: *See—*
Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., 4,633,245, Cl. 340-825.030.

Hakaridani, Mitsuhiro: *See—*
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,633,499, Cl. 381-43.000.

Hako Minuteman, Inc.: *See—*
Palmer, Gary E.; and Todd, Mike J., 4,631,775, Cl. 15-385.000.

Hall, Charles B.; and Mondek, Martin J., to Outboard Marine Corporation. Marine propulsion steering assist device. 4,632,049, Cl. 114-150.000.

Hall, David L.: *See—*
Bocchicchio, Keith A.; and Hall, David L., 4,631,815, Cl. 29-739.000.

Hall, George V. B.: *See—*
Kurasch, David H.; Hall, George V. B.; Cossel, Stephen C.; and Miskimin, Paul A., 4,633,091, Cl. 250-506.100.

Hall, James D.: *See—*
Marshall, John M.; and Hall, James D., 4,633,233, Cl. 340-550.000.

Hall, John B., to International Flavors & Fragrances Inc. Uses of methyl phenyl pentanol derivatives in augmenting or enhancing the aroma or taste of consumable materials. 4,632,831, Cl. 426-3.000.

Hall, Patricia A.; and Ratony, Alexander. Combination automobile infant seat and baby stroller assembly. 4,632,409, Cl. 280-30.000.

Halliburton Company: *See—*
Colle, Edward A., Jr., 4,632,034, Cl. 102-312.000.
Small, Tony M., 4,633,248, Cl. 340-853.000.

Hama, Fumio: *See—*
Suzuki, Toshitake; Hama, Fumio; and Kondo, Mitsuru, 4,633,277, Cl. 346-216.000.

Hambrecht, Juergen: *See—*
Muench, Volker; Hambrecht, Juergen; Echte, Adolf; Illers, Karl H.; and Swoboda, Johann, 4,632,946, Cl. 523-179.000.

Hamilton, Kenneth W.: *See—*
Brown, Jerry C.; and Hamilton, Kenneth W., 4,632,458, Cl. 297-353.000.

Hamuro, Mitsuro; Anao, Kimiharu; and Shimamaki, Keiichi, to Murata Manufacturing Co., Ltd. Chip-like electronic component series. 4,633,370, Cl. 361-380.000.

Handa, Kenichi, to Sanshin Kogyo Kabushiki Kaisha. Mounting structure for an electronic parts unit of an outboard engine. 4,632,662, Cl. 440-52.000.

Handymate Limited: *See—*
Roberts, Charles G., 4,631,985, Cl. 81-44.000.

Haneda, Hisao; and Araoka, Mamoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Boiler. 4,632,064, Cl. 122-1.00A.

Hanes, Ronnie M., to National Distillers and Chemical Corporation. Olefin hydroformylation. 4,633,021, Cl. 568-454.000.

Hankinson, Julian E., Jr.: *See—*
Young, William O., Jr.; and Hankinson, Julian E., Jr., 4,631,911, Cl. 57-1.0UN.

Hanna, Kenneth W.: *See—*
Wirth, Robert L.; Hanna, Kenneth W.; and Wilson, Hillis L., 4,632,580, Cl. 400-124.000.

Hannan, Randy R.; and Mulcahy, Timothy E. Sliding descent device. 4,632,218, Cl. 182-5.000.

Hansell, Gregory L.; Yaniv, Zvi; and Cannella, Vincent D., to Energy Conversion Devices, Inc. Thin film transistor having an annealed gate oxide and method of making same. 4,633,284, Cl. 357-23.700.

Hansmann, Johann: *See—*
Theurer, Josef; and Hansmann, Johann, 4,632,037, Cl. 104-7.200.

Hanson, Donald N.; and Lynn, Scott, to Hanson, Donald N.; and Lynn, Scott. Method of treating aqueous solutions. 4,632,760, Cl. 210-642.000.

Hanson, George E., to Norand Corporation. Information storage system with readily removable high capacity disk drive unit. 4,633,350, Cl. 360-98.000.

Hanss, Edgar: *See—*
Goessler, Gerhard; Wilde, Eugen; Essig, Willi; and Hanss, Edgar, 4,633,238, Cl. 340-593.000.

Hantaaki Oy: *See—*
Tiitola, Juha K.; Ikonen, Juhani A.; Suominen, Heikki S.; and Henttonen, Juha A., 4,632,673, Cl. 604-415.000.

Hara, Kiyoaki; Yokoyáma, Issei; and Yoshida, Natsuki, to Horiba, Ltd. Measuring method for a time resolved emission spectrum or a time resolved excitation spectrum. 4,632,550, Cl. 356-311.000.

Hara, Kunihiko: *See—*
Chmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, 4,632,509, Cl. 350-283.000.

Hara, Masato: *See—*
Niiho, Masaaki; Hara, Masato; and Takasugi, Eiji, 4,633,419, Cl. 364-559.000.

Harada, Masayuki, to Sony Corporation. Video tape cassette with easy assembly of its lid and reel brakes. 4,633,355, Cl. 360-132.000.

Harada, Takamasa: *See—*
Taguchi, Masaaki; Harada, Takamasa; and Suenaga, Hitoshi, 4,633,012, Cl. 560-138.000.

Harada, Yoshiyasu: *See—*
Tomita, Takeshi; Harada, Yoshiyasu; and Ohi, Kimio, 4,633,085, Cl. 250-311.000.

Harada, Yuji; and Shinohara, Hayato, to Canon Kabushiki Kaisha. Mounting assembly and mounting method for an electronic component. 4,631,820, Cl. 29-840.000.

Harada, Yutaka; and Nishino, Toshikazu, to Hitachi, Ltd. Superconducting read-only memories or programable logic arrays having the same. 4,633,439, Cl. 365-162.000.

Hardesty, Ronald C.: *See—*
Proctor, Robert H.; and Hardesty, Ronald C., 4,632,434, Cl. 285-39.000.

Harding, Bruce L., to Smith Valve Corporation. Top entry ball valve. 4,632,140, Cl. 137-315.000.

Hardy, James A., to Eastman Kodak Company. Laser printing apparatus having a multiple formatted output. 4,633,272, Cl. 346-108.000.

Hardy, N. Page, to Burlington Industries, Inc. Initial threading for vacuum spinning. 4,631,912, Cl. 57-279.000.

Harnagel, Gary L.: *See—*
Scifres, Donald R.; and Harnagel, Gary L., 4,633,476, Cl. 372-45.000.

Harris, Adam I. Automatically releasing knee brace. 4,632,096, Cl. 128-80.00F.

Harris, Alan J.; and Wright, Gordon E. R., to PSC Freyssinet Limited. Tendons for post-tensioned pre-stressed concrete structures. 4,631,883, Cl. 52-223.00R.

Harris, Chester R., Jr.: *See—*
Schiller, Robert E.; and Harris, Chester R., Jr., 4,632,455, Cl. 297-326.000.

Harris Corporation: *See—*
Norsworthy, Steven R., 4,633,107, Cl. 307-594.000.
Thompson, Thomas K., 4,632,557, Cl. 356-401.000.

Harris, Duane H.: *See—*
Mawby, Harold S.; Harris, Duane H.; and Fryover, Myrne E., 4,632,280, Cl. 222-275.000.

Harris Graphics Corporation: *See—*
Bardos, Andrew M.; Holmes, Jon E.; and Duchesne, Mark F., 4,633,351, Cl. 360-102.000.

Hart, John P.; and Krummell, John D., to Krummell, John D. Assemblable panel for a rack. 4,632,260, Cl. 211-189.000.

Hartmann, Joel; and Jeuch, Pierre, to Commissariat a l'Energie Atomique. Method for interconnecting the active zones and/or the gates of a C/MOS integrated circuit. 4,632,725, Cl. 156-643.000.

Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; and Tayler, Gerald E., to International Business Machines Corporation. Load balancing in a multiunit system. 4,633,387, Cl. 364-200.000.

Haruki, Kazuhito; Iwamoto, Masanori; and Tamada, Masuo, to Kabushiki Kaisha Toshiba. Mail sorting system with coding devices. 4,632,252, Cl. 209-546.000.

Haruna, Koichi: *See—*
Murata, Tomohiro; Komoda, Norihisa; and Haruna, Koichi, 4,633,385, Cl. 364-191.000.

Harvey Hubbell Incorporated: *See—*
Lutz, David L., 4,632,491, Cl. 339-164.00M.

Hasegawa, Akira, to AT&T Bell Laboratories. Generation of pulses of electromagnetic radiation by use of the induced modulational instability. 4,633,524, Cl. 455-612.000.

Hasegawa, Kiyoharu: *See—*
Tsujimoto, Michihiro; Akahori, Hiroyuki; Hasegawa, Kiyoharu; and Asano, Makoto, 4,632,987, Cl. 544-86.000.

Hashimoto, Akiyoshi: *See—*
Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, 4,632,878, Cl. 428-425.900.

Hashimoto, Hiroshi: *See—*
Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, 4,632,878, Cl. 428-425.900.

Hashimoto, Kunihiro: *See—*
Mizoguchi, Toshiaki; Wadaya, Shinichiro; Hashimoto, Kunihiro; and Takase, Shinichi, 4,633,352, Cl. 360-104.000.

Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner. 4,631,927, Cl. 62-280.000.

Hasircoglu, Alexander W., to Du Pont de Nemours, E. I., and Company. Insulation displacement coaxial cable termination and method. 4,632,486, Cl. 339-99.00R.

Haskell, Barin G.: *See—*
Gordon, Pat L.; Haskell, Barin G.; and Schmidt, Robert L., 4,633,311, Cl. 358-133.000.

Hasquenoph, Jean, deceased (by Hasquenoph, Simone, legal representative); and Coutin, Pierre F., to R. Alkan & Cie. Under aircraft load carrying and release device with triple roller escapement. 4,632,338, Cl. 244-137.00A.

Hasquenoph, Simone, legal representative: *See—*
Hasquenoph, Jean, deceased; and Coutin, Pierre F., 4,632,338, Cl. 244-137.00A.

Hattori, Kyo; and Sakurai, Kazuhiro, to Toyota Jidosha Kabushiki Kaisha. Device for driving a rotary valve. 4,632,082, Cl. 123-325.000.

Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, to Isuzu Motors Limited. Method of controlling the starting of a vehicle having automatic clutch. 4,632,231, Cl. 192-0.076.

Hattori, Yasuhiro: *See—*
Kato, Nobori; and Hattori, Yasuhiro, 4,631,981, Cl. 74-813.00R.

Hauck, Bobbie W.: *See—*
Huber, Gordon R.; and Hauck, Bobbie W., 4,632,795, Cl. 264-115.000.

Hauni-Werke Korber & Co. KG.: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; and Steiniger, Wolfgang, 4,632,130, Cl. 131-84.300.

Hay, Thomas E.; Wisebaker, Robert E.; and Kline, Gaylen O., to National Machinery Company, The. Progressive former with removable tooling, 4,631,950, Cl. 72-356.000.

Hayakawa, Yuji, to Brother Kogyo Kabushiki Kaisha. Magnetic recording and reproducing apparatus with means for increasing amount of information to be stored in a magnetic memory disk. 4,633,340, Cl. 360-69.000.

Hayashi, Haruhisa: *See—*
Yoshikumi, Chikao; Matsunaga, Kenichi; Hayashi, Haruhisa; and Oguchi, Yoshiharu, 4,632,743, Cl. 204-183.300.

Hayashi, Hideki; and Kikuchi, Kenichi, to Sumitomo Electric Industries, Ltd. Process for the production of a semiconductor device. 4,631,802, Cl. 29-576.00E.

Hayashi, Hiroshi: *See—*
Taneya, Mototaka; Matsui, Sadayoshi; Matsumoto, Mitsuhiro; and Hayashi, Hiroshi, 4,632,709, Cl. 148-171.000.

Hayashi, Koji; Yoshioka, Susumu; and Ono, Noritsugu, to Mitutuoyo Mfg. Co., Ltd. Coordinate measuring instrument. 4,631,834, Cl. 33-503.000.

Hayashi, Mikio; and Kawasumi, Kouzi, to Nippondenso Co., Ltd. Side-mirror driving apparatus. 4,632,525, Cl. 350-634.000.

Hayashi, Toshio; and Maeda, Youichi, to Nippon Telegraph and Telephone Public Corp. Impedance line matching device using feedback. 4,633,225, Cl. 340-347.00C.

Hayashi, Yoshimasa: *See—*
Aoki, Hirofumi; and Hayashi, Yoshimasa, 4,632,069, Cl. 123-41.150.

Hayashi, Yoshitake: *See—*
Oido, Hikofumi; Hayashi, Yoshitake; and Yamamoto, Minoru, 4,633,032, Cl. 136-251.000.

Hayashi, Yoshitoki, to Kitagawa Industries Co., Ltd. Holding unit. 4,631,783, Cl. 24-16.0PB.

Hayes, Donald C.: *See—*
Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, 4,632,010, Cl. 89-1.510.

Hayes Microcomputer Products, Inc.: *See—*
Heatherington, Dale A., 4,633,183, Cl. 328-14.000.

Hazeltine Corporation: *See—*
Wheeler, Harold A., 4,633,265, Cl. 343-797.000.

Head Stereo GmbH, Kopfbezogene Aufnahmeund: *See—*
Genuit, Klaus, 4,631,962, Cl. 73-585.000.

Heatherington, Dale A., to Hayes Microcomputer Products, Inc. Constant resolution frequency synthesizer. 4,633,183, Cl. 328-14.000.

Heberlein, Gustave E., Jr.: *See—*
McClellan, David P.; Brown, John M.; and Heberlein, Gustave E., Jr., 4,633,207, Cl. 335-16.000.

Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., to United States of America, Agriculture. Sex pheromone composition for southwestern corn borer. 4,632,829, Cl. 424-84.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Curable amidoalkylaromatic compositions. 4,632,965, Cl. 525-484.000.

Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Imide functional polyphenols; thermosettable compositions containing same and cured products therefrom. 4,632,972, Cl. 528-96.000.

Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Imide functional polyphenols; thermosettable compositions containing same and cured products therefrom. 4,632,974, Cl. 528-170.000.

Hegarty, W. Patrick: *See—*
Chen, Michael S. K.; Hegarty, W. Patrick; and Sampat, Dipak J., 4,632,818, Cl. 423-574.00R.

Hegeler, Wilhelm, to Blaupunkt-Werke GmbH. Remote control system for selectively activating and inactivating equipment. 4,633,247, Cl. 340-825.690.

Heidelberger Zement AG: *See—*
Meyer, Adolf; Pfeifer, Manfred; and Kraeft, Uwe, 4,632,720, Cl. 156-429.000.

Heider, Jurgen: *See—*
Fromm, Dietrich; Klingshirn, Helmut; Gosslar, Achim; and Heider, Jurgen, 4,633,136, Cl. 313-623.000.

Heider, Peter: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.

Heijboer, Jacobus A. E. W.: *See—*
Giller, Henricus F. J. I.; and Heijboer, Jacobus A. E. W., 4,633,126, Cl. 313-113.000.

Heinonen, Olli: *See—*
Lehto, Jukka K.; Miettinen, Jorma K.; and Heinonen, Olli, 4,632,778, Cl. 252-629.000.

Heinonen, Robert L.: *See—*
Wilson, James A.; and Heinonen, Robert L., 4,632,468, Cl. 175-325.000.

Heinrich Wunder GmbH & Co. KG.: *See—*
Zoor, Reinhold, 4,632,419, Cl. 280-614.000.

Heist, Hans; Toepfer, Dieter; Britzke, Sylvia; and Schoernig, Eberhard, to Hoechst Aktiengesellschaft. Roller engaging and disengaging device. 4,632,382, Cl. 271-273.000.

Heitmann, Uwe; Lorenzen, Heinz-Christen; and Steiniger, Wolfgang, to Hauni-Werke Korber & Co. KG. Method and apparatus for making a rod-like filler of smokable material. 4,632,130, Cl. 131-84.300.

Helfman, Robert: *See—*
Shacket, Sheldon; and Helfman, Robert, 4,631,893, Cl. 52-745.000.

Heller, Robert A.: *See—*
Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., 4,633,245, Cl. 340-825.030.

Heller, Rudolf; and Kern, Heiner, to Sulzer Brothers Limited. Picking band wheel for a weaving machine. 4,632,153, Cl. 139-449.000.

Hellman, Jan: *See—*
Stromgren, Peter; Hellman, Jan; and Hullberg, Soren, 4,632,253, Cl. 209-570.000.

Hellman, Martin E.; and Bach, Carl E., to Hellman, Martin E. Method and apparatus for use in public-key data encryption system. 4,633,036, Cl. 178-22.110.

Hendrickson, Max: *See—*
Palsgrove, Boyd H.; Hendrickson, Max; and Cohen, Harry A., 4,633,218, Cl. 340-310.00A.

Hendrikx, Kristina. Method of using photographic montage to make portrait photos in particular. 4,632,541, Cl. 355-79.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Ploger, Walter; Kluppel, Hans-Jurgen; and Forg, Franz, 4,632,826, Cl. 424-52.000.

Henken, Fritz: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.

Henningsson, Goran, to Ludvig Svensson International B.V. Greenhouse curtain. 4,632,863, Cl. 428-225.000.

Henssge, Ernst-Joachim: *See—*
Grundei, Hans; and Henssge, Ernst-Joachim, 4,632,098, Cl. 128-80.00C.

Henttonen, Juha A.: *See—*
Tiitola, Juha K.; Ikonen, Juhani A.; Suominen, Heikki S.; and Henttonen, Juha A., 4,632,673, Cl. 604-415.000.

Herberg, Helmut, to Siemens Aktiengesellschaft. Light-triggerable thyristor having low light power requirement and high critical voltage rise rate. 4,633,288, Cl. 357-38.000.

Herbst, John J.; Sider, Richard G.; Jaquith, Robert E.; and Meijer, Christoffel H., to Combustion Engineering, Inc. Nuclear plant safety evaluation system. 4,632,802, Cl. 376-216.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Benkwitz, Helmut, 4,632,655, Cl. 425-186.000.

Hermann, Bodo, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Method and apparatus for feeding shape-welded workpieces immediately after formation. 4,632,297, Cl. 228-222.000.

Hermann Finckh Maschinenfabrik GmbH: *See—*
Holz, Emil; and Hutzler, Hagen, 4,632,320, Cl. 241-46.170.

Hermann Kruger's EFTF. A/S: *See—*
Nielsen, Borge D., 4,631,899, Cl. 53-433.000.

Hermann, Rudolph J., Sr. Bridle arrangement for a horse or like animal. 4,631,906, Cl. 54-8.000.

Herriott, Leslie V., to Lowe & Fletcher Limited. Lock with locking elements movable by a magnetic key. 4,631,939, Cl. 70-276.000.

Herschlag, Herbert. Portable upholstered furniture. 4,632,459, Cl. 297-440.000.

Hertel, Gunther: *See—*
Rall, Gerhard; Hertel, Gunther; Hertel, Karl G.; and Kastner, Hermann, 4,632,614, Cl. 409-233.000.

Hertel, Karl G.: *See—*
Rall, Gerhard; Hertel, Gunther; Hertel, Karl G.; and Kastner, Hermann, 4,632,614, Cl. 409-233.000.

Hewlett-Packard Company: *See—*
Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., 4,633,308, Cl. 358-112.000.
Nygaard, Richard A., Jr.; and Palmer, Fredrick J., 4,633,410, Cl. 364-481.000.

Heyman, Eleanor; and Nager, Lois. Disposable garment shield. 4,631,752, Cl. 2-56.000.

Heymann, Ronald E.: *See—*
Flotow, Richard A.; Heymann, Ronald E.; and Kummer, Martin E., 4,632,235, Cl. 192-70.270.

Hibino, Masahiro: *See—*
Yamada, Norimasa; and Hibino, Masahiro, 4,633,500, Cl. 381-51.000.

Hickey, John L. Shoe insert device. 4,631,841, Cl. 36-91.000.

Higgins, Warwick A., to EMI Limited. Magnetic tape transports. 4,633,347, Cl. 360-90.000.

Higuchi, Atsunori: *See—*
Morisawa, Kunio; Kashihara, Yuji; and Higuchi, Atsunori, 4,631,983, Cl. 74-877.000.

Higurashi, Seiji; Miyashita, Atsushi; and Kobayashi, Kaoru, to Victor Company of Japan, Limited. Multi-mode magnetic recording system and multi-mode magnetic recording and playback system for VTR. 4,633,332, Cl. 360-10.300.

Hijikigawa, Masaya: *See—*
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,632,879, Cl. 428-522.000.

Hilfman, Lee, to UOP Inc. Fluid catalytic cracking hydrocarbon conversion process. 4,632,749, Cl. 208-120.000.

Hill, Herbert H., Jr.: *See—*
Knorr, Fritz J.; Eatherton, Randy L.; Siems, William F.; and Hill, Herbert H., Jr., 4,633,083, Cl. 250-282.000.

Hill-Rom Company, Inc.: *See—*
Fullenkamp, Eugene H., 4,632,591, Cl. 403-227.000.

Hill, Rowland A.: *See—*
Posma, Bonne W.; and Hill, Rowland A., 4,633,147, Cl. 318-52.000.

Hill, Stuart A. Method of forming forged joints. 4,631,797, Cl. 29-447.000.

Hillemann, Craig L., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,632,693, Cl. 71-93.000.

Hiller, Dietmar; and Saugeon, Ulrich, to Siemens Aktiengesellschaft. Method and apparatus for delaying an ultrasound signal. 4,632,124, Cl. 128-660.000.

Hilton-Davis Chemical Co., The: *See—*
Hung, William M.; and Jefferies, Patrick J., 4,632,783, Cl. 260-394.000.

Hines, William R., to General Electric Company. Gas turbine engine of improved thermal efficiency. 4,631,914, Cl. 60-39.050.

Hiniker Company: *See—*
Hodapp, Gary D., 4,632,417, Cl. 280-411.00C.

Hinman, Daryl E., to United States of America, Navy. Video zoom processor. 4,633,503, Cl. 382-47.000.

Hioki, Katsuhiko: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,632,782, Cl. 260-396.00R.

Hipwood, Leslie G. Semiconductor devices. 4,633,279, Cl. 357-16.000.

Hiraishi, Hisashi: *See—*
Shintaku, Yasuyuki; and Hiraishi, Hisashi, 4,631,793, Cl. 29-132.000.

Hiramatsu, Eiji: *See—*
Motonami, Masanao; Hiramatsu, Eiji; and Shiraishi, Daiichi, 4,631,865, Cl. 49-374.000.

Hiramatu, Hirosi, to Hokuyo Automatic Co., Ltd. Photoelectric switch. 4,633,081, Cl. 250-239.000.

Hirano, Yoshinori, to Nissan Motor Co., Ltd. Intercooler for supercharged internal combustion engine. 4,632,178, Cl. 165-39.000.

Hiraoka, Takeshi: *See—*
Takahashi, Kentaro; Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,632,074, Cl. 123-90.390.

Hirata, Akio; and Naito, Yosio, to Kabushiki Kaisha Toshiba. Control system for an AC motor. 4,633,158, Cl. 318-723.000.

Hiro, Masaaki: *See—*
Yashiki, Yuichi; Anayama, Hideki; and Hiro, Masaaki, 4,632,892, Cl. 430-58.000.

Hirohata, Nobuyuki, to Sanko Kikai Co., Ltd. Method and an apparatus for grinding a rod-like object. 4,631,868, Cl. 51-128.000.

Hirose Electric Co., Ltd.: *See—*
Matsuzaki, Shuichi; and Nakazawa, Akira, 4,632,493, Cl. 339-176.00M.

Hirota, Kazuo; Akahane, Shoji; and Tomioka, Kentaro, to G-C Dental Industrial Corporation. Compositions applied in the mouth. 4,632,824, Cl. 424-49.000.

Hisaka Works, Ltd.: *See—*
Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, 4,632,026, Cl. 99-349.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Sarugaku, Shinichi; and Tsuji, Masao, 4,633,059, Cl. 219-124.220.

Hitachi, Ltd.: *See—*
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.
Akatsu, Toshio, 4,632,556, Cl. 356-351.000.
Bessho, Yasunori; Uchikawa, Sadao; and Aoyama, Motoo, 4,632,803, Cl. 376-238.000.
Harada, Yutaka; and Nishino, Toshikazu, 4,633,439, Cl. 365-162.000.
Horie, Tsuneo; Ozaki, Shoji; and Takeuchi, Takikazu, 4,633,336, Cl. 360-45.000.
Kashiwazaki, Hiroshi, 4,633,380, Cl. 363-54.000.
Kosaka, Michitaka; and Miyamoto, Shoji, 4,633,261, Cl. 342-430.000.
Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, 4,632,478, Cl. 339-17.0LC.
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.
Mizuno, Hiroko; Kikuchi, Makoto; Horiuchi, Susumu; and Tamata, Shin, 4,632,779, Cl. 252-629.000.
Murata, Tomohiro; Komoda, Norihisa; and Haruna, Koichi, 4,633,385, Cl. 364-191.000.
Ohtake, Katsumoto; Ohshima, Yoshikuni; Mukai, Yasuteru; and Okouchi, Isao, 4,631,925, Cl. 60-688.000.
Osawa, Michitaka; Kimura, Yuichiro; and Miyajima, Hiroyuki, 4,633,145, Cl. 315-383.000.
Saitoh, Toshio; Takahashi, Noriyoshi; Sato, Masaki; and Watanabe, Masatoshi, 4,633,115, Cl. 310-213.000.
Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, 4,633,460, Cl. 370-58.000.
Tanabe, Masanori; and Kawakami, Kanji, 4,633,099, Cl. 307-308.000.
Tanaka, Yoshikazu; and Torii, Shunichi, 4,633,389, Cl. 364-200.000.
Tokiguchi, Katsumi; Okada, Osami; Sakudo, Noriyuki; and Koike, Hidemi, 4,633,138, Cl. 315-111.810.
Yabe, Yuhiko; Uzuhashi, Hideo; and Yoshikawa, Yoshiaki, 4,633,414, Cl. 364-513.000.
Yamamoto, Makoto; Kubota, Takashi; and Mikamo, Katsumi, 4,633,335, Cl. 360-35.100.

Hitachi, Ltd: *See—*
Sarugaku, Shinichi; and Tsuji, Masao, 4,633,059, Cl. 219-124.220.

Hitachi Maxell, Ltd.: *See—*
Kuse, Sadamu; and Kawarai, Seigi, 4,632,867, Cl. 428-323.000.

Hitachi Micro Computer Engineering Ltd.: *See—*
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Hiwasa, Shoichi: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.

Hiza, Misao; Yamazaki, Hajime; and Omote, Shigeo, to Yokohama Rubber Co., Ltd., The. Epoxy resin composition. 4,632,970, Cl. 528-27.000.

Ho, Teh C.; Young, Archie R., II; Jacobson, Allan J.; and Chianelli, Russell R., to Exxon Research and Engineering Company. Hydrotreating process employing catalysts comprising a supported, mixed metal sulfide iron promoted Mo and W. 4,632,747, Cl. 208-18.000.

Hobbs, Billy J., Jr.: *See—*
Premo, Kenneth W.; and Hobbs, Billy J., Jr., 4,632,312, Cl. 239-230.000.

Hodapp, Gary D., to Hiniker Company. Bi-fold hinge for a folding toolbar. 4,632,417, Cl. 280-411.00C.

Hodgson, Derek: *See—*
Maycock, Ian C.; and Hodgson, Derek, 4,632,237, Cl. 192-98.000.

Hoechst Aktiengesellschaft: *See—*
Heist, Hans; Toepfer, Dieter; Britzke, Sylvia; and Schoernig, Eberhard, 4,632,382, Cl. 271-273.000.
Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, 4,632,812, Cl. 423-309.000.
Kleiner, Hans-Jerg, 4,632,995, Cl. 549-6.000.
Vertesy, Laszlo ; Bender, Rudolf; Fehlhaber, Hans-Wolfram; and Geisen, Karl, 4,632,917, Cl. 514-54.000.

Hoener, Jost. Locking key with memory. 4,631,943, Cl. 70-395.000.

Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Machu, Erich H., 4,632,145, Cl. 137-516.210.

Hoevel, Lee W.: *See—*
Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., 4,633,245, Cl. 340-825.030.

Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,632,784, Cl. 260-397.200.
Mullin, John G., Jr.; Kierstead, Richard W.; and Triscari, Joseph, 4,632,925, Cl. 514-256.000.

Hoffmann, Wolfgang W.; and Otruba, Svatoboj, to Kris-Tech Corporation. Apparatus for applying labels to containers. 4,632,721, Cl. 156-458.000.

Hofmann GmbH: *See—*
Beilstein, Kurt H., 4,632,322, Cl. 241-169.100.

Hofrichter, James W.; and VanDuser, Harold J., to Seats Incorporated. Collapsible seat. 4,632,457, Cl. 297-335.000.

Hokanson, Lyle W.: *See—*
Averill, Stuart A.; Hokanson, Lyle W.; and Kroeker, David G., 4,632,194, Cl. 175-217.000.

Hokuyo Automatic Co., Ltd.: *See—*
Hiramatu, Hirosi, 4,633,081, Cl. 250-239.000.

Holck, Claus. Method for manufacturing a pair of briefs and briefs manufactured according to the method. 4,631,757, Cl. 2-402.000.

Holden, James R., to GTE Communication Systems Corp. Master-slave microprocessor control circuit. 4,633,039, Cl. 379-32.000.

Holdt, Donald H., to Cambridge Technologies, Inc. Convertible wheelchair/litter. 4,632,450, Cl. 297-84.000.

Holland, Gary V.: *See—*
Tillett, George C., Jr.; and Holland, Gary V., 4,633,029, Cl. 136-205.000.

Hollingworth, Franklin D., to Hollingworth, Marilyn G. Clutch in and for jewelry items. 4,631,929, Cl. 63-13.000.

Hollingworth, Marilyn G.: *See—*
Hollingworth, Franklin D., 4,631,929, Cl. 63-13.000.

Hollmann, Friedrich: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Hollmann, Friedrich, 4,631,948, Cl. 72-242.000.

Holmberg, Albert E. Reclosable container. 4,632,299, Cl. 229-7.00R.

Holmes, Jon E.: *See—*
Bardos, Andrew M.; Holmes, Jon E.; and Duchesne, Mark F., 4,633,351, Cl. 360-102.000.

Holmwood, Graham: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, 4,632,932, Cl. 514-383.000.

Holobeam, Inc.: *See—*
Cook, Melvin S., 4,633,030, Cl. 136-246.000.

Holtey, Thomas O.; and Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Multiple beam high definition page display. 4,633,244, Cl. 340-736.000.

Holz, Emil; and Hutzler, Hagen, to Hermann Finckh Maschinenfabrik GmbH. Apparatus for dissolving and sorting waste paper. 4,632,320, Cl. 241-46.170.

Homann, Herbert: *See—*
Maki, Clyde M.; and Homann, Herbert, 4,632,630, Cl. 414-700.000.

Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, to Toyota Jidosha Kabushiki Kaisha. Power assisted steering system. 4,632,204, Cl. 180-142.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Arai, Shokichi; and Fujii, Tadayoshi, 4,632,071, Cl. 123-41.860.
Fujita, Haruyasu; Honma, Kenji; and Ogawa, Masao, 4,632,413, Cl. 280-112.00A.
Kawashima, Yoshinori, 4,631,977, Cl. 74-606.00A.
Misawa, Mitsukuni; and Sato, Osamu, 4,632,085, Cl. 123-73.0AD.
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, 4,631,869, Cl. 51-165.710.
Morinaka, Shigehisa; and Komuro, Katsusuke, 4,632,206, Cl. 180-229.000.
Onda, Takanori; Yamamoto, Hitoshi; and Kimoto, Masahiko, 4,632,070, Cl. 123-41.580.
Otobe, Yutaka; and Iwata, Takahiro, 4,633,093, Cl. 290-40.00R.
Yagasaki, Akio; and Watanabe, Masaki, 4,632,448, Cl. 296-218.000.
Yamamoto, Hitoshi; Baba, Masayoshi; and Iwao, Eiichi, 4,632,210, Cl. 180-309.000.

Honda, Michitaka, to Kabushiki Kaisha Toshiba. Digital subtraction fluorographic method and apparatus. 4,633,307, Cl. 358-111.000.

Honeywell Inc.: *See—*
Beckey, Thomas J., 4,632,177, Cl. 165-12.000.
Kude, William B.; and Pearman, A. Noel J., 4,632,572, Cl. 374-37.000.
Palsgrove, Boyd H.; Hendrickson, Max; and Cohen, Harry A., 4,633,218, Cl. 340-310.00A.

Honeywell Information Systems Inc.: *See—*
Holtey, Thomas O.; and Marshall, J. Nathaniel, 4,633,244, Cl. 340-736.000.
Marshall, J. Nathaniel, 4,633,142, Cl. 315-365.000.

Hong, Sun H.: *See—*
Choi, Kwang H.; and Hong, Sun H., 4,632,242, Cl. 206-45.340.

Honma, Kenji: *See—*
Fujita, Haruyasu; Honma, Kenji; and Ogawa, Masao, 4,632,413, Cl. 280-112.00A.

Hooks, Thomas E. Multiple-unit apparatus for lifting sod. 4,632,192, Cl. 172-19.000.

Hooper, Alan; and North, John M., to United Kingdom Atomic Energy Authority. Solid state cell manufacture. 4,631,810, Cl. 29-623.500.

Hopkins, Lonnie: *See—*
Ritchie, Kim; Hopkins, Lonnie; and Galvagni, John, 4,633,175, Cl. 324-158.00F.

Horiba, Ltd.: *See—*
Hara, Kiyoaki; Yokoyama, Issei; and Yoshida, Natsuki, 4,632,550, Cl. 356-311.000.

Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoro, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, to Sharp Kabushiki Kaisha. Floppy disk driving with suitable on-delay and off-delay timing. 4,633,337, Cl. 360-57.000.

Horie, Tsuneo; Ozaki, Shoji; and Takeuchi, Takikazu, to Hitachi, Ltd. Magnetic recording apparatus. 4,633,336, Cl. 360-45.000.

Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Data correcting device in an automatic focus detecting system. 4,633,073, Cl. 250-201.000.

Horiuchi, Masatada: *See—*
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Horiuchi, Susumu: *See—*
Mizuno, Hiroko; Kikuchi, Makoto; Horiuchi, Susumu; and Tamata, Shin, 4,632,779, Cl. 252-629.000.

Horner, Larry D. Method and apparatus to fill primer feed tubes. 4,632,008, Cl. 86-24.000.

Horvath, Lorand: *See—*
Czabaffy, Andras; Kaffka, Karoly; Horvath, Lorand; and Nadai, Bela, 4,632,549, Cl. 356-300.000.

Horyoda, Hiroshi: *See—*
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.

Hosiden Electronics Co., Ltd.: *See—*
Komatsu, Yasuhiro, 4,633,048, Cl. 200-51.100.

Hoskins, Michael J.: *See—*
Hunsinger, Billy J.; and Hoskins, Michael J., 4,633,285, Cl. 357-26.000.

Hosoe, Kazuya: *See—*
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,633,075, Cl. 250-201.000.

Hotta, Sadayoshi: *See—*
Ogawa, Tetsu; Nagata, Seiichi; and Hotta, Sadayoshi, 4,632,514, Cl. 350-339.00F.

Hougen, Everett D. Annular hole cutter. 4,632,610, Cl. 408-204.000.

House Food Industrial Co. Ltd.: *See—*
Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, 4,632,026, Cl. 99-349.000.

Houser, David E., to International Business Machines Corporation. Method for joining metal components to a substrate. 4,631,821, Cl. 29-845.000.

Houston, Eric A., to Centronics Data Computer Corp. Ribbon feed mechanism providing a constant relative velocity between ribbon and print head. 4,632,582, Cl. 400-232.000.

Houwer, Gerke, to Ingenieursbureau Macoma B.V. Air conditioning systems for a room. 4,632,020, Cl. 98-31.600.

Hovnanian, Vahak S. Chemical dump site containment floor. 4,632,602, Cl. 405-128.000.

Howard, James K.; and Moshref, Mohammad T., to International Business Machines Corporation. Vertical recording medium with improved perpendicular magnetic anisotropy due to influence of beta-tantalum underlayer. 4,632,883, Cl. 428-611.000.

Howell, William R., Jr.: *See—*
Bedell, Stephen A.; Howell, William R., Jr.; and Coleman, William M., III, 4,632,912, Cl. 502-122.000.

Hrycak, Peter D., to Westinghouse Electric Corp. Lossless orthogonal beam forming network. 4,633,259, Cl. 342-373.000.

Hsiu, William. Solder-free circuit base plate. 4,632,589, Cl. 403-24.000.

Hsu, Feng-mei. Sound/video-recording tape storing device. 4,632,248, Cl. 206-387.000.

Hsu, Wen-Liang, to Goodyear Tire & Rubber Company, The. Boron phosphate catalyst for the production of dienes from aldehydes. 4,632,913, Cl. 502-202.000.

Hu, Thomas S. S.: *See—*
Gater, Arnold C.; and Hu, Thomas S. S., 4,631,944, Cl. 70-472.000.

Hubbard, Jack E. Squirrel feeder. 4,632,062, Cl. 119-51.00R.

Hubbard, James R.; and Idell, Frank V., to Graphic Controls Corporation. Means for mounting a pen on a chart recorder. 4,633,275, Cl. 346-140.00R.

Huber, Gordon R.; and Hauck, Bobbie W., to Wenger Manufacturing, Inc. Method and apparatus for extrusion processing of cellulose bearing materials. 4,632,795, Cl. 264-115.000.

Huchette, Michel: *See—*
Gosset, Serge; Lumaret, Jean-Claude; Fortunato, Francis; and Huchette, Michel, 4,632,848, Cl. 427-154.000.

Hudson, Kenneth C., to RCA Corporation. Headwheel for a multiple beam optical tape playback system. 4,633,455, Cl. 369-45.000.

Huels Aktiengesellschaft: *See—*
Mueller, Dieter J.; and Busse, Hans-Juergen, 4,632,706, Cl. 148-6.15R.

Hughes Aircraft Company: *See—*
Jensen, Stephen M., 4,632,518, Cl. 350-385.000.
Robusto, Paul F., 4,633,478, Cl. 372-83.000.
Yuan, Mark S., 4,632,339, Cl. 244-158.00R.
Yuan-Tai Chen, John, 4,633,289, Cl. 357-42.000.

Hughes Helicopters, Inc.: *See—*
Moore, Richard E., 4,632,337, Cl. 244-17.190.

Hughes, Matthew E. Open-ended ratchet wrench. 4,631,990, Cl. 81-62.000.

Hughes Tool Company: *See—*
Boncan, Virgilio G.; and Gandy, Richard, 4,632,186, Cl. 166-293.000.

Huhn, Edgar: *See—*
Doyen, Hans-Henning; and Huhn, Edgar, 4,631,910, Cl. 56-505.000.
Doyen, Hans-Henning; and Huhn, Edgar, 4,632,200, Cl. 180-53.700.

Hulings, James E.; Randall, Robert P.; Maynard, Robert H.; and Weiss, James, to TRACO. Billet lubrication apparatus 4,631,945, Cl. 72-43.000.

Hullberg, Soren: *See—*
Stromgren, Peter; Hellman, Jan; and Hullberg, Soren, 4,632,253, Cl. 209-570.000.

Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, to United States of America, Navy. AIRBOC chaff deployment system. 4,632,010, Cl. 89-1.510.

Hung, William M.; and Jefferies, Patrick J., to Hilton-Davis Chemical Co., The. Triphenylmethane dyestuffs. 4,632,783, Cl. 260-394.000.

Hunke, Friedrich. Apparatus for cooling and granulation of thermoplastic strands. 4,632,752, Cl. 210-173.000.

Hunsinger, Billy J.; and Hoskins, Michael J., to University of Illinois. Acoustic charge transport device and method. 4,633,285, Cl. 357-26.000.

Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., to Texas Instruments Incorporated. Method of fabricating defect free trench isolation devices. 4,631,803, Cl. 29-576.00W.

Hurner, Erwin E. Oil addition apparatus. 4,632,080, Cl. 123-196.00S.

Huseby, Lauren W.: *See—*
Samuel, Robert A.; Huseby, Lauren W.; Weitkamp, Erick W.; and Wiklof, Christopher A., 4,631,845, Cl. 40-2.00R.

Hutzler, Hagen: *See—*
Holz, Emil; and Hutzler, Hagen, 4,632,320, Cl. 241-46.170.

Hybritech Incorporated: *See—*
Valkirs, Gunars E.; Owen, Newton C.; and Levinson, Philip A., 4,632,901, Cl. 435-5.000.

Hydroacoustics: *See—*
Bouyoucos, John V., 4,632,214, Cl. 181-120.000.

Hygenic Corporation, The: *See—*
Riazi, John, 4,632,977, Cl. 528-502.000.

Hyman, Howard A.; and Trainor, Daniel W., to Avco Everett Research Laboratory, Inc. Two cell stimulated Raman scattering frequency conversion laser. 4,633,103, Cl. 307-426.000.

Hymmen, Theodor: *See—*
Pankoke, Werner, 4,632,722, Cl. 156-555.000.

Hyuga, Kounosuke, to Japan Tobacco & Salt Public Corporation, The. Knife feed system in rotary drum cutter. 4,632,318, Cl. 241-37.000.

I.S.F. S.p.A.: *See—*
Farina, Carlo; Pifferi, Giorgio; and Pinza, Mario, 4,632,982, Cl. 534-753.000.

Iacono, Joel G.; and Koval, Ronald J., to Federal Signal Corporation. Electronic outdoor warning siren. 4,633,229, Cl. 340-391.000.

Iannarelli, Anthony N. Insulated concrete masonry unit. 4,631,885, Cl. 52-405.000.

Ichihara, Yutaka; Magome, Nobutaka; Iizuka, Yutaka; Kunimatsu, Shuji; and Inaba, Tomonari, to Nippon Kogaku K. K. Focusing screen. 4,632,531, Cl. 354-200.000.

Ichikawa, Toshihito, to Pioneer Electronic Corporation. Separation control circuit. 4,633,497, Cl. 381-10.000.

Ichiki, Toshio: *See—*
Watanabe, Hiroyuki; Washita, Hiroshi; and Ichiki, Toshio, 4,632,877, Cl. 428-409.000.

ICI Americas: *See—*
Lynch, Matthew J., 4,632,937, Cl. 514-470.000.

Ideal Security Hardware Corporation: *See—*
Miller, Cardell E., 4,632,439, Cl. 292-166.000.

Idell, Frank V.: *See—*
Hubbard, James R.; and Idell, Frank V., 4,633,275, Cl. 346-140.00R.

Igarashi, Yoshiaki: *See—*
Inaji, Toshio; Minakuchi, Hiroshi; and Igarashi, Yoshiaki, 4,633,150, Cl. 318-254.000.

Ignaz Vogel GmbH & Co. KG: *See—*
Vogel, Ignaz, 4,632,452, Cl. 297-232.000.

Igura, Yasuo: *See—*
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, to Kissei Pharmaceutical Co., Ltd.; and Ono Pharmaceutical Co., Ltd. Imidazole derivatives and pharmaceutical use thereof. 4,632,934, Cl. 514-399.000.

Iizuka, Yutaka: *See—*
Ichihara, Yutaka; Magome, Nobutaka; Iizuka, Yutaka; Kunimatsu, Shuji; and Inaba, Tomonari, 4,632,531, Cl. 354-200.000.

Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, to Matsushita Electric Works, Ltd. Photoelectric switch with limit setting means to prevent disablement when the amplifier is saturated. 4,633,077, Cl. 250-214.00L.

IKARUS Karosszeria es Jarmugyar: *See—*
Csordas, Laszlo ; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.

Ikeda, Hiroshi: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Uno, Teruo; and Ikeda, Hiroshi, 4,632,885, Cl. 428-654.000.

Ikeda, Shoji: *See—*
Tsutsui, Kouichi; Umemoto, Hirotoshi; and Ikeda, Shoji, 4,632,961, Cl. 525-162.000.

Ikeda, Yoshio: *See—*
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Ikenoue, Yoshikazu: *See—*
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Iketani, Akira: *See—*
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Ikonen, Juhani A.: *See—*
Tiitola, Juha K.; Ikonen, Juhani A.; Suominen, Heikki S.; and Henttonen, Juha A., 4,632,673, Cl. 604-415.000.
ILC Technology, Inc.: *See—*
Roberts, Roy D.; and Miner, Robert L., 4,633,128, Cl. 313-113.000.
Illers, Karl H.: *See—*
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Imai, Chikara, to Ricoh Company, Ltd. Electrophotographic apparatus. 4,632,537, Cl. 355-14.00D.
Imai, Kazuyoshi: *See—*
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, 4,632,948, Cl. 523-219.000.
Imai, Masao: *See—*
Sasagawa, Katsuyoshi; Imai, Masao; and Kanno, Kimio, 4,632,969, Cl. 526-286.000.
Imai, Yoshio: *See—*
Saiki, Masatsugu; Imai, Yoshio; and Takagi, Makoto, 4,632,767, Cl. 252-8.800.
Imanishi, Shoichi; and Ikeda, Yoshio, to Kabushiki Kaisha Toshiba. Washing machine. 4,631,934, Cl. 68-23.00R.
Imatran Voima Oy: *See—*
Lehto, Jukka K.; Miettinen, Jorma K.; and Heinonen, Olli, 4,632,778, Cl. 252-629.000.
Imazeki, Kazuyoshi; and Kayama, Seiji, to General Research of Electronics, Inc. Horn antenna. 4,633,264, Cl. 343-786.000.
Immunologics: *See—*
Zee, Yuan C.; and Bolton, David C., 4,632,980, Cl. 530-380.000.
Inaba, Kazuo: *See—*
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, 4,632,948, Cl. 523-219.000.
Inaba, Tomonari: *See—*
Ichihara, Yutaka; Magome, Nobutaka; Iizuka, Yutaka; Kunimatsu, Shuji; and Inaba, Tomonari, 4,632,531, Cl. 354-200.000.
Inagaki, Saburo: *See—*
Shirouzu, Tatsuo; Sakata, Nobuhiro; Kono, Masaki; and Inagaki, Saburo, 4,631,811, Cl. 29-705.000.
Inaguma, Yoshiharu: *See—*
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.
Inaji, Toshio; Minakuchi, Hiroshi; and Igarashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Driving circuit for brushless DC motors. 4,633,150, Cl. 318-254.000.
Industrial Technology Research Institute: *See—*
Sun, Houng, 4,631,870, Cl. 51-165.710.
Ing. Alfred Schmidt GmbH: *See—*
Doyen, Hans-Henning; and Huhn, Edgar, 4,631,910, Cl. 56-505.000.
Doyen, Hans-Henning; and Huhn, Edgar, 4,632,200, Cl. 180-53.700.
Ing. C. Olivetti & C., S.p.A.: *See—*
Becchi, Raffaele; and Giacone, Felice, 4,632,584, Cl. 400-356.000.
Ing-Simmons, Nicholas K. D.: *See—*
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,633,392, Cl. 364-200.000.
Ingenieursbureau Macoma B.V.: *See—*
Houwer, Gerke, 4,632,020, Cl. 98-31.600.
Ingersoll, Evelyn. Jewelry storage device. 4,632,474, Cl. 312-305.000.
Ingram, John D.; and Liu, Olive Y. Method and apparatus for indirect determination of shear velocity from guided modes. 4,633,449, Cl. 367-75.000.
Inokuchi, Toshiyuki: *See—*
Segawa, Hideo; Inokuchi, Toshiyuki; Shibaguchi, Takashi; and Asano, Fumio, 4,633,271, Cl. 346-107.00R.
Inomata, Koichiro; Sawa, Takao; and Arakawa, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Torque sensor and method for manufacturing the same. 4,631,796, Cl. 29-446.000.
Inoue, Akira: *See—*
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Inoue, Eiji: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.
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Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi Ssr: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.
Institute of Gas Technology: *See—*
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Instytut Gornictwa Naftowego i Gazownictwa: *See—*
Dzwinel, Jan, 4,633,182, Cl. 324-335.000.
Integrated Power Components: *See—*
Frederick, W. Richard, 4,633,368, Cl. 361-328.000.
Intel Corporation: *See—*
Senderowicz, Daniel, 4,633,223, Cl. 340-347.0CC.
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Intermec Corporation: *See—*
Samuel, Robert A.; Huseby, Lauren W.; Weitkamp, Erick W.; and Wiklof, Christopher A., 4,631,845, Cl. 40-2.00R.
International Business Machines: *See—*
Pakulski, Francis J., 4,633,440, Cl. 365-189.000.
International Business Machines Corporation: *See—*
Ahn, Kie Y.; and DiStefano, Thomas H., 4,633,451, Cl. 369-14.000.
Beck, John L.; Good, Daniel L.; and Stacer, Daniel R., 4,633,349, Cl. 360-97.000.
Blanco, Alfred W.; McDowell, Judson A.; and Yeary, David A., 4,633,333, Cl. 360-31.000.
Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., 4,633,245, Cl. 340-825.030.
Bresenham, Jack E.; Bowater, Ronald J.; Gay, Adrian C.; and Sheen, Norman R., 4,633,243, Cl. 340-732.000.
Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., 4,632,295, Cl. 228-123.000.
Chesebro, Donald G.; and Sweetser, Robert W., 4,632,724, Cl. 156-626.000.
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,633,129, Cl. 313-153.000.
Druschel, William O.; Kostenko, Alexander; and Meinert, Rolf G., 4,632,294, Cl. 228-119.000.
Flurry, Gregory A., 4,633,436, Cl. 364-900.000.
Freeman, Joseph W.; and Webb, Gary E., 4,632,398, Cl. 273-148.00B.
Georgiou, Christos J.; and Ravn, Anders P., 4,633,394, Cl. 364-200.000.
Goertzel, Gerald; and Mitchell, Joan L., 4,633,490, Cl. 375-122.000.
Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; and Tayler, Gerald E., 4,633,387, Cl. 364-200.000.
Houser, David E., 4,631,821, Cl. 29-845.000.
Howard, James K.; and Moshref, Mohammad T., 4,632,883, Cl. 428-611.000.
Keener, Don S., 4,633,345, Cl. 360-77.000.
Luecke, Francis S., 4,633,456, Cl. 369-45.000.
Miller, Irvin M., 4,633,433, Cl. 364-900.000.
Nash, Dennis P., 4,632,583, Cl. 400-248.000.
Skatrud, Ralph O.; and Storm, Chester L., 4,633,468, Cl. 371-22.000.
International Combustion Australia Limited: *See—*
Tooth, Allan D., 4,632,359, Cl. 251-126.000.
International Flavors & Fragrances Inc.: *See—*
Hall, John B., 4,632,831, Cl. 426-3.000.
International Hydronics Corporation: *See—*
Mindler, Albert B., 4,632,737, Cl. 204-98.000.
International Minerals & Chemical Corp.: *See—*
Dougherty, Steven J.; and Barker, Ray E., 4,632,814, Cl. 423-321.00R.
International Sludge Reduction Company: *See—*
Riise, Morris M., 4,632,764, Cl. 210-702.000.
International Standard Electric Corporation: *See—*
Wiegel, Manfred; and Dorr, Harald, 4,633,186, Cl. 328-119.000.
Zanzig, Jurgen, 4,633,038, Cl. 379-400.000.
Internationale Octrooi Maatschaapij "Octropa" B.V.: *See—*
Van Der Zon, Petrus W., 4,631,896, Cl. 53-397.000.
Intersil, Inc.: *See—*
Bradshaw, Peter D.; and Evans, Lee L., 4,633,221, Cl. 340-347.0NT.
Intevep, S.A.: *See—*
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Iowa Mold Tooling Company, Inc.: *See—*
Bunkofske, William J., 4,632,157, Cl. 141-38.000.
Iowa State University Research Foundation, Inc.: *See—*
Larock, Richard C.; and Varaprath, Sudarsanan, 4,632,996, Cl. 549-209.000.
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Demmer, Christopher G.; Irving, Edward; and Losert, Ewald, 4,632,900, Cl. 430-323.000.
Irwin, David J.: *See—*
Mansbridge, Martin H.; Norton, John; Beazley-Long, Paul W.; and Irwin, David J., 4,632,296, Cl. 228-157.000.
Irwin, Dennis V. Portable shelter. 4,632,138, Cl. 135-109.000.
Isenhart, Kyle: *See—*
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Ishida, Kohji: *See—*
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Ishihara, Masaki: *See—*
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Ishihara, Yuji: *See—*
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Ishii, Katsumi: *See—*
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Ishii, Taira; Misawa, Yoshihiko; Maeda, Yoshinobu; and Tanaka, Souhei, to Matsushita Electric Industrial Co. Ltd. Electronic parts outfitting device. 4,631,800, Cl. 29-564.600.
Ishikawa, Hiromi: *See—*
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Ishikawa, Katsuji: *See—*
Iwata, Hiroshi; and Ishikawa, Katsuji, 4,632,530, Cl. 354-173.110.
Ishikawa, Kazuhiko: *See—*
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Ishikawa, Shinjiro: *See—*
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Ishikawa, Tuguo: *See—*
Gotoh, Akio; Yamamoto, Kazuo; and Ishikawa, Tuguo, 4,633,519, Cl. 455-277.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kawane, Minoru, 4,632,405, Cl. 277-150.000.
Ishimori, Shozo, to Kubota, Ltd. Hydraulic circuit construction for a tractor having a hydraulic stepless change speed apparatus. 4,631,980, Cl. 74-730.000.
Ishimoto, Shoji, to NEC. Dual port memory circuit. 4,633,441, Cl. 365-189.000.
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Eagle Industry Co., Ltd. Stern tube seal device providing a seal about a rotatable shaft. 4,632,403, Cl. 277-27.000.
Ishitani, Yusuke, to Mita Industrial Co., Ltd. Optical system of variable magnification and a method for varying magnification of the same. 4,632,522, Cl. 350-570.000.
Ishiwata, Kazuya, to Canon Kabushiki Kaisha. Electrochromic element. 4,632,516, Cl. 350-357.000.
Isotek Corporation: *See—*
Lomasney, Henry L.; Grawe, John G.; and Sheth, Vikram K., 4,632,847, Cl. 427-154.000.
Isozaki, Shin: *See—*
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Issakainen, Onni, to Oy Tampella AB. Feed storage for drill rods for a long-hole drilling apparatus. 4,632,618, Cl. 414-22.000.
Isuzu Motors Limited: *See—*
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,632,231, Cl. 192-0.076.
Itil, Turan M.: *See—*
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Ito, Hiroshi: *See—*
Okamoto, Satoru; and Ito, Hiroshi, 4,632,464, Cl. 301-11.00R.
Ito, Kazuyuki: *See—*
Fukutani, Masanori; Miwa, Naoto; Ito, Kazuyuki; and Ito, Keiji, 4,632,683, Cl. 55-523.000.
Ito, Keiji: *See—*
Fukutani, Masanori; Miwa, Naoto; Ito, Kazuyuki; and Ito, Keiji, 4,632,683, Cl. 55-523.000.
Ito, Kiyoshi; and Takekoshi, Taro, to Seiko Epson Corporation. Serial printer having trigger mechanism. 4,632,581, Cl. 400-187.000.
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, to Minolta Camera Kabushiki Kaisha. Copying machine with automatic resetting control features. 4,633,405, Cl. 364-184.000.
Ito, Novuei: *See—*
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, 4,633,064, Cl. 219-270.000.
Ito, Ryouichi; Banno, Yoshihiro; and Kakizaki, Tetsuji, to Mitsubishi Petrochemical Co., Ltd. Resin composition for masterbatch of foaming agent. 4,632,942, Cl. 521-92.000.
Ito, Soichi, to Nippon Kokan Kabushiki Kaisha. Movable fixed-type semi-submerged construction. 4,632,600, Cl. 405-30.000.
Ito, Yoshinori: *See—*
Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, 4,633,046, Cl. 370-32.100.
Itoh, Hiroshi: *See—*
Ohmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, 4,632,509, Cl. 350-283.000.
Itoh, Katsutoshi, to Tsubakimoto Precision Products Co., Ltd. Linear motion ball bearing. 4,632,573, Cl. 384-43.000.
Itoh, Tetsuo: *See—*
Yanagihara, Kenji; Itoh, Tetsuo; Kimura, Mituo; and Niinomi, Masahiro, 4,632,844, Cl. 427-38.000.
ITT Corporation: *See—*
Adam, Ian R.; and Mallon, James, 4,631,889, Cl. 52-565.000.
Goeb, Robert; and Silber, Nathaniel L., 4,633,487, Cl. 375-118.000.
Karbassiyoon, Kamran; Foster, Philip E.; Akers, Francis I.; and Fletcher, Daniel G., 4,632,684, Cl. 65-2.000.
Menn, Walter A., 4,633,227, Cl. 340-365.0VL.
ITT Industries, Inc.: *See—*
Backes, Reiner; and Schmidtpott, Friedrich, 4,633,106, Cl. 307-578.000.
Kircher, Dieter; and Batistic, Ivica, 4,632,467, Cl. 303-111.000.
Lowe, Derek R., 4,631,924, Cl. 60-562.000.
Iwahashi, Hiroyuki: *See—*
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,633,499, Cl. 381-43.000.
Iwamatsu, Noboru: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,631,807, Cl. 29-598.000.
Iwamoto, Masanori: *See—*
Haruki, Kazuhito; Iwamoto, Masanori; and Tamada, Masuo, 4,632,252, Cl. 209-546.000.
Iwamoto, Shuji: *See—*
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.
Iwanaga, Shin-ichiro: *See—*
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, 4,632,960, Cl. 525-117.000.
Iwao, Eiichi: *See—*
Yamamoto, Hitoshi; Baba, Masayoshi; and Iwao, Eiichi, 4,632,210, Cl. 180-309.000.
Iwasa, Hiroki; Ohmi, Kyozo; and Amano, Tokuhiro, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Rotary indicating device. 4,631,848, Cl. 40-427.000.
Iwasaki, Takayuki: *See—*
Ookubo, Mamoru; Iwasaki, Takayuki; and Mieda, Kenji, 4,631,795, Cl. 29-243.520.
Iwata, Atsushi: *See—*
Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, 4,633,194, Cl. 331-25.000.
Iwata Co. Ltd.: *See—*
Iwata, Takuzo, 4,631,836, Cl. 34-2.000.
Iwata, Hiroshi; and Ishikawa, Katsuji, to West Electric Co., Ltd. Automatic film winding system. 4,632,530, Cl. 354-173.110.
Iwata, Masahiro; Shirai, Teruhito; and Watanabe, Toshio, to Furukawa Aluminum Co., Ltd. Method of loading billet in the indirect extruding press. 4,631,949, Cl. 72-270.000.
Iwata, Noboru, to Daiichi Engineering Co., Ltd. Squeeze pump. 4,632,646, Cl. 417-477.000.
Iwata, Takahiro: *See—*
Otobe, Yutaka; and Iwata, Takahiro, 4,633,093, Cl. 290-40.00R.
Iwata, Takuzo, to Iwata Co. Ltd. Method of activating down and fiber materials. 4,631,836, Cl. 34-2.000.
Izaki, Osamu: *See—*
Takano, Hirokuni; Shimizu, Tadao; and Izaki, Osamu, 4,632,579, Cl. 400-121.000.
Izumi, Akio; and Tanaka, Hideyuki, to Fuji Electric Co., Ltd. Method and apparatus for detecting focusing in an image pickup device. 4,633,319, Cl. 358-227.000.
J. Kuhn GmbH & Co. Prazisionswerkzeug K.G.: *See—*
Johne, Frank, 4,632,609, Cl. 408-197.000.
Jackson, Harry G.: *See—*
Giesl-Gieslingen, Adolph; and Jackson, Harry G., 4,632,445, Cl. 295-1.000.
Jackson, Harry G., Jr.: *See—*
Giesl-Gieslingen, Adolph; and Jackson, Harry G., 4,632,445, Cl. 295-1.000.
Jackson, Harry G., Jr.: *See—*
Giesl-Gieslingen, Adolph; and Jackson, Harry G., 4,632,445, Cl. 295-1.000.
Jacobsen, Finn V.; and Jensen, Peter, to Schmidt & Jessen A/SD. Strainer basket provided with at least one tubular sighting net open at either ends. 4,632,753, Cl. 210-232.000.
Jacobson, Allan J.: *See—*
Ho, Teh C.; Young, Archie R., II; Jacobson, Allan J.; and Chianelli, Russell R., 4,632,747, Cl. 208-18.000.
Jacobson, Sol M., to Gem Electric Manufacturing Co., Inc. Safety terminal for electrical extension cord. 4,632,479, Cl. 339-36.000.
Jager, Helmut: *See—*
Knoke, Jurgen; Jager, Helmut; Dekant, Ludwig; and Groitzsch, Dieter, 4,632,858, Cl. 428-287.000.
James, Donald N., to Staodynamics, Inc. Simplified transcutaneous nerve stimulating device. 4,632,117, Cl. 128-421.000.
James, Richard A.: *See—*
Gallagher, Nicholas D.; Sternasty, Richard S.; and James, Richard A., 4,632,872, Cl. 428-350.000.
Jamieson, John R.: *See—*
Nelson, Frederic P.; and Jamieson, John R., 4,633,232, Cl. 340-542.000.
Jang, Kam-Yong: *See—*
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, 4,632,960, Cl. 525-117.000.
Yanagihara, Kenji; Itoh, Tetsuo; Kimura, Mituo; and Niinomi, Masahiro, 4,632,844, Cl. 427-38.000.
Japan Tobacco & Salt Public Corporation, The: *See—*
Hyuga, Kounosuke, 4,632,318, Cl. 241-37.000.
Nagata, Tomizou; and Kobayashi, Kazutaka, 4,631,904, Cl. 53-529.000.
Jaquith, Robert E.: *See—*
Herbst, John J.; Sider, Richard G.; Jaquith, Robert E.; and Meijer, Christoffel H., 4,632,802, Cl. 376-216.000.
Jarrott, Kenneth N.; and Parker, Eric J., to Commonwealth of Australia, The. Programmable electronic delay fuse. 4,632,031, Cl. 102-200.000.
Jaskolski, Stanley V.: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.

Jeanneret, Remy: *See*—
Rochat, Alain C.; Iqbal, Abul; Jeanneret, Remy; and Mizuguchi, Jin, 4,632,893, Cl. 430-58.000.

Jefferies, Patrick J.: *See*—
Hung, William M.; and Jefferies, Patrick J., 4,632,783, Cl. 260-394.000.

Jeffers, Frederick J., to Eastman Kodak Company. Unambiguously tracking a data track in response to signals derived from the track data itself. 4,633,344, Cl. 360-77.000.

Jeffery, Michael R., to Storviders Limited. Collapsible display stands. 4,631,849, Cl. 40-610.000.

Jelsma, Andries: *See*—
Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, 4,632,812, Cl. 423-309.000.

Jemison, Emanuel B.: *See*—
Blosser, Henry G.; Blosser, Gabe F.; Jemison, Emanuel B.; and Purcell, John R., 4,633,125, Cl. 313-62.000.

Jenkins, Thomas E.; and Cushing, Donald S., to General Electric. Refrigerator cabinet and method of assembly. 4,632,470, Cl. 312-214.000.

Jenoptik Jena GmbH: *See*—
Hahn, Eberhard, 4,633,090, Cl. 250-492.200.

Jensen, Peter: *See*—
Jacobsen, Finn V.; and Jensen, Peter, 4,632,753, Cl. 210-232.000.

Jensen, Stephen M., to Hughes Aircraft Company. Phase insensitive optical logic gate device. 4,632,518, Cl. 350-385.000.

JEOL Ltd.: *See*—
Tomita, Takeshi; Harada, Yoshiyasu; and Ohi, Kimio, 4,633,085, Cl. 250-311.000.

Jerden Industries, Inc.: *See*—
Pauls, Dennis A., 4,631,970, Cl. 74-44.000.

Jergl, Joseph J.: *See*—
Kump, William H.; and Jergl, Joseph J., 4,632,888, Cl. 429-187.000.

Jerila, Torsti T. T., to Acme General Corporation. Hardware for panel doors. 4,631,894, Cl. 52-823.000.

Jester, Willi; and Reiter, Norbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Adjustable holder for a cutting tool. 4,631,994, Cl. 82-36.00R.

Jeuch, Pierre: *See*—
Hartmann, Joel; and Jeuch, Pierre, 4,632,725, Cl. 156-643.000.

Jha, Anil D.: *See*—
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., 4,632,745, Cl. 204-301.000.

Jinba, Terumasa; Fukunaka, Shiro; Anan, Tatsuro; and Shiotani, Nobuo, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing one-side electrogalvanized steel strip. 4,632,733, Cl. 204-28.000.

Johansson, Nils E.; Eralp, Emin; and Itil, Turan M. Method and apparatus for conducting brain function diagnostic test. 4,632,122, Cl. 128-644.000.

Johne, Frank, to J. Kuhn GmbH & Co. Prazisionswerkzeug K.G. Rotary cutting tool. 4,632,609, Cl. 408-197.000.

Johns Hopkins University, The: *See*—
Todd, Donald A.; and Fischell, Robert E., 4,632,114, Cl. 128-346.000.

Johnsen, Jorgensen, Jaypak, Ltd.: *See*—
Maloney, John, 4,631,905, Cl. 53-554.000.

Johnson, Bruce G.: *See*—
Johnson, Louis W.; and Johnson, Bruce G., 4,632,751, Cl. 209-326.000.

Johnson, David R.: *See*—
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

Johnson, Gordon E. Accessory locking device for a doorknob having a keyhole therein. 4,631,938, Cl. 70-209.000.

Johnson, Harvey R. Electrical strain gauge. 4,633,212, Cl. 338-2.000.

Johnson, Louis W.; and Johnson, Bruce G. Shaker screen. 4,632,751, Cl. 209-326.000.

Johnson, Robert E.; and Booker, Philip H., III, to Tronomed, Inc. Safety medical cable assembly with connectors. 4,632,121, Cl. 128-639.000.

Johnston, Jack E.: *See*—
Gutierrez, Antonio; Brownawell, Darrell W.; Bloch, Ricardo; and Johnston, Jack E., 4,632,769, Cl. 252-48.600.

Johnstone Pump Company: *See*—
Wold, Robert E., 4,632,281, Cl. 222-389.000.

Jones, Donald K.; Tomisek, John D.; and Young, Harry M., to Packard Instrument Co., Inc. Reverse sum quench measurement using a liquid scintillation counter. 4,633,088, Cl. 250-369.000.

Jones, Donald W., to General Electric Company. Method of forming a superconductive joint between multifilament superconductors. 4,631,808, Cl. 29-599.000.

Jones, Gary A.: *See*—
Skerlos, Peter C.; Zato, Thomas J.; and Jones, Gary A., 4,633,297, Cl. 358-22.000.

Jones, Godfrey D., to Preci-Spark Limited. Laser machining apparatus. 4,633,058, Cl. 219-121.0LK.

Jones, J. Richard; and Mann, Alan B., to FiberLAN, Inc. Time divison multiplex ring. 4,633,246, Cl. 340-825.050.

Jones, James S. Carburetor fuel feed system with bidirectional passage. 4,632,788, Cl. 261-41.500.

Jones, Keith E., to Tektronix, Inc. Loop coupled YIG resonator. 4,633,205, Cl. 333-219.000.

Jones, Michael E., to Eaton Corporation. Speed-sensitive shift control. 4,631,984, Cl. 74-878.000.

Joslyn, Carl R.: *See*—
Punako, Stephen; Gallusser, David O.; and Joslyn, Carl R., 4,632,482, Cl. 339-59.00M.

Jouquey, Alain; Touyer, Gaetan; Salmon, Jean; and Mouren, Michel, to Roussel Uclaf. Novel radioactive estratrienes. 4,632,820, Cl. 424-1.100.

Jung Corporation: *See*—
Gamm, Paul B., 4,632,106, Cl. 128-165.000.

Jung, Gerd, to Varta Batterie Aktiengesellschaft. Galvanic primary cell. 4,632,887, Cl. 429-181.000.

Jurdi, Wissam J.: *See*—
Shibata, Tomoo; and Jurdi, Wissam J., 4,633,276, Cl. 346-200.000.

Jurgich, Donald. Holder for kitchen utensils and complementing stand. 4,632,347, Cl. 248-213.200.

Jurim, Adrain S. Prosthetic dentistry. 4,632,660, Cl. 433-215.000.

Kabelitz, Hans-Peter: *See*—
Frieden, Peter; Kabelitz, Hans-Peter; Ronthaler, Karl-Heinz; and Thielicke, Jorg, 4,632,650, Cl. 418-95.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Fukunaga, Takao; and Inoue, Akira, 4,632,233, Cl. 192-3.300.
Ookubo, Mamoru; Iwasaki, Takayuki; and Mieda, Kenji, 4,631,795, Cl. 29-243.520.
Tamura, Kazuhisa; Takeshita, Shigeru; and Fukunaga, Takao, 4,631,979, Cl. 74-730.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kawashima, Hirofumi, 4,633,124, Cl. 310-348.000.

Kabushiki Kaisha Kanemitsu: *See*—
Oda, Misao, 4,631,946, Cl. 72-68.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Omachi, Yoshio; and Yamada, Eisaku, 4,633,383, Cl. 364-167.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Iwasa, Hiroki; Ohmi, Kyozo; and Amano, Tokuhiro, 4,631,848, Cl. 40-427.000.

Kabushiki Kaisha Toshiba: *See*—
Haruki, Kazuhito; Iwamoto, Masanori; and Tamada, Masuo, 4,632,252, Cl. 209-546.000.
Hirata, Akio; and Naito, Yosio, 4,633,158, Cl. 318-723.000.
Honda, Michitaka, 4,633,307, Cl. 358-111.000.
Imanishi, Shoichi; and Ikeda, Yoshio, 4,631,934, Cl. 68-23.00R.
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.
Nagata, Niroo, 4,632,535, Cl. 355-3.0DD.
Namba, Hiromi, 4,633,502, Cl. 382-9.000.
Oyamatsu, Yasuyuki; Uematsu, Masashi; and Sakai, Hiroshi, 4,632,585, Cl. 400-613.000.
Shimbo, Takao; and Kurokawa, Hiroto, 4,633,452, Cl. 369-39.000.
Shimono, Mamoru, 4,632.534, Cl. 355-3.0DD.
Sugimoto, Hiroshi, 4,633,179, Cl. 324-309.000.

Kabushiki Kaisha Tsuzuki Seisakujo: *See*—
Tsuzuki, Kiyohiko, 4,632,383, Cl. 272-67.000.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Sakota, Kazuyuki; Naito, Yoshiyuki; and Kishimoto, Mitsuyuki, 4,633,024, Cl. 568-738.000.

Kaczmarski, Wally L.: *See*—
Haeder, Thomas Q.; and Kaczmarski, Wally L., 4,632,158, Cl. 144-34.00E.

Kaffka, Karoly: *See*—
Czabaffy, Andras; Kaffka, Karoly; Horvath, Lorand; and Nadai, Bela, 4,632,549, Cl. 356-300.000.

Kaga, Sumihiro: *See*—
Nakamura, Mitsuo; Kaga, Sumihiro; and Tanahashi, Toshitaka, 4,633,364, Cl. 361-216.000.

Kaga, Toru: *See*—
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Kahl, Horst: *See*—
Haberkern, Ottmar; and Kahl, Horst, 4,633,323, Cl. 358-254.000.

Kahle, Norman R. Bug catcher. 4,631,858, Cl. 43-134.000.

Kaiser, Donald F., to Beckman Industrial Corporation. Microprocessor controlled constant current circuit. 4,633,164, Cl. 323-312.000.

Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, to Uruko Seisakusho Co., Ltd. Veneer lathe. 4,632,161, Cl. 144-213.000.

Kakizaki, Tetsuji: *See*—
Ito, Ryouichi; Banno, Yoshihiro; and Kakizaki, Tetsuji, 4,632,942, Cl. 521-92.000.

Kalashov, Valentin P.: *See*—
Goldshtein, Lev I.; Kalashov, Valentin P.; Pleshkanovsky, Jury P.; Didenko, Vladimir F.; and Khaitin, Boris S., 4,631,926, Cl. 62-115.000.

Kale, Hemant D. Thermal baffle for water heaters and the like. 4,632,065, Cl. 122-13.00R.

Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., to Celanese Corporation. Process for the intercalation of graphitic carbon employing sulfur trioxide. 4,632,775, Cl. 252-502.000.

Kalteis, August: *See*—
Feyerl, Gunther; Kalteis, August; and Meyer, Karl, 4,632,325, Cl. 242-55.000.

Kalvinsh, Ivars Y.: *See*—
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.

Kamarehi, Mohammad: *See*—
Lynch, Donald; Kamarehi, Mohammad; and Ury, Michael G., 4,633,140, Cl. 315-248.000.

Kamijo, Yukio: *See*—
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.

Kamio, Kunimasa: *See*—
Kanagawa, Shuichi; Takagishi, Hisao; Adachi, Teruho; and Kamio, Kunimasa, 4,632,966, Cl. 525-502.000.

Kanagawa, Shuichi; Takagishi, Hisao; Adachi, Teruho; and Kamio, Kunimasa, to Sumitomo Chemical Company, Limited. Thermosetting resin composition of an allylated novolak and a bis-maleimide. 4,632,966, Cl. 525-502.000.

Kanbe, Yoshiaki: *See*—
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, 4,633,077, Cl. 250-214.00L.

Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, to Kawasaki Jukogyo Kabushiki Kaisha; and Kawasaki Steel Corporation. Labor saving apparatus for continuous casting facility. 4,632,173, Cl. 164-417.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,631,840, Cl. 36-50.000.

Kania, Alice M. Dust collecting apparatus. 4,631,774, Cl. 15-257.100.

Kanno, Hideomi: *See*—
Watanabe, Yasuo; and Kanno, Hideomi, 4,632,315, Cl. 241-26.000.

Kanno, Kimio: *See*—
Sasagawa, Katsuyoshi; Imai, Masao; and Kanno, Kimio, 4,632,969, Cl. 526-286.000.

Kano, Jiro: *See*—
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.

Kanzaki, Hiroyuki: *See*—
Takahashi, Susumu; and Kanzaki, Hiroyuki, 4,633,483, Cl. 375-25.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Suzuki, Toshitake; Hama, Fumio; and Kondo, Mitsuru, 4,633,277, Cl. 346-216.000.

Kaplan, Irwin; and Schneider, William B., to Broomer Research Corporation. Autocollimating alignment telescope. 4,632,547, Cl. 356-247.000.

Kaplan, Lester J., to Upjohn Company, The. Omega-(hydroxy-, ether and ester)-alkyl-2-amino-cycloalkyl- and cycloalkenyl amides as analgesics. 4,632,935, Cl. 514-429.000.

Kappel, Gary W.: *See*—
Olsen, David W.; Wittman, Leroy L.; Evenson, Marvin E.; and Kappel, Gary W., 4,632,262, Cl. 212-189.000.

Kar, Nareshchandra J.; and Roth, Cary A., to Smith International, Inc. Hermetically welded belleville seal for rock bits. 4,632,401, Cl. 277-1.000.

Karbassiyoon, Kamran; Foster, Philip E.; Akers, Francis I.; and Fletcher, Daniel G., to ITT Corporation. Method of and apparatus for making optical preforms from tubular bodies. 4,632,684, Cl. 65-2.000.

Karish, John: *See*—
Schuh, Frank J.; and Karish, John, 4,632,188, Cl. 166-368.000.

Karlsson, Lars, to Pharos AB. Optical scanning device. 4,632,503, Cl. 350-6.800.

Karnezos, Marcos; Nakanos, Howard H.; and Neukermans, Armand P., to Varian Associates, Inc. Anodic bonding method and apparatus for X-ray masks. 4,632,871, Cl. 428-336.000.

Karpa, Michael J. Weighing device. 4,632,197, Cl. 177-163.000.

Karreman, Jaap: *See*—
Eygelaar, Klaas; Karreman, Jaap; and Karreman, Peter, 4,632,656, Cl. 425-529.000.

Karreman, Peter: *See*—
Eygelaar, Klaas; Karreman, Jaap; and Karreman, Peter, 4,632,656, Cl. 425-529.000.

Karwoski, Theodore; and Matsuzawa, Yasuo, to Atrium Medical Corporation. Glow discharge process for producing implantable devices. 4,632,842, Cl. 427-2.000.

Kasai, Kazumi, to Nippon Notion Koygo Co., Ltd. Buckle having manually releasable interlocking male and female portions. 4,631,787, Cl. 24-616.000.

Kaschube, Karl-Friedrich: *See*—
Feldle, Kurt; and Kaschube, Karl-Friedrich, 4,632,404, Cl. 277-68.000.

Kase, Lawrence E.; and Branton, Philip L., to Summit Chemical Company. Floating article for improved control of aquatic insects. 4,631,857, Cl. 43-132.100.

Kashihara, Yuji: *See*—
Morisawa, Kunio; Kashihara, Yuji; and Higuchi, Atsunori, 4,631,983, Cl. 74-877.000.

Kashiwabara, Akihiro: *See*—
Sonobe, Hiraku; Miyake, Hiroyuki; and Kashiwabara, Akihiro, 4,632,536, Cl. 355-3.00R.

Kashiwagi, Toshihiro, to Anritsu Electric Company Limited. Apparatus for measuring a signal level. 4,633,173, Cl. 324-130.000.

Kashiwazaki, Hiroshi, to Hitachi, Ltd. Applied voltage detecting device for electric power convertor. 4,633,380, Cl. 363-54.000.

Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Receiver for RF-signals comprising a pair of parallel signal paths. 4,633,315, Cl. 358-188.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Children's automobile-mounted safety seat. 4,632,456, Cl. 297-328.000.

Kastner, Arnold. Cigarette making machine. 4,632,129, Cl. 131-70.000.

Kastner, Hermann: *See*—
Rall, Gerhard; Hertel, Gunther; Hertel, Karl G.; and Kastner, Hermann, 4,632,614, Cl. 409-233.000.

Katayama, Shigeharu: *See*—
Negishi, Hideo; Obokata, Mitsuyuki; and Katayama, Shigeharu, 4,632,257, Cl. 211-59.200.

Katkocin, Dennis M.: *See*—
Starnes, Robert L.; Katkocin, Dennis M.; Miller, Carl A.; and Strobel, Robert J., Jr., 4,632,905, Cl. 435-189.000.

Kato, Chiaki: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Kato, Hiroshi, to Fuji Xerox Co., Ltd. Picture image file device. 4,633,506, Cl. 382-56.000.

Kato, Hiroyuki: *See*—
Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, 4,632,878, Cl. 428-425.900.

Kato, Itsuro: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Kato, Noboru; and Hattori, Yasuhiro, to Toyoda Koki Kabushiki Kaisha. Machine tool with two tool changers. 4,631,981, Cl. 74-813.00R.

Kato, Takahiro, to Pioneer Electric Corporation. Rotary head type magnetic recording and reproducing device. 4,633,342, Cl. 360-75.000.

Kato, Tsutomu: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Katoh, Matsuo: *See*—
Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, 4,632,478, Cl. 339-17.0LC.

Katsuya, Hiroo: *See*—
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Katz, Lawrence H.; Wells, Douglas M.; and Bratt, Richard G., to Data General Corporation. Digital data processing system method for making a general call. 4,633,406, Cl. 364-200.000.

Kaufman, Harold R.: *See*—
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,633,129, Cl. 313-153.000.

Kauss, Valeryans Y.: *See*—
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.

Kaverud, Peter H.: *See*—
Naumec, John R.; and Kaverud, Peter H., 4,632,623, Cl. 414-148.000.

Kawabata, Takashi: *See*—
Matsumura, Susumu; Kawabata, Takashi; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,632,532, Cl. 354-403.000.

Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, to Fanuc Ltd. Method of manufacturing a permanent-magnet field rotor. 4,631,807, Cl. 29-598.000.

Kawakami, Kanji: *See*—
Tanabe, Masanori; and Kawakami, Kanji, 4,633,099, Cl. 307-308.000.

Kawakami, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a glass passivation type semiconductor device. 4,632,728, Cl. 156-659.100.

Kawakami, Naoya; and Fujisawa, Yoshiaki, to Sawafuji Electric Co., Ltd. Vibrating compressor. 4,632,645, Cl. 417-417.000.

Kawakami, Yasuo; and Kitamura, Katsushi, to Pioneer Electronic Corporation. NF tone control circuit. 4,633,189, Cl. 330-97.000.

Kawakubo, Shoji: *See*—
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Kawamoto, Mineo: *See*—
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Kawamura, Eiichi: *See*—
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,632,403, Cl. 277-27.000.

Kawamura, Toshio: *See*—
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Kawamura, Yoshiaki: *See*—
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, 4,632,960, Cl. 525-117.000.

Kawane, Minoru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for forcing piston ring radially outwardly. 4,632,405, Cl. 277-150.000.

Kawarai, Seigi: *See*—
Kuse, Sadamu; and Kawarai, Seigi, 4,632,867, Cl. 428-323.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.

Kawasaki Kasei Chemicals Limited: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,632,782, Cl. 260-396.00R.

Kawasaki Steel Corporation: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Mount for quartz crystal resonator. 4,633,134, Cl. 310-348.000.

Kawashima, Yoshinori, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission casing in motorized two-wheeled vehicle. 4,631,977, Cl. 74-606.00A.

Kawasumi, Kouzi: *See—*
Hayashi, Mikio; and Kawasumi, Kouzi, 4,632,525, Cl. 350-634.000.

Kawatsu, Teruo: *See—*
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.

Kawauchi, Satsuki: *See—*
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Onori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Kay, Ronald D. Latch mechanism for a battery holder. 4,632,201, Cl. 180-68.500.

Kayama, Seiji: *See—*
Imazeki, Kazuyoshi; and Kayama, Seiji, 4,633,264, Cl. 343-786.000.

KCJ Corporation: *See—*
Carr, Myra J.; Brosig, Frances H.; and Gottlieb, Robert G., 4,631,767, Cl. 5-449.000.

Kearney & Trecker Corporation: *See—*
Loerch, Richard J., 4,632,612, Cl. 409-231.000.

Keener, Don S., to International Business Machines Corp. Positioning misaligned disk heads. 4,633,345, Cl. 360-77.000.

Keesling, William A.; and Metzger, William J., to General Motors Corporation. Mounting arrangement for a mirror. 4,632,348, Cl. 248-222.100.

Kelm, Walter H., to General Electric Company. Grooving tool and method for making same. 4,631,993, Cl. 82-1.00C.

Kelsey, Terry D., to Chan, Mark; and Drew, Kevin. Timer for use in interval training. 4,632,570, Cl. 368-107.000.

Kempel, John J.: *See—*
Otto, Ronald F.; and Kempel, John J., 4,631,866, Cl. 49-504.000.

Kenall Manufacturing Company: *See—*
Mackiewicz, Edward T., 4,633,377, Cl. 362-309.000.

Kendall Company, The: *See—*
Wolfrey, Austin A.; and Temin, Samuel C., 4,632,859, Cl. 428-288.000.

Kenmochi, Hirohito: *See—*
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,632,781, Cl. 260-380.000.

Kennedy, Eugene J.: *See—*
Basile, Philip C.; and Kennedy, Eugene J., 4,633,202, Cl. 333-109.000.

Kennedy, Frank W. Apparatus for unrolling baled hay. 4,632,619, Cl. 414-24.600.

Kennedy, Richard A.; and Aldridge, Fredrick A., to General Motors Corporation. AGC voltage generator with automatic rate switching. 4,633,518, Cl. 455-242.000.

Kennedy, William D. Foldable clothes hanger. 4,632,255, Cl. 211-1.300.

Keppel, Robert A.; and Franchetti, Victoria M., to Monsanto Company. Iron/lithium—promoted catalysts for the production of maleic anhydride. 4,632,915, Cl. 502-209.000.

Keppel, Wolf D.; and Mannesmann, Reinhard C., to Mannesmann, Reinhard Carl. Method for producing fluid flow regulators. 4,632,791, Cl. 264-40.100.

Keritsis, Gus D.: *See—*
Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., 4,632,131, Cl. 131-355.000.

Kern, Heiner: *See—*
Heller, Rudolf; and Kern, Heiner, 4,632,153, Cl. 139-449.000.

Kesner, Burnce E., to Dresser Industries, Inc. Scrolling well logging data display method and apparatus. 4,633,446, Cl. 367-69.000.

Khaitin, Boris S.: *See—*
Goldshtein, Lev I.; Kalashov, Valentin P.; Pleshkanovsky, Jury P.; Didenko, Vladimir F.; and Khaitin, Boris S., 4,631,926, Cl. 62-115.000.

Khurgin, Jacob, to North American Philips Corporation. Halo-reducing faceplate arrangement. 4,633,131, Cl. 313-474.000.

Kibata, Asaharu: *See—*
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.

Kida, Masuyoshi: *See—*
Cannistra, Anthony T.; Kida, Masuyoshi; Tung, Min-Hsiung G.; and Ushiroda, Tatsuyuki, 4,633,507, Cl. 382-61.000.

Kideys, Fazil F. Multiple segment gas water heater and multiple segment gas water heater with water jacket. 4,632,066, Cl. 122-13.00R.

Kiely, William L.; and Pedersen, Kristen I., to Sofec, Inc. Mooring and transfer system and method. 4,632,663, Cl. 441-5.000.

Kierstead, Richard W.: *See—*
Mullin, John G., Jr.; Kierstead, Richard W.; and Triscari, Joseph, 4,632,925, Cl. 514-256.000.

Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Digital frequency divider suitable for a frequency synthesizer. 4,633,194, Cl. 331-25.000.

Kikuchi, Kenichi: *See—*
Hayashi, Hideki; and Kikuchi, Kenichi, 4,631,802, Cl. 29-576.00E.
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.

Kikuchi, Makoto: *See—*
Mizuno, Hiroko; Kikuchi, Makoto; Horiuchi, Susumu; and Tamata, Shin, 4,632,779, Cl. 252-629.000.

Kilian, Ernst A., to U.S. Philips Corporation. Monitoring arrangement. 4,633,231, Cl. 340-539.000.

Kim, Young-Wook: *See—*
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.

Kimberly-Clark Corporation: *See—*
Gallagher, Nicholas D.; Sternasty, Richard S.; and James, Richard A., 4,632,872, Cl. 428-350.000.

Kimoto, Masahiko: *See—*
Onda, Takanori; Yamamoto, Hitoshi; and Kimoto, Masahiko, 4,632,070, Cl. 123-41.580.

Kimura, Mituo: *See—*
Yanagihara, Kenji; Itoh, Tetsuo; Kimura, Mituo; and Niinomi, Masahiro, 4,632,844, Cl. 427-38.000.

Kimura, Shigeru, to Nifco Inc. Device for connecting tubes. 4,632,433, Cl. 285-38.000.

Kimura, Shigeru, to Nifco Inc. Device for connecting tubes or the like. 4,632,436, Cl. 285-305.000.

Kimura, Yuichiro: *See—*
Osawa, Michitaka; Kimura, Yuichiro; and Miyajima, Hiroyuki, 4,633,145, Cl. 315-383.000.

King, Alan M. Coffee brewer. 4,632,023, Cl. 99-302.00P.

King, Mavis. Foot operated door check. 4,631,776, Cl. 16-82.000.

King, William H., to Bourns, Inc. Method of manufacturing a multi-wire contact assembly. 4,631,824, Cl. 29-884.000.

Kingsford, Ted I., to Plough, Inc. Mascara application system. 4,632,136, Cl. 132-88.700.

Kinjo, Hisao, to Victor Company of Japan Ltd. Tubular recording medium having a flexible magnetic recording surface. 4,633,357, Cl. 360-136.000.

Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, to Hoechst Aktiengesellschaft. Process for making alkali metal phosphate solutions containing little vanadium. 4,632,812, Cl. 423-309.000.

Kinoshita, Takao: *See—*
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,633,075, Cl. 250-201.000.

Kircher, Dieter; and Batistic, Ivica, to ITT Industries, Inc. Brake system with brake slip control. 4,632,467, Cl. 303-111.000.

Kirst, Bertold: *See—*
Feige, Christian; and Kirst, Bertold, 4,632,012, Cl. 89-41.090.

Kishi, Hajimu; and Tanaka, Kunio, to Fanuc Ltd. Method of indicating diagnostic results. 4,633,469, Cl. 371-29.000.

Kishida, Kunio: *See—*
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,632,806, Cl. 420-479.000.

Kishimoto, Mitsuyuki: *See—*
Ueno, Ryuzo; Sakota, Kazuyuki; Naito, Yoshiyuki; and Kishimoto, Mitsuyuki, 4,633,024, Cl. 568-738.000.

Kishino, Takao; and Mizohata, Tadashi, to Futaba Denshi Kogyo Kabushiki Kaisha. Color fluorescent display device having anode conductors in zig-zig pattern. 4,633,134, Cl. 313-497.000.

Kissei Pharmaceutical Co., Ltd.: *See—*
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.

Kita, Gerald K., to AMP Incorporated. Right-angle modular connector with two-part housing. 4,632,495, Cl. 339-210.00M.

Kitagawa Industries Co., Ltd.: *See—*
Hayashi, Yoshitoki, 4,631,783, Cl. 24-16.0PB.

Kitamura, Katsushi: *See—*
Kawakami, Yasuo; and Kitamura, Katsushi, 4,633,189, Cl. 330-97.000.

Kitamura, Kozo, to Sharp Kabushiki Kaisha. System for transferring document data to non-volatile memory in a word processing apparatus. 4,633,432, Cl. 364-900.000.

Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, to Kokusai Denshin Denwa Co., Ltd.; and NEC Corporation. Adaptive echo canceller. 4,633,046, Cl. 370-32.100.

Kitts, Melvin M. Tester for electrical joy stick controllers. 4,633,167, Cl. 324-51.000.

Kjaerbye, Steffen: *See—*
Ohlsson, Ingemar; Madsen, Finn T.; and Kjaerbye, Steffen, 4,632,854, Cl. 428-36.000.

KLA Instruments Corporation: *See—*
Wihl, Mark J., 4,633,504, Cl. 382-54.000.

Klaas, Otto: *See—*
Kleinwachter, Jurgen; Kleinwachter, Hans; and Klaas, Otto, 4,631,922, Cl. 60-518.000.

Klausz, Remy, to Thomson-CGR. Method of controlling the positioning of a patient with respect to an X-ray device and installation for carrying out such method. 4,633,494, Cl. 378-205.000.

Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of phenyl- and thienyl-chlorophosphane derivatives. 4,632,995, Cl. 549-6.000.

Kleinhagen, Charles W., Jr., to Eaton Corporation. Automatic brake slack adjuster. 4,632,229, Cl. 188-196.00D.

Kleinwachter, Hans: *See—*
Kleinwachter, Jurgen; Kleinwachter, Hans; and Klaas, Otto, 4,631,922, Cl. 60-518.000.

Kleinwachter, Jurgen; Kleinwachter, Hans; and Klaas, Otto, to Bomin Solar GmbH & Co. KG. Heat engine. 4,631,922, Cl. 60-518.000.

Klimczak, William J., to Carter-Day Co. Cleaning air manifold with back draft damper. 4,632,679, Cl. 55-284.000.

Klimczak, William J., to Carter-Day Co. Planar sided air shaping inserts for filter bags. 4,632,680, Cl. 55-302.000.

Kline, Gaylen O.: *See—*
Hay, Thomas E.; Wisebaker, Robert E.; and Kline, Gaylen O., 4,631,950, Cl. 72-356.000.

Klingshirn, Helmut: *See—*
Fromm, Dietrich; Klingshirn, Helmut; Gosslar, Achim; and Heider, Jurgen, 4,633,136, Cl. 313-623.000.

Klinkwitz, Kurt: *See—*
Alf, Reinhard; and Klinkwitz, Kurt, 4,633,266, Cl. 343-903.000.

Klinsmann, Uwe: *See—*
Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klinsmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel, 4,632,897, Cl. 430-260.000.

Klockner-Werke Aktiengesellschaft: *See—*
von der Ohe, Helmcke; and Koliwer, Wolfgang, 4,632,651, Cl. 425-135.000.

Kluppel, Hans-Jurgen: *See—*
Ploger, Walter; Kluppel, Hans-Jurgen; and Forg, Franz, 4,632,826, Cl. 424-52.000.

Kmiec, Chester J.; and Novits, Michael F., to Pennwalt Corporation. Scorch resistant, crosslinkable composition containing mixture of copper and metal dithiocarbamates. 4,632,950, Cl. 524-202.000.

Kneuer, Joseph G.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

Knohl, Ernst-Dieter, to Carl-Zeiss-Stiftung. Supporting system for a telescope mirror. 4,632,523, Cl. 350-611.000.

Knoke, Jurgen; Jager, Helmut; Dekant, Ludwig; and Groitzsch, Dieter, to Carl Freudenberg, Firma. Filler fleece material and method of manufacturing same. 4,632,858, Cl. 428-287.000.

Knorr, Fritz J.; Eatherton, Randy L.; Siems, William F.; and Hill, Herbert H., Jr., to Washington State University Research Foundation, Inc. Chemical analysis by time dispersive ion spectrometry. 4,633,083, Cl. 250-282.000.

Knothe, Erich: *See—*
Ober, Jurgen; Melcher, Franz-Josef; and Knothe, Erich, 4,632,199, Cl. 177-238.000.

Knudsen, Ivan, to Danfoss A/S. Electronic switching apparatus. 4,633,094, Cl. 307-140.000.

Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, to Kabushiki Kaisha Toshiba; and Taisei Corporation. Interior panel. 4,631,879, Cl. 52-98.000.

Kobayashi, Kaoru: *See—*
Higurashi, Seiji; Miyashita, Atsushi; and Kobayashi, Kaoru, 4,633,332, Cl. 360-10.300.

Kobayashi, Kazutaka: *See—*
Nagata, Tomizou; and Kobayashi, Kazutaka, 4,631,904, Cl. 53-529.000.

Kobayashi, Masatsune: *See—*
Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, 4,632,703, Cl. 106-22.000.

Kobusch, Klaus: *See—*
Wesemann, Karl-Friedrich; Lenk, Rainer; Kobusch, Klaus; and Markan, Manfred, 4,631,792, Cl. 29-129.000.

Koch, Albert. Anti-falling device with rapid introduction and withdrawal of the cord in any position of this latter. 4,632,226, Cl. 188-65.100.

Koch, Gerhard: *See—*
Schuller, Reinhard; and Koch, Gerhard, 4,632,625, Cl. 414-429.000.

Koch, Tad H.: *See—*
Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., 4,632,922, Cl. 514-236.000.

Kocon, Florian T.; and Geiger, Kurt A., to Fuller Company. Self locking door retarder and hinge. 4,631,778, Cl. 16-337.000.

Koehring Company: *See—*
Maki, Clyde M.; and Homann, Herbert, 4,632,630, Cl. 414-700.000.

Koeijmans, Gerard D., to Mobil Oil Corporation. Three-dimensional display of adjacent seismic sections. 4,633,448, Cl. 367-72.000.

Koga, Daisuke; Tamura, Masahide; and Naito, Yukio, to Toyo Communication Equipment Co. Signal transmission and reception system. 4,633,511, Cl. 455-86.000.

Koga, Shigehiro: *See—*
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, 4,632,948, Cl. 523-219.000.

Kohama, Tetsuya: *See—*
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.

Kohl, Ernst: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.

Koike, Hidemi: *See—*
Tokiguchi, Katsumi; Okada, Osami; Sakudo, Noriyuki; and Koike, Hidemi, 4,633,138, Cl. 315-111.810.

Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, to Canon Kabushiki Kaisha. Recording liquid. 4,632,703, Cl. 106-22.000.

Koitabashi, Takatoshi, to Sanden Corporation. Electromagnetic clutch having high torque transfer. 4,632,236, Cl. 192-84.00C.

Kojima, Yoshio: *See—*
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, 4,633,046, Cl. 370-32.100.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,633,474, Cl. 372-19.000.
Endoh, Toshiaki; and Yamazaki, Yasuhiro, 4,633,326, Cl. 358-280.000.

Kolb, Richard P.; and Prince, Anthony P., to Outboard Marine Corporation. Single lever remote control-throttle dwell and friction mechanism. 4,632,232, Cl. 192-0.096.

Kolich, Charles H., to Ethyl Corporation. Process for preparing ring-halogenated vinyl aromatic monomers. 4,633,026, Cl. 570-200.000.

Koliwer, Wolfgang: *See—*
von der Ohe, Helmcke; and Koliwer, Wolfgang, 4,632,651, Cl. 425-135.000.

Kollmorgen Technologies Corporation: *See—*
Crook, James C., 4,633,151, Cl. 318-254.000.

Komai, Kensaku; and Yoshida, Eiji, to Sharp Kabushiki Kaisha. Automatic complex registration in a electronic cash register. 4,633,396, Cl. 364-405.000.

Komatsu, Hajime: *See—*
Konno, Toyohiko; Suga, Yozo; Nakamura, Motoharu; and Komatsu, Hajime, 4,632,708, Cl. 148-113.000.

Komatsu, Norimasa, to Alps Electric Co., Ltd. Cassette lid stop device in a cassette tape recorder. 4,633,353, Cl. 360-105.000.

Komatsu, Takashi: *See—*
Endo, Yuichi; Komatsu, Takashi; and Tohkura, Toshio, 4,633,139, Cl. 315-169.400.

Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, to Kawasaki Kasei Chemicals Limited. Oxidizing an organic compound. 4,632,782, Cl. 260-396.00R.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Jack with a switch. 4,633,048, Cl. 200-51.100.

Komatu, Yuji, to NEC Corporation. Monolithic semiconductor integrated a.c. switch circuit. 4,633,095, Cl. 307-255.000.

Komiya, Hidetsugu; and Kurakake, Mitsuo, to Fanuc Ltd. Numerical control system. 4,633,155, Cl. 318-640.000.

Komoda, Norihisa: *See—*
Murata, Tomohiro; Komoda, Norihisa; and Haruna, Koichi, 4,633,385, Cl. 364-191.000.

Komori, Tomoko: *See—*
Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, 4,632,703, Cl. 106-22.000.

Komuro, Katsusuke: *See—*
Morinaka, Shigehisa; and Komuro, Katsusuke, 4,632,206, Cl. 180-229.000.

Kondo, Mitsuru: *See—*
Suzuki, Toshitake; Hama, Fumio; and Kondo, Mitsuru, 4,633,277, Cl. 346-216.000.

Konicek, Tim R., to S. C. Johnson & Son, Inc. Automatic door-activated air freshener. 4,632,310, Cl. 239-43.000.

Konno, Kazuhiko: *See—*
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,633,008, Cl. 560-15.000.

Konno, Masashi: *See—*
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.

Konno, Toyohiko; Suga, Yozo; Nakamura, Motoharu; and Komatsu, Hajime, to Nippon Steel Corporation. Annealing separator used in the finishing annealing step for producing a grain-oriented electrical steel sheet. 4,632,708, Cl. 148-113.000.

Kono, Masaki: *See—*
Shirouzu, Tatsuo; Sakata, Nobuhiro; Kono, Masaki; and Inagaki, Saburo, 4,631,811, Cl. 29-705.000.

Konradt, Harald: *See—*
Otto, Wilfried; Papendieck, Hatto; Konradt, Harald; and Roder, Claus-Henning, 4,632,809, Cl. 422-254.000.

Kontron Holding AG: *See—*
Degrave, Philippe L.; and Lepage, Jean P., 4,633,169, Cl. 324-71.100.

Kooima, Roger D. Wheel lift apparatus for towing vehicles. 4,632,629, Cl. 414-563.000.

Kopacz, Elva P., to Atlantic Richfield Company. Biodesulfurization of carbonaceous materials. 4,632,906, Cl. 435-282.000.

Kopecko, Dennis J.: *See—*
Formal, Samuel B.; Baron, Louis S.; and Kopecko, Dennis J., 4,632,830, Cl. 424-92.000.

Kopera, Paul M.: *See—*
Stowe, David W.; and Kopera, Paul M., 4,632,513, Cl. 350-320.000.

Kopernicky, Jaroslav J., to Mapro Inc. Apparatus for removing moisture and volatiles from molding particulate plastic material feed. 4,632,564, Cl. 366-75.000.

Kopp, William L. Musical instrument sound quality enhancement device. 4,632,003, Cl. 84-1.160.

Koppers Company, Inc.: *See—*
Greco, Nicholas P., 4,633,022, Cl. 568-660.000.

Kordulla, Hans; and Eckhardt, Reiner, to Bodenseewerk Geratetchnik GmbH. Drive system for an oscillating mirror movable about an axis of oscillation in optical instruments. 4,632,502, Cl. 350-6.600.

Kordulla, Hans: *See—*
Uwira, Bernd; Kordulla, Hans; and Egger, Johann-Friedrich, 4,633,317, Cl. 358-213.000.

Korea Advanced Institute of Science and Technology: *See—*
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.

Koretsky, Alan P.: *See—*
Murphy-Boesch, Joseph A.; and Koretsky, Alan P., 4,633,181, Cl. 324-322.000.

Korsch, Dietrich G., to Boeing Company, The. Near-anastigmatic compact collimator. 4,632,521, Cl. 350-505.000.

Kosaka, Michitaka; and Miyamoto, Shoji, to Hitachi, Ltd. Method and apparatus for correlating target track data. 4,633,261, Cl. 342-430.000.

Koskela, Tauno. Sport shoe sole provided with pedestals. 4,631,842, Cl. 36-103.000.

Kostenko, Alexander: *See—*
Druschel, William O.; Kostenko, Alexander; and Meinert, Rolf G., 4,632,294, Cl. 228-119.000.

Kosugi, Yuhei, to NEC Corporation. Piezoelectrically actuated high-speed microwave switch. 4,633,118, Cl. 310-328.000.

Koval, Ronald J.: *See—*
Iacono, Joel G.; and Koval, Ronald J., 4,633,229, Cl. 340-391.000.

Kowalski, Ronald C.: *See—*
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.

Koyama, Hisashi. Clothes hanger. 4,632,286, Cl. 223-88.000.

Koyama, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. High-gain semiconductor device with capacitive coupling. 4,633,291, Cl. 357-51.000.

Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, to Hitachi, Ltd.; and Daiichi Denshi Kogyo Kabushiki Kaisha. Contact of connector. 4,632,478, Cl. 339-17.0LC.

Kozponti Elelmiszeripari Kutato Intezet: *See—*
Czabaffy, Andras; Kaffka, Karoly; Horvath, Lorand; and Nadai, Bela, 4,632,549, Cl. 356-300.000.

Kraeft, Uwe: *See—*
Meyer, Adolf; Pfeifer, Manfred; and Kraeft, Uwe, 4,632,720, Cl. 156-429.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Frewer, Hans; Muller, Rainer; and Schiffers, Ulrich, 4,631,915, Cl. 60-39.120.
Operschall, Hermann; and Stamm, Hubert, 4,632,740, Cl. 204-129.460.
Suchy, Peter, 4,632,805, Cl. 376-446.000.

Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic agents. 4,632,932, Cl. 514-383.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Schuller, Reinhard; and Koch, Gerhard, 4,632,625, Cl. 414-429.000.

Kreeft, Hendrik K.; and Teunissen, Adrianus F., to U.S. Philips Corporation. Apparatus for filling a cassette with a length of magnetic tape. 4,632,327, Cl. 242-56.00R.

Kreitmeier, Franz, to BBC Brown, Boveri & Company, Limited. Air storage gas turbine. 4,631,913, Cl. 60-727.000.

Kreitner, Ludwig: *See—*
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.

Kress Corporation: *See—*
Kress, Ralph H.; and Medley, Jackson C., 4,632,628, Cl. 414-513.000.

Kress, Hans-Jurgen; Eichenauer, Herbert; Ott, Karl-Heinz; Schoeps, Jochen; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. Stabilizer systems for ABS plastics and ABS alloys. 4,632,956, Cl. 524-359.000.

Kress, Ralph H.; and Medley, Jackson C., to Kress Corporation. Side-ejection vehicle. 4,632,628, Cl. 414-513.000.

Kreutze, Gerhard: *See—*
Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried, 4,632,845, Cl. 427-96.000.

Kriebel, Manfred: *See—*
Fischer, Herbert; and Kriebel, Manfred, 4,632,819, Cl. 423-574.00R.

Kris-Tech Corporation: *See—*
Hoffmann, Wolfgang W.; and Otruba, Svatoboj, 4,632,721, Cl. 156-458.000.

Krishnan, Sivaram, to Mobay Chemical Corporation. Flame retarding agents for polycarbonates. 4,632,949, Cl. 524-94.000.

Krivec, Bert; and Murphree, Gary R., to Sargent & Greenleaf, Inc. Digital readout combination lock dial assembly. 4,631,940, Cl. 70-332.000.

Kroeker, David G.: *See—*
Averill, Stuart A.; Hokanson, Lyle W.; and Kroeker, David G., 4,632,194, Cl. 175-217.000.

Krol, Thijs, to U.S. Philips Corporation. Multiprocessor computer system comprising n parallel operating computer modules, and computer module for use in such a multiprocessor computer system. 4,633,472, Cl. 371-40.000.

Kronberger, Leonard J.: *See—*
Novak, Robert J.; and Kronberger, Leonard J., 4,632,077, Cl. 123-146.50A.

Kronenthal, David, to E. R. Squibb & Sons, Inc. 3-acylamino-2-oxo-1-azetidinesulfonic acids. 4,632,985, Cl. 540-355.000.

Krude, Werner, to GKN Automotive Components Inc. Independent wheel suspension system using thrust bearing constant velocity universal drive joints as suspension members to minimize wheel camber. 4,632,203, Cl. 180-73.300.

Krummell, John D.: *See—*
Hart, John P.; and Krummell, John D., 4,632,260, Cl. 211-189.000.

Krupp-Koppers GmbH: *See—*
Firnhaber, Bernhard; Linke, Adolf; and Wetzel, Rolf, 4,632,766, Cl. 210-752.000.

Kubisen, Steven J., Jr.: *See—*
Cornell, John A.; and Kubisen, Steven J., Jr., 4,632,975, Cl. 528-354.000.

Kubo, Mitsuo: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.

Kubo, Seitoku: *See—*
Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, 4,631,982, Cl. 74-869.000.

Kubota, Ltd.: *See—*
Ishimori, Shozo, 4,631,980, Cl. 74-730.000.
Shintaku, Yasuyuki; and Hiraishi, Hisashi, 4,631,793, Cl. 29-132.000.

Kubota, Takashi: *See—*
Yamamoto, Makoto; Kubota, Takashi; and Mikamo, Katsumi, 4,633,335, Cl. 360-35.100.

Kubota, Yuichi; and Watanabe, Akio, to TDK Corporation. Magnetic recording medium. 4,632,866, Cl. 428-328.000.

Kude, William B.; and Pearman, A. Noel J., to Honeywell Inc. Impurity compensation for colorific content analyzer. 4,632,572, Cl. 374-37.000.

Kudo, Tsutomu: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Kuehfuss, Runwalt, to De La Rue Giori S.A. Method for checking sheets of bills during their production. 4,633,395, Cl. 364-403.000.

Kuhla, Donald E.: *See—*
Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., 4,632,927, Cl. 514-272.000.

Kuhnel, Frank, to VDO Adolf Schindling AG. Circuit for electrothermal level measurement compensated for ambient temperature. 4,633,491, Cl. 377-20.000.

Kuker, Wolfgang; and Findeklee, Heinz, to Linke-Hofmann-Busch GmbH. Guided central gantry for railroad passover protection. 4,632,039, Cl. 105-801.000.

Kulke, Gunter: *See—*
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,632,466, Cl. 303-7.000.

Kulwicki, Bernard M.: *See—*
Berg, Peter G.; Shukla, Vishwa; Kulwicki, Bernard M.; and Conlan, Thomas C., 4,633,069, Cl. 219-553.000.

Kum, Humberto: *See—*
Arias, Beatriz; Kum, Humberto; and Galiasso, Roberto, 4,632,914, Cl. 502-211.000.

Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, to Hitachi, Ltd.; and Hitachi Micro Computer Engineering Ltd. Stacked semiconductor memory. 4,633,438, Cl. 365-51.000.

Kume, Masao: *See—*
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, 4,631,869, Cl. 51-165.710.

Kummer, Martin E.: *See—*
Flotow, Richard A.; Heymann, Ronald E.; and Kummer, Martin E., 4,632,235, Cl. 192-70.270.

Kump, William H.; and Jergl, Joseph J., to GNB Incorporated. Battery carrying handle. 4,632,888, Cl. 429-187.000.

Kunihiro, Motoo: *See—*
Nakajima, Zenji; Okamoto, Shuichi; and Kunihiro, Motoo, 4,632,372, Cl. 267-140.100.

Kunimatsu, Shuji: *See—*
Ichihara, Yutaka; Magome, Nobutaka; Iizuka, Yutaka; Kunimatsu, Shuji; and Inaba, Tomonari, 4,632,531, Cl. 354-200.000.

Kunkle, Gerald E.; Demarest, Henry M.; and Shelestak, Larry J., to PPG Industries, Inc. Method of melting raw materials for glass or the like using solid fuels or fuel-batch mixtures. 4,632,687, Cl. 65-27.000.

Kunz, Rino E., to Gretag Aktiengesellschaft. Method and apparatus for focusing a beam of light on an object. 4,633,074, Cl. 250-201.000.

Kurakake, Mitsuo: *See—*
Komiya, Hidetsugu; and Kurakake, Mitsuo, 4,633,155, Cl. 318-640.000.

Kurasch, David H.; Hall, George V. B.; Cossel, Stephen C.; and Miskimin, Paul A., to Westinghouse Electric Corp. Container for the storage, transportation and ultimate disposal of low level nuclear wastes. 4,633,091, Cl. 250-506.100.

Kurata, Masami; and Saitoh, Hiroyuki, to Fuji Xerox Co., Ltd. Shading correction device. 4,633,314, Cl. 358-163.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Mizuno, Toshiya; Moriyama, Nobuhiro; Murayama, Naohiro; and Saitoh, Shigeru, 4,632,873, Cl. 428-364.000.
Yoshikumi, Chikao; Matsunaga, Kenichi; Hayashi, Haruhisa; and Oguchi, Yoshiharu, 4,632,743, Cl. 204-183.300.

Kuriyama, Shunichi; and Mitani, Yasuo, to Sanyo Electric Co., Ltd. Washable electric shaver. 4,631,825, Cl. 30-43.920.

Kurokawa, Hiroto: *See—*
Shimbo, Takao; and Kurokawa, Hiroto, 4,633,452, Cl. 369-39.000.

Kuroyanagi, Hidekatsu: *See—*
Morohoshi, Yozo, 4,632,839, Cl. 426-573.000.

Kuse, Sadamu; and Kawarai, Seigi, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,632,867, Cl. 428-323.000.

Kusumi, Katsuaki, to Fanuc Ltd. Sequence abnormality check system in programmable controller. 4,633,384, Cl. 364-184.000.

Kuter, Lutz: *See—*
Vock, Georg F.; and Kuter, Lutz, 4,632,567, Cl. 366-276.000.

Kuwada, James T. System and method for disposal of noncondensable gases from geothermal wells. 4,632,601, Cl. 405-128.000.

Kuwahara, Hiroshi: *See—*
Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, 4,633,460, Cl. 370-58.000.

Kuwahara, Kunisuke: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Kvitrud, James R., to Minnesota Mining and Manufacturing Company. Self venting syringe plunger. 4,632,672, Cl. 604-222.000.

Kwan, Chi L.: *See—*
Abel, Mark J.; Kwan, Chi L.; Polli, Philip V.; and Veach, Michael T., 4,633,467, Cl. 371-16.000.

Kwikset Corporation: *See—*
Gater, Arnold C.; and Hu, Thomas S. S., 4,631,944, Cl. 70-472.000.

Kyocera Corporation: *See—*
Fujinaka, Hiroshi; and Terasawa, Masami, 4,632,846, Cl. 427-96.000.

Kyoritsu Yuki Co., Ltd.: *See—*
Matsunaga, Yoshiki; Sugiyama, Toshiaki; and Maekawa, Eikichi, 4,632,984, Cl. 536-50.000.

Kyrian, Bohumil, to BBC Brown, Boveri & Company Limited. Amplitude-modulated transmitter with controlled carrier value. 4,633,512, Cl. 455-108.000.

Kyriss, Karl M.: *See—*
Yohe, Thomas L.; Donlan, Rodney M.; and Kyriss, Karl M., 4,631,961, Cl. 73-866.500.

La Telemecanique Electrique: *See—*
Belbel, Elie; Bataille, Christian; and Lauraire, Michel, 4,633,209, Cl. 335-261.000.

Laakso, Oliver A. Chip presteaming and air washing. 4,632,729, Cl. 162-17.000.

LaBate, Michael D. Device for introducing gas into molten metal. 4,632,367, Cl. 266-220.000.

LaCuticle, Inc.: *See—*
Reid, Georgianna, 4,632,134, Cl. 132-73.000.

Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., to Eaton Corporation. Horizontally layered MOMOM notch tunnel device. 4,633,278, Cl. 357-6.000.

Lade, Robert W.: *See—*
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,633,281, Cl. 357-22.000.

Lagerberg, Stig E. V., to Santrade Limited. Cutting tool and cutting insert. 4,632,606, Cl. 407-104.000.

Laird, James A.; and Beck, Warren R., to Minnesota Mining and Manufacturing Company. Ceramic spheroids having low density and high crush resistance. 4,632,876, Cl. 428-404.000.

Lamb-Weston, Inc.: *See—*
Doenges, Michael G., 4,632,838, Cl. 426-441.000.

Lamm, Gunther, to BASF Aktiengesellschaft. Pyridone dyes containing a oxydiazone substituent. 4,632,983, Cl. 534-772.000.

Lampman, David V. Housing for displaying articles. 4,632,469, Cl. 312-114.000.

Landau, Boris. Multiple chamber flexible container. 4,632,244, Cl. 206-219.000.

Landry, David M.: *See—*
Bailey, Timothy F.; and Landry, David M., 4,631,817, Cl. 29-747.000.

Lang, Donald; and Shortlidge, Joseph S. Adjustable and collapsible triangulated tension support structure. 4,632,344, Cl. 248-165.000.

Lanzilotta, Raymond P.: *See—*
Boyce, Columbus O. L.; Lanzilotta, Raymond P.; and Wong, Theodore M., 4,632,903, Cl. 435-69.000.

Lapidus, Herbert, to Combe Incorporated. Dental adhesive device and method of producing same. 4,632,880, Cl. 428-523.000.

Lapp, John; Hackney, Larry B.; Mason, Marco J.; and Anderson, David W., to Cooper Industries, Inc. Power factor correction capacitor. 4,633,369, Cl. 361-328.000.

Laramore, Larry W. Pedestal and framing system for supplemental roof construction. 4,631,878, Cl. 52-90.000.

Larock, Richard C.; and Varaprath, Sudarsanan, to Iowa State University Research Foundation, Inc. Organopalladium additions to alkenyl- and methylenecyclopropanes and alkenyl- and methylenecyclobutanes. 4,632,996, Cl. 549-209.000.

Larson, Willis A., to AMP Incorporated. Entry error elimination for data systems. 4,633,228, Cl. 340-365.00E.

Lasier, David D.; Meyer, John L.; and Sweda, Michael, to Motorola, Inc. Low stress, tolerance free method for mounting power devices. 4,631,819, Cl. 29-840.000.

Lau, Francis S.: *See—*
Bodle, William W.; Lau, Francis S.; and Mensinger, Michael C., 4,632,731, Cl. 201-4.000.

Lauderbach, Leo: *See—*
Wirges, Winfried; Lauderbach, Leo; and Schafer, Willi, 4,632,371, Cl. 267-64.280.

Lauderdale, Robert J. Potable water heat exchanger. 4,632,180, Cl. 165-70.000.

Laukien, Gunther: *See—*
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,633,180, Cl. 324-316.000.

Lauraire, Michel: *See—*
Belbel, Elie; Bataille, Christian; and Lauraire, Michel, 4,633,209, Cl. 335-261.000.

Lausier, Joan M.: *See—*
Barnett, Stanley M.; Lausier, Joan M.; and Montalto, Samuel J., 4,632,875, Cl. 428-402.220.

LaValley Industrial Plastics, Inc.: *See—*
LaValley, Richard W., 4,632,739, Cl. 204-128.000.

LaValley, Richard W., to LaValley Industrial Plastics, Inc. Electrolytic cell head with replaceable insert and method of protecting the same. 4,632,739, Cl. 204-128.000.

Laverick, William J., to Wizer Equipment, Inc. Printing press washer. 4,632,030, Cl. 101-425.000.

Lawn, Richard M.: *See—*
Bock, Susan C.; and Lawn, Richard M., 4,632,981, Cl. 530-393.000.

Lawrence, David L. Monorail vehicular system. 4,632,038, Cl. 104-120.000.

Laws, Gerald E.; and Diefendorff, Keith E., to Texas Instruments Incorporated. Self testing data processing system with processor independent test program. 4,633,466, Cl. 371-16.000.

Lawson, John R.: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.

Layland, Jim C.: *See—*
Beavers, Jerry E.; and Layland, Jim C., 4,633,052, Cl. 219-10.55E.

Lazaro, Eric J.: *See—*
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,919, Cl. 514-158.000.
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,920, Cl. 514-158.000.

Lazarus, Stanley D.: *See—*
Cordova, David S.; and Lazarus, Stanley D., 4,632,864, Cl. 428-265.000.

Leahy, William J.: *See—*
Conlon, Thomas J.; and Leahy, William J., 4,632,855, Cl. 428-36.000.

Lebesgue, Yves; and Zeana, Alexandru, to Societe Multibio. Process and installation for simultaneously producing compost and biogas from organic waste. 4,632,692, Cl. 71-10.000.

Lederman, Hans J., to Ganmill Limited. Patient transfer trolley. 4,631,761, Cl. 5-81.00R.

Lee, Chien-Ping, to Rockwell International Corporation. Metal-semiconductor field-effect transistor with a partial p-type drain. 4,633,282, Cl. 357-22.000.

Lee, Donald A.: *See—*
Stifle, John E.; Lee, Donald A.; and Bitzer, Donald L., 4,633,462, Cl. 370-85.000.

Lee, Henry D. Wheelchair table and desk attachments. 4,632,451, Cl. 297-153.000.

Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, to Korea Advanced Institute of Science and Technology. Sintered material of silicon nitride for cutting tools and process therefor. 4,632,910, Cl. 501-97.000.

Lee, Sang-Ho: *See—*
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.

Lee, Siu-Leung, to Ciba Corning Diagnostics Corp. Immobilized enzyme composites having carriers derivatized with an organotitanate. 4,632,904, Cl. 435-176.000.

Lefler, Jerrold P.: *See—*
Cuff, William A.; and Lefler, Jerrold P., 4,632,578, Cl. 400-91.000.

Lehto, Jukka K.; Miettinen, Jorma K.; and Heinonen, Olli, to Imatran Voima Oy. Procedure for ceramizing radioactive wastes. 4,632,778, Cl. 252-629.000.

Leibold, Kurt-Andre : *See—*
Bardoll, Meinrad; and Leibold, Kurt-Andre , 4,632,234, Cl. 192-3.580.

Leicht, Charles L. Adjustable staircases. 4,631,880, Cl. 52-105.000.

Leining, Lyndon R., to Geo. A. Hormel & Co. Hand skinner device. 4,631,780, Cl. 17-21.000.

Leipold, Ludwig: *See—*
Fellinger, Christine; Leipold, Ludwig; and Tihanyi, Jeno, 4,633,292, Cl. 357-53.000.

Leishman, Graham W.; and Minissale, Bruno. Automatic flushing system. 4,631,760, Cl. 4-300.000.

Leising, John O.: *See—*
Reynes, Enrique G.; and Leising, John O., 4,632,986, Cl. 544-85.000.

Le Magourou, Yves, to Societe d'Exploitation des Procedes Marechal (SEPM). Electrical pressure contact. 4,632,481, Cl. 339-46.000.

Lemelson, Jerome H.; and Grund, Christian. Video terminal and printer. 4,632,538, Cl. 355-14.00R.
Lemelson, Jerome H. Rotational molding apparatus. 4,632,654, Cl. 425-150.000.
Lenk, Rainer: *See—*
Wesemann, Karl-Friedrich; Lenk, Rainer; Kobusch, Klaus; and Markan, Manfred, 4,631,792, Cl. 29-129.000.
Lenox, Ronald S.: *See—*
Eshbach, John R.; and Lenox, Ronald S., 4,632,958, Cl. 524-574.000.
Lenting, Gerard J.; and Sytsma, Roelof H., to U.S. Philips Corporation. Hair-grooming means. 4,632,135, Cl. 132-85.000.
Lepage, Jean P.: *See—*
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Lequien, Jean: *See—*
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Lerner, David I., to Frizsche Dodge & Olcott Inc. Synthesis of methyl N-methylanthranilate. 4,633,009, Cl. 560-19.000.
Lerner, Nathan, to Duncan, Donald F. Display and transport medium for a hand held device such as a yo-yo. 4,632,245, Cl. 206-315.100.
Les Cables de Lyon: *See—*
Mignien, Georges; and Fasquel, Didier, 4,632,507, Cl. 350-96.230.
Le Salver, Robert; and Poupard, Dominique, to Automobiles Peugeot; and Automobiles Citroen. Anti-tilt device for a motor-drive unit of a motor vehicle. 4,632,211, Cl. 180-312.000.
Lesea, Austin H., to Candela Electronics, Inc. Personal branch exchange system. 4,633,040, Cl. 379-253.000.
Le Tanter, Gerard; and Luscan, Bernard, to Societe Europeenne de Propulsion. Integral booster/ramjet drive. 4,631,916, Cl. 60-245.000.
Letter, Eugene P.: *See—*
Letter, Gary P.; Letter, Raymond J.; and Letter, Eugene P., 4,631,859, Cl. 47-41.100.
Letter, Gary P.; Letter, Raymond J.; and Letter, Eugene P. Integral grave marker and flower receptacle. 4,631,859, Cl. 47-41.100.
Letter, Raymond J.: *See—*
Letter, Gary P.; Letter, Raymond J.; and Letter, Eugene P., 4,631,859, Cl. 47-41.100.
Lever Brothers Company: *See—*
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Levin, Robert F.: *See—*
Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Tinnan Steven S.; and Waltasti, Stephen A., 4,632,247, Cl. 206-343.000.
Levin, Wilfred. Accessory for use with an overhead projector 4,632,529, Cl. 353-122.000.
Levinson, Philip A.: *See—*
Valkirs, Gunars E.; Owen, Newton C.; and Levinson, Philip A., 4,632,901, Cl. 435-5.000.
Lewandowski, Alan J.; and Moench, Jerry D., to Motorola, Inc. Partial memory selection using a programmable decoder. 4,633,429, Cl. 365-96.000.
Lewis, Mike W. Combined generator and brake system for land vehicles. 4,632,205, Cl. 180-165.000.
Lewis, Shelton E.: *See—*
Villanueva, James G.; Matlack, John D.; Lewis, Shelton E., Pocock, John F. E.; and Cole, Charles A., 4,632,053, Cl. 118-66.000.
Leybold-Heraeus GmbH: *See—*
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Leyrer, Reinhold J.: *See—*
Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klussmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel, 4,632,897, Cl. 430-260.000.
Lhospice, Bernard, to Essilor International (Campagnie Generale d'Optique). Support structure for a spectacles frame and front intended to be adapted thereto. 4,632,526, Cl. 351-124.000.
Li, Tony C.; and Stubbs, Graham S., to Oak Industries Inc. Cable television master/slave decoder control. 4,633,309, Cl. 358-122.000.
Liautaud, James P. Remote radar detector control unit. 4,633,521, Cl. 455-345.000.
Libbey-Owens-Ford Company: *See—*
Rahrig, Donald D.; and Schave, Richard D., 4,632,688, Cl. 65-29.000.
Libin, Robert P., to Tamiko Inc. Pressure-point attachment for use with electrical hand-held massagers. 4,632,095, Cl. 128-67.000.
Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Turcsany, Jozsef; Gal, Pal; and Borbas, Istvan, 4,632,007, Cl. 84-487.000.
Liepinsh, Edvards E.: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.
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Lin, Kuang-Shin: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.
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Linde Aktiengesellschaft: *See—*
Seelman, Hans H., 4,631,920, Cl. 60-421.000.
Linden, Enok S. R. Dental instrument for optimal positioning of an X-ray film support, especially for use in the X-raying of front teeth. 4,633,493, Cl. 378-168.000.
Linderfelt, Hal R. Float for wave energy harvesting device. 4,631,921, Cl. 60-501.000.
Lindig, Christian; and Duffait, Roland, to VDO Adolf Schindling AG. Crossed-coil rotating-magnet measuring instrument. 4,633,174, Cl. 324-143.000.
Lindner, Gottfried: *See—*
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Linear Technology Inc.: *See—*
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Linke, Siegfried W.: *See—*
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,632,999, Cl. 549-519.000.
Liska, Georg, to Zahnradfabrik Friedrichshafen, AG. Pump arrangement for hydraulic installations. 4,632,641, Cl. 417-273.000.
Liston, Thomas V.; Lowe, Warren; and Small, Vernon R., to Chevron Research Company. Normally liquid C_{14} to C_{18} monoalkyl catechols. 4,632,771, Cl. 252-32.70E.
LITEF der Hellige GmbH: *See—*
Feige, Christian, and Kirst, Bertold, 4,632,012, Cl. 89-41.090.
Litman, Michael: *See—*
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Farris, Richard C., 4,632,215, Cl. 181-114.000.
Litton Systems Inc.: *See—*
Pavlath, George A., 4,632,551, Cl. 356-345.000.
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Thompson, William H., 4,632,944, Cl. 522-11.000.
Loerch, Richard J., to Kearney & Trecker Corporation. Spindle orientation apparatus, 4,632,612, Cl. 409-231.000.
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Lomasney, Henry L.; Grieve, John G.; and Sheth, Vikram K., to Isotek Corporation. In situ polymeric membrane for isolating hazardous materials. 4,632,847, Cl. 422-54.000
Long, Eric L.; and Roseborough, Keith A., to Switchcraft, Inc. Cord strain relief device. 4,632,488, Cl. 339-103.00R.
Looney, Raymond H., to Baird Manufacturing Company. Relief valve. 4,632,142, Cl. 137-539.500.
Lord, Harry C., III, to Syconex Corporation, The. In-situ gas analyzer. 4,632,563, Cl. 356-437.000.
L'Oreal: *See—*
Goncalves, Antonio L., 4,632,240, Cl. 206-15.200.
Lorenzen, Heinz-Christen: *See—*
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Method and system for the application of hair treatment solution, 4,632,132, Cl. 132-33.00G.
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Louw, Frank S. Sketch for a keyboard. 4,632,511, Cl. 350-276.00R.
Lowe, Derek R., to TRW Industries, Inc. Dual-circuit master cylinder having auxiliary piston and yoke with equalization chambers for hydraulic equalization, 4,631,924, Cl. 60-562.000.
Lowe & Fletcher Limited: *See—*
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Luce, John C.: *See—*
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Lucking, Anthony J., to Waddington & Duval Limited. Tap. 4,632,362, Cl. 251-310.000.
Ludvig Svensson International B.V.: *See—*
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Luecke, Francis S., to International Business Machines Corporation. Two axis electromagnetic actuator. 4,633,456, Cl. 369-45.000.
Lukevits, Edmund Y.: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.
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Luttig, Winfried: *See—*
Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried, 4,632,845, Cl. 427-96.000.
Lutz, David L., to Harvey Hubbell Incorporated. Wire retaining assembly. 4,632,491, Cl. 339-164.00M.
Lymburner, Robert K. Fluid cylinder position sensor mounting apparatus. 4,632,018, Cl. 92-5.00R.
Lynch, Donald; Kamarehi, Mohammad; and Ury, Michael G., to Fusion Systems Corporation. Electrodeless lamp having staggered turn-on of microwave sources. 4,633,140, Cl. 315-248.000.
Lynch, Matthew J., to ICI Americas. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,632,937, Cl. 514-470.000.
Lynn, Scott: *See—*
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M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See—*
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M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
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M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Simeth, Claus, 4,632,029, Cl. 101-348.000.
MA.CO Engineering S.r.l.: *See—*
Risi, Roberto, 4,632,238, Cl. 198-365.000.
Maassen, Egbertus J. P.; and van Meel, Franciscus A. M. M., to U.S. Philips Corporation. Color analyzer. 4,632,558, Cl. 356-404.000.
Macco, Richard. Union member accounts management system. 4,633,397, Cl. 364-406.000.
Maceross, John S.: *See—*
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Machu, Erich H., to Hoerbiger Ventilwerke Aktiengesellschaft. Lifting device for the closure plate of compressor valves. 4,632,145, Cl. 137-516.210.
Mack, Alfred, to Canadian Marconi Corporation. Radio communication system. 4,633,463, Cl. 370-95.000
Mack, George: *See—*
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Mackiewicz, Edward T., to Kenall Manufacturing Company. Lighting fixture with square beam pattern. 4,633,377, Cl. 362-309.000.
Madsen, Finn T.: *See—*
Ohlsson, Ingemar; Madsen, Finn T.; and Kjaerbye, Steffen, 4,632,854, Cl. 428-36.000.
Maeda, Junji, to Sanyo Electric Co., Ltd. Braking method, braking circuit and speed control apparatus for a DC motor. 4,633,154, Cl. 318-373.000.
Maeda, Yoshinobu: *See—*
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Maeda, Youichi: *See—*
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Maekawa, Eikichi: *See—*
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Magnuson, James M., to Peddinghaus Corporation. Punch press with self-adjusting stripper. 4,631,996, Cl. 83-23.000.
Mago nee Karacsony, Erzsebet: *See—*
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Magome, Nobutaka: *See—*
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Magoon, Richard E. Method and apparatus for drying fruit pulp and the like. 4,631,837, Cl. 34-9.000.
Maher, Galeb H., to Sprague Electric Company. Laminar electrical component with magnesium orthoborate. 4,633,366, Cl. 361-321.000.
Mahmud, Syed T., to Signetics Corporation. Flip-flop circuit with built-in enable function. 4,633,098, Cl. 307-279.000.
Mahoney, William J., Jr., to Young Industries, Inc., The. Apparatus for blending particulate solids. 4,632,565, Cl. 366-113.000.
Maillet, Fernand M., to Etat Francais represente par le Delegue General pour l'Armement. Arming method and devices for firing a submarine weapon. 4,632,035, Cl. 102-420.000.
Main, W. Eric, to Motorola, Inc. Balanced oscillator with constant emitter voltage level. 4,633,195, Cl. 331-117.00R.
Maina, Bruno, to Roj Electrotex S.p.A. Weft feeder for weaving looms. 4,632,154, Cl. 139-452.000.
Maina, Bruno, to ROJ Electrotex, S.p.A. Electromagnet for stopping the unwinding of the weft yarn in weft feeding devices for weaving looms. 4,632,155, Cl. 139-452.000.
Makhoul, Elie: *See—*
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Maki, Clyde M.; and Homann, Herbert, to Koehring Company. Forklift attachment. 4,632,630, Cl. 414-700.000.
Makino, Yukio. Liquid dispensing device. 4,632,276, Cl. 222-80.000.
Mako-Tek Corporation, The: *See—*
Alverth, Ronald W.; and Busam, Donald H., 4,632,575, Cl. 384-258.000.
Malka, Jacob H.; and Thurakal, Philip J., to Allied Corporation. Transformer isolated high voltage, high power amplifier system. 4,633,191, Cl. 330-275.000.
Mallinson, Andrew M., to Ferranti plc. Bipolar transistor logic circuits. 4,633,104, Cl. 307-454.000.
Mallon, James: *See—*
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Mallonen, Edward A.; and Autio, William A., to Eaton Corporation. Thermal overload relay with improved response. 4,633,210, Cl. 337-101.000.
Mallory, Glenn O., Jr., to Richardson Chemical Company. Electrolessly plated product having a polymetallic catalytic film underlayer. 4,632,857, Cl. 428-209.000.
Malm, Robert E., to Northrop Corporation. Voltage and current source fluctuation compensator and method. 4,633,190, Cl. 330-149.000.
Malofsky, Bernard M.: *See—*
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Maloney, John, to Johnsen, Jorgensen, Jaypak, Ltd. Bag making apparatus. 4,631,905, Cl. 53-554.000.
Malvern, Alan R., to British Aerospace PLC. Ring laser gyroscopes. 4,632,555, Cl. 356-350.000.
Mandokoro, Kozo: *See—*
Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, 4,631,982, Cl. 74-869.000.
Manente, Giuseppe: *See—*
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Manizza, Guelfo A., to Federal Paper Board Co., Inc. Shallow wall baking tray. 4,632,302, Cl. 229-171.000.
Mann, Alan B.: *See—*
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Mannesmann Aktiengesselschaft: *See—*
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Mannesmann, Reinhard C.: *See—*
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Mannesmann, Reinhard Carl: *See—*
Keppel, Wolf D.; and Mannesmann, Reinhard C., 4,632,791, Cl. 264-40.100.
Mannesmann Rexroth GmbH: *See—*
Schulte, Heinz, 4,632,016, Cl. 91-461.000.
Manning, Eugene P. Toppling game apparatus. 4,632,664, Cl. 446-2.000.
Mansbridge, Martin H.; Norton, John; Beazley-Long, Paul W.; and Irwin, David J., to British Aerospace PLC. Forming of stiffened panels. 4,632,296, Cl. 228-157.000.
Mansson, Arne: *See—*
Wallander, Anders; Borrman, Bo; and Mansson, Arne, 4,632,804, Cl. 376-444.000.
Mapro Inc.: *See—*
Kopernicky, Jaroslav J., 4,632,564, Cl. 366-75.000.
Marcus, Michael A.; and Morrison, Edward D. Multilayer thin film electrical devices free of adhesive. 4,632,856, Cl. 428-172.000.
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Marks, Gary T.; Rehkopf, Charles H.; and Sorensen, Fred L., to North American Philips Consumer Electronics Corp. Self-adhering cathode ray tube base. 4,633,132, Cl. 313-477.00R.
Markwell, John H.; and Isenhart, Kyle. Automatically adjustable climbing harness. 4,632,217, Cl. 182-3.000.
Marlett, Everett M., to Ethyl Corporation. Process for production of silane. 4,632,816, Cl. 423-347.000.
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Csordas, Laszlo; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.
Marsden, George M.: *See—*
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Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Multibeam graphic display system utilizing bit mapping memory. 4,633,142, Cl. 315-365.000.
Marshall, J. Nathaniel: *See—*
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Marshall, John M.; and Hall, James D., to Marshall, John M. Window security device. 4,633,233, Cl. 340-550.000.
Marshall, Sidney W., to Xerox Corporation. Character compression technique. 4,633,505, Cl. 382-56.000.
Marsoner, Hermann, to AVL AG. Optical sensor for fluorescence measurements. 4,632,807, Cl. 422-68.000.
Martella, David J., to Exxon Chemical Patents Inc. Diesel fuel containing a tetrazole or triazole cetane improver. 4,632,674, Cl. 44-57.000.
Martin, Alain: *See—*
Mok, Chuck K.; and Martin, Alain, 4,633,258, Cl. 342-373.000.
Martinez, Miguel R.; and Dischert, William A., to RCA Corporation. Robot hand. 4,632,444, Cl. 294-86.400.

Masanobu, Kazunori, to Tokyo Shibaura Denki Kabushiki Kaisha. Profile measurement apparatus using radiation. 4,633,420, Cl. 364-563.000.

Maschinenfabrik Lauffer GmbH & Co. KG.: *See—*
Plocher, Werner, 4,632,653, Cl. 425-149.000.

Maschinenfabrik Rieter AG: *See—*
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Masel, Ruben; and Valdshtein, George, to Masel, Ruben. Ice-cream making machine. 4,632,566, Cl. 366-149.000.

Mason, Marco J.: *See—*
Lapp, John; Hackney, Larry B.; Mason, Marco J.; and Anderson, David W., 4,633,369, Cl. 361-328.000.

Massachusetts Institute of Technology: *See—*
Fan, John C. C.; Tsaur, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 4,632,712, Cl. 148-175.000.
Smith, Henry I.; Atwater, Harry A.; Thompson, Carl V.; and Geis, Michael W., 4,632,723, Cl. 156-617.00R.

Massett, Stephen S.: *See—*
Cue, Berkeley W.; and Massett, Stephen S., 4,632,992, Cl. 546-116.000.

Masso, Jon D.; and Carmelite, Donald D., to American Optical Corporation. Anti-static ophthalmic lenses. 4,632,527, Cl. 351-166.000.

Masuda, Eiji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaishå. Semiconductor sample and hold switching circuit. 4,633,101, Cl. 307-353.000.

Masuda, Mitsuyoshi, to Aisin Seiki Kabushika Kaisha. Sliding roof for vehicles. 4,632,449, Cl. 296-222.000.

Mathauser, William R. Brake device for bicycles. 4,632,225, Cl. 188-24.180.

Matlack, John D.: *See—*
Villanueva, James G.; Matlack, John D.; Lewis, Shelton E.; Pocock, John F. E.; and Cole, Charles A.. 4,632,053, Cl. 118-66.000.

Matsubara, Toru, to Tokyo Juki Industrial Co., Ltd. Method of controlling upper thread in sewing machine. 4,632,048, Cl. 112-262.100.

Matsuda, Hiroto, to Canon Kabushiki Kaisha. Liquid ejection recording apparatus. 4,633,274, Cl. 346-140.00R.

Matsuda, Yoshinobu: *See—*
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Matsufuji, Akihiro: *See—*
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Matsui, Sadayoshi: *See—*
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Matsumoto, Mitsuhiro: *See—*
Taneya, Mototaka; Matsui, Sadayoshi; Matsumoto, Mitsuhiro; and Hayashi, Hiroshi, 4,632,709, Cl. 148-171.000.

Matsumoto, Yukio: *See—*
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Matsumura, Susumu; Kawabata, Takashi; Tsunekawa, Tokuichi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Focus detecting apparatus. 4,632,532, Cl. 354-403.000.

Matsunaga, Kenichi: *See—*
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Matsunaga, Tatsuaki: *See—*
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Matsunaga, Yoshiki; Sugiyama, Toshiaki; and Maekawa, Eikichi, to Kyoritsu Yuki Co., Ltd. Process for the production of cationic starch. 4,632,984, Cl. 536-50.000.

Matsuo, Kenji: *See—*
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Matsushima, Yuichi: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Arikawa, Tomio, 4,633,061, Cl. 219-202.000.
Fujita, Takayuki; Negishi, Shigetoshi; and Tanaka, Kunio, 4,631,816, Cl. 29-740.000.
Inaji, Toshio; Minakuchi, Hiroshi; and Igarashi, Yoshiaki, 4,633,150, Cl. 318-254.000.
Ishii, Taira; Misawa, Yoshihiko; Maeda, Yoshinobu; and Tanaka, Souhei, 4,631,800, Cl. 29-564.600.
Nakane, Shinichi; Maehara, Naoyoshi; and Yamamoto, Kazushi, 4,632,311, Cl. 239-101.000.
Nishida, Yayoi; and Ishii, Katsumi, 4,633,062, Cl. 219-212.000.
Noda, Kazushi; and Mitsunaga, Hiroshi, 4,631,976, Cl. 74-552.000.
Ogawa, Tetsu; Nagata, Seiichi; and Hotta, Sadayoshi, 4,632,514, Cl. 350-339.00F.
Oido, Hikofumi; Hayashi, Yoshitake; and Yamamoto, Minoru, 4,633,032, Cl. 136-251.000.
Yamamitsu, Chojuro; Ogura, Ichiro; Suesada, Kunio; and Iketani, Akira, 4,633,330, Cl. 358-310.000.

Matsushita Electric Works, Ltd.: *See—*
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, 4,633,077, Cl. 250-214.00L.
Sakaue, Hironobu; and Furukawa, Kaoru, 4,633,159, Cl. 320-39.000.

Matsushita, Takashi: *See—*
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Matsuta, Shigetoshi, to Alps Electric Co., Ltd. Mixer/amplifier circuit. 4,633,188, Cl. 330-51.000.

Matsuura, Takashi: *See—*
Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, 4,633,194, Cl. 331-25.000.

Matsuzaki, Shuichi; and Nakazawa, Akira, to Hirose Electric Co., Ltd. Electric connector receptacle and a method of producing the same. 4,632,493, Cl. 339-176.00M.

Matsuzawa, Yasuo: *See—*
Karwoski, Theodore; and Matsuzawa, Yasuo, 4,632,842, Cl. 427-2.000.

Mattei, Riccardo; and De Martis, Giancarlo, to G.D. Societa per Azioni. Method for packing batches of products, packets or boxes in cartons divisible into several complete units. 4,631,900, Cl. 53-448.000.

Matthews, Hugoe R. Procedure for draining fluid from lungs. 4,632,112, Cl. 128-305.300.

Mattson, Bertil A., to Broderna Hammarstedt Verkstads AB. Seat adjustment device in particular for vehicle seats. 4,632,353, Cl. 248-396.000.

Maurer, Manfred; Orth, Winifried; and Fickert, Werner, to Rutgerswerke AG. Process for production of zinc 2-mercaptopyridine-n-oxide. 4,632,991, Cl. 546-6.000.

Maurer, Otto; and Schaller, Werner, to Schaller-Automation Industrielle Automationstechnik KG. Method and device for monitoring lubrication points in bearings. 4,632,223, Cl. 184-6.100.

Maurer, William C.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,632,191, Cl. 175-19.000.

Maury, Christian; Lequien, Jean; and Pinson, Denis, to Cii Honeywell Bull. Method of and apparatus for writing data on a recording medium and the medium so produced. 4,633,343, Cl. 360-76.000.

Mawby, Harold S.; Harris, Duane H.; and Fryover, Myrne E., to White Consolidated Industries, Inc. Ice dispensing mechanism. 4,632,280, Cl. 222-275.000.

Maxam, Allen B.: *See—*
Maxam, Donald R.; and Maxam, Allen B., 4,632,407, Cl. 279-121.000.

Maxam, Donald R.; and Maxam, Allen B. Inside/outside chucking device. 4,632,407, Cl. 279-121.000.

Maycock, Ian C.; and Hodgson, Derek, to Automotive Products plc. Friction clutch for a vehicle. 4,632,237, Cl. 192-98.000.

Mayer & Cie. GmbH & Co.: *See—*
Gutschmit, Alan, 4,632,324, Cl. 242-47.010.

Maynard, Robert H.: *See—*
Hulings, James E.; Randall, Robert P.; Maynard, Robert H.; and Weiss, James, 4,631,945, Cl. 72-43.000.

McCandless, Harry E., to RCA Corporation. Multibeam electron gun having a transition member and method for assembling the electron gun. 4,633,130, Cl. 313-417.000.

McCartney, Richard I., Jr., to Sperry Corporation. Convergence correction apparatus for delta-gun color cathode ray tube displays. 4,633,143, Cl. 315-368.000.

McChesney, Charles E.: *See—*
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E.; and Yoon, Hyun-Nam, 4,632,798, Cl. 264-272.170.

McClellan, David P.; Brown, John M.; and Heberlein, Gustave E., Jr., to Siemens Energy & Automation, Inc. Cam following bridge contact carrier for a current limiting circuit breaker. 4,633,207, Cl. 335-16.000.

McCollor, Donald G.: *See—*
Repperger, Daniel W.; McCollor, Donald G.; and Gruesbeck, William G., 4,632,341, Cl. 244-230.000.

McCracken, Donald G., to Aeroquip Corporation. Sectional rotary joint. 4,632,431, Cl. 285-13.000.

McDiarmid, James: *See—*
Dixon, Robert E.; and McDiarmid, James, 4,632,058, Cl. 118-725.000.

McDonald, Henry S.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

McDonald, James A.; Gledhill, David E.; and Savich, Peter P., to Union Carbide Corporation. Encoding means and method for a bag making apparatus. 4,632,667, Cl. 493-187.000.

McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., to Gas Research Institute. Steering system for percussion boring tools. 4,632,191, Cl. 175-19.000.

McDowell, Judson A.: *See—*
Blanco, Alfred W.; McDowell, Judson A.; and Yeary, David A., 4,633,333, Cl. 360-31.000.

McFall, William V.: *See—*
Brull, Robert A.; Walker, Alan H.; and McFall, William V., 4,632,577, Cl. 400-56.000.

McGarry, Phillip E., to Standard Oil Company, The. Process for coal beneficiation by froth flotation employing pretreated water. 4,632,750, Cl. 209-166.000.

McGeoch, Ian L. M.; and Stawell, William B. Method and apparatus for identifying radar targets. 4,633,251, Cl. 342-44.000.

McGrady, Michael P.; Brand, Leonard A., Jr.; and Brand, Hunt K., to Picotrin Technology, Inc. Information signal delay system utilizing random access memory. 4,633,331, Cl. 360-7.000.

McGrath, John: *See—*
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,633,392, Cl. 364-200.000.

McHugh, Michael: *See—*
Schmidt, Gerry; and McHugh, Michael, 4,631,829, Cl. 30-294.000.

McIntosh, Harold A., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,633,211, Cl. 337-338.000.

McKelvy, Andy M., to Bechtel International Corporation. Frozen island and method of making the same. 4,632,604, Cl. 405-217.000.

McKibben, Barry A., to Tektronix, Inc. Dynamic focus signal shaper. 4,633,144, Cl. 315-382.000.

McKinney, James C. Adjustable safety latch with inoperable position. 4,632,438, Cl. 292-87.000.

McLane, Frank E. Lawn mower vacuum apparatus. 4,631,909, Cl. 56-202.000.

McLeod, Roderick D. Insertion drive system for tree savers. 4,632,183, Cl. 166-77.000.

McLeod, William D.: *See—*
Peyton, Ronald G.; and McLeod, William D., 4,632,392, Cl. 272-128.000.

McManis, George E.; Fletcher, Aaron N.; and Bliss, Dan E., to United States of America, Navy. Lithium composite anode. 4,632,889, Cl. 429-218.000.

McMonagle, Rodger P., to Rogers Corporation. Microwave circuit boards. 4,633,035, Cl. 174-68.500.

McNeely, Michael D., to Anderson, Greenwood & Co. Pressure boost attachment for pilot valves. 4,632,143, Cl. 137-488.000.

McPherson, Hugh; and Blakely, John P., to Ferranti plc. Chirp signal generator for pulse compression radar. 4,633,185, Cl. 328-56.000.

McVay, James D.; and Take, Hermann, to Continuous Casting Systems Inc. Continuous casting machine. 4,632,175, Cl. 164-426.000.

McVey, Charles I.: *See—*
Scott, Curtis E.; and McVey, Charles I., 4,633,137, Cl. 313-636.000.

Meckl, Heinz: *See—*
Wernicke, Ubbo; and Meckl, Heinz, 4,632,763, Cl. 210-670.000.

MED'di Reggiani Medardo: *See—*
Reggiani, Medardo, 4,632,083, Cl. 123-527.000.

Meddaugh, Timothy G.: *See—*
Boote, Robert A.; and Meddaugh, Timothy G., 4,632,326, Cl. 242-55.300.

Mediavault Inc.: *See—*
Tzur, Avi, 4,632,865, Cl. 428-304.400.

Medley, Jackson C.: *See—*
Kress, Ralph H.; and Medley, Jackson C., 4,632,628, Cl. 414-513.000.

Meeker, Paul K.; and Sedlack, Mark A., to Gerber Products Company. Seat belt fastener. 4,632,460, Cl. 297-467.000.

Meeus, Marcel L.; Strauven, Yvan A. J.; and Groothaert, Luc A. J., to Metallurgie Hoboken-Overpelt. Process for preparing zinc powder for alkaline batteries. 4,632,699, Cl. 75-0.50B.

Megabar Corporation: *See—*
Abegg, M. Taylor; and Peterson, John A., 4,632,714, Cl. 149-2.000.

Meijer, Christoffel H.: *See—*
Herbst, John J.; Sider, Richard G.; Jaquith, Robert E.; and Meijer, Christoffel H., 4,632,802, Cl. 376-216.000.

Meijer, Roelf J.; and Ziph, Benjamin, to Stirling Thermal Motors, Inc. Heat pipe. 4,632,179, Cl. 165-47.000.

Meiji Milk Products Company Limited: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,632,840, Cl. 426-602.000.

Meinert, Rolf G.: *See—*
Druschel, William O.; Kostenko, Alexander; and Meinert, Rolf G., 4,632,294, Cl. 228-119.000.

Meinhof, Andre H., to Siemens Aktiengesellschaft. Arrangement for the ejection of individual droplets from discharge openings of an ink printer head. 4,633,267, Cl. 346-1.100.

Meister, Earl E., III; and Stewart, Bruce E., to Whirlpool Corporation. Motor-fan mounting system for canister vacuum cleaner. 4,632,642, Cl. 417-363.000.

Melbert, Joachim G., to SGS-ATES Deutschland Halbleiter Bauelement GmbH. Series voltage regulator employing a variable reference voltage. 4,633,162, Cl. 323-275.000.

Melcher, Franz-Josef: *See—*
Ober, Jurgen; Melcher, Franz-Josef; and Knothe, Erich, 4,632,199, Cl. 177-238.000.

Melzi, Edward R.; and Sharon, Arie N. Disposable oil drain pan and container combination. 4,632,268, Cl. 220-1.00C.

Menkes, Henry E.: *See—*
Ebert, Harry K., Jr.; Menkes, Henry E.; Papathomas, Thomas V.; and Venkatram, Chitra R., 4,633,412, Cl. 364-493.000.

Menn, Walter A., to ITT Corporation. Programmable keyboard for a typewriter or similar article. 4,633,227, Cl. 340-365.0VL.

Mennell, Thomas W., to Y S Securities Limited. Isolator switch with interlock. 4,633,047, Cl. 200-50.00R.

Mensinger, Michael C.: *See—*
Bodle, William W.; Lau, Francis S.; and Mensinger, Michael C., 4,632,731, Cl. 201-4.000.

Merchandising Innovations, Inc.: *See—*
Sheffer, Phil B., 4,632,040, Cl. 108-157.000.
Sheffer, Phil B., 4,632,251, Cl. 206-577.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Gante, Joachim; Prucher, Helmut; Wahlig, Helmut; and Rudolph, Volkmar, 4,632,933, Cl. 514-399.000.

Mergenthaler Linotype GmbH: *See—*
Haerig, Thomas; and Plaot, Michael, 4,632,512, Cl. 350-316.000.

Meric Industries, Inc.: *See—*
Bernard, Andre , 4,632,790, Cl. 264-36.000.

Merkh, Arthur J. Informational device adapted to convert binary to decimal numerals. 4,633,070, Cl. 235-88.00M.

Merley, Kim R.: *See—*
Goetz, Paul W.; and Merley, Kim R., 4,633,198, Cl. 332-22.000.

Mery, Jean-Claude; Sauvee, Jean-Paul; and Thioux, Alain, to Societe Anonyme D.B.A. Pad and torque support assembly for disc brake. 4,632,227, Cl. 188-73.320.

Messenger, Lawrence W.: *See—*
Upadhyay, Anand; and Messenger, Lawrence W., 4,633,382, Cl. 363-132.000.

Metal Box p.l.c.: *See—*
Dick, David A.; Folland, Rickworth; Smith, Desmond P.; and Staines, Glyn, 4,632,799, Cl. 264-292.000.

Metallgesellschaft AG: *See—*
Fischer, Herbert; and Kriebel, Manfred, 4,632,819, Cl. 423-574.00R.
Geissen, Rolf; and Siebert, Wolfgang, 4,632,998, Cl. 549-248.000.

Metallurgie Hoboken-Overpelt: *See—*
Meeus, Marcel L.; Strauven, Yvan A. J.; and Groothaert, Luc A. J., 4,632,699, Cl. 75-0.50B.

Metrex Instruments Ltd.: *See—*
Motycka, Jiri, 4,631,959, Cl. 73-189.000.

Mettier, Werner: *See—*
Zingg, Peter; Mettier, Werner; and Lindner, Gottfried, 4,631,755, Cl. 2-239.000.

Metz, Josef; Pehker, Manfred; and Zielinski, Erich, to Rheinmetall GmbH. Automatic loader for an armored vehicle having a rotatable turret. 4,632,011, Cl. 89-36.130.

Metzger, Karl G.: *See—*
Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,632,918, Cl. 514-202.000.

Metzger, William J.: *See—*
Keesling, William A.; and Metzger, William J., 4,632,348, Cl. 248-222.100.

Meyer, Adolf; Pfeifer, Manfred; and Kraeft, Uwe, to Heidelberger Zement AG. Apparatus for preparing an annular body of a hydraulically setting mass. 4,632,720, Cl. 156-429.000.

Meyer, John L.: *See—*
Lasier, David D.; Meyer, John L.; and Sweda, Michael, 4,631,819, Cl. 29-840.000.

Meyer, Karl: *See—*
Feyerl, Gunther; Kalteis, August; and Meyer, Karl, 4,632,325, Cl. 242-55.000.

Meyer, Willy: *See—*
Schurter, Rolf; Thummel, Rudolph C.; Topfl, Werner; Meyer, Willy; and Durr, Dieter, 4,632,695, Cl. 71-93.000.

Mick, John R.: *See—*
Wilburn, Darrell L.; and Mick, John R., 4,633,417, Cl. 364-550.000.

Mickelson, N. Peter; and Shively, Edward H., to GTE Products Corporation. Surge arrester for RF transmission line. 4,633,359, Cl. 361-119.000.

Mickelson, Nils P., to GTE Products Corporation. Station protector. 4,633,360, Cl. 361-119.000.

Microdot Inc.: *See—*
Verin, Pierre, 4,632,483, Cl. 339-74.00R.

Microtrak, Inc.: *See—*
Gutschmit, Alan; and Queen, John C., 4,631,930, Cl. 66-1.00R.

Mieda, Kenji: *See—*
Ookubo, Mamoru; Iwasaki, Takayuki; and Mieda, Kenji, 4,631,795, Cl. 29-243.520.

Miettinen, Jorma K.: *See—*
Lehto, Jukka K.; Miettinen, Jorma K.; and Heinonen, Olli, 4,632,778, Cl. 252-629.000.

Mignien, Georges; and Fasquel, Didier, to Les Cables de Lyon. Cable-to-repeater joining device for underwater optical fiber cable. 4,632,507, Cl. 350-96.230.

Mikami, Tomohisa; and Noda, Tsugio, to Fujitsu Limited. Method and apparatus for heating thermal head. 4,633,269, Cl. 346-76.0PH.

Mikamo, Katsumi: *See—*
Yamamoto, Makoto; Kubota, Takashi; and Mikamo, Katsumi, 4,633,335, Cl. 360-35.100.

Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, to Aisin-Warner K.K.; and Toyota Jidosha K.K. Electronically controlled automatic transmission control system. 4,631,982, Cl. 74-869.000.

Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Mounting and demounting device of optical unit. 4,632,510, Cl. 350-257.000.

Mikiya, Toshio. Pneumatically-operated multi-needle chisel tool. 4,632,190, Cl. 173-133.000.

Miles Laboratories, Inc.: *See—*
Brunsting, Albert, 4,632,559, Cl. 356-416.000.
Corey, Paul F., 4,633,025, Cl. 568-866.000.

Miller, Cardell E., to Ideal Security Hardware Corporation. Door latching apparatus. 4,632,439, Cl. 292-166.000.

Miller, Carl A.: *See—*
Starnes, Robert L.; Katkocin, Dennis M.; Miller, Carl A.; and Strobel, Robert J., Jr., 4,632,905, Cl. 435-189.000.

Miller, Clifton L.; and Plumridge, Nigel R., to Millridge Safety Developments Pty. Ltd. Safety shackles. 4,632,443, Cl. 294-82.340.

Miller, Irvin M., to International Business Machines Corporation. Display system for displaying maps having two-dimensional roads. 4,633,433, Cl. 364-900.000.

Miller, Louis H.: *See—*
Carter, Richard; and Miller, Louis H., 4,632,909, Cl. 436-542.000.

Milliken Research Corporation: *See—*
Dischler, Louis; and Otto, Wolfgang K. F., 4,631,788, Cl. 26-25.000.

Millipore Corporation: *See—*
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., 4,632,745, Cl. 204-301.000.

Millridge Safety Developments Pty. Ltd.: *See—*
Miller, Clifton L.; and Plumridge, Nigel R., 4,632,443, Cl. 294-82.340.

Mills, Manuel D. Apparatus for controlling a pumpjack prime mover. 4,631,954, Cl. 73-151.000.

Minakuchi, Hiroshi: *See—*
Inaji, Toshio; Minakuchi, Hiroshi; and Igarashi, Yoshiaki, 4,633,150, Cl. 318-254.000.

Minami, Saburo, to Osaka Kanagu Co., Ltd.; and Speed Star Co., Ltd. Center locking device of ball train type for a disc wheel of motor vehicle. 4,631,936, Cl. 70-167.000.

Minato, Yoshihiko: *See—*
Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, 4,632,161, Cl. 144-213.000.

Mindler, Albert B., to International Hydronics Corporation. Electrolytic reduction of nitrate from solutions of alkali metal hydroxides contaminated by oxidizing transition metal ions. 4,632,737, Cl. 204-98.000.

Miner, Robert L.: *See—*
Roberts, Roy D.; and Miner, Robert L., 4,633,128, Cl. 313-113.000.

Minissale, Bruno: *See—*
Leishman, Graham W.; and Minissale, Bruno, 4,631,760, Cl. 4-300.000.

Minnesota Mining and Manufacturing Company: *See—*
Carey, Patrick H., Jr., 4,631,933, Cl. 66-192.000.
Kvitrud, James R., 4,632,672, Cl. 604-222.000.
Laird, James A.; and Beck, Warren R., 4,632,876, Cl. 428-404.000.
Patel, Ranjana C.; Stibbard, John H. A.; Fisher, Michael G.; and Baldock, Terence W., 4,632,895, Cl. 430-201.000.
Roche, Karen M., 4,632,111, Cl. 128-303.00R:

Minolta Camera Kabushiki Kaisha: *See—*
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,633,405, Cl. 364-184.000.
Miki, Yukio; and Egawa, Takeshi, 4,632,510, Cl. 350-257.000.

Mion, Abramo: *See—*
Bonetti, Massimo; Manente, Giuseppe; and Mion, Abramo, 4,631,839, Cl. 36-50.000.

Mirkovich, Ninko T.; and Zajac, John, to Tegal Corporation. Vacuum load lock apparatus. 4,632,624, Cl. 414-217.000.

Miroku, Yoshihiko, to Fuji Xerox Co., Ltd. Ink jet printer. 4,633,268, Cl. 346-75.000.

Misawa, Kenji: *See—*
Ueda, Shu; Narumiya. Joe; and Misawa, Kenji, 4,632,250, Cl. 206-524.200.

Misawa, Mitsukuni; and Sato, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Lubricating oil supply controller. 4,632,085, Cl. 123-73.0AD.

Misawa, Yoshihiko: *See—*
Ishii, Taira; Misawa, Yoshihiko; Maeda, Yoshinobu; and Tanaka, Souhei, 4,631,800, Cl. 29-564.600.

Miskimin, Paul A.: *See—*
Kurasch, David H.; Hall, George V. B.; Cossel, Stephen C.; and Miskimin, Paul A., 4,633,091, Cl. 250-506.100.

Mita Industrial Co., Ltd.: *See—*
Ishitani, Yusuke, 4,632,522, Cl. 350-570.000.

Mitani, Yasuo: *See—*
Kuriyama, Shunichi; and Mitani, Yasuo, 4,631,825, Cl. 30-43.920.

Mitchell, Joan L.: *See—*
Goertzel, Gerald; and Mitchell, Joan L., 4,633,490, Cl. 375-122.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Anami, Kenji, 4,633,192, Cl. 330-277.000.
Hashimoto, Yasuhiko, 4,631,927, Cl. 62-280.000.
Kawakami, Minoru, 4,632,728, Cl. 156-659.100.
Sasaki, Masaru; and Isozaki, Shin, 4,633,346, Cl. 360-78.000.
Sekikawa, Katsuhide, 4,633,409, Cl. 364-474.000.
Yamada, Norimasa; and Hibino, Masahiro, 4,633,500, Cl. 381-51.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Haneda, Hisao; and Araoka, Mamoru, 4,632,064, Cl. 122-1.00A.
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,632,403, Cl. 277-27.000.
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, 4,632,810, Cl. 423-242.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,632,806, Cl. 420-479.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Tsubai, Yasuo; and Okazaki, Koji, 4,632,896, Cl. 430-249.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Ito, Ryouichi; Banno, Yoshihiro; and Kakizaki, Tetsuji, 4,632,942, Cl. 521-92.000.

Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See—*
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,633,008, Cl. 560-15.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Nagano, Riichiro, 4,632,959, Cl. 525-70.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Asanuma, Tadashi; Ohoka, Tatuo; and Uchikawa, Nobutaka, 4,632,976, Cl. 528-497.000.
Sasagawa, Katsuyoshi; Imai, Masao; and Kanno, Kimio, 4,632,969, Cl. 526-286.000.
Tsujimoto, Michihiro; Akahori, Hiroyuki; Hasegawa, Kiyoharu; and Asano, Makoto, 4,632,987, Cl. 544-86.000.

Mitsunaga, Hiroshi: *See—*
Noda, Kazushi; and Mitsunaga, Hiroshi, 4,631,976, Cl. 74-552.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Sasaki, Kohji, 4,633,249, Cl. 340-870.370.

Mitutuoyo Mfg. Co., Ltd.: *See—*
Hayashi, Koji; Yoshioka, Susumu; and Ono, Noritsugu, 4,631,834, Cl. 33-503.000.

Miwa, Naoto: *See—*
Fukutani, Masanori; Miwa, Naoto; Ito, Kazuyuki; and Ito, Keiji, 4,632,683, Cl. 55-523.000.

Mix, Holger, to Deutsche Lufthansa AG. Process for electrochemically or chemically coating niobium. 4,632,734, Cl. 204-32.100.

Miyagi, Takeshi, to Zojirushi Baby Co., Ltd. Collapsible baby carriage. 4,632,420, Cl. 280-642.000.

Miyajima, Hiroyuki: *See—*
Osawa, Michitaka; Kimura, Yuichiro; and Miyajima, Hiroyuki, 4,633,145, Cl. 315-383.000.

Miyake, Hiroyuki: *See—*
Sonobe, Hiraku; Miyake, Hiroyuki; and Kashiwabara, Akihiro, 4,632,536, Cl. 355-3.00R.

Miyake, Shiyuichi, to Nihon Radiator Co., Ltd. Flat electric motor with adjustable bearing support. 4,633,112, Cl. 310-90.000.

Miyamoto, Shoji: *See—*
Kosaka, Michitaka; and Miyamoto, Shoji, 4,633,261, Cl. 342-430.000.

Miyashita, Atsushi: *See—*
Higurashi, Seiji; Miyashita, Atsushi; and Kobayashi, Kaoru, 4,633,332, Cl. 360-10.300.

Miyashita, Hitoshi: *See—*
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, 4,633,077, Cl. 250-214.00L.

Miyata, Hiroshi; and Nakamura, Kazumasa, to Toyota Jidosha Kabushiki Kaisha. Device for detecting center of steering angle in vehicle. 4,633,214, Cl. 340-73.000.

Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic workpiece engaging apparatus in grinding machines. 4,631,869, Cl. 51-165.710.

Miyazaki, Ken; and Okazaki, Shoichi, to Victor Company of Japan, Ltd. Tracking control apparatus using digitized vertical synchronizing signal. 4,633,334, Cl. 360-33.100.

Miyoshi, Takahito; Fujiyama, Masaaki; and Matsufuji, Akihiro, to Fuji Photo Film Co., Ltd. Magnetic recording media. 4,632,868, Cl. 428-328.000.

Mizoguchi, Toshiaki; Wadaya, Shinichiro; Hashimoto, Kunihiro; and Takase, Shinichi, to Ye Data Incorporated. Magnetic field noise shield for a magnetic head. 4,633,352, Cl. 360-104.000.

Mizohata, Tadashi: *See—*
Kishino, Takao; and Mizohata, Tadashi, 4,633,134, Cl. 313-497.000.

Mizuguchi, Jin: *See—*
Rochat, Alain C.; Iqbal, Abul; Jeanneret, Remy; and Mizuguchi, Jin, 4,632,893, Cl. 430-58.000.

Mizuno, Hiroko; Kikuchi, Makoto; Horiuchi, Susumu; and Tamata, Shin, to Hitachi, Ltd. Radioactive waste pellets in solidified form and a process for forming the same. 4,632,779, Cl. 252-629.000.

Mizuno, Toshiya; Moriyama, Nobuhiro; Murayama, Naohiro; and Saitoh, Shigeru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Ultrafine fiber of an ethylene tetrafluoride copolymer and a process for producing it and a porous membrane thereof. 4,632,873, Cl. 428-364.000.

Mizuta, Tamotsu: *See—*
Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, 4,632,744, Cl. 204-206.000.

Mobay Chemical Corporation: *See—*
Krishnan, Sivaram, 4,632,949, Cl. 524-94.000.

Mobil Oil Corporation: *See—*
Baugh, Benton F., 4,632,603, Cl. 405-210.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,632,811, Cl. 423-306.000.
Goldstein, Theodore P., 4,632,911, Cl. 502-62.000.
Koeijmans, Gerard D., 4,633,448, Cl. 367-72.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,633,027, Cl. 585-314.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,633,028, Cl. 585-331.000.
Park. Hee C.; O'Brien, Jeffrey J.; and Fosmire, Christopher R., 4,632,869, Cl. 428-315.500.
Smallwood, Larry D.; and Sprunt, Eve S., 4,631,964, Cl. 73-594.000.
Sprunt, Eve S.; and Smallwood, Larry D., 4,631,963, Cl. 73-594.000.
Valyocsik, Ernest W., 4,632,815, Cl. 423-328.000.

Moench, Jerry D.: *See—*
Lewandowski, Alan J.; and Moench, Jerry D., 4,633,429, Cl. 365-96.000.

Moest, Thomas: *See—*
Pich, Claus H.; and Moest, Thomas, 4,632,843, Cl. 427-3.000.

Mogi, Takao; and Suematsu, Masayuki, to Sony Corporation. Method and apparatus for transferring data for digitally controlling video equipment. 4,633,313, Cl. 358-160.000.

Mohan, Edwin R.: *See—*
Sherwin, Gary W.; and Mohan, Edwin R., 4,632,120, Cl. 128-639.000.

Mohrmann, Karl H.: *See—*
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,632,999, Cl. 549-519.000.

Mok, Chuck K.; and Martin, Alain, to SPAR Aerospace Limited. Phase slope equalizer. 4,633,258, Cl. 342-373.000.

Mollo, Leonard J. Emergency transport neck immobilizer. 4,632,099, Cl. 128-87.00B.

Molodecki, Edward J. Collapsible hut. 4,631,877, Cl. 52-70.000.

Momose, Denichi: *See—*
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.

Momose, Haruhiko: *See—*
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, 4,633,077, Cl. 250-214.00L.

Mondek, Martin J.: *See—*
Hall, Charles B.; and Mondek, Martin J., 4,632,049, Cl. 114-150.000.

Monsanto Company: *See—*
Chan, Albert S. C.; and Morris, Donald E., 4,633,015, Cl. 562-590.000.
Keppel, Robert A.; and Franchetti, Victoria M., 4,632,915, Cl. 502-209.000.

Montalto, Samuel J.: *See—*
Barnett, Stanley M.; Lausier, Joan M.; and Montalto, Samuel J., 4,632,875, Cl. 428-402.220.

Montres Rado S.A.: *See—*
Gogniat, Paul, 4,632,569, Cl. 368-35.000.

Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Timian, Steven S.; and Waltasti, Stephen A., to Panduit Corp. Tool for the automatic installation of discrete cable ties provided on a continuous ribbon of cable ties. 4,632,247, Cl. 206-343.000.

Mooney Chemicals, Inc.: *See—*
Cells, Paul L., 4,633,001, Cl. 556-44.000.

Moore Business Forms, Inc.: *See—*
Angus, Gordon, 4,632,427, Cl. 282-11.50R.

Moore, Richard E., to Hughes Helicopters, Inc. Helicopter rotor transmission systems. 4,632,337, Cl. 244-17.190.

Moore, Thomas S., to Ford Motor Company. Mechanism to engage part time drive system in a moving vehicle. 4,632,207, Cl. 180-247.000.

Moores, Gregory E., to Black & Decker, Inc. Electric knife drive mechanism. 4,631,827, Cl. 30-272.00A.

Moradi-Araghi, Ahmad; and Smith, Duane H., to Phillips Petroleum Company. Polymerflood process. 4,632,185, Cl. 166-273.000.

Morata, Philippe, to ETA S.A. Fabriques d'Ebauches. Electronic watch module able to adapt the polarity of a cell to that of the watch circuit. 4,632,571, Cl. 368-203.000.

Moreau, Jacques-Pierre: *See—*
Coy, David H.; and Moreau, Jacques-Pierre, 4,632,979, Cl. 530-313.000.

Morgan, Richard L.; and Pickett, David A., to Allied Corporation. Method of making a control device for diesel engines. 4,632,076, Cl. 123-145.00A.

Mori, Shigeto; and Fukazawa, Minoru, to Tokai Carbon Co., Ltd. Process for manufacturing whisker preform for composite material. 4,632,794, Cl. 264-87.000.

Mori, Toshihiro: *See—*
Oda, Takashi; Ohyagi, Takashi; and Mori, Toshihiro, 4,633,379, Cl. 363-19.000.

Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, to Mitsubishi Kinzoku Kabushiki Kaisha; and Fujitsu Limited. Copper alloy having high resistance to oxidation for use in leads on semiconductor devices. 4,632,806, Cl. 420-479.000.

Morimoto, Masafumi; Noda, Michihiro; Yanagiuchi, Shigenobu; and Yanagiuchi, Yasuko, to Sharp Kabushiki Kaisha. Electronic language translator capable of modifying definite articles or prepositions to correspond to modified related words. 4,633,435, Cl. 364-900.000.

Morinaga Milk Industry Co., Ltd.: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Morinaka, Shigehisa; and Komuro, Katsusuke, to Honda Giken Kogyo Kabushiki Kaisha. Water-cooled engine cooler for vehicle. 4,632,206, Cl. 180-229.000.

Morisawa, Kunio; Kashihara, Yuji; and Higuchi, Atsunori, to Toyota Jidosha Kabushiki Kaisha. Lever mechanism for cable linkage. 4,631,983, Cl. 74-877.000.

Morishita, Shizuo, to NEC Corporation. Interface unit inserted between a data transfer unit and a processor unit. 4,633,489, Cl. 375-121.000.

Morissette, Gilles. Auto collapsible load carrier. 4,632,289, Cl. 224-314.000.

Morita, Takashi: *See—*
Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, 4,633,460, Cl. 370-58.000.

Moriyama, Nobuhiro: *See—*
Mizuno, Toshiya; Moriyama, Nobuhiro; Murayama, Naohiro; and Saitoh, Shigeru, 4,632,873, Cl. 428-364.000.

Morohoshi, Yozo, to Kuroyanagi, Hidekatsu. Process for manufacturing soymilk products with wheat germs. 4,632,839, Cl. 426-573.000.

Morris, Donald E.: *See—*
Chan, Albert S. C.; and Morris, Donald E., 4,633,015, Cl. 562-590.000.

Morris, George R. Energy absorption apparatus. 4,632,424, Cl. 280-777.000.

Morrison, Charles B.; Figueroa, Luis; and Burghard, Andre, to TRW Inc. Semiconductor laser with blocking layer. 4,633,477, Cl. 372-46.000.

Morrison, Edward D.: *See—*
Marcus, Michael A.; and Morrison, Edward D., 4,632,856, Cl. 428-172.000.

Mortensen Educational Products, Inc.: *See—*
Mortensen, Vernon J., 4,632,661, Cl. 434-188.000.

Mortensen, Vernon J., to Mortensen Educational Products, Inc. Methods for structurally performing differential calculus. 4,632,661, Cl. 434-188.000.

Mosebach, Wilhelm; and Breidenbach, Dieter, to Carl Still GmbH & Co. KG, Firma. Method and device for stripping ammoniacal water countercurrently with steam. 4,632,676, Cl. 55-50.000.

Moseinco, David: *See—*
Gordon, Tsvi J.; Shmuel, Sorek; and Moseinco, David, 4,632,033, Cl. 102-252.000.

Moshref, Mohammad T.: *See—*
Howard, James K.; and Moshref, Mohammad T., 4,632,883, Cl. 428-611.000.

Moskowitz, Charles. Console bed. 4,631,764, Cl. 5-150.00B.

Moss, Ernest. Sport and health accessories weight system. 4,632,389, Cl. 272-119.000.

Mothersole, David S.; Crudele, Lester M.; Tietjen, James L.; and Thompson, Robert R., to Motorola, Inc. Data processor having dynamic bus sizing. 4,633,437, Cl. 364-900.000.

Motonami, Masanao; Hiramatsu, Eiji; and Shiraishi, Daiichi, to Toyoda Jidosha Kabushiki Kaisha. Construction of door in motor vehicle. 4,631,865, Cl. 49-374.000.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Hagemeister, Klaus, 4,632,182, Cl. 165-173.000.

Motorola, Inc.: *See—*
Dewitt, B. Chris, 4,633,097, Cl. 307-269.000.
Lasier, David D.; Meyer, John L.; and Sweda, Michael, 4,631,819, Cl. 29-840.000.
Lewandowski, Alan J.; and Moench, Jerry D., 4,633,429, Cl. 365-96.000.
Main, W. Eric, 4,633,195, Cl. 331-117.00R.
Mothersole, David S.; Crudele, Lester M.; Tietjen, James L.; and Thompson, Robert R., 4,633,437, Cl. 364-900.000.
Nowak, Michael E., 4,633,203, Cl. 333-161.000.
Olsen, Dennis R.; and Spanjer, Keith G., 4,631,805, Cl. 29-588.000.
Peled, Nahum; and Frenkel, Shmuel, 4,633,196, Cl. 332-11.00D.
Vanderspool, Jan P., II, 4,633,197, Cl. 332-16.00T.
Weber, Paul J., 4,633,141, Cl. 315-307.000.

Motycka, Jiri, to Metrex Instruments Ltd. Drag anemometer. 4,631,959, Cl. 73-189.000.

Motycka, Jiri: *See—*
Van Cauwenberghe, Roger; and Motycka, Jiri, 4,631,958, Cl. 73-189.000.

Moulet, Jean M. M., to Groupement pour l'Industrialisation du Batiment "G.I.B.A.T.". Method of manufacturing a sandwich wall panel by molding. 4,632,796, Cl. 264-253.000.

Mouren, Michel: *See—*
Jouquey, Alain; Touyer, Gaetan; Salmon, Jean; and Mouren, Michel, 4,632,820, Cl. 424-1.100.

Moye, Henry. Guide bracket for brick laying. 4,631,833, Cl. 33-408.000.

MPR Corporation: *See—*
Chung, Yun H.; and Chung, Dennis E., 4,631,901, Cl. 53-455.000.

MTU Muenchen GmbH: *See—*
Schlosser, Werner, 4,633,056, Cl. 219-121.0ED.

Mucha, Horst: *See—*
Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, 4,633,408, Cl. 364-474.000.

Mueller, Dieter J.; and Busse, Hans-Juergen, to Huels Aktiengesellschaft. Controlled process for the surface treatment of metals. 4,632,706, Cl. 148-6.15R.

Mueller, Richard H.; Drossard, Jakob-Matthias; and Ermann, Peter H., to E. R. Squibb & Sons, Inc. N-hydroxy protecting groups and process for the preparation of 3-acylamino-1-hydroxy-2-azetidinones. 4,633,017, Cl. 564-301.000.

Mueller, Richard L., Jr., to Argon Medical Corp. Suture tab. 4,632,670, Cl. 604-174.000.

Muench, Volker; Hambrecht, Juergen; Echte, Adolf; Illers, Karl H.; and Swoboda, Johann, to BASF Aktiengesellschaft. Halogen-free flameproofed thermoplastic molding material. 4,632,946, Cl. 523-179.000.

Muhlbauer, Ernst. Batch pack for silver filings for the preparation of dental amalgam. 4,632,243, Cl. 206-219.000.

Muhlnickel, Peter: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.

Mukai, Yasuteru: *See—*
Ohtake, Katsumoto; Ohshima, Yoshikuni; Mukai, Yasuteru; and Okouchi, Isao, 4,631,925, Cl. 60-688.000.

Mulcahy, Timothy E.: *See—*
Hannan, Randy R.; and Mulcahy, Timothy E., 4,632,218, Cl. 182-5.000.

Mullen, Stephen J. I-beam honeycomb material. 4,632,862, Cl. 428-116.000.

Muller, Egbert: *See*—
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,632,466, Cl. 303-7.000.

Muller, Friedemann: *See*—
Fuhr, Karl; Muller, Friedemann; and Eicher, Theobald, 4,632,951, Cl. 524-204.000.

Muller, Rainer: *See*—
Frewer, Hans; Muller, Rainer; and Schiffers, Ulrich, 4,631,915, Cl. 60-39.120.

Muller, Udo, to Diehl GmbH & Co. Electronic ignition control circuit. 4,632,032, Cl. 102-206.000.

Mullin, John G., Jr.; Kierstead, Richard W.; and Triscari, Joseph, to Hoffmann-La Roche Inc. N-substituted diphenylpiperidines and antiobesity use thereof. 4,632,925, Cl. 514-256.000.

Munz, Erich. Vertically adjustable shock-absorbing mounting device. 4,632,356, Cl. 248-638.000.

Murakami, Kanji: *See*—
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Murakami, Shinjiro; Horyoda, Hiroshi; Kohama, Tetsuya; Mizuta, Tamotsu; Ishikawa, Shinjiro; Iwamoto, Shuji; and Kibata, Asaharu, to Kawasaki Steel Corporation. Device for metal strip electrolytic processing. 4,632,744, Cl. 204-206.000.

Murakami, Toshinori: *See*—
Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, 4,632,026, Cl. 99-349.000.

Murata, Akira: *See*—
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.

Murata Manufacturing Co., Ltd.: *See*—
Hamuro, Mitsuro; Anao, Kimiharu; and Shimamaki, Keiichi, 4,633,370, Cl. 361-380.000.

Murata, Tomohiro; Komoda, Norihisa; and Haruna, Koichi, to Hitachi, Ltd. Method and apparatus for controlling an operation sequence of machinery. 4,633,385, Cl. 364-191.000.

Murayama, Naohiro: *See*—
Mizuno, Toshiya; Moriyama, Nobuhiro; Murayama, Naohiro; and Saitoh, Shigeru, 4,632,873, Cl. 428-364.000.

Murphree, Gary R.: *See*—
Krivec, Bert; and Murphree, Gary R., 4,631,940, Cl. 70-332.000.

Murphy-Boesch, Joseph A.; and Koretsky, Alan P., to University of Calif., Regents of the. Apparatus and method for increasing the sensitivity of a nuclear magnetic resonance probe. 4,633,181, Cl. 324-322.000.

Murphy, Joseph F.: *See*—
D'Antonio, John P.; and Murphy, Joseph F., 4,632,860, Cl. 428-290.000.

Murray Corporation: *See*—
Proctor, Robert H.; and Hardesty, Ronald C., 4,632,434, Cl. 285-39.000.

Murrell, John E. Safety ladder. 4,632,220, Cl. 182-111.000.

Nabisco Brands, Inc.: *See*—
Roa, Alvaro H.; and Cuartas, Jaime, 4,632,323, Cl. 241-247.000.

Nabulon, Werner, to Maschinenfabrik Rieter AG. Apparatus for texturizing of threads of endless filaments. 4,631,790, Cl. 28-255.000.

Nadai, Bela: *See*—
Czabaffy, Andras; Kaffka, Karoly; Horvath, Lorand; and Nadai, Bela, 4,632,549, Cl. 356-300.000.

Nadan, Joseph S., to North American Philips Corporation. Method for reducing the scan line visibility for projection television by using a different interpolation and vertical displacement for each color signal. 4,633,294, Cl. 358-11.000.

Naert, Michel S., to AB Volvo. Vehicle seat intended, for example, for such automobile vehicles as cars, trains and airplanes. 4,632,454, Cl. 297-284.000.

Nagahata, Tsutomu: *See*—
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Nagai, Tamio: *See*—
Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, 4,632,026, Cl. 99-349.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaishi. H-switch circuit with an overcurrent protection circuit. 4,633,358, Cl. 361-31.000.

Nagano, Riichiro, to Mitsui Petrochemical Industries, Ltd. Modified polyolefin composition. 4,632,959, Cl. 525-70.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Two-dimensional bandwidth compensating circuit for an endoscope using a solid state image pick-up device. 4,633,303, Cl. 358-98.000.

Nagasaki, Tatsuo, to Olympus Optical Co., Ltd. Endoscope assembly. 4,633,304, Cl. 358-98.000.

Nagase, Hiroshi; and Sato, Yasuo, to Takeda Chemical Industries, Ltd. Thiophenylureas, their production and use. 4,632,938, Cl. 514-594.000.

Nagashima, Hirohisa. Spout assembly. 4,632,282, Cl. 222-529.000.

Nagata, Niroo, to Kabushiki Kaisha Toshiba. Developing device. 4,632,535, Cl. 355-3.0DD.

Nagata, Seiichi: *See*—
Ogawa, Tetsu; Nagata, Seiichi; and Hotta, Sadayoshi, 4,632,514, Cl. 350-339.00F.

Nagata, Shoichi: *See*—
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,632,894, Cl. 430-84.000.

Nagata, Tomizou; and Kobayashi, Kazutaka, to Japan Tobacco & Salt Public Corp., The. Apparatus for compressing cigarettes. 4,631,904, Cl. 53-529.000.

Nager, Lois: *See*—
Heyman, Eleanor; and Nager, Lois, 4,631,752, Cl. 2-56.000.

Nagle, George J.: *See*—
Del Tufo, Mark J.; and Nagle, George J., 4,632,594, Cl. 403-322.000.

Nagubandi, Sreeramulu, to Stauffer Chemical Company. Aryloxyphenoxy benzamide herbicides and methods of use. 4,632,697, Cl. 71-94.000.

Nagy, John S.; and Fang, Jolson K., to Amdahl Corporation. Heat pipe heat exchanger for large scale integrated circuits. 4,633,371, Cl. 361-385.000.

Naito, Yoshiyuki: *See*—
Ueno, Ryuzo; Sakota, Kazuyuki; Naito, Yoshiyuki; and Kishimoto, Mitsuyuki, 4,633,024, Cl. 568-738.000.

Naito, Yosio: *See*—
Hirata, Akio; and Naito, Yosio, 4,633,158, Cl. 318-723.000.

Naito, Yukio: *See*—
Koga, Daisuke; Tamura, Masahide; and Naito, Yukio, 4,633,511, Cl. 455-86.000.

Nakagawa, Teruo: *See*—
Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, 4,632,878, Cl. 428-425.900.

Nakajima, Kunihiro: *See*—
Sato, Akihiko; and Nakajima, Kunihiro, 4,632,907, Cl. 436-10.000.

Nakajima, Shigeo: *See*—
Suzuki, Fumiaki; Takeda, Toshiyuki; Inoue, Takeo; and Nakajima, Shigeo, 4,633,510, Cl. 455-69.000.

Nakajima, Suemitsu, to Nitsuko, Ltd. Telephone handset comprising an adapter resiliently fixed for a transmitter or a receiver to a housing therefor. 4,633,044, Cl. 379-433.000.

Nakajima, Zenji; Okamoto, Shuichi; and Kunihiro, Motoo, to Toyo Rubber Industry Co.; and Toyota Jidosha Kabushiki Kaisha. Rubber vibration insulator. 4,632,372, Cl. 267-140.100.

Nakamura, Hiroshi: *See*—
Takeda, Yukio; Nakamura, Hiroshi; and Fukuda, Eisuke, 4,633,484, Cl. 375-77.000.

Nakamura, Kazumasa: *See*—
Miyata, Hiroshi; and Nakamura, Kazumasa, 4,633,214, Cl. 340-73.000.

Nakamura, Masatsugu: *See*—
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,632,894, Cl. 430-84.000.

Nakamura, Minoru: *See*—
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,633,405, Cl. 364-184.000.

Nakamura, Mitsuhiro: *See*—
Watanabe, Yasuo; and Nakamura, Mitsuhiro, 4,632,316, Cl. 241-26.000.

Nakamura, Mitsuo; Kaga, Sumihiro; and Tanahashi, Toshitaka, to Nippondenso Co., Ltd. Static shock climinator. 4,633,364, Cl. 361-216.000.

Nakamura, Motoharu: *See*—
Konno, Toyohiko; Suga, Yozo; Nakamura, Motoharu; and Komatsu, Hajime, 4,632,708, Cl. 148-113.000.

Nakamura, Yoshikatsu: *See*—
Takahashi, Kentaro; Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,632,074, Cl. 123-90.390.

Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane substituted amide-sulfonamide prostaglandin analogs useful in the treatment of thrombotic disease. 4,632,931, Cl. 514-382.000.

Nakane, Shinichi; Maehara, Naoyoshi; and Yamamoto, Kazushi, to Matsushita Electric Industrial Co., Ltd. Atomizing apparatus employing a capacitive piezoelectric transducer. 4,632,311, Cl. 239-101.000.

Nakanos, Howard H.: *See*—
Karnezos, Marcos; Nakanos, Howard H.; and Neukermans, Armand P., 4,632,871, Cl. 428-336.000.

Nakayama, Kazuhiko: *See*—
Ogawa, Yasuhiko; Nakayama, Kazuhiko; and Yasuda, Minoru, 4,633,121, Cl. 310-332.000.

Nakayama, Keiji, to Fuji Photo Film Co., Ltd. Method of recording image signals of photographic pictures. 4,633,305, Cl. 358-101.000.

Nakayama, Koichi; and Tanaka, Yoshito, to Toko, Inc. Switch circuit provided with means for setting up the initial condition thereof. 4,633,444, Cl. 365-228.000.

Nakazawa, Akira: *See*—
Matsuzaki, Shuichi; and Nakazawa, Akira, 4,632,493, Cl. 339-176.00M.

Nalbanti, Georges. Integrated circuit package holder. 4,633,239, Cl. 340-636.000.

Nalco Chemical Company: *See*—
Slanker, Steven R., 4,632,770, Cl. 252-49.500.

Nalewajek, David; and Soriano, David S., to Allied Corporation. Method for the preparation of allyl phosphonate diesters. 4,633,005, Cl. 558-125.000.

Namba, Hiromi, to Kabushiki Kaisha Toshiba. Optical recognizing apparatus. 4,633,502, Cl. 382-9.000.

Narayan, Badhri: *See*—
Statt, David J.; Narayan, Badhri; and Zeitzoff, Peter M., 4,633,092, Cl. 250-578.000.

Narbut, Gerald S. Bearing lubrication for spindles in vehicles. 4,632,202, Cl. 180-70.100.

Narumiya, Joe: *See*—
Ueda, Shu; Narumiya, Joe; and Misawa, Kenji, 4,632,250, Cl. 206-524.200.

Nasgowitz, Donald D., to DCI Marketing. Combination hand truck and display stand. 4,632,412, Cl. 280-47.260.

Nash, Dennis P., to International Business Machines Corporation. Flexible leader. 4,632,583, Cl. 400-248.000.

Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, to Energy Conversion Devices, Inc. Photovoltaic device and method. 4,633,033, Cl. 136-256.000.

Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, to Energy Conversion Devices, Inc. Photovoltaic device and method. 4,633,034, Cl. 136-256.000.

National Distillers and Chemical Corporation: *See*—
Hanes, Ronnie M., 4,633,021, Cl. 568-454.000.

National Machinery Company, The: *See*—
Hay, Thomas E.; Wisebaker, Robert E.; and Kline, Gaylen O., 4,631,950, Cl. 72-356.000.

National Mine Service Company: *See*—
Posma, Bonne W.; and Hill, Rowland A., 4,633,147, Cl. 318-52.000.

National Patent Development Corp.: *See*—
Ryder, Francis E.; and Williams, Fred E., 4,632,055, Cl. 118-703.000.

National Research Development Corp.: *See*—
Bergman, Imanuel, 4,632,746, Cl. 204-415.000.
Bloch, Paul D.; Barnard, Michael E.; and Paige, Edward G. S., 4,633,117, Cl. 310-313.00B.

Naumec, John R.; and Kaverud, Peter H., to United Technologies Corporation. Workpiece manipulator for a hot environment. 4,632,623, Cl. 414-148.000.

NCR Corporation: *See*—
Brull, Robert A.; Walker, Alan H.; and McFall, William V., 4,632,577, Cl. 400-56.000.
Wirth, Robert L.; Hanna, Kenneth W.; and Wilson, Hillis L., 4,632,580, Cl. 400-124.000.

Neal, Hubert W. T., to SKF (U.K.) Limited. Bearing units. 4,632,576, Cl. 384-537.000.

NEC: *See*—
Ishimoto, Shoji, 4,633,441, Cl. 365-189.000.

NEC Corporation: *See*—
Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, 4,633,046, Cl. 370-32.100.
Komatu, Yuji, 4,633,095, Cl. 307-255.000.
Kosugi, Yuhei, 4,633,118, Cl. 310-328.000.
Morishita, Shizuo, 4,633,489, Cl. 375-121.000.
Oda, Takashi; Ohyagi, Takashi; and Mori, Toshihiro, 4,633,379, Cl. 363-19.000.
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, 4,633,120, Cl. 310-328.000.
Sekiguchi, Toru, 4,633,341, Cl. 360-73.000.
Suzuki, Fumiaki; Takeda, Toshiyuki; Inoue, Takeo; and Nakajima, Shigeo, 4,633,510, Cl. 455-69.000.
Tsujimoto, Akira, 4,633,105, Cl. 307-482.000.
Usubuchi, Touru, 4,633,325, Cl. 358-260.000.
Yasuda, Tooru, 4,633,312, Cl. 358-136.000.

Neefe, Charles W. Method of making a contact lens material which may be identified. 4,632,773, Cl. 252-301.350.

Negishi, Hideo; Obokata, Mitsuyuki; and Katayama, Shigeharu, to Sanden Corporation. Article dispensing mechanism for a vending machine. 4,632,257, Cl. 211-59.200.

Negishi, Shigetoshi: *See*—
Fujita, Takayuki; Negishi, Shigetoshi; and Tanaka, Kunio, 4,631,816, Cl. 29-740.000.

Neil, Iain A., to Barr & Stroud Limited. Variable magnification infrared objective lens assembly. 4,632,498, Cl. 350-1.200.

Nelson, Frederic P.; and Jamieson, John R., to Nelson, Frederic P. Alarm device. 4,633,232, Cl. 340-542.000.

Nelson, Norvell J., to Psi Star. Copper etching process and solution. 4,632,727, Cl. 156-656.000.

Nemeth, Jozsef: *See*—
Csordas, Laszlo; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.

Nepera Inc.: *See*—
Erazo, Fernando; and Conant, Richard W., 4,632,284, Cl. 222-615.000.

Nepomuceno, Jose G.: *See*—
Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., 4,632,131, Cl. 131-355.000.

Neukermans, Armand P.: *See*—
Karnezos, Marcos; Nakanos, Howard H.; and Neukermans, Armand P., 4,632,871, Cl. 428-336.000.

Neukirchner, Ernst Peter: *See*—
Freienstein, Bernd; Neukirchner, Ernst Peter; Pilsak, Otmar; and Schlogl, Dietmar, 4,633,407, Cl. 364-450.000.

Neuschutz, Dieter: *See*—
Bebber, Hans J.; Neuschutz, Dieter; and Rosser, Heinrich-Otto, 4,632,700, Cl. 75-10.140.

Newell, Alfred T., III; and Nichols, Edward L., III, to A. T. Newell Co. Inc. Electronic thermostat. 4,632,304, Cl. 236-46.00R.

Newell, Stephen D.; Rowe, Stephen B.; and Bukousky, John M., to Alco Industries, Inc. Linear moving irrigating apparatus. 4,632,494, Cl. 239-184.000.

Newman, Arnold S. Textile bobbin. 4,632,332, Cl. 242-118.300.

Newman, Frank J., to Boeing Company, The. Advanced fuel receptacle lighting system for aerial refueling. 4,633,376, Cl. 362-62.000.

Newman, Malcolm; and Abraham, Carl J., to Athletic Safety Products, Inc. Protective headgear. 4,631,758, Cl. 2-424.000.

Newman, Neil F.: *See*—
Gardner, Irwin J.; Fusco, James V.; Newman, Neil F.; Kowalski, Ronald C.; Davis, William M.; and Baldwin, Francis P., 4,632,963, Cl. 525-332.300.

NGK Spark Plug Co., Ltd.: *See*—
Ogawa, Yasuhiko; Nakayama, Kazuhiko; and Yasuda, Minoru, 4,633,121, Cl. 310-332.000.

Nicholas, Beatrice M.: *See*—
Gray, George W.; and Nicholas, Beatrice M., 4,632,515, Cl. 350-350.00R.

Nichols, Edward L., III: *See*—
Newell, Alfred T., III; and Nichols, Edward L., III, 4,632,304, Cl. 236-46.00R.

Nichols, Jerram B., to Dow Chemical Company. Polyurethane foams prepared from alkyl dialkanol amine-containing polyols. 4,632,943, Cl. 521-129.000.

Nicholson, John P. Cathodic protection coating composition. 4,632,777, Cl. 252-511.000.

Nicol, Richard C.: *See*—
Cham, Wai K.; Clarke, Roger J.; and Nicol, Richard C., 4,633,296, Cl. 358-12.000.

Nicolet Instrument Corporation: *See*—
Vidrine, D. Warren; and Anderson, Charles R., 4,632,553, Cl. 356-346.000.

Nielsen, Axel L. Sump pump. 4,632,643, Cl. 417-367.000.

Nielsen, Borge D., to Hermann Kruger's EFTF. A/S. Method of dispensing a metered quantity of snuff and of packaging the individual, metered quantities of snuff. 4,631,899, Cl. 53-433.000.

Nifco Inc.: *See*—
Kimura, Shigeru, 4,632,433, Cl. 285-38.000.
Kimura, Shigeru, 4,632,436, Cl. 285-305.000.
Watanabe, Koji, 4,632,343, Cl. 248-73.000.

Nihon Plast Co., Ltd.: *See*—
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, 4,632,948, Cl. 523-219.000.

Nihon Radiator Co., Ltd.: *See*—
Miyake, Shiyuichi, 4,633,112, Cl. 310-90.000.

Niiho, Masaaki; Hara, Masato; and Takasugi, Eiji, to Asahi Kogaku Kogyo K.K. Angle measuring device. 4,633,419, Cl. 364-559.000.

Niinomi, Masahiro: *See*—
Yanagihara, Kenji; Itoh, Tetsuo; Kimura, Mituo; and Niinomi, Masahiro, 4,632,844, Cl. 427-38.000.

Nimbus, Inc.: *See*—
Butler, Kenneth C., 4,632,107, Cl. 128-204.240.

Nippon Cable System Inc.: *See*—
Suzuki, Kazuhiro, 4,631,975, Cl. 74-473.00R.

Nippon Electric Co., Ltd.: *See*—
Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, 4,633,194, Cl. 331-25.000.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,632,781, Cl. 260-380.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Suzuki, Hideo, 4,632,001, Cl. 84-1.010.

Nippon Kogaku K. K.: *See*—
Ichihara, Yutaka; Magome, Nobutaka; Iizuka, Yutaka; Kunimatsu, Shuji; and Inaba, Tomonari, 4,632,531, Cl. 354-200.000.

Nippon Kogaku K.K.: *See*—
Takahashi, Tomowaki, 4,632,519, Cl. 350-427.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Ito, Soichi, 4,632,600, Cl. 405-30.000.
Jinba, Terumasa; Fukunaka, Shiro; Anan, Tatsuro; and Shiotani, Nobuo, 4,632,733, Cl. 204-28.000.

Nippon Notion Koygo Co., Ltd.: *See*—
Kasai, Kazumi, 4,631,787, Cl. 24-616.000.

Nippon Paint Co., Ltd.: *See*—
Tsutsui, Kouichi; Umemoto, Hirotoshi; and Ikeda, Shoji, 4,632,961, Cl. 525-162.000.

Nippon Piston Ring Co.: *See*—
Takahashi, Kentaro; Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,632,074, Cl. 123-90.390.

Nippon Soken, Inc.: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, 4,633,064, Cl. 219-270.000.

Nippon Steel Corporation: *See*—
Konno, Toyohiko; Suga, Yozo; Nakamura, Motoharu; and Komatsu, Hajime, 4,632,708, Cl. 148-113.000.

Nippon Telegraph and Telephone Public Corp.: *See*—
Hayashi, Toshio; and Maeda, Youichi, 4,633,225, Cl. 340-347.00C.
Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, 4,633,194, Cl. 331-25.000.
Suzuki, Fumiaki; Takeda, Toshiyuki; Inoue, Takeo; and Nakajima, Shigeo, 4,633,510, Cl. 455-69.000.

Nippondenso Co., Ltd.: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, 4,633,064, Cl. 219-270.000.
Fujiwara, Kenichi, 4,632,305, Cl. 236-92.00B.
Fukutani, Masanori; Miwa, Naoto; Ito, Kazuyuki; and Ito, Keiji, 4,632,683, Cl. 55-523.000.

Hayashi, Mikio; and Kawasumi, Kouzi, 4,632,525, Cl. 350-634.000.
Nakamura, Mitsuo; Kaga, Sumihiro; and Tanahashi, Toshitaka, 4,633,364, Cl. 361-216.000.
Ohmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, 4,632,509, Cl. 350-283.000.

Nishida, Nariaki: *See—*
Sasaki, Michiaki; Sasaki, Norio; and Nishida, Nariaki, 4,632,270, Cl. 220-86.00R.

Nishida, Yayoi; and Ishii, Katsumi, to Matsushita Electric Industrial Co., Ltd. Electric blanket. 4,633,062, Cl. 219-212.000.

Nishikawa, Masahiko: *See—*
Sasaki, Yoshio; and Nishikawa, Masahiko, 4,632,078, Cl. 123-146.50A.

Nishimura, Yoshikazu; Yasukouchi, Yoshimi; and Asakura, Hisao, to Sony Corporation. AM synchronous detecting circuit. 4,633,187, Cl. 329-50.000.

Nishino, Toshikazu: *See—*
Harada, Yutaka; and Nishino, Toshikazu, 4,633,439, Cl. 365-162.000.

Nishio, Takumi: *See—*
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, to Sharp Kabushiki Kaisha. Speech recognition system. 4,633,499, Cl. 381-43.000.

Nishioka, Yoshiki: *See—*
Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoro, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, 4,633,337, Cl. 360-57.000.

Nishite, Yoshitoyo: *See—*
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.

Nissan Motor Co., Ltd.: *See—*
Aoki, Hirofumi; and Hayashi, Yoshimasa, 4,632,069, Cl. 123-41.150.
Endo, Hiroshi, 4,632,543, Cl. 356-5.000.
Fukuhara, Hiroshige, 4,633,260, Cl. 342-389.000.
Hirano, Yoshinori, 4,632,178, Cl. 165-39.000.
Sasaki, Michiaki; Sasaki, Norio; and Nishida, Nariaki, 4,632,270, Cl. 220-86.00R.
Shibayama, Takashi; and Sugano, Kazuhiko, 4,632,638, Cl. 417-218.000.

Nitsuko, Ltd.: *See—*
Nakajima, Suemitsu, 4,633,044, Cl. 379-433.000.

Noble, Charles H. Methods and lined molds for centrifugal casting. 4,632,168, Cl. 164-33.000.

Nocoi Inc.: *See—*
Gardner, Norman A.; and Voticky, Michael P., 4,632,429, Cl. 283-91.000.

Noda, Kazushi; and Mitsunaga, Hiroshi, to Toyoda Gosei Co., Ltd.; Matsushita Electric Industrial Co., Ltd.; and Toyota Jidosha K.K. Steering wheel. 4,631,976, Cl. 74-552.000.

Noda, Michihiro: *See—*
Morimoto, Masafumi; Noda, Michihiro; Yanagiuchi, Shigenobu; and Yanagiuchi, Yasuko, 4,633,435, Cl. 364-900.000.

Noda, Tsugio: *See—*
Mikami, Tomohisa; and Noda, Tsugio, 4,633,269, Cl. 346-76.0PH.

Noguchi, Masaru; and Ishikawa, Hiromi, to Fuji Photo Film Co., Ltd. Light beam scanning apparatus. 4,632,499, Cl. 350-6.200.

Noiles, Douglas G.: *See—*
Green, David T.; and Noiles, Douglas G., 4,632,290, Cl. 227-19.000.

Nolta, Arthur H.: *See—*
Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; and Tayler, Gerald E., 4,633,387, Cl. 364-200.000.

Nomura, Kazuhiro; and Nomura, Masayuki, to Toyota Jidosha Kabushiki Kaisha. Side door hinge mechanism in a motor vehicle. 4,632,447, Cl. 296-153.000.

Nomura, Masayuki: *See—*
Nomura, Kazuhiro; and Nomura, Masayuki, 4,632,447, Cl. 296-153.000.

Norand Corporation: *See—*
Hanson, George E., 4,633,350, Cl. 360-98.000.

Norberg, Rolf; and Svensson, Tomas, to Santrade Ltd. Programmable multi-channel tool monitor with multiple alarm limits and sensor taring. 4,633,424, Cl. 364-571.000.

Norchem, Inc.: *See—*
Dowd, Laurence E., 4,632,801, Cl. 264-566.000.

Nordson Corporation: *See—*
Pallante, Richard M., 4,632,277, Cl. 222-146.200.
Smith, James C.; and Rehman, William R., 4,632,314, Cl. 239-433.000.

Norris, James X. Fruit wax drying process. 4,632,835, Cl. 426-302.000.

Norsworthy, Steven R., to Harris Corporation. CMOS power-up reset circuit for gate arrays and standard cells. 4,633,107, Cl. 307-594.000.

North American Philips Consumer Electronics Corp.: *See—*
Marks, Gary T.; Rehkopf, Charles H.; and Sorensen, Fred L., 4,633,132, Cl. 313-477.00R.

North American Philips Corporation: *See—*
Khurgin, Jacob, 4,633,131, Cl. 313-474.000.
Nadan, Joseph S., 4,633,294, Cl. 358-11.000.
Strange, Thomas F.; and Carino, John W., 4,633,367, Cl. 361-272.000.

North, John M.: *See—*
Hooper, Alan; and North, John M., 4,631,810, Cl. 29-623.500.

Northeastern University: *See—*
Davies, Geoffrey; and El-Toukhy, Ahmed, 4,632,675, Cl. 44-72.000.

Northern Teleco M Limited: *See—*
Donaldson, Michael J., 4,632,278, Cl. 222-146.500.

Northern Telecom Limited: *See—*
Donaldson, Michael J.; Charlebois, Leonard J.; and Bailey, Kevin J., 4,632,279, Cl. 222-146.500.
Fitzpatrick, Michael H., 4,632,588, Cl. 403-16.000.
Vink, Anthony B.; Asam, Edward F.; and Ferris, Dewayne J., 4,633,415, Cl. 364-521.000.

Northrop Corporation: *See—*
Malm, Robert E., 4,633,190, Cl. 330-149.000.

Norton, John: *See—*
Mansbridge, Martin H.; Norton, John; Beazley-Long, Paul W.; and Irwin, David J., 4,632,296, Cl. 228-157.000.

Norton Pampus GmbH: *See—*
Wolki, Peter, 4,632,947, Cl. 523-206.000.

Novak, Robert J.; and Kronberger, Leonard J., to Chrysler Motors Corporation. Window-in-vane interrupter and switch plate assembly for ignition distributor. 4,632,077, Cl. 123-146.50A.

Novits, Michael F.: *See—*
Kmiec, Chester J.; and Novits, Michael F., 4,632,950, Cl. 524-202.000.

Novo Laboratories, Inc.: *See—*
Boyce, Columbus O. L.; Lanzilotta, Raymond P.; and Wong, Theodore M., 4,632,903, Cl. 435-69.000.
Starnes, Robert L.; Katkocin, Dennis M.; Miller, Carl A.; and Strobel, Robert J., Jr., 4,632,905, Cl. 435-189.000.

Nowak, Frederick H.; and Luce, John C., to Otis Elevator Company. Multicompartment elevator call assigning. 4,632,224, Cl. 187-29.00R.

Nowak, Michael E., to Motorola, Inc. Combined microstripline phase shifter and electric field probe. 4,633,203, Cl. 333-161.000.

NSK-Warner K. K.: *See—*
Saito, Hiroyuki; and Ueda, Takeo, 4,632,330, Cl. 242-107.40D.

Numata, Shigeaki: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,632,782, Cl. 260-396.00R.

Nuova Pignone S.p.A.: *See—*
Vinciguerra, Costantino; and Arrighi, Leonardo, 4,632,634, Cl. 415-139.000.

Nygaard, Richard A., Jr.; and Palmer, Fredrick J., to Hewlett-Packard Company. Method and apparatus for determining if a digital value lies within a range. 4,633,410, Cl. 364-481.000.

O.C.M.E. S.p.A. Officina Costruzioni Meccaniche Emiliana: *See—*
Ghiretti, Aldo; and Pallotti, Antonio, 4,631,895, Cl. 53-207.000.

Oak Industries Inc.: *See—*
Li, Tony C.; and Stubbs, Graham S., 4,633,309, Cl. 358-122.000.

Obayashi, Tomokazu: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Ober, Jurgen; Melcher, Franz-Josef; and Knothe, Erich, to Sartorius GmbH. Electronic balance for use in potentially explosive areas. 4,632,199, Cl. 177-238.000.

Obokata, Mitsuyuki: *See—*
Negishi, Hideo; Obokata, Mitsuyuki; and Katayama, Shigeharu, 4,632,257, Cl. 211-59.200.

O'Brien, Jeffrey J.: *See—*
Park, Hee C.; O'Brien, Jeffrey J.; and Fosmire, Christopher R., 4,632,869, Cl. 428-315.500.

Obstfelder, Gunther; Kreutze, Gerhard; and Luttig, Winfried, to F+O Electronic Systems GmbH & Co. Process for the fabrication of thermal printing boards in multilayer thick-film technology. 4,632,845, Cl. 427-96.000.

Ochi, Atsushi: *See—*
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, 4,633,120, Cl. 310-328.000.

Oda, Misao, to Kabushiki Kaisha Kanemitsu. Method of manufacturing sheet metal made poly-V pulleys. 4,631,946, Cl. 72-68.000.

Oda, Takashi; Ohyagi, Takashi; and Mori, Toshihiro, to NEC Corporation. DC-DC converter having feedback type switching voltage converting circuit. 4,633,379, Cl. 363-19.000.

Oerlikon Motch Corporation Div. Jetstream Systems Co.: *See—*
Danler, Richard, 4,632,321, Cl. 241-62.000.

Officine Meccaniche Pavesi & C.S.p.A.: *See—*
Barrera, Giorgio, 4,631,814, Cl. 29-736.000.

Ogaki, Kohei: *See—*
Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, 4,632,161, Cl. 144-213.000.

Ogasawara, Toshiharu: *See—*
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.

Ogasawara, Toshihide: *See—*
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, 4,631,869, Cl. 51-165.710.

Ogawa, Hiroshi, to Sony Corporation. Optical disc players. 4,633,453, Cl. 369-44.000.

Ogawa, Masahiro; and Abe, Susumu, to Toyota Jidosha Kabushiki Kaisha. Method for making a fine powder of a metal compound having ceramic coatings thereon. 4,632,849, Cl. 427-215.000.

Ogawa, Masao: *See—*
Fujita, Haruyasu; Honma, Kenji; and Ogawa, Masao, 4,632,413, Cl. 280-112.00A.

Ogawa, Tetsu; Nagata, Seiichi; and Hotta, Sadayoshi, to Matsushita Electric Industrial Co., Ltd. Color liquid crystal display apparatus. 4,632,514, Cl. 350-339.00F.

Ogawa, Yasuhiko; Nakayama, Kazuhiko; and Yasuda, Minoru, to NGK Spark Plug Co., Ltd.; Ogawa, Yasuhiko; and Nakayama, Kazuhiko. Comb-shaped piezoelectric drive device. 4,633,121, Cl. 310-332.000.

Ogawa, Yuji: *See—*
Shibasaki, Masakatsu; Sodeoka, Mikiko; and Ogawa, Yuji, 4,632,997, Cl. 549-214.000.

Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, to Sumitomo Electric Industries, Ltd.; and Sharp Kabushiki Kaisha. Method of producing a release agent applicator. 4,631,798, Cl. 29-458.000.

Oguchi, Yoshiharu: *See—*
Yoshikumi, Chikao; Matsunaga, Kenichi; Hayashi, Haruhisa; and Oguchi, Yoshiharu, 4,632,743, Cl. 204-183.300.

Ogura, Ichiro: *See—*
Yamamitsu, Chojuro; Ogura, Ichiro; Suesada, Kunio; and Iketani, Akira, 4,633,330, Cl. 358-310.000.

Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, to Sharp Kabushiki Kaisha. Photoconductive device having photoconductive layer containing hydroxyl radicals. 4,632,894, Cl. 430-84.000.

Ohi, Kimio: *See—*
Tomita, Takeshi; Harada, Yoshiyasu; and Ohi, Kimio, 4,633,085, Cl. 250-311.000.

Ohlson, Johnny, to Aktiebolaget Bofors. Blasting chamber. 4,632,041, Cl. 109-1.00S.

Ohlsson, Ingemar; Madsen, Finn T.; and Kjaerbye, Steffen, to Tetra Pak Developpement S.A. Web of packaging material with a sheet of plastics. 4,632,854, Cl. 428-36.000.

Ohmi, Kyozo: *See—*
Iwasa, Hiroki; Ohmi, Kyozo; and Amano, Tokuhiro, 4,631,848, Cl. 40-427.000.

Ohmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, to Nippondenso Co., Ltd. Glare-shielding type reflector. 4,632,509, Cl. 350-283.000.

Ohoka, Tatuo: *See—*
Asanuma, Tadashi; Ohoka, Tatuo; and Uchikawa, Nobutaka, 4,632,976, Cl. 528-497.000.

Ohshima, Yoshikuni: *See—*
Ohtake, Katsumoto; Ohshima, Yoshikuni; Mukai, Yasuteru; and Okouchi, Isao, 4,631,925, Cl. 60-688.000.

Ohtake, Katsumoto; Ohshima, Yoshikuni; Mukai, Yasuteru; and Okouchi, Isao, to Hitachi, Ltd. Apparatus for deaerating condensate in a condenser. 4,631,925, Cl. 60-688.000.

Ohtaki, Kiyoshi; and Ishida, Kohji, to Pioneer Electronic Corporation. Low-pass filter circuit. 4,633,496, Cl. 381-4.000.

Ohyagi, Takashi: *See—*
Oda, Takashi; Ohyagi, Takashi; and Mori, Toshihiro, 4,633,379, Cl. 363-19.000.

Oido, Hikofumi; Hayashi, Yoshitake; and Yamamoto, Minoru, to Matsushita Electric Industrial Co., Ltd. Package configuration of solar cell elements. 4,633,032, Cl. 136-251.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,633,354, Cl. 360-132.000.

Okada, Osami: *See—*
Tokiguchi, Katsumi; Okada, Osami; Sakudo, Noriyuki; and Koike, Hidemi, 4,633,138, Cl. 315-111.810.

Okamoto, Satoru; and Ito, Hiroshi, to Bridgestone Corporation. Rimmed wheels for use in vehicles wheel with stress relief groove for hub bolt. 4,632,464, Cl. 301-11.00R.

Okamoto, Shuichi: *See—*
Nakajima, Zenji; Okamoto, Shuichi; and Kunihiro, Motoo, 4,632,372, Cl. 267-140.100.

Okazaki, Koji: *See—*
Tsubai, Yasuo; and Okazaki, Koji, 4,632,896, Cl. 430-249.000.

Okazaki, Mitsunari, to Alps Electric Co., Ltd. Prescaler input circuit. 4,633,520, Cl. 455-319.000.

Okazaki, Shoichi: *See—*
Miyazaki, Ken; and Okazaki, Shoichi, 4,633,334, Cl. 360-33.100.

O'Keeffe, Michael J.: *See—*
Perera, S. Robert; and O'Keeffe, Michael J., 4,633,471, Cl. 371-38.000.

OKI Electric Industry Co., Ltd.: *See—*
Endo, Joichi; Komatsu, Takashi; and Tohkura, Toshio, 4,633,139, Cl. 315-169.400.
Takano, Hirokuni; Shimizu, Tadao; and Izaki, Osamu, 4,632,579, Cl. 400-121.000.

Okita, Tsutomu; Hashimoto, Hiroshi; Hashimoto, Akiyoshi; Nakagawa, Teruo; and Kato, Hiroyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,632,878, Cl. 428-425.900.

Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, to Morinaga Milk Industry Co., Ltd. Instant creaming powder. 4,632,832, Cl. 426-96.000.

Okouchi, Isao: *See—*
Ohtake, Katsumoto; Ohshima, Yoshikuni; Mukai, Yasuteru; and Okouchi, Isao, 4,631,925, Cl. 60-688.000.

Okuda, Yoshihiko: *See—*
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Momose, Haruhiko, 4,633,077, Cl. 250-214.00L.

Olin Corporation: *See—*
Trotz, Samuel I.; and Fedynyshyn, Theodore H., 4,632,881, Cl. 428-541.000.

Olpp, Hans; and Braun, Heini, to GFL Formteile-und Larmschutz Technik GmbH & Co. Ski for the handicapped. 4,632,408, Cl. 280-12.00K.

Olsen, David W.; Wittman, Leroy L.; Evenson, Marvin E.; and Kappel, Gary W., to FMC Corporation. Crane undecking arrangement. 4,632,262, Cl. 212-189.000.

Olsen, Dennis R.; and Spanjer, Keith G., to Motorola Inc. Semiconductor device including plateless package fabrication method. 4,631,805, Cl. 29-588.000.

Olson, Carlton D., to Eave-in-One, Inc. Gutter assembly and method of installation. 4,631,875, Cl. 52-12.000.

Olson, Donald M., to Advanced Semiconductor Materials America, Inc. Stable conductive elements for direct exposure to reactive environments. 4,633,051, Cl. 219-10.49R.

Olsson, Nils A.; and Shi, Yan-Chi, to AT&T Bell Laboratories. Cleaved-coupled-cavity-laser-driven system for measuring small signals. 4,632,552, Cl. 356-345.000.

Olympus Optical Co., Ltd.: *See—*
Horikawa, Yoshiaki, 4,633,073, Cl. 250-201.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,633,303, Cl. 358-98.000.
Nagasaki, Tatsuo, 4,633,304, Cl. 358-98.000.
Sanagi, Kenichiro, 4,632,110, Cl. 128-303.00R.
Yamamoto, Kimiaki, 4,633,457, Cl. 369-116.000.

Omachi, Yoshio; and Yamada, Eisaku, to Kabushiki Kaisha Komatsu Seisakusho. Method of supervising operating states of digging machines. 4,633,383, Cl. 364-167.000.

Omori, Sigelu: *See—*
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.

Omote, Shigeo: *See—*
Hiza, Misao; Yamazaki, Hajime; and Omote, Shigeo, 4,632,970, Cl. 528-27.000.

Onda, Takanori; Yamamoto, Hitoshi; and Kimoto, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Device for cooling engine power unit. 4,632,070, Cl. 123-41.580.

Onizuka, Masakazu: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, 4,632,810, Cl. 423-242.000.

Ono, Noritsugu: *See—*
Hayashi, Koji; Yoshioka, Susumu; and Ono, Noritsugu, 4,631,834, Cl. 33-503.000.

Ono Pharmaceutical Co., Ltd.: *See—*
Iizuka, Kinji; Akahane, Keniji; Momose, Denichi; Kamijo, Yukio; and Ajisawa, Yukiyoshi, 4,632,934, Cl. 514-399.000.

Ono, Yoshiaki, to Tokyo Electric Co., Ltd. Paper feeding apparatus. 4,632,380, Cl. 271-127.000.

Ookubo, Mamoru; Iwasaki, Takayuki; and Mieda, Kenji, to Kabushiki Kaisha Daikin Seisakusho. Manufacturing device of a clutch cover assembly. 4,631,795, Cl. 29-243.520.

Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, to Mitsubishi Yuka Fine Chemicals Co., Ltd. Anti-oxidant phenol derivatives. 4,633,008, Cl. 560-15.000.

Operschall, Hermann; and Stamm, Hubert, to Kraftwerk Union Aktiengesellschaft. Apparatus and method for decontaminating metallic components of a nuclear engineering installation. 4,632,740, Cl. 204-129.460.

Opsal, Jon: *See—*
Rosencwaig, Allan; and Opsal, Jon, 4,632,561, Cl. 356-432.000.

Orak, Zeki. Portable exercising device. 4,632,391, Cl. 272-128.000.

O'Rear, Jacques G.: *See—*
Griffith, James R.; and O'Rear, Jacques G., 4,633,023, Cl. 568-662.000.

Orlowski, Ronald C.: *See—*
Seyler, Jay K.; and Orlowski, Ronald C., 4,632,978, Cl. 530-307.000.

Oroskar, Anil R.; and Mack, George, to UOP Inc. Rotary valve for interconnecting conduits. 4,632,149, Cl. 137-625.150.

Orth, Charles D.; and Torrence, Robert J., to Eaton Corporation. Automotive air conditioning system including electrically operated expansion valve. 4,632,358, Cl. 251-117.000.

Orth, Winifried: *See—*
Maurer, Manfred; Orth, Winifried; and Fickert, Werner, 4,632,991, Cl. 546-6.000.

Osaka Kanagu Co., Ltd.: *See—*
Minami, Saburo, 4,631,936, Cl. 70-167.000.

Osawa, Michitaka; Kimura, Yuichiro; and Miyajima, Hiroyuki, to Hitachi, Ltd. Brightness control circuit for display apparatus with color picture tube. 4,633,145, Cl. 315-383.000.

Osborn, Harold L.; and Whipple, Roger B., to Outboard Marine Corporation. Two cycle cylinder block foam pattern. 4,632,169, Cl. 164-45.000.

O'Shea, Kenneth E. Trailer for loading and hauling agricultural bins. 4,632,626, Cl. 414-476.000.

Oskar Dilo Maschinenfabrik KG: *See—*
Dilo, Richard, 4,631,789, Cl. 28-107.000.

Osswald, Otto. Container cap. 4,632,266, Cl. 215-235.000.

Oster, Wilhelm; and Eisenhauer, Horst, to Stabilus GmbH. Cylinder piston device. 4,632,228, Cl. 188-282.000.

Otis Elevator Company: *See—*
Nowak, Frederick H.; and Luce, John C., 4,632,224, Cl. 187-29.00R.

Otis Engineering Corporation: *See—*
Deaton, Thomas M., 4,632,187, Cl. 166-323.000.
Renfroe, James B., Jr.; Dickson, Rennie L.; and Rion, Roger D., 4,632,184, Cl. 166-105.500.

Otobe, Yutaka; and Iwata, Takahiro, to Honda Giken Kogyo Kabushiki Kaisha. Method of feedback-controlling idling speed of internal combustion engine. 4,633,093, Cl. 290-40.00R.

Otruba, Svatoboj: *See*—
Hoffmann, Wolfgang W.; and Otruba, Svatoboj, 4,632,721, Cl. 156-458.000.

Ott, Karl-Heinz: *See*—
Kress, Hans-Jurgen; Eichenauer, Herbert; Ott, Karl-Heinz; Schoeps, Jochen; and Pischtschan, Alfred, 4,632,956, Cl. 524-359.000.

Otto, Ronald F.; and Kempel, John J., to Garland Manufacturing Co. Composite non-handed door jamb construction. 4,631,866, Cl. 49-504.000.

Otto, Wilfried; Papendieck, Hatto; Konradt, Harald; and Roder, Claus-Henning, to Schering Aktiengesellschaft. Apparatus for the crystallization/separation of material mixtures. 4,632,809, Cl. 422-254.000.

Otto, Wolfgang K. F.: *See*—
Dischler, Louis; and Otto, Wolfgang K. F., 4,631,788, Cl. 26-25.000.

Outboard Marine Corporation: *See*—
Hall, Charles B.; and Mondek, Martin J., 4,632,049, Cl. 114-150.000.
Kolb, Richard P.; and Prince, Anthony P., 4,632,232, Cl. 192-0.096.
Osborn, Harold L.; and Whipple, Roger B., 4,632,169, Cl. 164-45.000.
Walsworth, Frank J., 4,632,144, Cl. 137-505.250.

Owen, Charles J.: *See*—
Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., 4,632,295, Cl. 228-123.000.

Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., to Mobil Oil Corporation. Process for converting olefins to gasoline, distillate and alkylate liquid hydrocarbons. 4,633,027, Cl. 585-314.000.

Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., to Mobil Oil Corporation. Process for converting oxygenates to alkylated liquid hydrocarbons. 4,633,028, Cl. 585-331.000.

Owen, Newton C.: *See*—
Valkirs, Gunars E.; Owen, Newton C.; and Levinson, Philip A., 4,632,901, Cl. 435-5.000.

Owens-Illinois, Inc.: *See*—
Bartlett, John R., 4,632,300, Cl. 229-15.000.

Oy Tampella AB: *See*—
Issakainen, Onni, 4,632,618, Cl. 414-22.000.

Oyamatsu, Yasuyuki; Uematsu, Masashi; and Sakai, Hiroshi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,632,585, Cl. 400-613.000.

Ozaki, Shoji: *See*—
Horie, Tsuneo; Ozaki, Shoji; and Takeuchi, Takikazu, 4,633,336, Cl. 360-45.000.

P.P.M.D. Inc.: *See*—
Rivkin, Bernard W., 4,632,397, Cl. 273-145.0CA.

Pacific Handy Cutter, Inc.: *See*—
Schmidt, Gerry; and McHugh, Michael, 4,631,829, Cl. 30-294.000.

Packard Instrument Co., Inc.: *See*—
Jones, Donald K.; Tomisek, John D.; and Young, Harry M., 4,633,088, Cl. 250-369.000.

Paglione, Robert W.; and Woodward, Oakley M., to RCA Corporation. Antenna apparatus for scanning hyperthermia. 4,632,128, Cl. 128-804.000.

Paige, Edward G. S.: *See*—
Bloch, Paul D.; Barnard, Michael E.; and Paige, Edward G. S., 4,633,117, Cl. 310-313.00B.

Pakulski, Francis J., to International Business Machines. Multi-port memory chip in a hierarchical memory. 4,633,440, Cl. 365-189.000.

Pallante, Richard M., to Nordson Corporation. Bulk melter having drum hold-down device. 4,632,277, Cl. 222-146.200.

Pallotti, Antonio: *See*—
Ghiretti, Aldo; and Pallotti, Antonio, 4,631,895, Cl. 53-207.000.

Palmans, Jos, to Alliance Enamelsteel Corporation N.V. Device for holding a panel or other generally flat object on a wall. 4,631,888, Cl. 52-509.000.

Palmer, Fredrick J.: *See*—
Nygaard, Richard A., Jr.; and Palmer, Fredrick J., 4,633,410, Cl. 364-481.000.

Palmer, Gary E.; and Todd, Mike J., to Hako Minuteman, Inc. High speed floor burnisher. 4,631,775, Cl. 15-385.000.

Palsgrove, Boyd H.; Hendrickson, Max; and Cohen, Harry A., to Honeywell Inc. Apparatus for receiving low level digital signals transmitted over power lines. 4,633,218, Cl. 340-310.00A.

Panduit Corp.: *See*—
Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Timian, Steven S.; and Waltasti, Stephen A., 4,632,247, Cl. 206-343.000.

Panizza, Ettore; and Premoli, Ercole, to Fiat Auto S.p.A. Device for automatically restarting the engine of a motor-vehicle after sudden braking. 4,632,079, Cl. 123-179.00B.

Pankoke, Werner, to Hymmen, Theodor. Arrangement for applying a surface pressure upon movable workpieces. 4,632,722, Cl. 156-555.000.

Pantzar, Glenn G. E., to Santrade Limited. Indexable cutting insert. 4,632,607, Cl. 407-113.000.

Papathomas, Thomas V.: *See*—
Ebert, Harry K., Jr.; Menkes, Henry E.; Papathomas, Thomas V.; and Venkatram, Chitra R., 4,633,412, Cl. 364-493.000.

Papendieck, Hatto: *See*—
Otto, Wilfried; Papendieck, Hatto; Konradt, Harald; and Roder, Claus-Henning, 4,632,809, Cl. 422-254.000.

Papst-Motoren GmbH & Co. KG: *See*—
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Paradyne Corporation: *See*—
Betts, William L.; and Zuranski, Edward, 4,633,485, Cl. 375-99.000.

Pardue, Jerry E.: *See*—
Stapp, Paul R.; and Pardue, Jerry E., 4,632,786, Cl. 260-512.00C.

Parish, James M., to B.F. Goodrich Company, The. Inflatable shelter. 4,631,873, Cl. 52-2.000.

Park, Hee C.; O'Brien, Jeffrey J.; and Fosmire, Christopher R., to Mobil Oil Corporation. Resin composition, opaque film and method of preparing same. 4,632,869, Cl. 428-315.500.

Park, Joonsup: *See*—
Falcetta, Joseph J.; and Park, Joonsup, 4,633,003, Cl. 556-419.000.

Park, Tae-Hee: *See*—
Lee, June-Gunn; Kim, Young-Wook; Park, Tae-Hee; Choi, Long; Lee, Sang-Ho; and Jang, Kam-Yong, 4,632,910, Cl. 501-97.000.

Park, Tae S.: *See*—
Wilson, John K., Jr.; and Park, Tae S., 4,632,668, Cl. 604-8.000.

Parke, Daniel W.; and Baker, Kenneth S., to Lever Brothers Company. Low fat spreads containing emulsion disruptors. 4,632,841, Cl. 426-604.000.

Parke, Terence J. Handpiece for shearing equipment. 4,631,826, Cl. 30-207.000.

Parker, Eric J.: *See*—
Jarrott, Kenneth N.; and Parker, Eric J., 4,632,031, Cl. 102-200.000.

Parks, Charles K. Palatability stabilizer. 4,632,275, Cl. 222-25.000.

Parrish, William J., to Grumman Aerospace Corporation. Input circuit for infrared detector. 4,633,086, Cl. 250-338.000.

Parsons, Roger K.: *See*—
Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., 4,633,399, Cl. 364-421.000.

Patel, Navinchandra R., to Sundstrand Corporation. Side plate construction for permanent magnet rotor. 4,633,113, Cl. 310-156.000.

Patel, Ranjana C.; Stibbard, John H. A.; Fisher, Michael G.; and Baldock, Terence W., to Minnesota Mining and Manufacturing Company. Diffusion or sublimation transfer imaging system. 4,632,895, Cl. 430-201.000.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH: *See*—
Fromm, Dietrich; Klingshirn, Helmut; Gosslar, Achim; and Heider, Jurgen, 4,633,136, Cl. 313-623.000.

Paterson, William G., to Valleylab, Inc. Circuitry for processing requests made from the sterile field of a surgical procedure to change the output power level of an electrosurgical generator. 4,632,109, Cl. 128-303.140.

Patrick, Edward P.; and Auhl, J. Richard, to Aluminum Company of America. Resistance welding method. 4,633,054, Cl. 219-118.000.

Pauls, Dennis A., to Jerden Industries, Inc. Pumping unit. 4,631,970, Cl. 74-44.000.

Paulus, John R.: *See*—
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., 4,632,836, Cl. 426-302.000.

Pavlath, George A., to Litton Systems, Inc. Passive sampling interferometric sensor arrays. 4,632,551, Cl. 356-345.000.

Payne, Thomas R.; and Schneider, David A., to General Electric Company. Touch control arrangement for an electrical appliance. 4,633,067, Cl. 219-483.000.

Pearce, Ronald A. Apparatus for continuous strip casting of aluminum sheet material. 4,632,176, Cl. 164-481.000.

Pearce, Thomas H., to Queen's University at Kingston. Multiple frequency laser interference microscope. 4,632,554, Cl. 356-349.000.

Pearman, A. Noel J.: *See*—
Kude, William B.; and Pearman, A. Noel J., 4,632,572, Cl. 374-37.000.

Pechacek, Raymond E.; and Clay, Eugene J., to Hahn & Clay. Method and system for installing a layered vessel on location. 4,632,617, Cl. 414-10.000.

Peddinghaus Corporation: *See*—
Magnuson, James M., 4,631,996, Cl. 83-23.000.

Peddinghaus, Rolf. Apparatus for the torch cutting of a steel structural shape. 4,632,365, Cl. 266-48.000.

Pedersen, Kristen I.: *See*—
Kiely, William L.; and Pedersen, Kristen I., 4,632,663, Cl. 441-5.000.

Pehker, Manfred: *See*—
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,632,011, Cl. 89-36.130.

Pelc, Norbert J.: *See*—
Gullberg, Grant T.; and Pelc, Norbert J., 4,633,398, Cl. 364-414.000.

Peled, Nahum; and Frenkel, Shmuel, to Motorola, Inc. Delta modulator/demodulator with improved tracking of rapidly varying waveforms. 4,633,196, Cl. 332-11.00D.

Pellin, Michael J.: *See*—
Gruen, Dieter M.; Pellin, Michael J.; and Young, Charles E., 4,633,084, Cl. 250-306.000.

Pendergraft, Paul T., to Amoco Corporation. Method of treating low-quality acid gas and furnace therefor. 4,632,043, Cl. 110-345.000.

Pennwalt Corporation: *See*—
Kmiec, Chester J.; and Novits, Michael F., 4,632,950, Cl. 524-202.000.
Radice, Peter F., 4,633,122, Cl. 310-339.000.
Radice, Peter F., 4,633,123, Cl. 310-339.000.
Saunders, David N., 4,633,362, Cl. 361-152.000.
Scopatz, Stephen D., 4,632,254, Cl. 209-592.000.

Perera, S. Robert; and O'Keeffe, Michael J., to Storage Technology Partners II. Error detection and correction in an optical storage system. 4,633,471, Cl. 371-38.000.

Pering, Richard D.: *See*—
Dukes, John N.; Baumgartner, Richard A.; Bennett, Ian; Pering, Richard D.; and Fisher, George A., 4,633,308, Cl. 358-112.000.

Perkey, Russell C.: *See*—
Thoman, David C.; Perkey, Russell C.; and Eastman, James M., 4,632,635, Cl. 415-14.000.

Perkin-Elmer Corporation, The: *See*—
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Persson, Borje, to Soderhamns Verkstader AB. Rotation ring barker. 4,632,164, Cl. 144-341.000.

Pesa, Frederick A.: *See*—
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., 4,632,774, Cl. 252-373.000.

Peters, David; Denick, John, Jr.; and Talwar, Anil K., to Warner-Lambert Company. Magnesium trisilicate suitable for preparation of medicament adsorbates of decongestants. 4,632,821, Cl. 424-15.000.

Peters, David; Denick, John, Jr.; and Talwar, Anil K., to Warner-Lambert Company. Magnesium trisilicate suitable for preparation of medicament adsorbates of antiasmatics. 4,632,822, Cl. 424-15.000.

Peters, David; Denick, John, Jr.; and Talwar, Anil K., to Warner-Lambert Company. Magnesium trisilicate suitable for preparation of medicament adsorbates of appetite suppressants. 4,632,823, Cl. 424-15.000.

Petersen, Jorgen H., to Danfoss A/S. Apparatus with burner and heat exchanger. 4,632,658, Cl. 431-208.000.

Peterson, Jack E.: *See*—
Dupree, James N.; and Peterson, Jack E., 4,632,562, Cl. 356-436.000.

Peterson, John A.: *See*—
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Petrolite Corporation: *See*—
Thompson, Neil E. S.; Redmore, Derek; and Alink, Bernardus A. O., 4,633,019, Cl. 564-501.000.

Petschacher, Reinhard: *See*—
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Pettersson, Lars T.: *See*—
Blomberg, Sven G.; Berter, Sven G.; and Pettersson, Lars T., 4,632,608, Cl. 407-114.000.

Peyton, Ronald G.; and McLeod, William D. Exercise apparatus including tethered mass confines for movement on horizontal track. 4,632,392, Cl. 272-128.000.

Pezzoli, Nello, to VAMATEX S.p.A. Weft holding member in weft transport grippers for weaving looms. 4,632,152, Cl. 139-448.000.

Pfefferkorn, Dietmar: *See*—
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.

Pfeifer, Heinrich, to Deutsche ITT Industries GmbH. Circuit for decoding traffic information message tone signals. 4,633,517, Cl. 455-228.000.

Pfeifer, Manfred: *See*—
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Pfenninger, Heinz: *See*—
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Pfizer Inc.: *See*—
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Cue, Berkeley W., Jr., 4,632,993, Cl. 548-198.000.

Pharos AB: *See*—
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Philadelphia Suburban Water Company: *See*—
Yohe, Thomas L.; Donlan, Rodney M.; and Kyriss, Karl M., 4,631,961, Cl. 73-866.500.

Philip Morris Incorporated: *See*—
Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., 4,632,131, Cl. 131-355.000.

Phillips, Jeffrey, to United Chemi-Con, Inc. Lithium/valve metal oxide/valve metal capacitor. 4,633,373, Cl. 361-433.000.

Phillips Petroleum Co.: *See*—
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Moradi-Araghi, Ahmad; and Smith, Duane H., 4,632,185, Cl. 166-273.000.
Stapp, Paul R.; and Pardue, Jerry E., 4,632,786, Cl. 260-512.00C.
Tillett, George C., Jr.; and Holland, Gary V., 4,633,029, Cl. 136-205.000.

Phipps, Cornelius M., Jr.: *See*—
Phipps, Cornelius M., Sr.; Phipps, Cornelius M., Jr.; and Phipps, Hal A., 4,632,669, Cl. 604-118.000.

Phipps, Cornelius M., Sr.; Phipps, Cornelius M., Jr.; and Phipps, Hal A., to Plastic Specialties, Inc. Pressure indicating medical injection gun. 4,632,669, Cl. 604-118.000.

Phipps, Hal A.: *See*—
Phipps, Cornelius M., Sr.; Phipps, Cornelius M., Jr.; and Phipps, Hal A., 4,632,669, Cl. 604-118.000.

Piccardi, Paolo: *See*—
Giarda, Silvio; Cesti, Pietro; Confalonieri, Giovanni; and Piccardi, Paolo, 4,632,926, Cl. 514-259.000.

Pich, Claus H.; and Moest, Thomas, to BASF Aktiengesellschaft. Process for the preparation of solid pharmaceutical products. 4,632,843, Cl. 427-3.000.

Pickett, David A.: *See*—
Morgan, Richard L.; and Pickett, David A., 4,632,076, Cl. 123-145.00A.

Picotrin Technology, Inc.: *See*—
McGrady, Michael P.; Brand, Leonard A., Jr.; and Brand, Hunt K., 4,633,331, Cl. 360-7.000.

Pierrel, Michel, to Pont-a-Mousson S.A. Double boiler furnace for vertical ascending pipe casting. 4,632,174, Cl. 164-421.000.

Pierrel, Michel: *See*—
Etienne, Bernard; Francois, Michel; and Pierrel, Michel, 4,632,172, Cl. 164-301.000.

Pietkiewicz, Steven M.; and Bowers, Derek F., to Precision Monolithics, Inc. Temperature compensated voltage reference. 4,633,165, Cl. 323-314.000.

Pietrasanta, Yves: *See*—
Boutevin, Bernard; and Pietrasanta, Yves, 4,633,004, Cl. 556-419.000.

Pifferi, Giorgio: *See*—
Farina, Carlo; Pifferi, Giorgio; and Pinza, Mario, 4,632,982, Cl. 534-753.000.

Pigeon, Michel: *See*—
David, Bernard; Pigeon, Michel; and Vienot, Claude, 4,633,177, Cl. 324-220.000.

Pignataro, Dominic F.: *See*—
Ela, Roger B.; and Pignataro, Dominic F., 4,633,361, Cl. 361-145.000.

Pilsak, Otmar: *See*—
Freienstein, Bernd; Neukirchner, Ernst Peter; Pilsak, Otmar; and Schlogl, Dietmar, 4,633,407, Cl. 364-450.000.

Pinnekamp, Friedrich, to BBC Brown, Boveri & Company, Limited. Gas-blast switch. 4,633,049, Cl. 200-148.00A.

Pinson, Denis: *See*—
Maury, Christian; Lequien, Jean; and Pinson, Denis, 4,633,343, Cl. 360-76.000.

Pinza, Mario: *See*—
Farina, Carlo; Pifferi, Giorgio; and Pinza, Mario, 4,632,982, Cl. 534-753.000.

Pioneer Electric Corporation: *See*—
Kato, Takahiro, 4,633,342, Cl. 360-75.000.

Pioneer Electronic Corporation: *See*—
Ichikawa, Toshihito, 4,633,497, Cl. 381-10.000.
Kawakami, Yasuo; and Kitamura, Katsushi, 4,633,189, Cl. 330-97.000.
Ohtaki, Kiyoshi; and Ishida, Kohji, 4,633,496, Cl. 381-4.000.
Tsukai, Yoshiyuki, 4,633,454, Cl. 369-45.000.

Pipemakers, Inc.: *See*—
Sprung, Douglas L., 4,632,366, Cl. 266-87.000.

Pischtschan, Alfred: *See*—
Kress, Hans-Jurgen; Eichenauer, Herbert; Ott, Karl-Heinz; Schoeps, Jochen; and Pischtschan, Alfred, 4,632,956, Cl. 524-359.000.

Piskoti, Charles, to Piskoti, Charles. Aminofunctional polysiloxane compounds and method of preparation therefor. 4,633,002, Cl. 556-411.000.

Pittard, Gerard T.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Cohen, John H.; and Givler, Gregory C., 4,632,191, Cl. 175-19.000.

Pizza Hut, Inc.: *See*—
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., 4,632,836, Cl. 426-302.000.

Plaot, Michael: *See*—
Haerig, Thomas; and Plaot, Michael, 4,632,512, Cl. 350-316.000.

Plastic Flamecoat Systems, Inc.: *See*—
Reimer, James, 4,632,309, Cl. 239-8.000.

Plastic Specialties, Inc.: *See*—
Phipps, Cornelius M., Sr.; Phipps, Cornelius M., Jr.; and Phipps, Hal A., 4,632,669, Cl. 604-118.000.

Pledger, James R.: *See*—
Fister, Robert V.; and Pledger, James R., 4,632,898, Cl. 430-313.000.

Plempel, Manfred: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, 4,632,932, Cl. 514-383.000.

Pleshkanovsky, Jury P.: *See*—
Goldshtein, Lev I.; Kalashov, Valentin P.; Pleshkanovsky, Jury P.; Didenko, Vladimir F.; and Khaitin, Boris S., 4,631,926, Cl. 62-115.000.

Plessey Overseas Limited: *See*—
Wood, Robert S., 4,632,754, Cl. 210-257.200.

Plocher, Werner, to Maschinenfabrik Lauffer GmbH & Co. KG. Press with a plurality of injection plungers. 4,632,653, Cl. 425-149.000.

Ploger, Walter; Kluppel, Hans-Jurgen; and Forg, Franz, to Henkel Kommanditgesellschaft auf Aktien. Polishing composition and dentifrice. 4,632,826, Cl. 424-52.000.

Plough, Inc.: *See*—
Kingsford, Ted J., 4,632,136, Cl. 132-88.700.

Plumridge, Nigel R.: *See*—
Miller, Clifton L.; and Plumridge, Nigel R., 4,632,443, Cl. 294-82.340.

Pocock, John F. E.: *See*—
Villanueva, James G.; Matlack, John D.; Lewis, Shelton E.; Pocock, John F. E.; and Cole, Charles A., 4,632,053, Cl. 118-66.000.

Podell, Allen F., to TRW Inc. High current diode pulse modulator. 4,633,096, Cl. 307-268.000.

Podrini, Maurizio, to Centro Sperimentale Metallurgico S.p.A. Continuous casting tundish with post-refining treatment reactor functions. 4,632,368, Cl. 266-229.000.

Pohl, Andreas. Method and apparatus for making precision metal castings. 4,632,170, Cl. 164-250.100.

Polaroid Corporation: *See—*
Whiteside, George D., 4,632,542, Cl. 354-481.000.

Poling, William M., to Atlantic Richfield Company. Continuous miner-mounted mine ventilation system. 4,632,462, Cl. 299-12.000.

Polli, Philip V.: *See—*
Abel, Mark J.; Kwan, Chi L.; Polli, Philip V.; and Veach, Michael T., 4,633,467, Cl. 371-16.000.

Polyak, Mark, to American Medical Systems, Inc. Tubing connector system. 4,632,435, Cl. 285-243.000.

Polygram GmbH: *See—*
Tiefensee, Volkmar, 4,633,458, Cl. 369-275.000.

Pont-a-Mousson S.A.: *See—*
Etienne, Bernard; Francois, Michel; and Pierrel, Michel, 4,632,172, Cl. 164-301.000.
Pierrel, Michel, 4,632,174, Cl. 164-421.000.

Popp, Thomas M.: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.

Poppe, David A.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., to GTE Laboratories Incorporated. Method of producing integrated circuit structures. 4,631,806, Cl. 29-589.000.

Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., to GTE Laboratories Incorporated. Monolithic CMOS integrated circuit structure with isolation grooves. 4,633,290, Cl. 357-42.000.

Portec, Inc.: *See—*
Fischer, Richard L., 4,632,308, Cl. 238-265.000.

Posma, Bonne W.; and Hill, Rowland A., to National Mine Service Company. Electric powered vehicle and method of propelling the same. 4,633,147, Cl. 318-52.000.

Post, Steven W., to FMC Corporation. Valve arrangement. 4,632,141, Cl. 137-327.000.

Potoczky, Joseph B. Apparatus and method for injection molding of elongated hollow plastic container walls. 4,632,657, Cl. 425-556.000.

Poupard, Dominique: *See—*
Le Salver, Robert; and Poupard, Dominique, 4,632,211, Cl. 180-312.000.

Powaski, Frank S.: *See—*
Appleman, Robert H.; Bein, Jeffrey D.; and Powaski, Frank S., 4,632,068, Cl. 122-34.000.

Powers, Kerns H., to RCA Corporation. High definition television signal for film-television standards conversion system. 4,633,293, Cl. 358-11.000.

PPG Industries, Inc.: *See—*
Kunkle, Gerald E.; Demarest, Henry M.; and Shelestak, Larry J., 4,632,687, Cl. 65-27.000.
Schwenninger, Ronald L., 4,633,481, Cl. 373-152.000.
Welsh, David A.; and Dowbenko, Rostyslaw, 4,632,957, Cl. 524-548.000.

ppm, Inc.: *See—*
Shofner, Frederick M., 4,631,781, Cl. 19-200.000.

Preci-Spark Limited: *See—*
Jones, Godfrey D., 4,633,058, Cl. 219-121.0LK.

Precision Monolithics, Inc.: *See—*
Pietkiewicz, Steven M.; and Bowers, Derek F., 4,633,165, Cl. 323-314.000.

Preiss, Michael, to Bayer Aktiengesellschaft. Preparation of benzylidene compounds. 4,633,007, Cl. 560-014.000.

Premo, Kenneth W.; and Hobbs, Billy J., Jr., to Rain Bird Consumer Products Mfg. Corp. Impact drive sprinkler. 4,632,312, Cl. 239-230.000.

Premoli, Ercole: *See—*
Panizza, Ettore; and Premoli, Ercole, 4,632,079, Cl. 123-179.00B.

Price, J. B.; Bunch, Matthew L.; and Stitz, Robert W., to Spectrum CVD, Inc. CVD plasma reactor. 4,632,057, Cl. 118-719.000.

Price, J. B.: *See—*
Stitz, Robert W.; and Price, J. B., 4,632,056, Cl. 118-712.000.

Priefert Mfg. Co., Inc.: *See—*
Priefert, William D., 4,632,063, Cl. 119-98.000.

Priefert, William D., to Priefert Mfg. Co., Inc. Animal holding gate with automatic closing operation. 4,632,063, Cl. 119-98.000.

Prince, Anthony P.: *See—*
Kolb, Richard P.; and Prince, Anthony P., 4,632,232, Cl. 192-0.096.

Procter & Gamble Company, The: *See—*
Atkinson, Neil J., 4,632,768, Cl. 252-8.800.
Brown, Bruce, 4,632,350, Cl. 248-295.100.

Proctor, Robert H.; and Hardesty, Ronald C., to Murray Corporation. Coupling means for tubular members. 4,632,434, Cl. 285-39.000.

Prozee, Christiaan: *See—*
Beurskens, Johannes H. H.; and Prozee, Christiaan, 4,633,127, Cl. 313-112.000.

Prucher, Bryan P., to Chrysler Motors Corporation. Linear drive motor multiple carrier control system. 4,633,148, Cl. 318-135.000.

Prucher, Helmut: *See—*
Gante, Joachim; Prucher, Helmut; Wahlig, Helmut; and Rudolph, Volkmar, 4,632,933, Cl. 514-399.000.

PSC Freyssinet Limited: *See—*
Harris, Alan J.; and Wright, Gordon E. R., 4,631,883, Cl. 52-223.00R.

Psi Star: *See—*
Nelson, Norvell J., 4,632,727, Cl. 156-656.000.

Punako, Stephen; Gallusser, David O.; and Joslyn, Carl R., to Allied Corporation. Contact for an electrical connector. 4,632,482, Cl. 339-59.00M.

Purac Aktiebolag: *See—*
Andersson, Per-Erik; and Welander, Thomas G., 4,632,759, Cl. 210-603.000.

Purcell, John R.: *See—*
Blosser, Henry G.; Blosser, Gabe F.; Jemison, Emanuel B.; and Purcell, John R., 4,633,125, Cl. 313-62.000.

Puthran, Jayadeva R., to Raycon Corporation. Electrical discharge machine with automatically replaceable electrodes. 4,633,053, Cl. 219-69.00E.

Quad Systems Corporation: *See—*
Young, David H., 4,631,812, Cl. 29-714.000.

Quantel Limited: *See—*
Walker, Ian C., 4,633,416, Cl. 364-521.000.

Queen, John C.: *See—*
Gutschmit, Alan; and Queen, John C., 4,631,930, Cl. 66-1.00R.

Queen's University at Kingston: *See—*
Pearce, Thomas H., 4,632,554, Cl. 356-349.000.

Quinn, Michael D.: *See—*
Webler, William E.; Elson, Edward E.; and Quinn, Michael D., 4,632,125, Cl. 128-692.000.

R. Alkan & Cie: *See—*
Hasquenoph, Jean, deceased; and Coutin, Pierre F., 4,632,338, Cl. 244-137.00A.

R. C. Smith Company: *See—*
Smith, Richard C., 4,632,473, Cl. 312-257.0SK.

Rabinowitz, Michele S.: *See—*
Boivie, Richard H.; Feiner, Alexander; Rabinowitz, Michele S.; Szeto, Rickens T.; and Weinbaum, Barry J., 4,633,041, Cl. 379-354.000.

Radice, Peter F., to Pennwalt Corporation. Means for electrically connecting electrodes on different surfaces of piezoelectric polymeric films. 4,633,122, Cl. 310-339.000.

Radice, Peter F., to Pennwalt Corporation. Piezoelectric polymer keyboard apparatus. 4,633,123, Cl. 310-339.000.

Radiometer A/S: *See—*
Fog, Agner; and Atlung, Sven H. K., 4,632,732, Cl. 204-1.00T.

Ragazzoni, Silvio: *See—*
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,632,075, Cl. 123-90.580.

Rahn, Armin; Down, William H.; Drouin, Marcel; Rudzicz, Matthew J.; Buszard, John F.; Makhoul, Elie; and Woodgate, Ralph W., to Electrovert Ltd. Automatic wave soldering machine. 4,632,291, Cl. 228-9.000.

Rahrig, Donald D.; and Schave, Richard D., to Libbey-Owens-Ford Company. Apparatus and method for treating glass sheets. 4,632,688, Cl. 65-29.000.

Rain Bird Consumer Products Mfg. Corp.: *See—*
Premo, Kenneth W.; and Hobbs, Billy J., Jr., 4,632,312, Cl. 239-230.000.

Rakennus - Ja Konsulttitoimisto Risto Hukka Ky: *See—*
Vesterinen, Kauko I., 4,631,886, Cl. 52-410.000.

Rall, Gerhard; Hertel, Gunther; Hertel, Karl G.; and Kastner, Hermann, to Rall, Gerhard, by said Hermann Kastner. Composite tool unit for chip-removing machining. 4,632,614, Cl. 409-233.000.

Rall, Gerhard: *See—*
Rall, Gerhard; Hertel, Gunther; Hertel, Karl G.; and Kastner, Hermann (said Hermann Kastner assors. to), 4,632,614, Cl. 409-233.000.

Ramsland, Arnold. Centrifugal chromatography. 4,632,762, Cl. 210-657.000.

Randall, Robert P.: *See—*
Hulings, James E.; Randall, Robert P.; Maynard, Robert H.; and Weiss, James, 4,631,945, Cl. 72-43.000.

Randolph, Ralph A. Dump cart. 4,632,461, Cl. 298-2.000.

Ratchford, Michael; Bue, Richard L.; and Charov, Alexander, to United Technologies Corporation. Fault tolerant communications interface. 4,633,473, Cl. 371-68.000.

Ratony, Alexander: *See—*
Hall, Patricia A.; and Ratony, Alexander, 4,632,409, Cl. 280-30.000.

Ratzel, Dieter: *See—*
Strobel, Bernhard; and Ratzel, Dieter, 4,633,178, Cl. 324-309.000.

Raudsepp, Rein: *See—*
Beattie, Morris J. V.; Bacon, William G.; and Raudsepp, Rein, 4,632,738, Cl. 204-107.000.

Raveh, David. Picker spindle assembly for cotton pickers. 4,631,908, Cl. 56-50.000.

Ravn, Anders P.: *See—*
Georgiou, Christos J.; and Ravn, Anders P., 4,633,394, Cl. 364-200.000.

Raycon Corporation: *See—*
Puthran, Jayadeva R., 4,633,053, Cl. 219-69.00E.

Rayer, Paul H. Roof ladder. 4,632,219, Cl. 182-45.000.

Raymond, F. P.: *See—*
Raymond, Frank P.; and Snyder, Frank V., 4,632,051, Cl. 114-311.000.

Raymond, Frank P.; and Snyder, Frank V., to Raymond, F. P. Sea anchor. 4,632,051, Cl. 114-311.000.

Raytheon Company: *See—*
Borghese, Michael N., 4,633,442, Cl. 365-203.000.
Van Rees, H. Barteld, 4,632,710, Cl. 148-175.000.

RCA Corporation: *See—*
Avery, Leslie R., 4,633,283, Cl. 357-23.130.
Babcock, William E., 4,633,146, Cl. 315-395.000.
Basile, Philip C.; and Kennedy, Eugene J., 4,633,202, Cl. 333-109.000.
Butterwick, Gilbert N., 4,633,076, Cl. 250-213.0VT.
Dingwall, Andrew G. F., 4,633,222, Cl. 340-347.0SH.
Hudson, Kenneth C., 4,633,455, Cl. 369-45.000.
Martinez, Miguel R.; and Dischert, William A., 4,632,444, Cl. 294-86.400.
McCandless, Harry E., 4,633,130, Cl. 313-417.000.
Paglione, Robert W.; and Woodward, Oakley M., 4,632,128, Cl. 128-804.000.
Powers, Kerns H., 4,633,293, Cl. 358-11.000.
Steckler, Steven A.; and Balaban, Alvin R., 4,633,298, Cl. 358-25.000.
Sterzer, Fred, 4,632,127, Cl. 128-804.000.
Tallant, James C., II, 4,633,321, Cl. 358-243.000.
Willis, Donald H., 4,633,320, Cl. 358-243.000.

Recoton Corporation: *See—*
Schotz, Larry, 4,633,495, Cl. 381-3.000.

Redder, Manfred: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.

Redmore, Derek: *See—*
Thompson, Neil E. S.; Redmore, Derek; and Alink, Bernardus A. O., 4,633,019, Cl. 564-501.000.

Reed, David G.: *See—*
Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; and Tayler, Gerald E., 4,633,387, Cl. 364-200.000.

Reed, Edgar A., 3rd: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.

Reed, John T., to Singer Company, The. Spherical projection-type screen for use in a vehicle simulator. 4,631,867, Cl. 51-2.00R.

Reedy, Jeffrey W.: *See—*
Banton, Randall G.; Bhatia, Rajiv; Grust, Donald B.; Johnson, David R.; Kneuer, Joseph G.; Lin, Kuang-Shin; McDonald, Henry S.; Poppe, David A.; Reedy, Jeffrey W.; and Wurth, Richard T., 4,633,461, Cl. 370-58.000.

Regel, Erik: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; and Plempel, Manfred, 4,632,932, Cl. 514-383.000.

Regelman, Dale F., to Dow Chemical Company, The. Isocyanurate preparation. 4,632,989, Cl. 544-193.000.

Reggiani, Medardo, to MED di Reggiani Medardo. Injection unit for internal combustion engines fed with gaseous fuels such as liquefied petroleum gas or methane. 4,632,083, Cl. 123-527.000.

Rehkopf, Charles H.: *See—*
Marks, Gary T.; Rehkopf, Charles H.; and Sorensen, Fred L., 4,633,132, Cl. 313-477.00R.

Rehman, William R.: *See—*
Smith, James C.; and Rehman, William R., 4,632,314, Cl. 239-433.000.

Reichstein, Benjamin J., to University of Health Sciences/The Chicago Medical School. Ambulatory esophageal pH monitor. 4,632,119, Cl. 128-632.000.

Reid, Georgianna, to LaCuticle, Inc. Artificial fingernail construction. 4,632,134, Cl. 132-73.000.

Reid, Philip L. Gas humidification apparatus. 4,632,789, Cl. 261-63.000.

Reimer, James, to Plastic Flamecoat Systems, Inc. Method and apparatus for spray coating. 4,632,309, Cl. 239-8.000.

Reimer, William A., to GTE Communication Systems Corp. Test fixture including deflectable probes. 4,633,176, Cl. 324-158.00P.

Reinertz, Rudolf, to Grote & Hartmann GmbH & Co. KG. Process for producing cables fitted with electrical connectors. 4,631,822, Cl. 29-861.000.

Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, to Saint Gobain Vitrage. Program-controlled edge grinding machine for glass panes with a program-controlled rotatable grinding head. 4,633,408, Cl. 364-474.000.

Reiser, Wolf: *See—*
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,632,999, Cl. 549-519.000.

Reisman, George F., to Charm-Glo Mfg. Co., Inc. Device for supporting lamp shade on lamp socket. 4,633,378, Cl. 362-353.000.

Reiter, Norbert: *See—*
Jester, Willi; and Reiter, Norbert, 4,631,994, Cl. 82-36.00R.

Reneau, Bobby J., to Gripper, Inc. Remote ball connector. 4,632,432, Cl. 285-24.000.

Renfroe, James B., Jr.; Dickson, Rennie L.; and Rion, Roger D., to Otis Engineering Corporation. Submersible pump safety systems. 4,632,184, Cl. 166-105.500.

Repperger, Daniel W.; McCollor, Donald G.; and Gruesbeck, William G., to United States of America, Air Force. Stabilizing force feedback in bio-actuated control systems. 4,632,341, Cl. 244-230.000.

Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Cseh, Gyorgy, to Richter Gedeon Vegyeszeti Gyar R.T. Pyrazole derivatives with an ergoline skeleton, their acid addition salts, and a process for the preparation thereof. 4,632,928, Cl. 514-288.000.

Reynes, Enrique G.; and Leising, John O., to BFGoodrich Company, The. Process for purifying thiocarbamylsulfenamides. 4,632,986, Cl. 544-85.000.

Reynolds, Donald A. Building system. 4,631,884, Cl. 52-235.000.

Reynolds, Kenneth R., to General Electric Company. Motor coil retention apparatus. 4,633,114, Cl. 310-194.000.

Reynolds Metals Company: *See—*
Taylor, Robert L.; Sink, Danny R.; and Cudzik, Daniel F., 4,632,271, Cl. 220-258.000.

Rheem Manufacturing Company: *See—*
Clark, Keith R., 4,632,792, Cl. 264-45.200.

Rheinmetall GmbH: *See—*
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,632,011, Cl. 89-36.130.

Rhine, Ellen M.: *See—*
Rhine, Richard, 4,632,273, Cl. 220-411.000.

Rhine, Richard, to Rhine, Ellen M.; and Streets, Mary R. Disposable insulated container. 4,632,273, Cl. 220-411.000.

Rhone Poulenc Agrochimie: *See—*
Theissen, Robert J., 4,633,000, Cl. 549-551.000.

Riazi, John, to Hygenic Corporation, The. Method of plasticizing thermoplastic polymers. 4,632,977, Cl. 528-502.000.

Richards, David B. Movable roadway barrier. 4,632,598, Cl. 404-6.000.

Richardson Chemical Company: *See—*
Mallory, Glenn O., Jr., 4,632,857, Cl. 428-209.000.

Richey, Michael L. Weight lifting machine. 4,632,390, Cl. 272-120.000.

Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Cseh, Gyorgy, 4,632,928, Cl. 514-288.000.

Ricoh Company, Ltd.: *See—*
Imai, Chikara, 4,632,537, Cl. 355-14.00D.
Segawa, Hideo; Inokuchi, Toshiyuki; Shibaguchi, Takashi; and Asano, Fumio, 4,633,271, Cl. 346-107.00R.

Ricoh Electronics, Inc.: *See—*
Shibata, Tomoo; and Jurdi, Wissam J., 4,633,276, Cl. 346-200.000.

Rieder, Heinz; and Schwaiger, Max, to RSF Elektronik Gesellschaft m.b.H. Instrument for measuring lengths, 4,631,830, Cl. 33-125.00R.

Rieger, Harry, to United States of America, Navy. Fiber optics as an angular sensor. 4,633,079, Cl. 250-227.000.

Riemer, Jed A.: *See—*
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,633,006, Cl. 560-1.000.

Rieter Machine Works Ltd.: *See—*
Symon, Georg, 4,631,791, Cl. 28-271.000.

Riethmann, Alois W. Clasp for a chain. 4,631,785, Cl. 24-232.00R.

Rigopulos, Peter N.: *See—*
Bowers, William F.; and Rigopulos, Peter N., 4,632,761, Cl. 210-650.000.

Riihinen, Jaakko, to Valmet Oy. Apparatus and method for eddy current heating a roll in a paper machine. 4,631,794, Cl. 29-132.000.

Riise, Morris M., to International Sludge Reduction Company. Sludge dewatering process using multiple layer plate. 4,632,764, Cl. 210-702.000.

Ringel, Konrad, to Diehl GmbH & Co. Shaped charge. 4,632,036, Cl. 102-476.000.

Rinkewich, Isaac. Multiple chamber sprinkler. 4,632,313, Cl. 239-242.000.

Rion, Roger D.: *See—*
Renfroe, James B., Jr.; Dickson, Rennie L.; and Rion, Roger D., 4,632,184, Cl. 166-105.500.

Risi, Roberto, to MA.CO Engineering S.r.l. Apparatus for arranging oncoming articles, in particular containers, into plural article rows. 4,632,238, Cl. 198-365.000.

Ritchie, Kim; Hopkins, Lonnie; and Galvagni, John, to AVX Corporation. Testing method and apparatus for electronic components. 4,633,175, Cl. 324-158.00F.

Rittal-Werk Rudolf Loh GmbH & Co. KG: *See—*
Debus, Jurgen; Zachrai, Jugen; Butergerds, Helmut; and Wetzel, Manfred, 4,631,937, Cl. 70-207.000.

Ritter, Allen M.: *See—*
Casteel, Jordan B.; D'Atre, John D.; Ritter, Allen M.; and Wadding, Kenneth W., 4,633,241, Cl. 340-645.000.

Ritter-Plastic GmbH: *See—*
Emele, Edgar F.; and Brugner, Nikolaus, 4,632,568, Cl. 366-337.000.

RIV-SKF Officine di Villar Perosa S.p.A.: *See—*
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,632,075, Cl. 123-90.580.

Rivkin, Bernard W., to P.P.M.D. Inc. Amusement chance device. 4,632,397, Cl. 273-145.0CA.

Rizzo, Salvatore J. Soil aerating machine. 4,632,189, Cl. 172-22.000.

Roa, Alvaro H.; and Cuartas, Jaime, to Nabisco Brands, Inc. Food grinder. 4,632,323, Cl. 241-247.000.

Robbin, John D.; and Robbin, John W. Auxiliary support system for bicycle passenger. 4,632,453, Cl. 297-243.000.

Robbin, John W.: *See—*
Robbin, John D.; and Robbin, John W., 4,632,453, Cl. 297-243.000.

Robert Bosch GmbH: *See—*
Alf, Reinhard; and Klinkwitz, Kurt, 4,633,266, Cl. 343-903.000.
Freienstein, Bernd; Neukirchner, Ernst Peter; Pilsak, Otmar; and Schlogl, Dietmar, 4,633,407, Cl. 364-450.000.
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,632,466, Cl. 303-7.000.
Zirps, Wilhelm, 4,631,907, Cl. 56-11.900.

Roberts, Charles G., to Handymate Limited. Device for holding a screw or the like. 4,631,985, Cl. 81-44.000.
Roberts Industries: *See—*
Whellams, Geoffrey E., 4,632,156, Cl. 140-92.100.
Roberts, Roy D.; and Miner, Robert L., to ILC Technology, Inc. Short arc lamp with improved thermal characteristics. 4,633,128, Cl. 313-113.000.
Robertshaw Controls Company: *See—*
Gunter, James C., 4,632,592, Cl. 403-285.000.
McIntosh, Harold A., 4,633,211, Cl. 337-338.000.
Robertson, David W.: *See—*
Beedle, Edward E.; and Robertson, David W., 4,632,939, Cl. 514-619.000.
Robinson, James S. Marine cargo transfer device. 4,632,622, Cl. 414-139.000.
Robson, Anthony R.; and Marsden, George M. Pipe coupling. 4,632,437, Cl. 285-310.000.
Robusto, Paul F., to Hughes Aircraft Company. High efficiency RF excited gas laser with transverse discharge excitation. 4,633,478, Cl. 372-83.000.
Rochat, Alain C.; Iqbal, Abul; Jeanneret, Remy; and Mizuguchi, Jin, to CIBA-GEIGY Corporation. Electrophotographic recording material containing selected dithioke topyrrolopyrroles. 4,632,893, Cl. 430-58.000.
Roche, Karen M., to Minnesota Mining and Manufacturing Company. Acetabular cup positioning apparatus. 4,632,111, Cl. 128-303.00R.
Rockwell International Corporation: *See—*
Bliss, David H., 4,633,411, Cl. 364-481.000.
Lee, Chien-Ping, 4,633,282, Cl. 357-22.000.
Roder, Claus-Henning: *See—*
Otto, Wilfried; Papendieck, Hatto; Konradt, Harald; and Roder, Claus-Henning, 4,632,809, Cl. 422-254.000.
Roditis, John N. Electronic thermostat with switched power converter. 4,632,303, Cl. 236-10.000.
Roetling, Paul G., to Xerox Corporation. Enhancement halftoning. 4,633,327, Cl. 358-283.000.
Rogers Corporation: *See—*
McMonagle, Rodger P., 4,633,035, Cl. 174-68.500.
Traut, G. Robert, 4,633,262, Cl. 343-700.0MS.
Rohner Jacob AG: *See—*
Zingg, Peter; Mettier, Werner; and Lindner, Gottfried, 4,631,755, Cl. 2-239.000.
Roj Electrotex S.p.A.: *See—*
Maina, Bruno, 4,632,154, Cl. 139-452.000.
Maina, Bruno, 4,632,155, Cl. 139-452.000.
Roling, Franz: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.
Rommen, Hans: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Hollmann, Friedrich, 4,631,948, Cl. 72-242.000.
Ronai, Andras: *See—*
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Cseh, Gyorgy, 4,632,928, Cl. 514-288.000.
Ronthaler, Karl-Heinz: *See—*
Frieden, Peter; Kabelitz, Hans-Peter; Ronthaler, Karl-Heinz; and Thielicke, Jorg, 4,632,650, Cl. 418-95.000.
Roos, Wouter: *See—*
Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, 4,632,812, Cl. 423-309.000.
Roper, Hartmut: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.
Roquette Freres: *See—*
Gosset, Serge; Lumaret, Jean-Claude; Fortunato, Francis; and Huchette, Michel, 4,632,848, Cl. 427-154.000.
Rosa, Thomas: *See—*
Stevens, Robert; and Rosa, Thomas, 4,633,199, Cl. 333-1.100.
Rosborough, Keith A.: *See—*
Long, Eric L.; and Rosborough, Keith A., 4,632,488, Cl. 339-103.00R.
Rose, Friedhelm. Waterproof electrical enclosures. 4,632,269, Cl. 220-3.800.
Rosen, Joseph M.; and Grosser, Morton. Microelectronic axon processor. 4,632,116, Cl. 128-419.00R.
Rosenberg, Peretz. Filters cleanable by reverse flushing. 4,632,757, Cl. 210-411.000.
Rosencwaig, Allan; and Opsal, Jon, to Therma-Wave, Inc. Evaluation of surface and subsurface characteristics of a sample. 4,632,561, Cl. 356-432.000.
Rosenthal, Glenn K.; Stephens, Jeffrey D.; and Rosenthal, Robert D., to Trebor Industries, Inc. Near infrared apparatus for measurement of organic constituents of material. 4,633,087, Cl. 250-341.000.
Rosenthal, Robert D.: *See—*
Rosenthal, Glenn K.; Stephens, Jeffrey D.; and Rosenthal, Robert D., 4,633,087, Cl. 250-341.000.
Rosko, Peter J. Multi-reflective fishing lure. 4,631,854, Cl. 43-42.340.
Rosman, Alan H., to Dynamic Hydraulic Systems, Inc. Oil-well pumping system or the like. 4,631,918, Cl. 60-372.000.
Rosser, Heinrich-Otto: *See—*
Bebber, Hans J.; Neuschutz, Dieter; and Rosser, Heinrich-Otto, 4,632,700, Cl. 75-10.140.
Rossnagel, Stephen M.: *See—*
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,633,129, Cl. 313-153.000.
Roth, Cary A.: *See—*
Kar, Nareshchandra J.; and Roth, Cary A., 4,632,401, Cl. 277-1.000.
Rotron, Inc.: *See—*
Genco, Jerry J.; and Smith, Norman, 4,633,110, Cl. 310-71.000.
Rotzler GmbH & Co. Spezialfabrik fur Seilwinden und Hebezeuge: *See—*
Frommherz, Egon, 4,632,365, Cl. 254-309.000.
Roussel Uclaf: *See—*
Jouquey, Alain; Touyer, Gaetan; Salmon, Jean; and Mouren, Michel, 4,632,820, Cl. 424-1.100.
Rouzee, Daniel B., to Fichet-Bauche. Security device against attack on a lock. 4,631,935, Cl. 70-1.500.
Rowe, Stephen B.: *See—*
Newell, Stephen D.; Rowe, Stephen B.; and Bukousky, John M., 4,632,494, Cl. 239-184.000.
Rowlett, Jack. Side entry down hole pump for oil wells. 4,632,647, Cl. 417-498.000.
Roxor Corporation: *See—*
Blom, C. James, 4,632,524, Cl. 350-613.000.
Roy, Pradip K., to AT&T Bell Laboratories. Technique for reducing substrate warpage springback using a polysilicon subsurface strained layer. 4,631,804, Cl. 29-576.00W.
Rozsa, Gyula: *See—*
Csordas, Laszlo ; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.
RSF Elektronik Gesellschaft m.b.H.: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,631,830, Cl. 33-125.00R.
Ruaudel, Annie: *See—*
Barraud, Andre ; Ruaudel, Annie; and Vandevyver, Michel, 4,632,800, Cl. 264-298.000.
Rudolph, Volkmar: *See—*
Gante, Joachim; Prucher, Helmut; Wahlig, Helmut; and Rudolph, Volkmar, 4,632,933, Cl. 514-399.000.
Rudzicz, Matthew J.: *See—*
Rahn, Armin; Down, William H.; Drouin, Marcel; Rudzicz, Matthew J.; Buszard, John F.; Makhoul, Elie; and Woodgate, Ralph W., 4,632,291, Cl. 228-9.000.
Ruff, Gerd, to Teldix GmbH. Rotary waveguide switch having magnetic means for an accurate positioning thereof. 4,633,201, Cl. 333-106.000.
Ruggieri, Daniela: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.
Ruhenstroth-Bauer, Gerhard, to Atmospheric Weather Analysis Systems. Method for alerting patients with diseases affected by climate, such as epilepsy and myocardial infarction. 4,631,957, Cl. 73-170.00R.
Ruhl, Hermann. Transportation equipment recorder for highlighting operating parameters outside of preset limits. 4,633,270, Cl. 346-49.000.
Rundell, John P., to Storage Technology Partners II. Extended index for digital information storage and retrieval device. 4,633,391, Cl. 364-200.000.
Rundell, John P., to Storage Technology Partners II. Generic key for indexing and searching user data in a digital information storage and retrieval device. 4,633,393, Cl. 364-200.000.
Rupp, Herbert E. Sportfishing outriggers. 4,632,050, Cl. 114-255.000.
Russell, Theodore C. Anti-theft device for automobiles. 4,632,209, Cl. 180-287.000.
Rutgerswerke AG: *See—*
Maurer, Manfred; Orth, Winifried; and Fickert, Werner, 4,632,991, Cl. 546-6.000.
Rutten, Leon L. Rotor for centrifugal launching device. 4,632,086, Cl. 124-6.000.
Ryan, Barbara D. Nursing scarf. 4,631,754, Cl. 2-104.000.
Ryan, James A. Athletic swing plane trainer. 4,632,394, Cl. 273-26.00E.
Ryder, Francis E.; and Williams, Fred E., to Ryder International Corp.; and National Patent Development Corp. Apparatus for tinting soft contact lenses. 4,632,055, Cl. 118-703.000.
Ryder International Corp.: *See—*
Ryder, Francis E.; and Williams, Fred E., 4,632,055, Cl. 118-703.000.
S. C. Johnson & Son, Inc.: *See—*
Konicek, Tim R., 4,632,310, Cl. 239-43.000.
S & G Implants GmbH: *See—*
Grundei, Hans; and Henssge, Ernst-Joachim, 4,632,098, Cl. 128-80.00C.
S.R.C. Textiles, Inc.: *See—*
Sommers, Louis, 4,631,932, Cl. 66-192.000.
Sadahiro, Hisanori, to Sakaijuhkogyo Kabushiki Kaisha. Roller drum of a soil compacting machine. 4,632,599, Cl. 404-124.000.
Sagami Chemical Research Center: *See—*
Shibasaki, Masakatsu; Sodeoka, Mikiko; and Ogawa, Yuji, 4,632,997, Cl. 549-214.000.
Saglio, Robert: *See—*
De Vadder, Daniel; and Saglio, Robert, 4,631,965, Cl. 73-602.000.
Saiki, Masatsugu; Imai, Yoshio; and Takagi, Makoto, to Takemoto Yushi Kabushiki Kaisha. Antistatic agents for synthetic fibers. 4,632,767, Cl. 252-8.800.
St. Charles Manufacturing Co.: *See—*
Baitinger, William E.; and Saunders, G. Thomas, 4,632,022, Cl. 98-115.300.

Saint Gobain Vitrage: *See—*
Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, 4,633,408, Cl. 364-474.000.
Saito, Hiroyuki; and Ueda, Takeo, to NSK-Warner K. K. Automatic locking retractor. 4,632,330, Cl. 242-107.40D.
Saito, Isao; and Shimano, Noriyuki, to Dainippon Screen Mfg. Co., Ltd. Picture scanning and recording method. 4,633,328, Cl. 358-296.000.
Saito, Masaki: *See—*
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,633,008, Cl. 560-15.000.
Saitoh, Hiroyuki, to Fuji Xerox Co., Ltd. Method and apparatus with white balancing correction for separating a color signal and its complement. 4,633,301, Cl. 358-75.000.
Saitoh, Hiroyuki: *See—*
Kurata, Masami; and Saitoh, Hiroyuki, 4,633,314, Cl. 358-163.000.
Saitoh, Shigeru: *See—*
Mizuno, Toshiya; Moriyama, Nobuhiro; Murayama, Naohiro; and Saitoh, Shigeru, 4,632,873, Cl. 428-364.000.
Saitoh, Toshio; Takahashi, Noriyoshi; Sato, Masaki; and Watanabe, Masatoshi, to Hitachi, Ltd. Apparatus for connecting conductor strands with transposition in electrical rotary machine. 4,633,115, Cl. 310-213.000.
Sakaguchi, Yoshikazu: *See—*
Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, 4,631,982, Cl. 74-869.000.
Sakai, Hiroshi: *See—*
Oyamatsu, Yasuyuki; Uematsu, Masashi; and Sakai, Hiroshi, 4,632,585, Cl. 400-613.000.
Sakai, Kazuo: *See—*
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,633,474, Cl. 372-19.000.
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Signal accumulating time control method and apparatus for a signal accumulating type radiation sensing device. 4,633,075, Cl. 250-201.000.
Sakai, Shinji, to Canon Kabushiki Kaisha. Color information detecting device. 4,633,300, Cl. 358-41.000.
Sakaijuhkogyo Kabushiki Kaisha: *See—*
Sadahiro, Hisanori, 4,632,599, Cl. 404-124.000.
Sakamoro, Noriaki: *See—*
Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoro, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, 4,633,337, Cl. 360-57.000.
Sakamoto, Susumu: *See—*
Watanabe, Kenjiro; Sakamoto, Susumu; and Akamatsu, Junichi, 4,633,273, Cl. 346-135.100.
Sakata, Nobuhiro: *See—*
Shirouzu, Tatsuo; Sakata, Nobuhiro; Kono, Masaki; and Inagaki, Saburo, 4,631,811, Cl. 29-705.000.
Sakaue, Hironobu; and Furukawa, Kaoru, to Matsushita Electric Works, Ltd. Charging circuit. 4,633,159, Cl. 320-39.000.
Sakota, Kazuyuki: *See—*
Ueno, Ryuzo; Sakota, Kazuyuki; Naito, Yoshiyuki; and Kishimoto, Mitsuyuki, 4,633,024, Cl. 568-738.000.
Sakudo, Noriyuki: *See—*
Tokiguchi, Katsumi; Okada, Osami; Sakudo, Noriyuki; and Koike, Hidemi, 4,633,138, Cl. 315-111.810.
Sakurai, Kazuhiro: *See—*
Hattori, Kyo; and Sakurai, Kazuhiro, 4,632,082, Cl. 123-325.000.
Salmon, Jean: *See—*
Jouquey, Alain; Touyer, Gaetan; Salmon, Jean; and Mouren, Michel, 4,632,820, Cl. 424-1.100.
Samelson, Harold, to Allied Corporation. Optical limiter. 4,633,475, Cl. 372-25.000.
Sampat, Dipak J.: *See—*
Chen, Michael S. K.; Hegarty, W. Patrick; and Sampat, Dipak J., 4,632,818, Cl. 423-574.00R.
Sampson, Jay A.: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.
Samuel, Robert A.; Huseby, Lauren W.; Weitkamp, Erick W.; and Wiklof, Christopher A., to Intermec Corporation. Luggage tag. 4,631,845, Cl. 40-2.00R.
Samuels, George J., to Allied Corporation. Nickel/indium alloy for use in the manufacture of electrical contact areas electrical devices. 4,633,050, Cl. 200-268.000.
Sanagi, Kenichiro, to Olympus Optical Co., Ltd. Medical operation instrument for endoscope. 4,632,110, Cl. 128-303.00R.
Sand, Theodor: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.
Sanden Corporation: *See—*
Koitabashi, Takatoshi, 4,632,236, Cl. 192-84.00C.
Negishi, Hideo; Obokata, Mitsuyuki; and Katayama, Shigeharu, 4,632,257, Cl. 211-59.200.
Terauchi, Kiyoshi, 4,632,640, Cl. 417-269.000.
Sanders Associates, Inc.: *See—*
Apostolos, John T.; Boland, Robert P.; and Stromswold, Chester E., 4,633,257, Cl. 342-445.000.
Sanders, Bernard, to Beiersdorf A.G. Device for uniting components one to another. 4,633,508, Cl. 383-95.000.
Sandherr Packungen AG: *See—*
Schellenberg, Walter, 4,632,298, Cl. 229-5.500.
Sandner, Klaus: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.
San Hai, Wang. Fork ends and hub of bicycle. 4,632,415, Cl. 280-279.000.
Sanko Kikai Co., Ltd.: *See—*
Hirohata, Nobuyuki, 4,631,868, Cl. 51-128.000.
Sanmeidenki Kabushikikaisha: *See—*
Yokoi, Toshiro, 4,631,809, Cl. 29-607.000.
Sanner, Axel: *See—*
Barzynski, Helmut; Eckell, Albrecht; Elzer, Albert; Klinsmann, Uwe; Leyrer, Reinhold J.; and Sanner, Axel, 4,632,897, Cl. 430-260.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Handa, Kenichi, 4,632,662, Cl. 440-52.000.
Sansui Electric Co., Ltd.: *See—*
Takahashi, Susumu; and Kanzaki, Hiroyuki, 4,633,483, Cl. 375-25.000.
Santrade Limited: *See—*
Blomberg, Sven G.; Berter, Sven G.; and Pettersson, Lars T., 4,632,608, Cl. 407-114.000.
Lagerberg, Stig E. V., 4,632,606, Cl. 407-104.000.
Norberg, Rolf; and Svensson, Tomas, 4,633,424, Cl. 364-571.000.
Pantzar, Glenn G. E., 4,632,607, Cl. 407-113.000.
Sanyo Electric Co., Ltd.: *See—*
Kuriyama, Shunichi; and Mitani, Yasuo, 4,631,825, Cl. 30-43.920.
Maeda, Junji, 4,633,154, Cl. 318-373.000.
Takasu, Hiromi, 4,633,280, Cl. 357-17.000.
Sapini, Osvaldo: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.
Sardella, Louis M., to Ward Machinery Company, The. Method and apparatus for stacking serially advancing parallel streams of blanks. 4,632,378, Cl. 271-202.000.
Sargent & Greenleaf, Inc.: *See—*
Krivec, Bert; and Murphree, Gary R., 4,631,940, Cl. 70-332.000.
Sari, Hikmet, to U. S. Philips Corporation. Method of and arrangement for determining the optimum position of the reference tap of an adaptive equalizer. 4,633,482, Cl. 375-14.000.
Sarkes Tarzian Licensing Laboratory: *See—*
Valdettaro, Alarico A., 4,633,206, Cl. 334-47.000.
Sartorius GmbH: *See—*
Ober, Jurgen; Melcher, Franz-Josef; and Knothe, Erich, 4,632,199, Cl. 177-238.000.
Sarugaku, Shinichi; and Tsuji, Masao, to Hitachi, Ltd; and Hitachi Keiyo Engineering Co., Ltd. Method and apparatus for welding line tracer control. 4,633,059, Cl. 219-124.220.
Sasagawa, Katsuyoshi; Imai, Masao; and Kanno, Kimio, to Mitsui Toatsu Chemicals, Inc. Resin for high-refractivity lenses. 4,632,969, Cl. 526-286.000.
Sasaki, Akio: *See—*
Fujita, Shigeo; Matsuda, Yoshinobu; and Sasaki, Akio, 4,632,711, Cl. 148-175.000.
Sasaki, Kohji, to Mitutoyo Mfg. Co., Ltd. Displacement detector utilizing change of capacitance. 4,633,249, Cl. 340-870.370.
Sasaki, Masaru; and Isozaki, Shin, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head positioning device for a flexible disk. 4,633,346, Cl. 360-78.000.
Sasaki, Michiaki; Sasaki, Norio; and Nishida, Nariaki, to Nissan Motor Co., Ltd. Fuel supply port structure of fuel tank for vehicle. 4,632,270, Cl. 220-86.00R.
Sasaki, Norio: *See—*
Sasaki, Michiaki; Sasaki, Norio; and Nishida, Nariaki, 4,632,270, Cl. 220-86.00R.
Sasaki, Yoshio; and Nishikawa, Masahiko, to Toyota Jidosha Kabushiki Kaisha. Arrangement for facilitating correct coupling between distributor and driving shaft using alignment marks. 4,632,078, Cl. 123-146.50A.
Sassa, Yuusei; and Yoshieda, Keiichi, to Yoshida Kogyo K. K. Apparatus for applying sliders to separable slide fasteners. 4,631,818, Cl. 29-768.000.
Sato, Akihiko; and Nakajima, Kunihiro, to Shionogi & Co., Ltd. Preservative solution for fixed avian erythrocytes for the viral hemagglutination test. 4,632,907, Cl. 436-10.000.
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, to NEC Corporation. Electrostriction transducer comprising electrostriction layers of axially varied thicknesses. 4,633,120, Cl. 310-328.000.
Sato, Hideo: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.
Sato, Hiroki: *See—*
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, to Japan Synthetic Rubber Co., Ltd. Resin composition comprising a thermosetting resin component and a functional, rubbery copolymer component. 4,632,960, Cl. 525-117.000.
Sato, Masaki: *See—*
Saitoh, Toshio; Takahashi, Noriyoshi; Sato, Masaki; and Watanabe, Masatoshi, 4,633,115, Cl. 310-213.000.

Sato, Noboru; and Watanabe, Kenjirou, to Sony Corporation. Magneto-optical recording and reproducing apparatus having a magnetization direction detecting apparatus for a magnetic recording medium. 4,633,338, Cl. 360-59.000.
Sato, Osamu: *See—*
Misawa, Mitsukuni; and Sato, Osamu, 4,632,085, Cl. 123-73.0AD.
Sato, Yasuo: *See—*
Nagase, Hiroshi; and Sato, Yasuo, 4,632,938, Cl. 514-594.000.
Sato, Yuichi: *See—*
Matsumura, Susumu; Kawabata, Takashi; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,632,532, Cl. 354-403.000.
Satoh, Satoshi: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.
Sauer, Michael: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.
Sauers, Isidor, to United States of America, Energy. Process for measuring degradation of sulfur hexafluoride in high voltage systems. 4,633,082, Cl. 250-282.000.
Saugeon, Ulrich: *See—*
Hiller, Dietmar; and Saugeon, Ulrich, 4,632,124, Cl. 128-660.000.
Saum, Arthur M., to Saum Enterprises, Inc. Orifice metering fan device. 4,631,876, Cl. 52-27.000.
Saum Enterprises, Inc.: *See—*
Saum, Arthur M., 4,631,876, Cl. 52-27.000.
Saunders, David H., to Fluid Engineering Products Limited. Abrasive fluid jet apparatus. 4,631,871, Cl. 51-439.000.
Saunders, David N., to Pennwalt Corporation. Solenoid driven metering pump supply voltage compensation circuit. 4,633,362, Cl. 361-152.000.
Saunders, G. Thomas: *See—*
Baitinger, William E.; and Saunders, G. Thomas, 4,632,022, Cl. 98-115.300.
Sauvee, Jean-Paul: *See—*
Mery, Jean-Claude; Sauvee, Jean-Paul; and Thioux, Alain, 4,632,227, Cl. 188-73.320.
Savich, Peter P.: *See—*
McDonald, James A.; Gledhill, David E.; and Savich, Peter P., 4,632,667, Cl. 493-187.000.
Sawa, Takao: *See—*
Inomata, Koichiro; Sawa, Takao; and Arakawa, Osamu, 4,631,796, Cl. 29-446.000.
Sawafuji Electric Co., Ltd.: *See—*
Kawakami, Naoya; and Fujisawa, Yoshiaki, 4,632,645, Cl. 417-417.000.
Schaeff, Hans. Quick-change coupler. 4,632,595, Cl. 403-330.000.
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, to BASF Aktiengesellschaft. Tape cassette, in particular a magnetic tape cassette, and a reel support liner therefor. 4,632,334, Cl. 242-199.000.
Schael, Rudi. Device for testing the beam-setting of motor vehicle headlights. 4,632,545, Cl. 356-121.000.
Schafer, Willi: *See—*
Wirges, Winfried; Lauderbach, Leo; and Schafer, Willi, 4,632,371, Cl. 267-64.280.
Schallberg, Heidi L. Transparent separator for a row of index cards or the like. 4,631,846, Cl. 40-380.000.
Schaller-Automation Industrielle Automationstechnik KG: *See—*
Maurer, Otto; and Schaller, Werner, 4,632,223, Cl. 184-6.100.
Schaller, Werner: *See—*
Maurer, Otto; and Schaller, Werner, 4,632,223, Cl. 184-6.100.
Schave, Richard D.: *See—*
Rahrig, Donald D.; and Schave, Richard D., 4,632,688, Cl. 65-29.000.
Scheinert, Stefan, to U.S. Philips Corp. Process for selecting a control channel in a mobile radio station of a radio transmission system. 4,633,509, Cl. 455-33.000.
Schell, Howard C., to AT&T Bell Laboratories. Terminal grounding unit. 4,632,976, Cl. 339-14.00R.
Schellenberg, Walter, to Sandherr Packungen AG. Packing container. 4,632,298, Cl. 229-5.500.
Schenk, Christoph: *See—*
Sick, Erwin; and Schenk, Christoph, 4,632,546, Cl. 356-237.000.
Schering Aktiengesellschaft: *See—*
Otto, Wilfried; Papendieck, Hatto; Konradt, Harald; and Roder, Claus-Henning, 4,632,809, Cl. 422-254.000.
Schering Corporation: *See—*
Blythin, David J., 4,632,923, Cl. 514-247.000.
Scheuneman, James H., to Sperry Corporation. High performance storage unit. 4,633,434, Cl. 364-900.000.
Schewinski, Hartmut: *See—*
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, 4,632,239, Cl. 198-735.000.
Schiffer, Daniel K.: *See—*
Coplan, Myron J.; Bilewski, Friedhelm; Sebring, Robert; and Schiffer, Daniel K., 4,632,756, Cl. 210-323.200.
Schiffers, Ulrich: *See—*
Frewer, Hans; Muller, Rainer; and Schiffers, Ulrich, 4,631,915, Cl. 60-39.120.
Schiller, Robert E.; and Harris, Chester R., Jr. Chair with occupant assisting features. 4,632,455, Cl. 297-326.000.
Schiwiora, Harry; and Ahr, Willi, to Degussa Aktiengesellschaft. Precision attachment for securing dental prostheses. 4,632,659, Cl. 433-181.000.
Schleffendorf, John J. Exercising system with cable, pulleys and weights. 4,632,388, Cl. 272-118.000.
Schlogl, Dietmar: *See—*
Freienstein, Bernd; Neukirchner, Ernst Peter; Pilsak, Otmar; and Schlogl, Dietmar, 4,633,407, Cl. 364-450.000.
Schlosser, Manfred; and Brassel, Jakob, to Ciba-Geigy Corporation. Pest control compositions. 4,632,827, Cl. 424-78.000.
Schlosser, Werner, to MTU Muenchen GmbH. Method for manufacturing special-section tubes for tubular heat exchangers and tubes provided by such method. 4,633,056, Cl. 219-121.0ED.
Schlumberger Measurement & Control (U.K.) Ltd.: *See—*
Terepin, Stephen, 4,633,386, Cl. 364-200.000.
Schlumberger Technology Corporation: *See—*
Sinclair, Paul L., 4,632,484, Cl. 339-75.0MP.
Schlund, Gerald; Hagedorn, Leonhard; Hahn, A. David; and Fishpaugh, Charles E., to Black & Decker Inc. Cable connector interlock arrangement for electric shredders. 4,632,319, Cl. 241-37.500.
Schmalbein, Dieter: *See—*
Biehl, Reinhard; Schmalbein, Dieter; and Laukien, Gunther, 4,633,180, Cl. 324-316.000.
Schmeichel, Steven D.: *See—*
Wagner, Wayne M.; Bethke, Timothy A.; and Schmeichel, Steven D., 4,632,216, Cl. 181-255.000.
Schmidt, Gerry; and McHugh, Michael, to Pacific Handy Cutter, Inc. Hand-held safety holder for a single-edge razor blade for cutting a sheet or strand. 4,631,829, Cl. 30-294.000.
Schmidt & Jessen A/SD: *See—*
Jacobsen, Finn V.; and Jensen, Peter, 4,632,753, Cl. 210-232.000.
Schmidt, Robert L.: *See—*
Gordon, Pat L.; Haskell, Barin G.; and Schmidt, Robert L., 4,633,311, Cl. 358-133.000.
Schmidtpott, Friedrich: *See—*
Backes, Reiner; and Schmidtpott, Friedrich, 4,633,106, Cl. 307-578.000.
Schmoock, Roy F., to Fischer & Porter Company. Capacitance-type electrode assemblies for electromagnetic flowmeter. 4,631,969, Cl. 73-861.120.
Schneider, David A.: *See—*
Payne, Thomas R.; and Schneider, David A., 4,633,067, Cl. 219-483.000.
Schneider, William B.: *See—*
Kaplan, Irwin; and Schneider, William B., 4,632,547, Cl. 356-247.000.
Schoeps, Jochen: *See—*
Kress, Hans-Jurgen; Eichenauer, Herbert; Ott, Karl-Heinz; Schoeps, Jochen; and Pischtschan, Alfred, 4,632,956, Cl. 524-359.000.
Schoernig, Eberhard: *See—*
Heist, Hans; Toepfer, Dieter; Britzke, Sylvia; and Schoernig, Eberhard, 4,632,382, Cl. 271-273.000.
Schoop, Gunther-Dietmar; Roling, Franz; Grundken, Dieter; Redder, Manfred; Schewinski, Hartmut; and Sauer, Michael, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyor channel section. 4,632,239, Cl. 198-735.000.
Schotz, Larry, to Recoton Corporation. TV stereo adapter. 4,633,495, Cl. 381-3.000.
Schrammen, Peter; and Weide, Jurgen, to Wegmann & Co. GmbH. Device for measuring axle geometry of motor vehicles with the wheels turning. 4,631,832, Cl. 33-203.140.
Schubert, Dietmar: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.
Schuh, Frank J.; and Karish, John, to Atlantic Richfield Company. Subsea wellhead apparatus. 4,632,188, Cl. 166-368.000.
Schuller, Reinhard; and Koch, Gerhard, to Krauss-Maffei Aktiengesellschaft. Aircraft-towing tractor. 4,632,625, Cl. 414-429.000.
Schulte, Heinz, to Mannesmann Rexroth GmbH. Apparatus for controlling an adjustable arm. 4,632,016, Cl. 91-461.000.
Schultz, Steven G., to Abbott Laboratories. Heating system for rotating members. 4,632,908, Cl. 436-157.000.
Schurmann, Horst: *See—*
Ulubay, Hasan; and Schurmann, Horst, 4,632,730, Cl. 162-111.000.
Schurter, Rolf; Thummel, Rudolph C.; Topfl, Werner; Meyer, Willy; and Durr, Dieter, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-triazinylureas as herbicides and plant growth regulants. 4,632,695, Cl. 71-93.000.
Schutten, Herman P.: *See—*
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,633,281, Cl. 357-22.000.
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,633,278, Cl. 357-6.000.
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, to SKW Trostberg Aktiengesellschaft; and Haarmann & Reimer GmbH. Process for the production of concentrated extracts from plants. 4,632,837, Cl. 426-425.000.
Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,631,830, Cl. 33-125.00R.
Schweissindustrie Oerlikon Buhrle AG: *See—*
Werner, Alexander; and Pfenninger, Heinz, 4,632,882, Cl. 428-558.000.

Schwenninger, Ronald L., to PPG Industries, Inc. Induction heating vessel. 4,633,481, Cl. 373-152.000.
Science and Technology Agency: *See—*
Yamamoto, Masahiro; Tanaka, Hiroshi; and Watanabe, Chihiro, 4,632,808, Cl. 422-72.000.
Scifres, Donald R.; and Harnagel, Gary L., to Spectra Diode Laboratories, Inc. Semiconductor laser with internal reflectors and vertical output. 4,633,476, Cl. 372-45.000.
SCM Corporation: *See—*
Baucom, Keith B., 4,633,020, Cl. 568-13.000.
Scopatz, Stephen D., to Pennwalt Corporation. Method for adjusting weight breaks reactive to changes in distribution of object weight. 4,632,254, Cl. 209-592.000.
Scordo, Dominick, to AT&T Bell Laboratories. Clock circuit synchronizer using a frequency synthesizer controlled by a frequency estimator. 4,633,193, Cl. 331-1.00A.
Scott, Curtis E.; and McVey, Charles I., to General Electric Company. Glaze polished polycrystalline alumina material. 4,633,137, Cl. 313-636.000.
Scott, W. Thomas; and Soukup, Jerome, to Ceco Corporation, The. Ratchet wrench for scaffolding screw jack. 4,631,991, Cl. 81-90.100.
Scrivens, George W., to Surgikos Inc. Method of making apparel. 4,631,756, Cl. 2-243.00R.
Sea Marconi Technologies S.p.A.: *See—*
Tundo, Pietro, 4,632,742, Cl. 204-158.210.
Seaman, A. Matthew, to Cutters Exchange, Inc. Knife assembly for belt loop tacker. 4,632,047, Cl. 112-121.270.
Sease, R. Gregg. Molding strips and assembly thereof for mounting a flexible covering onto a support surface. 4,631,882, Cl. 52-222.000.
Seats Incorporated: *See—*
Hofrichter, James W.; and VanDuser, Harold J., 4,632,457, Cl. 297-335.000.
Sebring, Robert: *See—*
Coplan, Myron J.; Bilewski, Friedhelm; Sebring, Robert; and Schiffer, Daniel K., 4,632,756, Cl. 210-323.200.
Secretary of State for Defence in Her Britannic Majesty'Government of the United Kingdom of Great Britain and Nothern Ireland, The: *See—*
Gray, George W.; and Nicholas, Beatrice M., 4,632,515, Cl. 350-350.00R.
Sedlack, Mark A.: *See—*
Meeker, Paul K.; and Sedlack, Mark A., 4,632,460, Cl. 297-467.000.
Seelman, Hans H., to Linde Aktiengesellschaft. Controls for the drive of a vehicle with differential speed steering. 4,631,920, Cl. 60-421.000.
Segawa, Hideo; Inokuchi, Toshiyuki; Shibaguchi, Takashi; and Asano, Fumio, to Ricoh Company, Ltd. Optical writing device. 4,633,271, Cl. 346-107.00R.
Segebrecht, Udo; and Auschrat, Siegfried, to Sihi GmbH & Co. KG. Gas jet pump. 4,632,649, Cl. 417-151.000.
Seidah, Nabil G.; and Chretien, Michel. N-terminal fragment of human pro-opiomelanocortin and process therefor. 4,632,780, Cl. 530-306.000.
Seiei Kohsan Co., Ltd.: *See—*
Shimizu, Katsuo, 4,632,718, Cl. 156-352.000.
Seiko Epson Corporation: *See—*
Ito, Kiyoshi; and Takekoshi, Taro, 4,632,581, Cl. 400-187.000.
Seiko Instruments & Electronics Ltd.: *See—*
Taguchi, Masaaki; Harada, Takamasa; and Suenaga, Hitoshi, 4,633,012, Cl. 560-138.000.
Sekiguchi, Toru, to NEC Corporation. Tape address adjusting apparatus for video tape recorder. 4,633,341, Cl. 360-73.000.
Sekikawa, Katsuhide, to Mitsubishi Denki Kabushiki Kaisha. Numerical control device. 4,633,409, Cl. 364-474.000.
Sekiya, Fukuo, to Citizen Watch Company Limited. Row conductor scanning drive circuit for matrix display panel. 4,633,242, Cl. 340-719.000.
Sekiya, Isao: *See—*
Goto, Taizan; and Sekiya, Isao, 4,632,060, Cl. 118-730.000.
Selenia, Industrie Eletroniche Associate, S.p.A.: *See—*
Giaccari, Ennio, 4,633,254, Cl. 342-91.000.
Semiconductor Energy Laboratory Co. Ltd.: *See—*
Yamazaki, Shunpei, 4,631,801, Cl. 29-572.000.
Yamazaki, Shunpei, 4,633,287, Cl. 357-30.000.
Semmler, Caryl J.; Cook, Carol A.; and Smith, Jackie D., to Board of Regents, The University of Texas System. Neonatal infant seat. 4,631,766, Cl. 5-431.000.
Senderowicz, Daniel, to Intel Corporation. DC offset correction circuit utilizing switched capacitor differential integrator. 4,633,223, Cl. 340-347.0CC.
Senderowicz, Daniel, to Intel Corporation. Switched capacitor filter utilizing a differential input and output circuit. 4,633,425, Cl. 364-825.000.
Sennheiser Electronic KG: *See—*
Warnke, Egon F.; and Willemsen, Klaus, 4,633,498, Cl. 381-23.100.
Serpell, Stephen C., to British Telecommunications public limited company. Generation of identification keys. 4,633,037, Cl. 178-22.140.
Seyler, Jay K.; and Orlowski, Ronald C., to Armour Pharmaceutical Corp. 6-serine, des-19-leucine calcitonin. 4,632,978, Cl. 530-307.000.
SGS-ATES Deutschland Halbleiter Bauelement GmbH: *See—*
Melbert, Joachim G., 4,633,162, Cl. 323-275.000.
Shacket, Sheldon; and Helfman, Robert, to Trus-Us Inc. Single story house addition structure and method. 4,631,893, Cl. 52-745.000.
Shames, Harold: *See—*
Shames, Sidney J.; and Shames, Harold, 4,632,142, Cl. 137-437.000.
Shames, Sidney J.; and Shames, Harold. Ballcock assembly. 4,632,142, Cl. 137-437.000.
Shamie, Louis. Folding baby carriage with double lock. 4,632,421, Cl. 280-642.000.
Sharon, Arie N.: *See—*
Melzi, Edward R.; and Sharon, Arie N., 4,632,268, Cl. 220-1.00C.
Sharp Kabushiki Kaisha: *See—*
Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoro, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, 4,633,337, Cl. 360-57.000.
Kitamura, Kozo, 4,633,432, Cl. 364-900.000.
Komai, Kensaku; and Yoshida, Eiji, 4,633,396, Cl. 364-405.000.
Morimoto, Masafumi; Noda, Michihiro; Yanagiuchi, Shigenobu; and Yanagiuchi, Yasuko, 4,633,435, Cl. 364-900.000.
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,633,499, Cl. 381-43.000.
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigelu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,632,894, Cl. 430-84.000.
Takazume, Masafumi; and Ishikawa, Kazuhiko, 4,633,065, Cl. 219-400.000.
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,632,879, Cl. 428-522.000.
Taneya, Mototaka; Matsui, Sadayoshi; Matsumoto, Mitsuhiro; and Hayashi, Hiroshi, 4,632,709, Cl. 148-171.000.
Shaw, Robert A., to Digital Equipment Corporation. Phase-locked loop for MFM data recording 4,633,488, Cl. 375-120.000.
Shay, Robert H.; Berger, Kerry R.; and Bannos, Thomas S., to Air Products and Chemicals, Inc. Protective atmosphere process for annealing and/or hardening ferrous metals. 4,632,707, Cl. 148-16.500.
Sheen, Norman R.: *See—*
Bresenham, Jack E.; Bowater, Ronald J.; Gay, Adrian C.; and Sheen, Norman R., 4,633,243, Cl. 340-732.000.
Sheets, James B.: *See—*
Brolin, Charles A.; Sheets, James B.; and Benson, Ryan H., 4,631,955, Cl. 73-158.000.
Sheffer, Phil B., to Merchandising Innovations, Inc. Executive desk with locking flaps. 4,632,040, Cl. 108-157.000.
Sheffer, Phil B., to Merchandising Innovations, Inc. Storage cube. 4,632,251, Cl. 206-577.000.
Shelestak, Larry J.: *See—*
Kunkle, Gerald E.; Demarest, Henry M.; and Shelestak, Larry J., 4,632,687, Cl. 65-27.000.
Sherritt Gordon Mines Limited: *See—*
Genik-Sas-Berezowsky, Roman M.; and Weir, Donald R., 4,632,701, Cl. 75-118.00R.
Sherwin, Gary W.; and Mohan, Edwin R., to Westinghouse Electric Corp. Subkeratinous electroencephalographic probe. 4,632,120, Cl. 128-639.000.
Sherwood Medical Company: *See—*
Geil, James A., 4,632,108, Cl. 128-207.140.
Sheth, Vikram K.: *See—*
Lomasney, Henry L.; Grawe, John G.; and Sheth, Vikram K., 4,632,847, Cl. 427-154.000.
Shi, Yan-Chi: *See—*
Olsson, Nils A.; and Shi, Yan-Chi, 4,632,552, Cl. 356-345.000.
Shibaguchi, Takashi: *See—*
Segawa, Hideo; Inokuchi, Toshiyuki; Shibaguchi, Takashi; and Asano, Fumio, 4,633,271, Cl. 346-107.00R.
Shibamoto, Takeshi: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.
Shibasaki, Masakatsu; Sodeoka, Mikiko; and Ogawa, Yuji, to Sagami Chemical Research Center. Method for preparing cis-bicyclo[3.3.-0]octylidene derivative. 4,632,997, Cl. 549-214.000.
Shibata, Tomoo; and Jurdi, Wissam J., to Ricoh Electronics, Inc. Thermosensitive recording label. 4,633,276, Cl. 346-200.000.
Shibayama, Takashi; and Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Regulator valve for hydraulic control system including variable displacement pump. 4,632,638, Cl. 417-218.000.
Shiga, Koji, to Fuji Photo Film Co., Ltd. Automatic exposure device in camera for microfilm. 4,632,540, Cl. 355-68.000.
Shigeta, Yoshiharu: *See—*
Kikuchi, Hiroyuki; Iwata, Atsushi; Matsuura, Takashi; and Shigeta, Yoshiharu, 4,633,194, Cl. 331-25.000.
Shikatani, Osamu; and Yamaguchi, Jun, to Sumitomo Electric Industries, Ltd. Marked single-crystal III-V group compound semiconductor wafer. 4,632,884, Cl. 428-642.000.
Shimamaki, Keiichi: *See—*
Hamuro, Mitsuro; Anao, Kimiharu; and Shimamaki, Keiichi, 4,633,370, Cl. 361-380.000.
Shimano, Noriyuki: *See—*
Saito, Isao; and Shimano, Noriyuki, 4,633,328, Cl. 358-296.000.
Shimbo, Takao; and Kurokawa, Hiroto, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,633,452, Cl. 369-39.000.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, to Sumitomo Chemical Company, Limited; and Nippon Electric Co., Ltd. Liquid crystal dye compound. 4,632,781, Cl. 260-380.000.
Shimizu, Akihiro: *See—*
Kume, Hitoshi; Hagiwara, Takaaki; Horiuchi, Masatada; Kaga, Toru; Igura, Yasuo; and Shimizu, Akihiro, 4,633,438, Cl. 365-51.000.

Shimizu, Katsuo, to Seiei Kohsan Co., Ltd. Frame separator with positioning pin. 4,632,718, Cl. 156-352.000.
Shimizu, Tadao: *See—*
Takano, Hirokuni; Shimizu, Tadao; and Izaki, Osamu, 4,632,579, Cl. 400-121.000.
Shimizu, Taku: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, 4,632,810, Cl. 423-242.000
Shimono, Mamoru, to Kabushiki Kaisha Toshiba. Developing apparatus. 4,632,534, Cl. 355-3.0DD.
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treating waste gas to separate and recover gypsum and dust therein. 4,632,810, Cl. 423-242.000.
Shinoda, Nobuhiko: *See—*
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; and Hosoe, Kazuya, 4,633,075, Cl. 250-201.000.
Shinohara, Hayato: *See—*
Harada, Yuji; and Shinohara, Hayato, 4,631,820, Cl. 29-840.000.
Shintaku, Yasuyuki; and Hiraishi, Hisashi, to Chugai Ro Co., Ltd.; and Kubota, Ltd. Fiber reinforced metal alloy and method for the manufacture thereof. 4,631,793, Cl. 29-132.000.
Shionogi & Co., Ltd.: *See—*
Sato, Akihiko; and Nakajima, Kunihiro, 4,632,907, Cl. 436-10.000.
Shiotani, Nobuo: *See—*
Jinba, Terumasa; Fukunaka, Shiro; Anan, Tatsuro; and Shiotani, Nobuo, 4,632,733, Cl. 204-28.000.
Shira, Glenn L.: *See—*
Colwell, Robert E., Jr.; and Shira, Glenn L., 4,632,690, Cl. 65-134.000.
Shirai, Teruhito: *See—*
Iwata, Masahiro; Shirai, Teruhito; and Watanabe, Toshio, 4,631,949, Cl. 72-270.000.
Shiraishi, Daiichi: *See—*
Motonami, Masanao; Hiramatsu, Eiji; and Shiraishi, Daiichi, 4,631,865, Cl. 49-374.000.
Shiraishi, Shinji: *See—*
Kaneko, Hideo; Murata, Akira; Inoue, Eiji; Satoh, Satoshi; Shiraishi, Shinji; and Hiwasa, Shoichi, 4,632,173, Cl. 164-417.000.
Shirasu, Hirotoshi: *See—*
Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, 4,633,460, Cl. 370-58.000.
Shirilla, John E.: *See—*
Waltz, Thomas A.; and Shirilla, John E., 4,633,374, Cl. 362-17.000.
Shirouzu, Tatsuo; Sakata, Nobuhiro; Kono, Masaki; and Inagaki, Saburo, to Alps Electric Co., Ltd. Locking device for electronic parts. 4,631,811, Cl. 29-705.000.
Shively, Edward H.: *See—*
Mickelson, N. Peter; and Shively, Edward H., 4,633,359, Cl. 361-119.000.
Shmuel, Sorek: *See—*
Gordon, Tsvi J.; Shmuel, Sorek; and Moseinco, David, 4,632,033, Cl. 102-252.000.
Shofner, Frederick M., to ppm, Inc. Conditioned gas flow methods for processing and cleaning fiber, including aeromechanical and electrodynamic release and separation. 4,631,781, Cl. 19-200.000.
Shortlidge, Joseph S.: *See—*
Lang, Donald; and Shortlidge, Joseph S., 4,632,344, Cl. 248-165.000.
Shukla, Vishwa: *See—*
Berg, Peter G.; Shukla, Vishwa; Kulwicki, Bernard M.; and Conlan, Thomas C., 4,633,069, Cl. 219-553.000.
Sick, Erwin; and Schenk, Christoph, to Erwin Sick GmbH Optik-Elektronik. Grooved surface defect detection apparatus. 4,632,546, Cl. 356-237.000.
Sider, Richard G.: *See—*
Herbst, John J.; Sider, Richard G.; Jaquith, Robert E.; and Meijer, Christoffel H., 4,632,802, Cl. 376-216.000.
Sidoti, Kenneth C. Simulated bolt. 4,632,616, Cl. 411-480.000.
Siebert, Wolfgang: *See—*
Geissen, Rolf; and Siebert, Wolfgang, 4,632,998, Cl. 549-248.000.
Siegl, Christopher M.: *See—*
Watson, Charles W., Jr.; and Siegl, Christopher M., 4,633,421, Cl. 364-569.000.
Siemens Aktiengesellschaft: *See—*
Bar, Albrecht, 4,633,431, Cl. 364-900.000.
Fellinger, Christine; Leipold, Ludwig; and Tihanyi, Jeno, 4,633,292, Cl. 357-53.000.
Herberg, Helmut, 4,633,288, Cl. 357-38.000.
Hiller, Dietmar; and Saugeon, Ulrich, 4,632,124, Cl. 128-660.000.
Meinhof, Andre H., 4,633,267, Cl. 346-1.100.
Storck, Eckhard; and Wolff, Ulrich, 4,633,171, Cl. 324-77.00K.
Voss, Erich; and Wollnik, Hermann, 4,633,208, Cl. 335-210.000.
Zojer, Bernhard; and Petschacher, Reinhard, 4,633,219, Cl. 340-347.0AD.
Siemens Corporate Research & Support, Inc.: *See—*
Chiu, Ming-Yee, 4,633,388, Cl. 364-200.000.
Siemens Energy & Automation, Inc.: *See—*
McClellan, David P.; Brown, John M.; and Heberlein, Gustave E., Jr., 4,633,207, Cl. 335-16.000.
Siems, William F.: *See—*
Knorr, Fritz J.; Eatherton, Randy L.; Siems, William F.; and Hill, Herbert H., Jr., 4,633,083, Cl. 250-282.000.
Sierra, Rafael. Lock structures. 4,631,942, Cl. 70-368.000.
Signetics Corporation: *See—*
Mahmud, Syed T., 4,633,098, Cl. 307-279.000.
Sigwalt, Roland: *See—*
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.
Sihi GmbH & Co. KG: *See—*
Segebrecht, Udo; and Auschrat, Siegfried, 4,632,649, Cl. 417-151.000.
Silber, Nathaniel L.: *See—*
Goeb, Robert; and Silber, Nathaniel L., 4,633,487, Cl. 375-118.000.
Silverberg, Mort: *See—*
Whittaker, Gary L.; and Silverberg, Mort, 4,632,054, Cl. 118-657.000.
Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inking mechanism for letterpress and offset printing machines. 4,632,029, Cl. 101-348.000.
Simmons, Arturo: *See—*
Teherani, Towfik H.; and Simmons, Arturo, 4,632,886, Cl. 428-698.000.
Simms, John A.: *See—*
Altschuler, Lili W.; and Simms, John A., 4,632,964, Cl. 525-456.000.
Simone, Raymond J., to Automation Equipment Company. Programmable industrial robot having simplified construction. 4,632,632, Cl. 414-744.00A.
Sinclair, Paul L., to Schlumberger Technology Corporation. Connector for ceramic hybrid circuits for well-logging tools and method for connecting ceramic hybrid circuits for use in well-logging tools. 4,632,484, Cl. 339-75.0MP.
Singer Company, The: *See—*
Reed, John T., 4,631,867, Cl. 51-2.00R.
Singer, Morris. Retractable bed with a pivoted screw drive. 4,631,763, Cl. 5-149.000.
Singh, Balwant; and Forgione, Peter S., to American Cyanamid Company. Tertiary aralkyl triurethane. 4,633,010, Cl. 560-25.000.
Sink, Danny R.: *See—*
Taylor, Robert L.; Sink, Danny R.; and Cudzik, Daniel F., 4,632,271, Cl. 220-258.000.
Siraco, Frank J.: *See—*
Barrett, David S.; Ciccolo, Arthur; Fyler, Donald C.; Glick, F. Keith; Lawson, John R.; Sampson, Jay A.; Siraco, Frank J.; Whiteside, Robert D.; Whitney, Daniel E.; and Wood, George A., 4,632,046, Cl. 112-121.140.
Sissenstein, David W., Jr.: *See—*
Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., 4,632,295, Cl. 228-123.000.
Sjunnesson, Bengt O., to GKN-Stenman AB. Cylinder lock with permissible service entry. 4,631,941, Cl. 70-337.000.
Skatrud, Ralph O.; and Storm, Chester L., to International Business Machines Corp. Detecting and recovering from fault condition in a serial loop data transmission system. 4,633,468, Cl. 371-22.000.
Skerlos, Peter C.; Zato, Thomas J.; and Jones, Gary A., to Zenith Electronics Corporation. Television receiver having teletext processor with ROM for on-screen message. 4,633,297, Cl. 358-22.000.
SKF GmbH: *See—*
Feldle, Kurt; and Kaschube, Karl-Friedrich, 4,632,404, Cl. 277-68.000.
SKF (U.K.) Limited: *See—*
Neal, Hubert W. T., 4,632,576, Cl. 384-537.000.
Skinner, James, to Daymond, division of Redpath Industries Limited. Gutter system. 4,632,342, Cl. 248-48.200.
Skinner, Michael J., to Custom Cable Assemblies, Inc. Hood for electronic cable connector. 4,632,489, Cl. 339-103.00R.
Skura, William A., to Uniroyal Power Transmission Company, Inc. Power transmission belt and method. 4,632,665, Cl. 474-205.000.
SKW Trostberg Aktiengesellschaft: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.
Slack, Donald H., to Lincoln Packaging Corp. Storage container blank. 4,632,301, Cl. 206-292.000.
Slanker, Steven R., to Nalco Chemical Company. Polycarboxylic acid ester drawing and ironing lubricant emulsions and concentrates. 4,632,770, Cl. 252-49.500.
Slater, Robert A.: *See—*
Emmett, John C.; and Slater, Robert A., 4,632,924, Cl. 514-255.000.
Slavicek, Donald. Method of making a tape carrier. 4,631,897, Cl. 53-399.000.
Slawinski, Christopher: *See—*
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,631,803, Cl. 29-576.00W.
Small, Tony M., to Halliburton Company. Well logging instrument including shock isolation system. 4,633,248, Cl. 340-853.000.
Small, Vernon R.: *See—*
Liston, Thomas V.; Lowe, Warren; and Small, Vernon R., 4,632,771, Cl. 252-32.70E.
Smallwood, Larry D.; and Sprunt, Eve S., to Mobil Oil Corporation. Shear acoustic energy anisotropy of subsurface formations. 4,631,964, Cl. 73-594.000.
Smallwood, Larry D.: *See—*
Sprunt, Eve S.; and Smallwood, Larry D., 4,631,963, Cl. 73-594.000.
Smith, Desmond P.: *See—*
Dick, David A.; Folland, Rickworth; Smith, Desmond P.; and Staines, Glyn, 4,632,799, Cl. 264-292.000.
Smith, Douglas W. P., to Devron Engineering Limited. Solenoid operated check valve. 4,631,923, Cl. 60-530.000.

Smith, Duane H.: *See—*
Moradi-Araghi, Ahmad; and Smith, Duane H., 4,632,185, Cl. 166-273.000.
Smith, Edward H.: *See—*
Smith, William H., 4,632,636, Cl. 416-223.00R.
Smith, Henry I.; Atwater, Harry A.; Thompson, Carl V.; and Geis, Michael W., to Massachusetts Institute of Technology. Orientation filtering for crystalline films. 4,632,723, Cl. 156-617.00R.
Smith International, Inc.: *See—*
Geczy, Bela, 4,632,193, Cl. 175-65.000.
Kar, Nareshchandra J.; and Roth, Cary A., 4,632,401, Cl. 277-1.000.
Smith, Jackie D.: *See—*
Semmler, Caryl J.; Cook, Carol A.; and Smith, Jackie D., 4,631,766, Cl. 5-431.000.
Smith, James C.; and Rehman, William R., to Nordson Corporation. Adhesive foam generating nozzle. 4,632,314, Cl. 239-433.000.
Smith, James L., to Eastman Kodak Company. Filament coherency enhancing composition and textile yarns coated therewith. 4,632,874, Cl. 428-394.000.
Smith, Karl E., to Bethea Electrical Products, Inc. Bundle conductor stringing block gate. 4,632,364, Cl. 254-405.000.
Smith, Kellen R.: *See—*
Smith, Quintin R.; and Smith, Kellen R., 4,632,691, Cl. 65-273.000.
Smith, Norman: *See—*
Genco, Jerry J.; and Smith, Norman, 4,633,110, Cl. 310-71.000.
Smith, Quintin R.; and Smith, Kellen R. Complexly curved mold. 4,632,691, Cl. 65-273.000.
Smith, Richard C., to R. C. Smith Company. Cabinet assembly. 4,632,473, Cl. 312-257.0SK.
Smith, Richard W., to Wangner Systems Corporation. Woven low permeability fabric and method. 4,632,716, Cl. 156-148.000.
Smith Valve Corporation: *See—*
Harding, Bruce L., 4,632,140, Cl. 137-315.000.
Smith, William H., to Smith, Edward H. Propeller with blades having regressive pitch. 4,632,636, Cl. 416-223.00R.
SmithKline Beckman Corporation: *See—*
Emmett, John C.; and Slater, Robert A., 4,632,924, Cl. 514-255.000.
SMS Schloemann-Siemag AG: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Hollmann, Friedrich, 4,631,948, Cl. 72-242.000.
Snyder, Frank V.: *See—*
Raymond, Frank P.; and Snyder, Frank V., 4,632,051, Cl. 114-311.000.
Sobel, David D. Method for simultaneously cutting a plurality of picture frame mats. 4,631,997, Cl. 83-29.000.
Societe Anonyme D.B.A.: *See—*
Mery, Jean-Claude; Sauvee, Jean-Paul; and Thioux, Alain, 4,632,227, Cl. 188-73.320.
Societe d'Exploitation des Procedes Marechal (SEPM): *See—*
Le Magourou, Yves, 4,632,481, Cl. 339-46.000.
Societe Europeenne de Propulsion: *See—*
Le Tanter, Gerard; and Luscan, Bernard, 4,631,916, Cl. 60-245.000.
Societe Multibio: *See—*
Lebesgue, Yves; and Zeana, Alexandru, 4,632,692, Cl. 71-10.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Adrian, Robert; and Goulin, Maurice, 4,632,440, Cl. 292-229.000.
Sodeoka, Mikiko: *See—*
Shibasaki, Masakatsu; Sodeoka, Mikiko; and Ogawa, Yuji, 4,632,997, Cl. 549-214.000.
Soderhamns Verkstader AB: *See—*
Persson, Borje, 4,632,164, Cl. 144-341.000.
Sofec, Inc.: *See—*
Kiely, William L.; and Pedersen, Kristen I., 4,632,663, Cl. 441-5.000.
Softley, Eric J.: *See—*
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.
Sogabe, Masatoyo: *See—*
Kawada, Shigeki; Amemiya, Yoichi; Sogabe, Masatoyo; and Iwamatsu, Noboru, 4,631,807, Cl. 29-598.000.
Sold, Roland: *See—*
Schaeffer, Norbert; Pfefferkorn, Dietmar; Sold, Roland; Brinkmann, Uwe; Kreitner, Ludwig; and Sigwalt, Roland, 4,632,334, Cl. 242-199.000.
Somers, W. Karl; and Goble, Marlowe E., to Goble, Marlowe E. Suture anchor assembly. 4,632,100, Cl. 128-92.000.
Sommers, Louis, to S.R.C. Textiles, Inc. Knitted waistband curl-preventing strip. 4,631,932, Cl. 66-192.000.
Sondermeier, Johann: *See—*
Bleeker, Jochen; and Sondermeier, Johann, 4,632,306, Cl. 237-12.30C.
Sonobe, Hiraku; Miyake, Hiroyuki; and Kashiwabara, Akihiro, to Canon Kabushiki Kaisha. Copying apparatus and an optical assembly usable therewith. 4,632,536, Cl. 355-3.00R.
Sony Corporation: *See—*
Harada, Masayuki, 4,633,355, Cl. 360-132.000.
Mogi, Takao; and Suematsu, Masayuki, 4,633,313, Cl. 358-160.000.
Nishimura, Yoshikazu; Yasukouchi, Yoshimi; and Asakura, Hisao, 4,633,187, Cl. 329-50.000.
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Sato, Noboru; and Watanabe, Kenjirou, 4,633,338, Cl. 360-59.000.
Takahashi, Kenji, 4,633,356, Cl. 360-133.000.
Tanaka, Yutaka, 4,633,299, Cl. 358-29.000.
Watanabe, Kenjiro; Sakamoto, Susumu; and Akamatsu, Junichi, 4,633,273, Cl. 346-135.100.
Yamamoto, Koichi; and Fujioka, Yoshihisa, 4,633,522, Cl. 455-603.000.
Sorensen, Fred L.: *See—*
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Sorenson, Martin N.: *See—*
Tucknott, Kenneth A.; and Sorenson, Martin N., 4,633,237, Cl. 340-573.000.
Soriano, David S.: *See—*
Nalewajek, David; and Soriano, David S., 4,633,005, Cl. 558-125.000.
Soukup, Jerome: *See—*
Scott, W. Thomas; and Soukup, Jerome, 4,631,991, Cl. 81-90.100.
Souma, Keinosuke: *See—*
Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, 4,632,161, Cl. 144-213.000.
Spanjer, Keith G.: *See—*
Olsen, Dennis R.; and Spanjer, Keith G., 4,631,805, Cl. 29-588.000.
SPAR Aerospace Limited: *See—*
Mok, Chuck K.; and Martin, Alain, 4,633,258, Cl. 342-373.000.
Spectra Diode Laboratories, Inc.: *See—*
Scifres, Donald R.; and Harnagel, Gary L., 4,633,476, Cl. 372-45.000.
Spectrum CVD, Inc.: *See—*
Price, J. B.; Bunch, Matthew L.; and Stitz, Robert W., 4,632,057, Cl. 118-719.000.
Speed Star Co., Ltd.: *See—*
Minami, Saburo, 4,631,936, Cl. 70-167.000.
Spellman, Gordon B.: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.
Sperry Corporation: *See—*
Greeson, Jeffrey A.; and Zweifel, Terry L., 4,633,404, Cl. 364-433.000.
McCartney, Richard I., Jr., 4,633,143, Cl. 315-368.000.
Scheuneman, James H., 4,633,434, Cl. 364-900.000.
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., to University of Medicine & Dentistry of N.J. Process for prolonging recalcification, prothrombin and thrombin times of plasma. 4,632,919, Cl. 514-158.000.
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., to University of Medicine & Dentistry of New Jersey. Process for treating a warm-blooded animal following burn injury. 4,632,920, Cl. 514-158.000.
Sprague Devices, Inc.: *See—*
Frigon, Richard, 4,632,013, Cl. 91-7.000.
Sprague Electric Company: *See—*
Maher, Galeb H., 4,633,366, Cl. 361-321.000.
Sprague, Robert A., to Xerox Corporation. Eraseable solid state optical memories. 4,633,445, Cl. 365-234.000.
Sprecher & Schuh Gesellschaft m.b.H.: *See—*
Wogerbauer, Johann, 4,631,960, Cl. 73-384.000.
Sprung, Douglas L., to Pipemakers, Inc. Line travel normalizer. 4,632,366, Cl. 266-87.000.
Sprunt, Eve S.; and Smallwood, Larry D., to Mobil Oil Corporation. Method for measuring acoustic energy anisotropy through core samples. 4,631,963, Cl. 73-594.000.
Sprunt, Eve S.: *See—*
Smallwood, Larry D.; and Sprunt, Eve S., 4,631,964, Cl. 73-594.000.
Stabilus GmbH: *See—*
Oster, Wilhelm; and Eisenhauer, Horst, 4,632,228, Cl. 188-282.000.
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Stacer, Daniel R.: *See—*
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Staines, Glyn: *See—*
Dick, David A.; Folland, Rickworth; Smith, Desmond P.; and Staines, Glyn, 4,632,799, Cl. 264-292.000.
Stamm, Hubert: *See—*
Operschall, Hermann; and Stamm, Hubert, 4,632,740, Cl. 204-129.460.
Stamos, Mark E.: *See—*
Fields, Gary C.; and Stamos, Mark E., 4,633,042, Cl. 379-284.000.
Stanbel Group, The: *See—*
Bross, Elly, 4,632,472, Cl. 312-246.000.
Standard Elektrik Lorenz Aktiengesellschaft: *See—*
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Standard Oil Company, The: *See—*
Calahan, James L.; Cuellar, Edward A.; Desmond, Michael J.; and Currie, John C., 4,633,372, Cl. 361-433.000.
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., 4,632,774, Cl. 252-373.000.
McGarry, Phillip E., 4,632,750, Cl. 209-166.000.
Standard Oil Company (Indiana): *See—*
Domenico, Samuel N., 4,632,213, Cl. 181-106.000.
Standard Telephones and Cables Public Limited Company: *See—*
Byron, Kevin C., 4,633,428, Cl. 364-841.000.
Stanford, Joseph S. Bracing clamp for shoring structures. 4,632,221, Cl. 182-179.000.
Staodynamics, Inc.: *See—*
James, Donald N., 4,632,117, Cl. 128-421.000.

Stapp, Paul R.; and Pardue, Jerry E., to Phillips Petroleum Company. Sulfomethylated phenolic material useful in post primary oil recovery. 4,632,786, Cl. 260-512.00C.

Stark, Robert G., Jr.: *See—*
Stark, Robert G., Sr.; Stark, Tom; Stark, Robert G., Jr.; and Anderson, Joseph W., 4,632,148, Cl. 137-624.180.

Stark, Robert G., Sr.; Stark, Tom; Stark, Robert G., Jr.; and Anderson, Joseph W. Hydraulic distribution valve. 4,632,148, Cl. 137-624.180.

Stark, Tom: *See—*
Stark, Robert G., Sr.; Stark, Tom; Stark, Robert G., Jr.; and Anderson, Joseph W., 4,632,148, Cl. 137-624.180.

Starnes, Robert L.; Katkocin, Dennis M.; Miller, Carl A.; and Strobel, Robert J., Jr., to Novo Laboratories, Inc. Microbial sulfhydryl oxidase. 4,632,905, Cl. 435-189.000.

Staschek, George, Jr.: *See—*
Uber, Harry B.; and Staschek, George, Jr., 4,633,515, Cl. 455-166.000.

Stashko, Daniel R., to GTE Valeron Corporation. Pin lock insert holder. 4,632,593, Cl. 403-316.000.

State of Israel, Ministry of Defence, Israel Military Industries, The: *See—*
Gordon, Tsvi J.; Shmuel, Sorek; and Moseinco, David, 4,632,033, Cl. 102-252.000.

Statt, Bernhard: *See—*
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Statt, David J.; Narayan, Badhri; and Zeitzoff, Peter M., to Eastman Kodak Company. Light sensing device. 4,633,092, Cl. 250-578.000.

Stauffer Chemical Company: *See—*
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Stawell, William B.: *See—*
McGeoch, Ian L. M.; and Stawell, William B., 4,633,251, Cl. 342-44.000.

Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., to Conoco Inc. Method of seismic data enhancement using a phase of rectified trace seismic parameter. 4,633,399, Cl. 364-421.000.

Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Digitally controlled phase locked loop system having coarse and fine locking modes. 4,633,298, Cl. 358-25.000.

Stegherr, Ludolf. Method and apparatus for milling and grooving wooden framing members esp. halving joints. 4,632,165, Cl. 144-371.000.

Steinberger, Michael L.: *See—*
Fitch, Theodore A.; and Steinberger, Michael L., 4,633,465, Cl. 371-6.000.

Steinberger, Ned, to Steinberger Sound Corporation. Tremolo device for an electric guitar. 4,632,004, Cl. 84-313.000.

Steinberger, Ned, to Steinberger Sound Corporation. Tremolo mechanism for an electric guitar. 4,632,005, Cl. 84-313.000.

Steinberger Sound Corporation: *See—*
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Steinberger, Ned, 4,632,005, Cl. 84-313.000.

Steinhilber, Friedhelm. Device for feeding individual sheets to an office machine. 4,632,379, Cl. 271-127.000.

Steiniger, Wolfgang: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; and Steiniger, Wolfgang, 4,632,130, Cl. 131-84.300.

Step Engineering: *See—*
Wilburn, Darrell L.; and Mick, John R., 4,633,417, Cl. 364-550.000.

Stephen, James C.: *See—*
Tucker, James E.; Lohmeyer, Charles W.; Beecher, John, III; and Stephen, James C., 4,632,061, Cl. 119-51.00R.

Stephens, Jeffrey D.: *See—*
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Sternasty, Richard S.: *See—*
Gallagher, Nicholas D.; Sternasty, Richard S.; and James, Richard A., 4,632,872, Cl. 428-350.000.

Sterwerf, Lester J., Jr., to Cincinnati Mine Machinery Company, The. Combined base member and bit holder with protected retainer. 4,632,463, Cl. 299-91.000.

Sterzer, Fred, to RCA Corporation. Scanning microwave hyperthermia with feedback temperature control. 4,632,127, Cl. 128-804.000.

Stevens, Robert; and Rosa, Thomas, to Alpha Industries, Inc. High power circulating. 4,633,199, Cl. 333-1.100.

Stewart, Bruce E.: *See—*
Meister, Earl E., III; and Stewart, Bruce E., 4,632,642, Cl. 417-363.000.

Stibbard, John H. A.: *See—*
Patel, Ranjana C.; Stibbard, John H. A.; Fisher, Michael G.; and Baldock, Terence W., 4,632,895, Cl. 430-201.000.

Stifle, John E.; Lee, Donald A.; and Bitzer, Donald L., to University of Illinois, The Board of Trustees of the. Multiple access communication on a CATV reverse channel. 4,633,462, Cl. 370-85.000.

Stirling Thermal Motors, Inc.: *See—*
Meijer, Roelf J.; and Ziph, Benjamin, 4,632,179, Cl. 165-47.000.

Stitz, Robert W.; and Price, J. B. CVD temperature control. 4,632,056, Cl. 118-712.000.

Stitz, Robert W.: *See—*
Price, J. B.; Bunch, Matthew L.; and Stitz, Robert W., 4,632,057, Cl. 118-719.000.

Stockbower, Ellsworth A.: *See—*
Broadbent, Ronald W.; and Stockbower, Ellsworth A., 4,632,851, Cl. 427-435.000.

Stockman, Robert M., to American Radionic Co., Inc. Metallized capacitor with protective interrupter device and method of making the same. 4,633,365, Cl. 361-272.000.

Stoll, Kurt. Mount for a proximity sensor. 4,632,352, Cl. 248-313.000.

Stone, Steven G.: *See—*
Bachman, Wesley J.; and Stone, Steven G., 4,633,252, Cl. 342-99.000.

Stoneburg Manufacturing, Inc.: *See—*
Anders, Harry N.; and Ballard, William E., 4,633,215, Cl. 340-84.000.

Storage Technology Corporation: *See—*
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Storage Technology Partners II: *See—*
Perera, S. Robert; and O'Keeffe, Michael J., 4,633,471, Cl. 371-38.000.
Rundell, John P., 4,633,391, Cl. 364-200.000.
Rundell, John P., 4,633,393, Cl. 364-200.000.

Storck, Eckhard; and Wolff, Ulrich, to Siemens Aktiengesellschaft. Window function for an aperture window. 4,633,171, Cl. 324-77.00K.

Storm, Chester L.: *See—*
Skatrud, Ralph O.; and Storm, Chester L., 4,633,468, Cl. 371-22.000.

Storviders Limited: *See—*
Jeffery, Michael R., 4,631,849, Cl. 40-610.000.

Stove, Andrew G.; and Vincent, Richard P., to U.S. Philips Corporation. Moving target indication system. 4,633,253, Cl. 342-162.000.

Stowe, David W.; and Kopera, Paul M., to Gould Inc. Method of making a polarization-insensitive, evanescent-wave, fused coupler with minimal environmental sensitivity. 4,632,513, Cl. 350-320.000.

Stoy, Erich: *See—*
Bald, Wilfried; Stoy, Erich; Rommen, Hans; and Hollmann, Friedrich, 4,631,948, Cl. 72-242.000.

Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Pressure sensitive fault current interrupter for metallized film capacitors with oil impregnate. 4,633,367, Cl. 361-272.000.

Strasser, Thaddeus B. Base having removable side rails for elevating a toilet. 4,631,759, Cl. 4-252.00R.

Strata Bit Corporation: *See—*
Dennis, Mahlon, 4,632,196, Cl. 175-329.000.

Strauven, Yvan A. J.: *See—*
Meeus, Marcel L.; Strauven, Yvan A. J.; and Groothaert, Luc A. J., 4,632,699, Cl. 75-0.50B.

Streater, August L., to Franklin Electric Co., Inc. Control system for permanent magnet synchronous motor. 4,633,157, Cl. 318-723.000.

Streepy, Gary S.: *See—*
Abbott, Maxwell T.; Streepy, Gary S.; Paulus, John R.; Barrera, Ricardo; and Brewer, David E., 4,632,836, Cl. 426-302.000.

Streets, Mary R.: *See—*
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Striebig AG: *See—*
Striebig, Ludwig, 4,631,999, Cl. 83-471.200.

Striebig, Ludwig, to Striebig AG. Board saw. 4,631,999, Cl. 83-471.200.

Stringfield, Horace C. Method and apparatus for improved inspection of continuous webs. 4,632,560, Cl. 356-431.000.

Strobel, Bernhard; and Ratzel, Dieter, to Bruker Medizintechnik GmbH. Process for the excitation of a sample for NMR tomography. 4,633,178, Cl. 324-309.000.

Strobel, Robert J., Jr.: *See—*
Starnes, Robert L.; Katkocin, Dennis M.; Miller, Carl A.; and Strobel, Robert J., Jr., 4,632,905, Cl. 435-189.000.

Stromgren, Peter; Hellman, Jan; and Hullberg, Soren. Apparatus for separating cutlery from restaurant waste. 4,632,253, Cl. 209-570.000.

Stromswold, Chester E.: *See—*
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Struzek, Kenneth: *See—*
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Stubbs, Graham S.: *See—*
Li, Tony C.; and Stubbs, Graham S., 4,633,309, Cl. 358-122.000.

Studt, William L.: *See—*
Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., 4,632,927, Cl. 514-272.000.

Stumpe, Werner: *See—*
Grauel, Ingolf; Kulke, Gunter; Muller, Egbert; and Stumpe, Werner, 4,632,466, Cl. 303-7.000.

Suchy, Peter, to Kraftwerk Union Aktiengesellschaft. Fuel assembly with square cross section for water-cooled nuclear reactors. 4,632,805, Cl. 376-446.000.

Suematsu, Masayuki: *See—*
Mogi, Takao; and Suematsu, Masayuki, 4,633,313, Cl. 358-160.000.

Suenaga, Hitoshi: *See—*
Taguchi, Masaaki; Harada, Takamasa; and Suenaga, Hitoshi, 4,633,012, Cl. 560-138.000.

Suesada, Kunio: *See—*
Yamamitsu, Chojuro; Ogura, Ichiro; Suesada, Kunio; and Iketani, Akira, 4,633,330, Cl. 358-310.000.

Suga, Yozo: *See—*
Konno, Toyohiko; Suga, Yozo; Nakamura, Motoharu; and Komatsu, Hajime, 4,632,708, Cl. 148-113.000.

Sugano, Kazuhiko: *See—*
Shibayama, Takashi; and Sugano, Kazuhiko, 4,632,638, Cl. 417-218.000.

Sugie, Masuo: *See—*
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Sugimoto, Hiroshi, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging apparatus using shim coil correction. 4,633,179, Cl. 324-309.000.

Sugiura, Muneharu; and Tajima, Akira, to Canon Kabushiki Kaisha. Focus apparatus for zoom lens system with distance detection. 4,633,072, Cl. 250-201.000.

Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, to Victor Company of Japan, Ltd. Information signal recording medium and reproducing apparatus therefor. 4,633,329, Cl. 358-310.000.

Sugiyama, Toshiaki: *See—*
Matsunaga, Yoshiki; Sugiyama, Toshiaki; and Maekawa, Eikichi, 4,632,984, Cl. 536-50.000.

Suh, John T.; Chung, Rack H., deceascd (by Chung, Betsy Y., executrix); Wang, Nai-Yi; and Barton, Jeffrey N., to USV Pharmaceutical Corp. Method of hypertensive treatment using phenyl-alkylene-2-pyridyl derivatives. 4,632,929, Cl. 514-317.000.

Sulzer Brothers Limited: *See—*
Heller, Rudolf; and Kern, Heiner, 4,632,153, Cl. 139-449.000.

Sumino, Toshihiko: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Hioki, Katsuhiko; and Sumino, Toshihiko, 4,632,782, Cl. 260-396.00R.

Sumitomo Chemical Company, Limited: *See—*
Fujita, Shigeo; Matsuda, Yoshinobu; and Sasaki, Akio, 4,632,711, Cl. 148-175.000.
Kanagawa, Shuichi; Takagishi, Hisao; Adachi, Teruho; and Kamio, Kunimasa, 4,632,966, Cl. 525-502.000.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,632,781, Cl. 260-380.000.

Sumitomo Electric Industries, Ltd.: *See—*
Hayashi, Hideki; and Kikuchi, Kenichi, 4,631,802, Cl. 29-576.00E.
Ogino, Takao; Katsuya, Hiroo; Kato, Chiaki; Omori, Sigeiu; Kawauchi, Satsuki; Kato, Itsuro; and Kato, Tsutomu, 4,631,798, Cl. 29-458.000.
Shikatani, Osamu; and Yamaguchi, Jun, 4,632,884, Cl. 428-642.000.
Yazu, Shuji; Tsuji, Kazuo; and Yoshida, Akito, 4,632,817, Cl. 423-446.000.

Sumitomo Light Metal Industries, Ltd.: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Uno, Teruo; and Ikeda, Hiroshi, 4,632,885, Cl. 428-654.000.

Sumitomo Metal Industries, Ltd.: *See—*
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Summit Chemical Company: *See—*
Kase, Lawrence E.; and Branton, Philip L., 4,631,857, Cl. 43-132.100.

Sun, Houng, to Industrial Technology Research Institute. CNC grinding machine. 4,631,870, Cl. 51-165.710.

Sundstrand Corporation: *See—*
Patel, Navinchandra R., 4,633,113, Cl. 310-156.000.
Upadhyay, Anand, 4,633,381, Cl. 363-56.000.
Upadhyay, Anand; and Messenger, Lawrence W., 4,633,382, Cl. 363-132.000.

Sunsweet Growers, Inc.: *See—*
Gunnerson, Robert E., 4,632,027, Cl. 99-485.000.

Suominen, Heikki S.: *See—*
Tiitola, Juha K.; Ikonen, Juhani A.; Suominen, Heikki S.; and Henttonen, Juha A., 4,632,673, Cl. 604-415.000.

Surgikos Inc.: *See—*
Scrivens, George W., 4,631,756, Cl. 2-243.00R.

Suzuki, Fujio: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.

Suzuki, Fumiaki; Takeda, Toshiyuki; Inoue, Takeo; and Nakajima, Shigeo, to NEC Corporation; and Nippon Telegraph & Telephone Public Corporation. Electronic circuit capable of stably keeping a frequency during presence of a burst. 4,633,510, Cl. 455-69.000.

Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Polyphonic electronic musical instrument performing D/A conversion of tone waveshape data. 4,632,001, Cl. 84-1.010.

Suzuki, Kazuhiro, to Nippon Cable System Inc. Transmission operating device. 4,631,975, Cl. 74-473.00R.

Suzuki, Mikio: *See—*
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.

Suzuki, Morio: *See—*
Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, 4,632,478, Cl. 339-17.0LC.

Suzuki, Osamu: *See—*
Oishi, Kengo; and Suzuki, Osamu, 4,633,354, Cl. 360-132.000.

Suzuki, Taihei; Morita, Takashi; Shirasu, Hirotoshi; Kuwahara, Hiroshi; and Amada, Eiichi, to Hitachi, Ltd. Time division switching system. 4,633,460, Cl. 370-58.000.

Suzuki, Takashi: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Suzuki, Toshiaki: *See—*
Kozai, Hiroshi; Suzuki, Morio; Katoh, Matsuo; and Suzuki, Toshiaki, 4,632,478, Cl. 339-17.0LC.

Suzuki, Toshitake; Hama, Fumio; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive recording material. 4,633,277, Cl. 346-216.000.

Suzuki, Yasutoshi: *See—*
Ohmi, Shinya; Itoh, Hiroshi; Fukada, Tsuyoshi; Suzuki, Yasutoshi; and Hara, Kunihiko, 4,632,509, Cl. 350-283.000.

Svensson, Tomas: *See—*
Norberg, Rolf; and Svensson, Tomas, 4,633,424, Cl. 364-571.000.

Swallows, Elmer. Loader, transport and worktable cart. 4,632,627, Cl. 414-490.000.

Sweda, Michael: *See—*
Lasier, David D.; Meyer, John L.; and Sweda, Michael, 4,631,819, Cl. 29-840.000.

Sweetser, Robert W.: *See—*
Chesebro, Donald G.; and Sweetser, Robert W., 4,632,724, Cl. 156-626.000.

Switchcraft, Inc.: *See—*
Long, Eric L.; and Rosborough, Keith A., 4,632,488, Cl. 339-103.00R.

Swoboda, Johann: *See—*
Muench, Volker; Hambrecht, Juergen; Echte, Adolf; Illers, Karl H.; and Swoboda, Johann, 4,632,946, Cl. 523-179.000.

Syconex Corporation, The: *See—*
Lord, Harry C., III, 4,632,563, Cl. 356-437.000.

Symon, Georg, to Rieter Machine Works Ltd. Apparatus for interlacing a multi-filament yarn. 4,631,791, Cl. 28-271.000.

Sytsma, Roelof H.: *See—*
Lenting, Gerard J.; and Sytsma, Roelof H., 4,632,135, Cl. 132-85.000.

Szentes, John F.: *See—*
Gipp, Gregory H.; and Szentes, John F., 4,633,224, Cl. 340-347.00P.

Szentivanyi, Zsolt: *See—*
Buysch, Hans-Josef; Witt, Josef; and Szentivanyi, Zsolt, 4,633,016, Cl. 564-154.000.

Szeto, Rickens T.: *See—*
Boivie, Richard H.; Feiner, Alexander; Rabinowitz, Michele S.; Szeto, Rickens T.; and Weinbaum, Barry J., 4,633,041, Cl. 379-354.000.

Szombathelyi, Imre. Module element, building construction and method for erecting a building construction. 4,631,890, Cl. 52-570.000.

Taal, Martin: *See—*
Bilharz, Manfred; Henken, Fritz; Roper, Hartmut; Taal, Martin; Heider, Peter; Kohl, Ernst; and Schubert, Dietmar, 4,632,230, Cl. 192-0.033.

Tabak, Samuel A.: *See—*
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,633,027, Cl. 585-314.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,633,028, Cl. 585-331.000.

Tabasky, Marvin J.: *See—*
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,631,806, Cl. 29-589.000.
Poppert, Paul E.; Tabasky, Marvin J.; and Degenkolb, Eugene O., 4,633,290, Cl. 357-42.000.

Tadeka, Makoto: *See—*
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,633,008, Cl. 560-15.000.

Tadokoro, Akio: *See—*
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Taguchi, Masaaki; Harada, Takamasa; and Suenaga, Hitoshi, to Seiko Instruments & Electronics Ltd.; and Teikoku Chemical Industry Co., Ltd. Liquid crystal compound. 4,633,012, Cl. 560-138.000.

Taisei Corporation: *See—*
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.

Tajima, Akira: *See—*
Sugiura, Muneharu; and Tajima, Akira, 4,633,072, Cl. 250-201.000.

Takagi, Kazutoshi: *See—*
Yoshino, Hisakazu; Takagi, Kazutoshi; and Torii, Yoshitaka, 4,632,528, Cl. 351-211.000.

Takagi, Makoto: *See—*
Saiki, Masatsugu; Imai, Yoshio; and Takagi, Makoto, 4,632,767, Cl. 252-8.800.

Takagishi, Hisao: *See—*
Kanagawa, Shuichi; Takagishi, Hisao; Adachi, Teruho; and Kamio, Kunimasa, 4,632,966, Cl. 525-502.000.

Takahashi, Kaichiro: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Takahashi, Kenji, to Sony Corporation. Magnetic disc cartridge with counter display secured against inadvertent displacement. 4,633,356, Cl. 360-133.000.

Takahashi, Kentaro; Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Takeshita, Masajiro, to Nippon Piston Ring Co. Wear-resistant member for use in internal combustion engine and method for producing the same. 4,632,074, Cl. 123-90.390.

Takahashi, Nobuaki: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.

Takahashi, Noriyoshi: *See—*
Saitoh, Toshio; Takahashi, Noriyoshi; Sato, Masaki; and Watanabe, Masatoshi, 4,633,115, Cl. 310-213.000.

Takahashi, Sadayuki: *See—*
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, 4,633,120, Cl. 310-328.000.

Takahashi, Susumu; and Kanzaki, Hiroyuki, to Sansui Electric Co., Ltd. Near-instantaneous companding PCM involving accumulation of less significant bits removed from original data. 4,633,483, Cl. 375-25.000.

Takahashi, Takeshi: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,632,840, Cl. 426-602.000.

Takahashi, Tomowaki, to Nippon Kogaku K.K. Zoom lens including a wide angle of view. 4,632,519, Cl. 350-427.000.

Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, to Meiji Milk Products Company Limited. Process for preparation of dressings comprising W/O/W type multiple emulsions. 4,632,840, Cl. 426-602.000.

Takai, Kazuki, to Clarion Co., Ltd. Ejection mechanism for tape player. 4,633,348, Cl. 360-96.500.

Takamatsu, Shigeru; Ishihara, Yuji; and Takizawa, Masahiro, to TDK Corporation. Magnetic recording medium. 4,632,870, Cl. 428-329.000.

Takamura, Yoshiyuki, to Fuji Pack System Ltd. Wrapping machine and method of folding wrapping film in wrapping machine. 4,631,903, Cl. 53-466.000.

Takano, Hirokuni; Shimizu, Tadao; and Izaki, Osamu, to Oki Electric Industry Co., Ltd. Printing system in dot printer. 4,632,579, Cl. 400-121.000.

Takara, Senju; and Tanaka, Yoshihiro, to Toyo Kohan Co., Ltd; and Tobata Iron Works Co., Ltd. Coil-annealing spacer. 4,632,369, Cl. 266-262.000.

Takase, Shinichi: *See—*
Mizoguchi, Toshiaki; Wadaya, Shinichiro; Hashimoto, Kunihiro; and Takase, Shinichi, 4,633,352, Cl. 360-104.000.

Takasu, Hiromi, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Unit of light emitting diode arrays. 4,633,280, Cl. 357-17.000.

Takasugi, Eiji: *See—*
Niiho, Masaaki; Hara, Masato; and Takasugi, Eiji, 4,633,419, Cl. 364-559.000.

Takayama, Toshio; Ando, Hiromi; and Matsumoto, Yukio, to Tokico Ltd. Vehicle braking system. 4,632,208, Cl. 180-271.000.

Takazume, Masafumi; and Ishikawa, Kazuhiko, to Sharp Kabushiki Kaisha. Convection cooking apparatus. 4,633,065, Cl. 219-400.000.

Take, Hermann: *See—*
McVay, James D.; and Take, Hermann, 4,632,175, Cl. 164-426.000.

Takeda Chemical Industries, Ltd.: *See—*
Nagase, Hiroshi; and Sato, Yasuo, 4,632,938, Cl. 514-594.000.

Takeda, Keiji, to Fuji Photo Film Co., Ltd. Photopolymerizable image-recording process of producing a visible image. 4,632,899, Cl. 430-292.000.

Takeda, Toshiyuki: *See—*
Suzuki, Fumiaki; Takeda, Toshiyuki; Inoue, Takeo; and Nakajima, Shigeo, 4,633,510, Cl. 455-69.000.

Takeda, Yukio; Nakamura, Hiroshi; and Fukuda, Eisuke, to Fujitsu Limited. Receiver unit in radio communication system. 4,633,484, Cl. 375-77.000.

Takekoshi, Taro: *See—*
Ito, Kiyoshi; and Takekoshi, Taro, 4,632,581, Cl. 400-187.000.

Takemoto Yushi Kabushiki Kaisha: *See—*
Saiki, Masatsugu; Imai, Yoshio; and Takagi, Makoto, 4,632,767, Cl. 252-8.800.

Takemura, Yasuhiko: *See—*
Sato, Hozumi; Matsunaga, Tatsuaki; Iwanaga, Shin-ichiro; Enyo, Hiroji; Kawamura, Yoshiaki; and Takemura, Yasuhiko, 4,632,960, Cl. 525-117.000.

Takeshita, Masajiro: *See—*
Takahashi, Kentaro; Hiraoka, Takeshi; Nakamura, Yoshikatsu; and Takeshita, Masajiro, 4,632,074, Cl. 123-90.390.

Takeshita, Shigeru: *See—*
Tamura, Kazuhisa; Takeshita, Shigeru; and Fukunaga, Takao, 4,631,979, Cl. 74-730.000.

Takeuchi, Takikazu: *See—*
Horie, Tsuneo; Ozaki, Shoji; and Takeuchi, Takikazu, 4,633,336, Cl. 360-45.000.

Takigen Seizou Co. Ltd.: *See—*
Takimoto, Hideaki, 4,631,777, Cl. 16-315.000.

Takimoto, Hideaki, to Takigen Seizou Co. Ltd. Gravity door hinge. 4,631,777, Cl. 16-315.000.

Takizawa, Masahiro: *See—*
Takamatsu, Shigeru; Ishihara, Yuji; and Takizawa, Masahiro, 4,632,870, Cl. 428-329.000.

Talan, Jeffrey S. Method and apparatus for rapid manual transfer of data from standardized forms. 4,633,071, Cl. 235-487.000.

Tallant, James C., II, to RCA Corporation. Automatic kinescope bias control system. 4,633,321, Cl. 358-243.000.

Talwar, Anil K.: *See—*
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,821, Cl. 424-15.000.
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,822, Cl. 424-15.000.
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,823, Cl. 424-15.000.

Tam, Wee M. Cooking, fire, and burglar alarm system. 4,633,230, Cl. 340-521.000.

Tamada, Masuo: *See—*
Haruki, Kazuhito; Iwamoto, Masanori; and Tamada, Masuo, 4,632,252, Cl. 209-546.000.

Tamai, Shigeru: *See—*
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,632,840, Cl. 426-602.000.

Tamata, Shin: *See—*
Mizuno, Hiroko; Kikuchi, Makoto; Horiuchi, Susumu; and Tamata, Shin, 4,632,779, Cl. 252-629.000.

Tamiko Inc.: *See—*
Libin, Robert P., 4,632,095, Cl. 128-67.000.

Tamura, Kazuhisa; Takeshita, Shigeru; and Fukunaga, Takao, to Kabushiki Kaisha Daikin Seisakusho. Power transmission mechanism equipped with fluid and centrifugal clutch. 4,631,979, Cl. 74-730.000.

Tamura, Masahide: *See—*
Koga, Daisuke; Tamura, Masahide; and Naito, Yukio, 4,633,511, Cl. 455-86.000.

Tan, Sing L.: *See—*
van de Polder, Leendert J.; and Tan, Sing L., 4,633,295, Cl. 358-12.000.

Tanabe, Masanori; and Kawakami, Kanji, to Hitachi, Ltd. Feedback circuit for a semiconductor active element sensor. 4,633,099, Cl. 307-308.000.

Tanabe, Masato: *See—*
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.

Tanabe, Zenichi; Fukui, Toshiyasu; Uno, Teruo; and Ikeda, Hiroshi, to Sumitomo Light Metal Industries, Ltd. Aluminum base alloy clad material for use in heat exchangers. 4,632,885, Cl. 428-654.000.

Tanahashi, Haruhiko, to Toyota Jidosha Kabushiki Kaisha. Structure for mounting stabilizer in vehicle suspension. 4,632,423, Cl. 280-689.000.

Tanahashi, Toshitaka: *See—*
Nakamura, Mitsuo; Kaga, Sumihiro; and Tanahashi. Toshitaka, 4,633,364, Cl. 361-216.000.

Tanaka, Hideyuki: *See—*
Izumi, Akio; and Tanaka, Hideyuki, 4,633,319, Cl. 358-227.000.

Tanaka, Hiroshi: *See—*
Yamamoto, Masahiro; Tanaka, Hiroshi; and Watanabe, Chihiro, 4,632,808, Cl. 422-72.000.

Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture sensor. 4,632,879, Cl. 428-522.000.

Tanaka, Kenji: *See—*
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,633,008, Cl. 560-15.000.

Tanaka, Koji: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.

Tanaka, Kunio: *See—*
Fujita, Takayuki; Negishi, Shigetoshi; and Tanaka, Kunio, 4,631,816, Cl. 29-740.000.
Kishi, Hajimu; and Tanaka, Kunio, 4,633,469, Cl. 371-29.000.

Tanaka, Souhei: *See—*
Ishii, Taira; Misawa, Yoshihiko; Maeda, Yoshinobu; and Tanaka, Souhei, 4,631,800, Cl. 29-564.600.

Tanaka, Yoshihiro: *See—*
Takara, Senju; and Tanaka, Yoshihiro, 4,632,369, Cl. 266-262.000.

Tanaka, Yoshikazu; and Torii, Shunichi, to Hitachi, Ltd. Vector processor system comprised of plural vector processors. 4,633,389, Cl. 364-200.000.

Tanaka, Yoshito: *See—*
Nakayama, Koichi; and Tanaka, Yoshito, 4,633,444, Cl. 365-228.000.

Tanaka, Yutaka, to Sony Corporation. Color temperature control circuit using saturation level detector. 4,633,299, Cl. 358-29.000.

Taney, William H., to Berko Technology Corporation. Method and apparatus for converting television signals. 4,633,513, Cl. 455-131.000.

Taneya, Mototaka; Matsui, Sadayoshi; Matsumoto, Mitsuhiro; and Hayashi, Hiroshi, to Sharp Kabushiki Kaisha. Process for preventing melt-back in the production of aluminum-containing laser devices. 4,632,709, Cl. 148-171.000.

Tani, Chizuka: *See—*
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,632,781, Cl. 260-380.000.

Tapanainen, Matti. Procedure for manufacturing a brake block. 4,632,797, Cl. 264-260.000.

Taplast S.n.c.: *See—*
Evans, Santagiuliana, 4,632,264, Cl. 215-220.000.

Tarpley, Gerald W., Jr., to Ford Motor Company. Circuit for sensing the rotation stop of a take-up reel in a tape transport mechanism. 4,632,333, Cl. 242-186.000.

Tatani, Atsushi: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, 4,632,810, Cl. 423-242.000.

Tayler, Gerald E.: *See—*
Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; and Tayler, Gerald E., 4,633,387, Cl. 364-200.000.

Taylor, John E., to BICC Public Limited Company. Overhead flexible electric conductor. 4,632,506, Cl. 350-96.230.

Taylor, Robert L.; Sink, Danny R.; and Cudzik, Daniel F., to Reynolds Metals Company. Resealable container closure. 4,632,271, Cl. 220-258.000.

Taylor, Wilson G. Bowling ball. 4,632,396, Cl. 273-63.00A.

Tazuma, James J.: *See—*
Bergomi, Angelo; and Tazuma, James J., 4,632,988, Cl. 544-85.000.

TDK Corporation: *See—*
Kubota, Yuichi; and Watanabe, Akio, 4,632,866, Cl. 428-328.000.
Takamatsu, Shigeru; Ishihara, Yuji; and Takizawa, Masahiro, 4,632,870, Cl. 428-329.000.

Tegal Corporation: *See—*
Mirkovich, Ninko T.; and Zajac, John, 4,632,624, Cl. 414-217.000.

Teherani, Towfik H.; and Simmons, Arturo, to Texas Instruments Incorporated. Sulfidization of compound semiconductor surfaces and passivated mercury cadmium telluride substrates. 4,632,886, Cl. 428-698.000.

Teijin Seiki Company Limited: *See—*
Yamamura, Motohisa, 4,632,615, Cl. 409-235.000.

Teikoku Chemical Industry Co., Ltd.: *See—*
Taguchi, Masaaki; Harada, Takamasa; and Suenaga, Hitoshi, 4,633,012, Cl. 560-138.000.

Tektronix, Inc.: *See—*
Jones, Keith E., 4,633,205, Cl. 333-219.000.
McKibben, Barry A., 4,633,144, Cl. 315-382.000.

Teldix GmbH: *See—*
Ruff, Gerd, 4,633,201, Cl. 333-106.000.

Teledyne Industries, Inc.: *See—*
Brogdon, William, 4,632,072, Cl. 123-56.00R.

Temin, Samuel C.: *See—*
Wolfrey, Austin A.; and Temin, Samuel C., 4,632,859, Cl. 428-288.000.

Temperilli, Aldemio: *See—*
Bernardi, Luigi; Brambilla, Enzo; Chiodini, Laura; di Salle, Enrico; Ruggieri, Daniela; Sapini, Osvaldo; and Temperilli, Aldemio, 4,632,990, Cl. 544-329.000.

Temple, Stephen, to Xerox Corporation. Air-cooled apparatus. 4,632,539, Cl. 355-30.000.

Teng, Clarence W.: *See—*
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,631,803, Cl. 29-576.00W.

Teraoka, Masao, to Tochigifujisangyo Kabushikigaisha. Device for the distribution of motive power. 4,631,978, Cl. 74-710.500.

Terasawa, Masami: *See—*
Fujinaka, Hiroshi; and Terasawa, Masami, 4,632,846, Cl. 427-96.000.

Terauchi, Kiyoshi, to Sanden Corporation. Wobble plate type compressor with a capacity adjusting mechanism. 4,632,640, Cl. 417-269.000.

Terepin, Stephen, to Schlumberger Measurement & Control (U.K.) Ltd. Digital signal processor. 4,633,386, Cl. 364-200.000.

Terral, Donna K.: *See—*
Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., 4,633,399, Cl. 364-421.000.

Tetra Pak Developpement S.A.: *See—*
Ohlsson, Ingemar; Madsen, Finn T.; and Kjaerbye, Steffen, 4,632,854, Cl. 428-36.000.

Teunissen, Adrianus F.: *See—*
Kreeft, Hendrik K.; and Teunissen, Adrianus F., 4,632,327, Cl. 242-56.00R.

Texas Instruments Incorporated: *See—*
Berg, Peter G.; Shukla, Vishwa; Kulwicki, Bernard M.; and Conlan, Thomas C., 4,633,069, Cl. 219-553.000.
Childers, Jimmie D., 4,633,102, Cl. 307-354.000.
Childers, Jimmie D., 4,633,443, Cl. 365-203.000.
Flinchbaugh, Bruce E., 4,633,401, Cl. 364-421.000.
Flinchbaugh, Bruce E., 4,633,402, Cl. 364-421.000.
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,631,803, Cl. 29-576.00W.
Laws, Gerald E.; and Diefendorff, Keith E., 4,633,466, Cl. 371-16.000.
Teherani, Towfik H.; and Simmons, Arturo, 4,632,886, Cl. 428-698.000.
Tiku, Shiban K., 4,632,713, Cl. 148-188.000.
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,633,392, Cl. 364-200.000.

Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See—*
Feyerl, Gunther; Kalteis, August; and Meyer, Karl, 4,632,325, Cl. 242-55.000.

Th. Kieserling & Albrecht GmbH and Co.: *See—*
Daniels, Manfred; and Trimborn, Helmut, 4,631,813, Cl. 29-727.000.

Theissen, Robert J., to Rhone Poulenc Agrochimie. 2-nitro-5-(substituted-phenoxy) phenylalkanone oxime and imine derivatives as herbicides. 4,633,000, Cl. 549-551.000.

Therma-Wave, Inc.: *See—*
Rosencwaig, Allan; and Opsal, Jon, 4,632,561, Cl. 356-432.000.

Thesing, Richard A.: *See—*
Burnett, George H.; Keritsis, Gus D.; Thesing, Richard A.; Wayte, Alline R.; Nepomuceno, Jose G.; and Gergely, Alex S., 4,632,131, Cl. 131-355.000.

Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Moble track leveling, lining and tamping machine. 4,632,037, Cl. 104-7.200.

Thewlis, Duane E.: *See—*
Bishop, Marshall E.; and Thewlis, Duane E., 4,632,328, Cl. 242-72.00B.

Thielicke, Jorg: *See—*
Frieden, Peter; Kabelitz, Hans-Peter; Ronthaler, Karl-Heinz; and Thielicke, Jorg, 4,632,650, Cl. 418-95.000.

Thillays, Jacques C., to U.S. Philips Corporation. Method of coupling two optical elements to form an optical data transmission device, and device thus obtained. 4,632,504, Cl. 350-96.200.

Thioux, Alain: *See—*
Mery, Jean-Claude; Sauvee, Jean-Paul; and Thioux, Alain, 4,632,227, Cl. 188-73.320.

Thoman, David C.; Perkey, Russell C.; and Eastman, James M., to Allied Corporation. Turbine blade clearance controller. 4,632,635, Cl. 415-14.000.

Thomas, August A. Electro-mechanical heart compressor system. 4,632,094, Cl. 128-52.000.

Thomas, Francis, to Carpano et Pons. Programmer control device. 4,631,972, Cl. 74-113.000.

Thomas, Scipio. Pneumatic seat support with linkage and horizontal shock absorbers. 4,632,355, Cl. 248-584.000.

Thompson, Carl V.: *See—*
Smith, Henry I.; Atwater, Harry A.; Thompson, Carl V.; and Geis, Michael W., 4,632,723, Cl. 156-617.00R.

Thompson, Neil E. S.; Redmore, Derek; and Alink, Bernardus A. O., to Petrolite Corporation. α-aminoalkylsulfur compositions. 4,633,019, Cl. 564-501.000.

Thompson, Robert R.: *See—*
Mothersole, David S.; Crudele, Lester M.; Tietjen, James L.; and Thompson, Robert R., 4,633,437, Cl. 364-900.000.

Thompson, Stephen C., to Gould Inc. Broadband multi-resonant longitudinal vibrator transducer. 4,633,119, Cl. 310-325.000.

Thompson, Thomas K., to Harris Corporation. Alignment target image enhancement for microlithography process. 4,632,557, Cl. 356-401.000.

Thompson, William H., to Loctite Corporation. Polymerizable fluid. 4,632,944, Cl. 522-11.000.

Thoms, Roland, to BMC Industries, Inc. Multi-graded aperture mask method. 4,632,726, Cl. 156-644.000.

Thomson-CGR: *See—*
Klausz, Remy, 4,633,494, Cl. 378-205.000.

Thomson CSF: *See—*
Eumurian, Gregoire, 4,633,525, Cl. 455-613.000.

Thornson, Brandson R., to Fortune Ventures Inc. Apparatus for developing a propulsion force. 4,631,971, Cl. 74-84.00R.

Thornton, Dennis P.; Maceross, John S.; Foust, Jeff A.; and Cook, Keith R., to General Motors Corporation. Power window control with tape drive tension release. 4,633,153, Cl. 318-280.000.

Thummel, Rudolph C.: *See—*
Schurter, Rolf; Thummel, Rudolph C.; Topfl, Werner; Meyer, Willy; and Durr, Dieter, 4,632,695, Cl. 71-93.000.

Thurakal, Philip J.: *See—*
Malka, Jacob H.; and Thurakal, Philip J., 4,633,191, Cl. 330-275.000.

Ticks, Gerd-Heinz; and Grassmuck, Volker, to Carl Freudenberg, Firma. Hydraulically-damped mount. 4,632,370, Cl. 267-8.00R.

Tiefensee, Volkmar, to Polygram GmbH. Disc-shaped, optically-readable information carrier having a protective edge and/or center part. 4,633,458, Cl. 369-275.000.

Tietjen, James L.: *See—*
Mothersole, David S.; Crudele, Lester M.; Tietjen, James L.; and Thompson, Robert R., 4,633,437, Cl. 364-900.000.

Tihanyi, Jeno: *See—*
Fellinger, Christine; Leipold, Ludwig; and Tihanyi, Jeno, 4,633,292, Cl. 357-53.000.

Tiitola, Juha K.; Ikonen, Juhani A.; Suominen, Heikki S.; and Henttonen, Juha A., to Hantaaki Oy. Pierceable port for containers. 4,632,673, Cl. 604-415.000.

Tiku, Shiban K., to Texas Instruments Incorporated. Process of making Schottky barrier devices formed by diffusion before contacting. 4,632,713, Cl. 148-188.000.

Tillett, George C., Jr.; and Holland, Gary V., to Phillips Petroleum Company. Apparatus and method for use in thermoelectric power generation. 4,633,029, Cl. 136-205.000.

Tillotson, John G. Carpet coating method and apparatus. 4,632,850, Cl. 427-356.000.

Timian, Steven S.: *See—*
Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Timian, Steven S.; and Waltasti, Stephen A., 4,632,247, Cl. 206-343.000.

Tims, Jerry L.: *See—*
Garabedian, Michael E.; and Tims, Jerry L., 4,632,772, Cl. 252-106.000.

Tippmann, Robert T. Evaporative heat exchanger. 4,632,787, Cl. 261-30.000.

Toba, Rituji: *See—*
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Tobata Iron Works Co., Ltd.: *See—*
Takara, Senju; and Tanaka, Yoshihiro, 4,632,369, Cl. 266-262.000.

Tochigifujisangyo Kabushikigaisha: *See—*
Teraoka, Masao, 4,631,978, Cl. 74-710.500.

Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Asymmetrical triazine salts. 4,632,694, Cl. 71-93.000.

Todd, Donald A.; and Fischell, Robert E., to C. R. Bard, Inc.; and Johns Hopkins University, The, a part interest. Urethral sphincter cuff. 4,632,114, Cl. 128-346.000.

Todd, Mike J.: *See—*
Palmer, Gary E.; and Todd, Mike J., 4,631,775, Cl. 15-385.000.

Todorof, William J. Multi-layer thin film, flexible silicon alloy photovoltaic cell. 4,633,031, Cl. 136-249.000.

Toepfer, Dieter: *See—*
Heist, Hans; Toepfer, Dieter; Britzke, Sylvia; and Schoernig, Eberhard, 4,632,382, Cl. 271-273.000.

Tohkura, Toshio: *See—*
Endo, Joichi; Komatsu, Takashi; and Tohkura, Toshio, 4,633,139, Cl. 315-169.400.

Tokai Carbon Co., Ltd.: *See—*
Mori, Shigeto; and Fukazawa, Minoru, 4,632,794, Cl. 264-87.000.

Tokico Ltd.: *See—*
Endo, Mitsuhiro, 4,632,014, Cl. 91-369.00A.
Takayama, Toshio; Ando, Hiromi; and Matsumoto, Yukio, 4,632,208, Cl. 180-271.000.

Tokiguchi, Katsumi; Okada, Osami; Sakudo, Noriyuki; and Koike, Hidemi, to Hitachi, Ltd. Ion implanter. 4,633,138, Cl. 315-111.810.

Toko, Inc.: *See—*
Nakayama, Koichi; and Tanaka, Yoshito, 4,633,444, Cl. 365-228.000.

Tokuda, Yoshiaki: *See—*
Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, 4,632,026, Cl. 99-349.000.

Tokyo Electric Co., Ltd.: *See—*
Ono, Yoshiaki, 4,632,380, Cl. 271-127.000.
Uchimura, Mitsuo, 4,632,198, Cl. 177-211.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Matsubara, Toru, 4,632,048, Cl. 112-262.100.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Yoshino, Hisakazu; Takagi, Kazutoshi; and Torii, Yoshitaka, 4,632,528, Cl. 351-211.000..

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Gotoh, Akio; Yamamoto, Kazuo; and Ishikawa, Tuguo, 4,633,519, Cl. 455-277.000.
Inomata, Koichiro; Sawa, Takao; and Arakawa, Osamu, 4,631,796, Cl. 29-446.000.
Koyama, Takeshi, 4,633,291, Cl. 357-51.000.
Masanobu, Kazunori, 4,633,420, Cl. 364-563.000.
Masuda, Eiji; and Matsuo, Kenji, 4,633,101, Cl. 307-353.000.
Yoshida, Nobuyuki, 4,633,390, Cl. 364-200.000.

Tokyo Shibaura Denki Kabushiki Kaishi: *See—*
Nagano, Katsumi, 4,633,358, Cl. 361-31.000.

Toldy, Lajos: *See—*
Rettegi, Tivadar; Mago nee Karacsony, Erzsebet; Toldy, Lajos; Borsy, Jozsef; Berzetei, Ilona; Ronai, Andras; Druga, Aliz; and Cseh, Gyorgy, 4,632,928, Cl. 514-288.000.

Tomikawa, Yoshiro: *See—*
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.

Tomimura, Toshio: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Tomioka, Kentaro: *See—*
Hirota, Kazuo; Akahane, Shoji; and Tomioka, Kentaro, 4,632,824, Cl. 424-49.000.

Tomisek, John D.: *See—*
Jones, Donald K.; Tomisek, John D.; and Young, Harry M., 4,633,088, Cl. 250-369.000.

Tomita, Akira, to AMP Incorporated. Hinged electrical connector. 4,632,475, Cl. 339-4.000.

Tomita, Mamoru: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tomita, Mamoru; Kudo, Tsutomu; Suzuki, Takashi; Tomimura, Toshio; Takahashi, Kaichiro; and Obayashi, Tomokazu, 4,632,832, Cl. 426-96.000.

Tomita, Takeshi; Harada, Yoshiyasu; and Ohi, Kimio, to JEOL Ltd. Transmission-type electron microscope. 4,633,085, Cl. 250-311.000.

Tonegawa, Tadashi: *See—*
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,632,894, Cl. 430-84.000.

Tong, Po: *See—*
Berlekamp, Elwyn R.; and Tong, Po, 4,633,486, Cl. 375-116.000.

Tooth, Allan D., to International Combustion Australia Limited. Low noise flow control valve. 4,632,359, Cl. 251-126.000.

Topfl, Werner: *See—*
Schurter, Rolf; Thummel, Rudolph C.; Topfl, Werner; Meyer, Willy; and Durr, Dieter, 4,632,695, Cl. 71-93.000.

Toray Industries, Inc.: *See—*
Yokota, Mitsuru; Goshima, Tsutomu; and Fujioka, Shuji, 4,632,968, Cl. 526-279.000.

Torii, Shunichi: *See—*
Tanaka, Yoshikazu; and Torii, Shunichi, 4,633,389, Cl. 364-200.000.

Torii, Yoshitaka: *See—*
Yoshino, Hisakazu; Takagi, Kazutoshi; and Torii, Yoshitaka, 4,632,528, Cl. 351-211.000.

Torre, John J.: *See—*
Anderson, Philip M., III; and Torre, John J., 4,633,250, Cl. 342-27.000.

Torrence, Robert J.: *See—*
Orth, Charles D.; and Torrence, Robert J., 4,632,358, Cl. 251-117.000.

Toshiba Ceramics Co., Ltd.: *See—*
Arakawa, Kazumi; Sugie, Masuo; Watanabe, Takashi; Nishio, Takumi; Kawamura, Toshio; Nagahata, Tsutomu; and Matsushita, Takashi, 4,632,283, Cl. 222-600.000.

Toshiba Machine Co. Ltd: *See—*
Goto, Taizan; and Sekiya, Isao, 4,632,060, Cl. 118-730.000.

Totally, Inc.: *See—*
Bustance, William G.; and Borey, Robert E., 4,632,132, Cl. 132-7.000.

Tottori Sanyo Electric Co., Ltd.: *See—*
Takasu, Hiromi, 4,633,280, Cl. 357-17.000.

Touyer, Gaetan: *See—*
Jouquey, Alain; Touyer, Gaetan; Salmon, Jean; and Mouren, Michel, 4,632,820, Cl. 424-1.100.

Town, Joseph E.: *See—*
Govaert, Johan A.; and Town, Joseph E., 4,632,123, Cl. 128-659.000.

Toyo Communication Equipment Co.: *See—*
Koga, Daisuke; Tamura, Masahide; and Naito, Yukio, 4,633,511, Cl. 455-86.000.

Toyo Kohan Co., Ltd: *See—*
Takara, Senju; and Tanaka, Yoshihiro, 4,632,369, Cl. 266-262.000.

Toyo Rubber Industry Co.: *See—*
Nakajima, Zenji; Okamoto, Shuichi; and Kunihiro, Motoo, 4,632,372, Cl. 267-140.100.

Toyoda Gosei Co., Ltd.: *See—*
Noda, Kazushi; and Mitsunaga, Hiroshi, 4,631,976, Cl. 74-552.000.

Toyoda Jidosha Kabushiki Kaisha: *See—*
Motonami, Masanao; Hiramatsu, Eiji; and Shiraishi, Daiichi, 4,631,865, Cl. 49-374.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Kato, Noboru; and Hattori, Yasuhiro, 4,631,981, Cl. 74-813.00R.

Toyota Jidosha K.K.: *See—*
Miki, Nobuaki; Sakaguchi, Yoshikazu; Mandokoro, Kozo; and Kubo, Seitoku, 4,631,982, Cl. 74-869.000.
Noda, Kazushi; and Mitsunaga, Hiroshi, 4,631,976, Cl. 74-552.000

Toyota Jidosha Kabushiki Kaisha: *See—*
Hattori, Kyo; and Sakurai, Kazuhiro, 4,632,082, Cl. 123-325.000.
Honaga, Susumu; Suzuki, Mikio; Inaguma, Yoshiharu; Sato, Hiroki; Kikuchi, Kenichi; and Tanabe, Masato, 4,632,204, Cl. 180-142.000.
Miyata, Hiroshi; and Nakamura, Kazumasa, 4,633,214, Cl. 340-73.000.
Morisawa, Kunio; Kashihara, Yuji; and Higuchi, Atsunori, 4,631,983, Cl. 74-877.000.
Nakajima, Zenji; Okamoto, Shuichi; and Kunihiro, Motoo, 4,632,372, Cl. 267-140.100.
Nomura, Kazuhiro; and Nomura, Masayuki, 4,632,447, Cl. 296-153.000.
Ogawa, Masahiro; and Abe, Susumu, 4,632,849, Cl. 427-215.000.
Sasaki, Yoshio; and Nishikawa, Masahiko, 4,632,078, Cl. 123-146.50A.
Tanahashi, Haruhiko, 4,632,423, Cl. 280-689.000.

TRACO: *See—*
Hulings, James E.; Randall, Robert P.; Maynard, Robert H.; and Weiss, James, 4,631,945, Cl. 72-43.000.

Trageser, Milton B., to Charles Stark Draper Laboratory, Inc., The. Alignment system for a confocal unstable laser resonator. 4,633,479, Cl. 372-107.000.

Trainor, Daniel W.: *See—*
Hyman, Howard A.; and Trainor, Daniel W., 4,633,103, Cl. 307-426.000.

Trani, Aldo, to Gruppo Lepetit S.p.A. Process for decomposing N-oxide derivatives producing 5-vinyl-2-pyrrolidones. 4,632,994, Cl. 548-543.000.

Transamerica Distribution Services, Inc.: *See—*
Donavich, John, 4,631,891, Cl. 52-588.000.

Trapentsier, Peter T.: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.

Traudt, Ray F., to Analytics, Inc. Wind turbine. 4,632,637, Cl. 416-41.000.

Traut, G. Robert, to Rogers Corporation. Microstrip antenna with protective casing. 4,633,262, Cl. 343-700.0MS.

Trebor Industries, Inc.: *See—*
Rosenthal, Glenn K.; Stephens, Jeffrey D.; and Rosenthal, Robert D., 4,633,087, Cl. 250-341.000.

Treppner, Bernaht C. Adjustable angle block apparatus. 4,631,835, Cl. 33-536.000.

Tres, Paul A., to Dominion Automotive Industries Inc. Flashing lamp construction. 4,633,375, Cl. 362-35.000.

Tri-Lite Electronics, Inc.: *See—*
Von Gunten, Lee, 4,632,490, Cl. 339-154.00L.

Trimborn, Helmut: *See—*
Daniels, Manfred; and Trimborn, Helmut, 4,631,813, Cl. 29-727.000.

Triscari, Joseph: *See—*
Mullin, John G., Jr.; Kierstead, Richard W.; and Triscari, Joseph, 4,632,925, Cl. 514-256.000.

Trivett, Gene E.: *See—*
Blount, Marion L.; Hailpern, Brent T.; Heller, Robert A.; Hoevel, Lee W.; and Trivett, Gene E., 4,633,245, Cl. 340-825.030.

Trizna, Dennis B., to United States of America, Navy. Method for sea surface high frequency radar cross-section estimation using Dopler spectral properties. 4,633,255, Cl. 342-192.000.

Tronomed, Inc.: *See—*
Johnson, Robert E.; and Booker, Philip H., III, 4,632,121, Cl. 128-639.000.

Trotz, Samuel I.; and Fedynyshyn, Theodore H., to Olin Corporation. Pyrithione-containing bioactive polymers and their use in paint and wood perservative products. 4,632,881, Cl. 428-541.000.

Trowbridge, Charles A.: *See—*
Trowbridge, Craig A.; and Trowbridge, Charles A., 4,631,989, Cl. 81-62.000.

Trowbridge, Craig A.; and Trowbridge, Charles A., to Trowbridge, Craig A. Ratchet handle for use interchangeably with socket wrenches having coupling means of different sizes. 4,631,989, Cl. 81-62.000.

Trus-Us Inc.: *See—*
Shacket, Sheldon; and Helfman, Robert, 4,631,893, Cl. 52-745.000.

TRW Canada Limited: *See—*
Bracnik, Anthony S.; and Charlton, Keith D., 4,632,331, Cl. 242-107.40A.

TRW Inc.: *See—*
Morrison, Charles B.; Figueroa, Luis; and Burghard, Andre, 4,633,477, Cl. 372-46.000.
Podell, Allen F., 4,633,096, Cl. 307-268.000.

Tsaur, Bor-Yeu: *See—*
Fan, John C. C.; Tsaur, Bor-Yeu; Gale, Ronald P.; and Davis, Frances M., 4,632,712, Cl. 148-175.000.

Tsubai, Yasuo; and Okazaki, Koji, to Mitsubishi Paper Mills, Ltd. Processing solution for silver complex diffusion transfer process comprising amino alcohols. 4,632,896, Cl. 430-249.000.

Tsubakimoto Precision Products Co., Ltd.: *See—*
Itoh, Katsutoshi, 4,632,573, Cl. 384-43.000.

Tsuchimoto, Yoshihiro, to Asahi Glass Company Ltd. Connecting structure for connecting a ceramic shaft to a metallic shaft. 4,632,590, Cl. 403-30.000.

Tsui, James B. Y., to United States of America, Air Force. Instantaneous frequency measurement receiver with digital processing. 4,633,516, Cl. 455-226.000.

Tsuji, Kazuo: *See—*
Yazu, Shuji; Tsuji, Kazuo; and Yoshida, Akito, 4,632,817, Cl. 423-446.000.

Tsuji, Masao: *See—*
Sarugaku, Shinichi; and Tsuji, Masao, 4,633,059, Cl. 219-124.220.

Tsujimoto, Akira, to NEC Corporation. Bootstrap type output circuit. 4,633,105, Cl. 307-482.000.

Tsujimoto, Michihiro; Akahori, Hiroyuki; Hasegawa, Kiyoharu; and Asano, Makoto, to Mitsui Toatsu Chemicals Incorporated. Process for the preparation of triarylmethane compounds. 4,632,987, Cl. 544-86.000.

Tsukai, Yoshiyuki, to Pioneer Electronic Corporation. Optical information pickup apparatus. 4,633,454, Cl. 369-45.000.

Tsunekawa, Tokuichi: *See—*
Matsumura, Susumu; Kawabata, Takashi; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,632,532, Cl. 354-403.000.

Tsuruta, Yutaka: *See—*
Kobayashi, Hiroshi; Kano, Jiro; Kojima, Yoshio; Nishite, Yoshitoyo; and Tsuruta, Yutaka, 4,631,879, Cl. 52-98.000.

Tsutsui, Kouichi; Umemoto, Hirotoshi; and Ikeda, Shoji, to Nippon Paint Co., Ltd. Colored base composition and paint composition containing the same. 4,632,961, Cl. 525-162.000.

Tsuyama Mfg. Co., Ltd.: *See—*
Tsuyama, Sadaharu, 4,633,216, Cl. 340-134.000.

Tsuyama, Sadaharu, to Tsuyama Mfg. Co., Ltd. Data display unit for a bicycle. 4,633,216, Cl. 340-134.000.

Tsuzuki, Kiyohiko, to Kabushiki Kaisha Tsuzuki Seisakujo. Training tool for promoting grip. 4,632,383, Cl. 272-67.000.

Tucker, James E.; Lohmeyer, Charles W.; Beecher, John, III; and Stephen, James C., to Weber-Stephen Products Co. Birdfeeder. 4,632,061, Cl. 119-51.00R.

Tucker, Michael C., to Gearhart Australia Limited, a part interest. Method and apparatus for reinforcing and consolidating earth structures. 4,632,605, Cl. 405-259.000.

Tucknott, Kenneth A.; and Sorenson, Martin N., to Tucknott, Kenneth A. Patient bed alarm system. 4,633,237, Cl. 340-573.000.

Tulane Educational Fund: *See—*
Coy, David H.; and Moreau, Jacques-Pierre, 4,632,979, Cl. 530-313.000.

Tundo, Pietro, to Sea Marconi Technologies S.p.A. Process for the decomposition and decontamination of organic substances and halogenated toxic materials. 4,632,742, Cl. 204-158.210.

Tung, Min-Hsiung G.: *See—*
Cannistra, Anthony T.; Kida, Masuyoshi; Tung, Min-Hsiung G.; and Ushiroda, Tatsuyuki, 4,633,507, Cl. 382-61.000.

Turcsany, Jozsef; Gal, Pal; and Borbas, Istvan, to Licencia Talalmanyokat Ertekesito Vallalat. Page-turning device assembled suitably with actuating mechanism. 4,632,007, Cl. 84-487.000.

Tzur, Avi, to Mediavault Inc. Multi-layer intumescent-ablator endothermic fire retardant compositions. 4,632,865, Cl. 428-304.400.

Uber, Harry B.; and Staschek, George, Jr., to Uber, Harry B. Emergency broadcast alert detector. 4,633,515, Cl. 455-166.000.

Uchikawa, Nobutaka: *See—*
Asanuma, Tadashi; Ohoka, Tatuo; and Uchikawa, Nobutaka, 4,632,976, Cl. 528-497.000.

Uchikawa, Sadao: *See—*
Bessho, Yasunori; Uchikawa, Sadao; and Aoyama, Motoo, 4,632,803, Cl. 376-238.000.

Uchimura, Mitsuo, to Tokyo Electric Co., Ltd. Multi-range load cell weighing instrument. 4,632,198, Cl. 177-211.000.

Ueda, Shu; Narumiya, Joe; and Misawa, Kenji, to Dynic Corporation. Magnetic shielding members. 4,632,250, Cl. 206-524.200.

Ueda, Takeo: *See—*
Saito, Hiroyuki; and Ueda, Takeo, 4,632,330, Cl. 242-107.40D.

Uematsu, Masashi: *See—*
Oyamatsu, Yasuyuki; Uematsu, Masashi; and Sakai, Hiroshi, 4,632,585, Cl. 400-613.000.

Ueno, Ryuzo; Sakota, Kazuyuki; Naito, Yoshiyuki; and Kishimoto, Mitsuyuki, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Process for producing aromatic hydroxy compound. 4,633,024, Cl. 568-738.000.

Ueno, Toshihiko: *See—*
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,632,781, Cl. 260-380.000.

Ukawa, Naohiko: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Onizuka, Masakazu; and Shimizu, Taku, 4,632,810, Cl. 423-242.000.

Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging. Carton errector apparatus. 4,632,666, Cl. 493-23.000.

Ulubay, Hasan; and Schurmann, Horst, to Akzo NV. Method for increasing the absorption rate of paper. 4,632,730, Cl. 162-111.000.

Umemoto, Hirotoshi: *See—*
Tsutsui, Kouichi; Umemoto, Hirotoshi; and Ikeda, Shoji, 4,632,961, Cl. 525-162.000.

Umino, Hiroshi: *See—*
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Ogasawara, Toshihide; and Umino, Hiroshi, 4,631,869, Cl. 51-165.710.

Union Carbide Corporation: *See—*
Cornell, John A.; and Kubisen, Steven J., Jr., 4,632,975, Cl. 528-354.000.
Coughlin, Peter K., 4,632,941, Cl. 518-714.000.
McDonald, James A.; Gledhill, David E.; and Savich, Peter P., 4,632,667, Cl. 493-187.000.
Wheeler, Thomas N., 4,632,698, Cl. 71-106.000.

Uniroyal Power Transmission Company, Inc.: *See—*
Skura, William A., 4,632,665, Cl. 474-205.000.

United Aircraft Products, Inc.: *See—*
DeSalve, Dennis W., 4,632,360, Cl. 251-175.000.

United Chemi-Con, Inc.: *See—*
Phillips, Jeffrey, 4,633,373, Cl. 361-433.000.

United Kingdom Atomic Energy Authority: *See—*
Hooper, Alan; and North, John M., 4,631,810, Cl. 29-623.500.

United States of America
Agriculture: *See—*
Hedin, Paul A.; Davis, Frank M.; Dickens, Joseph C.; Burks, Marcus L.; and Bird, Thomas G., 4,632,829, Cl. 424-84.000.
Air Force: *See—*
Bishop, Wayne S., 4,633,418, Cl. 364-554.000.
Goetz, Paul W.; and Merley, Kim R., 4,633,198, Cl. 332-22.000.
Repperger, Daniel W.; McCollor, Donald G.; and Gruesbeck, William G., 4,632,341, Cl. 244-230.000.
Tsui, James B. Y., 4,633,516, Cl. 455-226.000.
Army: *See—*
Bovino, Lawrence J., 4,633,286, Cl. 357-30.000.
Formal, Samuel B.; Baron, Louis S.; and Kopecko, Dennis J., 4,632,830, Cl. 424-92.000.
Commerce: *See—*
Chadwick, Russell B., 4,633,256, Cl. 342-368.000.
Energy: *See—*
Ekdahl, Carl A., Jr.; and Frost, Charles A., 4,633,172, Cl. 324-126.000.
Gruen, Dieter M.; Pellin, Michael J.; and Young, Charles E., 4,633,084, Cl. 250-306.000.
Sauers, Isidor, 4,633,082, Cl. 250-282.000.
Williams, Jack M.; Wang, Hsien-Hau; and Beno, Mark A., 4,632,776, Cl. 252-518.000.
Witkover, Richard L., 4,633,523, Cl. 455-608.000.
Health and Human Services: *See—*
Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., 4,632,922, Cl. 514-236.000.
Carter, Richard; and Miller, Louis H., 4,632,909, Cl. 436-542.000.
National Aeronautics and Space Administration: *See—*
Gordon, Stephen S., 4,633,060, Cl. 219-130.010.
Gunter, William D., Jr.; and De Young, Anemarie, 4,632,548, Cl. 356-28.500.
Navy: *See—*
Bocker, Richard P., 4,633,427, Cl. 364-822.000.
Burns, William K., 4,633,170, Cl. 324-77.00K.
Curtis, Donald D., 4,632,715, Cl. 149-19.500.
Hinman, Daryl E., 4,633,503, Cl. 382-47.000.
Humphries, Waymon; Bryant, John; Eklund, Richard C.; Hayes, Donald C.; and Ferko, Peter, 4,632,010, Cl. 89-1.510.
McManis, George E.; Fletcher, Aaron N.; and Bliss, Dan E., 4,632,889, Cl. 429-218.000.
Rieger, Harry, 4,633,079, Cl. 250-227.000.
Trizna, Dennis B., 4,633,255, Cl. 342-192.000.
Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, 4,631,956, Cl. 73-170.00A.

U.S. Philips Corp.: *See—*
Beurskens, Johannes H. H.; and Prozee, Christiaan, 4,633,127, Cl. 313-112.000.
De Willigen, Hans C.; van der Hoek, Willem; and van Rens, Piet C. J., 4,632,689, Cl. 65-78.000.
Dielhof, Pieter B., 4,633,318, Cl. 358-223.000.
Giller, Henricus F. J. I.; and Heijboer, Jacobus A. E. W., 4,633,126, Cl. 313-113.000.
Graham, Gary, 4,633,160, Cl. 322-20.000.
Kasperkovitz, Wolfdietrich G., 4,633,315, Cl. 358-188.000.
Kilian, Ernst A., 4,633,231, Cl. 340-539.000.
Kreeft, Hendrik K.; and Teunissen, Adrianus F., 4,632,327, Cl. 242-56.00R.
Krol, Thijs, 4,633,472, Cl. 371-40.000.
Lenting, Gerard J.; and Sytsma, Roelof H., 4,632,135, Cl. 132-85.000.
Maassen, Egbertus J. P.; and van Meel, Franciscus A. M. M., 4,632,558, Cl. 356-404.000.
Sari, Hikmet, 4,633,482, Cl. 375-14.000.
Scheinert, Stefan, 4,633,509, Cl. 455-33.000.
Stove, Andrew G.; and Vincent, Richard P., 4,633,253, Cl. 342-162.000.
Thillays, Jacques C., 4,632,504, Cl. 350-96.200.
van de Polder, Leendert J.; and Tan, Sing L., 4,633,295, Cl. 358-12.000.
van Tuijl, Adrianus J. M., 4,633,100, Cl. 307-315.000.

United States Surgical Corporation: *See—*
Green, David T.; and Noiles, Douglas G., 4,632,290, Cl. 227-19.000.

United Steel & Wire Company: *See—*
Badger, Ronald L., 4,632,411, Cl. 280-33.99R.

United Technologies Corporation: *See—*
Naumec, John R.; and Kaverud, Peter H., 4,632,623, Cl. 414-148.000.
Ratchford, Michael; Bue, Richard L.; and Charov, Alexander, 4,633,473, Cl. 371-68.000.

University of Calif., Regents of the: *See—*
Murphy-Boesch, Joseph A.; and Koretsky, Alan P., 4,633,181, Cl. 324-322.000.

University of Colorado Foundation, Inc.: *See—*
Averbuch, Steven D.; Bachur, Nicholas R.; Gaudiano, Giorgio; and Koch, Tad H., 4,632,922, Cl. 514-236.000.

University of Health Sciences/The Chicago Medical School: *See—*
Reichstein, Benjamin J., 4,632,119, Cl. 128-632.000.

University of Illinois: *See—*
Hunsinger, Billy J.; and Hoskins, Michael J., 4,633,285, Cl. 357-26.000.
Stifle, John E.; Lee, Donald A.; and Bitzer, Donald L., 4,633,462, Cl. 370-85.000.

University of Medicine & Dentistry of N.J.: *See—*
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,919, Cl. 514-158.000.

University of Medicine & Dentistry of New Jersey: *See—*
Spillert, Charles R.; Devereux, Corinne; and Lazaro, Eric J., 4,632,920, Cl. 514-158.000.

University of Pittsburgh: *See—*
Asher, Sanford A., 4,632,517, Cl. 350-362.000.

University of Virginia Alumni Patents Foundation: *See—*
Wilson, John K., Jr.; and Park, Tae S., 4,632,668, Cl. 604-8.000.

Uno, Teruo: *See—*
Tanabe, Zenichi; Fukui, Toshiyasu; Uno, Teruo; and Ikeda, Hiroshi, 4,632,885, Cl. 428-654.000.

Unseki, Takashi: *See—*
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,632,403, Cl. 277-27.000.

Unterreiner, Ronald C.: *See—*
Graetz, Herbert; and Unterreiner, Ronald C., 4,632,717, Cl. 156-245.000.

UOP Inc.: *See—*
Hilfman, Lee, 4,632,749, Cl. 208-120.000.
Oroskar, Anil R.; and Mack, George, 4,632,149, Cl. 137-625.150.
Zinnen, Hermann A., 4,633,018, Cl. 564-424.000.

Upadhyay, Anand, to Sundstrand Corporation. Inverter shoot-through protection circuit. 4,633,381, Cl. 363-56.000.

Upadhyay, Anand; and Messenger, Lawrence W., to Sundstrand Corporation. Inverter control system. 4,633,382, Cl. 363-132.000.

Upjohn Company, The: *See—*
Kaplan, Lester J., 4,632,935, Cl. 514-429.000.

Urbantsok, Janos: *See—*
Csordas, Laszlo; Maros, Gyula; Nemeth, Jozsef; Rozsa, Gyula; and Urbantsok, Janos, 4,632,422, Cl. 280-689.000.

Uriuhara, Makoto: *See—*
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,632,231, Cl. 192-0.076.

Uruko Seisakusho Co., Ltd.: *See—*
Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, 4,632,161, Cl. 144-213.000.

Ury, Michael G.: *See—*
Lynch, Donald; Kamarehi, Mohammad; and Ury, Michael G., 4,633,140, Cl. 315-248.000.

Ushiroda, Tatsuyuki: *See—*
Cannistra, Anthony T.; Kida, Masuyoshi; Tung, Min-Hsiung G.; and Ushiroda, Tatsuyuki, 4,633,507, Cl. 382-61.000.

Uskokovic, Milan R.: *See—*
Baggiolini, Enrico G.; Uskokovic, Milan R.; and Wovkulich, Peter M., 4,632,784, Cl. 260-397.200.

USM Corporation: *See—*
Cable, Michael J., 4,632,621, Cl. 414-118.000.

Usubuchi, Touru, to NEC Corporation. Adaptive predictive encoding and/or decoding apparatus. 4,633,325, Cl. 358-260.000.

USV Pharmaceutical Corp.: *See—*
Suh, John T.; Chung, Rack H., deceased; Wang, Nai-Yi; and Barton, Jeffrey N., 4,632,929, Cl. 514-317.000.

Utaka, Katsuyuki: *See—*
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,633,474, Cl. 372-19.000.

Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Arrangement for producing visual images recorded on a disk of film. 4,633,306, Cl. 358-102.000.

Uwira, Bernd; Kordulla, Hans; and Egger, Johann-Friedrich, to Bodenseewerk Geratetechnic GmbH. Electro-optical detector system. 4,633,317, Cl. 358-213.000.

Uzuhashi, Hideo: *See—*
Yabe, Yuhiko; Uzuhashi, Hideo; and Yoshikawa, Yoshiaki, 4,633,414, Cl. 364-513.000.

Uzuka, Tadashi: *See—*
Kajikawa, Yoshimitsu; Souma, Keinosuke; Ogaki, Kohei; Uzuka, Tadashi; and Minato, Yoshihiko, 4,632,161, Cl. 144-213.000.

Valdettaro, Alarico A., to Sarkes Tarzian Licensing Laboratory. Expanded dial arrangement for 56 channel UHF tuner. 4,633,206, Cl. 334-47.000.

Valdshtein, George: *See—*
Masel, Ruben; and Valdshtein, George, 4,632,566, Cl. 366-149.000.

Valkirs, Gunars E.; Owen, Newton C.; and Levinson, Philip A., to Hybritech Incorporated. Method and apparatus for immunoassays. 4,632,901, Cl. 435-5.000.

Valleylab, Inc.: *See—*
Paterson, William G., 4,632,109, Cl. 128-303.140.

Valmet Oy: *See—*
Riihinen, Jaakko, 4,631,794, Cl. 29-132.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Crystalline layered silicate. 4,632,815, Cl. 423-328.000.

VAMATEX S.p.A.: *See—*
Pezzoli, Nello, 4,632,152, Cl. 139-448.000.

Van Cauwenberghe, Roger; and Motycka, Jiri, to Canadian Patents and Development Limited. Force-balance drag anemometer. 4,631,958, Cl. 73-189.000.

van de Polder, Leendert J.; and Tan, Sing L., to U.S. Philips Corporation. Color television transmission and data storage system, respectively with time-division multiplex encoding and data generator and data receiver suitable therefor. 4,633,295, Cl. 358-12.000.

van der Hoek, Willem: *See—*
De Willigen, Hans C.; van der Hoek, Willem; and van Rens, Piet C. J., 4,632,689, Cl. 65-78.000.

van der Schoot, Peter W. C., to Goudsche Machinefabriek B.V. Steam peeling apparatus. 4,632,025, Cl. 99-348.000.

Vanderspool, Jan P., II, to Motorola, Inc. Single resonant tank modulated oscillator. 4,633,197, Cl. 332-16.00T.

Van Der Zon, Petrus W., to Internationale Octrooi Maatschaapij "Octropa" B.V. Method, apparatus and blank for packing at least one article in a self-supporting wrapping having the shape of a rectangular parallelepiped. 4,631,896, Cl. 53-397,000.

Vandevyver, Michel: *See—*
Barraud, Andre; Ruaudel, Annie; and Vandevyver, Michel, 4,632,800, Cl. 264-298.000.

VanDuser, Harold J.: *See—*
Hofrichter, James W.; and VanDuser, Harold J., 4,632,457, Cl. 297-335.000.

van Meel, Franciscus A. M. M.: *See—*
Maassen, Egbertus J. P.; and van Meel, Franciscus A. M. M., 4,632,558, Cl. 356-404.000.

Van Noord, Andrew J. Multi-purpose exercising apparatus. 4,632,393, Cl. 272-134.000.

Van Rees, H. Barteld, to Raytheon Company. Vapor phase epitaxial growth of carbon doped layers of Group III-V materials. 4,632,710, Cl. 148-175.000.

van Rens, Piet C. J.: *See—*
De Willigen, Hans C.; van der Hoek, Willem; and van Rens, Piet C. J., 4,632,689, Cl. 65-78.000.

van Tuijl, Adrianus J. M., to U.S. Philips Corporation. Darlington transistor arrangement. 4,633,100, Cl. 307-315.000.

Varaprath, Sudarsanan: *See—*
Larock, Richard C.; and Varaprath, Sudarsanan, 4,632,996, Cl. 549-209.000.

Varian Associates, Inc.: *See—*
Chow, Robert; and Downey, Steven D., 4,632,719, Cl. 156-345.000.
Karnezos, Marcos; Nakanos, Howard H.; and Neukermans, Armand P., 4,632,871, Cl. 428-336.000.

Varta Batterie Aktiengesellschaft: *See—*
Jung, Gerd, 4,632,887, Cl. 429-181.000.

Vassilatos, George, to Du Pont de Nemours, E. I., and Company. Blend of polyethylene and polypropylene. 4,632,861, Cl. 428-296.000.

VDO Adolf Schindling AG: *See—*
Kuhnel, Frank, 4,633,491, Cl. 377-20.000.
Lindig, Christian; and Duffait, Roland, 4,633,174, Cl. 324-143.000.

Veach, Michael T.: *See—*
Abel, Mark J.; Kwan, Chi L.; Polli, Philip V.; and Veach, Michael T., 4,633,467, Cl. 371-16.000.

Venema, Harry J., to Borg-Warner Corporation. Measuring system for determining the reactance ratio of a pair of reactive devices. 4,633,168, Cl. 324-60.0CD.

Venema, Harry J., to Borg-Warner Corporation. Pressure temperature sensor. 4,633,213, Cl. 340-60.000.

Venier, Gerald O., to Canada, Her Majesty the Queen in right of. Method and apparatus for detecting a binary convoluted coded signal. 4,633,426, Cl. 364-724.000.

Venkatram, Chitra R.: *See—*
Ebert, Harry K., Jr.; Menkes, Henry E.; Papathomas, Thomas V.; and Venkatram, Chitra R., 4,633,412, Cl. 364-493.000.

Verin, Pierre, to Microdot Inc. Electrical terminal. 4,632,483, Cl. 339-74.00R.

Vertesy, Laszlo; Bender, Rudolf; Fehlhaber, Hans-Wolfram; and Geisen, Karl, to Hoechst Aktiengesellschaft. Pseudooligosaccharides with an α-glucosidase-inhibiting action, their use and pharmaceutical products. 4,632,917, Cl. 514-54.000.

Vesterinen, Kauko I., to Rakennus - Ja Konsulttitoimisto Risto Hukka Ky. Method and system for the facing of structures. 4,631,886, Cl. 52-410.000.

VETEM S.p.A.: *See—*
Giarda, Silvio; Cesti, Pietro; Confalonieri, Giovanni; and Piccardi, Paolo, 4,632,926, Cl. 514-259.000.

Veveris, Maris M.: *See—*
Bremanis, Gunar A.; Kalvinsh, Ivars Y.; Antsena, Irene B.; Lukevits, Edmund Y.; Veveris, Maris M.; Kauss, Valeryans Y.; Trapentsier, Peter T.; and Liepinsh, Edvards E., 4,633,014, Cl. 562-556.000.

Vickers Public Limited Company: *See—*
Charman, Michael D., 4,631,881, Cl. 52-220.000.

Victor Company of Japan, Limited: *See—*
Higurashi, Seiji; Miyashita, Atsushi; and Kobayashi, Kaoru, 4,633,332, Cl. 360-10.300.
Kinjo, Hisao, 4,633,357, Cl. 360-136.000.
Miyazaki, Ken; and Okazaki, Shoichi, 4,633,334, Cl. 360-33.100.
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Sato, Hideo; Kubo, Mitsuo; Tanaka, Koji; Furuki, Tsuneo; and Suzuki, Fujio, 4,633,329, Cl. 358-310.000.

Vidrine, D. Warren; and Anderson, Charles R., to Nicolet Instrument Corporation. Silicon beamsplitter. 4,632,553, Cl. 356-346.000.

Vienot, Claude: *See—*
David, Bernard; Pigeon, Michel; and Vienot, Claude, 4,633,177, Cl. 324-220.000.

Villanueva, James G.; Matlack, John D.; Lewis, Shelton E.; Pocock, John F. E.; and Cole, Charles A., to Amoco Corporation. Apparatus for coating containers. 4,632,053, Cl. 118-66.000.

Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., to Texas Instruments Incorporated. Self-configuring digital processor system with logical arbiter. 4,633,392, Cl. 364-200.000.

Vincent, Richard P.: *See—*
Stove, Andrew G.; and Vincent, Richard P., 4,633,253, Cl. 342-162.000.

Vinciguerra, Costantino; and Arrighi, Leonardo, to Nuova Pignone S.p.A. System for fixing the stator nozzles to a power turbine casing. 4,632,634, Cl. 415-139.000.

Vink, Anthony B.; Asam, Edward F.; and Ferris, Dewayne J., to Northern Telecom Limited. Windowing and scrolling for a cathode-ray tube display. 4,633,415, Cl. 364-521.000.

Visnapuu, Andres H. Computer video work station with copyholder. 4,632,471, Cl. 312-233.000.

Vock, Georg F.; and Kuter, Lutz, to BASF Farben & Fasern A.G. Vessel for receiving, transporting and mixing viscous, especially highly viscous, liquids. 4,632,567, Cl. 366-276.000.

Vogel, Ignaz, to Ignaz Vogel GmbH & Co. KG. Two-abreast passenger seat. 4,632,452, Cl. 297-232.000.

Volk, Hans-Joachim: *See—*
Dallwig, Claus; and Volk, Hans-Joachim, 4,632,426, Cl. 280-808.000.

Vollbrecht, Heinz-Rudiger: *See—*
Schutz, Erwin; Vollbrecht, Heinz-Rudiger; Sandner, Klaus; Sand, Theodor; and Muhlnickel, Peter, 4,632,837, Cl. 426-425.000.

Vollhardt, Frohmut, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Reactor construction. 4,632,587, Cl. 422-202.000.

von Ballmoos, Roland: *See—*
Derouane, Eric G.; and von Ballmoos, Roland, 4,632,811, Cl. 423-306.000.

von der Heide, Johann, to Papst-Motoren GmbH & Co. KG. Direct current linear motor. 4,633,108, Cl. 310-12.000.

von der Ohe, Helmcke; and Koliwer, Wolfgang, to Klockner-Werke Aktiengesellschaft. Hydraulically controlled extruder injection molding units for the processing of rubber. 4,632,651, Cl. 425-135.000.

Von Gunten, Lee, to Tri-Lite Electronics, Inc. Touch control connector for lamps. 4,632,490, Cl. 339-154.00L.

Von Holdt, John W. Mold for making a bucket with bail. 4,632,357, Cl. 249-58.000.

von Schenck, Raban: *See—*
Kinneging, Johannes-Wilhelmus; Roos, Wouter; Damman, Bernardus J.; Jelsma, Andries; and von Schenck, Raban, 4,632,812, Cl. 423-309.000.

Voss, Erich; and Wollnik, Hermann, to Siemens Aktiengesellschaft. Magnetic multi-pole arrangement of the nth order. 4,633,208, Cl. 335-210.000.

Vossloh - Werke GmbH: *See—*
Weber, Friedhelm, 4,632,307, Cl. 238-265.000.

Voticky, Michael P.: *See—*
Gardner, Norman A.; and Voticky, Michael P., 4,632,429, Cl. 283-91.000.

Vroenen, John J. Tooling apparatus. 4,631,995, Cl. 82-39.000.

W&C Pantin Ltd.: *See—*
Avey, Kenneth F. C., 4,632,633, Cl. 414-787.000.

W. R. Grace & Co.: *See—*
Bowers, William F.; and Rigopulos, Peter N., 4,632,761, Cl. 210-650.000.

Wackman, Connie M., Personal Representative: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.

Wackman, Peter H., deceased: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,633,492, Cl. 378-119.000.

Wadaya, Shinichiro: *See—*
Mizoguchi, Toshiaki; Wadaya, Shinichiro; Hashimoto, Kunihiro; and Takase, Shinichi, 4,633,352, Cl. 360-104.000.

Wadding, Kenneth W.: *See—*
Casteel, Jordan B.; D'Atre, John D.; Ritter, Allen M.; and Wadding, Kenneth W., 4,633,241, Cl. 340-645.000.

Waddington & Duval Limited: *See—*
Lucking, Anthony J., 4,632,362, Cl. 251-310.000.

Wagner, Wayne M.; Bethke, Timothy A.; and Schmeichel, Steven D., to Donaldson Company, Inc. Muffler apparatus and method for making same. 4,632,216, Cl. 181-255.000.

Wahlig, Helmut: *See—*
Gante, Joachim; Pruchèr, Helmut; Wahlig, Helmut; and Rudolph, Volkmar, 4,632,933, Cl. 514-399.000.

Wajima, Motoyo: *See—*
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Wajima, Motoyo; Toba, Rituji; Kawakubo, Shoji; and Tadokoro, Akio, 4,632,852, Cl. 427-437.000.

Walden, Robert G.; Berteaux, Henri O.; Bonde, Leslie W.; Dillon, David B.; Softley, Eric J.; Popp, Thomas M.; and Reed, Edgar A., 3rd, to United States of America, Navy. Air deployed oceanographic mooring. 4,631,956, Cl. 73-170.00A.

Wales, Desmond E. Air valve for improving the performance of an internal combustion engine. 4,631,917, Cl. 60-293.000.

Walker, Alan H.: *See—*
Brull, Robert A.; Walker, Alan H.; and McFall, William V., 4,632,577, Cl. 400-56.000.

Walker, Connie W.: *See—*
Ulrich, Lawrence W.; and Walker, Connie W., 4,632,666, Cl. 493-23.000.

Walker, Graham, to General Pneumatics Corporation. Joule-Thomson apparatus with temperature sensitive annular expansion passageway. 4,631,928, Cl. 62-514.0JT.

Walker, Ian C., to Quantel Limited. Video image creation system which simulates drafting tool. 4,633,416, Cl. 364-521.000.

Walker Magnetics Group, Inc.: *See—*
Ela, Roger B.; and Pignataro, Dominic F., 4,633,361, Cl. 361-145.000.

Wallander, Anders; Borrman, Bo; and Mansson, Arne, to Ab Asea Atom. Fuel assembly for a boiling water reactor. 4,632,804, Cl. 376-444.000.

Walsworth, Frank J., to Outboard Marine Corporation. Combined fluid pressure actuated fuel and oil pump. 4,632,144, Cl. 137-505.250.

Waltasti, Stephen A.: *See—*
Moody, Roy A.; Bulanda, John J.; Levin, Robert F.; Timian, Steven S.; and Waltasti, Stephen A., 4,632,247, Cl. 206-343.000.

Waltz, Thomas A.; and Shirilla, John E., to F. J. Westcott Co., The. Photographic light diffuser. 4,633,374, Cl. 362-17.000.

Wang, Chih-Chung, to Duracell Inc. Anode metal treatment and use of said anode in cell. 4,632,890, Cl. 429-218.000.

Wang, Hsien-Hau: *See—*
Williams, Jack M.; Wang, Hsien-Hau; and Beno, Mark A., 4,632,776, Cl. 252-518.000.

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Wang, Nai-Yi: *See—*
Suh, John T.; Chung, Rack H., deceased; Wang, Nai-Yi; and Barton, Jeffrey N., 4,632,929, Cl. 514-317.000.

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Smith, Richard W., 4,632,716, Cl. 156-148.000.

Ward Machinery Company, The: *See—*
Sardella, Louis M., 4,632,378, Cl. 271-202.000.

Wardell, Lawrence. Water circulated grill. 4,632,089, Cl. 126-25.00R.

Wargula, Lucian G., to Brunswick Corporation. Electrical lead retainer with compression seal. 4,632,487, Cl. 339-103.00B.

Warner-Lambert Company: *See—*
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,821, Cl. 424-15.000.
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,632,822, Cl. 424-15.000.
Peters; David; Denick, John, Jr.; and Talwar, Anil K., 4,632,823, Cl. 424-15.000.

Warnke, Egon F.; and Willemsen, Klaus, to Sennheiser Electronic KG. Infrared headphones for the hearing impaired. 4,633,498, Cl. 381-23.100.

Washida, Tsutomu: *See—*
Kitayama, Seishi; Washida, Tsutomu; Fukushi, Yuzo; and Ito, Yoshinori, 4,633,046, Cl. 370-32.100.

Washington State University Research Foundation, Inc.: *See—*
Knorr, Fritz J.; Eatherton, Randy L.; Siems, William F.; and Hill, Herbert H., Jr., 4,633,083, Cl. 250-282.000.

Washita, Hiroshi: *See—*
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Watanabe, Akio: *See—*
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Watanabe, Chihiro: *See—*
Yamamoto, Masahiro; Tanaka, Hiroshi; and Watanabe, Chihiro, 4,632,808, Cl. 422-72.000.
Watanabe, Hiroyuki; Washita, Hiroshi; and Ichiki, Toshio, to Asahi Glass Company Ltd. Laminated safety glass. 4,632,877, Cl. 428-409.000.
Watanabe, Kenjiro; Sakamoto, Susumu; and Akamatsu, Junichi, to Sony Corporation. Information recording medium including antimony-selenium compounds. 4,633,273, Cl. 346-135.100.
Watanabe, Kenjirou: *See—*
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Watanabe, Takashi: *See—*
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Watanabe, Toshio: *See—*
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Watanabe, Yasuo; and Kanno, Hideomi, to Fuji Electric Co., Ltd. Method and apparatus for electromagnetically crushing, mixing and stirring substances by employing a mechanical driver. 4,632,315, Cl. 241-26.000.
Watanabe, Yasuo; and Nakamura, Mitsuhiro, to Fuji Electric Co., Ltd. Method and apparatus for electromagnetically crushing, mixing and stirring substances by changing the electromagnetic field intensity level. 4,632,316, Cl. 241-26.000.
Waters, John R.; and Broman, Rodney, to Becton, Dickinson and Company. Method for detecting biological activity in a body fluid. 4,632,902, Cl. 435-29.000.
Watson, Charles W., Jr.; and Siegl, Christopher M., to General Signal Corporation. Method for transposing time measurements from one time frame to another. 4,633,421, Cl. 364-569.000.
Wayte, Alline R.: *See—*
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Tucker, James E.; Lohmeyer, Charles W.; Beecher, John, III; and Stephen, James C., 4,632,061, Cl. 119-51.00R.
Webler, William E.; Elson, Edward E.; and Quinn, Michael D., to American Hospital Supply Corp. Right heart ejection fraction and cardiac output catheter. 4,632,125, Cl. 128-692.000.
Wedco Inc.: *See—*
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Weide, Jurgen: *See—*
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Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased (by Wackman, Connie M., Personal Representative), to Eaton Corporation. Plasma pinch X-ray method. 4,633,492, Cl. 378-119.000.
Weiss, James: *See—*
Hulings, James E.; Randall, Robert P.; Maynard, Robert H.; and Weiss, James, 4,631,945, Cl. 72-43.000.
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Welterlin, Raymond E., to Buehler Products, Inc. Brushless DC motor. 4,633,149, Cl. 318-254.000.
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Huber, Gordon R.; and Hauck, Bobbie W., 4,632,795, Cl. 264-115.000.
Werner, Alexander; and Pfenninger, Heinz, to Schweissindustrie Oerlikon Buhrle AG. Filler wire. 4,632,882, Cl. 428-558.000.
Wernicke, Ubbo; and Meckl, Heinz, to Agfa Gevaert Aktiengesellschaft. Process for treating photographic washing waters. 4,632,763, Cl. 210-670.000.
Werrbach, Donn R. Program dependent crossover filter (PDC). 4,633,501, Cl. 381-100.000.
Wesemann, Karl-Friedrich; Lenk, Rainer; Kobusch, Klaus; and Markan, Manfred, to Mannesmann Aktiengesselschaft. Composite body. 4,631,792, Cl. 29-129.000.
West Electric Co., Ltd.: *See—*
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Westfall, Richard M. Electrolytic preparation of tin. 4,632,736, Cl. 204-59.00M.
Westinghouse Electric Corp.: *See—*
Appleman, Robert H.; Bein, Jeffrey D.; and Powaski, Frank S., 4,632,068, Cl. 122-34.000.
Baum, Allen J., 4,632,705, Cl. 134-3.000.
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Brunner, David E., 4,632,681, Cl. 55-493.000.
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Wheeler, Harold A., to Hazeltine Corporation. Low frequency/high frequency omnidirectional antenna formed of plural dipoles extending from a common center. 4,633,265, Cl. 343-797.000.
Wheeler, Thomas N., to Union Carbide Corporation. Biocidal 2-aryl-1,3-cyclopentanedione enol ester compounds. 4,632,698, Cl. 71-106.000.
Whellams, Geoffrey E., to Roberts Industries. Skeining apparatus. 4,632,156, Cl. 140-92.100.
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White, LeRoy L. Door or window guard system. 4,631,863, Cl. 49-141.000.
White, Luther J. Combination tool for opening, sealing, and puncturing a paint can. 4,631,769, Cl. 7-151.000.
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Whitehurst, Wendell P. Combination fishing net, weight scale and length scale. 4,631,851, Cl. 43-7.000.
Whiteman, Gary D. Airplane airconditioner. 4,632,019, Cl. 98-1.000.
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Wiegand, James H.; and Casper, Thomas J., to Envirex, Inc. Polymeric split sprocket wheel. 4,631,974, Cl. 74-450.000.
Wiegel, Manfred; and Dorr, Harald, to International Standard Electric Corporation. Digital signal pattern recognition circuit. 4,633,186, Cl. 328-119.000.
Wiens, David B. Solar energy collector apparatus and method. 4,632,091, Cl. 126-425.000.
Wiggers, Winfried, to Windmoller & Holscher. Apparatus for stacking pallets on which articles, preferably large sacks, have been deposited. 4,632,620, Cl. 414-95.000.
Wihl, Mark J., to KLA Instruments Corporation. Automatic photomask inspection system having image enhancement means. 4,633,504, Cl. 382-54.000.
Wijangco, Antonio, to Life Codes Corp. Hand held radiation detector. 4,633,089, Cl. 250-374.000.
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Williams, Jack M.; Wang, Hsien-Hau; and Beno, Mark A., to United States of America, Energy. Ambient-pressure organic superconductor. 4,632,776, Cl. 252-518.000.
Williams, Robert A. Connector socket. 4,632,496, Cl. 339-256.00S.
Willis, Donald H., to RCA Corporation. Video signal processor with automatic kinescope beam current limiter. 4,633,320, Cl. 358-243.000.
Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Vented heating element for sterile cutting and welding together of thermoplastic tubes. 4,633,063, Cl. 219-243.000.
Wilman, Hugh; and Brotton, James. Document scanner having an improved book support assembly. 4,633,080, Cl. 250-234.000.
Wilson, Craig A.; Curry, Stephen J.; Struzek, Kenneth; and Falcigno, Ralph, to Avco Corporation. Laser welder fault detector. 4,633,057, Cl. 219-121.0LC.
Wilson, Fred D. Support pedestal. 4,632,346, Cl. 248-176.000.
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Wilson, James A.; and Heinonen, Robert L., to Double-E Inc. Guide for well pump sucker rod. 4,632,468, Cl. 175-325.000.
Wilson, James L.; and Folweiler, Robert C., to GTE Laboratories Incorporated. Apparatus for fluidic support. 4,632,574, Cl. 384-12.000.
Wilson, John K., Jr.; and Park, Tae S., to University of Virginia Alumni Patents Foundation. Ventricular catheter. 4,632,668, Cl. 604-8.000.
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Wirges, Winfried; Lauderbach, Leo; and Schafer, Willi, to Stabilus GmbH. Gas spring of variable spring force. 4,632,371, Cl. 267-64.280.
Wirth, Robert L.; Hanna, Kenneth W.; and Wilson, Hillis L., to NCR Corporation. Dot matrix print head dampening mechanism. 4,632,580, Cl. 400-124.000.
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Wogerbauer, Johann, to Sprecher & Schuh Gesellschaft m.b.H. Electronic recording manometer. 4,631,960, Cl. 73-384.000.
Wold, Robert E., to Johnstone Pump Company. Magnadrum pump assembly. 4,632,281, Cl. 222-389.000.
Wolf, Stephen F.; and Liu, Chung-Tsing, to Economics Laboratory, Inc. Synthesis of alkyl phosphinate salts and bis(alkyl) phosphinate salts. 4,632,741, Cl. 204-157.730.
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Wolki, Peter, to Norton Pampus GmbH. Method of producing a polytetrafluorethylene material. 4,632,947, Cl. 523-206.000.
Wollermann, Kenneth A. Spindle tool retention and ejection mechanism. 4,632,613, Cl. 409-233.000.
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Yagasaki, Akio; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Light motor vehicles. 4,632,448, Cl. 296-218.000.
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Yamada, Norimasa; and Hibino, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Speech synthesizer. 4,633,500, Cl. 381-51.000.
Yamada, Tetsuya; Koga, Shigehiro; Imai, Kazuyoshi; and Inaba, Kazuo, to Chisso Corporation; and Nihon Plast Co., Ltd. Vinyl

chloride resin composition and molded products using same. 4,632,948, Cl. 523-219.000.

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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamakawa, Hiromitsu, to Fuji Photo Optical Co., Ltd. Plastic objective lens system adapted for correction for temperature. 4,632,520, Cl. 350-446.000.

Yamamitsu, Chojuro; Ogura, Ichiro; Suesada, Kunio; and Iketani, Akira, to Matsushita Electric Industrial Co., Ltd. Digital recording and reproducing apparatus for television signal. 4,633,330, Cl. 358-310.000.

Yamamoto, Hitoshi; Baba, Masayoshi; and Iwao, Eiichi, to Honda Giken Kogyo Kabushiki Kaisha. Engine exhaust system and supporting apparatus for two-wheeled/three wheeled vehicle. 4,632,210, Cl. 180-309.000.

Yamamoto, Hitoshi: *See*—
Onda, Takanori; Yamamoto, Hitoshi; and Kimoto, Masahiko, 4,632,070, Cl. 123-41.580.

Yamamoto, Kazuo: *See*—
Gotoh, Akio; Yamamoto, Kazuo; and Ishikawa, Tuguo, 4,633,519, Cl. 455-277.000.

Yamamoto, Kazushi: *See*—
Nakane, Shinichi; Maehara, Naoyoshi; and Yamamoto, Kazushi, 4,632,311, Cl. 239-101.000.

Yamamoto, Kimiaki, to Olympus Optical Co., Ltd. Optical information reading apparatus. 4,633,457, Cl. 369-116.000.

Yamamoto, Koichi; and Fujioka, Yoshihisa, to Sony Corporation. Apparatus for emitting and receiving light signals, more particularly infrared signals. 4,633,522, Cl. 455-603.000.

Yamamoto, Makoto; Kubota, Takashi; and Mikamo, Katsumi, to Hitachi, Ltd. Magnetic recording system for time-lapse magnetic video recorder. 4,633,335, Cl. 360-35.100.

Yamamoto, Masahiro; Tanaka, Hiroshi; and Watanabe, Chihiro, to Science and Technology Agency. Chemical manipulator. 4,632,808, Cl. 422-72.000.

Yamamoto, Minoru: *See*—
Oido, Hikofumi; Hayashi, Yoshitake; and Yamamoto, Minoru, 4,633,032, Cl. 136-251.000.

Yamamoto, Shinichi: *See*—
Gounji, Takashi; Yamamoto, Shinichi; Kawatsu, Teruo; Tomikawa, Yoshiro; Konno, Masashi; and Ogasawara, Toshiharu, 4,633,204, Cl. 333-186.000.

Yamamoto, Tsutomu; Murakami, Toshinori; Tokuda, Yoshiaki; and Nagai, Tamio, to Hisaka Works, Ltd.; and House Food Industrial Co. Ltd. Tray pressing device in a retort sterilizer for cooking foods. 4,632,026, Cl. 99-349.000.

Yamamura, Motohisa, to Teijin Seiki Company Limited. Machine tools. 4,632,615, Cl. 409-235.000.

Yamanaka, Toshihiro: *See*—
Horie, Nobuyuki; Nishioka, Yoshiki; Sakamoto, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, 4,633,337, Cl. 360-57.000.

Yamatake Honeywell: *See*—
Akano, Shinichi, 4,633,217, Cl. 340-310.00A.

Yamazaki, Hajime: *See*—
Hiza, Misao; Yamazaki, Hajime; and Omote, Shigeo, 4,632,970, Cl. 528-27.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co. Ltd. Method of making photoelectric conversion device. 4,631,801, Cl. 29-572.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor photoelectric conversion device. 4,633,287, Cl. 357-30.000.

Yamazaki, Yasuhiro: *See*—
Endoh, Toshiaki; and Yamazaki, Yasuhiro, 4,633,326, Cl. 358-280.000.

Yanagihara, Kenji; Itoh, Tetsuo; Kimura, Mituo; and Niinomi, Masahiro, to Japan Synthetic Rubber Co., Ltd. Optical product having a thin film on the surface. 4,632,844, Cl. 427-38.000.

Yanagiuchi, Shigenobu: *See*—
Morimoto, Masafumi; Noda, Michihiro; Yanagiuchi, Shigenobu; and Yanagiuchi, Yasuko, 4,633,435, Cl. 364-900.000.

Yanagiuchi, Yasuko: *See*—
Morimoto, Masafumi; Noda, Michihiro; Yanagiuchi, Shigenobu; and Yanagiuchi, Yasuko, 4,633,435, Cl. 364-900.000.

Yang, Tai-Her. Vise with sliding movable clamp surface. 4,632,374, Cl. 269-261.000.

Yang, Tai-Her. Servo-clamping device. 4,632,375, Cl. 269-262.000.

Yaniv, Zvi: *See*—
Hansell, Gregory L.; Yaniv, Zvi; and Cannella, Vincent D., 4,633,284, Cl. 357-23.700.

Yano, Takeshi: *See*—
Sato, Eiichi; Fukui, Izumu; Inui, Osamu; Yano, Takeshi; Takahashi, Sadayuki; and Ochi, Atsushi, 4,633,120, Cl. 310-328.000.

Yashiki, Yuichi; Anayama, Hideki; and Hiro, Masaaki, to Canon Kabushiki Kaisha. Photosensitive member with resin having low oligomer content in charge transport layer. 4,632,892, Cl. 430-58.000.

Yasuda, Minoru: *See*—
Ogawa, Yasuhiko; Nakayama, Kazuhiko; and Yasuda, Minoru, 4,633,121, Cl. 310-332.000.

Yasuda, Tooru, to NEC Corporation. Interframe encoding system having a buffer simulator. 4,633,312, Cl. 358-136.000.

Yasukouchi, Yoshimi: *See*—
Nishimura, Yoshikazu; Yasukouchi, Yoshimi; and Asakura, Hisao, 4,633,187, Cl. 329-50.000.

Yazu, Shuji; Tsuji, Kazuo; and Yoshida, Akito, to Sumitomo Electric Industries, Ltd. Method of synthesizing diamond. 4,632,817, Cl. 423-446.000.

Ye Data Incorporated: *See*—
Mizoguchi, Toshiaki; Wadaya, Shinichiro; Hashimoto, Kunihiro; and Takase, Shinichi, 4,633,352, Cl. 360-104.000.

Yeary, David A.: *See*—
Blanco, Alfred W.; McDowell, Judson A.; and Yeary, David A., 4,633,333, Cl. 360-31.000.

Yedlin, Matthew J.: *See*—
Stebens, Beverly; Parsons, Roger K.; Baumel, Robert T.; Terral, Donna K.; and Yedlin, Matthew J., 4,633,399, Cl. 364-421.000.

Yeh, Helen L.: *See*—
Brusic, Vlasta A.; Elmgren, Peter J.; Owen, Charles J.; Sissenstein, David W., Jr.; and Yeh, Helen L., 4,632,295, Cl. 228-123.000.

Yohe, Thomas L.; Donlan, Rodney M.; and Kyriss, Karl M., to Philadelphia Suburban Water Company. Sampling device for determining conditions on the interior surface of a water main. 4,631,961, Cl. 73-866.500.

Yokohama Rubber Co., Ltd., The: *See*—
Hiza, Misao; Yamazaki, Hajime; and Omote, Shigeo, 4,632,970, Cl. 528-27.000.

Yokoi, Toshiro, to Sanmeidenki Kabushikikaisha. Process for manufacture cores of electromagnet. 4,631,809, Cl. 29-607.000.

Yokota, Mitsuru; Goshima, Tsutomu; and Fujioka, Shuji, to Toray Industries, Inc. Contact lens and process for preparation thereof. 4,632,968, Cl. 526-279.000.

Yokoyama, Issei: *See*—
Hara, Kiyoaki; Yokoyama, Issei; and Yoshida, Natsuki, 4,632,550, Cl. 356-311.000.

Yokoyama, Yasumasa: *See*—
Koike, Shoji; Eida, Tsuyoshi; Kobayashi, Masatsune; Yokoyama, Yasumasa; and Komori, Tomoko, 4,632,703, Cl. 106-22.000.

Yoon, Hyun-Nam: *See*—
Eickman, Nancy C.; McChesney, Charles E.; Williams, Gary E., and Yoon, Hyun-Nam, 4,632,798, Cl. 264-272.170.

Yorifuji, Yuki: *See*—
Ikari, Motoo; Kanbe, Yoshiaki; Okuda, Yoshihiko; Yorifuji, Yuki; Miyashita, Hitoshi; and Moinose, Haruhiko, 4,633,077, Cl. 250-214.00L.

York, Marty. Stove arrangement. 4,632,090, Cl. 126-110.00R.

Yoshida, Akito: *See*—
Yazu, Shuji; Tsuji, Kazuo; and Yoshida, Akito, 4,632,817, Cl. 423-446.000.

Yoshida, Eiji: *See*—
Komai, Kensaku; and Yoshida, Eiji, 4,633,396, Cl. 364-405.000.

Yoshida, Hideaki: *See*—
Morikawa, Masaki; Yoshida, Hideaki; and Kishida, Kunio, 4,632,806, Cl. 420-479.000.

Yoshida, Hitoshi: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Novuei; and Atumi, Kinya, 4,633,064, Cl. 219-270.000.

Yoshida Kogyo K. K.: *See*—
Sassa, Yuusei; and Yoshieda, Keiichi, 4,631,818, Cl. 29-768.000.
Yoshioka, Hiroshi, 4,632,045, Cl. 112-104.000.

Yoshida, Natsuki: *See*—
Hara, Kiyoaki; Yokoyama, Issei; and Yoshida, Natsuki, 4,632,550, Cl. 356-311.000.

Yoshida, Nobuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Microprogram control system. 4,633,390, Cl. 364-200.000.

Yoshida, Toshiro: *See*—
Takahashi, Yasuyuki; Aizawa, Shigeru; Tamai, Shigeru; Yoshida, Toshiro; and Takahashi, Takeshi, 4,632,840, Cl. 426-602.000.

Yoshieda, Keiichi: *See*—
Sassa, Yuusei; and Yoshieda, Keiichi, 4,631,818, Cl. 29-768.000.

Yoshikawa, Yoshiaki: *See*—
Yabe, Yuhiko; Uzuhashi, Hideo; and Yoshikawa, Yoshiaki, 4,633,414, Cl. 364-513.000.

Yoshikumi, Chikao; Matsunaga, Kenichi; Hayashi, Haruhisa; and Oguchi, Yoshiharu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for examining cells by electrophoresis. 4,632,743, Cl. 204-183.300.

Yoshino, Hisakazu; Takagi, Kazutoshi; and Torii, Yoshitaka, to Tokyo Kogaku Kikai Kabushiki Kaisha. Method for determining refractive index of an object. 4,632,528, Cl. 351-211.000.

Yoshioka, Hiroshi, to Yoshida Kogyo K. K. Slider-moving unit in apparatus for sewing a slide fastener to a pair of fabric pieces. 4,632,045, Cl. 112-104.000.

Yoshioka, Susumu: *See*—
Hayashi, Koji; Yoshioka, Susumu; and Ono, Noritsugu, 4,631,834, Cl. 33-503.000.

Young, Archie R., II: *See*—
Ho, Teh C.; Young, Archie R., II; Jacobson, Allan J.; and Chianelli, Russell R., 4,632,747, Cl. 208-18.000.

Young, Charles E.: *See*—
Gruen, Dieter M.; Pellin, Michael J.; and Young, Charles E., 4,633,084, Cl. 250-306.000.

Young, Dale W., to Xerox Corporation. Off-set nip roll decurler. 4,632,533, Cl. 355-3.0SH.

Young, David H., to Quad Systems Corporation. Programmable substrate transport for electronic assembly. 4,631,812, Cl. 29-714.000.

Young Engineering Inc.: *See*—
Young, William O., Jr.; and Hankinson, Julian E., Jr., 4,631,911, Cl. 57-1.0UN.

Young, Harry M.: *See*—
Jones, Donald K.; Tomisek, John D.; and Young, Harry M., 4,633,088, Cl. 250-369.000.

Young Industries, Inc., The: *See*—
Mahoney, William J., Jr., 4,632,565, Cl. 366-113.000.

Young, William O., Jr.; and Hankinson, Julian E., Jr., to Young Engineering Inc. Apparatus for removing twist from moving fabric and method for accomplishing same. 4,631,911, Cl. 57-1.0UN.

Yount, Robert L., to GTE Service Corporation. Apparatus for use with key telephone systems. 4,633,043, Cl. 379-33.000.

Yuan, Mark S., to Hughes Aircraft Company. Spacecraft payload ejection mechanism. 4,632,339, Cl. 244-158.00R.

Yuan-Tai Chen, John, to Hughes Aircraft Company. Latch-up immune, multiple retrograde well high density CMOS FET. 4,633,289, Cl. 357-42.000.

Yuhasz, Kathleen M.: *See*—
Ferlauto, Robert J., Jr.; and Yuhasz, Kathleen M., 4,632,825, Cl. 424-52.000.

Yves Saint Laurent, Inc.: *See*—
Exley, Jyll; and Bouet, Thiebault, 4,632,137, Cl. 135-20.00R.

Zachrai, Jugen: *See*—
Debus, Jurgen; Zachrai, Jugen; Butergerds, Helmut; and Wetzel, Manfred, 4,631,937, Cl. 70-207.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Liska, Georg, 4,632,641, Cl. 417-273.000.

Zajac, John: *See*—
Mirkovich, Ninko T.; and Zajac, John, 4,632,624, Cl. 414-217.000.

Zambon S.p.A.: *See*—
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,632,940, Cl. 514-648.000.

Zanno, Paul R.: *See*—
Barnett, Ronald E.; Riemer, Jed A.; and Zanno, Paul R., 4,633,006, Cl. 560-1.000.

Zanzig, Jurgen, to International Standard Electric Corporation. Supply circuit for a variable load, particularly for a line circuit in telephone systems. 4,633,038, Cl. 379-400.000.

Zato, Thomas J.: *See*—
Fimoff, Mark; and Zato, Thomas J., 4,633,514, Cl. 455-151.000.
Skerlos, Peter C.; Zato, Thomas J.; and Jones, Gary A., 4,633,297, Cl. 358-22.000.

Zavody Tazkeho Strojarstva, Narodny Podnik: *See*—
Gecs, Jan, 4,631,782, Cl. 24-16.0PB.

Zeana, Alexandru: *See*—
Lebesgue, Yves; and Zeana, Alexandru, 4,632,692, Cl. 71-10.000.

Zee, Yuan C.; and Bolton, David C., to Immunologics. Ozone decontamination of blood and blood products. 4,632,980, Cl. 530-380.000.

Zeiler, Hans-Joachim: *See*—
Angerbauer, Rolf; Boberg, Michael; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,632,918, Cl. 514-202.000.

Zeitzoff, Peter M.: *See*—
Statt, David J.; Narayan, Badhri; and Zeitzoff, Peter M., 4,633,092, Cl. 250-578.000.

Zelenetz, Scott H. Flexible protective cover for the drive train elements of a bicycle. 4,632,416, Cl. 280-289.00G.

Zenith Electronics Corporation: *See*—
Burke, Dennis E.; and Lund, John A., 4,633,316, Cl. 358-197.000.
Fimoff, Mark; and Zato, Thomas J., 4,633,514, Cl. 455-151.000.
Skerlos, Peter C.; Zato, Thomas J.; and Jones, Gary A., 4,633,297, Cl. 358-22.000.

Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, to Bayer Aktiengesellschaft. Process for the preparation of oxiranes. 4,632,999, Cl. 549-519.000.

Zielinski, Erich: *See*—
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,632,011, Cl. 89-36.130.

Zingg, Peter; Mettier, Werner; and Lindner, Gottfried, to Rohner Jacob AG. Knitted clothing article. 4,631,755, Cl. 2-239.000.

Zinnen, Hermann A., to UOP Inc. Process for separating isomers of toluenediamine. 4,633,018, Cl. 564-424.000.

Ziph, Benjamin: *See*—
Meijer, Roelf J.; and Ziph, Benjamin, 4,632,179, Cl. 165-47.000.

Zirps, Wilhelm, to Robert Bosch GmbH. Hydraulic lifting device for harvesting machines. 4,631,907, Cl. 56-11.900.

Zojer, Bernhard; and Petschacher, Reinhard, to Siemens Aktiengesellschaft. Integrable analog-to-digital converter. 4,633,219, Cl. 340-347.0AD.

Zojirushi Baby Co., Ltd.: *See*—
Miyagi, Takeshi, 4,632,420, Cl. 280-642.000.

Zoor, Reinhold, to Heinrich Wunder GmbH & Co. KG. Ski binding. 4,632,419, Cl. 280-614.000.

Zuranski, Edward: *See*—
Betts, William L.; and Zuranski, Edward, 4,633,485, Cl. 375-99.000.

Zweifel, Terry L.: *See*—
Greeson, Jeffrey A.; and Zweifel, Terry L., 4,633,404, Cl. 364-433.000.

Zymark Corporation: *See*—
Dunlap, Raymond R., 4,632,441, Cl. 294-1.100.
Dunlap, Raymond R., 4,632,631, Cl. 414-736.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Comper, Louis F., deceased; and Scheiderich, Robert F., to Goodyear Tire & Rubber Company, The. Tire curing bladder lubricant. Re. 32,318, Cl. 106-38.220.

Du Pont de Nemours, E. I., and Company: *See*—
Jacobson, Howard W., Re. 32,320, Cl. 428-530.000.

Goodyear Tire & Rubber Company, The: *See*—
Comper, Louis F., deceased; and Scheiderich, Robert F., Re. 32,318, Cl. 106-38.220.

Jacobson, Howard W., to Du Pont de Nemours, E. I., and Company. TiO_2 pigment bearing a coating with cerium cations and sulfate-, phosphate- or silicate anions and laminate and coating containing same. Re. 32,320, Cl. 428-530.000.

Kollross, Gunter, to Teepak, Inc. Process and apparatus for automated manufacture of link sausages having casings formed of synthetic tubular material. Re. 32,315, Cl. 17-33.000.

Korb, Louis L.; and Waitkus, Phillip A., to Plastics Engineering Company. Vitreous carbon and process for preparation thereof. Re. 32,319, Cl. 423-445.000.

Kunkle, Gerald E.; and Matesa, Joseph M., to PPG Industries, Inc. Glass batch liquefaction. Re. 32,317, Cl. 65-135.000.

Matesa, Joseph M.: *See*—
Kunkle, Gerald E.; and Matesa, Joseph M., Re. 32,317, Cl. 65-135.000.

Plastics Engineering Company: *See*—
Korb, Louis L.; and Waitkus, Phillip A., Re. 32,319, Cl. 423-445.000.

PPG Industries, Inc.: *See*—
Kunkle, Gerald E.; and Matesa, Joseph M., Re. 32,317, Cl. 65-135.000.

Rhone-Poulenc Agrochimie: *See*—
Theissen, Robert J., Re. 32,316, Cl. 71-115.000.

S&C Electric Company: *See*—
Tobin, Thomas J., Re. 32,321, Cl. 200-82.00B.

Scheiderich, Robert F.: *See*—
Comper, Louis F., deceased; and Scheiderich, Robert F., Re. 32,318, Cl. 106-38.220.

Teepak, Inc.: *See*—
Kollross, Gunter, Re. 32,315, Cl. 17-33.000.

Theissen, Robert J., to Rhone-Poulenc Agrochimie. Substituted phenoxybenzoic acids and derivatives thereof. Re. 32,316, Cl. 71-115.000.

Tobin, Thomas J., to S&C Electric Company. Electric switch and improved device using same. Re. 32,321, Cl. 200-82.00B.

Waitkus, Phillip A.: *See*—
Korb, Louis L.; and Waitkus, Phillip A., Re. 32,319, Cl. 423-445.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Astec Industries, Inc.: *See*—
Brock, James D., B1 4,248,359, Cl. 222-58.000.

Bertozzi, Eugene R., to Thiokol Corporation. Acrylic acid esters of polythiödialkanols and related compounds. B1 4,131,716, 12-30-86, Cl. 428-423.100.

Brock, James D., to Astec Industries, Inc. Weigh-out system for collapsible surge bin. B1 4,248,359, 12-30-86, Cl. 222-58.000.

Chemische Fabrik Kalk GmbH: *See*—
Praetzel, Hans E.; and Jenkner, Herbert, B1 3,962,164, Cl. 524-373.000.

Dow Chemical Company, The: *See*—
Henton, David E., B1 4,367,310, Cl. 525-67.000.

Graphic Resources, Incorporated: *See*—
Hattemer, James C., B1 4,281,762, Cl. 206-390.000.

Hattemer, James C., to Graphic Resources, Incorporated. In-store coupon and methods. B1 4,281,762, 12-30-86, Cl. 206-390.000.

Henton, David E., to Dow Chemical Company, The. Blends of polycarbonate with rubber and monovinylidene aromatic copolymers. B1 4,367,310, 12-30-86, Cl. 525-67.000.

Jenkner, Herbert: *See*—
Praetzel, Hans E.; and Jenkner, Herbert, B1 3,962,164, Cl. 524-373.000.

Krider, Edmund P.; Noggle, Ralph C.; and Uman, Martin A., to University of Arizona Foundation, The. Detection system for lightning. B1 4,115,732, 12-30-86, Cl. 324-72.000.

MDT Instrument Company: *See*—
Roland, Max, B1 3,923,372, Cl. 350-96.240.

Nishimura, Shinicki: *See*—
Takizawa, Shiro; and Nishimura, Shinicki, B1 4,102,565, Cl. 351-214.000.

Noggle, Ralph C.: *See*—
Krider, Edmund P.; Noggle, Ralph C.; and Uman, Martin A., B1 4,115,732, Cl. 324-72.000.

Praetzel, Hans E.; and Jenkner, Herbert, to Chemische Fabrik Kalk GmbH. Self-extinguishing acrylonitrile-butadiene-styrene moulding composition. B1 3,962,164, 12-30-86, Cl. 524-373.000.

Roland, Max, to MDT Instrument Company. Fiber optic extra oral operatory light. B1 3,923,372, 12-30-86, Cl. 350-96.240.

Schibbye, Lauritz B., to Svenska Rotor Maskiner Aktiebolag. Screw rotor machine and rotors therefor. B1 3,423,017, 12-30-86, Cl. 418-117.000.

Svenska Rotor Maskiner Aktiebolag: *See*—
Schibbye, Lauritz B., B1 3,423,017, Cl. 418-117.000.

Takizawa, Shiro; and Nishimura, Shinicki. Slit lamp microscope. B1 4,102,565, 12-30-86, Cl. 351-214.000.

Thiokol Corporation: *See*—
Bertozzi, Eugene R., B1 4,131,716, Cl. 428-423.100.

Uman, Martin A.: *See*—
Krider, Edmund P.; Noggle, Ralph C.; and Uman, Martin A., B1 4,115,732, Cl. 324-72.000.

University of Arizona Foundation, The: *See*—
Krider, Edmund P.; Noggle, Ralph C.; and Uman, Martin A., B1 4,115,732, Cl. 324-72.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Rodomista, Guy F., 287,484, Cl. D13-11.000.

All State Fasteners Co., Ltd., Inc.: *See*—
Mallon, John D., 287,467, Cl. D9-415.000.

Allback, Hans C., to Utveckling AB Carmen. Combined infrared heating device and body thereof. 287,535, 12-30-86, Cl. D23-77.000.

American Commercial, Incorporated: *See*—
Laslo, Larry R., 287,449, Cl. D7-5.000.
Ohtake, Katsuhiro, 287,454, Cl. D7-319.000.

Applied Technology and Ethics Corporation: *See*—
Bricker, James C., 287,496, Cl. D14-65.000.

Arthur, John D. Lathe tool holder or the like. 287,442, 12-30-86, Cl. D6-461.000.

Astronics Corporation: *See*—
Winfield, Mason C., 287,479, Cl. D12-153.000.

AT&T Information Systems: *See*—
Danielson, David C.; and McGarvey, John N., 287,494, Cl. D14-60.000.

Babbitt, Eric K.: *See*—
Brown, Wilbert C.; Babbitt, Eric K.; and Tosto, Roger J., 287,491, Cl. D14-53.000.
Brown, Wilbert C.; Babbitt, Eric K.; and Tosto, Roger J., 287,492, Cl. D14-53.000.

Berlese, Remo. Glove pad. 287,424, 12-30-86, Cl. D29-22.000.

Blumenthal, Martin. Toy dump truck. 287,522, 12-30-86, Cl. D21-134.000.

Bouilhet, Henry, to La Societe Orfevrerie Christofle. Handle for an article of flatware. 287,453, 12-30-86, Cl. D7-152.000.

Bricker, James C., to Applied Technology and Ethics Corporation. Telephone handset shoulder rest. 287,496, 12-30-86, Cl. D14-65.000.

Brignole, Guillermo F.; Eisenstadt, Thomas P.; and Lee, Robert E., to TeleQuest. Telephone. 287,488, 12-30-86, Cl. D14-53.000.

Brockett, Keith P.; and Brockett, Laverne A. Barbell. 287,526, 12-30-86, Cl. D21-197.000.

Brockett, Laverne A.: *See*—
Brockett, Keith P.; and Brockett, Laverne A., 287,526, Cl. D21-197.000.

Broeils, John, to Maddak, Inc. Raised superimposed toilet seat or the like. 287,533, 12-30-86, Cl. D23-71.000.

Broeils, John, to Maddak, Inc. Raised superimposed toilet seat or the like. 287,534, 12-30-86, Cl. D23-71.000.

Broncucia, Shellee A. Shoe shine stand. 287,435, 12-30-86, Cl. D6-336.000.

Brother Kogyo K.K.: *See*—
Ito, Shigeo, 287,455, Cl. D7-351.000.

Brown Jordan Company: *See*—
Frinier, Richard; and Criqui, Eugene A., 287,437, Cl. D6-373.000.

Brown, Wilbert C.; Babbitt, Eric K.; and Tosto, Roger J., to TIE/Communications, Inc. Telephone set. 287,491, 12-30-86, Cl. D14-53.000.

Brown, Wilbert C.; Babbitt, Eric K.; and Tosto, Roger J., to TIE/Communications, Inc. Telephone set. 287,492, 12-30-86, Cl. D14-53.000.

Bussell, Vanda J. Toothbrush holder. 287,447, 12-30-86, Cl. D6-534.000.

Bussell, Vanda J. Lotion dispensing bottle. 287,461, 12-30-86, Cl. D9-300.000.

Bussell, Vanda J. Lotion dispensing bottle. 287,462, 12-30-86, Cl. D9-300.000.

Canon Kabushiki Kaisha: *See*—
Masaki, Nobuo, 287,503, Cl. D16-31.000.
Nibley, Richard; and Takemura, Makoto, 287,509, Cl. D18-22.000.
Yoshioka, Eiichi; and Harada, Yuji, 287,507, Cl. D18-7.000.
Yoshioka, Eiichi; and Suwa, Kaname, 287,508, Cl. D18-7.000.

Car-Mate Mfg. Co. Ltd.: *See*—
Sakai, Kazumi, 287,450, Cl. D7-70.000.

Carson's, Inc.: *See*—
Culler, Randy R., 287,439, Cl. D6-381.000.

Centennial Machine Company, Inc.: *See*—
Conner, Ronnie M.; and Harben, Grover S., Jr., 287,500, Cl. D15-139.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Newspaper vending machine. 287,513, 12-30-86, Cl. D20-6.000.

Clover Mfg. Co. Ltd.: *See*—
Okada, Hidekazu, 287,463, Cl. D9-303.000.

Conner, Ronnie M.; and Harben, Grover S., Jr., to Centennial Machine Company, Inc. Unloader attachment for a poultry processing machine. 287,500, 12-30-86, Cl. D15-139.000.

Container Corporation of America: *See*—
Gardner, Robert B., 287,466, Cl. D9-414.000.

Cowle, John T. Corner protector for preventing injury. 287,446, 12-30-86, Cl. D6-491.000.

Craft, Timothy W.; and Shepard, William M. Tree stand. 287,476, 12-30-86, Cl. D11-130.100.

Criqui, Eugene A.: *See*—
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Culler, Randy R., to Carson's, Inc. Sofa or similar article. 287,439, 12-30-86, Cl. D6-381.000.

Culver, Irven H.: *See*—
O'Quinn, Russell P.; and Culver, Irven H., 287,483, Cl. D12-342.000.

Cyberman Consultant Company Limited: *See*—
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D. J. Evans Design Limited: *See*—
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Danielson, David C.; and McGarvey, John N., to AT&T Information Systems. Telephone stand. 287,494, 12-30-86, Cl. D14-60.000.

Davis, Scott V. Speedometer cable grease fitting. 287,501, 12-30-86, Cl. D15-150.000.

Decursu, Giorgio, to Elesa S.p.A. Adjustable locking handle. 287,458, 12-30-86, Cl. D8-308.000.

Desrosiers, Andrew. Guitar body. 287,504, 12-30-86, Cl. D17-20.000.

Diederichs, Hanns-Juergen, Jr., to Nico-Pyrotechnic Hanns-Juergen Diederichs GmbH & Co. KG. Emergency pyrotechnic signalling device. 287,529, 12-30-86, Cl. D22-112.000.

Diffrient, Niels, to Hauserman, Inc. Chair. 287,436, 12-30-86, Cl. D6-367.000.

Donalies, Richard W., to Midwest Marine Development Corporation. Water ski rope connector. 287,459, 12-30-86, Cl. D8-382.000.

Drago, Joseph R. Disposable cup holder blank. 287,468, 12-30-86, Cl. D9-433.000.

Dresser Industries, Inc.: *See*—
Monigle, Glenn W.; and Roecker, David W., 287,498, Cl. D15-9.200.

Dry Forming Processes in Europe AB: *See*—
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Durward, Gregory W. Exercising weight. 287,525, 12-30-86, Cl. D21-196.000.

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Kobos, Duane M., 287,456, Cl. D8-24.000.

Eisenstadt, Thomas P.: *See*—
Brignole, Guillermo F.; Eisenstadt, Thomas P.; and Lee, Robert E., 287,488, Cl. D14-53.000.

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Ernst Stadelmann Gesellschaft m.b.H: *See*—
Kirchner, Balthasar, 287,425, Cl. D3-35.000.

Esslinger, Hartmut H., to Louis Vuitton S.A. Luggage. 287,429, 12-30-86, Cl. D3-76.000.

Estreich, David, to Pace Collection, Inc. Table. 287,445, 12-30-86, Cl. D6-480.000.

Evans, David J., to D. J. Evans Design Limited. Hand pump. 287,531, 12-30-86, Cl. D23-14.000.

Fichter, June C., to Polaroid Corporation. Photographic camera back or similar article. 287,502, 12-30-86, Cl. D16-10.000.

Fieldhouse, Robert. Slotted board with integral slot car and integral slot figures. 287,516, 12-30-86, Cl. D21-59.000.

Flight Concepts Limited Partnership: *See*—
O'Quinn, Russell P.; and Culver, Irven H., 287,483, Cl. D12-342.000.

Ford Motor Company: *See*—
Gransden, Ronald G., 287,515, Cl. D20-42.000.

Frinier, Richard; and Criqui, Eugene A., to Brown Jordan Company. Chair frame. 287,437, 12-30-86, Cl. D6-373.000.

Gardner, Robert B., to Container Corporation of America. Packaging container. 287,466, 12-30-86, Cl. D9-414.000.

General Binding Corporation: *See*—
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General Electric Company: *See*—
Points, Henry A.; and Talesfore, Nicholas F., 287,486, Cl. D13-35.000.

Godfrey, Kenneth V., to Paton Tupper Interiors (Proprietary) Limited. Cassette carrier. 287,426, 12-30-86, Cl. D3-35.000.

Good, Daniel H.: *See*—
Good, David S.; and Good, Daniel H., 287,423, Cl. D2-331.000.

Good, David S.; and Good, Daniel H. Sock. 287,423, 12-30-86, Cl. D2-331.000.

Goodner, Douglas E.; and Iorio, David V., to International Business Machines Corporation. Printer. 287,497, 12-30-86, Cl. D14-111.000.

Gransden, Ronald G., to Ford Motor Company. Wall sign. 287,515, 12-30-86, Cl. D20-42.000.

Grant, Fred W. Commode brush handle. 287,432, 12-30-86, Cl. D4-138.000.

GTE Communication Systems Corp.: *See*—
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Hamer, Merlin L.; and Mitchell, Wayne T. Safety lock for an electrical plug. 287,485, 12-30-86, Cl. D13-28.000.

Harada, Yuji: *See*—
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Hauserman, Inc.: *See*—
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Hitachi, Ltd.: *See*—
Wada, Hiromi; Tsuchihashi, Syuuhei; and Kawashima, Syouzi, 287,420, Cl. D2-512.000.

Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 287,431, 12-30-86, Cl. D4-123.000.

Hotz, Jean-Marie, to Omega SA. Watch. 287,472, 12-30-86, Cl. D10-39.000.

Houlihan, John T., to Timex Corporation. Case for a wristwatch. 287,470, 12-30-86, Cl. D10-30.000.

International Business Machines Corporation: *See*—
Goodner, Douglas E.; and Iorio, David V., 287,497, Cl. D14-111.000.

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Iwatsu Electric Co., Ltd.: *See*—
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Sekiguchi, Akira; and Kodama, Hideaki, 287,490, Cl. D14-53.000.

Jones, Robert E.; and Purkapile, Emerson, to Victaulic Company of America. Coupling. 287,532, 12-30-86, Cl. D23-43.000.

Jordan, David J. Depth gauge. 287,475, 12-30-86, Cl. D10-70.000.

K-Jack Engineering Company, Inc.: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Balance panel for an automobile. 287,480, 12-30-86, Cl. D12-181.000.

Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Balance panel for an automobile. 287,481, 12-30-86, Cl. D12-181.000.

Kaufman, Jack W. Scrub brush with wrap around sponge. 287,430, 12-30-86, Cl. D4-116.000.

Kawashima, Syouzi: *See*—
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Kendo Products Co., Inc.: *See*—
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Kirchner, Balthasar, to Ernst Stadelmann Gesellschaft m.b.H. Diskette storage container. 287,425, 12-30-86, Cl. D3-35.000.

Knoepke, Eckhard, to Samsonite Corporation. Portfolio. 287,428, 12-30-86, Cl. D3-52.000.

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Lee, Robert E.: *See*—
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MacGregor, Bruce; and Tong, James K., to Pensa, Inc. Shoe upper. 287,422, 12-30-86, Cl. D2-314.000.

MacKarvich, Charles J., to Tie Down Engineering, Inc. Rock anchor. 287,460, 12-30-86, Cl. D8-388.000.

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Broeils, John, 287,534, Cl. D23-71.000.

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Mallon, John D., to All State Fasteners Co., Ltd., Inc. Container with a hinged lid. 287,467, 12-30-86, Cl. D9-415.000.

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Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Oil-fired space heater. 287,537, 12-30-86, Cl. D23-124.000.

Nibley, Richard; and Takemura, Makoto, to Canon Kabushiki Kaisha. Paper feeder for printer. 287,509, 12-30-86, Cl. D18-22.000.

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Obara, Hiroyuki, to Takara Co., Ltd. Reconfigurable radio cassette recorder toy. 287,521, 12-30-86, Cl. D21-112.000.

Odegard, Paul A. Anchor line scope measuring device. 287,474, 12-30-86, Cl. D10-69.000.

Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable helicopter toy. 287,518, 12-30-86, Cl. D21-90.000.

Ohtake, Katsuhiro, to American Commercial Incorporated. Cream pitcher. 287,454, 12-30-86, Cl. D7-319.000.

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Sasaki, Yoshio; Nishimura, Toshio; and Matsuda, Kei, to Nitsuko Limited. Cordless telephone. 287,487, 12-30-86, Cl. D14-53.000.

Sato, Akito, to Pilot Ink Co., Ltd. Toy hippopotamus. 287,523, 12-30-86, Cl. D21-148.000.

Sato, Shinji; and Tsukida, Hiroshi, to Shiojiri Kogyo Kabushiki Kaisha. Watch case. 287,471, 12-30-86, Cl. D10-38.000.

Scaggs, David M. Knitted cap. 287,421, 12-30-86, Cl. D2-249.000.

Scharer, Roger M., to General Binding Corporation. Combined punch and binder. 287,511, 12-30-86, Cl. D18-34.000.

Schrock, David L. Vacuum bottle handle. 287,451, 12-30-86, Cl. D7-70.000.

Sekiguchi, Akira; and Kodama, Hideaki, to Iwatsu Electric Co., Ltd. Handset and stand telephone unit. 287,489, 12-30-86, Cl. D14-53.000.

Sekiguchi, Akira; and Kodama, Hideaki, to Iwatsu Electric Co., Ltd. Handset and stand telephone unit. 287,490, 12-30-86, Cl. D14-53.000.

Shaw, William J., to Small World Greetings, Inc. Note pad holder. 287,512, 12-30-86, Cl. D19-92.000.

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Sato, Shinji; and Tsukida, Hiroshi, 287,471, Cl. D10-38.000.

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Takamatsu, Takehiko; and Kurihara, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Body of excavator. 287,499, 12-30-86, Cl. D15-30.000.

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Talesfore, Nicholas F.: *See*—
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Brown, Wilbert C. Babbitt, Eric K.; and Tosto, Roger J., 287,492, Cl. D14-53.000.

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Tong, James K.: *See*—
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Tosto, Roger J.: *See*—
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Brown, Wilbert C.; Babbitt, Eric K.; and Tosto, Roger J., 287,492, Cl. D14-53.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kato, Mitsuo; and Kikuchi, Hideto, 287,480, Cl. D12-181.000.
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Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu, 287,536, Cl. D23-122.000.
Nakamura, Kazuharu, 287,537, Cl. D23-124.000.

Tsuchihashi, Syuuhei: *See*—
Wada, Hiromi; Tsuchihashi, Syuuhei; and Kawashima, Syouzi, 287,420, Cl. D2-512.000.

Tsukida, Hiroshi: *See*—
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Weinberger, Royal, to North American Systems, Inc. Closure cap. 287,469, 12-30-86, Cl. D9-435.000.

Wiens, Terry: *See*—
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Wilson, Frank G.; and Patton, William A., to Kendo Products Co., Inc. Foam sponge broom head. 287,539, 12-30-86, Cl. D32-50.000.

Winfield, Mason C., to Astronics Corporation. Beadlock for inflatable tires. 287,479, 12-30-86, Cl. D12-153.000.

Wolfe, Marjorie E.: *See*—
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Wolfe, William G.; and Wolfe, Marjorie E. Combined stool and tool holder for a gardener. 287,434, 12-30-86, Cl. D6-336.000.

Worrell, W. Robert, to Norwesco Inc. Diskette storage case. 287,427, 12-30-86, Cl. D3-35.000.

Yoke, Hideaki, to Takara Co., Ltd. Reconfigurable microscope toy. 287,520, 12-30-86, Cl. D21-109.000.

Yoo, Byung E., to Sam Woo Trading Co., Ltd. Soap tape dispenser. 287,448, 12-30-86, Cl. D6-542.000.

Yoshioka, Eiichi; and Harada, Yuji, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 287,507, 12-30-86, Cl. D18-7.000.

Yoshioka, Eiichi; and Suwa, Kaname, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 287,508, 12-30-86, Cl. D18-7.000.

Young, Michael, to International Quartz Ltd. Handset telephone and stand unit. 287,493, 12-30-86, Cl. D14-53.000.

LIST OF PLANT PATENTEES

Burks, Joe J., to City of Rosemead. Rose plant named 'City of Rosemead'. 5,843, 12-30-86, Cl. 21.000.

City of Rosemead: *See*—
Burks, Joe J., 5,843, Cl. 21.000.

Conard-Pyle Company, The: *See*—
Meilland, Marie-Louise, 5,844, Cl. 20.000.
Suzuki, Seizo, 5,841, Cl. 1.000.

Jackson & Perkins Company: *See*—
Warriner, William A., 5,842, Cl. 18.000.

Meilland, Marie-Louise, to Conard-Pyle Company, The. Rose plant—Meifula variety. 5,844, 12-30-86, Cl. 20.000.

Suzuki, Seizo, to Conard-Pyle Company, The. Rose plant—Keitoli variety. 5,841, 12-30-86, Cl. 1.000

University of California, The Regents of the: *See*—
Youngner, Victor B., deceased, 5,845, Cl. 88.000.

Warriner, William A., to Jackson & Perkins Company. Rose plant Jacade. 5,842, 12-30-86, Cl. 18.000.

Youngner, Victor B., deceased (by Youngner, Violet E., heir), to University of California, The Regents of the. Zoysiagrass plant 'El Toro'. 5,845, 12-30-86, Cl. 88.000.

Youngner, Violet E., heir. *See*—
Youngner, Victor B., deceased, 5,845, Cl. 88.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 30, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

56 4,631,752
85 4,631,753
104 4,631,754
239 4,631,755
243 R 4,631,756
402 4,631,757
424 4,631,758

CLASS 4

252 R 4,631,759
300 4,631,760

CLASS 5

81 R 4,631,761
90 4,631,762
149 4,631,763
150 B 4,631,764
417 4,631,765
431 4,631,766
449 4,631,767
464 4,631,768

CLASS 7

151 4,631,769
167 4,631,770

CLASS 8

158 4,631,771

CLASS 14

20 4,631,772

CLASS 15

4 4,631,773
257.1 4,631,774
385 4,631,775

CLASS 16

82 4,631,776
315 4,631,777
337 4,631,778

CLASS 17

1 B 4,631,779
21 4,631,780
33 Re.32,315

CLASS 19

200 4,631,781

CLASS 24

16 PB 4,631,782
4,631,783
170 4,631,784
232 R 4,631,785
460 4,631,786
616 4,631,787

CLASS 26

25 4,631,788

CLASS 28

107 4,631,789
255 4,631,790
271 4,631,791

CLASS 29

129 4,631,792
132 4,631,793
4,631,794
243.52 4,631,795
446 4,631,796
447 4,631,797
458 4,631,798
558 4,631,799
564.6 4,631,800
572 4,631,801
576 E 4,631,802
576 W 4,631,803
4,631,804
588 4,631,805
589 4,631,806
598 4,631,807
599 4,631,808
607 4,631,809
623.5 4,631,810
705 4,631,811
714 4,631,812
727 4,631,813
736 4,631,814
739 4,631,815
740 4,631,816
747 4,631,817
768 4,631,818
840 4,631,819
4,631,820
845 4,631,821
861 4,631,822
867 4,631,823
884 4,631,824

CLASS 30

43.92 4,631,825
207 4,631,826
272 A 4,631,827
276 4,631,828
294 4,631,829

CLASS 33

125 R 4,631,830
169 B 4,631,831
203.14 4,631,832
408 4,631,833
503 4,631,834
536 4,631,835

CLASS 34

2 4,631,836
9 4,631,837
57 A 4,631,838

CLASS 36

50 4,631,839
4,631,840
91 4,631,841
103 4,631,842
119 4,631,843

CLASS 37

58 4,631,844

CLASS 40

2 R 4,631,845
380 4,631,846
407 4,631,847
427 4,631,848
610 4,631,849

CLASS 43

4 4,631,850
7 4,631,851
19 4,631,852
23 4,631,853
42.34 4,631,854
53.5 4,631,855
57.1 4,631,856
132.1 4,631,857
134 4,631,858

CLASS 44

57 4,632,674
72 4,632,675

CLASS 47

41.1 4,631,859
58 4,631,860
70 4,631,861

CLASS 49

56 4,631,862
141 4,631,863
352 4,631,864
374 4,631,865
504 4,631,866

CLASS 51

2 R 4,631,867
128 4,631,868
165.71 4,631,869
4,631,870
439 4,631,871

CLASS 52

1 4,631,872
2 4,631,873
8 4,631,874
12 4,631,875
27 4,631,876
70 4,631,877
90 4,631,878
98 4,631,879
105 4,631,880
220 4,631,881
222 4,631,882
223 R 4,631,883
235 4,631,884
405 4,631,885
410 4,631,886
4,631,887
509 4,631,888
565 4,631,889
570 4,631,890
588 4,631,891
725 4,631,892
745 4,631,893
823 4,631,894

CLASS 53

207 4,631,895
397 4,631,896
399 4,631,897
4,631,898
433 4,631,899
448 4,631,900
455 4,631,901
461 4,631,902
466 4,631,903
529 4,631,904
554 4,631,905

CLASS 54

8 4,631,906

CLASS 55

50 4,632,676
158 4,632,677
180 4,632,678
284 4,632,679
302 4,632,680
493 4,632,681
498 4,632,682
523 4,632,683

CLASS 56

11.9 4,631,907
50 4,631,908
202 4,631,909
505 4,631,910

CLASS 57

1 UN 4,631,911
279 4,631,912

CLASS 60

39.05 4,631,914
39.12 4,631,915
245 4,631,916
293 4,631,917
372 4,631,918
413 4,631,919
421 4,631,920
501 4,631,921
518 4,631,922
530 4,631,923
562 4,631,924
688 4,631,925
727 4,631,913

CLASS 62

115 4,631,926
280 4,631,927
514 JT 4,631,928

CLASS 63

13 4,631,929

CLASS 65

2 4,632,684
9 4,632,685
18.1 4,632,686
27 4,632,687
29 4,632,688
78 4,632,689
134 4,632,690
135 Re.32,317
273 4,632,691

CLASS 66

1 R 4,631,930
83 4,631,931
192 4,631,932
4,631,933

CLASS 68

23 R 4,631,934

CLASS 70

1.5 4,631,935
167 4,631,936
207 4,631,937
209 4,631,938
276 4,631,939
332 4,631,940
337 4,631,941
368 4,631,942
395 4,631,943
472 4,631,944

CLASS 71

10 4,632,692
93 4,632,693
4,632,694
4,632,695
94 4,632,696
4,632,697
106 4,632,698
115 Re.32,316

CLASS 72

43 4,631,945
68 4,631,946
88 4,631,947
242 4,631,948
270 4,631,949
356 4,631,950

CLASS 73

3 4,631,951
23 4,631,952
49.5 4,631,953
151 4,631,954
158 4,631,955
170 A 4,631,956
170 R 4,631,957
189 4,631,958
4,631,959
384 4,631,960
585 4,631,962
594 4,631,963
4,631,964
602 4,631,965
861.12 4,631,969
861.25 4,631,967
863.03 4,631,966
864.32 4,631,968
866.5 4,631,961

CLASS 74

44 4,631,970
84 R 4,631,971
113 4,631,972
439 4,631,973
450 4,631,974
473 R 4,631,975
552 4,631,976
606 A 4,631,977
710.5 4,631,978
730 4,631,979
4,631,980
813 R 4,631,981
869 4,631,982
877 4,631,983
878 4,631,984

CLASS 75

0.5 B 4,632,699
10.14 4,632,700
118 R 4,632,701
228 4,632,702

CLASS 81

44 4,631,985
53.2 4,631,986
57.14 4,631,987
62 4,631,988
4,631,989
4,631,990
90.1 4,631,991
470 4,631,992

CLASS 82

1 C 4,631,993
36 R 4,631,994
39 4,631,995

CLASS 83

23 4,631,996
29 4,631,997
145 4,631,998
471.2 4,631,999
534 4,632,000

CLASS 84

1.01 4,632,001
1.16 4,632,002
4,632,003
313 4,632,004
4,632,005
422 S 4,632,006
487 4,632,007

CLASS 86

24 4,632,008
31 4,632,009

CLASS 89

1.51 4,632,010
36.13 4,632,011
41.09 4,632,012

CLASS 91

7 4,632,013
369 A 4,632,014
376 R 4,632,015
461 4,632,016
481 4,632,017

CLASS 92

5 R 4,632,018

CLASS 98

1 4,632,019
31.6 4,632,020
40.3 4,632,021
115.3 4,632,022

CLASS 99

293 4,632,024
302 P 4,632,023
348 4,632,025
349 4,632,026
485 4,632,027

CLASS 101

40 4,632,028
348 4,632,029
425 4,632,030

CLASS 102

200 4,632,031
206 4,632,032
252 4,632,033
312 4,632,034
420 4,632,035
476 4,632,036

CLASS 104

7.2 4,632,037
120 4,632,038

CLASS 105

801 4,632,039

CLASS 106

22 4,632,703
38.22 Re.32,318
288 Q 4,632,704

CLASS 108

157 4,632,040

CLASS 109

1 S 4,632,041

CLASS 110

243 4,632,042
345 4,632,043

CLASS 111

7 4,632,044

CLASS 112

104 4,632,045
121.14 4,632,046
121.27 4,632,047
262.1 4,632,048

CLASS 114

150 4,632,049
255 4,632,050
311 4,632,051

CLASS 116

70 4,632,052

CLASS 118

66 4,632,053
657 4,632,054
703 4,632,055
712 4,632,056
719 4,632,057
725 4,632,058
727 4,632,059
730 4,632,060

CLASS 119

51 R 4,632,061
4,632,062
98 4,632,063

CLASS 122

1 A 4,632,064
13 R 4,632,065
4,632,066
34 4,632,068

CLASS 123

25 A 4,632,067
41.15 4,632,069
41.58 4,632,070
41.86 4,632,071
56 R 4,632,072
73 AD 4,632,085
90.27 4,632,073
90.39 4,632,074
90.58 4,632,075
145 A 4,632,076
146.5 A 4,632,077
4,632,078
179 B 4,632,079
196 S 4,632,080
198 F 4,632,081
325 4,632,082
527 4,632,083
556 4,632,084

CLASS 124

6 4,632,086
41 A 4,632,087
78 4,632,088

CLASS 126

25 R 4,632,089
110 R 4,632,090
425 4,632,091
440 4,632,092

CLASS 128

12 4,632,093
52 4,632,094
67 4,632,095
80 C 4,632,097
4,632,098
80 F 4,632,096
87 B 4,632,099
92 4,632,100
92 VY 4,632,102
92 YW 4,632,101
157 4,632,103
163 4,632,104
165 4,632,105
4,632,106
204.24 4,632,107
207.14 4,632,108
303 R 4,632,110
4,632,111
303.14 4,632,109
305.3 4,632,112
335.5 4,632,113
346 4,632,114
370 4,632,115
419 R 4,632,116
421 4,632,117
477 4,632,118
632 4,632,119
639 4,632,120
4,632,121
644 4,632,122
659 4,632,123
660 4,632,124
692 4,632,125
732 4,632,126
804 4,632,127
4,632,128

CLASS 131

70 4,632,129
84.3 4,632,130
355 4,632,131

CLASS 132

7 4,632,132
33 G 4,632,133
73 4,632,134
85 4,632,135
88.7 4,632,136

CLASS 134

3 4,632,705

CLASS 135

20 R 4,632,137
109 4,632,138

CLASS 136

205 4,633,029
246 4,633,030
249 4,633,031
251 4,633,032
256 4,633,033
4,633,034

CLASS 137

172 4,632,139
315 4,632,140
327 4,632,141
437 4,632,142
488 4,632,143
505.25 4,632,144
516.21 4,632,145
539.5 4,632,146
563 4,632,147
624.18 4,632,148
625.15 4,632,149
625.46 4,632,150
854 4,632,151

CLASS 139

448 4,632,152
449 4,632,153
452 4,632,154
4,632,155

CLASS 140

92.1 4,632,156

CLASS 141

38 4,632,157

CLASS 144

34 E 4,632,158
85 4,632,159
136 R 4,632,160
213 4,632,161
229 4,632,162
336 4,632,163
341 4,632,164
371 4,632,165

CLASS 148

6.15 R 4,632,706
16.5 4,632,707
113 4,632,708
171 4,632,709
175 4,632,710
4,632,711
4,632,712
188 4,632,713

CLASS 149

2 4,632,714
19.5 4,632,715

CLASS 152

209 R 4,632,166

CLASS 156

148 4,632,716
245 4,632,717
345 4,632,719
352 4,632,718
429 4,632,720
458 4,632,721
555 4,632,722
617 R 4,632,723
626 4,632,724
643 4,632,725
644 4,632,726
656 4,632,727
659.1 4,632,728

CLASS 157

1 28 4,632,167

CLASS 162

17 4,632,729
111 4,632,730

CLASS 164

33 4,632,168
45 4,632,169
250.1 4,632,170
255 4,632,171
301 4,632,172
417 4,632,173
421 4,632,174
426 4,632,175
481 4,632,176

CLASS 165

12 4,632,177
39 4,632,178
47 4,632,179
70 4,632,180
158 4,632,181
173 4,632,182

CLASS 166

77 4,632,183
105.5 4,632,184
273 4,632,185
293 4,632,186
323 4,632,187
368 4,632,188

CLASS 172

19 4,632,192
22 4,632,189

CLASS 173

133 4,632,190

CLASS 174

68.5 4,633,035

CLASS 175

19 4,632,191
65 4,632,193
217 4,632,194
320 4,632,195
325 4,632,468
329 4,632,196

CLASS 177

163 4,632,197
211 4,632,198
238 4,632,199

CLASS 178

22.11 4,633,036
22.14 4,633,037

CLASS 180

53.7 4,632,200
68.5 4,632,201
70.1 4,632,202
73.3 4,632,203
142 4,632,204
165 4,632,205
229 4,632,206
247 4,632,207
271 4,632,208
287 4,632,209
309 4,632,210
312 4,632,211

CLASS 181

106 4,632,212
4,632,213
114 4,632,215
120 4,632,214
255 4,632,216

CLASS 182

3 4,632,217
5 4,632,218
45 4,632,219
111 4,632,220
179 4,632,221
4,632,222

CLASS 184

6.1 4,632,223

CLASS 187

29 R 4,632,224

CLASS 188

24.18 4,632,225
65.1 4,632,226
73.32 4,632,227
196 D 4,632,229
282 4,632,228

CLASS 192

0.033 4,632,230
0.076 4,632,231
0.096 4,632,232
3.3 4,632,233
3.58 4,632,234
70.27 4,632,235
84 C 4,632,236
98 4,632,237

CLASS 198

365 4,632,238
735 4,632,239

CLASS 200

50 R 4,633,047
51.1 4,633,048
82 B Re.32,321
148 A 4,633,049
268 4,633,050

CLASS 201

4 4,632,731

CLASS 204

1 T 4,632,732
28 4,632,733
32.1 4,632,734
37.6 4,632,735
59 M 4,632,736
98 4,632,737
107 4,632,738
128 4,632,739
129.46 4,632,740
157.73 4,632,741
158.21 4,632,742
183.3 4,632,743
206 4,632,744
301 4,632,745
415 4,632,746

CLASS 206

15.2 4,632,240
44 B 4,632,241
45.34 4,632,242
219 4,632,243
4,632,244
292 4,632,301
315.1 4,632,245
328 4,632,246
343 4,632,247
387 4,632,248
390 B1 4,281,762
431 4,632,249
524.2 4,632,250
577 4,632,251

CLASS 208

18 4,632,747
120 4,632,748
4,632,749

CLASS 209

166 4,632,750
326 4,632,751
546 4,632,252
570 4,632,253
592 4,632,254

CLASS 210

173 4,632,752
232 4,632,753
257.2 4,632,754
314 4,632,755
323.2 4,632,756
411 4,632,757
603 4,632,758
4,632,759
642 4,632,760
650 4,632,761
657 4,632,762
670 4,632,763
702 4,632,764
717 4,632,765
752 4,632,766

CLASS 211

1.3 4,632,255
50 4,632,256
59.2 4,632,257
70.6 4,632,258
119 4,632,259
189 4,632,260

CLASS 212

175 4,632,261
189 4,632,262

CLASS 215

11 R 4,632,263
220 4,632,264
232 4,632,265
235 4,632,266
253 4,632,267

CLASS 219

10.49 R 4,633,051
10.55 E 4,633,052
69 E 4,633,053
118 4,633,054
121 ED 4,633,056
121 LC 4,633,057
121 LK 4,633,058
121 PC 4,633,055
124.22 4,633,059
130.01 4,633,060
202 4,633,061
212 4,633,062
243 4,633,063
270 4,633,064
400 4,633,065
437 4,633,066
483 4,633,067
543 4,633,068
553 4,633,069

CLASS 220

1 C 4,632,268
3.8 4,632,269
86 R 4,632,270
258 4,632,271
324 4,632,272
411 4,632,273

CLASS 221

96 4,632,274

CLASS 222

25 4,632,275
58 B1 4,248,359
80 4,632,276
146.2 4,632,277
146.5 4,632,278
4,632,279
275 4,632,280
389 4,632,281
529 4,632,282
600 4,632,283
615 4,632,284

CLASS 223

88 4,632,285
4,632,286
98 4,632,287

CLASS 224

42.12 4,632,288
314 4,632,289

CLASS 227

19 4,632,290

CLASS 228

9 4,632,291
107 4,632,292
119 4,632,293
4,632,294
123 4,632,295
157 4,632,296
222 4,632,297

CLASS 229

5.5 4,632,298
7 R 4,632,299
15 4,632,300
171 4,632,302

CLASS 235

88 M 4,633,070
487 4,633,071

CLASS 236

10 4,632,303
46 R 4,632,304
92 B 4,632,305

CLASS 237

12.3 C 4,632,306

CLASS 238

265 4,632,307
4,632,308

CLASS 239

8 4,632,309
43 4,632,310
101 4,632,311
184 4,632,494
230 4,632,312
242 4,632,313
433 4,632,314

CLASS 241

26 4,632,315
4,632,316
30 4,632,317
37 4,632,318
37.5 4,632,319
46.17 4,632,320
62 4,632,321
169.1 4,632,322
247 4,632,323

CLASS 242

47.01 4,632,324
55 4,632,325
55.3 4,632,326
56 R 4,632,327
72 B 4,632,328
86.52 4,632,329
107.4 A 4,632,331
107.4 D 4,632,330
118.3 4,632,332
186 4,632,333
199 4,632,334
200 4,632,335

CLASS 244

3.22 4,632,336
17.19 4,632,337
137 A 4,632,338
158 R 4,632,339
198 4,632,340
230 4,632,341

CLASS 248

48.2 4,632,342
73 4,632,343
165 4,632,344
174 4,632,345
176 4,632,346
213.2 4,632,347
222.1 4,632,348
281.1 4,632,349
295.1 4,632,350
309.2 4,632,351
313 4,632,352
396 4,632,353
539 4,632,354
584 4,632,355
638 4,632,356

CLASS 249

58 4,632,357

CLASS 250

201 4,633,072
4,633,073
4,633,074
4,633,075
213 VT 4,633,076
214 L 4,633,077
216 4,633,078
227 4,633,079
233 4,633,080
239 4,633,081
282 4,633,082
4,633,083
306 4,633,084
311 4,633,085
338 4,633,086
341 4,633,087
369 4,633,088
374 4,633,089
492.2 4,633,090
506.1 4,633,091
578 4,633,092

CLASS 251

117 4,632,358
126 4,632,359
175 4,632,360
230 4,632,361
310 4,632,362

CLASS 252

8.8 4,632,767
4,632,768
32.7 E 4,632,771
48.6 4,632,769
49.5 4,632,770
106 4,632,772
301.35 4,632,773
373 4,632,774
502 4,632,775
511 4,632,777
518 4,632,776
629 4,632,778
4,632,779

CLASS 254

309 4,632,363
405 4,632,364

CLASS 260

380 4,632,781
394 4,632,783
396 R 4,632,782
397.2 4,632,784
501.15 4,632,785
512 C 4,632,786

CLASS 261

30 4,632,787
41.5 4,632,788
63 4,632,789

CLASS 264

36 4,632,790
40.1 4,632,791
45.2 4,632,792
58 4,632,793
87 4,632,794
115 4,632,795
253 4,632,796
260 4,632,797
272.17 4,632,798
292 4,632,799
298 4,632,800
566 4,632,801

CLASS 266

48 4,632,365
87 4,632,366
220 4,632,367
229 4,632,368
262 4,632,369

CLASS 267

8 R 4,632,370
64.28 4,632,371
140.1 4,632,372

CLASS 269

50 4,632,373
261 4,632,374
262 4,632,375

CLASS 271

4 4,632,376
9 4,632,377
127 4,632,379
4,632,380
202 4,632,378
270 4,632,381
273 4,632,382

CLASS 272

67 4,632,383
68 4,632,384
70 4,632,385
73 4,632,386
116 4,632,387
118 4,632,388
119 4,632,389
120 4,632,390
128 4,632,391
4,632,392
134 4,632,393

CLASS 273

26 E 4,632,394
55 B 4,632,395
63 A 4,632,396
145 CA 4,632,397
148 B 4,632,398
155 4,632,399
164 4,632,400

CLASS 277

11 4,632,401
15 4,632,402
27 4,632,403
68 4,632,404
150 4,632,405
188 A 4,632,406

CLASS 279

121 4,632,407

CLASS 280

12 K 4,632,408
30 4,632,409
32.5 4,632,410
33.99 R 4,632,411
47.26 4,632,412
112 A 4,632,413
246 4,632,414
279 4,632,415
289 G 4,632,416
411 C 4,632,417
603 4,632,418
614 4,632,419
642 4,632,420
4,632,421
689 4,632,422
4,632,423
797 4,632,424
801 4,632,425
808 4,632,426

CLASS 282

11.5 R 4,632,427

CLASS 283

76 4,632,428
91 4,632,429
4,632,430

CLASS 285

13 4,632,431
24 4,632,432
38 4,632,433
39 4,632,434
243 4,632,435
305 4,632,436
310 4,632,437

CLASS 290

40 R 4,633,093

CLASS 292

87 4,632,438
166 4,632,439
229 4,632,440

CLASS 294

1.1 4,632,441
16 4,632,442
82.34 4,632,443
86.4 4,632,444

CLASS 295

1 4,632,445

CLASS 296

37.6 4,632,446
153 4,632,447
218 4,632,448
222 4,632,449

CLASS 297

84 4,632,450
153 4,632,451
232 4,632,452
243 4,632,453
284 4,632,454
326 4,632,455
328 4,632,456
335 4,632,457

353 4,632,458
440 4,632,459
467 4,632,460

CLASS 298

2 4,632,461

CLASS 299

12 4,632,462
91 4,632,463

CLASS 301

11 R 4,632,464
108 S 4,632,465

CLASS 303

7 4,632,466
111 4,632,467

CLASS 307

140 4,633,094
255 4,633,095
268 4,633,096
269 4,633,097
279 4,633,098
308 4,633,099
315 4,633,100
353 4,633,101
354 4,633,102
426 4,633,103
454 4,633,104
482 4,633,105
578 4,633,106
594 4,633,107

CLASS 310

12 4,633,108
68 R 4,633,109
71 4,633,110
80 4,633,111
90 4,633,112
156 4,633,113
194 4,633,114
213 4,633,115
214 4,633,116
313 B 4,633,117
325 4,633,119
328 4,633,118
4,633,120
332 4,633,121
339 4,633,122
4,633,123
348 4,633,124

CLASS 312

114 4,632,469
214 4,632,470
233 4,632,471
246 4,632,472
257 SK 4,632,473
305 4,632,474

CLASS 313

62 4,633,125
112 4,633,127
113 4,633,126
4,633,128
153 4,633,129
417 4,633,130
474 4,633,131
477 R 4,633,132
489 4,633,133
497 4,633,134
594 4,633,135
623 4,633,136
636 4,633,137

CLASS 315

111.81 4,633,138
169.4 4,633,139
248 4,633,140
307 4,633,141
365 4,633,142
368 4,633,143
382 4,633,144
383 4,633,145
395 4,633,146

CLASS 318

52 4,633,147
135 4,633,148
254 4,633,149
4,633,150
4,633,151
257 4,633,152
280 4,633,153
373 4,633,154
640 4,633,155
696 4,633,156
723 4,633,157
4,633,158

CLASS 320

39 4,633,159

CLASS 322

20 4,633,160

CLASS 323

242 4,633,161
275 4,633,162
277 4,633,163
312 4,633,164
314 4,633,165
315 4,633,166

CLASS 324

51 4,633,167
60 CD 4,633,168
71.1 4,633,169
72 B1 4,115,732
77 K 4,633,170
4,633,171
126 4,633,172
130 4,633,173
143 4,633,174
156 F 4,633,175
158 P 4,633,176
220 4,633,177
309 4,633,178
4,633,179
316 4,633,180
322 4,633,181
335 4,633,182

CLASS 328

14 4,633,183
55 4,633,184
56 4,633,185
119 4,633,186

CLASS 329

50 4,633,187

CLASS 330

51 4,633,188
97 4,633,189
149 4,633,190
275 4,633,191
277 4,633,192

CLASS 331

1 A 4,633,193
25 4,633,194
117 R 4,633,195

CLASS 332

11 D 4,633,196
16 T 4,633,197
22 4,633,198

CLASS 333

1.1 4,633,199
28 R 4,633,200
106 4,633,201
109 4,633,202
161 4,633,203
186 4,633,204
219 4,633,205

CLASS 334

47 4,633,206

CLASS 335

16 4,633,207
210 4,633,208
261 4,633,209

CLASS 337

101 4,633,210
338 4,633,211

CLASS 338

2 4,633,212

CLASS 339

4 4,632,475
14 R 4,632,476
4,632,477
17 LC 4,632,478
36 4,632,479
45 M 4,632,480
46 4,632,481
59 M 4,632,482
74 R 4,632,483
75 M 4,632,485
75 MP 4,632,484
99 R 4,632,486
103 B 4,632,487
103 R 4,632,488
4,632,489
154 L 4,632,490
164 M 4,632,491
176 M 4,632,492
4,632,493
210 M 4,632,495
256 S 4,632,496
263 R 4,632,497

CLASS 340

60 4,633,213
73 4,633,214
84 4,633,215
134 4,633,216
310 A 4,633,217
4,633,218
347 AD 4,633,219
4,633,226
347 C 4,633,225
347 CC 4,633,223
347 DD 4,633,220
347 NT 4,633,221
347 P 4,633,224
347 SH 4,633,222
365 E 4,633,228
365 VL 4,633,227
391 4,633,229
521 4,633,230
539 4,633,231
542 4,633,232
550 4,633,233
566 4,633,234
568 4,633,235
569 4,633,236
573 4,633,237
593 4,633,238
636 4,633,239
638 4,633,240
645 4,633,241
719 4,633,242
732 4,633,243
736 4,633,244
825.03 4,633,245
825.05 4,633,246
825.69 4,633,247
853 4,633,248
870.37 4,633,249

CLASS 342

27 4,633,250
44 4,633,251
91 4,633,254
99 4,633,252
162 4,633,253
192 4,633,255
368 4,633,256
373 4,633,258
4,633,259
389 4,633,260
430 4,633,261
445 4,633,257

CLASS 343

700 MS 4,633,262
706 4,633,263
786 4,633,264
797 4,633,265
903 4,633,266

CLASS 346

1.1 4,633,267
49 4,633,270
75 4,633,268
76 PH 4,633,269
107 R 4,633,271
108 4,633,272
135.1 4,633,273
140 R 4,633,274
4,633,275
200 4,633,276
216 4,633,277

CLASS 350

1.2 4,632,498
6.2 4,632,499
6.5 4,632,500
6.6 4,632,501
4,632,502
6.8 4,632,503
96.20 4,632,504
96.21 4,632,505
96.23 4,632,506
4,632,507
96.24 B1 3,923,372
174 4,632,508
257 4,632,510
276 R 4,632,511
283 4,632,509
316 4,632,512
320 4,632,513
339 F 4,632,514
350 R 4,632,515
357 4,632,516
362 4,632,517
385 4,632,518
427 4,632,519
446 4,632,520
505 4,632,521
570 4,632,522
611 4,632,523
613 4,632,524
634 4,632,525

CLASS 351

124 4,632,526
166 4,632,527
211 4,632,528
214 B1 4,102,565

CLASS 353

122 4,632,529

CLASS 354

173.11 4,632,530
200 4,632,531
403 4,632,532
481 4,632,542

CLASS 355

3 DD 4,632,534
4,632,535
3 R 4,632,535
3 SH 4,632,533
14 D 4,632,537
14 R 4,632,538
30 4,632,539
68 4,632,540
79 4,632,541

CLASS 356

5 4,632,543
28.5 4,632,548
73.1 4,632,544
121 4,632,545
237 4,632,546
247 4,632,547
300 4,632,549
311 4,632,550
345 4,632,551
4,632,552
346 4,632,553
349 4,632,554
350 4,632,555
351 4,632,556
401 4,632,557
404 4,632,558
416 4,632,559
431 4,632,560
432 4,632,561
436 4,632,562
437 4,632,563

CLASS 357

6 4,633,278
16 4,633,279
17 4,633,280
22 4,633,281
4,633,282
23.13 4,633,283
23.7 4,633,284
26 4,633,285
30 4,633,286
4,633,287
38 4,633,288
42 4,633,289
4,633,290
51 4,633,291
53 4,633,292

CLASS 358

11 4,633,293
4,633,294
12 4,633,295
4,633,296
22 4,633,297
25 4,633,298
29 4,633,299
41 4,633,300
75 4,633,301
84 4,633,302
98 4,633,303
4,633,304
101 4,633,305
102 4,633,306
111 4,633,307
112 4,633,308
119 4,633,310
122 4,633,309
133 4,633,311
136 4,633,312
160 4,633,313
163 4,633,314
188 4,633,315
197 4,633,316
213 4,633,317
223 4,633,318
227 4,633,319
243 4,633,320
4,633,321
252 4,633,322
254 4,633,323
255 4,633,324
260 4,633,325
280 4,633,326
283 4,633,327
296 4,633,328
310 4,633,329
4,633,330

CLASS 360

7 4,633,331
10.3 4,633,332
31 4,633,333
33.1 4,633,334
35.1 4,633,335
45 4,633,336
57 4,633,337
59 4,633,338
69 4,633,340
73 4,633,341
75 4,633,342
76 4,633,343
77 4,633,344
4,633,345
78 4,633,346
90 4,633,347
96.5 4,633,348
97 4,633,349
98 4,633,350
102 4,633,351
104 4,633,352
105 4,633,353
132 4,633,354
4,633,355
133 4,633,356
136 4,633,357

CLASS 361

31 4,633,358
119 4,633,359
4,633,360
145 4,633,361
152 4,633,362
215 4,633,363
216 4,633,364
272 4,633,365
4,633,367
321 4,633,366
328 4,633,368
4,633,369
380 4,633,370
385 4,633,371
433 4,633,372
4,633,373

CLASS 362

17 4,633,374
35 4,633,375
62 4,633,376
309 4,633,377
353 4,633,378

CLASS 363

19 4,633,379
54 4,633,380
56 4,633,381
132 4,633,382

CLASS 364

167 4,633,383
184 4,633,384
4,633,405
191 4,633,385
200 4,633,386
4,633,387
4,633,388
4,633,389
4,633,390
4,633,391
4,633,392
4,633,393
4,633,394
4,633,406
403 4,633,395
405 4,633,396
406 4,633,397
414 4,633,398
421 4,633,399
4,633,400
4,633,401
4,633,402
431.05 4,633,403
433 4,633,404
450 4,633,407
474 4,633,408
4,633,409
481 4,633,410
4,633,411
493 4,633,412
500 4,633,413
513 4,633,414
521 4,633,415
4,633,416
550 4,633,417
554 4,633,418
559 4,633,419
563 4,633,420
569 4,633,421
571 4,633,422
4,633,423
4,633,424
724 4,633,426
822 4,633,427
825 4,633,425
841 4,633,428
900 4,633,430
4,633,431
4,633,432
4,633,433
4,633,434
4,633,435
4,633,436
4,633,437

CLASS 365

51 4,633,438
96 4,633,429
162 4,633,439
189 4,633,440
4,633,441
203 4,633,442
4,633,443
228 4,633,444
234 4,633,445

CLASS 366

75 4,632,564
113 4,632,565
149 4,632,566
276 4,632,567
337 4,632,568

CLASS 367

69 4,633,446
70 4,633,447
72 4,633,448
75 4,633,449

CLASS 368

35 4,632,569
107 4,632,570
203 4,632,571

CLASS 369

13 4,633,450
14 4,633,451
39 4,633,452
44 4,633,453
45 4,633,454
4,633,455
4,633,456
116 4,633,457
275 4,633,458

CLASS 370

13 4,633,459
32.1 4,633,046
58 4,633,460
4,633,461
85 4,633,462
95 4,633,463
111 4,633,464

CLASS 371

6 4,633,465
16 4,633,466
4,633,467
22 4,633,468
29 4,633,469
37 4,633,470
38 4,633,471
40 4,633,472
68 4,633,473

CLASS 372

19 4,633,474
25 4,633,475
45 4,633,476
46 4,633,477
83 4,633,478
107 4,633,479

CLASS 373

74 4,633,480
152 4,633,481

CLASS 374

37 4,632,572

CLASS 375

14 4,633,482
25 4,633,483
77 4,633,484
99 4,633,485
116 4,633,486
118 4,633,487
120 4,633,488
121 4,633,489
122 4,633,490

CLASS 376

216 4,632,802
238 4,632,803
444 4,632,804
446 4,632,805

CLASS 377

20 4,633,491

CLASS 378

119 4,633,492
168 4,633,493
205 4,633,494

CLASS 379

32 4,633,039
33 4,633,043
253 4,633,040
284 4,633,042
354 4,633,041
400 4,633,038

433 4,633,044

CLASS 381

3 4,633,495
4 4,633,496
10 4,633,497
23.1 4,633,498
43 4,633,499
51 4,633,500
100 4,633,501
155 4,633,045

CLASS 382

9 4,633,502
47 4,633,503
54 4,633,504
56 4,633,505
4,633,506
61 4,633,507

CLASS 383

95 4,633,508

CLASS 384

12 4,632,574
43 4,632,573
258 4,632,575
537 4,632,576

CLASS 400

56 4,632,577
91 4,632,578
121 4,632,579
124 4,632,580
187 4,632,581
232 4,632,582
248 4,632,583
356 4,632,584
613 4,632,585

CLASS 402

7 4,632,586

CLASS 403

16 4,632,588
24 4,632,589
30 4,632,590
227 4,632,591
285 4,632,592
316 4,632,593
322 4,632,594
330 4,632,595
345 4,632,596
351 4,632,597

CLASS 404

6 4,632,598
24 4,632,599

CLASS 405

30 4,632,600
128 4,632,601
4,632,602
210 4,632,603
217 4,632,604
259 4,632,605

CLASS 407

104 4,632,606
113 4,632,607
114 4,632,608

CLASS 408

197 4,632,609
204 4,632,610
205 4,632,611

CLASS 409

231 4,632,612
233 4,632,613
4,632,614
235 4,632,615

CLASS 411

480 4,632,616

CLASS 414

10 4,632,617
22 4,632,618
24.6 4,632,619
95 4,632,620
118 4,632,621
139 4,632,622
148 4,632,623
217 4,632,624
429 4,632,625
476 4,632,626
490 4,632,627
513 4,632,628
563 4,632,629
700 4,632,630
736 4,632,631
744 A 4,632,632
787 4,632,633

CLASS 415

14 4,632,635
139 4,632,634

CLASS 416

41 4,632,637
223 R 4,632,636

CLASS 417

151 4,632,649
218 4,632,638
223 4,632,639
269 4,632,640
273 4,632,641
363 4,632,642
367 4,632,643
415 4,632,644
417 4,632,645
477 4,632,646
498 4,632,647
502 4,632,648

CLASS 418

95 4,632,650
117 B1 3,423,017

CLASS 420

479 4,632,806

CLASS 422

68 4,632,807
72 4,632,808
202 4,632,587
254 4,632,809

CLASS 423

242 4,632,810
306 4,632,811
309 4,632,812
310 4,632,813
321 R 4,632,814
328 4,632,815
347 4,632,816
445 Re.32,319
446 4,632,817
574 R 4,632,818
4,632,819

CLASS 424

1.1 4,632,820
15 4,632,821
4,632,822
4,632,823
49 4,632,824
52 4,632,825
4,632,826
78 4,632,827
80 4,632,828
84 4,632,829
92 4,632,830

CLASS 425

135 4,632,651
137 4,632,652
149 4,632,653
150 4,632,654
186 4,632,655
529 4,632,656
556 4,632,657

CLASS 426

3 4,632,831
96 4,632,832
242 4,632,833
262 4,632,834
302 4,632,835
4,632,836
425 4,632,837
441 4,632,838
573 4,632,839
602 4,632,840
604 4,632,841

CLASS 427

2 4,632,842
3 4,632,843
38 4,632,844
96 4,632,845
4,632,846
154 4,632,847
4,632,848
215 4,632,849
356 4,632,850
435 4,632,851
437 4,632,852

CLASS 428

34 4,632,853
36 4,632,854
4,632,855
116 4,632,862
172 4,632,856
209 4,632,857
225 4,632,863
265 4,632,864
287 4,632,858
288 4,632,859
290 4,632,860
296 4,632,861
304.4 4,632,865
315.5 4,632,869
323 4,632,867
328 4,632,866
4,632,868
329 4,632,870
336 4,632,871
350 4,632,872
364 4,632,873
394 4,632,874
402.22 4,632,875
404 4,632,876
409 4,632,877
423.1 B1 4,131,716
425.9 4,632,878
522 4,632,879
523 4,632,880
530 Re.32,320
541 4,632,881
558 4,632,882
611 4,632,883
642 4,632,884
654 4,632,885
698 4,632,886

CLASS 429

181 4,632,887
187 4,632,888
218 4,632,889
4,632,890

CLASS 430

18 4,632,891
58 4,632,892
4,632,893
84 4,632,894
201 4,632,895
249 4,632,896
260 4,632,897
292 4,632,899
313 4,632,898
323 4,632,900

CLASS 431

208 4,632,658

CLASS 433

181 4,632,659
215 4,632,660

CLASS 434

188 4,632,661

CLASS 435

5 4,632,901
29 4,632,902
69 4,632,903
176 4,632,904
189 4,632,905
282 4,632,906

CLASS 436

10 4,632,907
157 4,632,908
542 4,632,909

CLASS 440

52 4,632,662

CLASS 441

5 4,632,663

CLASS 446

2 4,632,664

CLASS 455

33 4,633,509
69 4,633,510
86 4,633,511
108 4,633,512
131 4,633,513
151 4,633,514
166 4,633,515
226 4,633,516
228 4,633,517
242 4,633,518
277 4,633,519
319 4,633,520
345 4,633,521
603 4,633,522
608 4,633,523
612 4,633,524
613 4,633,525

CLASS 474

205 4,632,665

CLASS 493

23 4,632,666
187 4,632,667

CLASS 501

97 4,632,910

CLASS 502

62 4,632,911
122 4,632,912
202 4,632,913
209 4,632,915
4,632,916
211 4,632,914

CLASS 514

54 4,632,917
158 4,632,919
4,632,920
163 4,632,921
202 4,632,918
236 4,632,922
247 4,632,923
255 4,632,924
256 4,632,925
259 4,632,926
272 4,632,927
288 4,632,928
317 4,632,929
365 4,632,930
382 4,632,931
383 4,632,932
399 4,632,933
4,632,934
429 4,632,935
465 4,632,936
470 4,632,937
594 4,632,938
619 4,632,939
648 4,632,940

CLASS 518

714 4,632,941

CLASS 521

92 4,632,942
129 4,632,943

CLASS 522

11 4,632,944

CLASS 523

176 4,632,945
179 4,632,946
206 4,632,947
219 4,632,948

CLASS 524

94 4,632,949
202 4,632,950
204 4,632,951
217 4,632,952
239 4,632,953
240 4,632,954
275 4,632,955
359 4,632,956
373 B1 3,962,164
548 4,632,957
574 4,632,958

CLASS 525

67 B1 4,367,310
70 4,632,959
117 4,632,960
162 4,632,961
282 4,632,962
332.3 4,632,963
456 4,632,964
484 4,632,965
502 4,632,966

CLASS 526

194 4,632,967
279 4,632,968
286 4,632,969

CLASS 528

27 4,632,970
88 4,632,971
96 4,632,972
98 4,632,973
170 4,632,974
354 4,632,975
497 4,632,976
502 4,632,977

CLASS 530

306 4,632,780
307 4,632,978
313 4,632,979
380 4,632,980
393 4,632,981

CLASS 534

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772 4,632,983

CLASS 536

50 4,632,984

CLASS 540

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85 4,632,986
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CLASS 548

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CLASS 549

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4,633,004

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014 4,633,007
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662 4,633,023
738 4,633,024
866 4,633,025

CLASS 570

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CLASS 585

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331 4,633,028

CLASS 604

8 4,632,668
118 4,632,669
174 4,632,670
4,632,671
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415 4,632,673

D2—	249	287,421		456	287,441	D9—	300	287,461			287,481
	314	287,422		461	287,442			287,462		183	287,482
	331	287,423		467	287,443		303	287,463		342	287,483
	512	287,420		474	287,444		346	287,464	D13—	11	287,484
D3—	35	287,425		480	287,445		390	287,465		28	287,485
		287,426		491	287,446		414	287,466		35	287,486
		287,427		534	287,447		415	287,467	D14—	53	287,487
	52	287,428		542	287,448		433	287,468			287,488
	76	287,429	D7—	5	287,449		435	287,469			287,489
D4—	116	287,430		70	287,450	D10—	30	287,470			287,490
	123	287,431			287,451		38	287,471			287,491
	138	287,432		106	287,452		39	287,472			287,492
D5—	53	287,433		152	287,453		57	287,473			287,493
D6—	336	287,434		319	287,454		69	287,474		60	287,494
		287,435		351	287,455		70	287,475			287,495
	367	287,436	D8—	24	287,456	D11—	130.1	287,476		65	287,496
	373	287,437		74	287,457	D12—	85	287,477		111	287,497
	380	287,438		308	287,458		129	287,478	D15—	9.2	287,498
	381	287,439		382	287,459		153	287,479		30	287,499
	407	287,440		388	287,460		181	287,480		139	287,500

	150	287,501		112	287,521						
D16—	10	287,502		134	287,522						
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D17—	20	287,504		176	287,524						
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D18—	2	287,506		197	287,526						
	7	287,507		222	287,527						
		287,508		237	287,528						
	22	287,509	D22—	112	287,529						
	34	287,510		113	287,530						
		287,511	D23—	14	287,531						
D19—	92	287,512		43	287,532						
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	82	287,517		124	287,537						
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	109	287,520	D32—	50	287,539						

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	88	5,845									

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41 : 4,631,778 4,631,804 4,631,812 4,631,815 4,631,823 4,631,867 4,631,932 4,631,945 4,631,961 4,631,969 4,632,003 4,632,038 4,632,040 4,632,068 4,632,113 4,632,115 4,632,120 4,632,162 4,632,175 4,632,246 4,632,251 4,632,329 4,632,367 4,632,428 4,632,469 4,632,486 4,632,494 4,632,495 4,632,517 4,632,565 4,632,592 4,632,648 4,632,687 4,632,702 4,632,705 4,632,707 4,632,750 4,632,758 4,632,815 4,632,818 4,632,833 4,632,851 4,632,911 4,632,927 4,632,949 4,632,957 4,632,958 4,632,964 4,632,975 4,632,985 4,633,022 4,633,054 4,633,055 4,633,076 4,633,091 4,633,114 4,633,122 4,633,123 4,633,130 4,633,421 4,633,455 4,633,513 4,131,716 4,632,875
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